OFFICIAL GAZETTE

UNITED STATES PATENT OFFICE

VOL 46 & 47

JAN THRU APR

1889

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OFFICIAL GAZETTE

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OF THE Match

UNITED STATES PATENT OFFICE.

VOLUME XLVI.

JANUARY 1 TO MARCH 26, INCLUSIVE,

1889.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

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ERRATA.

395,653, page 109, strike out all after number— title, drawing, and claims—and insert CANCELED.
396,033, page 230, in title, name of assignee, for "Christian J. Weniman" read *Christian J. Weinman.*
396,041, page 232, in title, name of assignee, for "Walter I. Kidd" read *Walter J. Kidd.*
396,204, page 287, in title, name of inventor, for "Anders Haggvist" read *Anders Haqqvist.*
396,206, page 289, first claim, line 2, for a "lever-fulcrum" read *lever fulcrumed.*
396,396, page 347, in title, name of inventor, for "Parker Fant" read *Parker Faut.*
396,605, page 409, in title, insert after residence of inventor, *assignor of one-half to Charles N. Harder.*
396,863, page 496, in title, residence of inventor, for "Albany, N. Y." read *Albany, Oregon.*
396,907, page 510, in title, residence of assignee, for "same place" read *San Francisco, Cal.*
396,957, page 524, strike out all after number—title, drawings, and claims—and insert CANCELED.
397,118, page 582, in title, for "Means for Operating Motive Power from Water and Air Currents" read *Means for Obtaining Motive Power from Water and Air Currents.*
397,174, page 598, in title, name of assignee, for "John Schuholy" read *John Schuholz.*
397,175, page 599, second claim, line 3, for "frames" read *planes.*
397,281, page 626, in title, names of inventors, for "Olaris Senstad" read *Olaus Senstad.*
397,523, page 707, in title, name of inventor, for "Almason J. Scofield" read *Almaron J. Scofield.*
397,811, page 791, claim, line 2, insert *friction or* before "toothed."
397,849, page 802, in title, for "administrator" read *executor.*
398,274, page 940, in title, residence of assignees, for "same place" read *Manchester, England.*
398,590, page 1039, in title, name of inventor, for "Carl E. Ehnborn" read *Carl E. Ehnbom.*
398,763, page 1092, in title, name of inventor, for "Owen T. Boker" read *Owen T. Baker.*
398,770, page 1094, in title, for "assignor" read *assignor of one-half.*
399,057, page 1185, in title, number of Belgian Patent, for "No. 76,612" read *No.* 76,712.
399,156, page 1222, claim 2, line 3, strike out "open-ended" and insert the same before "tube" in line 2.
399,164, page 1224, in title, for "Automatic Grain Weigher and Measurer" read *Automatic Grain Weigher and Register.*
399,552, page 1363, in title, date of English Patent, for "1870" read 1888.
399,623, page 1383, in title, names of assignees, for "Jacob Habermann" read *Joseph Habermann.*
400,404, page 1629, third claim, line 2, strike out "and" and insert a comma instead; line 3, strike out the dashes after "metal" and "mercury" and insert a comma after "bismuth;" fourth claim, line 2, strike out "and" after "lead" and insert a comma instead, and also insert a comma after "bismuth."

Page 449—Disbarment of Attorneys—for "John Lee Taylor" read *John Lu Taylor.*

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OFFICIAL GAZETTE

OF THE

UNITED STATES PATENT OFFICE.

JANUARY–MARCH, 1889.

THE OFFICIAL GAZETTE

OF THE

United States Patent Office.

[BY AUTHORITY OF CONGRESS.]

VOL. 46—NO. 1. TUESDAY, JANUARY 1, 1889. PRICE—$5 per year.

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Fraudulent Practices by Attorneys.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., April 18, 1883.

The attention of this Office having frequently been called to circulars and communications of persons pretending to have access to the records of this Bureau, and claiming to possess information of the pendency of applications for patents, notice is hereby given the public that all such persons in so advertising themselves are acting under false representations and are guilty of unprofessional conduct, and should not be entitled to credit.

The Office has also received information that certain attorneys disbarred from practice under section 487 of the Revised Statutes are continuing to prosecute applications for patents under the names of other persons.

Hereafter a list will be published in the OFFICIAL GAZETTE containing the names and addresses of all such persons, and the public warned against employing them or intrusting applications or interests to their charge.

BENTON J. HALL, *Commissioner.*

The Office has information that *Isaac S. McGehan, No.* 155 *Broadway, New York,* a disbarred attorney, has been practicing under the name of *Alexander Melhado.*

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of January 1, 1889.

Patents	376	No. 395,305 to No. 395,680, inclusive.
Designs	8	No. 18,830 to No. 18,837, inclusive.
Trade-Marks	20	No. 16,131 to No. 16,150, inclusive.
Labels	5	No. 5,780 to No. 5,784, inclusive.
Reissues	1	No. 10,978.
Total issue	410	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama			Nebraska	1	
Arkansas			Nevada		
California	17		New Hampshire	3	
Colorado	2		New Jersey	18	
Connecticut	12	2	New Mexico Terri'y		
Dakota Territory	1		New York	70	4
Delaware			North Carolina	1	
District of Columbia	8	1	Ohio	23	3
Florida			Oregon	1	
Georgia	1		Pennsylvania	37	2
Idaho Territory	1		Rhode Island	4	
Illinois	31	1	South Carolina		
Indian Territory	1		Tennessee	4	
Indiana	9		Texas	4	2
Iowa	5		Utah Territory		
Kansas	8		Vermont	1	
Kentucky	3		Virginia	1	
Louisiana	1		Washington Terri'y		
Maine	3		West Virginia	1	
Maryland	4	1	Wisconsin	6	
Massachusetts	32	4	Wyoming Terri'y		
Michigan	15	1	U. S. Army		
Minnesota	5	2	U. S. Navy		
Mississippi	1				
Missouri	9		Total to citizens of the United States	351	24
Montana Territory	2				

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Austria-Hungary			Germany	6	
Barbadoes			Ireland		1
Belgium			Italy	1	
Bermuda			Mexico		
Brazil			New Zealand		
Canada	4		Switzerland		
Canary Islands			Russia		
Columbia, U. S. of			Scotland	1	
Cuba			Sweden	1	
Denmark			Victoria	3	
Ecuador					
England	13		Total to citizens of foreign countries	38	1
France	5				

DESIGNS.

18,830.—WAGON-BODY.—*Henry C. Armstrong*, Providence, R. I. Application filed September 1, 1888. Serial No. 284,371. Term of patent 14 years.

18,831.—HEATING-STOVE.—*Otto Germer* and *Gustave H. Guenther*, Erie, Pa., assignors to *Block & Germer*, same place. Application filed September 10, 1888. Serial No. 285,081. Term of patent 7 years.

18,832.—RADIATOR.—*John Hopson, Jr.*, New London, Conn. Application filed August 31, 1888. Serial No. 284,269. Term of patent 7 years.

18,833.—CHAIR-BACK.—*Herman Matsen*, Bedford, Ohio. Application filed November 5, 1888. Serial No. 290,020. Term of patent 3½ years.

18,834.—HEATING-STOVE.—*Frank Merion* and *Michael Hertenstein*, Columbus, Ohio. Application filed July 11, 1888. Serial No. 279,666. Term of patent 3½ years.

18,835.—JAPANESE TEA-STAND.—*William T. Merserecau*, South Orange, N. J. Application filed October 11, 1888. Serial No. 287,855. Term of patent 3½ years.

18,836.—GLASS OINTMENT-POT.—*John Whitall Nicholson* and *Joshua W. Gaskill*, Philadelphia, Pa., assignors to *James Whitall*, *John M. Whitall*, and *John Whitall Nicholson*, same place, *John Micker*, Millville, N. J., *C. Albert Tatum*, New York, and *Francis M. Underhill*, Brooklyn, N. Y. Application filed November 15, 1888. Serial No. 290,941. Term of patent 14 years.

18,837.—HEATING-STOVE.—*John A. Price*, Scranton, Pa. Application filed June 9, 1888. Serial No. 276,656. Term of patent 14 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,131.—POTATO-PLANTERS AND POTATO-DIGGERS.—*Aspinwall Manufacturing Company*, Three Rivers, Mich. Application filed October 25, 1888. Used since March, 1884.

"The word 'ASPINWALL.'"

16,132.—TOILET AND LAUNDRY SOAP.—*Beaver & Co.*, Dayton, Ohio. Application filed November 27, 1888. Used since September 25, 1885.

"The words 'GRAND MA'B.'"

16,133.—BLUE DRILLINGS.—*Boott Cotton Mills*, Lowell, Mass. Application filed November 27, 1888. Used since 1873.

"The letter 'A' and an ornamental floral border surrounding it."

16,134.—HALTER, DOG, PICTURE, AND SIMILAR CHAINS FORMED FROM WIRE.—*The Bridgeport Chain Company*, West Stratford, Conn. Application filed October 15, 1888. Used since July 1, 1887.

"The word 'TRIUMPH.'"

16,135.—SASH, SAFETY, AND SIMILAR CHAINS FORMED FROM SHEET METAL.—*The Bridgeport Chain Company*, West Stratford, Conn. Application filed October 15, 1888. Used since June 1, 1888.

"The word 'MONARCH.'"

16,136.—DETERGENTS CONTAINING AMMONIA.—*Columbia Chemical Works*, Brooklyn, N. Y. Application filed September 25, 1888. Used since October 4, 1886.

"The word 'ZOMONIA.'"

16,137.—OARS, HANDSPIKES, AND CAPSTAN-BARS.—*De Grauw, Aymar & Co.*, New York, N. Y. Application filed September 22, 1888. Used since June 15, 1888.

"The representation or figure of a lion."

16,138.—ARTIFICIAL FERTILIZERS.—*Joshua Horner, Jr.*, Baltimore, Md. Application filed November 23, 1888. Used since November 20, 1888.

"The words 'BUTCHER HOUSE.'"

16,139.—ARTIFICIAL DIAMONDS.—*Edward Ernest Kipling*, New York, N. Y. Application filed October 30, 1888. Used since September 15, 1888.

"The words 'AUSTRALIAN PEBBLES.'"

16,140.—WHISKY.—*Kirker, Greer & Co.*, (*Limited*,) Belfast, county of Antrim, Ireland. Application filed May 16, 1888. Used since 1880.

"An artistic label printed in colors, at the top of which appears a series of representations of medals, and at the center the representation of a shamrock-leaf, with the words 'THE SHAMROCK WHISKY' arranged in a circle around it."

16,141.—CIGARS AND CIGARETTES.—*Earnest Kohlberg*, El Paso, Tex. Application filed November 14, 1888. Used since January 1, 1887.

"The words 'LA INTERNACIONAL' printed on a central shield-like piece with the representation of the Mexican flag at one and of the American flag at the other side."

16,142.—FRICTION PARLOR-MATCHES.—*The Miller Match Company*, Akron, Ohio. Application filed November 20, 1888. Used since November 10, 1888.

"The words 'THE BEE MATCH' and the representation of a bee."

16,143.—FRICTION PARLOR-MATCHES.—*The Miller Match Company*, Akron, Ohio. Application filed November 20, 1888. Used since November 10, 1888.

"The words 'THE MILLER MATCH' and the representation of a moth miller."

16,144.—SOAP.—*Minnesota Soap Company*, St. Paul, Minn. Application filed October 22, 1888. Used since October 1, 1888.

"The representation of a leach and a kettle of boiling soap."

16,145.—TABLE-SAUCE.—*William C. Nicholson*, Boston, Mass., administrator of *William Halford*, deceased. Application filed November 28, 1888. Used since January 1, 1872.

"The representation of a crown bearing the letters 'H. S. Co.' and a star placed above the same."

16,146.—LINIMENT FOR MAN OR BEAST.—*A. B. Richards Medicine Co.*, Sherman, Tex. Application filed July 20, 1888. Used since July 1, 1887.

"The word 'HUNT'S.'"

16,147.—HORSE-COVERS, LAP-DUSTERS, HORSE-BLANKETS, AND HOODS.—*W. B. Riley & Co.*, Philadelphia, Pa. Application filed September 8, 1888. Used since June 1, 1884.

"'RED STAR' expressed pictorially or in words."

16,148.—WHEAT-FLOUR.—*Sidle, Fletcher, Holmes Company*, Minneapolis, Minn. Application filed May 8, 1888. Used since January 6, 1880.

"The word 'PERSIAN.'"

16,149.—WORSTED, WOOLEN, AND PART-WOOLEN GOODS.—*M. T. Stevens & Sons*, North Andover, Mass. Application filed October 6, 1888. Used since 1866.

"The representation of a bobbin and shuttle produced upon a shield."

16,150.—DRYING HOUSES OR KILNS FOR DRYING LUMBER, BRICKS, &c.—*I. & M. Wolff & Coleman*, Chicago, Ill. Application filed November 8, 1888. Used since June 15, 1888.

"The words 'CHICAGO IRON CLAD DRY KILN.'"

LABELS.

5,780.—Title: "EUSTACHIAN SNUFF FOR CATARRH."—*Emma Angeline Derby*, Boston, Mass. Application filed December 7, 1888.

5,781.—Title: "CRYSTALIZED VEGETABLE COMBINATION (FOR A COMPOUND FOR PAINTING PURPOSES.)—*Charles D. Fenstemaker*, Philadelphia, Pa. Application filed October 19, 1888.

5,782.—Title: "WHITE'S GLOVE-FITTING READY-CUT WAIST LINING."—*Phillipp Grosefeld*, Washington, D. C. Application filed December 1, 1888.

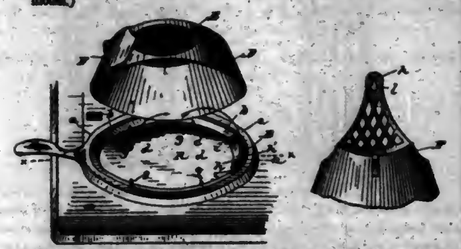
5,783.—Title: "MANAHAN'S DOUBLE STRENGTH PINE TAR OAKUM PAPER FOR PREVENTING MOTHS."—*Margaret E. Manahan*, New York, N. Y. Application filed December 7, 1888.

5,784.—Title: "OLIPHANT'S INVALUABLE RHEUMATIC REMEDY."—*Louis Oliphant*, Philadelphia, Pa. Application filed October 26, 1888.

PATENTS

GRANTED JAN. 1, 1889.

395,805. ODORLESS AND SMOKELESS GRIDDLE. ALEXANDER M. ARCH, Buffalo, N. Y. Filed Sept. 22, 1887. Serial No. 250,458. (No model.)

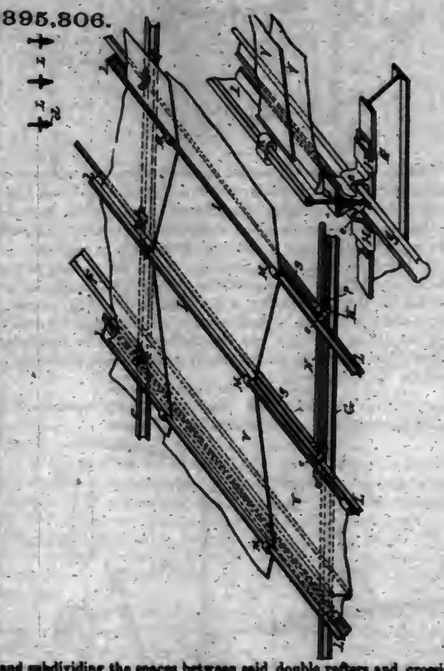


Claim.—1. A griddle, A, surrounded by an inwardly-projecting flange, *a*, an inwardly-sloping rim, *b*, within said flange, the griddle having a smoke and odor opening, B, partly in said rim and partly in the bottom of the griddle, and a flange, *h k*, surrounding said opening, in combination with the hood or cover D, substantially as described.

2. A griddle, A, surrounded by an inwardly-projecting flange, *a*, an inwardly-sloping rim, *b*, within said flange, the griddle having a smoke and odor opening, B, partly in the rim *b* and partly in the bottom of the griddle, a flange, *h k*, surrounding said opening, and a gutter, *i*, formed in rim *b* between the flange *k* and the flange *a*, in combination with the hood or cover D, substantially as described.

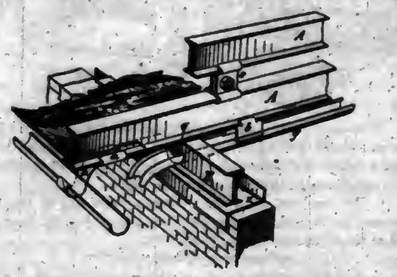
3. A griddle, A, having the inwardly-projecting flange *a*, the outward and downwardly projecting flange *c*, the sloping rim *b*, with the lugs *g* on its edge, the sloping sides *e*, the smoke and odor opening B, and the gutter *i*, in combination with the removable hood or cover D, substantially as described.

395,806. SKYLIGHT. OSCAR ANDRÉ, Paris, assignor of one-half to Georges Victor Alfred Berteaux, Neuilly, France. Filed Nov. 3, 1887. Serial No. 254,236. (No model.) Patented in France Feb. 26, 1887, No. 181,841.



Claim.—1. A roof-framing consisting of rafters and purlins crossing each other and fastened together, in combination with the sheets of glass secured to said framing and arranged in a plane beneath and separated from the purlins.

2. The combination, to form a glazed-roof structure, of double rafters at intervals consisting each of two parallel beams, one above the other, purlins crossing said rafters and embraced between the upper and lower beams thereof, single rafters arranged parallel with



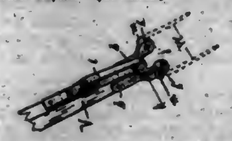


and subdividing the spaces between said double rafters and crossing said purlins, and the glass panes supported by said single rafters and the corresponding beams of said double rafters, all fastened together.

3. In a glazed-roof structure, the combination of a double rafter consisting of the flanged iron beams, one above the other, a flanged purlin crossing said rafter between the upper and lower beams thereof, with clamps for fastening together the upper and lower beams of the double rafter and embracing the purlin between them, and clamps engaging the flanges of the respective beams at their intersection.

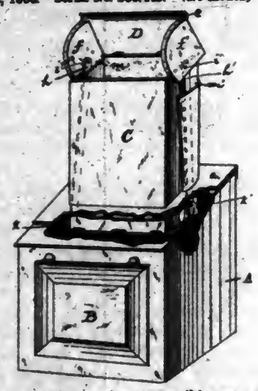
4. In a glazed-roof structure, the combination, with a flanged rafter of I-beam and a gutter extending longitudinally beneath it, of a hanger for said gutter of inverted-U shape having a flat plate against the bottom flange of the I-beam and lips turned upwardly and inwardly from said plate over the flange on the rafter, and said hanger extending down at both sides and fastened to the gutter.

395,807. TEDDER. ADDISE ARNDT, Albion, Mich. Filed Oct. 18, 1887. Serial No. 252,690. (No model.)



Claim.—The combination of a fork-holder, V, a spring, *l*, thereon, bearing-plates *k*, having bearing-eyes *i i* and provided on their outer sides above the eyes with bosses, forming shoulders *m*, a fork having a crank, *h*, offsets *j j*, forming journals, and tines W, the latter adapted to contact against the shoulders *m* to avoid torsional strain on the offsets *j j* when meeting obstructions, substantially as described.

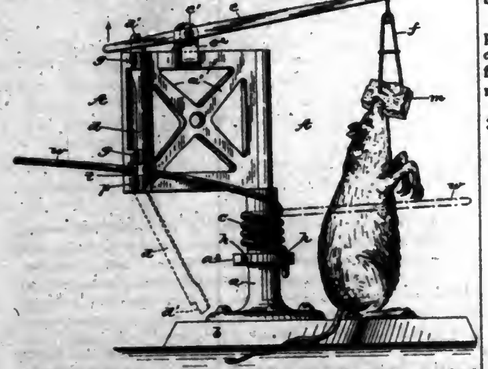
395,308. LETTER-BOX. WILLIAM R. AUGUSTINE, Aspen, Colo. Filed July 19, 1888. Serial No. 280,445. (No model.)



Claim.—1. A receiving-section for mail-boxes, said section provided at its top with a single flap and at its bottom with double flaps, the lower flaps independently connected with the upper flap by separate rods, and the section provided with a flange whereby it is adapted to be secured to the top of a mail-box, substantially as specified.

2. In combination with a mail-box having an opening in the cover or top thereof, a receiving-section having one end adapted to fit within the aforesaid opening, and a flange and bolts for securing same in said position, the receiving-section provided at its top with a single flap and at its bottom with double flaps, the lower flaps independently connected with the top flap by means of rods, substantially as and for the purpose set forth.

395,309. ANIMAL-TRAP. MARCUS J. BARTLETT, Providence, R. I. Filed July 27, 1888. Serial No. 281,204. (No model.)



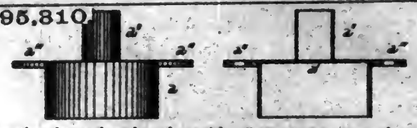
Claim.—1. In an animal-trap, the combination, with a standard having an extension provided with a bait-carrying tripping device, substantially as described, of a spring-arm, *w*, having an end thereof coiled around said standard and fixed therein, the opposite end thereof engaging with the tripping device, substantially as described, and for the purpose hereinbefore set forth.

2. The combination, in an animal-trap, with a standard and the spring-arm *w*, coiled around and attached to said standard, of a check-lever, *d*, pivoted to an extension of the standard adapted to retain the free end of said spring-arm in a normal position, and a pivoted tripping-lever, *e*, having one end adapted to engage the free end of the check-lever and the other provided with a bait-carrying hook, all constructed and arranged substantially as shown and hereinbefore described.

3. The animal-trap A, hereinbefore described, consisting of the standard *a*, provided with an extension, *a'*, the spring-arm *w*, coiled around the standard and secured thereto, the check-lever *d*, pivoted to said extension, and the pivoted bait-carrying tripping-lever *e*, adapted to engage the upper end of the check-lever, all combined and adapted for operation substantially as shown and described.

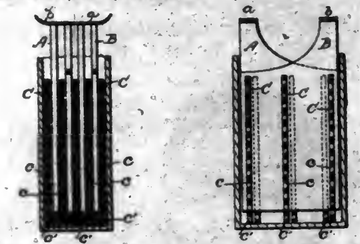
395,310. DEVICE FOR CUSHIONING LOOSE JOINTS. JOSHUA R. BOYNTON and WILLIAM CRISP, Elyria, Ohio. Filed Apr. 21, 1888. Serial No. 271,425. (No model.)

Claim.—In combination with a whiffletree and evener or crossbar, the short barrel *a*, provided with the tube *a'* and elastic cushion *b*,



operating in conjunction therewith, all for the purposes above set forth, and substantially as described.

395,311. INSULATING-SUPPORT FOR SECONDARY-BATTERY ELECTRODES. HENRY F. DE B. CAMERON, Detroit, Mich., assignor to the Woodward Electrical Company, same place. Filed Oct. 1, 1888. Serial No. 286,231. (No model.)

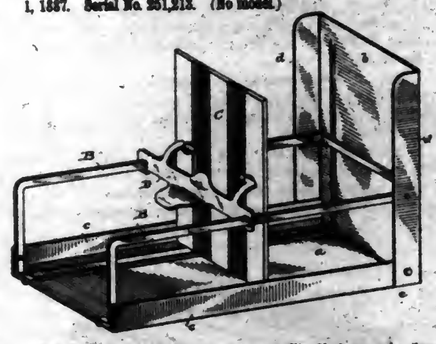


Claim.—1. In a storage-battery, the combination, with its elements, of insulators C, said insulators consisting of a number of separate loops having their heads *c'* at the bottom of the battery adapted to receive and hold the elements free from said bottom, and also so arranged that any one of the elements may be removed from the battery with its inclosing loop or loops without disturbing the other elements, substantially as described.

2. In a storage-battery, the combination, with its elements, of insulators, each of said insulators made in the form of a loop, the portions *c'* of which sustain and hold the battery-plate free from the bottom of the cell and provided with fluted arms *c*, standing up upon both sides of the element, substantially as described.

3. The insulator C for storage-battery elements, the same composed of hard rubber or equivalent insulating material, having a head, *c'*, for supporting a battery-plate free from the bottom of the cell with fluted arms *c*, adapted to stand up along the sides of a battery element, substantially as and for the purpose described.

395,312. FILE-BOX. MERLE R. CLINTON, Washington, D. C., assignor to the Schlicht & Field Company, New York, N. Y. Filed Oct. 1, 1887. Serial No. 251,213. (No model.)



Claim.—1. As an improvement in metallic file-boxes, the flanged base and the flanged end rising therefrom, in combination with the angular side bars attached at one end to the flanges of the front and at the opposite end to the flanges of the base.

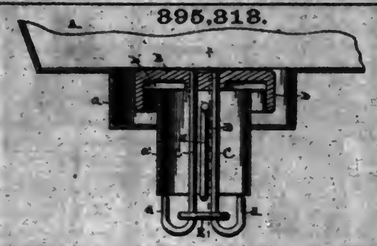
2. The improved body for a file-box, consisting of the flanged front and the flanged base formed in one piece, with the flanges fastened at the corner, substantially as shown.

395,313. COMBINED TRAP AND DIRT-COLLECTOR. HARRISON CLOUTTE, Manchester, N. H., assignor of one-half to Hiram C. Wiley, same place. Filed Apr. 30, 1888. Serial No. 272,250. (No model.)

Claim.—1. The herein shown and described trap, composed of the sink having a depression, the short tube projecting up from the bottom of the depression, the cap having ribs on its inner side and provided with arms having hooked ends, the anchoring-ball fitted between the arms, and the ring encircling the said arms, substantially as and for the purpose specified.

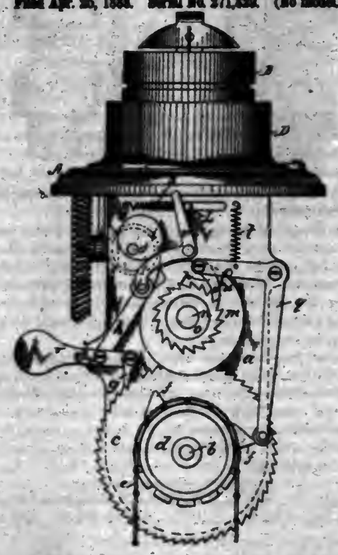
2. The combination, with the sink having the depression, and the

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tube *d'*, extending up from the bottom of the depression, of the cap having radial ribs on its inner side, the spring-arms C, having their lower ends bent to form hooks, the spring-ball D, fitted in the short tube, and the ring encircling the lower ends of the arms C below the top of the ball, substantially as and for the purpose described.

395,314. KNITTING-MACHINE. GEORGE H. GIDDEN, Laconia, N. H. Filed Apr. 25, 1888. Serial No. 271,830. (No model.)



Claim.—1. The combination, with a needle-cylinder provided on its lower end with inclines, the needles, and a rotary cam-cylinder to operate them, of a ring or annulus provided with inclines on which the needle-cylinder rests, a laterally-extending arm connected with the ring or annulus, a lever having one arm resting against said laterally-extending arm and the other against a rotary cam, and said cam, substantially as set forth.

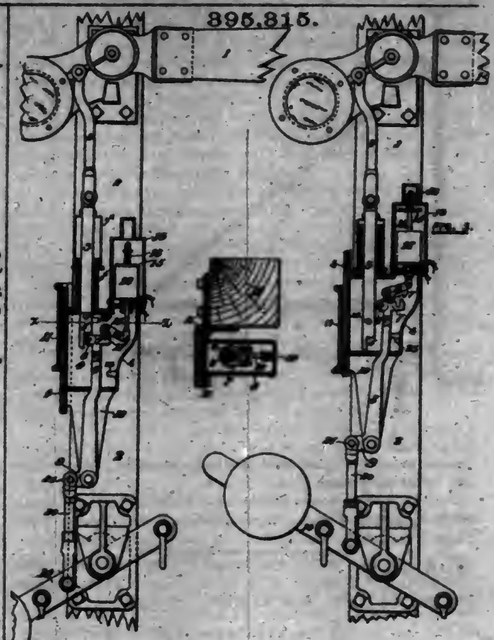
2. The combination, with a rotary sprocket-wheel, a pattern-chain, a pivoted lever provided with a pawl adapted to be operated by said pattern-chain and a ratchet-wheel with which said pawl engages, a cam connected with said ratchet-wheel, and an elbow-lever having one arm engaged with said cam, of the ring or annulus G, provided with arm L, with which the other arm of the said elbow-lever is engaged, the needle-cylinder, needles, and cam-cylinder, substantially as set forth.

395,315. ELECTRIC SIGNALING APPARATUS. JOHN P. COLEMAN, Swinevale, Pa. Filed Mar. 10, 1888. Serial No. 266,806. (No model.)

Claim.—1. In an apparatus for connecting a signal with its primary actuating mechanism, the combination, with the signal and its connecting-rod, of a pivoted lever which forms one of the mechanical connections between the signal and the actuating mechanism, said lever being movable on its pivot into and out of connection with the signal connecting-rod, and an electro-magnet which acts on the lever to hold it in connection with the said signal connecting-rod, substantially as and for the purposes described.

2. In an apparatus for connecting a signal with its primary actuating mechanism, the combination, with the signal and its connecting-rod, of a pivoted lever which forms one of the mechanical connections between the signal and the actuating mechanism, said lever being movable on its pivot into and out of connection with the signal connecting-rod, a trigger which engages the rod and holds the rod

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and lever in connection, and an electro-magnet which controls the trigger, substantially as and for the purposes described.

3. The combination of an electric circuit, a signal, a movable box or frame, a lever pivoted thereto and arranged to engage the signal-operating mechanism, a trigger controlled by an electro-magnet for holding the lever in operative relation with the signal, said lever being connected with the moving mechanism of the box or frame which acts thereon against the force of the magnet and tends to disengage the lever from the signal, substantially as and for the purposes described.

4. In an apparatus for connecting a signal with its primary actuating mechanism, the combination, with the signal and its connecting-rod, of a pivoted lever which forms one of the mechanical connections between the signal and the actuating mechanism, said lever being movable into and out of connection with the signal connecting-rod, an electro-magnet and its armature which acts on the lever to hold it in connection with the said signal connecting-rod, and a spring which bears on the armature, substantially as and for the purposes described.

5. In an apparatus for connecting a signal with its primary actuating mechanism, the combination, with the signal and its connecting-rod, of a rod or lever which is movable vertically to operate the signal, a box or case into which said rod or lever projects, said box or case being connected with the rod or lever and moving with it in its motions to operate the signal, and a magnet and its armature which are inclosed by the box or case and which act on said rod or lever to hold it in operative connection with the signal connecting-rod, substantially as and for the purposes described.

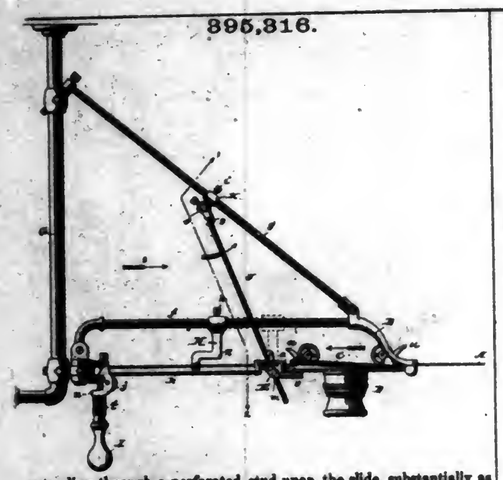
395,316. STORE-SERVICE APPARATUS. JAMES T. COWLEY, Lowell, assignor to the Lamson Store Service Company, Boston, Mass. Filed Dec. 3, 1887. Serial No. 256,916. (No model.)

Claim.—1. The combination, in a store-service apparatus having a way, carrier traveling thereon, and propelling-spring supported to engage with said carrier as it approaches the limit of its movement, of a slide independent of said spring provided with a catch for engaging with the carrier, a retracting device connected to the said slide, an adjustable contact-piece arranged to engage with the catch, and a spring-actuated arm for moving the slide outward, substantially as set forth.

2. The combination of the wireway A, a guide-rod, *f*, parallel thereto, a bracket supporting a propelling-spring, C, a carrier, a slide moving upon the way and provided with a catch for engaging with the carrier, a spring-actuated arm for moving the slide outward, and a contact-piece secured adjustably to the guide *f*, substantially as set forth.

3. The combination, with the slide carrying the catch for engaging with the carrier of a store-service apparatus, of a pivoted arm

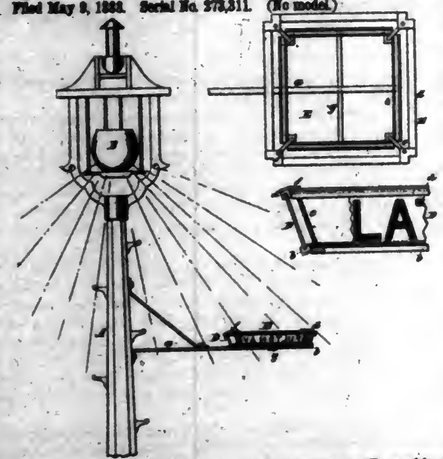
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extending through a perforated stud upon the slide, substantially as and for the purpose set forth.

4. The combination, with the slide E and pivoted arm J, of a block, K, adjustable upon a support, the arm J being pivoted to said block, substantially as set forth.

395,817. SIGN FOR ELECTRIC LIGHTS. EDWARD A. DUBEY, Brooklyn, N. Y., assignor of one-half to Thomas B. Eutan, same place. Filed May 9, 1888. Serial No. 273,311. (No model.)



Claim.—1. The electric-light post A, having a lamp, B, combined with a sign, D, which is carried by a bracket on said post, and entirely below and to one side of the lamp, so as to leave said lamp unobstructed, said sign being within the path of the pencils of light projected from the lamp to that side on which the sign is located, substantially as set forth.

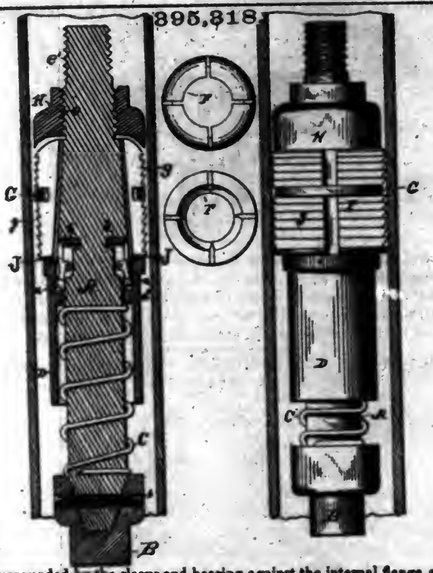
2. The open sign-frame E, constructed of upper and lower rails, *d b*, having longitudinal grooves facing each other, angle-pieces *f*, connecting the rails *d* and *d* and the rails *b* and *b*, and the connecting-rods *e e*, connecting the upper angle-pieces *f* with the lower angle-pieces *f*, in combination with the slanting sign D, that is held between said rails and rests in their grooves, substantially as described.

395,818. CASING-SPEAR FOR WELLS. WILLIAM H. EDWARDS, Foxburg, Pa. Filed Apr. 16, 1888. Serial No. 270,772. (No model.)

Claim.—1. A casing-spear comprising a central stem or mandrel provided with a tapered portion, expansible slips or wickers movably confined on the tapered portion, a spring-actuated sleeve longitudinally movable on the stem and normally tending to force the slips from the larger portion of the taper, and one or more dogs or catches adapted to detachably hold the sleeve in a depressed position, for the purpose described.

2. In a casing-spear, the combination, with a central stem provided with a tapered portion, of slips loosely confined on said taper, a sleeve embracing the stem below the taper and provided with an internal flange, and a spring embracing the lower part of the stem and partly

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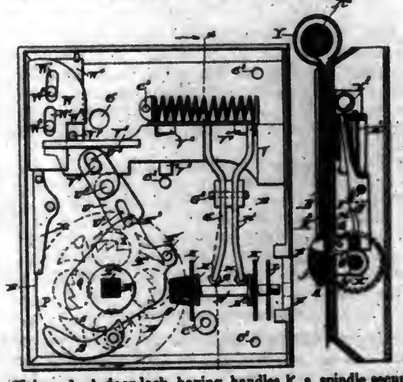


surrounded by the sleeve and bearing against the internal flange, substantially as described.

3. A casing-spear comprising a main stem provided with an upwardly-tapered portion, slips longitudinally movable on the taper and loosely and expansibly confined on the same, a collar or sleeve longitudinally movable on the stem and independent of and normally tending to force the slips from the larger portion of the taper, and a spring embracing the stem and exerting a constant upward pressure upon the sleeve, for the purpose set forth.

4. In a casing-spear, the combination, with a main stem having an upwardly-extending taper, of expansible slips separate from other parts and confined on the taper and having a longitudinal movement thereon, and comprising a circumferential series of separate and independent rectangular pieces, and a ring loosely surrounding the same, by which they are expansibly and movably confined on the taper, substantially as described.

395,819. RECORDING DOOR-LOCK. GEORGE J. FERGUSON, Greenville, Tex. Filed Mar. 16, 1887. Serial No. 231,101. (No model.)



Claim.—1. A door-lock having handles F, a spindle secured in said handles, and a rigidly-attached plate, T, provided with a pawl pivoted thereto, in combination with a ratchet-wheel, a set of gears, and a record-strip actuated by said gears to impart a step-by-step rotary motion in one direction to intermittingly move said record-strip, as described.

2. A lock having an adjustable record-strip and a shaft, N, rotated as described and suitably journaled in the case, a wheel or disk, L, fastened to said shaft, and an outer guard, A, having a slot to receive said wheel to cut off a margin of the record-strip, all combined as and for the purpose described.

3. In a lock, the combination of an adjustable record strip or roll, a lock-case containing the operating-gears, a guard in which are journaled the counter-gears, and an open space between the lock-case and

the guard through which to interpose and retain the record strip or roll for the double purpose of adjustment and to impress the tooth-marks of the gears on record strip or roll, as set forth.

4. In a lock, the combination of an adjustable record strip or roll, the lock being provided with handles, a spindle secured in a plate, a pawl pivoted to said plate, a detent pivoted to lock-case, a ratchet, and a bevel-wheel journaled on the spindle, said bevel-wheel meshing in a pinion secured on a shaft, said shaft being journaled to the lock-case and provided with spur-gears, said spur-gears meshing in counter-gears journaled in guard, an open space between lock-case and the guard through which to pass the record strip or roll, said spur-gear and counter-gear meshing in each other through record strip or roll, together with pawl and detent to prevent a retrograde movement of record strip or roll, substantially as set forth.

5. A lock, as described, having an adjustable record-strip, handles F, spindle D, plate T, pawl R, ratchet Q, bevel-wheels P and O, angular-ended shaft N, toothed wheels K K, and wheels J, all combined to automatically adjust the record-strip, and an independent means for adjusting said record-strip, consisting of key M, having an angular hole to fit the angular end of the shaft N, as and for the purpose described.

6. A lock having an adjustable record-strip and means for moving it, as described, combined with plates T and U, and the attached bolt V, for the purpose of projecting said bolt to lock and withdrawing the bolt to unlock the door, as and for the purpose described.

7. In a recording-lock, a record strip or roll adjusted by the operation of the lock and capable of an independent adjustment by the key, and a lock-bolt operated as described, said lock-bolt being provided with inclined surfaces V^2 and V^4 and reverse cam-surface V^3, in combination with the punch-levers G' and H' and the punches G and H, substantially as set forth.

8. A recording door-lock having a record-strip and marking mechanism, a lock-bolt, V, handles F, spindle D, plates T and U, and tumblers W, W^2, and W^3, with means for raising said tumblers to permit bolt V to move to its unlocked position, as described.

9. The combination, with a recording-lock mechanism and its record-strip, of movable tumblers W, W^2, and W^3, and stationary plate W^4, a hooked key, M, and bolt V, as and for the purpose described.

10. The combination, with a recording mechanism and its record-strip, of automatically-gravitating tumblers W, W^2, and W^3, and stationary plate W^4, to lock the bolt in projected position, and a lifting-catch, X, for unlocking from the inside, as described.

11. In a lock, a record strip or roll, a set of gears to adjust and mark said record strip or roll, a key having an angular socket fitting angular end of shaft to rotate said gears and thereby independently adjust said record strip or roll, a lock-bolt, and one or more recording-punches, said punches being operated by lock-bolt to record each locking and unlocking of lock on record strip or roll, as set forth.

12. The combination, with a record-strip and means for marking it, a lock-bolt, and means for moving the lock-bolt, of automatically-locking tumblers constructed as described to rise above the unlocking position and thereby prevent the withdrawal of lock-bolt, as and for the purpose described.

13. In a lock, the combination of a record strip or roll having consecutive numbers on one or both margins, a set of gears, a shaft journaled in lock-case, the spur-gears, a guard and its journaled counter-gears, and a key having an angular hole in its stem fitting angular end of shaft to rotate said gears to place a certain number above or below said guard, as set forth.

14. In a lock, the combination of an adjustable record strip or roll, a lock-case containing operating-gears, and a narrow guard supporting journaled counter-gears, said guard and gears constructed to retain and support said record strip or roll when interposed between them, and said record strip or roll being exposed above and below said guard, so it can be signed or otherwise marked, and said record strip or roll being capable of adjustment by operation of lock and independent adjustment by key, as set forth.

15. The combination, with a recording-lock secured to the door and provided with a record-strip, marking devices for the same, and a lock-bolt operating in the lock, of a locking-bar, 2, having an opening, 10, to permit said lock-bolt to move to locked position, the said bar being provided with guide-slots and screws, and adapted to lock at the top and bottom of the door, as and for the purpose described.

16. In a lock, the combination of a record strip or roll, a lock-case containing operating-gear, a guard supporting counter-gear, and an open space between lock-case and guard for record strip or roll to pass through, said guard supporting and retaining said record strip or roll to receive impressions and to be adjusted, for the purpose described.

17. In a continuous recording-lock, the combination of a record-roll, a case to contain and protect it, and the lock-case having guides to removably support the record-roll case, as set forth.

18. The combination, with the recording-lock provided with record-strip and marking devices, as described, of movable tumblers W, W^2, and W^3, having slots W^7, and a projecting portion, W^5, and a hooked key, M, the said tumblers having a range of movement above opening-point, and a stationary plate, W^4, to obstruct the movement of keys not made to fit, as set forth.

19. The combination, with a recording-lock provided with a record-strip and marking devices, of a key, M, having a hook-shaped bit and an angular hole in its stem to unlock the bolt and adjust the record-strip, as and for the purpose described.

20. In a lock, the combination of a record strip or roll, the operating-gears, the recording-punches, and a lock-bolt positively connected to operating-gears and the recording-punches, the movement of said lock-bolt effecting the double purpose of adjusting the record-strip and operating said recording-punches, for the purpose described.

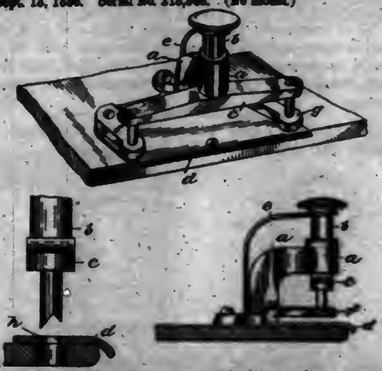
21. In a recording-lock having handles, a spindle secured in said handles, a lock-bolt, a record strip or roll, and means to simultaneously operate the lock-bolt and adjust the record strip or roll, substantially as set forth.

22. In a recording-lock, a record strip or roll and means to simultaneously move and mark said strip or roll, a lock-bolt simultaneously operated with said record strip or roll, and punches operated by the movement of the lock-bolt, substantially as set forth.

23. In a continuous recording-lock, the combination of knobs or handles, a spindle secured in said handles and suitably connected to lock both the movement of the handles, simultaneously operating a ratchet, a set of gears, a lock-bolt, recording-punches, a record strip or roll, an outer guard having an open space between it and the lock-case, through which to pass the record-roll to be operated on by said punches and teeth of gears, and thereby making continuous impressions on said record-roll by the locking and unlocking, and a case or receptacle to sustain, protect, and guide said record-roll, as set forth.

24. In a recording-lock, a record strip or roll and means to move and mark it, a lock-bolt operating horizontally, and a lock-bar operating vertically, said lock-bar having an opening to register with the lock-bolt in the locked position thereof, substantially as set forth.

395,820. PAPER-PUNCH. SAMUEL H. PERE, Hinsdale, Ill. Filed Sept. 12, 1888. Serial No. 283,986. (No model.)



Claim.—1. The combination, with the punches mounted upon the cross-bar carried by the plunger, of a spring for holding the plunger in its elevated position and three guides, one in the standard of the frame and one in each of the arms or legs, the cutting-edges of said punches being of the form shown, one lip or point of each being longer than the other lip or point, whereby the punches are directed through the dies, as described.

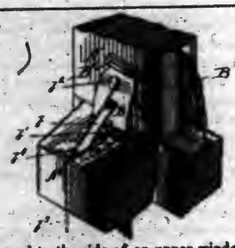
2. The combination, with the cross-bar and the plunger supported by its bearing in the standard of the frame, of the punches or cutters, respectively, at the different ends of the cross-bar, the cutting-edges of said punches being of the form shown, one lip or point of each being longer than the other lip or point, the legs with openings or guides surrounding the said cutting-edges, and the dies *h* in the plate below substantially as described.

3. The punches provided with cutting-edges of the form shown, one lip or point of each being longer than the other lip or point of the same punch, in combination with openings or guides surrounding the said cutting-edges, and dies, one for each cutter, whereby on forcing the punches through the guides several thicknesses of paper placed in their path may be perforated, substantially as and for the purpose specified.

395,821. FASTENER FOR MEETING-RAILS OF SASHES. JAMES S. FISHER, Chicago, Ill. Filed Oct. 10, 1888. Serial No. 287,705. (No model.)

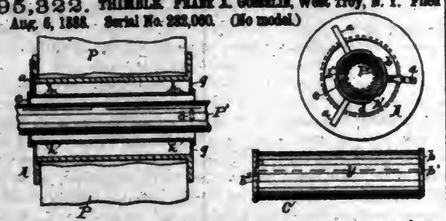
Claim.—The combination of a metallic plate with raised ledge

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B³ B³, being secured to the side of an upper window-sash with a metallic hinge, B a B', the arm B having its upper end free and being provided with a projecting knob, b^3, the arm B' being secured to the upper frame of the lower window-sash beneath the ledge B^3, and being provided with a flat metal spring, b, which presses the free end of B against the ledge B^3, substantially as set forth.

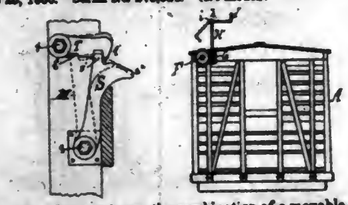
395,322. THIMBLE. FRANK X. GOEBELIN, West Troy, N. Y. Filed Aug. 6, 1888. Serial No. 282,060. (No model.)



Claim.—1. In a thimble, the combination, with an outer sleeve provided at each end with an annular wall-flange and inwardly-projecting radial arms, one of the wall-flanges being detachable, of an inner sleeve inserted in the outer sleeve and projecting therefrom at each end, and provided on each of its projecting ends with arm-engaging cams, substantially as described.

2. The combination, in a thimble, of two sleeves, one inclosed and supported by the other, the inner sleeve being contracted in diameter by an introverted pipe-supporting flange, and open at the other end and provided with air-passages through its shell, the outer sleeve being contracted in diameter by an introverted inner sleeve-supporting flange at one end and open at the other end, substantially as described.

395,323. STOCK-CAR. GEORGE HACKNEY, Topeka, Kans. Filed June 23, 1888. Serial No. 278,081. (No model.)



Claim.—1. In a stock-car, the combination of a movable platform with the stop M, composed of the pivoted boot-shaped pawl S, provided with the heel s', and the detent T, containing the recesses t' and t^2, fitted to receive the heel s', as and for the purpose stated.

2. A stock-car provided with a movable platform, C, chains c, shaft D, spur-wheel F, worm G, shaft H, and stop M, composed of the boot-shaped pawl S, bearing the heel s', and detent T, containing the recesses t' and t^2, as and for the purposes stated.

3. In a stock-car, the combination of the movable platform C, chains c, shaft D, spur-wheel F, worm G, shaft H, handle I, and stop M, composed of the boot-shaped pawl S with its heel s', and the detent T with its recesses t^2 and t', as and for the purposes stated.

395,324. PLATFORM-DOOR FOR CARS. JACOB HAHN, De Kalb, Ill. Filed Feb. 23, 1888. Serial No. 265,089. (No model.)

Claim.—1. The combination of the coach A, provided on its side with the vertical and external stanchion, C, and the slotted bracket K, attached thereto, the way or groove L on the lower edge of the roof, the door D, sliding on said way or groove and provided with the slotted bracket E and the rack P, the shaft G and pinion O engaging said rack and operating the door, and the lid M, attached to the shaft G, all substantially as and for the purposes set forth.

2. The combination of the coach A, having a way or trough, L, along its roof and an external vertical stanchion, C, having the slotted bracket K attached thereto, the door sliding in said way or trough

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and upon the rack P, and the braces H and J, pivoted at one end, and at the other sliding in the slots of said bracket.

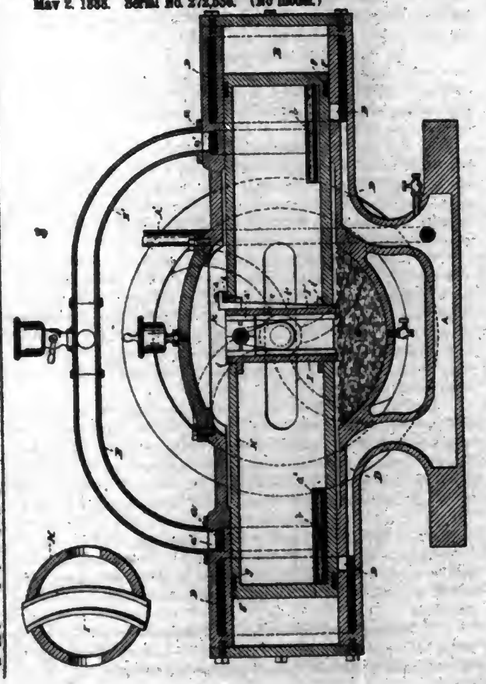
3. In combination with the car, the door D, sliding in the way or trough L at its upper end, and at its lower end on the rack P, with the lid M, and the pinion O and shaft G, to which shaft said lid and pinion are fixed.

4. In a car, the lid M, combined with and fixed to the shaft G, which carries the pinion by which the door is moved, and with the door, substantially as described.

5. In a car, the combination of the sliding side door with a lid to cover the steps, substantially in the manner set forth, whereby the forward or backward movement of the door serves, respectively, to lower or raise said lid, substantially as set forth.

6. In a railroad-car having movable side doors, a lid for covering the steps when the side doors are moved forward operated simultaneously with the movements of said side doors.

395,325. STEAM-ENGINE. EDGAR S. HARPER, Tyler, Tex. Filed May 2, 1888. Serial No. 272,536. (No model.)



Claim.—1. In a steam-engine, the curved guides transversely in the piston and the crank-pin brasses having projections adapted to engage said guides, substantially as specified.

2. In a steam-engine, the crank-pin brasses having the pivoted ribs thereon, the laterally-curved guideways of the piston, and the adjusting-key, substantially as specified.

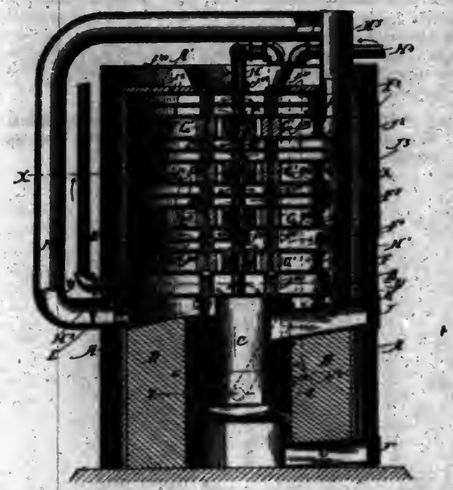
3. In a steam-engine, the combination, with the piston having the longitudinal slots, the cylinder, and the crank-shaft having bearings therein, of the laterally-curved transverse ways having their ends seated in the rectangular bearings, the inclined adjusting-key having the downwardly-turned end, the set-screw, and the crank-pin brasses, substantially as specified.

4. In a steam-engine, the combination of the cylinder, the hollow slotted piston, the crank-shaft having the crank within the piston, and oscillating mechanism engaging the crank-pin, substantially as specified.

5. A steam-engine consisting of a cylinder, a slotted piston having transverse curved guides, and a transverse crank-shaft passing through said piston and engaging said guides, substantially as specified.

6. The combination, with a steam-cylinder and a crank-shaft extending transversely through the same, of an oscillating reciprocating piston having a curved yoke engaging the crank by a slide movement and provided with ports, substantially as specified.

395,326. WATER-HEATER. MICHAEL HAVEY, Chicago, Ill. Filed July 23, 1888. Serial No. 280,712. (No model.)



Claim.—1. In a water-heater, in combination, substantially as set forth, a vertical series of horizontally-extended water-chambers communicating with each other successively through their horizontal walls, each of said chambers having a horizontal diaphragm intermediate its upper and lower walls and obstructing the line of communication between its induction and eduction openings, the water-supply pipe entering the uppermost of said chambers through its upper wall, and an eduction-pipe from the lowermost of said chambers, whereby the water descends by gravity from one chamber to the next, and is compelled to spread out over the horizontal diaphragm and return underneath it to pass to the next chamber.

2. In a water-heater, in combination with a case to which the products of combustion have access at the lower part and from which they escape at the upper part, a series of communicating water-chambers located within such case between the access and escape of the products of combustion, such chambers contacting the interior wall of said case throughout their entire periphery except a portion at one side, consecutive chambers having that portion at opposite sides of the case, each water-chambers communicating with each other successively, each of said chambers having a diaphragm intermediate its upper and lower walls wholly or in part discovered from the lateral walls of the chamber and obstructing the line of communication between its induction and eduction openings, the water-supply pipe entering the uppermost of said chambers above the diaphragm, and an eduction-pipe from the lowermost of said chambers, whereby the water descends by gravity from one chamber to the next, and is caused to flow back and forth in contact successively with the upper and lower interior surfaces of such water-chambers, while the products of combustion pass back and forth in contact successively with the lower and upper exterior surfaces of the same walls, substantially as set forth.

3. In a water-heater, in combination with the fire-chamber having double walls inclosing an annular chamber around the fire-chamber, a series of horizontal communicating chambers F F², located above the fire-chamber, the lowermost of said chambers communicating with the lower part of the annular chamber, and the chamber (as F) communicating with the upper part of the annular chamber, a water-supply pipe entering the topmost of the horizontal chambers, and the service-pipe leading from the chamber F, substantially as set forth.

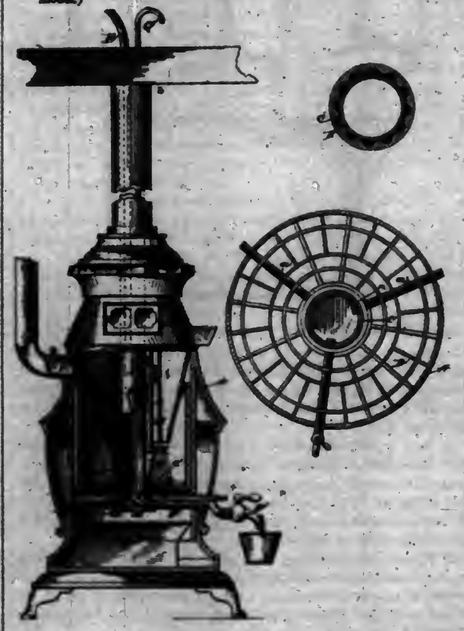
4. In combination, substantially as set forth, the fire-box and the water-chamber located above the same and supported thereby, said chambers having their upper and lower walls connected by posts (as f^{23}) and the blocks G' interposed between said chambers in vertical line with said posts, whereby the weight of the chambers is transmitted to and sustained by the walls of the fire-box.

5. In combination, substantially as set forth, the chambers F^3 and F', located one above another in vertical series and communicating through their bosses f^{32}, seating one upon another successively, each of said chambers having its upper and lower walls connected by the interior posts, f^{23}, the blocks G', interposed between said chambers in vertical line with said posts, said posts and blocks being vertically bored to admit the bolts G, inserted through them, whereby said chambers are bound together and the junctions at their bosses f^{32} kept tight.

6. In combination, substantially as set forth, the fire-chamber C, having the annular water-chamber C' surrounding it, and the horizontally-extended water-chamber F, located above it, communicating with the chamber C and with the service-pipe, the communicating chambers F' and F^2, located one above another and above the chamber F, the lowest of said chambers communicating with the annular chamber C' and the uppermost communicating with the induction-pipe H, whereby the water circulates downward by mere gravity until it reaches the annular chamber C' about the fire, and thence circulates upward to enter the service-pipe.

7. In combination with the case A, the fire-chamber, and the water-chambers located above it, the damper K, pivoted to the lowest of the water-chambers and adapted to close the communication past said chamber within the case, and the supplemental smoke-pipe H^3, communicating with the case below the lowest water-chamber and with the main smoke-pipe above the highest water-chamber, substantially as and for the purpose set forth.

395,327. HEATING-STOVE. HERBERT HOPKINS and JOSEPH R. PERRY, Wilkes-Barré, Pa. Filed Apr. 3, 1888. Serial No. 269,486. (No model.)



Claim.—1. As an improvement in stoves of the class herein described, the centrally-disposed pipe or cylinder, the ring or base into which the lower end of said cylinder is secured, and the boiler located in said pipe or cylinder and supported thereby at its lower end, a flue or passage-way being formed therebetween, substantially as shown and described.

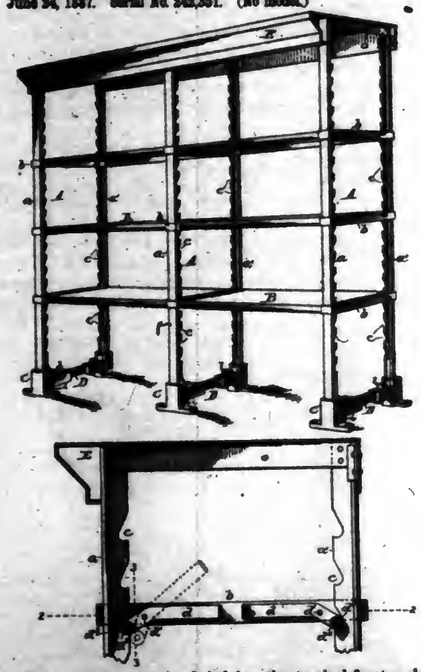
2. As an improvement in stoves of the class herein described, the stove having the ring or base, the conical tube secured at its lower end in said ring or base, the pipe or cylinder attached to the upper end of said conical tube, and the boiler inserted in said pipe or cylinder, whereby a hot-air flue or passage-way is formed, substantially as shown and described.

3. As an improvement in stoves of the class herein described, the stove having the central pipe or cylinder, the boiler secured therein and supported thereby at its lower end, the water-supply pipe, and the hot-water or steam-exhaust pipes connected to said boiler, substantially as shown and described.

4. The combination, with a stove having the ring or base, of the pipes or tubes supporting said ring or base and opening thereinto, the pipe or cylinder supported by said ring or base, and the boiler disposed in said pipe or cylinder and resting against the lower conical tube thereof, substantially as shown and described.

5. The herein-described improvement in stoves, comprising the ring or base, the pipes opening into said ring or base and supporting the same, the central pipe or cylinder, the boiler inserted into said pipe or cylinder, the hot-water pipe extending into said boiler, and the hot-water pipe connected to said boiler at its lower end and having a cock or faucet, substantially as shown and described.

395,328. METAL SHELVING. M. ROBEYN JEWELL, Rochester, N. Y., assignor to the Schlicht & Field Company, same place. Filed June 24, 1887. Serial No. 242,351. (No model.)



Claim.—1. In a system of shelving, the toothed front and rear posts, *a a'*, and the vertically-movable cross-bars *b*, in combination with dogs mounted in the opposite end of each bar *b* to engage in the toothed posts, and adapted to be simultaneously disengaged therefrom by one hand, as set forth.

2. In a system of shelving, a series of toothed posts, *a a'*, and two or more shelves adjustable thereon in the same horizontal plane, in combination with the vertically-movable slotted cross-bar *b*, provided with studs d^3 on each side to support the shelves, and the pivoted dogs concealed in the slotted bar to engage with the toothed posts, substantially as described.

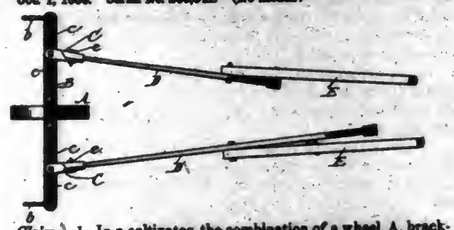
3. In a system of shelving, the posts *a a'* and shelves B, adjustable thereon, in combination with the slotted cross-bars *b*, having studs d^3 for the shelves, and the U-shaped dogs *d*, pivoted on each end of the bars and having a roller mounted in their engaging end, substantially as described.

4. In a system of shelving, the posts *a a'* and the cross-bars *b*, adjustable thereon and provided with the studs d^3, in combination with the sheet-metal shelf B, having its sides bent downward, as shown, to form strengthening-flanges, and provided with notches *f*, adapted to engage the studs on the cross-bars, substantially as and for the purpose specified.

5. In combination with the shelf-sustaining bars, their sustaining-dogs, the posts *a a'*, with which the dogs engage, the foot-blocks secured to the posts, and the cross-bars D, connecting said blocks.

6. In combination with the posts *a a'* and cross-bar D, the foot-blocks *i*, each having slot M, groove *j*, and block *k*, bolted in place.

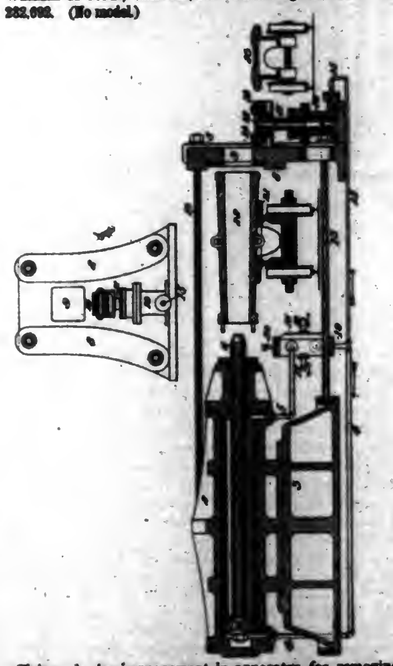
395,329. CULTIVATOR. FRED B. JONES, Dallas, Tex., assignor to himself, and the Rock Island Plow Company, Rock Island, Ill. Filed Oct. 1, 1888. Serial No. 286,841. (No model.)



Claim.—1. In a cultivator, the combination of a wheel, A, brackets *a*, cross-bar B, supported by the brackets *a*, two couplings, C, and two shovel-beams, D, each carrying a shovel, *d*, and each provided with a handle, E, whereby the shovels and beams can be moved independently both vertically and laterally, substantially as and for the purposes specified.

2. In a cultivator, the combination of a wheel, A, brackets *a*, cross-bar B, supported near its center by the brackets *a*, and provided with adjusting-holes *c* on each side of the brackets *a*, two couplings, C, and two shovel-beams, D, independent of each other, and each provided with a handle, E, and carrying a shovel, *d*, substantially as and for the purposes specified.

395,330. APPARATUS FOR REMOVING INGOTS FROM MOLDS. WILLIAM R. JONES, Braddock, Pa. Filed Aug. 13, 1888. Serial No. 282,698. (No model.)

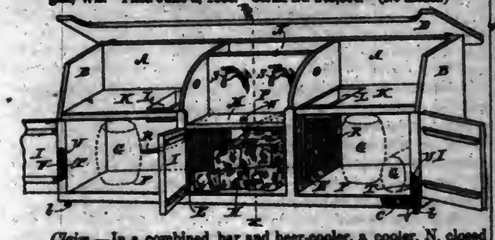


Claim.—1. An improvement in apparatus for removing ingots from the molds, which consists in the combination, with the ingot-pusher and a car upon which the ingot is pushed from the mold, of an interposed supporting-table which is movable into and out of the path of the ingot, substantially as and for the purposes described.

2. An improvement in apparatus for removing ingots from the molds, which consists in the combination, with the ingot-pusher and a car upon which the ingot is pushed from the mold, of an interposed supporting-table which is movable into and out of the path of the ingot, said table being provided with friction-rollers, substantially as and for the purposes described.

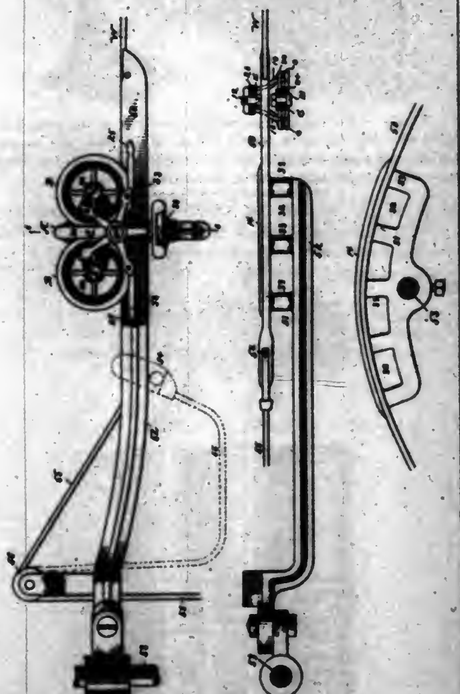
3. An improvement in apparatus for removing ingots from the molds, which consists in the combination, with the pusher and its motive cylinder, of a supporting-table and its motive cylinder by which it is movable into and out of the path of the ingot, the fluid-pressure supply-pipes of said cylinders being connected with a common supply, whereby the motions of the pusher and table are effected simultaneously, substantially as and for the purposes described.

395,331. BAR AND BEER-COOLER. JOHN F. KAUBLER, Sheboygan, Wis. Filed June 2, 1888. Serial No. 275,266. (No model.)



Claim.—In a combined bar and beer-cooler, a cooler, N, closed at the top by the swinging bar top D and adapted to be entirely filled with ice, in combination with a beer-chamber, F, an ice-receptacle, H, separated from the beer-chamber by a perforated partition only, the bottom of the beer-chamber being at least as low as the bottom of the ice-receptacle, and a pipe, R, leading from the beer-chamber into the cooler N and therefrom through the side of the cooler at a distance from the top and terminating there in a faucet, S, substantially as described.

395,332. STORE-SERVICE APPARATUS. GEORGE KETCHUM, Philadelphia, Pa., assignor to the Lamson Store Service Company, Boston, Mass. Filed Apr. 11, 1888. Serial No. 270,312. (No model.)



Claim.—1. The combination, with the frame of a carrier having a side opening, of a rotatable guard, C, closing said side opening in the frame, substantially as described.

2. The combination, with the frame of a carrier having a side opening, of a rotatable guard composed of a plurality of arms, *c*, closing said side opening, substantially as described.

3. The combination, with a track or way connected with a track-support by one or more bars, 33, of a carrier provided with a guard comprised of a plurality of arms adapted to be rotated by contacting with said bars to pass said track-support, substantially as described.

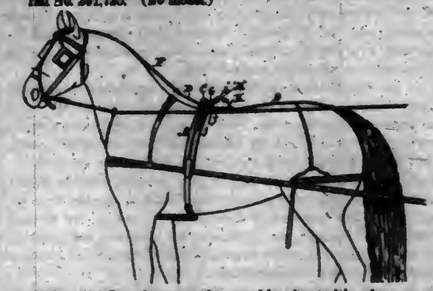
4. The combination, with a track or way connected with a track-support by one or more bars, 33, of a carrier provided with a rotatable guard having a plurality of arms, a lock for securing the guard against rotation, and a contacting-piece for moving the lock to free the guard, substantially as described.

5. The combination, with a track-wire, 50, its supporting-bracket, and connecting-web having a plurality of bars, 33, of a carrier provided with a rotatable guard, C, having a plurality of arms, *c*, adapted to contact with said bars in passing said supporting-bracket, substantially as described.

6. The combination, with a track-rail, 50, its supporting-bracket, and connecting-web having a plurality of bars, 33, and a contacting-piece, 14, at the side of said rail, of a carrier provided with a rotatable guard having a plurality of arms, *c*, and a lock for securing the guard in a fixed position, having a tongue adapted to contact with said contacting-piece to move the lock to free the guard, substantially as described.

7. The combination, with a carrier, a rotatable guard mounted thereon, and a lock for holding the guard against rotation, of a contacting-piece to operate the lock, substantially as described.

395,333. AUTOMATIC HORSE-CHECK. WASHINGTON H. KELSOEN, Olean, N. Y. Filed Jan. 12, 1888. Renewed Nov. 26, 1888. Serial No. 291,735. (No model.)



Claim.—1. In a harness, the combination, with a box, a spring-actuated tape therein, and a spring-actuated dog within the box for locking the tape, of a lever fulcrumed on the box, said lever provided with a hook in position to release the dog when operated, substantially as set forth.

2. In a harness, the combination, with a box, a spring-actuated tape having perforations therein, and a spring-actuated dog pivoted in the box for locking the tape, of a lever fulcrumed on the box, said lever having a hook in position to release the dog, an arm on one end of the lever, and a V-shaped crotch loosely connected with one end of the said lever, substantially as set forth.

3. In a harness, the combination, with a checkrein, of a box secured to the harness, a spring-actuated tape provided with a perforation mounted on a drum journaled in the box, a lever fulcrumed on the box, a V-shaped bar at one end of said lever adapted to enter the perforation in the tape, and a strap attached to the free end of the lever, by which to operate said lever to release the tape and checkrein, substantially as set forth.

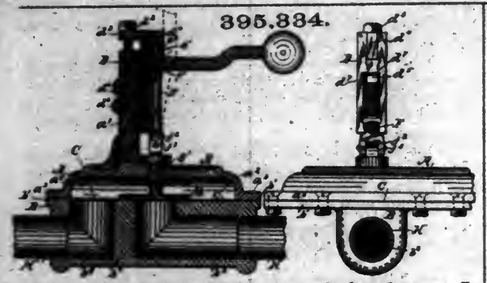
4. In a harness, the combination, with a checkrein, of a box secured to the harness, a spring-actuated tape mounted on a drum journaled in the box, said tape being provided with a perforation near one end and having its free end attached to a checkrein, a lever fulcrumed on the box, a bar of said lever adapted to enter the perforation of the tape, a strap attached to the free end of the lever, a loop on the harness, through which the strap is adapted to pass, and a V-shaped crotch at the free end of said strap, substantially as set forth.

5. In a harness, the combination, with a checkrein, of a box secured to the harness, a spring-actuated tape mounted in the box, a V-shaped bar made integral with the lever to enter a perforation in the tape, a rearwardly-projecting arm, also integral with the lever, a spring for maintaining the bar in engagement with the tape, and an arm secured to the lever to release the actuating mechanism, substantially as set forth.

395,334. AUTOMATIC CUT-OFF FOR GAS. CHRISTIAN M. KIRKPATRICK, Indianapolis, Ind., assignor of one-half to Joseph M. Taylor, same place. Filed Oct. 5, 1883. Serial No. 367,547. (No model.)

Claim.—1. In a gas cut-off, the two-part casing having the vertical standard and having the inlet and outlet ports b^2 b^3 normally covered by a flexible diaphragm, and a disk-valve to press the diaphragm closely over the inlet-opening, a valve-operating mechanism therefor, consisting of a weighted lever, a pitman pivoted thereto and to the valve-stem in such manner that when the valve is closed and the lever on a horizontal plane the pivotal points will be exactly aligned vertically, and the carriage D, connected to the weighted lever by pivot d^2 and adjustably connected to the standard *a'* by the bolt d^3, all substantially as shown and described.

395,334.



2. An adjusting device for the valve mechanism of gas cut-offs, consisting of the carriage D, to which one element of the valve mechanism is pivoted, adjustably secured to a portion of the casing by a tap-bolt, d^3, substantially as shown and described.

3. In a gas cut-off, the standard d', having a bolt-hole in its upper end, in combination with the carriage D, having the rearward projection d^3, and having ears d' to engage the standard, a bolt extending through the projection d^3 into the standard d', by means of which the carriage may be adjusted vertically, and a valve mechanism connected to said carriage, substantially as described.

4. A gas cut-off having a valve and valve-operating mechanism, consisting of a valve-stem, a weighted lever, and a connecting rod or pitman so pivoted together that when the valve is depressed the pivotal points are in a line directly central with relation to the movement of the valve, substantially as and for the purpose set forth.

5. In a gas cut-off, the standard d', cast integral with the casing, the carriage D, having the transverse longitudinal opening d^5 therethrough, the bolts d^6, extending through said opening and through the standard and securing the carriage to the standard, the adjusting-bolt d^3, and the valve-operating mechanism, all combined and arranged substantially as shown and described.

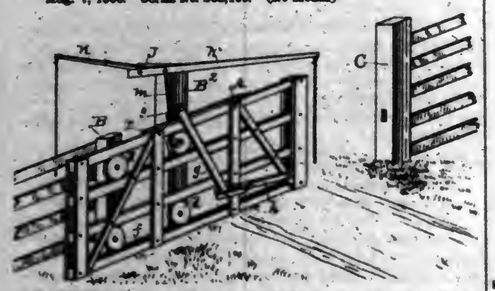
6. In a gas cut-off, the carriage D, adjustably secured to a standard of the casing, in combination with the weighted lever E, having the right-angle projection at its inner end, where it is pivoted to the carriage, and a valve-operating pitman pivoted to the inner end of the lever E in a line with but remote from the point at which the lever is pivoted to the carriage, all substantially as shown, and for the purpose described.

395,335. HAT. PHILIP N. KNAPP and JOHN R. BRITTO, South Norwalk, Conn. Filed Oct. 15, 1888. Serial No. 288,093. (No model.)



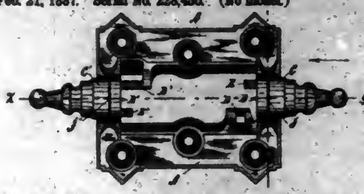
Claim.—The combination, with the hat-body and lining, of a series of flexible stays having their lower ends formed into hooks to which the lining is directly attached, the upper ends of said stays being secured to the hat-body, substantially as shown and described.

395,336. GATE. WILLIAM LA MAR, Pleasantville, Iowa. Filed Aug. 7, 1888. Serial No. 282,169. (No model.)



Claim.—The combination, with a sliding gate having a fixed block, *r*, on its top, of the bar A, pivoted to the gate, the elbow-lever *g*, pivoted to bar A, and also to the gate-post, so as to engage the block *r* with its short arm when the gate is closed, and an operating-lever, *k*, connected to its short arm, substantially as shown and described.

395,337. SPRING-HINGE. NEWTON LIBBEY, Freeport, Ill. Filed Feb. 21, 1887. Serial No. 228,430. (No model.)



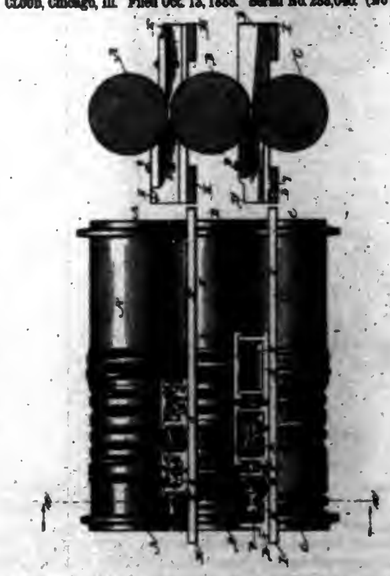
Claim.—The combination of the leaf A', provided with integrally-formed ears C C', bearing inwardly-projecting gudgeons F F', respectively, and the leaf A, provided with the ear B, perforated to receive one of said gudgeons, and with the leaf B', similarly perforated to receive the remaining gudgeon, and provided with a gradually-deepening groove, H, in its outer face, extending from the gudgeon-receiving perforation to the margin of the ear, substantially as and for the purpose set forth.

395,338. OVERSHOE. PHILIP LOSH, Perrysville, Ohio. Filed July 11, 1887. Renewed Aug. 25, 1888. Serial No. 283,794. (No model.)



Claim.—The combination, with an overshoe, of the plate provided with a spring and a tongue pivoted to the plate, said tongue having a pin adapted to enter a hole in the heel of the boot or shoe upon which the overshoe is worn, substantially as described.

395,339. MACHINE FOR REDUCING OLD RAILS. SIDNEY MCCLOUD, Chicago, Ill. Filed Oct. 13, 1888. Serial No. 288,040. (No model.)



Claim.—1. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having a rib adapted to bear upon the under side of the head portion of the rail, substantially as described.

2. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having a rib adapted to bear upon the under side of the head portion of the rail, said rib being of tapering shape from back to front, substantially as described.

3. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having side walls converging from front to back and having a central rib adapted to bear upon the under side of the head portion of the rail and tapering from back to front, substantially as described.

4. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide the top and bottom plates of which are provided with ribs or elevations adapted to bear upon the under side of the head portion of the rail, substantially as described.

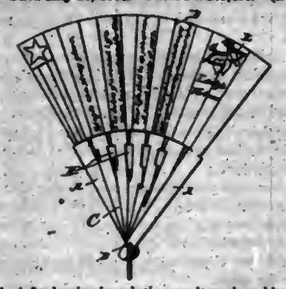
5. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having a rib for bearing upon the under side of the head portion of the rail, and a receiving-guide having a rib for bearing against the head portion of the rail upon the opposite side of the rail, substantially as described.

6. The combination, with a set of rolls for reducing railroad-rails, of a receiving-guide having a rib arranged to extend into the space between the head and flange portions of the rails as it passes through the rolls, substantially as described.

7. The combination, with a set of rolls for reducing railroad-rails, of a receiving-guide having a stop plate extending in proximity to the periphery of the rolls, substantially as described.

8. The combination, with a set of rolls for reducing railroad-rails, of a guide having a removable cover, substantially as described.

395,340. FORTUNE-TELLING FAN. WILLIAM MCWILLIE, Canton, Miss. Filed May 26, 1888. Serial No. 275,136. (No model.)

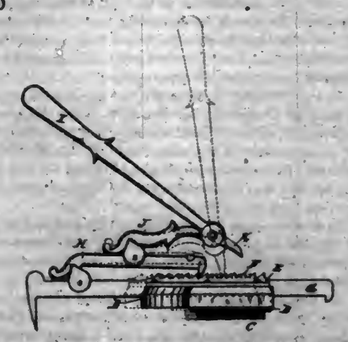


Claim.—1. A fan having inscriptions on its web and having notches in the edges of its ribs provided with an index, as set forth.

2. A fan having inscriptions on its web and notches in the edges of its ribs, said notches increasing in length successively from one side of the fan to the other and provided with an index, as set forth.

3. A fan having inscriptions on both faces of its web and having indexes in both sides of its ribs, the indexes on the opposite sides of the fan extending in reverse directions, as set forth.

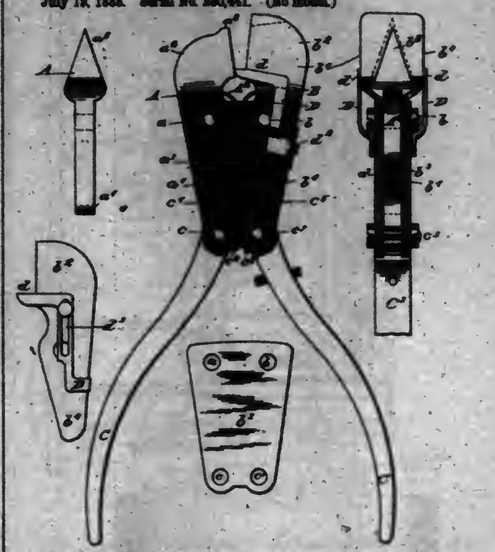
395,341. CARPET-STRETCHER. THOMAS R. NIXON, Gananoque, Ontario, Canada, assignor to the St. Lawrence Steel and Wire Company, (Limited,) same place. Filed May 15, 1888. Serial No. 273,903. (No model.)



Claim.—1. A carpet-stretcher consisting of a movable platform or base, a pad connected to the under side thereof and provided with pins or wires, a struck-up or cast flanged plate attached to the platform, a hooked bar beneath the plate, a lever which engages with ratchet-teeth upon the flanged plate, and an arm which connects said lever to a pawl attached to the hooked bar, substantially as shown and described.

2. A carpet-stretcher consisting of a grooved platform or base, A, pad B, attached to the under side thereof and provided with pins or wires C, hooked bar G, which extends through groove D in the platform or base A beneath a struck-up or cast flanged plate, E, a pawl, H, attached to hook-bar G and engaging with ratchet-teeth F, and a lever or handle, I, connected to pawl H by arm J, the short arm K of lever I so constructed as to engage with the ratchet-teeth of the plate E, substantially as shown and described.

395,342. PUNCH. STEPHEN T. HAKANSSON, Boston, Mass. Filed July 19, 1888. Serial No. 280,441. (No model.)



Claim.—1. The punching implement herein described, the same comprising the punch-lever A, having the head a^2 and punch a^3 integral therewith, the die-lever B, having the die-block b^2 integral therewith, provided with a flat surface, and a die-recess, b^3, extending from said surface through the block, the side plates, *a' b'*, the lever-pivots *a b*, the operating-arms C C', having the extensions c^2 c^3, to operate the punch and die levers, respectively, the pivots *c c'*, and the spring A^3, substantially as described.

2. The punching implement herein described, the same comprising the punch-lever A, having the head a^2 and the punch a^3 integral therewith, the die-lever B, having the die-block b^2 integral therewith, provided with a flat surface, and a die-recess, b^3, extending from said surface through the block, the side plates, *a' b'*, the lever-pivots *a b*, the operating-arms C C', having the extensions c^2 c^3, to operate the punch and die levers, respectively, the pivots *c c'*, the spring A^3, and the adjustable gage or gages D, substantially as described.

3. In a hand punching implement, the punch-lever A, having the head a^2 and punch a^3 integral therewith, and arm a^4, in combination with the die-lever B, having the die-block b^2 integral therewith, provided with a flat surface, a die-recess, b^3, extending from said surface through the block, and the arm b^4, substantially as described.

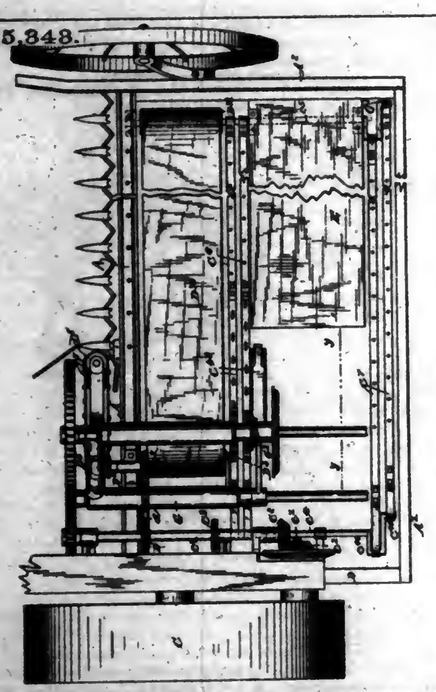
395,343. HARVESTER. LA VERNE W. NOYES, Chicago, Ill. Filed Feb. 24, 1888. Serial No. 265,140. (No model.)

Claim.—1. In combination with the continuously-operating endless-belt conveyer, a pair of alternately-reciprocating feed-bars operating parallel thereto and in the rear thereof, and a fixed platform-deck located in the rear of said feed-bars and substantially in the horizontal plane of the endless belt, substantially as and for the purpose set forth.

2. In combination with the binder-deck sloping upward from the receiving to the discharging side, the endless-belt platform conveyer extending underneath the receiving edge of the binder-deck and located at the forward part of the platform, and the alternately-reciprocating feed-bars parallel thereto and extending also beyond the receiving edge of the binder-deck nearly to the vertical plane of the needle rock-shaft and bent upward at their stubbleward ends, substantially as set forth.

3. In combination with the endless-belt conveyer located at the forward part of the platform, a pair of alternately-reciprocating feed-bars located in the rear of said endless conveyer and operating parallel thereto, and having an upwardly-sloping portion at their stubbleward ends, the binder-deck overhanging at its receiving end the stubbleward portion of the endless conveyer and divided to admit the upwardly-inclined portion of said feed-bars, said bars at their most stubbleward position extending stubbleward a considerable distance beyond the vertical plane of the receiving edge of the binder-deck and reaching nearly to the vertical plane of the needle rock-shaft, substantially as set forth.

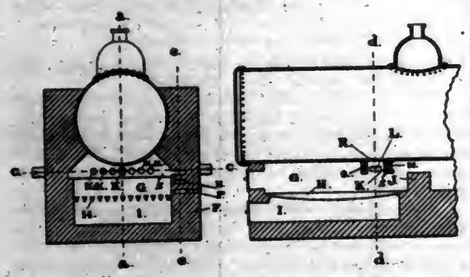
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4. In combination with the endless belt-conveyer located at the forward part of the platform, and the fixed decking located at the rear part, the binder-deck in two parts, the forward part having its receiving edge overhanging the stubbleward portion of the endless belt and sloping upward therefrom, and the rear part having its receiving edge secured to the fixed decking and sloping upward therefrom, and alternately-reciprocating feed-bars located and operating between the endless belt and the fixed decking and between the forward and rear parts of the binder-deck, substantially as set forth.

5. In a harvester, in combination with the two shafts c^4 and c^5, having each cranks ninety degrees apart, and the bars connecting corresponding cranks, the endless-belt conveyer D^{20}, having its driving-rollers at the grain side on the shaft c^5, substantially as set forth.

395,344. FURNACE. JOSEPH P. OLIVER, Oakland, Cal. Filed Aug. 27, 1888. Serial No. 283,236. (No model.)

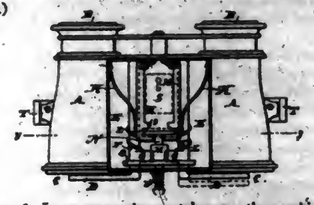


Claim.—1. In combination with a boiler-furnace, the deflector Q, the depending wall to the rear of the said deflector, having the openings K, slides or valves M, and the air-passages N, O, and L, for the purpose of supplying fresh air and increasing combustion, constructed, arranged, and operated substantially as and for the purposes set forth.

2. The combination, with a boiler-furnace, of the depending wall Z, having the air-openings K and slides M, for the purpose of regulating the passage of fresh air through said wall, substantially as set forth.

3. The combination, with a boiler-furnace having the return flues or passages N, of connecting-passages L and O, whereby fresh air may be supplied and partially heated, the deflector arranged beneath the boiler, the depending wall in rear of the said deflector provided with openings, and the slides M for closing the same, substantially as specified.

395,345. COIN-CONTROLLED OPERA-GLASS. CLARA B. PATTERSON, New York, N. Y. Filed Feb. 10, 1888. Serial No. 263,606. (No model.)



Claim.—1. In an opera-glass or telescope, the combination of the object-glass with a movable shutter, a lock to hold the shutter closed over said glass, a coin-receiving box or receptacle, and lock-controlling devices actuated by the deposited coin to unlock said shutter.

2. In an opera-glass or telescope, the combination of the object-glass with a movable shutter, a lock to hold the shutter closed over said glass, a coin-receiving box or receptacle, lock-controlling devices actuated by the deposited coin to unlock said shutter, and a spring to cause said shutter to move from in front of the glass when unlocked.

3. In an opera-glass or telescope, the combination of the object-glass with a movable shutter, a lock to hold shutter closed over said glass, a coin-receiving box or receptacle, lock-controlling devices actuated by the deposited coin to unlock said shutter, and a spring to reset the lock and secure said shutter over the glass when turned to such position.

4. In an opera-glass or telescope, the combination of the object-glass with a movable shutter, a lock to hold the shutter closed over said glass, a coin-receiving box or receptacle, lock-controlling devices actuated by the deposited coin to unlock said shutter, a spring to cause said shutter to move from in front of the glass when unlocked, and a spring to reset the lock and secure said shutter over the glass when turned to such position.

5. In an opera-glass or telescope, the combination of the object-glass with a movable shutter, a lock to hold the shutter closed over said glass, a coin-receiving box or receptacle, lock-controlling devices actuated by the deposited coin to unlock said shutter, and a latch controlled by the shutter to prevent resetting of the lock until the shutter is closed over the glass.

6. In an opera-glass or telescope, the combination of a movable shutter adapted to obstruct the view through the lenses or glasses, a coin-receiving receptacle, a lock to control the movement of the shutter, a stop device to control the movement of the lock and adapted to receive the coin, and an extension on the lock to force the coin against the stop device to move it for the purpose of allowing movement to the lock.

7. In an opera-glass or telescope, the combination of a movable shutter adapted to obstruct the view through the lenses or glasses, a coin-receiving receptacle, a lock to control the movement of the shutter, a stop device to control the movement of the lock and adapted to receive the coin, an extension on the lock to force the coin against the stop device to move it for the purpose of allowing movement to the lock, and a latching device to hold the lock in its unlocking position and controlled by the shutter, whereby the lock cannot be reset until the shutter is turned over the glass again.

8. In an opera-glass or telescope, the combination of a movable shutter adapted to obstruct the view through the lenses or glasses, a coin-receiving receptacle, a lock to control the movement of the shutter, and an obstruction in the path of the lock adapted to be pushed out of the way by the coin when it is inserted and the lock pressed in, whereby the lock may be moved out of the way and allow the shutter to move from in front of the glass.

9. In an opera-glass or telescope, the combination of a movable shutter adapted to obstruct the view through the lenses or glasses, a coin-receiving receptacle, a lock to control the movement of the shutter, an obstruction in the passage of the lock adapted to be pushed out of the way by the coin when it is inserted and the lock pressed in, whereby the lock may be moved out of the way and allow the shutter to move from in front of the glass, and a spring to automatically throw the shutter from off the glass.

10. An opera-glass having a coin-receiving receptacle formed thereon and consisting a part thereof, and arranged between and secured to the two fixed cylinders of the glasses.

11. An opera-glass of the usual kind in which the lenses are held permanently and rigidly in line by the inclosing frame or case, in combination with two shutters secured to the frame or case and adapted to be moved in front of the center of the lenses to obstruct the vision through the lenses, springs to hold them in position off the lenses, and a coin-actuated lock to unlock said shutters upon the passage of a coin through the lock.

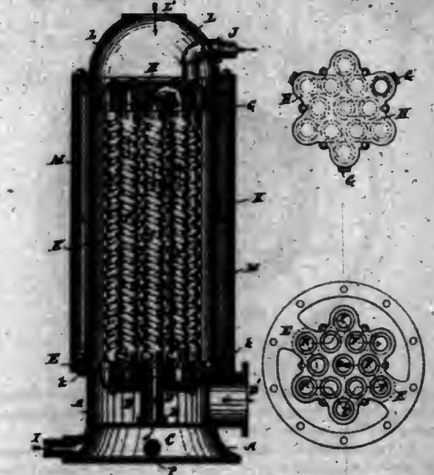
12. An opera-glass having two shutters pivoted or hinged to the frame of the glass between the cylinders and adapted to move in a plane parallel to the plane of the lenses to or from each other.

13. An opera-glass having a coin-receiving receptacle formed thereon and constituting a part thereof, arranged between the cylinders and provided with a slot for the coin and a coin-extracting door.

395,346. COUGH MIXTURE. ALONZO M. POE, Lakeport, Cal. Filed Jan. 17, 1888. Serial No. 261,007. (No specimens.)

Claim.—The herein-described cough mixture, consisting of eucalyptus, spikenard, yerba-santa, mullein, hoarhound, licorice, and oil of tar, substantially in the proportions named.

395,347. FEED-WATER HEATER. REUBEN F. PRATT, Revere, and CHARLES D. WAINWRIGHT, Medford, Mass., assignors to the Wainwright Manufacturing Company, Portland, Me. Filed Jan. 12, 1887. Serial No. 224,171. (No model.)

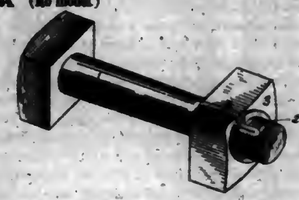


Claim.—1. In the feed-water heater, the base A, the tube-plate E, resting thereon, the core-plate H, bolted to said tube-plate, tubes F, tube-plate G, core-plate H, located thereon, and casing K L, in combination with suitable inlets and outlets for water and steam, located substantially as described, and all adapted for the purposes set forth.

2. In combination, a base, A, the tube-plate E, located thereon, the core-plate H, bolted under said tube-plate, tubes F, tube-plate G, core-plate H, located upon said tube-plate, casing K L, and the pipe J, connected with said tubes F, passing through and connected with said casing K L and serving to steady the tube-nest F H H, the whole provided with suitable inlets and outlets, all substantially as and for the purposes set forth.

3. In a feed-water heater, the base A, provided with a chamber, C, and an exhaust-chamber, D, in combination with the casing K, dome L, and a series of pipes, F, connected by core-plates H H, having return-bends cast therein, substantially as shown and described.

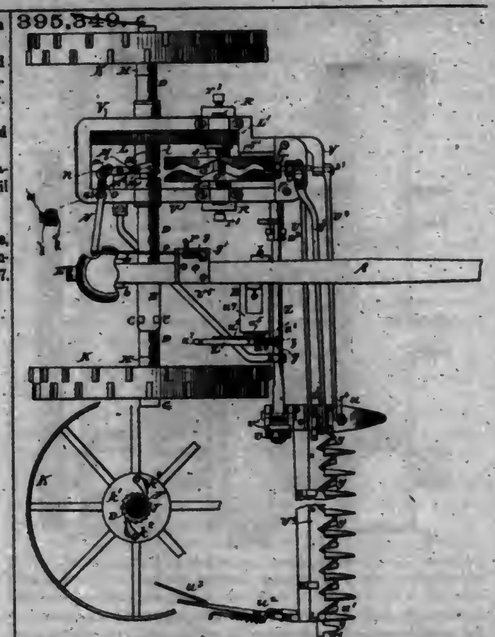
395,348. NUT-LOCK. SAMUEL H. RAY, St. Louis, Mo., assignor of one-half to George S. Tyler, same place. Filed Sept. 26, 1887. Serial No. 250,734. (No model.)



Claim.—1. The combination, in a nut-lock, of a full-threaded bolt, a nut having an eccentric key-groove and a beveled edge, as at 10, and a locking key or pin having a spring-arm adapted to clasp the nut, substantially as and for the purposes specified.

2. A tempered-steel locking-key for nut-locks, having the round locking-section, the folded driving and drawing section, and the spring-arm formed from a single piece of wire and shaped to clasp the nut, substantially as and for the purposes specified.

395,349. MOWER. JOHN H. REDFIELD, SAMUEL H. REDFIELD, and ABRAHAM B. HAMMOND, Glendale, Oreg. Filed Jan. 20, 1887. Serial No. 225,296. (No model.)



Claim.—1. In a mower, the combination, with the axle having a threaded end, of the ground-wheel K, provided with a hub having the annular flanges *k* standing out from both sides thereof, the ratchet-wheel l, recessed and seated on the flange *k* on the inner side of the hub, the spring-controlled pawl l^2, arranged to engage said ratchet-wheel, and the recessed nut G, screwed upon the extended and threaded end of the axle and provided with a circumferential flange that embraces the flange *k* on the outer side of the hub and bears on the periphery of the latter, substantially as specified.

2. In a mower, the combination of the main axle or shaft having the ground-wheels attached, the gear-wheel L, seated loosely on said axle and having its hub *l* forming one section of a clutch, the opposite section, *m*, of said clutch splined or feathered on said axle and provided with a circumferential groove, the pivoted and forked lever M, having the pin m^4 on its outer or rear end and the pin *m'* on the arms of its fork, which pins project into the circumferential groove of the clutch part or section *m*, the pivoted lever N, provided with the inclined or diagonal slot *n* and the pin *n'*, the coiled spring *o*, connecting the pins m^4 and *n'*, and the pivoted lever-handle P, having its front end within easy reach of the driver's seat, substantially as specified.

3. The combination, with the cam S, composed of two sections having waved facing edges that would fit upon each other if the sections were brought into contact, which sections are seated on the shaft R, the tapered openings through said shaft and through the outstanding bosses of said sections, and the tapered-adjusting-keys r^2, of the centrally-pivoted shaft T, having anti-friction rollers on its ends entering between said sections, the pitmen U U', connected to the respective ends of said lever T, and the cutter-bars attached to the outer ends of said pitmen.

395,350. APPARATUS FOR REROLLING OLD RAILS. ABRAM REESE, Pittsburg, Pa. Filed Apr. 20, 1888. Serial No. 271,267. (No model.)

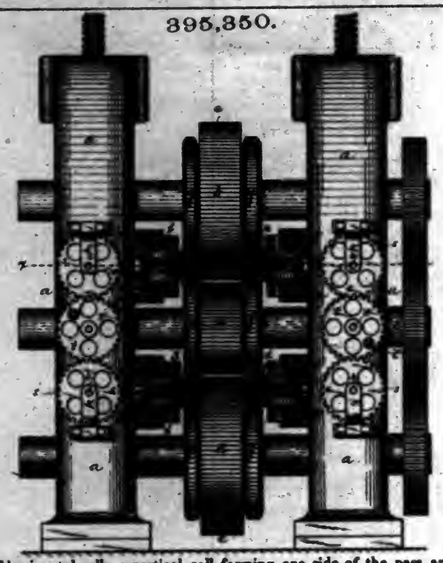
Claim.—1. In rolls for rolling rails or beams, the combination of three horizontal rolls forming three sides of two separate passes, with two vertical friction-rolls adjustable horizontally and forming the fourth side of said passes, substantially as and for the purposes set forth.

2. In rolls for rolling rails or beams, the combination of a pair of horizontal rolls, a vertical roll forming one side of the pass and mounted in journal-box in the housing, and a wedge-bar in the housing for adjusting said vertical roll, substantially as and for the purposes set forth.

3. In rolls for rolling rails or beams, the combination of a pair of horizontal rolls, a frame supported in the housing and having guide-ways therein, a vertical roll mounted in a journal-box sliding in said guideways, and a wedge for adjusting said vertical roll horizontally in the frame, substantially as and for the purposes set forth.

4. In rolls for rolling rails or beams, the combination of a pair

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of horizontal rolls, a vertical roll forming one side of the pass and mounted in a journal-box, a wedge-bar for adjusting said vertical roll horizontally, provided with a threaded bar, and a revolving nut screwing on said threaded bar for adjusting said wedge-bar longitudinally, substantially as and for the purposes set forth.

5. In rolls for rolling rails or beams, the combination, with three horizontal rolls mounted in suitable housings, of two vertical rolls mounted in suitable journal-boxes, wedge-bars beyond said journal-boxes for adjusting the rolls, threaded bars secured to said wedge bars, pinions screwing onto the threaded bars, and a pinion gearing with both said pinions, substantially as and for the purposes set forth

395,351. WATCH-REGULATOR. ROSE B. RICHMOND, Decatur, Ill. Filed May 7, 1888. Serial No. 273,003. (No model.)



Claim.—1. A micrometer watch-regulator comprising a graduated arc, an arm pivoted at or near the center of the circle that the arc would form if continued, a swivel on the arm between the pivot and the arc, adapted to carry the regulating-pointer, and means for adjusting the arm with relation to the arc, as and for the purpose set forth.

2. A micrometer watch-regulator comprising a graduated arc, an arm yieldingly pivoted near the center of the circle that the arc would form if continued, a roller in the arm bearing with a yielding pressure against the arc, and means for connecting the arm with a regulator-pointer, as and for the purpose set forth.

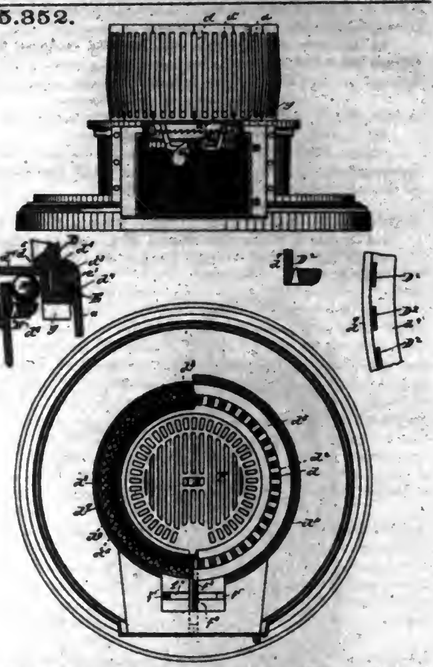
3. In micrometer watch-regulators, in combination, arc *b*, springs *b' b'*, carrying pivot *f*, arm *c*, pivoted at *f*, roller *d'* in arm *c*, bearing against the periphery of the arc, and swivel *e*, adapted to carry pointer *a*, as and for the purpose set forth.

395,352. HEATING STOVE AND FURNACE. CHARLES I. RIDGWAY, Boston, Mass., assignor to the Ridgway Furnace and Stove Company, Nashua, N. H. Filed July 27, 1885. Serial No. 172,748. (No model.)

Claim.—1. In a heating stove or furnace, the combination, with the wall of the ash-pit, of a transversely-angular supporting-ring resting upon such wall, a series of anti-friction rollers loosely supported upon such supporting-ring, an annular support resting upon the anti-friction rollers, and an annular or cylindrical fire-pot resting upon the annular roller-supported support, substantially as described.

2. The combination, with the wall of an ash-pit, of an annular support consisting of vertical and horizontal portions, a series of anti-friction rollers resting upon such annular support, a supporting-ring

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or double-angle plate resting upon the series of anti-friction rollers and covering the inner surface of the same, and a fire-pot resting upon such angle-plate, substantially as specified.

3. The combination, with the wall of an ash-pit, of a recessed and perforated annular support which rests thereon, a series of movable anti-friction rollers which are supported at bottom and covered exteriorly by such perforated annular support, a supporting-ring or double-angle plate which rests upon the anti-friction rollers and covers the same interiorly, and a fire-pot which rests upon the supporting-ring or double-angle plate, substantially as set forth.

4. The combination, with the wall of an ash-pit, of an annular support having an exterior vertical portion and an interior horizontal perforated portion, a series of anti-friction rollers upon such annular support, an annular rotary plate which has a main vertical portion, an upper exterior, and a lower interior horizontal portion, and a fire-pot which has double bearing-faces, one of which rests upon the exterior and the other upon the interior horizontal portion of the double-angle plate.

5. The ash-pit wall having a supporting-shoulder, the perforated single-angle plate, the series of anti-friction rollers, the double-angle plate, the fire-pot provided with inner annular flange or ledge at its lower extremity, and the cylindrical or annular covering-piece resting upon the flange or ledge and extending downwardly over the inner portion of the fire-pot and of the double-angle plate, all in combination, substantially as described.

6. The combination, with the wall of the ash-pit, of an annular support resting upon such wall, a series of anti-friction rollers upon such annular support, an upper annular angle-plate having a series of bottom engaging-teeth supported upon the anti-friction rollers, a fire-pot resting upon such upper annular angle-plate, and a horizontally-oscillating grate provided with a pawl for engagement with the bottom teeth upon the upper annular angle-plate, substantially as described.

7. The combination of the ash-pit wall d^{11}, having the shoulder d^{10}, the angle-plate d^9, the series of balls d^8, the rotary plate d^6, and the superposed fire-pot wall D, substantially as set forth.

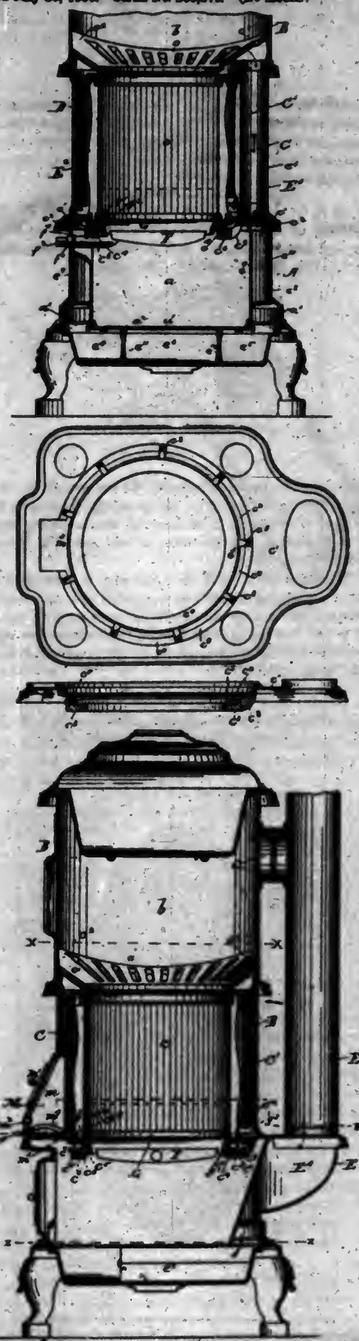
8. The combination, in a furnace or heating-stove, of a rotary fire-pot wall, a grate adapted to have an oscillating movement imparted to it, and a device connecting the grate or grate-operating mechanism with the fire-pot wall, whereby upon the movement of the same in one direction the fire-pot wall is caused to be revolved, all substantially as described.

9. The combination, in a heating stove or furnace, of a rotary fire-pot wall having teeth *g*, a grate adapted to have an oscillating movement imparted to it, and a pawl carried by the grate-operating arm or rod and arranged to engage the teeth of the fire-pot wall when it is moved in one direction, all substantially as described.

10. A heating stove or furnace which is provided with a rotary

fire-pot wall and with an oscillating grate which carries a pawl, which may or may not engage the fire-pot wall to rotate the same when the grate is oscillated.

395,353. HEATING-STOVE. CHARLES I. RIDGWAY, Everett, Mass., assignor to the Ridgway Furnace and Stove Company, Nashua, N. H. Filed July 28, 1886. Serial No. 208,576. (No model.)



Claim.—1. A heating-stove having the base-section A, the upper section, B, containing a combustion-chamber, a heat-radiating section or shell, C, the fire-pot *c*, inclosed thereby, and a chamber, D, interposed between the radiating outer section and the fire-pot, separated from the ash-pit and connected with the combustion-chamber, substantially as described.

2. The combination, in a heating-stove, of a base-section containing an ash-pit and base-flues, an upper section containing a combustion-chamber, an interposed section, the fire-pot contained therein provided with openings or recesses, a chamber, D, surrounding the same and opening into the combustion-chamber, a partition-plate separating the said chamber from the ash-pit, the pipes E K F F', forming the downflues, and the uptake E', substantially as described.

3. The combination of the base having the side flues, c^7 c^8, arranged on each side of the ash-pit, the side flues, c^4 c^5, and the horizontal flue c^6, below the ash-pit plate, the front flues, *c c'*, opening into the front ends of the side flues, c^4 c^5, the combustion-chamber *b*, and the uptake E', substantially as described.

4. The base-plate c', having the section c^3, forming an exposed surface of the section c^2, constituting a support for the fire-pot wall, and the intermediate arms, c^3, forming the recesses c^2, in combination, substantially as described.

5. The combination, with the stove, of the annular plate G, for supporting a fire-pot, having the recess g^2, for receiving the extension c^{12} of the fire-pot, substantially as described.

6. The combination, with a stove, of the annular plate G, having the downwardly-extending ring *g*, the surfaces g^6 g^7, the flange g^5, the teeth g^3, and the recess g^2, for receiving and holding the base of the fire-pot wall, substantially as described.

7. The plate c', having a ball-holding recess provided with the lip c^9, in combination with the balls c^8, the plate G, and the fire-pot wall *c*, substantially as described.

8. The combination, in a heating-stove, of the fire-pot *c*, the chamber D, opening into the combustion-chamber *b*, the casing C, forming the exterior of the stove, and the enlargement M to the chamber D, all substantially as described.

9. The combination of the scraper having two deflecting or scraping surfaces, *n*, with the plate G, having the extension or flange g^5, substantially as described.

10. The combination of the fire-pot *c*, the chamber D, the flues *c c' c⁶ c⁵*, and the guard *e*, substantially as described.

11. In a heating-stove, the combination, with the fuel-chamber, of the coal-guard *o*, raised or extending upward at its corners o^2, substantially as and for the purposes described.

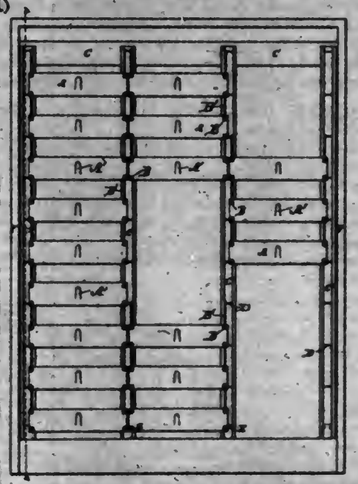
12. The combination of the outer casing, c^{10}, with the plate c', shaped to provide the base-flues c^7 c^8, substantially as described.

13. In a heating-stove, the ash-pit *a*, having the pocket *h'*, for holding the gear H, substantially as described.

14. The combination, in a heating-stove, of the chamber D, having the enlargement M, and the door *m'*, hinged at m^2 to open outward and downward, substantially as described.

15. The combination of the plate G, having the extension or flange g^5, with the scraper N, having one or more deflecting-surfaces, *n*, and supports to permit a vertical movement to be imparted to it by the plate or by any obstruction thereon, substantially as and for the purposes described.

395,354. RAILWAY-COUPON-TICKET RACK. GEORGE ROSS, South Butte, Mont. Filed June 20, 1888. Serial No. 277,090. (No model.)



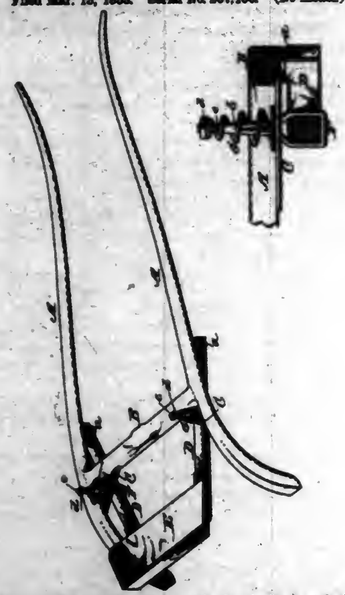
Claim.—1. The combination of the longitudinally-grooved standards, the transverse pegs secured in the standards, the links engaging

said pegs, and the ticket-holding plates secured to said links, as set forth.

2. The combination of the grooved standards, the transverse pegs D, the forwardly-projecting pegs E, the links B', adapted to engage the pegs D, and the ticket-holding plates having openings in their corners engaged by the links and engaging the pegs E, as set forth.

3. The combination of the casing, the links supported within the casing, and the ticket-holding plates detachably secured at their corners to the ends of the links, as set forth.

395,855. TWO-WHEELED VEHICLE. FREDERICK RUFF, Milford Ind. Filed Mar. 12, 1888. Serial No. 267,100. (No model.)

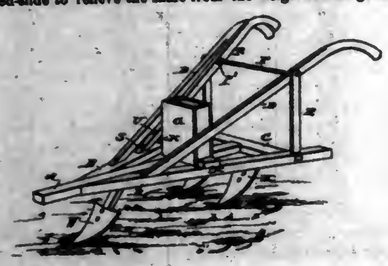


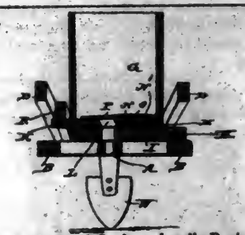
Claim.—1. The combination, with the shafts A and the bars D, pivoted at one end to the under side of said shafts and at the other end carrying the seat, of the diagonal supports C, the yokes F, embracing said bars, and having shanks *b* extended through holes in the supports C, the conical spiral springs encircling the said shanks, and the adjusting-nuts on the ends of said shanks and bearing on said springs, substantially as shown and described.

2. The combination, with the shafts, the clips *a* on the under side thereof, the cross-brace B, the diagonal bars D, pivoted at one end to said clips and at the other carrying the seat, and the metal supports C, extended in a diagonal direction from the shafts to said brace and secured thereto, of the yokes embracing the bars D near the center of their length, and formed with tapered shanks *b*, passed loosely through holes in the supports C in the crotch of the shafts and brace to the rear of the brace, the conical coiled springs encircling said shanks, and the adjusting-nuts on said shanks above the springs, substantially as shown and described, and for the purpose specified.

395,856. CORN-PLANTER. CHARLES M. RUFF, Rocky Fork, W. Va. Filed Mar. 22, 1888. Serial No. 268,154. (No model.)

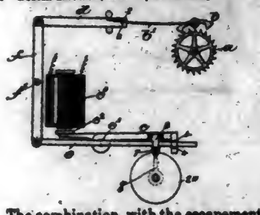
Claim.—In a planter, the combination, with the main frame, the handles D, secured thereto, the cross-bar F of the handles, and the hopper having in its bottom the groove I and a suitable discharge-opening, of the seed-slide having a discharge-opening, L, and shallow longitudinal groove M, the slotted plate N, adjusted by the screw O, the spring-guide plate and protector P, arching up centrally above the seed-slide to relieve the same from the weight of the grain that





might impede its motion, and the lever-handle R, pivoted at S on the main frame, connected at U to the seed-slide, provided with the slot P', by means of which it is supported and guided between the handles and prevented from being displaced or removed by the adjacent handle D, substantially as specified.

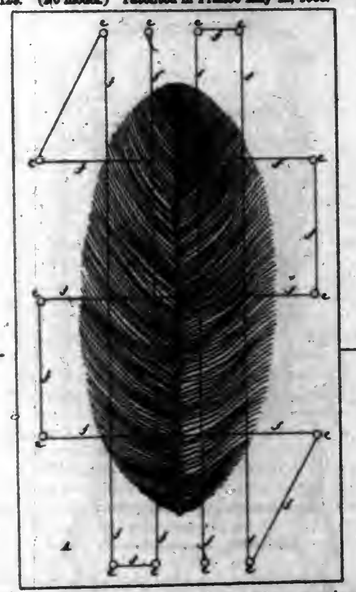
395,857. CONTROLLING DEVICE FOR THE REGULATING MEMBERS OF CLOCKS. WILLIAM S. SCALES, Somerville, assignor, by direct and mesne assignments, to Royal E. Robbins, Boston, Mass. Filed Mar. 17, 1888. Serial No. 267,457. (No model.)



Claim.—1. The combination, with the escapement *a* and verge *b*, of a resisting-spring for the verge, the operating bar or lever for varying the force or resistance of said spring, and an electro-magnet for moving or controlling the movement of said operating bar or lever, substantially as described.

2. The combination, with the regulating or controlling member of a clock, of a spring operatively connected with said member and the operating bar or lever for increasing or decreasing the force or amount of the resistance of said spring, and an electro-magnet for moving or controlling the movement of said operating bar or lever, substantially as described.

395,858. ART OF ORNAMENTING FEATHERS. OSCAR SOHEURER and ALPHONSE FORNEY, Paris, France. Filed June 25, 1888. Serial No. 278,129. (No model.) Patented in France May 12, 1888.

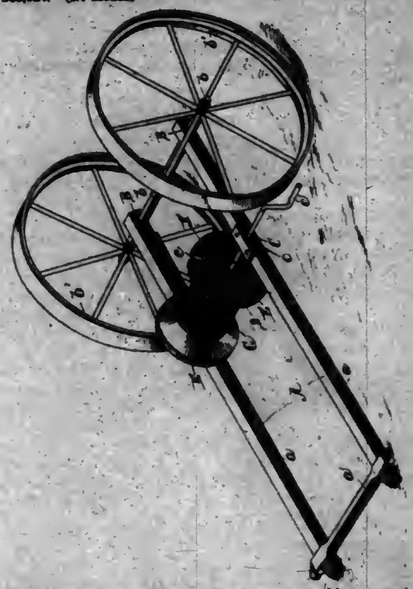


Claim.—1. The improvement in the art of ornamenting feathers for dress purposes, which consists in printing them in colors or patterns, substantially as described.

2. The improvement in the art of ornamenting feathers for dress purposes, which consists in placing the feather on a soft yielding cushion and printing it by means of a printing-plate, whereby during the impression the rib embeds itself in the cushion.

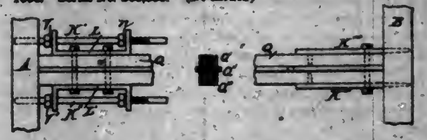
3. As a new article of manufacture, a feather for dress purposes printed in any color or pattern, as hereinbefore specified.

395,859. FENCE-WIRE-LAYING MACHINE. ORVIS R. SHARP and IRA J. REED, Marengo, Iowa. Filed Sept. 20, 1888. Serial No. 285,857. (No model.)



Claim.—The improved fence-wire-stringing machine, comprising the side bars, *a*, having notches in their under sides at one end adapted to engage an axle, the other ends of said bars being tapered and connected by a cross-bar, *a'*, the crank-shaft journaled in the side bars, the spool loosely mounted on the crank-shaft, and having annular flanges at its ends, one of said flanges having a radial notch in its edge, and the detent having one end pivoted in a staple on the crank-shaft, and having its end hooked and adapted to engage the notch in the flange of the spool, as specified.

395,860. GATE. JAMES SHOUP, Newport, Mich. Filed Feb. 25, 1888. Serial No. 265,233. (No model.)

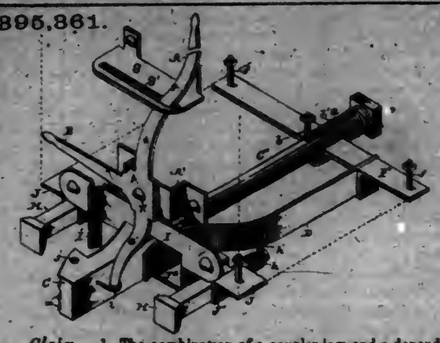


Claim.—1. In a wire gate, the combination, with two uprights, (hinge-board and latch-board,) of a center bar, Q, consisting of an iron plate laid between two boards, which are bolted edgewise to the plate, two iron straps, K''' K''', bolted one below and one above to the front or latch end of the center bar, the projecting rounded ends of said straps entering into the latch-board in lieu of tenons, two clips, L L', bolted—one above, the other below—to the hind or hinge end of the center bar, two straining-bolts, K' K'', passed through the upturned ends of said clips, each bolt having a shoulder near one end, with a thread and nut at the other, and their ends beyond the shoulders V V' entering the hinge-board in lieu of tenons, wires stretched across the gate, stiffening-cables, the strands of which pass round said wires, and a tie-rod stretched from the front part of the gate to the upper end of the hinge-board, where it is fastened by a thumb-screw or threaded nut, (the end of the tie-rod being threaded,) the whole substantially as and for the purposes set forth.

2. A wire gate having a center bar, Q, consisting of a plate of iron laid between two boards bolted edgewise to the plate, substantially as described.

3. A wire gate having its center bar provided with the combined straining-bolts K K' and clips L L'.

395,861. CAR-COUPLING. HENDRON SOMERFIELD, Canton, Kans. Filed Sept. 19, 1888. Serial No. 285,797. (No model.)



Claim.—1. The combination of a coupler-jaw and a depending stop arranged to one side thereof in a position to prevent lateral movements of opposing coupler-jaws, and formed by folding a metal plate, I, substantially as set forth.

2. In combination with a car-coupler jaw and the bumpers, a plate, J, secured to the under forward end of the car, having sockets J' for the bumpers, and a depressed portion, J², for the coupler-jaw, substantially as described.

3. In combination, a spring-actuated coupler-jaw, a plate, such as J, secured to the front end of the car and provided with sockets J' and a depression, J², and bumpers H, mounted in said sockets, substantially as described.

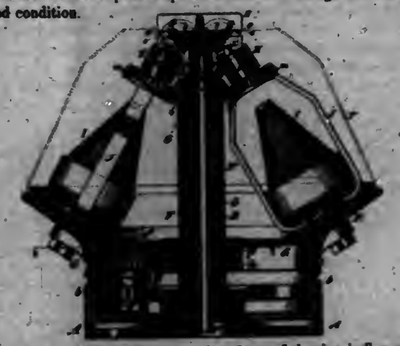
395,862. BRUSH FOR COTTON-GINS. ROBERT F. SPALDENBERGH, New Orleans, La. Filed Apr. 26, 1887. Serial No. 236,197. (No model.)



Claim.—A brush-cylinder provided with lags having diagonally-arranged inclined perforations in parallel series, as shown, and the tufts of bristles secured in the said inclined perforations, substantially as specified.

395,863. MACHINE FOR COVERING WIRE. HENRY SPLITDORF, New York, N. Y., assignor to the Splitdorf Wire Company, same place. Filed Dec. 5, 1887. Serial No. 256,972. (No model.)

Brief.—The invention consists in certain improvements upon the machine covered by Letters Patent No. 300,403, dated June 17, 1884, which is of that class of machines whereby the fibers are first untwisted and then placed upon the wire in a straightened and flattened condition.



Claim.—1. The bobbin-carrying frame J, having hollow spindle *l* and rotary support E for said frame J, spring-clamp L on the spindle *l* for holding the fibers as they are untwisted, and gear *m* on said frame J, combined with the hollow stationary spindle B for the passage of a wire, rotating tube G, and gear *i* on said tube, the gear *i* engaging the gear *m*, the fibers being led from the clamp to the wire above the end of the spindle, substantially as described.

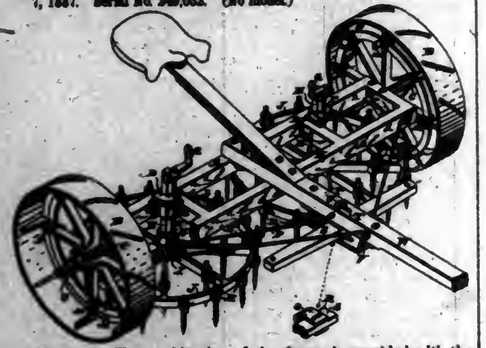
2. The support E, having hollow standard F, combined with the tube G within the standard F and projecting beyond said standard, and with gear-wheel *e* on the support E, gear A on tube G, and intermediate gear, *f g*, connecting the support E with the tube, whereby, when the support E rotates, said tube will be driven independently of said support, substantially as herein shown and described.

3. The rotating support E, having hollow standard F, tube G, gear *i* on said tube, and means for turning said tube independently of the support E, combined with the longitudinally-fluted rollers N O, for spreading and feeding the fibers, said rollers carrying gear *o*, and, with the gear *r*, meshing with the gear *i* on the tube G, and turning the gear *o* for driving the rollers N O, substantially as herein specified.

4. The combination, with the rotating support E, having hollow standard F, tube G, partially within said standard, and having gear *i*, and means for turning the tube G, of the frames J, having gear *m*, meshing with the gear *i*, spring-clamp L, and rollers N O, the roller N, having the gear-wheel *o*, pinion *p*, engaging gear *o* and gear-wheel *r* on the shaft with the pinion *p*, said gear *r* meshing with the gear *i*, whereby the rollers N O are driven by the tube G, substantially as described.

5. The combination of the base A, stationary hollow spindle B, support E above said base, said spindle passing through said support, tube G, embracing the stationary spindle B, and gearing *e f g h*, connecting the tube G with the support E, whereby as the support E rotates the tube G will be independently rotated by said support, substantially as herein shown and described.

395,864. ROTARY HARROW. IRA E. STUMP, Kirkville, assignor of one-half to A. C. and Gen. T. McConnell, Cleveland, Ohio. Filed Sept. 7, 1887. Serial No. 249,052. (No model.)



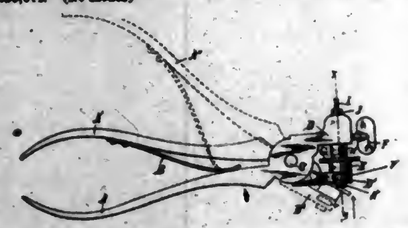
Claim.—1. The combination of the frame A, provided with the castings D, the spindles E, having located upon their lower ends the rotating harrows J, the screws F, provided with the handles G, the lifting lugs H, and the driving-lugs M, substantially as and for the purpose specified.

2. The combination of the frame A, the wheels B, the castings D, the screws F, the spindles E, having located upon their lower ends the rotating harrows J, and the draft-rod P, connecting the lifting-lugs H and the draft-strap O, substantially as and for the purpose specified.

3. The combination of the frame A, the wheels B, provided with secondary rims, and the driving-lugs M, adapted to be moved in radial slots and to engage with the teeth of the harrows J, substantially as and for the purpose specified.

4. The combination of the pole W, provided with the slot T, the doubletree S, provided with the slot R, the draft-strap O, and the draft-rods P, substantially as and for the purpose specified.

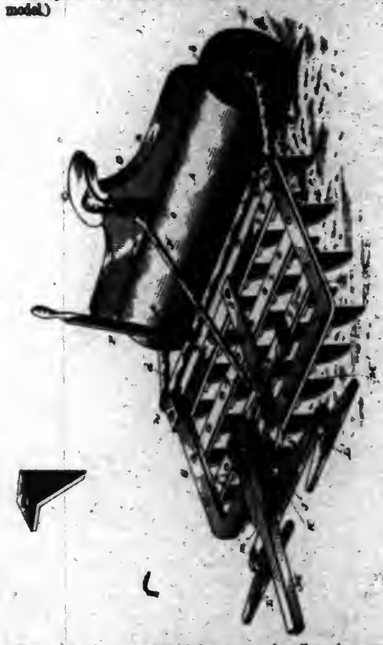
395,865. APPARATUS FOR FORMING ABRADING-WHEELS. WILLIAM H. TAGGART, Prospect, Ill. Filed Oct. 28, 1887. Serial No. 253,671. (No model.)



Claim.—1. In a device for forming abrading-wheels directly upon their shafts, the combination, with two coacting jaws, of a pressure-block attached to one of said jaws, a matrix attached to the other jaw and having a cutting-edge adapted to bear upon said pressure-block, and an axial bore adapted to receive a shaft, and means, substantially as shown and described, for securing a shaft in the bore of said matrix during the formation of an abrading-wheels, substantially as and for the purpose set forth.

2. In an apparatus for forming abrading-wheels directly upon their shafts, the combination, with two suitably-bored coacting jaws, of a pressure-block having a shank removably seated in the bore of one of said jaws, an axially-bored matrix having a shank removably seated in the other of said jaws and formed with a transverse opening, and a transverse set-screw seated in said last-named jaw and adapted to pass through the transverse opening in the shank of the matrix and to secure a shaft in said shank and at the same time to secure the shank in the jaw in which it is seated, substantially as and for the purpose set forth.

395,866. COMBINED HARROW AND ROLLER. JOHN T. VAN POOL, Tiptonville, Tenn. Filed Apr. 28, 1888. Serial No. 272,201. (No model.)



Claim.—1. In a combined harrow and roller, the combination, with the frame provided with an arm projecting therefrom, of a lever adjustably secured to said arm, substantially as set forth.

2. The combination, in a combined harrow and roller, with the roller, a beam connected therewith provided with an apertured plate, and a harrow connected with said roller and provided with a slotted lug, of a bar secured at its rear end to the apertured plate and having its front end engaging the apertured lug, substantially as set forth.

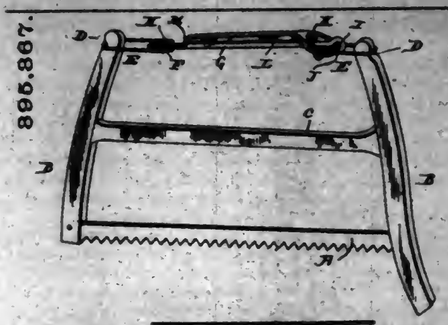
3. The combination, in a combined harrow and roller, with the roller, the connecting-frame, and the harrow, of bearing-plates removably secured to said harrow and engaging the frame, substantially as set forth.

4. The combination, in a combined harrow and roller, with the roller, a horizontal frame having bearings at its ends for the same, a lever for adjusting said frame, and a harrow connected with the latter, of a beam connected with the roller-axes and provided with a seat and an adjustable bar connecting said beam and harrow, substantially as set forth.

5. The herein-described harrow and roller, consisting of the roller, a beam connected with the axes thereof and provided with a seat and an apertured plate, a frame having bearings at its ends for said axes and provided with an adjusting-lever, a harrow connected with said frame and carrying an adjustable tongue, a slotted lug on said harrow, and a bar adapted to adjustably engage said lug and the said apertured plate, substantially as set forth.

395,867. SAW-TIGHTENER. SAMUEL WALTER, Dallas City, Ill. Filed Aug. 18, 1888. Serial No. 283,123. (No model.)

Claim.—The combination of the handles, the loops or bails engaging the upper ends of the handles, the stretching-bar having one end connected to the ends of one of the loops and its opposite end entering the end of the other loop, and the lever having a fork, K, at its end, provided with an integral cross-bar, J, the end of the stretching-bar being pivoted on the said cross-bar J and the ends of the adjacent bail being pivoted on the sides of the fork at a point between the cross-bar J and the end of the lever, as set forth.



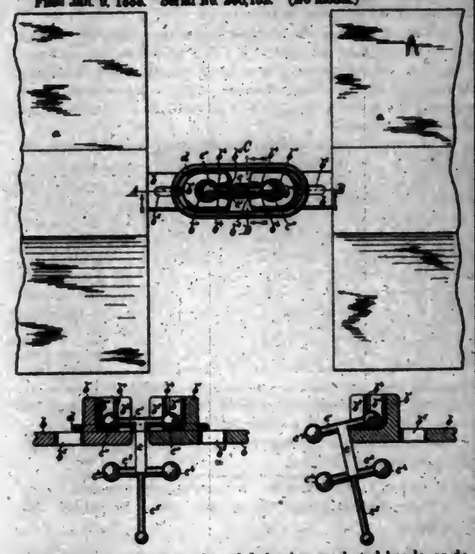
395,868. PROCESS OF COVERING HAMS, &c. ALEXANDER WARNER, New York, N. Y. Filed Feb. 9, 1888. Serial No. 263,308. (No specimens.)

Claim.—1. The within-described improvement in the art of applying preservative coverings to hams and other articles of food, consisting in first applying directly to the article a plastic composition containing amylaceous matter susceptible of coagulation, and afterward producing coagulation of said composition upon the article, substantially as set forth.

2. The process of producing preservative coverings upon hams and other articles of food, consisting in first applying closely to each article a binder or wrapper, in combination with a plastic composition containing amylaceous matter susceptible of coagulation, and afterward producing coagulation of said composition upon the articles, substantially as set forth.

3. The improvement in the art of applying preservative coverings to hams and other articles of food, consisting in applying thereto a coating of amylaceous matter with a wrapper, and subsequently immersing the so-coated article in a heated alkaline solution.

395,869. CAR-COUPLING. DARIUS WELLINGTON, Boston, Mass. Filed Jan. 9, 1888. Serial No. 260,132. (No model.)

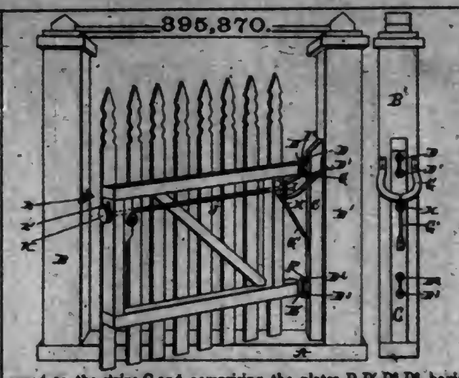


Claim.—1. The draw-bars *b b*, having pocketed heads, as described, combined with the cross-piece *d* and end projections, *c' c'*, thereon, the arm or lever *c* on said cross-piece, and the lower cross-piece, *c*², adapted to serve as a stop against the under side of the draw-bars to prevent the accidental uncoupling of the device, as set forth.

2. The draw-bars *b b*, having pocketed heads, as described, and the coupler composed of an arm or lever having one or more cross-pieces and end projections adapted to rest in the pocketed draw-bar heads, combined with the safety-link *d*, adapted to encompass the draw-bar heads, substantially in the manner and for the purpose set forth.

395,870. GATE-HINGE. SOLOMON D. WELLS, Fairmont, Minn. Filed July 19, 1888. Serial No. 280,647. (No model.)

Claim.—The combination, with the posts B B', sill A, and gate, of the strip G, interposed between the gate and post B', hinges secured to the stripe G and comprising the plates D D' D² D³, having eyes E E, the inclined U-shaped track G, secured to the post B', inclined bar G', and rod J, having rollers I K secured at each end, whereby the gate is opened and closed by its own gravity, substantially as and for the purpose described.



395,871. PIANO-TRUCK. CALVIN L. WEBER, New York, N. Y. Filed Apr. 28, 1888. Serial No. 272,196. (No model.)



Claim.—1. In a piano-forte truck, the bed-frame *b b' d d'*, united to the standards *m m'* in such manner that the bed-frame may revolve in the standards at points approximately opposite the balancing plane of an upright piano-forte, substantially as and for the purpose described.

2. In combination with the swiveled bed-frame of a piano-forte truck, as described in claim 1, a regulating-rod, *g*, connected with the cross-bar *l l*, *l'* and revolving coincidently with the revolution of the swiveled bed-frame by means of its insertion through the opening *p* in the upper cross-bar *d d'*, substantially as and for the purpose described.

3. In combination with the swiveled bed-frame and the regulating-rod *g* of a piano-forte truck, a stop or button, *k*, attached to the regulating-rod *g*, for the purpose of limiting the revolution of the truck around its centers *f f'*.

4. In combination with the swiveled bed-frame and the regulating-rod *g*, a set-screw, *c*, inserted into the upper cross-bar *b b'*, opposite the opening *p*, to bind or clamp the regulating-rod *g* in the opening *p*, substantially as described.

5. In combination with the regulating-rod *g*, the side pieces of the bed-frame *b b'*, terminated at their lower extremities by the dogs *a a'*, substantially as described.

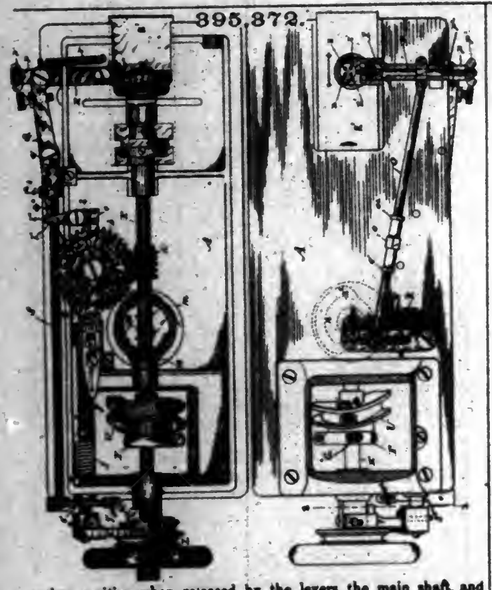
395,872. BUTTON-SEWING MACHINE. LEMAN C. WIRE, Boston, Mass., assignor, by direct and mesne assignments, to the Union Button Sewing Machine Company, of Massachusetts. Filed Sept. 4, 1886. Serial No. 212,673. (No model.)

Claim.—1. In a button-sewing machine, as a means for readily and with the utmost nicety adjusting the button-carrier with respect to the needle on a line substantially transverse to the reciprocating movements of the carrier, the combination, with a sewing mechanism, of a button-carrier provided with a rod, P, screw-threaded on its rear end, a presser-foot mechanism provided with a lug or block, *p*, having a hole through which the rod P passes, a thumb-screw, *p'*, on the outer end of the rod to adjust the button-carrier, and a locking-nut, *p*², to lock the button-carrier in adjusted position, substantially as set forth.

2. In a button-sewing machine, a sewing mechanism, a button-carrier and means for operating it, the main shaft, a dog, *f*, pivoted thereon, a driving-pulley running loose on the main shaft and adapted to engage the dog and drive the main shaft, a rock-shaft, J, and means for controlling the movement of the same, and an arm, *f'*, on the rock-shaft, provided with a spring-pressed pin, *g*, and having the inclined surface *f*³, substantially as set forth.

3. A sewing mechanism and a button-carrier, in combination with a lever, R, directly connected with the button-carrier, levers Q and *l*, for locking or holding the button-carrier in one position, lever Q being directly connected with lever R, and lever *l* being directly connected with lever Q, a spring for moving the button-carrier to

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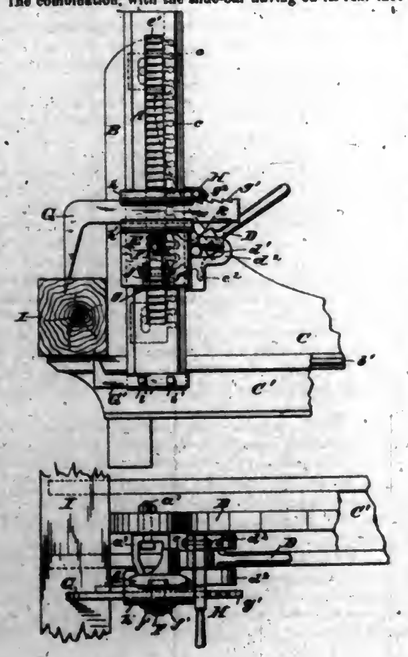


another position when released by the levers, the main shaft, and camshaft wipers operated by the main shaft and arranged to operate on lever *l*, substantially as and for the purposes set forth.

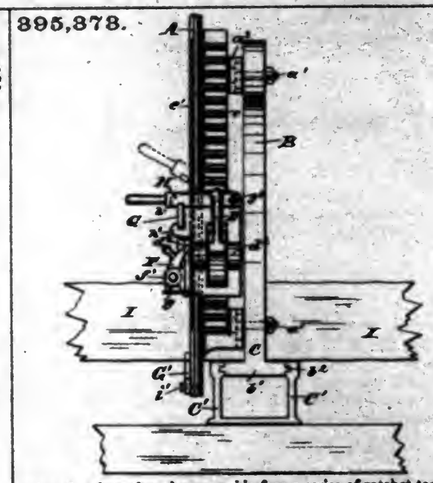
395,373. SAW-MILL DOG. HARVEY R. WOLFE, Louisville, Ky., assignor to John R. Bascom, and the Brennan & Co. South Western Agricultural Works, both of same place. Filed Dec. 27, 1887. Serial No. 259,007. (No model.)

Claim.—1. In a saw-mill dog, the combination, with an upright slide-bar having rack-teeth formed upon one face and provided with a timber-grasping dog at its lower end, of a sliding head engaging said slide-bar and provided with two grooved projections, a notched dog adjustable in said projections, a locking-lever pivoted to the sliding head and engaging with one of the notches in the adjustable dog, and a cog-lever pivoted to the sliding head, the cogs on said lever engaging the rack-teeth on the slide-bar to move the latter up and down, substantially as described.

2. The combination, with the slide-bar having on its rear face a



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series of rack-teeth and on one side face a series of ratchet-teeth and provided with a dog, of the sliding head carrying a dog, a cogged lever loosely journaled in said head to engage with the rack-teeth on the slide-bar, and a spring-pressed pawl pivoted on the sliding head to engage with the ratchet-teeth on the slide-bar, for the purposes set forth.

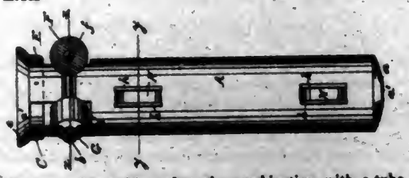
3. The combination, with the slide-bar having on its rear face a series of rack-teeth and on one side face a series of ratchet-teeth and provided with a dog, of the sliding head carrying a dog and having slotted ears, the upper sides of the slots in the ears being enlarged at their forward ends, a pawl pivoted on the sliding head to engage with the ratchet-teeth on the slide-bar, and a cogged lever loosely journaled in said ears to engage with the rack-teeth on the slide-bar, for the purposes set forth.

4. The combination, with the slide-bar having cylindrically-formed teeth on its rear face, provided with a dog, of the sliding head carrying a dog and the operating-lever loosely journaled in the head, the said lever having cylindrically-faced cog-teeth at its forward end to mesh with the teeth on the slide-bar, substantially as described, and for the purpose stated.

5. A saw-mill dog comprising the following essential elements, the upright or knee B, the slide-bar A, adjustably secured thereto and having the cylindrically-faced teeth at its rear and the ratchet-teeth upon its side, the sliding head E, having the mutilated cogged lever D to engage the teeth of the slide-bar A, and having the enlarged ended elongated bearing *d'* for the journal of the lever D, the locking mechanism consisting of the pawl F, pivoted to the sliding head, and the spring *g*, to hold said pawl into engagement with the ratchet-teeth of the slide-bar, said slide-bar carrying one of the timber-grasping dogs and the sliding head the other, substantially as shown and described.

6. The combination, in a saw-mill dog, of the slide-bar A, having the cylindrical rack-teeth *c* and ratchet-teeth *c'*, the slide-bar carrying one of the dogs G', the sliding head E, having the pivoted lever D to engage the teeth of the slide-bar, the spring-pawl-locking device to engage the ratchet-teeth, the notched dog G, adjustably seated in grooves in the sliding head, and the pivoted locking-lever H, to engage the notches of said dog and hold it against displacement, all substantially as shown and described.

395,374. WHIP-SOCKET. WILLIAM WEBBER, Plymouth, County of Devon, England. Filed May 21, 1888. Serial No. 274,469. (No model.)



Claim.—1. In a whip-socket, the combination, with a tube for the whip-handle, provided with a bell-mouthed flange at its upper end and slots or apertures in its sides below the flange, of the revoluble rollers projecting through the said apertures in the upper end of the tube.

2. In a whip-socket, the combination, with a tube for the whip-handle, of an unyielding ring secured to the mouth of the tube, and

rollers of elastic material having holes of larger diameter than the portions of the said ring upon which they are journaled.

3. In a whip-socket, the combination, with a tube provided with slots at its upper end and a circumferential bulge formed in the metal between the said slots, of a ring supported by the said bulge, and rollers journaled on the ring and projecting through the slots.

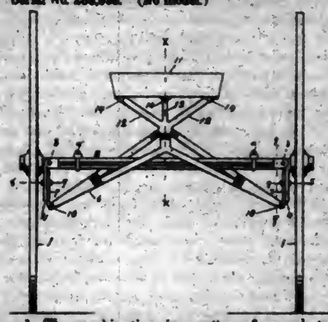
4. In a whip-socket, the combination, with a tube provided with slots at its upper end, of a ring secured to the tube between the slots, and rollers of elastic material having holes of larger diameter than the said ring upon which they are journaled.

5. In a whip-socket, the combination, with a tube having slots at its upper end and a circumferential bulge formed in the metal between the slots, of a ring having its ends butted together and held in position by the said bulge, and india-rubber rollers journaled upon the said ring and projecting through the slots.

6. In a whip-socket, the combination, with a tube provided with open-ended slots at its upper end, of a ring secured inside the tube between the slots, rollers projecting through the slots and journaled upon the said ring, and a collar secured to the top of the tube above the rollers.

7. In a whip-socket, the combination, with a tube provided with open-ended slots at its upper end, of a ring secured inside the tube between the slots, rollers journaled upon the ring and projecting through the slots, and a collar secured to the tube and provided with a bell-mouthed flange, and a circular shoulder resting upon the top edge of the tube.

395,375. SULKY. CHARLES O. YALE, Rome, N. Y. Filed Oct. 17, 1888. Serial No. 288,308. (No model.)

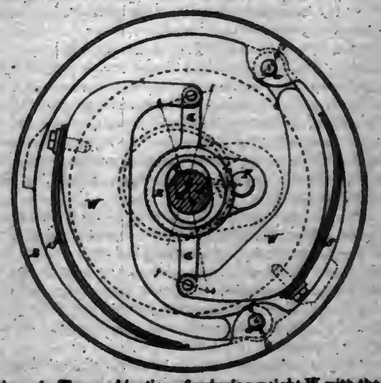


Claim.—1. The combination, in a sulky, of an axle-tree jointed inside of the hubs, the outer jointed portions of the axle-tree having downwardly-projecting angles, and a brace flexibly connected to the downwardly-projecting angles, substantially as set forth.

2. The combination, in a sulky, of the jointed axle-tree, the outer jointed portions of the axle-tree provided with downwardly-projecting angles, and a vertically-adjustable brace pivoted to the downwardly-projecting angles, substantially as set forth.

3. The combination, in a sulky, of the jointed axle-tree, the outer jointed portion of the axle-tree provided with downwardly-projecting angles, a brace pivoted to the downwardly-projecting angles, and the horizontally-adjustable seat mounted on the brace, substantially as set forth.

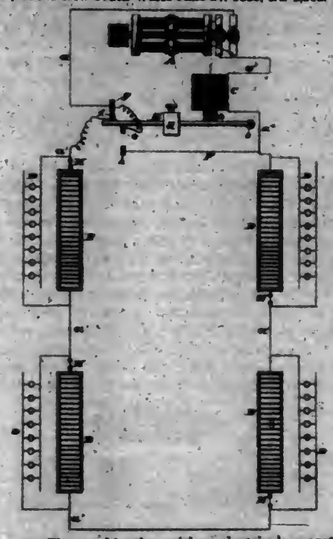
395,376. CUT-OFF GOVERNOR. JOHN F. ALLEN, New York, N. Y. Filed Feb. 22, 1888. Serial No. 264,960. (No model.)



Claim.—1. The combination of swinging weight W with the connecting-rod G, one end of the latter turning upon arm E, the whole constituting a reverse toggle-joint for moving arm E, substantially as specified.

2. The combination of curved weight W, hinged to pulley B and connected through rod G with a rock-shaft, F, turning in the web of said pulley and supporting the eccentric C, with flat spring S, the spring being curved or rolled upon the outer surface of the weight, substantially as specified.

395,377. SECONDARY-BATTERY CHARGING. CHARLES F. BROWN, Cleveland, Ohio, assignor to the Brush Electric Company, same place. Original application filed June 13, 1888, Serial No. 64,082. Divided and this application filed Dec. 11, 1888. Serial No. 114,308. (No model.) Patented in England July 1, 1888, No. 3,106; in Belgium July 23, 1888, No. 84,839; in Germany July 26, 1888, No. 44,583; in France July 26, 1888, No 190,318; in Russia Aug. 5, 1888, No. 5,699; in Italy Sept. 30, 1888, No. 14,463; in Victoria Nov. 13, 1888, No. 3,344; in Cape of Good Hope Dec. 15, 1888, No. 11/121; in South Australia Dec. 20, 1888, No. 318; in Spain Feb. 1, 1889, No. 3,478; in Austria-Hungary Apr. 15, 1889, No. 3,804; in Portugal May 2, 1889, No. 841; in India May 8, 1889, No. 170/88, and in New South Wales June 27, 1888, No. 1,902.



Claim.—1. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries included in the main or charging circuit in series, and a discharging or working circuit connected with each battery, of a switch constructed and arranged to switch all said batteries into the charging-circuit, and an electro-magnet included in the charging-circuit and adapted to actuate the switch and automatically and simultaneously switch all said batteries into the charging-circuit, substantially as set forth.

2. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries included in the main or charging circuit in series, each of said batteries having a discharging or working circuit connected therewith, of a switch constructed and arranged to switch all said batteries out of the charging-circuit and an electro-magnet included in the charging-circuit and adapted to actuate the switch and automatically and simultaneously switch all said batteries out of the charging-circuit, substantially as set forth.

3. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries included in the main or charging circuit in series, each secondary battery being provided with a discharging or working circuit, of a switch constructed and adapted to switch said batteries into and out of the charging-circuit, and a circuit around all of said batteries adapted to be opened and closed by said switch, and an electro-magnet constructed and arranged to actuate said switch and automatically and simultaneously switch said batteries and discharging-circuits out of the charging-circuit when the current stops or becomes sufficiently reduced and establish a circuit for the charging-current around all said batteries, substantially as set forth.

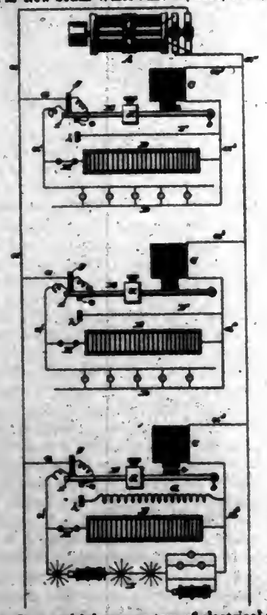
4. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries included in the main or charging circuit in series, each secondary battery being provided with a discharging or working circuit, and a circuit around all said batteries adapted to be opened and closed by a switch, of a switch constructed and arranged to open and close a circuit around said batteries and an electro-magnet included in the charging-circuit and adapted

to actuate said switch and automatically establish a closed circuit around said batteries and their discharging-circuits when the charging-current stops or becomes sufficiently reduced, substantially as set forth.

5. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries included in the main or charging circuit in series, each secondary battery being provided with a discharging or working circuit, of a circuit including a resistance around all said batteries, a switch for opening and closing the resistance-circuit, and an electro-magnet constructed and arranged to actuate the switch and automatically and simultaneously switch all said batteries out of the charging-circuits and establish a circuit, including the resistance, around said batteries, substantially as set forth.

6. In a system embracing a suitable electric generator, the combination, with a main or charging circuit, two or more secondary batteries included in the main or charging circuit in series, a discharging-circuit connected with each battery, and a circuit around said batteries adapted to be opened and closed by a switch, of a switch constructed and arranged to switch all said batteries into and out of the charging-circuit and to open and close a circuit around all said batteries, and an electro-magnet included in the charging-circuit and adapted to actuate the switch and automatically and simultaneously switch all said batteries out of the charging-circuit and establish a circuit around all said batteries when the charging-current ceases or becomes sufficiently reduced, and for opening said circuit and automatically and simultaneously switching the batteries into the charging-circuit when the charging-current is re-established, substantially as set forth.

395,878. SECONDARY-BATTERY CHARGING. CHARLES F. BRUSH, Cleveland, Ohio, assignor to the Brush Electric Company, same place. Original application filed June 13, 1883, Serial No. 64,083. Divided and this application filed Dec. 11, 1883. Serial No. 114,309. (No model.) Patented in England July 1, 1882, No. 3,108; in Belgium July 22, 1882, No. 58,889; in Germany July 25, 1882, No. 24,583; in France July 26, 1882, No. 150,318; in Russia Aug. 5, 1882, No. 5,690; in Italy Sept. 30, 1882, No. 14,453; in Victoria Nov. 13, 1882, No. 3,244; in Cape of Good Hope Dec. 15, 1882, No. 11/131; in South Australia Dec. 20, 1882, No. 318; in Spain Feb. 1, 1883, No. 3,478; in Austria-Hungary Apr. 15, 1883, No. 3,604; in Portugal May 2, 1883, No. 841; in India May 3, 1883, No. 170/82, and in New South Wales June 27, 1883, No. 1,362.



Claim.—1. In a multiple-arc system of electrical distribution, the combination, with an electric generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch for electrically connecting and disconnecting the secondary battery and charging-circuit, and an electro-magnet for automatically actuating the switch and switching the multiple-arc branch and the secondary battery included therein into the charging-circuit, substantially as set forth.

2. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch for electrically connecting and disconnecting the secondary battery and charging-circuit, and an electro-magnet for automatically actuating the switch and switching the multiple-arc branch and secondary battery included therein out of the charging-circuit, substantially as set forth.

3. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch constructed and adapted to electrically connect and disconnect the secondary battery and charging-circuit, and an electro-magnet for actuating the switch and automatically switching the multiple-arc branch and secondary battery included therein into and out of the charging-circuit, substantially as set forth.

4. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch for electrically connecting and disconnecting the secondary battery and charging-circuit, and an electro-magnet included in the charging-circuit of the battery and adapted to actuate the switch and automatically switch the secondary battery into and out of the charging-circuit while the charging-current is established therein, substantially as set forth.

5. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch for electrically connecting and disconnecting the secondary battery and main or charging circuit, and an electro-magnet included in the charging-circuit of the battery and adapted to actuate the switch and automatically switch the secondary battery out of the charging-circuit when the charging-current stops or becomes sufficiently reduced, substantially as set forth.

6. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch constructed and adapted to electrically connect and disconnect the secondary battery and charging-circuit, and a circuit around the battery adapted to be opened and closed by said switch, and an electro-magnet constructed and adapted to actuate the switch and automatically switch the secondary battery out of the charging-circuit when the charging-current stops or becomes sufficiently reduced and establish a circuit for the charging-current around the secondary battery, substantially as set forth.

7. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a switch for electrically connecting and disconnecting the secondary battery and charging-circuit, and an electro-magnet included in the charging-circuit of the battery and adapted to actuate the switch and automatically switch the battery and its multiple-arc branch circuit out of the charging-circuit while the charging-current is acting therein, substantially as set forth.

8. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, a secondary battery included in a multiple-arc branch of the main or charging circuit, and translating devices included in the discharging or working circuit of the secondary battery, of a switch and an electro-magnet included in the charging-circuit of the battery and adapted to automatically establish a closed circuit around the battery and its discharging-circuit when the charging-current stops or becomes sufficiently reduced, substantially as set forth.

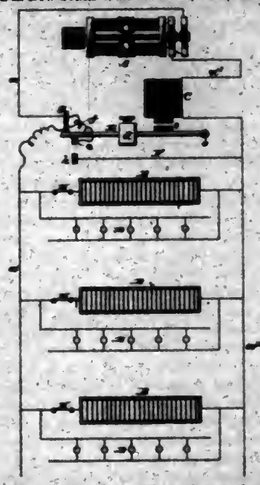
9. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and a secondary battery included in a multiple-arc branch of the main or charging circuit, of a resistance in a circuit around the battery, a switch constructed and adapted to electrically connect and disconnect the battery and charging-circuit, and a circuit including a resistance around the battery controlled by said switch, and an electro-magnet constructed and adapted to actuate the switch and automatically switch the battery out of the charging-circuit and automatically establish a circuit including the resistance around the battery, substantially as set forth.

10. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch of the main or charging circuit, of a switch and electro-magnet associated with each multiple-arc branch and constructed and adapted to automatically and independently switch the secondary batteries included therein into the charging-circuit, substantially as set forth.

11. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch of the main or charging circuit, of a switch and electro-magnet associated with each multiple-arc branch and constructed and adapted to automatically and independently switch the secondary batteries included therein out of the charging-circuit, substantially as set forth.

12. In a multiple-arc system of electrical distribution, the combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch of the main or charging circuit, of a switch, an electro-magnet included in the charging-circuit of each battery, and a shunt-circuit associated with each battery, said parts being constructed and adapted to automatically and independently switch each of said batteries out of the charging-circuit and establish a circuit around each battery when the charging-current ceases or becomes sufficiently reduced, and to automatically open said circuits around the batteries and switch the latter into the charging-circuit when the charging-current is re-established, substantially as set forth.

395,879. SECONDARY-BATTERY CHARGING. CHARLES F. BRUSH, Cleveland, Ohio, assignor to the Brush Electric Company, same place. Original application filed June 13, 1883, Serial No. 64,083. Divided and this application filed Dec. 11, 1883. Serial No. 114,310. (No model.) Patented in England July 1, 1882, No. 3,108; in Belgium July 22, 1882, No. 58,889; in Germany July 25, 1882, No. 24,583; in France July 26, 1882, No. 150,318; in Russia Aug. 5, 1882, No. 5,690; in Italy Sept. 30, 1882, No. 14,453; in Victoria Nov. 13, 1882, No. 3,244; in Cape of Good Hope Dec. 15, 1882, No. 11/131; in South Australia Dec. 20, 1882, No. 318; in Spain Feb. 1, 1883, No. 3,478; in Austria-Hungary Apr. 15, 1883, No. 3,604; in Portugal May 2, 1883, No. 841; in India May 3, 1883, No. 170/82, and in New South Wales June 27, 1883, No. 1,362.



Claim.—1. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch circuit of the main or charging circuit, each secondary battery having a discharging or working circuit connected therewith, of a switch for electrically connecting and disconnecting all of said secondary batteries and the main or charging circuit, and an electro-magnet constructed and arranged to actuate the switch and automatically and simultaneously switch all said batteries into the charging-circuit, substantially as set forth.

2. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch circuit of the main or charging circuit, each secondary battery having a discharging or working circuit connected therewith, of a switch for electrically connecting and disconnecting all of said secondary batteries and the main or charging circuit, and an electro-magnet constructed and arranged to actuate the switch and automatically and simultaneously switch all said batteries out of the charging-circuit, substantially as set forth.

3. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch circuit of the main or charging circuit, each secondary battery having a discharging or working circuit, of a switch for electrically connecting and disconnecting all said batteries and the main or charging circuit, and a circuit around all said batteries adapted to be opened and closed by said switch, and an electro-magnet included in the charging-circuit and arranged to actuate said switch and automatically and simultaneously switch all said batteries out of the charging-circuit when the current stops or becomes sufficiently reduced and establish a circuit for the charging-current around all said batteries, substantially as set forth.

4. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch of the main or charging circuit, each secondary battery having a discharging or working circuit, of a circuit adapted to be closed around all said batteries, and an electro-magnet included in the charging-circuit and arranged to actuate said switch and automatically establish a closed circuit for the charging-current around all said batteries when the charging-current stops or becomes sufficiently reduced, substantially as set forth.

5. The combination, with an electrical generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch of the main or charging circuit, each secondary battery having a discharging or working circuit, of a switch constructed and arranged to electrically connect and disconnect the batteries and the charging-circuit, a short circuit including a resistance around all said batteries adapted to be opened and controlled by said switch, and an electro-magnet constructed and arranged to actuate said switch and automatically and simultaneously switch all said batteries out of the charging-circuit and establish a circuit including the resistance around all said batteries, substantially as set forth.

6. A system embracing a suitable electric generator, a main or charging circuit, and two or more secondary batteries, each included in an independent multiple-arc branch of the main or charging circuit, each battery being provided with a discharging or working circuit, of a short circuit adapted to be opened and closed, and a switch included in the charging-circuit and arranged to simultaneously switch all said batteries into and out of the charging-circuit, and an electro-magnet constructed and arranged to actuate the switch and automatically and simultaneously switch all of the batteries out of the charging-circuit and establish a circuit around said batteries when the charging-current ceases or becomes sufficiently reduced, and for opening said short circuit and switching all of said batteries into the charging-circuit when the charging-current is re-established, substantially as set forth.

395,880. PRESSER-BAR. HENRY F. CAMPBELL, Malden, Mass. Filed Mar. 27, 1888. Serial No. 268,623. (No model.)



Claim.—The presser-bar provided with the lip a^3 and grooved at its under side, combined with the roller a^2, and boxes a^4, fitted in the said groove, and means to adjust said boxes and roller vertically independently of the presser-bar, whereby the position of the roller with relation to the presser-bar may be changed, as and for the purpose specified.

395,881. SUPPLEMENTAL BEARER FOR COFFIN OR GASKET STOOLS. BENJAMIN G. CARLES, Cleveland, Ohio. Filed July 2, 1888. Serial No. 278,044. (No model.)



Claim.—1. The combination, with a casket-stool having a main bearer, of an elevated supplemental bearer and interposed standards for supporting the elevated bearer above the main bearer, substantially as and for the purposes specified.

2. The combination, with a casket-stool having a main bearer provided with vertical pegs, of an elevated detachable supplemental bearer and interposed sleeve or tubular standards for supporting the elevated bearer above the main bearer, substantially as and for the purposes specified.

3. In a coffin or casket stool, the combination, with the main bearer, of vertical jointed pegs and a supplemental bearer having sleeve-standards which fit over the vertical jointed pegs of the main bearer, substantially as and for the purposes specified.

4. In a coffin or casket stool, the combination, with the main bearer having detachable pegs, of a supplemental bearer having sleeve or tubular standards which fit on the pegs of the main bearer, substantially as and for the purposes specified.

5. In a coffin or casket stool, the combination, with a bearer having vertical jointed pegs, of a supplemental bearer provided with detachable sleeve or tubular standards which fit over the jointed pegs of the main bearer, substantially as and for the purposes specified.

6. A folding supplemental bearer for coffin or casket stools, provided with detachable sleeve or tubular standards adapted to fit on pegs on the main bearer of a coffin or casket stool, substantially as and for the purposes specified.

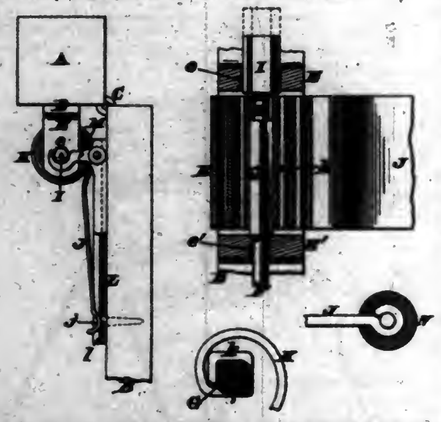
395,882. AUTOMATIC DAMPER. GEORGE H. CROWELL, Berlin Falls, N. H. Filed Apr. 4, 1888. Serial No. 269,563. (No model.)



Claim.—The combination, with the casing A, having the studs A' and slots *a*, of the reciprocating gridiron B, having openings *b*, straight slots *b'* and *b²*, and eccentric slot *b³*, the shaft *d*, passing through the slot *b²*, and carrying disk D', provided with pin *d'*, engaging with slot *b³*, the reciprocating damper C, having the openings *c* and superposed upon the gridiron B, the thermostatic bar F, and the bell-crank lever I, engaging with the damper C and connected with the bar F, all combined and operating substantially as and for the purpose set forth.

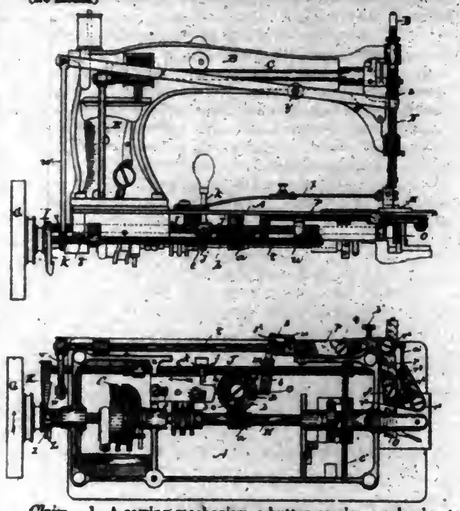
395,883. DOOR-SPRING. JOHN H. DAVIS, Covington, Ky. Filed May 14, 1888. Serial No. 273,854. (No model.)

Brief.—To the bearing-plate for the free end of the spring is secured a hook or fastener, which is adapted, when the door is thrown open, to engage with the head of the tension-adjusting pin of the spring, and thereby securely hold the door in an open position



Claim.—In combination with a spring having its free end in contact with a bearing-plate secured to a door or gate and its opposite end coiled around a tension-adjusting pin attached to a plate projecting from a post or frame, a swinging fastener coupled to said bearing-plate and engaged with the head of said pin when the door or gate is thrown wide open, as herein described.

395,884. BUTTON-SEWING MACHINE. LAWRENCE J. DEMOLL, Somerville, Mass., assignor, by mesne assignments, to the Union Button Sewing Machine Company. Filed Sept. 4, 1886. Serial No. 212,677. (No model.)

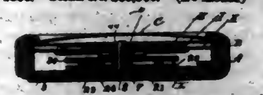


Claim.—1. A sewing mechanism, a button-carrier, mechanism to reciprocate it to present first one hole of a button and then another to the needle, locking devices consisting of a lever, *l*, a lever, *p*, and links or levers intermediate of the lever *p* and button-carrier to hold the latter in one reciprocating position, a spring to move the button-carrier to a second reciprocating position, a rotary shaft, a worm thereon, a wheel engaging and operating said worm, and a cam-piece or wiper on said wheel, said cam-piece being constructed and arranged to engage the lever *l*, whereby said lever may be moved to release the locking devices and permit the spring to move the button-carrier into the second-mentioned position, substantially as hereinbefore set forth.

2. In a button-sewing machine, the main shaft, means to drive the same, a clutch mechanism adapted to be operated to connect the driving means with the main shaft and disconnect it therefrom, a worm on the main shaft, a gear provided with a cam-piece or wiper engaged with and operated by said worm, a shipper-rod provided with devices connected with the clutch mechanism to hold the same out of operative position and allow the driving means to become connected with the main shaft, a shipper lever or handle, *k*, on said rod, a spring to rock said shipper-rod to cause its connected devices to operate said clutch mechanism to disconnect the driving means from the main shaft, and a slide, *c*, constructed and arranged to engage said shipper lever or handle *k* to lock or hold said shipper-rod and its connected devices against the tension of said spring and out of operative position with respect to the driving means, said slide being also arranged with respect to the cam-piece or wiper on said worm-wheel to be engaged thereby and be moved to permit the shipper lever or handle to be released or unlocked, and its connected devices to be moved by said spring into operative position, all combined substantially as hereinbefore set forth.

3. The sewing mechanism, a button-carrier and mechanism to move it to present first one hole of a button and then another to the needle, locking devices to hold the button-carrier in one reciprocating position, a spring to move the button-carrier into a second reciprocating position, a lever pivoted to the machine constructed and arranged to engage said button-carrier to raise the same, a rod provided with a finger constructed to engage said locking means and connected devices to move the same into the first-mentioned position, and a link connecting said rod with said lever, whereby when the latter is operated to raise the button-carrier said rod will be rocked and said finger operated, as before stated, all combined substantially as described.

395,885. CALENDAR. WILLIAM J. REECE, Cortland, N. Y. Filed Sept. 15, 1888. Serial No. 285,500. (No model.)



Claim.—1. The combination, in a calendar, of a base-plate provided with a sectoral slot, a handle, constructed as described, to reciprocate in said slot, ratchet-wheels mounted concentric to said slot and connected to indicating-plates, and pawls on the handle to engage said ratchets, as set forth.

2. In a calendar, a rotating disk bearing numbers and a ratchet connected thereto, a disk bearing names of days connected to a ratchet having its teeth facing in opposite direction from the other ratchets, and a reciprocating handle having pawls to engage all the ratchets when moving in one or the other direction.

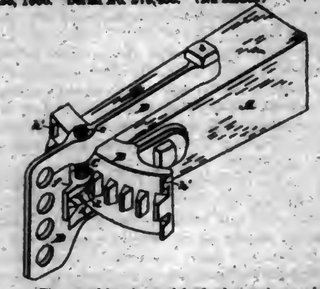
3. The combination, in a calendar, of a ratchet connected to an indicating-plate and having a notch in its periphery, a curved guide-pawl having a tooth to enter said notch, a reciprocating handle having a pivoted pawl resting against the guide-pawl, and a ratchet-wheel in position to be acted on by said last-mentioned pawl, substantially as described.

4. In a calendar, a ratchet and a month-indicating disk connected thereto, a second ratchet and a plate bearing the numbers of the days connected thereto, a dog in one of the ratchets, and a shifting-piece connected with the other ratchet controlled by a switch in the supporting-plate, whereby the two ratchets may turn together when the shifting-piece is in engagement with the dog, the elements in combination as set forth.

5. In a calendar, the combination of a month-indicating disk and a ratchet mechanism to rotate the same in one direction, a plate bearing numbers and a ratchet for moving in the opposite direction, a dog connected to one ratchet and a shifting-piece to the other, a switch controlling said shifting-piece, and a four-toothed wheel bearing on the shifting-piece, all substantially as described, whereby the ratchets are coupled together at certain times under the influence of the dog and shifting-piece, as set forth.

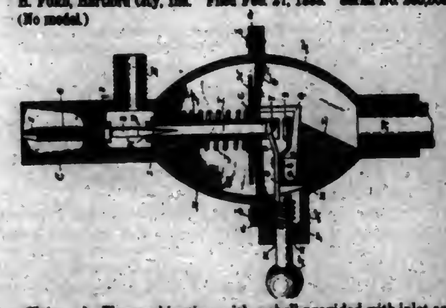
6. In a calendar, the combination of a ratchet and a wheel carrying the names of days connected thereto, a ratchet having a different number of teeth and a number-indicator connected thereto, a reciprocating handle and separate pawls carried thereby to engage both ratchets, and a bearer against which one of the pawls rests during a part of its movement, whereby the ratchets are moved independently and to different distances by the same movement of the handle, as set forth.

395,886. CLEVIS. OLIA A. REED, Canton, Ohio, assignor to the Universal Plow Company, same place. Filed Nov. 2, 1887. Renewed June 26, 1888. Serial No. 278,463. (No model.)



Claim.—The combination, with the beam A, provided with the crown-head B, of the draft link or bar D, pivotally attached to the beam A, the drop catch or lock provided with the pin C, projection *d*, shoulders *g*, side flanges, *h*, and recess *f*, the teeth *e*, and bar D, substantially as and for the purpose specified.

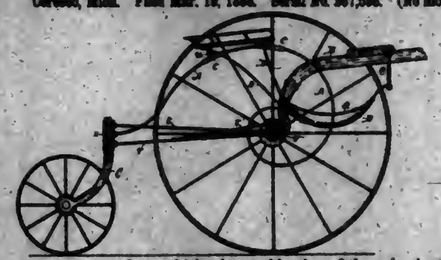
395,887. AUTOMATIC GAS REGULATOR AND CUT-OFF. EDWIN H. FORD, Hartford City, Ind. Filed Feb. 27, 1888. Serial No. 265,503. (No model.)



Claim.—1. The combination, with a shell provided with inlet and outlet pipes for the gas, and a tube-seat, as described, of a flexible diaphragm, a spring-pressed reciprocating tube secured to the diaphragm, an adjustable valve with which said tube coacts, a reciprocating spring-actuated arm, and a spring-pressed lever adapted to hold said arm out of contact with the tube while pressure is on the diaphragm, and also to release it and allow it to engage with the tube and seat it when pressure is off, substantially as set forth.

2. In an automatic regulator and cut-off, as described, the combination, with the adjustable valve, the flexible diaphragm, the spring-pressed reciprocating tube attached to the diaphragm, a collar and lugs on said tube, a supporting-plate between the collar and diaphragm, a washer below the diaphragm and secured to the tube, and a tube-seat, of a reciprocating spring-actuated arm having upwardly-inclined fingers for engaging with the lugs on the tube to press the tube to its seat, and a spring-pressed lever for holding the arm out of contact with the tube when pressure is on the diaphragm, and also for releasing the arm when pressure is off, substantially as described.

395,888. THREE-WHEELED VEHICLE. WILLIAM J. PRAEGER, Corunna, Mich. Filed Mar. 19, 1888. Serial No. 267,593. (No model.)

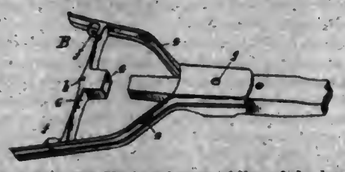


Claim.—1. In a vehicle, the combination of the axle, the thills shackled thereto, a body or seat-bars, the springs bowing from the axle upward and rearward and supporting the body or seat, thence extending rearward and downward, a thimble attached to the ends of said springs, rods attached to said thimble and to the axle, and a bar bearing a wheel swiveled in said thimble, substantially as set forth.

2. The combination of the axle, the springs, the third wheel, and the body flexibly hung at the forward end and adjustably supported at the rear end by the springs, substantially as set forth.

3. The combination of the body flexibly hung at the forward end, the upwardly-bowed springs having the re-enforced portions with series of holes, and the bolsters attached beneath the seat to the body and adjustably connected at their ends with said holes, substantially as set forth.

395,889. DRAW-IRON FOR WAGONS. JACOB GROH, Cochocton, Ohio. Filed Sept. 5, 1888. Serial No. 284,603. (No model.)



Claim.—1. A metallic draw-iron consisting of the bound-extension *a*, the cross-bar *c*, connecting the rear ends thereof, the sockets *b c*, adapted to receive the tongue, and provided with means for securing such tongue and the hammer-strap, and the bearings *f* to the rear of said cross-bar, adapted to receive the pivot-rod, the parts being arranged and combined substantially as described.

2. The combination, with the bounds, of the draw-irons secured to the forward ends thereof and formed with cross-bar *c*, sockets *c* and *b*, and with bearings *f* to the rear of said cross-bar, the tongue supported by said sockets with its rear end forward of the said bearings, and the pivot-rod C, connecting said bounds and passing through said bearings independent of the tongue, substantially as shown and described.

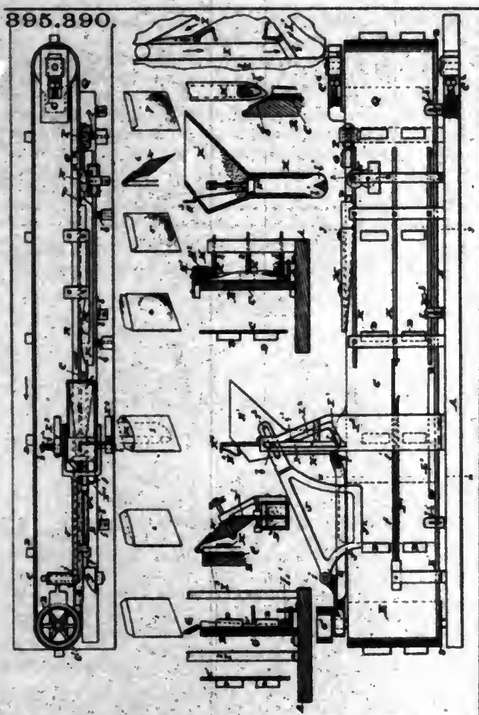
395,890. BAG-FILLING MACHINE. HARRY D. HAMMERSLEY, Bristol, assignor of one-third to Barnet Landreth, Mountain, Pa. Filed May 9, 1887. Serial No. 237,526. (No model.)

Claim.—1. In a bag-filling machine, a support for the bag, in combination with a reciprocating filling-nozzle made hollow and with discharge-openings at or near its bottom, and suitable means, substantially as described, to reciprocate said nozzle to cause it to enter the mouth of the bag.

2. In a bag-filling machine, a support for the bag, in combination with a reciprocating filling-nozzle made hollow and with discharge-openings at or near its bottom and with a hopper at the top, a valve to control the passage of material from the hopper to the nozzle, and suitable means, substantially as described, to reciprocate said nozzle to cause it to enter the mouth of the bag.

3. In a bag-filling machine, a traveling feed for the bags, in combination with a vertically and horizontally reciprocating filling-nozzle,

395,390.



and means, substantially as described, to operate said nozzle to cause it to enter the bag before discharging its contents.

4. In a bag-filling machine, a traveling feed for the bags, in combination with a vertically and horizontally reciprocating filling-nozzle, means, substantially as described, to operate said nozzle to cause it to enter the bag before discharging its contents, folding and pasting devices, substantially as set forth, to fold the flap of the bag and paste it down tight after being filled.

5. In a bag-filling machine, the combination of a magazine-feed for the bags, a vertically and horizontally reciprocating filling-nozzle adapted to enter, fill, and feed the bags in succession, means, substantially as described, to operate the nozzle, an endless feed-band for the bags to which they are delivered by the nozzle, and suitable pasting and sealing devices, substantially as set forth, for pasting down the flaps of the bags while in the custody of the endless feed-band.

6. The feeding device for a bag-filling machine, consisting of a magazine-feed for the bags and a vertically and horizontally reciprocating feeding-nozzle which enters the mouth of the bag and draws it from in front of the other bags, and suitable mechanism, substantially as described, to reciprocate said feeding-nozzle.

7. The combination of the nozzle H, having hopper H' at the top, the valve H^3, cord H^3, connecting with said valve at one end and fixed at the other, means, substantially as set forth, for reciprocating said nozzle and hopper, and a suitable support and feed for the bags normally below the nozzle when the latter is raised.

8. The combination of a reciprocating filling-nozzle made hollow and having discharge-openings at or near its bottom, a feeding device, substantially as described, to pass the bags in succession into operative position under the nozzle, and an endless conveying device, substantially as described, provided with mechanism, substantially as set out, to automatically and simultaneously feed the bags and reciprocate the nozzle synchronously, whereby the nozzle shall enter each bag in succession.

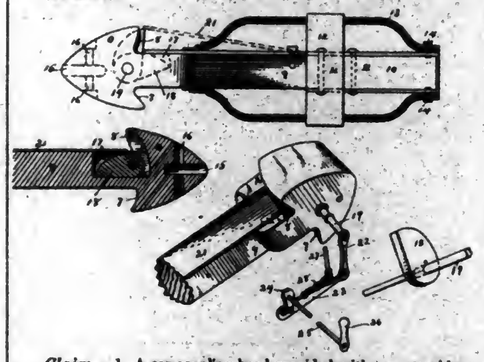
9. The combination of a reciprocating filling-nozzle made hollow and having discharge-openings at or near its bottom, a feeding device, substantially as described, to pass the bags in succession into operative position under the nozzle, and automatic mechanism, substantially as set out, to simultaneously feed the bags and reciprocate the nozzle synchronously, whereby the nozzle shall enter each bag in succession, and an adjustable guide for the bag to adjust it vertically with relation to the nozzle.

10. The combination of the feed-box S with its follower S' and guide G, the vertically-reciprocating nozzle H, horizontally-reciprocating frame J^4, carrying said nozzle, guides I, I', I^2, and I^4, and a pin or roller on the nozzle to run upon said guide, substantially as and for the purpose specified.

11. The combination of the feed-box S with its follower S' and guide G, the vertically-reciprocating nozzle H, horizontally-reciprocating frame J^4, carrying said nozzle, a dog, J', on said frame, guides I, I', I^2, and I^4, a pin or roller on the nozzle to run upon said guides, an endless band, C, having projections D, adapted to catch the dog J' to reciprocate the frame in one direction, and a weight or its equivalent to reciprocate the frame in the other direction, substantially as and for the purpose specified.

12. The combination of the feed-box S with its follower S' and guide G, the vertically-reciprocating nozzle H, horizontally-reciprocating frame J^4, carrying said nozzle, guides I, I', I^2, and I^4, a pin or roller on the nozzle to run upon said guides, and vertically-adjustable guide L', substantially as and for the purpose specified.

395,391. CAR-COUPLING. STARLING F. HEATH and HAYDEN A. THAYER, Fitchburg, Mass. Filed Dec. 15, 1887. Serial No. 257,967. (No model.)

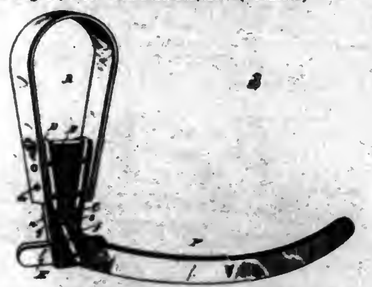


Claim.—1. A car-coupling head provided with two attaching-jaws and with a socket in the rear of one of said jaws, in combination with a cam located in said socket on a shaft extending transversely through the coupling-head, and a flat spring secured to the extension of the coupling-head and co-operating with the cam, substantially as set forth.

2. A pair of car-coupling heads, each provided with two attaching-jaws and with a socket in the rear of one of said jaws, in combination with cams located in said sockets on shafts extending transversely through the coupling-heads, a flat spring secured to the extension of each coupling-head, and appliances connected to said transverse shafts for actuating the same from the side or roof of the car, substantially as set forth.

3. The combination, with a pair of coupling-heads, each provided with two attaching-jaws and with a socket in the rear of one of said jaws, in combination with releasing-cams located in said sockets on shafts extending transversely through the coupling-heads, and appliances for operating said shafts, consisting of bar 22, rod 23, and rod and chain 27 and 28, substantially as set forth.

395,392. ANIMAL-POKE. JOHN D. HIGGINS, Mount Liberty, Ohio. Filed Aug. 13, 1888. Serial No. 282,629. (No model.)

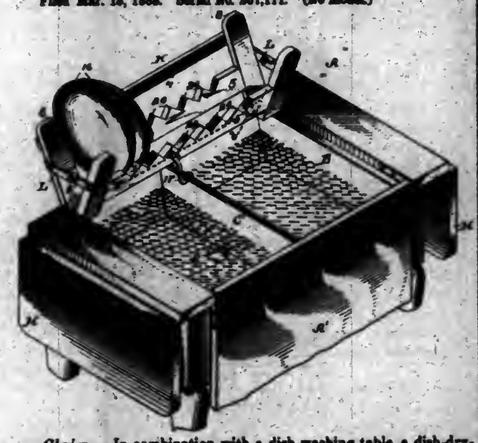


Claim.—1. The combination, with the yoke and a bolt passed therethrough, of a carrier fitting neatly within the yoke, hinged at its upper end on said bolt, and provided at its lower end with a breast-board, and a stale hinged at the upper edge of its inner or rear end to said carrier, the rear end of the stale resting normally against the carrier, substantially as described.

2. The combination, with the yoke and a bolt passed therethrough, of a carrier hinged at its upper end on said bolt and provided at its lower end with a breast-board, and a stale having a diagonally-cut inner end hinged at its upper edge to the said carrier, substantially as described.

3. The combination, with the yoke and a bolt passed through it, of a carrier fitting neatly within the yoke, hinged at its upper end on said bolt, and provided at its lower end with a breast-board, a stale having a diagonally-cut inner or rear end provided at said end on each side with a perforated metallic hinge-strip, the perforations in said strips being above the upper edge of the stale and a staple passed through the hinge-strips and secured in the carrier, the carrier being grooved to permit the free passage of the projecting ends of said strips in folding up the stale, substantially as described.

395,393. DISH-DRAINER. ISAAC HOLSHARK, Kansas City, Kans. Filed Mar. 12, 1888. Serial No. 267,111. (No model.)

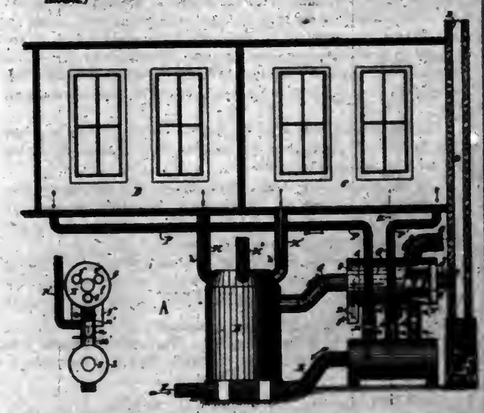


Claim.—In combination with a dish-washing table, a dish-drying rack hinged thereto, said rack being composed of a pair of hinged frames having their free ends provided with toggle-links and held in an upright position by means of a supporting-hook, substantially as described.

395,394. ELASTIC COMPOSITION. JOHN HUNTER, South Melbourne, near Melbourne, Victoria. Filed June 26, 1888. Serial No. 278,263. (No specimens.) Patented in Victoria Mar. 22, 1887, No. 4,511.

Claim.—An improved elastic compound consisting in the combination of black-jack, being the refuse of stearine-stills, with slaked lime, in or about the proportions substantially as described.

395,395. MEANS FOR HEATING AND VENTILATING BUILDINGS. EDWIN T. JOHNSON, Minneapolis, Minn., assignor to Sexton & Phillips, same place. Filed Feb. 9, 1888. Serial No. 263,551. (No model.)



Claim.—1. The combination, with a hot-air furnace having hot-air flues to the various rooms of a building, of an air-heating receptacle or draft-chamber inclosing the exit-flue of said furnace and having a foul-air outlet, an air-receptacle outside said furnace and communicating with the same, independent pipes connecting said outside air-receptacle and draft-chamber and provided each with a pair of dampers, and air-outlet ducts from the various rooms to said connecting-pipes, uniting each with its respective pipe at a point between said dampers, substantially as described.

2. The combination, with a hot-air furnace having hot-air flues to the various rooms of a building, of an independent air-heating receptacle or draft-chamber having a foul-air outlet, independent air-outlet ducts from the various rooms, each having a connection to said draft-chamber and a connection to said furnace, and dampers in said connections for throwing any and all of said ducts into communication with said draft-receptacle or with said furnace at will, substantially as described.

3. The combination, with a hot-air furnace having hot-air flues to the various rooms of a building, of an independent air-heating receptacle or draft-chamber having a foul-air outlet, an air-receptacle in communication with said furnace and sets of independent pipes, corresponding to the number of rooms, connecting said receptacles and provided each with a pair of dampers, and independent air-outlet ducts from the various rooms to said connecting-pipes, uniting each with its respective pipes at a point between said dampers, substantially as described

395,396. THILL-COUPLING. WALTER KETCH, North Attleborough, Mass. Filed Aug. 2, 1888. Serial No. 281,885. (No model.)



Claim.—1. In a thill-coupling, a clip having projecting ear-plates provided with vertical slots and a clip-plate extending beneath said ear-plates, in combination with a shaft vertically movable in said slots, on which shaft the thill is journaled, a barrel embracing said shaft, having a stud extending downwardly through said clip-plate, and a nut fitting on said stud beneath said clip-plate.

2. In a thill-coupling, a clip having projecting ear-plates provided with vertical slots and a clip-plate extending beneath said ear-plates, in combination with a shaft vertically movable in said slots, on which shaft the thill is journaled, a barrel embracing said shaft, having a stud extending downwardly through said clip-plate, a nut fitting on said stud beneath said clip-plate, and an elastic block interposed between said barrel and said clip-plate.

3. In a thill-coupling, a clip having projecting ear-plates provided with vertical slots and a clip-plate extending beneath said ear-plates, in combination with a shaft vertically movable in said slots, a thill having projecting cheek-plates journaled on said shaft between said ear-plates, a barrel embracing said shaft between said cheek-plates, a stud formed on said barrel extending downwardly through said clip-plate, a tightening and securing nut fitting on said stud beneath said clip-plate, an elastic block interposed between said barrel and said clip-plate, and elastic pieces between said cheek and ear plates.

395,397. GRATE. JOHN W. KEYES, PEKIN, Ill. Filed Jan. 24, 1888. Serial No. 261,742. (No model.)



Claim.—1. In a transversely extensible and folding grate, the combination of a part, r, having a longitudinal bar, q, and a head provided with openings x, and a part, r', having a longitudinal bar, q', carrying transverse fingers p', extending through the openings x, and means, substantially as described, for clamping together the parts r and r' and supporting the grate, substantially as set forth.

2. A grate formed in two parts, r and r', adjusted together to adapt them to be extended and folded transversely with reference to each other, in combination with a journal device, B, for supporting the grate at each end and clamping the parts r and r' together, comprising a journal, n, and a bearing, m, connected with the journal and provided with a lug, l, and means, substantially as described, for securing the device B in place, substantially as set forth.

3. A grate formed in two parts, r and r', adjusted together to adapt them to be extended and folded transversely with reference to

each other, in combination with a journal device, B, for supporting the parts *r* and *r'* together, comprising a journal, *n*, a bearing, *m*, connected with the journal and provided with a lug, *l*, and an opening, *k*, and a bolt and nut, C C', substantially as described.

4. In a transversely extensible and folding grate, the combination of a part, *r*, having a longitudinal bar, *q*, carrying transverse fingers *p*, and provided with a head, *o*, having openings coincident with the said fingers *p*, a longitudinal bar, *q'*, carrying transverse fingers *p'*, and provided with a head, *o'*, having openings coincident with the said fingers *p'*, and means, substantially as described, for clamping the parts *r* and *r'* together and supporting the grate, substantially as set forth.

5. In a transversely extensible and folding grate, the combination of a part, *r*, having a longitudinal bar, *q*, carrying transverse fingers *p*, a part, *r'*, having a longitudinal bar, *q'*, carrying transverse fingers *p'*, a combined clamp and journal, B, at each end, comprising the parts *n* and *n'*, and the bearing *m*, having a lug, *l*, and opening *k'*, and a bolt, C, and nut C', substantially as and for the purpose set forth.

395,398. SLEIGH-RUNNER. THOMAS H. LEWIS, Dublin, Tex.
Filed July 5, 1888. Serial No. 279,070. (No model.)



Claim.—1. A sleigh-runner formed of two adjustable sections adapted to embrace the rim of a wheel; one of said sections being provided with a tenon adapted to enter the opposite section, substantially as specified.

2. A sleigh-runner comprising two sections adapted to embrace the rim of a wheel, in combination with an intermediate tenon for entering each of said sections, substantially as specified.

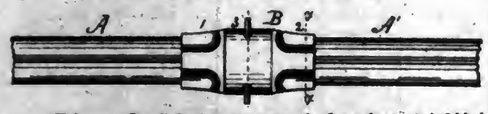
3. The combination, with the wheels of a vehicle, of two runner-sections provided with an intermediate tenon entering each of said sections and of an intermediate coupling device for locking the wheels against movement.

4. The combination, with the wheels of a vehicle, of a runner-section for each of U shape and adapted to embrace the rims of said wheels, an intermediate tenon entering each of the sections, and a coupling device connected to the sections and to the wheels and comprising two overlapping plates, substantially as specified.

5. The sections 1, curved, as at 2, and provided with the oppositely-located lugs 3, in combination with the tenon 6, wheels 16, plates 4, and nuts 5, substantially as specified.

6. The combination, with the wheels 16 and the runner-sections 1, constructed as described, of the overlapping plates 8, staples 10, plates 11, nuts 12, the adjusting-bolt 9, and the hook-arms 14, substantially as specified.

395,399. LIGHTNING-ROD. LOUIS L. MAST, West Milton, Ohio.
Filed Mar. 30, 1888. Serial No. 268,980. (No model.)

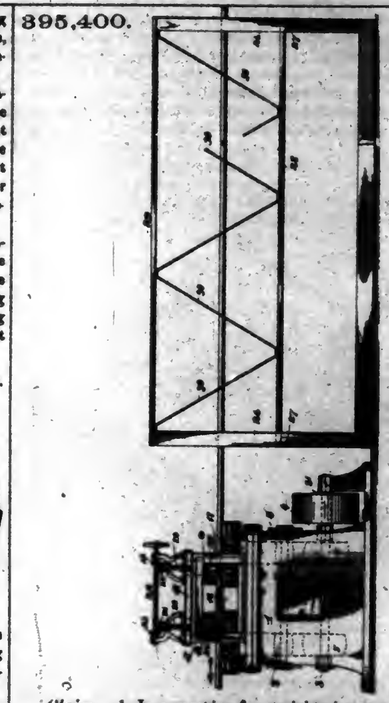


Claim.—1. In a lightning-conductor, the flanged core A, infolded with copper plate 4, and the edges thereof inwrapped by the upturned edge of one side being infolded by the other, substantially as shown and described.

2. In a lightning-conductor, connection-burr having a square orifice to embrace the end of a flanged rod, said orifice provided with projection 7 to enter orifice 6 of said flanged rod as said burr is compressed between the flanges of said rod to securely unite the same, substantially as set forth.

3. The connection-burr B of mated parts 1 and 2, having square orifices in the outer ends to embrace sections of rods, and each part having coincident semicircular circumferential grooves and coincident radial orifices, with wire adapted to said orifices to unite said parts, substantially as shown and described.

395,400. MACHINE FOR STRAIGHTENING METAL BARS, TUBES, &c. WILLIAM A. MCCOOL, Beaver Falls, Pa., assignor of one-half to H. W. Hartman, same place. Filed Oct. 1, 1888. Serial No. 286,836. (No model.)



Claim.—1. In a machine for straightening or polishing rods tubes, and like articles, the combination, with centrally-arranged rotary supports whose axes of rotation are parallel with the line of feed, of a series of rotary pressure-surfaces arranged before and behind the rotary supports, said pressure-surfaces having their axes of rotation parallel with each other and with the line of feed, substantially as and for the purposes specified.

2. In a machine for straightening or polishing rods, tubes, and like articles, the combination, with rotary rod-supports, of a series of pressure-rolls having parallel axes and lapping perimeters, substantially as and for the purposes specified.

3. In a machine for straightening or polishing rods, tubes, and like articles, the combination of rotary supports having parallel axes and convex perimeters and rotary pressure-rolls having parallel axes and lapping perimeters, substantially as and for the purposes specified.

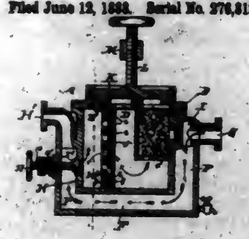
4. In a machine for straightening or polishing rods, tubes, and like articles, the combination, with adjustable pressure-rolls, of two parallel centrally-arranged rod-supports provided with pulleys and loop-belts and tightening-pulleys for rotating both of the rotary supports in the same direction, substantially as and for the purposes specified.

5. The combination, with a straightening or polishing machine, of a flexible or yielding rod, bar, or tube guide, substantially as and for the purposes specified.

6. The combination, with a straightening or polishing machine, of a flexible or yielding rod or tube guide arranged to support the bar at several different points along its length, substantially as and for the purposes specified.

7. The combination, with the series of straightening or polishing rolls, of a flexible or yielding strap-guide having a series of rod-holes and arranged in the line of feed of said rolls, substantially as and for the purposes specified.

395,401. GREASE-EXTRACTOR. WILLIAM D. NEASH, San Francisco, Cal. Filed June 12, 1888. Serial No. 276,812. (No model.)



Claim.—In a feed-water oil and grease extractor, the combination of the two-way cock I with filtering-chamber C and auxiliary passage or conduit F, valve I', chambers D and E, separated by filtering-screens, and the outlet-pipe H', as herein set forth.

395,402. CAR-COUPLING. FRANCIS W. PARSONS, Philadelphia, Pa.
Filed Dec. 17, 1887. Serial No. 258,201. (No model.)



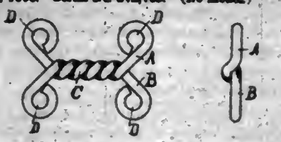
Claim.—1. In a car-coupling of the class described, the combination of a fixed jaw and a movable jaw with a locking-bolt arranged in rear of said movable jaw, and a pivoted arm mounted on said bolt and bearing on said movable jaw, substantially as specified.

2. In a car-coupling of the class described, a pivoted jaw having a shoulder at its rear end, in combination with a slotted spring-seated bolt and a rock-shaft provided with a blade seated in said slot and adapted to operate said bolt, substantially as specified.

3. The combination of the draw-head A, having the jaws A^7, arms A^2, and recesses $A' A^3$, with the jaw C, pivoted, as at C', in said arms and having the shoulders C^2 C^3, the bolt B, mounted in the recess A^3 and having a spring, B', and slotted, as at B^2, and the shaft B^4, having the blade B^5, passing through said slot and adapted to actuate the bolt, substantially as specified.

4. The combination of the head A, having the recesses $A' A^3$, fixed jaw A^7, the shoulders A^4 A^5, the arms A^2, carrying the pivoted jaw C, formed with the shoulders C^2 C^3 and knuckle C^4, and with the bolt B, mounted in said slot, having the spring B', opening B^3, and pivoted arm B^7, and the shaft B^4, having the blade B^5, entering said slot and adapted to actuate the bolt, substantially as specified.

395,403. WIRE HINGE. WILLIAM C. PERKINS, New Haven, Conn.
Filed May 4, 1888. Serial No. 272,786. (No model.)



Claim.—As a new article of manufacture, a hinge composed wholly of wire and consisting of two pieces of wire with their central portion twisted together and the remaining ends of each piece of wire turned outward from the center of the hinge in the same direction and plane and bent to form eyes for the reception of the screws which fasten it to the door, substantially as described.

395,404. HORSE-COLLAR PAD. SIMON R. RAW, Sheffield, Iowa.
Filed June 9, 1888. Serial No. 276,572. (No model.)

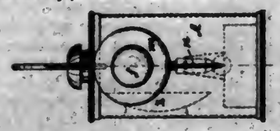


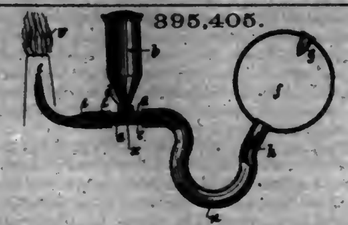
Claim.—1. A horse-collar pad having an arched saddle, a series of transverse laterally-yielding arched springs straddling the saddle, side bars secured to the saddle and to the ends of the springs, and a longitudinal bar or backbone secured to the middle of the springs, substantially as described.

2. A horse-collar pad consisting of the combination, with the perforated leather saddle A, of the side bars, B, secured thereto, the ox-bow-shaped springs C C, secured to the side bars, and the backbone D, secured to the springs, substantially as and for the purpose set forth.

395,405. SEMAPHORE. JOHN W. C. C. SCHIEN, Breslau, Prussia, Germany. Filed Oct. 10, 1888. Serial No. 287,771. (No model.)

Claim.—An optical signaling apparatus or semaphore consisting of the combination of pipe *a*, with truncated cone *x* within the bore





of the same, reservoir *b*, containing the powder, jet-pipe *c*, flame *v*, blast-pipe *n*, and blast or elastic ball *f*, having suction-valve *g* and exit-valve *h*, substantially as specified.

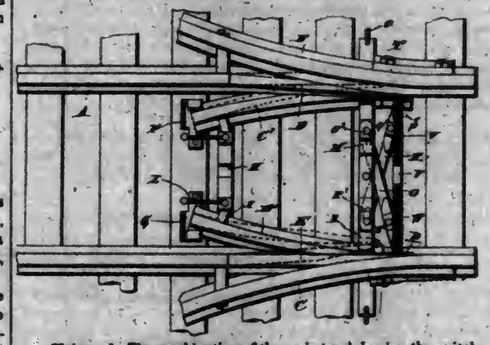
395,406. REVOLVING CHAIR AND STAND. LOUIS F. SMITH, Kewaunee, Wis. Filed May 24, 1888. Serial No. 274,207. (No model.)



Claim.—1. The combination, with a revolving seat or support, of a screw-threaded spindle secured thereto, a stand provided with a smooth-bored hole for said spindle to slide in vertically, and a retractible sectional block or nut provided with screw-threads engaging with said screw-threaded spindle and supported in the said stand, substantially as and for the purposes set forth.

2. The combination, with a revolving seat or support, of a screw-threaded spindle secured thereto, a stand provided with a smooth-bored hole for said spindle to slide in vertically, a sectional block or nut pivoted at its lower end to the stand and provided with screw-threads engaging with the said screw-threaded spindle, a spring pressing the nut into gear with the spindle, and a sliding foot-piece supported by the stand and connected to the said sectional nut, whereby it may be retracted out of gear with the spindle, substantially as and for the purposes set forth.

395,407. RAILROAD-SWITCH. DANIEL R. SHEA, Rochester, N. Y.
Filed July 14, 1888. Serial No. 279,973. (No model.)



Claim.—1. The combination of the main track having the switch-rails D E, the side tracks branching in opposite directions from the main track, having the switch-rails C B' on the inner sides of rails D E, respectively, the tie-bar connecting the free ends of the switch-rails C B', and the tie-bars R O, connecting the free ends of the switch-rails D E, respectively, to the switch-rails B' C', whereby the switch-rails B' C' will operate in unison together with one of the switch-rails D E, substantially as described.

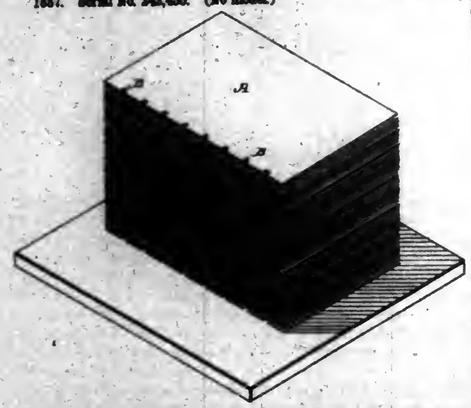
2. The combination of the main switch-rails, the side-track switch-rails on the inner sides thereof, the tie-bar connecting the free ends of the side-track switch-rails to cause the same to move in unison, the tie-bars connecting said tie-bar to the main-track switch-rails, and the springs normally to close the main-track switch-rails, substantially as described.

3. The combination of the side-track switch-rails having their free ends connected and thereby adapted to move in unison, the main-track switch-rails connected loosely with the side-track switch-rails and independently of each other, the guide-bar passing through the free ends of the main-track switch-rails, and the springs on said bar bearing against the inner sides of said switch-rails, for the purpose set forth, substantially as described.

4. The combination of the side-track switch-rails, the tie-bar M, connecting the free ends thereof, the main-track switch-rails, the tie-bars R O, loosely and independently connecting the free ends thereof to the tie-bar M, and the operating-rod attached to the tie-bars M R O, and the operating-lever connected to the said rod, substantially as described.

5. The combination of the main track having the switch-rails D E, the side tracks branching from opposite sides of the main track, having the switch-rails B C, the tie-bar M, the arms N, secured to the free ends of the side-track switch-rails and pivoted to the bar M, the tie-bars R O, loosely connected to the tie-bar M, the arm P, secured to switch-rail E and pivoted to the tie-bar O, and the arm S, secured to switch-rail D and pivoted to tie-bar R, substantially as described.

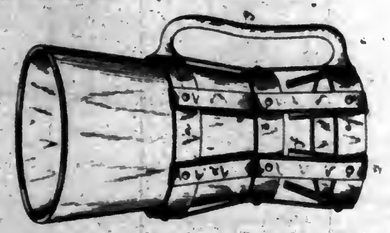
395,408. BOOK-BINDING. JOHN J. SULLIVAN, Cincinnati, Ohio, assignor of one-half to Thomas W. Graydon, same place. Filed June 25, 1887. Serial No. 242,435. (No model.)



Claim.—1. The above-described improvement in the art of book-binding, which consists in cutting a series of transverse grooves in the back edges of the leaves or signatures at about the same relative distances apart as the binding-cords usually employed and filling said grooves with liquid glue or other liquid cement, whereby when the adhesive substance solidifies the leaves or signatures will be united.

2. The above-described improvement in the art of book-binding, which consists in cutting a series of transverse grooves in the back edges of the leaves or signatures at about the same relative distances apart as the binding-cords usually employed, filling said grooves with liquid glue or other liquid cement, and applying the cover before the adhesive substance solidifies, for the purposes set forth.

395,409. REVERSIBLE TUMBLER-HOLDER. GEORGE F. WATERS, Washington, D. C., assignor of one-half to Francis McC. Criswell, same place. Filed Apr. 14, 1888. Serial No. 270,707. (No model.)



Claim.—1. A tumbler-holder open at both ends, and thereby adapted to receive a glass in either end, substantially as described.

2. A tumbler-holder open at both ends and having such ends of different diameter, and thereby adapting the holder to receive glasses of different diameter, substantially as described.

3. A tumbler-holder having the general outline of an hour-glass and open at both ends, and provided in each end with spring-fingers, substantially as described.

4. A tumbler-holder open at both ends, composed of a series of bands and a series of strips secured at right angles to the said bands, and spring-fingers arranged in the open ends, substantially as described.

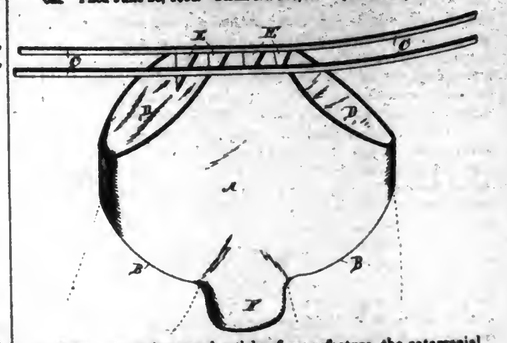
5. A tumbler-holder open at both ends and composed of annular bands *a b c*, strips *d*, secured to said bands and terminating within the bands at both ends in spring-fingers *f*, and thereby adapted to receive a tumbler in either end, and a handle, *g*, substantially as described.

6. A tumbler-holder open at both ends and provided internally with an obstructing medium for arresting the too great descent of a tumbler, substantially as described.

395,410. COMPOSITION FOR WATERPROOFING TEXTILE MATERIALS. JACOB WELTZ, New York, N. Y., assignor of one-half to Sigmund S. Hirschler, same place. Filed Nov. 19, 1887. Serial No. 255,630. (No specimens.)

Claim.—A waterproofing composition consisting of glue, sugar of lead, alum, chloride of zinc, tin-salt, and water, as described.

395,411. CATAMENIAL SACK. EMMA A. WILEY, Los Angeles, Cal. Filed June 28, 1882. Serial No. 278,473. (No model.)



Claim.—As an improved article of manufacture, the catamenial sack having the thin rubber body portion A, adapted to fit snugly around the lower portion of the trunk of the wearer and provided near its bottom on opposite sides of the center with thigh-openings B B, the loose depending sponge-containing pocket F, located between the thigh-openings and integral with the body portion, and the drawing strings or tapes C at the upper edge of the body portion, substantially as and for the purpose specified.

395,412. RAILROAD-CAR. DAVID Y. WILSON, Gum Tree, assignor of one-half to William B. Haslett, Parkesburg, Pa. Filed Oct. 9, 1883. Serial No. 267,640. (No model.)



Claim.—1. The combination, with a railroad-car having door-openings, of the doors arranged in said openings, and pivoted latches arranged between the edges of the doors and the sides of the openings, and having arms of unequal length extending in opposite directions from their pivots and adapted to hold the doors normally closed, as set forth.

2. The combination, with the car having the door-opening, of the door arranged in said opening and having the groove G and recess I, and the latch pivoted in the side of the opening, and having its arm resting in the groove G, and a keeper-plate pivoted to the door and normally extending across the latch, as set forth.

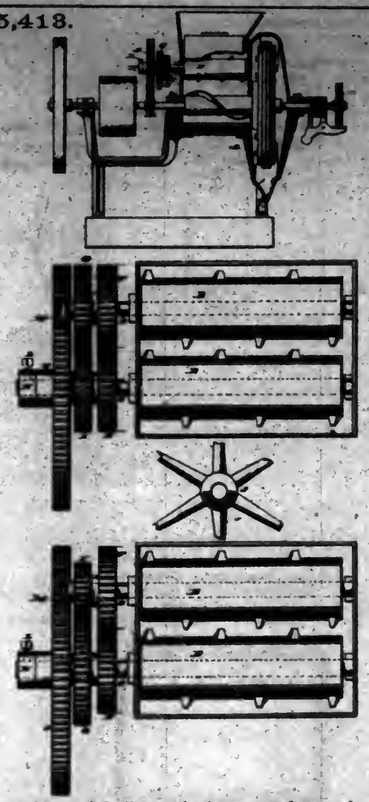
3. The combination, with the car having the door-opening B, of the door arranged in said opening, and the latch pivoted in one side of the door-opening and having a longer arm normally resting in a groove in one side of the door, and a shorter arm adapted to contact with the other side of the door when the longer arm is raised, as set forth.

4. The combination, with the car having the opening B, provided in one side with the sockets or recesses, of the door having pins to engage said sockets, and a latch at the opposite side of the opening, as set forth.

395,413. CRUSHING AND GRINDING MILL. JAMES F. WIRCHELL, Springfield, Ohio, assignor to the Foos Manufacturing Company, same place. Filed July 14, 1887. Serial No. 244,270. (No model.)

Claim.—1. In a crushing and grinding mill, the combination, with the main shaft, a crushing-conveyer thereon, and grinding mechanism,

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of the crushing and feeding mechanism mounted to crush and feed the material to the said conveyer, a driving gear-wheel geared to the main shaft and to the crushing mechanism, and an interchangeable pinion and idler connecting the said gear-wheel with the crushing mechanism, whereby the speed of the crushing mechanism may be varied with respect to that of the said conveyer and the grinding mechanism at will.

2. In a crushing and grinding mill, the combination, with the main shaft and grinding mechanism, of crushing mechanism mounted to crush and feed the material to the grinding mechanism, a driving gear-wheel geared to the main shaft and to the crushing mechanism, and an interchangeable pinion and idler connecting said gear-wheel with the crushing mechanism, whereby the speed of the crushing mechanism may be varied with respect to that of the grinding mechanism at will.

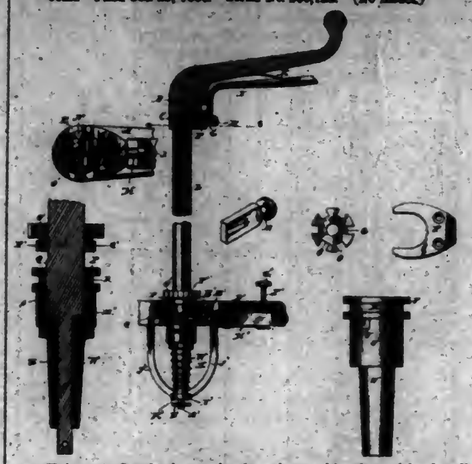
3. In a crushing and grinding mill, the combination, with the main shaft and the grinding mechanism, of feeding-crushers geared together, a driving-gear on the shaft of one of the said feeding-crushers and operated by the main shaft, and an interchangeable pinion and idler mounted on the shafts of said feeding-crushers and transmitting motion thereto.

4. In a crushing and grinding mill, the combination, with the main shaft, pinion, and a grinding-head carried thereby, and a stationary grinding-head, of two intergeared feeding-crushers, an idler on one and an intergeared pinion of different diameter on the other of the crushing-shafts, and a driving-gear on one of said shafts clutched with the pinion or idler on that shaft (as the case may be) and meshing with the pinion on the main shaft.

5. In a crushing and grinding mill, the combination, with the main shaft and a pinion thereon, of the feeding-crushers, the gear-wheels rigidly secured to the shafts of said crushers, one of said wheels being provided with a clutch or shoulder, the intermediate gear-wheel or idler, G, having a clutch or shoulder and loosely mounted on the shaft of one of the crushers, a smaller intermediate gear, I, loosely mounted on the shaft of the other crusher and provided with a clutch or shoulder, and a gear-wheel, J, also having a clutch, said wheel being loosely mounted on the same shaft with the last-named intermediate gear-wheel and meshing with the pinion on the main shaft.

6. In a crushing and grinding mill, the combination, with the main shaft and a pinion thereon, of feeding-crushers and gear-wheels rigidly secured to the shafts of said crushers, the intermediate gear-wheel or idler, G, mounted on the shaft of one of the crushers and a smaller intermediate gear-wheel, I, mounted on the shaft of the other crusher, the said gear-wheels G and I being interchangeable from one crusher-shaft to the other, and a gear-wheel, J, also mounted on one of the crusher-shafts and meshing with a pinion on the main shaft.

395,414. STREET-CAR BRAKE. JOHN H. WEBSTER, Bridgeport, Conn. Filed Oct. 25, 1888. Serial No. 288,122. (No model.)



Claim.—1. In a brake mechanism, the combination, with a handle having a horizontal coupling-pin and an independent hand-lever for operating the same, of a post carrying the handle, which is swiveled upon its upper end, and having a fixed collar provided in its periphery with retaining-points to receive the pin, which is radially moved toward and away from its periphery by the said hand-lever, substantially as set forth.

2. In a brake mechanism, the combination, with a handle having a flat square-edged coupling-pin and a spring-actuated hand-lever for operating the same, of a post carrying the handle and having a fixed collar provided in its periphery with a series of transverse slots corresponding in shape to the end conformation of the said pin, substantially as set forth.

3. In a brake mechanism, the combination, with a handle having a coupling-pin and a hand-lever for operating the same, of a post carrying the handle and having a fixed collar provided with retaining-points to receive the pin, and a retaining-plate secured to the handle and holding the same upon the post, substantially as set forth.

4. In a brake mechanism, the combination, with a post, of a chain-barrel sleeved over the post, so as to rotate freely thereupon when released for unwinding the chain, a clutch-head feathered upon the post close to the said barrel, so as to be directly engaged therewith to lock the barrel for winding the chain and to be disengaged therefrom to release the barrel for unwinding the chain, substantially as set forth.

5. In a brake mechanism, the combination, with a post, of a chain-barrel sleeved over the same, a clutch-head feathered on the post and adapted to be normally coupled with the head, the face of the head and the upper end of the barrel being constructed to couple when brought into one specific relation and in no other, whereby the handle returns to its right position after using the relief-clutch, substantially as set forth.

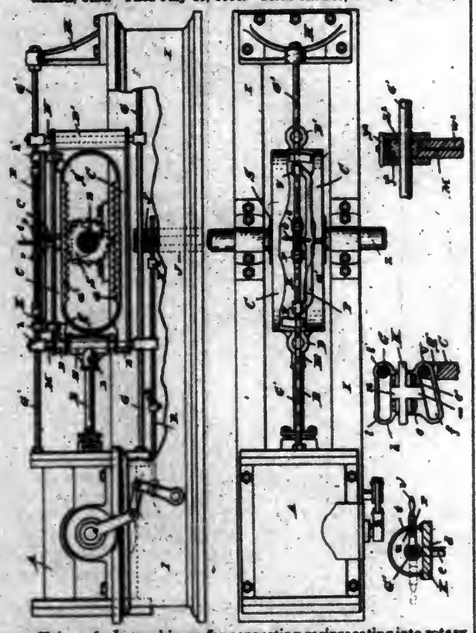
6. In a brake mechanism, the combination, with a post, of a chain-barrel sleeved over the same, a clutch-head feathered on the post and adapted to be normally coupled with the barrel-head, and lever mechanism connected with such head and arranged to be operated by the driver with his foot, substantially as set forth.

7. In a brake mechanism, the combination, with a brake-post, of a handle located at the upper end thereof, a stirrup-shaped brace secured to the car and provided with an offsetting bracket through which the lower end of the post passes, a chain-barrel sleeved over the post, so as to rotate freely thereupon when released and resting upon the said bracket, and means for locking the barrel to the post and releasing it therefrom, substantially as set forth.

8. In a brake mechanism, the combination, with a brake-post, of a handle located at the upper end thereof, a chain-barrel sleeved over its lower end, a clutch-head feathered upon the post and adapted to be normally coupled with the barrel, lever-connections with the said head for operating it to relieve the barrel, and guards inclosing such mechanisms from the dirt, substantially as set forth.

9. In a brake mechanism, the combination, with a brake-handle, of a post provided at its upper end with an offsetting shoulder and a retaining-plate secured to the handle and cut away to fit around the post, with the shoulder of which it engages to couple the post and handle together, substantially as set forth.

395,415. MECHANICAL MOVEMENT. RICHARD L. AYER, Cincinnati, Ohio. Filed July 16, 1888. Serial No. 280,152. (No model.)



Claim.—1. In machinery for converting reciprocating into rotary motion or the opposite, in combination with the body moving with a reciprocating motion, a rack-frame supported upon incline planes and containing two parallel racks so arranged that the rack-frame automatically ascends and descends the incline planes at the termination of each portion of the reciprocating motion, and the teeth of one rack engage with the teeth of a wheel during one portion of the reciprocating movement, and the teeth of the other rack engage with the teeth of the same wheel during the opposite movement, substantially as described.

2. In mechanism for converting reciprocating into rotary motion or the reverse, the combination, with a rack-frame having parallel racks, of a shifting-bar supported upon one of the supporting-rods upon which move the rack-frame and the shifting-bar, and also resting upon a projecting pin from the rack-frame, and also at its two extremities attached to the rack-frame by loops forming inclined planes, so constructed that when the rack-frame is at the upper portion of the loops one of the racks engages with the wheel to which or from which motion is to be transmitted, and when the rack-frame rests at the lower portion of the loops the opposite rack engages with the same wheel, substantially as set forth.

3. In machinery for converting reciprocating motion into rotary motion or the opposite, the combination of the piston-rod B, the rack-frame C, the racks *a a'*, the shifting-bar K, the loops *h h'*, the supporting-rod G', the loops *f f'*, and the wheel S, substantially as set forth.

4. In a device for converting reciprocating into rotary motion or the opposite, the combination of a shifting-bar supported at its center upon a pin extending from a rack-frame and at its extremities attached to the rack-frame by loops which form incline planes, with a connecting-bar whose extremities form a sliding connection with the supporting-rod, over which it moves freely until checked by nuts screwed at desired points upon the supporting-rod, and attached at its center by a guide to the shifting-bar, substantially as set forth.

5. In mechanism for converting reciprocating into rotary motion or the reverse, the combination of the reciprocating body B, the rack-frame C, the racks *a a'*, the wheel S, the shifting-bar K, the pin *c*, the loops *h h' f f'*, the connecting-bar P, with its guide *t*, the eyes *p q*, and the stops *r* and *s*, substantially as set forth.

6. In mechanism for converting reciprocating into rotary motion or the opposite, in combination with a toothed wheel upon a driving-shaft, a rack-frame attached to the reciprocating body, consisting, essentially, of two parallel racks which, alternately with the change of the reciprocating movement, engage the teeth of the wheel, sleeves at its two extremities through which pass cross-heads by which it is attached to supporting-rods along which it moves, and a flange surrounding the racks, with means for automatically raising and lowering the rack-frame, substantially as set forth.

395,416. BOILER FOR CLEANING OR BOILING RAGS. GEORGE F. BARTON, Warehouse Point, Conn., assignor of one-half to Charles B. Barton, same place. Filed Feb. 6, 1888. Serial No. 263,134. (No model.)

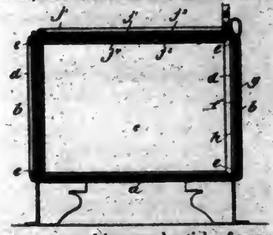


Claim.—1. The combination of a boiler of the class described, with the ejector at the discharge-opening of the boiler, and the pipe *m*, extending around to the opposite side of the boiler, substantially as described, and for the purpose specified.

2. In a boiler of the class described, the combination of an ejector, the covering screen or strainer *f*, hinged as described, and the pipe *m*, leading laterally to one side of the strainer in a line parallel to its hinge and from thence to the opposite side of the boiler, substantially as described, and for the purpose specified.

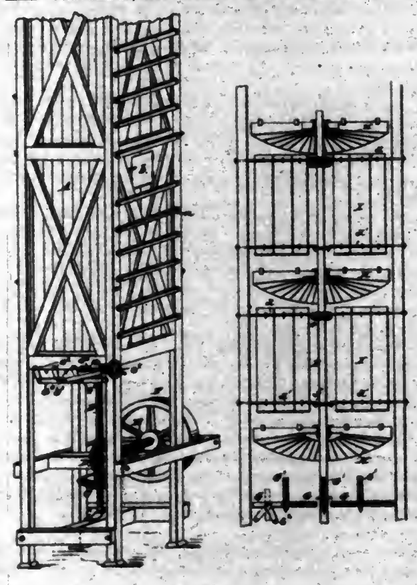
3. The combination of a boiler of the class described and the pipe *m*, extending from under the screen at the exit around to the opposite side of the boiler, substantially as described, and for the purpose specified.

395,417. ORNAMENTAL BOX. MENDEL BANKAN, New York, N. Y. Filed Nov. 20, 1888. Serial No. 291,202. (No model.)



Claim.—As a new and improved article of manufacture, an ornamental box composed of united panels forming the side and end walls of the box, each being made of slotted tubes holding an inner plate, *f*, an outer glass plate, *b*, and an interposed ornament, *h*, the panels being secured to a bottom, *a*, substantially as described.

395,418. AIR-DRAFT ENGINE. OTTO A. BERKENDORF, Wilmot, Kans. Filed Jan. 28, 1888. Serial No. 262,247. (No model.)



Claim.—The combination, with the upright air-flue and revolving shaft bearing horizontal wind-wheels, of the bearings for said shaft, tension-rods *d d'*, connecting said bearings to the sides of the flue, and wind-guides I, connected to and supported by said tension-rods, substantially as and for the purpose described.

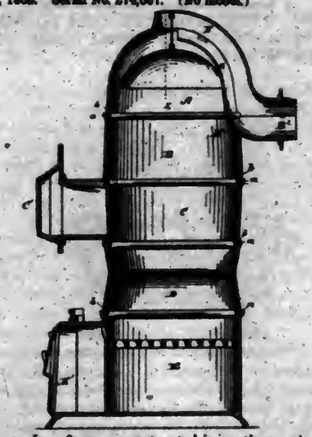
395,419. FURNITURE-DRAWER. GEORGE BOWER, Fayette, Mo. Filed June 28, 1888. Serial No. 278,396. (No model.)



Claim.—1. The combination, with a casing and a sliding drawer, of a roller journaled on the rear of the drawer, below the upper edge thereof, and having its ends projecting beyond the ends of the drawer, and cords wound on the projecting ends of the said roller and having their ends secured to the front and rear of the casing, substantially as described.

2. The combination, with a casing and a drawer sliding therein of brackets secured to the back of the sliding drawer, a roller journaled in the said brackets below the upper edge of the back of the drawer and having its ends projecting beyond the ends of the drawer, cords wound on the projecting ends of the roller and having one end connected to the rear of the casing, and adjustable pins secured to the front of the casing, and to which the other ends of the said cords are secured, substantially as herein shown and described.

395,420. HOT-AIR FURNACE. NICHOLAS BRAYER, Rochester, N. Y., assignor to the Co-Operative Foundry Company, same place. Filed May 16, 1888. Serial No. 274,067. (No model.)



Claim.—1. In a furnace constructed in sections, substantially as described, the combination, with the upper section, of the plate co-operating with the inside wall thereof and forming a passage communicating with the upper portion, and the succeeding lower section arranged to support said plate when in position, as set forth.

2. In a furnace constructed of superposed sections, the combination, with the top section, of the plate located on the inside thereof and co-operating with the side wall to form a passage communicating with the interior at the top, the interlocking lugs forming a connecting means, and the next lower section forming the support for the lower end of the plate, substantially as described.

3. In a furnace constructed of superposed sections, the combination, with the top section, of the plate located on the inside thereof and co-operating with the side wall to form a passage communicating with the interior at the upper portion, and means—such as interlocking lugs—connecting the plate and section and the next lower section having a portion of the exit-passage formed therein with which the end of the plate co-operates to form a continuation of the passage, substantially as described.

4. The combination, with the upper section having a portion of the exit-flue formed at the lower side thereof, of the plate located on the inside and co operating with the side wall to form a passage communicating with the interior at the upper portion, means—such as interlocking lugs—for connecting the plate and section, and the lower section having a portion of the exit-flue formed thereon adapted to co-operate with that on the upper section, and with which the lower portion of the plate also co-operates, substantially as described.

5. In a furnace, the combination, with the upper section having the lower portion, of the exit-flue formed thereon, and the plate removably secured therein and co-operating with the side wall to form a passage opening into the chamber near the top of the next succeeding section, having the groove in its upper side, with which the lower side of the upper section and the end of the plate co-operates to form a joint, and having also a portion of the exit-passage formed thereon, also grooved to co-operate with the edge of the corresponding portion on the upper section, substantially as described.

395,421. SAFETY DEVICE FOR USE IN ELECTRIC CIRCUITS. ARTHUR C. COCKBURN, London, England. Filed July 18, 1888. Serial No. 280,242. (No model.) Patented in England Mar. 18, 1887, No. 4,138; in France Aug. 30, 1887, No. 185,565, and in Germany Sept. 1, 1887, No. 42,912.



Claim.—1. A safety device for electric circuits, consisting of a rod fusible by an excess of current passing through it, secured at its ends, and having a weight arranged thereon between the ends for the purpose of breaking the rod the moment it reaches the molten state, substantially as described.

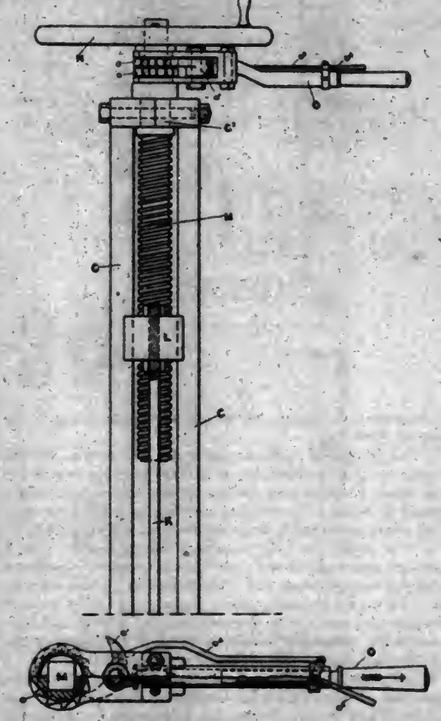
2. A safety device for electric circuits, consisting of a rod fusible by an excess of current passing through it, having a thickened weighted portion between its ends, substantially as and for the purpose described.

3. A safety device for electric circuits, consisting of a fusible wire or strip having a knotted thickened portion between its ends, substantially as described.

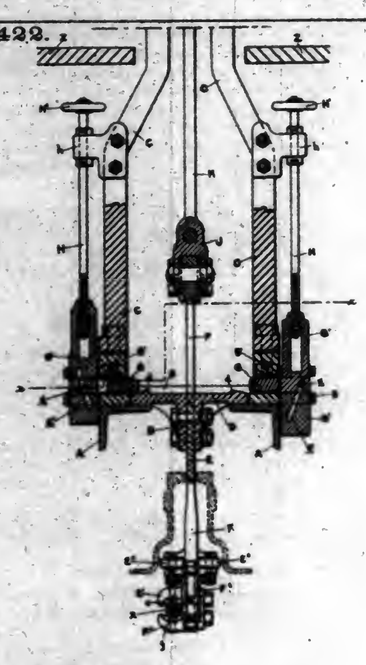
395,422. CABLE-TRAMWAY GRIPPER. WILLIAM N. COLAM, London, County of Middlesex, England. Filed Feb. 29, 1888. Serial No. 265,752. (No model.)

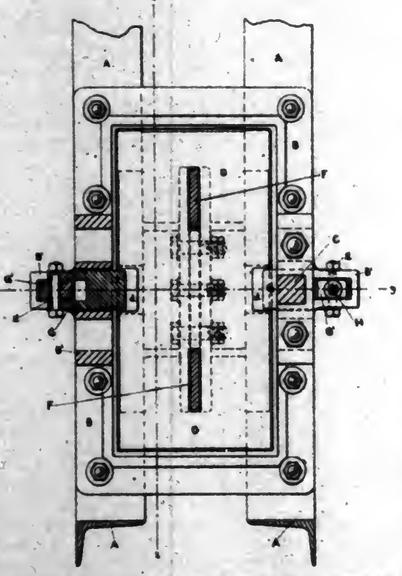
Claim.—1. In a gripper for cable tramways, the combination, with a foundation-plate permanently secured to the car, of a movable grip-jaw supported by the said foundation-plate, a fixed grip-jaw, and a plate detachably connected to the said foundation-plate and supporting the fixed grip-jaw, whereby the fixed grip-jaw and the cable may be raised by the continued upward motion of the moving jaw when required.

2. In a gripper for cable tramways, the combination, with the loose plate carrying the fixed jaw of the gripper, of the holding-down tongues mounted in blocks on the foundation-plate and adapted to



395,422.





slide transversely to engage with the said loose plate, as and for the purpose set forth.

3. In a gripper for cable tramways, the combination, with the loose plate carrying the fixed jaw, of the links and cross-head carrying the shank of the moving jaw and adapted to receive a vertical movement by means of the traveling nut working on the screw operated by a hand-wheel and lever, as and for the purpose set forth.

4. In a gripper for cable tramways, the combination, with a movable grip-jaw provided with a shank, a revoluble screw operatively connected to the said shank, and a foundation-plate permanently secured to the car for supporting the said moving jaw and its screw, of a fixed grip-jaw, a loose plate supporting the said grip-jaw, and locking mechanism detachably connecting the said loose plate to the foundation-plate, substantially as and for the purpose set forth.

5. In a gripper for cable tramways, the combination, with a movable grip-jaw provided with a shank, a revoluble screw operatively connected to the said shank, and a foundation-plate permanently secured to the car for supporting the said moving jaw and its screw, of a fixed grip-jaw, a loose plate supporting the said fixed grip-jaw, and retractible locking-tongues provided with guides and detachably connecting the said loose plate to the foundation-plate, substantially as and for the purpose set forth.

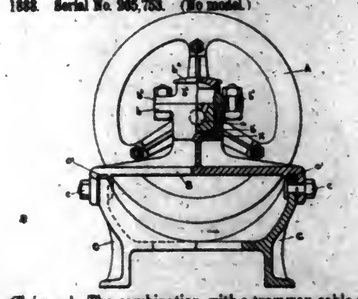
6. In a gripper for cable tramways the moving jaw of which is operated by a rotating screwed spindle, the combination, with a hand-wheel for operating the said screwed spindle, of a hand-lever pivoted on the said spindle and connected thereto by a reversible ratchet-and-pawl gear, as and for the purpose set forth.

7. In a gripper for cable tramways the moving jaw of which is operated by a rotating spindle, the combination, with a hand-wheel for operating the said spindle, of a telescopic hand-lever mounted loosely on the said spindle and connected thereto by a reversible ratchet-and-pawl gear, as and for the purpose set forth.

8. In a cable tramway the gripper of which is operated by the rotary motion of a screwed spindle, the combination, with a hand-wheel for operating the said spindle, of the auxiliary hand-lever for operating the said spindle with increased leverage, the loose plate carrying the shank of the fixed jaw of the gripper, the tongues for locking the loose plate of the foundation-plate carrying the gripper mechanism, and the screwed spindles for operating the locking-tongues through suitable sliding cams, as and for the purpose set forth.

9. In a gripper for cable tramways, the combination, with the moving jaw operated by a hand-wheel through a suitable endless screw and traveling nut, of the auxiliary telescopic hand-lever adapted to operate the said endless screw through a reversible ratchet-and-pawl gear, the loose plate carrying the fixed jaw adapted to be locked down to the foundation-plate carrying the gripper mechanism, the sliding tongues for locking down the said loose plate, the screwed spindles and sliding cam-pieces for operating the said tongues, and the detachable dies in the jaws, all arranged and operating as and for the purpose set forth.

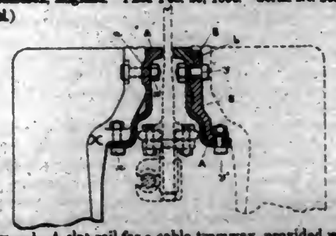
395,423. PULLEY-CARRIER FOR CABLE TRAMWAYS. WILLIAM H. COLAM, London, County of Middlesex, England. Filed Feb. 29, 1888. Serial No. 265,753. (No model.)



Claim.—1. The combination, with a tramway-cable guide-pulley, of a block adapted to slide laterally in a horizontal straight line for supporting the said pulley, a pedestal provided with a base-flange for attachment to the foundation and a flat upper surface for supporting the said sliding block, and bolts for regulating and securing the desired lateral adjustment of the said block, substantially as and for the purpose set forth.

2. The combination, with tramway-cable guide-pulley provided with an axle, of the bearing-blocks *b* for the ends of the axle to run in, the laterally-adjustable block B, having bearings for the bearing-blocks and caps for securing the bearing-blocks in said bearings, the pedestal C, provided with cross-slots at each end, and the bolts passing through lugs on block B and through the said slots for regulating and securing the lateral adjustment of the said block, substantially as and for the purpose set forth.

395,424. CABLE TRAMWAY. WILLIAM H. COLAM, London, County of Middlesex, England. Filed Feb. 29, 1888. Serial No. 265,754. (No model.)

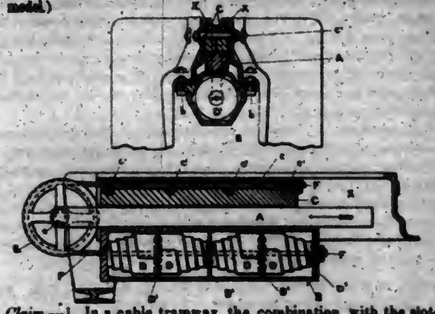


Claim.—1. A slot-rail for a cable tramway, provided with a horizontal flange upon one side at the top of it, a double bead in its vertical web, thereby throwing the lower part of said web to one side and a second horizontal flange at the bottom of the rail upon the opposite side of it from the top flange, substantially as and for the purpose set forth.

2. In a cable tramway, the combination, with the slot-rail hereinbefore described and shown, of the fish-plate adapted to be fixed to the slot-rail by two rows of bolts whose lines of tension are at right angles to one another, as and for the purpose set forth.

3. In a slot-rail for a cable tramway, the combination of the outward bend of the vertical web to give increased width to the slot, increased head-room in the cable-way, and to provide a bearing-surface for thrust-rollers mounted on the gripper-shank, the lower horizontal flange for fixing the slot-rail, and the longitudinal projection for supporting the same, as set forth.

395,425. CABLE TRAMWAY. WILLIAM H. COLAM, London, County of Middlesex, England. Filed Feb. 29, 1888. Serial No. 265,755. (No model.)



Claim.—1. In a cable tramway, the combination, with the slot-rails and cable-way, of the longitudinal box fixed to the said slot-rails and containing volute springs adapted to cushion longitudinally, as set forth.

2. In a cable tramway, the combination, with the slot-rails and the cable-way, of the longitudinal box containing four or more volute springs arranged in pairs with plates between them and adapted to cushion longitudinally, as set forth.

3. In a cable tramway, the combination, with the slot-rails and the cable-way, of the bar or piston sliding freely in a channel formed by and between the inner sides of the slot-rails, the top of the longitudinal box, and the inner side of packing-pieces fixed between the said rails, as set forth.

4. In a cable tramway, the combination, with the slot-rails, of the longitudinal box containing volute or analogous springs adapted to cushion longitudinally, and the bar or piston forked at its forward end to carry a small pulley and adapted to slide longitudinally in a channel formed between the slot-rails, as set forth.

5. In a cable tramway, the combination, with the slot-rails, of the bar or piston sliding freely in a horizontal plane between the slot-rails and carrying a pulley, partially round which passes a length of wire rope or chain fixed at one end to the slot-rails and passing through the volute springs in the longitudinal box and fixed to a plate bearing against the rear spring, as and for the purpose set forth.

6. In a cable tramway, the combination, with the sliding bar or piston and the longitudinal box containing the volute springs, of the packing-pieces in the top of the slot forming a top to the channel in which the rod or piston slides, and providing a means of attaching the fixed end of the rope or chain to the slot-rails or frame of the cable-way, as and for the purpose set forth.

7. In a cable tramway, the combination, with the slot-rails X X, of the rod or piston A, the longitudinal box B, the packing-pieces C C, the springs D D, &c., the plates D' D', &c., the pulley E, mounted on the axle-pin *e*, carried by the forked end of the rod or piston A, and the wire rope or cord F, all combined, arranged, and operating as and for the purpose set forth.

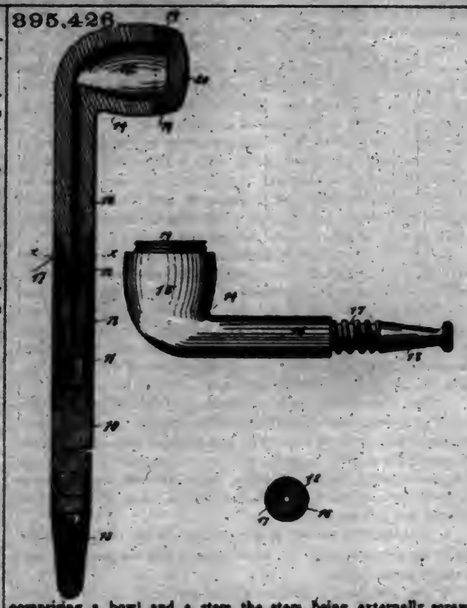
395,426. COMBINED TOBACCO-PIPE AND CANE. GEORGE H. COUDREY, Baltimore, Md. Filed July 2, 1888. Serial No. 278,768. (No model.)

Claim.—1. A walking-cane having a tobacco-pipe detachably secured to the upper end thereof, so that the bowl of the pipe will form the handle and the stem a portion of the cane, substantially as described.

2. The combination, with the staff of a walking-cane having a hollow upper end, of a tobacco-pipe having its stem detachably secured in the said hollow end of the cane, substantially as described, whereby the bowl of the pipe is made to form the handle and the stem of the pipe a portion of the cane, as set forth.

3. The combination, with the staff of a cane provided with a hollow upper end having an internal screw-thread, of a tobacco-pipe

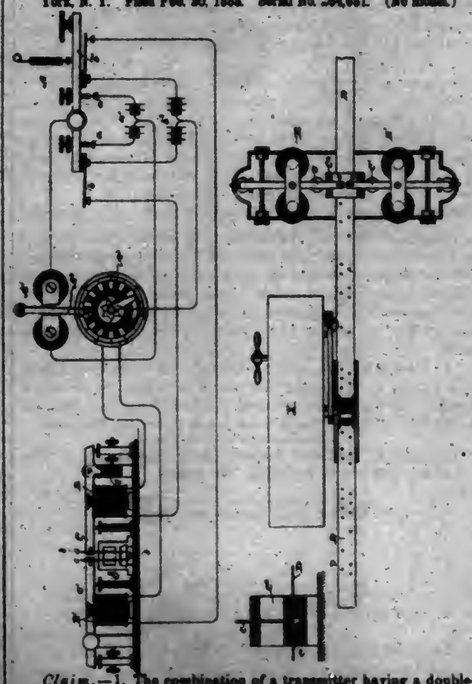
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comprising a bowl and a stem, the stem being externally screw-threaded near its outer end to adapt it to be screwed into the hollow upper end of the cane, substantially as and for the purpose set forth.

4. The combination, with the staff of a cane and an internally-screw-threaded collar secured to the upper end of the staff, of a tobacco-pipe comprising a bowl, a stem integral with the bowl, and a mouth-piece, the stem being externally screw-threaded adjacent to the mouth-piece to adapt it to be screwed into the said collar, substantially as herein shown and described, whereby the parts can be readily attached and detached, and when connected the bowl of the pipe is made to serve as a head for the cane and the stem a portion of the staff of the same, as set forth.

395,427. AUTOMATIC TELEGRAPHY. PATRICK B. DELANY, New York, N. Y. Filed Feb. 20, 1888. Serial No. 264,661. (No model.)



Claim.—1. The combination of a transmitter having a double-grooved surface over which the ribbon having lines of apertures coin-

ciding with said grooves passes, pivoted transmitting-fingers having pointed ends under which the ribbon runs connected with the main line and each arranged opposite or in line with one of the said grooves, insulated battery-connected stops against which said fingers fall when their pointed ends enter apertures in the ribbon, and a source of electric energy having poles of unlike sign connected to said stops, substantially as and for the purpose set forth.

2. The combination, with ribbon drawing or feeding devices, of a block or holder through which the ribbon is drawn, duplicate puncturers arranged side by side and having sharp or needle points for piercing the ribbon, their actuating-magnets, and the circuits of said magnets, the Morse key, and actuating-magnet circuit-completing devices interposed between said magnets and the key.

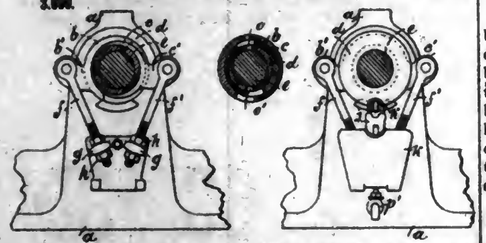
3. The combination of the duplicate recording devices, their magnets B B', and the circuits of said magnets, the alternate segments in the table A^2 included in the circuits of said magnets, the trailer traversing said segments, the Morse key, and trailer-actuating devices interposed between the trailer and key, whereby the trailer is moved when the key is depressed and when it is raised, and said magnets alternately energized for brief periods irrespective of the time during which the key is held in either position.

4. The combination, substantially as set forth, of the duplicate recording devices, their magnets B B', a key capable of being manipulated according to the Morse or like codes, circuit-controlling devices interposed between the magnets and key, and consisting of contacts or segments and a trailer traversing them, trailer-actuating devices interposed between the key and trailer, and the circuit of the magnets B B', for the purpose described.

5. The block C^3, formed with a passage for the reception of the ribbon, the recess opposite the recording-rod, and the groove c', substantially as set forth.

6. The combination, substantially as set forth, of two or more independent ribbon recorders, each having duplicate recording devices and actuating-magnets B B', the table of segments having alternate segments connected in circuit with the magnets B of the respective recorders, and the remaining segments connected in circuit with the magnets B' of the recorders, the trailer traversing said segments and connected in both said circuits, the Morse key, and trailer-actuating devices interposed between the trailer and key, whereby upon the manipulation of the key the same matter may be recorded upon several ribbons at the same time.

395,428. ADJUSTABLE SHAFT-BEARING. BENJAMIN A. DOBSON, Bolton, County of Lancaster, England. Filed July 26, 1888. Serial No. 281,054. (No model.) Patented in England Mar. 10, 1888, No. 3,690.

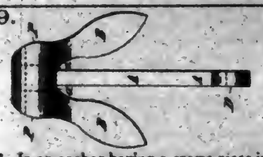


Claim.—1. The improved shaft-bearing consisting, essentially, of the following parts, combined substantially as shown and described; a non-rotating metal bushing forming a journal for the shaft and fitted within an eccentric sleeve, which is fitted within a second eccentric sleeve supported by the pedestal, and means for operating the eccentrics to adjust the position of the shaft with the said bushing as required.

2. The combination, with the pedestal *a*, of the bushing *d*, forming a journal for the shaft *c'*, the pair of eccentrics *b c*, the screw-threaded rods *f f'*, nuts *h*, and eyes *g*, attached to the pedestal, all substantially as and for the purposes herein shown and described.

395,429. ANCHOR. HERBERT O. DUER, Washington, D. C. Filed June 1, 1888. Serial No. 275,794. (No model.)



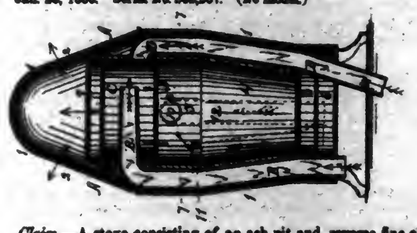


Claim.—1. In an anchor having a crown-piece integral with two spread flukes containing a longitudinal opening contracted on the fluke side, a shank with an enlarged tapered head containing a transverse cylindrical opening, said shank passing through the opening in the crown-piece, in combination with an axial bolt passing transversely through the shank-head and crown-piece, connecting the two, and allowing flukes to actuate each side of the shank, substantially as specified.

2. In an anchor having a crown-piece integral with two spread flukes containing a longitudinal opening shaped to fit a tapered shank-head and contracted on the fluke side, a bolt or pin, in combination with a shank having an enlarged tapered head containing a transverse cylindrical opening, said shank passing through the crown-piece and connected thereto by said bolt passing transversely through the crown-piece and shank-head, allowing angular motion, substantially as set forth.

3. In an anchor having an enlarged headed shank containing a transverse cylindrical opening for axial bolt, a crown-piece integral with two spreading flukes containing a longitudinal slot or opening allowing shank-head to actuate, in combination with an axial bolt, so that the shank has angular motion each sides of flukes, said slot or opening being contracted between the shoulders of the flukes and preventing detachment of shank in case of removal of axial bolt, substantially as specified and set forth.

395,430. STOVE. CHARLES W. EMERSON, Somerville, Mass. Filed Jan. 28, 1888. Serial No. 262,507. (No model.)



Claim.—A stove consisting of an ash-pit and reverse flue-chamber in the base, a grate, a fire-pot, a combustion-chamber, a heating-chamber above the combustion-chamber, provided with a perforated bottom, and a flue leading from the heating-chamber down through the base, a flue leading from the combustion-chamber down into the base and connected therefrom to the smoke-pipe, an air-inlet flue leading upward through the base and exterior to the fire-pot and combustion-chamber, but heated therefrom, into the upper part of the stove, and a casing inclosing all of these parts and perforated, substantially as described.

395,431. WRENCH. GEORGE R. FRANKLIN, Natick, Mass. Filed Apr. 28, 1888. Serial No. 271,582. (No model.)



Claim.—1. In a wrench provided with a fixed jaw, the movable jaw C, to which is pivoted a gripping-plate, D, furnished with the arm *f*, in combination with a spring-lever, E, disposed upon the back of said wrench and pivoted to the movable jaw, and the connecting-links G G, which unite said plate and lever, all operating substantially as and for purposes described.

2. In a wrench, the combination, with the fixed jaw and a movable jaw screw-actuated, of a gripping-plate pivoted to and carried by said movable jaw, and the compound lever system which actuates said gripping-plate, composed of the pivots *c d* in the movable jaw, the operating-lever E, lever-arm *f*, and a link or links, G, uniting said arm and lever, substantially as herein specified.

395,432. WEAR-IRON FOR VEHICLES. JACOB M. R. GERMEY, Little Falls, N. J. Filed Aug. 20, 1888. Serial No. 283,221. (No model.)

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Claim.—1. The combination, with the angle-plate formed with end bearings at its angle, of a roller mounted in said bearings, yielding blocks in said bearings abutting the ends of the roller, and a screw-plug in one of the bearings acting to press the yielding blocks and the roller together, substantially as described.

2. The herein-described wear-iron for vehicles, consisting of an angle-plate formed with a longitudinal socket at one end of its angle, a longitudinal sleeve at the other end thereof threaded internally at its other end, and a concave bearing between and in line with the said sleeve and socket, a plain cylindrical friction-roller mounted to turn in the socket, bearing, and sleeve, a threaded plug screwing longthwise in the outer threaded end of the sleeve, and compressible rubber or kindred blocks interposed between the ends of the roller and the socket-head and screw-plug, respectively, substantially as described.

3. In a wear-iron for vehicles, an angle-plate adapted to set over the angle of the vehicle-body and formed with a longitudinal socket at one end, a longitudinal sleeve at the other end, and a concave roller-bearing connecting and in line with said sleeve and socket, said sleeve, socket, and bearing being all diagonally in front of the angle of the plate, as and for the purpose specified.

395,433. BEVEL-GAGE. MILOS O. GORDON, Monrovia, Cal. Filed July 6, 1888. Serial No. 279,290. (No model.)



Claim.—1. The bevel-gage comprising the hinged-together plates, one being provided with a pointer or index and adapted for application to a planing-tool, while the other is provided with a graduated segmental plate and segmental rods passed through apertured posts applied to the aforesaid plate and provided with thumb-screws engaging said rods, substantially as set forth.

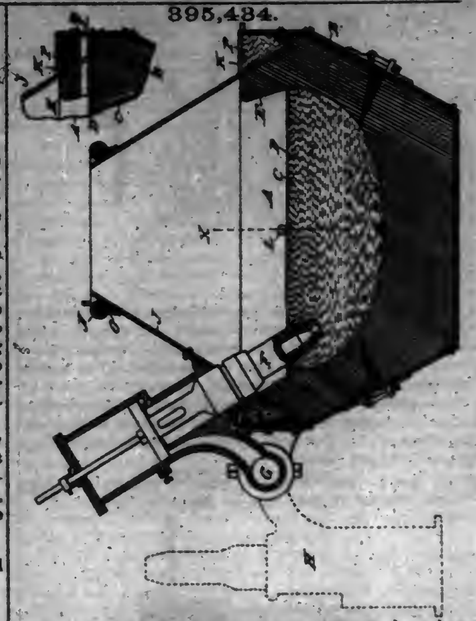
2. The bevel-gage consisting of the hinged-together plates, one plate having plate-like bars provided with clamp-plates, thumb-screws, and slots which receive screw-like studs or pins connecting with said clamp-plates, said latter-referred-to plate also having at its inner edge inwardly-projecting flanges and a pointer or index, while the other plate is provided with segmental rods and a graduated segmental plate, said rods being adjustably held in posts which are secured to the said plate-like bars, substantially as specified.

395,434. CONVERTER. FRED. W. GORDON, Philadelphia, Pa., assignor to Gordon, Strobel & Laureau, same place. Filed July 13, 1888. Serial No. 171,868. (No model.)

Claim.—1. In a dephosphorizing-converter, the combination of an acid lining-zone below the metal line and a neutral lining-zone at the metal line, substantially as and for the purpose set forth.

2. In a dephosphorizing-converter, the combination of an acid lining-zone below the metal line and a neutral lining-zone extending

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from the top of the acid zone upward to or above the slag, substantially as and for the purpose set forth.

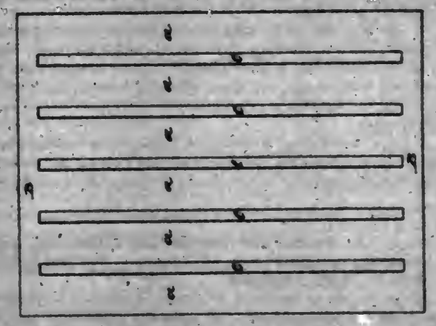
3. In a dephosphorizing-converter, the combination of an acid lining-zone below the metal line, a neutralized acid lining-zone at the metal line, and a cooling-channel in the neutral zone of the lining, substantially as and for the purpose set forth.

4. In a dephosphorizing-converter, the combination of an acid lining-zone below the metal line, a neutralized acid lining-zone at the metal line, a cooling-channel in the neutral zone of the lining, a hood of neutral material reaching upward from the neutralized lining-zone, and means for distributing a cooling agent contiguous but exterior to the splash-receiving surface of the hood, substantially as and for the purpose set forth.

5. In a converter, the combination of a converting-vessel, an acid lining therefor, and a tuyere formed of basic material and disposed free of contact therewith, substantially as and for the purpose set forth.

6. In a converter, the combination of a converting-vessel having a metal shell, an acid lining therefor, a hood joining said shell at about the metal line of the converter and converging upward to a top opening, an annular shower-pipe at the top of the hood, and a trough at the foot of the hood around the lining at the metal line, substantially as and for the purpose set forth.

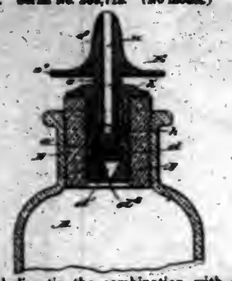
395,435. STEREOTYPE-PLATE. LEWIS GEE, Upper Montclair, N. J. Filed Mar. 19, 1888. Serial No. 267,883. (No model.)



Claim.—1. The stereotype-plate A, formed with columns *a*, slots C between said columns, and the end pieces, B B, by which the columns are united, substantially as described.

2. The plate A, formed with the grooves *h*, and diagonal slots *j*, forming the angles *P P* with the sides of the groove *h*, substantially as described.

395,436. INHALING-TIP. MYRON S. GREEN, New York, N. Y. Filed Nov. 1, 1888. Serial No. 289,712. (No model.)



Claim.—In an inhaling-tip, the combination, with a socket provided with a longitudinal internally-threaded bore, *d*, having conical walls *d'* at its lower end and a bottom channel, *d²*, leading into said bore, of a stem, E, adapted to screw into the socket, having a nipple-flanged top, *e'*, and a conical lower end, *e*, and provided with a longitudinal aperture, H, extending downward from its top, a diametrical aperture, *h*, crossing the longitudinal aperture at its bottom, and a longitudinal exterior air-channel, *h'*, below the nipple-flange, substantially as shown and described.

395,437. CAR-COUPLING. SAMUEL T. GRIMSLEY, West Plains, Mo. Filed Feb. 13, 1888. Serial No. 263,896. (No model.)



Claim.—1. In a car-coupling, the combination of the draw-head, the spring-arms secured therein and having their free ends arranged to bear close together, and one of said arms having a socket fitted to receive the end of a link, the pin-supporting slide, and a support therefor, substantially as set forth.

2. The combination, in a car-coupling, of the spring-arms adapted at their free ends to hold the link, a bar secured at one end to and projected upwardly from one of said arms, and the pin-supporting slide mounted on said bar, substantially as set forth.

3. The combination of the draw-head, the spring-arms adapted at their free ends to secure the link, the bar mounted on one of said arms and carrying the pin-supporting slide, and the screw operating between the spring-arms, substantially as set forth.

4. In a car-coupling, the combination of the draw-head, the spring having arms and secured in said draw-head and adapted at its forward end to engage and hold the link, and the auxiliary spring connected with and supplementing said armed spring, substantially as set forth.

5. The combination of the draw-head, the spring secured therein and having arms adapted at their forward ends to engage and hold the link, and the screw operating between the arms of said spring, substantially as set forth.

6. The improved car-coupling herein described, consisting of the draw-head, the pin-supporting slide movable under the upper wall thereof, the spring having arms adapted at their forward ends to engage and hold the link, the screw operating between the arms of said spring, and the auxiliary spring, substantially as and for the purposes specified.

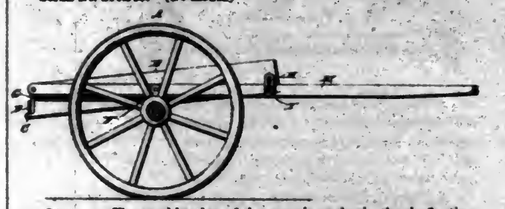
7. In a car-coupling, a spring, D, having arms bearing close together at their free ends, and one of the arms having its free end provided with a socket to receive the link, substantially as set forth.

395,438. WATER-PROOF COMPOUND CONTAINING CORK. CARL GRÜNWEG, Ludwigshafen-on-the-Rhine, Germany. Filed June 13, 1888. Serial No. 276,960. (Specimens.)

Claim.—1. As an improved article of manufacture, a granular water-proof and non-heat-conducting compound consisting of ground cork the granules of which are provided with a thin external coating of resin and asphalt, substantially as set forth.

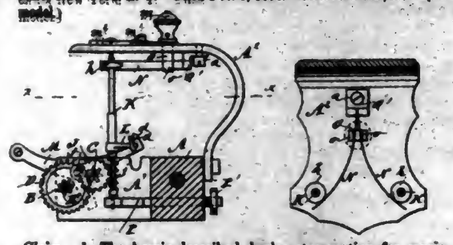
2. As an improved article of manufacture, a compressed water-proof and non-heat-conducting block or body formed of granules of cork coated thinly externally with resin and asphalt, substantially as set forth.

395,439. DUMPING-CART. JOHN C. GUSS, Knoxville, Tenn., assignor of one-half to Claude B. Prescott, same place. Filed June 9, 1888. Serial No. 276,565. (No model.)



Claim.—The combination of the carrying-wheels, the shafts, the brackets securing the shafts to the axle, the end-gate secured rigidly to the rear ends of the shafts, the body supported on the axle and provided at its rear end with the rearwardly-projecting shoulders C, adapted to receive and support the end-gate, and the pins D, projecting upward from the shoulders C in rear of the end-gate, as set forth.

395,440. STOP-MOTION FOR MUSIC-BOXES. GUSTAVE J. JACOBS, New York, N. Y. Filed Feb. 9, 1888. Serial No. 263,432. (No model.)



Claim.—1. The herein-described duplex stop-motion for music boxes, which consists of two vertical shafts having stop-arms, a stop-lever for each arm, and a counter-shaft provided with gears for revolving the vertical shafts, substantially as described.

2. The shafts K, provided with the brake-buttons *h*, in combination with the springs N, arranged to press upon the buttons, and the button *m* and fork O, for regulating the springs, substantially as described.

3. The combination, with the shaft C, of the shafts K, the connecting-gear, and the adjusting-plates P, in which the lower ends of the shafts K are journaled, substantially as described.

4. The stop-lever M, having arm M', and studs or projections *d*, in combination with the two shafts K K, stop-arms L L, shaft C, gear-wheels J J, pinion H, shaft B, gear-wheel D, and pinion E, substantially as described.

5. The springs N N, shafts K K, and buttons *h h*, in combination with the fork O, knob *m*, spring-arm *m'*, and notched plate *m²*, all arranged to operate substantially as described.

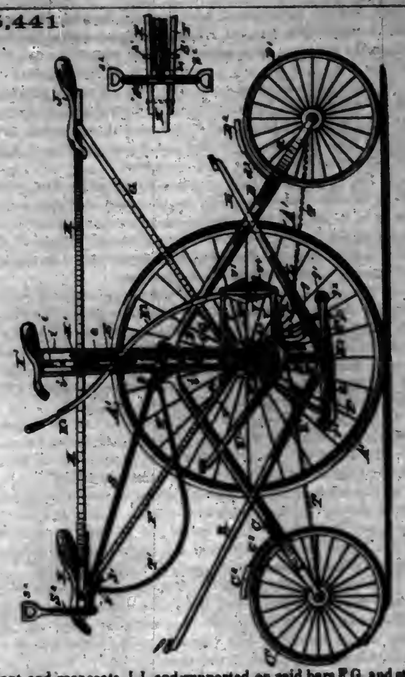
395,441. VELOCIPEDE. CALVIN JACKSON, Jacksonwald, Pa. Filed Jan. 10, 1888. Serial No. 260,318. (No model.)

Claim.—1. In a velocipede, the main frame constructed with a transversely-ranging frame, E, supported by the driving-wheel axle or axles, and bars F G, connected to said frame E and extending upward and forward and backward, respectively, to support an upper seat-frame, and said bars F G extended below to give support to the fulcrums of treadle-levers operated by riders on the upper seat-frame, substantially as herein set forth.

2. In a velocipede, the combination, with a transversely-ranging frame, E, supported by the driving-wheel axle or axles, of a seat-supporting frame bar or bars pivotally connected to the frame E for lateral movement thereon, and a lower carriage forming part of or connected to the seat-supporting frame bar or bars and swinging therewith, treadle-levers fulcrumed on said carriage, and mechanism connecting said levers with the axle or axles of the machine, substantially as described, for the purposes set forth.

3. In a velocipede, the combination, with the main frame consisting of a frame, E, supported by the driving-wheel axle or axles, a frame bar or bars pivotally connected to the frame E for lateral swinging movement thereon, and a lower treadle-lever carriage forming part of or connected to the seat-supporting frame bar or bars and swinging therewith, of anti-friction rollers H' H³ on the seat-frame and lever-carriage, respectively, which move on the frame E and brace it in vertical position transversely of the machine, substantially as herein set forth.

4. In a velocipede, the combination, with a transversely-ranging frame, E, supported by the driving-wheel axle or axles, of two bars, F G, pivoted to the frame E for lateral movement, a frame, H, carrying front and rear seats, I J, and supported on said bars F G, and stay-bars F F, connected to the lower ends of the bars F G, substantially as shown and described, whereby the laterally-movable frame F G F, while supporting the seats, will also furnish support for treadle-levers operated by the riders on said seats and connected to the driving-wheels for propelling the machine, as herein set forth.



5. The combination, in a velocipede, of a frame, two transversely-ranging axles pivoted at or near their outer ends to said frame and guided for vertical movement at their inner ends, shafts journaled to the frames or supports of said axles and carrying driving-wheels at their outer ends, and connections from the inner ends of said axles and in control of the rider for leveling the axles on transversely-sloping or uneven roads, substantially as herein set forth.

6. The combination, in a velocipede, of a transversely-ranging frame, E, a seat-frame supported thereat, two axles, A B, pivoted at or near the ends of the frame E and guided for vertical movement at their inner ends, rotating shafts A^4 B^4 in the axles A B and carrying driving-wheels A' B', a rack, *n*, on the frame E, a pulley and gear-wheel, M N, journaled on the seat-frame, said gear-wheel engaging the rack *n*, and a chain or belt, O, on said pulley and connected at opposite ends to the inner ends of the axles A B, substantially as described, for the purposes set forth.

7. The combination, in a velocipede, of a transversely-ranging frame, E, frame-bars F G, pivoted thereon for lateral movement and adapted to support a seat-frame and extended below their pivot e^3, stay-bars F F, connected to the lower ends of the bars F G and forming with them a lower carriage, treadle-levers fulcrumed on said carriage, driving-wheels A' B', supported on axles A B, pivotally connected to the ends of the frame E, mechanism, substantially as described, connected with the inner ends of both axles and adapted for leveling the axles, treadle-levers fulcrumed on the lower frame-carriage, and mechanism connecting the driving-wheel shafts with these levers, substantially as shown and described, whereby the seat-frame and treadle-lever carriage will swing laterally as the axles are leveled by depressing the treadle-levers, as and for the purposes set forth.

8. The combination, in a velocipede, of a transversely-ranging frame, E, having a rack, *n*, front and rear diagonally-ranging bars, F G, pivoted on the frame E for lateral movement, a seat-frame, H, supported on the bars F G, a pulley and gear-wheel, M N, journaled on the frame, said wheel N engaging the rack *n*, axles A B, pivoted at or near the ends of the frame E and guided for vertical movement at their inner ends, rotating shafts A^4 B^4 in said axles and carrying driving-wheels A' B', a chain or belt, O, on said pulley M and connected at opposite ends to the inner ends of the axles A B, and said frame-bars F G extended below their pivot e^3, bars F' F', connected to the bars F G and forming with them a lower carriage, treadle-levers fulcrumed on said carriage, pulleys on the driving-wheel shafts or axles, and belts connecting said pulleys with the treadle-levers, substantially as described, for the purposes set forth.

9. The combination, in a velocipede, and with a transversely-ranging frame, E, a seat-frame, H, supported thereat for lateral movement, and driving-wheels supporting said frame and mounted in axles pivoted to the frame E and connected at their inner ends to a device for leveling the axles, substantially as specified, of a latch device on the seat-frame engaging the frame E for locking the seat-frame at any desired lateral adjustment, substantially as herein set forth.

10. In a velocipede, the combination, with the main frame supported by side driving-wheels, of front and rear wheels, C D', bars C D, connected to said wheels C, a steering-bar jointed to the bars C D, and chains T, connecting the axles of the wheels C D' or their bars C D with the axle or axles of the main side driving-wheels, substantially as described, for the purposes set forth.

11. In a velocipede, the combination, with the main frame supported by side driving-wheels, of front and rear wheels, C D', bars C D, connected to said wheels C D', respectively, a universal joint connected to said bars, and an axially-movable steering-bar connected to the universal joint and in control of the rider for flexing said joint and operating both wheels C D' simultaneously in steering the vehicle, substantially as herein set forth.

12. In a velocipede, the combination, with the main frame comprising a transverse frame, E, supported by side driving-wheels, of front and rear frame-bars, F G, having a forked construction at their upper parts, front and rear wheels, C D', bars C D, connected to said wheels C D', respectively, and passed through the forked parts of the bars F G as guides, a universal joint connected to the bars C D, and an axially-movable steering-bar, S, connected to the universal joint and in reach of the rider for flexing said joint and operating both wheels C D' simultaneously, as herein set forth.

13. In a velocipede, the combination, with the main frame supported by driving-wheels, of front and rear wheels, C D', bars C D, connected to said wheels C D', coupling-sections R' R^2, connected pivotally at *r* and pivoted to the bars C D by pins c^2 d^2, ranging at right angles to the pivot *r*, and an axially-movable steering-bar, S, connected to the pivot *r* and controllable by the rider, substantially as herein set forth.

14. In a velocipede, the combination, with the main frame supported by side driving-wheels and a seat-frame thereon, of front and rear wheels, C D', bars C D, connected to said wheels C D', respectively, a universal joint connected to said bars, an axially-movable steering-bar connected to the universal joint and in control of the rider, and a spring, T, held at one end to the seat-frame and at its other end to the steering-bar, substantially as described, for the purposes set forth.

15. In a velocipede, the combination, with the main frame supported by side driving-wheels and supporting a seat-frame, of front and rear wheels, C D', bars C D, connected to said wheels C D', respectively, a universal joint connected to said bars, an axially-movable steering-bar, S, connected at one end to the universal joint and supported at its other end in a collar, S', held to the seat-frame, and in which collar the bar S has axial and lengthwise movement, substantially as described, for the purposes set forth.

16. A velocipede constructed with two short axles, each supported pivotally at or near its outer end on a suitable frame and carrying a driving-wheel, and the inner ends of said axles connected to a device for leveling the axles, and side seats supported on said axles, substantially as herein set forth.

17. A velocipede constructed with two short axles, each supported pivotally at or near its outer end on a suitable frame and carrying a driving-wheel, and the inner ends of said axles connected to a device for leveling the axles, side seats supported on the axles, pulleys on the driving-wheel shafts of the axles, and treadle-levers fulcrumed on supports held to said axles and connected to the pulleys, substantially as herein set forth.

18. In a velocipede, the combination, with a frame, an axle or axles, and driving-wheels thereon, of side seats mounted on the axle or axles, clutch-pulleys on the shafts of the driving-wheels, treadle-levers fulcrumed on the axle or axles or on frames held thereto, and hand-levers, also fulcrumed on the axle or axles or on the frames thereon, and said treadle and hand levers geared together for simultaneous operation, substantially as shown and described, whereby both hand and foot power may be used to propel the vehicle, as herein set forth.

19. In a velocipede, the combination, with a frame, an axle or axles, and driving-wheels thereon, of seats mounted on the axle or axles, clutch-pulleys on the shafts of the driving-wheels, frames V, fixed to the axle-frames, treadle-levers fulcrumed to said frames and provided with segmental gear v^4, and hand-levers, also fulcrumed on the frames V, and having segmental gear v^5, meshing with the gear v^4, substantially as described, for the purposes set forth.

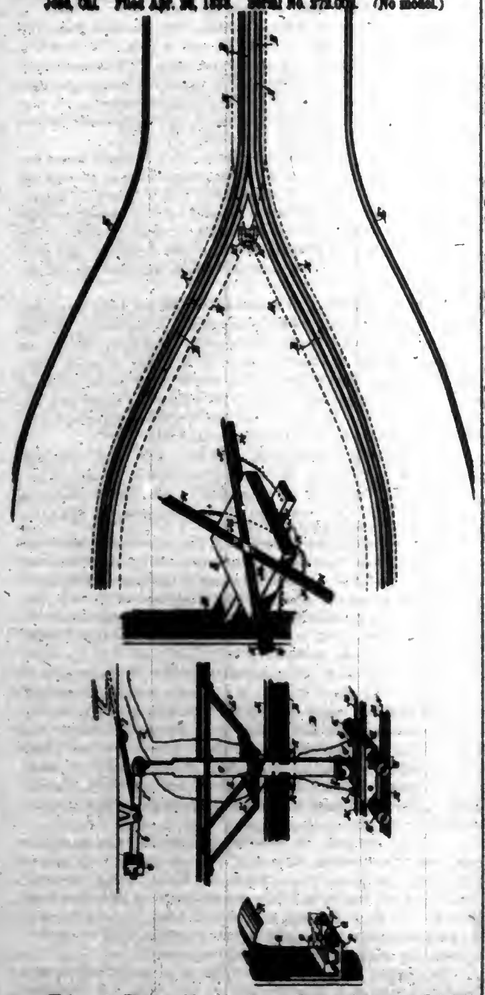
20. The combination, in a velocipede, of a transversely-ranging frame, E, a seat-frame supported thereat, two axles, A B, pivoted at or near the ends of the frame E and guided for vertical movement at their inner ends, rotating shafts A^4 B^4, journaled to the frames of

the axles A B and carrying driving-wheels A' B', and a pulley and belt device connected with the inner ends of both axles and adapted for leveling the axles on transversely-sloping or uneven roads, substantially as described, for the purposes set forth.

21. The combination, in a velocipede, of a transversely-ranging frame, E, a seat-frame supported thereat, two axles, A B, pivoted at the ends of the frame E and guided for vertical movement at their inner ends, rotating shafts A^4 B^4 in the axles A B and carrying driving-wheels A' B', and mechanism, substantially as described, connecting the inner ends of the axles to the seat-frame, whereby as the axles are leveled the seat-frame will be shifted laterally on the main frame, as and for the purposes set forth.

22. In a velocipede, the combination, with a frame, two transversely-ranging axles pivoted at or near their outer ends to said frame and guided for vertical movement at their inner ends, shafts journaled to the frames or supports of said axles and carrying driving-wheels at their outer ends, and connections from the inner ends of said axles and in control of the rider for leveling the axles, substantially as specified, of clutch-pulleys on the wheel-shafts, levers fulcrumed on the frame or axles, and straps connecting the levers and clutch-pulleys, a pulley journaled on the frame, and a cord or belt running on this pulley and connected at opposite ends to the driving-wheel clutch-pulleys, substantially as shown and described, whereby the pair of clutch-pulleys and levers will be reversed by downstroke of one of the levers and the clutch-pulley and lever connections will steady the inner ends of the driving-wheel shafts and axles, as and for purposes herein set forth.

395,442. CONDUIT ELECTRIC RAILWAY. BYRON JENNINGS, San José, Cal. Filed Apr. 26, 1888. Serial No. 272,002. (No model.)



Claim.—1. The combination, in a railway, of two parallel lines of track, a single underground tube or tunnel between the two with a slot through which connection is made with its interior from above, and parallel slot-irons upon which the inner rails of the two lines of track are formed or secured, substantially as herein described.

2. The underground tube or tunnel with a slot and parallel slot-irons at the top, said irons having rails formed with or secured to their outer edges and forming the inner rails of two lines of railway, the outer rails of which are parallel with the slot-irons upon opposite sides thereof, substantially as herein described.

3. The underground tube or tunnel having the yokes or frames forming its outline and supporting the combined slot-irons and inner track-rails, in combination with the transverse frames secured to the yokes, and the outer line of track secured to and supported on the frames to form a double line of parallel tracks and a single tube in one structure, substantially as herein described.

4. The trolley or truck through which connection is made between the electric conducting-rails within the tube and the motor on a car traveling upon the rails above, the shank C, by which the trolley or tube is suspended, and a movable slide through which the shank passes, in combination with the levers, by which it is raised and lowered to make and break the connection, and the adjustable counter-balance-weight, substantially as herein described.

5. The combination of the truck or trolley with its suspending shank, the movable slide through which said shank passes, the operating-levers, and the double or universal joint whereby the trolley automatically adjusts itself, substantially as herein described.

6. The truck or trolley through which communication is made between the electric conducting-rails and the motor, and the shank C, by which it is suspended and raised and lowered, in combination with the brace-rods fixed to the car, the guide, and the slide through which the shank C passes, substantially as herein described.

7. The conductor-supports bolted to the yokes within the tube and having the horizontal slotted tables, in combination with the glass insulating-chairs upon which the conducting-rails rest, said chairs having shanks extending into the slots in the tables and movable therein, substantially as herein described.

8. The horizontal slotted supports for the conductors bolted to the sides of the tube and having upturned sides or edges, in combination with insulating-chairs resting upon the supports, and the rails supported in the chairs, so as to automatically adjust themselves to the expansion and contraction, substantially as herein described.

9. The conducting-rails supported in insulating-chairs and having the depressions or channels formed in the upper surface, in combination with the re-enforcing wire-conductor fitted into said channel, so as to make a contact with the truck or trolley, which travels upon the rails, substantially as herein described.

10. The electric conductors supported within an underground tubular tunnel, in combination with the shields curved upward and outward and extending from the sides of the tunnel toward the center, so as to overhang the conductors and protect them, substantially as herein described.

11. The slotted underground tube or tunnel with the electric conductors, the truck or trolley through which connection with the conductors is made and broken, and the wires leading from the truck through the slot to the motor on the car, in combination with the shank C, having inclosing and protecting sleeves or collars surrounding the wires where they pass between the sides of the slot, substantially as herein described.

395,443. WALL-PAPER HANGER. LOUIS E. KENWORTHY, Ackworth, Iowa. Filed May 10, 1887. Serial No. 237,760. (No model.)

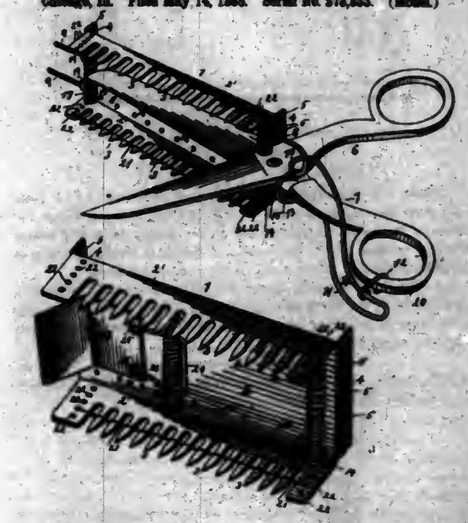


Claim.—1. In a machine for hanging wall-paper, the combination of the track or guide A, having the flanges B projecting from opposite sides of its face, the frame having the rollers I I bearing against the inner sides of the flanges, the shaft P, projecting laterally from one side of the frame and to which the roll of paper is adapted to be secured, the shaft K, journaled in said frame, projecting laterally from one side thereof, and having the rotating brush W, to bear against the roll of paper, and the wheels L L, engaging the outer side of the track, the fountain to supply paste to the brush, and the smoothing-brush Z, substantially as described.

2. In a paper-hanging machine, the combination, with the guide-track, of the traveling frame thereon and projecting from one side of the track, the main shaft K, journaled in the frame and having the wheels L engaging the track, the shaft P for the roll of paper, journaled in the frame, the rod R, secured to the frame, (said shaft P and rod R being on opposite sides of the main shaft,) the rotating brush W, secured to the main shaft, the fountain, and the smoothing-brush Z, attached to shaft R, substantially as specified.

3. In a paper-hanger, the combination of the guide-track, the main frame adapted to slide thereon, and having the main shaft K, provided with the wheels L, engaging the track, the said shaft having the projecting ends on opposite sides of the main frame, the shaft P, journaled in the main frame and adapted to slide longitudinally therein, the rod R, secured to the main frame and also movable longitudinally, the brush W, adapted to be attached to either end of the shaft K, and the brush Z, adapted to be secured to either end of the rod R, substantially as described.

395,444. APPARATUS FOR CUTTING HAIR. MARCUS KLEIN, Chicago, Ill. Filed May 14, 1888. Serial No. 273,833. (Model.)



Claim.—1. An apparatus for cutting hair, consisting of a double comb-frame provided with a scissors-securing frame and steadying-rests for one of the blades of the scissors, in combination with a pair of scissors having its blades located between the combs, substantially as described.

2. An apparatus for cutting hair, consisting of a double comb-frame provided with a scissors-securing frame laterally adjustable thereon and steadying-rests for one of the blades of the scissors, in combination with a pair of scissors having its blades located between the combs, substantially as described.

3. In an apparatus for cutting hair, the double comb-frame 1, formed with a bottom, 2, having a series of holes, 16, and lips 4, with perforations 5, sides 2', with teeth 3, and adjustable scissor-blade rests consisting of coiled springs 14 and 17, secured by wires 15 and 18 to the bottom of said frame, substantially as described.

4. In an apparatus for cutting hair, the double comb-frame 1, formed with a bottom, 2, having a series of holes, 16, and lips 4, with perforations 5, sides 2', with teeth 3, adjustable scissor-blade rests consisting of coiled springs 14 and 17, secured by wires 15 and 18 to the bottom of the frame 1, and the scissor-blade stop consisting of a bent plate, 23, with a U-shaped wire, 24, engaging the coiled spring 17, substantially as described.

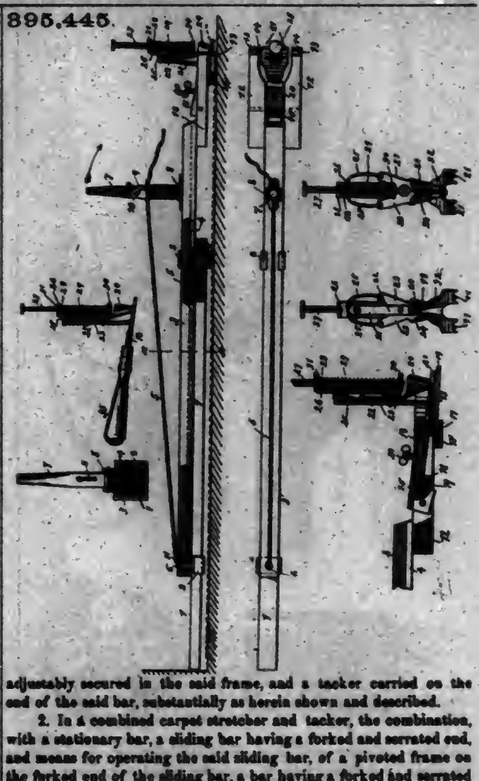
5. The combination, with a double comb-frame, 1, having sides 2', with teeth 3, and the series of holes 22 at the ends of sides 2', of a wire, 21, extending over and engaging the teeth 3, substantially as described.

6. The combination, with a double comb-frame, 1, having the series of holes 16 in its bottom, and having adjustable coiled-spring rests 14 and 17, also secured to said bottom, and depending lips 4 with holes 5, of the wire frame 7, with straight portions 8, extending through the lips 4 and secured by nuts 19, and the loops 10, with a wire guard, 13, the curved portions 11, with a hook, 12, and the scissors 6, having one of its blades resting in the coiled springs 14 and 17 and its pivotal portion located within the loops 10, and the guard 13 and the hook 12, engaging the thumb-hole 20 of said scissors, substantially as described.

395,445. CARPET STRETCHER AND TACKER. ANSEL F. LAMB, Stockbridge, Vt. Filed Apr. 28, 1888. Serial No. 271,907. (No model.)

Claim.—1. In a combined carpet stretcher and tacker, the combination, with a stationary bar and a sliding bar having a forked and serrated end, of a pivoted frame on the end of the sliding bar, a bar

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adjustably secured in the said frame, and a tacker carried on the end of the said bar, substantially as herein shown and described.

2. In a combined carpet stretcher and tacker, the combination, with a stationary bar, a sliding bar having a forked and serrated end, and means for operating the said sliding bar, of a pivoted frame on the forked end of the sliding bar, a bar having a forked and serrated end and adjustably secured in the pivoted frame, and a tacker on the forked end of the said adjustable bar, substantially as herein shown and described.

3. In a combined carpet stretcher and tacker, the combination of a stationary bar, a sliding bar having a forked and serrated end, a lever pivoted to the sliding bar and provided with a catch, a rope secured to the stationary bar, passed under and through an aperture in the sliding bar and engaged by the catch on the said lever, a pivoted frame on the forked end of the sliding bar, a bar having a forked and serrated end and adjustably secured in the pivoted frame, and a tacker on the forked end of the said bar, substantially as herein shown and described.

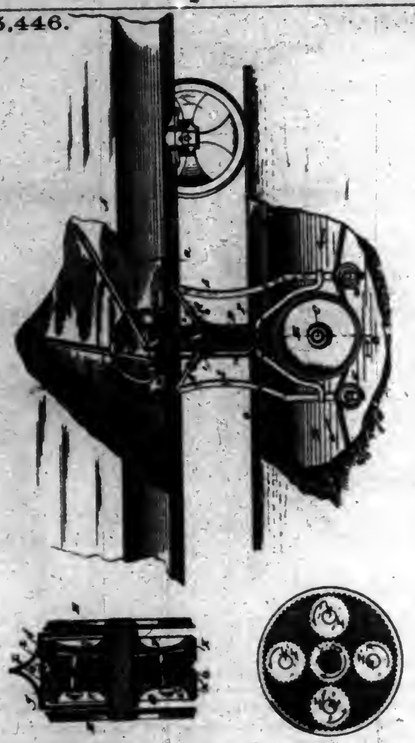
4. The combination, with the bar 16, having a forked and serrated end, and the standard 22, carried by said bar and provided with the bracket 26, of the arms 23, pivoted to the standard and having partly closed and tapering lower ends, the spring-arms 25, for holding the arms 23 closed, the plunger 27, working in the bracket 26, and the spring 29, surrounding the plunger, substantially as herein shown and described.

5. A combined carpet stretcher and tacking mechanism, consisting of the main bar 1 and the extensible bar 3 sliding thereon, held together by means of the sleeves 2, the outer end of the sliding bar 3 being formed with a forked head, 12, having the arms 13 and cross-piece 13' and serrated ends 14, and the frame 15, pivoted in the forked head 12 and having mounted therein a bar, 18, secured by the set-screw 20, and formed with a forked end having serrated points 21, and a tack-driving mechanism consisting of a standard, 22, mounted on the forked end of the bar 18, and provided with pivoted arms 23, having the lower tapering folded ends, 24, and the spring-arms 25, connected with their upper ends, and a spring-actuated plunger, 27, mounted on the frame 22, together with means for extending the sliding bar 3 consisting of the cord 5, fastened in the inner end of the bar 1, passing through a groove, 4, in the bottom of the bar 3, and an opening, 6, in the end of the bar 3, and secured to a lever, 7, mounted on the bar 3, by means of a pivoted catch, 9, substantially as described.

395,446. APPARATUS FOR TRANSMITTING POWER. THERON W. LEMBURG, Duluth, Minn. Filed Mar. 26, 1888. Serial No. 268,894. (No model.)

Claim.—1. In a device for transmitting a motion to a wheeled vehicle, the combination, with the standard B, a transverse shaft, C, journaled therein, the wheels B E, secured to the outer ends of said

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shaft, and means for reversing the motion of said shaft, substantially as described, of the inverted rails supported above the wheels, as and for the purpose described.

2. In a device for transmitting a reversible motion from a continuous-running cable to a car, the combination, with the standard B, the shaft C at its lower end, and means, substantially as described, for reversing the motion of said shaft, of the bars S, carrying cable-supporting sheaves T at their lower ends and connected at their upper ends to the standard B, and means, substantially as described and shown, for raising and lowering said bars, as and for the purpose specified.

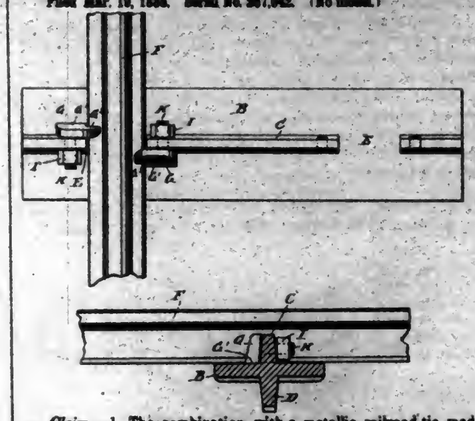
3. In a device for transmitting a reversible motion to a car, the combination, with the standard B, secured to said car, of the shaft C, the wheels secured on the outer ends thereof, the band-wheels F G, mounted on said shaft, the wheel F arranged for frictional contact with the cable, and the intermediate gearing for reversing the motion of said shaft, all arranged substantially as and for the purposes described.

4. In a device for transmitting a reversible motion to a car, the combination, with the standard B, carrying at its lower end the reversing mechanism, substantially as described, and provided with the yoke P, of the bars S, carrying the cable-sheaves T, said bars S guided in the yoke P, as shown, and means, substantially as described, for raising and lowering the bars S, as and for the purpose set forth.

5. In a device for transmitting a reversible motion to a car, the combination, with the standard B, the shaft C, the wheels E E, secured on said shaft, the inverted track-rails *d d*, and the gear J, fixed on said shaft C, of the band-wheels F G, loosely mounted on the shaft C, the intermediate gearing arranged on said band-wheels, said gearing imparting reversible motion to the gear J and shaft, the band-wheel F being arranged for frictional contact with the cable, substantially as and for the purpose specified.

6. In a device for transmitting a reversible motion to a car, the combination, with the standard B, the shaft C, journaled therein, the wheels E E, secured on said shaft, the inverted rails *d*, and the gear J, of the pulley F, loosely mounted on the shaft C and adapted to be revolved by contact with the cable, said wheel F provided with annular beveled flange *f*, provided with internal cogs, the pulley G, loosely mounted on said shaft C, the gears I, mounted on one face of the pulley G and adapted to gear with the cog-flange of the wheel F and the gear J, and suitable brake mechanism, substantially as shown, for holding either of the wheels F and G from turning, all arranged substantially as and for the purpose described.

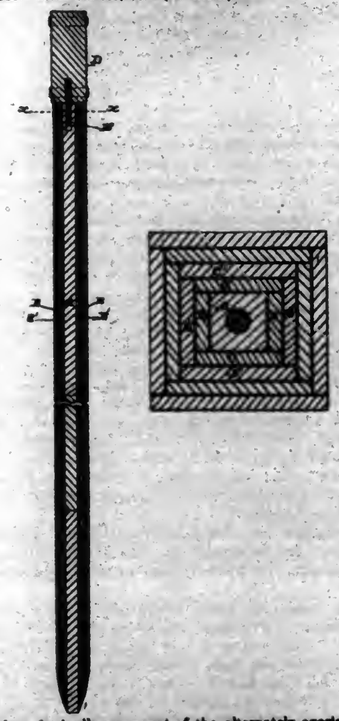
395,447. RAILROAD-TIE. MICHAEL MALONEY, Ironton, Ohio. Filed Mar. 19, 1888. Serial No. 267,842. (No model.)



Claim.—1. The combination, with a metallic railroad-tie made cross shape in cross-section and having openings in its top flange and offsets on its horizontal flanges, and a downwardly-extending flange, of a bolt secured to the top flange and having a head projecting on the base of the rail, substantially as shown and described.

2. A railroad-tie made cruciform in cross-section and formed with offsets B' D' on the lower face of its flanges B and on the lower edge of its flange D, the upper flange, C, having rail-receiving recesses, substantially as set forth.

395,448. PILE. ROBERT B. MARKLE, Westport, Cal. Filed Aug. 21, 1888. Serial No. 283,373. (No model.)



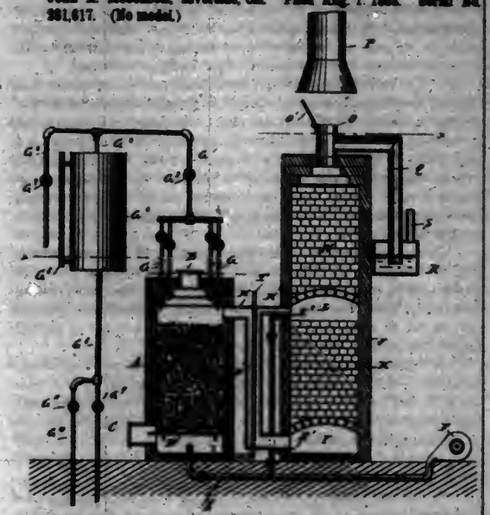
Claim.—1. A pile composed of the alternately overlapping sections secured together at right angles with each other, substantially as and for the purpose herein described.

2. A pile composed of alternately overlapping sections secured together at right angles, in combination with an intermediate filling of a preservative compound between each series, substantially as herein described.

3. A pile composed of strips or sections and overlapping each other successively at right angles, said sections being made in lengths, having

the adjacent abutting end joints at a distance from each other, substantially as herein described.

395,449. APPARATUS FOR THE MANUFACTURE OF GAS. JOHN A. MCCOLLUM, Riverside, Cal. Filed Aug. 1, 1888. Serial No. 281,617. (No model.)



Claim.—1. In a gas-making apparatus, the combination, with a furnace, of oil-supply pipes discharging into the top of the said furnace, a double fixing-chamber filled with checker-bricks and having two fire-places, being connected by pipes with the said furnace, and a blast-pipe discharging into the said fire-places, and also into the bottom of the said furnace, substantially as shown and described.

2. In a gas-making apparatus, the combination, with a furnace, of oil-supply pipes discharging into the top of the said furnace, branch pipes leading from the said furnace, a superheater filled with checker-bricks and having two fire-places into which discharge the said branch pipes, and a blast-pipe discharging into the said furnace at its bottom, and also provided with branch pipes leading into the said fire-places of the fixing-chamber, substantially as shown and described.

3. In a gas-making apparatus, the combination, with a furnace, of oil-supply pipes discharging into the top of the said furnace, branch pipes leading from the said furnace, a fixing-chamber filled with checker-bricks and having two fire-places into which discharge said branch pipes, a blast-pipe discharging into the said furnace at its bottom, and also provided with branch pipes leading into the said fire-places of the superheater, and a steam-pipe passing through one of the said branch pipes into the bottom of the said furnace, substantially as shown and described.

4. In a gas-making apparatus, the combination, with a furnace, of oil-supply pipes discharging into the top of the said furnace, branch pipes leading from the said furnace, a fixing-chamber filled with checker-bricks and having two fire-places into which discharge said branch pipes, a blast-pipe discharging into the said furnace at its bottom, and also provided with branch pipes leading into the said fire-places of the fixing-chamber, a steam-pipe passing through one of the said branch pipes into the bottom of the said furnace, and a pipe leading from the upper end of the said superheater and connected with a washer, substantially as shown and described.

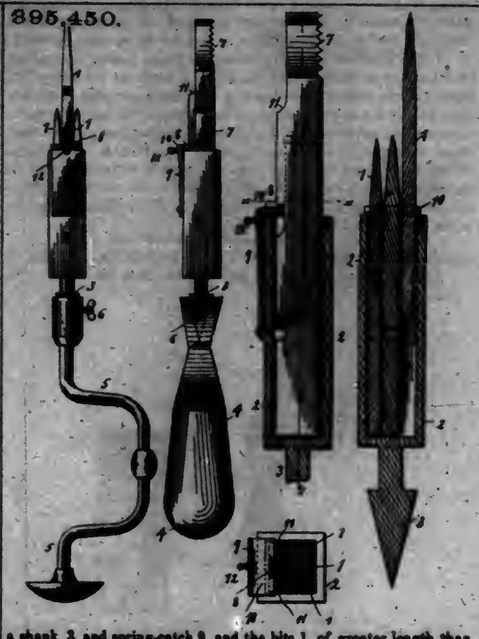
5. In a gas-making apparatus, the combination, with a furnace, of oil-supply pipes discharging into the top of the said furnace, branch pipes leading from the said furnace, a fixing-chamber filled with checker-bricks and having two fire-places into which discharge said branch pipes, a blast-pipe discharging into the said furnace at its bottom, and also provided with branch pipes leading into the said fire-places of the fixing-chamber, a steam-pipe passing through one of the said branch pipes into the bottom of the said furnace, and a valve held on the upper end of the said fixing-chamber to discharge into a smoke-stack, substantially as shown and described.

395,450. SCREW-DRIVER. CHARLES B. HOSMAN, Telluride, Colo. Filed Mar. 22, 1888. Serial No. 268,117. (No model.)

Claim.—1. In a compound screw-driver, the combination, with the detachable casing and its spring-catch 9, of the projecting bits 1 1, having the beveled shoulder 11 and notch 8 on one edge and the serrations 7 on the other, said bits being of greater length than the casing, so that their serrated ends project therefrom, as shown and described.

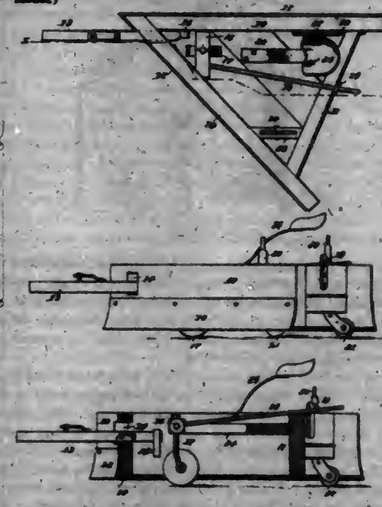
2. In a screw-driver, the combination of a casing, provided with

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a shank, 3, and spring-catch 9, and the bits 1, of greater length than the casing, and each provided with a notch, 8, and shoulder 11, substantially as herein shown and described.

395,451. ROAD GRADER AND DITCHER. MARLOW F. PERRY, West Osceola, N. Y. Filed July 16, 1888. Serial No. 280,141. (No model.)



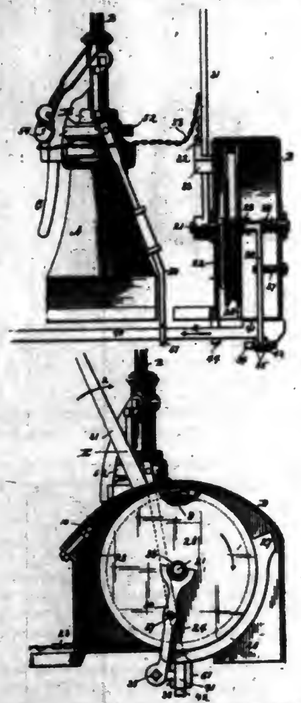
Claim.—1. The combination, with the triangular scraper, of the transverse rock-shaft 16, pivoted between the converging ends of the side bars, a caster-wheel, 17, having its shank depending from the said shaft, a vertically-movable lever connected at its forward extremity to the said rock-shaft for rocking it, and means for locking the said lever, the parallel vertical forwardly-swinging levers 20, pivoted at or near their lower rearwardly-curved ends within the rear end of the frame, and provided with wheels at their lower ends, substantially as set forth.

2. The combination, with a triangular frame, cutting or scraping blades secured to the base of the same, and a draft-beam pivoted in the forward end of the frame parallel with one side beam, of a rock-shaft journaled in the forward portion of the frame, a caster-wheel pivoted in said rock-shaft, a horizontal lever attached to the rock-shaft, vertical levers secured to the inner side of the frame at the rear, wheels pivoted in the lower end of said vertical levers, and

means, substantially as shown and described, for retaining the said levers in a predetermined position, as and for the purpose specified.

3. The combination, with a triangular frame, cutting or scraping blades attached to the face of the frame, a draft-bar pivoted to the frame parallel with one side beam, a rock-shaft journaled in the forward end of the said frame, and a caster pivoted in said rock-shaft, of vertical levers pivoted to the inner sides of the frame at the rear, wheels secured to the lower extremity of said vertical levers, racks inclosing the upper portion of the said levers, a horizontal lever attached to the rock-shaft, and a cleat secured to the rear of the frame adapted to engage the said horizontal lever, all combined to operate in the manner set forth.

395,452. INTERLOCKING SWITCH AND SIGNAL. ROBERT B. PORTER, Hilburn, N. Y. Filed Jan. 20, 1888. Serial No. 261,301. (No model.)



Claim.—1. The combination, with an automatic switch-stand and signal devices which tend automatically to go to the danger position, of a reciprocating rod connected to move with the switch-rails, and a clutch or locking device which operates to hold the signal devices in their safety position, and arranged to be operated by the said rod when moved, substantially as described.

2. The combination, with an automatic switch-stand and signal devices which tend to automatically go to the danger position, of a reciprocating rod connected to move with the switch-rails, a clutch or locking device which normally holds the signal devices against automatic movement, arranged to be operated by the said rod to release the signal devices, and an obstructing device operated by the signal devices and normally arranged in the path of the said rod when the signal is set to the safety position, substantially as described.

3. The combination, with the switch-stand having a vertically-moving block, E, and the signal devices, of a reciprocating rod, 40, connected to move with the switch-rails, a connecting-rod, 50, between the reciprocating rod and the block E, and an obstructing device actuated by the signal devices and arranged above and in the path of the rod 40 when the signal is set in the safety position, substantially as described.

4. The combination, with the switch-actuating devices and the signal devices, of a reciprocating rod connected to move longitudinally with the switch-rails, a connecting-rod between the reciprocating rod and a moving part of the switch-actuating devices, arranged to move the reciprocating rod transversely while the switch-actuating devices are moved, and an obstructing device connected with the signal devices and arranged by the side of the reciprocating rod when the signal is set to safety position to obstruct its transverse movement, substantially as described.

5. The combination, with the switch-rails and the switch-stand A, of the reciprocating rod 40, connected to move with the switch rails, a connecting-rod between the rod 40 and a moving part of the switch-stand, arranged to move the rod 40 transversely when the switch stand is operated, the wheel 20, by which the signal is operated, and an obstructing projection carried by said wheel and arranged to lie in the path of the rod 40 when the signal is set to "safety," to obstruct its transverse movement, substantially as described.

6. The combination, with the switch-rails and the switch-stand A, having the vertically-moving block E, of a reciprocating rod, 40, connected to move with the switch-rails, a connecting-rod between the rod 40 and the block E, the wheel 20, by which the signal is operated, and a flange, 26, provided with an expanded end, 27, carried by said wheel, said flange being arranged to lie above the rod 40 when the signal is set to "safety," and the expanded end 27 being arranged to one side of the rod 40 when the signal is set to "danger," substantially as and for the purpose set forth.

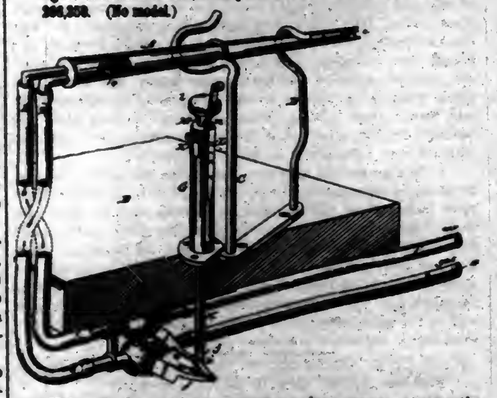
7. The combination, with the switch-rails, of the reciprocating rod 40, connected to move therewith, a signal-operating wheel, 20, loose upon its shaft, but normally held clutched thereto, an operating-handle by which the wheel is turned, and a shipping-lever operated by the rod 40 when reciprocated to throw the wheel out of engagement with its shaft, substantially as set forth.

8. The combination, with the switch-rails, of the rod 40, connected to move with the switch-rails, a signal-operating wheel, 20, loose upon its shaft, but normally held clutched thereto by a spring, a shipping-lever adapted to slide the wheel on its shaft out of engagement with its clutching device, and an adjustable contact-arm carried by the shipping-lever in the path of the rod 40 as it moves with the rails to the danger position, substantially as described.

9. The combination, with the switch-rails, a switch-stand, A, and the signal devices, of the rod 40, connected to move with the switch-rails, a connecting-rod between the rod 40 and a moving part of the switch-stand, a signal-actuating wheel, 20, loose upon its shaft, but normally held clutched thereto by a spring, an interlocking or obstructing device operated by the signal-actuating wheel to be moved into the path of the rod 40 to obstruct the same when the signal is set to "safety," and a shipping-lever for releasing the wheel from its shaft and provided with a projection in the path of the rod 40, substantially as set forth.

10. The combination, with the switch-rails, a switch-stand having a vertically-moving block, E, and the signal devices, of the reciprocating rod 40, connected to move with the switch-rails, the connecting-rod 50 between the block E and the rod 40, which latter is seated in a loop, 51, through which it slides freely, a signal-operating wheel 20, loose on its shaft, but normally held clutched thereto, the operating-handle 31, by which the wheel is turned, the flange 26, carried by said wheel and arranged above the rod 40 when the signal is set to "safety," whereby it obstructs the upward movement of the rod by the connecting-rod 50, and a shipping-lever for releasing the wheel from its shaft, provided with a projection in the path of the rod 40, substantially as set forth.

395,453. BLOW-PIPE. EDWARD B. POWERS, Taunton, Mass., assignor to Reed & Barton, same place. Filed Mar. 6, 1888. Serial No. 266,268. (No model.)



Claim.—1. In a soldering apparatus, the arrangement upon the work-bench B of the vertical standard C, having its upper end bent laterally to form a support for the blow-pipe, the vertically-sliding valve-rod H, and the guide G therefor, arranged close alongside and slightly in advance of said stand, as shown and described, whereby the head of the valve-rod is in front of the vertical bend of the stand, as shown, and for the purpose specified.

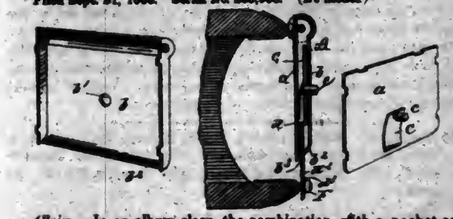
2. In a soldering apparatus, the combination, with a work-bench, a hollow standard secured vertically thereto, the blow-pipe, the air and gas tubes, and cut-off valves applied to said tubes, of a spring-supported rod arranged and adapted to slide within the said standard and connected with and operating the valves, and a catch which automatically engages the rod when the latter is depressed, and thereby holds the valves closed, as shown and described.

3. In a soldering apparatus of the class hereinbefore specified, the combination, with the blow-pipe, the air and gas tubes, valves for the latter, and a vertical guide, G, of the valve-rod working in said guide, a collar affixed to the valve-rod, and a spring-catch attached to the guide and having an inward bend or projection forming a shoulder, as specified, whereby the catch is adapted to engage with said collar when the rod is forced down, thus locking the valves in the open position.

4. In a soldering apparatus of the class hereinbefore specified, the combination of the spring-catch having the inward bend or projection forming a shoulder, the valve-rod having a collar which is located between its head and the guide in which the rod works, and is adjustable on said rod, the valves, and air and gas tubes, and a blow-pipe proper with which the latter connect, as shown and described.

5. In a blow-pipe apparatus, the combination, with the bench, the air-tube 1 and gas-tube 2, of the valves E and F, having the respective arms *e f*, of which the latter is longer than the former, the connecting-link *i*, the vertically-sliding rod H, the standard or tubular guide G, supported upon the bench, all as shown and described, whereby when said rod is depressed the air-valve is closed and the gas-valve but partly closed, as specified.

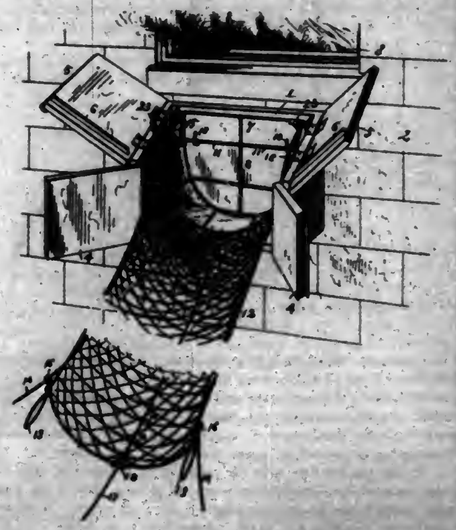
395,454. ALBUM-CLASP. LOUIS B. FRANAU, Brooklyn, N. Y. Filed Sept. 21, 1888. Serial No. 285,966. (No model.)



Claim.—In an album-clasp, the combination, with a pocket and a spring-pawl held within the pocket and provided with a button extending outward through one wall of the pocket, of a plate adapted to slide within the pocket and provided with ratchet-teeth engaging said pawl, and the stop for said plate, substantially as shown and described.

395,455. FIRE-ESCAPE. RUDOLPH A. REED, Hoboken, N. J., and EDWARD PFEIFFENOVER, New York, N. Y. Filed Nov. 2, 1888. Serial No. 289,790. (No model.)

Claim.—1. A fire-escape consisting of a casing with automatically-opening doors attached to a building, a frame with a U-shaped front projection detachably secured in the casing, with a trough-shaped chute attached at one end to the U-shaped projection, which gives the chute a U-shaped or trough form, and ropes extending lengthwise of and beyond the chute for detaching the frame from the casing, and drawing it down therefrom, substantially as shown and described.



2. A fire-escape chute constructed of netting and having secured at one end a frame formed with a U-shaped portion, to which the end of the chute is secured, giving it a U or trough shape, and a vertical rear portion adapted to engage retaining devices in a receptacle, substantially as described.

3. A fire-escape consisting of a casing attached to a building and formed with self-opening doors in front and spring-actuated opening-doors on top, a frame held in the casing by hooks and having a U-shaped front projection, a chute of netting secured at one end to the U-shaped projection and having hand-holds at its lower end, and ropes for detaching the frame from the retaining-hooks, which ropes pass over pulleys in the casing and through guides in the sides of the chute to and beyond its lower end, and a rope for drawing down the frame, and netting connected to the frame extending beneath the chute and through guides therein and beyond the lower end of the chute, substantially as shown and described.

395,456. ATTACHMENT FOR COMPRESSED-AIR ENGINES. ALBERT BAUER, Pittsburg, Pa. Filed Mar. 19, 1888. Serial No. 267,681. (No model.)

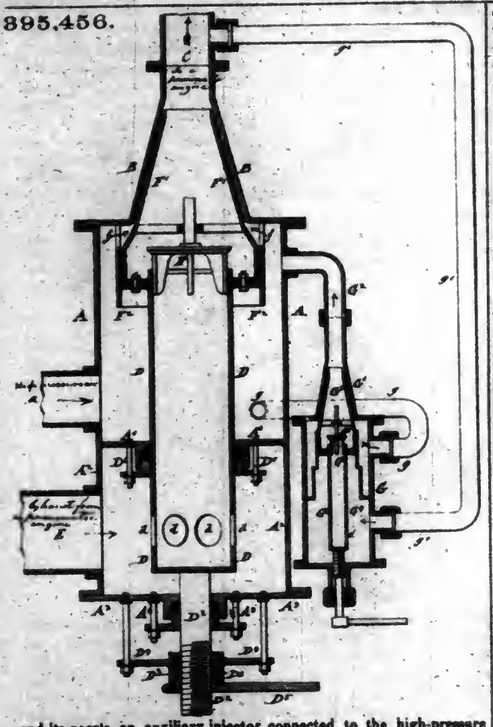
Claim.—1. The combination of a high-pressure air-cylinder, an injector communicating with said cylinder and the induction end of a pneumatic engine, an interior cylinder communicating with the eduction-pipe of said engine, and a check-valve at that end of the interior cylinder communicating with the injector, substantially as set forth.

2. The combination, with a high-pressure cylinder provided with the injector-nozzle connected with the induction end of a pneumatic engine, of an interior cylinder connected to the eduction end of said engine, a nozzle at the inner end of the interior cylinder, a check-valve in said cylinder, and means for adjusting the interior cylinder and its nozzle to the exterior nozzle of the high-pressure cylinder, substantially as set forth.

3. The combination of a high-pressure air-cylinder, an injector communicating with said cylinder and the induction end of a pneumatic engine, an interior cylinder communicating with the eduction end of said engine and at the opposite or inner end with said injector, and an auxiliary injector communicating with the high-pressure cylinder and the outlet-pipe of the same, so as to establish an equilibrium of pressure in the high-pressure cylinder and the outlet-pipe, substantially as set forth.

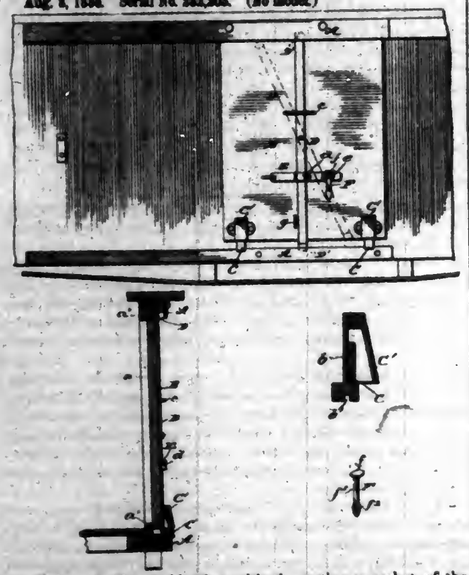
4. The combination of a high-pressure cylinder provided with an injector-nozzle connected to the induction end of a pneumatic engine, an interior cylinder connected to the eduction end of said engine, the inner end of the interior cylinder being provided with a nozzle and a check-valve, means for adjusting the interior cylinder

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and its nozzle, an auxiliary injector connected to the high-pressure cylinder and to the outlet-pipe of the same, and means for adjusting the auxiliary injector, substantially as set forth.

395,457. CAR-DOOR. EDWARD B. SEARLES, Baltimore, Md. Filed Aug. 2, 1888. Serial No. 282,203. (No model.)



Claim.—1. The combination, with the casting or socket, of the shoe or bearing, its horizontal portion having in the lower surface a groove or passage, its upper portion formed into a vertical arm entering the socket and having a loose connection therewith, whereby it is adapted to transverse play within said socket, substantially as shown and described.

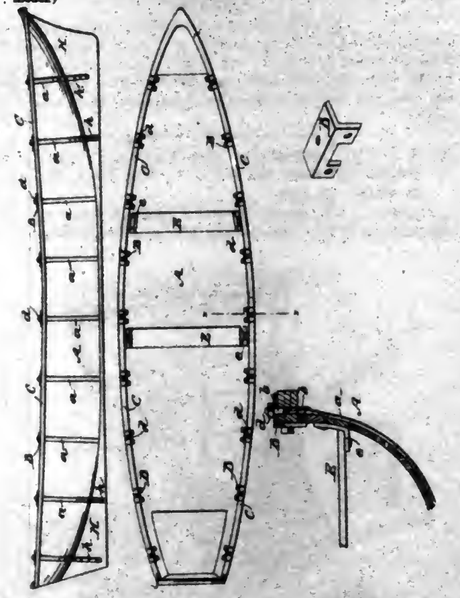
2. The combination, with the casting or socket having one of the faces of its chamber flared or inclined outward and downward toward its lower edge, of the shoe or bearing of step-like shape having in the lower surface of its horizontal portion a groove or passage, its upper or vertical portion entering the chamber, said portion adapted to transverse movement in said chamber, whereby it will rest against the vertical portion of said chamber when the door is open and against the inclined wall when the door is closed, substantially as and for the purpose described.

3. The combination, with the door fitting into the door-opening and flush with the outer side of the car-body and the rails applied to said car-body, of the shoes or bearings each of a step-like shape and having in the lower surface of its horizontal portion a groove or passage, their upper ends formed with upwardly-projecting arms, and the sockets or castings applied to said door and having interior chambers which receive the projecting arms of the bearings, forming a loose connection therewith, whereby said arms have a transverse movement in said chambers or sockets, substantially as and for the purpose specified.

4. The combination, with the door fitting into the door-opening and flush with the outer side of the car-body and the rails applied to said car-body, of the lever centrally pivoted to the door and having its ends fitting between the car-body and rails, the hasp connected to the door and having its central portion spanning said lever, while its slotted free end receives a staple projecting from the door, the pin or bolt for insertion into said staple, sockets connected to the door, and the shoes, their lower faces riding upon the rails, their upper ends projected and loosely fitted into the sockets, whereby said sockets are adapted to transverse movement on said shoes, substantially as herein before described.

5. The combination, with the door fitting into the door-opening and flush with the outer side of the car-body and the rails applied to the car-body, of the lever centrally pivoted to the door and having its ends fitting between the car-body and rails, the hasp connected to the door and spanning the lever, the lever stop and keeper applied to the door, the staple projecting from the door through the slot in the hasp, the pin or bolt for insertion into said staple, sockets connected to the door, and the shoes, the lower faces thereof riding upon the rails, their upper ends projected and loosely fitted into the sockets, whereby said sockets are adapted to transverse movement on said shoes, substantially as and for the purposes described.

395,458. BOAT. ALBERT L. SEARS, St. Louis, Mich., assignor to himself and William S. Turk, same place. Filed Oct. 11, 1886. Renewed Oct. 27, 1887. Again renewed May 17, 1888. Serial No. 274,198. (No model.)



Claim.—1. The method of constructing a vessel, which consists in first bending the planking over a form, then securing the ends of the planking at the stem and stern, and finally passing transverse bands around the structure from the gunwale and adjusting the bands to draw the longitudinal edges of the planking together, the said bands then serving as permanent braces, substantially as set forth.

2. The combination, with the planking or frame of a vessel, of outer transverse adjustable braces secured at their ends to the gunwale, whereby the longitudinal edges of the planking may be drawn together by adjusting said bands, substantially as set forth.

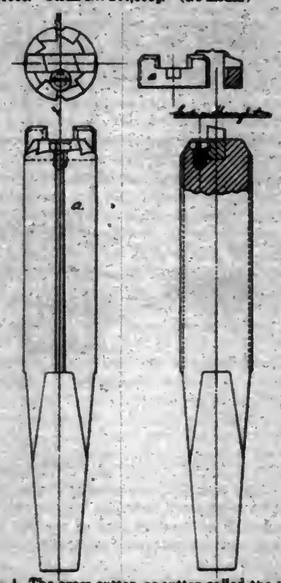
3. The combination, with a vessel, of outer transverse braces passed around the hull and having threaded ends extending up through the gunwale, and nuts thereon for drawing the edges of the planking together, substantially as set forth.

4. The combination, with a vessel and the angle-irons B, secured to the gunwale thereof, and having vertical apertures, of the outer braces passed around the hull and having their ends formed or provided with bolts extending through the vertical apertures in the angle-plates, and tightening-nuts on the threaded ends of the bolts, by tightening which the longitudinal edges of the planking may be drawn together, substantially as set forth.

5. The combination, with a vessel having outer transverse grooves therein, of the adjustable braces extending through or within said grooves and secured at their ends to the gunwale, substantially as set forth.

6. The combination, with a vessel having removable outer clamping-bands, of a keel having straps or securing devices connected with said clamping-bands, whereby the bands and keel may be removed together for repair, substantially as set forth.

395,459. BORING-TOOL. JOHN BEHRLE, Jersey City, N. J. Filed June 19, 1888. Serial No. 277,000. (No model.)



Claim.—1. The cross-cutter, or cutter called the "advance cutter," in combination with the rose-bit, for the purpose herein described in this specification.

2. The cross-cutter B in connection with the screw C, in combination with the rose-bit A.

395,460. OIL-FEED FOR LAMPS. CHRISTIAN GERBOLD, Salinas, Cal. Filed Mar. 30, 1888. Serial No. 268,974. (No model.)

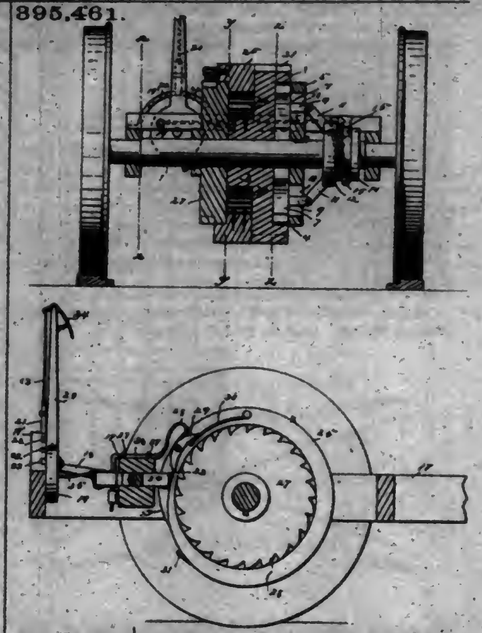


Claim.—1. The combination, with the lamp body or vessel A, having an inlet in its bottom, of the float D within the body, a depending tube, *d*, extending down through the said inlet, and having an opening, *g*, through one side and a cup on its lower closed end, substantially as set forth.

2. The combination, with a lamp-body, A, having a depending tube, *b*, of a float, D, within the body, a pipe, *d*, closed at its lower end, suspended from the float, passing down through the tube *b*, and provided in its side with an opening, *g*, said opening being below the lower end of the tube *b* when the float is lowered, substantially as set forth.

395,461. CAR BRAKE AND STARTER. JOHN R. SWAIM, Hoosburg, Ind. Filed Sept. 5, 1888. Serial No. 284,612. (No model.)

Claim.—1. A car starter and brake consisting of a toothed disk mounted on a car-axle, a pawl on the car-frame engaging the toothed



disk, a second toothed disk mounted on the car-axle, a ring loosely mounted on the second toothed disk, located between the toothed disks and having a spring-actuated pawl adapted to engage the second toothed disk, a coiled spring located within the ring and having one end secured thereto and the other to the first toothed disk, a spring-actuated pin and arm on the car-frame adapted to hold the ring from turning in the same direction with first toothed disk, and holding the pawl of the ring out of engagement with second toothed disk, a sleeve movable lengthwise on the car-axle and having sliding friction-blocks adapted to engage the first toothed disk, and a lever mechanism for operating the ring-engaging pin, the pawls of toothed disks and the friction-blocks and their disk on the axle, substantially as shown and described.

2. In a car starter and brake, toothed disks mounted on a car-axle, a loose ring located between the toothed disks and inclosing a coiled spring having one end secured to the ring and the other to one of the toothed disks, a spring-actuated pawl for holding one of the disks from turning in one direction, a spring-actuated pin and sliding arm on the said pin, and a spring-pawl on the ring for holding the latter from turning in the opposite direction to toothed disk connected with the coiled spring, and a lever mechanism for disengaging the ring from the car-frame and engaging it with the second toothed disk, substantially as shown and described.

3. The combination, with disk 1, having teeth 31, and spring-pawl 32, disk 27, with teeth 28, ring 25, loosely mounted on disk 27, and having tooth 33 and spring-pawl 29, and spring 26, connected at one end to ring 25 and at the other to disk 1, of lever 20, with spring-pawl 21, disk 19, cord 35, and sliding spring-pin 34, with bent arm 36, adapted to engage ring 25, and pawl 29, substantially as shown and described.

4. The combination, with disk 1, of disk 5, projecting into disk 1 and having sliding friction-blocks 7, adapted to bear against disk 1, with arms 9, pivoted bars 11, sleeve 12, connected by spline 13 to axle 2 and movable laterally thereon, and having circular groove 14, and forked lever 16, engaging groove 14, connecting-rod 18, and lever 20, with spring-pawl 21, and the disk 19, to which rod 18 is eccentrically pivoted, substantially as shown and described.

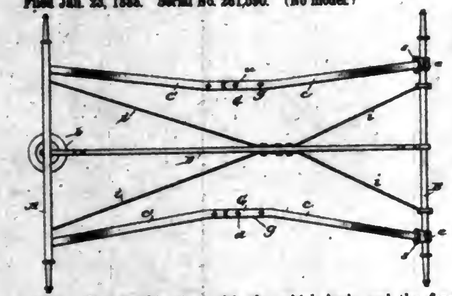
5. The disk 1, with teeth 31 and spring-pawl 32, disk 27, with teeth 28, ring 25, loosely mounted on disk 27 and having tooth 33 and spring-pawl 29, spring 26, connected at one end to ring 25 and at the other to disk 1, disk 5 projecting into disk 1 and having sliding friction-blocks 7, adapted to bear against disk 1 with arms 9, pivoted bars 11, and sleeve 12, movable laterally on axle 2 and having circular groove 14, in combination with lever 20, having spring-lever 24, rod 23, and pawl 21, engaging notches 22 in bar 19', disk 19, cord 35, sliding spring-pin 34, with bent arm 36, rod 18, eccentrically pivoted to disk 19, and forked lever 16, connected at one end to rod 18, and at the other having pins 15, engaging slot 14 in sleeve 12, substantially as shown and described.

395,462. FIGURED FABRIC. THOMAS TAYLOR and JACOB WARBURTON, Bolton, County of Lancaster, England. Filed Dec. 9, 1887. Serial No. 257,414. (Specimens.) Patented in England Dec. 13, 1886, No. 16,284.



Claim.—A figured fabric, of relatively fine and coarse weft and relatively fine and coarse warp threads, having raised figures in fine weaving upon a level ground or surface composed of the coarser-warp threads and finer-weft threads interwoven as calico or plain cloth, in combination with a backing composed of the coarser-weft threads interwoven with the finer or face warp, said coarser-weft threads lying between the face-cloth and the back warp where the figure comes, substantially as herein described and illustrated.

395,468. VEHICLE-SPRING. JAMES F. THOMAS, Alexandria, Nebr. Filed Jan. 23, 1888. Serial No. 261,590. (No model.)



Claim.—The combination, with the vehicle-body and the front and rear axles, of the continuous bowed side springs, G G, bent laterally inward at the middle parts, *g*, and there secured to the vehicle-body or cross-piece thereof, thence diverging in straight lines outward and clipped to the front and rear axles, substantially as set forth.

395,464. MILK-REFRIGERATOR. C. BRADLEY TRAVER, Brooklyn, N. Y. Filed Oct. 1, 1887. Serial No. 251,258. (No model.)



Claim.—1. A refrigerator box or case provided with a lining having ledges, as 5 6, and a lid for closing said case, combined with a false bottom resting upon ledge 5, a removable receptacle passing centrally through said false bottom, and a cover surrounding the mouth of said receptacle and resting upon ledge 6, substantially as set forth.

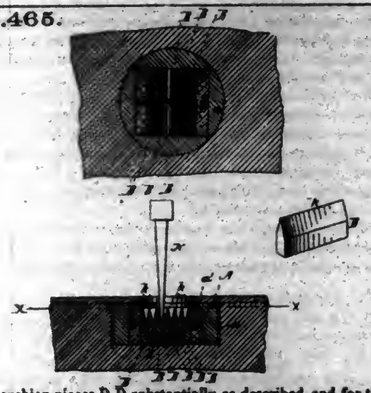
2. A refrigerator box or case provided with a lining having ledges, as 5 6, and a lid for closing said case, combined with a false bottom resting upon ledge 5, a removable receptacle passing centrally through said false bottom and provided with perforations at its top, and a cover surrounding the mouth of said receptacle above the perforations and resting upon ledge 6, substantially as set forth.

3. A refrigerator box or case provided with a lining having ledges, as 5 6, and a lid for closing the box or case provided upon its under surface with felt, and with a handle, as 16, combined with a false bottom resting upon ledge 5, a receptacle passing centrally through said false bottom and perforated at its top, and a cover surrounding the mouth of said receptacle and resting upon ledge 6, substantially as set forth.

395,465. LAST. FRED M. WADE, Campello, Mass. Filed Aug. 31, 1888. Serial No. 284,301. (No model.)

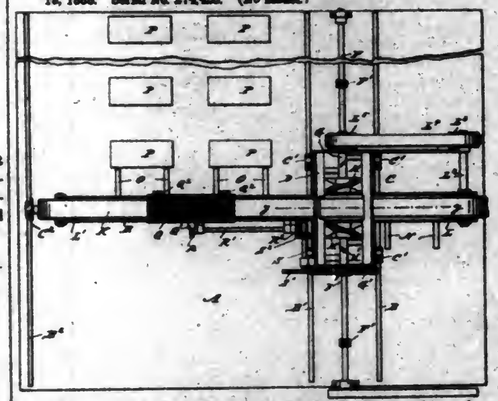
Claim.—In a last or other article in which nails are frequently driven, the combination of the metal case A, having a circular exterior and an interior square chamber, with the knife-edge pieces B and

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elastic cushion-pieces D D, substantially as described, and for the purpose set forth.

395,466. MOLDING AND MOLD-DISTRIBUTING MACHINE. MARTIN W. WALKER and WILLIAM JOWITT, Sing Sing, N. Y. Filed May 19, 1888. Serial No. 274,425. (No model.)



Claim.—1. In a molding and mold-distributing machine, the combination, with a carriage, of an endless belt mounted on the said carriage, and a flask-filling machine held on the said carriage and through which said endless belt passes, substantially as shown and described.

2. In a molding and mold-distributing machine, the combination, with a carriage, of an endless belt mounted on the said carriage and carrying the flasks, a casing held on the said carriage through which said belt passes, and means, substantially as shown and described, for filling the molds while passing through the said casing, as set forth.

3. In a molding and mold-distributing machine, the combination, with a carriage, of an endless belt mounted on the said carriage and carrying flasks, a casing held on the said carriage and containing sand to be filled into the molds, said belt passing through the said casing, a shaft journaled in the said casing, and spiral plates secured to the said shaft to press the sand into the molds on the said belt, substantially as shown and described.

4. In a molding and mold-distributing machine, the combination, with a carriage, of an endless belt mounted on the said carriage, a casing on the said carriage and containing sand to be filled into the flasks, said belt passing through the said casing, a shaft journaled in the said casing, spiral plates secured to the said shaft to press the sand into the molds on the said belt, and arms held on the said shaft to agitate the sand in the said casing, substantially as shown and described.

5. In a molding and mold-distributing machine, the combination, with a carriage, of an endless belt mounted on the said carriage, a casing on the said carriage and containing sand, a box held in the said casing, being open at its ends and provided in its sides with openings, said belt passing through the said box, and means, substantially as described, for filling the flasks while passing through the said box, as set forth.

6. In a molding and mold-distributing machine, the combination, with a carriage, of an endless belt mounted on the said carriage, a casing on the said carriage and containing sand, a box held in the said casing, being open at its ends and provided in its sides with open-

ings, said belt passing through the said box, and means, substantially as described, for filling the flasks while passing through the said box, comprising a shaft journaled in the said casing, and spiral plates secured to the said shaft and abutting at their inner ends on the sides of the said box, to press the sand through the openings in the said box into the flasks, substantially as shown and described.

7. In a molding and mold-distributing machine, the combination, with tracks laid on the foundry-floor, of a carriage on the said tracks, a casing secured on the said carriage, a shaft journaled in the said casing and carrying spiral plates, and an endless belt mounted on the said carriage, passing through said casing and being operated from the said shaft, substantially as shown and described.

8. In a molding and mold-distributing machine, the combination, with tracks laid on the foundry-floor, of a carriage on the said tracks, a casing secured on the said carriage, a shaft journaled in the said casing and carrying spiral plates, an endless belt mounted on the said carriage, passing through said casing and being operated from the said shaft, and a frame held on the said carriage and having guideways which support the said belt, substantially as shown and described.

9. In a molding and mold-distributing machine, the combination, with tracks laid on the foundry-floor, of a carriage on the said tracks, a casing secured on the said carriage, a shaft journaled in the said casing and carrying spiral plates, an endless belt mounted on the said carriage, passing through said casing and being operated from the said shaft, a frame held on the said carriage and having guideways which support the said belt, and a sieve hinged on the upper guideway and discharging into the upper part of the endless belt, so that the sand passes into the casing, substantially as shown and described.

10. In a molding and mold-distributing machine, the combination, with tracks laid on the foundry-floor, of a carriage on the said tracks, a casing secured on the said carriage, a shaft journaled in the said casing and carrying spiral plates, an endless belt mounted on the said carriage, passing through said casing and being operated from the said shaft, a frame on the said carriage and having guideways which support the said belt, a sieve hinged on the upper guideway and discharging into the upper part of the endless belt, so that the sand passes into the casing, and means, substantially as described, for imparting a swinging motion to the said sieve from the shaft in the casing, as set forth.

11. In a molding and mold-distributing machine, tracks held on the foundry-floor, bottom boards located on the foundry-floor, and a shaft having a rotary motion and provided with pinions, in combination with a carriage on the said tracks, a casing mounted on the said carriage, a shaft passing through the said casing and provided with a gear-wheel meshing into one of the said pinions, spiral plates secured on the said shaft in the said casing, a box formed longitudinally in the said casing and provided with open ends and openings in the sides, an endless belt operated from the said shaft in the casing, passing through the said box and supporting the flasks to be filled, a frame held on the said carriage and provided with guideways supporting the said endless belt, and arms projecting from the lower guideway, substantially as shown and described.

12. In a mold and mold-distributing machine, the combination, with a casing containing the sand, of a box open at its ends and held longitudinally in the said casing, the sides of the said box being provided with openings, spiral plates journaled in the said casing and abutting at their inner ends at the sides of the said box, and a belt passing longitudinally through the said box and supporting the flasks to be filled, substantially as shown and described.

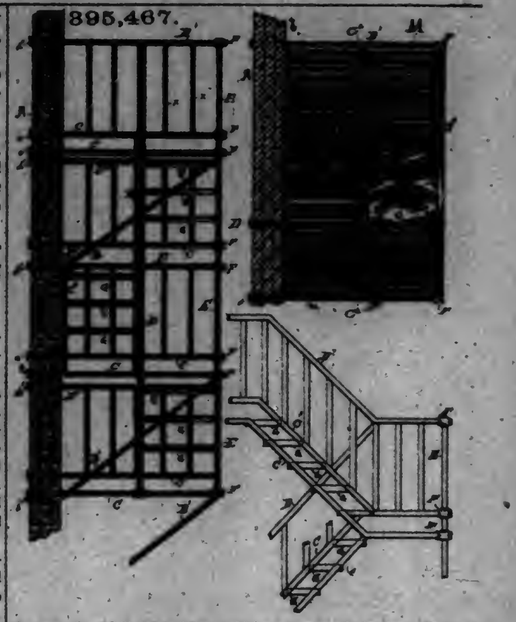
395,467. FIRE-ESCAPE. ALEXANDER WELSH and HAMILTON J. ROGERS, Bennett's Station, Pa. Filed Sept. 14, 1888. Serial No. 285,412. (No model.)

Claim.—1. In a stairway or fire-escape attached to the outside wall of a building, the outer hand-railing, the inner hand-railing, stringers, steps, uprights, and the braces secured to the building and to the uprights, all substantially as described.

2. In a fire-escape, the combination of the inner hand-railing secured to the wall of the building and formed of one continuous piece, and constructed substantially as described, the outer hand-railing composed of three sections, the double sets of stringers, the steps, and platforms, with the uprights and braces secured thereto by means of clamps, all constructed and arranged substantially as and for the purpose described.

3. In a permanent fire-escape attached to the outside wall of a building, the combination of the bars D', secured to the wall A and held therein by means of the nuts *d'*, the bars D^2, curved as described and secured to the rods D' and uprights E E by means of clamps F, the stringers C C, secured in the wall A and held therein by nuts *c*, the stringers C' C', attached to stringers C C and uprights E E by clamps F, and the stringers C^2 C^2 and C^3 C^3, secured to stringers C C, with the steps G, secured on stringers C' C' and C^2 C^2 and on stringers C^2 C^2 and C^3 C^3, uprights E E, braces B and B', clamps F and F', and

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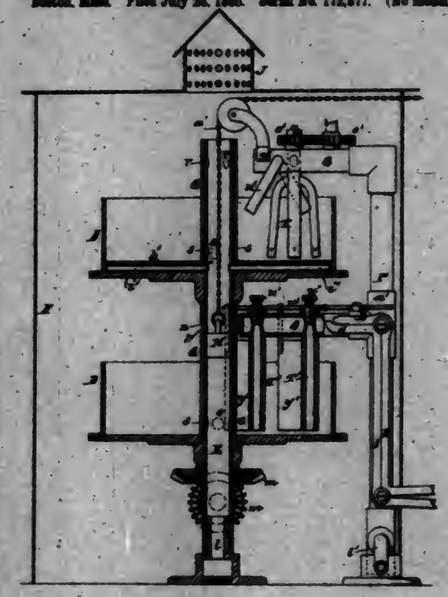
the nuts *b* and *b'*, for holding said braces securely in the wall A, all constructed and arranged substantially in the manner as and for the purpose described.

4. In a stairway or fire-escape, the combination, with the stringers C' C' and C^2 C^2, constructed and arranged as described and attached to stringers C C, of the steps secured thereto as shown, substantially as described.

5. In a fire-escape of the character described, the rod or inner rail, D', secured to the wall A by nut *d* and curved and bent upon itself substantially in the manner described, said rod being formed in one continuous piece, as set forth.

6. In a fire-escape, the combination of the uprights E E, rails D' D^2, the inner hand-rail, D, substantially as described, and the stringers C C C' C' C^2 C^2 C^3 C^3, with the braces B B', clamps F F', and nuts for securing said braces to the wall of the building, all constructed and arranged substantially in the manner as and for the purpose described.

395,468. APPARATUS FOR MAKING MALT. JESSE WHITNEY, Boston, Mass. Filed July 26, 1888. Serial No. 279,677. (No model.)

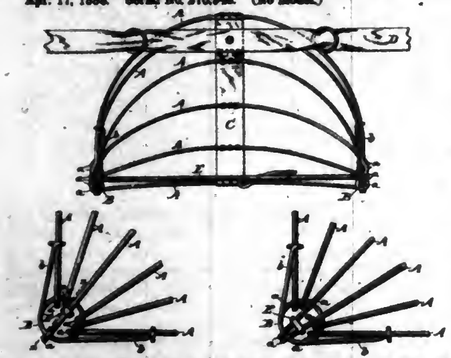


Claim.—1. The combination, in a malting apparatus, of the horizontal pan or pans, the vertical hollow shaft E, to which they are attached, and means for rotating said shaft, which is provided with inlet and outlet apertures *r s*, one or more sleeves, G, provided with lateral apertures *s o*, and the valve H, which is vertically adjustable within said shaft, essentially as and for the purpose specified.

2. The combination, with a horizontal pan in which the grain to be treated is placed and on the vertical hollow shaft to which said pan is attached, and means for rotating the same, said shaft having one or more lateral outlets *s* for the grain from the pan, and an adjustable perforated sleeve or valve controlling said outlet or outlets, of a stirrer within the pan arranged to one side of the vertical axis of the pan and composed of axially-adjustable arms or legs T, provided with side wings or vanes, *y*, essentially as specified.

3. The combination, in a malting apparatus, of a horizontal pan for containing the grain to be treated, a vertical hollow shaft to which the said pan is attached, and means for rotating said shaft, the perforated pipes *i*, attached to and radiating from the latter at the bottom of the pan, and the screen *K*, all substantially as shown and described.

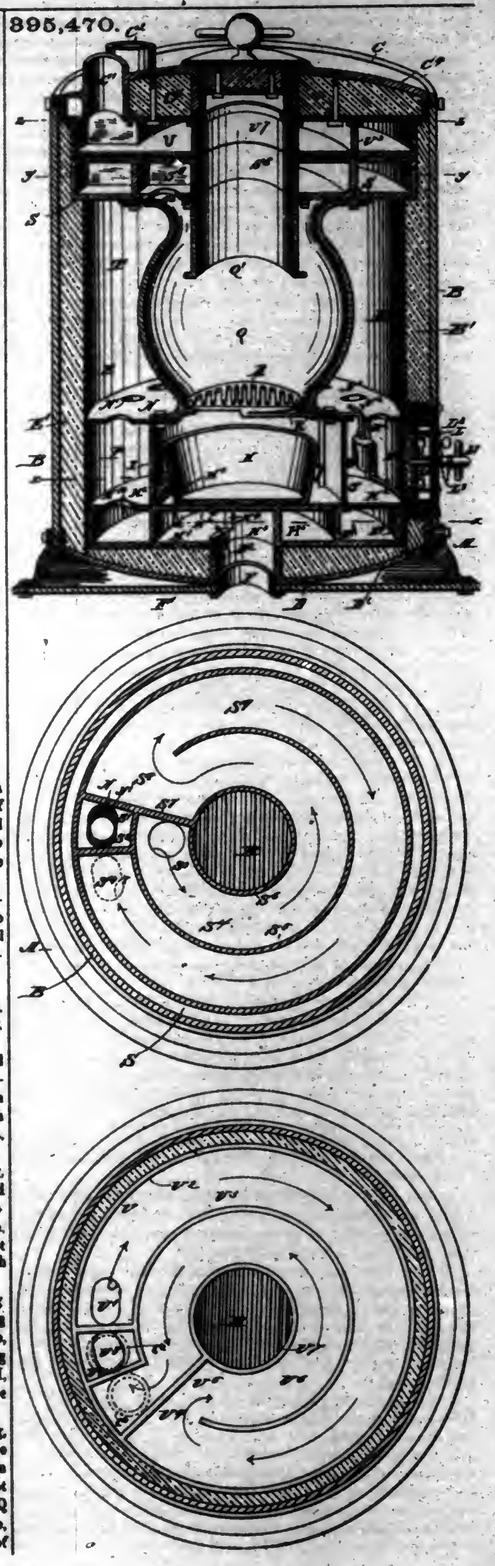
395,469. BUSTLE. HENRY C. WILLIAMS, New Britain, Conn. Filed Apr. 17, 1888. Serial No. 270,942. (No model.)



Claim.—1. The herein-described bustle, consisting, mainly, of a series of bows hinged at each end upon a pivotal eye, and a pair of springs, part of the bows being hinged upon one side of said eyes and a part of the bows extending across said pivotal eyes and hinged to the opposite side of said eyes, substantially as described, and for the purpose specified.

2. In a bustle, the combination of the series of bows and expanding springs, with a pivotal eye at the terminal ends of said bows, to which they are hinged, one of said bows extending across the pivotal eyes, and the cord E, attached to said bow at the center of said pivotal eyes, substantially as described, and for the purpose specified.

395,470. CAR-HEATER. JOHN G. WINFIELD and BENJAMIN H. STRICKLER, Broadway, Va. Filed Mar. 21, 1888. Serial No. 267,922. (No model.)



Claim.—1. In a car-heater, the combination, with a double-lined casing, of a cold-air casing held in the bottom of said first-named casing and provided with air-channels running in opposite directions, a third casing held on the top of the second casing and connected with the same, and doors leading from the said third casing to the ash-pit, substantially as shown and described.

2. In a car-heater, the combination, with a double-lined casing, of a cold-air casing held in the bottom of said first-named casing and provided with air-channels running in opposite directions, a third casing held on the top of the second casing and connected with the same, doors leading from the said third casing to the ash-pit, and a fire-pot resting on top of the said third casing and forming an air-space with the double-lined casing, substantially as shown and described.

3. In a car-heater, the combination, with a double-lined casing of the casing H, held in the bottom of the said double-lined casing and connected in its middle with the outside and leading to a space, P, a segmental partition, I, forming with the said double-lined casing the said space P, the doors J, held on the said segmental partition I, and the door L, registering with the said doors J and formed in the double-lined casing B, substantially as shown and described.

4. In a car-heater, the combination, with a double-lined casing, of the casing H, having channels running in opposite directions, the partition I, resting on top of the said casing H, the doors J, held on the said partition I, the plate N, having the apertures N', the fire-pot Q, resting on the said plate N, the grate R, held in the said fire-pot Q and provided with a shaking-rod, R', extending through an aperture, N², and the door L, held in the said double-lined casing in front of the said doors J and the outer end of the shaking-rod R', substantially as shown and described.

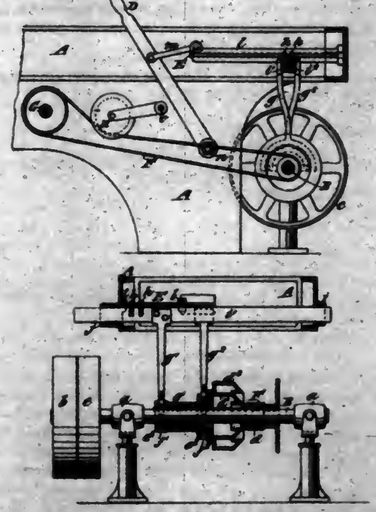
5. In a car-heater, the combination, with an outer casing and a fire-pot supported in the casing and forming with said casing an air-space, of a casing, S, supported upon the fire-pot and provided with chambers communicating with the fire-pot and space surrounding the same, and a second casing, U, supported upon the casing S and provided with chambers communicating with the chambers of the casing S, each of the casings S and U being provided with channels running in opposite directions, substantially as described.

6. In a car-heater, the combination, with an outer casing provided with hot-air and smoke outlets in its top and a fire-pot supported in the casing and forming with the said casing an air-space, of the casing S, supported upon the fire-pot and communicating with the fire-pot and the air-space surrounding the same and provided with channels running in opposite directions, and the casing U, arranged upon the casing S and communicating with the same and with the hot-air and smoke outlets and provided with channels running in opposite directions, substantially as herein shown and described.

7. In a car-heater, the combination, with a double-lined casing, of a fire-pot held in the said casing and forming a space between the said casing and the exterior of the fire-pot, the casing S, held on top of the said fire-pot and provided with channels leading in opposite directions, the casing U, held on top of the said casing S and provided with similar channels, the said casings S and U being provided with registering openings leading to the space formed between the said fire-pot and the double-lined casing, and an air-outlet pipe leading from the said casing U, substantially as shown and described.

8. In a car-heater, the combination, with a double-lined casing, of the fire-pot Q, the casing S, held on top of the said fire-pot Q and provided with channels leading in opposite directions, the casing U, held on top of the said casing S and also provided with channels leading in opposite directions, and central filling-pipes held in the said casings S and U, a threaded central filling-pipe held in the cover of the said double-lined casing, and a cover screwing on the said threaded central filling-pipe, substantially as shown and described.

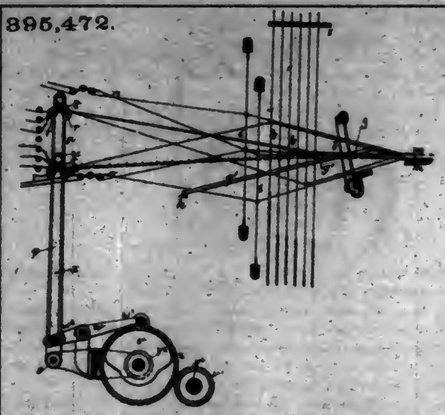
395,471. VARIABLE DRIVING MECHANISM FOR MACHINERY. ERNST F. AUTENRIETH, New York, assignor to the Glen Cove Machine Company, (Limited,) Green Point, Brooklyn, N. Y. Filed July 21, 1888. Serial No. 280,630. (No model.)



Claim.—The combination, with a driving-shaft and a series of pulleys thereon of different diameters sliding one over another and connected together and with the shaft, so as to turn with the shaft, of arms loosely connected with said pulleys, slider-bars to which said arms are rigidly connected near one of their ends, and a plate provided with cam-grooves engaging said slider-bars, adapted when moved to move said slider-bars in opposite directions, said cam-grooves being so constructed that they will lock the slider-bars against longitudinal movement when the latter are shifted to their farthest positions, substantially as specified.

395,472. DOUBLE-PILE-FABRIC LOOM. WILLIAM H. RAINBOW, Kidderminster, County of Worcester, England. Filed Dec. 2, 1886. Serial No. 220,615. (No model.) Patented in England Jan. 14, 1886, No. 610.

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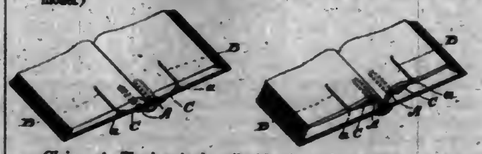


Claim.—1. The combination of the lay and harness of a double-pile-fabric loom, operating mechanism for the harness, and devices for operating the ground-warps, with clamps to retain the pile warps at each operation of the harness to prevent their weights from drawing the cloths together, all substantially as described.

2. The combination of the harness, operating mechanism for the harness, and devices for operating the ground-warps, with the upper shuttle-race, a lay having two shuttles, and clamps to retain the pile-warp threads at each operation of the harness to prevent their weights from drawing the cloths together, all substantially as set forth.

3. The combination of the lay and harness of a double-pile-fabric loom, operating mechanism for the harness, and devices for operating the ground-warps, with upper and lower sets of clamping-bars to retain the pile-warp threads of the upper and lower fabrics at each movement of the harness to prevent the weights of the said warp-threads from drawing the cloths together, and devices, substantially as described, for operating the clamping-bars, all substantially as set forth.

395,473. COMBINED BOOK MARK AND CLIP. JOSEPH D. BARTLEY, Bridgeport, Conn. Filed Aug. 24, 1888. Serial No. 283,467. (No model.)



Claim.—1. The herein-described book mark and clip made from a single piece of spring-wire, having terminal arms adapted to extend across the opposite faces of an open book, and intermediate fingers extending in the same direction with said arms and connected to the latter by cross-wires, substantially as set forth.

2. In a combined book mark and clip, the combination, with the terminal arms and fingers extending in the same direction, of cross-wires connecting said arms and fingers, substantially as shown and set forth.

3. In a combined book mark and clip, the combination of the fingers A, the cross-wires C, deflected at *a*, and the arms B, substantially as set forth.

395,474. MANUFACTURE OF DYE-STUFFS OR COLORING-MATTERS. FRIEDRICH BAYER, Elberfeld, Germany, assignor to Farbenfabriken, vormals Friedr. Bayer & Co., same place. Filed Jan. 17, 1887. Serial No. 224,500. (Specimens.)

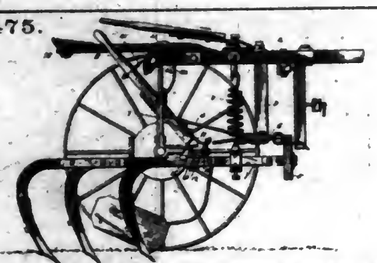
Claim.—The process of producing new red azo colors, which consists in combining a new monosulpho acid of betanaphthylamine, called "betanaphthylaminedeltasulpho acid," with the group of tetrazo compounds of paradiamines, such as tetrazodiphenyl, tetrazoditolyl, tetrazodiphenylether, tetrazostilben, or their sulphonic acids, substantially as described.

395,475. CULTIVATOR. JOSEPH C. BEER, Rising Sun, Md. Filed Oct. 13, 1888. Serial No. 288,051. (No model.)

Claim.—1. The combination, with a pivoted cultivator-beam capable of vertical and lateral movement, of a pivoted hand-lever capable of vertical and lateral movement for shifting the beam, and a lock for holding said hand-lever against lateral deflection when desired.

2. In a cultivator, the combination of a pivoted cultivator beam or beams, a pivoted hand-lever for controlling its lateral movement, a vertical projection on said hand-lever, and a folding arm secured to

395,475.



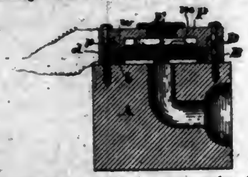
the frame of the machine, adapted to be interposed in the lateral path of the projection, as and for the purpose described.

3. In a cultivator, the combination of a pivoted cultivator-beam, a pivoted hand-lever for controlling its lateral movement, a forked vertical projection on said hand-lever, and a folding arm secured to the frame of the machine and adapted to be thrown into the fork or to either side of the same, as and for the purpose set forth.

4. In a cultivator, the combination of a pivoted cultivator-beam, a pivoted hand-lever for controlling its lateral movement, a vertical projection secured to said hand-lever, and a folding arm secured to the frame of the machine and adapted to be interposed into the lateral path of the projection, the support of said arm being laterally adjustable, as and for the purpose set forth.

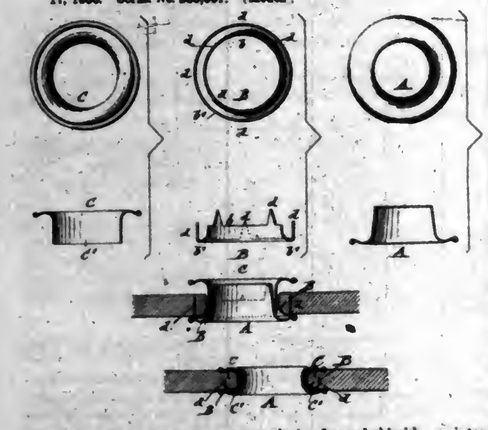
5. In a sulky-cultivator, the combination of a laterally-adjustable clevis, a cultivator-beam pivotally connected thereto, a pivoted hand-lever for controlling the lateral movement of the cultivator-beam, a laterally-adjustable hanger connecting the hand-lever and the cultivator-beam, a vertical projection on the hand-lever, a folding arm adapted to be interposed in the lateral path of said projection, said arm being within reach of the operator from his seat, and a laterally-adjustable support for said arm secured to the frame of the machine.

395,476. SPEAKING-TELEPHONE. FRANCIS BLAKE, Weston, Mass. Filed Aug. 14, 1886. Serial No. 210,576. (No model.)



Claim.—In a telephone employing a granulated conducting material—as the variable-resistance portion of a circuit—a transmitting-diaphragm carrying said granulated material loosely upon its upper surface, of a second electrode of large cross-section buried in said granulated material and mechanically connected with the center of the diaphragm to vibrate with it, the said second electrode having free edges, substantially as described.

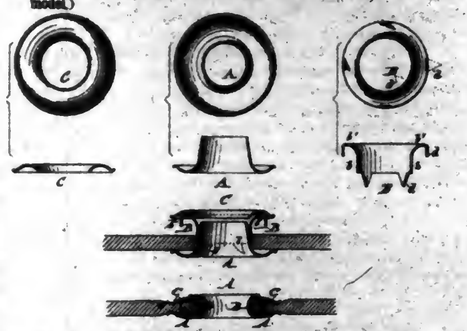
395,477. GROMMET. JOHN BOYLE, Brooklyn, N. Y. Filed Aug 17, 1888. Serial No. 283,001. (Model.)



Claim.—1. A grommet composed of a flanged thimble, an intermediate flanged eyelet provided with teeth or prongs at both edges said prongs alternating with each other, and a washer provided with a tubular shank interposed between the shank of the thimble and the eyelet, the shanks of the thimble and washer being securely clinched over the eyelet, substantially as set forth.

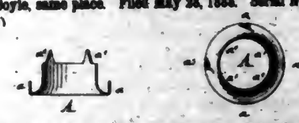
2. A grommet the flanged thimble and washer of which are provided at their outer circumferences with outwardly-bent and rolled-over rims, substantially as set forth.

395,478. GROMMET. ROBERT BLAIR, Brooklyn, N. Y., assignor to John Boyle, same place. Filed May 28, 1888. Serial No. 275,334. (No model.)



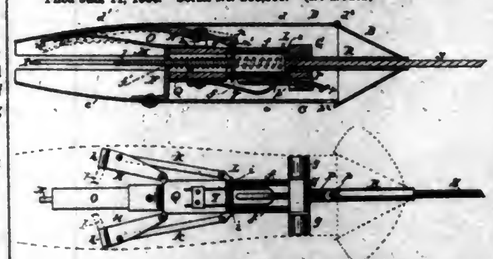
Claim.—A grommet composed of a flanged thimble, an intermediate flanged eyelet provided with teeth or prongs at both edges, said prongs alternating with each other, and a washer extending over the eyelet and secured by the clinched shank of the thimble, substantially as set forth.

395,479. EYELET. ROBERT BLAIR, Brooklyn, N. Y., assignor to John Boyle, same place. Filed May 28, 1888. Serial No. 275,335. (No model.)



Claim.—An eyelet provided at the edge of its flange with bent-up teeth or prongs and at the edge of its shank with teeth or prongs in line therewith, the teeth of the flange alternating with the teeth of the shank, so as to pierce the fabric at intermediate points when the shank is clinched, substantially as set forth.

395,480. FISH-HOOK. WILLIAM F. BREWSTER, East Orange, N. J. Filed Jan. 11, 1888. Serial No. 260,800. (No model.)



Claim.—1. The combination, substantially as set forth, of a yielding inclosing-case, a frame or support within said case, one or more hooks movably mounted in said frame or support, a hook-actuating spring, and a tripping-detent arranged between the hook or hooks and the yielding inclosing-case, whereby the hook or hooks are held within the inclosing-case while drawn through the water, and are thrown out from said case whenever the case is caused to yield by the bite of the fish upon it, and then move and release the tripping-detent.

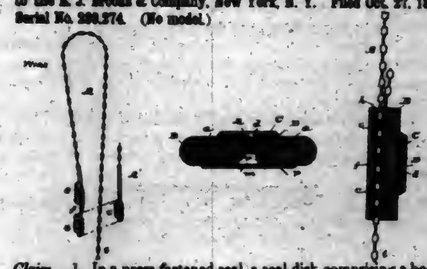
2. The combination, substantially as set forth, of a case or support, one or more hooks movably mounted in said case or support, and a positive locking-detent located within the same, arranged to engage with some movably-mounted portion of the hook-supporting frame, or with the hook or hooks, when the hook or hooks are thrown outwardly from said case or support, whereby, whenever the hook or hooks are thrown outwardly or are being thrown outwardly, the hook or hooks are positively locked in such outward position and positively prevented from being moved inwardly until the locking-detent is unlocked or released.

3. The combination, substantially as set forth, of a yielding inclosing-case, one or more hooks movably mounted in said inclosing-case, a hook-actuating spring, a tripping-detent arranged between the hook or hooks, and the yielding inclosing-case, and a positive locking-detent located within the same, arranged to engage with some movably-mounted portion of the hook-supporting frame, or with the hook or hooks, when the hook or hooks are thrown out of the inclosing-case, whereby the hook or hooks are held within the inclosing-case when being drawn through the water, and are thrown from said case whenever the case is caused to yield by the bite of the fish upon it, and thus move and release the tripping-detent, and the locking-detent is caused to engage with the movably-mounted hook-supporting frame, or with the hook or hooks, and positively lock the hook or hooks against being moved backwardly into the inclosing-case until the locking-detent is unlocked or released.

4. The combination, substantially as set forth, of a case or support, one or more hooks movably mounted in said case or support, and a positive locking-detent located within the same arranged to engage with some movably-mounted portion of the hook-supporting frame, or with the hook or hooks, when the hook or hooks are thrown outwardly, or are being thrown outwardly, from the said case or support, and the said locking-detent being provided with two or more locking points or catches, whereby the hook or hooks, when thrown outwardly from the case or support for a distance less than the entire distance or range the said hook or hooks are capable of being thrown out, will be positively locked against being moved backwardly, but are at the same time free to move outwardly to a still greater distance and be again positively locked against being moved backwardly or inwardly until the locking-detent is unlocked or released.

5. The combination, substantially as set forth, of an inclosing-case provided with a hinged part or lid, a frame or support mounted in said inclosing-case, a pair of hooks, I, movably mounted in said frame or support and provided with the arms H and connecting-bars K, rods *f*, having mounted thereon sliding cross-head L, the tripping-detent N, arranged to engage with the hinged lid of the inclosing-case and sliding cross-head L, and the locking-detent P, arranged to engage with the sliding cross-head L, for the purposes described.

395,481. SEAL. EDWARD J. BROOKS, East Orange, N. J., assignor to the E. J. Brooks & Company, New York, N. Y. Filed Oct. 27, 1888. Serial No. 289,274. (No model.)



Claim.—1. In a press-fastened seal, a seal-disk comprising a body of soft metal, a dish-shaped crystal having its margin provided with holes perpendicular to its face and embedded in the soft metal, and a label bearing distinguishing-marks behind the face of said crystal, substantially as hereinbefore set forth.

2. In a press-fastened seal, a flexible shackle of flat wire having one end provided with a tubular coil or coils in which the wire is disposed flatwise, in combination with a seal-disk having a body of soft metal cast fast upon said coiled end, the other end of the shackle being provided with an anchoring-twist and inclosed at a point or points by said coils, substantially as hereinbefore set forth.

3. In a press-fastened seal, a flexible metallic shackle having one end provided with a pair of tubular coils in one and the same line separated by a fastening-space, in combination with a seal-disk having a body of soft metal cast fast upon said coiled end, the other shackle end extending lengthwise through said coils and securely embedded in the soft metal at said fastening-space, substantially as hereinbefore set forth.

4. The combination, in a press-fastened seal, of a flexible metallic shackle having one end provided with a pair of tubular coils in one and the same line separated by a fastening-space, and a seal-disk cast fast upon this end of the shackle, inclosing also the other shackle end, which extends lengthwise through said coils and is securely embedded in the soft metal at said fastening-space, and having a crystal with a central hole at the face of the disk and a label behind the face of said crystal, substantially as hereinbefore set forth.

5. The combination, in a press-fastened seal, of a flexible metallic shackle having one end provided with a pair of tubular coils in one and the same line separated by a fastening-space, and a seal-disk inclosing said coils, with said space at the center of the disk inclosing also the other shackle end, which extends lengthwise through said coils, and having a crystal with a central hole at the face of the disk and a central recess in its back, substantially as hereinbefore set forth.

395,482. WATER-ELEVATING DEVICE. CHAS. P. BURTON, Brooklyn, N. Y. Filed Feb. 7, 1888. Serial No. 263,293. (No model.)

Brief.—Water is delivered to the hollow axle through two series of convolute coils, one right-handed and the other left-handed with respect to the axis. Either coil is adapted to be put in communication with the hollow axle by means of a sliding internal sleeve, and thus the device will raise water independent of the way the motor is rotated.

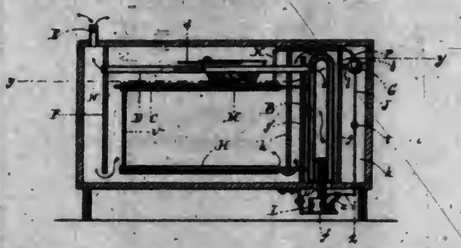


Claim.—1. The combination, in a water-elevating device, of two or more pump-wheels each forming a convolute passage having a receiving-mouth at its periphery and a substantially central discharge, said wheels being connected in reverse positions and having a common center of rotation, and a water-wheel concentric with said wheels and having floats or blades which by dipping into a tideway serve to rotate the wheels and to elevate water through one or the other of them according as the tidal flow is in one or other direction, substantially herein described.

2. The combination, with a central hollow shaft or pipe, of pump-wheels fast thereon, and each forming a convolute passage having a receiving-mouth at the outer end and delivering at the inner end into said shaft or pipe, the wheels being reversed in position on said shaft or pipe, of valves in said shaft or pipe for closing the communication of one or other of said convolute passages therewith, and a water-wheel upon said shaft or pipe having floats or blades which, by dipping into a tideway, impart rotary motion to said pump-wheels in one or other direction, and elevate water through one or other of them according to the direction of the tidal flow, substantially as herein described.

3. The combination, with a hollow shaft, B, of one or more pump-wheels, A, and one or more pump-wheels, A', reversed in position on said shaft relatively to each other, each wheel forming a convolute passage open at its outer end and communicating with the shaft at its inner end, and having its inner convolution closely hugging the shaft, an inner tube, E', adjustable in the shaft and having ports for controlling the communication of the inner ends of said passages with the shaft, and a water-wheel on the shaft having its floats or blades projecting radially beyond the pump-wheels, substantially as herein described.

395,483. INCUBATOR. JOHN F. CARR, Tiverton, R. I. Filed Sept. 8, 1887. Serial No. 249,066. (No model.)

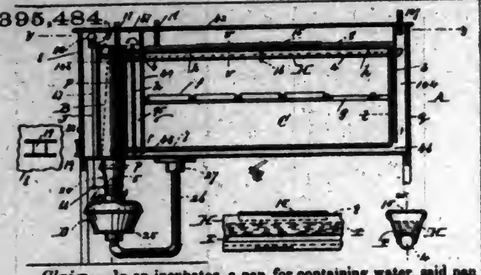


Claim.—1. The combination of an egg-chamber having end walls provided with openings near their lower ends, a hot-air chamber at one end of the egg-chamber, a heating device in the hot-air chamber, and a partition-wall between the wall of the egg-chamber and the heating device, said partition-wall extending nearly to the top of the hot-air chamber.

2. The combination of an egg-chamber, a hot-air chamber, a heating device within the hot-air chamber, and a conduit open at its upper end to communicate with the hot-air chamber, and also open at its lower end to communicate with the egg-chamber, whereby a continuous supply of hot air may be conveyed from the hot-air chamber to the egg-chamber, substantially as and for the purpose set forth.

395,484. INCUBATOR. JOHN F. CARR, Tiverton, R. I. Filed Apr. 3, 1888. Serial No. 269,471. (No model.)

395,484.



Claim.—In an incubator, a pan for containing water, said pan being disposed in the egg-chamber, in combination with a smoke-pipe leading from the boiler through said chamber, a portion of said pipe being removed and the opening thus formed covered or closed by the pan, whereby the smoke and heated air from the lamp are brought into direct contact with the pan on their passage through said pipe, substantially as and for the purpose set forth.

395,485. APPARATUS FOR FRAMING AND SETTING UP VEHICLE-BODIES. THOMAS CLEMENTS and GEORGE H. ROTCH, Rochester, N. Y., assignors to The James Cunningham Son & Company, same place. Filed Aug. 17, 1888. Serial No. 283,090. (No model.)

Claim.—1. The combination of the standard *a*, the cross-head *b*, the vertical screw *d*, the bearings *f f*, the right and left screw *g*, the adjustable rests *h h*, and the swinging arms *k k*, arranged to operate in the manner and for the purpose specified.

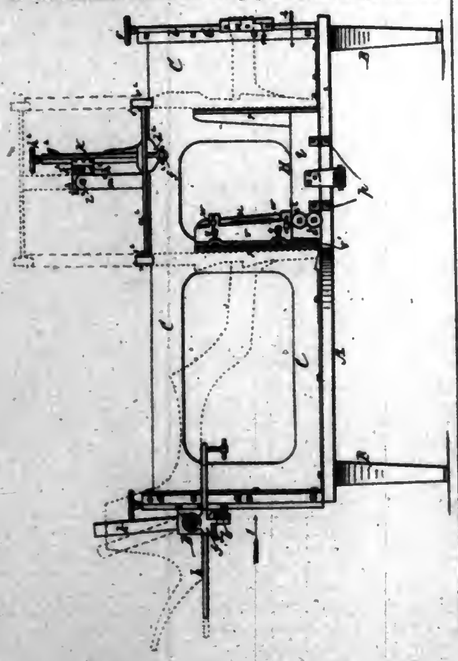
2. The combination, with the bearing *f*, of the arm *k*, pivoted to said bearing and capable of adjustment to different positions forward and back to fit the seat-riser of the rocker, as described.

3. In a machine for framing and setting up the sides of vehicles, the combination, with the bed-plate, of a side gage provided with upright arms for the fitting of the pillars of the rocker thereto, said side gage being hinged and capable of lateral adjustment by turning on its hinges, as and for the purpose set forth.

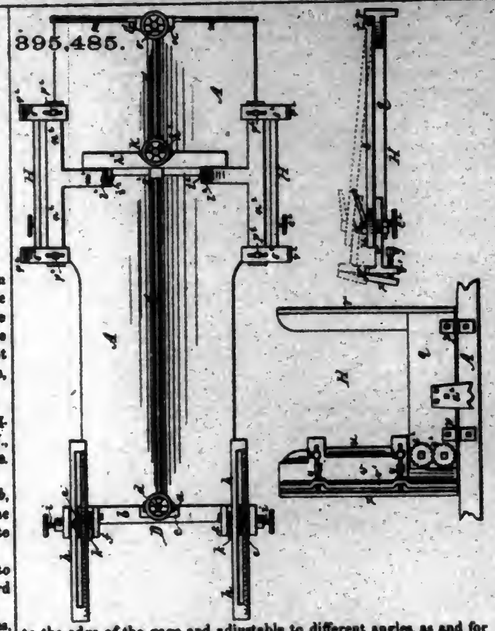
4. In a machine for framing and setting up the sides of vehicles, the combination, with the bed-plate, of a side gage hinged thereto to swing laterally, said gage consisting of two parts each provided with a vertical standard to gage the pillars of the rocker, one of said parts being hinged to the bed-plate, the other to the primary post, so as to swing inward horizontally, as and for the purpose specified.

5. The combination of the frame *q*, provided with the vertical standard *r*, the frame *s*, hinged to frame *q*, to swing inward horizontally, and a plate, *v*, attached to frame *q*, to be adjusted forward and back, as and for the purpose described.

6. The combination, with the side gage, H, of the flange *x*, pivoted



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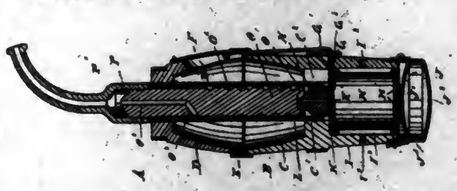
to the edge of the gage and adjustable to different angles, as and for the purpose specified.

7. The combination, with the side gage, of a top gage provided with arms that extend outward and gage the height of the pillars of the rocker, as herein shown and described.

8. The combination, with the side gage, of a top gage provided with arms extending outward and having flanges at the outer ends for gaging the lateral position of the pillars of the rocker, as herein shown and described.

9. The combination, with the slide h^3, of the bearings l^3, the arms m^3, jointed thereto, so as to be reversed in position, the cross-heads n^3, and slides o^3, provided with the flanges r^3, as and for the purpose specified.

395,486. TOBACCO-PIPE. GEORGE F. CHLOUTT, Purcell, Ind. Ter. Filed Mar. 29, 1888. Serial No. 268,789. (No model.)



Claim.—1. A tobacco-pipe provided with a storage-chamber having an opening leading into the bowl thereof and with a valve for closing the said opening, substantially as described.

2. A tobacco-pipe having a storage-chamber surrounding its stem and communicating with the bowl, substantially as described.

3. A tobacco-pipe having a storage-chamber surrounding its stem and communicating with a combustion-chamber at one end of the said storage-chamber, substantially as described.

4. In a tobacco-pipe, the combination, with a barrel for storing tobacco having a combustion-chamber at one end communicating with said barrel, of a slide for opening and closing the opening that establishes communication between the said barrel and combustion-chamber, substantially as described.

5. In a tobacco-pipe, the combination, with a barrel for storing the tobacco and provided in its bottom with an outlet, of a slide adapted to close said outlet and to be operated from the outside, a combustion-receptacle held on the bottom of the said barrel, and a pipe-stem leading from the said combustion-receptacle through the said barrel, substantially as shown and described.

6. In a tobacco-pipe, the combination, with a barrel provided with a side door and serving for the storage of tobacco, and having an outlet at the bottom, of a slide held over said outlet in the bottom of the barrel, a combustion-receptacle held on the bottom of the barrel, a tube held in the barrel and opening on the combustion-receptacle, and a pipe-stem provided with a spiral groove leading to the central opening in the tube, substantially as shown and described.

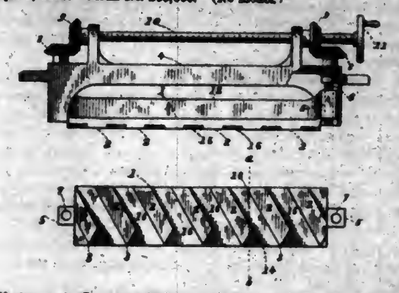
7. In a tobacco-pipe, the combination, with a barrel provided with a side door and serving for the storage of the tobacco and having an outlet in its bottom, of a slide held over the outlet in the bottom of the barrel, a combustion-receptacle held on the bottom of the barrel, a tube held in the barrel and opening on the combustion-receptacle, a pipe-stem provided with a spiral groove leading to the opening in the tube, and a mouth-piece held on the upper end of the said pipe-stem, substantially as shown and described.

8. In a tobacco-pipe, the combination, with a combustion-chamber, of a tube leading to the said chamber, a conical and apertured plug screwing into the tube, a pipe-stem in the tube and having a cone-shaped recess in its lower end, and provided with a spiral groove extending from its lower end to a central opening in its upper end, and a mouth-piece on the upper end of the said tube, substantially as described.

9. In a tobacco-pipe, the combination, with a central tube, of a plug having a central opening leading to the combustion-receptacle of the pipe, said plug having a cone-shaped upper end, a pipe-stem arranged in the tube and having a cone-shaped recess in its lower end and provided with a spiral groove extending from the bottom and leading to a central opening in its upper end, said pipe-stem being cone-shaped at its upper end, and a mouth-piece having a cone-shaped recess secured to the outer end of the said pipe-stem, substantially as shown and described.

10. In a tobacco-pipe, the combination, with a barrel having a recessed extension formed on its lower end and provided with openings in its side, of a combustion-receptacle provided with flanges at the top and bottom and fitted snugly into the recess of the said extension, so that outside air can pass through the said openings of the extension on the rim of the said combustion-receptacle, substantially as shown and described.

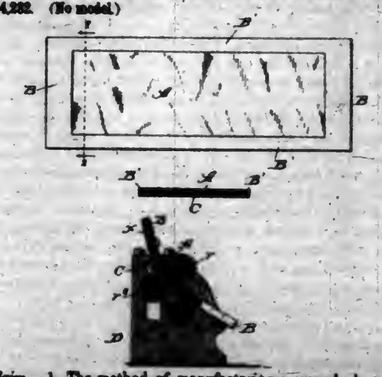
395,487. PRESSURE-PLATE FOR PLANING-MACHINES. FRANCIS H. CRAFTS, Buffalo, N. Y., assignor to R. & R. Holmes, same place. Filed Apr. 5, 1888. Serial No. 269,699. (No model.)



Claim.—1. In a wood-planing machine, a vertically-adjustable pressure-plate having a series of diagonal ribs, 2, and openings 15 between them on its under face, as and for the purposes specified.

2. An adjustable pressure-plate for wood-planing machines provided with a series of diagonal ribs, 2, having pointed ends 3 and open diagonal spaces 15 between them, substantially as and for the purposes described.

395,488. MANUFACTURE OF ELECTROTYPE OR STEREOTYPE PLATES. JAMES DALE, Chicago, Ill. Filed Feb. 16, 1888. Serial No. 264,282. (No model.)



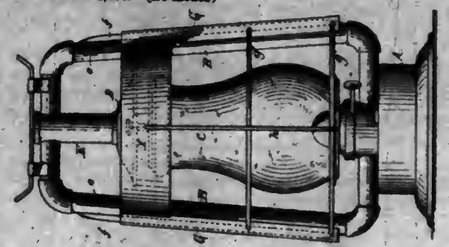
Claim.—1. The method of manufacturing a curved electrotype or stereotype plate, which consists in filling the spaces on the type-face of the flat plate and thus rendering the latter substantially uniform throughout, and then curving the plate, substantially as described.

2. The method of manufacturing a curved electrotype or stereotype plate, which consists in capping its flat type-surface and edges of the plate with a molten metal or the like, then, after the cap has become hard, passing the capped plate between bending-rollers, and finally removing the projecting edges of the cap to release the plate, substantially as described.

3. The method of manufacturing a curved electrotype or stereotype plate, which consists in capping its flat type-surface and edges of the plate with molten metal or the like, and having the article as much or substantially as much longer in the direction of the curve on both sides of the latter as will equal the tangential edges produced by bending it, then passing it between bending-rollers, and finally removing the tangential edges and laterally-projecting edges of the cap and releasing the plate, substantially as described.

4. The method of manufacturing a curved electrotype or stereotype plate, which consists in placing a flat electrotype or stereotype plate of the size required for the form in a suitable pan, pouring upon it molten metal or the like to form a cap, C, extending beyond and over the sides and adhering to the body of the plate, and forming at the opposite ends adhering extensions B, equal or substantially equal in width to the tangential edges to be produced by the bending, then passing the article thus produced between bending-rollers, and finally removing the tangential edges and lateral edges of the cap and releasing the plate, substantially as described.

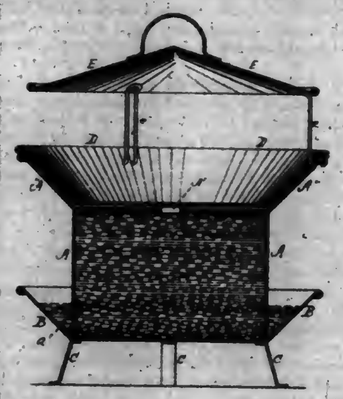
395,489. TUBULAR LANTERN. FREDERICK DIETZ, New York, N. Y., assignor to The R. E. Dietz Company, same place, and the Steam Gauge and Lantern Company, Rochester, N. Y. Filed Feb. 2, 1888. Serial No. 262,703. (No model.)



Claim.—1. The combination, with a tubular lantern, of a removable guard resting on the tubes and surrounding the body of the globe, and provided at its upper end with an annular shield which surrounds and protects the air-passages in the lantern-top, substantially as set forth.

2. The combination, with the channel-shaped uprights G G, adapted to rest on the tubes, of the horizontal guard-wires *g g*, secured to the lower portions of the uprights and connecting the same, and the annular shield I, secured to the upper portions of the uprights, substantially as set forth.

395,490. DEVICE FOR FEEDING AND WATERING POULTRY. MATTHEW FERRIN, Haverhill, Mass. Filed Apr. 16, 1888. Serial No. 270,966. (No model.)



Claim.—In a device for feeding and watering poultry, the combination of the tank A, formed up into pan shape at A', trough B, feed-pan D, canopy E, and detachable standards *c*, supporting said canopy, substantially as and for the purpose set forth.

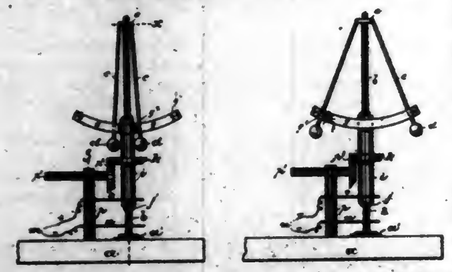
395,491. BREAD-BOARD. CHARLOTTE W. FULLER, Lincoln, Me. Filed July 14, 1888. Serial No. 279,918. (No model.)



Claim.—1. The improved bread-board described, consisting of the kneading-board A, with back B, and ends E E, in combination with the hinged cover C, having front wall, F, secured thereto, and with interior partitions, K L, substantially as and for the purpose set forth.

2. The kneading-board A, free at its front edge and having the ends E E and back B secured vertically along its other edges, in combination with the cover C, having front F and strengthening end pieces, I, and with interior partitions made removable, substantially as and for the purpose set forth.

395,492. REGULATOR. ALFRED GARDNER, Newark, N. J., assignor to Frederick T. Fearey, same place. Filed July 12, 1888. Serial No. 279,703. (No model.)



Claim.—1. In combination, in an electric governor, with the shaft *b* and weighted arms *c c*, and a sleeve, *i*, insulated from said shaft, a bar or bars, *g*, having bearings *g'*, adapted to make an electrical contact with said weighted arms, substantially as and for the purposes set forth.

2. In an electrical governor, the combination, with a revolving shaft and governing-arms adapted to be acted upon by centrifugal force, of contact bearings or points arranged on the path of said governing-arms and connected with a sleeve arranged on said shaft, and conducting-pieces *n o*, arranged in connection with said shaft and sleeve, respectively, substantially as and for the purposes set forth.

3. In an electrical governor, the combination of a revolving shaft having governing-arms adapted to be acted upon by centrifugal force, an insulated sleeve and bars *g'*, having bearings *g'* in electrical connection with said sleeve, a gear-wheel, *k*, arranged in connection with the main shaft of the motor, and springs *o n*, bearing on said sleeve and shaft, respectively, substantially as and for the purposes set forth.

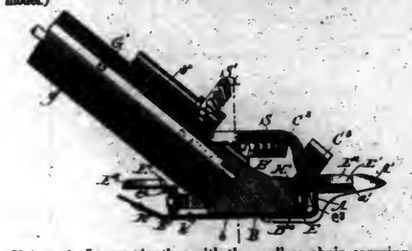
4. In combination, in an electrical governor, revolving shaft, and governing-arms, and insulated sleeve *i*, bars *g g*, providing a way for the said arms and bearings *g' g'*, and electrical conductors connecting with said shaft and said bearings *g'*, respectively, substantially as and for the purposes set forth.

5. In combination with the shaft *b* and governing-arms, bearings *g'*, and conductors connecting with said bearings and shaft, and insulators interposed between said bearings and shaft, substantially as and for the purposes set forth.

6. In combination with the shaft and governing-arms, and bars *g g*, forming a way and providing bearings *g'*, an insulator, *h*, for disconnecting said arms *c* and bars *g*, substantially as and for the purposes set forth.

7. In combination with the rod *b* and means for causing the same to revolve, a cross bar or head, *c*, arms *c*, hinged thereto, an insulated sleeve, bars *g*, bearings *g'*, insulators *h k'*, post *p*, springs *o n*, and wires *m*, all arranged and combined substantially as and for the purposes set forth.

395,493. CUTTING MECHANISM FOR HARVESTERS. PAUL HARMON, St. Paul, Minn. Filed Sept. 24, 1887. Serial No. 250,694. (No model.)



Claim.—1. In combination with the endless chain carrying the grain-cutting knives, the stop-bar B, located between the two plies of the chain and having its rear edge beveled at the upper side, and the conveyer having its front side abutting against the said rear beveled edge of the stop-bar between the two plies of the cutter-chain and extending obliquely backward therefrom, substantially as set forth.

2. In combination with the finger-bar and the forwardly-projecting fingers thereon, the endless chain having its forward ply moving always stubbleward, said chain having knives which project forward and run upon the top of the fingers, said knives having each a cutting-edge at the stubbleward side, and having a flange projecting from their upper surfaces, respectively, and located directly grainward from the vertical plane of the cutting-edge when the knife is traveling stubbleward, substantially as set forth.

3. In combination, substantially as set forth, the angle-iron finger-bar, the stop-bar B, having its rear edge beveled on the upper side, secured to the horizontal lip of the angle-iron at a short distance back from the vertical lip of the angle-iron, the sprocket-wheels located in the horizontal plane of the stop-bar, at the ends thereof, the fingers secured to the finger-bar on the forward side, the chain carried by the sprocket-wheels and traveling around the stop-bar, and carrying knives which project forward over the edge of the vertical lip of the finger-bar, and the conveyer whose forward side abuts against the beveled rear edge of the stop-bar between the two plies of the cutter-chain, and which slopes obliqeely upward and rearward over the rear ply thereof.

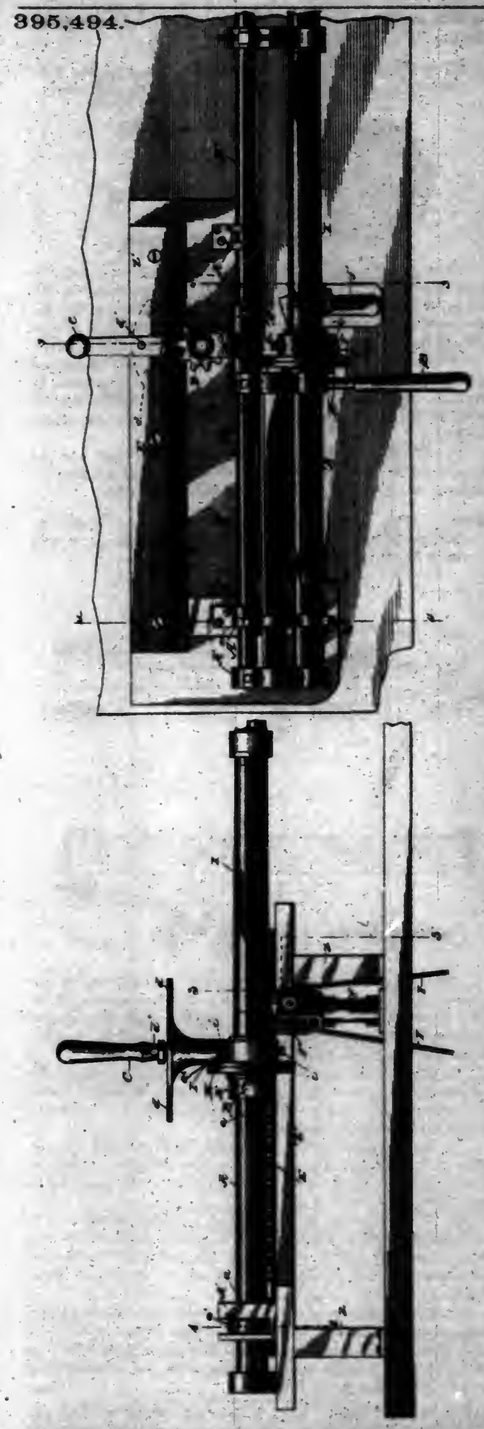
395,494. MACHINE FOR ORNAMENTING BILLIARD-CUE HANDLES, &c. AXEL F. HUBY, Chicago, Ill., assignor to the Brunswick-Balke-Collender Company, same place. Filed Jan. 3, 1888. Serial No. 259,661. (No model.)

Claim.—1. In a machine for ornamenting billiard-cue handles and for other analogous purposes, a shaft having a groove cut thereon, said shaft rotating freely in a frame adapted to move horizontally in guides, and a set-screw fitting adjustably in said groove, in combination with concentric disks, one of said disks secured to said rotatory shaft and adjustably connected to the other of said disks, means in said last-named disk for securing thereto a billiard-cue or other material, and a cutting-tool adapted to engage therewith, all substantially as described.

2. In a machine for ornamenting billiard-cue handles and for other like purposes, the combination of a shaft having a groove thereon, said shaft turning freely in a frame adapted to move horizontally, a set-screw adjustably fitting said groove, whereby the horizontal movement of the frame and shaft will produce rotary movement in said shaft when said set-screw is engaged therewith, a disk secured to said rotatory shaft, a concentric disk adjustably attached to said first-named disk, and with means for securing therein a billiard-cue handle or other analogous material, a cutting-tool adapted to engage with such material, a handle secured to said horizontally-moving frame, and a handle actuating a gear secured in said horizontally-moving frame, intermeshing with an immovable gear-rack, whereby a horizontal movement may be given said frame by either of said handles, all substantially as described, and for the purpose set forth.

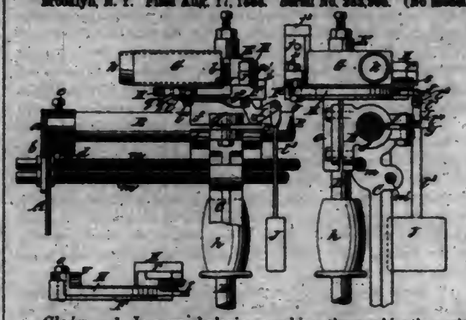
3. In a machine for ornamenting billiard-cue and other handles, the combination of a shaft rotating freely in a horizontally-moving frame, a disk concentric with said shaft, to which a billiard-cue handle or other analogous material may be secured, a cutting-tool adapted to engage with said material, said disk attached to said rotatory shaft

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and rotating therewith, a handle actuating a gear secured in said horizontally-moving frame, said gear intermeshing with an immovable gear-rack, and an immovable disk having holes therein, with which a pin in said handle adjustably engages, whereby the said horizontally-moving frame, together with the material secured to said disk, may be horizontally moved at regular intervals, all substantially as described.

395,495. WOOD-PLANING MACHINE. ALFRED B. HUTCHINSON, Brooklyn, assignor to the Gem Cove Machine Company, Green Point, Brooklyn, N. Y. Filed Aug. 17, 1888. Serial No. 282,962. (No model.)



Claim.—1. In a wood-planing machine, the combination, with the side cutter-head and a fixed head-plate below the said cutter-head, of a chip-breaker pivoted to the under side of said plate, but having its nose above said plate, substantially as herein described.

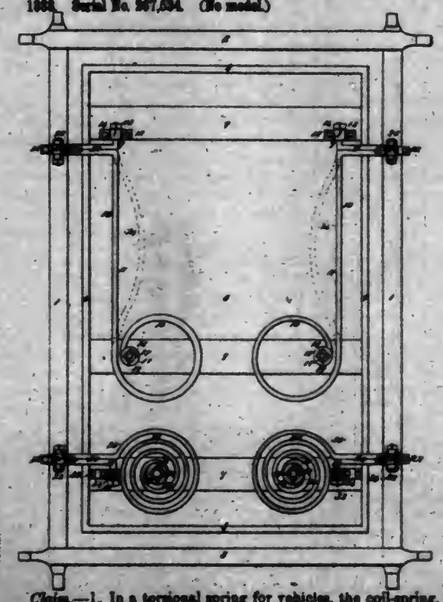
2. In a wood-planing machine, the combination with a side cutter-head and a head-plate below said cutter-head, of a chip-breaker pivoted to said plate and having the greater portion of its length outside of said plate, substantially as and for the purpose herein described.

3. In a wood-planing machine, the combination, with a side cutter-head and a head-plate below said cutter-head, of a chip-breaker pivoted to said plate and having the greater portion of its length below the upper surface of said plate, substantially as and for the purpose herein described.

4. In a wood-planing machine, the combination, with a side cutter-head and a head-plate below said cutter-head, of a chip-breaker pivoted to said plate, having the greater portion of its length below the upper surface of said plate, and having an upward offset, whereby its nose is brought above said plate, substantially as and for the purpose herein described.

5. The combination, with the spindle-frame C, the bearing *c*, and the head-plate F thereon, of a side cutter-spindle, D, fitted to turn in said bearing *c*, the cutter-head E on said spindle, and a chip-breaker lever, H, fulcrumed at one end to the under side of said head-plate F, having the upward offset *s* near to its nose *r*, and having the part between the fulcrum and the offset below and outside of the head-plate F, substantially as specified.

395,496. VEHICLE-SPRING. EDWIN JARRELL, Harper, Kans., assignor of one-half to Harry W. McMinn, same place. Filed Mar. 17, 1888. Serial No. 267,534. (No model.)



Claim.—1. In a torsional spring for vehicles, the coil-spring, the perforated terminal at the inner end of said coil, the spring-bar to

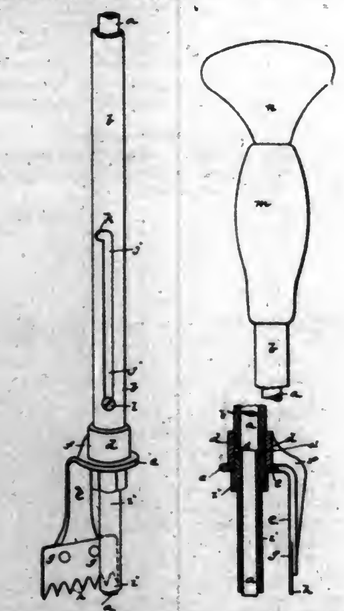
which said terminal is screw-bolted, the crank-arm and its means of attachment to the side bar, the extension spring-bar projecting laterally from said crank-arm, the bearing-spindle and the shackle within which it works arranged when the side sills of the bed press on the crank-arm and are released therefrom for the spindle to turn in its bearings as the spring torsions, and the spring-coil is made to compensate the torsional movement and the consequent expansion and contraction and prevent end movement of the spring, substantially as and for the purpose set forth.

2. In a torsional spring for vehicles, an end coil, a perforated terminal at the inner end of said coil, the spring-bar to which said terminal is screw-bolted, an elongated uncoiled spring-bar integral with said coil, the crank-arm placed at about a right angle from said uncoiled spring-bar, the loop at the end of said crank-arm and clip, and screw-bolt that secures it to the side bar of the vehicle, the extension-bar at about a right angle to said crank-arm, the bearing-spindle, and the shackle within which it has its bearings, substantially as and for the purpose set forth.

3. In a torsional spring for vehicles, the system of torsional springs, with a coil at one end and uncoiled extension at the other, the spring-bars to which said springs are secured, the rotating spindles at one end of said spring and shackles in which they have their bearings, the crank-arms that proceed at about a right angle from the springs, and means for securing them to the side bars, the said springs placed at both longitudinal and transverse position on the vehicle, so as to withstand concussions from any direction, substantially as and for the purpose set forth.

4. In a torsional spring for vehicles, the multiple-coil springs, the perforated center terminals to said coils, the spring bearer-arms 36, to which said terminals are bolted, the spring-bars to which said arms are bolted, the shackle-straps that re-enforce the attachment of said arms to said spring-bars and which are provided with journal-boxes, the spindles that rotate in said boxes when the spring torsions, and the crank-arms attached to said springs that support the side sills of the bed, and means for securing said crank-arms to the side bars, substantially as and for the purpose set forth.

395,497. CARPET-STRETCHER AND TACK-DRIVER. FERDINAND KOEPP and JOHN C. GUETH, Pittsburg, Pa. Filed May 9, 1888. Serial No. 273,273. (No model.)



Claim.—A carpet-stretcher and tack-driver consisting of a tube, *b*, having a slot, *j*, provided with an offset, *k*, a guide-tube, *i*, of less diameter than the tube *b* and arranged in line therewith, a hollow threaded casting, *d*, into opposite ends of which the meeting ends of the tubes *b i* are detachably screwed, having a laterally-bent arm, *c*, arranged at one side of said guide-tube *i* and terminating in a broad toothed head, *g*, and an endwise-movable rod, *a*, fitted in said tubes *b i*, and provided at an intermediate point of its length with a shoulder, *a'*, adapted to strike the tube *i*, and with a guide-pin, *l*, which works in the slot *j*, whereby the two tubes and the casting are united without bolts, and the tacks are guided to the proper position to be driven, substantially as described.

395,498. WOOL-WASHING MACHINE. WILLIAM LORD, Philadelphia, Pa. Filed June 14, 1888. Serial No. 277,072. (No model.)

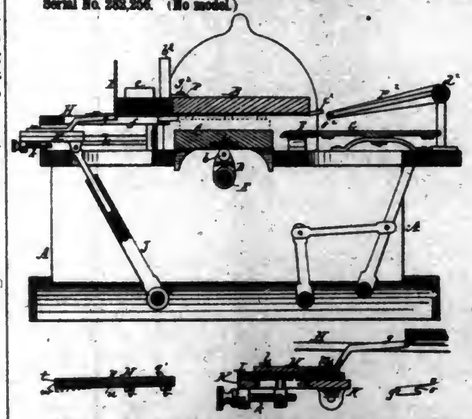


Claim.—1. The combination of the carrier-apron and retainer-apron, bars having teeth projecting from the carrier-apron, rolls for said apron recessed to receive the bars, and cam-slots whereby the bars are retracted and their teeth withdrawn from above the carrier-apron at the delivery end of the latter, all substantially as specified.

2. The combination of the carrier-apron composed of jointed and perforated slats, the bars having teeth adapted to the perforations of said slats, the rolls recessed for receiving said bars, and cam-slots for retracting the bars at the delivery end of the apron, all substantially as specified.

3. The combination of the carrier-apron and its teeth with the open-work retainer-apron engaging with said teeth and preventing the release of the wool therefrom, all substantially as specified.

395,499. MACHINE FOR PRINTING CARDS, &c. SAMUEL MCAULIFFE, Rochester, N. Y. Filed Oct. 19, 1885. Renewed Oct. 11, 1888. Serial No. 288,256. (No model.)



Claim.—1. The feed device consisting of the reciprocating carriage K, slide L, adjustable longitudinally upon the carriage, finger-plate M, attached to and adjustable up and down upon the slide, and the push-fingers *g g*, projecting forward and upward from the plate, substantially as herein specified.

2. The combination of the reciprocating carriage K, horizontally-adjustable slide L, vertically-adjustable finger-plate M, inclined fingers *g g*, adjustable gage I, and vertically-adjustable gage P, substantially as and for the purpose herein specified.

3. The combination of the reciprocating carriage K, slide L, finger-plate M, inclined fingers *g g*, having sharp-edged ends *n n*, and the slotted table or platform H, substantially as and for the purpose herein specified.

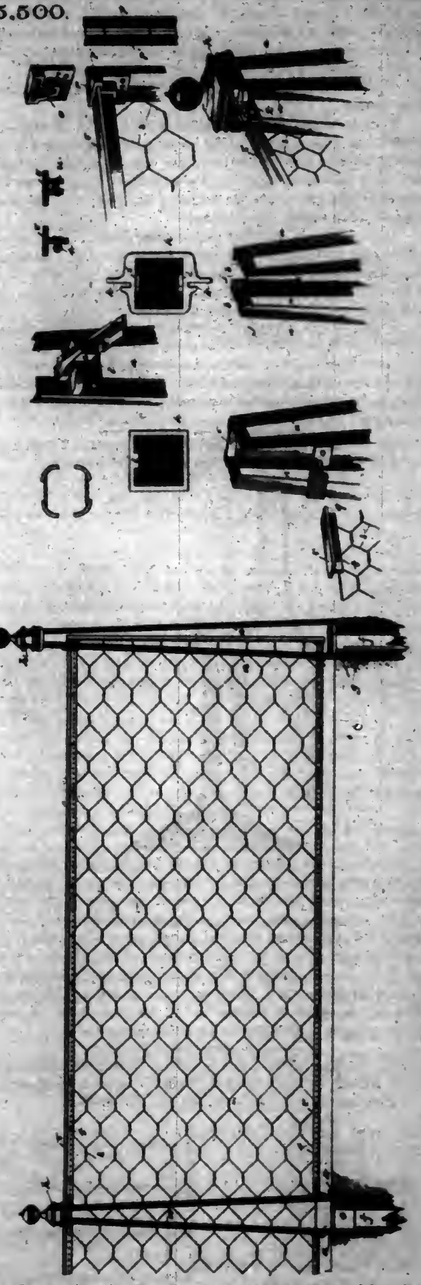
4. The combination of the guides N N, having standards b^9 b^9, and each provided with a groove, *t*, in its inner edge, the spring-strips *w w*, runways c^9 c^9 at the rear ends of the guides, and the delivering bands or tapes p^9 p^9, substantially as and for the purpose herein specified.

5. The combination of the reciprocating feed-carriage K, inclined push-fingers *g g*, actuated by the said carriage, guide I, guides N N, each provided with a groove, *t*, in its inner edge, spring-strips *w w*, and runways c^9 c^9 at the rear ends of the guides N N, substantially as and for the purpose herein specified.

395,500. FENCE. ROBERT B. MCMULLEN, Chicago, Ill. Filed Aug. 8, 1888. Serial No. 282,262. (No model.)

Claim.—1. In a fence, the combination, with a post composed of four bars secured together in pairs, of a removable cap adapted to embrace the upper end of said bars to prevent their separation, and provided with interior shoulders to fit the openings between the bars and prevent their inward movement, substantially as described.

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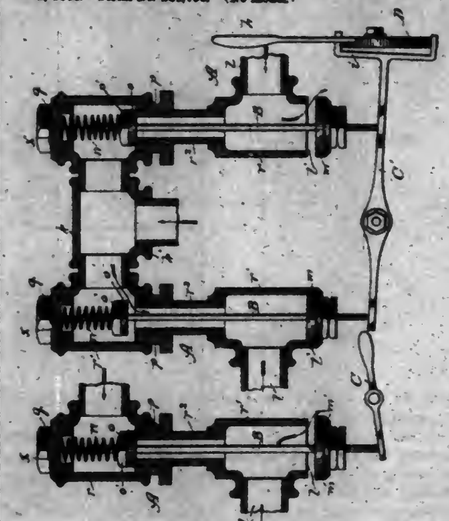
2. The combination, in a fence, of a post composed of four bars arranged in pairs to provide openings through which to pass a continuous fence-body, and a cap adapted to embrace the upper ends of said bars to prevent their separation, said cap provided with flanged bearings to receive the ends of the fence-rails, substantially as described.

3. The combination, in a fence, of a post composed of a plurality of bars disposed to provide an opening through which to pass a continuous fence-body, and said bars spread apart at their lower ends, a cap adapted to confine the upper ends of said bars, and rails joined to said cap and bars respectively, substantially as described.

4. The combination, in a fence, of a post composed of a plurality of bars so disposed as to provide an opening for the passage of the fence-body, a fence-body composed of a woven-wire fabric secured along its side margins to suitable rails, and a clamp for the end of said fabric, said clamp and the end of the fabric being movably supported by the post, whereby to compensate for contraction and expansion of said fabric, substantially as described.

5. The combination, in a fence, of a wire fabric composing the fence-body, suitable rail-carrying posts, rails having attaching-flanges for the fabric, provided with transverse perforations to receive securing-pins, and split pins adapted to embrace the selvage of the fabric, pass through the perforations of the rail, and have their ends separated, whereby to secure the fabric, substantially as described.

395,501. VALVE. MONTGOMERY B. MILLS, Chicago, Ill. Filed Aug. 2, 1888. Serial No. 281,760. (No model.)



Claim.—1. A valve device comprising, in combination, a shell having a chamber at one end provided with an inlet-opening and containing a valve-seat, and a chamber at its opposite end having an outlet-opening, *l*, and a discharge-opening, *l'*, a rod, B, extending from the first-named chamber through and beyond the discharge-opening *l'*, and having a valve, *o*, at one end normally against the said valve-seat, and a valve, *m*, toward its opposite end normally away from its seat and beyond the discharge-opening *l'*, substantially as and for the purpose set forth.

2. A valve device comprising, in combination, two shells, A, each having a section, *r*, provided with an inlet-opening, a section, *r'*, communicating with the section *r* through a reduced passage, r^4, and having a discharge-opening, *l'*, and an outlet-opening, *l*, between the inlet and discharge openings for waste or return fluid, a valve, *o*, normally maintained against its seat in the section *r*, a valve, *m*, normally maintained away from its seat at the discharge-opening *l'*, and a rod, B, connecting the two valves, a pipe, *k*, connecting the sections *r* of the two shells and having an opening, *k'*, and a lever, C, fulcrumed in position to engage with the valves *m* at opposite sides of its fulcrum and provided with a fork, *i*, at one end, and a cam, D, in the fork, substantially as described.

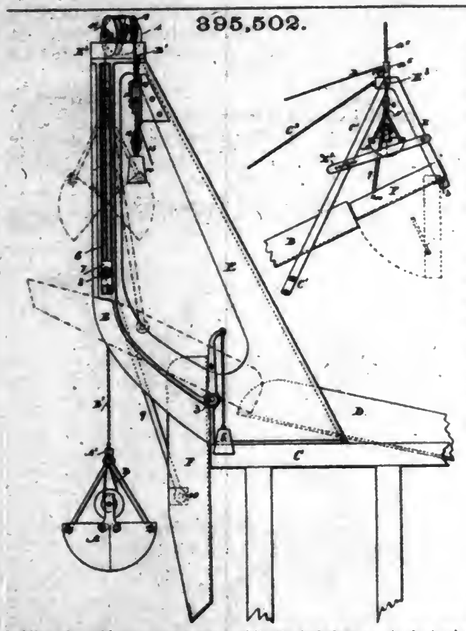
395,502. ELEVATING AND DISCHARGING APPARATUS. CHAS. A. MORSE, Bloomfield, N. J. Filed Aug. 17, 1886. Renewed June 1, 1887. Again renewed July 11, 1888. Serial No. 279,873. (No model.)

Claim.—1. The combination, with an elevating bucket having sections that swing in opening and closing and a rope or chain for hoisting the same, of a swinging chute, a yoke and links for drawing the chute up beneath the bucket, and a second rope or chain whereby the contents of the bucket are discharged into such swinging chute, substantially as specified.

2. The frames E, in combination with the swinging chute F, the cross-shaft for supporting the same, the yoke 8, guided at its ends in the frame E, the links 9, extending from the yoke to the chute, and the hoisting-rope and bucket having sections that swing in opening and closing for elevating the coal or other material, one rope or chain for closing and hoisting the bucket, and means for holding up the cross-head and parts as the rope is lowered to open the bucket, substantially as specified.

3. The combination, with the elevating-bucket and its hoisting-rope, of a second or discharge rope, a pulley over which the same passes, a weight to take up the slack of the rope, and a clamp for

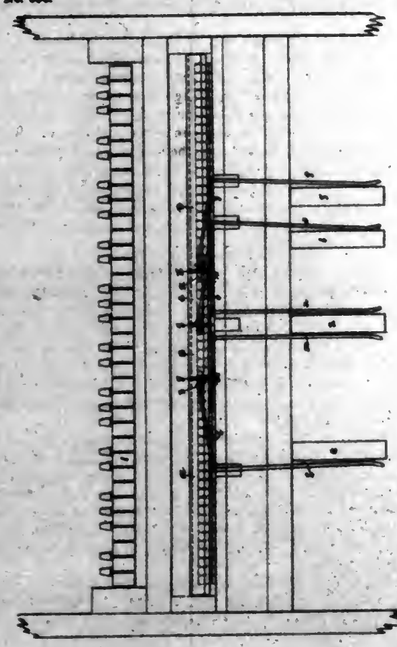
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holding the said rope and bucket while the hoisting-rope is slackened for opening the bucket, substantially as set forth.

4. The combination, with the hoisting-bucket having sections that swing in opening and closing and the rope or chain for the same, of a hoisting-pulley over which the rope or chain passes, a frame for supporting such pulley, a chute pivoted upon the frame, and connecting-links for swinging the chute up beneath the hoisting-bucket, and a weight to partially counterpoise the chute, and a stationary chute for receiving the materials from the swinging chute, and mechanism for sustaining the chute and other parts while the bucket is lowered and the sections swung open, substantially as set forth.

395,503. ORGAN STOP-ACTION. JOHAN P. NYTTRÖM, Carlstad, Sweden. Filed June 27, 1888. Serial No. 278,312. (No model.) Patented in Sweden Aug. 30, 1887, No. 1,556, and in Norway Sept. 16, 1887, No. 600.



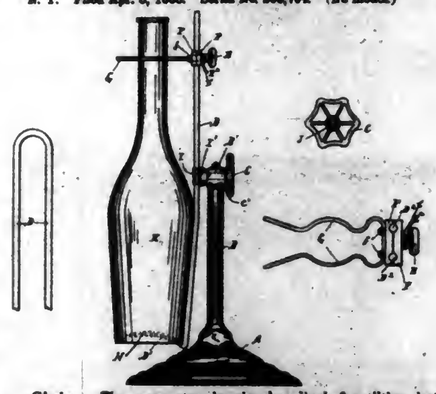
Claim.—1. In an organ, the combination, with a series of organ-reeds in a single row divided into groups, a lid or valve hinged in front of each group, levers for operating the lids or valves, and a forte lid or valve pivoted to the wind-chest extending in front of the entire row of reeds and the hinged lids or valves of the same, substantially as set forth.

2. In an organ, the combination, with a series of organ-reeds divided into groups, a hinged lid or valve in front of each group of reeds, transverse partitions between the ends of the lids or valves, a forte lid or valve extending along the wind-chest in front of the above-mentioned lids, and levers for actuating the lids or valves, substantially as herein shown and described.

3. In an organ, the combination, with a series of organ-reeds divided into groups, of a lid or valve hinged in front of each group, clips secured on the ends of same and extending over upon the ends of the adjacent lids, and angle-levers for operating said lids or valves, substantially as herein shown and described

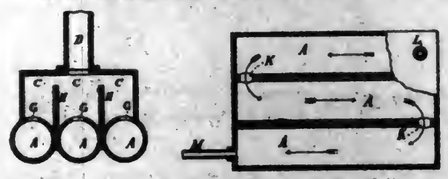
4. In an organ, the combination, with a series of reeds, of a hinged lid or valve in front of the reeds, an angle-lever, the upper end of which is connected with a lid or valve, and a swinging knee-lever at the side of the lower shank of said angle-lever but independent of the same, whereby, by pressing on the knee-lever, the angle-lever is operated, substantially as set forth.

395,504. BOTTLE-TILTING DEVICE. JAMES H. HASCH, Brooklyn N. Y. Filed Apr. 5, 1888. Serial No. 269,764. (No model.)



Claim.—The apparatus herein described for tilting bottles mechanically, consisting of a suitable stand having an upright bearing-column, a rod parallel to the column and bent at the lower end to form horizontal arms whereon the concave bed for holding the bottle rests, and having centrally a rigid yoke, wherefrom a pivotal operating-axis projects, to which a terminal hand-wheel is secured, and provided near the top with a sliding yoke having clamp-arms to encircle the neck of the bottle on one side, and a set-screw on the other side to adjust its position on the bent rod, in the manner and for the purpose herein fully shown and described.

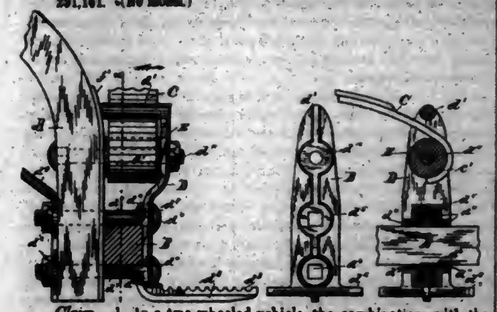
395,505. APPARATUS FOR CONCENTRATING ACIDS. EDMUND C. HATCH, Passaic, assignor to William M. Johnson, Hackensack, N. J. Filed Oct. 25, 1888. Serial No. 289,103. (No model.)



Claim.—1. The cast iron or steel still for concentrating acid, composed of two or more tubes, A, chamber C, and partition H, all cast together, there being an opening between one still and the next and openings at the upper portions of the respective tubes for the passage of the vapors into the chamber C, substantially as set forth.

2. The three still-tubes A, having partitions between them with openings at K, and the chamber C above the openings G in the tubes A, and the partitions H, rising within the chamber C, these parts being of iron or steel and cast in one, and an inlet-pipe, L, at one end of one still-tube, and the outlet-pipe M, for the discharge of the concentrated acid, and a pipe, D, for carrying away the vapors from the still, the same being connected to the top of the chamber C, substantially as set forth.

395,506. TWO-WHEELED VEHICLE. DAVID M. PARRY and THOMAS H. PARRY, Indianapolis, Ind. Filed Nov. 17, 1888. Serial No. 291,161. (No model.)



Claim.—1. In a two-wheeled vehicle, the combination, with the shaft and spring, of a metallic plate secured to the rear side of the shaft, near the lower end, and having a spring-supporting projection at its upper end, substantially as described, and for the purpose set forth.

2. In a two-wheeled vehicle, the plate D, having a spring-supporting portion at its upper end and secured to the rear side of the shaft, near the lower end, the spring C, movably engaging said plate D, and the axle B, secured between the plate and shaft, substantially as described.

3. In a two-wheeled vehicle, the combination, with the shaft A, of a plate, D, having the loosely-mounted friction-roller E at its upper end, the spring C, loosely engaging said roller, and the axle B, secured between the plate D and shaft, substantially as set forth.

4. The combination, with the shaft A, of the plate D, having the forwardly-projecting spring-supporting portion E and guard d' at its upper end and being secured to the rear side of the shaft at its lower end, and the axle B, secured between said plate and shaft approximately in a vertical line with the spring-supporting portion E, substantially as and for the purpose set forth.

5. In a two-wheeled vehicle, the combination, with the shaft A, of a plate, D, having a spring-supporting portion at its upper end, and a step portion, d^3, at its lower end, and the axle B, interposed between the plate D and shaft A, the whole being preferably secured together by bolts, substantially as described.

6. In a two-wheeled vehicle, the plate D, having the friction roller E removably secured near its upper end, and the guard d' and the step portion d^3 at the upper and lower ends of the plate D, as shown, all secured to the rear of the shaft and to the axle, substantially as described.

7. The combination, with the shaft A, of the plate D, having a spring-supporting portion and a guard at its upper end, the washer f', formed a part with or separate from the plate D, the axle B, interposed between the plate D and shaft, and the spring C, having the bent end c', all secured and arranged substantially as shown and described.

8. The plate D, having the spring-support E and guard at its upper end, and the transverse horizontal flanges d^3 at the inner face, the axle B resting between said flanges and the shaft A, all secured and arranged substantially as shown and described.

395,507. FRICTIONAL DRIVING MECHANISM. HENRY PARSONS, Marlborough, Mass. Filed Oct. 5, 1887. Serial No. 251,492. (No model.)

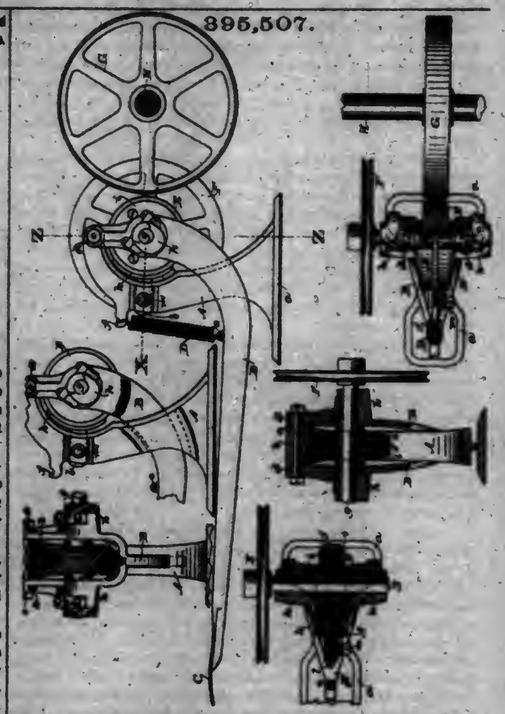
Claim.—1. In a frictional driving mechanism, the combination of a standard formed and adapted to be secured in position, a curved lever pivoted to said standard and provided with a foot-plate by which to actuate it as a treadle, a friction-wheel and band-wheel secured upon an arbor journaled in said lever, so that as the lever is actuated by the operator the friction-wheel will be forced into contact with a transmitting-pulley on another shaft, a brake duly arranged relatively to said friction-wheel, and a spring adapted to raise said lever and force said friction-wheel against said brake when the treadle is released from the foot of the operator.

2. The combination of standard A, upturned lever B, pivoted at its head to said standard, arbor g, journaled in said lever below its pivoted head, the frictional and band wheels secured on said arbor, and a foot-plate, C, on the rear end of said lever, all substantially as specified.

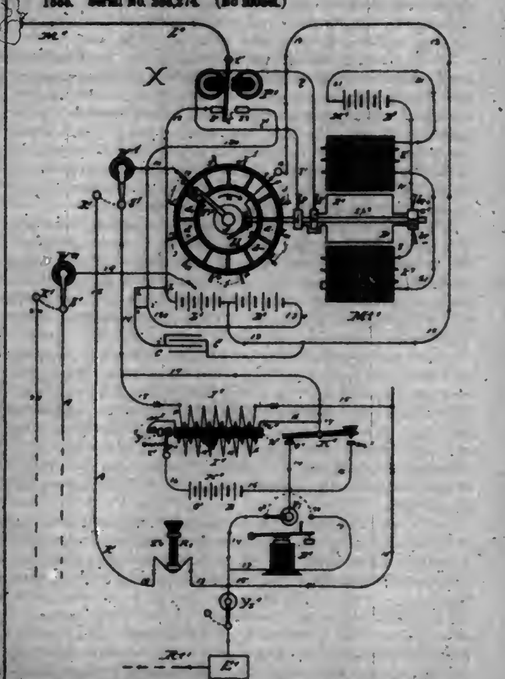
3. The combination of standard A, curved lever B, arbor g, wheels E F, brake k, and spring D, all combined and arranged substantially as specified.

4. In a driving friction mechanism, the combination of a standard, a lever thereto pivoted and adapted to be actuated as a lever, an arbor journaled in said treadle, and band and friction wheels secured on said arbor, all substantially as specified.

395,507.



395,508. MULTIPLEX TELEGRAPHY. FRANCIS J. PATTEN, New York, N. Y., assignor to J. M. Seymour, same place. Filed Oct. 16, 1883. Serial No. 288,274. (No model.)



Claim.—1. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving electric motors located at said stations, current-distributers driven by said motors, local branches successively connected to line by the distributer, a prac-

tically-continuous source of current for establishing synchronism, a source of current of different electro-motive force for signaling, and electric connections between said signaling source and the local distributer-segment, a controlling-key, and receiving-instruments to respond to said signaling-current, whereby the signaling-impulses are thrown upon the line during the continuance of the synchronizing current.

2. In a telegraph system, the combination of a series of synchronously-moving motors located at different stations, a line-circuit connecting the stations carrying a practically-continuous low-tension current for controlling the motors, a series of current-distributers driven by the motors, local branch circuits successively connected to line by the distributers, an induction-generator for throwing high-tension currents on line, and electric connections between the induced circuit of said generator and the local distributer-segment, a controlling-key, and receiving-instruments at the several stations to respond to the high-tension currents.

3. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving electric motors located at said stations, controlled by a low-tension current on said circuit, distributers driven by said motors, local branches successively connected to line by the distributers, a switch for connecting each branch through a low-tension or a high-tension receiving-instrument, being normally on the low-tension branch, and a transmitting-instrument at each station for throwing high-tension current through the distributer and line into a desired local branch, whereby any desired local may be first called and then communicated with.

4. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving electric motors located at said stations, current-distributers driven by said motors, local branches successively connected to line by the distributers, a practically-continuous source of low-tension current for establishing synchronism, a calling-instrument in normally-closed relation to each branch, an induction-generator, electric connections between said generator and the local distributer-segment, a controlling-key, and a receiving-instrument at each station to respond to said high-tension current.

5. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving distributing apparatus at each station, a source of low-tension current for controlling the same, local branches successively connected to line by said distributing apparatus, an induction-coil at each station having its fine wire in shunt relation to the local branch, a receiving-instrument in each branch adapted to respond to the induced current, and a key for throwing current through the primary of the induction-coil and simultaneously rupturing the low-resistance branch of the shunt.

6. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving distributing apparatus at each station, a source of low-tension current for controlling the same, local branches successively connected to line by said distributing apparatus, an induction-coil at each station having its high-tension coil in shunt relation to the local branch, a vibrator for said induction-coil, a key for throwing current through the low-resistance coil of the induction-coil and to line, and a receiving-instrument in each branch adapted to respond to the induced currents.

7. A synchronizing system for multiplex telegraphy, consisting of a line-circuit connecting different stations, a current-changer in said line, controlled electric motors at the different stations having independent field-magnet and armature circuits, the polarity of one being constant and that of the other being reversed in accordance with the changes in the line-current, and a current-distributer driven by the moving part of each motor.

8. A synchronizing system for multiplex telegraphy, consisting of a line-circuit connecting different stations, a current-changer for reversing current in said line, a relay at each station actuated by the line-current, a local circuit periodically reversed by the armature of said relay, an electric motor having independent field-magnet and armature circuits, one of which is included in the circuit reversed by the armature of the relay, the other of which is excited by a current of one direction, and a current-distributer driven by the moving part of said motor.

9. A synchronizing system for multiplex telegraphy, consisting of a line-circuit connecting different stations, a controlling electric motor at one station, a series of controlled electric motors at the other stations, a pole-changer for the line-current operated by the controlling-motor, a relay at each station actuated by the reversals of the line-current, a local circuit periodically reversed by the armature of said relay, an electric motor having independent field-magnet and armature circuits, the field-magnet coils being included in the circuit reversed by the relay-armature, the armature-coils being excited by a current of one direction, and a current-distributer driven by said motor.

10. A synchronizing system for multiplex telegraphy, consisting of a line-circuit including polarized relays at different stations, a pole-changer for reversing current in the line, the armature of each relay playing between contact-points, a split battery having its two poles connected to the said contact-points, a motor having independent field-magnet and amature circuits, one of which circuits is connected to the relay-armature and the middle point of the battery, the other of which circuits is excited by a direct current, and a current-distributor driven by said motor.

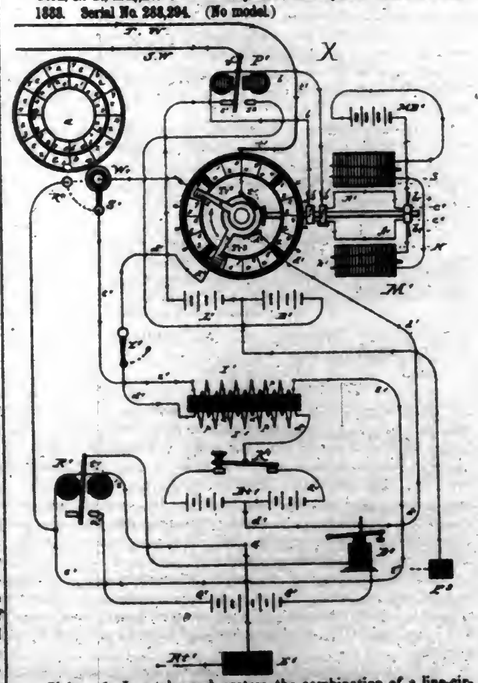
11. A telegraph system comprising a main line connecting different stations, a current-controller for the line-currents periodically changing said currents, an electric motor at each station having independent field-magnet and armature circuits, a current-reverser operated by the line-currents for reversing current in one of said independent circuits, the other independent circuit being excited by a direct current, current-distributers at the several stations driven by the motors in a branch between the main line and return, and telegraphic transmitting and receiving instruments in each branch.

12. A system of multiplex telegraphy comprising synchronously-moving electric motors at different main stations, a line connecting said main stations and controlling the motors, a segmental distributer connected to line at each station driven by the motor, a series of return branches from the segments of the distributer passing through the several local stations, an inducing-generator for each branch having its induced circuit electrically connected with a local segment, and a key controlling the induced circuit, and a receiving-instrument at each local adapted to respond to the high-tension current.

13. A system of multiplex telegraphy comprising a main line connecting different stations, electric motors at the stations synchronously controlled by the main-line current, return branches at the stations including distributers driven by the motor, a low-tension receiver normally in the branch, an induction-generator and transmitting-key for throwing high-tension currents into the distributer and line, a high-tension receiver at each station adapted to respond to said high-tension current, and a rheostat in each branch.

14. A synchronizing system for multiplex telegraphy, consisting of a line-circuit connecting the different stations, electric motors at the different stations having independent field-magnet and armature circuits, the polarity of one being constant and having its poles ninety degrees apart, a current-changer in the line-circuit for reversing the polarity of the other independent circuit, and a current-distributer driven by the moving part of the motor.

395,509. MULTIPLEX TELEGRAPHY. FRANCIS J. PATTEN, New York, N. Y., assignor to J. M. Seymour, same place. Filed Oct. 17, 1888. Serial No. 288,294. (No model.)



Claim.—1. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving current-distributers at the respective stations, local branches successively connected to line by said distributers, a source of induced current, electric connections between the line and the induced circuit of said source, a circuit-closer in the inducing-circuit of said source, contacts engaged by said circuit-closer simultaneously with the connection of a branch to line, and receiving-instruments adapted to respond to the induced currents.

2. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving circuit-distributers at the respective stations, local branches successively connected to line by said distributers, an induction-generator, the induced circuit of the generator being connected to line when a local branch is closed, and a rotating circuit-closer driven by the same synchronizing device for simultaneously varying the current in the inducing-circuit of said generator.

3. In a telegraph system, the combination of a line-circuit connecting different stations, synchronously-moving current-distributers at the respective stations, local branches successively connected to line by said distributers, signal transmitting and receiving instruments in operative relation to the local branches, an induction-coil having its high-resistance circuit connected to line when the local branch is closed, and a rotating circuit-closer driven by the same synchronizing device for simultaneously varying the current in its low-resistance circuit.

4. In a system of telegraphy, the combination of a line-circuit connecting different stations, an induction-generator, synchronously-moving current-distributers at the respective stations, and electrical connections from the distributer-segments to the inducing and induced circuits of said generator, each distributer simultaneously closing the two circuits pertaining to each local branch, the induced circuit being periodically connected to line and the inducing-circuit to a controlling-key by said distributer.

5. In a telegraph system, the combination of a line-circuit connecting different stations, an induction-generator, a synchronously-moving current-distributer having its trailer in both the inducing and the induced circuits of the generator, and contacts in the path of said trailer corresponding to the inducing and the induced circuits of the generator, the trailers simultaneously bearing on said contacts, whereby the inducing-circuit is varied and the induced circuit connected to line simultaneously.

6. In a system of multiplex telegraphy, the combination of a series of synchronously-moving current-distributers located at different stations, a controlling line-circuit for said distributers, an independent signaling line-circuit, local branch circuits successively connected to the signaling-circuit, an induction-generator having its induced circuit in operative relation to line, its inducing-circuit including a key, revolving circuit-closer, and a source of energy, and a receiving-instrument to respond to the induced current.

7. In a system of multiplex telegraphy, the combination of a series of synchronously-moving current-distributers located at different stations, a controlling line-circuit for said distributers, local branch circuits at the stations successively connected by said distributers, a source of high-tension current electrically connected through a key with the local distributer-segment, a polarized relay at each station to respond to the high-tension currents, and a sounder controlled by said relay.

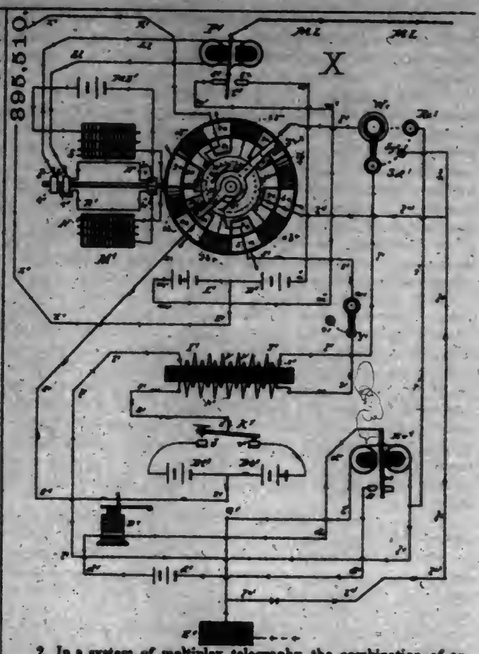
8. In a system of multiplex telegraphy, the combination of a line-circuit connecting different stations, synchronously-moving current-distributers at the respective stations, local branches successively connected to line by said distributers, an induction-generator, a pole-changing key controlling said generator and normally throwing a current of one polarity to line, and polarized receiving-instruments in the local branches at the stations adapted to respond to a current of the other polarity.

9. A current-distributing apparatus for a multiplex telegraph system, comprising a series of insulated contact-segments and a trailing arm successively engaging said segments, said trailing arm being in two circuits, one from a local branch through its insulated segment to line and the other including the primary of an induction-coil and a controlling-key, the secondary of the induction-coil being connected with the line through a switch, as and for the purpose set forth.

395,510. MULTIPLEX TELEGRAPHY. FRANCIS J. PATTEN, New York, N. Y., assignor to J. M. Seymour, same place. Filed Oct. 24, 1888. Serial No. 289,026. (No model.)

Claim.—1. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving electric motors at the stations controlled by a practically continuous current on said line-wire, current-distributers driven by said motors, the segmental contacts of said distributers being all in the synchronizing-circuit, a source of synchronizing-current, direct return branches at the stations connected to insulated contacts at the distributer, local branches at the several stations successively connected with the line-wire and return by said distributers, a source of signaling-current of different electro-motive force from the synchronizing-current, transmitting-instruments for throwing the signaling-current on line, and receiving-instruments to respond to the signaling-current.

395,510



2. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving electric motors at the stations controlled by a practically continuous current on said line-wire, current-distributers driven by said motors, the segmental contacts of said distributers being all in the synchronizing-circuit, a source of synchronizing-current, direct return branches at the stations for said current controlled by the distributers, local branches at the several stations successively connected with the line-wire and return by said distributers, a source of signaling-current of different electro-motive force from the synchronizing-current, transmitting-instruments for throwing the signaling-current on line, and receiving-instruments to respond to the signaling-current.

3. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving electric motors at the stations controlled by a practically continuous current on said line-wire, current-distributers driven by said motors, the segmental contacts of said distributers being all in the synchronizing-circuit, a source of synchronizing-current, direct return branches at the stations connected to insulated contacts at the distributer, local branches at the several stations connected to independent contacts at the distributer, transmitting and receiving apparatus at the local stations, and a switch for connecting either with the local branch.

4. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving electric motors at the stations controlled by the current on said line-wire, current-distributers driven by said motors, a source of synchronizing-current, direct return branches for said current at the station connected to insulated contacts at the distributer, local branches at the several stations connected to independent contacts at the distributer, and a switch in each local branch provided with three contacts controlling receiving apparatus, sending apparatus, and a direct connection with the return-circuit, respectively.

5. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving current-distributers at the several stations, the segmental contacts of said distributers being all in the synchronizing-circuit, a source of synchronizing-current at one station, low-resistance return branches at the stations connected to insulated contacts at the distributers, independent signaling-contacts at the distributer, and a switch for connecting the signaling-contacts with transmitting and receiving apparatus.

6. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving current-distributers at the several stations, the segmental contacts of said distributers being all in the synchronizing-circuit, a source of synchronizing-current for controlling said distributers, low-resistance return branches at the stations connected to insulated contacts at the distributers, independent contacts at the distributers connected with local stations, a source of signaling-current of different tension from

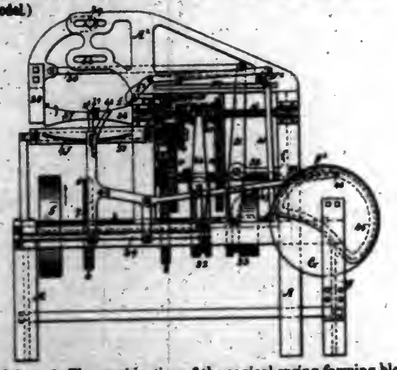
the synchronizing-current, transmitting devices at the local stations for throwing said signaling-current on line when desired, and receiving-instruments at the local stations adapted to respond to the signaling-current.

7. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving current-distributers at the several stations, a source of practically continuous synchronizing-current for controlling said distributers, low-resistance return branches at the stations connected to insulated distributer-contacts, independent signaling-contacts connected to local branches, and induction-generator for developing the signaling-current, the induced circuit of the generator being connected to the line-circuit through the signaling-contact, a key in the inducing-circuit of the generator, and means for varying the current in the inducing-circuit of said generator when the station-signaling contact is engaged.

8. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, synchronously-moving current-distributers at the several stations, a source of synchronizing-current for controlling said distributers, low-resistance return branches at the stations connected to insulated distributer-contacts, independent signaling-contacts connected to local branches, a constantly-driven dynamo-electric generator for developing the signaling-current, said generator having independent field-magnet and armature-circuits, connections between the induced circuit of the generator and the station-signaling contact, a key in the inducing-circuit, and means for varying the current in the inducing-circuit when a signaling-contact is engaged.

9. In a system of multiplex telegraphy, the combination of an insulated line-wire connecting different stations, segmental signaling-contacts connected to local branches, a trailer progressively engaging said contacts, synchronizing-contacts having a low-resistance return engaged by the trailer-arm, all of said contacts being in the synchronizing-circuit, an induction-generator having contacts in its inducing-circuit engaged by a distributer simultaneously with the signaling-contacts, a key and source of energy in said inducing-circuit, and a switch for connecting the induced circuit of said generator to line.

395,511. SPRING-COILING MACHINE. LEE J. PENNOCK, Jamestown, N. Y., assignor of two-thirds to Addison A. Taylor and Jesse W. Rice, both of same place. Filed June 8, 1888. Serial No. 276,454. (No model.)



Claim.—1. The combination of the conical-spring-forming blocks, the wire-carriage, its operating-cam, connecting-rod 47, link g^6, and disk G, substantially as and for the purpose set forth.

2. The combination of the conical-spring-forming blocks and their shaft 16, the gear 1, having perforations in its side, and clutch 25, having spring clutch-pins, with the pinions 12 and 13 upon a stud, the gear 11 and pinion 9 upon one shaft, and the gear 8 upon the counter-shaft 3, with the clutch-lever 23 and cam 22, whereby the coiling of the spring is started, substantially as described.

3. The combination of the conical-spring-forming blocks and their shaft 16, the gear 2, having recesses in its side, and clutch 25, having spring clutch-pins, with the pinions 19 20, and gear 18, whereby a back motion is given to the forming-blocks, substantially as described.

4. The combination of the spring-forming blocks with the cutters $f f^3$, the horizontal rod F, bell-crank F^2, the vertical rod 41, pivoted lever 42, and revolving collar-arm 40, substantially as described.

5. The combination of the spring-forming blocks, their shaft, and collar-cam 53, the spring-dog 54, and spring-latch 55, with a rod secured to said latch, the pivoted vertical lever 56, and gear 8, having a lug, 8', on the side thereof, whereby the forming-blocks are stopped in proper location, substantially as described.

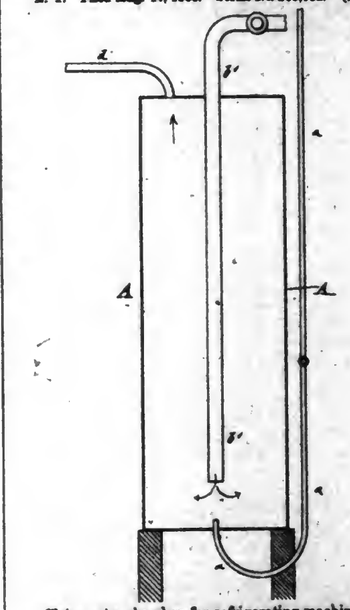
6. The combination of the spring-forming blocks and their shaft, the half-collar 34 on one side of said cone, the pivoted arm *e*, carrying said collar, the pivoted lever 36, the vertical rod 38, having a wedge-shaped upper end, the pivoted lever 39, and revolving arm E, whereby the spring formed on the cone-block is removed, substantially as described.

7. The combination of the spring-forming blocks, the arm 28, carrying one of them, the connecting-rod 30, lever 31, and cam 33, substantially as and for the purpose described.

8. The combination of the spring-forming blocks, the gears 1 and 2, the clutch between them, its clutch-lever, the gears 14, 12, 11, 9, and 8, and cam 22 on shaft 3, the elliptical gear 7 on said shaft, and the elliptical gear 6 on the main shaft, substantially as and for the purpose described.

9. The combination of two spring-forming blocks, one of which has its inner end provided with a screw having two prongs and the other with two grooves, and a solid central portion between said two grooves, substantially as and for the purpose described.

395,512. ABSORBER FOR REFRIGERATING-MACHINES. MICHAEL PIEL, East New York, assignor to Piel Brothers, Brooklyn, N. Y. Filed Aug. 17, 1888. Serial No. 283,062. (No model.)



Claim.—An absorber for refrigerating-machines, composed of a cylindrical vessel, a gas-induction pipe extending downward through the top of the absorber to near the bottom of the same, a supply-pipe for the weak ammonia-water entering at the bottom of the absorber, and a discharge-pipe connected to the top of the absorber for conducting off the strong ammonia-water, substantially as set forth.

395,513. FASTENER FOR MEETING-RAILS OF SASHES. DAVID J. POWERS, Chicago, Ill. Filed Aug. 18, 1887. Serial No. 247,233. (No model.)



Claim.—1. The combination of plate A, rotatable stud *a*, hinged lever D, having vertical and lateral motion, locking-bolt E, plate B, and the engaging-stud *b*, substantially as set forth.

2. In a window-lock, the combination of plate B, provided with a ledge, *b'*, to form a fulcrum, a rotatable stud, *a*, hinged lever D, having vertical and lateral motion, and adapted to engage the ledge on plate B, whereby to bring the upper surfaces of the meeting-rails in the same plane, locking-bolt E, plate A, and engaging-stud *b*, substantially as described.

395,514. CANDLE-HOLDER FOR CHRISTMAS-TREES. CHRISTOPH REINHARDT, Newark, N. J. Filed Sept. 20, 1887. Serial No. 250,195. (No model.)

395,514.



Claim.—The combination, with a stem of a candle-holder, bent as described, of a sheet-metal plate having its outer portion divided by radial cuts into sections *a* and *c* and bent upward, as shown, the central portion of said plate being formed into a drip-bowl and the sections *c* into a candle-holder, as described, for the purposes set forth.

395,515. CHEWING-GUM LOCKET. CHRISTOPHER W. ROBERTSON, Somerville, Tenn., assignor of one-half to Carie Booth Robertson, same place. Filed Sept. 10, 1887. Serial No. 249,394. (No model.)



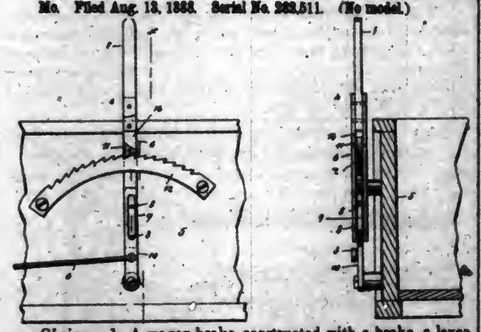
Claim.—1. A locket having hinged sections, each of which is fitted with an anti-corrosive lining, substantially as described, for the purpose specified.

2. A locket having hinged case-sections, each of which is fitted with a concave crystal removable from the case-sections, substantially as and for the purposes described.

3. The combination, in a locket, of the hinged case-sections, the concave linings, and separate rings forming rims for the protection of the edges of the linings, substantially as set forth.

4. The combination, in a locket, of the hinged case, the concave fragile lining, and the pad-lining placed between said case and concave lining, substantially as described.

395,516. WAGON-BRAKE. JAMES R. ROBINSON, Cornelia, assignor of two-thirds to Goodlet Crow and Charles Crow, both of Shawnee Mound, Mo. Filed Aug. 13, 1888. Serial No. 282,511. (No model.)



Claim.—1. A wagon-brake constructed with a brake, a lever-handle formed in two parts, the lower part pivoted to the wagon and the upper part having a pawl and a vertically-sliding connection with the lower part, a rack-bar on the wagon adapted to engage the pawl, and a connecting-rod pivoted to the brake and to the lower portion of the lever-handle, substantially as shown and described.

2. A wagon-brake constructed with a brake, a lever-handle pivoted to the wagon and formed in two parts, the upper part having a rotary pawl and being vertically movable on the lower part, a rack-bar with which the pawl is adapted to engage, and a connecting-rod pivoted to the brake and to the lower part of the lever-handle, substantially as shown and described.

3. A wagon-brake constructed with a brake, a lever, 4, pivoted to wagon 5 and formed with lower portion, 10, having vertical slot 9, and an upper portion with a handle, 7, having forked portion 6, and cross-pins 8, projecting through slot 9 in lower portion, 10, curved rack-bar 12, extending through forked portion 6, three-pointed pawl 11 in forked portion 6, located above rack-bar 12, and connecting-rod 3, pivoted to the brake and the lower portion, 10, of lever 4, substantially as shown and described.

395,517. LIFTING-JACK. BENDT A. SAHLMANN and JOSEF SCHEINOSKY, Marinette, Wis. Filed Sept. 10, 1888. Serial No. 285,008. (No model.)

Claim.—1. In a jack, the combination, with the frame thereof having a slotted front, of a gear-case mounted in the frame and carrying a train of gears, and a projecting power-shaft adapted to actuate the gears, and a rack-bar mounted for reciprocation within the case and arranged in mesh with one of said gears, and carrying a lifting-arm projecting and depending from the upper end of the rack-bar and adapted to operate in the slot of the frame, substantially as specified.

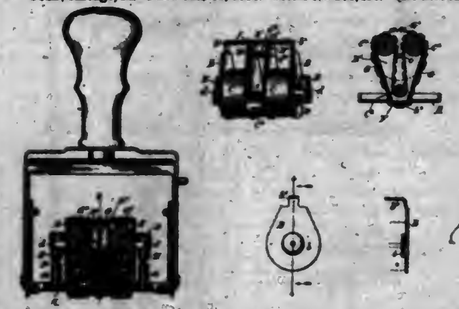
2. In a lifting-jack, a series of gears and a rack-bar adapted to be actuated thereby and provided with a trip, in combination with a bell and a hammer for the same adapted to be actuated by said trip, substantially as specified.

3. In a jack, a series of gears mounted in the gear-case, a rack-bar adapted to be actuated by the gears and provided with a tripping-pin, in combination with a bell, and a spring-actuated bell-hammer connected with the bell-crank lever, arranged in the path of the trip and adapted to be actuated thereby against the tension of the spring, substantially as specified.

4. In a jack, the combination, with the front and rear walls, 1 and 2, the former slotted, as at 23, and having the guide-plate 24, of the gear-case 3, having the shafts 9 15 18, carrying the gears 13, 14, 16, 17, and 19, the rack 20, meshing with the gear 19 and having the head 21, and depending lifting-arm 22, terminating in an angular end, 25, and adapted for reciprocation in the slot 23, substantially as specified.

5. The rack-bar 20, having the pin 35 and the gears for operating said rack-bar, in combination with the bell 26, the spring 28, terminating in the eye 30, bent as at 29 and having the hammer 31, and the bell-crank lever 33, pivoted, as at 32, and connected to the eye by the link 34 and projected in the path of the pin 35, substantially as specified.

395,518. DATING DEVICE FOR HAND-STAMPS. LOUIS K. SCOTTOAN, Chicago, Ill. Filed Jan. 12, 1888. Serial No. 260,496. (No model.)



Claim.—1. The combination, with the type-band, of a supporting-bar for sustaining said type-band at the point of printing, consisting of a sheet-metal strip bent into hollow or tubular form, substantially as described.

2. A type-band support for dating devices, comprising two side plates and a tubular cross-bar, said plates being provided with projecting lugs or ears entering the ends of said tubular cross-bar, substantially as described.

3. The combination, with a type-band, of a tubular cross-bar supporting the band at the point of printing, guides or rollers for the band, and side plates supporting the said guides or rollers, said side plates being provided with projecting lugs or ears entering the ends of the said tubular cross-bar, substantially as described.

4. A type-band support for dating devices, embracing two side plates, a tubular connecting-bar, and a rod passing through the plates, said plates being provided with projecting lugs or ears entering the ends of the tubular connecting-bar, and nuts upon the ends of the rod for holding together the parts of the frame, substantially as described.

5. The combination, with two or more type-bands, of a frame comprising side plates, an intermediate plate or plates located between the type-bands, and a tubular cross-bar, the outer plates being provided with projecting lugs or ears entering the ends of the cross-bar and the intermediate plate or plates being notched to engage said bar, substantially as described.

6. The combination, with a die-plate, of a type-band frame embracing side plates, a rod passing through said plates for holding said plates together, and nuts upon the ends of the rod, provided with ears

by which the frame may be connected with the die-plate, substantially as described.

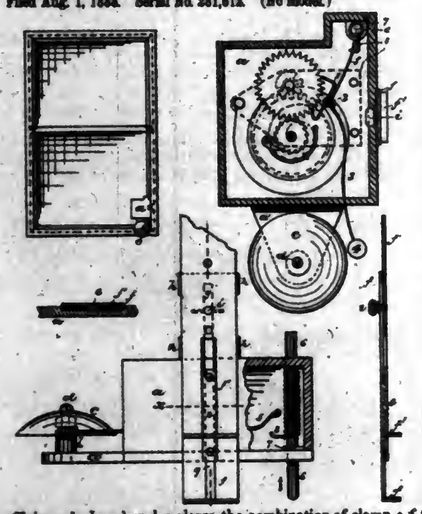
7. The combination, with a die-plate provided with standards screw-threaded upon their upper ends and grooved nuts upon said standards, of a type-band frame comprising side plates, a rod passing at its ends through the side plates, and nuts upon the ends of the rod, provided with ears engaging the nuts upon the standards, substantially as described.

8. The combination, with a die-plate provided with standards screw-threaded upon their upper ends and grooved nuts upon said standards, of a type-band frame comprising side plates provided with inwardly-extending lugs, a tubular cross-bar engaged at its ends with said lugs, a rod passing at its ends through said side plates, and nuts upon the rods, provided with ears engaging the grooves of the nuts upon the standards, substantially as described.

9. The combination, with a die-plate provided with standards screw-threaded at their upper ends and grooved nuts upon the standards, of a rod passing at its ends through said plates, and nuts upon the ends of said rod exterior to the plates, said nuts being made of sheet metal and having prongs or ears which are bent around and into the grooves of the nuts upon the standards, substantially as described.

10. The combination, with a die-plate and the plates B B, provided with recesses *b b* in their outer faces, of a rod, *c*, and nuts D D upon the ends of the rod, provided with ears *d d*, which project outside of the faces of the plates to engage holding devices by which the said plates are secured to the die-plate, substantially as described.

395,519. BURGLAR-ALARM. ROBERT T. SHILLIE, Newark, N. J.
Filed Aug. 1, 1888. Serial No. 281,612. (No model.)



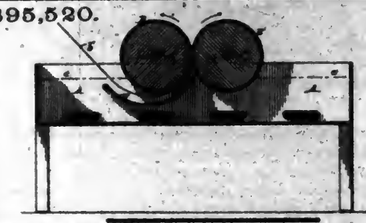
Claim.—1. In a burglar-alarm, the combination of clamp *e f*, the part *e* being secured to the case of the alarm, and the part *f* being adjustably secured to the part *e*, a train of wheels and a bell, a bell-hammer connected with said wheels, a spring for actuating said wheels and hammer, pin 6, detent 8, secured to said pin for automatically locking and releasing said wheels, as described, and a spring adapted to hold said pin and detent normally out of contact with the bell attachment, all said parts being arranged and combined as and for the purposes set forth.

2. The combination, in the case of a burglar-alarm, with a train of wheels, a bell-hammer connected therewith, and a spring for actuating said wheels and bell-hammer, of a lever, 5, pivotally connected to said case and with the bell-hammer lever 3, pin 6, adapted to move in and through the upper and lower walls of the case, and detent 8, secured to said pin 6 and adapted to engage with the free end of lever 5 for automatically locking and releasing the pallet 1 from contact with the train of wheels, all said parts being arranged and combined substantially as and for the purposes set forth.

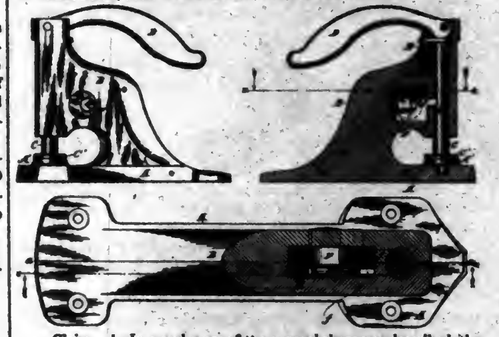
395,520. WAXED-PAPER BAG. EDWARD G. SPARKS, Brooklyn, N. Y. Filed Nov. 10, 1888. Serial No. 290,427. (Specimens.)

Claim.—As an improved article of manufacture, the within-described paper bag having its pores and interior surfaces charged with compressed wax and its exterior surfaces freed or nearly freed from the wax, as set forth.

395,520.



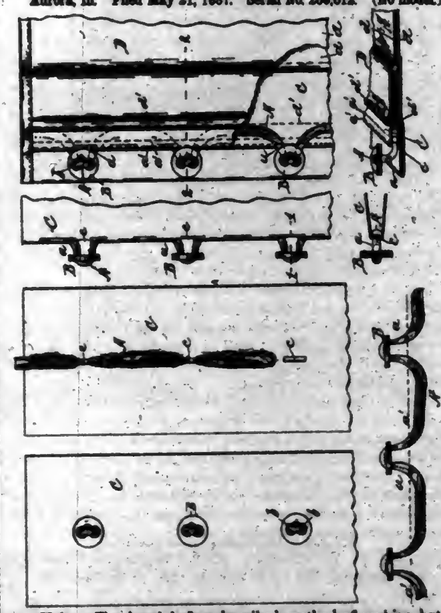
395,521. SEAL-PRESS. JOHN G. STROUTHAMER, Petersburg, Ill.
Filed Dec. 6, 1887. Serial No. 257,076. (No model.)



Claim.—1. In a seal-press of the general character described, the combination, with the standard and a plunger sliding therein and provided with a notch or shoulder, of a lock secured to the standard, the bolt of which lock engages the shoulder of the plunger, said shoulder being placed in position to secure the plunger-die in contact with or in close proximity to its opposing die, substantially as and for the purposes set forth.

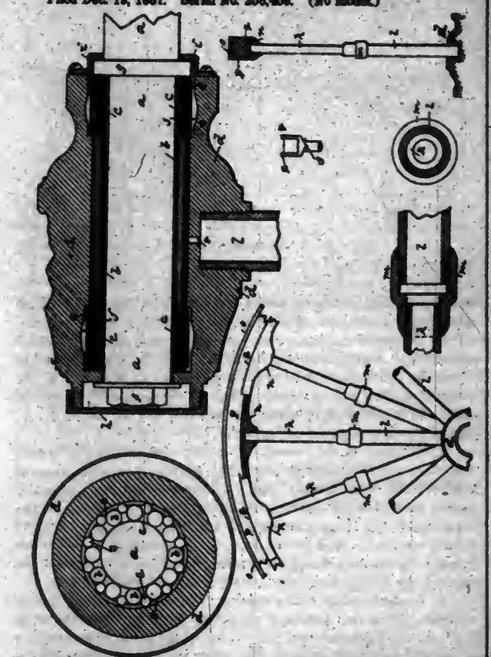
2. A seal-press of the general character described, comprising a metal frame constructed of two parts permanently fastened to each other, a lock having its working parts embraced between the parts of the frame, and a plunger working in the frame engaged by the lock-bolt when said plunger is at its lower position, substantially as and for the purposes set forth.

395,522. METHOD OF MAKING BUTTON-STRIPS. JAMES STONE, Aurora, Ill. Filed May 31, 1887. Serial No. 239,013. (No model.)



Claim.—The hereinbefore-described method of making button-strips, which consists in applying to a continuous tape a series of buttons at fixed distances greater than the final distances which separate the buttons in the finished strip, then forming from the surplus of the intermediate portions of the continuous tape a series of loops, one for each button, whereby the buttons are brought into their final and proper position, and then securing the continuous tape to a suitable base by stitching, substantially as and for the purposes specified.

395,523. VEHICLE-WHEEL. CHARLES TAYLOR, Elizabeth, Pa.
Filed Dec. 19, 1887. Serial No. 258,409. (No model.)



Claim.—1. In a journal-bearing such as described, the combination consisting of the journal *a* and hub *d*, and the parallel series of bearing-rollers *b*, having arranged at either ends short intermediate rollers, *c*, as and for the purpose set forth.

2. In a journal-bearing such as described, the hub *d*, having arranged therein a series of parallel rollers, *b*, and short intermediate rollers, *c*, the recesses *j*, for reducing the friction on the same, the cap *h*, and flexible covering *i*, for excluding dust from the journal, as and for the purpose described.

3. In a journal-bearing such as described, the hub *d*, having arranged therein and about the journal *a* a series of parallel rollers, *b*, and intermediate rollers, *c*, the recesses *j*, for reducing the friction on the same, the cap *h*, and flexible cover *i*, for excluding dust from the journal *a*, in combination with the adjustable and detachable metallic spokes, consisting of the tubes *k l*, of large and small diameter, and a suitably-constructed metallic bearing, *n*, for the reception of the tire *o* or felly *p*, substantially as described.

4. In a vehicle-wheel, the combination consisting of the metallic hollow spokes *k l*, divided into sections and secured together by a suitable coupling, *m*, and the segmental bearing *n*, recessed on its outer face for the reception of the tire *o* or felly *p*, substantially as set forth.

5. In a vehicle-wheel such as described, the hollow spokes *k l*, divided into sections for the purpose of reducing the weight and diameter of the outer ends of the same, and a means for securing the sections together.

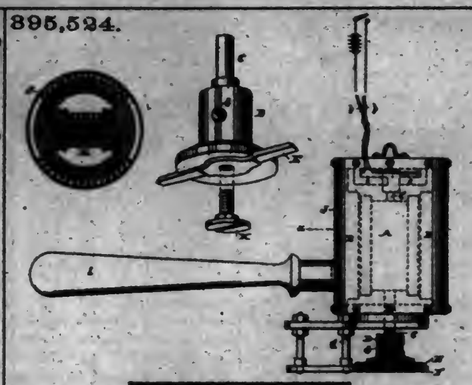
6. In a vehicle-wheel such as described, consisting of the sectional spokes *k l*, the segmental bearing *n*, having a sharp inner edge, *s*, for the purpose of allowing the same to be easily lifted or raised out of soft or moist earth.

395,524. ELECTRICALLY-OPERATED CUTTING DEVICE. RUSSELL THAYER, Philadelphia, Pa. Filed Jan. 3, 1888. Serial No. 259,652. (No model.)

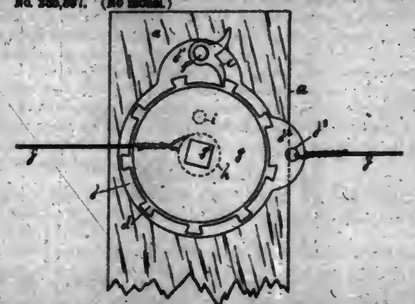
Claim.—1. In combination, an electric motor, a knife or series of knives connected to and revolved by said motor, a source of electric-current supply, and means to connect said electric-current supply with the motor.

2. In combination, an electric motor, a knife or series of knives connected to and revolved by said motor, a comb or guard, a source of electric-current supply, and means to connect said electric-current supply with the motor.

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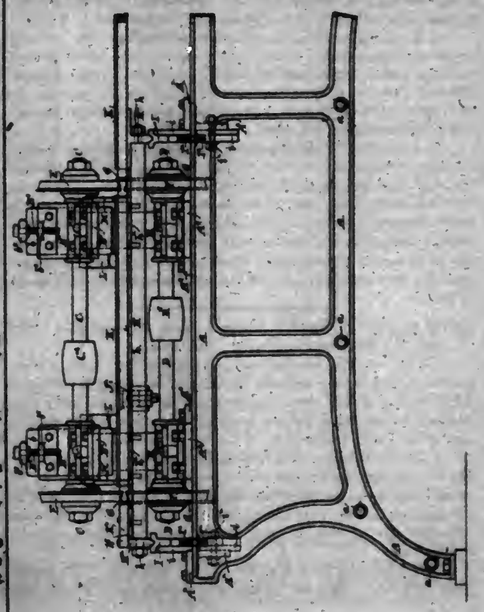
395,525. TIGHTENER AND FASTENER FOR FENCE-WIRES. ADELBERT L. THURTON, East Avon, N. Y. Filed Sept. 20, 1888. Serial No. 285,807. (No model.)



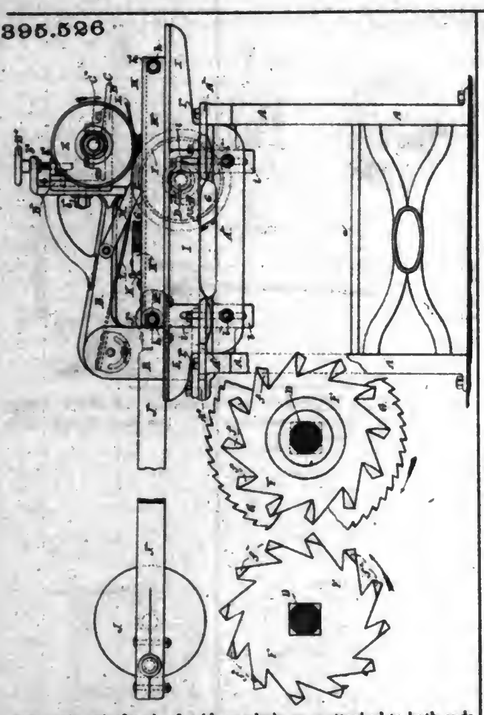
Claim.—A wire-tightener consisting of a double ratchet-plate, *d* a central hub, *h*, provided with a transverse orifice, *h'*, a front plate, *g*, a projecting square end, *g'*, and a bolt, *k*, all integral with each other, in combination with washer *b*, having projections *b'* and *b²*, (projection *b²* being provided with a perforation, *b²*,) and with double pawl *e*, carried by projection *b'*, all substantially as shown.

395,526. TENONING-MACHINE. RUSSELL TURMAN, La Grange, Ill. Filed Apr. 21, 1888. Serial No. 271,493. (No model.)

Claim.—1. A tenoning-machine comprising a machine-frame, two parallel mandrels mounted therein, a revolving cutting-disk mounted



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upon each end of each of said mandrels, saws attached to both ends of one of said mandrels outside the cutting-disks, drive-pulleys upon the mandrels, and a reciprocating carriage provided with a ledge to sustain and carry forward the work between said cutting-disks, whereby dovetailed tenons are formed upon both ends of a piece or strip and the same is cut the proper length at each reciprocation of the carriage, substantially as described.

2. A tenoning-machine comprising a frame provided with two overhanging arms or goose-necks, a mandrel mounted horizontally upon the frame, a second mandrel mounted upon said arms above and parallel with the first mandrel, cutting-disks upon each end of each of said mandrels, and a reciprocating carriage located and moving beneath the said overhanging arms, said carriage being provided with a ledge arranged to support and carry forward the work between the opposite pairs of cutting-disks, substantially as described.

3. A tenoning-machine comprising a machine-frame, two pairs of revolving cutting-disks, a reciprocating carriage and pawls pivoted upon the machine-frame and located in position to engage at their free ends with the work at the forward limit of the movement of the carriage to prevent the work being drawn backwardly with the carriage, substantially as described.

4. A machine for making dovetailed tenons, comprising a reciprocating carriage provided with a ledge to sustain and carry forward the work and two pairs of revolving cutting-disks for cutting the dovetails, each of said cutting-disks having a series of oblique cutting-edges arranged with those parts of the edges which act upon the outer or thicker parts of the tenons in advance, referring to the direction of motion of the cutters, of those parts of said edges which act upon the inner or thinner parts of the said tenons, substantially as described.

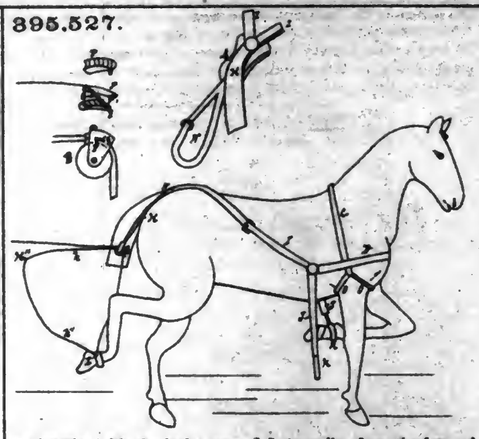
395,527. HARNESS. ALBERT F. TRASK, Onondaga, Mich. Filed Sept. 10, 1888. Serial No. 285,093. (No model.)

Claim.—1. The combination of a harness for a horse, a strap secured to said harness near the crupper and depending therefrom, a pulley secured to said depending strap near its lower end, and a rope passing through said pulley and provided with means for securing the hoof of the horse, substantially as shown and described.

2. The combination of a harness for a horse, a strap secured to said harness near the crupper and depending therefrom, a pulley secured to the lower portion of said depending strap and provided with a pulley-check, and a rope passing through said pulley and provided with means for securing the hoof of the horse, substantially as shown and described.

3. In a harness, the combination of the neck-strap C, the breast-strap, D, straps O, adapted to pass round the fore leg of a horse near

395,527.

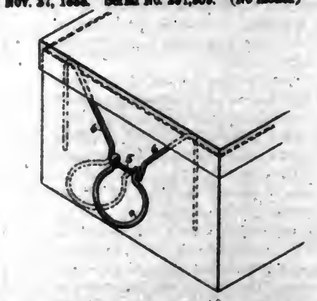


the junction with the body, straps J J, depending from the forward part of the harness and adapted to secure the fore feet of a horse, tugs I I, secured to the breast-strap and passing backward and upward and being secured together over the horse's back, the crupper attached to said tugs, the strap H, secured to said tugs on the back of the horse, a pulley secured to said strap H, and a rope passing through said pulley and provided with means for securing the horse's hoof, substantially as shown and described.

4. In a harness, the combination of the neck-strap C, the breast-strap D, straps K, adapted to pass round the fore legs of the horse at their junction with the body, tugs I I, secured to the breast-strap and passing backward and upward and being secured together over the horse's back, the crupper attached to said tugs, the strap H, secured to said tugs on the back of the horse, a pulley secured to said strap H, and a rope passing through said pulley and provided with means for securing the horse's hoof, substantially as shown and described.

5. In combination with a shoeing or breaking harness, a pulley consisting of the combination of the sheave, the pulley-case, and plugs F F', swiveled together by a link, G, said plugs being formed smaller at one end and enlarging toward the other end, and being inserted between the pulley-case and the sheave, and being limited in their motion by a projection from said plug extending into a slot in the pulley-case, substantially as shown and described.

395,528. BOX-HANDLE. JUDSON A. TRAUT, New Britain, Conn. Filed Nov. 27, 1888. Serial No. 291,959. (No model.)



Claim.—1. The herein-described box-handle, consisting of the handle-bar, the diverging and return arms adapted to clasp the box, and the drop-handle 4, hinged to said handle-bar, substantially as described, and for the purpose specified.

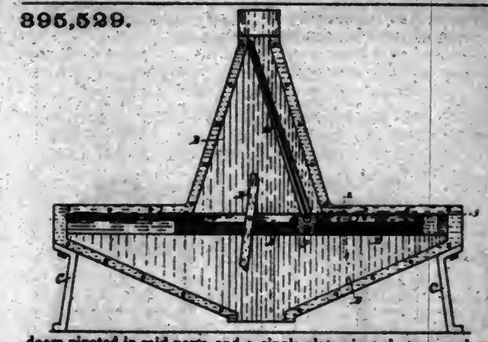
2. The herein-described box-handle, consisting of the handle-bar 5, diverging and return arms 6 and 7, for clasping the box, and the drop-handle, the diverging arms 6 6 being bent outwardly just above the handle-bar, substantially as described, and for the purpose specified.

395,529. WATER-MOTOR. HENRY B. TRIMBLE, Kalamazoo, Mich. Filed Aug. 3, 1888. Serial No. 281,571. (No model.)

Claim.—1. The combination of a suitable flume having induction and eduction ports, a piston consisting of an oscillating bar or plate in the plane of the flowing water through the flume, and a slide reciprocating transversely in the flume and to which one end of the piston is pivoted, substantially as set forth.

2. The combination of a suitable flume, a slide reciprocating transversely in said flume, having exhaust-ports, automatically-operative

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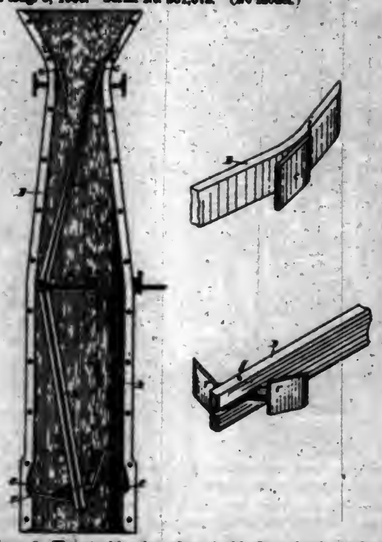


doors pivoted in said ports, and a single plate pivoted at one end to said slide and constituting an oscillating piston in the plane of the flowing water through the flume, substantially as set forth.

3. The combination of a suitable flume, a single-plate oscillating-piston in the plane of the flowing water in said flume, a slide reciprocating transversely to the flume, and to which slide said piston is pivoted at one end, and a piston-rod attached to said slide, substantially as set forth.

4. The combination of a suitable flume or chest, a reciprocating slide having exhaust-ports, said slide having bearings near the horizontal branches of the flume-walls, doors pivoted in the exhaust-ports off from the center of said doors, and a piston oscillating in the plane of the flowing water in said flume and pivoted to said slide between the exhaust-ports, substantially as set forth.

395,530. WATER-MOTOR. HENRY B. TRIMBLE, Kalamazoo, Mich. Filed Aug. 3, 1888. Serial No. 281,572. (No model.)



Claim.—1. The combination of a suitable flume having induction and eduction ports, automatic exhaust-valves in the latter-named ports, and the jointed piston, substantially as set forth.

2. The combination of a suitable flume, the jointed piston pivoted therein at one end, and the adjustable stop-gates consisting of the wings hinged in position for the free end of the piston to contact with, and the screws for adjusting the wings, substantially as set forth.

3. The combination of a suitable flume, an automatically-oscillating piston therein in the plane of the flowing water in the flume, and the adjustable stop-gates for the free end of the piston to contact with, consisting of the wings hinged in the induction-port, and means for swinging the wings in or out, substantially as set forth.

395,531. FEED-REVERSING ATTACHMENT FOR LATHES. GEO. G. WHITNEY, Hartford, Conn. Filed Aug. 21, 1888. Serial No. 283,220. (No model.)

Claim.—1. In combination with a lathe-head having the live-spindle and feed-shaft, the rocker mounted on the latter bearing the rocker-gears, and a pin that projects into a cam-slot in the shifter-spindle, the shifter-spindle having the cam-slot and having rotary movement in the socket in the lathe-head, all substantially as described.

395,531.



2. In combination with a lathe-head or like part of a machine-tool, a live-spindle, and a feed-shaft mounted in the head, the rocker loosely mounted on the feed-shaft and bearing the rocker-gears, the pin projecting from the rocker-arm, the shifter-spindle having a cam-slot for the reception of the pin on the rocker, and a threaded end fitting the threaded socket in the head, all substantially as described.

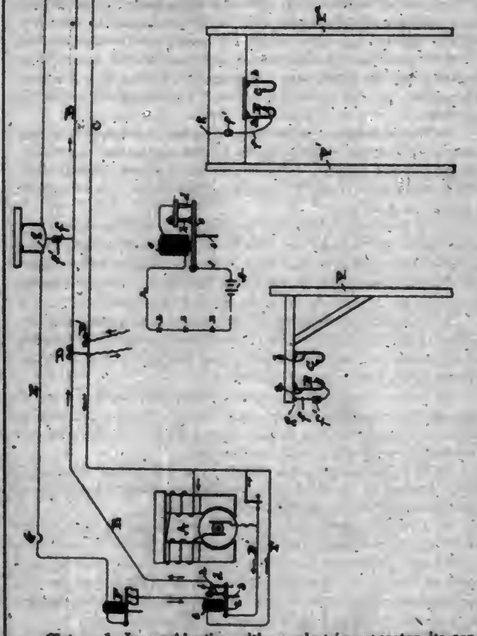
3. In a lathe-head gear-shifter, in combination with the rocker bearing the rocker-gears and a projecting pin, a rotary shifter-spindle having a threaded end fitting the threaded socket, and a cam-slot terminating in locking-sockets, and a handle located on the outer end of the spindle, all substantially as described.

4. In a lathe-head gear-shifter, in combination with the lathe-head having a spindle-socket threaded as described, the tilting rocker bearing the rocker-gears and a projecting pin, a rotary shifter-spindle having a threaded end fitting the threaded socket in the head, a pin-plot, and a handle located in the outer end of the spindle, all substantially as described.

395,532. PHOSPHATIC FERTILIZER. WILLIAM J. WILLIAMS, Camden, N. J. Filed Mar. 16, 1888. Serial No. 267,305. (No specimens.)

Claim.—The herein-described mode of producing fertilizers, said mode consisting in, first, treating nitrogenous matters with sulphuric acid, separately mixing water with calcined phosphate of alumina or iron, or a mixture of the two, and then thoroughly incorporating the mixture of sulphuric acid and nitrogenous matter with the phosphate in the water.

395,533. AUTOMATIC SAFETY CUT-OUT FOR ELECTRIC CIRCUITS. GRANVILLE T. WOODS, Cincinnati, Ohio. Filed Aug. 13, 1887. Serial No. 246,944. (No model.)



Claim.—1. In combination with an electric generator, its conducting-line circuit, and devices—such as lamps or motors—for utilizing the current passing over such circuit, a break-circuit armature in circuit in or near the generator held to conducting control by a

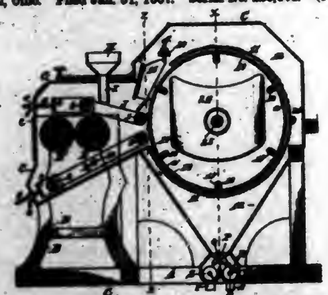
magnet normally charged by the electric charge upon the conducting-circuit against an independent normally-active withdrawing force acting automatically to hold the circuit closed while the conducting-line is otherwise intact and charged, and to open the circuit when the conducting-line is broken or impaired at any other point, substantially as set forth.

2. In combination with a generator and outgoing conductor of an electric circuit, (as an electric light or power circuit,) a circuit-breaking armature in the outgoing conductor, an auxiliary wire constituting a return branch of the circuit, and an electro-magnet in said return branch controlling the circuit-breaking armature, substantially as and for the purpose set forth.

3. In combination with a generator and outgoing conductor of an electric circuit, (as an electric light or power circuit,) a circuit-breaking armature in the outgoing conductor, an auxiliary wire constituting a return branch of the circuit and arranged parallel therewith, an electro-magnet in said return branch controlling the circuit-breaking armature, and insulated links connecting the main conductor to the auxiliary wire in such manner that a displacement of the main conductor will sever the auxiliary wire, substantially as and for the purposes set forth.

4. In an electric light or power circuit, the combination of a circuit-breaker in the outgoing conductor and a fusible cut-out, a variable-resistance device, and a magnet controlling the circuit-breaker in the return-conductor, arranged and operating substantially as set forth.

395,534. ROLLER REDUCTION-MILL. JOHN H. WOOLCOTT, Cincinnati, Ohio. Filed Jan. 31, 1887. Serial No. 226,071. (No model.)



Claim.—1. In a gradual-reduction mill, the combination of one or more sets of reducing-rolls with conveying-aprons J and K, one above and the other below the said reducing-rolls, and an elevating-reel and concave separating-screen, substantially as herein specified.

2. In combination with one or more sets of reducing-rolls, an elevating-reel, the outside separating concave screen, 11½, and adjustable guides 15, with conveying-aprons J K, substantially as herein specified.

3. The combination of the concave screen 11, the reel 13, having recesses 17, and the radially-adjustable spring-actuated brushes 16, arranged in said recesses, the reel 13 being arranged concentrically within the concave screen 11, with an annular space, *a*, between, substantially as described.

4. In combination with the reducing-rolls and the conveying-aprons above and beneath said rolls, the elevating-reel having recesses 17, the spring-pressed brushes 16, radially adjustable in said recesses, the concave screen, and the adjustable guides 15, arranged adjacent to the opening in said screen, substantially as described.

5. In combination with one or more sets of reducing-rolls and conveying-aprons, the concave screen 11, an elevating-reel, 13, and a series of adjustable guides, 15, arranged above the apron lying over the reducing-rolls, substantially as described.

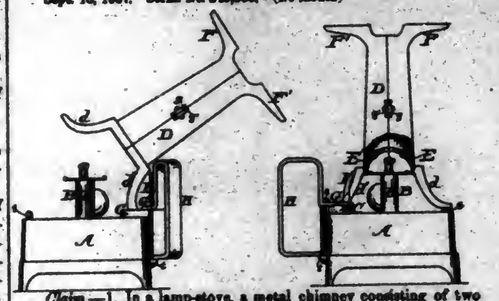
6. In combination with the conveying-aprons J and K, the reducing-rolls E E', arranged between said aprons and having their axes inclined to each other, the concave screen 11, and the elevating-reel revolving therein, substantially as described.

7. The combination, with the elevating-reel having recesses 17, of the brushes 16, having threaded shanks, the springs 18, nuts 19, and the concave screen 11, substantially as described.

8. A middlings-separator composed, substantially, of the revolving elevating-reel and brushes, a concave screen provided with an opening on one side, a conveying-apron delivering the product through said opening, another conveying-apron taking the tailings from the reel and delivering them to the reduction-rolls, and reduction-rolls arranged between said conveying-aprons, substantially as described.

9. The combination, with the roll E', journaled in fixed bearings, of the pressure-roller E, the L-shaped arms 27, the eccentric shaft 30, journaled in the knees of said arms, and the locking devices 36, for holding said shaft 30 in a fixed adjustment, substantially as described.

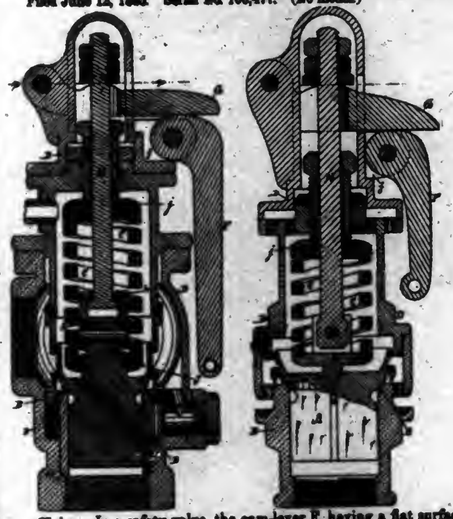
395,535. LAMP-STOVE. WILLIAM G. AMOS, Cleveland, Ohio. Filed Sept. 10, 1887. Serial No. 249,286. (No model.)



Claim.—1. In a lamp-stove, a metal chimney consisting of two parts, one part or half having arms F, one half, E, of the cone and one half of the chimney being cast integral, and the other half having arms F', one half, E', of the cone and one half the chimney being cast integral also, the said parts being fastened together by means of a screw or rivet passing through the ears, as a new article of manufacture.

2. The combination, with the base-fount A, provided with filling-neck C and wick-tube B, and the chimney D of a lamp-stove, of the handle H, pivotally attached to the fount and provided with covering-plate G, and arm I, for latching the chimney in its upright position, substantially as specified.

395,536. SAFETY-VALVE. HENRY G. ASHTON, Somerville, Mass. Filed June 12, 1885. Serial No. 168,477. (No model.)



Claim.—In a safety-valve, the cam-lever F, having a flat surface, *f'*, in combination with a lever, G, having a flat surface, *f''*, and the valve-spring, the levers and the spring being arranged substantially as shown, to keep the spring compressed when the flat surfaces *f' f''* are against each other, all substantially as and for the purpose set forth.

395,537. PORTABLE GRAVE-VAULT. SILVIO B. BAKER, Springfield, Ohio. Filed Jan. 18, 1888. Serial No. 261,110. (No model.)

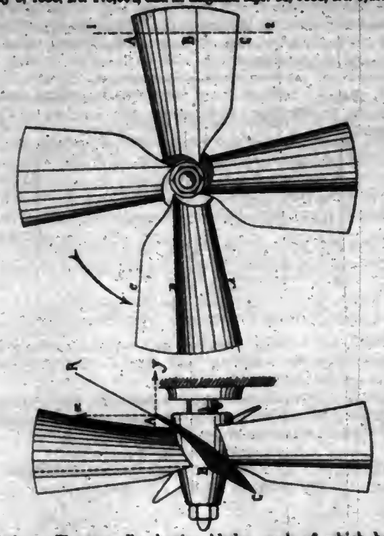


Claim.—1. In a portable grave-vault, a malleable-iron head having lugs formed integrally therewith to regulate the overlap of the top and bottom of the vault.

2. In a portable grave-vault, the combination, with a malleable-iron flanged head having lugs formed integrally therewith, of catches secured to said lugs, whereby the place of attachment of the catches to the head is not discoverable from the outer side.

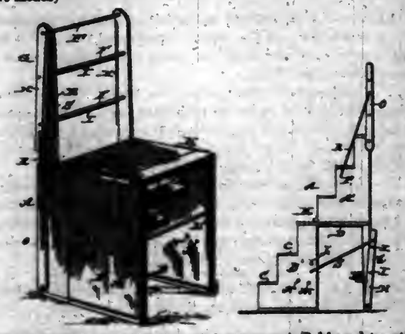
3. In a portable grave-vault, the combination, with the lower portion and a stud secured to the inside thereof, of the upper portion adapted to fit over the lower and having a bracket secured to the inner side thereof, a part of which stands opposite said stud to prevent the lower portion being sprung in at its upper edge.

395,538. SCREW-PROPELLER. LOUIS ERRAULD, Lyons, France. Filed May 1, 1888. Serial No. 272,406. (Model.) Patented in France May 3, 1886, No. 173,694, and in England Apr. 11, 1888, No. 5,402.



Claim.—The propeller having blades, each of which has an inclined and convex front face, the curvature increasing toward the rear edge, and a concave rear face from the advancing edge A to the line B, and an inclined plane between the line B and the rear edge, C, substantially as set forth.

395,539. COMBINED CHAIR AND STEP-LADDER. CHRISTIAN DOCKENDORFF, Kenosha, Wis. Filed Apr. 17, 1888. Serial No. 270,862. (No model.)



Claim.—1. The combination of the frames A B, hinged together and having the notched steps formed on their opposing sides, said frame A having the extending arms E, the frame G, pivoted to the outer ends of arms E, and the frame O, pivoted to the opposite end of frame A, substantially as described.

2. The combination of the frames A B, hinged or pivoted together at one corner and provided with the notched steps, as described, said frame A having the arms E and provided with the openings P, and said frame B having the openings L M N, the frame G, hinged or pivoted to the outer ends of arms E and having the links R, and the frames O, hinged or pivoted to the opposite end of frame A and having the links, all combined and arranged to operate substantially as shown and described.

395,540. BOLT. CHARLES BORNHARD, Detroit, Mich. Filed May 23, 1888. Serial No. 275,267. (No model.)

Claim.—1. In a lock for folding doors, the combination of the casing A, provided with the flanges B, the sliding bolt C, the curved arm D, provided with the notches *c c*, the retracting-spring E, the crank-shaft F, the crank G, engaging into the notch *c*, the crank H,



formed on the crank-shaft F, outside the casing, and the back plate I, provided with the guide-arm *d*, engaging into the notch *c*, the parts being arranged and constructed to operate substantially as described.

2. As a new article of manufacture, a lock for double doors consisting of an inclosing frame or casing, a sliding bolt secured therein, a spring arranged to normally retract the bolt, a crank-shaft journaled in the casing, a crank secured upon said crank-shaft within the casing and engaging with the bolt, and a crank on said crank-shaft outside the casing, substantially as described.

395,541. FENCE-POST. FRANCIS REGAN and WILLIAM J. REGAN, Hartford, Kans. Filed Sept. 27, 1888. Serial No. 286,586. (No model.)



Claim.—1. The combination of the post, the clamp-bar having a curved upper end and claws formed on its lower end, a stone or rock held between said post and clamp-bar, a screw-bolt passing through said bar and post, and a nut whereby said clamp-bar may be drawn tightly against said stone or rock to bind the same firmly against the post, substantially as described.

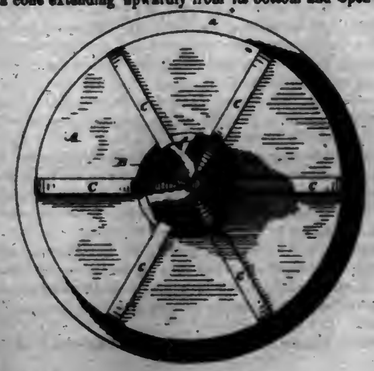
2. The combination, with an iron fence-post and a suitable base, of the clamp-bar having a curved upper end and a straight or flat lower end terminating in a bent and sharpened claw, a screw-bolt passing through said bar and post, and a nut for tightening the same, substantially as described.

3. The combination of the half-tubular iron post, the curved clamp having one end resting against said post, and the bolt for securing said post and clamp together, substantially as described.

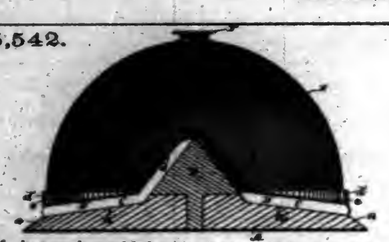
395,542. INSECT-TRAP. CLARA P. BROWN, New York, N. Y. Filed Nov. 7, 1888. Serial No. 290,211. (No model.)

Claim.—1. In an insect-trap, the combination, with a cage portion having a cone extending upwardly from its bottom and open at its vertex, of a plurality of passage-ways leading from the periphery of the bottom to the said cone portion to the vertex thereof, substantially as set forth.

2. In an insect-trap, the combination, with a cage portion having a cone extending upwardly from its bottom and open at its ver-



395,542.

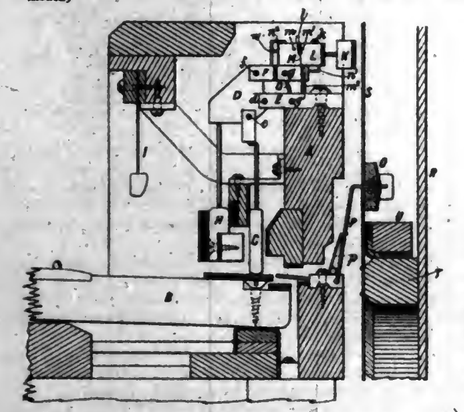


tex, of a bottom located below the bottom of the cage portion and spaced therefrom, said bottom provided with a cone projecting upwardly within the cone of the bottom of the cage portion, said cone provided with a plurality of passage-ways leading from its base to its vertex, substantially as set forth.

3. In an insect-trap, the combination, with a cage portion having a cone extending upwardly from its bottom and open at its vertex, of a bottom located below the bottom of the cage portion and provided with a conical projection extending upwardly within the cone of the cage portion, the two bottoms and cone portions being spaced apart by a set of radial partitions, substantially as set forth.

4. In an insect-trap, the combination, with a cage portion having a cone extending upwardly from its bottom and open at its vertex, of a bottom located below the bottom of the cage portion and provided with a conical projection extending upwardly within the cone of the cage portion, the two bottoms and cone portions being spaced apart by a set of radial partitions, a series of which terminate at the base of the cone, substantially as set forth.

395,543. KEY-BOARD MUSICAL INSTRUMENT. ANDREA L. CALDERA, Turin, Italy. Filed Aug. 25, 1888. Serial No. 283,787. (No model.)



Claim.—1. In the herein-described action for a key-board harp, the combination, with a mechanical finger or plectrum pivoted upon a vertical axis upon a jack receiving motion in a direction perpendicular to the string, as described, of a leaf-spring fixed at one end and applied to act at the other end against an abutment projecting laterally from the pivoted body of the plectrum for the purpose of effecting the escapement of the plectrum from the string, as described.

2. In the herein-described action for a key-board harp, the combination, with the mechanical finger or plectrum pivoted upon a vertical axis upon a jack receiving motion in a direction perpendicular to the string, as described, of escapement and counter-escapement abutments projecting laterally from the pivoted body of the plectrum, and of a leaf-spring fixed rigidly at one end and acting at the other end in opposite directions against the said abutments, the said spring being re-enforced, so as to be stiffer in one direction than the other, substantially as and for the purpose specified.

3. In the herein-described action for a key-board harp, the plectrum or mechanical finger having its acting head rigidly fixed to the pivoted body or elbow-lever by which it is carried and operated, as described, and having its acting face beveled, as described, for the purpose of facilitating its escapement from the string.

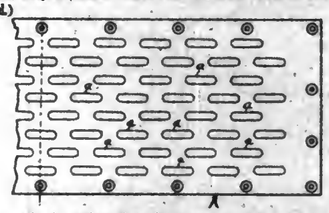
4. In an action for a key-board harp, the combination, with a lever or jack, of a hammer centered thereon, and connected thereto, as described, so as to be actuated thereby, and to have limited motion independently thereof by virtue of its own momentum, substantially as specified.

5. In an action for a key-board harp, the combination, with the hammer and its jack or lever, connected and operating as described, of the recoil and check springs, as specified.

6. A key-board harp in which the action acts partly by percussion and partly by plucking the strings, the percussive portion of the action being constructed and operating as herein specified, and being applied only at the bass-register, while the plucking part of the action is applied at the middle and upper registers, the strike-lines of the two parts of the action being continuous across the strings, as described.

7. The combination, with a key-board harp and its belly-bridge, of a mute or sourdine contiguous to the belly-bridge and applied, by means of a pedal or otherwise, against the strings while contiguous to the belly-bridge, as described.

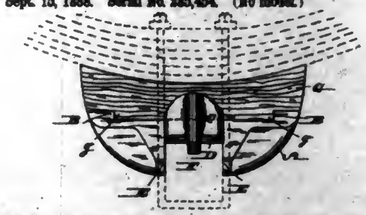
395,544. SUCTION-PLATE FOR PAPER-MACHINES. CHALMERS CHAPIN, Holyoke, Mass. Filed June 17, 1887. Serial No. 241,583. (No model.)



Claim.—1. A suction-plate for paper-machines, having within its edges a series of slots extending longitudinally of the plate, substantially as and for the purpose set forth.

2. The suction-plate A, having the slots *a*, the walls of which slots diverge from the upper to the lower surface of the plate, substantially as and for the purpose described.

395,545. SPRING-BLOCK. MORRIS W. CLARK, Camden, N. J. Filed Sept. 15, 1888. Serial No. 285,454. (No model.)



Claim.—1. A spring-block casting having the transverse shoulders B on its upper face and the vertical side flanges, C, said side flanges being integral with said block and rising above the said upper face, substantially as described.

2. A spring-block casting having the transverse shoulders B on its upper face and the upwardly-projecting flanges C on its sides, the depending flanges E, and lateral wings D, extending beyond the sides of the flanges, said flanges E and wings D forming the recess F, substantially as and for the purpose set forth.

3. A spring-block casting having the vertical flanges for embracing the sides of the block to prevent lateral movement thereof, the lateral wings adjacent to the vertical flanges for supporting the casting on the axle, and the depending flanges providing a recess to receive the axle, all arranged substantially as described.

395,546. ELECTRIC CABLE. WILLIAM A. CONNER, Pittsburg, Pa. Filed July 30, 1888. Serial No. 281,384. (No model.)



Claim.—1. In an electric cable, the combination of one or more insulated electric conductors, a lead covering surrounding the conductor or conductors, and a coating or surfacing formed of a metal more durable than the lead and covering the same, substantially as set forth.

2. In an electric cable, the combination of one or more insulated electric conductors, a lead covering surrounding the conductor or conductors, and a coating or surfacing of tin or alloy thereof for the lead covering, substantially as set forth.

395,547. TRACTION-TONGUE FOR THRASHING-MACHINES. HENRY COOPRIDER, Jr., Clay City, Ind. Filed July 31, 1888. Serial No. 281,543. (No model.)

395,547.



Claim.—1. The combination of the pivoted tongue, the bar provided with braces, the chain connected to the braces, the sprocket-wheel around which the chain passes, the toothed wheel, and an operating-pinion for turning the tongue in any desired direction, substantially as shown.

2. The combination of the stationary bar, the braces secured thereto, the sprocket-wheel, the chain, the perforated wheel secured to the shaft of the sprocket-wheel, the operating-pinion, and a locking-lever whereby the wheels can be locked in any desired position, substantially as described.

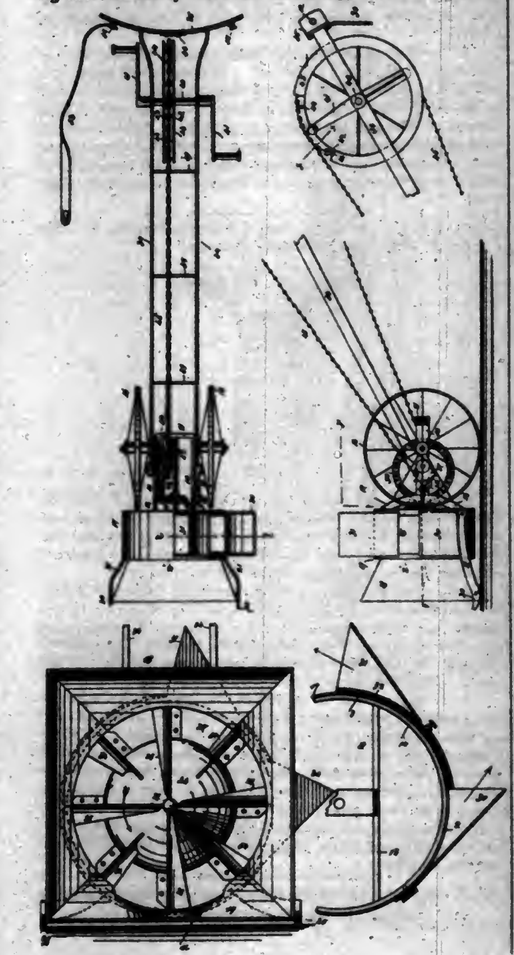
395,548. SNOW-PLOW. JOSEPH CORBETT, New York, N. Y., assignor to George H. Hobart, Jersey City, N. J., and Samuel G. Donaldson, New York, N. Y. Filed Feb. 13, 1888. Serial No. 263,761. (No model.)

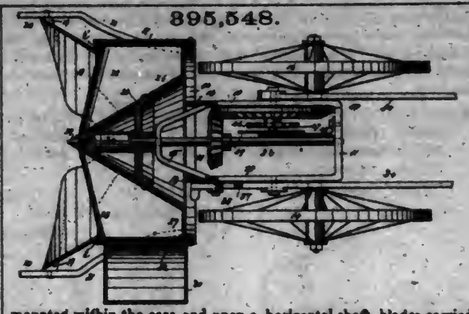
Claim.—1. In a snow-plow, a revoluble head provided with a series of blades, 26, and second series of short blades, 54, substantially as described.

2. In a snow-plow, a conical revoluble head provided with a series of blades, 26, and a second series of short blades, 54, substantially as described.

3. In a snow-plow, the combination, with a supporting-frame, of carrier-wheels upon which the frame is mounted, handle-bars pivotally connected to the frame, a rack formed at the lower end of one of the bars, and a weighted pawl pivotally connected to the frame and arranged to engage the rack, as and for the purpose stated.

4. In a snow-plow, the combination, with a main frame, of an apertured case carried thereby and formed with a forwardly-extending hood, runners by which the hood is supported, a conical head



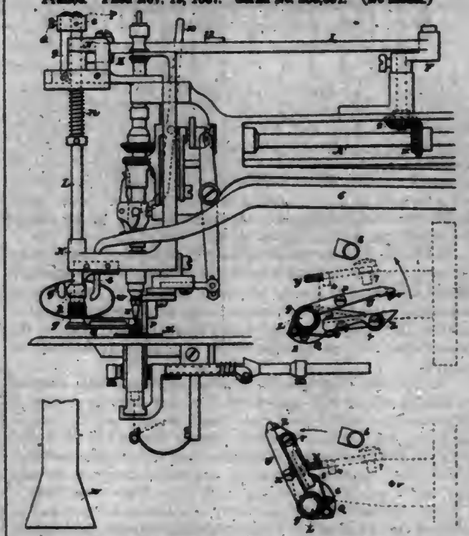


mounted within the case and upon a horizontal shaft, blades carried by the head, a gear carried by the horizontal shaft, a transverse shaft, a gear and sprocket wheel carried thereby, the gear of the transverse shaft engaging the gear of the horizontal shaft, a crank-shaft carrying a sprocket-wheel, and a drive-chain running in engagement with the two sprocket-wheels, substantially as described.

5. In a snow-plow, the combination, with a blade-carrying head and a means for revolving the head, of a case surrounding the head, and a flange, *i*, the lower portion of which is cut away, said flange being connected to the forward edge of the case, substantially as described.

6. In a snow-plow, the combination, with a revoluble blade-carrying head, of an open-faced case provided with hooded openings, one at the side and one at the top of the case, and a cover or slide arranged to close either of said openings and open the other, substantially as set forth.

395,549. EMBROIDERING-MACHINE. EMIL CORNELY, Paris, France. Filed Nov. 19, 1887. Serial No. 255,831. (No model.)



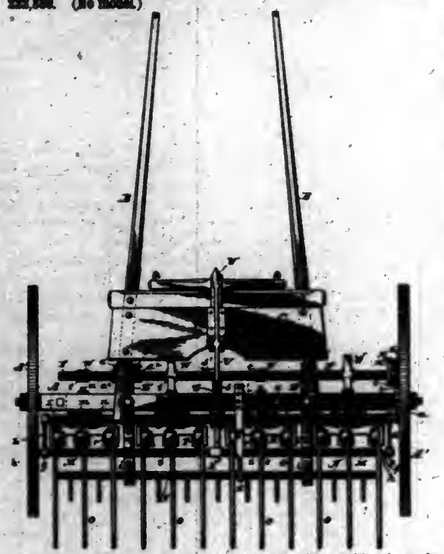
Claim.—1. The combination, with the stitch-forming mechanism, cutters, and means for operating said cutters to sever the thread at each ascent of the needle, of pliers composed of two jaws adapted to open and close, a vertical shaft carrying said pliers, connections for giving said shaft one complete oscillation for each reciprocation of the needle, devices for opening and closing said jaws at the proper times, a receptacle for receiving the cut threads at one end of the path of movement of said pliers, and a blast-pipe, substantially as described.

2. The combination, with the stitch-forming mechanism, including the reciprocating needle and nipple, and cutters arranged to sever the needle-thread at the completion of each stitch, of an oscillating shaft, a pair of pliers composed of two jaws carried by said shaft, one of said jaws being elastic or yielding, so that it can pass the nipple when the pliers are swung back into position to seize the thread, a projection—such as a pivoted latch—in the path of said pliers for opening said jaws to release the thread, and connections, as specified, for oscillating said shaft and the pliers carried thereby, substantially as described.

3. The combination, with the feed, feed-bar, and lever for rais-

ing the same, of the lever 10, having one end in proximity to said feed-lever, and a projection on one of the moving parts adapted to strike said lever 10, and through it to release the feed-bar from said feed-lever as soon as the machine is put in operation, substantially as described.

395,550. COMBINED HAY TEDDER AND RAKE. SAMUEL L. DEBNEY, Lancaster, Pa., assignor to Israel L. Landis, same place, and the Ohio Rake Company, Dayton, Ohio. Filed Dec. 20, 1886. Serial No. 222,880. (No model.)



Claim.—1. In a horse hay rake and tedder, the combination, with an axle, rearwardly-projecting limbs rigidly secured to said axle, the ground-wheels on the axle, and draft attachment, of a driving gear-wheel, a meshing pinion, a longitudinally-adjustable tappet-supporting shaft located in front and below the axle, a tooth-supporting shaft mounted in bearings on said rearwardly-projecting limbs, tooth-section plates mounted on the rear shaft, and corresponding tappets mounted on the front shaft, the tappets being adapted to bear on and elevate the tooth-plates, substantially as set forth.

2. The combination, with an axle, forwardly-projecting limbs carrying a tappet-shaft, the latter adapted to be moved endwise a limited distance, and a series of tappets mounted on said shaft, of rearwardly-projecting limbs secured to the axle, a shaft mounted in said limbs, and tooth-plates on the shaft adapted to be engaged by the tappets when the machine is operating as a tedder, substantially as set forth.

3. In a horse hay-rake, the combination, with an axle mounted on wheels and a driving gear-wheel, of a shaft carrying a series of independently-movable tooth-plates, teeth secured to said plates, a bar having hooks or loops adapted to engage the teeth of the several series and lock them against independent movement, a longitudinally-movable shaft carrying a gear-wheel adapted to engage the driving-gear, and tappets mounted on said shaft, substantially as set forth.

4. In a horse hay rake and tedder, the combination, with an axle and a rake-head mounted on a shaft, of a forked bracket-plate made to straddle a boss on a lever rigidly secured to the head-sustaining shaft, so as to permit a rise-and-fall motion of this lever, and at the same time prevent an end-play of the tooth-sustaining shaft, substantially as set forth.

5. In a horse hay-rake, the combination, with an axle and the two rearwardly-projecting limbs secured thereto, of a longitudinally-adjustable tappet-shaft, a tooth-supporting shaft journaled in boxes in said rearwardly-projecting limbs, tooth-sections mounted on said shaft and adapted to be engaged by tappets on the tappet-shaft, and a clearer-bar journaled in the outer ends of the limbs, substantially as set forth.

6. In a horse hay rake and tedder, the combination, with an axle, rearwardly-projecting limbs secured thereto, a tooth-supporting shaft journaled in boxes in the limbs, and a clearer-bar journaled in said limbs, near the rear ends thereof, of the longitudinally-adjustable tappet-shaft and the tappets mounted thereon to engage the arms of the tooth-sections, substantially as set forth.

7. In a horse hay rake and tedder, the combination, with an axle, a suitable draft attachment, and two wheels mounted on the axle, of a gear-actuated longitudinally-adjustable tappet-shaft located in front of the axle, rearwardly-projecting limbs secured to the axle, a series of tooth-sections mounted on a shaft journaled in rearwardly-projecting limbs, tappets mounted on the tappet-shaft and adapted to engage the tooth-sections and elevate them a limited distance, and a clearer-bar journaled in said limbs and provided with its downwardly-projecting teeth, substantially as set forth.

8. In horse rake and tedder, the combination, with a toothed section-plate having projections for two or more teeth, each projection having a substantially U-shaped groove in its face and a centrally-located spacing-flange between the ends of said groove, said flange being cut away at its forward end to form a seat for a washer, of a tooth bent into U form at its upper end, and a washer, bolt, and nut for each tooth, substantially as set forth.

9. In a horse rake and tedder, the combination, with an axle, a longitudinally-adjustable tappet-shaft mounted in front of the axle, and tappets secured thereon, of the rearwardly-projecting limbs, a tooth-shaft journaled therein to the rear of the axle, tooth-sections mounted on said shaft and carrying teeth, arms rigidly secured to said tooth-sections and extending forward into the path of the tappets, and the adjustable tooth-bearing bar mounted in said arms and adapted to rest upon extensions of the rearwardly-projecting limbs when in its lowered position, substantially as set forth.

10. In a horse rake and tedder, the combination, with an axle, rearwardly-projecting arms secured thereto, and a clearer-bar journaled in said arms and provided with teeth, of an arm rigidly secured to the clearer-bar, and a link pivoted to the upper end of said arm and having a series of perforations in its forward end, said perforations being adapted to receive a pin on the axle to vary the inclination of the clearer-teeth, substantially as set forth.

11. The tooth-sections consisting, essentially, of a plate having a slotted boss or bearing and projections, each of which is grooved and perforated and provided with a spacing-flange, and the washers, bolts, and nuts for securing the teeth to the sections, substantially as set forth.

12. In a horse hay rake and tedder, the combination, with an axle, a pair of shafts, two wheels, and a platform on the shafts, of a geared longitudinally-adjustable tappet-shaft, tappets placed fixedly on this shaft, a tooth-supporting shaft, tooth-carrying section-plates mounted on this shaft, teeth affixed to these plates, the section-plates being adapted to engage with the tappets for a limited vertical movement, a tooth-bearing bar provided with a lever to operate it and raise or lower the rake-teeth, and a clearer-bar, substantially as set forth.

395,551. OIL-TANK. JOHN C. DILWORTH, Pittsburg, Pa. Filed Oct. 22, 1888. Serial No. 288,980. (No model.)

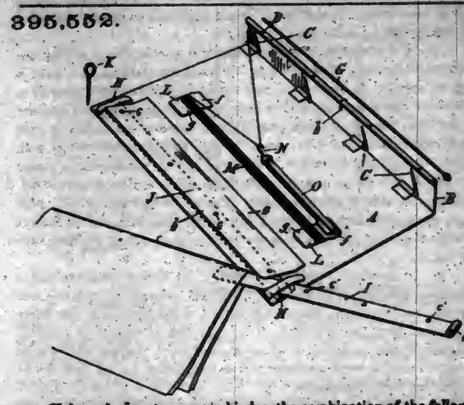


Claim.—1. The combination, with the diaphragm B of the oil-tank, provided with a waste-aperture, F, of an annular ring, G, secured in said aperture, provided with a horizontal flange, *g*, a strainer supported in said ring G, and a filtering-pocket secured to the lower end of the strainer, substantially as shown and described.

2. In an oil-tank, the combination, with the diaphragm B, having a waste-opening, F, of a strainer removably supported in said opening, said strainer consisting of a body portion, A, an apertured plate forming the top of said body, said body formed with a depending nipple, H', and a filtering-cloth extending over the mouth of said nipple, substantially as and for the purpose described.

3. As a new article of manufacture, a straining device for oil-tanks and the like, said device consisting of a ring, G, having an internal horizontal flange, *g*, said ring adapted to be secured in the waste-opening of the oil-tank diaphragm, a cup-shaped body portion, H, provided with a perforated horizontal plate across its upper face, the edge of said plate forming a flange whereby the body H may be supported on the flange *g* of the ring G, said body portion provided with a depending nipple, and a pocket, J, formed of filtering-cloth, detachably secured to said nipple, substantially as and for the purpose hereinbefore described.

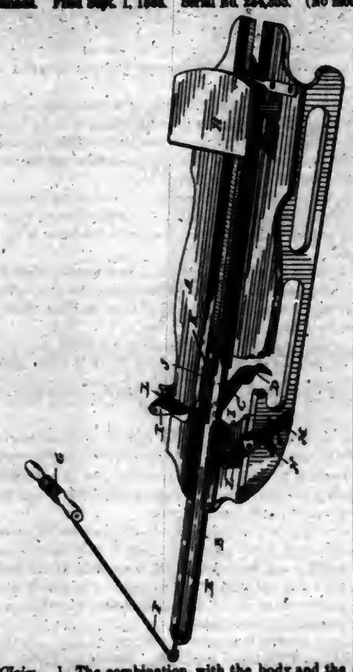
395,552. TEMPORARY BINDER. JACOB DORNBERGER, Sandusky, Ohio. Filed Sept. 19, 1888. Serial No. 285,764. (No model.)



Claim.—1. In a temporary binder, the combination of the following elements: the cover formed with the back, the thorns pivotally secured in the inner corner of the cover and back, the locking device for the thorns, the ruler removably secured upon the cover, the flap secured above the cover, the coincident holes through the flap, ruler, and cover, means for holding a supply of twine upon the cover, and the tension device of the twine, the parts being combined and arranged to operate substantially as and for the purpose described.

2. In a temporary binder, the combination, with the cover A and back B, of the thorns C, pivotally secured in the corner of the cover and back, the notched tabular seam F, formed on the edge of the back, the locking-rod G, detachably secured therein, the detachable ruler I, the loops H, secured to the cover to hold such ruler in position, the flap J, secured above the ruler, the coincident holes *c c' c''* in the flap, ruler, and cover, the ears L L, adapted to hold a supply of twine, and the hook N and spring O, forming a tension device for the twine, all the parts being arranged and constructed to operate substantially as and for the purpose described.

395,553. SLED-PROPELLER. JOHN DRAPER, Toronto, Ontario, Canada. Filed Sept. 1, 1888. Serial No. 284,303. (No model.)

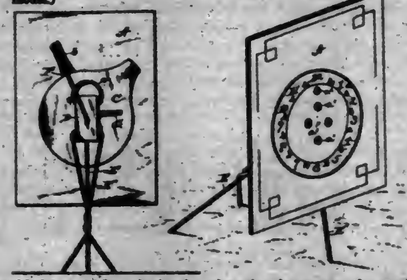


Claim.—1. The combination, with the body and the sliding bar working in guides thereon, of the leg pivoted to said bar, the foot pivoted to said leg, the rod E, parallel with the sliding bar and connected to said leg, and the rod F, pivotally connected to said rod E, substantially as described.

2. The combination, with the body and the sliding bar working in guides thereon, of the leg pivoted to said bar, the foot pivoted to said leg, the rod E, parallel with the sliding bar and connected to said leg, and the rod F, pivotally connected to said rod E, the notched holdfast K on the bar, and the chain J, fastened to the leg and engaging said holdfast, substantially as described.

3. The combination, with the body, of the arm L, pivoted to the side of said body and provided with a projection, M, and the spring N, acting on the under side of said arm, substantially as and for the purpose specified.

395,554. CHART FOR EDUCATIONAL PURPOSES. GEORGE I. REED, Wilmington, Ind. Filed Aug. 18, 1888. Serial No. 283,118. (No model.)

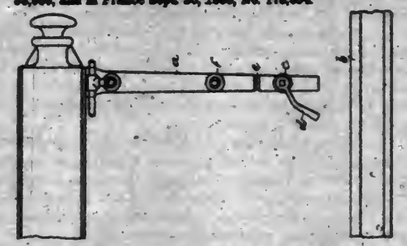


Claim.—1. In a device for educational purposes, the combination of a chart having a fixed figured dial and a number of openings, a pivot extending through the said chart, movable figured disks mounted upon the said pivot, and a block for keeping the disks in position against the chart, substantially as described.

2. In a device for educational purposes, the combination of a chart having a fixed figured dial and a number of openings, a pivot extending through the said chart, movable figured disks mounted upon the said pivot, a block for keeping the disks in position against the chart, and springs secured to the block for holding the disks at the desired point, substantially as described.

3. In a device for educational purposes, the combination of a chart having a fixed figured dial and a number of openings, a pivot extending through the said chart, movable figured disks mounted upon the said pivot, a block for keeping the disks in position against the chart, springs secured to the block for holding the disks at the desired point, and legs secured to the block to support the device, substantially as described.

395,555. AUTOMATIC BRAKE. PERCIVAL EVERITT, London, England. Filed Jan. 15, 1887. Serial No. 224,804. (No model.) Patented in England Dec. 8, 1886, No. 15,096; in Germany Sept. 19, 1886, No. 38,699, and in France Sept. 20, 1886, No. 173,694.



Claim.—1. The combination, with an air-brake pipe, of a pipe pendent therefrom, the same being weakened at a suitable point, a normally-closed valve in said pipe, and an external swinging arm connected with said valve for opening the same, substantially as set forth.

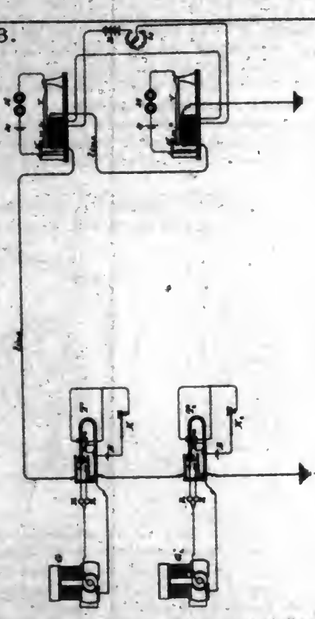
2. The combination, with an air-brake pipe, of a pipe pendent therefrom, the same being weakened at a suitable point, a normally-closed valve in said pipe, an external swinging arm connected with said valve for opening the same, and a valve for closing said pipe above said normally-closed valve and said weakened point, substantially as set forth.

395,556. VIBRATORY MULTIPLEX TELEGRAPHY. STEPHEN D. FIELD, Stockbridge, Mass. Filed June 13, 1888. Serial No. 276,994. (No model.)

Claim.—1. In a vibratory multiplex-telegraph system, two or more dynamo-electric generators having their armatures in series with each other and their fields each in plain shunt to its own armature, in combination with a group of pole-changing transmitting-keys, each adapted to change the polarity of its own generator with respect to the general circuit without opening the latter.

2. In a vibratory multiplex-telegraph system, a group of dynamo-

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electric generators in series, a corresponding group of vibratory pole-changers provided with vibrating mechanism and respectively adapted to change the polarity of their generators with respect to the general circuit at different rates of vibration, and a group of keys adapted to control the operation of the vibrating mechanism of said pole-changers.

3. In a multiplex-telegraph system, a pole-changing transmitter having two magnetic contact-levers and a vibrating magnet interposed between them adapted to exert an attractive effect on said levers, in combination with suitable pole-changing contacts on said levers and magnet, whereby springs may be dispensed with and their disturbing effects prevented.

4. In a multiplex-telegraph system, a pole-changing transmitter having iron contact-levers inductively polarized at their pivoted ends and a vibrating magnet-pole between their free ends, in combination with suitable pole-changing contacts on said levers and magnet, the polarity of said free ends and said interposed magnet-pole being of opposite sign, so as to produce mutual attraction of the levers toward said interposed magnet-pole, substantially as described.

5. In a vibratory telegraph system, a pole-changing transmitter composed of a U-magnet having suitable contact devices, an electro-magnet interposed between the legs of said magnet, and a local battery and key in circuit locally with said electro-magnet, whereby the operation of the key in the local circuit starts the U-magnet in vibration or stops it, according to position.

6. In a vibratory telegraph system, a pole-changing transmitter comprising, with suitable circuiting devices, a vibrator whose vibrations are controlled by intermittent magnetic attractions, in combination with an electro-magnet in circuit locally with a local battery and a key adapted to send the local current through said magnet, and thus control the vibrator, substantially as described.

7. In a vibratory telegraph system, a pole-changing transmitter comprising, with suitable circuiting devices, a tuned fork having between its legs an electro-magnet energized by a local battery and having a neutralizing-coil in addition to its energizing-coil, and contacts suitably arranged, the whole so constructed and adapted for operation that when said electro-magnet is energized it attracts said fork, and thereby closes the circuit of the neutralizing-coil and the attraction thereupon ceases, and thus the fork is automatically vibrated.

8. A relay or repeater for vibratory current impulses, consisting of a coil in the main line, a diaphragm arranged for free and unobstructed vibration responsively to said vibratory current impulses and located within inductive range of said coil, a local circuit having automatically-adjustable contacts actuated by said diaphragm, but depending for adjustment on devices in the local circuit, and receiving devices in said local circuit.

9. In a vibratory multiplex-telegraph system, a combined tone receiving and distributing apparatus comprising a coil in the main line, a vibratory diaphragm of inductive material arranged for free and unobstructed vibration responsively to all current changes in said coil, a local circuit having adjustable contacts actuated by said diaphragm, but dependent for adjustment on devices in the local circuit, one or more relays in said local circuit, and local sounders controlled by the relays.

10. In a vibratory multiplex-telegraph system, the receiving apparatus comprising the following elements in combination: first, a coil or helix in the main line, and within inductive range thereof a vibratory diaphragm capable of responding to the changes of current in the line; second, a single pair of back contacts controlled by said diaphragm and included in a local circuit containing tone-relays, and, third, a group of tone-relays in the local circuit respectively adapted to vibrate at rates corresponding to those of the various transmitting instruments, said diaphragm being adapted to operate its back contacts in accordance with the impulses on the main line, and said relays being adapted to selectively respond to the local current impulses thus set up.

11. A repeater or relay composed of an electro-magnetic coil, a vibrating diaphragm responsive to current changes in said coil and having back contacts, one moved by the diaphragm and the other controlled by a thermic wire or rod adapted to expansion and contraction by the presence or absence of current therein, and a local circuit including said contacts and thermic wire or rod and one or more receiving-instruments.

12. A vibratory or harmonic repeater or relay comprising, with a diaphragm and its actuating coil or coils, a wire controlling the back or local contacts and in the local circuit and adapted to be momentarily expanded by the local currents, substantially as described.

13. In a repeater or relay wherein the line-currents effect the vibration of a diaphragm, the combination therewith of a thermic wire in a local circuit containing a battery and contact devices for said local circuit controlled by the thermic wire, but actuated by the diaphragm, and mechanical connections between said thermic wire and contact device.

14. In a repeater or relay wherein the line-currents effect movement of one member of the relay, the combination, with such member, of a thermic wire in a local circuit containing a battery and contact devices for said local circuit controlled by the thermic wire, but actuated by said movable member, and mechanical connections between said thermic wire and contact device.

15. In a vibratory telegraph system, a tone-receiver comprising a tuned vibrating tongue or fork having suitably-arranged sounder-contacts and carrying an actuating annular helix fixed to said tongue and located in an annular field of force, whereby said helix sets the tongue vibrating in response to the current impulses sent through it.

16. In a vibratory telegraph system, a tone-receiver comprising a tuned vibrating fork having an actuating annular helix fixed to it, in combination with a tubular field-magnet for polarizing the field in which said helix moves.

17. In a vibratory telegraph system, a tone-receiver comprising a tuned vibrating fork having an actuating annular helix fixed to it in an annular field of force and a second annular helix stationary in the same field, both said helices being included in a common circuit, and one helix movable in said field.

18. In a vibrating telegraph system, a tone-receiver composed of two similar reeds, each carrying an annular helix, the two helices being in circuit together and arranged one inside the other in the same field of force.

19. In a vibratory telegraph system, a tone-receiver composed of two similar reeds, each carrying an annular helix, the two helices being in circuit together in the same field of force and the reeds being adjustable as to pitch.

20. In a vibratory telegraph system, a combined tone-receiver and relay composed of two similar reeds of the same pitch, each carrying an actuating-helix, both helices being in circuit together in the same field of force and each reed provided with one of a pair of contacts for the local circuit.

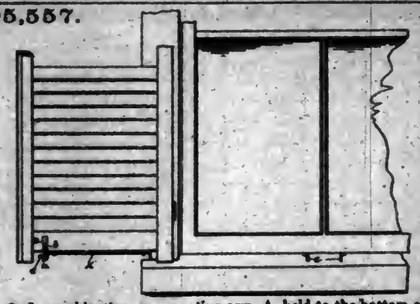
21. In a vibratory telegraph system, a group of two or more tone-receivers of different pitch in the local circuit of a general repeating-instrument adapted to respond to and analyze the line-currents and repeat them into the local circuit, in combination with a local battery and sounders, one for each tone-receiver.

22. A receiving-instrument for alternating current impulses, consisting of a vibratory diaphragm and a pair of coils wound side by side and controlling said diaphragm, both coils being at one end connected to earth and at the other to the terminals of a battery to which the main line is connected at an intermediate point, whereby magnetic lag in such instrument is eliminated.

395,557. SHUTTER-FASTENER. GEORGE F. FOLSOM, Boston, Mass. Filed Sept. 17, 1888. Serial No. 285,696. (No model.)

Claim.—1. A shutter-fastener consisting of an operating-arm, A, a loop, *a*, adapted to engage with a locking-catch in the open and closed positions of the shutter, and a spring-extension for one end of the loop *a*, for holding said loop normally in a position to engage with the holding-catches, substantially as described.

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2. In combination, an operating-arm, A, held to the bottom of a shutter, a depending loop, *a*, having a spring-extension, *b*, with its bearings in a recess in the shutter, and holding-catches on the outer wall and window-sill in line with the loop *a*, substantially as described.

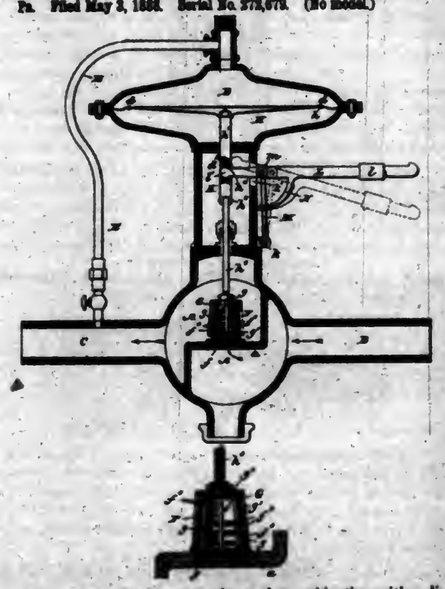
395,558. BOTTLE-STOPPER. GEORGE A. FULLERTON, Boston, Mass., assignor to the Pacific Bottle Stopple Company, of New York. Filed Feb. 4, 1888. Serial No. 262,973. (No model.)



Claim.—1. The bottle-stopper above described, composed of the ball D, with spring-legs *d*, and the holding device F, fast to the bottle, the legs of the ball extending down through the holding device and springing outwardly, as and for the purpose specified.

2. In a bottle-stopper, the combination of stopple B, with ball D, having its legs *d* hinged at *d'*, and holding device F, all substantially as described.

395,559. PRESSURE-REGULATOR. LOUIS R. FULTON, Pittsburg, Pa. Filed May 3, 1888. Serial No. 273,079. (No model.)



Claim.—1. In a pressure-regulator, the combination, with a diaphragm adapted to receive pressure from the pressure-regulator chamber, of a hollow valve-seat slightly tapered from its base to its top, and provided with an opening through its side wall, the valve adapted to fit the exterior wall of the valve-seat, and the valve-operating rod connecting the valve with the diaphragm, whereby the valve is relieved of frictional resistance when raised, but is not subject to any considerable lift from the high-pressure side when seated, substantially as set forth.

2. In a pressure-regulator, the combination, with a diaphragm adapted to receive pressure from the pressure-regulator chamber, of a slightly-tapered valve-seat provided with an opening through its side wall, the valve adapted to fit the exterior wall of the valve-seat, and provided with an opening in its side wall to register with the opening in the valve-seat when the valve is open, and the valve-operating rod connecting the valve with the diaphragm, whereby the valve is relieved of frictional resistance when raised, but is not subject to any considerable lift from the high-pressure side when seated, substantially as set forth.

3. In a pressure-regulator, the combination, with a diaphragm adapted to receive pressure from the pressure-regulator chamber, of a slightly-tapered valve-seat provided with a series of annular openings through its wall, the valve adapted to fit the exterior wall of the valve-seat and provided with a series of annular openings adapted to register with the openings in the valve-seat when the valve is open, and the valve-operating rod connecting the valve with the diaphragm, whereby the valve is relieved of frictional resistance when raised, but is not subject to any considerable lift from the high-pressure side when seated, substantially as set forth.

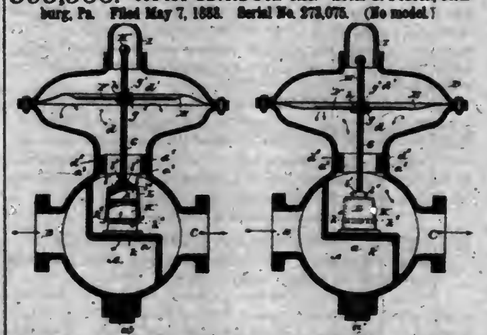
4. The combination, with a valve under pressure from the gas tending to close the valve, of a lever having a detachable connection with the valve and adapted to hold the valve open against the gas-pressure, a movable support for the lever, and means for moving the said support when the gas-pressure is removed, substantially as set forth.

5. The combination, with a diaphragm subject to gas-pressure from a gas-distributing pipe, a valve in connection with said diaphragm, and a lever having a detachable connection with the connected valve and diaphragm, of a movable support for the lever and means for automatically moving the said support when the gas-pressure is removed, substantially as set forth.

6. The combination, with the valve, the diaphragm connected therewith, and the lever having a detachable connection with the connected valve and diaphragm, of a vibrating support for the lever and means for vibrating the said support as the lever is tilted, substantially as set forth.

7. The combination, with the valve, the diaphragm connected therewith, and the lever having a detachable connection with the connected valve and diaphragm, of a swing-link forming a support for the lever, and an arm on the lever, whereby the swing-link support is automatically swung past center as the lever is abnormally tilted, and the lever thereby detached from the connected valve and diaphragm, substantially as set forth.

395,560. CUT-OFF DEVICE FOR GAS. LOUIS R. FULTON, Pittsburg, Pa. Filed May 7, 1888. Serial No. 273,075. (No model.)



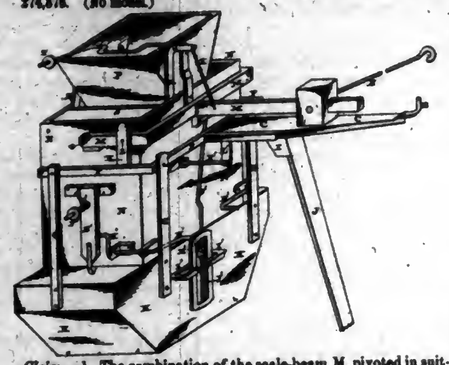
Claim.—1. The combination, with a hollow valve-seat slightly tapered from its base toward its top and provided with an opening through its side wall, of a tapered valve fitted to shut down over the valve-seat, and means in connection with the gas-pressure for holding the valve normally raised from its seat, whereby the valve is relieved of frictional resistance when raised, but is not subject to any considerable lift from the high-pressure side when seated, substantially as set forth.

2. The combination, with a hollow valve-seat slightly tapered from its base toward its top and provided with an opening through its side wall, of a valve fitted to shut down over the valve-seat, a diaphragm under gas-pressure from beneath it, and a connection between the valve and the diaphragm, whereby the valve is held normally suspended and relieved of frictional resistance, but is not subject to any considerable lift from the high-pressure side when seated, substantially as set forth.

3. The combination, with the slightly-tapered valve-seat provided with an annular series of openings in its side wall, of the valve fitted to shut tightly over the valve-seat and having openings in its top, a diaphragm under pressure, and a connection between the diaphragm and valve, substantially as set forth.

395,561. MACHINE FOR AUTOMATICALLY WEIGHING GRAIN.

HORACE M. FULWIDER, Redmon, Ill. Filed May 22, 1886. Serial No. 274,578. (No model.)



Claim.—1. The combination of the scale-beam M, pivoted in suitable bearings connected to the support C, with the box N, which is pivoted upon the ends of the scale-beam, the automatically-operating bottoms for closing the lower ends of the compartments in the box N, catches for supporting the bottoms in position, tripping-rods for operating the catches, and pivoted blocks connected to the rod which extends downward from the scale-beam, substantially as described.

2. The combination of the scale-beam pivoted in suitable bearings, the box N, divided by a partition into two compartments, the hopper, a bent shaft which passes through the upper portion of the hopper, a weight connected to the shaft, rods connected to the shaft and to the cut-off which closes the bottom of the hopper, and a chain connected to a crank on the shaft and to the scale-beam, substantially as specified.

3. The combination of the hopper, the bent partially-revolving shaft placed therein, a weight connected to this shaft, a cut-off operated by the shaft, and a chain connected to the shaft and to the scale-beam, substantially as specified.

4. The combination of the hopper, the box N, divided by a vertical forked partition into two compartments, the shaft C, having the bottoms B' secured thereto, a crank, D', upon the end of the shaft, the connecting-rod, the crank Z', and the deflector Y, substantially as shown.

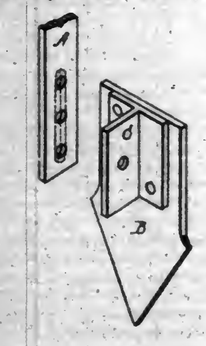
5. The combination of the box N, divided by a vertical partition into two compartments, the shaft C', the bottoms B', connected to the shaft, the catches E', the rods H', for operating the catches E', the vertically-moving rods, and the automatically-operating tripping-blocks pivoted to the vertically-moving rod secured to the scale-beam, substantially as described.

6. The combination of the box N, divided by a vertical partition into two compartments, the shaft C', the bottoms B', connected to the shaft, the crank M', secured to one end of the shaft and provided with suitable guiding eyes or loops, the vertically-moving rod J', connected to the scale-beam, the tripping-blocks secured thereto, the bent rods H', and the catches E', substantially as set forth.

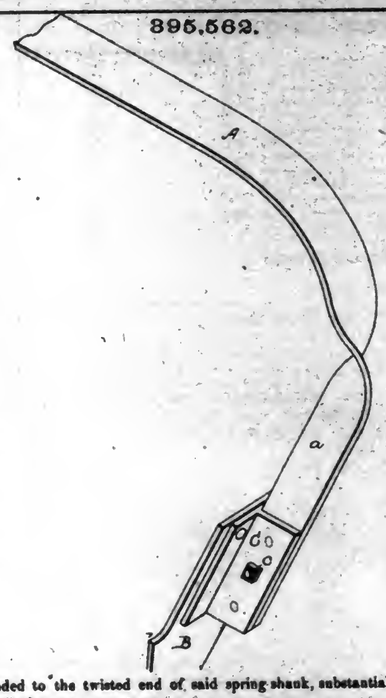
395,562. SPRING-TOOTH FOR CULTIVATORS.

HORATIO GALE, Albion, Mich., assignor to the Albion Manufacturing Company, same place. Filed Oct. 8, 1883. Serial No. 287,517. (No model.)

Claim.—A spring-tooth for cultivators, consisting of a spring-shank turned near its lower end at right angles to itself so as to present its edge to the front, and a shoe having a web or flange projecting back at right angles to its face parallel with and adapted to be fastened to the twisted end of said spring-shank, substantially as described.



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395,563. RAISED STONE INCRUSTED LETTER.

CHARLES GOSLING, Brooklyn, N. Y. Filed Sept. 3, 1883. Serial No. 284,962. (No model.)



Claim.—As a new article of manufacture, an onyx or other stone for jewelry, the same having a letter or other design in metal incrusted or inlaid in the stone, said design having a border of stone completely surrounding the same, the design and the border being in relief, raised above the surface of the surrounding stone, substantially as set forth.

395,564. SPONGE-TOP BOTTLE.

ISAAC N. HALEY, Baltimore, Md. Filed Nov. 1, 1888. Serial No. 289,727. (No model.)



Claim.—A sponge-spreader for bottles having, in combination, a cork for insertion in the neck of a bottle and provided with a passage, *d*, a tapered plug, *c*, inserted in the cork-passage, a sponge, F, connected directly to the top of the cork, and a tabular metal union, G, which surrounds both sponge and cork and is fastened to the cork to prevent separation.

395,565. STEERING APPARATUS.

JOHN HAYES, St. Louis, Mo. Filed Apr. 6, 1888. Serial No. 269,826. (No model.)

Claim.—1. In a steering device for boats, the combination, with the pilot-wheel, of tension-rollers adapted to bear against said wheel and toggle-levers for enforcing and a spring for releasing the tension of said rollers on said wheel, substantially as and for the purpose set forth.

2. In a steering device for boats, the combination, with the pilot-wheel and tension-rollers adapted to bear on opposite sides of said wheel, of toggle-levers for enforcing and a spring for releasing the tension of said rollers upon said wheel, and an engine for rotating said rollers to turn said wheel, substantially as set forth.

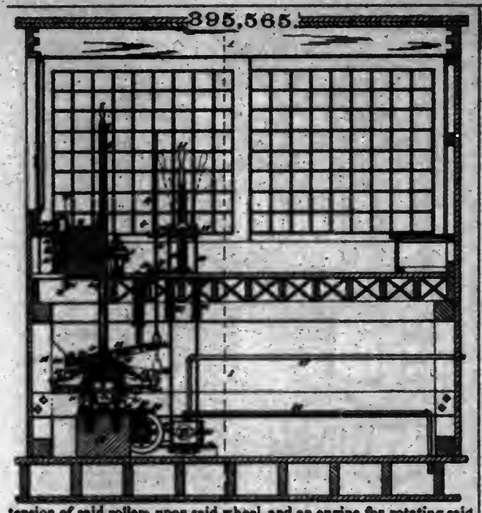
3. The combination, with the pilot-wheel and shaft upon which it is mounted, of the pinion on said shaft, a segment-rack engaged by said pinion, a finger carried by said rack, and bells arranged to be sounded by the movement of said finger, as set forth.

4. In a steering device for steamboats, the combination of the tension-rollers, the push-rods 29, the grip-bolts 30, that lock the push-rods, and connecting-levers and toggle-links for enforcing and releasing the tension of the rollers, substantially as and for the purpose set forth.

5. In a steering device for steamboats, the combination of the tension-rollers, means for enforcing and releasing their tension, throttle-lever 48, and reciprocating piston-rods 50, an engine whose reciprocating valves are operated by said rods, a drive-shaft, 51, actuated by said engine, the gear driven by said shaft, and the vertical shaft 24 of the tension-rollers arranged, as the throttle-lever is thrown relatively to the one hand or to the other, to rotate the rollers in corresponding directions, and when said rollers are under tension to turn the pilot-wheel and the rudder it commands to either hand, as required, substantially as and for the purpose set forth.

6. In a steering device for steamboats, the tension-rollers, means for enforcing and releasing their tension, means for utilizing steam-power from an engine by the throw of the throttle-lever in either direction to turn said tension-rollers and pilot-wheel against which they press, and the rack 11, trip-finger 12, and pivoted triggers 13, that as the pilot-wheel turns are actuated by their connecting-gear to trip the hammers 14 and strike the bells 15 to record the position of said rudder, substantially as and for the purpose set forth.

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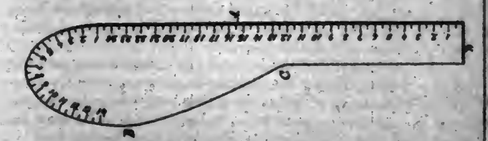
395,566. DRESS-CUTTER'S SCALE.

REBECCA HURDLE, Washington, D. C. Filed Oct. 12, 1888. Serial No. 287,898. (No model.)

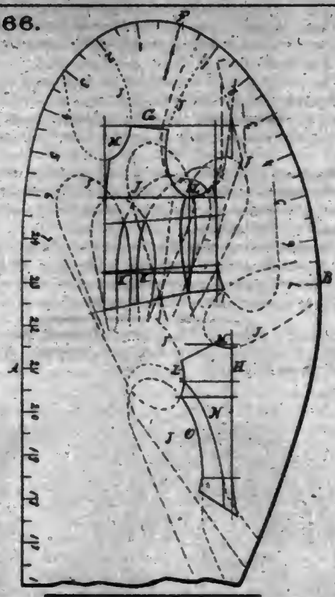
Claim.—1. A dress-cutter's scale of semi-elliptical form at one end, and having one edge extending in a straight line tangent from one side of the said semi-ellipse and the other edge sloping inward on a long graceful curve from the other side of the said semi-ellipse to a narrow point about midway the scale, the remaining portion of the scale being narrow, substantially as shown and described.

2. A dress-cutter's scale having curved edges, substantially as described, and provided with a diagram of a dress-pattern printed on it, and showing the outline of the said scale in various positions partly coinciding with the curves of the pattern, substantially as shown and described.

3. The combination of a dress-cutter's scale having curved edges and a printed diagram showing a dress-pattern and the outline of the said scale in various positions partly coinciding with the curves of the pattern, substantially as shown and described.

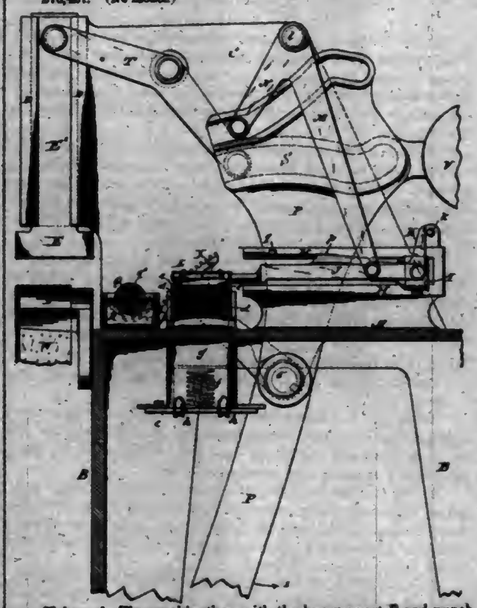


395,566.



395,567. MACHINE FOR APPLYING CORNER-STAYS TO BOXES.

GUSTAV L. JAEGER, New York, N. Y. Filed Apr. 12, 1888. Serial No. 270,427. (No model.)



Claim.—1. The combination, with the box-support F and punch E, of the holder G, the fountain R, the transmitter Q, the picker L, and mechanism, substantially as described, for imparting motion to the picker and to the punch.

2. The combination, with the box-support F and the punch E, of the holder G, the fountain R, the rotary transmitter Q, the picker L, and mechanism, substantially as described, for imparting motion to the picker and to the transmitter.

3. The combination, with the box-support F and the punch E, provided in its working-face with the cavity *b*, of the picker L, composed of two hinged wings, *j j'*, and mechanism, substantially as described, for imparting motion to the picker and to the punch.

4. The combination, in a machine for applying corner-stays to boxes, of a box-support, a reciprocating punch for pressing the stay on the box, a holder for containing the stays, a reciprocating picker

for picking up the stays from the holder and carrying them to the box, and means, substantially as described, for operating the punch and the picker.

5. The combination, in a machine for applying corner-stays to boxes, of a box-support, a reciprocating punch, a holder for containing the stays, a reciprocating picker for picking up the stays from the holder, and means, substantially as described, for rendering the stays adhesive.

6. The combination, with a reciprocating punch, a box-support and a holder for the corner-stays, of a picker for carrying the stays from the holder to the box, and means, substantially as described, for rendering the picker adhesive.

7. The combination, with the box-support F, the punch E, the fountain R, the transmitter Q, and the picker L, of yielding projections *l'*, fitted in the picker, and mechanism, substantially as described, for imparting motion to the punch and to the picker.

395,568. CAR-WHEEL. SAMUEL B. JEROME, New York, N. Y., assignor of one-half to Thomas F. Rowland, same place. Filed Sept. 15 1888. Serial No. 285,479. (No model.)



Claim.—1. In a car-wheel, the combination, with a hub and tire, of an annular spring arranged between the same, bearings for the spring arranged between the inner face thereof and the hub, and similar bearings arranged between the outer face of the spring and the tire, and located intermediate to the positions of the bearings on the hub.

2. In a car-wheel, the combination, with the hub and tire, of an annular spring arranged between the same, bearings for the spring, arranged between the inner face thereof and the hub, similar bearings arranged between the outer face of the spring and the tire and located intermediate to the position of the bearings on the hub, and side plates bolted to the hub and to each other.

3. In combination, in a car-wheel, a hub having radial projections, an annular spring supported upon the projections, cylindrical sleeves arranged between the springs and the tire and located intermediate to the positions of the said projections, and side plates which are bolted to the hub and to each other through said sleeves.

395,569. MACHINE FOR CUTTING FLANGED BEAMS. JULIAN KENNEDY, Latrobe, Pa. Filed Oct. 29, 1888. Serial No. 289,406. (No model.)

Claim.—1. In a machine for cutting the flanges of flanged beams, a plunger or knife-head having oppositely-directed right and left knives for separately cutting the right and left flanges of the beam, substantially as and for the purposes described.

2. In a machine for cutting the flanges of flanged beams, a plunger or knife-head having knives on opposite sides thereof for separately cutting the right and left flanges of the beam, in combination with bed-knives adapted to act in conjunction therewith, substantially as and for the purposes described.

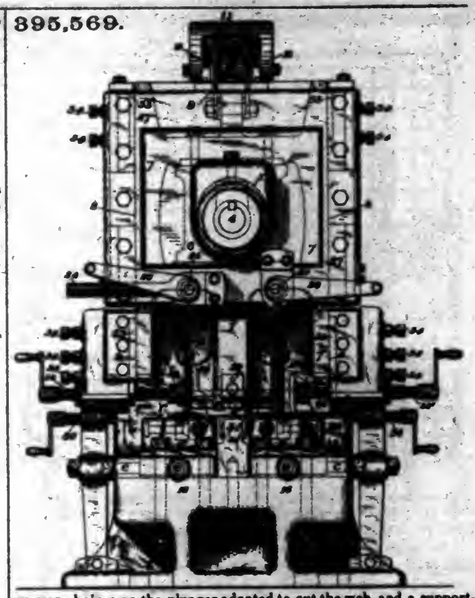
3. In a machine for cutting the ends of flanged beams, a moving knife and a bed-knife, each of angular shape, having a blade which cuts the flange of the beam transversely, and a blade which cuts the flange longitudinally in proximity to the web, substantially as and for the purposes described.

4. In a machine for cutting the flanges of flanged beams, a plunger having a laterally-projecting knife, and adjusting mechanism by which the web of the beam is held against the side of the knife, substantially as and for the purposes described.

5. In a machine for cutting the flanges of flanged beams, a plunger having a laterally-projecting knife, and adjusting mechanism by which the web of the beam is held against the side of the knife, said plunger being recessed to permit insertion of the beam beneath the knife within the limits of the plunger, substantially as and for the purposes described.

6. In a machine for cutting the ends of flanged beams, a plunger or knife-head having a knife on each side thereof for separately cutting the right and left flanges of the beam, in combination with one

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or more knives on the plunger adapted to cut the web, and a supporting block or anvil adapted to support the beam vertically during cutting of the flanges and to support the same horizontally during the cutting of the web, substantially as and for the purposes described.

7. In a machine for cutting the ends of flanged beams, the combination of a bed-knife having cutting-edges *d d'*, formed at an angle to each other, and an outer cutting-edge, *e*, and moving knives set on a single plunger, one of which knives acts in conjunction with the cutting-edges *d* and *d'*, while the other works in conjunction with the cutting-edge *e*, substantially as and for the purposes described.

8. In a machine for cutting the ends of flanged beams, the combination of right and left bed-knives oppositely placed, each having cutting-edges *d* and *d'*, formed at an angle to each other, and an outer cutting-edge, *e*, and right and left moving knives set on a single plunger and adapted to work in conjunction with the bed-knives, substantially as and for the purposes described.

9. In a machine for cutting the ends of flanged beams, the combination of a supporting-anvil adapted to receive the web of the beam and made of narrow surface, so as to be capable of receiving beams of different widths, knives for cutting the said web, and a stop adjacent to the supporting-anvil, against which the lateral edge of the beam abuts, substantially as and for the purposes described.

10. In a machine for cutting the ends of flanged beams, the combination of a supporting-anvil adapted to receive the web of the beam and made of narrow surface, so as to be capable of receiving beams of different widths, knives for cutting the said web, a stop adjacent to the supporting-anvil, against which the lateral edge of the beam abuts, and an adjusting-screw by which the beam is held against the stop, substantially as and for the purposes described.

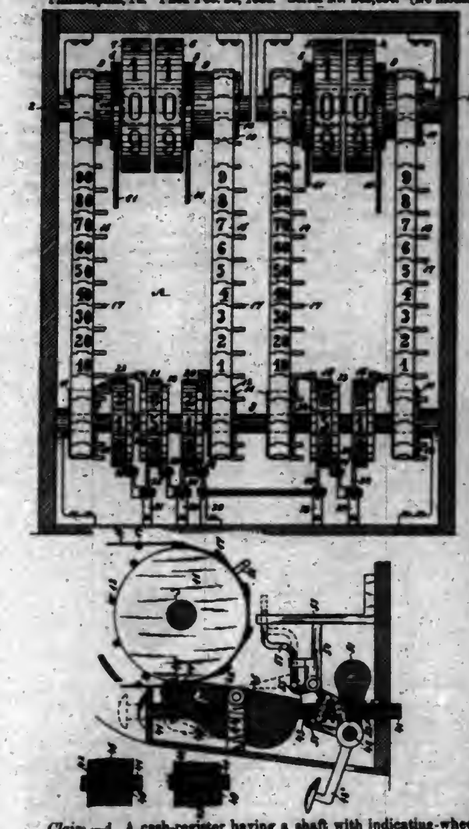
11. In a machine for cutting the ends of flanged beams, the combination of a supporting-anvil adapted to receive the web of the beam and made of narrow surface, so as to be capable of receiving beams of different widths, knives for cutting the said web, a stop adjacent to the supporting-anvil, against which the lateral edge of the beam abuts, and adjusting mechanism—such as liners—by which the distance between the stop and the anvil is variable, substantially as and for the purposes described.

12. In a machine for cutting the ends of flanged beams, the combination, with a supporting block or anvil for receiving the web of the beam, of knives for cutting the web, and a clamping-post which bears upon the web, substantially as and for the purposes described.

13. In a machine for cutting the flanges of flanged beams, a plunger or knife-head having on each side thereof a laterally-projecting portion, and a knife for separately cutting the right and left flanges of the beam, said laterally-projecting portions fitting in suitable slideways and extending to or nearly to the bases of the knives, substantially as and for the purposes described.

14. In a machine for cutting the ends of flanged beams, the combination, with right and left supporting blocks or anvils for receiving the web of the beam, of knives for cutting said web, and a stop between the said anvils, against which the lateral edge of the beam on either anvil abuts, substantially as and for the purposes described.

395,570. CASH INDICATOR AND REGISTER. GEORGE F. KOLB, Philadelphia, Pa. Filed Feb. 20, 1888. Serial No. 265,050. (No model.)



Claim.—1. A cash-register having a shaft with indicating-wheel loosely mounted thereon, a drum connected to said wheel and having pins on its periphery, a second shaft with a wheel rotatable thereon, said wheel having pins on its periphery, and an endless belt on said drum and last-mentioned wheel, said belt having pins projecting from its side and adapted to engage the peripheral pins of the said drum and wheel, said parts being combined substantially as and for the purpose set forth.

2. A cash-register, having the shaft 1, with indicating-wheel 4, having drum 9 secured thereto, and with pins 10 on the periphery thereof, the endless belt 13, with pins 17 projecting at the side thereof, the shaft 3, with wheel 11, having peripheral pins 12 thereon, a pawl connected to wheel 11, and registering-wheel 18, with ratchet-wheel 23 secured thereto, said parts being combined substantially as and for the purpose set forth.

3. A cash-register having a shaft with an indicating-wheel having a grooved pulley and a drum with peripheral pins secured thereto, the said wheel, pulley, and drum mounted on said shaft, a second shaft with wheel having peripheral pins thereon, an endless belt with pins projecting therefrom and engaging the peripheral pins of said drum and wheel, and a cord with weight, said cord secured to said grooved pulley, said parts being combined substantially as and for the purpose set forth.

4. A cash-register having the shafts 1 and 3, indicating-wheel 4, the drum 9, secured to said wheel, the wheel 11, with pins 12 and a pawl, the endless belt operating said drum and wheel 11, the pawl 59 and shaft 3, and the wheel 18, with ratchet 60 thereon, said parts being combined substantially as described.

5. In a cash-register, the shafts 1 and 3, the drum 10 on shaft 1, and wheel 11, with pawl, on shaft 3, the endless belt 13, with projecting pins operating said drum and wheel 11, the wheel 18, mounted on said shaft 3 and provided with lug 26, the wheel 19, mounted on shaft 3 and having ratchet-wheel secured thereto, and the pivoted lever 32, with pawl 37, the latter adapted to engage said ratchet-wheel, said parts being combined substantially as and for the purpose set forth.

6. In a cash-register, an endless belt with lug 58 thereon, the shaft 3, with wheel 11, operated by said belt, a plunger with a pin thereon, the pivoted arm 45, with the bayonet-slot 49 therein, and the sliding bar 57, said parts being combined substantially as and for the purpose set forth.

7. In a cash-register, the casing having the shafts therein bearing the indicating and registering wheels, the endless belts having the pins for operating the said wheels, and plungers carrying retaining-arms to engage the pins to retain the belts at the desired points, and devices for retaining and releasing the plungers, substantially as described.

8. In a cash-register, the shafts having the indicating-wheels thereon carrying pin-rollers, the shaft carrying the registering-wheels and pin-rollers, devices carried by the endless belts passing over said pin-rollers and engaging the pins or projections thereon to operate the indicating and registering wheels, the plungers operating the retaining-arms to cause them to engage the endless belts, and devices for releasing the plungers and returning them to their original position, substantially as described.

9. In a cash-register, the combination, with the endless designating-belts having the pins for operating the indicating and registering wheels, of the plungers, the retaining-arms operated by said plungers for engaging the pins on the belts, and the mechanism for holding and releasing the plungers, substantially as and for the purpose described.

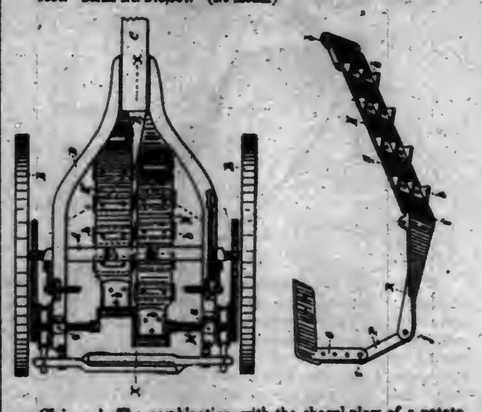
10. In a cash-register, the shaft 48, with key 48×, the arm 50 on said shaft, the standard 53, with arm 54, having the catch 55 pivoted thereto, and the sliding bar 57, said parts being combined substantially as and for the purpose set forth.

11. In a cash-register, the combination, with the endless designating-belts having pins for operating the indicating and registering wheels, of the spring-plungers having pins, retaining-arms having slots engaged by said pins to cause the retaining-arms to engage the pins on the belts, and mechanism for releasing the retaining-arms and allowing the plungers to return to their normal position, substantially as and for the purpose described.

12. In a cash-register, a designating-belt with pins, a wheel mounted on a shaft and operated by said belt, a pivoted arm, 48, with bayonet-slot 49 and engaging portion 46, a plunger with pin working in said bayonet-slot and the notch 43, and a rocking shaft with catch connected thereto and provided with a weighted arm, said parts being combined substantially as described.

13. In a cash-register, a designating-belt with projecting pins and lugs 58, a rotary wheel operated by said belt, a pivoted arm with the bayonet-slot 49, a plunger with the pin 42, a horizontal sliding bar with support, a rocking shaft with arm 50, and a pivoted catch resting on said arm 50 and in contact with said sliding bar, said parts being combined substantially as and for the purpose set forth.

395,571. POTATO-DIGGER. JAMES H. LEWIS, Detroit, Mich., assignor of one-half to Charles G. Hampton, same place. Filed May 11, 1888. Serial No. 273,667. (No model.)



Claim.—1. The combination, with the shovel-plow of a potato-digger, of a carrier-rake adjusted above that plow and actuated by mechanism to impart thereto a rake motion, said mechanism consisting of a crank or cranks carrying the rear end of the rake and provided with drive-connection from the ground-wheels, and of self-adjusting compensating hangers for suspending the front end of said rake, substantially as described.

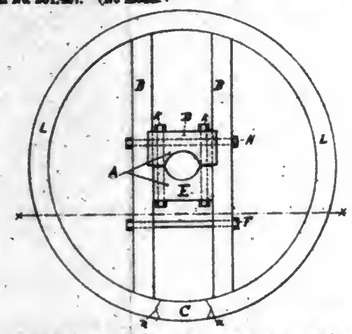
2. The combination, with the shovel-plow of a potato-digger, of two inclined reciprocating carrier-rakes mounted above said shovel-plow side by side, of self-adjusting compensating hangers suspending the front end of the rakes independently of each other, and a double-throw crank supporting the rear end of the rakes and imparting motion in opposite direction to such rakes, substantially as described.

3. The combination, with the forwardly-inclined rakes N N' of the double-throw crank-shaft M, upon which the rear end of each rake are mounted, of the arms R, hinged to the front ends of the rakes, the hangers O, secured to the frame, and the links P, pivotally connecting said hangers with the arms R, substantially as described.

4. The combination, in a carrier-rake for potato-diggers, substantially as described, of the V-shaped rake-teeth *h*, arranged in rows, and a rake-head, *g*, to which the teeth are secured, substantially as described.

5. The combination of the rake-head *g*, the rake-teeth *h*, secured thereto in rows, and the arm R, hinged to the forward end of the rake-head, and the rake-teeth *i*, formed on the lower side of said arm, substantially as described.

395,572. PULLEY. FRANCIS A. LOMONT, Fort Wayne, Ind., assignor of one-half to John Drefsbilbis, same place. Filed July 30, 1888. Serial No. 281,627. (No model.)



Claim.—1. The combination of a pulley-rim provided with a single removable section, the arms B B, securely attached to the larger portion of the rim, the hub-section D, permanently secured to the arms B B, the cap or hub-section E, removably secured to the fixed hub-section, the bolts K, to clamp the hub-sections to the shaft, and the bolt F, to clamp the ends of the rim against the ends of its removable section, all substantially as described.

2. The combination of the arms B B, securely attached to the rim of a pulley, the hub-section D, permanently secured to the arms B B, the cap or hub-section E, removably secured to the fixed hub-section, and the bolts K, to clamp the hub-sections on the shaft, all substantially as described.

395,573. PLOW. ALONZO R. MALLORY, Madison, Ga. Filed June 20, 1888. Serial No. 277,627. (No model.)



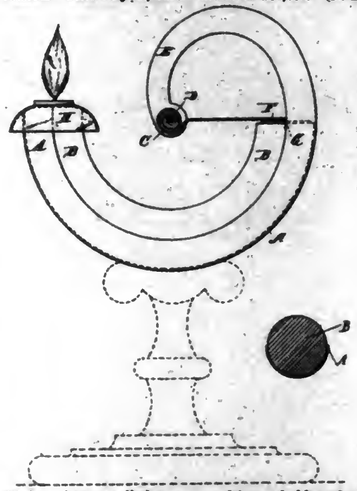
Claim.—1. A plow comprising the customary standard and draft appliances, a foot adapted to connect with the customary plow-standard, and having a curved upper or front portion adapted to independently receive and connect therewith a soil-turner and a point, an independent soil-turner and a point, each adapted to fit said foot and be independently connected thereto, said point having a central bevel-shaped beak, as explained, a landside secured at its front end to said foot, and a bevel-ended slab removably connected to the rear under face of said landside, substantially as set forth.

2. A plow comprising the customary standard and draft appliances, a soil-turner having an upwardly-projecting longitudinal rib on its upper face, a concaved side wing or wings, and at its front end a bevel-shaped beak, a foot having at its upper end a transverse bolt-hole for the attachment of the plow-standard and at its lower portion similar bolt-holes for the connection thereto, respectively, of the soil-turner and point, said foot also having depending side wings and a recessed base portion, a landside adapted to fit within the recessed base portion of the foot and having a recessed front end, and a nut-locking plate adapted to fit within said recess in the landside, substantially as set forth.

3. The foot or frame herein described, having a curved upper portion provided with bolt-holes for removably and independently connecting thereto, respectively, a plow-standard, soil-turner and point, depending side wings, and a recessed base portion, in combination with a landside adapted to fit and be secured within the recessed base of said foot, and a slab having a beveled front end and removably secured to the under face of the rear end of said landside, substantially as set forth.

4. The combination, with the foot or frame herein described, having a recessed base portion, of a landside having a recessed front end, a slotted nut-locking plate adapted to fit the recessed front end of said landside and the recess or step in the base of the foot, and a slat removably secured to the under face of the rear end of the landside, substantially as set forth.

395,574. CANDLE-LAMP. JOHN MARTIN, Kew, near Melbourne, Victoria. Filed July 16, 1888. Serial No. 280,366. (No model.)



Claim.—1. A candle-lamp comprising a holder of substantially the form of a volute, that portion of the volute designed for the reception of the candle being semi-cylindrical in cross-section, in combination with the cap H, the spring C on the end of arm E of the volute, and the spring-arm, substantially as and for the purposes specified.

2. A candle-lamp comprising a holder of substantially the form of a volute, that portion of the volute designed for the reception of the candle being semi-cylindrical in cross-section and provided at the burner end with the cap H and at the opposite end with the coiled spring C, and spring-arm extending into the semi-cylindrical portion of the holder, in combination with a stand to which said holder is secured, substantially as and for the purposes specified.

395,575. ELECTRO-MAGNETIC ROCK-DRILL. HARRY H. MARVIN, Syracuse, N. Y. Filed July 13, 1887. Serial No. 244,150. (No model.)

Claim.—1. In an electro-magnetic drill, the combination, with the reciprocating magnet-core, of the actuating pawl or dog carried thereby, and a magnet for throwing the same into engagement with a ratchet connected with the drill-tool, as and for the purpose described.

2. The combination, with the magnet A, provided with ratchet-teeth, of a pawl of magnetic material mounted, as described, so as to be capable of moving into and out of engagement by the magnetism of the magnet when the magnet and pawl come into proximity.

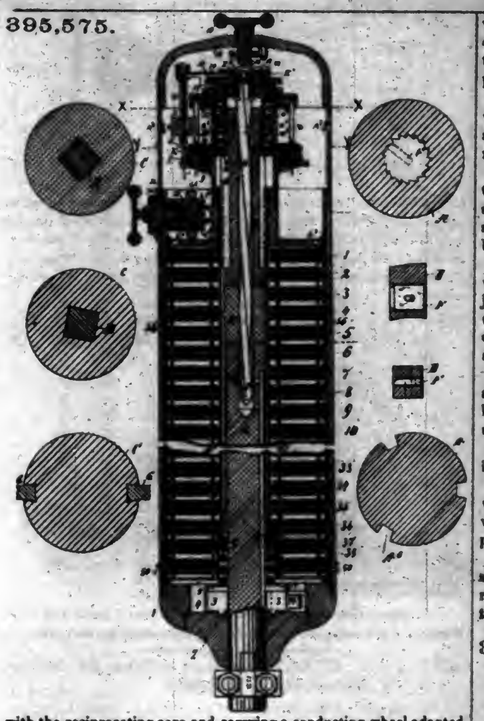
3. The combination, with the magnet-core A, of a pawl of magnetic material mounted on a non-magnetic support independent of the core, and a ratchet carried by the core, as and for the purpose described.

4. The combination, with the reciprocating magnet-core, of the rod of non-magnetic material, whose end is adapted to enter a cavity in the head of the core, and a loose pawl of magnetic material mounted on the end of the rod, and a ratchet connected with the drill-tube.

5. In an electro-magnetic drill or similar tool having a reciprocating core, magnet-coils spaced as described, to permit circulation of air between the coils and guide-tube for the reciprocating core.

6. The combination, with the reciprocating magnet-core, of a commutator actuated thereby and having the plane of its cylinder transverse to the line of movement of the core, said cylinder consisting of a fixed trundle or lantern wheel whose bars or teeth are insulated from one another, and a commutator-brush-holding arm connected

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with the reciprocating core and carrying a conducting-wheel adapted to gear with the lantern-wheel, as and for the purpose described.

7. The combination, with the cylindrical commutator, of a rotary brush-supporting plate loosely pivoted on its support concentrically with the commutator-cylinder, and a spring exerting a transverse pressure on said plate, whereby the brushes may be held in contact with the commutator-bars, as and for the purpose described.

8. The combination, with the reciprocating drill-rod, of a reciprocating core or rod, a ratchet and pawl for connecting the latter with the drill-rod, and a collar engaging with the drill-rod provided with a dog or pawl arranged to permit said rod to rotate when connected with the reciprocating and rotating rods, but arranged to prevent rotation of the collar in the opposite direction.

9. A combined reciprocating magnet-core and air-pump in which the guide-tube for the core serves as the cylinder of the pump, in combination with an air-delivery passage leading from said pump and arranged to deliver a current of air upon the magnet-coils, as and for the purpose described.

10. The combination, with the commutator-actuating devices, of the attached rod D and the reciprocating core having a longitudinal hole which receives the rod, said rod and core being connected together by devices, as described, whereby the reciprocation of the core may impart a rotary movement to the rod.

11. The combination, with the series of coils and the rotary commutator adapted to rotate in a plane parallel to the plane of the coils, of the actuating-core and the rod D, extending through or into the core and rotated thereby as said core reciprocates.

12. The combination, with the magnet-core and a series of actuating-coils, of a commutator and connections between the core and commutator for imparting movement positively to said commutator by the core on its downstroke, said connections being of adjustable length or extent, as and for the purpose described.

13. The combination, with a magnet-core and a series of actuating-coils, of a commutating device actuated thereby, but movable independently thereof at the end of the upstroke, and an adjustable stop in the connections between the core and commutator, whereby the position of the actuating set of coils with relation to the core on the downstroke will be varied according to the force of stroke desired.

14. The combination, with the reciprocating core, of the rotary commutator-driving arm moving with the core, and an adjusting device engaging with said arm for changing the relation of the same with regard to the portion of the commutator upon which the arm abuts.

15. The combination, with the two reciprocating cores and their actuating-coils, of a commutator actuated by the core through devices having an adjustable lost motion, whereby the extent of the shift of current in the series of coils in an upward direction may be determined, and the consequent force with which the upper core is impelled on the downstroke may be varied.

16. The combination, with the rotary arm 22, adapted to engage with the commutator and adjustably mounted on its support, of the adjusting-block 18, engaging with the arm at or about the center of rotation of the support, as and for the purpose described.

17. The combination, with the drill, of the switch arranged between two sets of resistance-coils, and having its contacts at either side arranged with reference to one another and the two sides of the switch, as described, to throw the coils of each set into circuit singly but alternately with the coils of the other set.

18. The combination, with the drill, of the two bands, one of which carries one adjustable leg, while the other carries two legs adjustable independently of one another, means for clamping the bands upon the drill, and nuts independent of said clamping devices for clamping the shoulders of the legs against the face of the bands, as and for the purpose described.

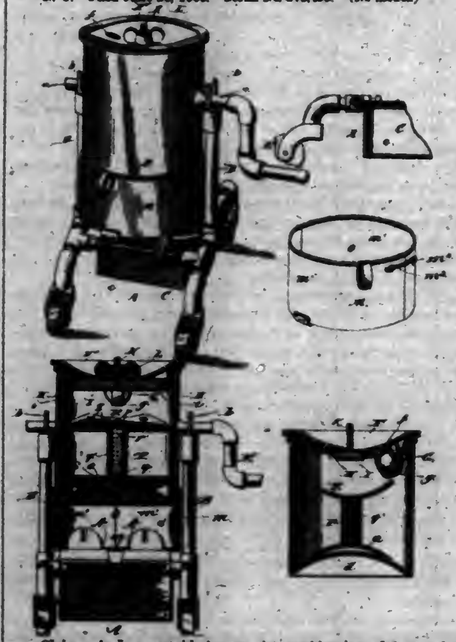
19. The combination, with the reciprocating magnet-core A, of a mechanism engaging with said core for rotating the same on its longitudinal axis, and a simultaneously-reciprocating core, U, connected with said rotating mechanism, as and for the purpose described.

20. The bodily-moving commutator-wheels carrying contacts I K, in combination with the fixed conducting-rings I' K'.

21. In an electro-magnetic reciprocating tool, the combination, with the reciprocating core, of a buffer-spring, W', the superposed washer, and the shouldered core or drill-holder, as and for the purpose described.

22. The combination, with the drill, of a buffer-spring, W', consisting of a coiled spring resting upon the lower head-plate and surrounding the drill-rod, said spring being engaged by said rod in case the rod is thrown below its normal limit of movement.

395,576. PORTABLE HEATER. DEWITT C. McINTIRE, Salamanca, N. Y. Filed June 28, 1888. Serial No. 278,453. (No model.)



Claim.—1. In a portable heater, the combination of the truck or frame provided with the uprights or standards, the heating device arranged between the uprights or standards, the boiler provided with lateral trunnions mounted in bearings on the upper ends of the uprights or standards, and the crank to enable the same to be rotated, and the cover on the upper end of the boiler, provided with a vent-opening and a gravity-valve adjacent thereto, substantially as specified.

2. In a portable heater, the uprights or standards and the heating device arranged between them, in combination with the boiler mounted between the uprights or standards and provided with the concave bottom adapted to concentrate the heat, and the concave cover fitting on the upper end of the boiler and provided with a vent-opening covered by a gravity-valve, substantially as specified.

3. In a portable heater, the uprights or standards and the heating device arranged between the same, in combination with the boiler mounted between the uprights or standards and provided with a concave bottom, the concave cover fitting on the upper end of the boiler and bearing on an elastic packing-ring, and the transverse bar arranged in the upper end of the boiler and provided with an upright threaded stud extending through a central aperture in the cover and engaged by a thumb-nut, substantially as specified.

4. In a portable heater, the combination of the boiler provided with interior ears near its upper end, the transverse removable bar provided with notches in its ends engaging the said ears, the threaded stud affixed to the center of the said bar, the cover fitting on the upper end of the boiler and provided with a central aperture fitting over the said threaded stud, and the thumb-nut engaging the projecting end of the stud and bearing on the outer side of the cover, substantially as specified.

5. In a portable heater, the uprights or standards and the heating device arranged between the same, in combination with the boiler mounted between the uprights or standards and provided with a suitable cover, and the agitator arranged in the boiler and comprising two perforated plates connected by a perforated tube and adapted to move longitudinally in the boiler as the latter is rotated, substantially as specified.

6. In a portable heater, the uprights or standards and the heating device arranged between the same, in combination with the boiler and the agitator comprising the upper and lower plates provided with central apertures, the perforated tube q' on the lower plate, arranged over the central aperture therein, and the perforated tube r' on the upper plate, arranged over the central aperture therein and fitting within the tube q', substantially as specified.

7. The boiler provided with a concave bottom, and the cover on the upper end of the boiler, in combination with the agitator arranged in the boiler and comprising the lower curved and perforated plate, Q, provided with a central aperture, the perforated tube q', affixed to the plate over the said aperture, the oppositely-curved and perforated upper plate, R, provided with a central aperture, and the perforated tube r', affixed to the under side of the plate under the central aperture and fitting in the tube q', all constructed and arranged substantially as and for the purpose specified.

8. In a portable heater, the uprights or standards and the heating device provided with the burners c' c', in combination with the revoluble boiler mounted between the uprights or standards, and the cap fitting on the lower end of the boiler and provided with a perforated bottom having apertures N N, fitting on the burners, the interior of the said cap forming a combustion-chamber to concentrate the heat on the bottom of the boiler, substantially as specified.

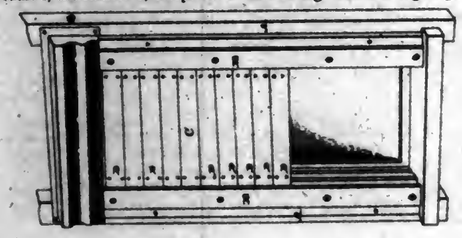
9. In a portable heater, the uprights or standards and the heating device arranged between the same, in combination with the boiler and the cap fitting on the lower end of the boiler, and comprising a perforated bottom and the semi-cylindrical side sections hinged to the bottom, substantially as specified.

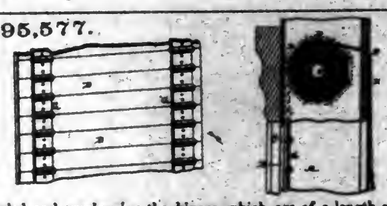
10. In a portable heater, the heating device provided with burners c', and the boiler mounted over the burners, in combination with the removable cap fitting on the lower end of the boiler, and comprising the perforated bottom m, provided with the apertures N N, fitting over the burners, and the sides formed of the semi-cylindrical sections m' m', hinged at their centers to the edges of the bottom and provided with hooks m^2 and keepers m^3, substantially as specified.

11. The truck or frame A, composed of hollow pipes or sections of pipes connected by couplings, the base of the frame being in the form of a rectangle with the ends or corners bent or turned down and provided with rollers, and the standards B, rising from the base of the frame and having the bearings or forks b b at their upper ends, and the boiler D, arranged between the standards and journaled in the bearings or forks, as set forth.

395,577. WINDOW-SHUTTER. JOHN T. MILLER and SOLOMON W. MILLER, Thayer, Kans. Filed June 16, 1888. Serial No. 277,361. (No model.)

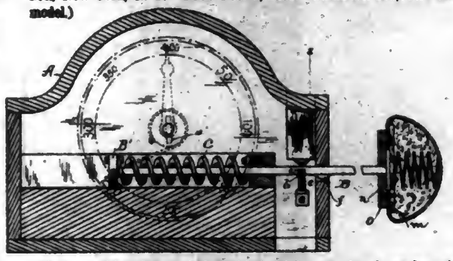
Claim.—In a window-shutter, the combination of the frame, the shaft I, the shutter C, composed of slats having their meeting edges





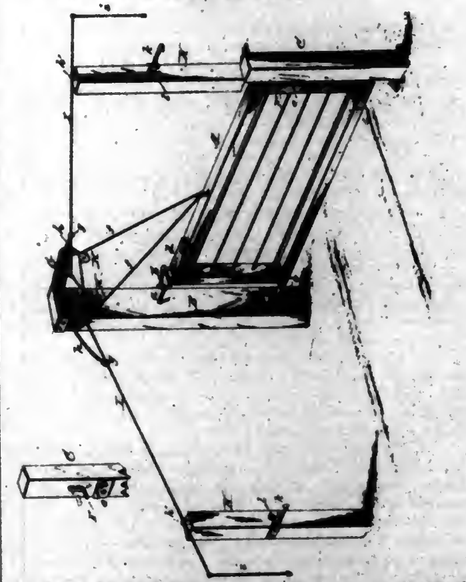
beveled and overlapping the hinges, which are of a length equal to the width of the slats and secured thereto upon their inner sides at opposite ends thereof, the operating-cord, and the pulley P, the shutter and cord being secured to the shaft and wound thereon in opposite directions, all combined to operate substantially in the manner described.

395,578. COIN-OPERATED BLOW-TESTER. THOMAS F. O'CONNOR, New York, N. Y. Filed Feb. 6, 1888. Serial No. 263,067. (No model.)



Claim.—The drive-rod provided with cam f and notch e, the spring C, the lever b, and the spring c, substantially as described.

395,579. FARM-GATE. ISAAC OLSEN, Manitowoc, Wis. Filed Sept. 24, 1888. Serial No. 286,227. (No model.)

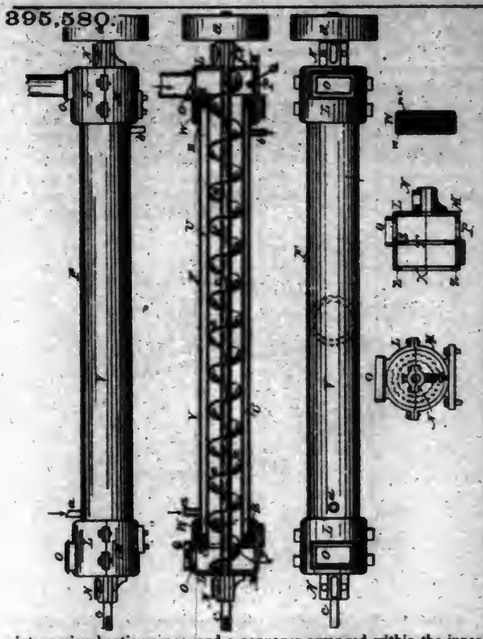


Claim.—The combination, with the hinged gate A and pivoted crank-stop F, of the mechanism for operating the gate, consisting of the hangers G, having pulleys H, the rods A, extending out from said arms and provided with eyes g, and the cords or ropes f, connected to the gate, passing over the pulleys in opposite directions and connected to the ends of rods I, said rods passing through the eyes of the rods A, which form guides therefor, substantially as and for the purpose set forth.

395,580. APPARATUS FOR TREATING MIDDLINGS. ALLEN R. PARKISON and JAMES PULLINGER, Monongahela City, Pa., assignors of one-third to James M. McGrew, same place. Filed Oct. 3, 1887. Serial No. 251,339. (No model.)

Claim.—1. In apparatus for heating middlings and similar product, the combination of the inner tube, the outer tube forming the

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intervening heating-space, and a conveyer arranged within the inner tube, with chambered parts secured upon the ends of said tubes, each part having a chamber into which the conveyer-tube opens at each end, and having, also, a chamber for receiving the ends of the outer tube, and a screw-ring within said chamber closing the ends of the outer tube, as described, and for the purpose specified.

2. In apparatus for heating middlings and similar product, the combination of the chambered-end parts each having a top and a bottom opening, O and P, an interior partition, S, and an inward-projecting end flange, Z, the removable lids Q, the outer tubular casting having the steam inlet and outlet pipes a b, and provided at both ends with exterior screw-threads, the inner tubular casting provided at both ends with exterior screw-threads, the rings W, having the interior screw-threads, w w^2, of different diameters, and the conveyer, substantially as described, for the purpose specified.

3. The middlings-heater herein described, consisting of the inner and the outer tubes forming an intervening chamber for containing steam, the outer tube provided with a pipe at one end at the top and at the other end at the bottom, the end-chambered parts having top and bottom openings, the lids for closing one of these openings in each chambered part, the rings W, each having two interior screw-threaded parts of different diameters adapted to fit upon the ends of the said tubes, and a conveyer having its shaft C mounted in bearings in said chambered parts and projecting alike at each end outside of said chambered parts to receive the pulley D on either end, whereby the conveyer may be driven from either end of its shaft, and the operation of the conveyer reversed in the manner and for the purpose stated.

4. The combination, with the inner and the outer tubes and a screw-conveyer operating within the inner tube, of the chambered parts formed of two equal box parts arranged upon these tubes at each end, each box part having bearing parts of different diameters with their centers in the same axial line, and a screw-ring adapted to be screwed upon the ends of said tubes, in the manner and for the purpose described.

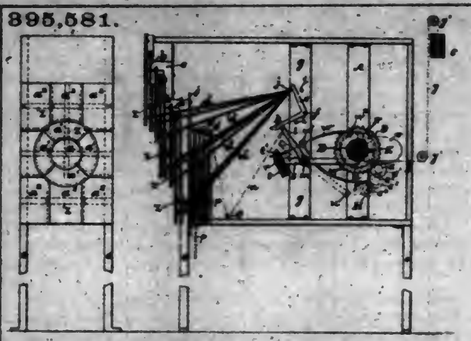
395,581. SELF-INDICATING TARGET. JAMES PATERSON, Glasgow, County of Lanark, Scotland. Filed Mar. 26, 1888. Serial No. 268,560. (No model.) Patented in England Apr. 20, 1887, No. 6,368.

Claim.—1. In a self-indicating target, the combination of the central section or bull's-eye and a congeries of overlapping sections arranged in overlapping concentric series, substantially as and for the purpose set forth.

2. In a self-indicating target, the combination of a series of overlapping sections or plates constituting the face of the target and a series of indicator-operating rods against which the sections have bearing, all of said rods being adapted to be operated separately and independently by said sections, substantially as and for the purpose set forth.

3. In a self-indicating target, the combination of a series of over-

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lapping sections suspended by tangs or straps at their top, arranged around a central section, and constituting the face of the target, and indicating devices individually operated by each of said sections, substantially as set forth.

4. In a self-indicating target, the combination of a series of overlapping sections disconnected from one another and arranged one back of the other, and a series of bridge pieces or strips arranged between the sections, substantially as and for the purpose set forth.

5. In a self-indicating target, the combination of the value-plates constituting the face of the target, disconnected rods bearing on the rear sides of said value-plates, a guide-strip through which the rear ends of the rods project, bell-crank levers arranged on a single pivot-pin and engaged at their upper ends by the rear ends of said rods, catches at the lower ends of said bell-crank levers, indicators, hammer or fall bars engaged by said catches, suspension-cords connecting the indicators and hammer or fall bars, and means for returning the indicators to their hidden position, substantially as set forth.

6. In a self-indicating target, the combination of the value-plates constituting the face of the target, the rods operated by said plates, the bell-crank levers engaged at their upper ends by said rods, catches at the lower ends of said bell-crank levers, stop-pins behind the upper ends and below the lower ends of said bell-crank levers, as explained, indicators, hammer or fall bars engaged by said catches, suspension-cords connecting the indicators and hammer or fall bars, and means for returning the indicators to their hidden position, substantially as and for the purpose set forth.

7. In a self-indicating target, the combination of the value-plates constituting the face of the target, indicators suspended by cords, pivoted hammer-bars to which the said cords are secured, mechanism, substantially as described, operated by the value-plates and provided with catches for supporting said hammer-bars, pivoted levers having a cross-bar pivoted between them, and cam mechanism for depressing the free ends of said levers, substantially as set forth.

8. In a self-indicating target, the combination of the indicators and mechanism for returning them to their hidden position, consisting of hammers l, drum B, operated by a cord wound upon it having a weight attached, loose ratchet-wheel D on the drum, pawl or detent w, engaging the teeth of the ratchet, said detent being adapted to be disengaged from the ratchet through the medium of suitable mechanism by the fall of the hammers l, and automatically-operated clock mechanism having a cam actuated thereby, whereby it is brought into engagement with the disengaging mechanism of the detent, substantially as set forth.

9. In a self-indicating target, the combination of the indicators suspended by cords, levers s, having bar t pivoted to them, pins projecting from said bar, detents w, engaged by said pins, fall-bars or hammers l, having the suspending-cords of the indicators attached to them, a shaft having a drum, gear-wheel and ratchet-wheel mounted thereon, the latter being loose and engaged by detent w, means for rotating the drum, and cam v, mounted on said shaft and engaging the ends of levers s, substantially as set forth.

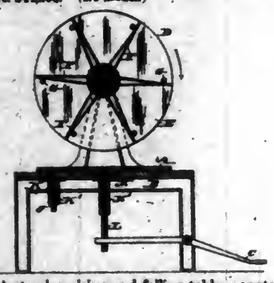
395,582. HAIR-PIN. WALTER F. PRET, Philadelphia, Pa. Filed May 26, 1888. Serial No. 275,213. (Model.)



Claim.—1. A hair-pin having a limb with coils, a portion of which has its convolutions in one direction and another portion on the same limb having its convolutions in the reversed direction, substantially as described.

2. A hair-pin having a limb with coils in reverse direction and a guiding portion between said coils, substantially as described.

395,583. APPARATUS FOR SCOURING, CLEANSING, AND POLISHING METAL, &c. JOHN PFEIFER, Philadelphia, Pa. Filed July 14, 1887. Serial No. 244,206. (No model.)



Claim.—1. A stand, a rising and falling table mounted on said stand, and a treadle connected with said table, in combination with a brush secured to a rotary axle which is mounted on said stand above said table and provided with cross-bars back of the brush material, forming together an improvement in apparatus for scouring and cleaning metal, as stated.

2. An apparatus for cleansing metal, consisting of the rotary brush D, journaled in bearings on the stand B, the latter having the bosses M' and K', the table A on said stand and having the rod L and pin J, and the treadle C, secured to said rod L, said parts being combined substantially as described.

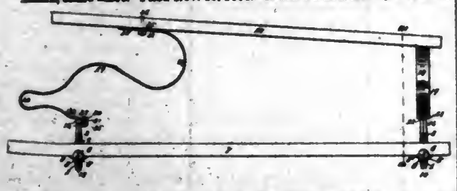
395,584. CONDUIT FOR ELECTRIC WIRES OR CABLES. EDWARD H. PHIPPS, New Haven, Conn., assignor to Edward S. Perot and James P. McQuaide. Filed July 26, 1887. Serial No. 245,326. (No model.)



Claim.—1. A conduit for electric conductors, consisting of a sheet-metal shell or tube provided with a lining of hydraulic cement, substantially as described.

2. A multiple-system conduit for electrical conductors, consisting of a suitable number of sheet-metal pipes lined with hydraulic cement, insulating-supports therefor, intervening filling of cementitious or like matter, and an inclosing-casing, substantially as described.

395,585. SPRING-GEAR FOR CHILDREN'S CARRIAGES. HENRY G. PORTMANN, St. Louis, Mo., assignor of one-half to William W. Portmann, same place. Filed Nov. 10, 1888. Serial No. 290,435. (No model.)



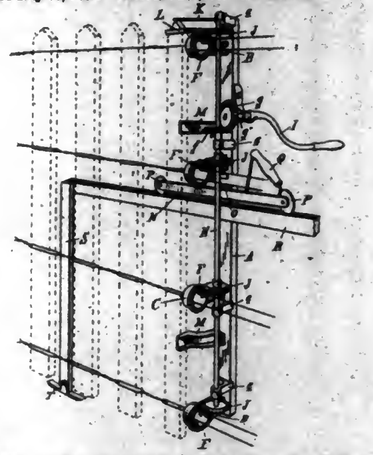
Claim.—1. In a child's carriage, the combination of the arch-bar that supports the springs, the foot-clamps on the ends of said bar, and the legs that project from said foot-clamps and clutch the axles beneath and the side bar above, substantially as and for the purpose set forth.

2. In a child's carriage, the combination of the arch-bars that support the springs, the foot-clamps on the ends of said bars, provided with bed-plates S, that carry the side bars, said plates integral with the foot-clamps, and the legs that project transversely from said foot-clamps and clutch the axles beneath and the side bars above, substantially as and for the purpose set forth.

3. In a child's carriage, the combination of the arch-bars, the spring-bars seated on said arch-bars, and the double-fold ogee tester-springs 29, that couple the rear spring-bar to the bed of the carriage and provide the means of teetering said carriage-bed and of its elastic rear support, substantially as and for the purpose set forth.

4. In a child's carriage, the combination of the arch-bars, the foot-clamps provided with transversely-presenting legs that clutch the axles beneath and the side bars above, the spring-bars that surmount said arch-bars, the loop-ended three-quarter elliptic spring that is secured to the front spring-bar and to the front of the carriage-bed, and the double-fold ogee tester-springs that couple the rear spring-bar to the bed of the carriage, arranged to provide the means of teetering said carriage-bed and of its elastic support, substantially as and for the purpose set forth.

395,586. PICKET-FENCE MACHINE. BELA RAMSON, Flint, Mich., assignor of two-thirds to Oren Stern and Edwin R. Woodin, same place. Filed May 15, 1888. Serial No. 273,906. (No model.)



Claim.—1. The combination, with the standard and the bracket B, secured thereto, of the hollow twister journaled in said bracket, and provided with circumferential gear and with bar *b*, and a detachable head formed with wire-passages and having lugs *c* engaging the bar *b*, substantially as described.

2. The combination, with the twister-frame and a carriage pivotally secured to said frame near the vertical middle of the machine, of a guide-rail independently and movably supported above the ground, and a handle secured to said carriage, substantially as described.

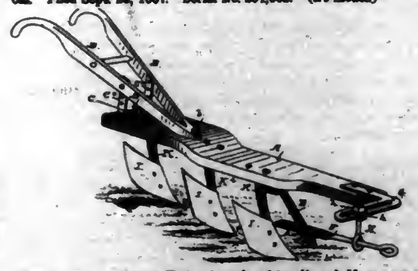
3. The combination, in a picket-fence machine, of the twister-frame, the carriage pivotally secured thereto, the clamp-screw and slotted clamping-plate adjustably securing the carriage to the standard, the guide-rail upon which said carriage is supported from the ground, and the shoe, substantially as described.

4. The combination, with the picket-fence machine provided with the carriage, substantially as described, of the guide-rail, the supporting-legs to the guide-rail, and the curved shoes secured to the legs of the guide-rail.

5. The combination, with the twister-frame of the picket-fence machine, of the picket-clamp L, consisting of the adjustable jaws *h h'* and clamp-screw *i*, substantially as described.

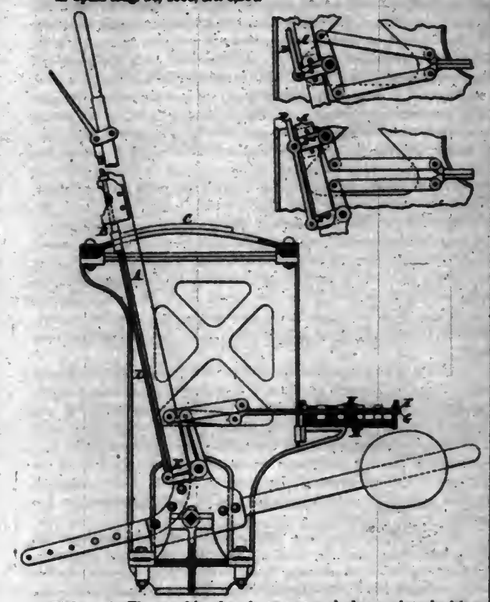
6. The herein-described tension, consisting of the twister-frame U, the tension-wheel W, mounted on the shaft V, the friction-disks *m n*, the tension-spring *o*, the tension-wire *q*, and the loose pulley *r*, the parts being combined and arranged to operate substantially as described.

395,587. VINEYARD-CULTIVATOR. CHRISTIAN REIMANN, Napa, Cal. Filed Sept. 20, 1887. Serial No. 251,062. (No model.)



Claim.—The standard K, having the sides *k'* and *k²* arranged at an angle to each other, said side *k²* having the lower vertical extension, *k⁴*, the point or landside L, bolted to said extension, the mold-board I, bolted to the side *k'*, the plate *k³* on the upper end of the standard and extending rearward therefrom, said plate having the opening *m'* in the rear end and the concentric opening *m²* in its front end, for the purpose set forth, and the brace-rod M, having its upper end bolted under the rear end of plate *k³* and its lower end bolted to the inner side of side *k'* at a suitable distance from the lower end of the standard, substantially as described.

395,588. SWITCH AND SIGNAL INTERLOCKING APPARATUS. HUGH REID, Derby, County of Derby, England. Filed May 23, 1888. Serial No. 274,868. (No model.) Patented in England Jan. 5, 1888, No. 153; in France May 3, 1888, No. 190,574; in Belgium May 2, 1888, No. 81,065; in Victoria June 8, 1888, No. 5,334; in New South Wales June 12, 1888, No. 718; in Italy July 3, 1888, XLIV, 365; in India July 11 and Aug. 14, 1888, No. 117/110; in Canada Aug. 4, 1888, No. 30,638, and in Spain Aug. 20, 1888, No. 8,264.

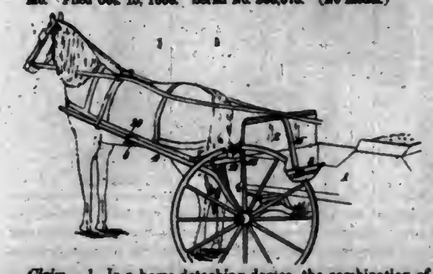


Claim.—1. The combination, in tappet and plunger interlocking apparatus for railway point and signal levers, of plungers made in two layers, tappets, levers, and spring-catches, said layers of the plungers moved, respectively, by the levers and the spring-catches, and having inclined notches which actuate the tappets and receive the latter only when the spring-catches are down, substantially as described.

2. The combination, in tappet and plunger interlocking apparatus for railway point and signal levers, of the plungers made in two layers, F and G, having inclined notches *f* and *g*, the levers A, the spring-catches B, the rods D, said levers and rods respectively connected with the layers of a plunger, and transverse slides H, having wedge-shaped tappets which are actuated by the inclined notches of the layers of the plungers when the latter are moved lengthwise, substantially as described.

3. The combination, with the levers and the spring-catches therefor, of plungers made in two layers and provided with inclined notches and wedge-shaped tappets which are thrust laterally out of engagement with one plunger by the inclined notches thereof when such plunger is moved lengthwise and into engagement with the inclined notches of the adjacent plunger, substantially as described.

395,589. HORSE-DETACHER. HARRY RIEMERSMA, St. Louis, Mo. Filed Oct. 15, 1888. Serial No. 288,078. (No model.)



Claim.—1. In a horse-detaching device, the combination of the sectional-cut singletree, the knockdown hinge that connect the sections of said singletree, the sectional dovetail tapered catch-block 9, and the clamping-block 13, substantially as and for the purpose set forth.

2. In a horse-detaching device, the combination of the sectional-cut singletree, the knockdown hinge that connects the sections of said singletree in front, the sectional catch-blocks at its back, the clamping-block, and the metal equalizing-straps 18, with their pendent lugs 19, substantially as and for the purpose set forth.

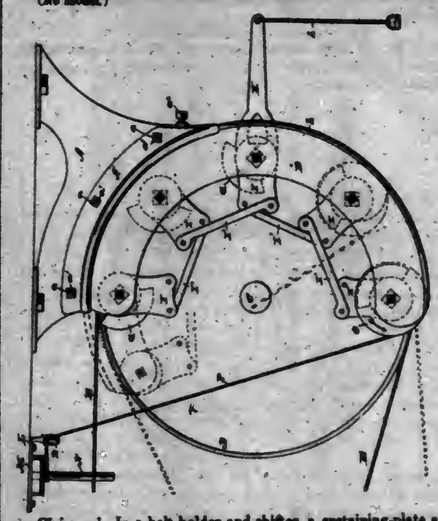
3. In a horse-detaching device, the combination of the sectional-cut singletree, the knockdown hinge that connects the sections of said singletree in front, the sectional dovetail tapered catch-block 9 at its back, the clamping-block 13, that clutches and couples the sections of said catch-block, the ball 16 on said clamping-block, the draw-strap 15 attached to said ball, and the snap-hook 17, that attaches said strap to the foot-bar, substantially as and for the purpose set forth.

4. In a horse-detaching device, the combination of the sectional-cut singletree, the knockdown hinge 8, sectional-tapered catch-block 9, clamping-block 13, attachment ball 16, the draw-strap 15, by which the detachment is operated, the metal equalizing-straps 18, with pendent lugs 19, and the holdback-hooks 6, secured to the shafts, with which the holdback-straps engage, substantially as and for the purpose set forth.

395,590. PROCESS OF MAKING BRICK. GEORGE SATTLER, Sr., and CARL HAGEL, St. Louis, Mo., assignors of one-half to George Sattler, Jr., East St. Louis, Ill. Filed Feb. 16, 1888. Serial No. 264,272. (No specimens.)

Claim.—The described method or process of making bricks, blocks, &c.—namely, by powdering the clay, heating it uniformly to a cherry-red heat, cooling, mixing it with sufficient water for molding, and then molding, drying, and burning, as usual.

395,591. BELT HOLDER AND SHIFTER. UNDO H. W. SCHENCK, Brooklyn, assignor to the Schenck Belt Holder and Shifter Company of New York, New York, N. Y. Filed Mar. 28, 1888. Serial No. 268,949. (No model.)



Claim.—1. In a belt holder and shifter, a sustaining-plate and a series of belt-supports arranged in a segmental line thereon, in combination with a series of vibratory spiral shifters mounted on axes transverse to the line of movement of the belt and adapted to engage with the under side of said belt, and suitable mechanism for operating said shifters, all constructed, arranged, and operating substantially as shown and described, whereby as said shifters are moved without the segmental line of the supports they will engage with the under side of the belt, lift the same, and shift it from said supports.

2. In a belt holder and shifter, a sustaining-plate and a series of belt-supports arranged in a segmental line thereon transverse to the line of movement of the belt, in combination with a series of vibratory spiral shifters mounted on said supports and mechanism, as described, for operating said shifters, all constructed, arranged, and operating substantially as set forth, whereby as the shifters are vibrated they will engage with the under side of the belt, lift the same, and shift it from the supports.

3. In a belt holder and shifter, the combination, with the sustaining-plates B and F, the series of bolts c and sleeves *d*, and bearings H, mounted thereon, of the vibratory spiral shifters G, mounted on the sleeves *d* and having the levers I and links I', connecting said

levers, and the operating-lever K, all constructed, arranged, and operating substantially as shown and described.

4. In a belt holder and shifter, the combination, with a bracket secured to a suitable support, an adjustable sustaining-plate secured thereto, and a series of belt-supports arranged in a segmental line on said plate, of a series of vibratory spiral shifters mounted on axes secured to the sustaining-plate and transverse to the line of movement of the belt and adapted to engage with the under side of said belt, and suitable mechanism for operating said shifters, all constructed, arranged, and operating substantially as shown and described.

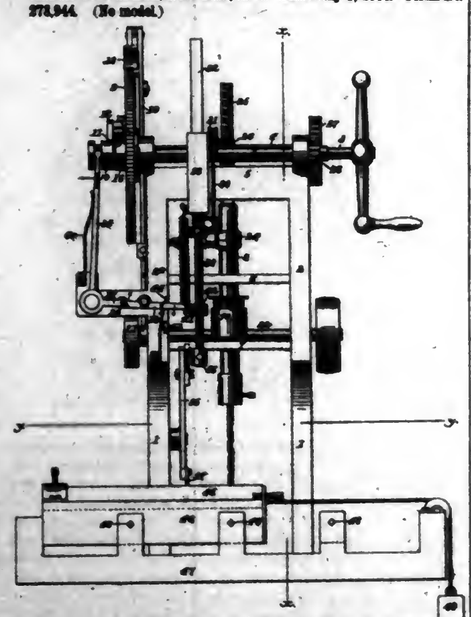
5. In a belt-holder, the combination, with a bracket secured to a suitable support and an associated pulley, of a sustaining-plate secured to said bracket and adjustable in the arc of a circle concentric with the associated pulley, and having a series of belt-supports arranged in a segmental line thereon, all constructed and arranged substantially as shown and described, as and for the purpose set forth.

6. In a belt holder and shifter, a suitable belt-holder frame arranged in close proximity to an associated pulley and belt, and a sheave mounted on said frame and connected with a suitable operating-lever, in combination with a sliding bar mounted in bearings and having a shifter-arm adapted to engage with the belt on its side away from the belt-holder, and a rope or chain secured at one end to the sheave and at the other to the sliding bar, all constructed, arranged, and operating substantially as shown and described, whereby when the sheave is turned the rope or chain will be wound around the same and draw the pending arm toward the holder and cause it to engage with and shift belt onto said holder.

7. In a belt holder and shifter, the combination, with the sustaining-plate B, having a series of belt-supports arranged in a segmental line thereon in proximity to an associated pulley and belt, of the sheave O, mounted on one of said supports and connected with a suitable operating-lever, the sliding bar M, mounted in bearings and having the shifting-bar N, engaging with the belt on its side away from the supports, and the rope or chain P, connecting the sliding bar and sheave, all constructed, arranged, and operating substantially as shown and described.

395,592. FEED ATTACHMENT FOR DRILLING-MACHINES.

MARTIN SCHWARZLER, New York, N. Y. Filed July 3, 1888. Serial No. 278,944. (No model.)



Claim.—1. In a feed mechanism for drills, the combination of the supporting-frame, the main driving-shaft, a rack-bar mounted to reciprocate vertically in said frame and terminating in a tripping-rod at its lower end, adjustable fingers on said rod, means, substantially as described, for automatically elevating said bar, a pinion on a counter-shaft meshing with said rack-bar, a ratchet-wheel revolving loosely on said counter-shaft, a clutch connecting the ratchet-wheel and shaft, a pawl operated by the main driving-shaft and engaging said ratchet-wheel, a second counter-shaft parallel with the first, a pinion thereon, a second vertically-reciprocating rack-bar parallel with the first and engaged by said pinion, a drill-spindle coupled to said second rack-bar, gearing coupling the two shafts, a bent lever actuating the clutch, and a second pivoted lever jointed to the outer arm of said clutch-lever and extended to contact with the pins on the vertically-reciprocating rod, all substantially in the manner and for the purpose herein set forth.

2. The combination, in a drilling-machine, with the vertically-reciprocating rod 38, the fingers 40 and 41 thereon, the clutch 10, and the interposed levers 35 and 39, of the spring-actuated catch 44, substantially in the manner and for the purpose herein set forth.

3. The combination, in a drilling-machine, with the vertically-reciprocating rod 38, the fingers 40 and 41 thereon, the spring 43, automatically elevating said rod, the clutch 10, and the interposed levers 35 and 39, of the auxiliary spring 60, bearing upon said lever 35, substantially in the manner and for the purpose herein set forth.

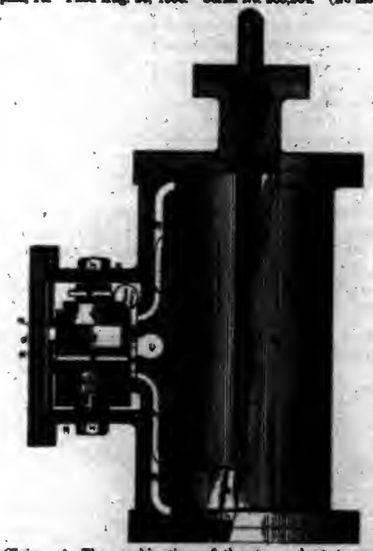
4. In a drilling-machine, the combination of its bed-plate and supporting-frame, the rack-bar 32, terminating in a tripping-rod, 38, and mounted to reciprocate vertically in said frame, a spring, 43, operating automatically to carry said rod upward, a finger, 56, projecting from the lower end of the rod, a counter-shaft meshing with said rack, a second rack-bar, to which the drill-spindle is coupled, gearing between the two rack-bars, means, substantially as described, whereby the counter-shaft is rotated and the rack-bars thereby fed downward, a carriage, 46, traversing upon the bed-plate under the drill-spindle, a weight, 49, to move the carriage automatically in one direction, a spring-actuated catch, 57, engaging the carriage to prevent said movement, a pivoted lever, 53, jointed to the catch, a second pivoted lever, 55, having one arm in position to contact with the finger 56 on the reciprocating tripping-rod, and a swinging latch, 54, on the opposite arm of said lever to engage and slide over the free arm of the catch-lever 53, all substantially in the manner and for the purpose herein set forth.

5. In a drilling-machine, the drill-spindle, the automatically-moving carriage 46 beneath it, the spring-actuated catch engaging the carriage to arrest its movement, the vertically-reciprocating rod mounted parallel with the drill-spindle to move in synchronism with it, the gearing between the rod and spindle, an adjustable finger projecting from the rod, and means for disengaging the catch from the carriage by the movement of the finger, consisting of the interposed pivoted levers 53 and 55, all substantially in the manner and for the purpose herein set forth.

6. The combination, in a drilling-machine, of the carriage 46, the lateral spring-actuated catch 51, and the detachable, reversible, notched cage-bar secured upon the carriage to be engaged by the catch, substantially in the manner and for the purpose herein set forth.

395,598. STEAM-ACTUATED VALVE.

THOMAS SMALL, Philadelphia, Pa. Filed Aug. 20, 1888. Serial No. 283,304. (No model.)



Claim.—1. The combination of the steam-chest, two stationary pistons secured therein, and a combined slide-valve and cylinder provided with a chamber for each piston, and having inlet and exhaust ports, and the port O, with both a stationary and a movable valve, and an extra steam-port extending from each end of the cylinder, and which slide-valve and cylinder is moved back and forth by the action of the steam between the two pistons, substantially as set forth.

2. The combination of the steam-chest, two stationary pistons secured therein, the combined slide-valve and cylinder, which is moved back and forth between the pistons by the action of the steam, and which is provided with inlet and outlet ports, a stationary valve, which rests upon the top of the slide-valve and cylinder, and a movable valve placed inside of the stationary valve, and which is operated by the movement of the slide-valve and cylinder, substantially as described.

3. The combination of the steam-chest, the two pistons secured thereto, a slide-valve and cylinder provided with the two chambers M, the inlet-ports X, the outlet-ports P, the exhaust-port O, extending through the partition L, the stationary valve S, and the movable valve R, placed in the opening in the valve S, substantially as set forth.

395,594. INK-ERASER.

GEORGE T. SMALLWOOD, Washington, D. C. Filed Mar. 12, 1888. Serial No. 267,014. (No model.)



Claim.—1. A burnishing attachment for an eraser formed in one piece and shaped so as to have one part form a clamp to secure it to the eraser and the other part to form a burnisher and extractor, substantially as shown and described.

2. A burnishing attachment for an eraser, shaped substantially as shown, its upper and lower portions serving for an attaching clamp and burnisher, respectively, as and for the purpose set forth.

395,595. WRENCH.

ALBION K. SPAULDING, North Bolgrade, Mo. Filed Apr. 13, 1888. Serial No. 270,562. (No model.)



Claim.—In wrenches, the swiveled handle H, carrying cam *g*, in combination with the loose ratchet E, held against said cam by a spring at its front end and provided with a lug, *e*, at the other end, as and for the purpose specified.

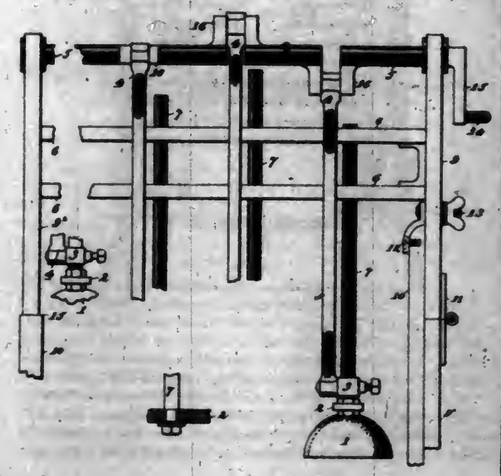
395,596. WASHING-MACHINE.

GEORGE J. SQUIRE, Aurora, Ill. Filed Sept. 3, 1887. Serial No. 248,696. (No model.)

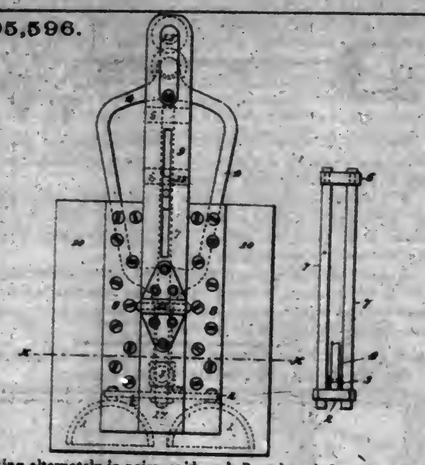
Claim.—1. In combination with the box or case, the slotted supports 9 9^a, cleats 8 8, the alternating stamps and crank-shaft upheld by said supports, hinge 11, slotted angle-iron 12, and thumb-screw 13, all substantially as and for the purposes set forth.

2. In a washing-machine, the combination of a tank, a frame hinged at one side of said tank, said hinged frame carrying and supporting the crank-shaft and crank-rods, vertical guide-rods, and a series of inverted cups, the combination serving, upon lifting the frame on its hinge, to lift with it all said devices, substantially as shown, and for the purposes set forth.

3. In combination, the box 10, frame or supports 9 9^a, hinged at 11, crank-shaft 5, cross-pieces 6 6, skeleton rods 4, inverted cups 1,

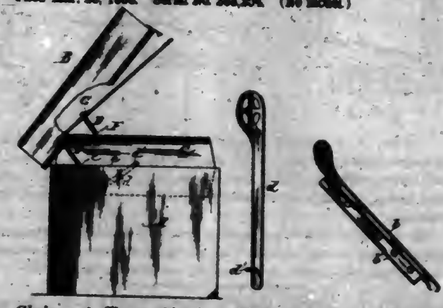


working alternately in pairs, guide-rods 7, and angle-iron 12, all substantially as shown and described.



395,597. TRUNK-FIXTURE.

CHARLES A. TAYLOR, Chicago, Ill. Filed Mar. 23, 1888. Serial No. 268,254. (No model.)



Claim.—1. The combination, with the body of a trunk and lid hinged to the rear upper edge thereof, of a brace, *b*, pivotally secured to the inner wall of the lid near its pivotal point and extending a suitable length, as shown, and having projecting outward a lateral rib or flange which terminates at a point near its end, which flange rests between the meeting edges of the lid and body when said trunk is closed, and the end of which forms a shoulder that rests upon the upper side edge of the body when the lid is open.

2. The combination, in a trunk, of the body part thereof, the lid thereof, and a tray hinged at the back to the rear upper edge of said body, with a brace, *d*, pivotally secured at a suitable point to the side edge of said tray, near the bottom thereof, having a projecting stud near the outer end which rests upon the upper side edge of the body of the trunk, which is provided with a transverse notch to afford a purchase for said stud when said tray is open.

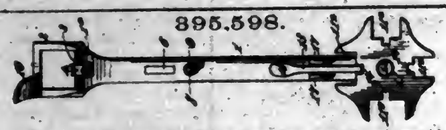
3. The combination, with the body of a trunk, the lid thereof, the tray hinged to the rear upper edge of said body, the lid of said tray hinged to the rear upper edge of said tray, and the knuckle-plate G, secured to the upper surface of said lid next the side edge, of the brace D, having a stud, *f*, projecting laterally and journaled in the knuckles of said plate G, so as to oscillate alongside of said edge of the lid, and having an inwardly-projecting finger, F, which projects inward and rests upon the upper side edge of the tray, so that when the tray-lid is open the gravity of said brace keeps the finger resting upon the adjacent edge of the tray, and when the lid is opened as far as desired maintains it open.

395,598. COMBINATION-TOOL.

ALBERT WAGGONER, Columbus, Ohio, assignor of one-half to William R. Dawson, same place. Filed Apr. 20, 1887. Serial No. 236,480. (No model.)



395,598.

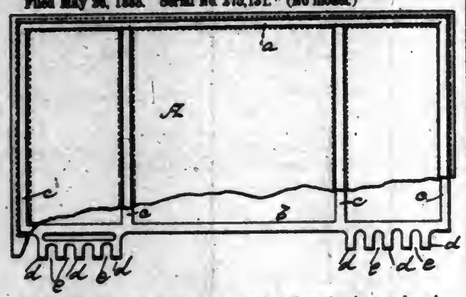


Claim.—1. A wrench having one or more sockets and provided with a wiper consisting of a plate of rubber set in or mounted on the shank or handle, substantially as described.

2. A wrench having one or more sockets and provided with a wiper consisting of a plate of suitably-vulcanized rubber set in or mounted on the shank and having a rigid supporting-plate lying on one side thereof, substantially as described.

3. A wrench having one or more sockets and provided with the knife 10, for detaching hardened oil from the axle-spindle, and the spindle-cleaning wiper 6, composed of a rubber plate set in or mounted on the shank, substantially as described.

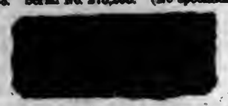
395,599. VEHICLE-DASH. ALBERT WAGGONER, Columbus, Ohio. Filed May 26, 1888. Serial No. 275,131. (No model.)



Claim.—1. A vehicle-dash provided with projections or lugs having spaces between them, as at *c*, and said spaces open at one end, in combination with the bolt *f*, having the nut A, and L-shaped perforated iron *g*, substantially as described, for securing the dash to the vehicle.

2. A vehicle dash-board having open slots formed by projecting lugs or fingers, in combination with the fastening-bolt and L-shaped iron, substantially as described, and for the purpose set forth.

395,600. DENTAL RUBBER. GILBERT WALKER, London, England. Filed May 8, 1888. Serial No. 273,236. (No specimens.)



Claim.—As a new article of manufacture, a variegated vulcanizable compound for artificial dentures, composed of variously-colored rubber finely comminuted and commingled, whereby the natural gum of the human mouth may be closely imitated in the vulcanized dentures, substantially as set forth.

395,601. ARTIFICIAL DENTURE. GILBERT WALKER, London, England. Filed July 5, 1888. Serial No. 279,066. (No model.)



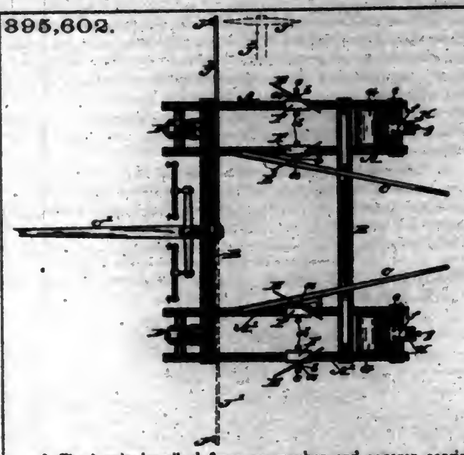
Claim.—An artificial denture the gum portion of which is of variegated vulcanized rubber in imitation of the natural gum of the human mouth, substantially as described.

395,602. FURROWER, MARKER, AND COVERER. JEREMIAH S. WATSON, Yorktown, and CHARLES S. ABERNETHY, Elmer, N. J. Filed May 3, 1888. Serial No. 272,675. (No model.)

Claim.—1. The herein-described combined furrower, marker, and coverer, consisting of the two connected frames, said frames having guiding-wheels in their forward ends, furrowers in their rear ends, and coverers intermediate of the said guiding-wheels and furrowers, the coverers being capable of a vertical and horizontal adjustment on the frames, substantially as described.

2. In a combined furrower, marker, and coverer, a frame having a pair of coverers each of which is vertically and horizontally adjustable, a roller in the rear of said coverers for smoothing or rolling the land after the coverers have thrown the same in the furrows, substantially as described.

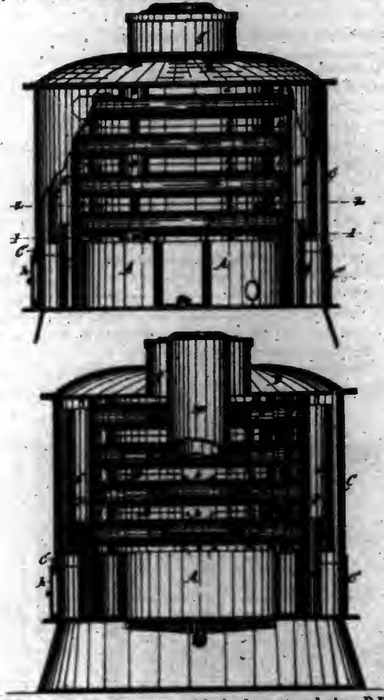
395,602.



3. The herein-described furrower, marker, and coverer, consisting of two connected frames carrying the guiding-wheels, vertically and horizontally adjustable coverers, land-rollers, furrowers, and the marker pivoted to one of the connecting-beams, all arranged and adapted to serve in the manner and for the purpose described.

4. In a combined furrower, marker, and coverer, a frame having parallel bars, a beveled roller between the forward ends of said bars, coverers adjustably connected with said bars, a land-roller journaled in said bars in the rear of the coverer, and a furrower behind said roller, said parts being combined substantially as described.

395,603. BOILER. CORTON WHEAT, Geneva, N. Y. Filed July 14, 1887. Serial No. 244,347. (No model.)



Claim.—1. In combination with the fire-pot and pipes P P P, the walls *a a*, provided with ports *b b*, the annular flues *c c*, formed between the pipes outside of the walls *a a*, ports *b' b'*, leading from the said flues, the case C, inclosing the aforesaid parts, and the exit-flue *f*, extended from said case, substantially as described and shown.

2. In combination with the hollow fire-pot shell and pipes P P P, the supporting-walls *a a*, provided with ports *b b*, separate annular flues *c c*, formed between the pipes outside of the walls *a a*, ports *b' b'*, leading from said flues, baffle-plates surrounding the flues *c c*, the case C, surrounding the baffle-plates, and the exit-flue *f*, extended from the case, substantially as described and shown.

3. In combination with the hollow fire-pot shell and inclosing-case C, the annular water-pipes P P, of different circumferences and arranged concentric over the fire-pot, pipes O O, connecting the pipes P P with each other and with the fire-pot shell, radial pipes *p p*, connecting the smaller with the larger annular pipes, and the magazine *m*, arranged concentric in the smaller pipes, P', and formed separate from said pipes, substantially as described and shown.

4. In combination with the hollow fire-pot shell A and inclosing-case C, the water-pipes P P, walls *a a*, interposed between said pipes, the dome D, pipes O O O, connecting the pipes P P with each other and with the fire-pot shell and dome, the flue *g*, extending vertically through the center of the dome, the magazine *m*, extending through said flue, and the direct exit-flue *f'*, extended from the flue *g*, substantially as described and shown.

5. In combination with the hollow fire-pot shell A and inclosing-case C, the pipes P P, arranged one above the other, the dome D, pipes O O, connecting the said pipes with each other and with the fire-pot shell and dome, the walls *a a*, interposed between the pipes P P and provided with ports *b b*, and separate flues *c c* between the pipes and provided with the ports *b' b'* diametrically opposite the ports *b b*, substantially as described and shown.

6. In combination with the hollow fire-pot shell A and inclosing-case C, the pipes P P, arranged one above the other, the dome D, pipes O O, connecting the said pipes with the fire-pot shell and dome, walls *a a*, interposed between the pipes P P and provided with ports *b b*, separate flues *c c* between the pipes P P, outside of the walls *a a*, and provided with ports *b' b'* diametrically opposite the ports *b b*, and the baffle-plates *d d'* between the flues *c c* and case C, substantially as described and shown.

7. In combination with the hollow fire-pot shell A and inclosing-case C, the water-pipes P P and P' P', of different circumferences and arranged concentric over the fire-pot, radial pipes *p p*, vertical pipes O O, dome D, flue *g*, extending vertically through the dome, the magazine *m*, separate from the pipes P' P' and extending through the flue *g*, walls *a a* between the pipes P P and provided with ports *b b*, separate flues *c c* between the pipes at the outside of the aforesaid walls and provided with the ports *b' b'* diametrically opposite the ports *b b*, the exit-flue *f*, provided with the damper *i*, and the direct exit-flue *f'*, extended from the flue *g* to the flue *f* and provided with the damper *n*, substantially as described and shown.

8. The combination, with the horizontal pipes P P and vertical pipes O O, connecting said horizontal pipes, of the partitions *t t*, extending through the pipes O O and across the pipes P P, substantially as described and shown.

9. The combination of the horizontal pipes P P, arranged one above the other, the vertical pipes O O, connecting the horizontal pipes alternately at diametrically-opposite points, and partitions *t t*, extending through the vertical pipes and across the horizontal pipes, substantially as and for the purpose set forth.

10. In combination with the fire-pot A, pipes P P, and flues *c c* around said pipes, the case C, having the base C', provided with the door A, and the baffle-plate *d*, adapted to be lifted from the bottom of the case, substantially as and for the purpose set forth.

395,604. DENTAL PLUGGER. JOHN D. WILKES, New York, N. Y. Filed July 12, 1888. Serial No. 279,760. (No model.)



Claim.—1. The combination, in a dental plugger, of the handle, the plunger-rod playing longitudinally in said handle and having a lateral transverse slot in its upper end, the sleeve or nut adjustable longitudinally upon said rod, the controlling-pin, and the wheel journaled in the upper end of the handle and carrying an actuating-pin to engage the slotted end of the plunger-rod, substantially in the manner and for the purpose herein set forth.

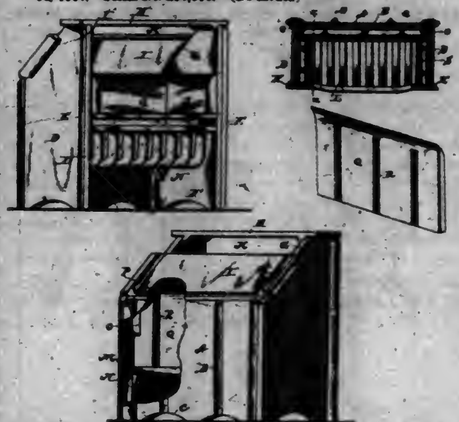
2. The combination, in a dental plugger, of the handle, the longitudinally-reciprocating plunger-rod fitted therein, the wheel journaled in the upper end of the handle and actuating said rod, substantially as set forth, the spindle carrying said wheel having a conical bearing at its inner end within the handle, the conical washer encircling the outer end of the spindle to fit in a counterpart seat formed on the outside of the handle, and a nut screwing upon the spindle to bear against said washer, all substantially in the manner and for the purpose herein set forth.

395,605. METHOD OF MANUFACTURING PLANISHED SHEET-IRON. WATERS D. WOOD, Pittsburg, Pa. Filed Nov. 15, 1883. Serial No. 260,950. (No specimens.)

Claim.—1. As a step in the method of manufacturing planished sheet-iron, applying to the sheet a deoxidizing-gas intermediate between the withdrawal of the sheet from the preliminary deoxidizing operation and the application thereto of an oxidizing agent, substantially as set forth.

2. As a step in the method of manufacturing planished sheet-iron, applying hydrogen or other gas containing a considerable proportion of hydrogen to the surfaces of the sheet intermediate between the preliminary deoxidizing operation and the application thereto of an oxidizing agent, substantially as set forth.

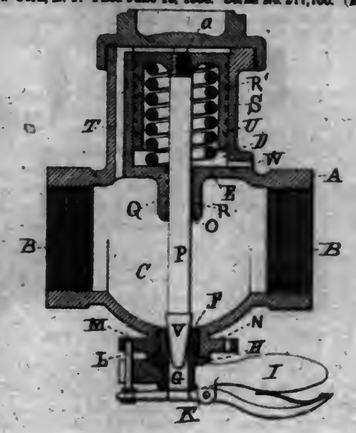
395,606. GRATE. LEWIS P. WOODS, Blairsville, Pa. Filed Dec. 14, 1887. Serial No. 257,893. (No model.)



Claim.—1. The combination of the rear piece having vertical ribs or projections, the side pieces each provided with an inclined upper portion terminating in a squared-off or horizontal surface and having edge ribs or strips, the horizontal top piece secured to the squared-off portions of the side pieces and having extending ends, and the inclined top piece provided with strips, the ends of said inclined piece extending beyond the side pieces and formed or provided with downward flanges engaging therewith, said inclined top piece being also of a width less than the width of the inclined portions of said side pieces, whereby a space or smoke-outlet is formed between the upper edge of said inclined piece and the rear edge of the horizontal top piece.

2. The combination of the frame having the vertical outer strips or ribs, the rear fire-plate having a curved upper edge and provided with vertical ribs or strips upon its rear surface, the side fire-plates having the upper parts of their rear edges curved, their outer or front edges provided with steps or shoulders, their upper edges curved outward and their rear surfaces provided with vertical strips or ribs, the corner-strips, and the cross-strip having the ends thereof resting upon the tops of said corner-strips.

395,607. DRAIN-VALVE FOR STEAM-PIPES. JAMES C. BAYLIS, New York, N. Y. Filed June 18, 1888. Serial No. 277,700. (No model.)

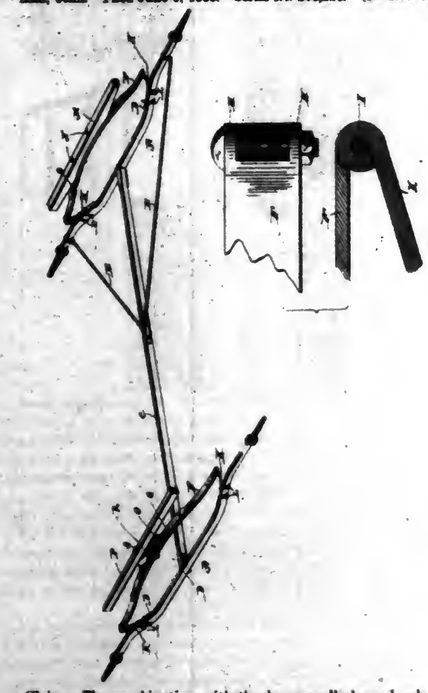


Claim.—1. In a drain-valve for steam-pipes, the combination, with the shell A, provided with the port-openings B and waste-opening F, of the means for controlling the area of the waste-opening, consisting of the diaphragm E, piston S, spring U, and stem P, substantially as set forth.

2. The combination, in a drain-valve for steam-pipes, with the shell A, provided with the port-openings B B and waste-opening F, of the means for adjusting the area of the waste-opening, consisting of the adjustable thimble G.

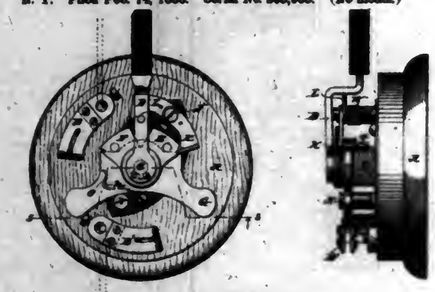
3. A drain-valve for steam-pipes, consisting of a shell or body having opposite port-openings in the sides thereof, a drip-opening in the lower portion of the body of said valve, and a device for controlling the area of the drip-opening actuated by the differential action of a spring and the pressure of the steam transmitted through the valve, substantially as described.

395,608. VEHICLE-SPRING. GEORGE H. BLAKEMAN, Birmingham, Conn. Filed June 6, 1888. Serial No. 276,226. (No model.)



Claim.—The combination, with the downwardly-bowed axle and the semi-elliptical springs F, of the short straight springs having their outer ends hinged to the ends of the semi-elliptical spring and their inner ends secured to the axle, the intermediate portions of said springs resting on the inclined portions of the axle, as specified.

395,609. ELECTRICAL SWITCH. PAUL H. BRADEN, Newark, N. J., assignor to the United States Electric Lighting Company, New York, N. Y. Filed Feb. 14, 1888. Serial No. 263,965. (No model.)



Claim.—1. The combination, with the pivoted contact-plate of an electric switch, of a spindle about which the plate turns, two spring-actuated parts adapted to encounter the plate on opposite sides of its fulcrum, detents for engaging with and locking the said pivots in a state of tension, and a handle or key adapted when turned to force the spring-actuated parts into position to engage with the detents and to release the detents from such engagement alternately, as set forth.

2. The combination, with the shifting contact plate or lever, of two spring-actuated arms adapted to bear upon or encounter said lever upon opposite sides of its fulcrum, detents in position to engage with and restrain the said arms, and a lever or handle for alternately shifting or turning the arms against the tension of their actuating-springs into a position to engage with the detent and to release them from such engagement, as set forth.

3. The combination, with a spindle and a contact plate or lever mounted loosely thereon, of two spring-actuated arms secured with lost motion to the spindle and adapted to encounter the contact lever on opposite sides of its fulcrum, and detents for restraining the arms placed in the path of the handle or key that turns the spindle where a given movement of said handle will release the detents from engagement with the spring-actuated arms, as set forth.

4. The combination, with a spindle and a contact lever or plate mounted loosely thereon, of two arms secured to the spindle, but with a lost motion around the same, and adapted to encounter the contact-lever, a spiral or coiled spring surrounding the spindle and having its ends connected to the two arms, respectively, detents for engaging and restraining the arms, and a handle or lever adapted to turn said arms into position to engage with the detents and to release the detents from such engagement alternately, as set forth.

5. The combination, with the spindle, a contact-plate turning loosely thereon, and a handle or lever for turning the spindle, of two arms capable of a limited lost motion around the spindle, a spiral spring surrounding the spindle, with its ends connected to pins set in said arms, that are adapted to encounter the contact-lever on opposite sides of the fulcrum, and two spring-detents for engaging with the arms, and a pin on the operating handle or lever adapted to force back or release either of said detents when caused to bear thereon.

395,610. REACH-CONNECTION FOR VEHICLES. JOHN H. BROWN, New London, Conn. Filed Mar. 17, 1888. Serial No. 267,447. (No model.)



Claim.—In combination with an axle and reach, an upper and lower plate secured to said reach and projecting outward to the axle, as set forth, an intervening washer-arm engaging the axle, a king-bolt passing through said upper, lower, and washer plates and the axle, and a spring located between the free ends of the said lower and washer plates, substantially as described, and for the purpose specified.

395,611. DEVICE FOR SUPPORTING AND GIVING VIBRATING MOTION TO HOSE-PIPES. HARRY C. COLLINS, Springfield, Mass. Filed Apr. 23, 1888. Serial No. 271,533. (No model.)

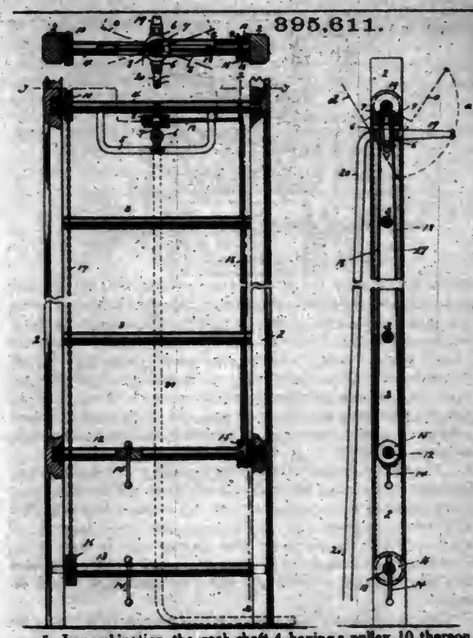
Claim.—1. Devices for supporting and imparting vertical and horizontal vibratory motions to a hose-pipe, consisting of a horizontal rock-shaft, 4, having an auxiliary shaft, 7, supported thereon at right angles to the axis of said rock-shaft, a hose-pipe attached to said auxiliary shaft, a movable frame, substantially as described, in which said horizontal shaft is supported, and two other rock-shafts, 12 and 13, supported in said frame having cord-connections, substantially as described, respectively with said auxiliary shaft and said shaft 4, whereby the hose-pipe-supporting shafts 4 and 7 have rocking motions in horizontal and vertical planes imparted thereto, combined and operating substantially as set forth.

2. The horizontal rock-shaft 4, provided with a pulley, 10, and having an auxiliary shaft, 7, supported thereon at right angles to the axis of said rock-shaft, a hose-pipe attached to said auxiliary shaft, a frame, substantially as described, in which said horizontal shaft is supported, and a pending cord or chain connected with said pulley, combined and operating substantially as described.

3. The horizontal shaft 4, having an auxiliary shaft, 7, having a pulley, 8, thereon, supported on said shaft 4 at right angles thereto, a hose-pipe attached to said auxiliary shaft, a frame, substantially as described, in which said horizontal shaft is supported, and a cord connected with said pulley 8, combined and operating substantially as set forth.

4. In combination, the rock-shaft 4, having a pulley, 10, thereon, the shaft 7, supported on said rock-shaft and having a pulley, 8, thereon, the tube 6, rigidly attached to said shaft 7 and having its ends screw-threaded, a frame, substantially as described, in which said rock-shaft is supported, and the two rock-shafts 12 and 13, having bearings in said frame and cord-and-pulley connections, substantially as described, with said shafts 4 and 7, substantially as set forth.

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5. In combination, the rock-shaft 4, having a pulley, 10, thereon, the shaft 7, supported on said rock-shaft and having a pulley, 8, thereon, the tube 6, rigidly attached to said shaft 7 and having its ends screw-threaded, a hose-pipe and a hose connected to the opposite ends of said tube, a frame, substantially as described, in which said rock-shaft is supported, and the two rock-shafts 12 and 13, having bearings in said frame and cord-and-pulley connections, substantially as described, with said shafts 4 and 7, substantially as set forth.

6. The horizontal rock-shaft 4, the auxiliary shaft 7, supported on said horizontal shaft at right angles thereto, a hose-pipe attached to said auxiliary shaft, and a frame, substantially as described, in which said horizontal shaft is supported, combined and operating substantially as set forth.

395,612. DECOY. SETH CURLER, Union City, Tenn. Filed Oct. 17, 1888. Serial No. 288,237. (No model.)



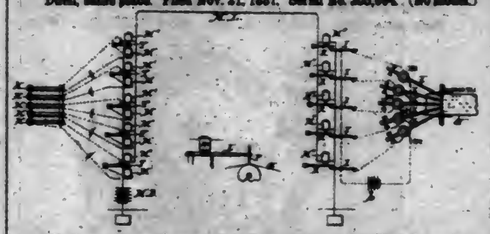
Claim.—1. A decoy comprising a buoyant collapsible body and a metallic air-valve depending from the middle of the body on the under side thereof, and having at an intermediate point of its length an exteriorly-accessible turning plug, the weight of said valve serving as a counter-balance to the buoyant body, substantially as and for the purpose set forth.

2. A decoy comprising a hollow collapsible body having at the middle of its under side a depending nozzle, E, made integral therewith, and a metallic air-valve detachably inserted in said nozzle and having a turning plug at a point below said nozzle, substantially as described.

3. A decoy comprising a hollow collapsible body having a nozzle depending from the under side thereof, a metallic air-valve having a flared upper end inserted in said nozzle, and a fastening for detachably connecting the air-valve to the nozzle, said air-valve also having a turning plug located in its longitudinal bore or passage *f'* at a point below the nozzle and accessible at all times, substantially as described.

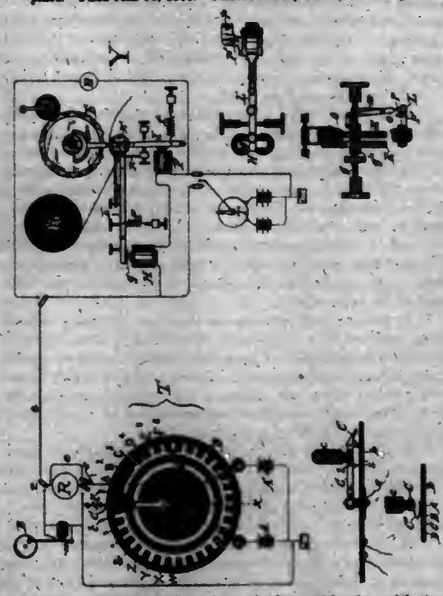
4. In a decoy, a buoyant body having means for inflating the same with air, a line connected to the body and having an anchor at its lower end for preventing dislodgment of said body, and a series of anchor-weights detachably connected to said line at suitable intervals to submerge the buoyant body to a greater or less degree, according to the number of anchor-weights employed, substantially as described.

395,613. ELECTRO-HARMONIC TELEGRAPHY. MARK W. DEWEY, Syracuse, N. Y., assignor of two-thirds to Emil Lasan and Charles H. Doell, same place. Filed Nov. 21, 1887. Serial No. 255,994. (No model.)



Claim.—In an electro-harmonic system, a plurality of manipulative transmitters arranged to be operated either separately or two or more simultaneously by one person, and a corresponding number of printers or markers actuated, respectively, by the aforesaid transmitters and arranged at right angles to the line of travel of the paper, and to produce by the simultaneous action of two or more of said printers or markers a corresponding number of marks in a row at right angles to the travel of the paper, and the row of marks so disposed representing a letter or character, as set forth.

395,614. PRINTING-TELEGRAPH. MARK W. DEWEY, Syracuse, N. Y., assignor of two-thirds to Emil Lasan and Charles H. Doell, same place. Filed Jan. 30, 1888. Serial No. 262,267. (No model.)



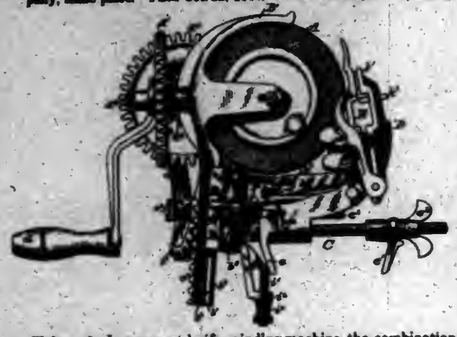
Claim.—1. In a printing-telegraph, the combination, with the recording or receiving instrument, of the transmitting-instrument, consisting of two concentric insulated annuli, one having a series of equidistant contact-points and the other being continuous, and a rotating key having contact-points adapted to be brought into contact with the respective annuli to transmit currents of different strength to the type-wheel-operating mechanism and the printing-lever, respectively, through suitable electrical connections and batteries, substantially as specified.

2. The transmitting-instrument consisting of two concentric insulated annuli, one having a series of interrupted contact-points and the other being continuous, in combination with a rotating and vibrating lever and proper electrical connections, whereby intermittent pulsations of different strength may be sent to the receiving-instrument when the transmitting and receiving instrument are electrically connected, substantially as specified.

3. The combination, with the printing-lever L and pivoted shaft *g*, of the laterally-movable type-wheels E E, connected to the said

shaft by groove and feather, the arm *m*, projecting from said shaft, the lever *o*, pivoted to said arm and connected at one end with the type-wheels, and the cams *p p'*, projecting from the printing-lever, one back of the other in the direction of the length of said lever and adapted to engage the free end of the lever *o* at opposite sides thereof, substantially as described and shown.

395,615. MACHINE FOR GRINDING MOWER-KNIVES. ROYAL DUTTON, New York, N. Y., assignor to the Mower Knife Grinder Company, same place. Filed Oct. 22, 1887. Serial No. 253,077. (Model.)



Claim.—1. In a mower-knife-grinding machine, the combination, substantially as hereinbefore described, of a flat-faced grinding-wheel, a knife-clamp, a knife-clamp frame, and a grinding-wheel frame, said frames being pivotally coupled with relation to each other to provide for lateral swinging adjustment, and said grinding-wheel frame being composed of two parts, one serving as an arm in which the wheel is mounted and sliding in said other part or base portion of said frame, a driving-crank mounted on a pivot on said arm portion of the frame at right angles to the axis of the grinding-wheel, and gearing, also mounted on said arm portion of the frame, for rotatively coupling said crank with the grinding-wheel.

2. In a mower-knife-grinding machine, a flat-faced grinding-wheel, a pivoted knife-clamp normally inclined toward the grinding-face of said wheel, a spring forcing said clamp toward the grinding-surface, and a sliding frame carrying said wheel and mounted in guide-bearings which are inclined toward said knife-clamp, substantially as described, whereby as the grinding-wheel is lifted by the sliding movement of its frame it will also be advanced toward a knife held in said clamp, and by forcing the latter rearward increase the force of said spring, and thus enable the tips of a knife-edge to be ground under abrasive pressure equal to that afforded while grinding the lower portion of the same edge.

3. In a mower-knife-grinding machine, the combination, substantially as described, of a knife-clamp, its frame, a flat-faced grinding-wheel and its frame, the latter being constructed in two parts, one sliding upon the other, a driving-crank standing at right angles to the axis of the grinding-wheel and coupled to said wheel by gearing, and a lever for lifting and lowering that portion of the wheel-frame in which said grinding-wheel is directly mounted.

4. In a mower-knife-grinding machine, the combination of a knife-clamp and a flat-faced grinding-wheel, both mounted in frames which are pivotally connected to admit of lateral swinging adjustment, stops for restricting said pivotal movement, and latches which confine or lock said stops when in position for service, substantially as described.

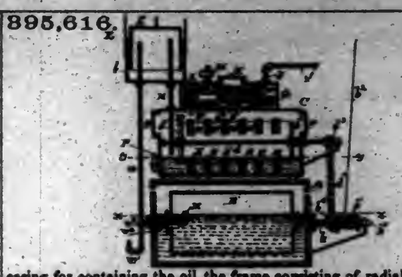
5. In a mower-knife-grinding machine, the combination, with the grinding-wheel, of a detachable wheel-frame arm in which said wheel is mounted, a hand-crank standing at right angles to the axis of the wheel and mounted on a stud projecting from said frame at the rear of said wheel, and gearing, also mounted on studs projecting from said frame, for coupling the crank with the grinding-wheel, substantially as described.

6. The combination, substantially as described, of the knife-clamp, the grinding-wheel, the sliding wheel-frame arm provided with a tail-piece having a rack-gear thereon, and a hand-lever having a segmental gear engaging with said rack-gear for lifting and lowering said grinding-wheel while its face is in contact with a mower-knife held in said clamp.

7. The combination of the wheel-frame arm having a flat tail-piece provided with a central spine or web and the wheel-frame base provided with a central vertical groove for receiving said web, and also provided with guide-bearings for receiving the two edges of said tail-piece, substantially as described.

395,616. CARBURETOR. HOSE J. DYER, Berkeley, Cal. Filed Nov. 5, 1887. Serial No. 254,430. (No model.)

Claim.—1. In a carburetor, the combination of the cylindrical



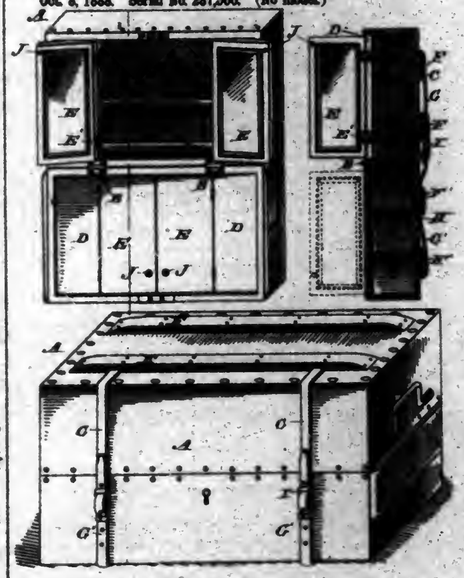
casing for containing the oil, the frame consisting of radial end arms and horizontal removably-secured wires, the wicks within the casing and suspended from said wires, power mechanism to rotate the frame, the air-pump, and the intervening aerometer or regulator connected with oil-casing, the feed-casing for oil, containing absorbent material mounted on top of the oil-casing and communicating therewith through apertures, said casing conforming to the curvature of the oil-casing, whereby depressions are formed in each side of the base of the feed-casing and on each side of the communicating apertures, substantially as herein described.

2. In a carburetor, the casing for containing the oil and having hand-holes for reaching its interior, the air-pump, and the intervening aerometer or regulator connected with the oil-casing, in combination with frame mounted within the oil-casing, said frame consisting of arms and removable peripheral wires hooked into the arms, power mechanism for rotating the frame, and strips of wicking suspended from the peripheral wires of said frame, substantially as herein described.

3. In a carburetor, the combination of the cylindrical casing for the oil, the frame consisting of radial end arms and horizontal removably-secured wires, with their suspended wicks, means for rotating said frame, the air-pump, and connected aerometer or regulator, the casing for feeding the oil, said feed-casing containing absorbent material and conforming to the curvature of the oil-casing, whereby depressions are formed on each side of the communicating apertures, an inlet-pipe for feeding the oil to the feed-casing, and a deflecting-plate under the inlet-pipe for directing the oil primarily into the depressions of the feed-casing, substantially as described.

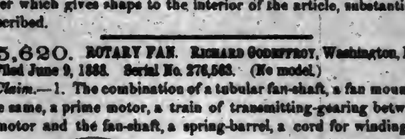
4. A carburetor comprising an air-pump consisting of a casing for water and inclosed rotary cylinder, a carbureting-chamber mounted on the air-pump and consisting of a casing for oil and airand inclosed rotary wick-carrying frame, a feed-casing mounted on the carbureting-casing and packed with absorbent material, said feed-casing communicating with the oil and air casing and having an oil-inlet pipe and a carbureted-air exit-pipe, and an aerometer or regulator above the feed-casing and connected with the air-pump and with the oil and air casing, substantially as described.

395,617. TRUNK. MINERVA J. EATON, Hot Springs, Dak. Filed Oct. 3, 1888. Serial No. 287,500. (No model.)



Claim.—In a convertible trunk made in two parts hinged together, the combination in each part of the longitudinal partitions C C, the transverse frame-pieces D D, and the doors hinged to the transverse pieces, with the bumpers J J, for holding the doors shut when closed, substantially as set forth.

395,618. CORK-EXTRACTOR. GEORGE HOWARD, Berkeley, Cal. Filed May 12, 1888. Serial No. 273,722. (Model.)



Claim.—An improved cork-extractor consisting of a frame or stock having an annular foot and a tubular top with notches, a tubular power-screw carried in the top and having a free linear movement therein, said screw having a top disk, a corkscrew the twist or thread of which is the reverse of that of the power-screw, said cork-screw having a stem passing freely through the tubular power-screw and provided with a head-flange fitting in the top disk of said power-screw, the pawl or catch-bar in the top disk and having projecting ends, and the notches in the stem-head flange, the handle-cap fitting over the top disk and engaging the projecting ends of the catch-bar, and the nut seated on the power-screw and having projections or teeth, whereby it is detachably connected with the notched top of the frame or stock, substantially as and for the purpose herein described.

395,619. HORIZONTALLY-DIVIDED DIE. JOHN A. FURMAN, Newark, N. J., assignor of one-half to the Celluloid Novelty Company, New York, N. Y. Filed Sept. 20, 1886. Serial No. 214,531. (No model.)

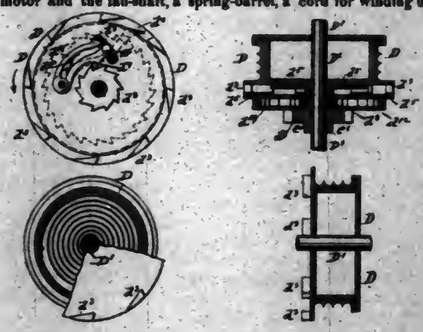


Claim.—1. In a horizontally-divided die for molding a number of hollow articles simultaneously, a bottom plate having a number of recesses therein adapted to give shape to the exterior of the lower portions of the articles and a central plate having a number of apertures corresponding in position with the recesses in the lower plate and adapted to give shape to the exterior of the upper portions of the articles, said plates being horizontally separable from each other, in combination with a top plate carrying plungers corresponding with the said recesses and apertures and adapted to give shape to the interior of the hollow articles, substantially as described.

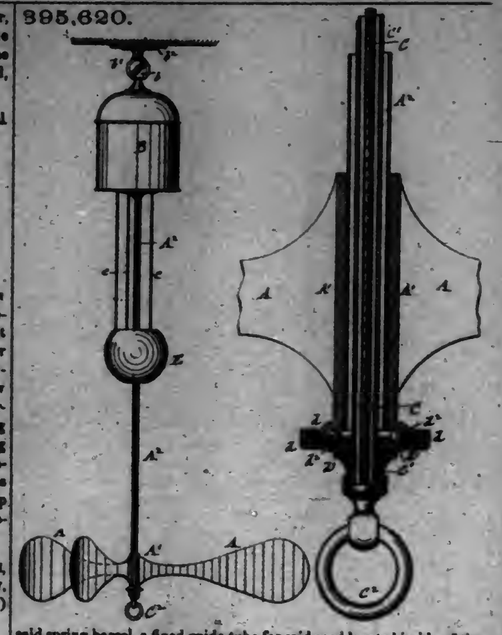
2. A die for giving shape to the exterior of hollow articles, consisting of a bottom plate having a recess therein enlarged at its upper portion and a central plate adapted to fit upon and be united to the bottom plate and having an aperture corresponding in position with the recess in the bottom plate enlarged at its lower portion, whereby the article formed is thickened or enlarged on the line of division between said plates, in combination with a plate carrying a plunger which gives shape to the interior of the article, substantially as described.

395,620. ROTARY FAN. RICHARD GODFFROY, Washington, D. C. Filed June 9, 1888. Serial No. 276,563. (No model.)

Claim.—1. The combination of a tubular fan-shaft, a fan mounted on the same, a prime motor, a train of transmitting-gearing between said motor and the fan-shaft, a spring-barrel, a cord for winding up



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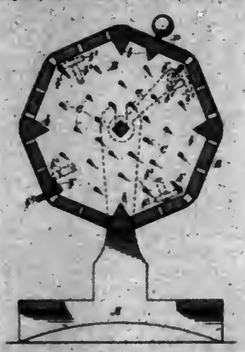


said spring-barrel, a fixed guide-tube for said cord located inside of the tubular fan-shaft, and a pawl-and-ratchet mechanism between the spring-barrel and train of gearing for winding up the spring-barrel and motor, whereby the latter is either wound up or released for actuating the clock-train and fan-shaft, substantially as set forth.

2. The combination of a tubular fan-shaft, a fan mounted on the same, a prime motor, a train of gear-wheels between said motor and the fan-shaft, a winding-up spring-barrel, a cord for winding up said barrel, a fixed guide-tube for said cord located inside of the tubular fan-shaft, an anti-friction bearing for the fan-shaft at the lower end of the guide-tube, a second anti-friction bearing for the upper end of the fan-shaft, and a pawl-and-ratchet mechanism between the spring-barrel and motor-barrel, substantially as set forth.

3. The combination of a supporting-frame having fixed sleeves, a guide-tube secured to said sleeves, a tubular fan-shaft inclosing said guide-tube, a fan mounted on said fan-shaft, a prime motor, an intermediate train of gear-wheels between said motor and the fan-shaft, a spring-barrel, a cord for winding up said spring-barrel, said cord being passed through the guide-tube and attached to the spring-barrel, and a pawl-and-ratchet mechanism between the spring-barrel and motor-barrel, substantially as set forth.

395,621. DRIED-FRUIT CLEANER. JOHN HARRELL, Plymouth, Cal. Filed May 31, 1888. Serial No. 275,651. (No model.)



Claim.—An improved fruit-cleaning machine consisting of a rotary hollow drum formed of separated or spaced slats, some of which are triangular in cross-section, forming buckets or elevators, the movable flat strips *b'*, forming other buckets or elevators, each provided with a crank and holding mechanism, and the yielding wires throughout the whole interior of the drum, for removing the fuzz as the fruit passes between them, as herein described.

395,622. DYNAMO-ELECTRIC MACHINE. JOHN F. KELLY, New York, N. Y., assignor to the United States Electric Lighting Company, same place. Filed July 25, 1888. Serial No. 280,962. (No model.)



Claim.—1. In an electrical generator, the combination, with an armature-core and conductors wound longitudinally thereon, of fan-blades at the end of the core and constructed or placed in such relation to the core as to create a current of air along or over the exterior of the core and coils when the armature is rotated, as set forth.

2. In an electrical generator, the combination, with field-magnets and a cylindrical armature-core with longitudinally-wound conductors thereon and mounted to rotate between said magnets, of fan-blades secured to the ends of the armature and constructed or placed in such relation thereto as to create a current of air along or over the exterior of the core and coils when the armature is rotated, as set forth.

395,623. THEATRICAL APPLIANCE. JOHN T. KILHAM, Lowville, N. Y. Filed June 15, 1888. Serial No. 277,187. (No model.)



Claim.—1. A scene composed of sets of interchangeable reversible sections, substantially as described.

2. A scene composed of interchangeable reversible hinged sections, substantially as and for the purpose described.

3. A scene composed of sets of interchangeable sections, the sections of one set constructed to alternately hide and expose those of the other set, and the whole adapted to be reversed to expose the opposite side of said sections, substantially as described.

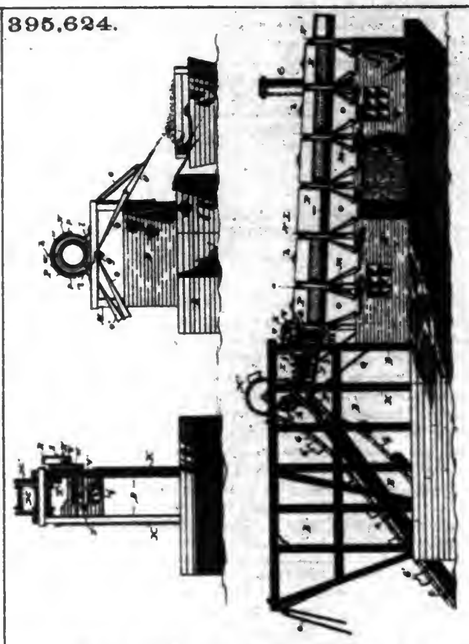
395,624. APPARATUS FOR DREDGING, WASHING, AND SEPARATING SAND AND GRAVEL. JAMES M. MILLER, Washington, D. C. Filed Mar. 31, 1888. Serial No. 269,092. (No model.)

Claim.—1. The combination, with a barge, of a dredge, a washer into which the dredge empties the dredged material, means, substantially as described, for supplying clear water to the washer, a revoluble screen in communication with the washer, and mechanism for operating the dredge, the washer, and the screen, as set forth.

2. The combination, with a barge provided with a cabin, of a dredge located at one end of the barge, a washer into which the dredge empties the dredged material, means, substantially as described, for supplying clear water to the washer, a revoluble screen mounted longitudinally of the barge above the cabin and in communication with the washer, aprons inclined outwardly and downwardly from underneath the screen and supported by the cabin, and mechanism for operating the dredge, the washer, and the screen, as set forth.

3. The combination, with a barge and a dredge and revoluble screen mounted on the barge, of a washer located between the dredge and screen, so as to receive the dredged material from the former and empty it into the latter, said washer consisting of a box having a

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concave inclined bottom, and an agitator-shaft mounted in a horizontal plane in said box and provided with a series of blades of various lengths reaching to near the inclined bottom of the box, pipes for supplying clear water to the washer, and mechanism for operating the dredge, the washer, and the screen, substantially as described.

4. The combination, with the barge and a dredge and revoluble screen mounted on the barge, of a washer located between the dredge and screen, so as to receive the dredged material from the former and empty it into the latter, said washer consisting of a box having a concave inclined bottom, and an agitator-shaft mounted in a horizontal plane longitudinally in said box and provided with rearwardly-curved blades of unequal lengths reaching to near the inclined bottom of the box, pipes for supplying clear water to the washer, and mechanism for operating the dredge, the washer, and the screen, substantially as described.

5. The combination, with the revoluble screen and downwardly and outwardly inclined aprons secured underneath the same on each side, of swinging deflectors adapted to be swung to either side of the screen for the purpose of deflecting the screened material onto either one of the aprons, as desired, substantially as described.

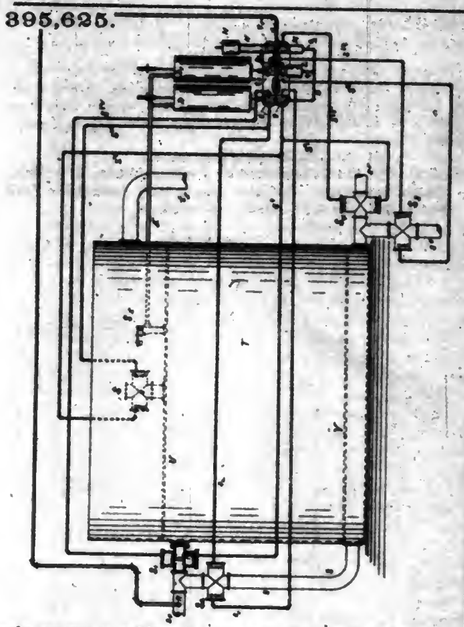
395,625. FILTER AND APPARATUS FOR AUTOMATICALLY CLEANING THE SAME. GEORGE H. MOORE, Norwich, Conn. Filed June 17, 1887. Renewed Dec. 5, 1888. Serial No. 292,756. (No model.)

Claim.—1. The combination, with a filter, of a primary valve governing one of the inlet or outlet openings thereof, said valve being operated by fluid or liquid under pressure, a conduit leading from a primary source of fluid or liquid under pressure to said valve, a secondary valve operated by gravity located in said conduit, and a pipe connecting the filter with said secondary valve, whereby the weight of water expelled from the filter through said pipe will operate said secondary valve to govern the admission of the fluid or liquid under pressure to said primary valve, substantially in the manner set forth.

2. The combination, with a filter having one of its inlet or outlet openings governed by a primary valve operated by fluid or liquid under pressure, of a reservoir, conduits connecting said reservoir with a primary source of fluid or liquid under pressure and with said valve, a secondary valve located in the conduit connecting said reservoir with the primary source of fluid or liquid under pressure, a pipe connecting said secondary valve with the filter, whereby said valve is operated by liquid expelled from the filter in one direction and a weight for operating said secondary valve in the opposite direction, arranged and operating substantially as and for the purpose described.

3. In combination with a filter, a primary valve comprising oppositely-located cylinders containing pistons, and a gate or closing device connected to and operated by said pistons, a pipe connecting each of said cylinders with a primary source of fluid or liquid under pressure, and a secondary valve governing the admission of said fluid or liquid

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under pressure to and its exhaustion from both of said cylinders, substantially in the manner and for the purpose described.

4. In combination with a filter, a primary valve comprising two oppositely-located cylinders containing pistons, and a gate or closing device connected with and operated by said pistons, two distributing-reservoirs for fluid or liquid under pressure, pipes connecting each of said reservoirs with one of the cylinders of said primary valve, and a secondary valve regulating the admission of the fluid or liquid under pressure to and its exhaustion from both of said reservoirs, substantially in the manner set forth.

5. In combination with a filter, a primary valve adapted to be opened and closed by fluid or liquid under pressure, two reservoirs having pipe-connection with said valve, and a secondary valve regulating the admission of the fluid or liquid under pressure to and its exhaustion from said reservoirs, said secondary valve having suitable connections with the filter, whereby it is operated in one direction by liquid expelled from the filter, and a weight for moving said secondary valve in the opposite direction, substantially as shown and described.

6. In combination with a filter, a series of primary valves, each comprising two oppositely-located cylinders containing pistons, and a gate or closing device connected with and operated by said pistons, two reservoirs, pipes connecting each of said reservoirs with opposite cylinders of each of said valves, and a secondary valve regulating the admission of fluid or liquid under pressure to and its exhaustion from both of said reservoirs, said secondary valve having suitable connections with the filter, whereby it is operated in one direction by water expelled from the filter, and a weight for moving said suction-valve in the opposite direction, arranged and operating substantially in the manner and for the purpose set forth.

7. In combination with a filter, a series of primary valves governing inlet and outlet openings thereof, a series of reservoirs arranged in pairs, pipes connecting each pair of reservoirs with one or more of said primary valves, secondary valves regulating the admission of fluid or liquid under pressure to and its exhaustion from each pair of reservoirs, intermediate connections with the filter, whereby said secondary valves are operated in one direction by liquid expelled from the filter, weights for moving said secondary valves in the opposite direction, and pipe-connections between said reservoirs and said secondary valves, whereby the latter are prevented from operating synchronously, substantially as and for the purpose described.

8. A high-pressure filter divided into three compartments, having open passages for liquid between its middle and lower compartments, and passages governed by valves between its middle and upper compartments, said filter also having a supply-pipe leading into its middle compartment, cleansing-liquid inlet and filtered-liquid outlet pipes communicating with its lower compartment, and a cleansing-liquid escape-pipe leading from its upper compartment, substantially as and for the purpose set forth.

9. In combination with a filter, valve A, having openings a^3 a^4 a^5 in the rear side of its shell and opening a^6 and passages a^2 in the front side thereof, piston B, having stem b', extending above the shell, and cylinder D, secured to said stem, said cylinder having inlet-passages a and outlet-passages a', substantially as and for the purpose set forth.

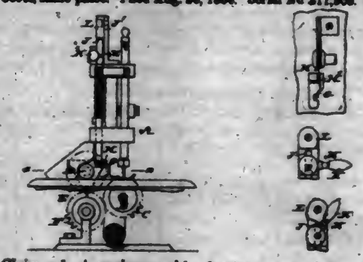
10. In combination with a filter, a valve having a vertically-movable piston, a hollow cylinder secured to said piston, a weight secured to the upper end of said cylinder by a belt passing over a pulley, a pipe leading from the filter extending through the top of said cylinder, a pipe leading from the bottom of said cylinder into a waste-pipe, and an inwardly-opening valve normally closing the mouth of the pipe at the bottom of the cylinder, substantially as shown and described.

11. The combination, with a filter and a primary source of fluid or liquid under pressure, of a series of pressure-actuated primary valves governing inlet and outlet openings of the filter, reservoirs f f^6 f^8, located between said primary source of fluid or liquid under pressure and said primary valves, secondary valves A A', connected to said reservoirs, as shown, said valves having suitable connections with the filter, whereby they are operated in one direction by water expelled from the filter, weights for moving said valves in the opposite direction, pipes connecting said primary valves with said reservoirs and said secondary valves with the primary source of fluid or liquid under pressure, cylinder L, connected to the bottom of valve A', said cylinder containing piston l, the stem of which projects into the chamber of said valve, and pipes c' O, connecting said cylinder with reservoir f, arranged and operating substantially as described, whereby said secondary valves are prevented from operating synchronously.

12. The combination, with a filter and a primary source of fluid or liquid under pressure, of a series of pressure-actuated primary valves governing inlet and outlet openings of the filter, reservoirs f f' f^6 f^7 f^8 f^9, located between said primary valves and the primary source of fluid or liquid under pressure, secondary valves A A' A^2, connected to said reservoirs, as shown, suitable connections between said valves A A' and the filter, whereby they are operated in one direction by water expelled from the latter, weights for moving said valves in the opposite direction, cylinder L, connected to valve A', said cylinder containing a piston the stem of which projects into the valve-chamber, cylinders M N, connected to valve A^2 and containing pistons operatively connected with the piston of said valve, weight H, also connected with the piston of said valve, for moving said piston in one direction, pipes connecting said primary valves with said reservoirs and said secondary valves with the primary source of fluid or liquid under pressure, and pipes connecting cylinders L M with reservoir f and cylinder N with reservoir f^2, whereby said secondary valves A A' are operated directly from the filter, while said secondary valve A^2 is operated by the fluid or liquid under pressure governed by said valves A A', substantially as and for the purpose described.

13. The combination, with the filter T, having head U and false bottom V, as shown, and having pipe c^4, leading into its middle compartment, pipes s s^2 s^3, communicating with its lower compartment, and pipes E c^5, leading from its upper compartment, of primary valves S S' S^2 S^3 S^4, arranged and operating substantially as shown and described, the distributing-reservoirs connected by pipes with said valves, as described, secondary valves A A' A^2, connected to and operating with said reservoirs and a waste-pipe, substantially as set forth, pipe R, connected to each of said secondary valves and to pipe s^4, cylinders D D', secured to the pistons of valves A A', weights connected to said cylinders for normally retaining them in their highest position, connections between each of said cylinders and pipe E and also between the cylinders and a waste-pipe, weight H, connected with valve A^2 in such manner as to normally retain its piston in its lowest position, cylinder L, connected to valve A', as shown, and having pipe-connection with one of the reservoirs connected with valve A, cylinders M N, connected to valve A^2, as shown, and pipe-connection between cylinder M and one of the reservoirs governed by valve A, and between cylinder N and one of the reservoirs governed by valve A', arranged and operating substantially in the manner and for the purpose set forth.

395,626. TRIMMING ATTACHMENT FOR SEWING-MACHINES. THOMAS B. MOORE, Philadelphia, Pa., assignor of one-half to John H. Scott, same place. Filed Aug. 26, 1886. Serial No. 211,903. (No model.)



Claim.—1. A sewing-machine having an upwardly-cutting trim-

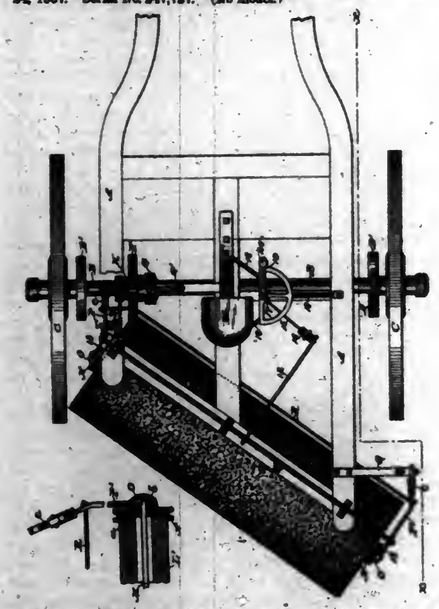
ming-knife journaled above the cloth-plate, mechanism, substantially as described, connected therewith and to the driving-shaft for rotating said knife, a presser-bar with foot, the latter having a slot in its heel portion in which the rotating knife operates, an operating-lever for said presser-bar, and a latch pivoted to an extension of the goose-neck above the presser-bar, whereby the presser-foot is held rigid during the process of trimming, said parts being combined substantially as and for the purpose set forth.

2. A sewing-machine having a presser-bar, a latch pivoted to the head of the goose-neck and normally lying in the path of the presser-foot, and means, substantially as described, attached to said presser-bar for removing the said latch from the path of said presser-bar, substantially as described.

3. A sewing-machine having a presser-foot, a movable latch connected with the frame of the machine over the presser-foot bar, and a projection on the presser-bar lifting-lever adapted to deflect said latch from the path of said bar, substantially as described.

4. A sewing-machine having a presser-foot, the latch L, pivoted to an upper extension of the head of the goose-neck, the eccentric lever K, pivoted to the presser-foot bar, and the stud M, secured to the lever K and operating on the latch L, all substantially as described.

395,627. STREET-SWEEPING MACHINE. CHARLES Z. O'NEILL, New York, N. Y., assignor to William Chapman, same place. Filed Aug. 24, 1887. Serial No. 247,727. (No model.)



Claim.—1. The combination, in a street-sweeping machine, of a broom revolving upon an axis inclined at an angle with the axle of the machine, a driving-shaft rotating parallel with the axle and geared thereto, sprocket-wheels upon the proximate ends of the driving-shaft and broom-shaft, intermediate guide-rollers whose pivotal axes oscillate freely and have free vertical play in their bearings, and a drive-chain carried over the two sprocket-wheels and said interposed guide-rollers, substantially in the manner and for the purpose herein set forth.

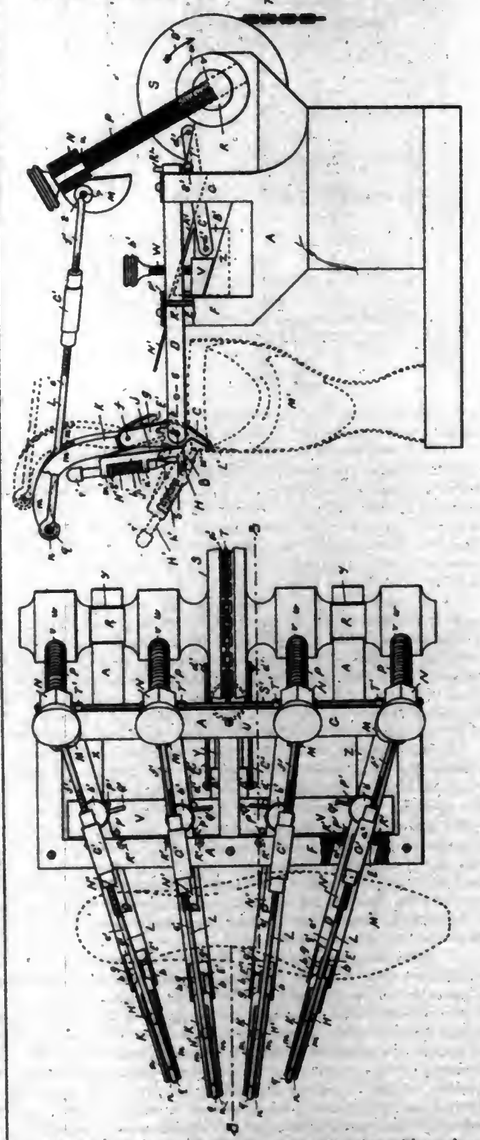
2. The combination, with the hollow wooden core of the cylindrical broom in a street-sweeping machine, of a central shaft carried through said core, transverse pins passing diametrically through the core and shaft at or near the ends thereof, a circular cap-plate fitted upon the ends of the core to embrace the same and formed with a central rectangular aperture to receive the counterpart angular end of the shaft, and a notched peripheral groove adapted to engage the links of a drive-chain, substantially in the manner and for the purpose herein set forth.

395,628. METALLIC SHANK FOR BOOTS OR SHOES. SILAS T. PETERSON and MARSHALL REED, Whitman, Mass. Filed July 28, 1888. Serial No. 281,262. (No model.)



Claim.—The self-fastening metallic shank for boots and shoes, consisting of the arched strip of plate-steel oppositely beveled at its ends and having the lateral extremities of said beveled ends B on opposite sides turned upward at right angles, presenting diagonally-opposite points.

395,629. LASTING-MACHINE. ALBERT F. PRESTON, Lynn, Mass., assignor to the Preston Lasting Machine Company, Portland, Me. Filed Sept. 5, 1887. Serial No. 248,894. (No model.)



Claim.—1. In a lasting-machine, the combination, with two jaws pivoted to a bar, D, arranged to move backward and forward in suitable guideways and provided with a shoulder, g', of a lever pivoted to one and arranged to engage with the other of said jaws and connected to means for operation thereof.

2. In a lasting-machine, the combination, with a series of bars, D, arranged to move backward and forward in suitable guideways, each bar carrying two jaws adapted to grasp and hold the upper of a boot or shoe between them, of a transverse bar, V, arranged to move backward and forward on inclined guideways, and on which transverse bar the bars D are adapted to rest and bear, and said bars D and V being connected to suitable mechanism for operation thereof, for the purpose specified.

3. In a lasting-machine, the combination, with a series of bars, D, provided with regulating-screws W, arranged to move backward and forward in suitable guideways, and each bar carrying two jaws, of a transverse bar, V, arranged to move backward and forward on inclined guideways, and on which transverse bar are adapted to rest and bear the bars D by said regulating-screws, substantially as and for the purpose specified.

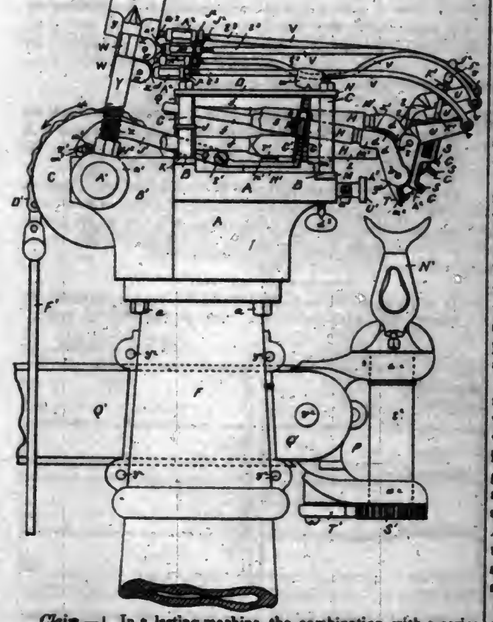
4. In a lasting-machine, the combination, with a bar, D, carrying two jaws, C H, and arranged to move backward and forward in suitable guideways in a frame, and provided with a series of holes or sockets, y', of a pin, R^3, adapted to fit said socket to abut against said frame to limit the forward movement of the said bar.

5. In a lasting-machine, the combination, with a series of bars, D, arranged to move backward and forward in suitable guideways, each bar carrying two jaws, and a lever, K, pivoted to one and arranged to engage with the other of said jaws, of an arm or lever, P, adjustably secured to a rock-shaft and connected to said lever K, for the purpose specified.

6. In a lasting-machine, the combination, with a series of bars D, arranged to move backward and forward in suitable guideways each bar carrying two jaws, and a lever, K, pivoted to one and arranged to engage with the other of said jaws, of an arm or lever, P, adjustably secured to a rock-shaft and connected to said lever K by a rod, L, formed of two parts and connected at their contiguous ends by a sleeve provided with a right and left screw-thread, for the purpose specified.

7. In a lasting-machine, the combination, with a series of bars, D, arranged to move backward and forward in suitable guideways, each bar carrying two jaws, and a lever, K, pivoted to one and arranged to engage with the other of said jaws, of an arm or lever, P, adapted to screw into a rock-shaft and provided with a swiveling sleeve, N, connected to said lever K by a rod, L, formed of two parts, connected together by a right and left screw-thread.

395,630. LASTING-MACHINE FOR BOOTS OR SHOES. ALBERT F. PRESTON, Lynn, Mass., assignor to the Preston Lasting Machine Company, Portland, Me. Filed Dec. 7, 1887. Serial No. 257,231. (No model.)



Claim.—1. In a lasting-machine, the combination, with a series of pairs of pivoted jaws arranged diagonally upon a suitable frame or support, all on one side and adapted to pull in diverging lines, of means, substantially as described, to close said jaws and grasp and hold one side of the upper of a boot or shoe at or about its edge at or substantially at one and the same time, so that each pair of jaws will pull upon said upper and stretch the same over the inner sole in a direction at right angles, or substantially at right angles, to the edge of the inner sole, where each pair of jaws grasps and holds the upper.

2. In a lasting-machine, the combination, with a series of pairs of pivoted jaws suitably attached and connected to bars or rods arranged diagonally in grooves or guideways upon a suitable frame or support, all on one side and adapted to pull in diverging lines, of means, substantially as described, connected to and arranged to pull said bars or rods in such diverging lines, for the purpose specified.

3. In a lasting-machine, the combination, with a series of pairs of pivoted jaws suitably attached and connected to bars or rods arranged diagonally upon a suitable frame or support in grooves or guideways and adapted to pull in diverging lines, and another series of pivoted jaws suitably attached and connected to bars or rods arranged diagonally on said frame or support in grooves or guideways and to pull in diverging lines opposite to or crossing more or less the diagonal and diverging lines of the first series of jaw-guiding bars or rods, of means, substantially as described, connected to and arranged to pull said guide bars or rods in such diverging lines, for the purpose specified.

4. In a lasting-machine, the combination, with a series of bars or rods arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H', provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h', and on which transverse bar rest and bear the guide-bars H, each provided with a shoulder to abut against its respective rib or shoulder m' on the transverse bar, substantially as and for the purpose specified.

5. In a lasting-machine, the combination, with a series of bars or rods arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H', provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h', and on which transverse bar rest and bear the guide bars or rods, &c., by a regulating-screw, G', for each screw to abut against its respective rib or shoulder m' on the transverse bar, substantially as and for the purpose specified.

6. In a lasting-machine, the combination, with a series of bars or rods, H, arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H', provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h', and on which transverse bar rest and bear the guide bars or rods H, arranged to engage with or abut against their respective ribs or shoulders m' on the transverse bar, and all connected to a rock-shaft or other suitable means for operation thereof, for the purpose specified.

7. In a lasting-machine, the combination, with a series of bars or rods, H, arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H', provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways h', and on which transverse bar rest and bear the guide bars or rods H by regulating screws G' in position for such screws to engage with or abut against their respective ribs or shoulders m' on the transverse bar, and all connected to a rock-shaft or other suitable means for operation thereof, for the purpose specified.

8. In a lasting-machine, the combination, with a series of bars or rods, H, arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H', provided with ribs or shoulders m' and arranged to move backward and forward on inclined guideways g', and on which transverse bar rest and bear the guide-bars H, and arranged to engage with or abut against their respective ribs or shoulders m' on the transverse bar, said transverse bar being connected by pitman-rods J' to a rock-shaft, A', by a slot-bearing, v', and pin w', and said guiding-bars to said rock-shaft by pitman-rods to levers or arms V, adjustably secured to said rock-shaft, all for operation substantially as and for the purpose specified.

9. In a lasting-machine, the combination, with a series of bars or rods, H, arranged to move backward and forward in suitable guideways and each carrying two jaws, of a transverse bar, H', provided with ribs or shoulders m' and arranged to move back and forward on inclined guideways g', and on which transverse bar rest and bear the guide-bars H by regulating screw G' in position for such screw to abut against their respective ribs or shoulders m' on the transverse bar, said transverse bar being connected by pitman-rods J' to a rock-shaft, A', by a slot-bearing, v', and pin w', and said guiding-bars to said rock-shaft by pitman-rods to levers or arms V, adjustably secured to said rock-shaft, all for operation substantially as and for the purpose specified.

10. In a lasting-machine, a bar or rod, H, arranged to move back and forth in suitable guideways made in two parts, connected together by an adjustable connection, one of said parts carrying two jaws pivoted thereto, for the purpose specified.

11. In a lasting-machine, a bar or rod, H, arranged to move backward and forward in suitable guideways made in two parts, one part provided with a tenon, n^3, adapted to fit within a socket, r^3, in the other part and secured thereto by a set-screw, s^3, and carrying two jaws pivoted thereto, for the purpose specified.

12. In a lasting-machine, the combination, with a bar or rod, H,

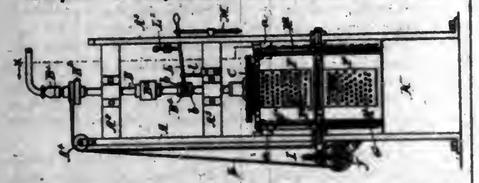
carrying two jaws pivoted thereto adapted to move backward and forward in a guideway provided at the front with friction-rolls and at the rear by a universal swiveling connection with the support, for the purpose specified.

13. In a lasting-machine, the combination, with two jaws pivoted to a bar or rod, H, arranged to move backward and forward in suitable guideways and provided with shoulders x' and h^3, of a lever pivoted to one of said jaws, having a shoulder, g^3, on its under side and arranged to engage with the other of said jaws and connected to means for operation thereof, for the purpose specified.

14. In a lasting-machine, the combination, with two jaws pivoted together for operation, substantially as described, and provided with openings, of a spring rod or driver, K', adapted to slide up and down in suitable guideways on one of said jaws, for the purpose specified.

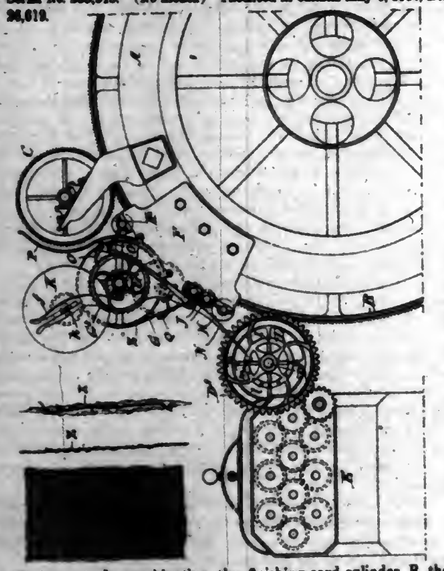
15. In a lasting-machine, the combination, with two jaws pivoted together, provided with openings for operation, substantially as described, the upper one having pivoted thereto blocks w^2, and each provided with a tapering groove, c^2, on its contiguous side or end, of a spring rod or driver, K', adapted to slide up and down in suitable guideways on said jaw, for the purpose specified.

395,631. SURFACING-MACHINE. RICHARD M. PRICHARD, New Rockland, Quebec, Canada, assignor of one-half to John James Williams, same place. Filed July 25, 1887. Serial No. 245,209. (No model.)



Claim.—In a school-slate-surfacing machine, the combination of a vertical hollow revolving shaft adapted to be rotated by any suitable means, frame of machine having suitable bearings for such shaft, an annular grinder rigidly secured on end of said shaft and revolving with it, the endless band of plane-surface slate-carriers for carrying the slates under the grinder, supports for such endless band while passing under said grinder, drums adapted to be rotated by any suitable means for operating such band, and a water-trough through which such endless band passes, as set forth.

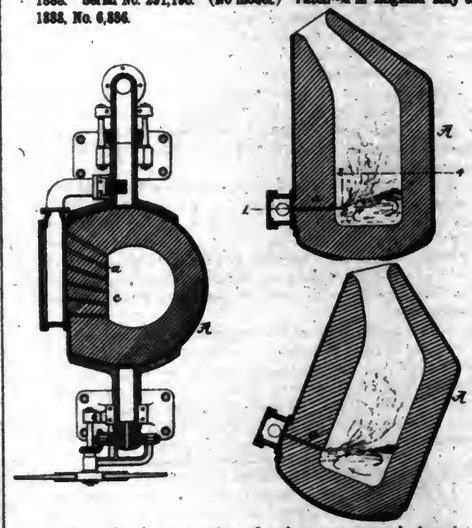
395,632. CARDING-MACHINE FOR MAKING MOTTLED ROVINGS. JOHN ROSS, Oxford, Nova Scotia, Canada. Filed Apr. 22, 1887. Serial No. 235,815. (No model.) Patented in Canada May 6, 1887, No. 26,619.



Claim.—1. In combination, the finishing-card cylinder B, the doffer D, a cylinder, G, means for supporting the spool carrying the rovings in frictional contact with the cylinder G, a gear on the shaft D', and an adjustable pin or pins set in said gear, a lever, N, provided with a pawl on one end, its free end projecting into the line of the pin on the gear of the shaft D', and a ratchet-wheel on the shaft of the cylinder G operated by the pawl of the lever N, leading-rolls J J, and a train of gearing between the shaft of cylinder G and said rolls, whereby the movement of the cylinder and rolls is simultaneous, substantially as described.

2. In combination with the finishing-card cylinder B, the frame carrying the same, the leading-rolls J J, and the doffer D, of the wipe-roll H, placed between said leading-rolls and the doffer and in close contact with the cylinder, for the purpose described.

395,633. PROCESS OF CONVERTING CRUDE IRON INTO MALLEABLE IRON OR STEEL. GUSTAVE L. ROBERT, Stenay, France, assignor to John Wesley Bookwalter, Springfield, Ohio. Filed Nov. 19, 1883. Serial No. 291,190. (No model.) Patented in England May 9, 1883, No. 6,336.

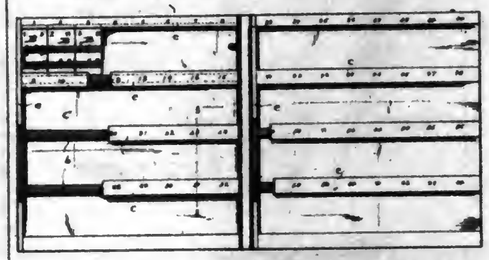


Claim.—In the conversion of molten cast or crude iron into malleable iron or steel, the mode, substantially as hereinbefore described, consisting in applying the air-blast to a portion only of the molten metal at the surface of the bath and directing the blast toward one side of the mass, creating thereby a gyrating circulation of the metal, substantially as described.

395,634. ORANGE AZO DYE-STUFF. CHRISTIAN RUDOLPH and BERNHARD PRIEBS, Offenbach-on-the-Main, Germany, assignors to K. Oehler, same place. Filed June 12, 1888. Serial No. 276,876. (No specimens.)

Claim.—The orange azo dye-stuff herein described, produced from tolidin by diazotation and subsequent heating with cresotinic acid and toluylendiaminesulpho-acid, and which is a red-brown powder which dissolves easily in hot water, and the solution of which in concentrated sulphuric acid is violet-red.

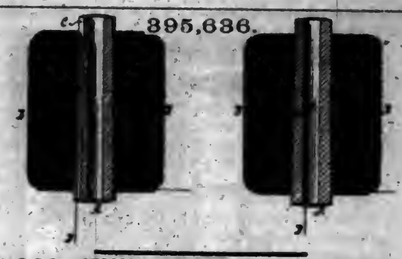
395,635. MUSICAL GAME APPARATUS. AUGUST SCHEMMEL, Milwaukee, Wis. Filed Nov. 3, 1887. Serial No. 254,590. (No model.)



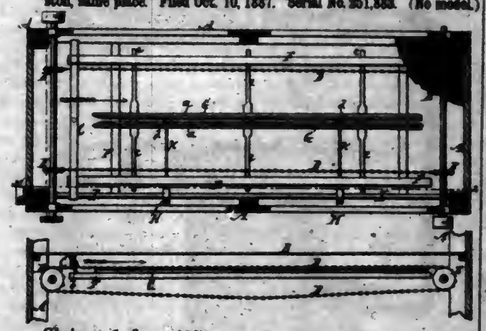
Claim.—In a game apparatus, the combination, with a box having a series of compartments, of a portfolio having a flexible center and a series of horizontal retaining-strips, and a series of interchangeable cards having music printed thereon, substantially as described

395,636. BALL OF THREAD. SIEGMUND STIELGLITZ, New York, N. Y. Filed Aug. 9, 1888. Serial No. 282,316. (No model.)

Claim.—As a new article of manufacture, a ball of thread provided with a central core having a channel in which the starting or inner end of the thread is arranged, substantially as described.



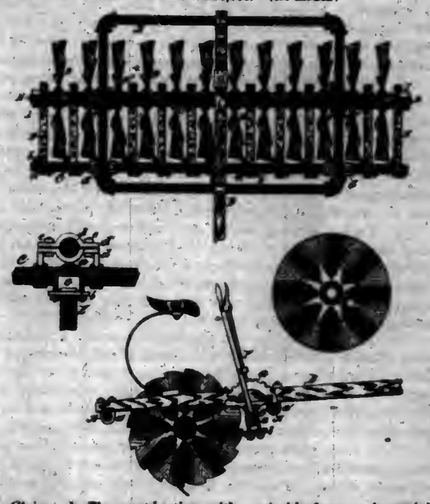
395,637. MIDDLINGS-PURIFIER. STEPHEN STONE and JOHN W. KINGSTON, Rochester, N. Y., assignors of one-third to Charles P. Kingston, same place. Filed Oct. 10, 1887. Serial No. 251,863. (No model.)



Claim.—1. In a middlings-purifier, the combination, with the screen, endless chains, and brush, of the stationary frame F, the ways G G, resting loosely on the frame, and devices for giving lateral vibration to the ways, as herein shown and described.

2. In a middlings-purifier, the combination, with the screen, endless chains, and brush, of the stationary frame F, the parallel angle-irons G G, forming an open-ended slot, a pin on the bottom of the brush which runs in the slot, and eccentrics H H and rods K K, for giving motion to the ways, as described.

395,638. HARROW. ADDISON A. STUART, Cedar Rapids, Iowa. Filed June 5, 1888. Serial No. 276,090. (No model.)



Claim.—1. The combination, with a suitable frame, substantially as described, of a series of the herein-described corrugated disks mounted on an axle, and a series of harrow-teeth mounted to operate between said disks and in connection therewith, substantially as and for the purpose set forth.

2. In a harrow, the described disk having radial corrugations and a serrated periphery, substantially as and for the purpose set forth.

3. In a harrow, the combination, with the frame thereof, substantially as described, of a series of the herein-described corrugated disks mounted on a suitable axle, and a series of intermediate spring harrow-teeth, mounted at or near their forward ends to a rotating shaft in front of said disks, adapted to stir the soil between said disks, and a hand-lever adapted to turn said shaft a limited distance and thereby adjust the relative depth of said teeth in the soil, substantially as specified.

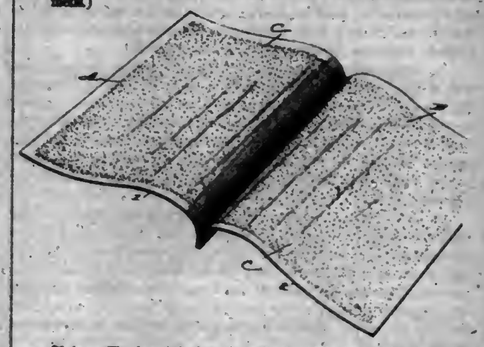
4. In a harrow, the combination, with a frame, substantially as described, of a series of revolving disks, a series of intermediate backwardly-extending spring-teeth, attached at their forward ends to a rotating shaft by means of clips *a a*, strap *b b*, and casting *c c*, and the yoke *d d*, the lower portion thereof forming the bearing for said shaft, substantially as described.

395,639. FLOUR AND MEAL BIN AND SIFTER. JEROME B. SWEETLAND, Pontiac, Mich., assignor to Enoch M. Beebe, Huron, Dak. Filed Dec. 20, 1887. Serial No. 258,334. (No model.)



Claim.—The combination of the body of the cabinet A, provided with a hinged cover, A', a funnel, G, the neck of which is inserted in a central aperture in the said cover, the parallel rubbing-bars K, secured to the lower end of the said funnel, the reciprocating board D, mounted on ways immediately below the cover of the cabinet, a lever, F, pivotally attached to the board D, for operating it, the pan E, inserted in an opening in the said reciprocating board D, this pan being provided with a reticulated bottom, *c*, the neck of the said funnel G being somewhat smaller in diameter than the pan E and extending down into the same in close proximity to the reticulated bottom *c*, whereby the rubbing-bars K upon the lower end of the neck of the funnel will disintegrate and force the flour through the said reticulated bottom *c*, substantially as herein set forth.

395,640. FLY-PAPER. WILLIAM THUM and OTTO THUM, Grand Rapids, Mich. Filed July 26, 1888. Serial No. 280,998. (No specimens.)



Claim.—The hereinbefore-described article, consisting of a sheet of sticky fly-paper composed of two leaves, each having a surface composed of sticky material on the interior faces, the two sheets being glued to each other on the margins, as and for the purpose set forth.

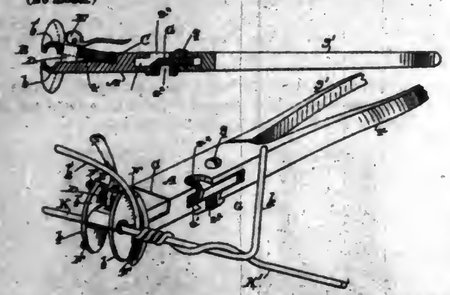
395,641. SHAFT-SUPPORTER FOR VEHICLES. HOWARD F. WELCH, Richfield Springs, assignor to Margaret Howard Chase, New York, N. Y. Filed Oct. 30, 1888. Serial No. 289,576. (No model.)



Claim.—As a new article of manufacture, a metal shaft-supporter made in a single piece, to sustain the shafts of vehicles, with

opposed open hooks upon each end and provided with a soft or yielding covering, substantially as shown and described.

395,642. WIRE SPLICER AND CUTTER. HENRY VORDE WILBECK, San Francisco, Cal. Filed June 29, 1888. Serial No. 278,567. (No model.)



Claim.—1. A wire-splicing implement consisting of a stock having a head with a fixed jaw and a movable jaw hinged to the fixed jaw, said jaws having grooved faces whereby the head of the implement may turn upon the wire, and laterally-extending flanges adapted to bear against the free end of the opposing wire, and to twist said wire around the wire upon which the implement turns, substantially as herein described.

2. A wire-splicing implement consisting of a stock having a fixed jaw and a movable jaw hinged to the fixed jaw, the said jaws being each provided with a grooved face for one of the wires and with outwardly-projecting curved flanges for engaging the free end of the opposing wire, substantially as herein described.

3. A wire-splicing implement consisting of a stock having a head with a fixed jaw and a movable jaw hinged to the fixed jaw, said jaws having a semicircular opposing groove in their faces, whereby the head of the implement may be fitted upon the wire which serves as a journal about which the implement may turn, and a fixed flange projecting outwardly from one side of each head for bearing against the free end of the opposing wire and forcing it to twist around the wire upon which the implement is pivoted, substantially as herein described.

4. A wire-splicing implement consisting of a stock having a head with a fixed jaw and a movable jaw hinged thereto, whereby the head of the implement may be pivoted upon the wire, and curved flanges on the sides of the head for bearing against the free end of the opposing wire and forcing it to twist about the wire upon which the implement is pivoted, substantially as herein described.

5. A wire-splicing implement consisting of a stock having a head with a fixed jaw and a movable jaw hinged to the fixed jaw, whereby the head of the implement may be pivoted upon the wire, a cam or eccentric lever acting against the movable jaw to hold it against the fixed jaw, and curved flanges on the sides of the head for bearing against the free end of the opposing wire and causing it to twist around the wire on which the head is pivoted, substantially as herein described.

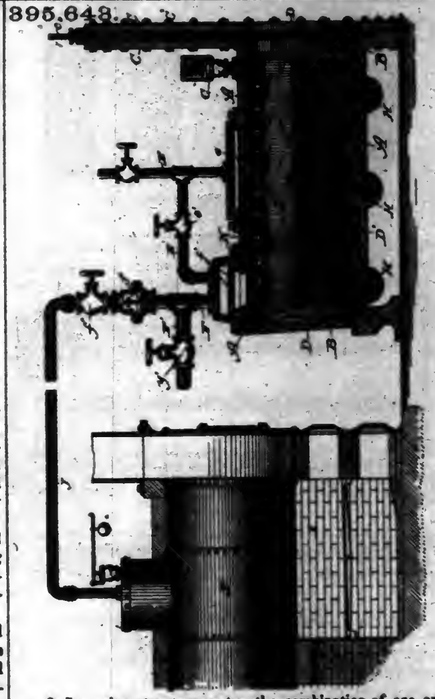
6. A wire-splicing implement consisting of a stock having a head with a fixed grooved jaw and a lug or ear extending from its face, a movable grooved jaw hinged to the fixed jaw and guided upon the lug or ear, a spring for holding the movable jaw back, a cam or eccentric lever pivoted upon the lug or ear of the fixed jaw and operating against the back of the movable jaw to force it up to the fixed jaw, and the curved grooved side flanges on the jaws, substantially as herein described.

7. A combined wire splicer and cutter consisting of a stock having a handle and a head with a fixed and a movable jaw, whereby the head may be pivoted on the wire, and curved flanges upon the sides of the head for twisting the end of the opposing wire, and the cutting-blade pivoted in the stock and having a handle opposing the handle of the stock, substantially as herein described.

395,643. SMELTING-FURNACE SLAG STEAM-GENERATING FURNACE AND PLANT. ORRERAS T. X. ADAMS, Chicago, Ill., assignor to the American Slag Furnace Company. Filed Apr. 2, 1888. Serial No. 269,230. (No model.)

Claim.—1. The combination, with a slag steam-generator having one or more steam-generating chambers wherein steam is generated by the heat from hot or molten slags, of a steam-generating boiler provided with a fuel-combustion chamber whereby steam is generated by the heat of fuel-combustion and one or more passages whereby the steam may flow from the slag steam-generating chamber to and in the fuel-combustion steam-generating boiler, the said passages having means for stopping or checking the flow of steam through them when desired, substantially as described.

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2. In a slag steam-generator, the combination of one or more steam-generating chamber having a passage thereto for the introduction of hot or molten material, means for closing and opening the said passage, water-supply and steam-exhaust passages communicating with the said chamber, and an automatic check-valve located in the steam-exhaust passage, through which the steam generated may pass from the generating-chamber, and which will be permitted to close or be closed by a cessation of the flow of steam from the generating-chamber or by a sufficient back steam-pressure, whereby steam is permitted to pass from the generating-chamber, but is prevented from returning, entering it through this passage, substantially as described.

3. The combination, with a slag steam-generator having one or more steam-generating chambers, a passage for the introduction of hot slags thereto, means for closing and opening such passage, water-supply and steam-exhaust passages thereto, and an automatic check-valve located in such steam-exhaust passage, of a steam-receiving chamber into which the steam generated in one or more of the said generating-chambers may pass, and means whereby the steam may pass into the said receiving-chamber, substantially as described.

4. In a slag steam-generator, the combination of a steam-generating chamber having a passage for the introduction of hot slags thereto, means for closing and opening such passage, water-supply and steam-exhaust passages, an automatic check-valve located in the said steam-passage, and a safety-valve communicating with the said generating-chamber, substantially as described.

5. In the combination of a slag steam-generator, a steam-generating chamber provided with one or more suitable water-supply and steam-exhaust pipes or passages and having a passage for the introduction of hot or molten material thereto, and a valve having a sliding valve-plate, whereby the said passage may be closed and opened, and means for operating the said plate, substantially as described.

6. In a slag steam-generator, the combination of a steam-generating chamber having a passage for the introduction of hot slag thereto, means for closing and opening the same, one or more steam-exhaust passages, one or more main water-supply passages, and one or more auxiliary water-supply passages, substantially as described, and for the purposes set forth.

7. In a slag steam-generator, the combination of a steam-generating chamber having a passage for the introduction of hot slags thereto, means for closing and opening the same, one or more water-supply passages thereto, one or more main steam-exhaust passages therefrom, and one or more auxiliary steam-exhaust passages therefrom having means for closing and opening the same, substantially as described, and for the purposes set forth.

8. In a slag steam-generator, the combination of a steam-generating chamber having a passage thereto for the introduction of hot slag, one or more water-supply and steam-exhaust passages thereto, and a perforated plate placed over the entrance of one or more of the said water and steam passages, substantially as described, and for the purposes set forth.

9. In a slag steam-generator, the combination of steam-generating chamber having a passage thereto adapted to admit a slag-containing vessel, means for closing and opening said passage, water-supply and steam-exhaust passages, a slag-containing vessel located therein, and a perforated plate or cover over the said slag-containing vessel, substantially as described.

10. In the slag steam-generator, the combination of a steam-generating chamber having a passage for the introduction of a slag-containing vessel thereto, means for closing and opening the said passage, water-supply and steam-exhaust passages, and one or more supports fixed within the said chamber, adapted to revolve and carry a vessel containing slag that may be placed therein, substantially as described.

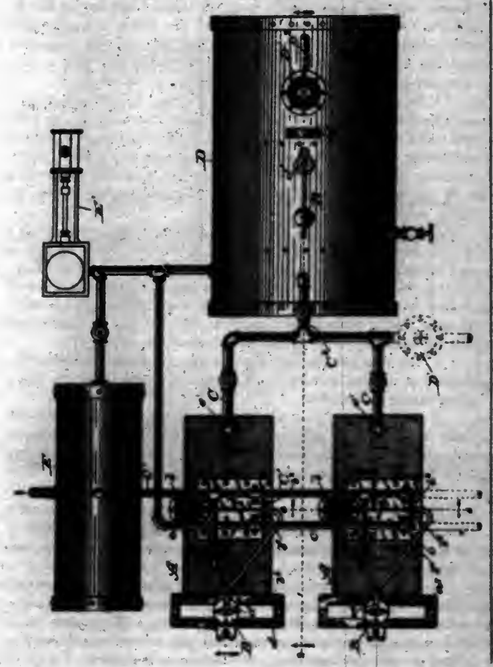
11. In a slag steam-generator, the combination of a steam-generating chamber having a passage thereto for the introduction of a slag-containing vessel, means for closing and opening said passage, water-supply and steam-exhaust passages, one or more supports adapted to revolve within the chamber, and a frame or supporting device outside of the said chamber, carrying-supports for the slag-containing vessel that are adapted to revolve, and placed in such a manner in relation to the entrance to the said chamber as to assist in supporting and carrying the slag-containing vessel to, into, and out of the said chamber substantially as described.

12. In a slag steam-generator, the combination of a steam-generating chamber having a passage thereto for the introduction of a vessel containing slags, means for closing and opening said passage, water-supply and steam-exhaust passages, a vessel containing slag adapted to be passed into said chamber, and a hinged or dumping supporting device located in such a manner as to receive the said vessel from through its passage to the chamber and support and hold it while being dumped, substantially as described.

395,644. SLAG-FURNACE. ORRERAS T. X. ADAMS, Chicago, Ill., assignor to the American Slag Furnace Company. Filed May 21, 1888. Serial No. 274,453. (No model.)

Claim.—1. In a slag-furnace, the combination of one or more generating-chambers having feed and steam-exhaust pipes or passages thereto, one or more passages to the said chamber or chambers for the introduction or removal of slags, one or more valves having a sliding valve-plate composed of two plates provided with means for raising and lowering said plates, and means for spreading or forcing them to their seats to close the said passage and render it steam-tight when they are lowered, substantially as described.

2. In a slag-furnace, the combination of a steam-generating chamber, water feed and steam-exhaust passages thereto, means for opening and closing the same, a passage to the said chamber for the introduction or removal of slag, a valve having a sliding valve for opening and closing the same, and a packing for rendering the steam-valve tight when down and in place, substantially as described.

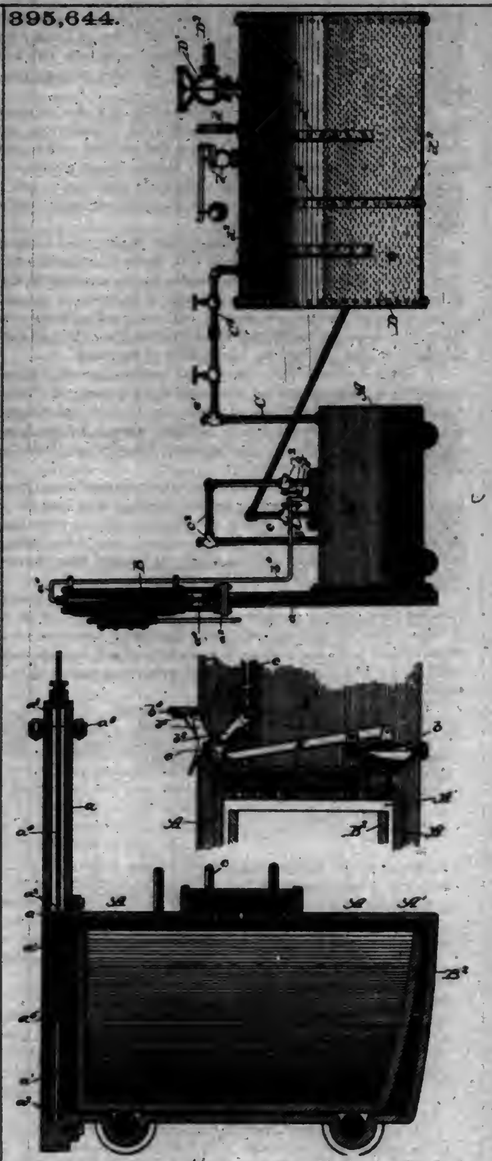


3. In a slag-furnace, the combination of a steam-generating chamber having one or more passages for the introduction or removal of slag, means for opening and closing the same, one or more water-supply and steam-exhaust pipes, and means for opening and closing one or more of the pipes, substantially as described.

4. In a slag-furnace, the combination of a steam-generator chamber having one or more passages for the introduction or removal of slag, means for opening and closing the same, one or more water-supply and steam-exhaust pipes or passages, means for opening and closing the same, and a diaphragm-regulator communicating with the said chamber and connected with pipe or pipes, as described.

5. The combination, with a slag-furnace having one or more steam-generating chambers, one or more passages thereto for the introduction or removal of slag, means for opening and closing the same, one or more water-supply and steam-exhaust passages or pipes, and means for opening and closing the said pipes or passages, of a steam wash and storage drum or chamber having plates for forcing, driving, or deflecting the

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steam that may pass through it into or through the water that may be contained in the said chamber or drum, and a pipe or passage for the steam to pass from the generating-chambers to the said wash and storage chamber, and a pipe or passage for the steam to pass therefrom, substantially as described.

6. The combination, with a slag-furnace having one or more steam-generating chambers adapted to receive hot or molten slag, and means for opening and closing the same and provided with water-supply and steam-exhaust passages, of a steam-exhaust pressure-reducer communicating with the said chamber or chambers in such a manner that the steam will pass through the pressure-reducer before being used, substantially as described.

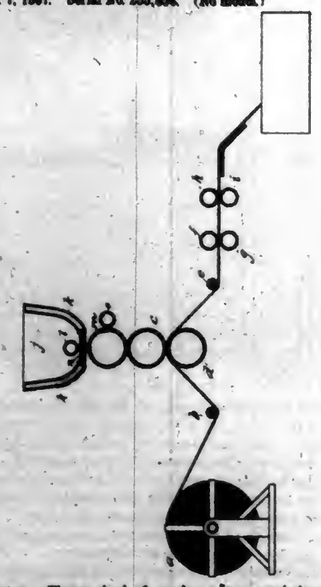
7. The combination, with a slag-furnace having one or more steam-generating chambers provided with means for operating the same, of a steam-generating storage-chamber having a passage for the steam to flow from the generating chamber or chambers to the said storage-chamber and a steam-pressure reducer communicating with the said storage-chamber through which the steam from the said storage-chamber must pass for use, substantially as described.

8. In the combination of a slag-furnace, a steam-generating chamber having a main passage for the introduction or removal of slag, means for opening and closing the same, one or more water-supply and steam-exhaust passages, and an auxiliary passage for the introduction of hot or molten slag, having means for opening and closing the same, substantially as described.

9. In a slag-furnace, the combination of a steam-generating chamber having one or more passages for the introduction or removal of slag, means for opening and closing the same, one or more water-supply and steam-exhaust pipes or passages thereto, means for opening and closing the same, and a drainage pipe or passage from the said chamber, substantially as described.

10. In a slag-furnace, the combination of a steam-generating chamber having one or more passages for the introduction or removal of slags, means for opening and closing the same, water-supply and steam-exhaust pipes, and a groove in the bottom of said chamber communicating with a recess at one end, and a pipe or passage from such recess, substantially as described.

395,645. METHOD OF WAXING PAPER. J. BURNHAM ANDERSON, Boston, Mass., assignor to George H. Heath, same place. Filed Apr. 7, 1887. Serial No. 233,936. (No model.)

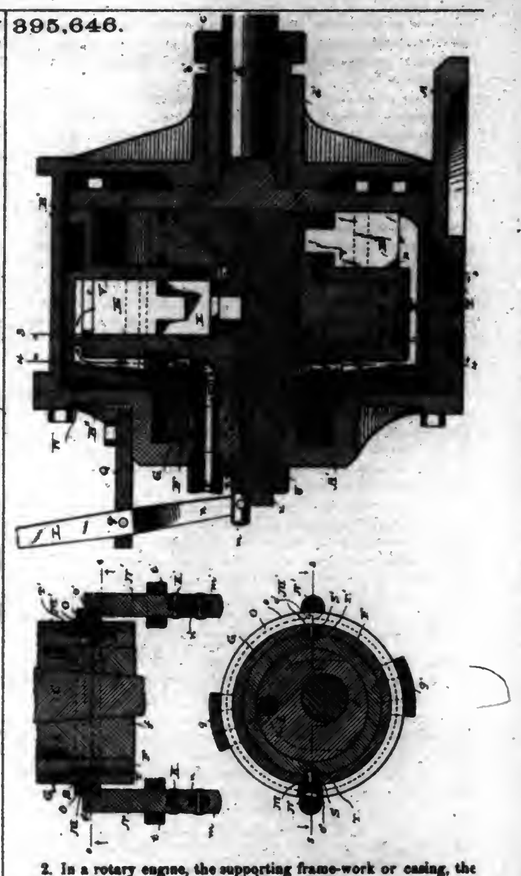


Claim.—The method of waxing paper, consisting in simultaneously heating the paper and applying wax to one side thereof, then subjecting the paper to heat and pressure, and finally cooling and pressing it, as set forth.

395,646. ROTARY-ENGINE REVERSING-GEAR. CYRUS BAILEY, Akron, Ohio. Filed Feb. 8, 1888. Serial No. 263,326. (No model.)

Claim.—1. In a rotary engine, the combination of the casing, the revolving crank-cylinder, the piston rigidly mounted thereon, and the rotary packing-cylinder mounted therein, together with a suitable valve on the crank-cylinder for introducing steam at either side of the piston, substantially as described.

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2. In a rotary engine, the supporting frame-work or casing, the rotary crank-cylinder having the rotary packing-cylinder mounted therein, and the piston rigidly mounted thereon and having the peripheral valve-ports, one on each side of the piston, in combination with suitable valve-passages connecting one port with the steam-inlet and the other port with the steam-exhaust, together with a valve mounted on the crank-cylinder, substantially as described.

3. In a rotary engine, the revolving crank-cylinder containing a suitable piston and packing-cylinder and having peripheral valve-ports and radial valve-passages leading to the same, in combination with an adjustable valve mounted on and revolving with the crank-cylinder, whereby either radial valve-passage may be thrown into connection with the steam-inlet and the other valve-passage opened to the exhaust, substantially as described.

4. In a rotary engine, the revolving crank-cylinder containing a suitable piston and packing-cylinder and having peripheral valve-ports and radial passages, in combination with the steam-inlet passage in the bearing on which the cylinder turns and an adjustable valve mounted on and revolving with the crank-cylinder, whereby either radial valve-passage may be thrown into connection with the said steam-inlet and the other opened to the exhaust, substantially as described.

5. In a rotary engine, the combination of a revolving crank-cylinder and an adjustable valve mounted on and revolving with the same, substantially as described.

6. In a rotary engine, the combination of a revolving crank-cylinder having radial valve-passages and a circumferentially-adjustable valve mounted on and revolving with the cylinder and registering with the valve-passages, substantially as described.

7. In a rotary engine, the combination of a revolving crank-cylinder having a projecting boss in which there are axial slots, a valve mounted on and surrounding said boss, having oblique slots in its shell, and pins passing through or engaging with both said slots, substantially as described.

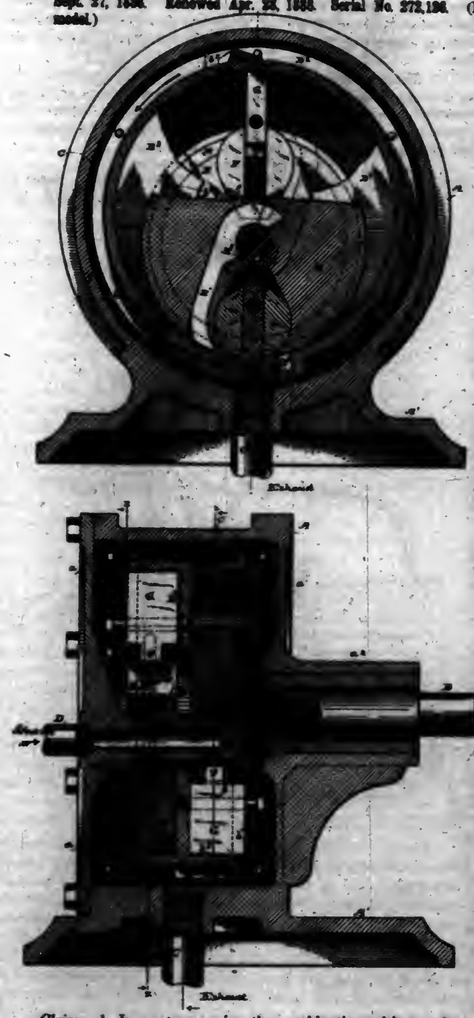
8. In a rotary engine, the combination of a revolving crank-cylinder having a projecting boss in which there are axial slots, a valve mounted on and surrounding said boss, having oblique slots in its shell, and radial pins set in an adjustable ring and passing through or engaging with both said slots, substantially as described.

9. In a rotary engine, the combination of a revolving crank-cylinder having a projecting boss in which there are axial slots, a valve mounted on and surrounding said boss, having oblique slots in its shell, and radial pins set in a grooved ring and passing through or engaging with both the said slots, together with axially-adjustable sliding pieces meshing with the groove in said ring, substantially as described.

10. In a rotary engine, the combination of a revolving crank-cylinder having a projected boss in which there are axial slots, a valve mounted on and surrounding said boss having oblique slots in its shell, and radial pins set in a grooved ring and passing through or engaging with both said slots, together with axially-adjustable sliding pieces meshing with the groove in said ring, and a hand-lever pivoted to the engine-frame and controlling the adjustment of said sliding pieces, substantially as described.

11. In a rotary engine, the rotary packing-cylinder mounted on an adjustable eccentric tapered stud, in combination with suitable mechanical devices for drawing the tapered stud into its bearing and holding it in any position of circumferential adjustment, substantially as described.

395,647. ROTARY ENGINE. CYRUS BAILEY, Akron, Ohio. Filed Sept. 27, 1886. Renewed Apr. 28, 1888. Serial No. 272,126. (No model.)



Claim.—1. In a rotary engine, the combination, with a main or driving shaft, of a rotating cylinder axially secured thereon, said shaft extending to one line only, a fixed piston extending into said cylinder, and a piston-wheel eccentrically supported within the cylinder and positively but flexibly connected with the piston, the wheel and piston together forming the abutment, substantially as described.

2. In a rotary engine, the combination, with an axially-mounted rotating cylinder, of an eccentrically-mounted rotating piston-wheel valve within the said cylinder arranged to control the ingress and egress of steam to and from the cylinder, substantially as described.

3. In a rotary engine, the combination, with a rotating axially-mounted cylinder, of a non-rotating steam-pipe projecting into said cylinder and a rotating piston-wheel mounted upon the steam-pipe and formed with steam passages and ports corresponding to those in its support and acting to control the entrance to and egress of steam from the cylinder, substantially as described.

4. In a rotary engine, a cylinder rotating upon its central axis, a non-rotating steam-pipe projected into the cylinder upon a different axis, a piston-wheel mounted on the steam-pipe and provided with steam ports and passages corresponding with the ports, and passages upon the steam-pipe for admitting live steam to the cylinder, substantially as described.

5. In a rotary engine, the combination of a rotating cylinder mounted upon the main shaft, a fixed steam-pipe projected into the rotating cylinder, and a piston wheel or wheels mounted upon the fixed steam-pipe and arranged to be rotated within the cylinder by the motion thereof and to control the ingress and egress of steam therefrom, substantially as described.

6. The combination, with a casing and shaft, and a cylinder mounted on the shaft inside the casing, the parts being arranged substantially as described, of one or more piston-wheels operating inside of the cylinder and eccentric therewith, said piston wheel or wheels being journaled on a non-rotating steam-pipe and held thereby in contact at the bottom with the cylinder, substantially as set forth.

7. The combination, with a rotating cylinder, piston-wheels, and steam-pipe arranged substantially as indicated, of a piston for each piston-wheel, such piston or pistons being set radially with the cylinder and rigidly secured thereto, and oscillating piston-seats seated in the piston-wheels and made to embrace and slide on the respective pistons, substantially as set forth.

8. The combination, with a casing, cylinder, pistons, piston-wheels, and non-rotating steam-pipe arranged substantially as described, of corresponding ports in the steam-pipe and piston-wheels for admitting steam rearward of the piston, and open exhaust-ports made through the casing of the cylinder in advance of the respective pistons, substantially as set forth.

9 The combination, with a rotating cylinder operating inside of a stationary casing, the parts being arranged substantially as indicated, of open exhaust-ports corresponding in number with the compartments of the cylinder, said ports being made in the periphery of the cylinder, the walls of said ports being shaped, substantially as described, to direct the exhaust-steam rearward or opposite the motion of the cylinder, substantially as set forth.

10. In a rotary engine, the combination, with the driving-shaft, of a revolving cylinder attached to and supported thereon, said shaft extending to one line only, a piston radially attached to the cylinder, and a piston-wheel operating inside the cylinder and arranged eccentric therewith, said piston-wheel having an oscillating seat made to embrace the piston and slide thereon, substantially as set forth.

11. In a rotary engine, the combination, with the driving-shaft, of a revolving cylinder attached to and supported thereon, a piston set radial with and rigidly secured to the cylinder, a piston-wheel operating in said cylinder and arranged eccentric therewith, said piston-wheel being journaled on a non-rotating steam-pipe, and induction-ports arranged in the piston-wheel and steam-pipe, the parts being arranged substantially as described.

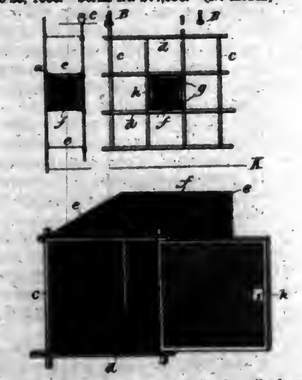
12. In a rotary engine, a revolving cylinder having a central opening at one side, an eccentrically-mounted steam-pipe projecting thereinto, and at the other formed with a central projection adapted to carry the driving connection or pulley, substantially as described.

13. In a rotary engine, a revolving cylinder having a central opening at one side, an eccentrically-mounted steam-pipe projecting thereinto, and at the other formed with a central projection or extension integral therewith, said extension constituting a portion of the main or driving shaft and acting to support and carry the cylinder, substantially as described.

14. In a rotary engine, the combination, with a stationary casing and a revolving cylinder operating inside the casing and of smaller diameter to form an annular exhaust-space between their walls, of a piston rigidly attached to the cylinder, and a piston-wheel operating inside the cylinder and arranged eccentrically therewith, said piston-wheel having an oscillating seat made to embrace the piston and slide thereon, substantially as set forth.

15. In a rotary engine, the combination, with a stationary casing and a revolving cylinder operating inside the casing and of smaller diameter to form an exhaust-space between them, of a piston set radially with and rigidly secured to the cylinder, a piston-wheel operating inside the cylinder and arranged eccentrically therewith, said piston-wheel being journaled on a steam-pipe, and induction-ports arranged in the piston-wheel and steam-pipe, the parts being arranged substantially as set forth.

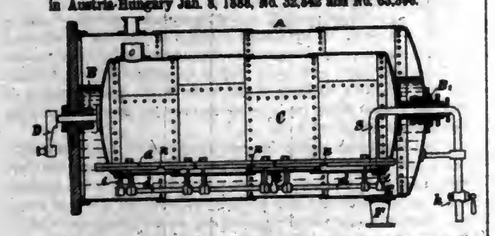
395,648. SHIP'S LOCKER. FRANCIS M. BARBER, Washington, D. C. Filed June 23, 1888. Serial No. 277,268. (No model.)



Claim.—1. The series of lockers herein described, consisting of a supporting-frame and sheets of open-work or reticulated material separating adjacent lockers from each other, and forming the tops, bottoms, and sides of all the lockers, substantially as described.

2. The series or tiers of lockers arranged against a bulk-head or partition of the vessel and comprising a frame-work of vertical, horizontal, and cross pieces, tops, bottoms, and side walls of wire cloth or mesh for each locker, and doors of the same material, said bulk-head or partition forming the backs of the lockers, substantially as described.

395,649. BOILER-CLEANER. JOSEPH BAUCHER, Breslau, Prussia, Germany, assignor to Emile Maurice Heber, same place. Filed Dec. 27, 1887. Serial No. 259,165. (No model.) Patented in England Aug. 18, 1887, No. 11,310; in Belgium Aug. 18, 1887, No. 78,611; in France Aug. 18, 1887, No. 185,389; in Germany Aug. 18, 1887, No. 42,693, and in Austria-Hungary Jan. 8, 1888, No. 32,842 and No. 63,396.

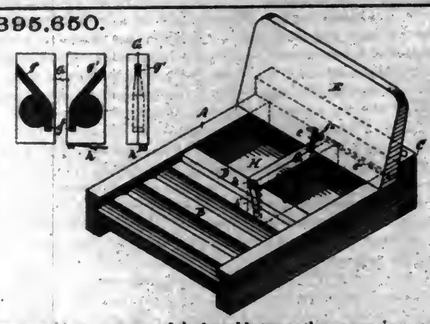


Claim.—1. The combination, with an exterior cylindrical boiler supported above a furnace with its axis in nearly a horizontal position, and having in either end bearings, substantially as specified, of an interior cylindrical boiler within said exterior cylindrical boiler and of such size as to allow for water and steam space between the interior of the exterior boiler and the exterior of the interior boiler, said interior boiler to contain no water, but being adapted for the admission of steam, and being mounted upon journals moving in the bearings aforesaid in the ends of said exterior boiler, one of the journals of said interior boiler being provided with a crank, by means of which the said boiler may be oscillated around its axis upon its said journals, having a series of scrapers attached to the exterior of said inner boiler within said outer boiler, so that when the said inner boiler is oscillated the scrapers moving therewith operate upon the inner surface of the bottom part of the said exterior boiler to remove the sediment, scales, and depositions of feed-water therefrom, substantially as and for the purpose set forth.

2. In a steam-generator, the combination, with the exterior boiler, A, having bearings B B', outlet-pipe F, valve G, and bulb H, having a waste-pipe closed with a valve, J, of the inner boiler, C, journaled in said boiler A at B and B', having the winch D attached to one of its journals, and the siphon-pipe S, passing from within through one of its journals and closed without by the cock A, the bearings *e*, attached to said inner boiler, the rod *d* in said bearings, the arms *c*, mounted on said bar *d*, and the scrapers *a*, mounted upon said arms *c*, to operate upon the interior of the said exterior boiler, A, substantially as and for the purpose set forth.

395,650. WASH-BOARD. SOLON BINGHAM, Onondagaville, assignor to Alanson A. Sumner, Albany, N. Y. Filed Feb. 7, 1888. Serial No. 263,256. (Model.)

Claim.—1. The combination, with a wash-board, of a lid or protector connected with and supported by a spring held centrally in a

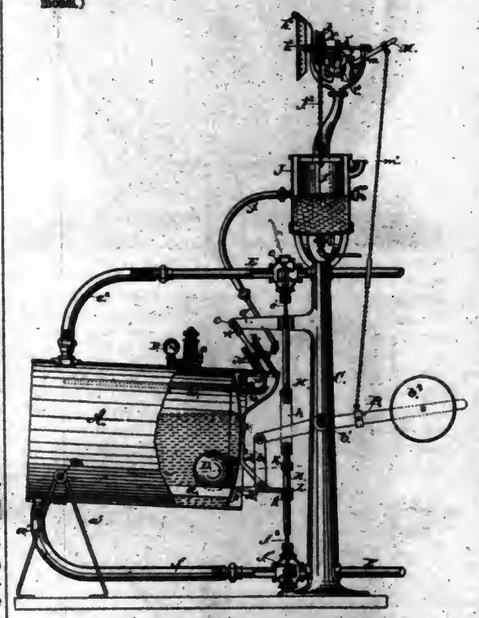


space in the upper part of the board between the crown-piece and the supporting cross-bar, substantially as shown, and for the purposes set forth.

2. The combination, with a wash-board, of two protectors pivoted to the arms of a spring supported in a block which is held within an opening in the upper part of the board between the crown-piece and the supporting cross-bar, substantially as and for the purposes set forth.

3. The combination, with a wash-board, of two protectors pivoted to the arms of a spring supported in a two-part block adjustably mounted in an opening in the upper part of the board between the crown-piece and the cross-bar, whereby either lid may be opened or closed, substantially as and for the purposes set forth.

395,651. APPARATUS FOR PURIFYING WATER. JAMES H. BLENNER, Albany, N. Y. Filed Dec. 4, 1886. Serial No. 220,702. (No model.)



Claim.—1. The combination of an oscillating water-receiver whose movement in one direction is effected by the weight of its contained liquid, and in the opposite direction by means of a counter-balance, said receiver being provided with a shifting weight, as herein described, an inlet water-pipe provided with an upwardly-opening valve, an outlet water-pipe provided with a downwardly-opening valve, said inlet and outlet valves being connected together, so that as one is opened the other will be reciprocally closed by the oscillations of said receiver, a tank containing liquid coagulant, and mechanism, substantially as described, whereby a given charge of coagulant will be fed into the receiver at each oscillation of the latter, as and for the purpose specified.

2. The combination of an oscillating water-receiver whose movement in one direction is effected by the weight of its contained liquid, and in the opposite direction by means of a counter-balance, said receiver being provided with a shifting weight, as herein described, an inlet water-pipe provided with an upwardly-opening valve, an outlet

water-pipe provided with a downwardly-opening valve, said inlet and outlet valves being connected together, so that as one is opened the other will be reciprocally closed by the oscillations of said receiver, a tank containing liquid coagulant, and an injecting-pump, operated by the oscillations of said receiver, by which a given charge of the coagulant is forcibly fed into each charge of water held in said receiver, as and for the purpose herein specified.

395,652. AUTOMATIC MEASURING DEVICE FOR LIQUIDS. BENJAMIN BURTON, Chicago, Ill., assignor of one-half to Edwin A. Giles, same place. Filed Aug. 9, 1886. Serial No. 209,336. (No model.)



Claim.—1. In an automatic measuring device for liquids, the combination, with a support for a barrel or tank, of a series of measuring-chambers arranged beneath or within such support and adapted to be connected with the barrel or tank by a pipe, and a cock in each measuring-chamber having a two-way valve, whereby the outlet from the measuring-chamber may be opened and the communication with the barrel cut off, or vice versa, substantially as and for the purpose described.

2. In an automatic measuring device for liquids, the combination, with a support for a barrel or tank, of a receptacle containing a series of measuring-chambers adapted to be placed beneath or within the support, a cock in each measuring-chamber having a two-way valve, a pipe connecting with each cock and adapted by means of an adjustable screw-collar to connect with the discharge-faucet of the barrel or tank, and one or more ventilating-tubes connecting with the measuring-chambers, substantially as described.

3. In an automatic measuring device for liquids, the combination, with the support A for a barrel or tank, of the removable receptacle C, containing the series of measuring-chambers D, the cocks G, having the two-way valves, the pipes H I *b*, connecting the cocks of the measuring-chambers, and the adjustable collar or coupling *c*, adapted to connect the measuring-chambers with the faucet of a barrel or tank, substantially as described.

4. The combination, in a measuring device for liquids, of the support A for a tank or barrel, the series of measuring-tanks D, the removable drawer or receptacle C, containing the measuring-tanks, the series of two-way cocks G, communicating with the measuring-tanks, the series of ventilating-pipes F, connecting with the measuring-tanks, the horizontal and vertical pipes H I *b*, connecting the two-way cocks, and the adjustable collar *c*, all constructed and arranged substantially as and for the purpose described.

5. The combination, in a measuring device for liquids, of the support for a barrel or tank, the series of measuring-chambers, each provided with a two-way cock and with ventilating-tubes, the receptacle containing the measuring-chambers adapted to be placed beneath or within the support, the pipes connecting the cocks of the measuring-chambers, the adjustable screw-collar adapted to connect said pipes with the discharge-spigot of a tank or barrel, and the wedges designed to enter the space beneath the receptacle for the measuring-chambers, substantially as described.

6. In an automatic measuring device for liquids, the combination, with a barrel or tank, of the independent support provided in its interior with a removable receptacle containing a series of measuring-chambers having ventilating-tubes and each provided with a two-way cock, and a pipe connecting said cocks having at its outer end an adjustable collar or flange-union for connecting it with the spigot of the barrel or tank, substantially as described.

7. The independent automatic measuring device for oil or other fluids, consisting of the support, the series of measuring-chambers provided with two-way cocks and ventilating-tubes, the removable drawer or receptacle containing the chambers, and the pipe connecting the two-way cocks having at its upper or outer end an adjustable flange-union for connecting said pipe with the spigot of a barrel or tank placed upon the support, all constructed and arranged substantially as and for the purpose described.

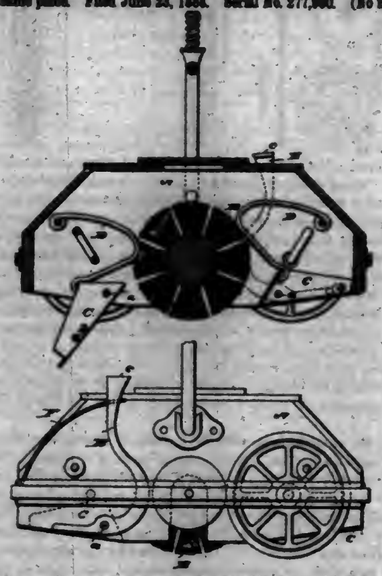
395,653. RUNNER FOR WHEELED VEHICLES. FREDERICK DEFFELL, Sterling, assignor to the Eureka Company, Rock Falls, Ill. Filed Oct. 18, 1888. Serial No. 288,050. (No model.)



Claim.—1. In combination with the body and running-gears of a road-cart, the rods E E, relatively downwardly divergent, the loop F, the cross-plate G, provided with the enlarged opening H and flange N, the rod J, provided with loop J' and lower threaded exterior, the plate L, provided with boss M and threaded opening M', and the cushion P, provided with the opening R, substantially as shown, and for the purpose described.

2. In combination with the body and axle of a road-cart, the thills C, rods J, provided with the loop J', adapted to be attached to said thills, the rods E E, relatively downwardly divergent and provided with the loop F, adapted to be attached to the body of the vehicle, cross-plate G, provided with the enlarged opening H and flange N, the plate L, provided with boss M, and the cushion P, provided with the opening R, substantially as shown, and for the purpose described.

395,654. CARPET-SWEEPER. HENRY A. GORE, Goshen, Ind., assignor of two-thirds to Edward W. Walker and Hiram W. Ra Ton, same place. Filed June 23, 1888. Serial No. 277,992. (No model.)



Claim.—In a carpet-sweeper, the combination, with the case and the dust-pans pivoted therein, of operating-levers pivoted to the side walls of the said case at the pivots of the dust-pans, with the forward ends of said levers engaging the said pans in advance of their pivotal points and their opposite ends extending slightly above the roof of the case, substantially as specified.

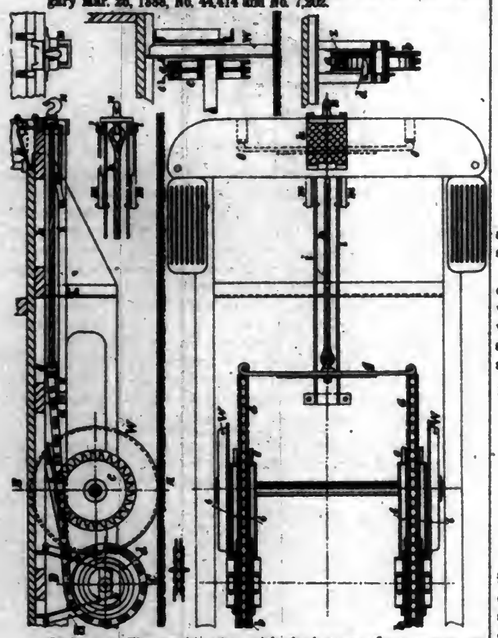
395,655. PLANTER. BENJAMIN P. GREEN, Rothetah, Mont. Filed Apr. 6, 1888. Serial No. 269,820. (No model.)



Claim.—1. The combination, with the seed-slides *b* D, of the vertical lever C, sliding head b^3, pivoted yoke b^4, eccentric b^5, shaft b^6, crank-disks *e e*, connected by the pivoted bar *e'*, and the roller-shaft *f*, whereby both of said slides are operated by the ground-roller, as described.

2. The combination, with the depth-gage wheel, of the V-frame beam-guides, the notched bar *n*, and the sliding lock-bolt O, as and for the purpose specified.

395,656. CAR-STARTER. ADOLF JENSEL, Breslau, Prussia, Germany. Filed Nov. 23, 1887. Serial No. 256,027. (No model.) Patented in Germany Sept. 14, 1887, No. 42,565; in Belgium Nov. 10, 1887, No. 79,486; in England Nov. 11, 1887, No. 15,306, and in Austria-Hungary Mar. 26, 1888, No. 44,414 and No. 7,202.

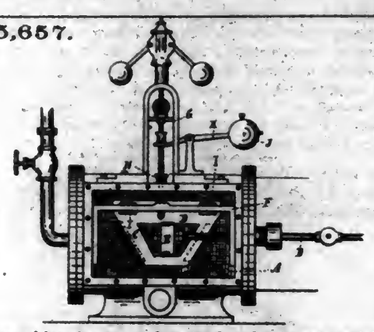


Claim.—1. The combination, with the bottom of a tramway-car and the wheel and axle thereof, of a hollow revoluble drum or barrel mounted in bearings upon suitable brackets fastened to the bottom of said car, a spiral spring placed within said drum or barrel, having one end attached to one of said brackets and the other end attached to the interior of said drum or barrel, a sprocket-wheel mounted upon the axle of said vehicle, a chain attached by one end to said drum or barrel, wound around said drum or barrel, passing over said sprocket-wheel, and extending under the bottom of said car far enough forward to be attached to a rope or chain, and a rope or chain one end of which is attached, as hereinbefore specified, to the end of said chain, extending forward over said sprocket-wheel from said drum or barrel, and, reaching far enough forward, is attached by its other end to the draft apparatus of the car, substantially as and for the purpose set forth.

2. The combination, with the bottom of a tramway-car and the wheel and axle thereof, of the drum or barrel *b*, mounted in bearings upon the brackets H, said brackets fastened to the bottom of said car, a spiral spring, *d*, wound within said barrel or drum *b*, having one end attached to the said bracket H and the other end attached to the interior of said drum or barrel *b*, a sprocket-wheel, *c*, mounted upon the axle of said vehicle, a chain, *e*, attached by one end to the periphery of said drum or barrel *b*, wound around said drum or barrel *b*, extending over and engaging the teeth of said sprocket-wheel with its links, and reaching far enough forward to be attached to one end of the draw-bar *g*, and a like chain accompanied by a like sprocket-wheel and a like drum or barrel, both mounted like the said drum or barrel and sprocket-wheel, and the drum or barrel being provided with a like spiral spring, the said chain being in like manner attached to the other end of the draw-bar *g*, the chain or rope *h*, attached by one end to the middle of said draw-bar *g*, reaching forward and attached to the draft-hook *n*, the guides *i* and *i*, attached to the bottom of said car, the stops *m*, *k*, and *o*, attached to the bottom of said car, the projection *f* of the said chain *e*, and the guide *e'*, attached to the bottom of said car, all substantially as and for the purpose set forth.

395,657. CUT-OFF VALVE FOR ENGINES. OTTO KROMER, Sandusky, Ohio, assignor of one-half to Frank Rinkleff, same place. Filed May 28, 1888. Serial No. 275,338. (No model.)

Claim.—1. In an automatic cut-off, the combination, with the governor, of the frame F, connected to the governor and having its ends fitted to the inner ends of the valve-chest, with a valve, B, having projecting guides I, fitting the frame F, and a slotted wrist, E, and



a valve-rod loosely connected to the slotted wrist, substantially as described.

2. In an automatic cut-off, the combination, with the governor, of the frame F, connected to the governor and counterbalanced by a weight, J, and having its end fitted to the inner ends of the valve-chest, with a valve, B, having projecting guides I, fitting the frame F, and a slotted wrist, E, and a valve-rod loosely connected to the slotted wrist, all substantially as described and shown.

395,658. VEHICLE-TOOL. LEROY S. LEWIS, Hartford, Conn., assignor of one-half to Harris B. Mitchell, Malden, Mass. Filed Sept. 11, 1888. Serial No. 285,138. (No model.)



Claim.—1. In a vehicle-tool, in combination with the body having upturned ends, one of which is bent at right angles to the plane of the tool, while the other is perforated, a movable spindle borne in said perforation, one end of the spindle being mortised to fit the end of the axle, while the other end bears a handle, substantially as described, and for the purpose specified.

2. In a vehicle-tool, in combination with the body having upturned ends, one of which is bent at right angles to the plane of the tool, while the other bears a movable spindle, the movable spindle and a locking device to prevent the slipping of the spindle when it is desired, substantially as described, and for the purpose set forth.

3. In a vehicle-tool, in combination with the body having upturned ends, one of which bears the hook 4 and the socketed lug 15 and the other is perforated and bears a sliding spindle, a locking device for the spindle and the clamp, substantially as described.

4. In a vehicle-tool, in combination with the body having upturned ends, one of which bears a hook, 4, and the other is perforated and bears in said perforation a rotary and sliding spindle, one end of which terminates in a handle, while the other is mortised to receive the end of the axle and is perforated to receive the shank of a clamp, the clamp 11, with a shank adapted to fit into the end of the spindle, substantially as described.

5. In a vehicle-tool, in combination with the body having upturned ends, one of which bears the hook 4 and the socketed lug 15 and the other is perforated and bears the locking device 9, a rotary and sliding spindle borne in said perforation, said spindle having a mortise to receive the end of the axle and a socket to receive the end of the shank of the clamp, a clamp, 11, chain 12, ring 13, encircling the body, and the socket 14, substantially as described.

395,659. CIGAR-BUNCHING MACHINE. RALPH H. LOGAN, Allegheny, assignor to the Eclipse Cigar Machine Company, (Limited,) Pittsburg, Pa. Filed June 1, 1888. Serial No. 275,706. (No model.)

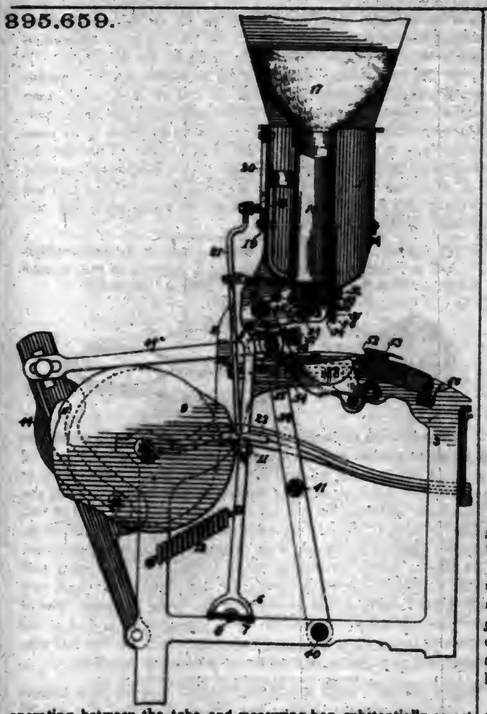
Claim.—1. In a cigar-bunching machine, the combination of a filler-feeding tube having a flexible support, mechanism for vibrating said tube, and a cut-off for regulating the escape of the filler from the tube, substantially as set forth.

2. In a cigar-bunching machine, the combination of a filler-feeding tube having its sides inwardly inclined from its lower to its upper end and having a flexible support, mechanism for vibrating said tube, and a cut-off for regulating the escape of the filler from the tube, substantially as set forth.

3. In a cigar-bunching machine, the combination of a hopper, a filler-feeding tube having a flexible mouth-piece connecting the hopper and tube, mechanism for vibrating the tube, and a cut-off for regulating the escape of the filler from the tube, substantially as set forth.

4. In a cigar-bunching machine, the combination of a filler-feeding tube having a flexible support, mechanism for vibrating said tube, a filler-measuring receptacle located below the tube, and a cut-off

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operating between the tube and measuring-box, substantially as set forth.

5. In a cigar-bunching machine, the combination of a filler-feeding tube having a flexible support, a blade for regulating the discharge from the tube, a cam provided with a groove having waved or serpentine walls, and connecting devices for operating the tube and blade, substantially as set forth.

6. In a cigar-bunching machine, the combination of a table, a bunching-roller, a smoothing and tension roll movable with the bunching-roll, an apron passing over the table and between the bunching and tension rolls, and a movable plate arranged transversely of the table and above the apron for supporting the binder after bunching operation, substantially as set forth.

7. In a cigar-bunching machine, the combination of a table, a bunching-roll, a tension-plate having its operative edge shaped to correspond to the contour of the bunch to be formed and located above the bunching-roll and movable therewith, and an apron passing over the table and tension-plate and in front of the bunching-roll and movable therewith, substantially as set forth.

8. In a cigar-bunching machine, the combination of a table, a bunching-roll, an adjustable tension-plate located above the bunching-roll and having its operative edge shaped to correspond to the bunch to be formed, and an apron passing over the table and tension-plate and in front of the bunching-roll, substantially as set forth.

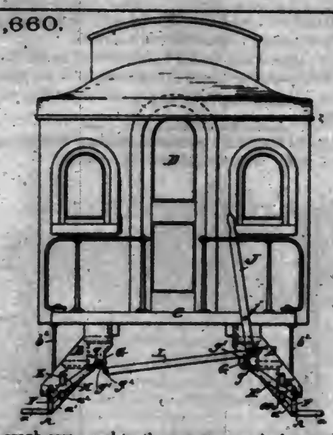
395,660. EXTENSIBLE CAR-STEP. HENRY A. MERRITT, Brooklyn, N. Y. Filed July 23, 1888. Serial No. 281,206. (No model.)

Claim.—1. The herein-described extensible car-step, comprising a foot-plate hung by parallel end pairs of links from the permanent car-steps, a transverse shaft journaled on the permanent steps and having crank-arms, and bars connecting said crank-arms with the suspension-links of the extensible step or foot-plate, substantially as herein set forth.

2. The herein-described extensible car-step, comprising a foot-plate hung by end pairs of links from the permanent car-steps, a transverse shaft journaled on the permanent steps and having crank-arms, bars connecting said crank-arms with the suspension-links of the extensible step or foot-plate and holding it extended, and a spring connected to the car-body or permanent steps and to a crank-arm on the shaft and locking the steps in either folded or extended positions, substantially as herein set forth.

3. The combination, with the permanent car-steps B, of an extensible step, A, formed with a foot-plate, *a*, and riser *a'*, pairs of links E F, pivoting each end of the step A to the steps B, a shaft, G, journaled on the steps B and having crank-arms *g g* at each end, a bar, H, connecting the arms *g* and links F, and a spring, as K, connected

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to one crank-arm *g* and to the car steps or body or a rod thereon, substantially as described, for the purposes set forth.

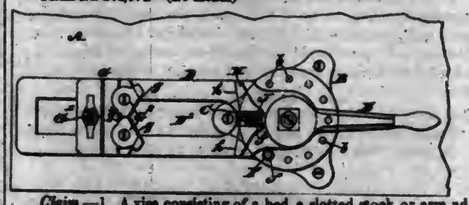
4. The combination, with permanent car-steps B, of an extensible step, A, links E F, connecting the steps A B, a shaft, G, having crank-arms *g g*, bars H, connecting said arms with the links F, a crank-arm, *g'*, on the shaft G, and a lever, J, fulcrumed on the car and engaging the crank-arm *g'*, substantially as herein set forth.

5. The combination, with permanent car-steps B, of an extensible step, A, links E F, connecting the steps A B, a shaft, G, having crank-arms *g g*, bars H, connecting said arms with the links F, a crank-arm, *g'*, on the shaft G, a lever, J, fulcrumed on the car and engaging the crank-arm *g'*, and a spring, K, connecting one crank-arm *g* of the shaft G with the car steps or body or a rod thereon, substantially as herein set forth.

6. The combination, with permanent car-steps B at each side of a car-platform, of extensible steps arranged therewith, links connecting the extensible steps with the permanent ones, a shaft, G, journaled at each series of steps B and provided with crank-arms *g g'*, bars H, connecting the crank-arms *g* with the extensible-step suspension-links, and a bar, I, connecting the crank-arms *g' g'* of both shafts G G, substantially as described, whereby the extensible steps at each side of the car-platform will be operated simultaneously, as set forth.

7. An extensible car-step hung to the permanent steps and formed with a foot-plate, *a*, and with a riser, *a'*, which closes the space between the plate *a* and the permanent steps above it when the step is extended, substantially as herein set forth.

395,661. VISE. EDWARD D. MORGAN, Delair, N. J., assignor of one-half to Charles M. Gordon, Philadelphia, Pa. Filed June 11, 1888. Serial No. 276,674. (No model.)



Claim.—1. A vise consisting of a bed, a slotted stock or arm adjustably connected with said bed, a head having jaws and arranged in the slot of the stock, a clamping-jaw pivoted to the stock, and an eccentric or cam lever for operating upon the said clamping-jaw, all arranged and operating in the manner described.

2. A vise consisting of a bed, a slotted arm or stock pivoted thereto, an adjustable head carried by the slotted stock, jaws having variable contact-faces pivoted to the head, a clamping-jaw carried by the stock and having a sliding and circular adjustment, and an eccentric or cam lever for operating upon said clamping-jaw, said parts being combined and operating in the manner and for the purpose described.

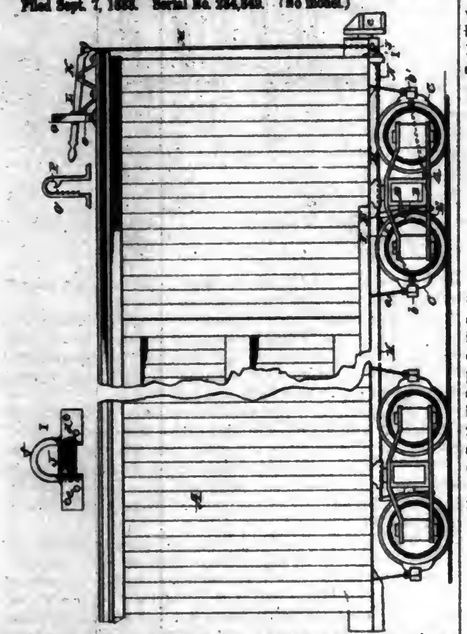
3. A vise consisting of a bed, a slotted stock adjustable thereon, an adjustable head in said stock-carrying jaws, a clamping-jaw pivoted in the stock, a nut carried by the pivot of said jaw and in a channel or groove in the stock, and an eccentric or cam lever for operating upon the clamping-jaw, said parts being combined and operating in the manner described.

4. A vise consisting of a bed, a slotted arm and a cam-lever, both pivotally connected to said bed, a head adjustable in said slotted arm and carrying two pivoted jaws, and a jaw pivotally connected with

said slotted arm and in contact with and operated by said cam-lever, said parts being combined substantially as described.

5. In a vise, a slotted arm having a head secured in said slot and provided with two pivotal jaws, and a block adapted to be placed between said jaws, whereby the same are secured in position, substantially as described.

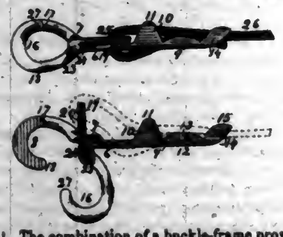
395,662. CAR-BRAKE. CHARLES W. MURRAY, Westborough, Mo. Filed Sept. 7, 1888. Serial No. 284,849. (No model.)



Claim.—1. In a car-brake, the combination, with brake beams and shoes, a pulley attached to the car at the lower edge of one end thereof, and brake-operating mechanism connecting the beams, of a chain connected to the brake-operating mechanism and passing under the pulley, a rod connected to the chain, a lever pivoted at a point between its ends to the car and provided with a hook at one end to engage a loop in one end of the rod, and a rack-bar secured to the top of the car-body in a position to engage the lever at a point behind the fulcrum of said lever, substantially as set forth.

2. In a car-brake, the combination, with brake shoes and beams and brake-operating device, of the lever pivoted at a point between its ends and provided with a hook at one end and a handle at its opposite end, and the rack-bar having a hook or rest to support the handle end of the lever in an elevated position, substantially as set forth.

395,663. COMBINED SNAP-HOOK AND BUCKLE. ANDREW J. MCCORD, Louisville, Ky., assignor of one-half to J. F. McGregor, Columbia, Tenn. Filed June 23, 1888. Serial No. 277,942. (No model.)



Claim.—1. The combination of a buckle-frame provided with the loop 6, having a shoulder, 24, extending the length of its front cross-bar and provided with a hook, 8, having a shank, 7, raised from the face of the said cross-bar, and another hook, 16, provided with a loop, 20, having a shoulder beneath its forward bar pivotally engaging the shoulder 24, the said forward bar being slotted to receive the shank 7, substantially as shown and described.

2. The combination of the hook 8, having the shank 7, the loop 6, having the shoulder 24 extending the length of its front cross-bar, the said shank being joined to the face of the cross-bar, and another hook, 16, provided with a loop, 20, having a shoulder beneath its forward bar pivotally engaging the shoulder 24, the said forward bar being slotted to receive the shank 7, and the two loops adapted to register with each other, substantially as shown and described.

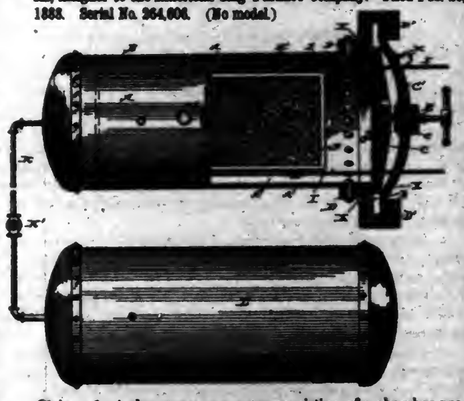
3. The combination of the hook 16, provided with the cross-bar 19 and a shoulder facing rearward at 24, and the hook 8, provided with a corresponding shoulder at 24, facing forward, and further provided with a buckle at its rear end, comprising the frame 9, the posts 10, the bars 11, 12, and 15, the stud 13 on the bar 12 and the elevated cross-bar 19, the pivotal shoulder of the hooks being below the level of the bar 19 and the plane of the lower faces of the bars 11 and 15 nearly on a level with the bar 19 when the hooks are closed, substantially as shown and described.

395,664. BOOT. WILLIAM MCKIE, Albany, N. Y., assignor of one-half to Francis C. Huyck and Chauncey R. Argersinger, both of same place. Filed Oct. 25, 1888. Serial No. 288,919. (No model.)



Claim.—As an improved article of manufacture, a composite boot which consists of a leg and upper composed of an outer body of sail-duck and an inner lining of felt or woven fabric, a sole of felt or india-rubber, and a sole-filling of leather or other flexible material, the outer body and lining of said leg and upper being composed of two pieces of each of the said materials cut to a uniform size and shape, secured together by a single seam at the front and rear, and turned inwardly to form a continuous flange around the lower edge, said front and rear seams being covered by stay-pieces of sail-duck, said sole-filling forming a flush surface with the upper and lower faces of said inturned flange, and said sole being cemented to the foot of the boot and then secured by a line of stitching which involves said sole, flange, and inner sole, as and for the purpose herein specified.

395,665. SLAG STEAM-GENERATOR. ORRIN B. PECK, Chicago, Ill., assignor to the American Slag Furnace Company. Filed Feb. 20, 1888. Serial No. 264,606. (No model.)



Claim.—1. A slag steam-generator consisting of a chamber provided with suitable water-supply and steam-exhaust pipes, in combination with a vessel adapted to receive heated or molten materials, said vessel being constructed to be placed in said chamber, and means for closing the chambers, substantially as described.

2. A slag steam-generator consisting of a jacketed chamber provided with suitable water-supply and steam-exhaust pipes, in combination with a vessel adapted to receive heated or molten materials, said vessel being constructed to be placed in said chamber, and means for closing the chambers, substantially as described.

3. A slag steam-generator consisting of a chamber provided with rails on the interior of the chamber and with suitable water-supply and steam-exhaust pipes, and means for closing the chamber, in combination with a wheeled vessel adapted to receive heated or molten materials and to be used in connection with the aforesaid chamber in the generation of steam, substantially as described.

4. The combination of a slag steam-generator having one or more steam-generating chambers and adapted to receive hot or molten materials and provided with suitable water-supply and steam-exhaust pipes or passages, and means for closing the said chambers, with a steam-receiving drum or chamber having a steam pipe or passage communicating with the steam-generating chamber or chambers, whereby the steam may pass from the generating-chambers to the storage or receiving chamber, substantially as described.

5. The combination of a slag steam-generator having one or more chambers wherein steam is generated by bringing water into direct contact with hot or molten material, with a chamber containing water and a steam-passage from the steam-generating chamber, whereby the steam may pass from the generating-chambers into the said chamber containing water and in contact with the water, whereby the steam may be washed or cleansed of its impurities and its temperature equalized, substantially as described.

6. In a slag steam-generator having a chamber wherein steam is generated by bringing water in direct contact with hot or molten slag and having water-supply and steam-exhaust pipes or passages, a lining in said chamber to protect the shell or walling that forms the chamber and prevent it from being destroyed by the intense heat of the slag or the steam within, substantially as described.

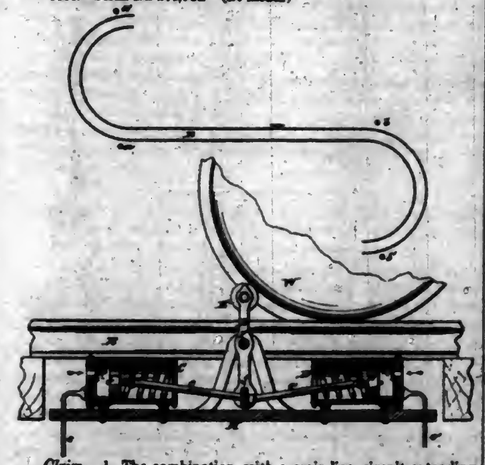
395,666. DUST-GUARD FOR VEHICLE-HUBS. JOHN T. RICHARDS and JOHN F. NEWELL, Gardiner, Me. Filed Apr. 11, 1888. Serial No. 270,303. (No model.)



Claim.—1. A dust-guard consisting of a cup or ring having a polygonal gripping-flange in its interior, substantially as set forth.

2. The combination, with a hub, an axle, and a shouldered spindle, the shoulder of the latter having a screw-thread thereon and an integral hub-band in close proximity thereto, of a removable cupped dust-guard, said guard having a screw-threaded opening in the center, and a polygonal gripping-flange integral with the interior of the guard, substantially as set forth.

395,667. ELECTRIC RAILWAY-SIGNAL. DANIEL G. SMITH, Pocatello, Idaho, assignor to Reinhart L. Brown, same place. Filed Apr. 17, 1888. Serial No. 270,944. (No model.)



Claim.—1. The combination, with a main-line circuit extending between two points, a local circuit connected with and of a higher resistance than the main circuit, an air-compressor mechanism actuated by a passing train, and a circuit-breaker operated by air from the air-compressor mechanism to break the main-line circuit, substantially as described.

2. The combination, with a main-line circuit extending between two points, a local circuit connected with and of a higher resistance than the main circuit, a pivoted lever operated by a passing train, an air-compressor mechanism, and a circuit-breaker operated by the air from the air-compressor mechanism to break the main-line circuit, substantially as described.

3. The combination, with a main-line circuit extending between two points, a local circuit connected with and of a higher resistance than the main circuit, a lever arranged to be operated by a passing train, an air-compressing cylinder having a piston connected with the lever, an air-reservoir connected with the cylinder, and a circuit-breaker operated by air from the reservoir to break the main-line circuit, substantially as described.

4. In combination with a main-line circuit and a local circuit, including electric signals directly connected therewith and of higher resistance that the main-line circuit, a circuit-breaker consisting of a U-shaped vessel, *f*, containing the mercury *m*, metallic plate *A*, and insulated terminals *s s*, connected with a reservoir for compressed air adapted to be operated by a passing train, substantially as and for the purposes set forth.

395,668. LAST. GEORGE E. SMITH, Haverhill, Mass., assignor of one-half to William A. Knipe, same place. Filed May 7, 1888. Serial No. 273,077. (No model.)



Claim.—1. In a last, the combination of the sections *a* and *b*, connected by a hinge, *c*, and separated above said hinge by a V-shaped space, a block, *e*, formed to fill said space, and a locking device, whereby said block may be detachably secured to one of the sections, as set forth.

2. A last divided transversely through its body and bottom into two sections, each having a solid bottom, said sections being connected by a hinge at or near the bottom portion of the last, whereby the rear section is enabled to swing upward and forward, as set forth.

3. In a last, the sections *a* and *b*, connected by a hinge or pivot located at or near the bottom of the last, whereby the section *b* is enabled to swing forward and upward, as shown, combined with a holder, whereby the section *b* may be rigidly secured in operative relation to the section *a*, as set forth.

395,669. PULLEY. GEORGE SERGEON, New Bedford, Mass., assignor, by direct and mesne assignments, of two-thirds to James Brunnad, same place, and Covel & Osborn, Fall River, Mass. Filed Aug. 28, 1888. Serial No. 283,977. (No model.)

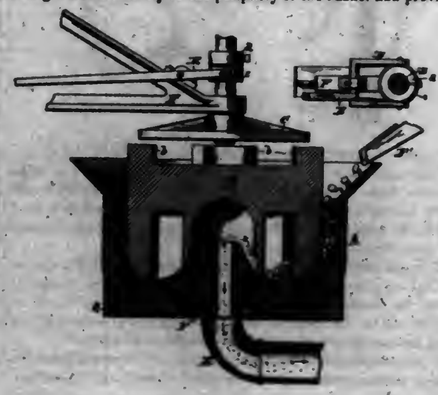


Claim.—A pulley having its peripheral face covered with a compound of Venice turpentine, glue, and acetic acid, and over said primary coating a coating of a compound of white lead, shellac, and pulverized chalk.

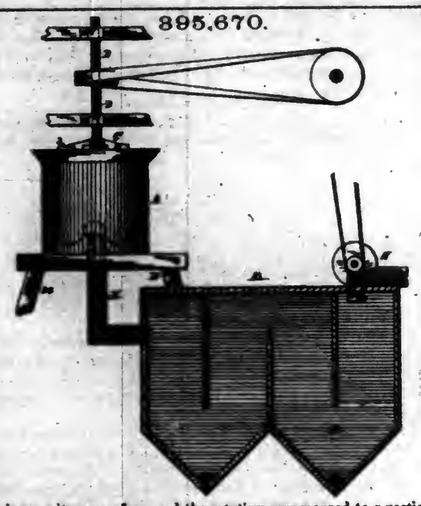
395,670. QUARTZ-MILL. PRINCE A. SURLL, Philadelphia, Pa., assignor to himself and Joseph H. Armbruster, same place. Filed Feb. 23, 1888. Serial No. 264,990. (No model.)

Claim.—1. The combination, in a quartz-mill having an annular matrix and central escape-passage, of the annularly-formed runner provided with passages extending from the central cavity to the periphery, whereby the quartz is carried from the outside to the center of the mill to be discharged, substantially as described.

2. The combination, in a quartz-mill having an annular matrix, of the annular runner having a central cavity, diverging passages extending from said cavity to the periphery of the runner and provided



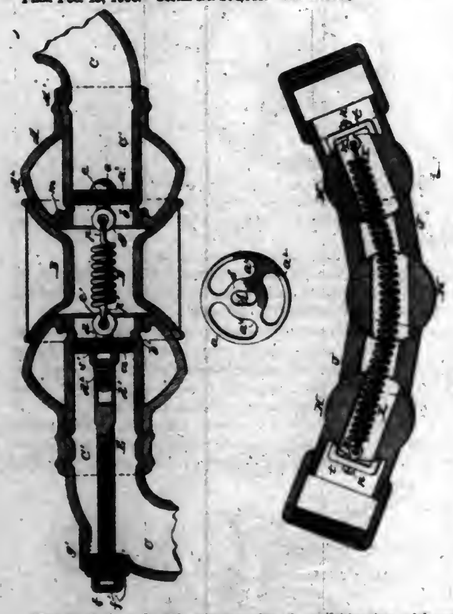
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with lugs on its upper face, and the rotating arm secured to a vertical driving-shaft, substantially as and for the purpose specified.

3. The combination, in a quartz-mill having an annular matriz and a central opening and an annular runner having a central cavity, and passages extending from the cavity to the periphery of the runner, adapted to conduct pulverized quartz into the said cavity, of the draft or escape passage and suitable exhaust mechanism whereby the pulverized quartz is drawn off and removed from the mill, substantially as specified.

395,671. PIPE-COUPLER. CHARLES G. THAYER, Dunkirk, N. Y. Filed Feb. 15, 1888. Serial No. 264,116. (No model.)



Claim.—1. In a flexible pipe-coupler, the combination, with convex heads and means of securing the heads to pipe ends with tight joints, of a sleeve having concave ends that fit the convex heads, and a spring located longitudinally in the sleeve and heads, which is so secured to the heads as to hold the parts together elastically, substantially as set forth.

2. In a flexible metallic pipe-coupler, the combination, with elbows, heads having convex or spherical faces, and a sleeve-piece interposed between the heads having concave ends that engage the convex or spherical ends of the heads, of a spiral spring, and a means for connecting the spring to the heads, substantially as set forth.

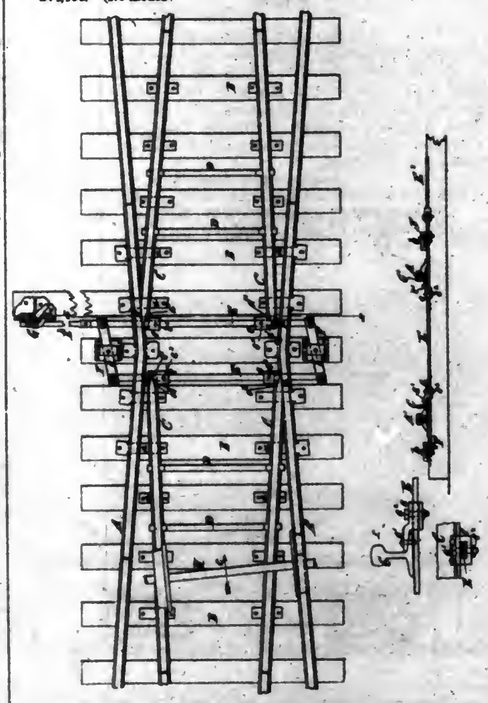
3. In a flexible metallic coupler for pipes, the combination, with elbows or sockets, perforated balls or oblate spheres, and a sleeve having capped ends that are adapted to form tight joints with the convex surfaces of the balls or spheres, of a spiral spring which by its retractile force holds the parts together and permits a flexing movement in any direction, substantially as set forth.

4. In a flexible metallic coupler for pipes, the combination, with heads adapted to connect with the ends of steam conduit-pipes, the heads having convex or spherical faces, of a sleeve or short cylinder having concave ends, and a spiral spring which holds the parts together by its contractile force, substantially as set forth.

5. In a pipe-coupling, the combination, with pipe-elbows, semi-spherical heads mounted thereon, and a sleeve with concave ends adapted to receive said heads, of a spring, and means for longitudinally adjusting and securing this spring to the heads and elbows, thereby regulating the tension of the spring, substantially as set forth.

6. In a flexible metallic pipe-coupler, the combination, with spheres formed of sheet metal that may be struck, spun, or otherwise made to afford true convex surfaces, of sleeves interposed between these oblate or true spheres to joint with them, and a spiral spring that is secured within the abutting spheres, and sleeves to hold them together by its contractile force and permit a flexible movement of the joined parts in any direction, substantially as set forth.

395,672. DOUBLE SAFETY-SWITCH CROSSING. DWIGHT TRACY, Suffern, N. Y. Filed Sept. 20, 1883. Renewed May 17, 1888. Serial No. 274,196. (No model.)



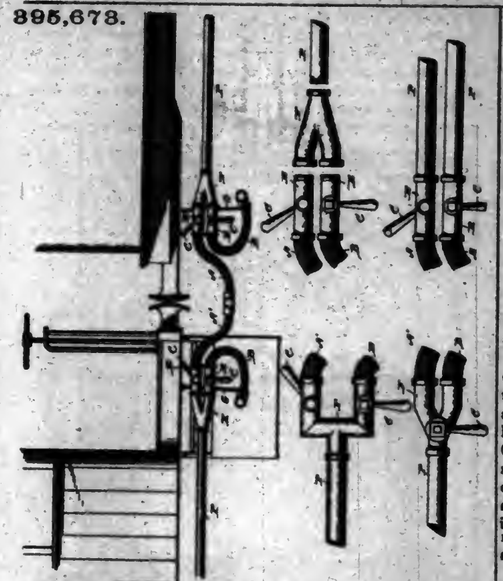
Claim.—1. The combination, in a double-switch crossing, with the bent fixed rails A A', each forming parts of two tracks, of the pairs of movable switch-rails C C', placed opposite each other and having their points beveled on both their inner and outer sides, and connections between the two pairs of movable rails whereby they are caused to move simultaneously in reverse directions, substantially as herein described.

2. The combination, with a switch-rail and its tie-bar, of a connection between the two, consisting of a sleeve loosely fitting on and secured to the bar and provided with a projecting flange or ear, which is secured to the rail, substantially as described.

395,673. AUXILIARY HOSE-COUPLING FOR STEAM AND AIR HOSE. GEORGE W. VERNON, Greensborough, N. C., assignor of one-half to Robert L. Vernon, same place. Filed June 7, 1888. Serial No. 276,316. (No model.)

Claim.—1. The combination, with a steam or air brake supply-pipe of a railway-car, of a branch pipe connected with said pipe at each end of the car, a hose connected with said supply-pipe for coupling it with the pipe of an adjoining car, a supplemental hose normally uncoupled and attached to the branch pipe with the free end suspended

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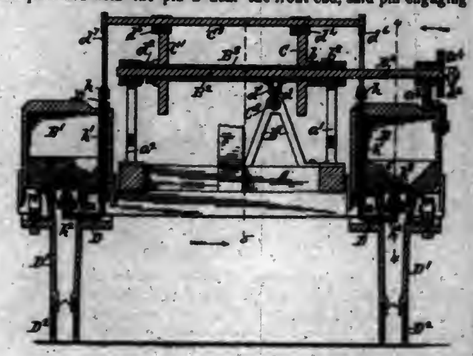
beneath the car, and adapted to be coupled with the pipe of the adjoining car in event of the primary coupling-hose becoming disabled, a hook for suspending the free end of the supplemental hose, and valves in the pipes to cut off the air or steam from one hose-coupling and direct it into the other, substantially as described.

2. The combination, with a steam or air brake supply-pipe of a railway-car, of a forked pipe connected to said supply-pipe at each end of the car, a primary coupling-hose for connecting one branch of said forked pipe with the pipe of an adjoining car, and a valve to said hose, a supplemental hose normally uncoupled and having its free end supported beneath the car and its other end connected with the second branch of said pipe, while the free end is in readiness to be coupled with the pipe of the adjoining car in the event of the primary coupling-hose becoming disabled, and a valve for controlling the passage of air or steam through such supplemental hose, substantially as and for the purposes set forth.

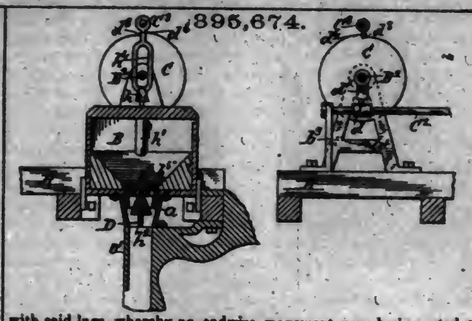
395,674. AUTOMATIC CORN-PLANTER. WILLIAM J. WALLIS, Chicago, Ill., assignor of one-half to Henry Wulff, same place. Filed Sept. 13, 1888. Serial No. 285,749. (No model.)

Claim.—1. In a planting-machine, the combination, with one of the sulky-wheels, of a crank-wheel rigidly secured to the hub thereof, the shaft B^2, a companion crank-wheel mounted on one end of said shaft, a rod connecting said crank-wheels, a sleeve loosely mounted on the shaft B^2, the disk-wheels C C', rigidly mounted on said sleeve, the ratchet-toothed hub b, the corresponding ratchet-collar, b^2, rigidly mounted on the shaft B^2, and the means described for engaging and disengaging said clutch mechanism, substantially as and for the purpose set forth.

2. In a planting-machine, the combination, with a sleeve or hollow shaft provided with legs and mounted on a rotating shaft, of the rocking rod C^2, having the lever b^2 mounted on the rear end thereof and provided with the pin d near the front end, said pin engaging



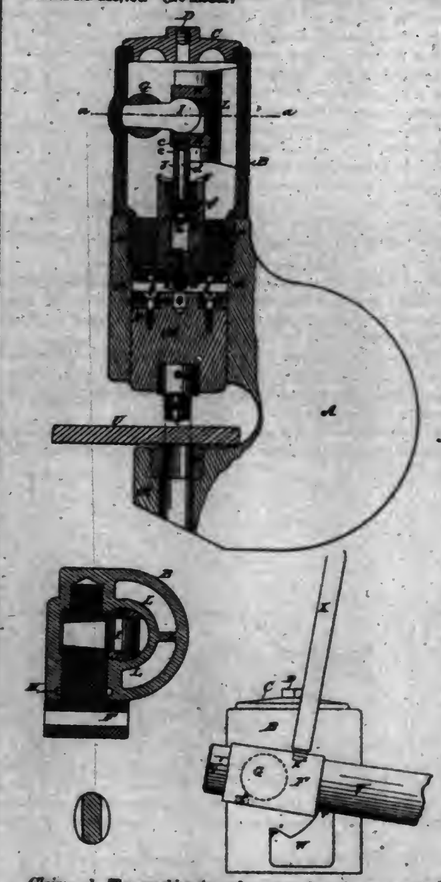
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with said legs, whereby an endwise movement may be imparted to said sleeve, substantially as and for the purpose set forth.

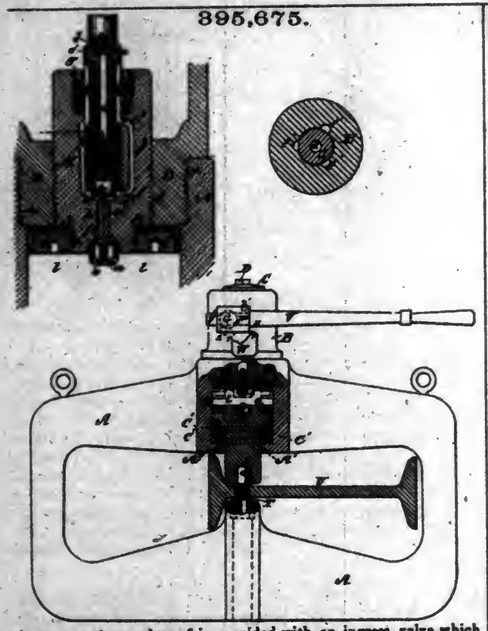
3. In a planting-machine, the combination, with the driving-shaft, of the sleeve B^2, mounted thereon, the disk-wheels C C', provided on their respective peripheries with a recess, d^2, the shaft C^2, located above and resting on top of said disk-wheels, the arms d^6 and d^7, having their upper ends mounted on the respective ends of the shaft C^2 and their lower ends provided with an interiorly-threaded boss, the angular dropping-levers D, the upper ends whereof have a threaded engagement with said boss, the lower ends being bent at right angles and terminating in the conical head A^3, and the seed-boxes provided in the seed-passage with the offset a, and the central aperture, A^3, surrounded by a number of lesser apertures for the passage of the seed, substantially as and for the purpose set forth.

395,675. HYDRAULIC PUNCH, &c. JOHN WEEKS, New York, N. Y., assignor to Richard Dudgeon, same place. Filed Jan. 26, 1887. Serial No. 225,758. (No model.)



Claim.—1. The combination of a reservoir and a pump, the suction whereof is located at or near the center of the reservoir, and the

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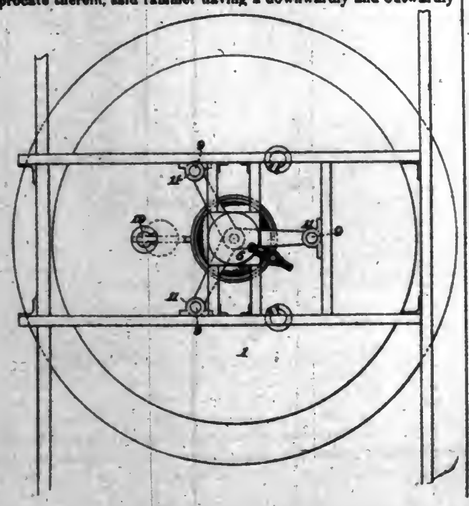
plunger or piston whereof is provided with an ingress-valve which opens on the upstroke but closes on the downstroke of the piston or plunger, a force-chamber, the liquid capacity of which is such relative to that of the reservoir that when the ram is projected to its utmost limit there will still be sufficient liquid in the reservoir to cover the suction of the pump irrespective of the position of the apparatus and mechanism to operate the pump, substantially as set forth.

2. The combination of a recessed socket, double stops cast on the exterior of the reservoir, one below the other, against the upper one of which the pumping-lever strikes on the downstroke of the plunger, and against the other the socket strikes on the downstroke of the plunger upon the removal of the pumping-lever, and a pumping-lever, both sides whereof, either of which may engage with the stop, are substantially equidistant from the medial line of the lever, substantially as set forth.

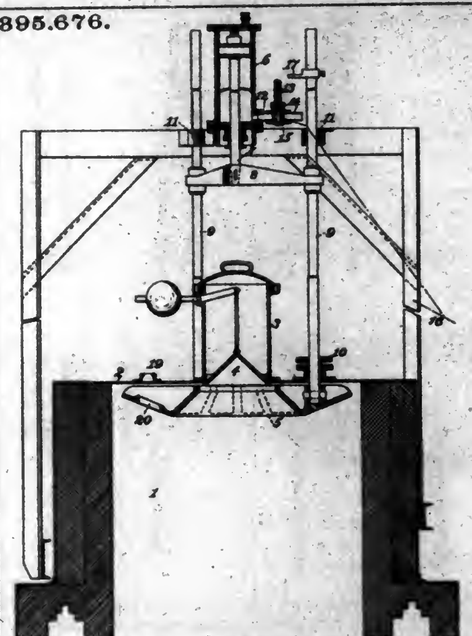
395,676. APPARATUS FOR COMPACTING FUEL IN GAS-FURNACES. SAMUEL T. WELLMAN, Cleveland, Ohio, assignor to the Fuel Gas and Electric Engineering Company, (Limited,) Pittsburg, Pa. Filed May 22, 1888. Serial No. 274,806. (No model.)

Claim.—1. The combination of a gas-producer and a reciprocating rammer for compacting the fuel within the producer, said rammer being provided with an opening therethrough for the passage of the fuel, substantially as set forth.

2. The combination of a gas-producer and a rammer fitted to reciprocate therein, said rammer having a downwardly and outwardly



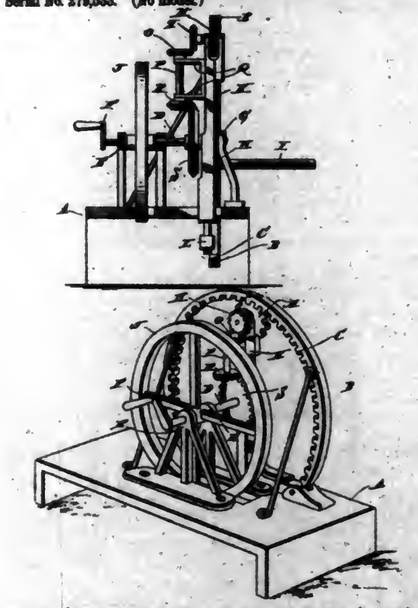
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tapered open-ended body and an upwardly-inclined circumferential flange of slightly less diameter than the producer connected to the lower end of the body, substantially as set forth.

3. The combination of a gas-producer, a rammer fitted to reciprocate therein, a fluid-pressure cylinder fixed above the top of the producer, a piston fitting said cylinder, and bars or rods passing freely through stuffing-boxes in the top of the producer and connecting the rammer with said piston, substantially as set forth.

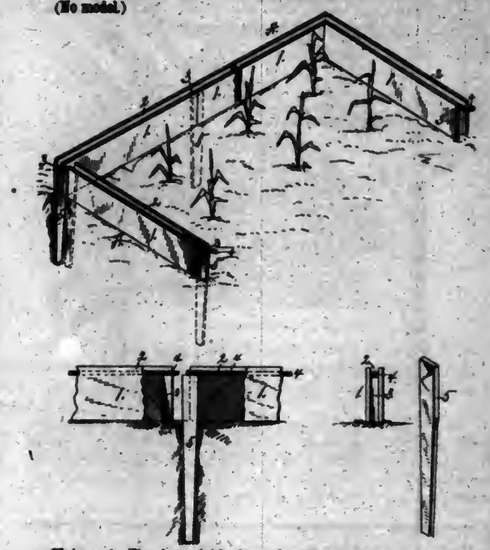
395,677. MECHANICAL MOVEMENT. CHARLES W. WHITE, Sleepy Eye, Minn., assignor of three-fourths to Thomas R. Bowen, John A. White, and Myron G. Burnside, same place. Filed July 10, 1888. Serial No. 279,533. (No model.)



Claim.—1. The combination of the main frame, the stationary ring having internal gear-teeth, the main shaft mounted on the frame, the lever mounted on the main shaft, a pinion on the end of the lever meshing with the gear-teeth of the stationary ring, and gearing between said pinion and the main shaft, as set forth.

2. The combination of the main frame, the stationary ring having internal gear-teeth, the main shaft, the lever mounted on the shaft, the pinion on the end of the lever meshing with the teeth of the stationary ring, the shaft mounted on the side of the lever and having pinions on its ends, and a bevel gear-wheel on the main shaft meshing with one of said pinions, the other one of said pinions being connected by gearing to the pinion meshing with the stationary ring, as set forth.

395,678. FENCE FOR INTERCEPTING INSECTS. FREDERICK A. WIENECK, Humboldt, Kans. Filed July 30, 1888. Serial No. 280,456. (No model.)

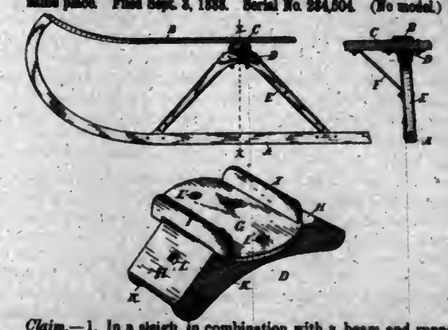


Claim.—1. The insecticide-fence herein described, composed of sections consisting of single narrow boards formed with a groove in their upper edges to receive and retain a substance noxious to insects, and grooves across their ends, and posts arranged in the end grooves of meeting ends of the sections, said posts having their tops arranged on a line with the bottom of the groove in the upper edge of the sections, substantially as described, and for the purpose stated.

2. The insecticide-fence herein described, composed of sections consisting of single narrow boards formed with a groove in their upper edges and grooves across their ends, posts arranged in the end grooves of meeting ends of the sections, said posts having their tops arranged on a line with the bottom of the grooves in the upper edges of the fence, and a saturable material arranged in the top groove of the fence, substantially as described, and for the purpose specified.

3. The insecticide-fence herein described, consisting of single narrow boards having grooves in their upper edges to receive a substance noxious to insects, said sections being laid to form a continual groove between their meeting ends, and posts at the meeting ends of the sections to hold them in line, substantially as described, and for the purpose specified.

395,679. COUPLING FOR BENT SLEIGH-KNEES. JOHN J. COSS, Grand Rapids, Mich., assignor to Sherwood Hall and Martin L. Sweet, same place. Filed Sept. 3, 1888. Serial No. 284,504. (No model.)



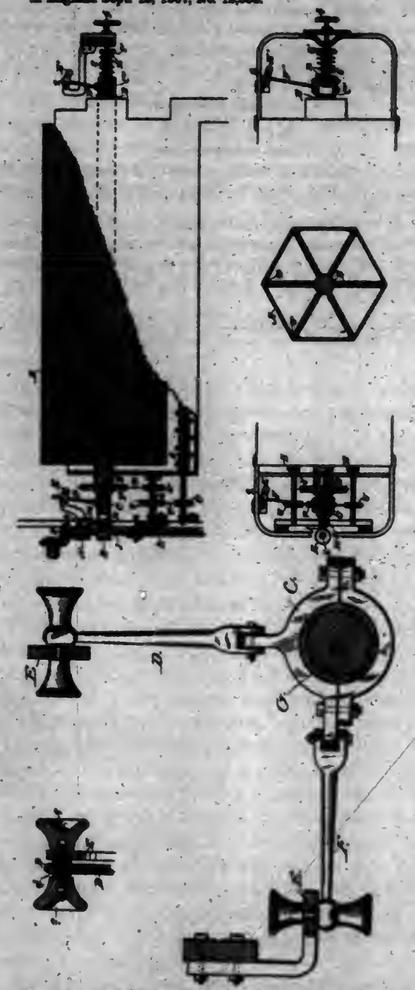
Claim.—1. In a sleigh, in combination with a beam and runner, a bent or arched sleigh-knee having its forward end secured to the runner and set bracing obliquely upward and backward, and its rear end secured to the runner and set bracing obliquely upward and forward and having a curved or arched apex, and a knee-cap of malleable iron or other suitable material cast integral and having opposite transverse upper and lower surfaces, the upper surface being flat and having flanges to engage the beam, and the under surface concave fore and aft to receive the apex of the arched knee, and having flanges to engage the sides of said knee, and provided with suitable means to secure said knee-cap, beam, and arched knee together, arranged between said beam and knee, substantially as described.

2. In a sleigh, in combination with a beam and runner, the knee-cap D, with arched knee E, arranged between the beam and runner, substantially as described.

3. In a sleigh, the combination of a knee-cap having flanges to embrace the beam and knee, the beam C, and the arched knee E, arranged between the rave and runner, substantially as described.

4. In a sleigh, in combination with rave B and runner A, the beam C, knee-cap D, and arched knee E, arranged substantially as described, and for the purposes set forth.

395,680. ROTARY BOLT. GEORGE STURGEON, San Francisco, Cal. Filed Mar. 15, 1888. Serial No. 267,370. (No model.) Patented in England Sept. 15, 1887, No. 12,532.



Claim.—1. A bolting-machine comprising a bolt having a shaft, mechanism for rotating said bolt, journal-boxes in which the journals of the shaft turn at opposite ends of the bolt, horizontal and vertical links loosely connected with the journal-boxes, and slotted hangers, in which the outer ends of said links are adjustably secured, substantially as herein described.

2. A bolting-machine comprising a bolt, a shaft, suspended journal-boxes at opposite ends of said shaft, vertical and horizontal links loosely connected with said boxes, slotted hangers, to which the outer ends of the links are adjustably connected, whereby the angle of con-

pension of said bolt may be varied, and means for imparting a reciprocation to the shaft and a rotary movement to the bolt, substantially as herein described.

3. The suspended journal-boxes at opposite ends of the rotary bolt, the shaft having hollow trunnions extending into said boxes, in combination with the bracket having a stem or spindle extending into the hollow trunnion, and having the roller J journaled vertically in its outer end, and the cam or eccentric K, mounted upon the vertical driving-shaft and turning in contact with the roller J, so as to produce an end oscillation or shake of the bolt, substantially as herein described.

4. The horizontal rotary bolt having the ends of its shaft journaled in boxes suspended by links from above, the bracket carrying the anti-friction roller J, and the eccentric or cam from which an end shaking motion is transmitted through the bracket and journal-boxes to the bolt, in combination with the depending plate, against which the upper end of the shaft of the roller J travels, and by which the bracket is retained in its upright position, substantially as herein described.

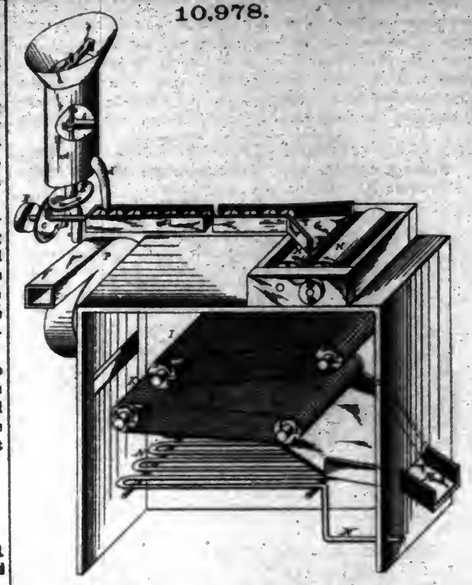
5. A bolting-machine comprising the horizontal rotary bolt, the suspended swinging boxes at the ends thereof, a shaft journaled in said boxes, horizontal links connected with the boxes and with a fixed support, a cam or eccentric at one end of said bolt, and a spring at the opposite end, whereby an end shaking or oscillating motion of the bolt is produced, substantially as described.

REISSUES.

10,978. PREPARING GRAIN. GEORGE H. CORMACK, Rockford, Ill. Filed Sept. 27, 1888. Serial No. 286,614. Original No. 353,924, dated Dec. 7, 1886.

Claim.—1. In the preparation of grain products, the process substantially as herein described, consisting in steaming the grain, partially drying the steamed grain, reducing the partially-dried grains, and subjecting the product to a drying process, as and for the purpose set forth.

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2. The herein-described process in the preparation of grain products, consisting in steaming the grain, partially drying and cooling the steamed grain, crushing the partially dried and cooled grains, and subjecting the crushed grains to a drying and separating process, substantially as and for the purpose set forth.

PHOTO LITH NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

COMMISSIONER'S DECISIONS.

EX PARTE KING.

Decided December 17, 1888.

STATEMENT.

Applicant has presented for registration as a Trade-Mark an exact representation of the well-known badge of the Grand Army of the Republic, which he proposes to use as a water-mark on writing-paper.

1. EXCLUSIVE PROPERTY IN EMBLEMS USED BY SOCIETIES.

The fact that the Grand Army of the Republic have adopted a certain design for their badge, or for the letter-head of writing-paper used by them, does not secure to such organization such exclusive property in the particular representation as would deprive an applicant who has complied with all the requirements of the statute of his right to register the same as a Trade-Mark. It is well settled that emblems which have been used by societies possess no sanctity or sacredness which precludes their being used and applied as Trade-Marks.

2. TRADE-MARKS WHICH EMBELLISH.

The objection of the examiner that the Trade-Mark embellishes the paper is not approved. It may be said that scarcely any Trade-Mark can be applied to paper without incidentally embellishing it. If the design is a legitimate subject of a Trade-Mark and is not prohibited by law, the fact that it incidentally embellishes the page on which it appears cannot deprive it of its lawful quality as a Trade-Mark.

3. REPRESENTATIONS PATENTED AS DESIGNS NOT BARRED FROM REGISTRATION AS TRADE-MARKS.

The fact that the Grand Army of the Republic have previously obtained a Design patent for this representation, the term of which has expired, does not constitute a legitimate bar to the employment of this design as a Trade-Mark in commerce with foreign nations. The mere fact that the organization originated the design would make no difference whatever if the design has been donated to the world to be used in all the ways of which it is capable. The Grand Army of the Republic retained no proprietary right after the term of their design patent expired. There is no property in the design itself vested in any one. Any person may apply the design as a Trade-Mark to a certain class of merchandise, and when thus applied it acquires the quality of property and becomes vested in him who first makes such new and distinct application of the design, and registration will be granted, provided the applicant has complied with all the requirements of the statute and the mark is used in commerce with foreign nations.

4. OFFICE BOUND BY THE OATH OF APPLICANT.

The Patent Office has not the means to investigate the question whether the applicant in the present case is simply seeking to obtain the guise of security round his Trade-Mark, when he really means to use it as an attractive embellishment for a particular class of persons in this country. The Office is bound by the oath of the applicant, and such a question as the above must be settled by the courts.

APPEAL from Primary Examiner.

TRADE-MARK FOR WRITING-PAPER.

Application of David King filed May 14, 1888.

Mr. H. A. Toulmin for the applicant.

HALL, *Commissioner:*

Applicant has presented as his Trade-Mark for writing-paper a design, which he uses as a water-mark, consisting, essentially, of the letters "G. A. R." and the representation of an eagle, a flag, and a star. It is proper to add that this design, which the applicant claims to have applied to his goods as a Trade-Mark, is an exact representation of the well-known badge of the Grand Army of the Republic. Although the applicant in his argument has attempted to draw some distinctions between the Trade-Mark exhibited by him and the badge of the Grand Army of the Republic, there can be no doubt that the similarity is such that the distinctions alluded to make no difference whatever.

This application for registration has been refused by the examiner, for the reason that the design has been heretofore adopted and employed by the Grand Army of the Republic upon badges worn by its members, and has been printed as a letter-head upon the writing-paper used by that organization in its correspondence. The examiner has also insisted that this design, when applied by way of a water-mark upon the paper, embellishes and consequently enhances the value of it, and this, having another use than that of a Trade-Mark, is not the proper subject of a Trade-Mark registration. It is also proper to add that heretofore this design was patented as a Design, but the term for which this security was obtained has expired, so that it is no longer protected. No objection is made to its registration on account of the fact that it is incorporated in the paper as a water-mark in the process of manufacture, for it is conceded that the water-mark is one of the ancient and well-known means of applying a Trade-Mark to writing-paper, and no reason is conceived for objecting to it on that ground. The question then arises whether the facts stated above constitute a proper and legitimate bar to the employment of this design in its application to interstate commerce as a Trade-Mark.

The fact that this proposed Trade-Mark may be said to be a design I think can make no possible difference. The records of the Office contain a multitude of Trade-Marks which are designs in the sense that they are fanciful pictures and illustrations, and it matters not how incongruous or meaningless a design may be it still, within some limits and restrictions, can be the subject of a Trade-Mark.

It is conceded that this design has never been used as a Trade-Mark by the Grand Army of the Republic

or by any other persons either in local trade, interstate commerce, or commerce with foreign nations. As is said by the examiner in a supplement to his statement, this design has become a matter of public knowledge and use, so that it is no longer capable of being exclusively appropriated in the ordinary sense as property. It has fallen into the mass of fanciful designs which may be employed by every person in any appropriate and lawful manner. The applicant in this case claims to have thus found it the subject of lawful use, and has so far appropriated and applied it as a Trade-Mark to a certain class of merchandise in a proper and legal manner. His doing this in no manner interferes with its proper and lawful use by all other citizens and persons. The Grand Army can still use it in precisely the same manner in which it has heretofore been used, upon the badges of the members and upon the paper which they use in their correspondence, whether such paper is manufactured by this applicant with the Trade-Mark incorporated as a water-mark, or whether the paper is entirely different in the respect of containing no water-mark whatever. So any other persons than the members of the Grand Army of the Republic can employ this design upon other materials than paper, and I see no reason why it may not be employed as a Trade-Mark when applied to any other class of merchandise to which it may be properly appropriated. The examiner concedes that this could be done. If a manufacturer of carpets saw proper to have this design woven in his carpet, certainly no objection could be raised against it. The design could also be printed upon wall-paper as an ornament simply, for the reason that, not being the subject of copyright and not being secured by any law applicable thereto, it is capable of general and universal use. The Trade-Mark law provides that when an individual has obtained or selected, either by his own ingenuity or by appropriating that which he finds existing in public knowledge, a device or design, and has applied it as a Trade-Mark to a class of merchandise which he is using in commerce with other nations, he shall be entitled to have such Trade-Mark registered and to receive the protection which the law gives to a Trade-Mark. This, of course, depends upon whether he is the first to have thus applied that device or design upon that class of goods which is the subject of foreign commerce.

In the present case the applicant has complied with the statute and filed the necessary affidavit asserting himself to be the first person who has adopted this design as a Trade-Mark in foreign commerce. There is nothing of record in the statement of the examiner intimating that the Grand Army of the Republic, or any other organization or person, has ever thus applied this design. I have already stated how the Grand Army of the Republic has used this badge or design. That use has been of such a character that no property in it remains with such organization, for its members have published it to the world. It seems that at one time they retained a property in one of the methods recognized by law—viz., by a Design patent. The period of that security has expired. Had that organization been engaged in the manufacture or sale of paper, or any other merchandise or commodity, and seen proper to apply this design to that class of merchandise as a Trade-Mark, they could have been secured in its use and enjoyment in the manner provided by the Trade-Mark law; but, as already stated, they have never engaged in such manufacture or sale, nor have they attempted to secure a property in the design in the manner set forth. They have, however, published the design to the world both in their use of it and by their Design patent, just as manuscripts and the results of thought are donated and given to the public by the ordinary and usual publication and use, when such public use and publication are not guarded and protected by conforming to the copyright law. There is, however, no property in the design itself vested in any one.

The applicant in this case, in selecting the design under consideration from what the examiner may term the worthless rubbish abandoned by its owner—the materials of dust heaps and accumulations—has acquired no property in the thing, and it is only by this new application of the design as a Trade-Mark to a certain class of merchandise that it newly acquires the quality of property and becomes invested in him who first makes such an application of it. I can conceive that there is no more reason why the applicant should be denied his right to a Trade-Mark under these circumstances than if he had selected some fanciful design which might have belonged to the order of St. John, or that had existed two or three centuries ago, the only condition being that, having selected it, he has applied it as a Trade-Mark to merchandise in foreign commerce, as required by the statute.

It is said that the seal of the Government belongs to all persons in the sense that no one can acquire an individual property in it or apply it as a Trade-Mark. I see no occasion to discuss that question now; but as to mere emblems which have been used by societies it seems to be settled by the decisions of the Office that there is no sanctity or sacredness about them which precludes their being used and applied as Trade-Marks.

Attention has been called to the case of *ex parte Tolle*, (2 O. G., 415;) but the later case of *ex parte Thomas* (14 O. G., 821; C. D., 1878, 113) seems especially to overrule the former one. The Commissioner in this later decision says:

> I cannot agree with the doctrine of that case, (*ex parte Tolle.*) There is no law giving to the Masonic fraternity a monopoly of the symbols used by them, and I see no reason why this Office should not hold in the same respect the symbols and emblems of the Odd Fellows and of other secret societies, and the particular emblems used by certain religious organizations.
>
> In regard to the character of the deception that might be caused by the use of such symbols on manufactured goods the decision is silent. It is inferred, however, from a careful perusal of the opinion that the public might be led to think that the manufacturer using the mark was a Mason, when he was not; or that, being a Mason, his goods were of first-rate quality, when in truth they were very poor.
>
> On consulting the statute, however, I find nothing at all indicating that the function of a Trade-Mark is to point out the character or social standing of its owner or the quality of his goods. Nor is there anything in the Office rules requiring us to apply any tests of this kind. The sole and independent office of a Trade-Mark is to distinguish the goods of one person from the same kind of goods made or sold by another. The relations to society the manufacturer bears or the particular quality of his goods are determined by the public in other ways.

It is proper to say in this case that I do not find, nor does the examiner suggest, that the design as used would be calculated to deceive, and the case is not brought within the principles announced in *ex parte M. Bloch & Co.*, (40 O. G., 443.)

It is suggested that if this Trade-Mark is allowed to be registered the members of the Grand Army of the Republic would be precluded from using the design or symbol in the manner in which they have heretofore used it. Evidently this is a misapprehension. As stated above, that organization will have precisely the same right to employ this design upon its badges even if the badges could be regarded as articles of merchandise, and also to imprint it in the manner heretofore done upon paper used in correspondence, whether that paper contains the water-mark or Trade-Mark of this applicant or is common and ordinary paper. But, it is said, suppose hereafter the Grand Army desire to manufacture paper or to use paper in which its members have caused this water-mark, their own symbol, to be impressed, would they not be regarded as infringers of the Trade-Mark thus registered by the applicant? It will be seen at once that whenever the Grand Army of the Republic enter upon the manufacture and sale of paper and attempt to employ this symbol as a feature of that paper they embark in a new business and attempt to apply this design to a new use. So, also, if they, instead of engaging in such manufacture or sale for the purpose of supplying themselves with this kind of paper, were to employ or induce others to manufacture and engage in the sale, then such other persons would themselves begin the manufacture and use of a quality of paper and the employment of this design in a use to which it had not heretofore been applied. Whether such a use of the design would constitute infringement of this Trade-Mark depends upon a number of important questions: First, would they employ it as a Trade-Mark? Second, would such Trade-Mark be applied in foreign commerce or interstate commerce or in local trade only? Finally, would such use be simply a matter of embellishment? In either event it would be an entirely distinct and new application of the use of this design by the Grand Army of the Republic, or by such persons as the organization should employ or induce to enter into the manufacture and sale of such paper, and when the Grand Army or such other persons began this new use of the design they must take it subject to the rights of other parties accrued prior to this new use and application. This is the condition in which every person finds himself placed when he applies for the registration of a Trade-Mark. If some other party has previously used the Trade-Mark and has registered it, an interference follows and the Office decides which one first properly applied the design to the same class of goods; or, if the question arises in the courts, the courts settle the rights of the parties, depending upon which one first thus applied the design as a Trade-Mark. I am not able to see that the Grand Army of the Republic would occupy any other or different position. The mere fact that they were the originators of the design or the authors of it, in my opinion, would make no difference whatever, for the reason that they have donated this design to the world to be used in all the ways in which the design is capable of use, and retained no proprietary right in themselves, and in that condition the Trade-Mark quality which follows the application of the design to merchandise belongs to him who first applies it to that particular purpose.

Then as to the question whether the Grand Army would have the right to embellish their paper with this design by means of the water-mark. Whether they would have the right to do that depends entirely upon whether it would be an infringement of a previously-registered Trade-Mark in which the same design was employed by means of the water-mark. If it were used solely for embellishment, and was never used in commerce, and was employed by the members of the Grand Army exclusively, it probably would not present a case of infringement, unless the courts should find that its use operated to deceive the public and induced it to purchase a particular kind of paper used and thus embellished by this organization upon the supposition or belief that it was the paper of the character and quality manufactured by the applicant under his Trade-Mark. In such a case the courts would probably hold that there was an infringement.

The examiner has made the objection that this Trade-Mark embellishes the paper and thus adds something to its intrinsic value, and that whatever possesses this quality cannot properly be made the subject of a Trade-Mark, and several cases are cited; but I do not think such cases support the proposition in its application to the present case. The proposition which lies at the foundation of this case is that a Trade-Mark may be impressed upon each sheet of paper as a water-mark, and I think it may be safely said that scarcely any Trade-Mark can be or would be thus applied without incidentally embellishing the page or the paper to a greater or less extent; but if the design itself is the proper and legitimate subject of a Trade-Mark, is not prohibited by law or contrary to public morals or public policy, the fact that it incidentally embellishes the page on which it appears cannot deprive it of its lawful quality as a Trade-Mark, and I do not think that objection is well taken under the circumstances.

There are several affidavits filed in the record in which this particular feature of the water-mark is set out, and it is undoubtedly true that paper of a suitable quality containing this water-mark might be particularly acceptable to members of the Grand Army; but the Trade-Mark is sought to be registered for its use in foreign commerce, and the affidavit of the applicant asserts that it has been thus used, although evidently not to any great extent as yet, and it is in the direction of such employment that the registration is allowed. The Patent Office is not constituted, nor has it the means, to investigate the question whether the applicant in the present application is simply seeking to obtain the guise of security around his Trade-Mark when he really means to use it as an attractive embellishment for a particular class of persons in this country. I feel that the Office is bound by the affidavit, and that in that respect the affidavit of the applicant cannot be controverted. Such a question as that must be settled by the courts.

In conclusion, the case is one that has given me no little difficulty. It has been thoroughly and elaborately presented by the examiner, and it is with the greatest hesitation that I find myself compelled to differ with his opinion; but in view of the fact that there is this difference between his opinion and mine I feel that it is due to the applicant to give him the benefit of the doubt.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

GOODYEAR'S INDIA RUBBER GLOVE MANUFACTURING COMPANY *et al. v.* THE GOODYEAR RUBBER COMPANY.

Decided December 10, 1888.

1. TRADE-MARK—WORDS DESCRIPTIVE OF A CLASS OF GOODS CANNOT BE APPROPRIATED AS A TRADE-MARK.
The name "Goodyear Rubber Company" is not one capable of exclusive appropriation as a Trade-Mark. "Goodyear Rubber" are terms descriptive of well-known classes of goods produced by the process known as Goodyear's invention. Names which are thus descriptive of a class of goods cannot be adopted as Trade-Marks and be thereby appropriated to the exclusive right of any one.
2. SAME—SAME—ADOPTED AS A CORPORATE NAME.
Nor will the incorporation of a company in the name of an article of commerce, without other specification, create any exclusive right to the use of the name.

APPEAL from the Circuit Court of the United States for the Southern District of New York.

Mr. F. H. Betts, *Mr. J. E. Hindon Hyde*, and *Mr. Samuel R. Betts* for the appellants.

Mr. W. W. MacFarland for the appellee.

Mr. Justice FIELD delivered the opinion of the Court.

This was a suit in equity, brought by the Goodyear Rubber Company, a corporation created under the laws of New York, to restrain Goodyear's India Rubber Glove Manufacturing Company, a corporation created under the laws of Connecticut, and others, defendants below, from using the name of "Goodyear's Rubber Manufacturing Company," or any equivalent name in their business. The bill alleges that the plaintiff was organized as a corporation on the 20th of November, 1872, for the purpose of manufacturing and dealing in india-rubber and gutta-percha goods, under its corporate name, in the city of New York; that it engaged in business in that city, where it has three large warehouses, with branch houses in other cities; that since its organization it has continually used its corporate name on signs at its various places of business and factories; on its bill and letter heads; on its various articles of manufacture; and on its corporate seal in contracts and other business transactions, that by reason thereof it has become possessed of an exclusive right and title to its corporate name, which, from its inseparable connection with the business and good-will of the company, has become of great value; and that its exclusive use is essential to the prosperity of the plaintiff. The bill then sets forth that at the time of its organization there existed a corporation carrying on business in the city of New York under the name of "Goodyear's India Rubber Glove Manufacturing Company," and dealing in various articles of which india-rubber formed a component part, its business being similar to that of the plaintiff; that prior to the organization of the plaintiff in November, 1872, that company conducted its business under its corporate name, using it on its business signs, on its letter and bill heads, on its seal, and in all contracts and business transactions; that after the creation and organization of the plaintiff that company began to call itself "Goodyear's Rubber Manufacturing Company," and, for the purpose of diverting to itself the business and good-will of the plaintiff, resorted to various devices and contrivances having for their object the imitation and appropriation to its use of the plaintiff's name; that among these devices was the representation of the words "India" and "Glove," sometimes in small letters and sometimes by initials, thereby constituting a name for practical purposes almost identical with the name of the plaintiff, producing much loss and inconvenience to plaintiff's business by causing a diversion of letters and telegrams addressed to it; that for the like purpose of taking from the plaintiff its customers and trade, and appropriating its good-will, that company, on or about the 1st of January, 1882, adopted for its principal sign the name "Goodyear's Rubber Mfg. Co." over the entrance to and in front of its warehouses, and that these devices deceive the public and divert business and customers from the plaintiff, by which it sustains, and, without the interference of this Court, will in the future sustain, great loss and damage.

The bill also alleges that the defendants Allerton and Vermule, with other persons unknown to the plaintiff, pretend to be a corporation under the name of "Goodyear's Rubber Manufacturing Company," and that they are the principal owners and managers of the business carried on under the name of "Goodyear's India Rubber Glove Manufacturing Company," and of "Goodyear's Rubber Manufacturing Company," and as such direct and control whatever is done under the names of both.

The several defendants appeared and filed answers to the bill. These allege in similar terms that the defendant, Goodyear's India Rubber Glove Manufacturing Company, was organized as a corporation under that name in Connecticut in 1847 for the purpose of manufacturing india-rubber goods, and in 1849 obtained license for their manufacture under patents of Charles Goodyear, and continued in that business during the existence of those patents; that after their expiration and in 1865, and continuously since, it has manufactured and sold very largely all kinds and classes of india-rubber goods, treated according to the patents of Goodyear; that it has been for upward of twenty years the most prominent corporation or association in the city of New York engaged in the manufacture of those goods, and has become known to the trade by abbreviated and generally-used titles of "Goodyear's Rubber Manufacturing Company," or "Goodyear Rubber Company," or "The Goodyear's Company," and other similar titles abbreviated from its full corporate name; that the name of "Goodyear" in connection with the word "Company," or "Co.," or with similar brief letters or words indicating a company engaged in rubber-manufacturing, has been its distinguishing characteristic; that by adoption of the name of "Goodyear" in connection with its business and acquiescence of the public therein, and general usage, that company acquired a valuable right and interest in it, and has exercised the same for upward of twenty years; that its use has been recognized by the plaintiff and its predecessors in repeated business transactions; that a large part of its correspondence during this period has been under the abbreviated names of "Goodyear Rubber Company," "Goodyear's Rubber Manufacturing Company," or "Goodyear's Company," or other similar abbreviated title; that it registered a trade-mark in the name of "Goodyear's Rubber Manufacturing Company," and for the purpose of protecting it filed a certificate of incorporation under that name in New York in March, 1873; and that its trustees and managers subsequently organized as a corporation under that name in Connecticut. The answers also allege that the organizers of the plaintiff company, prior to 1873, had done business only under the name of "Rubber Clothing Company," or as "F. M. & W. A. Sheppard," or as "Sheppard & Dudley;" that about January 1, 1873, for the purpose of injuring the defendant and appropriating its well-known name and good-will, and securing its business, they organized the plaintiff under the name of the "Goodyear Rubber Company," against which the defendant protested; and that such action on the part of the plaintiff has caused a diversion of the business of the defendant and general interference with it.

As a separate defense the answers also set forth various transactions of the plaintiff, which tended to show unfair and inequitable measures to divert to itself business from the defendant, "Goodyear's India Rubber Glove Manufacturing Company," but it is not deemed important to state them. That company also filed a cross-bill to restrain the conduct of the plaintiff in that respect, and praying that damages might be decreed against it for its wrongful and inequitable acts. Replications having been filed to the several answers, proofs were taken, upon which the court below rendered a decree in favor of the plaintiff, perpetually enjoining the defendants from using or in any way employing the name "Goodyear's Rubber Manufacturing Company," or the name "Goodyear Rubber Company," or any abreviation thereof representing such integral name in their business, upon their signs, bills of merchandise, receipts, letters, products of their manufacture, or otherwise; and directing that the cross-bill be dismissed. From the whole of that decree an appeal was taken to this Court.

The proofs in the case show very clearly that "Goodyear's India Rubber Glove Manufacturing Company" had, as alleged in its answer, been for many years in the use of abbreviations in the designation of its company, using sometimes a name similar to the corporate name of the plaintiff; and if any exclusive right to the abbreviated name were to follow from its protracted use, that right would seem to belong to that company rather than to the plaintiff. But the name of "Goodyear Rubber Company" is not one capable of exclusive appropriation. "Goodyear Rubber" are terms descriptive of well-known classes of goods produced by the process known as Goodyear's invention. Names which are thus descriptive of a class of goods cannot be exclusively appropriated by any one. The addition of the word "Company" only indicates that parties have formed an association or partnership to deal in such goods, either to produce or to sell them. Thus parties united to produce or sell wine, or to raise cotton or grain, might style themselves "Wine Company," "Cotton Company," or "Grain Company," but by such description they would in no respect impair the equal right of others engaged in similar business to use similar designations, for the obvious reason that all persons have a right to deal in such articles, and to publish the fact to the world. Names of such articles cannot be adopted as trade-marks, and be thereby appropriated to the exclusive right of any one; nor will the incorporation of a company in the name of an article of commerce, without other specification, create any exclusive right to the use of the name.

In *Canal Company* v. *Clark*, (13 Wall., 311,) an attempt was made to appropriate the term "Lackawanna" to coal brought by the canal company from Lackawanna Valley in Pennsylvania. The coal sold by the defendant Clark was a different kind, but was brought from the same valley, and he designated it also as "Lackawanna" coal. To enjoin this use of the name the suit was brought. The Court held that geographical names designating districts of country could not be thus appropriated exclusively, as they pointed only to the place of production, and not to the producer.

Could such phrases—

said the Court—

as "Pennsylvania wheat," "Kentucky hemp," "Virginia tobacco," or "Sea Island cotton" be protected as trade-marks; could any one prevent all others from using them, or from selling articles produced in the districts they describe under those appellations, it would greatly embarass trade and secure exclusive rights to individuals in that which is the common right of many.

In reaching this conclusion the Court considered the principles upon which the owner of a trade-mark is protected in its use, and held that—

the trade-mark must, either by itself or by association, point distinctively to the origin or ownership of the article to which it is applied. The reason of this is, that unless it does, neither can he who first adopted it be injured by any appropriation or imitation of it by others, nor can the public be deceived.

And again:

No one can claim protection for the exclusive use of a trade-mark or trade-name which would practically give him a monopoly in the sale of any goods other than those produced or made by himself. If he could, the public would be injured rather than protected, for competition would be destroyed. Nor can a generic name, or a name merely descriptive of an article of trade, of its qualities, ingredients, or characteristics, be employed as a trade-mark and the exclusive use of it be entitled to legal protection.

To the same purport is the decision in *Manufacturing Company* v. *Trainer*, (101 U. S., 51.) There the Court said:

The object of the trade-mark is to indicate, either by its own meaning or by association, the origin or ownership of the article to which it is applied. If it did not, it would serve no useful purpose, either to the manufacturer or to the public; it would afford no protection to either against the sale of a spurious in place of the genuine article. (See, also, *Amoskeag Manufacturing Co.* v. *Spear*, 2 Sandf., 599; *Falkenburg* v. *Lucy*, 35 Cal., 52; *Choynski* v. *Copia*, 39 Cal., 501; *Faggett* v. *Findlater*, Law Rep. 17 Eq., 29.)

The designation "Goodyear Rubber Company" not being subject to exclusive appropriation, any use of terms of similar import, or any abbreviation of them, must be alike free to all persons.

The case at bar cannot be sustained as one to restrain unfair trade. Relief in such cases is granted only where the defendant, by his marks, signs, labels, or in other ways, represents to the public that the goods sold by him are those manufactured or produced by the plaintiff, thus palming off his goods for those of a different manufacture, to the injury of the plaintiff. (*McLean* v. *Fleming*, 96 U. S., 245; *Sawyer* v. *Horn*, 4 Hughes, 239; *Perry* v. *Truefitt*, 6 Beavan, 66; *Croft* v. *Day*, 7 *Id.*, 84.) There is no proof of any attempt of the defendant to represent the goods manufactured and sold by him as those manufactured and sold by the plaintiff; but on the contrary, the record

shows a persistent effort on its part to call the attention of the public to its own manufactured goods, and the places where they are to be had, and that it had no connection with the plaintiff.

It follows that the decree of the circuit court as to the original bill must be reversed and the cause remanded, with instructions to dismiss that bill, with costs. No case was made out for relief to the plaintiff in the cross-bill. The costs of the appeal are awarded to the appellants.

U. S. Circuit Court—Northern District of Illinois.

PRESTON *v.* THE FIRE EXTINGUISHER MANUFACTURING COMPANY *et al.* LA FRANCE FIRE ENGINE COMPANY *v.* THE FIRE EXTINGUISHER MANUFACTURING COMPANY *et al.*

Decided November 5, 1888.

1. JURISDICTION—SUIT AGAINST NON-RESIDENT CORPORATION—SERVICE OF PROCESS.
   A corporation not a resident of this district cannot be sued in this court. Service of process upon the agent or officer of a non-resident corporation insufficient.
2. SAME—SAME.
   A corporation created and existing solely under the laws of another State, and having its principal office and place of business in another State and district, cannot be said to be an inhabitant of this district and be sued here, even though such corporation may do business in this district through agents.

Messrs. Munday, Evarts & Adcock for the complainants.

Messrs. Banning & Banning & Payson for the defendants.

BLODGETT, *J.*:

These cases are now before me upon a plea filed in the cause to the jurisdiction of the court. The plea sets up by way of challenge to the jurisdiction of the court the fact that this defendant, The Fire Extinguisher Manufacturing Company, at the time of the filing of the bill of complaint was a corporation duly organized and existing under and by virtue of the laws of the State of New York; that it has its principal office and keeps its books of account in that city, and that no stockholder, officer, or director resides in this city; that said company was not prior to nor at the date of the filing of the bill of complaint an inhabitant of the northern district of Illinois or of the State of Illinois.

In the case of the *Gormully & Jeffrey Manufacturing Company* v. *The Pope Manufacturing Company*, (34 Fed. Rep., 818,) before me in March last, I had occasion to examine this question and there came to the conclusion that under the act of March 3, 1887, and the same holds good in regard to the act as explained and modified by the act of August 13, 1888, a non-resident corporation cannot be sued in this district—that is, a corporation not a resident of this district cannot be sued here merely by service upon an agent or officer. The opinion in that case has been published, and counsel are familiar with it, so it is hardly necessary to quote from it. It is enough to say that the act of 1887 requires suit to be brought in the district whereof the defendant is an inhabitant, but drops from the latter the provision that he may also be sued in any district where he may be found at the time of the serving of the process. I have re-examined that question in the light of suggestions made by counsel for complainant, and still adhere to the conclusion there announced, that a corporation created and existing solely under the laws of another State, and having its principal office and place of business in another State and district, cannot be said to be an inhabitant of this district and be sued here, even although such corporation may do business in this district through agents. The agents can undoubtedly be sued here if the case is such as to make them personally liable, or when an injunction is sought against them.

The statute of the State of Illinois, (sec. 26, chap. 32, Rev. Stats. of Ill.,) which provides that foreign corporations shall be subject to all the liabilities, restrictions, and duties that are or may be imposed upon domestic corporations, I do not think helps the complainants in this case, as it has nothing to do with the question of jurisdiction or of the tribunal to which you can go for the purpose of bringing suit. It simply makes foreign corporations subject to the same liabilities as home corporations. It does not reach the question as to what tribunal you are to go into.

The bill charges defendants with the infringement of a patent owned by complainant, and it was stated on argument as to the sufficiency of this plea that defendants have a factory in this district and manufacture the infringing machines here as a reason why defendants may be sued here. It is very plain that if an individual, an inhabitant of another State, owned and carried on this factory, conducting its business through his agents and employés, he could not be sued in this district, and I see no reason why the same rule is not applicable to corporations of other States. In other words, it seems to me a corporation can by State comity carry on business in a State outside of that by which it was created without becoming an inhabitant of such outside State.

The plea in each case is held sufficient.

OFFICIAL GAZETTE

OF THE

UNITED STATES PATENT OFFICE.

SUPPLEMENT

CONTAINING THE

REVISED CLASSIFICATION OF SUBJECTS OF INVENTION,

ALPHABETICALLY ARRANGED.

JANUARY 1, 1889.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., January 1, 1889.

The following is the official classification of patents and inventions in the Patent Office. No changes will be made therein except by order of the Commissioner.

Should occasion arise for any modification of this classification, either by the discontinuance of any title or by the addition of a new one, the matter will be presented to the Commissioner for his action.

Examiners will not transfer patented drawings from one class or sub-class to another except on the Commissioner's approval.

Changes in classes and sub-classes will be published in the OFFICIAL GAZETTE.

BENTON J. HALL,
Commissioner of Patents.

CLASSIFICATION OF INVENTIONS.

REVISED AND APPROVED BY THE UNITED STATES PATENT OFFICE JANUARY 1, 1889.

All inventions are classified in the United States Patent Office.

The present classification, revised January 1, 1889, contains one hundred and eighty-eight classes, subdivided into over four thousand sub-classes.

Persons desiring to inform themselves in regard to the state of the art in any line of invention can best do so by purchasing printed copies of the specifications and drawings of patents in the sub-class containing the invention, the number and cost of which will be given upon application.

Those wishing to subscribe for the printed copies of specifications and drawings of future patents in any sub-class may do so by depositing any amount from five dollars upward, the sum depending upon the size of the sub-class. The copies will then be mailed to them weekly, at the rate of ten cents each, until the deposit shall have become exhausted, when notice will be duly sent for renewal of deposit, if desired.

Orders for specifications and drawings by classes should give the numbers as well as the titles of the class and sub-class.

Orders for single patents should give the number and date of the patent and the name of the inventor.

SPECIFICATIONS of patents issued since June 10, 1862, commencing with No. 35,520, have been printed up to this date; also, all patents previously issued for processes, and in the classes of Arms and Projectiles, Brakes and Gins, Distillation, Electricity, Fire-Arms, Fishing and Trapping, Harrows and Diggers, Harvesters, Injectors and Ejectors, Marine Propulsion, Metal-Founding, Ordnance, Packing and Storing Vessels, Plows, Projectiles, Seeders and Planters, Sewing-Machines, Sheet-Metal-Ware Making, Steam and Vacuum Pumps, Steam Water-Elevators, Sugar and Salt, Tobacco, Trees, Plants and Flowers, and Wire-Working, and the sub-classes of Bale-Band Tighteners, Bale-Ties, Cane-Mills, Cane-Strippers, Car-Seats, Cotton and Hay Presses, Tobacco-Driers, Tobacco-Elevators, Time-Locks, and Type-Writing.

DRAWINGS of all patents, from earliest to present date, have been photolithographed, with a few exceptions.

The cost of copies of drawings with the specifications, if printed, when ordered in quantites of twenty or more, is ten cents per copy. If the specification has not been printed, an additional cost of ten cents per hundred words for a manuscript copy of it will be charged.

For the convenience of those who do not desire to order as many as twenty copies at one time, coupon orders, good for one drawing and printed specification, are sold in quantities of twenty or more, at ten cents each. These may be used singly and are good till used.

CLASSES ALPHABETICALLY ARRANGED.

Number.	Class.	Division.	Number.	Class.	Division.
180	Accouterments and baggage	22	67	Lamps and gas-fittings	30
181	Acoustics	23	68	Laundry	27
40	Advertising	22	69	Leather	11
1	Aeration and bottling	9	70	Locks and latches	20
123	Air and gas engines	18	184	Lubricators	12
2	Apparel	24	74	Machine elements	12
86	Arms and projectiles. Making	13	115	Marine propulsion	22
166	Artesian and oil wells	15	72	Masonry	4
3	Artificial limbs	20	73	Measuring-instruments	23
106	Artificial stone, lime, and cement	15	185	Mechanical motors	19
4	Baths and closets	9	167	Medicines	6
5	Beds	8	153	Metal-bending	14
6	Bee-culture	2	10	Metal bolts, nuts, rivets, and screws	13
8	Bleaching and dyeing	6	77	Metal boring and drilling	13
9	Boats	22	78	Metal-forging	13
11	Book-binding	5	22	Metal-founding	14
12	Boots and shoes	11	75	Metallurgy	3
13	Brakes and gins	21	79	Metal personal wear. Making	13
107	Bread, cracker, and lozenge making	6	80	Metal-rolling	13
7	Brewing and fermenting	3	148	Metal tempering, annealing, and cementation	3
14	Bridges	4	76	Metal tools and implements. Making	13
15	Brushing and scrubbing	27	134	Metal tubing and wire	13
16	Builders' hardware	20	82	Metal turning, planing, and milling	13
17	Butchering	2	81	Metal-working tools	28
18	Caoutchouc and minor plastics	15	83	Mills	25
19	Carding	21	84	Music	5
119	Care of live stock	2	85	Nails and spikes	13
20	Carpentry	29	163	Needles and pins	13
21	Carriages and wagons	10	151	Nut and bolt locks	28
59	Chains, staples, and horseshoes	13	87	Oils, fats, and glue	6
155	Chairs	8	88	Optics	23
23	Chemicals	6	89	Ordnance	22
24	Clasps and buckles	11	150	Packing and storing vessels	14
25	Clay and pottery	15	91	Painting	6
26	Cloth-finishing	21	92	Paper-making	15
96	Coating with metal	3	93	Paper-manufactures	17
154	Composite roofing	15	94	Paving	15
147	Coopering	29	95	Photography	5
28	Cordage	21	97	Plows	1
29	Crinoline and corsets	24	98	Pneumatics	28
156	Curtains, shades, and screens	8	99	Preserving	6
30	Cutlery	20	100	Presses	2
31	Dairy	2	101	Printing	17
32	Dentistry	20	102	Projectiles	22
165	DESIGNS	24	103	Pumps	9
124	Distillation	3	164	Punching and shearing	13
33	Drafting	23	105	Railway-cars	10
34	Driers	28	104	Railways	4
35	Educational appliances	23	62	Refrigeration	28
171	Electricity. Generation	26	108	Roofing	4
172	Electricity. Motive-power	26	109	Safes	20
173	Electricity. Conductors	26	111	Seeders and planters	1
174	Electricity. Medical and surgical	26	182	Sewerage	4
175	Electricity. Special applications	26	112	Sewing-machines	24
176	Electric lighting	16	113	Sheet-metal ware. Making	14
177	Electric signaling	16	114	Ships	22
187	Elevators	12	116	Signals	22
37	Excavating	4	117	Silk	21
52	Explosives	6	118	Spinning	21
168	Farriery	28	120	Stationery	5
38	Felting and hat-making	15	160	Steam and vacuum pumps	18
39	Fences	1	122	Steam-boilers	18
71	Fertilizers	6	110	Steam-boiler furnaces	18
41	Fine arts	5	121	Steam-engines	18
42	Fire-arms	22	136	Steam-engine valves	18
169	Fire-extinguishers	9	161	Steam water-elevators	18
159	Fire escapes and ladders	4	125	Stone-working	15
188	Fire-proof buildings	4	186	Store service	12
43	Fishing and trapping	22	126	Stoves and furnaces	19
188	Fluid-pressure railway-brakes	18	127	Sugar and salt	2
50	Fluid-pressure regulators	18	128	Surgery	20
44	Fuel	6	129	Tanning	11
45	Furniture	8	178	Telegraphy	16
46	Games and toys	8	179	Telephony	16
48	Gas	3	130	Thrashing	25
49	Glass	15	131	Tobacco	2
51	Grinding and polishing	27	132	Toilet	5
53	Hardware-making	13	47	Trees, plants, and flowers	2
54	Harness	11	135	Umbrellas and canes	5
55	Harrows and diggers	1	27	Undertaking	20
56	Harvesters	7	146	Vegetable cutters and crushers	2
149	Hides, skins, and leather. Chemical treatment of	6	152	Wagon, car, and track irons	13
57	Hoisting	12	141	Washing apparatus	27
58	Horology	21	137	Water-distribution	9
60	Hose and belting	11	139	Weaving	21
61	Hydraulic engineering	4	157	Wheelwright-machines	29
138	Hydraulic motors	9	170	Wind-wheels	28
162	Injectors and ejectors	18	140	Wire-working	14
63	Jewelry	5	143	Wood-sawing	29
64	Journal-boxes, pulleys, and shafting	12	142	Wood-turning	29
65	Kitchen and table articles	8	144	Wood-working machines	29
66	Knitting and netting	21	145	Wood-working tools	29

CLASSES NUMERICALLY ARRANGED.

Number.	Class.	Division.
1	Aeration and bottling	9
2	Apparel	24
3	Artificial limbs	20
4	Baths and closets	9
5	Beds	8
6	Bee-culture	2
7	Brewing and fermenting	3
8	Bleaching and dyeing	6
9	Boats	22
10	Metal bolts, nuts, rivets, and screws	13
11	Book-binding	5
12	Boots and shoes	11
13	Brakes and gins	21
14	Bridges	4
15	Brushing and scrubbing	27
16	Builders' hardware	20
17	Butchering	2
18	Caoutchouc and minor plastics	15
19	Carding	21
20	Carpentry	29
21	Carriages and wagons	10
22	Metal-founding	14
23	Chemicals	6
24	Clasps and buckles	11
25	Clay and pottery	15
26	Cloth-finishing	21
27	Undertaking	30
28	Cordage	21
29	Crinoline and corsets	24
30	Cutlery	20
31	Dairy	2
32	Dentistry	20
33	Drafting	23
34	Driers	28
35	Educational appliances	23
37	Excavating	4
38	Felting and hat-making	15
39	Fences	1
40	Advertising	22
41	Fine arts	5
42	Fire-arms	22
43	Fishing and trapping	22
44	Fuel	6
45	Furniture	8
46	Games and toys	8
47	Trees, plants, and flowers	2
48	Gas	3
49	Glass	15
50	Fluid-pressure regulators	18
51	Grinding and polishing	27
52	Explosives	6
53	Hardware-making	13
54	Harness	11
55	Harrows and diggers	1
56	Harvesters	7
57	Hoisting	12
58	Horology	23
59	Chains, staples, and horseshoes	13
60	Hose and belting	11
61	Hydraulic engineering	4
62	Refrigeration	23
63	Jewelry	5
64	Journal-boxes, pulleys, and shafting	12
65	Kitchen and table articles	8
66	Knitting and netting	21
67	Lamps and gas-fittings	30
68	Laundry	27
69	Leather	11
70	Locks and latches	20
71	Fertilizers	6
72	Masonry	4
73	Measuring-instruments	23
74	Machine elements	12
75	Metallurgy	3
76	Metal tools and implements. Making	13
77	Metal boring and drilling	13
78	Metal-forging	13
79	Metal personal wear. Making	13
80	Metal-rolling	13
81	Metal-working tools	28
82	Metal turning, planing, and milling	13
83	Mills	25
84	Music	5
85	Nails and spikes	13
86	Arms and projectiles. Making	13
87	Oils, fats, and glue	6
88	Optics	23
89	Ordnance	22
91	Painting	6
92	Paper-making	15
93	Paper-manufactures	17
94	Paving	15
95	Photography	5
96	Coating with metal	3
97	Plows	1
98	Pneumatics	28
99	Preserving	6
100	Presses	2
101	Printing	17
102	Projectiles	22
103	Pumps	9
104	Railways	4
105	Railway-cars	10
106	Artificial stone, lime, and cement	15
107	Bread, cracker, and lozenge making	8
108	Roofing	4
109	Safes	20
110	Steam-boiler furnaces	18
111	Seeders and planters	1
112	Sewing-machines	24
113	Sheet-metal ware. Making	14
114	Ships	22
115	Marine propulsion	22
116	Signals	22
117	Silk	21
118	Spinning	21
119	Care of live stock	2
120	Stationery	5
121	Steam-engines	18
122	Steam-boilers	18
123	Air and gas engines	18
124	Distillation	3
125	Stone-working	15
126	Stoves and furnaces	19
127	Sugar and salt	2
128	Surgery	20
129	Tanning	11
130	Thrashing	25
131	Tobacco	2
132	Toilet	5
134	Metal tubing and wire	13
135	Umbrellas and canes	5
136	Steam-engine valves	18
137	Water-distribution	9
138	Hydraulic motors	9
139	Weaving	21
140	Wire-working	14
141	Washing apparatus	27
142	Wood-turning	29
143	Wood-sawing	29
144	Wood-working machines	29
145	Wood-working tools	29
146	Vegetable cutters and crushers	2
147	Coopering	29
148	Metal tempering, annealing, and cementation	3
149	Hides, skins, and leather. Chemical treatment of	6
150	Packing and storing vessels	14
151	Nut and bolt locks	28
152	Wagon, car, and track irons	13
153	Metal bending	14
154	Composite roofing	15
155	Chairs	8
156	Curtains, shades, and screens	8
157	Wheelwright-machines	29
159	Fire escapes and ladders	4
160	Steam and vacuum pumps	18
161	Steam water-elevators	18
162	Injectors and ejectors	18
163	Needles and pins	13
164	Punching and shearing	13
165	Designs	24
166	Artesian and oil wells	15
167	Medicines	6
168	Farriery	28
169	Fire-extinguishers	9
170	Wind-wheels	28
171	Electricity. Generation	26
172	Electricity. Motive-power	26
173	Electricity. Conductors	26
174	Electricity. Medical and surgical	26
175	Electricity. Special applications	26
176	Electric lighting	16
177	Electric signaling	16
178	Telegraphy	16
179	Telephony	16
180	Accouterments and baggage	22
181	Acoustics	23
182	Sewerage	4
183	Fire-proof buildings	4
184	Lubricators	12
185	Mechanical motors	12
186	Store service	12
187	Elevators	12
188	Fluid-pressure railway-brakes	18

SUB-CLASSES.

CLASS 180.—ACCOUTERMENTS AND BAGGAGE. (XXII.)

Sub-classes.

1. Accouterments.
2. Awnings.
11. Bayonets, scabbards, and sword-belts.
12. Camp and lunch kits.
13. Canteens and flasks.
3. Cartridge boxes and belts.
14. Hat and fur cases.
15. Knapsacks and haversacks.
4. Mail-bags.
16. Musicians' cases.
5. Package-holders.
6. Portfolios and pocket-books.
8. Tents.
9. Traveling-bags.
10. Trunks—
17. Convertible.

CLASS 181.—ACOUSTICS. (XXIII.)

Sub-classes.

1. Audiphones.
2. Ear-trumpets.
3. Mechanical telephones.
5. Miscellaneous.
4. Phonographs.

CLASS 40.—ADVERTISING. (XXII.)

Sub-classes.

1. Articles.
2. Automatic devices.
3. Card-racks.
19. Counters and shelves.
4. Desks and frames.
5. Door and drawer plates.
6. Dummies and hangers.
8. Indicators—
18. Time.
9. Labels.
10. Label-holders.
17. Map-holders.
11. Picture-exhibitors.
12. Show boxes and cards.
13. Show-cases.
16. Show stands and racks.
14. Signs.

CLASS 1.—AERATION AND BOTTLING. (IX.)

Sub-classes.

12. Beer apparatus.
3. Capping-machines.
5. Corking and filling.
14. Dispensing-fountains.
7. Gas-generators.
11. Sirup-fountains.
9. Soda-fountains.
10. Soda-water apparatus.

CLASS 123.—AIR AND GAS ENGINES. (XVIII.)

Sub-classes.

5. Attachments.
Engines—
1. Air,
2. Caloric,
Engines—
3. Explosive,
4. Gas.

CLASS 2.—APPAREL. (XXIV.)

Sub-classes.

34. Armpit-shields.
30. Bonnets.
1. Capes and shawls.
2. Coats and vests.
3. Collars and cuffs.
35. Combination garments.
4. Cutting.
36. Darning-lasts.
5. Diapers.
6. Embroidery-patterns.
37. Garment-protectors.
8. Garters and belts.
9. Gloves.
10. Handkerchiefs.
31. Hats and caps.
32. Hat-sweats.
33. Hat-ventilators.
38. Muffs and mufflers.
11. Neckties.
28. Needles.
39. Needle-threaders.
40. Nether garments.
13. Pin and needle cases.
14. Pinking.
16. Plaiting.
15. Pockets.
18. Sewing.
41. Shirts.
20. Skirt-elevators.
42. Skirts.
23. Stockings.
22. Stretchers and formers.
43. Supplemental bosoms.
25. Tailoring.
29. Thimbles.
44. Thread holders and cutters.
26. Trimmings.
27. Work-boxes.
45. Work-holders.

CLASS 86.—ARMS AND PROJECTILES. MAKING (XIII.)

Sub-classes.

1. Arms.
2. Bullets and shot.
3. Cannon and ball.
4. Cartridges and caps.
5. Gun-barrels.
7. Rifling.

CLASS 166.—ARTESIAN AND OIL WELLS. (XV.)

Sub-classes.

1. Casing-heads.
2. Cleaning.
3. Drilling and boring.
4. Drill-jars.
5. Drill-rod grabs.
6. Reamers.
10. Sucker-rods.
7. Tube-clamps.
8. Tubing and packing.
9. Walking-beams.

CLASS 3.—ARTIFICIAL LIMBS. (XX.)

Sub-classes.

1. Arms and hands.
4. Crutches.
2. Fracture apparatus.
3. Legs.

CLASS 106.—ARTIFICIAL STONE, LIME, AND CEMENT. (XV.)

Sub-classes.

1. Composition.
3. Limekilns.
4. Molds.
5. Plastering.
6. Processes.

CLASS 4.—BATHS AND CLOSETS. (IX.)

Sub-classes.

1. Basins and stands.
2. Bathing apparatus.
19. Bed-pans.
5. Closet-cisterns.
20. Dry closets.
11. Sinks and traps.
12. Urinals.
13. Vapor-baths.
Water-closets—
16. Plunger,
22. Siphon,
17. Valved.
18. Water-closet attachments.
15. Water-closet valves.
21. Water-closet and sewer ventilation.

CLASS 5.—BEDS. (VIII.)

Sub-classes.

Beds—
1. Air,
5. Camp.
Bed-bottoms—
23. Folding,
24. of cords,
25. of slats,
26. of slats and springs,
29. of springs,
19. of wire and other fabrics.
3. Bed-clothing.
4. Bedsteads—
8. Extension,
9. Folding,
12. Invalid,
Bedsteads—
16. Sofa,
17. Table,
18. Wardrobe.
22. Clothes-clamps.
6. Cording and fastenings.
7. Crib attachments.
20. Cribs and cradles.
10. Hammocks.
11. Head-sections.
13. Mattresses.
14. Mosquito-nets and canopies.
15. Pillows.
21. Springs.

CLASS 6.—BEE-CULTURE. (II.)

Sub-classes.

1. Bee-hives.
2. Hive appliances.

CLASS 8.—BLEACHING AND DYEING. (VI.)

Sub-classes.

16. Apron vats and stretchers.
2. Bleaching.
1. Carbon dyes.
5. Dyeing processes.
6. Dyes.
13. Mordants.
17. Perforated rolls and spray-jets.
7. Press-dyeing.
8. Renovating dress.
18. Vats. Close
19. Vats. Open
15. Steam and bleach chests.
12. Wool-cleaning.

CLASS 9.—BOATS. (XXII.)

Sub-classes.

1. Boat hooks and fenders.
2. Building.
3. Buoys and safes.
4. Detaching, hoisting, and lowering.
5. Life boats and rafts.
6. Life-preservers.
7. Oars and oar-locks.
8. Rafting and booming.
9. Sectional and folding.
10. Swimming appliances.

CLASS 11.—BOOK-BINDING. (V.)

Sub-classes.

1. Albums.
2. Binding-machines.
3. Books and covers.
4. Book-cover protectors.
5. Book-cutting.
6. Book-stapling.
7. Indexing.
9. Newspaper-files.
8. Ruling-machines.
10. Temporary binders.
11. Writing-tablets.

CLASS 12.—BOOTS AND SHOES. (XI.)

Sub-classes.

2. Boot-jacks.
30. Boot-treeing machines.
3. Boot-trees.
4. Burnishing.
24. Channeling-machines.
5. Crimping.
6. Edge-planes and shaves.
28. Glove and corset fastenings.
32. Hand nailing implements.
34. Heel-machines.
33. Heel-nailing machines.
29. Heel-stiffener machines.
7. Heels.
8. Ice-creepers.
9. Lasts.
10. Lasting-machines.
25. Lasting and lasting tools.
31. Peg-floats.
11. Pegs.
12. Pegging-jacks.
13. Pegging-machines. Nails and pegs—
35. Wire.
14. Rubber.
15. Shanks and machines.
16. Shoe-fastenings.
17. Soles.
18. Sole and heel trimming machines.
19. Sole-machines.
26. Sole and heel plates.
20. Tips and stiffeners.
21. Tools.
22. Uppers.
23. Upper-machines.

CLASS 13.—BRAKES AND GINS. (XXI.)

Sub-classes.

10. Delinting cotton-seed.
1. Gin attachments.
2. Hackling-machines.
3. Hair-pickers.
4. Oakum-machines.
5. Processes.
6. Reciprocating brakes.
7. Roller-gins.
8. Rotary brakes.
9. Saw-gins.

CLASS 107.—BREAD, CRACKER, AND LOZENGE MAKING. (VIII.)

Sub-classes.

1. Breadandcracker machines.
3. Cake-cutters.
6. Lozenge-machines.
4. Mixers and kneaders.
2. Pastry-boards.
7. Pie crimpers and trimmers.
8. Rolling-pins.

CLASS 7.—BREWING AND FERMENTING. (III.)

Sub-classes.

9. Fermented beverages.
1. Fermenting-vats.
8. Hop-backs.
3. Malting.
4. Mashing.
5. Mash-heaters.
6. Preserving beer and wine.
7. Purifying beer and wine.
10. Wine.

Sub-Classes in Brewing and Fermenting, with Explanatory Notes.

9. FERMENTED BEVERAGES. Includes all fermented beverages except beer or wine.

1. FERMENTING-VATS. Processes of and apparatus for fermenting; also, for the preparation of yeast.

8. HOP-BACKS. Devices for straining hops from beer.

3. MALTING. Processes of and apparatus for the germination of grain for the production of malt.

4. MASHING. Processes of and apparatus for the production of wort.

5. MASH-HEATERS. Apparatus for boiling the wort.

6. PRESERVING BEER AND WINE. Processes of and apparatus for imparting "keeping" properties to beer and wine.

7. PURIFYING BEER AND WINE. Clarifying beer and wine and analogous processes.

10. WINE. Processes of and apparatus for preparing wine.

CLASS 14.—BRIDGES. (IV.)

Sub-classes.

Bridges—
7. Arch,
1. Draw,
9. Gates,
6. Floating,
5. Suspension,
Bridges—
6. Truss.
2. Ferry-guards.
3. Girders and columns.
4. Piers.
10. Towers.

CLASS 15.—BRUSHING AND SCRUBBING. (XXVII.)

Sub-classes.

1. Blacking box and brush cases.
18. Blacking-box holders.
61. Boot-blacking machines.
2. Boot-cleaners.
4. Broom-machines.
Brooms—
19. Broom-heads,
20. Household,
21. Stable and yard,
22. Whisk.
23. Brush and broom bridles—
24. Handles,
6. Supports.
25. Brush-cleaners.
Brush heads and faces—
26. Bath and flesh brushes,
27. Brush and broom fiber,
28. Dusting-brushes,
29. Hair-brushes,
30. Hat and clothes brushes,
31. Horse-brushes,
32. Metal-cleaning brushes,
33. Metallic tuft-fasteners,
34. Molds and molded backs,
35. Nail-brushes,
36. Paint and whitewash brushes,
37. Rotary brushes,
13. Scrubbers,
38. Shaving-brushes,
39. Tooth-brushes.
7. Brush-machines.
40. Brush-trimming machines.
8. Carpet-cleaners.
60. Carpet-sweepers.
Chimney-cleaners—
41. Flue and stove-pipe,
42. Lamp.
43. Combined mop heads and wringers.
44. Combined scrubbers and mops.
45. Dressing and assorting machines.
Fountain-brushes—
46. Blacking,
47. Broom,
48. Hair,
49. Paint,
51. Scrubbers,
50. Shaving,
52. Tooth,
53. Window-cleaners.
Holders—
54. Brush-head,
55. Convertible mop and brush.
56. Mop-heads.
57. Mops.
12. Mop-wringers.
14. Scrubbing-machines.
15. Pails.
58. Shoe-blacking stands.
16. Shoe-brushes.
17. Street-sweepers.
59. Window-cleaners.

CLASS 16.—BUILDERS' HARDWARE. (XX.)

Sub-classes.

1. Blind-stops.
2. Bolts.
3. Carpet-fasteners.
4. Casters—
45. Ball,
21. Sewing-machine.
6. Door-checks—
46. Door checks and closers, Pneumatic.
47. Door-closers, Gravitating—
7. Hangers,
8. Securers,
9. Springs.
10. Handles.
11. Hinges—
48. Awning-blind,
5. Coach,
49. Gate,
12. Lock,
Hinges—
14. Safe,
25. Spring,
27. Table.
50. Nail-heads. Ornamental
15. Sash balances—
18. Fasteners,
19. Holders,
20. Weights.
16. Sash-cord fasteners—
17. Guides.
22. Shutter bowers—
23. Fasteners,
24. Workers.
26. Stair-rods and securers.
37. Till-alarms.
28. Transom-lifters.
29. Window-bead fasteners.
30. Window and door buttons.

CLASS 17.—BUTCHERING. (II.)

Sub-classes.

8. Butchers' stalls.
9. Chopping-blocks.
Dressing—
10. Fish-dressing machines,
11. Hog-scraping machines,
12. Intestine-cleaners,
13. Skinning.
14. Meat-clamps.
15. Hooks.
Meat-cutters—
16. Cracklings,
17. Crank mechanism,
18. Cube,
19. Cylinder and block,
20. Cylinder and concave,
Meat-cutters—
21. Double-cylinder,
22. Hand,
23. Rocking-knife,
24. Slicers,
25. Trip mechanism.
26. Meat-mixers.
Meat-tenderers—
27. Hand,
28. Pivoted-head,
29. Rotary.
6. Sausage-machines.
7. Scalding and singeing.
30. Slaughtering, elevating, and suspending.

CLASS 18.—CAOUTCHOUC AND MINOR PLASTICS. (XV.)

Sub-classes.

2. Articles.
1. Artificial ivory.
3. Celluloid.
4. Fabrics.
5. Hard rubber.
11. Insulating materials.
6. Machines for coating.
7. Miscellaneous compositions.
8. Soft rubber.
9. Vulcanizing apparatus.
10. Vulcanized fiber.

CLASS 19.—CARDING. (XXI.)

Sub-classes.

1. Burring.
2. Card-clothing.
3. Carding.
5. Coilers.
6. Combing.
12. Covering yarn.
7. Feeding-cards.
13. Fleece dividers and condensers.
14. Fleece-removers.
8. Lapping.
9. Pickers.
15. Stripping mechanism.
10. Wadding.
11. Wool oiling.

CLASS 110.—CARE OF LIVE STOCK. (II.)

Sub-classes.

Animal-stocks—
14. Hog-traps,
15. Horse and cattle,
16. Sheep.
46. Bird cages and houses.
17. Catching and holding tools.
48. Curry-combs.
47. Gags and muzzles.
18. Gangways.
3. Grooming.
49. Hitching-posts and ties.
51. Hopples.
4. Incubators.
52. Manure-pouches.
13. Nose-rings and ringing-tools.
12. Pokes.
5. Poultry-culture.
19. Sheep-protectors.
9. Stanchions.
Steading and feeding—
20. Calf-feeders,
21. Combined troughs and racks,
22. Feed-racks,
23. Feed-troughs,
52. Nose-bags,
24. Releasing devices,
25. Stall-floors,
Steading and feeding—
26. Stalls, sheds, and pens.
53. Stock-cars.
27. Stock-sorters.
Straw-cutters—
Cutter and bed—
28. Reciprocating-knife,
29. Rotary-cylinder.
30. Cylinder and concave.
31. Double-cylinder.
Pivoted-knife—
32. Rake-feed,
33. Roller-feed,
34. Without feed.
Rotary wheel—
35. Follower-feed,
36. Rake-feed,
37. Roller-feed,
38. Without feed.
Single-cylinder—
39. Rake-feed,
40. Roller-feed,
41. Without feed.
Sliding-knife—
42. Rake-feed,
43. Roller-feed,
44. Without feed.
50. Tethers.

CLASS 20.—CARPENTRY. (XXIX.)

Sub-classes.

34. Compound lumber.
2. Doors—
23. Car,
24. Sliding.
3. Door-operating device.
32. Drip-troughs.
4. Floors.
5. Frame houses.
7. Interiors.
9. Lathing—
42. Metallic.
10. Marquetry.
39. Mats—
43. Wire.
26. Moldings.
11. Portable houses.
12. Scaffolds—
28. Bracket.
13. Shingling-brackets.
14. Shutters—
29. Flexible,
30. Fire-proof,
Shutters—
44. Sliding,
45. Swinging.
15. Skylights.
16. Slatted floor-coverings.
33. Splices and joints.
17. Stairs.
18. Stair-covers.
31. Thresholds.
19. Weather-strips—
35. Hinged,
37. Sills,
38. Packing,
36. Sliding.
Window—
46. Chairs,
40. Guards,
47. Sashes—
48. Sliding,
50. Sliding and swinging,
49. Swinging.
20. Windows.

CLASS 21.—CARRIAGES AND WAGONS. (X.)

Sub-classes.

1. Ambulances.
2. Axle-boxes.
3. Axle-lubricators.
4. Axle-skeins.
5. Axles.
7. Bodies.
8. Brakes.
9. Brakes, Automatic
10. Brake-levers.
11. Carriage-irons.
12. Children's carriages.
13. Clips.
14. Close carriages.
15. Dash-boards.
16. Detaching horses.
17. Decrs.
18. Draft-equalizers.
19. Drays.
20. Dumping-wagons.
21. End-gates.
22. Felloes.
23. Fenders.
24. Fifth-wheels.
26. Hearses.
27. Holdbacks.
28. Hose-carriages.
29. Hounds.
30. Hub-attaching devices.
31. Hubs.
32. King-bolts.
33. Lumber-wagons.
36. Poles and shafts.
38. Road-engines.
39. Running-gear.
40. Sand-bands.
41. Seat-locks.
42. Seats—
43. Shifting,
44. Spring.
45. Shifting-rails.
75. Skates—
76. Roller,
77. Wheel.
74. Skaters' appliances.
46. Sled-brakes.
47. Sled-propellers.
48. Sleds.
49. Spoke-sockets.
50. Springs—
51. Platform,
52. Side,
53. Torsion.
54. Standards.
55. Steps.
56. Sulkies.
57. Thill-couplings.
58. Tires.
59. Tire-tighteners.
63. Tongue-supports.
60. Top-joints.
61. Top-props.
62. Tops.
64. Traction-wheels.
65. Trucks.
67. Velocipedes.
68. Wheelbarrows.
69. Wheels.
70. Whiffletree-hooks.
71. Whiffletrees.
73. Windows.

CLASS 59.—CHAINS, STAPLES, AND HORSESHOES. (XIII.

Sub-classes.

1. Chains.
2. Chain and link making.
4. Horseshoe-bars. Making
5. Horseshoe-calks. Making
6. Horseshoe-machines.
7. Staples.
8. Staples. Making

CLASS 155.—CHAIRS. (VIII.)

Sub-classes.

3. Chairs—
26. Attachments,
27. Adjustable backs,
28. Adjustable backs and seats,
29. Backs and seats independently adjustable,
4. Bottoms,
6. Convertible,
7. Dentists',
8. Folding,
30. Folding adjustable,
11. Invalid,
12. Nursery,
13. Opera,
16. Reclining,
18. Rocking—
31. Platform,
Chairs—
21. Step-ladder,
23. Surgical,
24. Tilting.
Rests—
9. Foot,
10. Head.
Seats—
2. Car,
5. Circus,
25. Spring.
19. Settees.
20. Sofas.
22. Stools and seats.
32. Stools. Folding

CLASS 23.—CHEMICALS. (VI.)

Sub-classes.

1. Acids. Mineral
21. Ammonia.
3. Apparatus.
24. Carbon compounds, not dyes, containing chiefly vinegar, salicylic acid, and other organic acids.
23. Distilling wood.
27. Electrolysis, containing only those cases in which the subject-matter is, producing chemical compounds by electricity.
5. Fire-extinguishing compounds.
10. Metalloids, embracing non-illuminating gases, sulphur, and phosphorus.
11. Packing chemicals.
26. Purifying water.
13. Salines.
22. Soda and potash.

CLASS 24.—CLASPS AND BUCKLES. (XI.)

Sub-classes.

26. Baggage-checks.
28. Buckles and snap-hooks combined.
1. Buckles—
27. Personal wear.
2. Buttons—
23. Hinged shoe,
21. Separable.
3. Buttoners.
4. Button-fasteners.
5. Button-machines.
29. Button-setting tools.
6. Clasps.
24. Cuff-holders.
7. Eyelets.
8. Eyeleting-machines.
25. Garment-supporters.
9. Hooks.
10. Hooks and eyes.
11. Necktie-fasteners.
13. Paper-fasteners.
14. Punches.
15. Rings.
16. Safety attachments.
17. Snap-hooks.
20. Suspenders.
18. Tags and tag-fasteners.
19. Ticket-clasps.

CLASS 25.—CLAY AND POTTERY. (XV.)

Sub-classes.

1. Bricks.
2. Brick-kilns.
Brick-machines—
4. Reciprocating,
3. Rotary,
5. Screw.
6. Brick-molds.
8. Drain-tiles.
9. Paving-tiles.
10. Pottery articles.
11. Pottery-kilns.
12. Pottery-machines.
13. Pug-mills, clay-mills, and mortar-mixers.
14. Pulverizers.
16. Sarcophagi.
17. Tile-machines.

CLASS 26.—CLOTH-FINISHING. (XXI.)

Sub-classes.

1. Drying.
2. Finishing.
3. Folding.
4. Napping.
5. Pressing.
6. Shearing.
7. Sponging.
8. Stretching.

CLASS 96.—COATING WITH METAL. (III.)

Sub-classes.

1. Electro-deposition.
2. Galvanizing.
9. Iron oxides.
5. Nickel-plating.
8. Precipitating.
7. Tinning.

Sub-Classes in Coating with Metal, with Explanatory Notes.

1. ELECTRO-DEPOSITION. Processes of and apparatus for coating with metals (other than nickel) by electro-deposition.

2. GALVANIZING. Processes of and apparatus for coating metals with molten zinc, copper, &c.

9. IRON OXIDES. Processes of and apparatus for oxidizing iron surfaces.

5. NICKEL-PLATING. Processes of and apparatus for electroplating with nickel.

8. PRECIPITATING. Processes of and apparatus for coating with metal by chemical processes, (not included in other subclasses,) including production of coating of sulphides, &c.

7. TINNING. Processes of and apparatus for coating metals with molten tin, terne, lead, &c.

CLASS 154.—COMPOSITE ROOFING. (XV.)

Sub-classes.

1. Apparatus.
2. Composite.
3. Felt.

CLASS 147.—COOPERING. (XXIX.)

Sub-classes.

1. Barrel-head making.
2. Barrel-hoop machines.
3. Barrel-making machines.
4. Basket-making machines.
5. Box-machines.
11. Coiling.
12. Crozing barrels.
6. Crozing staves.
13. Hoop-drivers.
8. Jointing staves.
10. Wooden articles.

Sub-Classes in Coopering, with Explanatory Notes.

1. BARREL-HEAD MAKING. The wood is held in a clamp and cut to disk form, usually with beveled edges, by a saw or cutter. The clamp revolves or cutter moves around it.

2. BARREL-HOOP MACHINES. For dressing or cutting wooden hoops by saws, or by rotary or reciprocating cutters, including mechanism for forming the taper or bevel of hoops.

3. BARREL-MAKING MACHINES. For assembling the barrel.
4. BASKET-MAKING MACHINES. For building up splints about a former.
5. BOX-MACHINES. For making pill-boxes, &c., by forming the box upon the stock by means of cutters, and then severing the box from the block.
11. COILING. Coiling hoops or veneers, usually about a collapsible former.
12. CROZING BARRELS. Machines for cutting the croze after the barrel is set up.
6. CROZING STAVES. Machines for cutting the croze in staves or blanks.
13. HOOP-DRIVERS. Machines for trussing and evening barrels.
8. JOINTING STAVES. Machines for producing the bevel on bulged staves.
10. WOODEN ARTICLES. Miscellaneous small articles of wood.

CLASS 28.—CORDAGE. (XXI.)

Sub-classes.

1. Balling.
2. Banding.
3. Bobbin-supporters.
4. Braiding.
5. Cords and ropes.
21. Cord and rope machines.
6. Covering cord.
7. Finishing yarn and thread.
8. Fuse.
9. Packaging braid and yarn.
10. Reels.
11. Separating rope.
12. Spools.
13. Tassels.
14. Warping.
Winding bobbins—
15. Warp-wind,
16. Weft-wind,
17. Sewing-machine shuttle.
22. Winding-heddle and seine-needles.
18. Winding-spools.
19. Winding tatting-shuttles.
20. Yarn guides and clearers.

CLASS 29.—CRINOLINE AND CORSETS. (XXIV.)

Sub-classes.

1. Bustles.
3. Corsets.
4. Hoops and clasps.
5. Hoop-skirts.
6. Pads.
7. Skirt-machines.
9. Stays.
8. Underwaists.

CLASS 156.—CURTAINS, SHADES, AND SCREENS. (VIII.)

Sub-classes.

1. Carriage-curtain fastenings.
2. Curtain-cord holders.
11. Curtain-cord tighteners.
3. Curtain-fixtures.
4. Curtain rollers and brackets.
5. Curtain-tassels.
6. Friction-rollers.
7. Inside blinds.
8. Ratchet and pawl.
9. Spring-rollers.
13. Window-cornices.
14. Window-screens.
10. Window-shades.

CLASS 30.—CUTLERY. (XX.)

Sub-classes.

1. Animal-shears.
2. Button-hole cutters.
3. Can-openers.
16. Envelope-openers.
21. Fork-guards,
5. Forks,
22. Forks and spoons. Solid
9. Knives—
20. Gage,
Knives—
8. Hay,
10. Pocket.
11. Pruning implements.
12. Razors.
13. Scissors and shears.
14. Twine-cutters.
15. Wick-trimmers.
17. Wire-shears.

CLASS 31.—DAIRY. (II.)

Sub-classes.

Butter and cheese—
24. Cutters,
23. Manufacture of
25. Butter workers and molds.
30. Centrifugal creamers.
21. Cheese-hoops.
26. Cheese-turners.
22. Cheese-vats and curd-breakers.
7. Churns—
9. Double-acting,
Reciprocating.
Crank mechanism—
29. Multiple-dasher,
30. Single-dasher,
31. Combined lever and crank mechanism,
32. Foot mechanism,
33. Hand and foot mechanism.
Lever mechanism—
34. Multiple-dasher,
35. Single-dasher,
36. Rocking-seat mechanism,
37. Without operating mechanism.
Rotary—
38. Diagonal-dasher,
39. Horizontal single-dasher,
Horizontal double-dasher—
40. Concentric shafts,
41. Parallel shafts.
Churns—
Rotary—
42. Vertical single-dasher.
Vertical double-dasher—
43. Concentric shafts,
44. Parallel shafts.
17. Vibrating,
18. Working body.
8. Cow-milkers.
27. Cream-pumps.
63. Drink-mixers.
57. Egg-beaters—
61. Reciprocating,
59. Rotary multiple-dasher,
58. Single-dasher.
60. Vibrating.
Milk-coolers—
45. Aerating.
46. Creaming-cans—
47. Agitators,
48. Depending-tube,
49. Floats,
50. Vacuum creamers,
51. Vertical-tube.
52. Milk-circulation.
53. Vats—
54. Air-circulation,
55. Horizontal-tube,
56. Removable-pipe.
13. Milk-stools.
14. Pails and strainers.
28. Tables and racks.

CLASS 32.—DENTISTRY. (XX.)

Sub-classes.

1. Articulators.
2. Drills.
3. Foil-condensers.
4. Mechanical.
5. Miscellaneous.
6. Molds.
7. Operative.
8. Pluggers.
9. Teeth.
10. Tools.

CLASS 165.—DESIGNS. (XXIV.)

The sub-classes conform as nearly as possible to those of the mechanical classes.

CLASS 124.—DISTILLATION. (III.)

Sub-classes.

1. Aging liquors.
2. Alcohol.
3. Burning-fluid.
4. Condensers.
7. Fresh water.
8. Oil.
9. Paraffine.
10. Preparing grain.
11. Refining oils.
13. Revenue-guards.
12. Turpentine.

Sub-Classes in Distillation, with Explanatory Notes.

1. AGING LIQUORS.—Processes of and apparatus for purifying and aging liquors by chemical agents, electricity, &c.
2. ALCOHOL. Processes of and apparatus for obtaining alcohols by distillation.
3. BURNING-FLUID. Liquids to be employed for burning in lamps, and processes of preparing the same, not involving distillation or the refining processes.
4. CONDENSERS. Processes of and apparatus for condensing vapors arising from liquids undergoing distillation.
7. FRESH WATER. Processes of and apparatus for distilling water for domestic purposes. (See Class 121, Condensers, Division XVIII.)
8. OIL. Processes of and apparatus for the distillation of mineral oils.
9. PARAFFINE. Processes of and apparatus for the preparation and purification of paraffine, ozokerite, &c.
10. PREPARING GRAIN. Processes of and apparatus for reducing grain to a moist disintegrated mass for immediate use in the mash-tub. Does not include articles primarily suitable for food, nor preparing the same, Class 99, Preserving, Division VI; nor cleaning and degerminating grain, Class 83, Mills, Division XXV.
11. REFINING OILS. Refining mineral oils.
13. REVENUE-GUARDS. Devices for testing liquor, especially adapted for use during the distillation process.
12. TURPENTINE. Preparation and refining of turpentine and rosin.

CLASS 33.—DRAFTING. (XXIII.)

Sub-classes.

13. Beam-compasses.
1. Calipers and dividers.
2. Curve-scribers.
5. Ellipsographs.
6. Pantographs.
7. Parallel-rulers.
8. Plotters.
12. Protractors—
9. Scribers,
10. Stair-curvers.

CLASS 34.—DRIERS. (XXVIII.)

Sub-classes.

13. Coffee-roasters.
1. Driers—
3. Fruit,
12. Glue,
4. Grain,
5. Lumber,
6 Malt,
7. Meal,
Driers—
8. Paper,
10. Tobacco,
11. Wool.
2. Feather-renovators,
14. Gravel-heaters.
9. Smoke-houses.

CLASS 35.—EDUCATIONAL APPLIANCES. (XXIII.)

Sub classes.

1. Alphabet-blocks.
2 Arithmetic.
3. Astronomy.
15. Blackboards.
4. Geography.
5. Globes.
13. Kryptography.
6. Maps.
12. Miscellaneous.
8. Penmanship.
9. Reading.
10. Slates.
14. Slate-mufflers.

CLASS 171.—ELECTRICITY. GENERATION. (XXVI.)

Sub-classes.

Batteries—
6. Galvanic,
72. Secondary,
74. Applications,
73. Thermal.
23. Friction-generators.
95. Galvanometers.
27. Induction-coils.
33. Magneto-electric—
118. Couplings.
76. Hand-machines.
34. Meters.
40. Regulators—
119. Alternating.
97. Systems of distribution.

Sub-Classes in Electricity—Generation—with Explanatory Notes.

6. BATTERIES. GALVANIC. Chemical generators of electricity.
72. BATTERIES. SECONDARY. Appliances for translating electricity into chemical energy and retranslating the same into electricity.
74. BATTERIES. SECONDARY. APPLICATIONS. Devices and systems which involve the use of secondary batteries.
73. BATTERIES. THERMAL. Appliances for translating heat directly into electricity.
23. FRICTION-GENERATORS. Generators of static electricity.
95. GALVANOMETERS. Devices for indicating the strength, tension, or direction of electric currents.
27. INDUCTION-COILS. Coiled conductors for producing and applying the higher order of currents from varying or intermittent primary currents.
33. MAGNETO-ELECTRIC. Including dynamic generators of electricity for producing currents by magneto-electric induction.
118. MAGNETO-ELECTRIC. COUPLINGS. Including combinations of generators with other generators and driving devices.
76. MAGNETO-ELECTRIC. HAND-MACHINES. Including machines for signaling, blasting, and medical purposes.
34. METERS. Devices for measuring and registering the flow of electric currents.
40. REGULATORS. Devices for controlling and governing electric generators and motors.
119. REGULATORS. ALTERNATING. Including devices for regulating alternating generators and motors.
97. SYSTEMS OF DISTRIBUTION. Organized systems for distributing electricity, including apparatus at a central station and circuits controlled therefrom.

CLASS 172.—ELECTRICITY. MOTIVE-POWER. (XXVI.)

Sub-classes.

9. Car-brakes.
15. Dental instruments.
75. Locomotion.
36. Motors—
120. Alternating.
8. Steering and propulsion.
83. Transmission of power.

Sub-Classes in Electricity—Motive-Power—with Explanatory Notes.

9. CAR-BRAKES. Devices for retarding the movement of vehicles.
15. DENTAL INSTRUMENTS. Includes teeth-extractors, drillers, and pluggers.
75. LOCOMOTION. Machines and devices adapted to the propulsion of vehicles by electricity.
36. MOTORS. Including machines for translating electricity into mechanical power.
120. MOTORS. ALTERNATING. Including electric motors operated by alternating currents.
8. STEERING AND PROPULSION. Devices for controlling and directing torpedo and other boats from a distant point.
83. TRANSMISSION OF POWER. Systems and apparatus for transmitting power to distant points by electricity.

CLASS 173.—ELECTRICITY. CONDUCTORS. (XXV.)

Sub-classes.

13. Conductors—
94. Lead-covered,
70. Underground,
14. Connectors.
28. Insulators.
31. Lightning-rods.
43. Rheostats.

Sub-Classes in Electricity—Conductors—with Explanatory Notes.

13. CONDUCTORS. Including cables, wires, and means for making and insulating the same.
94. CONDUCTORS. LEAD-COVERED. Lead-incased conductors, including machines for their manufacture.
70. CONDUCTORS. UNDERGROUND. Conduits and conductors for subterranean lines.
14. CONNECTORS. Including binding-posts, line-connectors, &c.
28. INSULATORS. Insulating bearing-points for line-wires.
31. LIGHTNING-RODS. Devices for protecting structures from lightning.
43. RHEOSTATS. Devices for producing artificial resistance.

CLASS 174.—ELECTRICITY. MEDICAL AND SURGICAL. (XXVI.)

Sub-classes.

87. Baths.
88. Body-wear.
89. Electrodes.

Sub-Classes in Electricity—Medical and Surgical—with Explanatory Notes.

87. BATHS. Applications of electricity to baths and bath-furniture for curative purposes.
88. BODY-WEAR. Galvanic devices to be applied to the body for curative purposes.
89. ELECTRODES. Circuit terminals for applying electricity to the body.

CLASS 175.—ELECTRICITY. SPECIAL APPLICATIONS. (XXVI.)

Sub-classes.

Applications—
4. General,
5. Tools and machines.
21. Electro-magnets—
96. Machines for winding.
16. Heaters.
Igniting devices—
115. Automatic,
Igniting devices—
117. Inductional,
116. Manual,
91. Portable.
25. Incrustation.
93. Magnetic locks and bolts.
90. Separators.
84. Valve-controllers.

Sub-Classes in Electricity—Special Applications—with Explanatory Notes.

4. APPLICATIONS. GENERAL. Includes applications of electricity not otherwise classified.
5. APPLICATIONS. TOOLS AND MACHINES. Includes application of electricity to machinery and mechanical implements.
21. ELECTRO-MAGNETS. Special constructions and arrangements of electro-magnets and their armatures.
96. ELECTRO MAGNETS. MACHINES FOR WINDING. Machines for winding insulated wire for electro-magnets and armatures.
16. HEATERS. Devices for heating or warming by the use of the electric current.
115. IGNITING DEVICES. AUTOMATIC. Including devices for opening the cock and producing the spark by automatic means.
117. IGNITING DEVICES. INDUCTIONAL. Including inductional devices for producing the spark.
116. IGNITING DEVICES. MANUAL. Including devices for opening the cock and producing the spark by hand.
91. IGNITING DEVICES. PORTABLE. Embracing detached devices for lighting gas and lamps adapted to be carried from place to place.
25. INCRUSTATION. Means for preventing injurious deposition in steam-boilers.
93. MAGNETIC LOCKS AND BOLTS. Application of electricity and magnetism to locks and bolts.
90. SEPARATORS. Electric and magnetic separators of heterogeneous matter.
84. VALVE-CONTROLLERS. Electrical devices for regulating and controlling valve movements.

CLASS 176.—ELECTRIC LIGHTING. (XVI.)

Sub-classes.

Cut-outs—
80. Electro-magnetic,
79. Mechanical,
78. Thermal.
Lights—
Arc—
104. Gravity-feed,
105. Clutch,
106. Gear-clutch,
107. Positive-feed,
108. Clutch,
Lights—
Arc—
109. Gear-clutch,
110. Arc and incandescent—
111. Non-feeding,
112. Special features,
102. Filaments and carbon,
18. Incandescent,
113. Special features,
98. Sockets and keys,
19. Systems.

CLASS 177.—ELECTRIC SIGNALING. (XVI.)

Sub-classes.

1. Alarms—
2. Burglar.
3. Annunciators.
7. Bells.
26. Indicators.
38. Railway-signals.
39. Recorders.

CLASS 187.—ELEVATORS. (XII.)

Sub-classes.

2. Controllers.
3. Dumb-waiters.
1. Elevators.
4. Hatchways.
5. Hod.
6. Indicators.
7. Lazy-tongs.
8. Safety devices.
9. Screw.

CLASS 37.—EXCAVATING. (IV.)

Sub-classes.

11. Diggers.
1. Dredgers—
18. Anchoring,
14. Clam-shell,
13. Scouring.
2. Earth-augers.
Excavators—
15. Carrier,
16. Dipper,
Excavators—
9. Hydraulic,
10. Rammers,
17. Wheel.
5. Scrapers—
7. Wheeled.
6. Self-loading carts.
8. Warping lands.

CLASS 52.—EXPLOSIVES. (VI.)

Sub-classes.

1. Blasting compounds.
2. Fulminates.
4. Gunpowder.
5. Matches.
3. Nitro compounds.

CLASS 168.—FARRIERY. (XXVIII.)

Sub-classes.

1. Calk-sharpeners.
2. Hoof and shoe spreaders.
3. Hoof cleaners and trimmers.
5. Hoof-pads.
6. Shoes.
7. Shoe-nail clinchers.
8. Shoeing-stands.
9. Toe-weights.

CLASS 38.—FELTING AND HAT-MAKING. (XV.)

Sub-classes.

1. Blocks.
2. Blocking and stretching.
4. Brushing and finishing.
6. Curling brims.
7. Fabrics.
8. Felting-machines.
9. Flock-cutting.
10. Forming-bats.
11. Fulling.
12. Furs and pelts.
14. Ironing.
15. Pouncing.
16. Pressing.

CLASS 39.—FENCES. (I.)

Sub-classes.

2. Fence-posts.
3. Fences—
1. Barbed,
4. Flood,
6. Iron,
9. Wire.
5. Gates—
15. Compound,
21. Expanding,
24. Dropping,
22. Jump,
23. Oscillating,
11. Railway—
42. Cattle-guard,
38. Electric,
36. Mast—
35. Automatic,
41. Platform-guard,
37. Pneumatic,
39. Rocking,
44. Sliding,
43. Swinging,
40. Vertically-moving,
7. Sliding—
29. Lever-openers,
28. Pulley or rack openers,
30. Suspended,
31. Vibrating tracks,
32. Sliding and swinging—
33. Hinged-roller,
34. Suspending frames,
8. Swinging—
18. Folding-panel,
Gates—
Swinging—
14. Hand-openers,
20. Load-openers,
17. Rotary,
16. Self-closers,
25. Tilting,
19. Vertically-adjustable,
13. Tilting—
26. Folding-panel.
12. Wire fasteners.
45. Wire-stretchers. Permanent—
46. Compensators,
47. Mid-wire take-up,
48. Path-closers,
49. Post-winders,
50. Vertical.
51. Wire-stretchers. Removable—
52. Clutch-bars,
53. Grips,
54. Levers—
55. Attached,
56. Loopers,
57. Rack-bars,
58. Ratchet-bars,
59. Reel-carriers,
60. Tongs,
61. Twin-hooks,
62. Windlasses.

CLASS 71.—FERTILIZERS. (VI.)

Sub-classes.

1. Apparatus.
9. Compositions.
6. Organic.
7. Phosphates.
8. Sewage and night-soil.

CLASS 41.—FINE ARTS. (V.)

Sub-classes.

1. Artists' appliances.
2. Artificial flowers.
19. Badges.
3. Banners and flags.
4. Canvas-stretchers.
5. Decorative painting.
6. Drawing-boards.
7. Easels.
8. Engraving-machines,
9. Engraving and tools.
10. Gilding. Leaf-
12. Medals.
21. Metal ornamentation.
13. Ornamenting cloth.
14. Picture-frames.
20. Picture-supports.
15. Pictures.
16. Sculpture.
17. Theater appliances.
18. Transfers.

CLASS 42.—FIRE-ARMS. (XXII.)

Sub-classes.

25. Ball-traps.
3. Bayonets.
5. Bows and cross-bows.
6. Breech-loaders.
8. Catapults.
26. Electrical appliances.
Guns—
1. Air and spring,
4. Blow,
7. Cane,
13. Magazine.
9. Gun-barrels.
10. Gun-trimmings.
11. Implements.
12. Locks—
28. Recoil-operated.
27. Muzzle-loaders.
15. Nipples and guards.
16. Pistol-swords.
18. Revolvers.
19. Rifling.
20. Sights.
21. Stocks.
22. Targets—
24. Flying.
23. Toy pistols.

CLASS 169.—FIRE-EXTINGUISHERS. (IX.)

Sub-classes.

4. Car-heater.
1. Chemical.
2. Portable.
3. Stationary.

CLASS 159.—FIRE ESCAPES AND LADDERS. (IV.)

Sub-classes.

10. Bed-bottom.
11. Blanket.
1. Chutes.
4. Friction.
5. Hoists—
9. Trolley.
8. Ladders—
Escape-ladders—
15. Fixed,
16. Mounting,
17. Sectional hand,
19. Shooting and truck,
Ladders—
Escape-ladders—
18. Trolley,
3. Flexible,
7. Step.
20. Ladder-trucks.
6. Lazy-tongs.
14. Sliding poles.
Towers—
13. Fixed,
12. Shooting.

CLASS 183.—FIRE-PROOF BUILDINGS. (IV.)

Sub-classes.

1. Ceilings, floors, and partitions. Non-metallic.
2. Columns and timber.
3. Cornices.
4. Fire-proof roofs.
5. Flooding.
6. Floor-arches.
7. Metallic sidings and partitions.

CLASS 43.—FISHING AND TRAPPING. (XXII.)

Sub-classes.

2. Decoys.
Fishing—
3. Fishways,
4. Floats,
6. Harpoons and spears,
7. Hooks,
9. Nets and seines,
10. Oyster-culture,
11. Oyster-dredges,
12. Oyster rakes and tongs,
13. Pisciculture,
15. Reels,
16. Rods,
17. Sinkers.
Insect-destroyers—
1. Catchers,
Insect-destroyers—
5. Fumigators,
8. Moth-exterminators,
14. Powder-dusters.
Traps—
18. Bed-bug,
19. Cage,
20. Fish,
21. Impalement,
22. Insect,
23. Jaw,
24. Self-set and over-set,
25. Sporting,
26. Victim-set,
27. Wire-choker.

CLASS 188.—FLUID-PRESSURE RAILWAY-BRAKES. (XVIII.)

Sub-classes.

1. Automatic.
2. Derailment.
3. Direct.
4. Electric.
5. Momentum-pump.
6. Vacuum.

CLASS 50.—FLUID-PRESSURE REGULATORS. (XVIII.)

Sub-classes.

1. Gas.
2. Steam.
3. Water.

CLASS 44.—FUEL. (VI.)

Sub-classes.

1. Artificial.
2. Fire-kindlers.
3. Peat-machines.
4. Purifying coal.

CLASS 45.—FURNITURE. (VIII.)

Sub-classes.

1. Book-cases.
2. Book-shelves.
3. Book-supports.
4. Brackets.
5. Bureaus.
43. Carpet stretchers and tackers.
45. Closets.
6. Desks.
7. Drawers.
10. Fire-screens.
44. Furniture-covers.
13. Hat and coat racks.
14. Hat-holders.
15. Insect-guards.
16. Kitchen-cabinets.
18. Mirrors—
39. Window.
19. Music stands and portfolios.
20. Nursery-gates.
21. Oil-can holders.
22. Packing furniture.
12. Pads and feet.
23. Picture-hangers.
24. Quilting-frames.
25. School seats and desks.
28. Soap-holders.
41. Spittoons.
42. Spittoon-lifters.
30. Table-leaf supports.
31. Tables—
8. Drawing,
9. Extension,
11. Folding,
17. Kitchen,
26. Self-waiting,
27. Sewing-machine.
32. Towel racks and stands.
33. Umbrella-stands.
34. Upholstering.
35. Wall-pockets.
36. Wall-protectors.
37. Wardrobes.
38. Wash-stands.

CLASS 46.—GAMES AND TOYS. (VIII.)

Sub-classes.

4. Balls and bats.
43. Base-balls.
6. Billiard appliances—
7. Balls,
8. Chalk-cups,
9. Cues,
10. Cue-tip fasteners,
11. Cushions,
12. Tables,
13. Table-levelers.
14. Buzzes and whirligigs.
15. Croquet.
16. Dice-boxes.
20. Game apparatus—
44. Projectile.
22. Hobby-horses.
23. Kites.
42. Lawn-tennis.
24. Masks.
25. Playing-cards.
41. Puzzles and magic.
27. Roundabouts.
30. Skipping-ropes.
31. Soap-bubble pipes.
32. Spinning-tops.
33. Stilts.
34. Swings.
35. Toy building-blocks.
36. Toy money-boxes.
37. Toys—
40. Figure—
45. Wheeled,
46. Sounding—
47. Wheeled,
48. Wheeled.
38. Trundles and hoops.

CLASS 48.—GAS. (III.)

Sub-classes.

1. Anti-combustion.
2. Carburetors—
24. Carbureting-lamps,
29. Float-vaporizers,
25. Gas and air mixers,
3. Jet-mixers,
26. Oil-feed, Float-valves,
27. Oil-feed, Rotary,
28. Revolving.
4. Center-seals and by-pass valves.
9. Dip-pipes.
22. Distribution.
10. Exhausters.
Gas—
5. Coal,
6. Coal and oil,
8. Coal and water,
7. Coal, oil, and water,
12. Hydrogen,
13. Oil,
14. Oil and water,
19. Water,
20. Wood.
11. Holders.
15. Purifiers.
18. Retort-chargers.
23. Retort gas-furnaces.
16. Retort-lids.
17. Retorts and settings.

Sub-Classes in Gas, with Explanatory Notes.

1. ANTI-COMBUSTION. Processes of and apparatus for deoxygenating air and generating gases to be used in extinguishing fires. Does not include Class 169, Fire-Engines, Division IX, Class 23, Fire-Extinguishing Compounds, Division VI.

2. CARBURETORS. Methods of and apparatus for carbureting air and gas for illuminating and heating purposes, including means for regulating the flow of air or gas before entering and upon leaving the carburetor, and of mixing the carbureted air or gas with air, and of regulating the flow of oil to the carburetor, and for heating the latter, and for heating the air or gas to be carbureted.

24. CARBURETORS, CARBURETING-LAMPS. Devices for carbureting air or gas, attached to individual lamps, burners, and chandeliers. Does not include Class 67, Lamps and Gas Fittings, Division XXX.

29. CARBURETORS, FLOAT-VAPORIZERS. Carburetors in which the air or gas to be carbureted is made to pass through or under a float resting on the carbureting-liquid.

25. CARBURETORS, GAS AND AIR MIXERS. Carburetors provided with means for mixing carbureted air or gas with pure air.

3. CARBURETORS, JET-MIXERS. Carburetors provided with means for introducing air or hydrocarbon vapor on the injector principle. Does not include injector-burners, Class 75, Division III; injectors and ejectors, Class 102, Division XVIII.

26. CARBURETORS, OIL-FEED, FLOAT-VALVES. Carburetors in which the supply of hydrocarbon oil is regulated by a float attached to the valve.

27. CARBURETORS, OIL-FEED, ROTARY. Carburetors with means whereby hydrocarbon oil is elevated by buckets moving on an endless chain.

28. CARBURETORS, REVOLVING. The evaporating-surfaces revolve in the carbureting-fluid.

4. CENTER-SEALS AND BY-PASS VALVES. Construction and operation of same in connection with gas works and mains.

9. DIP-PIPES. Modes of connecting the dip-pipes with the hydraulic main, means for sealing the dip and for carrying off the tar deposited in the main.

22. DISTRIBUTION. Systems of conveying and distributing gas, gas-conduits, automatic cut-offs, mains for conveying gas under pressure, means for detecting and collecting leakage from gas-mains, pipe-joints for gas-mains. (See Pipe Couplings and Mains and Pipes, Class 137, Division IX; and Gas-Pressure Regulators, Class 50, Division XVIII.)

10. EXHAUSTERS. Apparatus for exhausting in connection with gas-retorts. (See Steam-Engines, Exhaust Mechanism, Class 121, Division XVIII.)

5. GAS, COAL. Processes of and apparatus for manufacturing gas for heating and illuminating purposes by the destructive distillation of coal in retorts, horizontal or vertical, singly or in series, and the necessary appliances for operating the same; and in connection the purifiers, condensers, &c.

6. GAS, COAL AND OIL. Processes of and apparatus for manufacturing gas for heating and illuminating purposes by mixing the gas produced from distillation of coal with vapors of hydrocarbon oil; and devices for introducing the latter.

8. GAS, COAL AND WATER. Processes of and apparatus for manufacturing gas by mixing the gas produced by distillation of coal with water or water vapor; and special means for introducing the latter.

7. GAS, COAL, OIL, AND WATER. Processes of and apparatus for manufacturing heating and illuminating gas by mixing gas produced from distillation of coal, vapors of hydrocarbon oils, and gases from decomposition of steam; with devices for introducing the various elements in connection with superheaters, fixing-chambers, purifiers, &c.

12. GAS, HYDROGEN. Processes of and apparatus for manufacturing hydrogen gas by decomposing steam by passing it through incandescent fuel, by bringing water in contact with acids and zinc or other decomposing substances, by action of dilute acid on zinc or iron filings, &c.; with necessary means for carbureting and fixing the gas.

13. GAS, OIL. Processes of and apparatus for manufacturing gas from hydrocarbon oils by vaporizing the same in a heated retort, or in contact with a bath of molten metal, or in a tubular generator to contain oil which is vaporized by means of superheated steam in the tubes, &c.; and means for regulating the temperature in the retorts and the feed of the hydrocarbon.

14. GAS, OIL AND WATER. Processes of and apparatus for manufacture of heating and illuminating gas by decomposing steam, vaporizing hydrocarbon oil, and mixing the two to form a fixed gas; with the necessary appliances for operating the apparatus.

19. GAS, WATER. Processes of and apparatus for production of gas from decomposition of steam by passing same through highly-heated carbonaceous fuel; in connection with means for carbureting and fixing the gas.

20. GAS, WOOD. Processes of and apparatus for production of gas from distillation of wood or other substances, in connection with suitable devices for introducing hydrocarbon oil or vapors, and of fixing the gas.

11. HOLDERS. Receptacles for holding gas under pressure, means for sealing the holder; and, in connection with the necessary operation of the holder, brackets, rollers, guides, pulleys, and weights.

15. PURIFIERS. Methods of and apparatus for the washing or scrubbing of gas by passing through water, lime, and various other substances for removal of deleterious matter.

18. RETORT-CHARGERS. Apparatus for charging and drawing gas-retorts by means of scoops, wheeled carriages, &c., or brackets hung transversely on lateral bars; and means for leveling the charge in the retort.

23. RETORT GAS-FURNACES. Special construction of furnaces for manufacturing heating and illuminating gas, and necessary appliances for operating the same, with special construction of flues for introduction of air, and means for burning the gases within the furnace. (See Iron and Steel Direct, Retort-Furnaces, Class 75, Metallurgy, Division III.)

16. RETORT-LIDS. Caps or lids, as especially applied to the closing of gas-retorts.

17. RETORTS AND SETTINGS. Apparatus for generating various forms of gas, means for operating the same without special provision for flues, or for burning generated gases. (See Gas, Retort Gas-Furnaces.)

CLASS 49.—GLASS. (XV.)

Sub-classes.

1. Articles.
2. Cutters.
4. Enameling.
7. Molds.
8. Ornamentation.
10. Plate and window.
9. Presses.
11. Tools.

CLASS 51.—GRINDING AND POLISHING. (XXVII.)

Sub-classes.

1. Abrading materials and tools.
Glass and stone—
3. Curved surfaces,
11. Plane surfaces.
Metal—
2. Card-grinding,
4. Curved surfaces,
6. Cutlery-scourers,
7. Edge-tools,
8. Mower and reaper knives,
Metal—
9. Needle-eyes,
10. Needles, rods, and points,
12. Plane surfaces,
14. Rumbles,
15. Sheet metal and wire,
16. Strops, hones, and rifles.
Wood—
5. Curved surfaces,
13. Plane surfaces.

CLASS 53.—HARDWARE-MAKING. (XIII.)

Sub-classes.

1. Bridge-irons.
2. Builders' hardware.
3. Cutlery.
4. Eyebolts and hooks.
5. Fence-barbs of sheet metal.
6. Ferrules, rings, and thimbles.
8. Gas and water fittings.
10. Hinges.
23. Lamp-work.
11. Leather-workers' hardware.
9. Miscellaneous.
20. Musical-instrument work.
12. Pens, pencils, and holders.
21. Printing appliances.
13. Spinners and weavers.
15. Spoons. Manufacture of
16. Springs.
22. Stamping.
17. Sucker-rod joints.
19. Tie-bands.
18. Umbrella-irons.

CLASS 54.—HARNESS. (XI.)

Sub-classes.

1. Bonnets and covers.
2. Bridle-bits.
3. Bridles and halters.
4. Collar-fasteners.
5. Collar-machines.
6. Fly-nets.
8. Hame-fasteners.
28. Hame-tugs.
9. Hames.
10. Harness—
29. Attachments,
11. Machines,
30. Pads,
12. Saddles,
Harness—
13. Tools.
16. Horse-boots.
17. Horse-collars.
34. Neck-yokes.
31. Ox-yokes.
32. Rein-holders.
21. Riding-saddles.
22. Spurs and stirrups.
24. Trace-carriers.
25. Trimmings.
26. Tugs.
27. Whips.
33. Whip-sockets.

CLASS 55.—HARROWS AND DIGGERS. (I.)

Sub-classes.

1. Clod-crushers.
2. Forks.
3. Harrows—
11. Revolving,
13. Rotary,
19. Wheel—
20. Rotary.
4. Harrow-teeth.
5. Hoes.
6. Land-rollers.
7. Pivoted teeth.
8. Pivoted tooth-bars.
9. Potato-diggers.
10. Rakes.
12. Rollers and harrows.
14. Shovels.
15. Stalk-choppers.
16. Stalk-pullers.
17. Stone-gatherers.
18. Transplanters.

CLASS 56.—HARVESTERS. (VII.)

Sub-classes.

1. Bean-harvesters.
Binders—
35. Compressors,
36. Grain-adjusters,
37. Sheaf-carriers.
2. Clover-harvesters.
3. Combined rakes and tedders.
Corn-harvesters—
38. Binders and droppers,
39. Cutters,
40. Implements,
41. Strippers and huskers.
5. Corn-shockers.
6. Cotton-harvesters.
Cutting apparatus—
42. Endless,
43. Guard-fingers and finger-bars,
44. Reciprocating,
45. Rotary,
46. Vibrating.
Droppers—
47. Direct-tilting,
49. Miscellaneous,
48. Opening and closing,
50. Side-delivery,
51. Swinging and tilting.
99. Fruit-gatherers.
9. Gearing.
10. Grain-bands.
31. Grain wheels and casters.
Hand-binders—
52. Attachments,
53. Elevated delivery, Rear,
54. Elevated delivery, Side,
55. Flat delivery,
56. Manual traction.
12. Hand-rakers.
13. Hay-caps.
Hay-loaders—
61. Endless-belts,
62. Intermittent,
63. Lifting-reels,
64. Walking-rakes.
101. Hay-racks.
100. Headers.
16. Hedge-trimmers.
17. Hemp and flax harvesters.
Horse-rakes—
65. Draft-dumpers,
66. Drags,
Horse-rakes—
67. Hand-dumpers,
68. Hay-cockers,
69. Rake-teeth.
19. Lawn-mowers.
20. Manure-forks.
33. Miscellaneous.
Mowers—
70. Anomalies,
72. Center-cut,
73. Front-cut, One-wheel,
74. Front-cut, Two-wheels,
76. Rear-cut, One-wheel,
77. Rear-cut, Two-wheels,
75. Reciprocating-gear,
78. Thrust-cut.
32. Platform adjustments.
22. Reels.
Revolving rakes—
80. Flop-over,
81. Wheel.
27. Scythes and cradles.
24. Seats.
Self-binders—
82. Clips and prepared bands,
83. Cord-knotters,
84. General structure,
85. Gleaners and binders,
86. Tension and take-up devices,
87. Twisters and tuckers,
88. Wire-twisters.
Self-rakers—
89. Endless-carriers,
90. Gavelling-tongs,
91. Platform-movement,
92. Reciprocating horizontal curvilinear,
93. Reciprocating horizontal rectilinear,
96. Rotary horizontal axis,
94. Rotary vertical axis, switch,
95. Rotary vertical axis, no switch,
98. Traveling horizontal irregular path,
97. Traveling vertical irregular path.
28. Tedders.
29. Thrashers.
30. Track clearers and dividers.

CLASS 149.—HIDES, SKINS, AND LEATHER. CHEMICAL TREATMENT OF. (VI.)

Sub-classes.

2. Bating.
4. Coloring and polishing.
5. Currying.
6. Depilating.
8. Preserving hides.
9. Tanning materials.
10. Tanning processes.
11. Tawing.

CLASS 57.—HOISTING. (XII.)

Sub-classes.

2. Barrel rollers.
34. Block and tackle—
5. Differential pulleys,
22. Capstans and windlasses.
3. Car-movers.
37. Chutes.
4. Cranes and derricks—
36. Jibless,
57. Lever-jib,
58. Non-pivoted jib—
59. Rotating—
60. Portable,
61. Pivoted jib—
62. Rotating—
63. Portable,
64. Sliding-jib,
65. Traveling, double track,
66. Trolley.
67. Elevated-carrier—
68. Draft-sustaining,
69. Lever-lock,
70. Non-lowering support,
71. Ratchet-lock,
72. Rope-catch,
73. Sheave-frame catch.
29. Endless belts.
8. Grain-conveyers—
48. Pneumatic,
49. Screw.
9. Grapples.
38. Hay-forks—
39. Corkscrew,
40. Grapples,
41. Harpoon,
42. Tilting.
11. Hay-slings.

CLASS 57—Continued.

13. Hoisting-buckets—
74. Belt.
15. Lifting-jacks—
43. Lever,
44. Screw.
16. Loading and unloading—
52. Hay,
81. Load-binders,
80. Mail-bag catchers,
46. Pilers,
Loading and unloading—
47. Shoveling devices.
75. Tilting—
76. Hoist,
77. Platform.
18. Skids.
19. Stump-extractors.
53. Stackers—
54. Endless aprons.
79. Wagon-raisers.

CLASS 58.—HOROLOGY. (XXIII.)

Sub-classes.

8. Balance-escapements.
3. Clocks—
2. Calendar,
28. Electric,
9. Geographical,
29. Pneumatic.
4. Clock-cases.
5. Clock-striking.
6. Clock-winding.
34. Dials and hands.
10. Metronomes.
11. Pendulums.
35. Pendulum-escapements.
30. Repeaters.
12. Safety-wheels.
13. Stem-winders.
14. Sun dials.
15. Time-alarms.
16. Time-checks.
31. Time lamp-lighters.
33. Time-signals.
17. Watches
18. Watch-balances.
19. Watch-barrels.
20. Watch-cases.
21. Watch-case springs.
22. Watch dust-caps.
23. Watch-keys.
32. Watch-maker's tools.
24. Watch-plates.
25. Watch-regulators.
26. Watch-stops.
27. Watch-winding.

CLASS 60.—HOSE AND BELTING. (XI.)

Sub-classes.

1. Belt-fasteners.
2. Belt-machines.
7. Belt-stretchers.
3. Belting.
6. Drive-chains.
4. Hose and tubing.
5. Hose-machines.

CLASS 61.—HYDRAULIC ENGINEERING. (IV.)

Sub-classes.

1. Aqueducts.
19. Breakwaters.
2. Cable-laying.
3. Caissons—
20. Ship.
4. Canals—
28. Gate-valves.
27. Gates, Bear-trap—
21. Lock.
5. Chutes.
23. Cribbing.
24. Dams and levees.
22. Dams, Coffer—
25. Sectional.
7. Diving-armor.
8. Docks.
9. Drains.
26. Forming and preserving channels.
29. Jetties. Sectional
11. Marine ways.
12. Mining.
13. Pile-drivers.
18. Piles.
30. Protecting shores.
15. Tide-powers.
16. Tunnels.
17. Water-gates.
31. Wharves.

CLASS 138.—HYDRAULIC MOTORS. (IX.)

Sub-classes.

11. Chain—
8. Elevators,
9. Jacks,
10. Presses.
1. Oscillating.
2. Reciprocating.
3. Rotary—
12. Feathering.
Turbines—
4. Bottom supply,
5. Side ring supply,
6. Top and side direct supply
7. Top ring supply.

CLASS 162.—INJECTORS AND EJECTORS. (XVIII.)

No sub-classes.

CLASS 63.—JEWELRY. (V.)

Sub-classes.

1. Bracelets.
2. Brooches.
4. Ear-rings.
5. Finger-rings.
8. Gem-setting.
6. Lockets.
11. Metal stock and ornamental wire fabric.
7. Ornamental chains.
10. Processes.
9. Watch-chain attachments.

CLASS 64.—JOURNAL-BOXES, PULLEYS, AND SHAFTING. (XII.)

Sub-classes.

4. Belt-shifters.
5. Belt-tighteners.
6. Clutches.
7. Compensating journals.
9. Flexible shafting.
10. Journal-boxes—
16. Roller-bearings.
17. Pulleys—
8. Expansible,
18. Split.
12. Shaft-casings.
13. Shaft-couplings.
14. Shaft-hangers.

CLASS 65.—KITCHEN AND TABLE ARTICLES. (VIII.)

Sub-classes.

1. Butter-dishes.
2. Butter, egg, and table tongs.
3. Cake-turners.
6. Caster-bottles.
5. Casters.
9. Cheese-covers.
10. Compound tools.
45. Condiment-holders.
11. Corkscrews.
12. Culinary.
13. Cups.
15. Dishes and plates.
16. Dish-covers.
17. Dish-holders.
18. Dish-mats.
19. Dish stands and trays.
20. Dust-pans.
21. Egg-beaters.
22. Egg-cups.
23. Fish-scalers.
24. Fruit and cake dishes.
25. Fruit-lifters.
26. Jar-lifters.
27. Knife racks and rests.
28. Ladles.
29. Napkin-holders.
30. Oyster-openers.
31. Pitchers.
32. Plate-lifters.
33. Provision-safes.
35. Salt-cellars.
36. Scoops.
38. Spice-boxes.
41. Tea-service.
42. Tumbler-holders.
43. Twine-holders.

CLASS 66.—KNITTING AND NETTING. (XXI.)

Sub-classes.

1. Burrs and sinkers.
Circular—
2. Circular machines,
11. Looper pin and hook machines.
17. Crocheting.
3. Darning.
4. Fabrics.
12. Feeding.
5. Needles.
6. Netting.
7. Stopping.
Straight—
8. Straight machines,
13. Fashioning-machines,
14. Looper pin and hook machines,
15. Cams and stops,
16. Warp-machines.
9. Take-ups and tensions.
10. Tatting.

CLASS 67.—LAMPS AND GAS-FITTINGS. (XXX.)

Sub-classes.

43. Calcium and magnesium lights.
1. Candlesticks.
3. Chandeliers.
4. Chimney-holders.
50. Decorative lights.
5. Drop-lights and hangers.
6. Extinguishers.
7. Gas-burners—
51. Incandescent,
52. Regenerative.
40. Gas-extinguishers—
8. Fittings.
41. Lighting devices,
9. Regulating-burners.
33. Lamp-burners—
10. Argand,
11. Multiple-wick,
12. No-chimney.
13. Lamp chimneys—
14. Collars,
21. Posts,
22. Shades,
23. Wicks.
32. Lamps—
39. Bracket,
2. Car,
42. Cigar-lighting,
16. Forced-draft,
17. Independent-reservoir,
19. Miners',
20. Safety-tube and central-draft,
29. Street.
24. Lanterns—
35. Signal,
46. Submarine,
44. Tubular.
45. Lantern-holders.
25. Lighting devices.
26. Locomotive head-lights.
27. Match-safes.
28. Reflectors.
37. Refracting attachments.
34. Signal-lights.
38. Torches.
30. Vapor-burners.
31. Wick-raisers.

CLASS 68.—LAUNDRY. (XXVII.)

Sub-classes.

1. Bosom-boards.
2. Clamps.
34. Clothes-driers.
12. Clothes-line fasteners.
3. Clothes-lines.
4. Clothes-pins.
5. Clothes-pounders.
4. Clothes-line reels.
6. Clothes sticks and tongs.
7. Fluting-irons.
8. Hand-rubbers.
19. Ironing-machines.
10. Ironing-tables.
11. Laundries.
13. Mangles.
26. Sad-irons.
27. Sad-iron holders.
28. Starching-machines.
35. Wash-benches.
29. Wash-boards.
30. Wash-boilers.
31. Wash-tubs.
Washing-machines—
15. Agitator,
16. Boiler,
17. Combined washing and wringing,
18. Cylinder,
37. Miscellaneous,
19. Pounder,
20. Reciprocating rubber,
21. Rocking and swinging,
22. Roller,
23. Roller and bed,
24. Rotary rubber.
32. Wringers.
33. Wringer-rolls.

CLASS 69.—LEATHER. (XI.)

Sub-classes.

1. Cutting.
3. Machines.
4. Splitting.

CLASS 70.—LOCKS AND LATCHES. (XX.)

Sub-classes.

40. Baggage-seals.
3. Box-fasteners.
7. Key-fasteners.
8. Key-hole guards.
9. Keys.
10. Knobs.
11. Knob attachments.
12. Knob-roses.
13. Latches—
28. Gate,
21. Reversible.
14. Locks—
1. Alarm,
2. Bag,
4. Car-seat,
5. Hasp,

CLASS 70—Continued.

Locks—
6. Indicator,
18. Permutation,
20. Piano,
23. Seal,
31. Sliding-door,
25. Till,
26. Time,
Locks—
27. Trunk.
15. Lock-strikes.
16. Lock-trimmings.
29. Locks and latches combined.
17. Padlocks—
19. Permutation.
24. Shackles.

CLASS 184.—LUBRICATORS. (XII.)

Sub-classes.

1. Capillary attraction.
2. Condensation displacement.
3. Force-feed.
4. Gravity-feed—
5. Automatic cut-off.
6. Liquefiers.
7. Loose-pulley.
8. Miscellaneous.

CLASS 74.—MACHINE ELEMENTS. (XII.)

Sub-classes.

1. Cams and eccentrics.
5. Cranks and levers.
6. Fly-wheels.
7. Gearing—
21. Belt,
26. Frictional.
8. Gibs and keys.
28. Intermittent grip—
29. Strap and dog or ball,
30. Ratchet.
13. Machine-brakes.
14. Mechanical movements.
20. Overcoming dead-centers.
16. Pawls and ratchets.
17. Pitmen.
27. Racks and pinions.
18. Treadles.
19. Universal joints.

CLASS 115.—MARINE PROPULSION. (XXII.)

Sub-classes.

Propelling—
1. Buoyant propellers,
2. Chain-propellers,
3. Crank-paddles.
6. Hydraulic propellers,
20. Interior power,
21. Motion of vessel,
24. Oscillating propellers,
8. Pneumatic propellers,
12. Reciprocating propellers,
10. Steering-propellers, (except screw,)
13. Wheels in channel.
Paddle-wheels—
4. Feathering blades,
22. Fitting and driving,
23. Form and construction.
Screw-propellers—
14. Feathering blades,
15. Fitting and driving,
16. Form and construction,
17. Steering.
Towing—
18. External power,
19. Internal power.

CLASS 72.—MASONRY. (IV.)

Sub-classes.

9. Apartment-houses.
10. Bonding and tying.
13. Cellars.
12. Centering.
2. Cisterns.
14. Composite walls.
3. Construction.
11. Coping.
16. Facing walls.
5. Fire-shields.
17. Foundations.
18. Hollow tile walls.
7. Iron structures.
19. Smoke and air flues.
20. Stone and brick setting.
21. Subways.
23. Tile and metal floors.
22. Timber-seats.
24. Waste chutes and sinks.

CLASS 73.—MEASURING-INSTRUMENTS. (XXIII.)

Sub-classes.

1. Air and gas meters.
2. Anemometers.
3. Balances.
74. Ballot-boxes.
4. Barometers.
5. Bathometers.
6. Bevels.
7. Calculators.
84. Calculators. Tabular
8. Cart-scales.
86. Cash-indicators.
9. Cloth-measuring machines.
10. Coin-counters.
83. Coin-packages.
11. Coin-testers.
73. Conformators.
12. Diaphragm-meters.
13. Dividing-engines.
15. Dynamometers.
75. Fare-boxes.
59. Fare-registers.
16. Gages.
77. Gages. Micrometer
17. Game-counters.
19. Grain-meters.
78. Grain-meters. Rotating
20. Grain-tallies.
22. Hydrometers.
23. Hydrostatic scales.
24. Hygroscopes.
79. Lactometers.
63. Leather-measuring.
76. Letter-boxes.
60. Measuring-faucets.
61. Measuring-pumps.
62. Measuring-vessels.
27. Odometers.
28. Oscillating meters.
58. Passenger-registers.
29. Pendulum-scales.
30. Piston-meters.
80. Pitch-boards.
81. Planimeters.
72. Plumb-bobs—
71. Levels.
31. Pressure-gages.
68. Proportional meters.
32. Pyrometers.
33. Rain-gages.
34. Recorders.
35. Registers.
36. Rotary measures.
37. Rotary meters.
38. Sack-scales.
39. Scale-beams.
40. Scale-measures.
41. Scale-pans.
60. Ships' logs.
64. Shoe-makers' measures.
42. Specific-gravity apparatus.
43. Speed-measures.
44. Sphygmoscopes.
70. Spirit-levels.
45. Spirit-meters.
46. Spring-scales.
47. Squares.
66. Surface-gages.
48. Tailors' measures.
49. Tape-measures.
85. Telethermometers.
50. Testing illuminating fluids.
51. Testing-machines.
52. Thermometers.
65. Thermostats.
21. Tollers.
67. Track-gages.
53. Voting-machines.
54. Water-gages.
82. Water-gages. Float
55. Weather-vanes.
56. Weights.

CLASS 185.—MECHANICAL MOTORS. (XII.)

Sub-classes.

1. Horse-powers—
2. Equalizers,
3. Treads.
4. Manual.
5. Miscellaneous.
6. Spring.
7. Weight.

CLASS 167.—MEDICINES. (VI.)

Sub-classes.

1. Aerated beverages.
2. Capsules.
3. Disinfectants.
4. Extracts.
5. Hair dyes and tonics.
6. Insecticides.
7. Internal remedies.
8. Plasters.
9. Topical remedies.
10. Veterinary medicines.

CLASS 153.—METAL-BENDING. (XIV.)

Sub-classes.

1. Bending—
11. By press.
12. By rolls.
2. Coiling.
3. Corrugating.
4. Curving plates.
5. Dishing.
6. Flanging—
7. Straight.
8. Straightening—
9. Plates and sheets.
10. Twisting.

CLASS 10.—METAL BOLTS, NUTS, RIVETS, AND SCREWS. (XIII.)

Sub-classes.

1. Bolts and nuts. Dressing and assembling.
2. Bolts and rivets.
3. Bolts and rivets. Making
4. Capping screws and nails.
5. Metal-screw machines.
6. Nuts and washers.
7. Nuts and washers. Making
8. Screws.
9. Screw-blank feeders.
10. Screw-cutting machines.
11. Screw-swaging machines.
12. Screw-tapping machines.
13. Screw-threading machines.
14. Taps and dies.
15. Wood-screw machines.

CLASS 77.—METAL BORING AND DRILLING. (XIII.)

Sub-classes.

1. Bits.
2. Boring and drilling appliances.
3. Boring-machines.
4. Drill-chucks.
5. Drills, Hand—
9. Ratchet.
6. Drilling-machines.
7. Reamers and drifts.
8. Tapping mains.

CLASS 78.—METAL-FORGING. (XIII.)

Sub-classes.

1. Anvils.
17. Compositions.
16. Compressing.
3. Drop-hammers.
4. Forges.
20. Forge-tuyeres.
5. Forging and welding.
8. Oilers.
9. Power-hammers.
11. Riveting.
18. Shafts and pulleys.
19. Structural work.
15. Upsetting metal.

CLASS 22.—METAL-FOUNDING. (XIV.)

Sub-classes.

Metal molds—
1. Apparatus and plants.
2. Chains, hinges, and joints.
4. Hardware.
5. Hollow ware.
7. Ingots—
9. Compound.
6. Hollow and tube.
10. Plants.
11. Materials.
12. Ordnance and projectiles.
13. Pigs.
14. Plows.
15. Rolls.
18. Screw-threads.
16. Soft-metal machines—
21. Molds.
19. Shot.
20. Spoons.
22. Traps.
51. Type.
50. Tools.
23. Vehicle-wheels.
24. Wheels.

Molded molds—
25. Chains, hinges, and joints.
26. Hardware.
27. Hollow ware.

Molded molds—
28. Molded molds.
8. Molders' flasks—
29. Materials.
17. Tools and arts.
30. Ordnance and projectiles.
31. Pipes—
32. Horizontal.
3. Pipe-elbows.
33. Plants.
34. Plows.
35. Rolls.
36. Screw-threads.
37. Tools.
38. Vehicle-wheels.
39. Wheels.

Molding apparatus—
40. Blacking molds.
41. Hollow ware.
42. Machines.
43. Ordnance and projectiles.
44. Pipes—
45. Horizontal.
46. Pipe-cores.
47. Screw-threads.
48. Vehicle-wheels.
49. Wheels.

CLASS 75.—METALLURGY. (III.)

Sub-classes.

1. Alloys.
Amalgamators—
34. Electric,
35. Lead,
36. Mercury,
37. Plate,
33. Vacuum,
38. Vapor.
2. Assaying.
90. Blow-pipes.
7. Calcining-kilns.
8. Coke and charcoal.
3. Converters.
54. Drying air.
30. Fume-arresters.
10. Furnace-protecting—
82. Fire-brick.
Furnaces—
83. Annealing,
5. Blast—
4. Accessories,
96. Bells,
97. Tuyeres,
29. Crucible,
9. Cupola,
11. Gas—
81. Burners,
88. Heating air and gas,
78. Mixing air and gas,
80. Producers,
40. For heating blanks,
41. Hydrocarbon—
42. Injector-burners,
43. Retort-vaporizers,
84. Melting—
89. Glass-pots,
92. Pot-furnaces,
93. Tank-furnaces,
19. Pigment,
20. Puddling,
26. Shaft and shelf,
91. Slag.
Hot-blast ovens—
52. Single surface,
53. Double surface.
14. Iron and steel direct—
73. Bricks,
74. Flux,
71. Furnaces,
Iron and steel direct—
75. Gases,
72. Retort-furnaces,
76. Slag,
77. Sponge.
15. Lead.
16. Mechanical puddlers and tools.
22. Quicksilver.
17. Reducing and separating—
57. Apparatus,
58. Aluminium,
62. Copper,
59. Desilverizing lead,
60. Desulphurizing ores,
61. Disintegrating ores,
63. Flux,
64. Gold and silver,
85. Manganese,
66. Nickel and cobalt,
65. Ore bricks.
23. Regenerators—
95. Continuous or double surface,
94. Discontinuous or single surface.
24. Revolving roasters.
25. Roasting and smelting hearths.
18. Solution and precipitation—
86. Apparatus,
67. Chlorination,
68. Electrolysis,
69. Ferric salts,
70. Parting bullion.
28. Spelter.
27. Treating molten iron—
44. Air, steam, and gases,
45. Alloys,
46. Basic,
87. Basic linings,
47. Granulating,
48. Oxides,
49. Physic,
50. Scrap,
51. Vacuum.
55. Utilizing tin-scrap—
56. Wet processes.

Sub-Classes in Metallurgy, with Explanatory Notes.

1. ALLOYS. Includes amalgams and dental alloys, alloys for coating metals, anti-incrustation alloys, alloys for journal-bearings, anti-friction metals, coin metal, bronze, and bell metal, non-magnetic alloys for watch-works, fusible alloys, type-metal, and white metal. Does not include mixtures of metals with non-metallic substances. (See Caoutchouc and Minor Plastics, Class 18, Division XV; and Lubricants, Class 87, Oils, Fats, and Glue, Division VI.) (See Treating Molten Iron, Alloys, for special steels, and alloys of iron, such as ferro-manganese, ferro-silicon, tungsten steel, &c.)

34. AMALGAMATORS, ELECTRIC. Includes riffle, plate, and pan amalgamators in which continuous and intermittent currents of electricity are passed through the ore pulp or mercury, or both, for the purpose of assisting the amalgamation.

35. AMALGAMATORS, LEAD. Furnaces and processes for separating precious metals wherein the ore containing the metal is passed through molten lead or alloys of lead, zinc, mercury, &c.

36. AMALGAMATORS, MERCURY. Construction and arrangement of pans, mullers, barrels, riffles, &c., for the ordinary amalgamation of the precious metals; also, processes in which chemicals are used to remove "rust," grease, &c., and "enliven" the action of the mercury.

37. AMALGAMATORS, PLATE. Silver, copper, brass, and other metal plates coated with mercury, and arranged either in the sluiceways, riffles, or in connection with the pan, for the purpose of collecting the precious metals.

33. AMALGAMATORS, VACUUM. Apparatus and processes in which an exhaust is used to carry the ore through the mercury or lead contained in a closed vessel.

38. AMALGAMATORS, VAPOR. Apparatus and processes in which the ore is subjected to the vapor of mercury for the purpose of amalgamating the precious metals.

2. ASSAYING. Includes muffle and cupel furnaces; apparatus and burners used in assaying, &c.; also, methods of fire analysis.

7. CALCINING-KILNS. Stack-furnaces for roasting and desulphurizing metallic ores. (See Roasting and Smelting Hearths; and Shaft and Shelf Furnaces; and Lime-Kilns, Class 106, Division XV.)

8. COKE AND CHARCOAL. Processes of making coke; coke-ovens, and appliances for operating the same. Processes and kilns for charring wood. (See Distilling Wood, Class 23, Division VI.)

3. CONVERTERS. Includes apparatus for the pneumatic refining of iron; also, methods of operating converters, and tuyeres, tuyere-stoppers, bottoms, and blast appliances for same, and processes for lining. (For pneumatic processes see Treating Molten Iron, Air, Steam and Gases; and for Bessemer Plants see Metal-Founding, Division XIV.)

54. DRYING AIR. Apparatus for and methods of desiccating air by means of chloride of calcium, sulphuric acid, &c., for metallurgic purposes.

30. FUME-ARRESTERS. Devices for collecting dust from ore-furnaces and purifying waste gases. Does not include condensers for volatile metals. (See Quicksilver and Spelter; also, Gas-Purifiers, Class 48.)

10. FURNACE-PROTECTING. Devices for protecting furnace walls, hearths, doors, valves, tuyeres, &c., by air and water cooling. (See Furnaces, Blast, Tuyeres.)

82. FURNACE-PROTECTING, FIRE-BRICK. Compositions to be used in furnace-linings. Does not include lime or basic linings. (For which see Treating Molten Iron, Basic Linings.)

83. FURNACES, ANNEALING. Gas and coal burning furnaces for annealing glass.

5. FURNACES, BLAST. Form and general construction of furnaces for smelting iron ores, using either an air, steam, or gas blast. (See Cupola-Furnaces for blast-furnaces used in smelting lead and similar ores.)

4. FURNACES, BLAST, ACCESSORIES. Methods of and apparatus for feeding stock, except hoppers and bells. Includes devices for utilizing waste gases and gas-seals. (See Gas-Furnaces; for heating blast, see Hot-Blast Ovens.) (See, also, Furnace-Protecting; Furnaces, Blast, Bells; and Furnaces, Blast, Tuyeres.)

95. FURNACES, BLAST, BELLS. Bell and hopper mechanism for charging stack-furnaces. (See Furnaces, Gas-Producers; Water-Gas, Class 48; and Hoisting, Class 57, Division XII.)

39. FURNACES, BLAST, TUYERES. Water and air cooled tuyeres and tuyere-pipes for blast-furnaces. (See, also, Furnaces, Blast, Accessories; Furnaces, Hydrocarbon, Injector Burners; and Blow-Pipes.)

29. FURNACES, CRUCIBLE. Coal, oil, or gas burning furnaces for heating crucibles, muffles, and retorts, for assayers, jewelers, &c. (See Furnaces, Melting, Pot-Furnaces.)

9. FURNACES, CUPOLA. Furnaces for remelting iron and smelting lead, silver, and other similar ores. Does not include Blast-Furnaces for smelting iron ores.

11. FURNACES, GAS. Apparatus for generating and burning gases in metallurgical and other furnaces.

81. FURNACES, GAS, BURNERS. Devices for burning gas in metallurgical furnaces. (See Furnaces, Hydrocarbon, Injector-Burners.) (For Illuminating-Gas Burners, see Class 67, Division XXX.)

88. FURNACES, GAS, HEATING AIR AND GAS. Furnaces with devices connected therewith for heating the air or gas, or both, including arrangements of flues, blast-pipes, &c., to insure the complete combustion of the gaseous fuel. Such furnaces include reverberatory, smelting, blast, reheating, open-hearth, and all other furnaces used for metallurgic purposes. (See Hot-Blast Ovens and Regenerators.)

78. FURNACES, GAS, MIXING AIR AND GAS. Furnaces provided with appliances for mixing gas and air, either exterior to or within the combustion-chamber. (See Carburetors, Gas and Air Mixers; and Furnaces, Hydrocarbon.)

80. FURNACES, GAS-PRODUCERS. Gas-generators for metallurgic heating-furnaces which are either separated from or directly connected with the furnace in which the gas is consumed, but not including apparatus for generating gas for illuminating purposes. (See Class 48, Coal-Gas, Water-Gas, &c.)

40. FURNACES FOR HEATING BLANKS. Furnaces for heating ingots, pipe-skelps, gun-barrels, and blanks for bolts, car-wheels, and reheating-furnaces generally. Does not include Soaking-Pits. (See Class 22, Metal-Founding, Ingots. Plants, Division XIV; also, Class 75, Furnaces, Annealing, and Class 148, Metal Tempering, Annealing, and Cementation.)

41. FURNACES, HYDROCARBON. General apparatus for burning hydrocarbon oils in metallurgical furnaces, &c., where the oil is fed and burned upon trays, refractory material, water, &c.

42. FURNACES, HYDROCARBON, INJECTOR-BURNERS. Apparatus for injecting hydrocarbon oils, vapors, or gases, together with steam or air, or steam and air; also, apparatus in which the gases, &c., are mixed before injecting them into the furnace. (See Class 162, Injectors and Ejectors, Division XVIII; also, Class 67, Lamps and Gas-Fittings, Vapor-Burners, Division XXX.)

43. FURNACES, HYDROCARBON, RETORT-VAPORIZERS. Apparatus in which the oil is vaporized and the vapors heated, water converted into steam, and the steam superheated or decomposed; means for heating air and burners for consuming the commingled gases and vapors thus produced. (See Class 48, Oil Gas and Water-Gas; Class 67, Lamp and Gas Fittings, Vapor-Burners, Division XXX; and Class 126, Stoves and Furnaces, Vapor-Stoves, Division XIX.)

84. FURNACES, MELTING. Gas and coal burning furnaces for melting metals, glass, &c. (See Regenerators, &c.)

92. FURNACES, MELTING, GLASS-POTS. Structure of pots for melting glass for composition. (See Furnace-Protecting, Fire-Brick; also, Class 25, Clay and Pottery, Division XV.)

91. FURNACES, MELTING, POT-FURNACES. Furnaces adapted to melting and working out glass in pots. (See Furnaces, Crucible.)

90. FURNACES, MELTING, TANK-FURNACES. Hearths adapted to melting glass.

19. FURNACES, PIGMENT. Processes of and apparatus for obtaining pigment. (See Fume-Arresters, Spelter, and Quicksilver, for similar apparatus.)

20. FURNACES, PUDDLING. Reverberatory furnaces in which pig-iron is melted and rabbled by hand, including special construction of fire-boxes, flues for heating air, &c.

26. FURNACES, SHAFT AND SHELF. Furnaces for roasting ores, consisting of upright stacks, either clear or provided with shelves or partitions for delaying the progress of the ore, fully exposing it to the action of the heat.

97. FURNACES, SLAG. Processes of and apparatus for utilizing slag.

52. HOT-BLAST OVENS, SINGLE-SURFACE. Recuperators or discontinuous stoves for heating air; also, water-cooled valves used in hot-blast-oven flues. (See Furnace-Protecting. For special construction of bricks see Furnace-Protecting, Fire-Brick.)

53. HOT-BLAST OVENS, DOUBLE-SURFACE. Pipe or continuous stoves for heating air for blast-furnaces, converters, &c. Air is passed through externally-heated pipes, tubes, or chambers. (See Furnaces, Gas, Heating Air and Gas; and Regenerators, Continuous.)

14. IRON AND STEEL DIRECT. Processes of manufacturing wrought-iron and steel directly from ore or sponge. (See Treating Molten Iron.)

71. IRON AND STEEL DIRECT, FURNACES. Apparatus employed in the direct production of wrought-iron or steel. (See Iron and Steel Direct, Retort-Furnaces; also, Furnaces, Blast.)

72. IRON AND STEEL DIRECT, RETORT-FURNACES. Apparatus for reducing ores and making sponge-iron direct from the ores, in which the charge is placed in retorts which are heated internally or externally by furnace-gases, the product being subsequently reduced in a hearth usually connected with the retorts.

73. IRON AND STEEL DIRECT, BRICKS. Cylinders, blocks, and bricks of iron ore made up with or without fuel or flux; also, construction and arrangement of furnaces for reducing the same.

1. IRON AND STEEL DIRECT, FLUX. Compositions used in the reduction of iron ore, either in the direct or indirect processes.

74. IRON AND STEEL DIRECT, GASES. Processes for obtaining wrought-iron and steel from iron ores and for deoxidizing ores preparatory to smelting in blast-furnaces by means of gases or gaseous fuel.

76. IRON AND STEEL DIRECT, SLAG. Methods of utilizing furnace-slag and cinder in the manufacture of iron by the ordinary smelting processes.

77. IRON AND STEEL DIRECT, SPONGE. Processes of producing iron and steel sponge by heating iron ore in retorts with carbon.

15. LEAD. Hearth and blast furnaces for smelting lead ores and processes for same; also, apparatus for refining lead. Includes "Scotch hearths," but not water-jacketed lead-smelters. (See Furnaces, Cupola.)

16. MECHANICAL PUDDLERS AND TOOLS. Revolving or removable hearths or cylinders, horizontal and inclined. Devices for puddling and balling iron mechanically, including rabbles, mixers, cutters, &c. (See Revolving Roasters.)

22. QUICKSILVER. Processes of and apparatus for separating mercury from its ores and amalgams, including furnaces, retorts, collectors, condensers, and strainers; also, apparatus for retorting, purifying, and separating amalgams. (See Alloys.)

17. REDUCING AND SEPARATING. Processes of reducing and separating metals from their ores by application of heat, including processes in which the ore is melted by heat electrically generated, and reducing processes not otherwise classified, exclusive, however, of amalgamation.

57. REDUCING AND SEPARATING, APPARATUS. Special apparatus for treating ores and metals, not otherwise classified. (See Revolving Roasters, Roasting and Smelting Hearths, and Furnaces, Cupola.)

58. REDUCING AND SEPARATING, ALUMINIUM. Processes and apparatus for obtaining aluminium and other metals of the alkaline earths.

62. REDUCING AND SEPARATING, COPPER. Furnace processes for purifying and refining copper and extracting the same from ores and matte.

59. REDUCING AND SEPARATING, DESILVERIZING LEAD. Processes of and apparatus for separating silver and gold from bullion by Parke's, Pattison's, and other furnace methods. (See Reducing and Separating Gold and Silver.)

60. REDUCING AND SEPARATING, DESULPHURIZING ORES. Processes, apparatus, and compounds for freeing metallic ores (principally those of copper, gold, and silver) from sulphur. (See Calcining-Kilns; Roasting and Smelting Hearths; Furnaces, Shaft and Shelf.)

61. REDUCING AND SEPARATING, DISINTEGRATING ORES. Processes in which hot ore is dumped into water or chemical solutions preparatory to amalgamating or desulphurizing, and also processes for comminuting copper and other metals in a similar manner.

63. REDUCING AND SEPARATING, FLUX. Compositions of fluxes used in the reduction of metals.

64. REDUCING AND SEPARATING, GOLD AND SILVER. Processes of and apparatus for separating the precious metals from ores, speiss, amalgams, &c. (See Amalgamators; Solution and Precipitation, Chlorination; and Reducing and Separating, Disintegrating Ores and Desulphurizing Ores.)

85. REDUCING AND SEPARATING, MANGANESE. Processes of and apparatus for obtaining manganese from its ores and for the manufacture of ferro-manganese and spiegeleisen.

66. REDUCING AND SEPARATING, NICKEL AND COBALT. Processes of separating nickel and cobalt from their ores by furnace operations.

65. REDUCING AND SEPARATING, ORE BRICKS. Processes of forming bricks, blocks, lumps, and cakes of crushed or pulverized ore, especially ores of precious metals, preparatory to roasting. (See Iron and Steel Direct, Ore Bricks.)

23. REGENERATORS. Includes devices for reversing the direction of the gaseous currents, valves, and special constructions of brick. (See Furnace-Protecting, Fire-Brick; Furnaces, Gas; and Hot-Blast Ovens.)

94. REGENERATORS, CONTINUOUS OR DOUBLE SURFACE. Structures of the Ponsard type, with separate flues for the air and for the waste gases; for utilizing waste heat, as applied to metallurgical furnaces, especially open-hearth furnaces. (See Hot-Blast Ovens, Double-Surface.)

93. REGENERATORS, DISCONTINUOUS OR SINGLE SURFACE. Structures of the Siemens type, containing only a single system of passages; for utilizing waste heat, as applied to metallurgical furnaces, especially open-hearth furnaces. Waste gases and air are alternately passed through the flues, heating them and heated by them, respectively. (See Hot-Blast Ovens, Single Surface; and Furnaces, Gas, Heating Air and Gas.)

24. REVOLVING ROASTERS. Furnaces with one or more revolving chambers or cylinders for roasting, oxidizing, chloridizing, and desulphurizing ores. (See Mechanical Puddlers and Tools.)

25. ROASTING AND SMELTING HEARTHS. Hearth-furnaces for roasting and smelting metallic ores. (See, also, Revolving Roasters; Reducing and Separating; and Furnaces, Puddling.)

18. SOLUTION AND PRECIPITATION. Processes of and compounds for obtaining metals from solutions of ores, waste jewelers' solutions, leaching solutions, &c. (See Solution and Precipitation, Electrolysis; and Coating with Metal, Electro-Deposition.)

57. SOLUTION AND PRECIPITATION, APPARATUS. Special apparatus employed in solving processes not classified elsewhere in sub-classes of Solution and Precipitation.

67. SOLUTION AND PRECIPITATION, CHLORINATION. Processes of and compounds for chloridizing ores by subjecting the ore to the action of chlorine gas or chlorine solutions, and leaching them after chlorination. (See Revolving Roasters, and Roasting and Smelting Hearths.)

68. SOLUTION AND PRECIPITATION, ELECTROLYSIS. Processes of and apparatus for the electrolytic separation and purification of metals from their ores and alloys by solving operations; also, for chloridizing ores by electricity. (See Coating with Metal, Electro-Deposition.)

69. SOLUTION AND PRECIPITATION, FERRIC SALTS. Processes of and apparatus for treating ores of copper, silver, and gold by means of solutions of ferric salts.

70. SOLUTION AND PRECIPITATION, PARTING BULLION. Processes for refining bullion by dissolving silver in acid, and subsequent precipitation.

28. SPELTER. Processes and apparatus for obtaining metallic zinc from its ores, including furnaces, retorts, condensers, and appliances for operating them. (See Pigment-Furnaces and Fume-Arresters.)

27. TREATING MOLTEN IRON. Miscellaneous processes and apparatus for treating molten iron for the production of wrought iron and steel. (See Converters, and Iron and Steel Direct.)

44. TREATING MOLTEN IRON; AIR, STEAM, AND GASES. Processes and apparatus for treating molten iron with currents of air, steam, or gas, for the purpose of purifying the same or converting it into steel. (See Converters.)

45. TREATING MOLTEN IRON, ALLOYS. Processes and compounds of metals which are added to molten iron to produce an alloy of iron or steel; such as chrome, manganese, and tungsten steels.

46. TREATING MOLTEN IRON, BASIC. Processes of removing phosphorus by treating molten iron with lime, magnesia, and similar materials, either as additions or as the lining of the vessel in which the metal is placed, by uniting with which, to form a slag, the phosphorus is eliminated.

87. TREATING MOLTEN IRON, BASIC LININGS. Bricks or linings of lime, magnesia, &c. (See Furnace-Protecting, Fire-Brick.)

47. TREATING MOLTEN IRON, GRANULATING. Processes of granulating molten iron, and for treating iron prepared in this way or mechanically subdivided.

48. TREATING MOLTEN IRON, OXIDES. Decarbonizing crude molten iron by the use of iron oxides, nitrates, &c., either as additions or furnace-linings.

49. TREATING MOLTEN IRON, PHYSIC. Miscellaneous compounds which, when added to molten iron or steel, serve to purify, decarbonize, or, by uniting with the same, to improve the quality of the steel.

50. TREATING MOLTEN IRON, SCRAP. Processes of melting and utilizing iron and steel scraps, turnings, &c. (See Utilizing Tin-Scrap.)

51. TREATING MOLTEN IRON, VACUUM. Processes of treating molten iron in vessels from which air can be exhausted for the purpose of inducing a current of air through the molten mass, or removing gases therefrom. (See Furnaces, Cupola.)

55. UTILIZING TIN-SCRAP. Dry or furnace processes for separating tin and iron from tin-scrap by means of heat.

6. UTILIZING TIN-SCRAP, WET PROCESSES. Apparatus for and processes of separating tin, zinc, &c., from iron by chemical solutions, with or without the aid of electricity.

CLASS 79.—METAL PERSONAL WEAR, MAKING (XIII.)

Sub-classes.

1. Buttons and clasps.
2. Eyelets.
3. Ornamental chains.
4. Personal wear.
5. Thimbles. Manufacture of
6. Watches and clocks.

CLASS 80.—METAL-ROLLING. (XIII.)

Sub-classes.

11. Angle irons.
12. Compound plates and bars.
1. Cylindrical.
2. Foil. Manufacture of
3. Mill appliances.
4. Piles and fagots.
8. Plates and bars.
5. Puddlers' balls.
6. Railroad-rails.
13. Reworking.
7. Rolling. Miscellaneous
9. Sheet and hoop iron manufacture.
10. Taper.

CLASS 148.—METAL TEMPERING, ANNEALING, AND CEMENTATION. (III.)

Sub-classes.

7. Cementation and case-hardening.
8. Decarbonizing.
9. Tempering and annealing—
10. Applications of electricity,
11. Compositions,
Tempering and annealing—
3. Metals generally,
12. Metals other than iron,
4. Sheet and plate metal,
5. Wheels and tires,
6. Wire and springs.

Sub-Classes in Metal Tempering, Annealing, and Cementation, with Explanatory Notes.

7. CEMENTATION AND CASE-HARDENING. Processes of and apparatus for cementation and case-hardening; also, compositions for the entire or superficial conversion of wrought-iron into steel.

8. DECARBONIZING. Processes of and apparatus for decarbonizing cast-iron; also, compositions for the conversion of cast-iron into steel.

9. TEMPERING AND ANNEALING.

10. TEMPERING AND ANNEALING, APPLICATIONS OF ELECTRICITY. Processes of and apparatus for the application of electricity to heating and annealing.

11. TEMPERING AND ANNEALING, COMPOSITIONS. Chiefly compositions used in connection with the hardening process.

3. TEMPERING AND ANNEALING, METALS GENERALLY. Processes of and apparatus for tempering and annealing not specifically included in the other classes.

12. TEMPERING AND ANNEALING, METALS OTHER THAN IRON. Processes of and apparatus for tempering and annealing copper and metals other than iron or steel.

4. TEMPERING AND ANNEALING, SHEET AND PLATE METAL. Processes of and apparatus for tempering and annealing sheet and plate metal, such as saws.

5. TEMPERING AND ANNEALING, WHEELS AND TIRES. Processes of and apparatus for tempering and annealing wheels and tires.

6. TEMPERING AND ANNEALING, WIRE AND SPRINGS. Processes of and apparatus for tempering and annealing wire and springs.

CLASS 76.—METAL TOOLS AND IMPLEMENTS, MAKING (XIII.)

Sub-classes.

1. Augers.
2. Axes and hatchets.
27. Compound metal-working machines.
3. Cultivator-irons.
4. Dies.
5. Drills.
6. Farm implements.
7. File-blanks.
8. File-cutting.
9. Files and rasps.
10. Hammers.
11. Harvester-irons.
12. Hoes and shovels.
13. Picks and mattocks.
14. Pitchforks.
15. Plow-irons.
16. Rake and harrow irons.
26. Saw clamps and jointers.
19. Saw-setting.
22. Saw-swaging.
17. Saws.
18. Saws, Gumming
20. Saws, Sharpening reciprocating tool-
21. Saws, Sharpening rotary tool-
23. Scythes.
24. Tools and implements.
25. Wrenches

CLASS 134.—METAL TUBING AND WIRE. (XIII.)

Sub-classes.

1. Coiling and bending pipe.
10. Drawing.
2. Lead pipe, Making
3. Lightning-rods, Making
4. Lining cylinders with metal.
5. Plumbers' traps, Making
14. Reeling.
15. Rods for wire.
6. Tubes.
11. Tubing, Lapped—
12. Rolled,
13. Seamless.
16. Wire.
8. Wire, Pointing

CLASS 82.—METAL TURNING, PLANING, AND MILLING. (XIII.)

Sub-classes.

1. Centerers.
2. Cutters and cutter-holders.
4. Gear-cutting.
5. Key-seat cutters.
6. Lathe-chucks.
7. Mandrels and work-holders.
8. Milling.
9. Milling-cutters.
10. Planer-chucks.
Planers—
11. Reciprocating bed or cutter,
Planers—
12. Rotary bed or cutter.
13. Rests.
14. Shaping and slotting.
Turning—
15. Irregular forms,
16. Miscellaneous,
17. Tapers,
18. Wheels and axles.
19. Watch-makers' lathes.
20. Wrist-pin turners.

CLASS 81.—METAL-WORKING TOOLS. (XXVIII.)

Sub-classes.

26. Bolt-holders.
23. Cutting sharpeners.
24. Nippers.
Nut-wrenches—
5. Pivoted and spring-jaw,
6. Ratchet-wheel,
7. Rigid-jaw,
8. Rigid-socket and axle-nut,
9. Sliding-jaw,
27. Wheel.
Pipe-cutters—
10. Inside,
11. Outside.
12. Pipe-expanders.
Pipe-wrenches—
28. Chain.
13. Pivoted-jaw,
14. Pivoted-jaw, with cutter,
15. Rigid-jaw and spanner,
16. Sliding-jaw,
17. Sliding-jaw, with cutter.
25. Pliers.
18. Rod and bolt cutters.
19. Smiths' tongs.
Vises—
20. Pipe and rod,
21. Smiths',
22. Wood-workers'.

CLASS 83.—MILLS. (XXV.)

Sub-classes.

Bagging grain—
26. Bag-holders.
Chop-graders—
50. Bran-dusters, Beaters,
51. Bran-dusters, Brushes,
49. Electric purifiers,
42. Flour processes,
40. Gravity,
39. Rotary bolts,
38. Shaking bolts.
Dust-collectors—
47. Reciprocating,
48. Rotating.
Grain-scourers—
32. Centrifugal,
36. Concave face,
31. Conical,
30. Cylinder, Horizontal,
29. Cylinder, Vertical,
37. Disk-face,
33. Pestle-action,
35. Reciprocating and endless,
34. Screw-action.
Grinding-mills—
17. Balancing millstones,
9. Ball and drum,
21. Bark,
19. Cane,
45. Chasing,
18. Coffee,
10. Compound movement,
Grinding-mills—
13. Cone and shell,
12. Crushing-rolls,
14. Cylinder and concave,
7. Disk-action, Horizontal,
8. Disk-action, Vertical,
44. Feed-regulators,
15. Grain-samplers,
16. Grist-alarms,
23. Hominy,
46. Impact pulverizers,
6. Knife-action,
1. Mill-spindles,
3. Millstone-dress,
4. Millstone-exhaust,
2. Millstone-frame,
22. Paint,
11. Rotary beaters.
Ore and coal—
52. Coal-breakers,
53. Crushers.
Separators—
54. Dry,
58. Jiggers,
59. Washers,
56. Sifters and screens—
60. Household,
57. Stamps.
Preparing grain—
28. Processes,
27. Steaming and dampening.

CLASS 84.—MUSIC. (V.)

Sub-classes.

1. Accordions.
53. Auxiliary strings.
2. Banjos and guitars.
6. Castanets.
7. Clarionets and flutes.
55. Combined organ and piano.
54. Combination organ stop-actions.
8. Cornets and trumpets.
9. Couplers.
10. Drums.
81. Electric actions.
11. Exercising devices.
13. Harmonicas.
12. Harmonic attachments—
56. Dampers.
14. Harps.
48. Indicators.
15. Insulators.
57. Key-board self-playing attachments.
58. Key-holding devices.
16. Keys and key-boards.
49. Knee-swells.
17. Leaf-turners.
79. Mouth-pieces.
18. Notation.
19. Organ-actions—
50. Pneumatic,
20. Bellows,
21. Cases,
22. Pipes,
59. Stop-actions,
23. Swells,
47. Wind-chests.
24. Pedals.
61. Pianissimo devices.
25. Pianos—
63. Horizontal,
Pianos—
70. Sostenuto,
62. Upright,
31. Without strings.
26. Piano-actions—
65. Horizontal,
60. Pedal,
64. Upright.
66. Piano agraffes and bridges—
27. Attachments,
52. Cases,
28. Frames,
29. Legs,
30. Sounding-boards,
40. Stringing,
67. Tuning-pins.
32. Pipe-organs.
68. Recording attachments.
33. Reeds.
34. Reed-boards—
35. Organs,
36. Organ attachments.
37. Self-playing instruments—
71. Cylinder,
51. Pneumatic.
69. Solo attachments.
38. Steam-organs.
41. Transposers.
42. Tremolos.
43. Tuning-instruments.
44. Violins—
76. Practice.
72. Violin-bows—
73. Bridges,
74. Chin-rests,
75. Dampers and mutes,
77. Tail-pieces,
78. Tuning-pegs.
80. Zithers.

CLASS 85.—NAILS AND SPIKES. (XIII.)

Sub-classes.

1. Cut-nail making.
3. Horseshoe-nail-blank finishing.
2. Horseshoe-nail cutting.
4. Horseshoe-nail forging.
6. Nail-distributers.
8. Nail-plate feeders.
9. Nails and spikes.
15. Shoe nails and tacks.
16. Spike-making.
17. Wrought-nail making.

CLASS 163.—NEEDLES AND PINS. (XIII.)

Sub-classes.

1. Machine-needles, Making
4. Pins, Making
5. Pins, Papering
6. Sewing-needles, Making

CLASS 151.—NUT AND BOLT LOCKS. (XXVIII.)

Sub-classes.

9. Base.
1. Base, key and ratchet.
2. Base, washer.
3. Side.
4. Side, key and ratchet.
5. Thread.
6. Thread, key and ratchet.
7. Top.
8. Top, key and ratchet.

CLASS 87.—OILS, FATS, AND GLUE. (VI.)

Sub-classes.

17. Adhesives.
18. Artificial butter.
1. Barrel-linings.
2. Bleaching.
3. Candles and apparatus.
4. Decomposing fats.
5. Detergents.
6. Extracting oils.
7. Glue.
8. Lard-coolers.
9. Lubricants.
10. Lubricating. Treating oils for
12. Refining fat oils.
13. Rendering.
14. Soap.
15. Soap-cutting.
16. Soap-manufacture.
19. Wax.
20. Wool-oils.

CLASS 88.—OPTICS. (XXIII.)

Sub-classes.

1. Altitude-instruments.
19. Compasses.
2. Distance-instruments.
3. Heliostats.
4. Kaleidoscopes.
5. Lenses.
6. Leveling-instruments.
7. Magic lanterns.
8. Microscopes.
20. Optometers.
9. Photometers.
10. Prisms.
11. Sextants.
12. Spectacles.
22. Spectacle-cases.
13. Stakes and targets.
14. Stereoscopes.
17. Surveying-instruments.
15. Telescopes.
21. Testing-instruments.
16. Tripods.

CLASS 89.—ORDNANCE. (XXII.)

Sub-classes.

1. Breech-loading.
2. Carriages.
19. Cartridge-feed cases.
3. Counterpoise-carriages.
4. Disabling.
21. Electrical appliances.
7. Loading.
20. Locks—
23. Recoil-operated.
9. Machine-guns.
10. Mortars.
11. Muzzle-loaders.
12. Operating ordnance.
22. Pneumatic.
13. Shields.
15. Submarine guns.
16. Tompions and valves.
17. Trunnions.
18. Vents and stoppers.

CLASS 150.—PACKING AND STORING VESSELS. (XIV.)

Sub-classes.

Cloth, leather, and rubber—
134. Bag-fasteners.
128. Bags.
129. Baskets and buckets.
130. Boxes.
131. Unclassified.

Glass and pottery—
11. Bottles and jugs—
126. Neck-collars,
135. Brush and spreader.
42. Bottle-tops.
43. Boxes and tanks.
18. Ejectors.
12. Jackets—
81. Stands,
74. Wrapper.
44. Jars—
73. Clamp,
96. Expanding-stopper,
75. Screw-cap,
97. Screw-stopper,
79. Swing-cover,
80. Swing-fastener.
15. Stopper-fasteners—
77. Cap and tie,
99. Screw-cap,
86. Swing,
87. Swing-stopper—
164. Aside,
165. Yoke,
166. Yoke and lever,
167. Yoke and top levers.
16. Stopper-locks.
107. Stopper-pullers.
17. Stoppers—
105. Cap,
145. Dose,
88. Expanding,
46. Internal,
147. Rotary.
53. Screw—
106. Cap,
146. Tube.
49. Valve—
124. Screw,
125. Siphon.

Metallic vessels—
47. Baskets and crates.
29. Boxes—
65. Blacking,
137. Compartment,
83. Knockdown,
84. Pocket.
51. Canisters.
30. Cans and unclassed vessels—
100. Single-blank.
54. Casks.
55. Closures—
56. Clamp,
57. Screw-cap,
98. Screw-stopper,
58. Seam or solder,
108. Swing-cover.
52. Coal-scuttles.
110. Ears and bails.
111. Handles.
33. Hermetic sealing.
34. Jackets—
62. Cask,
63. Package,
123. Stand.
61. Jacked and stands. Swing
64. Linings.
36. Milk-cans.
37. Nozzles and vents—
65. Screw-cap,
114. Screw.
66. Valve—
115. Screw.
72. Pistons and stirrers.
50. Slop-buckets.
Metallic vessels—
116. Spouted—
117. Feeders—
118. Piston.
119. Stands—
120. Pump.
121. Storage.
122. Transport.

Paper vessels: bags—
142. Bags—
143. Closures,
144. Square-bottom.

Paper vessels: barrels and pails—
82. Barrels.
148. Pails.

Paper vessels: Boxes. Angular—
149. Boxes, Angular—
150. Blanks, Plural,
151. Compartment—
152. Folded,
153. End folds,
154. Side and end folds,
155. Side folds,
156. Side folds and end laps,
157. End laps,
158. Side and end laps,
159. Side laps,
160. Slide,
161. Stays.

Paper vessels: Boxes. Curved—
162. Boxes, Curved—
163. Compartment.

Wooden vessels: barrels, buckets, and pails—
132. Barrels—
1. Bent,
168. Stand.
101. Bungs—
102. Expanding,
103. Plug.
4. Bungs and vents.
5. Bung-wrenches.
133. Closures—
127. Screw and bayonet.
6. Covers.
7. Hoops.
8. Linings and coverings.
10. Stands.

Wooden vessels: baskets—
41. Baskets—
91. Covered,
67. Folding.

Wooden vessels: boxes—
19. Boxes—
94. Closures,
140. Compartment,
169. Bent—
92. Closures,
136. Linings and coverings,
93. Single blank,
95. Block.
20. Can and bottle cases.
21. Cell-cases—
68. Cloth or cord cells,
141. Paper box,
69. Paper cells,
70. Wood cells,
71. Wood-veneer cells.
22. Crates.
23. Crates and boxes, Folding—
109. Knockdown.
104. Linings and coverings.
27. Powders. Cases for
113. Stays. Corner-
112. Straps.

CLASS 91.—PAINTING. (VI.)

Sub-classes.

2. Enameling wood.
3. Fireproofing compounds.
4. Graining.
Ink—
21. Indelible,
5. Printing,
6. Writing.
7. Japanning.
8. Lamp-black.
9. Mixed paints.
20. Painting.
11. Painting-machines.
12. Paint-mixers.
22. Pigments.
13. Stencils.
14. Stove-polishes.
15. Striping.
16. Varnishes.
17. Varnishing-machines.
19. White lead.

CLASS 92.—PAPER-MAKING. (XV.)

Sub-classes.

1. Bleaching.
2. Bronzing-machines.
3. Calendering.
24. Carpet-lining.
4. Coating.
5. Digesters.
6. Disintegrating fibrous substances.
7. Fabrics.
8. Fibers.
9. Flocking.
10. Materials.
11. Molding machines and articles.
12. Ornamenting.
13. Paper-board.
14. Paper-hanging machines.
15. Paper-making machines.
16. Parchment.
17. Processes.
18. Pulp-engines and bed-plates.
19. Pulp washing and straining.
20. Rag dusters and engines.
21. Stock-grinders.
22. Waterproofing and sizing.
23. Wood-grinders.

CLASS 93.—PAPER-MANUFACTURES. (XVII.)

Sub-classes.

2. Articles.
3. Attaching labels.
5. Bag-machines.
6. Bank notes, checks, and bonds.
10. Box-machines.
11. Collar, cuff, and bosom machines.
13. Cutters. Reciprocating
14. Cutters. Rotary
15. Envelopes.
16. Envelope-machines.
17. Feeding.
18. Folding.
19. Label and tag machines.
21. Perforating and lace paper.
22. Postage and revenue stamps.
23. Tickets.
24. Tube-machines.
25. Wrapping-machines.

CLASS 94.—PAVING. (XV.)

Sub-classes.

2. Gutters.
Pavements—
1. Concrete,
3. Iron,
5. Stone,
Pavements—
8. Wood.
4. Road-rammers.
6. Tools.
7. Vault-covers.

CLASS 95.—PHOTOGRAPHY. (V.)

Sub-classes.

34. Actinometers.
1. Backgrounds and reflectors.
2. Baths. Chemical
3. Baths. Mechanical
4. Burnishers. (Presses.)
5. Cameras.
6. Camera attachments—
37. Shutters,
7. Stands.
8. Coloring.
30. Combined apparatus.
9. Daguerreotypy.
10. Dark-chambers.
11. Dippers.
12. Embossing.
13. Enameling.
14. Eye-rests.
31. Galleries.
15. Head-rests.
16. Heaters and driers.
17. Mechanical printing.
18. Mounts and mounting.
19. Negatives.
32. Photosculpture.
22. Pictures.
36. Plate-holders.
25. Printing and vignetting.
29. Processes.
26. Retouching.
38. Roller-holders.
35. Surfaces.
28. Washing apparatus.

CLASS 97.—PLOWS. (I.)

Sub-classes.

1. Attachments.
2. Beams.
3. Cleaners.
4. Clevises.
5. Corn-coverers.
6. Colters.
7. Couplings.
8. Cotton-choppers.
9. Cotton-scrapers.
10. Cultivators—
20. Parallel,
25. Rotary,
31. Straddle-row,
34. Wheel—
35. Straddle-row.
11. Cultivator-teeth.
37. Draft-eveners.
13. Fenders.
14. Gage wheels and runners
15. Handles.
17. Landsides.
18. Mold-boards.
21. Plows—
12. Ditching,
16. Hand,
19. Mole,
26. Shovel,
27. Side-hill,
30. Steam,
36. Wheel.
22. Points.
23. Revolving mold-boards.
24. Ridgers.
28. Sod-cutters.
29. Standards.
32. Subsoilers.
33. Weed-turners.

CLASS 98.—PNEUMATICS. (XXVIII.)

Sub-classes.

1. Aerial navigation.
Air and gas pumps—
31. Hydraulic,
32. Mechanical,
33. Mercury,
34. Rotary.
5. Bellows.
Chimneys and cowls—
22. Rotary,
23. Stationary.
28. Fan attachments.
27. Fans, Automatic—
29. Toilet.
13. Sand-blowers.
Ventilation—
7. Car,
10. Grain,
11. House,
12. Mine.
19. Window-ventilators.

Sub-Classes in Pneumatics, with Explanatory Notes.

1. AERIAL NAVIGATION. Balloons and flying-machines and their fittings for navigating the air, but not advertising-balloons, (Class 40, Division V,) toy balloons, (Class 46, Division XV,) signal-balloons, (Class 116, Division XXII,) or balloons for raising sunken vessels, &c., (Class 114, Division XXII.)

(31, 32, 33, 34. AIR AND GAS PUMPS. For compressing and exhausting aeriform fluids. Includes gas-pumps for ice-machines.)

31. AIR AND GAS PUMPS. HYDRAULIC. Those using water as a piston or in which a piston is operated by direct water-pressure.

32. AIR AND GAS PUMPS. MECHANICAL. Those having reciprocating pistons operated by applied mechanical power.

33. AIR AND GAS PUMPS. MERCURY. Those in which mercury or an analogous liquid acts as a piston, as in the Sprengel and Geissler pumps.

34. AIR AND GAS PUMPS. ROTARY. Those having rotating pistons. Includes rotary blowers and all separate air forcing and exhausting fans, but not fly-fans or devices for fanning the person and the like. (Sub-classes 27, 28, and 29.)

5. BELLOWS. Air-forcing devices and fittings involving flexible diaphragms, cylinders, walls, or bags, but not bellows organized for musical instruments (Class 84, Division II) or water-pumps, (Class 103, Division IX.)

22. CHIMNEYS AND COWLS. ROTARY. Cowls which automatically move in whole or part to prevent a draft down through the smoke-flue.

23. CHIMNEYS AND COWLS. STATIONARY. Chimneys and cowls which are designed to prevent a draft down through the smoke-flue and have no moving part.

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15. SAND-BLOWERS. Rotary blowers, air-pumps, and bellows specially adapted to throw sand by a blast of air.

7. VENTILATION. CAR. Those constructions whereby fresh air is directly or through filters introduced into the cars, or foul air is forced or drawn out; but does not include cooling air, (Class 62, Division XV,) or dust-guards for car-windows, (Class 98, Division IX,) or devices involving ventilation as an incident to warming, (Class 126, Division XIX.)

10. VENTILATION. GRAIN. Devices and flues for supplying fresh air to grain in bins, bulk, and stacks, but not devices and methods for *drying* grain by heat, (Class 34, Division XIX.)

11. VENTILATION. HOUSE. Those constructions whereby fresh air is directly or through filters introduced into the house, or foul air is forced or drawn out; but does not include cooling air, (Class 62, Division XV,) window-ventilators as defined, (Class 98, Division IX,) or devices involving ventilation as an incident to warming, (Class 126, Division XIX.)

12. VENTILATION. MINE. Those constructions whereby fresh air is directly or through filters introduced into mines and tunnels, or foul air or fire-damp is forced or drawn out; but does not include cooling air (Class 62, Division XV) or devices involving ventilation as an incident to warming, (Class 126, Division XIX.)

19. WINDOW-VENTILATORS. Ventilators depending in whole or part on the raising or lowering of the sash, removable ventilators which are inserted in the open window under or over the sash, devices for preventing moisture on the glass, schemes for ventilating bulk-head windows, and car-window dust-guards, all when mere attachments; but does not include ventilators or dust-guards involving the construction of the window or its frame, nor window-screens. (Class 20, Division IV.)

CLASS 99.—PRESERVING. (VI.)

Sub-classes.

1. Antiseptics.
2. Apparatus.
4. Cold.
5. Desiccation.
6. Egg-testers.
7. Embalming.
8. Exclusion of air.
11. Food compounds.
9. Fumigation.
10. Pasteurization.
12. Wood saturation.

CLASS 100.—PRESSES. (II.)

Sub-classes.

7. Baling—
27. Bale-box attachments,
21. Rack bar and pinion,
22. Ratchet and grapple bar,
29. Rebounding plunger,
23. Revolving bale-boxes,
24. Screw,
25. Toggle-joint,
31. Windlass.
2. Bale-band tighteners.
1. Bale-ties—
19. Wire.
26. Can-filling machines.
4. Cheese.
5. Cider and wine.
6. Cloth.
9. Flour-packers.
10. Fruit-packers.
11. Fruit.
26. Fuel.
12. Hop.
13. Lard and oil.
17. Oil-press mats.
18. Paint-expellers.
30. Silos.
14. Sugar.
15. Tobacco.
16. Wool.

CLASS 101.—PRINTING. (XVII.)

Sub-classes.

1. Addressing.
2. Autographic.
3. Blankets.
4. Block.
5. Branding-stamps.
7. Calico and fabric.
6. Card, tag, and ticket.
8. Chases.
9. Chromatic.
10. Composing-sticks.
11. Copying.
12. Cylinder.
13. Damping.
14. Delivering.
15. Electrotyping
16. Frisketa.
17. Furniture.
18. Galleys.
19. Glass.
20. Hand-stamps.
21. Inking.
22. Lever-presses.
23. Lithographic.
44. Matrix-making.
24. Oscillating.
25. Paging and numbering.
26. Perforating-stamps.
27. Plate.
28. Reciprocating.
29. Registering.
30. Rotary
31. Rules.
32. Setting and distributing.
33. Spool.
34. Stereotyping.
35. Stereotype blocks—
36. Plate holders.
37. Surfaces.
38. Types.
39. Type beds—
40. Cases.
41. Machines.
42. Type-writing.
43. Warp and yarn.

CLASS 102.—PROJECTILES. (XXII.)

Sub-classes.

1. Blasting and fuses.
2. Bomb-lances.
3. Cap-boxes
4. Cap-filling.
19. Cartridge implements.
5. Cartridge-loading.
6. Cartridges—
20. Electric.
7. Flasks and chargers.
8. Lubricating.
9. Marine torpedoes.
11 Primers.
12. Projectiles.
13. Rockets.
14. Sabots and wads.
15. Shells.
16. Shell-fuses.
17. Shot-cartridges.
18. Torpedoes.

CLASS 103.—PUMPS. (IX.)

Sub-classes.

45. Accumulators.
2. Attachments.
46. Brakes.
5. Cattle.
6. Chain.
7. Compound.
8. Compressed-air water-elevators.
10. Diaphragm.
11. Double-acting.
12. Double-cylinder.
13. Double-piston.
14. Drainage.
16. Force.
17. Hollow piston-rod.
22. Lift.
47. Lift and force.
48. Miscellaneous parts.
23. Oil.
25. Oscillating.
37. Pistons.
20. Rams.
44. Rotary double piston.
43. Rotary single piston.
31. Sand.
32. Ship.
35. Windlass water-elevators.

CLASS 104.—PUNCHING AND SHEARING. (XIII.)

Sub-classes.

1. Cutting.
2. Punching.
3. Sawing metal.
5. Shears. Lever and sliding
4. Shears. Rotary

CLASS 105.—RAILWAY-CARS. (X.)

Sub-classes.

1. Axle-boxes.
2. Axle-box lids.
3. Axle-lubricators.
4. Axles.
5. Baskets.
6. Brakes—
7. Automatic,
8. Rail.
9. Brake-shoes.
10. Bumpers.
Cars—
14. Dumping,
15. Freight,
16. Hand,
19. Passenger,
22. Safety,
23. Sleeping,
28. Steam street,
31. Street.
11. Change-able gage-trucks.
12. Couplings.
13. Draw-bars.
17. Locomotives.
20. Platforms.
21. Safety-bridges.
24. Springs.
25. Stake-holders.
26. Starters.
27. Starters and brakes.
35. Straps.
30. Street-car poles.
32. Trucks.
33. Wheel-fenders.
34. Wheels.

CLASS 104.—RAILWAYS. (IV.)

Sub-classes.

49. Buffers.
1. Car-replacers.
2. Chairs.
63. Compensators.
40. Crossings.
3. Deadening noise.
75. Deflection-stands.
76. Detector-bars.
4. Elevated.
50. Foot-guards.
5. Frogs.
35. Grippers—
87. Automatic release,
88. Friction,
89. Friction-belt,
90. Roller,
91. Sprocket-wheel,
92. Whelp-wheel.
7. Hose-bridges.
8. Inclined plane.
39. Interlocking.
9. Pneumatic—
93. Dispatch-tubes.
60. Pot-sleepers.
54. Rail-braces.
11. Rail-joints.
10. Rails.
21. Signals—
42. Automatic alarm,
67. Bar,
71. Danger,
31. Detonating,
68. Light,
27. Pneumatic,
69. Portable,
22. Switch,
70. Train-order.
94. Signals, Automatic—
72. Setting apparatus,
73. Tappets,
74. Trips.
61. Sledways.
95. Switch-chairs.
96. Switch-rods.
25. Switch-stands.
12. Switches—
23. Automatic,
77. Automatic safety,
26. Pneumatic,
78. Safety,
79. Spring,
24. Tramway.
13. Tank-feeders.
Track—
44. Fastenings,
14. Miscellaneous,
45. Portable,
46. Stringers and ties,
55. Metallic.
Track-cleaners—
36. Centrifugal,
37. Dumping,
38. Elevators,
56. Explosive,
52. Melters.
58. Removing weeds,
Snow-plows,
51. Stock-alarms,
57. Wheel-fenders.
16. Track-layers.
17. Track-platforms.
59. Track-raisers.
18. Traction—
80. Cable-shields,
81. Crossing conduits,
82. Crossing streams,
83. Curves,
53. Running and carrying rope,
84. Slot-closers,
85. Slot-switches,
86. Take-ups,
48. Transfer-tables,
64. Truck-changers,
19. Turn-tables,
47. Underground,
62. Yards and plants.

CLASS 62.—REFRIGERATION. (XXVIII.)

Sub-classes.

1. Air-cooling apparatus.
2. Beer-coolers.
3. Corpse-coolers.
4. Ice-cream freezers.
5. Ice-crushers.
6. Ice-machines.
7. Ice picks and shavers.
8. Implements.
10. Refrigerators.
11. Refrigerator-buildings.
12. Refrigerator-cars.
13. Water-coolers.
14. Wine-coolers.

CLASS 106.—ROOFING. (IV.)

Sub-classes.

1. Battening.
2. Eaves-troughs.
3. Fenders.
4. Metallic.
5. Roofs.
6. Slate and shingle.
7. Tile.

CLASS 109.—SAFES. (XX.)

Sub-classes.

1. Burglar-proof.
2. Fire-proof.
3. Safe bolt-work.

CLASS 111.—SEEDERS AND PLANTERS. (I.)

Sub-classes.

1. Broadcast—
2. Hand,
3. Revolving hoppers,
4. Walking.
5. Check-row.
8. Cups on belt.
9. Cups on disk.
Drills—
35. Adjustable rank,
18. Grain,
36. Walking.
10. Drills and broadcast combined.
11. Drill-teeth.
12. Elastic feed-wheels.
34. Fertilizer-distributers—
13. Hand,
14. Revolving hoppers,
15. Walking.
17. Force-feed.
19. Grain-drill cleaners.
24. Land-markers.
25. Pivoted seed-cups.
Planters—
6. Corn,
7. Cotton,
16. Foot,
20. Hand—
21. Oscillating,
22. Reciprocating,
23. Rotating,
27. Potato—
28. Walking,
32. Walking—
33. Vibrating hoppers.
26. Plungers.
29. Preparing seed.
37. Rolling hoppers.
31. Screw-feed.

CLASS 182.—SEWERAGE. (IV.)

Sub-classes.

1. Backwater and animal gates.
2. Cleaning.
3. Construction.
4. Flushing.
5. Man-holes and catch-basins.
6. Mechanical treatment.
7. Systems.

CLASS 112.—SEWING-MACHINES. (XXIV.)

Sub-classes.

35. Attachment-holders.
1. Binders.
2. Bobbin-winders.
41. Book-sewing.
3. Braiders and corders.
43. Broom-sewing.
4. Button-hole.
5. Chain and double chain.
7. Embroidering.
8. Feeding.
36. Glove-sewing machines.
9. Guides.
10. Hemmers.
34. Methods.
29. Miscellaneous parts.
11. Needles.
37. Needle-clamps.
13. Presser-feet and lifters.
14. Quilting.
38. Revolving hooks.
15. Revolving-hook machines.
16. Rufflers and gatherers.
17. Running-stitch.
18. Setters and threaders.
31. Sewing hats.
19. Sewing looped fabrics.
32. Sewing on buttons.
42. Sewing rugs.
20. Sewing shoes.
21. Short-thread.
22. Shuttle-machines.
23. Shuttles and bobbins.
24. Special machines.
25. Straw.
26. Take-ups.
39. Tensions.
33. Thread-cutters.
6. Trimmers.
27. Tuck creasers and markers.
12. Tucking-guides.
40. Turfing fabrics.
28. Wax-thread.

Sub-Classes in Sewing-Machines, with Explanatory Notes.

35. ATTACHMENT-HOLDERS. Devices adapted to secure different kinds of attachments in proper position relative to the sewing mechanism.

1. BINDERS. Attachments for guiding a binding and the fabric, to the edge of which it is to be secured, to the sewing mechanism.

2. BOBBIN-WINDERS. Attachments for winding or filling the bobbins or spools of shuttles and rotary hooks.

41. BOOK-SEWING. Machines and appliances for holding, feeding, and stitching signatures in book-binding.

3. BRAIDERS AND CORDERS. Attachments for guiding braids or cords to the sewing mechanism.

43. BROOM-SEWING MACHINES. For stitching brooms with cord, wire, &c.

4. BUTTON-HOLE. Machines and attachments for sewing over-edge or zigzag stitches for working the edges of button-holes or fabrics, or ornamenting fabrics.

5. CHAIN AND DOUBLE CHAIN. Machines for forming chain or loop stitches with one thread and double chain or double loop stitches with two threads, respectively.

7. EMBROIDERING. Machines and attachments for ornamenting fabrics with thread.

8. FEEDING. Includes improvements which relate to feeding mechanisms only.

36. GLOVE-SEWING MACHINES. Machines for sewing the seams of gloves.

9. GUIDES. Attachments for guiding fabrics to the sewing mechanism.

10. HEMMERS. Attachments for turning hems and guiding the fabrics to be hemmed to the sewing mechanism.

34. METHODS. Particular methods of forming stitches and peculiar methods of sewing.

29. MISCELLANEOUS PARTS. Sundry devices or machines not properly classifiable under other heads.

11. NEEDLES. Sewing-machine needles only.

37. NEEDLE-CLAMPS. Devices for securing the needle to the needle-bar.

13. PRESSER-FEET AND LIFTERS. Presser-feet and devices for raising the same when the work is to be removed or inserted; also, mechanisms for automatically lifting the presser-foot at each stitch.

14. QUILTING. Machines for sewing several seams simultaneously by means of multiplex stitch-forming mechanisms; also, attachments to ordinary machines for holding fabrics to be quilted.

38. REVOLVING HOOKS. Includes improvements in hooks and loopers, oscillating or revolving, and means for attaching the same to the shaft.

15. REVOLVING-HOOK MACHINES. Machines for forming lock-stitches by means of a needle and a co-operating rotary hook which carries the needle-thread around a locking-thread from a bobbin or spool which is in most instances stationary.

16. RUFFLERS AND GATHERERS. Attachments for forming ruffling, plaiting, and shirring, either by means of a tension-plate which checks the movement of one of two strips of fabric, thus permitting the other to be moved faster by the feeding device, or by means of reciprocating blades or other moving devices.

17. RUNNING-STITCH. Machines which crimp the fabric and feed the same on to a stationary threaded needle, thus forming the ordinary hand running-stitch.

18. SETTERS AND THREADERS. Attachments for properly setting the needle in the needle-bar and for threading the same.

31. SEWING HATS. Machines and attachments for sewing linings, bindings, &c., to hats.

19. SEWING LOOPED FABRICS. Special machines for uniting the edges of knitted goods by sewing.

32. SEWING ON BUTTONS. Machines and attachments for sewing buttons to fabrics.

42. SEWING RUGS. Includes frames, &c., upon which rugs, yarns, &c., are wound to be presented to the stitch-forming mechanism of sewing-machines.

20. SEWING SHOES. Machines for sewing the soles of boots and shoes to their uppers.

21. SHORT-THREAD. Machines other than running-stitch machines using measured lengths of thread, in contradistinction to those machines which sew with continuous threads.

22. SHUTTLE-MACHINES. Machines which form the lock-stitch by means of a needle and a co-operating shuttle.

23. SHUTTLES AND BOBBINS. Includes improvements in shuttles and bobbins, or spools for the same.

24. SPECIAL MACHINES. Machines for doing special kinds of work not otherwise properly classifiable.

25. STRAW. Machines for sewing straw braid into hats and bonnets.

26. TAKE-UPS. Includes improvements which relate to take-up devices only.

39. TENSIONS. Includes improvements which relate to tension devices only.

33. THREAD-CUTTERS. Devices for cutting the threads when the work is to be removed from the machine.

6. TRIMMERS. Attachments for trimming off the edges of the work simultaneously with the sewing.

27. TUCK CREASERS AND MARKERS. Attachments for creasing or marking the work simultaneously with the formation of a seam, to indicate where the fabric is to be folded to form the succeeding tuck.

12. TUCKING-GUIDES. Guiding attachments for forming plaits.

40. TURFING FABRICS. Apparatus for inserting a loop or a series of loops of pile, yarn, rags, &c., through perforations made in a foundation fabric.

28. WAX-THREAD. Machines for sewing leather, &c., with waxed threads; also, thread-waxing devices for such machines.

CLASS 113.—SHEET-METAL WARE, MAKING (XIV.)

Sub-classes.

23. Burnishing.
1. Cutting printers' leads.
2. Edging sheets.
3. Roller-tools.
4. Screw-thread bending.
5. Seaming sheets.
24. Spinning.
11. Tools.
12. Troughs and moldings.
Soldering—
6. Clamps.
7. Irons—
25. Heaters.
8. Machines—
26. Dip.
27. Soldering.
Soldering—
10. Solders.
Tubing—
13. Curved and spouts.
14. Grooving and seaming.
15. Pipe-elbows, Making
16. Straight, Making
Vessels—
17. Bending, Angular—
18. Curved.
19. Seaming, Die—
21. Roller.
20. Shaping, Die—
28. Fillers and forcers.
22. Wiring and flanging.

CLASS 114.—SHIPS. (XXII.)

Sub-classes.

1. Anchors.
2. Anchor-trippers.
3. Armor-clad.
4. Ballasting.
5. Berths, cabins, and furniture.
6. Bilge-water. Discharging
9. Building.
10. Cables and cable-stoppers.
12. Camels.
14. Center-boards and keels.
15. Cleats and belaying-pins.
16. Couplings and tow-lines.
17. Dead-lights.
18. Decks and hatches.
19. Fire-extinguishers.
21. Floating-docks.
22. Form.
23. Gangways and bridges.
24. Hanks, cringles, and hoops.
25. Hawser-clamps.
26. Ice boats and breakers.
27. Implements.
28. Iron.
29. Leak-stoppers.
30. Light and air ports.
32. Masts and spars.
46. Oil-distributers.
33. Raising sunken vessels.
34. Reefing and furling sails.
35. Sails and rigging.
36. Scows.
37. Scuppers and hawse-holes.
38. Steamboat-chimneys.
39. Steering mechanism—
47. Hydraulic,
48. Pneumatic,
50. Rudders,
49. Wheels and channels.
40. Submarine and torpedo.
41. Surge-relievers.
42. Travelers.
43. Turrets.
44. Valve and port stoppers.
45. Ventilating.

CLASS 116.—SIGNALS. (XXII.)

Sub-classes.

1. Alarms—
Burglar—
41. Combined,
42. Detonating,
43. Miscellaneous,
44. Ringing,
11. Fire,
15. Leak,
22. Shoal.
32. Annunciators.
33. Bells—
34. Call,
35. Door,
36. Letter-box,
37. Sleigh.
38. Bell-hanging—
39. Pulls,
40. Ringing.
12. Flag-staff holders.
31. Indicators.
22. Semaphores.
Signals—
9. Car,
13. Fog,
18. Nautical,
19. Pneumatic,
30. Pyrotechnic.
26. Speaking-tubes.
27. Station-indicators.

CLASS 117.—SILK. (XXI.)

Sub-classes.

1. Assorting.
2. Cleaning.
3. Cocooneries.
4. Doubling.
5. Silk.
6. Stretching.
7. Throwing.
8. Winding.

CLASS 118.—SPINNING. (XXI.)

Sub-classes.

1. Bobbin and cop builders.
2. Bobbins.
26. Clearers.
4. Cop-tubes.
5. Domestic.
6. Doubling.
7. Drawing and evening.
23. Drawing rollers.
17. Drawing stop mechanism.
28. Drawing trumpets.
29. Fliers.
8. Hemp, flax, and hair.
9. Mules and jacks.
10. Ring-frames.
11. Rings and travelers.
27. Spindles and appurtenances.
Spindles and bearings—
18. Bolsters,
19. Combined bearings,
20. Sleeve whirls and standards,
25. Spindles and bearings,
21. Steps.
24. Spindle-driving devices.
12. Stopping.
22. Top-roll saddles.
13. Throstles and caps.
14. Twisting-heads.
16. Yarn-controllers.

CLASS 120.—STATIONERY. (V.)

Sub-classes.

4. Bill-files.
5. Blotters.
6. Calendars.
7. Copy-holders.
39. Desk-rulers.
9. Erasers.
11. Fountain-pens.
12. Hand-rests.
13. Inkstands.
37. Knife erasers.
38. Lead and crayon holders.
36. Paper-clips.
17. Paper-weights.
18. Pens.
19. Pen-holders.
20. Pen and pencil cases.
21. Pen racks and cleaners.
22. Pencils.
23. Pencil-clasps.
24. Pencil-holders
25. Pencil-sharpeners.
26. Post-office boxes.
28. Scholars' companions.
29. Slate and blackboard rubbers.
30. Sponge-cups.
35. Stylographic pens.
32. Ticket-cases.
33. Ticket-reels.

CLASS 160.—STEAM AND VACUUM PUMPS. (XVIII.)

No sub-classes.

CLASS 122.—STEAM-BOILERS. (XVIII.)

Sub-classes.

1. Attachments.
2. Cleaners—
31. Scrapers,
20. Steam or air jet.
3. Coverings.
5. Circulation.
22. Feeders.
6. Fire-tube.
7. Flashers.
8. Flue and tubular.
Heating feed-water—
29. Furnace-gases,
30. Steam,
21. Steam-injected.
10. Incrustation.
11. Indicators.
12. Introducing smoke and gases
13. Rotary.
32. Safety devices.
14. Sectional.
15. Separators.
16. Superheaters.
17. Tubes and flues.
4. Vapor-generators.
23. Vertical.
27. Water-tube—
28. Coil.
18. Water fire-boxes.

CLASS 119.—STEAM-BOILER FURNACES. (XVIII.)

Sub-classes.

14. Attachments.
1. Bagasse.
2. Draft-regulators.
Furnace-feeding—
3. Air,
4. Fuel.
5. Furnaces.
6. Grates and grate-bars—
10. Hollow.
9. Pulverized-fuel.
12. Smoke and gas returning.
7. Spark-arresters—
13. Conductors.

CLASS 121.—STEAM-ENGINES. (XVIII.)

Sub-classes.

1. Attachments.
Condensers—
25. Injector,
26. Surface.
46. Cylinder relief-valves.
Engines—
2. Beam,
47. Bell-ringer,
3. Compound,
5. Direct-acting,
7. Fire,
16. Hammer,
9. Locomotive,
35. Multiple-cylinder,
48. Multiple-piston,
11. Oscillating,
13. Portable, traction, and dummy,
17. Pumping—
40. Duplex,
18. Rock-drilling,
14. Rotary—
30. Concentric-piston,
31. Eccentric-piston,
36. Impact,
34. Oscillating-piston,
41. Reciprocating-piston,
50. Wabbling-piston,
Engines—
51. Single acting—
52. Compound,
19. Steam-steering.
6. Exhaust mechanism.
27. Exhaust regenerated.
22. Mufflers.
Packing—
28. Compound and textile,
12. Metallic piston,
29. Rod,
32. Steam-joint.
53. Pistons.
23. Speed-governors—
37. Centrifugal,
38. Marine,
42. Pressure.
54. Steam sanding device.
20. Trips—
43. Expansion.
21. Valve-gear—
44. Link,
45. Rod,
33. Shifting-eccentric—
55. Automatic.
56. Tripping cut-off.

CLASS 136.—STEAM-ENGINE VALVES. (XVIII.)

Sub-classes.

1. Balanced-slide—
13. Double,
14. Roller.
2. Cut-off.
3. Gage-cocks.
4. Governor.
5. Piston.
6. Puppet.
12. Reversing.
7. Rotary.
9. Safety.
8. Slide.
10. Steam-actuated.
11. Throttle.

CLASS 161.—STEAM WATER-ELEVATORS. (XVIII.)

No sub-classes.

CLASS 125.—STONE-WORKING. (XV.)

Sub-classes.

2. Channeling-machines.
3. Chucks for rock-drills.
4. Diamond-tools.
5. Dressing slate.
6. Dressing stone.
10. Drills.
11. Millstone-dressing machines.
12. Millstone paint-stuffs.
13. Millstone-picks.
14. Mining-machines.
15. Monuments.
18. Sawing stone.
19. Tools.

CLASS 186.—STORE SERVICE. (XII.)

Sub-classes.

3. Buffers.
4. Carriers.
5. Carriers. Wheeled
6. Elevators and drops.
1. Gravity.
2. Propulsion.
10. Store service.
7. Switches.
9. Vending apparatus.
8. Ways.

CLASS 126.—STOVES AND FURNACES. (XIX.)

Sub-classes.

Boilers—
1. Agricultural,
16. Domestic—
17. Steamers,
84. Stand.
Burners—
79. Hay and straw,
49. Refuse.
9. Coffee and tea pots.
12. Corn-poppers.
13. Dampers—
14. Automatic.
95. Dough-raisers.
20. Fenders.
21. Fire-dogs.
22. Fire-places—
89. Blowers,
68. Fire-backs,
23. Fronts,
24. Grates,
70. Hot-air.
25. Fire-pots and linings.
27. Foot-warmers.
90. Fuel-boxes.
Furnaces—
76. Cremation,
37. Hot-air—
86. Steam,
43. Magazine,
46. Portable.
28. Glue-pots.
29. Grates—
96. Adjustable,
98. Compound-movement,
97. Cut-offs,
102. Raking-attachment,
99. Reciprocating,
100. Rocking-bar,
78. Rotary,
101. Vertical-movement.
31. Gridirons.
Heaters—
5. Barrel,
73. Car—
75. Pendent,
74. Steam,
15. Dish,
26. Flat-iron,
40. Lunch,
82. Solar,
32. Soldering-iron,
53. Heaters—Steam.
32. Heating-drums.
38. Hot-air registers.
Ovens—
4. Bakers',
19. Domestic.
87. Paint-breamers.
Pans—
2. Ash,
3. Bake,
80. Frying.
94. Pipe-hangers.
45. Platforms.
47. Pot and lid lifters.
81. Pots and kettles.
48. Ranges.
51. Shovel, tongs, and pokers.
83. Snow and ice melters.
72. Steam-radiator attachments.
85. Steam-radiators.
54. Steaming-tables.
55. Stove doors and windows.
56. Stove-hoods.
57. Stove-legs.
58. Stove lids and tops.
59. Stove-pipes.
60. Stove-pipe shelves.
61. Stove-pipe thimbles
62. Stove-shelves.
Stoves—
10. Cooking—
11. Hearths,
41. Magazine,
50. Reservoir,
71. Steam,
66. Gas,
69. Heating—
92. Central air-tube,
34. Horizontal-body,
33. Hot-air,
35. Open-front,
36. Panel,
91. Parlor,
39. Lamp,
44. Magazine—
42. Fire-place,
64. Vapor.
63. Tea-kettles.
88. Waffle-irons.

CLASS 127.—SUGAR AND SALT. (II.)

Sub-classes.

1. Bleaching cane-juice.
2. Bone-black.
3. Centrifugal machines.
4. Confectionery.
6. Cube sugar.
5. Cutters and crushers.
7. Defecating.
8. Diffusion apparatus.
9. Evaporating-pans.
10. Glucose.
19. Graining and draining.
11. Mixers.
12. Molds and carriages.
13. Pill-machines.
14. Refining salt.
15. Refining sugar.
16. Salt-making.
17. Sugar-making.
18. Vacuum-pans.

CLASS 128.—SURGERY. (XX.)

Sub-classes.

2. Atomizers.
33. Baby-jumpers—
34. Walkers.
3. Bandages.
4. Breast-pumps.
32. Capsule-machine.
5. Catamenial sacks.
9. Depuratora.
35. Dumb-bells and clubs.
10. Ear.
36. Exercising-machines.
11. Eye.
12. Inhalers and respirators.
15. Medical spoons.
23. Miscellaneous.
16. Movement cure.
17. Nasal douches.
18. Nipples.
19. Nursing-bottles.
20. Obstetrics.
21. Pessaries.
22. Pharmaceutical.
23. Scarificators and lancets.
24. Speculums.
25. Syringes.
26. Trusses.
27. Veterinary.

CLASS 129.—TANNING. (XI.)

Sub-classes.

7. Dressing.
2. Preparing hides.
3. Stretching.
4. Tanning.
5. Tanners' tools
6. Tan-vats.

CLASS 178.—TELEGRAPHY. (XVI.)

Sub-classes.

Telegraphs—
46. Automatic,
45. Circuits and systems,
47. Dial,
48. Duplex,
49. Dynamo,
50. Fire,
103. Fire alarms and extinguishers,
51. Multiplex,
52. Perforating,
54. Printing,
Telegraphs—
55. Quadruplex,
56. Railway-car,
63. Reed.
10. Circuit-closers.
12. Condensers.
29. Keys.
30. Lightning-arresters.
35. Morse registers.
41. Relays and sounders
42. Repeaters.
69. Transmitters.

CLASS 179.—TELEPHONY. (XVI.)

Sub-classes.

82. Anti-induction devices.
81. Conductors. Anti-inductive
Telephones—
57. Calls,
58. Details,
59. Electric,
60. Magnetic,
Telephones—
62. Radiophones,
77. Relays and repeaters,
100. Supports.
85. Switch-boards,
71. Switches,
64. Systems—
101. Automatic.

CLASS 130.—THRASHING. (XXV.)

Sub-classes.

1. Band-cutters and feeders.
31. Cane-strippers.
2. Clover-hullers.
3. Corn-cribs.
4. Corn-husking implements.
5. Corn-husking machines.
Corn-shellers—
6. Breast and cylinder,
7. Disk-action,
9. Ear-grasping,
10. Implements,
8. Peripheral action.
12. Fans and regulators.
13. Flax-thrashers.
32. Fruit and vegetable separators.
14. Granaries and bins.
Grain separators—
17. Gravity,
Grain-separators—
18. Oat, seed, and garlic,
16. Rotary screens,
19. Screens and riddles,
15. Shaking screens.
Straw-carriers—
21. Endless aprons,
22. Overhung rakes,
23. Reels,
24. Shaking tables,
20. Stackers,
25. Vibrators,
26. Walking-rakes.
Thrashing-machines—
27. Cylinder-machines,
29. Dust-conveyers,
28. Flail-machines,
30. Vine and seed strippers.

CLASS 131.—TOBACCO. (II.)

Sub-classes.

1. Boxes, cases, and pouches.
2. Cigars, cigarettes, and cartridges.
18. Cigar-bundling machines.
3. Cigar-cutters.
4. Cigar holders and stands.
5. Cigar-machines—
23. Continuous filler,
24. Roller,
25. Stationary-belt,
26. Traveling-belt.
19. Cigar-makers' implements.
20. Cigar-perforators.
27. Coloring and flavoring.
28. Coloring and flavoring machines.
6. Curing.
29. Dressing-machines.
7. Granulating.
8. Leaf-treating machine.
30. Moistening apparatus.
9. Molding cigars.
10. Mouth-pieces.
11. Packing-machines.
12. Pipes and stems.
13. Pipe-cleaners.
14. Plug-making.
15. Plugs.
31. Smoking-tobacco.
22. Smoking-tubes.
16. Snuff-manufacture.
32. Substitutes.
Tobacco-cutters—
33. Pivoted-knife,
34. Reciprocating,
35. Rotary.
21. Tobacco-hangers.
36. Wrappers.

CLASS 132.—TOILET. (V.)

Sub-classes.

1. Barbers' appliances.
2. Bathers' appliances.
3. Combs.
4. Crimping and curling.
5. Hair-pins.
6. Hair and wigs.
7. Jewel-boxes.
8. Mustache-guards.
9. Nail and ear cleaners.
14. Pins.
11. Toilet-cases.
12. Tooth-picks.
13. Tweezers.

CLASS 47.—TREES, PLANTS, AND FLOWERS. (II.)

Sub-classes.

2. Bouquet-holders.
4. Flower pots and stands.
6. Grafting.
13. Hedge-training.
7. Hop-culture.
14. Plant and tree culture.
8. Plant and tree protectors.
10. Propagation.
11. Sap-spouts.
12. Trellises.

CLASS 135.—UMBRELLAS AND CANES. (V.)

Sub-classes.

2. Canes.
3. Combined cane and umbrella.
4. Covers.
5. Drip-cups.
7. Handles and sticks.
8. Ribs and stretchers.
9. Runners and notches.
10. Tip-cups.
13. Umbrellas, Folding—
14. Self opening and closing,
12. Supporters.

CLASS 27.—UNDERTAKING. (XX.)

Sub-classes.

1. Biers.
2. Burial apparatus.
3. Coffins.

CLASS 146.—VEGETABLE CUTTERS AND CRUSHERS. (II.)

Sub classes.

8. Apple-parers.
16. Bunching-machines.
Crushers and graters—
15. Reciprocating,
9. Rotary.
Cutters—
12. Bread,
7. Reciprocating,
Cutters—
11. Rotary.
2. Fruit-squeezers.
3. Nut-crackers.
14. Peelers and washers.
6. Pitters, corers, and eye-cutters.
5. Seeders.

CLASS 152.—WAGON, CAR, AND TRACK IRONS. (XIII.)

Sub-classes.

1. Car axles and boxes. Making
2. Car and locomotive irons.
3. Carriage clips and shackles.
4. Carriage-irons. Miscellaneous
5. Car-wheels and tires.
6. Fifth-wheels. Making
7. Railway-chairs.
8. Repairing and capping rails.
9. Tire-heating furnaces.
10. Tire-upsetting.
11. Track-irons. Miscellaneous
12. Wagon axles and boxes. Making
13. Wagon tires and fellies. Making

CLASS 141.—WASHING APPARATUS. (XXVII.)

Sub-classes.

6. Barrel-washers.
7. Bottle and can washers.
9. Dish-cleaners.
8. Dish cleaners and drainers. Combined
10. Dish-cloth holders.
11. Dish-drainers.
12. Pitching casks.
3. Tumbler-washers.
5. Wool-washing machines.

CLASS 137.—WATER-DISTRIBUTION. (IX.)

Sub-classes.

1. Aquariums.
32. Check-valves.
Cocks and faucets—
26. Compound,
4. Reciprocating valves,
5. Sliding gates,
27. Tank,
6. Tube-compressors,
7. Turning plugs.
9. Cut-offs and spouts.
10. Filters.
11. Fountains.
12. Funnels.
33. Hose-patches.
13. Hydrants and plugs.
14. Irrigating and sprinkling.
16. Mains and pipes.
17. Nozzles.
Pipe-couplings—
28. Detachable,
34. Detachable and flexible,
29. Permanent,
30. Valved.
18. Sampling-tubes.
20. Siphons.
21. Tanks.
31. Water-supply hose-holders.

CLASS 139.—WEAVING. (XXI.)

Sub-classes.

47. Bag-turning-machines.
5. Carpet-rag looper.
6. Chenille—
40. Machines.
8. Cross-weaving.
9. Fabrics.
41. Fringe-machines.
10. Fringes.
13. Heddle-machines.
14. Heddles.
16. Jacquard mechanisms.
18. Looms—
1. Bag,
2. Basket,
3. Button-hole,
7. Circular,
11. Hair-cloth,
12. Hand,
15. Irregular,
17. Lappet,
19. Narrow-ware,
20. Needle,
23. Pile-fabric,
32. Slat, cane, and straw,
Looms—
39. Wire.
42. Pattern-chains.
21. Pickers.
22. Picker-checks.
24. Reeds and reed-making.
25. Shedding.
27. Shuttles—
44. Cop-cell and cover,
45. Float-detecting,
46. Guides and tensions.
28. Shuttle-boxes.
29. Shuttle-checks.
30. Shuttle-guards.
31. Shuttle-motions—
48. Fly,
49. Positive.
43. Shuttle-threaders.
33. Special machines.
34. Stopping.
35. Take-ups and let-offs.
36. Temples.
37. Tying-in warps.
38. Weft-forks.

CLASS 157.—WHEELWRIGHT-MACHINES. (XXIX.)

Sub-classes.

1. Axle-gages.
2. Boring hubs.
3. Carriage-bow setters.
8. Tire-setters.
9. Wheelwright-machines.

CLASS 170.—WIND-WHEELS. (XXVIII.)

Sub-classes.

4. Automatic regulators.
5. Gearing.
6. Power-transmitters.
Wind-wheels—
1. Horizontal,
Wind-wheels—
2. Vertical feathering-blades,
3. Vertical solid-wheel.

CLASS 140.—WIRE-WORKING. (XIV.)

Sub-classes.

1. Barbing—
12. Sheet-metal,
22. Tools.
3. Bending.
4. Bending and coiling.
5. Bending and twisting.
6. Coiling.
7. Covering.
8. Cutting and straightening.
9. Fabrics—
10. Making,
90. Working.
21. Feeding and tension
13. Heddles. Making
14. Joining.
15. Reels and spools.
16. Tools.
17. Wiring bottles and corks—
18. Brushes and cards,
19. Wood—
11. Fences,
23. Fencing.

CLASS 143.—WOOD-SAWING. (XXIX.)

Sub-classes.

11. Log-turners.
15. Saw-bucks.
25. Saw-guards.
26. Saw-guides.
16. Saw-hanging.
Sawing-machines—
1. Band-saw.
4. Circular-saw—
22. Angular,
6. Fire-wood,
23. Radial,
24. Traveling,
29. Drag, Crank—
30. Lever,
5. Edgers,
3. Mills, Circular-saw—
31. Auxiliary-saw,
12. Reciprocating-saw,
Sawing-machines—
32. Reciprocating-saw—
21. Scroll,
13. Resawing,
20. Shingle—
33. Horizontal-saw,
28. Tubular-saw.
17. Saw-mill appliances.
34. Saw-mill carriages. Feed
35. Saw-mill carriages. Offsetting
18. Saw-mill dogs.
9. Saw-mill set-works.
14. Saws.
19. Saw-teeth.
27. Saw-table gages.

Sub-Classes in Wood-Sawing, with Explanatory Notes.

11. LOG-TURNERS. Machines for turning logs by power.

15. SAW-BUCKS.

25. SAW-GUARDS. Shields to prevent accidents.

26. SAW-GUIDES. Devices to prevent vibration of the saw.

16. SAW-HANGING. Devices for holding saws on arbors or in gates.

1. SAWING-MACHINES. BAND-SAW. Machines using an endless flexible saw.

4. SAWING-MACHINES. CIRCULAR-SAW. For sawing on a table with a circular saw without a power-driven carriage.

22. SAWING-MACHINES. CIRCULAR-SAW. ANGULAR. Circular saws arranged to cut in planes inclined to each other.

6. SAWING-MACHINES. CIRCULAR-SAW. FIRE-WOOD. Circular sawing machines adapted to cross-cut rough sticks.

23. SAWING-MACHINES. CIRCULAR-SAW. RADIAL. Circular saws arranged to make cuts radial to the log

24. SAWING-MACHINES. CIRCULAR-SAW. TRAVELING. Revolving saw is carried to the work.

29. SAWING-MACHINE. DRAG. CRANK. Drag-saws in which there are crank-connections for reciprocating the saw.

30. SAWING-MACHINES. DRAG. LEVER. Drag-saws in which the saw is reciprocated by a lever and connecting devices.

5. SAWING-MACHINES. EDGERS. Machines having two or more circular saws on a shaft, usually adjustable relatively to each other.

3. SAWING-MACHINES. MILLS. CIRCULAR-SAW. For sawing logs. A power-driven carriage is usually present. The saw cuts through the log from side to side.

31. SAWING-MACHINES. MILLS. CIRCULAR-SAW. AUXILIARY-SAW. Circular saws enter the log above and below in the same plane.

12. SAWING-MACHINES. MILLS. RECIPROCATING-SAW. Machines with carriages for feeding logs or timber to a reciprocating saw, which is generally hung in a gate.

32. SAWING-MACHINES. RECIPROCATING-SAW. Includes machines in which a reciprocating saw is present except saw-mills, scroll-sawing machines, and drag-saws.

21. SAWING-MACHINES. RECIPROCATING-SAW. SCROLL. Jig-sawing machines where the feed is by hand or under the immediate control of the operator.

13. SAWING-MACHINES. RESAWING. For dividing sawed stuff from edge to edge, usually at an angle and generally with gages at each side of the work.

20. SAWING-MACHINES. SHINGLE. For sawing beveled pieces, and having devices for shifting the bolt so as to produce the bevel.
33. SAWING-MACHINES. SHINGLE. HORIZONTAL-SAW.
28. SAWING-MACHINES. TUBULAR-SAW. The saw is a hollow cylinder.
17. SAW-MILL APPLIANCES. Attachments—as brakes, wheels, log-decks, saw-dust conveyers, and carriages.
34. SAW-MILL CARRIAGES. FEED.
35. SAW-MILL CARRIAGES. OFFSETTING. Setting the carriage away from the saw before returning.
18. SAW-MILL DOGS. Devices to clamp the log to the saw-carriage.
9. SAW-MILL SET-WORKS. Mechanism for moving a log on its carriage. Includes head-blocks and knees.
14. SAWS. Wood-saws with solid teeth.
19. SAW-TEETH. Insertible teeth and fastenings.
27. SAW-TABLE GAGES. For guiding the work on the table.

CLASS 142.—WOOD-TURNING. (XXIX.)

Sub-classes.

9. Irregular forms.
Lathes—
12. Automatic-spindle,
2. Gage,
13. Many-spindle,
14. Single-chuck,
15. Tubular-cutter.
3. Lathe appliances.
8. Oval forms.
16. Polygonal forms.
Regular forms—
17. Lateral-movement,
18. Longitudinal-movement.

Sub-Classes in Wood-Turning, with Explanatory Notes.

9. IRREGULAR FORMS. Lathes having as essential elements revolving work-spindle, revolving pattern, and a bearing-surface, which rests on the pattern and controls the movement of the work-spindle or the rotary cutter.
12. LATHES. AUTOMATIC-SPINDLE. Lathes in which the spindles close on the work, usually for turning spools, buttons, &c.
2. LATHES. GAGE. Lathes having a revolving work-spindle, a traveling cutter, and fixed pattern for guiding the cutter.
13. LATHES. MANY-SPINDLE. Lathes with a series of spindles, which usually move past a series of cutters.
14. LATHES. SINGLE-CHUCK. Lathes in which the work is chucked to a single spindle.
15. LATHES. TUBULAR-CUTTER. A hollow revolving cutting-mandrel, through which the work is fed.
3. LATHE APPLIANCES. Attachments for wood-lathes.
8. OVAL FORMS. TURNING. Spindle of lathe has double or eccentric motion.
16. POLYGONAL FORMS. TURNING. Lathes in which a rotating stick is given of substantially a polygonal form in cross-section, because of the intermittent character of the rotation or because of the large circle of rotation.
17. REGULAR FORMS. TURNING. LATERAL-MOVEMENT. Simple lathes in which the cutter moves laterally toward the work.
18. REGULAR FORMS. TURNING. LONGITUDINAL-MOVEMENT. Same as above, with cutters made to move lengthwise of the stick, or nearly so.

CLASS 144.—WOOD-WORKING MACHINES. (XXIX.)

Sub-classes.

1. Bending wood.
2. Boring—
77. Portable.
48. Boring and reaming.
78. Box-nailing machines.
79. Bundling firewood.
20. Bundling shingles.
6. Clothes-pin machines.
8. Comb-teeth. Cutting
60. Cutters, Bits and non-rotary stocks—
49. Chain,
9. Rotary-stock.
10. Cutting dye-wood.
11. Cutting gears.
14. Dovetailing.
81. Feed mechanism—
82. Rolls.
50. Gaining.
51. Machine-tables.
16. Match-splints. Making
75. Match-trays.
83. Mitering-knife—
84. Saw.
Molding—
85. Axles,
52. Clamped-work,
53. Hand-feed,
54. Lateral-feed,
55. Pattern-feed,
56. Special-feed,
57. Straight-feed.
Mortising—
58. Auger-cutters,
59. Chisel and auger cutters,
60. Chisel-cutters,
Mortising—
61. Rotary cutters.
19. Osier-peelers.
20. Packing shingles.
22. Pencil-wood. Making
23. Planer attachments.
Planers—
64. Beveling,
65. Rotary-cylinder,
66. Rotary-disk,
25. Sliding,
27. Planing and matching.
28. Planing and sawing.
63. Presser bars and rolls.
67. Punching-cutters.
29. Rossing bark.
68. Routing—
4. Pattern.
Sashes and blinds—
31. Making,
74. Tenoning.
69. Shaving. Fixed-knife
Slicers—
70. Beveling,
71. Reciprocating,
72. Rotary and oscillating.
36. Slivering.
37. Special work.
38. Splitting and bundling.
73. Tenoning and boring.
40. Universal joiners.
45. Working rattan.
46. Wiring blinds.
42. Wooden pins. Making
43. Wooden trays. Making
44. Wood ornamentation.

Sub-Classes in Wood-Working Machines, with Explanatory Notes.

1. BENDING WOOD. Includes machines for bending sticks, devices holding them bent, and machines for rendering sticks pliant for bending by steaming or otherwise.
2. BORING. Machines which operate with a simple rotary bit or bits.
77. BORING. PORTABLE. Small boring-machines, operated usually by hand, adapted to be moved along the work.
48. BORING AND REAMING. Machines which have reamers for enlarging, as well as augers for boring, holes.
78. BOX-NAILING MACHINE. Machines for nailing the parts of a box together.
79. BUNDLING FIRE-WOOD.
20. BUNDLING SHINGLES.
6. CLOTHES-PIN MACHINES. For removing the wood between the legs of clothes-pins.
8. COMB-TEETH. CUTTING. Machines for slitting the spaces between the comb-teeth, usually circular saws with intermitting feed devices for the comb-blanks.
80. CUTTERS. BITS AND NON-ROTARY STOCKS. Includes bits or irons for cutter-heads for use in machines; also, non-rotary cutter-heads.
49. CUTTERS. CHAIN. Endless chains carrying cutting-blades.
9. CUTTERS. ROTARY-STOCK. Rotary heads with cutting-blades, (other than saws and augers.)
10. CUTTING DYE-WOOD. Chip-making machines.
11. CUTTING GEARS. Machines with cutters for forming gear-teeth, and generally a step-by-step feed.
14. DOVETAILING. Machines with rotary cutters or saws arranged at angles to the wood, which is fed in straight lines.
81. FEED MECHANISM. Means for feeding the work to the cutters in wood-working machines.
82. FEED MECHANISM. ROLLS. The work is fed by means of driven rolls.
50. GAINING. Machines with rotary cutting-tools having their axes parallel (or nearly so) to the surface in which a transverse groove is cut.
51. MACHINE-TABLES.
16. MATCH-SPLINTS. MAKING
75. MATCH-TRAYS. A device for receiving, clamping, adjusting, or preparing the splints for dipping, &c., and which may be connected to or disconnected from the match-splint machine proper.
83. MITERING-KNIFE. Includes miter-boxes and like devices for cutting bevels on wood by means of knives.
84. MITERING-SAW. The cutter is a saw.
85. MOLDING AXLES. Shaping wooden axles.
52. MOLDING. CLAMPED-WORK. The blank is clamped and the cutter advanced to operate on it.
53. MOLDING. HAND-FEED. The material is shaped by rotary cutters on axes parallel to the surface cut, the feed being under immediate control of the operator.
54. MOLDING. LATERAL-FEED. Machines with rotary cutters on axes parallel to the surface operated on, the blank being fed to the cutter and then withdrawn.
55. MOLDING. PATTERN-FEED. The material is shaped by cutters, the feed being in a direction fundamentally regular but modified by transverse movements produced by patterns, cranks, or cams.
56. MOLDING. SPECIAL-FEED. The work is shaped by rotary cutters, the feed being in curved, tortuous, or irregular lines.
57. MOLDING. STRAIGHT-FEED. The work is passed by shaping-cutters in a straight line.
58. MORTISING. AUGER-CUTTERS. Slots are formed by augers, which first bore a hole to the required depth and then move sidewise, cutting at the side.
59. MORTISING. CHISEL AND AUGER CUTTERS. Augers followed or accompanied by chisels which enlarge and square the hole bored.
60. MORTISING. CHISEL-CUTTERS. Machines with reciprocating chisel.
61. MORTISING. ROTARY CUTTERS. For cutting mortises by means of rotary, oscillating, or chain cutters, the axis of the cutter being parallel to the surface of the wood.
19. OSIER-PEELERS.
20. PACKING SHINGLES.
22. PENCIL-WOOD. MAKING
23. PLANER ATTACHMENTS. Miscellaneous attachments for planing-machines.
64. PLANERS. BEVELING. For planing tapered articles—as shingles, &c.—by rotary cutters.
65. PLANERS. ROTARY-CYLINDER. Planer with rotary cutter-head on axis parallel with face of bed; knives on cylindrical surface of cutter.
66. PLANERS. ROTARY-DISK. Planers with rotary disk having knives on the flat surface, which is parallel with the bed of machine. Traversing planers.
25. PLANERS. SLIDING. Planers with fixed or reciprocating knives, the work being fed to the knife or the knife reciprocated over the work.

27. PLANING AND MATCHING. Planers with matcher-heads attached.
28. PLANING AND SAWING. Planers with circular saws or edges attached.
63. PRESSER BARS AND ROLLS.
67. PUNCHING-CUTTERS. Machines for forming cylinders, cones, &c., by cutters which surround the article, cutting its outside, and machines for cutting patterns out of veneers.
29. ROSSING BARK.
68. ROUTING. Rotary cutters with their axes at right angles to the surface operated on, and capable of lateral movement over such surface, for panel-raising, &c.
4. ROUTING. PATTERN. Routing-machines for following the contour, usually with a tracer attached to the cutter.
31. SASHES AND BLINDS. MAKING. Machines for.
74. SASHES AND BLINDS. TENONING. Cutting round tenons on blind-slats by rotary cutters, against which the slats rotate.
69. SHAVING. FIXED-KNIFE. The work fed continuously to the stationary knife.
70. SLICERS. BEVELING. Machines with reciprocating or rotary splitting-knives, to which the work is fed by mechanism.
71. SLICERS. RECIPROCATING. Machines with reciprocating splitting-knives.
72. SLICERS. ROTARY AND OSCILLATING.
36. SLIVERING. Machines with sets of fine knives for making tooth-picks, excelsior, &c.
37. SPECIAL WORK. Machines for special purposes, (as gluing, driving parts together, fastening cane-seats, felling trees, &c.)
38. SPLITTING AND BUNDLING. Includes splitting devices for making fire-wood with or without bundling attachments.
73. TENONING AND BORING. Cutting round tenons by hollow augers which may be replaced or accompanied by boring-augers.
40. UNIVERSAL JOINERS. Machines for performing several operations simultaneouly or successively.
45. WORKING RATTAN.
46. WIRING BLINDS.
42. WOODEN PINS. MAKING
43. WOODEN TRAYS. MAKING
44. WOOD ORNAMENTATION. By cutting or embossing.

CLASS 145.—WOOD-WORKING TOOLS. (XXIX.)

Sub-classes.

1. Augers—
25. Countersink.
2. Auger-handles—
26. Ratchet.
3. Bench-dogs.
4. Bench-planes—
29. Gage attachments.
5. Bit-stocks—
27. Ratchet.
6. Box-openers.
7. Box-scrapers.
22. Cant-dogs.
8. Chisels.
9. Clamps.
10. Chalk-line holders.
30. Floor sets.
11. Gages—
31. Weather-board.
23. Handsaws.
12. Hammers and hatchets.
13. Hollow augers.
15. Nail-extractors.
16. Saw-handles.
17. Screw-drivers—
28. Ratchet.
18. Spokeshaves.
19. Tools.
20. Tool-handles—
32. Fastenings.
21. Work-benches.

SUBJECTS OF INVENTION.

Subjects of invention are divided into one hundred and eighty-eight classes, and assigned for examination to the thirty Examining Divisions of this Office, as follows:

DIVISION I.—EXAMINER FOX.

Classes.

39. Fences.
55. Harrows and Diggers.
97. Plows.
111. Seeders and Planters.

DIVISION II.—EXAMINER BLODGETT.

Classes.

6. Bee-Culture.
17. Butchering.
119. Care of Live Stock.
31. Dairy.
100. Presses.
127. Sugar and Salt.
131. Tobacco.
47. Trees, Plants, and Flowers.
146. Vegetable Cutters and Crushers.

DIVISION III.—EXAMINER MACLEAN.

Classes.

7. Brewing and Fermenting.
96. Coating with Metal.
124. Distillation.
48. Gas.
75. Metallurgy.
148. Metal Tempering, Annealing, and Cementation.

DIVISION IV.—EXAMINER POND.

Classes.

14. Bridges.
37. Excavating.
159. Fire Escapes and Ladders.
183. Fire-Proof Buildings.
61. Hydraulic Engineering.
72. Masonry.
104. Railways.
108. Roofing.
182. Sewerage.

DIVISION V.—EXAMINER BURKE.

Classes.

11. Book-Binding.
41. Fine Arts.
63. Jewelry.
84. Music.
95. Photography.
120. Stationery.
132. Toilet.
135. Umbrellas and Canes.

DIVISION VI.—EXAMINER ANTISELL.

Classes.

8. Bleaching and Dyeing.
23. Chemicals.
52. Explosives.
71. Fertilizers.
44. Fuel.
149. Hides, Skins, and Leather. Chemical Treatment of
167. Medicines.
87. Oils, Fats, and Glue.
91. Painting.
99. Preserving.

DIVISION VII.—EXAM'R GOLDSBOROUGH.

Classes.

56. Harvesters.

DIVISION VIII.—EXAMINER SKINNER.

Classes.

5. Beds.
107. Bread, Cracker, and Lozenge Making.
155. Chairs.
156. Curtains, Shades, and Screens.
45. Furniture.
46. Games and Toys.
65. Kitchen and Table Articles.

DIVISION IX.—EXAMINER TRYON.

Classes.

1. Aeration and Bottling.
4. Baths and Closets.
169. Fire-Extinguishers.
138. Hydraulic Motors.
103. Pumps.
137. Water-Distribution.

DIVISION X.—EXAMINER SANDERS.

Classes.

21. Carriages and Wagons.
105. Railway-Cars.

DIVISION XI.—EXAMINER CHAPMAN.

Classes.

12. Boots and Shoes.
24. Clasps and Buckles.
54. Harness.
60. Hose and Belting.
69. Leather.
129. Tanning.

DIVISION XII.—EXAM'R AUGHINBAUGH.

Classes.

187. Elevators.
57. Hoisting.
64. Journal-Boxes, Pulleys, and Shafting.
184. Lubricators.
74. Machine Elements.
185. Mechanical Motors.
186. Store Service.

DIVISION XIII.—EXAMINER JAYNE.

Classes.

86. Arms and Projectiles. Making
59. Chains, Staples, and Horseshoes.
53. Hardware-Making.
10. Metal Bolts, Nuts, Rivets, and Screws.
77. Metal Boring and Drilling.
78. Metal-Forging.
79. Metal Personal Wear. Making
80. Metal-Rolling.
76. Metal Tools and Implements. Making
134. Metal Tubing and Wire.
82. Metal Turning, Planing, and Milling.
85. Nails and Spikes.
163. Needles and Pins.
164. Punching and Shearing.
152. Wagon, Car, and Track Irons.

DIVISION XIV.—EXAMINER STOCKING.

Classes.

153. Metal-Bending.
22. Metal-Founding.
150. Packing and Storing Vessels.
113. Sheet-Metal Ware. Making
140. Wire-Working.

DIVISION XV.—EXAMINER HUDSON.

Classes.

166. Artesian and Oil Wells.
106. Artificial Stone, Lime, and Cement.
18. Caoutchouc and Minor Plastics.
25. Clay and Pottery.
154. Composite Roofing.
38. Felting and Hat-Making
49. Glass.
92. Paper-Making.
94. Paving.
125. Stone-Working.

DIVISION XVI.—EXAMINER BROWN.

Classes.

176. Electric Lighting.
177. Electric Signaling.
178. Telegraphy.
179. Telephony.

DIVISION XVII.—EXAMINER COOKE.

Classes.

93. Paper-Manufactures.
101. Printing.

DIVISION XVIII.—EXAMINER FOWLER.

Classes.

123. Air and Gas Engines.
188. Fluid-Pressure Railway-Brakes.
50. Fluid-Pressure Regulators.
162. Injectors and Ejectors.
160. Steam and Vacuum Pumps.
122. Steam-Boilers.
110. Steam-Boiler Furnaces.
121. Steam-Engines.
136. Steam-Engine Valves.
161. Steam Water-Elevators.

DIVISION XIX.—EXAMINER STEWARD.

Classes.

126. Stoves and Furnaces.

DIVISION XX.—EXAMINER WILKINSON.

Classes.

3. Artificial Limbs.
16. Builders' Hardware.
30. Cutlery.
32. Dentistry.
70. Locks and Latches.
109. Safes.
128. Surgery.
27. Undertaking.

DIVISION XXI.—EXAMINER RANDALL.

Classes.

13. Brakes and Gins.
19. Carding.
26. Cloth-Finishing.
28. Cordage.
66. Knitting and Netting.
117. Silk.
118. Spinning.
139. Weaving.

DIVISION XXII.—EXAMINER SEATON.

Classes.

180. Accouterments and Baggage.
40. Advertising.
9. Boats.
42. Fire-Arms.
43. Fishing and Trapping.
115. Marine Propulsion.
89. Ordnance.
102. Projectiles.
114. Ships.
116. Signals.

DIVISION XXIII.—EXAM'R F. A. SEELY.

Classes.

TRADE-MARKS.
LABELS.
181. Acoustics.
33. Drafting.
35. Educational Appliances.
58. Horology.
73. Measuring-Instruments.
88. Optics.

DIVISION XXIV.—EXAMINER PIERCE.

Classes.

165. DESIGNS.
2. Apparel.
29. Crinoline and Corsets.
112. Sewing-Machines.

DIVISION XXV.—EXAMINER WYNNE.

Classes.

83. Mills.
130. Thrashing.

DIVISION XXVI.—EXAM'R GEO. D. SEELY.

Classes.

171. Electricity. Generation.
172. Electricity. Motive Power.
173. Electricity. Conductors.
174. Electricity. Medical and Surgical.
175. Electricity. Special Applications.

DIVISION XXVII.—EXAMINER GOULD.

Classes.

15. Brushing and Scrubbing.
51. Grinding and Polishing.
68. Laundry.
141. Washing Apparatus.

DIVISION XXVIII.—EXAM'R TOWNSEND.

Classes.

34. Driers.
168. Farriery.
81. Metal-Working Tools.
151. Nut and Bolt Locks.
98. Pneumatics.
62. Refrigeration.
170. Wind-Wheels.

DIVISION XXIX.—EXAMINER TYLER.

Classes.

20. Carpentry.
147. Coopering.
157. Wheelwright-Machines.
143. Wood-Sawing.
142. Wood-Turning.
144. Wood-Working Machines.
145. Wood-Working Tools.

DIVISION XXX.—EXAMINER WOODWARD.

Classes.

67. Lamps and Gas-Fittings.

PRICE LIST

OF THE

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Persons desiring to inform themselves in regard to the state of the art in any line of invention can best do so by purchasing printed copies of the specifications and drawings of patents in the sub-class containing the invention, the number and cost of which will be given upon application.

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Orders for specifications and drawings by classes should give the numbers as well as the titles of the class and sub-class.

Orders for single patents should give the number and date of the patent and the name of the inventor.

SPECIFICATIONS of patents issued since June 10, 1862, commencing with No. 35,520, have been printed up to this date; also, all patents previously issued for processes, and in classes of making Arms and Projectiles, Brakes and Gins, Distillation, Electricity, Fire-Arms, Fishing and Trapping, Harrows and Diggers, Harvesters, Injectors and Ejectors, Marine Propulsion, Metal Founding, Ordnance, Packing and Storing Vessels, Plows, Projectiles, Seeders and Planters, Sewing-Machines, Sheet-Metal-Wire Making, Steam and Vacuum Pumps, Steam Water-Elevators, Sugar and Salt, Tobacco, Trees, Plants, and Flowers, and Wire-Working, and the sub-classes of Bale-Band Tighteners, Bale-Ties, Cane-Mills, Cane-Strippers, Car-Seats, Cotton and Hay Presses, Tobacco-Driers, Tobacco-Elevators, Time-Locks, and Type-Writing.

DRAWINGS of all patents, from earliest to present date, have been photolithographed, with a few exceptions.

The cost of copies of drawings with the specifications, if printed, when ordered in quantities of twenty or more, is ten cents per copy. If the specification has not been printed, an additional cost of ten cents per hundred words for a manuscript copy of it will be charged.

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THE OFFICIAL GAZETTE OF THE United States Patent Office.

[*BY AUTHORITY OF CONGRESS.*]

VOL. 46—No. 2. TUESDAY, JANUARY 8, 1889. PRICE—$5 per year.

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Fraudulent Practices by Attorneys.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., April 18, 1888.

The attention of this Office having frequently been called to circulars and communications of persons pretending to have access to the records of this Bureau, and claiming to possess information of the pendency of applications for patents, notice is hereby given the public that all such persons in so advertising themselves are acting under false representations and are guilty of unprofessional conduct, and should not be entitled to credit.

The Office has also received information that certain attorneys disbarred from practice under section 487 of the Revised Statutes are continuing to prosecute applications for patents under the names of other persons.

Hereafter a list will be published in the OFFICIAL GAZETTE containing the names and addresses of all such persons, and the public warned against employing them or intrusting applications or interests to their charge.

BENTON J. HALL, *Commissioner.*

The Office has information that *Isaac S. McGehan, No.* 155 *Broadway, New York*, a disbarred attorney, has been practicing under the name of *Alexander Melhado.*

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of January 8, 1889.

Patents	378—No. 395,681 to No. 396,058,	inclusive.
Designs	16—No. 18,838 to No. 18,853,	inclusive.
Trade-Marks	18—No. 16,151 to No. 16,168,	inclusive.
Labels	7—No. 5,785 to No. 5,791,	inclusive.
Reissue	1—No. 10,979.	
Total issue	420	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	1	....	Nebraska	1	....
Arizona Territory	....	....	Nevada	....	....
Arkansas	2	....	New Hampshire	2	....
California	11	....	New Jersey	13	....
Colorado	5	....	New Mexico Terri'ty	....	....
Connecticut	21	....	New York	51	10
Dakota Territory	3	....	North Carolina	5	....
Delaware	....	....	Ohio	30	2
District of Columbia	5	....	Oregon	1	....
Florida	3	....	Pennsylvania	54	2
Georgia	1	....	Rhode Island	4	....
Idaho Territory	....	....	South Carolina	....	....
Illinois	37	4	Tennessee	3	....
Indian Territory	....	....	Texas	6	....
Indiana	9	....	Utah Territory	....	....
Iowa	13	....	Vermont	....	....
Kansas	7	1	Virginia	3	....
Kentucky	1	....	Washington Territ'y	....	....
Louisiana	....	....	West Virginia	....	....
Maine	....	1	Wisconsin	5	....
Maryland	5	....	Wyoming Territory	....	....
Massachusetts	36	1	United States Army	....	....
Michigan	18	1	United States Navy	....	....
Minnesota	2	....			
Mississippi	2	....	Total to citizens of		
Missouri	9	....	the United States	369	22
Montana Territory	....	....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic	....	....	Germany	4	1
Australia	....	....	Ireland	....	....
Austria-Hungary	1	....	Italy	....	....
Belgium	....	....	Mexico	....	....
Bermuda	....	....	Netherlands	....	....
Brazil	....	....	New South Wales	1	....
Canada	7	....	Russia	....	....
Chili	....	....	Scotland	2	....
Colombia, U. S. of	....	....	Sweden	1	....
Cuba	1	....	Switzerland	1	1
Denmark	....	....	Victoria	1	....
England	6	1			
Finland	....	....	Total to citizens of		
France	....	....	foreign countries	25	3

DESIGNS.

18,838.—PLATE FOR CAR-SPRINGS.—*Thomas M. Bell*, Philadelphia, Pa., assignor to *The Charles Scott Spring Company*, same place. Application filed December 3, 1888. Serial No. 292,542. Term of patent 14 years.

18,839.—BOX.—*Frank K. Bowers*, Baltimore, Md. Application filed December 4, 1888. Serial No. 292,667. Term of patent 3½ years.

18,840.—ORNAMENTATION OF CORSETS.—*Morris P. Bray*, Ansonia, assignor to *Warner Bros.*, Bridgeport, Conn. Application filed October 29, 1888. Serial No. 289,471. Term of patent 14 years.

18,841.—ORNAMENTATION OF CLOCK-CASES.—*Walter Camp*, New Haven, Conn., assignor to *The New Haven Clock Company*, same place. Application filed August 13, 1888. Serial No. 282,659. Term of patent 7 years.

18,842.—CARPET.—*Edwin Fisher*, New York, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Application filed December 10, 1888. Serial No. 293,190. Term of patent 3½ years.

18,843 to 18,848, inclusive.—RUG.—*George B. Fox*, Philadelphia, Pa., assignor to *John Bromley & Sons*, same place. Applications filed December 17, 1888. Serial Nos. 293,915 to 293,920, inclusive. Term of patents 3½ years.

18,849.—SURFACE ORNAMENTATION OF CANES, &c.—*Gottlob Hauber*, New York, N. Y. Application filed September 18, 1888. Serial No. 285,744. Term of patent 7 years.

18,850 to 18,852, inclusive.—RUG.—*Julius Pegel*, Philadelphia, Pa., assignor to *John Bromley & Sons*, same place. Applications filed December 17, 1888. Serial Nos. 293,912 to 293,914, inclusive. Term of patents 3½ years.

18,853.—PHOTOGRAPH-EXHIBITOR CASE.—*George M. Porteous* and *Frederick S. Miller*, Chicago, Ill. Application filed November 5, 1888. Serial No. 290,063. Term of patent 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,151.—TONIC MEDICINE.—*Mary Colman Barrett*, Fredonia, N. Y. Application filed November 12, 1888. Used since June 1, 1888.
"The words 'THE HEBE TONIC,' with the figures of Jupiter and Hebe."

16,152.—SHOT-GUN CARTRIDGES.—*The Peters Cartridge Company*, Cincinnati and King's Station, Ohio. Application filed October 2, 1888. Used since August 1, 1888.
"The word 'SHOTLESS.'"

16,153.—SHOT-GUN CARTRIDGES.—*The Peters Cartridge Company*, Cincinnati and King's Station, Ohio. Application filed October 2, 1888. Used since August 1, 1888.
"The representation of a shot-gun shell and the words 'SHOT-GUN BLANKS' printed thereon."

16,154.—BUTCHERS' KNIVES AND STEELS.—*Friedrich Dick*, Esslingen, Wurtemberg, Germany. Application filed November 17, 1888. Used since January 1, 1877.
"The representation of an arrow and the name of 'F. DICK.'"

16,155.—WATCHES.—*M. C. Eppenstein & Co.*, Chicago, Ill. Application filed November 5, 1888. Used since October 15, 1888.
"The word 'GIANT.'"

16,156.—LEATHER.—*Horton & Co.*, New York, N. Y. Application filed December 7, 1888. Used since January 1, 1884.
"The representation of a leaf."

16,157.—PILLS.—*Rogers & Irvin*, New York, N. Y., and Doncaster, England. Application filed June 9, 1888. Used since April 1, 1888.
"The word 'ATLANTA.'"

16,158.—PHOTOGRAPH-ALBUMS.—*Koch, Sons & Company*, New York, N. Y., and Berlin, Germany. Application filed November 2, 1888. Used since October 11, 1888.
"The words 'NON PAREIL.'"

16,159.—NUTS.—*Francis H. Leggett & Co.*, New York, N. Y. Application filed November 12, 1888. Used since November 1, 1888.
"The picture of a squirrel."

16,160.—COFFEE.—*Walter McEwan*, Albany, N. Y. Application filed November 7, 1888. Used since August 1, 1888.
"The words 'ROYAL DUTCH.'"

16,161.—COMPRESSED COOKED BEEF.—*Armour Packing Co.*, Kansas City, Kans. Application filed October 18, 1888. Used since July 19, 1888.
"The words 'LUNCHEON BEEF' associated with an oval figure in which appears a block of beef on a plate."

16,162.—ICE-CREAM FREEZERS.—*Charles G. Shepard and Walter J. Shepard*, Buffalo, N. Y. Application filed December 8, 1888. Used since January, 1888.
"The word 'LIGHTNING.'"

16,163.—CORSETS AND ATTACHMENTS FOR SUPPORTING UNDERWEAR.—*Emma J. Swarticoul*, New York, N. Y. Application filed August 25, 1888. Used since May 1, 1886.
"The word 'DELSARTE.'"

16,164.—OUTER GARMENTS FOR MEN AND BOYS.—*L. C. Wachsmuth & Co.*, Chicago, Ill. Application filed October 26, 1888. Used since October 1, 1888.
"The words 'HAPPY HOME GUARANTEE.'"

16,165.—BARLEY-FLOUR KNOWN AS FLAKES.—*Farwell & Rhines*, Watertown, N. Y. Application filed November 12, 1888. Used since December, 1887.
"The word 'CRYSTALS.'".

16,166.—UNDERWEAR.—*Jaros Hygienic Underwear Company*, Chicago, Ill. Application filed October 11, 1888. Used since September, 1877.
"The words 'JAROS HYGIENIC UNDERWEAR.'"

16,167.—ANTIPYRETIC DRUG.—*Ivan Levinstein*, Manchester, county of Lancaster, England. Application filed October 23, 1888. Used since August, 1888.
"The word 'PYRODINE.'"

16,168.—WATCHES, WATCH-MOVEMENTS, AND WATCH-CASES.—*Emile Quartier, Fils*, Brenets, Switzerland. Application filed November 17, 1888. Used since July 29, 1887.
"The representation of a bell."

LABELS.

5,785.—Title: "MISS BUELL'S LOTION" (FOR CHAPPED HANDS.)—*Mary Buell*, Chicago, Ill. Application filed December 11, 1888.

5,786.—Title: "MANTECA CHICHARRON PREPARDA ESPRESAMENTE PARA LOS CLIMAS CALIDOS ENDURECIDA."—*Central Lard Company*, New York, N. Y. Application filed November 10, 1888.

5,787.—Title: "MELLIN'S FOOD FOR INFANTS AND INVALIDS."—*Dolliber-Goodale Company*, Portland, Me., and Boston, Mass. Application filed August 13, 1888.

5,788.—Title: "HAWLEY'S SPAVIN CURE."—*Edward T. Hawley & Co.*, Detroit, Mich. Application filed December 17, 1888.

5,789.—Title: "ANTISEPTIC CATARRH CURE."—*August P. Light-Aill*, Boston, Mass. Application filed December 17, 1888.

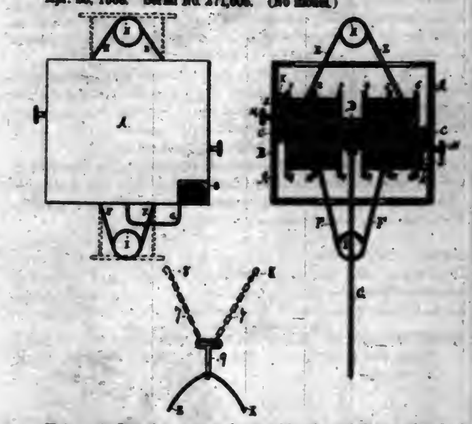
5,790.—Title: "IRIDIUM ANTI-FRICTION." (FOR METALS.)—*Merchant & Co.*, Philadelphia, Pa. Application filed December 14, 1888.

5,791.—Title: "IRIDIUM" (FOR ANTI-FRICTION METAL.)—*Merchant & Co.*, Philadelphia, Pa. Application filed December 14, 1888.

PATENTS

GRANTED JAN. 8, 1889.

395,681. FIRE-ESCAPE. JOHN ATTERS, New York, N. Y. Filed Apr. 23, 1888. Serial No. 271,608. (No model.)



Claim.—1. In a fire-escape, the combination of the case A, shaft B, drum D, mounted on the shaft, disks 1 2 3 4 5 6, attached to the drum, cords E, F, and G, and a suspending device, to which the cord E is connected, substantially as and operating in the manner specified.

2. The combination of the case A, revolving drum D, disks 1 2 3 4 5 6, attached to the drum, the wire cord E, having one end secured to the drum between the disks 1 and 2, and the other end secured to the drum between the disks 5 and 6, the wire cord F, having one end fastened to the drum between the disks 2 and 3, and the other end secured to the drum between the disks 4 and 5, and the cord G, one end of which is fastened to the center of the drum between the disks 3 and 4, after the cords E and F have been coiled upon the drum, and the other end passed out through an opening in the lower part of the case, and a suspending device, to which the cord E is connected, substantially as described.

3. In a fire-escape, the combination of the case A, shaft B, drum D, mounted on the shaft, disks 1 2 3 4 5 6, attached to the drum, cords E, F, and G, brake-levers J, provided with friction brake-shoes L, said levers being pivoted to the arms K, attached to the case, screws M, for regulating the brake-shoes, and a suspending device, to which the cord E is attached, substantially as specified.

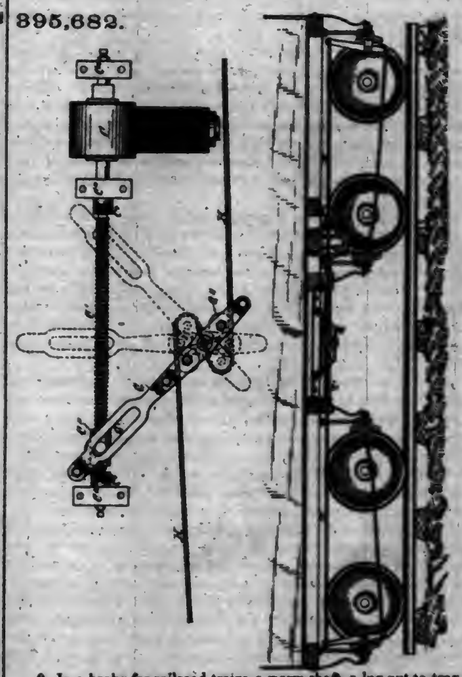
4. In a fire-escape, the combination of the case A, shaft B, drum D, disks 1 2 3 4 5 6, the cords E and F, attached to the drum and passed outside the case and there attached to a ring or bar, and the cord G, one end of which is fastened to the drum after the cords E and F have been coiled upon said drum, and a suspending device, substantially as specified.

5. In a fire-escape, the combination of the case A, shaft B, drum D, disks 1 2 3 4 5 6, and cords E, F, and G, attached to the drum, substantially as specified.

395,682. ELECTRIC TRAIN-BRAKE APPARATUS. ARCHIBALD I AMBLER, Washington, D. C., assignor to Rosaline M. Ambler, same place. Filed Apr. 16, 1888. Serial No. 271,027. (No model.)

Claim.—1. In a brake for railroad-trains, an electromotor, a series of independent batteries to energize said motor, a sliding contact-arm, fixed contact-pieces, and switch-board, substantially as described, to close and open the circuit between the motor and one or more of said independent batteries, the screw-shaft, the traverse-nut having lugs or projections thereon, a central lever, and connections between said lever and the truck-levers and brake-shoes of each car in the train, substantially as shown, as and for the purpose specified.

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2. In a brake for railroad-trains, a worm-shaft, a lug-nut to traverse thereon, an electromotor to actuate said shaft, a series of independent batteries to energize said motor, a sliding contact arm or switch, with follower to close and open the circuit between said motor and one or more of said independent batteries, independent fixed contact-pieces, truck-levers, brake-shoes, and the connections between said worm-shaft and said truck-levers and said brake-shoes, substantially as described.

3. A brake for railroad-trains, comprising a screw or worm shaft, an electromotor to actuate said shaft, a series of independent batteries which may be brought into electrical connection with said motor, a switch-board having independent fixed contact-pieces, a sliding contact arm or switch, with a follower to close and open the circuit between said motor and one or more of said batteries, a lug-nut to move on said screw-shaft, a central lever, and flexible connection with the truck-levers to set and release the brakes, substantially as shown and described.

4. In a train-brake for railroad-cars, a screw or worm shaft, a movable lug-nut thereon, and a lever connected at one end with said nut above and below and embracing the same to prevent lateral binding in its movement on the worm-shaft, and at the other end connected by means of a flexible connection passing partly around sheaves or frictional pulleys with the truck-levers, and by their connections with the brake-shoes of each car in the train, substantially as described.

5. In a brake for railroad-trains, the combination of a worm-shaft, a movable nut thereon having a lug above and below, a central lever connected at one end with said nut and embracing the same and moved thereby and at the other end by means of sheaves or pulleys, and a wire rope or flexible connection connected with the truck-levers and their connections by the brake-shoes of each car to op-

erate the same and equalize the pressure thereon, in combination with an electromotor and independent batteries to energize said motor, substantially as described, and for the purpose set forth.

6. The combination, with the brake-shoes, truck-levers, and wire rope or flexible connection therewith, of a swinging central lever, through the short arm of which passes said flexible connection from the long arm of one truck-lever to the other and partly round the sheaves or pulleys to operate the brake-shoes and equalize the pressure thereon on each car, substantially as described.

7. The combination of a screw-shaft, a movable nut having lugs, a lever connected therewith and embracing the same and to be moved thereby, and the truck-levers and brake-shoes of a railroad-car, an electromotor, a series of independent batteries to energize the motor, and the switch-board having fixed contact-pieces and a sliding contact arm or switch to throw either one or all of said batteries into circuit to set the brakes upon each car throughout the train, substantially as described.

8. The combination of a screw-shaft, an electromotor to actuate said shaft, a traversing lug-nut and the connections between said nut and the the truck-levers and brake-shoes of each car, and a series of independent electric batteries, a switch-board having independent fixed contact-pieces, separate electrical connections between each of said fixed contact-pieces and one of said batteries, and a switch or sliding contact-arm and follower connected therewith to throw one or more of said batteries into and out of circuit with the motor, substantially as described.

9. The combination, with a worm-shaft, an electromotor to actuate the same, and connections between said shaft and the brake-shoes of a railroad-car, of a series of independent batteries, a switch-board having independent fixed contact-pieces, separate electric connections between each of said fixed contact-pieces and each of said batteries, and a switch with a follower to throw one or more of said fixed contact-pieces and their connecting-batteries into and out of circuit with the motor, and transmitting-wires for return-circuit, substantially as described.

10. In a train-brake for releasing the brakes, the combination of an independent battery, transmitting and return current wires and connections to complete the circuit, a reversible electromotor, a fixed contact-piece upon the switch-board, and a sliding contact-arm, with a follower, by means of which upon a backward movement the follower may be connected with the fixed contact-piece, and the circuit closed for releasing the brakes, the magnets energized, the motor reversed, and the brakes released, substantially as shown and described.

11. In a train-brake, the combination of a worm-shaft, an electromotor to actuate the same, a sleeved nut having lugs moving upon said screw or worm shaft, with a lever having a looped end to embrace the opposite sides of said nuts to prevent undue lateral pressure or binding on said screw, and slots above and below to receive the lugs or projections upon said nut, and sheaves or pulleys carried at the opposite end of said lever, and a flexible or movable connection between the long arms of the truck-levers to actuate the brake-shoes and equalize the pressure, substantially as described.

12. The combination of a worm-shaft, a lug-nut moving thereon, a central lever pivoted to swing upon a fulcrum in the hanger or chair bolted to the central and under part of the body of each car, sheaves or pulleys pivoted in the loop of the short arm of said lever, the fulcrum of said lever being located between said sheaves and equidistant therefrom, and the flexible connection between the truck-levers and the brake-shoes of each car, substantially as described.

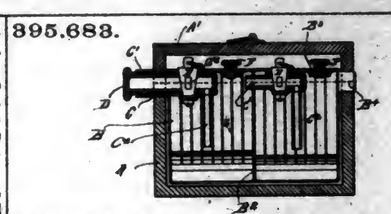
13. The central lever having the following combination and elements of construction, viz: a fulcrum pivoted to swing in the hanger, sheaves or pulleys to equalize the pressure, a loop for the sheaves and the passage of the rope at one end, and a loop and slots at the other end for the traverse of the lug-nut to actuate the lever, substantially as described.

14. In a railroad-train brake, a series of independent batteries, an electromotor and transmitting electric-current and return wires, an independent switch-board having a sliding contact-arm, a single fixed contact-piece, and a spring having a dog or catch by means of which the current in circuit may be thrown upon the magnet of the motor and there retained for the purpose of setting the brakes either automatically or by hand on each car in case of accident or disaster, substantially as described, and for the purpose set forth.

395,683. APPARATUS FOR COMBINING ANÆSTHETICS. JACOB S. ATHON, Reading, Pa. Filed Sept. 12, 1888. Serial No. 285,230. (No model.)

Claim.—1. In an apparatus for vaporizing and aerating anæsthetics, the pivoted chamber provided with inlet and outlet openings and an absorbent material, H, adapted to be wet by the oscillation of said chamber, substantially as set forth.

2. In an apparatus for vaporizing and aerating anæsthetics, the pivoted chamber provided with inlet and outlet openings, an outlet-



tube extending downward to near the fluid-level, and an absorbent material, H, adapted to be wet by the oscillation of said chamber, substantially as set forth.

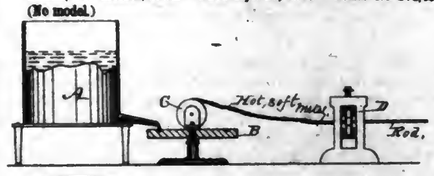
3. In an apparatus for combining anæsthetics, an oscillating chamber divided into two or more compartments, each of which is provided with inlet and outlet openings, and outlet-tubes with regulating-cocks converging from near the fluid-level of each compartment toward the mixing-compartment and from said mixing-compartment to an inhaler-nozzle, substantially as set forth.

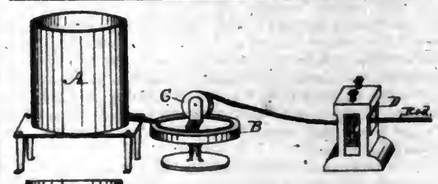
4. In an apparatus for vaporizing or combining anæsthetics, an oscillating semi-cylindrical chamber, B, provided with inlet and outlet openings, and with an absorbent material, H, normally retained above the fluid-level, substantially as described, in combination with an inclosing and supporting case, A, substantially as set forth.

5. In an apparatus for combining anæsthetics, the chamber B, divided into two or more compartments, each of which is provided with inlet and outlet openings, and outlet-tubes converging toward the first or mixing compartment, substantially as set forth.

6. In an apparatus for combining anæsthetics, the oscillating chamber B, divided into two or more compartments, each of which is divided into inlet and outlet openings, and outlet-tubes converging toward the first or mixing compartment, each compartment containing an absorbent material, H, arranged substantially as set forth.

395,684. METHOD OF MAKING RODS, RAILS, &c. GEORGE C. BAKER, Des Moines, Iowa. Filed Apr. 21, 1888. Serial No. 271,457. (No model.)







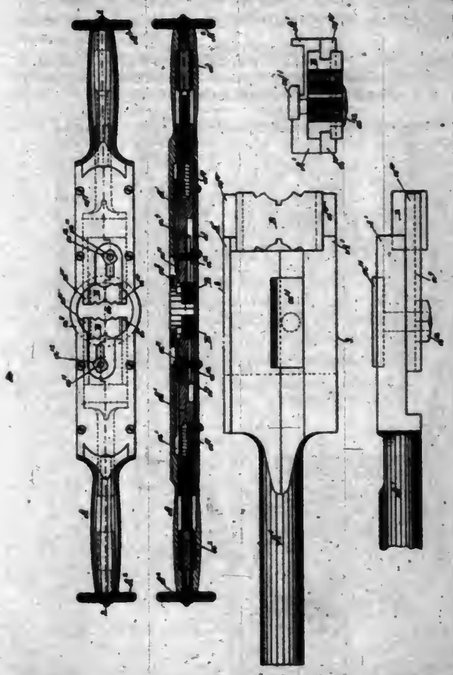
Claim.—The herein-described method of making metal rods, which mode or method consists in first melting the metal, then discharging it in a continuous stream into a groove or mold to temper and cool it and to produce a continuous flexible bar, and then passing the flexible bar between grooved rollers to reduce and shape it into a continuous rod.

395,685. FASTENER FOR THE MEETING-RAILS OF SASHES. JOHN I. BARINGER, Waterford, N. Y. Filed Oct. 6, 1888. Serial No. 287,355. (No model.)



Claim.—A sash-fastener comprising the casing having a heart-shaped recess in its upper side, a bolt within the casing, a spring to normally project the bolt, and a handle pivotally secured to the end of the shaft of the bolt and engaging the point of the heart-shaped recess to hold the bolt in its withdrawn or projected position, as set forth.

395,686. DIE-STOCK. ALBERT W. BARTHOLOMEW, Boston, Mass., assignor of one-third to Thomas C. Ashley, same place. Filed Mar. 28, 1888. Serial No. 268,264. (No model.)



Claim.—1. Stock A, having an opening, *a*, in combination with the tool-carriers A', mounted in stock A on opposite sides of the opening *a*, and screw-rods a^3, mounted in stock A and secured to tool-carriers A' to move the tool-carriers toward and away from the opening *a* in the stock, substantially as and for the purpose set forth.

2. Stock A, having an opening, *a*, intermediate the ends of the stock, tool-carriers A', mounted in the stock A, one on each side of the opening *a*, and means, substantially such as described, for moving the carriers toward and away from the opening *a*, in combination with a chuck, A^2, stock A and chuck A^2 being connected together, so that one can be rotated on the other, the opening *a* in stock A being located in relation to the jaws of the chuck, substantially as shown, and stock A being extended into handles, substantially as and for the purpose set forth.

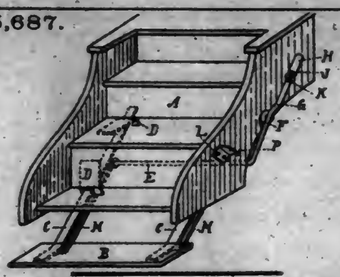
3. In a device substantially such as described, stock A, having an opening, *a*, and a recess, *a'*, portions of the side walls of which are parallel, in combination with carrier A', having parallel edges 3 and mounted in the recess *a'*, and screw-rods a^3, connected to carriers A' and mounted in the stock A, the carriers being on opposite sides of the opening *a* in stock A, all substantially as and for the purpose set forth.

4. In a device substantially such as described, carrier A', in combination with forked plate a^9, having arms a^{10}, substantially as and for the purpose set forth.

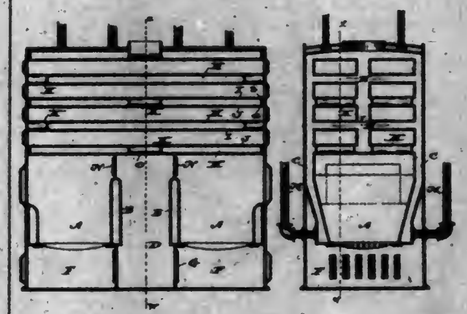
395,687. CAR-STEP. GUY M. BELTON, Knoxville, Tenn. Filed Sept. 26, 1888. Serial No. 286,433. (No model.)

Claim.—In a car-step, the combination, with the permanent steps, of the supplementary step B, the sliding bars C C, carrying that step and engaging into the bearings D, the crank E, laterally extending below the steps, the crank-rods M, connecting said crank with the supplementary step, the lever G, forming an extension of one arm of the crank, the sliding sleeve H upon said lever, and the catch I, provided with the inclined portion P, all arranged to operate substantially as and for the purpose described.

395,687. (image)



395,688. SECTIONAL WATER-HEATER. RICHARD RIDLEY, Toronto, Ontario, Canada. Filed July 7, 1888. Serial No. 279,240. (No model.)



Claim.—1. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues between the plates of the sections, and a water-space between each section, the said water-spaces being connected together by vertical passage-ways arranged substantially as and for the purpose specified.

2. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having longitudinal smoke-flues formed between the plates of the sections, and a water-space formed between each section, the said water-spaces being connected together by suitable passage-ways arranged as herein described and extending from a point near the grate to the crown of the said heater, substantially as and for the purpose specified.

3. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed, between the plates of the sections, and a water-space between each section, connected together by suitable vertical passage-ways, in combination with a fire-box located at each end of the heater and connected with the smoke-flues passing through the sections, substantially as and for the purpose specified.

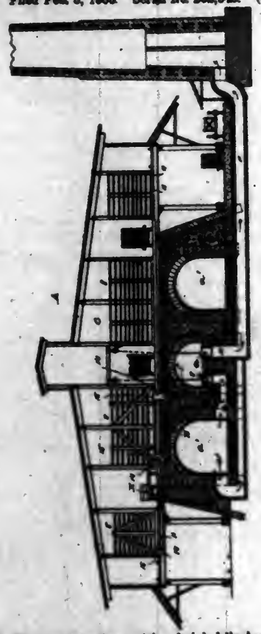
4. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed between the plates of the sections, and a water-space formed between each section, the said water-spaces being connected together by suitable vertical passage-ways, in combination with two fire-boxes located at each end of the heater, the said fire-boxes being separated by an air-space through which the smoke and heated gases pass from the fire-boxes on their way to the smoke-flues, arranged, as described, in the sections of the heater.

5. A hot-water heater having two fire-boxes separated by an air-space extending to a point where the smoke and heated gases pass into the flues arranged in the heater, combined with the adjustable dampers arranged above the water-backs of each fire-box, substantially as and for the purpose specified.

6. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed between each section, the said water-spaces being connected together by suitable vertical passage-ways extending from a point near the grate to the crown of the fire-box, in combination with two fire-boxes separated by an air-space extending upwards from the bottom of the ash-pit, from which it is separated by adjustable dampers arranged substantially as and for the purpose specified.

7. A hot-water heater composed of a series of sections having smoke-flues formed in each section and connecting with each other, the said sections being jointed together, so as to form the water-space between each section, substantially as and for the purpose specified.

395,689. COMBINED BRICK DRIER AND KILN. MAX A. T. BOESECKE, Omaha, Nebr., assignor to the Continuous Kiln Company, same place. Filed Feb. 3, 1888. Serial No. 262,845. (No model.)

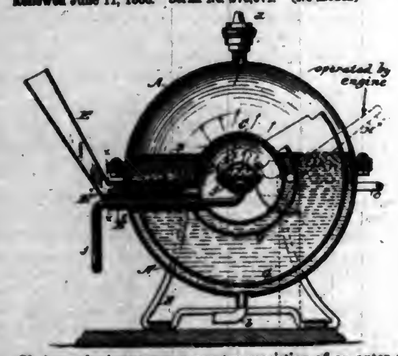


Claim.—1. The combination, with a brick-kiln having a continuous central smoke-chamber and the main ventilator-pipe B opening thereinto, of the drier-chamber disposed on said kiln, the series of ventilator-pipes having short extensions projected through the bottom of said chamber, and the dampers disposed on said extension, substantially as described, the inner ends of said ventilator-pipes E being secured to said main ventilator-pipe B, as stated.

2. The combination, with the brick-kiln having the continuous main ventilator-pipe, of the drier-chamber, and ventilator-pipes disposed between said drier-chamber and kiln and having openings into said drier-chamber and opening into said main ventilator-pipe, substantially as shown and described.

3. The combination, with the brick-kiln having a smoke-chamber provided with a continuous main ventilator-pipe having damper-covered openings or apertures extending into said smoke-chamber, of the drier-chamber, the series of drying-racks, the steam-exhaust pipes, the steam-supply pipe, the water-condensation pipe, and the ventilator-pipes opening into the bottom and arranged substantially as shown and described.

395,690. APPARATUS FOR CREATING A VACUUM FOR MOTIVE POWER. JOHN R. CAMERON, Pittsburg, Pa. Filed June 2, 1887. Renewed June 11, 1888. Serial No. 276,671. (No model.)

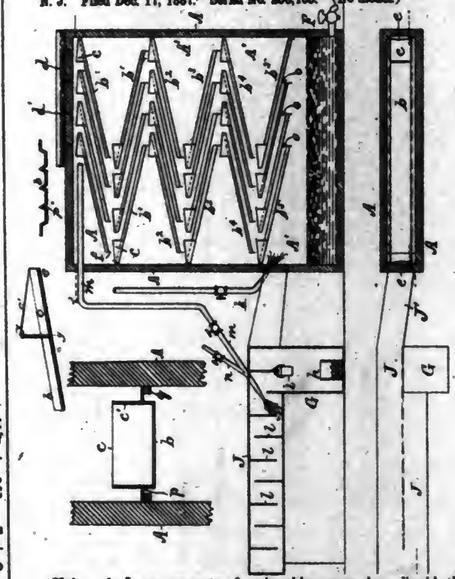


Claim.—1. A vacuum apparatus consisting of an outer casing adapted to receive water and provided with valved inlet and outlet pipes, a central heating-chamber, and a rock-shaft provided with a pair of invertible cups adapted to pass from the lower part of the casing to a position above the central heating-chamber, substantially as and for the purpose described.

2. The combination, with the outer casing, of a central heating-chamber having flue D, and a pipe-section, E, having a partition-plate, E', for separating the cold fresh air from the escaping products of combustion, substantially as shown and described.

3. The combination of the outer casing, A A', made in globular form in two sections, and having outwardly-opening relief-valve *d'*, the central heating-globe, C, with flue and smoke-pipe, as described, the hollow rock-shaft F F', with gears for reversing it, and an inwardly-opening branch, F^3, and the two hemispherical shells G G', rigidly fixed to the rock-shaft and adapted to be inverted, as described.

395,691. APPARATUS FOR ABSORBING GASES. FREDERICK CARLSER, Franklin, assignor of part to Charles E. Hoffman, Jersey City, N. J. Filed Dec. 17, 1887. Serial No. 258,165. (No model.)



Claim.—1. In an apparatus for absorbing gases by a liquid, the combination, with the narrow chamber A', of a series of longitudinal inclined conductors arranged one above another and provided each with a receptacle upon its upper end, the receptacle being open upon one side toward the higher end of the conductor, and thereby adapted to discharge the fluid over the end of the conductor upon its under side, and the fluid being delivered from the lower end of one conductor into the receptacle at the upper end of the next conductor throughout the series, substantially as herein set forth.

2. In an apparatus for absorbing gases by a liquid, the combination, with the narrow chamber A', of a series of longitudinal inclined conductors arranged one above another and provided each with a receptacle upon its upper end, the receptacle being open upon one side toward the higher end of the conductor, and thereby adapted to discharge the fluid over the end of the conductor upon its under side, and the conductor being grooved or bent adjacent to the casing of the chamber A', to confine the fluid to the under side of the conductor, as and for the purpose set forth.

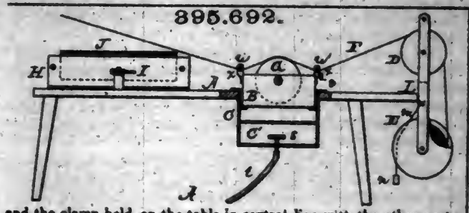
3. In an apparatus for absorbing gases by a liquid, the combination, with the narrow chamber A', of several series of sloping conductors arranged one above the other, with the narrow spaces *e* between the several conductors, each conductor being provided with a receptacle at its upper end, such receptacle being open upon one side toward the higher end of the conductor to discharge the fluid over the end of the conductor upon its under side, and the lower ends of the conductors being arranged over the receptacles of the conductors beneath the same, as and for the purpose set forth.

395,692. GLUING-MACHINE FOR BINDING-STRIPS. CHARLES H. CRAPPEL, Dayton, Ohio. Filed Sept. 20, 1888. Serial No. 285,676. (No model.)

Claim.—1. In a machine for gluing writing-tablets, the combination of spool E, roller D, vessel B, guide-roller *u'*, glue-roller G, provided with scraper *w*, and the guide-roller *u*, substantially as set forth.

2. In a machine for gluing writing-tablets, the combination of spool E, roller D, vessel B, guide-roller *u'*, glue-roller G, guide-roller *u*,

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and the clamp held on the table in central line with the other parts, substantially as set forth.

3. The combination of the flanged vessel C, provided with compartment for the gas-burner S, the vessel B, with glue-roller G, and guide-rollers *u u'*, substantially as shown and described.

395,693. DOOR-HANGER. REUBEN CLARKE, Toronto, assignor of one-half to Andrew Forester Barron, Barrie, Ontario, Canada. Filed Aug. 6, 1888. Serial No. 282,041. (No model.)



Claim.—The bracket D, having jaws *d*, combined with the bearing *c*, held in said jaws, and provided with a vertical shank, the pin *g* in said shank, the wedge-shaped block G on said shank and resting on said pin, and the adjusting-screw H, engaging said block, all arranged and operating substantially as shown and described.

395,694. PLANTER. THOMAS L. CROSIER, O'Daniel, Tex. Filed Aug. 22, 1888. Serial No. 283,419. (No model.)



Claim.—1. The combination, with a plow, of the detachable board E, the hopper E', secured thereto, the double-armed lever pivoted or swiveled on said board and vibrated from one of the conveyer-wheels, the spring O, and the seed-slide attached to the end of the inner arm of said lever, substantially as described.

2. The combination, with a plow, of the shaft or axle *h'*, detachably secured to the front portion of the beam thereof, the conveyer-wheels on said shaft, the actuating-rods secured to the inner face of the wheel I, the board E, detachably secured to the beam, the hopper at the rear end of the said board, the double-armed lever swiveled or pivoted upon the board, the spring O, and the seed-slide attached to the end of the rear arm of the said lever, substantially as described.

3. The combination, with a plow, of the board E, the clip G, detachably securing said board to the plow-beam, the hopper E', secured to the rear end of the board E and provided with the openings *e d* and brush d^2, the lever K, pivoted upon the clip G, the spring O, the seed-slide secured to the end of the rear arm of the lever K, and the dropping-tube F, screwed through its wing *f* to the plow-standard.

4. The combination, with a plow and the board E, the hopper, seed-slide, double-armed lever, and dropping-tube detachably secured thereto, of the bearing-arms H, the bolts *h*, the shaft *h'*, the conveyer-wheels I I', and the actuating-rods J, secured to the wheel I, substantially as specified.

5. The combination, with a plow, of the coverer-bar, the integral spring-rods secured thereto and passing on each side of the plow-standard and over the beam, and bolt N, passing through eyes, said rods and the nut *n* engaging said bolt, substantially as specified.

395,695. FOUNTAIN-PEN. JOHN H. CROWELL, Vineyard Haven, Mass. Filed Mar. 15, 1886. Serial No. 195,280. (No model.)



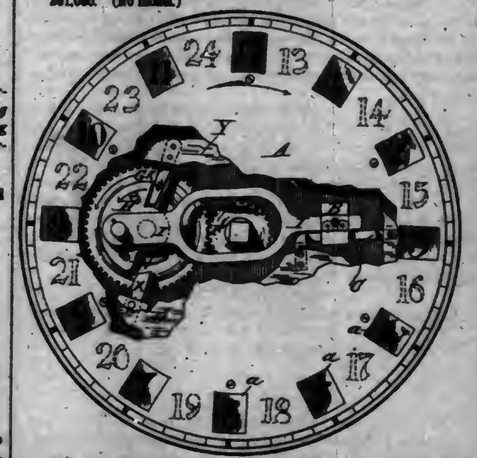
Claim.—1. In a fountain-pen, the combination, with the holder and reservoir, of a rod constructed to be moved longitudinally in said holder and reservoir, and provided with a cavity near its end which receives a given quantity of ink from the reservoir, and which from pressure applied longitudinally to said rod mechanically separates from the reservoir and conveys to or toward the pen said given quantity of ink, substantially as and for the purpose specified.

2. In a fountain-pen, the combination, with the holder A and reservoir F, of the longitudinally-sliding rod D, which has constructed in it near its end an annular groove or cavity, *e*, and which extends through the reservoir into the tip B and to the cap E, substantially as described.

3. In a fountain-pen, the combination and arrangement of the holder A, reservoir F, longitudinally-sliding rod D, provided with the cavity *e*, spiral spring *c*, collar *d*, and tip B, substantially as and for the purpose described.

4. In a fountain-pen, the combination of the holder A, reservoir F, longitudinally-sliding rod D, with its annular groove *e*, spiral spring *c*, collar *d*, tip B, with its sleeve *f*, pen C, and cap E, all arranged and operated substantially as and for the purpose described.

395,696. TIME-PIECE DIAL. MARTIN V. B. BYRNEDGE, Boston, Mass., assignor of two-thirds to John Swann, New York, N. Y., and Henry R. Waite, West Newton, Mass. Filed Jan. 18, 1888. Serial No. 261,060. (No model.)



Claim.—1. In a time-piece, the combination, with a shifting inner dial, of relatively-adjustable weights carried thereby on opposite sides of the central support of said dial and mechanical devices for adjusting the weights, consisting of a cam acting on projecting points on the dial, a connection between the cam and the weight on the opposite side of the dial-center, and actuating-gearing for the cam, substantially as described.

2. In a time-piece, the combination, with a shifting inner dial, of weights carried thereby on opposite sides of the dial-center, one of said weights being normally stationary, while the other is adjustable between points where it will and will not overbalance the other, and mechanical devices for adjusting the movable weight, all arranged to operate substantially as described.

3. In a time-piece, the combination of an apertured outer dial, a shifting inner dial, a sliding weight carried by a rod fixed to the inner dial on one side of its center, a stationary weight and projecting arms affixed to the dial on the opposite side of its center, a rotative cam acting on the projecting arms, a connecting-rod between the cam and the sliding weight, and actuating-gearing for the cam, all arranged to operate as set forth.

4. The combination of the inner dial, Y, the rod C, secured thereto and carrying weight B, the weight and arms X and W, likewise secured to the dial on the opposite side of the dial-center, the gear G, cam H, attached to said gear, connecting-rod I, and actuating-gear F, substantially as described.

395,697. FIRE-PLACE BACK. DAVID FARMER, Piedmont, Ohio. Filed Mar. 7, 1888. Serial No. 266,405. (No model.)



Claim.—The combination, with the fire-place, of the end walls, O,

resting on the grate, and the cross-pieces D, having end lugs, by which they are bolted to the end walls, and having overlapping flanges *e* and *e'*, which are bolted together and form a projecting ledge over the fire-pot, the upper cross-piece extending part way up the chimney to form a wall for the draft-flue, substantially as described.

395,698. CORN-COB HOLDER. FREDERIC B. PETTERSTONHAUGH, Toronto, Ontario, Canada. Filed Feb. 13, 1888. Serial No. 263,865. (No model.)



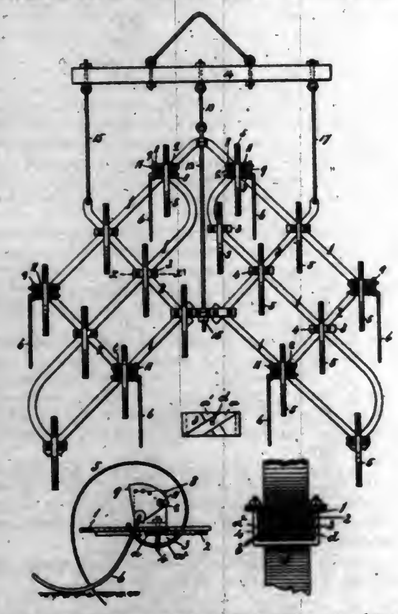
Claim.—1. As a holder for hot corn, two uprights, having pivoted on their outer ends the holding-knobs, to the spindles of which are secured the plates for holding the corn, in combination with two closed tubes, one of which fits into and is adjustable lengthwise within the other, and a spring inclosed in the tubes and connected with the opposite ends thereof, substantially as and for the purpose specified.

2. The uprights A and B, having plates C, provided with spikes or prongs *c*, the said plates being secured on the ends of the spindles of the knobs D, in combination with the inclosed tubes E and F, one sliding within the other, and a spring inclosed in the tubes and connected with the opposite ends thereof, substantially as and for the purpose specified.

3. The uprights A and B, plates C, and knob D, in combination with the closed tube F, provided at one end with a stop, *e*, the closed tube F, sliding within the other tube and provided at one end with a stop, *f*, and a spring inclosed in said tubes and connected with the opposite ends thereof, substantially as and for the purpose specified.

4. The corn-holder composed of two closed tubes, one adjustable within the other, the uprights each having an end within the tubes, the spring within the tubes with an end secured to each of said uprights, and the knobs carrying the prongs and rotatable in said uprights, substantially as and for the purpose specified.

395,699. SPRING-TOOTH HARROW. GEORGE GILLIES, Cananoque, Ontario, Canada. Filed July 18, 1888. Serial No. 280,395. (No model.) Patented in Canada Feb. 1, 1888, No. 28,430.

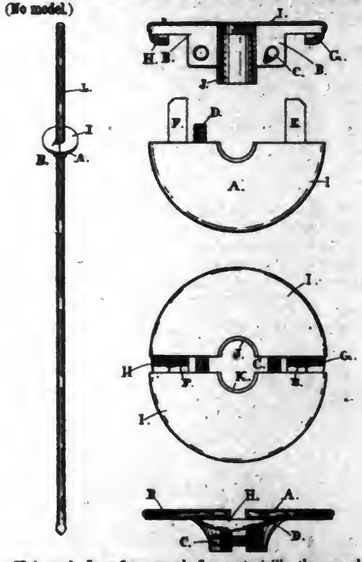


Claim.—1. A harrow composed of two sections hinged together in line with the draft, each section comprising front and rear parallel straight bars of approximately uniform length and diagonal to the draft, an intervening S-shaped bar having a straight portion parallel to said bars, one end of said bar intersecting the front bar near its forward end, the other end intersecting the rear bar at its rearward end, transverse bars at right angles from the forward end of the rear bar to the front bar, and the rearward end of the front bar to the rear bar, and clips connecting all the bars at their intersections to spring-teeth, substantially as described.

2. The adjustable runners 6, curved at the lower end and having a laterally square bent upper end provided with a quadrant, 9, having holes therein and journaled in a U-shaped bearing, 8, clipped to the harrow-bars and tooth-holder, said bearing provided with a spring-bolt, 11, engaging the holes in the quadrant and locking the runner at an adjusted position, as set forth.

3. The harrow-bars 1 2, having a coinciding indentation and projecting teat, *b*, and the tooth-holder 3, having an indentation, *d*, coinciding with said teat, in combination with a tooth, 5, and clip 4, as set forth.

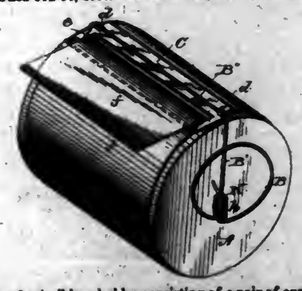
395,700. HAND-GUARD FOR ROCK-DRILLS. BALSARINI GIOVANNI, San Francisco, Cal. Filed Mar. 27, 1888. Serial No. 268,684. (No model.)



Claim.—1. In safety-guards for rock-drills, the guard composed of the parts A and B, having the guides E, F, G, and H, in combination with the washer J and K and bolts C and D, for the purpose of attaching to rock-drills and guarding the hands, substantially as and for the purposes set forth.

2. In combination with a rock-drill, L, the guard described, composed of the parts A and B, guides E, F, G, and H, bolts C and D, cushion I, and washer J and K, for the purpose of protecting the hands in drilling rock, constructed and operated substantially as and for the purposes set forth.

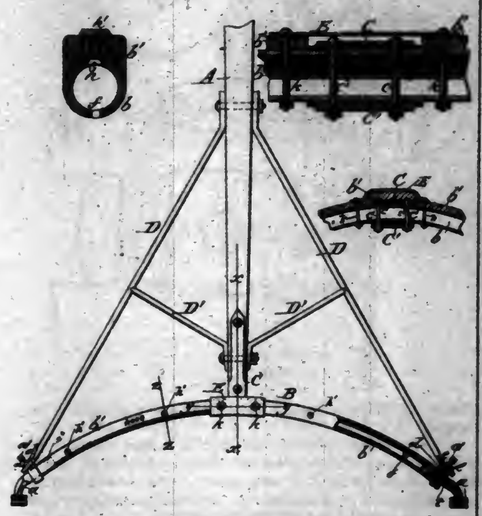
395,701. RIBBON-HOLDER. JAMES A. GRANT, Mount Pleasant, Iowa. Filed Oct. 30, 1888. Serial No. 289,516. (No model.)



Claim.—1. A ribbon-holder consisting of a pair of curved springs, B, formed on the inner ends of straight radial sections B' and arranged to lie in planes close to and corresponding with the ends of a ribbon-spool when attached, with their yielding ends provided with coils A, loosely surrounding the sections B', and the inward-pointing pivot-points K being coupled together by a straight section, B'', all constructed of one continuous wire, in combination with a ribbon roll or spool, substantially as shown, for the purposes specified.

2. A ribbon-holder consisting of a pair of curved springs, B, formed on the inner ends of straight radial sections B' and arranged to lie in planes close to and corresponding with the ends of a ribbon-spool when attached, with their yielding ends provided with coils A, loosely surrounding the sections B', and the inward-pointing pivot-points K being coupled together by a straight section, B'', all constructed of one continuous wire, with a plate, C, provided with a longitudinal slot, *c*, and fastened to the section B'', in combination with a ribbon roll or spool, substantially as shown, for the purposes specified.

395,702. CARRIAGE-POLE. JAMES IVES, Mount Carmel, Conn. Filed Apr. 27, 1888. Serial No. 272,060. (No model.)



Claim.—1. A carriage-pole comprising a pole proper, a divisible socket-coupling encircling the sweep and receiving the end of the said pole, a tubular sweep having connecting-eyes at its ends, screw-bolts connecting the pole proper, sweep, and parts of coupling together, and braces between the pole proper and the tubular sweep, substantially as and for the purpose described.

2. A carriage-pole comprising a pole proper, a divisible socket-coupling encircling the sweep and receiving the end of the said pole, a tubular sweep having connecting-eyes at its ends, a wood-finishing enlargement portion, screw-bolts connecting the pole proper, sweep, and parts of coupling together, and braces between the pole proper and the tubular sweep, substantially as and for the purpose described.

3. The divisible socket-coupling secured by bolts to the rear end of the pole and one of its parts provided with lugs, in combination with the curved metallic tube-sweep provided with orifices or recesses to receive the said lugs, substantially as and for the purpose described.

4. The combination, with the tubular sweep, of the wood-finishing enlargement portion *b'*, secured to the said tube by screws passed through the lower side of the tube, their heads bearing against the inner upper side of the same, and their body portions embedded and retained by screw-threads in the wood portion, substantially as and for the purpose described.

5. The combination, with the tubular sweep and the wood-finishing enlargement portion thereof, and the socket-coupling, of the cap E and screw-bolts, substantially as described.

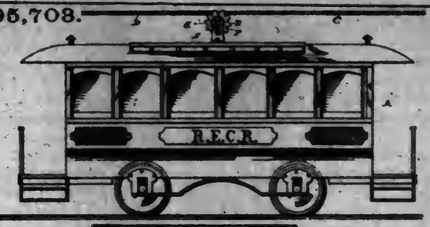
6. The curved sweep-tube *b*, provided with the wood-finishing enlargement portion *b'*, in combination with the connecting-eyes *a*, provided with shanks entering the ends of said tube and secured by suitable fastenings, substantially as described.

7. A carriage-pole comprising, in combination, the pole proper, the sweep, braces from the pole to the sweep, the wood-finishing enlargement portion, and the bayonet-fastenings connecting the ends of said sweeps with the braces, substantially as and for the purpose described.

395,703. TROLLEY FOR ELECTRIC RAILWAYS. WILTON P. JENKINS, Richmond, Va. Filed Apr. 18, 1888. Serial No. 271,019. (No model.)

Claim.—In combination with the main cable and cross-cables, the trolley having the flanges circumferentially scalloped, providing the projections G, and having said semicircular scallops of a diameter greater than the cable.

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395,704. COMBINATION-HOOK. LEE KENT, Hot Springs, Ark. Filed Apr. 13, 1888. Serial No. 271,075. (No model.)



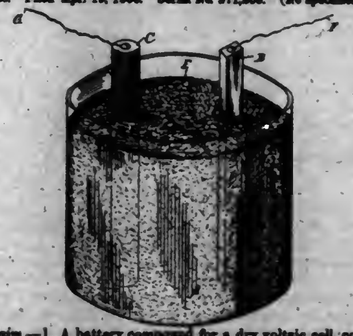
Claim.—The painter's combination pot-hook herein described, provided with the putty-knife A, tack-puller B, tack-hammer K, glass-cutter F, glass-nipper I, can-opener H J, and screw-driver G, substantially as shown and described.

395,705. RECTAL SPECULUM. JOHN M. KING, Stecoah, N. C., assignor of one-half to George F. Brock, same place. Filed Apr. 28, 1888. Serial No. 272,122. (No model.)



Claim.—In a speculum, the tapering conical tube having a slot throughout its entire length, a plug fitted to fill the end and having a shank fitted to a groove in the inner face of the tube, and a slide covering the entire slot and bearing against the rear end of the plug, substantially as described.

395,706. DRY VOLTAIC BATTERY. ISIDOR KITSEE, Cincinnati, Ohio. Filed Apr. 19, 1888. Serial No. 271,209. (No specimens.)



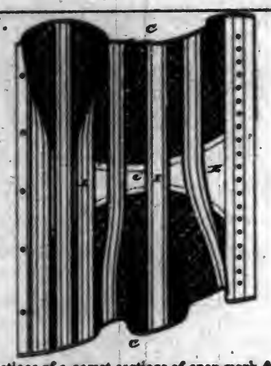
Claim.—1. A battery composed for a dry voltaic cell, consisting of chloride of ammonia or an equivalent chloride compound, bisulphate of mercury, and glycerine.

2. In a dry voltaic cell, in combination, a containing-vessel, positive and negative elements contained therein, and a battery compound consisting of chloride of ammonia or an equivalent chloride compound, bisulphate of mercury, and glycerine, contained within said vessel and in contact with said elements, as specified.

395,707. MANUFACTURE OF ORNAMENTAL CORSETS. LEOPOLD KRAUS, Birmingham, Conn. Filed July 6, 1888. Serial No. 278,178. (No model.)

Claim.—The within-described improvement in the manufacture of ornamental corsets, the same consisting in applying to irregular-

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shaped body-sections of a corset sections of open-work fabric, slitting said open-work section to permit the same to conform to the shape of the body portions, and then covering the parts by overlying strips I, securing the strips to the body portion upon the intermediate ornamental fabric, substantially as set forth.

395,708. BASKET-COVER. TILGHMAN W. LANKFORD, Pocomoke City, Md. Filed Nov. 16, 1888. Serial No. 291,002. (No model.)

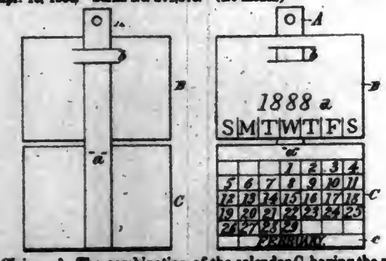


Claim.—1. The combination of the basket having the inner and outer concentric hoops, D E, the eyes formed each of a single piece of wire doubled and having its arms passed between the hoops and clinched on the exposed sides thereof, and the lid or cover having the devices to engage the eyes, substantially as described.

2. The basket having the eye F, in combination with the lid or cover having the catch M, the latter being formed of a single piece of wire and having the spring-coils N, the arm O, with eye S, and the arm T, having the hook U to engage the eyes F and S, substantially as described.

3. The basket-lid having the depending rim, the spring-catch M, having the eye S, and the hook U to engage the same, and provided, further, with the spring-coils N and the eye P, the tack or rivet R in the eye P and in the rim, and the eye L, engaging the spring-coils N, substantially as described.

395,709. CALENDAR. EDWARD S. MAY, Washington, D. C. Filed Apr. 18, 1888. Serial No. 271,073. (No model.)



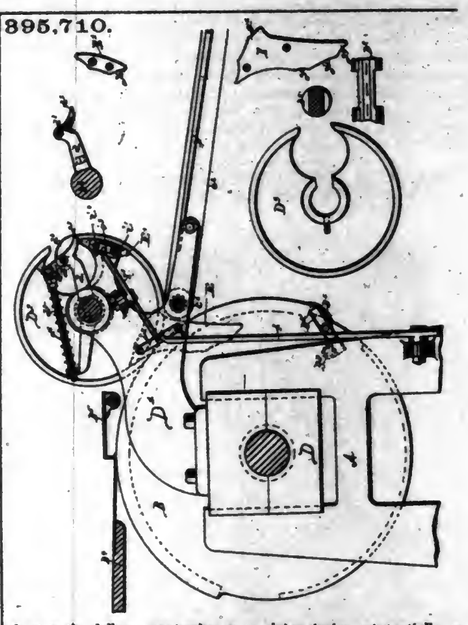
Claim.—1. The combination of the calendar C, having the mouth a, with the fixed piece A at the point a, and with the adjustable piece, B, having the year and days of the week d, and the strap b, arranged and operating substantially as and for the purpose set forth.

2. The adjustable screen B, having the strap b, and made to slide upon the piece A to a required point, the numerals 1 2 3 4 5, placed vertically upon the piece A and appearing singly through the opening in B, as at c, arranged and operating with a calendar, substantially as and for the purpose set forth.

395,710. SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES. ROBERT MIEHLE, Chicago, Ill. Filed Mar. 3, 1887. Renewed Aug. 22, 1888. Serial No. 283,514. (No model.)

Claim.—1. In a cylinder printing-press, the combination, with the impression-cylinder, of the revolving delivery-grippers and delivery-reels located at the front or top of the cylinder, the said delivery-grippers receiving one revolution and over before discharging the printed sheet to the said delivery mechanism or receiving device, substantially as described.

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2. In a cylinder printing-press, the combination, with the impression-cylinder, of delivery-grippers, delivery-reels, and the receiving-tapes located at the front or top of the cylinder, the delivery-grippers receiving one revolution and over before discharging the printed sheet to the said tapes, substantially as described.

3. In a cylinder printing-press, the combination, with the impression-cylinder, of the delivery-grippers, reels, tapes, and fly-fingers located at the front or top of the cylinder, the delivery-grippers receiving one revolution and over before discharging the printed sheet to the said tapes, substantially as described.

4. In a cylinder printing-press, the combination, with the impression-cylinder and vibrating fly-fingers, of the revolving delivery-grippers located at the front or top of the cylinder for seizing the leading edge of the printed sheet and discharging it upon the fly-fingers with the non-printed or dry side to said fly-fingers, which deposit the same upon the fly-table with the last-printed side down, substantially as described.

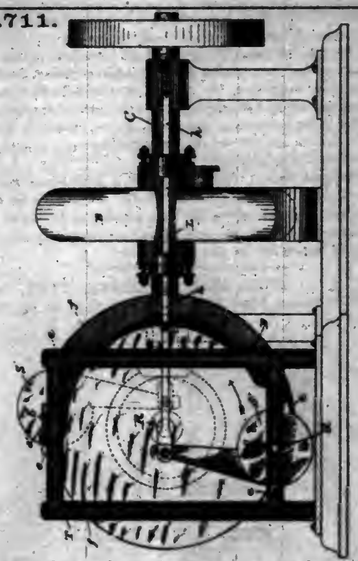
395,711. ROTARY ENGINE. HENRY T. MORSE, Boston, Mass. Filed June 18, 1888. Renewed June 18, 1888. Serial No. 277,483. (No model.)

Claim.—1. In a rotary engine, the combination of the annular cylinder having the ports I I', the piston adapted to move in the cylinder, the disk D and shaft C, rotated by the piston, the abutment-casing intersecting the cylinder, the two alternately-acting abutments in said casing, and mechanism for reciprocating said abutments, whereby the acting abutment is withdrawn from the cylinder to permit the passage of the piston across the abutment-casing and is immediately replaced by the other abutment after the passage of the piston, as set forth.

2. In a rotary engine, the combination of the annular cylinder



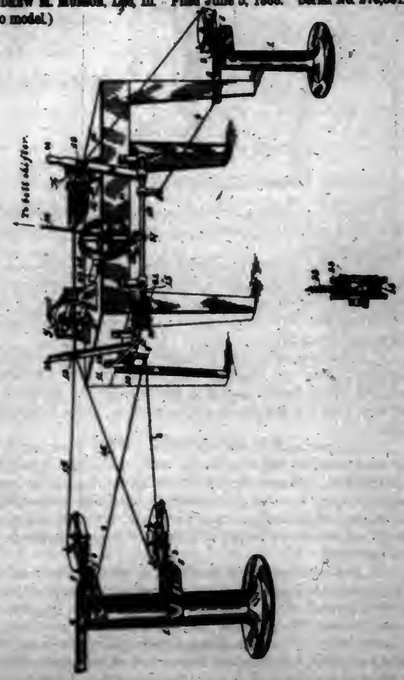
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having the ports I I', the piston adapted to move in the cylinder, the disk D and shaft C, rotated by the piston, the abutment-casing intersecting the cylinder between the ports thereof, the two abutments in said casing, the oscillatory levers S S', connected with said abutments, and the cams rotated by a connection with the shaft C, whereby said levers are oscillated and the abutments reciprocated, as set forth.

3. The combination of the casing having the annular cylinder, the piston, the disk to which the piston is attached, and the packing-rings G H, the former attached to the casing and the latter engaged with the disk, so as to be capable of expanding, said rings being beveled, as shown, so that only a knife-edge of the ring H is exposed to steam-pressure, as set forth.

395,712. AUTOMATIC STOP FOR WIRE-BARBING MACHINES. ANDREW M. MUNSON, Lee, Ill. Filed June 5, 1888. Serial No. 276,061. (No model.)



Claim.—1. In a wire-barbing machine provided with suitable feeding devices for drawing the wires from the reel, the combination of the standard I, arms 3 and 6, reel 2, chain 8, arm 9, and rock-shaft 10, having pinion 22, and shaft 19, having pinion 21, and connected with means for disconnecting the driving-power from the machine, whereby the suspension of the uncoiling of the wire causes the arm 3 to swing toward the machine and rock the shafts 10 and 19, whereby the power is disconnected from the machine, substantially as shown, and for the purpose described.

2. In a wire-barbing machine provided with suitable feeding devices for drawing the wires from the reels, the combination of the standard 1, inclined from the perpendicular outwardly and provided with the stops 5 and socket 4, the arm 3, pivoted at its inner end in said standard, the reel 2, pivotally seated on the outer end of arm 3, arm 6, provided with lug 7, adapted to be engaged by arm 3 in its forward swing, arm 9, seated on the shaft, and chain 8, connecting the outer end of arm 6 to the lower end of arm 9, and means connected with the shaft 10 for disconnecting the power, substantially as shown, and for the purpose described.

3. In a wire-barbing machine provided with suitable feeding devices for drawing the wires from the reels, the combination of the standard 1, inclined outward from the perpendicular and provided with the stop 5, the arms 6 and 3, pivoted thereon, the reel 2, pivoted on the outer end of arm 3, the arm 6, provided with flange 7, the chain 8, rock-shaft 10, provided with arm 9, spring 15, lever 12, provided with slot 13 and pinion 22, shaft 19, provided with pinion 21 and lever 20, and means for disconnecting the driving-power of the machine, substantially as shown, and for the purpose described.

4. In a wire-barbing machine provided with suitable feeding devices for drawing the wires from the reels, the combination of the side standard, 1, provided with stop 5, arms 6 and 3, pivotally seated thereon, reel 2, pivoted to said arm 3, chain 8, shaft 19, provided with arm 9, spring 15, lever 20, provided with slot 13, and means for disconnecting the driving-power, all substantially as shown, and for the purpose described.

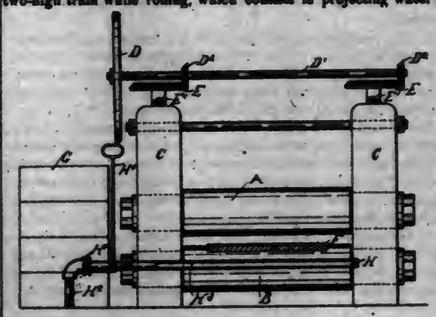
5. In a wire-barbing machine provided with suitable feeding devices for drawing the wires from the reels, the combination of the standard 1, inclined outward from the perpendicular and provided with the arms 6 and 3, pivoted thereon, reel 2, pivotally seated on arm 3, arm 6, provided with flange 7, the chain 8, the rock-shaft 10, provided with arm 9, lever 12, provided with slot 13, pinion 22, shaft 19, provided with pinion 21, lever 20, arm 37, pitman 36, lever 35, collar 28, provided with annular opening 30, and stop 31, the collar 25, shaft 23, slotted at 26, the key 27, adapted to be embedded in said slot, and the rope or chain 32, connecting with belt-shifting devices, substantially as shown, and for the purpose described.

6. In a wire-barbing machine provided with suitable feeding devices for drawing the wires from the reels, the combination of the side standard, 1, inclined outward from the perpendicular and provided with arms 3 and 6, the arm 6 having the flange 7, reel 2, the chain 8, lever 20, provided with slot 13, arm 37, pitman 36, lever 35, collar 28, and rope or chain 32, and means for disconnecting the driving-power from the machine, all arranged and interacting substantially as shown, and for the purpose described.

7. In a wire-barbing machine provided with feeding devices to draw the wire from the reels, the standard 1, the reel thereon, and the intermediate devices connecting it to the chain 8, the chain 8, the shaft 19, provided with arm 37, a pitman, 36, lever 35, sliding collar 28, provided with opening 30 and stop 31, the collar 25, shaft 23, slotted at 26, the key 27, adapted to be embedded in said slot, and rope or chain 32, attached at its lower end to said collar, and suitably fastened at its upper end to the ordinary shifting-lever, substantially as shown, and for the purpose described.

395,713. METAL-ROLL-COOLING DEVICE. FRANKLIN NEWLIN, Pottstown, Pa. Filed July 7, 1888. Serial No. 279,266. (No model.)

Claim.—The method herein described of cooling the rolls of a two-high train while rolling, which consists in projecting water up-

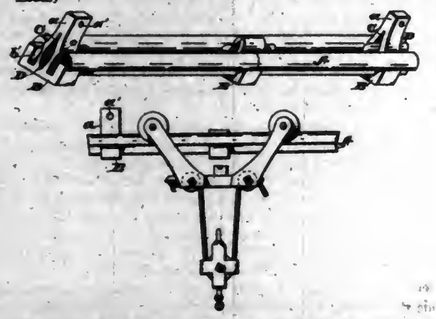


395,713.



wardly against the top roll, so as to strike below its center line and be deflected upon the top of the lower roll, substantially as set forth.

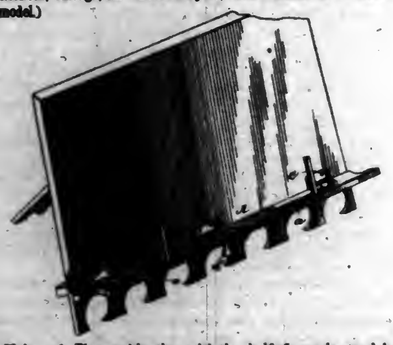
395,714. HAY-ELEVATOR TRACK. VOLENTINE L. NEY and JACOB NEY, Canton, Ohio. Filed May 23, 1888. Serial No. 274,844. (No model.)



Claim.—1. The securing-blocks B, provided with the grooves or notches *b'*, the ribs *c*, and the openings C, the key or wedge D, and the rails A, substantially as and for the purpose specified.

2. The securing-blocks B, provided with the openings C and the grooves or notches *b'*, the key or wedge D, the rails A, and means for suspending the rails, substantially as and for the purpose specified.

395,715. BOOK-SUPPORT OR MUSIC-STAND. RAYARD B. NICHOLS, Chicago, Ill. Filed May 21, 1888. Serial No. 274,530. (No model.)



Claim.—1. The combination, with the shelf of a music-stand, book-support, easel, or the like, of the uprights pivoted to said shelf, and the rod connecting the uprights and provided with a handle depending therefrom and capable of elevating and depressing the uprights, substantially as described.

2. The combination, with the shelf of a music-stand, book-support, easel, or the like, of the uprights pivoted to it, the rod connecting the uprights and capable of elevating and depressing the uprights, and a spring designed to act against the end of the connecting-rod to retain the uprights in a perpendicular position, substantially as described.

3. The combination, with the shelf of a music-stand, book-support, easel, or the like, of the pivoted uprights provided with arms, and rods connecting the uprights above and below the pivotal points, the lower one of said rods being provided with a handle depending therefrom, substantially as and for the purpose described.

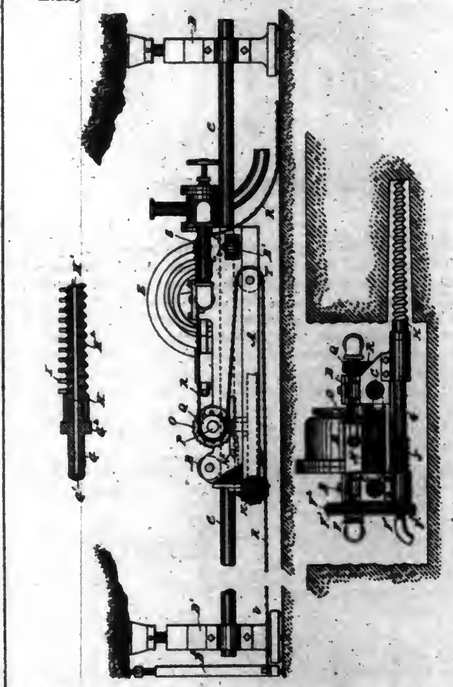
4. The combination, with the shelf of a music-stand, book-support, easel, or the like, of the uprights pivoted to it, the rod connecting the uprights and capable of elevating and depressing the uprights, and a handle pivotally secured to the connecting-rod to operate the device and designed to be turned parallel with the connecting-rod, substantially as and for the purpose specified.

5. The combination, with the shelf of a music-stand, book-support, easel, or the like provided with the kerf-slots and a kerf-recess connecting the kerf-slots, of the uprights pivoted in the kerf-slots, and the connecting-rod secured to the uprights and sliding in the kerf-recess and provided with a depending handle, substantially as and for the purpose described.

6. The combination, with the shelf of a music-stand, book-support, easel, or the like provided with the kerf-slots and a kerf-recess connecting the kerf-slots, of the uprights pivoted in the kerf-slots, the connecting-rod having a depending handle and secured to the uprights and sliding in the kerf-recess, and a stop secured in one of the kerf-slots, whereby the uprights are prevented sinking too deep in the kerf-slots, substantially as described.

7. The combination, with the shelf of a music-stand, book-support, easel, or the like provided with the felt or similarly-lined slots and connecting-recess, of the uprights pivoted in the slots, and a connecting-rod secured to the uprights and sliding in the kerf-recess, substantially as and for the purpose described.

395,716. MINING-DRILL AND CHANNEL-CUTTER. JOHN P. PAYNTER, Pomona, Kans. Filed Jan. 26, 1888. Serial No. 261,823. (No model.)



Claim.—1. A mining drill-tool consisting of a longitudinally and transversely apertured conical screw provided with cutters, substantially as described.

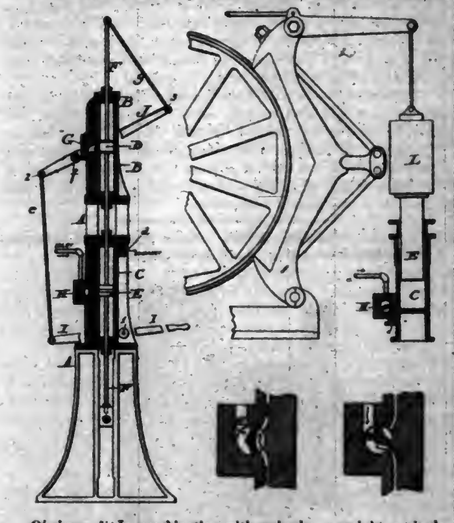
2. A mining drill-tool consisting of a conical screw having a central longitudinal aperture and a series of transverse apertures leading from the longitudinal aperture and provided with a series of removable cutters secured in the threads of the screw, substantially as herein shown and described.

3. In a mining-drill, the combination, with a drill-supporting frame mounted on wheels or rollers, of jack-screws provided with side bearings, and rods or bars supported in said bearings and forming a track for supporting the said frame, substantially as herein shown and described.

4. In a mining-drill, the combination, with a track and a frame mounted on rollers and traveling on said track, of an engine carried by the frame, a transverse cutter-shaft operated from the engine, a sprocket-wheel operated from the cutter-shaft, and a sprocket-chain having one end secured to a support and passing over the said sprocket-wheel and over guide wheels or pulleys, substantially as herein shown and described.

5. In a mining-drill, the combination, with fixed rods, of a frame adapted to slide longitudinally on the said rods, an engine located on the said frame and provided on its main shaft with a sprocket-wheel, a shaft mounted to rotate on the said frame and provided with a sprocket-wheel, an endless sprocket-chain passing over the said two sprocket-wheels, a drilling-tool having cutters and screw-threads and secured on the said shaft, a worm formed on the said shaft, a worm-wheel secured on a vertical shaft mounted in the said frame, said worm-wheel meshing in the said worm and also carrying a bevel gear-wheel, a bevel-pinion meshing in the said bevel gear-wheel, a shaft carrying the said bevel-pinion and mounted to rotate on the said frame, a sprocket-wheel secured to the said pinion-shaft, and a sprocket-chain passing over the said sprocket-wheel and having one end secured on a fixed point, substantially as shown and described.

395,717. BRAKE. EDWIN REYNOLDS and REUBO V. HORSBURG, Milwaukee, Wis. Filed Sept. 4, 1888. Serial No. 284,542. (No model.)



Claim.—1. In combination with a brake, a weight, a single-acting cylinder, a piston, a valve, a hand-lever, and intermediate connections, substantially such as shown, for causing the piston to follow the motion of the hand-lever.

2. In combination with a brake, a weight, a fluid-cylinder provided with a piston, a valve to control the admission and emission of fluid, a second cylinder provided with a piston and containing an inelastic fluid, and a piston-rod common to both pistons.

3. In combination with a brake, a weight, a fluid-cylinder and piston, a valve therefor, a second cylinder provided with a piston and containing a fluid, a valve for said cylinder, a piston-rod common to both pistons, and a connection between the two valves.

4. In combination with a brake, a weight, a single-acting cylinder provided with a piston adapted to release the brake, and a cushion, arranged substantially as shown, to counteract the momentum of the piston and weight.

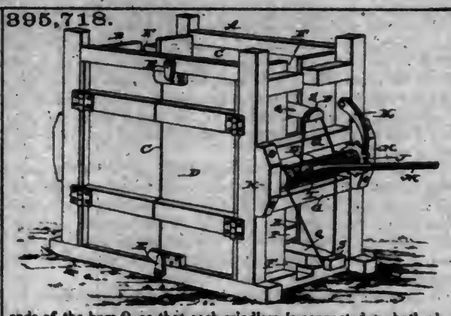
5. In combination with a brake, a weight, a cylinder and piston adapted to release the brake, a valve for controlling the admission to and exhaust from said cylinder, a second cylinder provided with a piston and with a valve adapted to connect opposite ends of the cylinder, a piston-rod common to both pistons, a rod or link connecting the valves, a hand-lever, and intermediate connections between the hand-lever and the valves and pistons, all arranged substantially as shown, whereby the movements of the hand-lever and pistons are caused to correspond.

6. In combination with a brake, a weight, a cylinder and piston to release the brake, a valve to control the admission and discharge from the cylinder, a hand-lever, and connecting-gear between the hand-lever and valve, whereby the movements of the hand-lever and piston are made to correspond, substantially as shown.

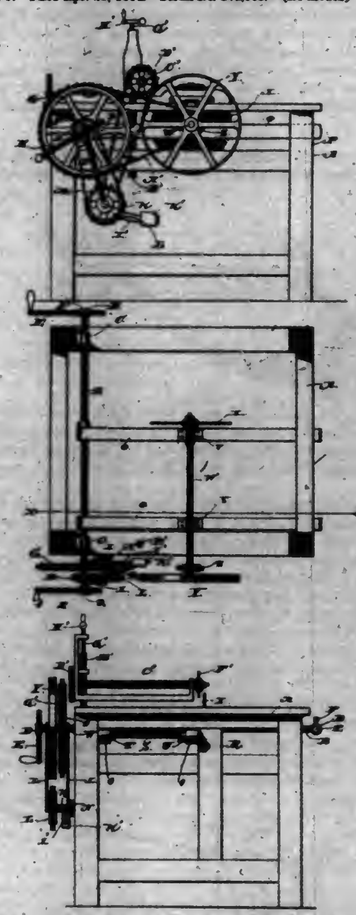
395,718. BALING-PRESS. TULLY BUNKLE, Farmersville, assignor of one-half to James F. Yeager, Prairie Creek, Ind. Filed May 25, 1888. Serial No. 275,006. (No model.)

Claim.—The improved baling-press herein described, comprising the box A, having the open sides and closed ends, the latter having slots F, the doors for closing the sides of the box, the windlasses I, one for each end of the box, journaled at the ends of the box, the pawl and ratchet for the windlasses, the latter having the openings L for the insertion of the detachable operating-levers M, the two plungers mounted in the press-box and having bars Q, projecting through slots F, and the two sets of cables at opposite ends of the press-box secured to the windlasses, wound in reverse directions thereon, extended outward on each side thereof, and connected to the extended ends of the bars Q, so that each windlass is connected to both plungers, as set forth.

395,718.



395,719. SAWING-MACHINE. EDGAR W. SUTPHEN, Jamesburg, N. J. Filed Apr. 25, 1888. Serial No. 271,805. (No model.)



Claim.—1. The combination of the frame having the vertical standard B', the driving-shaft journaled in the frame, the saw-frame hinged on said shaft, the saw-arbor journaled in said frame and having the wheel connected to a wheel on the driving-shaft, for the purpose set forth, the swinging frame I, pivoted to the driving-shaft, the shaft K, journaled in said swinging frame, the wheels and endless chain connecting said shaft to the main shaft, the vertically-movable frame guided on standard B', the shaft C', journaled in said frame and having the feed-wheel, and the wheels and endless chain connecting said shaft C' with the shaft K, substantially as described.

2. The combination, in a sawing-machine, of the frame A, hav-

ing the posts or guides P R, the driving-shaft journaled in the said frame, the wheel G on said shaft, the parallel bars O, having one end pivoted to the driving-shaft and having their free ends arranged between the guide-posts P R, clamping device to secure the free ends of the said bars to the said posts at any desired vertical adjustment, the saw-arbor journaled in bearings on the bars O and having the wheel Z, and the endless chain connecting the wheels Z and G, substantially as described.

3. The combination, in a sewing-machine, of the driving-shaft having the wheel H, the swinging frame or arm I, pivoted to the said shaft and having the shaft K, provided with the wheels L N, the sprocket-chain connecting the wheels H L, the vertically-movable shaft C, having the feed-wheel, for the purpose set forth, and the wheel D, and the sprocket-chain connecting the wheel D to the wheel N, substantially as described.

4. In a sewing-machine, the driving-shaft having the wheel H, the swinging frame or arm I, pivotally hung therefrom and having the shaft K, provided with the wheels L N, the sprocket-chain connecting the wheels H L, the adjustable shaft C, having the wheel D, the sprocket-chain connecting the wheel D to the wheel N, and the weighted arm I for the frame I, as set forth.

5. In a sewing-machine, the combination of the shaft W, having the saw X, the driving or main shaft having the wheels G H, the sprocket-wheel Z on shaft W, the chain connecting wheels G Z, the swinging frame I, having the sprocket-wheels L N, the chain connecting the wheels H L, the shaft C, having the sprocket D, and the chain connecting the sprocket-wheel N to the sprocket-wheel D, as set forth.

395,720. POLISHING-WHEEL. FERDINAND W. STARR, Springfield, Ohio. Filed July 24, 1886. Serial No. 208,920. (No model.)



Claim.—1. In a machine for polishing and finishing surfaces, the combination, with a main driving-shaft, of a slack polishing-belt passing loosely about a pulley upon said shaft and adapted to be brought into frictional contact with the pulley by the work to be operated upon.

2. In combination with a shaft, mechanism for imparting motion thereto, a polishing-belt passing loosely about said shaft and adapted to be brought into frictional contact with a pulley thereon by the work to be operated upon, and a support for said belt, arranged substantially as shown, whereby when the work is removed from the belt the latter will be prevented by its support from traveling.

3. The herein-described method of mounting and operating polishing belts or cords—that is to say, mounting or hanging an endless polishing belt or cord loosely on its driving-pulley, so that the belt or cord will remain practically stationary when not in use, and then applying to said belt or cord the article to be polished with the force necessary to cause the belt or cord to adhere to its driving-pulley and receive motion therefrom, substantially as shown and described.

395,721. LAWN-RAKE. HENRY W. STEINER, Easton, Pa., assignor of one-half to Edward W. Miller, same place. Filed Sept. 26, 1888. Serial No. 286,362. (No model.)



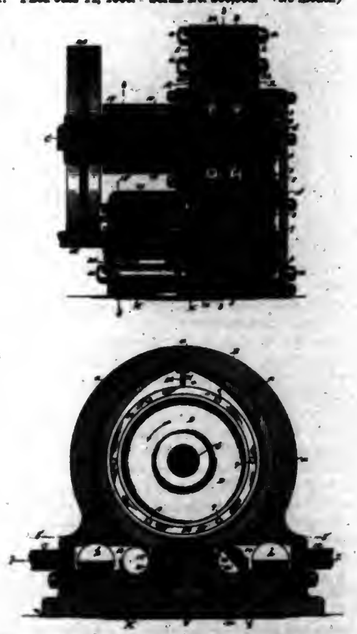
Claim.—1. A rake having its head, teeth, shank, and braces all formed of wire, the said wire being twisted centrally to form a screw-shank, C, a portion of which is engaged in the rake-handle, while a portion outside of the handle is bent downward to form a strong central brace for the rake-head, the strands of wire separating at the point D and carried outward in opposite directions on each side, bent downward from D a short distance, then bent upward in a curve, E, then inclined upward and outward, then downward in a curve, F, these reflex bends being continued far enough on each side to form one-half of the rake-head, the ends of the wire at each end of the rake-head being extended inward to form inclined braces H, which are secured to the rake-handle, as set forth.

2. A rake-head made of wire and composed of a series of reflex bends, the said bends having their lower ends arranged in a line which is curved upward on each side of the center of the rake-head, whereby the center of the rake-head first touches the ground, as set forth.

3. In a rake, a head composed of wire bent centrally upon itself to form a screw-shank, a portion of which twisted shank is engaged in the handle, while a portion outside therefrom is bent downward to form a strong central brace for the rake-head, and a series of reflex bends in the wire on each side of the central brace, said bends forming the teeth of the rake, substantially as specified.

4. The herein-described rake, composed of the handle A and the heavy spring-wire B, bent centrally to form the screw-shank C, having the downwardly-bent portion *d* outside the handle and bent reflexly outward on each side to form the curves E F and inclined arms or portions *e f*, and with its end portions bent toward the handle to form inclined braces H, having the loops A and secured to the handle by the rivet I, substantially as specified.

395,722. ROTARY ENGINE. JOSEPH THORNE, Port Richmond N. Y. Filed Jan. 11, 1888. Serial No. 260,262. (No model.)



Claim.—1. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed to maintain contact with the periphery of the piston and rotating in the same direction therewith, substantially as described.

2. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed and arranged to maintain contact with the periphery of the piston, induction and exhaust ports located upon the opposite sides of the abutment, and a rotary valve for controlling the induction-port, substantially as described.

3. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed to maintain contact with the periphery of the piston and connections between the piston and abutment for rotating the latter turn for turn with the former and in the same direction, substantially as described.

4. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed to maintain contact with the periphery of the piston, induction and exhaust ports located upon the opposite sides of the abutment, a rotary valve for controlling the induction-port, and connections between the piston, abutment, and valve for causing the abutment and valve to make turn for turn with the piston, substantially as described.

5. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed to maintain contact with the periphery of the piston and double adjustable gearing connecting the two to cause them to make turn for turn in the same direction without backlash, substantially as described.

6. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed to maintain contact with the periphery of the piston and rotating in the same direction therewith, induction and exhaust ports located upon the opposite sides of the abutment, and adjustable valves for controlling said ports, whereby the steam can be admitted upon either side of the abutment and exhausted upon the other, substantially as described.

7. The combination, with a rotary piston having a projection or lobe, of a rotary abutment formed to maintain contact with the periphery of the piston, induction and exhaust ports located upon the opposite sides of the abutment, and the rotary valves F G, for controlling said ports, which are geared to the shaft of the abutment and arranged to be inserted and withdrawn to reverse the engine, substantially as described.

8. The combination, with a plurality of rotary pistons having projections or lobes set in different positions with relation to the main shaft, of rotary abutments formed to maintain contact with the peripheries of said pistons and rotating in the same direction therewith, substantially as described.

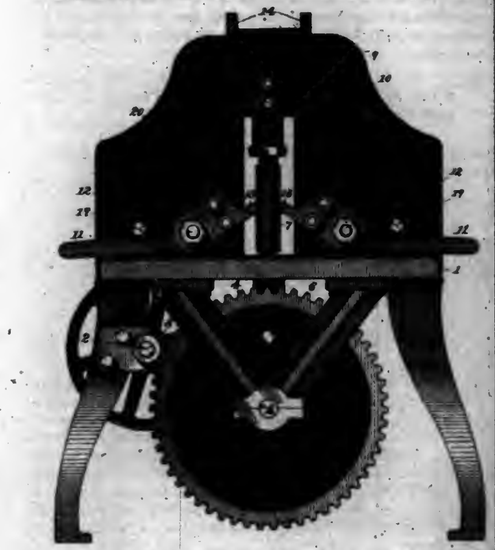
9. The combination, with a plurality of rotary pistons having projections or lobes sets in different positions with relation to the main shaft, of rotary abutments formed to maintain contact with the peripheries of said pistons, induction and exhaust ports located upon the opposite sides of the abutments, and rotary valves for controlling the induction-ports, said pistons, abutments, and valves being connected so as to make turn for turn, substantially as described.

10. The combination, with a rotary piston having a circular body and a lobe, the sides of which form arcs of two circles described about different centers, of a rotary abutment maintaining contact with the periphery of said piston and rotating in the same direction, and having a circular body and a depressed portion formed upon the arcs of two circles described about different centers, substantially as described.

11. The combination, with a rotary piston and the rotary abutment having the gear 19, of the rotary valves F G, arranged to be inserted and withdrawn, and having the gears 20 and the long gears 41, connecting the gears 19 20, substantially as described.

12. The combination, with the rotary piston and the rotary abutment, of the packing-blocks 21, mounted upon the body of the abutment, so as to be permitted to move outward by centrifugal force, substantially as described.

395,728. METAL-BENDING MACHINE. SAMUEL VANSTONE, Providence, R. I. Filed May 10, 1888. Serial No. 273,461. (No model.)



Claim.—1. The combination of the plunger and the lever-arms having the die portions, substantially as described, with the locking-bolts, the parts being so constructed and arranged that the plunger is caused, first, to give a partial bend to the central portion of the metal and the lever-arms having the die portions are caused, second, to give the final bend, as described.

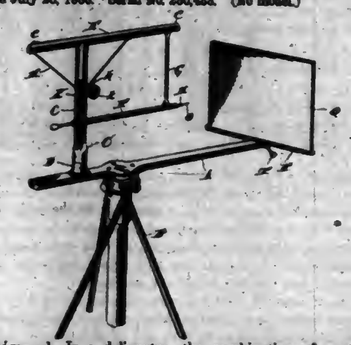
2. In combination with the plunger, the lever-arms having the die portions, the locking-bolts, as described, and the mechanism for withdrawing the same at the proper time.

3. The combination of the plunger, the lever-arms having the die portions, the cam-pieces, and the rods 15 15, with the locking-bolts, as described.

4. The combination of the plunger, the slide-block 9, having the cam-pieces 14 14, the bars 15 15, with the locking-bolts and lever-arms having the die portions, as described.

5. The machine described, having the reciprocating plunger adapted to perform the first part of the bending action, the pivoted lever-arms with die portions adapted to exert after the first bending action a further bending action, the locking-bolts for holding the lever-arms against action, and the mechanism for withdrawing the same at the proper time, as and for the purpose set forth.

395,724. DELINEATOR. DAVID K. WADE, McPherson, Kans. Filed July 20, 1888. Serial No. 280,483. (No model.)



Claim.—1. In a delineator, the combination of a standard mounted in a suitable socket, the sight-bar mounted on the upper end of the standard, the tubular arm pivoted at one end to the standard and connected at the other end to the free end of the sight-bar, whereby the tubular arm and the sight-bar are held parallel, and the pointer arranged in the tubular arm and provided at its front end with a suitable pencil or crayon adapted to bear against a vertical surface, substantially as specified.

2. In a delineator, the combination, with a base plate or bar arranged on a suitable stand or tripod and the vertical board longitudinally adjustable on the said plate or bar, of the standard mounted in a suitable socket on the base plate or bar, the sight-bar mounted on the upper end of the standard, the tubular arm pivoted to the standard at one end and connected by a suitable rod to the free end of the sight-bar, and the spring-actuated pointer mounted in the tubular arm and provided with a pencil or crayon adapted to bear against the said board, substantially as specified.

3. In a delineator, the combination, with a base plate or bar having a vertical board arranged thereon, of the standard swiveled at its lower end on the plate or bar, the sight-bar mounted on the upper end of the standard, the tubular arm connected to the sight-bar and carrying a suitable pointer, and the cord affixed at its ends to the sight-bar on opposite sides of the standard and passing at an intermediate point around a suitable drum or pulley, substantially as specified.

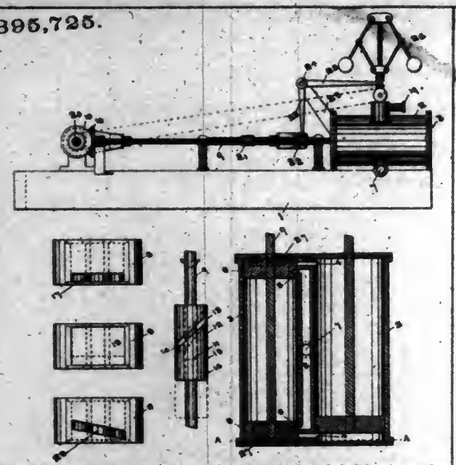
4. In a delineator, the combination, with a suitable base plate or bar provided with a suitable vertical board, of the standard swiveled on the said plate or bar and provided with a vertical slot, *c*, the spindle K, mounted in registering bearings in opposite sides of the slot *c* and provided with a thumb-wheel and a drum, the sight-bar provided with suitable sights, the cord attached at its ends to the sight-bar and passing at an intermediate point around the said drum, the tubular arm mounted in the lower end of the slot and connected at its free end to the sight-bar, and the pointer mounted in the tubular arm and provided with a suitable pencil or crayon, substantially as and for the purpose specified.

5. In a delineator, the combination, with the dovetailed base plate or bar A, provided with a socket, D, the standard mounted in the socket, the sight-bar mounted on the standard, the tubular arm mounted on the standard and connected to the sight-bar, and the pointer arranged in the tubular arm, of the vertical board provided with a depending casting having a dovetailed notch fitting snugly on the base plate or bar, and the thumb-screws arranged in the sides of the notch and bearing against the plate or bar to lock the board in the desired position, substantially as specified.

395,725. STEAM-ENGINE VALVE. WILLIAM A. WALKER, Rome, N. Y. Filed June 27, 1887. Serial No. 242,501. (No model.)

Claim.—1. The combination, within a steam-chamber, of a cir-

395,725.



cular seat having two ports therein, and a cylindrical shell having a slot or port through the shell adapted to register with one of the ports in the seat and having a pocket or recess upon the external cylindrical surface of the shell adapted to cover both ports in the seat and establish communication between them, one or more shells being mounted on a shaft within the chamber, so as to admit of a lateral movement of the shell upon the seat within the chamber.

2. In a rotary valve for a motor, the combination of a curved valve-seat located in a steam-chamber, the seat being provided with an inlet and exhaust ports for each end of the cylinder, a cylindrical shell mounted upon a shaft within a chamber, rotating in the curved seat, covering the ports, and provided with slotted openings through the shell adapted to register with the inlet-ports in the seat with each revolution of the shell, and recesses or pockets upon the external cylindrical surface of the shell, each pocket being adapted to cover the exhaust and inlet ports at each end of the cylinder and establish communication between them with each revolution of the valve, the shell being longitudinally adjustable in the seat, whereby the slotted openings of the shell are adjusted to a position not to or only partially to register with the inlet-ports.

3. The combination, with a rotary valve of a motor having a cylindrical shell mounted on a shaft covering inlet and exhaust ports for each end of the cylinder in a circular seat and the shell provided with slotted openings for establishing communication between the inlet-ports and the interior of the cylindrical shell and pocket upon the exterior cylindrical surface of the shell for establishing communication between the inlet and exhaust ports, of a governor connected with the shell for adjusting it longitudinally in the seat.

4. A steam-chamber having a circular seat having ports therein, and a rotary valve consisting of a cylindrical shell having a slot or port through the shell adapted to register with one of the ports in the seat and having a pocket or recess upon the external cylindrical surface of the shell adapted to simultaneously cover two of the ports in the seat and establish communication between them, one or more shells being mounted upon a shaft within the chamber, so as to revolve and also admit of a lateral movement of the shell upon the seat, the shaft being in sections and one of the sections provided with a movable sleeve revolving with and longitudinally adjustable upon the section of the shaft, the sleeve having a spiral slot and the other section of the shaft entering the sleeve and provided with a projection engaging the sleeve within the slot.

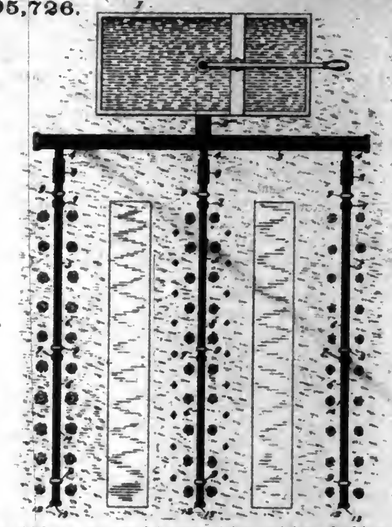
395,726. SPRINKLING OR IRRIGATING APPARATUS. JOHN WALTER, Winter Haven, Fla. Filed Feb. 9, 1888. Serial No. 263,452. (No model.)

Claim.—1. In a sprinkling or irrigating apparatus, the combination, with a main pipe having outlet-pipes arranged at the ends of the beds or rows of plants to be watered, of branch pipes which are formed with perforations in both sides and movably or slidingly connected to said outlet-pipes and supported above said plants, substantially as and for the purpose described.

2. In a sprinkling or irrigating apparatus, the combination, with a main pipe, of a sectional longitudinally-movable branch pipe formed with perforations in both sides and provided with a cap having a drainage-aperture in its lower portion, substantially as described.

3. In a sprinkling or irrigating apparatus, the combination of a water-supply source, a main pipe provided with outlet-pipes at the ends of the beds or rows of plants to be watered, sectional branch

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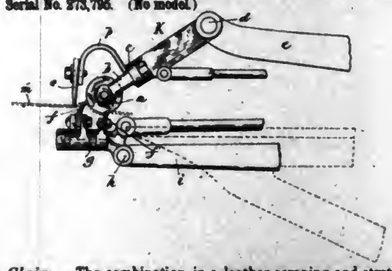


pipes which are connected by screw-joints and formed with rows of perforations registering with said beds or rows of plants and constructed to be longitudinally movable upon said outlet-pipes, and supports or stakes formed with notches or recesses in which said branch pipes may be slid longitudinally, substantially as and for the purpose described.

4. In a sprinkling or irrigating apparatus, the combination of the main pipe 3, having the outlet-pipes 4 opposite the ends of the rows or beds of plants, with the perforated branch pipes 5, having movable or sliding joints 8 at their inner ends, and caps 12, having apertures 13 at their outer or lower ends, substantially as and for the purpose described.

5. The herein-described sprinkling or irrigating apparatus, comprising a supply-tank provided with a discharge-opening, a valve, a spring for holding said valve closed, a rod and hand-lever for opening the same and an outlet-pipe, a main water-supply pipe having outlet-pipes, perforated branch pipes telescoping or slidingly connected to said outlet-pipes and formed in removable sections, and notched or recessed supporting-stakes provided with bails or straps, substantially as described.

395,727. MACHINE FOR STRETCHING, SCRAPING, AND FINISHING HIDES. NICHOLAS WEBER, Lynn, Mass. Filed May 14, 1888. Serial No. 273,795. (No model.)

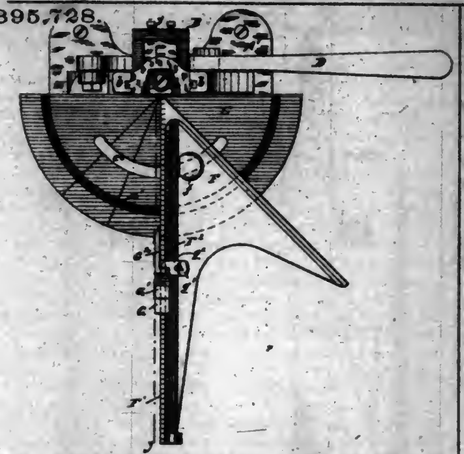


Claim.—The combination, in a leather scraping and stretching machine, of the yielding jaw or roll *a*, arranged to bear on the grain side of a skin, a scraping-jaw arranged to bear on the opposite side of the skin, holders for said jaws, the finishing or polishing blade secured to the holder of the yielding jaw or roll and arranged to bear on the grain side of a skin at one side of the line of contact of the said jaws with the skin, and mechanism for reciprocating and opening and closing said jaws, whereby the finishing-blade is caused to rub and polish the grain side of the skin while said jaws are closed thereon, as set forth.

395,728. MACHINE FOR CUTTING PRINTERS' RULES. FERDINAND WIBEL, New York, N. Y. Filed Aug. 7, 1888. Serial No. 282,149. (No model.)

Claim.—The combination of an upright standard, a vertically-reciprocating knife-holder guided in ways of the same, a cutting-knife in said holder, a lever for reciprocating said holder, a horizontal guide-

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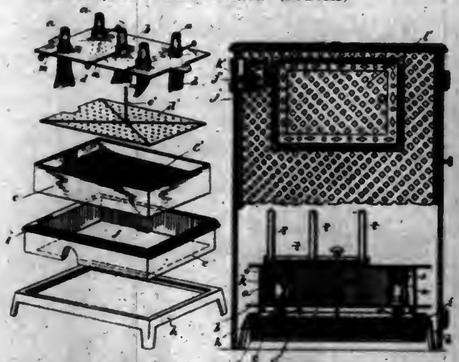
table, a horizontal adjustable guide-plate provided with a dovetailed edge-bar, a guide-rod fixed on said guide-plate parallel to said edge-bar, an adjustable stop on said guide-rod, and a push-piece guided on said edge-bar, substantially as set forth.

395,729. POCKET FOR GARMENTS. HENRY R. WHALEY, St. Paul, Minn. Filed Sept. 7, 1888. Serial No. 284,775. (No model.)



Claim.—A garment having a pocket-opening therein the edges of which are folded inward, in combination with a pocket attached to said inwardly-folded edges and re-enforcing strip attached by one of its edges between the adjacent edges of the pocket and the inwardly-folded edges of the pocket-opening, whereby the pocket-opening is supported and the strains distributed over the body of the garment contiguous thereto.

395,730. PORTABLE HEATING OR COOKING STOVE. J. BURNHAM ANDERSON, Boston, Mass., assignor to George H. Heath, same place. Filed Feb. 3, 1888. Serial No. 262,961. (No model.)



Claim.—1. The combination of a series of burners, a cage or frame composed of liquid-holding tubes arranged to be heated by said burners and inclosing a horizontal oven-receiving space, and a movable oven formed to be inserted in said space, as set forth.

2. The combination of a series of burners, a horizontal cage or frame composed of liquid-holding tubes arranged to be heated by said burners and inclosing a horizontal space, a movable oven formed to be inserted in said space, a removable cover formed to inclose said cage and oven, and a plate, *p*, provided with openings coinciding with the burners and arranged to support the oven, as set forth.

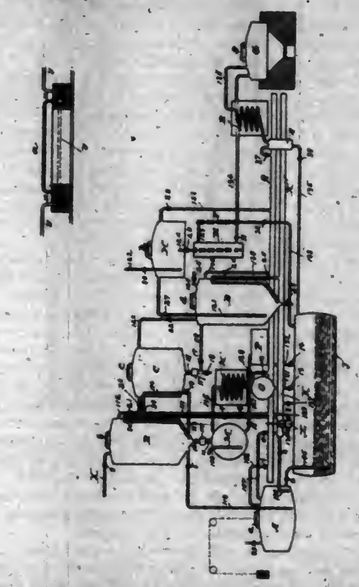
3. The reservoir *c*, having the fibrous absorbent material, combined with the perforated follower and means for depressing the same, as set forth.

4. The combination of the reservoir, the fibrous material thereon, the perforated follower, and the screw and fixed nut, whereby said follower may be depressed, as set forth.

5. The combination of the hollow casing *e*, having the outwardly-projecting flange *i*, the air-space, and the inwardly-projecting legs or supports *f*, the base *h*, formed to support the casing by its flange *i*, and the reservoir *c*, formed to be inserted in the casing and to rest on the legs *f* thereof, as set forth.

6. The combination of the burners *a*, the chamber *k*, having the chimneys *n* opening through its top, the plate *p*, having openings *q* arranged to coincide with the chimneys, and the tubes *l l* on said plate, formed into a hollow cage or oven-receptacle, all arranged and operating substantially as set forth.

395,731. BLEACHING AND REFINING RESINS AND OTHER SUBSTANCES. HENRY A. BERENDS, Bremen, Germany. Filed Oct. 31, 1885. Serial No. 181,543. (No model.) Patented in Germany June 7, 1885, No. 35,090; in England Sept. 19, 1885, No. 11,177, and in Belgium Sept. 21, 1885, No. 70,262.



Claim.—1. The within-described process of bleaching and refining resins and other similar substances, consisting in dissolving the same in a volatile substance having a low boiling-point, mixing the solution with an alkali to separate the impurities, removing the alkali with the impurities from the solution, and finally recovering the solvent and depositing the resin by evaporation, substantially as described.

2. The within-described process of bleaching and refining resins and other similar substances, consisting in first dissolving the same in a volatile substance, then mixing the solution with an alkali to separate the impurities, then removing the alkali and impurities from the solution, and then recovering the solvent and depositing the resin by evaporation, the movement of the substances during the several steps of the process being controlled by the compression and exhaustion of confined air, substantially as described.

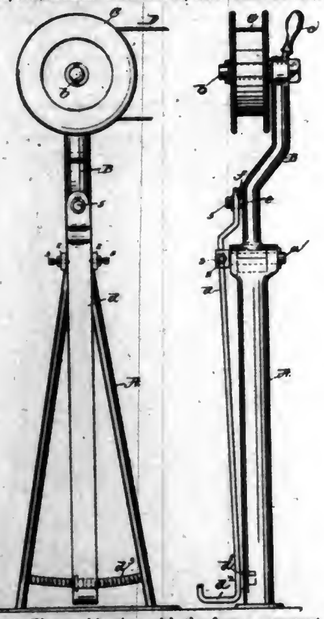
3. The within-described process of bleaching and refining resins and other similar substances, consisting in first dissolving the same in a volatile substance, then mixing the solution with an alkali to separate the impurities, then removing the alkali and impurities from the solution, then mixing with the solution a suitable bleaching agent and removing the latter, and finally separating the resin and solvent by evaporation and recovering the latter, substantially as described.

4. In an apparatus for bleaching and refining resins, the combination of the receptacle A, in which the resin is dissolved, a series of purifiers wherein the resin solution is subjected to decolorizing sub-

stances, the pipes leading from the purifiers, through which the decolorizing substances and the impurities are drawn off, the distilling apparatus for removing the solvent from the resin, the connecting-pipes between the said parts of the apparatus, whereby the resin solution passes in succession from one to the other, the pump having both high and low pressure connections with each of the purifiers, and stop-cocks in the said connections, substantially as and for the purpose set forth.

5. In an apparatus for bleaching and purifying, the combination, with the purifying-vessels, of a cap for closing the same, a channel for the reception of a fusible alloy, and a steam-pipe located in said channel, substantially as described.

395,782. BELT-TIGHTENER FOR BUFFING-MACHINES. JOHN G. BLOUNT, Boston, Mass. Filed Mar. 16, 1888. Serial No. 267,393. (No model.)



Claim.—1. The combination, with the frame or support, the pin *a*, arm B, pivoted thereon, the stud *c*, and strap-carrying pulley C, of a foot-lever pivotally attached to the said pin and movable toward and from the arm B upon the stud *c*, substantially as described.

2. The combination, with the support or frame A, pivoted arm B, and strap-carrying pulley C, of the handle *c*, rigidly connected with the upper end of the arm *b*, substantially as described.

3. The combination, with the frame or support A, pivoted arm B, and strap-carrying pulley C, of a foot-lever, *d*, having at its lower end the tooth d^1, and the ratchet-toothed bar d^2, with which the tooth of the foot-lever co-operates, substantially as described.

4. The combination, with frame or support A, the arm B, pivoted on the pin *a* and having the yoke 2 2, the strap-carrying pulley C, of the lever having pivots 3 in the said yoke, the stud *c*, the spring *f*, and a locking or engaging device, d^3, substantially as described.

5. The combination, with the main frame or support A, the pivoted arm B, and strap-carrying pulley C, of the foot-lever *d*, having the spring *f*, bearing against it at one end, and a locking or engaging device, substantially as described, at the other end of the foot-lever, as and for the purposes set forth.

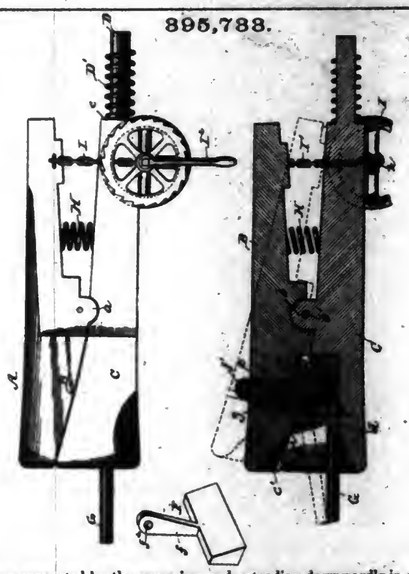
395,783. CAR-COUPLING. HARTWELL BRALEY, Langsville, Ohio. Filed July 6, 1888. Serial No. 279,220. (Model.)

Claim.—1. In a car-coupler, the combination, with a draw-head comprising two jaws pivoted together and provided with recesses at their forward ends, of projections extending from said jaws into said recesses, substantially as set forth.

2. In a car-coupler, the combination, with a draw-head composed of two jaws pivoted together and recessed at their forward ends, of a projection on one of said jaws having a straight rear face and a spring to maintain the forward portions of the jaws together, substantially as set forth.

3. In a car-coupler, the combination, with a draw-head composed of two jaws pivoted together and recessed at their forward ends, of projections extending from said jaws into the recess and a pendulous

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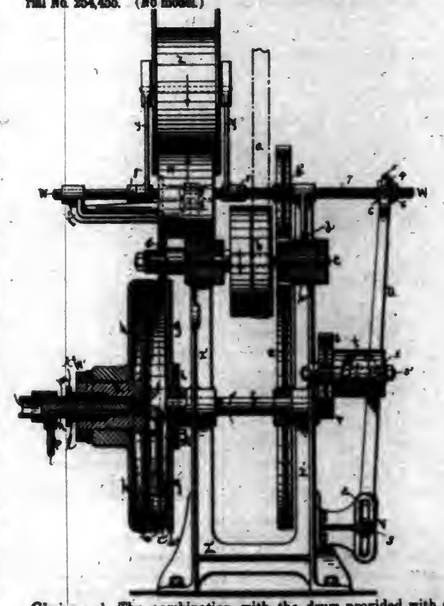


lever supported by the upper jaw and extending downwardly in rear of the projection on the lower jaw, substantially as set forth.

4. In a car-coupler, the combination, with a draw-head composed of two jaws pivoted together and recessed at their forward ends and projections extending from said jaws into the recess, of a pendulous lever supported by the upper jaw and extending downwardly in rear of the projections on the jaws and mechanism for vibrating said jaw, substantially as set forth.

5. In a car-coupler, the combination, with a draw-head made in two sections and recessed at their forward ends and projections extending from said jaws into the recesses, of a pendulous lever supported to oscillate in rear of said projections, hooked bars carried by the upper jaw and extending to the bottom of the recess in the lower jaw and mechanism for vibrating the jaws, substantially as set forth.

395,784. MACHINE FOR GRADING AND REELING STRAW BRAID. DANIEL BROWN, Wrentham, Mass. Filed Nov. 7, 1887. Serial No. 254,455. (No model.)



Claim.—1. The combination, with the drum provided with a raised rim on one side, of a shell adjustable on said drum with relation

to the rim, for the purpose set forth, and devices, substantially as described, for heating the drum.

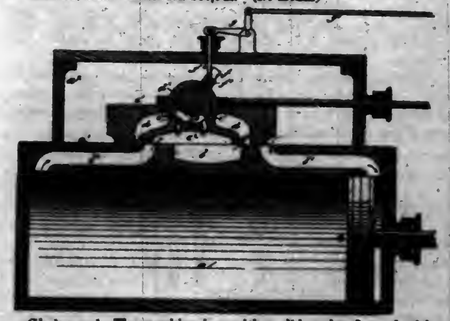
2. The combination, with the drum provided with a raised rim on one side and a screw-threaded projection on the other side, of a shell screwed onto said projection, and thereby adjustable on the drum with relation to the rim, for the purpose stated, and devices, substantially as described, for admitting steam to the interior of the drum for the purpose of heating it.

3. The combination, with the drum having a peripheral groove, as described, of a shaft journaled in eccentrics mounted in the main frame, means for holding the eccentrics in adjusted position, a pressure-roll secured on said shaft and working in the groove in the drum, and mechanism for driving the shaft, for the purposes set forth.

4. The combination, with the drum having a peripheral groove, as described, and a pressure-roll working in said groove, of a reciprocating shaft journaled in the main frame above said roll, a delivery-roll rigidly secured on said shaft, a reel journaled above the delivery-roll in supports loosely mounted on said shaft but reciprocating therewith, and means, substantially as described, for rotating and reciprocating the shaft.

5. The combination, with the drum having a peripheral groove and a pressure-roll working in said groove, of a guide for directing the straw braid under the pressure-roll, and a lifting-finger lying in the groove in the drum in rear of said roll for lifting the braid from the drum, substantially as described.

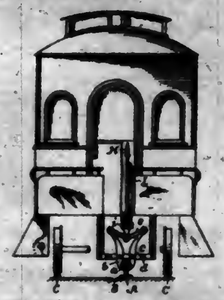
395,785. SLIDE-VALVE. THOMAS T. BROWN, Chicago, Ill. Filed Mar. 21, 1888. Serial No. 267,942. (No model.)



Claim.—1. The combination, with a slide-valve formed with a cored exhaust-passage in its face and a cored chamber on each side of the same connected by passages with the face of the valve, and also with its exhaust-passage, of a cored rock-valve seated in the main valve across the auxiliary passages and a stem for operating this valve connected to an adjustable point upon the valve-chest, whereby the throw of the auxiliary valve is adjusted to suit the stroke of the main valve, substantially as and for the purpose set forth.

2. The combination, with a slide-valve formed with suitable main and auxiliary exhaust-passages and a rock-valve seated in said auxiliary passages, of an operating-arm on this rock-valve and a guide for the arm swiveled upon a sliding rod past which the auxiliary valve is carried by the stroke of the main valve, and means, substantially as described, for moving said rod to increase or diminish the throw of the auxiliary valve inversely to the adjustment of the main valve, substantially as and for the purpose set forth.

395,786. SAFETY-BRAKE FOR CABLE CARS. CHESTER BULLOCK, Kansas City, Kans. Filed Feb. 24, 1888. Serial No. 265,126. (No model.)



Claim.—1. In a safety-brake for cable railways, a pair of oppositely-located gripping-jaws secured together at their upper ends by a toggle-joint and operated by means of an L-shaped lever, in combination with a notched bar for holding said lever at any desired adjustment, substantially as described.

2. The combination, in a safety-brake for cable cars, of a pair of oppositely-located gripping-jaws connected at their free ends by means of a toggle-joint, an L-shaped lever which is attached to said toggle and by which said joint is operated, and a notched bar secured to the car and adapted to hold said lever at any desired adjustment, substantially as described.

3. In a safety-brake for cable cars, the combination of a pair of gripping-jaws, a stationary rail having a rounded head, a toggle connecting said jaws at their upper free ends, an L-shaped lever by means of which said jaws are operated, a link connecting said lever to the toggle-joint, and a notched bar for holding the lever at any desired adjustment, all arranged and adapted to operate substantially as described.

395,787. RATCHET-AND-PAWL DEVICE. WILLIAM S. BUXTON, Springfield, Mass. Filed Apr. 23, 1888. Serial No. 271,618. (No model.)



Claim.—1. A pawl-and-ratchet device consisting of a shaft having at one end thereof a longitudinal groove, a hub capable of rotating on said shaft, having ratchet-teeth on its inner wall and an annular groove in said wall, combined with a pawl having a bar thereon extending into the groove in said shaft, and an arm on said bar engaging with said annular groove, and a head on the end of said bar adapted to have a vibratory motion at the end of said shaft and engaging by either end with said ratchet-teeth, substantially as set forth.

2. In combination, the shaft 2, having at one end thereof a longitudinal groove deepest at the end of the shaft, a hub, 3, capable of rotating on said shaft, having one end extending beyond the end of the shaft, and having in the inner wall thereof ratchet-teeth 6, and the annular groove 5 and the pawl 4, having a bar thereon extending into said groove in the shaft, a head on the end of said bar engaging with said ratchet-teeth, and an arm on said bar engaging with the annular groove in said hub, substantially as set forth.

3. In combination, the grooved shaft 2, the pawl 4, having a head, *c*, a bar, *e*, extending into the groove in said shaft, and a laterally-projecting arm, *x*, on said bar, a hub capable of rotating on said shaft extending beyond the end thereof and surrounding said pawl-head, and having ratchet-teeth with which said pawl-head engages, and an annular groove in its inner wall with which said arm *x* engages, and a cap, D, screwing on the end of said hub, substantially as set forth.

395,788. SPOKESHAVE. ISAAC CARMER, Chicago, Ill. Filed Sept. 29, 1887. Serial No. 251,063. (No model.)



Claim.—1. The combination, in a spokeshave, of the stock A, having open-sided recesses *a a* in the lateral walls of the bit-throat, the clamping-plate G, having marginal lugs *g g*, projecting laterally from its sides and adapted to rest in the recesses *a* to prevent a movement of the plate G in a plane with the cutter-bit, the holding-screw F, clamping-screw H, and cutter-bit C, essentially as set forth.

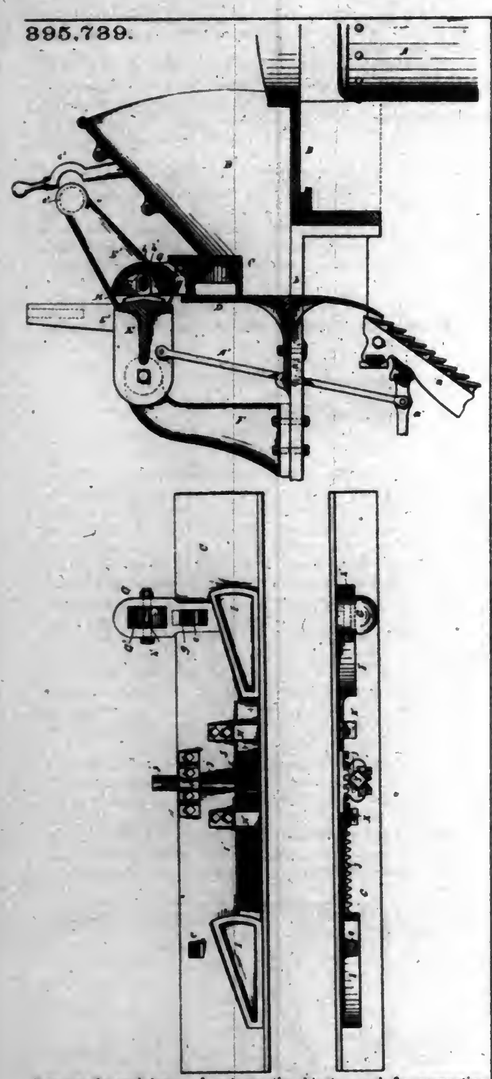
2. The combination, in a spokeshave, of the stock A, having open-sided recesses *a a* in the lateral walls of its bit-throat, the clamping-plate G, having marginal lugs *g g*, projecting laterally from its sides and adapted to rest in the recesses *a* to prevent a movement of the plate G in a plane with the cutter-bit, the holding-screw F, clamping-screw H, adjusting-screw D, and cutter-bit C, essentially as set forth.

395,789. DEVICE FOR FEEDING FUEL. HENRY H. CAMPBELL, Cleveland, Ohio, assignor of one-half to Nathan W. Taylor, same place. Filed May 25, 1888. Serial No. 275,083. (No model.)

Claim.—1. In a coal-feeding device, the combination, with reciprocating block for feeding the coal, and push-bars for actuating such block, of adjustable wedges interposed between the push-bars and reciprocating block for adjusting the throw of the latter, substantially as set forth.

2. In a coal-feeding device, the combination, with reciprocating block and push-bars, substantially as indicated, of wedges interposed

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between the push-bars and reciprocating block, a rack for connecting the wedges, and a pinion for operating the rack, the parts being arranged substantially as set forth.

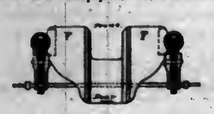
395,740. MACHINE FOR MOLDING MULTITUBULAR PIPE. CHARLES CARR, Boston, Mass. Filed July 14, 1887. Serial No. 244,253. (No model.)

Claim.—1. In a machine for molding multitubular pipe, the combination of a series of separate steam-cylinders, pistons, piston-rod hammers, and a pipe-mold, substantially as described.

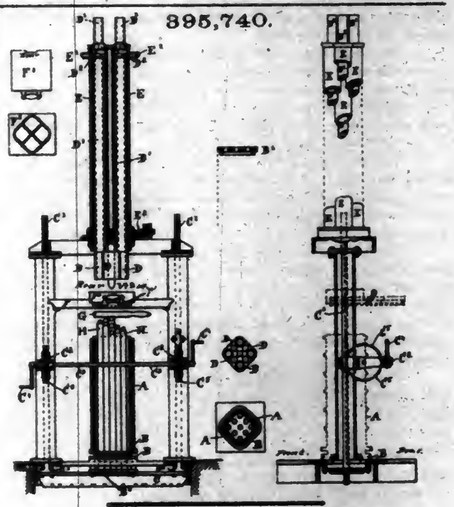
2. The combination of the follower and a series of dowel pins or blocks let into its upper face, substantially as described.

3. The combination of a perforated leather face with the dowel pins or blocks and the follower having a series of sockets in its upper face, substantially as described.

4. In a machine for molding multitubular pipe, a series of cores of gradually-varying length, in combination with the even or level-faced hammer or hammers and the pipe-mold, substantially as described.

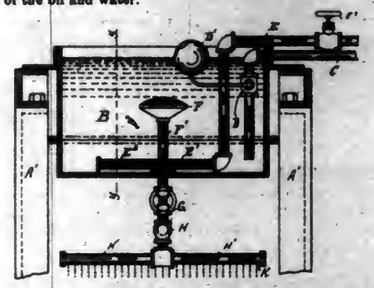


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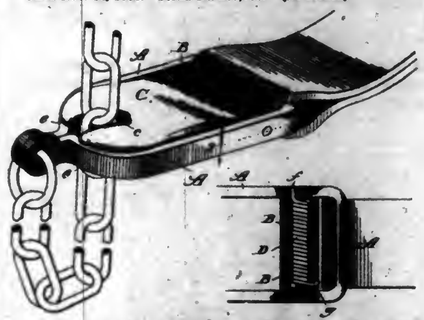
395,741. MACHINE FOR SOFTENING JUTE, HEMP, &c. JOHN CHESTER, Paterson, N. J. Filed July 7, 1888. Serial No. 279,335. (No model.)

Brief.—In passing through the machine the fiber is subjected to jets of oil in the usual way, after which it is subjected to jets of steam and boiling water from a separate pipe, the object being a better union of the oil and water.



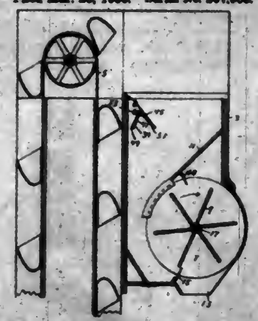
Claim.—The combination, with mechanism for softening the fiber and for supplying oil thereto, of the box B, the pipe C, provided with valve D and float D', the pipes E and E', the latter having perforations E², the pipe F, having perforated enlargement F and valve G, and the pipes H and H', the latter having the perforations K.

395,742. BUCKLE. LEONARD L. CORBEY, Benton Harbor, Mich. Filed Nov. 14, 1888. Serial No. 290,768. (No model.)



Claim.—A buckle comprising, in combination, a frame or jaws, A, a tongue, C, the outer end of which is provided with a slot, *c*, which tongue C works upon a hinge, B, together with a coiled metallic spring, D, within the hinge B, attached to the frame or jaws A and the tongue C, so that the tension will incline to keep the outer end of the tongue C against the outer end of the jaws or frame A, substantially as described.

395,743. AUTOMATIC GRAIN-MEASURE. HARRY W. COWAN, Gran, Dak. Filed Mar. 20, 1888. Serial No. 267,902. (No model.)



Claim.—1. The combination, in a device of the class described, of a measuring-wheel provided with a series of compartments, a receptacle constructed to hold a sufficient supply of material to fill all of the compartments of said measuring-wheel and adapted to supply material to said wheel, a driving mechanism adapted to revolve said measuring-wheel, and a tripping mechanism arranged in said receptacle and adapted to be moved by the material therein and to connect said driving mechanism with said measuring-wheel, whereby when said receptacle has received a sufficient supply of material to fill all of the compartments of said wheel said tripping mechanism will be operated by the material and will connect said driving mechanism with said measuring-wheel, as and for the purpose specified.

2. The combination, in a device of the class described, of the measuring-wheel provided with a series of compartments, the receptacle 3, constructed to receive a sufficient supply of material to fill all the compartments of said measuring-wheel, a driving mechanism, a clutch adapted to connect said driving mechanism and said measuring-wheel, and tripping mechanism arranged in said receptacle and adapted to be operated by the material therein when said receptacle has received a sufficient supply of material to fill all the compartments of said measuring-wheel.

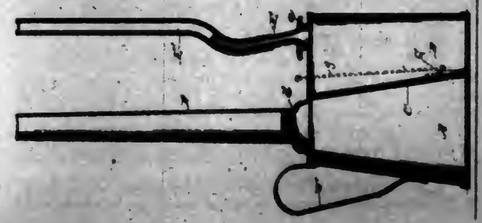
3. The combination, in a device of the class described, with the receptacle 3, of the measuring-wheel 7, the driving-wheel 19, mounted loosely upon the shaft of the said measuring-wheel, the clutch mechanism adapted to connect said driving-wheel with said shaft, the pivoted lever 31, the vibratory plate 45, arranged within said receptacle 3, the pivoted plate 51, the arm 55, the pivoted arm 53 upon the lever 31, the spring 35, and the wheel 37, provided with the lug 41, substantially as described.

4. The combination, in a device of the class described, with the measuring-wheel, the driving mechanism, and the clutch mechanism, of the operating-lever 31, provided with the arm 33 and the spring 35, the wheel 37, provided with the lug 41, and the tripping mechanism consisting of the vibratory plate 45, arranged in the grain-receptacle, the pivoted plate 51, and the arm 55, adapted to engage the arm 33, substantially as described.

5. The combination, in a device of the class described, with the measuring-wheel 7 and its shaft 17, of the wheel 19, mounted loosely upon said shaft and provided with the pins 32, the stationary ring 27, surrounding said shaft 17, the pivoted lever 25, the spring 29, and the operating-lever 31, substantially as described.

6. The combination, in a device of the class described, with the revolving measuring-wheel, of the pivoted stroke-board 60, extending across said measuring-wheel and adapted to be adjusted toward or from said wheel, the index on the outside of the casing, and the pointer secured upon the pivot of said board and adapted to be moved over said scale, and thereby to adjust said stroke-board, substantially as described.

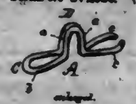
395,744. VETERINARY DRENCHING-HORN. GEORGE A. DORAN, Menominee, Mich. Filed May 16, 1888. Serial No. 274,089. (No model.)



Claim.—1. A drenching-horn composed of two receptacles, each receptacle having a nozzle, substantially as described, for the purpose specified.

2. The horsie shown and described drenching-horn, composed of a vessel, the partition dividing the vessel into two receptacles which have communication with one another, the valve for shutting off the communication between the two receptacles, and the nozzles, one for each receptacle, substantially as and for the purpose described.

395,745. BUTTON-FASTENER. GEORGE H. FOX, Boston, Mass. Filed May 21, 1888. Serial No. 274,080. (No model.)



Claim.—A button-fastener consisting of the open eye D, formed by the dual loops *a a* and the loop C, co-operating with the legs *c c*, divergent and lying in the same plane with said loop at right angles to the plane of said dual loops *a a*, substantially as and for purposes specified.

395,746. VEHICLE BRAKE-GEAR. CHARLES FULLER and JOHN H. CUNNINGHAM, Lodell, Kans. Filed Mar. 27, 1888. Serial No. 268,807. (No model.)



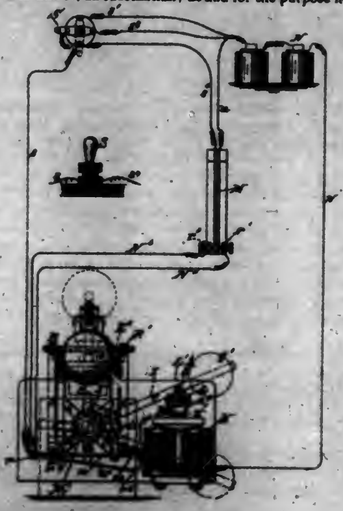
Claim.—The combination, with a vehicle having a vertically-moving axle and a brake, substantially as set forth, of the brake-bracket secured to the body of the vehicle, the clip secured to the axle, the right and left hand screw-threaded rods, the pivot-pins connecting the said rods to the brake-bracket and to the axle-clip, respectively, and permitting the said axle to move vertically, and the adjustable coupling-link provided with right and left hand screw-threaded holes for the screwed ends of the said rods, substantially as set forth.

395,747. SELF-RAISING FLOUR. GLENN L. HILLS and CARL G. HILLS, Bloomington, Ill. Filed Feb. 16, 1888. Serial No. 264,206. (No specimens.)

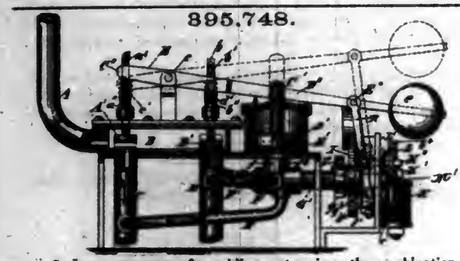
Claim.—A self-raising flour consisting of ground popped popcorn, wheat-flour, potato-flour, rice-flour, baking-powder, and sugar, substantially as described.

395,748. ANTI-FREEZING DEVICE FOR WATER-PIPES. JAMES W. KENT and ROBERT ORR, Brooklyn, N. Y. Filed Sept. 8, 1887. Serial No. 249,089. (No model.)

Claim.—1. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages *f f'*, cylinder E, piston D', pipes F' H C D A, chamber B, and valves A' and F, all substantially as and for the purpose herein set forth.



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2. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, valves A' and B', ratchet-wheel g, lever I, and pawl F, all substantially as and for the purpose herein set forth.

3. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, and valves A' and B', provided with the valve-stems a and b, all substantially as and for the purpose herein set forth.

4. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, valves A' and B', provided with the valve-stems a and b, and springs c' and d', all substantially as and for the purpose herein set forth.

5. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, valves A' and B', ratchet-wheel g, lever I, pawl I', electro-magnet K, and armature K', all substantially as and for the purpose herein set forth.

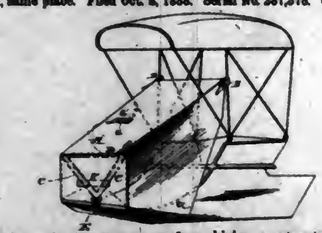
6. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, valves A' and B', ratchet-wheel g, lever I, pawl I', electro-magnet K, armature K', catch K'', spring L, and standard L', all substantially as and for the purpose herein set forth.

7. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, valves A' and B', ratchet-wheel g, lever I, pawl I', electro-magnet K, armature K', thermostat M, battery N, and a system of electric wires for automatically magnetizing and demagnetizing the electro-magnet to give movement to the armature, all substantially as and for the purpose herein set forth.

8. In an apparatus for voiding water-pipes, the combination of the double four-way cock with the valve-chest F, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, valves A' and B', ratchet-wheel g, lever I, pawl I', electro-magnet K, armature K', catch K'', spring L, standard L', thermostat M, battery N, and a system of electric wires for automatically magnetizing and demagnetizing the electro-magnet to give movement to the armature, all substantially as and for the purpose herein set forth.

9. In an apparatus for voiding water-pipes, the combination of the double four-way plug G, having a projecting end, a^2, with the valve-chest F, having a yoke, d^3, a screw or bolt, e^3, pipes or passages $f f^3$, cylinder E', piston D', pipes F' H C D A, chamber B, and valves A' and B', all substantially as and for the purpose herein set forth.

395,749. STORM-APRON FOR VEHICLES. CORYDON C. KING, Pittston, Pa., assignor of two-thirds to Wiseman & Co., and A. Fleischer, agt., same place. Filed Oct. 8, 1888. Serial No. 287,373. (No model.)

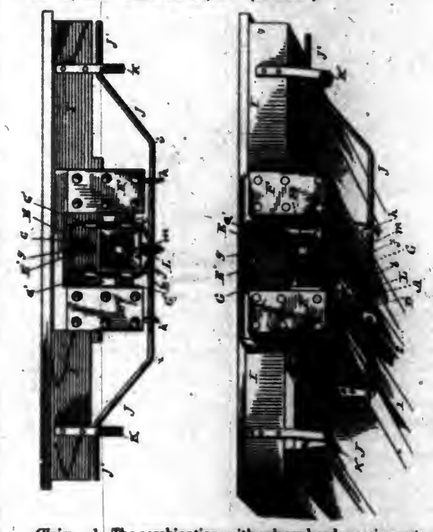


Claim.—1. A storm-apron for vehicles, constructed to extend over the dash, and provided with a hook arranged to depend from the apron and be secured at the lower edge of the dash, substantially as set forth.

2. A storm-apron provided with the converging-straps, and hook attached to their lower ends and adapted to be secured at the lower edge of the dash, substantially as set forth.

3. A storm-apron provided with the straps C C, the hook E, secured to the lower ends of the straps, and the elastic gathering-strap E', substantially as set forth.

395,750. CAR-COUPLING. SIDNEY D. KING, Pittston, Pa. Filed Jan. 10, 1888. Serial No. 260,329. (No model.)

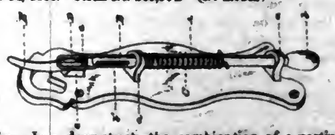


Claim.—1. The combination, with a draw-head, a spring-actuated slide in the draw-head, and a coupling-pin adapted to be held in an elevated position by the slide, of a yoke loosely mounted in the end of the car, said yoke having a sliding connection with the coupling-pin, substantially as set forth.

2. The combination, with a spring-cushioned draw-head, a spring-actuated slide therein, and a coupling-pin adapted to be held in an elevated position by the slide, of a yoke loosely mounted in loops secured to the end of the car, said yoke having a sliding connection with the coupling-pin, and an actuating-shaft having loose engagement with the yoke, substantially as set forth.

3. The combination, with a spring-cushioned draw-head having a spring-actuated slide therein, and a coupling-pin adapted to be held in an elevated position by said slide, said pin having a loop in its end, of a yoke arranged to slide in loops secured to the end of the car, this yoke having a loop in its lower end and an arm in its opposite end having a sliding connection with the loop in the coupling-pin, and an actuating-shaft provided with an arm having sliding connection with the loop in the yoke, substantially as set forth.

395,751. DOOR-CHECK. JOHN J. KROH, St. Augustine, Fla. Filed Sept. 14, 1888. Serial No. 285,364. (No model.)



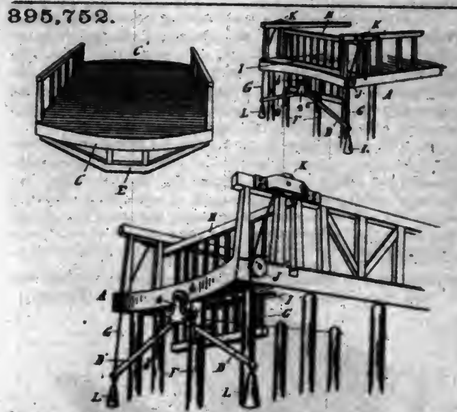
Claim.—In a door-check, the combination of a vertically-movable rod, a lever fulcrumed at one end at a point immediately above the rod, a spring for normally pressing the rod in one direction, and a sliding link pivoted to the lever at one side of the fulcrum thereof and having a sliding connection with the vertically-movable rod to be capable of a limited movement longitudinally of the same, substantially as described, for the purpose set forth.

395,752. AUTOMATIC GATE FOR SWING-BRIDGES. HENRY MARCHETTE, Wallaceburg, Ontario, Canada. Filed May 23, 1888. Serial No. 275,356. (No model.)

Claim.—1. The combination, with the swing provided with the bar E, of the vertically-movable gate, the levers fulcrumed on the stationary part of the bridge transverse of the same and connected with said gate, one of said levers being movable on its fulcrum, and the roller b, connected with said levers and adapted to be depressed by the bar E on the swing to elevate the gate, substantially as described.

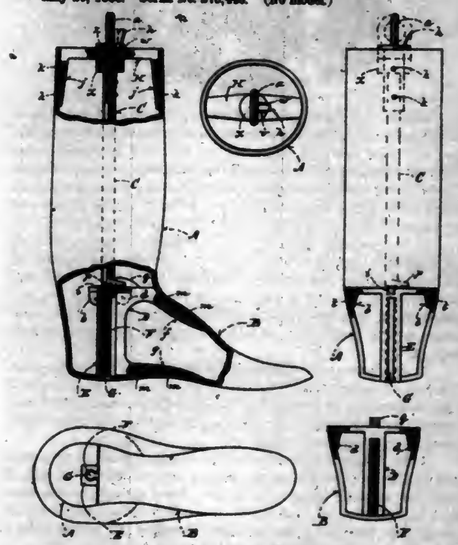
2. The combination, with a rising and falling gate, of the levers D D', fulcrumed at the stationary end of the bridge transverse with

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the same and having their inner ends pivotally connected and carrying the contact-roller b, the fulcrums c d, said lever D' being movable on its fulcrum, the weights L, secured to the ends of the levers, and the chains G, secured to the outer ends of the levers and to the outer ends of the gate, and the sheaves J K, substantially as described.

395,753. BOOT-TREE. ALFRED M. MOORE, Malden, Mass. Filed May 30, 1888. Serial No. 275,446. (No model.)



Claim.—1. In a boot-tree, the combination of a hollow leg portion, a centrally-disposed vertical standard secured in the bottom of said leg portion and provided in its outer face with a dovetail groove, a vertically-arranged locking-rod provided with a flange near its lower end, said rod being journaled in the top of said standard and in a brace in said leg portion, a foot-piece provided with a brace having a dovetail adapted to enter said dovetail groove, and a locking-cam on said brace adapted to engage the flange on said rod and thereby secure said leg portion to said foot-piece, substantially as set forth.

2. In a boot-tree, the combination of a hollow leg portion, a centrally-disposed vertical standard secured in the bottom of said leg portion and provided in its outer face with a dovetail groove, a vertically-arranged locking-rod provided with a flange near its lower end, said rod being journaled in the top of said standard and in a brace in said leg portion, a foot-piece provided with a brace having a dovetail adapted to enter said dovetail groove, a locking-cam on said brace adapted to engage the flange on said rod, and thereby secure said leg portion to said foot-piece, and a spring on said rod adapted to enter a slot in the brace in said leg portion and keep the rod from turning, whereby said cam and flange are prevented from becoming accidentally disengaged, substantially as described.

3. In a boot-tree, the combination of the leg A, the standard B, provided with the dovetail groove G, hole i, and arms d, the brace H, provided with the hole z and slot w, the locking-rod C, provided with the flange p and journaled to revolve in the holes i z, the spring A, secured to said rod and adapted to enter the slot w and prevent said rod from revolving, the foot-piece B, the brace D, secured in said foot-piece and provided with the dovetail F, adapted to enter said dovetail groove, and the locking-cam q on said brace, said cam being adapted to engage the flange p and secure said foot-piece to said leg portion, substantially as set forth.

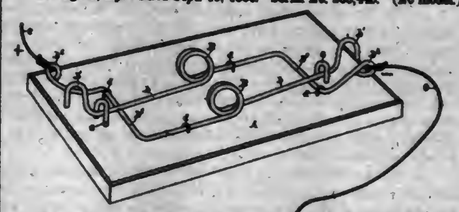
395,754. CANNON-PINION FOR WATCHES. DOLPHAS D. PALMER, Waltham, Mass. Filed June 2, 1888. Serial No. 275,815. (No model.)



Claim.—1. A cannon-pinion for watches, consisting of the pinion b, having the spring-acting arms b' and the independent tubular staff c, substantially as described.

2. A cannon-pinion for watches, consisting of the non-slitted pinion b, having the screw-threaded hub b^3 and spring-acting arms b', and the independent tubular staff c, substantially as described.

395,755. HOLDER FOR ELECTRIC-ARC LAMPS. JACOB PAWLOWSKI, Cincinnati, Ohio, assignor of one-half to Andrew Winter, West Covington, Ky. Filed Sept. 15, 1888. Serial No. 285,445. (No model.)



Claim.—1. A holder for electric-arc lamps, consisting of two lamp-supporting members of conducting material and forming, when the lamp is in operative position, its opposite poles, the lamp-holding end of each member crossing the plane of the opposite member, the two members being held normally in electrical connection, but arranged to be disconnected by the weight of the lamp when in position and automatically returned to the normal position when the lamp is disconnected, substantially as shown and described.

2. The combination, substantially as specified, of the board A, the two metallic holders, each consisting of a rigid part secured to the board and a spring holding-arm, the metallic holders being so formed that the spring-arm of each member crosses the rigid part of the opposite member, and the tension of the spring being to hold the opposite members in electrical connection, whereby the circuit is closed through the lamp when in operative position and automatically closed through the holder when the lamp is disconnected.

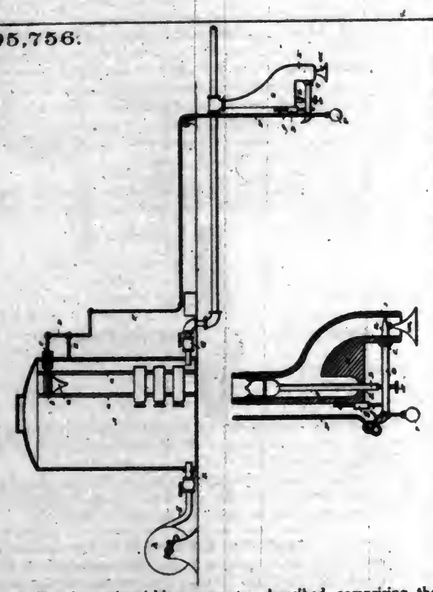
3. The combination, substantially as specified, of the board A, the two spring-wire holders B b b' b^3 b^3, and staples d, for securing them to the board, and the keeper c, to limit the movement of the arms b b.

395,756. FIRE-EXTINGUISHER. OCTAVIUS PIERCE, Chicago, Ill. Filed Aug. 27, 1888. Serial No. 283,941. (No model.)

Claim.—1. In a fire-extinguishing apparatus, the combination, with a reservoir for holding chemicals, of the discharge-pipe leading therefrom, a weight suspended within the reservoir, the nozzle H, secured to the discharge-pipe, the lever K, pivoted at one end to the nozzle, the opposite end of the said lever being secured by a fusible joint, g, to the body of the nozzle, and also having a weight secured thereto, the valve arranged in the nozzle and having its rod secured to the pivoted lever, and the rope F, leading from the weight supporting and tripping device at the reservoir to the free end of the lever K, substantially as specified.

2. In a fire-extinguishing apparatus, the combination of the reservoir having the guides a therein to receive chemical-holders and guide a weight, the weight B, arranged in the said guides, the reciprocating rod C, adapted to engage and normally sustain the weight, the angle-lever D, pivotally connected at one end to the reciprocating rod, and a rope, F, secured to its opposite end, whereby the drawing of the cord will precipitate the weight upon the chemical-holders, substantially as specified.

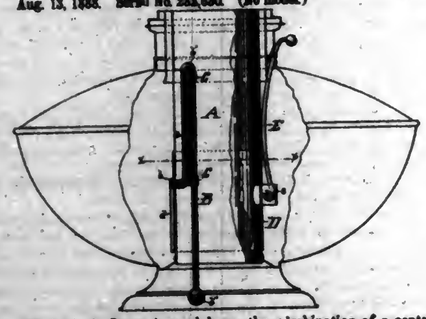
395,756.



3. The fire-extinguishing apparatus described, comprising the tank or reservoir having a guide-frame therein, a weight arranged in the said frame, a reciprocating rod adapted to engage the weight, an angle-lever for reciprocating the rod, an operating rope or wire connected with the said angle-lever and carrying a weight on its opposite end, a spray-nozzle connected with the tank, a valve in the nozzle, the valve-lever, a screw in said lever bearing against the valve-rod, and the said weighted cord connected with the outer end of the lever, substantially as specified.

4. The fire-extinguishing apparatus described, comprising the tank or reservoir having a guide-frame therein, a weight arranged in the said frame, a reciprocating rod adapted to engage the weight, an angle-lever for reciprocating the rod, an operating rope or wire connected with the said angle-lever and carrying a weight on its opposite end, a spray-nozzle connected with the tank, a lever pivoted to the nozzle, a valve in the nozzle, a screw in said lever bearing against the valve-rod, and the said weighted cord connected with the outer end of the lever, and a discharge-pipe in the tank adapted to receive a hose and provided with a cock, substantially as specified.

395,757. WICK-LIFTING DEVICE. FRANK REED, Meriden, Conn., assignor of one-half to the Edward Miller & Company, same place. Filed Aug. 13, 1888. Serial No. 282,630. (No model.)



Claim.—1. In an Argand lamp, the combination of a central-draft or inner wick-tube, a groove or recess in said tube, a wick-adjusting sleeve surrounding said tube, and a vertically-movable wick-lift stem or draw-bar, one leg of which passes into said groove or recess and engages with said sleeve, the other leg passing downward through said inner wick-tube, substantially as described.

2. In an Argand lamp, the combination of a central-draft or inner wick-tube, a groove or recess in said tube, a removable wick-adjusting sleeve surrounding said tube, and a vertically-moving wick-lift stem or draw-bar, one leg of which passes into said groove or recess and is adapted for detachable engagement with said sleeve, the other leg passing downward through said inner wick-tube, substantially as described.

3. In an Argand lamp, the combination of a central-draft or inner wick-tube, a groove or recess in said tube, a wick-adjusting sleeve surrounding said tube, a hollow exterior rib on said sleeve, and a vertically-movable wick-lift stem or draw-bar, one leg of which passes into said groove or recess and is bent outward at its lower end to enter and engage with said exterior rib, the other leg passing downward through said inner wick-tube, substantially as described.

4. In an Argand lamp, the combination of a central-draft or inner wick-tube, a groove or recess in said tube, a wick-adjusting sleeve surrounding said tube, a vertically-movable wick-lift stem or draw-bar, one leg of which passes into said groove or recess and is adapted to engage with said sleeve, the other leg passing downward through said inner wick-tube, and an auxiliary draw-bar connected with said sleeve and passing out of the top of the lamp, substantially as described.

395,758. CAR-AXLE LUBRICATOR. THEODORE SAUNDERS, Danbury, Conn. Filed June 23, 1888. Serial No. 277,961. (No model.)



Claim.—1. In a car-axle lubricator, a flexible absorbent pad or oil-spreader, in combination with supports which are connected to said pad only at its ends, and wicks pendent from said pad between said supports, substantially as described, whereby said pad may be maintained in free flexible contact with the exposed portion of a journal under slight tensile strain and enable it to freely absorb oil taken up by the wicks and to impart the same to the surface of a journal.

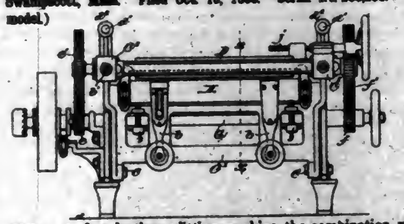
2. In a car-axle lubricator, the combination of an absorbent pad or oil-spreader having pendent wicks, of a pair of spring-supports attached to the ends of said pad and between which it is suspended, said supports being adapted to rest upon the bottom of an axle-box, substantially as described, for maintaining the pad under slight tensile strain in free flexible contact with the exposed surface of an axle-journal.

3. In a car-axle lubricator, the combination, with an oil-spreading pad, of spring-supports which are hinged to the two ends of said pad, substantially as described, whereby said supports may be folded toward each other below the pad for enabling the whole to be readily placed into or removed from an axle-box.

4. In a car-axle lubricator, the combination, with an oil-spreading pad, of two spring-supports attached at their tops to the ends of said pad, and each support having two crossed spring-legs adapted to rest upon the bottom of an axle-box, and by exerting vertical strains to maintain the pad against the exposed portion of a journal under a light tensile strain substantially as described.

5. In a car-axle lubricator, the combination, substantially as hereinbefore described, of an oil-spreading pad, two vertical spring-supports attached to the ends of said pad and adapted to rest upon the bottom of an axle-box, and a detachable keeper operating as a loose brace between the lower ends of said supports for maintaining them in a vertical position when in service.

395,759. LEATHER-SPLITTING MACHINE. FRANK F. STANLEY, Swampscott, Mass. Filed Oct. 16, 1888. Serial No. 288,238. (No model.)

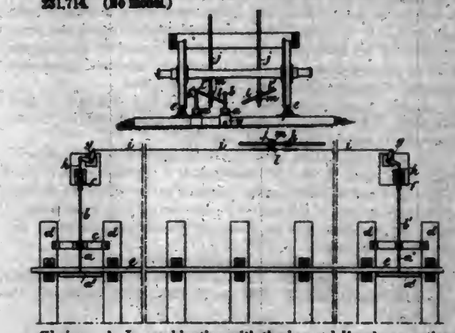


Claim.—1. In a leather-splitting machine, the combination, with the positively-rotated feed or pressure roll B, of the movable yoke or frame and the knife, and the gage-roll carried thereby and made movable in unison toward and from the said feed or pressure roll, substantially as described.

2. In a leather-splitting machine, the pivoted yoke or frame C, the knife carried thereby, the gage-roll mounted in movable boxes sustained in the said yoke, and wedge-bar to adjust the said boxes, combined with the feed-roll having rigid bearings, and rods, as d', and springs, as d, to enable the said yoke and the parts carried by it to yield toward and from the said feed-roll, substantially as described.

3. In a leather-splitting machine, the combination, with the feed or pressure roll B, of the movable yoke or frame, and the knife, and the gage-roll carried thereby and made movable in unison toward and from the said feed or pressure roll, and with the stop-screws, substantially as described.

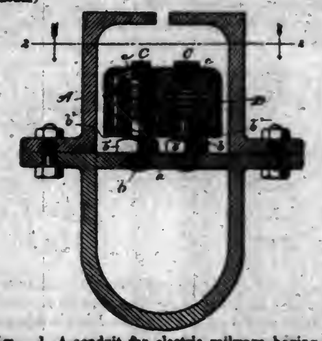
395,760. DEVICE FOR LIGHTING AND EXTINGUISHING LIGHTS IN RAILWAY CARRIAGES, STATIONS, &c. JOHN ST. CLAIR NEWTON STEWART, County of Wigtown, Scotland. Filed Mar. 21, 1887. Serial No. 231,714. (No model.)



Claim.—1. In combination with the levers b b' and connections arranged to be actuated by a passing train, the pipes j j k, levers l l, and devices connected to said levers b b' and serving to turn the gas off, as set forth.

2. In combination with the levers b b' and connections arranged to be actuated by a passing train, the wires i i, having crank-connections, as described, with said levers, pipes j k, lever l, and cock m, the combination being and operating substantially as set forth.

395,761. CONDUIT FOR ELECTRIC RAILWAYS. SAMUEL TROTT, Halifax, Nova Scotia, Canada. Filed Jan. 27, 1888. Serial No. 261,480. (No model.)



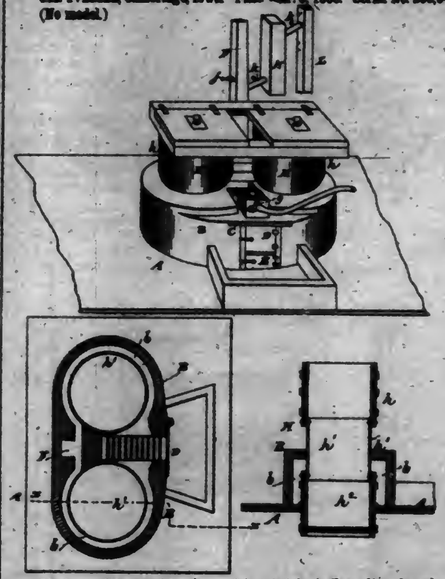
Claim.—1. A conduit for electric railways, having a metallic base which supports upright insulators carrying conductors, the insulators being mounted directly on the base of the conduit by means of upright pins, the insulators being also concaved at the bottom and each having a groove in its top to hold a conductor, substantially as described.

2. A conduit for electric railways, having a metallic base, in combination with a pair of conductors mounted upon upright insulators which are supported directly on the base of the conduit by means of upright pins, to which they are screwed, the said insulators being bell-insulators and grooved at the top to hold the conductors.

3. A metallic conduit for electric railways, upright pins screwed into the base thereof, jam-nuts for securing the pins, and bell-insulators screwed to the outer end of the pins, substantially as described.

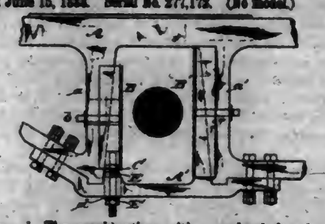
4. The combination, with an insulator having a wedge-shaped groove, of an L-shaped conductor, each arm of the L being wedge-shaped, and a wedge or key for locking the conductor and insulator together.

395,762. AGRICULTURAL BOILER OR BARREL-HEATER. TOBIAS TYRRELL, Cambridge, Iowa. Filed Mar. 5, 1888. Serial No. 266,048. (No model.)



Claim.—The combination, with a brick-shell median fire-place and smoke-stack, of two feed-barrels, one on each side of fire-place and extending both above and below it, a space between shell and barrels forming a flue, f, leading to the smoke-stack, as shown and described.

395,763. WEDGE-BOLT FOR LOCOMOTIVES. JOHN P. VAN NESS, Little Falls, N. J., assignor of one-half to John R. Earle, Middletown, N. Y. Filed June 15, 1888. Serial No. 277,172. (No model.)



Claim.—1. The combination, with a wedge-bolt, of a pedestal-brace having a hole large enough to permit the head of the bolt to pass through it, and a removable plug filling the space between the shank of the bolt and the wall of the hole, substantially as described.

2. The combination, with a wedge-bolt having a T-shaped head, of a pedestal-brace having a threaded hole large enough to permit the head of the bolt to pass through it, and a threaded bushing screwed into the hole and filling the space around the shank of the bolt, substantially as described.

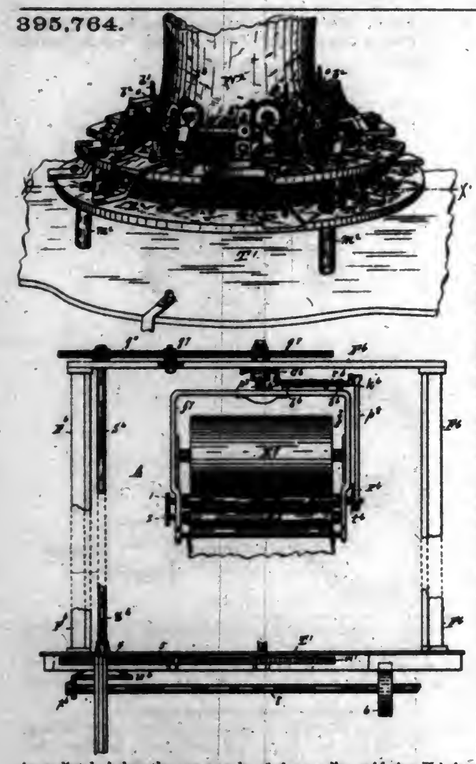
3. The combination, with the wedge B, of the wedge-bolt C, having a head, C', cut away at c, the pedestal-brace A', having a threaded hole large enough to let the head C' pass through it, the bushing D, screwed into the hole around the shank of the bolt, and the nuts E E', to adjust and lock the bolt, substantially as described.

395,764. CIRCULAR-KNITTING MACHINE. EUGENE VERMILYEA, Waterford, N. Y., assignor to the Tabor Knitting Mills, same place. Filed Apr. 16, 1888. Serial No. 196,635. (No model.)

Claim.—1. The combination, with the cylinder of a circular-knitting machine containing latch-needles and adapted to be rotated, and an exterior stationary ring provided with cams to operate the needle-jacks, of an interior deflecting-ring arranged inside of and immediately below the upper ends of the needles, and overhanging brackets connecting the deflecting-ring with the said exterior stationary ring, as shown and described.

2. The combination of the cylinder C, adapted to be rotated and provided with latch-needles, the exterior stationary rings E' and E^2, provided with cams to operate the needle-jacks, the deflecting-ring H, secured to overhanging brackets h^2, and arranged inside of and

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immediately below the upper ends of the needles, said ring H being provided with pressing-wheels I and d^3, and a take-up mechanism, A, substantially in the manner as and for the purpose set forth.

3. The combination, with the cylinder C, provided with latch-needles and adapted to be rotated, of the stationary ring R', provided with brackets b^3, and the stationary deflecting-ring H, secured to the overhanging ends of the brackets b^3, and arranged below and inside the upper ends of the needles, substantially as and for the purpose set forth.

4. The combination, with the cylinder C, provided with the latch-needles and adapted to be rotated, of the stationary ring R', provided with brackets b^3, the stationary deflecting-ring H, secured to the brackets b^3, and arranged below and inside of the upper ends of the needles, substantially as shown, and the pressing-wheels I and d^3, arranged on said ring H, substantially as and for the purpose set forth.

5. The combination, with the cylinder, the table, and the cam-ring of a circular-knitting machine, of brackets secured to the cam-ring and overhanging the upper edge of the cylinder, and a deflecting-ring, H, secured to the overhanging ends of said brackets, with its lower edge below the top edge of the cylinder, substantially as described.

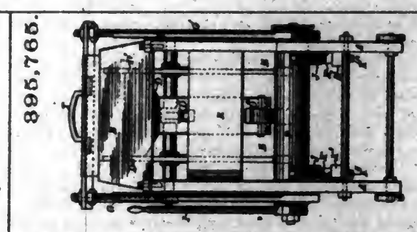
6. The combination, with the cylinder, the needles, and the table of a circular-knitting machine, of the stationary cam-ring R^2, supported on posts on the machine-table, the stationary cam-ring R', supported on posts on the ring R^2, the brackets b^3, having their upper ends projected over the upper edge of the cylinder, and the ring H, secured to the end of the brackets, with its lower edge below the inner top edge of the cylinder, substantially as described.

7. The combination, with the cylinder C, the needles, and cam-rings of a circular-knitting machine, of brackets mounted on the upper cam-ring, a fabric-deflecting ring secured on the upper end of said brackets, arranged as described, and presser-wheels mounted on the fabric-deflecting ring, substantially as described.

395,765. BRICK-MACHINE. WILLIAM WEBBER, Philadelphia, Pa. Filed Apr. 11, 1888. Serial No. 270,368. (No model.)

Claim.—1. The combination, with frame A of a brick-press, of mold-block B, guide R, plunger D, with its stem D', the plunger being adapted to fit snugly in the opening C of the mold-block, cam-shaft F, with its cam F' to raise the plunger-stem, pressure-plate H', secured to side arms, G G', and cams J J, impinging on blocks K K as the cam-shaft F is turned, whereby the plunger is raised by its cam

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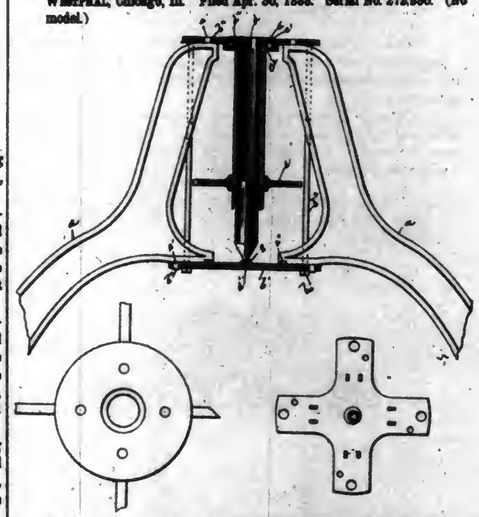
to press the brick, and the arms G G' are then raised by cams J J to throw the plate H' off the mold, substantially as described.

2. The combination, with frame A of a brick-press, of mold-block B, guide R, plunger D, with its stem D', end pieces, D' D', standards E E, supporting said end pieces, cam-shaft F, with its cams F' F'' F''', to operate on the standards and plunger-stem, pressure-plate H', with side arms, G G', and cams J J, to raise the latter and throw the pressure-plate off the mold, rock-shaft L, with its arms M M' M, to engage with the plunger-shaft, and standards to finally raise them and release the brick from the mold, substantially as described.

3. The combination, with the frame A and standards E E, of cam-shaft F, provided with cams F' F''' and elastic cushions U, substantially as and for the purpose described.

4. The combination, with the brick-press, of mold B, plate H, guide R, plunger D, stem D', standards E E, and side arms, G G', of cam-shaft F and its several cams, operating as shown, the latter being detachably secured to the said shaft, whereby as they wear layers or strips may be placed between them and the shaft to raise them, substantially as described.

395,766. HOLDER FOR REVOLVING STANDARDS. HENRY WESTPHAL, Chicago, Ill. Filed Apr. 30, 1888. Serial No. 272,880. (No model.)



Claim.—1. The combination, with the legs *a a* and the plates between which they are clamped, one provided with a conical step and the other with a central opening surrounded with a depressed flange, of a spindle in said support formed on one end with a cone-point and on the other with a peripheral flange, substantially as and for the purpose set forth.

2. The combination, with the legs *a*, plates *b b'*, socketed to receive the pins *a'* and held together by bolts b^3, the step *c*, and depressed flange c^3, of the spindle *d*, its plug *d'*, cone-pointed flange d^3, and the chills or equivalent devices d^4, substantially as and for the purpose set forth.

3. The combination, with the legs secured between a pair of plates, of a revolving spindle provided with a gear-wheel, and a point resting and revolving on the bottom plate and passing through the upper plate and laterally supported by rollers, chills, or similar anti-friction devices, substantially as shown and described, and for the purpose set forth.

395,767. COCKEYE. JOHN B. ALPHAN, Cascade, Iowa. Filed Oct. 18, 1888. Serial No. 288,412. (No model.)

Claim.—1. The combination, with the cockeye composed of a U-shaped frame, the limbs being brought close together at the closed

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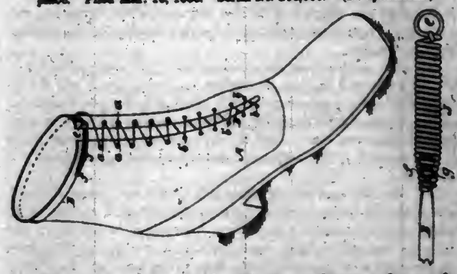


end of the said frame and one of the limbs having a vertical channel, of the catch pivoted near its lower end in the said channel, and having its upper end inclining upwardly and extending across the space between the said limbs, substantially as and for the purpose described.

2. The combination, with the U-shaped frame having its limbs brought close together near its closed end, and having the channel *e*, of the catch pivoted in the channel, and having a thumb-rest and the spring, substantially as described.

3. The herein-described cockeye composed of a U-shaped frame, having one of its limbs expanded laterally and provided with a vertical opening and with a channel, the catch pivoted to the said limb and adapted to work in the said channel, and the spring, substantially as set forth.

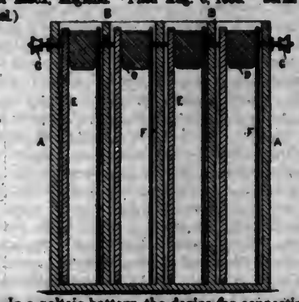
395,768. FASTENER FOR SHOES OR GLOVES. WILLIAM J. BROWN, Jersey City, N. J., assignor of one-half to Robert T. Means, same place. Filed Mar. 10, 1888. Serial No. 266,906. (No specimens.)



Claim.—1. As an improved article of manufacture, a fastener for shoes, gloves, and similar articles, having hook-fastenings through which the cord may reader, comprising a string or cord, and a coiled spring connected at one end to said cord, said coiled spring being provided at its other end with a hook or loop, substantially as specified.

2. As an improved article of manufacture, a fastener for shoes, gloves, and similar articles, comprising a string or cord, a coiled spring contracted near one end and provided with an opening through which the string or cord may be passed to secure it to the spring, said coiled spring being provided at its other end with a hook or loop, substantially as specified.

395,769. VOLTAIC BATTERY. THEOPHILUS CHAD, Forest Gate, County of Essex, England. Filed Aug. 6, 1888. Serial No. 282,044. (No model.)



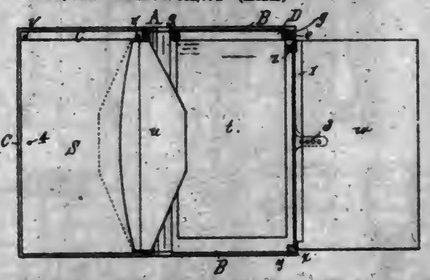
Claim.—In a voltaic battery, the device for connecting the positive and negative electrodes, consisting of the combination, with a piece of conductive metal held in or to the sides of the containing-cells and passing from one cell to another cell, of the wedge D or equivalent, as and for the purpose set forth.

395,770. FLOOD-FENCE. ALEXANDER COWAN, Urbana, Ohio. Filed Apr. 9, 1887. Serial No. 234,379. (No model.)



Claim.—The combination, with the posts A, having backwardly-projecting hooked arms *d* and inwardly-projecting stop-pins *f*, of the gate composed of a base-bar, *a*, having flat vertical face a^6 and rounded ends *a'*, which rest against the posts, the pickets *b*, secured to the face of bar *a*, and the standards *b'*, secured at the ends of the bar *a* in rear of the line of pickets, the bar *a* being connected to the posts by flexible connections which permit it to turn, the hooked arms *d* preventing backward movement of the gate past a vertical position, and the stop-pins *f* preventing the gate from swinging forward past a horizontal position, substantially as shown and described.

395,771. PAPER-HOLDER. CALVIN D. CRANE, St. Louis, Mo. Filed Nov. 13, 1885. Serial No. 182,774. (Model.)



Claim.—1. In a clamp paper-holder, the combination, with the threaded pin or post A and with the clamping-bar D, of a nut, *g*, having an annular groove therein at its lower end, the combination insuring a positive raising and lowering of the bar and maintaining it in its raised or lowered position, for the purpose set forth.

2. In a clamp paper-holder, the combination, with the threaded pin or post A and the bifurcated clamping-bar D, having one prong, *d*, at one of its ends shorter than the other, of a nut, *g*, having an annular groove therein at its lower end, the combination insuring a positive raising and lowering of the bar and maintaining it in its raised or lowered position, and also serving as a ready means for removing the bar from the nuts, all as set forth.

3. In a clamp paper-holder, the combination, with the clamping-bar D, of a nut, *g*, having an annular groove therein at its lower end, and the screw-hole enlarged or widened near its top, and the threaded post having a rivet or other head, *n*, as and for the purposes described.

4. In combination with the bottom board and with one of the posts A, the metal slide-piece *q* and spring *r*, such slide-piece and spring being located within a mortise, *p*, in the board, substantially as and for the purposes set forth.

5. In combination with the bottom board, the pivoted bent wire *x*, screwed to the board at one of its ends, and the spring-catch *z* at the upper end of the board, as and for the purposes set forth.

6. In combination with the wire *x*, bent and threaded at one end, as set forth, a threaded socket in which it turns as on a pivot, and the blotting-pad provided with a tube adapted for sliding such pad on and off the wire, as set forth.

7. In combination with the bottom board, the pivoted bent wire *x*, screwed to the board at its bent end, the blotting-pad provided with a tube, 2, whereby the pad may be readily slid on and off the wire, and held thereto as by a hinge, and the spring-catch *z*, all as set forth.

8. The threaded posts *h h* and their grooved nuts *g*, combined with a single bar for supporting both posts and in which the posts are secured, as set forth.

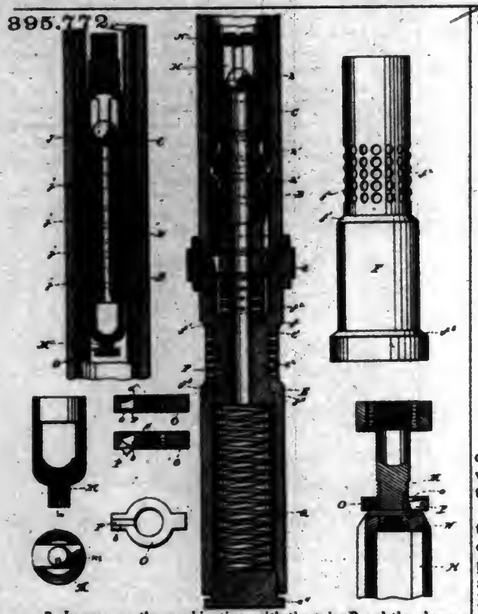
9. In combination with the posts and with the grooved nuts *g*, the bed-piece having the cavity 5 around the post, as and for the purpose set forth.

395,772. PUMP. JOSEPH DARLING, Petrolia, Pa. Filed Nov. 10, 1887. Serial No. 254,821. (No model.)

Claim.—1. In a pump, the combination, with a plunger and removable barrel, of the socket having the lower section, E, provided with a perforated circumferential recess and having its lower end closed, the perforated tubular valve having seats within said section, and the spring holding said valve up against its seat, substantially as specified.

2. In a pump for wells and other cavities, the combination of the plunger provided with an upwardly-opening valve, the removable barrel having an upwardly-opening valve in its lower end, the check-valve screwing into the upper end of the barrel, the section E, provided with a perforated circumferential recess and having its lower end closed, the perforated tubular valve having seats within said section, and the coiled spring holding said valve on its seat, substantially as specified.

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3. In a pump, the combination, with the tube B and the plunger D, of the circular nut O, provided with the radial notch *o*, and the detent P, having the toothed end corresponding to the thread of the circular nut O, engaging the lower end of the projection M, substantially as specified.

395,773. CATHODE FOR AN ELECTRO-DEPOSITING APPARATUS. ELISHA EMERSON, Providence, R. I. Filed Mar. 19, 1888. Serial No. 267,868. (No model.)



Claim.—In an electro-depositing apparatus, a cylindrical rotary cathode divided by a spiral line or band of insulation, so as to form one long strip of depositing-surface.

395,774. RATCHET-DRILL. GEORGE FLETCHER, Brooklyn, N. Y. Filed Sept. 22, 1888. Serial No. 286,060. (No model.)



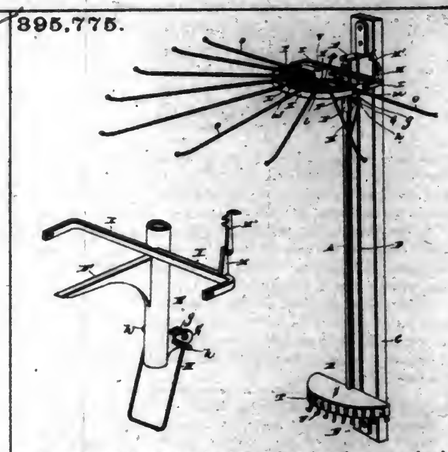
Claim.—1. A ratchet-drill having the drill-holder A, with two shoulders and ratchet-teeth, T, the yoke E, embracing the stem of the holder and on the lower shoulder, the collar G on upper shoulder and between the yoke and stem, the collar L, secured to holder and above the yoke, the pawl P in opening in the yoke, the hollow handle B, secured to the yoke, and with the spring S therein bearing against the pawl P, said parts being combined substantially as described.

2. A ratchet-drill having a holder with ratchet-teeth, a yoke embracing said holder and having a pawl in an opening, a collar intermediate of the yoke and stem of holder, a collar secured to the holder and retaining the yoke in place, a spring bearing against the pawl, said parts being combined substantially as described.

395,775. CLOTHES-DRIER. FRANCIS J. FESSEN, Miles Grove, Pa., assignor to John R. Killian, same place. Filed Oct. 19, 1887. Serial No. 252,831. (No model.)

Claim.—1. In a clothes-drier, the combination of the supporting-bar A, having notches *a a'* therein, the sliding head mounted on the said bar and carrying the drying-arms, and the spring H, mounted

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on the head and bearing at its free end against the supporting-bar, whereby it engages automatically in the said notches therein, substantially as specified.

2. In a clothes-drier, the combination of the supporting-bar A, the sliding head E thereon, having the horizontal arm F and the lateral arms I I, the supporting-frame K, pivoted to the arms I and comprising the curved bar L, having a series of notches in the upper edge, and the transverse bar L', and the drying-arms pivoted to the frame K and bearing in the notches in the curved bar L, substantially as specified.

3. In a clothes-drier, the combination, with the supporting-bar A, of the head E, sliding thereon, the supporting-frame K, secured to the said head and having the curved bar L, provided in the upper edge with the notches *l*, equally spaced around the curve, and the notches *m'*, arranged close together at the front of the bar L, and the drying-arms O, pivoted to the supporting-frame and adapted to be held in either the notches *l* or *m'*, substantially as specified.

4. In a clothes-drier, the combination, with the supporting-bar A, of the head E, sliding thereon and having the lateral arms I I, the supporting-frame K, pivoted to the said arms I and having the notches *l* and *m'*, the hook M', pivoted to one of the arms I and adapted to engage a stud or pin on the side of the supporting-frame when the latter is in the vertical position, and the drying-arms O O, pivoted to the supporting-frame and adapted to engage in the notches *l* and *m'*, substantially as specified.

5. In a clothes-drier, the combination, with the supporting-bar A, of the sliding head E, having the arm F, and the lateral arms I I, having a hook or catch, M', pivoted thereto, the supporting-frame K, pivoted to the arms I and comprising the semicircular notched bar L, the transverse bar L', having the semicircular loop N and the rearwardly-extending detent or stop V, and the longitudinal bar L^2, adapted to bear on the horizontal arm F when the frame is in the horizontal position, the stud or pin *m* on the frame K, adapted to be engaged by the hook M', the drying-arms O, having the eyes *p p* on the rear ends to engage the loop N, the said bars being adapted to rest in the notches in the bar L, and the spring P, bearing on the upper sides of the drying-arms to hold them in engagement with the notches in the bar L, substantially as and for the purpose specified.

6. In a clothes-drier, the combination of the vertical supporting-bar A, the vertical guide-rod D, adjacent to the supporting-bar, the sliding head E, having the arm G, provided in the end with a notch to receive the guide-bar, and the lateral pins *h*, the supporting-frame secured to the said head and carrying the drying-arms, and the spring H, secured to the pins *h* and adapted to bear against the rear side of the supporting-bar A and engage in notches therein, substantially as specified.

7. In a clothes-drier, the combination of the apertured brackets B B, the supporting-bar A, adapted to engage in apertures in the brackets and having shoulders to bear on the brackets, the rod D, passing at the ends through apertures in the brackets and adapted to have a nut screwed on one end to draw the brackets tightly against the shoulders on the supporting-bar, the head sliding on the bar A and having a guide-arm, G, to engage and slide on the rod D, and the supporting-frame secured to the said tube and carrying the drying-arms, substantially as specified.

8. In a clothes-drier, the supporting-bar A, the tubular head E, embracing the bar A and sliding thereon, the drying-frame carried by the head E, and the spring H, secured to the head and bearing at all times against the bar A, the latter having notches, as described, with

which notches the spring is adapted to engage, substantially as specified.

395,776. CAR-COUPLING. JOHN FREY, Van Wert, Ohio. Filed Oct. 3, 1888. Serial No. 287,043. (No model.)



Claim.—1. In a car-coupler, the combination, with the draw-head and coupling-pin, of the pulleys journaled above the draw-head upon the end of the car, the chains extending vertically upward from the pin and over said pulleys, and the levers pivoted to the end of the car near the sides thereof and having the outer ends of the chains secured to them at proper distances from their pivoted points, substantially as specified.

2. In a car-coupler, the combination, with the draw-head and coupling-pin D, having the stop-flange *d*, of the casing *f*, secured to the end of the car above the draw-head and provided with the hinged lid *f'*, the pulleys F, journaled in the front and rear of said casing, the chains E, rising vertically from the pin, passing over said pulleys and through openings in the sides of the casing, and the levers *e*, pivoted to the end of the car and having the outer ends of the chains secured to them, substantially as specified.

3. In a car-coupler, the combination, with the draw-head and coupling-pin, of the link pivoted at about the middle of its length upon the outer ends of swinging bars connected with the draw-bar, and means, substantially as described, whereby the said bars can be swung upward and outward and the end of the link thereby inserted into the recess of the draw-head, substantially as specified.

4. In a car-coupling, the combination, with the draw-head having a flaring mouth and the coupling-pin, of the link having outstanding journals at about the middle of its length, the link-bars having their outer ends mounted on said journals, the sector-wheel journaled in bars, connecting-clips secured, respectively, to the draw-bar and draw-head, and means, substantially as described, whereby the sector-wheel can be swung on its bearings, as specified.

5. The combination, with the draw-head, the draw-bar, the clips attached to the draw-bar, the bars connecting the front and rear clips, the sector-wheel journaled in said bars, and the link pivoted intermediate of its ends to the outer ends of link-bars, of the staples secured to the extended journals of the sector-wheel and the rods L, having their inner ends hooked to said staples, passing thence through elongated bearings attached to the truck of the car, and provided with crank-arms or handles at their outer ends, substantially as specified.

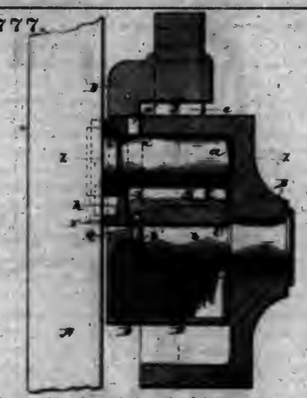
6. The combination, with the draw-head provided with the notches M in its floor, the longitudinally-movable draw-bar, and the coupling-pin, of the link J, the link-rods I, the sector-bars *g*, provided with bearings for the sector-wheel, the staples K, secured to the journals of said wheel, and the rods L, hooked to said staples, passing through elongated bearings, and having crank-arms at their outer ends, substantially as specified.

395,777. CAR-AXLE BOX AND BEARING. GEORGE W. FULMER and DAN T. FRY, Water Valley, Miss. Filed Sept. 3, 1888. Serial No. 284,881. (No model.)

Claim.—1. In a car-axle bearing, the combination, with the wheel having a journal and the flanged roller-bearing supported on the axle-journal and having a shaft or journal projecting from its inner side only, of the box supported on the shaft of the said roller, substantially as described.

2. The combination of a wheel having a journal, the flanged roller supported on the said journal and having a shaft or journal projecting from its said inner side, said shaft having a flange, the box having a shoulder to rest against one side of the flange, and the brass fitted in the box and adapted to bear against the other side of the flange, substantially as described.

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3. The combination of the wheel having a journal, the roller supported on the journal and having a shaft projecting from its inner side, said shaft having a flange on its inner end, the box mounted on the shaft and having a shoulder which is adapted to bear against one side of the flange, the brass interposed between the shaft and the box, and having its end adapted to bear against the other side of the flange, and having an extension on its back, which extension is fitted in a corresponding recess in the box, substantially as described.

4. The combination, with the wheel having a journal and the flanged roller supported on the journal and having a shaft on its inner side only, of the box mounted on the said shaft and having a recess in its side to give clearance for the flange of the roller, whereby the shaft, the journal, and the flange of the said roller are in approximately the same vertical plane, substantially as described.

5. In a car-axle bearing, the combination, with the box D, having a recess, A, in its side, of the guide-block I, fitted in the said recess and having a limited vertical movement, substantially as described.

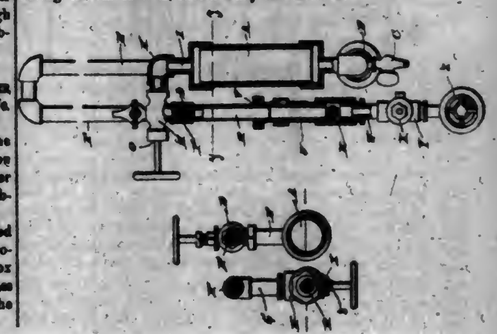
6. In a car-axle bearing, the combination, with the box D, having a recess in its side, of the guide-block fitted in the said recess and having the shoulder *i*, and the wheel having a corresponding shoulder, *a'*, on its journal, substantially as described, for the purpose specified.

7. The combination of the wheel having a shoulder on its journal, the flanged roller supported on the said journal and having a shaft on its inner side, the box mounted on the said shaft, having a recess in its side, and the guide-block fitted in the said recess, and having a corresponding shoulder to fit against the shoulder on the said journal, substantially as described.

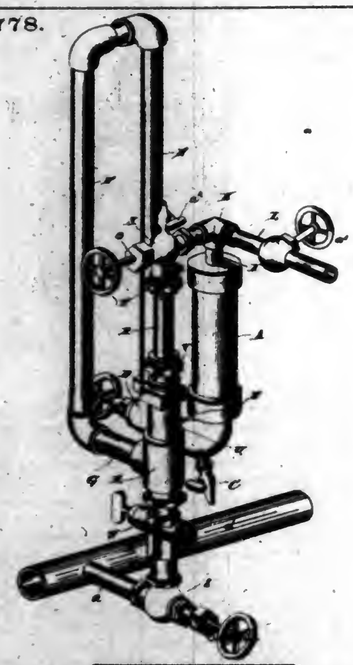
8. The herein-described box, having a recess, *c*, in its front side near its upper end, and having its lower portion hollow and provided with an opening leading from the hollow portion, said box having openings for the reception of the journals, substantially as described, for the purpose specified.

395,778. OILING-MACHINE. FRANKLIN P. HAWKINS, Piano, Ala. Filed June 15, 1888. Serial No. 277,191. (No model.)

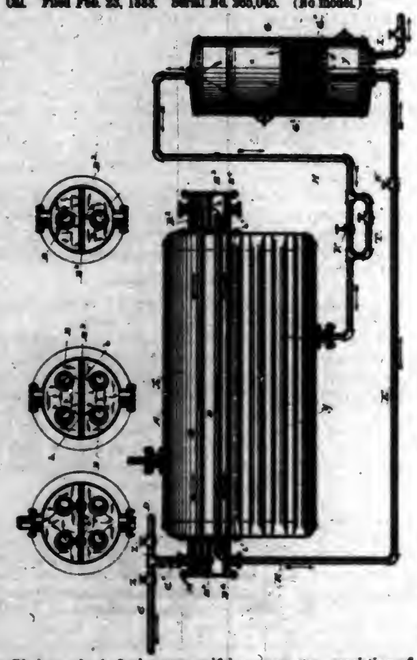
Claim.—The combination of the reservoir A, the pipe E, communicating with the lower end thereof, the valve D and cock C, for the purposes set forth, the supply-pipe communicating with the upper end of the reservoir and having the valve A^3, the pipe F, communicating with the upper end of pipe E, the pipes connecting the upper end of the reservoir and the pipe F, the drip-nozzle in one of said pipes, said nozzle having the valve N and air-cock c^4, and the pipes connecting the lower end of pipe F to the steam-pipe of an engine and having the valves W Z, substantially as described.



395,778.



395,779. FEED-WATER PURIFIER. ADAM HEBERER, Alameda, Cal. Filed Feb. 23, 1888. Serial No. 265,045. (No model.)



Claim.—1. A feed-water-purifying apparatus consisting of a water-heating device located inside the boiler, by which the heat within the steam-generating space is utilized for raising the temperature of the feed-water, said heating device consisting of the horizontal pipes or passages connected by the heads or chambers, arranged and constructed as set forth, a filtering device located outside the boiler, and suitable pipes with valves connecting the heating device with the feed-pump and with the filtering device, and also the filtering device with the steam-generating space of the boiler, whereby the feed-water is caused to pass through the heating device and then outside the boiler into and through the filtering device before being delivered into the boiler-water, substantially as described, for operation as set forth.

2. In a feed-water heating and purifying apparatus for steam-boilers, a heating device located within the boiler and connected with the feed-pump outside, said heating device consisting of the horizontal pipes connected by the heads or chambers, arranged and constructed as described, a conducting-pipe leading from said heater outside the boiler and adapted to deliver the feed-water therefrom into the boiler-water, and a filtering device interposed in the length of said pipe between the heater and the filter, in combination, substantially as described, the connections between feed-pump and heater and between filter and heater having the necessary valves for controlling the feed-water, as set forth.

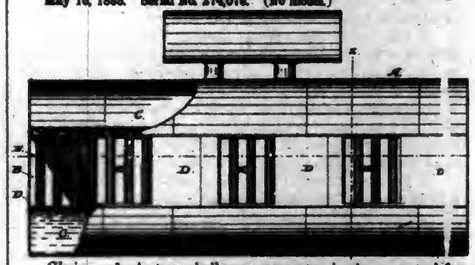
3. In combination with a steam-boiler, pipes or passages B, which extend through the steam-generating space of the boiler to the outside, the connecting heads or chambers B' B², by which said pipes or passages are made to form a return-passage, and suitable pipes by which one end of said return-passage is connected with the feed-pump and the other end with the water room or space in the boiler, substantially as described.

4. The combination of water tubes or passages inside a boiler and extending to the outside through the shell thereof, and connecting heads or chambers B' B², having separate compartments, of which those in one head are in communication with each other through an opening or openings, *b*, and those in the other head have no direct connection, but are connected by suitable pipes or passages, the one with the feed-pump and the other with the water-room of the boiler, substantially as described.

5. In combination with a steam-boiler, water-heating tubes or passages B, extending through the boiler-space to the outside, the connecting heads or chambers B' B², by which said pipes are made to form a return-passage, a feed-water pipe connecting one end of said heater with the feed-pump, a pipe connecting the other end with a filtering-chamber outside the boiler having a filtering diaphragm or partition, a pipe connecting said filter with the water room or space of the boiler, and a blow-off or waste pipe leading from the filtering-chamber, substantially as described, for operation as set forth.

6. A feed-water-purifying apparatus for steam-boilers, consisting of the water-heating tubes or passages leading into and out of the boiler, the connecting heads or chambers B' B², having separate compartments, a feed-water-supply pipe, a steam-pipe, a filtering-chamber divided by a filtering diaphragm or partition, a pipe connecting the compartment on one side of the partition with the heating device in the boiler, and the water room or space within the boiler with the other compartment, a blow-off or waste pipe, and suitable valves in said pipes for controlling the flow and circulation of the water directing the boiler-pressure through the apparatus, substantially as described, for operation as set forth.

395,780. STEAM-BOILER. ADAM HEBERER, Alameda, Cal. Filed May 16, 1888. Serial No. 274,076. (No model.)

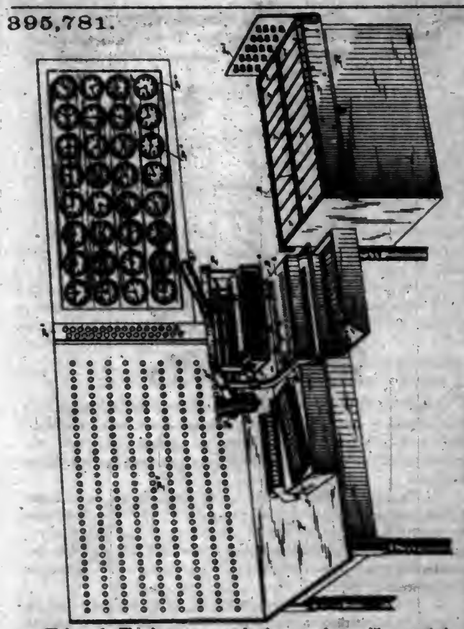


Claim.—1. A steam boiler or generator having a central fire chamber or passage, water-chambers C C above and beneath the fire-chamber, a series of separate vertical connecting-passages, D D, on each side between the fire-chamber and outer wall, and upright tubes E E, extending through the fire-chamber and connecting the said vertical chambers above and beneath the fire-chamber with each other, substantially as described.

2. In a steam boiler or generator, an outer shell or body, A, a central fire-chamber, B, generating-chambers C C above and beneath the fire-chamber, upright tubes E E, a series of separate vertical connecting-passages, D D, along the sides of the fire-chamber connecting the generating-chambers C C, and openings I I at the sides through the outer shell between the end walls of passages D D, in combination, substantially as described.

395,781. ART OF COMPILING STATISTICS. HERMAN HOLLERITH, New York, N. Y. Filed June 8, 1887. Serial No. 240,630. (No model.)

395,781.



Claim.—1. The improvement in the art of compiling statistics, which consists in first preparing a series of separate record-cards, each card representing an individual or subject; second, applying to each card at predetermined intervals circuit-controlling index-points arranged, according to a fixed plan of distribution, to represent each item or characteristic of the individual or subject, and, third, applying said separate record-cards successively to circuit-controlling devices acted upon by the index-points to designate each statistical item represented by one or more of said index-points, substantially as described.

2. As an improvement in the art of compiling statistical matters by the aid of mechanical or electrical appliances, the hereinbefore-described method of preparing and manipulating the circuit-controlling record, which consists in forming a separate record-card for each individual or thing by applying to said card at predetermined places index-points representing all the characteristic items pertaining to that individual or thing and subsequently subdividing the series of separate record-cards into groups and submitting the cards in each group or division to the action of the circuit-controlling devices, substantially as and for the purpose set forth.

3. The improvement in the art of compiling statistical matters, consisting in first forming a separate record-card for each individual or thing by applying to said card a series of index-points, each bearing a fixed relation to all the others and to a standard, separating the record-cards into different groups or series, and finally applying the record-cards of the series successively to a series of circuit-controlling devices corresponding in relative position to the predetermined series of index-points representing the several items forming part of the statistical matters to be computed, substantially as described.

4. The hereinbefore-described improvement in the art of compiling statistics, &c., which consists in first forming a permanent record of each individual or thing by applying a series of circuit-controlling index-points upon a separate card or tablet, each point occupying a fixed relation to all the others and to a standard, and subsequently separating the series of record-cards into groups or divisions and by means of electrical appliances co-operating with the index-points counting the series of statistical items represented by any given point or series of two or more points, substantially as described.

5. The improvement in the art of compiling statistical matters, as hereinbefore described, consisting in first locating a series of separate points or spaces upon a series of cards, each point or space having a fixed relation to all the others; secondly, apportioning the spaces or points among the several items entering into the computation and giving to each item one or more of the spaces or points as its representative; thirdly, forming upon each card the complete record of one individual or subject by applying in the representative space or spaces a circuit-controlling index point or points for each one of the series of items which relate to the particular individual or subject, and, finally, applying all the records thus formed separately and successively to the circuit-controlling apparatus operated by the index-points to designate any one or more of the items represented thereby, substantially as described.

6. As an improvement in the art of compiling statistics, the hereinbefore-described method for facilitating the classification of individual records and simplifying the process of computation, which consists in first assigning to each item entering into the proposed series of computations one or more designated points or spaces; secondly, forming a complete record of each individual or subject upon a single card by applying a circuit-controlling index point or points to each space appropriated to or indicative of each separate item in the given series which pertains to the individual or subject, and, finally, feeding said cards successively to an apparatus operated by the index-points on each card to designate the particular division to which it belongs, and depositing each card in a place or receptacle corresponding to the division thus indicated, substantially as described.

7. The hereinbefore-described improved system for compiling statistical matters, consisting, essentially, in the combination, with a series of circuits and operating electro-magnets and a series of pins controlling said circuits, of a series of separate record-cards, each card bearing circuit-controlling index-points indicative of items characteristic of an individual or subject.

8. The combination, to form a system for compiling statistical matters, as hereinbefore described, of a series of separate cards, each card bearing a series of index-points representing the items or characteristics of one individual or subject, an apparatus provided with a series of circuit-controlling devices corresponding and co-operating with the index-points on the cards, a system of electro-magnets connected to said circuit-controlling devices, and a series of operating electro-magnets forming part of said system, substantially as described.

9. In a system such as described, the combination, with the separate record-cards bearing index-points representing items or characteristics of the individual or unit, as described, of a series of pins co-operating with said index-points, a series of circuits controlled by the pins and index-points, and operating-magnets controlled by said circuits, substantially as described.

10. The combination, to form a system such as hereinbefore described, of a series of separate record-cards, each representing an individual or unit provided with circuit-controlling index-points, an indicator controlled by an electro-magnet, a circuit-controlling device co-operating with the index-points on the card, and circuit-connections, such as indicated, connecting the electro-magnet of the indicator with said circuit-controlling devices, substantially as described.

11. The combination, in a system such as described, and with a circuit-controlling apparatus, a system of circuits connected thereto, and a series of record-cards having index-points, of a series of sorting-boxes and indicators therefor included in the system of circuits controlled by the index-points on the cards, substantially as described.

12. The combination, to form a system such as described, of a circuit-controlling apparatus, a system of circuits connected thereto, a series of record-cards provided with index-points co-operating with said circuit-controlling apparatus, a series of electro-magnets included in said system of circuits, indicators controlled by said electro-magnets, and a series of sorting-boxes corresponding with the indicators, substantially as described.

13. In a system such as described, the combination, with a record card or strip, circuit-controlling devices, and a system of circuits connected thereto, of operating-magnets controlled by said circuits, and a series of boxes provided with lids controlled by said operating-magnets, substantially as described.

14. In a system such as described, the combination, with separate record-cards, of circuit-controlling devices co-operating with index-points on the cards, a system of circuits, one or more boxes or receptacles for cards, a movable lid or section controlling the entrance to each box or receptacle, and actuating devices for the movable lid or section, said devices being controlled by the index-points on the record-cards to designate the proper receptacle for each card, substantially as described.

15. The combination, to form a system such as described, of a series of record-cards having index-points, circuit-controlling devices operated by said index-points, a series of circuits connected to said circuit-controlling devices and including operating electro-magnets, a series of boxes or receptacles corresponding to the group into which the cards are to be divided, and indicating and directing devices actuated by said operating-magnets, substantially as described.

16. In a system such as described, and in combination with a record card or strip provided with index-points representing items, a circuit-controlling apparatus provided with a separate contact for each index-point of the series, and a series of operating electro-magnets for actuating independent counting and indicating devices, a system of circuits intermediate the circuit-controlling devices and operating-magnets, said system embracing a series of relay-circuits controlled by one or more of the contacts in the circuit-controlling apparatus, and a series of direct circuits, including the contacts of the relays and

governed by one or more contacts of the circuit-controlling apparatus, substantially as described.

17. The combination, to form a system such as described, of the record-cards bearing index-points, a circuit-controlling contact for each index-point in the series, operating-magnets, and a system of circuits, substantially such as described, embracing a series of circuits including the coils of relays and certain designated circuit-controlling contacts, and another series of circuits embracing one or more designated circuit-controlling contacts and the contacts of one or more relays, said operating-magnet being controlled by at least two pairs of contacts, substantially as described.

18. In a system such as described, the combination, with the perforated record-cards and a system of circuits controlled thereby, of a bed-plate and platen between which the cards are successively fed, a series of yielding-pins mounted upon the platen, and a corresponding series of mercury-cups in the bed-plate, substantially as described.

19. In a system such as described, the combination, with the record-cards provided with the series of index-points, a bed-plate provided with a series of contacts forming the terminals of a system of circuits, such as described, and a reciprocating platen carrying a series of contact-points or pins corresponding in number and arrangement with the index-points on the cards, of a gage or gages for locating the cards, and a pin connected to the ground or return circuit and located at or near the edge of the card to prevent the closing of the circuits until the card has been properly placed, substantially as described.

20. In a system such as described, the combination, with the record-cards, the electrically-controlled series of contact-points carried by the platen, and the insulated series of contacts in the bed-plate, of a series of conductors each connected at one end to a contact in the bed-plate corresponding in position to one of the index-points and at the other end to a contact common to all of said circuits, said common contact or ground co-operating with a contact-point in the platen, and thus closing any or all of the circuits, substantially as described.

21. In a system for compiling statistical matters, as hereinbefore described, the combination of a series of record-cards bearing circuit-controlling index-points, a circuit-controlling apparatus for co-operating with said cards, a switch-board to which the circuit-wires of said apparatus are connected, a series of mechanical counters and operating-magnets therefor, and a series of sorting-boxes provided with indicators and operating-magnets therefor, and a system of circuits and connections, substantially as herein described, for connecting the several devices for effecting the operation of counting and sorting, or both counting and sorting, the cards, as well as the items recorded thereon by index-points, substantially as and for the purpose set forth.

395,782. ART OF COMPILING STATISTICS. HERMAN HOLLERITH, New York, N. Y.

Original application filed Sept. 23, 1884, Serial No. 143,805. Divided and this application filed Oct. 27, 1885. Renewed Jan. 4, 1887. Again renewed Sept. 8, 1888. Serial No. 284,982. (No model.)

Brief.—By slight modification cards or sheets of electrically non-conducting material suitably perforated could be used. All the small circles in the diagrammatic figures represent magnets.

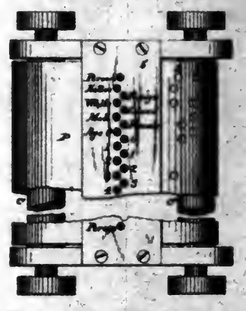


Claim.—1. The herein-described improvement in the art of compiling statistics, which consists in, first, forming or arranging a standard or templet indicating the relative position in which each item or characteristic of the individual is to be recorded; secondly, forming a record of each individual or thing by locating index-points upon a strip or tablet, said index-points representing the characteristics of the individual and bearing a determinate relation to each other and to the standard; and, finally, submitting said separate records successively to the action of circuit-controlling devices for operating the registering devices representing the statistical items to be compiled, whereby each statistical item or combination of items when contained in the record of any individual is accurately registered.

2. The herein-described method of compiling statistics, which consists in recording separate statistical items pertaining to the individual by holes or combinations of holes punched in sheets of electrically non-conducting material, and bearing a specific relation to each other and to a standard, and then counting or tallying such statistical items separately or in combination by means of mechanical counters operated by electro-magnets the circuits through which are controlled by the perforated sheets, substantially as and for the purpose set forth.

395,783. APPARATUS FOR COMPILING STATISTICS. HERMAN HOLLERITH, New York, N. Y.

Filed Sept. 23, 1884. Renewed Oct. 27, 1885. Again renewed Jan. 4, 1887. Again renewed Sept. 8, 1888. Serial No. 284,989. (No model.)



Claim.—1. The combination, with perforated sheets of electrically non-conducting materials, said perforations representing statistical items, of electro-magnets and mechanical counters in circuits controlled by said perforated sheets, substantially as and for the purposes specified.

2. The combination, with a series of mechanical counters, as described, and a perforated strip of paper, said perforations representing statistical items, of the drum A, bar D, provided with pointers *p*, and electro-magnets *m*, said electro-magnets being in circuits through the pointers *p* and connected with and operating the before-mentioned mechanical counters.

3. The combination, with a series of electro-magnets and the series of mechanical counters actuated thereby, said electro-magnets being arranged in circuits controlled by relays, of a perforated sheet of electrically non-conducting material, said perforations representing statistical items controlling the circuit through the electro-magnets, of the relays above referred to, substantially as and for the purposes described.

4. The combination, to form a system for automatically compiling and recording statistics, of a strip of non-conducting material perforated at intervals to designate separate items, grades, &c., pertaining to a single individual or object, a series of electric circuits, contact-fingers, or terminals in each of said circuits to vary the current in said circuits as each perforation registers with the corresponding contact-finger, and a recording mechanism for each item, grade, &c., operated by an electro-magnet included in a circuit whose current is thus varied by the contact finger or fingers entering the perforation or perforations in the strip representing the item to be recorded, substantially as described.

5. In a system such as described for automatically compiling and recording statistics, the combination of a series of independent mechanical counters for recording the separate items, an electro-magnet for actuating each of said counters, a series of electric circuits including said electro-magnets, a series of contact-fingers controlling said circuits, and a strip perforated at predetermined intervals denoting separate statistical items, each of said perforations being located in line with and actuating one of the said contact-fingers, whereby each perforation in the strip representing an item, quality, &c., is caused to actuate a contact-finger and thereby energize the electro-magnet whose circuit is controlled by the finger or fingers representing the item to be recorded on the mechanism actuated by the said electro-magnet.

6. In a system such as described for automatically compiling and recording statistics, the combination, with a series of electric circuits, a series of electro-magnets connected thereto, a recording mechanism for each electro-magnet, and a series of circuit-breakers controlling the flow of electricity in the before-mentioned circuits, of a movable record-strip provided with a series of indicating-points representing statistical items for actuating the circuit-breakers, whereby each item or combination of items represented upon said record-strip is automatically distributed and recorded, substantially as described.

7. In a system such as described for automatically compiling and recording statistics, the combination, with a series of recording-instruments, a series of electro-magnets for actuating said recording-instruments, a series of electric circuits including said electro-magnets, and a series of circuit-breakers for controlling said circuits, of a record-strip containing a series of indicators for actuating the circuit-breakers, said indicators each representing separate items characteristic of the person or thing, the whole so combined and arranged, substantially as described, whereby each item or series of items pertaining to each individual is recorded under its appropriate head as a statistical item.

395,784. SCRAPER AND ROLLER. WILLIAM HUGHES, Bushnell, Mich.

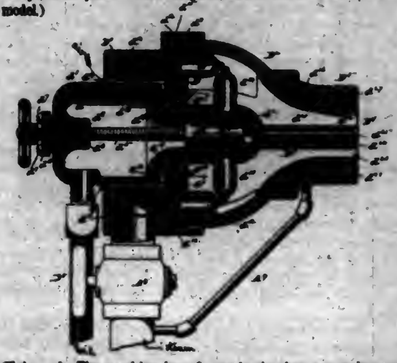
Filed Sept. 5, 1888. Serial No. 284,635. (No model.)



Claim.—The garden implement comprising the beams or handles B, the roller journaled between the beams, the oblique horizontal cutter M, with divergent side arms, the beams adapted to carry the cultivating-teeth P, having their lower ends, B, twisted to form the square or chisel edged teeth T, the said cultivating-teeth having their standards secured to opposite sides of the beam from the cutter M, substantially as described.

395,785. INJECTOR FOR BURNING PETROLEUM IN FURNACES. HENRY H. HYLAND, Pittsburg, Pa., assignor of one-half to Thomas H. Phelps, same place.

Filed Aug. 26, 1887. Serial No. 247,972. (No model.)



Claim.—1. The combination of a casting having an annular steam-chamber, a casting having an oil-chamber partly inclosed by and having an air-space between it and said steam-chamber, a nozzle having nipples, and a flange provided with nipples arranged at right angles to the nipples on the nozzle, and said nipples having communication with said oil and steam chambers, and a nozzle or casting, D^2, covering said nozzle and flange and having a contracted exit-opening.

2. The combination of a casting having an annular steam-chamber, a casting having an oil-chamber partly inclosed by said steam-chamber, a nozzle having nipples, and a flange provided with nipples arranged at right angles to the nipples on the nozzle, and said nipples communicating with said oil and steam chambers, and a nozzle or casting, D^2, covering said nozzle and flange and having a contracted exit-opening.

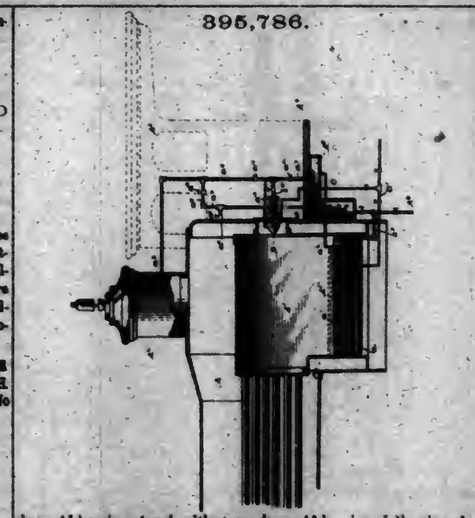
3. The combination of a casting having an annular steam-chamber provided with nipples, a casting having an oil-chamber, a nozzle having nipples arranged at right angles to the nipples on the steam-chamber and communicating with the oil-chamber, a casting covering said nipples, and a casting secured to the nozzle and having two or more partitions, which form mixing-chambers for each set of steam and oil nipples.

395,786. PETROLEUM-BURNER AND STEAM-GENERATOR. HENRY H. HYLAND, Pittsburg, Pa., assignor of one-half to Thomas H. Phelps, same place.

Filed Aug. 26, 1887. Serial No. 247,974. (No model.)

Claim.—1. In an apparatus for burning hydrocarbons, the combination, with the fire-box of a boiler, of a coil of pipe, A^6, located in the fire-box, and having pipes a^3 and a^4, the water-drum A^7, connected with pipe a^3, the steam-drum A^8, connected with coil A^6 by pipe a^4, the pipe a^5, leading from the steam-dome and connected with drum A^7 by pipe a^6 and with steam-drum A^8 by pipe a^7, the pipe a^8 connecting pipe a^4 with the water-space of the boiler, the injector B, connected with pipe a^5, and the oil-supply pipe connected with the injector and having the branch pipe extending into the fire-box, substantially as described.

2. In an apparatus for burning hydrocarbons, the combination with the fire-box of a boiler, of a coil of pipe, A^6, located in the fire-box and having the outer series of large pipe, *a*, and the inner series of smaller pipes, *a'*, the water-drum A^7, connected by pipe a^6 with pipes *a*, the steam-drum A^8, connected with pipes *a'* of coil A^6 by pipe a^3, the pipe a^5, leading from the steam-dome and connected with



drum A^7 by pipe a^6 and with steam-drum A^8 by pipe a^7, the pipe a^8, connecting pipe a^4 with the water-space of the boiler, the injector B, connected with pipe a^5, and the oil-supply pipe connected with the injector and having the branch pipe extending into the fire-box, substantially as described.

395,787. COMBINED CLOD-CRUSHER AND ROLLER. WILLIAM KNUTSEN, Donahoe, Iowa.

Filed Dec. 22, 1887. Serial No. 258,736. (No model.)



Claim.—The combination of a draft-frame, the front crushing-roller having a series of circumferential V-grooves, and the smooth cylindrical roller arranged to travel directly in rear of the first-named roller, as described and shown, whereby the clods are first pulverized and the surface of the soil formed into ridges, and these ridges subsequently rolled down, as and for the purpose described.

395,788. CAN FORMING AND SOLDERING MACHINE. FRANK M. LEAVITT, Brooklyn, N. Y., and EDWIN NORTON, Maywood, Ill., assignors to said Edwin Norton and Oliver W. Norton, Chicago, Ill.

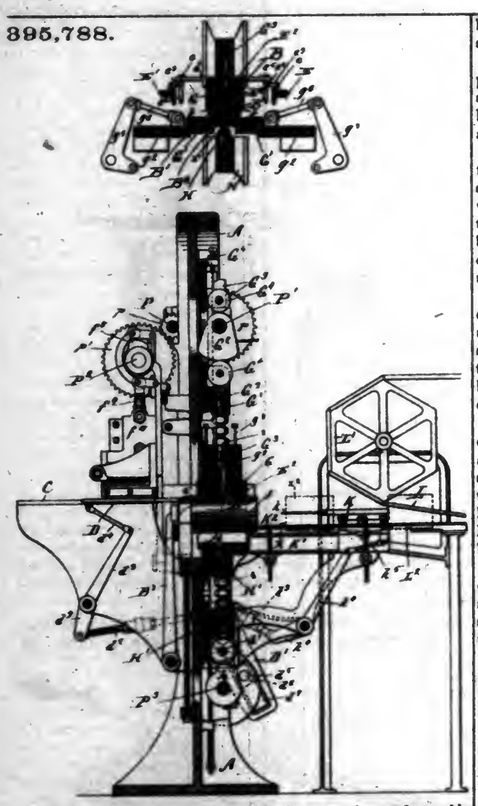
Filed Sept. 11, 1888. Serial No. 285,105. (No model.)

Claim.—1. The combination, with a can-body-former horn, of two guides above the horn, each of said guides having two separate and distinct guide-faces, one of said guide-faces being parallel to the plane of the sheet for the sheet to rest upon and the other at right angles thereto for the edges of the sheet to abut against to prevent lateral displacement of the sheet, the parallel guide-face being movable to permit the sheet to be folded downward around the horn, substantially as specified.

2. The combination, with a can-body-former horn, of movable guides above the horn for guiding and supporting the edges of the sheet, and means for moving or withdrawing said guides to permit the sheet to be folded downward around the horn, substantially as specified.

3. The combination, with a can-body-former horn, of movable guides above the horn for guiding and supporting the edges of the sheet, means for folding or bending the sheet downward around the horn, and a device for closing or squeezing the seam against the horn, substantially as specified.

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4. The combination, with a can-body-former horn, of movable guides above the horn, means for moving or withdrawing said guides to permit the sheet to be folded downward around the horn, and a feed-slide for delivering the sheet upon said guides above the horn, substantially as specified.

5. The combination, with a can-body-former horn, of movable guides above the horn, a feed-slide for delivering the sheet upon said guides, folders for bending the sheet downward around the horn, and means for withdrawing said guides out of the way of the sheet as it is bent downward around the horn, substantially as specified.

6. The combination, with a can-body-former horn, of movable guides above the horn for guiding and supporting the edges of the sheet, and a central guide adapted to receive the sheet between the same and the horn, substantially as specified.

7. The combination, with a can-body-former horn, of movable guides above the horn for guiding and supporting the edges of the sheet, a central guide adapted to receive the sheet between the same and the horn, and a folder for bending the sheet downward around the horn, provided with a longitudinal groove to receive said central guide, substantially as specified.

8. The combination, with the guides E, of movable guides E', feed-slide D, edge-folders for forming hooks on the edges of the sheet, a body-former horn below said feed-guides, folders for bending the sheet downward around the horn, and a device for squeezing or closing the interlocked folds of the seam, substantially as specified.

9. The combination of feed-guides E with movable guides E', feed-slide D, edge-folders F F' F², horn B below said feed-guides, vertically-reciprocating folder G, and horizontally-reciprocating folders G' G', substantially as specified.

10. The combination of feed-guides E with movable guides E', feed-slide D, edge-folders F F' F², horn B below said feed-guides E', vertically-reciprocating folder G, horizontally-reciprocating folders G' G', and vertically-reciprocating seam-closer H below said horn, substantially as specified.

11. The combination, with a can-body-former horn and mechanism for folding the sheet downward around the horn to bring the side seam centrally on the under side of the can-body, of a soldering device, M, a can-carrier chain, L, pulleys or sprocket-wheels L' for said chain, mounted above said soldering device, and mechanism for moving or delivering the can-body from said horn under and within the link of said carrier-chain while the same is passing in an inclined position, substantially as specified.

12. The combination of a body-former horn with can-body-supporting tracks or guides, a link-chain carrier, L, and pulleys L' above said tracks, and mechanism for conveying the can-body from said horn under and within the links of said chain-carrier, substantially as specified.

13. The combination of a can-body-former horn with mechanism for folding the sheet downward around the horn, so as to bring the side seam underneath, a solder bath, M, chain-carrier L, polygon wheels L' for said chain, and a reciprocating conveyer, K, having extractor-fingers *k* and feed projections or pawls k^2, whereby the can-bodies are moved from the horn within and under the links of said carrier-chain, one of said polygon wheels being mounted above said reciprocating extractor-slide K, substantially as specified.

14. The combination, with a can-body-former horn, of edge-folders, a reciprocating feed-slide, D, having feed pawls or projections *d* and *d'*, for operating upon two sheets at a time, in front of and above said horn, and a reciprocating feed-slide, K, having pawls or projections k k^2, for conveying two can-bodies at a time, at the rear of said horn, and a soldering device having a carrier into which the cans are delivered by said feed-slide K, substantially as specified.

15. The combination, with a can-body-former horn, of edge-folders, a reciprocating feed-slide, D, having feed-pawls or projections *d* and *d'*, for operating upon two sheets at a time, in front of and above said horn, and a reciprocating feed-slide, K, having pawls or projections k k^2, for conveying two can-bodies at a time, at the rear of said horn, a soldering device having a carrier into which the cans are delivered by said feed-slide K, and a common lever, D', for operating both of said feed-slides, substantially as specified.

16. The combination, with a can-body-former horn, of edge-folders, a reciprocating feed-slide, D, having feed pawls or projections *d* and *d'*, for operating upon two sheets at a time, in front of and above said horn, and a reciprocating feed-slide, K, having pawls or projections k k^2, for conveying two can-bodies at a time, at the rear of said horn, and a soldering device having a carrier into which the cans are delivered by said feed-slide K, and a common lever, D', for operating both of said feed slides, connecting-link d^3, lever d^4, link d^5, link k^3, lever k^4, and link k^5, all combined and operating substantially as specified.

17. The combination, with a body-former horn, of movable guides E', for supporting the sheet above the horn, reciprocating folder G, for bending the sheet downward around the horn, and mechanism operated or released by the downward movement of said folder or its slide to withdraw said movable guides E' as the folder G descends, substantially as specified.

18. The combination, with table C, of feed-guides E, feed-slide D, edge-folders F F' F², movable feed-guides E', horn B below said feed-guides and above which the sheet is fed, and mechanism for folding or bending the sheet downward around the horn, substantially as specified.

19. The combination, with a can-body-former horn, of movable guides above the horn for supporting the edges of the sheet, a central guide for holding or clamping the sheet on the horn, and a folder mechanism for bending the sheet downward around the horn, substantially as specified.

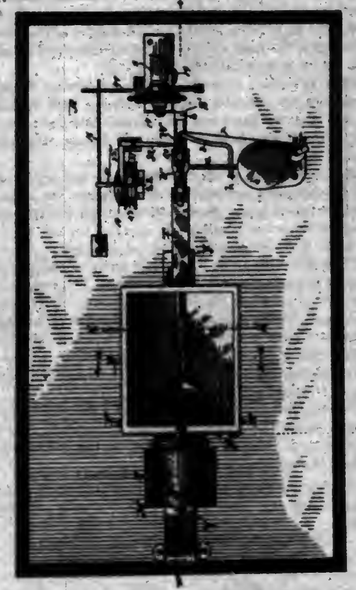
395,789. CIGARETTE-MACHINE. EDWIN J. LOMLEY, Washington, D. C., assignor of part to Thomas A. Mitchell, C. Bankes Brooks, Samuel D. Webb, John J. Griggs, and J. C. Haviland, all of same place. Filed Dec. 10, 1887. Serial No. 258,263. (No model.)

Claim.—1. In a cigarette-machine, the combination, with the supporting-table and driving mechanism, substantially as described, of a feed-hopper provided with a forming-tube, a reciprocating feed-bar within the feed-hopper, a pasting-trough connecting with the forming-tube, a paste-receptacle, an endless pasting-thread adapted to pass through the volume of paste in the paste-receptacle and also parallel with and above the pasting-trough, and a spring-pressed roller adapted to press the lap of the cigarette-wrapper as the cigarette is forced through the pasting-trough, substantially as specified.

2. In a cigarette-machine, the combination, with the forming-tube and the pasting-trough connecting therewith, of the paste-receptacle provided with the tube *d* and device d^x, the adjustable arm *l*, provided with the pulley *m*, the adjustable standard *e*, provided with the grooved disk *i*, and the endless pasting-thread passing over the grooved disk *i* through the paste-receptacle tube *d*, and device d^x, and over the pulley *m* on the arm *l*, substantially as specified.

3. In a cigarette-machine, the combination, with the standard 1, the parallel swinging arms provided with the rotary trimming-knife, the catch-carrier arm, and the return-spring 19, of the rocking pulley 23, connected to the treadle by the cord 37, the double cam 18 on wheel 20, pasting-roller W, having cam 50, the lever 32, provided with the hinged feed-pawl, and the spring-rod 16, provided with the dog 17, substantially as specified.

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4. In a cigarette-machine, the combination, with the rocking pulley 23, recessed in its rear face and provided with the spring-pressed plate 27, of the double cam on wheel 20, provided with pins 29 and 30, the lever 32, provided with the spring-pressed feed-pawl hinged thereto, the spring-rod 16, provided with the pawl 17, the swinging knife-carrier, the catch-carrier arm 44, having a shoulder, and the return-spring 19, substantially as specified.

395,790. CHAIN PIPE-WRENCH. GEORGE M. MARSHALL, Kilbourn City, Wis. Filed Aug. 13, 1888. Serial No. 282,580. (No model.)



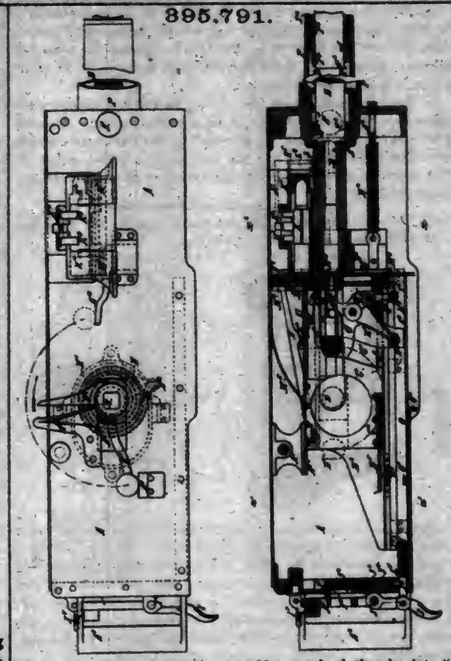
Claim.—1. In a chain pipe-wrench of the class described, the combination of a lever having a head, C, which is provided with a continuous curved serrated face, *c c'*, a clevis, E, pivoted directly to the head at a point on one side of the horizontal axis thereof and in rear of the convex face and having its free end extended beyond the extreme forward point of the convex face, another clevis, F, pivoted directly to the head on the opposite side of the axis thereof at a point in rear of the pivot of the clevis E and having its free end terminating in rear of the convex face of the head, and a chain connected to the free end of both clevises, substantially as and for the purpose described.

2. A chain pipe-wrench of the character described, consisting, essentially, of a lever, a contracted shank fixed thereto and having an enlarged head, C, at its free end, the face of the head being serrated and curved continuously from one side to the other at *c c'*, a U-shaped clevis, E, pivoted directly to the head at *c*, and having a horizontal slot, *g*, opening through its extreme forward end, another U-shaped clevis, F, pivoted to the opposite side of the head and having a slot, g^3, opening through one of the lateral edges thereof, and a chain having one end connected to the clevis E by a pin, g', and detachably connected at its other end to the clevis F by fitting one of its links over one edge of the slot g^3 of said clevis, substantially as described.

395,791. MACHINE-GUN. HIRAM S. MAXIM, London, England. Filed Oct. 10, 1885. Serial No. 179,454. (No model.) Patented in England July 8, 1885, No. 8,281.

Claim.—1. In a machine-gun, the combination, with a reciprocating breech-block, of a carrier arranged to slide vertically in said breech-block and adapted to engage with the cartridges in a belt or feed mechanism, and a spring in the path of movement of the carrier by which, in the backward movement of the breech-block, the carrier

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will be depressed to bring the cartridge retained thereby into line with the breech, as set forth.

2. In a machine-gun, the combination, with a reciprocating breech-block, of a carrier arranged to slide vertically in said breech-block and adapted to engage with the cartridges in a belt or feed mechanism, levers pivoted to the reciprocating breech mechanism and engaging with the carrier, a crank connected with the breech mechanism and adapted to be turned by the to-and-fro movement of the same, and pins or projections on the said crank adapted to encounter the levers and raise the carrier at a given point in the forward movement of the carrier, all substantially as herein set forth.

3. The combination, in a machine-gun, with a reciprocating breech-block movable in line with the barrel, of a cartridge-feed belt adapted to be intermittently moved through the gun above the breech, a carrier movable vertically in the breech-block and formed to engage with a cartridge in the feed-belt and that in the breech when the breech-block is in its forward position, and shifters or devices adapted to operate in conjunction with the moving breech-block to encounter the said carrier and raise or depress the same according to its position relatively to the breech, as set forth.

4. In a gun, a fire-arm having a reciprocating breech-block movable in line with the barrel, the combination, with the said breech-block and a cartridge-feeding mechanism, of a carrier movable vertically in said breech-block and adapted to engage with the shells in the breech and feed mechanisms, and shifters or devices placed in positions to encounter the carrier for depressing or raising it according to the position of the breech-block relatively to the breech, as set forth.

5. The combination, with the reciprocating breech-block C, the carrier M, arranged to slide vertically therein, the levers N, pivoted to the carrier, the crank-shaft D, provided with pins or projections D^4, which are adapted to encounter and move the levers N, the spring M^5, in position to bear upon and depress the carrier M, and the cartridge-retaining spring M^3, secured to the carrier, as set forth.

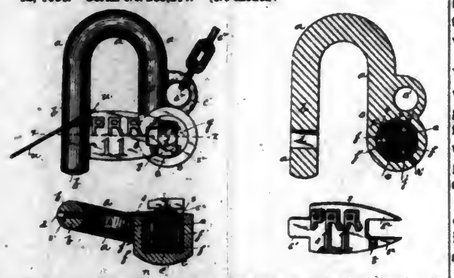
6. The combination, with the frame A and a resisting-spring, A^7, secured thereto, of an inner frame comprising the block B', the side plates B^2 B^2, and the cross-bar B^4, secured together and supporting the breech mechanism, the barrel B, fixed in the block B' of the inner frame and adapted to slide to and fro therewith in the frame A, the crank-shaft and pin for reciprocating the inner frame and thereby operating the breech mechanism, and the arm D^2, carried by the shaft and adapted to encounter the spring A^7, to aid the return or forward movement of the inner frame and breech mechanism, as set forth.

7. The combination, with the reciprocating breech-block, of the slide K^3, provided with the stud K^4, and the pawls K^5, adapted to act in conjunction with pawls K^4 for imparting an intermittent rotary movement to the cartridge-feeding mechanism, the arms L L', mounted

on a shaft in the chamber K', and the lugs B⁷ B⁸ on an extension or arm from the plate B², forming part of the reciprocating breech mechanism, the lugs B⁷ B⁸ being arranged to operate the arms L L' and impart movement to the slide K³ through the stud K⁴, to which the arm L' is connected, as set forth.

8. The combination, with the sliding barrel B of an automatic machine-gun, of a water-chamber, P, surrounding the barrel, the stuffing-boxes P' P³, and pistons P⁴, surrounding the barrel at opposite ends of the water-chamber, and the intermediate coiled spring, P⁵, acting upon the said pistons with equal pressure, as and for the purpose set forth.

395,792. SEAL-LOCK. EDUARD MEIER, Pittsburg, Pa. Filed Sept. 12, 1888. Serial No. 285,217. (No model.)



Claim.—1. In seal-locks, the combination of the bow having in one arm thereof a slot extending longitudinally of the arm, and having locking apparatus in the other arm provided with a locking-bar extending out on the side of said arm, and a seal-plate having one end fitting into said slot and the other end engaging with said locking-bar, so that the face of the seal-plate is exposed when the lock is hanging in a perpendicular position, substantially as and for the purpose set forth.

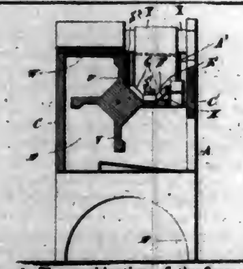
2. In seal-locks, the combination, with the bow or body *a*, having the socket *c* in one arm thereof, of the sleeve *f*, the rotating block *g* fitting within said sleeve, and the washer *n*, holding the block within the sleeve, and means for securing the sleeve within the socket, substantially as and for the purpose set forth.

3. In seal-locks, the combination, with the body or bow *a*, having the socket *c*, provided with a keyway, *p'*, of the sleeve *f*, having the corresponding keyway *p*, the key *o*, the rotating block having the collar *i* extending over said sleeve and key, and the washer *n*, engaging with said block, substantially as and for the purpose set forth.

4. In seal-locks, the combination, with a bow-shaped body and a seal-plate closing the ends of said bow and locking apparatus to secure it in place, of an inspection-tag adapted to be clipped upon one arm of the body before the lock is sealed and receive any inspection-marks to be made, substantially as and for the purpose set forth.

395,793. ORANGE-GRADER. THEOPHILUS W. MOORE, Fruit Cove, Fla. Filed May 31, 1888. Serial No. 275,966. (No model.)





Claim.—1. The combination of the frame having the inclined trough provided with the openings H of varying sizes, the revoluble gates arranged in the said openings, the detents or stops to engage the gates, and the weighted traps arranged in the bottom of the trough and connected to and adapted to operate the detents, substantially as described.

2. The combination of the inclined trough having the beveled groove in its bottom, the weighted traps pivoted in said bottom forming a portion thereof and communicating with the groove, and the revoluble gates arranged in openings in the bottom of the trough, the detents engaging the gates, and the links connecting said detents with the traps, substantially as described.

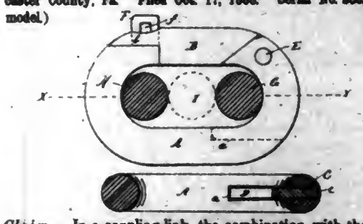
3. The combination of the inclined trough having the openings of varying sizes, the revoluble gates arranged in said openings, the detents engaging the gates, and the counter-balanced traps in the bottom of the trough connected to the said detents, substantially as described.

4. The combination of the inclined trough having the openings H, the revoluble gates arranged in said openings, the traps in the bottom of the trough having the detents connected thereto to engage the gates, and the arms or springs W, engaging the rear sides of the vertical wings of the gates, substantially as described.

5. The combination, with the inclined chute, of the pivoted gate Y, having the counterbalancing-weight Z, the yoke A', arranged transversely at the lower end of the chute and having the vertical arms, guiding-loops B' for the said arms, the spring-arms C', having their free ends connected to the lower ends of the yoke-arms, and arranged under the bottom of the chute, and the tappet-pins D', secured to the gate and engaging the spring-arms, for the purpose set forth, substantially as described.

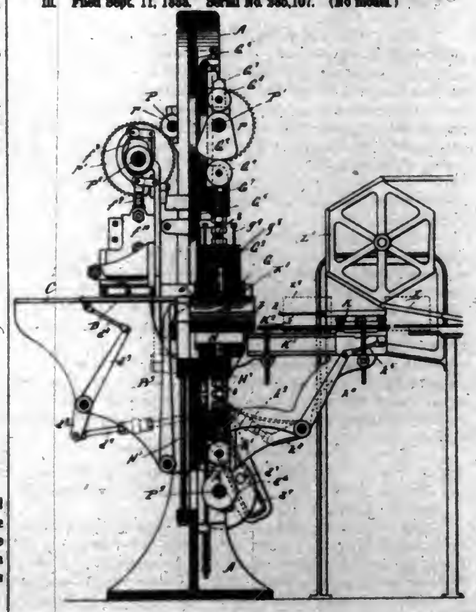
6. The combination of the inclined chute, the gate at the lower end thereof, adapted to tilt or incline, and the stop or yoke guided in suitable ways and connected to the gate, for the purpose set forth, substantially as described.

395,794. COUPLING-LINK. BENJAMIN MORTON, Five Forks, Lancaster County, Pa. Filed Oct. 17, 1888. Serial No. 288,356. (No model.)

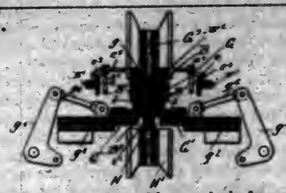


Claim.—In a coupling-link, the combination, with the body A, having a recess, *a*, formed therein which increases in width from the outer to the inner edge of the link, of the part B, hinged to the body A and having a tongue adapted to be received in the said recess, substantially as and for the purpose specified.

395,795. CAN FORMING AND SOLDERING MACHINE. ERWIN NORTON, Maywood, assignor to himself and Oliver W. Norton, Chicago, Ill. Filed Sept. 11, 1888. Serial No. 285,107. (No model.)



395,795.



Claim.—1. The combination, with a can-body-former horn, of a side-seam-closing device below the horn, adapted and operating to close the side seam against the lowermost part of the horn, a side-seam-soldering device having a can-body carrier, and mechanism for delivering the can-body from said horn into said carrier, substantially as specified.

2. The combination, in a can-body-forming machine, with a body-blank-feed device, of a can-body-former horn below said feed device and above which the blanks are fed, and mechanism for folding the blank downward around said horn, and a device below said horn for closing the folds of the seam against the horn, substantially as specified.

3. The combination, with a can-body-former horn, of mechanism above the horn for folding or forming the can-body downward around the horn, and a seam-closing device for squeezing or closing the folds of the seam against the horn, substantially as specified.

4. The combination, with a can-body-forming machine constructed and adapted to interlock and close the seam at the under side of the can-body, of a side-seam-soldering machine having a bath or soldering device over which the can-body is carried, and means for delivering the can-body from the forming-machine to the side-seam-soldering machine, substantially as specified.

5. The combination, with a can-body-former horn, of a device for feeding the blank sheets in above the horn, a device for folding the sheet downward around the horn, devices for forming the side seam of the can-body, a side-seam-soldering device having a carrier, and a device for moving the can-body from said horn and delivering the same into said carrier, substantially as specified.

6. The combination, with guides for the sheet, of a sheet-feed slide, edge-folders for forming hooks on the edges of the sheet, a body-former horn below said guides and above which the sheets are fed, a vertically-reciprocating folder above the horn for bending the sheet downward around the horn, two longitudinally-reciprocating folders for interlocking the hooks or folds of the seam at the lowermost point of the horn, and a seam-closing device below the horn for closing the folds of the seam against the horn, substantially as set forth.

7. The combination, with guides for the sheet, of a sheet-feed slide, edge-folders for forming hooks on the edges of the sheet, a body-former horn below said guides and above which the sheets are fed, a vertically-reciprocating folder above the horn for bending the sheet downward around the horn, two longitudinally-reciprocating folders for interlocking the hooks or folds of the seam at the lowermost point of the horn, a seam-closing device below the horn for closing the folds of the seam against the horn, a side-seam solderer having a can-body carrier, and an extractor-slide for removing the can-bodies from said horn and delivering them to said carrier, substantially as specified.

8. The combination, with guides for the sheet, of a sheet-feed slide, edge-folders for forming hooks on the edges of the sheet, a body-former horn below said guides and above which the sheets are fed, a vertically-reciprocating folder above the horn for bending the sheet downward around the horn, two longitudinally-reciprocating folders for interlocking the hooks or folds of the seam at the lowermost point of the horn, a seam-closing device below the horn for closing the folds of the seam against the horn, a side-seam solderer having a can-body carrier, and an extractor-slide for removing the can-bodies from said horn and delivering them to said carrier, said side-seam solderer having a fluxing device and a solder bath over or through which the can-bodies are carried by said carrier, substantially as specified.

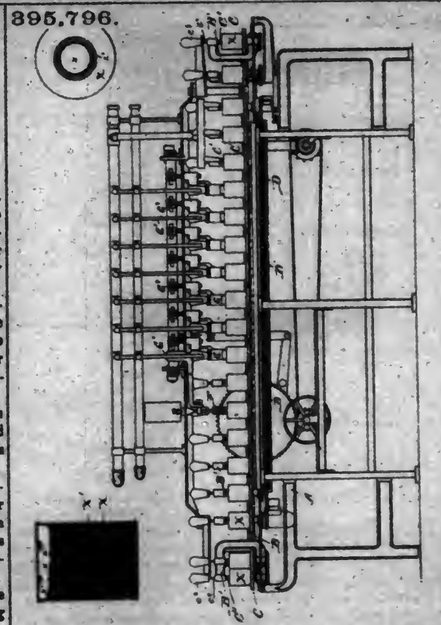
9. The combination, with a can-body former, of a side-seam solderer having a link or chain can-carrier, pulleys upon which said chain is mounted, means for delivering the can-bodies from said former to said carrier, and driving mechanism connecting the farther pulley of said chain carrier with the driving-shaft of the body-former, substantially as specified.

10. The combination, with a can-body-former horn, of a device below the horn for closing the seam against the horn, substantially as specified.

395,796. ART OF SOLDERING CAPS ON FILLED CANS. ERWIN NORTON, Maywood, assignor to himself, and Oliver W. Norton, Chicago, Ill. Filed Oct. 31, 1888. Serial No. 289,613. (No model.)

Claim.—1. The process of closing filled cans, consisting in placing vestless can-caps having their edges hemmed with solder on the cans

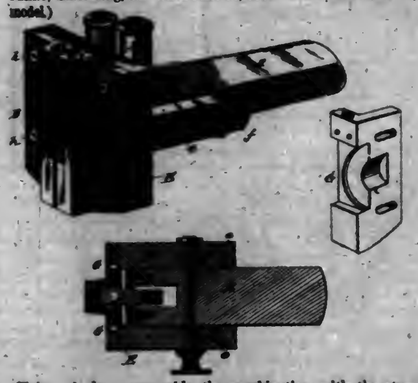
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and then heating and soldering the joint gradually by a series of successive steps, substantially as described.

2. The process of closing filled cans, consisting in placing vestless caps on the cans and then heating and soldering the joint by a series of successive steps, so that the air and gases under pressure produced during the first part of the heating and soldering operation may escape through the joint before the soldering thereof is completed, substantially as specified.

395,797. GUIDE FOR BAND AND SCROLL SAWS. DANIEL W. PERRY, Harrisburg, Pa. Filed June 21, 1888. Serial No. 277,743. (No model.)



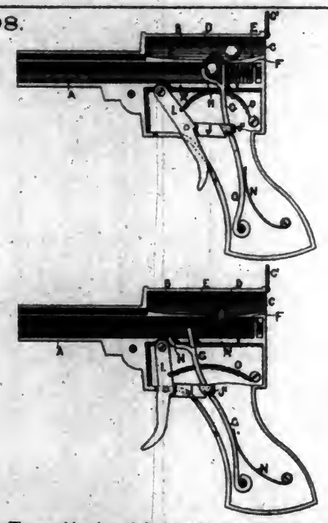
Claim.—1. In a saw-guide, the combination, with the stem A, having a roller in its front end and guideways on both sides, of the movable face E, having guide-arms suitably adjusted to slide in the ways on the stem A, the guide-pieces adjustably attached to the face E, substantially as set forth.

2. In a saw-guide, the combination, with the stem A, having a roller in its front end and guideways on both sides, of the movable face E, having guide-arms suitably adjusted to slide in the ways on the stem A, the guide-pieces attached adjustably to the face E, substantially as set forth.

3. The combination, with the stem A, having a roller in its front end, of a movable face, E, adjustably secured to slide on the stem A, the guide-pieces G G cut away in their central portion, substantially for the purpose specified.

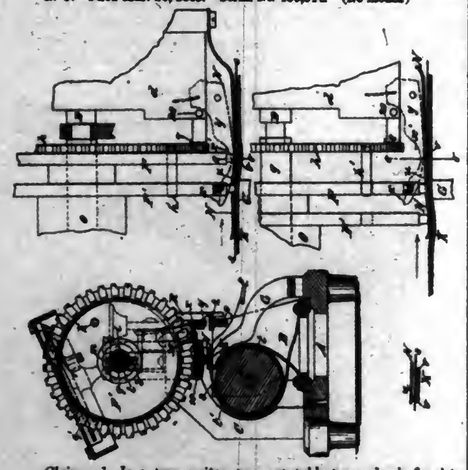
395,798. MAGAZINE TOY GUN. HENRY REASON, Brighton, County of Sussex, England. Filed June 4, 1888. Serial No. 276,098. (No model.)

395,798.



Claim.—The combination of the barrel A, connected to a suitable stock, magazine B, placed upon top of the barrel at the breech end and having a feeding-inlet for the shots, hole D, communicating with barrel A, spring F, spring-operated pivoted lever G, the top being provided with a prong, H, slot A' in bottom of barrel, trigger I, sear J, step K, projection L on side of G, and trigger-spring O, all substantially as and for the purposes stated.

395,799. TYPE-WRITING MACHINE. CHARLES SPIRO, New York N. Y. Filed Mar. 20, 1885. Serial No. 159,514. (No model.)



Claim.—1. In a type-writer, two rotatable type-wheels fixed to a common twirling handle and mounted on a depressible support and capable of being shifted longitudinally to and fro, substantially as and for the purpose set forth.

2. In a type-writer, the combination, with a fixed support for the paper or printed sheet, of two distinct rotary and reciprocating type-wheels arranged to reciprocate to and from said support and fastened together and to a common twirling handle, and capable of being shifted longitudinally to bring either wheel in the printing-plane, substantially as herein set forth.

3. In a type-writer of substantially the class described, a slotted guard-plate interposed between the shiftable type-wheels and the paper sheet and provided with feet to hold the plate out of contact with the freshly-printed character, substantially as herein shown and described.

4. In a type-writer substantially such as set forth, the combination, with the type wheel or wheels and fixed anvil G, of the intermittently-moving paper-carriage provided with the cushion-strap K, moving over said anvil, substantially as and for the purpose set forth.

5. The combination, with the type-wheels F F' and anvil G, of the intermittently-moving carriage having the cushion-strap K, with the guard-plate N, interposed between the wheels and strap, arranged and operating substantially as shown and described.

6. In a type-writer, the combination, with the two shiftable rotatable and reciprocating type-wheels F F', having recesses or stops of varying depth on their rims, of the reciprocating feed-pawl *y*, with its tail *x*, arranged in the specified relation to the type-wheels, and with the rack P, and an intermittent paper-carriage to which said rack is fixed, substantially as and for the purpose set forth.

7. The combination, with two rotatable and reciprocating type-wheels fastened together, provided with a common twirling handle and mounted on a depressible support and shiftable longitudinally, of a yielding or snapping spring-catch arranged to engage the support at each end of the longitudinal motion to hold the wheels in either position.

8. In a type-writer, the combination, with the depressible lever D, of the two rotatable and reciprocating type-wheels F F' and common twirling handle *o*, shiftable longitudinally on the end of the lever D, with the spring-catch *m*, and engaging recesses *n n*, arranged and operating substantially as and for the purpose set forth.

9. The combination, with the depressible lever D, locking-wheel A, crank-pin *k'*, and sleeve *g*, of the type-wheels F F' and twirling handle *o*, common to both wheels and shiftable on the sleeve *g*, substantially as set forth.

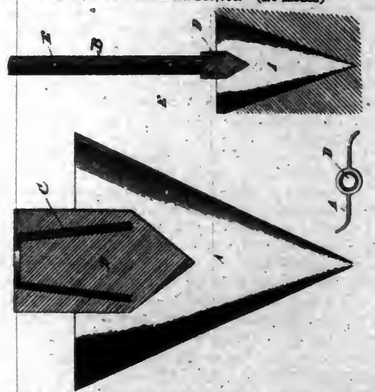
10. The combination, with the two rotatable reciprocating and shiftable type-wheels mounted on a depressible support, of the inking-disk 10, revolving in a plane inclined to the wheels, whereby the disk makes effective contact only with the active wheel, substantially as shown and described.

11. The combination of the two rotatable reciprocating and shiftable type-wheels F F', pendulous inker-arm *b*, and inclined rotary ink-disk 10, bearing upon one of the wheels, substantially as shown and described.

12. In a type-writer, the combination, with a type-wheel and an inking-disk revolving against the typed rim of the wheel, of the radial or pendulous arm supporting the ink-disk and made in two adjustable telescopic sections, *b b'*, with a fastening device, substantially as and for the purpose set forth.

13. The combination, with the shiftable type-wheels F F' and intermittent paper-carriage, of the reciprocating feed-pawl *y*, arranged to operate the carriage, with its tail *x* projecting in the path of the type-wheels, and provided with the gap *x'* to permit the free passage of one of the wheels, substantially as and for the purpose set forth.

395,800. FENCE-POST. WILLETT D. STILLMAN, Madison, Wis. Filed Mar. 19, 1888. Serial No. 267,760. (No model.)



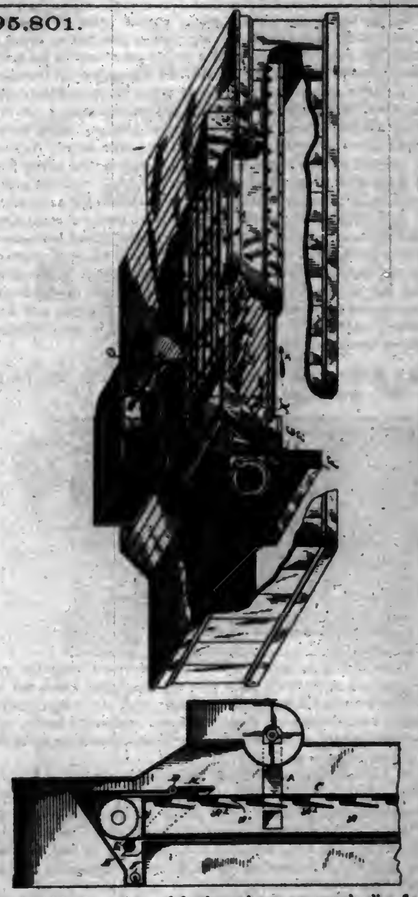
Claim.—An iron fence-post consisting of the base A, having opposite ribs curved reversely and terminating in a point, and having in its upper end the conical-shaped cavity C, with the fixed conical-shaped pin D within it, in combination with the upright tubular post B, having its lower end expanded about the pin within the cavity, as and for the purpose set forth.

395,801. DUST-COLLECTOR. JOSEPH H. WEBER, Battle Creek, Mich., assignor of one-half to Marvin C. Adams, Indianapolis, Ind. Filed Aug. 9, 1887. Serial No. 246,494. (No model.)

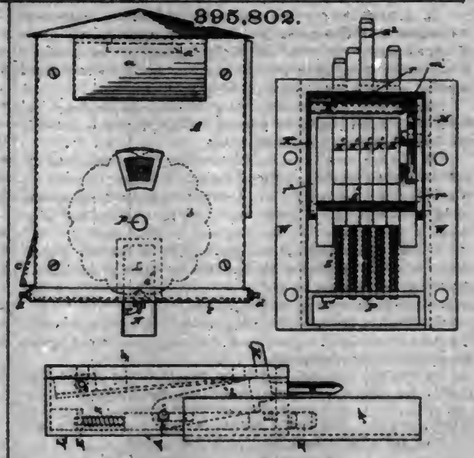
Claim.—1. The combination of an exhaust-fan, a dust-collecting apron, an air-trunk having exhaust-air passages leading from the trunk to the fan-case, and a chamber outside the trunk having exhaust-air passages leading from said chamber to the upper surface of the apron, substantially as described.

2. The combination of a casing, a rectangular air box or trunk

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located within the casing and having exhaust-passages leading from below its top to the fan-case and inlet-openings through the top only, a dust-collecting apron, and an exhaust-fan, substantially as described.

3. The combination of a rectangular air-trunk, a dust-collecting apron, an open perforated or wire-covered drum, a compartment or chamber for said drum, air-passages leading from the compartment, and a fan for exhausting air through the drum from the compartment, substantially as described.

4. The combination of the dust-collecting apron, the perforated drum, the exhaust acting from the inner side of the drum, and the balls, operating substantially as and for the purpose set forth.

5. The combination of the box or trunk having inlet-openings through the top only, valved openings arranged in the top of the box or trunk, the endless dust-collecting apron, and an exhaust from within the trunk, substantially as set forth.

6. The combination of the box or trunk having inlet-openings through its top only, the endless dust-collecting apron, the exhaust-fan, and the air-passages communicating with the interior of the box, substantially as set forth.

7. The combination of the trunk, the fan, the perforated drum the conveyer-trough, and the air-spouts communicating with the conveyer-trough and opening on the dust-conecting apron, substantially as and for the purpose set forth.

395,802. LETTER-BOX. MARTIN WIBERG, Stockholm, Sweden, assignor to Charles G. Lundborg, New York, N. Y. Filed Jan. 13, 1887. Serial No. 224,300. (No model.)

Claim.—1. A letter-box provided with a delivery-door and locking mechanism, in combination with a removable pouch provided with a receiving-door and locking mechanism, substantially as described, one of said locking mechanisms provided with a pin or projection, as T, adapted to automatically engage the other mechanism when the pouch and the box are joined, whereby the two mechanisms are compelled to lock and unlock in unison.

2. The box A, its door, the series of slotted tumblers, and the bar R', adapted to enter the slots in said tumblers.

3. The box A, its door, the series of slotted spring-actuated tumblers, the bail or cross-bar adapted to enter the slots in said tumblers, and the depending pin T, in combination with the receiving-pouch, its door, and locking mechanism having a cross-bar adapted to engage the pin T.

4. The box A, its door, and the series of spring-actuated tumblers, in combination with the receiving-pouch, its door, and the series of spring-actuated tumblers, the springs on said tumblers being of variable tension.

5. The box A, its door, and the series of spring-actuated tumblers, in combination with the receiving-pouch, its door, and spring-actuated tumblers, the springs on said tumblers being of different tension, the strong springs on one lock opposing the weak springs on the other lock, as and for the purpose described.

6. The box A, with the trunnions thereon, in combination with the receiving-pouch and the hooks thereon adapted to engage said trunnions, as and for the purpose described and shown, and locking devices for said receptacles.

7. The box A, its door and series of slotted tumblers, and the bar R', adapted to enter said slots, in combination with the receiving-pouch, its door, slotted tumblers, and bar R^2, one or more of which tumblers are constructed to enter and engage with the opposite lock when the two receptacles are placed together, whereby they are automatically locked together.

8. The box, its door, and the series of tumblers, in combination with the receiving-pouch, its door, the series of slotted tumblers, the cross-bar adapted to enter the slots in said tumblers, the lever connected to the door, and intermediate mechanism, whereby the closing of the door effects the release of the tumblers and consequent disconnection of the two receptacles.

9. The box A, its door, its slotted locking-tumbler, the cross-bar adapted to enter the slots in said tumblers, and its rigid depending pin, in combination with the receiving-pouch, its door, the series of slotted tumblers, the bar adapted to enter the slot in said tumblers and containing an opening for the pin T, the angular lever pivoted to the lock and engaging said bar, and projecting outward in the path to the door, and the operating-lever F, connected to the door, whereby the closing of the door trips the lever and causes the two bars to be withdrawn from the slots in the tumblers simultaneously.

10. The box, its door, and tumblers, in combination with the receiving-pouch, its door and tumblers, and the lever pivotally connected to the door of the pouch near its conjunction therewith, whereby the lever can be turned out of the way when not in use.

11. The box A, its door, the locking mechanism thereon, and the partition *f*, separating said mechanism from the mail-receiving portion of the box, as and for the purpose described.

12. The box A, its door, the series of spring-actuated tumblers, being reduced in thickness, and the cross-shaft A', seated in such reduced portion, whereby the motion of the tumblers is limited, substantially as and for the purpose described.

13. The receiving-pouch D', its door, the series of slotted tumblers thereon, the bail adapted to enter the slots in said tumblers, and the lever M, engaging said bail and adapted to be engaged by the door of the pouch, whereby the closing of the door will trip said lever and push the bail out of the slots in the tumblers, as and for the purpose described.

14. A letter-box provided with a door and locking mechanism, in combination with a mechanism mounted in a suitable casing, one of said mechanisms provided with a pin or projection, as T, adapted to automatically engage the other mechanism when the two are placed together, whereby one serves as a key to the other.

15. The box, its door and locking-tumblers, the opening *d*, and the shield *n* on the interior of the box for said opening, in combination with the check and receiving-pouch.

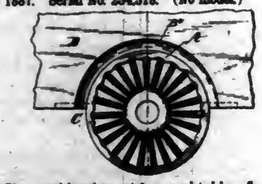
16. The box, its door and locking-tumblers, the opening *d* therein, and the shield *n* on the interior of the box, extending from the top of the opening in an outward and downward direction below the termination thereof, and in contact, or nearly so, with the door when closed, in combination with the check and receiving-pouch.

17. The box, its door and locking-tumblers, the opening *d* therein, located near the bottom of the box, and the exterior and interior shields for said opening, as and for the purpose described, in combination with the check and receiving-pouch.

18. The box, its door and locking-tumblers, the opening *d* therein, and the exterior shield, *n*, covering said opening, in combination with the check and receiving-pouch.

19. The box A, its door and locking-tumblers, and the opening *d* therein, in combination with the receiving-pouch and check.

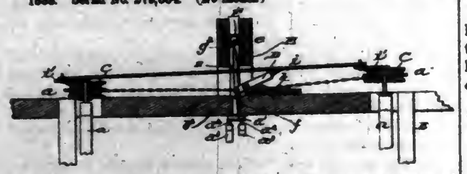
395,808. POOL-TABLE POCKET. JAMES ADAMS, Newark, N. J. Filed Apr. 9, 1887. Serial No. 234,318. (No model.)



Claim.—1. The combination, with a pool-table, of a pocket-holding plate shaped to conform to the contour of the wood-work of the table and provided with a series of holes, as *a*, and of a pocket composed of a net the upper loops of which are passed through the openings *a*, and a string, *b*, inserted through said loops on the rear side of the plate, as set forth.

2. The combination, with a pool-table having a notch, B*, in its edge, said notch being recessed in the lower portion thereof, as described, of a plate having a pocket secured to it and a leather facing or shield laid over the outer face, said plate with the pocket-facing being secured in the recess, the facing being clamped between the plate and walls of the recess, substantially as set forth.

395,804. GATE. JOSEPH ALDERS, Wells, Oreg. Filed July 13, 1888. Serial No. 279,884. (No model.)



Claim.—1. The combination, with a pair of pivoted gates, of pivoted opening-levers, connections between said levers and the pivots of the gates, a rod connected to the pivots of the gates, and holding-levers operated by the pivoted levers and engaging the said connecting-rod, substantially as described.

2. The combination, with a pair of pivoted gates, of disks on the pivots of the gates, pivoted operating-levers, flexible connections between the said levers and disks, and pivoted holding-levers connected to the flexible connections, substantially as described.

3. The combination, with a pair of pivoted gates, of disks secured to the pivots of the gates, a rod having its ends connected to the disks, pivoted operating-levers, pivoted holding-levers for engaging the said connecting-rod provided with pulleys, and cords or chains connected to the said disks passing around the pulleys of the holding-levers and connected to the operating-levers, substantially as described.

4. The combination, with a pair of pivoted gates, of disks secured to the pivots of the said gates, a rod having its ends eccentrically connected to the disks, holding-levers for engaging the rod provided with pulleys, ropes or chains passing around the pulleys of the holding-levers and connected to the operating-levers, and disks, spring-catches, and a connection between the said holding-levers and catches, substantially as herein shown and described.

5. The combination of a pair of pivoted gates with a notched rod connecting pulleys on the gate, pivoting or hinging posts, and a propping or holding lever engaging said rod, substantially as set forth.

6. The combination, with a pair of pivoted gates, of a notched rod connecting gate-operating pulleys, spring gate-locking plates or catches, and the propping or holding lever connecting with the spring plates or catches and engaging the said rod, substantially as described.

7. The combination, with a pair of pivoted gates and their operating-levers, of the gate-pulley-operating lines or chains, a rod connecting the gate-pulleys, and the holding or propping levers limited in their outward downward movement by a stop suitably disposed and carrying pulleys, said lines or chains connecting the gate-pulleys and the operating-levers and passing up in contact with the pulleys carried by said holding or propping levers, substantially as specified.

8. The combination, with a pair of pivoted gates carrying pulleys at the upper ends of their pivoting or hinging posts and bevel-ended plates or studs at the upper ends of their forward edges, of chains or lines applied to and operating said pulleys and applied to operating-levers, bowed or curved spring plates or catches, and the holding or propping levers connected to said spring plates or catches, said lines or chains passing up in contact with pulleys hung in said holding or propping levers, substantially as set forth.

395,805. CAR-DOOR. HENRY ALSOP, Chicago, Ill. Filed Feb. 18, 1888. Serial No. 264,530. (No model.)



Claim.—1. A car having its door formed with a bridge-like section provided at its lower edge with eyes, combined with a rod on which said eyes are fitted to turn and slide, such rod being extended laterally beyond the eyes, whereby the said bridge-like section may be swung outward or may be moved in the direction of length of the car, substantially as set forth.

2. The combination of the car having a doorway, a rod, F, extended below said doorway, the door-section D, provided with eyes fitting and capable of turning on and moving along said rod F, the rail E, extended above the doorway, the door-section C, having hangers engaging said rail, a fastening device for securing said door-sections together, and fastenings for securing such sections to the car, substantially as set forth.

3. The combination of the car, the door formed of upper and lower sections, a rod extended below the doorway, and eyes secured to the lower section and fitted on the rod, such rod being extended laterally beyond the eyes, whereby the eyes may slide along or turn on said rod, all substantially as and for the purposes specified.

395,806. MACHINE FOR GENERAL FORGING. JOHN R. BLAKESLEE, Cuyahoga Falls, Ohio. Filed Apr. 2, 1888. Serial No. 269,342. (No model.)

Claim.—1. In a machine for general forging, the combination, with a two-part slide and a lock which rigidly locks said portions together, of automatic mechanism which automatically releases said lock from engagement with said slide portions, substantially as set forth.

2. In a machine for general forging, the combination, with a two-part slide, the two portions of which are loosely connected together, and a reciprocating lock which locks said two portions together at will, of mechanism which automatically frees said lock from locking engagement, substantially as set forth.

3. In a machine for general forging, the combination, with a two-part slide, the two portions of which are loosely connected together, said two portions having an opening between them at certain portions of their stroke, and a lock adapted to fit in said opening, and thereby rigidly lock said two portions together, of actuating mechanism that at the will of the operator locks said two portions rigidly together or frees them from engagement with said lock, substantially as set forth.

4. In a machine for general forging, the combination, with a two-part slide, the two parts of which have an opening between them at certain portions of their stroke, of a vertically-reciprocating lock fitting in said opening at will of the operator, substantially as set forth.

5. In a machine for general forging, the combination, with a two-part slide, the two portions of which are respectively provided with bearing-plates on their adjacent faces, of a lock fitting between said two portions at will of the operator, substantially as set forth.

6. In a machine for general forging, the combination of a driving-shaft and movable die-block, the two-part slide connected, respectively, by intermediate mechanism with said shaft and die-block, and a lock which locks the two portions of said slide together, substantially as set forth.

7. In a machine for general forging, the combination of a two-part slide, the two portions of which have an opening formed between them at certain portions of their stroke, a bolt loosely connecting them together, and a lock fitting in the opening between said two portions, substantially as set forth.

8. In a machine for general forging, the combination of a two-part slide, one portion of which is provided with a recess, the other portion of which is provided with a tongue fitting in said recess, an opening being formed between said two parts at certain portions of their stroke, and a lock fitting in the opening between said two portions, substantially as set forth.

9. In a machine for general forging, the combination, with a stock-gage, of adjusting mechanism for adjusting said gage longitudinally and transversely of said machine, substantially as set forth.

10. In a machine for general forging, a stock-gage consisting in the combination of a standard, a rod having sliding bearing therein, a slotted head secured to said rod, and a second rod depending from the latter, substantially as set forth.

11. In a machine for general forging, the combination, with a two-part slide, a joint-lock, and primary and secondary rocking levers rigidly connected together, of actuating mechanism with which said primary lever engages, substantially as set forth.

12. In a machine for general forging, the combination of a two-part slide, a joint-lock, primary and secondary rocking levers rigidly connected together, and a rotary cam engaging with the primary lever, substantially as set forth.

13. In a machine for general forging, the combination of a two-part slide, a lock, a ratchet-wheel and cam rigidly connected, and mechanism adapted partially to rotate said ratchet-wheel at will, substantially as set forth.

14. In a machine for general forging, the combination of a two-part slide, locking mechanism, a cam-wheel, intermediate mechanism connecting the two latter, a ratchet-wheel and pawl, said ratchet-wheel and cam rigidly connected, and actuating mechanism engaging with said ratchet-wheel at the will of the operator, substantially as set forth.

15. In a machine for general forging, the combination of a two-part slide, a joint-lock, primary and secondary rocking levers rigidly connected together, a rotary cam engaging with the former, and mechanism adapted to rotate said cam, whereby said primary lever is raised and lowered as it respectively engages with the swell and depressed portions of said cam, substantially as set forth.

16. In a machine for general forging, the combination of a two-part slide, locking mechanism, primary and secondary rocking levers connected together, a ratchet-wheel, intermediate mechanism connecting said ratchet-wheel with said primary lever, and lever mechanism engaging with said ratchet-wheel at the will of the operator, substantially as set forth.

17. In a machine for general forging, the combination of a two-part slide, locking mechanism, primary and secondary rocking levers connected together, a ratchet-wheel provided on its side face with a pin, intermediate mechanism connecting said ratchet-wheel with said primary lever, and lever mechanism engaging with said pin at the will of the operator, substantially as set forth.

18. In a machine for general forging, the combination of a lock-bracket secured to a slide, a lock having bearing in said bracket, a lever engaging with said lock, and actuating mechanism for raising and lowering said lever, substantially as set forth.

19. In a machine for general forging, the combination of a shaft, primary and secondary levers rigid therewith, a lock having engagement with said primary lever, a cam having engagement with said secondary lever, and actuating mechanism rotating said cam, substantially as set forth.

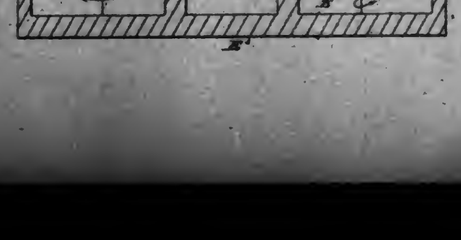
20. In a machine for general forging, the combination of a driving-shaft, a pitman journaled thereon, a secondary shaft, a cam and ratchet-wheel rigid thereon, a pawl-arm journaled on said shaft and having a pawl engaging with said ratchet, and mechanism connecting said pitman and pawl-arm, substantially as set forth.

21. In a machine for general forging, the combination of a die-block provided with a shoulder, a slide provided with an opening, a die-block fitting therein, a bar extending across the face of said die-block, and mechanism connecting said bar and shoulder, whereby the die-block is held rigidly in position, substantially as set forth.

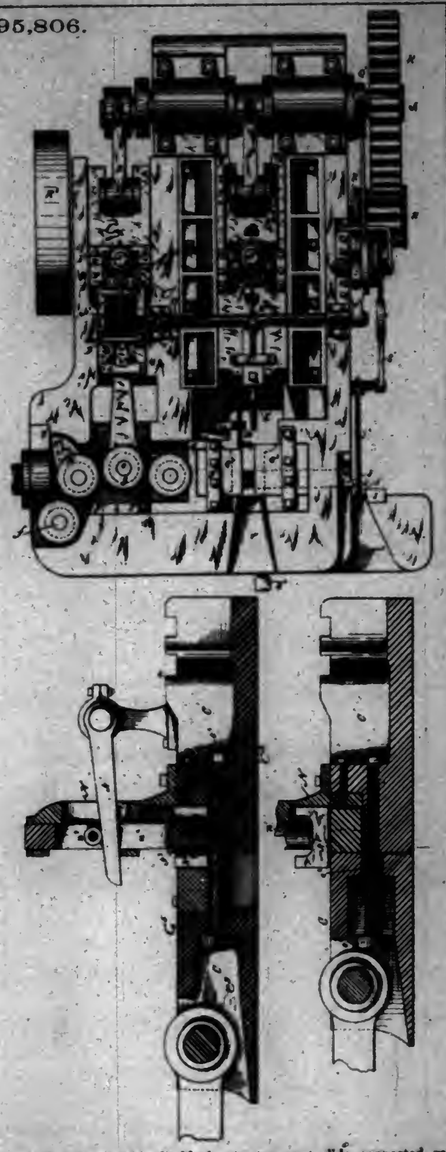
395,807. FURNACE FOR DESTROYING REFUSE MATTER. WILLIAM H. BLISS, Newport, R. I.; Edward Newton administrator of said William H. Bliss, deceased. Filed Nov. 16, 1887. Serial No. 255,305. (No model.)

Claim.—1. A furnace for destroying refuse material, constructed to form a fire-chamber, F, side retort-chambers, F', side flues, G, connecting the furnace with the said retort-chambers, and the return-flues E, connecting the retort-chambers with the furnace F below the fire-grates F', substantially as and for the purposes set forth.

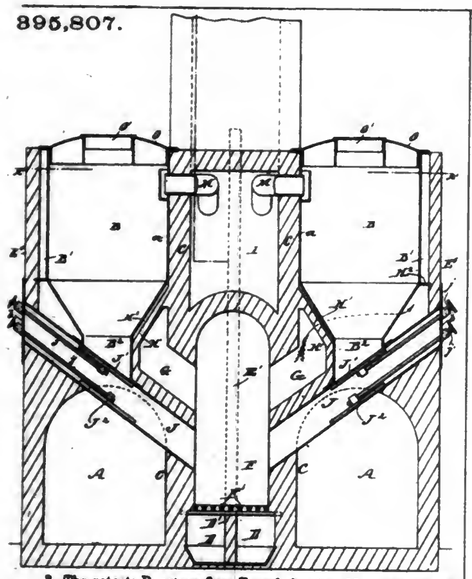
2. In a furnace for destroying refuse material, the fire-chamber F and connected retort-chambers B' and retorts B, in combination with the chutes J, connecting the retorts with the fire-chamber, substantially as and for the purposes set forth.



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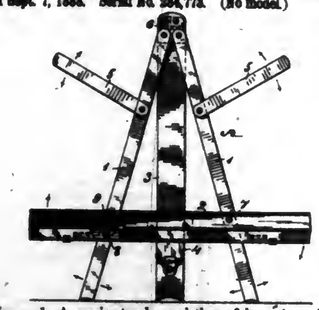


395,807.



3. The retorts B, return-flues E, and the pipes M, connecting the said retorts with the said return-flues, and the fire-chamber F, connected with the return-flues, and the passages G, connecting the fire-box to the retort-spaces, in combination with the chutes J, valve J', chambers A, and valve J³, substantially as and for the purposes set forth.

395,808. MUSIC-STAND. PHILIPP L. BRACHET, Philadelphia, Pa. Filed Sept. 7, 1888. Serial No. 284,773. (No model.)



Claim.—1. A music-stand consisting of legs pivoted to a top plate, a prop hinged to said plate, and a rest pivoted to one leg and having a slot to receive a pin on the other leg, substantially as described.

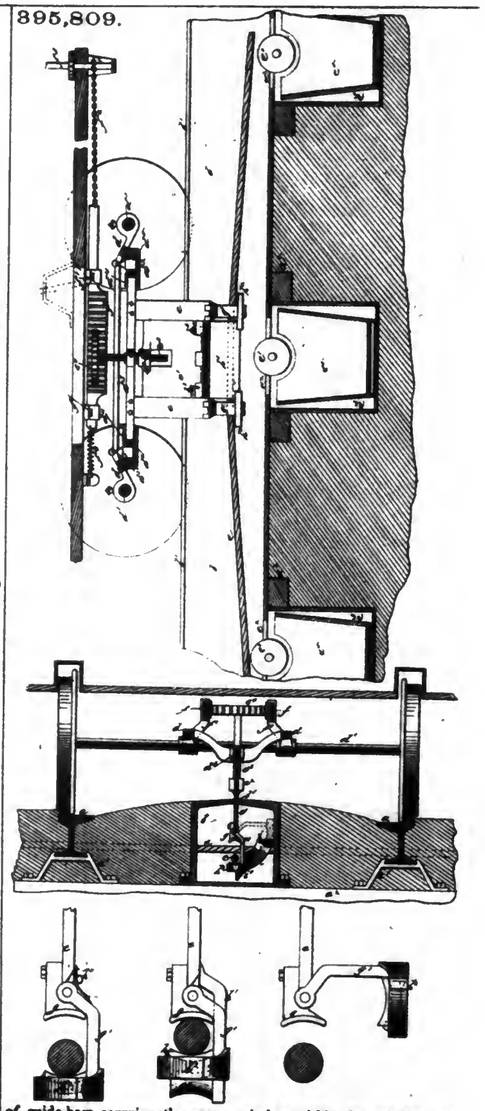
2. A music-stand having a rest which is pivoted to one leg and engages with the other leg, and formed of parallel bars hinged together, substantially as described.

3. A music-stand consisting of the diverging legs hinged at their upper ends, the rest supported on the legs near the widest portion thereof, and the arms hinged near the top or narrow portion of the legs, whereby said narrow portion is widened when the arms are extended, substantially as described.

4. A music-stand frame formed of legs, a rest, and a prop with a connecting-bar, the latter being provided with a folding tongue, and said rest with a keeper to receive said tongue, the parts being combined, substantially as described.

5. A music-stand consisting of legs pivoted to a top plate, a prop hinged to said plate, a folding rest pivoted to one of the legs and adapted to interlock with the other leg, a keeper on the rest, and a bar hinged to the prop having a hinged tongue which enters said keeper, said parts being combined and operating substantially as described.

395,809. TRACTION-CABLE SYSTEM. MILLARD F. BRADLEY, Chicago, Ill., assignor of one-third to Bruce B. Barney, same place. Filed Dec. 14, 1886. Serial No. 221,961. (No model.)



Claim.—1. In a grip for cable cars, the combination, with a pair of guide-bars carrying the upper grip-bar within the conduit and provided with the cable-supporting rollers on their lower ends, of the sliding grip-plate between the guide-bars provided with the lower grip-bar on its end and adapted, when lifted, to raise the cable and grasp it firmly, and when lowered to drop below the supporting-rollers to allow the cable to rest and move on the same, substantially as and for the purpose set forth.

2. The combination, with a gripping device having its whole lower body within the conduit hinged, of means, substantially as described, within the conduit for turning the hinged portion of the grip outward and upward to an approximately horizontal position, substantially as and for the purpose set forth.

3. In a traction-cable system, the combination, with a gripping device having its whole lower end hinged to swing in one direction, of the crossing cables, and a glide-bar within the conduit to swing this hinged grip aside and upward and support it in sliding over the crossed cables, substantially as and for the purpose set forth.

4. In a traction-cable system, the combination, with the conduit provided with a glide-bar having its ends bent and twisted down and aside, of a hinged grip-section provided with a beveled nose or guard to engage and ride up on the glide-bar, substantially as and for the purpose set forth.

5. In a grip for traction-cable systems, the combination, with a bar from which the whole gripping device is suspended, of a supporting-frame on the car provided with sockets to receive the ends of said bar, slides upon these sockets to confine the ends of the bar, and wedges or keys to lock the slides in place, substantially as shown and described.

395,810. SCREW-CUTTING DIE. ADOLPH E. BRION, Brooklyn, N. Y. Filed June 20, 1888. Serial No. 278,562. (No model.)



Claim.—1. As an improved article of manufacture, a screw-cutting die consisting in the outer soft iron or low-steel rim, B, and the central high-steel cutter, A, having cutting-edges *a* and clearance-spaces, substantially as set forth.

2. As an improved article of manufacture, an adjustable screw-cutting die consisting in the outer soft iron or low-steel rim, B, and the central high-steel cutter, A, having cutting-edges *a* and clearance-spaces, one of which extends through the cutter and rim, whereby when the die is compressed it will retain its position by reason of the soft-iron rim, substantially as set forth.

395,811. MEANS FOR ATTACHING EYEGLASSES TO HEAD-APPAREL. WILLIAM H. BROWNLOW, Brockville, Ontario, Canada, and JOEL S. WARNER, Ogdensburg, N. Y., assignors of one-third to John H. Brownlow, Ogdensburg, N. Y. Filed June 6, 1888. Serial No. 276,237. (Model.)



Claim.—1. The combination, with the attaching-plate having lugs, of a spindle journaled in said lugs and provided with a friction-spring bearing at its outer end against one of said lugs, and the eyeglasses depending from the attaching-plate, substantially as set forth.

2. The combination, with the attaching-plate, of an eyeglass-frame, and a lazy-tongs connected to the said plate and frame, substantially as set forth.

3. The combination, with the attaching-plate having a spindle journaled on its lower or under side, of an eyeglass-frame, and a lazy-tongs connected to the said spindle and to the spring of the eyeglass-frame, substantially as set forth.

4. The combination, with the attaching-plate having lugs on its under face, of the spindle journaled in said lugs and provided at one end with a coiled spring bearing at its outer end against the adjacent lug of the attaching-plate, lazy-tongs connected to the attaching-plate, and an eyeglass-frame attached to the other end of the lazy-tongs, substantially as set forth.

395,812. CHALK-HOLDER. FANNIE CHAMBERS, New York, N. Y. Filed Aug. 27, 1888. Serial No. 283,819. (No model.)

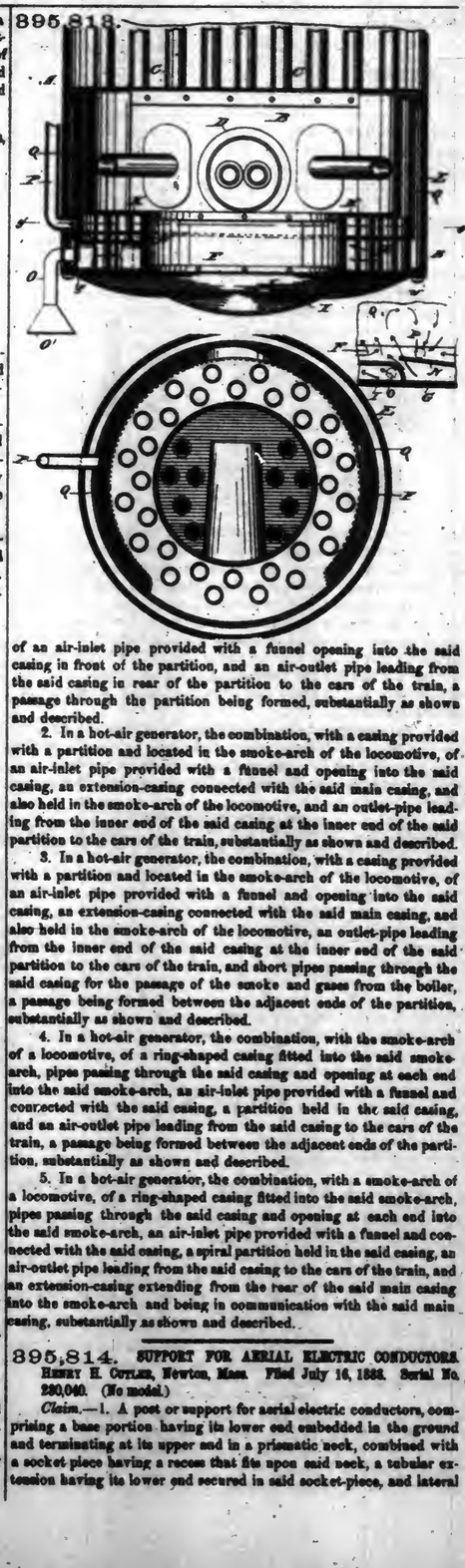


Claim.—An improved chalk-holder consisting of a casing, an operating screw-rod, a traveling nut mounted on the screw-rod within the casing, and a chalk-holding clamp on the traveling nut to receive the end of a chalk and firmly hold the chalk as it is projected out of and withdrawn into the casing by the operation of the screw-rod, substantially as shown and described.

395,813. HOT-AIR GENERATOR. ERNEST M. CRANDALL and THOMAS H. TURNER, St. Joseph, Mo. Filed Mar. 6, 1888. Serial No. 266,344. (No model.)

Claim.—1. In a hot-air generator, the combination, with a casing provided with a partition and held in the smoke-arch of a locomotive,

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of an air-inlet pipe provided with a funnel opening into the said casing in front of the partition, and an air-outlet pipe leading from the said casing in rear of the partition to the cars of the train, a passage through the partition being formed, substantially as shown and described.

2. In a hot-air generator, the combination, with a casing provided with a partition and located in the smoke-arch of the locomotive, of an air-inlet pipe provided with a funnel and opening into the said casing, an extension-casing connected with the said main casing, and also held in the smoke-arch of the locomotive, and an outlet-pipe leading from the inner end of the said casing at the inner end of the said partition to the cars of the train, substantially as shown and described.

3. In a hot-air generator, the combination, with a casing provided with a partition and located in the smoke-arch of the locomotive, of an air-inlet pipe provided with a funnel and opening into the said casing, an extension-casing connected with the said main casing, and also held in the smoke-arch of the locomotive, an outlet-pipe leading from the inner end of the said casing at the inner end of the said partition to the cars of the train, and short pipes passing through the said casing for the passage of the smoke and gases from the boiler, a passage being formed between the adjacent ends of the partition, substantially as shown and described.

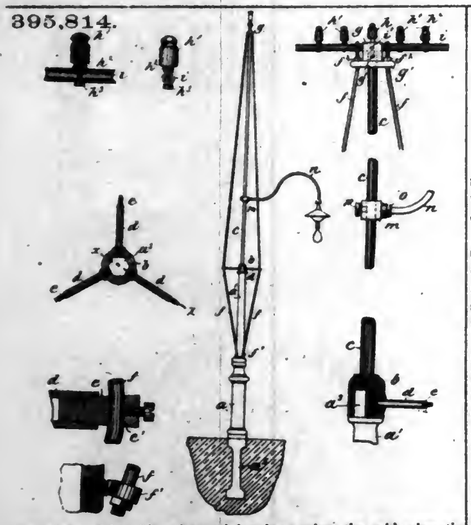
4. In a hot-air generator, the combination, with the smoke-arch of a locomotive, of a ring-shaped casing fitted into the said smoke-arch, pipes passing through the said casing and opening at each end into the said smoke-arch, an air-inlet pipe provided with a funnel and connected with the said casing, a partition held in the said casing, and an air-outlet pipe leading from the said casing to the cars of the train, a passage being formed between the adjacent ends of the partition, substantially as shown and described.

5. In a hot-air generator, the combination, with a smoke-arch of a locomotive, of a ring-shaped casing fitted into the said smoke-arch, pipes passing through the said casing and opening at each end into the said smoke-arch, an air-inlet pipe provided with a funnel and connected with the said casing, a spiral partition held in the said casing, an air-outlet pipe leading from the said casing to the cars of the train, and an extension-casing extending from the rear of the said main casing into the smoke-arch and being in communication with the said main casing, substantially as shown and described.

395,814. SUPPORT FOR AERIAL ELECTRIC CONDUCTORS. HENRY H. CUTLER, Newton, Mass. Filed July 16, 1888. Serial No. 280,040. (No model.)

Claim.—1. A post or support for aerial electric conductors, comprising a base portion having its lower end embedded in the ground and terminating at its upper end in a prismatic neck, combined with a socket-piece having a recess that fits upon said neck, a tubular extension having its lower end secured in said socket-piece, and lateral

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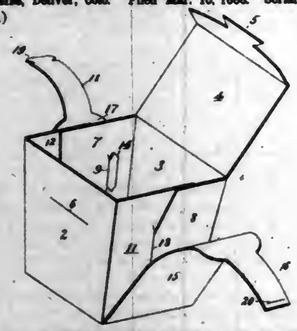


arms fastened in said socket and bearing against the said prismatic neck of the base portion, and tie-rods bearing against the ends of said lateral arms and secured to the base portion below said arms and to the tubular extension above said arms, substantially as described.

2. The combination of the cast-iron lower portion and wrought-iron tubular extension thereof, with lateral brace-arms at or near the juncture of said portions, plugs inserted in the ends of said brace-arms provided with transverse openings and set-screws, and tie-rods passing through said openings and fastened to the cast-iron portion below the wrought-iron portion above said arms, substantially as and for the purpose described.

3. The combination of a post or support composed of a cast-iron lower portion and tubular extension, with braces and tie-rods, with a lamp-supporting bracket connected with said tubular extension and vertically and laterally adjustable thereon, as and for the purpose described.

395,815. KNOCKDOWN BOX AND BLANK THEREFOR. NANCY J. DOBBINS, Denver, Colo. Filed Mar. 10, 1888. Serial No. 266,875. (Model.)



Claim.—1. A blank for a knockdown box, consisting of the base 1, extensions 2 3 4, for forming the sides and cover, extensions 7 8 11 12, for forming the ends, and extensions 15 16 17 18, for forming a looped handle, substantially as set forth.

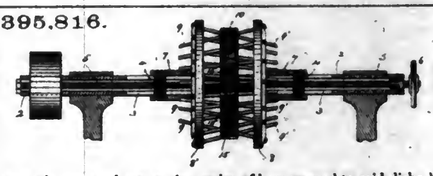
2. A blank for a knockdown box, consisting of a base, 1, side and end extensions, as shown, and prolonged extensions 15 17, attached to the base and having the one a tongue, 19, and the other a slot, 20, for forming a single loop-handle to the box.

3. The knockdown box herein described, consisting of the base, the sides attached thereto, the ends and cover attached to the sides, and handle-extensions attached to the base, and forming a single loop-handle for the box, substantially as set forth.

395,816. EXPANDING PULLEY. JOHN R. DUNTH, Lawrence, Mass. Filed Aug. 16, 1888. Serial No. 282,902. (No model.)

Claim.—1. An expanding pulley consisting of a flat-faced belt-supporting portion, a series of sectoral blocks circularly disposed, two apertured disks or spiders oppositely movable in right lines, and the

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reversely-arranged converging series of bars secured to said disks, by which the sectoral blocks are caused to converge and diverge concentrically as a unit, substantially as herein explained.

2. An expanding pulley composed of two apertured disks or spiders movable in right lines, two series of converging bars reversely disposed and intersecting midway of the spiders, the sectoral blocks apertured to receive said bars, and the curved plates which connect said blocks to maintain them concentric, substantially as and for the purposes herein described.

3. In combination with a supporting-shaft and the circular hubs movable in right lines thereon, an expanding pulley, substantially as herein described, composed of the apertured disks or spiders, two reversely-arranged converging series of bars, the sectoral blocks operated by the latter, and the rotary right-and-left-screw-threaded rod, and the non-rotary sleeve-nuts movable endwise thereon, substantially as stated.

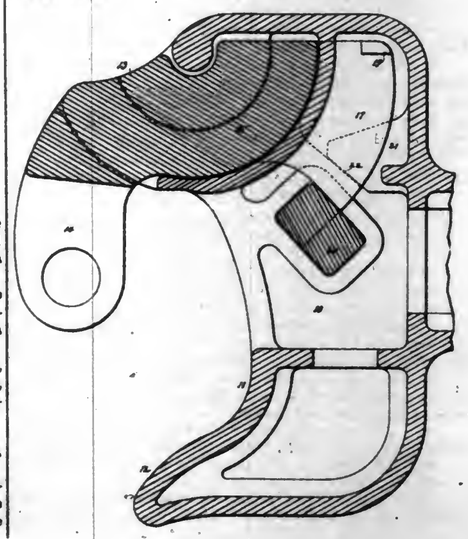
4. In combination with two oppositely-movable apertured disks or spiders and means, substantially as herein described, for actuating them in right lines, two series of oppositely-converging bars rigidly affixed to said spiders intersecting centrally between said disks, and the sectoral plates having the apertures 12, orifices 14 16, and the interconnecting curved plates 15, all for purposes substantially as herein explained.

5. In an expanding pulley, a circular flat-faced belt-supporting portion composed of sectoral blocks 10 10', having a transverse aperture 12, orifices 14 16, concentric with the face of the block, and a boss with a spring, 13, combined with two series of reversely-converging bars, 9 9 9' 9', affixed upon circular apertured disks or spiders oppositely movable to control the divergence or convergence of said blocks, substantially as herein stated.

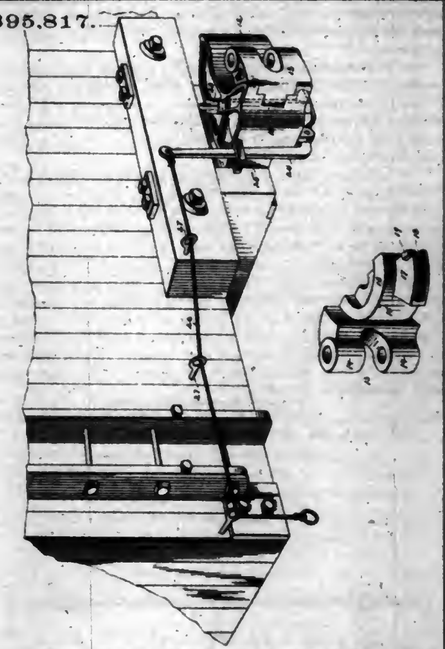
6. In combination with two apertured disks or spiders, 8 8', oppositely movable in right lines, and the reversely-converging series of bars 9 9 9' 9', the series of sectoral blocks 10 10', formed with orifices 14 16, the positions of the latter being reversed in each alternate block, and the interconnecting alternating plates 15, affixed in the orifice 14 in one block and movable vertically and longitudinally within the orifice 16 in the next adjacent block, all for purposes herein set forth and described.

395,817. CAR-COUPLING. EDWARD P. EASTWICK, Jr., New York, N. Y. Filed Oct. 10, 1888. Serial No. 287,741. (No model.)

Claim.—1. The combination, with a draw-head, of a buffing-stop which is integral with an inner wall, and whose bearing-surface is coincident with the radial line from the center of revolution, as shown and described.



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2. The combination, with a draw-head, a knuckle-link revolubly held therein, and a wing provided with a central recess attached to said knuckle, of a buffing-stop projection within the draw-head capable of entering the recess of the wing, substantially as shown and described.

3. The combination, with a draw-head, a knuckle-link revolubly held therein, and a wing extending at an angle from said knuckle provided with a longitudinal recess open at one end, of a buffing-stop projecting within the draw-head coincident, or approximately so, with a radial line from the center of revolution, substantially as shown and described.

4. The combination, with a link-knuckle for draw-heads, consisting of an outer locking section and a pivotal body-section, of a wing projected from the body-section provided with a longitudinal recess, substantially as and for the purpose specified.

5. The combination, with a draw-head provided with a pin-opening, of an angled lever fulcrumed upon the draw-head having one arm extending beneath the pin-opening and the other extending upward, and a chain or equivalent device attached to said upper arm of the lever, and all arranged to operate substantially as shown and described.

395,818. HEAT-RADIATOR APPARATUS. ASA C. EDWARDS, Westfield, Mass. Filed Aug. 30, 1888. Serial No. 284,171. (No model.)



Claim.—1. A heat-radiator consisting of a heating-drum having a series of rotary tubes with open ends, longitudinal flanges, and handles for operating the tubes, the latter being arranged across the drum and their flanges of a depth equal to the distance between the tubes, substantially as shown and described.

2. A heat-radiator consisting of a heating-drum having transverse rotary tubes with open ends, longitudinal flanges, and operating-handles, the flanges on one side being equal to the distance between the tubes and the walls of the drum, the flanges thereby serving as soot-scrapers and dampers, substantially as shown and described.

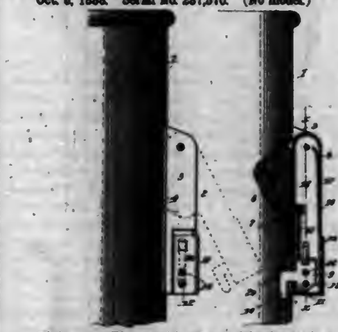
3. A heat-radiator consisting of a heating-drum having transverse rotary tubes with open ends, soot-scraper and damper-flanges and operating-handles, and a vertical spiral flange located beneath the tubes, substantially as shown and described.

4. A heat-radiator consisting of a heating-drum having transverse rotary tubes with open ends, soot-scraper and damper-flanges and operating-handles, and a spiral expansible rod having one end connected by a lever to one of the tube-operating handles, substantially as shown and described.

5. In a heat-radiator, a transverse rotary tube with operating-handle, and a soot-scraper rod adjacent to and parallel with the rotary tube, substantially as shown and described.

6. A heat-radiator consisting of drum 1, having the vertical spiral flange 2 mounted in its lower end, the transverse rotary tubes 5, located above the spiral flange 2 with open ends, soot-scraper and damper-flanges 7 and operating-handles 6, and the expansible spiral rod 8, secured in the lower part of drum, a lever pivoted on the outside of the drum and pivotally connected to the upper end of rod 8, and having a forked end, 12, engaging one of the lever-handles 6, substantially as shown and described.

395,819. WHIP-SOCKET. HERBERT ELDER, Harrisburg, Pa. Filed Oct. 6, 1888. Serial No. 287,370. (No model.)



Claim.—1. The combination, with the socket, of the attaching-plates 3 3, an arm pivoted at its upper end between said plates and having a projection on its inner side at the upper part thereof, and a vertically-sliding hook or catch mounted on the lower end of the said arm for locking it in place when closed, substantially as set forth.

2. The combination, with the socket, of the attaching plates or casing 3, the arm 5, pivoted at its upper end between said plates to swing vertically and having a cam projection on its inner edge, a block secured to the lower end of said arm to slide vertically thereon and having on its inner edge a hook, 10, below said projection, and a locking-hook pivoted on said block at right angles to the pivot of the arm 5 and adapted to lock the sliding block to the said swinging arm, substantially as set forth.

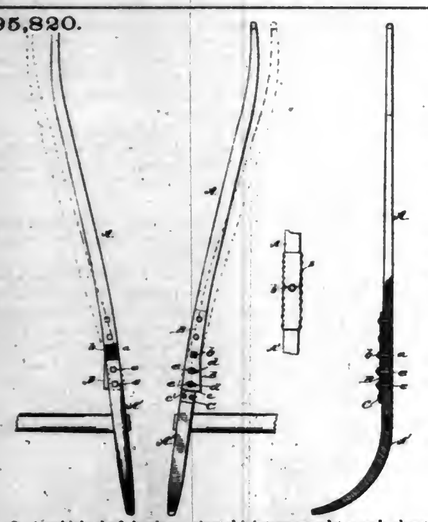
3. The combination, with the socket, of the plates or casing 3, the hollow arm 5, open at its outer side, having a projection, 8, at the upper end of its inner side and a slot, 11, below said projection, the cap 15, having sides 14, embracing the lower end of the arm to slide thereon and having a key-hole, 26, the block 9 within the lower end of the said arm and connected with the cap 15 to slide therewith, the downward-projecting hook 10, projecting from the inner face of the block through the slot 11, the transversely-swinging locking-hook 21 on the upper end of the block in line with the key-hole, substantially as set forth.

4. A whip-socket, 1, constructed with the slots 7 and 20 in its side, an arm, 5, pivoted to the side of the whip-socket and having a cam-shaped projection, 6, with a bearing-surface of soft material to clamp a whip in the socket 1, a cap, 15, with opening 26 and interior recess 23, slidable on the arm 5 and connected with a hook, 10, mounted on a sliding block, 9, projecting from arm 5 and adapted to project through slot 20 and engage whip-socket 1, and a hook, 21, with hole 27, pivoted to an extension of hook 10 and adapted to be locked with recess 23, substantially as shown and described.

395,820. ADJUSTABLE VEHICLE-SHAFT. WILLIAM B. FARRAR, Greensborough, N. C. Filed Sept. 21, 1888. Serial No. 285,980. (No model.)

Claim.—1. A vehicle-shaft having a pivotal joint arranged to work about a vertical axis, in combination with a horizontal splice-plate bolted rigidly to one section of the shaft, and having at its other ends transverse slots and bolts for connecting it to the other section of shaft for lateral adjustment, as described.

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2. A vehicle-shaft having a pivotal joint arranged to work about a vertical axis, in combination with a horizontal splice-plate bolted rigidly to one section of the shaft, and having at its other end transverse slots and bolts for clamping it to the other section of the shaft, and a positive locking device fixed upon the latter shaft-section and adapted to engage with the slotted end of the splice-plate, as described.

3. A vehicle-shaft having a pivotal joint arranged to work about a vertical axis, in combination with a horizontal splice-plate rigidly bolted to one section of the shaft and having transverse slots and bolts for clamping it to the other shaft-section, and a serrated or toothed end and a serrated plate fixed to the other shaft-section, having its teeth engaged with the serrated end of the splice-plate, substantially as shown and described.

4. A vehicle-shaft made in two sections, with square and splayed abutting ends, and a pivotal bolt, *b*, in the joint, in combination with a splice-plate, B, and locking devices for the same, substantially as shown and described.

5. A vehicle-shaft having a transverse joint with a splice-plate, combined with a pintle-bolt passing through said joint, and a leather casing placed under the head of the pintle-bolt and tacked to sides of shaft to prevent water and mud from getting in the joint and to make a neat appearance, as shown and described.

395,821. KNIFE. FREDERICK S. FOOTE, New York, N. Y. Filed Aug. 27, 1888. Serial No. 283,879. (No model.)



Claim.—1. The handle A, beveled at A' and formed with the guard-surface G, in combination with the blade C, formed with side members, *c c*, secured to handle A, and formed with the blade c^2 parallel with the front edge, B, of the handle, substantially as described.

2. The handle A, beveled at its front end, in combination with the blade C, having cutting-edge c^2 and side members, *c*, formed at the upper edge with the cutting-edge *f*, substantially as described.

395,822. STEAM-ENGINE. DANIEL A. FRASER, Mancelona, Mich. Filed Aug. 30, 1888. Serial No. 284,200. (No model.)



Claim.—1. In a steam-engine, in combination with a piston and crank, a connecting-rod having a joint near its middle and a lever pivoted to the frame and to said rod between the said joint and the crank, substantially as described.

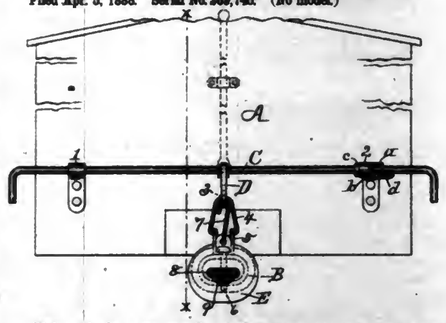
2. In a steam-engine, a cylinder having a steam-port at or near its middle, and two single-acting pistons moving in opposite directions from said port and connected to a common crank-shaft, substantially as described.

3. In a steam-engine, a cylinder having a central steam-port, two single-acting pistons moving in opposite directions from said port, one of said pistons attached to the crank by a connecting-rod, and a lever having a fulcrum near its middle and attached at one end to said connecting-rod and connected at the other end to the other of said pistons, substantially as described.

4. In a steam-engine, a cylinder open at both ends having a central steam-port, two pistons moving in opposite directions from said port, one piston attached to the crank by a rod having a joint near its middle, and a lever pivoted near its middle and connected at one end to said rod between said joint and crank and at its other end to the other of said pistons by a connecting-rod, substantially as described.

5. In a steam-engine, two cylinders arranged parallel to each other and open at both ends, each having a central port connecting it to a common steam-chest and opening under the respective ends of a D-valve, in combination with connecting-rods attaching said pistons to a common crank-shaft, whereby each cylinder acts alternately and the pistons in each cylinder operate in opposite directions to turn said shaft, substantially as described.

395,823. CAR-COUPLING. SILAS B. FYLER, East Syracuse, N. Y. Filed Apr. 5, 1888. Serial No. 269,740. (No model.)



Claim.—1. In a car-coupling, a link-guide consisting of a plate provided with a link-slot larger than the link and suspended in front of the draw-head from an arm connected to a horizontal operating-rod adapted to rotate and move longitudinally in its bearings, and adapted to raise or lower vertically the aforesaid link-guide, in combination with the draw-head and link, substantially as described and shown.

2. In a car-coupling, a horizontal operating-rod mounted in bearings upon the car and having rotary and longitudinal movement therein, a lateral arm connected to said rod, and the slotted link-guide suspended from said arm, in combination with the draw-head and link, substantially as described and shown.

3. In a car-coupling, a horizontal operating-rod mounted in bearings on a car and having rotary movement therein, a lateral arm secured to the said rod, and a slotted link-guide suspended at the front of the draw-head from said lateral arm, in combination with the draw-head and link, substantially as described, and for the purpose set forth.

4. In a car-coupling, the horizontal rod mounted in bearings upon the car and adapted to rotate and to move longitudinally therein, and provided with a lateral arm to which is connected a pin-holder consisting of a flat piece of metal with ears formed at its sides, and having an aperture at its bottom for a removable coupling-pin whose head lies upon the base of said holder, in combination with the draw-head and link, all constructed and operating together, substantially as described and shown.

5. In a car-coupling, the horizontal rod mounted in bearings upon the car and having rotary and longitudinal movement therein, one or more of said bearings being provided with a longitudinal slot having an internal shoulder, and the horizontal rod formed with a flanged portion contiguous to one end of the bearing and a ribbed portion adjacent to the opposite end and adapted to operate in the slotway of the bearing, and an arm connected to the horizontal rod and having a link guide or pin connected thereto, in combination with the draw-head and link, substantially as shown and described.

6. In a car-coupling, a guide-bracket provided with a longitudinal slot having an internal shoulder, in combination with the horizontal operating-rod mounted in said bracket and provided with a flanged and a ribbed portion, substantially as shown, all operating together as and for the purposes specified.

7. The guide-bracket 2, constructed with a horizontal slotway, *a*, extending from a side of the bracket part way the length thereof, said slotway being provided at its inner extremity with a rectangular shoulder portion rising perpendicularly above the lower face of the slotway, substantially as described, and for the purposes specified.

8. The operating-rod C, provided with a flange, *c*, and a rib or projection, *d*, contiguous thereto, and having a handle portion, substantially as described.

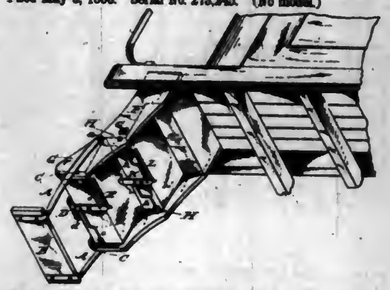
9. In a car-coupling, a horizontal operating-rod mounted in bearings upon the car and having rotary and longitudinal movement therein, a lateral arm secured to the aforesaid rod, and a vertical operating-rod fulcrumed in a bearing upon the car and having vertical movement therein and pivotally connected to the lateral arm, and the slotted link-guide suspended from the aforesaid arm, in combination with the draw-head, link, and pin, substantially as described.

10. In a car-coupling, a horizontally-disposed operating-rod mounted in guide-brackets upon the car and adapted to rotate and move longitudinally therein, one or more of said brackets being constructed with a longitudinal slotway extending from a side thereof part way its length, and having at its inner extremity a rectangular shoulder portion rising perpendicularly above the lower level of the slotway, the horizontal rod operating in the bracket and provided with a flange contiguous to an end thereof and, adapted to regulate the outward thrust of the rod, and having a longitudinal rib adjacent to the rectangular shoulder of the slotway, said rib being adapted to vertical movement alongside the perpendicular face of said elevated shoulder and adapted to move horizontally onto and rest thereon, and a lateral arm connected to the operating-rod and having a coupling-pin attached thereto, in combination with the draw-head and link, substantially as described, and for the purposes specified.

395,824. COSMETIC CREAM. NANCY K. GENTRY, Denver, Colo. Filed Mar. 13, 1888. Serial No. 267,107. (No specimens.)

Claim.—The herein-described composition of matter for a remedial cosmetic or cream, consisting of olive-oil, beeswax, gum-camphor, carbolic acid, glycerine, tincture of calendula flowers, and oil of bay, in the proportions substantially as set forth.

395,825. EXTENSION CAR-STEP. JOHN W. GRAHAM, Nyack, N. Y. Filed May 8, 1888. Serial No. 273,245. (No model.)



Claim.—1. A railroad-car provided with an extensible step rigidly secured to pivoted hangers, and spring-catches for retaining said hangers and step in both their raised and lowered positions, substantially as set forth.

2. The combination, with the steps of a car, of the hangers A, pivoted to the steps, the tread-board B, supported by the hangers, the spring-catches C, for locking the hangers when lowered, and the spring-catches H, for locking the hangers when raised, substantially as described.

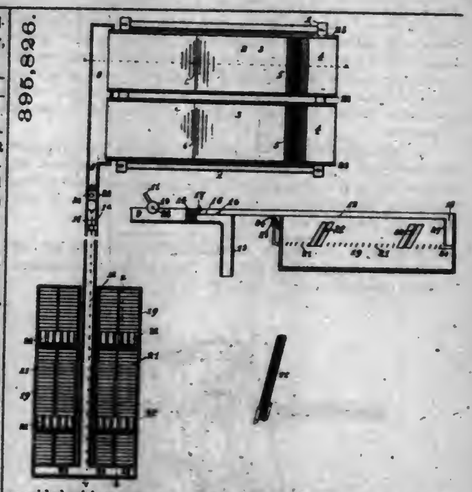
3. The combination of the pivoted hangers A, supporting the tread-board D, of the catches C H, the levers D K, the rods *c* A, connecting the catches with the ends of the levers, and the springs E L, attached to the levers, substantially as described.

395,826. APPARATUS FOR SAVING SLIMES. SOREN HARDER, Leadville, Colo., assignor, by direct and mesne assignments, of one-half to James C. Stephens, same place, and Mary E. Stephens and Harvey G. Brearley, both of Denver, Colo. Filed Jan. 11, 1888. Serial No. 260,446. (No model.)

Claim.—1. An apparatus for separating and saving slimes or floats, comprising a main flume leading from a concentrator or other source of supply of material to be treated, a horizontal and longitudinal partition dividing such main flume into two branch flumes, and a settling-tank, into which one of the branch flumes leads, having removable false bottoms or riffles dividing it into an upper and a lower compartment, such false bottoms being provided with a series or number of upwardly and forwardly projecting spoons for deflecting the slimes, substantially as set forth.

2. A tank for settling and saving slimes, floats, &c., having false bottoms or riffles dividing it into an upper and a lower portion, and

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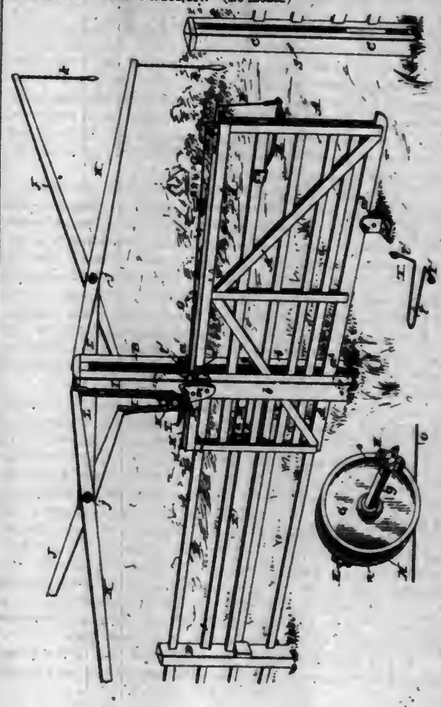


provided with one or more series of upwardly-projecting spoons for deflecting the slimes, &c., an inlet leading into the upper portion of the tank, and a discharge pipe or pipes rotatably seated in the walls of the tank, and then bent upwardly so that their point of discharge may be higher than their inlet, substantially as set forth.

3. A tank for saving and settling slimes, &c., having false bottoms or riffles dividing it into an upper and a lower compartment, said false bottoms or riffles being provided with a series of upwardly and forwardly projecting spoons for deflecting the slimes, &c., substantially as set forth.

4. The combination, in a settling and saving tank, of an inlet for the material thereinto, a discharge for the water therefrom, false bottoms or riffles dividing the tank into upper and lower compartments, and series or a series of forwardly and upwardly inclined spoons for deflecting the matter in the water passing through the tank, substantially as set forth.

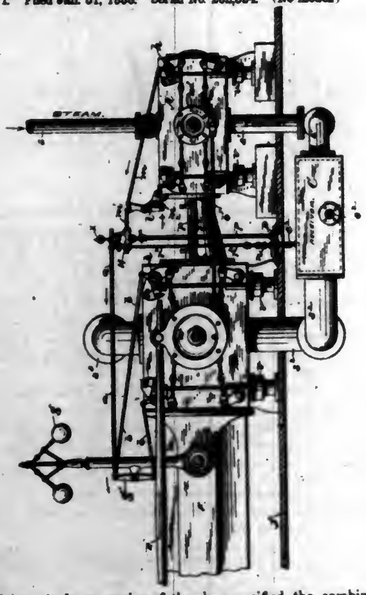
395,827. GATE. HIRAM S. HARRIS, Cincinnati, Ohio. Filed Oct. 18, 1888. Serial No. 288,417. (No model.)



Claim.—1. The combination, with posts and sliding gate, the drum, cords connected with the ends of the gate, and sprocket-wheels on the ends of the drum-shaft, of two chain belts fitted to said wheels, respectively, and pivoted pull-levers J K, arranged in pairs on opposite sides of the gate at right angles thereto, the levers of each pair being attached to the ends of a chain, as shown and described, to operate as specified.

2. The combination of the V-shaped guard T with the sliding gate the central post, a drum, and cords connected with the ends of the gate, the said guard being attached to the post, and its looped portion *t* extending beneath and in contiguity to the drum, as and for the purpose shown and described.

395,828. **AUTOMATIC PRESSURE-REGULATOR FOR THE RECEIVERS OF COMPOUND ENGINES.** JOHN T. HENTHORN, Providence, R. I. Filed Jan. 31, 1888. Serial No. 262,524. (No model.)



Claim.—1. In an engine of the class specified, the combination, with steam-cylinders provided with cut-off-valve gear, a receiver connecting the cylinders, and an auxiliary cut-off-controlling mechanism, substantially as hereinbefore described, actuated by the receiver-pressure, of a speed-controlling governor connected with said auxiliary cut-off-controlling mechanism and the said cut-off-valve gear, substantially as described, and for the purpose specified.

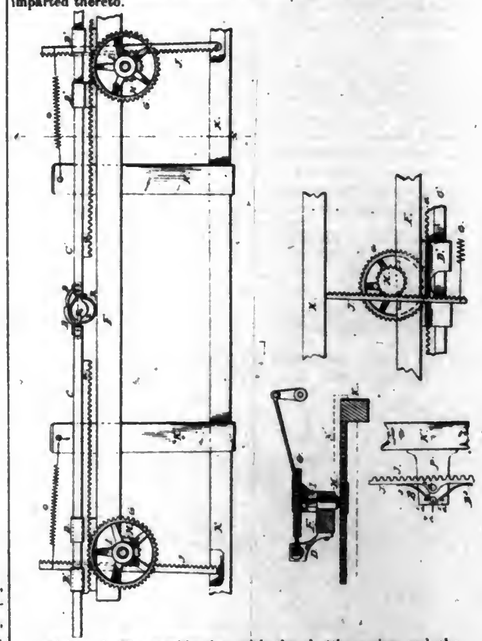
2. In a compound engine, the combination, with the steam-cylinders, a receiver uniting the cylinders, a speed-controlling governor, and cut-off-valve gear, substantially as described, of an automatically-operating pressure-controlling apparatus, substantially as described, communicating with the receiver and connected with the said governor and cut-off-valve gear by means of suitably mounted and supported toothed rods intergearing with a loosely-mounted gear-wheel, all combined, arranged, and operating, whereby any variation in the receiver-pressure from its normal pressure automatically produces a change in the point of cut off of said high-pressure cylinder independently of the governor's action, substantially as hereinbefore described and set forth.

3. In a compound engine, the high and low pressure cylinders provided with suitable valve-gear and mechanism for operating the same, a governor and cut-off rods leading therefrom and connecting with the releasing mechanism of the steam-valves, and an exhaust-receiver, as C, the combination therewith of a mounted diaphragm communicating directly with and adapted to be automatically actuated by the receiver-pressure, a vertically-mounted jointed rod having said diaphragm secured thereto, a frame mounted to travel back and forth, a pinion mounted therein having the upper portion of the diaphragm-carrying rod meshing into the pinion, oppositely-mounted and reversely-arranged toothed rods *a m'*, intergearing with the pinion and adapted to be reciprocated by said governor, and a weighted arm, as *k*, mounted to vibrate by the action of the pinion, substantially as shown and hereinbefore described, and for the purpose specified.

4. In a compound engine, the combination, with a diaphragm mounted in a chamber communicating with the receiver and a jointed and counterweighted vertically-mounted rod having a toothed upper portion, of two reversely-arranged toothed rods adapted to be reciprocated in unison by the governor, an adjustably mounted and guided frame in which the said three toothed rods are mounted, a pinion mounted in the frame and having the rods intergearing therewith, and a counter-weighted arm secured to the pinion-shaft, the whole arranged and operating substantially as shown and hereinbefore described, and for the purpose specified.

395,829. **POSITIVE SHUTTLE-MOTION FOR LOOMS.** WILLIAM F. HITCHCOCK, Homer, N. Y. Filed Jan. 28, 1888. Serial No. 262,283. (No model.)

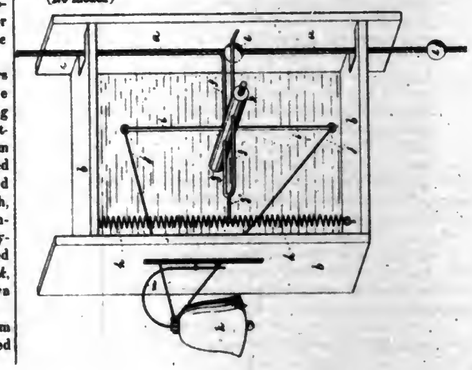
Brief.—As the lay moves up to the breast-beam and then recedes, by means of the racks pivoted to the loom-frame, the eccentric gears engaging therewith, the shafts, and the gears engaging with the racks on the shuttle-carriers, a variable reciprocatory motion is imparted thereto.



Claim.—1. The combination, with the shuttle-carriers and the toothed racks thereto fixed, gear-wheels adapted to engage the fixed racks and the racks on the carriers, and the lay, of the loom-frame and racks pivoted thereto, as and for the purpose specified.

2. The combination, with the shuttle-carriers and toothed racks thereto fixed, the lay, and the eccentric and concentric gear-wheels, combined as described, of the operating-racks and the loom-frame, as and for the purpose set forth

395,830. **OVERFLOW-ALARM.** LOUIS HOFMEISTER and OTTO R. SCHWARZ, New York, N. Y. Filed July 31, 1888. Serial No. 281,595. (No model.)

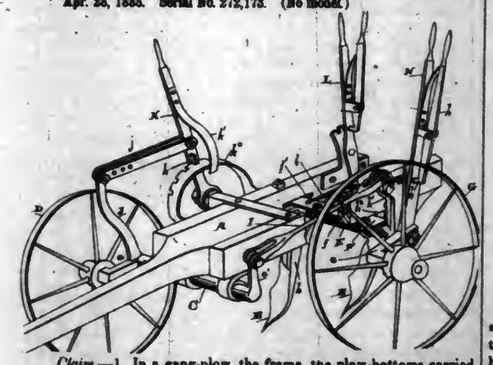


Claim.—1. The combination of a rock-shaft with a bell, a spring, and a stop, all three of which are connected to said rock-shaft, and with a rope having a series of projections that are adapted to engage the stop and rock the shaft against the action of the spring, substantially as specified.

2. The combination of a rock-shaft with a bell and with a rod, *i*, and wires *j*, that connect the bell to the rock-shaft, and with a spring, *k*, and stop *f*, also connected to the rock-shaft, and with a rope, *a*, having projections *e*, that are adapted to engage stop *f*, substantially as specified.

3. The combination of a rock-shaft with a bell, *k*, spring *k*, and U-shaped stop *f*, connected to said rock-shaft, and with a rope having projections *e*, adapted to engage the stop, and having a float and a weight secured to opposite ends, the bell *k* being suspended from spring *m*, substantially as specified.

395,831. **GANG-PLOW.** WILLIAM HOLLOWAY, Gilroy, Cal. Filed Apr. 28, 1888. Serial No. 272,173. (No model.)



Claim.—1. In a gang-plow, the frame, the plow-bottoms carried thereby, and a carrying-wheel on the front of the frame on the furrow side of the plow-bottoms, in combination with the carrying and gage wheel G, mounted opposite to the plow-bottoms and on the land side thereof and arranged to be turned to an angle on either side of the line of travel, whereby the plow is turned to or from the land, substantially as described.

2. In a gang-plow, the frame having the plow-bottoms and the front carrying-wheel on the furrow side, in combination with the rear carrying and gage wheel on the land side, a pivotally-mounted axle carrying said wheel, and a lever and connections with said axle, whereby the gage-wheel may be turned to or from the land, substantially as described.

3. In a gang-plow, the frame having the plow-bottoms and the front carrying-wheel on the furrow side, in combination with the rear carrying and gage wheel on the land side, the axle carrying the wheel, the pivoted bearing-plate carrying the axle, and the lever-and-link connection to the pivoted plate, whereby the gage-wheel may be turned to or from the land, substantially as described.

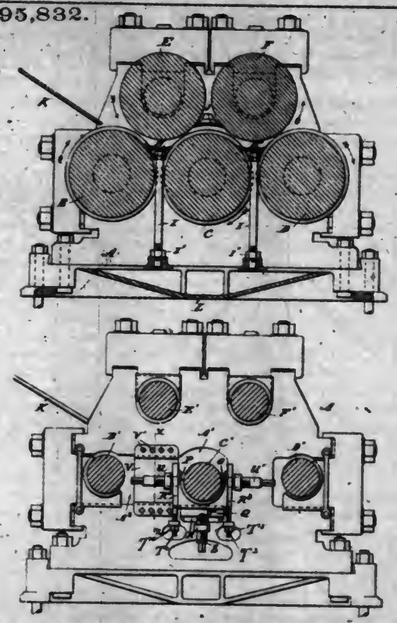
4. In a gang-plow, the frame having the plow-bottoms, the front crank-axle and carrying-wheel thereon, the rear axle having a pivoted crank and the carrying-wheel on said crank; and the connections, whereby the crank-axles are operated to raise or lower the plow and to level it, consisting of the lever H, connected with the pivoted crank of the rear axle, the pawl of the lever and the independent pivoted rack with which the pawl engages, the lever K, arm J, and connecting-link to the front axle, and the crank *c* and connecting-link l to the pivoted rack of the rear axle, substantially as described.

5. In a gang-plow, the frame having the plow-bottoms, the front crank-axle and carrying-wheel on the furrow side, the rear axle pivotally mounted and having a pivoted crank, and the carrying and gage wheel mounted on said crank and opposite the plow-bottoms on the land side thereof, in combination with the lever L and connections for turning the pivoted rear axle and directing the gage-wheel to or from the land, the lever H, connected with the pivoted crank of the rear axle for leveling the plow, and the lever K, and connections between it and the front axle and between the front axle and the crank of the rear axle, whereby the plows are raised or lowered, substantially as described.

395,832. **CANE-MILL.** CHARLES HUGHES, Matanzas, Cuba. Filed Sept. 22, 1887. Serial No. 250,411. (No model.)

Claim.—1. The combination, with the frame and the upper rolls, of the three lower rolls, the boxes P, receiving the journals of the middle lower roller, longitudinally-slotted wedges adjustable in the direction of the length of the roll under said boxes, vertically-adjustable set-screws having bearings on the frame and passing up through

395,832.



said slots for adjusting the boxes vertically, vertically-adjustable slotted wedges at both sides of said boxes, and transverse set-screws having bearings on the frame and extending through said wedges into contact with the vertical sides of the boxes, substantially as set forth.

2. The combination of the frame A, having the horizontal open-ended slots A', the central lower roller having boxes P, supported in the slots at their closed ends, the wedge-shape plates V, closing said slots beyond the roll, the roll B, journaled in the said slots beyond the plates V, the roll D, journaled in the frame in line with the rolls B C, the bottom and side wedges, and adjusting and set screws U U', the set-screws V' being carried by the plates V, substantially as set forth.

395,833. **DRILLING AND CENTERING TOOL.** JOHN E. KITCHEN, Morrilton, Ark. Filed June 22, 1888. Serial No. 277,828. (No model.)



Claim.—1. In a tool substantially as described, the combination of the framing, the slide-rod operating in said framing and provided with an arm or portion supporting the back center, and a spring arranged to actuate said slide-rod, whereby to feed the drill forward in the operation of the device, substantially as set forth.

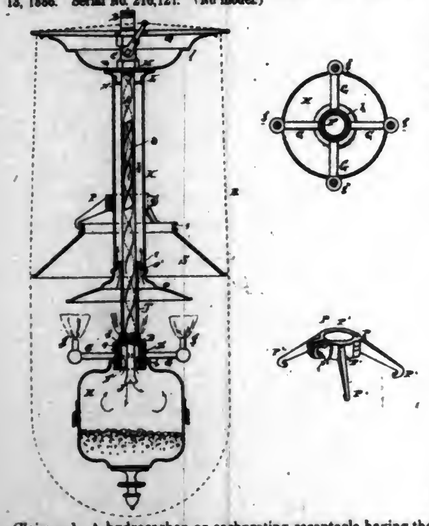
2. The combination, in a tool substantially as described, of the framing, the slide-rod extended through an opening in the frame and having arm or portion G, supporting the back center, a spring on said slide-rod, and a nut threaded on the slide-rod and forming an adjustable bearing for the actuating-spring, substantially as set forth.

3. The combination, with the framing, the slide-rod, the spring for actuating said slide-rod, and the arm or portion G, of a stay-rod extended from arm G and entering a guide-opening in the framing, substantially as set forth.

4. The improved tool, substantially as described, consisting of the frame having a bearing for one end of the drill or center-marker, the arm or portion arranged in rear of said bearing and supported by the rod, the spring arranged to operate said rod and give the arm a tension toward the bearing in the frame, and the back center supported in said arm or portion and arranged in rear of and in alignment with the bearing in the frame, all substantially as described, whereby the back center may be fed forward automatically, as and for the purposes specified.

5. The improved tool herein described, consisting of the frame having openings *a a'*, the slide-rod H, operating through opening *a* and having arm G, having a back center and provided with a stay-rod extended into the opening *a'*, and the actuating-spring, all substantially as and for the purposes specified.

395,834. CARBURETING-LAMP. ARTHUR KITSON and WILLIAM S. HOREY, Philadelphia, Pa., assignors, by direct and mesne assignments, to the Kitson Gas Light Improvement Company, same place. Filed Oct. 13, 1886. Serial No. 216,127. (No model.)



Claim.—1. A hydrocarbon or carbureting receptacle having the gas-burners permanently secured to it, in combination with the gas-supply pipe and a coupling-joint above the burners, whereby the carbureting-vessel and its burners are detachably connected with the supply-pipe, substantially as and for the purpose specified.

2. In a gas-fixture, the depending gas-pipe having burners at the bottom, a surrounding casing for said pipe closed at the top and having an enlarged mouth at the bottom, a clamp to surround and grip said casing, and a shade supported by said clamp, but forming an annular opening through its top, whereby the products of combustion are guided up around the casing and protect it from the action of cold-air currents, substantially as and for the purpose specified.

3. In a gas-fixture, the depending gas-pipe, a surrounding case to arrest and hold products of combustion to heat the incoming gas, the said case having a bell-shaped or flaring mouth at the bottom, a gas-burner at the bottom, a clamp adapted to surround the case and grip the same, and a shade held or supported by said clamp, whereby the shade and its clamps may be put upon a fixture already erected without dismantling the same.

4. In a gas-fixture, the depending gas-pipe, a surrounding case to arrest and hold products of combustion to heat the incoming gas, the said case having a bell-shaped or flaring mouth at the bottom and an enlargement of the top, a gas-burner at the bottom, a removable jointed clamp adapted to surround the case and grip the same, and a shade held or supported by said clamp, whereby the shade and its clamps may be put upon a fixture already erected without dismantling the same, substantially as and for the purpose specified.

5. In a gas-fixture, the combination of central gas-pipe, A, the surrounding heater-case K, forming an annular chamber, *k*, around the gas-pipe, the centering-shield L at the top to practically close said case K at the upper end, the centering-bell O at the bottom, having openings or perforations to support the case K and admit heated products thereto, the sleeve T, to support the bell O, suitable burners and a carbureting-receptacle rigidly secured together and detachably connected to the bottom of the gas-pipe, and a nut to hold said sleeve in place, the construction admitting of ready dismantling or putting of the parts together.

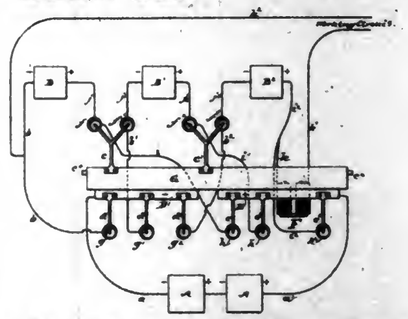
6. In a gas-fixture, the combination of central gas-pipe, A, the surrounding heater-case K, forming an annular chamber, *k*, around the gas-pipe, the centering-shield L at the top to practically close said case K at the upper end, the valve O at the upper end of pipe A, the body of which is adapted to hold shield L down, the centering-bell O at the bottom, having openings or perforations to support the case K and admit heated products thereto, the sleeve T, to support the bell O, suitable burners at the bottom of the gas-pipe, and a nut to hold said sleeve in place, the construction admitting of ready dismantling or putting of the parts together.

7. In a chandelier, a gas-supply tube above the burner having its interior divided into two longitudinal spiral or circuitous passage-ways, in combination with an inlet at one end connecting with both of said passage-ways and a gas-burner at the other end in like connection with both passage-ways, substantially as and for the purpose specified.

395,835. MODE OF PREPARING SOLUTION COMPOUNDS FOR GALVANIC BATTERIES. WILLIAM P. KOOKOGEY, Brooklyn, N. Y., assignor to the Kookogey Electric Company. Filed June 11, 1888. Serial No. 276,773. (No specimens.)

Claim.—The process of making a battery dry compound whose ingredients are sulphate of soda, bichromate of soda, and sulphuric acid, consisting of the following steps, viz: first, dissolving the sulphate and the bichromate in about one half of the quantity of acid to be used, the same being heated, and then adding quickly the remainder of the acid, substantially as described.

395,836. APPARATUS FOR CHARGING AND DISCHARGING SECONDARY BATTERIES. WILLIAM P. KOOKOGEY, Brooklyn, N. Y., assignor to the Kookogey Electric Company. Filed June 11, 1888. Serial No. 276,774. (No model.)



Claim.—1. The combination of the following elements: an electric generator and charging-circuit, a storage cell or battery, a working-circuit, an electro-magnet forming part of such working-circuit, and commutating mechanism controlled by such electro-magnet and operating a series of circuit closers and breakers, whereby the storage cell or battery is alternately connected in circuit with the charging-circuit and with the working-circuit, substantially as described.

2. The combination of the following elements: an electric generator and charging-circuit, a storage cell or battery, a working-circuit, an electro-magnet forming part of the working-circuit, a local battery and circuit, of which the working-circuit forms a part, and commutating mechanism controlled by such electro-magnet and operating a series of circuit closers and breakers, whereby the storage cell or battery is alternately connected in circuit with the charging-circuit and with the working-circuit, substantially as described.

3. The combination of the following elements: an electric generator and charging-circuit, a storage cell or battery, a working-circuit, an electro-magnet forming part of such working-circuit, commutating mechanism controlled by such electro-magnet during the period of discharge and operating a series of circuit closers and breakers, whereby the storage cell or battery is alternately connected in circuit with the charging-circuit and with the working-circuit, a local battery and circuit of which the working-circuit forms a part, and a second electro-magnet in the local circuit, controlling the change of the commutating mechanism from the position of charge to that of discharge, and thereby also breaking the local circuit, substantially as described.

4. The combination of the following elements: an electric generator and charging-circuit, a storage-battery consisting of a number of cells, a working-circuit, and commutating mechanism operating a series of circuit closers and breakers, whereby the storage-battery may be alternately connected in parallel in the charging-circuit and in tension series with the working-circuit, substantially as described.

5. The combination of the following elements: a primary galvanic battery and charging-circuit, a storage-battery consisting of a number of cells, a working-circuit, and commutating mechanism operating a series of circuit closers and breakers, whereby the storage-battery may be alternately connected in parallel in the charging-circuit and in tension series with the working-circuit, substantially as described.

6. The combination of the following elements: an electric generator and charging-circuit, a storage-battery consisting of a number of cells, a working-circuit, an electro-magnet forming part of such working-circuit, commutating mechanism controlled by such electro-magnet and operating a series of circuit closers and breakers, and circuit-connections between the various cells, whereby the storage-battery is alternately connected in parallel in the charging-circuit and in tension series with the working-circuit, substantially as described.

7. The combination of the following elements: an electric generator and charging-circuit, a storage-battery consisting of a number of cells, a working-circuit, an electro-magnet forming part of such working-circuit, a local battery and circuit of which the working-circuit forms a part, commutating mechanism controlled by such electro-magnet and operating a series of circuit closers and breakers, and circuit-connections between the various cells, whereby the storage-battery is alternately connected in parallel in the charging-circuit and in tension series with the working-circuit, substantially as described.

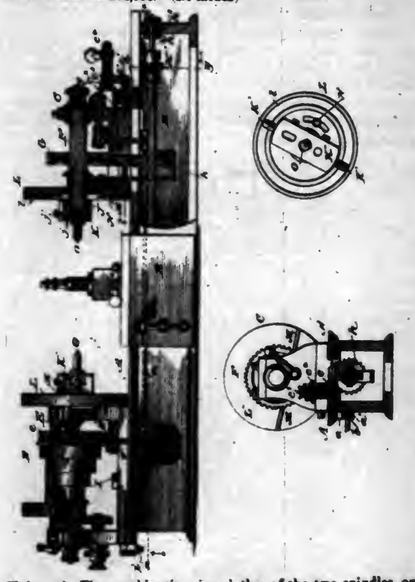
8. The combination of the following elements: an electric generator and charging-circuit, a storage-battery consisting of a number of cells, a working-circuit, an electro-magnet forming part of such working-circuit, commutating mechanism controlled by such electro-magnet and operating a series of circuit closers and breakers, with circuit-connections between the various cells, whereby the storage-battery may be alternately connected in parallel in the charging-circuit and in tension series with the working-circuit, a local battery and circuit of which the working-circuit forms a part, and a second electro-magnet in the local circuit, controlling the change of the commutating mechanism from the position of charge to that of discharge, and thereby also breaking the local circuit, substantially as described.

9. The combination of insulating-piece G, having attached to it conducting-strips D and E, and conducting-arms *c d e*, &c., and pivoted at its ends at such a point that gravity will hold the arms *d e*, &c., within their respective cups, with the lever *m*, carrying an armature, and the electro-magnet F, forming part of the working-circuit, substantially as and for the purpose described.

395,837. METHOD OF PREPARING SOLUTION COMPOUNDS FOR GALVANIC BATTERIES. WILLIAM P. KOOKOGEY, Brooklyn, N. Y., assignor to the Kookogey Electric Company. Filed Aug. 13, 1888. Serial No. 282,627. (No specimens.)

Claim.—The process of making a battery compound whose ingredients are sulphate of soda, bichromate of soda, and sulphuric acid, consisting of the following steps, namely: first dissolving the bichromate in just enough hot water to hold it in supersaturated solution and then mixing therewith the sulphuric acid and sulphate of soda, to be used substantially as described.

395,838. LATHE FOR TURNING BODIES HAVING ELLIPTICAL CROSS-SECTIONS. JOSEPH K. KOONS, Montgomery, Pa. Filed Apr. 20, 1888. Serial No. 271,358. (No model.)



Claim.—1. The combination, in a lathe, of the two spindles, one of which is movable laterally with reference to the other, the movable work-holders connected therewith, and the gearing and connecting-shaft between said spindles, such shaft being formed in sections united by universal couplings, substantially as set forth.

2. The combination, in a lathe, of the two spindles, the head-stocks supporting same, one of said head-stocks being movable laterally with reference to the other, the bed-frame, and the gearing and connecting-shaft connecting said spindles, such shaft being formed in sections and having its end section supported adjustably in the framing, substantially as set forth.

3. In a turning-lathe, the combination of the spindle, the head J, secured thereon, the plate K, held and movable in a groove in said head J and having a portion or arm, K', and a plate, L, having a groove to receive said portion, the parts J K being provided with openings 1 2, movable into register and adapted to receive a securing-pin, substantially as set forth.

4. In a turning-lathe, the combination of the bed-frame having a rack, *c'*, the tail-stock C, the shaft *c'*, journaled thereto and having a pinion, *c*, engaging rack *c'* and a bevel-gear, *c²*, and the counter-shaft *c⁴*, having a bevel-pinion, *c³*, substantially as set forth.

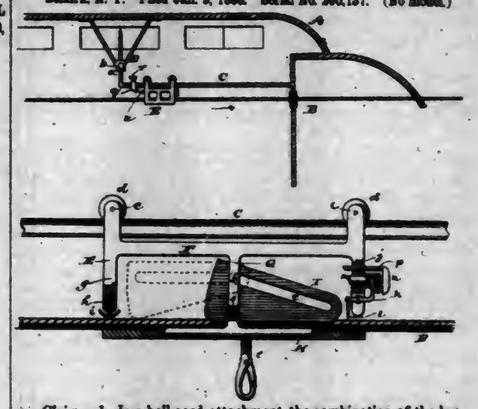
5. In a turning-lathe, the combination of the bed-frame, the head and tail stocks thereon, one of such stocks being adjustable laterally with reference to the other, the spindles and guide-plates supported by said stocks, the work-holder supports on said spindles and provided with studs or portions arranged to engage the guide-plates, and the gearing and connecting-shaft connecting such spindles, such shaft being formed in sections and having its end section supported adjustably in the framing, substantially as set forth.

6. The combination of the head supported on the spindle and provided with a dovetail groove, the work-support having a rib fitting said groove, the gib *j*, and set-screw *j'*, all substantially as and for the purposes specified.

7. In a turning-lathe, the combination of the head supported on the spindle, the support K, provided with the spindle O and having a slot, 3, fitted to receive the tail of a carrier, such support being movable radially and provided with a stud or projecting portion, and guides arranged for engagement by said stud or portion, substantially as set forth.

8. The combination, in a turning-lathe, of the bed-frame, the two head-stocks, one of said head-stocks being adjustable laterally with reference to the other, the spindles in said head-stocks, the gear-wheels in said spindles, the connecting-shaft formed in sections united by universal joints, and the pinions on the said shaft, one of said pinions being movable along the shaft, all substantially as and for the purposes specified.

395,839. BELL-CORD ATTACHMENT. GEORGE A. LA PEYRE, Selkirk, N. Y. Filed Jan. 9, 1888. Serial No. 260,137. (No model.)



Claim.—1. In a bell-cord attachment, the combination of the bar C, suspended from the ceiling of the car, the carriage E, provided with rollers *d*, adapted to rest upon the bar C, the slotted clamping-wedge I, inserted in a slot of the bar G, the knife L, the lever K, pivotally connected with the knife and pivoted in the carriage E, and the spring-pressed bar M, provided with the head N, arranged to engage the lever K and operate the knife L, substantially as specified.

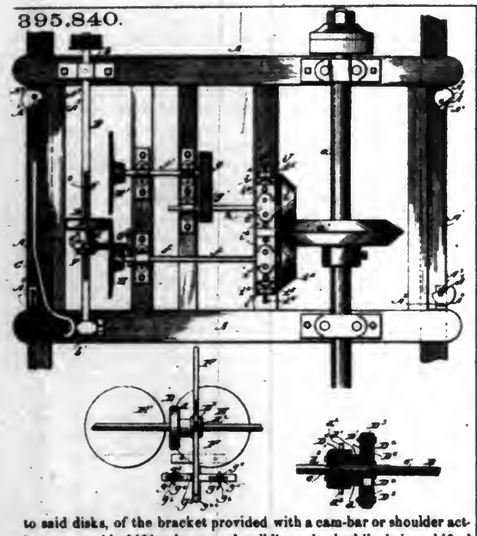
2. In a bell-cord attachment, the combination of the adjustable bar C, the frame F, provided with rollers *d*, resting upon the bar C, the grooved bar H, for receiving the rope B, the slotted wedge I, carried by the carriage E, and the spring-pressed follower *i*, carried by the carriage and adapted to clamp the rope B upon the grooved bar H, substantially as specified.

395,840. SAW-MILL FEED MECHANISM. ALON LANG, Atlanta, Ga. Filed Apr. 7, 1883. Serial No. 269,902. (No model.)

Claim.—1. In a saw-mill feed mechanism, the combination of the saw arbor or shaft wheel, the disks disposed edgewise to each other, together with shaft and gearing for transmitting motion from said wheel to said disks, and the sliding wheel having contact with either one or the other of said disks, and the feed-shaft pivotally supported in position, substantially as set forth.

2. In a saw-mill feed mechanism, the combination, with the shifting-lever, the sliding wheel having connection with said lever, the feed-shaft carrying said wheel and pivotally supported in position, and the disks, together with shafts and gearing for transmitting motion

395,840.



to said disks, of the bracket provided with a cam-bar or shoulder acting upon said shifting-lever as the sliding wheel while being shifted arrives opposite the space between the disks, substantially as specified.

3. In a saw-mill feed mechanism, the combination of the disks secured edgewise to each other and upon shafts driven from the saw-shaft wheel, the shifting-lever engaging with a wheel sliding upon a shaft, a lever having a cam-shaped pivoted end for moving the wheel to and from the said disks, and the bracket having a cam-bar adapted to act upon the wheel-shifting lever, substantially as specified.

4. In a saw-mill feed mechanism, the combination of the disks secured edgewise to each other and upon shafts driven from the saw-shaft wheel, the shifting-lever engaging with a wheel sliding upon the feed-shaft, and the bracket having a cam-bar acting upon the shifting-lever, substantially as set forth.

5. In a saw-mill feed mechanism, the combination of the disks secured edgewise to each other and upon shafts driven from the saw-shaft wheel, the shifting-lever engaging with a wheel sliding upon the feed-shaft, and a cam-bracket having arms limiting the throw or movement of the shifting-lever, substantially as set forth.

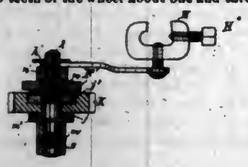
6. In a saw-mill feed mechanism, the combination of the disks secured edgewise to each other and upon shafts driven from the saw-shaft wheel, the shifting-lever engaging with a wheel sliding upon the feed-shaft, and a cam-bracket having adjustable arms limiting and varying the throw or movement of the shifting-lever, substantially as set forth.

7. In a saw-mill feed mechanism, the combination of the disks secured edgewise to each other and upon shafts driven from the saw-shaft wheel, the shifting-lever engaging with a wheel sliding upon the feed-shaft, all supported upon a frame adjustable by means of angle-irons or brackets having their horizontal arms provided with slots, and eccentrics applied to said brackets and adapted to be manipulated by a wrench, substantially as set forth.

8. In a saw-mill feed mechanism, the combination, with the sliding wheel shaft-boxes, of the plate provided with end pieces, fixed blocks secured upon said plate, sliding blocks, springs acting upon said latter blocks, and holding or adjusting screws working in said plate, end pieces, and against said springs, substantially as set forth.

395,841. SHUTTLE-CHECK FOR LOOMS. CHARLES A. LITTLEFIELD, Fall River, assignor of one-half to Elias A. Tuttle and James T. Milne, Bristol County, Mass. Filed Oct. 29, 1887. Serial No. 253,707. (No model.)

Brief.—The momentum of the shuttle is absorbed by a ratchet-wheel whose rotation is retarded by friction devices, the ratchet-wheel being engaged by a pawl carried by a lever connected to a vibrating arm of the shuttle-operating mechanism. At each pick the pawl is carried over the teeth of the wheel about one and three-fourths teeth.



Claim.—1. The combination, with a vibrating arm or lever of a shuttle-motion and the picker-stick connected thereto, of the lever F', connected to the said vibrating arm or lever, the pawl G, the wheel K, and devices for frictionally retarding the rotation of the said wheel, the combination being constructed and operating substantially as described, and serving to arrest the picker-stick in its outward movement before it reaches the extreme of the said movement and hold it there in position to arrest the flight of the shuttle.

2. The combination, with a vibrating arm or lever of a shuttle-motion and the picker-stick connected thereto, of the lever F', the link A, the collar H, means for adjustably securing said collar upon the said arm or lever of the shuttle-motion, the pawl G, the wheel K, and devices for frictionally retarding the rotation of the said wheel, the combination being constructed and operating substantially as described, and serving to arrest the picker-stick in its outward movement before it reaches the extreme of the said movement and hold it there in position to arrest the flight of the shuttle.

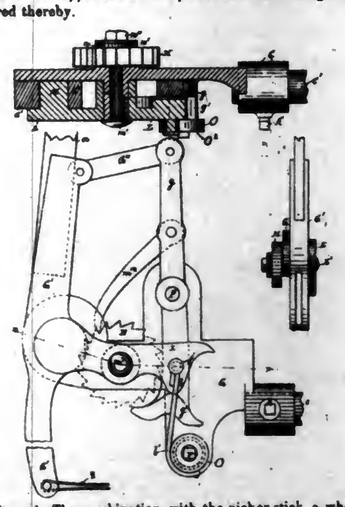
3. The combination, with a vibratory arm or lever of a shuttle-motion and the picker-stick connected thereto, of the collar H, the set-screw H°, the link A, the lever F', the pawl G, the wheel K, and devices for frictionally retarding the rotation of the said wheel, the combination being constructed and operating substantially as described, and serving to arrest the picker-stick in its outward movement before it reaches the extreme of the said movement and hold it there in position to arrest the flight of the shuttle.

4. The combination, with the wheel K and devices for frictionally retarding the rotation of the said wheel, of the pawl G, the lever F', the link A, the collar H, and means for clamping the said collar in place upon a vibrating arm or lever of a shuttle-motion, all being as and for the purposes set forth.

5. The combination, with the stock B and stud *k*, of the washer *m'*, the friction-washers *j' j'*, the wheel K, the nut *n*, having a reduced exterior portion, as described, the check-nut *n'*, the lever F', mounted upon the reduced portion of nut *n* and held in place laterally by the nut *n'*, and the pawl G, all substantially as described.

395,842. SHUTTLE-OPERATING MECHANISM FOR LOOMS. CHARLES A. LITTLEFIELD, Fall River, assignor of one-half to Elias A. Tuttle and James T. Milne, Bristol County, Mass. Filed Nov. 1, 1887. Serial No. 253,864. (No model.)

Brief.—The momentum of the shuttle is absorbed by a ratchet-wheel whose rotation is retarded by friction devices, the wheel being engaged by a pawl carried by a lever connected to the picker-stick. Said lever has at its lower end a cam portion adapted to engage the inner end of a lever carrying the picker-stick pivoted at its outer end, movement of the upper end of the picker-stick in a straight line being secured thereby.



Claim.—1. The combination, with the picker-stick, a wheel, and devices for frictionally retarding the rotation of said wheel, of a pawl connected with the said picker-stick and adapted to engage with the wheel in the outward movement of the picker-stick, the picker-stick being thereby stopped in the outward movement and held at a slight distance from the extreme end of the said movement and in position to receive the shuttle and check it in its flight from the opposite box, substantially as described.

2. The combination, with the picker-stick, of a wheel, devices for retarding the rotation thereof, and a pawl connected with the said picker-stick, the said pawl during the inward movement of the picker-stick moving over more than one tooth on the said wheel, but not far enough to engage with the following tooth, and the combination being and operating substantially as described, whereby the outward movement of the picker-stick is arrested by the engagement of the pawl with the tooth of the wheel passed over by the pawl, and the picker-stick is held in position to receive the shuttle.

3. The combination, with the picker-stick, of the pawl-carrying lever connected thereto, a wheel and devices for retarding the rotation thereof, the combination being and operating substantially as described, whereby during the increased movement of the picker-stick the pawl is moved a distance sufficient to carry it over more than one tooth on the wheel, but not far enough to engage with the following tooth, and whereby the outward movement of the picker-stick is arrested by the engagement of the pawl with the tooth of the wheel passed over by the pawl, and the picker-stick is held in position to receive the shuttle.

4. The combination, with the picker-stick, of the link G", the lever *g*, pawl m^{12}, wheel H, and devices for frictionally retarding the rotation of said wheel, the said pawl during the inward movement of the picker-stick moving over more than one tooth on the said wheel, but not far enough to engage with the following tooth, and the outward movement of the picker-stick being arrested by engagement of the pawl with the tooth passed over by the pawl, and the picker-stick held in position to receive the shuttle, substantially as described.

5. The combination, with the picker-stick and its holder or stock, of the lever on one end of which said holder or stock is pivoted, and a lever connected with the stock or holder and having a cam-formed portion engaging with the said lever, substantially as described, whereby the upper end of the picker-stick is caused to move in a horizontal straight line.

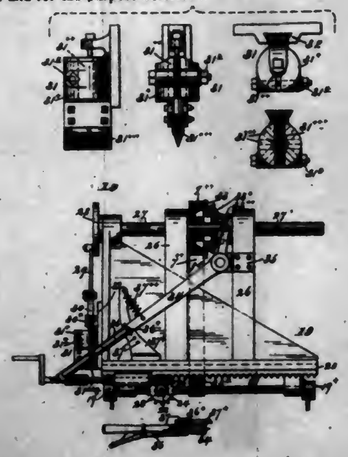
6. The combination, with the picker-stick and its holder or stock, of a supporting-lever on which said holder or stock is pivoted, a second lever connected with the holder or stock and provided with a cam-formed portion acting upon said supporting-lever, and a spring for holding the supporting-lever in contact with the cam portion of the second lever, substantially as described, whereby the upper end of the picker-stick is caused to move in a horizontal straight line.

7. The combination, with the stock G' and the lever L, of the lever *g*, connected with said stock and provided with the cam portion *g'*, and the spring *o*, connected with the said lever L, substantially as described.

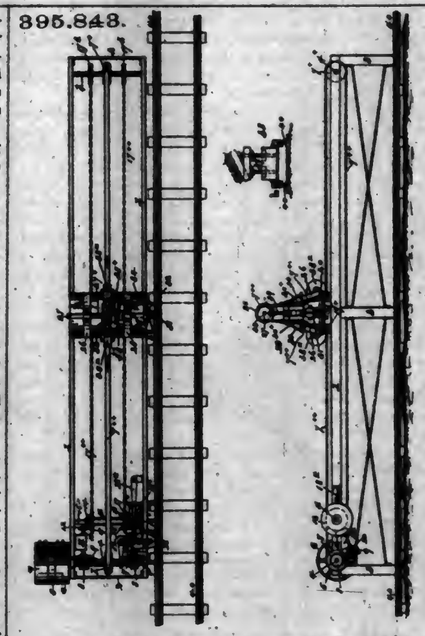
8. The combination, with the stock G' and the supporting-lever L, of the lever *g*, connected with the said stock and provided with the cam-formed portion *g'*, the spring *o*, connected with the supporting-lever L, the pawl m^{12}, the ratchet-wheel H, and devices for frictionally retarding the rotation of the said wheel, substantially as described.

395,843. MACHINE FOR DRESSING STONE. FRANK MANNING, Narberth, Pa., assignor to the Manning Machine Company, of New Jersey. Filed July 13, 1888. Serial No. 279,855. (No model.)

Claim.—1. In a stone-dressing machine, the combination, with the bevel gear-wheels on the inclined shafts, of the transverse shaft-carrying gear-wheels meshing therewith, one of said gear-wheels being loose on said shaft, and having a cut-out portion or notch, a sleeve enveloping the shaft and carrying sprocket-wheels, and a clutch-collar connected with one of the wheels and having a lug or projection for engaging the cut-out portion or notch in the bevel gear-wheel, substantially as and for the purpose described.



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2. In a stone-dressing machine, the combination, with the shaft having the collar or flange provided with a lug, and carrying the gear-wheels, one of which is loose and is provided with a notch, of the sleeve encircling said shaft and carrying the sprocket-wheels, the clutch or coupling collar having arms which pass through one of the sprocket-wheels and provided with a lug for engaging the notch in the bevel gear-wheel, and a notch to receive the lug on the collar or flange of the shaft, all arranged and adapted to serve substantially as and for the purpose described.

3. In a stone-dressing machine, the combination, with the frame, the shaft journaled therein, the loose cupped driving-pulley and clutch on said shaft, the crank-wheel, rod, spring, and hammer carrying the cutter, of the lever fulcrumed to the frame, having one end engaging the clutch for shifting the same, and devices carried by the lever for engaging means to retain said lever in the position to which it is shifted, substantially as described.

4. In a stone-dressing machine, the combination of a frame, shafts mounted in the frame carrying sprocket-wheels, sprocket-chains passing over said wheels, a carriage connected with said chains and traveling on the frame, and mechanism for imparting different speeds to the chains to cause the carriage to travel at different speeds, substantially in the manner and for the purpose set forth.

5. In a stone-dressing machine, the combination of a frame, shafts carrying sprocket-wheels mounted thereon, chains passing over said wheels, a carriage mounted on the frame and connected with the chains, the driving-shaft mounted in the frame and carrying worm-wheels, worm-gears meshing with said worm-wheels, bevel gear-wheels operated by the worm-gears, and bevel gear-wheels on one of the shafts carrying the sprocket-wheels meshing with said bevel-gears, whereby motion is transmitted to the sprocket-chains for moving the carriage on the frame, substantially in the manner and for the purpose described.

6. In a stone-dressing machine, the combination of a frame, the driving-shaft mounted therein carrying a pulley, shafts mounted in the frame carrying sprocket-wheels, a pulley on one of said shafts, a carriage mounted on the frame carrying pulleys, a band passing over the pulleys on the carriage and shafts, sprocket-chains passing over the sprocket-wheels on the shaft and connected to the carriage, and mechanism for imparting motion from the driving-shaft to the sprocket-wheels and pulleys, whereby the chains and band are caused to travel, substantially in the manner and for the purpose described.

7. In a stone-dressing machine, the combination of the sprocket-wheels, the chains passing over said sprocket-wheels, the carriage connected with said chains, the transverse rack carried by the carriage, the pinion engaging said rack, and the worm-wheel for operating the pinion, all operating as described, whereby the carriage is caused to travel longitudinally and transversely, substantially in the manner and for the purpose described.

8. In a stone-dressing machine, the hammer-head having the clamping-jaws, the cutter having an arm or extension adapted to be clamped in said jaws, and means in the hammer-head for causing the jaws thereof to clamp the arm of the cutter, substantially in the manner and for the purpose described.

9. In a stone-dressing machine, the hammer-head consisting of two spring clamping-jaws and a screw passing through said jaws for causing them to clamp the cutter in any desired position in said jaws, substantially in the manner and for the purpose described.

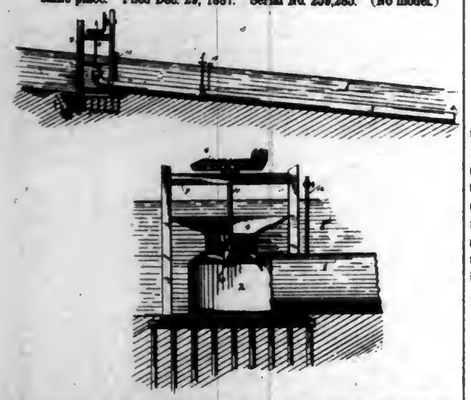
10. In a stone-dressing machine, the stone-carrying trucks having the depressions or recesses on the support thereof, and the screws having heads fitting in said depressions and capable of vertical adjustment in the frame of the truck, whereby the support of said truck can be adjusted to present the surface of the stone horizontally, or incline the stone to either side to present the edges thereof, on both sides of the stone, to the action of the cutter, substantially as described.

11. In a stone-dressing machine, the combination of the carriage, the cutting mechanism, the shaft mounted in the carriage for operating said mechanism, the loose pulley on said shaft, the clutch for making said pulley fast, devices for shifting said clutch into and out of contact with the loose pulley, and devices for retaining the shifting mechanism in the desired position, substantially in the manner described.

12. In a stone-dressing machine, the combination of the carriage, the shaft mounted therein, the loose pulley on said shaft, the guiding-pulleys on the carriage, the driving-belt passing over all of said pulleys, the clutch for making the loose pulley on the shaft fast, so as to rotate said shaft, and means for throwing the clutch into and out of operation, substantially in the manner described.

395,844. APPARATUS FOR UTILIZING HYDRAULIC PRESSURE.

JOHN M. MARTY, Cleveland, Ohio, assignor of one-half to Francis J. Wing, same place. Filed Dec. 29, 1887. Serial No. 259,285. (No model.)



Claim.—1. In the application of hydraulic power, the combination of an inclined open-ended pipe submerged in a stream of water and provided with a shut-off gate, and a water-wheel within the pipe connected with gearing, substantially as shown and described.

2. In hydraulic machinery, a conduit-pipe open at either end, the pipe at its upper end having an upright arm a cross-section of which is of less area than a cross-section of the main pipe, which upright arm is provided with a turbine wheel connected with gearing, such conduit-pipe being provided at its lower end with a shut-off gate or valve and with a vent-pipe with cock, the whole pipe being inclined at the angle of a stream of water and having both its upper and lower ends submerged therein, substantially as shown and described.

3. In hydraulic machinery, an inclined open-ended conduit-pipe provided with a water-wheel and gearing at its upper end and with a shut-off gate, such pipe being submerged at either end in a stream and inclined at the angle of descent of such stream, and being provided with a shut-off gate or valve at any point in the pipe below the level of the water at the lower end of such pipe, substantially as shown and described.

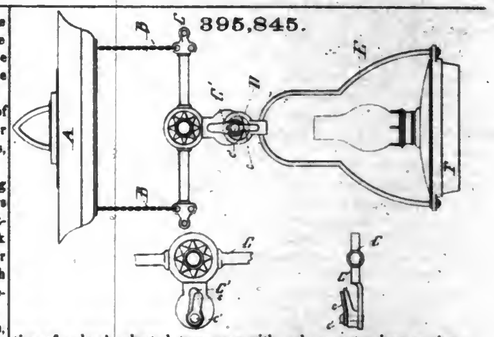
4. In machinery for the application of hydraulic power, the combination of the conduit-pipe 1, provided with arm 2 and flood-gate 5, and vent-tube and cock 12, with horizontal wheel 4, provided with shaft 11 and gearing 6, substantially as shown and described.

395,845. LAMP-HANGER.

EDWARD MILLER, Meriden, Conn., assignor to Edward Miller & Company, same place. Filed June 20, 1888. Serial No. 278,326. (No model.)

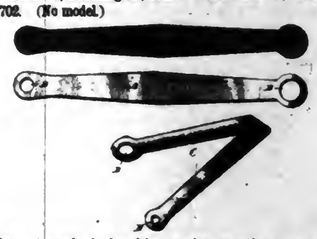
Claim.—In a hanger for lamps and other articles, the combination of a hook adapted to engage with and support a loop or ring, and a button pivotally attached at one end to the lower end of said hook and adapted to be turned upward in a line with said hook, so as to permit the engagement of said loop or ring and to be afterward turned downward to prevent the disengagement of said loop or ring, substantially as described.

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395,846. METHOD OF MAKING STEEL-TRAP SPRINGS.

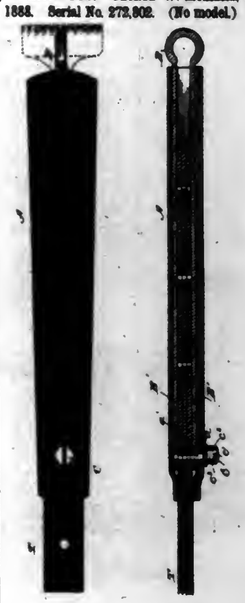
SAMUEL MITCHELL, Southington, Conn. Filed June 11, 1888. Serial No. 276,702. (No model.)



Claim.—A method of making steel-trap springs, consisting in cutting, straightening, and heating worn-out steel wagon and carriage wheel tires, then hot-rolling them to the thickness required for the springs, then working the strips so formed into trap-spring blanks, then perforating the ends of the blanks, or reaming out or enlarging such openings as may be in their ends, then heating each blank about midway of its length and bending it, then tempering them in water, and then dipping them in oil and burning off the adhering film thereof, those portions of the strips having unobliterated nail-holes being utilized in the ends of the blanks, substantially as set forth.

395,847. HAME-TUG.

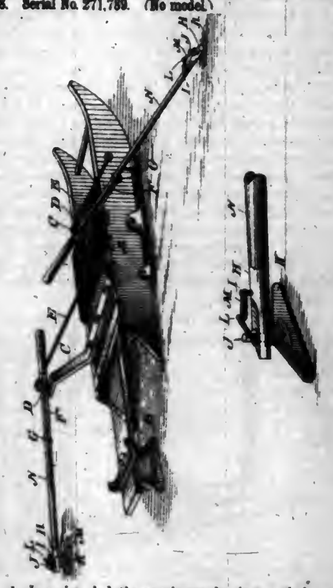
GEORGE W. MOLIERE, Ocean View, Cal. Filed May 4, 1888. Serial No. 272,802. (No model.)



Claim.—A hame-tug consisting of a hollow leather casing for the reception of the entire end of the trace, a metal eye or clip with shanks extending along the inside walls of the leather casing and leaving space between them for the tug, and a set-screw passing through the rear ends of the hollow casing, the extended shanks, and the trace, substantially as shown and described.

395,848. ICE-BOAT.

JOHN MCGRATH, Danbury, Conn. Filed Apr. 25, 1888. Serial No. 271,789. (No model.)



Claim.—1. In an ice-sled, the outriggers having at their extremities upwardly-projecting thole-pins, in combination with the oars having attached thereto keepers free at their outer ends, and the safety-catch adapted to slide on the oar-handles and close the keepers, substantially as set forth.

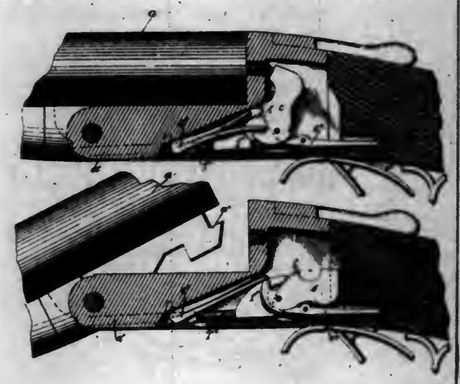
2. In an ice-boat, the combination, with the oar-handle having a ferrule at its outer end, of a swinging and resilient blade attached to said ferrule, substantially as shown and set forth.

3. The combination, with the oar-handle having a ferrule on its outer end, of the post extending upward through said ferrule, the oar-blade secured to the bottom of said post, the cross-pin extending through said post immediately above the ferrule, the pin projecting from said ferrule, and the coil-spring connecting the said pin and cross-pin, substantially as and for the purposes set forth.

395,849. BREECH-LOADING FIRE-ARM.

EDWARD G. PARRY, Ithaca, N. Y. Filed Mar. 19, 1888. Serial No. 267,616. (No model.)

Claim.—In a breech-loading gun, the combination, with the hinged barrels provided with a beveled catch, of a beveled spring-latch in the breech having its rear end flanged, a pair of headed pins engaging the flanged latch, and a breaking-lever having a rocking stud cut away on one side to engage and operate the pins, substantially as and for the purpose set forth.



395,849.



395,850. PITMAN.

FRANK H. ROGERS, Golden, Colo. Filed May 7, 1888. Serial No. 273,043. (No model.)



Claim.—1. The combination of a pitman or other connecting rod, two straps thereon having concaved ends forming the socket of a joint, and a second rod to be connected to the pitman-rod and carrying the head or ball of a ball-joint, the head or ball having a cylindrically-shaped lubricant-reservoir in its interior, an inclined plug or stopper therefor, and a passage or passages leading thence to the bearing to be lubricated, substantially as set forth.

2. The combination of a pitman or other connecting rod, two straps, one permanently secured thereto and one removably secured thereto, both straps having concaved ends for forming a socket for a ball-and-socket joint, and a second rod or shaft carrying the head of the joint, said head having a cylindrically-shaped lubricant chamber or reservoir in its interior, provided with a stopper or plug and with one or more inclined passages leading thence to the bearing to be lubricated, substantially as set forth.

3. The combination of a rod or shaft carrying the head or ball of a ball-and-socket joint, a pitman or other connecting rod, two straps, one permanently and one removably secured thereto and both formed with concaved ends for forming the socket of the joint, a loop for securing the rear end of the removable strap to the rod, a bolt seated against the fixed strap and having an elongated head adapted to pass through a correspondingly-shaped slot in the removable strap, and means for locking such head in holding position, substantially as set forth.

4. The combination of a pitman or other driving rod, a second rod or shaft, and a ball-and-socket joint uniting them, consisting of a socket attached to one rod and a head or ball carried by the other, said head or ball having an interior cylindrically-shaped oil or lubricant chamber, a plug or stopper closing the same, and an inclined passage or passages leading from the chamber to the bearing to be lubricated, substantially as set forth.

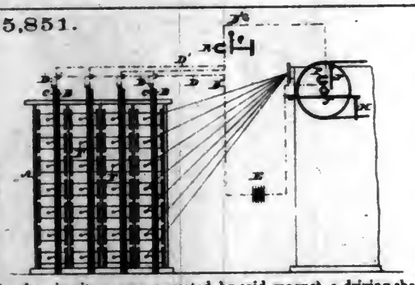
395,851. STOP-MOTION FOR WARPING-MACHINES.

LEWIS H. A. SCHWARTZ, Philadelphia, Pa., assignor to John A. Wiedersheim, same place. Filed Mar. 30, 1887. Serial No. 232,949. (No model.)

Brief.—The invention consists in improved electrically-actuated devices for stopping the warping-machine upon the breaking of a yarn.

Claim.—1. The electrically-insulated plates C and F, in combination with the yarn-guide F, pivoted to said plate F, and having the heel G, an electric generator with wires leading to said plates, a mag-

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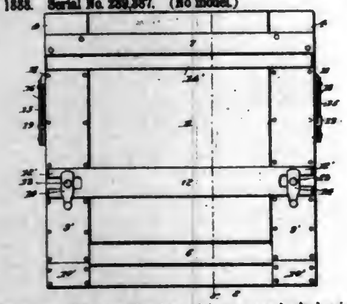


net in the circuit, an arm operated by said magnet, a driving-shaft with fast and loose pulleys thereon, the sleeve K, feathered on said shaft, and the loose sleeve K', with abutment M, said sleeves having cam contact-faces, the arm J, with shipper H, and a driving-belt, substantially as and for the purpose set forth.

2. The creels A, having the uprights B, the series of insulated plates C and F, secured to said uprights B, a series of guides, F, pivoted to one of the series of plates and normally disconnected from the other, an electric generator with main wires and a series of branch wires, the latter connecting the main wires to the said plates, the magnet P in said main circuit, a pivoted arm controlled by said magnet, a driving-shaft with fast and loose pulleys thereon, a belt, a shipper-actuating mechanism mounted on said driving-shaft and consisting of two sleeves having cam contact-faces, one of said sleeves having an abutment adapted to be in contact with the magnet-controlled arm, and the other sleeve feathered on said shaft, an arm actuated by the feathered sleeve and having a shipper, and a magnet and an indicator in each branch circuit, said parts being combined substantially as and for the purpose set forth.

3. A warping-machine having creels, and uprights secured to the frame of said creels, yarn-guides having supports connected to said frame, an electric generator, main wires connected with the generator, branch wires connected with the main wires and secured to said uprights, electric connections between said main wires and the yarn-guides, a magnet in the circuit, an arm operated by said magnet, a driving-shaft with fast and loose pulleys thereon, a sleeve feathered on said shaft, a loose sleeve on said shaft provided with an abutment, said sleeves having cam contact-faces, an arm with a shipper, and a driving-belt, substantially as described.

395,852. END-GATE. FRANK S. SEARS, Atkinson, Ill. Filed Oct. 29, 1888. Serial No. 289,367. (No model.)



Claim.—1. The combination, with a wagon-body having a projecting strip or ledge at the rear end of its bottom, of an end-gate adapted to rest on the projecting strip and connected to the wagon-body on each side by metallic straps pivoted together and hooks on the sides of the wagon-body with which the straps pivoted to the end-gate engage, substantially as described.

2. An end-gate constructed with a detachable panel and means for fastening the panel to the end-gate, substantially as described.

3. An end-gate constructed with the vertical portions 4, having projecting screw-threaded bolts 13, the bottom connecting-bar, 6, the top connecting-bar, 7, and the panel 11, with its upper end projecting within the bar 7 and its lower end resting on bar 6, the cross-bar 14', secured to panel 11 and having projecting ends overlapping vertical portions 4, and the cross-bar 12, secured to panel 11 and having projecting slotted ends 12', engaging bolts 13, and held in place by crank-nuts 14 on the bolts 13, substantially as described.

4. The combination, with a wagon-body having a projection at the rear end of its bottom, of an end-gate resting on the projection, brackets on the sides of the wagon-body, and hooks and straps on each side of the end-gate pivoted together at their inner ends and at their outer ends to the brackets and end-gate, respectively, the straps pivoted to the end-gate being laterally movable into engagement with the bracket-hooks, substantially as described.

5. The combination, with the wagon-body 1, having the projecting strip 2 at the rear end of its bottom provided with metallic plates 10', having inwardly-projecting hooks 10, and the brackets 18, with hooks 19, on the sides 5 of the wagon-body, of an end-gate formed with vertical portions 4, having a connecting-bar, 6, at their lower ends and a connecting-bar, 7, adjacent to their upper ends, metallic plates 9' on the vertical portions 4, provided with outwardly-projecting hooks 9 at their lower ends engaging hooks 10, and screw-threaded bolts 13, projecting from vertical portions 4, and a detachable panel, 11, having its upper end projecting within bar 7, a bar, 14', secured to panel 11 adjacent to bar 7, with projecting ends overlapping vertical portions 4, a cross-bar, 12, secured to panel 11 adjacent to its lower portion, having slotted ends 12', engaging bolts 13, and fastening crank-nuts 14 on bolts 13, adapted to register with slots 12', metallic straps 15 and 16 on each side of the wagon-body and pivoted together at their inner ends, the straps 15, which are laterally movable into and out of engagement with hooks 19, being pivoted at their outer ends to the end-gate, and the straps 16 being pivoted at their outer ends to the brackets 18, substantially as described.

395,853. SLAT-AND-WIRE-FENCE MACHINE. HENRY SNYDER, HIRAM STAPLER, and MATT BARR, Battle Creek, Mich. Filed Sept. 19, 1888. Serial No. 285,312. (No model.)



Claim.—1. In a slat-and-wire-fence machine, the combination, with a twister-frame, of an upright parallel thereto, L-irons pivoted to the twister-frame and having a sliding connection with the upright, and a lever for operating the twister-frame and upright, whereby independent movement of the twister-frame and upright over rough and uneven ground is permitted, substantially as described.

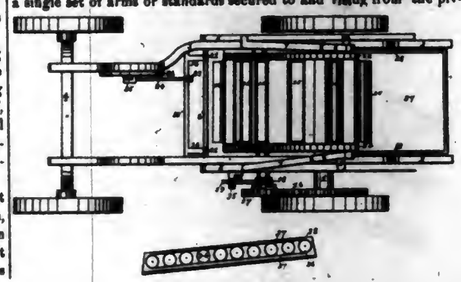
2. In a slat-and-wire fence machine, the combination of an upright twister-frame, an upright flexibly connected to the twister-frame, and a lever connecting the two, slotted at its bearing upon the upright to permit independent movement of the uprights, substantially as described.

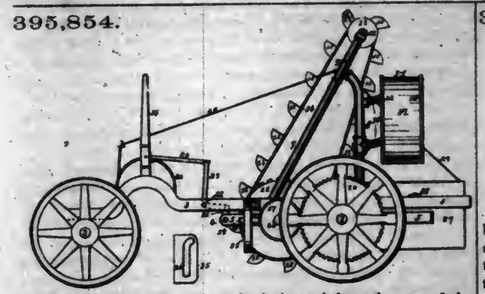
3. A tension device for wires, consisting of two relatively-adjustable parts, one convex and the other concave, the former fitting upon the latter to hold the wire taut, each part suitably grooved for the passage of the wire, and the convex part having a slotted overlapping flange for guiding the wires, substantially as described.

4. In a slat-and-wire-fence machine, the combination of a twister-frame and upright so connected together that they may be moved toward and from one another, the upright being provided with a clutch or gripping device consisting of the brace d, the handle d', connecting-rods d^3, and claws d^3, substantially as described.

395,854. EXCAVATOR. GEORGE J. STAFFORD, Aztec Springs, Colo. Filed Apr. 13, 1888. Serial No. 270,563. (No model.)

Claim.—1. The combination of the wheels and axles, a main frame rigidly supported thereon, a second frame pivotally supported on an axle and lying normally substantially parallel to the fixed frame, a single set of arms or standards secured to and rising from the pivoted frame, a set of sprocket-wheels journaled at the top of the standards, a set of sprocket-wheels journaled in the pivoted frame, an endless chain of buckets passing over the two sets of sprocket-wheels, gearing for actuating the lower sprocket-wheels, gearing upon the main driving wheel or axle, and a clutch mechanism for connecting and disconnecting such gearings, substantially as set forth.





2. The combination of the supporting wheels and axles, a main frame rigidly supported thereon, a second frame pivotally supported on the main axle, arms or standards secured thereto and rising therefrom, sprocket-wheels journaled in the upper ends of such arms or standards, sprocket-wheels journaled in the pivoted frame, an endless belt of scoops or buckets passing around such sprocket-wheels, a gear loose upon the shaft of the lower sprocket-wheels, a gear attached to the main driving wheel or axle, a clutch mechanism for locking the loose gear to the shaft of the lower sprocket-wheels, a lever-arm pivoted upon the fixed frame, and lever-arms connecting it to the pivoted frame to simultaneously rock the pivoted frame upon the main axle, lifting its forward end, and operate the clutch mechanism, substantially as set forth.

3. The combination of the supporting wheels and axles, a main frame rigidly supported thereon, a second frame pivoted upon the main axle, arms or standards secured thereto and rising therefrom to support an upper set of sprocket-wheels, a lower set of sprocket-wheels journaled in the pivoted frame, an endless band of scoops or buckets traveling around such wheels, a loose gear upon the shaft of the lower band or sprocket wheels, a clutch mechanism for locking such gear to its shaft, gearing attached to the main driving-wheel or its axle, arms 30, vertically adjustable upon the rear of two of the upright standards or arms, and a discharge-chute supported by such arms 30, substantially as set forth.

4. The combination of the supporting wheels and axles, a main frame rigidly supported thereon, a second frame pivotally supported on the main axle, arms or standards secured thereto and rising therefrom, a set of band or sprocket wheels journaled at the top of such arms or standards, a set journaled in the pivoted frame, an endless belt of buckets or scoops passing over such wheels, gearing actuated by the main drive-wheel or its axle for imparting motion to the sprocket-wheels and belt or chain of buckets, a clutch mechanism for such gearing, a lever-arm pivoted to the rigid frame, connections therefrom to control the clutch mechanism and swing or rock the pivoted frame, and a tilting overbalanced receiving box or hopper pivoted in the rear of the fixed frame, substantially as set forth.

5. The combination of the supporting wheels and axles, a main frame rigidly supported thereby, a second frame pivotally supported upon an axle, arms or standards secured thereto and rising therefrom, and each consisting of tubular sections united by a screw-ring coupling forming means for longitudinal adjustment, two sets of sprocket or band wheels, one set journaled in the upper ends of the standards and one set journaled in the pivoted frame, an endless belt or chain of buckets passing over such wheels, a gearing loose upon the shaft of the lower sprocket-wheels, a clutch mechanism for locking such gear to its shaft, and a gearing upon the main driving-wheel or its axle, substantially as set forth.

6. The combination of a rigid frame, a pivotally-supported frame, two sets of pulley or sprocket wheels journaled therein, an endless series of scoops or buckets traveling thereover, gearing connecting the wheels or pulleys to the main driving-wheels, and a clutch mechanism in such gearing having a projecting handle taking in a cam-groove attached to the rigid frame, substantially as set forth.

395,855. FEED-TROUGH. MARTIN V. B. STEVENSON, Jesup, Iowa. Filed May 22, 1888. Serial No. 274,733. (No model.)

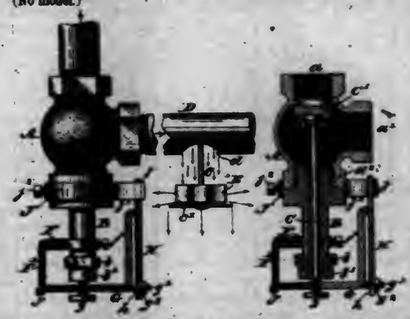
Claim.—1. The combination, with a feed-receptacle having an outlet in one side, of a laterally-swinging ∩-shaped agitator journaled above said outlet, with its arms depending in front and rear thereof, substantially as set forth.

2. In a feed-box, the combination, with a receptacle and a partition dividing the same into two compartments, the said partition being provided at the base with an opening, of a slide reciprocating over said opening, and an essentially U-shaped agitating-bar passing through said slide and journaled in said partition above said opening, the said bar having arms extending downward in each of the compartments, as and for the purpose specified.



3. In a feed-box, the combination, with a receptacle and a partition dividing the same into two compartments, the said partition provided with an opening at the base, of an inclined false bottom secured in one of the compartments, a slide covering the opening in the partition, and an essentially U-shaped agitating-bar passing through the said slide and journaled in the partition, and having arms extending vertically downward within each of the compartments, as and for the purpose specified.

395,856. AUTOMATIC FIRE-EXTINGUISHER. J. FRANKLIN STOCKERT, Philadelphia, Pa. Filed Apr. 28, 1888. Serial No. 272,155. (No model.)



Claim.—1. A fire-extinguisher consisting of a valve-chamber with inlet and outlet passages, a valve controlling said inlet-passage, an angle-arm supporting the stem of the valve and having a screw attachment, a second angle-arm secured to an attachment of the chamber and having a rounded lower end, a collar secured to the valve-chamber and having an opening in one side, a bifurcated bar with its upper end in said side opening of the collar and its bifurcated end embracing the screw attachment, and a clamping-nut, substantially as described.

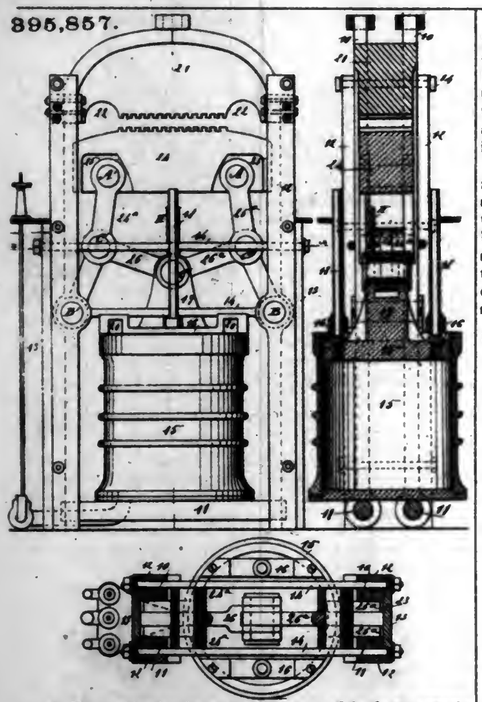
2. The combination of the chamber A, with an inlet and an outlet opening, a valve with stem C and screw g, a pipe secured to said chamber and having a discharge-opening, d, in one side thereof, the sleeve B, secured to said chamber A, the angle-arm F', secured to said sleeve B and having a rounded end, d, the angle-arm G, forming a bearing for the screw g and having a threaded extension, g', the bar H, with bifurcated end, and the fusible nut g^3, and a turbine below said discharge-opening d, substantially as described.

3. The valve-chamber A, with inlet-opening a, outlet-opening a', and lower opening, a^3, the sleeve B, secured in said opening a^3, the discharge-pipe D, with opening d, a collar with extended opening f' on its side, secured to said chamber and sleeve, the angle-arm F', secured to said sleeve B and provided with a round end, f, the angle-arm G, with end resting on the rounded end f' and forming a bearing for screw g, and provided with screw G', bar H, with upper end in opening f' of collar and having bifurcated lower end, A, and the fusible nut g^3, said parts being combined, substantially as described.

396,857. COTTON-COMPRESS. GEORGE TAYLOR, Hillsborough, Tex. Filed Apr. 12, 1888. Serial No. 270,398. (No model.)

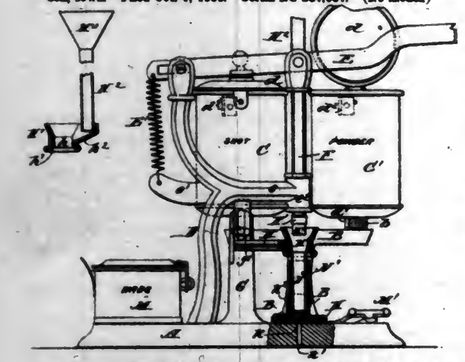
Claim.—1. The combination, in a cotton-compress, of the frame comprising vertical spaced angle-bars 12, the inner vertical spaced bars, 10, within the angles of said bars 12 and curved inwardly at their upper ends and there secured together to form the arch, and the tie-rods 14, with the upper platen, 21, curved to correspond to the said arch and bolted in the upper end of the frame, the lower platen working at its ends in the ways formed between said spaced bars 12 10, the cylinder, the piston, and the toggle-levers connecting the piston and lower platen, substantially as set forth.

395,857.



2. The combination, in a cotton-compress, of the frame comprising vertical spaced angle-bars 12, the spaced bars 10 within the angles of the bars 12 and curved inwardly at their upper ends to form the arch, the base-rods 11, the upper and lower tie-rods 14, said lower rods having eyes at their ends between the inner adjacent faces of the spaced bars 10 12, and the toggle centers or pivots B B', mounted in the sides of the frame at or near the upper end of the cylinder and passing through the eyes on said lower tie-rods, with the upper platen bolted in the said arch, the lower platen sliding in the ways formed by the spaces between said vertical bars 10 12, and having the pivots or centers A A', the toggle-levers 24^a 25^a, journaled at their opposite ends on said centers A A' B B', and the links 26 26^a, pivotally connected with the inner pivoted ends of the levers 24^a 25^a, the cylinder, and the piston having a vertical central post, 17, to the upper end of which the inner ends of the said links are pivotally connected, substantially as set forth.

395,858. CARTRIDGE-LOADER. JAMES V. THOMPSON, Fort Madison, Iowa. Filed Oct. 9, 1888. Serial No. 287,687. (No model.)

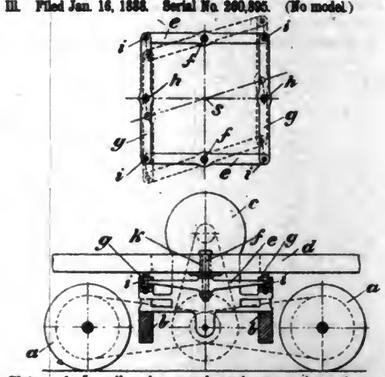


Claim.—1. The combination, with an essentially vertical standard, a horizontal arm projected from the same, a vertical sleeve integral with the said arm, and a spring-actuated lever pivoted in the top of said standard, of a plunger-carrying rod attached to the lever and reciprocating in said sleeve, a vertically-adjustable arm, a filling-cup attached to the arm, a disk beneath the cup, and a cushion embedded in said disk, substantially as shown and described.

2. The combination, with an essentially vertical standard, a horizontal arm projected from the same, a vertical sleeve integral with said arm, and a spring-actuated lever pivoted in said standard, of a plunger-carrying rod attached to the lever and reciprocating in said sleeve, a vertically-adjustable arm, a spouted filling-cup attached to the arm, a filling-tube passing through the said sleeve into the cup, a disk beneath the cup, and an apertured elastic cushion embedded in said disk, substantially as shown and described.

3. The combination, with an essentially vertical standard, a horizontal arm projected from the same, a vertical sleeve integral with said arm, a spring-actuated lever pivoted in said standard, and a detachable shot and powder magazine provided with a transverse scraper-bar, of a plunger-rod pivoted to the lever and reciprocating in said sleeve, a vertically-adjustable arm, a bottomless spouted cup attached to said arm, a filling-tube passing through the sleeve into the cup, a disk beneath the cup, and an apertured elastic cushion embedded in said disk, substantially as shown and described.

395,859. CAR-TRUCK CONNECTION. AARON TWYMAN, Pullman, Ill. Filed Jan. 16, 1888. Serial No. 260,995. (No model.)



Claim.—1. In railroad car and truck connections, the combination, with the car and truck, of a series of bars pivoted or jointed to one another around or outside of the center of the swiveling motion of the truck, to form an open central space, and pivoted, respectively, in sets, one to the car-body and another to the truck, substantially as specified.

2. In railroad car and truck connections, the combination, with the car and truck, of the within-described system or series of bars arranged in pairs in crossing relation with each other, to form an open central space, and pivoted to each other at their ends, the one pair of bars being pivotally connected intermediately of their length to the truck and the other pair of bars having each combined with them a socket and pin arranged to connect them intermediately of their length with the car-body, whereby the car is not only held in a central position upon the truck, but the bars may be made to sustain the weight of the car, essentially as shown and described.

3. In railroad car and truck connections, the combination, with the truck, of the car having an opening in its bottom or floor arranged over the center of the truck, and a series of parallel or crossing bars arranged in relation with said opening, to form an open central space thereunder, and pivoted or jointed to each other, also pivoted or connected intermediately of their length in pairs to the car and truck, substantially as and for the purpose or purposes herein set forth.

395,860. RAILWAY-CAR. GERALD P. WARREN, San Antonio, Tex. Filed Oct. 22, 1888. Serial No. 288,865. (No model.)



Claim.—1. A railway-car provided with a safety-compartment,

the sides of said compartment formed of sections hinged at their lower ends to the car-body, whereby the upper end may be swung outward, said sections provided at their ends with inwardly-projecting wing portions adapted to form end walls of the side sections when said sections are swung outward, substantially as and for the purpose described.

2. A railway-car provided at one end with a safety-compartment having hinged sections forming the sides thereof, doors arranged in said compartment and adapted to close the entrance to same from the platform and from the interior of the car, the inner faces of the sections, the end walls, and the doors of said compartment being lined with bullet-proof material, substantially as shown and described.

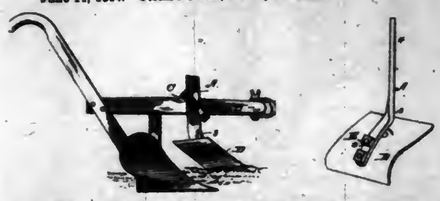
3. In a railway-car, the combination, with the car-body, of a safety-compartment constructed in one end thereof, said compartment consisting of the auxiliary compartments B and C and the partition-wall D, provided with a doorway, E, said compartments B and C provided with doors I K, the said doors hinged to swing outward, the door I adapted to close the passage-way E, and the door K adapted to close against the platform-door F when said doors are opened outward, said compartment provided with port-holes in the side and end walls thereof, all arranged as and for the purposes set forth.

4. The combination of the car-body A, provided with a compartment in one end thereof, the side walls of said compartment provided with cut-away portions, forming openings, and movable sections G, hinged at the lower edge of said openings, the upper ends of said sections G provided with inwardly-extending arms adjustably secured to end walls of the compartment, whereby the upper ends of said sections may be moved outwardly, substantially as shown and described.

5. A car-body having a safety-compartment formed therein, said compartment provided with open side walls, and movable sections hinged at their lower ends to the lower edge of the openings in the walls, side and consisting of the body portion G, and the inwardly-projecting wings G', said portions G and G' provided with port-holes, the upper ends of said sections provided with inwardly-projecting arms H, adapted to be adjusted to the side walls of the compartment, substantially as shown and described.

6. A car-body provided with a safety-compartment, said compartment having open side walls, movable sections hinged at their lower ends to the lower edge of said openings in the side walls, and consisting of the body portion G, the side wings, G', and the top piece, G^3, said sections provided with inwardly-slotted curved arms adapted to receive the adjusting-screw J, said movable section provided with port-holes N N', having sliding covers n n', all arranged substantially as and for the purpose described.

395,861. PLOW. JEREMIAH R. WHITE, Raymond, Miss. Filed June 11, 1887. Serial No. 241,060. (No model.)



Claim.—1. The scraper-blade as described, in combination with the standard twisted at a point just above the blade, the curve or twist of said standard being such that the face of the standard above the bend and the lower rear corner of the scraper-blade shall be approximately in line, and fastenings for securing the scraper-blade to the standard, substantially as set forth.

2. A reversible scraper-blade made of oblong diamond form and cylindrical in curve, so that all the corners will touch a flat surface, and having a central bolt-hole and indentations or gashes on either side of the center, substantially as set forth.

395,862. APPARATUS FOR INDICATING AND RECORDING CHANGES AT A DISTANT POINT. GEORGE R. WINSLOW, Waltham, Mass. Filed Mar. 27, 1888. Serial No. 268,667. (No model.)



Claim.—1. The combination of a movable actuator the changes in position of which are to be indicated with two electric contact-makers and two corresponding weights each having a part that engages and operates the corresponding contact-maker when the weight falls, and a weight-lifting pawl corresponding to each of said weights operatively connected with the said movable actuator, one pawl engaging its corresponding weight only when the actuator moves in one direction and the other pawl engaging the other weight only when the actuator moves in the opposite direction, substantially as described.

2. The combination of a shaft capable of rotary movement in either direction with a pawl-carrier and two connected oppositely-extended pawls thereon and weighted cam-hubs loose on said shaft, each provided with a shoulder to be engaged by the corresponding pawl, as set forth, whereby one is operated by movements of the shaft in one direction and the other by movements of the shaft in the opposite direction, substantially as described.

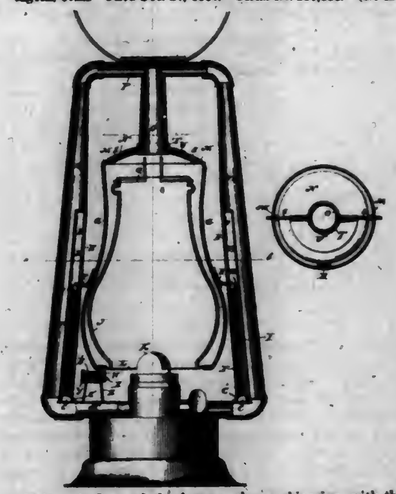
3. The combination of the shaft and pawl-carrier thereon with two pawls supported on said pawl-carrier and connected together, as set forth, and two weighted cam-hubs loose on said shaft, each hub having a raised portion provided with a notch to be engaged by the corresponding pawl, and the raised portion of one of said cam-hubs holding the other pawl in the notch engaged by it, substantially as and for the purpose set forth.

4. In a receiving-instrument, a toothed wheel capable of moving in either direction, combined with two electro-magnets and armature-levers therefor, provided with pawls, one of which rotates the said wheel in one direction and the other in the other direction, and a locking device for said wheel, consisting of the finger having a beveled portion and a square portion of proper width to enter between the teeth, and elbow-levers that operate the said locking device and are themselves operated by each of said armature-levers, as described, whereby the wheel is unlocked before the pawl of either armature-lever engages it, substantially as described.

5. The combination of a transmitting-instrument having two sets of contacts and a battery and line connected with the said contacts, as set forth, whereby one set of contacts connects the battery to line in one position and the other in the opposite position, with a polarized relay in said main circuit and a neutral electro-magnet in said circuit and armature therefor, having a notched projection that engages the armature of the polarized relay and retracts it to an intermediate position between its magnet-poles when the said armature of the neutral magnet is retracted, and a receiving-instrument having two electro-magnets and circuits therefor, controlled by the armature of said polarized relay and contacts at either side thereof, respectively, substantially as described.

6. The combination of a transmitting-instrument having two sets of contacts and a battery and a line connected with said contacts, as set forth, and the polarized relay at the receiving-station in said line, with a ground branch from said line at the transmitter and normally-open circuit-closer therein, a branch from said line between the transmitter and relay at the receiving-station, including a battery and relay connected with the ground, and a local circuit for said battery controlled by said relay, and the signal or alarm instrument included in said local circuit, substantially as described.

395,863. TUBULAR LANTERN. OLIVER D. WOODRUFF, Southington, Conn. Filed Dec. 27, 1887. Serial No. 258,118. (No model.)



Claim.—1. In a tubular lantern, the combination, with the main

draft-tubes thereof, of a globe and globe-carrier, and springs located entirely within the said tubes and connected with the globe-carrier for automatically lifting the globe, substantially as set forth.

2. In a tubular lantern, the combination, with the main draft-tubes thereof, of a globe and globe-carrier, a sealed spring-receiving tube located entirely within each of the said main tubes, and connection between such springs and the globe carrier, whereby the globe is automatically lifted, substantially as set forth.

3. In a tubular lantern, the combination, with main draft-tubes tapered at their upper ends, of a globe and globe-carrier, a spring-receiving tube located entirely within each of the tapered main tubes, and connection between such springs and the globe-carrier, whereby the globe is automatically lifted, substantially as set forth.

4. In a tubular lantern, the combination, with the main draft-tubes thereof, of the globe and the globe-carrier, a spring located entirely within each of the said tubes, and two short arms respectively projecting from the opposite sides of the carrier and connected with the said springs, substantially as set forth.

5. In a tubular lantern, the combination, with the main draft-tubes thereof, of a globe and globe-carrier, a spring-receiving tube located entirely within each of the main tubes and sealed from communication therewith, a spring located in each of the said spring-receiving tubes, which are slotted at their upper ends, and a short arm projecting from each side of the globe-carrier and connected with the spring in the adjacent spring-receiving tube, substantially as set forth.

6. In a tubular lantern, the combination, with main draft-tubes of oval transverse section, of a globe and globe-carrier, a spring-receiving tube located entirely within each of the main draft-tubes, and a spring located in each of the spring-receiving tubes and connected with the globe-carrier, substantially as set forth.

7. In a tubular lantern, the combination, with a central draft-tube and a globe-cap arranged to slide vertically thereupon, of a globe, a globe-carrier adapted to have vertical movement independent of the said cap, and a plate carried by the upper end of the carrier and located above the cap, substantially as set forth.

8. In a tubular lantern, the combination, with a central draft-tube and a globe-cap arranged to slide thereupon, of a globe, a globe-carrier constructed to have vertical movement independent of the said cap and a catch arranged to engage with the lower end of the carrier which is adapted thereto, substantially as set forth.

9. In a tubular lantern, the combination, with a globe, of a globe-cap and a globe-carrier adapted to have vertical movement independent of the globe-cap, substantially as set forth.

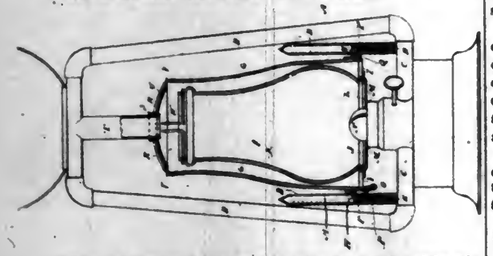
10. In a tubular lantern, the combination, with a central draft-tube and a globe-cap arranged to slide vertically thereupon, of a globe, an automatically-lifted globe-carrier arranged to slide vertically independent of the glnbe-cap and extending above the same, and finger-pieces located at the lower end of the globe-carrier, substantially as set forth.

11. In a tubular lantern, the combination, with a central draft-tube and a globe-cap located thereon, of a globe and a globe-carrier adapted to embrace the said tube at a point above the cap and to slide up and down thereupon independent of such cap, substantially as set forth.

12. In a tubular lantern, the combination, with a central draft-tube and a vertically-movable globe-cap, of a globe-carrier arranged to move vertically independent of the said cap, substantially as set forth.

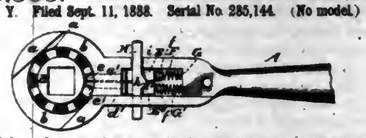
395,864. LANTERN. OLIVER D. WOODRUFF, Southington, Conn.

Filed Jan. 23, 1888. Serial No. 261,612. (No model.)



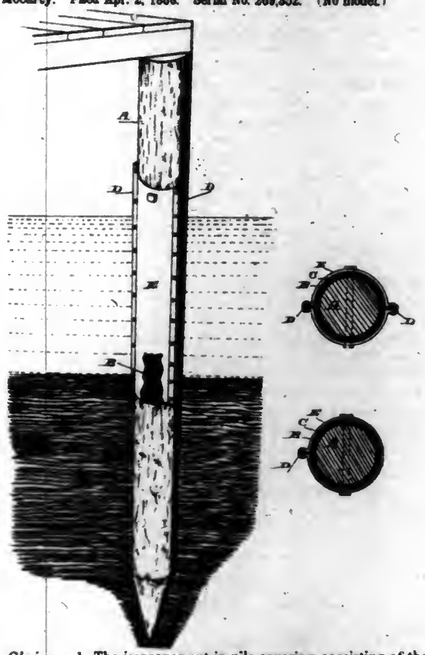
Claim.—In a tubular lantern, the combination, with a globe, of a globe-carrier, two perpendicular tubes respectively located in the lower corners of the lantern-frame, two springs respectively located in such tubes and connected with the said globe-carrier, so as to automatically lift the same, and a long loop-shaped spring connected at its upper end with one of such tubes, having its lower end adapted to engage with the lower end of the carrier and arranged to be operated by grasping it on opposite sides of the adjacent draft-tube of the lantern which supports the hand, substantially as set forth.

395,865. RATCHET-WRENCH. CHARLES E. ABRAMS, Chatham, N. Y. Filed Sept. 11, 1888. Serial No. 285,144. (No model.)



Claim.—In a ratchet-wrench, the combination, with the handle, the ratchet-wheel, and the pawls having recesses in their sides and having the corners *i* and *i'* beveled, of the reversing-bar having the double cam fitted in the said recesses and adapted to have the cam fit in the space formed between the beveled corners *i* and *i'*, substantially as described.

395,866. PILE-COVERING. HENRY ANDERSON, Oakland, and HUGH ELLAS, San Francisco, Cal., assignors of part to Robert W. King, Frank Cavagnaro, John Gambetta, Marino Monaco, James A. Orr, Benjamin F. Kohlberg, Herman O. Haas, Robert E. Murray, A. Reilly, and James M. McCarty. Filed Apr. 2, 1888. Serial No. 269,352. (No model.)



Claim.—1. The improvement in pile-covering, consisting of the pile turned to a smooth surface between the points which are to be protected, a coating consisting of a preparation of pitch or asphaltum, followed by a fibrous wrapping, and a second coating of the material, and a final inclosure or covering of metal, substantially as herein described.

2. The pile having the surface to be protected turned smooth, a coating of protecting material spread over this surface, a wrapping of cloth or fibrous material outside of the coating, and a final coating of material outside of the wrapping, in combination with a flanged cylindrical metallic case having bolts or rivet holes in the flanges, and a hole or holes, by which it is secured directly to the pile, substantially as herein described.

3. A pile-protector consisting of the exterior cylindrical metal casing having the flanges with bolt or rivet holes, by which it is drawn together about the pile, in combination with a packing or filling for the joints, substantially as herein described.

395,867. DETONATING TOY. DAVID BALDWIN, New York, N. Y.

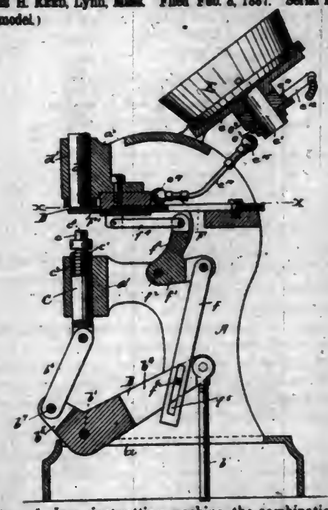
Filed Feb. 28, 1888. Serial No. 265,561. (No model.)



Claim.—1. A toy for producing loud explosions, consisting of a string coated at intervals with an explosive compound, with a cone-shaped tube for holding and causing the explosion of the same, as set forth.

2. The combination, in a detonating toy, of a string having a series of beads of explosive material, the said beads being covered with paper, with a tapering tube for causing the explosion of said beads, as set forth.

395,868. RIVET-SETTING MACHINE. FORREST W. BEALE and JAMES H. REED, Lynn, Mass. Filed Feb. 3, 1887. Serial No. 226,905. (No model.)



Claim.—1. In a rivet-setting machine, the combination, with the frame A, having the projecting arms or sections a' a^3, of the stationary header secured in the said arm or section a^3, the spindle or plunger C, sliding vertically in the said arm or section a' and provided with the die piece or block *c*, a rivet-hopper, a stationary rivet-feeding chute, a horizontally-movable rivet-transferring sliding plate, F F', moving beneath the said sliding header adjacent to the end of said chute, a rivet-holding hopper, a rotary mechanism for said hopper connected with said sliding plate, an operating-lever, and connections between said operating-lever and the said spindle or plunger and sliding plate, substantially as set forth.

2. In a rivet-setting machine, the combination, with the frame A, having the arms or sections a' a^3, of the reciprocating spindle or plunger fitted to slide vertically in the said arm or section a' and provided with the die piece or block *c*, having the threaded extension c' screwed into the said spindle or plunger, the stationary header D *d*, secured in the arm a^3, the rivet-hopper E, the stationary rivet-feeding chute G, the sliding rivet-transferring plate adjacent to the end of the said chute, the operating-lever B, and connections between said lever and the said spindle or plunger and transferring-plate, substantially as set forth.

3. The combination, in a rivet-setting machine, of the chute with a transferrer or carrier arranged to be moved below the end or foot thereof and having the arms *m m'*, one of which is provided with a point, m^4, and a curved surface, m^2, and the recess m^3, for receiving the shank of a fastening, substantially as described.

4. The combination of the chute G, the carrier F', with the chute-closer m^5, comprising a plate having an arm, a shoulder, m^6, and a notch or recess, m^{10}, and adapted to be moved outward by a rivet held by the carrier and to be moved inward by a spring, substantially as described.

5. The combination, in a rivet-setting machine, of the stationary header D, a reciprocating plunger, C, the rock-lever B, adapted to be operated by a treadle and connected with the plunger C by the link b^2, the said link, the carrier-plate F, the lever f' f^2, connected with said carrier-plate by the link f^4, and the link f, connecting the lever f' f^2 with the rock-lever B, substantially as described.

6. The combination of the head D, a reciprocating plunger, C, with the slide-plate F, the hopper feed-pawl c^5, the arm c^{13}, and the rod c^{14}, connecting the slide-plate with the feed-pawl, substantially as described.

7. The combination of the hopper E, having the latch-holes g^2, with the latch H, its operating-spring h^4, the arm h^3, and disengaging-block h^5, carried by the oscillating collar or plate operating the feed-pawl, substantially as described.

8. The combination of the hopper E, having the latch-holes g^2, with the latch H, its operating-spring h^4, arm h^3, and disengaging-block h^5, carried by the oscillating collar or plate operating the feed-pawl, and the latch L, carried by the spring-arm *l*, substantially as described.

395,869. LAWN-MOWER. DAVID BRAELY, New Castle, Ind. Filed Feb. 18, 1887. Serial No. 228,264. (No model.)



Claim.—1. In a lawn-mower, the combination of two separate and distinct revolving cutters upon separate and distinct axles, G^2 G^2, supported by carriers C D, pivoted to each of the plates B by pivots I I', the plates B, one on each side of the machine, and having projecting sleeves Q, upon which revolve the drive-wheels and through which passes the central shaft Q', the plates having slots H H', and sockets E for handles, and notches O O' O^2 O^2, for receiving and retaining the spring-levers F F', the wheels or pinions U, the flange-cogs on the wheels A, the side cutters, M, and lifting points N, rigid with the plates B, the carriers C and D, having the lugs J J and screw J' and having attached to said carriers the spring-levers F F', the knife-bars K', each bearing the stationary knife K, pivoted in hole K^3, boxes G and G' in carriers C and D, for receiving the axles of the revolving cutters, the plate T, the connecting-bar R, with tool-box S', all substantially as and for the purposes set forth and described.

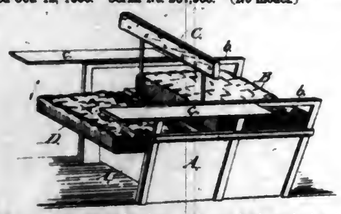
2. In a lawn-mower, the combination of two revolving cutters supported in movable carriers C D, attached by pivots to plates B B, the plates B B, one on each side of the machine, having projecting sleeves upon which revolve the drive-wheels A A and through which passes the central shaft, Q', the said plates B B having slots H H', sockets E for handles, and notches O O' O^2 O^2, for receiving and retaining the spring-levers F F', the wheels or pinions U, with ratchet-shaped notches in their central hole, the wheels A A, with flange-cogs, the movable carriers C and D, pivoted to the plates B B and having attached thereto the levers F F', the knife-bars K', each bearing a stationary knife, K, boxes G G' in carriers C D, for receiving the axles G^2 G^2 of the revolving cutters, the side cutters, M, and lifting-points N, the axles G^2 G^2, with slots for pawl W, the pawl W, and the connecting-bar R, the several parts arranged, as described, so that each of said revolving cutters may be simultaneously or alternately thrown in or out of gear by means of the spring-levers F F', attached to the movable carriers C D, moving said axles supported by said carriers back and forth in the slots H H', and retaining them in place by means of the levers F F', resting in the notches O O' O^2 O^2 in plates B B, substantially as and for the purposes set forth and described.

3. In a lawn-mower, the combination of the drive-wheels A A, each having a flange with cogs pointing to the central axis of the wheel, plates B B, with notches O O' O^2 O^2 in their marginal flanges, slots H H', hollow sleeve Q, and sockets E, side cutters, M, and lifting-points N, levers F F', pinions U, revolving cutters V and their axles, shaft Q', the carriers C D, pivoted to plates B, with lugs J J and boxes G G', the knife-bars K' K', and knives K, and setting-screws J' J', all substantially as and for the purposes set forth and described.

4. In a lawn-mower, the combination of the drive-wheels A A, having flange-cogs, the plates B B, with flanges having notches O O' O^2 O^2, sleeves Q, side cutters, M, lifting-points N, with carrier C, one on each side of machine, having spring-lever F, said carriers pivoted to plates B B and movable on said pivots, the slots H H' in plates B B for axles G^2 G^2 to move back and forth in as carriers C and D are moved on their pivots, and carriers D, one on each side, having spring-levers F', the cog-wheels U, with hole in center for receiving the ends of the axles of the revolving cutters, axles G^2 G^2, having a slot near each end for receiving pawl W, the four ratchet-shaped notches in the circumference of the hole in wheels U for engaging with pawl W, the pawl W, arranged to engage with said notches and to throw the cutters in gear when the mower is pushed forward and out of gear

when it is pulled backward, an upper and lower revolving cutter on axles G^2 G^2, stationary knives K, central shaft, Q', and cross-bar R, with tool-box S', all substantially as and for the purposes set forth and described.

395,870. VEHICLE. CHARLES M. BLYDENBURGH, Riverhead, N. Y. Filed Oct. 12, 1888. Serial No. 287,905. (No model.)



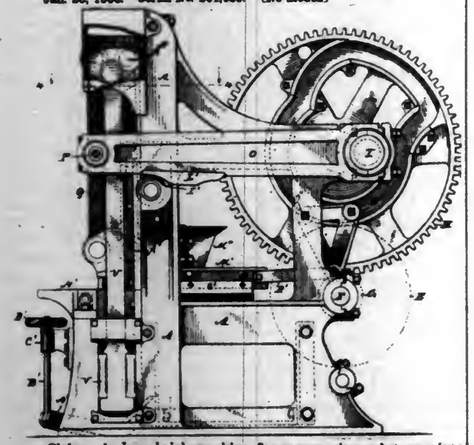
Claim.—1. The combination, with a vehicle-body having an internal chamber and a seat hinged to the front thereof and provided with a lazy-back, of a supplemental seat hinged in the rear of said front seat and adapted to serve as a rear seat, said rear seat being also adapted to fold up against and be secured to the said lazy-back, substantially as and for the purpose described.

2. The combination, with a vehicle-body having a folding seat, of suitable arm-supports secured to said body and projecting behind the body of the vehicle, substantially as and for the purpose herein described.

3. The combination, with a vehicle-body having a hinged front seat, of a rear seat adapted to fold within the body, and suitable supports, c, for the arms, said supports being secured to the sides of the body and projecting rearwardly beyond said body, whereby they serve as a protection to the occupant of the rear seat, substantially as described.

4. An improved vehicle comprising a chambered body portion, a front seat hinged thereto and provided with a lazy-back, a supplemental seat hinged in rear of the front seat and adapted to fold within said body and up against said lazy-back, and suitable arm-supports secured directly to the body and projecting in rear thereof, substantially as and for the purpose described.

395,871. BRICK-MACHINE. JOHN J. BREWIS, Chicago, Ill. Filed Jan. 23, 1888. Serial No. 261,655. (No model.)



Claim.—1. In a brick-machine for compressing substances into form, a toggle-lever or series of toggle-levers connected at their upper ends to a movable cross-head which in turn is secured or connected to a cross-head supporting the lower plungers, and mechanism, substantially as described, for operating said toggle-levers, in combination with the shelves G', having irregular surfaces, whereby pressure is exerted first on one and then on the other side of the brick, as set forth.

2. In a brick-machine of the character described, the toggle-levers provided with friction-wheels F', in combination with the shelves or ways G', having an irregular or broken surface, as set forth, whereby the plungers are caused to exercise a variable pressure on the clay.

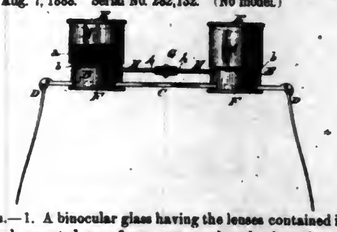
3. In a brick-machine of the character described, the pitman or lever O, for operating the toggles, in combination with the fixed or stationary friction-wheels I', operating as a fulcrum for said levers, as set forth.

4. In a self-feeding brick-machine of the character described, the table N', having inclined surfaces, as described, in combination with the feed-box M', having the adjustable sides S', as and for the purpose set forth.

5. The cross-head V, provided with the rubber cushion E', in combination with the lever A', rod B', and hand-wheel D', whereby the lower plungers are adjusted in the molds, as set forth.

6. In a brick-machine of the character described, the adjustable stud or bolt A'', secured to the cross-head R, as described, whereby the downward movement of the upper plungers is arrested, as set forth.

395,872. BINOCULAR GLASS. JAMES E. BRIGGS, Brooklyn, N. Y. Filed Aug. 7, 1888. Serial No. 282,132. (No model.)



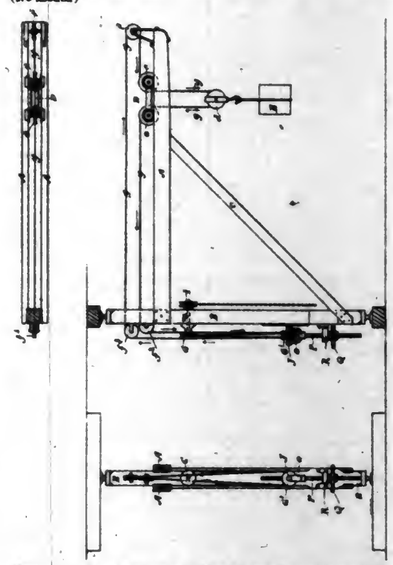
Claim.—1. A binocular glass having the lenses contained in tubes secured and mounted to a frame, arranged and adapted to support the glass in front of the eyes by the head of the spectator, as and for the purposes set forth.

2. A binocular glass having the lenses contained in tubes secured and mounted to the frame C D, arranged and adapted to support the glass by the head of the spectator, as and for the purposes set forth.

3. A binocular glass having adjustable tubes containing the lenses secured and mounted on the frame C D, arranged and adapted to support the glass by the head of the spectator, as and for the purposes set forth.

4. A binocular glass having adjustable tubes containing the lenses and provided with the bars H and nut G, secured and mounted on the frame C D, arranged and adapted to support the glass by the head of the spectator, substantially as and for the purposes set forth.

395,873. HOISTING AND CONVEYING MACHINE. ALEXANDER E. BROWN, Cleveland, Ohio. Filed Mar. 15, 1887. Serial No. 231,023. (No model.)



Claim.—1. In combination with the suitably-supported elevated tramway of a hoisting and conveying machine of the type shown, a carriage adapted to travel on said tramway, the single endless rope or cable *g*, the load-supporting sheave-block *d*, the wheels *f*, f^1, f^2, and G, having fixed axes of motion, and the set of rope-wheels G', having their shaft or axis of motion J mounted in a vertically-movable carriage, O, the whole constructed and operating in the manner and for the purposes set forth.

2. In a hoisting and conveying machine of the type hereinbefore mentioned, the combination, with the elevated tramway, the carriage

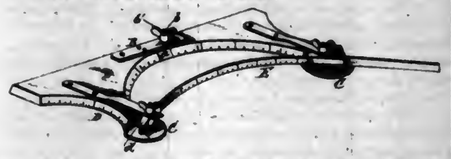
D, the endless cable *g*, the series of rope-wheels *f*, f^1, f^2, and G, of a drive-wheel, I, mounted fast on the shaft of wheel G, the vertically-adjustable carriage O, in which are mounted the wheels G', and provided with the screw-shaft P, and an actuating nut-wheel, Q, in engagement with said screw-shaft and bearing against a fixed stand, R, the whole arranged and operating substantially as and for the purposes set forth.

395,874. DRAFT-EQUALIZER. ALFRED G. BROWN, Egan, Dak. Filed Oct. 25, 1888. Serial No. 289,094. (No model.)



Claim.—As a new article of manufacture, the draft-equalizer herein described, consisting of the unequal levers A B, pivotally secured to each other, having terminal appliances for attaching the draft-animals, the lever C, whose ends are respectively joined to the levers A B by the pull-straps E, as shown, and the wear-plate G, to whose rear end the load is secured, and the forward end, G', whereof is secured, respectively, to the levers A B C by the hammer-straps D F, as shown and described, and for the purpose set forth.

395,875. PROTRACTOR. ABEL BUTLER, Dale, Ind. Filed Aug. 9, 1888. Serial No. 282,336. (No model.)



Claim.—1. A protractor formed of two parts hinged together and forming a semi-circle, and provided with an adjustable spring, substantially as described.

2. A protractor formed of two parts forming a semi-circle graduated as described, and a spring connecting the outer ends of said semi-circle, substantially as and for the purpose specified.

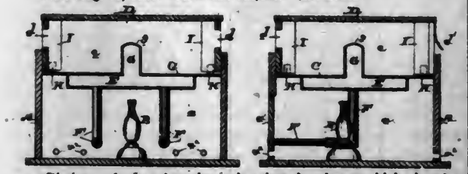
3. A protractor formed with graduated semi-circle formed of two parts hinged together, graduated arcs, and a graduated straight-edge on the back of the parts forming the semi-circle, substantially as described.

4. A protractor composed of a graduated hinged semi-circle, a graduated straight-edge, and graduated spring, and made adjustable, substantially as described.

5. A protractor formed with a semi-circle graduated as described, graduated arcs, straight-edge and ears, and a spring connecting the ends of the semi-circle and graduated as described.

6. A protractor formed with a graduated semi-circle, a graduated straight-edge, ears, and arcs, a graduated spring connecting the ends of the semi-circle, and swiveled holders for said spring, substantially as described.

395,876. CHICKEN-BROODER. LYMAN C. BYCE, Petaluma, Cal. Filed Aug. 10, 1888. Serial No. 282,470. (No model.)

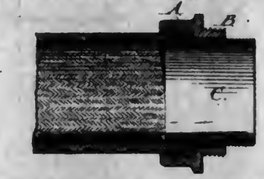


Claim.—1. In a brooder, a heating-chamber, a chick-chamber above, and a floor-plate separating the two, in combination with the air-chamber under said floor and terminating short of its edges, fresh-air pipes communicating with the outer air and with said air-chamber, said pipes passing through the heating-chamber, a supply-pipe let through the floor-plate and communicating with the center of the air-chamber below and the chick-chamber above, and escape-flues for the products of combustion from the heating-chamber located within the corner-posts of the upper box and passing through the chick-chamber, substantially as herein described.

2. In a brooder, the combination of the main box forming the heating-chamber, the floor-plate in the top of said box, the upper box forming the chick-chamber and having perforated or hollow corner-posts, the short flues in the corners of the floor-plate and connecting the heating-chamber with the hollow corner-posts of the upper box, whereby the products of combustion escape, and fresh-air pipes for supplying the chick-chamber, substantially as herein described.

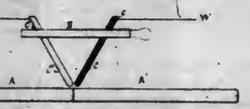
3. In a brooder, the combination of the main box forming the heating-chamber, the floor-plate in its top having the short flues at its corners communicating with the heating-chamber, the upper box set upon the floor-plate and forming the chick-chamber, said box having hollow corner-posts fitting over the short flues, the air-chamber on the bottom of the floor-plate, the fresh-air pipes communicating with the outer air and with said air-chamber and passing through the heating-chamber, and the supply-pipe connecting the air-chamber with the chick-chamber, substantially as herein described.

395,877. HOSE-COUPLING. CORNELIUS CALLAHAN, Boston, Mass., assignor to the Cornelius Callahan Company, same place. Filed Feb. 28, 1888. Serial No. 265,560. (No model.)



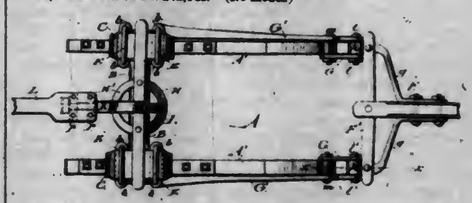
Claim.—In combination with a hose-coupling, the clamping-ring C, having parallel smooth sides for a portion of its length, and having the remaining portion threaded and adapted to project beyond the end of the coupling for the reception of a suitable tool, said ring having its inner end beveled or tapered, thereby adapting it to be forced into the end of the hose and to be held by frictional contact between the clamping-ring and coupling-section, substantially as described.

395,878. PROCESS OF ELECTRIC WELDING. CHARLES L. COFFIN, Detroit, Mich. Filed Sept. 18, 1888. Serial No. 285,742. (No model.)



Claim.—The process herein described of welding two articles together, which consists in subjecting the articles to the action of a voltaic arc of which one pole is metal conductor, fusing said conductor, depositing the molten metal on the joint of the two articles, and reenforcing said joint by such molten metal, substantially as set forth.

395,879. SLED. FRANCIS M. CONNER, Aurelia, Iowa. Filed May 3, 1888. Serial No. 272,643. (No model.)



Claim.—1. In a sled, the combination, with the runners and the oscillating axle-tree, of the braces D, having T-shaped heads, the head-blocks in which the ends of the axle-tree are mounted, and the clips E upon the ends of said head-blocks, by which said blocks are secured to the braces, and also prevented from splitting, substantially as described.

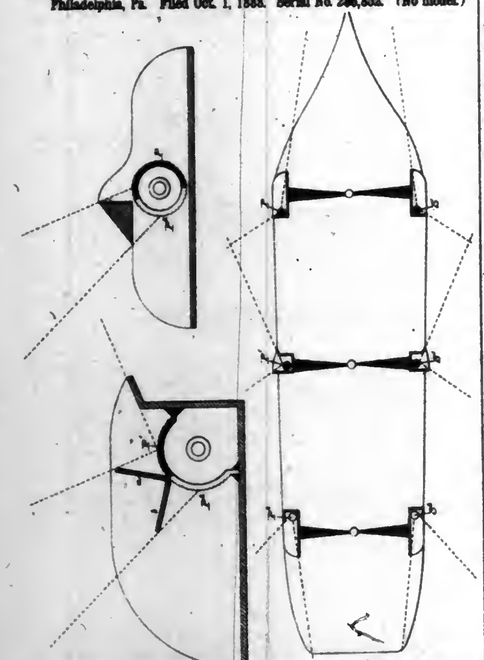
2. In a sled, the runners, the braces D, having T-shaped heads, and the head-blocks clipped thereto, in combination with the axle-tree having rounded ends fitted to rotate in said heads, the cap-plates on the outside of the heads between the clips, and the headed bolts passing through said plates into the ends of the axle-tree and holding the runners in place, substantially as described.

3. In a sled, the runners, the braces D, and the head-blocks clipped thereto, in combination with the axle-tree mounted to rotate in said boxes and provided with the lower fifth-wheel plate and king-bolt, the bolster swiveled on said bolt and carrying the upper fifth-wheel plate, the plate or connection K, secured to the bolster and provided with a rounded or cylindrically-formed rear end, and a reach secured thereto and having a grooved under face for said end, whereby said reach is permitted to turn thereon, substantially as described.

4. The runners, the oscillating axle-tree, the head-blocks, and the braces to which the latter are clipped, in combination with the pole or shaft having the tubular sockets A, the brace-rods G G', extending beyond the front of the runners, the bolts passing through the ends

of said rods and the tubular sockets, whereby the pole is pivotally secured, and the adjusting-nuts on said bolts, substantially as described.

395,880. SIGNAL-LIGHT FOR VESSELS. JOSEPH W. COULSTON, Philadelphia, Pa. Filed Oct. 1, 1888. Serial No. 286,852. (No model.)



Claim.—1. The combination, in signal-lights for vessels, of colored port and starboard lights, with a white warning or object light visible from dead astern and from a number of points to port or starboard of dead astern, but shielded from view from a point within the range of the said port and starboard lights, all substantially as specified.

2. The combination, in signal-lights for vessels, of colored port and starboard lights, with white supplementary side lights constituting warning or object lights visible from dead astern and from a number of points to port or starboard of dead astern, but shielded from view from all points within the range of the colored port and starboard lights, all substantially as specified.

3. The combination, in signal-lights for vessels, of the usual colored port and starboard lights, colored supplementary side lights visible through a range including a number of points to port or starboard, respectively, and one or more white warning or object lights visible from dead astern and through a range including a number of points to port and starboard of dead astern, but shielded from view from all points within the range of the colored port and starboard lights, all substantially as specified.

4. The within-described compound side light, consisting of a single lantern-box having a colored side light and a white warning or object light, the latter being visible from dead astern and from a number of points to port or starboard of dead astern, but shielded from view from all points in the range of the colored side lights, all substantially as specified.

5. The combination of the single lantern-box having a colored side light visible to port or starboard, and a white warning or object light visible from dead astern and from a number of points to port or starboard of dead astern, with adjustable shields for governing the range of said colored and object lights, all substantially as specified.

395,881. LINE-CARRYING ROCKET. PATRICK CUNNINGHAM, New Bedford, Mass., assignor to the American Carrier Rocket Company, same place. Filed Nov. 30, 1887. Serial No. 256,502. (No model.)



Claim.—1. The combination, with the charge-carrying tube of a rocket, of a line-carrying tube attached to and supported by the base of the same, said line-carrying tube tapering at its forward end toward the point of connection, as set forth.

2. The combination, of a metal rocket-case, a metal choke, a metal fuse-piece having a central conical deflector formed integral with said fuse-piece, and a surrounding series of diverging vents opening on the rear surface of the fuse-piece.

3. The combination, with the explosive-carrying tube provided with a perforated disk, D, at its rear end, of a line-carrying tube attached to said disk and entirely in the rear of the same, substantially as set forth.

4. A line-carrying rocket consisting of a head containing the rocket-charge, the base of the head being provided with an external screw-threaded projection, in combination with a carrying-tube having a tapering head engaging with said screw-threaded projection, as set forth, and containing a coiled line to be paid out as the rocket passes through the air, substantially as shown and described.

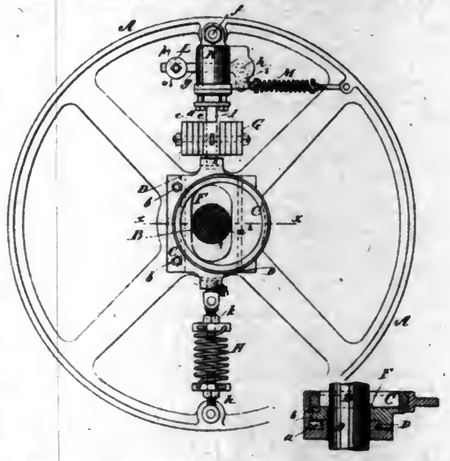
5. The combination, with the firing-head, of a hollow line-carrying tube, said tube being substantially the same diameter as the head, and being connected with said head at the center of the base thereof, the extremity of the carrying-tube next to the firing-head tapering at an angle nearly coincident with the vents for the propelling-gases in the base of said head, substantially as shown and described.

6. In a rocket of the character herein specified, a hollow line-carrying tube forming the tail of the rocket, said tube consisting of a body, H, screw-threaded at *g* for engaging with a tapering cap, G, cap G provided with internal cross-bar, G′, said cap having a screw-threaded perforation therein for engaging with the projection from the base of the head carrying the firing-charge, substantially as shown and described.

7. The combination, with the body A, carrying the firing-charge, of the plug D, having perforations *d* passing therethrough at an angle to its axis, external screw-threaded projection, E, and the line-carrying tube engaging with said projection, substantially as shown and described.

8. The combination of an explosive-carrying tube, a line-carrying tube attached thereto, a line located within said latter tube, and a non-conducting jacket or casing between said line-carrying tube and said line, for the purpose set forth.

395,882. GOVERNOR FOR ENGINES. DAVID P. DAVIS, Allendale, N. J. Filed Aug. 4, 1888. Serial No. 281,936. (No model.)



Claim.—1. In a governor for engines, the combination of an eccentric operating the cut-off mechanism, capable of variable adjustment of its center to or from the axis of the shaft, with a liquid-confined locking-piston connected with said eccentric and adapted to hold the same against displacement during rotation or to release the eccentric by release of the liquid confining said piston.

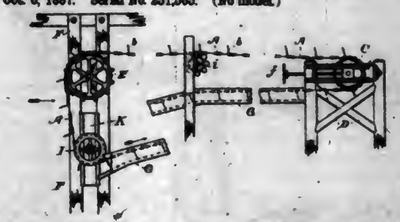
2. In a governor for engines, the combination of an eccentric operating the cut-off mechanism, capable of variable adjustment of its center to or from the axis of the shaft, with a liquid-confined locking-piston connected with said eccentric, check-valves normally opposing the escape of the liquid confined upon either side of said piston, and an automatic check-valve-tripping mechanism, consisting, substantially, of a centrifugally-operated weighted lever, a retracting-spring, and a tripping cam or toe operated by said weighted lever and spring to release the confined liquid, in the manner set forth.

3. The combination, with an eccentric transversely movable in parallel guideways for the adjustment of its center at variable distances from the axis of the shaft, of the herein-described liquid-confined locking-piston, liquid-releasing valves, centrifugal valve-operating weight, and counteracting spring, adapted as and for the purposes herein set forth.

4. The combination, with an eccentric swiveled upon a fulcrum aside from its center to move transversely for the adjustment of its center at variable distances from the axis of the shaft, of the herein-described liquid-confined locking-piston, liquid-releasing valves, centrifugal valve-operating weight, and counteracting spring, adapted as and for the purposes herein set forth.

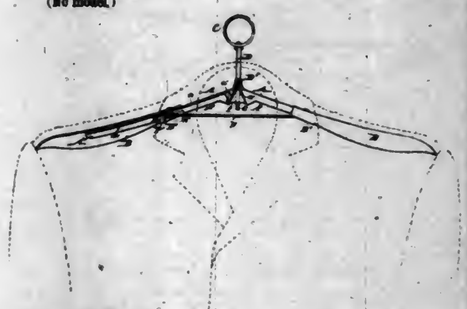
5. The combination, with an eccentric transversely movable for the adjustment of its center at variable distances from the axis of the shaft, a centrifugal eccentric moving weight, as G, and a retracting-spring, as H, of the herein-described liquid-confined locking-piston, liquid-releasing valves, centrifugal valve-operating weight, and counteracting spring, all adapted as and for the purposes set forth.

395,883. CHAIN CONVEYER. JAMES M. DODGE, Philadelphia, Pa., assignor to The Ewart Manufacturing Company, of Illinois. Filed Oct. 6, 1887. Serial No. 251,565. (No model.)



Claim.—In a chain conveyer of the type shown and described, the combination of the following instrumentalities, to wit: first, the endless chain A, provided with the usual flights, *b*; second, the stationary driving sprocket-wheel E and the adjustable driven sprocket-wheel C, around which said endless chain passes; third, the usual conveyer-trough, G, arranged or located to permit the action therein of the flights of the lower run of the chain; and, fourth, the automatic or gravitating take-up sprocket-wheel I, arranged beneath the driving-wheel within the double run of the flighted conveyer-chain and in the vicinity of the point of co-operation between the flights and the trough, the said instrumentalities all arranged and operating together substantially in the manner and for the purposes hereinbefore set forth.

395,884. FOLDING HANGER FOR GARMENTS. GEORGE H. DONALDSON, New York, N. Y. Filed Aug. 31, 1888. Serial No. 284,246. (No model.)

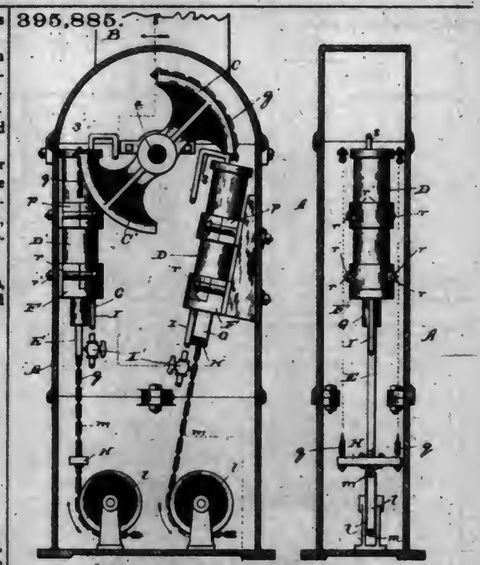


Claim.—1. In a folding hanger for garments having sections capable of sliding to adjust the width, the screws M, rigidly fixed to the sliding sections B, in combination with the nuts P and slotted main sections A *a*, arranged for joint operation, as herein specified.

2. In a folding hanger for garments, the slotted main sections A *a*, sliding sections B, screws M, set in the latter, and nuts P, having large heads P′, in combination with each other and with the spring-loop W, all arranged to serve as herein specified.

395,885. GATE. WILLIAM P. ELLIOTT and ARTHUR FARRAR, Chicago, Ill. Filed Jan. 31, 1887. Serial No. 226,957. (No model.)





Claim.—1. In a gate having a vertically-swinging bar on a post, and a cylinder having its piston connected with the bar on one side of the axis thereof, to actuate the same by fluid-pressure introduced against one side of the piston, the combination, with the cylinder, of a cap, F, having a hollow extension, G, forming a guide for the piston-rod, a valved air-inlet, *o*, and a controllable discharge-outlet, *n*, substantially as and for the purpose set forth.

2. In a gate having a vertically-swinging gate-bar on a post, and a cylinder having its piston connected with the bar on one side of the axis thereof, to actuate the same by fluid-pressure introduced against one side of the piston, the combination, with the cylinder and gate-bar, of a cap, F, having a hollow extension, G, forming a guide for the piston-rod, a cross-head, H, on the piston-rod, and a pulley-section on the axis of the gate-bar, recessed on its periphery and connected on opposite sides of its recess with the cross-head H, substantially as and for the purpose set forth.

3. In a gate having a vertically-swinging bar on a post, and a cylinder having its piston connected with the bar on one side of the axis thereof, to actuate the same by fluid-pressure introduced against one side of the piston, the combination, with the cylinder on the opposite side of the piston, of a valved air-inlet, *o*, and a controllable discharge-outlet, *n*, and, on the side of the piston against which the pressure is introduced, of an adjustable valve device, K, substantially as and for the purpose set forth.

4. In a gate having a vertically-swinging bar on a post and actuated by fluid-pressure introduced against a piston in a cylinder and connected with the gate-bar, means for connecting the piston with the gate-bar, comprising a recessed pulley or pulley-section on the gate-bar axis and a cross-head, H, on the piston-rod, connected near opposite ends with the recessed pulley or pulley-section, substantially as and for the purpose set forth.

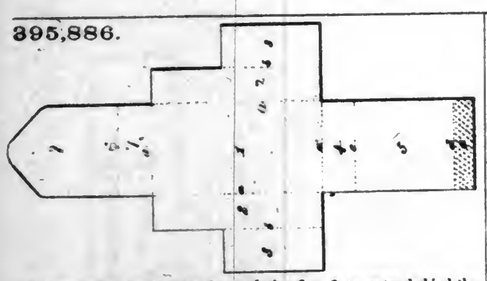
5. In a gate having a vertically-swinging bar on a post and actuated by fluid-pressure introduced against a piston in a cylinder, and connected with the gate-bar, the combination, with the gate-bar and cylinder, of a cap, F, having a guide-extension, G, for the piston-rod, a cross-head, H, on the piston-rod, and a recessed pulley or pulley-section on the gate-bar axis, connected with the cross-head H near its opposite ends, substantially as and for the purpose set forth.

395,886. PAPER BOX. WILLIAM H. EMERY, Brooklyn, N. Y., assignor to Charles G. Emery, same place. Filed June 21, 1888. Serial No. 277,731. (No model.)

Claim.—1. A paper box consisting of the back 1, the sides 2, having short flaps 3, bent toward each other in front, the bottom end, 4, provided with the short front 5, turned up and having its top end bent around the upper portion of the short flaps and fastened thereto, and the top closing end, 7, having the closing-flap 8 to pass down behind the short flaps and front, substantially as described.

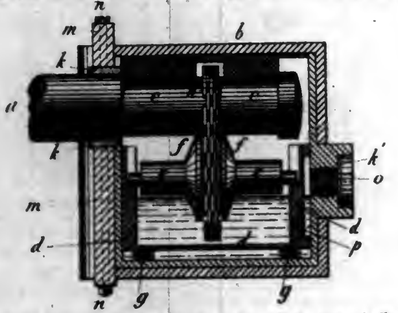
2. A paper box consisting of the back 1, the sides 2, having the short flaps 3, bent toward each other in front, the bottom end, 4, provided with the short front 5, turned up outside the short flaps and secured thereto to form a permanent short front wall, and the top

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closing end, 7, having the front closing-flap, 8, to enter behind the permanent short front wall, substantially as described.

395,887. CAR-AXLE LUBRICATOR. THOMAS F. H. FINCH, Worcester, County of Worcester, England. Filed Oct. 9, 1888. Serial No. 287,615. (No model.) Patented in England Nov. 7, 1887, No. 15,147.



Claim.—The combination of the axle-box *b*, the internal oil-carrying box, *d*, having the side oil-inlet opening, *p*, and carrying a loosely-journaled grooved wheel, *f*, revolving in superficial contact with the under side of the axle to supply the same with lubricant, the flexible chain *h*, passing around the grooved part of the wheel and over the axle to supply the uppermost portions of the latter with lubricant, and springs *g*, pressing the internal box upward, all substantially as shown and described.

395,888. METHOD OF FORMING METAL BLANKS FOR CAPPING NAILS. HENRY P. FISKE, Waterbury, Conn., assignor to the American Ring Company, same place. Filed June 25, 1888. Serial No. 278,123. (No model.)



Claim.—The method herein specified of forming metal blanks, the same consisting in cutting a piece of metal by suitable dies from a strip or sheet of metal which is narrower in width than the finished blank, and then compressing the blank and forming a circular rib upon one surface and simultaneously spreading the metal laterally to fill the die, substantially as specified.

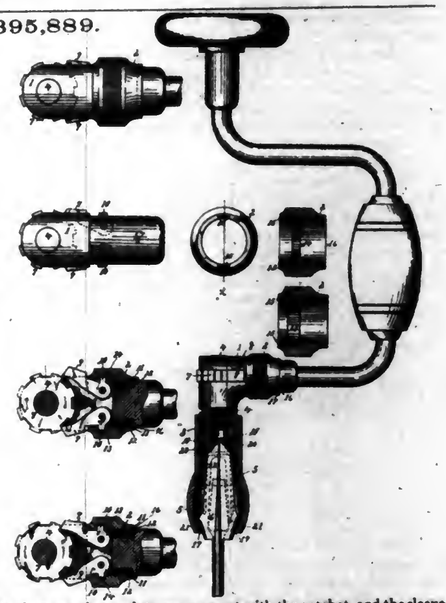
395,889. RATCHET-BRACE. JOHN S. FRAY, Bridgeport, Conn. Filed July 14, 1888. Serial No. 279,933. (No model.)

Claim.—1. In a brace, the combination, with the ratchet, of pivoted dogs adapted to engage opposite sides thereof and having lugs 10, and a sleeve having grooves 13, 14, and 15, adapted to be engaged by said lugs, whereby either dog may be lifted out of engagement with the ratchet, as and for the purpose set forth.

2. The ratchet, and the dogs having lugs 10, in combination with a sleeve having longitudinal grooves 15, and wide and narrow circumferential grooves on opposite sides thereof, whereby when either lug is caused to engage the narrow groove that dog is lifted out of engagement with the ratchet, but when neither lug is in engagement with the narrow groove both dogs are free to engage the ratchet.

3. The combination, with the ratchet, and dogs pivoted in the horizontal plane thereof, and having lugs 10, of springs 11, whereby

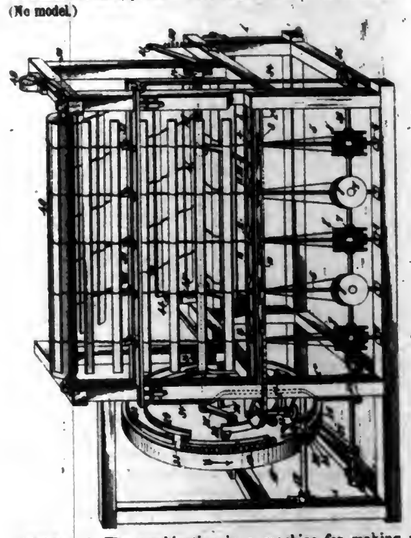
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the dogs are thrown into engagement with the ratchet, and the sleeve having wide and narrow circumferential grooves adapted to be engaged by said lugs, whereby either dog may be lifted out of engagement with the ratchet.

4. The stock having a pin, 17, the ratchet, and the dogs having lugs 10, in combination with the sleeve having cut-out portion 16, the ends of which are engaged by said pin to limit the oscillation of the sleeve, and wide and narrow grooves which are engaged by said lugs.

395,890. MACHINE FOR MAKING WIRE FENCING. LEANDER W. FREEMAN, Liberty, Ind. Filed May 17, 1888. Serial No. 274,162. (No model.)



Claim.—1. The combination, in a machine for making wire fencing, of a series of twister-heads having sprockets, a shaft having a sprocket-wheel and a bevel-gear, an endless belt connecting the sprocket-wheel with the sprockets of the twister-heads, a shaft having a pinion and a bevel-gear engaging the gear on the sprocket-wheel shaft, and a master-wheel having teeth to intermittingly rotate said pinion, substantially as described.

2. The combination, with a revolving master-wheel, of a series of twister-heads, rising and falling supports having spring-grippers, a spacing-shaft having arms or fingers, and means, substantially as described, for intermittingly rotating the twister-heads, intermittingly

raising the gripper-supports, and intermittingly rocking the spacing-shaft by the revolution of the master-wheel.

3. The combination, in a machine for making fences, of a series of twister-heads having sprockets, a shaft having a bevel-gear and a sprocket-wheel, an endless belt engaging the sprocket-wheel and alternately passing in front of and behind the sprockets of the twister-heads, a shaft having a pinion and a bevel-gear engaging the bevel-gear on the sprocket-wheel shaft, and a master-wheel having a segmental toothed flange for intermittingly rotating the said pinion, substantially as described.

4. The combination, in a machine for making wire-fencing, of a series of twister-heads having sprockets, a shaft having a sprocket-wheel and a bevel-gear, an endless belt connecting the sprocket-wheel with the sprockets on the twister-heads, a shaft having a concave stop-plate, a pinion and a bevel-gear engaging the gear on the sprocket-wheel, a master-wheel having a segmental toothed flange to intermittingly rotate the pinion, and a flange extending around the master-wheel and terminating at a short distance from the ends of the toothed flange, substantially as described.

5. The combination, with the intermittingly rotating twister-heads and a master-wheel having a cam-flange, of a spacing-shaft having arms or fingers and a crank-arm intermittingly operated by the cam-flange for turning the shaft to depress the arms or fingers, and a spring for turning the shaft to elevate the arms or fingers, substantially as described.

6. The combination, with intermittingly rotating twister-heads, of a master-wheel having a cam-flange on its inner vertical face, a spacing-shaft having at one end a crank-arm provided with a roller-stud operated by the cam-flange, a spring, and a crank-arm on the spacing-shaft connected with the spring, substantially as described.

7. In a machine for making wire fencing, the combination, with the twisting mechanism, of a feed for the completed web, consisting of a reciprocating support having cam-faced grippers pivotally mounted thereon, between which the web passes, substantially as described.

8. In a machine for making wire fencing, the combination, with the twisting mechanism, of a feed for the completed web, composed of a reciprocating support having cam-faced spring-actuated grippers pivotally mounted thereon, pitmen actuating the support, and a shaft vibrating the pitmen, said shaft having a crank-arm provided with a roll engaging a cam-flange on the outer vertical face of the master-wheel, substantially as described.

9. The combination, in a machine for making wire fencing, of intermittingly-rotating twister-heads and a support for said twister-heads, with guides for the palings consisting of elastic plates connected at one end with said support and having their other ends converged toward the respective twister-heads, substantially as described.

395,891. RAILWAY-SWITCH STAND. GEORGE F. GAGE, Huntingdon, Pa. Filed Oct. 19, 1888. Serial No. 288,529. (No model.)



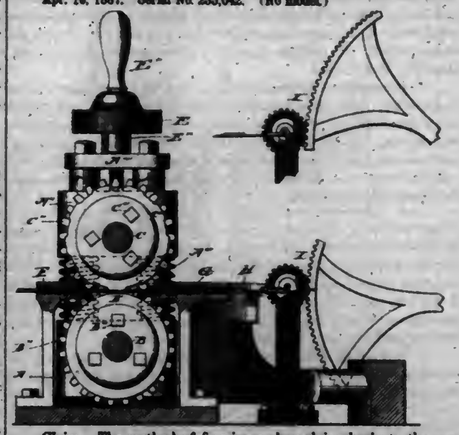
Claim.—1. The combination, with the main-track and the switch rails, of the operating mechanism for said switch-rails, and a weight loosely sleeved to slide on the operating-lever, substantially as and for the purpose specified.

2. The combination, with the main and switch rails, of the operating-lever carrying at one end a pinion, a pinion connected with the switch-rails and meshing with said pinion, and a weight loosely sleeved to slide on the operating-lever, the movement of the weight being limited by a stop arranged near the free end of the lever, substantially as shown and described, and for the purpose specified.

3 The combination, with the main and switch rails, of the arm pivotally connected with the switch-rails, the segmental pinion pivoted within journals secured to one of the cross-ties and secured to said arm, the operating-lever, fulcrumed as described, the segmental pinion on said lever and meshing with the aforesaid pinion, and a weight free to slide on said lever, its movement being limited by a stop near the free end of the lever, substantially as and for the purpose specified.

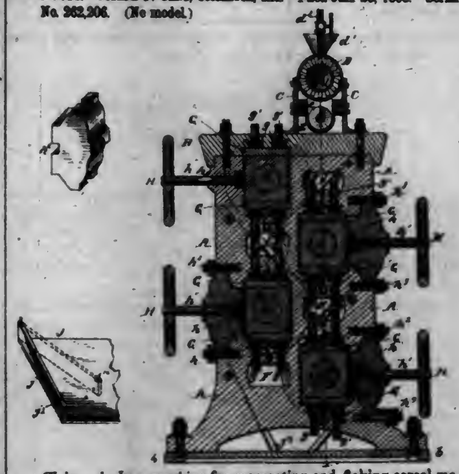
4. The combination, with the main and switch rails, of the cross-arm connecting said switch-rails, the arm pivotally connected thereto, the segmental pinion pivoted within journals secured to one of the cross-ties and secured to said arm, the operating-lever, the segmental pinion thereon, the pivotal connection between said arm and the first-mentioned pinion, and a weight loosely sleeved on said lever and free to slide thereon, substantially as and for the purpose specified.

395,892. PROCESS OF FORMING FENCE-WIRE BARBS. WILLIAM GENT, Rockford, assignor to Hiram Ellwood, De Kalb, Ill. Filed Apr. 16, 1887. Serial No. 235,042. (No model.)



Claim.—The method of forming and applying barbs to the supporting-wires in wire fencing, which consists in flattening the round wire from which the barbs are to be formed at certain intervals throughout its length, then coiling the same at the foremost flattened portion around the supporting-wire, and simultaneously or subsequently severing the wire at the round portion between the flattened parts by a diagonal cut to form the barbs, and continuing the operation, substantially as described.

395,893. MACHINE FOR MAKING SHEET OR FLAKE PRODUCTS. JOSEPH F. GENT, Columbus, Ind. Filed Jan. 26, 1888. Serial No. 262,206. (No model.)



Claim.—1. In a machine for macerating and flaking cereal materials, the combination, with the compressing-rollers, of the feeding device therefor, consisting of a cylinder having a feed-opening at the top at one end and a discharge-opening at the bottom at the opposite end, a trough having a series of fine perforations in the bottom of the same beneath the cylinder, a stirring device for said cylinder, and a conveyer for said trough, the said stirring device being adapted to move the material from its feed-opening to its discharge-opening, and the conveyer adapted to move the material in the opposite direction, substantially as described.

2. In a machine for macerating and flaking cereal materials, the combination, with the compressing-rollers, of the feeding device therefor, consisting of a cylinder having a feed-opening at the top at one end and a discharge-opening at the bottom at the opposite end, and steam and water inlet pipes, a trough having a series of fine perforations in the bottom of the same beneath the cylinder, a stirring device for said cylinder, and a conveyer for said trough, the said stirring device being adapted to move the material from its feed-opening to its discharge-opening, and the conveyer adapted to move the material in the opposite direction, substantially as described.

3. In a machine for macerating and flaking cereal materials, the combination, with the supporting-frame and the rollers, the said frame being provided with recesses in different horizontal and vertical planes and having bearings for the rollers in said recesses, of adjusting-screws mounted in said frame engaging the bearings above and below the same, whereby the vertical adjustment of said rollers is secured, substantially as described.

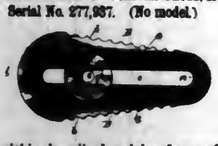
4. In a machine for macerating and flaking cereal materials, the combination, with the supporting frame and rollers, the said frame being provided with bearing-recesses and recesses above and below said bearing-recesses, of bearings for the rollers within said bearing-recesses, and screws above and below each of said bearings extending into the recesses of the frame above and below the bearing-recesses, substantially as described.

5. In a machine for macerating and flaking cereal materials, the combination, with the main frame provided with open bearing-recesses in different horizontal and vertical planes, said recesses opening on opposite sides of the frame, of movable bearings in said recesses, rollers mounted in said bearings, castings detachably secured to the main frame and closing the open side of said bearing-recesses, and screws passing horizontally through said castings and impinging against said bearings, substantially as described.

6. In a machine for macerating and flaking cereal materials, the combination, with the main frame having a bearing-recess open on one side of the same, and recesses above and below said bearing-recess, of a bearing in said bearing-recess, screws above and below said bearing, extending into the recesses above and below said bearing-recess and engaging the bearing, a casting detachably secured to the frame and closing the open side of the bearing-recess, and a screw passing through said casting and engaging said bearing, substantially as described.

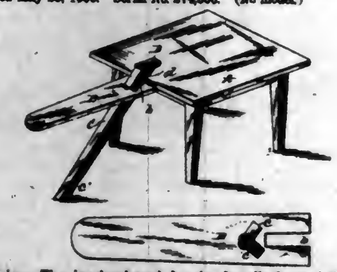
7. In a machine for macerating and flaking cereal materials, the combination, with the compressing-rollers, of a feeding-chute for the same, having the upper ends of its side pieces pivoted near the upper edge of the chute, and the free ends adapted to be secured at different points adjacent to the lower edge of the same, whereby the width of the delivery edge of the said chute can be regulated, substantially as described.

395,894. SASH-HOLDER. JOHN M. GRUBB, Ironton, Ohio. Filed June 22, 1888. Serial No. 277,937. (No model.)



Claim.—The within-described article of manufacture, consisting of a window-sash holder having semicircular ends of different diameters, a central longitudinal slot, *c*, the raised parallel internal side walls, *a a*, the corrugated external walls, *b*, converging toward the smallest end of the holder, and a wheel, C, adapted for use between the said walls *a a*, as specified.

395,895. IRONING-BOARD. BENJAMIN GUDE, St. Anthony, Ind. Filed May 23, 1888. Serial No. 274,868. (No model.)

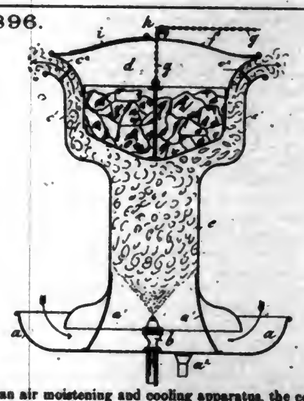


Claim.—The ironing-board herein described, consisting of the board having a longitudinal slot and buttons *c c*, and the standard C, having notches *d d* on opposite sides, all combined and arranged to operate substantially as shown and described, and for the purpose set forth.

395,896. APPARATUS FOR MOISTENING AND COOLING AIR. HERMANN D. R. GONTOW, Vienna, Austria-Hungary, and MAXIMILIAN A. LUTHER, Berlin, Germany. Filed July 7, 1888. Serial No. 279,227. (No model.)

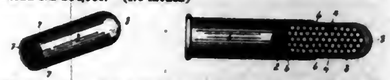
Claim.—1. In an air moistening and cooling apparatus, the combination, with an air-conductor, of a vertically-adjustable vessel in the outlet-opening of the conductor, said adjustable vessel having its bottom beveled from the center upward and outward, substantially as herein shown and described.

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2. In an air moistening and cooling apparatus, the combination, with a casing or shell, of a vertically-adjustable receptacle in the upper part of the same, said receptacle having its under side beveled upward and outward, and a cover above said receptacle, the edge of said cover and the top edge of the shell forming an outlet-opening for the moistened air, substantially as herein shown and described.

395,897. SHOT-CARTRIDGE. MARCELLUS HARTLEY, New York, N. Y., and ALFRED J. HOBBS, Bridgeport, Conn., assignors to the Union Metallic Cartridge Company, Bridgeport, Conn. Filed Sept. 6, 1888. Serial No. 284,689. (No model.)

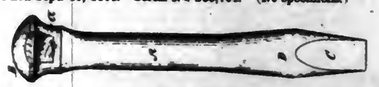


Claim.—1. A shot-cartridge consisting of a metallic shell and a wooden shot-case bored out to form a chamber for the shot, the walls of said chamber being thickest at the forward end, the edge of the shell being crimped upon and pressed into the wood of the shot-case, whereby the latter is held firmly in place.

2. A shot-cartridge consisting of a metallic shell and a wooden shot-case bored out to form a chamber for the shot and having exterior longitudinal grooves, for the purpose set forth, the edge of the shell being crimped into the wood of the shot-case, thereby holding the shot-case firmly.

3. A wooden shot-case for cartridges, having a solid strengthening portion at its forward end, and exterior longitudinal grooves, as and for the purpose set forth.

395,898. RAILROAD-SPIKE. HAYWARD A. HARVEY, Orange, N. J. Filed Sept. 19, 1888. Serial No. 285,791. (No specimens.)



Claim.—1. As a new article of manufacture, a rolled and headed metallic spike provided with a chisel-point the width of the cutting-edge of which is slightly less than the diameter of the adjacent round portion of the shank.

2. A rolled and headed metallic spike having the portion of its shank adjacent to the head enlarged in diameter and having a chisel-point the width of the cutting-edge of which is slightly less than the diameter of the smaller part of the shank.

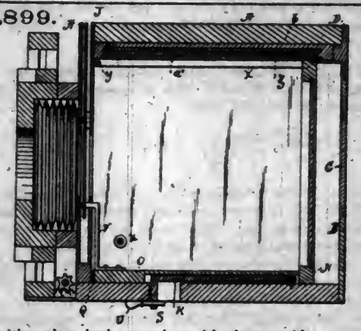
3. A rolled and headed metallic spike having the portions of its shank respectively adjacent to its head and point larger than the intermediate portion of its shank and provided with a relatively narrow chisel-point, substantially as and for the purpose set forth.

395,899. PHOTOGRAPHIC CAMERA. SYDNEY P. HASEY, New York, N. Y. Filed June 19, 1888. Serial No. 277,507. (No model.)

Claim.—1. The combination, in a detective camera, of a spring-actuated shutter, a movable ground-glass-holding frame provided with a catch which holds the frame in its forward position in the camera, a swinging frame which holds the sensitive plate, a holding device for the shutter, and a support for the frame of the sensitive plate, constructed and arranged to release the shield and the sensitive plate, respectively, by the rearward movement of the ground-glass-holding frame, substantially as set forth.

2. The combination, in a detective camera, of a spring-actuated shutter, a movable spring-actuated ground-glass-holding frame provided with a catch which holds the frame in its forward position against the action of its spring, a swinging frame for the sensitive plate, a holding device for the shutter, and a support for the frame of the sensitive plate, both engaging with the movable parts of the ground-glass-holding frame and constructed and arranged to release the shutter and the sensitive plate on the rearward movement of the ground-glass-holding frame, substantially as set forth.

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3. The combination, in a detective camera, of a spring-actuated shutter, a movable spring-actuated ground-glass-holding frame provided with a catch which holds the frame in its forward position against the action of its spring, a trigger operated from the exterior of the camera, which releases the catch of the ground-glass frame, a swinging frame for the sensitive plate, and a holding device for the shutter and a support for the frame of the sensitive plate, both engaging with the movable parts of the ground-glass frame and constructed and arranged to release the shutter and the frame of the sensitive plate on the rearward movement of the ground-glass frame, substantially as set forth.

4. The combination, in a detective camera, of a spring-actuated shutter, a movable ground-glass-holding frame provided with a catch which holds the frame in its forward position in the camera, a swinging frame which holds the sensitive plate, a holding device for the shutter, and a support for the frame of the sensitive plate constructed and arranged to release the shutter and the sensitive plate, respectively, by the rearward movement of the ground-glass-holding frame, and a stop for the shutter automatically operated by the falling of the sensitive plate, substantially as set forth.

5. The combination, in a detective camera, of a spring-actuated shutter, a movable spring-actuated ground-glass-holding frame provided with a catch which holds the frame in its forward position against the action of its spring, a swinging frame for the sensitive plate, a holding device for the shutter and a support for the frame of the sensitive plate, both engaging with the movable parts of the ground-glass-holding frame and constructed and arranged to release the shutter and the frame of the sensitive plate on the rearward movement of the ground-glass-holding frame, and a stop for the shutter automatically operated by the falling of the sensitive plate, substantially as and for the purposes set forth.

6. The combination, in a detective camera, of a spring-actuated shutter, a movable spring-actuated ground-glass-holding frame provided with a catch which holds the frame in its forward position against the action of its spring, a trigger operated from the exterior of the camera which releases the catch of the ground-glass frame, a swinging frame for the sensitive plate, a holding device for the shutter and a support for the frame of the sensitive plate, both engaging with the movable parts of the ground-glass frame and constructed and arranged to release the shutter and the frame of the sensitive plate on the rearward movement of the ground-glass frame, and a stop for the shutter automatically operated by the falling of the sensitive plate, substantially as set forth.

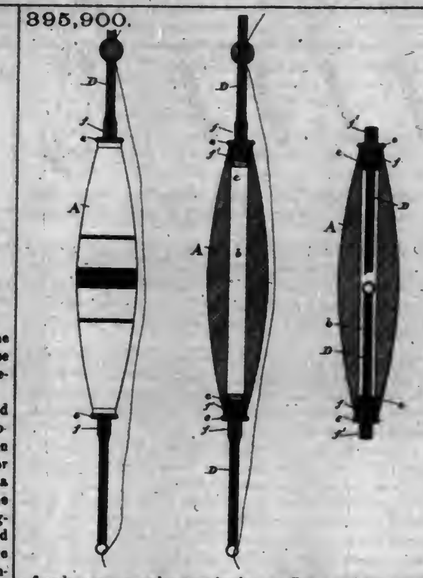
7. The combination, in a detective camera, of a spring-actuated shutter, a movable ground-glass-holding frame, a swinging frame for the sensitive plate, a holding device for the shutter and a support for the frame of the sensitive plate, both engaging with the movable parts of the ground-glass-holding frame and constructed and arranged to release the shutter and the frame of the sensitive plate on the rearward movement of the ground-glass-holding frame, and a stop for the shutter automatically operated by the falling of the sensitive plate, substantially as set forth.

395,900. FLOAT FOR FISHING-LINES. EDWARD J. HAYES and JOHN T. OGIER, Baltimore, Md. Filed June 23, 1888. Serial No. 278,045. (No model.)

Claim.—1. A float for fishing-lines, having a cavity and provided at its end with a reversible stem coupled to the float, whereby when the float is in use on a bait-line the stem may be attached and when not in use the stem may be inserted in the cavity.

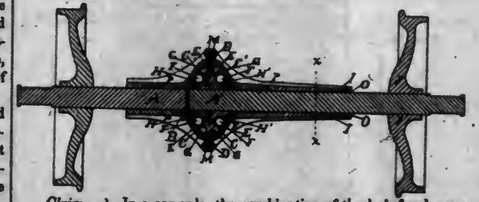
2. The combination of a float-body having a cavity provided with

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a female screw, *c*, and a stem having a collar, *e*, and two screw-couplings, one each side of said collar, for the purpose set forth.

395,901. CAR-AXLE. WILLIAM HAYES, Los Angeles, Cal. Filed May 18, 1888. Serial No. 274,283. (No model.)



Claim.—1. In a car-axle, the combination of the hub fixed upon the severed end of one section of the divided axle, the case fixed upon the severed end of the other section of the axle and inclosing the hub and leaving on each side of the hub, between it and the case, an annular chamber, the cross-section of which tapers from the inside of the annular chamber toward the periphery thereof, and anti-friction rollers within the chambers larger in cross-section than the cross-section of the outer edge of the annular chamber.

2. The combination of the hub L, fixed upon the severed end of one section of the divided axle, the case C C', fixed upon the severed end of the other section of the divided axle, inclosing the hub and leaving an annular chamber, E, upon each side of the hub between it and the walls of the case, and the balls F G within the chambers.

3. The combination of the sections A A' of the axle, the case C C', provided with the annular ribs H H', the hub L, and the balls F G.

4. The combination of the sections A A' of the axle, the case C C', provided with the axial opening O and the peripheral openings N, the hub L, and the balls.

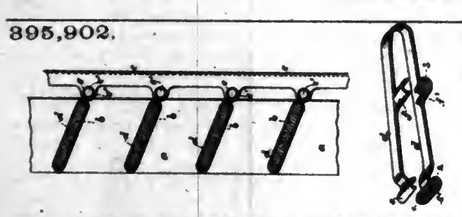
5. The combination of the sections A A' of the axle, the case C C', provided with the sleeve I, the hub L, and the loose balls within the chamber E.

6. In a car-axle, anti-friction rollers confined in chambers, the cross-section of which, taken on line of the axle, tapers outward from the axle, such chambers being located upon opposite sides of a hub fixed upon one of the severed ends of the axle and surrounded by a case fixed upon the other severed end of the axle, the hub, and the case forming the walls of each chamber, whereby the centrifugal force induced by the rotation of the axle projects the loose bodies into the narrower portion of the chamber and preserves contact between the hub and the case.

395,902. WINDOW-BLIND. ALLEN P. HEIDT, New York, N. Y. assignor to himself and Joseph C. Divine, same place. Filed Aug. 2, 1888. Serial No. 281,757. (No model.)

Claim.—1. A fastening device for slats, consisting of a metal strap, *d*, adapted to pass around the slat, laterally-projecting pivotal

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ends *c c'*, formed with said strap *d*, and a vertical bar, *c*, having openings for receiving the ends *e e'*, substantially as and for the purposes set forth.

2. A fastening device for slats, consisting of a metal strap, *d*, adapted to pass around the slat, half-round pivotal jaw ends *c c'* upon the ends of said strap, which ends are of greater length than the width of the strap, and a vertical U-shaped bar, *c*, having bearings *e'* adapted to receive the ends *e e'*, substantially as and for the purposes set forth.

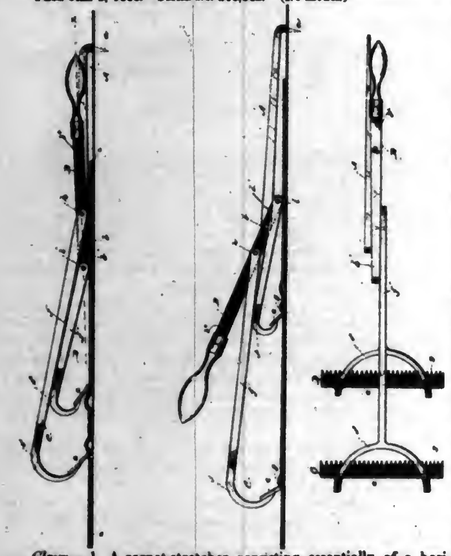
3. The combination, with the shutter-frame *a*, slats *b*, and vertical bar *c*, of the metal strap *d*, adapted to surround the slat and having pivotal bearings *f f'* to pass into holes in the frame and cause a friction between the respective parts, so as to hold the slats in any desired position, substantially as set forth.

4. A friction device for blind-slats, consisting of a metal strap, *d*, to pass around the slat, pivotal jaw ends *c c'*, and pivotal bearings *f f'*, substantially as and for the purposes set forth.

5. The combination, with the blind-slat *b* and the bar *c*, of the metal strap *d*, to be passed around the slat and having pivotal ends to be brought together to form a connection with the vertical bar, whereby a friction is caused at the pivot from the spring of the ends of the strap, substantially as specified.

6. The combination, with the blind-slat and the metal strap passing around the same and having pivotal ends, of a U-shaped vertical metallic bar having holes for the reception of the pivotal ends of the strap, substantially as specified.

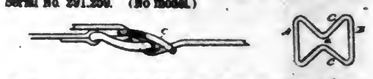
395,908. CARPET-STRETCHER. BURTON HOLDEN, Geneva, Ohio. Filed Jan. 5, 1888. Serial No. 260,012. (No model.)



Claim.—1. A carpet-stretcher consisting, essentially, of a horizontal fulcrum-bar having a depending tooth or spur for insertion into the floor to hold said bar in a fixed position, a lever pivoted at an intermediate point of its length to the horizontal fulcrum-bar, and the oppositely-movable toothed claws pivoted to the lever at equidistant points on opposite sides of the fulcrum of the lever, substantially as described, for the purpose set forth.

2. A carpet-stretcher consisting, essentially, of a fulcrum-bar provided with means for fixing the same in a stationary position to a floor, a hand-lever pivoted at an intermediate point of its length to the fulcrum-bar and adapted to fold close thereto, and the oppositely-movable claws pivoted to the lever at equidistant points on opposite sides of the fulcrum thereof, the pivots of said claws and the fulcrum of the lever being relatively located with respect to each other to all fall in a line drawn through the lever and the point of engagement with the carpet of one of the claws when said lever is depressed alongside the fulcrum-bar, substantially as described.

395,904. BUCKLE-GUARD. GEORGE M. HUBBARD, New Haven, Conn., assignor to W. & E. T. Fitch, same place. Filed Nov. 19, 1888. Serial No. 291,259. (No model.)



Claim.—1. The herein-described buckle-guard, consisting of the ends parallel with each other, connected by two sides, the said two sides bent inward midway of their length and toward each other, and longitudinally concavo-convex, substantially as described.

2. A buckle-guard made from wire bent to form two ends, A B, parallel with each other, and connecting sides C C, the said sides bent inward and toward each other, the two ends of the wire brought together upon one end of the frame and formed longitudinally concavo-convex, substantially as described.

395,905. CLEANER FOR SLATES, BLACKBOARDS, &c. NICHOLAY JENNES, Washington, D. C. Filed June 2, 1888. Serial No. 275,858 (No model.)



Claim.—1. A cleaner for slates, blackboards, glass, and like articles, consisting of receptacles for containing a liquid-supply and for drying material, said liquid-receptacle being composed of elastic material and provided with an opening normally closed by the tension of said elastic material, substantially as described.

2. In a cleaner for slates, blackboards, glass, and like articles, the combination, with a liquid-receptacle for containing absorbent material and having an opening for the insertion of the same, of a receptacle adjacent to said liquid-receptacle, the liquid-receptacle being composed of elastic material and provided with a discharge-opening, both of said openings being normally closed by the tension of the elastic material, substantially as described.

3. In a cleaner for slates, blackboards, glass, and like articles, the the combination, with a liquid-receptacle having a thickened bottom portion provided with an aperture the diameter of which is the smallest at its top, of a receptacle for drying material, substantially as described.

4. In a cleaner for slates and other articles, the combination, with an elastic receptacle, complete in itself, of a receptacle for absorbent material, the said receptacles being separable, but connected end to end, substantially as described

5. In a cleaner for slates, blackboards, glass, and like articles, the combination, with a liquid-receptacle composed wholly of elastic material and provided with an elastic flange, of a receptacle for drying material having rigid walls and provided with a diverging flange adapted to be engaged by said elastic flange, substantially as described.

6. In a cleaner for slates, blackboards, glass, and like articles, the combination, with a liquid-receptacle composed of elastic material and provided with a thickened bottom portion having an opening therein for the insertion of absorbent material, and being also provided with an elastic flange, of a receptacle for drying material having rigid walls and provided with a diverging flange adapted to be engaged by said elastic flange, substantially as described.

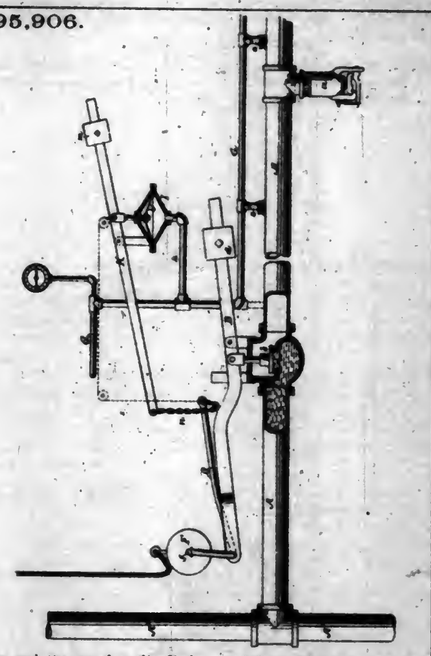
7. A cleaner for slates, blackboards, glass, and like articles, consisting of receptacles for containing a liquid supply and for drying material, said liquid-receptacle being composed of elastic material and provided with absorbent material within the same, substantially as described.

8. A cleaner for slates, blackboards, glass, and like articles, consisting of a liquid-receptacle composed of elastic material and having an absorbent material wholly within the said liquid-receptacle, substantially as described.

395,906. FIRE-EXTINGUISHER. JOHN KANE, Philadelphia, Pa. Filed Oct. 2, 1888. Serial No. 287,701. (No model.)

Claim.—1. The combination of the sprinkler-pipe of a fire-extinguishing system and a valve controlling the flow of water into the same with a valve-lever, a tilting weight-carrier hung thereto and having a weight loosely mounted upon it, whereby the valve is kept closed, an air-pipe having discharge-valves with fusible retainers, a casing communicating with said air-pipe and having a yielding diaphragm or its equivalent, and means whereby the movement of said diaphragm is transmitted to the tilting weight-carrier of the valve-

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lever, and thus causing the discharge of the weight therefrom and permitting the opening of the valve, all substantially as specified.

2. The combination of the sprinkler-pipe, its valve-lever, a tilting weight-carrier pivoted to the latter and having a weight loosely mounted upon it, whereby the valve is held closed, the air-pipe with its casing and diaphragm, and a weighted lever acted on by the stem of the diaphragm and connected to the tilting weight-carrier of the valve-lever, all substantially as specified.

3. The combination of the sprinkler-pipe, its valve and valve-lever, the air-pipe having discharge-valves with fusible retainers, a casing communicating with said air-pipe and having a yielding diaphragm or its equivalent, a lever fulcrumed on the valve-lever and having a forked short arm, a weight having trunnions mounted upon said forked arm, and serving when in position thereon to depress the valve-lever and keep the valve closed, and means whereby the movement of the diaphragm is transmitted to the weight-carrying lever to effect the tilting of the same and the discharge of the weight therefrom, all substantially as specified.

395,907. SEWER-TRAP. WILLIAM KERR, Cleveland, Ohio. Filed Sept. 10, 1888. Serial No. 285,058. (No model.)



Claim.—1. A sewer-trap consisting of a fixed upper section having the inlet and the outlet pipes wholly connected therewith, a detachable lower section, and a diaphragm extending down through the center of the trap near to the bottom of the lower section, substantially as set forth.

2. A sewer-trap consisting of two sections, each section having part of a central vertical diaphragm formed integral therewith and meeting substantially on the line of the joint between the sections, whereby the water entering upon one side of the trap is forced beneath the diaphragm to cross to the other side, substantially as set forth.

3. In a sewer-trap, a stationary upper section having the inlet and outlet pipes of the trap, a detachable lower section, a central diaphragm, a part of which is formed in each section, and arms supported on the upper section and engaging the lower section, whereby said sections are held together, substantially as set forth.

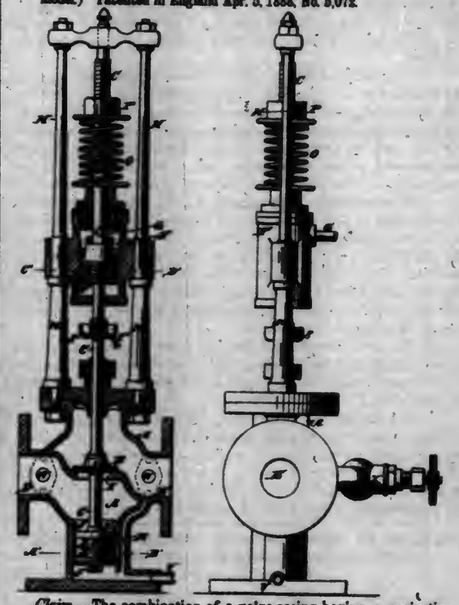
4. A sewer-trap consisting of two sections with a diaphragm, a part of which is formed in each section, a projecting rim on the lower section, and packing around said rim and between the parts of the diaphragm, substantially as set forth.

5. In a sewer-trap formed in two sections, an upper section having a transverse slot, the walls of which form a part of a diaphragm a lower section with a part of a diaphragm therein, the said parts matching each other, and a lock in the transverse slot to hold the lower section in position, substantially as set forth.

6. In a sewer-trap, an upper section having a transverse slot with walls forming a diaphragm, a lower section with a diaphragm immediately beneath the diaphragm in the upper section, and yoke-arms and screw in said slot to support the lower section, substantially as set forth.

7. In a sewer-trap, a cup-shaped detachable section, a fixed upper section having a transverse slot, pivoted yoke-arms in said slot with a thumb-nut for raising and lowering said arms, and shoulders on which said arms bear when being raised, substantially as set forth.

395,908. VALVE MECHANISM FOR AUTOMATICALLY STARTING STEAM-PUMPS. ERNEST KNOWLES, Mossfield Mill, Bolton, County of Lancaster, England. Filed July 21, 1888. Serial No. 280,596. (No model.) Patented in England Apr. 5, 1888, No. 5,072.



Claim.—The combination of a valve-casing having a projecting steam-cylinder and provided with an inlet and outlet, a valve-seat and a by-pass connecting the outer end of the steam-cylinder with the steam-outlet, a steam-packed piston in the steam-cylinder, a hydraulic cylinder located adjacent to the valve-casing and having a liquid-supply pipe for connecting with liquid-distributing sprinklers, a piston in the hydraulic cylinder moved by the liquid pressure therein, a valve-spindle connected with the piston in the hydraulic cylinder, having a valve to close on the valve-seat and extending through the valve-seat to the piston in the steam-cylinder, and a spring acting on the valve-spindle to move the valve from its seat when the pressure in the hydraulic cylinder is reduced for passing steam through the valve-casing to a pump and through the by-pass to the steam-piston, substantially as described.

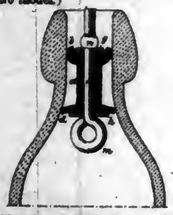
395,909. REAMER-HEAD FOR TAPS. DANIEL G. LANGLANDS and ORIN B. MOULTON, Dover, N. H., assignors to the Somersworth Machine Company, same place. Filed Nov. 7, 1887. Serial No. 254,573. (No model.)



Claim.—The combination, with the tap A, having at its lower

end the central stud or projection, a^4, the dowel-pins b^3, and the threaded hole b^4, of the independent cutting, drilling, or boring tool B, having holes b' for the reception of the said dowel-pins, the central opening or hole, b^3, fitting on the said projection a^4, and the countersink or recess b^5 in its lower face, and the screw b^4, the head of which fits in the said countersink or recess, substantially as set forth.

395,910. BOTTLE-STOPPER. EDWIN L. LLOYD, Philadelphia, Pa., assignor to the Joly Stopper Company, same place. Filed June 25, 1888. Serial No. 278,127. (No model.)



Claim.—1. The combination, in a bottle-stopper, of the stem having an upper flexible disk and a washer above and of slightly smaller diameter than the disk, and having below said disk a lock free to yield on the inward movement of the stopper, but expanding for engagement with the tapering neck after the stopper is inserted, and beyond said lock a portion for engaging with an extractor, whereby the stopper may be withdrawn when inverted, all substantially as specified.

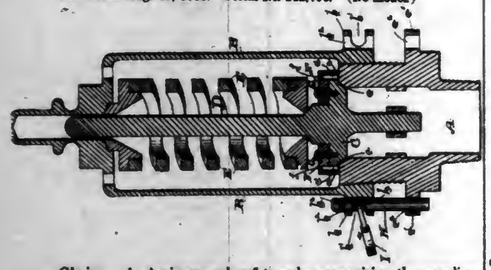
2. The combination, in a bottle-stopper, of a stem having an upper flexible disk and a washer of slightly smaller diameter than the disk, and having below said sealing-disk another flexible disk free to yield on the inward movement of the stopper, a washer against which the disk bears to prevent yield in the other direction, and beyond said washer a portion for engaging with an extractor, whereby the stopper may be withdrawn when inverted, all substantially as specified.

3. The combination, in a bottle-stopper, of a tubular shank, having a sealing-disk at the upper end and a locking-disk at the lower end, with a stem passing through said tubular shank and having above the sealing-disk a washer of slightly smaller diameter than the disk, said stem also having below the locking-disk a washer serving as a backing for said disk, and beyond said washer a portion for engaging with an extractor, whereby the stopper may be withdrawn when inverted, all substantially as specified.

4. The within-described sealing device for a bottle-stopper, the same consisting of a tubular shank with disks at top and bottom, the whole being of rubber or equivalent flexible material, all substantially as specified.

5. The combination of the sealing portion of the stopper, comprising a tubular shank having a sealing-disk at the top and a locking-disk at the bottom, confining-washers at the opposite ends of said shank, and a central stem having an eye at the inner end bearing against the lower washer, and a flattened portion forming shoulders for retaining the upper washer, all substantially as specified.

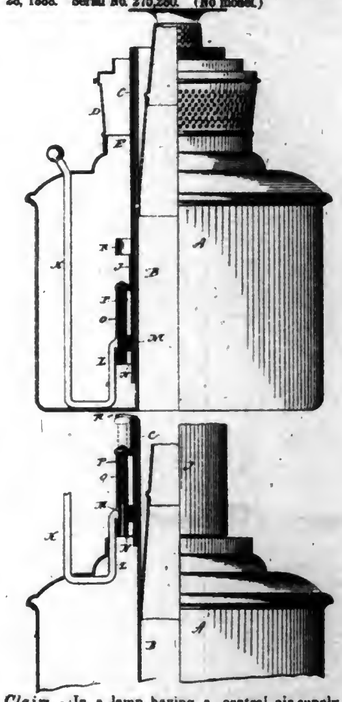
395,911. POP SAFETY-VALVE. FREDERICK A. MILLER, Oakland, Cal. Filed Aug. 15, 1888. Serial No. 282,796. (No model.)



Claim.—1. An improved safety-valve comprising the coupling and shell secured together and each provided with perforated flanges, the flange of the shell having also the groove b', a locking-bolt fitted in the perforations, and a lock secured to the pin in the said groove portion, a perforated valve and perforated cap-plate axially rotating thereon, and a spring above the valve for returning the latter to position, substantially as herein described.

2. In a safety-valve, the coupling and the shell screwed together, as described, in combination with the means for locking the shell, comprising the perforated flange on the coupling, a perforated grooved flange on the shell, a locking-bolt passing through the perforations of the two flanges and having a hole which is exposed in the groove of the shell-flange, and the lock engaging said hole, substantially as herein described.

395,912. CENTRAL-DRAFT LAMP. JOHN C. MILLER, Meriden, Conn., assignor to the Meriden Bronze Company, same place. Filed May 28, 1888. Serial No. 275,280. (No model.)



Claim.—In a lamp having a central air-supply tube and a wick encircling it, the fount having an open neck of larger diameter than the wick, a sleeve, J, adapted to surround and hold the wick when on the tube, the adjusting-rod K, arranged vertically through the fount outside the burner, the lower end of the said rod turned upward to form the arm L and terminating in a socket, M, the said sleeve constructed with ears N O, the one over the other, and between which the said socket M is adapted to set, with a removable pin, P, through said ears and socket to form the connection between said sleeve and adjusting-rod, substantially as and for the purpose described.

395,913. HAMMER FOR FIRE-ARMS. WILLIAM R. MILLER, Baltimore, Md. Filed Oct. 2, 1888. Serial No. 286,984. (No model.)

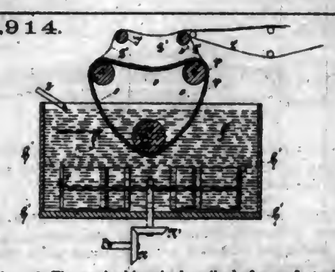


Claim.—In a gun, the hammer thereof having a secondary recess in the rear of the normal one, into which the thumb involuntarily enters as the hammer is lowered by hand, substantially as and for the purpose specified.

395,914. METHOD OF MANUFACTURING THREAD FROM SHORT FIBERS. ALEXANDER MITSCHERLICH, Freiburg, Baden, Germany. Filed Sept. 11, 1884. Serial No. 142,774. (No model.) Patented in England Aug. 28, 1884, No. 11,746; in Austria-Hungary Oct. 3, 1884, No. 30,411 and No. 44,963; in Italy Oct. 18, 1884, XVIII. 17,401, and in France Dec. 26, 1884, No. 163,787.

Brief.—The object of the invention is the utilization for the manufacture of threads of very short fibers, such as are obtained by boiling wood or other vegetable substance with a chemical agent.

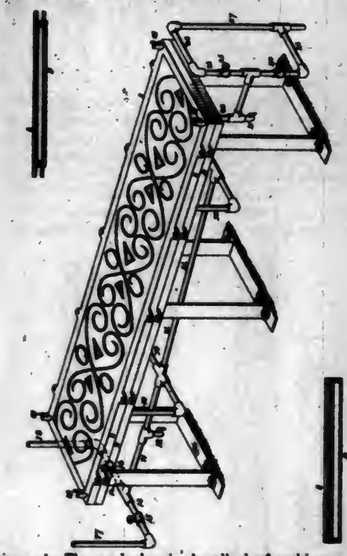
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Claim.—1. The method herein described of manufacturing thread from short fibers, (such as sulphite cellulose or soda cellulose,) said method consisting in forming these short fibers into a pulp, arranging the fibers substantially parallel to each other, producing fiber strips therefrom, and spinning the strips thus formed, substantially as described.

2. The method herein described of manufacturing thread from short fibers, (such as sulphite cellulose or soda cellulose,) said method consisting in first forming these short fibers into an aqueous pulp, producing directly from this pulp strips of pasteboard with the fibers parallel to each other, and spinning these strips into thread, substantially as described.

395,915. METHOD OF EMBOSSING CANVAS FOR DECORATING WALLS OR OTHER SURFACES. WILLIAM S. MORTON, Edinburgh, County of Mid-Lothian, Scotland. Filed Feb. 15, 1887. Serial No. 227,458. (No model.) Patented in England Nov. 13, 1884, No. 15,161, and Dec. 2, 1885, No. 14,793; in France Sept. 22, 1885, No. 171,381, and in Belgium Sept. 23, 1885, No. 70,264.



Claim.—1. The mode herein described of making embossed decorative work, said mode consisting in sizing the canvas, then working it into the intaglio parts of a mold, and afterward applying heat to the mold with the canvas on it.

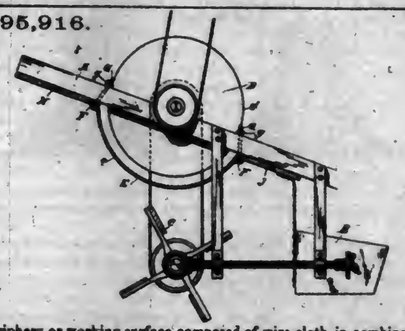
2. The mode herein described of making embossed decorative work, said mode consisting in sizing canvas, then working it into the intaglio parts of the mold, packing the deeper parts of the embossed canvas with paper-pulp or similar material and applying heat to the mold, and pasting a paper backing over the whole.

395,916. RAISIN-STEMMER. CHARLES L. NORTH, Fresno, Cal. Filed July 27, 1888. Serial No. 281,239. (No model.)

Claim.—1. In a raisin-stemmer, the horizontal rotary cylinder having its periphery or working-surface composed of wire-cloth, in combination with the concave under said cylinder and having its surface composed also of wire-cloth, the spring-strips *c*, supporting the wire-cloth, the rods on which the ends of the concave are supported, and the adjustable eyebolts supporting the rods, whereby the concave may be adjusted with relation to the cylinder, substantially as herein described.

2. In a raisin-stemmer, the horizontal rotary cylinder having its

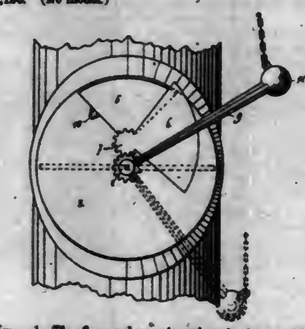
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periphery or working-surface composed of wire-cloth, in combination with an underlying concave having its surface composed also of wire-cloth and its frame made up of spring-strips, substantially as herein described.

3. In a raisin-stemmer, a horizontal rotary cylinder having its periphery or working-surface composed of wire-cloth, in combination with an underlying concave having its surface composed also of wire-cloth and its frame made of spring-strips, the rods supporting the spring-strips, and the adjustable eyebolts passing through the frame-timbers at an angle in converging planes, as described, whereby the concave may be adjusted up or down and its spring-frame bent to conform to the curvature of the cylinder in any position, substantially as herein described.

395,917. CHECK-DRAFT. WILLIAM J. OWENS, Utica, N. Y., assignor to Sayre, Owens & Co., same place. Filed July 5, 1888. Serial No. 278,126. (No model.)



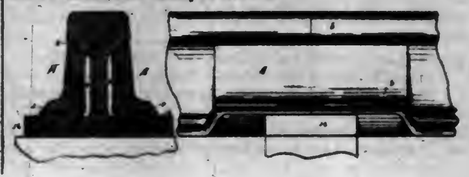
Claim.—1. The flue and opening therein, in combination with a pivoted lid having a gear-sector partially surrounding the pivotal point, the damper in the flue having an extended pivotal bearing, a weighted arm held to the end of the pivotal bearing of the damper, and a gear-sector on the pivotal bearing arranged to mesh with the gear-sector on the cover, substantially as set forth.

2. The head having an opening, in combination with a pivoted swinging cover having a gear-sector partially encircling the pivotal point of the cover, and the pivoted weighted arm having a gear-sector partially surrounding the pivotal point meshing into the gear sector on the cover, arranged substantially as set forth.

3. The combination of the flue, the damper in the flue, the weighted arm for operating the damper, the swinging cover for closing and opening into the flue, and the gear-sectors engaging each other, whereby the cover and damper are simultaneously movable, substantially as set forth.

395,918. AUTOMATIC LOCK-JOINT FOR RAILWAY-RAILS. JOHN L. PORT, Cleveland, Ohio. Filed Apr. 17, 1888. Serial No. 270,962. (No model.)

Claim.—1. In a rail joint, the fish-plates and rails having their surfaces of contact inclined downward and converged toward the web of the rail, substantially as set forth.



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2. In a rail-joint, a fish-plate having bearings along its edges converging inwardly and downwardly in straight lines, substantially as set forth.

3. In a rail-joint, a fish-plate having its lower edge provided with a bearing-surface at an acute angle and its upper edge with a bearing-surface at an obtuse angle to the plane of the web of the rail, and an inwardly-converging seat for the plate, substantially as set forth.

4. In a rail-joint, a fish-plate having bearings on its respective edges at differing angles to the plane of its sides and converging inwardly and downwardly, the lower bearing-surface having greater width than the upper, in combination with a converging seat in which the plate gravitates to a locking position, substantially as set forth.

5. In a rail-joint, a fish-plate having its lower edge re-enforced by a projection extending laterally outward therefrom and provided with a plain bearing-surface the full width of said edge and a plain bearing-surface along the upper edge of the plate, in combination with a seat for the plate at the side of the rail formed on lines converging inward and downward toward the web, substantially as set forth.

6. In a rail-joint, a rail having a bearing on its foot at an acute angle to the web and a bearing on its head at an obtuse angle to the web, substantially as set forth.

7. In a rail-joint, a rail having its foot turned up so as to bring the upper surface thereof to an acute angle to the web and a bearing on the head at an obtuse angle to the web, substantially as set forth.

395,919. STOVE-PANEL. JOHN A. PRICE, Scranton, Pa. Filed Mar. 30, 1888. Serial No. 268,977. (No model.)



Claim.—1. In a stove-panel, the combination, with the base-plate and the frame having the sunken ledge and raised rim, of the removable panel lying on the ledge below the level of the raised portion, and the screws passing through the panel for securing the same in position, substantially as described.

2. In a stove-panel, the combination, with the base-plate, the frame having the ledge, and the cross-bars, of the panel with the openings therein overlying said ledge and cross-bars, the tiles held in position in said openings by the cross-bars, and the screws uniting the panel and base-plate, substantially as described.

3. In a stove-panel, the combination, with the base-plate, the frame having the ledge, cross-bars, and projections, as described, of the panel overlying said ledge and cross-bars, having the openings opposite the latter, the tiles held in the openings by the cross-bars and engaging said projections, and the screws for holding said parts in position, as and for the purpose set forth.

4. In a stove-panel, the combination, with the base-plate and frame having the ledge and cross-bars, of the panel overlying and having openings opposite said cross-bars, the tiles held in the openings by the cross-bars, and the fastening-screws passing through the panel for drawing the parts together, substantially as and for the purpose set forth.

395,920. BORING AND REAMING TOOL. CHARLES ROHR, Chester, Conn. Filed Jan. 11, 1888. Serial No. 260,389. (No model.)

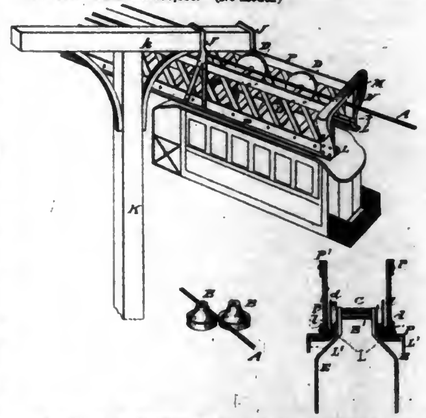
Claim.—1. In a boring and reaming tool, the combination, with a suitable bit and cutting-knives, of the head A, having chamber *c* and openings *d*, to form outlets for the chips to pass out at the top of the tool, substantially as and for the purpose set forth.

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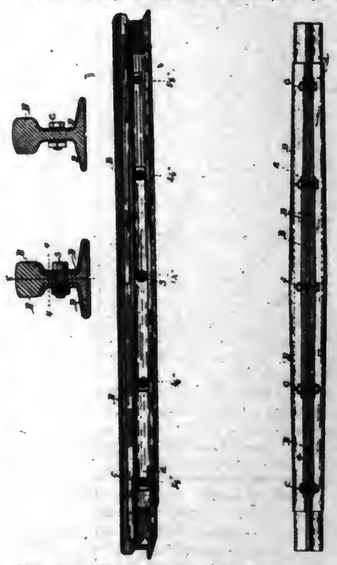
2. In a boring and reaming tool, the head A, having chamber *c* and openings *d* at the top, and cast with the sleeve *a* and shank *d*, substantially as and for the purpose specified.

395,921. ELEVATED STREET-RAILROAD. ROBERT F. ROBISON and HARRY M. CROCKER, Kansas City, Kans.; said Crocker assignor, by mesne assignments, to Howard A. Williams, same place. Filed Dec. 27, 1887. Serial No. 259,065. (No model.)



Claim.—In an elevated railway, the track-rails made with the two flanges *l l'*, in combination with arch cross-braces M N and longitudinal rails P P', the parts M N P P' being fastened to the flanges *l l'*, whereby the track-rails are firmly held in position and prevented from lateral displacement.

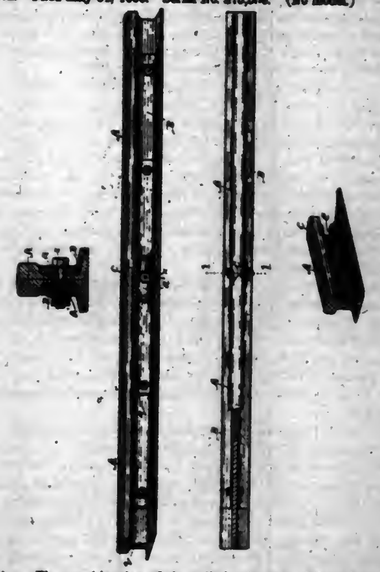
395,922. RAILWAY SPLICE-BAR. GEORGE P. ROSE, Fenton, Mich. Filed May 31, 1888. Serial No. 275,555. (No model.)



Claim.—1. A splice-bar shaped to fit against the exterior of the rail below the tread-surface, all portions of said bar, including its upper and lower flanges, being beveled longitudinally each way from the center, substantially as set forth.

2. The combination of rails and splice-bars having bolt-holes graduated as to size, said bars, including their upper and lower flanges, being beveled longitudinally each way from the center, and bolts graduated in size, as stated, all substantially as set forth.

395,923. RAILWAY SPLICE-BAR. GEORGE P. ROSE, Fenton, Mich. Filed May 31, 1888. Serial No. 275,556. (No model.)



Claim.—The combination of the rails having the oblique lapping ends, the splice-bars re-enforced at the center and the outer one being provided with the boss, and the securing-bolts, substantially as set forth.

395,924. RAILWAY SPLICE-BAR. GEORGE P. ROSE, Fenton, Mich. Filed May 31, 1888. Serial No. 275,557. (No model.)



Claim.—1. The combination of the rails having the holes the size of the bolts, the washers provided with the boss, the splice-bars having the slots longer than the boss on the washer, and the securing-bolts, substantially as set forth.

2. The combination of the rails having the end slot and bolt-holes the size of the bolts, the splice-bars having the central boss, and the slots to receive the washers, the washers having the boss of a length less than said washer-slots, and the securing-bolts, substantially as set forth.

3. The combination of the rails having the bolt-holes of a size to just receive the bolts, the splice-bars having the washer-slots, the washers having the boss of a length less than said slots, the holes in the washers on one side of the rail being screw-threaded, and the bolts having the screw-threaded ends in said screw-threaded holes, substantially as set forth.

4. The combination of the rails having the bolt-holes of a size to receive the bolts, the splice-bars having the washer-slots, the washers provided with the boss of a length less than said slots, the holes in the washers on one side of the rail being screw-threaded, the bolts having the screw-threaded ends in said holes, and the lock-nuts on the extended ends of the bolts, substantially as set forth.

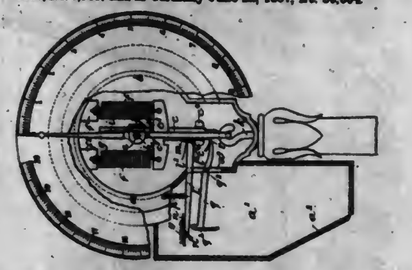
5. The combination of the rails having the end slots and bolt-holes, the splice-bars provided with the central boss and having the washer-slots, the washers provided with the boss of a length less than the washer-slots, the washers on one side of the rail having their bolt-holes screw-threaded, the bolts having the screw-threaded ends in said holes, and the lock-nuts, substantially as set forth.

395,925. RAILWAY-SPIKE. GEORGE P. ROSE, Fenton, Mich. Filed May 31, 1888. Serial No. 275,559. (No model.)



Claim.—The T-headed spike having threads on the two opposite sides, the upper side of which threads is at right angles to the spike, and having vertically-straight spaces between the threads and a bearing portion between the T-head and upper thread, which portion is circular in cross-section, and the wedge-point of the spike having two of its diagonally-opposite corners chamfered off to facilitate turning in the wood, substantially as set forth.

395,926. COIN-OPERATED WEIGHING-MACHINE. GEORGE SALTER, West Bromwich, County of Stafford, England. Filed Mar. 17, 1888. Serial No. 267,557. (No model.) Patented in England May 26, 1886, No. 6,983, and in Germany June 22, 1887, No. 39,664.



Claim.—1. In a weighing-machine, the combination, with weighing mechanism, of a lever one end of which engages said mechanism to hold it from operation, and whose other end is provided with a coin-receptacle, and means operated by the movement of the weighing mechanism for discharging the coin from said receptacle, substantially as set forth.

2. In a weighing-machine, the combination, with weighing mechanism, of a lever one end of which engages said mechanism to hold it from operation, a tilting plate on the other end of said lever for receiving a coin, and an arm moved by the weighing mechanism for tilting said plate to discharge the coin, substantially as set forth.

395,927. CIRCULAR-KNITTING MACHINE. ROBERT W. SCOTT and LOUIS M. D. WILLIAMS, Philadelphia, Pa. Filed Aug. 24, 1888. Serial No. 283,051. (No model.)

Brief.—The objects of the invention are to remove side strain or twist from the needles of the dial and to obviate the necessity of lubricating the needles.

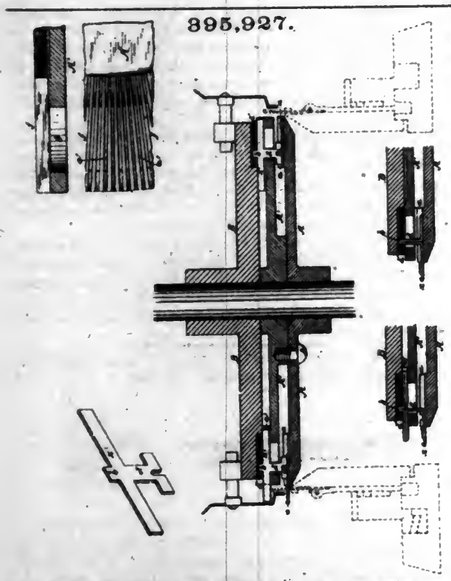
Claim.—1. The combination of the dial and its needles with a supplementary guiding-dial and a cam for actuating said needles, substantially as set forth.

2. The combination of the dial of a knitting-machine with a supplementary guiding-dial and a cam, and with needles having jacks adapted to grooves in said guiding-dial, substantially as described.

3. The combination of the dial and its needles, the supplementary dial and its guided jacks, and a dial-plate having cams for acting on said jacks, all substantially as specified.

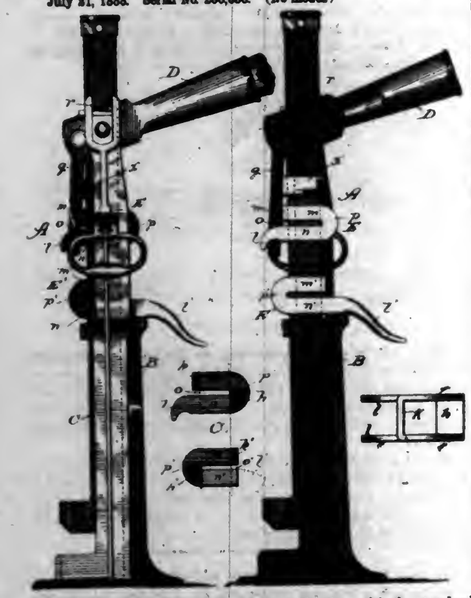
4. The supplementary dial having radical grooves in its upper

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face and having beneath said grooved portion an annular recess bridged by the ribs between the grooves, all substantially as specified.

395,928. LIFTING-JACK. AXEL A. STROM, Austin, Ill. Filed July 21, 1888. Serial No. 280,638. (No model.)



Claim.—1. In a lifting-jack, the combination, with the standard and lifting-bar, of a friction-clutch having a bar extending across the lifting-bar, cross-bars extending from opposite ends of said bar across opposite sides of the lifting-bar, and a handle rigidly connected or integral with and extending from one of said cross-bars at one side of the lifting-bar toward the opposite side of the latter, substantially as described.

2. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a friction-clutch, E, having a U-shaped bar, *p*, composed of rigidly-connected or integral bars *m* and *n*, a cross-bar, *k*, extending from the bar *m* across one side of the lifting-bar, and a cross-bar, *h*, extending across the opposite side of the lifting-bar, and a handle portion, *l*, on the bar *n*, connected by a suitable link-connection with the operating-lever D, substantially as described.

3. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a lifting-clutch, E, comprising two U-shaped bars, *p*, embracing the lifting-bar and each composed of the rigidly-connected or integral bars *m* and *n*, a cross-bar, *k*, connecting corresponding ends of the bars *m* at one side of the lifting-bar, a cross-bar, *h*, extending between the bars *p* across the opposite side of the lifting-bar, and a handle portion, *l*, forming extensions of the bars *n*, connected by a suitable link-connection with the operating-lever D, and a suitable retaining-clutch, substantially as described.

4. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a lifting-clutch, E, comprising two U-shaped bars, *p*, embracing the lifting-bar and each composed of the rigidly-connected or integral bars *m* and *n*, a cross-bar, *k*, connecting corresponding ends of the bars *m* at one side of the lifting-bar, a cross-bar, *h*, extending between the bars *p* across the opposite side of the lifting-bar, and handles, *l*, forming extensions of the bars *n*, extending beyond the side of the lifting-bar at which the cross-bar *k* is provided, and connected by a suitable link-connection with the short end of the operating-lever D, and a suitable releasing-clutch, substantially as described.

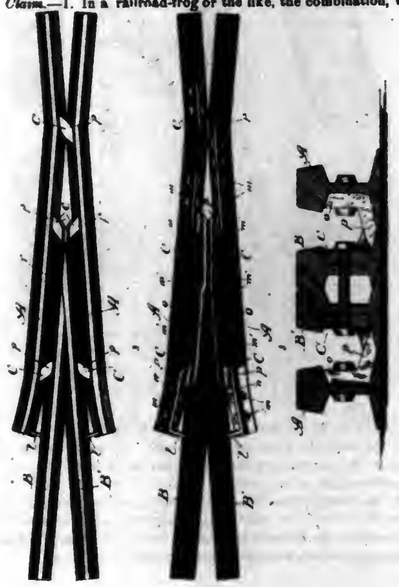
5. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a suitable lifting-clutch and a retaining-clutch, E′, having a U-shaped bar, *p′*, composed of rigidly-connected or integral bars *m′* and *n′*, a cross-bar, *k′*, extending from the bar *m′* across one side of the lifting-bar, and a cross-bar, *h′*, extending across the opposite side of the lifting-bar, and a handle portion, *l′*, on the bar *n*, at which the clutch is supported on the standard, substantially as described.

6. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a suitable lifting-clutch and a retaining-clutch comprising two U-shaped bars, *p′*, embracing the lifting-bar and each composed of the rigidly-connected or integral bars *m′* and *n′*, a cross-bar, *k′*, connecting corresponding ends of the bars *m′* at one side of the lifting-bar, a cross-bar, *h′*, extending between the bars *p′* across the opposite side of the lifting-bar, and a handle portion, *l′*, forming extensions of the bars *n′*, and at which the retaining-clutch is supported on the standard, substantially as described.

7. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a suitable lifting-clutch and a retaining-clutch, E′, comprising two U-shaped bars, *p′*, embracing the lifting-bar and each composed of the rigidly-connected or integral bars *m′* and *n′*, a cross-bar, *k′*, connecting corresponding ends of the bars *m′* at one side of the lifting-bar, a cross-bar, *h′*, extending between the bars *p′* across the opposite side of the lifting-bar, and handles *l′*, forming extensions of the bars *n′*, extending beyond the side of the lifting-bar at which the cross-bar *k′* is provided, and affording a lever for releasing the retaining-clutch at which it is supported on the standard, substantially as described.

395,929. RAILWAY-FROG. AXEL A. STROM, Austin, Ill. Filed Aug. 21, 1888. Serial No. 283,316. (No model.)

Claim.—1. In a railroad-frog or the like, the combination, with



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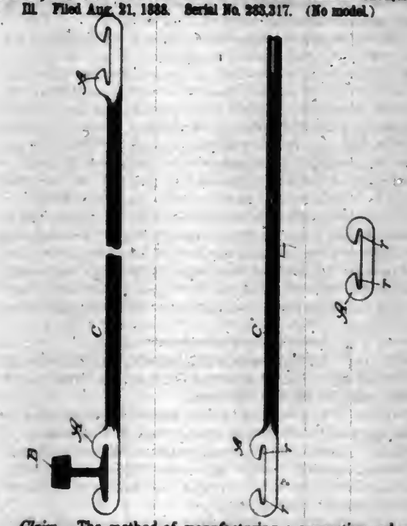
adjacent rails, of a brace, C, formed of a bent metal bar having foot portions *n* at opposite ends and an intermediate trough, *p*, substantially as and for the purpose set forth.

2. In a railway-frog, the frog-point comprising a point-rail, B′, and a point-rail, B, secured to the rail B′ and having its wedge-shaped end beveled on its upper side, as shown at *r*, in a downward direction toward the pivoted end of the frog, substantially as described.

3. In a railway-frog or the like, the combination, with adjacent rails, of a brace, C, comprising a body portion, *e*, having foot portions *n* at opposite ends extending laterally of the body portion, and a trough, *p*, between each foot portion and the adjacent end of the body portion, substantially as and for the purpose set forth.

4. A rail-frog having its point braced on opposite sides by means of flanged bearings resting flatwise against the adjacent flanges of the wing-rails and secured flatwise to the web portion of the point, substantially as described.

395,930. TIE-ROD FOR SWITCH-RAILS. AXEL A. STROM, Austin, Ill. Filed Aug. 21, 1888. Serial No. 283,317. (No model.)



Claim.—The method of manufacturing a connecting-rod or tie-bar, which consists in bending toward each other the opposite ends of a bar or bars of metal, thereby forming each bar into a clamp, A, and welding to one or each end of a bar one of said clamps, substantially as described.

395,931. FISHING-ROD. CHARLES S. TREADWAY, Bristol, Conn., assignor to the Horton Manufacturing Company, same place. Filed Oct. 8, 1888. Serial No. 287,495. (Model.)



Claim.—1. The herein-described fishing-rod, consisting of several sections made from tubular metal, the sections tapering except at the butt and tip portions, which said butt and tip portions of the respective sections are substantially cylindrical and integral with said tapering portions, the butt-end of one section corresponding to the tip-end of the next section at the rear, and so that the cylindrical portion of one may be set into the corresponding cylindrical portion of the other, substantially as described, and whereby the joint portions of each section are made integral therewith and the several sections separable.

2. A tubular metallic fishing-rod made in several sections, the body of each section tapering from the butt toward the tip, the butt and tip ends of each section made cylindrical and corresponding in diameter to the butt or tip end of the adjacent sections, as the case may be, and so that the adjacent end of one section may be set into the corresponding end of the next section, the said sections provided with a stationary band or collar at the junction of the cylindrical tapering portions, substantially as and for the purpose described.

395,932. MEDICAL BATTERY. HENRY R. WAITE, New York, N. Y. Filed Aug. 15, 1888. Serial No. 282,772. (No model.)



Claim.—1. In a medical battery, the combination, with a series of cells, a pole-changer, and adjustable switches for including more or less of cells in the circuit, of a pole-changer, electrodes for the patient, a series of resistances, a millampère-meter, and switches, whereby the resistance of the patient may be readily ascertained and the desired amount and kind of current applied, substantially as described.

2. In a medical battery, the combination, with the electrodes, of an interrupter located in and breaking the circuit of the electrode and an independent battery-circuit for operating the interrupter, substantially as described.

3. In a medical battery, the combination, with the primary circuit of the inductorium, of a loop-circuit including electrodes connected therewith and a key in a short circuit of the primary for opening and closing the same, substantially as described.

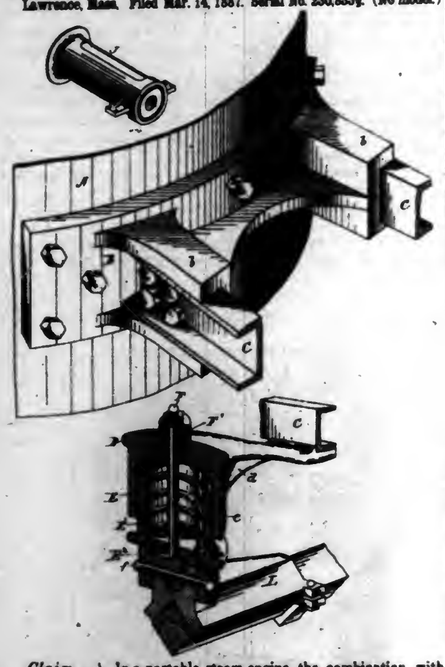
4. In a medical battery, the combination, with the primary of the inductorium, of a loop-circuit including electrodes connected therewith and a key for opening and closing a short circuit of the primary, and a secondary circuit including electrodes and a key for opening and closing said secondary circuit, substantially as described.

5. In a medical battery, the combination, with a base-piece containing switches and connections, substantially as described, of a mill-

ampere-meter connected thereto and provided with an inclined reflector, whereby the indications of the current through said circuits and switches may be observed, substantially as described.

6. In a medical battery, the combination, with a base-piece, of a switch arranged to include more or less battery-cells in the circuit, a pole-changer, a millampere-meter, an interrupter, a series of resistance-coil switches, an induction-coil, a key for opening and closing the primary of said coil, and circuits and switches, substantially as described, all arranged on the base, whereby the different therapeutic effects may be produced in the manner set forth.

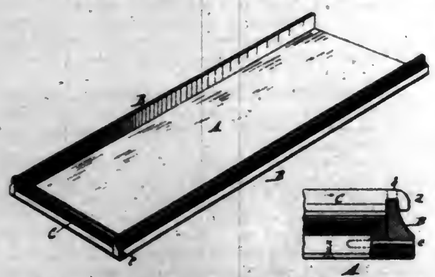
895,983. PORTABLE PUMPING-ENGINE. WILLIAM O. WEBBER, Lawrence, Mass. Filed Mar. 14, 1887. Serial No. 230,833. (No model.)



Claim.—1. In a portable steam-engine, the combination, with the boiler A, of the saddle B, secured thereto and provided with the forwardly-projecting lugs *b*, the channel-bars C, secured to the said lugs, and the spring-rocker D at the fore carriage, to which the forward ends of the said channel-bars are attached, substantially as set forth.

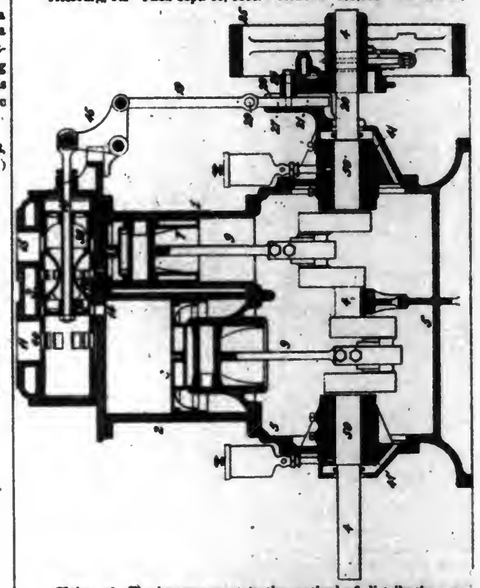
2. In a portable steam-engine, the combination, with the saddle L, of the rocker D, having cup-shaped housing E, the housing E', having the flange or portion E^3, the spring *e*, the eyebolt F, the counter-spring F', and the transverse bolt *f*, substantially as set forth.

895,984. PRINTER'S GALLEY. FERDINAND WIBEL, New York, N. Y. Filed June 5, 1888. Serial No. 276,132. (No model.)



Claim.—The combination, in a printer's galley, of the bottom of the galley with the side walls and head connected by screws to said bottom, the head being provided with hook-shaped ends, which engage recesses in the upper edges of the side walls, substantially as set forth.

895,985. METHOD OF DISTRIBUTING MOTIVE FLUID IN COMPOUND ENGINES. HENRY H. WESTINGHOUSE and FRANCIS M. RITER, Pittsburg, Pa. Filed Sept. 12, 1888. Serial No. 285,201. (No model.)



Claim.—1. The improvement in the method of distributing motive fluid in compound engines, which consists in supplying the same to a preliminary or high-pressure cylinder and a continuously-communicating clearance-chamber of determined volume, substantially greater than that required to serve as an avenue for the passage of motive fluid, exhausting the same under compound expansion into a secondary or low-pressure cylinder, and thereafter closing the exit from said clearance-chamber and raising high-pressure compression to initial pressure therein, substantially as set forth.

2. The improvement in the method of distributing motive fluid in compound engines, which consists in raising high-pressure compression to initial pressure in a chamber of suitable determined volume without limitation by or disturbance from variations of load or initial pressure by commencing high-pressure compression coincidently with low-pressure expansion, substantially as set forth.

3. The improvement in the method of distributing motive fluid in compound engines, which consists in supplying the same to a preliminary or high-pressure cylinder and a continuously-communicating clearance-chamber of suitable determined volume, exhausting the same under compound expansion into a secondary or low-pressure cylinder, varying the grade of simple expansion in the same direction in both the high and the low-pressure cylinders, and effecting high-pressure compression to initial pressure in the clearance-chamber by initiating said compression coincidently with each and every variation of the grade of low-pressure expansion, substantially as set forth.

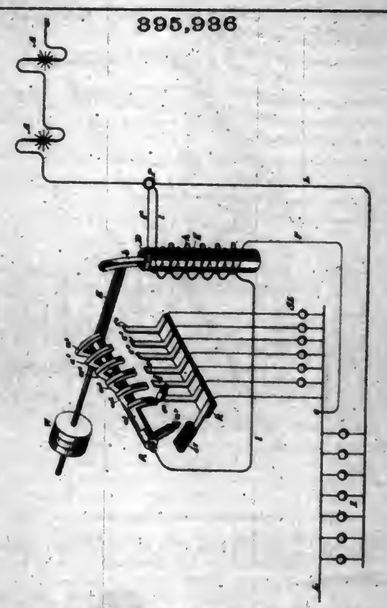
4. The improvement in the method of distributing motive fluid in compound engines, which consists in counteracting and compensating for the tendency of variations of the point of cut off to induce variations in terminal high-pressure compression by effecting a corresponding variation of pressure at the point of initial compression coincidently with each variation of the point of cut off, substantially as set forth.

895,986. REGULATOR FOR INCANDESCENT ELECTRIC-LIGHTING SYSTEMS. MERLE J. WIGHTMAN, Hartford, Conn. Filed June 29, 1888. Serial No. 278,008. (No model.)

Claim.—1. In a regulator for an electric-lighting system, an electro-magnet one of whose coils is in a constantly-closed circuit, an assisting-coil, branches, and a series of contacts in the circuit thereof, which are automatically brought into circuit and removed therefrom by increases and decreases of current in said circuits to correspond with the number of lamps in use.

2. In a regulator for an electric-lighting system, an electro-magnet one of whose coils is in a constantly-closed derived circuit, an assisting-coil, branches, and a series of contacts in the circuit thereof, said branches containing compensating resistances which are automatically and successively brought into circuit and removed therefrom by the reciprocal action of said coils due to increases and decreases of current in said circuits corresponding to changes of resistance in the external circuit.

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3. In a regulator for an electric-lighting system, an electro-magnet one of whose coils is in a constantly-closed derived circuit, an assisting-coil, branch circuits, and a series of contacts in the circuit thereof, said branch circuits containing compensating resistances connected with the line which are automatically and successively brought into circuit and removed therefrom by increases and decreases of current in said circuits to correspond with the number of lamps in use, and a cut-out circuit constituting one of said branch circuits.

4. A regulator for an electric-lighting system, consisting of circuit-controlling devices, branch circuits connected with the main line containing compensating resistances, two solenoids for controlling said circuit-controlling devices, one in a derived circuit and the other in the circuit of said compensating resistances, which circuit is normally broken, but which is completed by said circuit-controlling devices through the action of the first solenoid, as set forth.

5. A regulator for an electric-lighting system, consisting of circuit-controlling devices, branch circuits connected with the main line containing compensating resistances, two solenoids for controlling said circuit-controlling devices, one in a derived circuit and the other in the circuit of said compensating resistances, which circuit is normally broken, but which is completed by said circuit-controlling devices through the action of the first solenoid, and a cut-out for the lamps in the external circuit and for the compensating resistances brought into action by said solenoids after the last resistance has been introduced, as set forth.

6. A series multiple regulator for incandescent lamps, embodying a derived circuit containing safety-lamps in multiple arc, a series of contacts in electrical connection therewith, and two assisting-solenoids, one in the aforesaid derived circuit and the other in a derived circuit parallel therewith, for placing a greater or less number of said safety-lamps in circuit, as set forth.

7. A series multiple regulator for incandescent lamps, embodying a derived circuit containing safety-lamps in multiple arc, a series of contacts in electrical connection therewith, and two assisting-solenoids, one of low and the other of high resistance, for controlling said contacts, one located in the aforesaid circuit, which is normally broken, and the other in a derived circuit, which is always closed.

8. A series multiple regulator for incandescent lamps, embodying a derived circuit containing safety-lamps in multiple arc, a series of contacts in electrical connection therewith, and two assisting-solenoids, one of low and the other of high resistance, for controlling said contacts, one located in the aforesaid circuit, which is normally broken, and the other in a derived circuit, which is always closed, and a cut-out for both the external lamps and the safety-lamps controlled by said solenoids at a predetermined time, as set forth.

9. A regulator for a series multiple of incandescent lamps, consisting of an arbor having a plurality of curved arms mounted thereupon at different radial distances, a lever secured to said arbor substantially at right angles thereto, a solenoid composed of two coils, one in a constantly-closed derived circuit of high resistance, the other in a low-resistance circuit parallel therewith, normally open, but closed by said curved arms, and having multiple branches containing safety-lamps, and a core for said solenoid suitably connected with and actuating said lever, for the purpose set forth.

10. A regulator for a series multiple of incandescent lamps, consisting of an arbor having a plurality of curved arms mounted thereupon at different radial distances, a lever secured to said arbor substantially at right angles thereto, a solenoid composed of two coils, one in a constantly-closed derived circuit of high resistance, the other in a low-resistance circuit parallel therewith, normally open, but closed by said curved arms, and having multiple branches containing safety-lamps, and a core for said solenoid suitably connected with and actuating said lever, an adjustable counterpoise for the latter, and a cut-out, also mounted upon said arbor.

11. A regulator for a multiple series system of incandescent lamps, having a series of contacts mounted upon an arbor, another series of contacts co-operating therewith, circuits therefrom containing safety devices connected with the main line *l*, a solenoid and suitable connections therefor, intermediate devices for operating said lever by the current flowing in said solenoid, and a cut-out, also mounted upon said arbor, operating as and for the purpose described.

12. A retracting device for an incandescent electric-light regulator, having a pivoted lever actuated by changes of current, and safety devices cut in or out of circuit through the instrumentality of said lever and other suitable devices, consisting of a roller freely mounted upon said lever, and a retracting-spring suitably connected with said roller, whereby the retracting leverage, and thereby the retracting force, is changed at a predetermined time as the inclination of the lever increases.

13. A retracting device for an incandescent electric-light regulator, having a pivoted lever actuated by changes of current, and safety devices cut in or out of circuit through the instrumentality of said lever and other suitable devices, consisting of a roller freely mounted upon said lever, a retracting-spring suitably connected with said roller, whereby the retracting leverage, and thereby the retracting force, is changed at a predetermined time as the inclination of the lever increases, and a cut-out modified in its action by the aforesaid means.

14. A retracting device for an incandescent electric-light regulator, having a pivoted lever actuated by changes of current, and safety devices cut in or out of circuit through the instrumentality of said lever and other suitable devices, consisting of a roller freely mounted normally in a notch in said lever, a retracting-spring suitably connected to the said roller, and an adjustable counterpoise for the lever for regulating the operation of the parts above enumerated.

15. A regulator for a series multiple of incandescent lamps, consisting of an arbor having a plurality of curved arms mounted thereupon at different radial distances, a lever secured to said arbor, a solenoid having a core governed by the reciprocal action of the current flowing in two coils connected with the main line, which core is suitably fastened to said lever, circuits controlled by said curved arms, safety-lamps in said circuits, a cut-out, also mounted upon the aforementioned arbor, and a shifting retracting device for said lever, for the purpose set forth.

895,987. CAR-LAMP. WARD W. WILLIS, Chicago, Ill., assignor to the Adams & Westlake Company, same place. Filed May 9, 1888. Serial No. 273,349. (No model.)

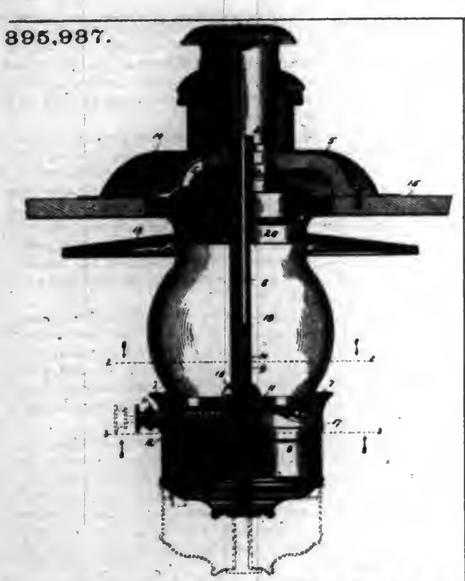
Claim.—1. In a lamp, a globe-holding device consisting of a bottom globe-support, in combination with a spider secured to the roof or ceiling and a rod depending therefrom, running through said globe, and connecting said spider and bottom support.

2. In a lamp, the globe-holding device comprising the spider adapted to be secured to the roof, the central rod depending therefrom, the single globe surrounding said rod, the globe-support at its lower end, and the metal top between the spider and the globe.

3. In a lamp, the combination of a single central supporting-rod, 6, the supporting-spider adapted to be attached to the roof, the globe-support 7, spring-catch 11, and pin 9, projecting upwardly from the oil-pot, and the oil-pot adjustably supported by said pin.



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4. In a lamp, the combination of a spider, 5, adapted to be attached to the roof of the car, a central supporting-rod, 6, globe-support 7, and hinged burner-plate 17, attached to the globe-support.

395,938. TOP ROLL FOR SPINNING-MACHINES. EDWARD WRIGHT, Worcester, assignor to the Davis & Furber Machine Company, North Andover, Mass. Filed Sept. 10, 1888. Serial No. 284,970. (No model.)



Claim.—1. A top roving-roll for spinning-machines, consisting of the axle-arbor A, having upon each of its ends a roller composed of two sheet-metal die-drawn cups, *b* and *c*, fitted one within the other and concentrically fixed upon said arbor, substantially as described.

2. In a top roving-roll for wool-spinning machines, the combination, with the axle-arbor A, having the bearing portion *a* and shoulders *d* and *e*, of the pair of rollers B, each composed of the cylindrical die-drawn sheet-metal cup *b*, fitted upon the arbor against the shoulder *d*, and the die-drawn sheet-metal cup *c*, fitted upon the arbor against the shoulder *e*, with its peripheral rim fitting within and supporting the rim of the cup *b*, and retained by riveting the end of the arbor at E, substantially as set forth.

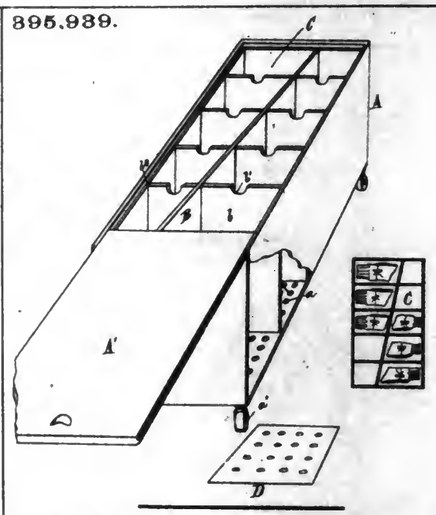
395,939. MERCHANDISE-CABINET. SAMUEL C. ADLER, Philadelphia, Pa. Filed Sept. 15, 1888. Serial No. 285,450. (No model.)

Claim.—1. A cabinet for shoes or articles of graded sizes, which consists in a main inclosure subdivided lengthwise by an obliquely-inclined removable partition into two trapezoid compartments, each of which is subdivided by removable transverse partitions, each provided with an upper cut-away notch, *b'*, into a series of smaller compartments successively graduated in length, as and for the purpose intended, substantially as described.

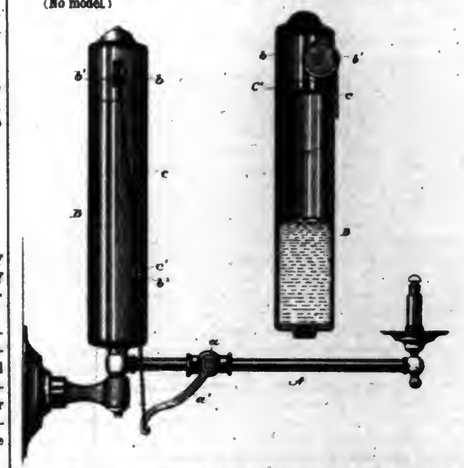
2. A cabinet for shoes or articles of graded sizes, consisting of a case, A, provided with a foraminous bottom, said case subdivided into two rows of compartments, C, one of which rows gradually increases in length from end to end of the incasement, the other row having compartments C, each increasing in length in a direction reversed from the opposite row, in combination with removable perforated sheets D, adapted to lie intermediate of layers of merchandise when placed within said compartments, substantially as described.

3. A cabinet for displaying and holding articles of merchandise of diverse length in separation, which consists of the following elements: a main incasement, A, having a cover, A', removable partitions B, arranged to reach lengthwise of the case in an oblique direction, and transverse partitions *b*, each having midway of its upper edge a notch, *b'*, the incasement provided with a foraminous bottom, *a*, all in combination with removable perforated sheets D, as and for the purpose intended and set forth, substantially as described.

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395,940. AUTOMATIC GAS-EXTINGUISHER. CHARLES L. ALEXANDER, Charlotte, N. C. Filed Dec. 21, 1887. Serial No. 258,606. (No model.)



Claim.—1. An automatic light-extinguisher comprising a valve or cut-off, a receptacle adapted to be partially filled with liquid, and a suspended hollow body open at its lower portion, provided with a vent and connected with the valve or cut-off, substantially as described.

2. An automatic light-extinguisher comprising the receptacle partially filled with liquid, a hollow body suspended therein, provided with air-vents at its top and open at its lower portion, a valve or cut-off provided with an operating-lever, and a connection between the hollow body and the lever, substantially as described.

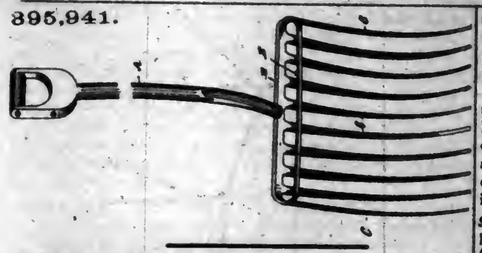
3. In an automatic light-extinguisher, a valve or cut-off provided with an operating-lever, a receptacle partially filled with liquid, a hollow body suspended therein, provided with air-vents at its top and open at its lower portion, a chain or the like for connecting the suspended body and the lever, and a projection or button on the outside of the receptacle to engage the chain or the like, substantially as described.

395,941. FORK. FAIRMAN L. ANDREWS, Miles Grove, Pa. Filed July 16, 1888. Serial No. 280,104. (No model.)

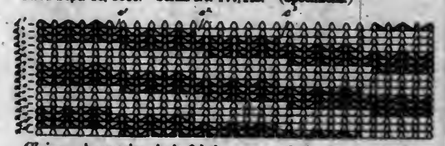
Claim.—1. A coke-fork having a guard integral therewith secured above the fork-head and parallel thereto extending from one end of the fork-head to the other, substantially as and for the purpose set forth.

2. A guard extending from one end of a fork-head to the other and made integral and parallel therewith, substantially as and for the purpose set forth.

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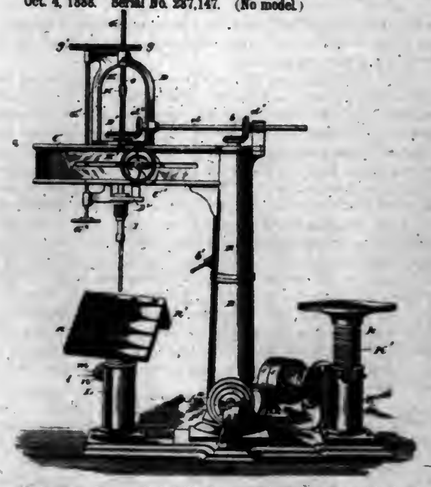


395,942. KNIT FABRIC. ROBERT M. APPLETON, Lake Village, N. H. Filed Sept. 18, 1886. Serial No. 177,443. (Specimens.)



Claim.—A seamless knit fabric composed alternately of continuous stripes of tuck-stitch and plain-stitch knitting extending spirally around the fabric, said stripes being formed of circumferential rows of stitches, part of which are tuck-stitches and part plain stitches, the tuck-stitch parts forming offsets in the contours of the stripes and the plain-stitch parts likewise forming offsets corresponding to those of the tuck-stitch parts, substantially as herein shown and described.

395,943. RADIAL DRILL. JOHN J. BAYMAN, Sunbury, Pa. Filed Oct. 4, 1888. Serial No. 287,147. (No model.)



Claim.—1. In a radial drill, the combination of a table having circumferential grooved column or stock M, the upper end of which is bifurcated and provided with a clamping-bolt, *p*, for securing the table of said column or stock, and a slotted support, L, for said column or stock, carrying a shaft, *m*, with pinion *n*, and a nut on said shaft for jamming the support upon the stock, substantially as shown, and for the purpose set forth.

2. In a drill, the combination of the drill-frame D, constructed substantially as shown and provided with a movable guide, H, having a central recess, within which the upper end of the spindle lies, and a screw-threaded recess, *k*, above the recess for the spindle, with which the lower end, *k'*, of the feed-screw engages, so as to bear upon the upper end of the spindle, substantially as shown, and for the purpose set forth.

3. The combination, in a drill, of the drill-frame provided with upper and lower bearings for the spindle, the lower opening, J, of said drill-frame being conical and provided with a conical split sleeve, J', the upper portion of which is screw-threaded, and a nut, *j*, for tightening and holding said sleeve in place, substantially as shown, and for the purpose set forth.

4. The combination, in a drill, of a drill-stock constructed substantially as shown and provided with guide-rods *e e*, the transverse bar made of two corresponding parts bolted together, so as to embrace said guide-arms and the upper portion of the spindle, and a feed-screw having the lower end provided with threads, which engage with the screw-threads in the arms H H, said threads being of different pitch from the feed-threads, substantially as shown, and for the purpose set forth.

5. The combination, in a drill, of a drill-stock constructed substantially as shown and provided with laterally-projecting arms E and E', guide-rods *e e*, supported thereby, removable cross-bar mounted on the guide-rods and carrying centrally the upper end of the spindle and lower end of the feed-screw, a lower bearing for the spindle carrying a conical sleeve, through which the spindle passes, a driving-wheel, D, for rotating the spindle, and a shaft, G', carrying a pinion, *g'*, which engages with a pinion, *g*, for turning the feed-screw, the parts being organized substantially as shown, and for the purpose set forth.

6. The combination, in a drill, of a table support or column provided with circumferential grooves, a support for said column having a vertical slot, adjacent to which are provided outwardly-projecting ears forming bearings for a bolt or shaft, upon which is placed a pinion, which engages with a support, said shaft having a nut for clamping the parts together, so as to be in frictional contact, substantially as and for the purpose set forth.

395,944. SIGHT FOR FIRE-ARMS. JOHN S. BLANKMAN, Washington, D. C. Filed June 26, 1883. Serial No. 279,250. (No model.)



Claim.—1. In combination with a gun, an open sight-tube of substantially uniform bore secured to the gun to narrow the field of sight and direct the vision, substantially as set forth.

2. For use with a gun, a sight-tube having a groove in its external wall parallel with the bore of the tube, substantially as set forth.

3. For use with a gun, an open sight-tube having in its bore two sight-pins, the bore having a practically uniform diameter, substantially as set forth.

4. A sight-tube having two sight-pins in its bore and two sight pins on its exterior, substantially as set forth.

5. An open sight-tube journaled to move about a journal or support and in a vertical plane, in combination with a sight-leaf and with a vertically-adjustable clamp, whereby the tube and its bearings can be moved up or down on the leaf, substantially as set forth.

6. An open sight-tube having journal-bearings in a clamp, the journal having a screw-threaded thumb-nut, the elastic clamp, and the leaf, all combined substantially as set forth, whereby the clamp can be made to firmly hold both the tube and the leaf.

7. The open sight-tube journaled in the folding or hinged support and said support adapted to be attached to a gun, in combination with the gun, substantially as set forth.

8. The clamp to support the sight-tube upon the leaf or equivalent part of a gun, adapted to embrace the leaf and provided with wings having bearings for the journals of a sight-tube, in combination with said tube, substantially as set forth.

9. An elastic sheet-metal clamp provided with perforated wings or extensions, combined with a sight-tube and journal and a sight-leaf or equivalent, substantially as set forth.

10. An open sight-tube adjustable about its bearings, provided on its exterior surface with a graduated scale of angles, in combination with an index, substantially as set forth.

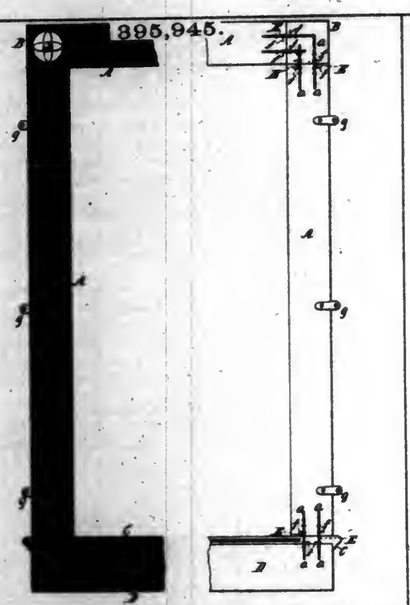
11. A sight-tube adjustable about its bearings and provided with a graduated scale of angles, combined with a clamp which constitutes an index, substantially as set forth.

395,945. FINISHING OF HOUSE INTERIORS. WILLIAM J. BODA, Dayton, Ohio. Filed Apr. 16, 1888. Serial No. 270,730. (No model.)

Claim.—1. In a finished window-casing, the combination of the pilasters, the apron, and the interposed stool-board secured together by tie-bars driven into coincident kerfs cut in their inner sides and extending across the joints between the parts, substantially in the manner and for the purpose described.

2. In a finished window-casing, the combination, with the pilasters and the apron, of a two-part stool-board, the inner part of which is interposed between and secured to the apron and pilasters by tie-bars

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driven into coincident kerfs cut in the inner sides of said three parts and extending across the joints between them, substantially as and for the purpose described.

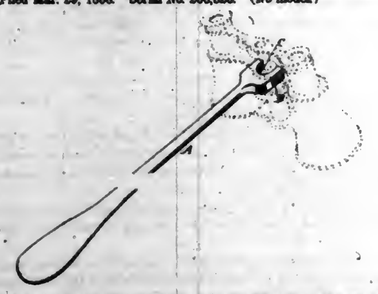
3. In a finished window-casing, the combination, with the pilasters and the apron, of a stool-board composed of two parts tongued and grooved together, the inner part of which is interposed between and secured to the apron and pilasters by tie-bars driven into coincident kerfs cut in the inner sides of said three parts and extending across the joints between them, substantially as and for the purpose described.

4. In a finished casing, the combination, with the pilasters, top facing, and interposed corner-blocks having flat abutting joints, of tie-bars driven into coincident kerfs cut in the inner sides of said parts and extending across the joints between them, substantially as and for the purpose described.

5. The combination, with the pilasters A and apron D, of the interposed stool-board C, the parts secured together by the tie-bars E, driven into coincident kerfs *a*, cut in their inner sides and extending across the joints between them, substantially as and for the purpose described.

395,946. OPERA-GLASS HOLDER. HENRY BORSCH, Chicago, Ill.

Filed Mar. 29, 1888. Serial No. 268,823. (No model.)

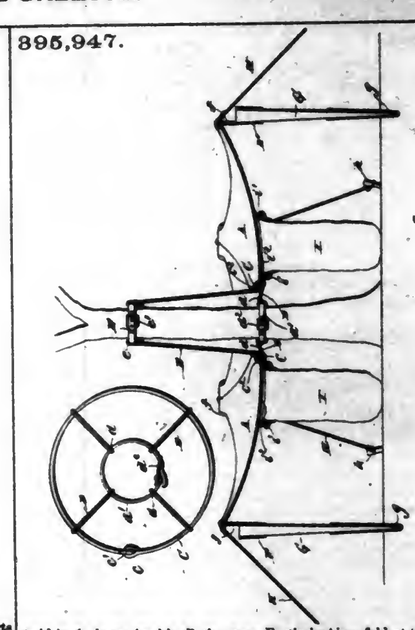


Claim.—A detachable opera-glass holder provided with slots at right angles to each other, forming a four-pronged clasp adapted to embrace the opposite sides of the cross-bar and to receive the nut on one side of said bar and the spindle or screw on the other, substantially as described.

395,947. FRUIT-GATHERER. JAMES G. BRADLEY, Allegheny, Cambria County, Pa. Filed Mar. 3, 1888. Serial No. 265,905. (No model.)

Claim.—1. In a fruit-gatherer, the combination of the canvas having the central conical portion and the outer flaring portion extending from the base of the conical portion, the wire hoop at the base of the conical portion with its ends hooked together, the radial wires swung to said hoop and having their inner ends looped, the strap *d'*,

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held in the loops, buckle d^2, the strap E, stitched in a fold at the upper end of the central conical portion, and supports for the outer edge of the flaring portion, as set forth.

2. In a fruit-gatherer, the combination of the canvas having the central conical portion and the outer flaring portion extending from the base of the conical portion with its ends hooked together, the radial wires swung to said hoop and having the inner ends looped, the strap *d'*, held in the loops, the strap E, stitched in a fold at the upper end of the central conical portion, the socket-pieces at the outer edge of the flaring portion, and the pointed iron-shod stakes secured in said socket-pieces, as set forth.

3. The combination of the canvas having the central conical portion and an outer flaring portion extending from the base of the conical portion and provided with the openings i^3 and depending folds *i'*, the wire hoop C at the base of the conical portion, the radial wires D, swung to said hoop, the straps *d'* E at the inner ends of the wires and upper end of the cone, respectively, having buckles d^2 *d'*, respectively, the socket-pieces F at the edges of the flaring portion, the iron-shod stakes G, secured in said socket-pieces, the brace-cords H, secured to the socket-pieces, pins *h*, and the sacks I, suspended by the hooks *i* below the openings i^3, as set forth.

395,948. TAPE AND RIBBON DELIVERING DEVICE. JAMES BRADY, Brooklyn, assignor to the Dunn Safety Ticket and Register Company, New York, N. Y. Filed Apr. 23, 1888. Serial No. 271,561. (No model.)



Claim.—1. In an apparatus for feeding or delivering tapes, ribbons, or other continuous strips wound in rolls, the combination, with a supporting-frame having parallel slots, of a strip-roll having its journals in said slots and a riding roll upon which said strip-roll rests, the free end of the strip being taken or drawn from between said rolls, substantially as described.

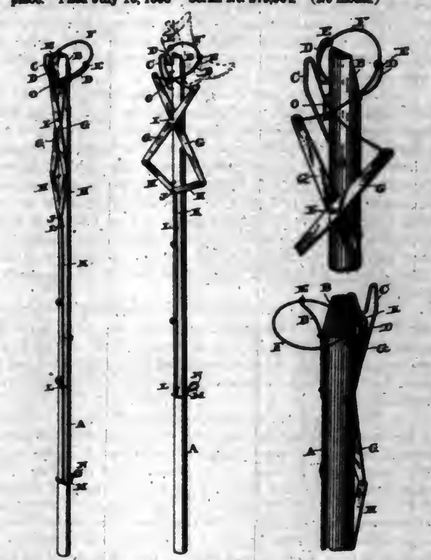
2. The combination, with a supporting-frame having parallel slots, of a strip-roll having its journals lying in said slots, a riding roll upon which the periphery of the strip rests, and a weight-roll resting upon the strip-roll and having its journals also lying in the slots of the frame and descending therein as the diameter of the strip-roll diminishes, substantially as described.

3. The combination, with a supporting-frame consisting of two parallel upright arms having parallel slots, of a riding roll having the journals of its shaft resting at the bottoms of the slots in the arms, and a strip-roll resting upon the riding roll and having its journals also lying

in the slots of the frame and descending therein as the strip-roll is consumed, the free end of the strip being drawn between the strip-roll and riding roll, substantially as described.

4. In an apparatus for feeding or delivering tapes, ribbons, or other continuous strips wound in rolls, the combination, with a suitable support for a strip-roll, of a riding roll upon which said strip-roll turns, the parts being so arranged that as the diameter of the strip-roll decreases by the withdrawal of the strip the axes of the said strip-roll and of the riding roll shall in a corresponding degree approach each other, substantially as described.

395,949. DEVICE FOR HANDLING SHELF GOODS, &c. GEORGE CADE, Memphis, Tenn., assignor of one-half to John W. Maumee, same place. Filed July 19, 1888. Serial No. 279,564. (No model.)



Claim.—1. The combination of the pole, the sliding rod, the toggle joint or lever, the flexible loop, and the arms for guiding and supporting the latter, substantially as and for the purpose shown and set forth.

2. A compound implement comprising the pole beveled at its upper end, the arms attached to opposite sides of the same and provided with eyes at their outer ends, the flexible loop inserted through said eyes, the toggle joint or lever, the sliding rod for operating the latter, and the fixed hook, all constructed and combined to operate substantially as and for the purpose shown and set forth.

395,950. ELECTRICAL HEATING. JOHN V. CAPEK, Brooklyn, assignor to himself, and Edward H. Johnson, New York, N. Y. Filed Mar. 12, 1888. Serial No. 266,922. (No model.)



Claim.—1. In an electrical heater, a conducting body of little thickness and large surface provided with electrical circuit-connections, the resistance and radiating surface of such body being so proportioned to the current that such body is heated to a temperature below the igniting-point of wood, paper, and like combustible materials, substantially as set forth.

2. An electrical heater consisting of insulating strips or plates provided with thin coatings of carbon and electrical circuit-connections to said carbon, the resistance and radiating surface of said carbon being so proportioned to the current that said carbon is heated to a temperature below the igniting-point of wood, paper, and like combustible materials, substantially as set forth.

3. An electrical heater for rooms and inclosed spaces, consisting of a thin coating of electrical conducting material—such as carbon—placed upon the walls of the room and provided with electrical connections, the resistance and radiating surface of the conducting material being so proportioned to the current that said conducting material is heated to a temperature lower than the igniting-point of wood, paper, and like combustible materials, substantially as set forth.

4. An electrical heater consisting of one or more non-conducting strips or plates coated with carbon and a protecting-covering for the carbon and provided with electrical connections, substantially as set forth.

5. In an electrical heater, the combination of two or more non-conducting strips or plates coated with carbon, placed side by side, and electrically connected at their edges, substantially as set forth.

6. In an electrical heater, the combination of two or more non-conducting strips coated with carbon and united by conducting-strips laid upon their meeting edges, substantially as set forth.

7. An electrical heater consisting of strips or plates of graphitized card-board and electrical connections, the resistance and radiating surface of the carbon being so proportioned to the current that said carbon surfaces may be raised to a temperature below the igniting-point of the card-board, substantially as set forth.

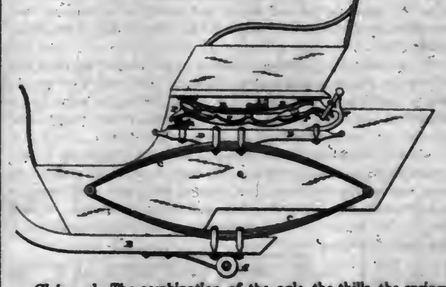
8. In an electrical heater, the combination of an insulating-frame, plates or strips of insulating material coated with carbon secured to said frame, conducting-strips joining the meeting edges of the carbon-coated strips, and a protecting-covering for the carbon surface substantially as set forth.

395,951. PROCESS OF TREATING FIBER WARE. HENRY CARMICHAEL, Malden, Mass. Filed Apr. 13, 1887. Serial No. 234,630. (Specimens.)

Claim.—1. The art or method of treating articles of pulp or other fiber, which consists, first, in saturating the article with a solution of indurating substance; second, freeing the article from the solvent, and, lastly, subjecting the article freed from solvent, but containing the indurating substance, to a baking process, whereby the indurating substance in the fiber is oxidized or hardened, substantially as and for the purpose specified.

2. The art or method of treating articles of pulp or other fiber, which consists, first, in saturating the article with a solution of indurating substance; second, freeing the article from the solvent; third, subjecting the article freed from solvent, but containing the indurating substance, to a baking process; fourth, subjecting the baked article to a bath of linseed-oil or a mixture thereof, and, lastly, subjecting the article to a second baking, substantially as described.

395,952. ROAD-CART. CHARLES D. CARTER, Spring Arbor, Mich. Filed July 14, 1888. Serial No. 279,355. (No model.)



Claim.—1. The combination of the axle, the thills, the springs, and the side bars with the supporting-brackets placed upon the rear ends of the side bars, the links, the supports secured to the seat or body and connected at their rear ends to the links with the front brackets, the friction-roller, and the bearing secured to the seat or body which rests upon the roller, whereby the seat or body has a vibratory movement independently of the side bars, substantially as shown.

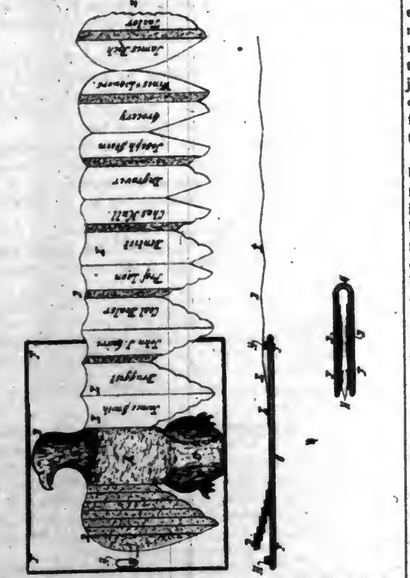
2. The combination of the side bars, the brackets L, secured thereto, the supporting-bar connected at its rear end to the link, and which is supported at its front end by the friction-roller N upon the bracket L, the top bar loosely connected to the supporting-bar and rigidly secured to the seat or body, and the friction-rollers, which are placed between the two bars, substantially as described.

3. In a cart, the combination of the side bars, the seat or body, which is supported at its rear corners by means of supporting-links loosely connected to the side bars, suitably-grooved bearings at the front corners of the seats, and friction-rollers, which are placed between these bearings, whereby the seat has a movement independently of the side bars, substantially as shown.

4. The combination of the body or seat of a cart, side bars between which the seat or body is suspended, suitable supporting-bars loosely connected to the side bars, and friction-rollers placed between the supporting-bars, whereby the seat automatically adjusts itself into a horizontal position, substantially as specified.

5. In a road-cart, the combination, with the frame, of the seat, bars between which the seat is suspended, and the bearings placed between the seat and the frame, and which extend in the radius of a circle of which the axle is the center, and upon which the seat rests, whereby the frame is allowed a free movement without affecting the seat, substantially as shown and described.

395,953. DEVICE FOR ADVERTISING. THOMAS CLARK, Brooklyn, N. Y., assignor to Anna Jane Clark, same place. Filed May 3, 1888. Serial No. 272,696. (No model.)



Claim.—1. An advertising device consisting of the body in the form of a bird having the wings at opposite sides each composed of a series of sections to fold and unfold, and the several sections of each wing having spaces to receive advertisements or the like, substantially as described.

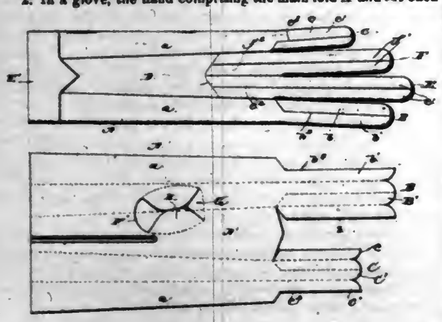
2. An advertising device consisting of the body in the form of a bird having the wings at opposite sides each composed of a series of sections to fold and unfold, and locks H, for holding the wings folded, the several sections of each wing having spaces to receive advertisements or the like, substantially as shown and described.

3. An advertising device consisting of the folding cover F, having the joint G, and the body A in the form of a bird mounted on the cover, and having the wings D at opposite sides, each composed of a series of sections to fold and unfold, and the several sections of each wing having spaces for advertisements or the like, substantially as shown and described.

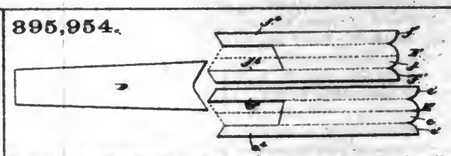
395,954. GLOVE. JENNINGS CORRIE, Gloversville, N. Y. Filed Jan. 17, 1888. Serial No. 261,037. (No model.)

Claim.—1. In a glove, the hand having the oval opening F therein, the ears H on opposite sides of the opening and formed integral with the hand, and the thumb arranged at its inner edges under the ears and stitched to the palm around the opening F, the said ears being stitched to the sides of the thumb, substantially as specified.

2. In a glove, the hand comprising the main fold A′ and the back



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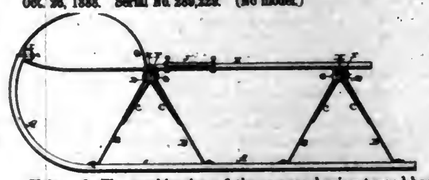
flaps, *a a*, in combination with the gore D, inserted between the adjacent edges of the said back flaps and terminating above their lower ends, the said gore being provided in its lower end with a V-shaped notch, the outer fingers at the lower end of the hand, and the intermediate fingers, E F, attached together and to the hand, and having tongues e^2 f^2 on their upper ends stitched together to form a projection or extension which is secured between the exposed lower ends of the flaps *a a*, and is provided with a wedge-shaped upper end fitting in the V-shaped notch in the lower end of the gore, substantially as specified.

3. In a glove, the hand A, comprising the main fold A′ and the back flaps, *a a*, the gore D, arranged between the adjacent edges of the flaps *a a* and terminating above their lower ends, and the fingers B C, integral with the hand A, in combination with the fingers E F, arranged between the fingers B C, and comprising the main folds *e f*, the back flaps, *e′ e′* and *f′ f′*, stitched, respectively, together at their adjacent edges, and the tongues e^2 e^2 and f^2 f^2 on the upper ends of the said back flaps, respectively stitched together to form extensions, which extensions are stitched together at their adjacent edges, stitched at their upper ends to the lower end of the gore, and stitched at their outer edges to the exposed edges of the flaps *a a*, substantially as specified.

4. In a glove, the combination of the hand having a thumb-opening, F′, the integral wedge-shaped point G at the lower end of the opening F′, the integral ears H H on the sides of the opening F′, and the thumb stitched in the said opening and having the ears H and the point G stitched thereto, substantially as and for the purpose hereinbefore specified.

5. The herein-described glove, comprising the hand A, consisting of the main fold A′ and the back flaps, *a a*, on its edges, the gore D, stitched between the opposing edges of the flaps *a a*, the outer fingers, B C, integral with the lower end of the hand and consisting of the main folds B′ C′, the back folds, *b′ c′*, on the outer edges of the main folds, having recesses b^2 c^2 therein, the tongues *b c* on the inner edges of the main folds, fitting within the said recesses and stitched to their edges, the intermediate fingers, E F, provided with extensions or tongues on their upper ends, stitched to the lower end of the gore, and fitting between the lower ends of the flaps *a a*, and the thumb stitched in a suitable opening in the hand, substantially as specified.

395,955. SLEIGH. HENRY A. CURRIER, Almont, Mich. Filed Oct. 26, 1888. Serial No. 289,229. (No model.)

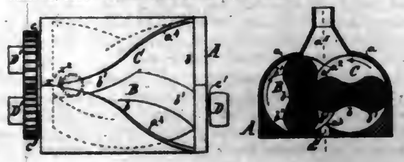


Claim.—1. The combination of the runners having turned-back ends, the knees, the raves, and the cross-bars, with the castings applied to the ends of the cross-bars, and to which the ends of the knees, the raves, and the ends of the runners are secured, and the two clamping-bolts by which the parts are held in position, substantially as shown.

2. The combination of the runners having the ends of the wooden portions beveled, as shown, the raves having their ends turned upward and applied to the wooden portions, the draft-bar, which is applied to the ends of the raves, and the clamping-bolts, substantially as described.

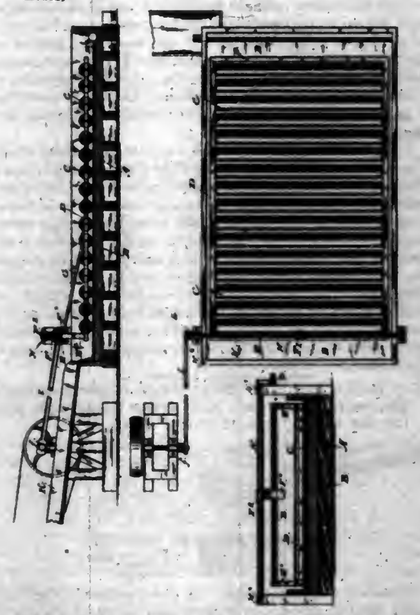
3. The combination of the runners, the knees, the raves, cross-bars, clamping-bolts, and the castings applied to the ends of the bars, the castings being provided with recesses to receive the ends of the knees and the raves, substantially as set forth.

395,956. FORGE-BLOWER. JOHN DAY, Malta Bend, Mo. Filed Mar. 23, 1888. Serial No. 268,192. (No model.)



Claim.—The combination, with twin screws formed, respectively, with two blades, each blade having a half-twist, of the case having a small outlet on top, above and near one end of the screws, and a relatively-large tapering inlet in its bottom beneath the screws, and extending from end to end of the screws and equally on opposite sides of the center of the bottom of the case, substantially as and for the purpose described.

395,957. PULVERIZER AND AMALGAMATOR. ESTEBAN DEMMER, San Francisco, Cal. Filed Jan. 31, 1888. Serial No. 262,574. (No model.)



Claim.—The combination, with a solid bed with inclosed sides and overlaid plates, of the system or series of pressure-rollers, a frame within which they are mounted, said frame being provided with a transverse bar at the upper end thereof, a rock-shaft with forked arms engaging said bar, and means, substantially as described, for operating the rock-shaft, as set forth.

395,958. ELECTRIC SIGNALING APPARATUS. MARK W. DEWEY, Syracuse, N. Y., assignor of two-thirds to Emil Lenze and Charles H. Duell, same place. Filed Mar. 31, 1888. Serial No. 269,163. (No model.)

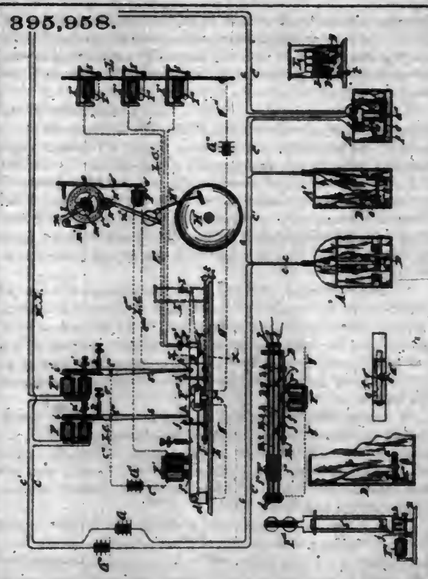
Claim.—1. A plurality of transmitting-stations, a number whereof are each equipped with a single circuit maker and breaker connected with a single line-wire, and the remainder of said stations being each equipped with a combination of two or more circuit makers and breakers connected with a corresponding number of line-wires, in combination with a plurality of interchangeably-movable feelers, magnets in the main-line circuits, and armatures for said magnets controlling the movements of said feelers, as set forth.

2. In combination with a plurality of line-wires, a plurality of interchangeably-movable feelers, magnets in the line-wires, armatures for said magnets controlling the movements of said feelers, a series of signal-boxes, a number thereof equal to the number of the aforesaid wires being provided with a single circuit maker and breaker, and the remainder of said boxes being each equipped with a combination of circuit makers and breakers connected with two or more of the aforesaid wires, and the circuit makers and breakers being operated automatically with the opening and closing of the doors of the boxes containing the same, as set forth.

3. A signaling system comprising a plurality of transmitting-stations, a number whereof are each equipped with a single circuit maker and breaker connected with a single line-wire, and the remainder of said stations being each equipped with a combination of two or more circuit makers and breakers connected with a corresponding number of line-wires, in combination with a plurality of interchangeably-movable feelers, magnets in the line-wires, armatures for said magnets controlling the movements of said feelers, and an audible signal in a local circuit also controlled by the movements of said armatures, substantially as set forth.

4. A signaling system comprising a plurality of transmitting-

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stations, a number whereof are each equipped with a single circuit maker and breaker connected with a single line-wire, and the remainder of the said stations being each equipped with a combination of two or more circuit makers and breakers connected with a corresponding number of line-wires, in combination with a plurality of interchangeably-movable feelers, one for each transmitting-station, magnets in the line-wires, armatures for said magnets controlling the movements of said feelers, and an annunciator operated by the movements of the aforesaid feelers, substantially as set forth.

5. In a signaling apparatus, the combination of a plurality of line-wires, transmitting-stations connected with said line-wires, magnets F F^x at the receiving-station connected with the said line-wires, plates *s s′*, operated by said magnets, feelers B B, operated by a local circuit, a clock-work having the detent M arranged to be actuated by the feeler, the metallic disk P, rotated by said clock-work, metallic arms *x x*, projecting from said disk, insulators *y y* between the arms, the pivoted bar P′, the gong R′, hammer R, magnet Q, arranged to actuate the hammer, the battery P″, and wires connecting the disk P, magnet Q, and bar P′ with the battery, substantially as described and shown.

6. In combination with the feelers B B and movable plates *s s′*, the battery G′, contact-stops *j j*, magnet F′, audible signal mechanism, magnet F″, for operating said signal mechanism, and an electric conductor connecting the plates, stops, and magnets with the battery, substantially as described and shown.

7. In combination with the feelers B B and pivoted plates *s s′*, the batteries G G″, main-line circuit-wires, circuit makers and breakers connected with said wires, magnets F F^x in said circuits and arranged to actuate the aforesaid plates, battery G′, magnet F′, arranged to actuate the feelers, circuit-closers *j j*, and an electric conductor connecting magnet F′ with the battery G′, as and for the purpose set forth.

8. In combination with the feelers B B and pivoted plates *s s′*, the batteries G G″, main-line circuits M L, composed of separate wires, one for each of said plates, magnets F F^x, for operating the plates, signal-boxes each connected with one or more of the aforesaid wires, circuit-breakers connected to said boxes, and the plurality of circuit-breakers in a box, arranged to operate simultaneously, substantially as set forth.

9. In combination with the feelers B B and pivoted plates *s s′*, the batteries G G″, main-line circuits M L, composed of separate wires, one for each of said plates, magnets F F^x, connected with the main lines and arranged to operate said plates, signal-boxes each connected with a different wire or different set of wires of said circuits, circuit-breakers connected to said boxes, the battery G′, stops *j j*, and the magnet F′, arranged to operate the feelers, and electric conductors connecting the plates *s s′*, stops *j j*, and magnet F′ with the battery G′, substantially as set forth and shown.

10. In combination with the feelers B B, magnet F′, for operating said feelers, and pivoted plates *s s′*, the battery G′, arranged to operate the feelers, the rock-shaft *j′*, stops *j j*, connected to said rock-shaft, the alarm-tripper *o″*, magnet F″, for operating said tripper, local

circuit-wire connecting the plates *s t* with one of the poles of the battery G', wire connecting the rock-shaft *j'* with the magnet F'', wire connecting the magnet F'' with the magnet F', and wire connecting the magnet F' with the battery G', substantially as described and shown.

11. In combination with the feelers B B and pivoted plates *s t*, the rock-shaft *j'*, stops *j j* and armature *j''*, connected to said rock-shaft, magnet F'', for attracting said armature, battery G'', contact-points *p*, attached to the feelers, contact-points *p'*, annunciator L, magnets I'' I'' I'', wire *g*, and feelers B, connecting the magnet F'', respectively, with the contact-points *p* and with the battery G'', and wires *p''* and *g''*, connecting the annunciator-magnets, respectively, with the contact-points *p'* and with the aforesaid battery, and an audible signal operating electrically and simultaneously with the annunciator, substantially as described and shown.

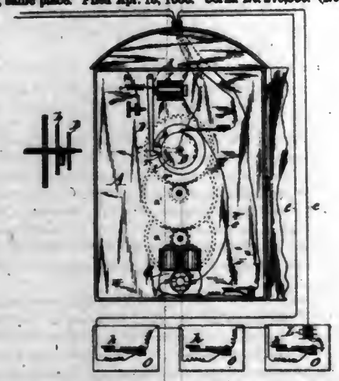
12. The combination, with a signal-box having a movable door, of an electric contact-point secured stationary to the interior of the box, an electric contact-point supported movably in the box and normally separated from the other contact-point, a push-bar projecting from the movable contact-point toward the door, and a latch adapted to lock the push-bar and prevent the same from following the movement of the door, as set forth.

13. In a plurality of line-circuits, a signal-station in said circuits, a plurality of primary circuit makers and breakers at said station, and a supplemental circuit maker and breaker carried on movable electric conducting-supports adapted to make and break contact with the metallic portions of the primary circuit makers and breakers, substantially as specified and shown.

14. In a fire-alarm signal-box, a pluranty of primary circuit makers and breakers, through each of which a separate current flows, and a supplemental circuit maker and breaker actuated automatically by the primary circuit makers and breakers and carried on movable electric conducting-supports adapted to make and break contact with the metallic portions of the primary circuit makers and breakers, substantially as set forth and shown.

15. In a fire-alarm signal-box, the combination of a plurality of primary circuit makers and breakers, consisting of stationary contact-points *a'* and movable contact-points *a*, carried on spring-arm *b* and actuated by the opening and closing of the door of the box, the spring 6, connected at one end to the metallic portion of one of the said contact-points and having its free end adapted to make and break contact with its opposite contact-point, the spring-arms *b'* and *b''*, with springs 5 5 attached to said arms and adapted to make and break contact with the conducting material of the contact-points *a a'*, stops 2 2, for limiting the movement of the spring-arms *b' b''*, concentrating circuit making and breaking contact-points *a''' a'''*, carried on the spring-arms *b' b''*, the insulating material 3, interposed between the contact-points *a''' a'''*, and the spring 4, connected at one end to one of said contact-points and having its free end adapted to make and break contact with the conducting material of the opposite contact-point, substantially as described and shown.

395,959. ELECTRIC SIGNALING APPARATUS. MARK W. DEWEY, Syracuse, N. Y., assignor of two-thirds to Emil Lenz and Charles H. Duell, same place. Filed Apr. 13, 1888. Serial No. 270,589. (No model.)



Claim.—1. In an electric-alarm system, the combination, with the transmitting-instrument, of an auxiliary circuit and an electromotor in said circuit and connected with the transmitting-instrument to operate the same, and a stop to limit the movement of said motor, as set forth.

2. In combination with a main circuit and a public alarm-box in said circuit, a circuit-breaking mechanism in said box, an auxiliary circuit, and an electric motor connected with the latter circuit and adapted to move said circuit-breaking mechanism, and a stop arranged to limit the movement of said motor, substantially as set forth.

3. In combination with a main circuit and a public alarm-box in said circuit, a circuit-breaking mechanism, an auxiliary circuit, a detent controlled by an electro-magnet in the auxiliary circuit for restraining and releasing the movement of the main-circuit breaking mechanism, and an electric motor in the auxiliary circuit adapted to operate said mechanism, whereby the loss of time and expense of manual labor of winding up said mechanism are dispensed with, substantially as set forth.

4. In combination mith the main circuit and an electric-alarm box in said circuit, having a circuit-breaking wheel, an auxiliary circuit, an electric motor connected with said circuit and adapted to rotate said breaking-wheel, a detent controlled by an electro-magnet in the auxiliary circuit and adapted to stop and release the motion of the breaking-wheel, and keys or equivalent devices for controlling the current of the auxiliary circuit, substantially as described and shown.

5. In an electric signaling system comprising a plurality of signaling-boxes, each having a circuit-breaking wheel, an electric motor within each of said boxes connected with and adapted to rotate said breaking-wheels, a detent adapted to engage and release the breaking-wheel, a magnet for operating said detent, an auxiliary circuit extending from a generator successively to the electric motors of the respective boxes, branches extending from said circuit to sub-stations in the neighborhood of the boxes, and return-paths for the branches to the generator, each branch including the magnet in one of the boxes, and keys or devices at said sub-stations for controlling the current through said branch and thereby releasing and operating the aforesaid electric motor and breaking-wheel or restraining the same, substantially as described and shown.

395,960. CARPET-SWEEPER. WALTER J. DREW, Grand Rapids, Mich., assignor to The Bissell Carpet Sweeper Company, same place. Filed Mar. 21, 1888. Serial No. 267,980. (Model.)



Claim.—1. The combination, with a sweeper-case having a bail pivoted centrally thereto and shiftable from one side of the case to the other, of a spring acting on the case and bail to raise that side of the case nearest the operator and depress that side farthest from the operator, substantially as described.

2. The combination, with a sweeper-case having a bail pivoted centrally to the ends thereof above the axis of the brush-shaft and shiftable from one side of the case to the other, of a spring connected at one end with the case and at the other end with the bail above its pivotal bearing, and acting on the case and bail to raise that side of the case nearest the operator and depress that side farthest from the operator, substantially as described.

395,961. ELECTRICAL STORE-SERVICE APPARATUS. RICHARD N. DYER, East Orange, N. J. Filed July 1, 1887. Serial No. 243,116. (No model.)

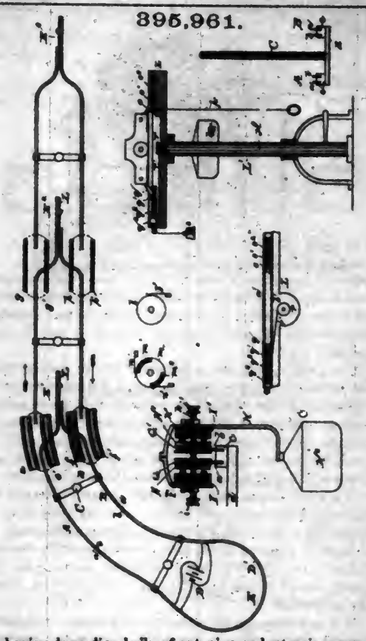
Claim.—1. In electrical store-service apparatus, the combination, with two ways, each composed of two parallel tracks placed close together, of supports connecting such ways together and supporting them from their inner sides, whereby the tracks will be left clear upon their tops and their outer sides and beneath for the movement of the carrier-receptacles, wheeled carriers traveling on such ways and having electric motors by which they are driven, taking current from the tracks, and provided with bails hanging down on the outer side of the ways and curved laterally beneath such ways to support the receptacles, and a source of electrical energy connected with the tracks of both ways, substantially as set forth.

2. In electrical store-service apparatus, the combination, with outgoing and returning ways, each consisting of two tracks, and carriers with electric motors traveling upod such ways, of a source of electric energy connected from one pole to the inner tracks of the two ways and from the other pole to the outer tracks, and a turn-table for reversing the position of the carrier in shifting from one way to the other, substantially as set forth.

3. In an electrical store-service apparatus, the combination, with the two ways supported and connected together on their inner sides, of carriers having electric motors traveling on such ways and provided with bails depending on one side, and a turn-table for reversing the position of the carriers in shifting them from one way to the other, substantially as set forth.

4. In electrical store-service apparatus, the combination, with

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carriers having depending bails, of outgoing and returning ways, each of which is broken and deflected laterally at stations, and bridging switching-plates at such breaks for lifting carriers to or from succeeding stations over such breaks, substantially as set forth.

5. In electrical store-service apparatus, the combination, with carriers having depending bails, of outgoing and returning ways, each of which is broken and deflected laterally at stations, and bridging switching-plates at such breaks for lifting carriers to or from succeeding stations over such breaks, and a turn-table at each sales-station for reversing the position of the carriers in shifting from one way to the other, substantially as set forth.

6. In electrical store-service apparatus, the combination, with outgoing and returning ways, each consisting of two tracks, and carriers with electric motors traveling upon such ways, of a turn-table for reversing the position of the carrier in shifting from one way to the other, and a spring which is put under tension by the turning of the table and acting when the carrier is released to start it onto the return way, substantially as set forth.

7. In electrical store-service apparatus, the combination, with outgoing and returning ways, each consisting of two tracks, and carriers with electric motors traveling upon such ways, of a turn-table for reversing the position of the carrier in shifting from one way to the other, a spring-stop with pivoted releasing-latch, and a spring starting device with a pivoted latch over which the carrier rides, substantially as set forth.

8. In electrical store-service apparatus, the combination, with outgoing and returning ways, each consisting of two tracks, and carriers with electric motors traveling upon such ways, of a turn-table for reversing the position of the carrier in shifting from one way to the other, a turning pipe on which the turn-table is mounted, a stationary shaft within said pipe, a spring mechanism for starting the carrier on its return journey, and a connection between the stationary rod and the spring, substantially as set forth.

9. In electrical store-service apparatus, the combination, with outgoing and returning ways having each two tracks connected with the source of electrical energy, of a section of track disconnected from the circuit and joining the ways together at the cashier's end, substantially as set forth.

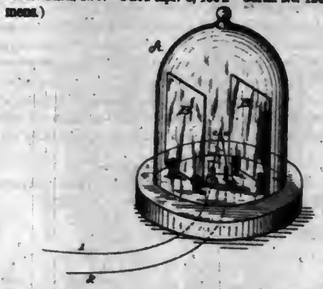
395,962. METHOD OF MANUFACTURING ELECTRIC LAMPS. THOMAS A. EDISON, Menlo Park, N. J., assignor to the Edison Electric Light Company, New York, N. Y. Filed Sept. 22, 1888. Serial No. 72,337. (No specimens.)

Claim.—1. The process of producing a high vacuum in the inclosing-globe of an incandescing electric lamp, consisting in placing within said globe a compound of chlorine or equivalent element and then withdrawing the air from said globe, the filament of the lamp being heated to incandescence by an electric current during a portion of the latter step, substantially as set forth.

2. The process of producing a high vacuum in the inclosing-globe of an incandescing electric lamp, consisting in placing on the clamps which hold the filament of said lamp a quantity of bichloride of platinum and then withdrawing the air from said globe, the filament being heated to incandescence by an electric current during a portion of the latter step, substantially as set forth.

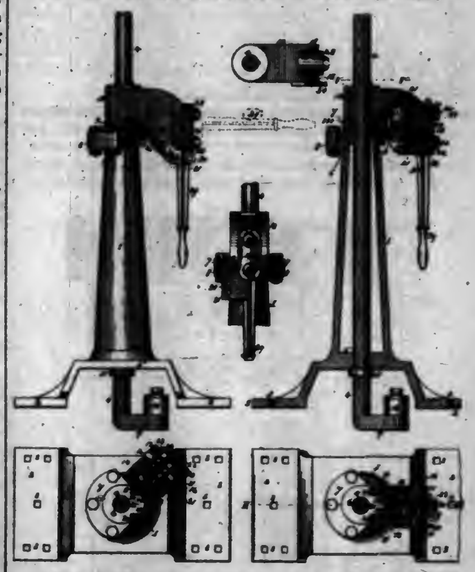
3. The process of producing a high vacuum in the inclosing-globe of an incandescing electric lamp, consisting in placing on the clamps which hold the filament of said lamp a quantity of bichloride of platinum and then withdrawing the air from said globe, said filament being heated to incandescence by an electric current during a portion of the latter step, substantially as set forth.

395,963. INCANDESCENT-LAMP FILAMENT. THOMAS A. EDISON, Menlo Park, N. J. Filed Apr. 5, 1884. Serial No. 126,802. (No specimens.)



Claim.—The process of preparing material for the manufacture of filaments for incandescent electric lamps, consisting in volatilizing a substance having a high electrical resistance by electrically heating such substance in a vacuum, causing such substance to be deposited in the form of filaments or as a sheet from which filaments are formed, substantially as set forth.

395,964. AUTOMATIC SWITCH-STAND. HENRY ELLIOT, St. Louis, Mo. Filed May 31, 1888. Serial No. 275,537. (No model.)



Claim.—1. The combination, in a switch-stand, of a fixed part having locking-recesses, an upright signal-shaft, 4, with a crank connected with the switch-rails, and a pivoted block upon the signal-shaft having a spring-bolt with beveled end adapted to engage in the locking-recesses, substantially as and for the purpose set forth.

2. The combination, in a switch-stand, of a fixed part, 7, having recesses 24, a bolt, 15, housed in a pivoted block, 14, guide-pins 20, springs 23, screw-threaded bearings 22, and screw-plugs 28, substantially as and for the purpose set forth.

3. The combination, in a switch-stand, of the block 7, having recesses 24, the signal-shaft carrying a head, 12, with block 14, pivoted thereto, a spring-bolt working in said block and adapted to engage in

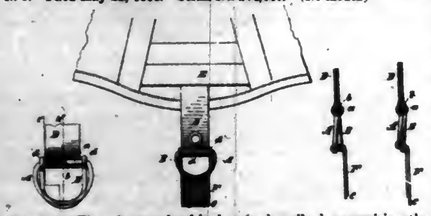
the recesses, and a handle, 29, upon the block 14, for the purpose set forth.

4. The combination, in a switch-stand, of a fixed part of the stand-pillar having locking-recesses, an upright signal-shaft, a block pivoted upon the signal-shaft and turning in a vertical plane and carrying a handle, by which it may be turned, and a spring-bolt having bearing in the block and having a beveled end adapted to engage in the locking-recesses when the block is in a certain position, substantially as described.

5. The combination, in a switch-stand, of a fixed part of the pillar having recesses 24 and a tongue, 25, the signal-shaft 4, a head, 12, secured to the shaft, a block, 14, pivoted to the head by a horizontal pivot or arbor, 16, a bolt, 15, working in the block 14 and having guide-pins 20, surrounded by springs 23, and handle 29 upon the block 14, all substantially as and for the purpose set forth.

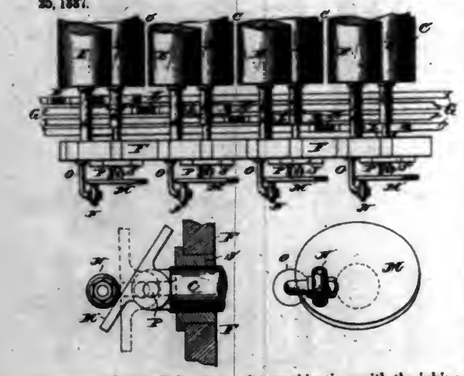
6. The combination, in a switch-stand, of a fixed part of the pillar having recesses 24 and a tongue, 25, between the recesses, the signal-shaft 4, a head, 12, secured to the shaft, a block, 14, pivoted to the head by a horizontal pivot or arbor, 16, a bolt, 15, working endwise in the block 14 and having guide-pins 20, surrounded by springs 23, for the purpose set forth, and a handle, 29, upon the block 14, with a slotted lug, 31, engaging on a fixed staple, 30, all substantially as set forth.

395,965. CLASP OR BUCKLE. SHERWOOD B. FERRIS, Lakewood, N. J. Filed May 22, 1888. Serial No. 274,649. (No model.)



Claim.—The clasp or buckle herein described, comprising the semicircular loop A, having the inwardly-bent ends *a*, the loop B, narrower than loop A, and having the eyes *d* at the ends of its arms pivoted on the ends *a* and arranged within the sides of loop A, said loop B being longer than loop A, so that its central portion bears upon the central portion of loop A, and the tube *b*, inclosing the inwardly-bent ends *a*, substantially as described.

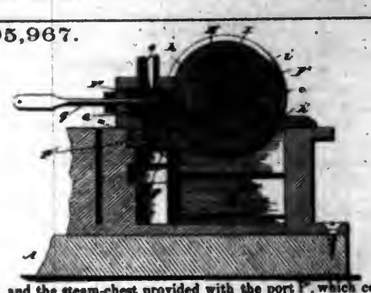
395,966. MEANS FOR RECIPROCATING INK-DISTRIBUTING ROLLS OF PRINTING-MACHINES. HENRY C. A. PYNOT, Sydney, New South Wales. Filed Sept. 15, 1887. Serial No. 249,796. (No model.) Patented in Victoria Feb. 4, 1887, No. 4,921; in New Zealand Feb. 27, 1887; in New South Wales Apr. 6, 1887, No. 2,064, and in England Apr. 25, 1887.



Claim.—In a printing-press, the combination, with the inking-roll and the ink-distributing roll, of devices for imparting endwise motion to the distributing-roll, which consists of a disk pivoted on the roller-journal to adapt the same to be set to an inclination relatively to the axis of the roll, an abutment bearing on the face of the disk, and a spring for returning said roll into its normal position when moved out of it, substantially as and for the purposes specified.

395,967. STEAM-ENGINE. GEORGE W. FITZ, New Richmond, Ohio. Filed Aug. 10, 1888. Serial No. 282,406. (No model.)

Claim.—1. In a steam-engine, the combination of the cylinder provided with the chambers G G', the piston H, mounted in the cylinder and provided with the radial wings *h h'*, fitting in the said chambers, and the steam-chest provided with the port P, which communicates with the chambers of the cylinder on opposite sides of the wings *h h'*, and the port P', which communicates with the said chambers on the reverse sides of the said wings, substantially as and for the purpose specified.



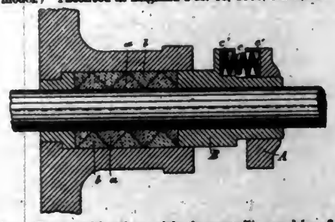
2. In a steam-engine, the combination of the cylinder provided with the chambers G G', the piston H, having the wings *h h'*, mounted in the cylinder, and the steam-chest provided with the steam-port P, which communicates through the channels *p* and p^2 with opposite ends of the said chambers G' and G, respectively, and the steam-port P', which communicates through the channels p^3 and p^4 with opposite ends of the chambers G and G', respectively, substantially as specified.

3. In a steam-engine, the combination of the cylinder provided with the chambers G and G', and having the heads I and K, provided, respectively, with the channel p^3 and the diverging channels p^3 and p^4, the piston H, mounted in the said cylinder, and the steam-chest provided with the ports P P', which communicate with the cylinder through the sets of channels *p* p^2 and *p'*, p^3, and p^4, respectively, substantially as specified.

4. In a steam-engine, the cylinder divided into chambers G G', and provided with the channels *p* p^2, which communicate, respectively, with the adjacent and remote sides of the chambers G' and G, and the channels p^3 and p^4, which communicate, respectively, with the adjacent and remote sides of the chambers G and G', in combination with the piston H, mounted in the cylinder and provided with wings *h h'*, and the steam-chest provided with the port P, which communicates with the channels *p* and p^2, and the port P', which communicates with the channels p^3 and p^4, substantially as specified.

5. In a steam-engine, the combination of the cylinder provided with chambers G and G', and steam-channels *p*, p^2, p^3, and p^4, communicating, respectively, with the ends of the said chambers, the piston H, having the wings *h h'*, mounted in the cylinder, the steam-chest provided with the exhaust-port *o*, and the steam-ports P and P', communicating, substantially as described, with the said channels, and the valve covering the said exhaust-port and one of the steam-ports, substantially as and for the purpose specified.

395,968. METALLIC STUFFING-BOX PACKING. FRIEDRICH O. FRANKE, St. Gall, Switzerland. Filed Mar. 19, 1888. Serial No. 267,639. (No model.) Patented in England Feb. 18, 1888, No. 2,456.



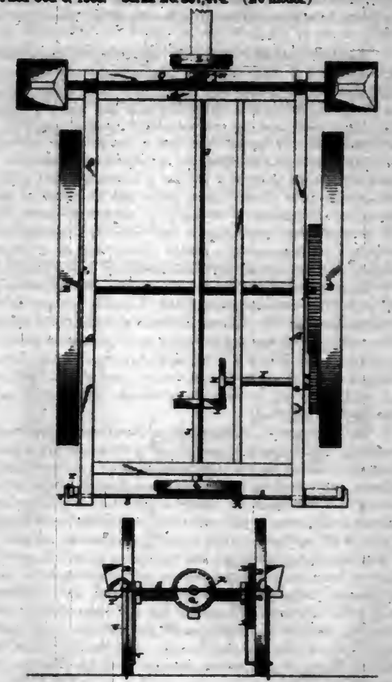
Claim.—The combination, with the metallic packing formed triangular in cross-section, substantially as described, of the box B, bearing against said packing and provided with the cavities *c'* and the projecting portion on its front end, the flange, also provided with cavities *c'* and sliding upon the said projection, the springs in the cavities between the flange and the box, and the nuts *d* for tightening up the said flange and increasing the pressure of the springs upon the metallic packing, substantially as set forth.

395,969. LAMP. JOHN FRANKLIN, Cincinnati, Ohio. Filed Feb. 7, 1888. Serial No. 263,306. (No model.)



Claim.—The combination of the ring 15, the burner-tubes 13, the lava tips 18, and the bushing 42, composed of lava or other refractory non-conductor.

395,970. CORN-PLANTER. JAMES A. FULLERTON, Mounts, Ind. Filed Oct. 8, 1888. Serial No. 287,474. (No model.)



Claim.—1. The combination of the driving-wheel, the axle upon which it is placed, the cog-wheel D, secured to the axle, the axle F, the cog-wheel G, secured thereto, the arm or lever H, secured to the end of the shaft F, the shaft J, the wheel or ratchet I, secured to the shaft J, the wheel L, secured to the front end of the shaft J, the pinion N, and the crank O for operating the seed-slide, substantially as shown.

2. The combination of the shaft J, provided with the wheel or ratchet, I, and the arm or lever H and its operating mechanism for operating the shaft J, with the wheel Q, secured to the rear end of the shaft, the shaft S, pinion R, secured to the shaft, the cranks T upon the ends of the shaft S, the markers U, and the guides V, secured to the frame through which the markers operate, substantially as described.

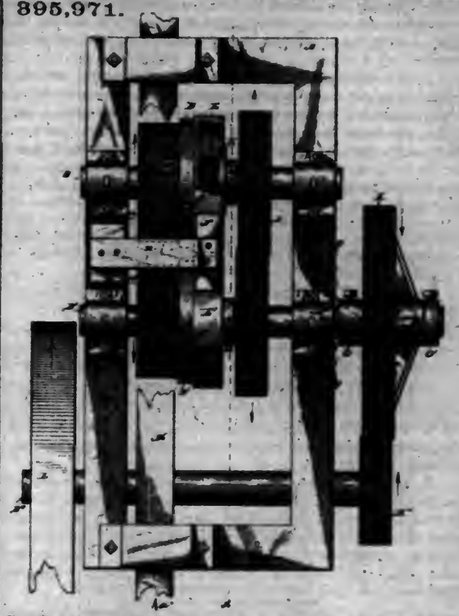
395,971. MECHANICAL MOVEMENT. JAMES C. FULTON, Rockport, Tex. Filed July 11, 1888. Serial No. 279,646. (No model.)

Claim.—1. In a device of the class described, the combination, with a suitably-mounted shaft, of two gear-wheels, one mounted loosely and the other rigidly upon said shaft, a reciprocating rack-bar engaging said loose gear, a pulley mounted loosely on said shaft, and a pawl pivoted to said loose pulley and provided with a finger engaging said loose gear, said pawl having a limited oscillation upon its pivot, whereby it may be thrown out of or into engagement with said rigidly-mounted gear-wheel, substantially as and for the purpose set forth.

2. The combination, with the shaft B, of the loose gear C and rack-bar M, the rigidly-mounted pinion G, the loose pulley E, and the pawl F, pivoted to said loose pulley and provided with the finger *f*, passing through a slot, *e*, in the pulley E and engaging the loose gear C, whereby the movement of the rack-bar in one direction throws the pawl F into engagement with the pinion G and rotates said pinion and the shaft B, and the movement of the rack-bar in the opposite direction throws the pawl out of engagement with the pinion and rotates the pawl about the shaft B without affecting the shaft.

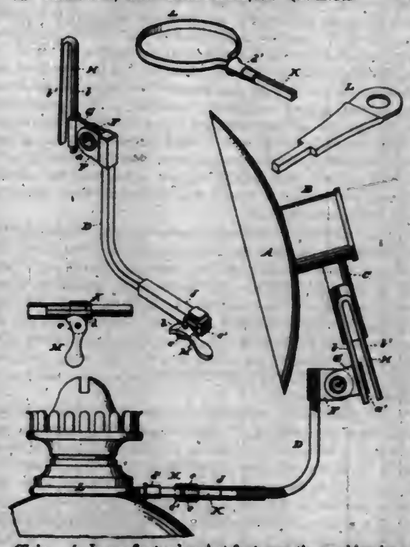
3. The combination, with the suitably-journaled parallel shafts B B', of the loose gears C C', mounted on said shafts respectively, the pinions G G', rigidly mounted on said shafts, the pulleys E E', loosely mounted on said shafts, and the oppositely-placed pawls F F', pivoted to the pulleys E E', respectively, and provided with fingers *f f'*, engaging the gears C C', whereby the movement of the rack-bar in either direction throws one of said pawls into engagement with the corresponding pinion and throws the other of said pawls out of engagement with the other pinion, substantially as and for the purpose set forth.

395,971. (duplicate)



4. The combination, with the shafts B B', of the loose gears C C and fixed gears G G', mounted on said shafts, the loose pulleys E E', also mounted on said shafts respectively, the oppositely-placed pawls F F', pivoted to the pulleys E E' and provided with fingers engaging the loose gears C C', the rack-bar M, engaging the loose gears C C' and adapted when moved in one direction to rotate one of said shafts and when moved in the opposite direction to reversely rotate the other shaft, and the gears I I', rigidly mounted on the shafts B B' and engaging each other, whereby the reciprocal movement of the rack-bar rotates the shaft B' constantly in one direction.

395,972. REFLECTOR-BRACKET. HENRY M. GOULD, Pittsburg, Pa. Filed Feb. 1, 1888. Serial No. 262,613. (No model.)

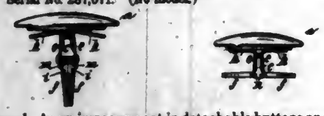


Claim.—1. In a reflector-bracket for lamps, the combination, with the collar L, of the curved holder having the broad bearing-plates F thereon, the lug G, having the socket *d'*, the tubular rivet *a*, the spring-

pintle H, having the downwardly-turned arms rounded on their exterior surface, one of said arms engaged in the socket *a'*, and the reflector having the tubular leg engaging said pintle, substantially as specified.

2. In a reflector-bracket for lamps, the combination, with the collar having the tang square in cross-section, of the curved arm having at one end the square or angular socket having a slot, *e*, and having the broad bearing-plates F at the other end, the cam-lever fulcrumed in the bearings on the socket, the sheet-metal lug G, having the socket *a'*, the tubular rivet *a*, the spring-pintle having its arms rounded on the exterior surface, and the reflector having the tubular leg engaging said pintle, substantially as specified.

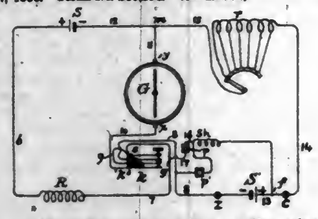
395,973. BUTTON OR STUD. HEINRICH F. HAMBRUCH, Hamburg, Germany, assignor to Aug. F. Richter, same place. Filed Oct. 3, 1888. Serial No. 287,071. (No model.)



Claim.—1. As an improvement in detachable buttons or studs, the button herein described having the spring-arms *e e* secured thereto, the movable shank disposed between said spring-arms, and the wings *f f*, pivoted to said shank and acted upon by said spring-arms, substantially as set forth.

2. As an improvement in detachable buttons or studs, the button herein described having the plate *g*, the spring-arms secured thereto at their upper ends, movable shank disposed between said spring-arms, the wings *f f*, pivoted at their inner ends to said shank and having holes or openings through which the lower ends of said spring-arms project, and the levers A A, secured to said plate *g*, bearing at their inner ends upon said shank, substantially as set forth.

395,974. ELECTRICAL MEASURING APPARATUS. HAMMOND V. HAYES, Cambridge, and ANTHONY C. WHITE, Boston, Mass. Filed Oct. 27, 1888. Serial No. 289,351. (No model.)



Claim.—1. The combination, in a direct-reading voltmeter, of a standard battery, a fixed resistance, terminals for connecting a battery or other generator to be tested, an adjustable and calibrated resistance, all in circuit together, a galvanometer in a bridge or derived circuit, a circuit-closer for simultaneously closing the circuit of the standard battery through the fixed resistance and the circuit of the generator under test through the adjustable resistance, and for directing the currents of both immediately thereafter, but in opposite directions, through the galvanometer, and means for varying the adjustable resistance until the currents through the galvanometer, as indicated by the absence of deflection, are equal, the said adjustable resistance being so calibrated that the figures representing the amount of adjustable resistance in circuit shall indicate in direct terms the electro-motive force required.

2. In an electrical measurement apparatus, the combination of the testing-circuit, the galvanometer in a bridge dividing said circuit into two parts, a standard battery and fixed resistance on one side of said bridge, an adjustable resistance and terminals for introducing a generator to be tested on the other side of said bridge, so that the current of said generator will oppose that of the standard battery in the galvanometer, and a compound circuit-controlling key normally maintaining both divisions of the circuit as well as the bridge open, but adapted when depressed to close both divisions and also said bridge, substantially as described.

3. The combination, substantially as hereinbefore described, in a direct-reading voltmeter, of a normally-open testing-circuit, a galvanometer in a bridge or derivation of the said circuit, the said bridge acting to divide the said circuit in two parts, itself being common to both, a standard battery and a fixed resistance included in the said circuit on one side of the bridge, terminals for the connection in said circuit of a battery or other generator to be tested, the said terminals being located upon the remaining side of the bridge and adapted to connect with the said generator so that its current shall pass through the galvanometer in a direction opposite to that of the standard battery, a key normally maintaining both divisions of the circuit and also the bridge-circuit open, and adapted when depressed to close both, and also the said bridge, and an adjustable resistance connected in that part of the circuit which includes the generator under test, and having its several coils so proportioned, calibrated, and graduated that the figures opposite the coils introduced shall when the galvanometer-needle remains without deflection upon the depression of the key indicate the electro-motive force in volts of the generator under test.

4. In a direct-reading voltmeter for measuring the electro-motive force of a battery or other electrical generator, the combination of a testing-circuit, including a variable resistance through a galvanometer, and a standard battery in a circuit through said galvanometer, including a fixed resistance, the current of said standard battery in the galvanometer being in opposition to that of the generator under test, the said variable resistance being so calibrated and graduated that the amount required to effect a balance indicates in direct terms the electro-motive force of the battery under test by means of figures placed opposite the resistance-varying plugs, substantially as described.

5. In an electrical measurement apparatus, the combination of a test-circuit, a galvanometer in a bridge dividing said circuit into two divisions, a standard battery and fixed resistance in one division, and in the other a variable resistance and terminals for connection of a generator to be tested in such manner that its current will pass through the galvanometer in the opposite direction to that of the standard battery, means for closing the circuit of both generators and of the galvanometer when a test is to be made, a normally-open shunt-circuit around the terminals for the generator to be tested, a fixed resistance in said shunt, and a circuit-closer therefor, substantially as and for the purpose described.

6. The combination, substantially as hereinbefore described, in an electrical measurement apparatus, of a direct-reading voltmeter comprising a testing-circuit, including a variable resistance and galvanometer, and a standard battery in circuit through said galvanometer with a fixed resistance, the battery or generator to be tested being in operation connected in the test-circuit, so that its current will oppose that of the standard battery in said galvanometer, the said variable resistance being calibrated and graduated in such manner that the amount required to effect a balance indicates in direct terms the electro-motive force of the generator under test, with a normally-open shunt-circuit connected around the said battery under test or looping from the fixed terminals thereof, and a circuit-closer therefor, whereby a second reading may be taken with the said shunt closed and the resistance of said battery deduced from the relations of the two readings, as set forth.

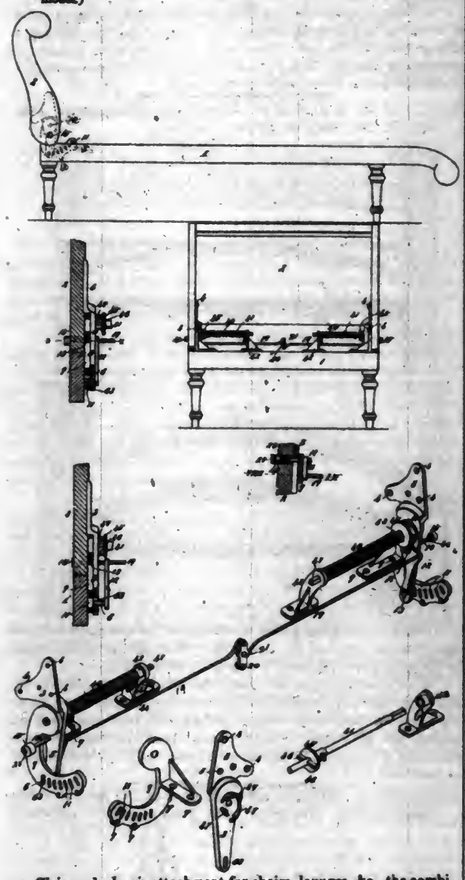
7. The combination, in an instrument for measuring electro-motive forces and resistances, of a standard battery, terminals for connecting a battery or other generator to be tested in such a way that its current will re-enforce that of the standard battery in direct circuit, a fixed resistance, an adjustable resistance consisting of a number of spools of wire adapted to be introduced and withdrawn from circuit by the withdrawal or introduction of plugs, and calibrated, as described, to indicate electro-motive forces in direct terms, a normally-open electric circuit serially connecting the said instrumentalities, a galvanometer, a bridge or derived circuit, including the said galvanometer, and connecting with the said normally-open circuit so as to divide it in two parts, itself being common to both, one including the standard battery and fixed resistance and the other the terminals of the battery to be tested, and the adjustable resistance, a compound key controlling both parts and adapted to close the circuits of the standard battery and of the battery under test through the galvanometer, and a shunt-circuit shunting the terminals of the battery under test, and controlled also by the said key, whereby the internal resistance of a battery may be calculated from its shunted and unshunted electro-motive forces.

8. In an instrument for electrical measurement, the combination, with a standard cell, a fixed resistance in circuit therewith, and a galvanometer, circuit-connections whereby the cell to be measured may be caused to oppose its current to that of the standard cell in the galvanometer-coils, a circuit-closing key controlling the circuit of both batteries and adapted to direct by the same motion the current of both, but oppositely, through the galvanometer, devices for varying the resistance in the circuit of the cell under test, the said devices being calibrated and graduated so that the amount of resistance introduced will indicate in direct terms the electro-motive force of the cell under test, and a shunt-circuit of known resistance arranged to short-circuit the said cell under test, substantially as and for the purposes specified.

9. In an instrument for measuring electrical magnitudes, the combination, with a standard cell, a fixed resistance in circuit therewith, and a galvanometer, of circuit-connections whereby the battery or like appliance to be tested may be connected and caused to traverse the galvanometer coils in a direction opposite to that of the standard cell, a circuit-closing key controlling the circuit of both batteries and adapted to close both, and thereupon to direct their currents through

the galvanometer, so as to oppose one another therein, devices for varying the resistance in the circuit of the cell under test, the said devices being calibrated and graduated in such a manner that the amount of resistance introduced will indicate in direct terms the electro-motive force of a cell under test, a shunt-circuit of known resistance arranged to short-circuit the said cell under test for the measurement of its internal resistance, and circuit-changing devices interposed in the said shunt-circuit, whereby it may be closed direct or diverted through the circuit-controlling key, substantially as specified.

395,975. ATTACHMENT FOR CHAIRS, LOUNGES, &c. JOHN HOGAN, St. Louis, Mo. Filed May 14, 1883. Serial No. 273,614. (No model.)



Claim.—1. In an attachment for chairs, lounges, &c., the combination of the members 3 and 7, members 7 being attached to the body of the chair or lounge at the sides and member 3 to the movable portion at the sides, plates 12, arranged parallel with members 3 and 7, and having pins 6 near their lower ends and push-rods 13 near their upper ends, the members 7 having slots or elongated openings 11 to receive the pins 6, and springs adapted to act on said pins and hold them normally in engagement with said slots, substantially as and for the purpose set forth.

2. In an attachment for chairs, lounges, &c., the combination of the members 3 and 7, members 7 being attached to the body of the chair or lounge and members 3 to the movable portion, vertical plates 12, having pins 6 near one end and push-rods 13 near the other end, having buttons 15 on each side of the movable portion of the chair or lounge, the members 7 having openings to receive the pins 6, and the buttons 15, having recessed or countersunk faces, substantially as and and for the purpose set forth.

3. In an attachment for chairs, lounges, &c., the combination of the members 3 and 7, plates 12, pins 6, secured to the plates, push-rods 13, provided with buttons on their outer ends, connecting-rods 19, and link 20, the members 7 having openings to receive the pins 6, all substantially as and for the purpose set forth.

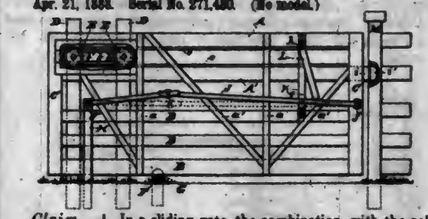
4. In an attachment for chairs, lounges, &c., the combination of the members 3 and 7, the latter having perforations 11 and the former having a slot, 63, plate 12, pins 6, and rods 13, secured to the plates, buttons 15 on the outer ends of the rods 13, and springs 23, all arranged and operating substantially as and for the purpose set forth.

5. In an attachment for chairs, lounges, &c., the combination of the main members 3 and 7, pivoted together, members 7 being attached to the body of the chair or lounge and members 3 to the movable portion, removable pin for connecting the members at their lower ends, and spring-shafts 41, having non-circular ends for the application of a key, substantially as and for the purpose set forth.

6. In an attachment for chairs, lounges, &c., the combination of the members 3 and 7, members 7 being attached to the body of the chair or lounge and members 3 to the movable portion, shafts or spindles 41, having disks 45 at their outer ends, projections 46 on the faces of the disks, teeth or projections 47 on the members 7, with which projections 46 engage, and springs 40 surrounding the shafts substantially as and for the purpose set forth.

7. In an attachment for chairs, lounges, &c., the combination of the members 3 and 7, the members 7 having openings 11, plate 12, having pins 6 passing through openings in the lower ends of the members 3 and 7, push-rods 13 on the plates 12, shafts or spindles 41, springs 40 surrounding the shafts or spindles, disks 45 on the shafts or spindles, projections 46 on the disks, and teeth or projections 47 on the members 7, all substantially as and for the purpose set forth.

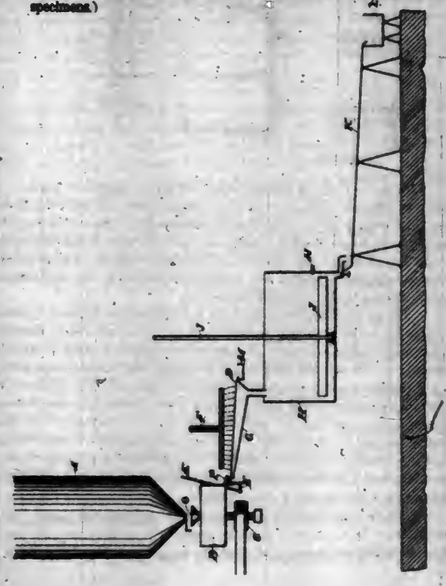
395,976. GATE. THOMAS J. HOWARD, Highland, Kans. Filed Apr. 21, 1888. Serial No. 271,480. (No model.)



Claim.—1. In a sliding gate, the combination, with the rollers journaled on the upright posts, the roller-ways, the bar A, the toggle-joint bar, and the post M, of the bar A', having the extended end adapted to enter a recess in the post M, the strip K, having the guide-opening, and the locking-block pivoted within the guide-opening, substantially as specified.

2. In a sliding gate, the combination of the bars A, A', and B, the roller-way on the bars A A', the flanged rollers, the bearing-roller, the upright posts D, the bolts *b'*, the post H, the standards C C', the toggle-joint bar pivoted at one end to the standard C' and at its opposite end to the post H, the strip having the guide-opening, and the locking-block pivoted therein, substantially as specified.

395,977. PROCESS OF MANUFACTURING STARCH. JOHN H. HURTT, Indianapolis, Ind. Filed Feb. 21, 1888. Serial No. 264,894. (No specimens.)

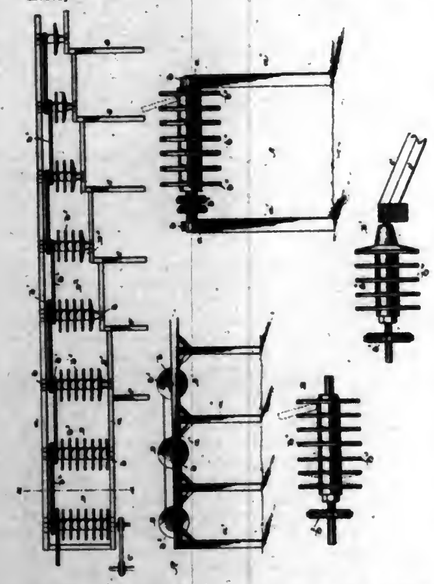


Claim.—1. The process of manufacturing starch, substantially as described, which consists in subjecting the maize or other cereal grain in a substantially unfermented condition to the action of chloride of sodium and separating the gluten and other impurities therefrom by flotation.

2. The process of manufacturing starch, substantially as described, which consists in first steeping, grinding, and sifting the maize or other cereal grain, and then subjecting the starch-liquor in a substantially unfermented condition to the action of chloride of sodium and separating the gluten and other impurities therefrom by flotation.

3. The process of manufacturing starch, which consists in first steeping the grain a sufficient length of time to soften but not perceptibly ferment it, then grinding it, then sifting it under a flow of water through sieves or screens, whereby the starch and finer particles are precipitated into vats and the coarser products run off untreated to be used for feed, then, after the starch has settled, drawing off the supernatant water until the liquid remaining is equal to about twenty-five gallons for each bushel of grain originally used, then adding chloride of sodium either in solution or otherwise, substantially as described, then mixing the starch-milk so treated thoroughly, then adding thereto sufficient water to make the whole quantity about thirty-three gallons for each bushel of grain, and then separating the starch from the other ingredients by settling or passing over runs and floating the by-products away, substantially in the manner described.

395,978. MECHANISM FOR CONVEYING AND DISTRIBUTING LUMBER. THEODORE B. HYMAN, Goldsborough, N. C., assignor to Anna C. Hyman, same place. Filed June 16, 1888. Serial No. 277,284. (No model.)



Claim.—1. In an apparatus for conveying boards or planks in different parallel paths, a series of succeeding power-driven rolls, each provided with a series of narrow circumferential grooves having a depth much greater than the width, said grooves open or unobstructed at the top to permit the insertion of the boards therein, whereby the rolls are adapted to receive and maintain the boards on edge and carry them endwise in their respective grooves.

2. In an apparatus for conveying and distributing lumber, a series of parallel or substantially parallel power-driven rolls, each having deep and relatively narrow circumferential grooves open or unobstructed at the top, the rolls at the receiving end of the system having a greater number of grooves than the remainder, the rolls at an intermediate point in the system having a less number of grooves than those of the receiving end, and the rolls at the terminal end of the system having a less number of grooves than those at intermediate points, whereby the lumber inserted in the different grooves at the receiving end is carried forward and delivered automatically at different points in the length of the apparatus.

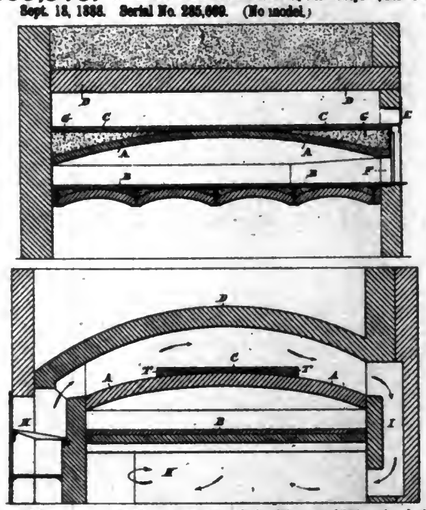
3. In an apparatus for conveying and distributing lumber, the combination of a series of parallel power-driven rolls provided with open unobstructed narrow and relatively deep circumferential grooves, the grooves of the successive rolls diminishing in number toward the delivery end of the system.

4. In an apparatus for conveying and distributing lumber, two or more parallel power-driven rolls having narrow and relatively deep grooves to sustain and carry the lumber on edge therein and a succeeding roll having a beveled flange or hub to effect the lateral delivery of the lumber as it passes thereto.

5. In an apparatus for conveying and distributing lumber, a conveyer-roll provided with a series of narrow and relatively deep grooves to sustain and carry the boards on edge therein, and having also at one end a beveled flange or hub to effect the lateral delivery of boards received at that point.

6. In an apparatus for conveying and distributing lumber, a series of horizontal grooved rolls mounted in suitable bearings, successive rolls at the delivery end of the series, with diminishing number of grooves and conical ends, and the receiving ways or platforms located at different points in the length of the system.

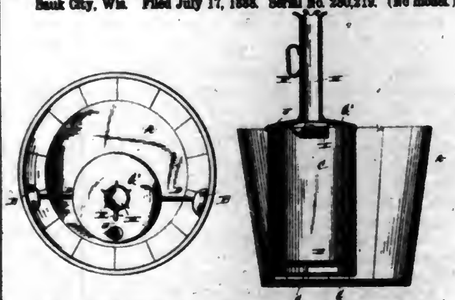
395,979. BAKING-OVEN. JULIUS JUNKER, Philadelphia, Pa. Filed Sept. 18, 1888. Serial No. 285,669. (No model.)



Claim.—1. A baking-oven provided with an additional sole laid upon the thin crown of the oven, and with a door for giving access to the space above said sole, substantially as described.

2. In a baking-oven, the combination, with the sole, thin crown, and thick crown, of an additional sole laid upon the thin crown, forming a baking-chamber between it and the thick crown, said sole extending the full length of the oven and about half-way across the same, and a door opening into the space above said sole, substantially as described.

395,980. HEATING APPARATUS. JOHN JUST and PETER JUST, Sauk City, Wis. Filed July 17, 1888. Serial No. 280,219. (No model.)

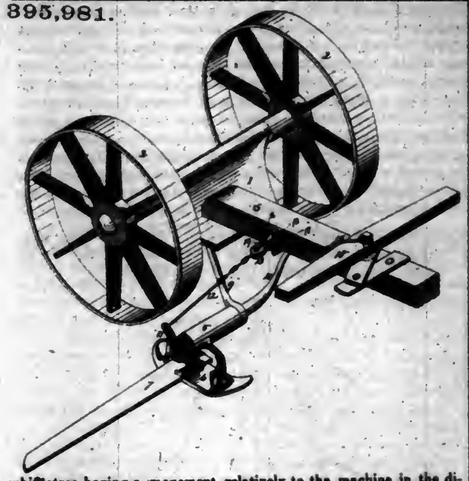


Claim.—The combination, with the fire-pot or heater having an interior draft-flue, of the removable cover having an opening registering with said draft-flue and rotatable upon said fire-pot or heater to permit of the closing of the latter flue, substantially as set forth.

395,981. MOWING-MACHINE. WILLIAM A. KNOWLTON, Rockford, Ill., assignor to Dexter A. Knowlton. Filed Feb. 23, 1886. Serial No. 192,806. (No model.)

Claim.—1. In a mower, the combination, with a rising-and-falling cutting apparatus connected at one end to the main frame, and a

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whiffletree having a movement relatively to the machine in the direction of the line of draft, of a flexible connection of the whiffletree with the folding or finger-bar portion of the cutting apparatus, substantially as set forth.

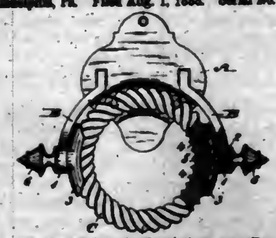
2. In a mower, the combination, with a rising-and-falling cutting apparatus connected at one end to the main frame, and a whiffletree having a movement relatively to the machine in the direction of the line of draft, of a flexible connection of the whiffletree with the folding or finger-bar portion of the cutting apparatus, and a bearing for the flexible connection intermediate of its end connections, the said bearing being located at one side of the direct line between the linked connection with the whiffletree and the folding or finger-bar portion of the cutting apparatus, substantially as set forth.

3. In a mower, the combination, with a rising-and-falling cutting apparatus connected at one end to the main frame, and a whiffletree having a movement relatively to the machine in the direction of the line of draft, of a flexible connection of the whiffletree with the folding or finger-bar portion of the cutting apparatus, and a bearing for the linked connection located at one side of the direct line between its connections with the whiffletree and the folding or finger-bar portion of the cutting apparatus, the said bearing having a vertical adjustment, substantially as set forth.

4. In a mower, the combination, with a rising-and-falling cutting apparatus connected at one end to the main frame, and a whiffletree having a movement relatively to the machine in the direction of the line of draft, of a flexible connection of the whiffletree with the folding or finger-bar portion of the cutting apparatus, said flexible connection of the whiffletree being connected with this portion of the cutting apparatus in vertical adjustment, substantially as set forth.

5. In a mower, the combination, with a rising-and-falling cutting apparatus connected at one end to the main frame, and a whiffletree having a movement relatively to the machine in the direction of the line of draft, and a bearing for the linked connection secured to the machine in vertical adjustment, of the flexible connection of the whiffletree and folding or finger-bar portion of the cutting apparatus, the said flexible connection engaged in said bearing and having a vertical adjustment at the end connected with the folding or finger-bar portion of the cutting apparatus, substantially as set forth.

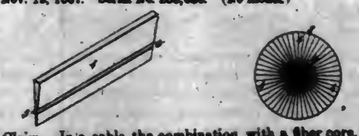
395,982. COFFIN-HANDLE. BENJAMIN C. KOEHLER and DAVID HERR, Philadelphia, Pa. Filed Aug. 1, 1888. Serial No. 281,642. (No model.)



Claim.—1. The handle of a burial-casket or coffin, having a grip of angular form and rising and falling arms on which said grip is journaled, substantially as described.

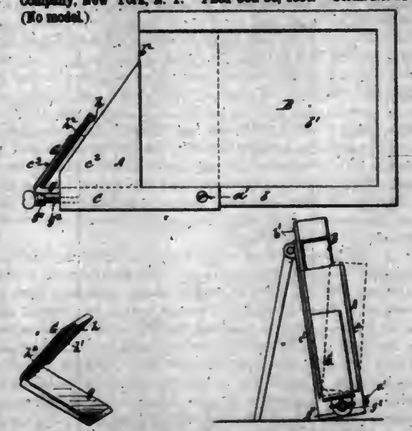
2. The handle of a burial-casket or coffin, having a grip, segments connected with opposite sides of said grip, journals projecting laterally from said segments, arms having bosses forming bearings for said journals, and a back or attaching plate to which said arms are pivoted, the parts being combined and operating substantially as described.

395,983. WIRE CABLE. HENRY LISCHEN, St. Louis, Mo. Filed Nov. 19, 1887. Serial No. 255,636. (No model.)



Claim.—In a cable, the combination, with a fiber core, of a number of strands twisted around and resting upon said core, and each of said strands consisting of bevel flat wires, the cross-section of each of which is a sector of a circle, arranged radially and provided with interlocking corrugations near their inner edges, substantially as set forth.

395,984. LEAD AND RULE HOLDER FOR TYPE-COMPOSITORS USE. A. AUGUSTUS LOW, Brooklyn, assignor to The Alden Type Machine Company, New York, N. Y. Filed Oct. 30, 1886. Serial No. 217,616. (No model.)



Claim.—1. In a lead and rule holder substantially such as described, the combination, with the inclined floor of the holder and with the inclined end rest, G, and the side wall, c^2, formed with a front edge parallel to the said end rest, G, and creating therewith a lateral opening in the channel, for the purpose and substantially in the manner described, of a movable gravity line-end rest or follower formed with a line-end bearing-surface which is inclined at an angle substantially parallel to that of the said front end rest, G, and front edge of the side wall, c^2, substantially as set forth.

2. In combination with a lead and rule holding compartment and with means for controlling the delivery of the leads or rules from the front end of the compartment, substantially as described, the hinged lateral support for the said compartment, arranged and operating substantially in the manner and for the purpose described.

3. In a lead and rule holder substantially such as described, the combination, with the stationary side wall formed with the inclined front edge and with the inclined rear line-end support or follower, of a parallel front end-line support which is adjustable with relation to the said inclined front edge of the side wall, for the purpose and substantially in the manner described.

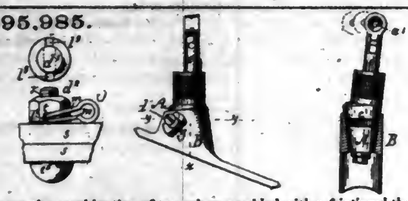
4. In a lead and rule holder substantially such as described, a front line-end support formed with an inner bearing-surface which decreases in width downward, in combination with the adjoining portion of the channel-floor, formed of less width than the width of the leads or rules to be accommodated in the holder, substantially in the manner and for the purpose described.

5. An attachment to a printer's type-galley formed with an inclined front end-line rest and with a side wall having an inclined edge parallel to the said inclined front end-line rest, in combination with the galley and with means for securing the attachment thereto, substantially in the manner and for the purpose described.

395,985. CLAMPING OPERATING-HANDLE FOR ADJUSTING-SCREWS. WILLIAM LYMAN, Middlefield, Conn. Filed July 10, 1888. Serial No. 279,516. (No model.)

Claim.—1. In mechanism operated or adjusted by a rotatable arbor

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or part, the combination of the arbor provided with a frictional thrust collar or flange and a head having a recess or recesses in its face extending from the periphery inward, the fixed bearing for receiving the arbor, and fixed faces or shoulders in juxtaposition with and corresponding to the working-faces of the arbor-head and the frictional thrust-collar, and an operating clamp-handle consisting, essentially, of a forked, looped, or U-shaped spring having its ends received or journaled and held in the recess or recesses of the arbor-head and adapted as the spring is swung around the recess as a pivotal point to press against the arbor-head, and corresponding fixed bearing to clamp the frictional thrust-collar to its seat or to bear against the sides of the recess to release the arbor, for the purpose specified.

2. In mechanism operated or adjusted by an adjusting-screw, the combination of the adjusting bolt or screw provided with journals, a frictional thrust-collar, and a collar or flange having recesses or slots in its face extending from the periphery inward toward the body of the screw, the fixed bearings for receiving the journal or journals of the screw, and faces or radial bearings corresponding to and in juxtaposition with the screw-head and thrust-collar, and a looped or U-shaped spring having each leg or part of its loop forked or bifurcated to swing over the screw-head and formed with an inwardly-projecting prong at each end of each fork adapted to be received in the recesses in the screw-head and bear against the sides thereof when the spring is vertically over the screw-head and to press between the screw-head and its fixed seat when the spring is folded down in the plane of the screw-head, thereby clamping the frictional collar to its seat to hold the screw stationary.

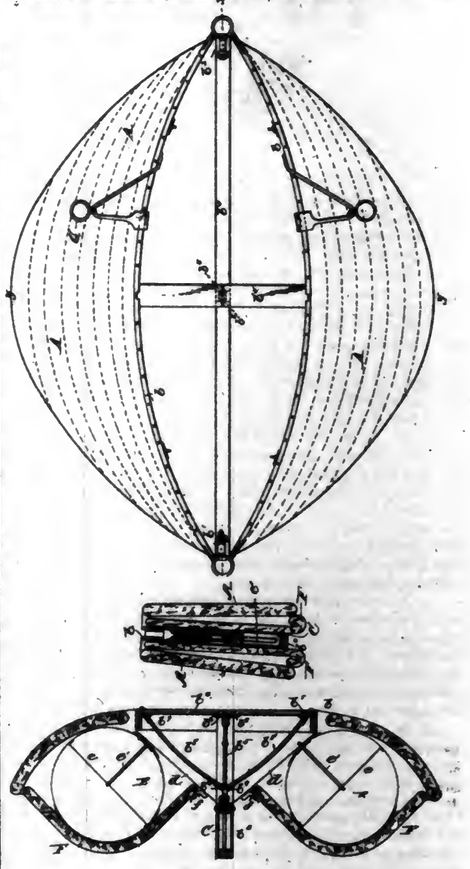
3. In mechanism operated or adjusted by an adjusting-screw, the combination of the adjusting-screw provided with journals, a frictional thrust-collar, and a head or flange having opposite recesses or slots extending from the periphery inward toward the body of the screw, the fixed bearings for receiving the journal or journals of the screw, and faces or radial bearings corresponding to and in juxtaposition with the working-faces of the screw-collars, and the looped or U-shaped springs arranged one on each side of the screw-head and joined by a connecting-web or tie part forming a handle and having at each end of each loop an inwardly-projecting prong or point, which prongs are adapted, when the springs are compressed, to be received in the recesses under the head of the screw and clamp the screw upon its frictional seat or release it therefrom as the handle is folded down in the plane of the screw-head, with the oppositely-acting prongs bearing, respectively, upon the screw-head and face of the screw-bearing, or is swung up vertically over the screw-head, with the prongs resting against the sides of the recesses, for the purpose specified.

4. In mechanism operated by a rotatable arbor or screw, the combination of the arbor provided with a friction-shoulder and a head having opposite recesses or slots in its face extending from the periphery inward and being enlarged back from the face of the head, fixed journal-bearings for receiving the arbor, and fixed shoulders corresponding to the face of the arbor-head and the friction-shoulder, and an operating clamp-handle consisting, essentially, of a double-looped spring having a loop fork or bight on each side of the arbor-head joined by a connecting-web, and the points of each loop being bent inward and received in the corresponding recess of the head, substantially in the manner and for the purpose specified.

5. In mechanism operated by an adjusting-screw, the combination of an adjusting-screw provided with journals, a frictional thrust-collar, and a head or flange having opposite recesses or slots *l* on the under side thereof, fixed bearings h h^3, for receiving the journals of the screw, and faces or radial bearings h' h^3, corresponding with and contiguous to the bearing-shoulders of the screw, and a looped or U-shaped spring, J, having each leg or part of the loop forked or bifurcated to swing over the screw-head and formed with an inwardly-projecting prong or projection, *n*, on each end of each fork adapted to be received in the recesses of the screw-head, and whereby the tension of the spring is adapted to be exerted between the screw-head and a fixed bearing or upon the respective sides of the recesses as the handle is folded down in the plane of the screw-head or swung into a position vertical thereto, substantially in the manner and for the purpose specified.

6. In a wind-gage sight for fire-arms, the combination of the sight-base B, the conical eccentric A, having a circular rack on its periphery and seated in the base carrying the sight-post, the adjusting-screw *d*, journaled in the base of the sight with its threads intermeshing with the rack of the conical eccentric and provided with the friction collar or nut *i*, and the head *f*, having the recesses on its inner side, and the combined folding and clamping operating-handle consisting, essentially, of a flat looped spring, J, having each part of its loop forked or spread to admit the body of the screw-head, and formed with an inwardly-extending prong or projection, *n*, on each end of each part of the loop, which projections are received in the recesses in the screw-head, whereby the operating-handle may be turned on the prongs as a journal and swung from a position at right angles to the screw-head down into the plane thereof to release or clamp the screw, substantially in the manner and for the purpose specified.

395,986. COMBINED LIFE-BOAT AND MATTRESS. JOHN MARTIN, Daylesford, Victoria. Filed July 13, 1888. Serial No. 280,292. (No model.) Patented in Victoria May 21, 1887, No. 5,080.



Claim.—1. The herein-described life-saving boat, consisting of a skeleton frame comprising a keel, a stem and stern post secured thereto, flexible sheer-strakes hinged to opposite sides of the stem and stern post, a vertical standard, a horizontal brace formed in two sections hinged to said standard, stays for staying said brace, hinged together and to the keel so as to form a groove in which the standard is stepped, and a canvas covering for said frame, substantially as described.

2. The herein-described life-saving boat, consisting of a skeleton frame comprising a keel, a stem and stern post secured thereto, flexible sheer-strakes hinged to opposite sides of the stem and stern post, a vertical standard, a horizontal brace formed in two sections hinged to said standard, stays for staying said brace hinged together and to the keel so as to form a groove in which the standard is stepped, the outer ends of the stays being hinged to the outer ends of the brace, and a canvas covering for said frame secured to the keel, the stem and stern posts and the sheer-strakes, respectively, substantially as described.

3. A convertible life-saving boat comprising a canvas-covered skeleton folding frame, and mattresses extending lengthwise of the frame on opposite sides, substantially as and for the purposes specified.

4. In a collapsible life-saving boat, the combination, with a canvas-covered foldable skeleton frame, of inflatable air-chambers divided into a plurality of compartments or cells arranged and extending lengthwise of the frame on opposite sides, substantially as and for the purposes specified.

5. In a collapsible and convertible life-saving boat, the combination, with a skeleton canvas-covered folding frame and mattresses secured to and extending lengthwise on opposite sides of said frame, of inflatable air-chambers interposed between the mattresses and the skeleton frame, substantially as and for the purposes specified.

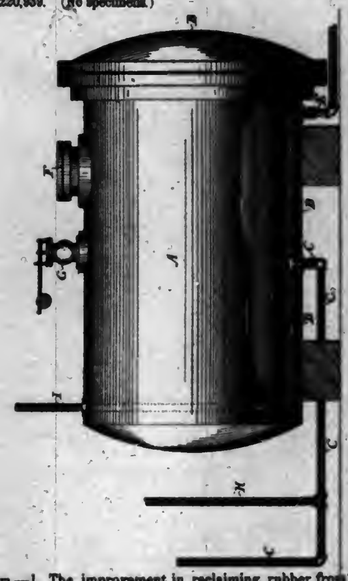
6. In a collapsible and convertible life-saving boat, the combination, with a skeleton canvas-covered folding frame and mattresses secured to and extending lengthwise on opposite sides of said frame, of inflatable air-chambers divided into a plurality of compartments interposed between the mattresses and the skeleton frame, substantially as and for the purposes specified.

7. In a collapsible and convertible life-saving boat, the combination, with a canvas-covered foldable skeleton frame, of mattresses A F, connected with each other and with the sheer-strakes, and canvas covering and inflatable air-chambers interposed between said mattresses and the boat, substantially as and for the purposes specified.

8. In a collapsible and convertible life-saving boat, the combination, with a canvas-covered foldable skeleton frame, of mattresses A F, connected with each other and with the sheer-strakes and canvas covering, and inflatable air-chambers divided into a plurality of compartments interposed between said mattresses and the boat, substantially as and for the purposes specified.

9. In a collapsible life-saving boat, a skeleton frame comprising a keel, stem and stern posts, and a sheer-strake hinged to opposite sides of said posts, of a vertical central standard hinged to the keel, a horizontal brace formed in two parts hinged to the central standard, and the lateral or rib braces b^5 b^5, connected with the horizontal brace and vertical standard, as described, for the purposes specified.

395,987. PROCESS OF RECOVERING RUBBER FROM WASTE. NATHANIEL C. MITCHELL, Philadelphia, Pa. Filed Dec. 7, 1886. Serial No. 220,939. (No specimens.)

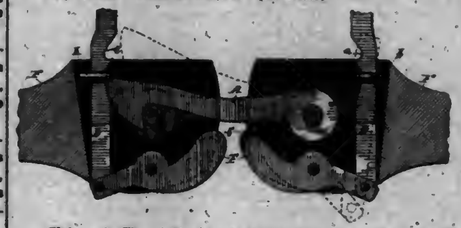


Claim.—1. The improvement in reclaiming rubber from waste, consisting in heating the waste immersed in the reclaiming solution in a close vessel under pressure above the ordinary boiling-point of such solution, substantially as described.

2. The improvement in reclaiming rubber from waste, consisting in heating the waste immersed in a solution containing for each one hundred (100) pounds of waste about fifteen to twenty-five (15 to 25) pounds of hydrochloric acid or its specified substitute in excess of the quantity requisite to combine with the decomposable mineral compounds in a close vessel under pressure to about two hundred and forty degrees Fahrenheit, (240° F.,) substantially as described.

3. The improvement in reclaiming rubber from vulcanized waste, consisting in treating the waste with a reclaiming solution, so as to corrode the fibrous matter, and then washing out the products of corrosion and steaming the rubber at a high temperature and pressure, substantially as described.

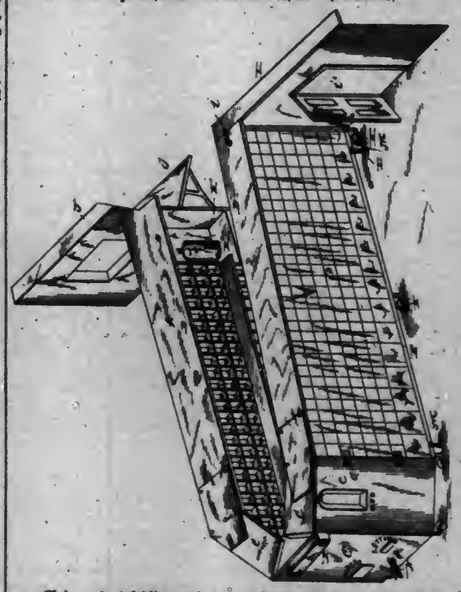
395,988. CAR-COUPLING. GEORGE H. MOATS, Ironton, Ohio. Filed May 7, 1888. Serial No. 273,129. (No model.)



Claim.—1. The within-described automatic car-coupler, comprising a gravitating coupling-hook, the shaft C between the jaws of the coupling-head on which said hook articulates, a vertical depressing-lever notched as described, the keeper for this lever, and a gravitating striking bar or lever provided with a superposed piece, *b'*, and pivoted to the said depressing-lever, all substantially as set forth.

2. The combination, with coupling-head, of a curved gravitating coupling-hook, a transverse shaft, C, to which this hook is pivoted, a loaded striking bar or lever, E, provided with a superposed piece, *b'*, for the purpose described, a notched depressing-lever pivoted to the tail of said striking-bar, and a keeper, *b*, all constructed and adapted to operate substantially as herein set forth.

395,989. POST-OFFICE FURNITURE. JOHN M. MORRIS, Chicago, Ill. Filed Sept. 15, 1888. Serial No. 285,475. (No model.)



Claim.—1. A folding and removable post-office compartment consisting of a frame-work containing lock boxes and drawers in the sides, suitable openings through which to deposit the mail matter, openings through which the mail may be delivered, and compartments for containing the mail-bags, registered letters, and other mail matter, substantially as described.

2. A folding and removable post-office compartment consisting of a folding end, sides hinged to the said end, and an end hinged to one of the said sides and adapted to be swung out at right angles to the said side, substantially as described.

3. In a folding and removable post-office compartment consisting of the side wings provided with the lock-boxes and the lock-drawers, the corner wings provided with the delivery-windows and the end wing provided with suitable openings in which to deposit mail to be delivered, substantially as described.

4. In a folding and removable post-office compartment, the combination, with the side wings, of the shelves H, secured thereto and designed to meet each other when the device is folded to prevent any mail matter falling to the floor, substantially as described.

5. In a folding and removable post-office compartment, the combination with the side wings provided with shelves H, of the end wing, J, provided with the shelf *j*, substantially as described.

6. In a folding and removable post-office compartment, the combination, with the bottom of the device, of the casters secured thereto and designed to facilitate its removal, substantially as described.

7. In a folding and removable post-office compartment, the combination, with the bottom portion provided with casters, of the hooks designed to engage staples in the floor to hold the device stationary, substantially as described.

8. In a folding and removable post-office compartment, the combination, with the end wing, of a box secured thereto and designed to contain the rope or chain to be used when the device is to be removed from the building, substantially as described.

9. In a folding and removable post-office compartment, the combination, with the side wings provided with suitable compartments to serve as lock-boxes and lock-drawers, of the compartment designed for the reception of the mail-bags, substantially as described.

395,990. HORSE-DETACHER. GEORGE W. MCLAUGHEN and ALONZO K. LOFTIN, Gastonia, N. C. Filed Oct. 30, 1888. Serial No. 289,547. (No model.)



Claim.—1. The combination, with the hame, of the link or plate fitting in a slot in the thill, the chain connecting the said link or plate to the hame, and a spring-bolt mounted on the thill and engaging a notch in the link or plate, substantially as set forth.

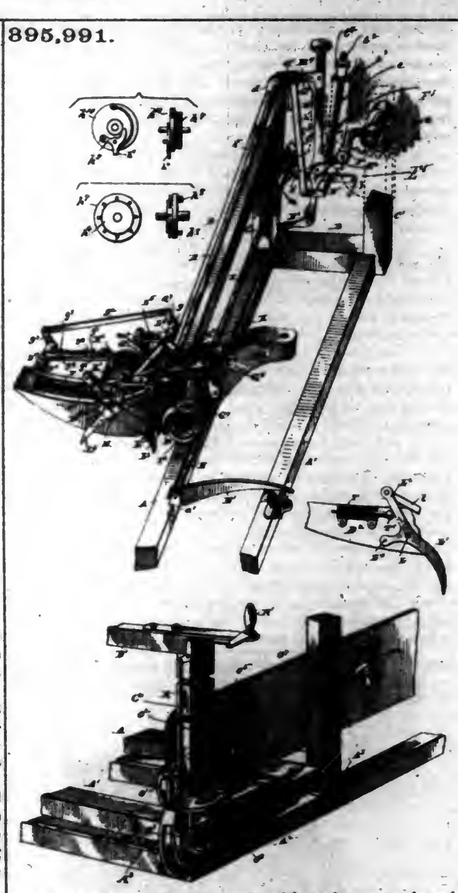
2. The combination, with the thill provided with a longitudinal slot, of the link or plate fitting in the said slot, the rearward-extending arm on the hame provided with an elongated loop, and the trace-chain connected to the link or plate and sliding in the said loop, as set forth.

3. The combination, with the thill provided with a longitudinal slot having a wedge-shaped tenon or projection at its front end, the link or plate flexibly connected to the hame, fitting in the slot in the thill and provided at its front end with a V-shaped notch engaging the said tenon or projection, and the spring-bolt engaging a notch in the rear end of the link or plate, substantially as specified.

4. The combination, with a thill provided with a longitudinal slot having a wedge-shaped projection, E, at its front end, of the link or plate connected by a chain to the hame, fitting in the slot in the thill and provided at its front end with a V-shaped notch engaging the wedge-shaped projection in the slot, the spring-actuated bolt fitting in a longitudinal bore at the rear end of the slot and engaging a notch in the rear end of the link or plate, and the operating-cord I, attached to a lateral eye on the bolt and passing rearwardly through guiding-eyes on the thill, substantially as specified.

5. The combination, with the thill provided with a longitudinal slot, B, and the spring-actuated bolt mounted in a bore in rear of the slot, of the link or plate C, fitting in the slot and engaged by the bolt, and provided with a longitudinal slot, *c*, having offsets or notches *c'* in its upper side registering with notches c^3 in the upper side of the thill, the elongated loop on the thill, and the trace-chain engaged at its front end in the said loop and at its rear end in the registering offsets and notches *c'* c^3, when the link or plate is in position in the slot, substantially as specified.

395,991. GRAIN-BINDER. MARION L. NICHOLS, New York, N. Y., assignor to the Nichols Harvester Company, same place. Filed Oct. 8, 1887. Serial No. 251,787. (No model.)



Claim.—1. The combination of packers which deliver the grain to the grain-receptacle, the auxiliary intermittently-operating packers, and an intermittently-operating separator acting to force the grain backward away from the main packers, substantially as described.

2. The combination of the packers which deliver the grain to the grain-receptacle, the intermittently-operating packers, an intermittently-operating separator, and a grain-trip arm controlled by the grain accumulated to form the bundle, acting to throw the packer-operating mechanism out of action and the separator-arm-actuating mechanism into action.

3. The combination of the binder, the intermittently-operating packers, a binder-trip for throwing the binding devices into action, and intermediate mechanism between said trip and the intermittently-operating packers, whereby the stopping of the packers causes through the intermediate mechanism the starting of the binder.

4. The combination of the separator, mechanism for actuating the same, said separator connected with the binder-trip to control the action of the binding devices, and intermittently-operating packers connected to the separator-actuating mechanism, substantially as described, whereby the packers act to control the action of the separator, as set forth.

5. The combination of a grain-trip arm connected with the packer-trip arm to control the action of the intermittently-operating packers to throw the same out of action, a separator, a trip for controlling the action of the separator intermediate between the packers and the separator and acted upon by the intermittently-operating packers, and a binder-trip connected with the separator to be acted upon and controlled thereby, substantially as described.

6. The combination, with intermittently-operated packers, a trip-arm therefor, a separator, a trip therefor, and a trip-arm controlled by the grain accumulated to form the bundle and acting upon both the packer and separator trips, of mechanism connecting the separator and packer trips together, substantially as described, whereby the grain-trip arm shall act upon the packer-trip arm, and in connection with the packer-trip arm also upon the separator-trip, as set forth.

7. The combination of the grain-trip arm acted upon and controlled by the grain accumulated to form the bundle, the gear-wheel for operating the binding devices, a lever, F, acted upon by the grain-trip arm, and a hub and cam on the gear-wheel for engaging the lever, substantially as and for the purpose set forth.

8. The combination of intermittently-operating packers, a clutch for engaging said packers with their operating-shaft, a packer-trip arm acting to throw the packers out of action, and a locking-dog on the packer-trip arm acting on said packer-clutch, substantially as described, whereby the dog is caused to lock and hold the trip-arm until engaged with the clutch holding the packers in action, as set forth.

9. The combination of intermittently-operating packers, a clutch for engaging said packers with their operating-shaft, a packer-trip arm acting to throw the packers out of action, a grain-trip arm acted upon by the grain accumulated to form the bundle to throw the packer-trip arm into the path of the pawl of the clutch, a separator, a separator-trip, and a locking-dog mounted upon and acting on the packer-trip arm, substantially as described, whereby the separator-trip is held from being thrown into action until the packer-trip arm is engaged by the pawl of the clutch and the packers thrown out of action, as set forth.

10. The combination of the packers, the clutch for engaging the same with their operating-shaft, the pawl of said clutch, a swinging packer-trip arm mounted on the packer-frame to engage the pawl to throw the packers out of action, and a dog mounted on the swinging packer-trip arm in position to be acted upon by the pawl of the clutch to release the dog, substantially as and for the purpose set forth.

11. The combination of the packers, the clutch for engaging the same with their operating-shaft, the pawl of said clutch, a separator, mechanism for throwing the same into and out of action, a swinging packer-trip arm mounted on the packer-frame, a dog mounted on the swinging packer-trip arm to engage the pawl of the packer-clutch, substantially as described, whereby the packers are thrown out of action as the separator is thrown into action, as set forth.

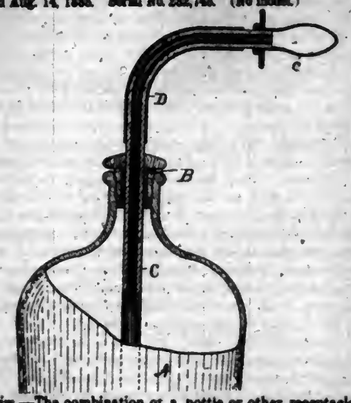
12. The combination of the separator, the gearing for operating the same, the clutch for engaging the separator with its actuating mechanism, the pawl of said clutch, and a spring-bolt mounted on the separator-supporting frame to engage the arm of the separator, substantially as described, whereby the pawl of the clutch is held out of contact with the friction-rollers carried by the driving-shaft when the separator is at rest, as set forth.

13. The combination of the harvester-frame, the binder-frame mounted and adapted to move thereon, and a pivoted swinging lever mounted on the harvester-frame and connected with both the header-board and the binder-frame, so that an accelerated movement is imparted to the header-board by the movement of the binder-frame, as set forth.

14. The combination of the harvester-frame, the binder-frame mounted and adapted to move thereon, a pivoted swinging lever mounted on the harvester-frame, having one long and one short arm, a header-board connected to the long arm, and a connection between the short arm and the binder-frame, whereby an accelerated movement is imparted to the header-board by the movement of the binder-frame, as set forth.

15. The combination of the harvester-frame, a movable binder-frame, the pivot-pin on the harvester-frame, the pivoted swinging lever having one long and one short arm and mounted to oscillate on the pin, and its long arm connected to the header-board and its short arm slotted and engaging a pin on the binder-frame, substantially as described.

395,992. NURSING-BOTTLE. LOUIS W. OSTER, Cleveland, Ohio. Filed Aug. 14, 1888. Serial No. 282,743. (No model.)



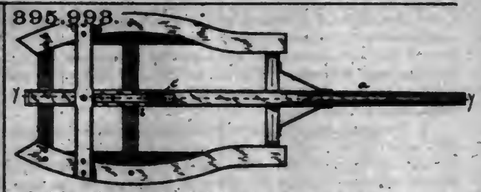
Claim.—The combination of a bottle or other receptacle and a stopper with a glass tube passing through said stopper, the part of said tube outside the bottle being bent substantially at right angles to the other part thereof, a nipple, and a tight-fitting rubber tube surrounding the bent part of said glass tube, substantially as and for the purpose specified.

395,993. BOB-SLED. JACOB FARR, Irwin, Pa. Filed Jan. 23, 1888. Serial No. 261,606. (No model.)

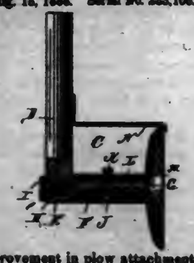
Claim.—1. In a bob-sled or other vehicle, the combination of a continuous pole pivoted at an intermediate point of its length and a fixed truss or back-stop arranged in close proximity to and in rear of the rear extremity of said pole, to limit the depression of the rear end of the pole at a point slightly below the normal position thereof, substantially as described.

2. In a bob-sled or other vehicle, the combination of a continuous pole pivoted near its rear end, a fixed truss or back-stop arranged in rear of said pole in close proximity thereto, to limit the downward movement of the rear end of the pole at a point slightly below the normal position thereof, and a spring secured to the frame of the sled or vehicle, to limit the upward movement of the rear end of the pole, substantially as described, for the purpose set forth.

3. In a bob-sled or other vehicle, the combination of a continuous pole pivoted at an intermediate point of its length, a vertically-inclined fixed truss or back-stop, *b*, arranged in rear of said pole in close proximity to the rear extremity thereof, and adapted to limit the depression of the rear end of said pole at a point slightly below its normal position, and a spring, *c*, fixed to the frame of the sled or vehicle, and bearing on the upper side of the pole to limit the upward play thereof, substantially as described.

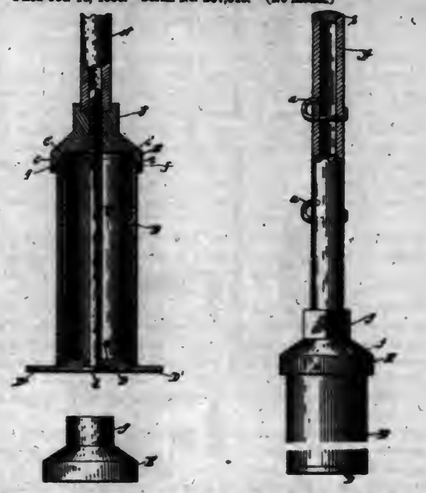


395,994. PLOW ATTACHMENT. ADDISON J. PARKHURST, Frederick, Dak. Filed Aug. 18, 1888. Serial No. 283,106. (No model.)



Claim.—As an improvement in plow attachments, the combination of the standard having its lower end provided with a transverse angular tapered opening, E, the cylindrical axle having an annular groove and provided with a reduced tapered angular projection inserted through the opening E and properly secured, the concave disk having a hollow cylindrical hub fitting on the cylindrical axle, the set-screw mounted in the hub and engaging the annular groove in the axle, and the scraper secured to the standard and bearing against the front concave face of the disk, as specified.

395,995. FENCE-POST. WILLIAM A. PRATER, Paw Paw, Mich. Filed Oct. 11, 1888. Serial No. 287,815. (No model.)



Claim.—1. The combination of a cylindrical tile, a bottom cap-plate therefor, an upper flanged cap-plate for the tile, provided with

a central passage and an enlargement, *g*, upon its upper surface, this enlargement being recessed, a central securing-bolt passed up centrally through the cap-plates and tile, and a metallic tubular post screwed upon the upper projecting end of the said bolt, and having its lower end fitted in the recess in the upper end of the said enlargement *g*, substantially as described.

2. The combination of the cylindrical tile B, having its upper outer edge beveled, as at *c*, a centrally-perforated metallic bottom cap, D, fitted over the lower end of the tile and provided with the upper circular enlargement, *e*, and the lateral annular flange D′, the upper centrally-perforated cap, E, fitted over the upper beveled end of the tile and provided with an overhanging beveled flange, *f*, and an enlargement, *g*, a securing-bolt passed up centrally through the caps and tile, and a hollow metallic post, A, tapped upon the upper projecting end of the said securing-bolt, and fitting in a recess in the upper end of the said enlargement *g*, substantially as and for the purposes herein specified.

395,996. FLYING TARGET. ALBERT C. REESE, Belleville, Ill.

Filed Mar. 29, 1888. Serial No. 268,776. (No model.)



Claim.—1. In a flying target, the combination of the cylindrical casing 3 and disk 10, forming the central air-chamber, 2, and the casing 6, forming an annular chamber, 5, concentric with the chamber 2, whereby when the target is rotated and sprung buoyancy is added to its flight, substantially as and for the purpose set forth.

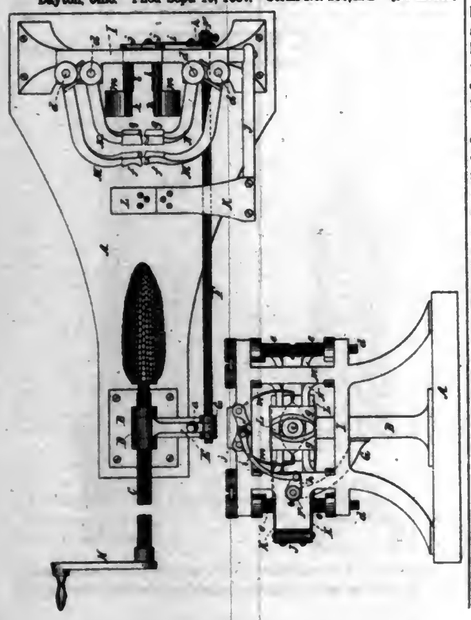
2. In a flying target, the combination of the cylindrical and annular faces, the circumferential cylindrical walls forming central and annular air-chambers, the understep 4, and circular rims 7, 8, and 9, all arranged when the flying target is rotated and sprung to add buoyancy and stability to its flight, substantially as and for the purpose set forth.

3. A flying target consisting of a circular solid face and concentric cylindrical and annular air-chambers extending from one side thereof, substantially in the manner herein set forth.

4. A flying target consisting of a circular solid disk, a concentric cylindrical air-chamber extending therefrom, a concentric annular disk formed on said cylindrical air-chamber in a different plane from the circular disk, and a concentric annular air-chamber extending from said annular disk, as herein shown and described.

5. In a flying target, a circular or annular solid face having formed thereon cylindrical rims or flanges forming cylindrical or annular air-chambers, and thus affording buoyancy and stability to the flight of the target, as herein explained.

395,997. MACHINE FOR HULLING GREEN CORN. JOHN RITTY, Dayton, Ohio. Filed Sept. 19, 1887. Serial No. 250,194. (No model.)



Claim.—1. In a machine for hulling green corn, the combination, with a rotary screw-threaded ear-carrying shaft and a nut engaging the same, of stationary spring-pressed cutter-jaws provided with cutting-points for splitting the kernels transversely of the cob and spring-pressed inclined presser-jaws set spirally opposite the pitch of the screw of the ear-carrying shaft for forcing the meats out through the slits formed by the cutting-points, substantially as described.

2. In a machine for hulling green corn, the combination, with the rotary forwardly-progressing ear-carrying shaft, gearing engaging the same to cause its forward movement, and the cutting-knives and presser-jaws, of grappling-jaws connected to the shaft-gearing, whereby they will grasp the cob during the return movement of the shaft and automatically release the same upon the engagement of the gearing for moving the shaft forward, substantially as described.

3. In a machine for hulling green corn, the combination, with the cutting-knives and pressing-jaws and ear-carrying shaft having the screw for engaging the ear, of grappling-jaws for positively holding the cob when passed through the cutting and pressing devices and preventing its backward rotation, whereby the screw on said shaft may be disengaged from the cob, substantially as described.

4. In a machine for hulling green corn, the combination, with the cutting-knives and pressing-jaws, the screw-threaded ear-carrying shaft having the screw for engaging the ear, and the half-nut engaging said shaft, of grappling-jaws for positively holding the cob when passed through the cutting and pressing devices and preventing its backward rotation, whereby when said nut is disengaged from the shaft the latter may be rotated and the screw withdrawn from the cob held by said grappling-jaws, substantially as described.

5. In a machine for hulling green corn, the combination, with the cutting and pressing devices, the screw-threaded ear-carrying shaft having the screw for engaging the ear, and the half-nut engaging said shaft, of grappling-jaws for holding the cob when passed through the cutting and pressing devices and a shaft connecting said jaws and half-nut, whereby when the latter is released from the shaft the jaws will be caused to close and grasp the cob, substantially as and for the purpose set forth.

6. In a machine for hulling green corn, the combination, with the knives for cutting the kernels and the ear-carrying shaft, of a shaft and operating mechanism, substantially as described, connecting the knives and the gearing of the ear-carrying shaft, for causing the separation of said knives during the disengagement of said gearing and the return movement of the shaft, substantially as described.

7. In a machine for hulling green corn, the combination, with the knives for cutting the kernels, the screw-threaded ear-carrying shaft, and the half-nut engaging the same, of a shaft connecting said knives and nut, whereby when the nut is disengaged from the shaft the knives will be separated to prevent their engagement with the shaft during its return movement, substantially as described.

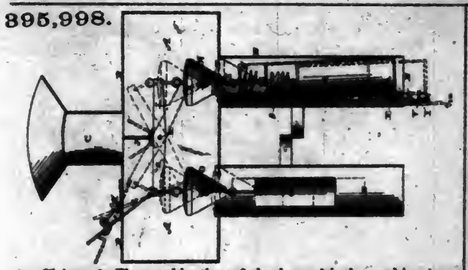
8. In a machine for hulling green corn, the combination, with the knives for cutting the kernels, the screw-threaded ear-carrying shaft having the screw for engaging the ear, the half-nut engaging the shaft, and the jaws for grasping the cob after being passed through the knives, of a shaft connecting the half-nut, knives, and grappling-jaws, whereby when the nut is disengaged from the shaft the knives will be opened and the grappling-jaws closed to effect the release of the shaft from the cob and its return to first position, substantially as described.

9. In a machine for hulling green corn, the combination, with the cutting-knives carried by the flat springs K K, the screw-threaded ear-carrying shaft having the screw for engaging the ear, the half-nut engaging the shaft, and the jaws for grasping the cob after being passed through the knives, of a shaft, F, on which the half-nut is mounted, said shaft carrying a cam located between said springs K K, and being connected to the grappling-jaws for operating the latter, whereby when the half-nut is disengaged from the ear-carrying shaft the shaft F will be rotated, the knives separated by the cam, and the grappling-jaws closed, permitting the disengagement of the shaft from the cob and its return to first position, as set forth.

10. In a machine for hulling green corn, the combination, with the cutting-knives, the screw-threaded ear-carrying shaft, the half-nut engaging said shaft, and the jaws connected by gear-teeth for grasping the cob after it has passed between the knives, of a shaft on which said nut is mounted, having a crank-arm thereon, and a link connecting the crank-arm and one of said grappling-jaws, whereby said jaws will be separated upon the disengagement of the nut with its shaft and the consequent rotation of the shaft upon which it is mounted, substantially as described.

11. In a machine for hulling green corn, the combination, with the yielding cutter-jaws L, provided with cutting points *b*, of the yielding presser-jaws M N, provided with the spirally-set presser-blocks *f f g g*, substantially as and for the purpose described.

395,998. RAIN-WATER CUT-OFF. DANIEL W. ROLAND, Akron, Ohio. Filed Oct. 23, 1888. Serial No. 288,923. (No model.)



Claim.—1. The combination of the box with the rocking lever placed therein, the valves attached to opposite ends, a weight attached to one of the valves, a can or bucket attached to the other valve, an automatically-acting valve, which is closed by the side of the pipe E as the can is raised, connected to the bucket or can, and the outlet and discharge pipes, substantially as shown.

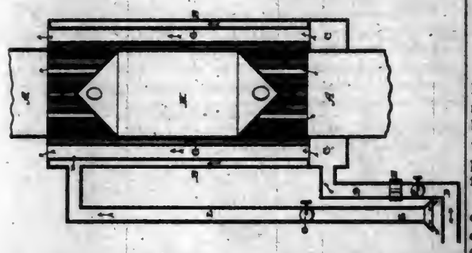
2. The combination of the box provided with the inlet-pipe and the outlet and discharge pipes, the rocking lever having a valve attached to each end, a weight attached to one of the valves, a bucket or can attached to the other end, a spring, F, for supporting the bucket or can, and an automatically-operating valve connected to the bucket, substantially as described.

3. The combination of the rocking lever, the valve for closing the waste-pipe, a spring connected to the valve, a bucket or can connected to the lower end of the spring, a spring having a valve connected thereto for closing the leak-hole in the can or bucket, and the notched extension secured to the waste-pipe for operating the valve, substantially as described.

4. The combination of the bucket provided with a flange, S, at its top, and a leak-hole, with the outlet-pipe, the U-shaped extension V, provided with the notch W, and the wire U, provided with a valve, X, substantially as shown.

5. The combination of the rocking lever provided with a valve at each end for closing the outlet and waste pipes, a rod connected to one end of the lever and extending to the top of the box, and a catch or locking device for engaging with the rod, substantially as described.

395,999. COMBINED STOVE-PIPE HEATER AND VENTILATOR. ALEXIS H. ROSS, Waukon, Iowa. Filed June 29, 1888. Serial No. 278,514. (No model.)



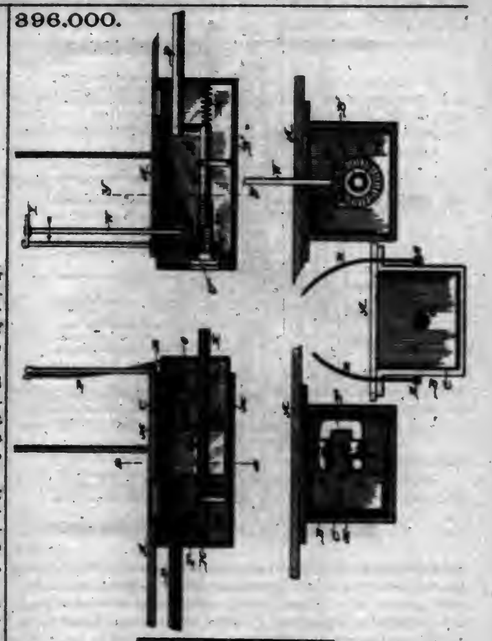
Claim.—The combination of the stove-pipe, the air-chamber located in its lower end, the pipe for admitting air to this chamber, the pipes G, which extend from the top of the chamber through the heater, the chamber H, located in the center of the heater and provided with the pipes G′ J, and which chamber H receives its air from the chamber C, substantially as described.

396,000. CAR-HEATER. ROBERT P. SARTELL, St. Cloud, Minn. Filed July 8, 1887. Serial No. 243,731. (No model.)

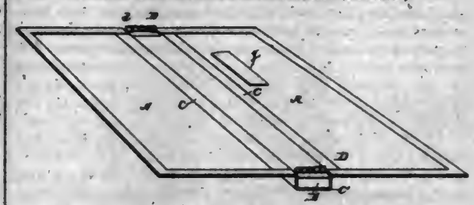
Claim.—1. The combination, in railway-car heaters, of two cars provided with the chests B and B′, one of the said chests having its outer end open and provided with the longitudinally-movable chest L in the said open end, the steam-pipes extending through said chests, and the coupling to connect the opposing ends of the steam-pipes when the cars come together, substantially as described.

2. The combination, of the cars having the chests B and B′ on their opposing ends, the outer end of the chest B′ being closed and the outer end of the chest B being open, the longitudinally-movable chest L, arranged in the open end of chest B and adapted to be projected therefrom, and the lever connected to the chest L and adapted to move the same longitudinally, for the purpose set forth, substantially as described.

396,000. [duplicate]



396,001. TEMPORARY BINDER. GREGORY H. SCHARF, Toledo, Ohio. Filed May 15, 1886. Serial No. 202,302. (No model.)



Claim.—1. In a binder for periodicals and other papers, foldable leaves flexibly attached to a back piece provided with retainers at right angles to the back piece and having openings through which a binding-cord is passed, the upper encircling edge of each opening to which the binding-cord is fastened being at a height from the back piece corresponding to the thickness of material to be bound, as and for the purpose set forth.

2. In a binder for periodicals and other papers, flexible binding-cords held in parallel relation to a rigid back piece and at a distance corresponding to the thickness of the material to be bound by retainers attached to the back piece, as and for the purpose set forth.

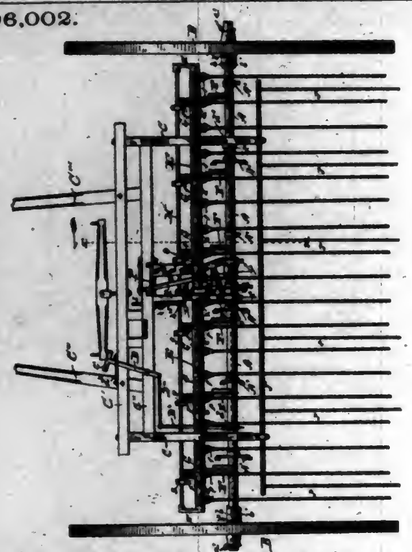
3. As a new article of manufacture, a binder comprising the foldable leaves, the rigid back piece to which the leaves are connected, and the end retainers carried by and projecting at right angles from the back piece, each retainer being bent from a single piece of wire and having a series of overlapping loops, substantially as described.

396,002. COMBINED HAY RAKE AND TEDDER. SAMUEL B SHANK, Millersville, assignor to Israel L. Landis, Lancaster, Pa. Filed June 21, 1888. Serial No. 277,791. (No model.)

Claim.—1. The combination, with the axle provided with a spindle, of a wheel journaled upon the said spindle, a sleeve, *b*, secured upon the axle and extending over the joint between the inner end of the hub of the wheel and the shoulder of the axle, this sleeve being serrated or notched on its periphery at or near its outer end, and a spring-actuated pawl pivoted upon the inner face of the hub and normally engaging the said ratcheted sleeve, substantially as herein set forth.

2. The combination, with an axle provided with transporting-wheels, tappets secured upon the axle, and stop-collars *d d*, secured upon the axle, the former collar being flanged, of a movable frame mounted upon the axle and limited in its movements by the said stop-collars, a rake-shaft mounted in the frame and movable with it, independent oscillating rake-sections pivoted upon the rake-shaft and pro-

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vided with cams, the lever D', pivoted upon the frame and engaging the stationary stop-collar *d*, connecting-link D'', a spring-lever, D, pivoted upon the frame of the machine and provided with a foot-piece, and a notched retaining-loop, *d''*, bolted to the frame, all arranged as and for the purpose set forth.

3. The combination of the axle provided with transporting-wheels, a frame mounted upon the axle, a rake-shaft mounted upon the frame, rake-tooth sections pivoted upon this shaft, these rake-sections being provided with forwardly and downwardly extending arms *c'*, a rock-shaft, H, parallel to the rake-shaft and journaled in arms upon the ends of the rake-shaft, adjustable clips *g*, secured upon the said rock-shaft, these clips being provided with rearwardly and downwardly inclined lips *g'* to engage the arms *c'*, and means, substantially as described, for rocking the shaft H, as herein described.

4. The combination, with an axle mounted on wheels, a frame upon the axle, a rake-shaft journaled in the frame, rake-sections pivoted on the rake-shaft, and a dumping-lever, K, mounted on the rake-shaft, a portion of this lever extending below the rake-shaft, of a stationary bracket secured to the frame, a stationary clutch-sleeve, M, on the axle, a sliding clutch-sleeve on the axle adapted to engage the stationary clutch-sleeve, an angle-lever, O, pivoted upon the said stationary bracket and connected to the sliding clutch-sleeve, an operating-lever, P, attached to this angle-lever O, a rigid arm, M'', on the said stationary sleeve, and a link, M''', pivotally connecting this rigid arm with the said dumping-handle K, all arranged to operate substantially as herein set forth.

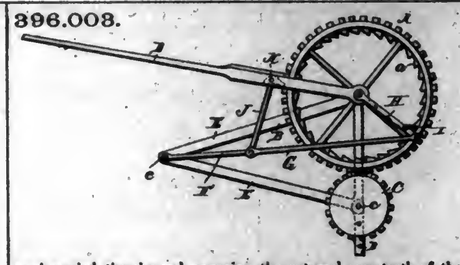
5. The combination of an axle provided with transporting-wheels, a frame, a rake-shaft mounted in the frame, independent rake-sections pivoted on this rake-shaft, each of these rake-sections being provided with forwardly and downwardly projecting arms *c'*, a rock-shaft parallel with and in front of the shaft and journaled in arms H', secured on the same, adjustable clips *g*, secured on the rock-shaft and provided with rearwardly and downwardly projecting lips *g'*, these lips being adapted to bear upwardly upon the said arms *c'* on the rake-sections, a forwardly and downwardly inclined lip, *h'*, secured rigidly on the rock-shaft, and a knee-lever, I, pivoted on the frame, the rear end of this lever being adapted to bear upon the said inclined lip *h'* on the rock-shaft, substantially as and for the purpose set forth.

6. The combination of an axle provided with wheels, a frame, a rake-shaft, rake-sections mounted on this shaft and provided with forwardly and downwardly projecting arms *c'* and upwardly-projecting arms *f''*, a rock-shaft, H, journaled in rigid arms on the rake-shaft and arranged parallel therewith, clips *g*, secured on the rock-shaft and provided with rearwardly-extending lips *g'*, adapted to bear upon the said arms *c'*, and means for rocking the rock-shaft, substantially as described.

396,003. MECHANICAL MOTION. WASHINGTON C. SHOWALTER, Lancaster, Wis., assignor of one-half to J. H. Reed, same place. Filed Feb. 16, 1888. Serial No. 264,310. (No model.)

Claim.—1. The combination of the main gear-wheel A, having an internal ratchet and external gear-teeth, the operating-lever, the

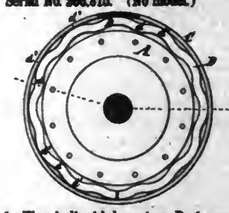
396,003.



pawl carried thereby and engaging the external gear-teeth of the wheel A, the link-rod, the pawl carried by the link-rod and engaging the internal ratchet of said wheel A, and toggle-lever connections between the link-rod and the operating-lever, as set forth.

2. In a mechanical motion to convert reciprocatory motion into circular motion, the combination, with the driving gear-wheel having the internal ratchet, *a*, the lever pivoted upon the shaft of said gear-wheel, and the pawl K, pivoted on the lever and engaging the gear-wheel, of the rod F, pivoted to the point of junction of the supporting-bars E, the rod G, pivoted to and forming a toggle-joint with the rod F, the link-rod H, connecting the outer end of the rod G and the shaft of the gear-wheel A, the link-rod J, connecting the lever and toggle-joint, and the pawl I, pivoted on the link-rod H and engaging the ratchet *a*, substantially as specified.

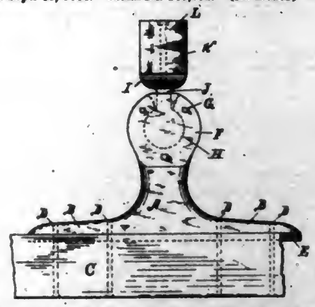
396,004. PISTON. WILLIAM SIMPKIN, Richmond, Va. Filed Mar. 10, 1888. Serial No. 266,815. (No model.)



Claim.—1. The helicoidal spring D, formed with corrugations *d d'* on its bearing-surface for expanding piston-packing, said circles of corrugations being adapted for bearing on different circles of packing, substantially as described.

2. The combination, with a piston-head and its packing, of a helicoidal spring provided with longitudinal corrugations on its bearing-surface, the said corrugations forming circles of spaced impact points on the helicoidal winds of the strip of which the spring is formed, said corrugations being adapted for bearing on different circles of packing, substantially as and for the purpose described.

396,005. SLEIGH-KNEE. WILLIAM H. SPEAR, Humboldt, Iowa. Filed Sept. 18, 1888. Serial No. 285,752. (No model.)



Claim.—1. A sleigh-knee composed of two parts, the first terminating in a circular disk united to the part at one side by a narrow neck in its own plane, and the second having a recess receiving and closely fitting said disk, whereby the two parts are articulated in a manner permitting limited motion in a single vertical plane only, substantially as set forth.

2. The combination, with the runner C and the beam K, of the plate I, secured to said beam and bearing the integrally-formed neck J and disk H, the knee-body A, provided with the recess in its upper end to receive said disk and bolted at its lower end to said runner, and the plate F, retaining said disk in said recess, substantially as set forth.

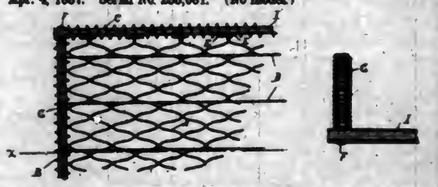
396,006. PLATFORM-ADJUSTING DEVICE FOR HARVESTERS. JOHN F. STEWARD, Chicago, Ill. Filed Apr. 3, 1888. Serial No. 269,479. (No model.)



Claim.—1. In a harvesting-machine, the ground-wheel, the vertically-adjustable platform-frame, and the intermediate wheel-support, as usual, in combination with a guide on the platform-frame, a chain passed beneath the guide, with one end extended upward and secured to the wheel-carrier and the other end left free to be grasped and lifted by hand, and a plate or fastening device on the frame to engage and hold said chain, whereby the operator is enabled by a direct upward lift upon the chain to effect the easy and positive adjustment of the platform-frame.

2. The harvester-platform, the arm or bracket hinged thereto and the grain-wheel carried by the arm, in combination with the guide or bearing *b* on the frame, and the chain passed from the wheel-carrying arm downward beneath the guide and exposed at the opposite end, that it may be grasped and lifted by hand, whereby the attendant standing at the side of the machine is enabled to apply a direct lifting action and to easily effect the vertical adjustment of the frame.

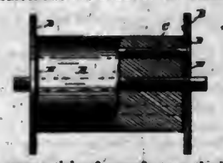
396,007. WIRE FABRIC. DANIEL C. STOVER, Freeport, Ill. Filed Apr. 4, 1887. Serial No. 233,681. (No model.)



Claim.—In a wire fabric, a helical coil passing along one margin thereof, a bar passing along the adjacent or intersecting margin of the fabric, and a rod engaging said bar and entering said coil axially, the greatest diameter of said rod being slightly greater than the normal interior diameter of the coil, whereby the marginal coil and the bar may be rigidly connected at the corner of the fabric.

396,008. BOBBIN. OTHO C. SULLIVAN, Stonington, Conn. Filed Sept. 19, 1887. Renewed June 28, 1888. Serial No. 278,462. (No model.)

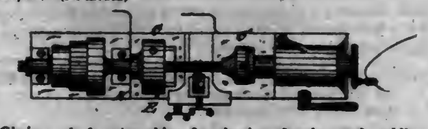
Brief.—The object of the invention is to improve the construction of bobbins for winding silk, to prevent the drawing down of the silk thread between the barrel and the heads of the bobbin.



Claim.—1. As a new article of manufacture, the bobbin comprising the drum, the heads secured on the ends of the drum, and the elastic pieces E, secured between the said heads and the ends of the drum, and thereby filling the cracks or spaces between the said heads and the ends of the drum, for the purpose set forth, substantially as described.

2. As a new article of manufacture, the bobbin comprising the drum A, made of wood, the heads B, made of metal and secured on the ends of the drum, and the pieces E, of rubber, cloth, felt, or other suitable elastic material, secured between the ends of the drum and the heads B, for the purpose set forth, substantially as described.

396,009. FORMING, BRAZING, AND WELDING OF METALS BY ELECTRICITY. ELIHU THOMSON, Lynn, assignor to the Thomson Electric Welding Company, Boston, Mass. Filed Feb. 21, 1887. Serial No. 228,277. (No model.)



Claim.—1. In a machine for shaping, forming, and welding metals, means for holding and rotating the metal to be operated upon, connections to pass heavy electric currents through the same, and means for imparting the lateral pressure of die-surfaces to the rotating metal, as and for the purpose described.

2. In an electric metal-working apparatus, die or forming-surfaces faced with a non-conductor of heat of a refractory nature.

3. In an electric metal-working apparatus, rotary chucks or holders mounted on a suitable frame, but insulated from one another, and suitable means for passing heavy electric currents to the work in said holders.

4. A lathe having its chucks or holders insulated from one another, in combination with means for passing heavy electric currents through the metal mounted on the lathe.

5. In an electric metal-working apparatus, the combination of two rotary chucks or holders insulated from one another and means connected with one of said chucks for moving it to and from the other chuck after the manner of the back head of a lathe.

6. The combination, with suitable holders for rotating a metal piece and suitable connections for passing a heavy electric current through the same, of one or more lateral die-rolls, as and for the purpose described.

396,010. METHOD OF ELECTRIC FORGING. ELIHU THOMSON, Lynn, assignor to the Thomson Electric Welding Company, Boston, Mass. Original application filed May 21, 1886, Serial No. 202,842. Divided and this application filed Feb. 6, 1888. Serial No. 263,153. (No model.)



Claim.—1. The herein-described art of upsetting metals into any desired shape, which consists in subjecting the blank to be worked to the heating action of a heavy electric current sufficient in volume to soften the same and then subjecting the blank to an endwise pressure, substantially as described.

2. The herein-described art or process of electric upsetting, consisting in clamping the bar or blank of metal at two points, leaving a section of the metal between the clamps, passing an electric current through the clamps and section of metal between them so as to soften the metal, then causing said blanks to approach each other in the line of the blank to upset the heated bar or blank between the clamps, substantially as specified.

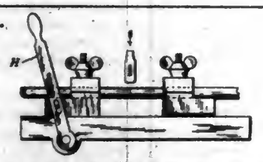
3. The herein-described method of upsetting metal bars or blanks, which consists in heating the bars or blanks by electric currents traversing them and upsetting the metal bar into the desired shape.

4. The herein-described process of forming a lateral expansion or projection on a bar or piece of metal, consisting in passing a heavy electric current through the metal blank and then subjecting the blank to pressure while inclosed in a non-conducting mold having a lateral opening.

396,011. METHOD OF ELECTRIC WELDING. ELIHU THOMSON, Lynn, Mass. Filed May 15, 1886. Serial No. 278,960. (No model.)

Claim.—1. The herein-described method of forming a finished joint between two pieces of metal, consisting in heating the joint by an electric current passed through the same, applying pressure while the metal is in a heated condition, removing the pressure, and then hammering and shaping the metal while subjected to a heating electric current.

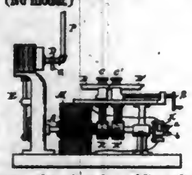
396,011.



2. The herein-described method of finishing an electric weld, consisting in removing the pressure by which the weld is effected, and then hammering or shaping or otherwise working the pieces while they are traversed by a heating electric current.

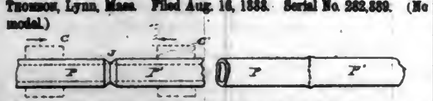
3. The herein-described method of finishing an electrically-welded joint, consisting in simultaneously applying a heating electric current, and a force tending to separate the joint while subjecting the joint to the hammering or other operation.

396,012. APPARATUS FOR ELECTRIC WELDING AND WORKING METALS. ELIHU THOMSON, Lynn, Mass. Filed May 17, 1888. Serial No. 274,194. (No model.)



Claim.—An apparatus for electric welding, forging, brazing, or other metal-working operations in which an electric current is employed as the heating agent, comprising, in combination, a dynamo-machine supplying heating-current, a driving-power for the same, suitable clamps or holders for the work, and suitable means in proximity to the work and under the control of the operator for throwing the driving-power on or off to any desired amount, as desired, to vary the current and the heating effects in the work at will.

396,013. ELECTRIC PIPE-JOINING AND PIPE-WORK. ELIHU THOMSON, Lynn, Mass. Filed Aug. 16, 1888. Serial No. 282,859. (No model.)



Claim.—1. The herein-described improvement in forming electrically-welded joints between pipes, tubes, or tubular pieces, consisting in forming the taper or chamfer upon the end of the tube or tubular portion, abutting the end of the tube against the tube or pipe to which it is to be joined, and subjecting the two pieces or sections of pipe to an endwise pressure while they are in a heated state, as and for the purpose described.

2. The herein-described improvement in electrically welding pipes, tubes, or tubular pieces or objects, consisting in forming a double taper or chamfer both from the bore out and from the outside inward, as and for the purpose described.

3. The herein-described improvement in electrically welding pipes, tubes, or tubular pieces, consisting in chamfering or tapering the tubular end so as to leave a narrow ridge or edge rather nearer the inside than the outside diameter of the tube, as and for the purpose described.

4. The herein-described improvement in electrically welding lead, tin, or other soft pipes, tubes, or tubular pieces, consisting in forming the abutting end of the tube with a narrowed edge preliminarily to the welding operation, as and for the purpose described.

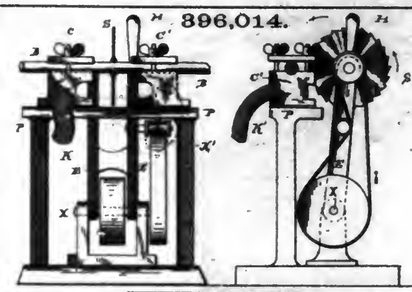
5. The herein-described improvement in welding together two tubular sections or pieces of lead, tin, or other soft metal, consisting in forming the abutting ends of the tubes or tubular portions with a narrow edge or ridge, passing a heating electric current across the joint, and moving the pieces together to follow the melting of the tapered portion.

396,014. ELECTRIC METAL WORKING. ELIHU THOMSON, Lynn, Mass. Filed Oct. 3, 1888. Serial No. 287,561. (No model.)

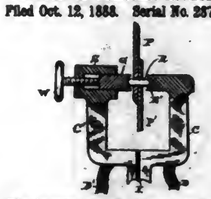
Claim.—1. The hereinbefore-described method of reducing or separating metal rods, bars, or pieces, consisting in heating the same by an electric current of large volume and then applying a suitable force to separate the metal or to extend the same at the heated section.

2. The herein-described novel art of cutting off or reducing the section of bars or rods, consisting in heating the bar or rod electrically at the point of division or reduction and then applying the proper separating or reducing power or force, as and for the purpose described.

396,014.



396,015. METHOD OF ELECTRIC RIVETING. ELIHU THOMSON, Lynn, Mass. Filed Oct. 12, 1888. Serial No. 287,910. (No model.)



Claim.—1. The herein-described improved method of riveting, consisting in heating the rivet or rivet-blank electrically while in place, and then heading either or both ends of the same.

2. The herein-described method or process of riveting, consisting in making the rivet while in position a portion of a circuit carrying a heating or large volume of electric current, and then setting the rivet by any desired means, as and for the purpose described.

3. The herein-described method of riveting, consisting in passing a heavy electric current through the rivet or rivet-blank while the same is in position, and then applying end-pressure to the rivet to set the same.

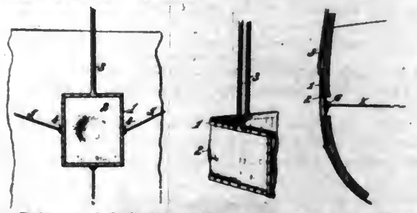
4. The herein-described method of riveting, consisting in applying to opposite ends of the rivet while in position suitable metal blocks or pieces, either or both movable, including said blocks and rivet in an electric circuit carrying an electric current of large volume for the purpose of heating the rivet, and then forcing said blocks or pieces toward one another to set the rivet.

5. The herein-described method of riveting, consisting in heating the rivet while in place by an electric current until it assumes a welding temperature, and then applying pressure to set the rivet in its seat and unite the sides of the same to the metal body through which it passes.

6. The herein-described method of fastening two pieces of metal together, consisting in passing a heating electric current through a rivet or rivet-blank, passing through the pieces as well as through the pieces of metal themselves in the neighborhood of the rivet, and applying pressure to set the rivet and weld the pieces together.

7. The herein-described method of electric riveting, consisting in pressing the plates together, heating the rivet inserted through the plates by a heavy electric current flowing through the same, and applying end-pressure to the rivet to head or set the same.

396,016. LEAK-STOPPER FOR HOLDS OF VESSELS. PLATT B. VIELE, Rochester, N. Y. Filed Apr. 10, 1886. Renewed June 14, 1888. Serial No. 277,091. (No model.)



Claim.—1. A leak-stopper for vessels, composed of a frame of detachable and flexible flat steel bars or strips that will conform to the shape of the vessel and a flexible covering secured to said frame, substantially as described.

2. A leak-stopper for vessels, composed of a supporting-frame provided with handles and a flexible covering secured to said frame, and having loops or rings attached to its inner side for attachment of ropes or guys to pass through the opening in the hull of the vessel, substantially as described.

3. A leak-stopper for vessels, consisting of a frame and handles therefor composed of detachable bars provided with perforations, a flexible covering secured to said frame and having loops or rings on its inner side, and guys attached to said frame and to the loops on the inner side of its covering, substantially as described.

396,017. WRENCH. THOMAS WARREN, Centralia, Ill. Filed July 31, 1888. Serial No. 281,552. (Model.)



Claim.—In a wrench, the combination of the handle provided with a series of notches and the sliding sleeve or collar placed thereon, with the jaw provided with a shank which is pivoted to the handle, the sliding jaw, and the brace provided with projections at its free end to catch in the notches in the handle, substantially as set forth.

396,018. DRILLING-MACHINE. CHARLES M. WOOLWORTH, Ottumwa, Iowa. Filed Mar. 24, 1888. Serial No. 268,423. (No model.)



Claim.—1. The combination of frame A, having bars A' A', provided with notches *c'* and ribs *a*, with the drill-shaft D, nut *d*, having arms *d'*, and the frame E, carrying the driving-gearing for said shaft, provided with the brace-plates E' E', bearing against the inner faces of the bars A', substantially as and for the purpose described.

2. The combination of the supporting-frame A, having notched side bars, substantially as described, and the grooved drill-shaft D and nut *d*, having outstanding arms *d'*, with the frame E, carrying the drill-shaft driving-gear and provided with plates E' E', bearing against the inner faces of bars A', and bracing the frame laterally, and lugs *e e*, all constructed and arranged substantially as and for the purpose described.

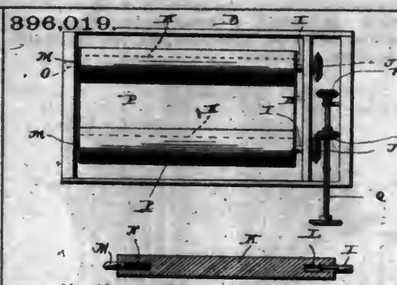
3. The combination of the frame A, composed of side bars, A' A', having ribs *a* and notches *c'*, and the sleeve B, adjustable tube B', and block C, with their adjustable rods and tubes, with the nut *d*, having arms *d'*, the grooved shaft D, and the frame E, carrying the gears F and G, with their shafts and cranks, and having the brace-plates E' E', engaging the inner faces of bars A', and the lugs *e*, engaging the outer edges of said bars, all constructed substantially as and for the purpose described.

396,019. STATION-INDICATOR. JOSEPH R. ANGEL, Bald Mount, Pa., assignor of one-half to Silas C. Fulton, Denver, Colo. Filed Nov. 6, 1888. Serial No. 290,106. (No model.)

Claim.—As an improvement in station-indicators, the combination of the casing having the sockets O in one end, the shafts I I, journaled within the casing and having angular inner ends, the belt-carrying rollers having recesses in their opposite ends, the recesses in one end being angular and adapted to engage the angular inner ends of the shafts I, the pintles mounted in the recesses in the opposite ends of the rollers and adapted to engage the sockets O, and the springs



396,019.



arranged in said recesses, between the ends of the same and the pintles, and normally projecting the pintles outward to engage the sockets, as specified.

396,020. SAFETY-GATE FOR FURNACE FEED-PIPES. CHARLES C. BARBOUR, Grand Rapids, Mich., assignor of one-half to Foster, Stevens & Co., same place. Filed Oct. 13, 1888. Serial No. 288,472. (No model.)



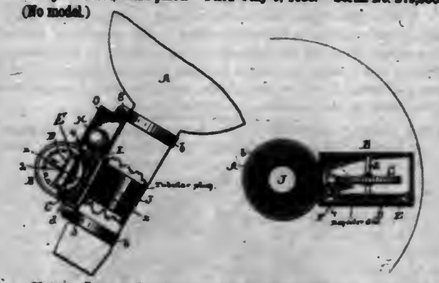
Claim.—1. In a furnace feed-pipe, the safety-gate, which consists of a section of said pipe severed from the main part and adapted to be removed from its position, leaving a space exposed to the air between the adjacent parts of the pipe, substantially as described.

2. In a furnace feed-pipe, the safety-gate, which consists of a section of the pipe severed from the main part and adapted to be removed from its position, in combination with the slides adapted to close the apertures left in the pipe by the removal of said section, substantially as described.

3. In a safety-gate for furnace feed-pipes, the combination, with the pipe having a section severed and adapted to be removed, of the upper and lower plates attached, respectively, to the upper and lower remaining parts of the pipe, said plates having guides or ways and the slides moving in such ways or guides, the severed sections of the pipe being fastened between said slides, and said plates and slides provided with perforations registering with the openings in the pipes, substantially as described.

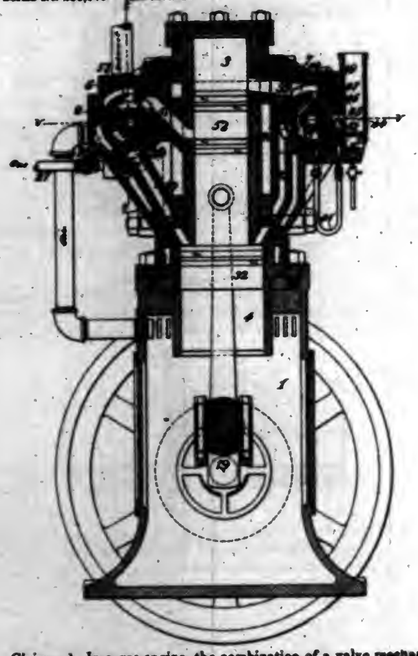
4. In a safety-gate for furnace feed-pipes, the severed section of the pipe adapted to be removed, the slides to which it is attached, the ways for such slides, and the doors in the slides to give access to the pipes when the gate is closed, substantially as described.

396,021. DRINK-REGISTERING ATTACHMENT FOR LIQUOR-BOTTLES. HENRY C. BARKER, Kansas City, Mo., assignor of one-half to Henry P. Scott, same place. Filed July 9, 1888. Serial No. 279,350. (No model.)



Claim.—In a registering attachment for bottles, the combination of a closed case provided with exterior devices which hold it upon the bottle, the shaft 2, mounted within said case, the ratchet-wheel C, mounted on said shaft, the lever I, pivotally mounted in said case, the pawl *d*, carried by one end of said lever and arranged to engage the teeth of the ratchet-wheel, a loose ball, H, which engages and depresses the end of said lever opposite said pawl when the bottle is turned, a spring which returns the lever to its normal position after engagement with said ball, the pointer D, also mounted upon shaft 2, so as to move in unison with the ratchet-wheel, and a graduated dial-plate, substantially as described.

396,022. GAS-ENGINE. J. CHARLES BECKFELD, Allegheny, Pa., assignor of one-half to Albert Schmid, same place. Filed Nov. 23, 1887. Serial No. 255,979. (No model.)



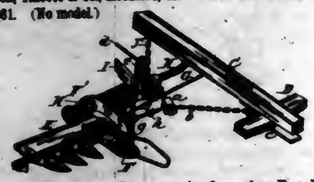
Claim.—1. In a gas-engine, the combination of a valve mechanism controlling the flow of gas and air from the compression-cylinder to the power-cylinder and the passage of flame from the igniter to the power-cylinder, a burner having a supply-connection with the power-cylinder, and a burner connected to and receiving its supply of gas and air through the valve mechanism, substantially as set forth.

2. In a gas-engine, the combination of a valve mechanism controlling the flow of gas and air from the compression-cylinder to the power-cylinder and the passage of flame from the igniter to the power-cylinder, a burner having a supply-connection with the power-cylinder, a burner connected to and receiving its supply of gas and air through the valve mechanism, and a burner having an independent source of supply, substantially as set forth.

3. In a gas-engine, the combination of a valve mechanism for controlling the passage of flame from the igniter to the power-cylinder, a burner having a supply-connection with the power-cylinder, and a burner receiving its supply of gas and air from the compression-cylinder, substantially as set forth.

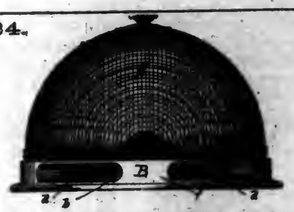
4. In a gas-engine, the combination of a compression-cylinder and a power-cylinder suitably connected for the passage of gas and air, a burner receiving its supply of gas and air from the compression-cylinder, and a valve mechanism for controlling the passage of flame from the burner to the power-cylinder and preventing the extinction of the flame by the explosion, substantially as set forth.

396,023. MOWER. JOHN C. BLOOM, Kalamazoo, Mich., assignor to Emerson, Talcott & Co., Rockford, Ill. Filed Jan. 27, 1887. Serial No. 225,661. (No model.)



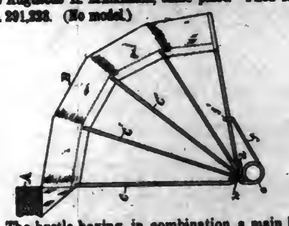
Claim.—The hinged coupling-arm, the finger-bar H and pivoted shoe F, post *g* on the shoe, and sheave *a* on the coupling-bar, with the flexible connection *b*, having the limit-stop *b*' thereon, in combination with the movable evener, substantially as specified.

396,024. INSECT-TRAP. JOHN H. BROWN, New York, N. Y., assignor to Geo. C. Twinbury, same place. Filed Aug. 27, 1888. Serial No. 283,898. (No model.)



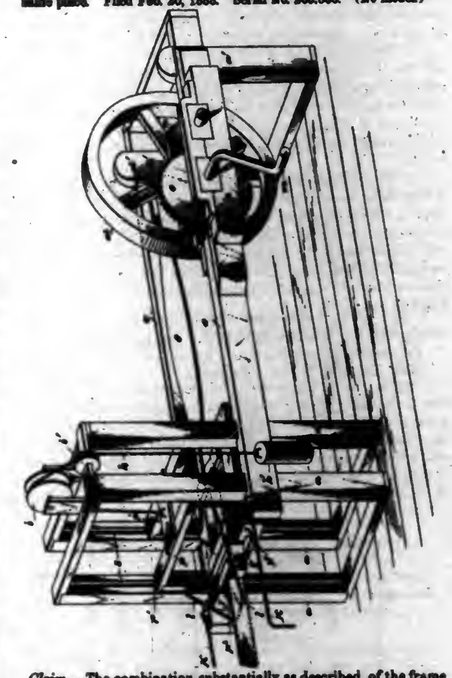
Claim.—An insect-trap consisting of a dish-shaped base having a bottom within the dish formed as a low cone and provided with an aperture through the side or wall, in combination with the covered way leading from the aperture to a narrow opening within the trap, the said covered way being formed of woven wire, the edges of which are attached to the wall and bottom of the dish, and having a mouth at the inner end projecting over the top of the cone, the said base having also a suitable cover, all substantially as described.

396,025. BUSTLE. VICTOR H. BUSCHMANN, Baltimore, Md., assignor to Augustus H. Brinkmann, same place. Filed Nov. 19, 1888. Serial No. 291,232. (No model.)



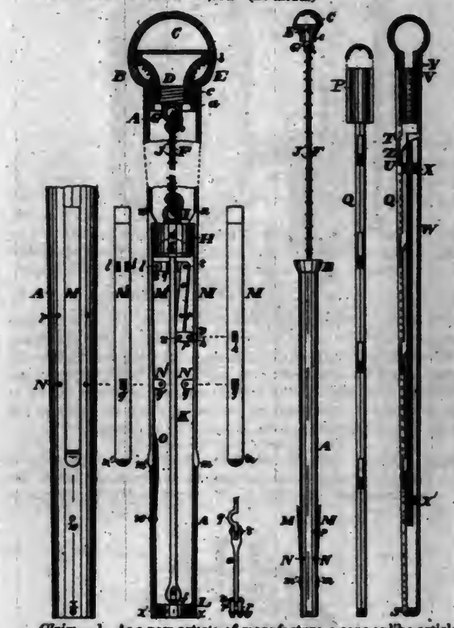
Claim.—The bustle having, in combination, a main bow, C, provided near each end with a lateral U-shaped bend, *d*, a coil, *e*, below the said U-shaped bend, and a spring-arm, *f*, projecting from the coil, the bows C, each having hook ends *g*, all of which on one side pivot in one of said U-shaped bends of the main bow, and a hook, *h*, uniting the two sides of the U-bend and confining the hook ends of the bows, as set forth.

396,026. WOOD-SAWING MACHINE. BENJAMIN F. CAMP, Clinton, Ky., assignor, by mesne assignments, of one-half to John E. Bowers, same place. Filed Feb. 20, 1888. Serial No. 265,060. (No model.)



Claim.—The combination, substantially as described, of the frame provided at front with vertical standards having ways, the gravitating counterbalanced sash-frame mounted in said ways and provided with horizontal grooved side sills, the cross-head mounted to slide in said grooves and connected by pitman with the driving-crank, the saw secured at one end to the front of the cross-head, and guides secured to the sash-frame adjacent to the cross-head and bearing with their free ends upon opposite sides of the saw-blade.

396,027. CANE. WILBUR M. CARPENTER, St. Louis, Mo. Filed Oct. 4, 1886. Serial No. 215,318. (No model.)



Claim.—1. As a new article of manufacture, a cane or like article composed of a suitable case, a detachable head, and a flexible connection between said head and the cane-body, whereby the head is allowed a certain range beyond the end of the cane, and is thereby adapted to be used as a weapon of defense, substantially as described.

2. A cane or like article consisting of a case, a detachable head, and a connection between said head and the cane, whereby the said head is allowed a certain range of movement beyond the end of the cane, the connection between the head and cane being formed with spurs or teeth, substantially as described.

3. A cane or like article consisting of a case, a head detachable therefrom having a smooth exterior and teeth or like projections upon its under surface, and a connection between said head and case allowing limited movement of the head, and also provided with spurs or projections throughout its extent, substantially as described.

4. A cane or like article consisting of a body portion, a head detachable therefrom, a connection between said head and the cane, and elastic means for automatically withdrawing said head to its normal position after use, substantially as described.

5. A cane or like article consisting of a case, a head detachably connected therewith, positive means for holding said head in position, and a hand device for releasing the holding device, whereby the said head may have a limited movement to be used as a weapon of defense, substantially as described.

6. A cane or like article consisting of a suitable case, a detachable head, a flexible connection between said head and cane, holding-catches for keeping the head in its normal position, and releasing means in connection with each other, whereby in the operation of one upon one side of the cane the other will be automatically operated to release the head, substantially as described.

7. In a cane or other staff having a button or plunger, as shown, an elastic cord connecting said button or plunger to the bottom of the case, substantially as shown.

8. A cane or like article consisting of a suitable case, a detachable head, a sliding block within the cane, the connection between said sliding block and the cane-head, the flexible connection between said sliding block and the cane-body, and holding-catches for retaining the block in position until released, substantially as described.

9. In a cane or other staff having a button or plunger, two catches and their connecting rods and levers, and a spring, substantially as shown.

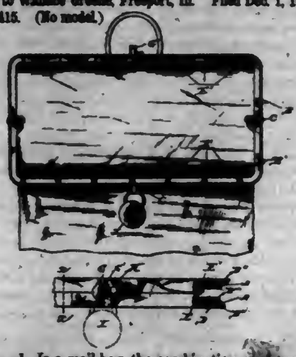
10. A cane or like article having a body portion and a weighted part extensibly connected to said body portion, and a catch, as M, for holding said weighted part in place, said catch, terminating in a handle, substantially as described.

396,028. PAPER PAIL. JOHN L. COLHAPP, Chicago, Ill., assignor of two-thirds to Charles Chamberlain, same place. Filed Mar. 24, 1888. Serial No. 268,402. (No model.)



Claim.—An oyster-bucket the sides and bottom of which consist of a blank of flexible material having a practically-circular bottom, and an octagonal edge, said blank divided by radial creases into segments, each of which is again divided by a crease which intersects a radial side of the segment at the center and is at right angles to the peripheral side of the segment, the blank being folded into an inner and outer series of folds, respectively, on the creases B and C, substantially as shown and described, in combination with rivets which hold the gathered portions of the blank so as to form the top of the bucket, a bail attached thereto, and cement between the folded portions of the sides of the bucket, all substantially as and for the purpose shown and described.

396,029. BAG-LOCK. LYMAN B. CUTLER, Monmouth, assignor of one-half to Wallace Greene, Freeport, Ill. Filed Dec. 1, 1888. Serial No. 292,415. (No model.)



Claim.—1. In a mail-bag, the combination, with two pivotally-connected opposing jaws secured to the edges of the bag's open end, of a series of hooks arranged at intervals along the inner face of one of said jaws, a series of catches arranged at corresponding intervals along the inner face of the opposing jaw, and legs having inclined impinging surfaces fixed upon the respective jaws and overlapping when the jaws are closed, whereby the jaws may be thrown bodily in opposite directions as the bag closes to permit engagement of the hooks, substantially as set forth.

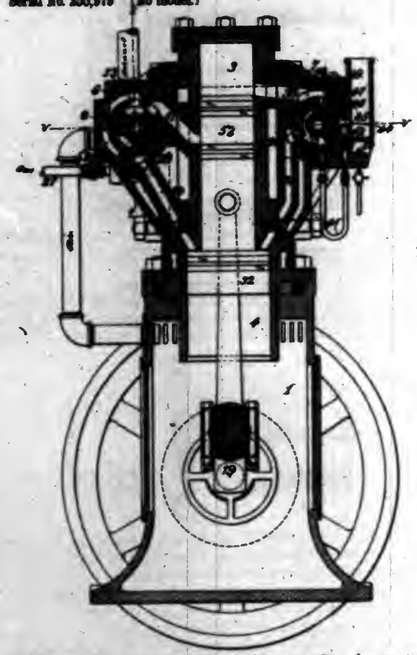
2. The combination, with a mail-bag, of two opposing jaws secured to the bag's edges, a series of rigid hooks arranged at intervals along one of said jaws, a series of catches placed at corresponding intervals along the other jaw and adapted to be simultaneously engaged by said hooks when the jaws are moved bodily in the proper direction with reference to each other, and the lock passing through both jaws, or projections thereon, to prevent such bodily motion.

3. The combination, with a mail-bag, of the downwardly-bent pivotally-connected jaws secured to its edges, the staples fixed at intervals upon one of said jaws, the correspondingly-placed hooks fixed upon the opposing face of the other jaw and adapted to engage the staples respectively, the leg fixed upon one jaw and having the V-shaped projection, the overlapping leg fixed upon the opposing jaw and provided with a corresponding depression, and the lock having its link passed through both legs and preventing bodily movement of the jaws with reference to each other, substantially as set forth.

396,030. AUTOMATIC VEHICLE-BRAKE. BENJAMIN A. DAVIS, Bermuda, assignor to George Davis, Petersburg, Va. Filed Nov. 7, 1888. Serial No. 290,230. (No model.)

Claim.—The combination, in a wagon or other vehicle, of the pole having the slots or openings *c c*, the pins or bolts *e e*, passing through said openings, the brake-bar, the chain, and pawl and ratchet connecting with said pole, substantially as described.

396,022. GAS-ENGINE. J. CHARLES BUSKFELD, Allegheny, Pa., assignor of one-half to Albert Schmid, same place. Filed Nov. 23, 1887. Serial No. 256,979. (No model.)



Claim.—1. In a gas-engine, the combination of a valve mechanism controlling the flow of gas and air from the compression-cylinder to the power-cylinder and the passage of flame from the igniter to the power-cylinder, a burner having a supply-connection with the power-cylinder, and a burner connected to and receiving its supply of gas and air through the valve mechanism, substantially as set forth.

2. In a gas-engine, the combination of a valve mechanism controlling the flow of gas and air from the compression-cylinder to the power-cylinder and the passage of flame from the igniter to the power-cylinder, a burner having a supply-connection with the power-cylinder, a burner connected to and receiving its supply of gas and air through the valve mechanism, and a burner having an independent source of supply, substantially as set forth.

3. In a gas-engine, the combination of a valve mechanism for controlling the passage of flame from the igniter to the power-cylinder, a burner having a supply-connection with the power-cylinder, and a burner receiving its supply of gas and air from the compression-cylinder, substantially as set forth.

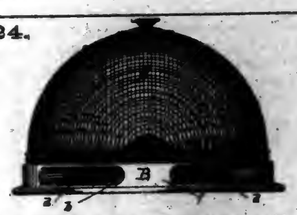
4. In a gas-engine, the combination of a compression-cylinder and a power-cylinder suitably connected for the passage of gas and air, a burner receiving its supply of gas and air from the compression-cylinder, and a valve mechanism for controlling the passage of flame from the burner to the power-cylinder and preventing the extinction of the flame by the explosion, substantially as set forth.

396,023. MOWER. JOHN C. BLOOM, Kalamazoo, Mich., assignor to Emerson, Talcott & Co., Rockford, Ill. Filed Jan. 27, 1887. Serial No. 225,661. (No model.)



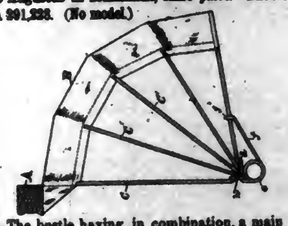
Claim.—The hinged coupling-arm, the finger-bar E and pivoted shoe F, post *g* on the shoe, and sheave *a* on the coupling-bar, with the flexible connection *b*, having the limit-stop *h* thereon, in combination with the movable evener, substantially as specified.

396,024. INSECT-TRAP. JOHN H. BROWN, New York, N. Y., assignor to Geo. C. Townsbury, same place. Filed Aug. 27, 1888. Serial No. 283,898. (No model.)



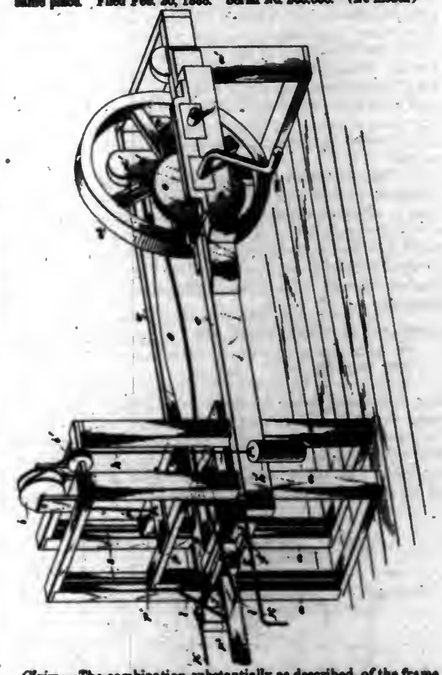
Claim.—An insect-trap consisting of a dish-shaped base having a bottom within the dish formed as a low cone and provided with an aperture through the side or wall, in combination with the covered way leading from the aperture to a narrow opening within the trap, the said covered way being formed of woven wire, the edges of which are attached to the wall and bottom of the dish, and having a mouth at the inner end projecting over the top of the cone, the said base having also a suitable cover, all substantially as described.

396,025. BUSTLE. VICTOR H. BUSCHMANN, Baltimore, Md., assignor to Augustus H. Brinkmann, same place. Filed Nov. 19, 1888. Serial No. 291,228. (No model.)



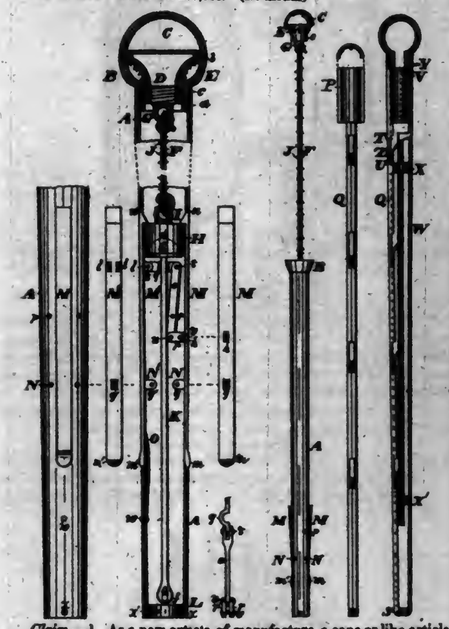
Claim.—The bustle having, in combination, a main bow, C, provided near each end with a lateral U-shaped bend, *d*, a coil, *e*, below the said U-shaped bend, and a spring-arm, *f*, projecting from the coil, the bows C, each having hook ends *g*, all of which on one side pivot in one of said U-shaped bends of the main bow, and a hook, A, uniting the two sides of the U-bend and confining the hook ends of the bows, as set forth.

396,026. WOOD-SAWING MACHINE. BENJAMIN F. CAMP, Clinton, Ky., assignor, by mesne assignments, of one-half to John R. Bowers, same place. Filed Feb. 20, 1888. Serial No. 265,060. (No model.)



Claim.—The combination, substantially as described, of the frame provided at front with vertical standards having ways, the gravitating counterbalanced sash-frame mounted in said ways and provided with horizontal grooved side sills, the cross-head mounted to slide in said grooves and connected by pitman with the driving-crank, the saw secured at one end to the front of the cross-head, and guides secured to the sash-frame adjacent to the cross-head and bearing with their free ends upon opposite sides of the saw-blade.

396,027. CANE. WILBUR M. CARPENTER, St. Louis, Mo. Filed Oct. 4, 1886. Serial No. 215,318. (No model.)



Claim.—1. As a new article of manufacture, a cane or like article composed of a suitable case, a detachable head, and a flexible connection between said head and the cane-body, whereby the head is allowed a certain range beyond the end of the cane, and is thereby adapted to be used as a weapon of defense, substantially as described.

2. A cane or like article consisting of a case, a detachable head, and a connection between said head and the cane, whereby the said head is allowed a certain range of movement beyond the end of the cane, the connection between the head and cane being formed with spurs or teeth, substantially as described.

3. A cane or like article consisting of a case, a head detachable therefrom having a smooth exterior and teeth or like projections upon its under surface, and a connection between said head and cane allowing limited movement of the head, and also provided with spurs or projections throughout its extent, substantially as described.

4. A cane or like article consisting of a body portion, a head detachable therefrom, a connection between said head and the cane, and elastic means for automatically withdrawing said head to its normal position after use, substantially as described.

5. A cane or like article consisting of a case, a head detachably connected therewith, positive means for holding said head in position, and a hand device for releasing the holding device, whereby the said head may have a limited movement to be used as a weapon of defense, substantially as described.

6. A cane or like article consisting of a suitable case, a detachable head, a flexible connection between said head and cane, holding-catches for keeping the head in its normal position, and releasing means in connection with each other, whereby in the operation of one upon one side of the cane the other will be automatically operated to release the head, substantially as described.

7. In a cane or other staff having a button or plunger, as shown, an elastic cord connecting said button or plunger to the bottom of the cane, substantially as shown.

8. A cane or like article consisting of a suitable case, a detachable head, a sliding block within the case, the connection between said sliding block and the cane-head, the flexible connection between said sliding block and the cane-body, and holding-catches for retaining the block in position until released, substantially as described.

9. In a cane or other staff having a button or plunger, two catches and their connecting rods and levers, and a spring, substantially as shown.

10. A cane or like article having a body portion and a weighted part extensibly connected to said body portion, and a catch, as M, for holding said weighted part in place, said catch, terminating in a handle, substantially as described.

396,028. PAPER PAIL. JOHN I. COLHAPP, Chicago, Ill., assignor of two-thirds to Charles Chamberlain, same place. Filed Mar. 24, 1888. Serial No. 268,402. (No model.)



Claim.—An oyster-bucket the sides and bottom of which consist of a blank of flexible material having a practically-circular bottom, and an octagonal edge, said blank divided by radial creases into segments, each of which is again divided by a crease which intersects a radial side of the segment at the center and is at right angles to the peripheral side of the segment, the blank being folded into an inner and outer series of folds, respectively, on the creases B and C, substantially as shown and described, in combination with rivets which hold the gathered portions of the blank so as to form the top of the bucket, a bail attached thereto, and cement between the folded portions of the sides of the bucket, all substantially as and for the purpose shown and described.

396,029. BAG-LOCK. LYMAN B. CUTLER, Monmouth, assignor of one-half to Wallace Greene, Freeport, Ill. Filed Dec. 1, 1882. Serial No. 262,415. (No model.)



Claim.—1. In a mail-bag, the combination, with two pivotally-connected opposing jaws secured to the edges of the bag's open end, of a series of hooks arranged at intervals along the inner face of one of said jaws, a series of catches arranged at corresponding intervals along the inner face of the opposing jaw, and lugs having inclined impinging surfaces fixed upon the respective jaws and overlapping when the jaws are closed, whereby the jaws may be thrown bodily in opposite directions as the bag closes to permit engagement of the hooks, substantially as set forth.

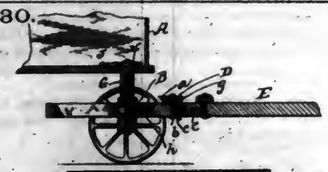
2. The combination, with a mail-bag, of two opposing jaws secured to the bag's edges, a series of rigid hooks arranged at intervals along one of said jaws, a series of catches placed at corresponding intervals along the other jaw and adapted to be simultaneously engaged by said hooks when the jaws are moved bodily in the proper direction with reference to each other, and the lock passing through both jaws, or projections thereon, to prevent such bodily motion.

3. The combination, with a mail-bag, of the downwardly-bent pivotally-connected jaws secured to its edges, the staples fixed at intervals upon one of said jaws, the correspondingly-placed hooks fixed upon the opposing face of the other jaw and adapted to engage the staples respectively, the lug fixed upon one jaw and having the V-shaped projection, the overlapping lug fixed upon the opposing jaw and provided with a corresponding depression, and the lock having its link passed through both lugs and preventing bodily movement of the jaws with reference to each other, substantially as set forth.

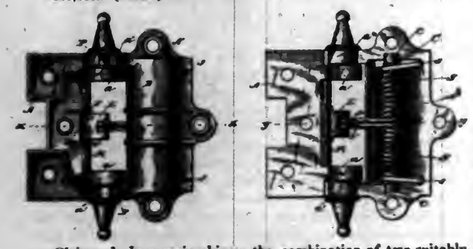
396,030. AUTOMATIC VEHICLE-BRAKE. BENJAMIN A. DAVIS, Bermuda, assignor to George Davis, Petersburg, Va. Filed Nov. 7, 1888. Serial No. 290,220. (No model.)

Claim.—The combination, in a wagon or other vehicle, of the pole having the slots or openings *c c*, the pins or bolts *c c*, passing through said openings, the brake-bar, the chain, and pawl and ratchet connecting with said pole, substantially as described.

396,030.



396,031. SPRING-HINGE. LEVI M. DEVORE and FRED. W. HOEFER, Freeport, Ill., assignors, by direct and mesne assignments, to the Stover Manufacturing Company, same place. Filed Feb. 27, 1888. Serial No. 265,460. (Model.)

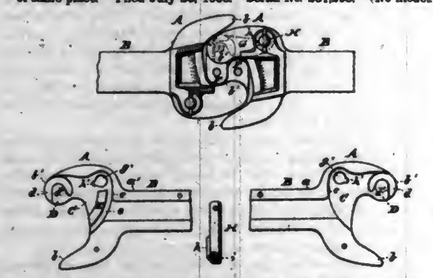


Claim.—1. In a spring-hinge, the combination of two suitably-connected leaves, one of which is provided with a pivotal rod or pin, a spring-coil mounted parallel to the hinge-axis upon the other of said leaves and having its free or working end upon the side of the coil next the door or jamb, and a link connecting said free end with said pivotal rod, substantially as set forth.

2. The combination, with the leaf A', of the leaf A, connected therewith by suitable pintles and having the rod R at one side of the axis of the leaves, the arbor C, mounted on the leaf A', the springs S S, coiled about the arbor C and having their outer ends, *s s*, secured to the leaf A' and their inner ends, *s' s'*, extending toward the rod R, and the link L, connecting the ends *s' s'* and the rod R and adapted to cross the axis of the hinge as it is opened or closed, and thereby to reverse the operation of the spring upon the leaves, substantially as and for the purpose set forth.

3. The combination of the leaves A A', one provided with the rod R at one side of the axis of the leaves and the other with the hood or shell B, the arbor C, lying within the shell B and having its ends secured in bearings *c c* in the leaf, the springs S S, coiled about the arbor and having their ends *s s* secured by passing through the shell and their ends *s' s'* extended toward the rod R, and the link L, connecting the ends *s' s'* with the rod, substantially as and for the purpose set forth.

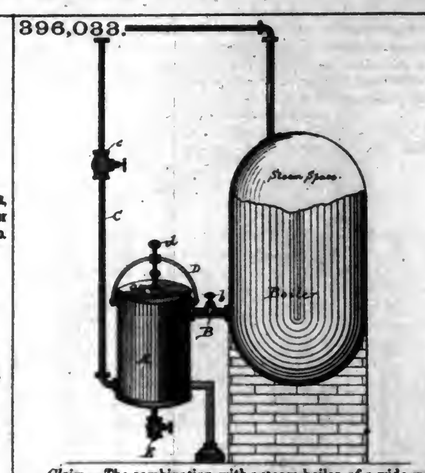
396,032. CAR-COUPLING. ROBERT H. DOWLING, Newark, Ohio, assignor of two-thirds to Charles Follett and Charles H. Follett, both of same place. Filed July 28, 1888. Serial No. 281,293. (No model.)



Claim.—1. The combination of the draw-head having the recess C, the hubs forming the curved way *d*, and the shoulder *d'*, the coupling-jaw having the shank provided with the curved ribs *f* to engage the hubs, and the locking-bolt having the guard thereon, substantially as specified.

2. The combination of the draw-head having the recess, the curved rear wall, and the curved rib E, the hubs forming the curved way and the shoulder, the coupling-jaw having the shank portion at right angles thereto, provided with the curved lug, the bolt-opening having the beveled edge, the curved rib *f*, and the locking-bolt having the guard and the beveled end, substantially as specified.

396,033. DEVICE FOR PREVENTING INCRUSTATION. EDWARD E. EICHENROER, Dayton, Ohio, assignor of one-half to Christian J. Wentman, same place. Filed June 11, 1888. Serial No. 276,763. (No model.)



Claim.—The combination, with a steam-boiler, of a wide-mouthed receptacle having a removable cover, a pipe leading from the steam-dome to the lower part of the receptacle, and a pipe leading from the upper part of the receptacle to the lower part of the boiler, above the bottom thereof, whereby the anti-incrustation solution is caused to circulate from the receptacle into the boiler, above the sediment and at the most advantageous point, substantially as specified.

396,034. ADDING-MACHINE. DORR E. FELT, Chicago, Ill., assignor, by direct and mesne assignments, to himself and Robert Tarrant, same place. Filed May 31, 1887. Serial No. 239,781. (No model.)

Claim.—1. In an adding-machine, the combination, with the numeral-wheels and the carrying mechanism, embracing pawls and ratchet-teeth for actuating said wheels, of a stop for preventing over-rotation by the carrying mechanism, consisting of arms movable into locking position with said pawls, substantially as set forth.

2. The combination, in an adding-machine, with the numeral-wheels having equispaced teeth J, of the arms L and pawls M, substantially as set forth.

3. In an adding-machine, the combination, with the numeral-wheels having equispaced teeth J, of the cam-disks F, the arms L, and pawls M, substantially as set forth.

4. In an adding-machine, the combination, with the numeral-wheels having the teeth J and the carrying pawl and lever, of the locking-arm and its moving devices, substantially as specified.

5. The combination, in an adding-machine, and with the numeral-wheels and setting mechanism thereof, of the locking devices consisting of arms L and pawls M and cam-disks for releasing the former, substantially as set forth.

6. The combination, with the stop devices L and M, acting in conjunction with ratchet-teeth J, of said teeth J, the cam-disks, the pinions actuating the disks, the segment-levers, and the cams S, substantially as and for the purpose specified.

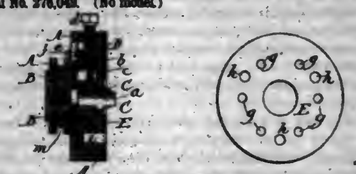
7. In an adding-machine, the combination, with the numeral-wheel and its carrying-mechanism, of a stop for preventing over-rotation under the impulse of the carrying mechanism, consisting of an arm movable into position to act with the actuating-pawl of the carrying mechanism in locking the numeral-wheel, and means for moving said arm out of such position at will, substantially as set forth.

8. In an adding-machine, the combination, with the numeral-wheels and their carrying mechanism, of a stop device consisting of an arm acting in conjunction with the pawl of the carrying mechanism to lock the numeral-wheels, said pawl being withdrawable from the locking position for renewing the carrying operation, substantially as set forth.

9. The locking-detents *i*, having heads *a* formed on its edges and

integral therewith, in combination with the rods *h* and the stop-levers H, substantially as set forth.

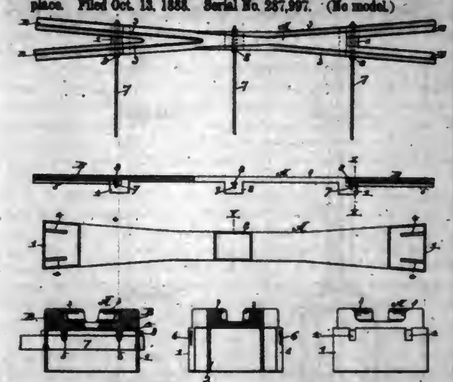
396,035. LATHE-CHUCK. DORR E. FELT, Chicago, Ill., assignor of one-fourth to Robert Tarrant, same place. Filed June 4, 1888. Serial No. 276,042. (No model.)



Claim.—1. In combination with a shell, A, and body B, jaws for holding a wire or disk, adjustable blocks D, toggle-links *c*, face-plate E, screws for adjusting the blocks D, and set-screws *f*, for holding the blocks D in their adjusted position, substantially as and for the purpose specified.

2. In a chuck, the combination of a shell, A, and body B, with holding-jaws, adjustable blocks D, toggle-links *c*, face-plate E, and dowel-pins *i*, substantially as and for the purpose specified.

396,036. STREET-RAILWAY TRACK. THOMAS H. GIBSON, Albany, N. Y., assignor to the Metallic Street Railway Supply Company, same place. Filed Oct. 13, 1888. Serial No. 287,997. (No model.)



Claim.—1. A base-plate for street-railway frogs and switches, provided with angularly-arranged treads and having at its opposite ends pendent boxes extended therefrom, said boxes being adapted to receive the ends of track-rails whose heads coincide with said treads, as and for the purpose herein specified.

2. A base-plate for street-railway frogs and switches, provided with angularly-arranged treads and having pendent boxes formed thereon, the sides of said boxes being provided with oppositely-located openings for receiving cross-ties, and the keys by which said cross-ties are secured in place, as and for the purpose herein specified.

396,037. METHOD OF MAKING FERRULES. ERNST L. GOTTGHALD, Dresden, Germany, assignor to John Bister, Brooklyn, N. Y., and Joseph Schmitt, Hoboken, N. J. Filed Oct. 5, 1888. Serial No. 287,317. (No model.)

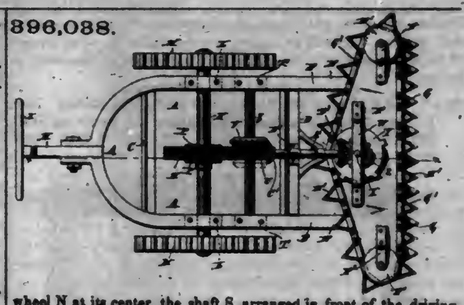


Claim.—The process herein described of manufacturing ferrules, which process consists in first passing a rivet through an aperture in the closed end of a ferrule, in then placing disks or plates on the projecting end of said rivet, and in then welding the rivet and disks together in a compact mass, substantially as described.

396,038. LAWN-MOWER. LEWIS D. HALL, Concordia, Kans., assignor of one-half to S. D. Houston, Jr., same place. Filed Oct. 13, 1887. Serial No. 252,238. (No model.)

Claim.—1. The combination, in a mower, of the frame having the finger-plate at its front end, the pulleys on the ends of the said finger-plate, the fingers secured to the front side of the finger-plate, the sprocket-wheel arranged on the finger-plate, the miter-wheel Z, secured to the said sprocket-wheel, the endless chain engaging the sprocket-wheel and passing around the pulleys, the cutters attached to the said endless chain and adapted to pass continuously over the fingers, the driving-shaft journaled in the frame and having the gear-

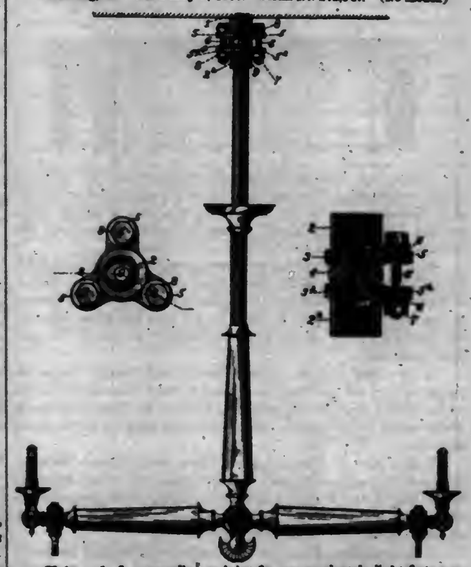
396,038.



wheel N at its center, the shaft S, arranged in front of the driving-shaft and having the pinion engaging with the gear-wheel and adapted to be reversed on shaft S, for the purpose set forth, and the longitudinally-arranged shaft A', midway between the sides of the frame, having the miter-wheel at its front end engaging the wheel Z and the miter-wheel at its rear end engaging the wheel V, substantially as described.

2. The combination of the frame, the driving-shaft journaled therein, the shaft S, geared to the driving-shaft, the plate arranged at the front end of the frame and having the fingers sharpened on their projecting converging edges, the endless sprocket-chain on the plate, having the cutters H' sharpened on their projecting converging edges, the sprocket-wheel arranged at the center of the plate and engaging the sprocket-chain to drive the latter, the longitudinal shaft A', arranged in the center of the frame, gears D' and Z, connecting the same with the sprocket-wheel, and gears C' and V, connecting shaft A' with the driving-shaft, the said gear V being adapted to be reversed on shaft S to operate the sprocket-chain in either direction, substantially as described.

396,039. COUPLING FOR GAS AND ELECTRIC-LIGHT FIXTURES. REINHOLD HERMAN, Crafton, assignor to George H. Baxter, Pittsburg, Pa. Filed May 2, 1888. Serial No. 272,547. (No model.)



Claim.—1. In a coupling or joint for gas or electric-light fixtures, the combination of two threaded nipples, each provided with circular seats at their adjacent ends, and a bearing-ball formed of insulating material arranged between said nipples, substantially as set forth.

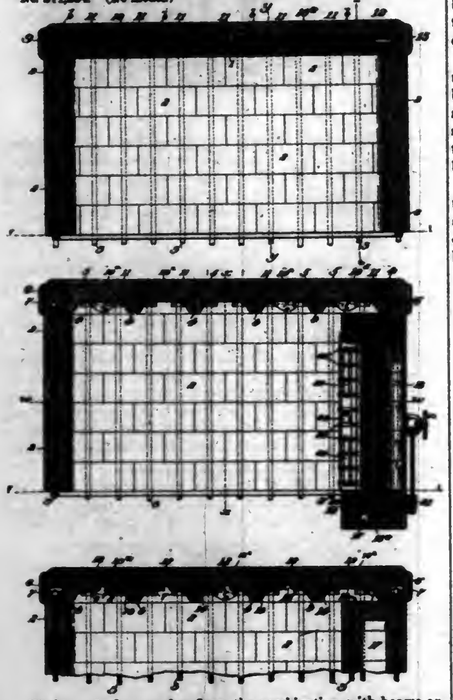
2. In a coupling or joint for gas or electric-light fixtures, the combination of two threaded nipples, each provided with circular seats at their adjacent ends, a bearing-ball formed of insulating material interposed between said nipples, and bolts for adjusting the nipples in proper relation to each other, substantially as set forth.

3. In a coupling or joint for gas or electric-light fixtures, the combination of two threaded nipples, each provided with circular seats at their adjacent ends, and perforated bearing-ball formed of insulating material arranged between said nipples, substantially as set forth.

4. In a coupling or joint for gas or electric-light fixtures, the com-

tination of two threaded nipples, each provided with circular seats at their adjacent ends, and an angularly-perforated bearing-ball formed of insulating material arranged between said nipples, substantially as set forth.

396,040. ROOF FOR VAULTS AND OTHER STRUCTURES. JOHN T. HOUSE, Chicago, Ill., assignor to the National Safe Deposit and Vault Manufacturing Company, Pittsburg, Pa. Filed Apr. 19, 1888. Serial No. 271,234. (No model.)



Claim.—1. In a roof or floor, the combination, with beams arranged side by side and having key-strips on the opposing sides thereof, of blocks interposed between the beams and secured to the key-strips, the said blocks having lateral recesses to receive the flanges of the beams, substantially as and for the purposes described.

2. In a roof or floor, the combination, with beams arranged side by side and having dovetailed key-strips on the opposing faces thereof, of blocks interposed between the beams and having lateral grooves or mortises corresponding in shape to the said key-strips, whereby the blocks are fitted on the strips, substantially as and for the purposes described.

3. In a roof or floor, the combination, with flanged beams arranged side by side, of blocks interposed between them and supported by the flanges, and tie-rods extending through the blocks lengthwise of the beams and connecting the blocks, substantially as set forth and described.

4. In a roof or floor, the combination, with flanged beams arranged side by side, of blocks interposed between them and supported by the flanges, and blocks 14, secured to the sides of the flanged beam and having seats to which the key-blocks of the roof structure are secured, substantially as set forth and described.

5. In a roof or floor, the combination, with flanged beams arranged side by side, of blocks interposed between them and supported thereby, the outer beams of the series being arranged with the flanges beneath the upper blocks of the walls and with the webs of the beam in contact with the sides of the blocks, substantially as set forth and described.

6. In a roof or floor, the combination, with flanged beams arranged side by side, of blocks interposed between them and supported by the flanges, and tie-rods connecting the blocks, said tie-rods being divided, and intermediate blocks of the series having cavities within which the tie-rods project, so as to afford means for tightening them, substantially as set forth and described.

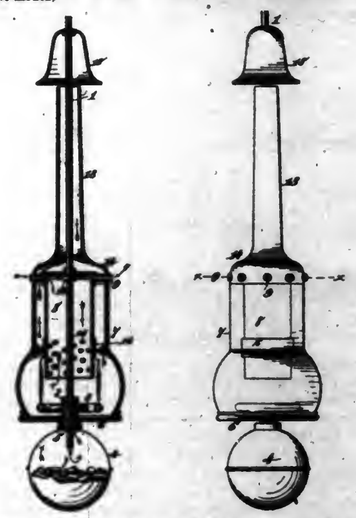
7. In a roof or floor, the combination, with flanged beams arranged side by side, of blocks interposed between them, fitting against the sides or webs of the beams, and laterally recessed for the reception of the flanges of the beams on both sides of the blocks, and connected with each other by tongues and grooves at their meeting ends, said blocks extending above the flanges on the outer sides of the beams, overlapping the same, and meeting over the said flanges, substantially as and for the purposes described.

8. In a roof or floor, the combination, with beams arranged side by side and having dovetailed key-strips on the opposing faces thereof, of blocks interposed between the beams and having lateral grooves or mortises corresponding in shape to the said key-strips, whereby the blocks are fitted on the strips, said blocks having also interlocking tongues and grooves at the ends, substantially as and for the purposes described.

9. In a roof or floor, the combination, with flanged beams arranged side by side, of blocks interposed between them and supported by the flanges, supporting-blocks 14 at the sides of the flanged beams and having seats to which the key-blocks of the roof structure are secured, and tie-rods which extend lengthwise of the beams and pass through open slots in the key-blocks and through holes in the other blocks of the series, substantially as and for the purposes described.

10. In a roof or floor, the combination, with flanged beams arranged side by side, of a series of blocks interposed between them and keyed laterally thereto by longitudinal keys, and a block at the end of the series which is bolted in place on the inner side and is not keyed to the beams, substantially as and for the purposes described.

396,041. CARBURETING-LAMP. JOSHUA KIDD, Newark, N. J.; James Kidd (administrator of said Joshua Kidd, deceased) assignor to Walter I. Kidd, same place. Filed May 12, 1886. Serial No. 201,984. (No model.)



Claim.—1. In a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, the combination of a gas-burner, a carbureting-vessel located below the gas-burner, a gas-inlet pipe communicating with the carbureting-vessel, and in which the gas is heated before entering said vessel, for the purpose of melting and vaporizing the hydrocarbon, and a heat-arrester closed at the top and placed about the gas-inlet pipe to retain the heat in contact with said pipe, substantially as described.

2. In a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, the combination of a vertical gas-inlet pipe communicating with the carbureting-vessel, and in which the gas is heated before it enters said vessel, a gas-burner adjacent to the carbureting-vessel and the gas-inlet pipe, a tube surrounding the gas-inlet pipe and communicating with the gas-burner and the carbureting-vessel, a vertical tubular casing provided with a bell-shaped or flaring lower opening placed around the vertical gas-pipe to converge and retain the heat in contact with said pipe, and a carbureting-vessel detachable from the fixed part of the apparatus, substantially as and for the purposes described.

3. In a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, the combination of a gas-burner, a carbureting-vessel located below the gas-burner, a central gas-inlet pipe adjacent to the gas-burner and communicating with the carbureting-vessel, an inner tubular casing open at the lower end and provided with air-inlet tubes at the upper end and placed about the gas-inlet pipe to converge the heat and bring it in contact with said pipe, and an outer glass chimney surrounding the gas-inlet pipe and the inner tubular casing to cause a circulation of air about the flame, substantially as and for the purposes described.

4. In a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, the combination of a carbureting-vessel, a gas-burner communicating with the carbureting-vessel, a central gas-inlet pipe adjacent to the gas-burner and communicating with the carbureting-vessel, an outer casing located around the gas-burner and the central gas-inlet pipe, an air-heating device suspended within the outer casing and surrounding the central pipe, a solid plate or disk located below the gas-burner for supporting the outer casing and closing its lower end, and a piece of platinum located in proximity to the gas-burner, so as to be brought to a state of incandescence by the heat, substantially as described.

5. In a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, the combination of a carbureting-vessel, a gas-burner communicating with the carbureting-vessel, a gas-inlet pipe also communicating with said vessel, a gas-heating device formed on or attached to said pipe and adjacent to the gas-burner, and a piece of platinum or other similar substance capable of being raised to a state of incandescence by the heat from the flame and located in proximity to the gas-burner, substantially as and for the purposes described.

6. The combination, in a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, of a gas-burner, a carbureting-vessel located below the gas-burner, a straight vertical gas-inlet pipe adjacent to the gas-burner and communicating with the carbureting-vessel, and a heat-retaining casing placed about the inlet-pipe to bring the heat from the gas-flame in contact with said pipe, substantially as described.

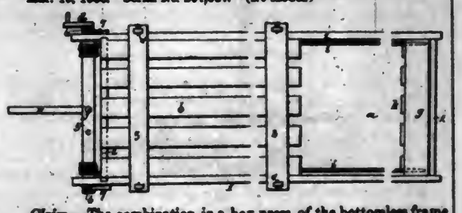
7. The combination, in a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, of a gas-burner, a straight vertical gas-inlet pipe adjacent to the gas-burner and communicating with the carbureting-vessel, a casing placed about the inlet-pipe to bring the heat from the gas-flame in contact with said pipe, and a carbureting vessel detachable from the fixed portion of the apparatus, substantially as described.

8. The combination, in a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, of a carbureting-vessel, a gas-burner connected with said vessel, a gas-inlet pipe adjacent to the burner and communicating with the carbureting-vessel, and an air-heating device consisting of two or more vertical casings, one within the other, the outer casing surrounding the gas-burner and closed at its lower end, and the inner casing having its lower end above the gas-burner, substantially as described.

9. The combination, in a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, of a gas-burner, a carbureting-vessel, a central gas-inlet pipe located above the gas-burner and communicating with the carbureting-vessel, and a glass chimney surrounding the burner and inlet-pipe to intensify the combustion of the flame and to increase the heat on said pipe, substantially as described.

10. The combination, in a carbureting-lamp for enriching gas by the vapor of naphthaline or other heavy hydrocarbon, of a carbureting-vessel, a gas-burner, a straight vertical gas-inlet pipe in which the gas is heated before entering the carbureting-vessel, a tube communicating with the gas-burner and the carbureting-vessel and located around the inlet-pipe, and a heat-arresting casing placed around the inlet-pipe to bring the heat from the gas-flame in contact with said pipe, substantially as and for the purposes described.

396,042. PORTABLE HAY-PRESS. GEORGE R. LOCKEY, Paris, Tenn., assignor of one-half to W. Devereaux Kendall, same place. Filed Mar. 19, 1888. Serial No. 267,667. (No model.)



Claim.—The combination, in a hay-press, of the bottomless frame having end and side walls, the removable top shutter arranged upon one end of the press, and a follower device comprising a follower, a rope or chain, and a windlass, the whole constituting a portable hay-press which may be used upon any suitable floor of a vehicle or building, substantially as herein described.

396,043. FOLDING SIGHT FOR FIRE-ARMS. WILLIAM LYMAN, Middlefield, Conn. Filed July 10, 1888. Serial No. 279,517. (No model.)



Claim.—1. In folding sights for fire-arms, the combination of a base, post, or supporting part for the folding sight-piece, having a seat or guide for receiving or holding a spring, the folding sight-piece hinged or pivoted to the supporting part and adapted to swing down from the vertical or aiming position, stops on the fixed and folding parts for limiting the swing of the sight-piece, a spring contained or guided in the supporting part, and a connecting-piece between the spring and the folding sight-piece in position to swing to each side of the central plane through the sight-hinge and spring as the sight is folded up or down, and thus direct the pressure of the spring upon the sight-piece to hold it securely in place at each extremity of its throw.

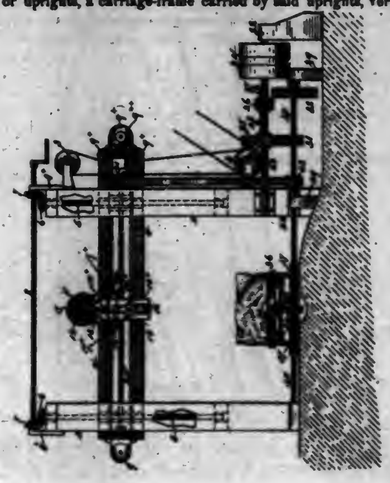
2. In folding sights for fire-arms, the combination of a base or supporting part for the sight-piece, having a seat or guide for receiving or holding a spring, the folding sight-piece hinged to the supporting part and adapted to swing down from the vertical or aiming position, a spring contained or guided in the supporting part, a pitman or connecting-piece resting upon and guided subject to the expansion of the spring at the lower end and pivoted or hinged to the folding sight-piece at its upper end in position to adapt the spring to hold the sight-piece securely at either extremity of its swing, and suitable stop-shoulders on the sight-piece and supporting part to limit the folding movement of the sight-piece, for the purpose described.

3. In folding sights for fire-arms, the combination, with the sight-post having a barrel chamber or recess to receive a spring, of the folding sight-piece hinged to the sight-post above the spring-chamber, a spiral spring received in the chamber or recess of the sight-post, and a pitman or connecting-piece attached to or bearing upon the spring at one end and attached or pivoted to the folding sight-piece at the opposite end at a point forward of a central line through the hinge thereof and the spring when the sight-piece is elevated and sufficiently near each line to swing by to the opposite side thereof as the sight-piece is depressed, whereby the spring is adapted to hold the sight-piece either in the aiming or in the depressed position, as specified.

4. In folding sights for fire-arms, the combination, with the sight-post A, having a barrel chamber or recess, *y*, the folding sight-piece C, hinged to the sight-post, a spiral spring, A, received in the chamber or recess of the sight-post, and a pitman or connecting part fitted in the barrel of the sight-post at its lower end, resting upon the spring, and pivoted at its upper end to the folding sight-piece forward of its hinge and in such position that the thrust of the spring is brought against the sight-piece to hold it in a vertical position, and when the sight-piece is folded down to press against the same on the opposite side of its hinge and hold the sight depressed, substantially in the manner described.

396,044. MACHINE FOR DRESSING STONE. FRANK MANNING, Narberth, Pa., assignor to the Manning Machine Company, of New Jersey. Filed July 13, 1888. Serial No. 279,854. (No model.)

Claim.—1. In a stone-dressing machine, the combination of standards or uprights, a carriage-frame carried by said uprights, vertical



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traveling screws engaging the frame for adjusting said frame vertically, a carriage mounted on said frame, a screw in the frame for causing the carriage to travel transversely, a pulley on said screw, a transverse shaft mounted in the uprights carrying a pinion and pulley, a band passing over the pulleys on the shaft and screw, and a stone-carrying truck provided with a rack adapted to mesh with the pinion on the transverse shaft, said parts being arranged and operating substantially in the manner and for the purpose described.

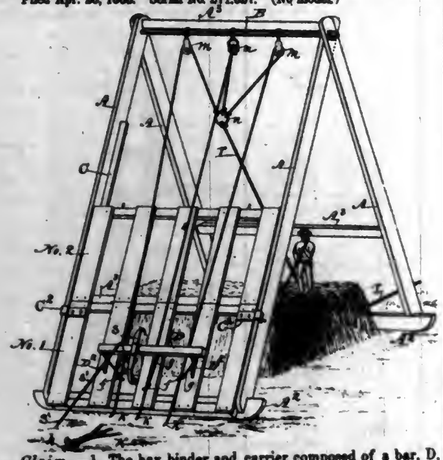
3. In a stone-dressing machine, the combination of the posts or uprights, the carriage-frame mounted therein, the pulleys carried by the frame, the carriage carrying the cutting mechanism mounted on said frame, the pulleys on the carriage, the belt passing over the pulleys of the carriage-frame and carriage for operating the cutting mechanism, and mechanism in the carriage for throwing the cutting mechanism into and out of operation, substantially in the manner and for the purpose described.

3. In a stone-dressing machine, the combination of the standards or uprights, the vertically-adjustable carriage-frame carrying pulleys, the transversely-traveling carriage mounted on said frame carrying pulleys, the belt passing over the pulleys of the carriage-frame and carriage for operating the cutting mechanism, the transverse shaft mounted in the standards, the gear-wheel on said shaft, and the truck carrying the rack meshing with said gear-wheel, said parts being arranged and operating substantially in the manner and for the purpose described.

4. In a stone-dressing machine, the combination of the standards or uprights, the vertically-adjustable carriage-frame carrying pulleys mounted therein, the carriage mounted in the frame carrying pulleys, pulleys on the standards, a belt passing over the pulleys on the frame and standards and a belt passing over the pulleys on the frame and carriage, a transverse screw in the carriage-frame carrying a pulley, a transverse shaft mounted in the standards carrying a pulley, a belt passing over the pulley of the screw and shaft, a gear-wheel on said shaft, a rack on the stone-carrying trucks meshing with said gear-wheel, differential gearing on said shaft, and a driving-shaft having differential gearing adapted to mesh with the differential gearing of said transverse shaft for imparting different speeds to said shaft, substantially in the manner and for the purpose described.

5. In a stone-dressing machine, the combination of the standards or uprights, the carriage-frame mounted in said standards carrying a single pulley at one end, a double pulley at the opposite end, and guiding-pulleys adjacent to the double pulley, a carriage having cutting mechanism mounted on the frame, pulleys carried by the carriage, a belt passing over the single and double pulleys, and the pulleys on the carriage-frame, operating substantially in the manner and for the purpose described.

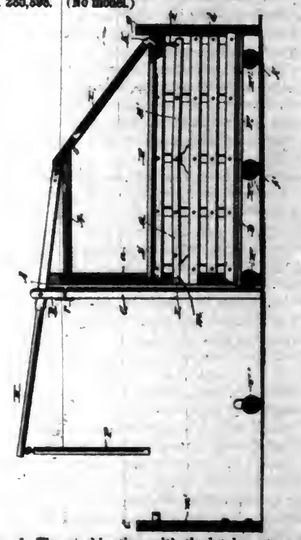
396,045. PORTABLE HAY-STACKING MACHINE. LEROY MILLER, Albia, Iowa, assignor of one-half to William F. Walker, same place. Filed Apr. 23, 1888. Serial No. 271,627. (No model.)



Claim.—1. The hay binder and carrier composed of a bar, D, having a pivoted lever, *s*, the ropes *g*, the rings *f*, *h*, and *n*, and the ropes *k* and *r*, in connection with a derrick having an inclined frame, and pulleys *m*, to operate in the manner set forth.

2. The uprights A, having fixed strips C, and connected with cross-pieces to produce a rigid frame, a second frame constructed in the same manner and hinged to the top ends of the uprights A, an inclined frame formed in detachable sections adapted to be placed upon the fixed strips or bearings C, a hay binder and carrier comprising a bar, D, having a pivoted lever or hook, *s*, rings *f*, *h*, and *n*, ropes *g*, *k*, and *r*, and pulleys *m*, arranged and combined to operate in the manner set forth.

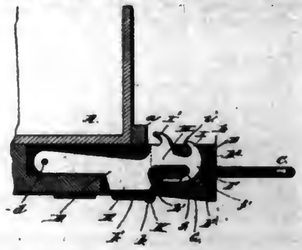
396,046. GATE. CASTNELL J. MOORE, Webster, Iowa, assignor of one-half to Manville D. Johnson, same place. Filed Sept. 20, 1888. Serial No. 285,898. (No model.)



Claim.—1. The combination, with the latch-post provided with a suitable latch-bar, *m'*, and the gate adapted to close against the said post, of the latch mounted on the gate and comprising the levers M and M', connected together at their adjacent ends, the free end of the lever M being provided in its lower edge with a notch, *m*, adapted to engage the said latch-bar, the operating-levers, and the bell-crank or angle lever K, having one of its arms connected by the cord or wire *k* to the free end of the lever M', and having its other arm connected to the ends of the operating-levers by means of the swinging bar I, substantially as and for the purpose specified.

2. The combination, with the main post, of the roller F, arranged at its lower end, the rollers F' F', arranged on opposite sides of the main post below the plane of the roller F, the gate provided at its lower edge with a track sliding on the said rollers, and operating means, substantially as specified, for the purpose set forth.

396,047. CAR-COUPLING. SAMUEL MYERS, Manheim, Pa., assignor of two-thirds to Emanuel Balmer and Ephraim W. Stine, same place. Filed June 16, 1888. Serial No. 277,327. (No model.)



Claim.—1. The combination of the link of ordinary construction, the draw-head B, having the recess *b*, open at top, the sides *b²*, and floor *b³*, all inclined outwardly within the mouth of the draw-head, and the slot *b'* in its floor, and the locking-bar D, pivoted at a proper point within the draw-head and provided with the convex outer end, F, the projections or points *f* I I', respectively, and rectangular projection E, standing in the slot *b'*, substantially as specified.

2. The combination, with the link, the draw-head having its recess open above and having the slot *b'* in its floor, and the locking-bar D, having the convex outer end, the projections or points *f* I I', respectively, and the rectangular projection E, resting in the slot *b'*, of mechanism, substantially as described, whereby the said locking-bar can be raised from the sides or top of the car, substantially as specified.

3. The combination of the draw-head having the longitudinal slot *b'* in its floor and the longitudinal notch *f''* in the upper side of the floor, the locking-bar pivoted in the draw-head and having the projection E, engaging the slot *b'*, and the point *f*, resting in the notch *f''*, the shaft mounted transversely on the bottom of the draw-head and having a crank-arm bearing against the projection E, and the link engaging the locking-bar, as set forth.

396,048. COMBINED SHAFT-HOLDER AND WRENCH. HENRY W. HOTT, Cameron, Tex., assignor of one-half to Sterling P. Cross, same place. Filed May 2, 1888. Serial No. 272,576. (No model.)

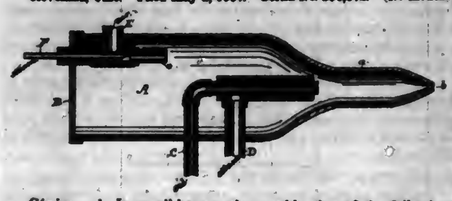


Claim.—1. In a combination shaft-holder and wrench, the combination of the arms A B, and the threaded shaft attached to the arm A and engaging a tapped aperture in the arm B, substantially as specified.

2. The combination of the arms A B, the jaws attached to the ends of the arms, and the threaded shaft attached to the end of the arm A and engaging a tapped aperture, D, in the arm B, substantially as specified.

3. The herein-described combination shaft-holder and carriage-tool, consisting of the arms A B, having their lower ends tapered to form screw-drivers E F, of different sizes, the heads on the upper ends of the arms, the jaws G G on the heads, and the threaded shaft attached to one of the arms and engaging a tapped aperture in the other arm, substantially as specified.

396,049. OIL-BURNER. AUGUSTUS U. PAGE and JOHN BRAGG, Cleveland, Ohio. Filed May 2, 1887. Serial No. 236,572. (No model.)



Claim.—1. In an oil-burner, the combination of the following elements, to wit: a shell or case having a contracted nozzle, with a centrally-compressed and laterally-expanded outlet, with an air-inlet pipe to said case having an expanded chamber with contracted outlet, and inclosing within such chamber a steam-pipe, and an oil-inlet pipe to said case surrounded by a separate and independent steam-pipe, substantially as described.

2. An oil-burner composed of a shell having a contracted nozzle, with centrally-compressed and narrow laterally-elongated opening, and containing an air-inlet pipe inclosing a steam-inlet pipe, and an oil-inlet pipe surrounded by a separate steam-inlet pipe, substantially as described.

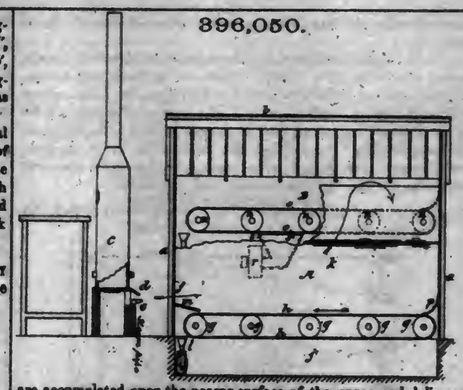
396,050. APPARATUS FOR GATHERING MINERAL WOOL. RICHARD D. A. PARROTT, Arden, N. Y., assignor to Livingston Gifford, Jersey City, N. J. Filed Feb. 14, 1888. Serial No. 263,990. (No model.)

Claim.—1. In an apparatus for gathering mineral wool, the combination, with a blowing-chamber, of a traveling meshed screen obstructing the passage to the outer air, whereby the fibers are arrested from the currents and delivered from the blowing-chamber, substantially as described.

2. In an apparatus for gathering mineral wool, the combination, with the blowing-chamber, of a meshed traveling screen arranged at the bottom thereof, through which the shot are sifted, substantially as described.

3. In an apparatus for gathering mineral wool, the combination, with the blowing-chamber, of a meshed apron traveling in the opposite direction to that at which the currents enter the chamber, whereby the shot falling at the further extremity of the chamber fall upon the bare surface of the apron and are sifted therethrough, and the fibers

396,050.



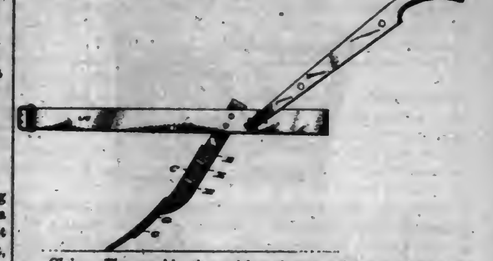
are accumulated upon the nearer surface of the apron and delivered thereby, substantially as described.

4. In an apparatus for gathering mineral wool, the combination, with the blowing-chamber, of a meshed traveling screen arranged at the bottom thereof and provided with means whereby it is shaken to sift the shot, substantially as described.

5. In an apparatus for gathering mineral wool, the blowing-chamber divided into compartments A and B, each of said compartments being provided with a traveling meshed apron and said compartments communicating with each other by an elevated passage, whereby the coarser fibers will be separated from the lighter fibers, substantially as described.

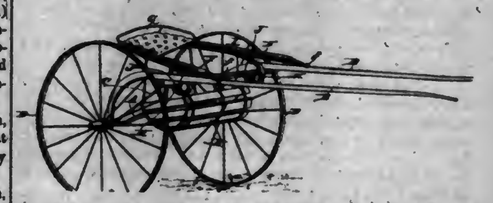
6. In an apparatus for gathering mineral wool, the combination, with a blowing-chamber, of a traveling meshed screen obstructing the passage to the outer air, whereby the fibers are arrested from the currents and delivered from the blowing-chamber, and an air-exhaust arranged to induce a forced current through the screen, substantially as described.

396,051. PLOW. WILLIAM T. RHODES, Flatonia, Tex., assignor of one-half to Richard G. Faires, same place. Filed Aug. 2, 1888. Serial No. 281,719. (No model.)



Claim.—The combination, with a plow or cultivator blade provided with countersunk holes near its lower end and in advance of the lower end of the standard, of the double-ended point H, provided with countersunk holes nearer one end than the other, the said point being constructed to be secured to the blade by bolts passing through the holes in both the blade and point before mentioned, whereby the said point may be reversed and positively secured at different lengths below the shovel, substantially as specified.

396,052. ROAD-CART. WILLIAM H. SCHMEDLEN and ROBERT E. BYRNE, Coldwater, Mich.; said Byrne assignor to said Schmedlen. Filed Nov. 14, 1888. Serial No. 290,803. (No model.)

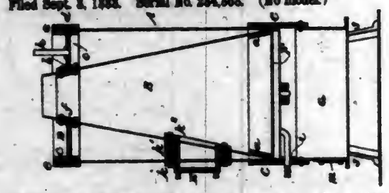


Claim.—1. In a road-cart, the combination, with the thills and the seat-bars pivoted to the thills, of the inverted-C springs interposed between the seat-bars and the cross-bars of the thills by a swinging yoke-coupling, and the foot-rest secured at its lower end to the said

coupling and at its upper end to the seat-bars, substantially as set forth.

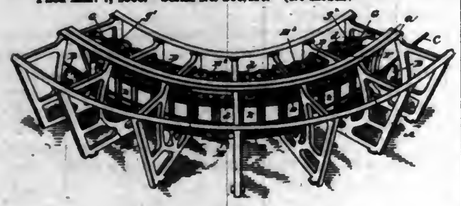
2. The herein-described sulky or road-cart, composed of the axle having wheels, the thills suitably braced and provided with a cross-bar, the seat-bars pivoted at their lower ends to the thills and supporting the seat at their upper ends, the inverted-C springs secured to the seat-bars and having their lower ends fastened to the said cross-bar by a swinging yoke-coupling, and the foot-rest having its lower end connected with the said yoke-couplings and having its upper end secured to the said seat-bars, substantially as set forth.

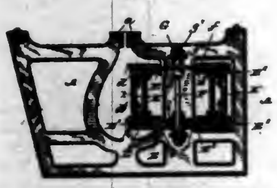
396,053. STEAM-GENERATOR. ISAIAH SHARP, Rodney, Ind. Filed Sept. 5, 1888. Serial No. 284,963. (No model.)



Claim.—The combination, with the casing A and tapering flue B, of a top plate provided with a central opening and formed with a flanged ring, *c*, and an inclined ring, *b*, fitting around the flue, an inner ring, *f*, fitted within the flue, and a ring, *d*, secured outside of the casing, substantially as set forth and described.

396,054. CURVE FOR CABLE RAILWAYS. CHARLES L. SNYDER, Kansas City, Mo., assignor of one-half to Isaac M. Ridge, same place. Filed Mar. 7, 1888. Serial No. 266,406. (No model.)





Claim.—1. In a cable railway, the combination, with a cable, of an endless carrier composed of a plurality of wheeled travelers for carrying the cable or grip, the cable or grip bearing faces of the travelers being substantially fixed in a plane parallel to the path of the travelers, substantially as set forth.

2. In a cable railway, the combination, with a cable, of an endless carrier composed of a plurality of wheeled travelers linked together, the cable or grip bearing faces of the travelers being substantially fixed in a plane parallel to the path of the travelers, substantially as set forth.

3. In a cable railway, the combination, with a cable, of an endless carrier composed of a plurality of travelers the axles of which are linked together, the cable or grip bearing portions of the travelers being secured to the links, substantially as set forth.

4. In a cable railway, a traveler forming one of the elements of an endless carrier, the said traveler consisting, essentially, of a block, a pair of wheels secured to one side of the block to rotate freely relatively thereto, and bearings provided with laterally-extended seats *h h'* for securing the block to the wheels, substantially as set forth.

5. In a cable railway, a traveler forming one of the elements of an endless carrier, the said traveler consisting, essentially, of a block, an upper and a lower bearing separable from each other and secured to one side of the block, and a pair of wheels journaled in the bearings, the said bearings being provided with laterally-extended seats for the blocks and with transverse eyes at their ends, substantially as set forth.

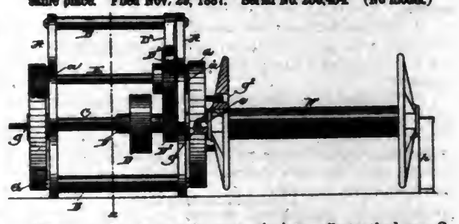
6. In a cable railway, the combination, with an upper track and a lower track, of a series of travelers forming an endless carrier for the cable or grip, each traveler consisting of a pair of wheels provided with flanges to rest on the upper edges of the tracks and a bearing-block attached to the wheel-bearings to travel in a plane parallel with the tracks, substantially as set forth.

7. In a cable railway, the combination, with an advance-track a return-track, each track consisting of an upper and a lower rail and a series of travelers forming an endless carrier suspended on said tracks, the wheels of the carrier having flanges on their upper edges, of an end spindle provided with scallop-edged disks adapted to engage the faces of the wheels below the said flanges and carry them bodily around the ends, substantially as set forth.

8. In a cable railway, the combination, with an advance-track, a return-track, and a series of travelers forming an endless carrier suspended on said tracks, of an end spindle for carrying the travelers around from one track to the other and a guide-plate attached to the spindle to form a support for the travelers around the end, substantially as set forth.

9. The combination, with suitable supporting-brackets forming a conduit for the cable and grip, of a set of tracks secured to the supporting-brackets within the conduit, a set of tracks secured to the brackets at one side of the conduit, a pair of end spindles journaled in suitable bearings attached to the brackets, and a series of travelers forming an endless carrier mounted on the tracks and spindles, each traveler having an extended bearing-surface presented toward the center of the conduit as it travels along the conduit, substantially as set forth.

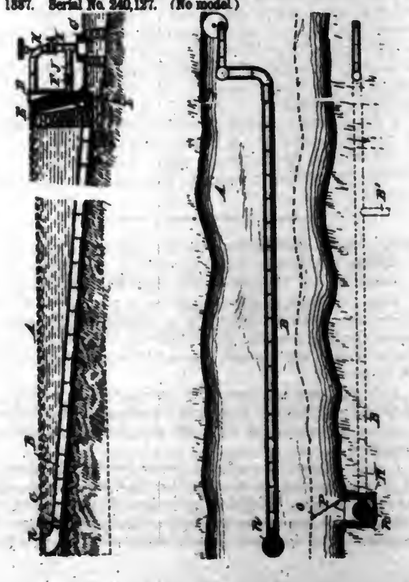
396,055. WARP-BEAMING MACHINE. SUSAN F. STONE and JOSEPH H. STONE, North Andover, Mass., (administrators of Joseph M. Stone, deceased,) assignors to the Davis & Furber Machine Company, same place. Filed Nov. 29, 1887. Serial No. 256,434. (No model.)



Claim.—1. In a beamer for warps, the internally-toothed gear G, having dogs or projections to engage the head of and rotate a warp-beam, the shaft E and its attached pinion *a*, spur-gear D^8, and its holding-pawl D^4, combined with pulley D' and pinion D^3, to engage and drive the said gear D^3, all substantially as shown and described.

2. In a beamer, two gears or plates, G, having each a series of internal teeth, as *b*, combined with a rotating shaft, as E, and with a pinion, as *a*, upon each end of the said shaft to rotate the said gears or plates, whereby two warp-beams may be rotated, substantially as described.

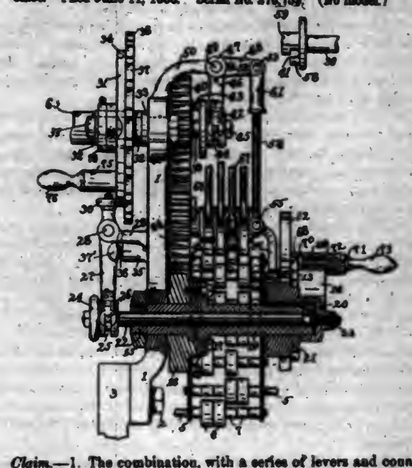
396,056. WATER-POWER DEVICE. JAMES SWAN, Chicago, Ill., assignor of one-half to Bernard A. Eckhart, same place. Filed June 3, 1887. Serial No. 240,127. (No model.)



Claim.—1. The combination of an inclined water-pipe with a receiving attachment at one end to receive water from a water-source—as, for instance, a stream, lake, or the like—with a stand-pipe having a discharging end and a power device to receive the said water from said pipe at a point below the surface of the water in such water-source at the place at which such water is received in such inclined pipe.

2. The combination of an inclined water-pipe the receiving end of which receives water from a water-source—as, for instance, a lake, stream, or the like—in combination with a stand-pipe at the lower end of such water-pipe, and a discharge end thereon, a power appliance to which water is supplied, said stand-pipe, discharge end, and power appliance being placed at a point on the inclined water-pipe below the point at which such pipe receives its supply of water.

396,057. PATTERN MECHANISM FOR LOOMS, &c. WILLIAM WATTIE, Worcester, Mass., assignor to the Knowles Loom Works, same place. Filed June 11, 1888. Serial No. 276,739. (No model.)



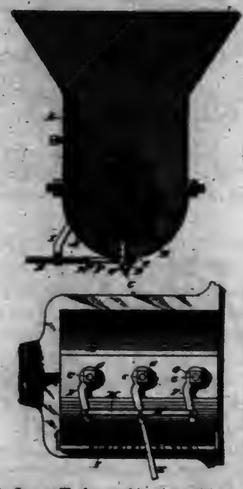
Claim.—1. The combination, with a series of levers and connections to a loom or other machine, of a main pattern-surface, star-wheel, sliding pin-wheel, hollow pin-wheel stud supporting a driving-gear in train, and said driving-gear and means for actuating the same, hollow sleeve fast to said gear, adjustable connecting-rod passing through said hollow stud and sleeve and means for adjusting said rod, spring-actuated rocker-lever, and an auxiliary pattern-surface, star-wheel, sliding pin-wheel driven by a gear in train, and said gear and means for actuating the same, hollow pin-wheel stud supporting said gear, spring-actuated bell-crank, adjustable connector, and pattern-lever, substantially as shown and described.

2. The combination, with a series of levers and connections to a loom or other machine, of a main pattern-surface, shaft carrying said pattern-surface, star-wheel loose on said shaft and provided with a series of sockets the same angular distance apart as the pattern-bars, collar fast on said shaft, spring-actuated pin socketed in said collar, sliding pin-wheel, pin-wheel stud, sleeve, gear in train and means for actuating the same, connecting-rod, rocker-lever, and an auxiliary pattern-surface, star-wheel, sliding pin-wheel and connections between said pin-wheel and gear in train, and said gear in train and means for actuating the same, pin-wheel stud, bell-crank, connector, and pattern-lever, substantially as shown and described.

3. The combination, with a series of levers and connections to a loom or other machine, of a main pattern-surface, shaft carrying said pattern-surface, star-wheel loose on said shaft and provided with a series of sockets the same angular distance apart as the pattern-bars, collar fast on said shaft, spring-actuated pin socketed in said collar, sliding pin-wheel, pin-wheel stud, sleeve, gear in train and means for actuating the same, connecting-rod, rocker-lever, and an auxiliary pattern-cam loose on an auxiliary star-wheel and provided with a spring-actuated pin socketed on said cam, auxiliary star-wheel provided with a series of sockets the same angular distance apart as the points and indications on cam, sliding pin-wheel and connection between said pin-wheel and gear in train, and said gear in train and means for actuating the same, pin-wheel stud, bell-crank, connector-rod, and pattern-lever, substantially as shown and described.

4. The combination, with a series of levers and connections to a loom or other machine, of a main pattern-surface made up of links, rolls, tubes, and reversible projecting bars, star-wheel, sliding pin-wheel, pin-wheel stud, sleeve, gear in train and means for actuating the same, connector-rod, and rocker-lever, and an auxiliary pattern-surface, star-wheel, sliding pin-wheel, and connections between said pin-wheel and gear in train, and said gear in train and means for actuating the same, pin-wheel stud, bell-crank, connector, and pattern-lever, substantially as shown and described.

396,058. FEED-REGULATOR FOR GRINDING-MILLS. JAMES F. WISCHELL, Springfield, Ohio, assignor to the Foos Manufacturing Company, same place. Filed Apr. 23, 1887. Serial No. 235,949. (No model.)



Claim.—1. In a mill, the combination, with a casing and a crushing-chamber composing a part of the frame thereof, a main shaft rotated longitudinally through the chamber and across the casing, and grinding mechanism in the casing near one end of the chamber, the rotating part thereof being carried by said shaft, of a series of bars located across the chamber, having shanks which extend through the wall of the chamber, a handle on one of them and arms on the others, a bar connecting the arms with the handle, and a locking device with which the handle engages, whereby the said bars may be adjusted and held, and a cylindrical body on the shaft having lugs or projections which coact with said bars and crush the material and feed it to the grinding mechanism.

2. In a mill, the combination, with a casing and a crushing-chamber composing a part of the frame thereof, a main shaft running longitudinally through the chamber and across the casing, and grinding mechanism in the casing near one end of the chamber, the rotating part thereof being carried by the said shaft, of a series of bars located across the said chamber, having shanks which extend through the wall thereof, devices connected to said shanks to adjust and hold the bars at varying angles in one general direction and at varying angles in the opposite general direction, whereby said bars control the speed of feeding from the maximum to the minimum degree of slowness and from the maximum to the minimum degree of rapidity, one of said directions being of a general slow feeding and the other of a general faster feed, and a cylindrical body on said shaft within said chamber, and having peripheral lugs or projections which coact with said bars to crush and feed the material.

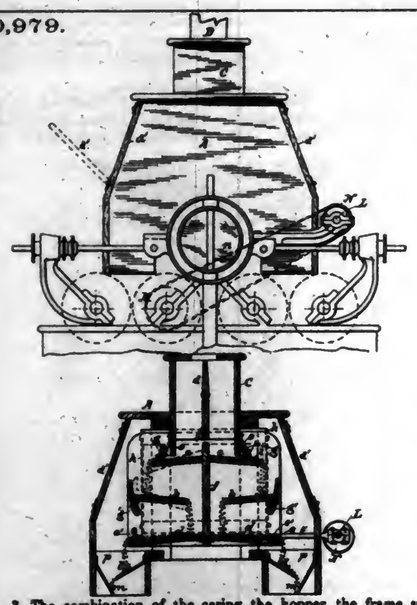
REISSUES.

10,979. FEED MECHANISM FOR ROLLER-MILLS. WILLIAM M. JEWELL, Pine, Colo., assignor to Samuel H. Templeton, Scranton, Iowa, and J. A. McAnulty, Denver, Colo. Filed June 13, 1885. Serial No. 168,559. Original No. 280,184, dated June 26, 1883.

Claim.—1. The combination, with the rollers of a roller-mill, of the vibrating inclined riffle-board *d*, having a corrugated or serrated upper surface, and an end riffle, *c*, which is adjustable back and forth, and the spout *p*, having the oppositely-inclined overlapping equalizing-shelves *l* and *m*, projecting from its opposite sides or walls, substantially as described.

2. The combination, with the casing A and the hopper C, of the frame B, suspended within said casing and provided with a series of oppositely-inclined adjustable distributing-shelves, the eccentric-shaft L, and the rod or pitman *k*, for imparting vibratory or shaking motion to said frame, and the rollers of a roller-mill, substantially as described.

10,979.



3. The combination of the casing, the hopper, the frame suspended beneath said hopper and provided with a series of oppositely-inclined adjustable distributing-shelves, the upper shelf of the series having an anti-centering ridge or rib at its outer end, the eccentric-shaft and the rod or pitman for vibrating said frame, and the rollers of a roller-mill, substantially as described.

4. The combination of the grain-reducing rollers, the hopper, the frame suspended between said rollers and hopper, means to shake or vibrate said frame, and the inclined riffle-boards *d*, provided with the adjustable end riffles, *e*, substantially as described.

5. The combination, with the casing A and the hopper C, of the vibrating frame B, provided with two oppositely-inclined distributing-shelves, *c* and *b*, and the spout *p*, having the oppositely-inclined overlapping equalizing-shelves *l* and *m*, which project from its sides or walls, substantially as described.

6. The combination, with the rollers of a roller-mill, of two oppositely-inclined shaking distributing-shelves, *c* and *b*, the outwardly and downwardly inclined riffle-board *d*, having a corrugated or serrated upper surface, and the spout *p*, having the oppositely-inclined overlapping stationary equalizing-shelves *l* and *m* projecting from its sides or walls, substantially as described.

7. The combination of the hopper C, the casing A, the vibrating frame B, suspended therein and provided with the downwardly and outwardly inclined adjustable shelf *c*, with the downwardly and inwardly inclined adjustable shelf *b*, and with the downwardly and outwardly inclined riffle-board *d*, having a serrated upper surface, and the spout *p*, having the stationary oppositely-inclined overlapping equalizing-shelves *l* and *m*, substantially as described.

8. The combination of a casing, a hopper having a swinging gate at the lower edge of its front wall, two oppositely-inclined vibrating distributing-shelves, an outwardly and downwardly inclined riffle-board having a corrugated or serrated upper surface, and an adjustable riffle at its outer end, substantially as described.

9. The combination, with a casing and a hopper, of an outwardly-inclined vibrating distributing-shelf arranged closely to said hopper and provided at its outer end with an anti-centering ridge or rib, an inwardly-inclined vibrating distributing-shelf, a riffle-board having a serrated upper surface, and devices for adjusting the plane of said shelves, substantially as described.

10. The combination, with the casing A and the hopper C, of the vibrating frame B, suspended beneath said hopper and provided with an outwardly-inclined shelf, *c*, having a ridge or rib, *i*, with an inwardly-inclined shelf, *b*, and with an outwardly-inclined riffle-board, *d*, having a serrated upper surface and an adjustable end riffle, *e*, and means for vibrating said frame, substantially as described.

11. The combination of a casing, A, a hopper, C, a vibrating frame, B, suspended beneath said hopper and provided with an adjustable outwardly-inclined shelf, *c*, having a ridge or rib, *i*, at its outer end, with an adjustable inwardly-inclined shelf, *b*, and with an outwardly-inclined riffle-board, *d*, having a serrated upper surface and an adjustable end riffle, *e*, and means for vibrating said frame, substantially as described.

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DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

MARSH *et al. v.* NICHOLS, SHEPHERD & COMPANY.

Decided December 10, 1888.

STATEMENT.—PATENT DEFECTIVE BY REASON OF THE OMISSION OF THE SIGNATURE OF THE SECRETARY OF THE INTERIOR.

The patent had not at the date of the suit been signed by the Acting Secretary of the Interior, but was subsequently signed by him. The Circuit Court dismissed the bill. Complainant took an appeal in 1885 to this Court. In 1887 Congress passed an act for relief of patentees, making the patent legal, valid, complete, and operative from its original date, December 28, 1880. *Held:*

1. DEFECTIVE PATENTS—PROCEEDINGS AGAINST.

While a patent of the United States can be attacked for defects upon its face only by regular proceedings instituted for that purpose, and is not open to collateral attack, except where specially provided by statute, this rule applies only to such patents as have been in fact executed under proper authority, and does not apply to any others.

2. SAME—CERTAIN DEFECTS SPECIFIED.

Thus it may be shown that the patent was never executed by the person whose name appears on it, or that it was wrongly dated, or was never signed by the person who appeared to have signed it, or was signed after the official was out of office.

3. PATENTS DEFINED—WHAT IS SECURED BY THE GRANT.

A patent for an invention conveys nothing which the Government owns or its predecessor ever owned, is the evidence of the inventor's exclusive right, and creates for him a property interest, which Government secures to him by a grant.

4. WHAT IS REQUIRED TO SECURE THE GRANT.

This grant, however, is regulated by statute, and requires the signatures of all the officials required by statute.

5. DEFECTIVE GRANT MAY BE CORRECTED BY EXISTING OFFICERS OF THE DEPARTMENT.

Such grants, if defective from insufficient execution, may be corrected subsequently, upon application to the proper Department; but the correction must be made by the existing officers of the Department.

6. SAME—BUT DATE OF CORRECTION BECOMES THE TRUE DATE OF PATENT.

The correction by the same Acting Secretary of the Interior is sufficient, the Commissioner of Patents remaining the same at the date of the correction, which is the true date of the patent.

7. DATE OF CORRECTION MAY BE ESTABLISHED BY PROOF.

In this instance the actual date of correction, being more than six months after the date written in the patent, may be shown by proof.

8. WHAT PROFITS TO BE ACCOUNTED FOR.

In this instance there can be no accounting for profits earned subsequently to the suit, which was not tenable at the date of its commencement.

APPEAL from the Circuit Court of the United States for the Eastern District of Michigan.

Mr. R. A. Parker and *Mr. O. D. Conger* for the appellants

Mr. C. F. Burton for the appellees.

Mr. Justice FIELD delivered the opinion of the Court.

This is a suit in equity for the infringement of an alleged patent of the United States, which, it is averred, was obtained by the complainant Marsh and his assignee and co-complainant, Lefever, for a new and useful improvement in steam-engine valve-gear, with a prayer that the defendant corporation may be required to account for and pay over to the complainants the profits acquired by it and damages sustained by them by its unlawful acts, and be enjoined from further infringement. The bill sets forth that the alleged patent was obtained on the 28th day of December, 1880, and was in due form of law, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior, countersigned by the Commissioner of Patents, and dated on that day and year. The answer of the defendant to these allegations is, that it knows nothing of the issue of the patent, except as informed by the bill or by hearsay, and, therefore, neither admits nor denies them, but leaves the complainants to make such proofs thereof as they may deem advisable. A replication having been filed to the answer, proofs were taken, among which there was put in evidence an instrument in the form of a patent of the United States, purporting to be signed "A. Bell, Acting Secretary of the Interior," and countersigned and sealed as alleged in the bill. By stipulation of the parties certain facts were admitted with reference to this instrument, and allowed to be considered, "so far as relevant, competent, or material, on any motion or at any stage of the cause, including final hearing." The facts thus admitted were substantially these: That the instrument was received from the Patent Office by the complainants Marsh and Lefever (the parties named therein as patentees) on or about January 2, 1881, in all respects in the same condition as it now is, save that the words "A. Bell" were not thereon where they now appear; that the signature to it of E. M. Marble, Commissioner of Patents, and the seal of the Patent Office are genuine; that neither of the complainants nor their counsel knew of the omission of the signature of the Secretary of the Interior to the instrument, but supposed it was in all respects regular, their attention never having been called to the same until on or about February 12, 1882, long after the commencement of the present suit; that on or about February 17 following, it was sent by the solicitor of the complainants to the Patent Office at Washington, accompanied by a request of the complainants Marsh and Lefever to have the mistake corrected; and that on or about February

24 it was returned to the solicitor signed "A. Bell," Acting Secretary of the Interior, but without any other change.

A letter dated April 28, 1882, from E. M. Marble, who was the Commissioner of Patents when the instrument was issued, was also admitted in evidence. The letter set forth the various steps taken by Marsh and Lefever to obtain a patent for the invention claimed, and by the officers of the Patent Office in preparing, executing, and delivering it to them; and shows that every requirement of the law and of the regulations of the Patent Office was complied with when the instrument was issued, except the affixing to it of the signature of the Acting Secretary of the Interior, and that its omission, as established by the history and record of the case, was purely accidental, and probably was caused by the instrument being inadvertently laid aside or withdrawn from before the Acting Secretary while he was engaged in signing patents.

The circuit court held that the signature of the Secretary of the Interior was essential to render the instrument operative as a patent of the United States for the invention claimed; that until thus signed it was not only a defective instrument, but was entirely void, and therefore that the suit could not be maintained; and it dismissed the bill. Its decree was entered on the 16th of April, 1883, and from it the complainants on the 26th of February, 1885, took an appeal to this Court. Subsequently, and on the 3d of February, 1887, Congress passed an act for the relief of the patentees, reciting in its preamble the issue to them on the 28th of December, 1880, of the Letters Patent mentioned in due form of procedure, except that by accident or mistake they were not signed by the Secretary of the Interior, and that they were signed by the then Acting Secretary on February 24, 1882, and declaring as follows:

That the letters-patent named in the preamble of this act are hereby, and by this act, made legal, valid, complete, and operative, in law and equity, from the twenty-eighth day of December, eighteen hundred and eighty, to the same extent and for the same term that the same would have been legal, valid, complete, and operative if the signature of the Secretary of the Interior had, at the time of the supposed issue of said letters-patent on the day aforesaid, been placed thereon, and the omission of said signature thereon had not occurred: *Provided, however*, That the provisions of this act shall not be held or construed to apply to or affect any suits now pending, nor any cause of action arising prior to its passage. (24 Stat., 378.)

In support of their appeal the appellants now contend in substance as follows: first, that the defendant could not impeach the patent for the irregularity in its signing and issue, this not being apparent on its face, without pleading such defense and regularly putting the question in issue; second, that the patent being regular on its face, evidence to show that the signature was irregularly placed to it was incompetent; third, that the correction of the omission in the patent was within the power of the Acting Secretary of the Interior at the time; that when the omission was thus remedied the patent was operative from its original date, or, at least, from the date of the correction, February 24, 1882; and that the complainants were, even in this latter view, entitled to an accounting from that date; fourth, that if the patent did not become valid from its date on the subsequent signature by the Acting Secretary of the Interior, then the act of Congress of February 3, 1887, cured all irregularities in the signing of the patent, made it valid from its date, and must govern the decision in this Court. The first three positions may be considered together.

It is undoubtedly true as a general rule that a patent of the United States, whether for land or for an invention, can be attacked for defects, not apparent on its face, only by regular proceedings instituted for that purpose, and is not open to collateral attack, except where specially provided by statute. (*Eureka Co.* v. *Bailey Co.*, 11 Wall., 488, 492.) But this rule applies only to those cases where the patent has been in fact executed, and the authority of the officers to issue the same was complete. In such cases the impeachment must be by pleadings setting up the specific acts which, it is alleged, vitiate and defeat the instrument. It is always open to show that an instrument produced in evidence, whether in an action at law or in a suit in equity in support of a claim or defense, was never executed by the person whose signature it bears, but that it is a simulated and forged document. And when the time of execution is material to the enforcement of the instrument, it is competent to show the date when the signature of the party was attached. Antedating cannot be used to cut off existing rights or defenses of third parties which would not be impaired or defeated if the true date was given. With respect to patents for land we have had frequent occasion to assert their inviolability against collateral attack, where the Land Department had jurisdiction, and the land formed part of the public domain, and the law provided for their sale. But we have also held that if the land patented was never the property of the United States, or had been previously sold, or reserved for sale, or the officers had no authority to execute the instrument, the fact could be shown in any action or proceeding whenever the patent is offered in evidence. (*Smelting Co.* v. *Kemp*, 104 U. S., 636, 641; *Steel* v. *Smelting Co.*, 106 U. S., 447, 452, 453; *Mahn* v. *Harwood*, 112 U. S., 354, 358.) And so also may the fact be shown, if the instrument itself was never signed by the officers whose names are attached to it, or when they were in office, or at the time stated. As was said in a case lately before this Court, antedating by an agent after his power has been revoked, so as to bind his principal, partakes of the nature of forgery, and is always open to inquiry, no matter who relies upon it. (*Anthony* v. *Jasper County*, 101 U. S., 693, 698.) The same doctrine applies when a patent is signed by an officer of the Patent Office, or Land Department, after he has gone out of office. His power to give effect to his acts as an officer of the Government is then at an end, and no efficacy can be imparted by antedating them, even though the act be the correction of a mere mistake or omission. The mistake or omission must stand in the condition he left it so far as he is concerned, with all its consequences. If corrected at all, it must be by officers in power at the time of the correction, who have succeeded to his authority. This doctrine has special force in its application to a patent for an invention. A patent for land has, in the legislation of Congress, a twofold operation. It conveys the title where previously that remained in the United States; but where issued upon the recognition and confirmation of a claim to a previously-existing title it is evidence of record of the existence of

that title, or of equities respecting the land requiring recognition by a quit-claim from the Government. It always imports that the Government conveys, or has previously conveyed, interests in the lands, something which it at the time owns, or its predecessor once owned. And by the proceedings previous to its issue there is created in the claimant an equitable right to the conveyance of the legal title, or his right to such title is so established that he can enforce it against others who, with notice of his claims, may have obtained the patent. (*Langdeau* v. *Hanes*, 21 Wall., 521, 529.) But the patent for an invention conveys nothing which the Government owns or its predecessors ever owned. The invention is the product of the inventor's brain, and if made known would be subject to the use of any one, if that use were not secured to him. Such security is afforded by the act of Congress when his priority of invention is established before the officers of the Patent Office, and the patent is issued. The patent is the evidence of his exclusive right to the use of the invention; it therefore may be said to create a property interest in that invention. Until the patent is issued there is no property right in it, that is, no such right as the inventor can enforce. Until then there is no power over its use, which is one of the elements of a right of property in anything capable of ownership. In *Gayler* v. *Wilder*, (10 How., 477, 493,) this subject was to some extent considered, when the Court, by Chief Justice Taney, said:

The inventor of a new and useful improvement certainly has no exclusive right to it until he obtains a patent. This right is created by the patent, and no suit can be maintained by the inventor against any one for using it before the patent is issued.

And again:

The monopoly did not exist at common law, and the rights, therefore, which may be exercised under it cannot be regulated by the rules of the common law. It is created by the act of Congress, and no rights can be acquired in it unless authorized by statute, and in the manner the statute prescribes.

Section 4883 of the Revised Statutes prescribes the manner in which patents for inventions shall be attested. It declares that—

all patents shall be issued in the name of the United States of America, under the seal of the Patent Office, and shall be signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and they shall be recorded, together with the specifications, in the Patent Office in books to be kept for that purpose.

The signatures of all the officers here named must be attached to the instrument, or it will be an uncompleted document, and therefore ineffectual to confer—

the exclusive right to make, use, and vend the invention or discovery throughout the United States and the Territories thereof.

The omission of one signature is no more permissible than the omission of all. On this point we have a pertinent adjudication in *McGarrahan* v. *Mining Company*, (96 U. S., 316.) There the question arose as to the validity of an instrument as a patent for land of the United States, which had not been countersigned by the Recorder of the General Land Office. The law then in force respecting patents for land issued by the General Land Office provided that they should be issued in the name of the United States under the seal of said office, and be signed by the President of the United States, or by a secretary appointed by him for that purpose, and countersigned by the Recorder of the General Land Office, and be recorded in said office in books to be kept for that purpose; and the Court held that the fact the instrument was not countersigned by the Recorder of the General Land Office was fatal to its validity, and that the instrument did not become operative as a patent until it was attested by all the parties named in the statute. Until then the United States had not executed a patent for a grant of lands. In deciding the case the Court, by Mr. Chief Justice Waite, said:

Each and every one of the integral parts of the execution is essential to the perfection of the patent. They are of equal importance under the law, and one cannot be dispensed with more than another. Neither is directory, but all are mandatory. The question is not what, in the absence of statutory regulations, would constitute a valid grant, but what the statute requires. Not what other statutes may prescribe, but what this does. Neither the signing nor the sealing nor the countersigning can be omitted, any more than the signing or the sealing or the acknowledgment by a grantor, or the attestation by witnesses, when, by statute, such forms are prescribed for the due execution of deeds by private parties for the conveyance of lands. It has never been doubted that in such cases the omission of any of the statutory requirements invalidates the deed. The legal title to lands can not be conveyed except in the form provided by law.

This decision is as applicable to a patent for an invention as it is to a patent for lands, and in accordance with it the instrument issued to the complainants Marsh and Lefever for the invention they claim was not, at the time it was issued, by reason of the absence of the signature of the Secretary of the Interior, operative to create any right in them. But though the instrument was thus inoperative, they were not barred from afterward obtaining a correction of it so as to render it effective as a patent, to which they had become entitled. Where mistakes are committed by officers of the Land Department in issuing evidence of a claimant's rights, not amounting to errors of judgment in the exercise of judicial discretion, but which are the result of accident or inadvertence, they may be remedied upon proper application to the Department. We have an instance of such action in the case of *Bell* v. *Hearne*, (19 How., 252.) It there appeared that a patent for land was issued to one James Bell, while the records of the office showed that one John Bell was the applicant and the party entitled to it. Some years after it was received by James Bell, he returned it to the General Land Office, and upon an examination of the records of the Department, and being satisfied therefrom of the original mistake in the designation of the first name of the party entitled to the patent, the Commissioner of the General Land Office canceled the original patent and issued a new one to John Bell; and the question before the Court was as to the power of the Commissioner to receive the original patent and to issue a new one, upon which question the Court said:

The Commissioner of the General Land Office exercises a general superintendence over the subordinate officers of his department, and is clothed with liberal powers of control, to be exercised for the purposes of justice, and to prevent the consequences of inadvertence, irregularity, mistake, and fraud in the important and extensive operations of that officer for the disposal of the public domain. The power exercised in this case is a power to correct a clerical mistake, the existence of which is shown plainly by the record, and is a necessary power in the administration of every department.

It is true the omission of the signature of the Acting Secretary of the Interior to the instrument issued to the complainants Marsh and Lefever was not a mere clerical error, but an omission of a signature essential to the creation of the instrument as a patent, being in that respect like the omission of a grantor's name to a deed. A clerical error, as its designation imports, is an error of a clerk or a subordinate officer in transcribing or entering an official proceeding ordered by another. But we have no doubt that the

power of the Department to prevent the consequences of inadvertences and mistakes in its officers extends so far as to remedy an omission like the one under consideration. The manner of affording the remedy is the only question in such cases. Clearly, it must be by the action of existing officers of the Department, not by former officers, who have gone out of office. Mr. Schurz, who was Secretary of the Interior when the instrument in question was issued, could not have supplied the omission by signing the document when it was returned to the Department for that purpose in February, 1882, for he was then no longer in office. Mr. Kirkwood had succeeded him as Secretary, and was then in office. He could undoubtedly have taken up the application of the complainants Marsh and Lefever, and having found upon examination that they were entitled, by proceedings and proofs already had in the Department, to the patent, have signed the instrument and delivered it to them in a perfected form. This official duty, however, appears to have been performed by Mr. Bell, who was Acting Secretary under him, as he had been under Secretary Schurz. The omission in the instrument as originally issued was thus supplied. The Revised Statutes (sec. 177) provide that in the case of the death, resignation, absence, or sickness of the head of any department, the first or sole assistant thereof shall, except in certain cases referred to, (not material here,) perform the duties of such head until a successor is appointed or such absence or sickness shall cease. The signing of the instrument by Mr. Bell as Acting Secretary implies that one of the conditions on which he was authorized to act in that capacity had arisen. With his signature added the instrument was complete. No other signature was required, the same person who signed it as Commissioner of Patents still continuing in office. The only embarrassment from completing the instrument in this way arises from its date. The signature, which completed its execution, was attached February 24, 1882, while its date is December 28, 1880, more than thirteen months before. The statute declares that—

every patent shall bear date as of a day not later than six months from the time at which it was passed and allowed and notice thereof was sent to the applicant or his agent. (R. S., section 4885.)

This provision was intended to prescribe the date on which the patent would begin to run; but should any question arise in the future as to the duration of this patent, the time at which its execution was completed by the signature of the Acting Secretary may be proved. It would have been well if the date of the signing had been added to his signature, or in some way indicated on the instrument itself, so that it might have gone upon the records of the Patent Office, as from that time only could the instrument operate as a patent for the invention claimed, unless greater efficacy was imparted to it by the act of Congress, which we shall presently consider.

The position that an accounting for profits earned subsequently could be claimed in this suit is not tenable. An accounting for such profits after suit can be demanded only where the infringement complained of took place previously and continued afterward.

As to the act of Congress passed February 3, 1887, for the relief of the appellants, only a few words need be said. It may be conceded that the defect arising from the omission of the Secretary's signature to the instrument is cured as to the future by that act, but it contains a proviso which excepts its provisions from applying to or affecting any suits then pending, or any cause of action arising prior to its passage. It is evident that Congress did not intend to give to the act any retroactive effect, and to prevent such a construction inserted the proviso, thus limiting the extent of its operation. (*Wayman* v. *Southard*, 10 Wheat. 1, 30.) As thus limited, the act, as well observed by counsel, is in harmony with the law relating to reissues, allowing the inventor upon the surrender of his patent with a defective specification to have a new patent for the remainder of his term.

For the reasons expressed it follows that the decree below must be affirmed; and the cross-appeal, being from rulings in the exclusion of evidence offered with respect to the alleged infringement, must be dismissed; and it is so ordered.

U. S. Circuit Court—Northern District of Illinois.

THE SCHLICHT & FIELD COMPANY *v.* THE SHERWOOD LETTER FILE COMPANY.

Decided November 5, 1888.

SHANNON—TEMPORARY BINDERS.

The first claim of Letters Patent No. 217,907, granted July 29, 1879, to James S. Shannon, for improvements in temporary binders, as modified by a disclaimer limiting the combination by the addition of the words, "when the fixed and vibrating wires are used in pairs, whether operating simultaneously or each separately," *Held* void, in view of the prior state of the art, as a mere duplication.

Messrs. Banning & Banning for the complainant.
Messrs. Dyrenforth & Dyrenforth for the defendant.

BLODGETT, *J.*:

By the bill in this case the defendant is charged with the infringement of Letters Patent No. 217,907, granted July 29, 1879, to James S. Shannon, for an improvement in temporary binders, and an injunction and accounting for damages are asked for.

The patentee in his specification says:

My invention relates to a novel construction in temporary binders of the class having fixed receiving-wires and hinged or vibrating transfer-wires; and consists, first, in giving movement to the latter on a vertical axis for the purpose of swinging their free ends toward or from the free ends of the fixed wires; secondly, in means, provided and arranged substantially as herein shown and described, whereby the vertically-vibrating wires are held stationary, either in contact with or removed from the fixed wires; and, thirdly, in connecting the two swinging wires of a double file, so that in rotating one the other is also operated.

The patent contains four claims; but infringement is here charged only as to the first, which is in the following words:

1. In combination with the fixed wire B and the base A, the arched vibrating wire C, having a positive rotary movement in the axis of its vertical portion, whereby its free end may be swung into contact with or away from the free end of the fixed wire, substantially as described.

The complainant has filed a disclaimer, which is in the following words:

Your petitioner is aware that in the patent to William C. Bussey, No. 198,968, issued January 8, 1878, for an improvement in bill-files, an arrangement of a base-plate, one fixed wire and one arched vibrating wire are shown, but in that and similar arrangements where only one wire is used there is nothing to steady the papers and prevent them from turning to one side or the other. Your petitioner therefore limits the first claim of said patent to a combination, with the fixed wire B and the base A, of the arched vibrating wire C, having a positive rotary movement in the axis of its vertical portion when the fixed and vibrating wires are used in pairs, whether operating simultaneously or each separately, as shown and described in said patent.

So that by this disclaimer the complainant limits this first claim to the use of the vertical and vibrating wires in pairs.

The patent shows devices whereby the vertically-vibrating wires are held stationary, either in contact with or removed from the fixed wires, and also a device whereby the two vibrating wires are rotated simultaneously by pressure upon either one. But these two devices for holding the wires stationary either in contact with or away from the fixed wires and for operating both wires simultaneously are not involved in this suit.

The defenses interposed are: (1) that the patent as shown by this first claim is void for want of novelty; (2) that defendant does not infringe.

The disclaimer filed by the complainant admits that the Bussey patent of January 8, 1878, anticipates the combination of a single vibrating or arched wire with a fixed vertical wire as shown by the first claim of complainant's patent; but complainant has attempted by the disclamer filed herein to obviate the effect of the Bussey patent by limiting the complainant's device to a tablet or letter file containing at least a pair of wires, so that we now have to deal with complainant's patent, as amended or limited by the disclaimer, as consisting of two vertical wires and two vibrating wires, each vibrating wire coacting with one of the vertical wires to form a continuous arch or ring, so that the papers upon the file may be passed over from the spindle on to the transfer or vibrating wire for the purpose of removing the letter or paper from the file without disturbing the relations of the other papers upon the file, and the vibrating wires having a free movement on their vertical axes, so as to admit the swinging of the free ends into contact with or away from the ends of the fixed wires. And the question now is, it being conceded that the Bussey patent shows a single vertical or vibrating wire coacting with a fixed vertical wire, precisely like the single vertical and vibrating and fixed wires described in the first claim of the complainant's patent, is there any invention in duplicating these wires so as to hang the papers to be filed upon two spindles instead of one? That there may be some advantage in holding the papers by two points of suspension or attachment to the letter-file, or "temporary binder," as it is called in this patent, is probable; but when Bussey had shown the method of making a file with one set of wires, could there be any invention in simply making a letter-file with two such sets, so as to have two points of attachment of the papers to the letter-file, thereby, as in the language of the disclaimer, "steadying the papers and preventing them from turning to one side or the other?" It does not seem to me that this mere duplication of parts calls for the exercise of inventive talent. There is no more invention in fastening papers to a letter-file by two points of attachment instead of one than there would be in fastening a board to a piece of studding or beam by two nails instead of one.

In *Dunbar* v. *Myers* (94 U. S., 187) the patent was for putting deflecting-plates on both sides of a circular saw for cutting veneers. It was conceded that the use of a deflecting-plate on one side of the saw was old, and the Court said at page 195:

Grant that two such plates are in certain cases better than one used alone, still the question arises whether it involves any invention to add the second plate to a machine already constructed with one plate. Beyond doubt every operator who had used a machine having one deflecting-plate knew full well what the function was that the deflecting-plate was designed to accomplish, and the reasons for placing it at the side of the saw are obvious to the understanding of every one who ever witnessed the operation of a circular saw. Ordinary mechanics know how to use bolts, rivets, and screws, and it is obvious that any one knowing how to use such devices would know how to arrange a deflecting-plate at one side of a circular saw which had such a device properly arranged on the other side, it being conceded that both deflecting-plates are constructed and arranged precisely alike, except that one is placed on one side of the saw and the other on the opposite side. Both are attached to the frame in the same manner; nor is it shown either in the specification or drawings that there is anything peculiar in the means employed for arranging the deflecting-plates at the sides of the saw, or in attaching the same to the frame.

And the same rule was followed in *Mellner* v. *Voss*, (4 Hughes, 262.)

I am therefore of opinion that in the light of the Bussey patent the complainant has gained nothing by the attempt to limit this patent to the use of the wires in pairs, and I must therefore find that this patent is void for want of novelty.

U. S. Circuit Court—Northern District of Illinois.

THE SCHLICHT & FIELD COMPANY *v.* THE SHERWOOD LETTER FILE COMPANY.

Decided November 5, 1888.

SHANNON—PAPER-FILE.

The first claim of Letters Patent No. 254,847, granted March 14, 1882, to James S. Shannon, for a paper-file, *Held* void as covering only an aggregation of parts, and not a patentable combination.

Messrs. Banning & Banning for the complainant.
Messrs. Dyrenforth & Dyrenforth for the defendant.

BLODGETT, *J.*:

The bill in this case charges the defendant with the infringement of Letters Patent No. 254,847, granted March 14, 1882, to James S. Shannon for a paper-file, and asks for an injunction and accounting for damages.

In his specification the patentee says:

This invention relates to paper-files having receiving-wires; and it consists in providing a punch attached to the file base or tablet, adapted to simultaneously punch as many holes in the papers to be filed as there are receiving-wires on the file, and to punch them somewhat larger than and in proper position to admit said receiving-wires. By this means the papers may lie closer and smoother on the file. They may be shifted more freely on the wires, and the apertures therein are not torn out or enlarged in filing or shifting them. It is more particularly intended as an improvement on the files described in Letters Patent of the United States No. 217,907 and No. 217,909, dated July 29, 1879, wherein the receiving-wires are sharpened to puncture the papers, and wherein transferring-wires are employed in connection with the receiving-wires. In the use of said files the papers are often shifted from one pair of wires to the other, and it is found that in such frequent transfers the apertures made by the puncturing-wires are apt to be torn out or enlarged. Moreover, in the act of filing by thrusting the papers down upon the wires the edges of the apertures so made are ragged, a burr, so to speak, is formed about the holes in the paper, and in pressing the papers down and in shifting them the burrs of one sheet enter the holes in the adjacent sheet above it, so that the sheets are not readily separable without inconvenience or tearing. By providing on the file a punch adapted by a single motion to cut clean-edged holes in the papers corresponding with the number and position of the receiving-wires, and a little larger than the wires, the papers so punched may be more expeditiously filed, they will lie flat and compact upon the tablet, they may be freely transferred from the receiving to the transfer-wires and back again, and in no ordinarily careful handling are they liable to be torn.

No claim is made in this case upon the form of construction embodied in the punch; but the patent covers simply and only the idea of affixing to a letter-file tablet a punch for the purpose of perforating the papers to be filed, so that they may be more readily manipulated upon the receiving-wires of the letter-file.

Infringement in this case is charged only as to the first claim of the patent, which is:

1. The paper-file described, consisting of a base, A, and two parallel receiving-wires, B B, provided with a double punch mounted upon the same base, and adapted to simultaneously punch two holes in the paper in position and of size to admit the receiving-wires, substantially as set forth.

The defenses set up are: (1) non-pantentability of the device, and (2) that defendants do not infringe.

The defendants manufacture and sell a letter-file containing receiving and vibrating wires, operating substantially like those shown in the complainant's patent, with a punch located under the arch of the vibrating wires, so that the papers to be filed are passed through the space between the ends of the receiving and vibrating wires to the punch, where they are perforated, when they may be retracted or drawn back and passed over the receiving-wires upon the file. The defendant's punch is attached to the tablet, and in that respect is like the complainant's, although in the exhibits of the complainant's and defendant's tablets offered in evidence the defendant's punch is located at a different place from the location of the punch on the complainant's tablet; but as there is no specific place designated in the complainant's patent as to where the punch shall be located, I do not know that this difference is in any special degree material in the consideration of this case, so that the case simply presents this question: Is it patentable to locate any kind of a punch upon a paper-file, so that the papers to be filed thereon may be punctured by the punch to enable them to be more readily passed upon the receiving-wires of the file?

It is obvious that the punch performs no new function by reason of its being attached to a tablet from what it would if it were attached to a table, window-sill, or any other location where it could be used readily in connection with the tablet, and a patent, therefore, merely for this attachment seems to me to come entirely within the principle laid down by the Supreme Court in *Hailes* v. *Van Wormer* (20 Wall., 253) and *Reckendorfer* v. *Faber*, (92 U. S., 347.) In the latter case the patent was for the idea of attaching a piece of rubber to the end of a lead-pencil, so that the rubber could be used readily to erase pencil-marks. In that case the rubber performed no new function by being attached to the pencil. It was undoubtedly a convenient arrangement, whereby the rubber was readily at hand to erase or correct any mistakes made in the use of the pencil, but it was still nothing but an eraser attached to the pencil; and the Court in its opinion says:

This combination consists only of the application of a piece of rubber to one end of the same piece of wood which makes a lead-pencil. It is as if a patent should be granted for an article, or a "manufacture," as the patentee prefers to term it, consisting of a stick twelve inches long, on one end of which is an ordinary hammer, and on the other end is a screw-driver or a tack-drawer, or what you will see in use in every retail shop, a lead-pencil on one end of which is a steel pen. It is the case of a garden-rake, on the handle end of which should be placed a hoe, or on the other side of the same end of which should be placed a hoe. In all these cases there might be the advantage of carrying about one instrument instead of two, or of avoiding the liability to loss or misplacing of separate tools. The instruments placed upon the same rod might be more convenient for use than when used separately. Each, however, continues to perform its own duty and nothing else. No effect is produced, no result follows from the joint use of the two.

A handle in common, a joint-handle, does not create a new or combined operation. The handle for the pencil does not create or aid the handle for the eraser. The handle for the eraser does not create or aid the handle for the pencil. Each has and each requires a handle the same as it had and required, without reference to what is at the other end of the instrument, and the operation of the handle of and for each is precisely the same whether the new article is or is not at the other end of it. In this and the cases supposed you have but a rake, a hoe, a hammer, a pencil, or an eraser, when you are done. The law requires more than a change of form or juxtaposition of parts, or of the external arrangement of things, or of the order in which they are used to give patentability.

So here the punch performs no new or increased function by being attached to the tablet. It is still nothing but a punch, and, as the proof shows, is often attached to a table or some other permanent fixture, so as to be convenient for use in connection with several tablets. I therefore think that this is but an aggregation of parts, and as such does not come within the field of invention.

In *Pickering* v. *McCulloch* (104 U. S., 310) the Supreme Court, speaking by Mr. Justice Matthews, said:

In the patentable combination of old elements all the constituents must so enter into it as that each qualifies every other. * * * It must form either a new machine of a distinct character and function, or produce a result due to the joint co-operating action of all the elements. It is not the mere adding together of separate contributions.

For these reasons I consider the defense of non-patentability is fully made out, and the bill is dismissed for want of equity.

U. S. Circuit Court—Southern District of Iowa.

WESTINGHOUSE *v.* CARPENTER.

Decided June 29, 1888.

EXPIRATION OF PATENT—INJUNCTION THEREAFTER.

Under the law the monopoly secured by a patent ceases with the expiration of the patent, and articles made during the life of the patent in infringement of it cannot be enjoined after its expiration, and an injunction already granted as to such articles will be dissolved.

MOTION to dissolve injunction.

Mr. J. Snowden Bell, Mr. Nathaniel French, Mr. George H. Christy, and *Mr. William Bakewell* for the complainant.

Messrs. Banning & Banning for the defendant.

MILLER, *J.*:

We are of the opinion that the motion ought to be granted. The attorney for the plaintiff practically concedes, from the decisions of the courts on that subject, that the motion to dissolve the injunction should be granted on account of the expiration of the patent, which expired a few days ago with the expiration of a prior English patent. He, however, insists that the injunction should be continued as to the use and sale of those articles which were manufactured and sold while the patent was alive, the manufacture of which was an infringement of this patent; that he should have the benefit of having forbidden them while the patent was in existence, and that the injunction should be continued as to the selling or using of those manufactures, notwithstanding the expiration of the patent.

We are of the opinion that with the expiration of his patent the plaintiff's right to forbid anybody to make, sell, or use the articles to which this invention refers expires. His monopoly is continued for seventeen years by law, or whatever period the law allows his patent to run. That monopoly is against the making, selling, or using of such articles. He has the benefit of that monopoly, and has had that benefit with regard to those articles in which he now asks to be further protected. He may recover the damages he has sustained in this suit, which is still pending in this court. He may recover for the damages which were inflicted before the injunction was brought, and he still asks that the court shall enjoin the sale and use of those articles for which he expects to get damages. Speaking for myself and also for Judge Love, I do not believe that is the true doctrine on this subject.

There are some particular circumstances showing that the use of this patented article was an experiment to see whether it could be used successfully in this country, and under all the circumstances we are disinclined to make any modification of the motion to dissolve the injunction, but dissolve it absolutely.

THE
OFFICIAL GAZETTE
OF THE
United States Patent Office.
[BY AUTHORITY OF CONGRESS.]

VOL. 46—No. 3. TUESDAY, JANUARY 15, 1889. PRICE—$5 per year.

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Full Names of Applicants.

(ORDER No. 521.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., January 4, 1889.

It is hereby directed that all applications which disclose the full name of the applicant in the preamble of the specification will be received and considered as a sufficient compliance with Rule 40 of the Rules of Practice.

BENTON J. HALL,
Commissioner.

Indexes to Patents on Electricity.

Appendix No. 2 to the index to patents relating to electricity, covering the period of time from July 1, 1882, to June 30, 1883, has been issued, and is now for sale. These indexes, arranged alphabetically, numerically, and by classes, are completed to June 30, 1883, and comprise the following volumes:

Vol. 1. Index to patents relating to electricity granted by the United States prior to June 30, 1881, with an appendix, July 1, 1881, to June 30, 1882. One volume, 250 pages. In paper covers, $3; bound, $5.

Vol. 2. Appendix No. 2, July 1, 1882, to June 30, 1883. One volume, 50 pages. In paper covers, $1.50.

Vol. 3. Appendix No. 3, July 1, 1883, to June 30, 1884. One volume, 60 pages. In paper covers, $1.50.

Vol. 4. Appendix No. 4, July 1, 1884, to June 30, 1885. One volume, 60 pages. In paper covers, $1.50.

Vol. 5. Appendix No. 5, July 1, 1885, to June 30, 1886. One volume, 54 pages. In paper covers, $1.50.

Vol. 6. Appendix No. 6, July 1, 1886, to June 30, 1887. One volume, 52 pages. In paper covers, $1.50.

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of January 15, 1889.

Patents	325	No. 396,059 to No. 396,383, inclusive.
Designs	20	No. 18,854 to No. 18,873, inclusive.
Trade-Marks	28	No. 16,169 to No. 16,196, inclusive.
Labels	14	No. 5,792 to No. 5,805, inclusive.
Reissues	None.	
Total issue	387	

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TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	3	....	Nebraska	....	1
Arkansas	....	....	Nevada	....	....
California	6	....	New Hampshire	2	....
Colorado	3	....	New Jersey	23	....
Connecticut	12	....	New Mexico Terri'y.	1	....
Dakota Territory	....	....	New York	50	12
Delaware	....	....	North Carolina	....	1
District of Columbia	2	1	Ohio	20	5
Florida	1	....	Oregon	1	....
Georgia	4	....	Pennsylvania	42	1
Idaho Territory	....	....	Rhode Island	3	....
Illinois	33	2	South Carolina	1	....
Indian Territory	....	....	Tennessee	1	....
Indiana	12	....	Texas	6	1
Iowa	4	....	Utah Territory	1	....
Kansas	6	....	Vermont	3	....
Kentucky	4	....	Virginia	....	....
Louisiana	....	....	Washington Terri'y.	....	....
Maine	1	1	West Virginia	1	1
Maryland	5	....	Wisconsin	7	....
Massachusetts	23	1	Wyoming Terri'y	....	....
Michigan	13	5	U. S. Army	....	....
Minnesota	5	....	U. S. Navy	1	....
Mississippi	....	....			
Missouri	18	1	Total to citizens of the United States	321	33
Montana Territory	....	....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Austria-Hungary	2	....	Germany	6	3
Barbadoes	....	....	Ireland	....	1
Belgium	....	....	Italy	....	....
Bermuda	....	....	Mexico	....	....
Brazil	....	....	New Zealand	....	....
Canada	2	....	Switzerland	....	....
Canary Islands	....	....	Russia	....	....
Colombia, U. S. of	....	....	Scotland	....	....
Cuba	....	2	Sweden	....	....
Denmark	....	....	Victoria	1	....
Ecuador	....	....			
England	10	2	Total to citizens of foreign countries	24	9
France	3	1			

DESIGNS.

18,854 and 18,855.—BUST.—*Maximilian Bachmann*, Philadelphia, Pa., assignor to *Harper Forrest Smith, Sr.*, same place. Applications filed October 4, 1888. Serial Nos. 287,239 and 287,240. Term of patents 7 years.

18,856 and 18,857.—ORNAMENTATION OF CORSETS.—*Morris P. Bray*, Ansonia, assignor to *Warner Bros.*, Bridgeport, Conn. Applications filed October 29, 1888. Serial Nos. 289,470 and 289,472. Term of patents 14 years.

18,858.—RAILING.—*William C. Hanna, Jr.*, New York, N. Y., assignor to *J. W. Fiske*, same place. Application filed September 21, 1888. Serial No. 286,048. Term of patent 7 years.

18,859.—PEDESTAL FOR BURIAL-CASKETS.—*Isaiah G. Hatcher*, Chicago, Ill., assignor to *The Cleveland Burial Case Company*, Cleveland, Ohio. Application filed November 26, 1888. Serial No. 291,912. Term of patent 7 years.

18,860.—TYPE.—*Andrew Little*, New York, N. Y. Application filed October 3, 1888. Serial No. 287,096. Term of patent 7 years.

18,861 to 18,868, inclusive.—OIL-CLOTH.—*Charles T. Meyer* and *Victor E. Meyer*, Bergen, N. J., assignors to *Edward C. Sampson*, New York, N. Y. Applications filed December 13, 1888. Serial Nos. 293,502 to 293,509, inclusive. Term of patents 3½ years.

18,869.—RUG.—*Adolph Petzold*, Philadelphia, Pa., assignor to *John Bromley & Sons*, same place. Application filed December 17, 1888. Serial No. 293,923. Term of patent 3½ years.

18,870.—PHOTOGRAPH-EXHIBITOR STAND.—*George M. Porteous* and *Frederick S. Miller*, Chicago, Ill. Application filed November 5, 1888. Serial No. 290,004. Term of patent 7 years.

18,871.—PHOTOGRAPH-EXHIBITOR-CASE BODY.—*George M. Porteous* and *Frederick S. Miller*, Chicago, Ill. Application filed December 17, 1888. Serial No. 293,887. Term of patent 7 years.

18,872 and 18,873.—PHOTOGRAPH-EXHIBITOR STAND.—*George M. Porteus* and *Frederick S. Miller*, Chicago, Ill. Applications filed December 17, 1888. Serial Nos. 293,888 and 293,889. Term of patents 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,169.—CIGARS.—*The Cigarmakers Co-Operative Association*, Boston, Mass. Application filed September 24, 1888. Used since April 1, 1888.

"The representation of two tobacco-leaves arranged nearly vertically, their stems being bent toward each other and crossed, three cigars placed at the top of the space between the leaves, two cigars being oblique to each other, and the third cigar vertical below the two others, and the letters 'C C A,' a 'C' on each side of the vertical cigar and the 'A' below it."

16,170.—TEAS AND COFFEES.—*Samuel Cleland Davidson*, Belfast, Ireland. Application filed October 30, 1888. Used since September, 1885.

"The word 'SIROCCO.'"

16,171.—FABRIC MACHINE-BELTING.—*The Eureka Belting Manufacturing Company*, New York, N. Y. Application filed November 21, 1888. Used since January, 1888.

"The words 'EUREKA BELT.'"

16,172.—IRON AND WOOD PUMPS.—*Flint & Walling Manufacturing Company*, Kendallville, Ind., Kansas City, Mo., and Fort Worth, Tex. Application filed November 22, 1888. Used since October 1, 1888.

"The word 'HOOSIER.'"

16,173.—WIPERS MADE OF SILK WASTE WOVEN INTO CLOTH.—*Louis C. Fuchs*, Chicago, Ill. Application filed November 23, 1888. Used since October 25, 1888.

"The word 'SILKOLINE.'"

16,174.—CIGARS.—*Manuel Garcia*, Havana, Cuba. Application filed December 12, 1888. Used since January, 1887.

"The words 'LA VERDADERA' and a monogram of the letters 'M G.'"

16,175.—LEATHER, CLOTH, AND RUBBER BOOTS AND SHOES.—*Hanan & Son*, New York, N. Y. Application filed November 2, 1888. Used since January 1, 1883.

"The word 'HANAN' inclosed by an elliptical border or line."

16,176.—CACHOUX.—*Thomas Jackson*, Manchester, county of Lancaster, England. Application filed November 20, 1888. Used since 1849.

"A profile likeness of Prince Albert."

16,177.—BOILER AND PIPE COVERINGS, FILLINGS, LININGS, AND THE LIKE.—*H. W. Johns Manufacturing Company*, New York, N. Y. Application filed October 26, 1888. Used since March 15, 1888.

"The word 'ASBESTO-SPONGE.'"

16,178.—WRITING-PAPER.—*David King*, Springfield, Ohio. Application filed May 14, 1888. Used since May, 1888.

"The letters 'G. A. R.' and the representation of an eagle mounted upon two crossed cannon, the American flag, and a five-pointed star."

16,179.—ANTIPYRETIC DRUG.—*Ivan Levinstein*, Manchester, county of Lancaster, England. Application filed October 23, 1888. Used since August, 1888.

"The words 'PYRODINE LEVINSTEIN.'"

16,180.—CIGARS.—*Antonio Lopez*, Havana, Island of Cuba. Application filed December 12, 1888. Used since January, 1881.

"The words 'LA ROSA AROMATICA.'"

16,181.—PERFUMED TABLETS FOR BATH AND TOILET USE.—*Heinrich Mack*, Ulm, Wurtemberg, Germany. Application filed November 26, 1888. Used since June 8, 1887.

"The words 'PASTA MACK,' printed diagonally in a square, and the fac-simile of the registrant's signature, 'H. MACK, ULM °/D.'"

16,182.—PERFUMERY PREPARATIONS FOR THE BATH.—*Heinrich Mack*, Ulm, Wurtemberg, Germany. Application filed November 26, 1888. Used since June 8, 1887.

"The words 'PASTA MACK.'"

16,183.—PERFUMERY PREPARATIONS FOR THE BATH.—*Heinrich Mack*, Ulm, Wurtemberg, Germany. Application filed November 26, 1888. Used since June 8, 1887.

"The words 'PASTA MACK' and the representation of a lady lying in a bath, from which clouds of steam are rising."

16,184.—CRACKERS AND CAKES.—*Fredrick W. Medcraf*, Syracuse, N. Y. Application filed November 19, 1888. Used since October 1, 1888.

"The representation of a sheaf of wheat inclosed within a circle surrounding the same in the form of a seal."

16,185.—REMEDIES FOR ALL DISEASES OF THE NOSE, THROAT, AND BRONCHIAL TUBES.—*James I. Moore*, *Henry Robinson*, and *William S. Blackshear*, Waco, Tex. Application filed September 19, 1888. Used since January, 1886.

"The word 'CACTERINE' and the picture of a cactus."

16,186.—STEAM AND HYDRAULIC COMBINATION PISTON-PACKING.—*Moran & Saunderson*, New York, N. Y. Application filed October 12, 1888. Used since February 20, 1872.

"The representation of a crowing cock standing upon a roll of piston-packing, underneath appearing the words 'WHILE I LIVE I'LL CROW,' the whole thereof inclosed within a circle."

16,187.—CIGARS.—*Mutual Union Cigar Company*, Chicago, Ill. Application filed October 15, 1888. Used since September 9, 1887.

"The letter 'A,' the figure '1,' and the word 'STAR' or the symbol of a star."

16,188.—TONIC AND ALTERATIVE REMEDY.—*Samuel Nicholson*, Washington, D. C. Application filed September 6, 1888. Used since March 30, 1887.

"The words 'PHOSPHA ALTA COMP—.'"

16,189.—PLUG CHEWING AND PREPARED SMOKING TOBACCO.—*Mathew L. Ogburn*, Winston, N. C. Application filed November 16, 1888. Used since June 1, 1885.

"The words 'BULL OF THE WOODS.'"

16,190.—SHOTGUN-CARTRIDGES.—*The Peters Cartridge Company*, King's Mills and Cincinnati, Ohio. Application filed September 25, 1888. Used since January 1, 1888.

"A red label bearing the words 'DUCKING CARTRIDGES.'"

16,191.—SHOTGUN-CARTRIDGES.—*The Peters Cartridge Company*, King's Mills and Cincinnati, Ohio. Application filed September 25, 1888. Used since January 1, 1888.

"The words 'PETERS POPULAR.'"

16,192.—SHOTGUN-CARTRIDGES.—*The Peters Cartridge Company*, King's Mills and Cincinnati, Ohio. Application filed September 25, 1888. Used since August 1, 1886.

"The representation of a blank cartridge resting on a shotgun with the words 'BLANK SHOT GUN CARTRIDGES.'"

16,193.—SHOTGUN-CARTRIDGES.—*The Peters Cartridge Company*, King's Mills and Cincinnati, Ohio. Application filed September 25, 1888. Used since January 1, 1888.

"The words 'QUICK SHOT CARTRIDGES.'"

16,194.—CORSETS.—*Henry Le Prince*, Paris, France. Application filed November 22, 1888. Used since 1883.

"The representation of an oval band, within which are the words 'ELÉGANCE & SOLIDITÉ: PARIS.' Inside the band are the letters 'L. P.' Surmounting the band and resting upon the top thereof is the representation of a Prince's crown, and beneath the whole are the words 'MARQUE DE FABRIQUE.'"

16,195.—COLLARS AND CUFFS.—*Rogers, Peet & Co.*, New York, N. Y. Application filed November 22, 1888. Used since November 16, 1888.

"The compound word 'HOME-RULER.'"

16,196.—CIGARS, CHEROOTS, CIGARETTES, AND MANUFACTURED TOBACCO.—*Ernest Wenigmann*, New York, N. Y. Application filed November 16, 1888. Used since November 1, 1888.

"The word 'WATERLOO.'"

LABELS.

5,792.—Title: "AMBER" (FOR PAINTS AND COLORS.)—*Binswanger & Pollock*, Philadelphia, Pa. Application filed December 19, 1888.

5,793.—Title: "THE COTTON OIL PRODUCT CO'S COTTON SEED LARD."—*The Cotton Oil Product Company*, New York, N. Y. Application filed December 20, 1888.

5,794.—Title: "THE COTTON OIL PRODUCT CO'S FOR THE NURSERY," (FOR A PURGATIVE MEDICINE.)—*The Cotton Oil Product Company*, New York, N. Y. Application filed December 20, 1888.

5,795.—Title: "THE COTTON OIL PRODUCT CO'S TOILET COTTON SEED SOAP."—*The Cotton Oil Product Company*, New York, N. Y. Application filed December 20, 1888.

5,796.—Title: "THE COTTON OIL PRODUCT CO'S SOAP POWDER."—*The Cotton Oil Product Company*, New York, N. Y. Application filed December 20, 1888.

5,797.—Title: "THE COTTON OIL PRODUCT CO'S LAUNDRY COTTON SEED SOAP."—*The Cotton Oil Product Company*, New York, N. Y. Application filed December 20, 1888.

5,798.—Title: "MELLINS FOOD FOR INFANTS AND INVALIDS."—*Dolliber-Goodale Company*, Portland, Me., and Boston, Mass. Application filed August 13, 1888.

5,799.—Title: "LABEL FOR LENSES."—*Johnston Optical Co.*, Detroit, Mich. Application filed December 10, 1888.

5,800.—Title: "LABEL FOR LENSES."—*Johnston Optical Co.*, Detroit, Mich. Application filed December 10, 1888.

5,801.—Title: "LABEL FOR LENSES."—*Johnston Optical Co.*, Detroit, Mich. Application filed December 10, 1888.

5,802.—Title: "LABEL FOR LENSES."—*Johnston Optical Co.*, Detroit, Mich. Application filed December 10, 1888.

5,803.—Title: "LABEL FOR LENSES."—*Johnston Optical Co.*, Detroit, Mich. Application filed December 10, 1888.

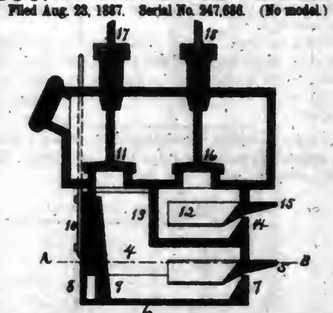
5,804.—Title: "GOLD AND SILVER SOLUTION" (FOR A MEDICINAL REMEDY.)—*Harrison B. Meech*, Omaha, Nebr. Application filed December 21, 1888.

5,805.—Title: "DR. SCHAEFFER'S DENTIFRICE."—*Elizabeth Schaeffer*, Charlestown, W. Va. Application filed December 20, 1888.

PATENTS

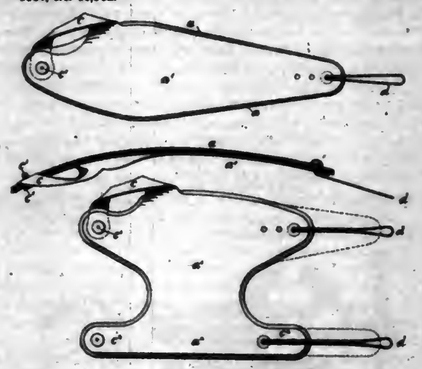
GRANTED JAN. 15, 1889.

396,059. SPRINKLING-NOZZLE. JOHN W. ANDERSON, South Bend, Ind. Filed Aug. 23, 1887. Serial No. 247,636. (No model.)



Claim.—In a sprinkling-nozzle, a shell having two water-ways therein and having an independent discharge-slot communicating with each water-way, and an upwardly-inclined flange forming the upper side of each slot and projecting out beyond that portion of the shell which forms the lower side of the slots, in combination with two inlet-valves located inside the body of the nozzle, substantially as shown and described.

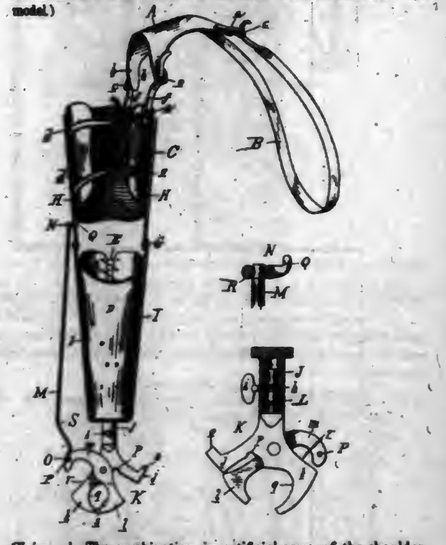
396,060. BLOTTING-PAD. MOSES AFLALO, London, England, assignor of one-half to James Aylward Game, same place. Filed June 5, 1888. Serial No. 276,072. (No model.) Patented in England July 23, 1887, No. 10,502.



Claim.—1. A blotter consisting of the blotting-pad *a*, a shield, *a'*, on which said pad is mounted, an integral tab, *c*, which forms the thumb attachment, a stud, *c'*, to which the free end of said tab is detachably secured, and a loop, as *d*, secured to the pad and shield opposite to the stud *c'*, and adapted to engage the said stud and form an attachment to the palm of the hand, all combined and arranged substantially as set forth.

2. A blotter consisting of the blotting-pad *a*, a shield, *a'*, on which said pad is mounted, having an extension, a^2, an integral tab, *c*, on the shield *a'*, a stud, *c'*, to which said tab is attached, thus forming a loop to receive the thumb, a loop, *d*, on the main part of the shield, adapted to engage the stud *c'*, and a similar loop, $d^\times$, on the extension a^2, adapted to engage a stud, c^3, on the opposite side of said extension, all combined and arranged substantially as set forth.

396,061. ARTIFICIAL ARM AND HAND. JUDSON J. ALLWARD, Columbiaville, Mich. Filed Oct. 29, 1888. Serial No. 289,367. (No model.)



Claim.—1. The combination, in artificial arms, of the shoulder-cap A, provided with a body-strap, B, the casing C, strapped to the shoulder-cap, the socket of the forearm D, secured by an elbow-joist to the casing C, the socket J on the forearm, the claw detachably secured to said socket, and the rod M, connected by the swivel-joist N to the casing of the upper arm and to the movable jaw of the claw, substantially as described.

2. The combination, with the forearm, of the socket J, formed thereon, the claw K, provided with a shank, L, adapted to engage into the socket J and having an annular groove, *k*, and the set-screw *i*.

3. In an artificial arm, the combination, with the movable jaw of a claw provided with an eye, P, of the rod M, provided with the hook O, and the swivel N, detachably connecting it to the casing of the upper arm near the elbow-joint, substantially as described.

4. The combination, with the casing C and socket D, of the bars H and I, secured upon opposite sides thereof, respectively, the elbow-joint G, the claw K, having the stationary and movable jaws, and the rod M, provided upon one end with the hook O and at the other with the swivel N, consisting of the hook-stud Q, provided with an eye, R, in which the rod M is rotatably secured, all arranged and constructed to operate as described.

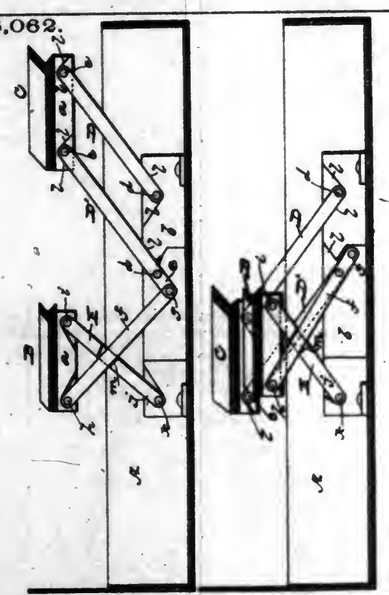
5. The claw K, consisting of the stationary jaws *j* and *k* and the movable jaws *l* and *m* in one piece and pivotally secured to the stationary part of the claw, in combination with the rod M, substantially as described.

6. The claw K, provided with a shank, L, adjustably and detachably secured to the socket of the arm D, the stationary jaws *j* and *k*, provided with the hook O and circular face *q*, respectively, and the movable jaw *l*, provided with the curved face *s*, and the hook-shaped movable jaw *m*, substantially as described.

396,062. SHIFTING SEAT FOR VEHICLES. ENOCH H. BATES, Washington, D. C. Filed Mar. 29, 1888. Serial No. 268,743. (No model.)

Claim.—1. The combination, in a shifting-seat vehicle, of the

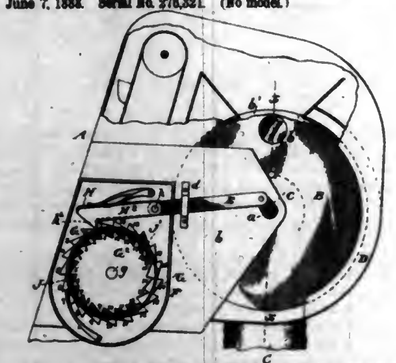
396,062.



cross-bars *f* E, pivoted at *h i* to the front seat, and the bar E, pivoted at *k* to the bearing *b*, and pivoted rear seat-bars, said bar *f* pivoted directly to the extended end *e* of the bar *D'*, substantially as described.

2. The combination of the pivoted cross-bars provided with supporting lugs or bearings, and the pivoted rear seat-bars, said cross-bars and rear bar, *D'*, connected directly to one another, as shown and described.

396,063. GRAIN-TALLY. JASON BURR, Owatonna, Minn. Filed June 7, 1888. Serial No. 276,321. (No model.)



Claim.—1. The combination, with the revolving measure, the crank-arm on the shaft thereof, and the pitman connected at one end to said crank-arm and the other end free of the wheels or shaft of the registering mechanism, of the notched wheel having an annular notched flange, the smaller notched wheel within said flange, and the spring-actuated dogs on the free end of said pitman, substantially as and for the purpose specified.

2. The combination of the revolving measure, its shaft, the crank-arm on said shaft, the notched wheel provided with a notched flange, the smaller notched wheel within said flange, the pitman connected at one end to said crank-arm, with its other end free of said wheels and their shaft, the dogs pivoted to the free end of the pitman on a common pivot and engaging said wheels, and the springs on a common pivot and bearing one on each of said dogs, substantially as described.

396,064. INSIDE CALIPERS OR GAGE. JOHN A. BLAIR, Philadelphia, Pa. Filed Aug. 4, 1888. Serial No. 282,005. (No model.)



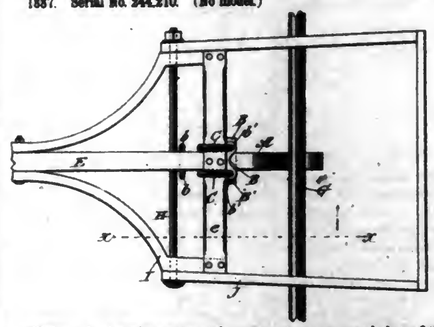
Claim.—1. An interior calipers consisting of a tube having an exteriorly-screw-threaded end with a rod adapted to slide in said end, and a sleeve secured to said rod and adapted to rotate on the screw-threaded end of said tube, and having a collar with clamping-screw whereby said sleeve is secured in place on said tube, substantially as described.

2. An interior calipers consisting of the tube A, with an exteriorly-screw-threaded end, the plug K, adapted to fit in the other end of the tube A and having a pointed end, a rod adapted to slide in the screw-threaded end of the tube and having a pointed outer end, the sleeve C, with split collar D and screw E, and the screw H securing said collar to the said sliding rod, said parts being combined substantially as and for the purpose set forth.

3. The described measuring-tool or interior calipers, consisting of two extensible parts adapted to slide the one within the other, in combination with a connecting-sleeve having a set-screw for securing one of said extensible parts and an interiorly-screw-threaded collar with set-screw attachment for securing the other of said parts, substantially as described.

4. The combination of the hollow sleeve A, screw-threaded at one end, with the sliding extension part B and connecting-sleeve C, with collar D and screw-threads on its interior at one end and provided with set-screws for securing said parts together, substantially as described.

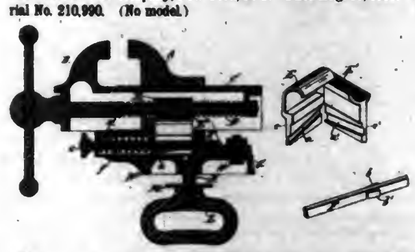
396,065. WAGON-TONGUE SUPPORT. EDWIN D. BLAKE, Chicago, Ill., assignor of two-fifths to Frank Scales, same place. Filed July 13, 1887. Serial No. 244,210. (No model.)



Claim.—1. A spring-support for wagon-tongues, consisting of the spring A, having a straight portion at the front end adapted to fit the straight surface of the tongue, and a portion at the rear curved down to the under side of the axle and then up behind the same, in combination with plates and bolts, substantially as shown and described, for securing the same to the rear end of the tongue, as specified.

2. A spring-support for wagon-tongues, consisting of the part A, having a straight portion at one end and a curved portion at the other end, in combination with plates B, provided with ears *b'*, having bolt-holes, bar B', with bolt-holes registering with those of said ears, and hook-bolts C, for attaching the said part A to the rear end of the wagon-tongue, substantially as specified.

396,066. VISE. JOHN A. BLAKE, Watertown, N. Y., assignor to the Prentiss Vise Company, New York, N. Y. Filed Aug. 16, 1886. Serial No. 210,990. (No model.)



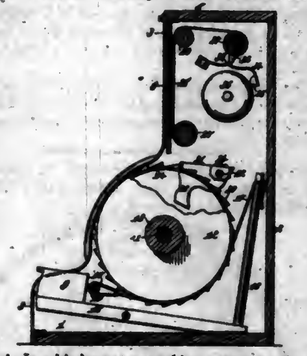
Claim.—1. In a vise, and in combination with the screw thereof, a divided nut consisting of two vertically-moving sections, each having a rigid part extending below the screw, and an opener, as the bar F, working in recesses in the sections, substantially as described.

2. In a vise, the two half-nuts arranged to move in parallel lines and provided with the shanks having oppositely-inclined channels, the sliding bar carrying the wedges or inclines, and the clamping-screw, combined and arranged for operation substantially as shown and described.

3. In a vise, the two half-nuts arranged to move in parallel lines and provided with the channeled shanks, the sliding bar carrying the two wedges for engaging with the shanks and forcing the half-nuts to move simultaneously in opposite directions, a returning spring applied in connection with said bar, and the clamping-screw mounted in the sliding vise-bar, combined and arranged substantially as shown and described.

4. In a vise, and in combination with the screw thereof, a divided nut having one section constructed to rise and the other to fall, and each section having an inclined groove, the two grooves running in opposite directions and their central lines crossing each other, a slide working between the sections, provided with studs working in said grooves, whereby the one section is raised and the other lowered, substantially as described.

396,067. KINDERGARTEN TEACHING APPARATUS. HOWARD BODEY, Norristown, Pa. Filed Apr. 7, 1888. Serial No. 269,953. (No model.)



Claim.—1. In a kindergarten teaching apparatus, the combination, with a flanged alphabet-wheel, of a key-lever having a standard at one end, a cord attached to the upper part of said standard and arranged in frictional contact with the flange of the alphabet-wheel, a spring attached to the other end of said cord, and a support for said spring, substantially as described.

2. In a kindergarten teaching apparatus, the combination, with a cup-shaped or flanged alphabet-wheel having ratchet-teeth struck from its closed side, of a weighted pawl pivoted above said alphabet-wheel in position to engage its ratchet-teeth and prevent backlash, said pawl being provided with a pivotal bearing on each side of the ratcheted alphabet-wheel, and having a cross-piece or brace that extends across the flange of the wheel to stiffen the pawl and connect its pivotal bearings, substantially as described.

3. In a kindergarten teaching apparatus, the combination of a series of flanged alphabet-wheels having projecting ratchet-teeth, pawls engaging said teeth to prevent backlash, means for independently rotating the alphabet-wheels, and a casing having in its face openings to expose the letters or characters on the wheel-flanges, and provided between said openings with segmental grooves projecting from the face of the casing to receive the ratchet-teeth of the alphabet-wheel and permit the letters on the wheel-flanges to be exposed in close proximity to the openings in the face of the casing, substantially as described.

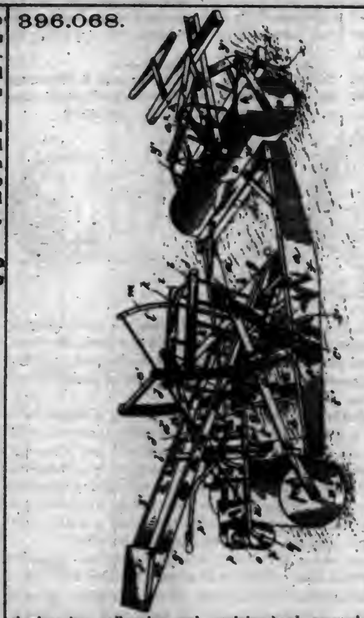
4. A kindergarten teaching apparatus, comprising the wood cabinet containing a traveling pictorial strip rotating alphabet-wheels having ratchet-teeth and key-levers for the wheels, and a front wall to the cabinet composed of a sheet of metal provided with the top opening, 6, for exposing the pictures, a transverse line of openings, 7, for exposing the alphabet-letters, grooves 10, for the ratchet-teeth, and a transverse bottom opening, 8, through which the keys project, and having its top, bottom, and opposite side edges bent inward to form flanges, which are secured to the inner sides of the cabinet, substantially as described.

396,068. HARROW AND ROLLER. JESSE BOLLINGER, Carrollton Md. Filed Sept. 17, 1888. Serial No. 285,655. (No model.)

Claim.—1. In a combined land-roller and harrow, the combination, with the pivoted harrow-bars, of the pivoted frame secured thereto, the curved lever having the notches, the tubular standard provided with the coiled spring, angular lever, slotted curved pivoted side bars for the rear roller, the tilting frame provided with the small rollers and the cord, and the vertical lever connected to said cord and to the pivoted frame and harrow-frame, substantially as described.

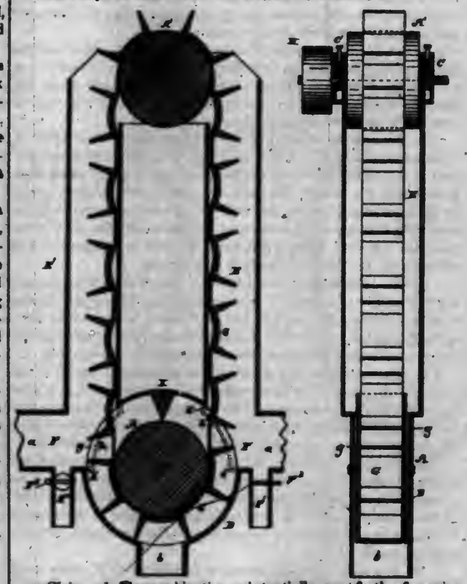
2. The combination, with the harrow-frame provided with the teeth and the operating parts connected thereto, as described, of the front harrow hinged to the frame of the tongue and provided with

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the loop-bar, coil-spring, and retaining-hook pivoted to said tongue, substantially as described.

396,069. WATER-MOTOR. BYRON R. BOWER, Bainbridge, Ga. Filed Sept. 24, 1887. Serial No. 250,608. (No model.)



Claim.—1. The combination, substantially as set forth, of a casing, the upper and lower pulleys, the bucket-carrying belt, the buckets thereon, the side rings on the lower pulley, and the water-stop located over the lower pulley and between the side rings.

2. The combination, substantially as set forth, of the upper and lower pulleys, the casing for the lower pulley completely inclosing it, except at the water-ports, the bucket-carrying belt, the buckets thereon, an entrance-port at the side of the casing, a discharge-port at the bottom of the casing and entrance-port on the opposite side of the apparatus and the drain-spouts, and valves located under the entrance-ports.

3. The combination, substantially as set forth, of the upper and lower pulleys, the casing for the lower pulley inclosing it and having

an entrance-port at one side and a discharge-port at the bottom, the side rings on the lower pulley, and the water-stop over the pulley between the rings.

396,070. RIBBON-WINDING DEVICE. WILLIAM S. BURROUGHS, St. Louis, Mo., assignor to the American Arithmometer Company, same place. Filed Nov. 22, 1887. Serial No. 255,923. (No model.)



Claim.—1. The combination of a ribbon and two spools carrying the same, a driver for each spool, one of which is a reversible driver, and both drivers connected with one operating device, and a yielding connection, substantially as described, between one of the spools and its driver, substantially as described.

2. The combination, with two spools carrying a ribbon, of a driver turning in but one direction, having a yielding connection with one of said spools, a reversible driver connected with the other said spool, and means for operating said drivers, substantially as described.

3. The combination, with two spools, of a step-by-step driver for one of the spools, a yielding connection between the driver and said spool and a reversible driver for the other spool, and means for operating said drivers simultaneously, substantially as described.

4. The combination of the two spools, ribbon, and two connected drivers, one of said drivers having a yielding connection with one of said spools, and of less diameter than the other, whereby to move the latter spool at a greater speed than the other spool, substantially as described.

5. The combination of two spools carrying a ribbon, a driver frictionally connected with one spool, a driving spring-pawl engaging with the wheel of the other spool-driver and supported on a radially-yielding bearing, and a connection, substantially as described, between said pawl and said driver, substantially as specified.

6. In a ribbon-winding device, the combination of a spool mounted upon a shaft, *a*, and having a toothed driving-wheel, a vibrating arm, a vibrating spring-actuated pawl carried by the arm, and means, substantially as described, for vibrating the arm, and a radially-yielding bearing for the pawl, substantially as described.

7. In a ribbon-winding device, the combination of spool A, mounted on a shaft, *a*, a toothed driving-wheel, a vibrating arm pivoted to the shaft and having a sliding bearing, a spring which tends to draw the arm toward the shaft, a pivoted reversible pawl carried by the arm, engaging with the teeth on the wheel, and carrying a pin projecting through a slot in the arm concentric with the pivot of the pawl, and a pivoted spring which holds the pawl in engagement with the teeth of the wheel, substantially as described.

8. The combination, with a spool, B, and frictionally-connected driver therefor, of a spool, A, and reciprocating driving-pawl having a radially-yielding support and pivoted to swing to either side, and a spring connected to press said pawl against the spool in each position, and means for operating said drivers, substantially as described.

9. In a ribbon-winding device, the combination of spools A and B, a driving-wheel, C, positively connected with the spool A, a driving-wheel yieldingly connected with the spool B and of less size than the driving-wheel of spool A, and means, substantially as described, for simultaneously turning said wheels, substantially as described.

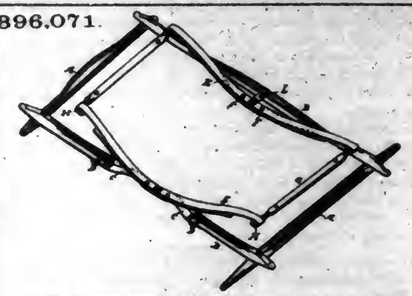
10. In a ribbon-winding device, the combination of spools A and B, driving-wheel C, positively connected with spool A, a driving-wheel yieldingly connected with spool B and of less size than wheel C, and an intermittently-operating pawl for wheel D, tending to rotate spool B away from spool A, and a reversible pawl for the wheel C, substantially as described.

11. In a ribbon-winding device, the combination of spools A and B, toothed wheel C, positively connected with wheel A, toothed wheel D, frictionally connected with spool B, the vibrating arm carrying a reversible spring-actuated pawl for rotating wheel C, vibrating arm carrying a non-reversible spring-actuated pawl for rotating wheel D, and reciprocating devices connecting said arms for vibrating them synchronously, substantially as described.

396,071. SIDE SPRING FOR CARRIAGES. EDWIN A. CRUSE, Cortland, N. Y. Filed Nov. 17, 1883. Serial No. 291,060. (No model.)

Claim.—1. The combination, with the side bars of a buggy, of curved hangers forming central supports for the springs, the curved springs centrally supported therein, and the end bars swiveled in said springs, substantially as described.

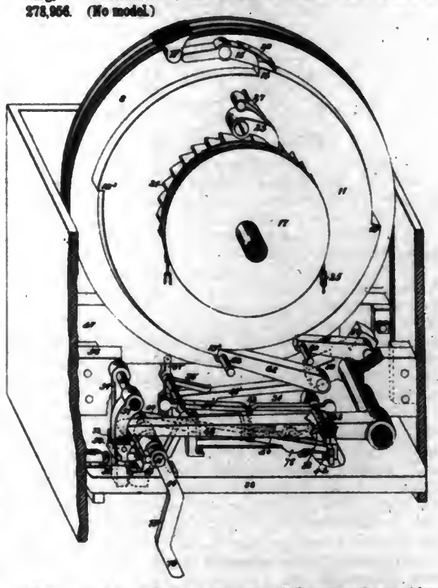
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2. The combination, with the side bars of a buggy, of a pair of curved hangers, the longitudinally-extending springs, and the retaining drop-bracket attached to the side bars and springs, substantially as described.

3. The combination, with the side bars, of the curved hangers secured thereto and the springs centrally supported thereon and extending lengthwise of the vehicle, all arranged substantially as shown and described.

396,072. RAILROAD-CROSSING GATE. OLIVER H. CLARK, Pittsburg, Pa. Filed Jan. 24, 1884. Renewed July 3, 1888. Serial No. 278,956. (No model.)



Claim.—1. In a railroad-crossing or similar gate, the combination of an oscillating barrier, a wheel secured to the shaft of the barrier, two loose clutch-wheels, one on each side of the fixed wheel, and having reversely-arranged pawl, ratchet, and trip mechanism, locking-stops for each clutch-wheel, and the escapement mechanism, substantially as described, for actuating the stops, whereby the barrier may be both raised and lowered by pulleys and weights, substantially as and for the purposes specified.

2. In a railroad-crossing or similar gate having an oscillating barrier with a fixed wheel on its shaft, and a loose clutch-wheel, the combination therewith of a shaft, 46, having two arms or cranks, 57 and 58, stops or pawls 59 and 62, pivoted on said arms, an arm or lever, 48, secured to and extending transversely from the shaft, a support, 51, and suitable mechanism for tripping the support 51, substantially as and for the purposes specified.

3. In a railroad-crossing or similar gate having an oscillating barrier with a fixed wheel and loose clutch-pulleys on its shaft, and having a rocking arm with locking stops or pawls, the combination therewith of a vibrating arm or lever attached to the rock-shaft of the pawls, a support for the free end of the vibrating arm or lever, and a second vibrating lever, 40, controlled by a trip, and an arm, 73, on the shaft of the last-mentioned lever, which controls the support or trip of the first-named vibrating arm or lever, substantially as and for the purposes specified.

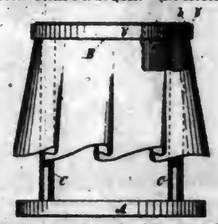
4. In a railroad-crossing or similar gate having an oscillating barrier with a fixed wheel and loose clutch-wheels on its shaft, a rock-shaft with pawls or stops, a vibrating arm for controlling the rock-shaft, a trip, and a second vibrating arm, 40, for controlling the first trip, 51, the combination therewith of a second trip, 34 42, operated by the armature of an electro-magnet, substantially as and for the purposes specified.

5. In a railroad-crossing or similar gate having an oscillating barrier with a fixed wheel and loose clutch-wheels on its shaft, a rock-arm with pawls or stops, trips, and vibrating levers for operating the trips, the combination therewith of a hook, 65, and a trip, 68 and 70, operated from the fixed wheel 8 of the shaft, substantially as and for the purposes specified.

6. In a railroad-crossing or similar gate having an oscillating barrier with a fixed wheel and loose clutch-wheels on its shaft, a rock-arm with pawls and trips, the combination therewith of a tappet, 45, and a cam-arm, 44 75 76, keyed to the shaft of a vibrating lever, 40, and a pin on a rock-arm, 48, whereby the rock-arm is caused to operate the lever 40, substantially as and for the purposes specified.

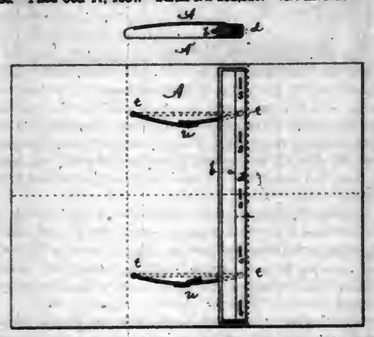
7. In a railroad-crossing or similar gate having an oscillating barrier with a fixed wheel and loose clutch-wheels on its shaft, and rock-shaft and pawls, the combination therewith of an escapement mechanism consisting of the vibrating arm 48, trip 51 54, vibrating arm 40 73, tappet 45, cam-arm 44, hook 65, trip 68 70, fixed wheel 8, trip 34 42, and an electro-magnet and its armature, substantially as and for the purposes specified.

396,073. EMBROIDERY-FRAME. GEORGE W. CORY, Kane, Ill. Filed May 19, 1888. Serial No. 274,445. (No model.)



Claim.—In an embroidery-frame having a stretcher consisting of two circular hoops adapted to each other, as herein described, the combination therewith of a support consisting of two vertical standards secured immovably in a circular lap-board adapted to rest and permit of being rotated horizontally upon the lap of the operator, the inner hoop of the stretcher being pivotally secured at diametrically-opposite points to the upper ends of the standards, as and for the purpose set forth.

396,074. STUB-FILE ENVELOPE. JOHN W. CHRISMANN, Troy, Ohio. Filed Oct. 17, 1887. Serial No. 252,523. (No model.)

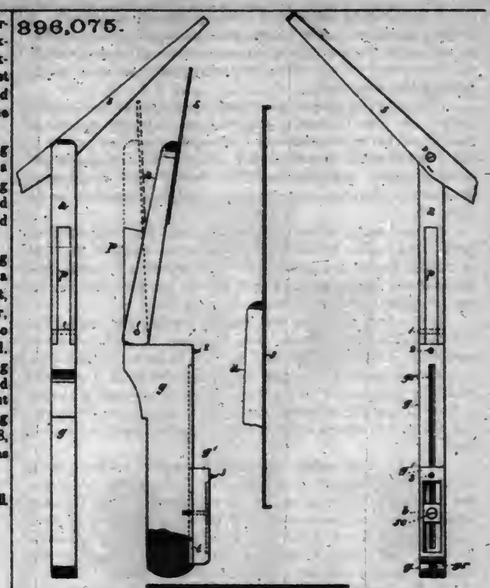


Claim.—As a new article of manufacture, a stub-file envelope comprising adhesive flaps with intervening narrow strips of paper and the same attached to the envelope near one end thereof to hold and enfold legal-cap sheets, and elastic straps held in orifices in the back of said envelope to bind the contents thereof, substantially as shown and described.

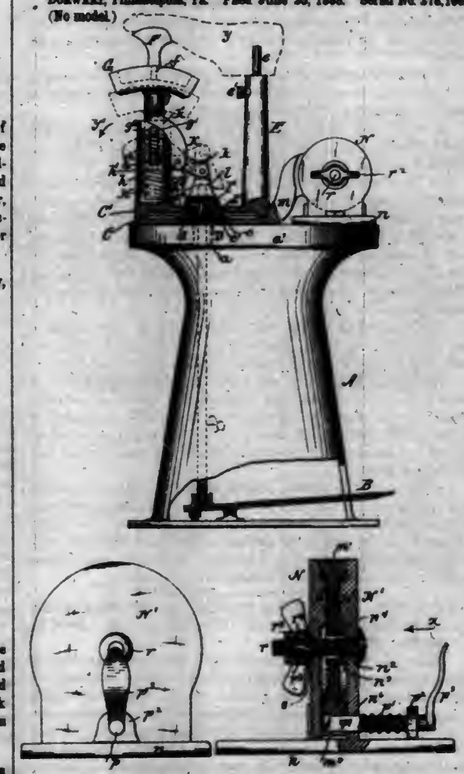
396,075. SIDING GAGE AND SQUARE. PHILANDER M. CURTIS, Lebanon, Ind. Filed May 10, 1888. Serial No. 273,493. (No model.)

Claim.—The siding-gage herein described, comprising the gage *g*, having the spur 2, the adjustable gage-block *g'*, connected therewith, having the spur 3 upon its face, and the movable arm *a*, hinged to the gage *g*, as shown, and carrying the straight-edge *f*, pivoted at its upper extremity, all combined substantially as shown and described.

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396,076. HEELING, NAILING, AND FINISHING JACK. GEORGE DORWART, Philadelphia, Pa. Filed June 25, 1888. Serial No. 278,106. (No model.)



Claim.—1. In a heeling, nailing, and finishing jack, the combination of plate C, the plate C', rotating thereon, a post having adjustable pin rigidly secured to plate C', another standard or column rigidly secured to plate C', a spring-supported block, G, on said standard or column, an adjustable toe-rest on block G, and devices for elevating and depressing said block G and toe-rest, substantially as set forth.

2. In a heeling, nailing, and finishing jack, the combination of rotating plate C', the post E thereon, having adjustable pin *e*, the tubular column H, provided with spring-supported block G and toe-rest F, and devices for vertically raising and lowering said toe-rest and block, substantially as set forth.

3. In a heeling, nailing, and finishing jack, the combination of a plate, C, the plate C', rotating thereon, a post, E, rigidly secured to plate C' and having adjustable pin *e*, the spring-supported toe-rest F, and a disk or end, *m'*, secured to plate C and pivoted or hinged to and between parallel clutching-plates N N', having lower permanently-fixed ends or edges and upper free ends or edges, substantially as set forth.

4. In a heeling, nailing, and finishing jack, the combination of plate C', the tubular standard H thereon, having spring A^9, the head or block G, having stem *g*, fitting the bore of standard H, resting upon spring A^9 and having studs or pins *g'*, lever K, toe-rest F, and actuating devices for said lever, substantially as set forth.

5. In a heeling, nailing, and finishing machine, the combination of hinged plate C, the rotating plate C' on plate C, tubular sleeve or connection D between said plates, the post E, having adjustable pin *e*, column or standard H, having spring-supported block G, provided with stem *g*, adjustable toe-rest F on block G, pins or studs *g'* on stem *g*, lever K, engaging with said pins or studs, and devices for operating said lever to depress said block and toe-rest F, substantially as set forth.

6. In a heeling, nailing, and finishing machine, the combination of plates C C', the hollow or tubular sleeve D, connecting said plates the treadle-bar *b*, passing up through said sleeve, a post, E, having adjustable pin *e*, column or standard H, having spring-supported block G, provided with stem *g*, having pins or studs *g'*, and an adjustable toe-rest, F, and a lever, K, engaging with pins *g'* and having a pivoted block, *l*, engaging with bar *b*, substantially as set forth.

7. In a heeling, nailing, and finishing jack, the combination of plate C, having central opening, *c*, with recess *c'* on the lower side of said plate, plate C', having threaded central opening, c^3, and sleeve D, having flange *d*, fitting recess *c'* in plate C and screw-threaded at d^2 for engaging with the threaded opening c^3 in plate C', substantially as set forth.

8. In a heeling, nailing, and finishing jack, the toe-rest head or block G, having in its upper side a series of transverse recesses or slots G', substantially as and for the purpose set forth.

9. In a heeling, nailing, and finishing jack, the toe-rest head or block G, having stem *g* and segmental end in the top of which are transverse recesses G', substantially as set forth.

10. In a heeling, nailing, and finishing jack, the combination of jack-plate C, plate C', rotating thereon, a heel and a toe rest on plate C', a disk or end, *m'*, having opening or recess m^2, and stops m^4, secured to plate C, a bracket, *n*, having integral parallel plates N N', having stops n^2 between, and to which plates N N' said disk or end *m'* is pivoted, a thumb-nut for the pivot for said disk or end, and spring-actuated stop-bar *p*, engaging with opening or recess m^2 in end *m'*, substantially as set forth.

11. In a heeling, nailing, and finishing jack, the combination of plates N N', having clamping bolt and nut r r^2, the plate end *m'*, pivoted to said plates N N', and stop-bar *p*, substantially as set forth.

12. In a heeling, nailing, and finishing jack, the combination of plates N N', united by base-plate *n* and having central apertures, a tubular bearing, n^4, and an opening, n^5, in one of said plates, stops n^2 on plates N N', bolt and nut clamp r r^2, stop-bar *p*, and plate end *m'*, pivoted on bearing n^4 and having stop m^4 and peripheral slot m^3, substantially as set forth.

13. In a heeling, nailing, and finishing jack, plate C, provided with arm *m* and disk or plate *m'*, pivoted to clutching-plates having stops for limiting the movement of said plate *m'* on its pivot, and a stop-bar for locking it in its normal position, in combination with plate C', swiveled to plate C, and heel and toe rest supports or posts rigidly secured to said plate C', substantially as set forth.

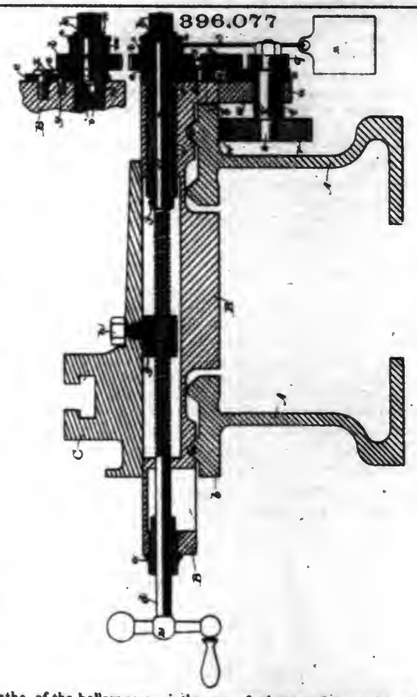
396,077. MACHINE FOR TURNING AND GRINDING TAPERS.

JOSEPH FLATHER, Nashua, N. H. Filed July 26, 1888. Serial No. 280,963. (No model.)

Claim.—1. The combination of bed A, provided with rack *w*, saddle B, arranged to move on ways *a* and provided with tool-post slide C, screws *d i*, having independent rotative action, but secured from relative lineal displacement, a threaded connection between screw *d* and the tool-post slide, and a system of gearing connecting the rack with screw *i*, and through screw *d* with tool-post slide C, whereby the lineal movement along bed A may impart a rotary movement to screw *i* and a movement to screw *d* and slide C transverse to said bed, substantially as specified.

2. The combination of bed A, its rack *w*, saddle B, tool-post slide C, screws *d i*, and a train of gears engaging said rack and screw *i*, all arranged to operate substantially as specified.

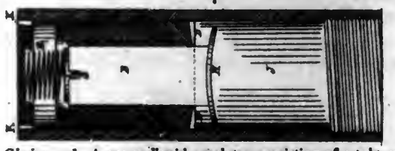
3. The combination, with the tool-support of a metal-turning



lathe, of the hollow screw *i*, the cross-feed screw *d*, journaled in and interlocked with said hollow screw, a rack, and the gear mechanism connected with said rack and hollow screw, all substantially as specified.

396,078. APPARATUS FOR REGULATING AND CONTROLLING THE EXIT OF GAS OR LIQUIDS.

CHARLES S. FORD, Sr., Philadelphia, Pa., assignor to Charles T. Hallowell and Frank W. Shriver, both of same place. Filed Mar. 29, 1883. Serial No. 268,909. (No model.)



Claim.—1. A gas or liquid regulator consisting of a tube with grooves in its lower end, a post adapted to slide in the bore of said tube and having secured to its lower end a disk or diaphragm, a second disk with openings therein, and a spring between second diaphragm and post, the said post being fitted in said tube so as to form passages leading from end to end thereof, said parts being combined substantially as described.

2. A gas or liquid regulator consisting of a tube having radial grooves in its lower edge, an angular post in the bore of said tube, forming passages between said post and tube, a perforated disk above said post, a spring between said disk and post, and a disk connected to the lower end of said post, said parts being combined substantially as described.

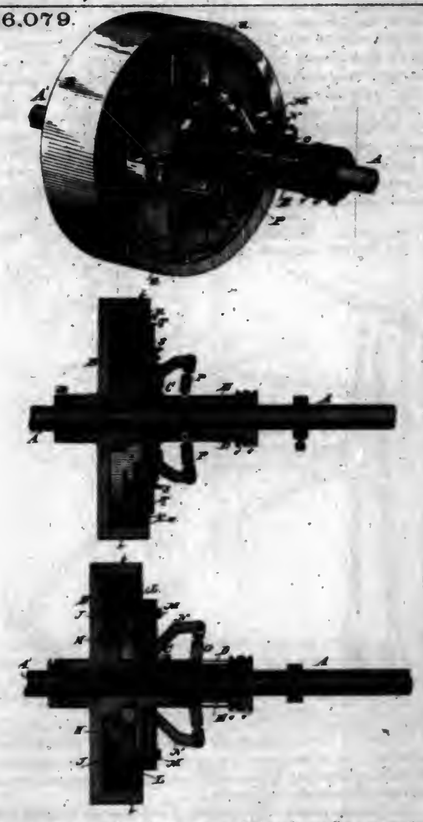
3. A gas-regulator consisting of the tube or cylinder A, having the radial grooves D at its lower end, the angular post B, adapted to slide within the tube A, and having the diaphragm H secured to its lower end, the pin-piece G, secured to the upper end of the post B, the diaphragm F, having the perforations K, and the spring E between said diaphragm F and pin-piece G, said parts being combined substantially as described.

396,079. CLUTCH.

JAMES GIBBONS, Springfield, Mass. Filed June 22, 1887. Serial No. 242,195. (No model.)

Claim.—1. The combination, in a clutch, of friction engaging mechanism and positive engaging mechanism, each independently operative, two operating-collars supported on the same shaft with the clutch, and levers connecting the collars with their respective parts, whereby the movement of one collar causes the friction engaging

396,079.



mechanism to operate and movement of the other collar causes the positive mechanism to operate, and a stop to prevent the operation of the positive mechanism until the friction mechanism is fully operated, substantially as shown and described.

2. A clutch having friction parts and positive engaging-jaws operating independently, and a stop whereby the positive operative mechanism cannot be brought into action until after the friction-connection is made, substantially as shown.

3. A clutch having positive jaws, one or both sets of which have inclined faces, one set of which give sidewise, whereby the other set will engage therewith when forced in contact, substantially as described.

4. In a clutch, the combination of a shell, as B, having jaws, as H, and a friction-surface, as *b*, with a plate, as C, carrying movable jaws, as J, and friction-blocks U, and means whereby the said movable parts are operated, substantially as shown.

5. In a clutch, the combination of a plate provided with movable jaws, as J, and inclined pieces L, engaging therewith, as shown, and bell-crank levers to move the pieces L, whereby the jaws are caused to traverse the incline and be moved to engage or disengage the jaws on a part, as B, substantially as shown.

6. In a clutch, the combination of independently-operating positive and friction engaging means with a stop to prevent operation of the positive mechanism until the friction mechanism is home, and means to cause the stop to cease to act by the complete operation of the frictional mechanism, substantially as shown.

7. A shell or part, as B, provided with positive locking-jaws, in combination with a plate or part, as C, having jaws, as J, movably secured thereto, and inclined pieces L, secured to parts M, and a collar, as E, connected with the parts M through the levers, as O and N, substantially as shown.

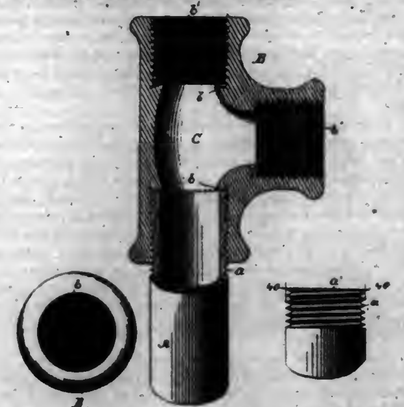
8. In a clutch having friction and positive engaging mechanism, the combination of two collars, as D and E, one being connected with the friction mechanism and the other with the positive mechanism, and a stop operating to prevent the locking movement of the positive locking means until the friction locking means is operated, said collars being connected with the jaws and friction-blocks by a system of levers, substantially as shown.

9. The combination of collars E D, one partially within the other, with plate C, having movable jaws and friction-blocks, and shell B having jaws, as H, and the connecting-levers O and P, and bell-crank levers, all substantially as shown.

10. Collars D E, having operating-levers provided with adjusting-collars *l*, in combination with positive and frictional engaging means and connecting-levers, substantially as described.

396,080. PIPE-JOINT.

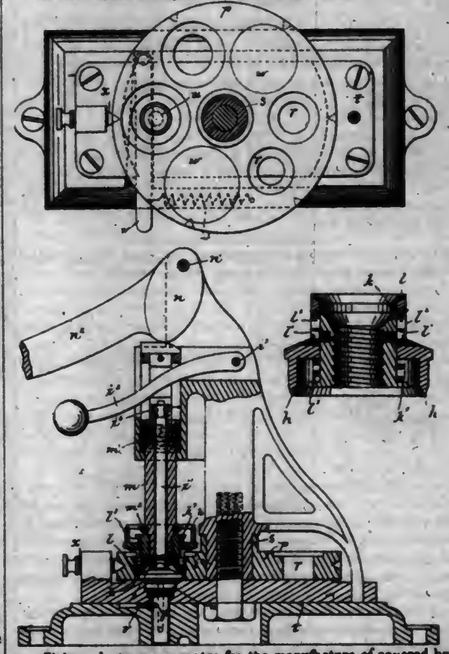
JOHN A. GILLIAN, Kansas City, Mo. Filed Feb. 14, 1888. Serial No. 263,937. (No model.)



Claim.—A metal pipe-connection having an internal screw-threaded recess, the end walls of which are inclined from the bottom of the recess toward the end of the connection, and being of a diameter greater than that of the threads; in combination with an externally-threaded pipe adapted to enter said metal pipe-connection and be expanded by said end walls to fill said recess, in the manner and for the purpose substantially as described.

396,081. BUTTON-MACHINE.

JAMES M. GOTENDORF, Jr., Paris, France, assignor to Brunt Good, New York, N. Y. Filed Mar. 20, 1888. Serial No. 268,702. (No model.) Patented in France Dec. 10, 1886, No. 180,212, and in Belgium July 8, 1887, No. 78,153.



Claim.—1. In an apparatus for the manufacture of covered buttons, the combination, with a sliding plunger provided at its lower end with a punch, as *i*, whose acting face is outwardly beveled and hol-

lowed, of a second independent punch, as *k*, secured to said sliding plunger in concentric relation to the first-mentioned punch, and having an inwardly-beveled acting face, whereby simultaneously with the clinching of the neck of the button the teeth of its collet may be forced inward and into the covering fabric, substantially as set forth.

2. In an apparatus for the manufacture of covered buttons, the combination, with a tubular sliding plunger provided with an inner stem, as i^2, arranged to slide independently of said plunger, and carrying at its lower end a punch, as *i*, of a second punch, as *k*, secured to the lower end of said sliding plunger in concentric relation to the first-mentioned punch, whereby the punch *i* may be brought down independently and in advance of punch *k*, for pushing the parts of the button into proper position for being acted upon, and simultaneously with the clinching of the neck of the button the teeth of its collet may be forced inward and into the covering fabric, substantially as set forth.

3. In an apparatus for the manufacture of covered buttons, the combination, with a sliding plunger provided at its lower end with a punch, as *i*, whose acting face is beveled and hollowed, as shown, of a second independent punch, as *k*, secured to said sliding plunger in concentric relation to the first-mentioned punch, and having an inwardly-beveled face and a gathering-tool, as *l*, adapted to receive the collet of the button, and having an inwardly-beveled acting face and fitted to slide on punch *k*, and a spring, as l^3, the parts being arranged whereby, first, the edges of the covering fabric are turned inwardly; second, the teeth of the collet are forced into said fabric, and, third, the neck of the shell of the button is clinched over the collet, all in one operation without change or readjustment of the operating-tools, substantially as set forth.

4. In an apparatus for the manufacture of covered buttons, the combination, with the sliding plunger, of punch *k* and a combined gathering-tool and ring-cutter, the latter reversible on the punch *k*, substantially as set forth.

5. The sliding plunger *m*, screw-threaded at its lower end and provided with abutment m^2, in combination with punch *k*, formed with an interior nut, and the combined gathering-tool and ring-cutter *l k*, substantially as set forth.

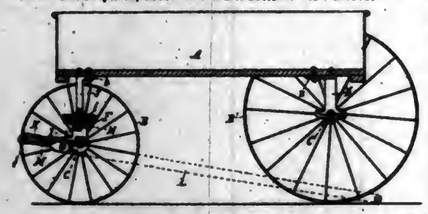
6. In an apparatus for covering the buttons herein described, the rotary die and cutter bed-plate, in combination with the cam and spring-actuated rectilinearly-movable punching, gathering, and cutting tools, substantially as specified.

7. In an apparatus for covering buttons, the combination, with the rotary die-plate, of a base-plate fitted with a spring-follower and a latch for securing said spring-follower depressed, substantially as set forth.

8. In an apparatus for covering buttons, the combination, with the rotary die-plate provided with a series of cavities, as *r*, of a base-plate fitted with a spring-follower having a head co-operating with said cavities, and a stem provided with a notch, as v^2, and a spring-actuated latch, *v*, co-operating with the notch in the follower-stem, substantially as and for the purpose set forth.

9. In an apparatus for covering buttons, a recessed base-plate, *t*, fitted with a headed spring-follower, a spring-actuated latch, as *v*, a rotary die-plate provided with a series of cavities, as *r*, and mounted to rotate about a central pillar, *s*, immediately over said base-plate, combined and co-operating with a punch-plunger, substantially as and for the purpose set forth.

396,082. WAGON RUNNING-GEAR. FRANK H. HARRIS, Toledo, Ohio. Filed Apr. 10, 1888. Serial No. 270,193. (No model.)



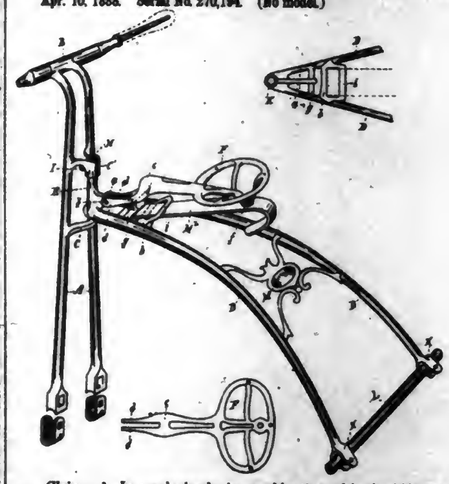
Claim.—1. The combination, in a wagon running-gear, of the front axle, the arched cap secured to said axle, the recess formed on the under side of said cap, the screw-threaded king-bolt engaging into said cap, and the nut for securing said king-bolt engaging into the recess of said cap to keep it from turning off, and the arched bolster supported by said cap, substantially as described.

2. The combination, with the front and rear axles of an express wagon, of the clamping-boxes E, consisting of the upper part, *a*, integrally formed with the axle-cap or support, and provided with the lip *c* and the part *b*, secured thereto and provided with the hook *d*, substantially as described.

3. The combination of the front axle, C, the axle-cap D, secured thereto, the forwardly-projecting bounds K, integrally formed therewith and provided with the inwardly-projecting hooks *j*, the pole L, and the draft-irons M, provided with the eyes *k* at their rear ends and secured to the pole at their forward ends, substantially as described.

4. In a wagon running-gear, the combination, with the front axle, C, of the arched cap D, the clamping-boxes E, securing it to the front axle, the recess G, formed in the under side of the cap, the circular bearing F, formed on top of the cap D, the arched bolster J, secured to the wagon-body and provided with the circular bearing-plate *i*, the screw-threaded king-bolt I, and the king-bolt nut H, seated in the recess of the cap D, substantially as described.

396,083. VELOCIPEDE. FRANK H. HARRIS, Toledo, Ohio. Filed Apr. 10, 1888. Serial No. 270,194. (No model.)



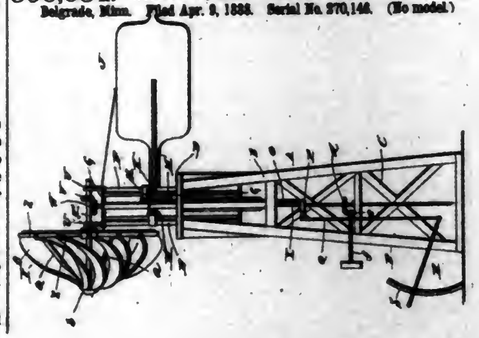
Claim.—1. In a velocipede, in combination with the bifurcated backbone, a spring seat-support secured at one end to the seat-frame and slidingly engaging at the other end between cross-bars in the backbone, substantially as described.

2. The combination of the bifurcated backbone, the saddle-frame pivotally secured thereto at its forward end, and the spring seat-support held at its forward end between the cross-bars in the bifurcation of the backbone and secured at its rear end to the rear end of the saddle-frame, substantially as described.

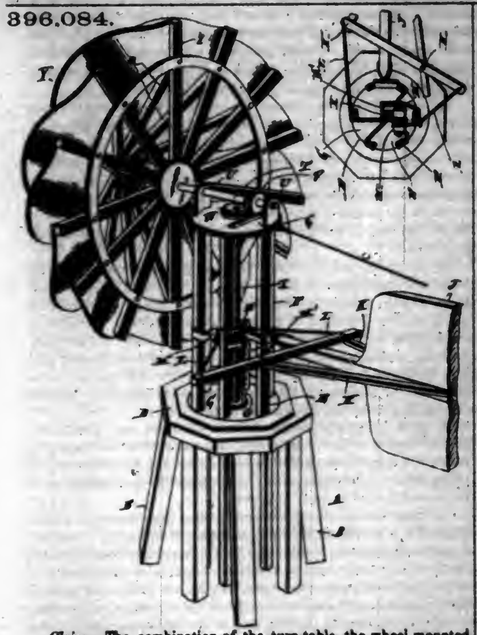
3. In a velocipede, the combination of the saddle-frame provided with the shank *c*, bifurcated at its forward end and terminating in the ears *d*, the backbone provided with the bracket *a*, having the rearward extension *j*, engaging between the bifurcations of the saddle, and the seat-supporting spring M', supporting the rear end of the seat, substantially as described.

4. The combination, with the bifurcated backbone D, of the saddle-frame provided with the shank *c*, bifurcated upon its forward end, the rearwardly-projecting arm *a* of the backbone, to which the forward end of said shank is pivotally secured, the rearward extension *j*, engaging between the bifurcations of the saddle-frame, the cross-bars *g*, *h*, and *i*, integrally formed with the backbone, and the seat-supporting spring M', supported at its forward end between these cross-bars upon all sides and at its rear end to the saddle-frame, substantially as described.

396,084. WINDMILL. NILS P. HISS and CHRR. VESTERGARD, Belgrade, Minn. Filed Apr. 9, 1888. Serial No. 270,146. (No model.)

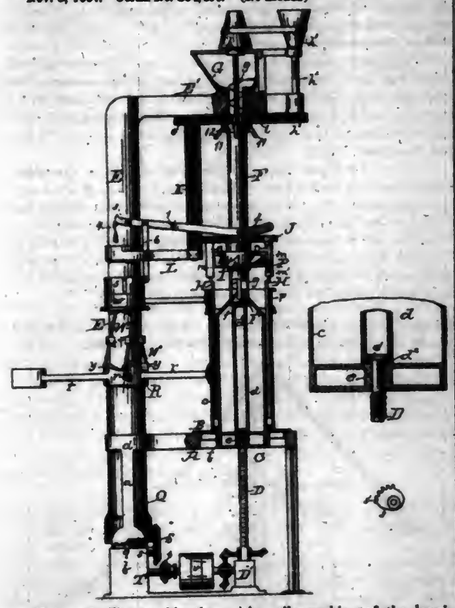


396,084.



Claim.—The combination of the turn-table, the wheel mounted thereon, the vane hinged to the turn-table, the cord secured to the vane and passing around the wheel, and the vertically-movable rack-bar meshing with said wheel, as and for the purposes specified.

396,085. TILE-MACHINE. FRANK M. HIGBY, Chicago, Ill. Filed Nov. 5, 1887. Serial No. 254,400. (No model.)



Claim.—1. The combination, with a tile-machine, of the longitudinally-vibrating tamping-bars revolving horizontally around a common center, a vertically-reciprocating central core, and a removable mold surrounding the same between which the tiles are made.

2. In a tile-machine, the combination, with the mold and core, of a series of tamping-bars operating between the mold and core, a revolving cam or lifting plate which imparts longitudinal vibrations to the tamping-bars, and supporting-frames for the tamping-bars, the said tamping-bars, cam or lifting plate, and supporting-frames being connected to move vertically together upon a support extending in the same direction as the axis of the mold, upon which they are free to slide, whereby as the material is fed into the mold the cam-plate and tamping-bars are automatically moved simultaneously to accommodate themselves to such material, substantially as set forth.

3. In a tile-machine, the combination of a series of longitudinally-vibrated tamping-bars, a core and mold having its upper end increased in diameter, supports for the tamping-bars movable in the direction of the axis of the tile being formed, and also free to be moved radially, and spreaders which move the said supports and tamping-bars radially from their common center, substantially as and for the purpose set forth.

4. The combination, with a tile-machine, of the tamping-bars having a longitudinally-vibrating motion and moving around a common center, so that they together form a circle struck from said center, a removable mold, and a vertically-reciprocating core between which the tile is made.

5. In a tile-machine, the combination, with a core and mold, of a series of vibrating tamping-bars and an oscillating former adapted to be brought into contact with the inner surface of the tile being formed to produce a shoulder thereon, mounted upon a rotating support within the tile, substantially as described.

6. In a tile-machine, the combination, with a series of independently-acting tamping-bars placed an equal distance from a common center, a mold and core of a hollow vertical shaft arranged concentric with the said common center of said tamping-bars above and in alignment with the center of said core, and a spiral conveyer therein, said conveyer and shaft revolving independently one from the other, as set forth.

7. In a tile-machine, the combination, with a core and mold, one revolving relatively to the other, of a series of tamping-bars, movable formers carried by the core at its upper end adapted to engage with the interior of the tile to form a shoulder therein, and spreaders connected with the said formers to move them outward into contact with the tile when the tamping-bars have reached the upper end of the mold, substantially as described.

8. In a tile-machine, the series of longitudinally-vibrating tamping-bars, in combination with a mold having its upper end flared outward, a core, and spreading-blocks 16 and miter-blocks 17, as described, attached to the upper end of said core for making a shoulder in the upper end of said tile between said flared end of the mold and said core.

9. In a tile-machine, the combination, with the vertically-reciprocating core, a removable mold, and a platform upon which the same are supported, of a vertical shaft in alignment with the center of said core, and above and independent of the same a circular frame for supporting and directing the movements of the tamping-bars, and said tamping-bars.

10. In a tile-machine, the combination, with a vertically-reciprocating core, a removable mold, and a platform for supporting the same, of a vertical shaft in alignment with and above the center and independent of said core, a series of tamping-bars, and circular frame for supporting and directing the same and revolving around the center of said shaft, said tamping-bars having a longitudinal vibration, as set forth.

11. In a tile-machine, the combination, with a removable mold, a vertically-reciprocating core, and platform for supporting the same, of a vertical shaft above and in alignment with the center, but independent of said core, a series of tamping-bars having lateral arms at or near their upper ends, the cam-wheel I, having one or more cam-surfaces on its periphery and revolving with said shaft, and a circular frame for supporting and directing the vibrations of said tamping-bars.

12. In a tile-machine, the combination, with a mold, core, and platform for supporting the same, of a vertical shaft above and in alignment with the center of said core, a series of tamping-bars having transverse arms near their tops, gear-wheel revolving independently around said shaft having hangers depending from its arms with guides thereon for directing said tamping-bars, and cam-wheel I, fast to said shaft, having several cam-surfaces around its circumference.

13. The combination, with the mold, core, and platform supporting the same, of shaft F, tamping-bars H, having transverse arms near the upper ends with friction-rollers journaled in them, gear J, hangers *m*, depending from the arms thereof, having guides *m'* thereon, and cam-wheel I, having several cam-surfaces around its circumference and so mounted on said shaft as to revolve therewith, but having an independent vertical movement, substantially as and for the purpose set forth.

14. In a tile-machine, the combination, with the mold, core, and platform supporting same, of shaft F, cam-wheel I thereon, having cam-surfaces *k*, tamping-bars H, having lateral arms projecting from them near their upper ends, gear J, revolving around shaft F independently thereof, and inverted-L-shaped hangers *m*, having suitable guides on their vertical arms for directing the movement of said tamping-

bars and secured to the arms of gear J by straps, in combination with spreading-bars 11, as set forth.

15. The combination, with tamping-bars H, gear J, and inverted-L-shaped hangers *m*, secured to the arms of said gear by straps and expansion-spring 9, of spreading-bars 11, as set forth.

16. The combination, with the tamping-bars having laterally-projecting arms at or near their upper ends, friction-rollers *n n* on the ends of said arms, hangers *m*, having guides *m'* thereon, and frames from which said hangers depend, of the cam-wheel I, having cam-surfaces *k* around its periphery.

17. The combination, in a tile-machine, with the core, a sleeve, *d*, arranged centrally and vertically therein, and screw-shaft D, having its upper end stepped to a less diameter, as shown, of shaft F, above and in vertical alignment with the center of said sleeve, whose upper end edges slip around the lower end of the heel of said shaft and are of such shape as to transmit the motion imparted to it by the screw D thereto.

18. In a tile-machine, the combination, with a screw-shaft, D, having its upper portion stepped to a less diameter and provided with a head at its upper extremity, the circumference of which is serrated, of the vertically-reciprocating core having a central boss in its bottom tapped to receive said screw, and a vertical central sleeve having its lower end edges flanged inward and serrated with reference to the serrated head of said screw.

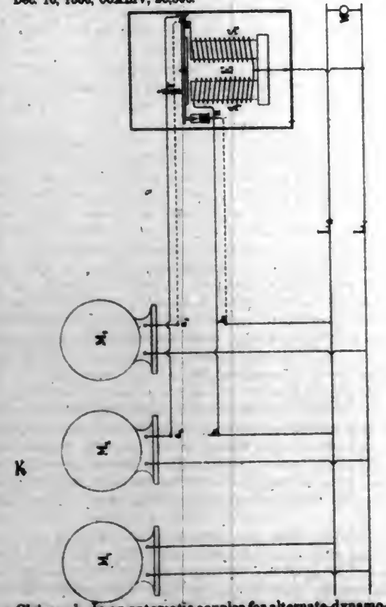
19. In a tile-machine, the combination, with the mold and core having a truncated-cone-shaped top, of the hollow shaft F, having its lower end open and connected to a casting, F', which rests upon the said truncated part of the top of said core when the latter is at the limit of its upward movement, and has its sides beveled in alignment with the sides of said core top and converging to a common point.

20. In a tile-machine, the combination, with mold C, of the revolving boss R and radiating arms *r r* thereof, having their ends bifurcated and embracing said mold, substantially as and for the purpose set forth.

21. In a tile-machine, the combination, with a mold, of the cam *s*, the sleeve Q, collar R, and arms *r*, having their ends bifurcated.

22. In a tile-machine, the combination, with a mold, of the cam *s*, the sleeve Q, collar R, and arms *r*, having their ends bifurcated, said cam having a series of cogs on its major radius, which, after said cam has raised said sleeve a distance corresponding to the difference between the major and minor radius of said cam, are adapted to engage a series of cogs, *q*, on the lower edge of said sleeve and revolve it a distance corresponding to that between said arms.

396,086. SYNCHRONIZING DEVICE FOR DYNAMO-ELECTRIC MACHINES. CARL HOFFMANN, Berlin, Germany, assignor to Siemens & Halske, same place. Filed Dec. 2, 1887. Serial No. 256,590. (No model.) Patented in Germany Sept. 15, 1886, No. 39,680; in Belgium Nov. 26, 1886, No. 75,380; in France Nov. 29, 1886, No. 179,969, and in Italy Dec. 10, 1886, CCXLIV, 20,898.



Claim.—1. In an automatic coupler for alternate-dynamo-electric machines, the combination, with a main circuit and auxiliary generator, of a magnet provided with two coils, one of the said coils being included in the main circuit and the other of the said coils being included in the circuit of the auxiliary generator, and an armature adapted when moved by the said coils to include the said auxiliary generator in the main circuit, as and for the purpose described.

2. In an automatic coupler for alternate-dynamo-electric machines, the combination of a main external circuit, an auxiliary generator, a magnet, coils surrounding the said magnet, one of the said coils having its ends connected to the main external circuit, the other of the said coils having its ends connected with the poles of the auxiliary generator, and an armature provided with a retracting device, adapted to include the auxiliary generator in the main circuit when moved by the said magnet, as and for the purpose described, and substantially as set forth.

3. In an automatic coupler for alternate-dynamo-electric machines, the combination of a main external circuit, an auxiliary generator, a magnet, coils surrounding the same, one of the said coils having its ends connected to the main external circuit, the other of the said coils having its ends connected with the poles of the auxiliary generator, and an armature electrically connected with the said auxiliary generator and adapted when moved by the said magnets to include the said generator in the main circuit at the time their impulses coincide, as and for the purpose described.

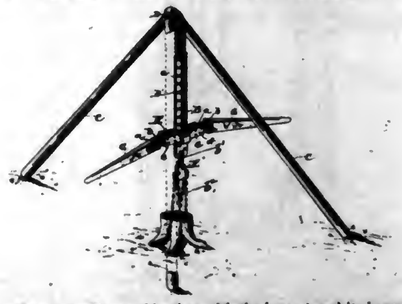
4. In an automatic coupler for alternate electrical generators, the combination, with a main circuit and an auxiliary alternate generator, of a magnet provided with an armature adapted to include the said generator in the main circuit at the moment their impulses coincide, as and for the purpose described.

5. In an automatic coupler for electrical generators, the combination of a main external circuit, consisting of two leads, L' and L^2, an auxiliary generator having one pole thereof connected with the lead L' of the main circuit, a horseshoe-magnet, around one leg of which is a coil, the ends of which are connected to the two leads of the main circuit, and around the other leg of which is a coil, one end of which is attached to the free pole of the said generator and the other end to the lead L', and an armature connected with the said pole to which the coil is attached, and adapted when moved by the magnet to form an electrical connection with the lead L^2 of the main circuit, as and for the purpose described.

6. In an automatic coupler for electrical generators, the combination of a main external circuit, an auxiliary generator, having one pole thereof connected with the corresponding lead of the main circuit, a horseshoe-magnet, around one leg of which is a coil connected with the main external circuit, and around the other leg of which is a coil, one end of which is connected to the same lead of the external circuit that is connected with one pole of the auxiliary generator, the other end of the said coil being connected to the other pole of the generator, and an armature adapted to include the said generator in the main circuit when moved by the said magnet, as and for the purpose described.

7. In an automatic coupler for electrical generators, the combination of a main external circuit having two leads, L' and L^2, an auxiliary generator having one pole thereof connected with the said lead L', a horseshoe-magnet, one leg of which is excited by a current derived from the main circuit, and the other leg of which is excited by a current from the auxiliary generator, and an armature adapted when moved by the said magnet to include the said generator in the main circuit, as and for the purpose described.

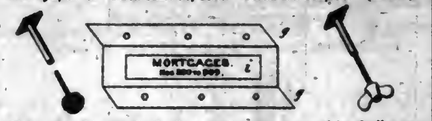
396,087. STUMP-EXTRACTOR. HARRY HOLLOWELL, Longville, Pa. Filed July 11, 1888. Serial No. 279,857. (No model.)



Claim.—1. The combination, with the lever A and its hanger B, and the perforated bar D', having link *b'*, and shouldered plate E', of the arms E, having projections *g*, adapted to be secured in the perforations *e* and bear against the upper edge of the lever in the curved recesses *d*, substantially as and for the purpose specified.

2. The combination, with the lever A and its hanger B, of the fulcrum-plates *a*, secured to the lever at each side and forming recesses, wherein the ends of the hanger to which the lever is fulcrumed extend, substantially as shown and described.

396,088. RECORD OR OTHER FILE. FREDERICK J. HOWARD, Brooklyn, N. Y. Filed Mar. 30, 1887. Serial No. 232,999. (Model.)

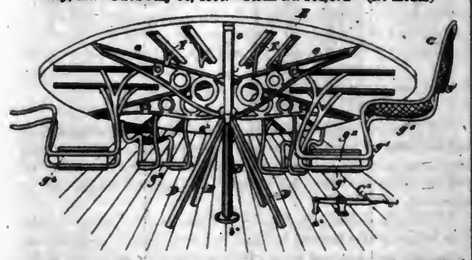


Claim.—1. The method of preparing paper or other similar material to be bound by a consecutive binding in a volume by the application of adhesive material to a portion of the surface of each of the sheets of such paper for the purpose of securing sheet to sheet, and providing suitable holes in the same for metal screws to pass through, such holes and adhesive substance being for the purpose of constituting a permanent volume, substantially as and for the purpose set forth.

2. The process of filing legal records or other papers in a consecutive binding by preparing such papers with adhesive material upon the surface of the separate sheets, providing suitable holes for a fastening device, fastening the same within the covers, one or more sheets at a time, by the use of such adhesive material and of metal fastening devices, completing the binding by the use of a proper back and permanent fastening devices, substantially as and for the purpose set forth.

3. The combination, in a record or other file, of written or printed matter in sheets previously prepared by the application of adhesive material to the surface of the separate sheets, a metallic fastening device for rigidly fastening the same at one side or end by a consecutive binding by single sheets within suitable covers, so that the sheets are held as a solid volume capable of being changed to a permanent binding of said covers, and of suitable devices for completing the permanent volume, substantially as and for the purpose set forth.

396,089. ROTARY DINING-TABLE. DANIEL JOHNSON, Kansas City, Mo. Filed July 30, 1888. Serial No. 281,474. (No model.)



Claim.—1. The combination, with a rotating table, of a vertical rotating power-shaft adapted to support and rotate said table, suspensory rods adjustably attached to said table, and a seat connected with said rods adapted to rotate in unison with said table, as described.

2. The combination, with a rotating table provided with supporting-guides on its under portion, of a vertical power-shaft adapted to rotate and support said table, suspensory rods adjustably attached to and beneath said table in said guides, and a vibrating seat or seats attached to said rods and rotating with said table, as described.

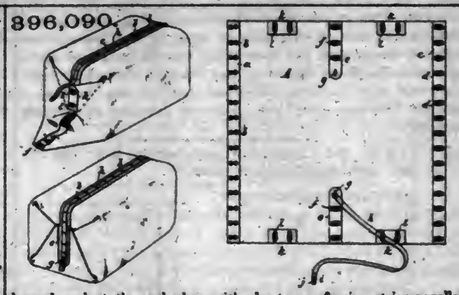
3. The combination, with a rotating table provided with supporting-guides on its under portion, of a vertical power-shaft adapted to support and rotate said table, suspensory rods adjustably attached to and beneath said table in said guides, a seat pivotally attached to said rods, and a counterbalancing-weight attached to said seat, for the purpose described.

396,090. SAMPLE PACKAGE OR WRAPPER. HENRY H. JOHNSON, New York, N. Y. Filed May 23, 1888. Serial No. 275,313. (No model.)

Claim.—1. A wrapper for sample and other packages, consisting of a sheet of flexible material provided at one edge with eyelets, at the opposite edge with staples arranged to pass through said eyelets when the edges are overlapped, and at one end edge with a strap so positioned that when the wrapper is folded the strap may pass through the staples, and at the other end edge with means for fastening and securing the free end of the strap, substantially as described.

2. A wrapper for sample and other packages, consisting of a sheet of flexible material having re-enforcing strips on its two side edges, one of said strips being provided with eyelets and the other with staples arranged to pass through said eyelets when the edges are overlapped, and at the end edges with short re-enforcing strips parallel with and intermediate the side strips, one of said side strips provided with a strap adapted to pass through the staples when the wrapper is folded, and the other end strip with means for fastening and securing the free end of the strap, substantially as described.

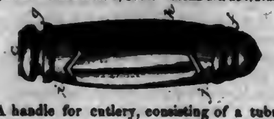
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3. A wrapper for sample and other packages, consisting of a sheet of flexible material provided at one of its side edges with a series of staples, at the opposite side edge and end edges with series of eyelets, said eyelets being relatively arranged to register with each other and with the staples when the wrapper is folded, and a strap secured near one end edge and arranged to lock the staples within the eyelets when the wrapper is folded, and a loop or eyelet in the free end of the strap for engaging a staple near the other end edge, substantially as and for the purposes described.

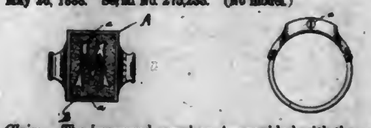
4. A wrapper for sample and other packages, consisting of a sheet of flexible material having re-enforcing strips *a e* on its side edges, in one of which is secured a row of staples and in the other a corresponding row of eyelets, re-enforcing strips *c c* at central points between the strips *a c* and parallel therewith, re-enforcing strips *k k* at the end edges intermediate the strips *a c* and *c c*, said strips *c* and *k* being provided with eyelets, and a locking-strap attached to one of the strips *c*, and adapted to pass through the staples when the wrapper is folded and be locked to a staple in the other strip *c*, substantially as described.

396,091. HANDLE FOR CUTLERY. FREDERICK R. KALDENBERG, New York, N. Y. Filed Dec. 9, 1887. Serial No. 257,472. (No model.)



Claim.—A handle for cutlery, consisting of a tubular shank or core provided with a flange at one end, and having a screw-threaded extremity fitting a threaded socket in an end section, and intermediate sections mounted on said shank to form a solid handle, as set forth.

396,092. GEM-SETTING. DAVID KUTNER, Brooklyn, N. Y. Filed May 26, 1888. Serial No. 275,233. (No model.)



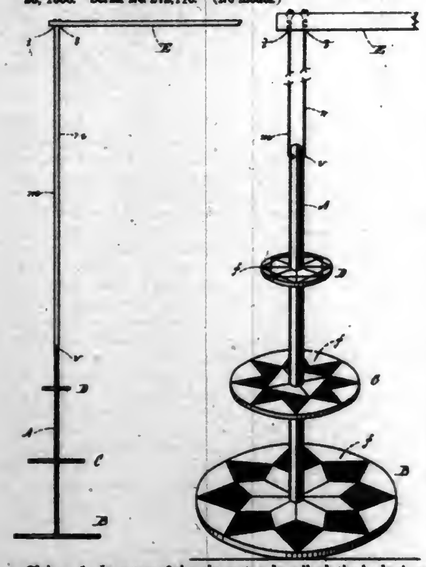
Claim.—The improved gem-box A, provided with the set-screws *a a*, terminating in the flattened portions *a' a'*, in combination with the gem B, provided with the slotted opening *b*, substantially as and for the purpose set forth.

396,093. HARROW-TOOTH. GEORGE A. LAKE, Sherman, Mich. Filed June 29, 1888. Serial No. 278,532. (No model.)



Claim.—The combination, with a harrow-frame, of the curved spring-teeth B, each of which has an upper nearly circularly bent portion, a downwardly and frontwardly curving lower end, and a curved shoulder above said lower end, whereby the teeth are prevented from entering the soil above said shoulders, and the frame is prevented from descending to the ground at any point, substantially as specified.

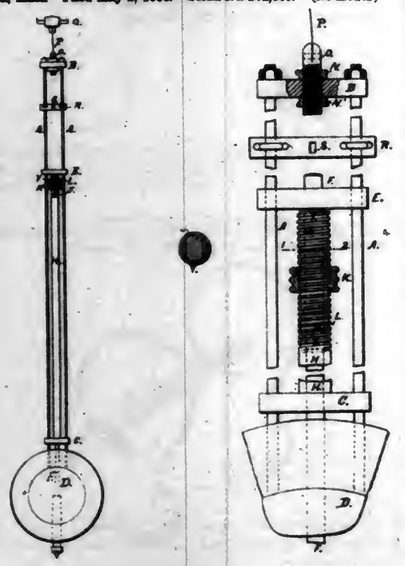
396,094. TOY. EBENEZER F. LANE, Swanzey, N. H. Filed Apr 28, 1888. Serial No. 272,110. (No model.)



Claim.—1. In a toy of the character described, the body A, provided with a series of wheels of different sizes arranged in regular gradation, as B C D, the stock E, and the double cord *m*, combined and arranged to operate substantially as set forth.

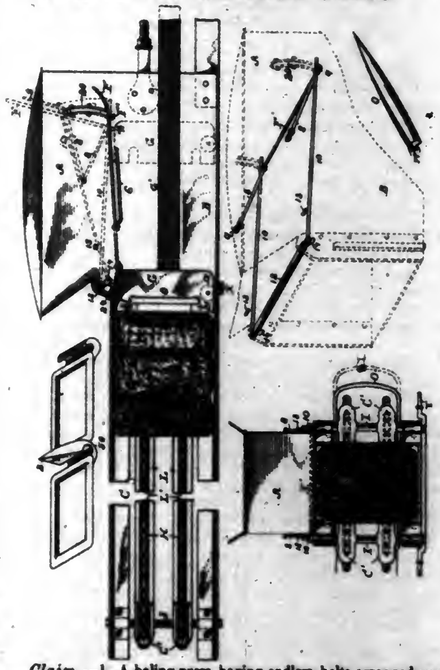
2. In a toy of the character described, a body, as A, provided with a series of graded wheels secured thereon, as B C D, said wheels being ornamented or provided with figures, &c., to adapt them to produce kaleidoscopic effects when rotated, in combination with a stock, as E, and a double string, as *m*, connecting said body and stock, all being arranged to operate substantially as specified.

396,095. COMPENSATION PENDULUM. ALVIN LAWRENCE, Lowell, Mass. Filed May 2, 1888. Serial No. 272,805. (No model.)



Claim.—In a compensation pendulum, the combination, with the screw-nut, of a segmental or slotted cylinder having screw-threads thereon, and a rod fitting within said cylinder and also having screw-threads thereon, the nut engaging the threads of both the cylinder and the rod whereby the cylinder and rod are connected together by said nut, substantially as described.

396,096. BALING-PRESS. WINFIELD S. LIVINGOOD, Kansas City, Mo. Filed Feb. 11, 1888. Serial No. 263,701. (No model.)



Claim.—1. A baling-press having endless belts arranged upon opposite sides of the baling-chamber, and provided with teeth which engage the material while being compressed, and also prevent it from moving backward when the plunger is withdrawn, substantially as described.

2. The combination of a baling-chamber, endless chains located upon opposite sides thereof, and provided with teeth for engaging the compressed material, and brakes for controlling the movement of the chains, as set forth.

3. In a baling-press, a baling-chamber provided with endless chains having laterally-projecting teeth which engage the compressed material during the passage through the chamber, substantially as described.

4. In a baling-press, a baling-chamber provided with endless chains traveling over sprocket-wheels, in combination with brakes for regulating the friction imparted to said wheels, substantially as described.

5. In a baling-press, a pair of levers pivoted at their rear ends to a horizontal bar, said horizontal bar arranged to be moved in a vertical plane, suitable fulcrums for said levers, and devices, substantially as described, for raising and depressing the free ends of said levers substantially as set forth.

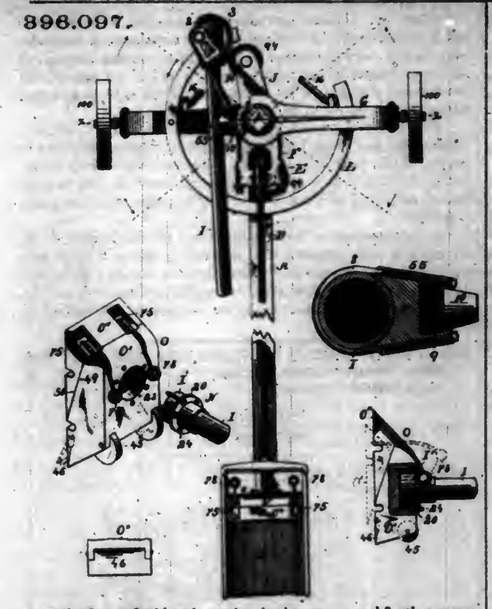
6. In a baling-press, a feeding-apron connected to a compressing plunger, in combination with a feed-hopper and a press-box, levers arranged on either side of the hopper, and having their rear ends connected to a horizontal bar which extends across the hopper, and which is movable in a vertical plane, suitable fulcrums for said levers, and devices, substantially as described, connected with said apron for raising the free ends of the levers, substantially as set forth.

396,097. BALING-PRESS. WINFIELD S. LIVINGOOD, Kansas City, Mo. Filed Mar. 9, 1888. Serial No. 266,743. (No model.)

Claim.—1. In a baling-press, a pitman-rod provided with a bumper consisting of a hard base, a rubber cushion, and metallic contact-piece located upon the outside of the rubber, in combination with a stirrup for securing them to the pitman, substantially as described.

2. In a baling-press, a plunger-head consisting of a main section, in combination with a counterbalanced section hinged to and hanging

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over the front of said main section, in the manner and for the purpose described.

3. In a baling-press, a plunger-head composed of two sections consisting of a main rear section attached to the pitman-rod and a counterbalanced upper section arranged to hang over the front face of said main section, in the manner and for the purpose set forth.

4. In a baling-press, a plunger-head consisting of a main section, in combination with a movable section hinged to and hanging over the front face of said main section, in the manner and for the purpose substantially as described.

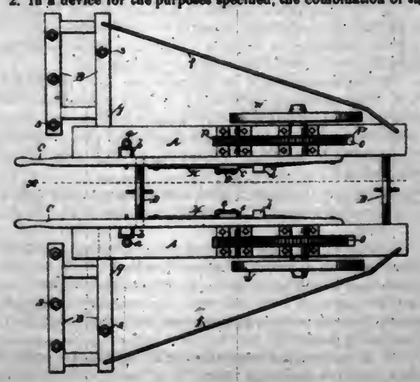
5. The combination, in a baling-press, of a plunger composed of two sections, as described, a scraper hinged to the front of the main section thereof, a counterbalanced section hinged above said scraper and to the main section, a swivel-jointed pitman-rod, and actuating mechanism, substantially as described.

6. In a horizontal baling-press, a reciprocating plunger composed of two parts, the forward upper end of the lower or main part being inclined upward and backward, and the rear side of the upper part correspondingly inclined and adapted to slide on the incline of the main part, substantially as described.

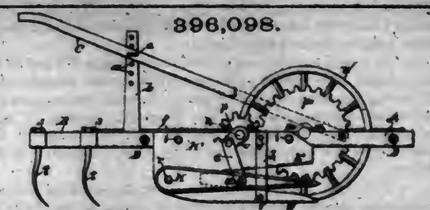
396,098. COMBINED STRAWBERRY-VINE CUTTER AND CULTIVATOR. GEORGE W. LOVE, Grayling, Mich. Filed Mar. 21, 1888. Serial No. 267,995. (No model.)

Claim.—1. In combination with the frame A, the transporting-wheel, the stationary forked cutting-blade H', the double-edged cutting-blade H, the pinions and intermediate parts coupling the pinions to the double-edged cutting-blade, and handles attached to the rails of the two-part frame, as and for the purposes specified.

2. In a device for the purposes specified, the combination of the

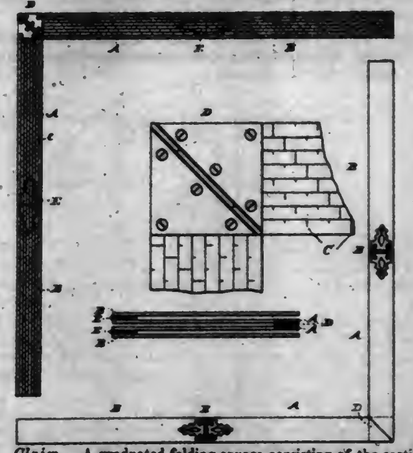


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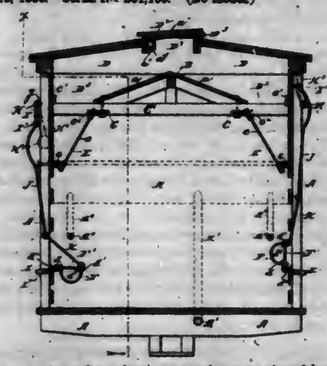
frames A, the rods D for adjusting said frames, the transporting-wheels, the pinions mounted on said frames, the forked cutting-blades H', the double-edged cutting-blades H, the mechanism coupling the blades H to the pinions P, the cultivators attached to the frame A, and handles for guiding the machine, as and for the purposes specified.

396,099. DRESS-MAKER'S SQUARE. KATIE A. LOVE, Clinton, Mo. Filed Apr. 26, 1888. Serial No. 271,977. (No model.)



Claim.—A graduated folding square consisting of the sections A B, the sections A, mitered at one end, the miter-hinge secured to the surface of the sections having its edges in line with the edges of the sections, and the strap-hinges securing the sections A B together and placed on the sides opposite the miter-hinge, substantially as specified.

396,100. STOCK-CAR. ALONZO C. MATHER, Chicago, Ill. Filed Jan. 18, 1888. Serial No. 261,109. (No model.)



Claim.—1. A stock-car having a continuous series of doors located centrally in and along the car-roof to form an unobstructed running board and give direct access to a feed-storage chamber located immediately beneath the car-roof, said chamber being provided with a floor of less width than the car and inclined from the center downward and outward toward openings D^2 on each side, and racks arranged below said openings along the sides of the car, substantially as described.

2. In a stock-car, the combination of the troughs F F, hinged to the sides of the car, the longitudinal rods H H, located along the sides of the car above said troughs and provided with levers H' H' and

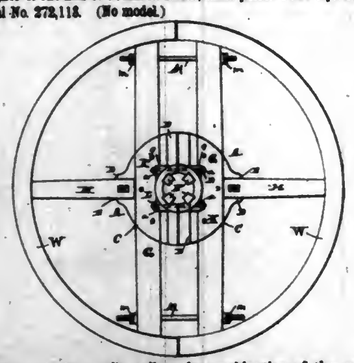
cranks I I, and the jointed rods J J and K K, connecting said cranks to the troughs, substantially as described.

3. In a stock-car, the combination of the troughs F F and F^6 F^6, the reservoir M, extending across one end of the car, the main pipe M', leading therefrom and passing beneath the car to the opposite end thereof, said pipe being provided with an upright extension, M^3, having branches M^3 M^3, leading to the troughs F^6 F^6, and the pipes M^4 M^4, leading from the reservoir to the troughs F F, substantially as described.

4. In a stock-car, the combination, with the doorways G G and feed-storage chamber D, of upwardly-folding racks having chains f^7 f^7 attached to their inner sides, the rods f' f' on the sides of the doorways, and the links f^8 f^8, substantially as described.

5. The combination, in a stock-car, of the feed-racks E E, made in sections and arranged along side of the car, below the chamber D, the said racks having doorway-sections, with vertical guide-rods f' f' and links f^3 f^3, for connecting the said doorway-sections to the rods f' f', and a series of chains, f f, for forming the rear side of the said doorway-sections, arranged as shown and described, and for purposes set forth.

396,101. SPLIT PULLEY. JOHN J. MCERLAIN, South Bend, Ind., assignor of one-half to Frank A. Baker, same place. Filed Apr. 26, 1888. Serial No. 272,113. (No model.)



Claim.—1. In a split pulley, the combination of the opposite flanged hub-sections with the parallel spoke-bars secured, respectively, to the flanges of the opposite sections, the rim-sections attached, respectively, to said bars, the spokes H, and the rods and nuts uniting said spoke-bars on opposite sides of the hub, all constructed and arranged substantially as and for the purpose described.

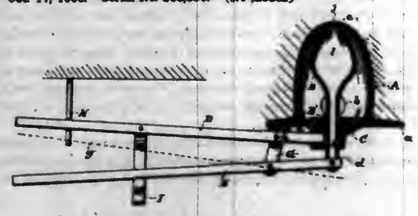
2. The combination of the opposite hub-sections having lateral channeled flanges with the parallel spoke-bars seated in said channels, the rim-sections, the bolts uniting said hub-sections, and the rods and nuts uniting the spoke-bars, all constructed and arranged substantially as and for the purpose described.

3. The combination, with the hub-sections having channeled flanges and the parallel spoke-bars seated in said channels, of the spokes attached to the flanges and extending at right angles to the spoke-bars, rim-sections attached to said bars and spokes, and the uniting bolts and nuts for the parts, all constructed and arranged substantially in the manner and for the purpose described.

4. The combination of the opposite hub-sections having lateral flanges with the spokes and spoke-bars secured to said flanges, the retaining-plates bolted to said flanges over the spokes and bars, the rim-sections, and the securing bolts and rods, all constructed and arranged substantially as specified.

5. The combination of the hub-sections having semicircular flanges provided at center with peripheral extensions and channeled, substantially as described, with the parallel spoke-bars, the spokes, the securing-plates, rim-sections, and uniting bolts and rods for the hub-sections and the spoke-bars, all constructed and arranged substantially as and for the purpose described.

396,102. TUYERE. BERNARD MCGRODER, Cleveland, Ohio. Filed Oct. 17, 1888. Serial No. 288,330. (No model.)

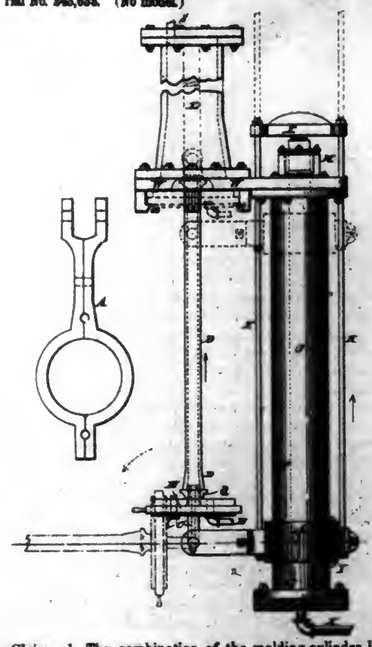


Claim.—1. A tuyere-iron consisting of the valves B C and levers D and E, in combination with the air-chamber constructed as described, with the said valve B adapted to the chamber and the opening e in the crown thereof, of the valve C having a seat in the base of said chamber and sliding upon the tubular stem of the valve B, arranged substantially as set forth, for the purpose described.

2. In combination with the levers D E, hollow valve B, having a tubular stem, and valve C, of the air-chamber, arranged as shown in relation to said valve B, of the guide I, secured to the lever D and inclosing the lever E, with projections *i* at the inside thereof, forming stops to arrest and hold said lever E at divers points within the guide, as set forth.

3. In a tuyere-iron, the combination of the air-chamber, a hollow valve, B, with a tubular stem, and having one or more air-passages in the apex of said valve, of the valve C, surrounding the tubular stem, and the levers D E, arranged in conjoint and operative relation with said valves, in the manner and for the purpose substantially as set forth.

396,108. MACHINE FOR FORMING SEAMLESS TUBES FROM PULP. HORACE J. MEDBERY, Ballston, N. Y. Filed July 7, 1887. Serial No. 243,633. (No model.)



Claim.—1. The combination of the molding-cylinder L, having inlet water-pipe S and outlet water-pipe M, the rubber bag secured at both top and bottom of the cylinder, the adjustable foraminated former D, with detachable head *d*, having water-outlets *m* in the same, the rotary adjustable locking-ring E, and the hooks *w*, substantially as and for the purpose described.

2. The grooved and perforated metal cylinder D, having groove *g*, the foraminated jacket *o*, of metal, the outer covering, O, of cloth, and the locking-key Q, fitting in the groove *g* and securing the said cloth covering, substantially as shown and described.

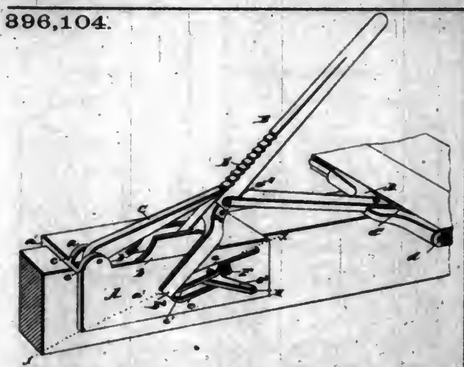
3. The combination of the hydraulic jack F G, cross-head I, rods K K, attached lifter A, surrounding the jack-cylinder, the molding-cylinder fixed to the upper end of the jack-cylinder, and the foraminated former D, with head *d*, and the hinge C, for connecting the former to the lifter, with an articulated joint, substantially as shown and described.

396,104. FLOOR-CLAMP. DELL B. MORRILL and FRANK S. MORRILL, Blackberry, Ill. Filed Mar. 13, 1888. Serial No. 267,105. (No model.)

Claim.—1. The combination of the case, the lever pivoted on the upper side of the same and having rack-teeth on its rear side, the clutch-bar pivotally connected to the front side of the lever, and the pawl pivoted at its lower end upon the upper side of the case, and having its upper end engaging the rack-teeth on the rear side of the lever, as set forth.

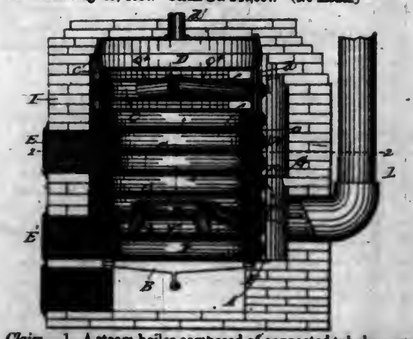
2. In a clamp, the combination, with the case composed of the plate *a* and two depending plates, *a'* *a'*, of the lever-handle pivoted to

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lugs on the plate *a*, and having the downward extension b^3, the semicircular dog having rearwardly-inclining teeth on its curved edge, and a forwardly-extending arm, c^3, and pivoted near said arm in a downwardly-inclined slot in the side of the case, and the coiled spring forcing the arm c^3 outward, substantially as specified.

396,105. STEAM-GENERATOR. CLARENCE C. MULFORD, Streator, Ill. Filed Aug. 15, 1887. Serial No. 247,007. (No model.)



Claim.—1. A steam-boiler composed of connected tubular water-rings, combined together substantially as described, whereby the space inclosed within said rings serves as a fire-box, combustion-chamber, and direct-draft flue, a portion of said rings being incomplete circles, forming an aperture or apertures opening directly into the fire-box, whereby direct access to the fire is afforded through a door, substantially as described.

2. The combination of a series of connected horizontally-arranged water-rings with a suitable dome, and flanges with openings between two or more of said rings, substantially as and for the purpose specified.

3. In a steam-generator, a boiler composed of horizontal water-rings, the upper two or three of which rings have vertical flanges at their meeting-points, which flanges are cut away at the rear of said boiler, substantially as and for the purpose specified.

4. The combination of a boiler composed of horizontal water-rings secured together substantially as specified, whereby a direct-draft flue is formed within said rings, and a dome placed upon said rings, with a jacket surrounding said boiler and inclosing a space which serves as a diving-flue, a horizontal partition dividing said diving-flue into an upper and lower flue, connections between said direct flue and diving-flue at the back of the boiler, connections between the upper and lower diving-flues at the front of the boiler, and the smoke-pipe at the back of the boiler, substantially as specified.

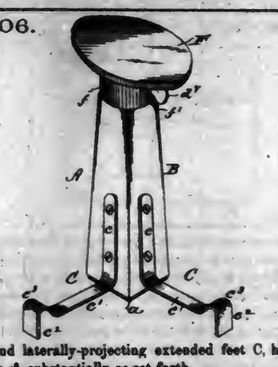
396,106. SHOE-MAKER'S ANVIL. PHILIP MURTHA, Philadelphia, Pa. Filed Aug. 20, 1888. Serial No. 283,229. (No model.)

Claim.—1. A shoe-maker's anvil, herein described, comprising a standard having at its upper end a set-screw and at its lower end laterally-projecting feet having curved or raised outer ends, and removable anvil-blocks secured to said standard by said set-screw, substantially as set forth.

2. A shoe-maker's anvil comprising a standard having at its upper end a set-screw, d^3, removable anvil-block F, and at its lower end a cushion, *a*, and laterally-projecting feet C, having raised or curved ends c^2, substantially as set forth.

3. In a shoe-maker's anvil, the combination of standard A, having at its upper end a bracket or clip, d^3, the anvil-block F, having socket *f* and vertical slot *f'*, a cushion, *a*, on the lower end of said

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standard, and laterally-projecting extended feet C, having raised or curved ends c^2, substantially as set forth.

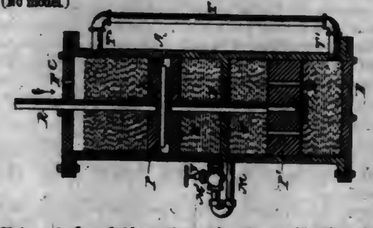
396,107. FLUID SPEED-REGULATOR FOR ELEVATORS. WILLIAM R. NICKERSON, Cambridge, Mass. Filed Sept. 21, 1888. Serial No. 285,996. (No model.)



Claim.—1. In a fluid speed-regulator, the combination of the cylinder A, the piston-rod D D', and the piston B, having opening *b b*, with the fluid-tanks C C', substantially as described, and for the purpose set forth.

2. In a fluid speed-regulator, the combination of the cylinder A and piston B, said cylinder A and piston B being adapted to admit of the passage of fluid from one side of the piston to the other, with the fluid-tanks C C', substantially as described, and for the purpose set forth.

396,108. FLUID SPEED-REGULATING DEVICE. WILLIAM R NICKERSON, Cambridge, Mass. Filed Oct. 22, 1888. Serial No. 288,804. (No model.)



Claim.—1. In a fluid speed-retarder, the combination of the cylinder A, divided by a diaphragm, D, into two chambers, and pipes leading from one chamber to the other, with two pistons, P P', and piston-rod R, all operating together substantially as described, and for the purpose set forth.

2. In a fluid speed-retarder, the combination of the cylinder A, divided by a diaphragm into two chambers, with pistons P and P', having passages through them, the piston-rod R, and pipe T, substantially as described, and for the purpose set forth.

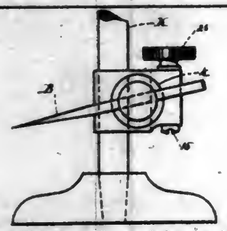
3. In a fluid speed-retarder, the combination of the cylinder A, divided by a diaphragm, D, into two chambers, with the pistons P P' and a pipe leading from one chamber to the other, having a valve to regulate the flow of fluid, substantially as described, and for the purpose set forth.

396,109. SURFACE-GAGE. CARL G. OSTMAN, Boston, Mass. Filed Sept. 6, 1888. Serial No. 284,669. (No model.)

Claim.—1. In a surface-gage, the combination of a body, a shaft journaled in said body and provided with an opening for receiving a pointer, a worm-gear on the shaft, provided with a pointer-groove, a worm in said body for actuating said gear, a nut on the shaft, whereby the pointer may be clamped onto said groove, and means for securing said body to a base or support, substantially as set forth.

2. In a surface-gage, the combination of a standard, a body provided with a clamping-arm for securing it to said standard, a shaft journaled in said body and arm and provided with a transverse opening for receiving a pointer, a worm-gear disposed on said shaft and

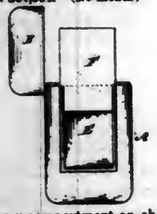
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fitted to revolve in said body, said gear being provided in its outer face with a transverse slot for receiving said pointer, a worm fitted to revolve in said body and rotate said gear, and a nut adapted to be turned onto said shaft, whereby said body may be clamped onto said standard and said pointer clamped against said worm-gear and prevent it from revolving on the shaft as the worm is turned, substantially as set forth.

3. In a surface-gage, the standard K, in combination with the body A, having the clamping-arm *p*, the shaft *m*, journaled in said arm and body, the pointer B, disposed in an opening in said shaft, the worm-gear *k*, fitted to rotate in said body and provided with a slot in which said pointer may rest, the worm 15, journaled in said body in engagement with said gear, and provided with the rosette 25, and the nut H, adapted to be turned onto said shaft, whereby said body may be clamped in position on said standard and said pointer clamped against said gear, substantially as described.

396,110. POCKET-BOX. GEORGE W. PARIS, Brooklyn, N. Y., assignor to Hiram Howard and Stephen C. Howard, Providence, R. I. Filed Oct. 8, 1888. Serial No. 287,551. (No model.)



Claim.—A box having a compartment or chamber for matches, having an inwardly-bent portion forming a compartment or chamber for postage-stamps closed at its ends, a sliding cover for the latter, a swinging cover for the match compartment or chamber, the said swinging cover extending across the said sliding cover when the compartments or chambers are closed, and stops for preventing the entire removal of the sliding cover, substantially as specified.

396,111. VETERINARY REMEDY. BAILY M. V. B. PRICE, Arroyo Grande, Cal. Filed Nov. 6, 1888. Serial No. 290,126. (No specimens.)

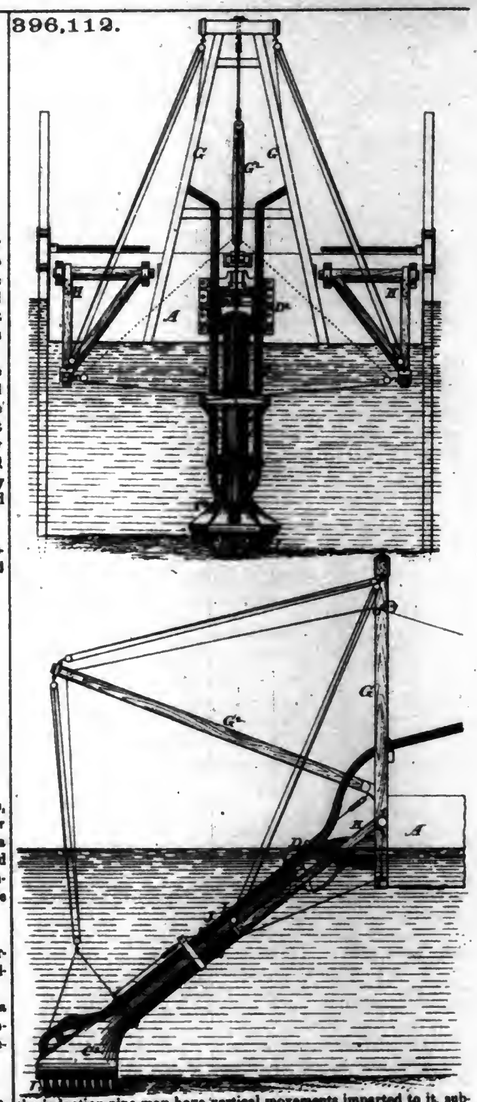
Claim.—The herein-described composition of matter, forming a medical compound, to be used in inoculating animals, which compound consists of equal parts of allium, (garlic-root,) phytolacca, (poke-root,) and asafetida, substantially as specified.

396,112. HYDRAULIC EXCAVATOR. WALTER P. RICE, Cleveland, Ohio. Filed June 4, 1888. Serial No. 276,042. (No model.)

Claim.—1. In hydraulic excavators, the combination, with a scow having a sluiceway, of an induction-pipe attached to the scow and leading into said sluiceway by means of a turn-table joint consisting of drum D^4, set in the frame D^4, and having trunnions d^3 d^3, playing in boxes *d d* on said frame, by which said induction-pipe may have imparted to it a side-swinging motion, substantially as and for the purpose specified.

2. In hydraulic excavators, the combination, with a scow having a sluiceway, of an induction-pipe attached to the scow and leading into said sluiceway by means of a turn-table joint, substantially as above described, and a second joint consisting of shell E, attached to a neck, D^4, of the drum D^3, and the shell F, hinged at E^2 to the shell E and having the induction-pipe C secured to said shell F, whereby





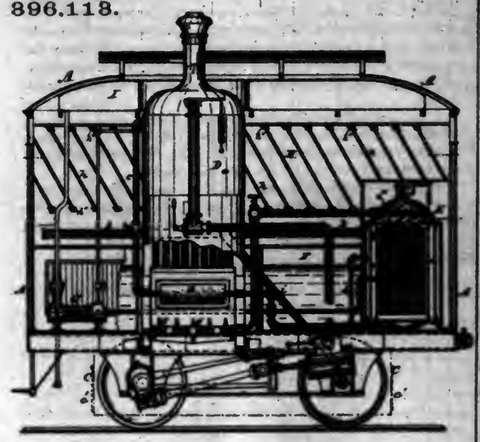
the induction-pipe may have vertical movements imparted to it, substantially as and for the purpose specified.

3. In hydraulic excavators, the combination, with the induction-pipe C, having the open foot C^3, of the pipes I J, leading into said foot C^3 from a force-pump on the scow, one of said pipes being curved and provided with a nozzle, K, and discharging into the axis of pipe C for inducing a current upward therein, and the other pipe curved and terminating in lower middle portion of the foot C^3, and provided with downwardly-projecting jet-nozzles N N, for disintegrating the earth, constructed and operating substantially as and for the purpose specified.

4. In hydraulic excavators, the combination, with a scow having a sluiceway provided therein, of an induction-pipe connected with said sluiceway by means of a turn-table joint, whereby said pipe is swung from side to side, a hinge-joint whereby it is also raised and lowered, pipes connected with force-pumps on the scow and leading into the foot, said foot having the plow-points and the nozzles, and a mechanism for imparting a swinging movement to the induction-pipe, all arranged to operate substantially as described, and for the purpose set forth.

396,113. STREET-LOCOMOTIVE. THOMAS ROBERTS, Baltimore, Md., assignor, by direct and mesne assignments, of one-half to John Stanley Frederick, John Carson, Mamie B. Gott, M. J. Kilroy, and William Dugdale, all of same place. Filed Nov. 28, 1887. Serial No. 255,890. (No model.)

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Claim.—1. In a street-locomotive, the condenser placed on the sides of the locomotives and provided with removable perforated plates or diaphragms to condense the exhaust-steam from the engines in a noiseless manner, as described.

2. In a street-locomotive, the combination of a boiler having a superheating device connected by pipes with a hydrocarbon-generator with one or more condensers provided with a series of removable perforated diaphragms and the perforated inlet-pipe for the exhaust-steam, all as specified.

3. In a street-locomotive, the boiler having a superheating device connected by a pipe to the hydrocarbon-generator with the inclined engines, the condenser having removable perforated plates and a perforated inlet-pipe for the exhaust-steam, and a water-tank under the roof, as shown.

4. In a street-locomotive, the boiler having a superheating device arranged in the furnace and connected to the hydrocarbon-generator, and the burners, as shown, with the engines and condensers having a series of removable perforated diaphragms and a perforated inlet-pipe for th exhaust-steam, arranged to produce a smokeless and noiseless locomotive, as specified.

5. In a street-locomotive, a boiler having a superheating device in the furnace and a series of hydrocarbon-burners for generating the steam, in combination with a hydrocarbon-generator, a pair of inclined engines arranged under the floor inclosed in a casing, and a condenser having a series of removable perforated diaphragms and perforated inlet-pipe for the exhaust-steam, a pump, and a tank under the roof for injection-water, all as specified.

6. In a street-locomotive or its equivalent, the combination of a boiler provided with a superheating device, *d*, and a series of hydrocarbon burners, with a generator, E, consisting of a casing having removable top and bottom, containing an inner casing with tubes, its upper tube-sheet provided with openings, and a perforated outlet-pipe for mixing the carbon vapors with the superheated steam, and a pair of inclined engines arranged under the floor, in the manner shown and described.

7. The combination of a boiler in which the steam is generated by burners with hydrocarbon vapors, and having a superheating device with one or more hydrocarbon-generators, a pair of engines, and one or more condensers provided with removable perforated diaphragms for condensing the exhaust-steam and producing a noiseless and smokeless locomotive, as and for the purpose set forth.

8. In street-locomotives, the combination of one or more condensers, H, having a series of removable perforated diaphragms, with a tank, I, for the condensing-water arranged above said condensers, a pump, G, and the feed-water tanks F, all arranged as shown and specified.

9. The street-locomotive herein described, consisting of the frame, the boiler D, having a superheating device, *d*, and the hydrocarbon-burners *g* for the generation of the steam, with the hydrocarbon-generator E, provided with tubes secured only at one end and free to expand and contract, a perforated outlet-pipe, *f*, for the vapors, the condensers H, tank I, pump G, feed-water tanks F, and engines B, inclosed in casing C, all constructed as shown and set forth.

10. The combination, in a street-locomotive, of a pair of inclined engines arranged under the floor of the locomotive and inclosed in a casing, as shown, with the condenser provided with removable perforated plates and a perforated inlet-pipe, and a generator, constructed as and for the purpose specified.

396,114. CIGAR-BOX. WILLIAM T. ROBERTSON, Montgomery, Ala. Filed Nov. 30, 1888. Serial No. 292,943. (No model.)



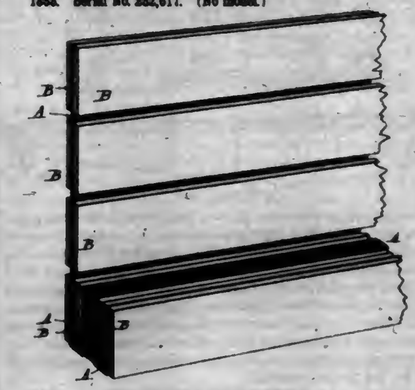
Claim.—1. In a receptacle, a false bottom, in combination with pliable bails adapted to lie wholly within the receptacle when not in use and to be bent over the upper edges of same when in use, in the manner and for the purpose substantially as described.

2. In a receptacle, a false bottom, in combination with pliable bails secured to the bottom and arranged to lock over the upper edges of the receptacle for holding the bottom at various heights, in the manner and for the purpose described.

3. The herein-described false bottom, provided with pliable metallic bails secured directly thereto, in the manner and for the purpose set forth.

4. The herein-described false bottom, provided with flat pliable metallic bails secured to its opposite sides, in the manner and for the purpose substantially as described.

396,115. INSIDE BLIND. CLARK ROBINSON, Hartley, Iowa, assignor of one-fourth to Moses J. Young, same place. Filed Aug. 13, 1888. Serial No. 282,617. (No model.)



Claim.—1. As an improved article of manufacture, the material herein described, comprising a flexible sheet and slats applied to opposite faces thereof, said slats being separated from one another a sufficient distance to permit their folding one upon the other.

2. In combination with the flexible sheet, the slats applied to both faces thereof directly opposite each other, those on the same face of the flexible sheet being separated from each other, substantially as shown, whereby the fabric may be folded upon itself.

396,116. METHOD OF DECORATING SURFACES. THOMAS ROBINSON, Cambridge, assignor to the Stalactite Decorative Company, Brookline, Mass. Filed Apr. 11, 1888. Serial No. 270,343. (No specimens.)

Claim.—1. The improved method of decorating metal, wood, and other surfaces herein described, the same consisting in spreading an acidulated pigment upon the surface to be decorated, and then applying a liquid hop extract to said pigment, as set forth.

2. The improved method of decorating surfaces, the same consisting in spreading an acidulated pigment upon the surface to be decorated, and then applying to said pigment a liquid hop extract containing a dissolved gum, as set forth.

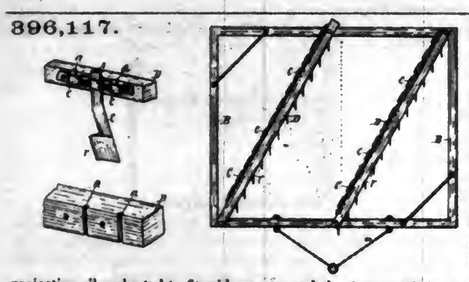
396,117. HARROW. CHARLES P. RUSSELL, Kalamazoo, Mich. Filed Apr. 30, 1888. Serial No. 271,274. (No model.)

Claim.—1. In a rectangular-shaped harrow-frame, the combination of the obliquely-placed tooth-bars D D, the mortises or grooves *a a* in said bars, and teeth with projecting ribs adapted to fit said mortises or grooves for preventing lateral displacement of the teeth, as shown and described.

2. In a rectangular-shaped harrow-frame, the combination of the tooth-bars D D, the mortises or grooves *a a*, the twisted ribbed teeth adapted to fit said grooves, and the continuous clip-plate for securing said teeth to bar D, as described and shown.

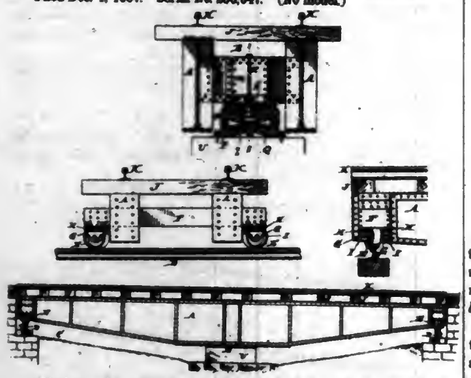
3. In a rectangular-shaped harrow-frame, the combination of the bars D D, having mortises or grooves *a a*, as shown, the teeth having

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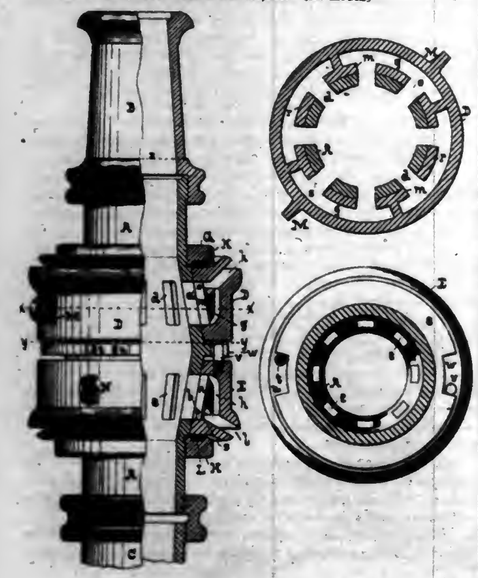
projecting ribs adapted to fit said grooves, and the share consisting of a diamond-shaped plate secured to said tooth, as shown and described.

396,118. TURN-TABLE. FRANCIS H. SAYLOR, Philadelphia, Pa. Filed Dec. 1, 1887. Serial No. 256,647. (No model.)



Claim.—In a turn-table, the combination, with the central pivoted support, of the main girders arranged to rest upon it without the interposition of adjusting-screws, beams, or struts F at each end of the main girders, said beams extending continuously across and on each side of the girders and being firmly riveted thereto, the trailing wheels having journal-boxes, and one or more movable plates interposed between the journal-boxes and the projecting ends of the beams F, so that each wheel can be independently adjusted without interfering with the solidity of its attachment to the table, all substantially as and for the purpose specified.

396,119. HOSE-NOZZLE. WALLACE STEBBINS, Baltimore, Md. Filed Oct. 17, 1888. Serial No. 288,349. (No model.)

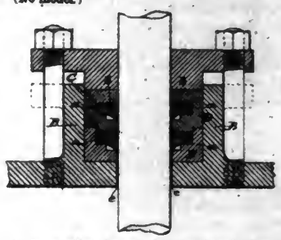


Claim.—1. In combination with a nozzle having a perforated conical face, a circumferentially-moving sleeve adapted to fit over the said face, having an annular chamber with apertures in its inner wall corresponding, practically, with those in the nozzle, and an angularly-directed outer escape-opening, substantially as and for the purpose specified.

2. In combination with a nozzle having two conical perforated faces separated by a flange, a pair of sleeves having annular chambers, with angularly-directed escape-openings, and inner perforated walls, substantially as and for the purpose specified.

3. In combination with a nozzle having a perforated conical face, a sleeve adapted to fit over the said conical face, having an annular chamber and a perforated inner wall, a flange on the said nozzle, and a pin projecting from the said sleeve into a notch in the said flange, substantially as and for the purpose specified.

396,120. METALLIC PACKING FOR STUFFING-BOXES. WILLIAM W. ST. JOHN, Brooklyn, N. Y. Filed Sept. 12, 1887. Serial No. 249,439. (No model.)

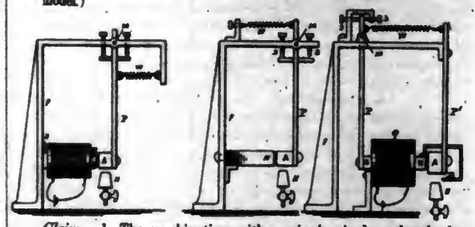


Claim.—1. In stuffing-boxes, the sectional rings *a*, provided at their contact-surfaces with a bevel side, *c*, for forcing it against the rod, and a rectangular recess for the ring *b* on its outer side, and arranged in a receptacle having rings D B C, into which said rings *a* and *b* fit, all as and for the purpose set forth.

2. A stuffing-box consisting of the rings C D E, of the cross-section shown, to receive the sectional rings *a*, having one side beveled, as at *c*, and provided with a recess to receive the rectangular rings *b*, all arranged as shown and herein specified.

3. In stuffing-boxes, the counterbored rings C D E, of the cross-section shown, in combination with the rings *a*, having the bevel *c* on one side and the recess for the rings *b*, all constructed as shown and set forth.

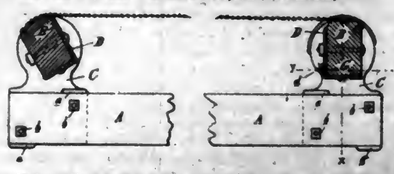
396,121. THERMO-MAGNETIC MOTOR. NIKOLA TESLA, Smiljan, Lika, Austria-Hungary. Filed Mar. 30, 1886. Serial No. 197,115. (No model.)



Claim.—1. The combination, with a swinging body under the influence of magnetism, of a burner or other source of heat acting to vary the magnetism, and a spring or other power to move the swinging body in the opposite direction to the action of the magnetism, substantially as set forth.

2. The combination, with two or more armatures connected to each other, of magnets to influence such armatures, and burners or other sources of heat to vary the magnetic action and cause the armatures to move, substantially as set forth.

396,122. COMBINED CORNER-IRON AND TIGHTENING DEVICE FOR WIRE MATTRESSES. CHARLES H. TRIPHAGEN, Portland, Mich. Filed Mar. 27, 1888. Serial No. 268,624. (No model.)



Claim.—The combination, with the side and cross bars of a mattress-frame, of the sets of brackets C, provided with flanges *a* and set-

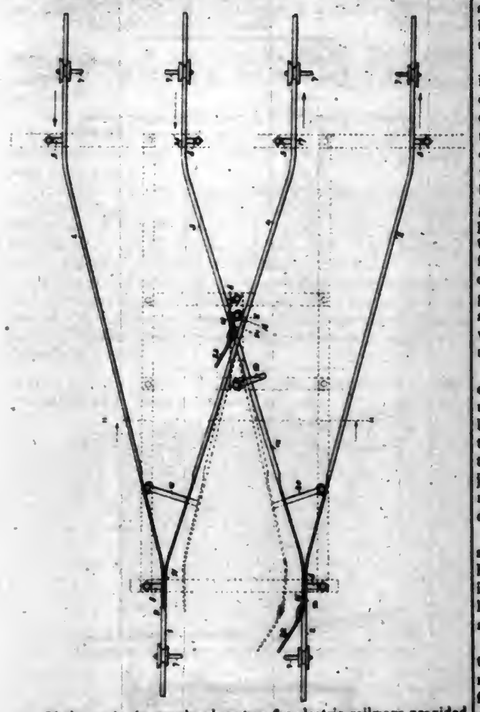
cured to said side bars, the set of brackets at one end of the frame being provided with the corner-irons, to which the cross-bar B is secured, the brackets at the opposite end of the frame provided with adjusting-holes, and the cross-bar journaled therein and having the locking-latch G, which engages the adjusting-holes, substantially as described.

396,123. KEY-HOLE GUARD. CHARLES R. UHLMANN, Peoria, Ill. Filed May 2, 1888. Serial No. 272,615. (No model.)



Claim.—The combination, with the lock-case A, having its edge wall notched to a suitable depth and provided with integrally-formed lugs C H, of the sliding key-hole guard E, provided with the recess J, adapted to receive the lug H, the guard-actuating stud E', formed integrally with the guard and projecting through the notch in the edge wall of the case, the spring-actuated stud F, projecting from the guard E against the lug C, and the removable side plate, K, resting upon the guard E and stud E', retaining them in position, substantially as set forth.

396,124. SUSPENDED SWITCH FOR ELECTRIC RAILWAYS. CLARK H. WELLS, Kansas City, Mo. Filed Apr. 26, 1888. Serial No. 271,825. (No model.)



Claim.—1. An overhead system for electric railways provided with traveling trolleys and depending motor-connections, and consisting of main conductors carrying currents of opposite polarity, two pairs of branch conductors, the outer members of which form continuations of the main conductors, and the inner members being connected to said main conductors by an automatic switch provided with flexibly-supported end sections normally in contact with said main conductors, but adapted to be swung aside to permit the passage of trolleys traveling in either direction, substantially as described.

2. An overhead system for electric railways provided with traveling trolleys and depending motor-connections, and consisting of main conductors carrying currents of opposite polarity, two pairs of branch conductors, the outer members of which form continuations of the main conductors, a swinging bracket supporting the free end of one of the inner branch conductors and holding it normally in contact with one of the main conductors, said main conductor and free end being flattened at their surfaces of contact, and said free end rising gradually from its point of contact to the point where it crosses the plane of the other branch conductor, a movable switch-section flattened at its opposite ends and forming a lap-joint with the flattened free end of the other branch conductor and with the remaining main conductor, said free end and said movable switch-section being each provided with a gravitating guide-arm for shifting the switch-section, and swinging brackets normally holding said switch-section in contact with the said latter branch and main conductors, substantially as described.

3. An overhead system for electric railways provided with traveling trolleys and depending motor-connections, and consisting of main conductors carrying currents of opposite polarity, two pairs of branch conductors, the outer members of which form continuations of the main conductors, a swinging bracket supporting the free end of one of the inner branch conductors and holding it normally in contact with one of the main conductors, said free end rising from its point of contact with the main conductor to the point where it crosses the plane of the other branch conductor, and a movable switch-section connecting the free end of said latter branch conductor with the remaining main conductor, and swinging brackets normally holding said switch-section in contact with the latter branch and main conductors, substantially as described.

4. An overhead system for electric railways provided with traveling trolleys and depending motor-connections, and consisting of main conductors carrying currents of opposite polarity, two pairs of branch conductors, the outer members of which form continuations of the main conductors, a swinging bracket supporting the free end of one of the inner branch conductors and holding it normally in contact with one of the main conductors, said free end rising gradually from its point of contact with the main conductor to the point where it crosses the plane of the other branch conductor, a movable switch-section connecting the free end of the other branch conductor with the remaining main conductor, said free end and said movable switch-section being each provided with a gravitating guide-arm, and swinging brackets normally holding said switch-section in contact with the said latter branch and main conductors, substantially as described.

5. An overhead system for electric railways provided with traveling trolleys and depending motor-connections, and consisting of main conductors carrying currents of opposite polarity, two pairs of branch conductors, the outer members of which form continuations of the main conductors, a swinging bracket supporting the free end of one of the inner branch conductors and holding it normally in contact with one of the main conductors, said main conductor and free end being flattened at their surfaces of contact, and said free end rising gradually from its point of contact to the point where it crosses the plane of the other branch conductor, a movable switch-section flattened at its opposite ends and forming a lap-joint with the flattened free end of the other branch conductor and with the remaining main conductor, said free end and said movable switch-section being each provided with a gravitating guide-arm for shifting the switch-section, and swinging brackets normally holding said switch-section in contact with the said latter branch and main conductors, substantially as described.

6. An overhead system for electric railways provided with traveling trolleys having depending motor-connections, and consisting of main conductors and two pairs of branch conductors, the outer members of said pairs forming continuations of the main conductors, and the inner members crossing the one above the other at the switch, the lower one being provided at the point of crossing with a separable joint normally closed, but permitting the passage of the depending motor-connection of a trolley upon the upper branch, substantially as described.

7. In an overhead system for electric railways of the kind described, the combination, with a movable switch-section, of an obliquely-hinged gravitating guide-arm adapted thereby to fall normally in the path of a trolley advancing toward the branch from the main line, but to be thrown out of obstructive engagement by the trolleys advancing in the opposite direction, substantially as described.

8. In an overhead system for electric railways provided with trolleys and depending motor-connections, the combination, with a main conductor, of a branch and a swinging hanger supporting the free end of the branch and normally holding it in contact with said main conductor, and a gravitating obliquely-hinged guide-arm attached to the free end of said branch and projecting into the path of movement of a trolley advancing along the main conductor, substantially as described.

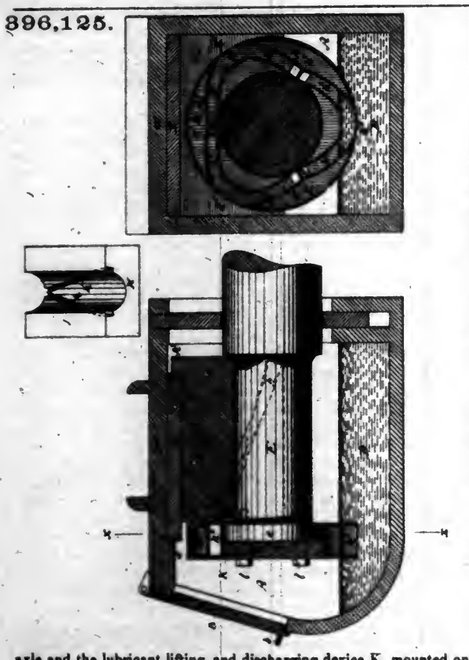
396,125. CAR-AXLE LUBRICATOR. HENRY P. WEST, Gloucester City, N. J. Filed Apr. 10, 1888. Serial No. 270,190. (No model.)

Claim.—1. The lubricant lifting and discharging device K, in combination with the journal E of the axle, arranged as described, and for the purposes set forth.

2. The lubricant lifting and discharging device K, in combination with the journal E of the axle and the saddle H, having diverging channels formed in the body thereof, all arranged as described, and for the purposes set forth.

3. In a car-axle box, the combination, with the journal E, of the

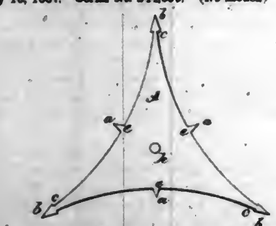
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axle and the lubricant lifting and discharging device K, mounted on said journal, means, as described, for holding the same in position thereon, and the saddle H, provided with diverging channels in the body thereof, whereby the lubricant elevated by said device may be uniformly distributed over the surface of the journal, all arranged as described, and for the purposes set forth.

4. In a car-axle box, the combination of the journal E of the axle, the lubricant lifting and discharging devices K, mounted on said journal, means, as described, for adjustably maintaining said devices in position on said journal, and the saddle H, having diverging channels in the body thereof, whereby the lubricant lifted by said devices may be distributed uniformly over the surface of the journal in both directions, as shown and described.

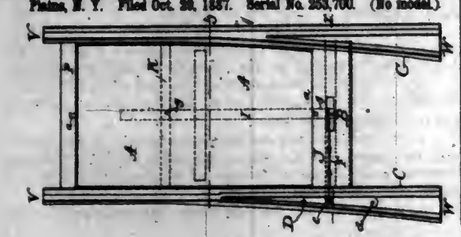
396,126. CORNER-SHIELD. HOWARD WHITE, Lansdowne, Pa. Filed July 18, 1887. Serial No. 244,659. (No model.)



Claim.—1. A triangular-shaped corner-shield with barbed or arrow-headed points, substantially as shown, for the purpose specified.

2. In a corner-shield consisting of a triangular plate of metal, the combination of points projecting from the edges, with barbed or arrow-headed points at its vertices and a screw-hole in its center, all substantially as set forth.

396,127. STREET-RAILWAY SWITCH. WILLIAM WHITE, White Plains, N. Y. Filed Oct. 29, 1887. Serial No. 253,700. (No model.)



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Claim.—1. In combination with a tilting platform, as A, a rock-shaft, as I, provided with a double-armed lever, as N, and a rocker-arm, as H, a rocker-arm, as G, said rocker-arms articulated together by a circular socket-joint, and a connecting-rod, as E, articulated to a vibrating tongue, as D, whereby said tongue is operated by the tilting of said platform, substantially as and for the purposes set forth.

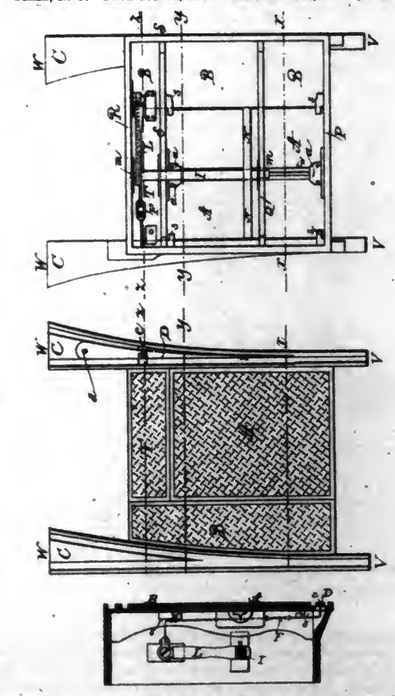
2. In a railroad tongue-switch, in combination with a tilting platform, a shaft, as I, an arm, as H, a yoke, as G, and a connecting-rod articulated to a movable tongue and provided with a turn-buckle, as F, for the adjustment of said parts, substantially as and for the purposes set forth.

3. A railroad tongue-switch provided with a tilting platform for operating its tongue, and a covered compartment outside of said platform between the rails containing working mechanism for operating said tongue, whereby access is obtained to the working parts through said compartment, substantially as and for the purposes set forth.

4. In a street-car switch, a movable tongue provided with a pivot, as *d*, re-enforced by a collar, as *p*, substantially as and for the purposes set forth.

5. In a street-car switch, in combination with a movable tongue and a connecting-rod for operating the same, a yoke, as G, an arm, as H, and a rock-shaft, as I, substantially as and for the purposes set forth.

396,128. STREET-RAILWAY SWITCH. WILLIAM WHITE, White Plains, N. Y. Filed Oct. 29, 1887. Serial No. 253,701. (No model.)



Claim.—1. In combination with a tilting platform, as A, a rock-shaft, as I, provided with a double-armed lever or beam, as N, and an arm, as L, having within a socket therein a spring, as J, and a follower, as K, a bell-crank, as G, a bar-spring, as *c*, and a connecting-rod, as E, united to said crank by said spring and articulated to a vibrating tongue, as D, whereby said tongue is operated by the tilting of said platform, substantially as and for the purposes set forth.

2. In a movable-tongue switch, a bell-crank, as G, having one arm adapted to receive a spring, as *c*, and another arm adapted to receive the reaction of another spring, substantially as and for the purposes set forth.

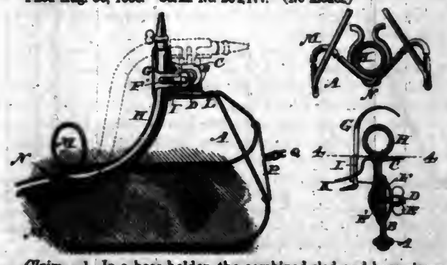
3. In a movable-tongue switch, a spring, as J, socketed within a vibrating arm, in combination with a follower, as K, substantially as and for the purposes set forth.

4. In a street-car switch, in combination with a movable tongue, a spring connecting-rod secured thereto for operating the same, substantially as and for the purposes set forth.

5. In a movable-tongue switch, a tilting platform or table provided with transverse and longitudinal braces, as O *w*, substantially as and for the purposes set forth.

6. In a movable-tongue switch, a stop or stops, as *s*, secured to the framing of the switch to limit the arc of vibration of the tilting platform, and provided with inclined grooves or gutters for rapidly conducting away any water falling upon and between said platform and adjacent parts of the switch box or framing, substantially as and for the purposes set forth.

396,129. HOSE-HOLDER. WARREN C. WILLITS, Denver, Colo. Filed Aug. 30, 1888. Serial No. 284,177. (No model.)



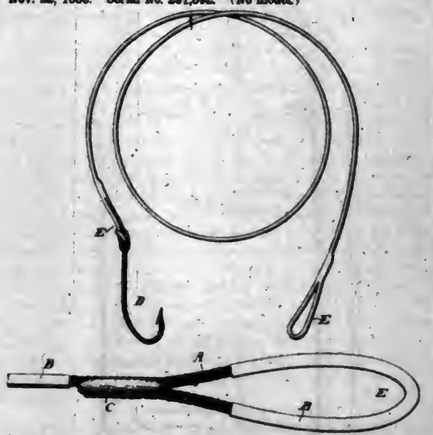
Claim.—1. In a hose-holder, the combined sled and hose-clamp, having a hose-supporter in front and formed of a single piece of metal bent around so as to form a hose-clamp in the rear, substantially as set forth.

2. In a hose-holder, the combined sled having a hose-supporter in front and formed of a single piece of metal bent around to form a hose-clamp in the rear, and a brace, S, from front to rear, substantially as set forth.

3. In a hose-holder, the combination of a standard composed of a fixed part, B, a movable part, C, pivoted thereto, and a vertically-sliding part, G, secured to the part C, and the spring-washer F and the extension K thereof engaging with the sliding part G for clamping the hose upon the part C, substantially as set forth.

4. The combination, with the runners of a hose-holder formed of bent wire or metal, of the pivoted standard B C, the vertically-adjustable slide G, and the spring-washer F and the extension K thereof engaging with the slide G for clamping the hose upon the part C, substantially as set forth.

396,130. SHELL. HUGH L. WILLOUGHBY, Newport, R. I. Filed Nov. 22, 1888. Serial No. 291,592. (No model.)

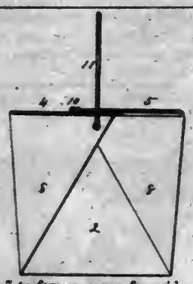


Claim.—In a shell for fishing-tackle, the combination of a wire cord and an exterior coating of celluloid or equivalent tough or elastic material, substantially as set forth.

396,131. OYSTER-BUCKET. HENRY L. R. WOLF, Dayton, Ohio. Filed July 23, 1886. Serial No. 209,706. (No model.)

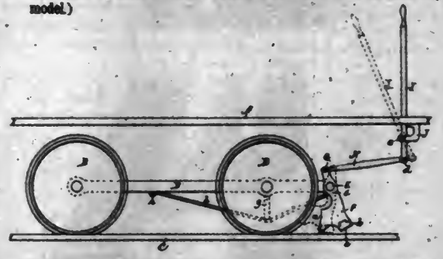
Claim.—The paper vessel having the bottom, the sides, and the ends with corner folds, as specified, provided with parts 4 and 5, and

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having folds 6 and 7 to form a cover for said vessel, substantially as shown and described.

396,132. BRAKE FOR CARS. JOHN YARRICK and EDWARD MEISTER, Philadelphia, Pa. Filed May 1, 1888. Serial No. 272,402. (No model.)



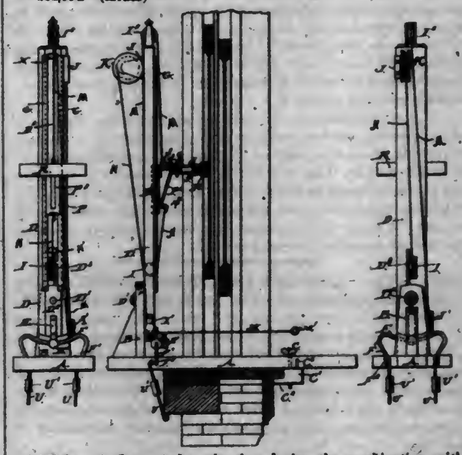
Claim.—1. The combination, with brake F, pivoted at E and adapted to engage with both the rail and wheel, of rods G and H and lever I, substantially as set forth.

2. The combination of frame D, brake F, and connecting and operating levers, substantially as described.

3. The combination, with the brake F, of the removable shoe *b*, substantially as described.

4. In the herein-described brake, the combination, with frame D, of rods *g* and *h*, substantially as and for the purposes set forth.

396,133. DEVICE FOR CLEANING WINDOWS. WILLIAM R. ZERR, Spring, Berks County, Pa. Filed Mar. 29, 1887. Serial No. 232,934. (Model.)

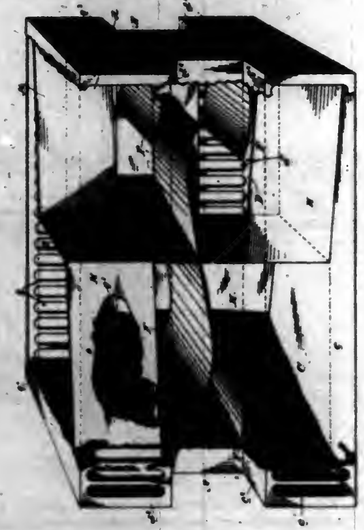


Claim.—1. In a window-cleaning device, the combination, with a base-piece having a standard at its outer end, of a post adjustably pivoted to said standard, a cross-head located in guides in the post, a rubber attached to the cross-head, an operating-cord secured to the top of said cross-head, and a separate cord secured to the bottom and attached to a spring-balance, all arranged and adapted to operate substantially as set forth.

2. In a window-cleaning device, the combination, with a cross-head guided in a vertical post secured to a base-piece, of two cords attached to opposite sides of said cross-head, one of which is adapted to raise said cross-head and the other is connected to a spring-balance and adapted to lower it, substantially as set forth.

3. In a window-cleaning device, the combination, with a vertical post provided with guideways, of a cross-head adapted to move in said guideways, and having a clamp for a suitable rubber pivoted horizontally to it, substantially as set forth.

396,134. VENTILATOR. PETER ABRAHAMSON, San Francisco, Cal. Filed July 27, 1888. Serial No. 281,940. (Model.)



Claim.—1. A ventilator for the walls of buildings, houses, apartments, &c., consisting of a box or case having a central partition dividing it into independent separate passages, each passage having an aperture on opposite sides and at different elevations, one communicating with the outside and the other with the inside, the apertures on the same level in the two passages being reversed with respect to the side with which they communicate, substantially as herein described.

2. In a ventilator for buildings, houses, apartments, &c., a box or casing having a central partition dividing it into two independent separate passages having on opposite sides and at different elevations an aperture communicating the one with the inside and the other with the outside, the apertures on the same level in the two passages being reversed with respect to the side with which they communicate, and the deflecting-plates within the passages for breaking up the draft, substantially as herein described.

3. In a ventilator, a box or case having a partition dividing it into independent separate passages, each passage having an aperture on opposite sides and at different elevations, one communicating with the outside and the other with the inside, the apertures on the same level in the two passages being reversed with respect to the side with which they communicate, the side extensions for each aperture, and the plates H within the extensions, whereby the passages are kept separate, substantially as herein described.

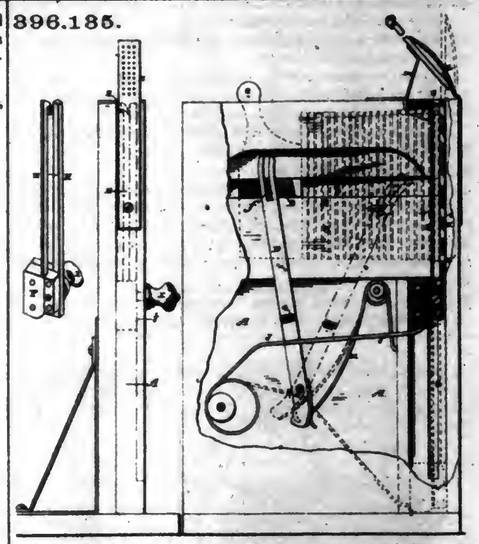
396,135. MATCH-SAFE AND AUTOMATIC LIGHTER. FRANK S. BALLARD, Burlington, Vt. Filed Apr. 21, 1888. Serial No. 271,373. (No model.)

Claim.—1. In a match-box, the combination, with a case adapted to receive a card or block of matches, of a spring-actuated slide for forcing the matches forward, a vertically-moving base, a knife secured thereto which passes between the matches and severs them as it is forced down, and a follower which is adapted to descend below the matches and to force them outward when it ascends, substantially as described.

2. In a match-box adapted to receive a card of matches, the combination of a spring-actuated slide for forcing the matches forward, a vertically-moving base, a follower for forcing the matches out of the box, secured thereto at its lower end, and a vertically-moving knife for severing the matches placed inside of the follower the width of a match, whereby it is in the proper position to sever it when forced down, substantially as shown.

3. In a match-box, the combination, with the case provided with grooves in one edge thereof, of the base, follower, and knife moving therein, the spring-actuated slide for forcing the matches forward, and a spring which engages the base and forces it upward when released, the knife and the follower being secured to the base at their lower

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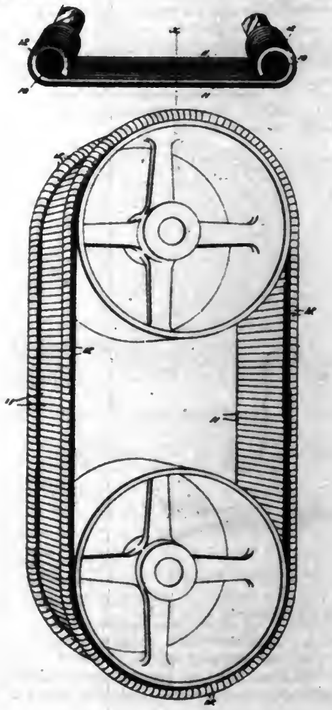


ends, whereby they both move together in their proper relative positions, substantially as set forth.

4. In a match-box adapted to receive matches and automatically force them out lighted, the combination of a spring-actuated slide for feeding the matches forward, a spring-actuated follower for forcing them upward out of the box, the spring-lighter L, and the spring *m*, both secured to the case at their lower ends, just above the exit of the match, and between which the match is held, substantially as specified.

396,136. CONVEYING-BELT. DANIEL BRENNAN, Jr., Salterville, N. J. Filed Jan. 6, 1888. Serial No. 259,942. (No model.)

Claim.—1. A belt consisting of a series of metallic strips having end loops strung side by side upon a pair of ropes, substantially as shown and described.



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2. The combination, in a belt, of endless ropes and a series of metallic strips having end-loops and arranged side by side throughout the length of the belt and having a plain inner or contact surface, substantially as shown and described.

3. The combination, in a belt, of a pair of endless ropes connected and held apart by flexible metallic transverse strips arranged side by side throughout the length of the belt and having looped ends encompassing the ropes, substantially as shown and described.

4. The combination, in a belt, of two ropes, and a series of abutting metallic connections between and spacing said ropes and provided with end loops encompassing, but not firmly clamping, said ropes, the said strips forming a contact-surface of practically unbroken continuity, substantially as shown and described.

5. The combination, in a belt, of a pair of ropes, and a series of metallic strips connecting said ropes and abutting each other, whereby the said strips form the entire contact-surface of the belt, and which contact-surface is of practically unbroken continuity throughout the length of the belt, substantially as shown and described.

6. In a belt, the combination, with two ropes, of juxtaposed connecting-strips provided with looped ends through which the ropes pass, and with upwardly-extending projections forming a continuous side flange along the belt, substantially as shown and described.

7. The combination, with a pair of endless ropes, of a series of transverse strips connected to and spacing said ropes, the strips being provided with end loops encompassing the ropes, the interior surface of the loops being convexed, substantially as described.

396,137. FOOT-SHIELD FOR PIANO AND ORGAN CASES. MAX R. BRENKMAN, New Haven, Conn. Filed Oct. 31, 1888. Serial No. 289,854. (No model.)



Claim.—1. The combination, with a shoe essentially U-shaped in cross-section, of a shield adapted to enter the said shoe, consisting of a padded body portion containing a pedal-recess in the bottom at each side of the center and a metal plate or stay, correspondingly recessed, attached to the body at the center thereof, substantially as shown and described, whereby the padded portion of the shield will extend a distance beyond each end of the stay, as and for the purpose specified.

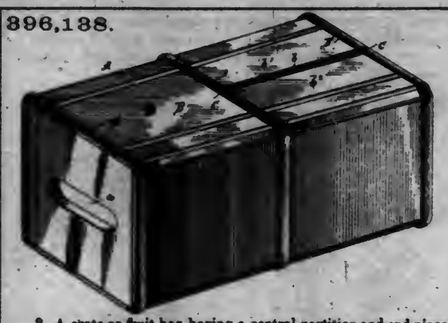
2. The combination, with the casing of a piano, organ, or similar instrument, and a shoe essentially U-shaped in cross-section attached to the bottom of the said casing at the center of the front, of a shield consisting of a body portion provided with a padded outer face and pedal-recesses in the lower edge, one at each side of the center, and a metal plate or stay correspondingly recessed secured to the outer face of the said body, substantially as and for the purpose specified.

3. The combination, with the front casing of a piano, organ, or similar instrument, and a shoe essentially U-shaped in cross-section, provided with apertures in its outer wall, attached at the center and bottom of the said casing, of a shield adapted to enter the said shoe, consisting of a body portion of wood or equivalent material having a padded outer face, which padding extends over the top and bottom, partially covering the back, and having pedal-recesses produced in the lower edge, one at each side of the center, a metal plate or stay of less length than the shield-body, correspondingly recessed and attached to the outer face of the said body, and screws or equivalent fastening devices passed through the apertures in the shoe into the said plate or stay, all combined for operation substantially as shown and described.

396,138. FRUIT-BOX. JOSEPH S. BROWN, Huntington, Fla. Filed Apr. 16, 1888. Serial No. 270,846. (No model.)

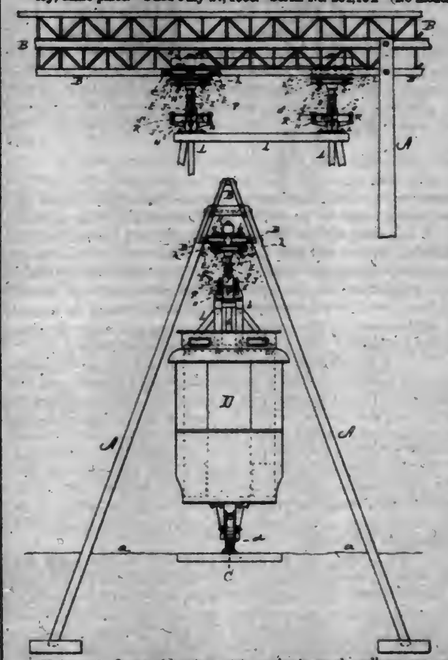
Claim.—1. A crate or fruit-box comprising a body, a partition intermediate of its ends, hoops encircling the body, one of said hoops passing around the partition, and a nail or similar retaining device passing through said hoop and entering the partition, and a cover having a longitudinal kerf-slit extending from one end of the box to the partition, substantially as and for the purpose described.

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2. A crate or fruit-box having a central partition and end pieces, hoops passing around the crate at the central partition and end pieces, and nails passing through the central partition and one of the end pieces, in combination with a slotted cover having its legs, formed by the slot, straddling the nails, whereby the cover may be withdrawn from the crate without removing the hoops, substantially as described.

396,139. SINGLE-RAIL RAILWAY. RUFUS H. BROWN, Peabody, Mass., assignor, by mesne assignments, of one-third to Frank W. Stanley, same place. Filed July 27, 1888. Serial No. 281,164. (No model.)



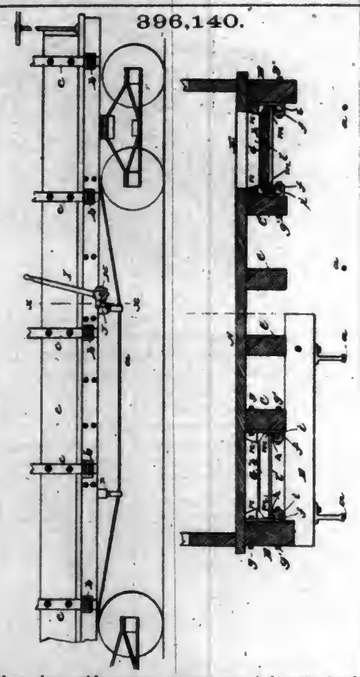
Claim.—1. In combination with a single-track railway-car and a trestle provided with a track, the following mechanism intermediate with the car and trestle, viz: wheels for running along the trestle-track, spring mechanism next said wheels for taking up rocking motion, springs next the rigid connections with the car for taking up rocking motion, and spring mechanism centrally located between the car and trestle for allowing vertical play, substantially as set forth.

2. The combination of the trestle provided with the track *c* and legs A, the wheels E, truck H H' H², axle *d*, and springs *h*, post I I', spring *g*, and block J, support K, pivots J', arms N P, and springs R, and the rigid connections L with the car, all substantially as and for the purpose described.

396,140. DUMPING-CAR. FERDINAND E. CANDA, New York, N. Y. Filed Mar. 9, 1888. Serial No. 266,674. (No model.)

Claim.—1. In a dumping-car having a substantially flat bottom or floor, and which dumps directly through one or more discharge-apertures in said floor, the combination, with said floor and the sills which support it on opposite sides of the discharge aperture or apertures therein, of the horizontally moving or sliding door or doors

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adapted to close said aperture or apertures below the level of the floor and arranged for support by said sills, substantially as specified.

2. In a dumping-car, the combination, with the car-floor and the sills which support said floor on opposite sides of one or more dumping or discharge apertures therein, of one or more horizontally-sliding doors adapted to close said aperture or apertures below the level of the floor and above the bottoms of the sills and arranged for support by and between the sills, and suitable operating mechanism for opening and closing said door or doors, substantially as specified.

3. In a dumping-car, the car-floor provided with a discharge-orifice, in combination with a horizontally-moving door to open and close said orifice, and constructed, in connection with its supports, to leave, when the dumping-orifice is closed, a free or open space between the edges of said door and its supports for the escape of small particles which could otherwise clog the door, essentially as described.

4. In a dumping-car, the combination, with a car-floor provided with a discharge-aperture, of beveled cleats fixed at the sides of the aperture and a horizontally-moving door arranged to operate below the beveled cleats and adapted to close the said discharge-aperture, substantially as specified.

5. In a dumping-car, the combination, with the car-floor A, provided with the discharge-aperture E, of the beveled cleats *n*, arranged at the side of the said aperture and below the car-floor, the horizontally-moving door G, provided with beveled edges, the bars or rails *h*, adapted to support the said door, and series of hooks or brackets *f*, secured to the car-sills and carrying the bars or rails *h*, substantially as specified.

6. In a dumping-car, the combination, with the horizontally-moving door G, of the door-supporting bars or rails *h* and the hooks or brackets *f*, the said door G being arranged with an intervening space between its edges and its supports for the escape of dust or particles which could clog the door, substantially as specified.

7. In a dumping-car, the combination, with the horizontally-moving door, of the metal cleats *l*, provided with angled ends *m*, and the supporting bars or rails *h*, substantially as specified.

8. The combination, with the horizontally-moving door G, of the metal cleats *l*, provided with angled ends *m*, the supporting bars or rails *h*, the hooks or brackets *f*, and the distance-pieces *i*, substantially as specified.

9. In a dumping-car, the combination, with the horizontally-moving door G, adapted to close the opening in the car-floor, of the plate *k*, secured to the upper surface of the said door, substantially as specified.

10. In a dumping-car, the combination of the car-floor A, provided with an aperture, E, the beveled cleats *n*, arranged at the sides of the aperture, the hooks or brackets *f*, the bars or rails *h*, the distance-pieces *i*, the horizontally-moving door G, provided with the metallic cleats *l* and with the metallic covering *k*, and suitable mechanism for operating the same, substantially as described.

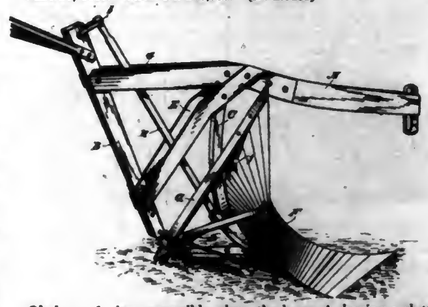
396,141. HEAD-PROTECTOR. GEORGE H. CHAPPELL, WILLIAM BROWN, and JOHN BROWN, Brownton, Minn. Filed May 8, 1888. Serial No. 273,174. (No model.)



Claim.—1. The head-protector herein shown and described, the same consisting of the ring A, sliding ribs or arms *h*, connected thereto, supports *c d*, shoulder-pieces *f*, and web and covering B C, substantially as described.

2. In a head-protector, the ring A, formed with ways *a*, in combination with the sliding plates *g* and the arms or ribs *h*, hinged thereto, substantially as described.

396,142. REVERSIBLE PLOW. JAMES A. COLE, Julian, Cal. Filed June 29, 1888. Serial No. 278,585. (No model.)



Claim.—1. In a reversible plow, the beam A, having a slotted rear end, *a*, and the forward and rear standards secured to the beam, in combination with the pivot-shaft mounted in the lower ends of the standards, the double mold-board and landsides on said shaft, the lugs *f* on the back of the mold-board, the locking-lever H, fulcrumed on the shaft, so as to move forward and back, and having an eye on its lower end for engaging the mold-board lugs, said lever passing upwardly through the slotted rear end of the beam, and a catch for securing it to the rear standard, substantially as described.

2. In a reversible plow, the beam A, having a slotted rear end, *a*, the rear standard and the forward standard secured to the beam, and the inclined slotted brace bolted to both standards and to the beam, in combination with the pivot-shaft mounted in the lower ends of the standards, the double mold-board and landsides on said shaft, the lugs *f* on the back of the mold-board, the locking-lever H, fulcrumed on the shaft, so as to move forward and back, and having an eye on its lower end for engaging the mold-board lugs, said lever passing upwardly through and guided by the slotted brace and the slotted rear end of the beam, and the pivoted catch on the upper end of the rear standard for engaging the upper end of the locking-lever, substantially as described.

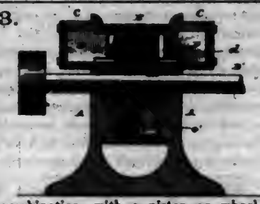
396,143. ROTARY ENGINE. WILLIAM C. CULBERTSON, Girard, Pa. Filed Mar. 1, 1883. Serial No. 265,833. (No model.)

Claim.—1. In a device of the kind described, a wheel or piston having inclined valve-operating grooves in its opposite faces.

2. The combination of a wheel or piston having inclined grooves in its opposite faces with heads having sliding valves working in said grooves, as set forth.

3. The combination, with a wheel or piston having inclined grooves in its opposite faces, of heads having valves adapted to work in said grooves and provided with base-flanges on one side thereof, as set forth.

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4. The combination, with a piston or wheel having inclined grooves in its opposite faces, heads having steam-chests, and sliding valves working in the grooves, of the wheel and exhaust-ports through heads back of the valves, substantially as set forth.

396,144. EYEGLASS-HOLDER. HENRY J. DALE, Chicago, Ill. Filed June 6, 1888. Serial No. 276,240. (No model.)



Claim.—An eyeglass-holder consisting of a body portion, a safety-pin substantially parallel with the body, an aperture or recess in the upper portion of the body, and a hook bent from the same piece of metal as the body of the holder, having its upper end bent downward and inward and shaped to fit in the recess in the upper portion of the body, substantially as described.

396,145. SAW-CLAMPING DEVICE. ROBERT F. DARLING, Seneca Falls, N. Y. Filed July 9, 1888. Serial No. 279,394. (No model.)



Claim.—1. The saw-vise jaws A A' *a a'*, having thereon the recessed stud or extension *c*, arranged for holding a pad against the saw, all made in one and the same piece, substantially as and for the purposes specified.

2. The saw-vise jaws A A' *a a'*, having thereon the extensions B B', all made in one and the same piece, in combination with the pivoted arms C C, provided at their free ends with movable or adjustable jaw-compressors, substantially as and for the purposes specified.

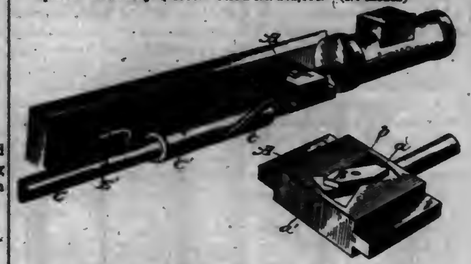
3. A saw vise or clamp in which the jaws and their supporting-arms are made in one and the same piece of cast metal, sufficiently flexible to permit the jaws to be clamped upon and released from the saw, and in which the said single or unitary part is combined with one or more clamps for temporarily clamping the saw between the jaws, substantially as and for the purposes specified.

396,146. LAMP-COVERING. GEORGE H. DEAN, St. Louis, Mo. Filed Jan. 10, 1883. Serial No. 260,326. (No model.)



Claim.—In a lamp-covering, the combination, with the concave halves forming a closed cover, of the hinge connecting the lower ends of the halves and the spring bearing on the halves at their hinged ends and holding them normally closed, substantially as set forth.

396,147. MECHANISM FOR CONVERTING MOTION. JOHN DE MORSIER, Corvallis, Oreg., assignor of one-half to John R. Bryson, same place. Filed May 4, 1888. Serial No. 272,801. (No model.)



Claim.—1. The mechanism for converting motion, comprising a swiveled or pivoted cam or lever, in combination with and engaging in opposite directions spiral grooves in a cylinder applied to a shaft, and means consisting of stationary or fixed cams for shifting or switching the pivoted cam, substantially as set forth.

2. In mechanism for converting motion, the combination, with the cross-head of an engine-piston provided with a swiveled or pivoted cam or lever, of a shaft carrying a cylinder provided with spiral grooves or channels, and means consisting of stationary or fixed cams for shifting or switching the said pivoted cam, substantially as set forth.

3. In mechanism for converting motion, the combination, with the piston cross-head carrying the pivoted or swiveled cam or lever, of the shaft carrying the cylinder, provided with grooves or channels spirally traversing the same and converging or meeting at opposite sides and ends thereof, and stationary or fixed cams for shifting or switching the pivoted or swiveled cam or lever, substantially as set forth.

4. In mechanism for converting motion, the combination, with the piston cross-head carrying the pivoted or swiveled cam or lever, consisting of a lower smaller portion provided with double beveled or pointed ends, and of an upper larger portion set in a recess in the cross-head, of the shaft carrying a cylinder provided with spiral grooves or channels converging or meeting at opposite sides and ends thereof, and fixed or stationary hook-shaped cams for switching or shifting the swiveled or pivoted cam or lever, substantially as set forth.

396,148. SUPPORT FOR SPINDLES AND RINGS OF RING-SPINNING MACHINES, &c. EDWARD DUNKER, Auburndale, (Newton,) Mass. Filed Aug. 3, 1887. Serial No. 246,075. (No model.)

Brief.—The spindle and its supports are so combined with the ring that the latter may have a lateral motion corresponding to that of the spindle.

Claim.—1. The combination, with a spindle, a spindle-bolster, and means for supporting said bolster in a yielding or flexible manner, of a ring, and connections between said bolster and ring, whereby the ring is caused to gyrate or vibrate with the bolster and spindle, substantially as specified.

2. The combination, with a spindle, a spindle-bolster, and means for supporting said bolster in a yielding or flexible manner, of a ring, and sliding connections between said bolster and ring, whereby the ring is caused to gyrate or vibrate with the bolster and spindle, substantially as set forth.

3. The combination of a fixed support, a spindle, a spindle-bolster, means for connecting said bolster with said fixed support in a yielding or flexible manner, a ring, sliding connections between said bolster and ring, and a rail movable in the direction of the length of the spindle and connected flexibly with said ring, substantially as set forth.

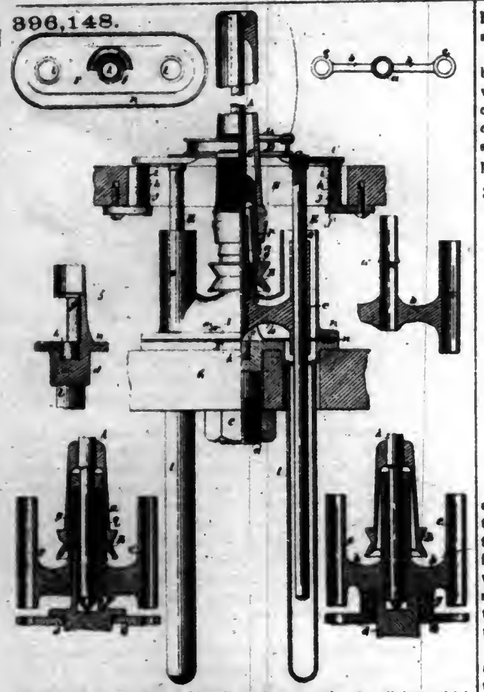
4. The combination, with a spindle, a spindle-bolster, means for supporting said bolster in a yielding or flexible manner, a ring, and sliding connections between said bolster and ring, whereby the ring is caused to gyrate or vibrate with the bolster, of a support or stand containing a chamber for oil inclosing the bolster and the bearings of said sliding connections, substantially as set forth.

5. The combination, with a spindle, a spindle-bolster, means for supporting said bolster in a yielding or flexible manner, a ring, and connections between said bolster and ring, whereby the ring is caused to vibrate or gyrate with the bolster, of a support or stand containing an oil-chamber inclosing the bolster, substantially as set forth.

6. The combination of a spindle, a yieldingly or flexibly supported spindle-bolster, rods adapted to move longitudinally and in the direction of the length of the spindle, bearings for said rods fixed to the spindle-bolster, and a ring fixed to said rods, substantially as set forth.

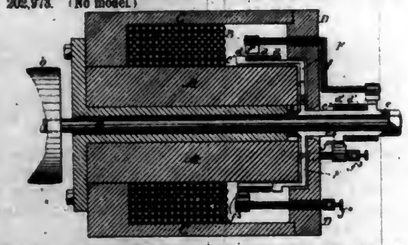
7. The combination of a spindle, a bolster therefor flexibly supported, rods adapted to move longitudinally and in the direction of the length of the spindle, bearings for said rods fixed to the spindle-

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bolster, a ring fixed to said rods, and receptacles for oil into which said rods extend, substantially as specified.

396,149. UNIPOLAR DYNAMO-ELECTRIC MACHINERY. RUDOLF EICKEMEYER, Yonkers, N. Y. Filed May 22, 1886. Serial No. 202,973. (No model.)



Claim.—1. In an electro-magnetic or magneto-electric machine, the combination, substantially as hereinbefore described, of a rotating armature provided with a series of independent radial bar-conductors, and outside conductors which couple the outer and the inner ends of the armature bar-conductors and couple said conductors in linear circuit.

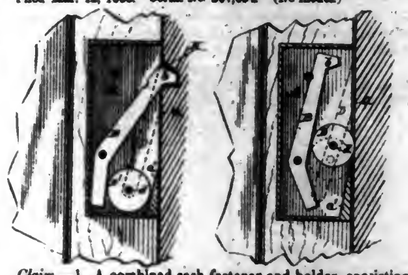
2. In an electro-magnetic or magneto-electric machine, the combination, substantially as hereinbefore described, of a rotating armature carrying a series of radial bar-conductors coupled in linear circuit by outside conductors, a magnetic shell affording annular coincident faces at right angles to the axis of the armature, and an exciting-helix housed within said shell for developing in said faces opposite polarity and affording between them an annular magnetic field for the reception of said radial armature-bar-conductors.

3. In an electro-magnetic or magneto-electric machine, the combination, substantially as hereinbefore described, of a rotating armature provided with a series of radial conductors and outside conductors which couple the outer ends of two or more of said armature-conductors with the inner ends of two or more other armature-conductors, and thus provide on said armature a linear electric circuit which at all points in its path includes two or more of said radial conductors.

4. In an electro-magnetic or magneto-electric machine, the combination, substantially as hereinbefore described, of an armature provided with a series of independent radial conductors and outside conductors, each in electric communication with four or more of said armature-conductors, and coupling said armature-conductors in a linear circuit which embraces in its path at all points two or more of said armature-conductors.

5. In an electro-magnetic or magneto-electric machine, the combination, substantially as hereinbefore described, of an armature provided with a series of independent radial conductors and a series of conducting-rings coupled in pairs to two or more of said armature-conductors, and a series of outside conductors communicating with said rings and affording a continuous circuit which embraces at all points in its path two or more of said radial conductors.

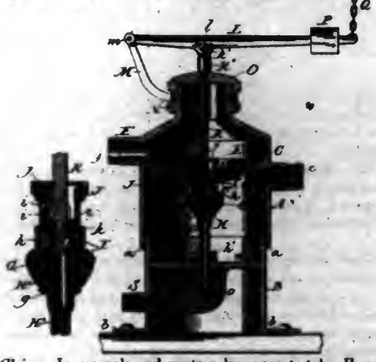
396,150. SASH-FASTENER. JOHN G. ERICKSON, Hadley, Minn. Filed Mar. 12, 1888. Serial No. 267,094. (No model.)



Claim.—1. A combined sash-fastener and holder, consisting in a casing having an opening in one side, an inclined locking-bolt within the casing and projecting, when thrown through said opening, to positively lock the sash when closed, a vertically and outwardly movable friction-holder, also in said casing in front of and below the bolt, whereby, when moved vertically, said friction-holder will retract and ride up said inclined bolt and be forced simultaneously outward thereby through the said opening in the casing to hold the sash open, substantially as set forth.

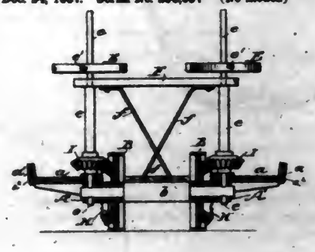
2. A sash-fastener comprising a casing having a side opening and a downward incline in the lower end of said casing, a bolt pivoted between its ends in said casing, and a disk working on said incline and against the lower end of said bolt to hold its upper end projected through the case-opening, substantially as set forth.

396,151. SUPPLY AND WASTE VALVE. RICHARD FIEN, Chicago, Ill. Filed Feb. 16, 1888. Serial No. 264,231. (No model.)



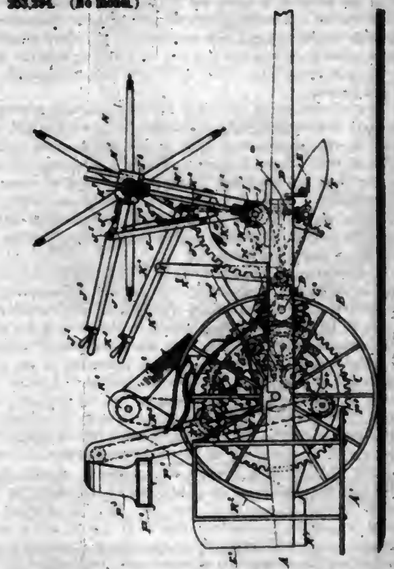
Claim.—In a supply and waste valve, a waste-tube, H, carrying a supply-valve seating upward, and a cage, J, above the supply-valve, in combination with a valve-stem, K, carrying a waste-valve, I, located in the cage J and seating downward to close the waste-tube H for simultaneously opening and closing the valves, substantially as specified.

396,152. CORN-CUTTER. GEORGE W. GIBSON, Kimbolton, Ohio. Filed Dec. 24, 1887. Serial No. 258,987. (No model.)



Claim.—The combination, with the machine-frame A, having the forward axle, *b*, the body being square and at its ends round and having vertical apertures within the side bars of the frame, wheels B, turning on said round ends of the axle and provided with gears H, and the side tables, *a a*, having fixed knives D, of the vertical shafts *e e*, extending at their lower ends down through the apertured side bars of the frame and the apertures in the axle, the gears I on the lower ends of the said shafts meshing into gears H, and the reels E on their upper ends, the cross-bar F, supporting the upper ends of shafts *e*, and the brace-bars G *f*, supporting said bar, the former from the rear of the frame and the latter from the forward axle, substantially as set forth.

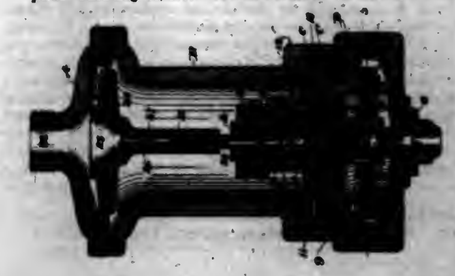
396,153. COMBINED HARVESTER AND THRASHING-MACHINE. LESTER A. GILLETT, Leonardville, Kans. Filed Oct. 26, 1887. Serial No. 253,294. (No model.)



Claim.—1. The combination, with a swinging frame carrying the cutter-bar and the endless carrying-belt, of a link connected with said swinging frame, a lever carrying said link, a lever-pawl pivoted on said swinging frame, a fixed notched segment engaged by said lever-pawl, and means, substantially as described, for connecting said lever-pawl with the handle end of said lever, so as to enable the operator to raise and lower the swinging frame and lock the same in position, substantially as shown and described.

2. The combination, with the swinging frame F, of the link K^{10} pivotally connected with the swinging frame F, the arm K^7, mounted on the main frame, the lever K^6, fulcrumed on the arm K^7 and pivotally connected with the link K^{10}, the hand-lever K^5, fulcrumed on said lever K^6, the link K^4, connected with the hand-lever K^5, the bell-crank lever K^3, fulcrumed on the end of said lever K^6 and connected with the link K^4, the link K^2, connected with said bell-crank lever K^3, the lever-pawl K, connected with said link K^2 and pivoted on said swinging frame F, and the fixed segment K', provided with notches in which said lever-pawl K engages, substantially as shown and described.

396,154. VALVE FOR FLUID-PRESSURE BRAKES. HERMAN GUHL, St. Louis, Mo., assignor to the American Brake Company, same place. Filed Aug. 21, 1888. Serial No. 283,333. (No model.)

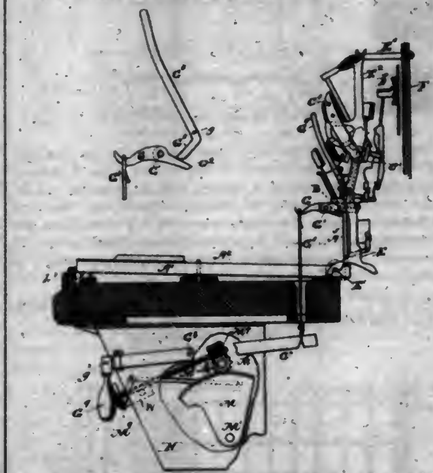


Claim.—1. In a valve for fluid-pressure brakes, the combination of a balanced valve having ports leading to the reservoir and cylinder, a secondary valve having ports leading from the reservoir and balanced valve, and an exhaust-port, a diaphragm-chamber which communicates with the train-pipe, and a diaphragm connected with the secondary valve, and having a leak-port which is constantly open, substantially as and for the purpose specified.

2. In a valve for fluid-pressure brakes, the combination of a balanced valve having ports leading to the reservoir and cylinder, a secondary valve whose stem is of less cross-sectional area than the valve, ports leading from the auxiliary reservoir to the secondary-valve chamber and to the balanced valve, an exhaust-port for the secondary-valve chamber, a diaphragm-chamber connected with the train-pipe, and a diaphragm connected with the secondary valve and having a leak-port, substantially as and for the purposes specified.

3. The combination, with the valve-stem 18, of the perforated annular plug or gland 14 and the pin 19, substantially as and for the purposes specified.

396,155. PIANO-FORTE. FRANCIS W. HALE, Boston, Mass. Filed May 7, 1888. Serial No. 273,102. (No model.)



Claim.—1. In a piano-forte, the combination of the hand-lever G^3 G^7, rod G^2, and lever G, having an extension, G^4, adapted to lift the levers B and to throw forward the upper end of the lever G^3 G^4, with the hammer-stem rail C^9, substantially as described, and for the purpose set forth.

2. In a piano-forte, the combination of the key A', sticker L^3, and lever L, with the link L^4, lever L^5, cord L^7, and spring L^9, all operating together substantially as described, and for the purpose set forth.

3. In a piano-forte, the combination of the key A', sticker L^3, lever L, link L^4, lever L^5, cord L^7, and spring L^9, with swinging segment mechanism M M^2 M^3, all operating together substantially as described, and for the purpose set forth.

4. In a piano-forte, the combination of the lever L, link L^4, lever L^5, cord L^7, and spring L^9, with the resisting-bar L^8, spring L^{11}, and rocker L^{12}, substantially as described, and for the purpose set forth.

5. In a piano-forte, the combination of the segment M, link L^{16}, crank-arm L^{15}, shaft L^{14}, arm L^{13}, and rod L^{20}, with the resisting-bars L^8, all operating together substantially as described, and for the purpose set forth.

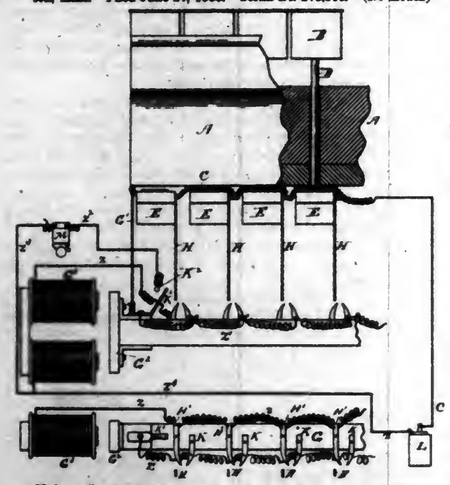
6. In a piano-forte, the combination of the key A', sticker L^3, lever L, and click-striker L^{16}; with the spring-plate P' P^2 P^3 P^4 and the contact-hook P^5 P^6, adapted to make and break an electric circuit, substantially as described, and for the purpose set forth.

7. In a piano-forte, the combination of the click-striker L^{16} and spring-plate P' P^2 P^3 P^4 with the contact-hook P^5 P^6, adapted to make and break an electric circuit, substantially as described, and for the purpose set forth.

8. In a piano-forte, the combination of the key A', sticker L^3, lever L, and click-striker L^{16}, with the spring-plate P' P^2 P^3 P^4 and spring-brace R, adapted to make and break an electric circuit, substantially as described, and for the purpose set forth.

9. In a piano-forte, the combination of the click-striker L^{16} with the spring-plate P' P^2 P^3 P^4 and spring-brace R, adapted to make and break and electric circuit, substantially as described, and for the purpose set forth.

396,156. ATTACHMENT FOR PIANOS. FRANCIS W. HALE, Boston, Mass. Filed June 27, 1888. Serial No. 278,368. (No model.)



Claim.—In connection with a piano-forte action, the combination of the stickers D and levers E, having metallic strips H electrically connected to one pole of a battery, with the movable rail G, adapted to be moved by magnetic action, and having upon it electric contact points or plates (electrically connected to a battery) adapted to be presented automatically in turn to the strips H, and an electrically-connected bell or other signal device, operating substantially as described, and for the purpose set forth.

396,157. WINDOW BURGLAR-GUARD. JOHN B. HARRIS, Butaw, Ala. Filed Nov. 30, 1888. Serial No. 291,386. (No model.)



Claim.—1. A window-guard consisting of a metallic grating having downwardly-projecting sharp spikes on its lower edge and mounted to slide vertically inside of a window, a catch for holding the grating in elevated position and for locking it when lowered, a weighted ball mounted on a tilting support and connected to the catch, and means adjacent to the window for releasing the catch, substantially as set forth.

2. A window-guard consisting of a metallic grating having downwardly-projecting sharp spikes on its lower edge and mounted to slide vertically inside of a window, springs bearing against the upper end of the grating to throw it downward, a catch for holding the grating in elevated position, with the springs compressed, and for locking it when lowered, a weighted ball mounted on a tilting support and having a cord connecting it to the catch, a step mounted on springs beneath the window-sill on the inside of the window, a cord leading from the tilting support and held across the lower portion of the window, and a cord leading from the tilting support and connected to the spring-step, substantially as shown and described.

3. In a window-guard, a metallic grating having sharp spikes projecting downward from its lower end and mounted to slide vertically inside of a window, a catch for holding the grating in elevated position, a detachable weight mounted on a movable support and connected by a cord to the catch to release the same, and a cord extended across the lower portion of the window and connected to the movable support, substantially as shown and described.

4. In a window-guard, a metallic grating having sharp spikes projecting downward at its lower end and mounted to slide vertically inside of a window, a catch for holding the grating in elevated position, a detachable weight mounted on a movable support, a step mounted on springs beneath the window-sill, and a cord leading from the step to the movable support, on which the weight rests, substantially as shown and described.

5. In a window-guard, the combination, with metallic grating 2, having sharp downwardly-projecting points at its lower end and vertical bars 10, with serrated edge 22, at its sides and mounted to slide vertically on window-frame 1 inside of window 2, of springs 38, connecting the upper end of grating 2 with the upper end of frame 1, lever 15, mounted in recess 17 in the window-frame 1 and having pin 19 adapted to engage holes 20 in adjacent bar 10, and a cam-shaped head, 16, with teeth 21, adapted to engage serrated edge 22 of bar 10, substantially as shown and described.

6. A window-guard consisting of the metallic grating 2, formed with the sharp points or spikes 4 at its lower end and mounted to slide in window-frame 1 on the inside of window 5, with vertical serrated bars 10, having holes 20 and located in pockets 9 in the window-frame, cushion-blocks 37, located in the lower ends of pockets 9, and coiled springs 38 in their upper end connected to the window-frame and to the grating 2, a lever, 15, pivoted in a recess, 17, in the side of window-frame 1 and having an arm, 18, projecting out of recess 17, and a cam-shaped head, 16, with teeth 21 adapted to engage serrated bar 10 and lock grating 2, and a pin, 19, adapted to engage holes 20, a bracket, 23, on the side of window-frame 1, a tilting bracket, 24, hinged to bracket 23 and having an arm, 25, a weighted ball, 26, adapted to rest on brackets 24 and 23 and having a cord, 27, leading to arm 18 of lever 15, a step, 30, mounted on springs 31, a cord, 35, leading from step 30 to arm 25, and a cord, 28, leading from staple 29 across the lower portion of window 5 and attached to arm 25, substantially as shown and described.

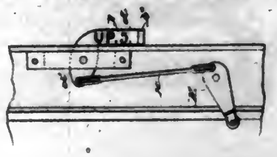
396,158. PROCESS OF RETTING FLAX. EDWIN A. HARTSHORN, Troy, N. Y. Filed Nov. 1, 1887. Serial No. 254,008. (Specimens.)

Claim.—The process hereinbefore described of retting flax, consisting of subjecting the flax to the action of hot water within a closed vessel under a pressure of from twenty to sixty pounds to the inch for about an hour, and then immediately thereafter treating it with cold air until cool, and then in sequence subjecting the flax to the action of steam in a closed vessel under a pressure of from thirty to sixty pounds to the inch for about an hour, and immediately thereafter and in sequence treating the flax with cold water, as herein set forth.

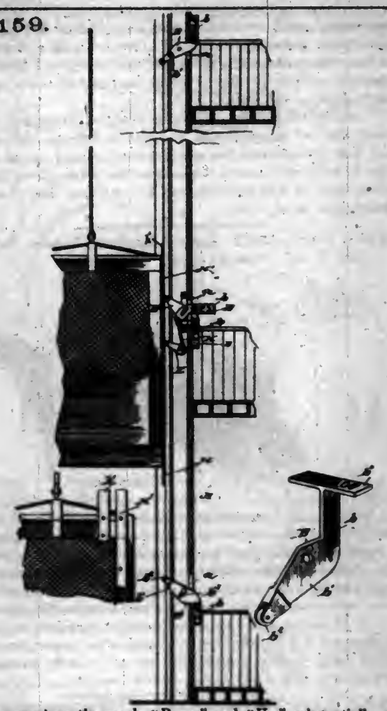
396,159. INDICATOR FOR ELEVATORS. OLIVER C. HAYWARD, New York, N. Y. Filed Feb. 1, 1888. Serial No. 262,630. (No model.)

Claim.—1. In an indicator for elevators, the combination, with a vertical shaft, stages or floors adjacent to said shaft, and the car adapted to travel in the latter, of angle-blocks which are pivoted above such stages or floors, one member or arm thereof projecting through the side of the shaft to engage with the car, and the outer member of said block being provided with an indicating-word and weighted to cause it to hang normally vertical parallel to the side of the shaft, as shown and described, to operate as specified.

2. In an indicator for elevators, the combination, with the car provided with side projections, of a double series of angle indicating-blocks, one series provided with a friction-roller upon the inner end adapted to engage the car, a lever connected with the inner member of the second series engaging the car and operating the block, and a horizontal projection integral with the outer member of each series of blocks, the said series having produced upon the faces of the respect-

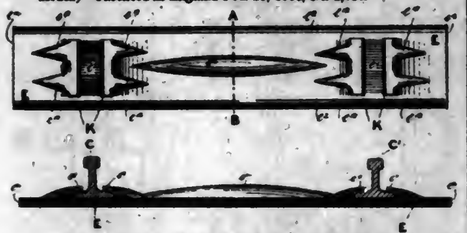


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ive outer members the words "Down" and "Up," substantially as and for the purpose specified.

396,160. SLEEPER. HENRY HIPKIN, Birmingham, County of Warwick, England. Filed May 30, 1888. Serial No. 275,466. (No model.) Patented in England Feb. 23, 1888, No. 2,716.



Claim.—A metallic sleeper in one piece, provided near its ends with pairs of raised jaws for holding the rails and ribs c^{19} for bracing said jaws, said sleeper also having a raised rib, c^4, extending lengthwise of said jaw as far as the inner ends of said ribs c^{19}, for the purpose set forth.

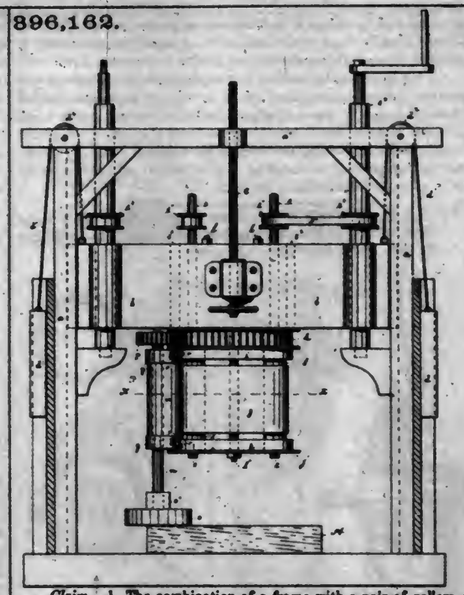
396,161. RESPIRATOR FOR FIREMEN. HUDSON R. HURD, Cleveland, Ohio. Filed Dec. 17, 1887. Serial No. 258,242. (No model.)



Claim.—A fireman's smoke-protecting device comprising a hat or cap provided with a strong projecting peak, *a*, a flexible visor secured to the edges of the said peak and provided with a glazed sight-aperture, and a cord, *b*, for securing the said visor to the face of the wearer, a long flexible air-inlet tube depending from the said visor, and the air-escape E on the peak of the cap, all arranged substantially as described and shown, and for the purpose set forth.

396,162. MACHINE FOR POLISHING STONES. MICHAEL HURTT, Poughkeepsie, N. Y. Filed Apr. 13, 1888. Serial No. 270,551. (No model.)

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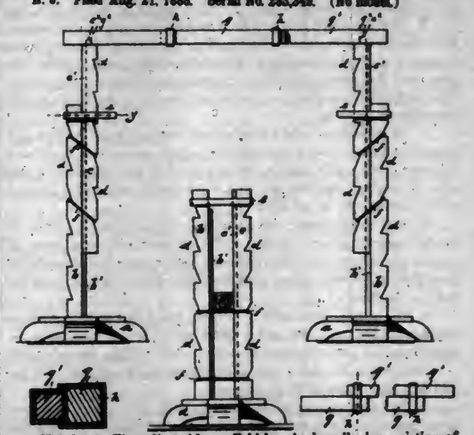


Claim.—1. The combination of a frame with a pair of rollers, a surrounding apron, a rack, a tube secured to said apron, a shaft passing through said tube and carrying a gear-wheel meshing into the rack, and a polishing-tool secured to the shaft, substantially as specified.

2. The combination of a frame with a pair of rollers, a surrounding apron, a rack, a pair of flanges, a tube secured to the apron and provided with a pair of guide-pins operating in conjunction with the flanges, and a tool-carrying shaft passing through the tube and in gear with the rack, substantially as specified.

3. The combination of a frame with a vertically-adjustable cross-head, a pair of rollers suspended therefrom, an apron surrounding said rollers, a rack, a tube secured to said apron, and a shaft passing through said tube and in gear with the rack, the shaft carrying the polishing-tool, substantially as specified.

396,163. ADJUSTABLE SCAFFOLD. MATTHIAS KILL, Newark, N. J. Filed Aug. 21, 1888. Serial No. 283,349. (No model.)



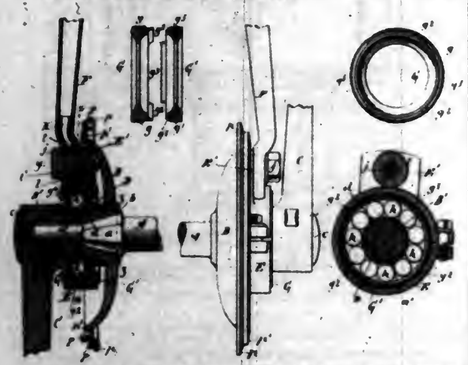
Claim.—1. The adjustable scaffold herein described, consisting of notched tongued standards secured to bases and provided with fixed bands, grooved standards adapted to pass through said bands and vertically adjustable on said fixed standards, and metallic loops for holding said adjustable standards when in position, and extensible rods connecting the tops of said adjustable standards, substantially as and for the purposes set forth.

2. In an adjustable scaffold, the combination, with a base or support and a fixed notched standard, of a vertically-adjustable notched standard, a metallic band rigidly secured to said fixed standard and

provided with notches *d d*, to hold said adjustable standard, and adjustable metallic loops for holding said adjustable standard when in position, substantially as shown, and for the purposes set forth.

3. In an adjustable scaffold the combination, with a base or support and a fixed notched standard, of a vertically-adjustable notched standard, a metallic band rigidly secured to said fixed standard and provided with recesses to receive said adjustable standard, adjustable metallic loops for holding said adjustable standard when in position, and rods connecting the tops of said adjustable standard, substantially as and for the purposes set forth.

396,164. VELOCIPEDE. BERRY G. LATTA, Friendship, N. Y., assignor to the Pope Manufacturing Company, Portland, Me. Filed Jan. 20, 1888. Serial No. 261,361. (No model.)



Claim.—1. In a journal-bearing, the combination, with a bearing box or case provided in its bore with right and left hand screw-threads, of two adjustable grooved collars arranged within said bearing-box and provided on their outer surfaces with right and left hand screw-threads, respectively, and having their inner adjacent portions beveled and made of smaller diameter than the main screw-threaded portions of the collars, and beveled segmental ribs or projections arranged on the inner faces of said reduced portion of the collars, substantially as set forth.

2. The combination, with the axle having a contracted cylindrical extension, *a'*, and the hub-flange B, having a tubular extension, B', of a crank, C, arranged upon said tubular extension, a screw-nut, *c*, applied to the end of the axle-extension *a'*, a grooved collar or sleeve, D, arranged between the hub-flange and the crank, grooved adjustable collars G G', and a bearing box or case, E, surrounding the collars G G', substantially as set forth.

3. The described improvement in the construction of a tubular fork end for attachment to a bearing in a velocipede, consisting in the extension of the tube end, the tapering, flattening, and forming the same with the insertion of a core, and the perforation of the two parts thus conformed together for attachment directly to the bearings, substantially as set forth.

4. The combination of a tubular fork-arm and a tubular fork end wrought thereon, and a strengthening-core inserted and conformed therewith, and a bolt passing through the fork end and its core and with its nut and shoulder securing the same directly to the bearing parts, substantially as set forth.

5. The combination, with a tubular fork-arm having a bent or concavo-convex lower end, of a stiffening or re-enforcing piece arranged in the lower end of the fork-arm, and supports having similarly-shaped faces bearing against opposite sides of the fork-arm, substantially as set forth.

6. The combination, with a tubular fork-arm having a bent or concavo-convex lower end and a stiffening or re-enforcing piece arranged therein, of the bearing box or case having a lug provided with a conical projection, and a fastening-bolt passing through the fork end and said lug, substantially as set forth.

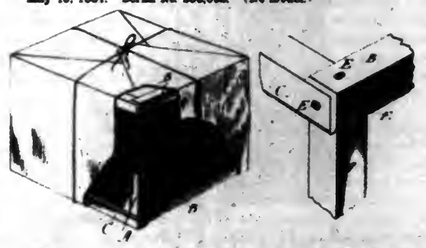
7. The combination, with a tubular fork-arm having a bent or concavo-convex lower end and a stiffening-piece inserted in said lower end, of the bearing box or case having a lug provided with a conical projection bearing against one side of the fork end, and a fastening-bolt, whereby the fork end is secured to said lug, and having in its head a conical seat, against which the opposite side of the fork end rests, substantially as set forth.

8. The combination, with two independent rows or sets of spokes, of a hub flange or disk provided with two annular rims arranged in different vertical planes, each of said rims supporting the inner ends of one set of spokes, substantially as set forth.

9. The combination, with a hub flange or disk provided with an internal annular rim and an external annular rim arranged in different vertical planes, of a set of spokes attached to said internal rim and a set of spokes attached to said external rim, the spokes attached to one of said rims passing outwardly from the hub in a direction substantially opposite to that of the spokes attached to the other rim, substantially as set forth.

10. The combination, with the axle, of two hub-flanges, each provided with two marginal rims arranged in different vertical planes, and each provided with two sets of spokes arranged against the outer sides of said rims, whereby the spokes of one set draw over the spokes of the other set, and both sets draw over the outer sides of said rims, substantially as set forth.

396,165. CRATE. ALBERT T. LINDERMAN, Whitehall, Mich. Filed May 13, 1887. Serial No. 238,082. (No model.)

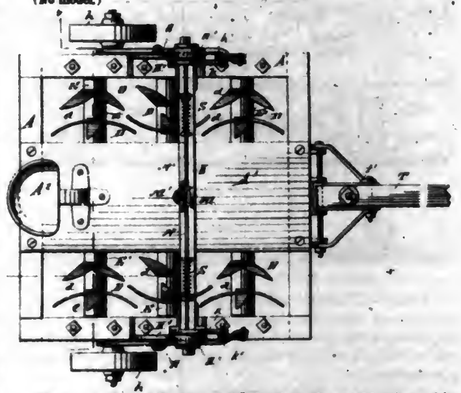


Claim.—1. In combination with a rectangular package, right-angled protectors arranged upon all of the edges of the package and a means for holding them in place, as and for the purpose stated.

2. In combination with a box, boxes, or packages, the pieces of right-angular angle-wood, A B C, applied on the outside of the corners, and means for holding them in place, substantially as described.

3. In combination with a box, boxes, or packages, the pieces of angle-wood, A B C, applied on the outside of the corners, one of these pieces being tenoned and the other two pieces being mortised to fit this tenon to form a lock-corner, as described.

396,166. SOD-CUTTER AND PULVERIZING-HARROW. ABRAHAM MADSON, Frenchville, Wis. Filed June 20, 1888. Serial No. 277,602. (No model.)



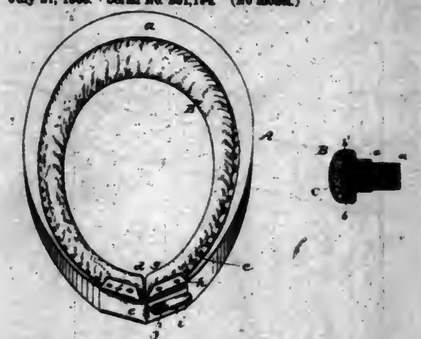
Claim.—1. In a sod cutter and pulverizer, the combination, with a shaft, of a series of cutters, D, arranged upon the shaft, each cutter consisting of two knives, *d*, curved in the direction of their longitudinal axis and having circular cutting-edges *d'*, and each cutter being spaced and arranged with its blades in alignment with the space between the blades of the adjacent cutter, substantially as herein shown and described.

2. In a sod cutter and pulverizer, the combination, with the recessed hangers *a* and the shaft B, having screw-threaded ends, of the cutters D, mounted on the said shaft, the sleeves E F, and the nuts *b b c*, substantially as herein shown and described.

3. In a sod cutter and pulverizer, the combination, with the supporting-frame, of the pivoted levers H, the wheels A, carried on the lower ends of the said levers, the rock-shaft K, provided with the arms *k*, the links connecting the arms *k* to the levers H, and means for locking the rock-shaft in position, substantially as herein shown and described.

4. In a sod cutter and pulverizer, the combination, with the supporting-frame and apertured brackets carried thereby, of the pivoted levers H, the wheels A, carried by the said levers, the rock-shaft K, provided with the apertured arms *k* and standard M, the links *k'*, connecting the arms *k* and levers H, the levers *m m'*, pivoted to the standard M, the hand-lever M', connected to the said levers *m m'*, and the sliding and spring-actuated rods N N', for engaging the apertures of the brackets and arms *k*, substantially as herein shown and described.

396,167. HORSE-BOOT. THOMAS B. MASON, Trenton, N. J. Filed July 27, 1888. Serial No. 281,194. (No model.)

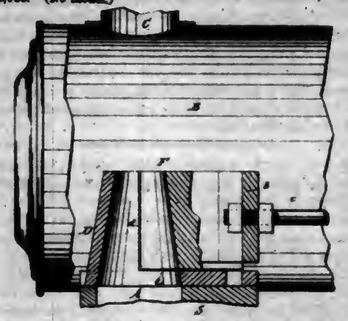


Claim.—1. A horse-boot formed of a divided ring having a widened portion, *a*, the hasp *c*, attached to one end of the divided ring, and the plate *h* and button *i*, attached to the opposite end of the divided ring, substantially as specified.

2. In a horse-boot, the divided elastic ring A, having the integral widened portion *a* between its ends, flanges *b b'* on its upper and lower sides at the inner edges thereof, and a fastening for the ends of the ring, substantially as set forth.

3. The combination, with the divided ring A, provided with the flanges *b b'*, of the lining B, secured to the said ring, and the padding C, interposed between the lining B and the inner edge of the ring, substantially as specified.

396,168. EXHAUST-NOZZLE. JOHN H. MCINDOE and WILLIAM MEREDITH, Mount Pleasant, Pa. Filed Aug. 17, 1888. Serial No. 282,963. (No model.)



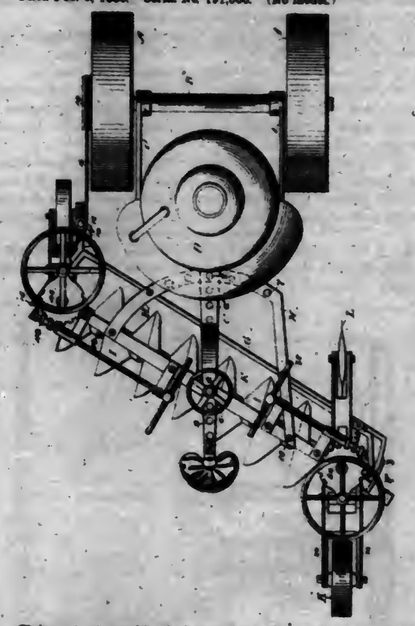
Claim.—The combination, with the seat S, having an exhaust-channel, A, forming an opening through it, of the internally-tapering or conical nozzle D, arranged over said seat and provided in the fixed portion of its base with an opening, *e*, of as large area as the channel-opening through said seat, with which it registers, and the sliding block F or F', of tapering construction, on its inner end, fitted to slide at its base up to, subject to the action of, a stop, and away from or back of said opening *e* without overlapping it, whereby said sliding block when moved in or out not only operates to increase or diminish the top opening of the nozzle, but when fully adjusted inward does not contact said opening *e*, and baffling of the steam in the exhaust-channel is avoided, substantially as specified.

396,169. HOOK. PERKINS MILLS, Brooklyn, N. Y. Filed May 29, 1888. Serial No. 275,414. (No model.)



Claim.—The overhead double hook composed of a single length of wire having its two hooks back to back, both hooks coupled at their lower ends by a portion of the wire which serves as a brace, a bearing-surface at the upper end of each stem of each hook, an eye at one terminal of the wire midway between said bearing-surfaces, and a screw-threaded shank which occupies said eye, substantially as described.

396,170. STRAW-PLOW. JOHN Q. A. NEWSOM, Seymour, Ind. Filed Feb. 9, 1888. Serial No. 191,306. (No model.)



Claim.—1. A combined plow and traction-engine mounted upon a rigid frame and having a pair of non-swiveling supporting-wheels forward, a steering device located at the rear, consisting of a journaled curved or bent frame carrying a furrow-wheel at its rear end and a cutting-disk at the front end, and a hand-wheel having a horizontal shaft provided with a worm meshing with a sector-gearing connected to the steering-wheel and adapted to positively adjust said steering-wheel, substantially as described.

2. The combination, with the adjustable plow-shaft, of a series of spiral cutting-blades secured thereto and to each other, so as to form a continuous spiral cutter, the main part of such blades being formed on straight radial lines and its peripheral section being of concavo-convex form, substantially as described.

3. A spiral cutting-blade for attachment to a rotary plow-shaft, having its main portion formed on straight radial lines from its point of attachment to the shaft and its peripheral section of concavo-convex form, substantially as described.

4. The combination, with a revolving plow-shaft obliquely adjustable to the line of draft and supporting a series of spiral cutters adapted to form oblique ridges or furrows, of an auxiliary plow working in the line of draft and cutting a straight furrow intersecting the oblique furrows made by the spiral blades, and thus completing the cut, substantially as described.

5. The combination, with the draft-bar C, connected to the axle of the traction-wheels, of the bolster E, the screw 4, and the universal joint 5, substantially as described.

6. The combination, with the bolster E and the plow-shaft suspended therefrom, the draft-bar C, and the universal joint 5 between the draft-bar and bolster, of the segment H, bolted to the bolster and adjustable on the draft-bar, substantially as described.

7. The combination, with the bolster E, of the adjustable hanger J, carrying the journaled trailing-wheel K at one end and the leading cutter-wheel L at the other, substantially as described.

8. The combination of the bolster E, the hanger J, the disk 32 and pin 31, the disk 34, the worm 33, and hand-wheel 35, substantially as described.

9. The combination of the bolster E and plow-shaft, the hanger J, the screw M, and threaded lug 36, substantially as described.

10. The combination, with the traction-wheels and pulley 14, the

suspended adjustable plow-shaft having the pulley 15, and the cable or chain 16, of guide-pulleys interposed between pulleys 14 and 15 and means for adjusting such guide-pulleys relatively to the horizontal adjustment of the plow-shaft, substantially as described.

11. The combination, with the traction-wheels and axle and the adjustable plow-shaft, of the chain or cable for transmitting power to the plow-shaft and the adjustable bracket 19, carrying guide-pulleys, substantially as described.

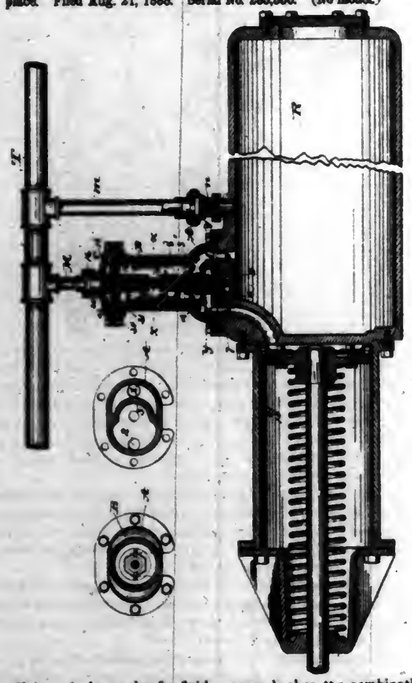
12. The combination, with the adjustable plow-frame, of the adjustable bracket 19, having independently-adjustable arms 22 and carrying guide-pulleys, substantially as described.

13. The combination, with the revolving plow-shaft supporting a series of spiral cutting-blades, of a series of traveling scrapers operated by the revolution of said blades, substantially as described.

14. The combination, with the revolving plow-shaft supporting a series of spiral cutting-blades, of an endless chain carrying a series of forked scrapers and operated by the revolution of said blades, substantially as described.

15. The combination, with the revolving plow-shaft supporting a series of spiral cutting-blades, of an endless chain, a series of forked adjustable scrapers pivoted to the chain guide-wheels on the scrapers, and a track for supporting the guide-wheels, substantially as described.

396,171. VALVE FOR FLUID-PRESSURE BRAKES. GEORGE H. POOR, St. Louis, Mo., assignor to the American Brake Company, same place. Filed Aug. 21, 1888. Serial No. 283,330. (No model.)



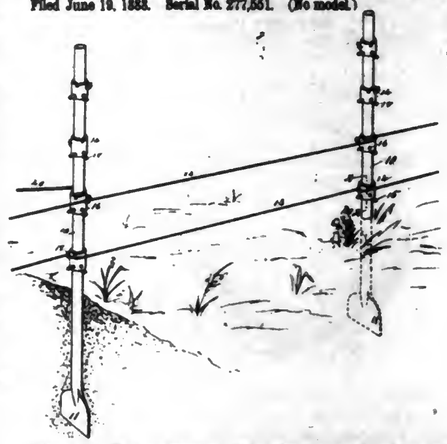
Claim.—1. In a valve for fluid-pressure brakes, the combination, with the inlet and exhaust valves, of an impulse-chamber which communicates with the auxiliary reservoir, a diaphragm which is arranged in the impulse-chamber and connected with the valves, and a reduction-valve arranged in a passage leading from the impulse-chamber to the train-pipe, substantially as and for the purposes specified.

2. In a valve for fluid-pressure brakes, the combination of the inlet and exhaust valves having a stem common to both, an impulse-chamber which communicates with the auxiliary reservoir, a diaphragm arranged in the impulse-chamber, and a reduction-valve interposed between the impulse-chamber and the train-pipe, substantially as for the purposes specified.

3. In a valve for fluid-pressure brakes, the combination of an exhaust-valve, a double-seated inlet-valve, an impulse-chamber, a leak leading from the impulse-chamber to the reservoir, said leak arranged to be closed by one face of the double valve, and a reduction-valve interposed between the impulse-chamber and the train-pipe, substantially as and for the purposes specified.

4. In a valve for fluid-pressure brakes, the combination of shell-section A, having passages 1 and 2 and ports 4 and 6, valves 5 and 7, connected by stem 8, hollow post 10, impulse-chamber 15, a diaphragm having a hollow stem, and a reduction-valve arranged in the hollow stem of the diaphragm, substantially as and for the purposes specified.

396,172. WIRE-TIGHTENER. THOMAS REILY, Glencoe, Iowa. Filed June 19, 1888. Serial No. 277,551. (No model.)



Claim.—1. The combination, with a fence-post, of a sleeve held to revolve thereon, provided with an attached arm on its outer side for engaging the fence-wire and aligning slots in the upper end, and means, substantially as shown and described, for retaining the sleeve in a fixed position, as and for the purpose specified.

2. The combination, with a cylindrical fence-post provided with diametrically-opposite apertures, of a sleeve revoluble upon said post, provided with apertures near the lower end, aligning slots in the upper end, and an upwardly-extending arm or projection secured to the outer surface, a detachable pin adapted to pass through the apertures of the sleeve and the apertures of the post, and means, substantially as shown and described, for supporting said sleeve, as set forth.

3. The combination, with a cylindrical fence-post provided with two sets of diametrically-opposite apertures, of a sleeve revoluble upon said post, provided with a series of apertures near the lower end, slots in the upper end, and a projection or arm secured to the outer surface, a detachable pin adapted to be passed through one set of post-apertures below the sleeve, and a second pin adapted to be passed through apertures in the sleeve and the other set of post-apertures, substantially as shown and described.

396,173. GATE. HARVEY C. RILEY, Perryville, Mo., assignor to himself and Robert M. Wilson, same place. Filed Oct. 29, 1888. Serial No. 289,377. (No model.)

Claim.—1. The combination, with a swinging gate having a horizontal double-ended lever-bar with angular arms at its ends, mounted on the hinged end of the gate, of posts located at the side of a road on opposite sides of the gate, a gate-operating cord leading from one of the posts to one end of the double-ended lever, a gate-operating cord leading from the other post to the other end of the double-ended lever, a cord for operating the gate-latch, leading from one of the posts to one angular arm of double-ended lever, over a guide thereon, to and over a guide on the other angular arm of double-ended lever, and from thence to the other post, and a latch-operating branch cord leading from the latch to the main operating latch-cord and connected therewith between the cord-guides on the angular arms of double-ended lever-bar, substantially as shown and described.

2. The combination, with swinging gate 1, having the horizontal Z-shaped bar 10, with arms 11 and 12, secured to the top of hinged upright 2, and the pivoted latch 6, of the post 16, with arm 15, and post 25, with arm 24, located at the side of a road on opposite sides of and at a suitable distance from the gate 1, a gate-operating cord, 26, with an end suspended beneath arm 24 of post 25, passing over a pulley, 29, thereon and extending and secured to arm 11 of Z-shaped bar 10, a gate-operating cord, 13, with an end suspended beneath arm 15 of post 16, passing over pulley 14 thereon and extending and secured to arm 12 of Z-shaped bar 10, a main latch-operating cord, 19, suspended beneath arm 24 of post 25, passing over a pulley, 23, thereon, extending to and passing over a pulley, 22, on arm 12 of Z-shaped bar 10, from thence to and over a pulley, 21, on arm 11 of bar 10, to and over a pulley, 20, on arm 15 of post 16, from which it is suspended, and a branch operating-cord, 17, extending from latch 6 to main latch-cord 19 and secured thereto between pulleys 21 and 22, substantially as shown and described.

3. The combination, with gate 1, hinged to fence-post 5, and having a pivoted latch, 6, and a Z-shaped double-ended lever-bar, 10, with angular arms 11 and 12 at its ends, of a post, 28, located at the side of a road a distance from fence-post 5 equal to the length of the gate, and having a latch-catch, 30, a post, 25, with an arm, 24, and a post, 16, with an arm, 15, located at the side of a road on opposite sides of the gate and at a suitable distance from post 5, a gate-operating cord, 26, connected to arm 11 of bar 10 and extending to and over a pulley, 29, on arm 24 and suspended therefrom, a gate-operating cord, 13, connected to arm 12 of bar 10 and extending to and over a pulley, 14, on arm 15, and suspended therefrom, a main operating latch-cord, 19, suspended from and extending over a pulley, 23, on arm 24, to and over a pulley, 22, on arm 12, to and over a pulley, 21, on arm 11, and from thence to and over a pulley, 20, on arm 15, and suspended therefrom, and a branch latch-cord, 17, extending to main latch-operating cord 19 and secured thereto between pulleys 21 and 22, substantially as shown and described.

396,174. BUSH-HAMMER. LUTHER H. ROWELL, South Thomaston, Me. Filed Mar. 22, 1888. Serial No. 268,115. (No model.)



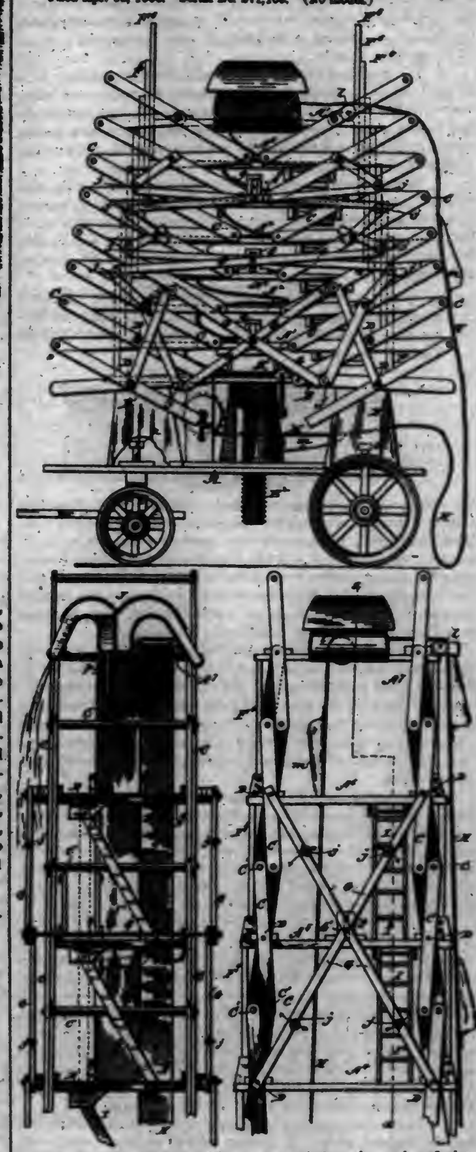
Claim.—1. In a bush-hammer, the combination, with two pole-plates provided each with spaced bolt-holes and a shank-section tapered and threaded at the outer end, of a tapering-threaded sleeve and fastening-bolts, substantially as shown and described.

2. In a bush-hammer, a rectangular plate provided with a semi-cylindrical shank-section tapered and threaded at its outer end, and with spaced bolt-holes, substantially as shown and described.

3. The combination, with two pole-plates formed with shank-sections and provided with spaced bolt-holes, of cuts held between the plates, a sleeve engaging the shank-sections, and fastening-bolts, substantially as shown and described.

4. A bush-hammer pole comprising the separate and independent apertured pole-plates, each having shank forming a half-socket on its inner edge, a transverse integral gib extending inwardly from the outer edge of one plate, the outer edge of the opposite plate having a transverse recess receiving the end of said gib, and a sleeve surrounding the two-part handle socket, substantially as set forth.

396,175. FIRE-ESCAPE. JOHN D. BILLMANN, San Antonio, Tex. Filed Apr. 18, 1888. Serial No. 271,100. (No model.)



Claim.—1. An extensible tower consisting of a series of platforms, a series of lifting toggle-levers arranged in pairs as lazy-tongs at the four corners, and a series of bracing toggle-levers arranged, as described, to work reversely to the lifting-toggles, substantially as and for the purpose set forth.

2. An extensible tower consisting of a series of platforms, a series of lifting toggle-levers arranged in pairs as lazy-tongs at the four corners, and a series of bracing toggle-levers arranged to work reversely to the lifting-toggles, and having in their lengths outwardly-folding and inwardly-locking knuckle-joints *j*, substantially as and for the purpose described.

3. An extensible tower consisting of a series of vertically-adjustable platforms with hatchways, combined with a series of supporting toggle-levers, and folding ladders extending from one platform to the next, substantially as shown and described.

4. The combination, with an extensible tower, of a water-receptacle arranged at the top of the same and having perforated eave-troughs and a hose-pipe leading thereto from below for showering spray down between the tower and a burning building, as described.

5. The combination, in an extensible tower, of the vertically-adjustable platforms, the series of lazy-tongs for lifting the same, and a set of rigid upright guide-bars arranged on each platform and extending through an opening in the platform above, substantially as and for the purpose described.

6. The combination, with an extensible tower consisting of a series of vertically-adjustable platforms having hatchways and lifting devices, as described, of a set of pulleys or rollers arranged at the top and bottom of the tower, and an endless belt with pockets passing around said rollers and through the hatchways for the safe lowering of goods and persons, as set forth.

7. The combination, with an extensible tower consisting of a series of vertically-adjustable platforms and a series of toggle-levers arranged as lazy-tongs for raising and lowering them, of a set of bridges or gang planks having folding hand-rails adapted to be folded and rest between the platforms when lowered, substantially as shown and described.

396,176. ELECTRIC COUPLING FOR HOSE-PIPES. DAVID J. SIMPSON, Pittsburg, assignor of one-half to George C. Corken and Hawdon Marshall, Allegheny County, Pa. Filed Apr. 16, 1888. Serial No. 270,833. (No model.)



Claim.—1. In combination with the sections A B of a coupling such as described, provided with ring-seats and an interposed non-conducting gasket, a contact-electrode carried by one section of the coupling and connected with the line through the gasket, and an opposing contact secured to the other section of the coupling in position to engage the first-mentioned contact when the gasket is clamped between its seats, said contacts and connecting-wires being insulated from the metallic couplings, substantially as described.

2. In combination with the detachable sections of a hose-coupling such as described, an insulated conductor or contact carried by one section and projected upon the face of the gasket interposed between and forming the water-tight joint, and an annular contact or conductor forming the ring-seat on the opposite coupling-section, said ring-seat being insulated from the coupling-sections with circuit-wires connected to each of said contacts, substantially as and for the purpose set forth.

3. In combination with the separable sections of a hose-coupling such as described, an electric contact mounted upon but insulated from one section of the coupling and projected through the non-conducting elastic gasket, and an opposing electric contact mounted upon but insulated from the co-operating section of the coupling and engaging the first-mentioned contact and the gasket to close the circuit and protect the joint, substantially as and for the purpose set forth.

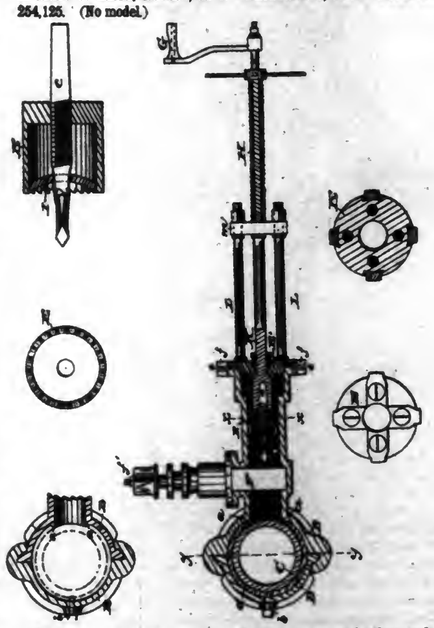
4. In combination with the separable metallic sections of a hose-coupling such as described, provided with clamping devices and an elastic non-conducting gasket interposed between seats within the two sections, a line-wire connected to the metallic sections of the couplings, and a second or return wire connected to contact plates or terminals insulated from and supported within the coupling-sections, one of said contacts forming part of the gasket-seat on one section and the other opposing contact projecting upon the side of the gasket facing the opposite section, so that when said coupling-sections are united one line will be closed through the coupling and the other between the gasket and its seat, substantially as and for the purpose set forth.

5. In combination with the sections A B, the hose attached thereto and the insulated wires D D′, forming parts of an electric circuit, the wire D′, attached to and connected through the metallic sections A B, the insulating-support inserted in section A and provided with annular contact 1, the gasket, and the contact 2, passing through said gasket, said contacts 1 and 2 being connected to wires D′, insulated from the metallic coupling-sections, as and for the purpose set forth.

6. In a hose-coupling such as described, comprising separable sections A B, an interposed non-conducting gasket, and means for holding the two sections together and clamping them upon the gasket, a contact plate or ring, 1, insulated from but sectioned to one of said coupling-sections in line with the gasket and provided with an insulating lining or covering, a contact or conductor, 2, carried by the opposite coupling-section insulated from the latter and projected upon the exposed face of the gasket, said gasket co-operating with the insulated lining of contact 1 to form a tight joint and exclude water or other liquid-conducting medium from contacts 1 and 2, as set forth.

7. In a hose-coupling such as described, containing separable sections A B, the insulated ring bearing annular contact 1, inserted in section A, the wire D, passing through section A and attached to ring 1, the non-conducting elastic gasket fitting over the annular contact 1 and interposed between the sections, and the contact 2, passing through the gasket in position to engage contact 1 when the sections A B are connected, as and for the purpose set forth.

396,177. APPARATUS FOR TAPPING AND CONNECTING MAINS. ANTHONY P. SMITH, Newark, N. J. Filed Nov. 2, 1887. Serial No. 254,125. (No model.)



Claim.—1. A branch connection for water, gas, and other mains, combining therein a split sleeve adjusted around said main and held together by a clutch or grip joint, and a branch connected with one of the pipe-sections of said sleeve, and provided with a gate-valve chamber made integral therewith, substantially as and for the purposes set forth.

2. The combination of a split sleeve adjusted around a main and held together by a clutch or grip, a branch connected with one of the sections of said sleeve and provided with a stop or gate valve chamber made integral therewith, and a drilling and tapping apparatus secured to the end of said branch, substantially as and for the purposes set forth.

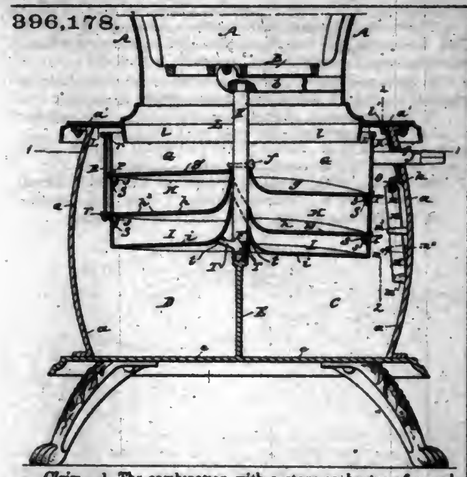
3. The combination of a branch pipe provided with a stop or gate valve chamber made integral therewith and having an annular seat, *a*, and packing *a′*, adapted to form a water-tight joint, and a drilling apparatus connected to the end of said branch, and operated substantially as and for the purposes set forth.

4. The combination of a sleeve adjusted around the main, composed of two sections, one of which is provided with a branch pipe projecting therefrom and carrying a stop or gate valve chamber made integral therewith, a rim surrounding the opening of said branch and carved to fit the contour of the main pipe, and a set-screw carried by the other section of said sleeve, and adapted to operate substantially as and for the purposes set forth.

5. The combination, with a main pipe, of a branch sleeve having an annular raised seat, *a*, adapted to fit on said main, so as to form a packing-chamber between said sleeve and main pipe, and a packing, *a′*, substantially as and for the purposes set forth.

6. An improved apparatus for drilling and tapping mains, consisting of a drill-frame, drill-holder, drill and cutting head or milling-tool, the shank of said drill having two series of screw-threads separated by a small intervening space, one of said series holding and carrying the cutting-head or milling-tool, and the other holding the piece to be removed, said apparatus being provided with any desired means for securing it to the main, all said parts being arranged and combined as herein shown and described, and for the purposes set forth.

396,178. ASH-SIFTER FOR STOVES. EDWARD E. SMITH, New York, N. Y. Filed May 17, 1888. Serial No. 274,120. (No model.)



Claim.—1. The combination, with a stove or heater, of an ash-sifter fitted therein below the fire-pot for horizontal oscillation, consisting of an upper ash-receiving section having an imperforate sloping floor and a lower sifting-section having a sloping perforated floor, and said sections relatively arranged to cause the upper section to discharge the mixed ashes and cinders onto the higher portion of the perforated floor of the lower section, substantially as herein set forth.

2. The combination, with a stove or heater, of an ash-sifter fitted below the fire-pot for horizontal oscillation, consisting of a sifting-section having a sloping perforated floor receiving the mixed ashes and cinders from the fire-pot, and with a lower ash-receiving section having an imperforate floor receiving the ashes from the sifting-section and discharging them at a place separate from the cinders falling from the sifting-section, substantially as herein set forth.

3. The combination, with a stove or heater, of an ash-sifter fitted below the fire-pot for horizontal oscillation, consisting of an upper ash and cinder receiving section having an imperforate sloping floor, an intermediate next lower sifting-section having a sloping perforated floor, receiving at its upper part the mixed ashes and cinders from the upper section, and a lower section having an imperforate floor receiving the ashes from the sifting-section and discharging them at a place separate from the cinders discharged from the sifting-section, substantially as herein set forth.

4. An oscillatory ash-sifter consisting of a supporting-shaft and three sifter-sections thereon, or an upper ash and cinder receiving section having an imperforate sloping floor, an intermediate next lower sifting-section having a sloping perforated floor receiving at its upper part the mixed ashes and cinders from the upper section, and a lower section having an imperforate floor receiving the ashes from the sifting-section and discharging them at a place separate from the cinders discharged from the sifting-section, and bolts R, holding the sifter-sections together vertically, substantially as herein set forth.

5. An oscillatory ash-sifter consisting of a supporting-shaft and three sifter-sections thereon, or an upper ash and cinder receiving section having an imperforate sloping floor, an intermediate next lower sifting-section having a sloping perforated floor receiving at its upper part the mixed ashes and cinders from the upper section, and a lower section having an imperforate floor receiving the ashes from the sifting section and discharging them at a place separate from the cinders discharged from the sifting-section, bolts R, holding the sections together vertically, and interlocking lugs and sockets at the section-joints preventing independent axial movement of the sections during their oscillation, substantially as herein set forth.

6. In a horizontally-oscillating ash-sifter having upper, middle, and lower sections, substantially as described, the section H, having a perforated sloping floor, *h*, provided with one or more steps or shoulders, h^4, substantially as herein set forth.

7. In a horizontally-operating ash-sifter having upper, middle, and lower sections, substantially as specified, the sifter-section H, having a sloping floor perforated at h^3 and provided with shoulders h^4, and having plain portions h^5 next its upper edge, *h′*, and the shoulders h^4, substantially as herein set forth.

8. The combination, in an ash-sifting apparatus for stoves, of a partition, E, at the base of the stove, forming compartments C D therein, a vertical spindle, F, having supports or shoulders, as T, sifter-sections I H G, supported on said shoulders and on each other, and said section G formed with an imperforate floor, *g*, and said section H formed with a floor, *h*, mainly perforated and having an imperforate portion, H′, next its edge discharging the cinders into the compartment D, and said section I having an imperforate floor, *i*, receiving ashes from the section H and discharging them into the compartment C, and all three sections held together for simultaneous horizontal oscillation, substantially as herein set forth.

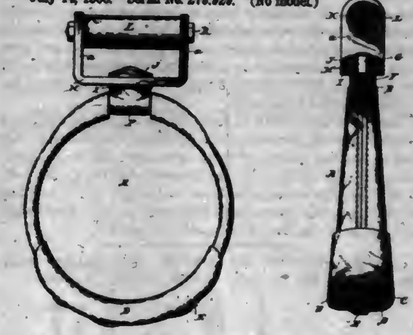
9. The combination, with a casing or frame having a slot and an oscillatory sifting device supported in said casing and provided with a shaker-bar entering the casing-slot, of a spring held to the casing, and against which the shaker-bar or a connection therewith may strike, substantially as described, whereby the resistance of the spring will prevent noisy contact of the shaker-bar at the ends of the slot in which its works, substantially as herein set forth.

10. The combination, with a casing or frame having a slot, and an oscillatory sifting device supported in said casing and provided with a shaker-bar entering the casing-slot, of a spring held to the casing and stop-lugs on the casing for the clamped end or part of the spring, substantially as described, whereby the spring will be held in a manner to have greater resistance against the movement of the bar in one direction than in the other direction, as and for the purposes set forth.

11. The combination, with the shaker-bar of an ash-sifting device passed through a slot in the sifter-support, of a dust-guard plate, K, on the bar at the slot and provided with shoulders *o o*, and a spring held to the sifter-support and in the path of said shoulders to be struck thereby, to prevent contact of the shaker-bar with the ends of the slot through which it works, substantially as herein set forth.

12. The combination, with the shaker-bar of an ash-sifting device passed through a slot in the sifter-support, of a dust-guard plate, K, on the bar at said slot and provided with shoulders *o o*, and a spring, M, held in lugs m' m^2 m^3 on the sifter-support and in the path of said shoulders, substantially as shown and described, whereby the resisting-power of the spring will be increased and diminished at opposite strokes of the shaker-bar, substantially as herein set forth.

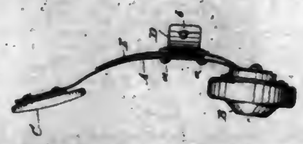
396,179. STIRRUP. JOHN C. TAYLOR, Springer, N. Mex. Filed July 14, 1888. Serial No. 279,929. (No model.)



Claim.—1. In a stirrup, the combination, with the foot-piece, of the sleeve fitted around the upper portion thereof, so that the foot-piece will be free to swing therein, and provided with the upwardly-extending stud or pin, and the strap-plate fitted loosely around said stud or pin, so that the foot-piece may turn freely at right angles to the direction in which it swings, substantially as and for the purposes set forth.

2. In a stirrup, the combination of the foot-piece, the sleeve fitted around the upper portion thereof, so that the foot-piece will be free to swing therein, and provided with the upwardly-extending pin or stud, the strap-plate fitted around said stud or pin, so that the stud may turn therein, and the washers or plates fitted around said stud or pin above and below the strap-plate, substantially as and for the purposes set forth.

396,180. TRUSS. JAMES A. TISDER, Rome, Ga. Filed June 9 1888. Serial No. 276,571. (No model.)

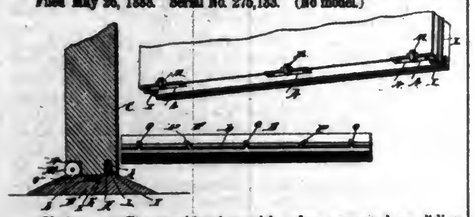


Claim.—1. A truss consisting in the vertically-ranging outwardly-bowed plate-spring A, having abdominal and hernial pads secured to its inner face at its upper and lower ends, respectively, and a transverse plate and a spring secured to the first-named spring below its center and above the upper end of the lower pad curved inwardly and

provided with strap-attaching devices at its ends, substantially as set forth.

2. The combination, with the two outwardly-bowed plate-springs A E, having upper and lower securing-bolts, *a a*, and an abdominal and a hernial pad, of the transverse inwardly-bowed spring B, held between the said two springs and their bolts below the centers of the springs but above the upper end of the lower pad, and provided at its ends with strap-attaching devices, substantially as set forth.

396,181. WEATHER-STRIP. JOSEPH WALKER, Belleville, Kans. Filed May 26, 1888. Serial No. 275,183. (No model.)



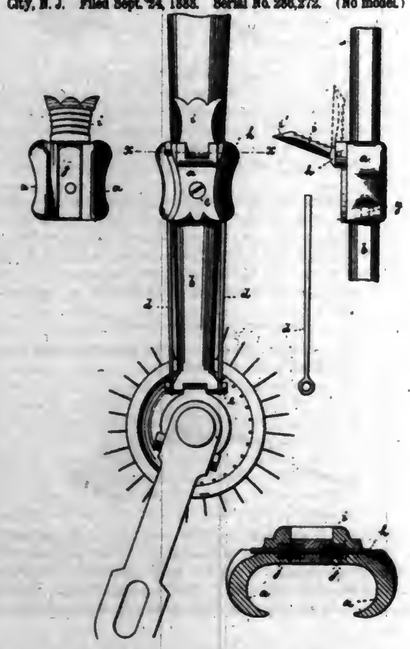
Claim.—1. The combination, with a door mounted on sliding joint-hinges, of the flexible strips attached to the edges of the door and the anti-friction rollers mounted on the bottom of the door, substantially as specified.

2. The combination, with a door having strips on its edges and mounted on sliding joint-hinges, of the anti-friction rollers mounted on the lower edge of the door and bearing on the sill, and adapted to be received in beveled sockets in the sill, substantially as specified.

3. The combination, with a door frame or casement and sill having a drip-groove, the channels leading from the groove, and the beveled sockets of the door, the sliding joint-hinges having projections on the lower ends of their movable knuckles to engage corresponding notches in the upper ends of lower stationary knuckles, whereby the door drops as its free edge strikes the casement, and the anti-friction rollers mounted on the lower edge of the door and bearing on the sill, and adapted to be received in the said sockets in the sill, all constructed and arranged to operate substantially as and for the purpose hereinbefore specified.

4. The combination, with a door provided with grooves in its edges, of the holders K, located in the grooves, and comprising the rolls *k*, formed by doubling the holder twice upon itself, and the flanges *k'*, bearing on the edge of the door and formed integral with the rolls, and the flexible strips arranged at their inner edges in the rolls and doubled on themselves therein, and projecting at their outer edges beyond the edge of the door, substantially as specified.

396,182. FOOT-REST FOR BICYCLES. HENRY WALTER, Jersey City, N. J. Filed Sept. 24, 1888. Serial No. 286,272. (No model.)

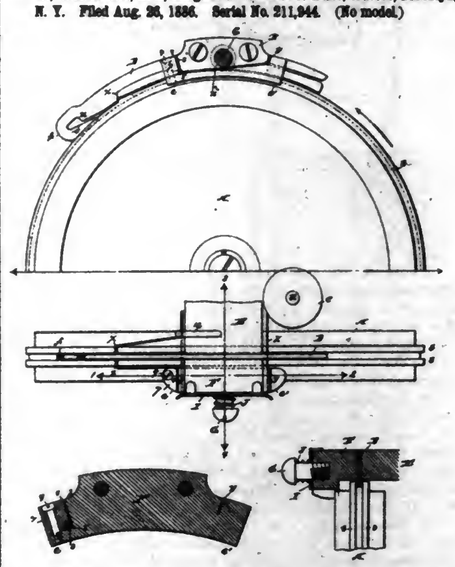


Claim.—1. The combination of clamp *a*, adapted to straddle the fork of a bicycle, with foot-piece *i*, pivoted to such clamp and having a beveled edge, *i'*, substantially as specified.

2. The combination of clamp *a*, with foot-piece *i*, pivoted thereto, and with a spring, *j*, and set-screw *c*, substantially as specified.

3. The combination of clamp *a*, having mortises *g*, with the bars *d*, set-screw *c*, pivoted foot-piece *i*, and spring *j*, substantially as specified.

396,183. THREAD-GRIPPING DEVICE. SIMON W. WARDWELL, Jr., Woonsocket, R. I., assignor to William P. Earle, trustee, Brooklyn, N. Y. Filed Aug. 26, 1886. Serial No. 211,944. (No model.)



Claim.—1. The combination, in the take-up of a sewing-machine, of a part of the machine having a V-shaped notch adjacent to the normal path of the thread, a deflector whereby said thread is carried into said notch and there gripped as the thread is taken up, and a thread-releaser arranged to disconnect the thread from the deflector, substantially as described.

2. The combination of the stationary head F, a revolving shouldered thread-deflecting disk arranged adjacent thereto, a thread-gripping notch in said head at right angles to the disk, and a thread-releasing device, as D, substantially as described.

3. The combination of the thread-guides, the stationary V-shaped thread-grip adjacent to the normal path of the thread, a revolving take-up which deflects the thread into the thread-grip during its operation, and a releasing device which disengages said thread from the revolving take-up, substantially as set forth.

4. The combination, with the thread-guides, a stationary thread-receiving notch, and a revolving deflector which deflects the thread from its normal path into said notch, where it is positively held, of a cast-off or releasing device for disengaging the thread from the deflector and notch and a pressure device arranged to apply tension to the thread between the spool and notch, substantially as set forth.

5. The combination, with the take-up of a sewing-machine, of a head, F, arranged between the spool and take-up, having the ears *e e'*, one of said ears having formed in it a thread-guide slot and the other being provided with a detachable grip-block, 7, arranged to form a second guide-slot and beveled at the lower face to form a grip-notch, substantially as described.

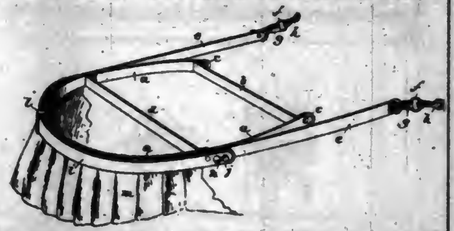
6. The combination of the head provided with a thread-grip notch, a revolving take-up provided with a rib, a thread-releasing device, and a retaining-bar having a shoulder against which the thread is held until the rib has passed the shoulder, substantially as described.

7. The combination of the take-up, consisting of the revolving ribbed and shouldered disk and retaining-bar having an inclined edge and shoulder, and a bracket or head having a V-shaped notch arranged to receive the thread when deflected by the take-up, substantially as set forth.

8. The combination, with a sewing-machine, of a stationary head, F, provided on one side with a thread-guiding slot and on the other with a thread-gripping notch, a revolving shouldered disk, and a bar, D, supported by said head and having an inclined edge and shoulder, substantially as described.

9. The combination, in a sewing-machine, of a stationary head, F, having a thread-guiding slot and a thread-gripping notch, a tension device intermediate of said slot and notch, a revolving shouldered disk arranged to deflect the thread into said thread-gripping notch, and a device carried by the head for releasing the deflected thread from the shoulders of the disk, substantially as described.

396,184. DRESS-SUPPORTING STEEL. MARY E. WHALEN, New York, N. Y., assignor, by mesne assignments, to Mary Agnes Whalen, same place. Filed Feb. 23, 1888. Serial No. 264,931. (No model.)



Claim.—1. A dress-steel consisting of a bow having metallic straps secured thereto and forming a bow with double ends, substantially as described.

2. A dress-steel consisting of a bow having metallic straps secured thereto and projecting beyond the ends of the bow, substantially as described, whereby a bow with double ends is formed, as and for the purpose set forth.

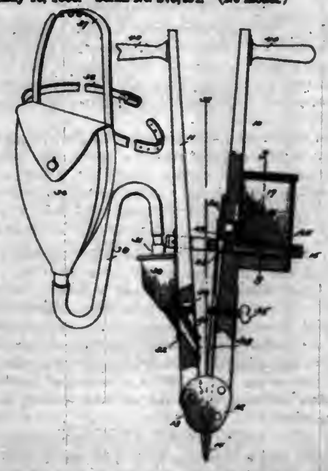
3. The combination, in a dress-steel, of a main member, a connecting-strap for the ends thereof for maintaining it in a bowed position, and metallic extensions united thereto at or near the ends and carrying rings at their free ends, substantially as described.

4. The combination, in a dress-steel, of a main member, a connecting-strap for the ends thereof for maintaining it in a bowed position, a supplemental brace-strap inward from said end connecting-strap, and extensions united to the main member at or near the ends and forming a medium for attaching the steel to a skirt, substantially as described.

5. A dress-steel consisting of a bow provided with double ends a catch at one side, and a band secured to the side opposite the catch and having its free end engaging the said catch and clamping the folds of the skirt between said band and bow, substantially as herein shown and described.

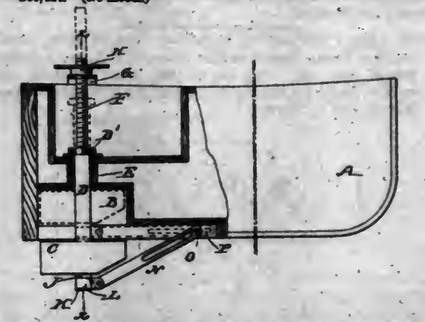
6. In a dress-steel, the combination of a main member or bow having a connecting-strap at its ends, a band on the outside at the back secured at one end to said main member and free at the other end to engage said member by a suitable catch, and rings at the forward ends of the steel, substantially as described, whereby the steel may be detachably secured to the skirt at its rear and at two independent parts at its front, as specified.

396,185. HAND-PLANTER. WILBUR S. WHELS, Union, W. Va. Filed May 10, 1888. Serial No. 273,491. (No model.)



Claim.—In a hand-planter, the combination, with vertical parallel arms hinged at their lower ends, one of which arms is provided with a diagonal bore, and a receptacle secured to the outer side of one arm communicating with said bore, of a bag adapted to contain fertilizer, a flexible tube connecting said bag and receptacle, a spring-actuated valve hinged to the inner side of one arm, covering the inner end of the bore therein, and a set-screw passing through the opposing arm and adapted for engagement with said valve, as and for the purpose specified.

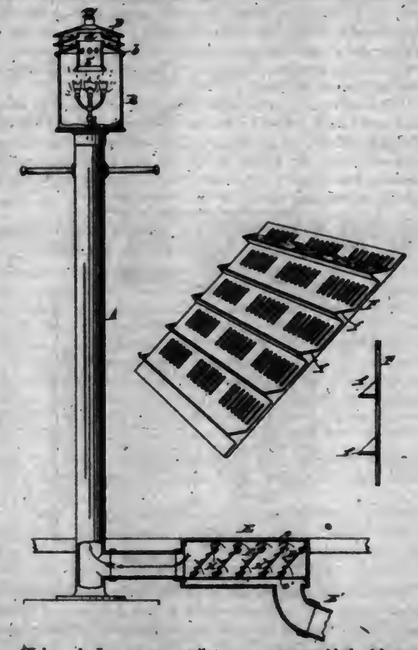
396,186. AUXILIARY STEERING DEVICE FOR VESSELS. CHARLES D. WOOLEY, Walden, N. Y. Filed Apr. 3, 1888. Serial No. 269,414. (No model.)



Claim.—1. The combination, with the round rudder-post D, screw-threaded at its upper end and having a rudder on its lower end, of the adjusting-nut on said threaded portion, and the tiller D', fixedly secured to the post at the juncture of the threaded and non-threaded portions.

2. The combination, with a marine vessel having downwardly-opening rudder and brace-receiving recesses in its bottom, of a vertically-adjustable rudder-post carrying a rudder and projecting below the same, a loose sleeve on the said projecting end of the rudder-post, and a brace pivotally connected to said sleeve and to a pin or part within the brace-recess, substantially as described.

396,187. SEWER-VENTILATOR. THOMAS P. WORTHINGTON, Southshore, Blackpool, County of Lancaster, England. Filed Mar. 19, 1888. Serial No. 267,641. (No model.)



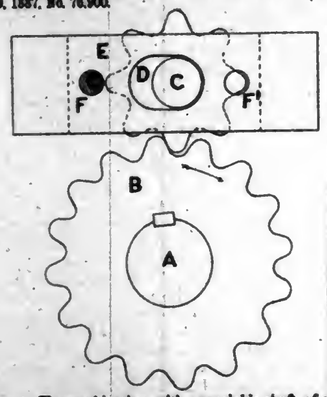
Claim.—1. In a sewer-ventilator, a grate provided with a series of ledges, forming pans for holding disinfectants, and apertured between the ledges, substantially as described.

2. In a sewer-ventilator, the combination, with a tubular lamp-post, of a chamber arranged between the lamp and the sewer, and a series of grates arranged in the chamber and provided with a series

of ledges, forming pans for holding disinfectants, substantially as herein shown and described.

3. The combination, with a tabular lamp post, standard, or pillar, a lamp provided with an apertured cap, and the burner of said lamp, of an exterior disinfectant-chamber connected at one end with the post and adapted for connection at the opposite end to a sewer provided with perforated partitions above the sewer-connection, and a series of grates and supporting-ledges forming pans or receptacles projected from the partition adapted to retain disinfectants, substantially as shown and described.

396,188. REVERSIBLE RACK-STOP. LUKE ANDERSON, London, County of Surrey, England, assignor of one-half to Leicester Bradney Stevens, same place. Filed Aug. 21, 1888. Serial No. 283,380. (No model.) Patented in England Feb. 23, 1887, No. 2,787, and in Belgium Mar. 29, 1887, No. 76,900.

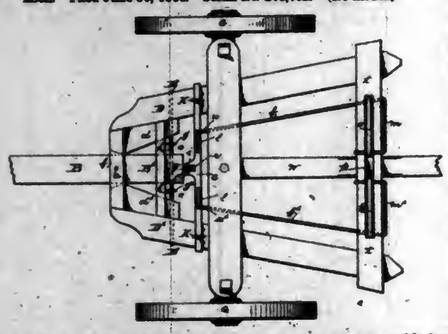


Claim.—1. The combination, with a revoluble shaft, of a toothed wheel secured on the shaft, a laterally-movable pinion gearing into the toothed wheel, and a stop adapted to engage with the said pinion and prevent the back motion of the shaft, substantially as set forth.

2. The combination, with a revoluble shaft, of a toothed wheel secured on the shaft, a laterally-movable pinion gearing into the toothed wheel, a fixed bracket provided with a hole on each side of the pinion, and a removable stop adapted for insertion into either of the said holes for arresting the motion of the pinion, substantially as and for the purpose set forth.

3. The combination, with a revoluble shaft, of a toothed wheel secured on the shaft, a fixed bracket provided with a central slot and a hole upon each side of the slot, a laterally-movable pinion gearing into the said wheel and guided by the said slot, and a stop adapted for insertion into either of the said holes for arresting the motion of the pinion, substantially as and for the purpose set forth.

396,189. WAGON-TONGUE LOCK. CHANCY C. ANDREWS, Nottawa, Mich. Filed June 30, 1888. Serial No. 278,702. (No model.)



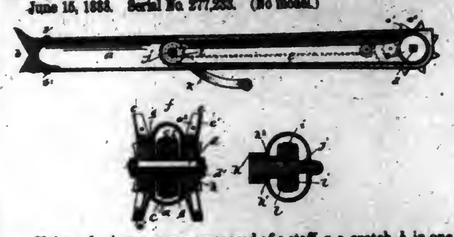
Claim.—1. In a wagon-lock, a pivoted tongue and movable bar engaged thereby, in combination with a rock-shaft having one end engaged by said bar and the other end provided with a locking-latch, substantially as described.

2. In a wagon-lock, a fifth-wheel and pivoted tongue, in combination with rock-shafts provided with locking-latches, substantially as described.

3. The combination of a fifth-wheel provided with a pivoted tongue, a horizontal bar passing through the tongue and provided with stops upon opposite sides thereof, a reciprocating bar, a pair of rock-shafts engaged by said bar, and locking-latches operated by said shafts, all arranged and adapted to operate substantially as described.

4. In combination with the fifth-wheel and tongue, a pair of rock-shafts having locking-latches pivoted thereon, and having their heavier free ends also pivotally connected to the bent ends of the shafts, substantially as described.

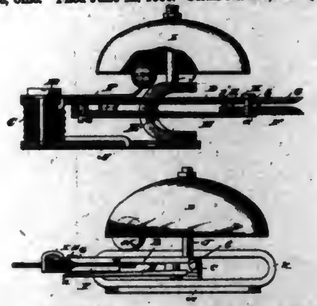
396,190. CAR-MOVER. CLARENCE I. BARNHART, Flint, Mich. Filed June 15, 1888. Serial No. 277,233. (No model.)



Claim.—1. A car-mover composed of a staff, *a*, a crotch, *b*, in one end of such staff to engage a car, a gripper, *f*, supported upon a shaft which is borne by the other end of said staff, said gripper being composed of dished halves *e*, provided with hubs to receive the shaft, and with fingers *d'*, having biting-edges d^2 thereon, which halves are independently and detachably fixed to the shaft, and gearing for imparting rotary motion to said gripper, substantially as and for the purpose described.

2. A rotary gripper composed of dished halves *e*, provided with hubs *g*, and having the fingers *d'*, with knives d^2 fastened thereon, combined with a hollow staff having openings in its sides forming bearings for said hubs, a shaft to which said halves are independently and detachably fixed, and operating-gearing for imparting rotary motion to said gripper, substantially as described.

396,191. CORD-TENSION ALARM FOR GRAIN-BINDERS. MILFORD H. BIEBERBACH, Upper Sandusky, and NELSON M. BIEBERBACH, Melmore, Ohio. Filed June 12, 1888. Serial No. 276,851. (No model.)



Claim.—1. The combination, with the attaching-plate having a loop, as described, and a gong arranged thereon, of a pivoted arm having clamping-jaws at its outer end and connected with the plate at its opposite end by means of a spring, and a pivoted hammer mounted on but moving with the pivoted arm and having a limited play thereon, substantially as specified.

2. The combination, with the attaching-plate having a loop, as described, of a gong arranged thereon, a pivoted arm having adjustable clamping-jaws at one end and pivoted on the plate at the other end and playing in the loop, and a spring connecting the arm with the plate, and a pivoted hammer for the gong mounted on the same pivot as the arm and moved by the said arm, substantially as specified.

396,192. COMPOSITION FOR CLEANING THE TEETH. CHARLES R. CLARK, New Britain, Conn., assignor of one-half to Henry C. Burton, U. S. Army. Filed Nov. 7, 1887. Serial No. 254,560. (No specimens.)

Claim.—1. A composition for a dentifrice, consisting of menthol and abrading substance, substantially in the proportions specified.

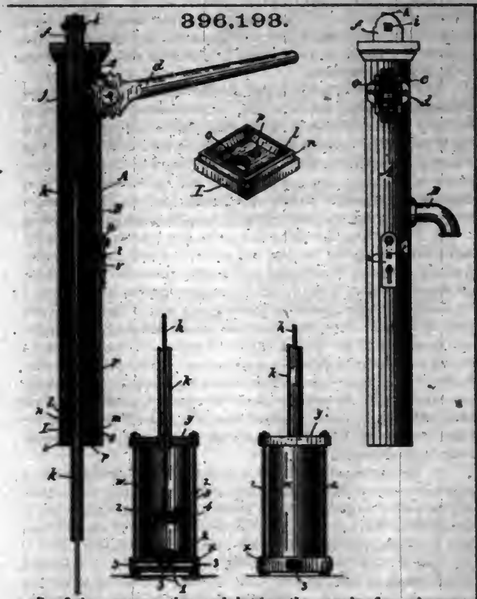
2. A composition for a dentifrice, consisting of menthol, glycerine, and abrading substance, substantially in the proportions specified.

3. A composition for a dentifrice, consisting of menthol, glycerine, abrading substance, flavor, and odor, substantially in the proportions specified.

396,193. PUMP. WILLIAM H. CLOUD, Kokomo, Ind., assignor of one-half to William Styer, same place. Filed Mar. 15, 1888. Serial No. 267,212. (No model.)

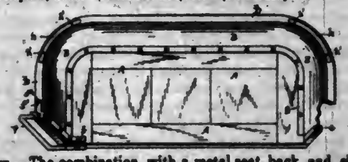
Claim.—In a pump, the combination, with the upper and lower sections of the pump-stock, of the above-described coupling-block, consisting of a rectangular block adapted to fit into grooves in the

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walls of the upper section, and having the annular flange *l*, screw-threaded opening *o*, and drainage-opening *p*, and the annular packing *s*, all arranged substantially as specified.

396,194. VEHICLE-SEAT. FRANK A. COMSTOCK, Columbus, Ohio. Filed Sept. 3, 1888. Serial No. 284,388. (No model.)



Claim.—The combination, with a metal seat back and sides, of the strengthening-fillet *b*, of wood, in the form of a parallelogram, bent to conform to the line of the upper flanged edge of the seat back and sides to which it is secured, the wooden end and connecting-pieces *c*, into which are made to extend the ends of said back and side piece, handles F, having perforated extension-arms *f'*, and strengthening perforated corner-plates A, substantially as and for the purpose specified.

396,195. ARMATURE FOR DYNAMO-ELECTRIC MACHINES. LEO DAFT, Plainfield, N. J. Filed Nov. 12, 1885. Renewed May 4, 1888. Serial No. 272,855. (No model.)



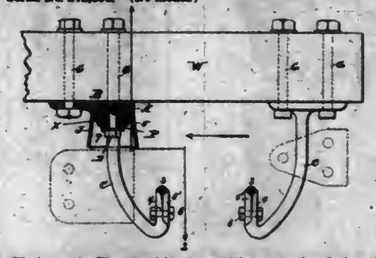
Claim.—1. An armature consisting of a cylindrical core, rings connected to the core and having outwardly-extending arms, and spiders connected to said arms, substantially as described.

2. The combination, with the core, of a ring, another intermediate ring interposed between the core and the said ring, a spider, and arms joining the spider and intermediate ring, substantially as described.

3. The combination, with the core, of a ring having notches, an intermediate ring having laterally-projecting arms fitting said notches, and spider-arms supporting the latter, substantially as described.

4. In an armature, the combination, with the core, of a ring of diamagnetic material, over which the wires may be wound, an intermediate ring having integral arms, also of diamagnetic material, and spider-arms connected to the intermediate ring supporting the core, substantially as described.

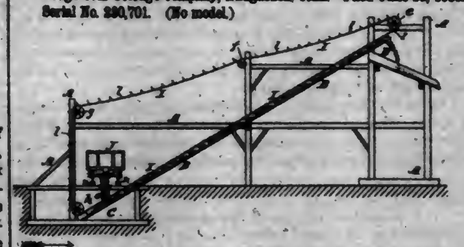
396,196. INSULATOR-SUPPORT FOR ELECTRIC CONDUCTORS. LEO DAFT, Plainfield, N. J. Filed Dec. 29, 1886. Renewed May 4, 1888. Serial No. 272,856. (No model.)



Claim.—1. The combination, with an overhead electrical conductor, and with a bracket supporting the same, of an overhead support, a bonnet secured to said support and receiving a cross-head of the bracket, and fastenings extending through the cross-head into the bonnet and through insulating material between the fastenings and the cross-head and between the latter and the bonnet, substantially as set forth.

2. The combination of the support, pendent bonnet, bracket supporting a conductor and provided with a cross-head having openings *x*, bolts passing through said openings into the bonnet, an insulating material between the heads of the bolts and the cross-head and between the cross-head and the bonnet, substantially as set forth.

396,197. CHAIN CONVEYER FOR UNLOADING CARS. JAMES M. DODGE, Philadelphia, Pa., assignor, by mesne assignments, to the Dodge Coal Storage Company, Naugatuck, Conn. Filed June 23, 1888. Serial No. 280,701. (No model.)



Claim.—In an apparatus or contrivance for transisting coal from the dumping-cars of a surface railroad to a higher elevation, the combination, with the usual pit located beneath the surface track and adapted to accommodate the lowermost portion of the chain-conveyer trough and to receive the coal as discharged from the dumping-cars located on said track, of, first, the obliquely-arranged conveyer-trough having its lowermost end located within said pit and its upper end at a higher elevation, and, second, the flighted endless conveyer-chain having its lower run arranged to operate in conjunction with said trough, and having its upper run arranged to encompass the track and the dumping-car which may be located thereon, the whole constructed and operating in substantially the manner hereinbefore described, for the purposes set forth.

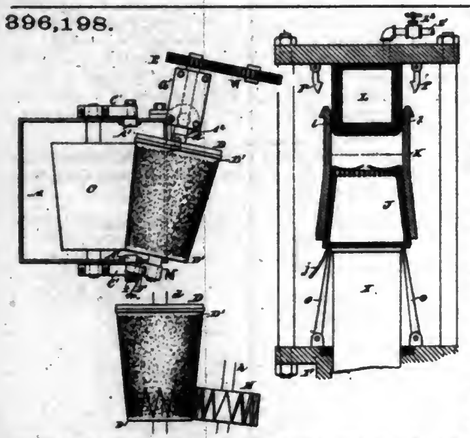
396,198. MANUFACTURE OF PAILS, &c., FROM PAPER-PULP. HENRY FAIRBANKS, St. Johnsbury, Vt. Filed June 1, 1887. Serial No. 239,943. (No model.)

Claim.—1. That improvement in the manufacture of articles from paper-pulp that consists in admitting live steam properly confined to press directly upon the surface of fluid pulp to force the water out, lay the fiber, and keep the semi-solid mass of the partly-formed vessel flexible while the pressing-dies are being brought into action, as herein specified.

2. The method herein described of softening and drying, in connection with shaping, articles of paper-pulp by compressing mechanically between properly-formed perforated dies and also forcing steam from one die to the other through the article, substantially as herein specified.

3. The within-described method of manufacturing pails and analogous articles of paper-pulp by tearing partially-hardened pulp, applying the torn edges nearly together, flowing thin pulp between and

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causing it to saturate and become incorporated with the said edges, and subsequently draining, heating, softening, and partially drying by steam and pressing the compound mass, all substantially as herein specified.

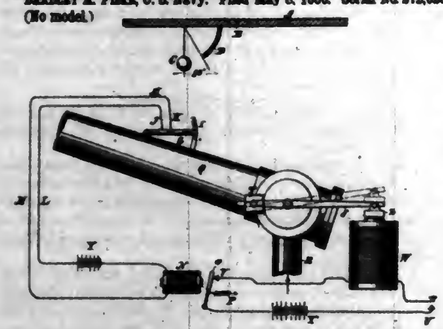
4. The bearing A^3 A^2 and vertical shaft G, supported therein, said shaft having the head G', in combination with the shaft *d*, journaled in said head at approximate right angles to said vertical shaft G, the conical roll D, mounted on said shaft *d*, with its smaller end remote from said head, the tank A, and rolls for supplying a coating of pulp to said conical roll D, substantially as herein specified.

5. A machine for the manufacture of articles from paper-pulp, comprising the bearings A^2 A^3 and vertical shaft G, supported therein, said shaft having the head G', in combination with the shaft *d*, journaled in said head at approximate right angles to said vertical shaft G, the conical roll D, mounted on said shaft *d*, with its smaller end remote from said head, the box M, in which the free end of said shaft *d* is journaled, the hook *m* upon said box, the tank A, standard A', and pin *a* upon said tank, lever F, pivoted at one end upon said standard and adapted to engage said hook and pin, for the purpose set forth, and rolls for supplying a coating of pulp to said conical roll D, substantially as herein specified.

6. In the manufacture of articles from paper-pulp, the pail-former J, having a finely-perforated top to receive the truncated cone of partially-hardened pulp, in combination with the removable piece K, of which the conical lower part fits over said truncated cone and the cylindrical upper part is adapted to receive a quantity of thin pulp to join the edges and form the bottom, substantially as herein specified.

7. In an apparatus for manufacturing articles from paper-pulp, the combination of the conical former J, having a finely-perforated top, the cylindrical box L, having finely-perforated bottom, the removable piece K, comprising a conical lower part fitting said former and a cylindrical upper part fitting said box, hooks *m* on said cylinder K, and dogs P for engaging said hooks and supporting said cylinder in elevated position, for the purpose set forth, and means for forcing said former upward, substantially as herein specified.

396,199. ELECTRIC APPLIANCE FOR DISCHARGING GUNS. BRADLEY A. FISKE, U. S. Navy. Filed May 3, 1888. Serial No. 273,023. (No model.)



Claim.—1. The combination of a gun, an electrode supported so as to be free to move under the action of gravity, an electrode partaking of the motion of elevation and depression of said gun and arranged in the path of said first electrode, an electrical firing apparatus for said gun, a source of electricity, and a circuit including said firing apparatus, source of electricity, and electrodes, the said second electrode being adjustable nearer to or farther from said first electrode, substantially as described.

2. The combination of a gun, an electrode free to move under the action of gravity and controlled by the elevation or depression of said gun, a second electrode rigidly connected to said gun and partaking of the motion thereof, an electrical firing apparatus for said gun, a source of electricity, and a circuit including said firing apparatus, source of electricity, and electrodes, the said second electrode being disposed in the path of motion of said first electrode and adjustable nearer to or farther from said first electrode, substantially as described.

3. The combination, with a pneumatic gun, a source of air-supply, and a valve interposed between said source and said gun, of an electro-magnet having its armature mechanically connected to said valve, an electrode free to move under the action of gravity and controlled by the elevation or depression of said gun, a second electrode in the path of motion of said first electrode rigidly connected to said gun and partaking of the motion thereof, a source of electricity, and a circuit including said electro-magnet, source of electricity, and electrodes, said elements being combined and operating so that when the gun reaches a certain predetermined elevation the movable electrode shall make contact with the fixed electrode, and the electro-magnet being energized shall through its armature open said valve, substantially as described.

4. The barrel or air-tube of a pneumatic gun movable about a center in a vertical plane, a valve regulating the air-supply to said tube, and an electro-magnet having an armature controlling said valve, in combination with a level containing a conducting-liquid disposed parallel to the longitudinal axis of the tube, movable about a center in the same vertical plane as and partaking of the motion of said tube, circuit-terminals entering said level, a source of electricity, and circuit-connections including said terminals and said electro-magnet, the aforesaid parts being constructed and disposed so that said electro-magnet shall be energized or de-energized by the making or breaking of circuit at said terminals by said liquid under the action of gravity, substantially as described.

5. The barrel or air-tube of a pneumatic gun movable about a center in a vertical plane, a valve regulating the air-supply to said tube, and a motor operating said valve, in combination with a vessel containing a conducting-liquid and movable about a center in the same vertical plane as and partaking of the motion of said tube, circuit-terminals entering said vessel, a source of electricity, and circuit-connections, the aforesaid parts being constructed and disposed so that the said motor shall be governed by the making or breaking of circuit at said terminals by said liquid under the action of gravity, substantially as described.

6. The combination of the barrel Q of a pneumatic gun, a valve regulating the air-supply therefor, a lever, S, controlling said valve to open or close the same, a level, G, containing a conducting-liquid supported by said barrel and adjustable in a vertical plane at an angle to the longitudinal axis of the bore, circuit-terminals J K, entering said level, battery Y and magnet N in circuit with said terminals, and a motor controlled by the armature of magnet N, for moving said lever S to open said air-valve, substantially as described.

7. The combination of the barrel Q of a pneumatic gun, a valve regulating the air-supply therefor, a counterweighted lever, S, controlling said valve, a level, G, containing a conducting-liquid and pivoted on said gun and adjustable in a vertical plane at an angle to the longitudinal axis of the bore, circuit-terminals J K, entering said level, battery Y, magnet N, armature O, and in circuit with said armature the battery Y', contact-stop V, magnet W, and armature Z of said magnet W, the said armature communicating with the lever S, substantially as described.

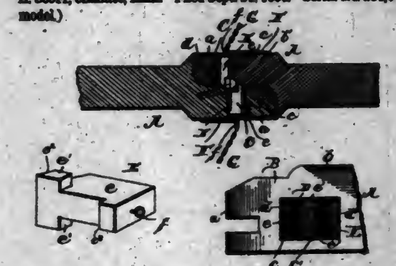
8. The combination of the barrel Q of a pneumatic gun, a valve regulating the air-supply therefor, a counterweighted lever, S, controlling said valve, a level, G, containing a conducting-liquid and pivoted on said gun and adjustable in a vertical plane at an angle to the longitudinal axis of the bore, circuit-terminals J K, entering said level, battery Y, magnet N, armature O, and in circuit with said armature the battery Y', contact-stop V, magnet W, armature Z, communicating with lever S, and circuit-closing key U, arranged between said electro-magnet and battery Y, substantially as described.

396,200. DIE USED IN MAKING DECORATIVE NAILS. HENRY P. FISKE, Waterbury, Conn., assignor to the American Ring Company, same place. Filed June 25, 1888. Serial No. 278,122. (No model.)



Claim.—The die *a*, having a hole for the passage of a wire which forms the shank of the nail, said hole opening into a conical recess in the die to form the cup or rest that connects the sheet-metal head to the shank, and said die having a circular shoulder or offset at 2, in combination with the matrix *b*, having a recess corresponding in shape to the exterior of the sheet-metal nail-head, and a circular opening into which the shoulder 2 fits tightly, so as to confine the sheet metal of the nail-head and render the head true and perfect by the pressure of the die upon the same, the metal being confined between the die and matrix, substantially as set forth.

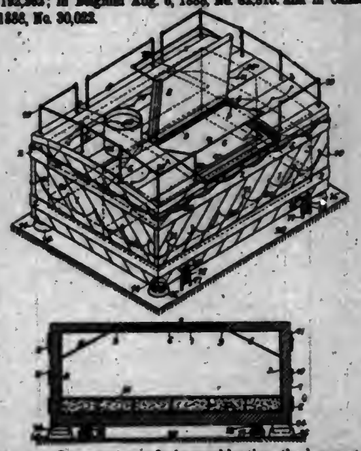
396,201. CAR-COUPLING. JOHN W. FORNEY, Thayer, and SAMUEL H. SCOTT, Chanute, Kans. Filed Sept. 21, 1888. Serial No. 286,044. (No model.)



Claim.—1. The combination of the draw-heads, each having a recess, B, and a projection, *a*, the projection *a* being provided with a transverse opening having a rectangular portion, *c*, and a T-shaped portion, *c'*, and the locking-block having a rectangular portion fitting in the portion *c* of the opening, and the flanges *c'*, fitting in the T-shaped portion thereof, as specified.

2. In a car-coupler, the combination, with the draw-head provided with the recess B, the opening C, and recess D, of the locking-block E, provided with the flanges *c'*, beveled point c^3, and shoulder c^2 on its inner edge, the spring-rod F, and the chain G, substantially as specified.

396,202. MARINE SAFE. WILLIAM W. FORNEY, Havelet, Guernsey, England. Filed Aug. 17, 1888. Serial No. 282,956. (No model.) Patented in England July 19, 1888, No. 10,480; in France Aug. 6, 1888, No. 192,963; in Belgium Aug. 6, 1888, No. 82,510, and in Canada Oct. 20, 1888, No. 30,022.



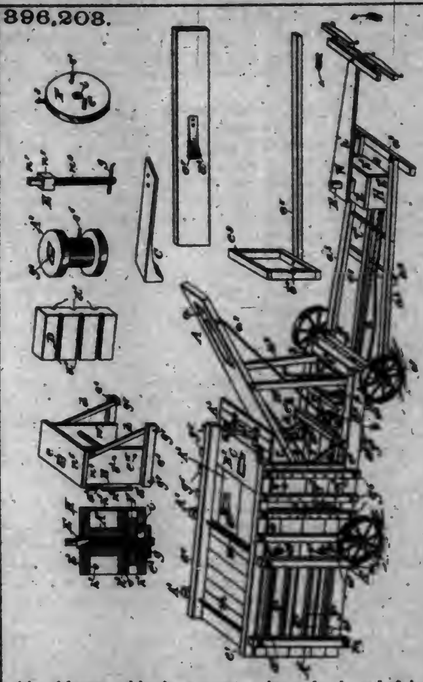
Claim.—1. In a marine safe, in combination, the buoyant water-tight casing 1, strengthened with surrounding bands 2, and adapted with life-lines 10, top railing, 19, cylinder 12, and contained buoy 13, and water-tight doors 8, with an inner partitioned water-tight lining, 3, partitioned off into a ballasting-compartment, 21, buoyant compartments 5, and water-tight compartments for reception of mail or other matter, and adapted with water-tight doors 7, as set forth.

2. The combination, with the buoyant and water-tight casing, of the conical feet 14, fitting into like-shaped recessed sockets 16, the staples 15 17, and the lashing-cord 18, substantially as set forth.

396,203. HAY-PRESS. ALFONSO A. GARNER, Waverland, Iowa. Filed May 14, 1888. Serial No. 273,901. (No model.)

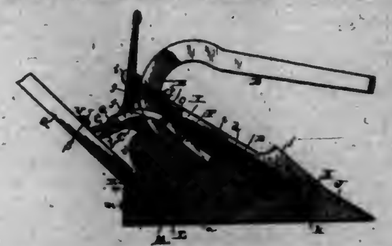
Claim.—1. A baling-press windlass consisting of the frame H, the spool A^3, the wheel F, provided with the pins c^3, the driving-rod E, provided with the pin *g*, and which passes through the spool and wheel, the sweep *w*, mounted upon the driving-rod, and the lever c^4, provided with a fulcrum and having one end resting under the end of the driving-rod, all combined substantially as described.

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2. The press-box K, the car B, the ram A, pivoted to the car and provided with the pulley *a*, the arms a^3, pivoted to the ram, the frame H, the spool A^3, supported in the frame, the wheel F, supported in the frame and having the pins c^3, the driving-rod E, provided with the pin *g*, and which passes through the spool A^3 and wheel F, the sweep *w*, mounted upon the driving-rod, the lever c^4, provided with a fulcrum and having secured to one end the frame c^5, the rope *n*, secured at one end to the car and at the other end to the wheel F, and the chain a^2, which passes over the pulley *a* and is secured at one end to the frame of the press and at the other to the spool, all combined substantially as described.

396,204. PLOW. ANDERS HAGVERT, South Bend, Ind. Filed July 26, 1888. Serial No. 281,153. (No model.)



Claim.—1. In a plow, the combination of a mold-board adapted to be shifted to right or left of the landside with a plow-beam adapted to be retracted to permit turning of the mold-board over the landside, substantially as specified.

2. The combination, in a plow, of a shifting mold-board turning over the landside with a retractible plow-beam, and connections between the beam and mold-board whereby the mold-board is turned by the shifting of the beam, substantially as described.

3. The combination, in a plow, of a shoe, a retractible plow-beam thereon, and the mechanism for shifting said beam with a mold-board pivotally connected to the shoe and connected to the beam and adapted to be shifted to right or left of the beam over the shoe, substantially as described.

4. The combination of the landside and mold-board adapted to be shifted over and to right and left of said landside with the shifting-quadrant pivoted to said landside and bracing the mold-board and the laterally-adjustable handles, substantially as described.

5. The combination, with the shoe having a socket and the plow-beam having a foot sliding in said socket, of a mold-board adapted to be shifted over the shoe beneath the handle and the devices for retracting and shifting the beam while the mold-board is being turned, substantially as set forth.

6. In a plow, a shoe having a landside, a mold-board pivotally connected to and turning over said shoe, a pivoted shifting bracing quadrant for the mold-board, and a longitudinally-shifting plow-beam, all combined and arranged substantially as described.

7. The combination of the shoe, the mold-board pivotally attached thereto, the retractible plow-beam mounted thereon, and the adjustable handles with the lever-and-link connections, whereby the beam and mold-board are shifted and the handles locked simultaneously, substantially as described.

8. The combination of the shoe having an inclined socket, the shifting plow-beam having a foot engaging said socket, and the double-faced mold-board pivoted on said shoe and turning to right or left over the same with the short shaft journaled in the rear portion of the shoe, its arm and link-connection between the same and plow-beam, and the link-connection between said beam and mold-board, whereby the beam is shifted and the mold-board turned upon the the oscillation of said shaft, substantially as described.

9. The combination of the slotted and channeled shoe and the shifting plow-beam having a foot engaging in the socket of the shoe with a transverse key attached to said beam and engaging in slots in the walls of the channel to prevent the escape of the beam from the shoe, substantially as specified.

10. In a plow, an angular-pointed shoe having an inclined slot and a channel slotted at the sides and ending in arms at the rear upper portion of the shoe, a mold-board adjustable to right or left of the shoe and pivotally attached thereto, a quadrant-brace pivoted to the shoe and supporting the wings of the mold-board, an adjustable beam having a foot mounted in the socket and channel of the shoe and keyed in the slots of said channel, a lever pivoted to a shaft journaled in the arms of said shoe, the link-connections between said shaft and beam, the link-connection between said beam and mold-board, and the adjustable handles, all combined and constructed substantially as set forth.

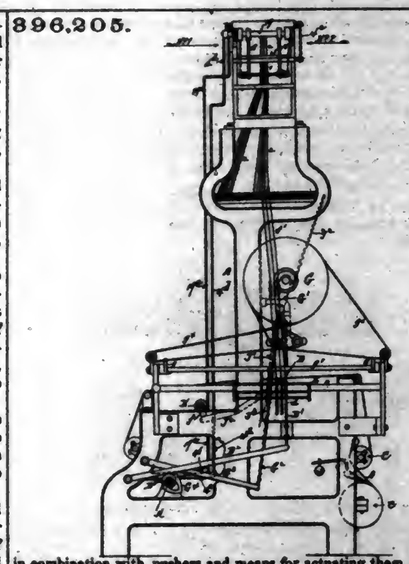
11. The combination of the shoe A and the mold-board I, having point J, pivoted to the front end of the shoe and provided with a brace-piece, O, with the angular brace *l*, pivoted in a slot in the rear of the shoe, the arc-shaped rod N, secured to the arms of said brace, and the eyes *n*, attached to brace O and engaging bar N, all substantially as specified.

12. The combination of the shoe with the mold-board I, having wings *i i* and point J, and brace O, provided with eyes *o o*, with the brace *l*, pivoted in a slot in said shoe and having its arms on opposite sides of the same, and the rod N, passing through eyes *o o* and attached to the ends of brace *l*, and the handles attached to said shoe in rear of the brace, substantially as and for the purpose set forth.

13. The combination of the shoe A, having landside *a* and inclined socket B, channel *b*, and arms C C, and the shifting mold-board pivotally mounted on said shoe, with the slotted beam D, having foot *d*, engaging socket B, the shaft G, journaled in arms C C, the lever *g*, the arm *f* and link F, connecting the shaft and beam, and the key H and slots *h*, all substantially as and for the purpose set forth.

14. The combination, in a hillside-plow, of a foot, A, having inclined socket B and channel *b*, arms C C, the beam D, having foot *d*, engaging socket B, and the shaft G, lever *g*, arm *f*, and link F, for shifting the beam, with the mold-board I, having share J, formed with shoulder K on its under side and pivoted on the front end of the shoe, the quadrant L, pivoted to the shoe and supporting the wings of said mold-board, the link P, connecting said mold-board and beam, and the adjustable handles and their locking devices operated by lever *g*, all constructed and arranged substantially as set forth.

396,205. LOOM FOR WEAVING CHENILLE AND FRINGE. KEDAR HAZELEY, Philadelphia, Pa., assignor, by direct and mesne assignments, of one-half to Joseph Hanson, same place. Filed Apr. 23, 1887. Serial No. 236,728. (No model.)



Claim.—1. The combination, with a Jacquard mechanism, of a series of thread-holders, each being provided with a hinged holding or tension arm, and each having independent connection with the Jacquard mechanism and capable of vertical adjustment thereby, and a laterally-adjustable carriage in which said holders are supported, as set forth.

2. A thread-holder and connections to a Jacquard mechanism by which the same is raised, in combination with said Jacquard mechanism, a supporting-stick, and means, substantially as described, for raising it under the holder and supporting said holder thereby, as set forth.

3. A thread-holder and sliding carriage in which said thread-holder is mounted, and means for vertically adjusting them therein, in combination with pushers and means for actuating them, substantially as described, for adjusting said carriage laterally.

4. A series of thread-holders, a sliding carriage, and means, substantially as described, for raising the holders separately, in combination with the pushers for centering the elevated holder and carriage, and means, substantially as described, for advancing the said pushers from the sides to the center, as set forth.

5. The combination, with a series of thread-holders, means for vertically adjusting them, a stick for sustaining a raised holder in an elevated position, means for actuating said stick, pushers, and actuating devices therefor for centering a holder when raised, of an arm with nippers on one end, and means, substantially as described, for projecting the said arm from the opposite side of the warp-threads for seizing the thread and drawing it through between the said warp-threads.

6. The combination, with a series of thread-holders and means for elevating them separately, a stick to hold the raised holder elevated, and means for actuating the stick, of the nippers for carrying the thread across through the warp, means for actuating the nippers, a knife and guides in which it works, connections and pivoted lever, and a cam for elevating the knife by acting on the lever and releasing the lever to let the knife drop, as set forth.

7. The combination, with a Jacquard mechanism and the vertically-movable thread-holders and laterally-sliding carriage in which they are held, of levers pivoted to the carriage and extended through the stems of the holders, and connections to the Jacquard harness from said levers for raising the said holders separately, as set forth.

8. The combination, with a Jacquard mechanism, vertically-movable thread-holders, and sliding carriage in which they are held, of levers pivoted at one end to a part of the carriage-frame and inserted through the stem of the holders, connections from the said levers to the Jacquard harness, pushers, and means for actuating them, substantially as described, for centering the sliding carriage and the elevated thread-holder, as set forth.

9. The combination, with the laterally-adjustable carriage, thread-holders held therein, and means whereby they are raised and dropped therein, of the pushers, cords connected to said pushers, a drum to which the cords are connected at the other end, and means, substantially as described, for giving the drum a partial rotation and then returning it to the normal position, whereby the pushers are operated, as set forth.

10. The combination, with the pushers, the cords connected thereto, the drum to which the cords are connected at the other end, the crank-pitman, lever, and cam for partially rotating the drum, and the rod and spring for returning the drum to the proper normal position, of the thread-holders and means for raising them and sliding carriage, substantially as set forth.

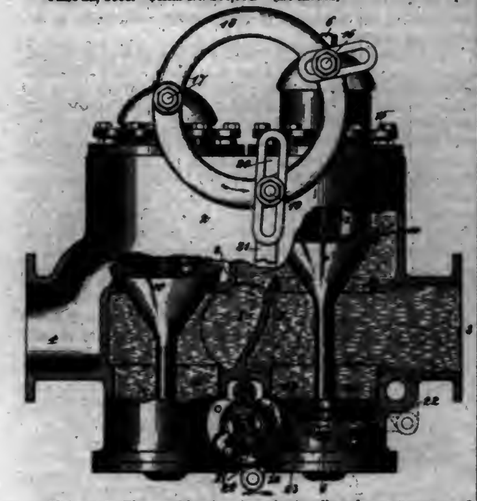
11. A thread-holder for looms, consisting of stem and grooved projection, as described, and having an opening or hole through the head thereof, and a pivoted arm which rests in the groove, substantially as set forth.

12. A pattern-card and supporting and feeding devices therefor, and shield with line of perforations lying back of said card, and means, substantially as described, for moving the said parts sidewise, as set forth.

13. The combination of a pattern-card, supporting and feeding devices therefor, and a shield having a line of perforations, with the needles, needle-cords and cord-lifting devices, and cam-bars actuated by said needle-cords for moving the pattern supporting and feeding devices and the card and shield sidewise, substantially as set forth.

14. The combination, with a laterally-movable card-carriage, card and feeding devices therefor, and shield having the line of perforations, of the needles, needle-cords and cord-lifting devices, and sliding bars having wedges or cams thereon for moving the card-carriage and attached parts, said bars being connected to the needle-cords, as set forth.

396,206. HYDRAULIC VALVE. TRADDEUS W. HERRMANN, Chicago, Ill., assignor to The Crane Elevator Company, of Illinois. Filed June 22, 1888. Serial No. 277,204. (No model.)



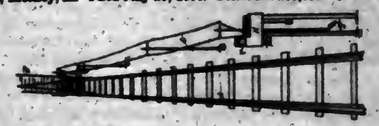
Claim.—1. The combination, in a hydraulic-valve apparatus, of two valves, a lever-fulcrum to both said valves, a pilot-valve, and a floating lever having a movable fulcrum and operating the pilot-valve and connected to the first-named lever, substantially as described.

2. The combination of two valves, one controlling the inlet and the other the exhaust opening, pistons connected to said valves, a lever fulcrumed to both said valves, a pilot-valve controlling the admission of water to said pistons, and a floating lever having a movable fulcrum and operating said pilot-valve and connected to the first-named lever, substantially as described.

3. The combination of the casing 2, divided by the partitions 7 and 8 into three chambers communicating with the inlet 3, cylinder-opening 5, and exhaust 4, respectively, the valves 9 and 10, seating in said partitions, the pistons 11, connected to said valves, the pilot-valve 25, admitting water to said pistons, the lever 18, connected to pistons 9 and 10, the floating lever 21, connected to the lever 18 and the valve-arm 24, and having the movable fulcrum 34, substantially as described.

4. In a hydraulic motor for elevators, the combination, with the inlet and exhaust valves and fluid-motors for operating them and an oscillating pilot-valve for controlling the flow of fluid to said motors, of a lever having suitable pivoted connections with said inlet and exhaust valves, said connections serving alternately as fulcrums for the lever as the valves are moved, a floating lever pivoted at one end to the piston-valve to oscillate it and connected at its other end to the first-named lever by a pivotal connection constructed to permit an independent longitudinal movement of said floating lever, and a connecting-rod to which power is applied, attached to the floating lever between the ends of the floating lever and engaging stops connected to the pilot-valve and the floating lever to limit their relative movements, substantially as described.

396,207. ELECTRIC SIGNALING APPARATUS. WILLIAM HENRY, Ritchey, Ill. Filed July 25, 1888. Serial No. 281,053. (No model.)



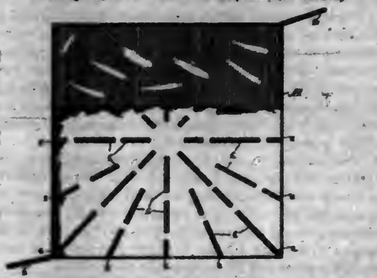
Claim.—1. In the electric signaling apparatus shown and described, in combination with the vibrating lever *a* of the electric instrument, the shaft S, adapted to be rotatable by means of a cord-and-weight mechanism and having the oppositely-arranged arms *c* and *c'* for alternately engaging said lever, the oppositely-arranged arms on the outer end of said shaft respectively having different-colored targets R W on their outer ends, the housing H for alternately exposing said signals to view, rod L, having one end protected to be a non-conductor and arranged to be within sleeve F, sleeve F, secured to the slide-rail B, clip E, for securing the opposite unprotected end of said rod to main rail A, non-conductor strip G, rail A, and line-wires *e*, arranged to connect the opposite poles of the electric instrument, respectively, with said rails and with each other through the medium of bolt L, clip E, and sleeve F, to form an electric circuit, substantially as and for the purpose set forth.

2. In the electric signaling apparatus shown and described, in combination with the vibrating lever *a* of the electric instrument, the shaft S, having the arms *c c'*, and arms S', having respectively different colored targets arranged on their outer ends, the cord-and-weight mechanism, the housing H, having the colored opposite lights V V, the line-wires *e*, and the permanent rail A and slide-rail B, connected so as to open and close the electric circuit, substantially as and for the purpose set forth.

3. In an electric signaling apparatus, in combination with the electric instrument having the vibrating lever *a*, the rotating shaft S, having the oppositely-arranged arms *c c'* for alternately engaging said lever, the oppositely-arranged arms S', respectively carrying on their outer ends the different-colored targets, and the housing H, arranged to cause said targets to be alternately exposed to view, substantially as and for the purpose set forth.

4. In an electric signaling apparatus, in combination with an electric instrument, line-wires, and main and slide rails of a railroad, the rod L, having one end protected to be a non-conductor and secured at its opposite end to one of said rails in such manner as to be separated therefrom by a non-conductor, and the sleeve F, secured to the opposite rail in such manner as to receive the non-conductor end of said rod, so that it may reciprocate therein and alternately bring it in contact with the conductor and non-conductor parts of said rod to open and close the electric circuit, substantially as and for the purpose set forth.

396,208. WATER BANDAGE. GEORGE P. HERNDON, Washington, D. C. Filed Apr. 2, 1888. Serial No. 269,316. (No model.)



Claim.—A water bandage formed of impervious material and having its walls stayed against inflation by means of tubes, said tubes being arranged within the covering of the bandage and having communication with the inclosed space of the bandage, substantially as and for the purpose specified.

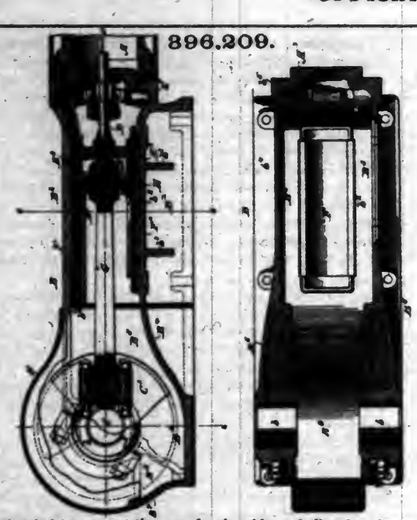
396,209. ENGINE-FRAME. ALBERT L. IDE, Springfield, Ill. Filed Feb. 20, 1888. Serial No. 264,607. (No model.)

Claim.—1. An engine-frame constructed for the attachment of a cylinder at one end and having two shaft-bearings at its opposite end, said frame comprising a straight tubular part adjacent to the cylinder, constructed to support the cross-head guides and having two vertical walls at each side of the frame, which form continuations of the side walls of the said tubular part, and which are connected with each other to form two hollow girders connecting the shaft-bearings with said tubular part of the frame, substantially as described.

2. An engine-frame constructed for the attachment of a cylinder at one end and having two shaft-bearings at its opposite end, said frame comprising a straight tubular part adjacent to the cylinder, constructed to support the cross-head guides, a hollow base located beneath said tubular part, and two vertical walls at each side of the frame, which are connected with each other to form hollow girders continuous with the side walls of said tubular part, and which are constructed to support the shaft-bearings, substantially as described.

3. An engine-frame constructed for the attachment of a cylinder at one end and having two shaft-bearings at its opposite end, said frame comprising a straight tubular part adjacent to the cylinder,

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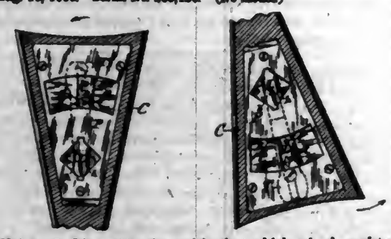
constructed to support the cross-head guides, a hollow base beneath said tubular part, vertical side walls continuous with the side walls of the tubular part and supporting the shaft-bearings, and a bottom wall or plate, B^4, extending downwardly from the lower wall of the tubular part to a point beneath the crank-shaft bearings and connected at its side margins with the said vertical side walls, substantially as described.

4. An engine-frame comprising a cylindric part adjacent to the cylinder, a hollow base beneath said cylindric part, two connected vertical walls at each side of the frame forming hollow girders continuous with the side walls of the said tubular part and supporting the shaft-bearings, and a bottom plate or wall, B^4, extending from the bottom of the tubular part to a point beneath the shaft-bearings and extending between and connecting the said vertical side walls, substantially as described.

5. The combination, with an engine-frame provided with a tubular part adjacent to the cylinder and having vertical side walls forming continuations of the sides of said tubular part for supporting the shaft-bearings, and having a bottom plate, B^4, extending from the bottom wall of the tubular part between said vertical walls beneath the shaft-bearings, of a hood or cover fitted to the adjacent margins of the said side walls, bottom plate, and tubular part for covering the crank-disks, substantially as described.

6. The combination, with an engine-frame comprising a tubular part adjacent to the cylinder, vertical side walls forming continuations of the tubular part for supporting the shaft-bearings, a bottom wall, B^4, between said side walls, and a transverse wall, B^7, connected at its side margins with the said side walls, of a cover or hood, H, fitted at its margins to the said tubular part, the side walls and the upper margin of the cross-wall B^7, substantially as described.

896,210. ODOMETER. GEORGE W. JOHNSON, Geneva, N. Y. Filed Aug. 18, 1888. Serial No. 283,126. (No model.)



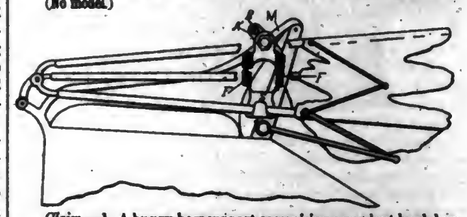
Claim.—1. In combination, with the vehicle-wheel, registering mechanism, and the supporting-frame of the latter secured to said wheel, a ratchet-wheel secured to one of the shafts of the registering mechanism, a gravitating lever pivoted at one end to said frame, a pawl on said lever engaging the ratchet-wheel, and a gravitating tumbler provided with catches adapted to alternately engage and release the aforesaid lever during the revolution of the vehicle-wheel, as set forth.

2. In combination with the vehicle-wheel, registering mechanism, and the supporting-frame of the latter secured to said wheel, the ratchet-wheel R, secured to one of the shafts of the registering mechanism, the lever L, pivoted at one end to the aforesaid frame and weighted at the opposite end, the pawl *a*, connected to the lever, and the gravitating tumbler T, arranged movable laterally and longitudinally and provided with catches adapted to alternately engage and release the lever L during the revolution of the vehicle-wheel, as specified.

3. In combination with the wheel W, frame A, and registering mechanism connected to said frame, the ratchet-wheel R, secured to one of the shafts of the registering mechanism, the lever L, pivoted at one end to the frame A at a point between the ratchet-wheel and hub of the wheel and having its free end extending across the ratchet-wheel and weighted, the pawl *a*, connected to said lever, pins *l l*, projecting from the lever L, the gravitating tumbler T, provided with the longitudinal slot *b*, and connected oscillatory and movably longitudinally to the frame by the screw *c* in the said slot, and the lug *d*, projecting from the tumber and adapted to alternately engage and release the pins *l l* during the movement of the tumbler, substantially as described and shown.

4. In combination with the frame A and registering mechanism connected thereto, the ratchet-wheel R, secured to one of the shafts of said mechanism, the gravitating lever L, pivoted at one end to the frame A and having its free end extending across the ratchet-wheel, the pawl *a*, connected to said lever, the plate P, secured to the frame over the ratchet-wheel and lever and provided with the elongated aperture *e* and the quadrilateral aperture *f*, which latter is arranged diagonally in relation to the lever L, the tumbler T, provided with the longitudinal slot *b* and connected oscillatory and movably longitudinally to the plate P by the screw *c*, passing through the said slot, the lug *d*, projecting from the tumbler into the aperture *e*, the pins *l l*, projecting from the lever into the said aperture, and the guide A, projecting from the tumbler into aperture *f*, substantially as described and shown.

896,211. BUGGY-BOW SUPPORT. JONATHAN F. KOLB, HOMER H. ALLEN, and CHARLES F. ST. CLAIR, Oceanside, Cal.; said Allen and said St. Clair assignors to said Kolb. Filed July 24, 1888. Serial No. 280,947. (No model.)



Claim.—1. A buggy-bow support comprising a pendent hook having a spiral spring-support, and means for securing the spring-support to the buggy-seat with the point of the hook upward.

2. The combination of the clamp, the pivot-bolt projecting therefrom, the hanger secured thereon, the pendent hook, and spiral springs connecting the hook with the hanger.

3. The combination of the clamp A A', the bolts B, the pivot-bolt C, secured to and projecting from the clamp, the hanger D, the spiral springs F, secured thereto by their upper ends, and the hook H, secured to the lower ends of such springs.

4. The combination of the clamp, the pivot-bolt C, the hanger D, the spiral springs F F, secured thereto by their upper ends, and the hook H, comprising the loops I J K, secured to the lower ends of the springs.

5. In a buggy-bow support such as described, the hook and springs formed of a single piece of wire having a spring-coil, F, near each end and being bent upon itself between the springs A to form the loops I J K and the hook H.

6. The combination of the clamp, the pivot-bolt C, the nut E, the hanger D, the spiral springs F F, secured thereto by their upper ends, and the hook H, comprising the loops I J K, secured to the lower ends of the springs.

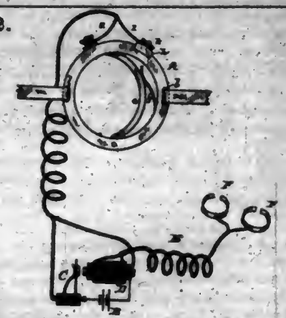
7. The combination of the clamp, the pivot-bolt C, the nut E, the hanger D, the spiral springs F F, secured thereto by their upper ends, and the hook H, comprising the loops I J K, secured to the lower ends of the springs, and the sheath S.

896,212. ELECTRICAL BODY-WEAR. JOHN V. LOSE, Jersey City, N. J. Filed Feb. 28, 1888. Serial No. 265,566. (No model.)

Claim.—1. In a circuit-controller, the combination of a supporting-body so formed and constructed as to be capable of being supported in the situation hereinbefore indicated, and relatively-movable contacts carried within said body, substantially as set forth.

2. The combination, with a circuit-controller consisting, essentially, of a supporting-body so formed and constructed as to be capable of being supported in the situation hereinbefore indicated, and relatively-movable contacts carried within said body, of devices in a circ-

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cuit connected with said contacts for awakening the user from sleep, substantially as set forth.

3. In a circuit-controller, the combination of a supporting-body so formed and constructed as to be capable of being supported in the situation hereinbefore indicated, and relatively-movable contacts carried within said body and having their extent of movement adjustable, substantially as set forth.

4. The combination, with a circuit-controller consisting, essentially, of a supporting-body so formed and constructed as to be capable of being supported in the situation hereinbefore indicated, and relatively-movable contacts carried within said body, of an induction-coil whose primary is in the circuit controlled by said contacts and whose secondary has terminals adapted to be placed in contact with the user's body, substantially as set forth.

5. In a circuit-controller, the combination of a ring or collar of insulating material and relatively-movable contacts supported within the same, substantially as set forth.

6. In a circuit-controller, the combination of the ring or collar of insulating material, the contact-making arm pivoted upon and within said collar, and the stationary contact carried by said collar, substantially as set forth.

7. In a circuit-controller, the combination of the ring or collar of insulating material and the relatively-movable contacts supported within the same, the normal relative position of said contacts being adjustable, substantially as set forth.

8. In a circuit-controller, the combination of the ring or collar of insulating material, the contact-making arm pivoted upon and within said collar, and the adjustable stationary contact carried by the collar, substantially as set forth.

9. In a circuit-controller, the combination of the ring or collar of insulating material, the circuit-terminals upon the same, the arm pivoted within the collar, and the contact carried by said arm flexibly to one of said terminals and adapted to be moved into connection with the other, substantially as set forth.

896,213. SECONDARY BATTERY. ORAMEL LOSE, New York, N. Y. Filed June 20, 1888. Serial No. 277,673. (No specimens.)

Claim.—1. The described process of preparing spongy or divided material for use in secondary or polarization batteries, which consists in mixing two metallic salts, then putting them in solution, and finally subjecting zinc to the action of this solution, substantially as described.

2. The described process of preparing spongy or divided lead for use in secondary or polarization batteries, which consists in mixing chloride of sodium with acetate of lead, then putting them in solution, and finally subjecting zinc to the action of this solution, substantially as described.

3. The described process of preparing a substance for occluding or absorbing the gases evolved in charging a secondary or polarization battery, which consists in superposing two finely-divided elements upon each other, substantially as described.

4. The described process of preparing a substance for occluding or absorbing the gases evolved in charging a secondary or polarization battery, which consists in superposing two finely-divided metals, substantially as described.

5. The described process of preparing a substance for occluding or absorbing the gases evolved in charging a secondary or polarization battery, consisting in creating a finely-divided or spongy mass of material, then superposing a second material upon or throughout the mass of the first-named material, substantially as described.

896,214. SECONDARY BATTERY. ORAMEL LOSE, New York, N. Y. Original application filed June 20, 1888, Serial No. 277,673. Divided and this application filed Sept. 4, 1888. Serial No. 284,550. (No specimens.)

Claim.—1. The described gas-absorbent for use in storage or polarization batteries, consisting of superposed allotropic materials, substantially as described.

2. An absorbent or occluding substance for use in secondary or polarization batteries, consisting of finely-divided or allotropic metals superposed upon each other, substantially as described.

3. The described absorbent or occluding substance for polarization or secondary batteries, consisting of finely-divided material of atom-like nature, each atom or divided portion being entirely covered by a coating of an independent material, substantially as described.

4. The described absorbent or occluding substance for the gases generated in secondary or polarization batteries, consisting of finely-divided or allotropic or spongy lead, each particle of which is coated or covered with allotropic or finely-divided or spongy copper, substantially as described.

5. An electrode for a secondary or polarization battery, consisting of atom-like material adapted to absorb or occlude the gases evolved in charging, substantially as described.

6. A secondary or polarization battery having electrodes composed of atom-like material adapted to occlude or absorb the gases evolved in charging, substantially as described.

7. A secondary or polarization battery having electrodes of atom-like material immersed in an electrolytic fluid, substantially as described.

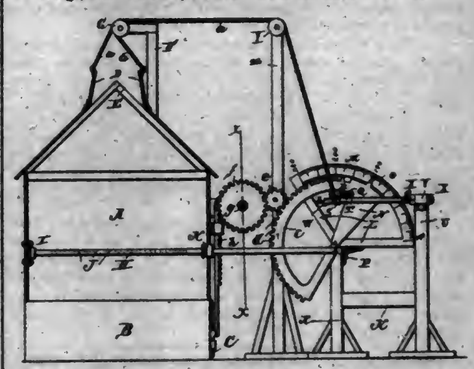
8. A secondary or polarization battery having electrodes of disintegrated atom-like material adapted to absorb or occlude the gas evolved during the process of charging, substantially as described.

9. A secondary or polarization battery having electrodes of atom-like material packed around conducting plates or surfaces and immersed in an electrolytic fluid, substantially as described.

10. A secondary or polarization battery having electrodes of atom-like material packed in porous jars or cups located in an electrolytic fluid, substantially as described.

11. A secondary or polarization battery having electrodes composed of atom-like material packed around conducting plates or surfaces contained in porous jars, said jars being immersed in an electrolytic fluid, substantially as described.

896,215. TEMPERATURE-REGULATOR. HENRY J. LUTCHER, Orange, Tex. Filed July 20, 1888. Serial No. 280,581. (No model.)



Claim.—1. The combination of the sweep-arm, the expansible rod pivoted thereto, the vertical arm U, the rod W, adjustably supported thereon, the tappet-arm carried by the sweep-arm and moving on the rod W, the doors D, and the cord extending therefrom and having a ring engaging the rod W and adapted to be disengaged therefrom by the tappet-arm, as set forth.

2. The combination of the sweep-arm, the expansible rod pivoted thereto, the door C, gearing between the same and the sweep-arm, the tappet-arm carried by the sweep-arm, the doors D, and intermediate devices whereby said doors D are closed by the tappet-arm, substantially as set forth.

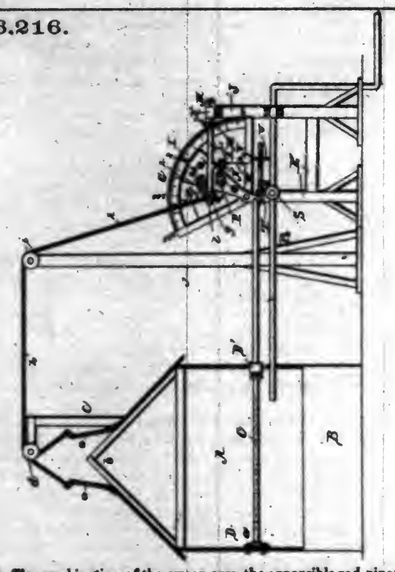
3. The combination of the sweep arm or lever, the expansible rod pivoted to said sweep-arm, the door C, provided with rack-bars, and gearing between said rack-bars and the sweep-arm, as set forth.

4. The combination of the sweep-arm provided with an integral toothed sector, the expansible rod pivoted to the sweep-arm, the door C, having the rack-bars, and gearing between the rack-bars and the sector, as set forth.

896,216. FIRE-EXTINGUISHER. HENRY J. LUTCHER, Orange, Tex. Filed July 20, 1888. Serial No. 280,582. (No model.)

Claim.—1. The combination of the sweep-arm, the expansible rod having one end pivoted to the sweep-arm, the steam-pipe provided with a cut-off valve, and the weight normally supported in an elevated position by the sweep-arm and adapted to be released thereby to open the valve, as set forth.

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2. The combination of the sweep-arm, the expansible rod pivoted thereto, the steam-pipe having a cut-off valve provided with a lever, and the weight supported by the sweep-arm over the lever and adapted to be released by the same to drop upon the lever and operate the valve, as set forth.

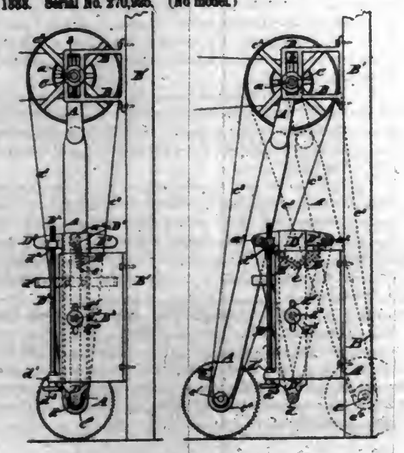
3. The combination of the sweep-arm, the expansible rod pivoted thereto, and the adjustable rod carried by the sweep-arm, the weight normally suspended from said rod, and the steam-pipe having a valve adapted to be operated by the weight, as set forth.

4. The combination of the expansible rod, the sweep arm or lever pivotally connected thereto, the horizontal rod L, the doors *a*, the cord connected to said doors and to the rod L, and adapted to be disengaged from said rod L by the sweep arm or lever, as set forth.

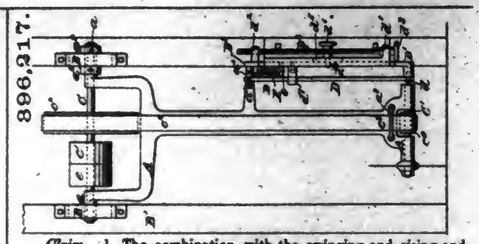
5. The combination of the sweep arm or lever, the expansible rod having one end pivoted to the sweep arm or lever, the tappet-arm carried by the sweep-arm, the rod L, the doors *a*, the cord connected to said doors, and the ring secured to said cord and slipped on the rod L, and adapted to be disengaged therefrom by the tappet-arm, as set forth.

6. The combination of the expansible rod, the sweep arm or lever pivotally connected thereto, the horizontal rod L, the doors *a*, the cord connected to said doors and to the rod L, and adapted to be disengaged from said rod L by the sweep-arm, the steam-pipe provided with a cut-off valve, and the weight supported normally in an elevated position by the sweep-arm and adapted to be released thereby to open the valve, as set forth.

396,217. SWING-SAW MACHINE. EDWARD D. MACKINTOSH, Brooklyn, assignor to Paul Pryhil, New York, N. Y. Filed Apr. 17, 1888. Serial No. 270,925. (No model.)



396,217.



Claim.—1. The combination, with the swinging and rising and falling frame, the driving-shaft about which said frame swings and which rises and falls therewith, and a shaft for a saw or rotary cutter carried in the lower part of said frame, of a guide-link pivoted at its upper part to the said frame, at about the middle of the length of the latter, and a fixed pivot to which the lower part of said link is connected at a point substantially in line with the line of the rising and falling motion of the frame and opposite the path described by the axis of said shaft in the swinging of the frame, substantially as and for the purpose herein described.

2. The combination, with the rising and falling and swinging frame, the driving-shaft about which said frame swings and which rises and falls therewith, and a shaft for a saw or rotary cutter carried by said frame, of a guide-link pivoted at its upper part to said frame, a fixed pivot to which the lower part of said link is pivoted, and an adjustable support for said fixed pivot, whereby the adjustment of said pivot is made to adjust the height of said frame and its shafts and the saw or cutter, substantially as herein described.

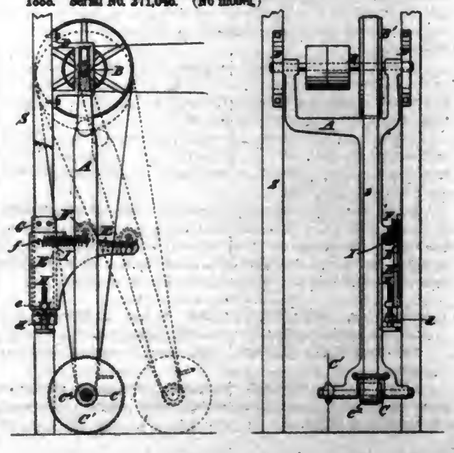
3. The combination, with the swinging and rising and falling frame, the driving-shaft rising and falling therewith, the fixed pivot on one side of the lower part of said frame, the guide-link swinging on said fixed pivot, and the upper pivot a^3, connecting said link with the said frame, of a fixed lateral guide-bearing, D^3, for said frame near said upper pivot, substantially as herein described.

4. The combination, with the swinging and rising and falling frame A, the driving-shaft upon which said frame swings and which rises and falls with it, and the pivoted guide-link D, of the fixed guide-yoke d^7 and a support therefor embracing the said link, substantially as and for the purpose herein described.

5. The combination, with the swinging frame which is capable of moving in both directions beyond a vertical position, and the upper part of which is free to rise and fall to permit the guiding of the lower part, of a spring connected with said frame and a fixed support for said spring, upon which the latter is self-reversing, to pull the frame in either direction toward a vertical position, substantially as herein described.

6. The combination, with the swinging frame which is capable of moving in both directions beyond a central vertical line, and the upper part of which is free to rise and fall to permit the guiding of the lower part, of a spring attached to the said frame and a fixed support for said spring on one side of said line, upon which the said spring is self-reversing, to pull the said frame in either direction toward a vertical position, but to exert a greater force upon the said frame in one direction than in the other, substantially as herein described.

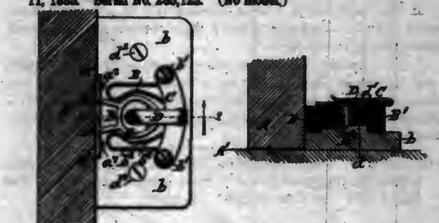
396,218. SWING-SAW MACHINE. EDWARD D. MACKINTOSH, Brooklyn, assignor to Paul Pryhil, New York, N. Y. Filed Apr. 18, 1888. Serial No. 271,046. (No model.)



Claim.—1. The combination, with the swinging and bodily rising and falling frame, the driving-shaft about which said frame swings, and the shaft for the saws or rotary cutter carried by said frame, of a guide-rail for supporting said frame and guiding it in its swinging movement, a fixed support for said guide-rail, and means of adjusting said guide-rail on said support, all substantially as herein described, whereby the frame and shafts are all adjusted with said guide-rail, as herein set forth.

2. The combination of the swinging saw-frame, the adjustable guide-rail E, and the spring I, connecting the said frame with the said rail and adjustable along with said rail and frame, substantially as herein described, and for the purpose set forth.

396,219. DOOR-CHECK. JACOB MAIER, Warsaw, Ind. Filed Sept. 11, 1888. Serial No. 285,122. (No model.)



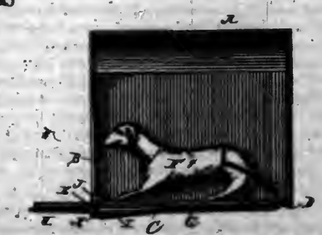
Claim.—1. In a door-check, the combination, with the member B, consisting of the head or ring *a*, the foot-bar *a'*, and the arms a^2, of the member B', adapted to receive and loosely engage the companion member, and the base-block *b*, provided with a raised inclined surface, b^4, substantially as and for the purpose set forth.

2. In a door stop and lock, the combination, with the head or ring *a*, provided on the inner side with a lip or swell, *a'* of the bar C, the latch D, and the locking-pin *d*, engaging with said lip, substantially as and for the purpose set forth.

396,220. PROCESS OF STAMPING DESIGNS IN METAL LEAF. MARK J. MASTERS, New York, N. Y., assignor of three-fourths to Basil D. Vassiliades, Constantine D. Vassiliades, and Alexander D. Vassiliades, all of same place. Filed Nov. 1, 1887. Serial No. 254,015. (No specimens.)

Claim.—The process of stamping designs in metal leaf upon materials having a hard smooth surface—such as celluloid, ivory, or pasteboard—which consists in first applying to the surface of such materials a dry powder composed of gum-sandarac and best golden yellow shellac fused together in equal parts, then placing upon said powder a leaf of metal, and finally subjecting said leaf to the pressure of a die of the desired design heated to a point sufficient to insure the melting of said powder, substantially as described.

396,221. MECHANICAL TOY. JOHN MORROW, London, County of Middlesex, England. Filed July 10, 1888. Serial No. 279,492. (No model.)

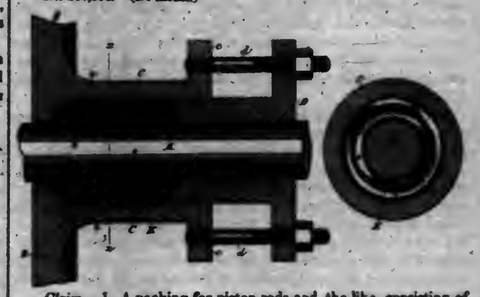


Claim.—1. A mechanical toy comprising a base, an elastic figure secured thereon, a trip arranged in advance of the figure, and a cord secured to the figure, extending forward under the base, and controlled by the trip, whereby upon raising the trip the figure will automatically spring up, as set forth.

2. A mechanical toy comprising the base, the elastic figure secured thereto, the trip arranged in advance of the figure, the trigger secured to the base and connected to the trip, the cord secured to the figure and extending past the trigger, and the detent secured to said cord and engaging the trigger, as set forth.

3. A mechanical toy comprising the base having a vertical opening near its rear end and a transverse slot near its front end, the trigger consisting of a leaf-spring having its rear end secured to the under side of the base and its front end bent upward through the transverse slot, the trip secured to the extremity of said upturned end, the elastic figure secured on the base, the cord secured to the figure extending through the rear opening in the base and thence forward past the trigger, and the detent secured to the cord and resting against the trigger, as specified.

396,222. PACKING. SILAS H. MOSHER, Chicago, Ill., assignor of one-half to Charles F. Elmes, same place. Filed Mar. 19, 1888. Serial No. 267,598. (No model.)



Claim.—1. A packing for piston-rods and the like, consisting of soft-metal pipe or tubing surrounding the same, provided with perforations, and filled with a non-fluid lubricant, substantially as described.

2. A packing for piston-rods and the like, consisting of soft-metal pipe or tubing surrounding the same, having perforations, and provided with a fibrous filling saturated with a lubricating substance, all substantially as described.

396,228. SPRING-VEHICLE. HARVEY A. MOYER, Syracuse, N. Y. Filed Sept. 27, 1888. Serial No. 286,543. (No model.)



Claim.—1. In combination with the running-gear and side springs, reaches extending to the central portions of the side springs and lying on the under side thereof, body-supporting bars extending across the under side of the reaches at their junction with the side springs, and clips embracing the springs and underlying reaches and fastened to the body-supporting bars, substantially as set forth and shown.

2. In combination with the running-gear and side springs, the front end portions, R" R", of the reaches contiguous to the under side of the central portions of the springs, the body-supporting bars *a a*, extending across the under side of said portions of the reaches, and clips embracing the springs and underlying portions of the reaches and fastened to the bars *a a*, substantially as described and shown.

3. In combination with the running-gear and side springs, the front end portions, R" R", of the reaches lying contiguous to the under side of the central portions of the springs and fastened thereto and having their front extremities passing under the front axle, and the king-bolt passing through them, substantially as described and shown.

4. In combination with the running-gear and side springs, the front end portions, R" R", of the reaches lying contiguous to the under side of the central portions of the springs and secured thereto and having their front extremities lapping one upon the other underneath the front axle, and the king-bolt passing through the lapping portions of the reach portions R" R", substantially as described and shown.

5. In combination with the running-gear and side springs, the front end portions, R" R", of the reaches lying contiguous to the under side of the central portions of the side springs and secured thereto, and having the front extremities lapping one upon the other and extending under the axle and forward therefrom, and the king-bolt and brace *b*, passing through said lapping portions of the reach portions R" R", substantially as described and shown.

6. In combination with the running-gear and side springs, two reaches, each formed in one piece, with the central portion, R, lying on the under side of the central portion of one of the springs and secured thereto, the rear end portion, R', secured to the end portion of the rear axle, and the front end portion, R", secured to the center of the front axle, substantially as described and shown.

7. In combination with the running-gear and side springs, two reaches, each formed in one piece, with the central portion, R, lying on the under side of the central portion of one of the springs and secured thereto, the rear end portion, R', secured to the end portion of the rear axle, and the front end portion, R", extending under the axle, said reaches having their front ends lapping one upon the other

and the king-bolt passing through the same, substantially as described and shown.

8. In combination with the running-gear and side springs, two reaches, each formed in one piece, with the central portion, R, contiguous to and parallel with the under side of the central portion of one of the springs, the rear end portions, R', secured to the end portion of the rear axle, the front end portion, R", extending under the front axle and forward therefrom, said reaches having the front ends lapping one upon the other, and the king-bolt and brace *b*, passing through the lapping portions of the reaches, substantially as described and shown.

9. In combination with the running-gear and side springs, two reaches, each formed in one piece, with the central portion, R, contiguous to and parallel with the under side of one of the springs, the rear end portion, R', secured to the end of the rear axle, and the front end portion, R", extending under the axle and forward therefrom, said reaches having their front ends lapping one upon the other, the king-bolt and brace *b*, passing through the said lapping portions of the reaches, body-supporting bars *a a*, extending across the under sides of the central-portions of the two reaches, and clips embracing the springs and underlying portions of the reaches and secured to the bars *a a*, substantially as described and shown.

396,224. ADVERTISING-LID FOR BEER-GLASSES. MAXIMILIAN L. MUELLER, Schandau, Saxony, Germany. Filed Mar. 12, 1888. Serial No. 267,052. (No model.)



Claim.—1. A cover for goblets, beer-glasses, and the like, comprising, in combination, an under plate, D, forming a cover to said goblet or the like, a pin, K, thereon, adapted to receive advertising-sheets, and a plate, C, adapted to cover and retain said advertising-sheets.

2. A cover for goblets, beer-glasses, and the like, comprising, in combination, an under plate, D, forming a cover to said goblet or the like, a pin, K, thereon, adapted to receive advertising-sheets, and a cover-plate, C, attached to said plate D and projecting over said pin K, so as to hold the sheets thereon, substantially as set forth.

3. The combination, with a plate, D, adapted to form a cover to a goblet, beer-glass, or the like, of slots in said plate, a plate, *z*, tongues on said plate *z*, engaging in said slots, a projecting pin, K, on said plate *z*, and a plate, C, integral with said plate *z*, and extending over the same and over the said pin K, substantially as and for the purpose set forth.

4. The combination, with a plate, D, adapted to form a cover to a goblet, beer-glass, or the like, of slots *i* in said plate, a spring-bow formed, substantially, by two parallel plates, *z* C, tongues H on said plate *z*, adapted to engage in said slots *i*, a pin, K, projecting from said plate *z*, and a recess, *k*, in the plate C, adapted to cover said pin, substantially as and for the purpose set forth.

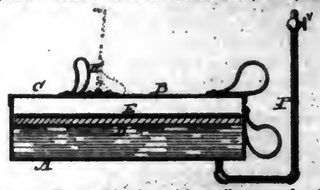
396,225. ART OF MANUFACTURING ARTIFICIAL MARBLE. LEWIS NATHAN, New York, N. Y., assignor to the Cuba Marble Company, same place. Filed June 4, 1888. Serial No. 276,040. (No specimens.)

Claim.—1. The improvement in the art of manufacturing artificial marble hereinbefore set forth, which consists in subjecting the marble before applying the polishing material to the action of heat to draw the alum contained in the marble material to the surface and then removing the alum.

2. The improvement in the art of manufacturing artificial marble hereinbefore set forth, which consists in honing down the face of the marble, then applying a mastic to fill the pores, then subjecting the marble to the action of heat in order to draw the alum contained in the marble material to the surface, then removing the alum, and finally applying the polishing material.

3. The improvement in the art of manufacturing artificial marble hereinbefore set forth, which consists in honing down the face of the marble, then applying a mastic to fill the pores, then smoothing the mastic, then subjecting the marble to the action of heat in order to draw the alum contained in the marble material to the surface, then removing the alum by means of a fine abrading material and a volatile fluid, and finally applying the polishing material.

396,226. HYDROCARBON-BURNER. JAMES L. NEWTON, Cleveland, Ohio. Filed Feb. 3, 1888. Serial No. 262,894. (No model.)

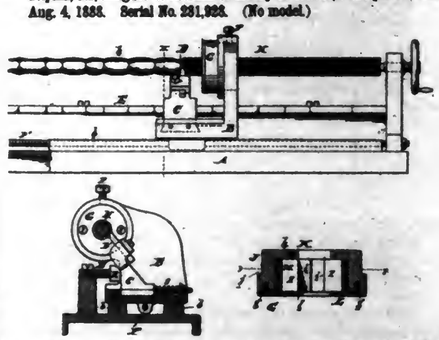


Claim.—1. The combination, with an oil-receptacle, of a float and perforated plate carried upon the same, substantially as described.

2. The combination, with an oil-receptacle, of a float and a perforated plate supported upon and at a slight distance above said float, substantially as described.

3. The combination, with an oil-receptacle, of the float D, plate E, and the hinged cover C, having a handle on its upper side constructed to act as a stop when the cover is thrown back, whereby it performs two functions—first, as a stop, and, secondly, as a handle—substantially as described.

396,227. WOOD-TURNING LATHE. LEANDER N. NORCROSS, Philadelphia, Pa., assignor of one-half to Henry B. Graves, same place. Filed Aug. 4, 1888. Serial No. 281,923. (No model.)



Claim.—1. A guide support or holder for wood-turning lathes, consisting of a box having a circular recess and an opening on each side thereof, in combination with two or more sections or jaws contained within said recessed box, and having their outer faces curved and inner faces shaped so that when they are put in place they shall form a polygonal aperture.

2. A guide support or holder for wood-turning lathes, consisting of a box having a circular recess and an opening on each side thereof, in combination with two or more sections or jaws contained within said recessed box, having their outer faces curved and inner faces shaped so that when they are put in place they shall form a polygonal aperture, and an encircling band surrounding said sections or jaws and between them and the curved face of the recessed box.

3. A guide support or holder for wood-turning lathes, consisting of a box having a circular recess and an opening on each side thereof, in combination with two or more sections or jaws contained within said recessed box, having their outer faces curved and inner faces shaped so that when they are put in place they shall form a polygonal aperture, and an encircling spring to hold said sections or jaws together and allow of slight variations in the size of the polygonal aperture.

4. The combination of the box J, having a circular recess, S, and flange *k*, cap L, and sections I, having curved outer faces and polygonal-shaped inner faces, *i*.

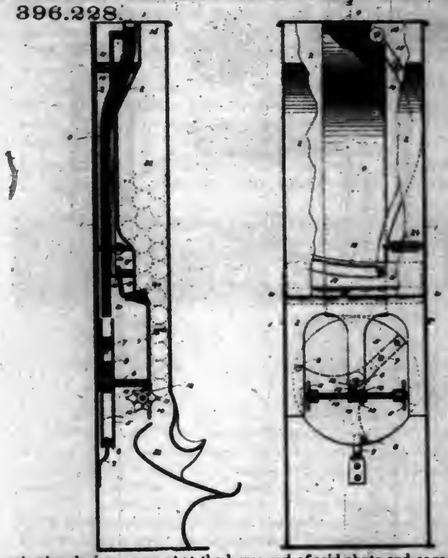
5. The combination of the box J, having circular recess S, and flange *k*, cap L, and sections I, having curved outer faces, polygonal-shaped inner faces, *i*, and the circular spring-band M, interposed between the sections I and curved wall of the recessed part of the box.

6. The combination of the lathe having the longitudinal reciprocating frame B and laterally or transversely reciprocating tool-holder C, carried by the frame B, and the wood-holder G, having a revolving center formed of two or more sections or jaws with a polygonal aperture.

396,228. AUTOMATIC VENDING APPARATUS. JAMES M. O'KELLY, New York, N. Y., assignor of eleven-twentieths to George D. Bayard same place. Filed July 19, 1888. Serial No. 280,419. (No model.)

Claim.—1. In an automatic vending apparatus, the combination, with the casing having a coin-slot, of a tilting coin-receptacle, an escapement connected therewith, a merchandise-chute, and a merchandise-

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ejecting device arranged at the lower end of said chute and engaged by said escapement, substantially as set forth.

2. In an automatic vending apparatus, the combination of a coin-receptacle, an escapement attached to and operated by said receptacle, a chute for containing the merchandise, a shaft provided with fluted disks arranged in said chute, and stops on said shaft adapted to be engaged by the said escapement, substantially as and for the purpose set forth.

3. The combination, with the shaft 6 and the coin-feeding tube, of a tilting coin-receptacle mounted on said shaft, an escapement, 12, on said shaft, adapted to be operated by said receptacle, the shaft 10, and a merchandise-ejecting device having stops 13 mounted on said shaft and adapted to be engaged by said escapement, substantially as and for the purpose set forth.

4. In an automatic vending apparatus, the combination, with the casing having a coin-slot, of a tilting coin-receptacle, a merchandise-chute, a merchandise-ejector having fluted disks, and stops 13, arranged at the lower end of said chute, and an escapement connected to and operated by said receptacle and adapted to engage said stops, as set forth.

5. In an automatic vending apparatus, the combination of a coin-receptacle, an escapement attached to and operated by said receptacle, a chute for containing the merchandise, an ejector arranged in said chute under the merchandise and adapted to be operated by the weight of the latter, and said ejector having stops adapted to be engaged by said escapement, substantially as set forth.

6. In an automatic vending apparatus, the combination of the tilting coin-receptacle, an escapement attached to and operated by said receptacle, a vertical chute for containing the merchandise, a shaft, fluted disks on said shaft projecting into the lower part of said chute and adapted to be revolved by the weight of said merchandise, and stops on said shaft adapted to be engaged by said escapement substantially as set forth.

7. In an automatic vending apparatus, the combination, with the coin-feeding passage and the shaft 6, of a tilting coin-receptacle mounted upon said shaft, a merchandise-chute, a merchandise-ejecting device consisting of fluted disks having points projecting into said chute, adapted to support the articles of merchandise between them, stops for locking said disks against rotation, and an escapement on shaft 6 for releasing said stops, substantially as set forth.

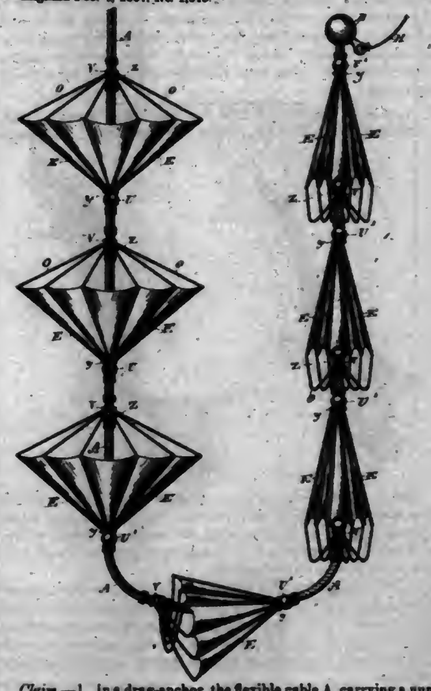
8. In an automatic vending apparatus, the tilting coin-receptacle consisting of a flanged wheel, 5, mounted on shaft 6 and having pins 8 8, in combination with a fixed stop, 9, substantially as set forth.

9. In an automatic vending apparatus, the tilting coin-receptacle consisting of flanged wheel 5, having pins 8 8 and weight 7, in combination with a fixed stop, 9, substantially as set forth.

10. The combination, with the merchandise-feeding chute 22 and coin-feeding tube 4, of an agitator, 20, projecting into the merchandise-chute, and the lever 14, having operating-connection with said agitator at one end and projecting into the coin-feeding tube at the other end, substantially as and for the purposes set forth.

11. The combination, with the merchandise-feeding chute 22 and coin-feeding tube 4, of a pivoted agitator, 20, projecting into the merchandise-chute and connected with wing 19, having slot 18, and a pivoted lever, 14, having a pin entering said slot and itself entering the coin-feed tube at its other end, substantially as set forth.

396,229. DRAG-ANCHOR. EMILE J. PAGAN, Paris, France. Filed Mar. 23, 1888. Serial No. 268,208. (No model.) Patented in France Jan. 8, 1887, No. 180,773; in Belgium Jan. 21, 1887, No. 76,089, and in England Feb. 4, 1887, No. 1,815.



Claim.—1. In a drag-anchor, the flexible cable A, carrying a number of balls, combined with the parachutes E, having ribs that are secured to the cable at one end contiguous to said balls and with the flexible connections O, that are secured to said ribs and also to the cable contiguous to other balls, whereby the parachutes are held in position on the cable, substantially as described.

2. In a drag-anchor, the flexible cable A, combined with a series of parachutes, E, that are arranged along said cable, and with the separate weight B at the end of the cable, substantially as described.

396,230. WIRE GATE. JAMES W. PALMER, North Springfield, Mo. Filed July 23, 1888. Serial No. 281,206. (No model.)



Claim.—1. A gate-forming device for wire fences, consisting of a supporting-arm adapted to be secured to a post, a cross-bar adapted to be secured to the wires of the fence, and a locking-lever connected to said cross-bar and adapted to engage the supporting-arm, said lever being provided with a retaining or locking hook adapted to engage a wire of the gate, substantially as described.

2. In a wire fence, the combination, with parallel wires constituting a portion of the fence, of a cross-bar secured to said wires, a supporting-arm secured to a post, and a locking-lever attached to said cross-bar and engaging the supporting-arm, said lever being provided with a retaining-hook adapted to engage one of the said parallel wires, substantially as described.

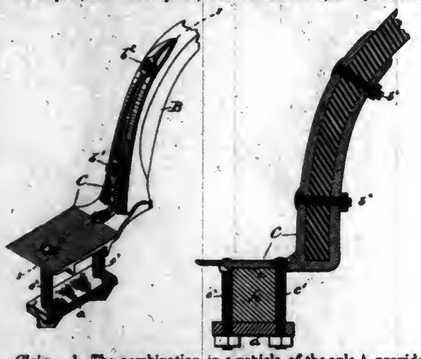
3. In a wire fence, the combination, with parallel wires, of a supporting-arm provided with a stud and secured to a post, a cross-bar attached to said parallel wires, and a lever having one end pivotally attached to said cross-bar and having a projection intermediate its ends to engage a stud on the supporting-arm, the free end of the lever being provided with a locking-hook to engage a fence-wire, the wire-engaging portion of which is below the horizontal plane of the main body of the lever, substantially as described.

4. The combination, with a wire gate, of an arm adapted to support one end of the same, and an angular lever having one end attached to said gate and provided with a projection to engage a stud on said

supporting-arm, the free end of said lever being bent downward and provided with a locking-hook adapted to engage one of the parallel wires, the wire-engaging portion of said hook lying below the plane of the lever, substantially as described.

5. The combination, with a wire fence, of posts, one of which is provided with retaining-hooks and the other with a supporting-arm, a gate consisting of parallel wires engaging the retaining-hooks and provided with a cross-bar, and a lever having one end attached to said cross-bar and provided with a projection to engage the supporting-arm, the free end of said lever being provided with a locking-hook adapted to engage one of the parallel wires, the wire-engaging portion of said hook lying below the plane of the lever, substantially as described.

396,231. SHAFT-COUPLING FOR VEHICLES. DAVID M. FARRY, Indianapolis, Ind. Filed Apr. 10, 1888. Serial No. 270,207. (No model.)



Claim.—1. The combination, in a vehicle, of the axle A, provided with a cavity, and the coupling C, provided with a projection, *c*, which is adapted to enter said cavity when the coupling is placed on the axle, whereby said coupling is held securely in position on said axle, substantially as shown and described.

2. The combination, in a vehicle, of the axle, the shaft, a coupling, formed as described, between the two forward arms whereof the shaft is secured and to the under side of the rearwardly-extending portion whereof the axle is secured, the top of said rearwardly-extending portion being roughened or serrated to form a step, substantially as set forth.

396,232. BOB-SLEIGH. JAMES F. PLATT, Sterling, Ill. Filed Sept. 28, 1888. Serial No. 286,664. (No model.)



Claim.—1. The combination of the bolster D, provided with the recess G, the beam E, provided with the recess H, the metallic box J, provided with the upwardly-extending flanges L and the downwardly-extending flanges M, and the reach A, whereby the latter through the medium of said box holds said beam and bolster in a vertical position, substantially as shown.

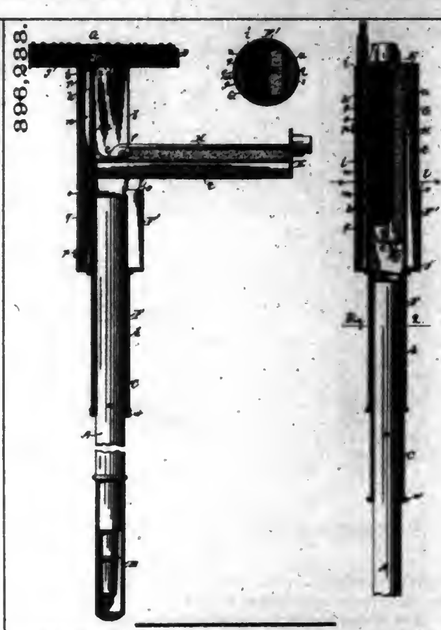
2. The combination of the bolster D, provided with the recess G, the beam E, provided with the recess H, the metallic box J, provided with the upwardly-extending flanges L, the downwardly-extending flanges M, and the horizontal projections N, and the reach A, whereby said box is held in place, substantially as shown, and for the purpose described.

396,233. RUBBER STAMP. EDWIN REYNOLDS, Providence, R. I. Filed Aug. 29, 1887. Serial No. 248,217. (No model.)

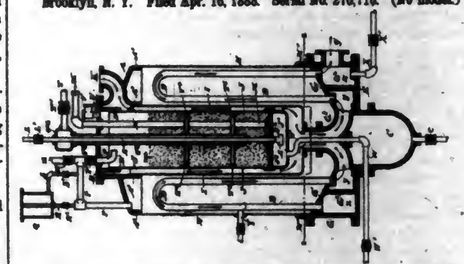
Claim.—1. In combination, the spring-operated die-holder pivoted to the shank, the spring-operated ink-pad holder, also pivoted to the shank, and the case adapted by its sliding movement upon the shank to cause the opening or closing of the die and pad, substantially as described.

2. In combination, the spring-operated die-holder pivoted to the shank, the spring-operated ink-pad holder, also pivoted to the shank, and the slotted case provided with a pen-slide and adapted to cause the opening or closing of the die and pad, substantially as described.

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396,234. WATER HEATER AND FILTER. JOHN S. ROAKE, Brooklyn, N. Y. Filed Apr. 16, 1888. Serial No. 270,716. (No model.)



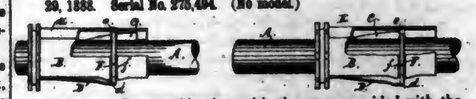
Claim.—1. The water heater and filter described, having the chamber I, inclosing the filter J, with a space between for the passage of steam, in combination with provisions for filtering the water in the interior vessel and for supplying and taking away such water continuously, substantially as herein specified.

2. In a water heater and filter, the wash-pipe T, with its perforated branches T^4 T^5, in combination with the filter-case J and with the exterior casing, I, and provisions for circulating steam between, adapted to serve at will for filtering the water by a downward current and for cleaning the filter by an upward current through the filtering material, substantially as herein specified.

3. In a water heater and filter, in combination with the filter J and the surrounding casing I, and with provisions for passing steam through the same, the vessel Q, adapted to receive a chemical, and the pipes R S, arranged for introducing the chemical gradually into the water during its transition from the heating-chamber I to the filter, as herein specified.

4. The combined water heater and filter described, having filtering material, *m*, and provisions for passing water through it, inclosed in a casing, J, in combination with a larger casing, I, in which it is inclosed, with provisions for passing steam through the space between, and with a larger casing, H, with provisions for heating the water in the space between I and H previous to its introduction to the filter, as herein specified.

396,235. UMBRELLA. DAVID ROSE, Lancaster, Pa. Filed May 29, 1888. Serial No. 275,494. (No model.)



Claim.—1. The combination, with the stem provided with the catches C C, of the runner having the perforated hollow rib E and angular recess *f*, the spring D, secured by one end to the runner, and the collar F, encircling the end of the runner and attached to the vibrating end of the spring, all constructed and operating substantially as specified.

2. The combination, with the stem having the catches C C, of the runner, the collar F, encircling said runner, and the spring connected with the runner and the collar, substantially as and for the purpose specified.

396,236. RAILWAY-RAIL-JOINT FASTENER. HIRAM ROWE, Rockvale, Colo. Filed June 1, 1888. Serial No. 276,706. (No model.)

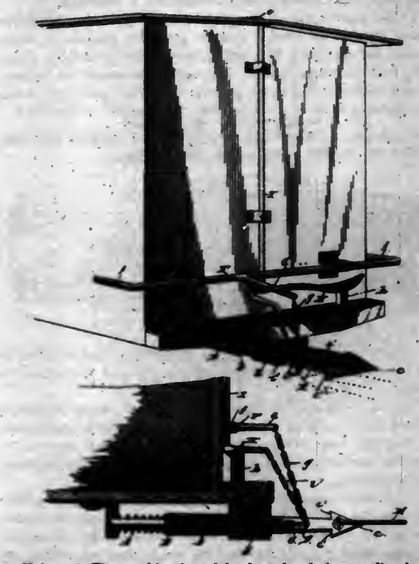


Claim.—1. The herein-described fastening, consisting of the bolt having a hook at one end and the cam-lever journaled on the bolt and adapted to have its end bent to engage with the rail or timber, substantially as described, for the purpose specified.

2. The combination, with a series of bolts having hooked ends, of the cam-levers having the end of one lever extending beneath the head of the next lever, whereby the levers mutually lock each other, substantially as described.

3. The combination, with the rail having elongated openings in its web and the fish-plate having corresponding elongated openings, of the bolts passed through the openings and having hooked ends, and cam-levers mounted on the hooked ends of the bolts, the said levers mutually locking each other, and the last lever of the series being bent over the fish-plate, substantially as set forth.

396,237. CAR-COUPLING. JOHN C. ROSE and REUBEN BROWN, Northumberland, Pa. Filed Sept. 20, 1888. Serial No. 286,781. (No model.)

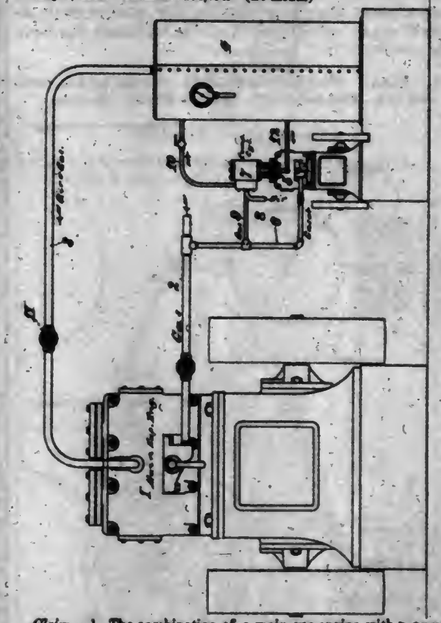


Claim.—1. The combination of the draw-head, the coupling-hook pivoted thereto and having the triangular head, and the V-shaped link having its ends pivoted to the opposite sides of the said triangular head, as set forth.

2. The combination of the draw-head, the coupling hook pivoted thereto, the arm D, projecting laterally from the side of the coupling-hook, the rock-shaft arranged above the coupling-hook and having an arm, G, and the chain connecting the arms D G, as set forth.

3. In a car-coupler, the combination, with the draw-heads having the lateral ears *b*, the pivoted coupling-hooks having the triangular heads *c* and lateral arms D, and the supporting-brackets, of the double-armed lever H, pivoted on the support A, the vertical rod I, having the handle *f* above the car, and the chain *i*, connecting the arm D and the adjacent arm of the lever H, substantially as specified.

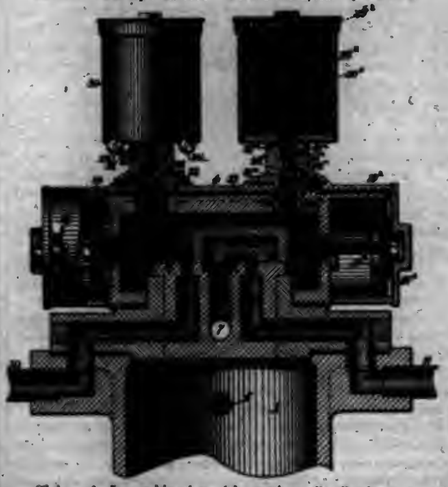
396,238. GAS-ENGINE. ALBERT SIPHER, Pittsburg, Pa. Filed May 2, 1887. Serial No. 236,756. (No model.)



Claim.—1. The combination of a main gas-engine with a pumping-engine provided with gas and air supply ports and having a suitable connection with the explosion-chamber of the main engine, whereby a sufficient amount of combined gas and air may be forced into the main engine to effect on the explosion thereof one or more revolutions of the main engine, substantially as set forth.

2. The combination of a main gas-engine, a pumping-engine provided with gas and air supply ports, and a reservoir having a pipe-connection with the pump, the pumping-engine, and the main engine, whereby a sufficient supply of gas may be stored in said reservoir to effect on its admission into and explosion in the chambers of the main and pumping engines one or more revolutions thereof, substantially as set forth.

396,239. FLUID-PRESSURE ENGINE. JESSE G. SOMERSIDE, Swissvale, Pa. Filed Apr. 26, 1888. Serial No. 272,102. (No model.)

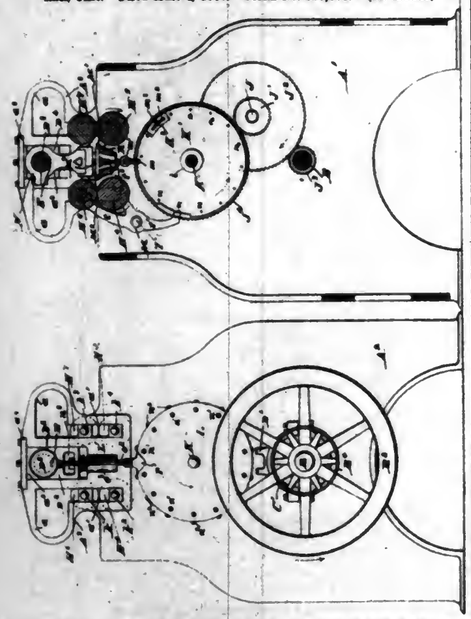


Claim.—1. In combination with a main or distributing-valve of a fluid-pressure motor, pistons connected therewith and operated by

fluid-pressure on opposite ends thereof, and electrically-actuated valves, each valve controlling the exhaust from one end of said pistons and the admission of fluid-pressure to the opposite end thereof substantially as set forth.

2. In combination with a main or distributing valve, pistons connected therewith for shifting said valve in opposite directions, electrically-actuated valves 23 23^a, passages 19 19^a, ports 20 20^a 22 22^a, valves 27 and 27^a, exhaust-ports 32 and 32^a, and passage 33, substantially as set forth.

396,240. PERFORATING-MACHINE. CHARLES SEYBOLD, Cincinnati, Ohio. Filed Mar. 4, 1887. Serial No. 229,673. (No model.)



Claim.—1. In a perforating-machine, the combination of the shaft B, eccentric-rods, punch-bar D^4, provided with a key which engages with said eccentric-rods, cam p', and wheel L_4, and connecting and operating parts, substantially as set forth.

2. In a perforating-machine, the shaft B, eccentrics, eccentric-rods having notches b^3, and punch-bar D^4, having the key E, in combination with mechanism, substantially as set forth, for causing parts b and b' of said key E to engage and disengage with the notches in the eccentric-rods, substantially as set forth.

3. In a perforating-machine, the combination of the bar D^4, carrying key E, rods D, having notches b^3, box D^4 being recessed, plunger L^4, having the concave and convex heads S and S', and mechanism for automatically raising and lowering said plunger at determinate periods, substantially as set forth.

4. In a perforating-machine, the yoke H, rods i^3, disks G and G', gears G^3 and E^3, pins A' and d, springs i^3 and G^2, and block d', in combination with wedge or segment e and suitable mechanism for operating said segment backward and forward, substantially as set forth.

5. In a perforating-machine, the combination of shaft B, eccentric-rods having notches b^3, punch-bar D^4, provided with key E, composed of parts b and b', box D^4, plunger L^4, provided with means for moving the parts of key E into and out of said notches, arm L^5, rod o^4, spring o^4, cam p', and wheel L_4, with pins n', substantially as set forth.

6. In a perforating-machine, the combination of yoke H, disks G, G', and E^4, and mechanism, substantially as set forth, for operating said disks, substantially as set forth.

7. In a perforating-machine, the cam K', pawl M, having fingers f f^2, rod T, pawl M^2, lever M', and gage M^3, in combination with feed-rolls, substantially as set forth.

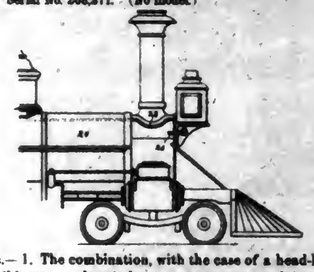
8. In a perforating-machine, the cam K' and block K^2, in combination with finger m, pin H', yoke H, disks G G', and E^4, and means for operating said yoke and disks, substantially as set forth.

9. In a perforating-machine, the combination of the shaft B, eccentric-rods, punch-bar D^4, provided with a key which engages with said eccentric-rods, and means, substantially as set forth, for enabling said key to engage and disengage with said eccentric-rods, and wheel L_4, and connecting and operating parts, substantially as set forth.

10. In a perforating-machine, the combination of shaft B, gear-wheels C and E^3, friction-disks E^4, G, and G', gear g^3, gears H^3 and H^5, attached to rollers H^4 and H^6, and rollers H^2, H^3, H^4, and H^7, substantially as set forth.

11. In a perforating-machine, the mechanism shown and described for automatically stopping the feed while the perforating is being accomplished, and consisting of the rod D, block d^4, lever k^2, having slot d^5 and wedge or segment e, and suitable mechanism for operating said rod D, substantially as set forth.

396,241. HEAD-LIGHT. JABEZ F. SHAWHAN, Dayton, Ohio, assignor of one-half to James W. Carpenter, same place. Filed Mar. 23, 1888. Serial No. 268,271. (No model.)



Claim.—1. The combination, with the case of a head-light, of an ordinary oil-lamp, an electric lamp, a generator supplying current to said lamp, and a motor for operating the generator, the whole being inclosed within the case of the head-light, substantially as described.

2. The combination, with the case of a head-light, of a base-board, the whole being inclosed within the case of the head-light supporting an electric lamp, a generator for said lamp also supported on the base-board, and a motor for driving said generator also mounted on said base-board, substantially as described.

3. In a head-light, a base-board having a standard supporting the parabolic reflector, an oil-lamp attached to said base-board, the burner of which extends through the lower opening of said reflector, an electric lamp supported on the base-board having one electrode extending through the upper opening of the reflector, a generator for said lamp, and a motor driving said generator, the whole being inclosed within the head-light case, substantially as described.

4. The combination, with a locomotive-engine, of a head-light mounted thereon, an electric lamp, a generator therefor, a motor operating the generator, all being inclosed in the head-light, a pipe leading from said head-light to the source of power on the locomotive, and another exhaust-pipe leading from said head-light to the smoke chest or drum of the locomotive, substantially as described.

396,242. FIRE-ESCAPE. JACOB P. SIMON, Grigsby's Bluff, Tex. Filed Oct. 16, 1888. Serial No. 288,197. (No model.)



Claim.—1. In a fire-escape, the cushion provided with flexible sides and having an inlet-valve and outlet-openings G, substantially as specified.

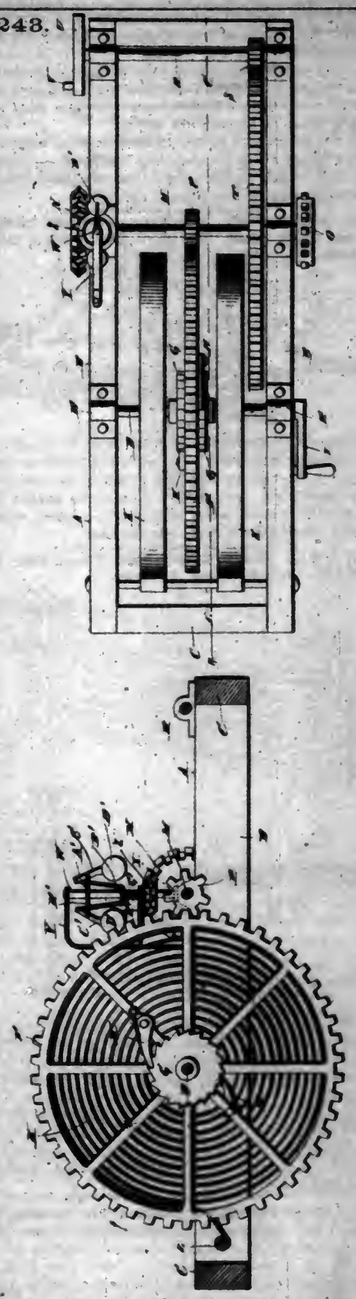
2. In a fire-escape, the pneumatic cushion A, having its bottom provided with an inlet-valve and outlet-openings G, the secondary bottom arranged under the said cushion, and the springs disposed between the secondary bottom and the bottom of the cushion, substantially as specified.

3. In a fire-escape, the combination, with the pneumatic cushion comprising the top B, provided with a pad or cushion, L_4, the bottom provided with an inlet-valve, E, and outlet-openings G, and the flexible sides connecting the said top and bottom, of the rings or loops attached to the top and adapted to engage hooks at the bottom of the cushion, whereby it may be held in a compressed position, substantially as specified.

396,243. SPRING-MOTOR. CHARLES H. SMITH, Beaumont, Kans. Filed July 31, 1888. Serial No. 281,514. (No model.)

Claim.—The combination of the frame, the shaft M, journaled therein, the gear-wheel N on the end of said shaft, the spring-actuated driving-wheel geared to said shaft M, the vertical shaft W, arranged at one side of the frame, the pinion on said shaft meshing with the wheel N, the curved arm Y, erected on the frame and receiving

396,243.



the upper end of the shaft W, the arm F', projecting from the frame, the disk B', movable on the shaft W, the spring around said shaft between the arm F' and the disk B', the yoke A', the governor-arms pivoted in the ends of the yoke, and the links E', connecting the governor-arms with the disk B', as specified.

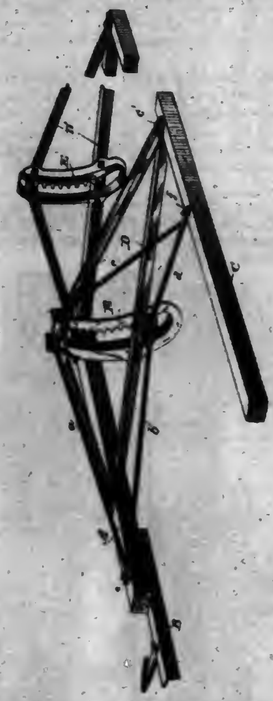
396,244. INTERMITTENT GRIP DEVICE. HENRY A. SMITH, Atlanta, Ga. Filed Apr. 16, 1888. Serial No. 270,999. (No model.)

Claim.—In an intermittent grip device, the driven disk C, secured to the shaft A, in combination with clutch-lever D, provided with gripping-jaws d d', spur e, and slot d'', spring b, and driver-disk B, provided with a pin, substantially as shown and described.

396,244.



396,245. HARVESTER-FRAME. JOHN F. STEWARD, Chicago, Ill. Filed May 19, 1888. Serial No. 274,413. (No model.)



Claim.—1. In a harvester-frame, the front and rear sills, A C, and the connecting-truss D, in combination with the four diagonal braces extended grainward from the truss and connecting the same at top and bottom with the sills.

2. In a harvester-frame, the truss and the front sill, in combination with the front braces, a b, extending forward and grainward from the top and bottom of the truss to the sill.

3. In a harvester-frame, the truss and the rear sill, C, secured thereto, in combination with the braces c d, extending rearward and grainward from the top and bottom of the truss to said sill.

4. In a harvester-frame, the front and rear sills and the connecting-truss, in combination with the four diagonal braces extended grainward from the truss and connecting the same at the top and bottom with the respective sills and each adapted for independent longitudinal adjustment.

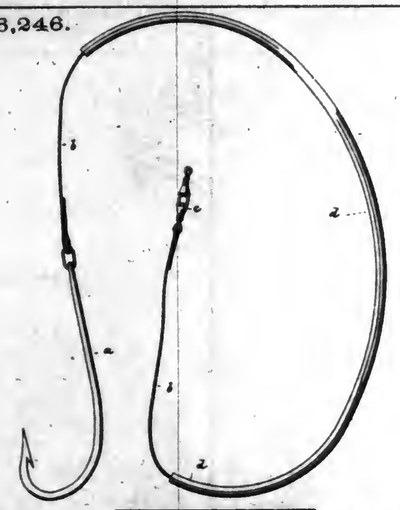
396,246. SHELL. EDWARD C. VON HOYE, Brooklyn, N. Y. Filed Nov. 20, 1886. Serial No. 201,238. (No model.)

Claim.—1. As a new article of manufacture, a fishing-shell composed of a line, b, and a surrounding rubber tube, d, substantially as specified.

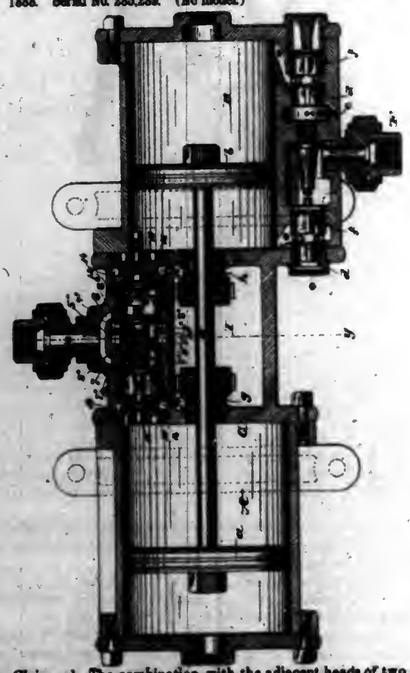
2. The combination of hook a and line b, with a flexible tube, d, surrounding said line and held thereon by frictional contact, the tube being adapted to slip upon the line under tension, substantially as specified.

3. The combination of hook a and line b, with tube d shorter than such line, a part of line b being exposed between hook and tube, substantially as specified.

396,246.



396,247. STEAM-PUMP. HENRY A. WAHLERT, St. Louis, Mo., assignor to the American Brake Company, same place. Filed Sept. 13, 1888. Serial No. 285,239. (No model.)



Claim.—1. The combination, with the adjacent heads of two cylinders, of a third interposed cylinder which connects said heads and forms the cylinder of a piston-valve as well as a bridge, substantially as and for the purposes specified.

2. The combination of two cylinders having connected pistons, an intermediate valve-chamber, and a tappet-valve provided with tappet-rods adapted to enter the cylinders in the path of the pistons, substantially as and for the purposes specified.

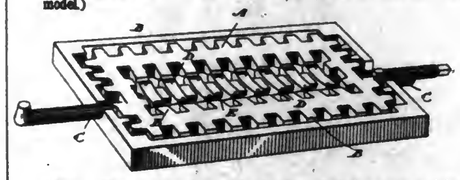
3. The combination, with two cylinders having connected pistons, of an intermediate valve-chamber, combined tappet and steam-actuated valves having tappets arranged to be struck by the pistons, and a main valve arranged to be actuated by the final movement of the tappet-valves, substantially as and for the purposes specified.

4. The combination, with the valve-chamber having suitable live-steam and exhaust ports, of two piston tappet-valves connected to move in unison and an intermediate valve arranged loosely on the rod which connects the two tappet-valves, adapted to be moved at or near the close of the stroke of the tappet-valves, substantially as and for the purposes specified.

5. The combination, with the valve-chamber, of the end bushings having the caps 11, annular steam-chambers 12, and ports 13, of two connected tappet piston-valves and an intermediate piston-valve, substantially as and for the purposes specified.

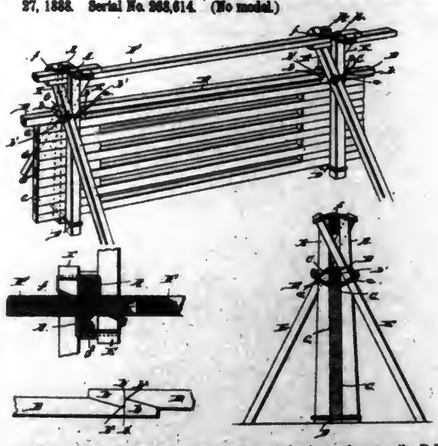
6. The combination of two adjacent heads of independent cylinders, a tubular bridge for connecting said heads, and plugs for closing the ends of said tubular bridge to convert it into a valve-cylinder, substantially as and for the purposes specified.

396,248. GRATE. JOHN WAKEHAM and JOHN CUNNINGHAM, Toronto, Ontario, Canada. Filed Apr. 5, 1888. Serial No. 269,744. (No model.)



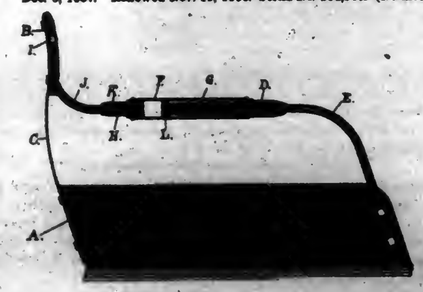
Claim.—The combination, with the frame, of the grate A, journaled therein on trunnions C, set to one side of the center and formed with fingers B, projecting inside and outside of the same and with a central opening, and the spindle E, formed with angular fingers D, working in the central opening of the grate A, and all arranged and operating substantially as shown and described.

396,249. FENCE. DANIEL WARNER, Bronson, Mich. Filed Mar. 27, 1888. Serial No. 268,614. (No model.)



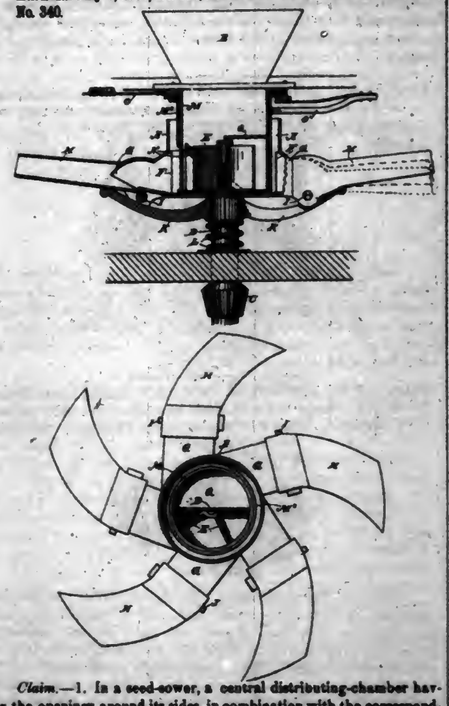
Claim.—In a fence, the combination of the lapped top rails, B B, provided with the notches b' and the shoulders b^2 on contacting sides, which engage with each other, the wire loop C, loosely encircling the joint between the top rails, the tapering posts A A, extending through opposite ends of the said loops and connected together at their lower ends by the wire loops D, whereby the adjacent sides of the said posts are held parallel, the inclining braces E E, bearing on and crossing above the top rails and connected to the adjacent posts by wire loops e e, and the panel-rails lapped between the posts A, substantially as and for the purpose specified.

396,250. VEHICLE-SEAT. JOSEPH A. WEST, San Rafael, Cal. Filed Dec. 6, 1887. Renewed Nov. 19, 1888. Serial No. 291,305. (No model.)



Claim.—In combined seat-rail and spring-braces for buggies, the combined seat-rail and back, composed of the rods E and J, connected by the couplings H and D, the sleeve F, and spring G, in combination with the spring-back B and spring-supporting braces C, constructed and operated substantially as and for the purposes set forth.

396,251. ROTARY SEED-SOWER. JAMES H. ADAMSON, North Melbourne, Victoria, Australia. Filed Sept. 21, 1888. Serial No. 286,090. (No model.) Patented in Victoria Mar. 20, 1884, No. 3,637; in South Australia July 7, 1887, No. 814, and in New South Wales Nov. 17, 1887, No. 340.



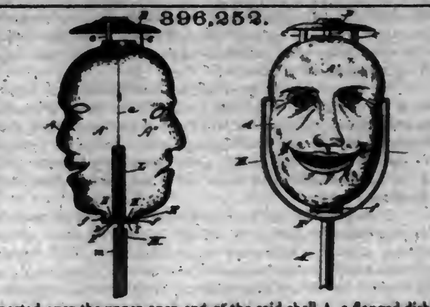
Claim.—1. In a seed-sower, a central distributing-chamber having the openings around its sides, in combination with the correspondingly-arranged tubes or spouts hinged or supported in line with these openings, so that their outer ends will rise or be depressed with the varying velocity of rotation and the area of seed-distribution be regulated, substantially as herein described.

2. A series of distributing spouts or tubes having their lower sides pivoted or flexibly attached to the seed-distributing chamber, in combination with springs by which the outer ends of the tubes are raised when at rest or moving slowly, said springs having such a tension that as the speed increases the centrifugal force will depress the outer ends of the spouts, substantially as herein described.

3. The central chamber receiving seed from the hopper or source of supply, and the rotary feed-wheel by which the seed is discharged through the openings in the side of the chamber, in combination with the series of corresponding discharge and distributing arms having their lower sides supported by springs or spring-actuated arms, so that when moving slowly the discharge will be in a direction above the horizontal plane, while a rapid rotation will cause the mouths of the tubes to be depressed in a degree corresponding to the speed at which they are rotating, substantially as herein described.

4. The cylindrical chamber with the discharge-openings, the hinged distributing-pipes automatically adjustable by centrifugal movement, and the feed-wheel by which the seed is ejected from the chamber, in combination with one or more adjustable cylinders placed within the chamber A, and having openings whereby the direction in which the seed is discharged is controlled, substantially as herein described.

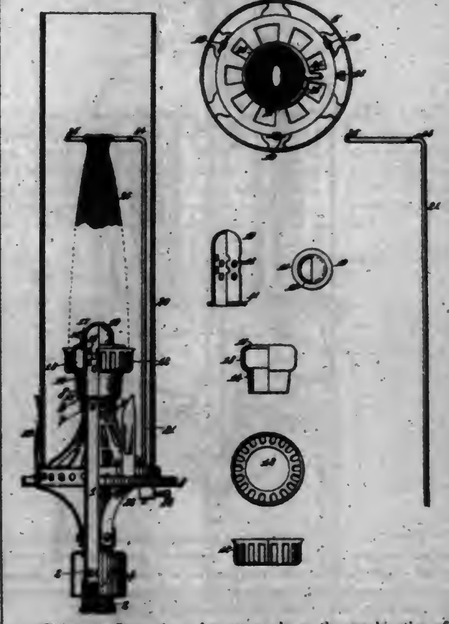
396,252. JACK-A-LANTERN. GEORGE A. BEISLER, Middletown, Pa. Filed Feb. 17, 1888. Serial No. 264,404. (No model.)



Claim.—1. In a jack-a-lantern or campaign-torch, the combination of the body or shell A, constructed of two halves, A' A'', united at their vertical edges, one of the said halves, A', being formed into the shape of a human face and provided with openings for the passage of the light through its eyes, mouth, and nostrils, and the other half, A'', being provided with a central bull's-eye, C, a hood, D, supported over the upper open end of the said shell A, a flanged disk, F, secured over the lower open end of the shell, this disk carrying an illuminating device, and a bail pivoted to the shell A, substantially as herein described.

2. In a campaign-torch or jack-a-lantern, the combination of the shell composed of two sections, A' A'', united at their vertical edges, the said sections being provided with openings for the passage of the light, a hood supported over the upper open end of the said shell, and a flanged disk secured over the lower opening of the said shell, this flanged disk carrying an illuminating device, substantially as herein described.

396,253. INCANDESCENT GAS-BURNER. HAROLD J. BELL, Woodbury, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Mar. 3, 1888. Serial No. 266,504. (No model.)



Claim.—1. In an incandescent gas-lamp, the combination of a burner-tip provided with lateral gas-exits, a cap, 13, surrounding said exits and forming with the burner-tip an annular flame-passage, 17, and a mantle placed above and around said burner-tip and cap, substantially as described.

2. In an incandescent gas-lamp, the combination, with a burner-tip having lateral gas-exits, of a cap surrounding said exits and provided with a flame-passage, and a cup held in place by said cap, substantially as described.

3. In an incandescent gas-lamp, the combination, with a burner, of a perforated cup surrounding the burner, and a mantle placed above and around the burner, with its lower end surrounded by said perforated cup, substantially as described.

4. In an incandescent gas-lamp, the combination, with a burner-tube and a detachable burner-tip, of a detachable cap surrounding the burner-tip, and a detachable collar to hold said burner-tip and cap in place on the burner-tube, substantially as described.

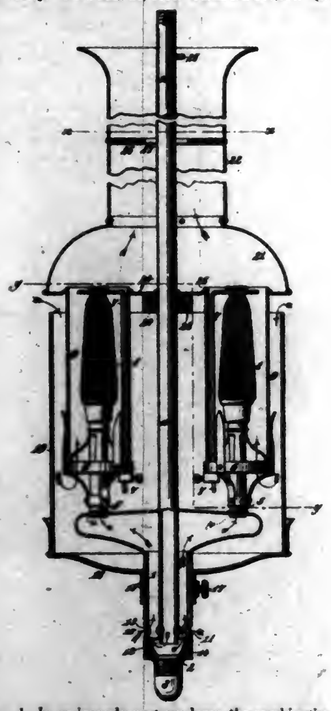
5. In an incandescent gas-lamp, the combination, with a burner-

tube and a detachable burner-tip, of a detachable cap surrounding the burner-tip, a detachable collar to hold said burner-tip and cap in place on the burner-tube, and a detachable cup held in place by said collar and cap, substantially as described.

6. In an incandescent gas-lamp, the combination of a burner-tube, a chimney-gallery supported on said tube, a detachable collar supported on and projecting above the gallery and burner-tube, a detachable burner-tip, a detachable cap supported in said collar between the collar and burner-tip, a mantle, and a cup supported by the collar and cap and surrounding the lower end of the mantle, substantially as described.

7. An incandescent gas-lamp comprising an atmospheric-gas tube, a chimney-gallery supported on said tube, a collar supported on and projecting above the gallery and burner-tube, a detachable burner-tip, a detachable open-top cap, and detachable mantle-protecting cup held in place by said collar, a mantle, a straight mantle-supporting rod, and a straight chimney cylindrical throughout its entire length, substantially as described.

396,254. INCANDESCENT GAS-BURNER. HAROLD J. BELL, Woodbury, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Mar. 21, 1888. Serial No. 267,967. (No model.)



Claim.—1. In an incandescent gas-lamp, the combination, with a gas and air mixing chamber and a number of gas-burners supported on and communicating with said chamber, of a central gas-tube passed vertically through said chamber, and a perforated disk surrounding the open lower end of said tube, substantially as described.

2. In an incandescent gas-lamp, the combination, with a number of atmospheric gas-burners arranged in a group or cluster and a corresponding number of incandescent devices suspended above said burners, of a chimney surrounding each incandescent device, a vertically-adjustable globe surrounding the entire group or cluster of burners and incandescent devices, and a vertically-adjustable metallic hood and chimney supported above the several incandescent devices and their surrounding chimneys and globe, but penetrated by said chimneys, substantially as described

3. In an incandescent gas-lamp, the combination of a number of atmospheric gas-burners, a corresponding number of incandescent devices suspended above said burners, chimneys surrounding said incandescent devices, a globe surrounding all the burners and chimneys, and a globe-holder having a closed or imperforate bottom, substantially as described.

4. In an incandescent gas-lamp, the combination of a gas and air mixing chamber, a number of burners supported by said chamber, a central tube having an adjustable collar, and a metal hood supported on said collar above the gas-burners, substantially as described.

5. In an incandescent gas-lamp, the combination, with a group of gas-burners and incandescent devices and their chimneys, of a central tube having a collar, 20, and pin 28, and a hood, 21, supported on said collar, and having a slotted bar, 26, adapted to engage the pin 28, whereby the hood can be raised and supported clear of the burner-chimneys, substantially as described.

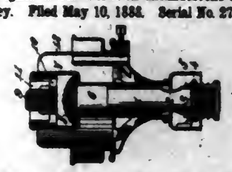
6. In an incandescent gas-lamp, the combination of a gas and air mixing chamber, a number of gas-burners supported by said chamber, incandescent devices suspended above the burners and surrounded by chimneys, an adjustable globe surrounding the entire group of burners and incandescents, and an adjustable metal hood suspended above but penetrated by the burner-chimneys, substantially as described.

396,255. ATMOSPHERIC GAS-BURNER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 273,455. (No model.)



Claim.—The combination, with an atmospheric gas-burner tube having lateral air-inlets 2 and provided with an externally screw-threaded or spiral-grooved base, 7, of a vertically-adjustable bell-shaped shield having a spiral ring, 5, to engage the external spiral groove on the base of the burner-tube, and a neck, 8, to cover or uncover the lateral air-inlets, substantially as described.

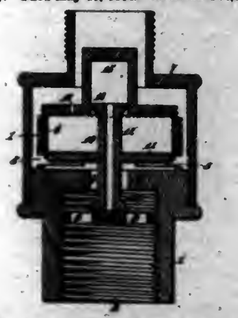
396,256. ATMOSPHERIC GAS-BURNER. HAROLD J. BELL, Gloucester, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 273,457. (No model.)



Claim.—1. The combination, with an atmospheric gas-tube having lateral air-inlets, of a vertically-adjustable bell-shaped shield movably supported on the base of said tube and a vertically-adjustable burner-tube supported on the shield and movable therewith to cover and uncover the lateral air-inlets, substantially as described.

2. The combination of an atmospheric gas-tube having lateral air-inlets and an externally-screw-threaded base, a vertically-adjustable bell-shaped shield having an internal spiral ring to engage the said externally-screw-threaded base, and a vertically-adjustable burner-tube supported on the shield and movable therewith, substantially as described.

396,257. GAS-REGULATING BURNER. HAROLD J. BELL, Gloucester, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 274,261. (No model.)



Claim.—1. In a gas-governor or gas-regulating burner, the combination of a shell, 1, having a contracted central gas-passage, 4, and provided with lateral gas-passages 5, located above said central passage, an adjustable cap, 6, to control the quantity of gas flowing through said lateral gas-passages, the shell 7, surrounding said cap and lateral gas-passages, and a float-valve, 10, comprising a valve, 14, beneath the central gas-passage, 4, and a disk-float, 11, above said passage to control the pressure of gas at the burner, substantially as described.

2. In a gas-governor or gas-regulating burner, the combination

of the shell 1, having a central gas-passage, 4, and lateral gas-passages 5, the adjustable cap 6, adapted to control the quantity of gas flowing through the lateral gas-passages, said cap being provided with a central upper chamber or guideway, 15, and a perforation, 16, the shell 7, surrounding said cap and lateral gas-passages 5, and the float-valve 10, having a tubular stem, 12, carrying a valve, 14, beneath the central gas-passage, 4, and a disk-float, 11, above said passage, substantially as described.

3. In a gas-governor or gas-regulating burner, the combination of the shell 1, having a partition, 3, provided with central gas-passage, 4, and lateral gas-passages 5, located in the shell above said partition, the adjustable cap 6, to control the lateral gas-passages, a float-valve, 10, to control the central gas-passage, an adjustable support, 8, for said float-valve, and a shell, 7, surrounding the cap 6 and lateral gas-passages 5, said shell being adapted to connect with a burner, substantially as described.

396,258. GAS-REGULATING BURNER. HAROLD J. BELL, Gloucester, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 274,262. (No model.)

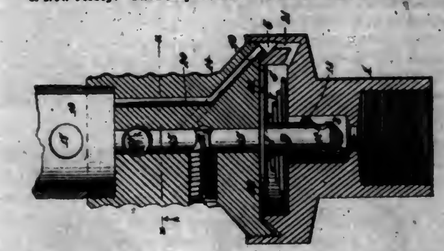


Claim.—1. In a gas-governor or gas-regulating burner, the combination, with a shell having a partition, 3, provided with gas-passage 4, and a cap, 7, having a central chamber, 15, and separate vertical gas-passages 18, of a float-valve, 10, comprising a disk, 11, and a tubular stem, 12, carrying a valve, 14, substantially as described.

2. In a gas-governor or gas-regulating burner, the combination of the shell 1, having a partition, 3, provided with gas-passage 4, the cap 7, having chamber 15 and separate vertical gas-passages 18, the float-valve 10, the perforated disk 19, and the tube 16, leading from the chamber 15 and through the disk 19, substantially as described.

3. In a gas-governor or gas-regulating burner, the combination of the shell 1, having central gas-passage, 4, the disk 8, having perforations 9, the cap 7, having chamber 15 and separate vertical gas-passages 18, the float-valve 10, the disk 19, having gas-passage 20 and screws 21, controlling said passage, and the tube 16, leading from the chamber 15 and through said disk 19, substantially as described.

396,259. GAS-REGULATING BURNER. HAROLD J. BELL, Gloucester, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 274,263. (No model.)



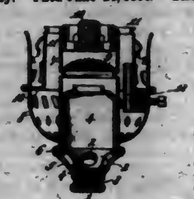
Claim.—1. In a gas-governor or gas-regulating burner, the combination of a base having a central gas-passage, a valve-seat, and a float-chamber, a cap or pillar attached to the upper end of said base and having a central gas-passage provided with an adjustable screw or screws for regulating the quantity of gas admitted to the burner, a float-valve consisting of a disk having a tubular stem perforated near its lower end and carrying a valve on its lower end, and a spring located in the float-chamber to normally support said float-valve, substantially as described.

2. In a gas-governor or gas-regulating burner, the combination of a base adapted to be attached to a gas-fixture and having a central gas-passage with a contracted valve-seat and an expanded float-chamber, said float-chamber being surrounded by an annular recess, a cap or pillar engaged in said recess and having a central gas-passage provided with an adjusting screw or screws to control the quantity of gas admitted to a burner, said base and pillar being provided with vents communicating with the annular recess, and a normally spring-supported float-valve located between the base and pillar and having a hollow laterally-perforated stem and valve operating in the passage of the base above the valve-seat to automatically regulate the pressure of gas, substantially as described.

3. In a gas-governor or gas-regulating burner, the combination of a base having a central gas-passage, a valve-seat, and a float-chamber, a cap or pillar having a central gas-passage provided with means for controlling the quantity of gas admitted to the burner, and a normally spring-supported float-disk located in the float-chamber between the central gas-passage of said base and cap, said float being provided with a central perforation and a tubular laterally-perforated stem carrying on its lower end a valve to seat downward in the valve-seat of the gas-passage in the base, whereby gas admitted through said tubular stem will expand on the upper face of the float-disk and said disk be forced down by an excessive pressure to lower the valve and diminish the flow of gas, substantially as described.

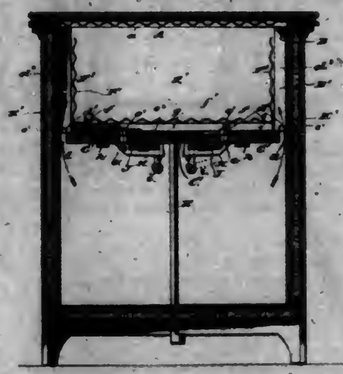
4. In a gas-governor or gas-regulating burner, the combination of the base 1, having central gas-passage, 3, valve-seat 4, float-chamber 5, annular recess 6, and vent 21, the cap or pillar 14, having a central gas-passage, 15, provided with an adjusting screw or screws and vent 20, the float-valve 8, consisting of a centrally-perforated disk, 10, and perforated tubular stem 9, having valve 11, gas-inlets 12, and shoulder 13, and the spring 7 for normally supporting said float-valve, substantially as described.

396,260. INCANDESCENT GAS-BURNER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed June 21, 1888. Serial No. 277,715. (No model.)



Claim.—The combination of the burner-base 1, having a flaring upper end provided with a series of air-inlets, 2, the rotatable shell 4, open around said base and projecting above the same, the lower portion of said shell being provided with a series of air-inlets corresponding with the air-inlets of the base, and a combined burner-tube and gallery supported on and closely surrounding the upper portion of the shell 4 above the air-inlets, substantially as described.

396,261. REFRIGERATOR. JOHN C. BERGER, Michigan City, Ind. Filed May 17, 1888. Serial No. 274,153. (No model.)



Claim.—1. In a refrigerator, the combination, substantially as described, of the ice-chamber having an inclined bottom provided with flanged openings, fixed supports for the bottom of the ice-chamber, an ice-tray of corrugated metal provided with upwardly-projecting ends, and strips secured vertically in the corners of the ice-chamber to support the upwardly-projecting ends of the tray against outward pressure.

2. In a refrigerator, the combination, substantially as described, of the metal-lined ice-chamber occupying the entire upper part of the refrigerator and having its bottom provided with flanged openings, a removable metal ice-tray having openings in its bottom and upwardly-projecting ends extending to near the top of the ice-chamber, strips arranged vertically in the corners of said chamber to support the upwardly-projecting ends of the tray at a little distance from the ends thereof, and triangular strips connecting the upper ends of the vertical strips and serving to deflect any air-currents that may rise through

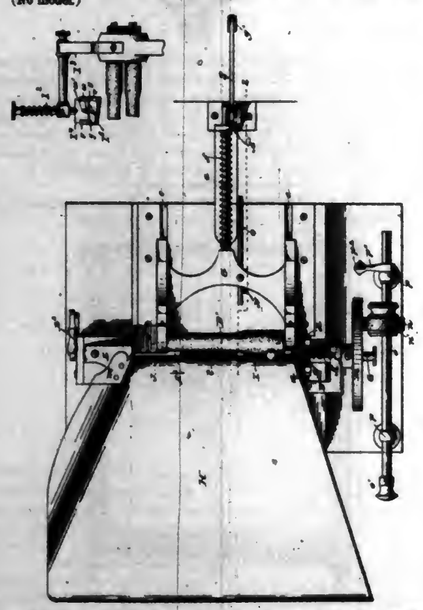
the spaces between the ends of the ice-chamber and the upwardly-projecting ends of the ice-tray.

396,262. WHEEL. HAMILTON BOLAND, Columbus, Ga. Filed Mar. 15, 1888. Serial No. 267,230. (No model.)



Claim.—In a wheel, the combination of the hub formed with the end apertures, the rim having the inwardly-extending flange provided with the apertures, and the spokes formed each of a single length of wire doubled and twisted together in opposite directions, substantially as described.

396,263. CIGAR WRAPPING OR ROLLING MACHINE. CLARK W. BORAN, New York, N. Y. Filed Sept. 8, 1888. Serial No. 284,918. (No model.)

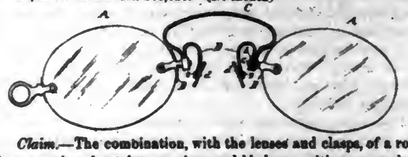


Claim.—1. The combination of the cigar-receiving rolls divided into two sets, D D', the movable carriage C, for one of said sets, and the cigar-supporter actuated from or by said carriage at the times and in the manner substantially as hereinbefore set forth.

2. The combination of the cigar-receiving rolls D D', the movable carriage C, in which the set of rolls D' is mounted, the two-part thimble having one of its parts attached to and movable with said carriage, and the cigar-supporter actuated from or by said carriage at the times and in the manner substantially as hereinbefore set forth.

3. The combination, with cigar-receiving rolls, of the compound tucker provided with the toothed blade I^a and clearer-blade I^b, capable of limited vertical movement independently of one another, and the spring whereby the clearer-blade is held normally with its spring-edge below the toothed edge of the other blade, substantially as and for the purpose hereinbefore set forth.

396,264. EYEGLASSES. HENRY BORSCH, Chicago, Ill. Filed Mar. 20, 1888. Serial No. 268,229. (No model.)



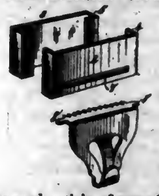
Claim.—The combination, with the lenses and clasps, of a round-wire nose-piece bent into an inverted-U shape, with one arm longer than the other, the outer extremities of the arms being free of each other and the shorter arm secured to the clasp with the free end of the longer arm extended below the end of the shorter arm and carrying a facing, substantially as described.

396,265. FIFTH-WHEEL. WILLIAM T. CHEATHAM, Pulaski, Tenn. Filed Oct. 5, 1888. Serial No. 287,264. (No model.)



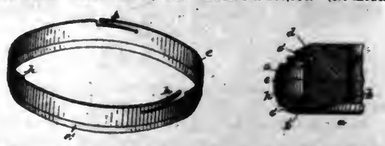
Claim.—The combination of the axle, the circle secured rigidly thereon, the king-bolt secured to the axle and projecting upward therefrom, the head-block composed of a T-shaped casting having the cross-bar E and the coupling-plate F, the said cross-bar being provided with a vertical opening for the reception of the king-bolt, and the coupling-plate being provided on its upper side with vertical ribs arranged in diverging pairs, and the guide for the circle secured to the under side of the coupling-plate, as specified.

396,266. BUCKLE. CHARLES D. CHESEBRO, Birmingham, Conn. Filed Oct. 31, 1888. Serial No. 289,662. (No model.)



Claim.—As an improved article of manufacture, the herein-described buckle, composed of the slotted front plate carrying a swinging clamping-lever and having bent ends, and the separate back plate having its end portions bent substantially at right angles, rigidly connected with the front plate, and then extended toward each other to overlie and rest against the inner end portions of the body of the stationary front plate for taking up or bearing the strain of the clamping-lever, substantially as described.

396,267. DUST-BAND FOR WATCHES. DUANE H. CHURCH, Newton, Mass. Filed June 23, 1888. Serial No. 277,968. (No model.)



Claim.—1. A dust-band for watches, having an elastic seating or bearing at one edge, whereby a yielding pressure is imparted to the band when it is incased, as set forth.

2. A dust-band for watches, having an elastic seating or bearing at one edge and a beveled portion or flange at its other edge, as set forth.

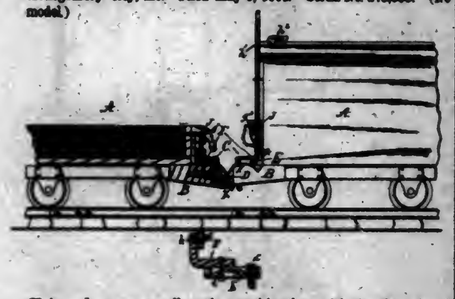
3. A dust-band for watches, having elastic tongues or springs at one edge, as set forth.

4. A dust-band for watches, having elastic tongues or springs at one edge and a beveled surface or flange at the other edge, as set forth.

5. The combination of a watch-movement, a case having flanges c' d, a dust-band surrounding the movement between the flanges of the case, and means whereby an edgewise pressure is imparted to the dust-band, as set forth.

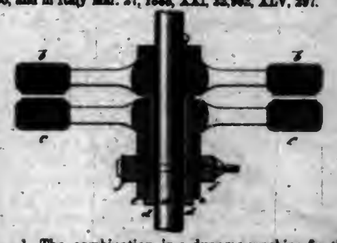
6. The combination of a watch-movement, a case having flanges c' d, and a dust-band surrounding the movement between said flanges, and provided at one edge with elastic bearings or springs and at the other edge with an inclined portion or flange, which is pressed by said springs against the case-flange, as set forth.

396,268. CAR-COUPLING. ANTHONY COMLY and JAMES H. MOUNTS, Montgomery City, Mo. Filed May 9, 1888. Serial No. 273,363. (No model.)



Claim.—In a car-coupling, the combination, with the draw-head B, pin C, and link D, of the link guard and holder composed of a spring steel rod, K, secured at one end to the end of the car, curved upward at k', and then at right angles at k^2, and head K', secured at the outer end of said spring-bar and formed with a curved top, j, and beveled end j', as described, for the purposes specified.

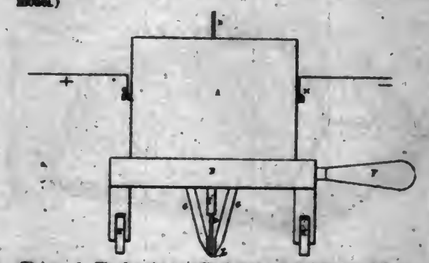
396,269. ELECTRO-DYNAMIC MACHINE. CARL COEPPER, Cologne, Prussia, assignor to the Helios Actien-Gesellschaft für Elektrisches Licht und Telegraphenbau, Ehrenfeld, Germany. Filed Feb. 15, 1888. Serial No. 264,077. (No model.) Patented in Belgium Jan. 12, 1888, No. 949; in England Jan. 14, 1888, No. 633; in France Feb. 4, 1888, No. 188,555, and in Italy Mar. 27, 1888, XXI, 23,902, XLV, 397.



Claim.—1. The combination, in a dynamo-machine for the electrical transmission of power, of a shaft or axle, an armature and field-magnets on said shaft or axle, one of the elements of the dynamo-machine, either the armature or field-magnets, being loosely mounted on the shaft or axle, and a brake or other check mechanism applied to the loosely-mounted element and capable of locking the same in a position of rest, substantially as set forth.

2. In a dynamo-machine for the electrical transmission of power, the combination, with a shaft or axle, of a field-magnet mounted rigidly on said shaft or axle, an armature applied loosely on the shaft or axle, and a brake or other check mechanism applied to the armature and capable of locking the same in a position of rest, substantially as set forth.

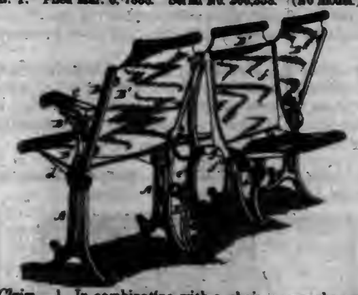
396,270. PROCESS OF ELECTRIC WELDING. CHARLES L. COFFIN, Detroit, Mich. Filed June 19, 1888. Serial No. 277,513. (No model.)



Claim.—1. The herein-described process of electric welding, consisting in forming a voltaic arc between two conductors extending outward from said conductors and submitting the joint to be welded to the action of said arc.

2. The herein-described process of electric welding, consisting in forming a voltaic arc between two conductors extending beyond the points thereof, feeding a strip of metal into the arc between the conductors, and submitting the joints to be welded and said strip of metal simultaneously to the action of said arc.

396,271. FOLDING CHAIR. CORNELIUS R. DEMAREST, Brooklyn, N. Y. Filed Mar. 6, 1888. Serial No. 266,332. (No model.)



Claim.—1. In combination with a chair, a secondary chair having the upper end of its back pivoted to the back of the primary chair, and its seat having a hinge-connection with the back of the secondary chair, and also a sliding hinge-connection with the frame of the primary chair.

2. The combination of a chair having a seat and sides supporting the back thereof and secured to the rear of said sides, and a frame, E, having grooves therein, with a secondary chair-back having its sides pivoted to said frame and a seat having its supports pivoted to said sides, and lugs on the ends of said supports received within the grooves of the frame E, substantially as and for the purpose described.

396,272. VEHICLE-SPRING. JOHN DIEHL, Franksville, Wis. Filed Aug. 24, 1888. Serial No. 283,053. (No model.)



Claim.—1. A vehicle-spring comprising a bar, a semi-elliptic spring secured to the central portion of the bar, and sockets adjustably secured to the ends of said bar and provided with lugs designed to come on opposite sides of bolster-stapdards, substantially as set forth.

2. A vehicle-spring comprising a bar, a semi-elliptic spring recessed at its ends and secured to the central portion of the bar, and sockets adjustably secured to the ends of said bar and provided with lugs designed to come on opposite sides of bolster-standards, substantially as set forth.

3. A vehicle-spring comprising a bar, a semi-elliptic spring secured to the central portion of the bar and having upwardly and outwardly curved ends, and lugs depending from said bar to come upon said ends of the semi-elliptic spring, substantially as set forth.

4. A vehicle-spring comprising a bar, a semi-elliptic spring secured to the central portion of the bar and having upwardly and outwardly curved ends, and sockets adjustably secured to the ends of said bar and provided with lugs having downward extensions, substantially as set forth.

5. A vehicle-spring comprising a bar, the semi-elliptic spring F, secured to the bar to have its ends rest upon the vehicle-bolster, and the springs L, arranged to depend from the bar and be normally out of contact with said semi-elliptic spring, substantially as set forth.

6. A vehicle-spring comprising a bar, a single semi-elliptic spring secured to the central portion of the bar, and two spiral springs of different lengths arranged to depend from each end of said bar, whereby one of the spiral springs in each pair is always in contact with the semi-elliptic spring and the other normally out of contact therewith, substantially as set forth.

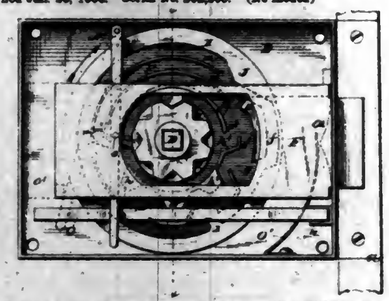
7. A vehicle-spring comprising a bar, a single semi-elliptic spring secured to the central portion thereof, two spiral springs of different lengths arranged to depend from each end of the bar, and short spiral springs depending from beneath said semi-elliptic spring, whereby one

of the spiral springs in each pair is always in contact with the semi elliptic spring and the other normally out of contact therewith, substantially as set forth.

8. A vehicle-spring comprising a bar provided at each end with the recesses B C, the semi-elliptic spring F, the spiral springs K, arranged in the recesses C of the bar and impinged against the ends of said semi-elliptic spring, the springs L, arranged in the recesses B of said bar and having their upper ends provided with eyes L', the plates D, and the rivets M, connecting said eyes and plates, substantially as set forth.

9. A vehicle-spring comprising the bar A, adjustable sockets P, arranged on the ends thereof and provided with lugs T, having extensions T', the semi-elliptic spring F, having the upwardly and outwardly curved ends F', and the spiral springs K L, of different lengths, suspended from said bar, substantially as set forth.

396,273. PERMUTATION-LOCK. BYRON J. DOUDS, Canton, Ohio. Filed Jan. 28, 1888. Serial No. 262,905. (No model.)



Claim.—1. In a lock, the combination, with a disk having cams and stops, of a movable device provided with a pin adapted to be engaged by the cams, and a spring adapted by its engagement with the stops to yieldingly hold the disk for the purpose of indicating the position of the pin on the face of the disk.

2. In a lock, the combination, with a disk having a series of cams thereon, of a pendulum-lever engaged by the cams on the disk, and a bolt engaged and operated by said lever.

3. In a lock, the combination, with a disk having a series of cams and passages on one face, of a pendulum-lever engaged by the said cams, a sliding bolt operated by said lever, and a spring exerting pressure on the bolt in one direction, substantially as set forth.

4. In a lock, the combination, with a disk having a series of cams and passages on one face and a series of stops, of a pendulum-lever having a laterally-projecting pin adapted to traverse said passages and engage said cams, and a spring-arm located in position to engage the stops on the disk, substantially as set forth.

5. In a lock, the combination, with a casing and a disk having a series of cams and passages on one face thereof, of a movable device having a pin adapted to traverse the passages and engage the cams, a spring bearing upon the device, and mechanism for operating the disk, substantially as set forth.

396,274. FERTILIZER. HERMANN ENDEMANN, Brooklyn, N. Y. Filed Apr. 6, 1888. Serial No. 269,963. (No specimens.)

Claim.—As a new article of manufacture, the above-mentioned fertiliser or product produced from tobacco, having the characteristics that it is of brown color, that the larger part of it is soluble in acidulated water, that when warmed with a solution of caustic soda it develops the characteristic odor of dry tobacco-leaf, and that it is free from cellulose and contains salts of the mineral acid used in making the product.

396,275. PROCESS OF MAKING A LEAD PIGMENT. AMBROSE G. PELL, New York, N. Y. Filed Mar. 1, 1887. Renewed June 14, 1888. Serial No. 277,066. (Specimens.)

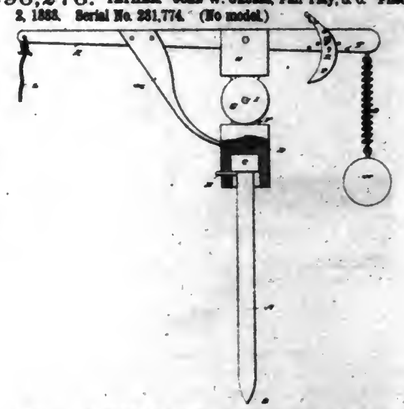
Claim.—1. The herein-described method of producing the new pigment herein described, which consists in forming a solution of a salt of lead, forcing sulphurous acid through the said solution, whereby the lead is converted into normal sulphite, separating said sulphite from the liquid, steaming it, and drying it.

2. The herein-described process of treating sulphite of lead for the production of a lead pigment, which process consists in subjecting the sulphite to the action of steam or its equivalent, for the purpose and in the manner described.

3. The method of producing the new pigment herein described, which consists in forming a solution of acetate of lead, forcing sulphurous acid through the said solution, whereby the lead is converted into normal sulphite, separating said sulphite from the liquid, steaming it, and drying it, substantially as set forth.

4. As a new manufacture, a lead pigment consisting, substantially, of a lead sulphite white in color and distinguished by yielding a blue streak and by the other properties and characteristics herein set forth.

396,276. TETHER. JOHN W. GRUBB, Fair Play, S. C. Filed Aug. 2, 1888. Serial No. 281,774. (No model.)



Claim.—A tether for animals, consisting of the post, the block swiveled thereto, the lever pivoted to the block, the stop M on one side of the pivot-point, the weight N on the other side of the said point, and the adjustable stop P between the said pivot and weight, substantially as specified.

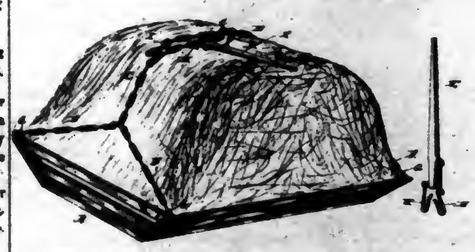
396,277. ADJUSTABLE CULTIVATOR-SHOVEL. HENRY C. HART, Wannakee, assignor to the Fuller & Johnson Manufacturing Company, Madison, Wis. Filed Oct. 2, 1888. Serial No. 286,970. (No model.)



Claim.—1. In an adjustable cultivator-shovel, the combination of the shovel, a grooved base adjustably secured thereto, a standard, and studs secured to the said standard for engaging the grooves in the base, substantially as described.

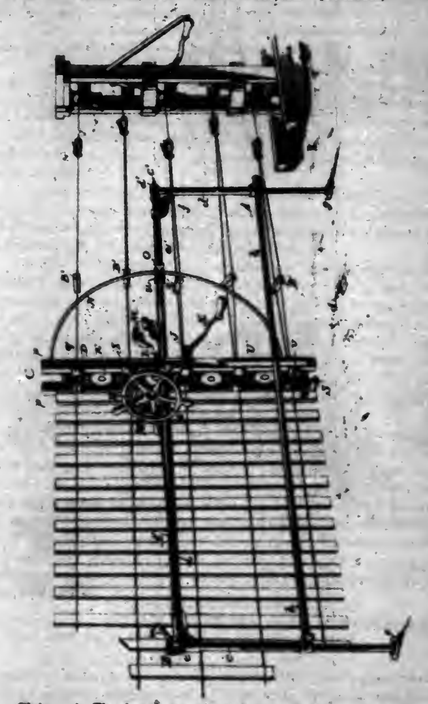
2. In an adjustable cultivator-shovel, the combination of the standard, a base adjustably secured thereto and provided at its forward and rear ends with transverse grooves, a standard, and studs secured to the standard for engaging the forward transverse grooves, a yoke fitting on the standard, and a clip pivoted to the yoke and engaging the rear transverse groove of the base, substantially as and for the purpose specified.

396,278. HAY-BINDER. ALEXANDER W. HENDRICK, Paw Paw, Mich. Filed Sept. 22, 1888. Serial No. 286,122. (No model.)



Claim.—A hay-binder comprising the central chains, C C, the chains D D, extending from the ends of the chains C C and adapted to engage the corners of a hay-rack, and the operating-lever provided with hooks near one end which are adapted to engage the chains C C, as set forth.

396,279. FENCE-MACHINE. MIRAJAH C. HEDLEY, Richmond, Ind. Filed Nov. 12, 1886. Serial No. 218,711. (No model.)



Claim.—1. The herein-described fence-weaving apparatus, consisting of frame A, having an elevated track or rail, *a*, and a loom or twister frame pivotally supported at or about its middle to tip forward and backward upon the track or rail and arranged to traverse the same, substantially as set forth.

2. In combination with a supporting-frame having an elevated track or rail, a pivotally-supported loom or twister provided with wheels or pulleys at or about its mid-length to rest upon the track or rail and carry the loom or twister, said loom or twister being adapted to be tipped forward and backward.

3. In combination with a loom or twister frame provided with supporting-wheels at or near its mid-length, a supporting-frame provided with an elevated track or rail, said track or rail passing through the loom or twister and beneath the supporting-wheels thereof.

4. In combination with a supporting-frame provided with an elevated rail or track, a carriage mounted and movable upon said track, and a loom or twister frame pivoted at or about its mid-length to the carriage, whereby it is adapted to be tipped to and to stand at any desired inclination.

5. In combination with a supporting-frame provided with an elevated track or rail, a carriage mounted and movable upon said track, a loom or twister frame pivotally attached at or about its mid-length to said carriage, a brace for holding the loom-frame at any desired angle to the carriage and track, and a clamping device bearing upon and serving to hold the brace.

6. In combination with a supporting-frame having upper track, *a*, and lower rod or brace, *b*, a loom or twister frame mounted upon the track and provided with a strap or bar to hold the frame to the lower brace or rod and prevent lateral movement of said frame.

7. In combination with a supporting-frame having a track or bar, *a*, a carriage mounted and movable upon said track, a loom or twister frame pivotally attached to said carriage, a sleeve or block movable upon the track, a brace extending from the loom or twister frame to the block, and a clamping device, substantially as shown and described, for clamping the brace and block together to hold the loom at any desired angle to its track.

8. In combination with a supporting-frame having a track or rail, a carriage mounted and movable upon said frame, a loom or twister pivotally attached to said carriage, a sleeve movable along the track, a brace extending from the loom or twister to the sleeve, and a set-screw or clamping device adapted to clamp the sleeve to the track, whereby the loom may be held stationary at any desired point on the track.

9. In combination with frame A, having track or rod *a*, and with a loom or twister frame carried thereby, a clamp, B, attached to the frame and serving to secure the frame to a picket of the fence.

10. In combination with a loom or twister, a supporting-frame consisting of longitudinal rods or bars *a'* and *b*, uprights *c* and *d*, and a clamping device consisting of a curved bearing-plate, *i*, carried by the frame, a lug, *l*, in rear of said plate, a threaded stem, *k*, passing through said lug, a clamping-head, *j*, carried by said stem, and a clamping-lever applied to the stem and serving to draw the head toward plate *i*.

11. The combination, with a supporting-frame having a track or rail, of a loom or twister mounted upon and arranged to traverse the rail, said frame being provided at either or both ends with an adjustable foot, whereby the inclination of the track or rail may be varied.

12. In combination with track *a*, carriage L M, loom or twister C, pivotally attached to said carriage, sleeve *u*, mounted upon track *a*, curved brace N, attached to the loom or twister and passing through an eye of said sleeve, and a set-screw or clamping device, O, serving to bind the brace to the sleeve.

13. In combination with frame A, having elevated track *a*, loom or twister C, provided with cross-plates *q r*, twister heads or disks D, intermediate gear-wheels, E, and small pinions F G, the latter serving to connect the other gear-wheels and disks of the series, but affording space for the passage of track *a* through the loom or twister frame.

14. In combination with a supporting-frame having an elevated track, *a*, a loom or twister frame provided with a lug, *i'*, and an adjustable foot-piece, *f'*, whereby the frame is adapted to be supported upon its foot and to form a support for the frame as the latter is moved back.

15. In combination with a loom or twister frame for fence-weaving, a yielding foot or support carried thereby to support the lower end of the picket.

16. In combination with a fence loom or twister frame, a gage at or near the upper end thereof to control the height of the picket, and a yielding foot or support at or near the lower end of the loom to support the base of a picket, the yielding foot permitting pickets of more than the prescribed length to be dropped down to bring their heads beneath the top gage.

17. In combination with a loom or twister frame, a foot rest or support adapted to be swung or pressed back to permit the foot of a picket to pass below it.

18. In combination with a loom or twister provided with lugs *v*, a foot or support for pickets, consisting of stems or rods Q, springs R, plate S, and clamping devices, substantially as described and shown, for securing the rods Q at any desired height.

19. In combination with a supporting frame or track, and with a band extending from end to end thereof, a loom or twister frame mounted upon said track, a wheel carried by said loom or frame and engaging with the band, and a lever applied to said wheel or its shaft and serving to rotate the same, and thereby to move the twister-frame along the track.

20. In combination with a frame having an elevated track, *a*, a carriage, L, mounted thereon, a loom or twister, C, supported by said carriage, a shaft, *z*, provided with wheel M to run upon the track, a band running from end to end of the frame, a wheel, V, engaging with said band, and a hand wheel or lever by which to rotate the wheel V to move the carriage and twister.

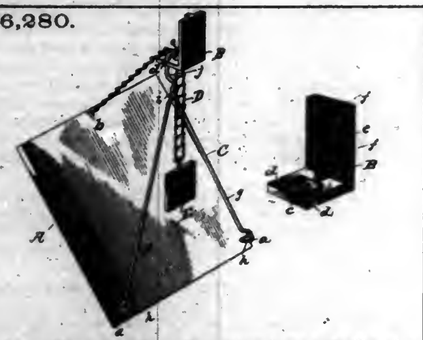
21. In combination with a frame having a track, *a*, a carriage, L, provided with wheels M to run upon the track, a loom or twister supported by said carriage, a shaft, *z*, extending from the side of the carriage, a band-wheel, V, and a notched hub, W, mounted upon said shaft, a band extending lengthwise of frame A and engaging with the band-wheel V, and a hand wheel or lever provided with a locking-dog, whereby it may be connected with or disconnected from the notched hub at will.

22. The combination, substantially as set forth, of a supporting-frame provided with a track, a carriage having wheels mounted upon said track, a loom or twister supported by said carriage, a shaft, *z*, projecting from the side of the carriage, a band-wheel, V, and notched hub W, mounted upon said shaft, a hand-wheel, X, mounted upon the shaft and provided with bolt Y to engage with hub W, hand-piece Z, connected with and serving to operate the bolt, and a band extending lengthwise of frame A and in engagement with band-wheel V, whereby the loom may be moved back and forth regularly and gradually or suddenly, as desired.

23. In combination with a supporting-frame having track *a*, carriage L M, mounted thereon and provided with band-wheel V, and band A', attached permanently to frame A at one end and at the other end to an adjustable stem, *c*.

396,280. AUTOMATIC ADJUSTABLE PICTURE-HANGER. OTTO JABNER and ALEXANDER JABNER, Philadelphia, Pa. Filed Apr. 23, 1888. Serial No. 271,599. (No model.)

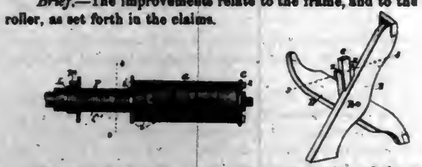
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Claim.—The combination, with a picture-frame or the like, of an L-shaped bracket formed with an opening in its vertical portion and provided on opposite sides of said opening with the ribs *f f*, and having in the horizontal portion thereof the hole *e*, and notches *d d* on its edges, the bifurcated brace twisted at *i* to form the loop *j* and bent at its ends into hooks, and the chain provided with the pendant E, substantially as described.

396,281. HAND-LOOM. WILLIAM H. KYBERT, Battle Creek, Mich. Filed May 24, 1887. Serial No. 239,270. (No model.)

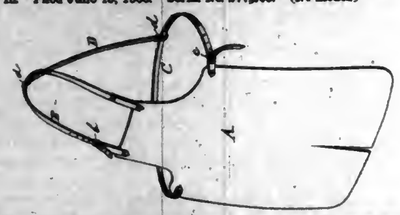
Brief.—The improvements relate to the frame, and to the warp-roller, as set forth in the claims.



Claim.—1. In a loom-frame, the combination of the crossed pivoted legs, said legs provided with the gains in their contiguous sides, and the adjustable keys for insertion in said gains to hold the loom-frame at different heights, substantially as set forth.

2. In a loom, a warp-roller having the radial grooves for the reception of the pins, a fixed head at one end of said roller, a head at the other end adapted to slide thereon, and a set-screw to fix the movable head at given points of adjustment, substantially as set forth.

396,282. LUMBERMAN'S APRON. ALEXANDER LEVIN, Chicago, Ill. Filed June 18, 1888. Serial No. 277,263. (No model.)



Claim.—1. The combination, with a lumberman's apron having neck-strap B and waist-strap C, of an elastic back-strap, D, connecting both straps B and C, substantially as and for the purpose set forth.

2. The combination, with a lumberman's apron having neck-strap B and waist-strap C, of an elastic back-strap, D, provided with loops to its ends for coupling the straps B and C, substantially as and for the purpose set forth.

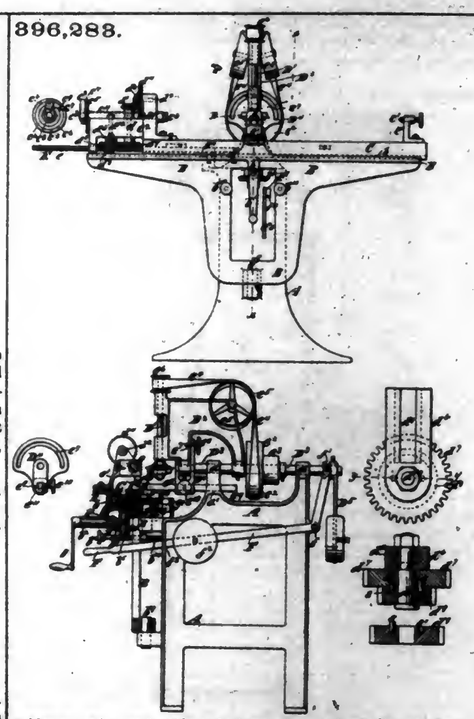
396,283. LATHE FOR TURNING SPIRAL FORMS. EDWARD D. MACKINTOSH, Brooklyn, assignor to Paul Fryhil, New York, N. Y. Filed Mar. 10, 1888. Serial No. 266,792. (No model.)

Claim.—1. The combination, with a work-frame mounted on a vertical pivot which occupies a fixed position, of a work-table carrying work-spindles and movable lengthwise in guides in said frame and a rotary spindle carrying a cutter-head and cutters for operating on the work between said spindles, substantially as herein described.

2. The combination, with a work table or bed provided with centers for carrying a piece of work, a frame or guideway therefor, and gearing for traversing the table or bed along the said frame or guideway, of a swinging spindle-frame having the axial line on which it swings in the same plane with said centers, and a spindle journaled in said spindle-frame in a position transverse to the fulcrum and carrying a cutter-head, substantially as herein described.

3. The combination, with a work-frame having a rectilineal guideway and a work table or bed carrying work-spindles and movable lengthwise in said guideway, of a cutter-spindle carrying a cutter-head and movable toward and from the work and a former on the table or bed which governs the approach of the cutter-spindle toward the work, substantially as herein described.

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4. The combination, with a longitudinally-movable work table or bed provided with work-centers, of a spindle-frame, a fulcrum-bar therefor extending transversely to the table or bed and loaded to carry it and the frame toward the work, a rotary cutter-head and a spindle therefor journaled in said frame, and a former for governing the approach of the cutter and spindle-frame toward the work, substantially as herein described.

5. The combination, with a work-frame mounted on a vertical pivot to swing horizontally, of a work table or bed movable lengthwise in said frame and carrying work-spindles, a cutter-spindle and a cutter-head thereon, and a steady-block mounted upon the work-frame and receiving the work through it, the cutter-head cutting its way to the work through the block, and the block serving to steady the work opposite the cutter-head, substantially as herein described.

6. The combination, with a longitudinally-movable work table or bed having centers for work, of the spindle-frame D^3 and its fulcrum-bar D^2, the guide-bar d^3, and the holding-frame D^4, receiving the guide-bar through it and having an arc-shaped adjustable connection with the spindle-frame, bearings for the fulcrum-bar, and a guide in the main frame for the guide-bar, and a spindle, D', journaled in the spindle-frame and carrying a rotary cutter-head, substantially as herein described.

7. The combination, with a work table or bed provided with centers for holding work and a frame whereon the table or bed is movable lengthwise, and which is supported by vertical pivots, of a swinging spindle-frame and a fulcrum-bar therefor in substantially the same vertical plane as said vertical pivots and transverse to the line of said work-centers, and a cutter-spindle journaled in said spindle-frame and arranged at substantially right angles to said fulcrum-bar, substantially as herein described.

8. The combination, with the main stationary frame A and the work-frame B, supported thereon by circular bearings which provide for swinging it in a horizontal plane, of adjustable stops, as screws b^{10}, to lock said work-frame against swinging, the work table or bed provided with centers for work and gearing for traversing it along said work-frame, the spindle-frame D^3 and its fulcrum-bar D^2, and the cutter-spindle D', journaled in said spindle-frame, substantially as herein described.

9. The combination, with work-spindles, of a cutter-head and a cutter-spindle, D', and the spindle-frame D^3, wherein it is journaled, and the fulcrum-bar D^2, on which said frame is mounted, and which is movable lengthwise in its bearings to carry the cutter-head toward and from the work, substantially as herein described.

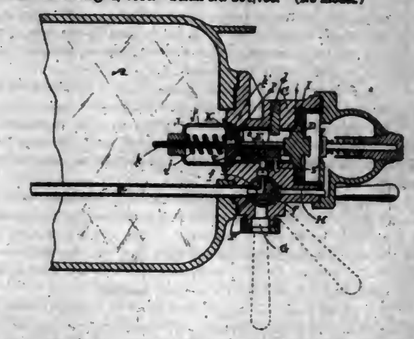
10. The combination, with a swinging spindle-frame and a cutter-spindle journaled therein, of a work-frame and a work table or bed movable on said work-frame, a rack on the table or bed, and gearing on said work-frame for driving into said rack and traversing said table or bed, a head-spindle and a tail-spindle or center on the table or bed, a fixed rack on the work-frame, and gearing whereby the head-spindle is geared with a wheel engaging said rack and the head-spindle and work driven as the table or bed is moved lengthwise, substantially as herein described.

11. The combination, with the rack-bar E and change-wheels for engaging therewith, of the support d^9, having a stud for supporting the change-wheels and adapted to be slid lengthwise and turned on its securing-bolt d^{10}, substantially as herein described.

12. The combination, with a spindle-frame and a cutter-spindle journaled therein, of a work-frame and a sliding work table or bed thereon and supporting head and tail spindles, gearing for traversing the table or bed along the work-frame, two racks on said work-frame facing in opposite directions, gearing for imparting motion to the head-spindle, and which includes a change-wheel and a bearing or support for the change-wheel secured to the work table or bed and adjustable to hold said wheel in engagement with either of said two racks, substantially as herein described.

13. The combination, with a spindle-frame and a cutter-spindle journaled therein, of a work-frame and a sliding table or bed thereon and head and tail spindles on the table or bed, gearing for traversing the table or bed, a rack on said work-frame, a transmitting gear-wheel in permanent geared engagement with the head-spindle, change-wheels gearing one into the rack and the other into said transmitting-wheel and connected together to rotate as one by pins secured one in each wheel and entering a hole in the other wheel, and a bearing or support for the change-wheels on said table or bed, substantially as herein described.

396,284. AUTOMATIC AIR-BRAKE. GEORGE W. MARSH, Oakland, Cal. Filed Aug. 1, 1888. Serial No. 281,706. (No model.)



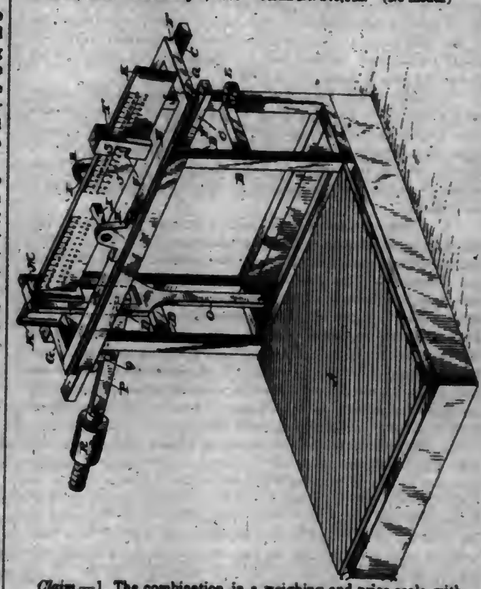
Claim.—1. In the automatic air-brake herein described, having the auxiliary reservoir, the brake-cylinder, the train-pipe connection, and the valve chest or chamber, with its grooved piston-valve, ported slide-valve, and port e, the spring *j*, for throwing the valves back when the pressure within the auxiliary reservoir equals the pressure in front of the piston-valve, and the exhaust-port e^3 in the valve-chest, which is opened by the ported slide-valve when thrown back, substantially as and for the purpose herein described.

2. In the automatic air-brake herein described, having the auxiliary reservoir, the brake-cylinder, the train-pipe connection, and the valve chest or chamber, with its grooved piston-valve, ported slide-valve, and port *e*, the ported inner valve bearing against the inner end of the slide-valve and the grooved inner end of the stem of the piston-valve, the spring acting against said inner valve for causing it to move forward to its seat and throw the piston-valve and slide-valve back when the pressure within the auxiliary reservoir equals the pressure in front of the piston-valve, and the exhaust-port e^3 in the valve-chest, which is opened by the ported slide-valve when thrown back, substantially as herein described.

3. In the automatic air-brake herein described, having the auxiliary reservoir, the brake-cylinder, the train-pipe connection, and the valve chest or chamber, with its grooved piston-valve, ported slide-valve, and port *e*, the ported cap on the inner end of the valve-chest, the ported inner valve within said cap and bearing against the end of the slide-valve and the grooved inner end of the stem of the piston-valve, the spring within the cap and acting against the inner valve for causing it to move forward to its seat and throw the piston-valve and slide-valve back when the pressure within the auxiliary reservoir equals the pressure in front of the piston-valve, and the exhaust-port e^3 in the valve-chest, which is opened by the ported slide-valve when thrown back, substantially as and for the purpose herein described.

4. In the automatic air-brake herein described, having the auxiliary reservoir, the brake-cylinder, the train-pipe connection, and the valve chest or chamber, with its grooved piston-valve, ported slide-valve, port *e*, and exhaust-port *e'*, a cock for closing and opening the exhaust-port *e'*, a spring for throwing the valves back when the pressure within the auxiliary reservoir equals the pressure in front of the piston-valve, and the supplementary exhaust-port e^3 in the valve-chest, which is opened by the ported slide-valve when thrown back, substantially as herein described.

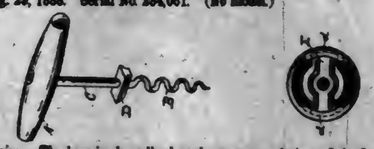
396,285. WEIGHING AND PRICE SCALE. JOHN G. MCNEILL, Ottawa, Kans. Filed May 7, 1888. Serial No. 273,112. (No model.)



Claim.—1. The combination, in a weighing and price scale, with the frame, of a sliding frame thereon having end pieces and a scale-beam fulcrumed upon the sliding frame, the ends of which are limited in the vertical movement by the end pieces of the sliding frame, substantially as set forth.

2. The combination, in a weighing and price scale, of a sliding frame and a scale-beam fulcrumed thereon, the ends of which are semi-cylindrical and provided with cylindrical bores, substantially as set forth.

396,286. CORKSCREW. LEVI S. MCWHORTER, Chicago, Ill. Filed Aug. 23, 1888. Serial No. 284,061. (No model.)



Claim.—The herein-described corkscrew, consisting of the handle A, spiral screw B, shank C, and the cross-bar D upon the shank just above spiral screw B, forming a key adapted to engage the raised portions *b b'* of the cap E when the corkscrew is inserted, all substantially as shown and described.

396,287. FILTER. LEWIS W. MONROE and ISAAC STIERS, Kansas City, Mo. Filed Oct. 2, 1888. Serial No. 286,986. (No model.)

Claim.—1. A filter comprising a casing, intersecting transverse and longitudinal partitions within the single casing, dividing the interior thereof into four compartments, a bucket pivoted in the upper end of one of the compartments formed by the partitions, a valve in the lower end of the next adjacent compartment, and connections between the valve and the bucket, as set forth.

2. A filter comprising a single casing, vertical partitions within the casing arranged at right angles to each other and dividing the

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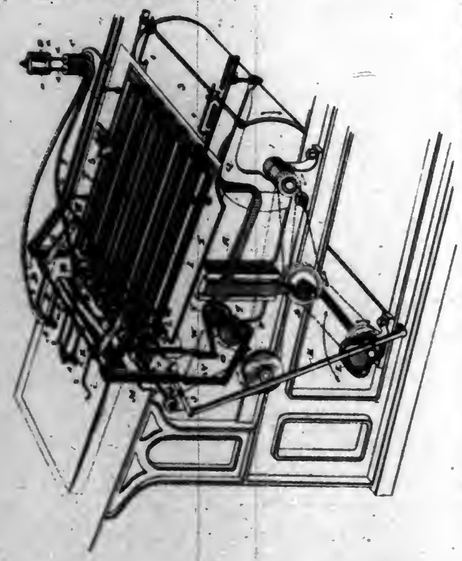
interior of the casing into the compartments H I J K, the water being received in the upper end of the compartment H, and passing thence successively through the compartments I J K back into the lower end of the first compartment, H, the bucket pivoted in the upper end of the compartment H to receive the water, and the valve in the lower end of the adjacent compartment, I, controlled by the bucket to discharge the surplus water, as set forth.

3. A filter having the compartments H I at one end, the compartment H, having an escape-opening, Y, in its bottom, and the compartment I, having a discharge-opening, D, in its bottom, the bucket in the upper end of the compartment H, having an escape-opening, Z, in its bottom, and the valve in the lower end of the compartment I, controlled by said bucket, and adapted to close the discharge-opening D, as set forth.

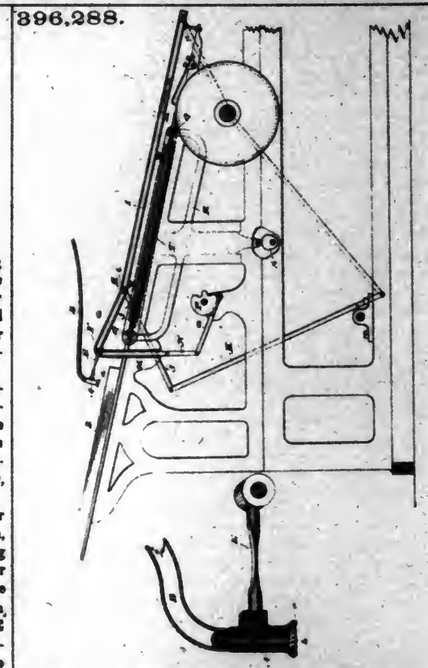
4. A filter comprising the casing, the transverse partition E, near the rear end of the same, having perforations in its lower portion, the imperforate partition G between the partition E and the casing and forming the compartments H I, the supply-opening being over the upper end of the compartment H and the discharge-opening in the lower end of the same, the compartment I, having an opening, D, in its bottom, the longitudinal partition extending from the partition E to the front end of the casing and having a perforated upper portion and forming the compartments J K, the perforated shelves in the said compartments J K, adapted to support filtering material, and the horizontal imperforate partition in the lower end of the compartment H, over the discharge-opening, as set forth.

5. The combination of the casing having the compartments H I near one end, the compartment I, having an opening in its bottom, the valve O, adapted to close said opening, the bucket pivoted in the upper end of the compartment H, the arm M, projecting from the bucket over the upper end of the compartment I, the valve-rod rising from the valve O and having its upper end secured to an intermediate point of the arm M, the transverse rod R, the weighted lever playing through said rod, and the link connecting the end of said lever with the end of the arm M, as specified.

396,288. FEEDING APPARATUS FOR PRINTING-MACHINES. WILLIAM HUBER, Toronto, Ontario, Canada. Filed Dec. 24, 1887. Serial No. 258,886. (No model.)



396,288.



Claim.—1. One or more cups suitably connected to an air-exhauster and driven by mechanism so timed and arranged that the cup or cups shall travel as each sheet of paper is lifted by the suction of the exhaust, and the horizontal spring-arms E, attached to said cups, substantially as and for the purpose specified.

2. In a printing-press, a cup, A, connected by a flexible tube, B, to the air-pump C or other exhauster, and supported by the spring-arms E, connected to the rod F, carried in guideways I, in combination with mechanism by which the rod F is conveyed away from the pile of blanks Z, on which the cups A rest, substantially as and for the purpose specified.

3. In a printing-press, a cup, A, connected by a flexible tube, B, to the air-pump C or other exhauster, and supported by the spring-arms E, attached to the rod F, connected by the arm G to the rod H, the rods F and H being supported in guideways I, and an arm, J, connected to the pivoted lever K, in combination with the cam L, arranged substantially as and for the purpose specified.

4. In a printing-press, a cup, A, connected by a flexible tube, B, to the air-pump C or other exhauster, and supported by a rod carried in suitable guideways and caused to travel from the pile of blanks Z, with the top blank adhering to the cup, in combination with the bracket R, carrying the axles Q, upon which the endless traveling tapes revolve, the said bracket being supported by a cam, S, designed and timed to lower the bracket R so as to deposit the sheet onto the rollers T, substantially as and for the purpose specified.

5. In a printing-press, the rollers T, geared together by the wheels U, connected to the rack V, in combination with the cam Y, connected to and operating the rack V, substantially as and for the purpose specified.

6. In a printing-press, the bar M, fitting into the guideways I, so as to support the rod F, in combination with the cam P, designed to operate the bar M, substantially as and for the purpose specified.

396,289. METALLIC BRUSH. STEPHEN PORTER, Boston, Mass., assignor, by mesne assignments, to the Eagle Manufacturing Company, of Maine. Filed Dec. 31, 1887. Serial No. 258,988. (No model.)

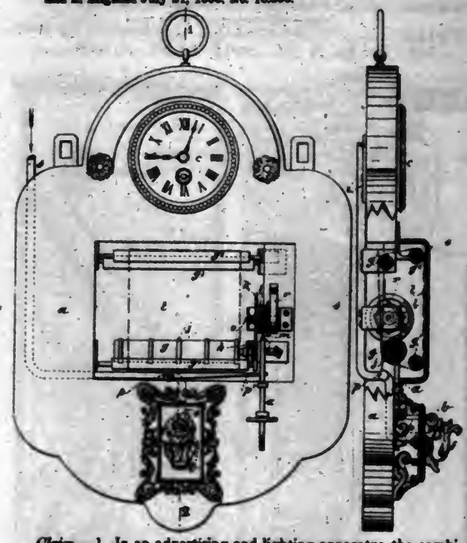


Claim.—1. In metallic brushes, a continuous integral metallic ring struck from a blank and provided with a series of fastening-lips, also integral therewith, arranged around its lower edge or contour, said lips being disposed transversely of said edge, substantially as and for the purposes described.

2. In metallic brushes composed of a back portion and a flexible piece of material studded with a massed series of wires attached thereto, a series of fastening devices inserted in said back, combined with a metallic ring having transversely-disposed fastening-lips adapted to engage the fastenings on the brush, substantially as set forth.

3. In metallic brushes, the combination, with the back 2 and the fastenings 8, a massed series of wires, 4, and the flexible material 3 with its fastenings 5, of the integral continuous metallic ring 6, concavo-convex in cross-section, adapted to rest upon the back 2 and overlap the projecting edge of the material 3, and the series of holding-lips 7, integral with and bent transversely of said ring, all co-operating as herein set forth and described.

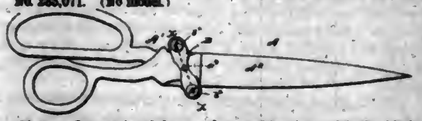
396,290. ADVERTISING DEVICE. VITO M. POSSE, Paris, France. Filed Aug. 17, 1888. Serial No. 283,963. (No model.) Patented in France Mar. 6, 1888, No. 186,185; in Belgium Mar. 3, 1888, No. 80,988, and in England July 21, 1888, No. 10,566.



Claim.—1. In an advertising and lighting apparatus, the combination, with the igniting device and a button or handle for operating the same to produce or increase the flame or spark, of movable advertisements carried by suitable supports, mechanism for moving the same to bring different inscriptions into view, and connections between said handle and mechanism whereby the movement of the handle for lighting purposes is communicated to said mechanism to move the advertisements, substantially as set forth.

2. In an advertising and lighting apparatus, the combination, with a gas-burner and a handle for regulating the supply of gas to the same, of movable advertisements carried by suitable supports, mechanism for moving the same to bring different inscriptions into view, and connections between said handle and mechanism whereby the movement of the handle for lighting purposes is communicated to said mechanism to move the advertisements, substantially as set forth.

396,291. SHEARS. WILLIAM RICHARD, Moorville, Ohio, assignor of one-half to Martin Koller, same place. Filed Aug. 18, 1888. Serial No. 283,071. (No model.)



Claim.—In a pair of shears, the combination, with the blade A', provided with the stationary pivot a^2, and the integral internally-threaded ears a' a', arranged obliquely to each other on opposite edges of said blade A', of the blade A^3, moving on the pivot a^2, the clamp B, resting upon the blade A^3 and having apertured lugs at its ends, and the adjusting-screws b^3-b^3, engaging the apertured lugs of the clamp and the integral ears of the blade A', substantially as specified.

396,292. ROOF. ROBERT C. RANTOUL, Shelburne Falls, Mass. Filed Apr. 14, 1888. Serial No. 270,677. (No model.)



Claim.—1. As an improved article of manufacture, the building material herein described, comprising a flexible water-proof sheet and shingles or strips applied to both faces thereof.

2. A roof, wall, or similar structure comprising a lower layer of shingles overlapping each other substantially in the manner shown, an upper layer of shingles or slate, also overlapping each other, and an interposed water-proof covering.

3. In a roof, wall, or similar structure, the combination, with the two layers of shingles C and E, of the interposed water-proof material, D, projecting below the lower edges of the upper layer of rows of shingles, all substantially as shown.

4. In a roof, wall, or similar structure, the combination of the two layers of shingles and the interposed water-proof sheet, the upper layer of shingles or strips being cemented together along their edges, substantially as shown and described.

396,293. TETRAZO DYE-STUFF. CHRISTIAN RUDOLPH, Offenbach-on-the-Main, Germany, assignor to K. Oehler, same place. Filed Sept. 3, 1888. Serial No. 284,466. (No specimens.)

Claim.—The tetrazo dye-stuff herein described, which is produced from the sulpho-acids of the amido-cresols by their combination with naphthylamine, the diazotation of the compound thus obtained and its combination with naphtholdisulpho-acid, and which is a black-brown powder with a bronze luster having the following properties, viz: forming when dissolved in water a blue-violet solution, which by the addition of ammonia is changed to pure blue, showing a green reaction with concentrated sulphuric acid, and dyeing wool from violet-blue to blue-black, according to its strength, substantially as herein specified.

396,294. YELLOW COLORING-MATTER. CHRISTIAN RUDOLPH and BERNHARD PRIEBS, Offenbach-on-the-Main, Germany, assignors to K. Oehler, same place. Filed June 13, 1888. Serial No. 276,970. (No specimens.)

Claim.—The yellow azo dye-stuff herein described, produced from benzidin or tolidin, cresotinic acid and salicylic acid, and which is a brown-yellow powder easily soluble in hot water and dissolves in sulphuric acid with a violet-red color, substantially as herein set forth.

396,295. TOY. JOHN SEDGFIELD, New Haven, Conn. Filed Apr. 20, 1888. Serial No. 271,372. (No model.)



Claim.—1. In combination, the tubular support A, formed into a whistle, the movable device, as the wind-wheel, and a movable deflector for preventing the sounding of the whistle without cutting off the current of air to the wind-wheel, substantially as described.

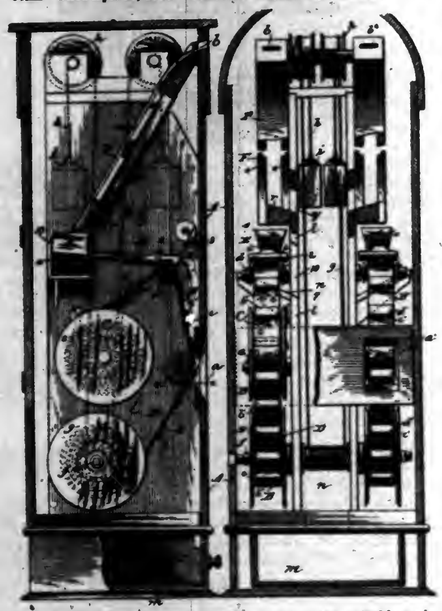
2. In combination, the tubular support A, having a notch formed therein, the beveled block inserted within said tubular support, with its larger end at the notch, the movable device, as the wind-wheel, and the movable deflector for preventing the sounding of the whistle without cutting off the current of air to the wind-wheel, substantially as described.

3. In combination, the tubular piece A, having the whistle formed therein, movable device supported thereby, and the deflector pivoted to the piece A, for preventing the sounding of the whistle without cutting off the current of air to the wind-wheel, substantially as described.

4. In combination, the tube having the opening 3 formed therethrough, a whistle-block arranged with its edge extending across said opening, and thus providing a blast-opening, *a*, for the escape of the air, and an opening, *b*, of the sounding-chamber, and a freely-movable

deflector to be operated by hand and to lie between the air-blast opening *a* and the opening *b*, substantially as described.

396,296. VENDING APPARATUS. JOHN SCHOFIELD, New Haven, Conn. Filed Apr. 30, 1888. Serial No. 272,313. (No model.)



Claim.—1. In an automatic vending apparatus, a suitable casing provided with an opening for the delivery of the articles, a flexible carrier having pockets for holding the articles, supporting-reels for said carrier, a weight, a locking-lever, a coin-slide, and a bearing for the flexible carrier at the delivery-opening and approximately in line with the wall of the casing, whereby the carrier with the articles is directed to the opening and such articles rendered accessible to the hand of the purchaser, substantially as described.

2. In combination, a suitable casing with a delivery-opening, the flexible carrier having pockets for holding the articles, the reels C D, having the ends of the carrier thereon and adapted to wind and unwind the carrier, the weight, and the locking-lever, substantially as described.

3. In an automatic vending-machine, a flexible carrier supported therefor, a weight, said carrier having pockets to receive the articles to be sold, stops on said carrier, a locking-lever adapted to check the movement of said carrier by engagement with said stops, and a coin-slide arranged with its lower end above said lever, whereby the lever is operated by the dropping in of a coin to release the carrier and to allow it to move, substantially as described.

4. In combination, the flexible carrier for the articles, the reel C, carrying one end of the carrier and adapted to receive and hold the carrier when wound upon it, suitable bearings adapted to support and direct said carrier to an opening in the wall of the case, a second reel carrying the other end of the carrier and for receiving the carrier as it is moved from the first reel, a weight in connection with the reels for moving them, and a locking-lever, substantially as described.

5. In an automatic vending-machine, a flexible carrier provided with pockets and having stops or projections on its surface, a spool or reel, C, from which the carrier is unwound, a supporting-spool, *d*, a pivoted lever, E, having a hooked end in line with the studs on said carrier, a coin-slide in line with the end of said lever for operating the same to release the carrier, and a bearing approximately in line with the opening in the wall of the case, and a receiving spool or reel, *d*, with a weight, substantially as described.

6. In an automatic vending-machine, a carrier provided with pockets, supports for the same, a weight, a locking-lever, E, having a hooked end engaging with projections on said carrier, a coin-slide, the said lever E having a box, 4, with an inclined bottom arranged beneath the coin-slide adapted to receive the coin and to deflect it to the cash-box, substantially as described.

7. In an automatic vending-machine, the vertical partition, a coin-slide arranged on one side thereof having an open bottom with a passage formed between the same and an inclined plate, *p*, and the cash-box located on the opposite side of the partition, said partition having an opening for directing small coins to the cash-box, substantially as described.

8. In a vending-machine, a coin-slide having an open bottom with a passage beneath the same and an inclined plate, *p*, for directing the smaller coins into the cash-box, substantially as described.

9. In an automatic vending-machine, a flexible carrier having pockets, a number of studs, *d' d'*, arranged on the carrier between the pockets, a locking-lever, E, and a coin-slide in line with said lever, substantially as described.

10. An apparatus comprising a suitable inclosing-case, the two partitions forming an intermediate chamber, *n*, the cash-box in communication with the said chamber, the flexible carriers B B', their reels, locking-levers, and coin-slides upon the outer sides of said partitions, said partitions being provided with openings to the chamber *n*, and the deflectors to direct the coin from both sides to the chamber *n*, substantially as described.

11. In combination, the flexible carrier having pockets for holding the articles, the supports for said carrier, the weight for moving the carrier, a locking-lever, stop-pins to be engaged by said lever positioned at a distance apart to allow the carrier movement equal to the space between the pockets, intermediate stop-pins between those first mentioned, and a coin-slide, substantially as described.

396,297. VENDING APPARATUS. JOHN SCHOFIELD, New Haven, Conn. Filed Apr. 30, 1888. Serial No. 272,314. (No model.)



Claim.—1. In combination, in an automatic vending apparatus, a reservoir for storing the articles, a rotary carrier-wheel arranged directly below the reservoir and provided with recesses entirely around its periphery to receive the articles from the mouth of the reservoir, and a weight for giving the carrier-wheel forward movement to bring said recesses successively and separately into line with mouth of the reservoir upon the introduction of coins, substantially as described.

2. In combination, in an automatic vending apparatus, a reservoir for storing the articles, said reservoir being circuitous in form, a rotary carrier-wheel, C, arranged directly below the reservoir, provided with recesses entirely around its periphery to receive the articles from the mouth of the reservoir, and having a step-by-step movement to bring said recesses successively into position beneath the reservoir and a toothed wheel, D, the pivoted lever 3, the coin-slide, and a weight tending constantly to move the carrier, substantially as described.

3. In combination, a vertically-arranged reservoir for holding the articles, having a single continuous circuitous passage, with walls on each side of said passage situated at a distance apart, to confine the articles and direct them one after the other in proper order, and a carrier having recesses adapted in size to one of the articles, arranged directly below the mouth of the single passage, said carrier having a step-by-step movement to bring the recesses separately and successively in line with the mouth of the single passage, substantially as described.

4. In a vending-machine, a reservoir formed of two parts, one of said parts being adjustably supported to adapt the reservoir to different-sized articles, substantially as described.

5. In an automatic vending apparatus, a reservoir, a carrier beneath the same, a toothed wheel in connection with the carrier, a weight, a pivoted lever having a single catch to engage directly with the toothed wheel, a spring for pressing said catch into engagement, and a coin-slide in line with the rear end of the pivoted lever, substantially as described.

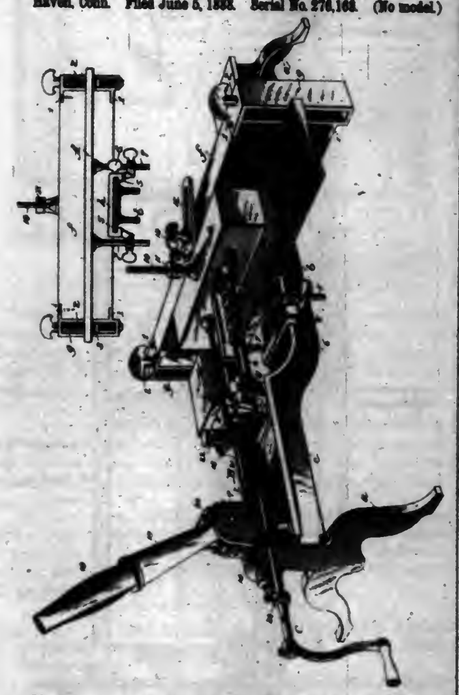
6. In an automatic vending-machine, a coin-slide having a channel adapted in size to a certain-sized coin, provided with a deflector, as 13, extending across and above the channel, whereby coins too large for the channel will be detected above the same, substantially as described.

7. In an automatic vending-machine, a coin-slide formed of two parts, one of which is adjustable toward and from the other, whereby the machine may be adapted for use with different sizes of coins, substantially as described.

8. In an automatic vending apparatus, a reservoir, a carrier, a weight, a toothed wheel having adjustable teeth, and a pivoted lever having a rear extension extending beneath the coin-slide, substantially as described.

9. A vending apparatus comprising the reservoir, the carrier arranged directly beneath the same and provided with recesses for receiving the articles, a pocket to one side in the wall of the casing, an incline between said pocket and the carrier, and a spring arranged between the reservoir and the incline for applying pressure to the articles, substantially as described.

396,298. WOOD-WORKING MACHINE. JOHN SCHOFIELD, New Haven, Conn. Filed June 5, 1888. Serial No. 276,163. (No model.)



Claim.—1. In combination, the supporting-frame, the work-supporting table consisting of the cross-piece *f*, the brackets supporting a piece, A, the screws for adjusting the brackets vertically, and pins supported by the frame and arranged to bear upon the under side of the piece A, said pins also being vertically adjustable, whereby the table may be raised or lowered and supported in any position by the brackets and pins, substantially as described.

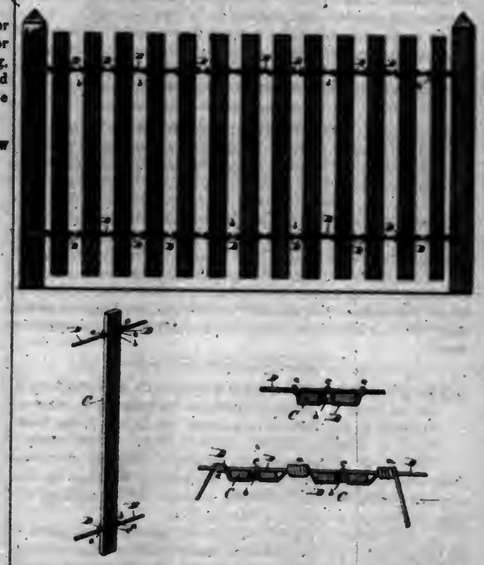
2. In combination, a tool-holder, a supporting-frame cast in one piece and in elongated form, the said tool-holder being arranged longitudinally of the frame, the said frame being adapted in width to the tool-holder and having the raised portion *c*, for supporting the tool-holder, and a lower portion, *b*, and a piece, *f*, and table extending at right angles to the elongated frame and across the lower portion, substantially as described.

3. In combination, the cross-piece *f*, supported on the frame and having the screw-rods at its ends extending vertically and having bearings at the top and bottom of the piece *f*, the piece A, the brackets secured to the said piece and extending rearwardly therefrom, and having screw-threaded nuts in engagement with the screw-rods at points intermediate of the bearings, the said parts—viz., the screw-rods and brackets—constituting the supporting means for the piece A, and also the adjusting means for the same, substantially as described.

4. In a wood-working machine, a reciprocating tool-holder, an adjustable table, A, and a supplemental work-support having an angular bearing-face and a notch for the end of the work, substantially as described.

5. In combination, the table A, supported adjustably on the cross-piece *f*, said cross-piece being adjustable longitudinally, an adjustable bracket supporting adjustable pins for the under part of the table, an adjustable arm and pin for preventing vertical displacement of the work, and horizontally-adjustable pins for preventing forward displacement, substantially as described.

396,299. FENCE. JOSEPH M. SHERIFF, Mercer, Pa. Filed Oct. 19, 1888. Serial No. 288,555. (No model.)



Claim.—The combination, with a fence rail and picket, the latter being bored or punctured horizontally, as at *b*, of a wire fastener, D, secured to the fence-rail at its ends and provided with a loop, *c*, said loop passing through the hole in the picket and embracing the fence-rail, substantially as described.

396,300. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Sept. 25, 1885. Serial No. 178,206. (No specimens.)

Claim.—1. A composition for forming a refractory crystalline compound, consisting of magnesia oxide or carbonate, caustic strontia, calcium fluoride, feldspar, and glycerine, hydrocarbon oil, or their equivalent.

2. A refractory crystalline compound composed of magnesia oxide or carbonate, caustic strontia, calcium fluoride, and feldspar, said compound being white or opalescent, rough on the surface, and practically infusible.

396,301. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Sept. 25, 1885. Serial No. 178,207. (No specimens.)

Claim.—1. A composition for forming a refractory crystalline compound, consisting of magnesia oxide or carbonate, caustic strontia or carbonate, alumina oxide or carbonate, calcium fluoride, (fluor-spar,) feldspar, and hydrocarbon oil, glycerine, or their equivalents.

2. A refractory crystalline compound composed of magnesia oxide or carbonate, caustic strontia or carbonate, alumina oxide or carbonate, calcium fluoride, (fluor-spar,) and feldspar, said compound being white or opalescent, rough on the surface, and practically infusible

396,302. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Sept. 26, 1885. Serial No. 178,308. (No specimens.)

Claim.—1. A composition for forming a refractory crystalline compound, consisting of calcium oxide or carbonate, magnesia oxide or carbonate, caustic strontia or carbonate, alumina oxide or carbonate, calcium fluoride, (fluor-spar,) feldspar, and hydrocarbon oil, or its equivalent.

2. A refractory crystalline compound composed of calcium oxide or carbonate, magnesia oxide or carbonate, caustic strontia or carbonate, calcium fluoride, (fluor-spar,) and feldspar, said compound being white or opalescent, rough on the surface, and practically infusible.

396,303. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Oct. 31, 1885. Serial No. 181,473. (No specimens.)

Claim.—1. A composition for forming a refractory crystalline compound, consisting of calcium oxide or carbonate, magnesia oxide or carbonate, strontia oxide or carbonate, alumina oxide or carbonate, cryolite, and glycerine, hydrocarbon oil, or their equivalent.

2. A refractory crystalline compound composed of calcium oxide or carbonate, magnesia oxide or carbonate, strontia oxide or carbonate, alumina oxide or carbonate, and cryolite, said compound being white or opalescent, rough on the surface, and practically infusible.

396,304. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Oct. 31, 1885. Serial No. 181,474. (No specimens.)

Claim.—1. A composition for forming a refractory crystalline compound, consisting of calcium oxide or carbonate, magnesia oxide or carbonate, strontia oxide, strontia carbonate, feldspar, aluminite or ammonia alum, and a suitable fluid to make the composition plastic.

2. A refractory crystalline compound composed of calcium oxide or carbonate, magnesia oxide or carbonate, strontia oxide, strontia carbonate and feldspar, and aluminite or ammonia alum, said compound being white or opalescent, rough on the surface, and practically infusible.

396,305. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Nov. 12, 1885. Serial No. 182,611. (No specimens.)

Claim.—1. A composition for forming a refractory crystalline compound, consisting of arragonite or the caustic lime from arragonite, magnesia oxide, celestine or strontia sulphate, barium sulphate, calcium fluoride, and a suitable moistening-fluid.

2. A refractory crystalline compound composed of arragonite or the caustic lime from arragonite, magnesia oxide, celestine or strontia sulphate, barium sulphate, and calcium fluoride, said compound being white or opalescent, rough on the surface, and practically infusible.

396,306. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Nov. 12, 1885. Serial No. 182,612. (No specimens.)

Claim.—1. A composition for forming a refractory compound, consisting of celestine or strontia sulphate, magnesia carbonate, silica or silicic acid, carbonates of soda and potassa, and a suitable moistening-fluid.

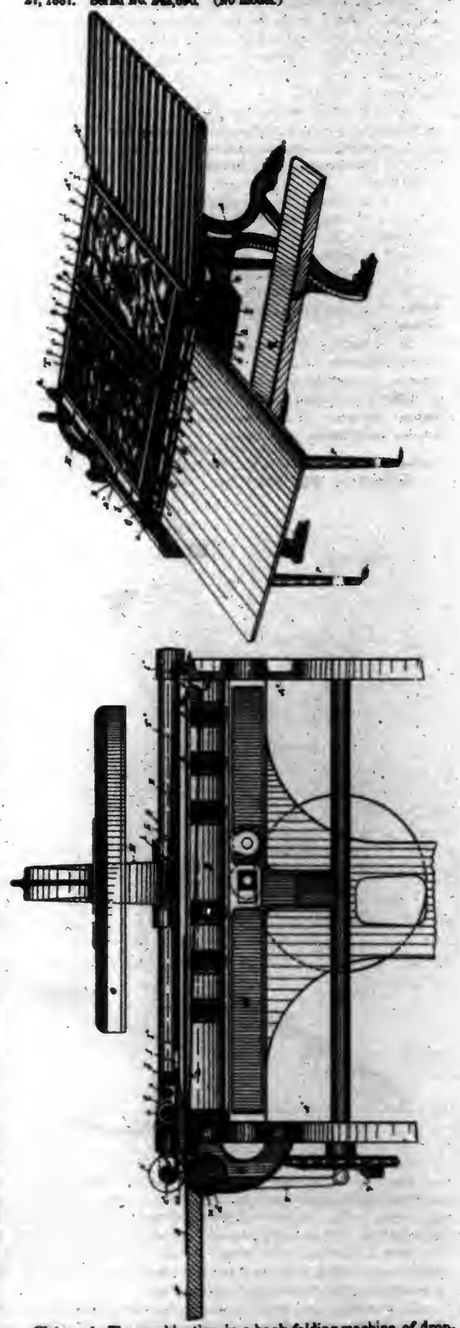
2. A refractory crystalline compound composed of celestine or strontia sulphate, magnesia carbonate, silica or silicic acid, and carbonates of soda and potassa, said compound being white or opalescent, rough on the surface, and practically infusible.

396,307. PLASTIC MINERAL COMPOSITION, &c. JOHN L. STEWART and JAMES L. HASTINGS, Philadelphia, Pa., assignors, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Dec. 26, 1885. Serial No. 187,000. (No specimens.)

Claim.—1. A composition for forming a refractory compound consisting of magnesia oxide or carbonate, strontia oxide, strontia carbonate, strontia sulphate, calcium oxide or carbonate, glucinium oxide or carbonate with or without zirconium oxide, fluor-spar as a flux, and a suitable moistening-fluid.

2. A refractory crystalline compound composed of magnesia oxide or carbonate, strontia oxide, strontia carbonate, strontia sulphate, calcium oxide or carbonate, glucinium oxide or carbonate with or without zirconium oxide, and fluor-spar as a flux, said compound being white or opalescent, rough on the surface, and practically infusible.

396,308. COMBINED POINT-FEED AND DROP-ROLL-FEED BOOK-FOLDING MACHINE. JOHN H. STONEBRAKER, Millbury, Mass., assignor to the Stonemetz Printer's Machinery Company, same place. Filed June 27, 1887. Serial No. 242,690. (No model.)

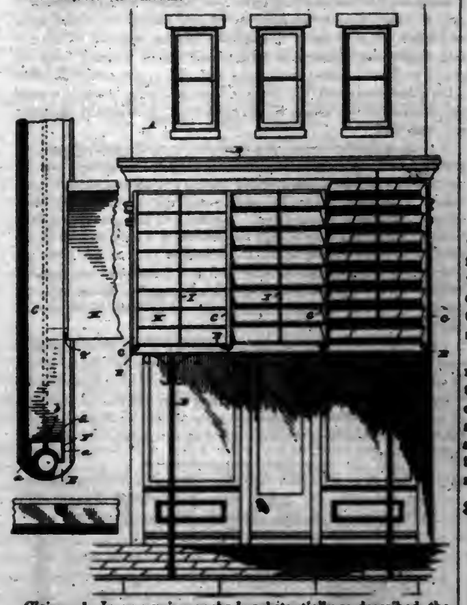


Claim.—1. The combination, in a book-folding machine, of drop-roll-feed and carrier-tape mechanism with point-feed mechanism in the tables thereof, by means whereof two sheets fed from different feed-tables at the same time can be folded together, substantially as set forth.

2. The combination, in a book-folding machine, of drop-roll-feed and carrier-tape mechanism for feeding and conveying sheets from a feed-table at one side of the machine to the first folding-rolls, with removable tables on said machine, having point-feed mechanism thereon arranged to feed from a feed-table at the end of the machine, whereby said machine is adapted to operate either as a drop-roll-feed machine or as a point-feed machine, as desired, substantially as set forth.

3. The combination, in a book-folding machine, of the feed-table N, the drop-roll-feed mechanism *d d' d' y y'*, the guides v^2 v^3, and the feed-roll *d*, and the carrier-tapes *n*, and sheet-stop *s*, with the feed-table M, the machine-tables T T', having points *l* therein, the folding-blade *e*, and the folding-rolls B B, substantially as and for the purpose set forth.

396,309. AWNING. FRANK TRIPP, Louisville, Ky. Filed Feb. 18, 1887. Renewed Jan. 23, 1888. Again renewed Dec. 22, 1888. Serial No. 293,863. (No model.)



Claim.—1. In an awning or shade substantially as described, the combination, with forwardly-extending supports having seats for slats, of overlapping slats pivotally seated therein, and a trough arranged beneath the said supports and the transverse edges of the slats and adapted to receive the drip-water and conduct the same away from a building, substantially as specified.

2. In an awning, the combination of the forwardly-extending metallic boxes having their lateral vertical walls provided with notched seats, the slats having their journals bearing in said seats, the central longitudinal division-wall therein, and the removable cap, substantially as specified.

3. In an awning, the combination, with the forwardly-extending pipes, of the metallic boxes having their bottoms circularly recessed to receive the said pipes longitudinally therein and their lateral walls notched, and the slats bearing in said notches, substantially as and for the purposes specified.

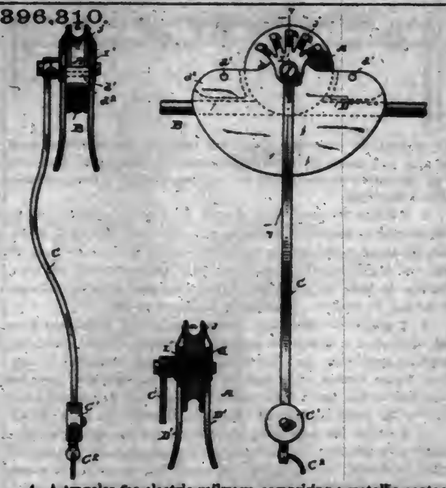
396,310. TRAVELER FOR ELECTRIC RAILWAYS. CHARLES J. VAN DEPOELE, Chicago, Ill. Filed June 6, 1888. Serial No. 276,267. (No model.)

Claim.—1. A traveler for electric railways, comprising a metallic contact wheel or wheels arranged to travel upon the conductor, a metallic frame inclosing the wheel or wheels, and contact devices electrically connecting the exterior of the wheel or wheels and the frame, substantially as described.

2. A traveler for electric-railway conductors, comprising a contact wheel or wheels adapted to move upon the conductor, a metallic frame inclosing the contact-wheels, contact devices electrically connecting the exterior of said contact-wheels and the said frame, and a downwardly-extending electrical connection, substantially as described.

3. A traveler for electric-railway conductors, comprising metallic contact wheel or wheels moving upon the conductor, and a downwardly-depending pendulum in electrical connection with the exterior of said contact-wheel, and provided with a weight at its lower extremity for retaining the contact devices in substantially perpendicular position, substantially as described.

396,310.



4. A traveler for electric railways, comprising a metallic contact wheel or wheels arranged to move upon the conductor, a metallic frame inclosing the contact wheel or wheels and extending downwardly below the periphery thereof on each side, contact devices electrically connecting the wheels and frame, and a downwardly-extending arm or pendulum provided with an adjustable weight at or near its lower extremity, substantially as described.

5. A traveler for electric-railway conductors, comprising one or more contact-wheels, an inclosing-frame extending downwardly below the contact wheel or wheels, and a metallic arm or pendulum pivotally connected to and extending downwardly from the contact device, and adapted to maintain the same in a substantially perpendicular position and to swing forward or backward without affecting the relation between the contact wheel or wheels and the conductor, substantially as described.

396,311. HOOKED SUSPENDER FOR ELECTRIC-RAILWAY CONDUCTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Nov. 7, 1888. Serial No. 290,176. (No model.)



Claim.—1. A suspending device for electric conductors, consisting of a metallic hook having a downwardly-extended part adapted for attachment to a conductor to be supported and a laterally-extending supporting wire or cable connected to the hook, substantially as described.

2. The combination, with a suitable conductor, of a suspending device therefor, comprising a metallic hook provided with a downwardly-extending part adapted to engage and be attached to the conductor to be supported, and an arched portion extending laterally therefrom and downward into the plane of its support, and a laterally-extending supporting wire or cable connected to the hook, substantially as described.

3. In combination with a suitable conductor and a supporting-ear attached thereto, a suspender device therefor, consisting of a metallic hook having a downwardly-extending part adapted for attachment to said ear, substantially as described.

4. In combination with a suitable conductor and a supporting-ear attached thereto, a suspending device therefor, consisting of a metallic hook having a downwardly-extending part detachably secured to said ear, substantially as described.

5. In combination with a suitable conductor and a supporting ear or ears attached thereto, a suspending device therefor, consisting of a metallic hook having a downwardly and laterally extending part connected to said ear or ears, substantially as described.

396,312. SUSPENSION DEVICE FOR ELECTRIC-RAILWAY CONDUCTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Nov. 7, 1888. Serial No. 290,177. (No model.)

Claim.—1. A device for suspending electric conductors, consisting of an arch secured to a transverse support or supports, and an ear or bail connected to the conductor to be suspended and adjustably secured to the arch, substantially as described.

2. A device for suspending electric conductors, consisting of an

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arch secured to transverse supports, and an ear or bail depending from said arch and connected to the conductor to be suspended, said arch being adjustably secured to the ear and insulated therefrom, substantially as described.

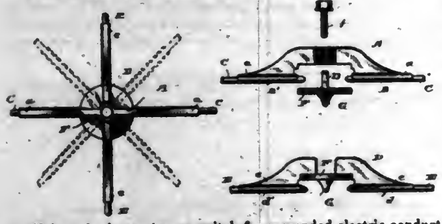
3. A device for suspending electric conductors, consisting of an arch secured to transverse supports, an ear or bail depending therefrom, the upper end of said ear forming a bearing upon which the arch rests, and a bolt secured to said ear and passing through the arch, whereby the same may be adjusted, and insulating material between the ear and its support, substantially as described.

4. A device for suspending electric conductors, consisting of an arch secured to a transverse support or supports, an ear depending therefrom supporting the electric conductor, said ear having a horizontal flange formed at or near its upper part upon which the arch is adapted to rest, and a bolt passing through said flange and arch, whereby the same is rendered adjustable, substantially as described.

5. A device for suspending electric conductors, consisting of a metallic arch spanning the conductors to be supported, an ear attached to said conductor, insulating material secured to the arch, and means securing the conductor-supporting ears to the said insulating material, substantially as described.

6. A device for supporting electric conductors, consisting of an arch supported so as to present its opening below, an ear secured to the conductor to be carried, means for connecting the ear and arch, and an insulating medium interposed between the ear and the arch to prevent the passage of the main current to the supporting devices, substantially as described.

396,313. ADJUSTABLE CROSSING AND SWITCH FOR OVERHEAD CONDUCTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Nov. 14, 1888. Serial No. 290,832. (No model.)



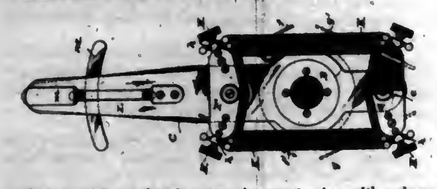
Claim.—1. A crossing or switch for suspended electric conductors, comprising two or more adjustably-connected members adapted for attachment to the respective conductors, substantially as described.

2. A crossing or switch for suspended electric conductors, comprising two or more adjustably-connected members and electric conductors secured to the said members, substantially as described.

3. A crossing or switch for electric conductors, comprising a contact or surface, members connected in adjustable relation thereto and extending from the surface, and ribs or extensions upon the members to which the conductors are attached, substantially as described.

4. An adjustable switch for electric conductors, comprising two or more adjustably-connected members, each adapted to receive and be attached to a terminal of the conductor, and each provided with a depending rib to guide the contact-wheel, and a pivot uniting the members, substantially as described.

396,314. COMMUTATOR-BRUSH CARRIER FOR ELECTRIC MOTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Feb. 8, 1887. Renewed Nov. 24, 1888. Serial No. 291,801. (No model.)



Claim.—1. In an electric motor, the combination, with a circumferentially-movable lever, insulated commutator-brush-carrying frames pivotally mounted with respect to said lever, insulated connections extending between the pivoted frames for moving both simultaneously, and a double set of commutator-brushes secured in said frames and adapted to be interchangeably brought into operative relation with the commutator-cylinder by the movement of either one of said frames, and to be moved about the commutator, as desired, by the movement of the hand-lever, substantially as described.

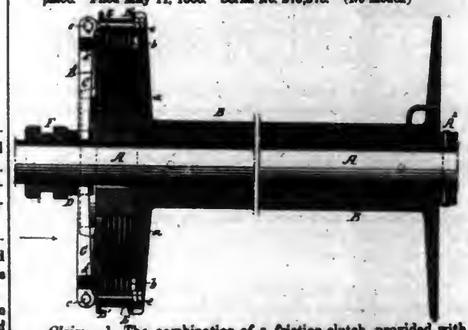
2. In an electric motor, the combination, with a circumferentially-movable lever, insulated commutator-brush-carrying frames pivotally mounted with respect to said lever, insulated connections extending between the pivoted frames for moving both simultaneously, a double set of commutator-brushes secured in said frames, and an adjusting-lever connected to one of said frames and arranged to be adjustably secured with respect to the pivoted lever, whereby said brushes may be interchanged upon any desired portion of the commutator-cylinder, substantially as described.

3. In an electric motor, the combination, with a fixed support, of a commutator-brush-carrying hand-lever radially movable thereon, a pair of commutator-brush-carrying frames pivotally mounted upon said lever, a double set of commutator-brushes secured to each of said frames, and connections between said frames, whereby when one set of brushes is placed in contact with the commutator the other set is lifted therefrom, the brushes when set being movable around the commutator by means of the hand-lever, substantially as shown and described.

4. In an electric motor, the combination of the hand-lever C, radially movable upon the bearing B and around the armature-shaft, the pivoted commutator-brush-carrying frames F G, secured to said lever, links K, extending between the said pivoted frames, an auxiliary hand-lever, L, extending upward from the frame G and provided with a latch-spring arranged to engage the notches of a rack carried by the bar C, whereby when the handle L is moved to right or left of the bar C the brush-carrying frames will be rocked and the set of commutator-brushes controlling the desired direction of rotation be brought into operative position upon the commutator, substantially as shown and described.

5. In an electric motor, the combination of the lever C, pivoted upon one of the main bearings thereon and provided with the rack M, of the pivoted frames F G, secured to the lever C on opposite sides of said support, binding-posts I, extending from said frames, and links K, extending between the opposite sides of the binding-posts, and thereby mechanically connecting said frames, substantially as shown and described.

396,315. FRICTION-CLUTCH. THOMAS A. WESTON, Stamford, Conn., assignor to The Yale & Towne Manufacturing Company, same place. Filed May 11, 1888. Serial No. 273,570. (No model.)



Claim.—1. The combination of a friction-clutch, provided with disk-formed friction-faces, with two or more pressing-levers, each fulcrumed at the pulley-rim, and thence extending toward the pulley-axis, and a sliding collar embracing the free ends of all of said levers, substantially as set forth.

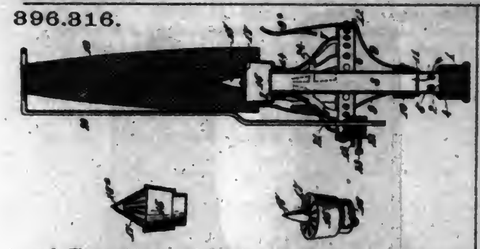
2. The combination, in a friction-clutch, of the pulley or drum, the friction-disks, the presser-plate, a series of radiating levers fulcrumed at their outer ends to the pulley or drum, and each having a projection adapted to bear against the presser-plate, and a central sliding collar adapted to act upon the converging ends of the levers, substantially as set forth.

3. The combination, in a disk friction-clutch, of the series of radiating levers, the central sliding collar acting upon the converging ends of the said levers, and a pulley or drum carrying adjustable fulcrums for the levers, substantially as set forth.

396,316. INCANDESCENT GAS-BURNER. FREDERICK DE L. WILLIAMS, London, England, assignor to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Mar. 31, 1888. Serial No. 269,173. (No model.)

Claim.—1. The combination, with a gas-burner, of a chimney-gallery having converging ribs 7, connected by a horizontal rib, 24, substantially as described.

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2. The combination of a gas-burner, a mantle or hood for incandescent illumination, a chimney-gallery supported on the upper end of the burner-tube, and a cap supported on the gallery above said burner-tube and provided at its top with a conical grating, substantially as described.

396,317. VEHICLE-SPRING. JOHN A. WITNER, Wabarun, Ind. Filed Nov. 5, 1888. Serial No. 290,313. (No model.)

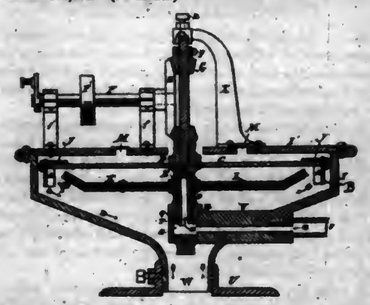


Claim.—1. In combination with a side-bar vehicle, the springs D, coiled centrally and provided with forwardly-projecting arms which are attached to the under side of the body and to the side bars, so that the arms will extend in the line of draft, substantially as shown, and for the purpose set forth.

2. The combination, in a side-bar vehicle, of the springs D, having a curved upper arm, *d*, coils *c*, and a straight lower arm, *d'*, with a horizontally-bent end, *f*, said arms diverging from the coils, substantially as shown.

3. The combination, in a side-bar vehicle, of the coiled springs D D D D, having forwardly-projecting and laterally-diverging arms attached to the under side of the vehicle-body and to the under side of the side bars, the coils of said springs being located rear of the points of attachment to the body and side bars, substantially as shown, and for the purpose set forth.

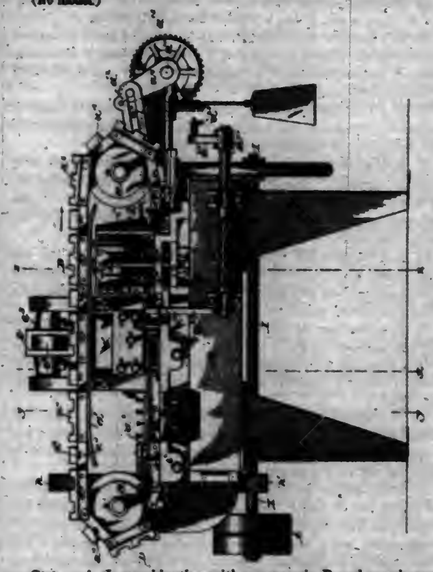
396,318. WATER-MOTOR. HARVEY R. WOLFE, Louisville, Ky., assignor of one-half to John R. Bascom, same place. Filed June 13, 1888. Serial No. 277,001. (No model.)



Claim.—1. In a water-motor having two concentric wheels, the combination, with the frame I, having the top I', of the bracket X, the set-screw *x*, the vertical shaft N, the boss O on the wing V, the bevel-pinion G, and the set-screw *g*, substantially as set forth, and for the purpose specified.

2. In a water-motor, the combination, with the case I, having a removable top, I', provided with holes M, and a wing, V, provided with a boss, O, of an inlet-opening, *v*, through the wing V, a recess or bore, S, in the wing under the boss O, a screw-plug, T, a vertical shaft, N, hollow in its lower part, a piston-head, P, a turbine wheel having its conduit-arms provided with stop-cocks L and inclined upward at their extremities, a modified overshot wheel having floats A and shrouding J, a bevel-pinion, D, a bevel-wheel, H, and a bevel-pinion, G, having a set-screw, *g*, substantially as set forth, and for the purpose specified.

396,319. MACHINE FOR BENDING HINGE-BLANKS. MCCLINTOCK YOUNG, Frederick, Md. Filed Nov. 15, 1888. Serial No. 290,942. (No model.)



Claim.—1. In combination with a reservoir, B, and a reciprocating feed-slide at its base, the upwardly-yielding detent c^6, overlying the slide at the delivery side of the reservoir, whereby the outgoing blank is prevented from carrying those above.

2. In a machine for bending hinge-blanks, the reservoir comprising the wall c^{11}, the laterally-adjustable walls c^{10}, and the adjustable uprights c^{10}.

3. In a machine for bending hinge-blanks, the reservoir, a reciprocating feed-slide at its base, an actuating-slide, *c*, the arm c^3, connected to the slide *c*, a cam, c^2, to move the feed-slide rearward, and a spring, c^4, to move the slide forward.

4. In a machine for bending hinge-blanks, the reservoir having two chambers and laterally-adjustable walls, in combination with a slide, *c*, the mechanism for reciprocating said slide a constant distance, and the feed-slides C, connected to the slide *c*, and adjustable both longitudinally and laterally thereon, whereby the mechanism is adapted to receive and deliver blanks of different shapes and sizes.

5. In a machine for bending hinge-blanks, as a means of carrying the blanks, a bed or table in combination with an endless chain traveling thereover and provided in its edge with recesses to receive the blanks.

6. In combination with the endless chain having notches or recesses to receive the blanks, the reservoir, and a feed-slide moving at right angles to the chain, whereby the blanks are transferred from the reservoir to the chain.

7. In combination with the reservoir, a reciprocating feed-slide, an endless notched chain lying at right angles to the path of the feed-slide, and an operating mechanism, substantially as described, for advancing the slide and the chain alternately.

8. In a machine for bending hinge-blanks, the carrier-chain provided with reversible plates d^4, notched in their two edges, whereby the chain may be adapted to carry blanks of different forms.

9. In combination with the carrier-chain, the transverse locking-bolt d^{17}, adapted to engage said chain.

10. The notched endless carrier-chain and the locking-bolt d^{17}, in combination with operating devices adjusted to advance the bolt and the chain alternately.

11. The endless carrier-chain, in combination with the slide d^9, the chain-actuating dog attached thereto, the weighted cord to advance the slide and dog, the slotted pitman d^{10}, and the crank d^{16}, whereby the chain is advanced with an intermitting movement.

12. In combination with the notched carrier-chain and the reciprocating pawl for advancing the same, the chain-locking bolt d^{17}, the spring to advance the same, the cam d^{16}, and the intermediate connections for retracting the bolt, whereby the chain is advanced intermittingly and locked during its periods of rest.

13. The combination, in a machine for bending hinge-blanks, of a bed or support for the blank, a clamp to confine the blank thereon, with its edge exposed, and a concave die, *f*, arranged to act upon the

exposed edge of the blank, whereby the blank is given a primary curvature.

14. The combination, with an anvil or support, c^3, of a clamping-slide, c', a concave die, f, and a pivoted die-carrying lever, f'.

15. In a machine for bending hinge-blanks, the anvil or support for the blank, the slide c, provided with a clamping-face, c', its actuating-lever c^6, the concave die f, its supporting-lever f', and the shaft H, provided with the cams c^4 and f^4.

16. In a machine for bending hinge-blanks, the combination of a fixed anvil or support, and a movable die, g, having a concave surface to act upon the exposed edge of the blank.

17. In a machine for bending hinge-blanks, the combination of an anvil or support, c^3, adapted to sustain a blank with its edge exposed beyond the anvil, the die g, having the concave face to act upon the exposed edge of the blank, the die-supporting slide g', and the eccentric and pitman for moving said slide.

18. In a machine for bending hinge-blanks, the anvil c^3, to sustain the blank, the concave die g, its supporting-slide g', the eccentric g^5, the pitman g^6, and adjustable connections, substantially as shown, between the pitman and slide.

19. In a machine for bending hinge-blanks, the combination of an anvil to support the flat blank, and a bending-die, g, having a concave face arranged to reciprocate in a line parallel with the faces of the blank, whereby the die is adapted to act directly against the edge of the blank.

20. In a machine for bending hinge-blanks, the combination, substantially as described, of a bed or table, an endless carrier-chain, and two bending mechanisms arranged adjacent to the chain in position to act successively on the blanks carried thereby.

21. In a machine for bending hinge-blanks, the combination of a reservoir for the blanks, a feed-mechanism to deliver the blanks successively therefrom, a primary bending mechanism, a secondary bending mechanism, and a carrier-chain extended past the reservoir, and the two bending mechanisms, whereby the blanks are delivered from the reservoir to the chain and presented by the latter to the action of the two bending mechanisms successively.

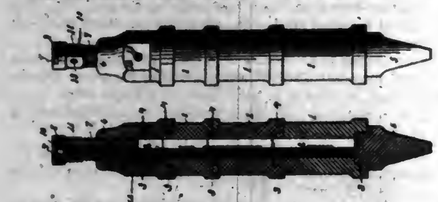
396,320. SASH-FASTENER. GEORGE H. AYLWORTH, Brighton, Ill. Filed July 30, 1888. Serial No. 280,551. (No model.)



Claim.—1. In a sash-lock, the combination of a case having in its bottom a curved guide slot or groove, and a curved bolt having at its inner end a pin which projects into said guide-slot and governs the movement of the inner end of the bolt when the latter is projected.

2. In a sash-lock, the combination, with the case having in its bottom a curved guide slot or groove, a^3, of a curved bolt, B, having at its inner end a pin which projects into said guide-slot, and a spring, C, for projecting the bolt, substantially as shown and described.

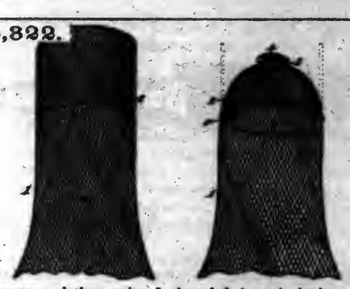
396,321. SECTIONAL JACK. JOSEPH H. BAIRD, Oakville, Conn. Filed June 2, 1888. Serial No. 275,882. (No model.)



Claim.—As a new manufacture, a lifting-jack comprising interchangeable sections of varying lengths, each section having a socket and hub, as shown, and a top section adapted to engage any section of the series and provided with a lifting-screw of ordinary construction.

396,322. GAS-INCANDESCENT. HAROLD J. BELL, Gloucester City, assignor to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed July 2, 1888. Serial No. 278,736. (No model.)

Claim.—The combination, with a mantle or tubular incandescent device having a turned-in or re-enforced upper portion, of a platinum gathering-wire, 3, threaded through the upper part of the re-



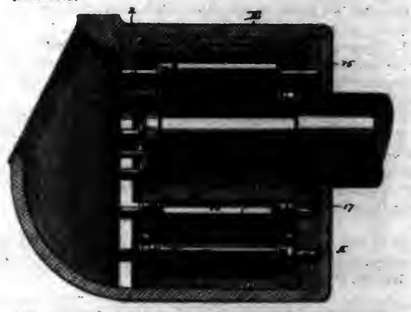
enforcement, a platinum wire, 5, threaded through the lower part of said re-enforcement in a circular direction, a number of doubled and diverging platinum suspending-wires, 6, attached at equidistant points to and around the circularly-arranged wire 5, and a circular support for said suspending-wires, substantially as described.

396,323. FASTENING FOR WHIP-SOCKETS. FRANCIS R. BENTON, Stoughton, Mass. Filed May 22, 1888. Serial No. 274,635. (No model.)



Claim.—A whip-socket fastener made of a strip of spring metal with one end turned back and riveted at b, the nut-block C, and the screws D E, holes for said screws being made at b' b^2 b^3 in the metallic strip, as and for the purpose described.

396,324. ROLLER-BEARING FOR CAR-AXLES. WILLIAM J. BREWER, London, England. Filed Mar. 13, 1888. Serial No. 267,065. (No model.)



Claim.—1. In roller-bearings for journals, the combination, with a connected series of rollers addpted to contact with only a portion of the journal at one time, of a stripping guide or guides for directing the series of rollers away from the journal after they have passed their effective bearing-point, substantially as described.

2. In roller-bearings for journals, the combination, with a connected series of rollers adapted to contact with only a portion of the journal at one time, of a stripping guide or guides for directing the series of rollers away from the journal after they have passed their effective bearing-point, and an idle-roll, 13, substantially as described.

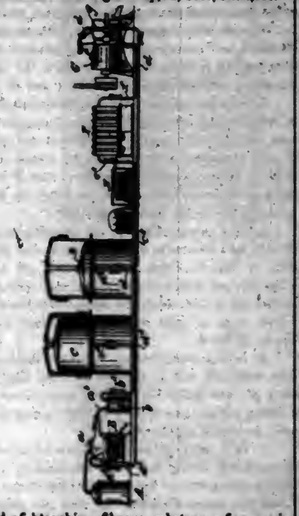
3. The combination, with a journal, a series of rollers, 10, and links 12, connecting said rollers in an endless series and affording a bearing for said journal, of a bushing, 9, connecting the ends of two adjacent links together, substantially as described.

4. In roller-bearings for journals, the combination, with a connected series of rollers adapted to contact with only a portion of the journal at one time, of a fixed rest, G, to take the vertical thrust of the axle-box and provided with a recess for an absorbent of the lubricant, substantially as described.

5. In roller-bearings for journals, the combination, with a connected series of rollers adapted to contact with only a portion of the journal at one time, of a bearing-shell, E, interposed between the rollers and the wall of the box, and a stripping guide or guides for directing the series of rollers away from the journal after they have passed the effective bearing-points between said journal and the shell, substantially as described.

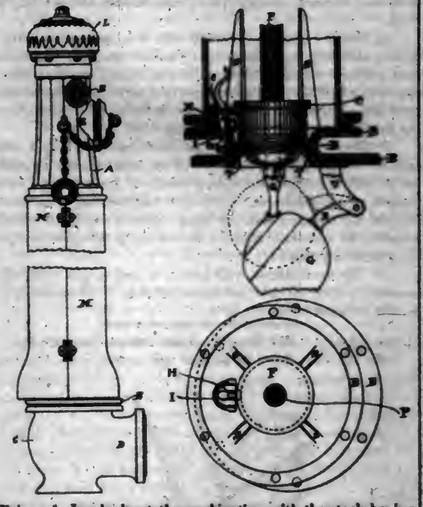
6. In roller-bearings for journals, the combination, with a connected series of rollers adapted to contact with the journal and having projecting journals 11, of a bearing-shell, E, provided with flanges 15 for contact with the journals of the rollers, substantially as described.

396,325. METHOD OF BLEACHING FIBROUS SUBSTANCES. ARTHUR BERK, 89 Brompton Crescent, County of Middlesex, England, and LÉON G. BERK, Paris, France. Filed Aug. 16, 1887. Serial No. 247,074. (No model.) Patented in England Apr. 2, 1887, No. 4,982.



Claim.—The method of bleaching fibrous substances for use in paper-making by, first, forming a mixture of oxygen and chlorine gases; second, subjecting said gases to the action of electricity, and, third, subjecting the fibrous substances to the action of such gases, substantially as described.

396,326. HYDRANT. CHARLES CARR, Boston, Mass. Filed May 22, 1886. Serial No. 203,046. (No model.)



Claim.—1. In a hydrant, the combination, with the stock having a flange at its bottom, of the base having a flange at its top, and the intermediate casting, B, having a central valve-opening, and guides for the main valve projecting from its upper surface, and having a flange at its top adapted to receive the stock, and of sufficient width on top to form a base for the waste-valve seat within the stock, and a flange at its bottom for bolting it to the hydrant-base, the waste-valve seat, waste-valve, and main valve, substantially as described.

2. In a hydrant, the combination, with the stock and base, of the intermediate main-valve seat having a flange at its top adapted to support the stock and a flange at the bottom for bolting it to the base, said flange at the top being provided with a vertical waste-valve orifice and the main and waste valves, substantially as described.

3. In a hydrant, the combination, with the stock and base, of the intermediate valve-seat, B, having a central main-valve opening and a supplementary-float-valve opening, waste-valve opening, and provided with upper and lower flanges to receive the stock and base and with upwardly-projecting main-valve guides and depending hangers, a supplementary float-valve hinged in said hangers, a main valve, and a waste-valve, substantially as described.

4. The combination of a main flanged plug-valve, an adjustable waste-valve, the described supplementary float-valve, and intermediate valve-frame, B, constructed with vertically-projecting main-valve guides and attached supplementary-valve hangers, and upper flange forming a base for a waste-valve, the main-valve guides, and the stock, substantially as described.

5. In a hydrant, the combination of the stock having a lower flange, an intermediate valve-frame having a corresponding upper flange, and a lower flange eccentric thereto, valve-opening concentric with the upper flange, and the main and hinged supplementary valves and base, substantially as described.

6. In a hydrant, the combination, with the stock and base, of an intermediate valve-frame constructed with upper and lower flanges adapted to be bolted to said stock and base, respectively, and with upwardly-projecting main-valve guides, and with vertical waste-orifice in the upper flange discharging upon the lower flange, and the main and waste valves, substantially as described.

7. In a hydrant, the combination, with a stock having a flange at its bottom, of a base having a flange at its top, the intermediate valve-frame having upper and lower flanges corresponding to said flanges on the stock and base and having suitable valve seats and guides, a stop for the waste-valve, the main valve, the waste-valve, and the supplementary valve hinged to the valve-frame, substantially as described.

8. The combination, in a hydrant, of the stock, the shouldered screw N, connected to the valve to operate it, the loose stop-collar g thereon above the shoulder, the valve F and stem F, and stop-cap L, secured to the stock and surrounding the screw above the collar, substantially as described.

9. In a hydrant, a waste-valve having an adjustable tilting arm attached to the valve by a friction-clutch joint, substantially as described.

10. In a hydrant, the combination of a tilting waste-valve operated within a cage and clamped to a journaled wrist having an operating-arm by means of a screw friction-clamp, the cage-arm, and main valve, substantially as described.

11. In a hydrant, the combination of the main-valve guiding-rim and standing guides, the tilting waste-valve, having an arm operated by said rim to open the waste-valve and adjust said arm relatively to the wearing down of the main valve, and also upon and in relation to the waste-valve, and another arm operated also by said rim to readjust the other arm when the main valve is taken out, and the main valve, said adjustment of arms being effected by means of a friction-clamp, substantially as described.

12. In a hydrant, the combination of two arms rigidly fixed to each other, but adjustable upon and in relation to the waste-valve, the waste-valve, main valve, guides, and guiding-rim, substantially as described.

13. In a hydrant, the combination of a tilting waste-valve having an operating-arm connected thereto by a friction-clamp, and a stop with a waste-valve seat provided with a stop arranged to engage the stop on the waste-valve, and a main valve having a portion which engages the operating-arm of the waste-valve, substantially as described.

14. The combination of a valve-seat cast with upwardly-projecting fingers on one side and journal-bearings on the other, and the valve hinged in the journal-bearings, and a stop to prevent its tilting above the fingers, substantially as described.

15. The combination, in a hydrant, of the double-flanged valve-frame bearing a waste-valve seat, main-valve seat, hinged float-valve seat, and main-valve guides, the stock seated thereon, said seats, their valves, guides, and the base, substantially as described.

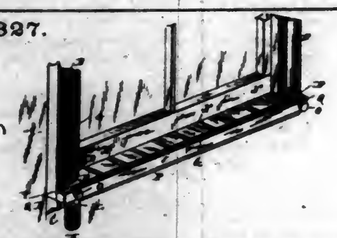
16. In a hydrant, the combination of the eccentrically-flanged valve-frame having the attached curved hanger beneath, said curved hanger, the base upon which it rests, and the stock which rests upon it, and the swinging supplementary valve hinged to said hanger, substantially as described.

17. In a hydrant, the combination of the double-collar-headed screw N, the sleeve O, inclosing said double-collared head, and having the extension-rod connected to the valve, said rod, the nut, and main valve, substantially as described.

396,327. PROTECTOR FOR CARPETS, CURTAINS, &c. JULIAN A. CRANE, Vining, Kans. Filed Mar. 19, 1888. Serial No. 267,724. (No model.)

Claim.—A protector for carpets, curtains, and like articles, adapted to be secured to the lower portion of a window-frame, consisting of a board formed with a longitudinal groove communicating with an aperture, and with short grooves intersecting the longitudinal groove at right angles, in combination with a can or receptacle, a hollow ex-

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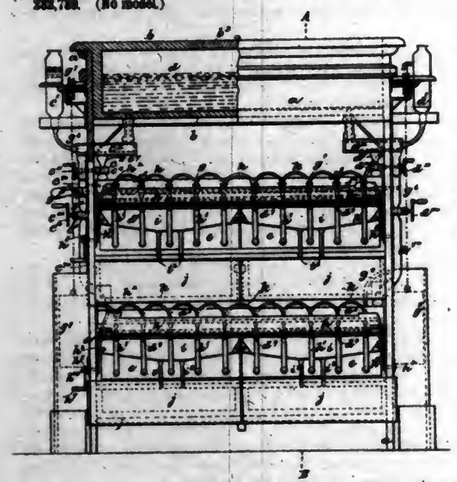
teriorly-screw-threaded tenon open at its lower end and provided with a flange or collar at its upper end, by means of which it is secured by screws or other suitable fastening devices to the under side of the board and registering with the said aperture, and an interiorly-screw-threaded socket secured upon the top of the can or receptacle and encircling the aperture therein, substantially as set forth.

896,828. QUILTING-FRAME FOR SEWING-MACHINES. HENRY T. DAVIS, New York, N. Y. Filed Sept. 26, 1887. Serial No. 250,737. (No model.)



Claim.—The combination, with the bearing-rail composed of sections 3 4, of the wedge-shaped bearing-bar, the bolt 8, passing through one section of said rail and the bar, the screws 6, passing through the bar and into the other section of rail, clamps 9, secured to the ends of said bar, and the bolts 7, passing through the bar and rail and said clamps, as set forth.

896,829. GALVANIC BATTERY. PAUL R. DE F. D'HUMY, Clapham Rise, County of Surrey, England. Filed Aug. 15, 1888. Serial No. 282,789. (No model.)



Claim.—1. In a galvanic battery, the frame *a*, cistern *b*, divided into two compartments, *a d*, provided with gages or levels *c' d'*, a series of cells, c^3 d^3, formed with openings c^4 d^4, leading into compartments c^5 d^5 of a receiver, c^6 d^6, having overflow-notches c^{100} d^{100}, corresponding with grooves or channels i^3 of a lip or ledge, i', discharging into a trough, *i*, furnished with conducting-pipes i^5, leading into removable trays *j*, the means for filling the cells, consisting of conduits c^8 d^8, c^9 d^7, c^{10} d^{10}, and c^{11} d^{11}, compressors c^{10} c^{100} d^{10} d^{100}, for cutting off or admitting the supply of liquid to the cells, the means for emptying the cells, consisting of pipes *k'*, leading from the cells to a conduit, *k*, carried by an arm, k^2, and capable of being raised and lowered by means of a crank-handle, k^7, and retained in its raised position by means of a pawl, k^8, and ratchet-wheel k^9, or their equivalent, the means for counterbalancing and raising and lowering the metal electrodes *g*, consisting of shaft g^3, upon which the metal electrodes *g* are fixed, levers g^4, fixed upon shaft g^3, rod g^5, fixed to covers g^{10}, to which the electrodes *g* are bolted, connecting-link g^{11}, for coupling the two series of metal electrodes of two groups of cells so that they shall move in unison, and counterbalance-weights g^6, connected by cords or chains g^7 to the levers g^4, all arranged and operating in manner substantially as hereinbefore shown and described, as and for the purpose stated.

2. In a galvanic battery, the combination, with a suitable frame or support, of a cistern divided into two compartments, a series of cells beneath the cistern comprising two elements, each with separate compartments, receivers arranged on opposite sides of the cells and having compartments corresponding and communicating with the compartments in the cells, communication between the compartments of the cistern and the respective receivers, and receivers mounted without the cells and connected to the bottoms thereof by means of flexible tubes, said outer receivers being mounted on hinged arms, whereby they may be lowered or raised to allow the liquid to flow into or from the same, substantially in the manner and for the purpose specified.

3. In a galvanic battery, the combination, with a cistern, a series of cells located beneath the cistern, communication between the cistern and the cells, and a reservoir or trough, *h*, mounted on arms h^2, and connected with the cells by means of a flexible tube, *h'*, said arms h^2 being mounted on shafts or axes h^4 h^{40}, one of said axes having a pawl and ratchet and a crank-handle for controlling the arms, substantially in the manner specified.

4. In a galvanic battery, the combination, with two or more series of cells, and electrodes fitting said cells and pivoted at one side to the cells, of rods to which the electrodes are connected at their other sides, pivoted arms carrying one of said rods, a lifting cord and weight connected to said arms, and connections between the rods for the different series of cells, whereby they move in unison, substantially as herein set forth.

5. In a galvanic battery, substantially as described, the combination, with the cell or cells, of pivoted electrodes *g*, pivoted guide-arms g^4, connection between the guide-arms and the electrodes, and a lifting weight and cord, g^5 g^4, for raising said electrodes out of the cells, as herein explained.

6. In a galvanic battery, the combination, with the cells *c*, of the electrodes *f*, fitting said cells, substantially as set forth, and forming the compartments d^9 between the sides of the cell *c* and the electrodes *f*, and the compartments c^9 between the electrodes *f*, the former for receiving the other electrode and the latter for forming the porous cap for the depolarizing-liquid, substantially in the manner explained.

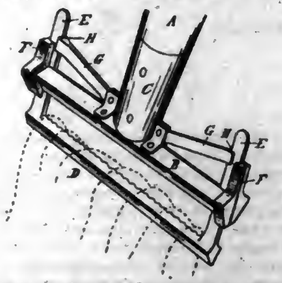
7. The combination, with the cell or cells of a galvanic battery, of an emptying and filling device consisting of troughs *h*, mounted on arms h^2, having tubes *h'* communicating between the trough and each compartment of the cells, and means, substantially as described, for controlling the elevation of said trough, whereby it may be raised to fill and lowered to empty the compartments, substantially as set forth.

8. The combination, with the cells of a galvanic battery comprising each two compartments, of a pair of troughs mounted on pivoted arms on each side of the cells and having communication, respectively, with the different compartments of the cells, and suitable controlling mechanism for raising and lowering the troughs, whereby the compartments may be emptied and filled at will.

9. The combination, with a galvanic battery having a series of cells, of troughs fixed at the sides of the cells and having communication with the respective compartments of the cells, and swinging troughs, substantially as described, communicating with the fixed troughs and having means for fixing them in any desired elevation, whereby the amount of liquid in the cells may be regulated at will, in the manner explained.

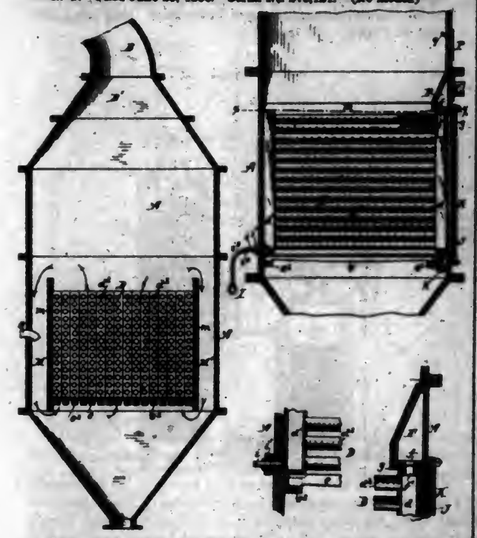
10. The combination, with cells *c*, of the troughs *h*, having communication with the cells, and elevating-arms h^2, substantially as and for the purposes herein set forth.

896,830. MOP-HOLDER. JAMES DUNCAN, Coshocton, Ohio. Filed Mar. 20, 1888. Serial No. 267,865. (No model.)



Claim.—In a mop-holder, the combination, with the fixed part of the mop-head, consisting of the cross-bar B, slotted upon its outer ends and provided with the guide-bearings F, of the sliding part of the mop-head, consisting of the cross-bar D, provided with the arms E, projecting at right angles therefrom and slidingly engaging with the fixed part of the mop-head, and a locking device, as the clamping-levers G, adapted to engage with the arms E, substantially as described.

896,831. EVAPORATING-PAN. JOSEPH M. DUNCAN, Silver Springs, N. Y. Filed June 26, 1888. Serial No. 278,121. (No model.)



Claim.—1. The combination, with an evaporating-pan, of flat heating-sections, each composed of a row of heating-pipes and manifolds with which the pipes are connected, the several sections being independent of each other and arranged with their flat sides adjacent to each other, and the pan being provided in one of its upright walls with an opening through which each section can be removed, substantially as set forth.

2. The combination, with an evaporating-pan, of flat removable heating-sections, each composed of a row of heating-pipes and manifolds with which the pipes are connected, the several sections being independent of each other and arranged with their flat sides adjacent to each other, and a supply-manifold secured to the pan and communicating with each heating-section, substantially as set forth.

3. The combination, with an evaporating-pan, of flat removable heating-sections, each composed of a row of heating-pipes and manifolds with which the pipes are connected, the several sections being independent of each other and arranged with their flat sides adjacent to each other, and circulating-passages arranged outside of the heating-sections and connecting the portions of the pan above and below the heating-sections, substantially as set forth.

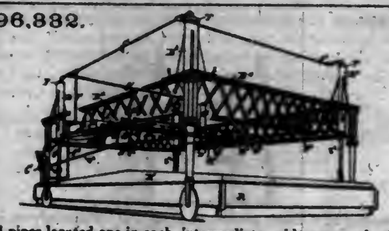
4. The combination, with the evaporating-pan, of removable vertical sections of heating-pipes arranged side by side within the pan, and guide-bars arranged in the pan underneath the sections, substantially as set forth.

5. The combination, with the evaporating-pan, of removable vertical sections of heating-pipes arranged side by side within the pan, each composed of end manifolds and connecting-pipes, and beveled guide-bars arranged in the pan and entering grooves in the lower ends of the manifolds, substantially as set forth.

6. The combination, with the evaporating-pan, of removable vertical sections of heating-pipes arranged side by side within the pan, each composed of end manifolds and connecting-pipes, a horizontal supply-manifold communicating with the supply-manifolds of the sections, drip-pipes attached to the discharge-manifolds of the sections, and packing-boxes in the wall of the pan through which the drip-pipes pass, substantially as set forth.

7. The combination, with the evaporating-pan, the sections of heating-pipes, each provided with an end manifold, and a main manifold extending across the ends of the section-manifolds and secured in the pan, of adjusting-screws attached to the pan and bearing against the section-manifolds, whereby the latter are pressed against the main manifold, substantially as set forth.

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said pipes located one in each intermediate said pump and said cylinders, and rods for operating said valves individually, substantially as and for the purpose set forth.

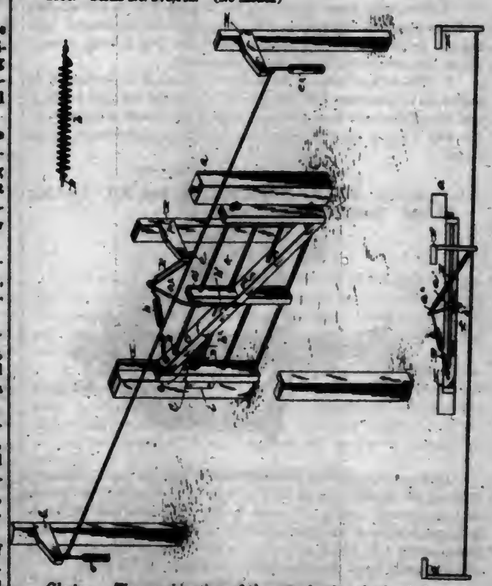
2. In an apparatus for elevating the cover of a gas-purifier, the combination, with several cylinders mounted on the cover-carriage and having the rods of their several pistons attached, respectively, to the corners of the purifier-cover, together with a pump for operating said pistons mounted on said carriage, of pipes extending longitudinally of the carriage and connected, respectively, to said cylinders and to pipe-sections extending laterally of the carriage, a stand-pipe uniting said lateral pipe-sections, a pipe connecting said stand-pipe and the pump, and valves, located one in each of the longitudinal pipes, having rods reaching to and provided individually with operating-levers on that side of the carriage-frame on which the said pump is located, all substantially as and for the purpose set forth.

3. In an apparatus for elevating the cover of a gas-purifier, the combination, with several cylinders mounted on the cover-carriage and having the rods of their several pistons attached, respectively, to the purifier-cover at the corners thereof, together with a pump for operating said pistons, of a tank mounted on said carriage and having connection with said pump, and pipes leading severally from an aperture in the upper head of each cylinder to said tank, substantially as described, and for the purpose set forth.

896,882. APPARATUS FOR ELEVATING THE COVERS OF GAS-PURIFIERS. JAMES R. FLOYD, New York, N. Y. Filed June 2, 1888. Serial No. 275,811. (No model.)

Claim.—1. In an apparatus for elevating the cover of a gas-purifier, the combination, with the several described cylinders connected to the carriage B^4 and having the rods of their several pistons attached to the purifier-cover at various points thereon, respectively, together with a pump, C, for operating said pistons, of the described pipes severally connecting said pump with said cylinders, valves in

896,833. GATE. MILTON C. PEIFER, La Harpe, Ill. Filed June 13, 1888. Serial No. 276,912. (No model.)

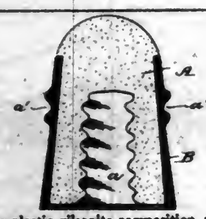


Claim.—The combination of the gate having the latch formed with a horizontal rearwardly-projecting portion or arm which is weighted or downwardly acted upon and a downwardly and forwardly projecting portion, the latch-operating rod pivoted upon the gate and having an arm at its upper end, and near its lower end an arm connected to a rod secured to the downwardly-projecting portion of the latch, a chain or its equivalent having applied thereto a spring connected to the gate and to the upper arm or end of the latch-operating rod, and the gate-manipulating lines, also connected to the upper arm or end of the latch-operating rod, substantially as set forth.

896,834. OVERHEAD INSULATOR. SAMUEL H. GILES, Salt Lake City, Utah. Filed Sept. 26, 1888. Serial No. 286,703. (No model.)

Claim.—1. As a new article of manufacture, an overhead insu-

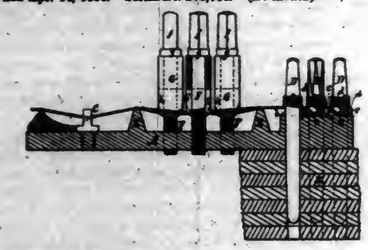
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lator composed of a plastic silicnite composition, substantially as described.

2. As a new article of manufacture, an overhead insulator composed of a plastic silicnite composition, and a surrounding band, substantially as and for the purposes described.

396,335. STRINGING AND TUNING DEVICE FOR PIANOS. GEORGE M. GUILD, Boston, Mass., assignor to H. R. Guild, same place. Filed Apr. 14, 1888. Serial No. 270,661. (No model.)

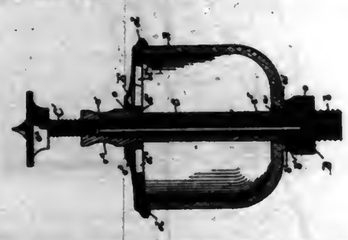


Claim.—1. The string-frame provided with the teeth *c*, having the undercut, as described, in combination with the straining-pins D, having the pins *e*, as set forth.

2. The string-frame A, having the bridges E E, in combination with the pins F, having the integral heads *f*, and the followers G, having the projections *h*, with the grooves *h'*, the pins F being smooth where they are in the followers G, as set forth.

3. The string-frame A, having the bridges E E perforated as shown, in combination with the pins F, having the integral heads *f*, and the followers G, having a hooked projection with the groove *h'*, the pins F being smooth where they are in the followers G, as set forth.

396,336. OIL-CUP. JOHN S. HALL, New York, N. Y. Filed July 16, 1888. Serial No. 280,056. (No model.)



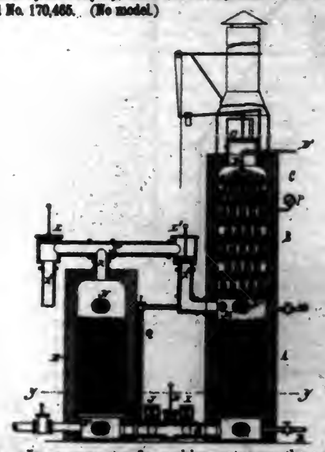
Claim.—In an oil-cup, the combination, with the cup A and valve-tube, of the skeleton frame D, fitted and rigidly attached to the rim of the cup and uniting the same to the valve-tube, and the lid E, adapted to close down upon and cover said frame, and provided with the aperture *c*, by which said cover is free to move vertically and be tilted laterally upon the valve-tube, substantially as set forth.

396,337. TANNING PROCESS. JEREMIE LALER, Independence, Iowa. Filed Nov. 14, 1887. Serial No. 255,155. (Specimens.)

Claim.—1. The hereinbefore-described process of tanning, which consists in first removing the hair and grease from the hides, then immersing the hides in a bath of soot, salt, and water, in about the proportions stated, and then squeezing and drying the hides, substantially as set forth.

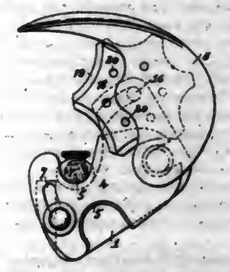
2. The hereinbefore-described process of tanning, which consists in first removing the hair and grease from the hides, then immersing the hides in a bath of soot, salt, and water, then squeezing and drying the hides, then giving the hides a dressing of ordinary tanner's oil, then again immersing the hides in a bath of soot, salt, and water, and then again squeezing and drying the hides, substantially as set forth.

396,338. APPARATUS FOR THE MANUFACTURE OF GAS. THADDEUS S. C. LOWE, Norristown, Pa., assignor to the Guarantee Trust and Safe Deposit Company, trustee, of Pennsylvania. Filed July 2, 1885. Serial No. 170,465. (No model.)



Claim.—In an apparatus for making water-gas, the combination of a main generator comprising the fuel-chamber A, the steam-superheater B, and the steam-generator C, all inclosed by a single upright shell having an ash-pit and steam-inlet at the bottom, an air-blast inlet at the upper part of the fuel-space, and a valve, O, and water-spraying device D above the steam-generator, a separate generator or fuel-chamber, E, a flue, G, connecting the ash-pits of the chambers A and E, the valve H and valved air-inlets I J, located in the flue G the valved flues K K' K², connecting the chambers A and E at the top, and a steam-pipe, Q, connecting the flues K² and G, substantially as described.

396,339. CIGAR-CUTTER. FREDERICK C. MILLER, Newport, Ky. Filed June 26, 1888. Serial No. 278,290. (No model.)



Claim.—1. A cigar-cutter constructed with a grooved bed or support for the cigar, an upper cutting-blade and a lower concave blade having means of vertical adjustment relatively to the bed, to adapt it to cigars of different taper, substantially as set forth.

2. A cigar-cutter constructed with a grooved bed or support for the cigar and a pair of cutting-blades having concave edges, and the lower blade having means of vertical adjustment relatively to the bed, to adapt it to cigars of different taper, substantially as set forth.

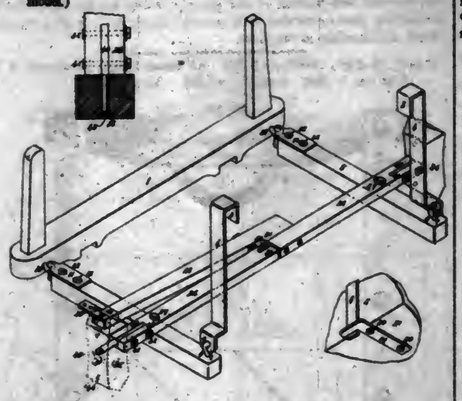
3. In a cigar-cutter, the combination, with the upper cutter and carrier on which it is mounted, the lower cutter having a notch at one end and a slot concentric with said notch near the other end, and a screw occupying said slot, substantially as set forth.

4. In a cigar-cutter, the combination of the upper movable vertical cutter and the lower reversible vertical cutter having concave knife-edges on opposite sides, the curves of which are of different radii, whereby different edges may be used for different-sized cigars, as and for the purpose set forth.

5. In a cigar-cutter, the combination of the upper movable vertical cutter having concave knife-edges the curves of which are of different radii, and the lower reversible vertical cutter having concave knife-edges on opposite sides, the curves of which are of different radii, whereby different edges may be used for different-sized cigars, substantially as shown and described.

6. In a cigar-cutter, the combination, with the upper-cutter carrier on which it is mounted, and axis of the carrier, of the lower-cutter plate having a notch at one end bearing against said axis, and means for adjustment at the other end, substantially as set forth.

396,340. ATTACHABLE BRAKE FOR WAGON-BEDS. STEPHEN R. RUPLE, Foley, Mo. Filed July 9, 1888. Serial No. 279,490. (No model.)



Claim.—1. In a wagon-brake, a hanger-frame that carries the brake-bars, which frame is secured to the stationary bolster in the rear and by pendent hooks to the wagon-bed in front, substantially as and for the purpose set forth.

2. In a wagon-brake, the combination of the carrier-bars that support the brake-bars, the strap-hooks secured to the rear end of said bars, and the eyelet-bolts in which they engage, said bolts being secured to the stationary bolster, the pendent straps whose hooks saddle over the side-boards of the wagon-bed, and the hook-bolts that secure the front ends of the carrier-bars to said pendent straps, substantially as and for the purpose set forth.

3. In a wagon-brake, the combination of the hanger-frame that carries the brake-bars, the strap-hooks and eyelet-bolts that secure said frame to the stationary bolster, and pendent strap-hooks that secure it to the wagon-bed, the operative brake-bar that spans the carrier-bars, and the pivot-pin that secures it to one of said bars, the said bar being formed in two sections bolted together near the middle in a form to provide an offset and recess, the said recess providing room for the attachment of the subsidiary section of the brake-bar, substantially as and for the purpose set forth.

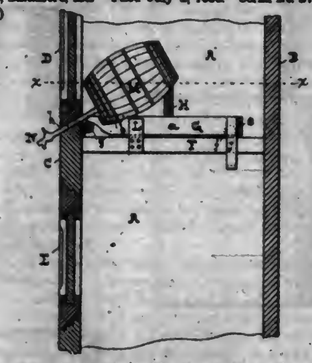
4. In a wagon-brake, the combination of the hanger-frame that carries the brake-bars, secured from adverse longitudinal movement while braking by attachment to the stationary bolster, and the hanger-strap hooks by which it is suspended from the wagon-bed, and the angle-hooks secured to the bottom of said wagon-bed and that engage with said hanger-straps that lock said bed from an adverse slide on a downgrade, substantially as and for the purpose set forth.

5. In a wagon-brake, the combination of the attachable and detachable hanger-frame, the sectional operative brake-bar that spans from one carrier-bar of the frame to the other and is pivoted near one end to one of said carrier-bars of the hanger-frame, the bolted attachment of the sections of said brake-bar in a position to form a recess at said junction, the subsidiary brake-bar whose attachment end is located in said recess, the triplicated fork at said end of said bar that provides cross-slots in its end, the T screw-bolt that passes through the horizontal slot between said forks, whose T-head is seated in the vertical slot and whose screw-bolt is secured in its perforated seat in the operative brake-bar, and the screw-nuts on said bolt that adjust the relative attachment of the subsidiary brake-bar to the operative bar in line with said bar, and pivot-pin that secures the subsidiary bar to the carrier-bar that supports it, substantially as and for the purpose set forth.

6. In a wagon-brake, the combination of the hanger-frame that carries the brake-bars, secured to the stationary bolster in the rear and in front by pendent bars to the wagon-bed above, the sectional operative brake-bar formed with a recess in which is jointed the subsidiary brake-bar, the metal straps that are seated in the slots at the terminals of said brake-bars, with screw-bolt extensions for the attachment of the rubbers and the screw-bolts that pass through said brake-bars, and metal straps to secure them together, substantially as and for the purpose set forth.

7. In a wagon-brake, the combination of the hanger-frame that carries the brake-bars, the sectional brake-bars they carry, the metal bolted straps and screw-bolts secured in slots at the terminals of said bars, the wooden reversible rotating rubbers arranged with the grain end on for friction service, the metal tie-straps inside and outside of said rubbers, through the central perforations in which the attachment bolts on the terminals of the brake-bars pass and in the outer one of which they have a locking-screw attachment, the said rubbers on their friction-surfaces cut with a curve to correspond with the periphery of the tire and bevel-edged at top and bottom to best take on friction at top and prevent splitting with the grain at bottom, substantially as and for the purpose set forth.

396,341. ICE-BOX FOR HOLDING BEER-KEGS. CHARLES C. RUMPF, Baltimore, Md. Filed July 2, 1888. Serial No. 278,821. (No model.)



Claim.—In an ice-box for holding kegs of beer, the combination of the stringers F in the said box, the carriage G, and the rollers *f* and *g*, the same being placed, respectively, on the front of the box and the rear of the said carriage, and the said carriage having the keg-supports *b* and H, and its lower front ends carved, substantially as and for the purpose specified.

396,342. GALVANIC BATTERY. BERNHARD SCHEITHAUER, Halle-on-the-Saale, Germany. Filed Dec. 5, 1887. Serial No. 257,012. (No model.)



Claim.—1. In a galvanic battery, the combination of a receptacle having a horizontal perforated wall, negative and positive plates above said wall, and a mixture adapted to evolve chlorine below said wall, with a liquid or liquids suitable for exciting said battery and production of chlorine, substantially as set forth.

2. The combination of a receptacle having a horizontal perforated wall, negative and positive plates above said wall, asbestus fiber about the negative plate or plates, and a mixture adapted to evolve chlorine below said wall, with liquid or liquids for exciting said battery and production of chlorine, substantially as and for the purpose set forth.

396,343. PROCESS OF MAKING SOAP. HERMANN F. D. SCHWABE, Kansas City, Mo. Filed Mar. 9, 1888. Serial No. 266,734. (Specimens.)

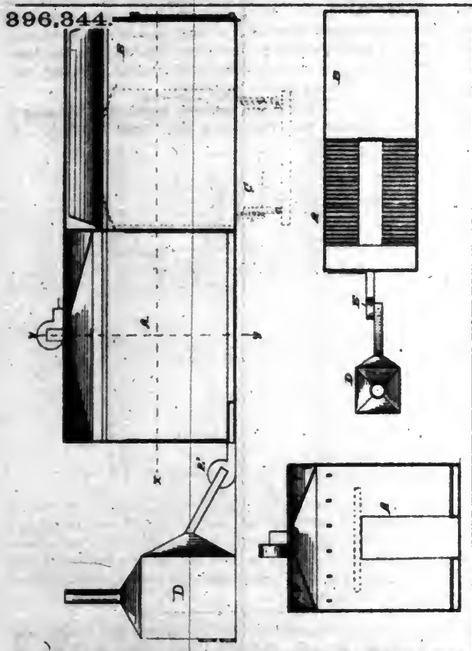
Claim.—The described method of making soap, consisting of melting the fat, mixing therewith the lye while at a temperature of about 120° Fahrenheit, mixing with this the described soap solution while at a temperature of about 150° Fahrenheit, and then raising the temperature to about 180°, substantially as set forth.

396,344. PREPARING MEATS FOR TRANSPORTATION. JOHN W. STERRY, Chicago, Ill. Filed Mar. 20, 1886. Serial No. 197,001. (No specimens.)

Claim.—1. The herein-described process of preparing meat, it consisting in subjecting it immediately after slaughtering and while inclosed in an apartment to the action of currents of air forced through the said apartment and heated to a temperature between 70° Fahrenheit and the degree at which cooking occurs, and maintaining said treatment until the products of normal waste have been eliminated, and subsequently cooling it to arrest the further elimination and escape of materials therefrom, substantially as set forth.

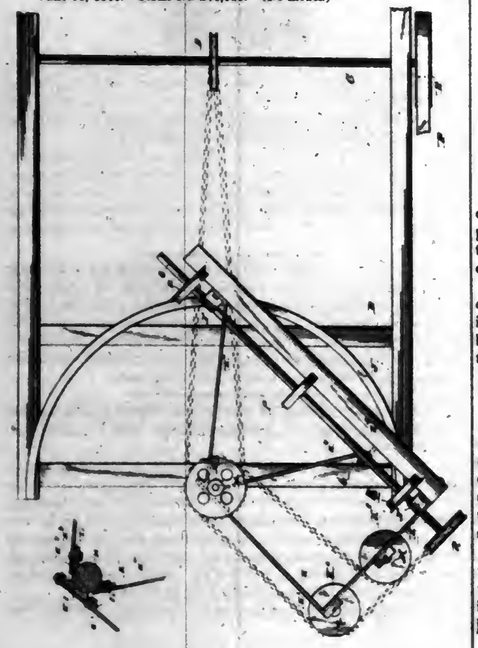
2. The herein-described process for preparing slaughtered beef

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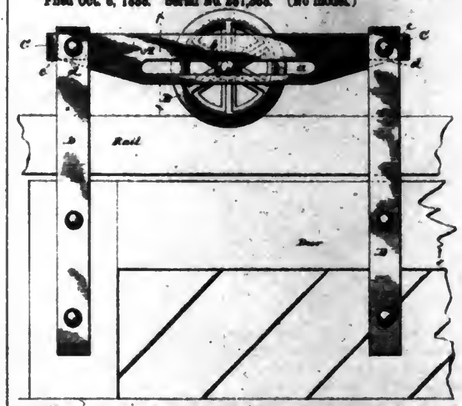
for transportation, it consisting in first subjecting the said beef immediately after slaughtering and while inclosed in an apartment to the action of currents of air heated to a temperature between 70° Fahrenheit and that at which cooking occurs, said air having its humidity reduced before bringing it in contact with the meat, and maintaining such treatment until the products of normal waste have been eliminated, then inclosing said meat in a transporting-vehicle containing refrigerating or cooling apparatus, and therewith arresting further elimination and escape of materials from the meat, substantially as set forth.

396,845. STRAW-CARRIER. FREDERICK STROBEL, Marion, Ohio, assignor to the Marion Manufacturing Company, same place. Filed June 30, 1888. Serial No. 278,623. (No model.)



Claim.—The combination, with a frame projecting from the rear end of the thrashing-machine and a short vertical shaft journaled in the forward end thereof, of the pivoted frame having its forward-projecting pieces provided with recessed blocks for engaging the said shaft, substantially as set forth.

396,846. DOOR-HANGER. LE GRAND TERRY, Horseheads, N. Y. Filed Oct. 6, 1888. Serial No. 287,263. (No model.)



Claim.—1. In a door-hanger, the combination, with rider-plates and spacing-blocks, of bracket-arms supported alike upon the edges of the rider-plates and on the spacing-blocks, substantially as set forth.

2. The combination, with rider-plates and spacing-blocks having a flange on the outer end extending flush with the outer faces of the plates, of L-shaped bracket-arms resting on the upper edges of the rider-plates and secured in place by a rivet or bolt extending through the plates, blocks, and bracket-arms, substantially as set forth.

396,847. METHOD OF RE-ENFORCING MANTLES OF REFRACTORY INCANDESCING EARTHS. CARL A. VON WELSBACH, Vienna, Austria-Hungary, assignor to the Welsbach Incandescent Gas Light Company, Jersey City, N. J. Filed Mar. 31, 1888. Serial No. 269,201. (No model.)



Claim.—1. The method of strengthening or re-enforcing mantles or hoods of refractory incandescing material at the point where a suspending-wire is inserted, which consists in applying to that part of the mantle or hood a strengthening-fluid of the salts of refractory earths in solution, substantially as described.

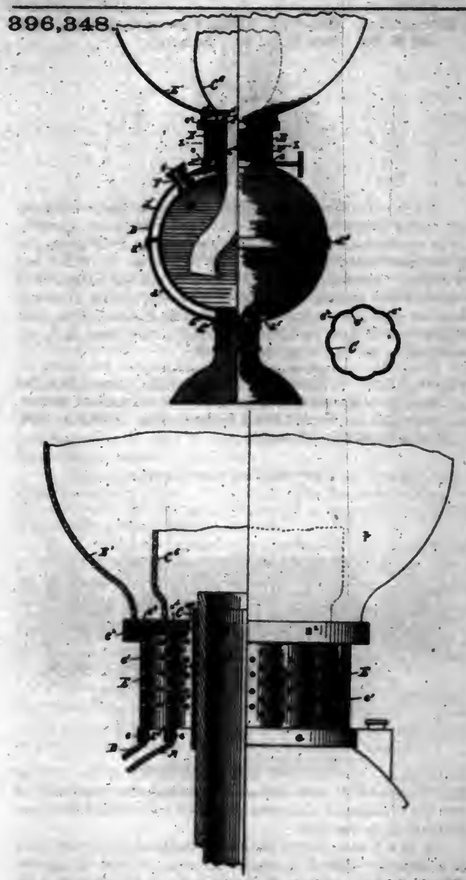
2. The method of strengthening or re-enforcing mantles or hoods of refractory incandescing earth at the point where a suspending wire is attached, which consists in applying to that part of the mantle or hood a solution of magnesium nitrate and aluminum nitrate, substantially as described.

396,848. LAMP. JAMES W. WILLIAMS, Brooklyn, N. Y. Filed Apr. 30, 1888. Serial No. 271,256. (No model.)

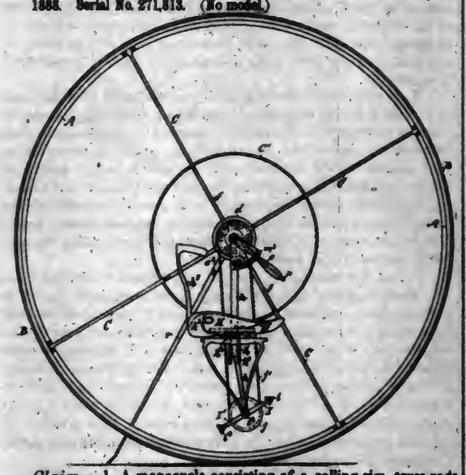
Claim.—1. In a lamp, the combination, with the reservoir A, provided with the described jacket D, and the burner C, with its perforated wall c', surmounted by a flange, c^3, having concentric grooves c^4, of the perforated sleeve E, carried by said jacket and surrounding said burner and provided with the top flange, e^3, adapted to fit snugly to the flange on the burner, substantially as and for the purpose specified.

2. In a lamp, the combination, with the reservoir A, provided with the described jacket D, and the burner C, with its perforated wall c', surmounted by the flange c^3, having the concentric grooves c^4 in its upper exposed face, of the perforated sleeve E, carried by said jacket and surrounding said burner, and provided with the top flange, e^3, adapted to fit snugly to the flange on the burner, and having the concentric grooves e^4 in its upper exposed face, substantially as and for the purpose set forth.

396,848.



396,849. VELOCIPEDE. HERMANN BEER, Philadelphia, Pa., assignor of one-half to G. William Friedgen, same place. Filed Apr. 26, 1888. Serial No. 271,813. (No model.)



Claim.—1. A monocycle consisting of a rolling rim, truss-rods connected with said rim and an axle-box and located on one side beyond the vertical median line of the rim, stay-rods connected with said box and truss-rods, an axle in said box, and a depending bracket carrying an adjustable seat on the opposite side beyond said vertical median line, cranks supported beneath said seat, and means connected with said box and cranks for causing motion to be imparted to said vehicle, substantially as described.

2. A monocycle consisting of a rolling rim, rods connected with said rim and a box and located on one side beyond the vertical median line of said rim, an axle passing through said box, a depending bracket formed integral with said axle and having a slotted projection, in which an adjustable seat is mounted, and cranks journaled in the depending arm, and an arm depending from said projection, and means connected with said box and cranks, whereby motion may be imparted to said vehicle, substantially as described.

3. A monocycle consisting of a rolling rim or wheel, truss-rods connected with said rim and a box, stay-rods connected with said rods and box, a hollow axle and a spindle mounted in said box and located on one side beyond the vertical median line of said rim, a depending bracket mounted on said spindle having a slotted projection, a seat mounted therein and located beyond said vertical median line, cranks supported beneath said seat, and means connected with said box and cranks, whereby motion may be imparted to said vehicle, all arranged as shown and described.

4. The herein-described monocycle provided with rods attached to a rolling rim and an axle-box, stay-rods attached to said rods and box, a hollow axle and a spindle mounted in said box, a depending arm pivotally connected with one extremity of said spindle, and means, as described, connected with the opposite extremity of said spindle, whereby said depending rod may be actuated, as shown and for the purpose set forth.

5. A monocycle consisting of a rolling rim and truss-rods attached to said rim and an axle-box, stays connected with said rods and box, a hollow axle and a spindle mounted in said box, a depending arm pivotally connected with one extremity of said spindle and with said hollow axle by means of a rod hinged thereto, a lever pivotally connected with the opposite extremity of said spindle, a latch-bar pivoted to said lever, and a sector with a rack formed integral with said hollow axle, substantially as and for the purposes set forth.

6. A monocycle provided with truss-rods attached to the rolling rim and to an axle-box, stays secured to said box and truss-rods, a ring secured to said truss-rods for strengthening them, a hollow axle and a spindle mounted in said box, a depending bar connected with said spindle, and means connected with said axle and spindle for actuating and holding said bar in a desired position and located beyond the vertical median line of said rolling rim, a depending bracket formed integral with said axle and extending beyond the median line on the opposite side of said rolling rim and provided with a slotted projection, an adjustable seat held therein, cranks supported beneath said seat, and means connected with said cranks and box, whereby motion may be imparted to said vehicle, substantially as and for the purposes set forth.

396,850. NEEDLE-CLAMP FOR SEWING-MACHINES. CHARLES P. BOSTIAN, Milton, assignor of one-half to John F. Meekly, Watsontown, Pa. Filed Feb. 24, 1888. Serial No. 265,179. (No model.)

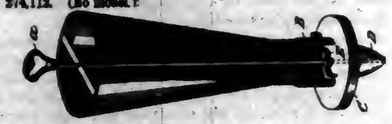


Claim.—1. A sewing-machine needle-clamp consisting of two parts formed with a needle-groove in each of their inner faces, a hinge-pin to hold the parts together, said hinge-pin having its upper part extended across and between the inner faces of the clamp and constituting the needle-holding bar, a spring to hold the needle-holding bar in engagement with the needle, and a locking-pin to lock the parts together, substantially as described.

2. A sewing-machine needle-clamp consisting of two parts formed with a needle-groove in each of their inner faces and each having a transverse groove, 5, across its face, a hinge-pin to hinge the parts together, said hinge-pin having its upper part extended across and between the parts and arranged in the transverse grooves 5, a spring, 4, fixed in the face of one of the parts to throw the arm of the hinge-pin in engagement with a needle, and a locking-pin, 14, having an angular part, 15, to lock the parts together, substantially as described.

3. A sewing-machine needle-clamp consisting of two parts hinged together and formed with a needle-groove in each of their inner faces, and a locking-pin projected through the free edges of the parts, substantially as and for the purpose specified.

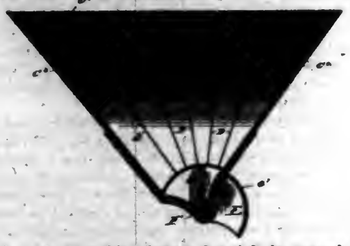
396,851. IMPLEMENT FOR DROPPING FERTILIZER. BRAUMAN BUTLER, St. Johnsbury Centre, Vt. Filed May 16, 1888. Serial No. 274,112. (No model.)



Claim.—1. The combination, with a vessel adapted to hold and drop fertilizing material, of side openings near its lower end and a handle having corrugated wings attached at its lower end, adjusted to press the fertilizer through the side openings, as and for the purpose set forth.

2. The combination, with a vessel adapted to hold and drop fertilizing material, substantially as described, of a sliding band near the lower end of the vessel, for the purpose of opening or closing said side openings, as and for the purpose set forth.

396,852. SAND-BOX FOR RAILWAY-CARS. WILLIAM H. CLARK, Chicago, Ill., assignor to Horace G. Bird, same place. Filed Apr. 16, 1888. Serial No. 271,089. (No model.)



Claim.—1. A sand-box hopper-shaped in its general outline, having an orifice at or near its bottom, and provided with one or more plates secured in the sand-space within said hopper, whereby to permit sand to pass on both sides of said plate or plates and thereby prevent the packing or clogging of the same, substantially as described.

2. In a sand-box, the combination, with the hopper-shaped sand-receptacle having an opening in its bottom, of a series of plates located transversely in said receptacle, whereby to permit the sand to pass on both sides of said plates, substantially as and for the purpose described.

3. The combination, with a hopper-shaped sand-box having an opening in its bottom, of a series of plates secured therein, radially arranged with reference to said opening, substantially as described.

4. In a sanding apparatus, the combination, with the sand-receptacle having an opening at or near its bottom, of a feed-cup fitted to said opening and provided with a pocket and a solid portion, and adapted to be rocked to bring said pocket and said solid portion alternately beneath said opening, substantially as described.

5. The combination, in a sanding apparatus, with a hopper-shaped receptacle having an opening in its bottom, of a series of plates secured therein and a feed-cup provided with a pocket and a solid portion adapted to said opening and to be rocked, whereby to bring said pocket and said solid portion alternately to said opening, substantially as and for the purpose specified.

396,853. VAPOR-BURNER. JOHN H. CLAYTON, Ypsilanti, Mich., assignor of one-half to Joshua Lambert, John R. Lambert, Charles R. Lambert, and Bert L. Lambert, all of same place. Filed Aug. 6, 1888. Serial No. 282,082. (No model.)



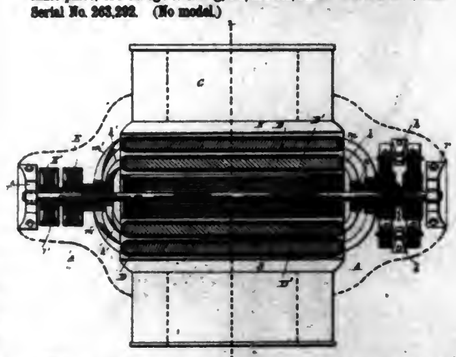
Claim.—A vapor-burner consisting of the plate A, having at one end the valve-shell B, provided with the vapor-orifice E and valve J, the hood C, secured to the under side of the plate to constitute a combustion-chamber between the latter and the side and rear end walls of said hood, with its front open for the discharge of the flame, a combining-tube, D, opening through the rear wall of the hood opposite the vapor-orifice, and the vaporizing-pipe L, having means to connect with the fuel-supply and extending in a curved path around and bearing against the under side of the plate in the combustion-chamber and connected with the valve-shell to form a flame-guard at the mouth of the combustion-chamber, substantially as and for the purposes described.

396,854. PIPE-JOINT. PATRICK V. DWYER, St. Paul, Minn. Filed Oct. 22, 1888. Serial No. 288,704. (No model.)



Claim.—The combination, with a water-closet trap or other piping having flanged adjacent ends, of a coupling consisting of semicircular overlapping sections D' D^2 D^3 D^4, said sections D^2 D^4 having pins g', adapted to enter inclined slots g^2 in the sections D' D^3, and said sections D' D^2 united by one end on one side, and said sections D^3 D^4 united on the opposite side, whereby when said sections are drawn together around the piping the pins and inclined slots coact to cause said sections to draw the ends of the piping toward each other, substantially as and for the purpose set forth.

396,855. DYNAMO-ELECTRIC MACHINERY. ISAAC T. DYER, Chicago, Ill., assignor of five-eighths to Peter Fish and Gustav Mourath, same place, and George C. Ewing, Jr., Enfield, Mass. Filed Feb. 7, 1888. Serial No. 263,292. (No model.)



Claim.—1. In a dynamo-electric machine, the combination of two sets of magnets and movable armatures, one set within the other, substantially as described.

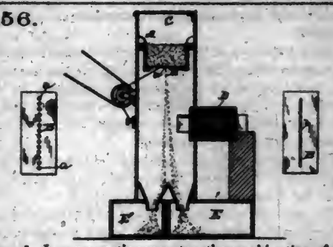
2. In a dynamo-electric machine, in combination with the frame A, a stationary shaft, B, a magnet, C, having its poles on opposite sides of the shaft, a magnet, C', secured on the shaft between the poles of the magnet C, and movable armatures D and D', supported from the shaft B and actuated, respectively, in front of the poles of the magnets C and C', substantially as described.

3. In a dynamo-electric machine, in combination with the frame A, a stationary shaft, B, a magnet, C, having its poles on opposite sides of the shaft, a magnet, C', secured on the shaft between the poles of the magnet C, and hollow cylindrical rotary armatures D and D', supported one within the other around the shaft and actuated, respectively, in front of the poles of the magnets C and C', substantially as described.

4. In a dynamo-electric machine, in combination with the frame A, a shaft, B, rigidly supported on the frame, a magnet, C, having its poles on opposite sides of the shaft, a magnet, C', secured on the shaft between the poles of the magnet C, loose rotatory sleeves n and n', near opposite ends of the shaft, carrying between them a hollow cylindrical armature, D, surrounding the shaft and magnet C' and extending between the poles of the magnet C, and loose rotatory sleeves l and l', near opposite ends of the shaft, carrying between them a hollow cylindrical armature, D', inside the armature D, surrounding the magnet C', substantially as described.

5. In a dynamo-electric machine, in combination with the frame A, a shaft, B, rigidly supported on the frame, a magnet, C, having its poles on opposite sides of the shaft, a magnet, C', secured on the shaft between the poles of the magnet C, loose rotatory sleeves n and n', near opposite ends of the shaft, having arms m and m', carrying between them a hollow cylindrical armature, D, surrounding the shaft and magnet C' and extending between the poles of the magnet C, and loose rotatory sleeves l and l', extending through the sleeves n and n' on the shaft, and having arms k and k', carrying between them a hollow cylindrical armature, D', inside the armature D, surrounding the magnet C', substantially as described.

396,856. MAGNETIC SEPARATOR. THOMAS A. EDISON, Llewellyn Park, N. J., assignor to the Edison Ore Milling Company, (Limited,) New York, N. Y. Filed Mar. 20, 1888. Serial No. 268,749. (No model.)



Claim.—1. In a magnetic separator, the combination of a hopper having a flat bottom and an opening therein, with a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

2. In a magnetic separator, the combination of a hopper having vertical sides and a flat bottom with an opening therein, with a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

3. In a magnetic separator, the combination of a hopper having a flat bottom and a row of small holes therein, with a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

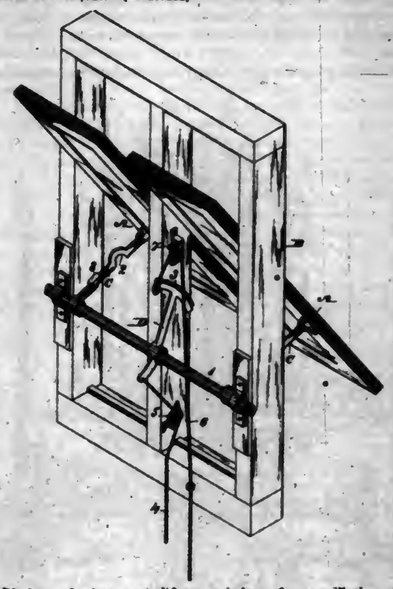
4. In a magnetic separator, the combination of a hopper having a thin metal bottom plate with an opening therein, with a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

5. In a magnetic separator, the combination of a hopper having a thin metal bottom plate with a row of small holes therein, with a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

6. In a magnetic separator, the combination, with a hopper having a flat bottom with an opening in it and means for vibrating it, of a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

7. In a magnetic separator, the combination, with a hopper having a flat bottom with a row of small holes in it and means for vibrating it, of a magnet below said hopper for altering the trajectory of magnetic material falling therefrom, substantially as set forth.

396,857. TRANSOM-LIFTER. JOHN FREEMAN, Philadelphia, Pa., assignor to Thomas Devlin & Co., same place. Filed Sept. 20, 1888. Serial No. 285,842. (No model.)



Claim.—1. A transom-lifter consisting of an oscillating shaft, a toggle-lever having the lip 8 at the pivotal connection of its parts, and the recessed portion 2, said lever adapted to be pivotally connected to said shaft and a transom, the arm D, rigidly connected to said shaft and having a segment on one end, the pulleys 5 and 7, and the cords 4 and 6, said parts combined substantially as described.

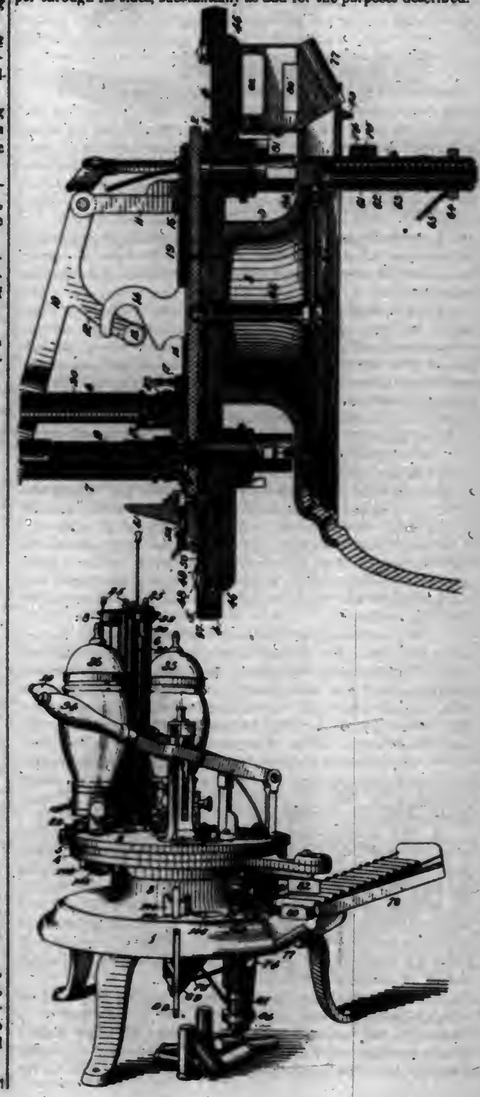
2. The combination of a rocking shaft with a two-arm lever se-

cured to said shaft, so as to extend radially therefrom peripherally-grooved, a segment at the outer end of one of its arms, the pulley 7 above said segment, the cord 6, secured to the segment and passing over said pulley 7, the pulley 5 below the rocking shaft, and the cord 4, secured to the other arm of the lever and passing through the said pulley 5, said parts being combined so as to operate or rock said shaft in opposite directions, substantially as described.

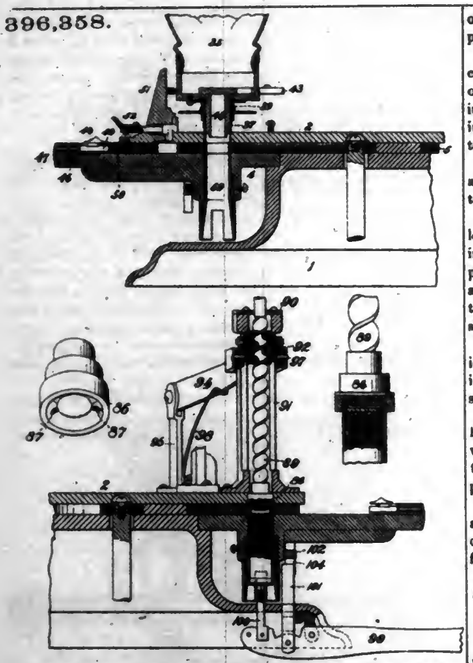
396,858. CARTRIDGE-LOADING MACHINE. EDWARD A. FRANKLIN, Brenham, Tex., assignor to Bailey Farrell & Co., Pittsburg, Pa. Filed Dec. 12, 1887. Serial No. 257,638. (No model.)

Claim.—1. The combination, in a machine for loading cartridges, of a stationary bed-plate mounted on a stand and an oscillating plate, 5, beneath it, with a revolubie plate arranged beneath the oscillating plate and carrying a pair of shell-holders at opposite sides, powder, shot, and wad chargers, together with a plunger for charging the cartridges, mounted on the bed-plate, and a feeding device comprising a shell-hopper, chute, and guide having a plunger, all arranged in conjunction with and operated from the movable plates for charging the empty shells into the holders, substantially as and for the purposes described.

2. A wad-hopper consisting of an open frame formed of vertical wires, one of which is removable for the purpose of charging the hopper through its sides, substantially as and for the purposes described.



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3. A wad-hopper having a threaded lower end, whereby it may be adjustably attached to a threaded socket, and a lock-nut whereby its adjusted position may be fixed, substantially as and for the purposes described.

4. In a cartridge-loading machine, a bed-plate, combined with a hopper for supplying ammunition and having a charging-chamber at its base composed of an externally-threaded tube fast on said bed-plate, a tube extending from the hopper into the first-named tube, and a screw-collar swiveled to the hopper and engaging the externally-threaded tube and rotatable to raise and lower the hopper, and thereby vary the capacity of the charger, substantially as and for the purposes described.

5. In a cartridge-loading machine, a bed-plate, combined with a hopper for supplying ammunition and having a charging-chamber at its base composed of an externally-threaded tube fast on said bed-plate, a tube extending from the hopper into the first-named tube, and a screw-collar swiveled to the hopper and engaging the externally-threaded tube and rotatable to raise and lower the hopper, and thereby vary the capacity of the charger, and a bracket rising from the bed-plate and provided with a set-screw tapped into the hopper and adapted to bind the hopper to the bracket, substantially as and for the purposes described.

6. The combination of a stationary bed-plate, a charging-plunger, wad-hoppers arranged on opposite sides of the plunger, wad-slides operated by spring-dogs for feeding the wads into the path of the plunger, an oscillating striker having a spring-pawl for engaging and retracting the slides, so as to permit the feed of the wads, and a tripping device for tripping the pawl to permit the release of the spring-dog, substantially as and for the purposes described.

7. The combination of a revoluble plate carrying the shell-holders with a spring-actuated incline arranged below the plunger for raising the shell in the holder into proper position with relation to the range of the plunger, substantially as and for the purposes described.

8. In a cartridge-loading machine, the stationary bed-plate, in combination with the revoluble plate and the shell-holders depending therefrom, a partly-revoluble plate interposed between the bed-plate and the revoluble plate, cartridge charging or loading devices fixed to the bed-plate, slides for such devices arranged in the bed-plate and adapted to be moved to open and close the loading devices, and arms projecting from the revoluble plate and carrying pawls to operate such slides, and also to connect and release the two plates, substantially as and for the purposes described.

9. The combination of the oscillating or partially-revolving plate with a tubular guide attached to the bed-plate and provided with a hinged side, which, when opened, acts to receive the empty shells, a plunger operating inside of the guide, an incline operated by a radial arm from said plate for actuating said plunger, and a bent rod for opening and closing the hinged side, substantially as and for the purposes described.

10. The combination of the tubular guide for receiving the empty cartridge, a spring-plunger arranged in said guide and operated by an oscillating incline to depress the plunger, a spring-stop for maintaining the plunger in a depressed position, and a wedge on said oscillating incline for tripping the stop and releasing the plunger, substantially as and for the purposes described.

11. The combination of the shell-holder with a tubular guide and a spring-plunger for feeding the empty shell into the holder, substantially as and for the purposes described.

12. The combination of the shell-hopper having a chute at its lower end, one part of which is movable, with a pivoted stop for closing the end of the hopper when the hinge of the chute is closed, a stop placed back of the end of the hopper the distance of one shell, and a pin arranged in the path of the hinged part of the chute, so as to trip the end stop when the hinged part is open and close the second stop, substantially as and for the purposes described.

13. The combination of the revoluble shell-holder with a crimping device arranged on the bed-plate and a recessed pitman for raising the cartridge up to and centering it beneath the crimper, substantially as and for the purposes described.

14. The combination of a cartridge-loading device and a feed-hopper for feeding the shells, said hopper having a track or way elevated above the bottom of the hopper to free the rims or flanges of the shells from contact with the hopper's bottom and thus insure their proper descent, substantially as and for the purposes described.

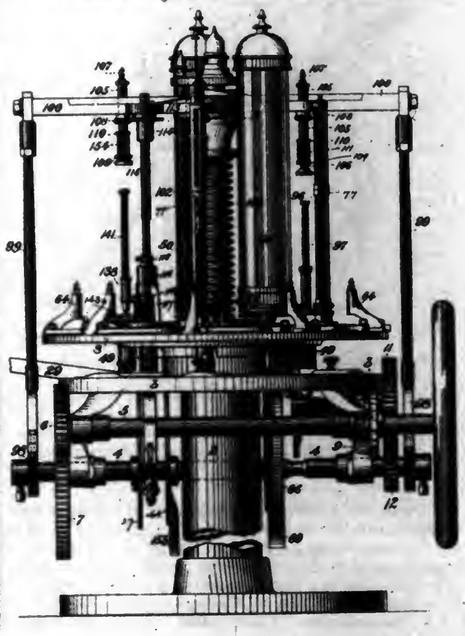
15. The combination of a bed-plate, a detachable shell-holder, and a revoluble plate in the bed-plate, and provided with circular feed-openings of different gages, so as to enable the holder to be changed for different-gage shells, substantially as and for the purposes described.

396,859. CARTRIDGE-LOADING MACHINE. EDWARD A. FRANKLIN, Brenham, Tex., assignor to Bailey Farrell & Co., Pittsburg, Pa. Filed Dec. 12, 1887. Serial No. 257,640. (No model.)

Claim.—1. In a cartridge-loader, the combination of a stationary bed-plate, a revoluble plate situated above the stationary plate and carrying one or more shell-holders, a shell-hopper, a shell-feeder situate below the plane of the shell-holders, and adjustable plates secured to the stationary bed-plate in the line of the movement of the shell-holders for accommodating different-lengthed shells, substantially as and for the purposes specified.

2. A wad-holder composed of two or more cylinders fitting one within the other and provided with slots sufficiently wide to admit of the passage of wads into the wad-holder laterally, the said cylinders being rotarily adjustable on a longitudinal axis to bring said slots into and out of register, substantially as and for the purpose described.

3. In a cartridge-loading machine, the combination of a stationary



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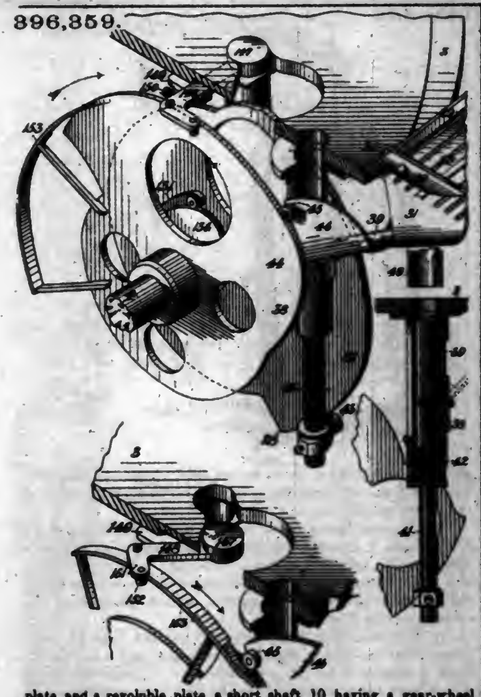


plate and a revoluble plate, a short shaft, 10, having a gear-wheel, 11, operated by the main shaft 4, a collar, 13, fast on the short shaft, two oppositely-radiating arms, 14 15, fast to said collar, and a flange, 16, depending from the revoluble plate and having ratchets 17 for the purpose of imparting an intermittent rotary motion to the revoluble plate, substantially as and for the purposes specified.

4. In a cartridge-loading machine, the combination of a stationary plate, a revoluble plate provided with depending ratchets 17, a driven shaft, 10, having arms 14 and 15 fixed thereto, the cams 20 and 21, also connected with and moved by said shaft, and a lock-rod, 22, operated by said cams to engage and disengage the revoluble plate, substantially as and for the purpose described.

5. In a cartridge-loading machine, an inclined shell-hopper, 29, provided on its lower surface with a series of ridges or grooves, 30, so as to raise the body of the shell above the bottom of the hopper sufficiently to prevent the rim on the head of the cartridge-shell from coming in contact therewith, substantially as and for the purposes described.

6. In a cartridge-loading machine, the combination of an inclined shell-hopper, a retaining shield or guard, 32, constructed of two or more superposed segmental sections of sheet metal adjustably connected by a slot and set-screw, and pivoted in the mouth of the shell-hopper, a shell-feeder having a pivoted leaf, the rotary cam acting upon said leaf, and a projection from the pivoted guard extended into the path of movement of the pivoted leaf, substantially as and for the purposes specified.

7. In a cartridge-loading machine, the combination of a shell-hopper, a retaining shield or guard, 32, vibrating arms 34, secured to said guard and pivoted to the hopper so as to locate the guard in the discharge end of the hopper, the shell-feeder having the pivoted leaf 39, and the bent rod 36, connecting the said pivoted leaf and guard, substantially as and for the purpose described.

8. In a cartridge-loading machine, the shell-feeder constructed of a cylindrical tube having a hinged leaf, 39, and an arm, 46, provided with the roller 45, combined with a rotary cam, 44, substantially as and for the purpose described.

9. In a cartridge-loading machine, the combination of a shell-hopper, a shell-feeder having a hinged leaf arranged to fall at the discharge end of the hopper, and a spring and a cam co-operating with the said leaf to direct the shell from the hopper into the feeder, and a plunger arranged in the feeder and connected with a retracting cam and a projecting spring, substantially as and for the purpose described.

10. In a cartridge-loading machine, the combination of a stationary bed-plate, an intermittently-revoluble plate, a series of shell-holders secured to the last-named plate, a shell-hopper and a vibrating shield or guard arranged in the discharge end of the hopper, a shell-feeder situated below the stationary bed-plate, and into which the shells are delivered from the hopper by the vibrating shield or guard, a spring-plunger for delivering the shells from the shell-feeder into the shell-holder, and a rotary cam for actuating the plunger, substantially as and for the purpose described.

11. In a cartridge-loading machine, the combination of a powder or shot canister mounted upon a stationary plate, a charger situated below the canister, a sliding plate for making and breaking connection between the canister and the charger, said plate having a cam on its outer edge, and a post or posts mounted on the revolving plate so as to operate the slides, substantially as and for the purposes described.

12. In a cartridge-loading machine, the combination of a stationary plate, 51, and a shot or powder canister having a charger connected to said plate, a cut-off in the upper end of such charger, and a slide, 60, arranged in the lower end of each charger and provided with a slot and thumb-screw, 61, to connect it movably to the plate 51, so as to cut off the lower mouth of the charger and close the same until the shell is brought into position for its charge of powder or shot, substantially as and for the purposes specified.

13. In a cartridge-loading machine, the combination of the stationary plate 51, having openings 56, shot or powder canister having a charger arranged beneath it, a spring-slide, 62, arranged in the bottom of the canister to admit a charge into the charger and then cut off the supply, and a revoluble plate, 8, having a series of shell-holders attached thereto, said holders being open at the top of the revoluble plate, substantially as and for the purposes described.

14. In a cartridge-loading machine, the combination of a stationary bed-plate, a type-holder, 72, arranged to rotate upon said plate, an inking-pad, 68, also arranged upon said plate to swing up against and ink the type in the type-holder, a rotary cam and connections between it and the type-holder and inking-pad, and a revoluble plate having a series of shell-holders provided with slots into which the type-holder is projected, substantially as and for the purpose described.

15. In a cartridge-loading machine, the combination of a stationary plate, a revoluble plate having a series of shell-holders and arranged above the stationary plate, a second non-rotating plate arranged above the revoluble plate, a wad-hopper and a wad-plunger on said non-rotating plate, a wad-slide arranged beneath the wad-hopper, and inclined arms 155, mounted upon the revoluble plate and acting upon the wad-slide, substantially as and for the purpose described.

16. In a cartridge-loading machine, the wad-slide 82, composed of two strips of metal removably united, combined with a slideway and an adjustable hopper, substantially as and for the purpose described.

17. In a cartridge-loading machine, the combination of a stationary plate, a revoluble plate having a series of shell-holders arranged above the stationary plate, a second non-rotating plate arranged above the revoluble plate, a wad-hopper and a wad-plunger on said non-rotating plate, a wad-slide arranged beneath the wad-hopper, and inclined arms 155, adjustably mounted upon the revoluble plate and acting upon the wad-slide, substantially as and for the purpose described.

18. In a cartridge-loading machine, the combination of a spring stamping-plunger, a vertically-reciprocating cross-head, a hammer attached with an intervening spring to said cross-head and arranged thereon in the plane of the plunger to act upon and depress it upon the descent of the cross-head, and an inking-roller to supply ink to the stamping device, substantially as and for the purpose described.

19. In a cartridge-loading machine, the stationary bed-plate 3, having an opening through which the shell is discharged after being stamped, the pivoted disk 147, arranged in said opening to support the disk while being stamped, and the cam 153 and spring 150, for operating the said disk, in combination with the stamping device secured above the bed-plate and comprising a plunger and the reciprocating cross-head having a hammer to descend upon the plunger to operate the stamping device, substantially as and for the purpose described.

20. In a cartridge-loading machine, the combination of a stationary plate having an aperture for the passage of the wad, an inserted plate, 87, which plate is provided with two or more openings of different sizes to accommodate different sizes of wads, and a locking-bolt, 86, substantially as and for the purpose specified.

21. In a cartridge-loading machine, the combination of a wad-hopper, a wad-slide, and the arm 160, arranged vertically in the wad-hopper base and provided with a spring normally elevating it, and a set-screw for depressing it at pleasure, and the arm 161, connected to and moving with the other arm to close and open the wad-hopper through the movements of said arm 160, substantially as and for the purpose described.

22. In a cartridge-loading machine, the combination of a rotating crimping-head, a plunger, 122, arranged beneath said head and carrying the shell to be crimped, a cam, 134, on the rotary shaft 4, the plunger-operating arm 129, pivoted to a stationary member of the machine and having the arm 131 engaging the cam, and an ad-

justable foot on said lever interposed between it and the plunger, substantially as and for the purpose described.

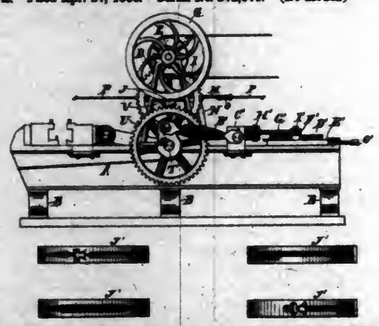
396,360. LETTER-BOX. MADORA J. HEWLETT, Paducah, Ky. Filed July 25, 1888. Serial No. 281,014. (No model.)



Claim.—1. The combination, in a letter-box, of the frame H, secured thereto and provided with an opening, and a partially-revolving disk, I, placed in the frame, with the lid C, provided with a projection, of a rod engaging the disk, and a bottom or door to the box which operates the rod and the disk, substantially as described.

2. The combination, in a letter-box, of the lid C, provided with a projection upon its inner side, with the disk I, which is held in position by the projection, the operating-rod, and the bottom or door for operating the disk through the rod, substantially as set forth.

396,361. ROLLING-DIE MACHINE. WILLIAM H. JOHNSON, Racine, Wis. Filed Apr. 27, 1888. Serial No. 272,076. (No model.)



Claim.—1. In a die-machine, two segmental oscillating die-blocks having opposing convex surfaces respectively pivoted to a stationary support, in combination with each other and with operating mechanism adapted to communicate an oscillating movement to both of said dies simultaneously, substantially as and for the purpose specified.

2. The combination, in a die-machine, of two rolling die-blocks, D' D', each provided with interchangeable adjustable face-blocks J' J', die-retaining pivots F' F', connecting-links G' G', head-block C, pitmen B' B', cranks A' A', shaft T, and a chain of gears communicating therefrom with the driving mechanism, substantially as and for the purpose specified.

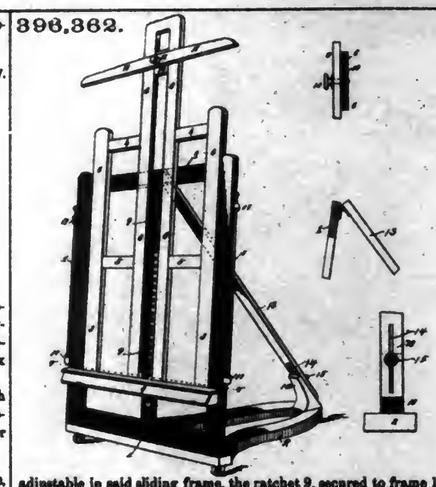
3. The combination of the driving-shaft J, the therein-revolving spur-wheels I I, provided with notched hubs K K, and the grooved collars L L, provided with teeth or lugs *d d*, levers M M, centrally pivoted on standard N and provided with bifurcated ends riding in the grooves in collars L L, the toggle-arms O O, and reciprocating rod P, supported and riding in the top of standard N and provided with handles, substantially as and for the purpose specified.

4. In the die-operating mechanism herein described, the combination of the shaft T, geared with the operating mechanism of the machine, cranks A' A', pitmen B' B', reciprocating cross-head C', connecting-links G' G', communicating between the cross-head C' and the oscillating die-blocks D' D', and the convex removable dies or face-blocks J' J', affixed to the opposing ends of the die-blocks D' D', substantially as and for the purpose specified.

5. The combination of the shaft T, geared with the operating mechanism of the machine, cranks A' A', pitmen B' B', cross-head C', pivots H' H', connecting-links G' G', die-blocks D' D', interchangeable die-blocks J' J', having opposing convex surfaces connected with said blocks D', and adjustable journal-bearings L L, secured in said die-blocks D' and adapted to operate on the die-supporting pivots F' F', all substantially as and for the purpose specified.

396,362. EASEL. CHARLES MAHER, St. Louis, Mo. Filed Apr. 17, 1888. Serial No. 270,908. (No model.)

Claim.—1. The combination, to form an easel, of the frame 1, hinged to the base 2, the sliding frame 3, mounted directly upon the frame 1, a cross-piece, to which the canvas is adapted to be secured,



adjustable in said sliding frame, the ratchet 9, secured to frame 1, and the catch 8 therefor, attached to said sliding frame, substantially as and for the purpose described.

2. The combination of the frame 1, hinged to the base 2, the sliding frame 3, mounted directly upon said frame 1, an adjustable cross-piece, 11, to which the canvas is adapted to be secured, movable in said sliding frame, a leg, 13, hinged to the frame 1 and adjustably secured to the base 2 by means of slot and thumb-screw, substantially as described.

3. The combination of the hinged frame, as 1, a second frame sliding within the same, to which the canvas is secured, a ratchet, 9, a catch, 8, secured to the sliding frame, a block, 10, adjustable in said sliding frame and provided with cross-piece 11 and thumb-screw 12, a leg, as 13, hinged to said frame 1, and adjustable by means of slot and thumb-screw, substantially as described.

396,363. SASH-FASTENER. WILLIAM T. MORGAN, Muncie, Ind. Filed Aug. 4, 1888. Serial No. 282,019. (No model.)



Claim.—1. The combination, with a stationary rod secured to the window-frame and provided with a series of perforations and a groove, of a sliding spring-rod secured to the upper sash and provided with a pin adapted to slide in said groove and enter said perforations, all constructed, arranged, and operating substantially as shown and described.

2. The combination, with a stationary rod secured to the window-frame and provided with a series of perforations and a groove, of a sliding rod having its upper end bifurcated to form arms and secured to the upper sash, and a pin arranged between the said arms and said stationary rod, passed between said arms on the sliding rod, substantially as described.

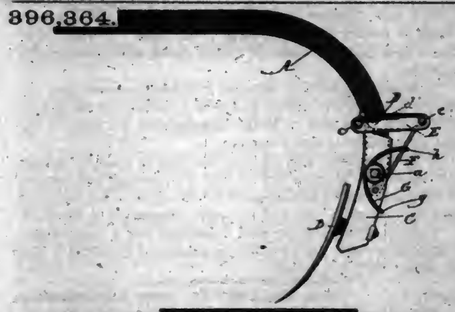
3. The combination, with a stationary rod and a sliding rod secured to the upper sash and adapted to engage said stationary rod, said sliding rod provided with a series of perforations and a groove, of a hook secured to the lower sash and adapted to slide in said groove and enter said perforations, substantially as described.

396,364. CULTIVATOR. JOHN F. PACKER, Chicago, Ill., assignor to The David Bradley Manufacturing Company, same place. Filed Oct. 27, 1888. Serial No. 289,230. (No model.)

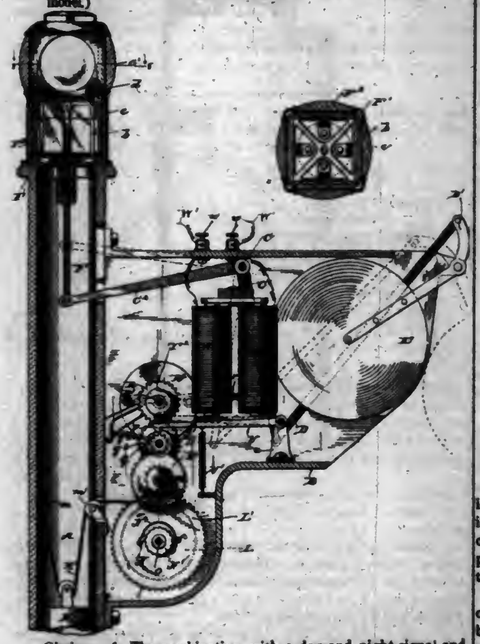
Claim.—1. In a cultivator-beam, the combination, with a spring-sustained pivoted shovel-support, C, of the locking bar or rod F, whereby the spring-vibrations are prevented from being communicated to the shovel, substantially as described.

2. A standard or beam and a shovel and shovel-support pivoted to the beam, in combination with links D and E, hooked rod F, and spring G, constructed substantially in the form shown, substantially as and for the purpose specified.

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396,365. RAILWAY-SIGNAL. WILLIAM C. PAUL and OSCAR D. KLEINSTUBER, Milwaukee, Wis., assignors of one-third to Thomas K. Ewing, same place. Filed July 21, 1887. Serial No. 244,903. (No model.)



Claim.—1. The combination, with a day and night signal and suitable gearing, of two cam-wheels facing in opposite directions and arranged one above the other, an electro-magnet, and an armature-pawl, one end of which is pivoted to the casing and the other having a head adapted to engage alternately with the notches of the respective cam-wheels, a wrist-wheel carried by the shaft of one of the cam-wheels, a link wristed to said wrist-wheel, and a bell-crank lever connected by said link with the wrist-wheel and toggled to the day and night signals, substantially as described.

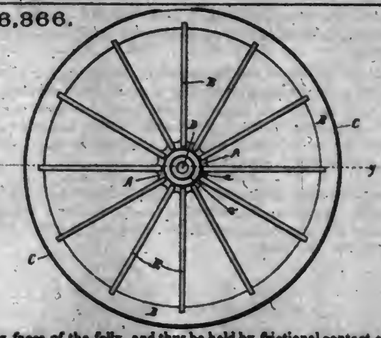
2. The combination, with the electro-magnet and its pivoted armature having a double catch-head on its free end, of two oppositely-faced cam-wheels, and clock-work gearing for driving them, a wrist-wheel carried by the shaft of one of the cam-wheels, and levers linked to said wrist-wheel and to the signals, substantially as described.

396,366. WHEEL. THOMAS J. RICE, Beulah, Colo. Filed June 26, 1888. Serial No. 278,269. (No model.)

Claim.—As a new article of manufacture, a wheel whose spokes E are inwardly inclined at their bases *b'* reversely to the adjacent surface of the hub A, so that a wedge-like union of the hub and spokes is established and covered by driving the hub in or out of contact without dislocating the spokes, and whose outer bases, *b b*, are inclined outwardly from a transverse median line to correspond with the ad-



396,366.



joining faces of the felly, and thus be held by frictional contact solely, for the purpose set forth, and in the manner specified and illustrated.

396,367. SECONDARY BATTERY. ISAIAH L. ROBERTS, Brooklyn, assignor to the Roberts-Brevoort Electric Company, (Limited,) New York, N. Y. Filed May 1, 1888. Serial No. 272,519. (No model.)

Claim.—The combination, in an electric battery, of a suitable conductor carrying upon it the oxide of a metal with its coated side or sides in contact with a mass of paste, substantially as described, which holds the oxide in place upon the conductor and permits electrolysis.

396,368. SECONDARY BATTERY. ISAIAH L. ROBERTS, Brooklyn, assignor to the Roberts-Brevoort Electric Company, (Limited,) New York, N. Y. Filed May 1, 1888. Serial No. 272,520. (No model.)



Claim.—1. In an electric battery, a conducting-support covered in whole or in part with a salt of a metal, the said salt being formed into a paste and intimately spread upon the supporting-conductor, in combination with a pasty mass through which electrolysis can take place, which pasty mass is adapted to hold the salt in contact with the conducting-support, substantially as described.

2. In an electric battery, a conducting-support covered in whole or in part with a salt of a metal in a finely-divided condition, in combination with a pasty mass through which electrolysis can take place, which pasty mass is adapted to hold the salt in contact with the conducting-support, substantially as described.

3. In an electric battery, a conducting-support covered in whole or in part with the salt of a metal surrounded by an envelope of gelatinized fiber, in combination with a pasty mass through which electrolysis can take place, which pasty mass is adapted to hold the salt in contact with the conducting-support, substantially as described.

4. The combination of a conducting-support formed of metal having upon its surface a salt of the same metal, in combination with a pasty mass adapted to hold the salt in position and to permit of electrolysis, substantially as described.

396,369. SECONDARY BATTERY. ISAIAH L. ROBERTS, Brooklyn, assignor to the Roberts-Brevoort Electric Company, (Limited,) New York, N. Y. Filed Oct. 11, 1888. Serial No. 287,575. (No model.)



Claim.—1. The process of making an electric battery, which consists in covering a conducting-support with a metallic salt itself made into a paste, and then holding the same in position upon the

support in the completed battery by the use of a paste capable of electrolysis, or of permitting chemical action to pass, substantially as described.

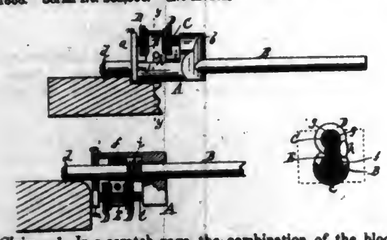
2. The process of making an electric battery, which consists in covering a conducting-support with a metallic salt, enveloping the same in an envelope or bag of suitable material, preferably gelatinized fiber, then surrounding the conducting-support, salt, and bag with a paste capable of electrolysis, or of permitting chemical action to pass, substantially as described.

396,370. APPARATUS FOR SIZING BARRELS. THOMAS ROBERTS, Philadelphia, Pa., assignor of one-half to John J. Crouse, same place, and John Ansty, Lansdale, Pa. Filed Aug. 25, 1888. Serial No. 283,755. (No model.)



Claim.—A pair of skids for sizing barrels, said skids having side rails with recesses out of line with each other, substantially as described.

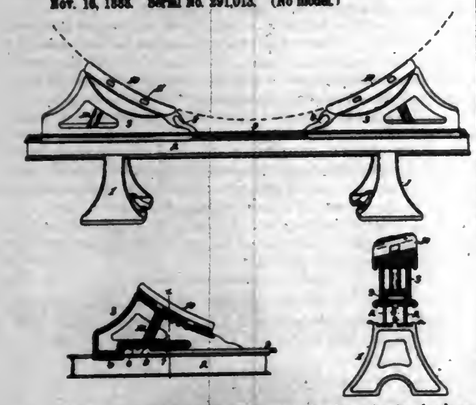
396,371. SCRATCH-GAGE. WILLIAM G. ROSS, Decatur, Ill., assignor of one-half to William A. Houck, Rochester, N. Y. Filed Aug. 9, 1888. Serial No. 282,380. (No model.)



Claim.—1. In a scratch-gage, the combination of the block A, the rod B, extending through the same and provided with the scratch-point *d*, the screw C, the adjusting-nuts D D, slotted clamp E, and the thumb-screw *h*, arranged to operate in the manner and for the purpose specified.

2. In a scratch-gage, the combination of the block A, the rod B, provided with scratch-point *d*, the screw C, the adjusting-nuts D D, the slotted clamp E, the thumb-screw *h*, and the spring *i*, arranged to operate in the manner and for the purpose specified.

396,372. BARREL-STAND. CHARLES C. SCHREINER, Cincinnati, Ohio, assignor to the L. Schrufer & Sons Company, same place. Filed Nov. 16, 1888. Serial No. 291,013. (No model.)



Claim.—1. The combination of supporting-bases having horizontal ways, the shoes movable along the length of the ways to adjust the shoes to and from each other, locking devices for securing the shoes in their adjusted position, and saddles on the shoes for sustaining a cask, substantially as described.

2. The combination of supporting-bases having ways, two shoes arranged on the ways, and one movable to and from the other along the length of the ways, locking devices for holding the shoes stationary, and a rocking saddle on each shoe, substantially as described.

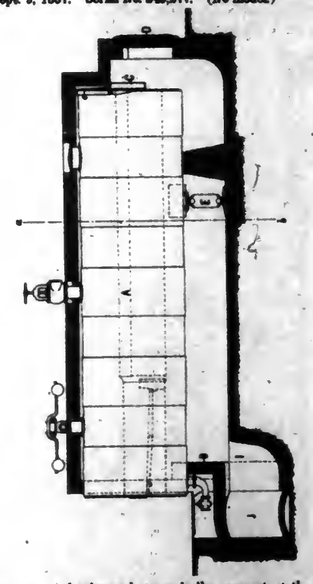
3. A cask-support consisting of the stands 1, provided with grooves to receive the flanged ways 2, the shoes 3, provided with concave seats, and the saddles 10, having convex bases, substantially as specified.

4. In combination with the ways 2, rigidly supported upon the base, the shoes 3, provided with lock-teeth 7, and the lock-bar 9, resting upon the ways, with its hooks engaging with the teeth of the shoes, substantially as herein specified.

5. In combination with the ways 2, having an aperture between them, the shoes 3, provided with a tenon, 4, projecting down between the ways and adapted to slide upon and be locked to the ways, and means for locking the shoes to the ways, substantially as described.

6. In a cask-support, the shoe 3, provided with a concave seat, in combination with the self-adjusting saddles 10, supported in said seat, substantially as specified.

396,373. STEAM-BOILER SETTING. GEORGE H. SELLERS, Ridley Park, Pa., assignor to the Edge Moor Iron Company, Edge Moor, Del. Filed Sept. 9, 1887. Serial No. 249,277. (No model.)



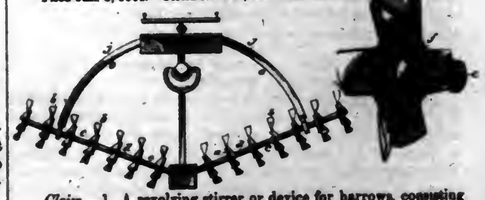
Claim.—1. A horizontal steam-boiler, except at the firing end, inclosed within a chamber, so that products of combustion shall have access to the entire exterior of the boiler within the chamber, in combination with a rocker-support and a fixed safety-support, substantially as and for the purposes set forth.

2. In combination with a steam-boiler and a suitable support, the saddle G, composed of two pieces united by the loop-strap *d d*, substantially as described.

3. A steam-boiler and the saddle G, in combination with the rocker-frame E, which supplements the loop-strap *d d*, substantially as described.

4. In combination with a steam-boiler, the rocker-support E, composed of the rocker-frame E, its base-plate F, and the saddle G, arranged and combined substantially as and for the purposes set forth.

396,374. HARROW. EDWIN F. SHERMAN, Springfield, Mass.; Caroline M. Sherman executrix of said Edwin F. Sherman, deceased. Filed Jan. 5, 1888. Serial No. 259,901. (No model.)



Claim.—1. A revolving stirrer or device for harrows, consisting of a central plate, *a*, in combination with radial blades *b*, projecting therefrom, the leading edges of which blades are radial and the following edges bent or offset from the plane of rotation, said offset being on a straight line, substantially as shown.

2. A revolving-blade device for harrows, consisting of a central plate, *a*, having exterior ribs, as *f*, and having blades *b* attached to said plate between said ribs and projecting radially therefrom, substantially as shown.

3. In a revolving harrow, the combination of a shaft, blade-holding plates *a*, sleeves *d*, and removable blades *b*, whose inner ends project below and are held in place by the sleeve ends, substantially as and for the purposes stated.

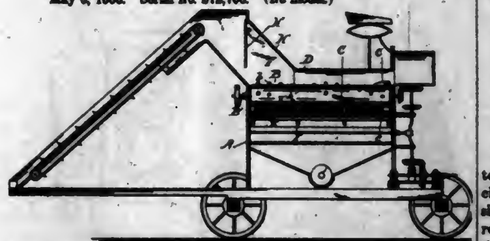
4. In a harrow or cultivator, a revolving harrow or tooth plate with tooth-supporting ribs upon each side, in combination with removable blades whose inner ends fit between said ribs, substantially as shown.

5. A blade for revolving harrows, having the rear portion of its earth-working part offset or bent at an angle on a straight line extending from the outer edge from a point a short distance back from the leading edge and extending upward and rearward, substantially as shown.

6. The revolving stirrer or device described, consisting of a hub or central portion, *a*, and plate-metal arms secured alternately to the opposite sides of said central portion and extending radially therefrom, the following corners of which arms are bent alternately in opposite directions, substantially as described.

7. In a revolving harrow, the combination of a shaft, *c*, a series of single plates, *a*, sleeves *d*, disposed between said plates, and removable blades whose inner ends rest between the ends of the sleeves and plates, substantially as shown.

396,375. CORN-SHELLER. DAVID SHELLING, Adams, La Salle County, assignor to the King & Hamilton Company, Ottawa, Ill. Filed May 3, 1888. Serial No. 272,703. (No model.)



Claim.—1. In a corn-sheller, a shelling-cylinder provided with teeth arranged spirally on the cylinder and short spiral wings arranged at intervals in the spiral rows of teeth, in combination with a tubular casing surrounding said cylinder, substantially as and for the purposes specified.

2. In a corn-sheller, the casing D, composed of bars E and circular supports F, in combination with the shelling-cylinder B, provided with teeth *b*, arranged in spiral rows, and short spiral wings C, mounted on said cylinder adjacent to the circular supports F of the casing, substantially as and for the purposes specified.

396,376. OVERFLOW-CHECK NOZZLE. EPHRAIM W. SPEAR, Boston, Mass., assignor of two-thirds to George W. Lawler and James L. Smith, same place. Filed Aug. 18, 1888. Serial No. 283,097. (No model.)

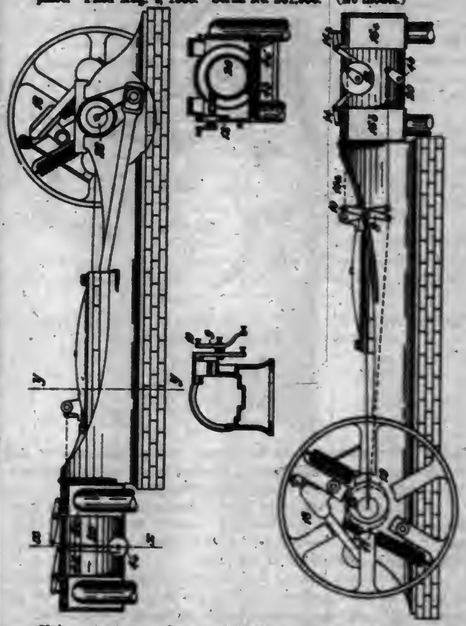


Claim.—1. An automatic overflow-check nozzle consisting of the combination of a liquid-discharge nose, a separate air-admitting tube, and an acoustic indicator, constructed and arranged substantially as and for the purposes described.

2. An automatic overflow-check nozzle consisting of a discharge-nose, N, a separate air-admitting tube, B, terminating at its outer end near the end of the said nose and at its inner end near the inner side of the can, and an acoustic indicator, C, attached to the inner end of the tube B, substantially as and for the purposes described.

3. An automatic overflow-check nozzle provided with an acoustic indicator, substantially as described.

396,377. VALVE-GEAR FOR ENGINES. JOSEPH W. THOMPSON, Salem, Ohio, assignor of one-half to the Buckeye Engine Company, same place. Filed Aug. 4, 1888. Serial No. 281,953. (No model.)



Claim.—1. A cam plate or disk for valve-gears, which is fitted to oscillate upon a central bearing and provided with one or more circumferentially-adjustable sections, each having a cam-groove consisting of substantially concentric portions of longer and shorter radius, respectively, connected by an intermediate eccentric portion, substantially as set forth.

2. The combination of a cam plate or disk having a central hub fitted to oscillate upon a fixed bearing and a peripheral rim or flange, one or more cam-sections fitting between and abutting against said hub and rim, each having a groove consisting of substantially concentric portions of longer and shorter radius, respectively, connected by an intermediate eccentric portion, and bolts passing through slotted holes in the cam sections or disk and securing the sections adjustably to the disk, substantially as set forth.

3. The combination of a valve governing one or more cylinder-ports, an oscillating cam having a cam-groove, substantially as described, a valve-lever coupled to the valve-stem and engaging the cam-groove, and an eccentric actuating a rod coupled to a pin connected with the oscillating cam, substantially as set forth.

4. The combination of an eccentric fixed upon a driving-shaft, an eccentric mounted adjustably upon said shaft, a compound rocker system connected to the rods of the fixed and adjustable eccentrics, a cam fitted to oscillate upon a fixed bearing and provided with one or more cam-grooves, substantially as described, a rod coupling a pin connected to said cam with a pin on the compound rocker system, and an induction valve or valves, each actuated by a lever engaging one of said cam-grooves, substantially as set forth.

396,378. BOOT OR SHOE TRIMMING MACHINE. CHARLES H. TRASK, Lynn, Mass. Filed Mar. 19, 1888. Serial No. 267,597. (No model.)

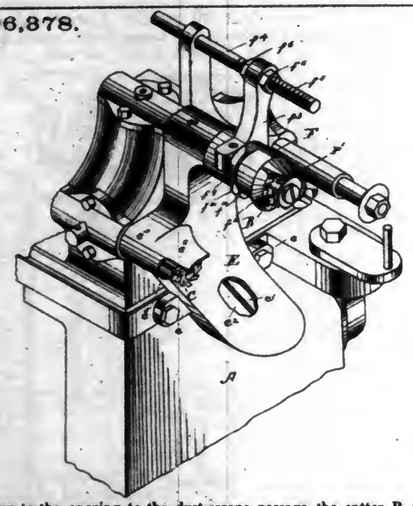
Claim.—1. The combination, in a sole or heel edge trimming machine, of a rotary cutter with a hood containing a passage connecting with a passage extending to an exhaust-chamber and horizontally adjustable by means substantially as specified, as and for the purposes described.

2. The combination of the box or casing having a section of the escape-passage, the section e^3, having an opening, e^5, the hood F, the rod f^9, the supporting-arm f^3, the nuts f^4, and the cutter B, substantially as described.

3. The combination of the hood F, having the section *f*, provided with the hole f^7, to fit the shaft f^9, the cutter B, and devices for moving the hood horizontally upon the shaft, substantially as described.

4. The combination of the hood F, adjustable horizontally in re-

396,878.



lation to the opening to the dust-escape passage, the cutter B, and a sole-edge rest, f^7, formed upon or attached to said hood and horizontally movable therewith, substantially as described.

5. The combination of the hood F, horizontally adjustable in relation to the cutter B and having a recess, f^9, the spring-heel edge-rest f^7, supported by said hood, and the adjusting-nuts f^{10}, held in said recess f^9, substantially as described.

6. The combination of the shank-edge cutter C, with the box or casing having a section, c^4, provided with an opening, c^6, and an extension, c^5, projecting over the cutter, substantially as described.

7. The combination of the shank-edge cutter C, the sole-edge cutter B, the box E, having the passage communicating with the exhaust and provided with the section c^4, having the opening c^6 in proximity to the shank-edge cutter C, and the section c^5, having the adjustable or movable sleeve provided with an opening in proximity to the sole-edge cutter B, substantially as described.

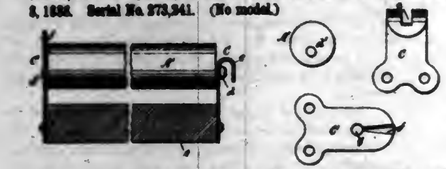
8. The combination of the cutter B and the hood F, having the opening g', and the end F', drawn in or reduced in size to provide the narrow opening g between it and the cutter, and forming a narrow passage of uniform width about the cutter, substantially as described.

396,879. HEMMER FOR SEWING-MACHINES. ALONZO WAYNE, Lancaster, Wis., assignor of one-half to Lemuel J. Arthur, same place. Filed July 25, 1888. Serial No. 281,095. (No model.)



Claim.—The combination, with a hemmer-plate, of a longitudinally-divided hem-turning scroll having its parts hinged together to permit opening for the insertion of the work, and a spring fixed to the hemmer-plate, with its free end resting upon the scroll and provided with a bend to receive the scroll when partially open and to resist further opening or closing motion thereof, whereby the parts are held firmly in convenient position for the insertion of the work.

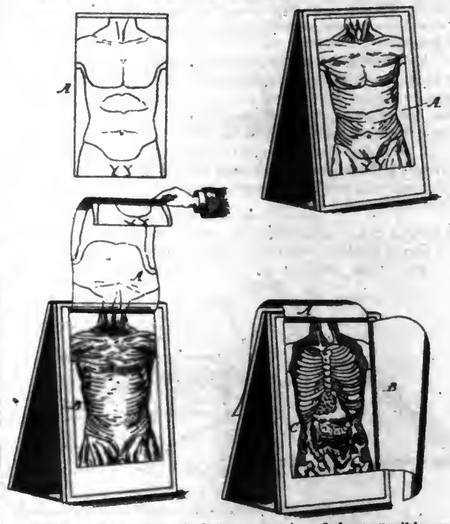
396,880. TROUSERS-STRETCHER. THOMAS WHITE and JOHN MILNE, New York, N. Y.; said Milne assignor to said White. Filed May 8, 1888. Serial No. 273,241. (No model.)



Claim.—1. In a trousers-stretcher, the combination, with a suitable brace, of clamping-bars, one fixed and the other movable, eccentric pivots on the ends of the movable bar, and bearings for said pivots on the fixed bar, one such bearing being slotted and hook-shaped and the pivot therein being headed to permit the movable bar to be swung away from the fixed bar without disconnecting said pivot from the bearing, and the other bearing constructed to permit removal of the pivot therefrom, substantially as and for the purpose described.

2. In a trousers-stretcher, the combination, with a suitable brace of clamping-bars, one fixed and the other movable, eccentric pivots on the ends of the movable bar, and bearings for said pivots on the fixed bar, one such bearing being slotted and hook-shaped and the pivot therein being headed, for the purpose specified, and the other bearing having a groove extending from the pivot-hole to the extremity thereof to act as a guide for the proper pivot, substantially as and for the purpose described.

396,881. ANATOMICAL CHART. LEVI W. YAGGY, Chicago, Ill., assignor to the Western Publishing House, same place. Filed Oct. 1, 1888. Serial No. 286,847. (No model.)



Claim.—In an anatomical chart, a series of sheets flexibly connected together, each having thereon a representation of some part or organ of the body, in combination with a transparent or semi-transparent sheet having thereon a front view of the exterior of the trunk and flexibly connected with the main part of the chart, whereby such transparent sheet can be brought over any one or more of the remaining sheets of the chart which may be at any one time exposed to view and the position of such exposed sheet or sheets relative to the front exterior of the body can be seen through such transparent sheet, substantially as specified.

396,882. TWO-WHEELED VEHICLE. DAVID A. GARVER and CLARENCE H. STRAIGHT, Bryan, Ohio; L. W. Wilder administrator of said Clarence H. Straight, deceased. Filed Sept. 8, 1888. Serial No. 284,573. (No model.)

Claim.—1. In a two-wheeled vehicle, the combination, with the axle and shafts connected thereto, of seat-bars connected to the shafts at the forward ends and brought together at the rear ends at a point near the center of the front edge of the seat, and springs for supporting said bars, substantially as described.

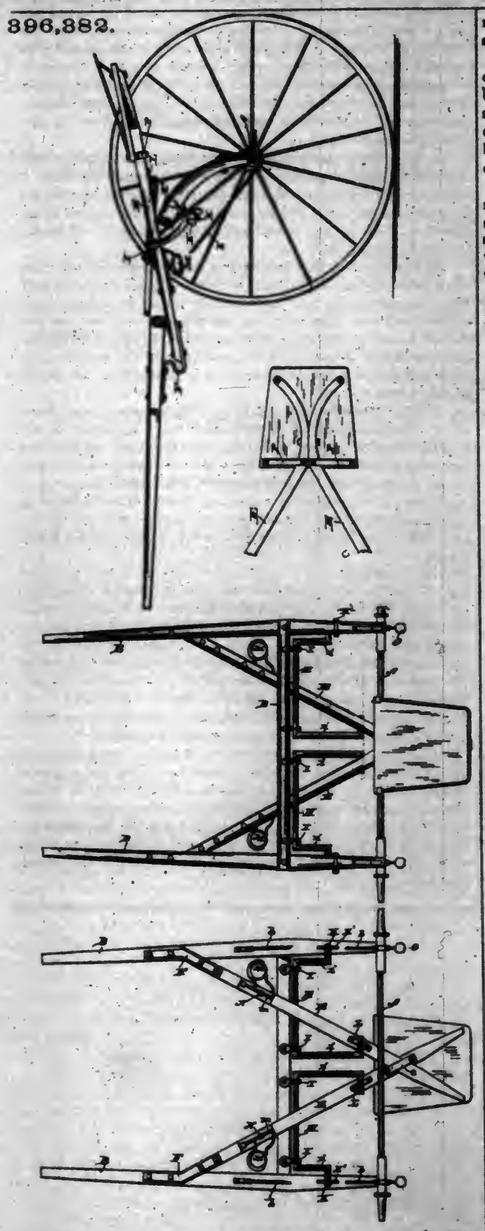
2. In a two-wheeled vehicle, the combination, with the axle and shafts connected thereto, of seat-bars connected to the shafts at the forward ends and extended back and crossed at substantially the center of the front edge of the seat, the crossed ends forming the support for the seat, and springs for supporting said bars, substantially as described.

3. In a two-wheeled vehicle, the combination, with the axle and shafts connected thereto, the seat-bars connected to the shafts at the forward ends and brought close together at the rear ends, forming the support for the seat, and the cross-bar connecting the shafts, of the torsion-springs mounted on and parallel with the cross-bar, the ends being extended at right angles and engaging the shafts and seat-bars, respectively, substantially as described.

4. In a two-wheeled vehicle, the combination, with the axle, shafts connected thereto, cross-bar uniting the shafts, and the seat-bars, of torsion-springs lying parallel with and in proximity to the cross-bar, one end of each of said springs being adjustably connected to the shaft and the opposite end engaging the seat-bars to support the same, substantially as described.

5. In a two-wheeled vehicle, the combination with the axle, the shafts connected thereto, the cross-piece uniting the shafts, and the

396,882.



seat-bars, of the torsion-springs mounted on the cross-piece, the outer ends of said springs being bent backward and connected to the shafts and the inner ends bent backward at points between the seat-bars and engaging said bars to support the same, whereby the space at either side of the seat-bars is unobstructed, substantially as described.

6. In a two-wheeled vehicle, the combination, with the axle, the shafts connected thereto, and the cross-piece uniting the shafts, of the seat-bars connected to the shafts by substantially S-shaped springs and extended backward beneath the cross-piece, and torsion-springs mounted on and parallel to the cross-piece with the backwardly-extending ends for supporting said bars, substantially as described.

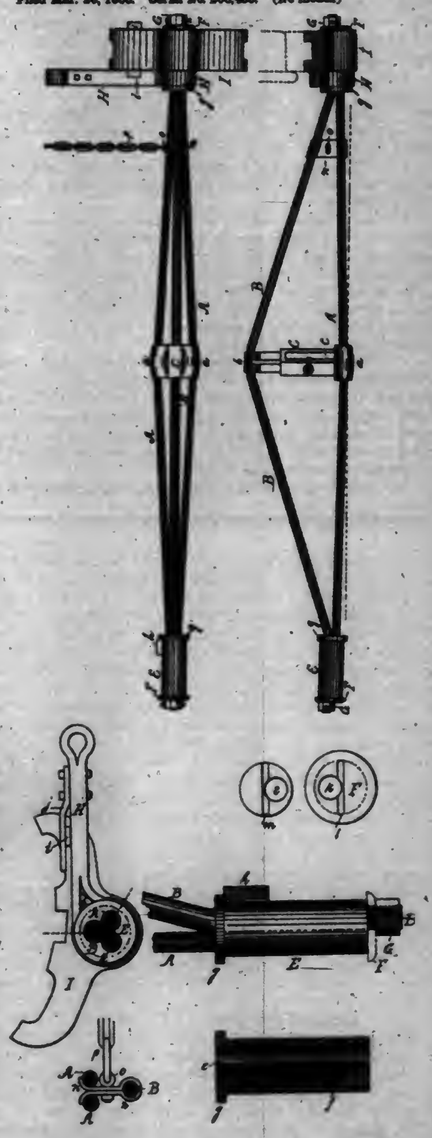
7. In a two-wheeled vehicle, the combination, with the axle, the shafts connected thereto, the cross-bar, and the seat-bars connected to the shafts at the forward ends by the substantially S-shaped springs and extending backward beneath the cross-bar of the seat supported on the rear ends of the seat-bars and the stirrups or foot-rests mounted on said seat-bars at the forward ends, substantially as described.

8. In a two-wheeled vehicle, the combination, with the axle, shafts connected thereto, seat-bars united to the shafts at the forward ends by substantially S-shaped springs, and the cross-piece uniting the shafts, of torsion-springs mounted on the cross-piece and bent at the ends to engage the shafts and seat-bars, respectively, the seat on said bars at the rear, and the foot-rests or stirrups thereon at the forward ends, substantially as described.

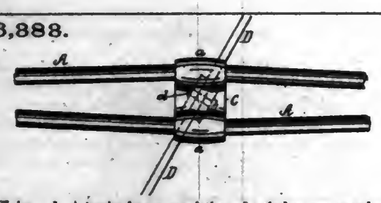
9. In a two-wheeled vehicle, the combination, with the axle, the shafts connected thereto, the cross-piece uniting the shafts, and the seat-bars connected to the shafts at the forward ends, of the torsion-springs engaging the seat-bars to elevate the same and connected to the under side of the shafts by the bolt, set-nut, and clip, whereby the tension of said springs may be adjusted, as set forth.

10. In a two-wheeled vehicle, the combination, with the shafts B B, of cross-piece D, springs H, having rearward extensions i', clips I, the seat-bars E, and wear-plates L, substantially as described.

396,883. BRAKE-BEAM. HARVEY L. PRESTON, Hudson, Wis. Filed Mar. 26, 1888. Serial No. 268,483. (No model.)



896,888.



Claim.—1. A brake-beam consisting of a tie-bar composed of two rods separated at their middle point, a double-inclined truss-rod, a sleeve uniting the said three rods at their extremities, the said sleeve forming bearings adapted to receive a hanger and brake-head, and means, substantially as described, for adjustably cambering said tie-rods to incline said sleeve-bearings to a greater or less angle from the longitudinal line of the beam.

2. A brake-beam consisting of a tie-bar composed of two rods separated at their middle point, a double-inclined truss-rod, a removable sleeve having a triple socket adapted to receive and unite the extremities of the said three rods, the said sleeve forming bearings adapted to receive a brake-hanger and brake-head, and a branching king post or strut, the said branches having bearings for said tie-rods and the opposite end of the body of the strut having a bearing for said truss-rod, substantially as and for the purpose herein specified.

3. In a brake-beam of the character described, consisting of two tie-rods and a truss-rod supported at their middle point by a forked strut, a triple sleeve removably mounted upon and retaining together the extremities of said rods, an outwardly-extending annular flange formed on the inner end of said sleeve, a V-shaped lug upon said sleeve abutting against said flange, and a brake-hanger adapted to surround said sleeve and having a recess to receive said lug, substantially as specified.

4. A brake-beam consisting of a tie-bar composed of two rods separated at their middle point, a double-inclined truss-rod, the extremities of the said tie-rods and truss-rod being brought together and united at their extremities by means of a removable sleeve forming bearings for the brake-hanger and brake-head, and the said tie-rods being cambered from their middle point, substantially as described, whereby the said sleeve-bearings are held at a slight angle to the longitudinal line of the beam.

5. A brake-beam consisting of three rods trussed together at their middle point by means of a forked strut forming the fulcrum-bar, the said rods being brought together at their extremities, a movable sleeve mounted upon and retaining said extremities together, and means for retaining said sleeve normally in position upon the extremities of the rods to form a seat for the brake-head, substantially as and for the purpose herein specified.

6. In a brake-beam of the character described, consisting of two main rods mounted in bearings formed at one end of the fulcrum-bar and a truss-rod mounted in a bearing at the opposite end of said fulcrum-bar and bent at its extremities to lie substantially parallel with the main rods, a triple sleeve having a socket of a form to receive the extremities of the three rods, the said truss-rod extending entirely through said sleeve and provided with a screw-thread and nut, whereby the sleeve may be retained in place, substantially as and for the purpose herein specified.

7. In a brake-beam of the character described, consisting of the two main rods and a truss-rod supported at their middle point by a forked strut, a triple sleeve mounted upon and retaining together the extremities of said rods, and an outwardly-extending annular flange formed on the inner end of said sleeve, substantially as and for the purpose herein specified.

8. In a brake-beam, in combination with the main rods and truss-rod, a sleeve having a triple socket of a form to fit the combined bulk of the several rods, the truss-rod extending entirely through the sleeve and provided at its outer projecting end with a screw-thread and nut, and the main rods abutting against an upright shoulder formed near the outer end of the sleeve by the termination of the portion of the triple socket in which said rods are held, substantially as and for the purpose herein specified.

9. In a brake-beam, in combination with the main rods and truss-rod, a triple sleeve mounted upon the outer united extremities of said rods and adapted to form a seat for the brake-head, the truss-rod extending entirely through said sleeve and provided at its outer projecting extremity with a screw-thread and nut, and a flange-cap of larger diameter than the said sleeve and adapted to be held in place upon the outer extremity of the truss-rod between said nut and the outer end of the sleeve, substantially as and for the purpose herein specified.

10. In a brake-beam, in combination with the main rods and truss-rod, a triple sleeve mounted upon the outer extremities of said rods and adapted to form a seat for the brake-head, the truss-rod extending entirely through said sleeve and provided at its outer extremity with a screw-thread and nut, a flange-cap of larger diameter than the said sleeve and adapted to be held in place upon the end of the truss-rod between said nut and the outer end face of the sleeve, the said sleeve having a groove formed across its outer end face, and a correspondingly-shaped feather formed across the inner face of the flange-cap, substantially as and for the purpose herein specified.

11. In a brake-beam of the character described, consisting of the main rods and the truss-rod united at their extremities and supported at their middle by means of bearings in a forked strut, the clamp-plates *n n*, adapted to grasp the several rods at the opposite extremities of the plates, and an eyebolt, *o*, passing through said plates and adapted to be connected with the supporting frame-work by means of a chain or other suitable support, substantially as and for the purpose herein specified.

PHOTO LITH. NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

STACHELBERG *et al. v.* PONCE.

Decided December 17, 1888.

TRADE-MARK.

It appearing that the mode in which the complainants packed their cigars, the kind of boxes used by them, the number of cigars in each bunch, the particular color of ribbon or tape around each bunch, and the size and shape of the cigars were all old in the trade, and that the name "La Normanda" had been used for cigars resembling the "La Normandi" cigars in size and shape, &c., in different parts of the country several years prior to the adoption of the words "La Normandi" by the complainants or their assignor, the adoption of these words as a Trade-Mark and their registration could not take away the right previously acquired by the public in the use of the words "La Normanda" as indicating a particular kind of cigars.

APPEAL from the Circuit Court of the United States for the District of Maine.

STATEMENT OF THE CASE.

This is a Trade-Mark case. The principal relief asked by the appellants, who were the plaintiffs below, is a decree enjoining the appellee, who was the defendant below, his agents and servants, from using as a trade-name in their business of manufacturing and selling cigars, the words "Normandie," or "E. P. Normanda," or "La Normanda," or "Normanda;" such use of those words being, it is alleged, a violation of the right of the plaintiffs to the exclusive use of the words "La Normandi" and "Normandi" in their business of manufacturing and selling cigars of a certain kind.

It is alleged, among other things, that one Asher Bijur, of New York, was engaged from 1858 to 1865 in manufacturing and packing cigars of various grades and shapes, some of which, of superior quality, were called "La Normandi," and were put up in boxes containing 250 each, labeled and branded with those words; that, being of fine stock, skillfully made, and of a shape that pleased the eye, his cigars of that kind became widely known, gaining great favor with the public, particularly in the New England States; that the first use by any one engaged in the manufacture, packing, or sale of cigars of the words "La Normandi" or "Normandi" was by him, those words constituting his Trade-Mark for cigars of the above description; that on or about February, 1865, he assigned, sold, transferred, and conveyed to the plaintiff, Michael Stachelberg, his heirs, and assigns, all his right, title, and interest in and to the exclusive use of the words "La Normandi" and "Normandi;" that on or about January 1, 1873, the plaintiffs formed a partnership under the firm-name of M. Stachelberg & Co., said Trade-Mark becoming their joint property; that since said assignment they have been engaged in manufacturing cigars under the names "La Normandi" and "Normandi," bestowing great care upon their packing, putting them up in bunches, (each bunch being tied with a peculiar colored and striped ribbon,) and offering them for sale in boxes containing 250 cigars each, branded with the words "La Normandi;" and that they have incurred great expense in bringing such cigars so named to public attention, whereby large profits have accrued from their sale.

The bill also states that on the 19th of February, 1876, the plaintiffs deposited in the Patent Office at Washington the name "Normandi" as a Trade-Mark, and March 7, 1876, received from that Office a certificate showing such record; that after said assignment, and up to the date of and since such deposit, they have used the word "Normandi," with the prefix "La," and that by virtue of such assignment, and of their uninterrupted use of the words "La Normandi," they acquired and have the sole and exclusive right to use them as a Trade-mark.

It is further alleged that since January 1, 1881, the defendant Ponce has been manufacturing, and causing to be manufactured, and offering for sale, cigars substantially similar in shape, size, and outward appearance to their La Normandi cigars, and has put them in boxes of the same pattern, general shape and size, and tied with ribbons colored and striped and resembling the ribbons used by them, his boxes being branded some with "Normanda," some "E. P. Normanda," and others "Normandie," whereby the defendant has fraudulently imposed and, unless restrained from so doing, will continue to impose upon the public his cigars as the real "La Normandi" cigars, manufactured, put up, and sold first by Bijur and afterward by the plaintiffs, and whereby, also, great and irreparable injury will be done to the plaintiffs in their business.

The defendant admits in his answer that he has sold cigars under the brand or label of "La Normanda;" but those words, he alleges, have always been accompanied on the boxes or packages containing them by the words "E. P.," or "E. Ponce," or "Ernesto Ponce," and sometimes by the words "Portland, Maine," thus indicating the manufacturer and the place at which his cigars were made. Denying that his Trade-Mark infringes the alleged trade-name of the plaintiffs, or that he intends to use any trade-name of theirs, he insists that Bijur did not, and could not, have an exclusive right to the words "La Normandi" as a Trade-Mark; that the words "Normandi" and "Normanda" are of foreign origin and of different significations, the former being a geographical and the latter a personal name; that the word "Normanda" has long been publicly used as a name or designation for cigars, was stamped upon boxes and packages containing them long prior to any of the alleged rights of the complainants; and that such terms were in public use as a designating-mark for a manufacture of cigars at Havana as early as 1861, and were so used in that year as a brand for cigars put up and sold by him, as well as by others. He contends that there is nothing in the shape or size of his cigars, or in the manner in which he bundles or ties them up, which can be exclusively appropriated by the plaintiffs. In respect to the use of the words "La Normandie," he denies that he has ever manufactured, or ordered to be manufactured, any cigars branded with those words, although in the course of his business he has bought and sold other and common brands of cigars marked in that way.

It was in proof that the alleged Trade-Mark, "La

Normandi," was used by the assignor of the plaintiffs as part of a label that consisted of those words printed at the top thereof; a picture, immediately below those words, of the interior of a cigar-factory while occupied by the employés of the manufacturer; and a fac-simile of Bijur's signature, together with the initials "A. B." The label used by the plaintiff consists of the words "La Normandi" at its top, beneath those words a picture of the interior of a cigar-factory as above stated, and at the bottom of the picture the following words and a fac-simile signature of M. Stachelberg, to wit:

Genuine La Normandi Segars are branded with my initials and the labels inside are signed in my own handwriting. M. Stachelberg. Entered according to act of Congr. A. D. 1866 by M. Stachelberg in the Clerk's Office of the Dis. Court of the Southern District of N. Y.

By the decree below the bill was dismissed upon the ground that when a right to the use of a Trade-Mark is transferred, either by the act of the original owner or by operation of law—

the fact of transfer should be stated in connection with its use; otherwise a deception would be practiced upon the public. (*Stachelberg v. Ponce*, 23 Fed. Rep., 490.)

Mr. Rowland Cox for the appellant.

Mr. William Henry Clifford for the appellee.

Mr. Justice HARLAN delivered the opinion of the Court.

After stating the facts as above, he continued: We are of opinion that the plaintiffs are not entitled to an injunction restraining the defendant from using the words "La Normanda" or "Normanda" as part of a brand or label for cigars manufactured or sold by him. If it was satisfactorily shown that those words were not used in the trade to designate a particular kind of cigars, until after the words "La Normandi" or "Normandi" had become a part of the established Trade-Mark of Bijur, it might be necessary to consider whether the former words taken in connection with the entire label or brand used by the defendant, his mode of packing his cigars, and their size and appearance, were calculated to deceive the public by inducing the belief that they were the same cigars as La Normandi cigars, manufactured and sold by Bijur and by the plaintiffs. But no such case is made by the proof. On the contrary it appears, by a preponderance of evidence: First, that the mode in which Bijur, and after him Stachelberg & Co., packed their La Normandi cigars, the kind of boxes used by them, the number of cigars in each bunch, the particular color of the ribbon or tape around each bunch of 25, the putting of 250 cigars in each box, and the size and shape of the cigars, were all old in the trade, preceding, in point of time, the adoption by Bijur of the words "La Normandi" as part of his trade-name; second, that for several years prior to the adoption by Bijur of his Trade-Mark, and from about that date until the bringing of this suit, cigars resembling the La Normandi cigars, in size and shape, in the color of the ribbon or tape by which the bunches of 25 were tied, and in the manner in which they were put up and packed, were and have been made and sold, in quite large numbers, in different parts of this country, under the name of "La Normanda." An effort is made to discredit the evidence establishing these facts by showing by witnesses, engaged for many years in the business of manufacturing and selling cigars, that they never knew or heard of any being sold under the name of "La Normanda." But the evidence to that effect is entirely negative in its character, and is not sufficient to overcome the direct positive testimony of witnesses, some of whom, as early as 1853, actually manufactured and sold La Normanda cigars of the kind above described, while others remember that domestic cigars, under that designation, were in the market before Bijur commenced the manufacture of the La Normandi cigars. In this view of the evidence the plaintiffs are not entitled to the relief asked. The adoption by Bijur of the words "La Normandi" as part of his Trade-Mark could not take away the right previously acquired by the public in the use of the words "La Normanda" as indicating a particular kind of cigars.

This conclusion is sufficient to dispose of the case, and renders it unnecessary to consider other grounds upon which, it is insisted, the decree below should be sustained.

The decree is affirmed.

U. S. Circuit Court—Eastern Judicial District of Missouri, Eastern Division.

BRINKERHOFF *v.* ALOE.

Decided December 24, 1888.

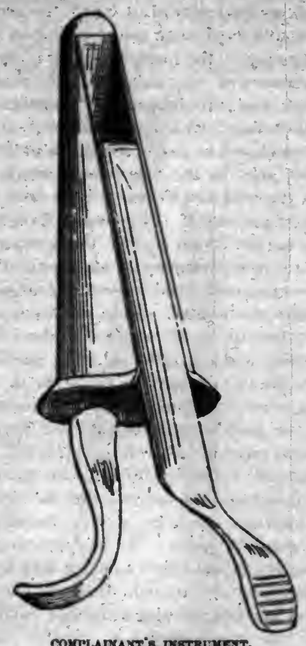
1. BRINKERHOFF PATENT—FIRST CLAIM IS ANTICIPATED.
   The first claim of the patent granted to A. W. Brinkerhoff March 2, 1880, on rectal speculums, is for a slide extending the entire length of the tube. *Held* anticipated by the older art.
2. MATERIAL NOT ESSENTIAL.
   Where an element of a claim does not depend for its novelty in the material of which it is made it will be anticipated by a like element in a like instrument of different material.
3. SAME.
   The slide employed in the Brinkerhoff instrument and covered, broadly, by the first claim of the patent is made of metal. The patent makes no mention of any novelty existing in the material of which the slide is composed. *Held* that the claim is anticipated by a glass slide in a similar instrument.
4. PATENTABILITY—WHAT DOES NOT AMOUNT TO INVENTION.
   A speculum consisting of a tube with a slide and a closed end was old. *Held* that adding an incline to the closed end to prevent the impaction of pile-tumors did not involve invention.
5. SAME—THIRD CLAIM VOID FOR WANT OF INVENTION.
   The third claim of the Brinkerhoff patent covers a speculum composed of a tube with a closed end and a slide and having an incline at the closed end. *Held* void for want of invention.
6. AGGREGATION.
   A claim consisting of a number of elements which do not coact to produce a new and useful result is a mere aggregation and not a patentable combination.
7. SAME—BETTER RESULTS NOT PROOF OF INVENTION.
   Where several old elements are so combined as to produce a better instrument than was formerly in use, but each of the old elements does only what it formerly did in the instrument from which it was borrowed and in the old way, *Held* that the combination is not a patentable one.
8. SAME—SECOND CLAIM IS AN AGGREGATION AND VOID.
   The second claim of the Brinkerhoff patent covers a slotted tube having an incline and a slide. *Held* that the incline acted precisely as it did when placed in the forward end of a slotted tube not provided with a slide, and that therefore the claim covered an aggregation only and was void.

Messrs. Lee, Brown & Lee for the complainant.

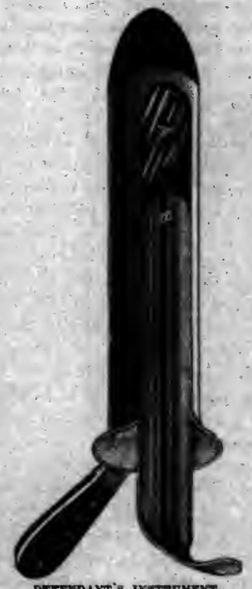
Mr. George H. Knight and *Mr. A. Binswanger* for the defendant.

THAYER, *D. J.*:

This is a bill to restrain the infringement of Letters Patent No. 224,991, granted to Alexander W. Brinkerhoff, under date of March 2, 1880, for an improvement in rectal specula.



COMPLAINANT'S INSTRUMENT.



DEFENDANT'S INSTRUMENT.

The patentee in his specification thus describes his invention:

My speculum is made of metal and plated in the usual manner to secure a bright interior and smooth surface. In shape it is conical, and has one side slotted through its entire length of chamber. Into such slot H is closely fitted a movable slide, B, having upon its rear end a handle, D, for actuating it. On the side of tube A, opposite the slide, is another handle, D, by which to hold the tube when in use.

Around the large end of tube A is a flange or lip. * * * and in the forward end of the chamber is an incline, K, made necessary in specula having closed ends to prevent * * * the impaction of pile-tumors, enlarged glands, or surplus membrane in the end of the chamber, and thereby enable the operator to withdraw the instrument with safety and ease.

Of the nature of his invention the patentee says:

* * * My invention consists in the use of a slide extending through the length of one side of the tube and an incline inside of the forward or small end of the chamber, extending from the bottom of the chamber upward and forward to the under side of the slide when in place, to prevent injury to the membrane while withdrawing the instrument, &c.

The claims made in the specification are as follows:

1. A slide in the side of a speculum, extending through its whole length, and used substantially as herein described.
2. The incline in the front end of the chamber, in combination with the tube, slot, and slide, substantially as and for the purposes herein set forth.
3. In cylindrical tubular specula having a slotted side and closed end to prevent the entrance of faeces, the incline in the front end of the chamber, extending upward from the bottom and forward to under side of slide, substantially as described, and for the purposes herein set forth.

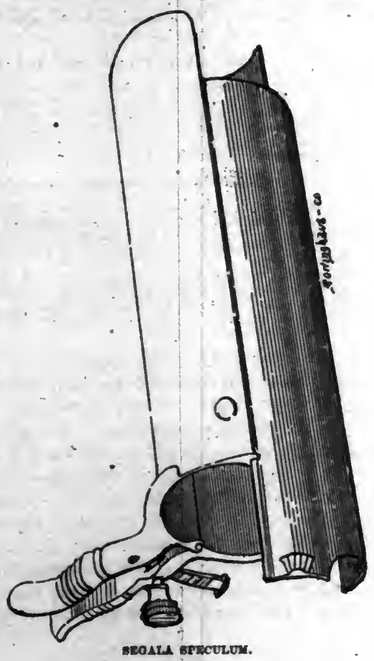
First. It is clear that the first claim of this patent covering "a slide in the side of a speculum, extending through its whole length," cannot be sustained. Indeed, it is not seriously contended by complainant's counsel that the device covered by that claim is novel. I shall not go into the details of the evidence, therefore, on this branch of the case, but will content myself with the general statement that the testimony of Dr. Warren B. Outen, Dr. Chas. Bernays, and Dr. Charles E. Michel, as well as the testimony of Wm. Grady and Herman Speckler, satisfies me that rectal speculums closed at one end, having a slot in the side



REED'S INSTRUMENT.

extending the full length of the chamber and fitted with a slide, had been used by the medical fraternity in this country before the date of the alleged invention. While it is true that defendant has not produced any of the speculums that were so in use, and

has only produced a model of one made in his own shop since this suit was filed, known as the "Reed speculum," yet I consider this fact not sufficient in



SEGALA SPECULUM.



CATHETER.

itself to overcome the positive statements of intelligent and entirely disinterested witnesses, who had occasion to know the fact whereof they speak, that speculums with slotted sides fitted with slides were in use and to some extent were on sale in this country prior to the date of the alleged invention in July, 1878. The Reed instrument, and possibly all the instruments of which the witnesses above named have spoken, had glass slides instead of metal; but that fact is not important, as the material of which the slide is composed is not claimed as an essential feature of the device. But even if the foregoing view is erroneous, I am furthermore of the opinion that the first claim of the patent was anticipated by "Segala's tri-valve vaginal speculum," which was produced on the hearing and was shown to have been in use in this country since 1860; also, by the "catheter," which was produced on the trial and shown to have been on sale in this country since 1874. (Defendant's Exhibits 17ª and 5ª.) The use for which both of the instruments last referred to were designed is analogous to that in which complainant employs his instrument. Both instruments are tubular. Each has a slot in the side extending the full length of the chamber, fitted with a metal slide, which is intended to be wholly or partially withdrawn (the same as the slide in the rectal speculum) when the operator has occasion to examine or treat the particular organs for the treatment of which these instruments were constructed. In view of the slides shown in Segala's vaginal speculum and in the catheter and the use made of the same it must be held that there is nothing novel in the slide claimed in complainant's patent. He has in this particular matter merely appropriated a device long known and used in surgical instruments fitted for the examination of certain interior membranes or cavities of the body for the improvement of another instrument adapted to the treatment of other interior membranes. Hilton's rectal speculum, an instrument said to have been in use in England as early as 1870, also clearly anticipates the first claim of complainant's patent, and probably the second and third claims. If Hilton's speculum, as contended, was described in a printed publication in England as early as 1876, that fact also invalidates the first claim of the patent under consideration, and most likely the second and third claims. The original printed publication relied upon, said to have been published in London as early as 1876, was not produced at the hearing before the master, but in lieu thereof a volume, entitled "Rest and Pain," published in New York in 1879, which purports to be a reprint of the earlier English publication, was produced. Some testimony was offered to the effect that application had been made to the English publishers and to other book-sellers in London and in this country for a copy of the original publication, and that they reported the work to be out of print. All of the testimony, however, tending to show that a book entitled "Rest and Pain" was published in London in 1876 and that the work reprinted in this country in 1879 is an accurate copy thereof is of the nature of hearsay; and, as objection was duly taken to the testimony when it was produced before the master, and was insisted upon at the trial, the objection must be sustained, no matter how persuasive the inference may be that there was a foreign publication which described Hilton's speculum. The latter instrument is accordingly ignored as an anticipation of complainant's invention.

Second. The third claim of the patent is a claim for the "incline" in cylindrical tubular specula having a slotted side and closed end. The particular device attempted to be covered by this claim was anticipated, in my opinion, by a rectal speculum produced by Dr. Mudd, (Defendant's Exhibit 18ª,) and shown to the satisfaction of the court to have been purchased at an instrument-store and to have been in use in this country before the date of complainant's invention.



DR. MUDD'S INSTRUMENT.

The instrument in question is tubular; it is conical in form, has a slotted side, a closed end, and, what is of more importance, an incline at the closed end extending from the bottom of the chamber upward and forward to the end of the slot. It is true that the angle made by the incline with the axis of the tube in the latter instrument approaches more nearly to a right angle than the incline in complainant's speculum. Nevertheless there is a pronounced "incline," and, moreover, Dr. Mudd testifies that one purpose of the "incline" is to protect the mucous membrane from injury when the speculum is withdrawn. It should be further observed that complainant's specification does not make the angle at which the incline is set in his speculum an essential feature of the device. As described in his specification, the utility of the incline consists in preventing "the impaction of pile-tumors," &c., and in enabling the operator to withdraw the instrument without injury to the membranes. This is precisely the function of the incline in the speculum produced by Dr. Mudd, and apparently it was set at an angle which effectually accomplished that purpose. At all events no complaint appears to have been made against that speculum on the ground that the incline failed to accomplish the purpose had in view. The Squire speculum (Defendant's Exhibit 9ª) also shows an incline in the forward or closed end in all respects like that in complainant's instrument; but the testimony in the case leaves it somewhat doubtful whether the "incline" in Squire's speculum was placed therein shortly before or shortly after complainant claims to have invented it. For that reason the patent is not affected by the evidence offered by defendant in relation to the Squire instrument.

Third. In view of what has been said it appears that plaintiff's right to relief depends on the second claim, for the "incline * * * in combination with the tube, slot, and slide." This claim is attacked on two grounds: first, that the combination as a whole was anticipated by Dr. Hodgen when he caused an incline in the form of a mirror to be set permanently in the forward end of the old "Reed speculum," about the year 1876; and, second, that the combination is devoid of invention and patentable novelty. I shall concede that the evidence as to what Dr. Hodgen caused to be done with the Reed speculum 12 or 13 years since is, under the circumstances, not of that certain and convincing character which ought to be required to overturn the claims of a duly-issued patent. The second objection to the claim, however, is more formidable. The Reed speculum, before alluded to, shows "the tube, slot, and slide" combined in a manner that does not differ essentially from the form in which the same elements are combined in complainant's combination. To these three elements the patentee added a fourth—the "incline in the front end of the chamber." But the "incline," as before stated, was itself an old device which had been used in speculums such as were produced by Dr. Mudd. Furthermore, it was used in the old instruments for the same purpose that complainant professes to have invented it—that is to say, to avoid injuring protruding membranes when the speculum was withdrawn. Even if complainant had been the first to use the incline in tubular speculums having closed ends, the device was a very obvious one, scarcely rising to the dignity of an invention considering the function it performed, as is well illustrated by the account which the patentee gives of the manner in which the idea was conceived. He states that he first constructed his speculum, as shown in the specification, with a tube, slot, and slide, but without an incline. When he made the first trial of the instrument, he discovered the risk of injuring such membranes as happened to protrude through the slot, as others had discovered, who used the Mudd instrument. Thereupon he employed a jeweler to solder a small piece of metal in the forward end of the chamber, so as to form an incline, and subsequently amended his specification by adding the third claim, which is substantially a claim for the incline as an independent device. But regardless of the obvious nature of the improvement made by adding the incline, the court is of the opinion that the combination so formed was not patentable, because no new result or effect was produced by the united action of the old elements. To sustain a patent on a combination of old devices it is well settled that a new result must be obtained which is due to the joint and co-operating action of all the old elements. Either this must be accomplished or a new machine of distinct character and function must be constructed. (*Pickering* v. *McCullough*, 104 U. S., 310; *Hailes* v. *Van Wormer*, 20 Wall.,

353; *Tack Co.* v. *Manfg. Co.*, 9 Bissell, 258; *Wringing Mach. Co.* v. *Young*, 14 Blatch., 46.) If several old devices are so put together as to produce even a better machine or instrument than was formerly in use, but each of the old devices does what it had formerly done in the instrument or machine from which it was borrowed, and in the old way, without uniting with other old devices to perform any joint function, it seems that the combination is not patentable. (*Hailes* v. *Van Wormer, supra; Beckendorf* v. *Faber*, 92 U. S., 347.)

In the present case the incline when placed in combination with the "tube, slot, and slide" acted precisely as it did when placed in the forward end of a slotted tube not provided with a slide. Its action was in no sense modified by the new relation in which it was placed, nor did it in unison with the other elements of the combination produce a distinctively new result.

In accordance with these views the bill is dismissed.

U. S. Circuit Court—District of Maryland.

STUART *v.* THORMAN *et al.*

Decided November 5, 1888.

STUART—COMPOSITE PAVEMENTS.

Letters Patent No. 269,480, granted December 19, 1882, to Peter Stuart, for an improvement in composite pavements, again sustained and *Held* not anticipated by Patent No. 90,825, June 1, 1869, to Dotch and Duempelman.

APPLICATION for preliminary injunction to restrain infringement of patent.

STATEMENT OF THE CASE.

Bill was filed to enjoin the infringement of Patent No. 269,480, granted to Peter Stuart, of Glasgow, Scotland, December 19, 1882, for composite pavements. The claim of the patent is as follows:

A composite pavement formed with circular, square, or analogous depressions of equal or nearly equal diameter in each direction, and with even or level margin on the pavement surface, to adapt them to operate in the manner described.

The specification describes the mode of operation as follows:

My improvement is especially, though not exclusively, intended for application to sidewalks; and it consists in the formation in the surface of pavements of depressions of such a character that in stepping thereon the pressure of the feet will expel the air, causing a partial vacuum, which, supplementing the mechanical effect of the roughened surface, will operate to afford an additional hold to the feet and prevent slipping. This beneficial effect is greater when the pavement is wet, at which time pavements as ordinarily constructed with smooth or grooved surfaces are more than usually slippery.

Messrs. Price & Steuart for the complainant.

Mr. William Pinkney Whyte for the defendants.

MORRIS, *J.*:

The complainant exhibits his patent, together with the record of the case of the *Vulcanite Paving Company* v. *The American Artificial Stone Pavement Company* in the Circuit Court of the United States for the Eastern District of Pennsylvania, in which, by the judgment of Judges McKennan and Butler, his patent was adjudicated and sustained. The same defenses were made in that case as in this, and were considered and passed upon by the court. All the anticipating patents now set up in defendants' answer were set up then, except No. 90,825, dated June 1, 1869, granted to Dotch and Duempelman. I am satisfied that this is not an anticipation of the invention claimed by complainant.

The specification of the Dotch and Duempelman patent states:

The smooth surface of all concrete pavements is very objectionable on account of the liability of horses slipping thereon. To obviate this difficulty we pass over the pavement before it becomes perfectly cool a corrugated roller or a roller having a series of flanges or projections around its circumference, which indents the surface, leaving it in the condition of the Nicholson or any other well-paved road.

This was simply a method of producing lines of depression or indentations in a composition road-bed such as would catch the shod feet of horses and prevent them from slipping. It would not accomplish what the complainant sets out to accomplish, and complainant's invention would be almost entirely useless in preventing horses from slipping, which was the object which Dotch and Duempelman had in view. Complainant's invention is especially intended for sidewalks, and consists in the formation in the surface of a smooth pavement of depressions of such a character that in stepping on them the pressure of the foot on a number of them at once will expel the air, and by causing a vacuum afford by suction an additional hold to the sole of the foot to prevent slipping. This result, it is claimed, is more effectively attained when the pavement is wet and ordinarily would be more slippery, because then the suction is more complete. It is perfectly plain that continuous corrugated lines or large depressions, such as would assist the foothold of shod horses, would have no such effect.

The case in the eastern district of Pennsylvania having been, as appears from the record and the briefs of the very able counsel who took part in its presentation, thoroughly contested, the complainant is entitled now to the benefit of that adjudication in his favor. The affidavits filed in support of this motion for a preliminary injunction and the specimens of the pavement put down by the defendant exhibited in court leave no doubt in my mind as to the infringement.

The complainant, therefore, under all the rules of practice governing such applications, is entitled to the granting of a preliminary injunction as prayed.

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OF THE
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[BY AUTHORITY OF CONGRESS.]

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

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The following indexes to foreign patents have been translated, compiled, and published under the authority of the Commissioner of Patents, and may be obtained as a Patent Office publication at the prices given below:

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Indexes to Patents on Electricity.

Appendix No. 2 to the index to patents relating to electricity, covering the period of time from July 1, 1882, to June 30, 1883, has been issued, and is now for sale. These indexes, arranged alphabetically, numerically, and by classes, are completed to June 30, 1883, and comprise the following volumes:

Vol. 1. Index to patents relating to electricity granted by the United States prior to June 30, 1881, with an appendix, July 1, 1881, to June 30, 1882. One volume, 250 pages. In paper covers, $3; bound, $5.

Vol. 2. Appendix No. 2, July 1, 1882, to June 30, 1883. One volume, 50 pages. In paper covers, $1.50.

Vol. 3. Appendix No. 3, July 1, 1883, to June 30, 1884. One volume, 60 pages. In paper covers, $1.50.

Vol. 4. Appendix No. 4, July 1, 1884, to June 30, 1885. One volume, 60 pages. In paper covers, $1.50.

Vol. 5. Appendix No. 5, July 1, 1885, to June 30, 1886. One volume, 54 pages. In paper covers, $1.50.

Vol. 6. Appendix No. 6, July 1, 1886, to June 30, 1887. One volume, 52 pages. In paper covers, $1.50.

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Issue of January 22, 1889.

Patents	337—	No. 396,384 to No. 396,720, inclusive.
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Trade-Marks	23—	No. 16,197 to No. 16,219, inclusive.
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Reissues	None.	
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TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	..	Nebraska	3	..
Arizona Territory	..	..	Nevada	1	..
Arkansas	1	1	New Hampshire	5	..
California	10	..	New Jersey	12	2
Colorado	..	..	New Mexico Territ'y	2	..
Connecticut	5	..	New York	56	11
Dakota Territory	..	..	North Carolina	2	..
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District of Columbia	2	..	Oregon	..	..
Florida	1	..	Pennsylvania	20	1
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Illinois	22	2	Tennessee	3	..
Indian Territory	..	..	Texas	4	..
Indiana	5	..	Utah Territory	..	..
Iowa	11	..	Vermont	5	..
Kansas	5	1	Virginia	3	..
Kentucky	2	..	Washington Territ'y	..	..
Louisiana	..	..	West Virginia	..	..
Maine	1	..	Wisconsin	5	..
Maryland	..	..	Wyoming Territory	..	..
Massachusetts	32	2	United States Army	..	..
Michigan	17	..	United States Navy	..	..
Minnesota	8	1			
Mississippi	1	..	Total to citizens of		
Missouri	4	1	the United States	308	23
Montana Territory	..	..			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic	..	..	Germany	11	..
Australia	..	..	Ireland	..	..
Austria-Hungary	..	..	Japan	..	1
Belgium	..	..	Mexico	..	..
Bermuda	..	..	Netherlands	..	..
Brazil	..	..	New South Wales	..	..
Canada	6	..	Russia	..	..
Chili	..	..	Scotland	1	..
Colombia, U. S. of	..	..	Sweden	..	..
Cuba	..	..	Switzerland	3	..
Denmark	1	..	Victoria	..	..
England	10	1			
Finland	..	..	Total to citizens of		
France	3	..	foreign countries	35	2

DESIGNS.

18,874.—CORNER-IRON FOR TRUNK-TOPS.—*Philip Carpeles*, Milwaukee, Wis. Application filed December 21, 1888. Serial No. 294,330. Term of patent 7 years.

18,875.—TRUNK.—*Philip Carpeles*, Milwaukee, Wis. Application filed December 21, 1888. Serial No. 294,331. Term of patent 7 years.

18,876 to 18,878, inclusive.—PHOTOGRAPH-EXHIBITOR-CASE BODY.—*George M. Porteous* and *Frederick S. Miller*, Chicago, Ill. Applications filed December 28, 1888. Serial Nos. 294,874 to 294,876, inclusive. Term of patents 7 years.

18,879.—THERAPEUTIC BOTTLE.—*Emeline Clark Post*, Yorktown, Va. Application filed December 4, 1888. Serial No. 292,668. Term of patent 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,197.—CUTICLE OINTMENTS.—*The Bolling Drug Company*, Little Rock, Ark. Application filed September 19, 1888. Used since January 1, 1888.

"The words 'CRYSTAL CREAM' with the representation of a sparkling or cut jewel between them."

16,198.—PRESERVED MEATS.—*The Cunningham & De Fourier Company, (Limited,)* London, England. Application filed October 12, 1888. Used since January 1, 1879.

"The words 'STRASBOURG MEATS' and a pictorial group of buildings representing a bird's-eye view of the town of Strasbourg."

16,199.—BOOTS, SHOES, AND SLIPPERS.—*Fannie Dalsimer*, Philadelphia, Pa. Application filed December 10, 1888. Used since October 1, 1887.

"The word 'REFORM.'"

16,200.—SHOES.—*The Elderkin Taylor Company*, Rochester, N. Y. Application filed December 24, 1888. Used since April, 1887.

"The word 'RUBA.'"

16,201.—OLEAGINOUS FOOD SUBSTANCES.—*N. K. Fairbank & Company*, Chicago, Ill. Application filed August 24, 1888. Used since August 1, 1888.

"The representation of the head, head and neck, or head, neck, and other portions of a steer or other bovine visible through a body of growing cotton."

16,202.—CUTLERY.—*Graef & Schmidt*, New York, N. Y. Application filed November 28, 1888. Used since October 1, 1888.

"The representation of a spider."

16,203.—BAKING-POWDER.—*George C. Hanford*, Syracuse, N. Y. Application filed December 17, 1888. Used since March 1, 1877.

"The words 'NONE SUCH.'"

16,204.—WRITING-PAPER AND ENVELOPES.—*Bradley A. Hard*, New York, N. Y. Application filed December 18, 1888. Used since October 1, 1888.

"The word 'AMERICA.'"

16,205.—LEATHER FOR THE UPPERS OF SHOES.—*Charles S. Hull*, Boston, Mass. Application filed December 18, 1888. Used since November, 1888.

"The words 'LA CONFIANCE.'"

16,206.—JAPAN TEA.—*Henry J. Hunt*, Yokohama, Japan, London, England, and Chicago, Ill. Application filed December 8, 1888. Used since September, 1888.

"The word 'HIRADO.'"

16,207.—COUGH MEDICINE FOR INTERNAL USE.—*Benjamin T. Jacobs*, Stapleton, N. Y. Application filed December 1, 1888. Used since November 25, 1888.

"The letters 'A. B. C.'"

16,208.—COLOGNE.—*Benjamin Kent*, Paterson, N. J. Application filed December 8, 1888. Used since September 1, 1888.

"The words 'SILK CITY.'"

16,209.—NERVE TONIC AND STIMULANT.—*Benjamin Kent*, Paterson, N. J. Application filed December 8, 1888. Used since June 1, 1888.

"The word 'COCA-COLA.'"

16,210.—MIXTURE OR COMPOUND FOR MAKING GINGER-ALE.—*M. Michaelis & Son*, New York, N. Y. Application filed September 18, 1888. Used since December 13, 1883.

"The word 'CREAM.'"

16,211.—MEDIUM-GRADE RUBBER BELTING.—*New York Belting and Packing Company*, New York, N. Y. Application filed December 4, 1888. Used since November 20, 1888.

"The word 'THRASHER.'"

16,212.—SIRUP AND SUGAR.—*Lyman F. Palmer*, Topeka, Kans. Application filed December 4, 1888. Used since November, 1888.

"The word 'MAPLEETTE.'"

16,213.—MAIZE OR INDIAN CORN.—*Charles E. Prunty*, St. Louis, Mo. Application filed December 10, 1888. Used since June, 1888.

"The words 'PRINCE CHARLES.'"

16,214.—WRITING-PAPER.—*The Riverside Paper Company*, Holyoke, Mass. Application filed December 8, 1888. Used since January 1, 1888.

"The representation of a Pompeian lamp."

16,215.—BAKING-POWDER.—*Konn B. Sayres*, Cincinnati, Ohio. Application filed November 12, 1888. Used since November 1, 1888.

"The bust portrait of a North American Indian."

16,216.—JAPAN TEA.—*Smith, Baker & Co. of Japan*, New York, N. Y. Application filed September 28, 1888. Used since May 1, 1888.

"The words 'THE ARATA TEA,' two large diamonds arranged one above the other with their greatest diameter in a horizontal line and touching at their points, and two small ones arranged in the angles of the lines forming the two large diamonds."

16,217.—COTTON OR PARTLY COTTON AND WOOL AND PARTLY WOOL WOVEN FABRIC.—*Smith, Hogg & Gardner*, New York, N. Y. Application filed November 30, 1888. Used since August 2, 1887.

"The word 'OUTING.'"

16,218.—FLOUR, WHEATEN GRITS, FARINA, OATMEAL, CORNMEAL, AND HOMINY.—*The St. Paul Roller Mill Company*, St. Paul, Minn. Application filed December 23, 1887. Used since December 6, 1887.

"The representation of a branch of orange-blossoms diagonally across an irregular square border in one corner in connection with the words 'ORANGE BLOSSOM.'"

16,219.—LIQUID REMEDY FOR ABRASIONS AND OTHER EXTERNAL INJURIES AND DISEASES OF THE SKIN.—*Egbert B. Waldo*, Syracuse, N. Y. Application filed November 5, 1888. Used since January 1, 1870.

"The words 'ELASTIC CUTICLE.'"

LABELS.

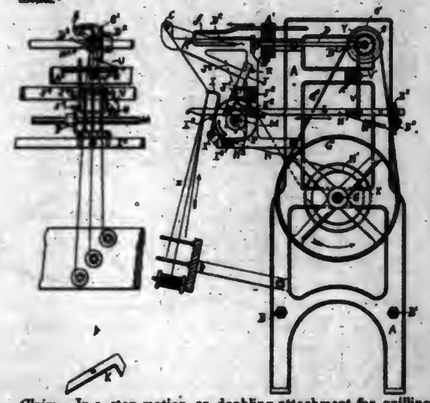
5,806.—Title: "ROGERS & DIAMOND'S CELEBRATED COUGH CURE."—*Rogers & Diamond*, Chicago, Ill. Application filed December 24, 1888.

5,807.—Title: "THE GREAT INDIAN SALVE AND PLASTER."—*Oscar S. Stearns*, New York, N. Y. Application filed December 17, 1888.

PATENTS

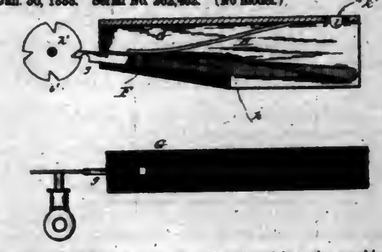
GRANTED JAN. 22, 1889.

396,884. STOP-MOTION FOR QUILLING-MACHINES. DWIGHT ASHLEY, Paterson, N. J. Filed Feb. 1, 1888. Serial No. 262,502. (No model.)



Claim.—In a stop-motion or doubling attachment for quilling-machines, a rock-lever which carries one end of the quill-spindle shaft provided with a tension-spring, a tilting lever provided with a pin and a slot, as illustrated and described, a reach-rod carrying a taper piece used as a wedge, and having a spring for drawing the same backward when unlatched, and stop-pins to limit its backward and forward motion, a latch-lever which acts by gravity, a revolving toothed wheel which engages with a pin in the tilting lever to force it backward, and the drop-wires shown and described, and for the purposes described and set forth.

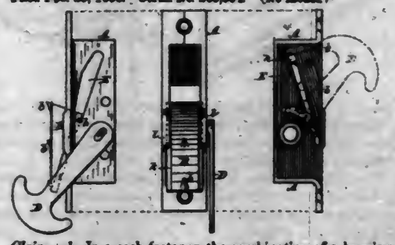
396,885. SYSTEM AND APPARATUS FOR EXTINGUISHING FIRES. CHARLES ARROGAST and JOHN W. KUEHLER, Pittsburg, Pa. Filed Jan. 30, 1888. Serial No. 262,462. (No model.)



Claim.—1. In a fire alarm and extinguisher, the combination, with the water-supply pipes of an extinguishing system and a series of spring-actuated cocks controlling the same, of a notched wheel or disk connected to said cocks or valves, a pivoted spring-lever adapted to engage with said wheels, and a fusible plug normally restraining said levers and preventing the movement of said cocks, substantially as described.

2. In a fire-extinguishing system comprising a water-supply pipe leading to the interior of a building and having one or more branch distributing-pipes, a spring-actuated or automatic cock or valve connected to said supply-pipe, a notched disk secured to the stem of said valve, a casing containing a pivoted lever engaging with said disk, a spring which presses upon said lever, and a fusible plug upon which said lever normally bears, all the parts being so arranged that when said plug is fused the lever will be pressed downward and out of engagement with the valve-stem, substantially as described.

396,886. SASH-FASTENER. FRANK A. BACON, Greenville, Pa. Filed Feb. 25, 1888. Serial No. 265,234. (No model.)



Claim.—1. In a sash-fastener, the combination of a housing with a sector mounted therein, a wedge guided in slots in said housing, and a gravitating lever for operating the same, substantially as specified.

2. The combination of a bisected housing having slots therein with the wedge seated in said slots and provided with teeth on its rear side, a sector, also provided with teeth to engage the teeth of the wedge, and a gravitating lever for operating the same, substantially as and for the purpose set forth.

3. In a sash-fastener, the combination of the housing with the sector C, having a double set of teeth, the wedge B, having a double set of teeth on the back thereof, said teeth being adapted to engage the teeth of the sector, and a gravitating lever, substantially as set forth.

4. The housing A, provided with slots E and guides *l*, in combination with the wedge B, having lugs *k*, flanges *k*, to engage with said slots and guides, and provided with teeth *b*, a double sector meshing with the teeth of said wedge, and a gravitating lever, D, connected therewith, substantially as and for the purpose set forth.

396,887. COMPOSITION FOR PRINTERS' INKING-ROLLERS. JOHN D. BAYLIS, Philadelphia, Pa. Filed Apr. 6, 1888. Serial No. 269,854. (No specimens.)

Claim.—1. The herein-described composition of matter for the making of printers' inking-rollers, the same consisting of a mixture of glue, glycerine, sugar, Venice turpentine, rosin-oil, and saltpeter, and in the proportions substantially as described.

2. The herein-described composition of matter for the making of printers' inking-rollers, the same consisting of a mixture of glue, glycerine, sugar, Venice turpentine, oil of tar, rosin-oil, and saltpeter, and in the proportions substantially as described.

396,888. BAG. LORENZO D. BENNER, Peoria, Ill. Filed May 30, 1887. Serial No. 238,576. (Model.)



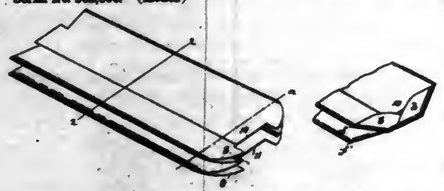
Claim.—1. The herein-described bellows-sided bag, the bottom whereof is provided with the portions 10 12, folded back upon the underlying portion of the bag, and the portions 14 16, folded over and cemented to the portions 10 12, substantially as described.

2. The herein-described bellows sided-bag, the bottom whereof when distended is formed by the two folded-back portions 10 12, the underlying inturned portions, and the folded-over and overlapping portions 14 16, substantially as described.

3. The herein-described bellows-sided bag, the bottom whereof when distended is formed by the oppositely folded-back portions 10 12 and the oppositely folded-over portions 14 16, the said portions 10 12, contiguous with the portions 14 16, being folded over upon themselves on diagonal lines *f f'*, substantially as described.

4. The herein-described bellows-sided bag, the bottom whereof is formed by folding back the end portions, 10 12, leaving projecting side pieces, which are folded back on diagonal lines *f f'* onto the body of the bag, so as to close the mouth of the bag.

396,389. BAG. LORENZO D. BENNER, Peoria, Ill. Filed Feb. 3, 1888. Serial No. 262,890. (Model.)

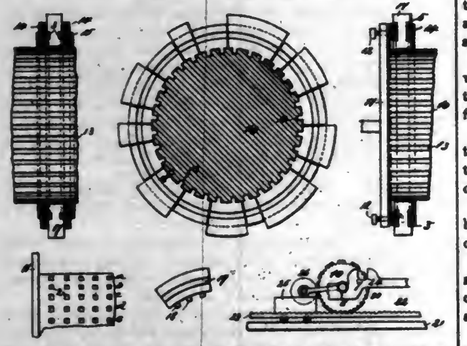


Claim.—1. The herein-described bag provided with the side incisions, 9, forming free end flaps, and the ends of the sides of the blank folded back on oblique lines onto the opposite sides of the body of the bag to close the end of the bag.

2. The herein-described bag provided with the side incisions, 9, forming free end flaps, 10 11, and freed projections 12 13, which are folded back on oblique lines onto the opposite sides of the body of the bag to close the end of the bag.

3. The herein-described bag-blank the end of which is cut on curved lines to form free end flaps, 10 11, and freed projections 12 13, the two projections being of sufficient length to close the end of the blank.

396,390. PRINTING-CYLINDER. WILLIAM BERRI, Brooklyn, N. Y. Filed Dec. 13, 1887. Serial No. 257,775. (No model.)



Claim.—1. A segmental printing block or die formed with recessed side faces and with projections extending from its inner circumferential face, as and for the purpose stated.

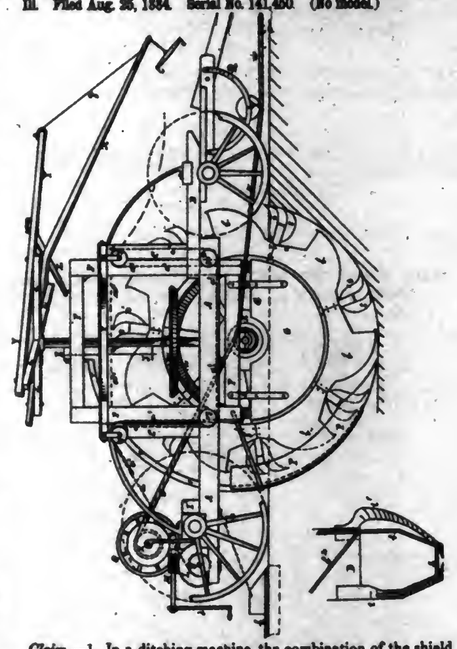
2. A printing block or die formed with recessed side faces and transverse ribs on its inner face, substantially as described.

3. The combination, with a cylinder provided with a series of recesses on its peripheral face, of printing-blocks having recessed side faces and projections on their inner faces, and binding-rings provided with laterally-extending projections, substantially as described.

4. The combination, with a cylinder provided with a series of longitudinal grooves, of segmental printing blocks or dies provided with recesses on their side faces and with transverse ribs on their inner faces, clamping rings provided with laterally-projecting flanges and binding-screws, substantially as herein shown and described.

5. The combination, with a cylinder formed with a recessed peripheral face, of printing blocks or dies having recessed side faces and provided with projections which extend from their inner circumferential faces, said projections being arranged to enter the recesses formed in the peripheral face of the cylinder, clamping-rings arranged about the cylinder and formed with laterally-extending projections arranged to enter the recesses of the printing blocks or dies, and a means for locking the parts together, as and for the purpose stated.

396,391. DITCHING-MACHINE. ULRIC BLOCKENDORFER, Chicago, Ill. Filed Aug. 25, 1884. Serial No. 141,450. (No model.)



Claim.—1. In a ditching-machine, the combination of the shield or guard G, the straps *s*, and the movable frame with the gear-wheel *n* and the excavating-wheel, substantially as described.

2. In a ditching-machine, the combination, with the vertically-adjustable frame and the excavating-wheel, of the curved chute P, trough-shaped in cross-section and secured to the adjustable frame and supported by the curved supports *r* and stays *f'*, substantially as shown and described.

3. In a ditching-machine, the combination of an excavating-wheel, a spool-shaped drum, H, mounted on the shaft which carries the excavating-wheel, and an adjustable roller, V, substantially as set forth.

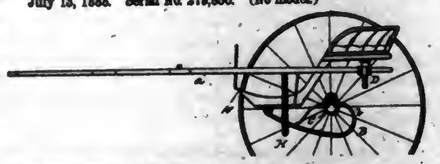
4. In a ditching-machine, the combination of the movable frame, the excavating-wheel mounted therein, the axle 1, adapted to support two riding-wheels, and the removable axle 1', adapted to receive one of the riding-wheels, substantially as described.

5. In a ditching-machine, an excavating-wheel provided with buckets *b*, in combination with projecting mold-board-shaped picks or teeth *t'*, substantially as and for the purpose set forth.

6. In a ditching-machine, the combination of an excavating-wheel, a spool-shaped drum, H, mounted on the shaft which carries the excavating-wheel, and a roller, K, to receive the tow-line, substantially as set forth.

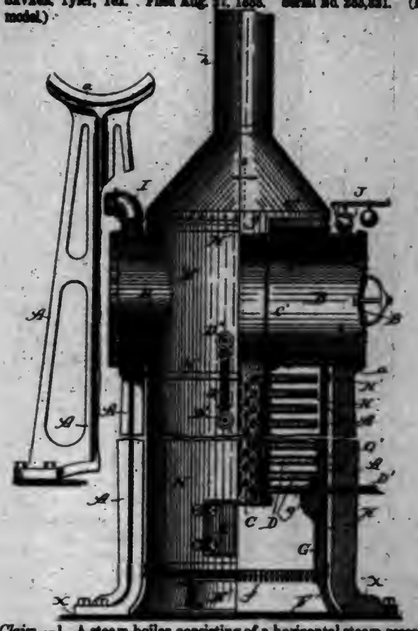
7. In a ditching-machine, a vertical driving-shaft, N, in combination with cross-bars *h*, secured to said shaft N, a curved or inclined sweep secured to the said cross-bars *h* at one end thereof, a projecting bar, Y, secured at the other end of said cross-bars *h*, and a rod or chain, *g*, substantially as and for the purpose specified.

396,392. ROAD-CART. LEWIS F. GASTON, Philadelphia, Pa. Filed July 13, 1888. Serial No. 279,830. (No model.)



Claim.—The combination, in a road-cart, of the body N, the rear end or seat portion of which is supported by means of a transverse spring, D, rigidly secured to the thills *a a*, which pass to the rear of the axle C, and the hook-shaped springs B, the rear curved ends clipped to the axle C, and the forward ends of which are suitably connected to the under side of the front of the foot portion of the body N, substantially as specified.

396,393. RADIAL-TUBE BOILER. JOHN CLARKE and ROBERT W. SAVAGE, Tyler, Tex. Filed Aug. 17, 1888. Serial No. 283,231. (No model.)



Claim.—1. A steam-boiler consisting of a horizontal steam-reservoir, a vertical cylinder provided with radial tubes suspended therefrom and forming a steam-generating chamber, all supported by standards placed underneath said horizontal steam-reservoir and outside of the casing surrounding said steam-generating chamber, and the fire-box placed under said steam-generating chamber, all substantially as described, and for the purposes set forth.

2. A steam-boiler consisting of a horizontal steam-reservoir, a vertical steam-generating chamber with radial tubes thereon suspended from said horizontal steam-reservoir, a fire-box placed underneath said vertical steam-generating chamber, a casing composed of fire-brick and other suitable material surrounding said fire-box, vertical steam-generating chamber, and a portion of said horizontal steam-reservoir at a suitable distance therefrom, and standards placed outside of said casing and underneath the ends of said horizontal steam-reservoir, thereby supporting said horizontal steam-reservoir and said vertical steam-generating chamber with the radial tubes placed thereon, all substantially as described, and for the purposes set forth.

3. The combination, in a steam-boiler, of ash-pan F, fire-box brick G G', placed thereon, arch G'', covering H, surrounding said fire-brick G G' and arch G'', bands H' H', securing covering H in position, horizontal steam-reservoir B, supported by standards A A, placed outside of said covering H, and vertical steam-generating chamber C, provided with radial tubes D, suspended from said horizontal reservoir B, all substantially as described, and for the purposes set forth.

396,394. COIN-CONTROLLED WEIGHING-MACHINE. WILLIAM S. DAVENPORT, St. Johnsbury, Vt. Filed Mar. 4, 1887. Serial No. 229,672. (No model.)

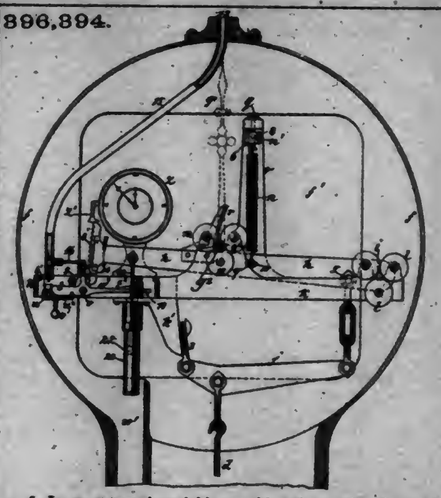
Claim.—1. The combination of the counterbalanced beam *h*, having the rack *r*, with the rotary index-shaft g^3, having the pinion *r'*, and the groups of rollers 12, supporting the index-shaft, substantially as shown and described.

2. The combination, with the pivoted beam *h*, of the counterbalance-spring *n*, attached at one end near the center of said beam, the non-rotating block *n'*, carrying the other end of said spring, frame *k* and support *o*, and adjusting-screw *q*, substantially as shown and described.

3. The combination of the frame *k* and support *o* and the pivoted beam-lever *h* with the counterbalance-spring *n*, connected to said lever near the center thereof, longitudinally-adjustable spring-stud 9, non-rotating vertically-adjustable block *n'*, and adjusting-screw *q*, substantially as shown and described.

4. In an automatic weighing-machine, a coin-receiving-trip device consisting of a counterbalanced lever, *i*, having coin bucket or socket *i'*, in combination with the escapement device *u* u^2, and counterbalanced trip-lever *v*, engaging the escapement device, substantially as shown and described.

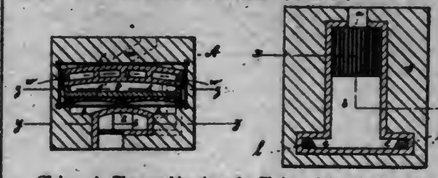
396,394.



5. In an automatic weighing-machine, the combination of the scale-beam *h*, a detent-rack, *d'*, attached to the scale-beam of the machine, with the detent-pawl *s*, engaging the same, the counterbalanced coin-lever *i*, operatively engaging said detent-pawl, the coin-recess *i'* on said lever, the coin-duct 15, terminating over said recess, the escapement *u* u^2, and the trip-lever *v*, arranged and operating substantially as shown and described.

6. In an automatic weighing-machine, the combination of the coin-duct 15 and slide, a coin-lever, *i*, having a coin-bucket, *i'*, arranged under the end of said duct, the detent-pawl *s*, and a projection on the coin-lever engaging said pawl, with a cut-off valve, 16, arranged to close said slide and connected with said coin-lever, whereby the valve is closed in the duct when the coin-lever is swayed by the weight of the coin, substantially as shown and described.

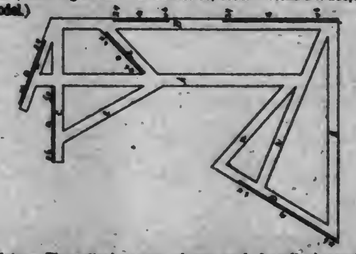
396,395. BAKER'S OVEN. FRITZ DÜRRKOP, New York, N. Y. Filed Oct. 8, 1888. Serial No. 287,508. (No model.)



Claim.—1. The combination of a T-shaped fire-chamber, *b*, having the fire-place *a* in the rear end of the oven, with the baking-chamber *g* and interposed air-chamber *c*, and with the upright flues *l*, communicating with the branches *c* of chamber *b*, substantially as specified.

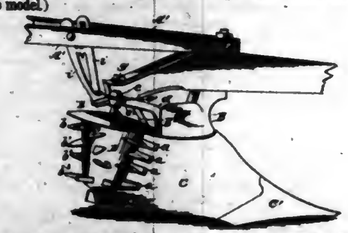
2. The combination of a fire-chamber, *b*, having the fire-place in the rear of the oven, with a superposed air-chamber, *c*, which is wider than such fire-chamber, and which is solidly supported on both sides of the same, and with a baking-chamber, *g*, above the air-chamber *c*, substantially as specified.

396,396. TAILOR'S AND DRESS-MAKER'S SQUARE. PARKER FAIRT, Wilmington, Ill. Filed Oct. 18, 1888. Serial No. 288,415. (No model.)



Claim.—The tailor's square shown and described, consisting of the combination of the right-angled blades B and S, the angle-blades *a*, *c*, *e*, *i*, *n*, and *r*, and brace *o*, all having graduated scales, as shown, and brace A, arranged parallel with blade B, for supporting said angle-blades, substantially as and for the purpose set forth.

396,397. REVOLVING MOLD-BOARD FOR PLOWS. CHARLES GAYLORD, East Wilson, N. Y. Filed June 15, 1888. Serial No. 277,196. (No model.)



Claim.—1. The combination, with a plow-standard and a mold-board, of a conical drum or cylinder having teeth that radiate from its side, substantially as set forth.

2. The combination, with a mold-board supported on a plow-beam, of a conical cylinder supported to rotate near the rear edge of the mold-board, and attached radial teeth, substantially as set forth.

3. The combination, with a mold-board, a standard, and a plow-beam, of a conical cylinder having rows of teeth radiating from its side surface adapted to register with notches cut in the adjacent edge of the mold-board, substantially as set forth.

4. The combination, with a mold-board and a revolubly-supported conical cylinder having rows of radial teeth, of a disk mounted on the top of the conical cylinder and adapted to rotate with it, substantially as set forth.

5. The combination, with a mold-board, a standard, and a plow-beam, of a conical cylinder, boxes to support the cylinder, journals axially affixed to the cylinder to engage these boxes, and rows of radial teeth secured to the cylinder so as to project through notches made in the mold-board and be rotated by the impinge of a furrow-slice cut by the plow, substantially as set forth.

6. The combination, with a plow-beam, a standard, a mold-board, and a plowshare, the mold-board plate being notched at intervals, of a cylinder, teeth arranged in rows which project radially from the side surface of the cylinder, journals affixed axially in the ends of the cylinder, boxes adapted to revolubly support the cylinder, and a convex cylinder-disk secured concentric with the cylinder on its upper end, substantially as set forth.

7. The combination, with a plow-standard, of a mold-board, a revoluble tapering cylinder, teeth affixed radially in the cylinder, and scrapers adapted to bear on the surface of the cylinder between the rows of teeth, substantially as set forth.

8. The combination, with a plow-beam, a standard, a mold-board, plowshare, and landside, of a revoluble conically-tapered cylinder, rows of teeth radially projecting from the cylinder, notches made in the mold-board to receive the teeth and allow them to move freely therein, and a series of scraper-blades made to project from the standard and be in position to scrape the soil from the cylinder between the rows of teeth, substantially as set forth.

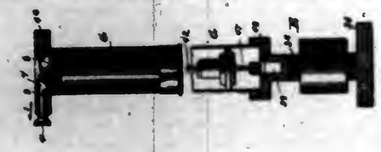
396,398. CARTRIDGE-LOADING MACHINE. EMILE F. GENEVAY, Corinth, Miss. Filed May 3, 1888. Serial No. 272,885. (No model.)

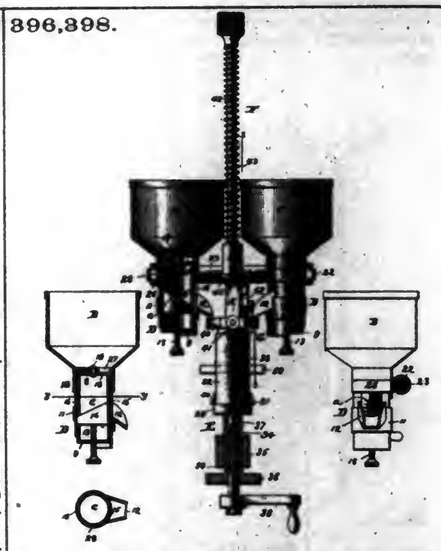
Claim.—1. In a cartridge-loading device, the combination of a supporting-frame, a pair of hoppers for the powder and shot, a removable bar, 22, and sleeves connected with said hoppers and adapted to be supported by said bar upon opposite sides of the frame, substantially as described.

2. In a cartridge-loading device, the combination of a supporting-frame, a pair of hoppers for the powder and shot, a removable bar, 22, having a web, 25, and sleeves connected with said hoppers adapted to surround the bar upon opposite sides of the frame, and having slotted ends to receive a portion of the web, substantially as described.

3. The combination, with a hopper, of a rotatable chambered valve connected thereto, having two openings, one at its end for permitting a quantity of material to enter the valve, and the other at its side for discharging such material therefrom, substantially as described.

4. The combination, with a hopper, of a valve-casing, a rotatable chambered valve mounted therein and having closed ends, one of said ends provided with an opening registering with the hopper-opening,





and a second opening in the side of the valve registering with a discharge-opening in the casing, substantially as described.

5. The combination, with a hopper, of a valve-casing connected thereto, a chambered valve mounted in said casing and having closed ends, one of which is provided with an opening registering with the hopper-opening, and the other end providing an adjustable bottom for varying the size of the chamber, substantially as described.

6. The combination, with a hopper, of a valve-casing connected thereto, a rotatable chambered valve pivotally mounted in said casing, a movable bottom in said valve, and an adjusting-rod for moving the bottom, substantially as described.

7. The combination, with a hopper, of a valve-casing connected thereto, a chambered valve mounted in said casing, and a movable end for varying the size of the chamber, of an adjustable spout carried by the casing, substantially as described.

8. The combination, with a hopper, of a cylindrical casing connected thereto having an opening, 27, communicating with the hopper and a side discharge-opening, a cylindrical chambered valve mounted in said casing, having an opening in its end adapted to register with the opening 27 in the casing, and a side discharge-opening adapted to register with the similar opening in the casing when the valve is moved to close the other openings, substantially as described.

9. In a cartridge-loading device, the combination of a vertically-adjustable cartridge-supporting spindle, 34, a cup-shaped rest mounted on said spindle and having a crank for rotating it, a bracket, 40, for sustaining the upper end of the cartridge, and a reciprocating plunger, F, substantially as described.

10. In a cartridge-loading device, the combination of a vertically-adjustable cartridge-supporting spindle, 34, a cup-shaped rest mounted on said spindle and having a crank for rotating it, a divided sustaining-sleeve, 32, and a bracket, 40, for sustaining the upper end of the cartridge, substantially as described.

11. In a cartridge-loading device, the combination of a vertically-adjustable cartridge-supporting spindle, 34, having a central opening, a cup-shaped rest, 29, having a stem, 37, extending through the opening in the spindle, and a crank for rotating the rest, a bracket, 40, and a beading-tool, 41, substantially as described.

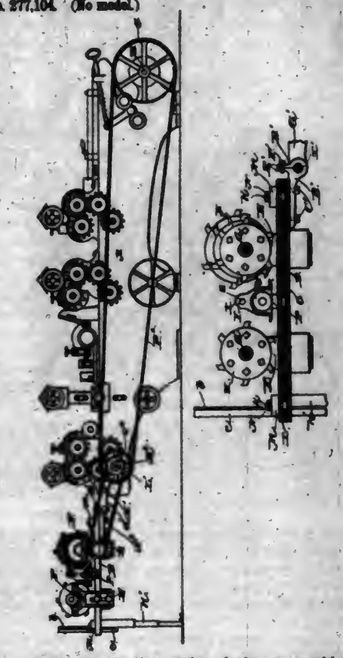
12. In a cartridge-loading device, the combination of a cartridge-supporting spindle, 34, a rotatable rest, 29, mounted on said spindle, a bracket, 40, for sustaining the end of the cartridge-shell, and beading-tool 41, movably mounted in said bracket and having a beading-groove, 9, substantially as described.

13. In a cartridge-loading device, the combination of a rotatable rest for the cartridge, a fixed bracket, 40, for sustaining the upper end of the cartridge, and a beading-tool seated in said bracket and adapted to be moved into operative position, substantially as described.

14. In a cartridge-loading device, the combination of a cartridge-supporting spindle, a rotatable rest carried thereby, a fixed bracket, 40, for sustaining the upper end of the cartridge and having a central opening for the passage of the load into the cartridge, and a beading-tool seated in said bracket and adapted to be moved into operative position over the cartridge, substantially as described.

15. In a cartridge-loading device, the combination of a rotatable rest for the cartridge, a fixed bracket, 40, for sustaining the upper end of the cartridge, and a beading-tool seated in said bracket and having a groove, 9, and a projection, 7, that is adapted to be moved to place said groove and projection in operative position, substantially as described.

396,399. MACHINE FOR GROOVING LUMBER. JULIAN T. GRZYBOWSKI, Grand Rapids, Mich., assignor of one-half to Richard H. Butterworth and James Lowe, same place. Filed June 14, 1888. Serial No. 277,104. (No model.)



Claim.—1. The combination, with a planing or matching machine, of a grooving-machine hinged or pivoted at its feed end directly to the rear end of the planer or matcher and adapted to be raised to a horizontal position or folded down out of the way, substantially as described.

2. The combination, with the planing-machine having the counter-shaft L', adapted to be driven by the driving-shaft B, of the grooving-machine pivoted at its feed end directly to the rear or discharge end of the planer or matcher, and having the oppositely-inclined shafts carrying the cutters, and provided with pulleys connected to pulleys on the counter-shaft by suitable belts, substantially as described.

3. In a grooving-machine adapted to be connected to a planer or matcher, the combination of the table or bed having the bearings D', the brackets or plates G', adapted to be secured to and disconnected from the planer or matcher, and the pintle shaft or rod extending through openings in the plates G' and in the bearings D', whereby the grooving-machine may be hinged to one end of the planer or matcher, substantially as described.

4. The combination, in a grooving-machine adapted to be attached to a planer or matcher, of the table or bed D, having the separate brackets B', provided with the split bearings D' and the clamping-bolts therefor, the separate plates or brackets G', adapted to be attached to one end of the planer-frame, and the pintle rod or shaft fitted in openings in said brackets or plates and in the split bearings D', substantially as described.

5. In combination with a planing or matching machine, the grooving-machine hinged or pivoted to the discharge end of said planing-machine, said hinge or pivotal attachment of the two machines being capable of lateral adjustment, as set forth.

6. In combination with the planer having the pintle rod or shaft I' secured rigidly thereto, the grooving-machine having affixed to its table or bed the brackets B', provided with bearings D', to fit the shaft I' and pivot the grooving-machine thereto, said bearings D' being laterally adjustable on the pintle-shaft I', as set forth.

7. In a grooving-machine, the combination of the cutters, the rollers M, arranged at the feed and discharge end of the machine on opposite sides of the cutters, said rollers being arranged in pairs set at a distance apart to receive the board between them, and the rollers U, arranged between the cutters and set at a distance apart, the rollers U bearing on top of the board and the rollers M bearing against the sides thereof, as set forth.

8. In a grooving-machine, the table or bed having the standards P laterally adjustable transversely across the table, each standard being independently adjustable, the rollers U, journaled in said standards and adapted to bear on the top of the board to be worked upon, as set forth.

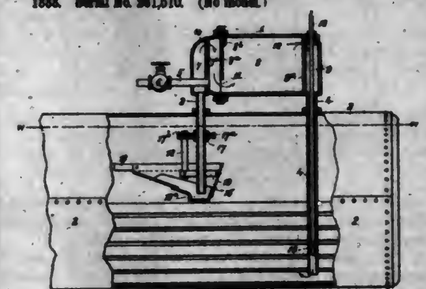
9. In a grooving-machine, the table or bed having the standards P laterally adjustable transversely across the table, each standard being independently adjustable, the rollers U, journaled in said standards and adapted to bear on the top of the board to be worked upon, and the guards or shields X, attached to the standards on the outer side of the rollers and having the feet A', to bear against the upper side of the board.

10. The combination, in a grooving-machine, of the standards P, secured to the table or bed and having the vertical slots, the rollers U, the spindles therefor secured and vertically adjustable in the slots, and the guards or shields X, fitted over the said rollers and having the clamping-bolts securing them to the standard, said clamping-bolts being also adjustable in the slots, substantially as described.

11. In a grooving-machine, the table having the openings *a* at one end, combined with the transverse shield *b*, arranged across the table, having depending legs *c* at the ends designed to fit in the openings *a*, as set forth.

12. In combination with the planing or matching machine, the grooving-machine hinged or pivoted at its feed end directly to the discharge end of the planer or matcher, the outer or discharge end of the grooving-machine being provided with a leg or standard, K, as set forth.

396,400. BOILER-CLEANER. GEORGE GUILD, Knoxville, Tenn., assignor of one-half to Charles H. Brown, same place. Filed Jan. 21, 1888. Serial No. 261,510. (No model.)



Claim.—1. The combination, with the boiler, of a settling-drum, pipes connected to the bottom of said drum remote from each other and to said boiler, partitions dividing said drum from top to bottom between said pipes and having perforations at their tops, a deflector extending downward into said drum to within a short distance from its bottom, and a blow-off pipe extending through the end of said drum, and also through one of said partitions at a level below the end of said deflector, whereby sediment throughout the extent of the bottom of said drum between said partitions may pass out via the blow-off without obstruction, as set forth.

2. The combination, with a settling-drum, a boiler, and pipes connecting the drum with the boiler, of a device for collecting the scum from the surface of the water, consisting of the skimmer 15, a bracket secured adjustably to one of said pipes, and a hanger suspending said skimmer from said bracket, as herein set forth.

3. The combination, with a settling-drum, a boiler, and pipes connecting the drum with the boiler, of the skimmer 15, for collecting the scum, a basin, 15^a, at one end of said skimmer, a bracket secured to one of said pipes, and a hanger secured to said bracket and to said skimmer, supporting said basin directly under the end of said pipe, substantially as set forth.

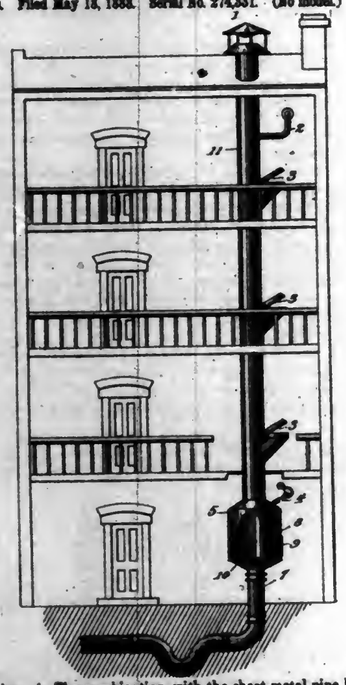
4. The combination, with a boiler and a pipe extending into the boiler for drawing off water, of means for collecting the scum, consisting of a skimmer, 15, having in one end a basin, 15^a, arranged under the end of said pipe, floats secured to the other end, and a hanger hinged to the end opposite said floats and mounted adjustably on the said outlet-pipe, as set forth.

5. In a boiler, the combination of an outlet-pipe, 3, a bracket, 17, on the pipe, a hanger, 18, a frame, 19, on a skimmer, 15, hinged to said hanger, and floats 16 on the other end of the skimmer, as set forth.

6. The combination, with a boiler, of a drum supported thereon

by two pipes leading from the boiler, the said drum having a settling-chamber, a blow-off pipe communicating with the lower part of the settling-chamber, two end chambers with which the supporting-pipes communicate, and which communicate with the settling-chamber at the top of the drum, and a partition, D, in the settling-chamber for directing the water downward, as herein shown and described.

396,401. SWILL-RECEPTACLE. JUDSON W. HALL, Worcester, Mass. Filed May 18, 1888. Serial No. 274,331. (No model.)



Claim.—1. The combination, with the sheet-metal pipe having a ventilator at its top, of the receptacle at its lower end provided with apertures S, substantially as and for the purpose set forth.

2. The combination of the ventilated sheet-metal pipe and its receptacle with the water-supply pipe 2, in connection with the house water-pipe, substantially as described.

3. The combination, with the sheet-metal pipe, the receptacle, and its connection to the sewer, of the hot-water pipe 4, substantially as set forth.

4. A swill-receptacle comprising, in combination, the ventilated sheet-metal pipe having covered inlets at each story, the water-supply pipe connected with said ventilated pipe and the house water-pipe, the receptacle at the bottom of the ventilated pipe connected with the sewer, and the hot-water pipe connected with said bottom receptacle and the house-boiler, substantially as set forth.

396,402. MACHINE FOR WAXING PAPER. SAMUEL HOSKINSON, Steubenville, Ohio, and GEORGE B. RAYMOND, Chicago, Ill. Filed July 2, 1887. Serial No. 243,283. (No model.)

Claim.—1. The combination, with fixed standards and rollers journaled therein, of pivoted standards, rollers journaled in said pivoted standards, and metallic belts carried by these rollers, substantially as set forth.

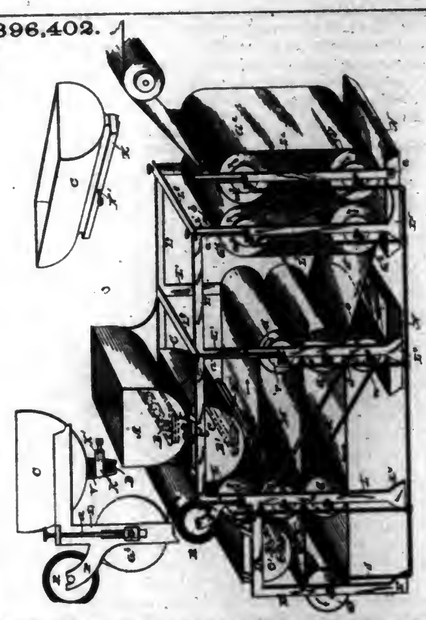
2. The combination, with fixed standards, pivoted standards, and hollow metallic rollers journaled in these standards, of flexible metallic belts and adjusting-screws for varying the contact of these metallic belts, substantially as set forth.

3. The combination, with fixed standards, pivoted standards, and hollow metallic rollers journaled in said fixed and pivoted standards, of flexible metallic belts carried on said rollers, heating-pipes passing through the rollers, and adjusting-screws for varying the relative positions of the rollers, and the metallic belts, substantially as set forth.

4. The combination, with a set of standards, rollers journaled therein, and web and metallic belts carried on said rollers, of wax-troughs, the latter each having a mouth in its bottom, a fibrous filling in the mouth, and an adjusting-screw for opening and closing the mouth, substantially as set forth.

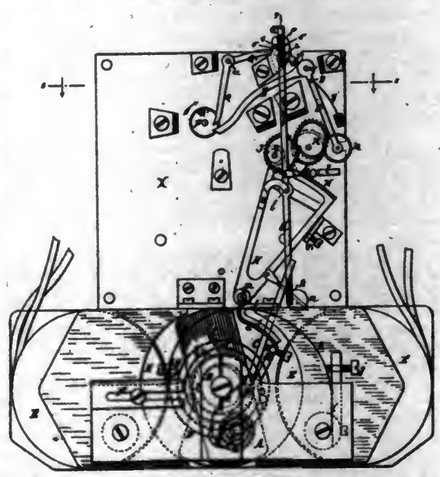
5. The combination, with a set of standards, rollers journaled

396,402.



therein, and drip-pans located in position to catch the superfluous coating material, of fibrous and metallic belts carried on the rollers, belts for communicating motion to the rollers, feed-troughs located over the fibrous belts, and screws for varying the contact of the rollers and belts, substantially as set forth.

396,403. ELECTRIC METER. MARIE J. B. JACQUEMIER, Paris, France. Filed Aug. 20, 1888. Serial No. 283,172. (No model.) Patented in France Apr. 12, 1887, No. 183,830; in England Oct. 18, 1887, No. 14,236; in Germany Oct. 22, 1887, No. 45,422; in Belgium Oct. 24, 1887, No. 79,297, and in Italy Nov. 26, 1887, XVI, 22,688, XLIV, 490.



Claim.—1. The combination of an electro-motive device, a moving part or detector, and a totalizer, with a motor clock-work adapted to impart motion to said detector and totalizer, a detent normally restraining said clock-work, a timing clock-work, and a cam driven thereby and adapted at certain intervals of time to displace said detent and free the motor clock-work.

2. In an electric meter, an electro-motive device, the moving member of which is displaced more or less according to the varying energy of the current to be measured, a retracting-spring acting against said moving member in opposition to the current, a movable stop, against which said retracting-spring is re-enforced, and a more sensitive supplemental spring tending to displace said stop, acting on

said moving member through the main retracting-spring and adapted to retract it against feeble currents.

3. The combination, with an electro-motive device, a detector, and a totalizer, of a clock-work adapted to impart motion to said detector and totalizer, a detent adapted to arrest said clock-work upon the contact of the detector with the moving member of said electro-motive device, and a timing clock-work adapted to release said parts at certain intervals of time.

4. The combination, with an electro-motive device, a detector, and a totalizer, of a clock-work adapted to impart motion to said detector and totalizer, a timing clock-work adapted to release said clock-work at certain intervals of time, and thereby permit the advance of the detector and totalizer, a detent for arresting said driving clock-work upon the stoppage of said detector by the moving member of the electro-motive device, and a disengaging device for throwing said driving clock-work out of engagement with said detector during the return of the latter to its normal position.

5. The combination, with an electro-motive device, of a detector-lever adapted to be arrested thereby, a toothed sector to which said lever is pivoted, said lever adapted to make contact at one end with the moving member of said electro-motive device, a detent connected to the other end of said lever, and a clock-work adapted to impart motion to said sector and to be arrested by said detent.

6. The combination, with an electro-motive device, of a detector-lever adapted to be arrested thereby, a toothed sector to which said lever is pivoted, said lever adapted to make contact at one end with the moving member of said electro-motive device, a detent connected to the other end of said lever, a clock-work adapted to impart motion to said sector and to be arrested by said detent, a retractile device acting to restore said sector after its displacement, and a disengaging device for disconnecting said clock-work from said sector.

7. The combination, with an electro-motive device, a detector, and a totalizer, of a clock-work adapted to impart motion to said detector and totalizer, and intermeshing toothed wheels arranged between said detector and totalizer, said wheels having such shape that the angular displacement of the totalizer from the starting position until the detector is stopped by the moving member of said electro-motive device is proportional at each instant to the energy of the current acting on the said electro-motive device.

8. The combination, with an electro-motive device and a detector-lever, of a clock-work adapted to impart motion to the fulcrum of said lever, and a detent adapted to be displaced by the movement of said lever upon its encounter with the moving member of the electro-motive device, and on such displacement to arrest said clock-work.

9. The combination, with an electro-motive device, of a detector-lever adapted in its movement to be stopped by the moving member of said electro-motive device, a clock-work for imparting motion to said lever, a detent normally engaging the flier of said clock-work in order to restrain the same, a timing clock-work adapted to release said detent at intervals, and a detent adapted to be displaced by said detector-lever upon its stoppage by the moving member of said electro-motive device, and by such displacement to arrest the clock-work.

10. The combination, with an electro-motive device, of a detector-lever, a carrier to which said lever is pivoted, a clock-work adapted to impart motion to said detector through said carrier, a disengaging device for disconnecting said clock-work from said carrier, a detent for restraining said clock-work, and a timing clock-work adapted at intervals to first release said detent, and thereby permit said clock-work to effect the movement of said detector, and subsequently to operate said disengaging device to permit the restoration of said detector and its carrier to their normal positions.

11. The combination, with an electro-motive device, a detector, and a clock-work for imparting motion to said detector, of a detent for restraining said clock-work, a lever, Q, for operating said detent, a disengaging device for disconnecting said clock-work from said detector, a lever, S, for operating said disengaging device, a timing clock-work, and a rotary cam, P, driven by said timing clock-work and adapted to displace successively said levers Q and S.

12. The combination of an electro-motive device, a detector, and a clock-work for moving said detector at intervals toward the moving member of said electro-motive device, an arm connected to and moved by said moving member and arranged to contact with and stop said detector, and a yielding connection between said arm and moving member for reducing the shock of the arm against the detector in case of the sudden movement of said moving member due to a sudden change in the current.

13. The combination of an electro-motive device, a detector adapted to move at intervals until stopped by such electro-motive device, a clock-work for imparting motion to said detector, and means for winding said clock-work, consisting of an electro-magnet and a circuit-closer in circuit therewith, adapted to close the circuit thereto upon the relaxation of the spring to be wound below a certain tension, and mechanical connections between the armature of said magnet and said spring for winding the latter upon the excitation of the magnet.

14. The combination, with an electro-motive device, a detector adapted to move at intervals from its initial position until stopped by said electro-motive device, a clock-work for imparting motion to said detector, and a timing clock-work for setting said clock-work in motion at intervals, of means for rewinding said clock-work, consisting of an electro-magnet and a circuit-closer in circuit therewith, adapted to close the circuit thereto upon the relaxation of the spring to be wound below a certain tension, and mechanical connections between the armature of said magnet and said spring for winding the latter upon the excitation of the magnet.

15. In an electric meter, the combination, with a clock-work, of an automatic rewinding device therefor consisting of an electro-magnet, a rock-lever provided with a retractile weight, a ratchet-and-pawl connection between said rock-lever and the spring to be rewound, a circuit-closer adapted to close the circuit through said magnet upon the fall of said rock-lever under the impetus of its retractile weight to its lowest position, and a connection between the armature and said rock-lever, whereby the attraction of the armature by the magnet serves to rock said lever and lift its retractile weight, whereby the spring is kept wound to a tension proportional to the retractile tension of said weight.

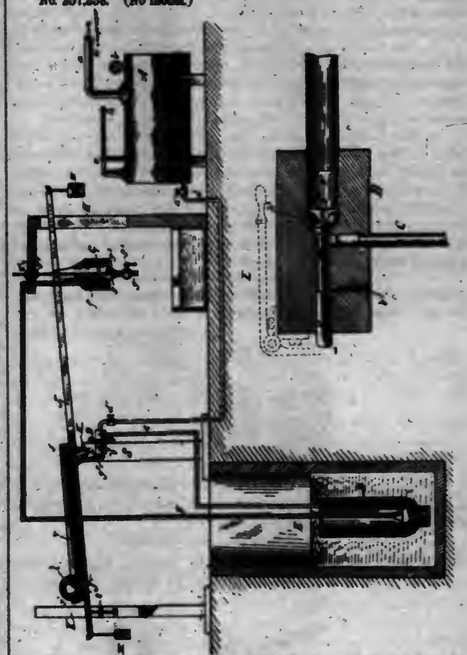
396,404. CHAIN-LINK. HARRY R. KELLEY, Niagara Falls, N. Y. Filed July 7, 1888. Serial No. 279,261. (No model.)



Claim.—1. A flat chain-link, A, stamped or cut out of sheet metal, one end having a hole at *a* for the reception of the next link at that end, the other end having the link-opening *c'*, and slot *d* continuing therefrom and adapted to receive the next link and to be closed edgewise against the edge of the link itself, making a cold-shut, substantially as specified.

2. As a new article of manufacture, the flat chain-link A, made from sheet metal and having an open end or ends, *c' d*, and the side or end *c*, adapted to be shut against the edge of the link A, substantially as set forth.

396,405. AUTOMATIC COMPRESSED-AIR WATER-ELEVATOR. JOHN K. LESLY, Tom's Brook, assignor of two-thirds to Noah W. Solomberger and German Smith, Winchester, Va. Filed Dec. 8, 1887. Serial No. 257,238. (No model.)



Claim.—1. The combination, with the storage-vessel, the submerged drum provided with a valve opening upward, a valve-box

provided with a connected plunger and valve, and an air-vent, of pipes connecting the vessel A, the drum D, and valve-box B, a vibrating beam, J, provided with a toe, *f*, adapted to act on plunger *b'*, a bucket hung from one arm of said beam and provided with an outlet-pipe, a stationary valve for this outlet-pipe, and a pipe leading from the drum D and arranged to discharge water into said bucket, all substantially as described.

2. The combination, with a pivoted working-beam, J, and a bucket, G, pivoted to this beam and provided with an outlet and a valve-seat in its bottom, of a stationary adjustable valve adapted to close upon the valve-seat in the bottom of the said bucket, a support for the valve, a support for the beam J, a supply-pipe, F, emptying into said bucket G, and means for elevating the water, substantially as described.

3. The combination, with a pivoted weighted beam, J, provided with a toe, g^3, a bucket, G, pivoted to the said beam, and a rolling counterbalancing-weight upon said beam, of a stationary valve, *g*, adapted to close upon a valve-seat in the bucket G, a valve-box, B, a reciprocating valve in said box, this valve being opened by the toe g^3 on the beam J, air-pipes *d e*, a submerged drum, D, provided with an inwardly-opening valve, and a water-supply pipe, F, leading from the drum D to the said pivoted bucket G, all arranged as and for the purpose herein stated.

396,406. SAW-SET. ANTHONY J. LEWIS and FREDERICK A. SAUER, Wilkes-Barré, Pa. Filed Oct. 12, 1888. Serial No. 287,900. (No model.)



Claim.—1. In a saw-set, the combination, with the stock or body having an anvil on its upper side, of the gage or guide consisting of a plate, F, arranged transversely to the stock or body and provided at its rear edge with the vertical ribs or flanges G G, and the prongs H, passing around the anvil and projecting in rear of the same, and the set-screw inserted between said prongs into the body and having its head bearing on the prongs to clamp them to the body, as set forth.

2. The combination of the body having a lip, L, at its rear end, the hammer mounted on the body, the lever fulcrumed thereon and engaging the hammer, the pin mounted in the lip L and having a trip-plate at its upper end engaging the hammer, and a spring coiled around said pin between the trip-plate and the lip L, as set forth.

3. The combination of the body provided at its rear end with a lip, L, having a perforation, M, the hammer mounted on the body and having its rear end provided with the offset N, the pin O, having its lower end inserted into the perforation M and its upper end provided with a trip-plate, P, having its front edge turned up, forming a rib engaging the offset N, the spring coiled around the pin O, between the trip-plate and the lip L, and the lever fulcrumed on the body and engaging the hammer, as set forth.

396,407. ELECTRIC-WIRE CONDUIT. JOHN LYNCH, Washington, D. C. Filed Nov. 5, 1888. Serial No. 290,082. (No model.)



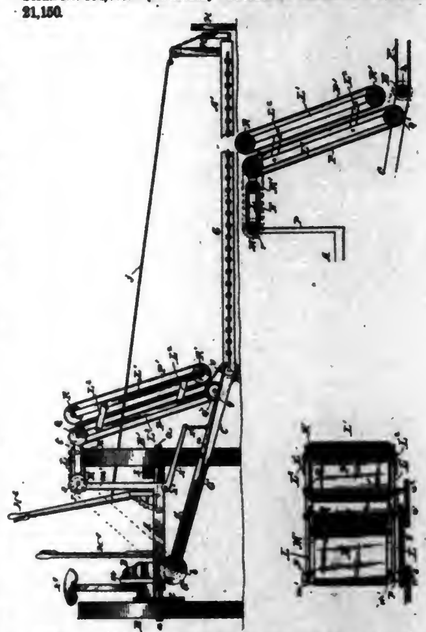
Claim.—A rectangular terra-cotta-wire conduit-pipe having rectangular partitions, all of uniform thickness and made in one integral piece, substantially as shown and described.

396,408. TAIL-PIECE FOR VIOLINS. ROBERT A. MACBRADY, New York, N. Y. Filed Mar. 26, 1886. Serial No. 196,800. (No model.)



Claim.—The combination, with the tail-piece of a violin or other similar instrument, of the studs with split heads adapted to hold strings or wires.

396,409. HARVESTER. SAMUEL D. MADDEN, Mimosburg, Ohio, assignor to Mary Madden, Sarnia, Ontario, Canada. Filed June 13, 1884. Serial No. 134,776. (No model.) Patented in Canada Feb. 25, 1885, No. 21,150.



Claim.—1. The combination of the main wheel-frame, a pivoted platform-frame extending laterally beyond the main wheel-frame, an intermediate pivoted connecting-frame, and an elevator consisting of two frames, each supporting a grain-conveying belt, and one frame being upwardly and outwardly inclined and hinged to the intermediate frame near the inner end of the grain-platform and jointed at its upper end to the other frame, which is arranged substantially horizontally and is jointed to standards upon the main wheel-frame, substantially as described.

2. The combination of the main wheel-frame supported by two wheels, a pivoted platform-frame extending laterally beyond the main wheel-frame, an intermediate frame pivoted to the wheel-frame and extending laterally in front and rear of one of the supporting-wheels, and an elevator consisting of two parts or frames jointed together and one hinged to standards upon the main wheel-frame and the other to the said intermediate frame, substantially as described.

3. The combination, with a main wheel-frame supported upon driving-wheels, a platform-frame, and an intermediate frame pivoted at its opposite ends to said main and platform-frames, of an elevator composed of two frames jointed together and one hinged to the main wheel-frame and the other to the intermediate frame, rollers journaled in said frames and provided at their forward ends with driving-wheels, a driving-belt between the said wheels, and elevator-belts mounted upon said rollers, substantially as described.

4. The combination, with the main wheel-frame supported by two wheels and the grain-platform frame, of the grain-elevator, which delivers the cut grain from the grain-platform over the inner wheel, consisting of a substantially-horizontal frame, L, hinged to supports on the main wheel-frame, an inclined elevating-frame, L^2, pivoted at its upper end to the frame L and supported at its lower end adjacent to the grain-platform, and the upper belt-frame, L', hinged by links to the frame L^2, substantially as described.

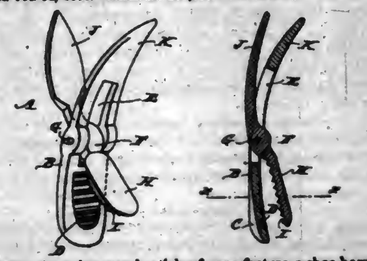
5. The combination of the main wheel-frame, its supporting-wheels, the platform-frame in lateral alignment with said main wheel-frame, an intermediate frame connecting said main wheel and platform frames and extending laterally in front and rear of one of the supporting-wheels, the jointed elevator composed of frames L L^2, the frame L^2 being connected at its lower end to said intermediate frame, the frame L being hinged to supports on the main wheel-frame, and the upper belt-frame, L', connected to the frame L^2 of the jointed elevator by links whereby to move independent of said jointed elevator, and whereby, also, both frames forming the elevator are moved toward the main wheel-frame when the platform-frame is raised, substantially as described.

396,410. STENCIL. WILLIAM F. MCKAY, Toronto, Ontario, Canada; Sara McKay administratrix of said William F. McKay, deceased. Filed Jan. 5, 1888. Serial No. 257,737. (Model.)



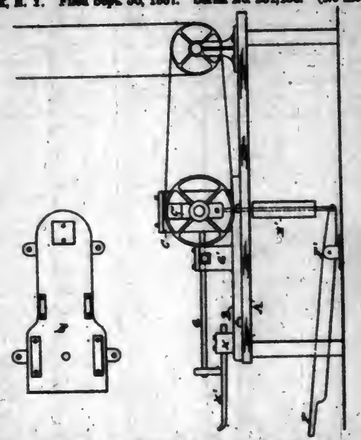
Claim.—The frame A, carrying stencil, having journaled roll C at one end, supported on springs F F at the other and provided with pins G G, in combination with a plate, B, arranged under the stencil, and a table, E, carrying gages D D, as shown and described.

396,411. SHOE-HORN. SAMUEL D. MCKENZY, Philadelphia, Pa. Filed Oct. 31, 1888. Serial No. 289,656. (No model.)



Claim.—As an improved article of manufacture, a shoe-horn consisting of the horn B, having the concave lower end, C, and the handle K, and provided with the slot E and the ridges D, and the arm F, passing through and pivoted in the slot of the horn and provided with ridges I on the inner side of its lower end, as set forth.

396,412. SHARLING-MACHINE. WILLIAM MCPHERSON, New York, N. Y. Filed Sept. 30, 1887. Serial No. 251,153. (No model.)



Claim.—1. In a sharling-machine, the combination of the sharling-iron, the hammer, the trip-wheel operatively connected therewith, and the sliding boxes in which the trip-wheel is journaled, substantially as set forth.

2. In a sharling-machine, the combination of the hammer, the trip-wheel operatively connected therewith, the sliding boxes in which the trip-wheel is journaled, and the adjustable sharling-iron, substantially as set forth.

3. In a sharling-machine, the combination of a hammer, a trip-wheel operatively connected therewith, the sliding boxes in which the trip-wheel is journaled, and the weighted foot-lever to govern the force of the blow of the hammer, substantially as set forth.

4. In a sharling-machine, the combination of the hammer, the trip-wheel operatively connected with the hammer, the sliding boxes in which the trip-wheel is journaled, and the foot-regulator connected with the boxes, substantially as set forth.

5. A sharling-machine consisting of a sharling-iron, a hammer suitably fulcrumed and its inner end provided with a lip or catch constructed to engage the trundles of the trundle or trip wheel, and a bumper surrounded by a spring to prevent the rebound of the hammer, substantially as shown and described.

396,418. SKATE. THOMAS H. MCGROWN, Biggsville, Ill. Filed May 7, 1888. Serial No. 273,098. (No model.)



Claim.—1. In a skate, the combination, with a sole-plate, of a rear runner rigidly secured thereto, having an inwardly-curved front edge and guide-lugs projecting beyond said edge, and a front runner pivoted to said plate and having an outward curve on its rear edge conforming to the curvature of said forward edge of the rear runner, substantially as described.

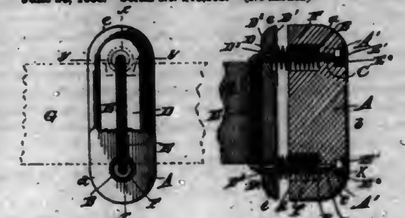
2. In a skate, the combination, with a sole-plate, of a runner rigidly secured thereto, having an inclined lower front edge, as I', and an upper curved front edge, as I, a runner pivoted to said plate in front of said other runner, and having a curved upper rear edge, as H, and an inclined lower rear edge, as H', which are adapted to fit against the said edge of the rear runner, substantially as described.

3. In a skate, the combination, with the plate and a rigidly-secured runner, of a pivoted runner having a curved spring, as K, secured thereto and to the plates between the forward ends thereof, substantially as described.

4. In a skate, the combination, with the plate, of a rigid runner secured thereto, having lugs permanently secured thereon projecting obliquely from its forward sides, a runner pivoted to said plate and working between said lugs, and a spring, as K, between the forward ends of said plate and pivoted runner, said spring being rigidly secured to the plate and runner, substantially as described.

5. In a skate, the combination, with the plate, of a rigidly-secured runner C, having lugs G on its forward end and a curved and inclined edge, as I and I', a forward pivoted runner in alignment with said other runner, brackets, as F, secured to said plate, in which said runner is pivoted, and a spring, as K, secured between the pivoted runner and the forward end of the plate, substantially as described.

396,414. TRUSS. JOSEPH B. MELONEY, Hosmer, Wis. Filed June 23, 1888. Serial No. 278,360. (No model.)



Claim.—In a truss, the combination of a base-block and a head-block, each provided with two openings, the respective openings in one block being in alignment with the corresponding openings in the companion block, the inner part of each opening being recessed or enlarged, two spiral springs interposed between the blocks and seated in the respective aligning openings, as specified, a yoke-shaped rod having its side arms in the respective springs and openings aforesaid, the ends of said arms being secured to the base-block, the cross-piece of the yoke lying outside of the head-block, whereby the body-band may be secured between said cross-piece and head-block, substantially as specified.

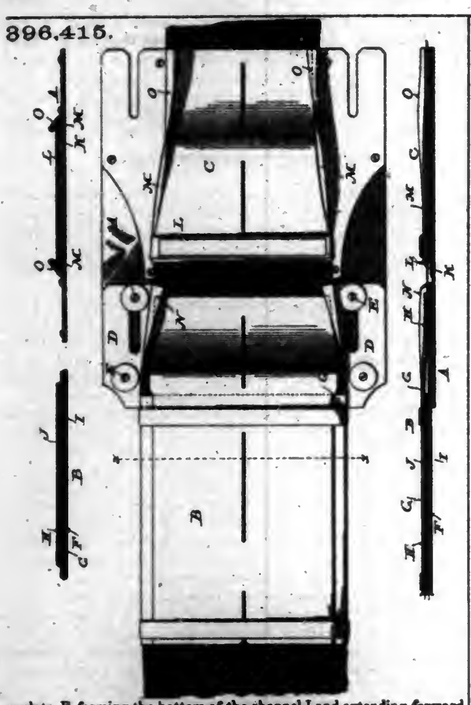
396,415. DEVICE FOR FOLDING THE EDGES OF FABRICS. JOHN R. MCKENZIE, Glens Falls, N. Y., assignor of one-half to Joseph Fowler, same place. Filed Oct. 6, 1888. Serial No. 287,377. (No model.)

Claim.—1. In a device for folding the edges of one fabric upon the edges of another, the combination, with a folder, B, comprising the separated channels I J, of different widths, one above the other, and the converging folding-lips N, of the folder C, provided with converging lips O, to receive the double fabric and fold it upon itself.

2. In a device for folding the edges of one fabric upon the edges of another, the combination of the plates F, G, and H, separated from one another to form channels I and J, of different widths, the plate G terminating short of the plates F and H, and the plate H being bent down in line with the plate G, and converging folding-lips N, formed upon the lower plate, F, and extending from the lower channel, I, upward toward each other and above and overhanging the plate H.

3. In a device for folding cloth, in combination with the folder B, having two channels, I and J, of different widths, separated by a partition, G, a plate, H, forming the top of the channel J and extending forward and downward in advance of and in line with the partition G,

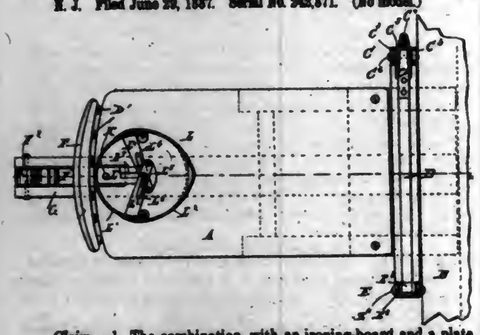
896,415.



a plate, F, forming the bottom of the channel I and extending forward in advance of the partition G, and U-shaped folding-lips N, formed upon the plate F and converging toward each other above the upper plate, H.

4. In a device for folding the edges of one fabric upon the edges of another, the combination, with the body provided with two fabric-receiving channels, one above the other, and the lower channel of greater width than the upper, of converging folding-lips on each side of the body, arranged in line with the wider channel, to receive the fabric passing through the latter and to turn it over upon the edges of the fabric passing through the narrow channel.

896,416. SHIRT-IRONING TABLE. JAMES H. MOUNT, Jamesburg, N. J. Filed June 29, 1887. Serial No. 242,871. (No model.)



Claim.—1. The combination, with an ironing-board and a plate, C, attached thereto and formed with hinge-lugs C^2, a shoulder, C^3, and a curved or inclined bearing, C^4, of a clamping-bar, D, hinge-plates C^2, attached to the end of the same, a pivot, C^2, passed through the lugs C^2 and plates C^2, a spring, C^7, coiled on the pivot C^2, and having its ends resting against the shoulder C^3 and the bar D, respectively, and a check-spring, C^8, attached to the bar D, and adapted to co-operate with the bearing C^4, substantially as shown and described.

2. The combination, with an ironing-board and a block, H, fixed below the same and formed with a longitudinal groove, G^2, in its under side, of a bar, G, mounted to slide lengthwise in said groove and formed with longitudinal slots in its front and rear ends, a clamping-screw, G^2, passed through the rear one of said slots into the block H, a clamping-bar, F, adapted to bear against the ironing-board and having a shank pivoted in the front one of said slots, and a cam-lever pivoted in the latter slot and adapted to work against said shank, substantially as shown and described.

3. In a yoke-clamping device for shirt-ironing boards, the combination of a pivotal cam-lever, F^2, having its bearing-surface F^3 cut on a circle of which the pivot of the lever is the center, and a swinging clamping-bar, F, having the bearing-surface F^4 of its shank F' cut on a like circle, substantially as and for the purpose specified.

4. The combination, with an ironing-board, of a neckband-ring formed of two movably-connected sections of thin elastic material, one section being connected to the board, and both sections having inwardly-compressible end portions, substantially as described.

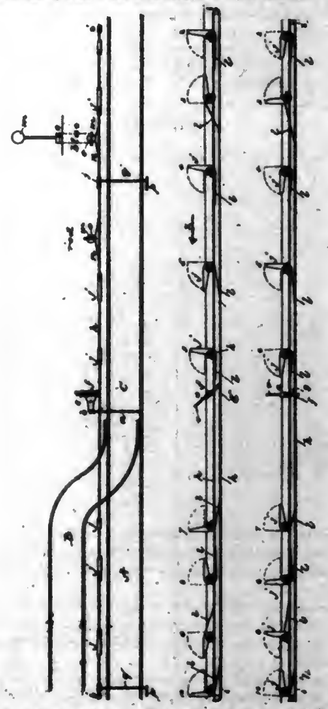
5. A neckband-ring formed of elastic hoop-sections L' and L^2, an interiorly-projecting bar, L^3, on one section, and interiorly-projecting arms L^4 on the other section pivotally connected to the bar L^3, substantially as described.

896,417. DYE. SYLVESTER M. NEVILLE, Cleveland, Ohio. Filed Dec. 2, 1887. Serial No. 256,811. (No specimens.)

Claim.—1. A coloring composition insoluble in water and alcohol and soluble in benzine, turpentine, and similar solvents, consisting, essentially, of fatty matter—such as common soap—sulphate of zinc, and such pigment as before compounding is soluble in water or liquid, substantially as set forth.

2. A coloring composition insoluble in water and alcohol and soluble in benzine, turpentine, and similar solvents, consisting, essentially, of common soap diluted or dissolved in water, coloring-matter, as aniline colors such as will dissolve in liquid soap, and sulphate of zinc, substantially as set forth.

896,418. AUTOMATIC RAILWAY-SWITCH. A. INGRAM PARSONS, St. Louis, Mo.; H. F. Parsons (administrator of said A. Ingram Parsons, deceased) assignor, by mesne assignments, to the Parsons Block, Switch and Frog Company, New York, N. Y. Filed Mar. 11, 1886. Renewed Oct. 4, 1888. Serial No. 287,209. (No model.)



Claim.—1. A railway-switch comprising a switch-bar, a worm-geared operating-lever, a worm-shaft meshing therewith, all arranged at the side of the track, an endless bar, chain, cable, or the like, and vertical levers connected thereto to move it in opposite directions, and means, substantially as described, for actuating said vertical levers to rotate said worm-shaft, and thereby actuate the worm-geared lever and simultaneously lock it, and consequently the switch, in desired position, substantially as set forth.

2. A railway-switch-operating mechanism comprising an endless rod, chain, cable, rope, or the like, mounted upon pulleys, a series of vertical levers to move said rod in either of two directions, and a switch-lever having a worm-gear, and a worm-shaft connected to said rod, and all arranged at the side of the track, combined with signals connected to said endless rod and operated by the operating of the switch, substantially as set forth.

3. The combination of the endless rod or its described equivalent and a series of vertical levers flexibly connected in order to the upper and lower members of said rod, with a switch mechanism comprising a switch-bar, a worm-geared segmental lever connected thereto, and a worm-shaft connected to and rotated by the movement of the said rod, the whole arranged parallel to the rails, substantially as described.

4. A switch-operating mechanism comprising a switch-bar and rails, as usual, and two series of alternately rising and falling or reversing levers connected with the switch-bar, and each by its operation in one way causing the other to operate in the reverse direction, thereby always to present for use one or the other series of levers, substantially as described.

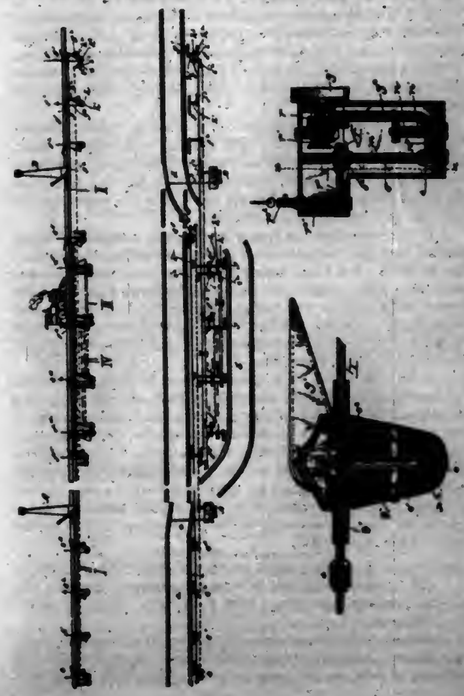
5. A switch-bar and a locking mechanism connected therewith, which is also its operating medium, combined with series of rising and falling levers connected with said operating medium and arranged to work in series, so as to insure the presentation of one or the other series in operative position for reversing the last movement of the switch, substantially as described.

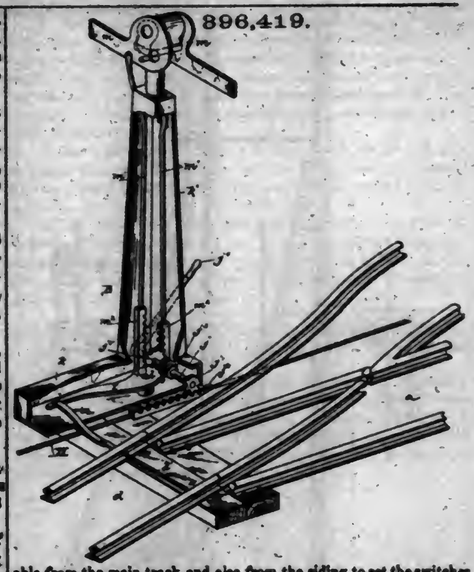
896,419. RAILWAY SWITCH AND SIGNAL. HENRY F. PARSONS, New York, N. Y., assignor, by mesne assignments, to the Parsons Block, Switch and Frog Company, same place. Filed Apr. 23, 1888. Serial No. 271,603. (No model.)

Claim.—1. A main track, a siding, and switches at each end of the siding, combined with switch-operating mechanism, comprising two systems, each having two series of permutable reversing-levers and connecting mediums for coupling in pairs the series of each system, substantially as described.

2. In a railway switch and signal mechanism, the rails and bar of the switch, combined with a suitable number of the reversing so-called "levers" of this specification, each lever comprising the exposed arm adapted to be operated by or from a passing train or locomotive, a toothed arm connected to said exposed arm, a rotary shaft operated from said toothed arm, a rotary signal, rods connecting the several levers together and to the switch, and gearing interposed in each lever between its rotary shaft, rods, and signal, substantially as described.

3. The main track, an interposed siding, switches at each end of said siding, and switch-stands for said switches, combined with the levers c, c', c^2, c^3, c^4, c^5, and c^6 and the levers f, f', f^2, f^3, f^4, f^5, and f^6, connected in two systems of two series each, which systems are operable from the main track and also from the siding to set the switches and signals, substantially as described.





4. A combined switch-stand and signal-tower comprising a suitable casing, a shaft and means to rock it, a gear-wheel on said shaft, semaphores or targets, and toothed rack-bars meshing with said wheel and connected with the said targets, in combination with the switch and switch-bar, substantially as described.

5. A combined switch-stand and signal-tower comprising a suitable casing, a rotary or rocking worm-shaft, a horizontal lever geared to said worm-shaft and coupled to the switch-bar, a pinion, semaphores or targets, and toothed rack-bars geared to said pinion and engaging the said targets, substantially as described.

6. The so-called "lever" of this specification, comprising an exposed arm adapted to be operated by or from a passing train or locomotive, a toothed arm connected to said exposed arm, a rotary shaft operated from said toothed arm, and gearing which is interposed between the parts operated by said lever and said rotary shaft, substantially as described.

7. In a railway-switch, the combination of a pair of oppositely-movable rods with a series of "levers," herein so called, each consisting of an exposed arm to be operated by a passing locomotive or train, a toothed arm connected to said exposed arm, a rotary shaft geared with said toothed arm, and a rotary shaft which in turn is geared to the rods, substantially as described.

8. The so-called "levers" of this specification, combined with the water-tight casing and a separable cap therefor containing in packed bearings the rods for connecting the levers in series, substantially as described.

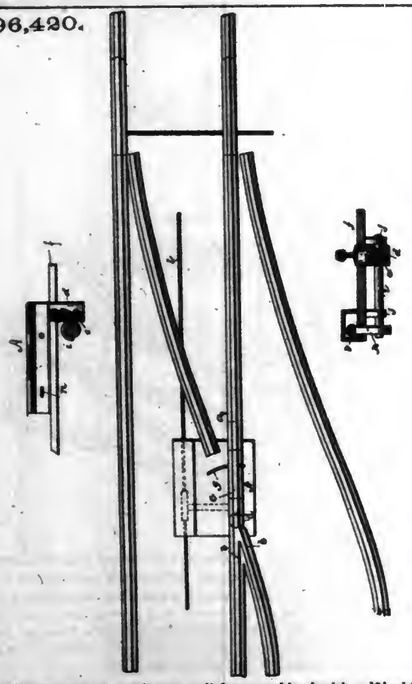
9. A combined switch and signals therefor, composed of a main track, an interposed siding, switches at each end of said siding, and switch-stands, and signals for said switches, combined with the levers c, c', c^2, c^3, c^4, c^5, and c^6 and the levers f, f', f^2, f^3, f^4, f^5, and f^6, each provided with a co-operating signal and connected in two systems of two series each, which systems are operable from the main track and also from the siding to set the switches and signals, substantially as described.

10. The combination, with automatic switch-operating mechanism, comprising a suitable number of the so-called "levers" of this specification and the combined switch-stand and signal-tower, substantially such as described, of the frog s and connections between them, substantially as described.

11. The so-called "lever" of this specification, comprising an exposed arm adapted to be operated by or from a passing train or locomotive, a toothed arm connected to said exposed arm, and a rotary shaft operated from said toothed arm, combined with a signal and rods for connecting a series of such levers and gearing interposed between the said rotary shaft and the rods and signal, substantially as described.

896,420. CONTINUOUS RAIL-FROG FOR RAILWAYS. HENRY F. PARSONS, New York, N. Y., assignor, by mesne assignments, to the Parsons Block, Switch and Frog Company, same place. Filed Apr. 23, 1888. Serial No. 271,609. (No model.)

396,420.



Claim.—1. A continuous rail-frog, combined with self-locking worm-gearing for operating it, substantially as described.

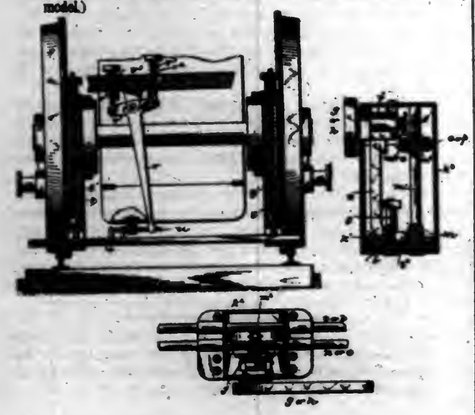
2. A railway-frog provided a toothed gear, combined with a shaft and a toothed gear thereon meshing with the gear of the frog, and by its rotation serving to move or shift the frog and lock it in given position, substantially as described.

3. The combination, with a pivoted frog and a segmental worm-gear thereon, of a worm-shaft geared with the worm-gear and adapted to be rotated to shift the frog from one position to another and back again and incidentally to lock the frog in its positions of use, substantially as described.

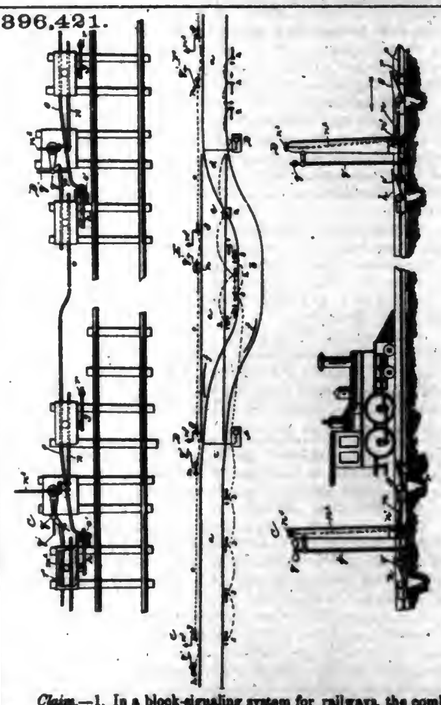
4. The combination, with a continuous rail-frog, of automatic operating mechanism and self-locking worm-gearing connecting the two, substantially as set forth.

5. A railway-frog provided with a toothed gear, and a shaft and a toothed gear thereon meshing with the gear of the frog, and by its rotation serving to move or shift the frog and lock it in given position, combined with automatic operating mechanism connected with said shaft, substantially as described.

396,421. AUTOMATIC BLOCK-SIGNALING SYSTEM AND APPARATUS FOR RAILWAYS. HENRY F. PARSONS, New York, N. Y., assignor, by mesne assignments, to the Parsons Block, Switch and Frog Company, same place. Filed Apr. 23, 1888. Serial No. 271,510. (No model.)



396,421.



Claim.—1. In a block-signaling system for railways, the combination of a series of signal-stations arranged along the track at suitable intervals, each comprising an entrance-signal connected with a lever to be operated by or from the locomotive, and a second signal connected with an independent lever adapted to be similarly operated, the second lever being provided with a blocking mechanism for the entrance-lever, and also with connections with the entrance-lever of the station in advance, substantially as described.

2. In a block-signaling system for railways, the combination of a number of signal-stations arranged alongside the track, each comprising two levers independently geared to individual signal-targets at its own station and respectively independently geared to the target-operating levers of the stations next adjoining on both sides, substantially as described.

3. In a block-signaling system for railways, a number of signal-stations arranged alongside the track, and each comprising two levers, g and h, connected to independent signals, the levers g and h of adjacent stations being connected for co-operation, and a blocking mechanism for the station in the rear being also included in this connection and operable by it, substantially as described.

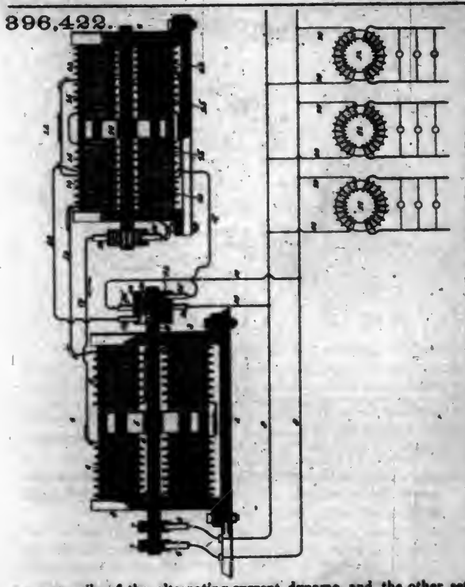
4. In a block-signaling system for railways, a number of signal-stations arranged alongside the track and comprising the combination of levers g and h and signals n^2 and q' at each station, toothed rack-bars n and p, respectively geared to the levers g and h and signals n^2 and q' of their own station, a pivoted block, o', beneath each lever h, and a toothed rack-bar, o, geared to the lever g and coupled to block o' of one station and geared to lever h of the station in advance, substantially as described.

5. In an automatic block-signaling system for railways, a number of signal-stations arranged alongside the road, and each comprising signals and entrance and exit levers therefor and blocking devices for the entrance-levers, with connections between the levers and signals of adjacent stations on both sides, combined with a bar on the locomotive movable laterally to engage the levers and depress them to operate the signals and block an entrance-lever in the rear, and also yielding vertically by contact with an immovable obstacle—such as one of the blocked levers—to arrest the attention of the engineer, substantially as described.

396,422. REGULATION OF ALTERNATE-CURRENT GENERATORS. GUSTAV FRANKENBURG, Cleveland, Ohio, assignor to the Brush Electric Company, same place. Filed Nov. 5, 1887. Serial No. 254,415. (No model.)

Claim.—1. The combination, with an alternating-current dynamo, of a separate exciting-dynamo having its field-magnets provided with two sets of coils, one set being included in the circuit of the field-

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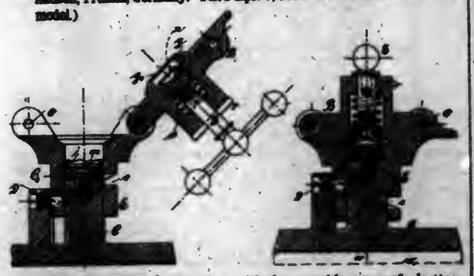
magnet coils of the alternating-current dynamo, and the other set being included in a shunt across the brush-terminals of the alternating-current dynamo.

2. The combination, with an alternating-current dynamo, of a separate exciting dynamo having its field-magnets provided with two sets of coils, one set being included in the circuit of the field-magnet coils of the alternating-current dynamo, and the other set being included in a shunt across the working-circuit, and a commutator included in the shunt for straightening the current to the set of field-coils therein, substantially as set forth.

3. In a system of electrical distribution, the combination of a separately-excited alternating-current generator having its field-coils charged by a self-exciting dynamo, with auxiliary differential coils upon the field-magnets of the exciter in a shunt across the brush-terminals of the alternating-current generator, and a commutator for straightening the currents in the shunt, substantially as described.

4. The combination, with an alternating-current dynamo, inductoriums in multiple-arc branches of the main line from the alternating-current dynamo, and translating devices included in the secondary circuits of the inductoriums, of a separate exciting-dynamo having two sets of field-magnet coils, one set being included in circuit with the field-magnet coils of the alternating-current dynamo, and the other set included in a shunt from the main line, substantially as set forth.

396,423. BUTTON-MACHINE. CARL A. PFENNING, Barmen Ritterhausen, Prussia, Germany. Filed Apr. 5, 1888. Serial No. 269,670. (No model.)



Claim.—1. The combination, with the movable cover of a button-making machine, of a button-forming stamp carried by the cover, a retaining device, as described, for temporarily holding the stamp in its elevated position, an operating-spring whereby the stamp is thrust downward when released, and an operating-handle, all substantially as and for the purpose set forth.

2. The combination, in a button-forming machine, of a movable cover containing a button-forming stamp driven by a spring and a pin attached to the stem and resting in ways, whereby the upward movement of the stamp is caused by the sliding of the pin in the ways, substantially as described.

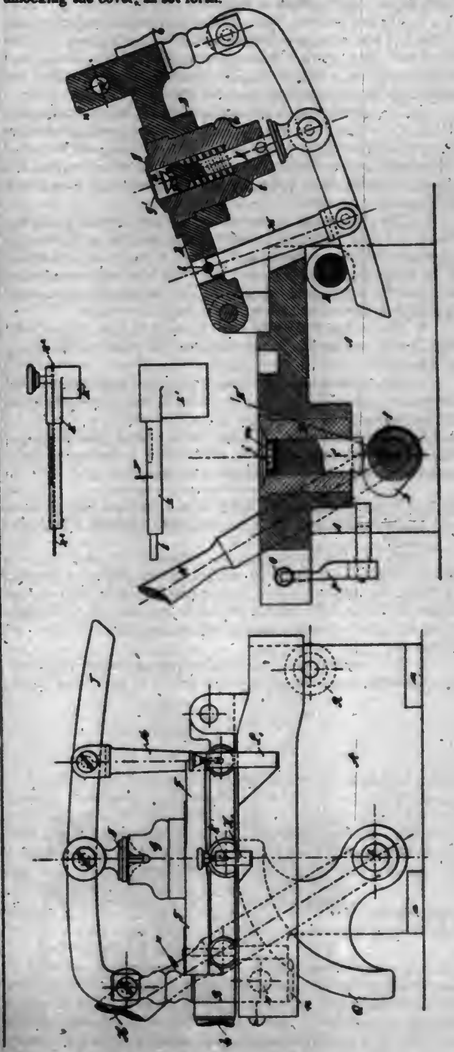
3. The combination, in a button-forming machine, of a base, a screw centrally mounted thereon, a surrounding sleeve engaging with said screw and carrying the button-forming core upon its upper end, a second sleeve surrounding said first sleeve and adapted to move vertically thereon, a cover containing button-forming mechanism mounted upon said sleeve, and a handle for operating said button-forming mechanism, substantially as described.

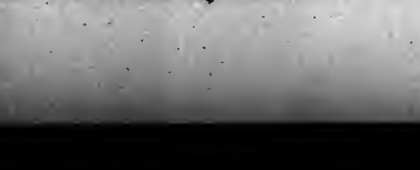
4. The combination of the core C, the sleeve E, the cover B, pivoted upon the sleeve E and locked thereon in operation, the button-forming plunger S, driven by a spring, s, and raised by a pin, r, traveling in the slot r', substantially as described.

5. The combination of the base w', carrying screw w, the part C, screwing upon the screw w, the pin D, suitably supported upon the part C, the sleeve E, having slot e, and the cover B, pivoted on the sleeve E and carrying the button-forming mechanism operated by the handle S, substantially as described.

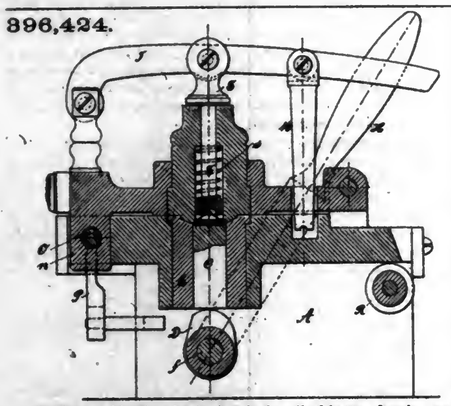
396,424. BUTTON-MACHINE. CARL A. PFENNING, Barmen Ritterhausen, Prussia, Germany. Filed Apr. 5, 1888. Serial No. 269,672. (No model.)

Claim.—1. The combination, in the herein-described button-forming mechanism, of a base carrying a core for forcing the button upward, a cover containing button-forming mechanism pivoted thereon, a lock for locking the cover upon the base, and a lever provided with connections, substantially as described, for raising the core and unlocking the cover, as set forth.





396,424.



2. The combination, in the herein-described button-forming machine, of a cover containing button-forming parts and a bolt for locking the button-shank within the cover until it is dropped upon the parts beneath, substantially as described.

3. The combination, in the herein-described button-forming machine, of a pivoted cover containing button-forming mechanism driven downward by a spring, a lever operating said spring and connected to the cover, and a roller fixed to the base for operating the lever and raising the spring, substantially as described.

4. The combination, in the herein-described button-forming machine, of a pivoted cover containing button-forming mechanism driven downward by a spring, a lever operating said spring and connected to the cover, and a roller fixed to the base for operating the lever and raising the spring, and a spring-lock for locking the spring when raised, substantially as described.

5. The combination, in the herein-described button-forming machine, of a base containing a longitudinally-movable button-forming core operated by an eccentric upon a shaft, a lever for operating said shaft, a bolt for locking the cover upon the base, and a connection, substantially as described, between the lever and the bolt for operating the lock between the cover and the base, as set forth.

6. The combination of the base A, cover B, lever H, and bolts K, L, and O, operated by the movement of the lever H, substantially as described.

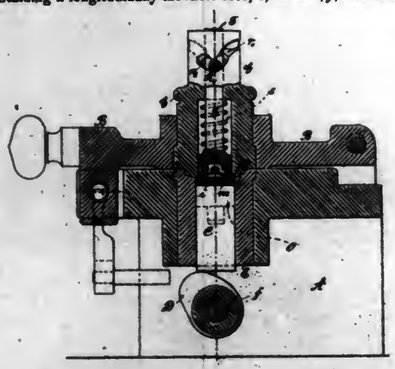
7. The combination of the base A, the cover B, pivoted thereon, the lever J, operating stamp S, and a roller, R, for operating the lever, substantially as described.

8. The combination of the base A, the cover B, pivoted thereon, the lever J, operating stamp S, a roller, R, for operating the lever, and an arm, M, and bolt *l*, substantially as described.

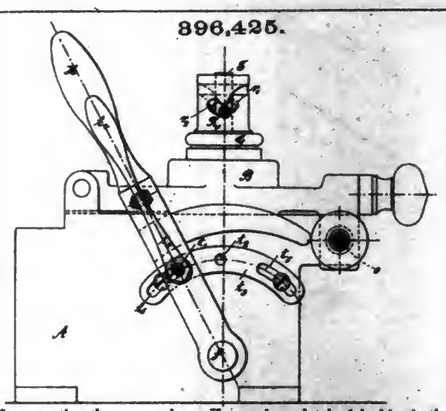
396,425. BUTTON-MACHINE. CARL A. PFENNING, Barmen Ritterhausen, Prussia, Germany. Filed Apr. 5, 1888. Serial No. 269,673. (No model.)

Claim.—1. The combination, in a button-forming machine, of a base, a longitudinally-movable core supported thereon, a cam arranged in the path of the core, an operating-handle for the cam, and a latch for temporarily securing the handle intermediate of the limits of its swinging movement, substantially as and for the purpose described.

2. The combination, in a button-forming mechanism, of the base A, containing a longitudinally-movable core, C, an axis, *f*, and cam D,

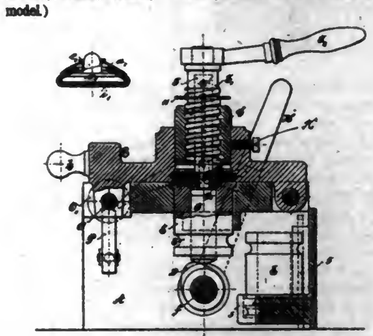


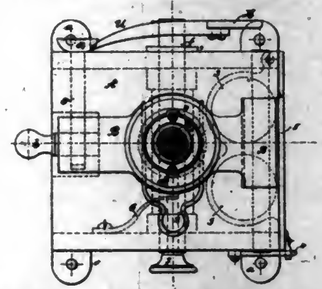
396,425.



for operating the same, a lever, H, carrying a latch, *f'*, locking in the segment *f*, which itself is capable of longitudinal adjustment by means of the slots *f'*, substantially as described.

396,426. BUTTON-MACHINE. CARL A. PFENNING, Barmen Ritterhausen, Prussia, Germany. Filed Apr. 5, 1888. Serial No. 269,674. (No model.)





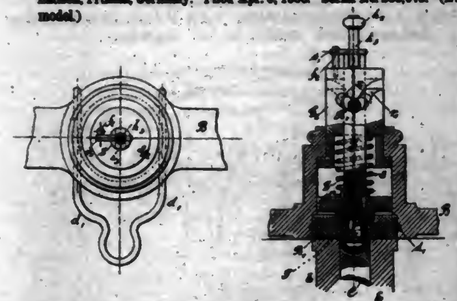
Claim.—1. In the machine herein described, the combination of a base supporting a button-forming cylinder and a central core and an adjusting device therefor, a cap above the cylinder provided with a corresponding die removably locked therein by a pronged wire, as described, and a stamp carried by the cap and adapted to be driven through said cap and die by a screw, substantially as set forth.

2. In the machine herein described, the combination of a base supporting a button-forming cylinder and a central core, a cap removably connected to the base and provided with a die having lateral recesses coinciding with recesses in the cap and detachably locked in place by a pronged wire fitted to said recesses, and a stamp carried by the cap and adapted to be driven through said cap and die by a screw, substantially as described.

3. The combination, in a button-forming machine, of a frame, A, a button-forming cylinder, E, a central core, C, and a bolt, 7, entering a recess in the part E and projecting without the casing, substantially as described.

4. The combination, in a button-forming machine, of a frame containing the button-forming part G', locked therein by a pronged wire, and the ejector-wire 9, for ejecting the same, substantially as described.

396,427. BUTTON-MACHINE. CARL A. PFENNING, Barmen Ritterhausen, Prussia, Germany. Filed Apr. 6, 1888. Serial No. 269,675. (No model.)



Claim.—1. In a button-forming machine, a cylinder within which the button is formed, a core for raising the button therein, a stamp having its axis coincident with the core, and a hook for sustaining the button passing through said stamp, substantially as described.

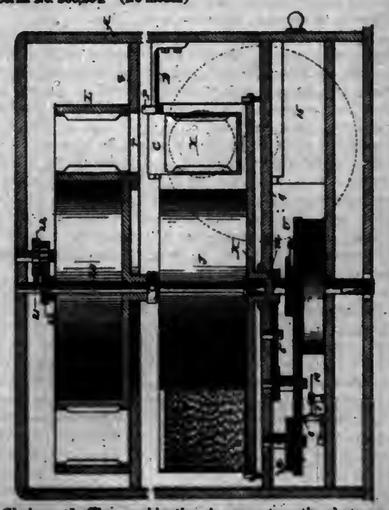
2. In a button-forming machine, a movable guide and a stamp, S, supported and centralized thereby and detachably connected thereto, in combination with the spring *s*, actuating said guide, and the handle R', traveling in the slot *r'*, for elevating the guide and stamp, substantially as described.

3. The combination, in a button-forming machine, of the cap B the button-forming part B', provided with bevel *g*, and the stamp S', depressed by spring *s* and raised by handle R', traveling in the slot *r'*, substantially as described.

4. The combination, in a button-forming machine, of a stamp, S', and a central longitudinally-movable button-holding wire, *k'*, substantially as described.

5. The combination, in a button-forming machine, of the stamp S, provided at its upper end with a slot, a central button-supporting wire traversing the stamp, and an arm at or near the upper end of said supporting-wire, whereby the latter may be sustained from the top of the stamp or be permitted to drop into the slot therein, substantially as and for the purpose described.

396,428. AUTOMATIC PHOTOGRAPHIC APPARATUS. WILLIAM B. POPE and EDWARD L. POOLE, Baltimore, Md. Filed Jan. 9, 1888. Serial No. 260,204. (No model.)



Claim.—1. The combination, in an automatic photographing apparatus, of a camera for prepared plates, baths to receive said plates in succession, a shutter, and an actuating motor and detent, and detent-operating device, whereby on the release of the detent the shutter, carrier, and plates are automatically moved to first expose the plates and then pass them successively through the baths, substantially as described.

2. The combination, with a camera, of a plate-carrier within the same constructed to support a series of separately-detachable plates, a plate-holder to receive the plates from the carrier, a shutter, a detent, a motor, whereby said carrier is automatically moved to feed the plates into the field of the lens after each exposure, and the baths, substantially as described.

3. The combination, with a camera, of a movable plate-carrier, baths, shutter, automatic carrier, and shutter operating and stop devices, and stop-actuating mechanism, substantially as set forth.

4. The combination, with a camera, of a movable plate-carrier and baths and shutter within the same, and carrier and shutter actuating and stop devices, a coin-holder, and connections between the same and the stop, whereby the latter is released in the presence of a coin, substantially as described.

5. In an automatic photographic apparatus, a plate-carrier, baths, shutter, electric stop arranged within a camera, and generator electrically connected with said stop, and a coin-holder having points connected with the generater and arranged to contact with a coin in said holder to complete a circuit, substantially as described.

6. The combination, with a camera, of a plate-carrier and a series of baths, a motor connected to move the parts to carry the plate to and from the baths, and a stop and stop-actuating device, substantially as described.

7. The combination, in a camera, of a plate-carrier, shutter, motor, electric stop, and coin-holder electrically in line with the generator and stop, and with contacts arranged to complete an electric circuit to withdraw the stop when a coin is in the holder, substantially as described.

8. The combination, with a camera box and plate-holder, of a shutter, an electric shutter-actuating mechanism, and a coin-holder electrically in line with said actuating mechanism and a battery, and with contacts arranged to contact with opposite sides of a coin in the holder to complete the circuit, substantially as set forth.

9. The combination, with a camera, shutter, and stop device, of a coin-holder provided with a movable retaining device connected with the shutter-stop device to be operated thereby to release the coin when the shutter is released, substantially as set forth.

10. The combination, with a camera, of a plate-holder, a series of baths, a motor connected to move the parts to introduce the holder in succession into said baths, a stop for holding said motor out of action, a coin-holder, and connections between the latter and the said stop, whereby the motor is released as the coin passes through the holder, substantially as set forth.

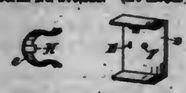
11. The combination, with the camera, plate-carrier, baths, spring-motor, and motor-stop device, of a shutter and actuating device, a shutter-catch connected with said stop device, and a coin-holder provided with a retaining device connected with said catch, substantially as set forth.

12. The combination, with the camera and pivoted plate-holder therein, of a movable rack carrying a series of plates for supplying said holder with said plates in succession, and the movable baths, substantially as set forth.

13. The combination, in a camera, of a movable plate-holder and a series of baths, and actuating means for carrying said holder from one bath to another in succession, and plate-discharging mechanism for discharging each plate after it passes through the last bath, substantially as set forth.

14. The combination, with a camera, of a shutter and a movable plate-holder, a movable rack for supplying the plate to the holder, a series of baths for receiving the plate in succession, all arranged within the camera-box, motor devices for actuating the moving parts, stops for retaining said parts normally at rest, and a coin-holder and connections between the same and said stop, substantially as and for the purpose set forth.

396,429. DOOR-CHECK. CHARLES A. PRATT, Toledo, Ohio. Filed June 7, 1888. Serial No. 276,322. (No model.)

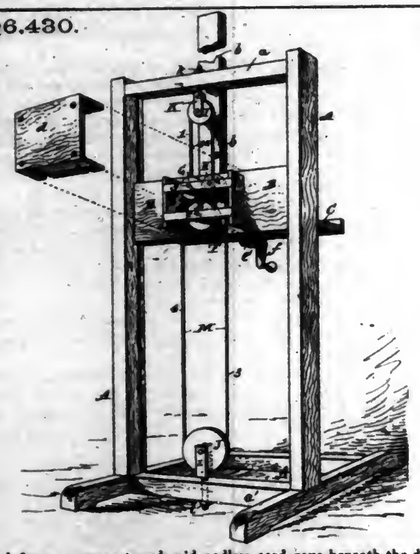


Claim.—In a door-catch, the combination of a C-shaped spring having a riveting-lug, H, at one side of its middle or bent portion, a backing or plate provided with a recess for receiving said lug and with means for attaching the plate to the door or frame, and a disk formed with an elongated slot for permitting the adjustment of the disk and with means for its attachment opposite to the spring, substantially as described.

396,480. DIFFERENTIAL PULLEY-AND-CORD HOISTING-GRADING. CARL H. W. RENNER, New York, N. Y. Filed June 23, 1888. Serial No. 277,503. (No model.)

Claim.—1. The combination, in differential hoisting or drawing gearing, of two pulleys of different diameters held by one shaft to the part or structure to be moved, an endless cord, idler pulleys or guides allowing the cord to be passed under both the differential pulleys, upper and lower pulleys or guides for the cord held to a relatively-

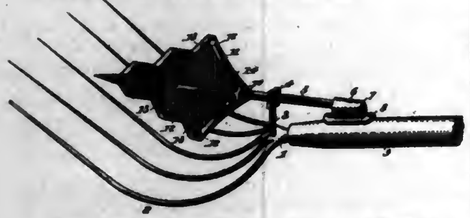
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fixed frame or support, and said endless cord rove beneath the differential pulleys and over the idler pulleys or guides on the movable part or structure, and also rove around or over the pulleys or guide on the relatively-fixed frame or structure, substantially as herein set forth.

2. The combination, in differential hoisting or drawing gearing, of two differential pulleys, E F, on a shaft, *e*, journaled to a movable part or structure, guide-pulleys G H on said structure, guide-pulleys I J on a relatively stationary frame or support, and an endless cord, M, passed beneath the pulleys E F and over the pulleys G H and around or over the pulleys I J, substantially as herein set forth.

396,431. BAND-CUTTING FORK. ARTHUR ROGMAN, Holder, Ill. Filed Apr. 23, 1888. Serial No. 271,542. (No model.)



Claim.—1. An attachment for grain-forks, consisting of the tapering blade 11, having shouldered cutting-edges 12 on opposite sides, and provided with the bar 5, the screw-threaded post 3, having the enlarged and apertured part 4, and the socket-piece 7, substantially as described.

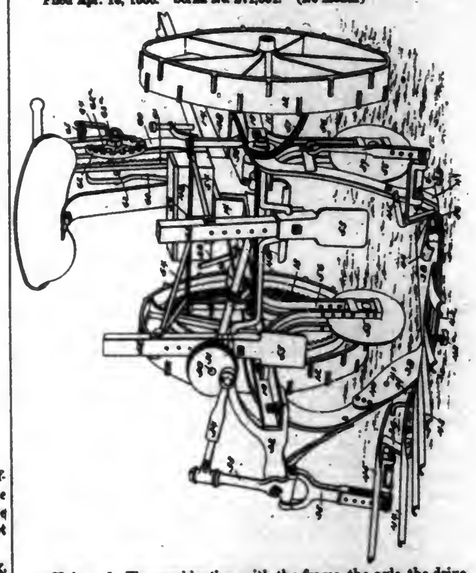
2. The combination, with the fork 2, the handle 9, provided with the socket-piece 7, and the post 3, secured to the head of the fork and having apertured enlargement 4, of the bar 5, secured in the socket-piece and enlargement of the post, and the cutting-blade 11, provided with the shoulders 12, having bearded cutting-edges 13, substantially as herein shown and described.

396,432. PROCESS OF MAKING PAINT FROM OIL FOOTS. GEORGE W. SCOLLAY, New York, N. Y. Filed Mar. 31, 1888. Serial No. 268,007. (Specimens.)

Claim.—1. The process, substantially as herein described, of making paint of the residuum resulting from the refinement of vegetable oils, which consists of mixing vegetable oil with alkali in solution, for the purpose of precipitating the residuum and refining the oil, then separating the refined oil from the residuum, and then mixing said residuum with a metallic chloride or its equivalent, for the purpose of converting it into paint.

2. The process, substantially as herein described, of making paint of the residuum resulting from the refinement of vegetable oils, which consists of mixing vegetable oil with alkali in solution, for the purpose of precipitating the residuum and refining the oil, then separating the refined oil from the residuum, then excluding the air from said residuum until it assumes a lighter or yellow color, and then mixing said residuum with a metallic chloride or its equivalent, for the purpose of converting it into paint.

396,433. POTATO-DIGGER. JAMES W. SCOTT, Uhrichsville, Ohio. Filed Apr. 16, 1888. Serial No. 271,091. (No model.)



Claim.—1. The combination, with the frame, the axle, the drive-wheel, a transverse shaft rotated from the drive-wheels, a longitudinal shaft driven from said transverse shaft, and a shovel adjustably secured to the frame, of a reciprocating shaker-bar hinged at one side to the frame, a lever-connection between the shaker-bar and the longitudinal shaft, substantially as shown, fingers attached to said shaker-bar and graduated from the center, an auxiliary bar attached longitudinally to the shaker-bar at its ends, and a set-screw passing through the auxiliary bar in engagement with the shaker-bar, substantially as shown and described, whereby the shaker-bar may be more or less straightened, concaved, or convexed, as set forth.

2. The combination, with the frame, the axle, the drive-wheel, a transverse shaft rotated from the drive-wheel, a longitudinal shaft driven from said transverse shaft, and a shovel adjustably secured to the frame, of a reciprocating shaker-bar hinged at one side to the frame, a lever-connection between the shaker-bar and longitudinal shaft, said connection consisting of an upper arm, 33, pivoted upon the bracket 32, of the frame, and an adjustable connecting-rod, 34, pivoted to arm 33 and connected at its opposite end to the crank-disk 31 upon the longitudinal shaft 30, and an arm, 35, pivoted upon lateral projections upon the lower end of the arm 33, said arm 35 capable of forward and rearward movement and adjustably connected at its lower end to the shaker-bar, said shaker-bar provided with fingers connected to the shovel, all arranged substantially as and for the purpose described.

3. In a potato-digger, essentially as described, the combination, with the main frame, the vertical standards 48, mounted thereon, the transverse cross-bar 49, connected to said standards, the drive-wheels, the axle, and sprocket-wheels upon the axle adjacent to the drive-wheel, of a crank-shaft journaled in the frame, a sprocket-wheel carried by the shaft, an endless belt connecting the sprocket-wheels of the crank-shaft and axle, alternately vertical reciprocating posts pivoted upon the crank-shaft, and shovels adjustably secured to the lower extremities of the posts, their upper ends pivoted to the cross-bars 49 by means of the horizontal connecting-arms 54, substantially as and for the purpose described.

4. In a potato-digger, substantially as described, the combination, with the frame, the axle, the drive-wheels, the plow secured to the rear end of the frame, and the tongue pivoted upon the axle and extending forward over the front of the main frame, of the means for raising and lowering the frame, said means consisting of a rearwardly-inclined bar, 61, extending upwardly from the tongue 14, provided with a longitudinal slot, one wall of which is toothed, a perpendicular standard, 60, mounted upon the forward end of the frame 10, a notched disk, 62, formed upon the upper outside edge thereof, a spindle, 63, passing transversely through said disk 62, and bar 60, provided at its inner end with a pinion engaging the toothed wall of the standard 61, and a crank-arm, 63*, mounted upon the outer end of said spindle, said arm adapted to be normally held in engagement with the notched disk by means of the plate 64 and spring 65, all arranged substantially as and for the purpose described.

5. In a potato-digger, the combination, with a reciprocating shaker-bar and fingers secured to the same, of an auxiliary bar attached at its ends longitudinally beneath the main shaker-bar, and a set-screw passing through the auxiliary bar to an engagement with the main bar, substantially as shown and described, whereby the main bar may be straightened, concaved, or convexed, as desired.

6. In a potato-digger, substantially as herein described, the combination, with a shovel, a reciprocating shaker-bar, fingers secured to the same and graduated to ascend from the center, the outermost of which fingers are secured to the shovel, of an auxiliary bar attached at its ends longitudinally beneath the main shaker-bar, and a set-screw passing through the auxiliary bar to an engagement with the main shaker-bar, substantially as and for the purposes specified.

7. In a potato-digger, essentially as herein described, the combination, with a reciprocating shaker-bar, and fingers attached to said bar graduated to ascend from the center outward, of an auxiliary bar attached at its ends longitudinally beneath the main shaker-bar, and a set-screw passing through the auxiliary bar to an engagement with the main bar, substantially as shown and described, whereby the potatoes are prevented from spilling over the sides of the shaker, as set forth.

396,434. PLOW. THOMAS W. SHUNK, Bucyrus, Ohio. Filed Oct. 1, 1888. Serial No. 286,876. (No model.)



Claim.—1. In a plow, the combination, with the frog or sheth, of a point proper having a vertical wall, *a*, a horizontal lateral flange, *b*, and an inclined lateral flange, *c*, forming a tapering recess in which said frog is fitted, and a bolt or other device to secure the frog and point together.

2. In a plow, the combination, with the frog or sheth, a vertical adjustable standard secured to it, and braces also secured to it, of a beam pivotally connected with the said standard and with said braces.

3. In a plow, the combination, with the frog or sheth, a standard having a slot and a series of holes, bolts carried by the frog or sheth and fitted to said slot and either of said holes, and braces secured, one of them by one of said bolts and the other by another bolt, to the frog or sheth, of a beam pivoted to the standard and to said braces by horizontal bolts.

4. In a plow, the combination, with the frog or sheth having two bolts and integral lugs near one side of one bolt and the opposite side of the other bolt, of a standard adjustably secured by said bolts and fitted between the said lugs.

5. In a plow, the combination, with the frog and the point fitted thereto and constructed in the wall thereof away from the landside, with a groove, *f*, and constituting a shoulder by the remaining upper portion of said wall, of a share-wing secured to the frog and fitted against said shoulder so constituted and into the said groove.

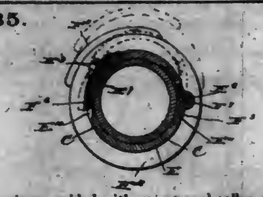
6. In a plow, the combination, with the frog or sheth, of a point proper having a vertical wall, *a*, a horizontal lateral flange, *b*, and an inclined lateral flange, *c*, whereby a tapering recess is formed for the point of the frog, a bolt fitted through the walls of the frog and point, and an elongated bolt-hole to admit of adjusting the point.

396,435. HOSE-COUPLING. JAMES D. SLOAN, Rushville, Ind. Filed June 1, 1888. Serial No. 275,702. (No model.)

Claim.—1. In a hose-coupling, the combination, with the coupling-body E, provided with a lug, E', and a projection, E^2, a hinged portion, F, provided with a forwardly-extending spring-catch adapted to engage the lug E' when closed and the projection E^2 when opened, said hinged portion and the body portion provided with internal



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grooves, of a pipe provided with an external collar adapted to enter the internal grooves in the coupling, substantially as and for the purpose specified.

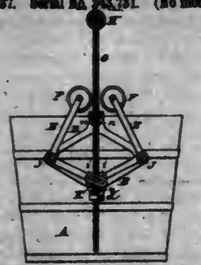
2. A hose-coupling consisting of a body provided with a lug, E', said lug being provided with a smaller lug, E^2, a hinge engaged to said body, said hinge portion being provided with a spring-catch, F^2, the inner sides of the body aforesaid being grooved, in combination with a pipe provided with a collar adapted to engage with the groove in the body aforesaid, substantially as and for the purpose specified.

3. A hose-coupling consisting of a body provided with a recess, E^{2a}, on its outer side, a lug, E', provided with a smaller lug, E^2, a spring-actuated hinge portion engaged to said body, said hinge portion being provided with a spring-catch, F^2, the inner sides of the body aforesaid being grooved, the hinge portion being beveled, as specified, in combination with a pipe provided with a collar adapted to engage with the groove and bevel parts aforesaid, substantially as and for the purpose specified.

4. A hose-coupling consisting of a body portion, E, provided with an opening for the reception of a hinge portion, and a hinge for closing said opening, said body being provided with external corrugations, and also provided with collars E' E^3 E^4, the respective inner sides of the body and hinge portion being grooved and beveled, as specified, one side of the hinge portion being provided with a grooved extension, F^3, in combination with the pipe C, provided with collars C' C^3 and external corrugations, substantially as and for the purpose specified.

5. A hose-coupling consisting of a body portion, E, provided with an opening for the reception of a hinge portion, and a hinge portion for closing said opening, said body being provided with external corrugations and threads, also provided with shoulder and flange, the inner side of the body being grooved, one side of the hinge portion being provided with a grooved extension, F^3, in combination with the pipe C, having collars C' C^3, and also provided with external corrugations and threads, and the internally-threaded collars D D', substantially as and for the purpose specified.

396,436. MOP-WRINGER. F. ROLLIN SMITH, Bennington, Vt. Filed July 8, 1887. Serial No. 243,791. (No model.)



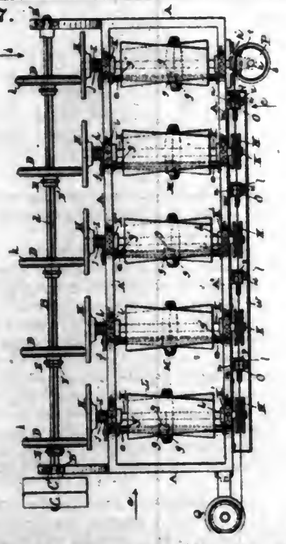
Claim.—1. The combination, with a pail, of two pairs of bell-crank levers pivoted on the pail—one pair on each side thereof—a pair of rollers journaled in the outer co-ordinate arms of said levers and parallel to each other, and a vertically-sliding bail-handle adapted to slide in guideways attached to the sides of the pail and fitted with suitable provisions for connecting with the inner co-ordinate arms of said levers, substantially as shown, whereby the vertical movements of said bail will cause said rollers to approach and recede from each other, substantially in the manner described, and for the purposes set forth.

2. The combination, with a pail, of the casting B, provided with legs *c d*, the bell-crank levers E, pivoted thereon and having slots in their inner arms, and rolls F, journaled in their outer arms, and the bail G, passing through lugs *c d* and provided with pins K, which engage the slots in the inner ends of the bell-crank levers, whereby the upward movement of the bail separates the rolls and the downward brings the rolls into operative position, substantially as described, and for the purposes set forth.

396,437. WIRE-DRAWING MACHINE. HERBERT SMITH, Worcester, Mass. Filed Nov. 7, 1888. Serial No. 290,126. (No model.)

Claim.—1. In a wire-drawing machine, the combination of a

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series of adjustable rotary friction driving-disks and a series of rotary friction-driven disks driven at varying speeds from the first-named disks, with a series of friction-cones on the same shafts as the friction-driven disks, a series of friction-cones driven at varying speeds from the first-named cones through the medium of a series of adjustable belts arranged one between each pair of cones of the series, a series of drawing-through pulleys, and the wire-drawing block, said pulleys being on the same shafts as the driven cones and the block on an independent shaft driven in turn from the shaft of one of said driven cones, all having suitable supports, as well as constructed and arranged for operation substantially as and for the purpose set forth.

2. In a wire-drawing machine, the combination of a series of adjustable rotary disks and a series of rotary disks driven at varying speeds from the first-named disks, with a series of friction-cones on the same shafts as the driven disks, a series of friction-cones driven at varying speeds from the first-named cones through the medium of a series of adjustable belts arranged one between each pair of cones of the series, a series of drawing-through pulleys, and the wire-drawing block, said pulleys being on the same shafts as the driven cones and the block on an independent shaft driven in turn from the shaft of one of said driven cones, a series of adjustable die-holders, and the dies, all having suitable supports, as well as constructed and arranged for operation substantially as and for the purpose set forth.

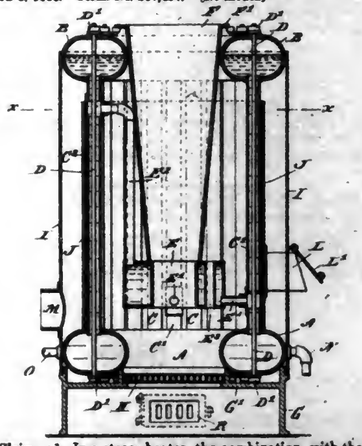
3. In a wire-drawing machine, the combination of the adjustable rotary friction driving-disks D, mounted on and keyed to driving-shaft B so as to slide but not turn thereon, and having means for moving each independently on said driving-shaft, with the rotary friction-driven disks H, mounted on shafts arranged at right angles to shaft B and having means for forcing said disks H against disks D, friction-cones J L, the cones J on the same shafts with disks H and cones L on shafts parallel to said first-named shafts, adjustable friction-belts M, interposed between the peripheries of each pair of cones J L and having means for moving the same laterally between the ends of the cones, the drawing-through pulleys N, and block P, said pulleys mounted on the same shafts as the friction-driven cones L, and the block on an independent shaft driven from one of the shafts of said driven cones, the stationary adjustable die-holders O, arranged between the drawing-through pulleys, in line therewith, the dies *l*, held in position in said die-holders, suitable means for supplying the lubricating-fluid to said dies and for discharging or carrying off the waste, a suitable reel for holding the wire as it is drawn forward into the machine, and suitable means for supporting the various parts, substantially as and for the purpose set forth.

4. In a wire-drawing machine, the combination of the adjustable rotary friction driving-disks D, mounted on and keyed to driving-shaft B so as to slide but not turn thereon, and having means for moving each independently on said driving-shaft, with the rotary friction-driven disks H, mounted on shafts arranged at right angles to shaft B and having means for forcing said disks H against disks D, friction-cones J L, the cones J on the same shafts with disks H and cones L on shafts parallel to the first-named shafts, adjustable friction-belts M, interposed between the peripheries of each pair of cones J L and having means for moving the same laterally between the ends of the cones, and the drawing-through pulleys mounted on the same shafts as the driven cones L, substantially as and for the purpose set forth.

5. In a wire-drawing machine, a die-holder comprising, in combination, the vertical plate *m*, having a vertical holding-slot in its front side and secured to a stationary support, the angle-plate *n*, adjustably fastened in the slot in said plate *m* and having the horizontal arm *n'*, provided with the vertical slot n^3, and the die-receptacle *p*, adjustably fastened to said arm *n'*, substantially as set forth.

6. In a wire-drawing machine, the combination of the die *l* with a die-holder, O, consisting of a stationary holding-plate, *m*, an angle-plate, *n*, adjustably fastened to said plate *m*, and a receptacle, *p*, in turn adjustably fastened to plate *n*, substantially as set forth.

896,438. STEAM-HEATER. HENRY SPERL, Susquehanna, Pa. Filed Oct. 8, 1888. Serial No. 287,497. (No model.)



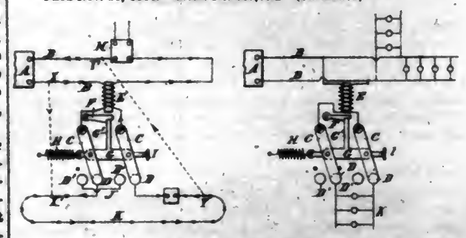
Claim.—1. In a steam-heater, the combination, with the tubular base and crown rings, of pipes connecting and communicating with said rings, a reservoir, E, mounted above the said base-ring, said reservoir being provided with a central opening and a series of flues, a series of pipes, E', connecting the reservoir and pipes aforesaid, and a furnace, substantially as described.

2. In a steam-heater, the combination, with the tubular base and crown rings, of pipes connecting said rings and communicating therewith, a reservoir mounted above said base-ring, said reservoir being provided with a central opening and a series of flues, a series of pipes, E' E^2, connecting the reservoir and pipes aforesaid, and a furnace, substantially as described.

3. In a steam-heater, the combination, with the tubular base and crown rings, of pipes connecting and communicating with said rings, a reservoir provided with a central opening and a series of flues, a series of pipes, E' E^2, connecting and communicating with the reservoir and pipes aforesaid, an outer and inner jacket, a magazine, and a furnace, substantially as described.

4. In a steam-heater, the combination, with the tubular base and crown rings, of pipes connecting and communicating with said rings, a reservoir provided with a central opening and a series of flues, a series of pipes, E' E^2, connecting and communicating with the reservoir and pipes aforesaid, an inner and outer jacket, a series of dampers, a magazine, and a furnace, substantially as described.

896,439. ELECTRICAL SWITCH. ELMER A. SPERRY, Chicago, Ill., assignor, by mesne assignments, to Herbert E. Goodman, Boston, Mass. Filed Nov. 23, 1886. Serial No. 219,654. (No model.)



Claim.—1. In combination with a double switch adapted to be operated by a spring or equivalent, a catch organized to oppose said spring, and an electro-magnetic core wound with two coils of equal magnetizing effect, which are placed one in the circuit with each switch-arm, said magnet placed so as to control and operate the catch, substantially as and for the purpose specified.

2. An electrical switch provided with two simultaneously-moving arms, a retracting device previously energized, an armature operating a catch to retain said arms in opposition to said retracting device, and differential electro-magnet in circuit with each of the two arms of said switch adapted to control the said catch, as and for purpose specified.

3. In combination with the main circuit, a duplex switch forming a connection between said main circuit and a loop or branch circuit, a differential magnetic system, the opposing helices of which are in electrical connection one with each arm of the switch, and an actuating mechanism, said magnet placed so as to control and operate the actuating mechanism and the latter to operate the switch, substantially as and for the purpose specified.

4. In a duplex switch, the combination, with simultaneously-moving switch-arms, of a retracting device, a catch to hold the same, and a magnet operating said catch having two helices, one in circuit with each switch-arm, substantially as and for the purpose specified.

5. Two loop or branch circuits terminating each in two electrical contacts, in combination with a duplex switch the arms of which are adapted to operate in connection with said contacts, and which are in connection with the main circuit through two electro-magnetic helices which oppose each other, and connecting mechanism consisting of the catch and spring or its equivalent for operating said switch, said magnet placed so as to control and operate the catch, substantially as and for the purpose specified.

6. The duplex switch, substantially such as described, in combination with two differentially-acting electric helices, the circuits through which being those passing the arms of the switch, said magnets being located between said switch-arms and the points of production of the electrical currents upon the circuit, substantially as specified and shown.

7. The combination of a main line with a service-loop thereon, a duplex switch whose arms complete the connections with the main line, a differential magnet through which the loop-current passes in opposite directions, a retracting-spring connected with such switch, and a catch to hold such switch, said catch controlled by the magnet, so as when released to release the switch and permit the loop to be cut out of the main line.

896,440. AERATED TONIC BEVERAGE. WALTER B. STARKEY, Stockton, Cal. Filed Aug. 21, 1888. Serial No. 283,375. (No specimens.)

Claim.—The herein-described aerated tonic beverage, composed of granulated sugar, water, oil of sassafras, oil of cajeput, attar of rose, alcohol, phosphate of iron, tartaric acid, Honduras sarsaparilla, burnt sugar, and carbonated water, in the proportions specified.

896,441. CULTIVATOR AND PULVERIZER. HORACE H. TAYLOR, Santa Rosa, Cal., assignor to himself and Charles R. Wheelock, same place. Filed Aug. 9, 1888. Serial No. 282,285. (No model.)



Claim.—In a cultivator and pulverizer, the combination, with the main frame, of the cross-bars C C, the transversely-arranged rotatable shafts, the cams fixed to the said shafts, the two sets of cutter-bars F, arranged one set in advance of the other and journaled near one end to the lower portion of the said cross-bars, and the springs D, secured at one end to the cross-bars and their opposite ends bearing upon the upper sides of the bars, the said bars having their upper ends extended beyond the fulcrum-point to be engaged by the cams, substantially as specified.

896,442. SHUTTER-BOWER. JOHN J. TAYLOR, Philadelphia, Pa., assignor to himself and William H. Abbott, same place. Filed Mar. 29, 1888. Serial No. 268,750. (No model.)



Claim.—A combined shutter hinge and holder comprising the short leaf B, the long leaf E, jointed to the leaf B, bent at right angles to its inner end and formed with integral vertically-apertured lugs along its arm G, the holding-arm M, having a downwardly-extending outer end, L, and an attaching-plate to which the inner end of said arm is pivotally connected, substantially as set forth.

896,443. BOX FOR ICE-CREAM. JAMES VAN DYK, Brooklyn, N. Y. Filed Nov. 5, 1888. Serial No. 290,265. (No model.)

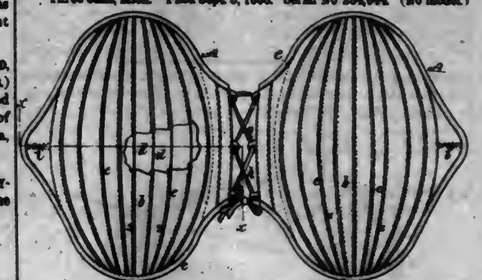


Claim.—1. The herein-described box and movable bottom therefor, the box being formed open at top and bottom and provided with an inwardly-extending flange at its bottom extending upward into the interior of the box, forming a channel around the body at the inside thereof, and forming, also, a seat for the movable bottom, the said bottom being provided with a downwardly-extending flange on its under side, the flange of the body and that of the movable bottom being relatively so formed as to fit tightly one within the other, substantially as described.

2. The combination, with the box-body open at top and bottom and the movable bottom therein, of a fixed stop or retainer for the bottom, secured to the inner surface of the body a distance from the bottom to allow a limited outward movement of the bottom, substantially as described.

3. The combination of the movable bottom formed with a downwardly-extending flange on its under side, and the body formed open at top and bottom and provided with a raised flange around the under side at the bottom and with a retainer for the movable bottom, the flange on the body and that on the movable bottom being relatively so formed as to fit one within the other, substantially as described.

896,444. BOSOM-PAD. EDWARD K. WARREN and JOSEPH H. ARES, Three Oaks, Mich. Filed Sept. 5, 1888. Serial No. 284,644. (No model.)



Claim.—1. A dress and garment pad or form having its covering or facing composed of a single thickness of cloth, with elastic ribs arranged at suitable distances apart, secured by stitching thereto, and having its ends at the opposite ends of the ribs gathered or drawn together, substantially as specified.

2. The within-described dress and garment pad or form, consisting of a covering or facing of cloth of single thickness, and having stitched pocket-like plaits in it, elastic ribs of incorrodible material within said plaits, the whole being gathered or drawn together at the ends of the ribs, and a marginal binder applied to said gathered portions, essentially as set forth.

896,445. BUTTON. TALBOT WATSON, Baltimore, Md. Filed May 12, 1888. Serial No. 274,396. (No model.)

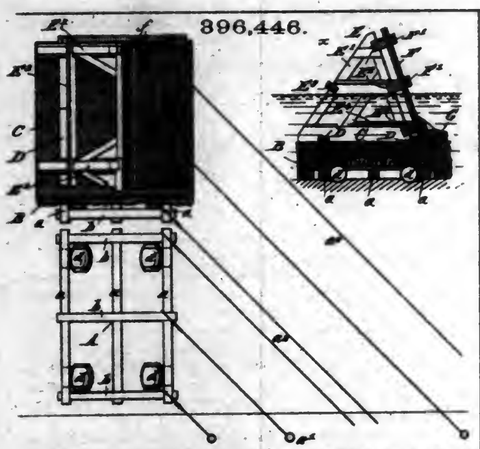


Claim.—In a button, the combination of the top 2, provided with slots on the under side thereof, a shank, 5, a bottom, 6, said bottom being in the form of a T, and a locking device consisting of a disk with springs on the top thereof, and wings on the under side thereof, said locking device being free to rotate on the said shank, for the purpose set forth.

896,446. DIKE. HENRY C. WEBER, St. Charles, Mo. Filed Nov. 6, 1888. Serial No. 290,101. (No model.)

Claim.—1. A dike comprising a float-frame, layers of poles, brush, willows, or rails thereon, trestle E, and inclined front layer, F, of poles, brush, willows, rails, or other similar material, substantially as described.

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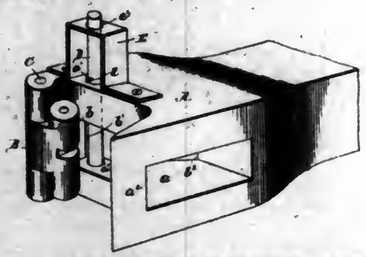
2. The float-frame A and opposite layers, B C, of poles, brush, willows, or rails, in combination with a trestle, E, and inclined layer F, of poles, brush, willows, or rails, substantially as described.

3. The trestle E, built upon layers of poles, brushes, rails, or willows, and a float-frame, and formed with shelves E^4, substantially as and for the purposes set forth.

4. The float-frame A, layers B C thereon of poles, rails, brush, or willows or other material, and the trestle composed of A-shaped end frames and the front bars, E^3 E^3, in combination with the layer of poles, brush, willows, or rails F, bound to the bars E^3, substantially as described.

5. The float-frame and layers of poles, brush, rails, or willows thereon and the trestle-frame and inclined poles, willows, rails, or brush F, in combination with the bundle of poles, brush, willows, or rails G, secured at the bottom of the poles F, substantially as described.

396,447. CAR-COUPLING. DAVID Y. WILSON, Gum Tree, assignor of one-half to Adam P. Reid, Parkersburg, Pa. Filed June 4, 1888. Serial No. 276,001. (No model.)



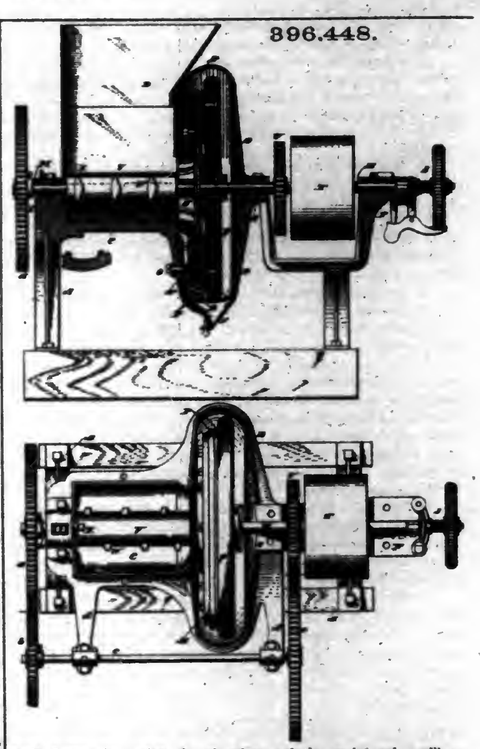
Claim.—In a locking mechanism for car-couplings, the combination, with a coupler-head provided with a transverse opening and a locking-tongue in the transverse opening, and limited in its forward movement by the front wall thereof, and having its rear portion flattened to afford a gravity-support, and provided upon its upper face with a concavity forming a pin-seat and on its front edge with a pin-notch, of a coupling-pin adapted to be supported by the rear portion of the locking-tongue and rest in the said concavity, forming a pin-seat to hold the locking-tongue in the proper position preparatory for coupling, and fall in front of said tongue in the pin-notch when the support is withdrawn, substantially as described.

396,448. CRUSHING AND GRINDING MILL. JAMES F. WITCHELL, Springfield, Ohio, assignor to the Foos Manufacturing Company, same place. Filed July 27, 1887. Serial No. 245,395. (No model.)

Claim.—1. In a crushing and grinding mill, the combination, with the main shaft and grinding mechanism carried thereby, of an auxiliary shaft mounted opposite the center of the grinding mechanism independently of the main shaft, a feeding-crusher mounted on the auxiliary shaft, a chamber in which the feeding-crusher operates, and motion-conducting mechanism interposed between the main shaft and the feeding-crusher, and consisting of a shaft geared to the main and auxiliary shafts through interchangeable gearing, whereby the relative speed of the main and auxiliary shafts may be varied and motion conducted from one of them to the other.

2. In a crushing and grinding mill, the combination, with the

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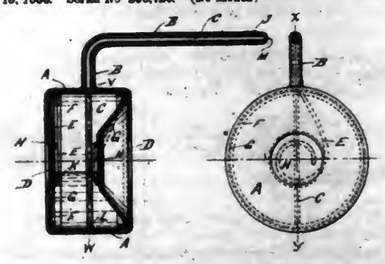


main frame, the casing, the chamber, and the main and auxiliary shafts mounted upon the frame substantially in line with each other, of a stationary grinding-head within the casing, a rotary grinding-head carried by main shaft, and a feeding-crusher within said chamber and carried by the auxiliary shaft, a pinion on the main shaft, a gear-wheel on the auxiliary shaft, and motion-conducting mechanism transmitting motion at different speeds from one shaft to the other, consisting of a shaft mounted upon said frame, a gear-wheel carried thereby and meshing with the said pinion, and a pinion carried thereby and meshing with the first-named gear-wheel.

3. In a crushing and grinding mill, the combination, with the main shaft and grinding mechanism, of an auxiliary shaft mounted substantially in line with the main shaft, a feeding-crusher mounted thereon and arranged to feed the material longitudinally to the grinding mechanism, a chamber in which the crusher operates, and a shaft geared to the main and auxiliary shafts and rotating the latter at a different speed from the former.

4. In a crushing and grinding mill, the combination, with the main frame and casing, of an auxiliary shaft mounted at one end in the frame and at the other within the eye of a grinding-head, and a grinding-head secured to the casing and having an eye therein, and spiders extending across the eye and having the upper and lower faces thereof at an angle to a horizontal plane.

396,449. ATOMIZER. JOHN B. WOOTTEN, Reading, Pa. Filed Nov. 13, 1888. Serial No. 290,736. (No model.)



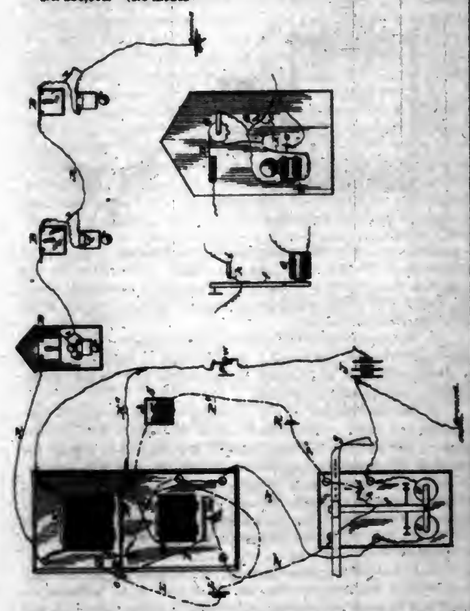
Claim.—1. In an atomizer, the combination, with a compressible liquid-receptacle, of an air-tube, B, secured to and communicating with the upper portion of said receptacle, and a liquid-tube, C, extending to the lower portion of the same, all arranged and operated substantially as set forth.

2. In an atomizer, the combination of a liquid-receptacle consisting of a rigid case with opening and flexible lining, substantially as described, and air and liquid tubes communicating with said receptacle, all adapted to operate substantially as set forth.

3. In an atomizer, the combination, with a rigid case with opening and flexible lining, substantially as described, of a spring or springs arranged to press upon said lining, substantially as and for the purpose set forth.

4. In an atomizer, the combination, with a compressible receptacle, of an interior spring or springs arranged to restore said receptacle to its normal shape after being compressed, for the purpose set forth.

396,450. MUNICIPAL TELEGRAPH SYSTEM. THEODORE J. ZOELLER, Louisville, Ky., assignor, by mesne assignments, to the United States Signal Clock Company, same place. Filed Jan. 5, 1888. Serial No. 259,893. (No model.)



Claim.—1. The combination, with an electric circuit and slowly and rapidly operating circuit-breakers or transmitters therein, of a primary and a secondary relay located at a given station, a register and an indicator, and local circuits, those containing the register and secondary relay being controlled by the main or primary relay alone and that containing the indicator being controlled conjointly by the main and secondary relays and the register, as and for the purpose set forth.

2. A central-station apparatus for combined fire and police telegraphs, consisting of a main or primary and a secondary relay and two receiving-instruments—such as a register or recorder and an indicator—combined by means of the following circuits: a local circuit containing the register and closed by the contact of the main relay-armature with its back-stop, a local circuit including the secondary relay and closed by the contact of the main relay-armature with a front stop, *d*, and a local circuit including the indicator and closed by the simultaneous contact of the main relay-armature with front stop, *c*, the secondary relay-armature with its back-stop, and a spring on the register-armature with a stop, *i*, as and for the purpose set forth.

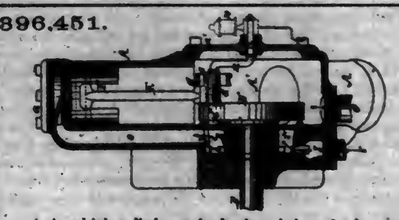
396,451. MULTIPLE-CYLINDER ENGINE. CHARLES C. ABBE, Brooklyn, N. Y. Filed Jan. 24, 1888. Serial No. 261,774. (No model.)

Claim.—1. A multiple-cylinder engine having the cylinders and shaft-bearing formed in one piece and the crank, valve, and cylinder-chambers open to each other.

2. A multiple-cylinder engine having a driving-shaft provided with a crank and a valve around the shaft and between the crank and the power-transmitting end of the shaft.

3. A multiple-cylinder engine having a shaft with a single crank, and a valve around the shaft and between the crank and the bearing of the shaft.

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4. A multiple-cylinder engine having a balanced valve surrounding the driving-shaft and provided with an annular distributing-chamber communicating with the cylinders.

5. A multiple-cylinder engine having a shaft provided with a single crank, and a valve seated in a casing around the shaft and between the crank and the power-transmitting end of the shaft.

6. A multiple-cylinder engine having a hollow valve seated in a valve-chamber around the driving-shaft and behind a single crank and held to its seat by the crank.

7. A multiple-cylinder engine having a valve behind the crank and supported upon a hub which forms the bearing for the crank-shaft.

8. A multiple-cylinder engine having a crank-shaft, and a valve in the form of a hollow ring around the shaft and behind a single crank, the outer periphery of the valve being tapered and adapted to a corresponding seat in the casing.

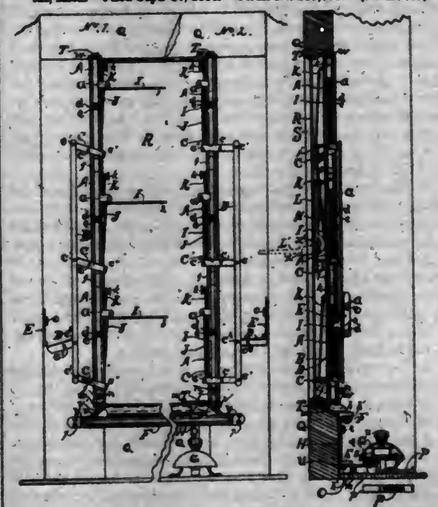
9. The combination of a crank, pistons, and piston-rods having feet adapted to a crank-pin with a tapering threaded split ring and a corresponding threaded confining-ring.

10. The combination of a crank, pistons, and piston-rods having feet adapted to a crank-pin, and one of said feet having a pin adapted to a split ring provided with a recess for said pin, and a confining-ring for the split ring.

11. A multiple-cylinder engine having a valve with an inlet-port, *i*, around its periphery opening into an annular chamber within the valve, a port, *p*, in the periphery opening from the annular chamber, and an exhaust-port, *p'*, also in the periphery in same plane with port *p*, and a diaphragm separating the steam from the exhaust-space.

12. A multiple-cylinder engine having an annular chamber with cylinder-casings radiating from same and adapted to support within the casings the cylinder-tubes proper, which are held in position at the outer ends by close frictional contact and at the inner ends by projecting lugs, whereby exhaust-steam from the crank-chamber is permitted to circulate around the cylinders.

396,452. BURGLAR-ALARM. WILLIAM J. ACKERMAN, Grand Rapids, Mich. Filed Sept. 17, 1888. Serial No. 285,632. (No model.)



Claim.—1. A burglar-alarm having an alarm-bell and stop-lever, in combination with a tripping device, H, attached to the sash in such a manner that it may be raised and lowered with or without raising the sash, and provided with a projection, *h*, which rests upon the cross-bar, a projection, *h'*, that rests upon the stop-lever, and a slot, *r*, to allow of its being raised and lowered without raising and lowering the sash by turning the cross-bar, a cross-bar, F, arranged to turn

freely in and supported by plates 1 and provided with a flattened surface, *k'*, so arranged that the turning of the bar will raise or lower the slide H, and with inclines *v*, which act with corresponding inclines on the end of the rod T to turn the cross-bar when the rods turn, supporting-rod T, having the lower end cut diagonally to correspond with the inclines *v* on the cross-bar, pressure-bars I, attached to the supporting-rods and arranged to throw out over the surface of the glass or to fold down by the side of the supporting-rod, springs J, attached to the support and arranged to throw the pressure-bars out over the glass, spring K, arranged to draw the pressure-bars toward the glass, and pins *k* in the support, for the reception of the spring K, substantially as and for the purpose set forth.

2. The combination, in a burglar-alarm, of an alarm-bell and a stop-lever with a tripping device or slide, H, attached to the sash by a pin, *t*, passing through the slot *r*, and provided with projections *k* and *k''*, a cross-bar, F, supported by and arranged to turn freely in plates attached to the window-sash, and provided with a flattened surface for the support and manipulation of the slide H, and with projecting inclines *v*, for turning the cross-bar by the action of the diagonal end of the supporting-rod T, supporting-rod T, having the lower end formed to act upon the inclines *v*, so as to turn the cross-bar when the rod turns, and provided with jackets or tubes A, within which it is arranged to turn freely, with collars for the support of the tubes, pins *c*, which are acted upon by the tubes to turn the rod, and a knob, *n*, with which to turn the rod to place by hand, and is attached to the sash-stile by means of plates *w*, in which it turns freely, tubes or supports A, which are arranged to work freely upon the rod T, and are provided with slots *d*, for the free action of the pins *c*, and with a pin, *k*, for the reception of the end of the spring K, pressure-bars I, attached to the tubes or supports A in such a manner that they may be folded down by the side of the supports or thrown out over the glass, springs J, attached at one end to the tubes and arranged to act upon the pressure-bars in throwing them out over the glass, springs K, attached at one end to the sash and at the other end to the pin *k*, for the purpose of drawing the pressure-bars against the glass, catches C, pivoted to the sash and arranged to hold the pressure-bars down to the side of the supports, connection B, lever D, and bracket E, arranged to act upon the catches C, all substantially as described, and for the purpose set forth.

3. The combination, in a burglar-alarm, of an alarm-bell and stop-lever with a slide, H, having projections *k*, *k'*, and *k''*, and a slot, *r*, and attached to the sash by means of a pin, *t*, a cross-bar, F, provided with a flattened surface for the support of the slide, and inclines to facilitate turning the cross-bar, and attached to the bottom rail of the sash by means of plates, in which it turns freely, supporting-rods T, attached to the sash-stile by means of plates, in which it is arranged to turn freely, supports A, arranged to work freely upon the supporting-rods, springs K, arranged to turn the supporting-rods by attaching one end to the sash-stile and the other end to a pin on the support, catches C, pivoted to the sash-stile and arranged to extend over the support and hold the pressure-bars to place, connection B, lever D, and bracket E, arranged to set upon the catches, and a lever, L, pivoted to the sash-stile with one end resting upon the glass, and a spring, M, one end of which is attached to the sash-stile, and the other end passes over the lever and against the end of the catches in such a manner that when the lever is thrown down the spring will force the catches around and allow the arms to throw out over the surface of the glass, substantially as and for the purpose set forth.

4. The combination, in a burglar-alarm, of an alarm-bell provided with the necessary stop-motion, with supporting-rods T, arranged to turn freely in plates *w*, attached to the sash-stile and provided with a pin, *k*, pressure-bars I, attached to the supporting-rods in such a manner that they may be folded down by the side of the rod, or may be extended out over the glass, a spring, K, which attaches at one end to the sash-stile and at the other end to the pin *k* on the supporting-rod, to hold the pressure-bars solidly against the glass, and a catch for holding the pressure-bars in place at the side of the supporting-rod, substantially as and for the purpose set forth.

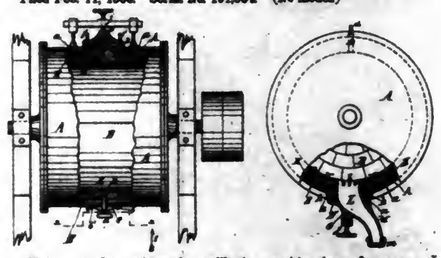
5. The combination, in a burglar-alarm, of an alarm-bell provided with the necessary stop-motion, with supporting-rods for the support of the tubes A, said supporting-rods being provided with collars *f*, one below each tube, and a pin, *c*, to work in each slot *d* in the tubes, and supported in bearings or plates secured to the sash, supports A, which are arranged to turn freely upon the supporting-rod, and are provided with slots that work over the pins *c* in the rod, and with pins *k* to receive one end of the springs K, pressure-bars I, so attached to the supporting-tubes that they may be folded down by the side of the support, or may be thrown out over the glass, springs J, arranged to throw the pressure-bars out over the glass, catches C, arranged to secure the pressure-bars down to the body of the supports, connections B, lever D, pivoted to the sash-stile, and bracket E, pivoted to the window-jamb for the purpose of operating the catch, substantially as and for the purpose set forth.

6. A burglar-alarm having an alarm-bell with the necessary stop mechanism, and having supporting-rod T, supporting-tubes A, pressure-bars I, catches C, with connections B, D, and E, spring J, for throwing the pressure-bars to position, spring K, for holding the pressure-bars solidly against the glass, and a pin, *k*, for the reception of the spring K, in combination with a lever, L, pivoted at one end to the ogee of the sash-stile, the other end being left free to rest upon the glass, and a spring, M, attached at one end to the sash-stile, the other end passing over the lever and resting against the end of a catch, C, substantially as and for the purpose set forth.

7. A burglar-alarm consisting of an alarm having the necessary stop-motion, in combination with pressure-bars pivoted to a standard at the side of the sash-stile, arranged to extend out over and be held firmly against the surface of the glass, substantially as and for the purpose set forth.

396,453. TRITURATING-MILL. JOHAN R. ALSING, New York, N. Y.

Filed Feb. 11, 1886. Serial No. 191,584. (No model.)



Claim.—1. In a triturating-mill, the combination of a cover, J, composed of the cap *d'*, and the inner block, *d*, secured to the said cap, with the cylinder provided with lining having an integral block, K, formed with a hole or opening suitable to tightly fit the said block *d*, substantially as specified.

2. The combination, with a triturating-cylinder having a charge-opening, of the spout or funnel L, provided with an inner grate, *l*, and a discharge-pipe, M, and adapted to replace the cover in the charge-opening, substantially as specified.

3. The combination, with a triturating-cylinder having a charge-opening and ring *k*, of the spout or funnel L, provided with an inner grate, *l*, and an outer discharge-pipe, M, and adapted to replace the cover in the charge-opening, the same being provided with a flange, N, and a packing-ring, *n*, in the said flange, and with the screw-seat O and a set-screw engaging the said seat and threaded through an arm or bar attached to the said cylinder to form a tight packing with the ring *k*, surrounding the discharge-opening, substantially as hereinbefore set forth.

4. In a triturating-mill, the combination, with the cylinder having lining B, discharge-opening, and an air-hole, E, to facilitate the discharge through said opening, of the plug D, fitting tightly the said air-hole, said plug being made of material adapted to wear off by the grinding action evenly with the inner lining, B.

5. In a triturating-mill, the combination, with the cylinder having lining B, discharge-opening, and an air-hole, E, to facilitate the discharge through said opening, of the plug D, fitting tightly the said air-hole, and the spring-latch *e* and catch *b'*, to tighten the said plug, substantially as specified.

396,454. PROCESS OF FORMING MOLDS FOR CASTING. BERA J. AMES, Austin, Minn. Filed Oct. 26, 1888. Serial No. 289,176. (No specimens.)

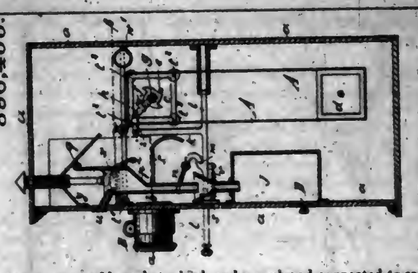
Brief.—Prefers, after applying the plaster-of-paris to the face of the mold, to dust over it a thin charcoal facing, and then return the pattern to the mold, thereby pressing the facing firmly against the sand of the mold.

Claim.—The process of forming a mold for casting which consists in molding the pattern in a body of green sand, drawing out the pattern, and applying to the surface of the mold thus formed a coating or lining of dry plaster-of-paris, which absorbs the moisture from the sand and becomes set, substantially as described.

396,455. AUTOMATIC PICTURE-EXHIBITOR. CONRAD RAGE, St. Gallo, Switzerland. Filed June 6, 1888. Serial No. 276,271. (No model.) Patented in Germany Mar. 6, 1888, No. 10,732; in France Mar. 6, 1888, No. 176,166; in England Mar. 6, 1888, No. 2,375; in Austria-Hungary Mar. 6, 1888, No. 3,473, and in Belgium Mar. 15, 1888, No. 80,896.

Claim.—1. In an automatic picture-exhibitor, a chain of pictures supported on two drums having flat sides or faces of equal dimensions and revolving on suitable shafts, in combination with a ratchet-wheel rigidly mounted on one of said drum-shafts having the same number of teeth as each of said drums has sides or faces, a lever bearing a pawl to operate said ratchet-wheel, and a push-rod connected to said lever, substantially as described.

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2. In an automatic picture-exhibitor, a chain of pictures supported on two drums revolving on suitable shafts, in combination with a ratchet-wheel rigidly mounted on one of said shafts, a lever bearing a pawl to operate said ratchet-wheel, a push-rod connected to said lever, a spring to restore said push-rod to its normal position when removed therefrom, and a pivoted lever, one end of which is in locking-contact with said push-rod and the other end of which extends into a pivoted coin-chute, substantially as and for the purpose specified.

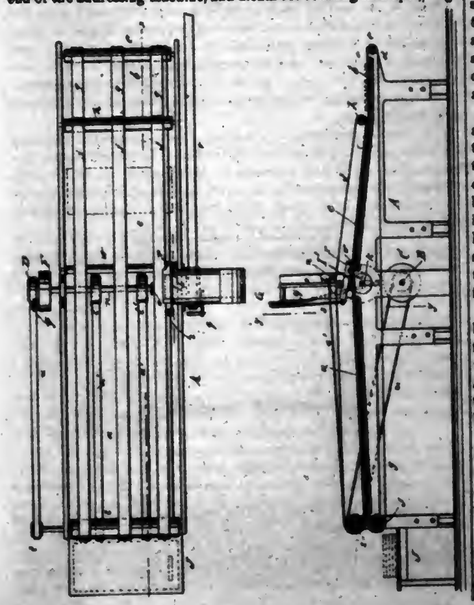
3. In an automatic picture-exhibitor, a pivoted coin-chute having a rigid arm attached thereto, in combination with a chain of pictures supported on revolving drums operated by a push-rod and pawl and ratchet-wheel, a pivoted lever one end of which is in locking-contact with said push-rod and the other end of which extends into said pivoted coin-chute, and a projecting roller attached to the edge of said chain of pictures, so that as the chain revolves the roller will come in contact with the arm of the chute and push said chute slightly from said chain of pictures, in the manner and for the purpose set forth.

396,456. BISCUIT. PERCY H. BAILY, London, County of Middlesex, England, assignor of one-half to B. F. Smith, Chicago, Ill. Filed Mar. 31, 1888. Serial No. 269,130. (No specimens.)

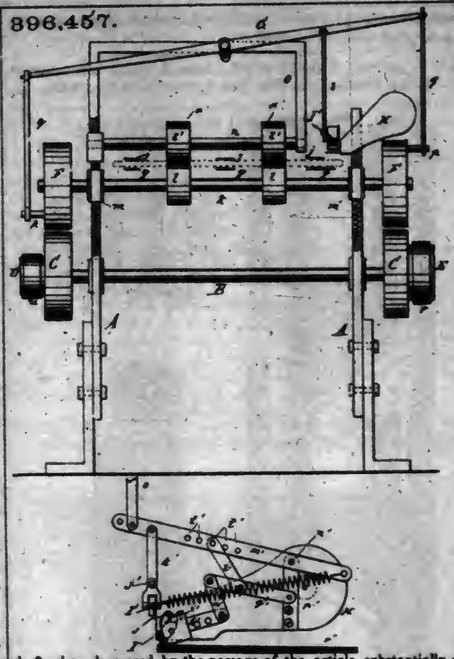
Claim.—A food or health biscuit composed of a flour, butter, sugar, and milk combined with an artificial powder consisting of tribasic phosphate of calcium, carbonate of calcium, fluoride of calcium, phosphate of magnesium, phosphate of soda, and chloride of sodium, substantially in the proportions set forth.

396,457. ADDRESSING-MACHINE. HENRY BAKER, Jr., La Grange, Ga. Filed Sept. 4, 1886. Serial No. 212,715. (No model.)

Claim.—1. The combination, with an addressing-machine having a rotary vertically-movable operating-shaft receiving its vertical movement from the article to be addressed, of a carrier extending past said shaft at right angles thereto and adjacent to the delivery end of the addressing-machine, and means for rotating said operating-



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shaft when depressed by the passage of the article, substantially as set forth.

2. The combination, with an addressing-machine having a rotary vertically-movable operating-shaft depressed by the passage of the article and a second shaft parallel with the said shaft and mounted in fixed bearings, of a carrier passing between said shafts and adjacent to the delivery end of the addressing-machine, and a power-shaft with which said vertically-movable shaft is engaged when depressed by the article, substantially as set forth.

3. The combination, in a machine for addressing newspapers, with the table having a transverse opening and the endless carrier passing along the upper face of the table, of a rotary and vertically-movable shaft extending across the under side of the table and having rollers extending up through said transverse opening, a power-shaft below the roller-shaft and adapted to rotate it upon the depression of the said roller-shaft by the passage of the paper over it, a transverse shaft journaled in fixed bearings above the vertically-movable shaft and having rollers contacting with the rollers thereon, an addressing device, and mechanism for operating the said adressing device when the vertically-movable shaft is depressed by the paper and rotated by the said power-shaft, substantially as set forth.

4. The combination with the frame, the endless carrier, and the addressing-machine at one side of the frame, of a yielding shaft adapted to be depressed by the passage of the article to be addressed and extending transversely to the carrier and having crank-pulleys at its ends provided with oppositely-arranged crank-pins, a lever pivoted between its ends above the shaft and parallel therewith, rods connecting the ends of the lever with said crank-pins, a rod connecting the lever between its ends with the addressing-machine, and a power-shaft below said pulleys for operating them upon the depression of the yielding shaft by the article to be addressed, substantially as set forth.

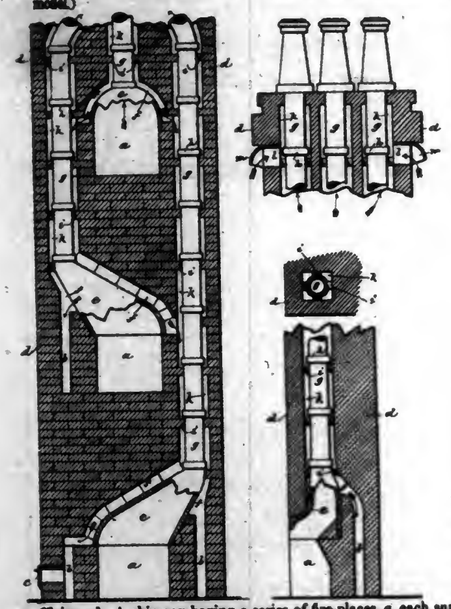
5. In an addressing-machine, the combination, with the endless bands *j a' g* and devices for supporting and moving the bands, of the fixed shaft *n*, provided with wheels *l' l'*, the movable shaft *k*, provided with wheels *l l*, the friction-wheels F, secured on the ends of the shaft *k* and carrying crank-pins *p*, the driving-shaft B, provided with friction-wheels C, the lever G, the addressing device H, and the connecting-rods *q s*, substantially as shown and described.

6. In an addressing-machine, the combination, with the feed-rollers *d' e'*, ratchet *g'*, arm *K'*, having a pawl, *i'*, engaging said ratchet, the lever *q'*, the link *u'*, the link *r'*, and lever *m'*, of the fixed blade I and the pivoted blade I', connected to lever *m'*, substantially as set forth.

7. The combination, with the feed-rollers, the ratchet *g'*, arm *K'*, and pawl *i'*, of the lever *m'*, pivoted near its rear end and connected between its ends with the arm *K'* of the fixed blade I, pivoted blade I', connected to the forward end of lever *m'*, and the spring *p'*, con-

necting the rear end of lever *m* with the outer end of the pivoted shear-blade, substantially as set forth.

396,458. CHIMNEY-FLUE. JAMES R. BARNEY and SAMUEL R. BRYAR, Pittsburg, Pa. Filed July 9, 1888. Serial No. 279,460. (No model.)



Claim.—1. A chimney having a series of fire-places, *a*, each surrounded by an air-space, *b*, which communicates with the exterior surrounding atmosphere by openings *c*, a separate vertical flue for each fire-place, which flues are arranged in different vertical planes and communicate with the air-space *b*, a hood, *e*, placed over each fire-place and having a contracted exit which terminates in the lower end of the vertical flue, and the flue-liners *g*, housed within said flues and communicating with the hoods *e*, the flue-liners being of less diameter than the flues, to leave an intermediate air-space, *k*, substantially as and for the purpose described.

2. A chimney having a series of fire-places, *a*, each surrounded by an air-space, *b*, which communicates with the surrounding atmosphere, a series of vertical flues, one of which is provided for each fire-place and communicating with the air-space *b* thereof, the connecting-flues *f*, intermediate of the vertical flues, a hood, *e*, placed over each fire-place and having a contracted exit terminating in the lower end of the vertical flue, and a flue-liner, *g*, provided in each vertical flue, to leave an intermediate air-space, *k*, and connected with the contracted exit of the hood *e*, the upper end of the vertical flues communicating with the surrounding atmosphere by openings *l*, which are protected by depending curved hoods *m*, substantially as and for the purpose described.

396,459. FLOWER-STAND. PETER BERTRAND, South Lyon, Mich. Filed June 5, 1888. Serial No. 276,112. (No model.)

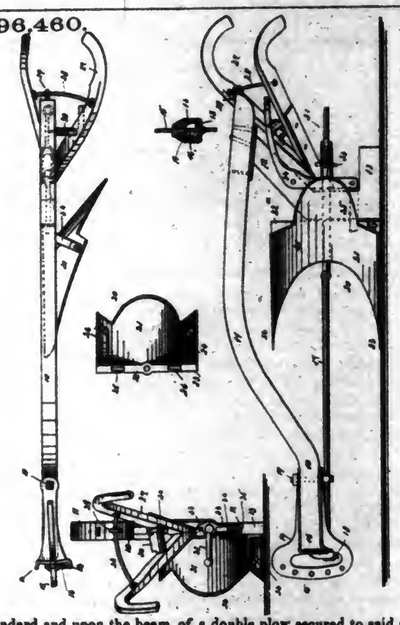


Claim.—The flower-stand described, composed of the inclined staves of unequal length, the longer staves bent outwardly at their lower ends, forming legs for the stand, the bottom D, arranged above the lower end of the shorter staves, leaving a chamber, G', below the bottom D, and the vessel H, concealed within said chamber and supported by the lower ends of the shorter staves, substantially as shown and described.

396,460. SWIVEL-PLOW. FERDINAND J. BLANKE, Whitewater, Wis. Filed Aug. 25, 1888. Serial No. 283,717. (No model.)

Claim.—1. The combination, with a plow-beam, a standard projected therefrom, and a longitudinal rotary shaft journaled in said

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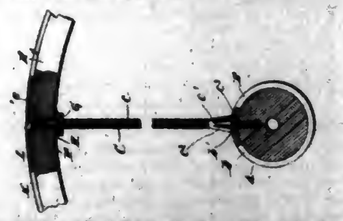
standard and upon the beam, of a double plow secured to said shaft, consisting of continuous mold-boards and attached aligning shares, and provided with recesses in the rear end of the landsides, a lever pivoted to the standard, a bolt sliding in the standard pivoted to the lever, and a crank-arm secured to the rear end of the shaft, substantially as shown and described.

2. The combination, with a plow-beam, a standard projected therefrom, and a longitudinal shaft journaled in said standard and upon said beam, of a double plow secured to said shaft, provided with a recess in the rear of each landside, a lever fulcrumed to the standard, a bolt sliding in said standard pivoted to said lever, plow-handles pivoted upon the shaft, and a crank-arm secured to the rear end of the shaft, having lugs capable of alternately engaging the handles, substantially as shown and described.

3. The combination, with a plow-beam, a standard projected therefrom, and a longitudinal shaft journaled in said standard and upon the beam, of a double plow secured to said shaft, provided with a recess in the rear of each landside, a lever fulcrumed upon the standard, a bolt sliding in said standard pivoted to said lever, plow-handles having a sliding attachment to the beam and pivoted upon the shaft, a latch-bar secured to said handles, and a crank-arm secured to the rear end of the shaft, provided with oppositely-disposed lugs alternately engaging the handles, substantially as shown and described.

4. The combination, with a plow-beam, a standard projected therefrom, and a clevis pivoted to the beam, having side ears, of a longitudinal rotary shaft journaled in said standard and clevis, a cam secured to the forward end of the shaft, capable of alternately engaging the side ears of the clevis, and a double plow rigidly attached to the said shaft, substantially as shown and described.

396,461. VEHICLE-WHEEL. JEROME BOLICK, Conover, N. C. Filed Oct. 27, 1888. Serial No. 289,266. (No model.)



Claim.—1. In a wheel, the combination of the hub, the spokes having the hollow portions *c* and the solid portions *c'* at their inner ends, the said solid portions being screw-threaded to screw in apertures in the hub, the rigid tapered collars c^2, hexagonal in transverse section on the solid portions of the spokes, tapered toward their outer

ends, and provided at their inner ends with shoulders bearing on the hub, and the felly secured to the outer ends of the spokes, substantially as specified.

2. In a wheel, the combination of the sockets F, fitting in radial perforations in the felly, the exteriorly-threaded spokes C, extending into the said sockets, the nuts G, screwing on the threaded portions of the spokes, and the washers H, fitting around the spokes and interposed between the nuts and the felly, substantially as specified.

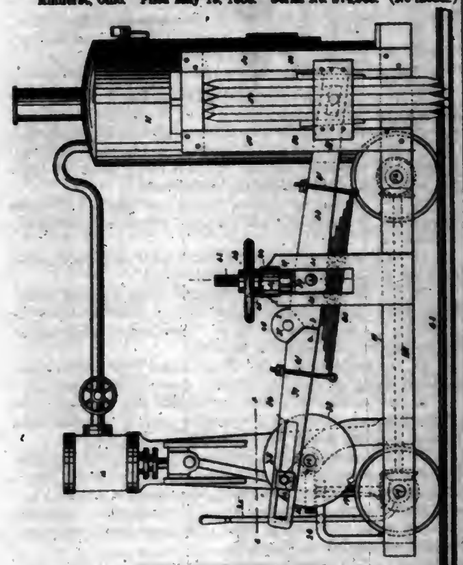
3. In a wheel, the combination of the sockets F, fitting in perforations in the felly, the exteriorly-threaded spokes C, extending into the said sockets, the nuts G, screwing on the threaded portion of the spokes and bearing against the inner side of the felly, and the screws L, passing through the tire and engaging the outer ends of the spokes, substantially as specified.

4. In a wheel, the combination, with the hub, of the sleeve fitting over the inner end of the hub and comprising the sand-band, the central band provided with perforations registering with perforations in the hub, and the intermediate connecting portion between the sand-band and central band, and the spokes fitting in the registering perforations, substantially as set forth.

5. In a wheel, the combination of the sockets F, fitting in perforations of the felly, the exteriorly-threaded spokes extending into the sockets, and the nuts G, screwing on the spokes and bearing against the felly, as set forth.

6. In a wheel, the combination of the sockets F, fitting in perforations of the felly, the screws L, engaging the tire and entering the felly, the exteriorly-threaded spokes extending into the sockets, and the nuts G on the threaded portion of the spokes.

396,462. CHANNELING-MACHINE. WILLIAM H. BRYANT, North Amherst, Ohio. Filed May 19, 1888. Serial No. 274,385. (No model.)



Claim.—1. In a channeling-machine, the combination, with a pivoted drill-carrying lever formed of sections which are aligned and pivoted together at their abutting ends, of a leaf-spring arranged parallel thereto and spanning the joint between the sections, and connected thereto at its respective ends, substantially as and for the purpose specified.

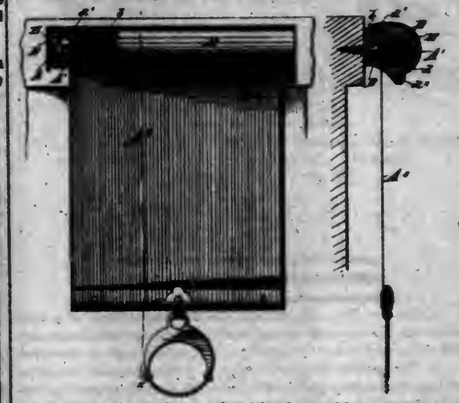
2. In a channeling-machine, the combination, with the drill-carrying lever, made of two aligned abutting sections pivoted together a fulcrum on which the longer section of said lever is pivoted, a leaf-spring arranged beneath the fulcrum and extending an equal distance each way therefrom and beneath the joint of the lever-sections in line with the same, and shackles which connect the ends of the spring with the respective lever-sections, as shown and described.

3. In a channeling-machine, the combination, with a lever made up of sections 37 and 53, formed, respectively, with bearing faces or shoulders 4 and 3, and connected by a pivot or pintle, 2, of an adjustable fulcrum upon which the lever is mounted, a crank-shaft, crank or wrist pins carried thereby, blocks arranged in longitudinal slots formed in the lever-sections 37, the crank-pins engaging said blocks, a drill-carrying box mounted in vertical guides and provided with a stud or pin which rides in a slot formed in the lever-section 53, and a spring, 60, arranged beneath the lever and connected to the lever-sections by shackles 61, substantially as described.

4. In a channeling-machine, the combination, with a crank-shaft provided with a wrist-pin, of a block with which said wrist-pin engages, a lever-section, 37, formed with a longitudinal slot, 36, in which the block rides, a lever-section, 53, pivotally connected to the section 37, the sections 37 and 53 being formed with abutting bearing-faces 4 and 3, a fulcrum-pin, 38, upon which the lever is mounted, a means, substantially as described, for adjusting said fulcrum-pin, a spring arranged beneath the lever and connected to the lever-sections by shackles 61, a drill-carrying block, ways in which said block is mounted, a stud or pin extending from the block and riding in a longitudinal slot formed in the lever-section 53, substantially as described.

5. In a channeling machine, the combination, with a drill-carrying lever and a means for rocking the same, of a fulcrum-pin upon which the lever is mounted, a block, 39, arranged to support the fulcrum-pin, a threaded shank extending upward from said block, a plate supported above the lever and provided with ratchet-teeth, the threaded shank passing through said plate, a nut engaging the threaded shank above the plate, a pawl carried by said nut and arranged to engage the ratchet, and a jam-nut carried by the shaft below the ratchet-plate, substantially as described.

396,463. EXHIBITOR FOR WINDOW-SHADES, MAPS, &c. EDWIN A. BULLARD, Vassar, Mich. Filed July 10, 1888. Serial No. 279,512. (No model.)

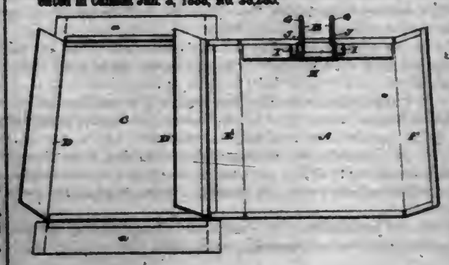


Claim.—1. As an improved article of manufacture, a protector for window-shades, consisting of a semi-cylindrical body having closed ends and provided along its upper longitudinal edge with a downwardly-projecting flange, and a cylindrical bead along its lower longitudinal edge, as set forth.

2. The combination, with a slat having a longitudinal groove in the upper edge, said slat adapted to carry a curtain and fixture, of a protector consisting of a semi-cylindrical body provided with a longitudinal flange extending at right angles downward from the upper edge and engaging the groove of said slat, substantially as shown and described.

3. The combination, with a slat having a longitudinal groove in the upper edge, said slat adapted to carry a curtain and fixtures, of a protector consisting of a semi-cylindrical body having closed ends and provided with a longitudinal flange extending downward at right angles to the upper edge, and a cylindrical bead integral with the lower edge, all combined to operate substantially as shown and described.

396,464. BINDING-CASE. CALVIN A. CAMPBELL, Montreal, Quebec, Canada. Filed June 1, 1887. Serial No. 239,967. (Model.) Patented in Canada Jan. 3, 1888, No. 26,265.



Claim.—1. A knockdown binding-case composed of the bottom A, top C, flap E, hinged to the top and bottom, and the side D, hinged to the top adjacent to the flap E, substantially as described.

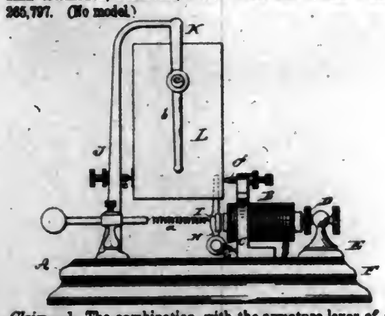
2. A knockdown binding-case composed of the bottom A, top C, flap E, hinged to the top and bottom, the sides D D, hinged to the top upon opposite edges thereof, and the flap F, hinged to the side of the bottom opposite the flap E, substantially as and for the purpose specified.

3. The arched transferring-wires G, made of a single piece of wire pointed at the ends, as shown, combined with the hinged receiving-wires J, beveled at the ends, with the bevel extending in the direction of a line drawn through the two receiving-wires and arranged to lock the points of the transferring-wires, substantially as described.

4. The arched transferring-wires G, made of a single piece of wire pointed, as shown, in combination with the receiving-wires J, beveled substantially at right angles to a line drawn through the wires G J, and connected together by the body-piece L, hinged to the bed-plate H and acted upon by the spring K, substantially as specified.

5. The combination of the fixed plate and arched transferring-wires secured thereto with the body-piece L, carrying the receiving-wires, pivoted to the fixed plate and overlapping the same, substantially as described.

396,465. SOUNDER ATTACHMENT. GEORGE H. CAREY and WILLIAM MCARTHUR, Dellarville, Mich. Filed Mar. 1, 1888. Serial No. 265,797. (No model.)



Claim.—1. The combination, with the armature-lever of a relay or sounder, of a resonant box adjustably suspended above the sounder, with the armature-lever projecting into it, substantially as described.

2. The combination, with a relay, of a bent standard secured to the base of the relay and provided with downwardly-projecting forks on its bent end, a resonant box suspended between the forks of the standard by the set-screws *e*, and the adjusting-screws *e f*, substantially as herein shown and described.

396,466. TILE-MACHINE. CHARLES CARR, Boston, Mass. Filed July 14, 1887. Serial No. 244,362. (No model.)

Claim.—1. In a machine for molding multitubular pipe-sections, the combination of the side rod hammers, cross-head, piston-rod, piston, steam-cylinder, and mold, substantially as described.

2. In a machine for molding multitubular pipe-sections, a series of independently-free vertically-sliding cores seated upon a vertically-sliding core rest or table, substantially as described.

3. In a machine for molding multitubular pipe, the series of relatively-smaller retracting-rods attached to independently-movable cores, in combination with a detached reciprocating core-rest, substantially as described.

4. In a machine for molding multitubular pipe-sections, the steam-cylinder constructed with the side-hammer-rod guides, in combination with the hammer or hammers, piston-rod, side-hammer rods, cross-head, and mold, substantially as described.

5. In a machine for molding multitubular pipe, in combination with a steam-cylinder, piston, rod, cross-head, and side rod hammers, the union *n*, substantially as described.

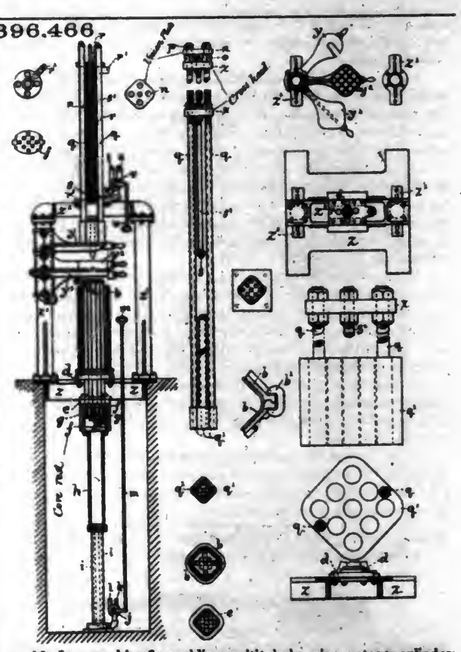
6. The combination of the steam-cylinder, the core-rest, and the detached core-retractors, and independent cores, substantially as described.

7. In a machine for molding multitubular pipe-sections, the convertible hammer consisting of heads *q'*, rods *q*, and head *x*, piston-rod *s'*, piston *s*, and union *n*, substantially as described.

8. In a machine for molding multitubular pipe, a set of separately-free vertically-sliding cores, and upper and lower guide-sockets, in combination with a vertically-movable core-rest, substantially as described.

9. The combination of the stationary piston, traveling cylinder, core-rest, and cores, substantially as described.

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10. In a machine for molding multitubular pipe, a steam-cylinder and core-rest, in combination with a series of graduated retracting-rods and separately-movable cores in guides, substantially as described.

11. In a machine for molding multitubular pipe-sections, in combination with separately-movable vertically-sliding cores, the upper and lower core-guides, substantially as described.

12. In a machine for molding multitubular pipe, the journaled hammer-rest, in combination with the tamping-hammers, substantially as described.

13. In a machine for molding multitubular pipe, the journaled table and feed-hopper, substantially as described.

14. In a machine for molding multitubular pipe, the series of tubular hammer-rods and hammer head or heads, in combination with the cross-head *x*, a mold having a cluster of cores, and a hammer-actuating mechanism, substantially as described.

15. The combination of the falling-hammer lifter and the simultaneously-falling but detached hammer, substantially as described.

16. In a machine for molding multitubular pipe, the combination of the union *n*, a cross-head, *x*, a mold, a series of hammers, and a hammer-actuating mechanism, substantially as described.

17. The combination of a dead weight, inelastic hammer, dropping simultaneously with but unattached to a falling-hammer lifter, a mold, and hammer-lifting mechanism, substantially as described.

18. The hammer unattached to and in combination with a simultaneously-falling cross-head or lifter, a piston-rod, piston, and steam-cylinder, substantially as described.

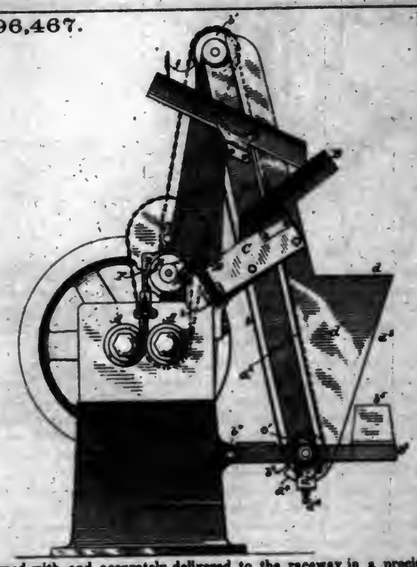
396,467. MACHINE FOR FEEDING HORSESHOE-NAILS. JOHN A. COLEMAN, Providence, R. I. Filed Jan. 26, 1887. Renewed Oct. 26, 1887. Again renewed July 2, 1888. Serial No. 278,856. (No model.)

Claim.—1. The combination, substantially as hereinbefore described, of a raceway for supporting pendent blanks in line and in precise axial adjustment, a receptacle for said blanks wherein said axial adjustment is maintained or controlled, and diving-fingers which are interposed between said raceway and receptacle and detach blanks singly from said raceway, turn them end for end, and cause them to dive into said receptacle.

2. The combination, substantially as hereinbefore described, of a raceway for supporting pendent blanks in line and in a precise axial adjustment, a feed-tube which controls or maintains said axial adjustment, and diving-fingers which are interposed between said raceway and feed-tube and detach blanks singly from said raceway, reverse them endwise, and cause them to dive into said feed-tube.

3. The combination, substantially as hereinbefore described, of a raceway slotted to support pendent nail-blanks in a precise axial adjustment and an inclined V-shaped adjusting-chute merging at its foot with the slot in said raceway, whereby blanks with rectangular heads on being dropped into said chute are axially adjusted and their shanks

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aligned with and accurately delivered to the raceway in a precise axial adjustment.

4. The combined adjusting chute and raceway, substantially as hereinbefore described, consisting of a raceway slotted to support flat-sided and substantially rectangular-headed nail-blanks in a pendent position and with a precise axial adjustment, and an inclined V-shaped chute merging with said raceway and having at their junction a longitudinal central groove which is in line with the slot of the raceway and with the center of the chute and has a width less than the width of the head of a blank and slightly greater than its thickness, whereby a blank while sliding down said chute is partially adjusted axially therein, then fully adjusted by being turned on its edge in said groove and then delivered to and held by said raceway in a pendent position and in a precise axial adjustment.

5. In horse-nail-feeding mechanism, the combination, substantially as hereinbefore described, of a combined adjusting chute and raceway essentially embodying an inclined V-shaped supporting-surface and a slot or space for receiving blanks and supporting them in a pendent position, a receptacle for nail-blanks in mass, and carriers for detaching single blanks from said mass and delivering them to said chute, whereby a row or line of blanks is deposited on and supported by said raceway, each in a pendent position and in a precise axial adjustment.

6. In horse-nail-feeding mechanism, the combination, substantially as hereinbefore described, of the combined adjusting chute and raceway, a receptacle for blanks, carriers for detaching and conveying blanks from the mass to said chute, and diving-fingers at the foot of the raceway which pick blanks from said raceway, turn them end for end, and cause them to dive into a receptacle which maintains or controls the axial adjustment of the blanks.

7. In horse-nail-feeding mechanism, the combination, with the raceway, of a revolving disk provided with fingers which pick blanks from said raceway, reverse them end for end, and cause them to dive into a suitable receptacle, substantially as described.

8. In horse-nail-feeding mechanism, the combination of the diving-fingers, a blank-supporting raceway, and a spider-wheel provided with yielding arms, which sweep along a portion of the path occupied by the blanks while supported on said raceway, substantially as described, and thereby to place the foremost blank within the path of the diving-fingers to enable the latter to pick the blanks in regular order from the raceway.

9. In horse-nail-feeding mechanism, the combination, substantially as hereinbefore described, of a blank-supporting raceway provided at its foot with thin sleader projections for supporting a headed blank by contact with the sides thereof adjacent to its neck, and diving-fingers separated by a space slightly greater than that occupied by said projections, whereby said fingers may readily move freely by the projections and nevertheless engage with the head of a blank for picking it from the raceway.

10. In horse-nail-feeding mechanism, the combination, with the raceway, of diving-fingers and the revolving disk carrying said fingers and provided at its periphery with a recess for the reception of the shank of a blank carried by said fingers.

11. In horse-nail-feeding mechanism, the combination, substantially as hereinbefore described, of a pan or receptacle for receiving blanks in mass, a feed-tube for delivering said blanks to the metal-working mechanism and interposed between said pan and tube, a series of blank-carriers on an endless belt, a combined adjusting-chute and raceway, and diving-fingers which detach blanks singly from said chute and cause them to dive into said feed-tube.

12. In a horse-nail-feeding mechanism, the combination, substantially as hereinbefore described, of a pan for receiving blanks in mass, an endless belt traveling within the pan and along its back and provided with carriers for engaging with the heads of the blanks, and thereby detaching blanks from the mass and discharging them singly from the pan.

13. The combination, substantially as hereinbefore described, of the blank-pan, the endless belt, and the belt-tightening frame.

14. The combination, substantially as hereinbefore described, of the blank-pan, the endless belt traveling within said pan, and an adjustable support for said pan, whereby the bottom of the latter is adjusted vertically with relation to the lower portion of the belt.

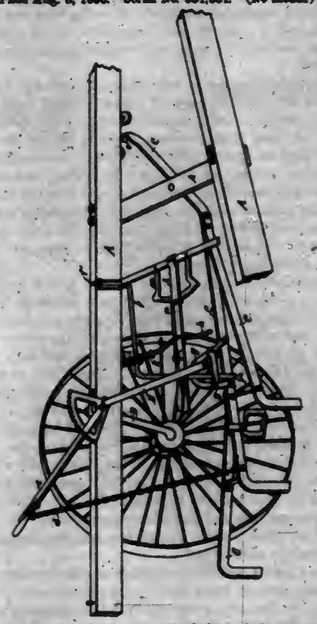
15. The endless belt provided with a series of carrying-studs in pairs and adapted to engage with the heads of blanks, substantially as described.

16. The endless belt provided with the series of carrying-studs arranged in diagonal lines on the face of the belt, substantially as described.

17. The raceway provided with surfaces for supporting headed nail-blanks in a pendent position and with interior coincident ribs for restricting the shank-space without undue frictional contact with the shanks of the blanks.

18. The combination, with the feed-tube and the diving-fingers, of the clearer within said tube and in the center of the path in which said fingers are moved, substantially as described.

396,468. WHEEL-CULTIVATOR. EDWARD R. COWLIN, Wauseon, Ohio. Filed Aug. 3, 1888. Serial No. 281,881. (No model.)



Claim.—1. In a cultivator, a swiveled crank brace-rod rotating horizontally, in combination with the plow-beam or drag-bar provided with a guide sliding upon said brace-rod, substantially as shown and described, for the purpose specified.

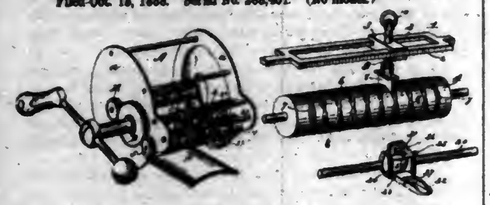
2. In a cultivator, a swiveled crank brace-rod rotating horizontally, in combination with the plow-beam or drag-bar provided with a guide sliding upon said brace-rod, and spring *k*, substantially as shown and described, for the purpose specified.

3. In a cultivator, the frame of the machine, the plow-beams, swiveled brace-rods *f*, and guides *g*, in combination with cross-rod *h* and lever *n*, substantially as shown and described, for the purposes specified.

4. In a cultivator, the frame of the machine, the plow-beams, swiveled brace-rods *f*, and guide *g*, in combination with cross-rod *h*,

lever *l*, rack *m*, and stop *n* and springs *k*, substantially as shown and described, for the purposes specified.

396,469. FISHING-REEL. JOSEPH P. COTTIGAN, St. Paul, Minn. Filed Oct. 18, 1888. Serial No. 288,461. (No model.)



Claim.—1. The combination, with the spool and winding mechanism of a reel, a guide-bar attached to the frame and having parallel grooves or ways therein, and a slide mounted to reciprocate in said grooved ways, of a cylinder provided with reversed grooves mounted in proximity to said guide-bar, and a pin adjustably mounted in said slide and provided with a blade entering the groove in the cylinder to reciprocate the slide, substantially as described.

2. In combination with the spool-frame and winding mechanism of a reel, a cylinder provided with reversed grooves and connected to the driving mechanism, a guide-bar mounted in proximity to said cylinder, a slide mounted to reciprocate upon said guide-bar, an eye or guide for the line connected to said slide, and an adjustable pin supported in said slide and carrying a blade for engaging the grooves in the cylinder, substantially as described.

3. In combination with the spool of a reel such as described, a tension device composed, essentially, of two guides through which the line is passed, and an intermediate hinged cross-piece, substantially as and for the purpose set forth.

4. In combination with the winding drum or spool of a reel, a tension device consisting, essentially, of two guides supported upon the frame, and a yoke pivotally supported to swing between the guides and carrying a cross-bar with supporting-springs, substantially as described.

5. The combination, in a fishing-reel and with the winding drum or spool, of two angularly-disposed guides mounted upon the frame, and a yoke pivoted to swing between said guides and carrying a cross-piece with yielding tension devices operating to hold the line when passed through the guide and over the cross-piece clamped between the cross-piece and wall of the guide, substantially as described.

6. The combination, in a fishing-reel and with the winding-spool thereof, of a guide through which the line is carried to the spool, and a cross-bar or support for the line mounted upon a swinging support and adapted to be moved toward the guide to clamp the line against the latter, substantially as described.

7. The combination, in a fishing-reel and with the winding-spool thereof, of a guide through which the line is conducted to the spool, and a friction-bar mounted on movable supports in front of said guide and held pressed toward the wall of the guide by elastic tension devices, said bar being adapted and arranged to be drawn toward the guide by the friction of the line upon it, substantially as described.

8. In a fishing-reel and in combination with the winding-spool thereof, two guides angularly disposed, and a pivoted yoke carrying a cross-bar mounted upon springs, said cross-bar being interposed between the guides in position to be acted upon by the line and swung up toward the rear guide to clamp the line, substantially as described.

9. The combination, to form a tension attachment for a fishing-reel, of the bar provided with a line-guide and a frictional tension-bar mounted upon said bar and movable toward and from the front of the guide with an elastic support for holding said bar pressed upon the line, substantially as described.

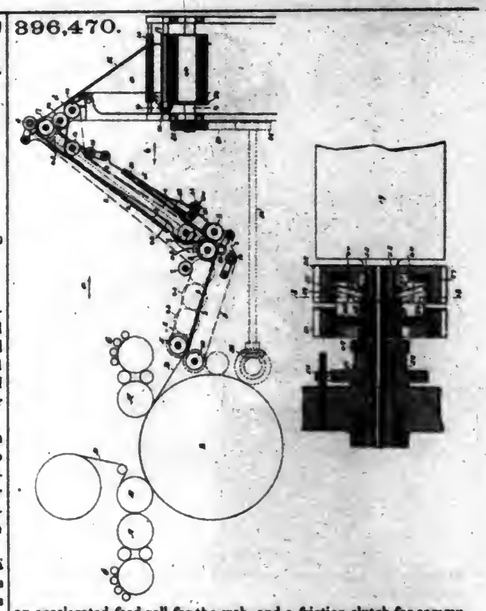
10. In a fishing-reel and in combination with the spool, the winding mechanism and an eye or guide reciprocated longitudinally of the reel to lay the line, and a tension device, substantially such as described, consisting of a guide for the line and a movable bar supported to reciprocate in front of said guide and provided with elastic pressure devices, substantially as described.

11. In combination with the spool and winding mechanism of a fishing-reel, substantially as described, the slide carrying the line-guide and blade, the grooved cylinder, and the pinion connected to said cylinder by a pawl-and-ratchet connection and receiving motion from the driving mechanism, whereby the spool may be rotated backwardly without moving the cylinder, substantially as described.

396,470. WEB-FEEDING MECHANISM. LUTHER C. CROWELL, Brooklyn, N. Y. Filed Dec. 9, 1887. Serial No. 257,459. (No model.)

Claim.—1. The combination, with a web-printing mechanism and a web-severing mechanism, of a longitudinal folding mechanism,

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an accelerated feed-roll for the web, and a friction-clutch for communicating the motion to said roll, substantially as described.

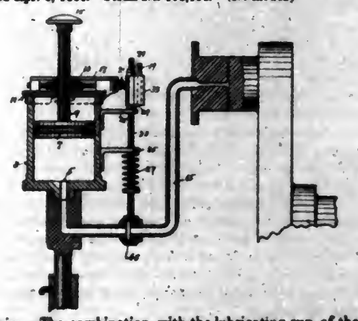
2. The combination, with a web-printing mechanism and a web-severing mechanism, of a web-turning mechanism, an accelerated feed-roll for the web, and a friction-clutch for communicating the motion to said roll, substantially as described.

3. The combination, with a web-printing mechanism and a web-severing mechanism, of an accelerated feed-roll for the web and a friction-clutch for communicating the motion to said roll, substantially as described.

4. The combination, with a web-printing mechanism and a web-severing mechanism, of a pair of accelerated feed-rolls for the web and an adjustable friction-clutch for communicating motion to said rolls, substantially as described.

5. The combination, with a web-printing mechanism and a pair of web-feeding rolls, as 14 or 19, of the fast gear 21 and the loose gear 22, the flange 37, spring 29, and adjusting-screw for regulating the pressure of the spring upon the flange, substantially as described.

396,471. LUBRICATOR. WILLIS M. DERBY, Minneapolis, Minn. Filed Apr. 8, 1886. Serial No. 196,190. (No model.)

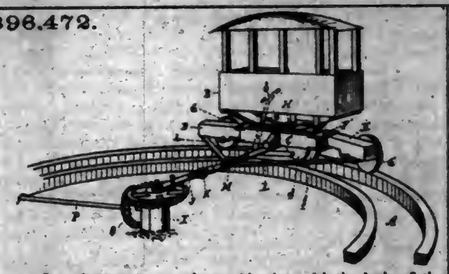


Claim.—The combination, with the lubricating-cup, of the piston arranged therein, the pipe connected to the crank-pin and jointed to the exit-pipe of the lubricator, the operating-rod, and connecting mechanism between said operating-rod and said piston, whereby the crank-pin may be lubricated, as described.

396,472. CIRCULAR COASTER. JAMES DUNCAN, Coshocton, Ohio. Filed Mar. 20, 1888. Serial No. 267,806. (No model.)

Claim.—1. In a circular coaster, the combination, with the body, of two or more supporting-wheels in circular alignment, outriggers adjustable on said body and each carrying one of the wheels, and of a tongue secured in radial relation thereto and provided with means for attaching it to a fixed point, substantially as described.

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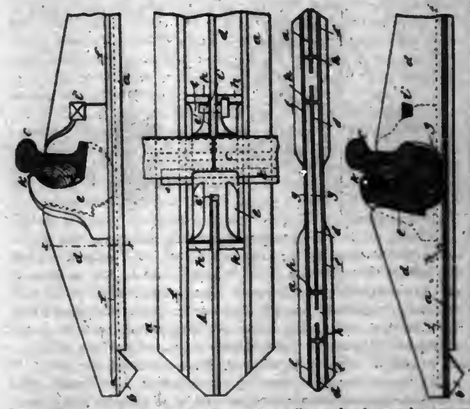


2. In a circular coaster, the combination, with the body of the vehicle, of the supporting-truck, in three sections pivotally connected together, and each provided with the supporting-wheels adapted to be adjusted to different circular alignment with each other, substantially as described.

3. In a circular coaster, the combination, with the body of the vehicle, of the supporting-truck, in three sections pivotally connected together, and each provided with the supporting-wheels in circular alignment with each other, of the radial tongue secured to the central part of the body, and of two hounds adjustably securing the end trucks with the tongue, substantially as described.

4. In a circular coaster, the combination, with the single-rail track, of the body B, the supporting-truck consisting of the central part, C, provided with the supporting-wheel H, and the outriggers D and E, pivotally and laterally connected thereto and provided with the supporting-wheels G, in circular alignment with each other, the propelling devices applied to the central wheel, substantially as described, the radial tongue provided with the extension-joint, and the hounds L, adjustably connected to the tongue, all the parts being arranged and constructed to operate substantially as described.

396,473. COMBINED RAIL-CHAIR AND SLEEPER. CLEMENT P. BEPINASSE, Montauban, France. Filed Nov. 6, 1888. Serial No. 290,086. (No model.)



Claim.—1. A metallic sleeper for railways having on its upper surface a central longitudinal rib, longitudinal side ribs parallel therewith, and pairs of transverse ribs intersecting said central and side ribs, said central rib being recessed and notched near its extremities, substantially as shown and described.

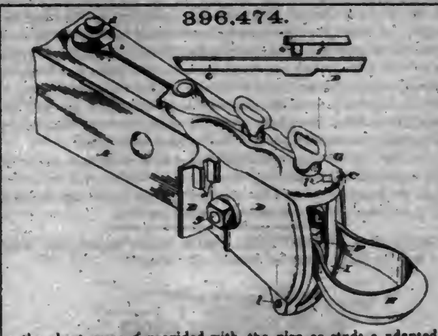
2. The combination, with a metallic railway-sleeper having on its upper surface a central longitudinal rib, longitudinal side ribs parallel therewith, and pairs of transverse ribs intersecting said central and side ribs, said central rib being recessed and notched near its extremities, of a compressible packing-block having a serrated upper surface inclosed by said side and transverse ribs, a rail-chair having a serrated bottom surface bearing on said packing-block and said central rib and between said side and transverse ribs, and means for locking the rail in said chair, substantially as shown and described.

396,474. PLOW-CLEVIS. CHARLES A. REESE, Canton, Ohio. Filed Oct. 10, 1888. Serial No. 287,750. (No model.)

Claim.—1. The combination of the beam A, having attached thereto the crown-head B, the frame formed in two sections, C and D, said sections being hinged together, the draft-link E, pivotally attached to the frame and carrying the screw-threaded nut F, and the screw G, substantially as and for the purpose specified.

2. The combination of the sections C and D, the long arms *b* and

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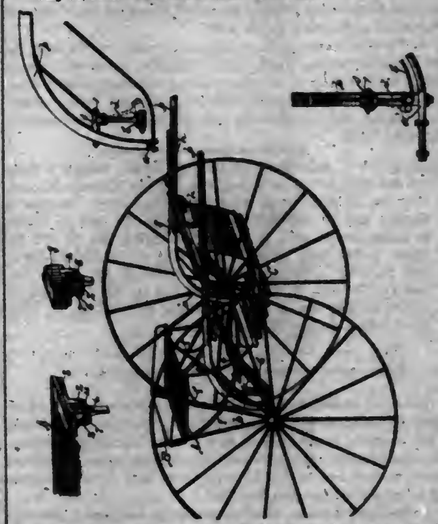
c, the short arms *f*, provided with the pins or studs *e*, adapted to enter the apertures in the arms *b* and *c*, and a draft-link, substantially as and for the purpose specified.

3. The pin or key H, provided with the tange *k*, in combination with the crown-head B, provided with the teeth *a*, and with the frame C D, substantially as and for the purpose specified.

4. The combination of the frame formed in two sections, said sections being hinged together, the draft-link E, pivotally attached to said frame and carrying the screw-threaded nut F, the screw G, and bolt *g*, substantially as and for the purpose set forth.

5. The combination of the frame formed in two sections, the fender I, provided with the pins or extensions *l* and *P*, the draft-link E, and bolt *g*, and the beam A, substantially as and for the purpose specified.

396,475. ROAD-CART. GEORGE GIMSON, Fairmount, N. Y. Filed July 30, 1888. Serial No. 281,426. (No model.)



Claim.—1. The combination of a shackle having journal-bearings arranged one above the other and at substantially right angles to each other, and a pivot-bolt, *l*, for securing the shackle to the cart, with a pendent stirrup, *d*, pivoted at one extremity to the said shackle at its other journal-bearing and secured to the end of the supporting-spring S, substantially as and for the purpose set forth.

2. The combination of the seat-supports hinged at their forward extremity to the frame of the cart, a transverse spring secured to the seat-supports, a shackle pivoted to the shafts, a stirrup pivoted at one extremity to the shackle, and the extremities of the spring pivoted to the opposite extremity of the pivoted stirrup, substantially as and for the purpose set forth.

3. The combination of the seat A, braces *f*, supporting the seat, pivoted at their forward extremity, and secured to a transverse cross-spring between their two extremities, with shafts secured to the axle, shackles pivoted to the shafts and rocking transversely of the cart, stirrups *d*, pivoted to the rocking shackle and rocking lengthwise of the cart, with a pivotal connection between the extremities of the transverse spring and the stirrups, substantially as and for the purpose set forth.

4. The combination, with a shackle having journal-bearings arranged one above the other and at substantially right angles to each other, and a pivot-bolt, *l*, for securing the shackle to the cart, a pendent stirrup, *d*, pivoted at one extremity to the said shackle at its other journal-bearing and secured to the end of the supporting-spring S, with a detachable foot-rest connected to the cart, and braces A, secured on the frame in suitable proximity to the foot when in position for speeding, substantially as and for the purpose set forth.

5. The combination of the seat A and cross-bar *g*, each provided with lugs 2, the rails 4 of the foot-rest provided with eyes fitting between the lugs 2, the bolts 6, for securing the rails to the lugs, and the pins 7, substantially as and for the purpose set forth.

396,476. FIFTH-WHEEL. JOHN M. GIRAUD, Warwick, Md. Filed Aug. 24, 1888. Serial No. 283,672. (No model.)



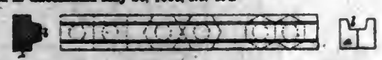
Claim.—1. The improved fifth-wheel herein described, comprising the wheel A, provided with a circumferential rim-flange, *a'*, and having circular portions *a a*, projected above and below such flange, the circle having an opening to receive one of such portions *a* and a rabbet to receive the flange *a'*, and the ring arranged to cover such flange *a'*, and having an opening to receive one of the portions *a*, substantially as set forth.

2. In a fifth-wheel, the combination of a wheel, A, having a circumferential rim-flange, *a'*, and provided with circular portions *a a*, projected above and below such flange, and the framing or holder receiving such wheel, substantially as set forth.

3. The circle having opening *b* and rabbet *b'*, combined with the wheel having similar circular portions, *a a*, and flange *a'* between the same, such flange being fitted to the rabbet *b'*, and the ring C, secured to the circle, substantially as set forth.

4. The combination, substantially as described, of the axle, the circle B, having opening *b* and rabbet *b'*, the bolster, the wheel A, having portions *a a* and flange *a'*, the clips securing said wheel to the bolster, the ring C, and the clips having their arms extended upon opposite side of the axle through the circle and ring and secured, all substantially as set forth.

396,477. MANUFACTURE OF LOCK-NUTS. GEORGE A. GOODWIN and WILLIAM P. HOW, Westminster, County of Middlesex, England. Filed Oct. 19, 1888. Serial No. 288,566. (No model.) Patented in England Mar. 10, 1887, No. 3,654; in Italy Dec. 14, 1887, No. 22,750; in France Dec. 16, 1887, No. 187,619; in Belgium Dec. 16, 1887, No. 79,942; in New South Wales Jan. 4, 1888, No. 451; in Victoria Feb. 3, 1888, No. 5,008; in South Australia Feb. 6, 1888, No. 956; in New Zealand Feb. 20, 1888, No. 2,867; in Spain Feb. 24, 1888, No. 13,495; in Austria-Hungary Apr. 8, 1888; in Portugal Apr. 20, 1888, No. 1,239, and in Queensland May 26, 1888, No. 404.



Claim.—1. In the art of making lock-nuts, the improvement which consists in forming a superficially-ribbed bar or piece of metal, cutting the bar, punching in the blank so formed a hole having the raised or ribbed projections contiguous thereto, and compressing the projections inwardly to form locking-lugs for engagement with the bolt, substantially as and for the purposes described.

2. The method herein described of making lock-nuts, which consists in forming a double-ribbed metal bar or blank, cutting the blank, punching a hole transversely through the ribbed face between the ribs and contiguous thereto, tapping the nut, and compressing the projecting ribbed portions to contract the intervening space, and to form clamping or locking lugs for the bolt, substantially as set forth.

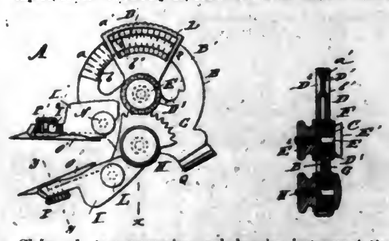
396,478. MACHINE FOR TRIMMING, PLANING, AND SAWING STEREOTYPE-PLATES. LUCIUS GOSS, Upper Montclair, N. J., and SAMUEL W. TREW, Brooklyn, N. Y. Filed Apr. 11, 1888. Serial No. 270,249. (No model.)

Claim.—1. The machine herein shown and described, consisting of a suitable frame and a reciprocating bed-plate, C, in combination with edge-trimming knives, plane, diagonally-set saw, and the holding-bars, all arranged substantially as and for the purposes set forth.

2. The combination, with the reciprocating bed-plate, of the holding-bars formed at their under surfaces with beveled ribs or projections *c*, substantially as and for the purposes set forth.

3. The combination, with the reciprocating bed-plate C, of the circular trimming-knives F, the axes of which stand slightly above the bed-plate, whereby the movement of the stereotype-plate in contact with the knives will cause them to revolve, substantially as described.

396,479. CALIPERS AND DIVIDERS. THOMAS GREEN, East Davenport, Iowa. Filed July 13, 1888. Serial No. 279,837. (No model.)



Claim.—1. In a measuring and drawing instrument, the combination, with a plate having a segmental graduated part and a fixed arm held on the said plate, of an indicator held to turn on the said plate over the said graduated part, a gear-wheel formed on the said indicator, a segmental gear-wheel in mesh with the said gear-wheel on the indicator and turning on the said plate, and an arm held on the said segmental gear-wheel and adapted to support divider-arms or inside or outside caliper-arms, substantially as shown and described.

2. In a measuring and drawing instrument, the combination, with a plate having a segmental graduated part, of an indicator held to turn on the said plate over the said graduated part, a gear-wheel formed on the said indicator, a segmental gear-wheel in mesh with the said gear-wheel and turning on the said plate, an arm held on the said segmental gear-wheel, and divider-arms held on the said fixed plate and segmental arm, substantially as shown and described.

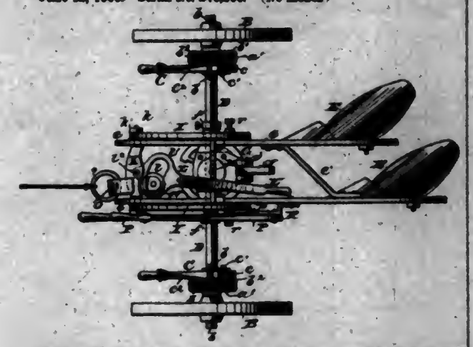
3. In a measuring and drawing instrument, the combination, with a plate having a segmental graduated part, of an indicator held to turn on the said plate over the said graduated part, a gear-wheel formed on the said indicator, a segmental gear-wheel held in mesh with the said gear-wheel on the indicator and turning on the said plate, an arm held on the said segmental gear-wheel, and inside caliper-arms held on the said plate and the said segmental arm, substantially as shown and described.

4. In a measuring and drawing instrument, the combination, with a plate having a segmental graduated part, of an indicator held to turn on the said plate over the said graduated part, a gear-wheel formed on the said indicator, a segmental gear-wheel held in mesh with the said gear-wheel on the indicator and turning on the said plate, an arm held on the said segmental gear-wheel, and outside caliper-arms held on the said plate and on the segmental arm, substantially as shown and described.

5. In a measuring and drawing instrument, the combination, with a plate provided with a lug and a beveled part, of an arm secured to the said plate by a bolt and provided with a recess in which fits said lug, and also provided with an under-cut fitting onto the said bevel, substantially as shown and described.

6. In a measuring and drawing instrument, the combination, with a plate provided with a notch and a beveled part, of an arm secured to the said plate by a bolt and provided with a lug fitting into the said notch, and also provided with an under-cut fitting onto the said bevel, a segmental arm held to turn on the said plate, and an arm fastened to the said segmental arm by a bolt and provided with a notch fitting onto a lug on the said segmental arm, and also provided with an under-cut fitting on the bevel end of the said segmental arm, substantially as shown and described.

396,480. SULKY-PLOW. GEORGE W. HAINES, Stockton, Cal. Filed June 12, 1888. Serial No. 276,800. (No model.)



Claim.—1. In a sulky-plow, the combination, with the frame and a transverse shaft held thereto and vertically adjustable thereon, of a rocking support on said shaft, guide-plates held to said support, a plow or plows having beams extending next the guide-plates, a bar or plate connecting said guide-plates and also connecting the forward ends of the plow-beams, and a draft attachment connected to said bar or plate, substantially as shown and described, whereby the plows may be adjusted to working depth independently of the sulky-wheels, or so that their depth of working may be controlled by or from the wheels, as herein set forth.

2. In a sulky-plow, the combination, with the frame and a transverse shaft held thereto and vertically adjustable thereon, of a rocking support on said shaft, guide-plates held to said support, a plow or plows having beams extending next the guide-plates, and a bar or plate connecting said guide-plates and also connecting the forward ends of the plow-beams, and said beams having a series of holes to receive the bar or plates, substantially as described, for the purposes set forth.

3. In a sulky-plow, the combination, with the frame, a transverse shaft thereon, a fifth-wheel plate-coupling supported on said shaft, opposite parallel guide-plates held to said coupling and receiving the plow-beams between them, a bar connecting the forward ends of the beams and guide-plates, and a draft device connected to the plow-beams, substantially as herein set forth.

4. In a sulky-plow, the combination, with the frame A, of a shaft, D, vertically adjustable on the frame, a fifth-wheel coupling, G H, hung on said shaft, a latch, J, for said coupling, guide-plates I I, held to the coupling-plate H, a plow or plows having a beam or beams ranging along the plates I I, a cross bar or plate, K, loosely connecting the plow-beams and guide-plates, and a draft device held to the bar K, substantially as described, for the purposes set forth.

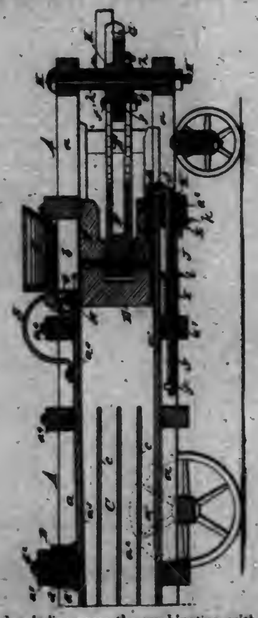
5. In a sulky-plow, the combination, with a frame, a transverse shaft thereon, a rocking support on said shaft, guide-plates held to said support, and a plow or plows having beams ranging along said plate or plates and connected thereto at the forward end, of a rack, R, on the guide-plate, a lever, P, slotted at *p'* and fulcrumed on a pin, *r*, passed through the slot *p'* into the guide-plate, and a latch on the lever adapted to the rack R, substantially as herein set forth.

6. In a sulky-plow, the combination, with the frame, a support thereon, and a plow or plows held to said support, of a draft-bar fitted to the plow beam or beams, a lever having a transverse slot or cross-head at its forward end and pivoted thereat to the draft-bar, a draft-clevis fitted to slide transversely on the lever-head, and a detent for the lever, substantially as shown and described, whereby by shifting the lever the clevis will automatically adjust itself to secure any required side draft of the plows, as herein set forth.

7. In a sulky-plow, the combination, with the frame, a transverse shaft thereon, a rocking support on said shaft, a plow or plows held to said support and provided with a series of upper and lower draft-holes at their forward ends, a rocking bar, as K, adapted to said draft-holes, a lever, L, having a slot, *l*, and pivoted to the bar K, a rack on the plows with which the lever is adapted to lock, and a draft-clevis fitted to slide transversely in the lever-slot *l*, substantially as herein set forth.

8. In a sulky-plow, the combination, with the frame, a transverse shaft, D, thereon, a rocking support on said shaft, plates I I, held to said support, a plow or plows having beams held between the plates I I, and provided with a rack, M, a rocking bar or plate, K, held to the plow-beams and to the plates I, a lever, L, having a head-slot, *l*, and pivoted to the bar K, and a laterally-movable draft-clevis, as N O, fitted to the lever L at its slot *l* and adapted to engage the rack M, substantially as described, for the purposes set forth.

396,481. BALING-PRESS. DAVID L. HANHAY, Grapeville, N. Y. Filed July 5, 1888. Serial No. 279,076. (No model.)



Claim.—1. In a baling-press, the combination, with the press-case and a plunger therein having a lug or shoulder, *c*, of a rod, J, made flat-sided and provided with a lug, *j*, a bushing journaled on the press-frame and in which the flat-sided rod is fitted for endwise movement, and a spring normally forcing the rod backward substantially as described, for the purposes set forth.

2. In a baling-press, the combination, with the press-case and a plunger therein having a lug or shoulder, *c*, of a flat-sided rod, J, provided with a lug, *j*, a bushing journaled on the press-frame and in which the flat-sided rod is fitted for endwise movement, a spring normally forcing the rod backward, and an operating-rod connected to the bushing for turning it and the rod J, substantially as herein set forth.

3. The combination, with the baling-box, of a triangular folder extending across the box and journaled for rotation at the rear of its feed-opening, and a yielding device normally holding the folder with one angle downward and one face presented to the drawn-back plunger, substantially as described, whereby the folder will be given a partial rotation for folding material by one face of it at each effective stroke of the plunger, and will present its next face to the plunger when the latter retracts, as and for the purposes set forth.

4. The combination, with the baling-box, of a triangular folder extending across the box and journaled for rotation at the rear of its feed-opening in vertically-yielding bearings, and a yielding device normally holding the folder with one angle downward and one face presented to the drawn-back plunger, substantially as described, whereby the folder will be given a partial rotation for folding material by one face of it at each effective stroke of the plunger and will yield bodily to avoid excessive friction on the plunger, and will present its next face to the plunger when the latter is retracted, as and for the purposes set forth.

5. The combination, with the press-frame, of a triangular folder, N, journaled across the baling-box at its feed-opening, and a spring S, held to the frame and bearing on the folder, substantially as herein set forth.

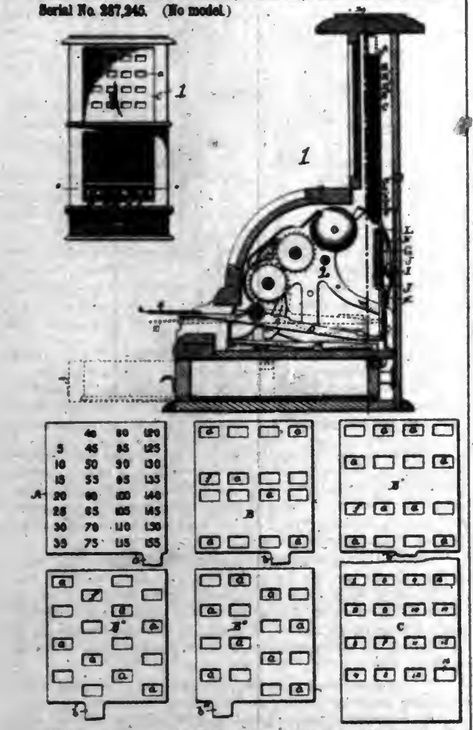
6. In a baling-press, the combination, with the press-frame, of vertically-movable flanged plates O, pins or bolts P, holding them to the frame, springs R on the bolts, a triangular folder, N, journaled to the plates and crossing the rear end of the feed-opening, and a spring normally holding the folder with one side vertical and facing the drawe-back plunger, substantially as herein set forth.

396,482. FIRE-BAR. HUGO HARTUNG, Berlin, Germany. Filed Mar. 16, 1888. Serial No. 267,415. (No model.) Patented in England Dec. 23, 1887, No. 17,006, and in Belgium Dec. 31, 1887, No. 79,134.



Claim.—In a fire-bar having the polygonal-shaped divisions A, which taper into the body of the fire-bar at *a*, in combination with the peculiarly-formed air-passages B between each division and the alternated slanting surfaces *c*, for the purpose as described.

396,483. INDICATING DEVICE FOR CASH REGISTERS AND INDICATORS. JOHN C. HARLETT, Muscatine, Iowa. Filed Oct. 4, 1888. Serial No. 287,245. (No model.)



Claim.—1. In a cash-register, the combination of a plate having a series of numbers thereon, another plate having a series of sight-openings, one of these plates being movable relatively to the other, a series of movable perforated exposing-plates, and keys or levers for moving the said plates, substantially as described.

2. In a cash-register, the combination of a plate having thereon a series of numbers, another plate having a series of sight-openings, one of these plates being stationary relatively to the other, the number of rows of numbers being twice the number of the rows of sight-openings, the movable perforated exposing-plates, and the levers for moving the plates, substantially as described.

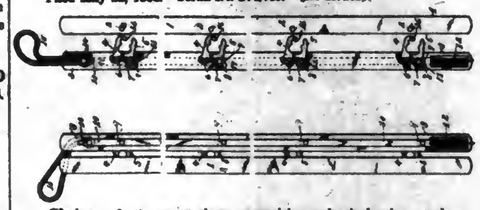
3. In a cash-register, the combination of a movable plate, A, having thereon a series of figures, a stationary plate, C, in front of the plate A, having a series of sight-openings, the movable perforated exposing-plates arranged between the plates A and C, and the levers for moving said plates, substantially as described.

4. In a cash-register, the combination of the plate A, having thereon a series of numbers, the movable perforated exposing-plates lying one in front of another in front of the plate A, the operating levers or keys, and the arms connecting the levers or keys and the plates arranged in the same plane, substantially as described.

5. In a cash-register, the combination of a plate bearing a series of numbers, movable perforated exposing-plates, operating-levers for the movable plates, connecting-arms between the movable plates and levers arranged in the same plane, locking projections, as the nuts J, carried by the arms, and a rocking bar arranged to be contacted by the said projections when the levers are moved, substantially as described.

6. In a cash-register, the combination of the plate A, bearing a series of numbers, the movable perforated exposing-plates B, B′, B″, and B‴, the stationary plate C, having a series of sight-openings, a series of levers or finger-keys, connecting-arms between the levers and plates, the nuts J on the arms, and the rocking bar I in rear of the arms in position to be struck and operated by the said nuts as the levers are operated, substantially as described.

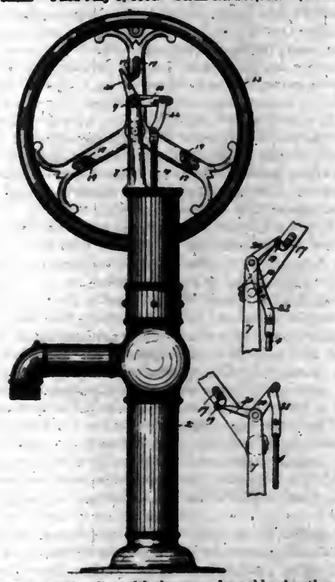
396,484. CORSET-CLASP. MAX W. HENIUS, Bridgeport, Conn. Filed May 22, 1888. Serial No. 274,713. (No model.)



Claim.—1. A corset-clasp comprising a busk having studs, a second busk having fixed eye portions 4, curved to form hooks 16, pointing slightly inward toward said second busk, and thereby adapted to hold the studs and take all of the strain when the corset is tightly laced, movable eye portions also carried by said second busk and adapted to prevent the escape of the studs when the corset is loosely laced, and a slide connecting and adapted to operate said movable eye portions, substantially as set forth.

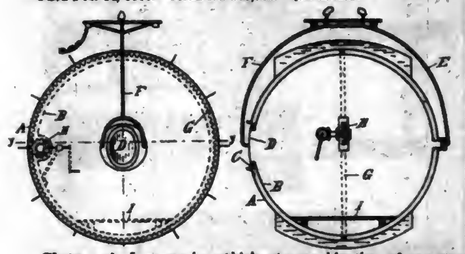
2. A corset-clasp comprising a busk having studs, a second busk having fixed eye portions 4, pivoted movable eye portions 5, having vertical slots and also carried by said second busk, and a slide, 10, carrying studs engaging said vertical slots of eye portions 5, substantially as set forth.

396,485. PUMP-OPERATING MECHANISM. OLE HENJUM, Minneapolis, Minn. Filed July 9, 1888. Serial No. 279,263. (No model.)



Claim.—The combination, with the pump-barrel having the standards 7, of the fly-wheel 13, pivoted to one of said standards 7 and having the projections 17, the shaft 9, adapted to turn in proper bearings in the standard 7 and having the arm 20, adapted to be engaged by the projections 17 in the revolution of the fly-wheel, the arm 10, adjustably secured to the shaft 9, so as to regulate the length of "throw" of the pump-plunger, the plunger 4, having suitable flexible or link connection with the arm 10, and the spring 23, fitted upon said plunger, adapted to force it downward when the arm 19 is released from engagement with the fly-wheel, substantially as described.

396,486. MARINE VEHICLE. WILLIAM HENRY, Alpena, Mich. Filed Feb. 14, 1888. Serial No. 263,902. (No model.)



Claim.—1. In a marine vehicle, the combination of an outer globe and an inner water-tight globe concentrically supported within the outer globe and the two made relatively rotatable to each other, substantially as described.

2. In a marine vehicle, the combination of an outer globe and an inner globe concentrically within the outer globe on trunnions, and the two made relatively rotatable to each other, and paddles secured to the outer globe, substantially as described.

3. In a marine vehicle, the combination of an outer globe, an inner globe concentrically secured within the outer globe by means of trunnions, a hollow trunnion projecting through the outer globe, and air-circulating devices connecting with said trunnions and projecting to the top of the vehicle, substantially as described.

4. In a marine vehicle, the combination of an outer globe, an inner globe concentrically secured within the outer globe by means of trunnions, a hollow trunnion projecting through the outer globe, and air-circulating devices connected with the hollow trunnion, made of hollow tubing and forming a skeleton frame for a seat above the device, substantially as described.

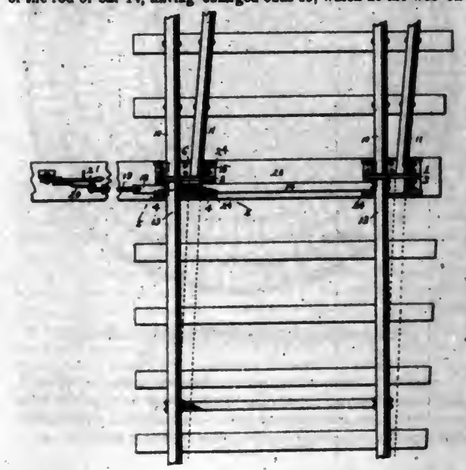
5. In a marine vehicle, the combination of concentric inner and outer globes rotatably secured in relation to each other and provided with the means for propelling the outer globe from the inner globe, and a platform within the inner globe, substantially as described.

6. In a marine vehicle, the combination of an outer globe, the inner globe concentrically supported on trunnions, the equatorial gear upon the inside of the outer globe, the drive-pinion carried by the inner globe, and a crank-shaft and connecting-gear for conveying power thereto, substantially as described.

7. In a marine vehicle, the combination of an outer globe, the inner globe concentrically supported on trunnions, the equatorial gear upon the inside of the outer globe, the drive-pinion carried by the inner globe, a crank-shaft and connecting-gear for conveying power thereto, and a platform in said inner globe, substantially as described.

396,487. COMBINED HEAD-CHAIR AND CONNECTING-ROD. WILLIAM J. HOOPER, Rincon, N. Mex. Filed Feb. 15, 1888. Serial No. 264,149. (No model.)

Claim.—1. In a switch, the combination, with the throw-rails 13, of the rod or bar 14, having enlarged ends 15, which fit the web on the inner sides of the rails, outer plates, 17 18, fitting the webs of the rails and bolted through the rails to said ends 15, and the switch-bar 18, connected with said outer plate, 17, whereby the rails will be firmly connected above the plane of the top edges of the chair-sockets, substantially as set forth.





2. The combination, with throw-rails 13, of rod or bar 14, having enlarged ends 15, fitted to said rails, one of which is bolted to the outer throw-rail, 13, and a plate, 16, fitted thereto and the other to the inner throw-rail, 13, and the enlarged end 17, having a rod or bar, 18, connected with a switch-operating mechanism, substantially as described.

396,488. DOOR-CHECK. FRANKIE A. HOOVER, Kinsco, Kans. Filed Sept. 6, 1888. Serial No. 284,907. (No model.)



Claim.—1. In a door-check, the combination, with the bracket secured to the door and provided with a guide loop or box having a rib or projection, *c*, of the swinging check-arm pivoted at one end to the casement and operating at its free end in the loop or box, the said arm being provided with a notched rib or rack which is adapted, when the arm is elevated, to engage the rib or projection *c*, and the latch arranged under the free end of the said arm and adapted to raise the same, substantially as and for the purpose specified.

2. In a door-check, the combination, with a guide loop or box arranged at the upper edge of a door and provided with the rib or projection *c*, of the catch arranged on the casement at the free edge of the door, and the swinging check-arm pivoted to the casement, operating in the guide loop or box, and adapted to engage the said catch when the door is closed, the said swinging arm being provided with a notched rib or rack to engage the rib *c*, substantially as and for the purpose specified.

3. In a door-check, the combination, with a guide loop or box arranged on a door, of the swinging arm pivoted to the casement and operating in the said loop or box, and the adjustable stop M, arranged on the said arm, substantially as specified.

4. In a door-check, the combination, with a guide loop or box arranged on a door, of the swinging arm pivoted to the casement and operating in the guide loop or box, and the catch H, secured to the casement at the free edge of the door and provided with an anti-friction roller, A, provided with a rubber or elastic periphery, the free end of the swinging arm being adapted to engage the said catch, substantially as and for the purpose specified.

5. In a door-check, the combination, with a guide loop or box, E, provided with a depending rib or projection, *c*, of the swinging check-arm G, operating at its free end in the said loop or box, the latch arranged under the free end of the swinging arm and adapted, when operated, to raise the same and engage it with the rib or projection *c*, and the revoluble door-knob connected by suitable rods or wires with the said latch, whereby, when the knob is turned, the latch is operated, substantially as specified.

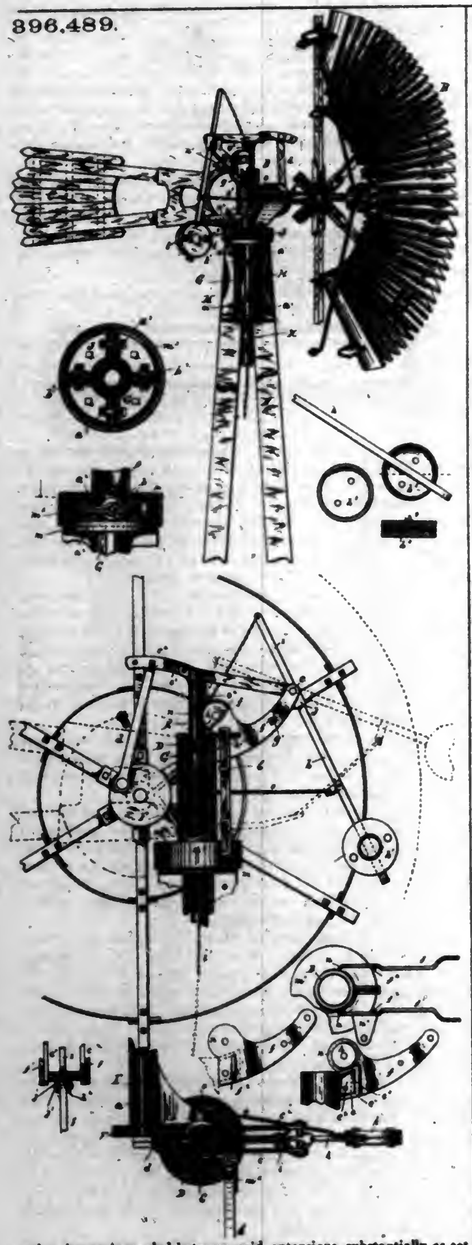
6. In a door-check, the combination, with the guide loop or box provided with the rib or projection *c*, and the swinging check-arm operating at its free end in the loop or box, and adapted, when elevated, to engage the rib or projection, of the latch mounted on the door and adapted to engage the swinging arm, the rods or wires connecting this latch to the revoluble door-knob, the swinging link connected at its free end to the said wires or rods, and the locking-arm adapted to engage the swinging link to hold the swinging arm in its elevated position, substantially as specified.

7. In a door-check, the combination, with the guide loop or box E, provided with the rib or projection *c*, the swinging check-arm operating at its free end in the loop or box, and the latch mounted on the door and adapted to operate the swinging arm, of the sleeve C, arranged on the shank of the revoluble door-knob, the swinging link connected at its free end to the latch and the sleeve by the rods or wires *k* and *k′*, and the locking-arm L, adapted to engage the swinging link, to hold the swinging arm in its elevated position, substantially as specified.

396,489. WINDMILL. DAVID J. HOWENSTEIN, Canal Fulton, Ohio. Filed Oct. 19, 1887. Serial No. 252,788. (No model.)

Claim.—1. In a windmill, the combination of hollow rotary spindle D, provided with lug *e*, having rib *e′*, and arms *f f′*, provided, respectively, with ears f^3, engaging with rib *e′*, said arms each provided with extensions *n*, projecting over the opening in the hollow spindle,

396,489.



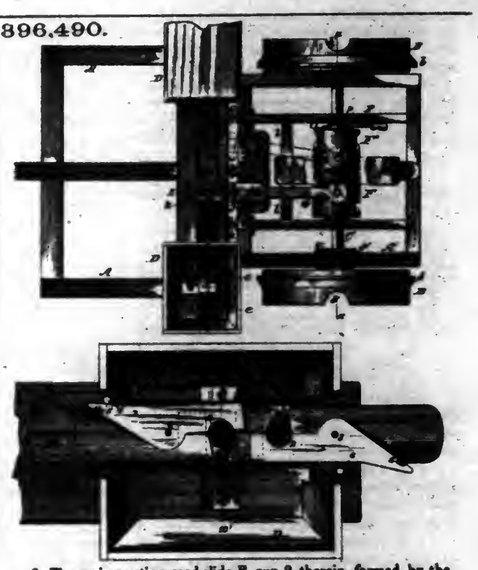
and a sheave journaled between said extensions, substantially as set forth.

2. In a windmill, the combination of hollow rotary spindle D, provided at its upper portion with lug *e*, having rib *e'*, and arms *f f'*, provided, respectively, with ears *c'*, engaging, respectively, with rib *d'*, said arms each provided with the extension *n*, projecting over the opening in the hollow spindle, one of said arms provided with lug *n'*, and a sheave pivoted between said extensions, and vane G, pivoted at its upper portion to said lug *n'*, substantially as set forth.

396,490. CORN-PLANTER. SAMUEL HUFFMAN, Matamora, Kans. Filed Dec. 2, 1886. Serial No. 184,492. (No model.)

Claim.—1. In a corn-planter, the seed-slide E, carrying a pivoted part, 1, that forms one half of the cup 2, in combination with the removable block 4 in the opposite half for graduating the size of the seed-hole, substantially as shown and described.

396,490.



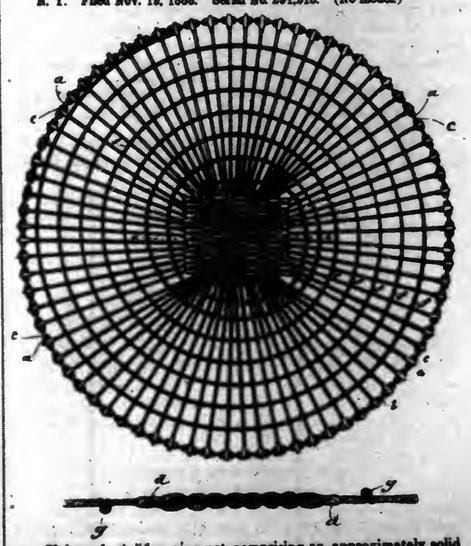
2. The reciprocating seed-slide E, cup 2 therein, formed by the pivoted part 1, and the removable block 4, in combination with the sectional lever G, pivoted upon the frame A', all substantially as described and shown.

3. The hinged pivoted lever G, with the double cam F and F' for hill-dropping or drilling, in combination with the seed-slide E, having the cup 2 therein, formed by the pivoted part 1, and the removable block 4, as shown and described.

4. In a corn-planter, the seed-slide E, having a hinged pivoted lever, G, cams F and F', axle C, pointer *o*, revolving with the axle, and index-plate N, secured to frame A', in combination with the bearing-wheels B B, one of which is provided with scale S and notches *b'*, substantially as shown and described.

5. In a corn-planter, the seed-slide E, hinged pivoted lever G, cams F and F', ratchet-wheels O, pawl P, axle C, index-plate N, and pointer *o*, in combination with the bearing-wheels provided with the marking-notches *b'* and raised flange *b*, all as shown and described.

396,491. LIFE-SAVING NET. MALCOM HUSTER, Long Island City, N. Y. Filed Nov. 19, 1888. Serial No. 291,313. (No model.)

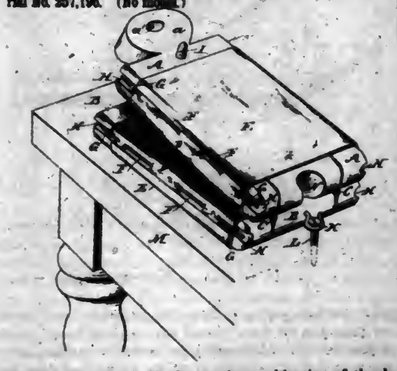


Claim.—1. A life-saving net comprising an approximately solid rope center piece and ropes radiating therefrom to form the body proper of the net, said radiating ropes being combined at their outer ends with a grasping rope or chain, substantially as specified.

2. A life-saving net comprising an approximately solid rope center piece formed from the radiating ropes and spliced pieces, substantially as specified.

3. A life-saving net the body of which is made of rope and consists of pieces radiating approximately from a common center and a spirally-wound rope secured thereto at regular intervals, substantially as specified.

396,492. KNIFE-CLEANER. ROBERT W. JAMIESON, Prince Albert, Saskatchewan, Northwest Territory, Canada. Filed Dec. 7, 1887. Serial No. 257,196. (No model.)

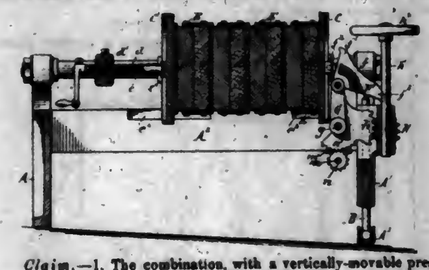


Claim.—1. In a knife-cleaner, the combination of the double-faced reversible blocks A and B, hinged together, one of them being provided with a hook, K, at the hinged end, and the other block provided, near the hinge, with a notch or recess, N, to allow passage of the hook when the blocks are reversed, substantially as described.

2. In a knife-cleaner, the combination, with a block provided with eyes or staples G, of a cleaning or polishing fabric or facing passed over the face of the block and at the edges thereof, and pins F, interlaced through the facing and entering the eyes or staples, substantially as herein set forth.

3. In a knife-cleaner, the combination, with a cleaning or polishing block having edge grooves H and eyes or staples G therein, of a cleaning or polishing fabric or facing passed over the face of the block and entered into the slots H, and pins F, interlaced through the edges of the facing in the slots and entering the eyes or staples G, substantially as herein set forth.

396,493. CHEESE-PRESS. WILHELM JEPPESEN, Nytjobing, Falster, Denmark, assignor to Johan D. Frederiksen, Little Falls, N. Y. Filed Sept. 25, 1888. Serial No. 286,304. (No model.) Patented in Denmark Nov. 18, 1887, No. 225.



Claim.—1. The combination, with a vertically-movable press-frame, of a movable head-block, a pressure-screw by which the head-block is moved, a stationary support, a lifting device resting on said support and carrying the movable end of the press-frame, and a movable foot-block bearing against said lifting device, whereby the cheese is pressed and the press-frame is raised by tightening the screw, and further pressure is exerted upon the cheese by the descent of the frame as the cheese shrinks, substantially as set forth.

2. The combination, with a vertically-movable press-frame, of a movable head-block, a pressure-screw by which the head-block is moved, a stationary support, a lifting-lever resting on said support and carrying the movable end of the press-frame, a movable foot-block bearing against the lifting-lever, a hanger pivoted on the press-frame and connected with the lifting-lever, and an adjusting device, whereby the hanger can be turned forwardly or backwardly, thereby adjusting the leverage of the lifting-lever, substantially as set forth.

3. The combination, with the horizontal press-frame having one of its ends made vertically movable, of a pressure-screw arranged lengthwise in said frame, a movable head-block upon which said screw operates, a stationary support provided with guides on which the movable end of the press-frame can be raised and lowered, a lifting device resting on said support and carrying the movable end of the press-frame, and a movable foot-block bearing against said lifting device, substantially as set forth.

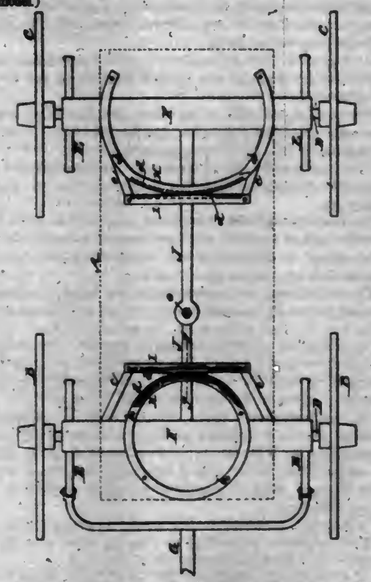
4. The combination, with the press-frame, the movable foot-block C, the head-block C', and a pressure-screw, *d*, of the foot-piece A^2, provided with upright rods B, passing through openings in the press-frame, and the lifting-lever F, attached to the press-frame and resting upon the rods B, substantially as set forth.

5. The combination, with the press-frame and the movable head and foot blocks, of a support arranged at one end of the press, a lifting-lever resting on said support, a hanger provided with a toothed segment, and a worm journaled in the press-frame and engaging with said segment, substantially as set forth.

6. The combination, with the press-frame, the movable head and foot blocks, and the stationary supports B, of the lifting-lever F, the adjustable hanger G, having a gear-segment, n', the shaft *m*, provided with a pinion, *n*, meshing with said gear-segment, and the pointer or indicator *k*, mounted on the shaft *m*, substantially as set forth.

7. The combination, with the press-frame, the movable head and foot blocks C C', and the stationary supports B, of the lifting-lever F, the adjustable hanger G, provided with gear-segments n' *h*, the worm H, engaging with the segment *h*, the shaft *m*, provided with a pinion meshing with the segment n', and the indicator *k*, mounted upon said shaft and traversing a scale, *k'*, substantially as set forth.

396,494. RUNNING-GEAR FOR VEHICLES. ALFRED W. JOHNSON, New Brunswick, N. J. Filed Sept. 7, 1888. Serial No. 284,774. (No model.)



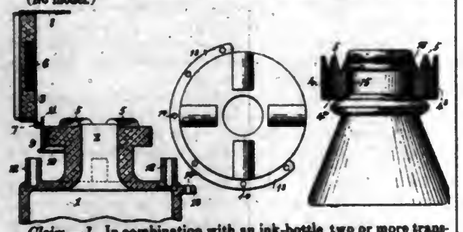
Claim.—1. In wagons and other vehicles having swiveling axles, the swiveling axle or axles arranged loosely beneath the body of the vehicle and adapted to admit of said body moving laterally over such axle or axles, in combination with rope or chain carriers attached the one to the body over the swiveling axle and the other connected with the adjacent axle, and crossing flexible connections uniting said carriers, substantially as specified.

2. In wagons and other vehicles having swiveling axles D D, the combination of the body A, arranged loosely over said axles, the rope or chain carriers H H, secured to the under side of said body over the axles, the flexibly-connected cross-beams F F, loose from the body and arranged over the axles, springs connecting said cross-beams with the axles, rope or chain carriers I I, connected with said cross-beams, and the crossing-rope or flexible connections *d*, uniting the carriers H and I, essentially as herein set forth.

3. The combination of the swiveling axles D D, the body A, arranged loosely over said axles, the rope or chain carriers H H, secured to the under side of said body over the axles, the cross-beams F F, loose from the body and arranged over the axles, springs connecting said cross-beams with the axles, rope or chain carriers I I, connected with said cross-beams, the crossing rope or flexible connections *d d*,

uniting the carriers H and 1, and separate laterally-flexible connections between said cross-beams and said axles, respectively, substantially as described.

396,495. INK-BOTTLE AND ATTACHMENT THEREFOR. NELSON JOHNSON, Knoxville, Pa. Filed Mar. 6, 1888. Serial No. 266,373. (No model.)



Claim.—1. In combination with an ink-bottle, two or more transverse ribs or projections formed radially across the head or shoulders of the bottle for supporting a pen, substantially as herein described.

2. The combination, with an ink-bottle having two or more transverse projections or ribs formed on its head, of a hinged cap having corresponding grooves or depressions, whereby the same is adapted to close tightly upon said head, as shown, the said ribs and depressions serving for the support of the pen-holder when the bottle is open, as herein set forth.

3. An ink-bottle having a number of upwardly-extending pins or projections on its shoulder, substantially as and for the purpose set forth.

4. An ink-bottle having on its shoulder a number of upwardly-extending perforated pins or projections arranged circumferentially, as and for the purposes set forth.

5. An ink-bottle having a number of pins or projections on its shoulder extending upwardly and inclined inwardly, as and for the purpose set forth.

6. The combination, with an ink-bottle, of a horizontal annular flange or collar surrounding the same, said flange having perforations for the insertion of pins, for the purpose set forth.

7. The combination, with an ink-bottle, of a collar thereon having a number of upwardly-extending projections, for the purpose herein set forth.

8. The combination, with an ink-bottle, of a collar having a horizontal portion and an upturned portion or flange, said upturned portion being serrated or notched and said horizontal portion being secured to the neck or shoulder of the bottle.

9. The combination, with an ink-bottle, of a collar, 4, consisting of horizontal portion 4^a, upturned portion 4^b, and projections 15, for supporting it on the neck of the bottle, as set forth.

10. In combination with an ink-bottle, a collar, 4, consisting of the horizontal portion 4^a, upturned serrated portion 4^b, and projections 15, for supporting the collar on the bottle, said projections being secured around the neck of the bottle by a wire, 16, as set forth.

11. In combination with an ink-bottle, a collar, 4, consisting of the horizontal portion 4^a, serrated portion 4^b, and spring projections 15, for supporting the collar on the bottle, substantially as set forth.

12. An ink-bottle having formed integrally therewith a circumferentially-arranged series of substantially vertical projections, substantially as described.

13. A dipping attachment for ink-bottles, consisting of the tube 18, fitting to said bottle and having overlapping edges, whereby the same is rendered collapsible, substantially as described.

14. In combination with an ink-bottle, a tube, 18, fitting in said bottle and having a spring, 18^b, coiled on it and confined between the flange 18^a and mouth of the bottle, as herein set forth.

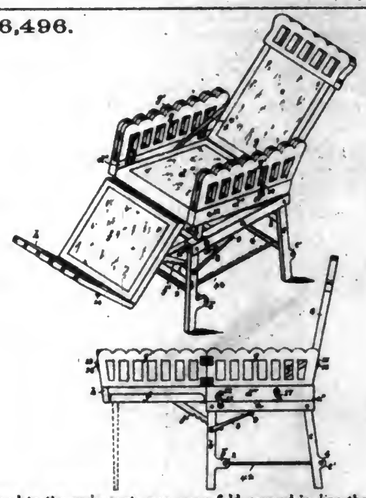
15. In a dipping attachment for ink-bottles, the combination of the conical thimble 18 and the springs 19, secured thereto, substantially as and for the purpose set forth.

396,496. FOLDING CONVERTIBLE CHAIR. DANIEL B. KEMPTER, Boston, Mass. Filed Jan. 23, 1888. Serial No. 261,643. (No model.)

Claim.—1. In a chair, in combination, the seat *d*, the back *e*, hinged thereon, means, substantially as described, for adjusting and locking said back in position, the rest *f*, hinged to the seat, means, substantially as described, for adjusting and supporting said rest in position, the foot-rest *h*, hinged to said rest, the arms made in two parts, *g* and *g'*, the main parts *g* hinged to the seat and the parts *g'* hinged to the main parts *g* and adapted to fold around in line therewith, means, substantially as described, for locking the arms *g* and *g'* to the back *e* and foot-rest *h*, respectively, the legs *b b' c*, hinged and connected, substantially as described, so as to fold down flush with the frame or body of the chair, and means for locking said legs in an upright position, all substantially as and for the purpose set forth.

2. In a chair, the arms made in two parts, *g* and *g'*, the parts *g* hinged to the seat so as to fold down parallel therewith and the parts

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g' hinged to the main parts *g* so as to fold around in line therewith, a leg-rest hinged to the front edge of the seat, and means, substantially as described, for locking said arms securely in position, all combined and operating substantially as and for the purpose described.

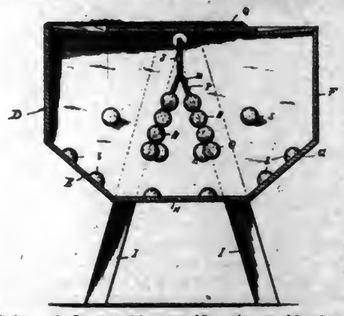
3. In a chair, the combination, with the main frame *a*, having a rearward projection, a'', of the rest *f*, hinged to the front edge of the seat and having the hinged foot-rest *h*, the leaves of the hinge being applied directly to the flat surface of said rest, and the projection a'' being so located as to engage with the end of the foot-rest *h* and fold it up against the rest *f* when the parts are turned beneath the seat, substantially as described.

396,497. TRUSS FOR TORSION-BALANCES AND THE LIKE. WILLIAM KENT, Pontois, assignor to the Springer Torsion Balance Company, Jersey City, N. J. Filed June 4, 1888. Serial No. 275,969. (No model.) Patented in England Apr. 13, 1886, No. 5,134.



Claim.—The combination, with a torsion-wire, of a truss composed of a single piece of metal extended or expanded against said wire, substantially as set forth.

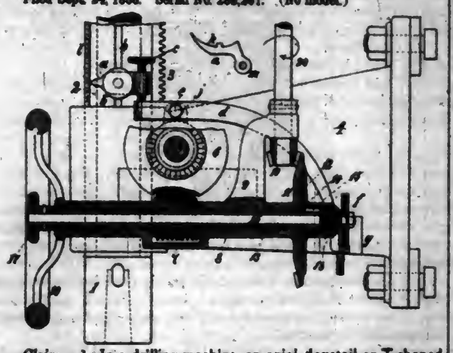
396,498. WASHING-MACHINE. CHARLES D. LA PORT, Carson, Iowa. Filed Mar. 29, 1888. Serial No. 268,670. (No model.)



Claim.—1. In a washing-machine, the combination, with the body, of an agitator having arms extending out therefrom, balls rigidly secured on the ends of said arms, and a series of balls on the arms above the rigid balls adapted to revolve and move vertically thereon, substantially as described.

2. In a washing-machine, the combination, with the suds-box having hemispherical projections on its inner faces, of an agitator having diverging arms extending downwardly therefrom, balls rigidly secured on the outer ends of the arms, a series of rotatable and vertically-movable balls above the said other balls, and springs on the arms for forcing the movable balls down, substantially as described.

396,499. AUTOMATIC FEED-STOPPING DEVICE FOR DRILLING-MACHINES. WILLIAM LODGE and CHARLES DAVIS, Cincinnati, Ohio. Filed Sept. 24, 1888. Serial No. 286,261. (No model.)

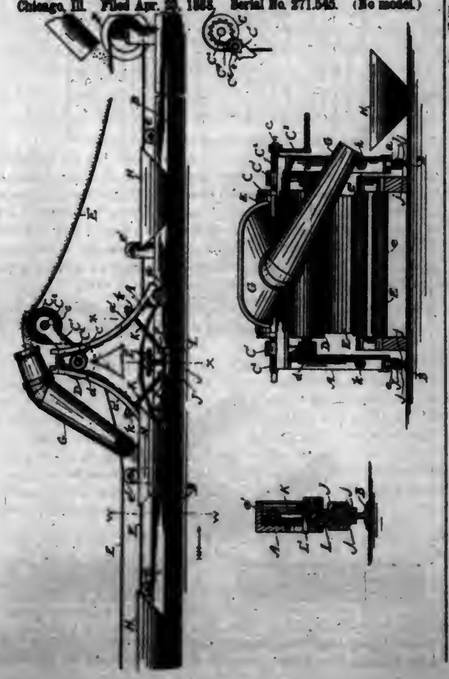


Claim.—1. In a drilling-machine, an axial dovetail or T-shaped groove, *h*, worked into the outside of sleeve 2, an axial graduation in inches and their fractions cut on the outside of said sleeve, and a pointer, *a*, fitting to the circular form of sleeve 2, sliding with its tongue in groove *h*, having a radial extension, *m*, to receive an adjusting-screw, *c*, in combination with pointer *a*, a screw, *i*, sliding with its head in groove *h*, and a knob, *b*, serving as nut for said screw, adapted to tighten said pointer to sleeve 2, all substantially as described, and for the purpose specified.

2. In a drilling-machine, a lever, *d*, fulcrumed on the sliding head 4 and so shaped as to come on its front end in contact with an adjusting-screw, *c*, attached by virtue of pointer *a* to sleeve 2, and form on its rear end a pawl, *n*, to engage with a ratchet-wheel, *f*, secured to rod 16 in the feed mechanism, and a bracket, *g*, secured to the sliding head 4 and serving as support for the rear end of lever *d*, all substantially as set forth, and for the purpose specified.

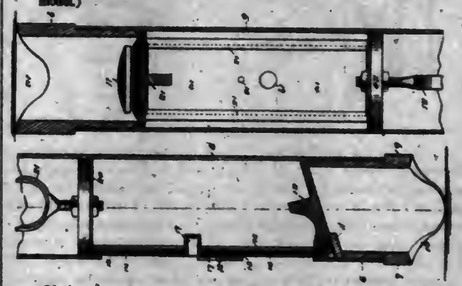
3. In the feed mechanism of a drilling-machine, the combination of a hollow worm-shaft, 8, with rod 16 revolving within its bore, said rod having on its front end a fixed actuating-knob, 17, on its rear end a fixed collar or nut to keep it in place a thread to engage with half-clutch 12, and a fixed ratchet-wheel, *f*, to engage with a lever, *d*, fulcrumed on the sliding head of a drilling-machine, all substantially as described.

396,500. BELT CONVEYER AND TRIPPER. JAMES MACDONALD, Chicago, Ill. Filed Apr. 23, 1888. Serial No. 271,545. (No model.)



Claim.—The combination, with a movable belt conveyer and tripper, of a clamping-shoe arranged between the wheels of the tripper and normally adjusted to loosely clamp the flange of the track-rail, a set-screw for rigidly securing the same to the rail, and obliquely-adjusted rods extending in opposite directions and attached, respectively, to the opposite ends of said clamping-shoe and to the frame of the tripper, whereby said tripper may be rigidly secured to the track or permitted to move thereon while said shoe is in normal engagement with said track, substantially as shown and described.

396,501. SAND OR MUD PUMP. RANSOM G. MEAD and BOOM MAGEE, Warren, Pa. Filed Sept. 3, 1887. Serial No. 248,716. (No model.)

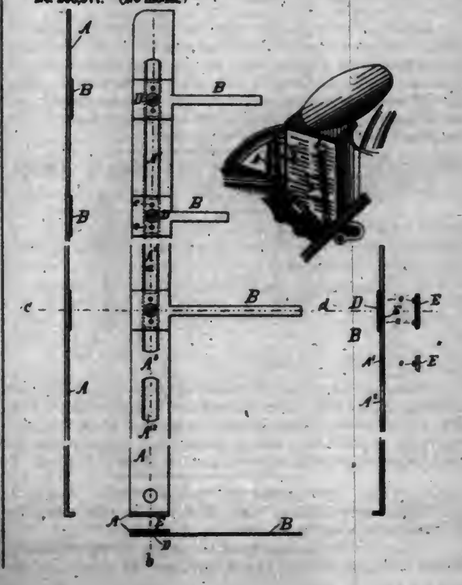


Claim.—1. In a sand-pump, the pump cylinder having the discharge-opening 13, an interior wall-slide, 14, for closing said opening, and a valve having its hinge secured to the pump-wall at the lower edge of said opening and inclining upward therefrom, whereby the said valve when closed is caused to act as an inclined chute to facilitate the discharge of the sand and mud from the cylinder through said opening when the latter is uncovered, as shown and described.

2. The combination, in a sand-pump, of the pump-cylinder having the discharge-opening 13 and wall-slot 18, a valve, and a piston with a slide fitted in interior guides, and means for operating said slide from the outside, consisting of a socket, 19, projecting inward from said slide, having an uncovered relation to the cylinder-slot 18, while the latter is maintained in closed relation to the pump-chamber by said slide, substantially as described.

3. The pump-cylinder having the wall discharge-opening 13 and slot 18, and having the interior guides, 15 15, in combination with the slide 14, having the interior projecting socket, 19, and the exterior projecting pin, 16, the latter operating to maintain the uncovered relation of said socket to said cylinder-slot 18, and the slide serving to perpetually close said slot, the valve 12, and the piston 20, substantially as described.

396,502. GRIPPER FOR PLATEN PRINTING-PRESSES. RICHARD MURRAY, Jr., Saratoga Springs, N. Y. Filed Mar. 24, 1888. Serial No. 268,377. (No model.)



Claim.—1. In a platen-press, a gripper provided with a slot, A', and a metallic plate, E, placed into the slot A', with the finger B, attached to the said plate, substantially as described, and for the purpose set forth.

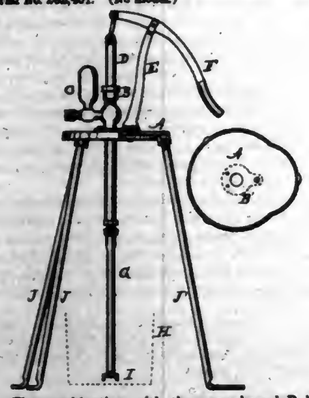
2. In a platen-press, a gripper provided with a slot, A', a plate, E, provided with studs *e e*, placed into the slot A', and the fingers B B, attached to the studs *e e* on the plate E and adjusted by the screw D, all substantially as described, and for the purpose set forth.

396,503. CHECK-VALVE AND TRAP. CHARLES K. MOORE, Elizabeth, N. J. Filed July 30, 1888. Serial No. 281,365. (No model.)



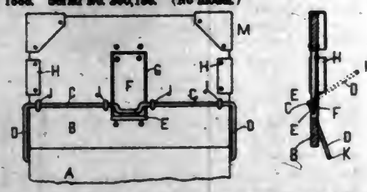
Claim.—The combination of the parts hereinabove recited, viz: the casing or body A, having inclined neck or inlet and rapidly-descending valve-chamber bottom, the recessed or chambered cover B, the valve disk or gate C, having central projection with concavity or socket formed therein, and the hinge-arm or valve-stem D, having T-shaped upper extremity and spherical lug-provided lower termination, these said parts being constructed, relatively arranged, and operated substantially as shown and described, and for the purposes specified.

396,504. PUMP. ABRAM H. NIXON, Dayton, Ohio. Filed Aug. 10, 1888. Serial No. 282,401. (No model.)



Claim.—The combination, with the pump-barrel B, having a flange, of the plate A, provided with legs upon which said flange rests and through which the said barrel extends, the standard E, secured upon the top of said flange by a threaded extension which passes through said flange and plate and is provided with a nut beneath, and the plunger D and handle F therefor, said handle being pivoted to the top of said standard, substantially as described.

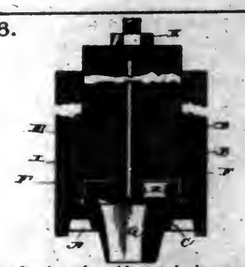
396,505. BOOK-CLIP. JOHN W. NOLAN, Chicago, Ill. Filed Jan. 9, 1888. Serial No. 260,196. (No model.)



Claim.—In a book-clip, the combination of a body, B, with the fastening devices M H, a wire clip composed of the portions K, D D, C C, and E, the same being journaled on the back of the body, and the spring F, which bears against the portion E and thus keeps the other side of the wire-clip depressed upon the leaves of the book.

396,506. APPARATUS FOR MOLDING PIPES. WILLIAM A. PALMER, South Pittsburg, Tenn. Filed Aug. 28, 1888. Serial No. 283,726. (No model.)

Claim.—1. The combination of the pattern having the annular rabbet at its lower end, the plug or cone below the pattern, and the



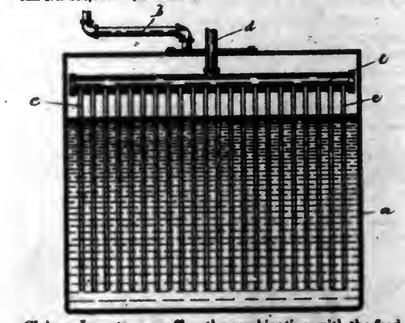
contracting ring fitted on the rabbet at the lower end of the pattern, provided with the projecting bead or flange, and adapted to engage the cone or plug when the pattern is pulled upward out of the ring, substantially as described.

2. The combination of the pattern having the reduced portion at its lower end and the contracting ring lying in the said reduced portion of the pattern and provided with the projecting flange or bead, substantially as described.

3. The combination of the pattern having the reduced lower portion, the rod movable longitudinally through the pattern, the centering cone or plug at the lower end of said rod, and the contracting ring lying in the reduced lower end of the pattern and provided with the projecting bead or flange, substantially as described.

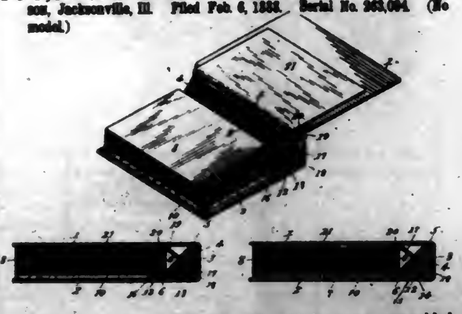
4. The combination of the chill-plate having the opening C, the centering-plug fitting the said opening and having the flange at its upper edge, the rod extending upward from the said plug, the pattern having the longitudinal opening through which the rod extends, and provided at its lower end with the reduced portion, and the contracting ring lying in reduced portion of the pattern and provided with the projecting bead or flange, substantially as described.

396,507. STEAM-MUFFLER. WILLIAM B. PEARSON, Saugus, assignor to Nathan H. Daniels, Boston, Mass. Filed Dec. 12, 1887. Serial No. 257,602. (No model.)



Claim.—In a steam-muffler, the combination, with the feed-water tank, of the upper longitudinally-disposed head or steam-receptacle having a pipe, *d*, opening into said head and a plurality of long nozzles extending from the said head or steam-receptacle, the combined area of said nozzles being equal to or greater than that of the said head or receptacle, substantially as shown and described, said nozzles being open at their outer ends only, whereby the steam in traversing said nozzles raises the temperature of the water, as set forth.

396,508. COVER FOR WRITING-TABLETS. WILLIAM B. PEARSON, Jacksonville, Ill. Filed Feb. 6, 1888. Serial No. 263,094. (No model.)



Claim.—1. The combination, with a binder or cover provided with buttons, of a tablet provided with button-holes for permitting

the attachment and detachment of said tablet to and from said binder or cover, substantially as described.

2. The combination, with a binder or cover provided with buttons, of a tablet provided with a supporting-board formed with button-holes for permitting the attachment and detachment of said tablet to and from said binder or cover, substantially as described.

3. The combination of a binder or cover provided with buttons with a tablet provided with a supporting-board formed with button-holes which are wider at one end than the other for permitting the attachment and detachment of said tablet to and from said binder or cover, substantially as described.

4. The combination, with a binder or cover provided with buttons, of a tablet provided with a supporting-board formed with button-holes for the admission and removal of said buttons, and a tilting arm or stop for retaining and releasing said tablet in and from said binder or cover, substantially as described.

5. The combination of the cover provided with the block in its back and the buttons upon the inner face of its lower lid, the tablet provided with the supporting-board formed with button-holes, and the arm pivoted in the end of said block and serving as a stop for said tablet, substantially as and for the purpose described.

6. The combination of the cover provided with the buttons upon the inner face of its lower lid and with the block secured to its back and lower lid and formed with the groove 13, having the recess 14 at its inner end, the tablet provided with the supporting-board, formed with the button-holes, and the tiltable wire 12, arranged in said groove 13, with its bend 15 in said recess 14, and having its retaining arm or stop 16 at its outer end, substantially as and for the purpose described.

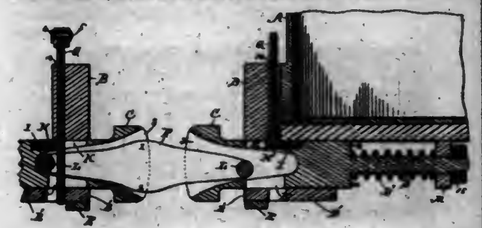
7. The combination of the cover and the stiffening-block secured to the back and to the lower lid thereof, and having the beveled inner face, with the tablet and devices for securing the same to the lower lid of said cover, substantially as and for the purpose as described.

8. The combination of the binder or cover, the tablet secured to the same, the block secured to the back of said binder or cover and formed with the groove 18, the wire 17, arranged in said groove and having the arms at its ends bent to form pintles, and the blotter having the folded or doubled portion at its inner or upper edge for the reception of said pintles, substantially as described.

9. The combination, with the cover, the tablet removably secured thereto, and the block formed with the groove 18, of the wire 17, adapted to be tilted or rocked in said groove, and having the arms at its ends bent to form registering or corresponding pintles, and the removable blotter having the fold at its inner or upper edge for the reception of said pintles, substantially as described.

10. The combination of the cover provided with the buttons upon the inner side of its lower lid and with the block having the beveled inner face, the tablet having the supporting-board formed with the button-holes, the retaining arm or stop pivoted in said block, the wire having arms formed with pintles adapted to be tilted or rocked in said block, and the blotter having the fold at its inner or upper edge for the reception of said pintles, substantially as described.

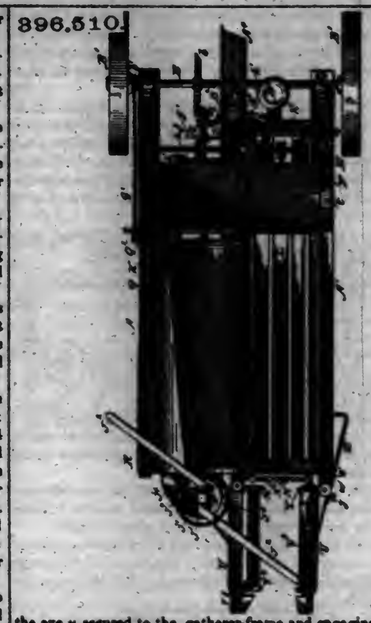
396,509. CAR-COUPLING. RICARD L. POWER, Silver City, N. Mex. Filed May 12, 1888. Serial No. 273,646. (No model.)



Claim.—In a railway-car coupling consisting of the recessed buffer-head C, shank D, with spring D', and sill B, having the socket for the pin, and the sill B', for the support of the coupling-head, the combination of block H with spring I, coupling-pin G, and a link, whereby the draft is taken off the draw-head entirely and transferred exclusively to the front sills or frame-work of the car, and the coupling of the cars is effected automatically by the contact of the buffer-heads without the pressure of the link, all constructed and arranged as and for the purpose shown and described.

396,510. COMBINED CORN HARVESTER AND HUSKER. ANDREW L. RASMUSON, Clermont, Iowa. Filed Jan. 24, 1887. Serial No. 225,205. (No model.)

Claim.—1. In a corn-harvester, the combination of the main frame having eye Y, the gatherer-frame formed with a lower portion or base-bar provided at its ends with upwardly-extended portions forming supports for the belt, the belt extended between said supports,



the eye *y*, secured to the gatherer-frame and engaging the eye Y of the main frame, whereby said frames are pivotally connected, and an adjustable brace or support between the lower portion of the gatherer-frame and the harvester main frame, substantially as and for the purposes specified.

2. The combination of the main frame having the eye Y, the gatherer-frame having the eye *y*, engaging said eye Y, the adjustable brace Z, connecting the gatherer-frame with the main frame, and the rod 3, connected with the gatherer-frame and extended rearwardly therefrom and joined with an operating device, substantially as set forth.

3. In a corn-harvester, a gatherer comprising the base-plate V, the upright bar *v*, projected from the front end thereof, the upright bar *v'*, projected from the rear end of said base-plate, the extension V', connected adjustably with the rear upright, *v'*, the shafts journaled in the parts *v* V', and the belt passed around said shafts, substantially as set forth.

4. In a corn-harvester, the combination, with the gatherer-frame, of the V-shaped point having its base-plate pivoted at its rear end to the gatherer-frame and its top plate extended rearwardly from the forward end of said base-plate, and the spring 8, bearing between the said point and the gatherer-frame and inclosed between the base and top plates of the point and the gatherer-frame, whereby such spring is protected from contact with obstructions in the path of the machine, substantially as and for the purposes specified.

5. The combination, with the main frame having bearing W^3 and the gatherer-frame having shafts V^3 V^3 and bearing W^3, and connected adjustably with the main frame, of the shaft W, formed in sections united by a universal joint, and having such sections journaled in bearings W^3 and W^3, each shaft being geared with shaft V^3 and with the drive-shaft, substantially as set forth.

6. The combination of the main frame having eye Y and bearing W^3, the gatherer-frame having plate V, provided with uprights or bars *v v'*, the extension V', connected adjustably with upright or bar *v'*, the shafts V^3 V^3, the latter having pinion V^4, the belt V^5, the bearing W^3, the eye *y*, and the shaft W, formed in sections united by universal joint W' and journaled in bearings W^3 W^3, substantially as set forth.

7. The combination of the drive-shaft B, having gear *b*, the shaft I, having pinion *i* and a clutch-section, *i'*, whereby said pinion may be keyed to the shaft, the shafts E, G, and H, gearing between said shafts and the shaft I, the reel-shaft, the carrier-apron, the gatherer-frame, a pinion, i^2, on shaft I, arranged to engage the pinion on the reel-shaft, a clutch, I^2, for keying pinion i^2 to shaft I, and means whereby clutches i' I^2 may be independently operated, substantially as set forth.

396,511. MANUFACTURE OF WINDOW AND PLATE GLASS. JACOB REESE, Pittsburg, Pa. Filed Aug. 8, 1887. Serial No. 246,410. (No model.)

Claim.—1. The process of manufacturing window and plate glass which consists in subjecting the glass to a rolling operation while the glass and the rolling apparatus are inclosed within a furnace or chamber which is maintained at or near the lowest temperature the glass is ductile at.

2. The method of manufacturing window and plate glass, which consists in forming molten glass into plates, slabs, or molds, then placing the plates, slabs, or molds in a furnace, and then subjecting the glass to the action of rolls until it has been reduced to the desired thickness while the temperature of the glass and the rolls during the operation is maintained at or near the lowest degree the glass is ductile at.

396,512. MANUFACTURE OF GLASS. JACOB REESE, Pittsburg, Pa. Filed Aug. 8, 1887. Serial No. 246,411. (No model.)

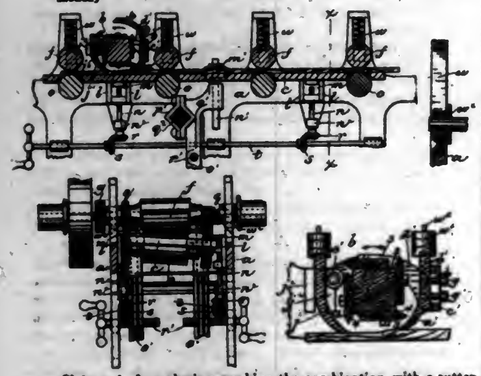


Claim.—1. A plant for rolling glass, comprising a set of reducing-rolls inclosed within a chamber capable of being maintained at the temperature of ductility of the glass.

2. A plant for rolling glass, comprising a set of reducing-rolls provided with feeding-tables inclosed within a chamber capable of being maintained at the lowest temperature at which glass is ductile.

3. A plant for rolling glass, comprising a set of reducing-rolls inclosed within a chamber capable of being maintained at the lowest temperature that glass is ductile, in combination with mechanism for revolving said rolls.

396,513. PLANING-MACHINE. JOSEPH A. SAUCIER, Holland, Vt. Filed Jan. 20, 1887. Renewed June 23, 1888. Serial No. 278,083. (No model.)



Claim.—1. In a planing-machine, the combination, with a cutter-head revolving in a constant plane, and a series of upper feed-rolls and gear-wheels, of a table supported adjustably at both its side edges, a series of lower feed-rolls journaled in bearings secured to said table, and gear-wheels on the shafts of said feed-rolls, all constructed and arranged so that the table, lower feed-rolls, and gearing may be inclined from the horizontal in either direction, substantially as set forth.

2. In a planing-machine, the combination, with the main frame, upper feed-rolls and gearing supported thereby, and vertically-adjustable slides *m*, of a table having its opposite edges supported by said slides, and a series of lower feed-rolls and gear-wheels supported by and below said table, whereby the table, lower driving-gearing, and lower feed-rolls may be inclined in either direction from the horizontal by the vertical movement of the slides *m* upon one side, substantially as described and shown.

3. In a planing-machine, the frame having the slots or guides for the sliding boxes of the feed-rolls, the lower ends of said slots being inclined, as and for the purpose specified.

396,514. VEHICLE-WHEEL. NICOLAS SCHAUS and FRANK MAYER, Collins, N. Y. Filed Mar. 29, 1888. Serial No. 268,908. (No model.)

Claim.—1. In a wheel, the combination of the felly having a spoke-socket flattened laterally to the felly, the spoke, a non-rotatable cap secured to the outer end of the spoke and provided with a socket-pin corresponding in cross-section to that of said socket, a threaded portion between said pin and the spoke, and a nut engaging said

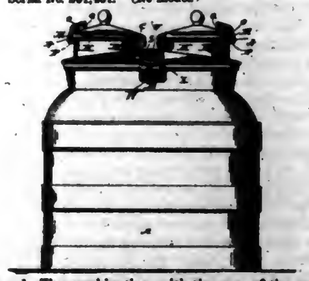
396,514.



threaded portion and bearing against a clip or washer seated on the inner edge of the felly, whereby the latter may be moved outward from the hub, substantially as specified.

2. In a wheel, the combination, with a felly provided with the spoke-socket *a*, flattened laterally to the felly, and the clip C, provided with the opening *c'* and surrounding shoulder c^2, and having lateral wings, by means of which it may be shrunk in position on the felly, of a spoke, the non-rotatable cap D thereon, which cap is provided with the socket-pin d^3, flattened on its sides and fitting in the socket, and with the threaded portion *d'*, and the nut E, engaging on said threaded portion and fitting against the seat c^2 of the clip, substantially as specified.

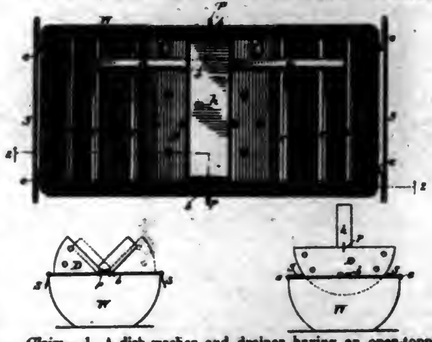
396,515. CAN. ANDREW D. SHUMAN, Toledo, Ohio. Filed Jan. 20, 1888. Serial No. 261,401. (No model.)



Claim.—1. The combination, with the can, of the curved lid fitting in the upper end of the same and having the necks H H, the band passing transversely over the curved face of the lid between said necks, and the clutches mounted in the ends of said band and engaging catches at the upper end of the can, as set forth.

2. The combination, with the can, of the curved lid fitting in the upper end of the same and having the necks H H, the covers hinged to the upper ends of said necks and adapted to close the same, catches carried by said covers and adapted to engage the necks, a band passing transversely over the curved face of the lid between the necks, and clutches mounted in the ends of said band and adapted to engage catches at the upper end of the can, as set forth.

396,516. DISH WASHER AND DRAINER. URIAH B. SMITH, West Liberty, Iowa. Filed May 4, 1888. Serial No. 272,846. (No model.)

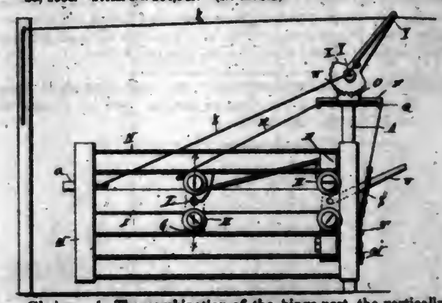


Claim.—1. A dish washer and drainer having an open-topped water-holder with central open pivot-bearings at its upper edge, and an open-topped semi-cylindrical dish-holder within said water-holder, having central pivots which rest in said bearings, a rigid handle at the top connecting the sides of the dish-holder at said pivots, and an externally-smooth bottom that is concentric with said pivots, provided with stop-ribs on its inner surface and perforated for the free admission of water and the escape therewith of crumbs and the like, substantially as hereinbefore specified.

2. In combination with an open-topped water-holder, a swinging dish-holder within the same, perforated for the free admission of water and the escape therewith of crumbs and the like, and provided internally with agitator-bars near one side thereof, substantially as hereinbefore specified.

3. In combination with an open-topped water-holder and a swinging dish-holder perforated for the free admission of water and the escape therewith of crumbs and the like, a pair of supports which rest upon the upper edges of the water-holder to support the dish-holder in elevated position for draining the dishes, substantially as hereinbefore specified.

396,517. GATE. JOEL R. STANBROUGH, Sheridan, Ind. Filed Sept. 25, 1888. Serial No. 286,345. (No model.)



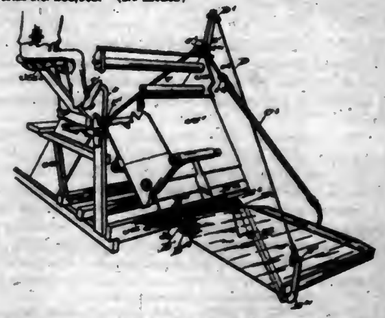
Claim.—1. The combination of the hinge-post, the vertically-movable frame mounted thereon, the gate carried by said frame, the collar secured to the upper end of the hinge-post, the rope and chain having one end secured to the frame, supported by said collar, and engaging a hook on the gate, and the lever pivoted to the frame and having a hook adapted to engage the chain, as set forth.

2. The combination of the hinge-post, the frame mounted thereon, the gate carried by the frame, the lower hinge of the frame provided with a hook, T, the collar at the upper end of the hinge-post having the arms P, provided with the eyes Q, the rope secured to the frame passing through said eyes, the chain connected to said rope and adapted to engage the hook T, and a lever pivoted on the frame and having a hook, V, adapted to engage one of the links of the chain, as set forth.

3. The combination of the hinge-post, the gate supported thereby, the collar at the upper end of the hinge-post, connections between said collar and the gate, the segmental rack-bar fulcrumed at the upper end of the hinge-post and engaging said collar, the latch at the front end of the gate, and the operating-rope secured to the latch and passing through the segmental rack-bar, and then in opposite directions from said rack-bar, as set forth.

4. The combination of the hinge-post, the frame D, mounted thereon, the gate carried by said frame, the collar on the upper end of the hinge-post, the rope and chain connected to the frame D and operated by said collar, the segmental rack-bar pivoted at the upper end of the hinge-post and engaging said collar, the latch at the front end of the gate, and the operating-rope secured to the latch and passing to the rack-bar and in opposite directions therefrom, as set forth.

396,518. BUNDLE-CARRIER FOR GRAIN-HARVESTERS. JOHN F. STEWARD, Chicago, Ill. Filed July 9, 1885. Renewed Oct. 10, 1888. Serial No. 288,602. (No model.)



Claim.—1. In combination, substantially as set forth, the gibbet having the vertical post pivoted to the harvester-frame, the carrier-platform pivoted on and rocking over the horizontal arm of said gibbet, a cranked rock-shaft journaled on the harvester-frame, having a crank-arm higher than the carrier-platform and farther forward than the gibbet-post, and an arm for rocking it at will, and a link connected to the first crank-arm at one end and at the other end to the carrier-platform at a point forward of the vertical plane of the axis over which it rocks, whereby said link causes that either the swinging of the gibbet or the rocking of the cranked shaft dumps the carrier-platform.

2. In combination, substantially as set forth, the gibbet having the vertical post pivoted to the harvester-platform and its horizontal arm extending from the post forward and thence bent outward, the carrier-platform pivoted on and rocking over said outwardly-bent part, and a link connected at one end to the carrier-platform at a point forward of the vertical plane of the axis over which it rocks and at the other end pivoted at a point higher than the carrier-platform and farther forward than the gibbet-post.

3. In combination, substantially as set forth, the gibbet having its vertical post pivoted to the harvester-frame and its horizontal arm extending from the post forward and thence outward and backward at an acute angle to its first or inner portion, and the carrier-platform pivoted on and adapted to rock over said outwardly-extended portion.

396,519. PAPER-WEIGHT. ALBERT E. SWIFT, Buffalo, N. Y. Filed May 14, 1888. Serial No. 273,771. (No model.)

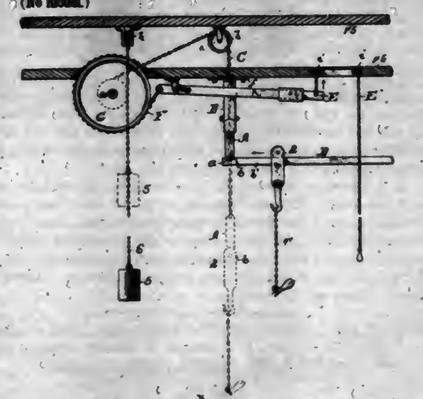


Claim.—1. The combination, with a box or casing, of a removable ring applied to one end of the box and provided with an inwardly-projecting flange or rim, and a picture, mirror, or advertising-card arranged between the end of the casing and the flange of the ring, substantially as set forth.

2. In a paper-weight, the combination, with the inner body or casing, of removable rings applied to opposite ends of said casing and provided at their outer ends with inwardly-projecting flanges or rims, and removable pictures, mirrors, or advertising-cards arranged between the ends of the casing and said flanges or rims and exposed through said rings, substantially as set forth.

3. In a paper-weight, the combination, with the box or casing A, containing a suitable weight or filling, C, and having a cover, B, of the removable rings D D', applied to opposite ends of the casing A and provided at their outer ends with inwardly-projecting flanges or rims *d d'*, and removable pictures, mirrors, or advertising-cards E E', interposed between the ends of the casing A and the rims or flanges of said rings, substantially as set forth.

396,520. APPARATUS FOR USE IN DRESSING HOGS. JOHN THOMAS, Kansas City, Kans. Filed Mar. 21, 1888. Serial No. 268,080. (No model.)



Claim.—1. In a slaughtering apparatus, the combination of a suitable supporting-track suspended from overhead, traveling hooks adapted to engage said track, and a vertically-movable lowering-cage upon which said traveling hooks are discharged from said track, substantially as set forth.

2. In a slaughtering apparatus, the combination of a suitable supporting-track suspended from overhead, wheeled hooks adapted to travel on said track, a vertically-movable lowering-cage which

registers with the end of said track when at the limit of upward movement and upon which such wheeled hooks are discharged to be lowered, a counter-weight which returns the cage to its normal position at end of the track after being lowered, and a suitable brake which controls the downward movement of the cage when loaded, substantially as set forth.

3. In a slaughtering apparatus, the combination of supporting-track D, suspended from overhead and provided with angular end *b'*, vertically-movable lowering-cage A, provided with depression *a* and angular projection *b*, which latter is adapted to come into contact with the end *b'* of said rail when said cage is at the limit of upward movement, a suitable guiding-bracket for said cage suspended near the point of contact of the cage and track, a counter-weight for said cage, and suitable brake mechanism which controls the downward movement of said lowering-cage, substantially as set forth.

4. In a slaughtering apparatus, the combination of overhead track D, having angular end *b'*, lowering-cage A, provided with angular projection *b* and curved depression *a*, guiding-hanger B, chain C, to the free end of which chain said cage is attached, chain 6, carrying weight 5 at its free end, lowering-drum 60, around which said chains C and 6 are wound in reverse directions, friction-drum G, arranged to revolve with said lowering-drum, strap-brake F, which encircles said friction-drum, weighted lever E, and hand rope or chain E', all constructed substantially as set forth.

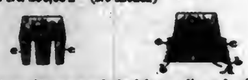
5. In a slaughtering apparatus, the combination of a hoisting-chain having a hook at its lower end, a wheeled hook attached to the hook at the lower end of this chain, and a flexible supporting-track hung in the vertical path of said wheeled hook, substantially as set forth.

6. In a slaughtering apparatus, the combination of a wheeled hook adapted to be moved in a vertical path, a supporting-track hung in the path thereof, so as to be moved to one side thereby, suitable devices for elevating the wheeled hook to said track, a lowering-cage upon which said hook is discharged from the end of said track, and suitable lowering devices for said cage, substantially as set forth.

7. In a slaughtering apparatus, the combination of parallel suspended tracks, wheeled hooks adapted to travel on said tracks and provided with eyes at their upper ends, the detachable combined tree and support *y*, provided with arms 12, which project in opposite directions from its ends and engage the eyes of the hooks, and a suitable hoisting-chain, H', and drum H, all constructed and operated substantially as set forth.

8. The combined tree and support *y*, consisting of main horizontal bar 11, bail 14, having eye 15 formed at the middle of its length and having its ends attached to said main bar, arms 12, located at the ends of said bar 11; so as to project from opposite sides thereof, and bent guide-lugs 13, located at a short distance from said arms and projecting in opposite directions from said bar 11, substantially as set forth.

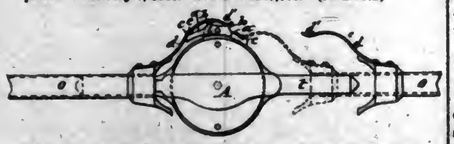
396,521. HORSESHOE. GEORGE W. WEMPLE, Boston, Mass., assignor of nine-twentieths to Brainard W. Child, same place. Filed Dec. 1, 1887. Serial No. 256,634. (No model.)



Claim.—1. A horseshoe provided with two diverging inclined holes passing through or partially through the same, in combination with a calk provided with two tenons at right angles to the under surface of said calk and constructed and arranged to be driven into said holes and follow the inclination thereof, bending upon themselves to form a clinch to firmly hold the calk in position.

2. A horseshoe provided with two diverging inclined holes and a central hole at right angles with the surface of said shoe, in combination with a calk provided with three tenons at right angles to the under surface of said calk and constructed and arranged to be driven into said holes, the outer tenons bending upon themselves and following the inclination of said diverging holes, thus forming a clinch to firmly hold said calk in position.

396,522. POSITIVE SHUTTLE-MOTION FOR LOOMS. CHESTER F. WICKWIRE, Cortland, N. Y., assignor to Wickwire Brothers, same place. Filed July 5, 1888. Serial No. 278,060. (No model.)

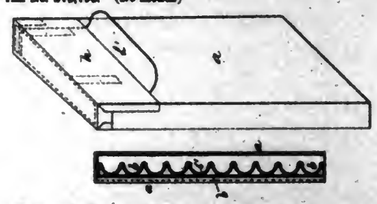


Claim.—1. In combination with the shuttle and its carrier-arms, a catch-lever mounted on the shuttle movably in a plane parallel with the plane of the shuttle, and spring-latches extending from the carrier-arms and movable in the aforesaid plane and adapted to interlock with the catch-lever, substantially as described and shown.

2. In combination with the shuttle and its carrier-arms O O, the two-armed lever *l*, pivoted to the shuttle to rock in the plane thereof, and provided with hooks *e e* on its extremities, and the spring-latches *d d*, extending from the carrier-arms and movable in planes parallel with that of the shuttle and provided with the apertures *e e*, adapted to engage the hooks *e e*, substantially as described and shown.

3. In combination with the shuttle and its carrier-arms O O, the two-armed lever *l*, pivoted to the shuttle to rock in the plane thereof and formed with the cams *b b*, and having its arms *a a* inclined toward the ends of the shuttle and terminating with hooks *e e*, and the spring-latches *d d*, extending from the carrier-arms and formed with the apertures *e*, and bowed outward from their free ends rearward, substantially as described and shown, for the purpose set forth.

396,523. CARTRIDGE-FEED CASE. JAMES G. ACCLES, 41 Craven Street, Strand, County of Middlesex, England. Filed July 2, 1888. Serial No. 278,796. (No model.)

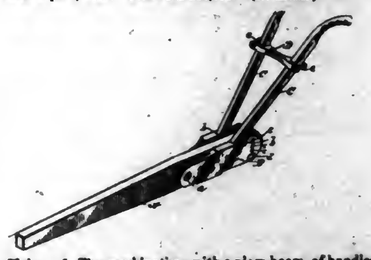


Claim.—1. The combination of a cartridge box or case and a slide or slides within the box, provided with grooves or recesses in which the cartridges lie, and adapted to be withdrawn longitudinally from the box, substantially as and for the purpose set forth.

2. The combination of the cartridge-box, the longitudinally-adjustable cartridge-carrying slide, the removable cover on the front end of the box, the flap at the end of the cover, and the flexible or yielding retainer beneath the cover, secured to the box and engaging with the cartridges, substantially as set forth.

3. The combination of the cartridge-box having a slot, *f*, at its front end to permit of the removal of the cartridges one at a time, the cartridge carrying slide moving longitudinally in the box, the yielding retaining device on the front end of the box, and the cover for closing the front end of the box, substantially as set forth.

396,524. PLOW-HANDLE. STANDISH I. ALLEN, Crossville, Ala. Filed Sept. 4, 1888. Serial No. 284,530. (No model.)



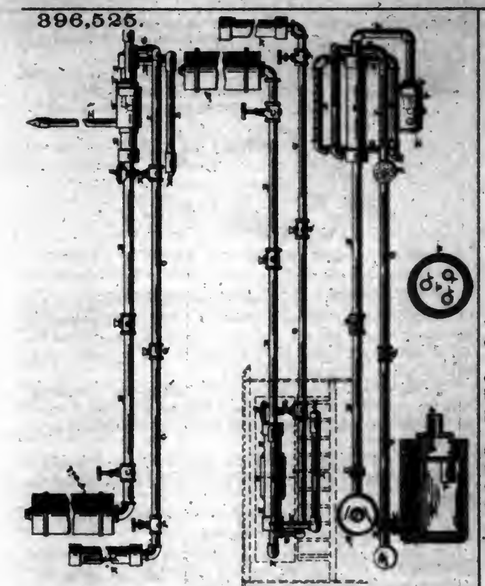
Claim.—1. The combination, with a plow-beam, of handles adjustably secured to the beam, and a vertically-adjustable brace, D, secured between the handles, the ends of this brace being bifurcated to embrace the handles and provided with securing-bolts, substantially as described.

2. The combination, with a plow-beam and handles, of a pair of clamping-plates pivotally bolted upon opposite sides of the said plow-beam, these plates being provided with grooves in their inner faces for the reception of the plow-handles, and each plate being also provided with a vertical series of apertures, a removable bolt, *d*, passed through the plow-beam and the apertures in the plates, an adjustable brace D, placed between the handles, the ends of this brace being bifurcated to embrace the handles, and clamping-bolts *c c*, passed through the bifurcated ends of the said brace, substantially as described.

396,525. OIL-BURNER. JAMES RAINS, Cincinnati, Ohio. Filed Aug. 8, 1888. Serial No. 282,196. (No model.)

Claim.—1. The combination of a reservoir for holding oil, a pipe extending therefrom, a generator to which this pipe is connected, a second reservoir for holding gasoline, a pipe, O, extending therefrom, and a pipe, G, for connecting the pipe O also with the generator, the gasoline-pipe being provided with perforations, so as to form a burner,

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I, and a burner pipe, L, which is connected to the generator, substantially as shown.

2. The combination of a reservoir or tank, a pipe leading therefrom, the retort to which one end of the supply-pipe is connected, a pipe, F, extending from the opposite end of this retort, a vaporizing-chamber connected to this pipe and located to one side of the burners, the chamber U, formed at one end of the vaporizing-chamber, and two or more pipes extending from the inner end of the chamber U into the vaporizing-chamber, substantially as described.

396,526. SULPHUR COMPOUND. ROBERT RAUMANN, Freiburg, Baden, assignor to Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. Filed Nov. 22, 1883. Serial No. 291,582. (No specimens.)

Claim.—The product herein described, being a new sulphone, which has the chemical name diethylsulphonemethylethylmethan, melting at 76°, crystallizing in silvery gleaming scales, difficultly soluble in cold water, easily in other, alcohol, and benzine, being without smell but of a weak, bitter taste, and melting in boiling water, substantially as described.

396,527. PRODUCTION OF COLORING-MATTER. FRITZ REINDER, Frankfort-on-the-Main, assignor to A. Leonhardt & Co., Mühlheim-on-the-Main, Germany. Filed Apr. 12, 1888. Serial No. 270,455. (No specimens.)

Claim.—The coloring-matter herein described, which is produced by the action of caustic alkalies upon paranitrotoluolsulpho-acid in presence of water, alcohol, or glycerine with an oxidable substance, and which is a brownish powder, giving, when dissolved in water, a yellowish solution the color of which is scarcely altered by the addition of caustic soda-lye, dissolving in concentrated sulphuric acid with a violet color, and the watery solution of which, when heated with a chloride of barium, yields a brownish-red precipitate, and when boiled with caustic soda-lye and zinc-dust gives a colorless solution which in presence of air assumes an intensely-red color, substantially as herein specified.

396,528. BELT-FASTENER. HENRY BLAKE, East Pepperell, Mass., assignor to himself, and J. Ashton Greene, Brooklyn, N. Y. Filed Mar. 3, 1888. Serial No. 266,095. (No model.)



Claim.—As an improved article of manufacture, a belt-fastener consisting of a curved bar or shank circular in cross-section, having on each end and in one piece with it a T-shaped or segmental head formed with square shoulders, substantially as described.

396,529. TYPE-WRITER CIPHOGRAPH. GUSTAV BOTTGER, New York, N. Y. Filed Feb. 28, 1887. Serial No. 229,074. (No model.)

Claim.—1. The combination, with the actuating-keys of a type-

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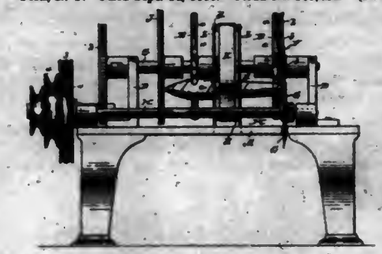


writing machine, of finger-pieces provided with indicating letters or characters disposed in abnormal relation to the normal keys.

2. The combination, with the key-board of a type-writing machine, of an auxiliary key-board, the keys of the auxiliary key-board being provided with indicating letters or characters which are disposed in abnormal relation to the keys of the normal key-board.

3. A ciphographic attachment for a type-writing machine, consisting of a frame or casing for adjustment over the key-board of a type-writing machine, and a series of auxiliary keys supported in said casing, and provided with indicating letters or characters which are disposed in abnormal relation to the keys of the ordinary key-board.

396,530. CIGAR-TRIMMING MACHINE. CLARK W. BOBAR, New York, N. Y. Filed Sept. 14, 1888. Serial No. 285,411. (No model.)

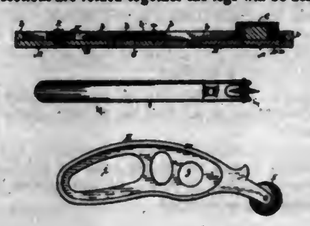


Claim.—1. The combination of the power-driven endless bed provided with pockets for the reception of individual cigars, the presser consisting of a yielding endless belt which moves by reason of its frictional contact with the cigars, the shearing-wheel moving in unison with the endless bed and provided with peripheral recesses *b*, and the knife G, co-operating with said shearing-wheel, as and for the purposes hereinbefore set forth.

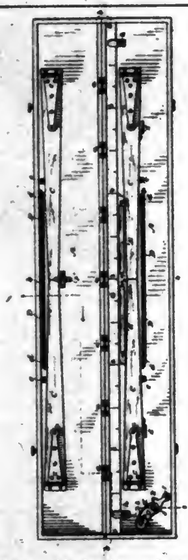
2. The combination of the power-driven endless bed provided with pockets for the reception of individual cigars, the yielding presser actuated by contact with the cigars, the gage plate or disk placed at one end of the endless bed and moving in unison therewith, the shearing-wheel located at the other end of said bed, and also moving in unison therewith, and the co-operating knife G, substantially as and for the purposes hereinbefore set forth.

396,531. FOLDING TABLE FOR THE USE OF PAPER-HANGERS. GEORGE H. BOTHER, Philadelphia, Pa. Filed Apr. 18, 1888. Serial No. 271,063. (No model.)

Claim.—The folding and hinged longitudinal sections A A, having downwardly-projecting strips *b b*, in combination with the folding legs C C, each of which is thicker than the distance which the said strips *b b* project beneath said sections A A, two of which legs are hinged to the under side of each section, the legs on one side being hinged to their section close to the edge thereof, and the legs on the other section being hinged centrally thereto, substantially as set forth, so that when the sections are folded together the legs will be nested therein.



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the legs of one section lying side by side with the legs of the other section.

396,532. ENDLESS APRON FOR FEEDING OR OTHER MACHINES. WILLIAM C. BRAMWELL, Hyde Park, Mass. Filed June 14, 1887. Serial No. 241,317. (No model.)



Claim.—1. In an endless apron or carrier, the slats or bars and connecting metal links and pins, said slats having recessed and beveled edges, for the purpose described, in combination with pulleys or rolls supporting said apron and having teeth or projections fitting in between said slats, whereby a positive motion will be imparted to the apron by the pulleys.

2. An endless apron composed of slats or bars having beveled edges and formed with recesses *e*, in combination with links having their pivotal bearings situated within the recesses *e*.

3. An endless apron or carrier composed of the slats having beveled edges and formed with recesses *e*, in combination with a series of metal links formed with heads and pins passing through the said heads, forming hinges at this point, situated within the recesses *e*, substantially as and for the purposes shown and described.

396,533. GARMENT-STAY. MORRIS P. BRAY, Ansonia, Conn., assignor of one-half to John Kendrick, Chicago, Ill. Filed Oct. 22, 1888. Serial No. 288,787. (No model.)

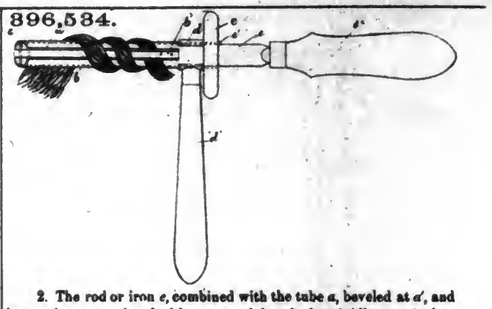


Claim.—The herein-described dress-stay, consisting of a woven covering forming two longitudinal parallel pockets, combined with a cord between the two pocket sand a cord at each edge of the stay, the said cords introduced in the process of weaving, and with bones in said pockets, substantially as described, and whereby the stay is provided with a flexible cord at both its edges and center as a means of attaching the stay to the dress.

396,534. DEVICE FOR CURLING HAIR. WALTER I. BRIGHAM, South Framingham, Mass. Filed Dec. 20, 1887. Serial No. 258,696. (No model.)

Claim.—1. In a device for curling hair, the rod or iron *e*, and the handle *d'*, having an attached bearing, combined with the rotatable cylindrical tube *a*, having the disk *c*, the tube rotating in the said bearing, substantially as described.

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2. The rod or iron *e*, combined with the tube *a*, beveled at *a'*, and its contiguous spring locking or retaining device rigidly attached to the tube at its inner end and extended longitudinally thereon, the free end of said locking device overlying said beveled portion, substantially as and for the purpose described.

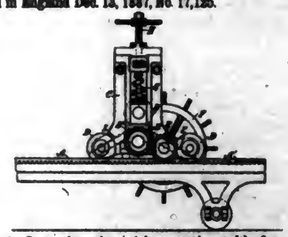
3. The cylindrical rod *e*, having the limiting-stop *d'*, combined with the rotatable tube or cylinder *a*, a detachable bearing, *d*, therefor, and the disk *c*, against which said stop abuts, substantially as described.

4. The rod *e*, combined with the tube or cylinder *a*, having a beveled end, and the locking device, as the spring *b*, substantially as described.

5. The rod *e* and tube *a*, combined with the removing device encircling the tube, substantially as described.

6. The rod *e* and tube *a* and its locking device, as the spring *b*, combined with the removing device, as the ring *d*, cut away at d^2, and its handle *d'*, substantially as described.

396,535. APPARATUS FOR ROLLING GLASS PLATES. ANTHONY D. BROGAN and ANDREW M. MALLOCH, Firhill, Glasgow, County of Lanark, Scotland. Filed July 23, 1888. Serial No. 280,775. (No model.) Patented in England Dec. 13, 1887, No. 17,126.

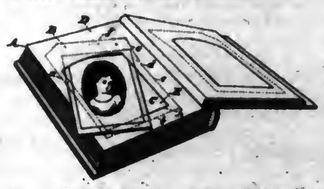


Claim.—1. In conjunction with a casting-table for rolling glass, a pair or pairs of rollers carried on a framing adapted to be traversed over said table, the said rollers being operated so that the glass plate rolled upon the table is drawn through between them and thereby impressed with a surface-pattern.

2. In combination with the casting-table A, the framing C, carrying pattern-impressing rollers B B and adapted to be traversed over the table, substantially as and for the purpose set forth.

3. In conjunction with a casting-table for rolling glass, pattern-impressing apparatus composed of the following elements in combination, to wit: the framing C, rollers B B, guide-plates I I', and gearing, such as E E', for driving the rollers, substantially as described.

396,536. ALBUM. ROBERT BROWN, Miamisburg, Ohio. Filed Sept. 20, 1888. Serial No. 285,905. (No model.)



Claim —1. The album-leaf consisting of the body portion provided with an opening having the edges *a b* parallel with the outer edge, the portional edge *c*, parallel with the edge *a*, the inclined edge *e*, and the top edge, in combination with the facing having the opening, substantially as specified.

2. The album-leaf consisting of the body portion having the opening provided with edges parallel to the outer edges, the angle edge *c*, the top edge at right angles thereto, and the obtuse angle, the facing

having the projecting keeper edges, and the backing, substantially as specified.

396,537. RUBBER-DAM CLAMP. WALKER G. BROWER, Atlanta, Ga., assignor of one-half to Richard B. Winder, Baltimore, Md. Filed Nov. 5, 1888. Serial No. 290,007. (No model.)



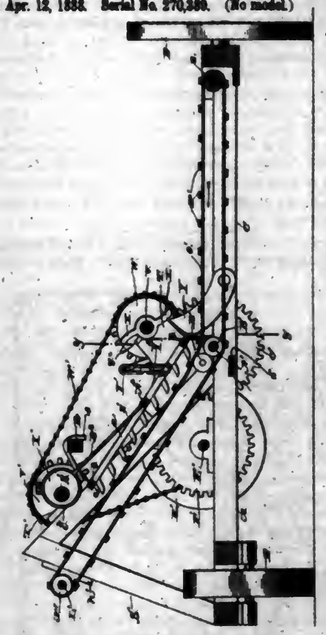
Claim.—1. In a clamp of the character described, the two arms pivoted together, a set-screw passing through one bar and swiveled in the other, and longitudinally-adjustable clasps arranged in pairs and movable longitudinally of the bars, all in combination, substantially as described.

2. The combination, with the bars *a d* and means for opening and closing the same, of the clasps *n n*, having mortises to pass over said bars, and projections which bear on the bars and on which the clasps may have a rocking movement, substantially as described.

3. The combination, with the bar, as *a*, of a clamp, of a friction-spring extending along said bar, and the clasp *n*, having a mortise to embrace said bar and spring, substantially as described.

4. The combination, with the clasping-bars *a d* and means for operating the same, of the spreader *r*, movably supported on one of said bars, said spreader having a wedge or blade, *s*, to extend between the teeth, substantially as described.

396,538. CORN-HARVESTER. EDWARD W. CADY, Rockwell, Iowa. Filed Apr. 12, 1888. Serial No. 270,389. (No model.)

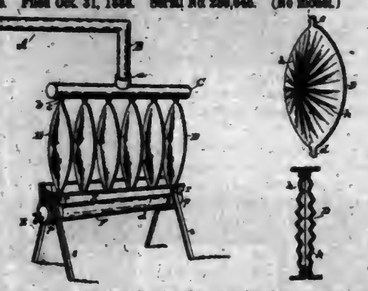


Claim.—1. The combination of the main frame, the platform-frame, the inclined frame mounted on the main frame, the endless carrier-belt supported by said frames, the rake arranged over the belt and provided with downwardly-projecting teeth, the shaft S', journaled in the inclined frame and above the belt, the eccentric on said shaft, the transverse rock-shaft in the rake, and the pitman connecting said rock-shaft and the eccentric, as set forth.

2. The combination of the main frame, the platform-frame, the inclined frame mounted on the main frame, the cross-bar Y' thereon, the endless belt supported by said frames and passing under the cross-bar, the shaft S' above the belt, the eccentric on said shaft, the rake arranged over the belt, the pitman extending between the rake and the eccentric, and the links depending from the cross-bar Y' and connected to the rake, as set forth.

3. The combination of the main frame, the platform-frame, the inclined frame mounted on the platform-frame, the endless carrier-belt supported by said frames, the transverse shaft V, mounted on said inclined frame and extending over the belt, the radial vertical cutters secured on said shaft, the stationary cutter secured to the inclined frame adjacent to the radial cutters and shearing against the same, and the rake supported by the inclined frame over the belt, as specified.

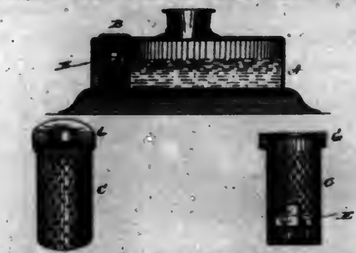
396,539. CONDENSING APPARATUS. JOHN F. CHASE, Augusta, Me. Filed Oct. 31, 1888. Serial No. 289,646. (No model.)



Claim.—1. The combination, in a condensing apparatus, of the pipes A B, the tube C, centrally connected with said pipe B and having a series of lips formed on one side thereof, the series of disk-shaped condensing-chambers formed of the concavo-convex plates joined at their peripheries connected to said lips, the receiving-tube having a series of lips on one side connected with said condensing-chambers, and means for supporting said receiving-tube, substantially as described.

2. The combination, in a condensing apparatus, of the pipes A B, the tube C, connected with said pipe B, a series of upright condensing-chambers formed by the disk-shaped concavo-convex plates having the tapering corrugations therein, and the receiving-tube communicating with said chambers, substantially as described.

396,540. INDICATOR FOR LAMPS, LANTERNS, &c. WILLIAM A. CHASE, Morrisville, Vt., assignor of one-half to Fred. B. Livingston, same place. Filed Mar. 21, 1887. Serial No. 231,724. (No model.)



Claim.—The herein-described indicator for lamps, consisting of a perforated cylinder or tube having a closed lower end and an open exteriorly screw-threaded upper end, and a luminous float within said cylinder in the form of a six-pointed cubical cross, substantially as specified.

396,541. OIL-BURNING LIMEKILN. ALBERT V. CLARK and ELISHA T. MAPES, Alameda, Cal. Filed Aug. 17, 1883. Serial No. 283,005. (No model.)

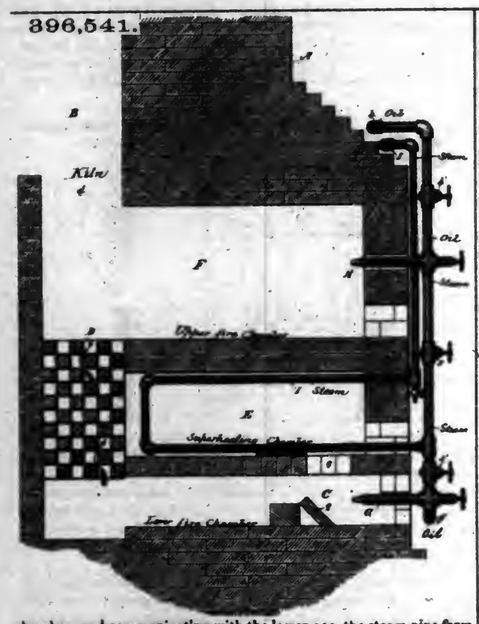
Claim.—1. In an oil-burning furnace, the combination of an upper and lower fire-chamber, the oil-burners therein, a separate chamber communicating with the lower fire-chamber, and a steam-pipe in said separate chamber connected with and supplying superheated steam to the oil-burner, substantially as herein described.

2. In an oil-burning furnace, the combination of the lower fire-chamber, the checker-work communication at its inner end with the kiln, the oil-burner in the front of the fire-chamber, the separate chamber above and communicating with the fire-chamber, and the steam-pipe within said separate chamber connected with the oil-burner, substantially as herein described.

3. In an oil-burning furnace, the combination of the lower fire-chamber, an oil-burner therein, the upper fire-chamber and the oil-burner therein, the intervening separate chamber communicating with the lower fire-chamber, and the steam-pipe within said separate chamber and connected with the two burners, substantially as herein described.

4. In an oil-burning furnace having a shell inclosing the kiln, the combination of the lower fire-chamber of the shell and the upper fire-chamber, both communicating with the kiln, the separate oil-burners inserted in said fire-chambers, the separate chamber between the fire-

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chambers and communicating with the lower one, the steam-pipe from the boiler within the intervening chamber, and valve-controlled connections between said steam-pipe and the burners, substantially as herein described.

396,542. BOOT OR SHOE. DAVID B. CLOSSON, Boston, assignor of one-half to William B. Rice, Quincy, Mass. Filed June 18, 1888. Serial No. 277,419. (No model.)



Claim.—The herein-described Balmoral or laced boot, having the sections A and A', the edges of which abut, but do not overlap, the lower portions of the said sections being provided with eyelet-holes c' c^2 and the upper portions thereof with lacing-studs or eyelet-holes, an elastic piece, B, and elastic cord C, connecting the said lower portions of said sections, a non-elastic lacing cord or cords for the upper portions of said sections, and a tongue, E, covering the space or opening between said sections, substantially as shown and described.

396,543. UNDERGROUND SYSTEM OF ELECTRIC WIRES. HENRY B. COHB, Wilmington, Del. Filed Apr. 19, 1888. Serial No. 271,165. (No model.)



Claim.—1. The combination of an insulated electric conducting-wire, B, a metal ferrule, C, surrounding the wire B near its end, an insulated conducting-wire, B', having a metal ferrule, C', surrounding it near its end, and a metal thimble, E, substantially as and for the purpose set forth.

2. The combination of an electric conducting-wire, B, inclosed within an insulating-tube, A, a metal ferrule, C, surrounding the wire B near its end in the insulating-tube, a conducting-wire, B', inclosed within an insulating-tube, A', having a metal ferrule, C', surrounding the wire B' near its end in the insulating-tube, and a metal thimble, E, substantially as and for the purpose set forth.

3. In an underground system of electric wires having an insulated conductor extending into a man-hole, vault, or the like, the combination, with the said conductor, of a removable and adjustable cap, F, to cover its end, substantially as and for the purpose set forth.

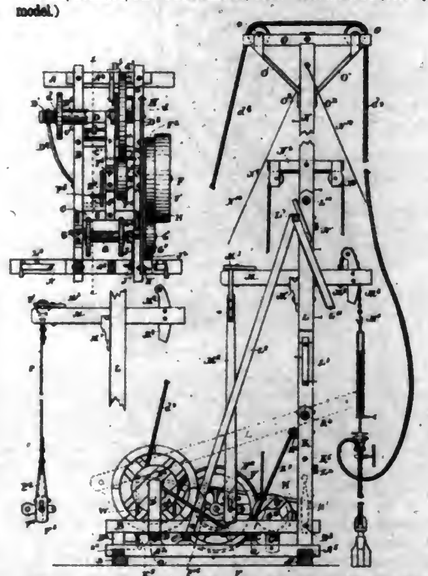
4. The combination of an electric conducting-wire, B, a metal ferrule, C, in a tube, A, of insulating material and surrounding the wire B near its end, and a cap, F, substantially as and for the purpose set forth.

5. The combination of an insulated electric conducting-wire, B, a metal ferrule, C, surrounding the wire B near its end, and a cap, F, comprising a section of insulating-tube, F', having a thimble, E', and containing a filling, p, substantially as and for the purpose set forth.

6. The combination of an electric conducting-wire, B, inclosed within an insulating-tube, A, a metal ferrule, C, having an enlarged portion, r, a reduced portion, r', and shoulder r^2, and surrounding the wire B near its end in the insulating-tube and secured to the said wire, a coupler, D, comprising a conducting-wire, B', inclosed within an insulating-tube, A', metal ferrules C', surrounding the wire B' near each end in the insulating-tube, secured to the said wire and formed like the ferrule C, and a metal thimble, E, substantially as and for the purpose set forth.

7. The combination of an electric conducting-wire, B, inclosed within an insulating-tube, A, a metal ferrule, C, having an enlarged portion, r, a reduced portion, r', and shoulder r^2, and inserted around the wire B into the insulating-tube to cause its extremity to be flush with that of the said insulating-tube, a coupler, D, comprising a conducting-wire, B', inclosed within an insulating-tube, A', metal ferrules C', formed like the ferrule C and inserted around the wire B' into opposite ends of the insulating-tube to cause their extremities to be flush with those of the said insulating-tube, and metal thimbles E, inserted around the reduced portions of the ferrules C into the opposite ends of the tubing A' and extending beyond the latter, substantially as and for the purpose set forth.

396,544. RIG FOR DRILLING AND PUMPING WELLS. GEORGE CORBETT, Bradford, Pa. Filed June 27, 1887. Serial No. 242,613. (No model.)



Claim.—1. In a rig for drilling and pumping wells, the derrick consisting of a bed-frame, samson-posts rigid thereon, and a mast in two sections pivoted together and one pivoted to the samson-posts, substantially as set forth.

2. The combination, with the driving-shaft, of a friction-wheel thereon, a bull-wheel, a friction-wheel thereon, a pivoted lever in which the bull-wheel at one end is mounted, means for oscillating said lever for disengaging said friction-wheels, and a strap-brake immovably secured at one end and connected at the other to the lower end of said pivoted lever and partially surrounding said bull-wheel friction-wheel, substantially as set forth.

3. In combination with the driving-shaft and friction-wheel thereon, the bull-wheel mounted in a pivoted lever at one end, a friction-wheel on said bull-wheel, a strap-brake partially surrounding the friction-wheel of the bull-wheel, a lever with which both the pivoted supporting-lever and the strap-brake are connected, and means for operating said lever, substantially as set forth.

4. The combination, with the bull-wheel having a friction-wheel, of a pivoted lever in which the bull-wheel is mounted, a strap-brake partially surrounding said friction-wheel, and a crank-shaft having connection with said lever and with one end of said brake and having means of operation whereby the wheel and the brake are moved in opposite directions.

5. In a rig, the combination, with the bull-wheel having a friction-wheel thereon and a pivoted lever in which it is mounted, of an extension, D^4, at one end of said lever, a crank-shaft journaled in the bed-frame and connected with said extension D^4, a strap-brake partially surrounding said friction-wheel and immovably secured at one end and connected at the other to the crank of said shaft, and means for operating said crank-shaft, substantially as set forth.

6. The combination, with the friction-wheel and the strap-brake E, having a series of holes, e, embracing said wheel, of a shaft having a crank in its length, and the clamp E^3, adapted to be secured to said strap-brake in any of the holes e, and having a groove for the passage of said crank between the clamp and the strap-brake, as set forth.

7. The combination, with the derrick and driving-shaft having a crank, of a walking-beam having bifurcated ends with a segment, M^3, mounted in one end, a chain secured to said beam and passing over said segment and through the bifurcation, and a pitman pivoted to said crank and secured to the walking-beam by means of the cap M^3, as set forth.

8. In combination with the driving-shaft having a friction-wheel, a bull-wheel having a friction-wheel and a strap-brake partially surrounding the latter friction-wheel, and a stirrup fixed to one end of said strap-brake, straddling one of the friction-wheels, and pivotally connected to the bed-frame, substantially as set forth.

9. In a well-drilling rig, the combination, with the derrick and the necessary ropes, of a walking-beam and a saddle for pivotally supporting said beam, the saddle consisting of a pair of plates placed upon opposite sides of the beam, having flanges engaging beneath the beam, and trunnions or pivots supported by the derrick, substantially as set forth.

10. In combination with the derrick, a bull-wheel, and a spudding-rope fixed to the bull-wheel and running over pulleys on the derrick, a crank-shaft, a block pivoted on the wrist-pin of the crank, and a flat hook pivoted to said block and engaging with the spudding-rope, substantially as set forth.

11. In a well-drilling rig, the combination, with the derrick, a bull-wheel, and a single continuous spudding-rope fixed to the bull-wheel, so as to be capable of winding thereon, passing over suitable guiding devices, and having the drilling-tool attached thereto, of a crank-shaft and a hook pivotally connected to the wrist-pin of the crank and having the spudding-rope passing through it, the arrangement being such that the rope may be paid out or unwound without disengaging the same from said hook, substantially as set forth.

12. The combination, with the mud-sills A A', the longitudinal sills A^3 A^3, having blocks a and held together by notched sills A^4 A^5, the plates B B', having supports B^2, B^3, B^4, and B^5, cross-ties C C', and sill D, resting on blocks a and supporting the crank-sill C^2 and plates B B', a bull-wheel post, D^3, planted on sill D and braced by bar D^5, and the fixed posts K K', tenoned in sills A^4 and A^5 and having cross-bar K^3, to which and to the plates B B' braces K^2 are secured.

13. The combination, with a shaft having a key-seat and a wheel mounted on said shaft and having a key-seat, of a key for fitting in said seats, consisting of two wedge-shaped pieces whose outer or remote edges are parallel when the pieces are placed together, substantially as set forth.

14. The combination, with a mast or derrick formed in sections and pivoted together, of a transverse block secured to the pivoted section and adapted to strike against the other sections of said mast, whereby it is prevented from passing the perpendicular when being erected.

15. The combination, with the beam M, the derrick, and the sucker-rod, of the brackets Q^4 Q^5, having slots and rollers mounted in said slots at unequal distances from the derrick for guiding the sucker-rod in a vertical plane, as set forth.

16. The combination, with the beam M, mounted in blocks M', the derrick, and the sucker-rod connected to said beam, of the block M^7, located above the blocks M', substantially as and for the purposes set forth.

17. The combination, with the post D' and the truss D^4, of the lever D^6, pivoted to the truss D^4, and bull-wheel journaled at its respective ends in said lever and post, of a friction-drum on one and a flexible brake on the other side of said bull-wheel, the said brake being connected with the end of said lever, whereby when said lever is operated in one direction it will push the brake away from the bull-wheel and force the latter in contact with the friction-drum, and when operated in the other direction will cause the bull-wheel and brake to move toward each other, substantially as set forth.

18. In a rig, the combination, with the mast or derrick and the pumps having a sucker-rod, of brackets secured to said mast and pulleys journaled to said brackets and bearing upon opposite sides of said sucker-rod, as set forth.

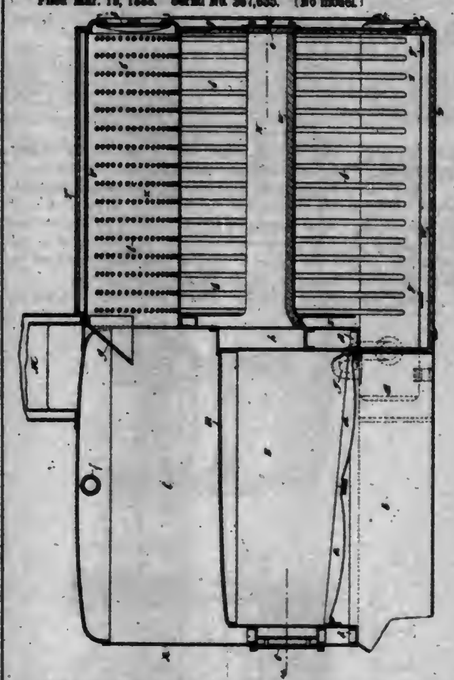
19. In a rig, the combination, with the mast and the beam M, having a bifurcated end mounted thereon, and a pump having a sucker-rod, of a clamp secured to said sucker-rod and having a bifurcation, and the rod R, passing through the bifurcation of said beam and clamps and having the T-head at each end, substantially as and for the purposes set forth.

20. In a rig, the combination, with the mast and a pump having a sucker-rod, of the brackets Q^4 Q^5, secured to said mast, having bifurcated ends through which said sucker-rod passes, and grooved pulleys journaled in said brackets upon opposite sides of the said rod, as set forth.

21. In a rig, the combination, with the mast, a walking-beam journaled thereon, and a pump having a sucker-rod, of guides for restricting said rod to a vertical movement and a clamp adjustably secured to said rod and pivotally connected to said beam, substantially as set forth.

22. In a rig for drilling and pumping wells, the combination, with the frame, a walking-beam having a bifurcated end, and the means for imparting to said beam an oscillatory motion, of a segment mounted perpendicularly in said bifurcation at a distance from the end of the beam, whereby the sucker-rod of the pump may be attached to said end, or a rope or chain may be secured to the beam and passed over the curved surface of said segment for suspending the tools, substantially as set forth.

396,545. STEAM-BOILER. WILLIAM COWLES, Brooklyn, N. Y. Filed Mar. 19, 1888. Serial No. 267,635. (No model.)



Claim.—1. In a steam-boiler, the combination, with horizontal water and steam drums and vertical or substantially vertical circulating-tubes connecting said drums, of the shell A, communicating with said drums and forming with the steam-drum a steam-chamber, C, substantially as described.

2. In a steam-boiler, the combination, with horizontal water and steam drums, of vertical or substantially vertical circulating-tubes connecting said drums and located in rows, with space between adjacent rows for the removal and insertion of any one tube without disturbing any of the others, and the shell A, communicating with said drums and forming with the steam-drum a steam-chamber, C, substantially as described.

3. In a steam-boiler, the combination, with horizontal water and steam drums and vertical or substantially vertical circulating-tubes connecting said drums, of the shell A, communicating directly with said steam-drum and forming a steam-chamber, C, and with said water drum or drums by a water leg or legs, substantially as described.

4. In a steam-boiler, the combination, with horizontal water and steam drums, of vertical or substantially vertical circulating-tubes connecting said drums and located in rows, with space between adjacent rows for the removal and insertion of any one tube without disturbing any of the others, the shell A, communicating directly with said steam-drum and forming a steam-chamber, C, and communicating also with said water drum or drums by a water leg or legs, substantially as described.

5. The combination, with the steam-drum F and the steam-chamber C, of the baffle-plate *y*, for directing the steam and water downward from the mouth of the steam-drum, substantially as described.

6. The combination, with the water drum or drums and the vertical or substantially vertical circulating-tubes G, of the baffle plate or plates *n*, for arresting the sediment in the water drum or drums, substantially as described.

7. The combination, with the horizontal steam and water drums and the vertical or substantially vertical circulating-tubes G, of the shell A, the water leg or legs, and the feed-water pipe or pipes *l*, entering said water leg or legs, substantially as described.

8. The combination, with the horizontal water and steam drums and the vertical or substantially vertical circulating-tubes, of the casing D, inclosing the same, and the horizontal deflector H, substantially as described.

9. The combination, with the horizontal water and steam drums and the vertical or substantially vertical circulating-tubes, of the casing D, inclosing the same, and the vertical deflector I, substantially as described.

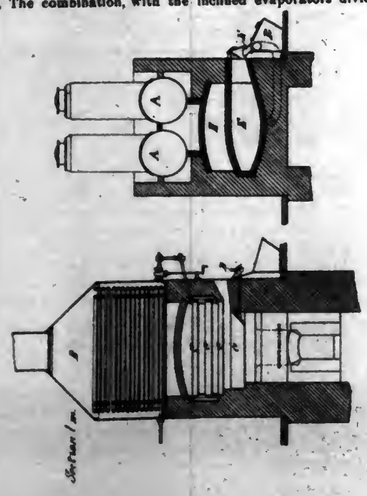
10. The combination, with the horizontal water and steam drums and the vertical or substantially vertical circulating-tubes, of the casing D, inclosing the same, the horizontal deflector H, and the vertical deflector I, substantially as described.

11. The combination, with the water drum or drums and the vertical or substantially vertical circulating-tubes G, of the baffle plate or plates *n*, for arresting the sediment in the water drum or drums, and the blow-off pipe or pipes, substantially as described.

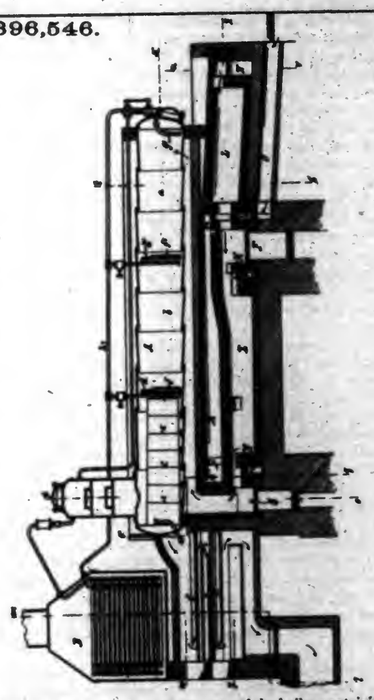
396,546. RECOVERING SODA. CARL F. DAHL, Dantzic, Prussia, Germany. Filed Apr. 16, 1887. Serial No. 235,131. (No model.)

Claim.—1. In an apparatus for inspissating lyes used in the manufacture of cellulose, the combination, with inclined evaporators divided by partitions into several compartments, of a boiler, a worm contained therein, and a connection between said worm and the dome of the evaporator, whereby the worm is supplied with vapor produced by the action of the evaporator, substantially as described.

2. The combination, with the inclined evaporators divided by



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partitions into several compartments, of the boiler containing a worm connected to the dome of the evaporator, and the flat open pans arranged below the evaporators, and one beneath the next preceding one, substantially as described.

3. The combination, with the melting-furnace L and the inspissating-vat E, of the kettle A, boiler B, and evaporating-pans C, said parts being so arranged that the heat from one part serves to heat the succeeding part, suitable fire-places or heaters, N P G, and a receiver, K, communicating with one of said fire-places, substantially as described.

396,547. FOUNTAIN-PEN. SAMUEL A. DE NORMANVILLE, Kensington, County of Middlesex, England. Filed Dec. 20, 1887. Serial No. 258,523. (No model.)



Claim.—1. In a fountain-pen, the combination, with the ink-reservoir, of a writing-nib composed of two substantially half-tubular sections joined edge to edge and fitted in a reservoir, the outer ends of both sections projecting the same distance from the reservoir and being tapered to equal degree, so as to meet and form a point, substantially as described.

2. In a fountain-pen, a writing-nib consisting of two half-tubes of equal length and size, both tapering at one end to equal degree and fitted together edge to edge throughout their entire lengths, substantially as described.

3. In a fountain-pen, the combination, with a reservoir in the handle of the pen and a supplementary reservoir, K, fitted to said handle, of a tubular cap, L, closing the end of said reservoir, and a writing-point passing through a hole in the end of said cap, substantially as described.

4. In a fountain-pen, the combination, with reservoir B, supplementary reservoir K, and cap L, closing the end of said reservoir K, of tubular writing-nib D, projecting through said reservoir K, and having an opening, H, within said cap, substantially as described.

5. In a fountain-pen, the combination, with elastic reservoir B and casing A, inclosing said reservoir and having hole A′, of ink-supply tube C and writing-point D, all constructed and arranged substantially as described.

6. In a fountain-pen, the combination, with reservoir B, supply-tube C, and writing-point D, communicating with said reservoir and having slot H, of supplementary reservoir K, having port P, and cap L, embracing said writing-point and closing the end of reservoir K, substantially as described.

396,548. SASH-FASTENER. CHARLES H. DEXTER, Annapolis, Md. Filed July 6, 1888. Serial No. 279,196. (No model.)



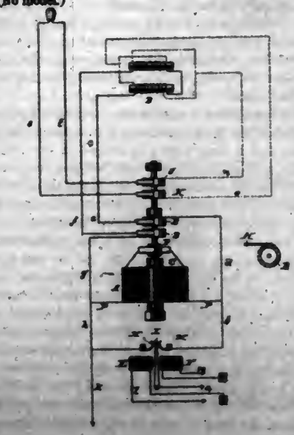
Claim.—1. The combination of the spring-actuated bolt E, having collar *e*, and the gravitating locking-plate D, substantially as described.

2. The keeper-socket F, formed with a flared entrance, a roller-bearing concave surface, a groove, and a screw-shank, in combination with the spring-actuated bolt B and its roller e^2, and the gravitating locking-plate D, substantially as and for the purpose described.

3. The gravitating locking-plate D, having the angular flanges, thumb-button *d*, having shank *d′*, and the plate C, provided with an inclined surface, c^3, and slot c^2, substantially as and for the purpose described.

4. The combination of the spring-actuated bolt having a locking-collar and a roller, the gravitating locking-plate, and a keeper-socket, substantially as and for the purpose described.

396,549. SYSTEM OF ELECTRICAL DISTRIBUTION. EDWARD N. DICKERSON, Jr., New York, N. Y. Filed Nov. 7, 1887. Serial No. 254,565. (No model.)



Claim.—1. The system of electrical conversion herein described, which consists in causing a direct current to flow upon the line-wire in locally reversing the same by a reverser independent of the generator, the said reverser being driven by the electricity generated in the main generator, in causing the said reversed current to flow through a converter, thereby producing a series of secondary reversing currents, and in rectifying said currents through a second reversing-commutator moving synchronously with the first commutator, substantially as described.

2. The system of electrical conversion herein described, which consists in causing a direct current to flow upon a main circuit and through a current-reverser in reversing a subordinate circuit supplied from the main circuit, in converting the said reversing-circuit into a circuit of different tension by means of a converter, and in again straightening said converted circuit by a reversing-commutator moving synchronously with the commutator which reverses the primary circuit, substantially as described.

396,550. PIPE-COUPLING. JOHN P. DILL and SAMUEL A. ROTE, Ridgway, Pa. Filed Aug. 6, 1888. Serial No. 282,114. (No model.)

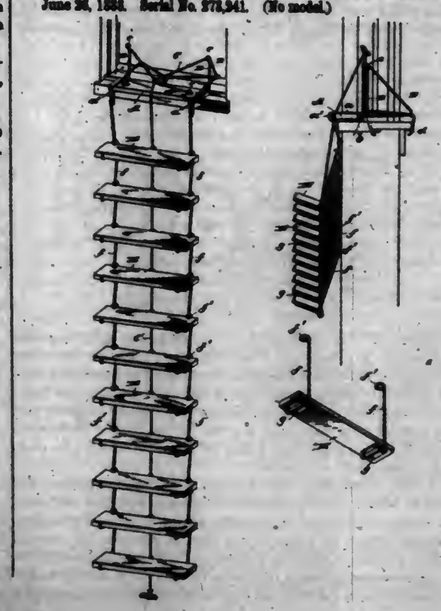


Claim.—The combination of the pipes A, having the threaded portions at their meeting ends and having the shoulders *a*, the collars C, secured to said pipes, the interiorly-threaded sleeves or nuts E, engaging the threaded portions of the pipes and having the shoulders *b* at their inner ends, for the purpose set forth, one of said sleeves or nuts engaging both pipes and serving to couple the same, and the other nut being jammed against the coupling-nut, and the coiled extensile springs arranged on the pipes and bearing between the collars C and the sleeves or nuts, substantially as described.

396,551. PROCESS OF BLEACHING COTTON. FREDERICK R. DROWN, Pawtucket, R. I. Filed May 2, 1888. Serial No. 272,506. (No specimens.)

Claim.—The improvement in the art of bleaching, consisting in passing cotton fabric spread out wide through a boiling solution of caustic soda, then subjecting it to the action of steam by passing it over perforated steam-pipe, then cooling it by passing it into a cold solution of caustic soda, then boiling in a solution of soda-ash and washing, then subjecting the material to the action of chlorine liquor, then steaming, souring, and finally washing, substantially as set forth.

396,552. FIRE-ESCAPE. CHARLES RESSEY, Ryota, Minn. Filed June 26, 1888. Serial No. 278,241. (No model.)



Claim.—1. The combination, in a folding ladder, of the steps E E, having bars *f* pivotally secured to the under side thereof, the upper ends of said bars being formed into eyes which encircle corresponding bars attached to the step immediately above, substantially as shown, and for the purpose set forth.

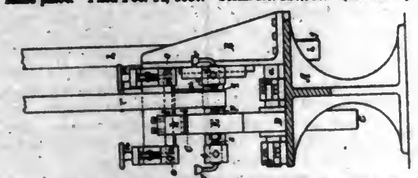
2. In a fire-escape or folding ladder, the combination of the step A, pivotally attached by means of loops *a* to a frame made up of bars B and D, which are bent substantially as shown, and provided with hooks *d d*, and a ladder constructed substantially as shown, adapted to be suspended therefrom, the parts being organized substantially as shown, and for the purpose set forth.

3. In a ladder, the steps E, provided with bars *f*, the lower ends of which are pivoted to the steps, their upper ends being formed into eyes which slide upon the bars attached to the adjacent step, and a cord, C, passing through eyes projecting from the rear edges of the steps and connected to a supporting-frame having upwardly-projecting arms, substantially as shown, and for the purpose set forth.

4. The combination, with a flexible ladder, of a step, A, provided with loops *a*, having eyes *a'* and *b* formed on opposite sides thereof, a central eye, *c*, and bar B, having ends formed into eyes *c c*, loop *c'*, passing through the eyes *b b*, hooks *d d*, and members extending from the upper portion of said hooks to the eye *c*, and brace-rods D D, extending from the upper portion of the hooks to the eyes *c c*, the parts being organized substantially as shown, and for the purpose set forth.

396,553. MACHINERY FOR GRINDING METALLIC BANDS.

JOHN L. FOWLE, Woburn, Mass., assignor to Walter Franklin Fowle same place. Filed Feb. 14, 1887. Serial No. 227,596. (No model.)



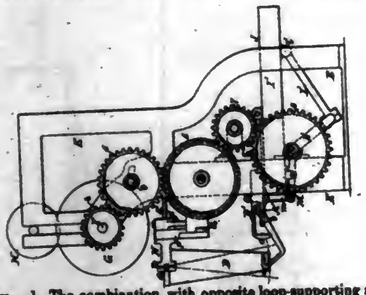
Claim.—1. The standard B on the frame A with extended arms and having adjustable boxes *m* attached thereto, in combination with the loose shaft *l*, having a longitudinal and transverse adjustment and supporting the rest *i*, as and for the purpose set forth.

2. The combination of the grinding-wheels E E', situated relatively to each other, as described, the rest *i* in an adjustable block, *k*, supported on the shaft *l*, with longitudinal and transverse adjustments in the boxes *m m*, as and for the purpose described.

396,554. WARP-LINKING MACHINE.

RICHARD GARNED, JOSHUA GARNED, and WILLIAM MASON, Philadelphia, Pa. Filed Apr. 11, 1887. Serial No. 234,383. (No model.)

Brief.—The object of the invention is to form by machinery a double-linked warp, and the invention is an improvement upon the machine shown in Letters Patent No. 25,501, dated September 20, 1859.



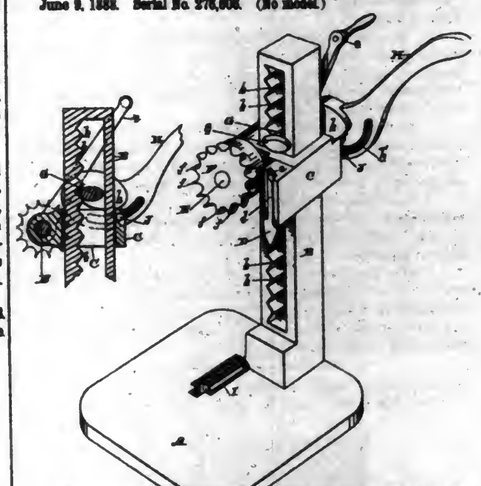
Claim.—1. The combination, with opposite loop-supporting arms and means for looping a warp around first one arm and then the other, of a reciprocating finger co-operating with each of said arms, provided with a hook for engaging the loops as laid upon the arm and drawing the same rearwardly thereon, and with a projection for lifting said loops and throwing them over the end of the arm in the forward movement of the finger, and means for actuating said fingers alternately, substantially as described.

2. The combination, with opposite loop-supporting arms and means for looping a warp around first one arm and then the other, of a reciprocating finger co-operating with each of said arms, provided with a hook for engaging the loops as laid upon the arm and drawing the same rearwardly thereon, and with a projection for lifting said loops and throwing them over the end of the arm in the forward movement of the finger, and means for reciprocating said fingers alternately and raising the free ends thereof after engagement of the throwing-off projections with the loops, all substantially as set forth.

3. The combination of the loop-supporting arm A, a reciprocating slide, a linking-finger pivoted thereto, a pin, *m*, acting on said finger, and means for reciprocating said pin, all substantially as and for the purpose described.

396,555. CAN-OPENER.

THOMAS H. GILHAM, Cortez, Nev. Filed June 9, 1888. Serial No. 276,606. (No model.)



Claim.—1. In a can-opener, the combination of a fixed knife, against which the can is forced, a rotary gripping-disk located to one side of said knife for turning the can, and means for rotating said disk, substantially as herein described.

2. In a can-opener, the combination of a fixed knife for penetrating the can, and against which said can is forced, a rotary disk to one side of said knife, provided with teeth for piercing the can and turning it, and means for imparting rotary motion to said disk.

3. In a can-opener, a fixed standard and a carrying-head mounted thereon so as to move up and down, in combination with a rotary gripping-disk carried by said head for engaging and turning the can, and a fixed knife, also carried by the head, and against which the can is forced, substantially as herein described.

4. In a can-opener, a fixed standard and a vertically-movable carrying-head thereon, in combination with a crank-shaft carried by the head, a gripping or piercing disk on and operated by the crank-shaft for engaging and turning the can, and a fixed knife, also carried by the head, and against which the can is forced, substantially as herein described.

5. In a can-opener, a base-plate having a standard and a vertically-movable carrying-head on said standard, in combination with a crank-shaft in the head, having a gripping or piercing disk for turning the can, a fixed knife carried by the head and against which the can is forced, and a roller in the base-plate and upon which the can rests, substantially as herein described.

6. In a can-opener, a fixed standard and a vertically-movable carrying-head thereon, in combination with a rotary gripping-disk and fixed knife on the head, and a cam-lever on the standard bearing upon the head for forcing its disk and knife into the can, substantially as herein described.

7. In a can-opener, a fixed slotted standard having notches in its slot, a movable pin passing through the slot and adapted to engage the notches, and a lever with a cam-head on the end of the pin, in combination with a vertically-movable carrying-head on the standard, upon which the cam-head of the lever bears, a crank-shaft with gripping or piercing disk carried by the head, and a fixed knife, also carried by the head, substantially as herein described.

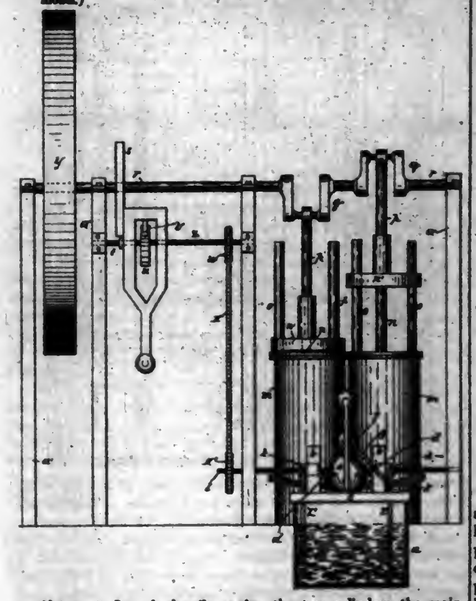
8. A can-opener consisting of a base-plate having a slotted notched standard and a roller for the can to rest upon, a movable carrying-head on the standard, having a crank-shaft with a gripping or piercing disk and a fixed knife on said head, a movable pin in the slotted standard adapted to engage its notches, and a lever with a cam-head on the end of the pin, said lever being adapted to bear down upon the carrying-head and to force its gripping or piercing disk and its knife into the can, substantially as herein described.

9. In a can-opener, a fixed standard and a vertically-movable carrying-head thereon, in combination with a rotary gripping-disk and fixed knife on the head, a lever on the standard, having a cam-head

bearing on the carrying-head and provided with a groove, and a fixed pin projecting from the carrying-head and playing on the groove of the cam-head, substantially as herein described.

396,556. HYDRAULIC ENGINE.

HENRY G. T. GLASSBROOK, Westhouse, Ontario, Canada. Filed Oct. 4, 1886. Serial No. 215,314. (No model.)

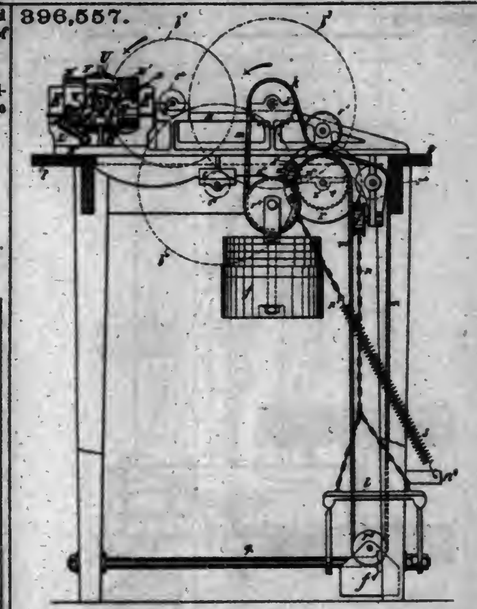


Claim.—1. In a hydraulic engine, the two cylinders, the main shafts actuated by two pistons fitting in said cylinders, the inlet-pipes, outlet-pipes, and blocks in which said inlet and outlet pipes are fitted, in combination with the regulating-shaft fitted into said blocks as bearings, and pierced at its intersections with said blocks, so that the apertures opening into the inlet-pipe of one cylinder and the outlet-pipe of the other cylinder are parallel and at right angles to the outlet-pipe of the former cylinder and the inlet-pipe of the latter cylinder, the gear-wheel mounted upon said regulating-shaft, a second gear-wheel gearing with said wheel, a shaft upon which said second wheel is mounted and carrying a swinging weighted frame bearing a pawl and a ratchet-wheel engaging with said pawl, and an arm rigidly mounted upon said main shaft and engaging with said weighted frame at intervals, substantially as described.

2. In a hydraulic engine, the two cylinders, the main shaft actuated by two pistons fitting in said cylinders, the inlet-pipes, outlet-pipes, blocks in which said inlet and outlet pipes are fitted, and a regulator in the path of said inlet-pipes, in combination with the regulating-shaft fitted into said blocks as bearings, and pierced at its intersections with said blocks, so that the apertures opening into the inlet-pipe of one cylinder and the outlet-pipe of the other cylinder are parallel and at right angles to the outlet-pipe of the former cylinder and the inlet-pipe of the latter cylinder, the gear-wheel mounted upon said regulating-shaft, a second gear-wheel gearing with said wheel, a shaft upon which said second wheel is mounted and carrying a swinging weighted frame bearing a pawl and a ratchet-wheel engaging with said pawl, and an arm rigidly mounted upon said main shaft and engaging with said weighted frame at intervals, substantially as described.

396,557. DYNAMO FOR TELEGRAPHIC PURPOSES.

REINHOLD GUHR, Schiers, and OTTO PLATE, Niederurnen, Switzerland, assignors of one-half to Bronislav Dutenberg, Travalt, Bosnia, and Joseph Guhr, Schiers, Switzerland. Filed June 9, 1888. Serial No. 276,564. (No model.)



Claim.—1. A weight-motor consisting of a train of gearing containing a chain-wheel, *k*, an endless chain, *m*, having two loops, one of said loops engaging the wheel *k*, a weight, *f*, carrying a roller, r^4, that is placed in one of the loops of the chain *m*, and chain-wheel *k'*, for the chain *m*, ratchet s^3, rigid with said wheel *k'*, and pulley *r*, having a pawl, s^2, to engage the ratchet-wheel s^3, and a treadle, *l*, connected by a chain, *n*, to the pulley *r*, combined with a dynamo-electric machine provided with a field-magnet made of a metallic conductor for retaining magnetism, said field-magnet being wound with shunt-coils of high resistance and magnetized with small current-power, whereby the dynamo will give quick and certain currents with the speed obtained from said weight-motor, substantially as described.

3. A weight-motor consisting of a train of gearing containing a chain-wheel, *k*, an endless chain, *m*, having two loops, one of said loops engaging the wheel *k*, a weight, *f*, carrying a roller, r^4, that is placed in one of the loops of the chain *m*, and chain-wheel *k'*, for the chain *m*, ratchet s^3, rigid with said wheel *k'*, and pulley *r*, having a pawl, s^2, to engage the ratchet-wheel s^3, and a treadle, *l*, connected by a chain, *n*, to the pulley *r*, combined with a dynamo-electric machine having a field-magnet consisting of a cast-iron bed-plate, two iron cores secured to said bed-plate, said cores being wound with shunt-coils of high resistance that are magnetized with small current-power, all arranged and operating substantially as herein shown and described.

4. A weight-motor consisting of a train of gearing containing a chain-wheel, *k*, an endless chain, *m*, having two loops, one of said loops engaging the wheel *k*, a weight, *f*, carrying a roller, r^4, that is placed in one of the loops of the chain *m*, and chain-wheel *k'*, for the chain *m*, ratchet s^3, rigid with said wheel *k'*, and pulley *r*, having a pawl, s^2, to engage the ratchet-wheel s^3, and a treadle, *l*, connected by a chain, *n*, to the pulley *r*, combined with a dynamo-electric machine having a field-magnet that is wound with shunt-coils of about one-third to one-fifteenth as much resistance as that of the respective outside circuit, substantially as herein shown and described.

5. In a dynamo-machine, the cores E, having shunt-coils E' E', combined with the switch U, having contact-pieces 1, 2, 3, and 4, that are connected to the shunt-coils and brushes, as described, and with the cross-switch F, that is adapted to engage two or more of the contact-pieces 1 2 3 4 at a time, whereby the field-magnet may be switched into series or multiple arc, and whereby the coils of the dynamo may be cut off from the outside circuit to protect the dynamo from lightning, substantially as described.

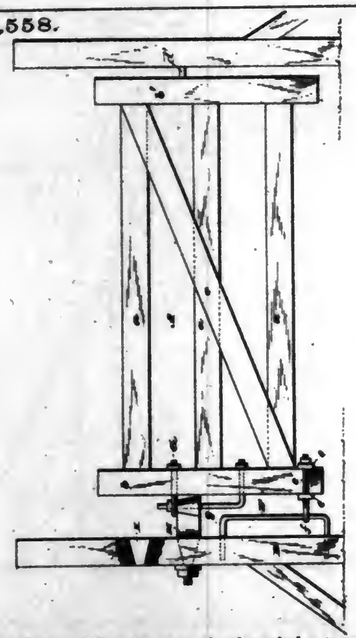
6. In a dynamo or magneto electrical machine for telegraphic or telephonic purposes, the armature-shaft e^6 and the disk E', carried by said shaft, combined with the brake consisting of the bar N', handle L, and elastic tongue N, all arranged substantially as herein shown and described.

396,558. GATE.

ALFRED H. COMPERT, Jamaica, Iowa. Filed Sept. 20, 1888. Serial No. 285,570. (No model.)

Claim.—The combination, in a swinging gate, of a post provided

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with parallel bars F F, having inturned ends, conical or tapered openings I, located above and between the bars F F, an iron, H, adapted to fit within said openings and provided with a screw-threaded portion and nut for wedging the same in position, the end of said iron having a conical opening, the gate-batten A having irons with recesses secured near the lower portion of the batten, an angle-iron, *g*, adapted to pass through the opening in the iron H, and an eyebolt, G, embracing the upper end of said angle-iron, the parts being organized substantially as shown, and for the purpose set forth.

896,559. GRINDING-MILL. FRANK C. HALL, Philadelphia, Pa. Filed May 5, 1888. Serial No. 273,181. (No model.)



Claim.—1. In combination, the runner of a mill having a grinding-surface, a crushing-surface above the grinding-surface, the shell or casing, and a series of crushing-rollers arranged around and bearing upon said crushing-surface.

2. In combination, the revolving runner, the casing O, having the central feed-opening, *i*, and the series of conical crushing-rollers arranged around said opening, the said casings having the bearings for the rollers, substantially as described.

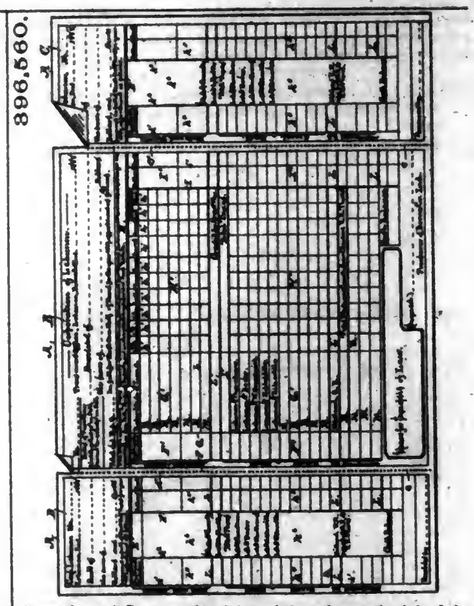
3. In combination with the casing and the runner of a mill having an annular rack upon the upper margin of its grinding-surface and a conical surface above the said rack, a series of conical crushing-rollers having teeth engaging with said rack, and bearings in the casing, substantially as described.

4. In combination, a suitable hopper, a runner arranged beneath the same, having a grinding-surface and a crushing-surface above the grinding-surface, a shell or casing, rollers adapted to bear on said surfaces, and a yielding support for the runner.

896,560. TAX-RECEIPT BLANK. JOHAN S. HARRISON, Lebanon, and JOHN M. HOWARD, Thorntown, Ind. Filed May 14, 1888. Serial No. 273,842. (No model.)

Claim.—1. A combined tax-receipt duplicate coupon and duplicate stub consisting of a single sheet of paper ruled and printed and divided by the perforations *d' d'* into three distinct parts or elements—*i. e.*, the main or central tax-receipt blank, B, having a suitable heading and suitable spaces for a plurality of complete accounts, the coupon

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C, and the stub D, one at the right and the other at the left of the main receipt-blank B, both of which are duplicates in brief of said main receipt and are detachable, substantially as shown and described.

2. The sheet of paper, A, (in one piece,) comprising the ruled and printed tax-receipt B, the duplicate coupon C, and duplicate stub D, and having the perforations extending vertically from the lower to the upper edge of the sheet A midway, or approximately so, between said receipt B and coupon C, and between the receipt B and duplicate stub D, whereby either the coupon or main receipt, or both, may be detached, substantially as described.

3. A combined tax-receipt, coupon, and stub consisting of the single sheet A, separated or divided by vertical perforations *d' d'*, as shown, to form three distinct connected but detachable parts—*i. e.*, the main-receipt blank B, having a suitable heading and ruled or printed to form the vertical columns F' G' H' I', the duplicate coupon C, and duplicate stub D, one at the right and the other at the left end of said sheet A, and each having a heading similar to the heading in the main-receipt blank B, and each being ruled or printed to form the vertical columns L^4 L^5 L^6, which correspond to the columns F' G' I' in the main-receipt blank, all substantially as shown, and for the purpose described.

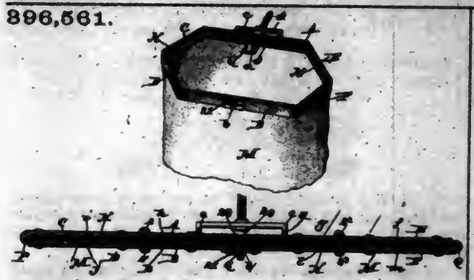
4. The continuous sheet A, ruled and printed to form and combine the three followingly-arranged parts—*i. e.*, the main-receipt blank B, having suitable vertical entry-columns divided horizontally by lines L M, as described, the duplicate coupon C and stub D at the right and left of the main-receipt blank B, having duplicate vertical entry-columns, and having horizontal spaces and horizontal lines to correspond to and in a line with the horizontal spaces and lines in the main blank receipt B, and being detachably divided off from the blank receipt by vertical perforations *d' d'*, substantially as described, and for the purpose set forth.

5. In a tax-receipt, the continuous sheet A, the main-receipt blank B, having the vertical dividing-lines F G H I, to form the number, descriptive, and amount columns F' G' I', and the intermediate recording-columns, H', and having the horizontal lines L M, to divide the entire main-receipt blank B into a given number of parts or spaces, whereby the real tax, gravel-road tax, railroad tax, &c., may be recorded, so as to be independent of each other, and the removable coupon C and stub D, having columns and lines to correspond with the columns and lines in the main receipt B, and each of said parts—*i. e.*, the main receipt B, coupon C, and stub D—having lines and spaces at the lower end on or in which signatures or remarks may be written, substantially as described, and for the purpose set forth.

896,561. BAG-HOLDER. THOMAS W. HARRISON, Emmetsburg, Iowa. Filed May 18, 1887. Serial No. 238,711. (No model.)

Claim.—1. The herein shown and described frame for a bag or sack, composed of two side sections, A and B, the folding end sections, C and D, uniting the side sections at one end, and the folding end sections, E and F, uniting the side sections at their other end, substantially as set forth.

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2. The herein shown and described frame for a bag or sack, composed of the side sections, A and B, and their folding end sections, C D and E F, the joints P and Q of the end sections projecting inward, and the joints *a*, *a'*, a^2, and a^3 between the end and the side sections projecting outward, substantially as and for the purpose described.

3. The combination, with the frame composed of a series of sections hinged together, one section having an oblong opening, of the rotatable lock-bolt having an oblong head and secured to a corresponding opposite section of the frame and adapted to have its head thrust through and set crosswise of the said opening, and the spring for engaging with the said head, substantially as and for the purpose described.

4. The combination, with the frame composed of a number of sections hinged together, one section having an oblong opening, of the lock-bolt having an oblong head and a groove, 28, the pin 20, for securing the lock-bolt to a section of the frame and permitting a partial rotary movement of the said bolt, and the spring 21 to prevent the back movement of the said bolt, substantially as and for the purpose described.

5. The combination, with the frame, of the holder secured to the side of the frame by rule hinge-joints and adapted to hold the frame in a horizontal position and to fold upward, substantially as and for the purpose described.

6. The combination, with the frame and the holder or bail C, angular in cross-section, of the bracket-support having its head provided with the depression *v*, which corresponds to the holder in cross-section, substantially as and for the purpose described.

7. A combined frame and holder for sacks, composed of a series of sections hinged together, one of the sections having lugs *d* and *e*, and the holder hinged by a rule-joint to the said lugs, substantially as and for the purpose described.

8. The combination, with the frame composed of a series of sections hinged together, the hinge-joints projecting beyond the opposing sides of the sections, of the bag secured to the frame and the packing-strips secured to the opposing sides of the frame, substantially as and for the purpose described.

896,562. DRIER. ANDREW J. HATCH, San Francisco, Cal. Filed Apr. 2, 1888. Serial No. 269,338. (No model.)

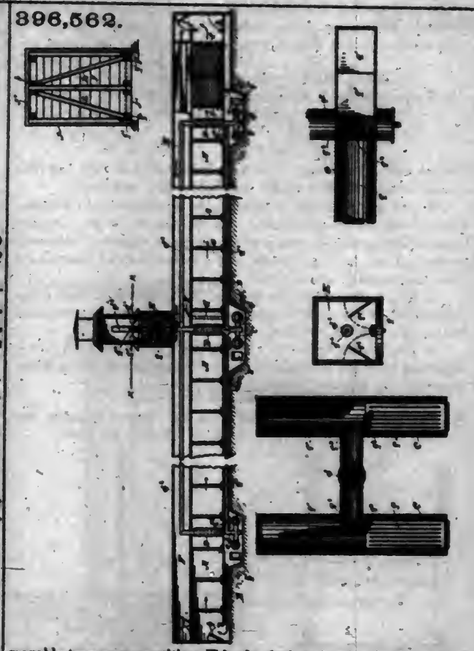
Claim.—1. In a drier, the combination of a drying-chamber having valve-controlled openings at each end for the passage of the air into either end of the chamber, a conduit or air-passage on the top of said chamber parallel therewith and extending its full length, valve-controlled apertures connecting the ends of the drying-chamber with the ends of the conduit or air-passage, and an exhaust passage or aperture in the conduit or air-passage, whereby the course of the air in the drying-chamber may be reversed in direction by manipulating the valves, substantially as herein described.

2. In a drier, a drying-chamber having valve-controlled openings at each end for the passage of the air, and an air passage or conduit above connected at each end with the ends of the drying-chamber by gate-controlled apertures, in combination with a tower or vertical passage communicating with the air passage or conduit, a suction-fan in the side of said passage for creating an artificial draft, the gates *c'*, for closing the tower or passage above the fan, and the gates c^2, for shutting off the fan when the natural draft is desired, substantially as herein described.

3. In a drier, a drying-chamber having valve-controlled end openings for the passage of the air, the air passage or conduit on top of said chamber and communicating at each end by gate-controlled apertures with the ends of the drying-chamber, and the single exhaust-tower connected with the air-conduit above, in combination with a vertical partition dividing the drying-chamber into two parts, and the gate-controlled aperture in the top of the drying-chamber and communicating with the air-conduit above, whereby but half of the drying-chamber may be utilized, substantially as herein described.

4. In a drier having a drying-chamber, the cars I therein having compartments divided by air-tight partitions, in combination with removable transverse partitions H in the drying-chamber having openings communicating with one of the compartments of the cars, substantially as herein described.

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5. In a drier having a drying-chamber, the cars I therein having compartments separated by air-tight partitions, in combination with the removable transverse partitions H in the drying-chamber having openings in alignment with one of the compartments of the car, and casings *K'*, surrounding said openings and joining with the partitions of the car, whereby a practically air-tight continuous flue is formed in the main drying-chamber and of reduced capacity, substantially as herein described.

6. In a drier having a chamber and open-sided cars adapted to move in and out, the means for closing the open sides of the cars as they are moving in and out, consisting of curtains attached to the chamber-frame and to the front of the car and covering its sides as it is drawn out, substantially as herein described.

7. In a drier having a drying-chamber with openings, and open-sided cars moving in and out of said openings, the means for closing the open sides of the car as they are moving, consisting of rollers mounted within the drying-chamber, and curtains attached to said rollers and to the front end of the cars, whereby they cover their open sides as they are drawn out, substantially as herein described.

8. In a drier, the drying-chamber having door-frames and the open-sided cars passing through the door-frames into and out of the chamber, in combination with the spring-rollers mounted within the door-frames and on each side thereof, and the curtains attached to the rollers and to the front end of the cars, substantially as herein described.

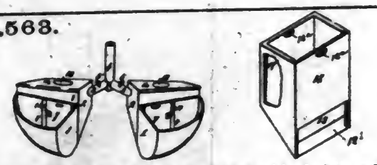
9. In a drier, the furnaces or heaters having the transverse partition c^3 forward of the outlet, in combination with the sliding longitudinal partition *c'*, made of independent and separately-movable sections, whereby a route is formed for the passage of the products of combustion, more or less direct, substantially as herein described.

10. In a drier, the drying-chamber, the heating-chamber below, the furnaces or heaters within the heating-chamber, and the radiators within the drying-chamber, in combination with the means for varying the radiation from the furnaces or radiators, respectively, consisting of the transverse partition c^3 in the furnaces forward of the outlet, and the sliding longitudinal partition or partitions movable to and from the transverse partition, whereby the course of the products of combustion is made more or less direct, substantially as herein described.

896,563. FEED-TROUGH. WILLIAM HAWKINS, St. Louis, Mo. Filed Feb. 16, 1888. Serial No. 264,196. (No model.)

Claim.—1. In a device for feeding animals, the combination, with a feed bin and box communicating therewith, of a removable close receptacle, 12, fitting the box and having a shutter whereby it may be

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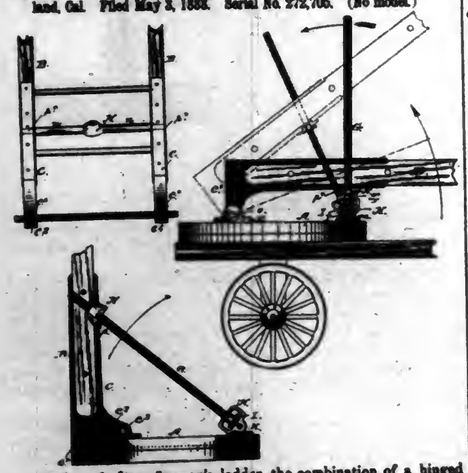
filled at a distant point, conveyed to and inserted in the box, and then opened to allow the flow of the material, as fully explained.

2. In a feeding device for animals, the combination of a feed-bin, a provisional feed-box connected with one side of the bin, a shutter located between the bin and provisional box, a mash-box within the provisional box, having an outlet, and a shutter located between the boxes, substantially as described.

3. In a feeding device for animals, the combination, with a provisional box, of the removable mash-box fitting within the provisional box, substantially as described.

4. In a feeding device for animals, the combination of a provisional feed-box and a removable mash-box fitting therein, having downwardly-flaring chamber, substantially as described.

896,564. FIRE EXTENSION-LADDER. HENRY T. HAYES, Oakland, Cal. Filed May 3, 1888. Serial No. 272,705. (No model.)

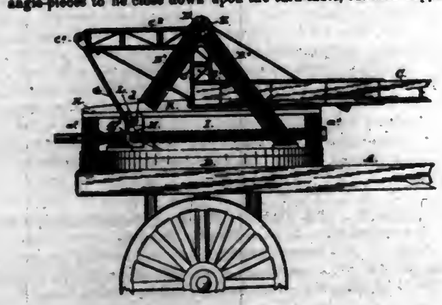


Claim.—1. In a fireman's ladder, the combination of a hinged ladder having its hinge or pivot located at one side of the ends or feet of the side bars and a lifting mechanism consisting of the screw-shaft capable of movement in a vertical arc, the swiveled nut located in the center of the ladder or midway between the side bars and the power-shaft, constructed and arranged for operation substantially as set forth.

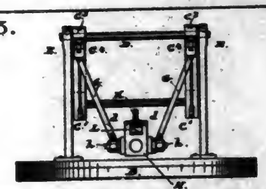
2. In combination, the fire-ladder mounted on a turn-table, the centrally-placed lifting-screw, swiveled nut, and transverse power-shaft geared into said screw and adapted to apply power to the same from either side.

896,565. FIRE EXTENSION-LADDER. HENRY T. HAYES, Oakland, Cal. Filed June 25, 1888. Serial No. 277,940. (No model.)

Claim.—1. In combination with a fire-ladder of the hinged or pivoted kind, the angle-pieces on the foot of the ladder, having the pivot D at the angle, and the ladder-beams secured at one end of the angle-pieces to lie close down upon the turn-table, suitable supports



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on the turn-table adapted to support the pivot above the turn-table, and lifting mechanism consisting, essentially, of the screw I and traveling nut H and connecting-links G G, substantially as hereinbefore described.

2. In an extension-ladder which is mounted for use on a truck, substantially as described, the combination of the supports for the pivot D, the angle-pieces composed of the parts C', adapted to be secured to the foot of the ladder and having the pivot D at the end, and the arms C^3, extending forward and on the opposite side of the pivot and attached at their outer ends to a lifting mechanism, as a screw and traveling nut, arranged for operation as set forth.

3. In an extension-ladder of the hinged or pivoted kind, the lifting mechanism consisting of the screw I, the traveling nut H, having the recess and friction-roller L, and the guide-rail K, arranged for operation substantially as set forth.

896,566. DENTAL ARTICULATOR. RICHMOND S. HAYES, East Bloomfield, N. Y. Filed Sept. 10, 1888. Serial No. 285,018. (No model.)



Claim.—1. The combination, with a dental articulator having holding-frames one above the other, the upper frame having a bar at its rear end of a length to correspond with the average distance from one condyle to the other, provided with projections on its front and rear sides at right angles thereto, the front projection being longer than the rear one, and the two forming ear-shaped cavities, of arms connected with the lower holding-frame having outwardly-extending processes working in said cavities, the bar of the upper holder being yieldingly secured to the lower holder and adapted to be tilted or rocked from side to side upon said processes, as set forth.

2. The combination, with holders adjustable one upon the other, having straight bars extending laterally across their rear ends, of a spring adjustment uniting said bars at their center, the upper bar having near its ends front and rear projections, forming ear-shaped cavities, and the ends of the lower bar forming condyles working in said cavities, adapting the upper holder to be tilted or rocked from side to side, as set forth.

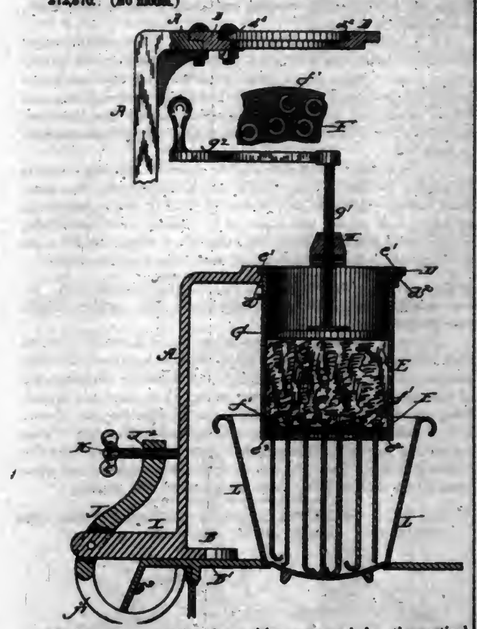
3. The combination, with holders one of which is adjustably held over and at a parallel distance above the other, with straight bars extending laterally across their rear ends, of a spring-hook secured to the center of the lower bar, having its shank extending through the upper bar, with a spring thereon, and a socket-nut yieldingly holding said spring down upon the upper bar, as set forth.

4. The combination, with holders one above the other, of a post in the lower holder, a re-enforced sleeve on said post having curved arms extending outward and backward, the ends of the arms united by a lateral bar having condyles on its ends, and an adjusting-screw in the re-enforced portion of the sleeve, the upper holder having a bar with cavities near its ends adapted to work over said condyles and yieldingly secured to the lower bar at its center, as set forth.

5. The combination, with adjustable holders one over the other, having lateral bars at their rear ends yieldingly secured together at their center, of front and rear projections near the ends of the upper bar forming an ear-shaped cavity, the rear projections having adjusting-screws extending into the cavities, and condyles on the lower bar working in said cavities, as set forth.

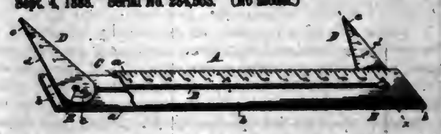
6. The combination, with holders one above the other, yieldingly secured together by bars at their rear ends, of a tongue extending forward from the upper bar, having its edges recessed downward and outward from the top to a lateral flange beneath, the tongue having a set-screw therein and collar on the screw, and a beveled slotted tongue on the upper holder resting on said flange and extending above its tongue under the collar, adapted to be adjusted back and forth and to be held in place by the said screw, as set forth.

896,567. MACHINE FOR MAKING MACARONI AND NOODLES. CHRISTIAN HELD, Indianapolis, Ind. Filed Apr. 30, 1888. Serial No. 272,370. (No model.)



Claim.—In a machine for making macaroni, &c., the vertical standard A, having the outwardly-projected upper end, the horizontally-extended base B, and the rearwardly-projected bar I at the lower end, the ring D, removably secured to the upper end of the standard A, the cylinder E, (or receptacle,) having mechanism for forming macaroni or noodles, removably secured to the ring D, and the clamp J, pivoted to the bar I of the standard and having two upwardly-curved fingers at its forward end remote from each other, adapted to encircle the rim of the stove and press against the under side of the stove-top, and the adjusting-screw K, extended through the upper end of the clamp and pressing against the standard to force the bifurcated or fingered end of the clamp closely in contact with the stove-top, substantially as shown, and for the purpose set forth.

896,568. DRAFTING-RULER. WILLIAM F. HELLER, Washington, D. C., assignor of one-half to Thomas A. Mitchell, same place. Filed Sept. 4, 1888. Serial No. 284,503. (No model.)



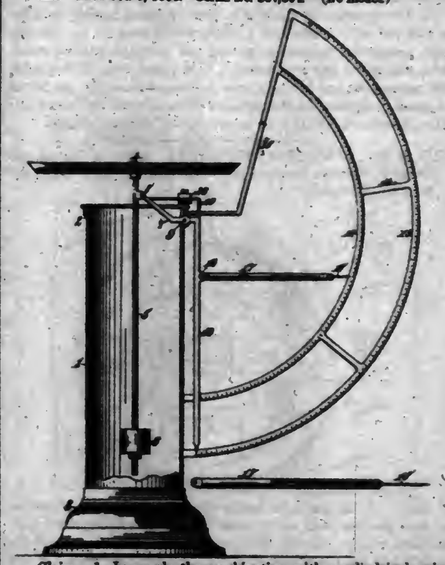
Claim.—1. The combination, with a drafting-ruler having a scaled bar, of reversible and adjustable graduated arms thereon having their inner edges straight and at an obtuse angle extending outward from the bar and their outer edges at a right angle to the edge of the bar, as set forth.

2. The combination, with a scaled bar having pockets in its edge and slots in its sides, of scaled arms pivoted in said slots and adapted to be folded into the pockets or opened to form an obtuse angle at their inner edges and a right angle at their outer edges with the edge of the bar, as set forth.

3. The combination, with a scaled bar composed of two sections having slots in their sides united together with spacing-strips between their ends and center, forming pockets therein, of scaled arms pivoted in said slots and adapted to be folded into the pockets or opened so their inner edges will form obtuse angles and their outer edges right angles with the edge of the bar, as set forth.

4. The combination, with a scaled bar composed of two sections having slots in their sides extending from near one end to the other, said sections being united with spacing-strips between them at their ends and center, forming pockets therein, of triangular-shaped scaled arms having holding-lips on their outer edges near their ends pivoted and adjustable in said slots and adapted to be folded into the pockets or to be opened, so their inner edges will form obtuse angles with the edges of the bar, as set forth.

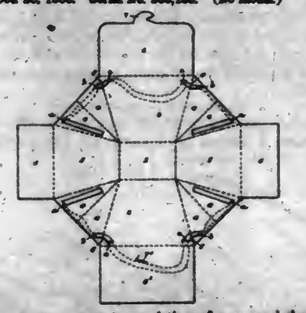
896,569. WEIGHING-SCALE. THOMAS H. HERNDON, Birmingham, Ala. Filed Oct. 9, 1888. Serial No. 287,664. (No model.)



Claim.—1. In a scale, the combination, with a cylindrical casing, of a central spindle having a weight at its lower end and a scale-pan at the upper end, an arm or index fulcrumed on the casing and pivotally connected to the spindle, said arm being bent beyond its fulcrum and extended down vertically to give indications on a curved graduated plate, and an auxiliary index pivotally mounted on said arm and having an extensible needle indicating the graduations of the curved plate or of an outer parallel plate, substantially as specified.

2. In a scale, the combination, with a cylindrical casing, of a central spindle carrying the pan and having a weight at its lower end, an arm pivotally connected to the spindle, fulcrumed on the casing and bent beyond the fulcrum vertically downward, an auxiliary arm or index pivotally mounted on said arm and having an extensible needle, an auxiliary or counterbalancing weight moving upon an arm rigidly mounted on the arm pivoted to the spindle, and two graduated arc-shaped plates having their center at the fulcrum of said arm and rigidly mounted on the casing, substantially as specified.

896,570. PAPER BOX. FREDERICK G. HOVENDEN, Brooklyn, N. Y. Filed Oct. 25, 1888. Serial No. 289,132. (No model.)



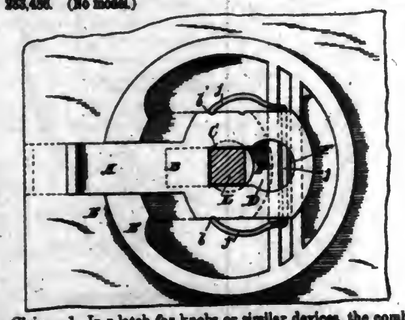
Claim.—1. A receptacle consisting of a creased sheet of paper, having a body comprising a bottom, two sides, two ends, creased gussets at the corners connecting the sides and ends, and tapes secured at their ends to one of the two plies of each gusset, and threaded through slits in the plies of the gusset and the adjacent side of the box, substantially as set forth.

2. A receptacle consisting of a creased sheet of paper, having a body comprising a bottom, two sides, two ends, and inwardly-folded creased gussets at the corners, connecting the adjacent sides and ends,

and having, also, end cover-flaps on the box ends overlapping main cover-flaps 6 6' on the box sides, a fastening for the outer main cover-flaps, and handles formed of tapes 8 8, threaded through slits in the box sides and in the plies of the gussets, said tapes being secured at their ends to the gusset-plies, as described, whereby the said tapes serve as a means for folding the body of the receptacle and retaining it when folded, as set forth.

3. A receptacle consisting of a sheet of paper, having its adjacent side and end connected by a gusset with creases at the junction of said gusset with the respective side and end, and a crease which divides said gusset into two plies, 4 4, said gusset being folded inside of the receptacle, and having a tape secured at its end to one ply of said gusset, and threaded through slits in the plies of the gusset and in the adjacent side of the box, as and for the purpose set forth.

396,571. DOOR-KNOB ATTACHMENT. HENRY A. IDDINGS and JOSEPH P. MEENATH, Omaha, Nebr. Filed Aug. 22, 1888. Serial No. 283,456. (No model.)



Claim.—1. In a latch for knobs or similar devices, the combination, with the rose-plate, of the cross-bars F F, the sliding catch A B, adapted to engage with the shank of a knob and supported on the bars F F, and the retaining-spring engaging with said bars F F and with the sliding catch, the latter having a handle projecting beyond the rose-plate, substantially as set forth.

2. The combination, with the base E, having the cross-bars F F, and the guide H, of the sliding catch mounted in said guide and upon said cross-bars and adapted to engage with the shank of the knob, and the rose-plate which secures in place both the base and the sliding catch, substantially as set forth.

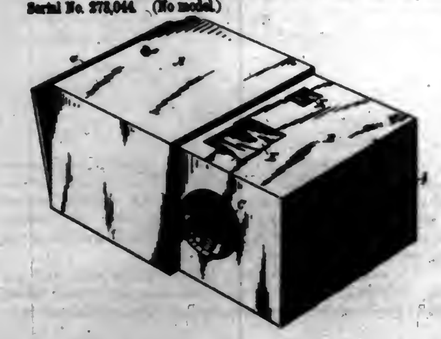
3. The combination, with the sliding catch adapted to engage with the shank of the knob, of the support upon which said catch slides, and a spring bent to have the part *j* below the catch, and the parts *j'* to engage therewith, substantially as described.

396,572. AXLE. JAMES JENCKES, Brooklyn, N. Y. Filed Feb. 15, 1886. Renewed May 10, 1888. Serial No. 273,391. (No model.)



Claim.—The combination, with the axle-bar having a hole in the end and a nut screwing upon such axle-bar, of a removable axle having a round inner end that fits the hole in the axle-bar, a conical collar that is clamped by the nut, and a tapering outer end, substantially as specified.

396,573. CAMERA-CARRYING CASE AND PLATE-CHANGING BOX. JAMES H. JOHNSON, San Francisco, Cal. Filed June 23, 1888. Serial No. 278,044. (No model.)



Claim.—1. A camera-carrying case and plate-changing box composed of an exterior frame with a lid or cover for affording access to its interior and an interior frame with a bottom and provided with hand-holes having wristbands, said frames telescoping to form when closed a complete case, and when extended a box within which the plates may be changed by inserting the hands through the wristbands, substantially as described.

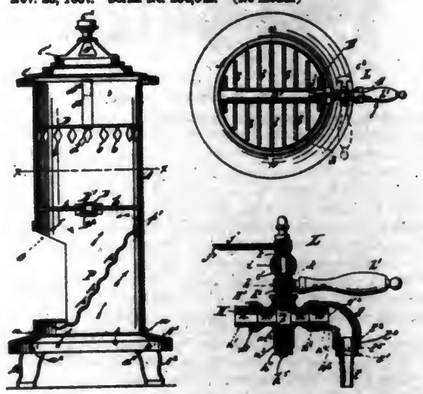
2. A camera-carrying case and plate-changing box composed of an exterior frame with a lid or cover affording access to its interior and an interior frame with a bottom, and provided with hand-holes having wristbands and with a suitable non-actinic glass or glasses, said frames telescoping to form when closed a complete case, and when extended a box within which the plates may be changed, substantially as described.

3. The exterior frame with a lid or cover for affording access to its interior, the interior frame with a bottom and provided with hand-holes having wristbands, said frames telescoping, and the stop-strips by which their closing and extension are limited, the whole forming when closed a case for carrying the camera, and when extended a box in which the plates may be changed, substantially as described.

396,574. FORMATION OF PURPLE COLORING-MATTER. ALFRED KERN, Basle, Switzerland. Filed Apr. 11, 1888. Serial No. 270,294. (No specimens.)

Claim.—The purple coloring-matter herein described, obtained from the methylic ether of gallic acid and hydrochloric nitroso-dimethylaniline, showing the formula $C_{16}H_{14}N_2O_5HCl$, having the properties of dissolving in cold water and very easily in hot water, and crystallizing out of the cooled concentrated solutions when they are allowed to cool and stand or when common salt is added, the crystals being slender and brownish brilliant, and, if pressed out, showing brownish brilliantly-shining scales, the solutions becoming fuchsine red when treated with acids and blue violet when treated with alkalies.

396,575. GAS-STOVE. LANDON KETCHUM, Bridgeport, Conn. Filed Nov. 25, 1887. Serial No. 256,042. (No model.)



Claim.—1. In a gas-stove, the combination, substantially as hereinbefore set forth, with a gas-burner composed of a series of horizontal and parallel gas-supply pipes provided on their upper surfaces with openings or jets for the escape of the gas and connected with a central supply-pipe, of a horizontal diaphragm placed in the interior of the stove above the burner, a space being left around the periphery of the diaphragm for the passage of gases, the exterior shell of the stove being provided with a series of horizontal openings immediately below the diaphragm and one or more openings in the top of the stove above the diaphragm, for the purposes set forth.

2. In a gas-stove, the combination, as described, of a gas-burner composed of a series of horizontal and parallel gas-supply pipes provided upon their upper surfaces with openings for the escape of gas, an inclined plate placed below the burner, an outer shell provided with an opening in the front of the stove and opposite said plate, and an open bottom back of said plate for admitting air to the space back of the same, a space being provided for the passage of air between the top of the inclined plate and the shell of the stove and immediately under the burner, for the purposes set forth.

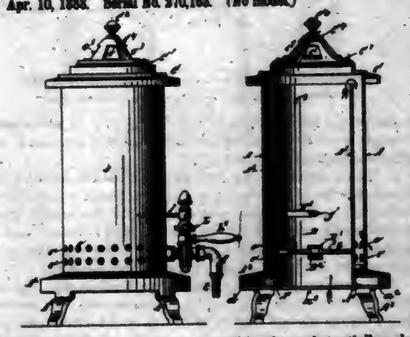
3. In a gas-stove, the combination, substantially as hereinbefore set forth, with the spindle and handle of the gas-supply valve, of an igniter having the horizontal hollow igniting-arm *j* attached to the passage *k* in the valve-spindle, there being an opening, m^3, in the walls of the valve-spindle for connecting said passage with the main gas-supply passage, the thumb-screw *l*, and the valve *i*, placed in the passage *k* for cutting off the gas-supply from the same, so constructed and arranged that the opening of the supplying-valve causes the igniter to enter the stove and light the burner.

4. In a gas-stove, the combination, with the shell and with the horizontal gas-burner composed of a series of horizontal and parallel gas-supply pipes, of a horizontal diaphragm placed within the stove above and parallel to the gas-burner, said diaphragm being of such size that a passage is left between its periphery and the shell of the stove for the escape of the heated gases, the outer shell being provided with a series of openings in close proximity to the diaphragm for the escape of the heated gases.

5. In a gas-stove, the combination, substantially as hereinbefore described, with the shell of the stove provided with openings in the top above the diaphragm and means for regulating the size of said openings, as described, of a diaphragm placed in the interior of the stove above the burner of such relative size that a passage is left between its periphery and the shell of the stove, the said shell being provided with a series of openings for the discharge of hot gas immediately below said diaphragm.

6. In a gas-stove, the combination, substantially as hereinbefore set forth, with the shell of the stove provided with the openings *o' o'* in its top and the openings *o o* in its side walls, of the diaphragm D in the interior of the stove, so arranged that its periphery shall be in close proximity to and immediately above said openings for throwing the heated air to the sides of the stove and through said openings.

396,576. GAS-STOVE. LANDON KETCHUM, Bridgeport, Conn. Filed Apr. 10, 1888. Serial No. 270,163. (No model.)



Claim.—1. In a gas-stove, the combination, substantially as hereinbefore set forth, of an outer hollow shell or cylinder surmounted by a closed top having an adjustable opening therein and provided with one or more openings at or near the bottom of the same for the escape of gas, an inner hollow shell or cylinder within the said outer shell open at both top and bottom and unobstructed throughout its entire length except by the burner, so as to permit a free escape of the hot air and gas, means, substantially as described, for closing the space between the two shells at the bottom, and a gas-burner in the hollow interior of the inner shell at or near the base of the same.

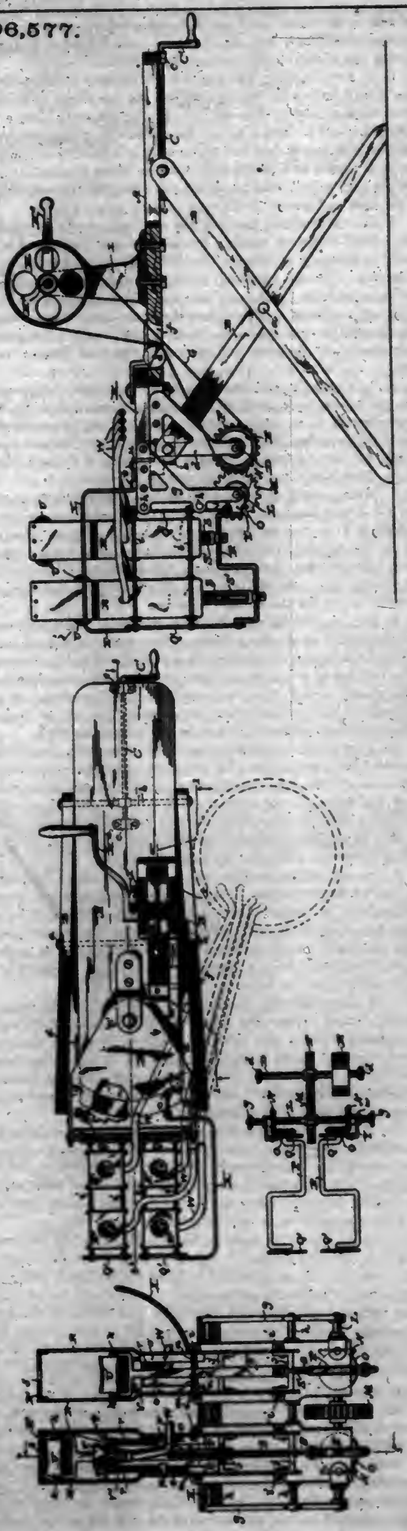
2. In a gas-stove, the combination, substantially as hereinbefore set forth, of an outer hollow shell or cylinder closed at the top and provided with one or more openings at or near the bottom of the same for the escape of the hot gases, an interior hollow shell or cylinder within the said outer shell open at both top and bottom and unobstructed throughout its entire length except by the burner, so as to permit of the free escape of hot air and gas, means, substantially as described, for closing the space between the two shells at the bottom, and a gas-burner in the hollow interior of the inner shell at or near the base of the same.

3. In a gas-stove, the combination, as hereinbefore set forth, of an outer shell or cylinder closed at the top, provided with one or more openings at or near the bottom of the same, an inner hollow shell or cylinder within said outer shell open at both top and bottom and unobstructed throughout its entire length except by the burner, so as to permit of free escape of hot air and gas, means, substantially as described, for closing the space between the two shells at the bottom, and the gas-burner in the hollow interior of said shell at or near the base of the same, composed of a series of horizontal and parallel gas-supply pipes having openings or jets on their upper surfaces for the burning of the gas, said pipes being connected with the central gas-supply pipes.

396,577. COW-MILKING MACHINE. JOHN J. LAWRENCE, Jonesburg, Wis. Filed Aug. 24, 1888. Serial No. 283,602. (No model.)

Claim.—1. In a cow-milking machine, the combination of a milking apparatus, a supporting-base having front and rear cleats upon its under side, four legs that cross each other in pairs and are pivoted together at their crossing-points and individually pivoted at their up-

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per ends to the cleats, and a screw-threaded adjusting-rod having its bearings on said base and engaged by a screw-threaded opening in the rear one of said cleats, substantially as set forth.

2. In a cow-milking machine, the combination of a supporting-base, a shaft having its bearings thereon and carrying a gear-wheel, means, substantially as described, for driving the shaft, a table pivoted to the base to have a lateral movement with relation thereto, a latch for locking said base and table together, a shaft having its bearings on the table and provided with a gear-wheel arranged to mesh with the gear-wheel on the base-shaft, and a milking apparatus carried by the table and geared to the shaft thereon, as set forth.

3. In a cow-milking machine, the combination of a supporting-base, a shaft having its bearings thereon and carrying a gear-wheel, means, substantially as described, for driving the shaft, a table pivoted to the base, a pivotal guard-rail having one end thereof arranged to serve as a latch for locking said base and table together, a shaft having its bearings on the table and provided with a gear-wheel arranged to mesh with the gear-wheel on the base-shaft, and a milking apparatus carried by the table and geared to the shaft thereon, as set forth.

4. In a milking-machine, the combination, with a supporting-base and driving mechanism, of spring-plates connected to the driving mechanism to be reciprocated thereby, opposing pressure-rollers carried by the spring-plates, anti-friction rollers carried by said spring-plates, and inclined tracks arranged in the path of the anti-friction rollers, substantially as and for the purpose set forth.

5. In a cow-milking machine, the combination, with a supporting-base and driving mechanism, of spring-plates connected to the driving mechanism to be reciprocated thereby, opposing pressure-rollers carried by the spring-plates, anti-friction rollers carried by said spring-plates, inclined tracks arranged in the path of the anti-friction rollers, and spouted cups arranged beneath each pair of pressure-rollers, substantially as and for the purpose set forth.

6. In a cow-milking machine, the combination, with a supporting-base and driving mechanism, of spring-plates arranged in pairs, crank-shafts geared to the driving mechanism, sliding rods fast to the spring-plates and linked to the crank-shafts, opposing pressure-rollers journaled to said spring-plates, and anti-friction rollers carried by said spring-plates, and inclined tracks arranged in the path of the anti-friction rollers, substantially as and for the purpose set forth.

7. In a cow-milking machine, the combination, with a supporting-base and driving mechanism, of spring-plates arranged in pairs, crank-shafts geared to the driving mechanism, sliding rods fast to the spring-plates and linked to the crank-shafts, opposing rollers journaled to said spring-plates, means, substantially as described, for compressing the latter at predetermined intervals, spring-supported cups, and spouts leading therefrom, as and for the purpose set forth.

8. In a cow-milking machine, the combination, with a supporting-base and driving mechanism, of spring-plates connected to the driving mechanism to be reciprocated thereby, opposing pressure-rollers carried by the spring-plates, anti-friction rollers, also carried by said spring-plates, and tracks for the anti-friction rollers arranged at an angle to a vertical plane and having oppositely-beveled ends, substantially as and for the purpose set forth.

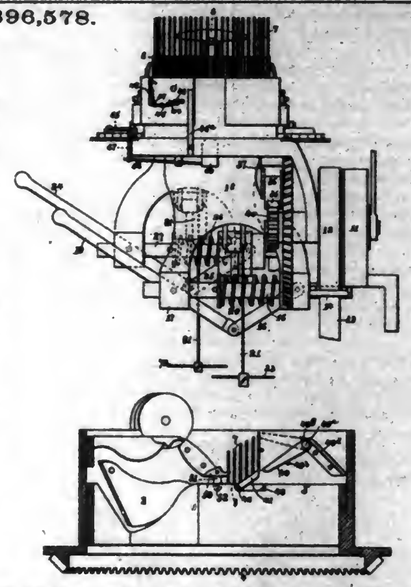
9. In a cow-milking machine, the combination of a base, A, table K, pivoted thereto, the guard-rail X, having the latch end u, for engaging the base and table, the plates Q, Q', and R, the transverse tent-guides R', the tracks o on the plates R, the sliding rods S, links S', and crank-shafts P, the spring-plates T, carrying rollers U, the spring-supported cups V, and a driving mechanism geared to said crank-shafts, substantially as set forth.

10. In a cow-milking machine, the combination of the plates Q Q', connected by longitudinal rods *i*, and said plates Q loosely arranged on transverse rods *h*, the plates R, loosely arranged on the rods *i*, the reciprocating spring-plates T, carrying rollers U, means, substantially as described, for compressing said plates at predetermined intervals, and driving mechanism, as and for the purpose set forth.

11. In a cow-milking machine, the combination of the adjustable plates Q R, the spring-plates T, carrying-rollers U and connected to sliding rods S, means, substantially as described, for compressing said spring-plates at predetermined intervals, crank-shafts P, linked to said sliding rods and provided with the bevel gear-wheels O, the bevel gear-wheels N, adjustably arranged on a shaft, L, and in mesh with said gear-wheels O, and a driving mechanism, substantially as described, geared to the shaft L, as and for the purpose set forth.

396,578. CIRCULAR-KNITTING MACHINE. ELIAS LIPPITT, Zanesville, assignor to Anna L. Lippitt, Muskingum County, Ohio, and H. H. Sturtevant and John Martin. Filed Sept. 5, 1887. Serial No. 248,871. (No model.)

Claim.—1. In a circular-knitting machine, the combination, with the needles, a needle-holder, and a cam-cylinder, of a cam, as 41, pivoted to said cylinder below the path of the needles for throwing the needles up out of action, a lever connected with the pivotal shaft of



said cam on the outside of the cylinder, a lever, as 45, and a spring and toggle-levers for actuating said lever, whereby the cam is operated, substantially as described.

2. The combination, with the main frame, needles, needle-holder, and cam-cylinder, of throwing-up cams, arms pivoted to said cylinder on which said cams are pivoted, arms secured to the journals of said first-mentioned arms on the outside of said cylinder, vertically-moving rods arranged on said cylinder beneath said arms, and cams on the main frame for moving said rods, substantially as described.

3. The combination of the needles, the needle-holder, the cam-cylinder, throwing-up cams having pivotal connections with carrying-arms pivoted to the cylinder on each side of the stitch-cams, arms connected with said carrying-arms, cams on the main frame, vertically-moving rods mounted on the cam-cylinder operated by said cams on the main frame for moving the said arms, and thus operating the throwing-up cams, and ratchet-wheels and pawls for rotating the cams on the main frame by the movement of the cam-cylinder, substantially as set forth.

4. The combination of the needles, needle-holder, cam-cylinder, throwing-up cams, and arms on which said cams are pivoted, levers secured to said arms outside the said cylinder, cams on the main frame, rods between said last-named cams and said levers, a lever pivoted on the main frame and operated by said cams on the main frame, a lever and cam operated by said last-named lever, swinging arms, as 70, on said cylinder operated by the last-mentioned cam, throwing-down cams located near the upper inner portion of the said cylinder, studs secured to the same, vertical rods resting on said arms 70 for moving said studs, whereby the throwing-down cams are operated, springs on said rods, and the ratchets and pawls, substantially as described.

5. The combination of the needles, the needle-holder, the cam-cylinder, the stitch-cams, a throwing-down cam on each side of the stitch-cams, a cam supported on the main frame, swinging arms secured on the cylinder, spring-actuated rods supported on said arms and placed in contact with studs formed on said throwing-down cams, said cam on the main frame coming in contact with said arms, whereby said cam operates the throwing-down cams, and a lever and cam secured on the main frame for operating said cam supported on the main frame, substantially as set forth.

6. The combination, in a circular-knitting machine, of throwing-down cams having studs projecting out therefrom, springs and rods for forcing said studs upward, arms, as 70, supporting said rods and springs, a cam located on the main frame for operating said arms 70, and levers and a cam located on the main frame for operating said other cam, whereby the same is raised and lowered, substantially as described.

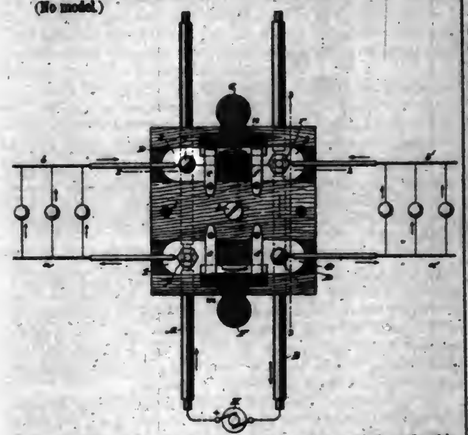
7. The combination, in a circular-knitting machine, of the throwing-down cams, disks whereon the same are mounted, studs on said disks, spring-pressed rods bearing under said studs, spring-supported arms for operating said rods, and a cam on the main frame for operating said rods, substantially as described.

8. In a circular-knitting machine, the combination, with the main frame, of a cam-cylinder, 1, ratchet-cams mounted on the main frame, pawls carried by the cam-cylinder for operating said ratchet-cams, throwing-up and throwing-down cams secured to the cam-cylinder, a lever having a cam, 69, secured thereto, swinging arms secured to the cylinder and with which said cam comes in contact, spring-actuated rods supported on said arms and acting against studs connected with said throwing-down cams, vertically-moving rods carried by said cylinder, having contact with arms connected with the throwing-up cams and operated by said ratchet-cams, the lever 65, and the rod 67, substantially as described.

9. The combination, in a circular-knitting machine, of the cam-cylinder, circular driving-rack 4 thereon, bevel-gear 9, shaft 10, pinion 40, rack-bar 35, pulley 31, connected to said rack-bar, loose pulley 30, belt 29, belt-shifting mechanism and pan 79, and rod 80, for operating said belt-shifting mechanism, substantially as described.

10. The combination of a cam-cylinder, 1, driving-rack 4 thereon, gear 9, shaft 10, pinion 40, rack-bar 35, mechanism for reciprocating said rack-bar, bracket 37, sliding block 36, supporting said rack-bar and supported by said bracket, and handle 38, with cam 39, for throwing said rack-bar into and out of engagement, substantially as set forth.

396,579. WIRING-BLOCK FOR ELECTRICAL CIRCUITS. ORSON P. LOOMIS, Somerville, Mass., assignor to the Loomis Electric Manufacturing Company, of New York. Filed Aug. 17, 1888. Serial No. 282,164. (No model.)



Claim.—1. A safety-strip for electric circuits, consisting of a thin piece of vulcanized non-conducting fiber of the form shown and described, with a projecting thumb-piece and a cut-away edge having tin-foil wrapped around the same, and spring terminals adapted to hold the same in place and complete the circuit by way of the tin-foil, substantially as described.

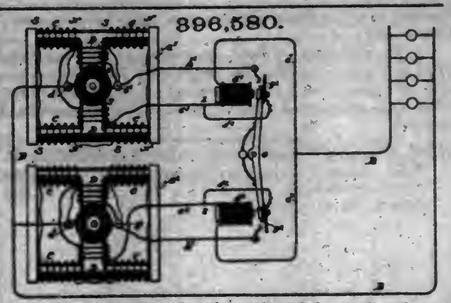
2. The combination of the conductors A B, the metal pieces 1 2 3 4, mounted in a grooved block of non-conducting material, the subsidiary conductors *a b a' b'*, clamping devices *p r*, for the main conductors and one terminal of the subsidiary conductors, binding-screws *q s*, for the other terminals thereof, and fusible connections between said metal pieces 1 3 and 2 4.

3. The combination of the conductors A B, the metal pieces 1 2 3 4, mounted in a grooved block of non-conducting material, the subsidiary conductors *a b a' b'*, clamping devices *p r*, for the main conductors and one terminal of the subsidiary conductors, binding-screws *q s*, for the other terminals thereof, springs *c d e f*, mounted upon said block over said metal pieces, and removable tongues or strips F G of non-conducting material or fiber bearing tin-foil, bridging the space between the metal pieces and springs, in the manner and for the purpose described.

396,580. COUPLING DYNAMOS. ORSON P. LOOMIS, Somerville, Mass., assignor to the Loomis Electric Manufacturing Company, of New York. Filed Sept. 13, 1887. Serial No. 249,573. (No model.)

Claim.—1. The combination, with dynamo-machines supplying current to an electric current in multiple arc, of electro-magnets arranged in the circuits emanating from said dynamo-machines, and contacts controlled thereby to modify the magnetizing effect of the field-magnet coils thereof, so as to produce an equalizing effect between the same.

2. The combination, with dynamo-machines arranged in multiple arc in an electric circuit, of electro-magnets arranged in the circuits emanating from said dynamos, contacts controlled by said electro-



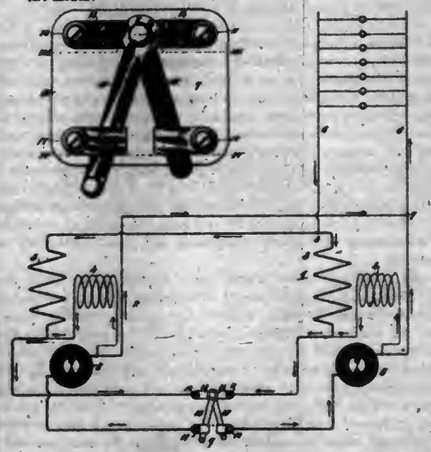
magnets as one or the other dynamo overbalances the other, and electrical connections from the field-magnet coils having their terminals arranged in the path of said contacts, for the purpose described.

3. The combination of the dynamos A' and A² of any suitable type arranged in multiple arc in an electric circuit, the electro-magnets *d'* *d²* in the circuits leading from said dynamos, a pivoted lever, *e*, disposed between the same, and electrical connections from said dynamos controlled by said electro-magnets and lever to equalize the current supplied by said dynamos upon a rise of potential in either.

4. The combination, with the compound-wound dynamos A' and A² of any suitable type arranged in multiple arc in an electric circuit, of the electro-magnets *d'* and *d²* in the circuits emanating from said dynamos, a normally-open short circuit around the series coils of said dynamo, and contact devices controlled by the preponderance of current circulating in said electro-magnets to close the short circuit of the series coils of the preponderating dynamo to equalize the current supplied by the two.

5. The combination, with the compound-wound dynamos A' and A² of any suitable type supplying an electric circuit in multiple arc, of a normally-open short circuit around the series coils of each, electro-magnets arranged in the circuits emanating from said dynamos and in the circuit of said short circuit when established, and a pivoted lever maintained in normal position bearing armatures for said electro-magnets, and controlled thereby to establish one or the other short circuit as one or the other dynamo preponderates in electro-motive force.

396,581. COUPLING OF DYNAMOS AND MOTORS. ORSON P. LOOMIS, Somerville, Mass., assignor to the Loomis Electric Manufacturing Company, of New York. Filed Apr. 19, 1888. Serial No. 271,216. (No model.)

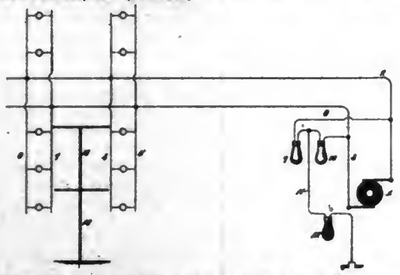


Claim.—1. The combination of the dynamos 1 and 2, supplying a working-circuit in multiple arc and having shunt and series coils, the terminal 11, connected to one end of the shunt and series coils of the dynamo 1, the terminal 10, connected to one end of the shunt and series coils of the dynamo 2, switch-levers 15 and 16, pivoted one above the other to metal pieces 13 and 14 in electrical connection with said terminals, respectively, and terminals 17 and 18, arranged within the path of said switch-levers and connected to one of the commutator-brushes of the dynamos 2 and 1, respectively, substantially as described, whereby the shunt and series coils of each dynamo may be connected to a terminal of the other dynamo for the purpose

described, or may be disconnected therefrom and the dynamos worked independently.

2. The combination of the binding-posts 10 11, the metal pieces 13 14, arranged as described, the switch-levers 15 16, pivoted one above the other to said metal pieces, respectively, and two sets of spring-terminals connected to the binding-posts 17 18, substantially as described.

396,582. AUTOMATIC GROUND-DETECTOR FOR ELECTRIC CIRCUITS. OSBORN P. LOOMIS, Somerville, Mass., assignor to the Loomis Electric Manufacturing Company, of New York. Filed Aug. 7, 1888. Serial No. 282,182. (No model.)



Claim.—An automatic ground-detector for electric-light circuits, consisting of a wire, 8, connected, preferably, between the mains of said circuit at the central station, electric lamps 9 and 10 in series in said circuit 8, a ground-connection between the two, for the purpose described, and a signal-giving device located in said ground, substantially as and for the purpose described.

396,583. INCANDESCENT-LAMP SOCKET. OSBORN P. LOOMIS, Somerville, Mass., assignor to the Loomis Electric Manufacturing Company, of New York. Filed Sept. 3, 1888. Serial No. 284,400. (No model.)

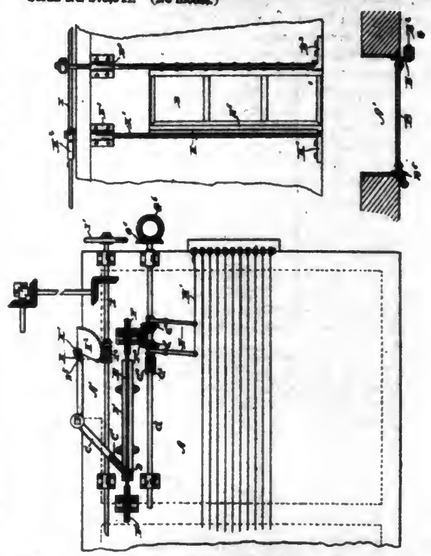


Claim.—1. In an incandescent electric lamp, the combination, with the lamp-stem provided with the insulating projecting post carrying the lamp-terminals, which are formed with transverse coupling-corrugations, the said post and terminals together having a cross-section of greater length than breadth, of the lamp-socket adapted to receive the lamp-stem, a pair of spring-clutching contact-jaws arranged within the socket and connected to line and spaced correspondingly with the terminals and suitably corrugated, and a guard-plate located within the socket and formed with an opening of greater length than breadth, so as to allow said lamp-terminals to be entered therethrough only when properly presented, the said contact-jaws being accessible to the terminals through the opening of said plate, substantially as described.

2. In an incandescent electric lamp, the combination, with the lamp-stem 6 and the post 9, made of insulating material and having the lamp-terminals 10 and 11 attached thereto, said terminals formed with the transverse coupling-corrugations 13 and connected to the leading-in wires, and the post and terminals together having a cross-section of greater length than breadth, of the lamp-socket 14 and the spring contact-jaws 15 16, located therein and connected to line and formed with the transverse coupling-corrugations 17 17, and the guard-plate 19, formed with the opening 18 of greater length than breadth, and through which the contacts are accessible to the lamp-terminals, substantially as and for the purpose set forth.

3. In an incandescent electric lamp, the combination, with the lamp-stem having the lamp-terminals projecting therefrom, the lamp-socket for receiving the stem, and the line-contacts arranged within said socket and adapted to be engaged by the lamp-terminals when the lamp is put together, of the insulating guard-plate 19, formed with an opening, such as 18, and set within the lamp-socket, the line contacts being only accessible to the lamp-terminals through said opening 18 of the guard-plate, whereby false contact may be obviated in putting the lamp together, substantially as and for the purpose set forth.

396,584. STRENGTHENING AND LOCKING APPLIANCE FOR DOORS. GEORGE H. MARTIN, Columbus, Ohio. Filed May 28, 1888. Serial No. 275,241. (No model.)



Claim.—1. In a cell such as described, the combination of a door, an angle-iron riveted to the hinge edge of the door, and a bar rigidly attached to the said angle-iron and mounted in bearings, the lower of which is removed from the wall of the cell and the upper is secured to the wall of the cell at or near the top of the same, substantially as described.

2. In a cell such as described, the combination of a door, an angle-iron rigidly attached to the hinge edge of the door, a bar rigidly attached to the said angle-iron and mounted in bearings, the lower of which is removed from the wall of the cell and the upper is secured to the wall of the cell at or near the top of the same, a flange rigidly attached to the opening edge of the door and extending over the jamb, and any suitable means for securing the door when closed passing over the said flange, substantially as described.

3. In a cell such as described, the combination of a door, an angle-iron rigidly attached to the hinge edge of the door, and a T-iron rigidly attached to the opening edge, both irons extending the whole length of the door, to brace the same, substantially as set forth.

4. In a cell such as described, the combination of a door provided with angle-irons rigidly attached to the opposite edges, a bar forming the hinge rigidly attached to one of the said angle-irons and mounted in bearings which are removed from the wall of the cell, a bar similarly mounted in bearings at the opening side of the door and having a flange or fingers adapted to rest over the adjoining angle-iron on the door, and mechanism for rotating the said bar to bring the flange over the said angle-iron and for maintaining the same in position, substantially as described.

396,585. CAR-WINDOW. FRANK B. MALLORY, Flemington, N. J., assignor of one-fourth to Clarkson C. Dunham, same place. Filed May 31, 1888. Serial No. 275,547. (No model.)



Claim.—1. The combination, with the up and down sliding sash-frames of car-windows on both sides of a car, of two series of reversely-swinging and separately-adjustable glazed frames hinged to the sliding frames, one series on both sides of the car being adjustable to oblique positions adapted to one direction of movement of the car, and the other series adjustable to reverse oblique positions adapted to an opposite direction of movement of the car, substantially as and for the purpose described.

2. The combination, with a single up and down outer sliding sash-frame of a car-window, of two inner glazed frames hinged, respectively, to the uprights of the outer sliding sash, and separately adjustable to reverse oblique positions relatively to the side of the car, substantially as and for the purpose described.

396,586. VESSEL FOR HOLDING LIQUID GLUE. DAVID H. MARTIN, Gloucester, Mass., assignor to the Le Page Glue and Cement Company, same place. Filed Aug. 30, 1888. Serial No. 284,141. (No model.)



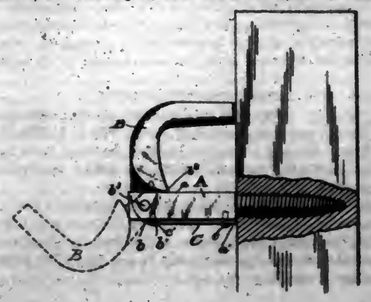
Claim.—1. As a new article of manufacture, a vessel for holding liquid glue and similar substances, consisting of a receptacle having a contracted neck surmounted by an annular shoulder, a top rising above said shoulder and having an opening, a cap or cover having a substantially central box provided with a central opening to receive the shank of the brush, and a wire fastener having arms 15, the ends of which are pivotally and positively fastened in opposite sides of said box, said arms extending laterally or in opposite directions from said box, and being bent downward beside the sides of the top, and provided with shoulders 17, lying beneath and in engagement with the shoulder above the neck, and connected by a yoke, 18, partly surrounding said neck, substantially as described.

2. In a bottle for holding liquid glue or other similar substance, said bottle having a neck surmounted by an annular shoulder, a cover seating upon the top of said neck and provided with a box, and a fastening having its ends pivotally mounted and positively fastened within said box, and extending laterally therefrom, thence bent downward, the lower ends of the converging arms being bent inwardly under the annular shoulder, and connected by a spring-yoke having a diameter slightly less than that of the neck beneath the shoulder, and lying in a plane which forms an angle of less than ninety degrees with the plane of the depending arms, the parts being combined to operate substantially as described.

3. The combination, with a bottle or other vessel for holding liquid glue, said bottle having a neck surmounted by an annular shoulder formed upon a portion having the shape of an inverted frustum of a cone, of a cover seating upon the top of said frustum and provided with a circular box, and a fastening having two laterally-extending arms pivotally mounted in and positively engaged with said box, the said arms being bent into approximate parallelism with the opposite sides of the inverted frustum, their lower ends curved under the annular shoulder, and connected by a spring-yoke in a plane forming an angle of less than ninety degrees with the depending converging arms which engage the upper part of the frustum, substantially as described.

4. The combination, with a bottle, 1, having a neck, 2, surmounted by a flat shoulder, 3, formed on a portion, 4, having the shape of an inverted frustum, of a cover, 8, seating upon a circular flange, 9, on the top of the portion 4, said cover having a box, 12, and a fastening having laterally-extending arms 15, pivotally mounted in and positively engaged with said box, said arms having depending arms 16, bent to converge downwardly, and having elbows 17, curving under the shoulder 3, and connected by a spring-yoke, 18, of slightly less diameter than the neck 2, and bent to lie in a plane forming an angle of less than ninety degrees with the plane of the converging arms 16, substantially as described.

396,587. HOOK FOR AWNINGS, &c. WILLIAM F. MAULICK, Columbia, Pa. Filed July 16, 1888. Serial No. 280,052. (No model.)



Claim.—The combination of the shank provided at one end with screw-threads and the other end with a longitudinal slot, a hook having a tenon formed thereon for engaging the said slot and a shoulder to prevent its falling inward, and a spring secured to the under side of the shank and adapted to engage a shoulder of the tenon to prevent the hook from falling outward, substantially as described.

396,588. JOINT FOR FURNITURE. CHARLES P. MCGREGOR, Arkadelphia, Ark., assignor of one-half to Hubert R. Estes, St. Louis, Mo. Filed May 23, 1888. Serial No. 274,048. (No model.)



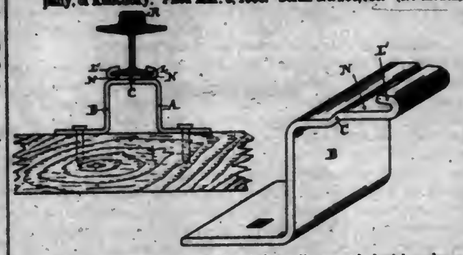
Claim.—In a joint for furniture, the combination of the members 1 and 2, meeting at right angles and having interlocking wings 4 and 10 projecting downwardly and upwardly from the contiguous faces of each member respectively, and each having a flat face lying against the inner face of the contiguous member, said wings having triangular bases at their juncture with the faces of the members, said triangular bases having their bases *a* at right angles to the inner contiguous edges of the members, (their altitudes *c* being portions of the lengths of the inner contiguous edges of the members,) the hypotenuses *b* of the triangles extending from the outer ends of the bases *a* to the ends of the altitudes, where they form with the latter the apexes of the triangles, said wings also having inner edges, *d*, extending from the apexes of the triangles to the points 5 of the wings, and said wings also having outer sides, 10, extending from the bases of the triangles, and beveled meeting faces 8, extending from the edges *d* and hypotenuses *b* to the edge 9 of the sides 10, the relative arrangement of said parts being such that when joined the edges *d* and hypotenuses *b* will be contiguous, substantially as shown and described.

396,589. PROCESS OF MAKING ROLLS FOR EMBOSSING PLASTIC MATERIAL. HUGH MCHUGH, New Bedford, Mass. Filed Dec. 16, 1887. Serial No. 258,114. (No model.) Patented in England Dec. 31, 1887, No. 18,019.



Claim.—The herein-described process of making rolls for embossing plastic material, by engraving a complete section of the desired pattern or design in wood, taking molds therefrom of elastic plastic material and arranging them around the inside of a cylinder in such a manner as to form a complete strip of ornamentation, then depositing thereon a skin of copper, and then giving the copper skin a suitable backing in order that it may be used on an arbor of a machine for embossing plastic material, as described.

396,590. TWO-PART SELF-LOCKING-LUG CHAIR. WILL MCLAIN, Johnstown, Pa., assignor to The Johnson Steel Street Rail Company, of Kentucky. Filed Mar. 3, 1888. Serial No. 266,613. (No model.)

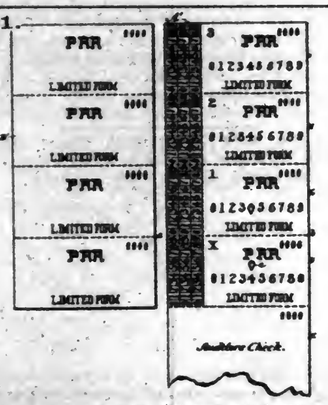


Claim.—A two-part chair for girder-rails, provided with a clamping-lug on each part for connecting rail and chair together by the interlocking of the parts without other fastenings, substantially as set forth.

396,591. RAILROAD-TICKET. WILLIAM A. MEGRATH, Macon, Ga. Filed Feb. 14, 1888. Serial No. 264,018. (No model.) Patented in Belgium Apr. 3, 1888, No. 81,378.

Claim.—1. A railroad-ticket consisting of a series of coupons having distinguishing characters, each coupon being provided with a series of numbers, each number indicating a mile of travel, and corre-

396,591.



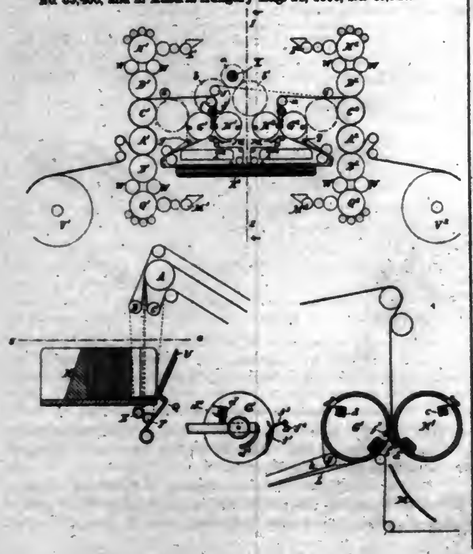
sponding numbers being arranged in a line one above the other upon the several coupons, and at such a distance from the dividing-line between the coupons that on folding the coupons back to back upon said dividing-line a punch-mark through the number upon the upper coupon will be reproduced exactly above and in immediate proximity to the corresponding number on the lower coupon, substantially as set forth.

2. A railroad-ticket consisting of a series of coupons bearing distinguishing characters, each coupon being provided with a series of numbers, each number indicating a mile of travel, said series being arranged immediately below the longitudinal center of its coupon, and corresponding numbers in the several series being arranged in a line one above the other, substantially as and for the purposes set forth.

3. A railroad-ticket consisting of a series of coupons provided with numbers indicating miles of travel, and each coupon being provided with additional numbers representing hundreds, tens, and units, whereby on the last undetached coupon an indication may be given of the number of miles just honored by the conductor, substantially as set forth.

4. A railroad-ticket consisting of a series of coupons bearing distinguishing characters, each coupon being provided with a series of numbers, each number indicating a mile of travel, said series being arranged immediately below the longitudinal center of its coupon, and corresponding numbers in the several series being arranged in a line one above the other, and additional rows of numbers representing hundreds, tens, and units upon each of said coupons, substantially as set forth.

396,592. ROTARY PRINTING-MACHINE. JULES MICHAUD, Paris, France. Filed June 6, 1887. Serial No. 240,374. (No model.) Patented in France June 5, 1886, No. 169,380, and Sept. 18, 1886, No. 173,606; in Belgium Feb. 22, 1886, No. 72,096; in England Feb. 25, 1886, No. 2,773, and May 25, 1887, No. 7,464; in Germany Apr. 1, 1886, No. 39,460, and in Austria-Hungary Aug. 21, 1886, No. 40,547.



Claim.—1. The combination of two rotary printing-machines for printing from separate continuous webs of paper, the two machines being arranged symmetrically and each having the impression-cylinders, the printing-cylinders and the inking-cylinders arranged in the same vertical line at opposite ends of the combined machine, the cutting and folding cylinders of each being arranged in a horizontal line toward the center of such combined machine, whereby the paper from one reel after being printed by the printing-cylinders at one end of the machine can be led to either pair of cutting and folding cylinders so that the webs of paper after being printed may either be separately cut into sheets of the same dimensions and then separately folded and delivered or be superposed, cut, and folded together without any change in the direction of the travel of either web, substantially as described.

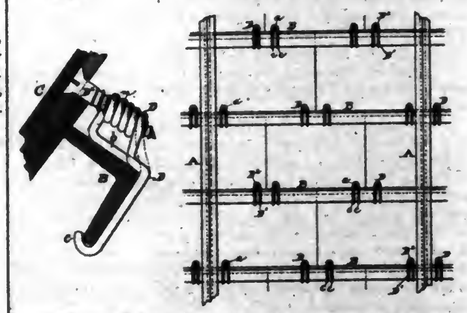
2. The combination, with one of the cutting and folding cylinders, of a movable bar journaled in said cylinder and located close to and in the rear of the cutting apparatus in the direction of rotation of such cylinder, blades carried by said bar, and cams for projecting said blades from the cylinder after the cut is effected to complete the separation of the sheets, and at the same time to direct the forward end of such sheets away from the cylinder which effects the fold, substantially as set forth.

3. In a printing-machine provided with two sets of printing, cutting, folding, and delivering appliances, a shaft provided with two gear-wheels, each capable of being made fast with or to revolve loose upon such shaft, one of such wheels serving to transmit motion to one half of the machine and the other wheel to the other half thereof, in combination with fast and loose pulleys on said shaft and a driving-belt adapted to be shifted from one to the other, substantially as described.

4. In a delivery apparatus, the combination, with a set of tapes, the middle tapes of which proceed only to a point above the delivery-table clear of the flier, while the end tapes pass down below the table, whereby the sheet is arrested by coming in contact with the table, of the oscillating flier and the angle-pieces O P in advance of the plane of the falling sheet, the whole arranged for operation substantially as described.

5. The herein-described cutting apparatus, comprising a cutting-cylinder, a knife carried by said cylinder, a maiden, a strip of india-rubber thereon, a working-surface of leather over said india-rubber strip, and a bar removably securing said leather in position, so as to oppose a yielding elastic pressure to the action of the knife, substantially as described.

396,593. FASTENING FOR ROOF-SLATES. ORLANDO W. NORCROSS, Worcester, Mass. Filed Nov. 23, 1883. Serial No. 291,701. (No model.)

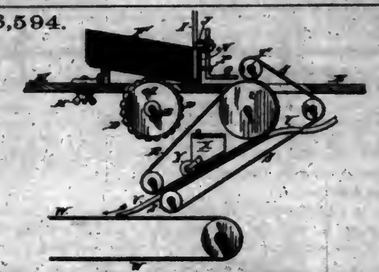


Claim.—A fastening device for roof-slates, comprising, in combination, a wire spring part bent in such manner as to be hooked over or around the purlin and adapted to bear upon the upper side thereof, also to form a spiral coil or spring-nut at or about right angles to the slate and at a short distance above the purlin when fitted thereto, and a suitable screw adapted to be passed down through the slate and turned into the aforesaid spring-nut, substantially as set forth and shown.

396,594. APPLIANCE FOR SPACING OR PANNING OUT ENVELOPE-BLANKS OR SHEETS OF PAPER FOR GUMMING OR BORDERING. WILLIAM C. PELLATT, Brockley, County of Kent, England. Filed Jan. 26, 1888. Serial No. 262,057. (No model.) Patented in England Feb. 7, 1887, No. 1,897.

Claim.—The combination, with the table E, of the roller A having studs D, projecting through and above a slot in said table, the adjustable check-bar f, the leather or rubber strip N, held against the back of said check-bar, the back guide, Q, and the endless tapes R S, substantially as described.

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396,595. TROUGH FOR WATERING STOCK. THOMAS A. PERRY, Abilene, Kans. Filed Aug. 15, 1888. Serial No. 282,779. (No model.)



Claim.—1. The hereinbefore-described trough for water stock having a water-compartment at one end formed by the wall B, the short tube E, secured at one end to the wall B, the check-valve G, of yielding or flexible material, the float H, having the arms A A, which are connected with the wall B by leather, the rod J, having its upper end connected with the said float and having its lower end extended through the tube E and connected with the valve G, substantially as described.

2. The herein-described watering-trough having a water-compartment at one end formed by the wall B, the double-inclined top having openings in its lower edge, which openings extend into the sides of the trough and flare on their inner edges, the short tube E, placed in the wall B, the check-valve G, of flexible material, the float H, having its inner end cut away to form the arms A A, which are hinged by leather to the wall B, and the rod J, having the guide-sleeve *g* at its lower end, which end is connected with the check-valve G, and having its upper end bent at right angles and connected with the said float, substantially as set forth.

396,596. PADLOCK. ALFRED PETERSON, St. Paul, Minn. Filed June 23, 1888. Serial No. 278,485. (No model.)



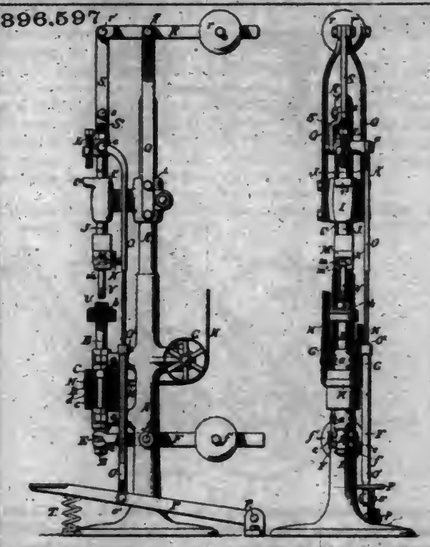
Claim.—1. The combination, with the case formed with hole *a*', of the frame carrying the operating parts of the lock, and the movable spring-actuated pin carried by said frame and adapted to engage said hole and hold the parts in place in said frame, substantially as and for the purpose specified.

2. The combination, with the case and the removable frame, of the tumblers pivoted to said frame, the locking-bolt movable lengthwise in said frame, and the transverse pin carried by said locking-bolt and projecting beneath said tumblers, substantially as shown and described.

396,597. MACHINE FOR FITTING NUTS ON BOLTS. FERDINAND PHILIPS, Philadelphia, Pa. Filed Nov. 5, 1883. Serial No. 289,977. (No model.)

Claim.—1. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

2. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, an adjustable stop secured to the shaft for regulating the extent of its downward motion, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.



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3. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, an adjustable stop secured to the shaft for regulating the extent of its downward motion, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

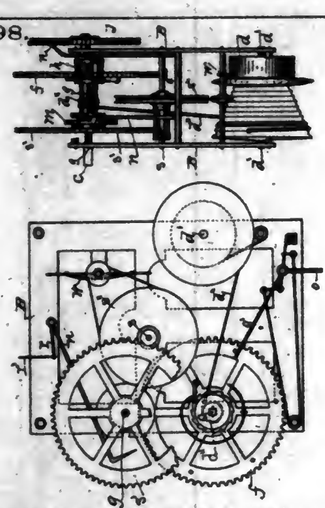
4. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a longitudinally-movable shaft arranged above and concentric with the shaft holding the chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, an adjustable stop secured to the bolt-holding device for regulating the position of the bolt therein, and mechanism for drawing down the upper shaft, all substantially as and for the purpose specified.

5. In a machine for fitting bolts in nuts, the combination of a vertical longitudinally-movable shaft having a chuck for holding the nut at its upper end, a counter-balance arranged to hold it normally in its uppermost position, a driving-drum, a clutch arranged to connect the shaft and drum when the shaft is moved downward, a vertically-adjustable supporting-block, a longitudinally-adjustable shaft journaled in said block so as to be above and concentric with the shaft having the nut-holding chuck, a counter-balance arranged to hold this shaft normally in its uppermost position, a device at the bottom of the shaft for holding a bolt by its head, a foot-lever, and a connecting-rod made in two pieces and adjustable in length, connecting the upper shaft and foot-lever, all substantially as and for the purpose specified.

396,598. CLOCK STRIKING MECHANISM. WILLIAM H. POOLE, Oxford, Iowa. Filed June 24, 1887. Serial No. 242,243. (No model.)

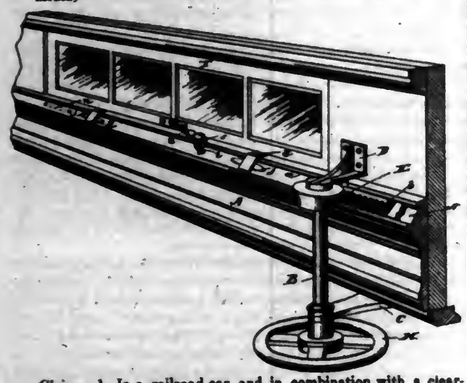
Claim.—An automatic counting-bell for lodge purposes, comprising the following elements, to wit: a driving-shaft having a fixed drum and a fixed wheel, *f*, a shaft, *g*, having a fixed lantern-wheel, *h*, and a one-toothed pinion, *l*, and a toothed wheel, *d*', a count-wheel, J, a cam-wheel, *m*, and a duplex detent, *n*, a rotating fan connected with the driving mechanism by means of a band and pulley, a shaft, *s*, having a fixed lantern-wheel and a fixed driver-pulley, *s*', a shaft, *d*', having

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a spring and fusee fixed thereto, and a bell and a striker arranged and combined with a frame in a case, substantially as shown and described, to operate silently, in the manner set forth, for the purposes stated.

396,599. WINDOW OPENER AND CLOSER. AUGUST RAPP, Pullman, assignor to the Pullman's Palace Car Company, Chicago, Ill. Filed Sept. 17, 1887. Renewed July 30, 1888. Serial No. 281,423. (No model.)



Claim.—1. In a railroad-car, and in combination with a clear-story window-sash pivotally supported, a sliding bar, *a*, a rod, *c*, connected at one of its ends with said bar by a joint admitting of vertical and lateral movements and at the other end hinged to the window-sash, a rack, *b*, connected with bar *a*, a pinion, E, for actuating said rack, a shaft, B, upon which said pinion is mounted, which shaft is provided with a hand wheel or crank, H, and plates *d*, provided with spring-extensions *j*, for retaining bar *a* in position, substantially as set forth.

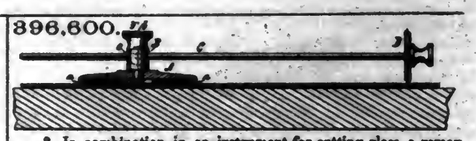
2. In a railroad-car, the combination, with a clear-story window the sash of which is pivotally supported, of a sliding bar, *a*, a rod, *c*, hinged or pivotally attached at its ends, respectively, to the bar and window, and a rocking plate, *e*, with which rod *c* engages, and so pivoted that the end of said rod in closing the window passes the pivotal point of the rocking plate, whereby a bearing is effected against the outer end of said plate *e*, and the inner end of the plate is brought into contact with the rod *c* to secure the latter and the window, substantially as set forth.

396,600. GLASS-CUTTER. ALEXANDER M. ROWLAND, Brooklyn, N. Y., assignor to Richard H. Oakman, Jr., Greenfield, and Warren P. Dustin, Turner's Falls, Mass. Filed Aug. 27, 1888. Serial No. 283,536. (No model.)

Claim.—1. In an instrument for cutting glass, an adjustable head to which is pivoted a series of cutters, A, as and for the purpose described.

2. An instrument for cutting glass, consisting of two or more revolving steel cutters pivoted to an adjustable head fixed to an arm which revolves about a base, as and for the purpose described.

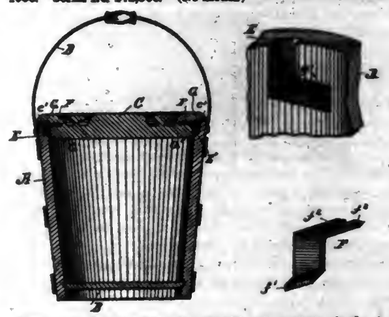
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3. In combination, in an instrument for cutting glass, a removable and adjustable head with two or more cutters, A, pivoted thereto, and a swivel whereby the cutters may move in an arc, as and for the purpose described.

4. In a glass-cutting instrument, the combination of the base A, binding-post B, rod C, and adjustable cutter-head D, provided with a series of steel cutters, *h*, as and for the purpose described.

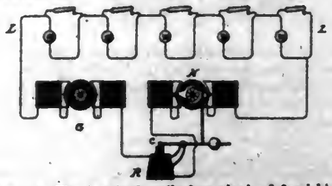
396,601. CLOSURE FOR BUCKETS. JOHN C. REED, Indianapolis, Ind., assignor of one-half to David W. Coffin, same place. Filed May 2, 1888. Serial No. 272,586. (No model.)



Claim.—1. In a bucket, the combination of the body A, having the inclined-faced grooves E E' formed therein at the opposite inner faces thereof, the lower or inclined portions of which are turned in opposite directions to each other, the cover C, and the locking-plates F, having the prongs f^2 extended into the periphery of the cover and having each a projecting portion to engage the inclined face of the grooves to hold the cover in close contact with the body, substantially as shown, and for the purpose described.

2. In combination, the body A, having the L-shaped grooves E E' formed in its inner face, with the lower ends inclined downward, the cover C, and the Z-shaped locking-plates F, having the barbs or points f^2 extended into the periphery of the said cover, and having the lower outwardly-inclined projection, f', to enter said inclined grooves in the body A, substantially as shown, and for the purpose described.

396,602. COMBINATION OF ELECTRIC GENERATORS. EDWIN W. RICE, Jr., Lynn, Mass. Filed Oct. 26, 1887. Serial No. 253,666. (No model.)



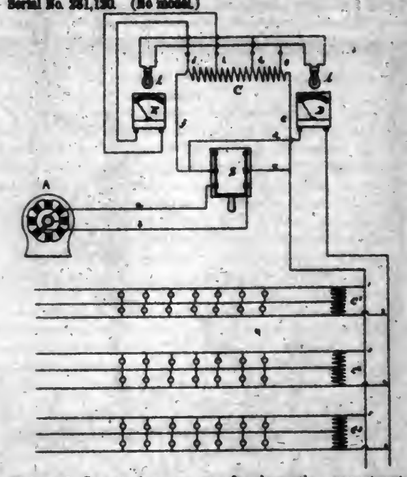
Claim.—1. The herein-described method of furnishing a regulated current from a number of dynamo-generators, consisting in keeping one or more of said generators constantly at work supplying a definite or fixed amount of electricity to the circuit and regulating the remaining generator to adapt the total current-supply to the demand of the circuit.

2. The herein-described method of furnishing a regulated current from two or more dynamo-generators coupled in series, consisting in keeping one or more of said generators constantly at work supplying a definite or fixed amount of electricity, and on a decrease of the demand upon the generators to a determinate extent converting one or more of the generators into a counter electro-motive-force generator, as and for the purpose described.

3. The herein-described method of regulating the current upon a circuit, consisting in supplying the bulk of the current from a generator or generators of suitable capacity doing continually a predetermined or constant amount of work, and controlling the variations of current by regulating a comparatively small regulable generator in series with the main generator or generators and of a capacity for regulation determined by the normal variations of load on the circuit.

4. The herein-described method of furnishing a regulated current to a circuit supplied from dynamo-generating sources in series, consisting in running one or more of said sources with its commutator in a fixed or invariable position, and adjusting the commutator of another generator or generators to vary the electro-motive force of the same.

396,608. SYSTEM OF ELECTRICAL DISTRIBUTION. E. WILBUR RICE, Jr., and ALBERT L. ROHNER, Lynn, Mass. Filed July 26, 1888. Serial No. 281,120. (No model.)



Claim.—1. In a station apparatus for alternating-current systems of distribution, a double-pole switch placed between the generator and the mains, and a branch between the mains connected thereto at the opposite side of the double-pole switch from the generator, said branch containing potential-indicating appliances, all as shown, whereby on operation of the switch both the mains and the potential-indicator are severed from connection with the machine at both terminals.

2. In a station apparatus for an alternating-current system of distribution, a branch from the supply-mains, containing a reactive coil, and indicating appliances connected to said coil.

3. In station apparatus for an alternating-current system of distribution, mains *a b*, connecting the alternating source to a double-pole switch, connections from the switch to the supply-mains, a current-indicator in said connections, and a branch from the switch and supply-mains, including a reactive coil with which indicating devices are connected.

4. A station apparatus for alternating-current systems of distribution, comprising a reactive coil connected in a branch across the mains, and having two local circuits connected to it, one leading to pilot-lamps and the other to a potential-indicator, a current-indicator in the supply-main, and a double-pole switch between the dynamo and the converter, the current-indicator, and the supply-mains.

5. In a station apparatus for alternating-current systems of distribution, the reactive coil in a branch across the supply-mains, and two local circuits connected to said coil, one containing a potential-indicator, E, and the other pilot-lamps *l*.

6. In an alternating-current system of distribution, supply-mains *c d*, having compensating-converters connected in multiple between them and in turn connected with the local wires, of translating devices, and a station apparatus consisting of a double-pole switch in the connection from the dynamo to the supply-mains, a current-indicator in the mains, and a branch having a compensating-converter with which a potential-indicator and pilot-lamps are connected.

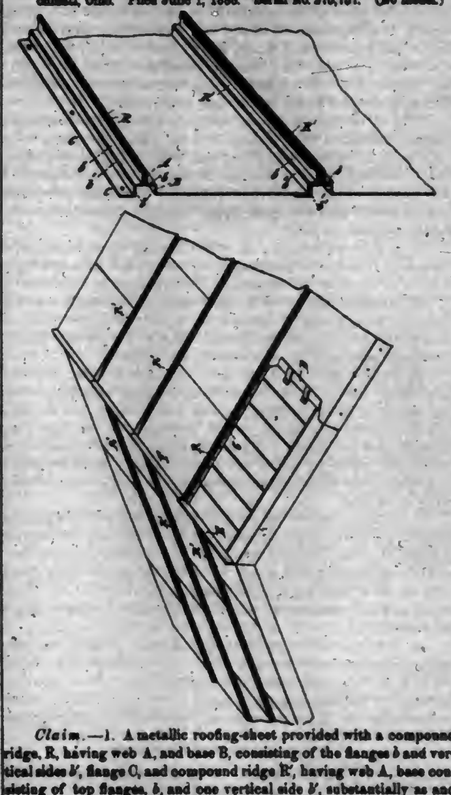
396,604. RING FOR CURTAIN-POLES. JULIUS REISS, Detroit, Mich. Filed Feb. 7, 1888. Serial No. 263,252. (No model.)



Claim.—1. A ring for curtain-poles and the like, consisting of two similar sections, A A, united by transverse screws or rivets B, and having their lower ends provided with attaching-eyes I, and their upper ends formed with roller-sockets D, having openings E, and located, respectively, at opposite sides of the median line of the sections, and rollers F, arranged in said sockets between the two sections comprising the ring, substantially as described.

2. A ring for curtain-poles and the like, consisting of the two similar sections, A A, united by screws or rivets B, and formed integral at their lower ends with attaching-eyes I, and at their upper ends with roller-sockets D, having openings E, and separated ridges or riders H on their walls, and rollers F in said sockets rotatable on the ridges or riders and arranged, respectively, at opposite sides of the median line of the ring, substantially as described.

396,605. METALLIC ROOFING. LOMBLEY L. SAGENDORPH, Cincinnati, Ohio. Filed June 1, 1888. Serial No. 276,737. (No model.)

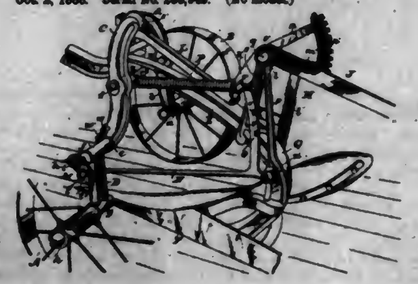


Claim.—1. A metallic roofing-sheet provided with a compound ridge, R, having web A, and base B, consisting of the flanges *b* and vertical sides *b'*, flange C, and compound ridge R', having web A, base consisting of top flanges, *b*, and one vertical side *b'*, substantially as and for the purposes specified.

2. The combination of two sheets, each provided with compound ridges, substantially as described, of which the webs A are pinched together or approximated at their bases and bent at an angle from the vertical, substantially as and for the purposes specified.

3. In a sheet-metal roof, the combination of roofing-plates provided with flanges E, and the cone F, and compound ridges R, having web A and base B, and compound ridges R', substantially as and for the purposes specified.

396,606. WHEEL-PLOW. HANS H. SAYER, Dubuque, Iowa. Filed Oct. 2, 1888. Serial No. 286,949. (No model.)



Claim.—1. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, at one end of said axle, a swinging arm, D, at the other end of said axle, a land-wheel, A, at the lower end of said swinging arm D, and a rod, N, connecting said arm with the plow-beam, substantially as set forth.

2. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, at one end of said axle, a swinging arm, D, at the other end of said axle, the land-wheel A at the lower end of said swinging arm, a cam, M, rigidly secured to said swinging arm, and a connecting-rod, N, connecting said cam with the plow-beam, substantially as set forth.

3. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, at one end of said axle, swinging arm D at the other end of said axle, a land-wheel, A, at the lower end of said swinging arm, a cam, M, rigidly secured to said swinging arm D and provided with a series of openings or holes, *t t t t*, and a rod, N, provided with a cylindrical lug thereon and connecting said cam with the plow-beam, substantially as set forth.

4. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, at one end of said axle, a swinging arm, D, at the other end of said axle, a land-wheel, A, at the lower end of said swinging arm D, a rod, N, connecting said swinging arm with the plow-beam, and a lever, J, pivoted above said plow-beam, and connected with the upper end of said axle, substantially as and for the purposes set forth.

5. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel at one end of said axle, a swinging arm, D, at the other end of same, a land-wheel, A, at the lower end of said swinging arm, a rod, N, connecting said swinging arm with the plow-beam, a lever, J, pivoted above said plow-beam and connected with said axle, and the curved rack *x'* at one side of said lever, for the purpose set forth, substantially as described.

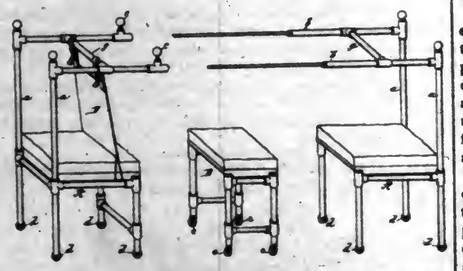
6. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, on one end of said axle, a swinging arm, D, at the other end of the same, a land-wheel, A, at the lower end of said swinging arm, a rod, N, connecting said swinging arm with the plow-beam, a lever, J, pivoted above said plow-beam and connected with the upper part of said axle, a segment, H, on one side of said lever J, and a supporting-bracket, I, on the other side, substantially as set forth.

7. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, on one end of said axle, a swinging arm, D, at the other end of said axle, a land-wheel, A, at the lower end of said swinging arm, a rod, N, connecting said swinging arm D with the plow-beam, a rod, O, extending upward from the rod N, and a spring, P, connecting said rod O with the axle C, substantially as set forth.

8. A sulky-plow having an axle, C, a plow pivotally suspended beneath the same, a furrow-wheel, B, on one end of said axle, a swinging arm, D, on the other end of the same, a land-wheel, A, on the lower end of said swinging arm, a lug, *w*, on the lower end of said axle, and a similar lug, *w'*, on the upper portion of said swinging arm, substantially as set forth.

396,607. INVALID-BED. WILLIAM SAUNDERS, West Point, N. Y.

Filed Apr. 6, 1888. Serial No. 269,843. (No model.)

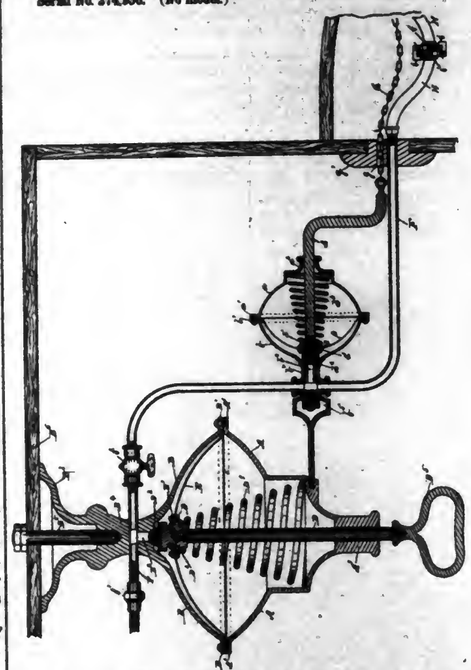


Claim.—1. An invalid-bedstead composed of two end sections, the side rails of each section being entirely disconnected from the side rails of the other, in combination with an elevated extensible frame forming the sole means for connecting said sections and holding them in the proper relation to each other, substantially as specified.

2. An invalid-bedstead composed of two end sections, the side rails of each section being entirely disconnected from the side rails of the other, in combination with an elevated extensible frame forming the sole means for connecting said sections and holding them in the proper relation to each other, and sliding bars made adjustable upon the extensible parts of said frame, substantially as specified.

396,608. PNEUMATIC BELL-ALARM. CHARLES R. SAWYER, Braintree, and CHARLES PARENT, Boston, Mass. Filed May 24, 1888.

Serial No. 274,956. (No model.)



Claim.—1. The combination of an air-chamber, J, one of the walls of which is composed of a flexible diaphragm, K', a piston, L, attached to the diaphragm and connected with the hammer of a bell, an air-tube opening into the chamber J through the wall K opposite the diaphragm K', and a pump connected with the air-tube, whereby suction of air from chamber J will cause diaphragm K' to move inward and reciprocate the piston L, and thereby throw the bell-hammer, substantially as described.

2. The combination of an air-chamber, J, one wall of which consists of a flexible diaphragm, K', a piston, L, attached to the diaphragm and connected with the hammer of a bell, an air-tube opening into the chamber J through the wall opposite the diaphragm K', a pump connected with the air-tube, the operation of which causes suction of the diaphragm K', thereby reciprocating the piston L and throwing the bell-hammer, and a regulator for keeping the hammer under tension during a portion of its stroke, and then releasing the tension before the blow, substantially as and for the purpose described.

3. The combination of an air-pump, an air-tube connected at one end with the pump and at the other end opening into an air-chamber, the wall opposite the opening consisting of a flexible diaphragm, a piston with one end secured to the diaphragm and the other end pivoted to one end of a lever fulcrumed in a shaft which is journaled in a supporting-frame, the other end of the lever having a segmental rack thereon which engages with a pinion mounted on a shaft in said frame, a hammer attached to the pinion-shaft, and a bell, substantially as described.

4. The combination of an air-pump, an air-tube connected at one end with the pump and at the other end opening into an air-chamber, the wall opposite the opening, consisting of a flexible diaphragm, a piston with one end secured to the diaphragm and the other end pivoted to one end of a lever fulcrumed in a shaft which is journaled in a supporting-frame, the other end of the lever having a segmental rack thereon which engages with a pinion mounted on a shaft in said frame, a hammer attached to the pinion-shaft, a bell, and a regulating device for holding the hammer under tension during a part of its upward movement and then releasing the tension before the blow, substantially as described.

5. The combination of an air-pump, an air-tube connected at one end with the pump and at the other end opening into an air-chamber, the wall opposite the opening, consisting of a flexible diaphragm, a piston with one end secured to the diaphragm and the other end pivoted to one end of a lever fulcrumed in a shaft which is journaled in a supporting-frame, the other end of the lever having a segmental rack thereon which engages with a pinion mounted on a shaft in said frame, a hammer attached to the pinion-shaft, a bell, and a regulating device for holding the hammer under tension during a portion of its upward movement and then releasing the tension before the blow, said regulating device consisting of a lever having an upwardly-turned arm and a fulcrum at the bend, the lower arm carrying a weight and the upper arm having pivoted at its end a tripping-lever, one end of which acts as a trigger and engages with a tripping-rod projecting from the pinion-shaft, so that when the hammer rises the tripping-rod will engage with the trigger and tip the weighted bent lever on its pivot, thus holding the hammer under tension in its upward movement until the tripping-rod escapes the trigger, and when the trigger releases the tripping-rod the hammer completes its stroke with an impulse, substantially as described.

6. An air-pump consisting of two metallic cups, A B, a flexible cup-shaped diaphragm, E, inside one of the cups, B, with its rim clamped between the rims of the two cups and forming an air-tight partition between the two cups, a piston working through base of cup A and having its inner end secured to the diaphragm, the cup B having a port leading to an air-tube, a stopper on the convex side of the diaphragm to close the passage from cup B to the air-tube, and a spring connected with the piston to keep it closed, substantially as described.

7. An air-pump consisting of two metallic cups, A B, a cup-shaped diaphragm in one of the cups, B, clamped at its edge between the rims of the two cups A B and forming an air-tight partition between the two cups, the cup B having a port leading to an air-tube, and the cup A having a piston working through the base of cup A, attached at its upper end to the diaphragm E, a stopper on the convex side of the diaphragm to close the port in the cup B, and a spring connected with the piston to keep the port closed, in combination with an air-tube leading from the port in cup B and an air-chamber at the other end of the tube, the wall of the chamber opposite the tube being composed of a flexible diaphragm, substantially as and for the purpose described.

8. An air-pump consisting of two metallic cups, A B, a cup-shaped diaphragm in one of the cups, B, clamped at its edge between the rims of the two cups A B and forming an air-tight partition between the two cups, the cup B having a port leading to an air-tube and the cup A having a piston working through the base of cup A, attached at its upper end to the diaphragm E, a stopper on the convex side of the diaphragm to close the port in the cup B, and a spring connected with the piston to keep the port closed, in combination with an air-tube leading from the port in cup B and an air-chamber at the other end of the tube, the wall opposite that through which the tube enters being composed of a flexible diaphragm, K', a piston with one end secured to the diaphragm K' and the other end connected with the hammer of a bell, whereby the operation of the pump will cause suction of the diaphragm K', reciprocating its piston and throwing the bell-hammer, substantially as described.

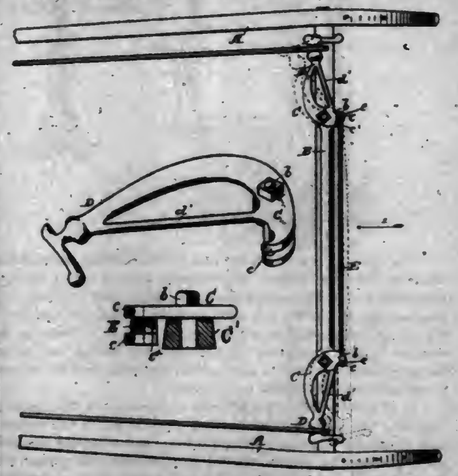
9. An air-pump consisting of two metallic cups, A B, a cup-shaped diaphragm in one of the cups, B, clamped at its edge between the rims of the two cups A B and forming an air-tight partition between the two cups, the cup B having a port leading to an air-tube, and the cup A having a piston working through its base and attached at its upper end to the diaphragm E, a stopper on the convex side of the diaphragm to close the port in the cup B, and a spring connected with the piston to keep the port closed, in combination with an air-tube leading from the port in cup B and an air-chamber, J, at the other end of the tube, the wall opposite that through which the tube enters consisting of a flexible diaphragm, K', a piston with one end secured to the diaphragm K' and the other end pivoted to one end of a lever fulcrumed in a shaft, which is journaled in a supporting-frame, the other end of the lever having a segmental rack thereon which engages with a pinion mounted on a shaft journaled in said frame, a hammer attached to the pinion-shaft, and a bell, substantially as described.

10. An air-pump consisting of two metallic cups, A B, a cup-shaped diaphragm in one of the cups, B, clamped at its edge between the rims of the two cups A B and forming an air-tight partition between the two cups, the cup B having a port leading to an air-tube, and the cup A having a piston working through its base and attached at its upper end to the diaphragm E, a stopper on the convex side of the diaphragm to close the port in the cup B, and a spring connected with the piston to keep the port closed, in combination with an air-tube leading from the port in cup B and an air-chamber, J, at the end of the tube, the wall opposite that through which the tube enters consisting of a flexible diaphragm, a piston with one end secured to the diaphragm and the other end pivoted to one end of a lever fulcrumed in a shaft, which is journaled in a supporting-frame, the other end of the lever having a segmental rack thereon which engages with a pinion mounted on a shaft journaled in said frame, a hammer attached to the pinion-shaft, a bell, and a regulating device for holding the hammer under tension during a part of its upward movement, and then releasing the tension before the blow, substantially as described.

11. An air-pump consisting of two metallic cups, A B, a cup-shaped diaphragm in one of the cups, B, clamped at its edge between the rims of the two cups A B and forming an air-tight partition between the two cups, the cup B having a port leading to an air-tube, and the cup A having a piston working through its base and attached at its upper end to the diaphragm E, a stopper on the convex side of the diaphragm to close the port in the cup B, and a spring connected with the piston to keep the port closed, in combination with an air-tube leading from the port in cup B and an air-chamber, J, at the other end of the tube, the wall opposite that through which the tube enters consisting of a flexible diaphragm, a piston with one end secured to the diaphragm and the other end pivoted to one end of a lever fulcrumed in a shaft which is journaled in a supporting-frame, the other end of the lever having a segmental rack thereon which engages with a pinion mounted on a shaft journaled in said frame, a hammer attached to the pinion-shaft, a bell, and a regulating device for holding the hammer under tension during a part of its upward movement, and then releasing the tension before the blow, substantially as described.

12. An automatic bell-ringing apparatus consisting of an air-pump composed of two metallic cups, one of which has a port connecting with an air-tube, a flexible cup-shaped diaphragm within said cup and clamped at its edge between the rims of the two cups, a piston working through a hole in the base of the second cup, the inner end of the piston being secured to the diaphragm, a stopper on the convex side of the diaphragm to close the port leading to the air-tube, a fragile connection of the piston with the piston of a similar pump in an adjoining car, a flexible hose-connection between the air-tubes of the two cars, and an air-chamber into which the end of the air-tube opens, said air-chamber having a flexible diaphragm connected with a bell, the bell being operated by suction of air from the air-chamber by means of the said pump, the hose-connection between the cars being so adjusted that the separating of the cars will cause the chain connecting the pistons of the pumps to pull the piston and ring the bell before the hose breaks, substantially as described.

396,609. DRAFT-EQUALIZER. EDWARD SOBERICK, Columbus, Ohio, assignor to the Lochner Manufacturing Company, same place. Filed Oct. 12, 1886. Serial No. 216,013. (No model.)



Claim.—1. In combination with the shafts and the cross-bars, the levers provided with the downwardly-projecting hollow hubs, and with the throats below the parts C C, and the bar E, provided with the cross-pivots mounted in the throats, substantially as set forth.

2. In combination with the shafts and the cross-bars, the levers provided with the downwardly-projecting hollow hubs C', with the throats below the parts C C, and with the shoulders *c' c'*, and the elastic bar pivoted in the throats, substantially as set forth.

396,610. TAG-FASTENER. CHARLES SCHOOLEDER, Beatrice, Nebr. Filed July 31, 1888. Serial No. 281,560. (No model.)



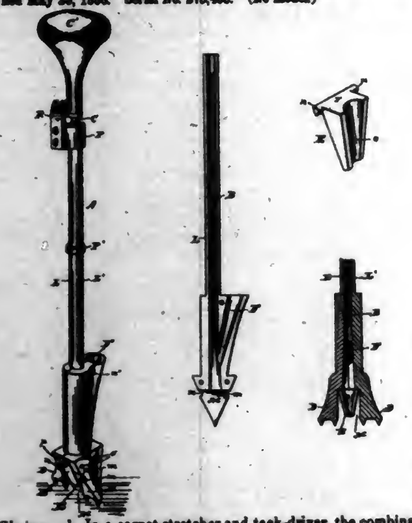
Claim.—1. The fastener having an outer frame, C, provided at its lower side with a hook or catch, *c*, and the pin connected to the frame and adapted to engage the hook or catch, combined with a tag arranged between the frame and the pin and provided in its lower edge with a notch, *g*, to fit over the hook or catch, substantially as specified.

2. A fastener provided with a frame, C, pressure-fingers connected to the frame and bearing toward the same, and the pin B, substantially as specified.

3. A fastener comprising the frame C, provided with a hook or catch, *c*, at its lower side, the angular pressure-fingers F, having their outer sides connected to the frame and their inner sides connected together, and the pin B, connected at its upper end to the inner sides of the fingers, substantially as specified.

4. The herein-described fastener, formed from a single piece of spring-wire and comprising the frame C, having the hook or catch *c* at its lower side, the pressure-fingers F F, arranged between the sides of the frame and comprising the outer sides, *f*, formed on the upper ends of the sides of the frame C by bends *f*³, and inner sides, *f'*, joined together, and the pin B, integral with one of the sides *f'* and engaging the hook or catch *c* at its free end, substantially as specified.

396,611. CARPET-STRETCHER AND TACK-DRIVER. HENRY L. SOUTHER, Rochester, N. Y., assignor to Freeman Clarke, same place. Filed May 20, 1888. Serial No. 275,455. (No model.)



Claim.—1. In a carpet-stretcher and tack-driver, the combination, with the stock divided longitudinally, formed in two sections, each section containing a portion of the plunger and tack-receiving channels, one of the stretcher-prongs and the recessed portions beside the prongs, and the sockets or bearings for the jaws, of fastening devices for holding the sections together, the tack-holding jaws having the projections or trunnions arranged to co-operate with the recesses in the sections, substantially as described.

2. In a combined carpet-stretcher and tack-driver, the combination, with the stock divided longitudinally, formed in two sections, each containing a portion of the plunger and tack-receiving channels, one of the stretcher-prongs, recessed portions beside the prongs, and the recesses for the bearings for the tack-holding jaws, of fastening devices for holding the sections together, the tack-holding jaws having the trunnions or projections arranged to co-operate with the recesses in the sections when placed in them, and springs for pressing the jaws toward each other, substantially as described.

3. In a carpet-stretcher and tack-driver, the combination, with the stock, of a collar or ring on the upper end thereof, having a tack-drawing claw formed upon or attached to it, substantially as described.

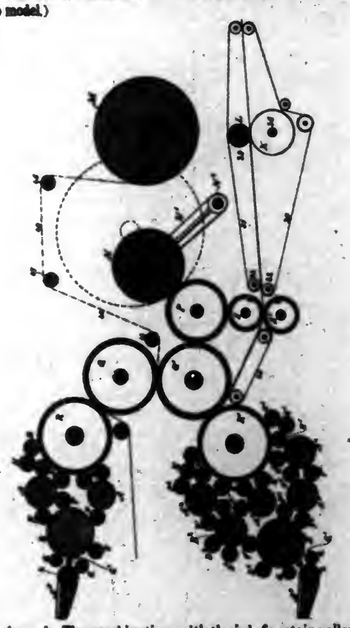
4. In a carpet-stretcher and tack-driver, the combination, with the stock constructed in two parts, of a collar or ring for binding them together, having a tack-drawing claw formed upon or attached to it, substantially as described.

5. The combination, with the stock having the plunger-channel, an opening communicating therewith for the insertion of tacks, and the open-sided recesses formed at the sides of the end of the plunger-channel, of the tack-holding jaws having bearing portions formed thereon arranged to enter the recesses in the stock, and the springs bearing upon the jaws for holding the bearing portions in the recesses and pressing them together, substantially as described.

6. The combination, with the stock having the plunger-channel, an opening communicating therewith for the insertion of tacks, and the open-sided recesses formed on the sides of the plunger-channel, of the tack-holding jaws having bearings fitting said recesses, and a face engaging the stock and preventing movement too far inward, and the springs bearing on said jaws, holding their bearing portions in the recesses, and pressing them toward each other, substantially as described.

7. The combination, with the stock having the plunger-channel, an opening communicating therewith for the insertion of tacks, and the open-sided recesses formed on the sides of the plunger-channel, of the tack-holding jaws having bearings fitting said recesses, and the flat springs secured to the stock and bearing upon the jaws, holding their bearing portions on the recesses, and pressing them toward each other, substantially as described.

396,612. INKING APPARATUS FOR PRINTING-MACHINES. WALTER SCOTT, Plainfield, N. J. Filed Oct. 10, 1887. Serial No. 251,872. (No model.)



Claim.—1. The combination, with the ink-fountain roller and the ink-distributing cylinder, of two ductor-rolls, a rock-shaft between the ductor-rolls, and arms extending out in opposite directions and supporting such ductor-rolls, and mechanism for vibrating the rock-shaft and moving the ductor-rolls simultaneously into contact with the fountain-roll and distributing-cylinder, respectively, substantially as set forth.

2. The combination, with the ink-fountain roll and the ink-distributing cylinder, of two ductor-rolls, a rock-shaft and arms extending out in opposite directions and carrying the ductor-rolls, and adjustable bearings upon the arms for one of the ductor-rolls, substantially as set forth.

3. The combination, with the ink-fountain roll and ink-distributing cylinder, of two ductor-rolls, a rock-shaft and arms carrying the ductor-rolls, a crank-arm upon the rock-shaft, an adjustable link, a lever, and a cam and connecting-link for giving motion to the parts, substantially as set forth.

4. The combination, with the two ink-fountains and their rolls and the ink-distributing cylinders, of two ductor-rolls to each ink-fountain roll, a rock-shaft and arms for the ductor-rolls, crank-arms on the ends of the respective rock-shafts, adjustable links connected

to the said rock-shaft and connected to each other at their ends, and mechanism, substantially as specified, for giving motion to the adjustable links and moving the ductor-rolls simultaneously, substantially as set forth.

396,613. STREET OR STATION INDICATOR. WILLIAM F. SEELEY, Detroit, Mich. Filed Sept. 20, 1888. Serial No. 285,882. (No model.)



Claim.—1. In a street and station indicator, the combination, with the casing, the rollers C C', the apron, and the rollers B B', having the ratchet-wheels and pawls, of the bevel-gear H on the ends of the roller-journals, the bevel-gears H' on the shaft A, meshing with the gears H, the shaft projecting through the rear of the casing and provided with the handle K', and the spring-controlled stop-pin passing through the handle K', substantially as specified.

2. In a street or station indicator, the combination, with the casing, the rollers C C', the apron, and the rollers B B', having the ratchet-wheels, of the dials provided with the depressions *i* and secured to the outer face of the casing, the cranks J on the roller-journals, the spring-controlled pins passing longitudinally through the handles, and the projections *j* on the knobs, adapted to enter the depressions *i* in the dials I, substantially as specified.

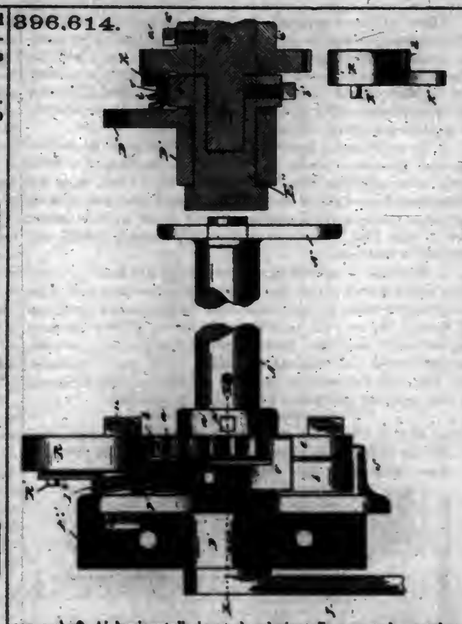
396,614. MECHANISM FOR OPERATING CAR BRAKES AND COUPLINGS. HENRY H. SIMMONS, Pullman, assignor to the Pullman's Palace Car Company, Chicago, Ill. Filed Jan. 30, 1888. Serial No. 262,209. (No model.)

Claim.—1. In railway-car construction, a shaft pivotally mounted in a horizontal position in the timbers of the car-platform that is adapted for winding thereon, a chain or cable for operating the brakes or coupling of the car, a ratchet rigidly mounted on said shaft, an actuating-pawl having a movable bearing and adapted to engage with said ratchet, a retaining-pawl having a permanent bearing and adapted to engage with the ratchet, a lever connected with the actuating-pawl, adapted by a reciprocating movement thereof to impart a like movement to the said actuating-pawl, a stationary tripping part by which the ratchet end of the actuating-pawl is disengaged when the lever is brought to a given position, and a movable tripping point or cam actuated by the lever and adapted to disengage the retaining-pawl from the ratchet when the parts operated by the lever are in such position that the actuating-pawl is also disengaged.

2. In railway-car construction, a shaft to which is attached a chain or cable, the latter adapted for operating the brakes or coupling, said shaft having a horizontal position and pivotally bearing on the car-timbers, a ratchet-wheel mounted rigidly on said shaft, a pivotal sleeve or shank that serves as a bearing for one end of the shaft to which the chain or cable is attached, a cam rigidly secured on said sleeve or shank, a pawl mounted on said cam and adapted to engage with the ratchet-wheel, a retaining-pawl, also adapted to engage with the ratchet having a permanent bearing, and a lever so connected with the mechanism as to be adapted to operate the actuating-pawl.

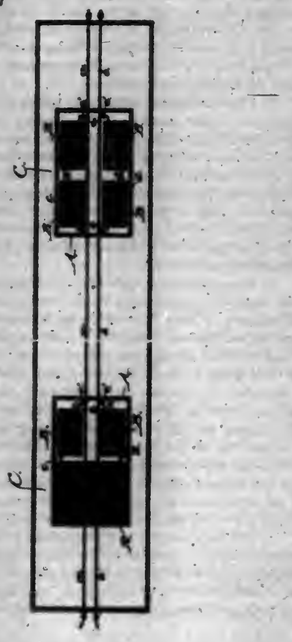
3. In railway-car construction and applied to the platform of a

396,614.



car, a shaft, A', horizontally located and pivotally mounted, a ratchet, *c*, rigidly mounted on said shaft, a bearing, D', a pivotal shank or sleeve, E', adapted as a journal-bearing for the end E of the shaft, a cam, *b*, rigidly mounted on the shank or sleeve E', a pawl, E, secured to said cam, a pawl, R, attached to the permanent structure, a spring, *i*, for holding said pawl in engaged position, a movable toe or tripping part, *b'*, for disengaging the pawl R, a permanent tripping part, S, for disengaging the pawl *c*, and the lever J, adapted when not in use to occupy a horizontal position at the side of the platform that is so connected with the actuating mechanism as to be available for operating the same, substantially as described.

396,615. APPARATUS FOR HEATING RAILWAY-CARS. PATRICK H. SEARNOS, Jamestown, N. Y., assignor of one-half to Fred Bates and Henry H. Cooper, same place. Filed Nov. 5, 1887. Serial No. 254,593. (No model.)

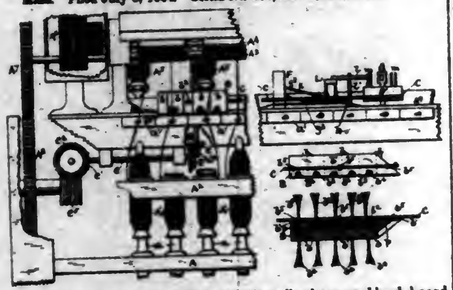


Claim.—1. In an apparatus for heating railway-cars, the caloriferes consisting of external boxes or receptacles and internal independent chemically-filled flasks or receptacles, in combination with the steam-pipes leading from the engine, and branch pipes connecting with the main pipes at points inside of the caloriferes passing through and independently coiled in each internal flask or receptacle, whereby its contents are heated, substantially as described.

2. In a car-heating apparatus, the main steam-pipes, in combination with caloriferes secured in the cars and consisting of exterior boxes, chemically-filled flasks or receptacles within said boxes but independent thereof and of each other, and pipes connected with the main pipes having a plural number of coils, one of which is located inside of each flask, whereby its contents are internally heated, substantially as described.

3. The boxes or caloriferes, and the independent flasks or receptacles placed therein so as to leave a surrounding air-space, said boxes containing chemicals, in combination with the main steam-pipes passing through the cars and caloriferes, and branch pipes of the same diameter as the main pipes connected with said pipes at points inside the outer boxes and independently coiled within each chemically-filled flask, and the cocks in the main and branch pipes for directing the course of the steam, substantially as described.

396,616. CLEARER FOR REMOVING WASTE, &c., FROM THE TOP OF SPINNING-FRAMES, &c. WILLIAM E. SHARPLES, Fall River, Mass. Filed July 5, 1884. Serial No. 136,813. (No model.)



Claim.—1. The combination, with the roller-beam and back board of a ring-spinning frame, twisting-frame, speeder, or similar machine, of the cleaning device and an endless belt or band connected to said device for moving it along the top of the machine in the path of said band, revolving supports for the band, and means, substantially as described, for driving said band from the working parts of the machine, the said cleaning device being thereby caused to pass over the top of the frame upon one side of the central line of the roller-beam when moving in one direction and upon the other side of said line when moving in the opposite direction, cleaning the whole of the roller-beam, the back board, and other parts immediately adjoining the roller-beam, substantially as described.

2. The combination, with a ring-spinning frame, twisting-frame, speeder, or similar machine, of the cleaning device B, operating on both sides of the central line of the roller-beam, an endless belt or band, C, connected to said device for continuously moving it along the top of the machine, revolving supports for said belt, means, substantially as described, for driving said belt from the working parts of the machine, and one or more waste-retainers, substantially as described, located in the path of movement of the device B and adapted, as described, to remove therefrom the waste, &c., collected by the device, substantially as set forth.

3. The combination, with the roller-beam, back board, and guide-wire board of a ring-spinning frame, twisting-frame, speeder, or similar machine, of an endless belt or band, revolving supports for such band, located upon the roller-beam, a cleaning device directly attached to said band and having upon its bottom and projecting laterally from the sides thereof upon both sides of said band means, substantially as described, for cleaning the top of the frame, and means, substantially as described, for driving said band from the working parts of the machine, the said cleaning device being thereby caused to pass over the top of the frame upon one side of the central line of the roller-beam when moving in one direction and upon the other side of said line when moving in the opposite direction, cleaning the whole of the roller-beam, the back board, and other parts immediately adjoining the roller-beam, substantially as described.

4. The combination, in a ring-spinning frame, twisting-frame, speeder, or similar machine having hinged guide-wire blocks, of the cleaning device B, pointed or beveled at its forward end to turn down any of such guide-wire blocks that may have been left up after doffing, and having its bottom and two lateral sides provided with means, substantially as described, for cleaning the top of the frame, an endless band or belt, C, attached directly to said device for continuously moving it along the top of the machine, revolving supports for the band, located on the roller-beam of the machine, means, substantially as described, for driving said band from the working parts of the machine, and one or more waste-retainers, substantially as described, located in the path of movement of the cleaning device B, and adapted, as described, to remove the waste, &c., collected upon the bottom and sides of the cleaning device, said cleaning device being made to project upon both sides of the band C, so that by one round trip the whole of the roller-beam is cleaned, substantially as described.

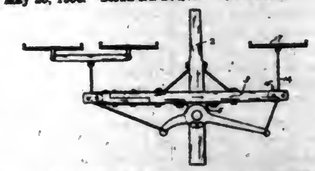
5. The combination, with a ring-spinning frame, twisting-frame, speeder, or similar machine, of the cleaning device B and endless belt *c*, connected to said device for continuously moving it along the top of the machine, revolving support for said belt, means, substantially as described, for driving said belt from the working parts of the machine, one or more waste-retainers, substantially as described, located in the path of movement of the device B, and adapted, as described, to remove therefrom the waste, &c., collected by the device, and means, substantially as described, for cleaning the belt C, substantially as set forth.

6. The combination, with a ring-spinning frame, twisting-frame, speeder, or similar machine, of the cleaning device B, composed of a series of blocks flexibly jointed together and provided with brushes b^4, means, substantially as described, for giving said device a continuous movement along the top of the machine, one or more waste-retainers, F, located in the path of movement of the device B, and provided with flannels, as described, for removing the waste, &c., from the brushes b^4, and having the flannels on the inner side raised above the top of the machine, as described, and the plate H, located transversely between said flannels, substantially as set forth.

7. The cleaning device B, composed of a series of blocks flexibly connected together, with the foremost block beveled or pointed, and said blocks provided with flannels b^3 and brushes b^4, substantially as and for the purposes specified.

8. The waste-retainer F, having openings f' and f^3, flannels g g' g^2 g^3, extending from the openings f^3, the upper flannels being weighted, as described, the plate H, and the wire K, for supporting the outer end of the flannel g^3, substantially as and for the purposes specified.

396,617. DRAFT-EQUALIZER. FRANK SHERIDAN, Rockford, Minn. Filed May 23, 1888. Serial No. 274,797. (No model.)



Claim.—1. In a draft-equalizer, the combination, with the tongue, of the bar 3, adapted to be adjusted laterally upon the tongue, so as to have its longer end upon either side of the said tongue, the reversible lever 7, pivoted upon the tongue at the rear of said bar, and the cables or chains connecting the ends of the lever with the whiffletrees, substantially as described.

2. In a draft-equalizer, the combination, with the tongue, of a casting, 5, secured to said tongue, a lever, 7, pivoted upon said casting and capable of being reversed thereon, and the extensible bar 3, adjustably secured to the said casting and arranged to be extended to the right or left, substantially as described.

396,618. ELECTRIC-RAILWAY TROLLEY AND SUPPORT. SIDNEY H. SHORT, Columbus, Ohio. Filed Nov. 12, 1888. Serial No. 290,614. (No model.)

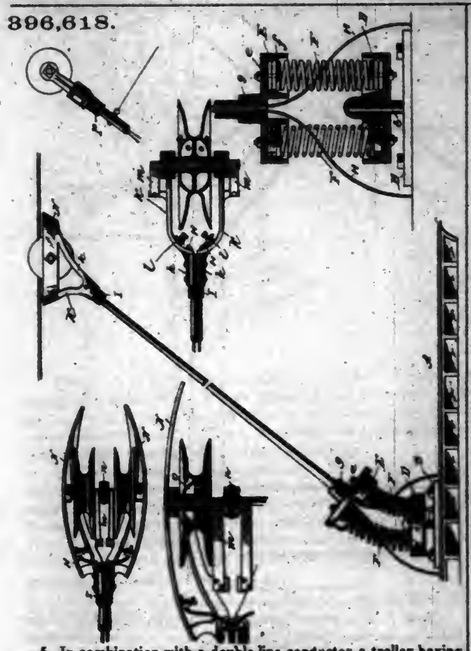
Claim.—1. The spring-support for the trolley-rod, consisting of a pair of springs attached to suitable caps and arranged one in front and the other in rear of the axis of the trolley-rod, whereby one is made to act under tension and the other under compression, substantially as described.

2. The lower cap formed with a socket, the upper cap carrying the trolley-rod, seats in said caps for the springs, and springs connected to said seats and arranged to act under tension or compression, and a stud, *b*, fitted to the central socket, substantially as described.

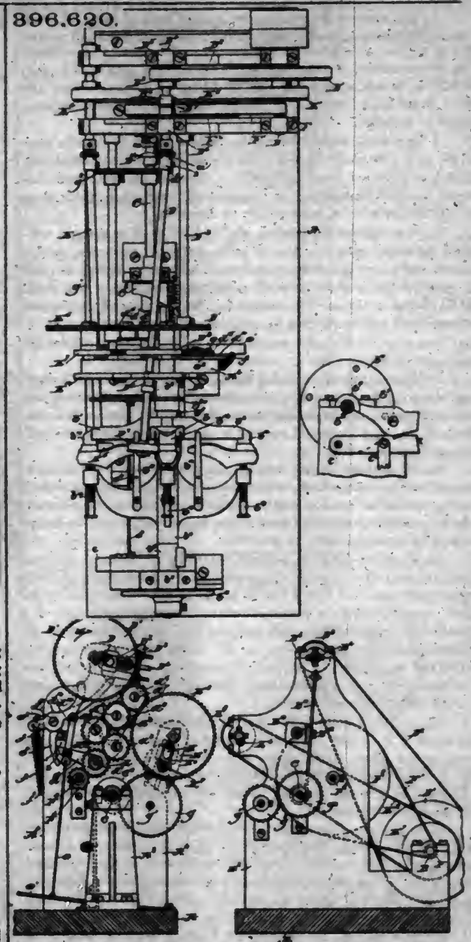
3. The insulating-sleeve on the upper end of the trolley-rod, the arms K, having shanks fixed to the sleeve, and the trolley-wheels, all substantially as described.

4. In combination with the shaft of the contact-wheel, the arms K, and the brush-connection extending directly between the wheel-axle and the arms K, substantially as described.

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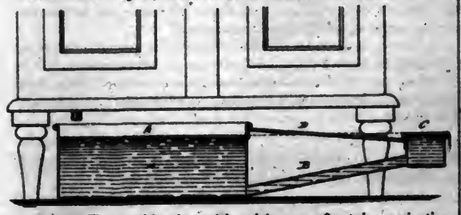


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5. In combination with a double-line conductor, a trolley having a pair of wheels mounted on axles which revolve therewith, insulating material between the ends of the axles, said wheels being arranged each to bear upon one of the wires of the double line, and independent electrical connections between each axle and one terminal of the motor, substantially as described.

396,619. PAN FOR ICE-BOXES. CHARLES W. SMITH, Brooklyn, N. Y. Filed July 16, 1888. Serial No. 280,131. (No model.)



Claim.—The combination, with a drip-pan, of a tube projecting from one side of the same, and a cup on the end of said tube and connected with the drip-pan by said tube, the top of said cup being open and the top edge of the cup being some distance below the top edge of the drip-pan, substantially as set forth.

396,620. MACHINE FOR FINISHING HEELS OF BOOTS OR SHOES. JOHN P. SMITH, Exeter, N. H. Filed Feb. 7, 1888. Serial No. 263,305. (No model.)

Claim.—1. In the herein-described machine for treating the heels of boots or shoes, the rotating shaft b^3, capable of sliding longitudinally in bearings or boxes secured to the frame of the machine, and a plurality of jacks secured thereto, combined with a plurality of tools to act on the heels of the boots or shoes held by the said jacks, gearing, substantially as described, to operate said tools, and with lifting devices to move the rotating tools away from the said heels preparatory to moving the said shaft longitudinally, in order to enable the jack to be rotated, whereby a jack containing a shoe which has been acted upon by one tool may be brought into position to be acted upon by a second tool, substantially as described.

2. In the herein-described machine for treating the heels of boots or shoes, a shaft capable of sliding in its bearings, and a plurality of jacks secured thereto, combined with a plurality of tools to act on the heels of the boots or shoes held by the said jacks, gearing, substantially as described, to operate said tools, and with a stop mechanism to move the operating-tools away from the said boots or shoes to permit the said shaft to be moved longitudinally to remove the jacks out of the path of movement of the said tools, thereby enabling a jack containing a shoe which has been acted upon by one tool to be brought into position to be acted upon by a second tool, and provided with a guard or clamp for the toe of the boot or shoe, substantially as described.

3. In a machine for treating the heels of boots or shoes, a power-shaft and a driving-shaft, F^3, and two tool-carrying shafts, D E, rotated by the said power-shaft, guide arms or yokes D^6 E^{10} for the tool-shafts, gears D' E^9, connected to the said yokes, an intermediate gear, d^5, to mesh with the gears D' E^9, a second intermediate gear, d^3, in mesh with the gear d^4, a gear, F^4, on the driving-shaft, and a gear, d, in mesh therewith, combined with a driving-gear, d^2, and a reversing-gear, d^4, and with levers connected to and so as to operate the said driving and reversing gears, substantially as described.

4. In a machine for treating the heels of boots or shoes, a jack consisting of an arm, as *b*, provided with a seat having an opening, b^{16}, and a breasting-knife adapted to enter the said opening, substantially as described, combined with a second arm and a clamping device carried thereby, and by which the heel of a boot or shoe is held to its seat, substantially as described.

5. In a machine for treating the heels of boots or shoes, a jack consisting of an arm, as *b*, provided with a seat having an opening, as b^{16}, and a second arm and a clamping device carried thereby, and by which the heel of a boot or shoe is held to its seat, combined with a clamp consisting of spring-arms, as b^{18}, to engage the toe of a boot or shoe, as and for the purpose specified.

6. In a machine for treating the heels of boots or shoes, the combination, with a sliding shaft, of a jack mounted thereon and having an arm provided with a seat for the heel of a boot or shoe, and having an opening, as b^{16}, a breasting-knife adapted to enter the said opening and breast the heel, and a cam for moving the said breasting-knife, substantially as described.

7. In a machine for treating the heels of boots or shoes, the combination, with a shaft, of a jack mounted to slide thereon and consisting of an arm, as *b*, provided with a seat, and a second arm, a clamping device carried thereby, and by which the heel of a boot or shoe is held to its seat, a clamp to engage the toe of a boot or shoe, and a breasting-knife and cam for moving the same to operate substantially as described.

8. In a machine for treating the heels of boots or shoes, a cam-shaft, as **C**, provided with a cam and a breasting-knife, combined with a spring-controlled lever connected to the said breasting-knife and acted upon by the said cam to automatically produce reciprocations of the breasting-knife, substantially as described.

9. In a machine for treating the heels of boots or shoes, a tool-shaft provided with a sleeve or collar having lugs or ears, as *a'*, a second shaft having a sleeve or collar provided with lugs or ears, and a square block, as a^9, to unite the shafts, combined with a cam-shaft, as C, having a cam, as B^{14}, and with a lever connected to the said second shaft and acted upon by the said cam to produce a longitudinal movement of the said second shaft, substantially as and for the purpose specified.

10. In a machine for treating the heels of boots or shoes, a former, and a tool-shaft adapted to travel over said former, combined with a conical sleeve mounted on said shaft and adjustable thereon to enable heels of the same shape, but varying in size, to be operated upon, substantially as described.

11. In a machine for treating the heels of boots or shoes, a former and a tool-shaft adapted to travel over said former, combined with a conical or tapering sleeve adjustably mounted on the said tool-shaft to enable heels of the same shape, but varying in size, to be operated upon, substantially as described.

12. In a machine for treating the heels of boots or shoes, a jack-carrying shaft capable of longitudinal movement and a tool-carrying shaft provided with a tool to act on a boot or shoe held by the jack, combined with a stop mechanism consisting, essentially, of a lever, as b^9, to engage the jack-carrying shaft and prevent its longitudinal movement, and a lever, as b^{20}, to engage the tool-carrying shaft and move it out of the path of movement of the jack, and connections, substantially as described, between said levers, substantially as and for the purpose specified.

13. In the herein-described machine for treating the heels of boots or shoes, a reversing mechanism consisting, essentially, of a loose gear, as *d*, a sleeve, as d^3, having gears d^3 d^5, and an arm, d^{12}, combined with a lever, as d^{14}, connected to the said arm, and with a second lever, as c^3, to be engaged by the arm d^{12}, substantially as and for the purpose specified.

14. In the herein-described machine for treating the heels of boots or shoes, a reversing mechanism consisting, essentially, of a loose gear, as *d*, a sleeve, as d^3, having gears d^3 d^5, and an arm provided with a toe or projection, combined with a lever, as d^{14}, connected to the said arm, and with a second lever, as c^3, provided with notches to be engaged by the said toe or projection, substantially as described.

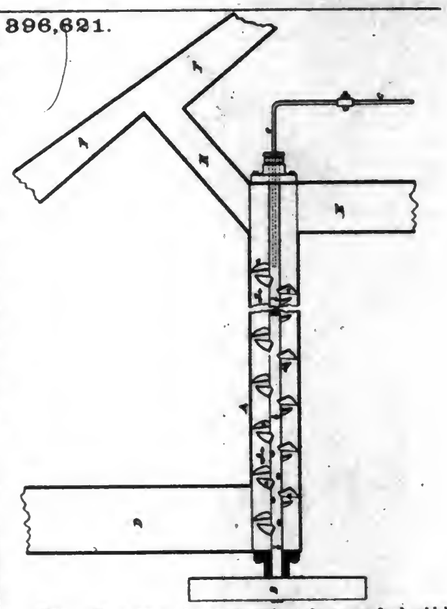
15. In a machine for treating the heels of boots or shoes, a reversing mechanism consisting, essentially, of a loose gear, as *d*, a sleeve, as d^3, having gears d^3 d^5 and an arm, a lever, as d^{14}, connected to said arm, and a second lever, combined with a support, as D^3, for a tool-shaft, and gearing, substantially as described, to produce rotation of the tool-shaft, the said support alternately acting on the levers d^{14} c^3 to alternately cause the gears d^5 d^4 to be engaged with the gearing rotating the tool-shaft, substantially as described.

16. In a machine for treating the heels of boots or shoes, a jack-carrying shaft capable of longitudinal movement, and a tool-carrying shaft having bearings in a movable support, combined with a stop mechanism consisting, essentially, of a lever, as b^9, to engage the jack-carrying shaft and prevent its longitudinal movement, and a lever, as b^{20}, to engage the tool-carrying shaft and move it out of the path of movement of the jack, and connections, substantially as described, between said levers, substantially as and for the purpose specified.

17. In a machine for treating the heels of boots or shoes, a jack-carrying shaft capable of longitudinal movement, and a tool-carrying shaft provided with a tool to act on a boot or shoe held by the jack, combined with a stop mechanism consisting, essentially, of a lever, as b^9, to engage the jack-carrying shaft and prevent its longitudinal movement, and a lever, as b^{20}, to engage the tool-carrying shaft and move it out of the path of movement of the jack, and means, substantially as described, to prevent rotation of the jack-carrying shaft when the lever b^9 is in engagement with the said jack-carrying shaft, substantially as described.

396,621. PREPARING WHEAT FOR FOOD. RICHARD SMITH, Stoke-on-Trent, County of Stafford, England. Filed Jan. 20, 1887. Serial No. 225,914. (Specimens.) Patented in England Oct. 6, 1886, No. 12,736; in France Nov. 2, 1886, No. 178,380, and in Germany Mar. 22, 1887, No. 42,457.

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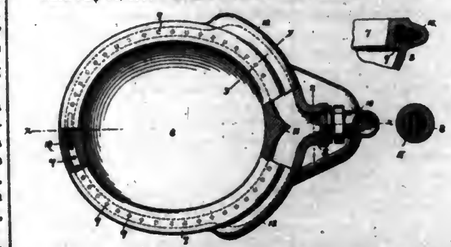
Claim.—The process of preparing wheat for use as food, which consists in subjecting wheat-germs to the action of superheated steam until the flavor of the germs is imparted to the steam, and then subjecting the broken wheat to the action of the same steam, substantially as described.

396,622. WATERPROOFING COMPOUND. CHARLES T. SNEDEKOR, New York, N. Y. Filed Oct. 6, 1888. Serial No. 287,411. (No specimens.) Patented in Canada Dec. 7, 1888, No. 43,500.

Claim.—1. A composition of matter for waterproofing purposes, consisting of asphalt, glue, cotton-seed oil, peroxide of manganese, talc, china-clay, isinglass, ammonia, linseed-oil, copal gum, pyrites, and coloring material, substantially as described.

2. A composition of matter for waterproofing purposes, consisting of liquid asphalt, glue, cotton-seed oil, peroxide of manganese, French talc, china-clay, Russian isinglass, ammonia, linseed-oil, West India copal gum, Zanzibar copal gum, pyrites, and lamp-black, substantially as described.

396,623. WATER-CLOSET. SAMUEL F. SHIPPEN, New York, N. Y. Filed July 31, 1888. Serial No. 281,567. (No model.)

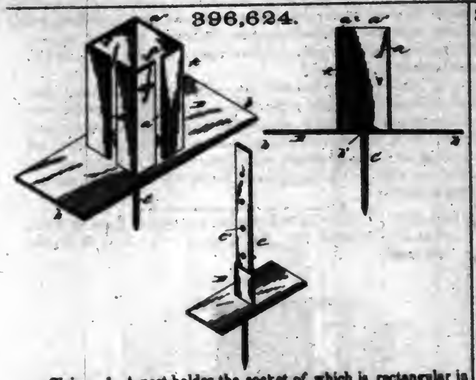


Claim.—1. A washout water-closet provided with an inlet-nozzle at the rear of the bowl, and having a perforated flushing-rim composed of contracted and enlarged portions, the latter being arranged adjacent to the inlet-nozzle, and the former extending from the enlarged portions to the front of the bowl and constructed thereat to provide the greatest discharge, substantially as set forth.

2. A washout water-closet provided with an inlet-nozzle at the rear of the bowl, a divider opposite said nozzle, and a perforated flushing-rim composed of contracted and enlarged portions, the latter being arranged adjacent to the inlet-nozzle, and the former extending from the enlarged portions to the front of the bowl and constructed thereat to provide the greatest discharge, as set forth.

396,624. POST-HOLDER. WILLIAM B. THOMAS, Green Camp, Ohio. Filed Sept. 28, 1888. Serial No. 286,668. (No model.)

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Claim.—1. A post-holder the socket of which is rectangular in shape and provided with two slots extending from the bottom to the top and dividing the said socket into two unequal parts, the larger of which acts as the post-holder and the smaller as a clamp to hold the post securely in position, substantially as described.

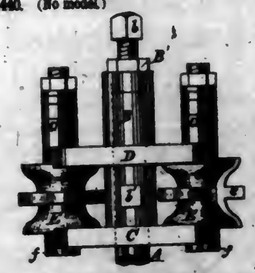
2. The combination, with a post-holder the socket of which is rectangular in shape and provided with two slots extending from the bottom to the top and dividing the said socket into two unequal parts, the larger of which acts as the post-holder and the smaller as a clamp, of a bar passing through the base of the socket and having a rounded head, on which the post rests, substantially as and for the purpose specified.

396,625. HOSE-CLAMP. OTTO TEUN, Grand Rapids, Mich. Filed Oct. 5, 1888. Serial No. 287,284. (No model.)



Claim.—A clamp consisting of a divided ring having a tapering underlap and an overlapping portion, parallel studs *d*, connected by means of a bolt, the stud of the overlap being set back from the end of the ring to form the strengthening-lug *e*, substantially as described.

396,626. CUTTER-HEAD. JAMES P. THURMAN, Atlanta, Ga., assignor of one-half to John T. Thurman, same place. Filed Feb. 17, 1888. Serial No. 264,440. (No model.)

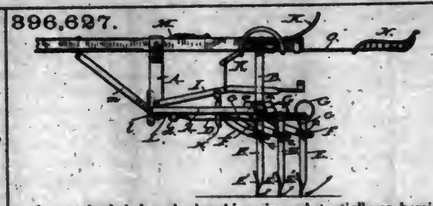


Claim.—A cutter-head consisting of the mandrel A, sleeve B, and flanges C and D, in combination with the cutters *e*, secured to said flanges by means of bolts *f*, passing through the centers of said cutter and the flanges, and provided with washers G, substantially as shown and described.

396,627. CULTIVATOR. JOHN G. THUFF, Richville, Mich. Filed Oct. 31, 1888. Serial No. 289,800. (No model.)

Claim.—1. The main frame, the arched axle, the drag-bars, and the forked shovel-standards, in combination with the braces pivoted to said drag-bars and passed through the forked ends of the standards, breaking-pins securing said braces to the standards, and coiled springs having one end secured to the drag-bars and the opposite end secured to the standards below the breaking-pins, substantially as herein described.

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2. In a cultivator, the main frame having the arched front portion, the arched axle secured to said frame at its rear, and the drag-bars and attachments, in combination with the removably-secured plate, to which the central drag-bars are attached, a draft attachment extending above and below said plate, and a brace extending from the draft attachment to the pole or tongue, substantially as herein described.

3. In a cultivator, the combination, with the main frame, the main axle and bearing-wheels, and the drag-bars and attachments, of the pole or tongue and the seat having a spring-standard removably secured beneath the rear end of the pole or tongue, substantially as herein described.

4. In a cultivator, the main frame, the main axle and bearing-wheels, and the drag-bars and attachments, in combination with the yoke H, consisting of the upper and lower longitudinal bars *g* and the vertical uniting-bars *h*, arranged in pairs and separated from each other to permit the passage of the drag-bars, substantially as and for the purpose specified.

396,628. LOCK. HENRY VAN HOEVENBERGH, New York, N. Y. Filed July 19, 1888. Serial No. 280,416. (No model.)



Claim.—1. In a pin-tumbler lock, the combination, with a revolving tumbler-carrier, of a stationary holder having two series of ducts, in line with either of which the line of tumblers in the carrier may be placed by the revolution of the carrier.

2. The combination of a tumbler-case and a key-cylinder revolving therein, the case containing two series of tumbler-recesses, and the cylinder having one series of tumbler-recesses, which latter may be made to coincide with either series of recesses in the case by the revolution of the carrier, and tumblers of varying lengths in said recesses.

3. The combination of a tumbler-case having two series of tumbler-recesses, a tumbler-carrier or key-cylinder having one series of tumbler-recesses, which may be brought into line with either series in the tumbler-case by the revolution of the cylinder, and limiting-stops for arresting the cylinder in either position.

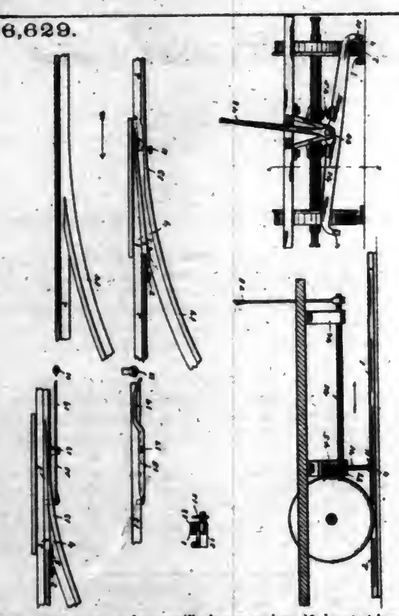
4. The combination of a tumbler-case having the series of tumbler-recesses, a tumbler-carrier or key-cylinder having one series of tumbler-recesses, which may be brought into line with either series in the tumbler-case by the revolution of the cylinder, limiting-stops for arresting the cylinder in either position, and tumblers of varying lengths in said recesses, whereby keys of different forms may be used to operate the lock.

396,629. RAILWAY-SWITCH. CHARLES W. WALKER, St. Paul, Minn. Filed July 17, 1888. Serial No. 280,174. (No model.)

Claim.—1. The combination, with the main track, of the pivoted switch-tongue 1, normally forming a part of the main rail and adapted to be thrown open to switch a car, a spring bearing at one end against the tail end of said tongue and at the other against the main stationary rail, a car adapted to run over the track and provided with a device to be depressed to move the tongue against the tension of said spring and adapted to be operated from the car-platform, and means between the device on the car and the tongue to transmit motion from the car to said tongue, said means comprising a lateral projection bearing against the tongue, and extending beyond the side of the rail and adapted to be moved for shifting the tongue, substantially as and for the purposes set forth.

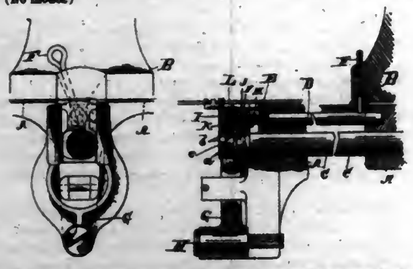
2. The combination, with the main track, a pivoted switch-tongue, and means for automatically returning the tongue to its normal position, of a car provided, essentially, with a rock-shaft, 40, a lever for

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oscillating the same, and an oscillating cross-bar, 41, located beneath the car and operated from said lever to bring one of its ends against a part connecting with said tongue to move the latter, substantially as and for the purposes set forth.

396,630. FEEDING MECHANISM FOR SEWING-MACHINES. SIMON W. WARDWELL, Jr., Woonsocket, R. I., assignor to William P Earle, trustee, Brooklyn, N. Y. Filed Sept. 2, 1886. Serial No. 212,563. (No model.)



Claim.—1. In a sewing-machine feed, the combination of a feed-frame, a slide mounted therein and provided with cloth-engaging projections, mechanism for giving the said slide up and down movements, another slide also mounted in the frame, and mechanism for giving forward and back motions to the said second slide, and through it to impart lateral motions to the frame and the other slide carried thereby, substantially as described.

2. In a sewing-machine feed, the combination of a feed-frame, a slide mounted therein having cloth-engaging projections, a cam for giving said slide up and down movements, another slide mounted in the frame, a cam for moving the said second slide, and an adjusting deflecting-guide with which the second slide engages, whereby said second slide and through it the frame and other slide are given lateral movements, substantially as described.

3. In a four-motioned feed for sewing-machines, the combination of a rocking frame having ways, two slides, one provided with cloth-engaging projections independently movable in said ways, cams for independently actuating said slides, and a deflecting-guide with which one of the slides engages, substantially as described.

4. In a sewing-machine feed, the combination of a rocking frame, two slides, one provided with cloth-engaging projections, movable independently of each other in said frame on lines radial to its pivot, cams for moving said slides independently, and means for imparting lateral motions to one of the slides to rock the frame, substantially as described.

5. In a sewing-machine feed, the combination of a rocking frame, two slides movable up and down therein independently of each other, one of the slides having feeding-teeth and the other a laterally-projecting stud, and a deflecting-guide with which said stud engages, whereby said slide is given a lateral motion and the frame rocked, substantially as described.

6. In a sewing-machine feed, the combination, with the main shaft and cams carried thereby, of two slides, one of which is provided with cloth-engaging projections, moved by said cams independently of each other, but in the same directions, a frame in which the slides are mounted, an adjustment-shaft, and a guide carried by said shaft, with which one of said slides engages and by which it is deflected, substantially as described.

396,631. SHUTTLE FOR SEWING-MACHINES. SIMON W. WARDWELL, Jr., Providence, R. I. Filed June 11, 1887. Serial No. 241,043. (No model.)

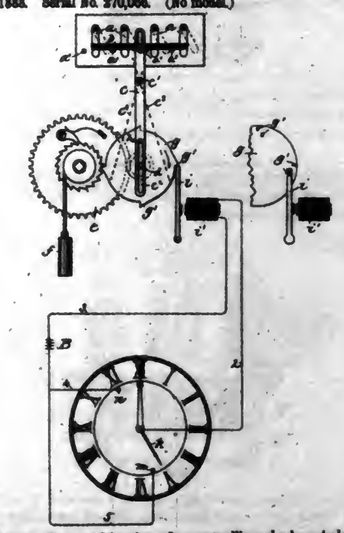


Claim.—1. A shuttle-case having two inner shoulders extending entirely around the bobbin, substantially in line with the inner edges or faces of the bobbin-heads, substantially as described.

2. A shuttle-case having flanges A', to retain the bobbin, and two inner shoulders extending entirely around the bobbin, substantially in line with the inner faces of the bobbin-heads, the case being recessed between the shoulders to form an annular recess entirely around the bobbin to receive the uncoiled thread, substantially as described.

3. A shuttle having a recess for the reception of a bobbin, provided with a tension-lever pivoted near one end mounted on one side of the body and having its other end arranged to bear on the thread, and a spring mounted at the side of the body opposite the lever, its long end bearing against the short end of said lever, and an adjusting-screw engaging with and regulating said spring, whereby the said lever is made to bear with more or less pressure upon the thread, substantially as described.

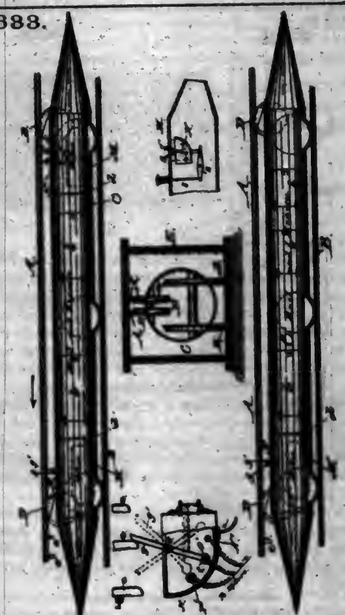
396,632. TIME-SWITCH. BENJAMIN F. WATKINS, Brockton, assignor of one-half to Moses H. Hatch, New Bedford, Mass. Filed Apr. 9, 1888. Serial No. 270,066. (No model.)



Claim.—The combination of a controlling-clock and electric contacts, as m and n, operated thereby, with a motor having a number of stop projections, as g', which are double the number of said clock-controlled electric contacts, and a detent, as i, co-operating with the stops of the motor and governed by the clock-controlled electric contacts, substantially as described.

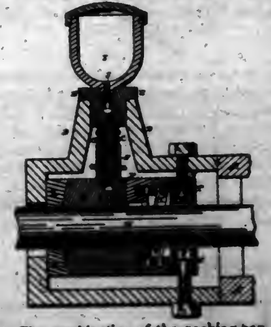
396,633. ELECTRIC-RAILWAY SYSTEM. DAVID G. WEEKS, Baltimore, Md., assignor to the Electro-Automatic Transit Company of Baltimore City, Maryland. Filed June 14, 1888. Serial No. 277,092. (No model.)

396,633.



Claim.—In an electric-railway system for transporting mail and packages, the combination, with upper and lower rails, and stops on the line of road, of an electrically-operated car, means for conveying the current thereto, and adjustable housings on the car having levers, which are actuated by the stops, substantially as and for the purpose described.

396,634. METALLIC PACKING. FRANK A. WESTBROOK, Port Jervis, and WINFIELD S. COOK, Middletown, N. Y.; said Cook assignor to said Westbrook. Filed Mar. 13, 1888. Serial No. 267,116. (No model.)



Claim.—1. The combination of the packing-box, the ring K, which forms a tight joint against the inner end thereof, the packing-ring H, which fits tightly against the piston-rod and forms a tight joint with the ring K, the ring P, which has a socket in its end to receive the conical end of the ring H, the spring Y, placed inside of the ring P, the collar T, and the screws which hold it in position, substantially as shown.

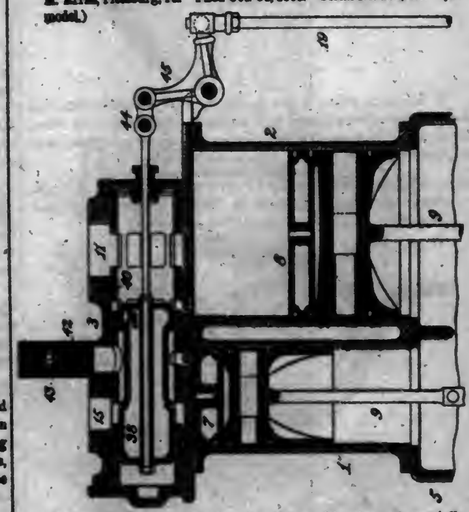
2. The combination of the packing-box, the ring K, which forms a tight joint against the inner side of its outer end, packing-ring H, provided with a shoulder or angular part, N, the ring P, having a socket in its end to fit over the conical part of the ring H, the recess O and the projections R, the ring Y, the collar T, provided with recesses S to receive the projections R, and the screws V, which pass through the side of the packing-box into the collar, substantially as described.

3. The combination of the packing-box, the packing-rings, the conducting-tube made in two parts, the spring C, placed between the two parts of the tube, the plug E, and the oil-cup provided with a valve, the packing-rings being held from turning upon the piston-rod W by suitable stops extending through the packing-box, substantially as set forth.

4. The combination of the packing-box, the packing-rings, which have a lateral movement with the piston-rod, and an adjustable oil-conducting tube having its inner end seated in or upon the packing-ring, the screw-plug, and the oil-cup, the packing-rings being prevented from turning upon the piston-rod W by stops which catch in the inner ring or collar, substantially as specified.

5. The combination of the packing-chamber, the ring K, the packing-ring H, the ring P, provided with the flange X, the collar T, and the screws V, the parts being arranged to operate substantially as shown and described.

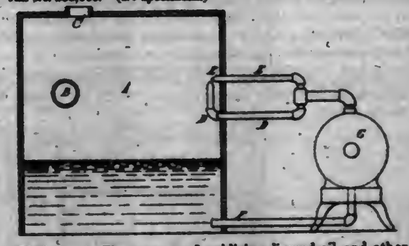
396,635. STEAM-ENGINE. HENRY H. WESTINGHOUSE and FRANCIS M. REYNS, Pittsburg, Pa. Filed Oct. 31, 1883. Serial No. 290,637. (No model.)



Claim.—1. In a compound engine, the combination, substantially as set forth, of a valve-chest, a high-pressure cylinder communicating by a continuously-open port therewith, and a clearance-chamber of variable capacity which communicates continuously with the valve-chest and high-pressure-cylinder port.

2. In a compound engine, the combination, substantially as set forth, of a valve-chest, a high-pressure cylinder communicating by a continuously-open port therewith, a clearance-chamber which communicates continuously with the valve-chest and high-pressure-cylinder port, and an adjustable head or plunger adapted to traverse within and be fixed in different positions in the clearance-chamber.

396,636. PROCESS OF OXIDIZING OILS OR OTHER LIQUIDS. GEORGE B. WIBER, South Newmarket, N. H. Filed Oct. 21, 1887. Serial No. 253,009. (No specimens.)



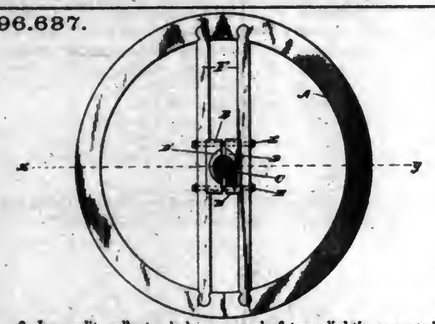
Claim.—1. The process of oxidizing linseed-oil and other oils and liquids by forcing the same alone in finely-divided particles into a body of air which is being constantly renewed, substantially as described.

2. The process of oxidizing linseed-oil and other oils and liquids by breaking the same into finely-divided particles by means of two currents of the oil or liquid striking against each other in a body of air which is being constantly renewed.

396,637. SPLIT PULLEY. WILLIAM A. WILLINGHAM, Chattanooga, Tenn. Filed Aug. 28, 1888. Serial No. 283,574. (No model.)

Claim.—1. In a split pulley, a bushing made up of two slightly separated parts, each having its external and its internal surface cylindrical, and each thinner in its middle than at either of its lateral edges, substantially as and for the purpose set forth.

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2. In a split pulley, a hub composed of two slightly-separated parts having in their adjacent faces registering bushing-grooves whose curved surfaces are portions of cylinders of a diameter greater than the greatest distance between those surfaces.

396,688. CABLE-RAILWAY STRUCTURE. WILLIAM H. YOUNG, Chicago, Ill., assignor of one-half to William J. Morden, same place. Filed May 23, 1888. Serial No. 274,846. (No model.)

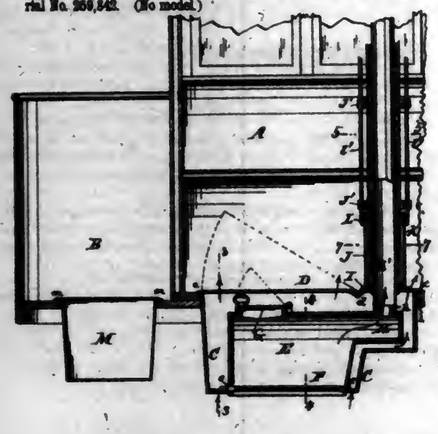


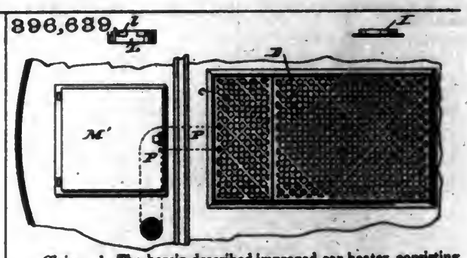
Claim.—1. A railway-chair adapted to receive and support the rail, recessed in its base to receive the yoke, and having corrugations to engage similar corrugations on said yoke, and adapted to be secured thereto by a key, substantially as described.

2. A railway-chair having in a single casting a base portion adapted to receive the base of the rail, a transverse recess one wall of which is corrugated to adapt it to engage corresponding corrugations of the yoke and the other wall provided with a key-seat, and having, also, an upright shoulder or flange to support the web and tread of the rail, substantially as described.

3. A railway-chair consisting of a casting, C, having groove *b*, shoulder D, having key-seat *d*, and a base portion having a recess to receive the yoke, one wall of which recess has the corrugations *e* and the other a key-seat, *f*, said walls converging downwardly, whereby to provide a dovetailed joint, substantially as described.

396,689. CAR-HEATER. JOHN ZIMMERMAN, Cincinnati, Ohio, assignor to the Zimmerman Machine Company. Filed Jan. 3, 1888. Serial No. 259,842. (No model.)





Claim.—1. The herein-described improved car-heater, consisting of a casing supported at its upper edge in the floor of the interior of the car, a perforated cover for said casing composed of sections hinged together, a furnace or fire-box having a cover, G, supported immediately beneath the perforated cover of the casing, a smoke-pipe, *N*, attached to the furnace or fire-box and passing directly upward through one of the sections of the perforated cover and also through the interior of the car, substantially as shown and set forth.

2. In a car-heater, the furnace or fire-box supported in the car, the smoke-pipe *N*, a perforated metal casing surrounding said smoke-pipe, and an open frame or guard composed of strips of wood or other non-conducting material surrounding the said perforated casing, with a space intervening between said casing and frame, substantially as shown and described.

3. In a car-heater, the furnace or fire-box supported in the car, the smoke-pipe *N* thereof provided with a surrounding perforated metal casing, and a frame or guard of wood or other non-conducting material surrounding the perforated casing, substantially as shown and described.

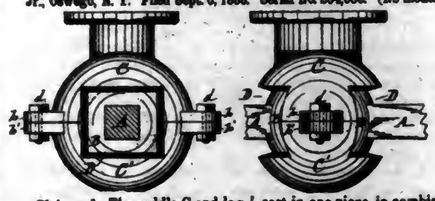
396,640. TWO-WHEELED VEHICLE. ARTHUR A. ABBOTT, Chicago, Ill. Filed June 14, 1887. Serial No. 241,291. (No model.)



Claim.—1. In a two-wheeled vehicle, the combination of shafts pivotally connected to the forward part of the body, springs for supporting said body connected at their rear ends to the axle, extended in line with the sides of the body and connected at their forward ends thereto, and springs connected at one end to the shafts, extended rearwardly in line therewith and connected at their rear ends to hangers depending from the body, substantially as described.

2. The combination of axle *a*, springs *c* and *d'*, frame *b b' c d'*, pivoted shafts *d* and *d'*, and springs *k* and *k'*, substantially as described and shown.

396,641. COUPLING FOR VEHICLE-AXLES. LEONARD ANES, Jr., Oswego, N. Y. Filed Sept. 6, 1888. Serial No. 284,668. (No model.)



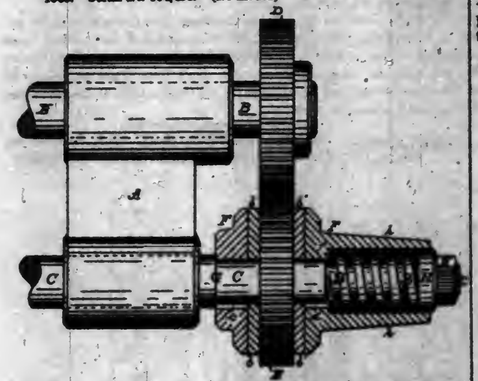
Claim.—1. The saddle C and leg *l*, cast in one piece, in combination with the axle A, ball B, rigidly secured to the axle, and the clip C', embracing the lower portion of the axle and connected to the saddle, substantially as described and shown.

2. In combination with the axle A, the ball B, formed with sockets *a a'*, respectively, in its top and bottom, the saddle C and leg *l*, cast in one piece, and the clip C' and lug *l'*, cast in one piece, substantially as described and shown.

3. In combination with the saddle C, clip C', and axle A, the dowel-pin *e*, secured to the axle, and the ball B, cast around the portion of the axle containing the dowel-pin, substantially as set forth.

4. The combination of the axle A, dowel-pin *e*, secured thereto, the ball B, cast around the axle and inclosing the dowel-pin, and formed with the elongated sockets *a a'*, respectively, in its top and bottom, and the saddle C and clip C', having integral with them, respectively, the lugs *l* and *l'*, projecting into the sockets *a a'*, substantially as described and shown.

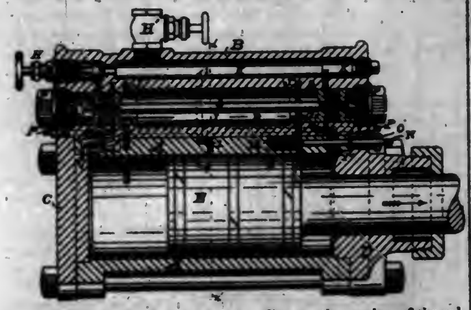
396,642. FRICTION-CLUTCH. ALBERT BALL, Claremont, N. H., assignor to the Sullivan Machine Company, same place. Filed Dec. 2, 1885. Serial No. 184,432. (No model.)



Claim.—1. The combination of a shaft, a gear loosely mounted thereon, a friction-plate on each side of said gear, a collar, F, securely fastened to said shaft and bearing against one of said plates, and a collar, F', formed with a chambered hub, A, thereon, inclosing the regulating-spring and bearing against the other plate, and a spring bearing against said collar F' and rendered adjustable by means of a nut, substantially as set forth.

2. The combination, with a suitable shaft and driving-gear on same, of a feed-shaft and loose gear mounted on same between two disks or plates, a fixed and a movable collar on the other sides of said disks or plates, a spiral spring arranged within said movable collar, and an adjusting-nut screwed on the said shaft, substantially as and for the purposes described and shown.

396,643. STEAM-ACTUATED VALVE. ALBERT BALL, Claremont, N. H., assignor to the Sullivan Machine Company, same place. Filed May 11, 1887. Serial No. 237,853. (No model.)



Claim.—1. The combination, in a direct acting engine, of the cylinder A, steam-chest B, piston E, double-balanced valves G G, steam-inlet ports I I', steam-exhaust ports J J', and hand-valves H H in said steam-inlet ports above said double balanced valves, so that the supply of steam to either end of said cylinder may be regulated before passing through said double-balanced valves, substantially as described.

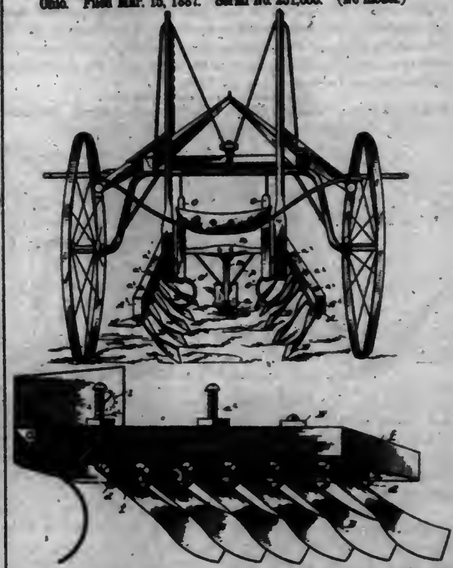
2. In a direct-acting engine, the combination of the piston provided with two inlet-pockets, 2 and 8, and the exhaust-pockets 4 and 9, the double-balanced steam-actuated valves to regulate the movements of said piston, and steam-passages 1, 3, 5, 6, and 7 to and from said pockets and valves and entirely separate and independent from the main steam-passage, substantially as described.

3. In a direct-acting engine, the combination of the piston provided with two inlet-pockets, 2 and 8, and with two exhaust-pockets, 4 and 9, the double-balanced steam-actuated valves to regulate the movements of said piston, steam-passages 1, 3, 5, 6, and 7 to and from said pockets and said valves and entirely separate and independent from the main steam-passage of the engine, and speed-regulators P, which control the quantity of steam passing through the passages 5 and 5 to and from said double-balanced valves, substantially as described.

4. The combination, in a direct-acting engine, of the cylinder A, double-balanced valves G G, piston E, steam-inlet ports I I', steam-exhaust ports J J', and the gate M in the exhaust-port J, substantially as and for the purpose set forth.

5. The combination, in a direct-acting engine, with the cylinder A and double-balanced valves G G, of the piston E, provided with pockets or concavities therein and entirely independent and separate from each other, for the purpose set forth, substantially as described.

396,644. PULVERIZING-HARROW. MARTIN BRUNER, Rockland, Ohio. Filed Mar. 15, 1887. Serial No. 231,055. (No model.)

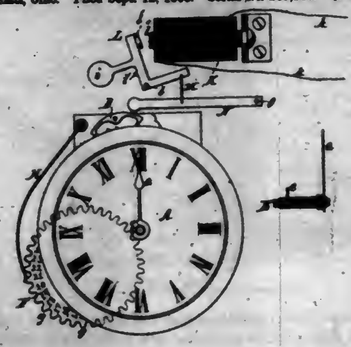


Claim.—1. In a harrow, the main beams having the double rows of bolts arranged thereon, and the harrow-teeth provided with perforations and slots engaging one of the rows of bolts, the other row of bolts connecting the edges of said teeth, and the cushioning-springs, in combination with the harrow-teeth, as shown and described, and for the purposes set forth.

2. In a harrow, the main beams having the double rows of bolts arranged thereon, and the harrow-teeth provided with perforations and slots engaging one of the rows of bolts, the other row of bolts connecting the edges of said teeth and their heads holding the teeth against displacement, in combination with the harrow-teeth, as shown and described, and for the purposes set forth.

3. In a harrow, the combination, with the main beams having a double row of bolts for connecting the teeth to the beams, and coiled springs interposed between the teeth and beams, of the pivoted spring-tooth interposed between the front of the beams, as shown and described, and for the purposes set forth.

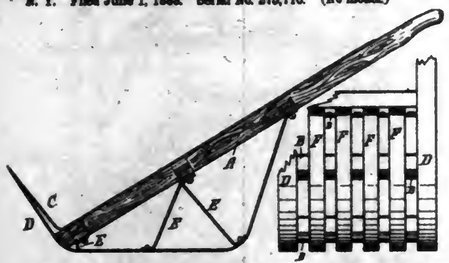
396,645. ELECTRIC TIME-METER. GEORGE F. CARD, Covington, Ky., assignor to the George F. Card Manufacturing Company, Cincinnati, Ohio. Filed Sept. 12, 1888. Serial No. 285,219. (No model.)



Claim.—1. In an electric meter, a clock mechanism the arbor of the hand-wheel of which is provided with a finger, *e*, a toothed and numbered dial, F, arranged to be engaged by the finger *e* and have imparted to it an intermittent rotary motion upon the rotation of said finger, combined with an electro-magnet and devices intermediate of the electro-magnet and clock mechanism for starting or stopping the operation of the clock upon the action of the electro-magnet, substantially as set forth.

2. In an electric meter, a clock mechanism the arbor of the hand-wheel of which is provided with a finger, *e*, a toothed and numbered dial, F, and a spring, H, engaging said wheel to hold it from accidental rotation, the said wheel being arranged to be engaged by the finger *e* and have imparted to it an intermittent rotary motion upon the rotation of said finger, combined with an electro-magnet and devices intermediate of the electro-magnet and clock mechanism for starting or stopping the operation of the clock upon the action of the electro-magnet, substantially as set forth.

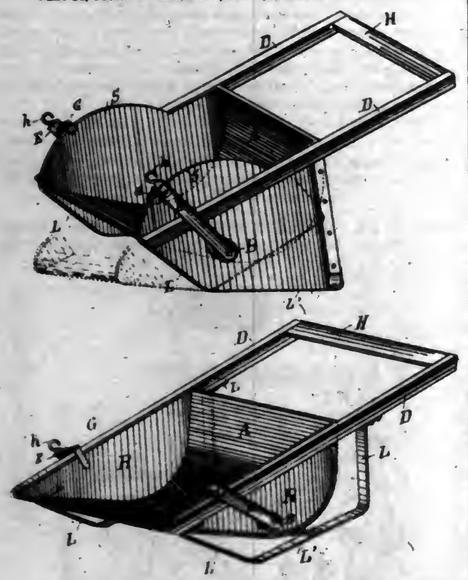
396,646. SLEIGH-TRUCK. LEONARD R. CARBART, Coeymans, N. Y. Filed June 1, 1888. Serial No. 275,710. (No model.)



Claim.—1. In a sleigh-truck, the combination of the side bars, A A, having attached to the upper portion thereof the metal bar C, said bar C being curved and extending above the side bars, A A, with the runners D D, attached to the side bars, A A, and to the metal bar C above the side bars, A A, substantially as described, and for the purpose set forth.

2. In a sleigh-truck, the combination of the side bars, A A, secured together by the cross-pieces B B, having attached to the upper portion of the said side bars the metal bar C, said bar being curved and extending above the side bars, A A, with the runners D D, attached to the side bars, A A, and to the metal bar C above the side bars, with the runners F F, attached to the cross-bars B B between the runners D D, substantially as described, and for the purpose set forth.

396,647. SCRAPER. LEONARD R. CARBART, Coeymans, N. Y. Filed June 11, 1888. Serial No. 276,689. (No model.)

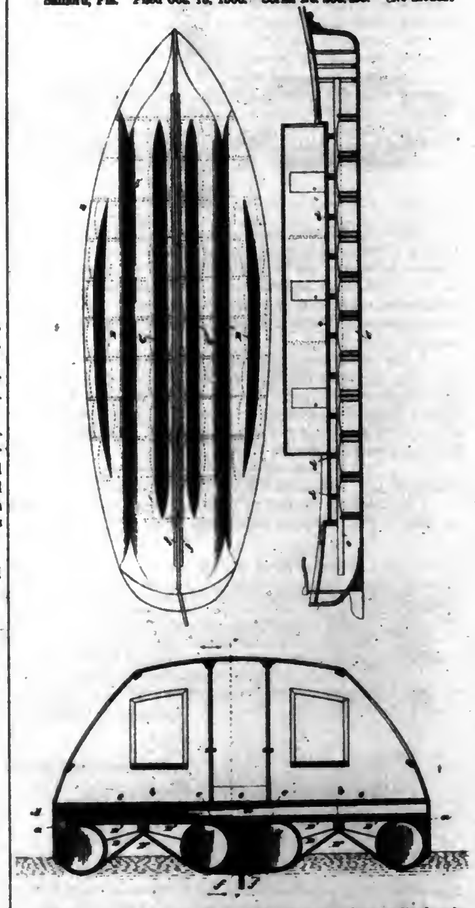


Claim.—1. In an ice-scraper, the combination of the runners L L', formed at an angle to each other, with the bars D D, attached to the side pieces, with the hook-bars E, movable about bolts B and provided with hooks *h*, all substantially as described, and for the purpose set forth.

2. In an ice-scraper, the combination of the runners L L', formed at an angle to each other, with the bars D D, attached to the side pieces, with the hook-bars E, movable about bolts B and provided with hooks *h*, and the guide-hooks G, all substantially as described, and for the purpose set forth.

3. In an ice-scraper, the combination of the runners L L', formed at an angle to each other, with the side pieces, S S, having their upper edges convex in form, with the bars D D, attached to the side pieces, S S, with the hook-bars E, movable about bolts B and provided with the hooks *h*, and the guide-hooks G, all substantially as described, and for the purpose set forth.

396,648. CONSTRUCTION OF VESSELS. JOHN D. CORNWALL, Sanford, Fla. Filed Oct. 18, 1888. Serial No. 288,495. (No model.)

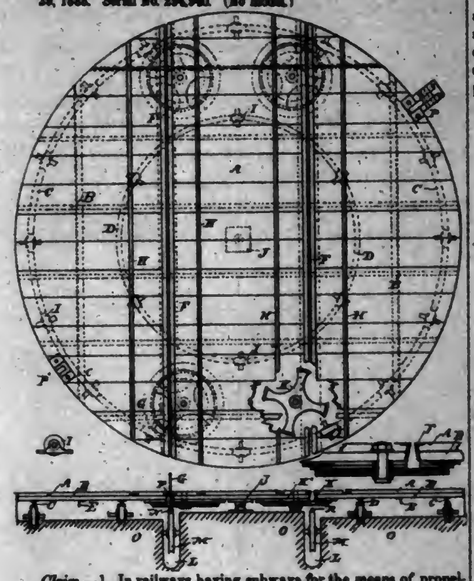


Claim.—1. In a vessel, the combination of a longitudinal series of barrels or casks, B B' and C C', braces D, having stay-pieces attached thereto abutting against the barrels, said braces being cut away centrally to provide a water-way, F, and exterior planking, substantially as shown.

2. The combination, in a vessel, of a series of braces, D, vertical planks *f f*, secured to the inner ends of said braces, longitudinal and transverse beams connected to said braces and supporting a superstructure, and a series of barrels held in place between the braces by stay-pieces, the exterior planking being attached to said braces so as to inclose either partially or wholly the barrels, substantially as shown, and for the purpose set forth.

3. The combination, in a vessel constructed substantially as described and provided with a series of longitudinal floats or barrels, of transverse braces forming compartments between said barrels, and an exterior planking having perforations formed therein to admit water flowing in and out between the braces, for the purpose set forth.

396,649. TURN-TABLE FOR CABLE OR ELECTRIC RAILWAYS. WARD DAVIDSON, Oakland, Cal. Filed May 27, 1887. Renewed Dec. 29, 1888. Serial No. 294,940. (No model.)



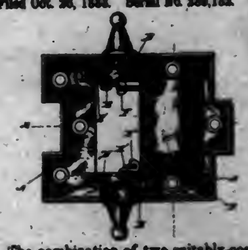
Claim.—1. In railways having subways for the means of propelling their cars, a turn-table consisting, essentially, of divided sections between which the device connecting between the car and the propelling medium may pass, and suitable means for connecting said sections together, so that the table they form may be revolved as one connected whole, said means of connection being arranged within the path of the said device connecting between the car and the propelling medium and adapted to be moved to permit said device to pass it as the car moves on or off the table, substantially as and for the purpose herein described.

2. A turn-table for cable, electric, or other railways having subways for the power appliances, consisting, essentially, of divided sections supported on rollers set below a circular track secured to the under side of the table and connected together at opposite ends by suitable locking devices adapted to be moved to permit the passage of the grip as the car moves on or off the table, substantially as and for the purpose set forth.

3. The lock for railway turn-tables having divided sections, consisting of the wheel K, having radiating arms with upturned ends, in combination with the plate K', having grooved surface to receive the upturned ends of the arms of the wheel, both wheel and plate being secured to the sections of the table, substantially as and for the purpose herein described.

4. As a means for operating to turn and move the cars at the termini of cable or electric railways, the combination of a turn-table divided by the grip-slot into practically separate sections, suitable means for connecting these sections together by or through which the grip may pass, and a cable or conductor supported under the table, so as to be accessible to be engaged with the gripper while the car is upon the table, substantially as and for the purpose described.

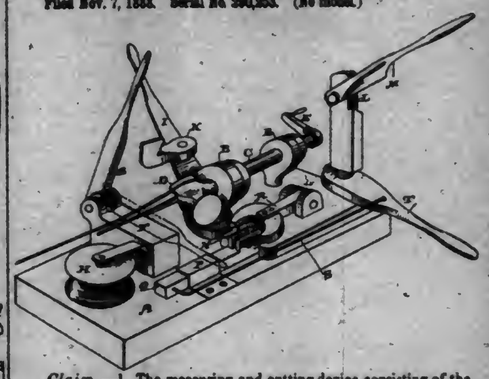
396,650. SPRING-HINGE. LEVI M. DEVORE and FREDERICK W. HOSTER, Freeport, Ill., assignors to the Stover Manufacturing Company, same place. Filed Oct. 26, 1888. Serial No. 289,182. (No model.)



Claim.—1. The combination of two suitably-connected hinge-leaves, one of which is provided at each end with a pivotal stud or pin, a spring-coil mounted parallel to the hinge-axis upon the other of said leaves, and links connecting, respectively, the ends of said spring with said pins, substantially as set forth.

2. The combination, with the leaf A', provided with the pins E E', and the leaf A, joined to the leaf A' by suitable pintles, of the spring-arbor D, mounted in suitable bearings upon the leaf A, the spring C, coiled about said arbor, and the links F F', connecting the ends of said spring with said pins, respectively, substantially as and for the purpose set forth.

396,651. BALE-TIE TWISTER. CHRIS FRANCO, Livermore, Cal. Filed Nov. 7, 1888. Serial No. 290,253. (No model.)



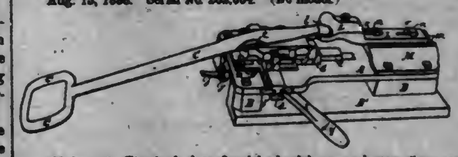
Claim.—1. The measuring and cutting device consisting of the head K, around which the loop is placed, the roller H, and a cutter, L N, substantially as herein described.

2. The semi-cylinder N, the slide O, with its jaws Q, and the holding-plate R, in combination with the lever T and the connecting-rod S, substantially as herein described.

3. The hook-forming device and gage consisting of the semi-cylinder N, the slide O, and the lever by which the slide is reciprocated to and from the open side of the cylinder, in combination with the pulley H, the loop-holder K, and the lever I, substantially as herein described.

4. A device for measuring, cutting, and forming loops in the ends of the wires for baling purposes, consisting of the rotary shaft with its twisting-head, anvil, and holding-lever, the reciprocating slide, and semi-cylindrical standard, the guide roller or pulley at the end of the table, the stretching hook and lever, and the knives or cutters, substantially as herein described.

396,652. MACHINE FOR TRIMMING SOFT-METAL LININGS OF CAR-AXLE BEARINGS. TIMOTHY W. OSTRAM, West Troy, N. Y. Filed Aug. 13, 1888. Serial No. 282,684. (No model.)



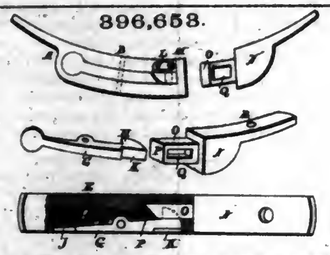
Claim.—1. The bed-plate furnished with an end stop for a car-axle bearing and having the lengthwise and transverse slotted ways, combined with the sliding clamps extending through and engaging with said slotted ways, and the operating-lever mounted under the bed-plate and having cams engaging with said clamps, substantially as described.

2. The bed-plate having the lengthwise and transverse slotted ways, the fixed end stop, D, and the vertical sockets *i*, adjacent to said stop, the movable end stop, D', fitting in said sockets, and the lever *j*, pivoted to the bed-plate and engaging with said movable stop, combined with the sliding clamps upon, extending through, and engaging with said slotted ways, and the lever mounted under the bed-plate and having cams engaging with said clamps, substantially as set forth.

3. The combination, with the bed-plate furnished with an end stop for a car-axle bearing and having the lengthwise and transverse slotted ways, the sliding clamps upon, extending through, and engaging with said slotted ways, and the lever mounted under the bed-plate and having cams engaging with said clamps, of the stock L, mounted upon and adjustable lengthwise along and above said bed-plate, and the hand-lever C, having the trimming-blade and connected to said stock by a ball-and-socket joint, as set forth.

396,653. HAME-FASTENER. GEORGE W. HARBOR, Manhattan, Kans. Filed May 12, 1888. Serial No. 273,743. (No model.)

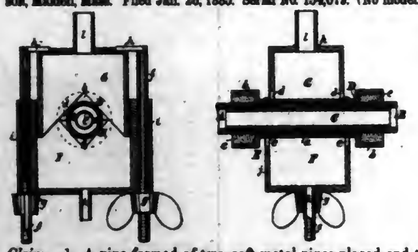
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Claim.—1. The within-described hame-fastening, consisting of the part A, enlarged at B and having the slot E, provided at its forward end with the opening C and flaring mouth D, and at its rear end terminating in the recess F, the hook-latch G, pivoted in the slot E, the spring J, acting on said latch, and the part N, having a central projecting scarfed and perforated bolt, O, the several parts made and all combined in the manner set forth.

2. In a hame-fastener, the combination of the part A, having a pivoted holding-finger, L, and slotted, as described, and having the hooked latch therein, said latch being cut away at K, combined with the part N, having stud O, perforated and scarfed, as described.

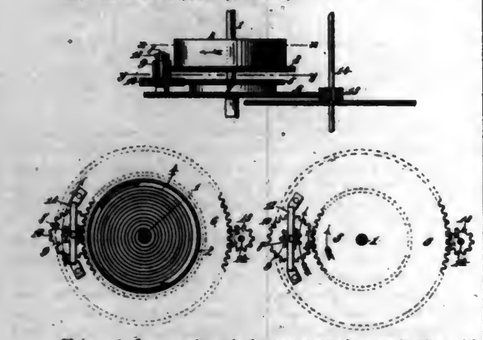
896,654. JOINT FOR SOFT-METAL PIPES. WILLIAM A. HENDERSON, Malden, Mass. Filed Jan. 26, 1885. Serial No. 154,072. (No model.)



Claim.—1. A pipe formed of two soft-metal pipes placed end to end and united simply by fusing the metal of the pipes at the place of juncture, the diameter of the pipe at the place of juncture being the same as the diameter of said ends, substantially as set forth.

2. A pipe formed of two soft-metal pipes placed end to end and united by fusing the metal of the pipe at the place of juncture, the diameter of the pipe at the place of juncture being the same as the diameter of said ends, and said pipe having within and covering said place of juncture a tube conforming to the interior of the pipe, substantially as set forth.

896,655. CLOCK. HERMANN HERWIG, Media, Pa. Filed Oct. 12, 1888. Serial No. 287,898. (No model.)

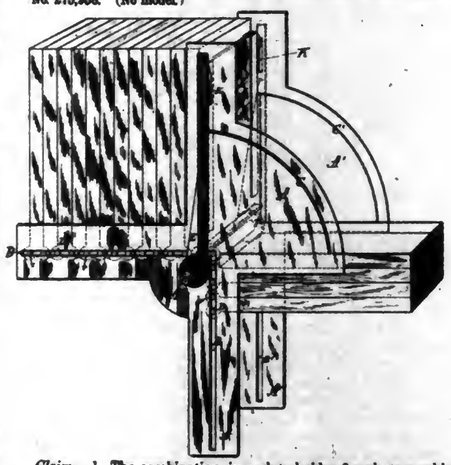


Claim.—1. In a watch or clock movement, the combination, with an arbor, of a barrel carrying a rigidly-attached gear loosely mounted on said shaft or arbor, a wheel consisting of the gears rigidly connected together and of unequal diameter loosely mounted on the same arbor, a pinion journaled on a stud, projecting from the flat face of the larger gear of said wheel, said pinion meshing with the gear carried by the barrel and carrying a pinion which meshes with the smaller gear of the wheel, substantially as described.

2. In a watch or clock movement, the combination, with an arbor, of a barrel and a gear rigidly mounted on said barrel, both loosely mounted on the shaft 1, a wheel composed of two unequal gears rigidly connected together, a pinion mounted on a stud projecting from the flat face of the longer gear, said pinion meshing with the gear carried by the barrel and having rigidly attached a pinion meshing with the smaller gear of the wheel, a shaft having a pinion meshing with one of the gears of the wheel, and a coiled spring connecting the barrel to the arbor, substantially as described.

3. In a watch or clock movement, the combination, with the arbor 1, of a barrel, 2, carrying a rigidly-attached gear, 3, loosely mounted on said arbor, a wheel composed of two rigidly-connected unequal gears, 5 and 6, the latter being provided with a stud, 8, a pinion, 9, having a rigidly-connected pinion, 10, journaled on said stud, the former meshing with the gear 3 and the latter with the gear 5, a shaft, 14, having a pinion, 13, and a spring, 4, connecting the barrel 2 and arbor 1, substantially as described.

896,656. MAGAZINE PLATE-HOLDER FOR PHOTOGRAPHIC PLATES. FREDERICK A. HETHERINGTON, Brooklyn, assignor of one-half to Henry A. W. Wood, New York, N. Y. Filed June 4, 1888. Serial No. 275,968. (No model.)

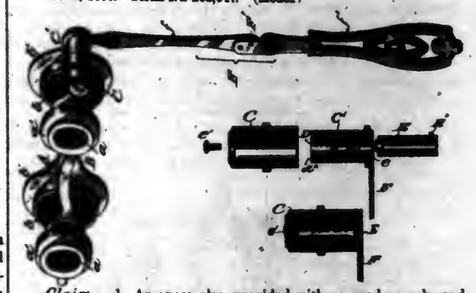


Claim.—1. The combination, in a plate-holder for photographic plates, of a series of leaves linked or hinged together and having flanged edges for protecting the photographic plates, with side plates having guide-slots, as described, substantially as and for the purposes set forth.

2. In a magazine plate-holder for photographic plates, the combination of a series of leaves hinged directly together, as shown, with side plates having guide-slots arranged so that by the act of turning a leaf through an arc of ninety degrees the next following leaf shall come into position for another exposure, substantially as set forth.

3. The combination, in a magazine plate-holder for photographic plates, of a series of hinged leaves having slotted side plates, as described, with operating levers, rods, and stops, substantially as and for the purposes set forth.

896,657. OPERA-GLASS. GUSTAV HOLLE, Philadelphia, Pa. Filed Feb. 1, 1888. Serial No. 262,647. (Model.)



Claim.—1. An opera-glass provided with an eye-lens yoke and an object-lens yoke, a telescopically-related extensible device the parts of which are secured to the extremities of the yokes for adjustably connecting said yokes, and capable of sufficient contraction to bring the lens-yokes into immediate proximity, and suitable mechanism for causing the extension or contraction of said extensible device, substantially as set forth.

2. An opera-glass provided with an eye-lens yoke and an object-lens yoke adapted to approach and lie in immediate proximity to each other, connective devices for adjustably connecting said yokes, a stud mounted upon a connection of one of said yokes and working in a spiral slot formed in a rotatable cylinder mounted in connection with the other of said yokes, substantially as set forth.

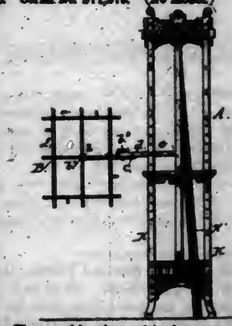
3. An opera-glass provided with an eye-lens yoke and an object-lens yoke adapted to approach and lie in immediate proximity to each other, a telescopically-related extensible device for adjustably connecting said yokes, suitable mechanism for causing the extension or contraction of said connecting device, and a depending handle hingedly connected to a connection of one of said yokes, substantially as set forth.

4. An opera-glass provided with an eye-lens yoke and an object-lens yoke adapted to approach and lie in immediate proximity to each other, connective devices for adjustably connecting said yokes, a rotatable spirally-slotted cylinder mounted in connection with one of said yokes, a fixed stud mounted in connection with the other of said yokes, and a depending folding handle rigidly attached to said rotatable slotted cylinder, substantially as set forth.

5. An opera-glass provided with an eye-lens yoke and an object-lens yoke, a telescopically-related extensible connecting device, exterior to the space between said two yokes for adjustably connecting said yokes, a rotatable spirally-slotted cylinder mounted within said extensible device and in connection with one of said yokes, a fixed stud mounted within said extensible device in connection with the other of said yokes and engaged with the spiral slot of said cylinder, and a depending handle rigidly attached to said rotatable slotted cylinder, substantially as set forth.

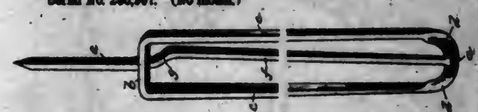
6. An opera-glass provided with an eye-lens yoke and an object-lens yoke, a telescopically related extensible connecting device exterior to the space between said two yokes for adjustably connecting said yokes, a rotatable spirally-slotted cylinder mounted within said extensible device and in connection with one of said yokes, a fixed stud mounted within said extensible device in connection with the other of said yokes and engaged with the spiral slot of said cylinder, and a sectional latch-provided handle attached to said rotatable slotted cylinder, substantially as set forth.

896,658. ARTIST'S EASEL AND ATTACHABLE REST. JOHN A. JOHNSON, Austin, Tex., assignor to John J. Tobin, same place. Filed Apr. 20, 1888. Serial No. 271,570. (No model.)



Claim.—The combination, with the rest, as described, of the bar c, pivoted to said holder by bolt b^3, the perforated bar d, pivoted to bar c by bolt b^4, and the easel A, united to the bar d by a suitable round bolt, substantially as and for the purpose set forth.

896,659. DITCHING-SPADE. JOHN R. KEUCHAN, JAMES H. KEUCHAN, and SQUIRE R. KEUCHAN, Anamosa, Iowa. Filed July 25, 1888. Serial No. 280,967. (No model.)

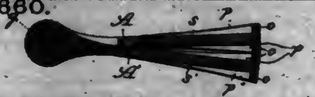


Claim.—A skeleton spade consisting of side bars, a a, formed of a single bar bent centrally to provide the cross-bar b, with its ends approximately parallel to form the sides a a, said sides being flattened and curved at their lower ends and united to form the cutting-edge, and the central bar, f, extending and inclining from said cutting-edge rearwardly, provided with a bend, g, at its top, substantially as described.

896,660. HINGE. DAVID S. LOUD, Chicago, Ill., assignor of one-half to Walter P. Conyers, same place. Filed Oct. 11, 1888. Serial No. 287,827. (No model.)

Claim.—1. A hinge comprising two butts with the usual knuckle-and-pin connection, the opposite surfaces of each butt forming divergent and substantially-radial planes, of which the axial line is the center, substantially as described.

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2. A hinge comprising two butts with the usual knuckle-and-pin connection, the opposite surfaces of the butts being provided with projections, as the flanges o p, whereby when the hinge is folded in either direction projections of the adjacent sides will meet, substantially as described.

3. A hinge comprising two butts with the usual knuckle-and-pin connection, the leaf of each butt extending in direct radial line from the axis of the hinge, and being provided along its opposite ends with curvilinearly divergent flanges p and on opposite sides of its outer edge with flanges o, whereby when the hinge is folded in either direction flanges of the adjacent sides will meet, substantially as described.

896,661. STUD OR OTHER JEWELRY. ADOLPH LUETY, New York, N. Y., assignor to A. Luthy & Co., same place. Filed Feb. 10, 1888. Serial No. 263,694. (No model.)



Claim.—1. The combination, with the base, a stem projecting therefrom, and two radial fastening-arms, the one rigid with said stem and the other mounted to turn on the axis of said stem and adapted to fold against the rigid arm or to be turned outwardly therefrom, of stops on the relatively-moving parts to hold the turning arm in coincidence with the rigid one, and inclines on the moving parts, respectively, to hold said turning arm frictionally in place when turned away from the rigid arm.

2. The combination, with the base and the stem projecting therefrom, of two radial fastening-arms, the one rigid with said stem and the other mounted to turn on the axis of said stem and adapted to fold against the rigid arm or to turn outwardly therefrom, and the said arms formed with stops to hold them in coincidence, and inclines on the moving parts, respectively, to hold the turning arm frictionally in place when turned away from the rigid arm.

3. The combination, with the base and a stem projecting therefrom, of two radial fastening-arms, the one rigid with said stem and the other mounted on a screw engaging said stem and adapted to fold against the rigid arm or be turned outwardly therefrom.

4. The combination, with the base, of the stem projecting therefrom and two fastening-arms projecting radially from said stem, the one rigid with said stem and the other mounted to turn relatively thereto, and both being half-round in cross-section and constructed to fit together, whereby when in coincidence they form a lateral continuation of such stem, and their insertion is facilitated.

5. The combination, with the base, of the stem projecting therefrom and two radial fastening-arms projecting from the rear of said stem at an obtuse angle, the one rigid with said stem and the other mounted to turn relatively thereto, and the two adapted to fold together, and constructed when thus coinciding to appear as a continuation of such stem.

6. The combination, with the base and a stem projecting therefrom, of two radial fastening-arms, the one rigid with said stem and the other mounted to turn relatively thereto, the one arm having its end extended beyond the other and thickened and formed with a shoulder abutting against the end of the other arm when the two arms are in coincidence.

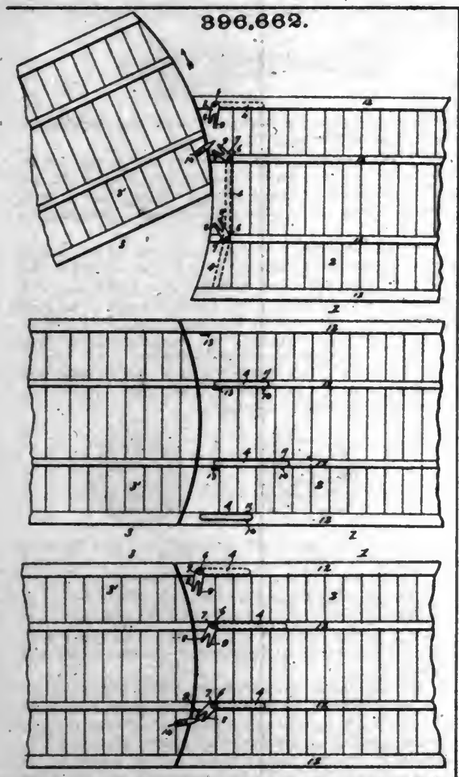
7. The combination, with the base, of a tubular stem projecting therefrom and engaged therewith, a radial fastening-arm projecting rigidly from the rear end of such stem, a screw-shank screwing into said stem, and a radial fastening-arm fixed on said shank and adapted to turn therewith and to fold against the rigid arm.

8. The combination, with the base, of a stem projecting therefrom and screwing into the threaded socket therein, whereby it is adjustable relatively thereto, and two radial fastening-arms, the one rigid with said stem and the other mounted to turn on the axis thereof and to fold against the rigid arm.

896,662. DRAW-BRIDGE GATE. OLE MOEN, Manistee, Mich. Filed July 20, 1888. Serial No. 280,981. (No model.)

Claim.—1. The combination, with a pier or an abutment and a horizontally-swinging gate journaled thereon and provided with a lever or detent upon its vertical shaft, of a swinging draw span or bridge provided with a projecting finger or dog which is adapted to

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directly engage and turn said lever or detent and gate, substantially as described.

2. The combination, with a pier or an abutment and a horizontally-swinging gate having a vertical post journaled thereon and provided with a bifurcated lever or detent, of a swinging draw span or bridge provided with a finger or dog which projects therefrom and is adapted to directly engage and turn said bifurcated lever or detent and gate, substantially as described.

3. The combination, with a pier or an abutment and a swinging draw span or bridge, of a series of gates provided with vertical posts which are journaled upon said pier or abutment, bifurcated detents projecting from said vertical gate-posts, and a finger or dog which projects from the end of said swinging draw span or bridge and is adapted to directly and successively engage and turn said bifurcated detents and the gates with them, substantially as described.

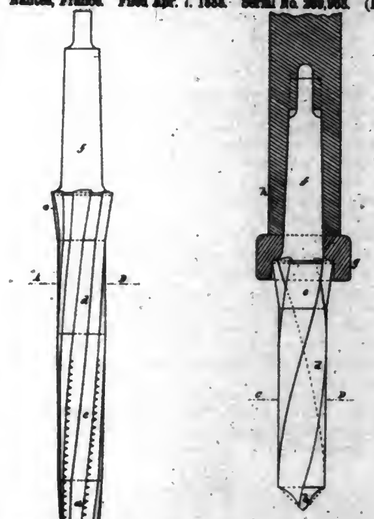
4. The combination, with a pier or an abutment and a swinging draw span or bridge, of a series of gates arranged in a segment of a circle having its center in the center of said draw span or bridge and provided with vertical posts which are journaled with their lower ends in said pier or abutment, bifurcated detents projecting from the lower ends of said vertical gate-posts, and a finger or dog which projects from the end of said swinging draw span or bridge and is adapted to successively engage and turn said bifurcated detents and gates, substantially as described.

5. The combination, with a pier or an abutment and a swinging draw span or bridge, of a gate provided with a vertically-journaled post, a bifurcated lever or detent secured to the lower end of said post and formed with a long finger or prong and a short finger or prong, and a finger or dog secured upon the end of said swinging draw span or bridge and adapted to engage and turn said bifurcated lever or detent and gate, substantially as described.

6. The combination of a swinging draw span or bridge, a pier or an abutment provided with a roadway and sidewalks, having beams or copings, a series of gates provided with vertical posts which are journaled with their lower ends in bearings secured in said beams or copings, bifurcated levers or detents projecting from the lower ends of said posts, a finger or dog secured upon the end of said swinging draw span or bridge and adapted to engage said bifurcated levers or detents, spring-latches secured upon said beams or copings, and stops arranged upon said abutment or pier at points at right angles to said spring-latches, substantially as and for the purpose described.

7. The combination of the swinging draw span or bridge 3, the pier or abutment 1, provided with the roadway and sidewalks, having the beams or copings 12, the series of gates 4, provided with vertical posts 5, which are journaled at their lower ends in the bearings 6 in said beams or copings, the bifurcated levers or detents 7, projecting from the lower ends of said posts and formed with short and long fingers or prongs 8 and 9, the spring-latches 10, secured upon said beams or copings, the stops 13, arranged upon said pier or abutment at points at right angles to said spring-latches, and a dog or finger, 14, secured upon the end of said swinging draw span or bridge at an angle to the central line of the same and adapted to successively engage said bifurcated levers or detents and turn the same and said gates, substantially as described.

396,663. COUNTERSINK AND DRILL. AUGUSTE MORIMEAU, Nantes, France. Filed Apr. 7, 1888. Serial No. 269,963. (Model.)

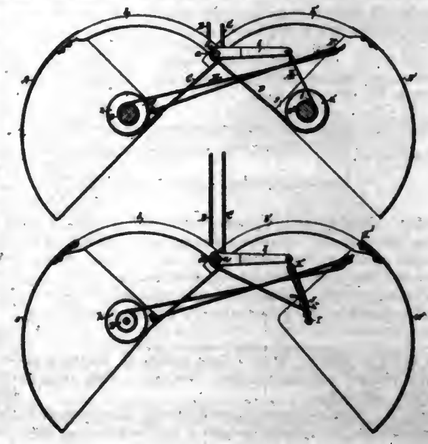


Claim.—1. In combination with a drill or reamer having a conical upper end and the socket, a washer of any desired thickness fitting upon the upper end of said drill so as to overhang it, whereby the reamer may be allowed to descend to any given depth into the hole that is to be reamed, substantially as described.

2. The within-described tool, having any desired twist, *c d*, and an enlarged conical upper end, *c*, combined with the washer *g* and the socket *A*, substantially in the manner and for the purposes set forth.

396,664. HOISTING-BUCKET. GEORGE B. NEWELL, Pawtucket, R. I. Filed Aug. 6, 1888. Serial No. 282,096. (No model.)

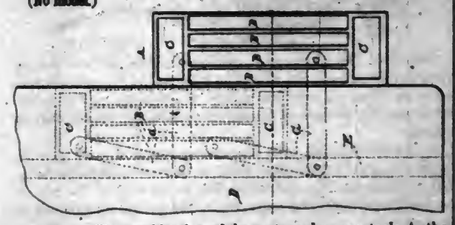
Claim.—In a hoisting-bucket, the combination, with the bucket-jaw and lever, of the opposite bucket-jaw pivoted to the said lever at a point intermediate of its ends, the guided rope or chain C, for closing the bucket, the guided rope or chain G, which is operatively connected with the outer end of the lever, and the power-multiplying movement for opening the bucket, substantially as described.



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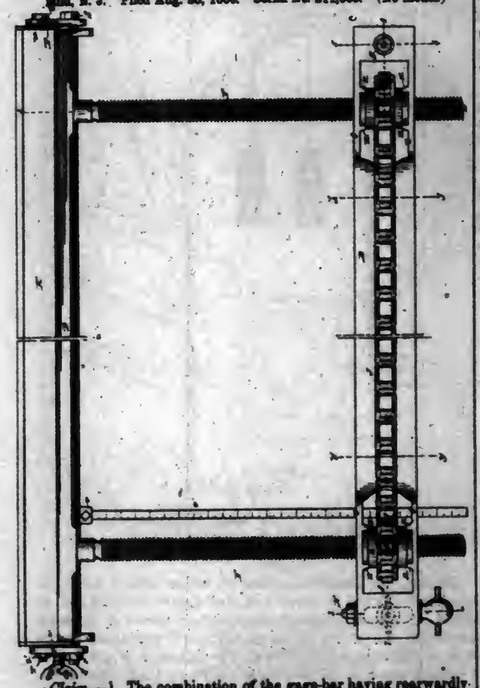


396,665. DESK ATTACHMENT. ARTHUR W. POTTER and THOMAS J. MCCORMICK, Wilkes-Barré, Pa. Filed Oct. 13, 1887. Serial No. 252,243. (No model.)



Claim.—The combination of the rectangular receptacle A, the cleat or strip B, having the same height as said receptacle and secured to the under surface of the desk-top parallel to the edge of said top and distant from said edge a space equal to the width of the receptacle, and the parallel arms G, of equal length, having their inner ends pivoted to the lower edge of the cleat and their outer ends pivoted to the bottom of the receptacle at points equally distant from the sides thereof, substantially as specified.

396,666. ADJUSTABLE SAW-GAGE. WILLIAM V. PRINCE, Vineland, N. J. Filed Aug. 25, 1886. Serial No. 211,869. (No model.)



Claim.—1. The combination of the gage-bar having rearwardly-projecting screw-stems, toothed nuts to which said stems are adapted, an endless chain adapted to said toothed nuts, and a single fixed bar or frame adapted to rest upon the saw bench or table and having bearings for both of the toothed nuts, the whole forming a single self-contained structure applicable to or removable from the saw bench or table as a unit, all substantially as specified.

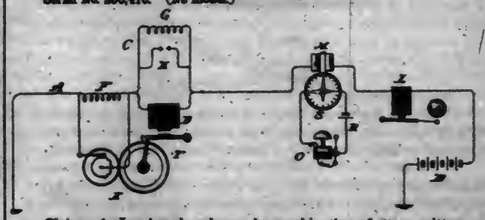
2. The combination of the work table or bed, the frame B, pivoted thereto at one end, but free to swing at the opposite end, means for securing said free end of the frame after adjustment, a gage-bar having projecting screws, nuts carried by the frame B and adapted to said screws, and means for simultaneously operating said nuts, all substantially as specified.

3. The combination of the work table or bed, the gage-bar, the pivoted frame B, a screw-connection between the same and the bar, a pin adapted to an opening in the work-table and having a nut, and a screw-stem carried by the frame B and adapted to said nut, all substantially as specified.

4. The combination of the gage-bar, the gage-block, the hanging-links, pivot-bolts for connecting one end of each link to the gage-bar and the other end to the gage-block, cheek-pieces interposed between the links and the ends of the gage-blocks, and a clamping-screw carried by one of the links and bearing against one of the cheek-pieces, all substantially as specified.

5. The combination of the gage-bar, the frame B, and the screw-connection between the two, with the work-table having a groove and a plate having a block adapted to said groove, and bolts for the reception of the opposite ends of the frame B, all substantially as specified.

396,667. BURGLAR-ALARM. ARTHUR C. ROBBINS, Brooklyn, assignor to William S. Andrews, New York, N. Y. Filed Sept. 22, 1887. Serial No. 250,410. (No model.)

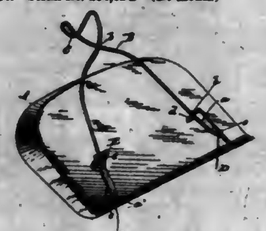


Claim.—1. In a burglar-alarm, the combination of a transmitter, a closed circuit, a resistance in said circuit, and a normally-open short circuit around the said resistance, in which the transmitter is located, a magnet in said closed circuit controlling the transmitter, a closed shunt around the magnet, a resistance in the shunt, and signaling apparatus at the central station corresponding to the action of the said transmitter, and also to a change in the resistance of the circuit.

2. In a burglar-alarm, the combination of a transmitter, a magnet controlling the same, a closed shunt around the magnet leading to the spot to be protected, a resistance in the said shunt, a galvanometer in the circuit controlling an alarm at the central station, and a second alarm adapted to be operated by the said transmitter.

3. In a burglar-alarm, the combination of a transmitter, a magnet controlling the same, a shunt around the magnet containing a resistance, and distinctive sets of alarms at the central station corresponding one to the said transmitter and the other to a change in the line-resistance.

396,668. DUST-PAN. PRATT A. STICKER, Marshall, Mich. Filed Dec. 5, 1887. Serial No. 257,094. (No model.)



Claim.—1. In a dust-pan, a pan provided with ears, in combination with a detachable foot-rest, substantially as and for the purpose specified.

2. In a dust-pan, the pan having ears, in combination with an elastic detachable foot-rest, substantially as and for the purpose specified.

3. As a new article of manufacture, an elastic detachable foot-rest having fastening devices at its free ends to engage with a dust-pan, substantially as and for the purpose specified.

4. A dust-pan having sockets for the reception of the ends of a detachable foot-rest, one of said sockets having a slot and a lug to hold the end of the foot-rest against accidental displacement, in combination with a detachable foot-rest adapted to fit into said sockets and slot, substantially as described.

5. A dust-pan having sockets for the reception of the ends of a detachable foot-rest, one of said sockets having a slot and a lug to

hold the end of the foot-rest against accidental displacement, the other being provided with a perforated guard, in combination with a detachable foot-rest adapted to fit into said sockets and slot, substantially as described.

6. In a dust-pan, the pan having ears and an elastic detachable foot-rest, in combination with a guard having a perforation adapted to receive said foot-rest, and sockets for the reception and accommodation of the ends of said foot-rest, substantially as and for the purposes described.

396,669. DUST-PAN. PRATT A. SPICER, Marshall, Mich. Filed June 3, 1887. Renewed July 30, 1888. Serial No. 281,096. (No model.)



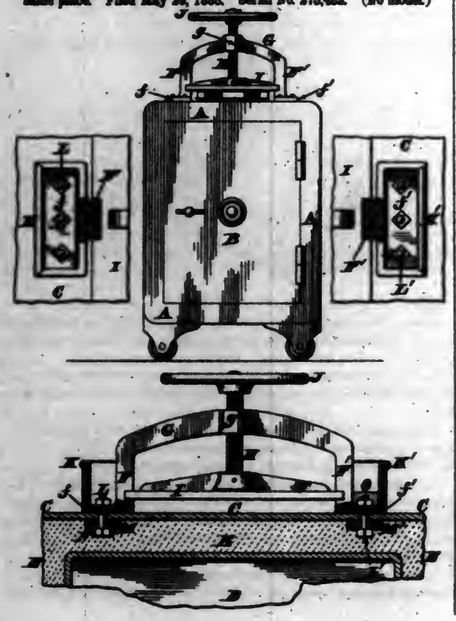
Claim.—1. A dust-pan having an elastic steadying and spreading piece secured to its bottom front edge and extending back to a point below and in alignment with the handle, substantially as described.

2. In a dust-pan, the combination, with the main pan, of a steadying and spreading piece secured to its under lower side at its front edge and extending back to a point below and in alignment with the handle forming a bearing for the said pan, substantially as described.

3. In a dust-pan, the combination, with the main pan, of a steadying and spreading piece consisting of an elastic wire bent at its middle portion in a loop to form a bearing for the pan, and having its ends secured to the front edge of the pan at opposite corners, substantially as described.

4. In a dust-pan, the combination, with the main pan, of a two-ended steadying and spreading piece consisting of an elastic wire bent in a loop and secured to the under side of the pan at its forward edge and at opposite corners, and extending back to a point below and in alignment with the handle, where it is bent up to form a projection against which the foot of the user is adapted to rest for the purpose, substantially as herein shown and described.

396,670. COMBINED SAFE AND COPYING-PRESS. THOMAS R. SPIVEY, Cincinnati, Ohio, assignor to the Victor Safe and Lock Company, same place. Filed May 29, 1888. Serial No. 275,482. (No model.)



Claim.—1. A safe having the standards of a copying-press attached to its top plate, whereby said plate serves as the base or bed of said press, substantially as herein described.

2. A safe having the standards of a copying-press attached to its top plate, said standards being provided with integral pockets or pits, for the purpose described.

396,671. VEHICLE-SPRING. ROBERT SPROUL, Pittsburg, Pa. Filed July 2, 1888. Serial No. 278,333. (No model.)

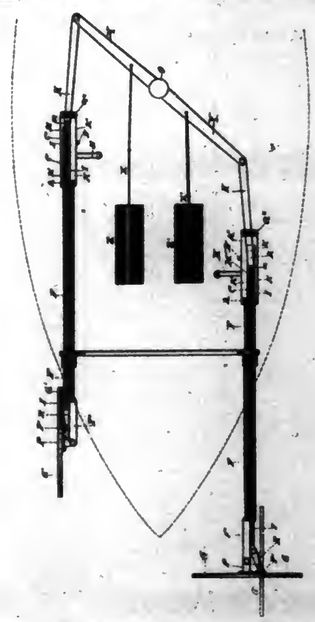


Claim.—1. The combination, with the running-gear and body of a vehicle, of a brace-rod attached at its lower end to the axle and provided at its upper end with two springs, whereby the vertical movement of the vehicle-body is controlled and limited, substantially as described.

2. The combination, with the running-gear and body of a vehicle, of a vertical brace-rod provided at its lower end with a frame which embraces the axle and is attached to the body of the vehicle by means of a hollow casing containing buffer-springs, substantially as described.

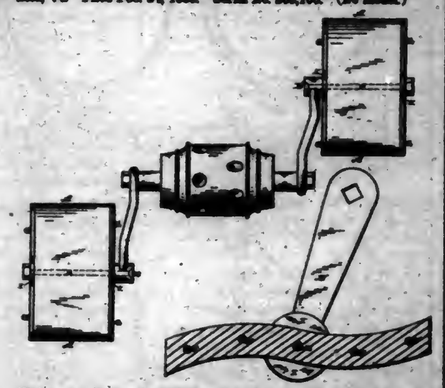
3. The combination, with the running-gear and body of a vehicle, of rods E E', frame F, casing G, and springs *h h'*, all arranged and combined substantially as described.

396,672. MECHANISM FOR PROPELLING SHIPS. JOHN STEWARD, Sr., Troy, N. Y. Filed July 17, 1888. Serial No. 280,159. (No model.)



Claim.—The combination, with the tubular slides F, moving in guides within the hull of a ship and extending without said hull, as specified, a box or trough having collars A a^{x} and sides A' A", mounted upon the end of said slide, of the stops C and C' within said box or trough, the triple lever A H' H", pivoted to the bottom of said trough, the heads D and D' of the said levers H' H", working in the slots I and I' in the bottom of said trough and raising said stops C and C', substantially as specified, the sliding rods I, moving within said tubular slides F, the levers R, attached to the outer ends of said rods I, the projections F' upon the outer ends of the tubular slides F, the stems P, hinged to said projections, the paddles G, mounted upon said stems, the brackets P', fastened to said paddles beside the said stems, the short levers R, connecting the brackets P' and the rods I, the pinion K, connecting the rods I and the oscillating levers Y, the oscillating levers Y, pivoted at O and connected with the rods I, as specified, and means, substantially as specified, for oscillating said levers Y, all substantially as and for the purpose set forth.

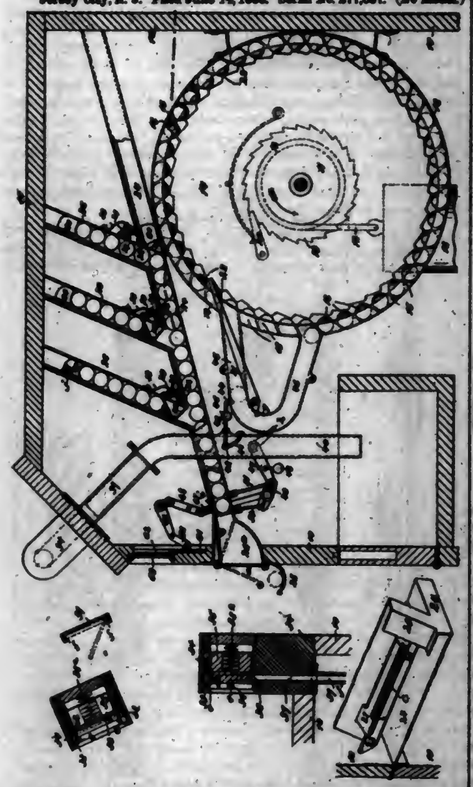
396,673. PEDAL FOR VELOCIPEDES. ELMER E. TUPPS, Springfield, Vt. Filed Feb. 24, 1888. Serial No. 265,109. (No model.)



Claim.—1. A treadle which is curved upon both of its sides alike, so as to form a bearing both for the hollow and the toe of the foot, substantially as shown.

2. A treadle having its body formed of wood, and which is curved upon both of its sides alike, in combination with the metallic plates applied thereto, and the rivets which pass through the body and the plates, substantially as described.

396,674. AUTOMATIC SELLING-MACHINE. JOHN W. VARNEY, Jersey City, N. J. Filed June 14, 1888. Serial No. 277,067. (No model.)



Claim.—1. In an automatic selling-machine, a coin-chute provided with one solid side, a top and a bottom, and flanges projecting from said top and bottom toward each other from the edges of said top and bottom opposite the edges connected with the solid side, thereby forming a longitudinally-slotted side of the chute opposite the solid side, said chute having its sides inclined to the vertical plane, substantially as herein shown and described.

2. In an automatic selling-machine, the combination, with a weightway, of a weight-releasing lever, an article-releasing mechanism, substantially as set forth, and a lever connected with the article-releasing mechanism and provided with a toe which enters the weightway, substantially as herein shown and described.

3. In an automatic selling-machine, the combination, with a coin-chute, of a weightway, a tripping-lever arranged in connection with the chute and way, an article-releasing mechanism, substantially as set forth, and a second tripping-lever arranged in connection with the releasing mechanism and the weightway, substantially as herein shown and described.

4. In an automatic selling-machine, the combination, with a weightway, of a weight-carrier, a weight-releasing lever, a tripping-lever arranged in connection with the weight-carrier, an article-releasing mechanism, substantially as set forth, and a lever connected with said releasing mechanism and provided with a toe which enters the weightway, substantially as herein shown and described.

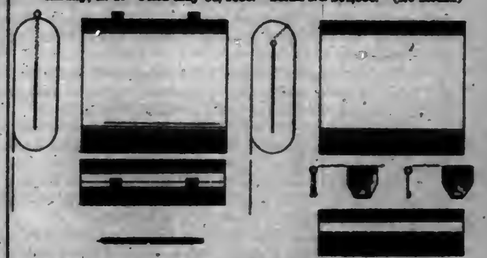
5. The combination, with a drum, of a weight connected thereto by a cord, a weight-carrier formed with weight-receiving recesses in its peripheral face and mounted to turn forward with the drum, a ratchet rigidly connected to the weight-carrier, a jacket surrounding the weight-carrier, a way leading therefrom, a lever mounted to engage the ratchet and provided with a toe which enters the weightway, a tripping-lever formed with a projection which enters the weightway and provided with a pin which enters a coin-chute, said chute, a rocking frame, a lever connected thereto and formed with a toe which enters the weightway, a delivery-chute, and slides arranged in connection therewith and connected to the rocking frame, substantially as described.

6. The combination, with a delivery-chute, of a trap or door formed of two leaves that are rigidly connected at an angle to each other, and hinged at the lower or delivery end of said chute, substantially as herein shown and described.

7. The combination, with a case or housing, of a spring-pressed plunger mounted therein, spring-tongues arranged in connection with the plunger, and a coin-chute leading from the case or housing, substantially as described.

8. The combination, with a case or housing, of a spring-pressed plunger mounted therein and formed with a groove in its peripheral face, spring-tongues formed with projections which normally rest within the plunger-groove and with inclined-faced projections which overlap the plunger's end, and a coin-chute leading from the case or housing, substantially as described.

396,675. TOILET OR WRAPPING PAPER ROLL. EDEN WEBSLER, Albany, N. Y. Filed May 11, 1886. Serial No. 201,906. (No model.)



Claim.—1. A toilet or wrapping paper roll having all of its lines of perforations or incisions in the same plane and provided with a stay applied thereto, substantially as described, to keep the perforations in said plane.

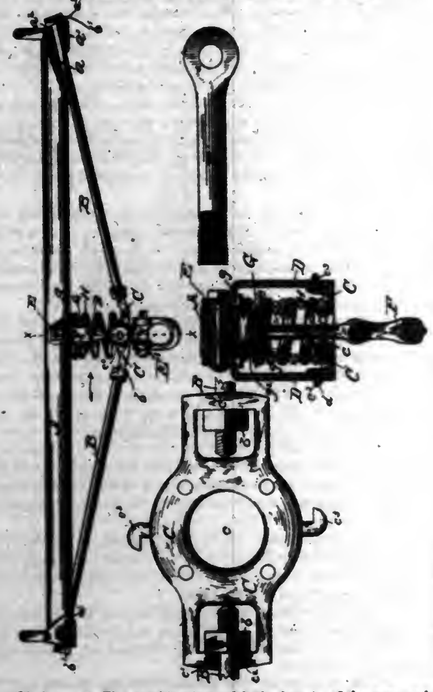
2. A toilet or wrapping paper roll having all of its lines of perforations or incisions in the same plane and provided with a stay passed through said perforations or incisions and secured therein, substantially as set forth.

3. A toilet or wrapping paper roll having all of its lines of perforations or incisions in the same plane, combined with a stay passed through said perforations or incisions and secured therein, the outer end of said stay having a hook or eye by which the roll may be suspended, substantially as described.

4. A toilet or wrapping paper roll having all of its lines of perforations or incisions in the same plane, combined with a stay passed through said perforations or incisions and having its inner end engaging the inner part of the roll, substantially as set forth.

5. A toilet or wrapping paper roll having all of its lines of perforations or incisions in the same plane, in combination with a spring-ball passed through the perforations or incisions and having its flaring inner ends spread apart to engage the inner part of the roll, substantially as described.

396,676. WHIFFLETREE. FREEMAN R. WILLSON, Sr., Columbus, Ohio. Filed June 16, 1888. Serial No. 277,493. (No model.)



Claim.—1. The combination, with the bar A, of the truss-rods extending, respectively, from the outer ends of the bar A to points near the central transverse line, and having their inner ends separately and adjustably fastened by means of nuts at their inner ends, adapted to rotate while the parts are joined, substantially as set forth.

2. The combination, with the front bar of the whiffletree and the terminal clips *a'*, of the two truss-rods extending, respectively, in from the terminal clips to a connecting-plate at the center, and nuts engaging with said plate and adapted to rotate while in place for binding together the said central plate, the terminal clips, and the truss-rods, substantially as set forth.

3. The combination of the bar A, the truss-plate C, the truss-rods B B, the coiled spring bearing directly against the said truss-plate, and the draw-bar connected to the spring, substantially as set forth.

4. The combination of the bar A, the draw-bar E, the truss-plate C, extending around the draw-bar, the braces D, and the rods B B, adjustably connected to the plate C, substantially as set forth.

5. The plate or frame-piece C, having the aperture for the draw-bar and having the bars *c'*, with the apertures for the truss-rods, and having a seat for the spring, substantially as set forth.

6. The combination, with the bar A, of the truss-rods and the terminal clips having end walls covering the ends of the bar and engaged by the truss-rods, substantially as set forth.

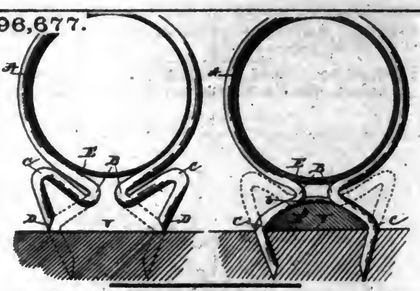
7. The combination, with the whiffletree bar A and the spring, of the plate against which said spring bears directly, the strut or brace D, interposed between the bar A and said plate, and the draw-rods B, having their inner ends connected to the plate at the end of the spring independently of the bar A, substantially as set forth.

396,677. DEVICE FOR FASTENING CONDUCTORS. WILLIAM P. ZIMMERMAN, Freeport, Ill. Filed May 7, 1888. Serial No. 273,073. (No model.)

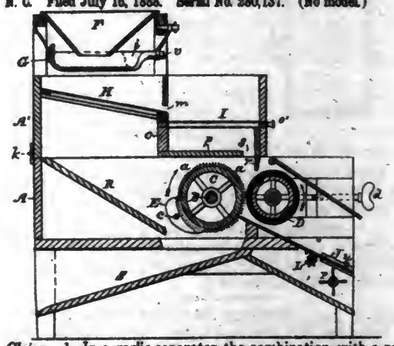
Claim.—1. As an improved article of manufacture, the herein-described device for holding and fastening conductors, &c., the same consisting of a section of wire bent into the shape shown in the drawings—that is to say, so as to form a loop adapted to fit closely around the conductor, the inner meeting ends of this loop being doubled to form shoulders B B, and then again doubled to form the outer shoulders, C C, terminating in pointed ends D D, substantially as and for the purpose shown and set forth.

2. The combination, with the device for holding and fastening conductors herein shown and described, of the grooved brace-block F, substantially as and for the purpose shown and set forth.

396,677.



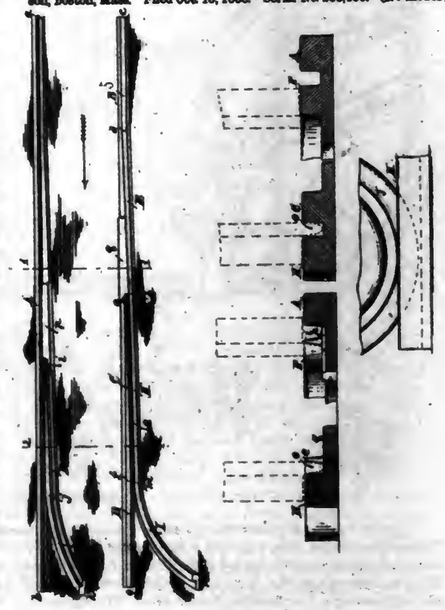
396,678. GARLIC-SEPARATOR. WILLIAM C. AYERS, Plymouth, N. C. Filed July 16, 1888. Serial No. 280,137. (No model.)



Claim.—1. In a garlic-separator, the combination, with a rotary cylinder provided with teeth on its periphery, which teeth are in rows extending around the cylinder, of an adjacent rubber roller in contact with said cylinder, a clearing-comb the teeth of which extend between the said rows of teeth to the surface of the cylinder, and an adjustable cut-off chute, substantially as and for the purposes described.

2. In a garlic-separator, the combination, with the rotary cylinder provided with teeth which are arranged in rows extending around the cylinder, of an adjacent rubber roller in contact therewith and a clearing-comb which is provided with teeth the inner edges of which are curved and conform to the periphery of the cylinder, substantially as set forth and described.

396,679. RAILWAY-SWITCH. WILLIAM H. BARWICK, Everett, assignor to himself, Calbee O. Benton, Cambridge, and Fred J. Hutchinson, Boston, Mass. Filed Oct. 13, 1888. Serial No. 288,039. (No model.)



Claim.—1. In a railway-switch, the combination of fixed rails of one track providing the tread A, and tread B, and tread C with fixed rails for a branch track, providing the tread E H, and the tread F, the tread B and tread C being parallel with tread A, the tread H being parallel with the tread F, and the tread E H being in one continuous line and extending each way beyond the end or point *e* of the tread C a distance equal to or about equal to the distance between the two wheels on one side of a car-truck, substantially as and for the purpose set forth.

2. The combination of fixed rails providing the tread A, tread B and tread C parallel with tread A, tread E and tread H about equal in length to each other, and tread F parallel with tread H, the distance between the tread H of the turn-out and the tread C of the main track being about equal to the thickness of the flange of a car-wheel, substantially as and for the purpose set forth.

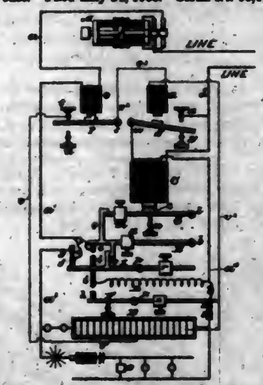
3. The combination of fixed rails forming a railway-switch and providing a tread, A, on one side of the main track, a tread, B, and tread C on the other side of the main track, a tread, F, on one side of the turn-out, a tread, H, on the other side of the turn-out, opposite to and parallel with the tread F, a tread, E, between the tread B and tread C and forming part of each track, and the raised flanges *p* and *q*, the tread E and tread H forming a continuous line and equal in length to twice the distance between the two wheels on one side of a car-truck, substantially as described.

396,680. LINING FOR SAFES. WALTER W. BOOTH, Elmsford, assignor to himself, and Charles Francis Stone, New York, N. Y. Filed Dec. 27, 1888. Serial No. 191,902. (No model.)



Claim.—In a safe having inner and outer shells, the lining consisting of aluminous clay and feldspar fused together, substantially as described.

396,681. SECONDARY-BATTERY CHARGING. CHARLES F. BRUSH, Cleveland, Ohio. Filed May 21, 1888. Serial No. 95,608. (No model.)



Claim.—1. The combination, with an electric generator, a main or charging circuit, and a secondary battery, of switch mechanism constructed to connect and disconnect the opposite ends of the battery and the charging-circuit, and electro-magnets included in the charging-circuit and adapted to actuate the switch mechanism and automatically connect the opposite ends of the battery with the charging-circuit when the charging-current has approximately reached its normal strength, (and not until then,) substantially as set forth.

2. The combination, with an electric generator, a main or charging circuit, and a secondary battery, of switch mechanism constructed to connect and disconnect the opposite ends of the battery and the charging-circuit, a circuit around the battery adapted to be opened and closed, and electro-magnets included in the charging-circuit and circuit including the battery, and arranged to actuate the switch mechanism and automatically disconnect the opposite ends of the battery from the charging-circuit and simultaneously close the charging-circuit around the battery, substantially as set forth.

3. The combination, with an electrical generator, a main or charging circuit, and a secondary battery, of switch mechanism constructed to connect and disconnect the opposite ends of the battery and the charging-circuit, and electro-magnets included in the charging-circuit and circuit including the battery and arranged to be actuated by the rise of electrical potential of the secondary battery attending the completion of its charge and operate the switch mechanism and automatically disconnect the opposite ends of the battery from the charging-circuit and close the latter around the battery, substantially as set forth.

4. The combination, with an electrical generator, a main or charging circuit, a secondary battery, and translating devices included in the discharging-circuit of the secondary battery, and a circuit around the battery adapted to be opened and closed by a switch, of switch mechanism constructed to disconnect the opposite ends of the battery from the charging-circuit and closing the latter around the battery and electro-magnets included in the charging-circuit and circuit including the battery connected with and adapted to automatically actuate said switch mechanism, substantially as set forth.

5. The combination, with an electrical generator, a main or charging circuit, a secondary battery, and translating devices included in the discharging-circuit of the secondary battery, and a circuit around the battery adapted to be opened and closed by a switch, of switch mechanism included in the charging-circuit and circuit including the battery and arranged to disconnect the opposite ends of the battery from the charging-circuit and simultaneously close the latter around the battery, said switch mechanism being constructed to allow the working-circuit to be energized either by the generator or secondary battery, or both, and electro-magnets connected with and adapted to automatically actuate said switch mechanism, substantially as set forth.

6. The combination, with an electrical generator, a main or charging circuit, and a secondary battery, of switch mechanism for connecting the opposite ends of the battery with the charging-circuit, and electro-magnets included in the charging-circuit and circuit including the battery and arranged to actuate the switch mechanism and automatically connect the opposite ends of the battery with the charging-circuit when the electrical potential of said battery shall have reached a predetermined minimum, substantially as set forth.

7. The combination, with an electrical generator, a main or charging circuit, and a secondary battery, of switch mechanism constructed and arranged to connect and disconnect the opposite ends of the battery and the charging-circuit and a circuit around the battery adapted to be opened and closed by a switch, and electro-magnets included in the charging circuit and circuit including the battery and arranged to actuate the switch mechanism and open the charging-circuit around the battery and to connect the opposite ends of the latter with the charging-circuit when the electrical potential of said battery shall have reached a predetermined minimum, substantially as set forth.

8. The combination, with an electrical generator, a main or charging circuit, a secondary battery, and translating devices included in the discharging or working circuit of the secondary battery, of switch mechanism constructed and adapted to connect the opposite ends of the battery and charging-circuit, and thereby switch the battery and its discharging or working circuit into the main or charging circuit, and electro-magnets included in the charging-circuit and circuit including the battery and arranged to actuate said switch when the electrical potential of the battery shall have reached a predetermined minimum and automatically switch the battery and its working-circuit into the main or charging circuit, substantially as set forth.

9. The combination, with an electrical generator, a main or charging circuit, a secondary battery, and a resistance included in a branch circuit adapted to be closed around the battery, of switch mechanism and electro-magnets for operating the same, the parts being constructed and arranged to automatically switch a part of the charging-current around the battery, and then divert the entire charging-current around the battery and disconnect the opposite ends of the battery from the main or charging circuit, substantially as set forth.

10. The combination, with an electrical generator, a main or charging circuit, a secondary battery, and an open resistance branch circuit around the battery, of switch mechanism and electro-magnets for actuating the same, the parts being constructed and arranged to be actuated by the fall of electrical potential of the battery for automatically connecting the opposite ends of the battery with the main or charging circuit and switching part of the charging-current through the battery and part around the battery, and then breaking the short circuit around the battery and diverting the entire charging-current through the battery, substantially as set forth.

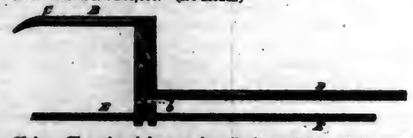
11. A system embracing an electrical current-generator, a main or charging circuit, two or more secondary batteries or groups of secondary batteries, and switch mechanism and electro-magnets connected with each of said batteries or group of batteries, said switch mechanism and electro-magnets, the latter included in the charging-circuit and circuit including the battery and arranged to automati-

cally and independently connect the opposite ends of its battery or group of batteries with the charging-circuit when the charging-current has approximately reached its normal strength, substantially as set forth.

12. A system embracing an electrical current-generating apparatus, a main or charging circuit, two or more secondary batteries or group of secondary batteries, and switch mechanism and electro-magnets associated with each battery or group of batteries, said switch mechanism and electro-magnets being included in the charging-circuit and circuit including the battery and arranged to automatically and independently disconnect the opposite ends of each battery or group of batteries from the charging-circuit by the rise of electrical potential of said battery or group of batteries which attends the near completion of the charging process, substantially as set forth.

13. A system embracing an electrical current-generator, a main or charging circuit, two or more secondary batteries or groups of secondary batteries, and switch mechanism and electro-magnets associated with each battery or group of batteries, said switch mechanism and electro-magnet (the latter included in the charging-circuit and circuit including each battery or groups of batteries) being constructed and arranged to automatically and independently connect the opposite ends of each battery or group of batteries with the charging-circuit by the fall of electrical potential of said battery or group of batteries which attends the near exhaustion of its charge, substantially as set forth.

396,682. WIRE-TIGHTENER. CONSTANT B. BUTLER, Alliance, assignor of one-half to Pleasant W. Harrison, Paris, Tex. Filed Apr. 7, 1888. Serial No. 270,003. (No model.)



Claim.—The wire-tightener described, consisting of the metallic rectangle A, provided with the arm B, terminating in the claw C, the arm D, and the notches *a b*, substantially as shown and described.

396,683. TONGUE-TIP FOR VEHICLES. WRIGHT CHATTERSON, Portsmouth, assignor to Orrin W. Hawkins, same place, and John W. Hawkins, South Bay City, Mich. Filed June 28, 1888. Serial No. 278,419. (No model.)



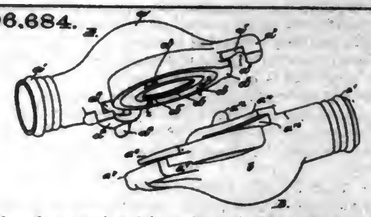
Claim.—1. The combination, with a vehicle-tongue and a socket upon the end of the tongue having a forwardly-projecting portion, *e*, provided with an opening, *f*, of a hook, *j*, having a shank, *k*, passed through the opening *f*, and provided with a head, *m*, substantially as and for the purpose set forth.

2. The combination, with a vehicle-tongue, of a socket, *b*, provided with an upwardly-extending brace portion, *g*, and a forwardly-projecting portion, *e*, having an opening, *f*, and a curved hook, *j*, having a straight portion, *k*, passed through the said opening *f* and provided with a head, *m*, substantially as and for the purpose set forth.

3. The combination, with a vehicle-tongue and a socket, *b*, provided with a forwardly-projecting portion, *e*, having an opening, *f*, and with an upwardly-projecting brace portion, *g*, and the curved hook *j*, having a straight portion, *k*, passed through the said opening *f* and provided with the head *m*, of the supporting portions *g*, extending forwardly from the brace portion *g* upon each side of the said portion *k* of the hook, substantially as and for the purpose set forth.

4. The combination, with a vehicle-tongue, a socket, *b*, provided with an upwardly-extending brace portion, *g*, and a forwardly-projecting portion, *e*, having a vertical opening, *f*, and a curved hook, *j*, having a straight portion, *k*, passed through the said opening *f*, and a head, *m*, of a pawl, *r*, pivoted to the curved portion of the said hook and with its inner free end resting upon the projecting portion *e*, substantially as and for the purpose set forth.

396,684. HOSE-COUPLING. JOHN COGHLAN, Boston, Mass., assignor to Charles W. Sherburne, same place. Filed July 30, 1888. Serial No. 281,266. (No model.)



Claim.—1. In a hose-coupling, two like halves or portions, each composed of the shell or case having the passage through it, the abutting face *c*⁶, arranged at right angles, as described, the ears *a*⁹ *a*⁷, the projection *a*¹⁰, and recess *a*¹², all substantially as described.

2. A hose-coupling composed of like halves or portions, each half consisting of a shell or case having an upturned end and an abutting face, ears or projections, as *a*⁹ *a*⁷, at the end of the shell or case opposite the upturned end, and the projection *a*⁶, formed upon the ear *a*⁷, and the projection *a*¹⁰, formed upon the shell or case between the abutting face and the upturned end, and the recess *a*¹², one wall or side of the projection *a*¹⁰ being in the arc of a circle eccentric to its opposite wall, and the recess formed between the projection *a*⁶ and the side wall of the shell or case corresponding in shape to the projection *a*¹⁰, all substantially as and for the purpose set forth.

3. In a hose-coupling, two like halves or portions, each composed of a shell or case having a passage through it, an abutting face, *a*⁶, arranged at right angles, as described, the ears *a*⁹ *a*⁷ and boss *a*⁸, forming a recess tapering from one end to the other, both in the direction of its length and its depth, and the projection *a*¹⁰ and recess *a*¹², substantially as and for the purpose set forth.

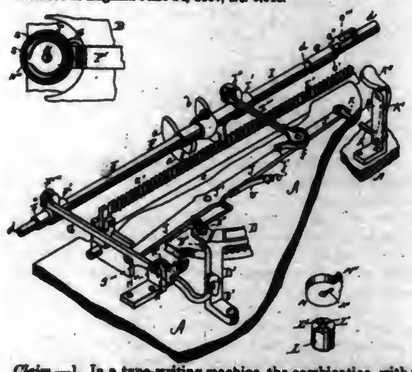
4. In a hose-coupling, the two like halves having abutting faces and provided with interlocking devices alike on each half, and consisting of the ears *a*⁹ *a*⁷ and boss *a*⁸ on each half, forming a tapering recess between them on one side of the face, and the projection *a*¹⁰ and its subjacent tapering recess *a*¹² on the other side of the face and constituting, essentially, sectional screw-threads to permit the screwing together of the two halves, substantially as and for the purpose set forth.

396,685. APPAREL-COLLAR. ESEK R. CROFUT, Newburyport, Mass., assignor to the Solid Fiber Company, Portland, Me. Filed Dec. 23, 1887. Serial No. 258,786. (Model.)



Claim.—A turn-over collar consisting of two portions, the outer portion composed of an impervious material of the character described and having a permanent roll, the inner portion or band lapping with said roll and cemented thereto, substantially as described.

396,686. TYPE-WRITING MACHINE. JAMES H. CURRIER and EUGENE I. BLODGET, Somerville, assignors to the Boston Type Writer Company, Boston, Mass. Filed Dec. 5, 1887. Serial No. 256,967. (No model.) Patented in England June 24, 1887, No. 9,013.



Claim.—1. In a type-writing machine, the combination, with the carriage provided with the feed-rack E' and the hinged frame C, of the disk-shaped pawls *a* and *b*, adapted to engage said feed-rack by turning on an axle or shaft common to said pawls and said frame, said pawls, by means of their disk shape, remaining in engagement with the feed-rack when the hinged frame is lifted and the pawls partially rotated, substantially as described.

2. In a type-writing machine, the combination of the carriage provided with the feed-rack E', the rod or axle *d*, sleeves F I, provided, respectively, with the pawls *a b*, adapted to be rotated simultaneously and engage the feed-rack alternately, the supplemental sleeve *e*, placed on said rod at a suitable distance to allow of a slight longitudinal play in the sleeve I, and a suitable stop, substantially as and for the purpose described.

3. In a type-writing machine, the combination of the carriage provided with the feed-rack E', the rod or axle *d*, sleeves F I, provided, respectively, with the pawls *a b*, adapted to be rotated simultaneously and engage the feed-rack alternately, the supplemental sleeve *e*, placed on the said rod at a suitable distance to allow of a slight longitudinal play in the sleeve I, said supplemental sleeve being provided with a notch, *c'*, and the adjustable stop *c''*, substantially as and for the purpose set forth.

4. In a type-writing machine, the combination of the rod *d*, sleeve F, pawl *a*, hub F', rod G, elbow-lever H, standard H', spring H'', and pivoted frame C, substantially as and for the purpose described.

5. In a type-writing machine, the combination of the rod *d*, sleeve I, hub I', pawl *b*, lever I'', spring *f*, lever J, rod K, lever K' K'', and standard K''', substantially as and for the purpose set forth.

6. In a type-writing machine, the combination of the rod *d*, sleeves F I, hubs F' I', pawls *a b*, lever I'', spring *f*, lever J, spring U, rod G, provided with the catch *g*, elbow-lever H, spring H'', standard H', and type-frame C, substantially as and for the purpose described.

7. In a type-writing machine, the combination of the base B, post L, provided with the radial grooves L', disk N, provided with the hook N'' and projection N', sleeve P, provided with the lever P', spring S, having its opposite ends secured to said lever and said disk, link R, and carriage M, substantially as and for the purpose set forth.

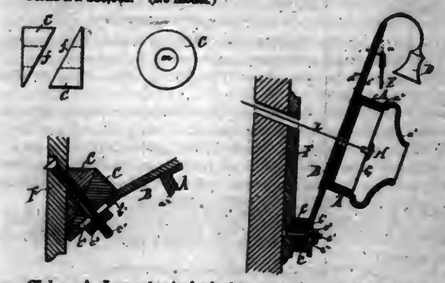
396,687. CAR-COUPLING. GEORGE CORNER, Hamilton, Ontario, Canada. Filed Feb. 4, 1888. Serial No. 263,010. (No model.) Patented in Canada Feb. 10, 1888, No. 26,508.



Claim.—1. A car-coupling in which the gripping-surfaces of the point-headed hooks A are formed, respectively, concave or a segment of a circle from the center of their operating-pins, substantially as and for the purpose specified.

2. The Miller car-coupling constructed with concave gripping-surfaces of the point-headed hooks, substantially as and for the purpose specified.

396,688. MECHANICAL TELEPHONE. THOMAS S. DAVIS, Cape Girardeau, Mo., and WILLIAM W. DAVIS, Lawrence, Kans., assignors of one-third to Thomas Johnson, Cape Girardeau, Mo. Filed July 14, 1888. Serial No. 280,002. (No model.)

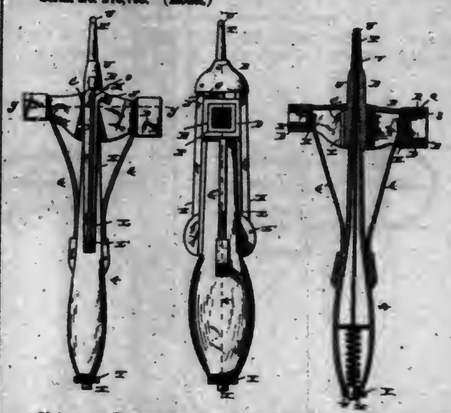


Claim.—1. In mechanical telephones, steel spring B, having vertical shank *b'* and slot *c*⁴ said steel spring B being bent outward at its upper end and fastened to telephone-box A, in combination with the adjustable-eccentric-blocks C C, core *m*, bolt *c'*, and nut *c*², as and for the purpose set forth.

2. The adjustable eccentric-blocks C C, having diagonal faces *f f* and core *m*, said eccentric-blocks C C being adjustable on their diagonal faces *f f* in the manner of an eccentric, in combination with conducting-wire X of telephone-box A, bracket F, shank *b'* of steel spring B, bolt *c'*, and nut *c*², as and for the purpose set forth.

3. The combination of telephone-box A with ball D, depending from wire *d'*, and call or indicator E, having hinge *n* attached to wire *d'*, said ball D and call or indicator E being attached by said wires to said telephone-box A and placed immediately over same, as and for the purpose set forth.

396,689. WRENCH. ALEXANDER L. DUNBAR, Roscoe, N. Y., assignor of one-half to Thomas L. Lindsay, same place. Filed Apr. 16, 1888. Serial No. 270,705. (Model.)



Claim.—1. The combination of the wrench handle or stem, the fixed jaws projecting at right angles from the same and provided with hollow boxes at their outer ends, the movable chucks sliding in said hollow boxes, and the springs pressing with their free ends against the back part of the movable chucks, substantially as and for the purpose herein shown and set forth.

2. The combination of the wrench handle or stem, the fixed jaws projecting at right angles from the same and provided with a hollow box at their outer ends, the movable chucks sliding in said hollow boxes, and the levers provided with right-angled projections adapted to engage the sliding chucks and to fix the same in their position within the jaws, substantially as and for the purpose shown and set forth.

3. The combination, in a wrench having recessed jaws, of the movable chucks and the spring-actuated levers adapted to lock the chucks in position within the recessed jaws, substantially as and for the purpose shown and set forth.

4. The improved wrench herein shown and described, consisting, essentially, of the following elements: a stem or handle, recessed jaws fixed upon and projecting from opposite sides of the same, the movable chucks, the springs bearing with their free ends against said chucks, the elbow-levers adapted to engage and lock the chucks in their position within the recessed jaws, and the springs engaging with their free ends the lower ends of said levers, the whole constructed and combined to operate substantially in the manner and for the purpose shown and set forth.

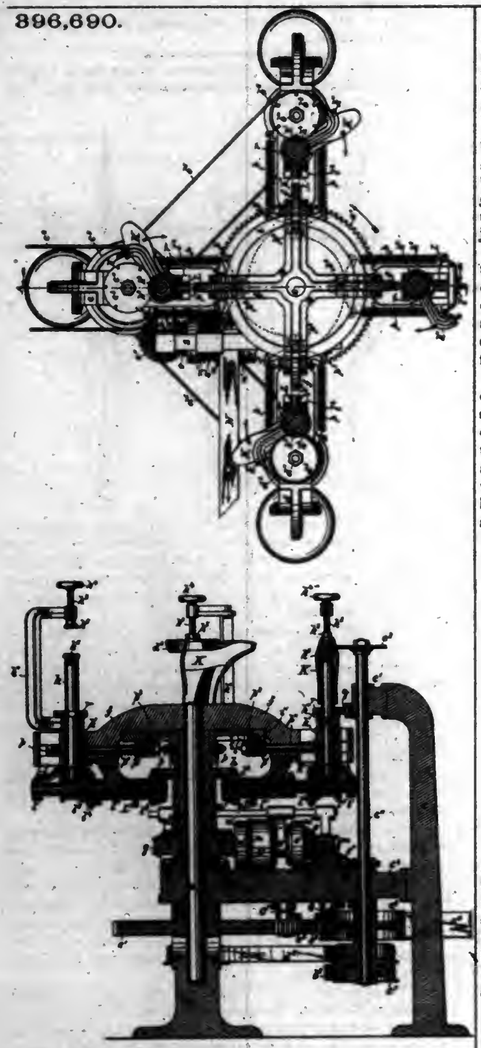
5. The improved wrench herein shown and set forth, consisting, essentially, of the following elements: a tubular stem or handle adapted to form an oil-receiver, recessed jaws fixed upon and projecting from opposite sides of the same, the movable chucks, the springs bearing with their free ends against said chucks, the elbow-levers adapted to engage and lock the chucks in their position within the recessed jaws, the springs engaging with their free ends the lower ends of said levers, the milled nut at the lower end of the handle, the rod extending through the handle and provided at its lower end with a button projecting through the milled nut, and the knob or button at the upper end of said rod adapted to close the nozzle which forms the outlet of the oil-receiver within the handle, all constructed and combined to operate substantially in the manner and for the purpose herein shown and set forth.

396,690. HEEL-FINISHING MACHINE. ALFRED B. FOWLER and GEORGE E. WARREN, Exeter, N. H., assignors to the Rockingham Machine Company, same place. Filed May 10, 1888. Serial No. 273,536. (No model.)

Claim.—1. The combination of an intermittently-rotating jack, a series of rotary tools located around the jack outside thereof, a series of radially-movable blocks carried by the jack, a series of circularly-oscillating work-holders on the radially-movable blocks, and means for rotating the tools, intermittently rotating the jack, oscillating the work-holders, and automatically moving the blocks and work-holders radially inward while the jack is rotating and outward when the jack ceases to rotate, substantially as described.

2. The combination of an intermittently-rotating jack, a series of rotary tools around the jack outside thereof, a series of radially-mov-

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ing blocks mounted on the jack, a series of circularly-oscillating work-holders carried by the radially-moving blocks, means for rotating the tools, intermittently rotating the jack and oscillating the work-holders, and a face-cam for moving said blocks radially inwardly while the jack is rotating and permitting their outward radial movement when the jack ceases to rotate, substantially as described.

3. In a heel-finishing machine, the mechanism for automatically moving the work-holders to and from the rotary tools, consisting of the intermittently-rotary jack *f f*, having blocks *k'*, arranged to slide out and in on said jack, and having spring-pressed spindles p^x secured to them, combined with the stationary cam *i* and pins, or pins and rolls p^2, mounted on said spindles p^x, substantially as and for the purpose set forth.

4. In a heel-finishing machine, the mechanism for automatically oscillating the work-holders, consisting of the intermittently-rotating gear *h*, the shafts L L, having pinions l^3 secured to their inner ends and geared to the said gear *h*, and having longitudinally-adjustable pinions l^4 geared to pinions k^2, secured to the work-holding spindles *k*, substantially as and for the purpose set forth.

5. In a heel-finishing machine, the intermittently-rotating jack *f f*, having mounted in its slotted arms the radially-movable and oscillating work-holding spindles *k k*, in combination with the intermittently-rotating gear *h*, positively geared, as described, to said spindles *k*, and the stationary cam *i*, substantially as and for the purpose set forth.

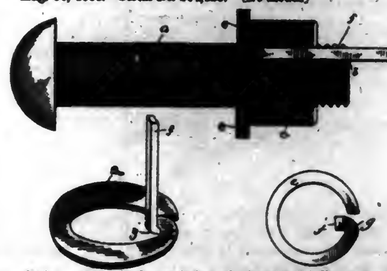
6. In a heel-finishing machine, the intermittently-rotating jack *f* and its radially-adjustable work-holding spindles *k*, and automatic mechanism for oscillating said spindles, combined with the heel-formers *r*, secured to said spindles, and rollers or projections *g*, arranged relative to the rotary tools of the machine, substantially as and for the purpose set forth.

7. In a heel-finishing machine, the mechanism for automatically imparting an intermittent rotary motion to the jack *f f* and to the gear *h*, consisting of the rotary pulley *n*, the friction-clutch *m'*, secured to shaft *m*, the worm *g'*, also secured to the latter, and worm-wheel *g*, secured to the gear *h*, and clutch-gear *o*, loosely journaled on said shaft *m* and geared in a suitable manner to the gear-wheel *c'* on the jack-shaft *c*, substantially as and for the purpose set forth.

8. In a heel-finishing machine, the intermittently-rotating gear *h*, the shafts L and their pinions l^3, geared to said gear *h*, for the purpose of imparting an oscillating motion to the work-holders, as described, combined with the shipper-lever *s*, having tooth or projection *s'*, and pins or projections L' L^x, secured to the shafts L, for automatically reversing the movement of said shipper-bar, substantially as and for the purpose set forth.

9. The combination of an intermittently-rotating jack, a series of rotating tools arranged around the jack and outside thereof, a series of radially-moving blocks on the jack, a series of circularly-oscillating work-holders carried by the blocks, means for intermittently rotating the jack, rotating the tools, and oscillating the tools, a cam acting to move the blocks and work-holders radially inward while the jack is rotating, and springs to move the blocks and work-holders radially outward when the jack ceases to rotate, substantially as described.

396,691. NUT-LOCK. GEORGE H. GRIFFIN, Abingdon, Va. Filed Aug. 30, 1888. Serial No. 284,126. (No model.)



Claim.—A nut-lock consisting of a longitudinally-grooved bolt, a nut, of a locking-washer provided with a washer portion embracing the bolt beneath the nut, and a locking-tongue resting in the groove and having its free end bent laterally to hold the nut, said lock consisting of an integral metal bar having a portion of its length bent to form the washer portion and the remainder of its length extending inwardly from one of the ends of the washer portion and then upwardly at right angles to the plane of the same, substantially as described.

396,692. PRINTING OF INDULINE DYE-STUFFS. GOTTFRIED GEIS, Elberfeld, Germany, assignor to the Farbenfabriken, vormals Fr. Bayer & Co., same place. Filed Feb. 21, 1888. Serial No. 264,857. (Specimens.)

Claim.—1. The process for producing a new printing-color of the induline dye stuffs herein described, which consists in mixing the induline paste with the formylethers of glycerine to form a dark-blue solution having the qualities for printing cotton clothe, and showing the same properties to chemical bodies as the induline dye-stuffs themselves, substantially as hereinbefore described.

2. Printing the above-described induline paste by adding the formylethers of glycerine to the printing-paste, substantially as described.

396,693. PROCESS OF PRODUCING REFRACTORY COMPOUNDS. JAMES L. HASTINGS, Philadelphia, Pa., assignor, by mesne assignments, to the Welsbach Incandescent Gas Light Company, Gloucester City, N. J. Filed Mar. 20, 1886. Serial No. 195,994. (No specimens.)

Claim.—1. The process of producing a refractory crystalline compound, which consists in forming a base from two or more pulverized mineral substances—such as oxides, carbonates, or sulphates of metals—then adding a haloid salt, then moistening and molding the mixture, then subjecting the mixture to a low drying-heat, and finally exposing it to a high temperature, substantially as described.

2. The process of producing a refractory crystalline compound, which consists in forming a base from two or more pulverized mineral substances—such as oxides, carbonates, or sulphates of metals—then mixing said base with a flux composed of one or more haloid salts—such as chlorides, iodides, fluorides, or bromides of metals—then moistening the mixture with perchloric acid or its equivalent, then molding the mixture and subjecting it to a low drying-heat, and finally exposing the compound to a high temperature, substantially as described.

396,694. WAGON-SPRING. CHARLES A. HOWARD, Pontiac, Mich., assignor to Albert G. North, same place. Filed Sept. 1, 1888. Serial No. 284,329. (No model.)

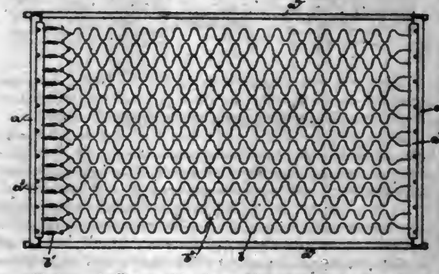


Claim.—1. In a vehicle-bolster-spring mechanism, the combination, with the bed plate or plates adapted to rest on the bolster, and the cross-bar adapted to receive the weight of the load, of spiral springs extending between said bed-plates and cross-bar at their extremities, and a semi-elliptic spring adapted to be swung either on or off the bolster at will, substantially as described.

2. In a vehicle-bolster-spring mechanism, the combination, with the bed-plates, the cross-bar, and a semi-elliptic spring pivoted to the said cross-bar and adapted to be swung either on or off the bolster, of spiral springs extending between the said bed-plates and the plates *c* on the cross-bar, and held in place by the bolts c^6, substantially as described.

3. In a vehicle-bolster-spring mechanism, the combination, with the bed-plates, the cross-bar, the spiral springs, and the semi-elliptic spring pivoted on the cross-bar and adapted to be swung either on or off the bolster, of means for locking the semi-elliptic spring in a position either on or off the bolster, substantially as described.

396,695. WIRE MATTRESS. ORIN HOWE, Cambridgeport, Mass. Filed Feb. 14, 1888. Serial No. 263,961. (No model.)



Claim.—1. The combination, with a mattress-frame, of a wire mattress consisting of vertically-bowed independent wires *b*, corrugated or made serpentine for the whole or a portion of their length at right angles to the plane of the bow, and connected to the head and foot rails of the mattress-frame to extend longitudinally the length of the bed, substantially as and for the purpose specified.

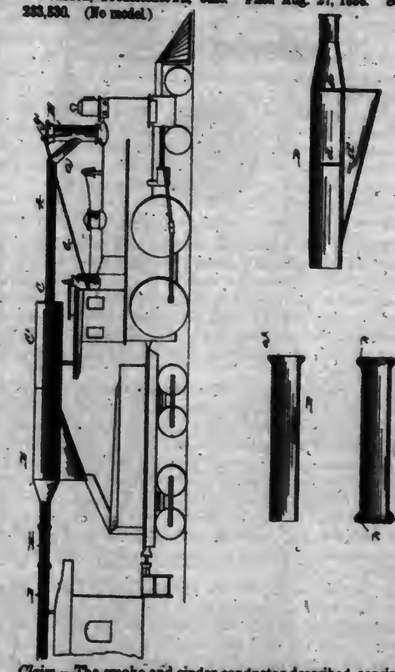
2. The combination, with a mattress-frame, of a wire-mattress consisting of independent bow-shaped wires *b*, corrugated or made serpentine for the whole or a portion of their length at right angles of the said bow, and connected to the head and foot rails of the mattress-frame to extend longitudinally the length of the bed, the said bow-shaped wires being elongated or made substantially flat by tension when secured to the mattress-frame, substantially as and for the purpose specified.

396,696. SPRING-TOOTH HARROW. CHARLES H. JEWELL, Auburn N. Y., assignor of one-half to Albert M. Nye, same place. Filed Mar 1, 1888. Serial No. 265,576. (No model.)



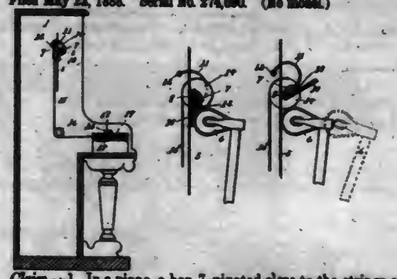
Claim.—A clip or clamp for fastening the teeth to the intersecting frame-bars of spring-tooth harrows, said clamp consisting of the seat portion *b*, having thereon a depending part, *j*, formed and arranged to enter the forward angles formed by the intersection of the said bars and to there bear upon the two bars forming said angles, respectively, and also having a horizontal extension or bar plate, *g*, all made in one and the same piece of cast metal, a detachable tooth-compressor, and fastenings for holding the said compressor against the teeth and for securing the said seat to the frame, substantially as specified.

396,697. SMOKE, SPARK, AND CINDER ARRESTER. WALTER R. JOHNSON, Fredericktown, Ohio. Filed Aug. 27, 1888. Serial No. 283,530. (No model.)



Claim.—The smoke and cinder conductor described, consisting of the section A, the shut-off located at the junction of said section and the smoke-stack, the section C, having the larger pipe, C', surrounding it, the section D, having the perforated screens *d* and the downwardly-projecting flaring portion under said screen and provided with the orifice *d'*, the flexible couplings H, and the section E, all substantially as described and set forth.

396,698. DEVICE FOR MUTING PIANOS. JOSEPH KELLER, Bridgeport, Conn., assignor to the Keller Piano Company, same place. Filed May 22, 1888. Serial No. 274,690. (No model.)



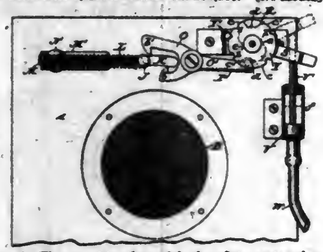
Claim.—1. In a piano, a bar, 7, pivoted close to the strings above the hammers and carrying a strip, 10, adapted to rest on the strings and be engaged by the hammers, in combination with a spring acting upon the bar to place the strip in operative position.

2. The combination, with the strings and hammers, of a pivoted bar and a strip of rubber carried by said bar and adapted to lie between the strings and hammers, and a spring acting to hold the strip in operative position.

3. The pivoted bar, strip 10, carried thereby, and a roller upon said bar, in combination with a cord attached to the roller and extending downward and outward, where it is attached to a slide, and a stud and set-screw, whereby the slide is locked in its retracted position to hold the strip out of engagement with the string.

4. Bar 7, carrying strip 10 and roller 14, in combination with a spring acting to hold the strip in operative position, and a cord extending from the roller and connected to a slide provided with a set-screw, whereby the bar may be partially rotated to place the strip out of operative position, and retained in that position.

396,699. PHOTOGRAPHIC SHUTTER. EDMOND KUHN, New York, N. Y. Filed Dec. 6, 1887. Serial No. 257,105. (No model.)

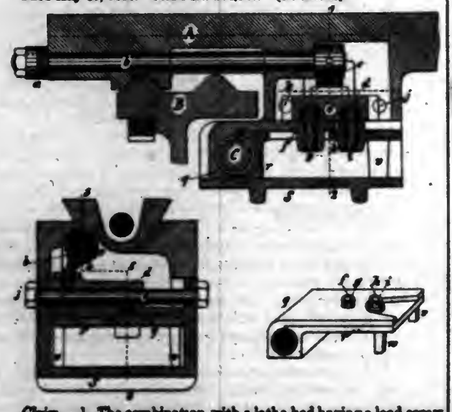


Claim.—1. The combination with the plate embracing the lens-opening in a photographic camera, a toothed ring revolving concentrically about the center of said opening as its axis, pinions geared to said ring, and shutters carried by said pinions to revolve therewith, of an arm projecting from said ring, a spring attached to said arm to draw it automatically in one direction, and stops adapted to limit the movement of the arm, all substantially in the manner and for the purpose herein set forth.

2. The combination, with the shutters pivoted to swing over the lens-opening in a photographic camera, pinions actuating said shutters, a toothed ring geared to said pinions, an arm extending from said ring and stops limiting the movement thereof, of a pin projecting from said arm, an escapement-plate pivoted in position to engage said pin and formed with two opposite hooks at different distances from its pivotal center wide enough apart to permit the pin on the arm to pass in a right line between them, a spring operating to draw the arm away from the escapement-plate, and mechanism, substantially as described, for moving said escapement-plate, all substantially in the manner and for the purpose herein set forth.

3. The combination, with the vibrating arm or lever E, the shutters C, controlling the lens-opening B, the intermediate mechanism, substantially as herein described, whereby the oscillation of the lever is made to open and close said shutters, a pin projecting from said lever, an escapement-plate pivoted in position to engage said pin and formed with two opposite hooks at different distances from its pivotal center wide enough apart to permit of the passage of the pin on the arm in a right line between them, a spring operating to draw the lever away from the escapement, and stops limiting the movement of the lever, of an arm projecting from said escapement-plate, a revolving disk having cams on its periphery to engage said arm and thereby determine the position of the escapement-hooks in relation to the lever-pin, and mechanism, substantially as described, for controlling and actuating said cam-disk, substantially in the manner and for the purpose herein set forth.

396,700. LATHE-CARRIAGE. WILLIAM LODGE, Cincinnati, Ohio. Filed May 18, 1888. Serial No. 274,340. (No model.)

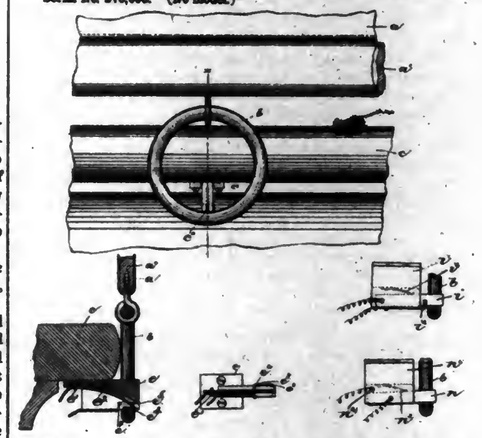


Claim.—1. The combination, with a lathe-bed having a lead-screw mounted inside of the same under the front shear, of a carriage having secured to the lower part of its cross-bridge the rectangular box B, provided on each side with the extension tubular journals for the lead-screw, substantially as set forth.

2. In a lathe, the combination, with the carriage thereof, having the box B, of the sliding cam *d* and the half-nuts *g* and *r*, having the wing of one superposed upon the other and provided with the roller-capped studs engaging the grooves of said cam, substantially as described.

3. The combination, in a lathe, of the carriage and its box B, the rod *b*, journaled in the carriage and having at one end an actuating-crank and at the other a lever, *e*, the sliding cam actuated by said lever, and the half-nuts with their studs in engagement with said cam, substantially as described.

396,701. BURGLAR-ALARM. GEOFFREY R. LENT, Medford, assignor of one-half to Bernice J. Noyes, Boston, Mass. Filed Apr. 14, 1888. Serial No. 270,698. (No model.)



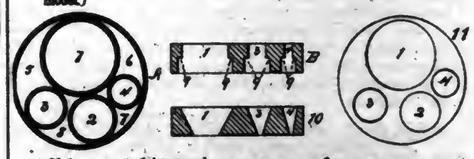
Claim.—1. In a burglar-alarm, the circuit-changing lever receiving upon it and being held in its abnormal position by the pendant of a spring-actuated curtain or shade, substantially as described.

2. In a burglar-alarm, the spring-controlled circuit-changing lever, combined with the slitted guard within which it is placed, said lever receiving upon it and being held in its abnormal position by the pendant of a curtain or shade, substantially as described.

3. In a burglar-alarm, the spring-controlled circuit-changing lever, bent as at c^2, to receive the pendant of a curtain or shade, combined with the slitted block *c*, within which the said lever is made movable, and the contact against which the said lever normally bears, substantially as described.

4. In a burglar-alarm, the circuit-changing lever normally resting on a contact and receiving the pendant of a curtain or shade, by which it is moved into and held in its abnormal position, substantially as described.

396,702. FISHING-ROD CASE. HENRY LOFTIS, Syracuse, N. Y. Filed June 3, 1887. Renewed Dec. 26, 1888. Serial No. 294,698. (No model.)



Claim.—1. A fishing-rod case consisting of an outer tube, a set of diametrically-graduated tubes placed within the outer tube, and end caps, substantially as described.

2. A fishing-rod case consisting of an outer tube, a set of diametrically-graduated tubes inclosed therein with suitable packing or filling, and end caps, substantially as described.

3. A fishing-rod case consisting of an outer tube, a set of diametrically-graduated tubes inclosed therein, and a holder, 10, for retaining the ends of the rod-sections, provided with tapering perforations and fitting upon the lower ends of the inner tubes, substantially as described.

4. A fishing-rod case consisting of an outer tube, a set of diametrically-graduated tubes inclosed therein, and metallic or flexible plates for steadying the upper ends of the rod-sections fitting on top of the inner tubes, and caps inclosing the ends of the outer tube, substantially as described.

5. A fishing-rod case consisting of an outer tube inclosing other tubes constituting a series of distinct diametrically-graduated compartments, substantially as described.

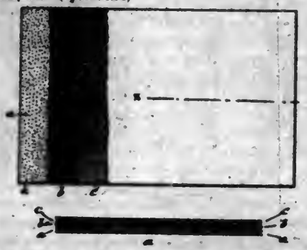
6. A fishing-rod case consisting of an outer tube, a set of diametrically-graduated tapering tubes to conform to the varying thickness of the several rod-sections inclosed therein, and end caps, substantially as described.

396,703. PROCESS OF MAKING BASIC LEAD SALTS. FARNHAM M. LYTE, Cotford, Oakhill Road, Putney, County of Surrey, England. Filed Aug. 30, 1887. Serial No. 248,273. (No specimens.) Patented in England Aug. 11, 1886, No. 10,206, and Sept. 18, 1886, No. 11,889; in France Aug. 9, 1887, No. 185,257; in Belgium Aug. 9, 1887, No. 73,822; in Germany Aug. 26, 1887, No. 44,008; in Italy Sept. 30, 1887, XXI, 22,192, XLIII, 479, and in Spain Apr. 20, 1888, No. 7,586.

Claim.—1. The herein-described process of rendering basic in a definite predetermined degree the insoluble or sparingly-soluble lead salts, which process consists in first precipitating the extra base out of a given volume of a solution of basic lead acetate, and then boiling the precipitate with such a volume of the same or a similar basic liquor as will impart the desired degree of basicity to the precipitate, as specified.

2. The process herein described of rendering insoluble or sparingly-soluble lead salts basic, consisting in first treating basic lead acetate with sulphuric acid to precipitate the extra base out of the same, then rendering the precipitate basic by the addition of basic lead acetate, and finally boiling the mixture, as set forth.

396,704. SIGN-PLATE. DAVID MACDONALD, Toronto, Ontario, Canada, assignor to William Stone, same place. Filed Apr. 11, 1888. Serial No. 270,261. (Specimens.)



Claim.—1. A sign-plate composed of a metal foundation plate or backing having a porous or roughened surface, an intermediate layer of cement, and a face layer of paper united with the foundation-plate by pressure, substantially as set forth.

2. A sign-plate composed of a metal foundation plate or backing having a porous or roughened surface, an intermediate layer of cement, and a face layer of sized and varnished paper united with the foundation-plate by pressure, substantially as set forth.

396,705. OBTAINING AMMONIA AND OXALIC ACID FROM SUGAR WASTE. EMIL MEYER, Berlin, assignor to Carl Uhl & Co., Brunswick, Germany. Filed Sept. 15, 1888. Serial No. 285,518. (No specimens.) Patented in Germany Aug. 22, 1887, No. 43,345; in Belgium Dec. 13, 1887, No. 79,896; in France Dec. 13, 1887, No. 187,573; in England Dec. 16, 1887, No. 17,347, and in Austria-Hungary May 2, 1888, No. 43,264 and No. 10,260.

Claim.—1. The novel process which consists in first heating a solution of a caustic alkali in a suitable receptacle, then gradually adding to the said solution at separate intervals a predetermined quantity of concentrated desaccharized lye or its equivalent in the form of molasses, in the proportions hereinbefore set forth, continuing the application of heat, and finally separating the oxalic salts from the resultant mass, substantially as described.

2. The novel process which consists in first heating a solution of a caustic alkali in a suitable receptacle, then adding concentrated desaccharized lye or its equivalent in the form of molasses, continuing the application of heat to liberate all the ammonia, then separating the oxalic salts from the resultant mass, and finally rendering the alkaline residue caustic, whereby it may be used over again, all substantially as and for the purpose set forth.

396,706. SAW-GIN. ROBERT S. MUNGER, Dallas, Tex. Filed June 16, 1888. Serial No. 277,263. (No model.)





Claim.—1. The combination, with a gin-frame, of the saw-carrying shaft having a pulley, 38, an idle-pulley, 39, pivoted swinging arms 41, connected and carrying the idle-pulley, a pendent arm, 44, connected to one of the pivoted arms, a bar, 45, connected to the lower end of the pendent arm, and having a handle, 48, for swinging the pivoted arms, a detent for said bar, a power-pulley, a brush-shaft pulley, 37, located between the saw-shaft and the idle-pulley, and a single belt passing from the power-pulley over the idle and brush-shaft pulleys and about the saw-shaft pulley, substantially as described.

2. The combination, with a gin-frame and a lengthwise-adjustable breast hinged thereto, of a hinge composed of two plates, one movably secured to the gin-frame and the other fixed to the breast, and a set-screw mounted on the gin-frame and engaging the movable plate of said hinge to adjust the breast lengthwise, substantially as described.

3. The combination, with a gin-frame and a lengthwise-adjustable breast, of hinges each composed of two parts, one movable laterally with respect to the other and secured, respectively, to the gin-frame and breast, a hinge composed of two plates, one movably secured to the gin-frame and the other fixed to the breast, a lug on the gin-frame, and a set-screw carried by the lug and engaging a part of the said movable plate of the hinge, substantially as described.

4. The combination, with a gin-frame and a lengthwise-movable breast hinged thereto, of a hinge composed of two plates, one slotted and movably secured to the gin-frame and having a vertical lug and a lug fixed to the gin-frame, a set-screw swiveled to the lug on the gin-frame and screw-threaded into the lug on the movable plate of the hinge, substantially as described.

5. In a cotton-gin, the saw-cylinder consisting of a shaft having both ends screw-threaded, saws on the shafts, spacing-blocks between the saws, one of which is rigidly secured to the shaft at or adjacent to the middle of its length, and a nut at each end of the shaft, substantially as described.

6. In a cotton-gin, the combination, with a shaft, of a space-block rigidly connected thereto at or near its center, alternating saws and space-blocks arranged in a series upon each side of the rigid block, collars placed upon the ends of the shaft, and nuts turned upon said ends and resting against the collars, substantially as described.

7. In a cotton-gin, the combination, with the gin-frame, of a breast having a hinge-connection with the gin-frame, pins projecting through the gin-frame and supporting the hinged breast, said pins having beveled heads, a rod carrying oppositely-beveled blocks engaging the beveled heads of said pins, and means for giving longitudinal adjustment to said rod to project the supporting-pins outward, substantially as described.

8. In a cotton-gin, the combination, with a gin-frame and a breast having hinge-connections with the gin-frame, of pins projecting through the gin-frame and supporting the breast upon their ends, a rod arranged in parallelism with the breast and carrying beveled blocks engaging oppositely-beveled heads upon the supporting-pins, a set-nut turned upon the threaded end of said rod, and a housing inclosing one of the supporting-pins, substantially as described.

9. In a cotton-gin, the combination, with the gin-frame, of a breast hinged to the gin-frame, a longitudinally-movable rod arranged behind said breast and carrying cam-blocks engaging with adjustable supports for said breast, and means for giving longitudinal movement to said rod, substantially as described.

396,707. LINE-GUIDE FOR FISHING-RODS. JOEL C. PARKER, Grand Rapids, Mich. Filed July 9, 1888. Serial No. 279,454. (No model.)



Claim.—1. A line-guide for fishing-rods, having an opening substantially parallel to the axis of the rod, and a passage through the side of said guide not in contact with the rod, through which the line may be brought within the said opening, the sides of said passage being substantially parallel and arranged at an angle to or spirally around the axis of said opening, substantially as described.

2. A line-guide for fishing-rods, consisting of two or more spiral coils attached to said rod, arranged with the axis of said coils substantially parallel to the axis of said rod, and with space between the turns of said coils for insertion of the line, substantially as described.

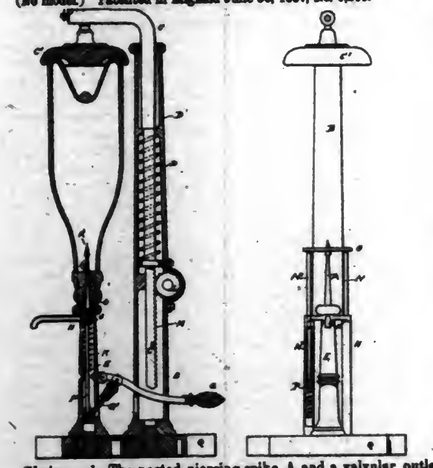
3. A line-guide for fishing-rods, consisting of a number of turns

of a spiral coil, one end of which is prolonged substantially parallel to the axis of said coil and secured to the rod by a seizing or other suitable fastening, substantially as described.

4. A line-guide for fishing-rods, consisting of one or more turns of a spiral coil attached at one end to the end of the rod, and having the free end extended outside of said coil substantially parallel with the axis of the same and terminating opposite the end of said rod, and adapted to permit the insertion of the line by passing the same between the respective turns of the coil, substantially as described.

5. A line guide for fishing-rods, consisting of substantially one and one-half turn of a spiral coil having substantially a triangular form, one angle thereof being near the middle of the overlapping part of said coil and secured to the rod by a strap or other suitable fastening engaging with the side of the triangle opposite said angle, substantially as described.

396,708. APPARATUS FOR WITHDRAWING EFFERVESCING OR GASEOUS LIQUIDS FROM CORKED RECEPTACLES. WILLIAM J. PAYNE, London, assignor to John Edward Bingham and Charles Henry Bingham, Sheffield, England. Filed Apr. 26, 1888. Serial No. 272,163. (No model.) Patented in England June 30, 1887, No. 9,289.



Claim.—1. The ported piercing-spike A and a valvular outlet therefor, combined with the hollow column B, the vertically-sliding rod C in said column, the block C' on said rod, the spiral spring D, acting on the rod to depress it, and the gearing for controlling the movement of the rod, all constructed and arranged substantially as described.

2. In apparatus for permitting the discharge of gaseous liquids from bottles, the tapered cork-piercing tube A, having ports A^2, the column E, having a chamber into which the tube opens, an outlet-spout, H, for said chamber, the valve J, arranged in said chamber beneath the tube to open and close it, and suitable means for raising and lowering said valve, in combination with a vertically-sliding rod provided with a cap to engage the bottom of the bottle, a column to support the said rod, and suitable means—such as a spring—to draw down the rod and force the cork-piercing tube through the cork, substantially as described.

3. In apparatus for the purpose herein specified, the combination, with a tapered tube, A, having an enlarged point, A', and entrance-ports A^2, and a support for the tube, of the columns N, with the rods and plate O, and springs P, substantially as described and shown.

396,709. SASH-HOLDER. LOUIS FRIBERT, Pullman, assignor to George M. Pullman, Chicago, Ill. Filed Feb. 6, 1886. Serial No. 191,070. (No model.)

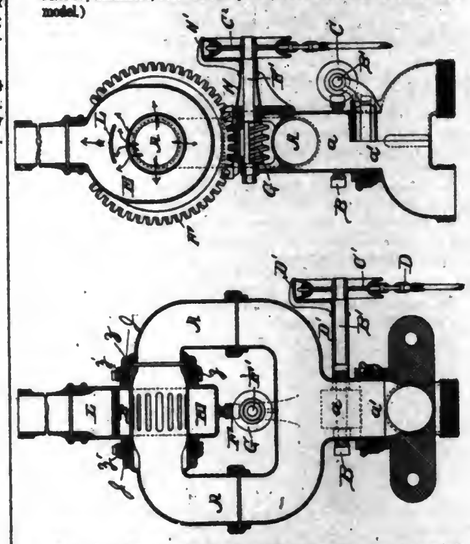


Claim.—1. The combination of a casing provided with a groove, a sash sliding in the said groove, and a two-armed spring pivoted to the sash, one arm of said spring bearing against one face of the groove and the other arm of the spring resting upon the sash, substantially as described and shown.

2. The combination of a casing provided with a groove, a sash sliding in the said groove, and a two-armed plate-spring attached to the sash, the two arms being connected to each other by a tubular portion, one of said arms bearing against one of the interior faces of the groove, substantially as and for the purpose set forth.

3. As a means for holding a sash in place, a bent metal plate, A, in combination with hubs C, by means of which it is pivoted to the sash and spring G, for increasing the tension of the plate, one arm of said plate resting upon the sash, and the other arm being pressed against the surface of the sash-casing, substantially as described and shown.

396,710. FIRE-EXTINGUISHING APPARATUS, &c. JOHN R. PROUTY, Baltimore, Md. Filed Apr. 30, 1888. Serial No. 272,333. (No model.)



Claim.—1. The combination, with an adjustable pipe or conduit, of an annular or auxiliary chamber provided with a radially-extending discharge-nozzle, said chamber tightly embracing a portion of the pipe or conduit and capable of turning upon the same to direct and hold the nozzle pointing in any direction, and a baffle-plate extending across the interior of the auxiliary chamber between the periphery of the pipe or conduit and the inner end of the discharge-nozzle.

2. The combination, with a continuous horizontally-adjustable pipe or conduit provided with a series of discharge-ports around its upper horizontal portion, of an auxiliary chamber embracing the horizontal portion of said conduit and forming an annular chamber around the discharge-ports in the same, a discharge-nozzle extending radially from said chamber, the same being adjustable around the pipe to direct and hold the nozzle in any direction, and a baffle-plate within the chamber between the inner end of the discharge-nozzle and the ports in the pipe or conduit, whereby the pressure is equalized and the retroactive force of the water overcome.

3. A pipe and a nozzle adjustably mounted on the same and provided with an annular or auxiliary chamber at its rear end, into which the water is centrally and radially discharged, in combination with the herein described baffle-plate located in said chamber at the inner or induction end of the nozzle, for the purpose set forth.

4. The combination of a vertical approximately annular conduit provided with a central rigid hollow neck at its lower portion, through which the water is received and by which the conduit is swiveled to turn horizontally, said conduit being provided with a series of discharge-ports around its upper horizontal portion, an auxiliary chamber embracing and adjustable around the horizontal part of the conduit and forming an annular chamber around said discharge-ports, a discharge-nozzle extending radially from said chamber, whereby the nozzle can be directed in any direction, gearing for horizontally adjusting the apparatus upon said central hollow neck as a pivot, and separate and independent gearing for vertically adjusting the nozzle around the upper horizontal portion of said conduit.

5. The combination of a vertical approximately annular conduit provided with a central neck extending downwardly from its lower portion, and through which the water is received and by which the conduit is swiveled to turn horizontally, horizontal gearing encircling the periphery of said neck, a shaft provided with a screw or worm meshing with said gearing, and by which the device is rotated horizontally, an auxiliary chamber in communication with, embracing, and forming an annular chamber around the upper horizontal portion of said conduit, a discharge-nozzle extending from said chamber, said chamber, and hence the nozzle, being adjustable in a vertical plane, gearing around the outer periphery of the chamber, and a shaft located in the open center of said conduit and provided with a screw meshing with said gearing and by which said nozzle is vertically adjusted.

6. The combination of a vertical approximately annular conduit provided with a series of eduction-ports around its upper horizontal portion, a central hollow neck rigidly secured to or cast with the lower horizontal portion of said conduit and extending downwardly from the same and journaled in a suitable base to allow the conduit to be horizontally adjusted, an auxiliary chamber embracing the upper horizontal portion of said conduit and forming an annular chamber around the eduction-ports in the same, whereby the water is radially discharged from the conduit into the annular chamber, and a discharge-nozzle extending from said chamber, said auxiliary chamber being capable of rotation upon the conduit, whereby the nozzle can be vertically adjusted.

7. In combination, the hollow base, the vertical continuous conduit capable of rotatory adjustment in a horizontal plane, the central downwardly-extending neck provided with peripheral gearing, a suitably-journaled shaft connected with said gearing, a chain extending to or near the ground and operating said shaft, a nozzle having an auxiliary chamber mounted upon the upper horizontal portion of said conduit, vertical gearing on the periphery of said chamber, a shaft connected with the same, and a chain extending to or near the ground and operating said shaft.

8. In a portable fire-extinguishing apparatus, the combination of a hollow base to which the water-pipes are secured, a vertical approximately annular conduit journaled on said base to render the conduit capable of rotatory adjustment in a horizontal plane, a nozzle rotatable in a vertical plane and provided with a chamber embracing and mounted upon the upper horizontal portion of said conduit, and the herein described and shown folding and jointed standard pivoted to said base and supporting the device.

9. The combination of a supply pipe or conduit, the auxiliary chamber embracing and rotating upon the same, packing and retaining rings at the junction of pipe and chamber to make a water-tight joint, and a ring embracing the pipe and adjustable to and away from said chamber to prevent lateral play or motion of the same.

10. In a fire-extinguishing apparatus, the combination of a hollow base, a vertical approximately annular conduit journaled in said base to render the conduit rotatable in a horizontal plane, and a nozzle rotatable in a vertical plane and provided with an auxiliary chamber journaled upon and embracing the upper horizontal portion of said conduit and into which the water from the conduit is radially discharged.

11. The combination, with the hollow base, of the vertical approximately annular conduit, a central hollow neck journaled in said base and extending from the lower horizontal portion of the conduit, and rendering the same capable of rotatory adjustment in a horizontal plane, gearing around the periphery of said neck, a suitably-journaled shaft provided with a worm meshing with said gearing, and by which the conduit is rotated, and the nozzle journaled upon the upper horizontal portion of said conduit and rotatable thereon in a vertical plane.

396,711. GUM-BOX FOR ENVELOPE-MACHINES. FRANCIS H. RICHARDS, Springfield, Mass., assignor of one-half to the Pratt & Whitney Company, Hartford, Conn. Filed Nov. 15, 1886. Serial No. 218,878. (No model.)



Claim.—1. The combination and arrangement, in a gum-box and with the roll R thereof, of the movable scraper-carrying frame having a fixed stroke toward and from the roll, the scraper adjustably mounted rigidly on said frame and free of said roll, the actuating-handle having a forward and backward movement, and connecting mechanism, substantially as described, operating said frame from said handle, all substantially as shown and set forth.

2. The combination, in a gum-box, of the box and its roll, the laterally-movable frame carrying the adjustably-mounted scraper and having slot 7, and shaft 6, journaled in said box and having a crank-pin working in said slot, substantially as set forth.

3. The combination of a frame having a concave groove, the scraper C, having rib 14 fitting said groove and bored to receive screws 15, and the spherical-headed screws 15, all substantially as set forth.

396,712. CULTIVATOR. JOSEPH B. ROSIER, Germantown, Nebr. Filed Oct. 24, 1888. Serial No. 288,094. (No model.)



Claim.—1. In a cultivator, the runners and the transverse beams or plates having the projecting side portions with the adjusting-holes therein, in combination with the cylindrical beams, the standards secured in said holes and having sockets in which the beams are adjusted, set-screws for holding the beams in their adjusted positions, and adjustable slotted shovels or plows on the rear ends of the beams, substantially as herein described.

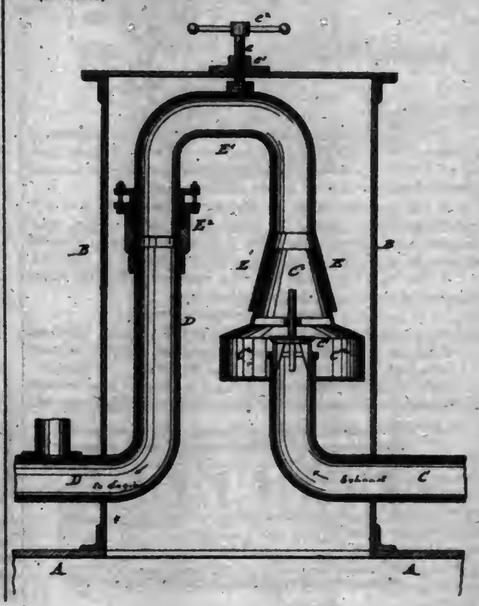
2. In a cultivator, the runners and the transverse plates or beams B B' B'', having arched central portions and projecting side portions, standards carried by said side portions and adjustable in holes therein, cylindrical beams journaled in said standards, and adjustable slotted shovels or plows on the rear ends of the beams, substantially as herein described.

3. In a cultivator, the combination of the runners, the transverse beams or plates, the shovels with their beams and suitable vertically-adjustable floats or plates near the front of the machine and adapted to rest upon the ground, whereby clods are crushed and rocking motion of the machine prevented, substantially as herein described.

4. In a cultivator, the runners, the transverse plates B B' B'', the adjustably-secured standards, the beams C D, journaled therein, and the shovels or plows carried by said beams, in combination with T-shaped standards carried by each projecting side portion of the front plate, B, horizontally-placed plates or floats beneath said projecting side portions, hinged pins attached to said plates and passing through the T-standards, and set-screws for adjustably securing said pins, whereby the floats or plates may be raised or lowered, substantially as herein described.

5. In a cultivator, the runners, the shovels and beams, and the transverse beams B' B'', having tubular sockets in their outer ends, in combination with bent rods I, journaled in the tubular sockets and provided with inwardly-turned front portions, and having the rear portions adapted to enter the ground and serve as rudders for the machine, substantially as described.

396,713. REGENERATING-EXHAUST. ALBERT SAUER, Pittsburg, Pa. Filed Mar. 19, 1888. Renewed Dec. 20, 1888. Serial No. 294,346. (No model.)



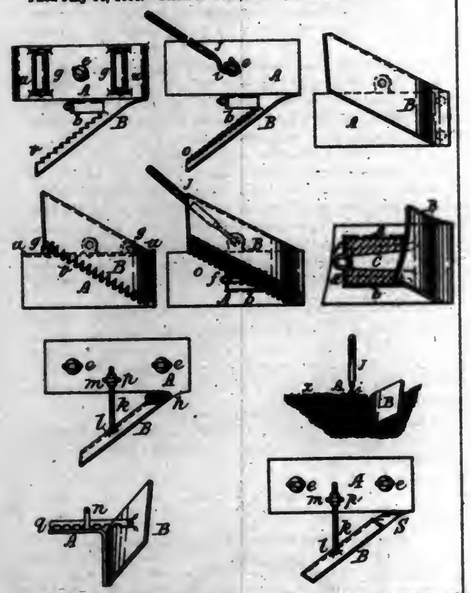
Claim.—1. The combination, with the dome of a steam-generator, of an injector located in said dome, a live-steam pipe connecting the discharge end of the injector with the motor-engine, and an exhaust-pipe connected to the suction end of the injector and provided with a check-valve, substantially as set forth.

2. The combination, with the dome of a steam-generator, of an exhaust-pipe terminating at the outside of said dome, a check-valve at the end of the exhaust-pipe, a casing surrounding the valved end of the exhaust-pipe, the casing being provided with a conical exhaust-nozzle, a second nozzle surrounding the exhaust-nozzle, and a live-steam pipe connecting the exterior nozzle with the motor-engine, substantially as set forth.

3. The combination, with the dome of a steam-generator, of an exhaust-pipe terminating inside of said dome, a check-valve at the end of said exhaust-pipe, a casing surrounding the valved end of the exhaust-pipe, said casing being provided with a conical exhaust-nozzle, a second nozzle surrounding the exhaust-nozzle, a bent pipe applied to the nozzle, a live-steam pipe having a stuffing-box for the end of the bent pipe, and means for adjusting the bent pipe and exterior nozzle, so as to increase or decrease the supply of live steam to the same, substantially as set forth.

396,714. EDGING-PLOW. JOHN S. STEVENS, London, England.

Filed July 30, 1888. Serial No. 281,269. (No model.)



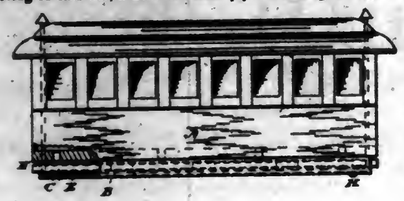
Claim.—1. An edging-plow for gardening purposes, consisting of a plate bent at a right angle for fitting upon the edge of border, having a turn-furrow attached thereto, said plow operating by means of a handle fitted with a hook, for the purposes described.

2. The combination of the edging-plow, having the socket *b*, with the turn-furrow having the tongue C, screwed pin *d*, and nut *f*, for purpose of fastening the parts A B, and the eye *e*, mounted thereon, for operating the plow by means of handle J, as described.

3. The right-angle plate A, having cambered ends *a* and rollers *g g* mounted thereon, for the purposes set forth.

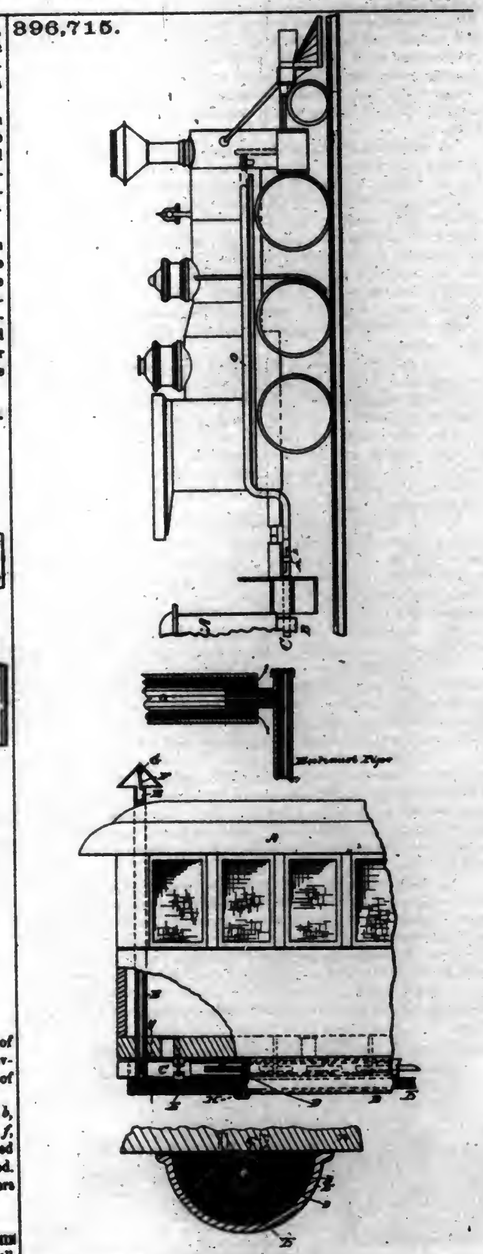
396,715. MEANS FOR HEATING RAILWAY-CARS. BENJAMIN F. TAYLOR, Newark, N. J., assignor to himself and Andrew D. Campbell, same place. Filed Feb. 28, 1887. Serial No. 229,157. (No model.)

Claim.—In combination with a car, A, a casing secured beneath the flooring of said car, a heat or steam pipe extending through the



chamber formed by said casing, a perforated outer air-pipe extending through said chamber, and a heat-absorbent receptacle arranged within said steam-pipe and open to said chamber formed by said casing, all said parts being arranged and adapted to co-operate substantially as and for the purposes set forth.

396,715.

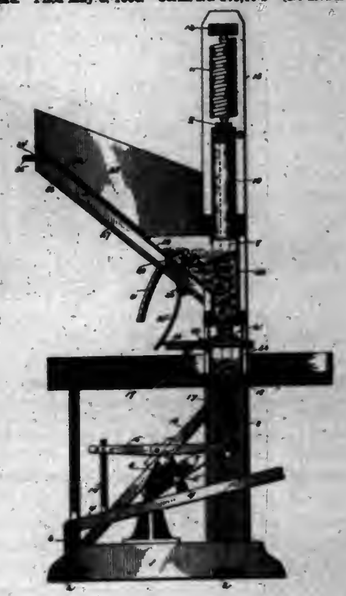


396,716. CHANGEABLE BILL OF FARE. DELANCY E. TERRILL, Copenhagen, N. Y. Filed Nov. 6, 1888. Serial No. 290,078. (No model.)

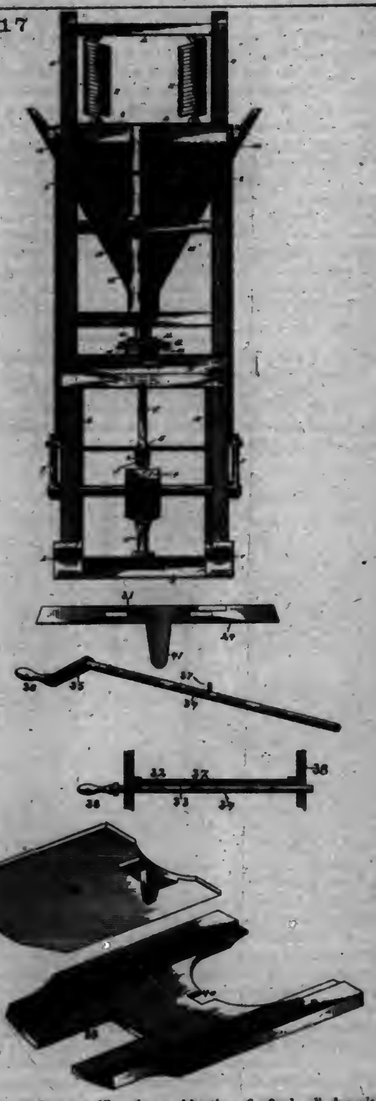


Claim.—As an improved article of manufacture, the herein-described changeable bill of fare, comprising, in combination, a series of trays, each having its ends and one of its sides turned up, as described, and a spring secured at one of its ends to the side of the tray, removable indicating-strips held within the tray, and a series of cases having hinged connection at their adjacent edges, and each having the upper edges of its turned-up sides and end turned inwardly, so as to retain and form a frame for the tray containing the indicating-strips, substantially as shown and described.

396,717. CAN-FILLING MACHINE. BENONI P. THOMAS, North East, Md. Filed May 8, 1888. Serial No. 273,190. (No model.)



396,717



Claim.—1. In a can-filler, the combination of a feed-cylinder with a hopper communicating with said cylinder, said hopper being provided with a perforate bottom and means for opening and closing the perforations, whereby the consistency of the canning material can be kept uniform.

2. In a can-filler, the combination, with a feed-cylinder, of a hopper communicating with said cylinder, said hopper being provided with a perforate bottom and an auxiliary perforated bottom sliding on the main bottom, and an exterior handle to throw the two sets of perforations into or out of register.

3. In a can-filler, the combination of a feed-cylinder with a hopper having perforate bottoms 32 33, means to throw the perforations into and out of register, a drip-chamber below the bottoms, and a discharge-pipe to the drip-chamber.

4. In a can-filler, the combination of a feed-cylinder, a vertically-reciprocating can-support, a plunger, means for bringing the plunger and can-support simultaneously toward the discharge-opening of the feed-cylinder, a spring-actuated can-ejector, and a cover for the discharge-opening controlled thereby, whereby when the plunger is lifted the can is automatically ejected and the discharge-opening sealed.

5. In a can-filler, the combination of a feed-cylinder having a contracted end provided with a flange, with a reciprocating can-support, an automatic cut-off to seal the discharge-orifice of the cylinder when

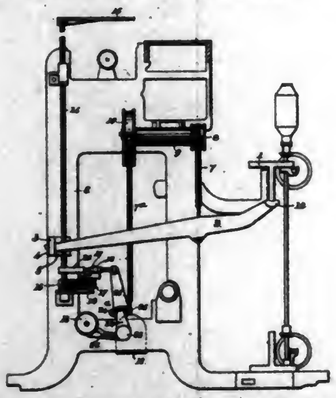
the can is removed, and a flexible washer on the lower face of the flange, said washer overlapping the cut-off when the mouth of the feed-cylinder is open.

6. In a can-filler, the combination of a feed-cylinder with a sliding plate, 23, adapted to seal the mouth of the cylinder when pushed forward, a lug on said plate to engage the can, and a spring to push the plate, simultaneously eject the can, and seal the cylinder, and an elastic washer around the mouth of the cylinder, said washer overlapping the plate when the mouth of the feed-cylinder is open.

7. In a can-filler, the combination of a feed-cylinder with a supply-hopper in communication therewith, said hopper being provided with a perforate bottom and means for opening and closing the perforations, whereby the consistency of the canning material can be kept uniform, a plunger, a can-support, a foot-lever, and connecting devices for simultaneously bringing the plunger and can-support toward the discharge-opening of the cylinder, and an automatic ejector and cylinder-seal for discharging a filled can and preventing waste of the filling material.

396,718. ROVING-FRAME, &c. SAMUEL TWEEDALE, Accrington, County of Lancaster, England. Filed July 12, 1887. Serial No. 244,106. (No model.) Patented in England Jan. 12, 1885, No. 395.

Brief.—The object of the invention is to provide improved means for balancing the lifting-rail and for raising and lowering the bottom cone, so as to facilitate the transfer of the cone-strap.



Claim.—1. In combination, the rail 1, a pivoted lever supporting said rail directly beneath its center, a supplemental shaft, pulleys thereon, a strap directly connected to the pivoted lever, and a counterbalance-weight, substantially as described.

2. In combination, the cone 13, the rock-shaft 23, having arms 26 for supporting the cone, the hand operating-shaft 14, provided with the handle 15, and connections between the hand operating-shaft 14 and the shaft 23, for transmitting the motion from the former to the latter for moving the cone, said connections consisting of a lever, 20, a gear and crank-pin connection for operating said lever, and connections between the lever 20 and the shaft 23.

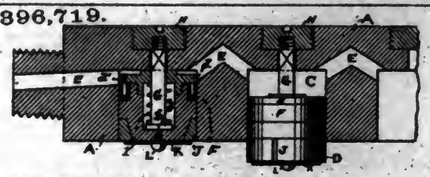
3. In combination, the cone 13, the rock-shaft 23, having arms 26 for supporting the cone, the operating-shaft 14, a segment, 16, on the end of the shaft 14, a gear, 17, meshing therewith, a lever, 20, a gear, 17, and crank-pin for operating said shaft, and connections between the lever 20 and the shaft 23, substantially as described.

4. The combination, with the bottom cone, of devices for raising and lowering it, consisting of the shaft 14, segment 16, pinion, 17, crank-pin 18, and slotted lever 20, the slotted arm 21, operated by the said lever 20, the shaft 23, and the arm 24, adapted to operate the said shaft 23 through the turning of the arm 21, and arms 26 26, adapted to lift and lock the cone 13, all substantially as and for the purpose set forth:

396,719. MINING-MACHINE. ALFRED R. WATKINS, South Orange, N. J., assignor of one-half to Rufus R. Rockwell, Boston, Mass. Filed June 17, 1887. Serial No. 241,597. (No model.)

Claim.—1. In a mining-machine, a frame provided with a series of two or more ram-chambers and with ports or passages leading to said chambers from a pressure-supplying device, in combination with

396,719.



a corresponding series of rams each of which is held movably within its chamber by a retaining-bolt, substantially as shown and described.

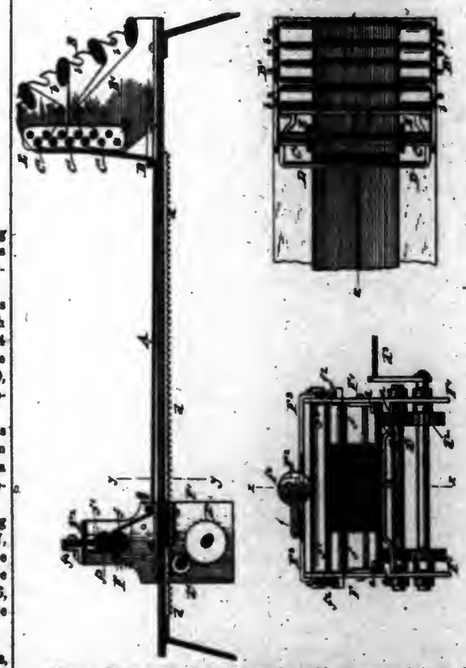
2. In a mining-machine, the combination of a frame, a ram supported therein, a port or passage leading to said ram from a pressure-supplying device, and a sectional ring mounted to slide upon the outer end of said ram and adapted to be contracted diametrically when the body of the ram is partially drawn out of said ring, substantially as and for the purposes shown and described.

3. In a mining-machine, the combination of a frame provided with a ram-chamber which is in communication with a pressure-supplying device, a ram within said chamber, a stop to prevent the ram from being forced entirely out of said chamber, and a spring adapted to draw said ram back into said chamber when the ram is relieved from pressure, substantially as shown and described.

4. In a mining-machine, the combination of the frame A, the ram D, the passages E, communicating with a pressure-supplying device, the stop G, the spring I, and the relief-passage M, substantially as shown and described.

5. In a mining-machine, the combination of the frame A, ram D, passages E, communicating with a pressure-supplying device, and bolts G, held in position by the removable plugs H, substantially as shown and described.

396,720. MACHINE FOR FILING TEXTILE FABRICS. OTTO WOLFSOHN, New York, N. Y., assignor of one-half to Michael Wolbach, same place. Filed June 13, 1888. Serial No. 276,978. (No model.)



Claim.—The combination of a cutting-table, a supporting-stand at one end for the fabrics, and a traversing-carriage provided with a stretcher-bar, a fixed clamping-jaw, a vertically-movable clamping-jaw, springs for forcing said jaws apart, and an eccentric for pressing them together.

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DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

MCCORMICK *et al. v.* WHITMER.

Decided January 7, 1889.

1. GRAHAM—HARVESTERS.

Letters Patent No. 74,342, granted to Alvaro B. Graham February 11, 1868, for an improvement in harvesters, construed, and claims 1 and 2 *Held*, in view of the state of the art and of the special limitations put upon them on the requirement of the Patent Office, to be limited to the special construction and arrangement set forth in the claims.

2. INFRINGEMENT.

Under this construction of claims 1 and 2 of the plaintiff's patent the defendants have not infringed.

APPEAL from the Circuit Court of the United States for the Northern District of Illinois.

Mr. R. H. Parkinson for the appellants.

Messrs. E. & T. A. Banning for the appellee.

Mr. Justice BLATCHFORD delivered the opinion of the Court.

This is a suit in equity, brought in the Circuit Court of the United States for the Northern District of Illinois, by Hugh Graham against Cyrus H. McCormick, Leander J. McCormick, and Robert H. McCormick, on the 8th of June, 1877, founded on the alleged infringement of Letters Patent No. 74,342, granted to Alvaro B. Graham, February 11, 1868, for an "improvement in harvesters." In the course of the suit the defendant Cyrus H. McCormick having died, his executor, Cyrus H. McCormick, and his executrix, Nettie Fowler McCormick, were substituted as defendants in his stead.

The defenses set up in the answer were want of novelty and non-infringement. After issue joined, proofs were taken on both sides, and on the 24th of April, 1882, the court made an interlocutory decree, holding the patent to be valid as regarded its first and second claims, decreeing that the defendants had infringed those claims, awarding a recovery of profits to the plaintiff from the 12th of August, 1870, the date of the assignment of the entire patent by the patentee to the plaintiff, and referring it to a master to take an account of profits and damages. On the 21st of July, 1884, the master made a report awarding a sum of money in favor of the plaintiff, to which both parties filed exceptions. On a hearing, the court sustained some of the defendants' exceptions and overruled all others, and rendered a money decree in favor of the plaintiff. Both parties prayed appeals to this Court, but the plaintiff did not perfect his appeal. Since the record was filed in this Court, the plaintiff has died, and his administrator, Peter Whitmer, has been substituted in his place as appellee.

Only claims 1 and 2 of the patent are involved. The specification states, among other things, that one object of the improvements which constitute the invention set forth in the patent, is to obtain a greater capacity of movement in a floating finger-beam, while retaining its connection with a gearing-carriage that is drawn forward by a stiff tongue; that, to that end, the first of the improvements of the patentee—

consists of the combination of the finger-beam with the gearing-carriage by means of a vibratable link extending crosswise to the line of draft, a draft-rod extending parallel with the line of draft, and two swivel-joints, the one for the vibratable link, and the other for the draft-rod, so that the finger-beam can rise and fall at either end, and rock forward or backward independently of the gearing-carriage, while maintaining its connection with it—

and that his—

next improvement consists of the combination of the finger-beam, gearing-carriage, vibratable link, draft-rod, and swivel-joints, with an arm connected with the finger-beam, to enable it to be rocked for the purpose of setting its guard-fingers at any desirable inclination to a horizontal line.

The specification further says:

My improvements may be embodied in a machine having the finger-beam arranged in advance of the axial line of the shaft or arbor of the driving-wheel, or arranged in the rear of that axial line. In the former case the vibratable link that connects the finger-beam with the gearing-carriage will be arranged in advance of the driving-wheel, and in the latter case in the rear of the driving-wheel. In the former case also the rod hereinbefore called a "draft-rod," (because the strain to which it is subjected is a pulling-strain,) becomes a pushing or thrust rod, and connects the inner end of the finger-beam with the rear of the gearing-carriage. In the former case the radius-bar for the reel and raking-platform connects with the rear end of the gearing-carriage, and in the latter case with its front end.

I prefer to construct a harvesting-machine with the finger-beam in the rear of the line of the axle of the driving-wheel, and as a description of such a machine, perfected by my improvements, will enable them to be fully understood, all of my improvements are embodied in the harvesting-machine of that description, which is represented in the accompanying drawings, and which is an illustration of the best mode which I have thus far devised of embodying them in a working-machine.

There are twelve figures of drawings. The specification states that the machine is what is commonly called a "combined machine," and is adapted to reaping and mowing; that, when used for the former purpose, it is arranged as represented in Figures 1 to 6; that, when used for the latter purpose, certain of its parts are removed, as thereinafter stated, and a grass-divider is substituted for the grain-divider, at the outer end of the finger-beam; and that the gearing which imparts motion to the sickle and reel is mounted upon a carriage, A, which is supported by two running or ground wheels, and is provided with a tongue to which the horses are hitched.

The parts of the specification which relate particularly to the subject-matter of claims 1 and 2 are as follows:

The finger-beam G of the machine projects at one side of the rear end of the gearing-carriage A, and is fitted with guard-fingers H, through the slots of which a scalloped cutter, I, is arranged to reciprocate endwise. The end of this cutter that is nearest the gearing-carriage is connected with the crank-wrist *g* of the crank-shaft D^2 by means of a connecting-rod, J. The fin-

ger-beam is connected with the rear end of the gearing-carriage in the following manner: The end of the beam nearer the carriage is provided with a shoe, K, from which lugs *a a* project upward. These lugs are perforated to admit a joint-bolt, a^1, which connects the shoe with one end of a vibratable forked link, L, whose other end is connected by a swivel-joint, M, with a bracket, N, secured to the rear of the gearing-carriage. This swivel-joint is formed by a cross-head, (m, Fig. 1^a,) the center of which is bored transversely to permit a journal formed on the end of the forked link L to turn in it. The ends of the cross-head *m* are formed into journals, which turn in bearings upon the bracket N. Hence the finger-beam can both rise and fall freely at either end, and rock forward and backward without twisting the link that forms its connection with the gearing-carriage. Moreover, the axis of the cross-head *m* of the swivel-joint is arranged in line, or thereabout, with the axis of the crank-shaft D^2, that imparts motion to the cutter, so that such rising and falling, or rocking, does not materially change the distance between the crank-shaft and the cutter. The shoe K of the finger-beam is connected also with the front end of the gearing-carriage by a draft-rod, O, and the connection between the rear end of this draft-rod and the said shoe is a swivel-joint, M', of which the joint-pin a^1 of the vibratable link L is the longitudinal axis, and its T-head m^1 the horizontal axis. This swivel-joint, therefore, while maintaining a firm connection with the draft-rod, gives free play for both the longitudinal and rocking movements of the finger-beam. Hence, when the machine is used for cutting grass the said finger-beam may be left free, not only to rise and fall at either end, but also to rock or to be rocked forward and backward, so that the points of its guard-fingers incline toward or from a horizontal plane.

In order that the finger-beam may be rocked by the conductor of the machine, the vibratable link L is fitted with an arm, *l*, whose upper end is connected by a rod with the lower end of a lever, P, that is pivoted to the gearing-carriage near its forward end. The upper end of this lever P extends within the reach of the driver, who sits upon the driver's seat Q, so that he may rock the finger-beam by moving the said lever to and fro. This rocking lever P is fitted with a spring-bolt, whose end can engage in any one of a number of notches formed in a segment, R, which is attached to the gearing-carriage concentrically with the pivot of the rocking lever, so that the finger-beam may be fastened in the desired position by the engagement of the spring-bolt in the appropriate notch. The rocking lever is fitted with a lever-handle, *p*, and rod connecting with the spring-bolt, by which the spring-bolt may be withdrawn from the notched segment and held disengaged therefrom during the movement of the lever. In order that the connection between the cutter on the finger-beam and the crank-shaft on the gearing-carriage may not obstruct the free rocking of the finger-beam, the connecting-rod J is connected with the cutter I by means of a swivel-joint, S, consisting (see Fig. 1^b) of a head, *s*, that is pivoted to the cutter-stock (by a shank that extends lengthwise therewith, and turns in an ear, s^1, secured to the end of the cutter-stock,) and of a cross-pivot, s^2, that passes through the said head and through two ears formed upon the connecting-rod J.

There are ten claims in the patent, claims 1 and 2 being as follows:

1. The combination, as set forth, in a harvester, of the finger-beam with the gearing-carriage by means of the vibratable link, the draft-rod, and the two swivel-joints M and M', so that the finger-beam may both rise and fall at either end, and rock forward and backward.

2. The combination, as set forth, in a harvester, of the finger-beam, gearing-carriage, vibratable link, draft-rod, swivel-joints, and arm, by which the rocking of the finger-beam is controlled.

It will conduce to a solution of the questions involved in the case, to give a history of the progress of the application for the patent through the Patent Office, as gathered from certified copies of those proceedings found in the record. On the 4th of December, 1865, the patentee, Alvaro B. Graham, as assignor to himself, William B. Werden, and Cyrus A. Werden, filed in the Patent Office an application for a patent, which was sworn to by him on the 25th of February, 1864. The specification of this application stated that one object of the invention was the free passage of the finger-bar over the ground, and the perfect moving of it to adjust itself to the inequalities of surface over which it might pass; and that another object of the invention was the cutting in a proper manner of lodged grass or grain. It also stated that the machine had a finger-bar, I, the inner end of which was attached, by a joint, *h*, to a bar, J, which was at the rear of the main frame A, and was connected thereto, at its left-hand side, by a swivel or universal joint, K, such joint being composed of a rod, *i*, which was allowed to turn in a bearing, *j*, attached to the main frame, the end of the bar J being cylindrical and allowed to turn in the rod *i*; that the joint K admitted of the bar J and finger-bar I being raised vertically, and also admitted of those bars being turned in a more or less inclined position, in their transverse section, to admit of the fingers and sickle being turned more or less down toward the ground, as might be required; that this adjustment of the fingers and sickle was effected through the medium of a lever, M, which was connected by a rod, *l*, with an upright, *m*, on the bar J; that this lever M might be retained in any desired position, within the scope of its movement, by means of a perforated bar, *n*, into the holes of which a pin on the lever caught; that the finger-bar I might be raised separately from the joint *h*, as a center, through the medium of a lever, N, which, like the lever M, was attached to the main frame A, and had a chain or cord attached to its lower end, said chain or cord passing around a pulley, *q*, on the bar J, and being attached to the upper end of an upright, *r*, attached to the finger-bar at the joint *h*; that both bars I and J might be elevated simultaneously by a lever, O, which was also attached to the main frame A, and bore at its lower end on another lever, P, the outer end of which was connected by a chain, *s*, with the bar J; that the lever O might be retained at any desired point, within the scope of its movement, by means of a rack-bar, P'; that, in case an obstruction presented itself to the inner end of the finger-bar I, the lever O was actuated in order to raise such end of the finger-bar, and, if an obstruction presented itself to the outer end of the finger-bar, the lever N was actuated; and that the applicant did not claim the connecting of the finger-bar I to the bar J, by a joint, *h*, for that had been previously done.

There were five claims in the specification, the first two of which were as follows:

1. The attaching of the bar J to the main frame A by means of the swivel or universal joint K, when used in combination with the finger-bar I, attached to it by a joint, *h*, and this I claim irrespective of any peculiar position of the parts or particular application of the same to the frame of the machine, so long as the desired result is obtained.

2. The arrangement of the lever N, chain or cord *p*, and upright *r*, substantially as shown, for raising the outer end of the finger-bar I, as set forth.

On the 30th of December, 1865, the Patent Office rejected claims 1 and 2 on a reference to prior patents. On the 24th of March, 1866, the applicant erased claims 1, 2, and 3, and substituted for claim 1 the following:

1. The combination of the finger-bar I and bar J, attached to the frame A by means of the universal joint or swivel K, in the manner and for the purpose herein specified.

On the 4th of April, 1866, the Patent Office rejected this substituted claim 1, by a reference to a prior rejected application and to a prior patent. On the 1st of October, 1866, it allowed the two remaining claims applied for, which had been numbered 4 and 5 originally. On the 18th of June, 1867, the applicant filed a withdrawal of the amendments filed March 24, 1866, the effect being to limit the invention claimed under the patent to the two claims allowed October 1, 1866, and the patent was granted July 23, 1867, as No. 67,041, with those two claims, which in no manner relate to any question involved in the present suit. Prior to such withdrawal of June 18, 1867, and on the 11th of February, 1867, Mr. Graham filed an application which resulted in the patent in suit, No. 74,342, issued February 11, 1868. Claims 1 and 2 of the specification of that application originally read as follows:

1. The combination, in a harvester, of the finger-beam with the gearing-carriage, by means of a vibratable link, draught-rod, and two swivel-joints, so that the finger-beam may both rise and fall at either end, and rock forward and backward, substantially as set forth.

2. The combination, in a harvester, of the finger-beam, gearing-carriage, link, draught-rod, swivel-joints, and arm, by which the rocking of the finger-beam is controlled, substantially as set forth.

There were 15 claims in all made in the specification. On the 29th of July, 1867, the Patent Office rejected claims 1 and 2, by a reference to prior patents. On the 31st of December, 1867, the applicant amended claims 1 and 2 so as to read as they are in the patent as granted. The changes thus made in those two claims, and which, under the circumstances, were made to secure the issuing of the patent, the claims having been rejected in the shape in which they were first proposed, were these: In claim 1, "the combination as set forth," was substituted for "the combination;" "the vibratable link," for "a vibratable link;" "the draught-road," for "draught-rod;" "the two swivel-joints M and M'," for "two swivel-joints;" and the words "substantially as set forth" were erased. In claim 2, "the combination as set forth," was substituted for "the combination;" "vibratable link," for "link;" and the words "substantially as set forth" were erased. In the second claim the word "the" was always prefixed to the enumerated elements composing the combination claimed.

The principal question for determination, in the view we take of the case, is that of infringement. The circuit court, in its opinion, delivered on the making of the interlocutory decree, (10 Biss., 39, and 11 Fed. Rep., 859,) considered especially two prior patents, one granted to David Zug, October 4, 1859, No. 25,697, and the other granted to F. Ball, October 18, 1859, No. 25,797. In considering those patents, on the question of infringement as well as on the question of novelty, the circuit court said:

> The two claims of the Graham patent, which are alone in controversy here, are the first and second. The first claim is for a combination of the finger-beam with the gearing-carriage by means of the vibratable link, the draft-rod, and the two swivel-joints, M and M', so that the finger-beam may both rise and fall at either end and rock backward and forward; and the second claim is the same as the first with this only added, that an arm is attached to the vibratable link by which the rocking of the finger-beam is controlled by the driver. The object of this invention, as set forth in these two claims, seems to be mainly to produce the rocking motion of the finger-beam as described and by the method described. In the Ball patent, while there may be said to be something equivalent to the swivel-joint M of the plaintiff's machine, where it is attached to the frame, and also something similar to the draft-rod and the arm, there is nothing to produce the rocking motion, which is the essential object in the first two claims of the plaintiff's machine; and consequently there is no swivel-joint M', as in the plaintiff's machine; so that there is nothing in the Ball machine to prevent the validity of the combination in the first two claims of the plaintiff's patent. The Zug machine has, if not a swivel-joint like that of the plaintiff's at M, where connected with the frame, something which seems substantially similar. It has a vibratable link and it has something which is equivalent to the draft rod, the main difference being that it is attached beneath the shoe instead of above, but there is no swivel-joint M'. There is an arm which is attached to the draft-rod and shoe by which it can be raised and lowered, but Zug claims in his patent that when the machine is in progress over the field, and when the finger-bar strikes any obstacle, there is a device in a box in which the forward part of the draft-rod is fastened, by which the finger-bar yields to the obstacle; and that there is also a mode by which the vibratable rod is attached to the frame, called "joint 16," in his patent, and what has been termed an open clevis where the vibratable link is connected with the draft-rod, by which a motion is given to the finger-bar, and thus the finger-bar is relieved from the obstacle. Zug does not claim that the finger-bar in his machine has a rocking motion, but only that the mode by which the draft-rod is fastened and the motion given to the finger-bar, prevents the obstacle which the machine may meet from doing damage to it. These seem to be the main differences between the two machines, and the question is, whether there is anything in the Zug machine to prevent the combination named in the first two claims of the plaintiff's patent from being valid. The defendants' machine has the swivel-joint attached to the frame, the vibratable link in the same form as the plaintiff's, and the draft-rod attached forward in substantially the same way as the plaintiff's, but instead of having a swivel-joint at M', as stated in plaintiff's machine, forward of the shoe, the draft-rod has a swivel-joint at the rear end of the shoe; and there is an arm attached to a part of the vibratable link substantially like that of the plaintiff's; and the substantial difference, as it seems, between the plaintiff's device as described in the first and second claims, and that of the defendants', is, that the draft-rod is attached to the rear part of the shoe, and not to the forward part, as in the plaintiff's patent. There are also other devices in defendants' machine which may make it different from the plaintiff's. But as to the swivel-joint, the vibratable link, and the mode in which the motion is produced in the finger-bar, there does not seem to be much difference in substance; and in both machines, and by substantially the same means, there is produced a rocking motion. In this connection it is noticeable that the defendants, in the claim set forth in the specification of their patent, make a rocking motion of the shoe and cutter a feature of their combination. In their second claim they say that they claim the combination of the "shoe, and the drag-bar extending over and in the rear of the shoe, and its swiveled pin connecting it with the rear end of the shoe, whereby the drag-bar sustains the thrust of the shoe while leaving it free to rock on its hinges." Again, in their fifth claim, they say that they claim the combination "of the shoe, the forked coupling-arm, the drag-bar extending over and in rear of the shoe, the swivel-pin connecting the two, the rocking lever and the detent mounted on the drag-bar, and the adjustable link-connection between the lever and coupling-arm, whereby the shoe readily may be rocked or adjusted." And again, the motion which seems to be produced in the operation of plaintiff's machine is more distinctly described in the seventh claim made by the defendants in their patent, as follows: The combination "of the shoe, the drag-bar, the forked coupling-arm," and the other elements of mechanism before mentioned, "whereby the shoe is first rocked, and then lifted by one continuous movement of the lever." It must be confessed that the difference between the Zug machine and the first two claims of plaintiff's patent is not very marked. But in view of the description contained in the specifications of Zug's patent and in those of the plaintiff's patent, we are inclined to think that the plaintiff's patent may be sustained on the ground that there is a difference in the manner in which the draft-rod is attached to the shoe, and the finger-bar to the shoe and to the vibrating link; and that there is also a difference in the manner in which the combination of the various parts are adjusted; and that there is an effect produced in the plaintiff's machine which does not exist in the Zug machine. In the plaintiff's machine there is a rocking motion, and not a mere vibratory motion, such as exists in the Zug machine in consequence of the open clevis; neither is there in the plaintiff's machine the yielding of the draft-rod, as described in the Zug patent; and it is obvious, too, from the manner in which the parts are constructed in the Zug machine, that there is only a small vibratory action of the finger-bar; so that, on the whole, we think that the combination as described in plaintiff's patent may be sustained. Then, from what we have said, we do not see that there can be any substantial difference between the combination, as described, in the plaintiff's machine, of the swivel-joints, draft-rod, and vibratable link, with the frame and shoe and finger-bar, and that of the defendants' machine. The differences which have been stated between the two machines in this respect do not constitute any difference in principle. The one is substantially the same as the other. The additions which have been made to defendants' machine, such as the device by which the pressure of the cutting apparatus upon the ground is regulated, and other devices which have been made, do not affect the combination as claimed in the plaintiff's machine. The attachment of the draft-rod to the rear part of the shoe instead of to the front part, which is substantially the only difference that there seems to be in the mode of construction, cannot constitute a difference in principle, and cannot prevent the defendants' machine from being an infringement of the plaintiff's patent. It may be said that there are differences also between the defendants' machine and that of the plaintiff, in the manner in which the arm is attached to the vibratable link, and also as to the mode in which the force applied to the arm may operate upon the finger-bar; but these are differences of form and not of substance.

The specification referred to in that opinion as the specification of the defendants, and quotations from claims 2, 5, and 7 in which are made, is a patent under which the defendants' machines were constructed, No. 193,770, granted July 31, 1877, to Leander J. McCormick, William R. Baker, and Lambert Erpelding, assignors to C. H. and L. J. McCormick.

The invention of the patentee is carried back to November or December, 1863, at which time he made a model containing his perfected invention, which he shortly afterward sent to his patent solicitors, and which was sent to the Patent Office with the application sworn to February 25, 1864, and filed December 4, 1865. The delay seems not to have been attributable to the applicant.

The patents introduced in this case as affecting the questions of novelty and infringement, and which were prior to the invention of Graham, and which seem to be relied on by the appellee, were as follows:

To George C. Dolph, No. 18,141, issued September 8, 1857; to W. S. Stetson and R. F. Maynard, No. 24,063, issued May 17, 1859; the Zug patent; the Ball patent; and one to Stephen S. Bartlett, No. 34,545, issued February 25, 1862.

We are of opinion that the circuit court took an erroneous view of the question of infringement. The capacity of the finger-beam to "rise and fall freely at either end," spoken of in the specification of the plaintiff's patent, was not a new thing with him, but had been used for many years in mowing and reaping machines, the finger-beam moving on a pivot at its inner end; and the plaintiff, in the specification of his patent of July 23, 1867, stated that he did not claim the connecting of the finger-bar I to the bar J by the joint *h*, because that had been previously done. It was also old to have a lever connected by a loose connection, by which the driver could tip up the front edge of the finger-bar arbitrarily, and secure it so that it could not fall below the inclination at which he had set it, although it was left free to tip up further automatically.

The arrangement spoken of in the plaintiff's specification, whereby the finger-beam can "rock forward and backward without twisting the link that forms its connection with the gearing-carriage," was secured by making the pivot on which the crosswise tilt takes place, at a point in front of the beam, so that the pivot rises and falls with the guard-fingers, and an arm is provided by which the movement of the finger-beam in both directions is controlled by the driver, instead of its being independent of his control in its downward movement, as was the case in prior machines. It is apparent, from the proceedings in the Patent Office on his application, and from the terms of his specification and of claims 1 and 2 as granted, that the intention was to limit the modification which he made, to the particular location of the swivel-joint M', on which the crosswise rocking movement takes place, and to the rigid arm by which the positive rocking of the finger-beam in both directions is effected and controlled.

In a mowing-machine for cutting grass, where it is desirable to cut near to the ground in order to cut and use as much of the grass as possible, the front edge of the finger-beam must bear closely on the surface of the ground, with a yielding pressure, so that it will rise freely in order to pass over such irregularities in the surface of the ground as do not require that the finger-beam should be bodily lifted. This yielding pressure is secured by a capacity in it to swing upward on its heel as a pivot, because, if its front edge were held rigidly down upon the ground, the guard-fingers would be driven into every obstruction. This necessity does not exist in machines for harvesting grain, because in them the finger-beam is set several inches above the ground, the grain being the desirable object, rather than the straw, and the carrying of the finger-beam at an elevation prevents its meeting with obstructions; and hence there is no such occasion, as in mowing-machines, for its front edge being left free to swing upward.

The capacity, if any, which Graham added to the machines in general use, was one for raising and lowering the pivot of oscillation, which had before been stationary, and a further capacity for a positive downward tilt or forward rocking, which enabled the driver to tip up the heel of the finger-beam and force the fingers under lodged grain or grass. The rocking forward and backward, spoken of in the plaintiff's specification, is applied to a tilting backward which rocks the front of the finger-beam upward, and to a tilting forward which rocks the heel of that beam upward and its front downward. In the defendants' machine, there is no such rocking backward and forward, but there is a swinging motion, the same as in the prior Ball patent, the pivot on which the tilting takes place being in the rear of the finger-beam, and there being no means of positively tipping the front of the beam downward or of raising its heel to force its front edge and the finger-guards downward. In the Ball patent, the draft-rod passes under the finger-beam, and in the defendants' machine the draft-rod passes over the finger-beam, to reach the pivotal point, which is in both cases the same. In both of them, the weight of the finger-beam being in front of the pivot tends to hold its front edge down upon the ground, but, when the finger-guards strike any elevation, the front edge of the beam swings up freely on its rear pivot, the tendency being for its weight to carry it back to its original position as soon as the elevation is passed. In the Ball patent, there is a lever connected with a chain which can raise the finger-beam or hold it up, but cannot affirmatively depress it, its downward movement being dependent solely upon the fact that its weight is in front of the pivot on which it turns. In the defendant's machine, there is a substitute for the Ball chain, namely, a loose sliding link, which permits of the same upward movement that the chain does, and which cannot force or hold the beam down. In both the Ball machine and the defendant's machine, the propelling force from the draft-rod is exerted from the pivot in the rear, and in both the front edge of the finger-beam, where the guards are situated, is left free for the swinging movement above mentioned. In contradistinction to this, the pivotal connection between the finger-beam and the draft-rod in the plaintiff's machine, instead of being at the heel of the finger-beam, is placed in front of it, at the swivel-joint M', and a rigid arm, *l*, is mounted on the vibratable link, so that the beam can thereby be rocked backward and forward by the driver, to tip the heel of the shoe up and the front down, or the front up and the heel down, the heel of the finger-beam being lifted by the forward rocking of the arm *l*, and its front being lifted by the backward rocking of such arm. By the locking of the lever which works the arm, the finger-beam can be set at any desired inclination. The movement of the finger-beam in each direction is positive. In the defendants' machine, it swings on a pivot at its rear, which is not raised or lowered by the upward or downward tilt of the guard-fingers, while in the plaintiff's machine, as the finger-beam rocks on the swivel-joint M', the heel of the finger-beam is lifted from the ground as the finger-guards are turned downward.

In the Zug patent, of October, 1859, there is a finger-beam attached to the rear end of the machine by a vibratable link, which is itself attached at its rear end loosely to the machine, and is also fitted loosely within the draft-rod, so that there is a considerable rising and falling motion to the front end of the shoe, whereby the guard-fingers can be elevated and depressed to a considerable extent, and in substantially the same manner as in the defendants' machine, the raising and lowering of them being accomplished at a similar point as in the defendants' machine, the difference in the rising and falling motion of the finger-beam in the Zug and in the defendants' machine being a difference only in degree.

In the Ball patent of October, 1859, there is a finger-beam attached by a hinged, vibratable link, and there is a draft-rod, which is hinged at its front end. A shoe is attached to the rear end of the draft-rod, with a free up-and-down hinged joint. The finger-beam of the machine is attached in front of this hinge, and such hinged connection admits of the rising and falling of the front of the shoe and of the finger-beam. This motion is not a rocking motion, as in the plaintiff's patent, but is substantially the same rising and falling motion that is found in the defendants' machine, the only material difference being that, in the Ball patent, the draft-rod extends under the shoe and the finger-beam, and prevents them from falling down lower than a horizontal position; whereas, in the defendants' machine, the draft-rod extends over the shoe and finger-beam to the same point of attachment as in the Ball patent, and thus the finger-beam can fall lower than in the Ball patent, and even to below a horizontal position; but the finger-beam in the Ball patent can rise and fall as freely at either end as in the defendants' or the plaintiff's machine, and the crosswise rising and falling motion in the Ball patent is of the same character as in the defendants' machine, but wholly unlike the rocking motion, or the forward and backward motion, of the finger-beam in the plaintiff's patent.

In the Bartlett patent, of February, 1862, there is a finger-beam attached at its rear by a vibratable link, which has a swivel-joint at its outer end and a free joint at its inner end, in connection with a shoe and with a draft-rod which extends from the front end of the machine to the rear end of the shoe; and the finger-beam is attached to the shoe in front of the vibratable link. There is also a lever which rocks forward and backward, and is so arranged that the finger-beam and the draft-rod rise and fall, and the finger-beam rocks forward and backward, substantially in the same manner as in the plaintiff's patent, though with a less perfect motion. But there is considerable forward and backward rocking motion, and the rocking takes place with substantially rigid lever devices, and there is substantially the same rising and falling motion of the finger-beam at either end as in the plaintiff's patent.

In view of this prior state of the art, the question of infringement stands in this way: In the defendants' machine, there is, in combination with the gearing-frame, a vibratable link-connection with the finger-beam, not very materially different from the vibratable link connection in the plaintiff's patent; but the draft-rod in the defendants' machine is different from that of the plaintiff's patent, in that its forward connection is not substantially a swivel-joint, but is so hinged as to afford no torsional action, and the draft-rod is connected with the shoe at nearly the extreme rear end of the shoe, while the draft-rod in the plaintiff's patent has swivel-joints at both its forward and rear ends, and such joints have substantially a free torsional capacity. So, too, the draft-rod in the plaintiff's patent is attached to the shoe in front of the finger-beam, instead of at the extreme rear end of the shoe, as in the defendants' machine. As a consequence of these several arrangements, the finger-beam in the plaintiff's patent rocks freely both forward and backward, in such manner that the rear of the finger-beam may be elevated and the guards be thrown down, or the front of it may be elevated and the guards be thrown up, with an equal rocking motion in either direction; whereas, in the defendants' machine, when the finger-beam is operated upon by the lever, the front part of it merely rises and falls with a swinging motion from its pivoted point in the rear. The defendants' machine differs from the plaintiff's patent in that its finger-beam cannot be raised at all at its rear by the lifting-lever, and cannot be positively moved downward by that lever. Therefore, as the finger-beam in the defendants' machine does not have the motion which results from the combination of the elements specified in the first claim of the plaintiff's patent, and does not "rock forward and backward" in the sense of that claim, or in the sense described in the specification of the plaintiff's patent, it does not infringe such first claim. Nor does it contain the swivel-joint M', specified in the first claim, located and operating as in the plaintiff's patent. The first claim of that patent must, in view of the state of the art, and of the special limitations put upon it on the requirement of the Patent Office, be limited to the special construction and arrangement set forth in that claim. The same views apply to the second claim of the patent, which contains combined all the elements set forth in the first claim, with the addition of the rigid arm *l*. That arm, in the plaintiff's patent, has a rigid connection with the vibratable link to which it is attached, and through such arm the finger-beam is made to rock backward or forward by positive action, in either direction; while in the defendants' machine there is no such rigid arm, but only a connection by which the front of the finger-beam can be lifted, while it falls by its own weight when released, instead of being positively forced down, as in the plaintiff's patent. This species of lifting device was old.

In regard to the extracts set forth in the opinion of the circuit court from the defendants' patent of July, 1877, we are of opinion that the second, fifth, and seventh claims of that patent, in speaking of the shoe as "rocking," can only refer to its swinging on a hinge at its rear end; and that the term "rocking" is not used in the sense in which it is used in the plaintiff's patent, because, neither in the defendants' patent nor in their machine has their shoe or their finger-beam any such rockin ; motion as is describ d in the plaintiff's patent.

It results from these views that, on a proper construction of claims 1 and 2 of the plaintiff's patent, the defendants have not infringed it, and that the decree of the circuit court must be reversed, and the cause be remanded with a direction to dismiss the bill of complaint, with costs.

Supreme Court of the United States.

ANDERSON *v.* MILLER *et al.*

Decided January 14, 1889.

ANDERSON—DRAWERS.

Letters Patent No. 265,733, granted October 10, 1882, to Robert H. Anderson, for an improvement in drawers, not infringed by an article manufactured by the appellees for more than two years prior to the appellant's application for a patent.

APPEAL from the Circuit Court of the United States for the Eastern District of Virginia.

Mr. C. S. Whitman for the appellant.
Mr. John S. Wise for the appellees.

Mr. Justice LAMAR delivered the opinion of the Court.

This is a suit in equity, brought in the Circuit Court of the United States for the Eastern District of Virginia, by the appellant against the appellees, founded on an alleged infringement by them of Letters Patent No. 265,733, granted to appellant, October 10, 1882, upon an application filed June 24, 1882, for an improvement in drawers.

The alleged infringement consisted in appellees placing on drawers manufactured by them a patch extending down the front and lapping the seam of the crotch by at least half an inch, which process of re-enforcing the garment, it was alleged, was the invention of the appellant.

The bill avers that—

the defendants, Henry T. Miller and William Mitchell, both of the city of Richmond, in the county of Henrico and State of Virginia, and citizens of the said State of Virginia, constituting the firm of Henry T. Miller & Co., doing business at Richmond, in the county, State, and district aforesaid, * * * are now using said patented improvements, or improvements in some parts thereof substantially the same in construction and operation as in the Letters Patent mentioned, and, in violation of his rights, have made, used, and vended within the eastern district of Virginia * * * large quantities of drawers described and claimed in the Letters Patent aforesaid, &c.

The answer of the defendants, in their own separate names, with the firm-name, precisely as they are stated by the bill, in response to complainant's interrogatories, admits that they are residents of Richmond, Va., and engaged in the business of the manufacture and vending of drawers for the clothing trade in that city.

The averments of the answer, material to this inquiry, are—

that drawers, as re-enforced as described in Letters Patent of plaintiff, had been made and in public use and on sale by sundry and divers persons for many years prior to plaintiff's application—

that they, the defendants—

have been manufacturing one particular kind, and only one particular kind, of re-enforced drawers for more than five years hitherto continuously, a specimen of which drawers, manufactured by them, is filed as "Exhibit A," &c., and that these are the only kind of re-enforced drawers that have been manufactured by them, or either of them, during the last five years—

and that—

even if the drawers manufactured by them are either identically or substantially the same as those manufactured by the complainant, he is entitled to no relief whatever against them, because these respondents are prepared to prove that Henry T. Miller & Co. and Henry T. Miller have hitherto continuously for over five years manufactured the identical re-enforced drawers filed as "Exhibit A," and that for over four years prior to the application for said patent they used and sold re-enforced drawers of the pattern and design of those now filed as "Exhibit A," and none other.

The circuit court dismissed the bill, and an appeal from that decree of dismissal brings the case here.

It is contended by the appellant that the answer of the defendants below did not contain a sufficient notice, under the statute, of the defense of want of novelty and two years' public use, in that it did not state the names and places of residence of the persons by whom and where it was used. The object of this statutory requirement is to apprise the plaintiff of the nature of the evidence which he must be ready to meet at the trial. This object is substantially and fully accomplished by the pleadings in this case, and we decline to disturb the action of the court below overruling the motion made at the hearing to strike out the testimony of the witnesses for the defense, who testified to the prior use of the patented article.

We do not deem it necessary to consider the question whether the patent of the appellant is for a new and useful invention within the meaning of section 4886 *et seq.*, Revised Statutes, inasmuch as it is the opinion of this Court that there has been no infringement of it in this case by the appellees. It is satisfactorily shown by the evidence in the record that for more than two years prior to the application for the patent in question the appellees had been manufacturing, at their place of business at Richmond, Va., garments identical in pattern with those that are now alleged to infringe appellant's patent.

The decree of the circuit court is affirmed.

DECISIONS OF STATE COURTS.

Supreme Court—State of New York.

MUNRO *v.* BEADLE *et al.*

Decided October 11, 1888.

TRADE-MARK.

The word "Sleuth," being a word having a place and meaning in the language, cannot be appropriated as a Trade-Mark for a book or periodical.

Mr. Roger Foster for the complainant.
Mr. Rowland Cox for the defendants.

INGRAHAM, *J.*:

The only act of the defendants complained of by the plaintiff is the introduction of the word "Sleuth" in the title of certain stories published by the defendants. There was no attempt on the trial to show that the defendants had used any symbol or design invented by the plaintiff to designate his series, and unless the plaintiff can establish that he has in some way acquired the exclusive right to use the word "Sleuth" in connection with stories of detectives no right of plaintiff's has been infringed.

The word "Sleuth" has a well-defined meaning, and is defined by Webster to mean "the track of man or beast as followed by the scent." It is used in connection with a hound to indicate that a hound follows the track of a human being or animal, and as applied to man would have the same meaning.

The adoption by the plaintiff of the name of "Old Sleuth" to designate the series of books published by him could hardly be said to give to the plaintiff the exclusive right to use the word "Sleuth" in all future publications of every character, so that the rest of the world must invent a new word to express that meaning. That would be the logical effect of sustaining the position taken by the plaintiff in this case.

The titles adopted by the defendants in the publication of their books would be perfectly intelligible to any one having no knowledge of the use to which the word had been applied by the plaintiff, and, assuming that the plaintiff had acquired a Trade-Mark in the words used by him to designate his publications, nothing proved in this case would show that the defendants have violated any rights that they have acquired. The plaintiff has therefore failed to show any cause of action against the defendants, and the complaint must be dismissed, with costs.

THE
OFFICIAL GAZETTE
OF THE
United States Patent Office.
[BY AUTHORITY OF CONGRESS.]

VOL. 46—No. 5. TUESDAY, JANUARY 29, 1889. PRICE—$5 per year.

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Transfer of Classes.

(ORDER No. 522.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., January 23, 1889.

It is hereby directed that Class 125, Stone-Working, and Class 166, Artesian and Oil Wells, be transferred from Division XV to Division XXV.

BENTON J. HALL,
Commissioner.

Attorneys.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., January 22, 1889.

SIR: The Secretary of the Interior has ordered that John Lee Taylor, of Chicago, Ill., be not recognized after this date as attorney or agent in the prosecution of any claim or other matter before this Department or any bureau thereof.

Very respectfully,

GEO. A. HOWARD,
Chief Clerk.

The Commissioner of Patents.

The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of January 29, 1889.

Patents	382	No. 396,721 to No. 397,102, inclusive.
Designs	11	No. 18,889 to No. 18,899, inclusive.
Trade-Marks	16	No. 16,220 to No. 16,235, inclusive.
Labels	8	No. 5,808 to No. 5,815, inclusive.
Reissues	3	No. 10,980 to No. 10,982, inclusive.
Total issue	420	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	....	Nebraska	10	....
Arkansas	....	....	Nevada	1	....
California	10	....	New Hampshire	4	....
Colorado	3	....	New Jersey	13	3
Connecticut	17	1	New Mexico Terri'y	....	....
Dakota Territory	2	....	New York	63	7
Delaware	1	....	North Carolina	2	....
District of Columbia	4	....	Ohio	23	....
Florida	1	....	Oregon	2	....
Georgia	3	....	Pennsylvania	28	4
Idaho Territory	....	....	Rhode Island	5	....
Illinois	26	....	South Carolina	1	....
Indian Territory	....	....	Tennessee	2	1
Indiana	13	....	Texas	5	....
Iowa	7	2	Utah Territory	1	1
Kansas	6	1	Vermont	3	....
Kentucky	5	....	Virginia	....	....
Louisiana	....	....	Washington Terri'y	1	....
Maine	2	....	West Virginia	2	....
Maryland	5	....	Wisconsin	5	1
Massachusetts	21	....	Wyoming Terri'y	....	....
Michigan	11	....	U. S. Army	2	....
Minnesota	9	....	U. S. Navy	....	....
Mississippi	1	....			
Missouri	6	....	Total to citizens of the United States	309	21
Montana Territory	....	....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries	Patents and Designs.	Trade-Marks and Labels.	Countries	Patents and Designs.	Trade-Marks and Labels.
Austria-Hungary	1	....	Germany	4	....
Barbadoes	....	....	Ireland	....	....
Belgium	1	....	Italy	....	....
Bermuda	....	....	Norway	1	....
Brazil	....	....	Queensland	1	....
Canada	2	....	Russia	....	....
Canary Islands	....	....	Scotland	1	3
Colombia, U. S. of	....	....	Sweden	1	....
Cuba	....	....	Switzerland	1	....
Denmark	....	....	Victoria	1	....
Ecuador	....	....			
England	8	....	Total to citizens of foreign countries	24	3
France	2	....			

DESIGNS.

18,880.—BUTTON-HOLE DECORATION.—*William W. Burns*, Governor's Island, N. Y., assignor to *Bailey, Banks & Biddle*, Philadelphia, Pa. Application filed November 30, 1888. Serial No. 292,332. Term of patent 14 years.

18,881.—AX-HANDLE.—*James W. Carver*, Pawlet, Vt., assignor to himself and *Gibbons L. Kelty*, Brooklyn, N. Y. Application filed October 5, 1888. Serial No. 287,321. Term of patent 7 years.

18,882.—NEWEL-POST.—*William C. Hanna, Jr.*, New York, N. Y., assignor to *J. W. Fiske*, same place. Application filed September 26, 1888. Serial No. 286,467. Term of patent 7 years.

18,883.—CURTAIN.—*William F. Riley Hartley*, Philadelphia, Pa., assignor to *Barnes & Beyer*, same place. Application filed January 3, 1889. Serial No. 295,340. Term of patent 3½ years.

18,884.—FONT OF COMBINATION TYPE ORNAMENTS.—*Herman Ihlenburg*, Philadelphia, Pa., assignor to *The MacKellar, Smiths & Jordan Company*, same place. Application filed November 30, 1888. Serial No. 292,335. Term of patent 7 years.

18,885.—FONT OF COMBINATION TYPE ORNAMENTS.—*Herman Ihlenburg*, Philadelphia, Pa., assignor to *The MacKellar, Smiths & Jordan Company*, same place. Application filed November 30, 1888. Serial No. 292,336. Term of patent 14 years.

18,886.—CANE-HANDLE.—*Frederick R. Kaldenberg*, New York, N. Y. Application filed November 8, 1888. Serial No. 290,333. Term of patent 7 years.

18,887.—CURTAIN-POLE END.—*Charles W. Lawrence*, New York, N. Y. Application filed May 23, 1888. Serial No. 274,842. Term of patent 7 years.

18,888.—NUT-CRACKER.—*Henry Marcus Quackenbush*, Herkimer, N. Y. Application filed November 19, 1888. Serial No. 291,287. Term of patent 14 years.

18,889.—BRAID.—*Valentine G. Schuck*, New York, N. Y., assignor to *The Sutro Brothers Braid Company*, New York. Application filed November 23, 1888. Serial No. 291,685. Term of patent 14 years.

18,890.—UPHOLSTERY PLUSH.—*Edward W. Tingue*, New York, N. Y., assignor to *The Tingue Manufacturing Company*, Seymour, Conn. Application filed December 28, 1888. Serial No. 294,871. Term of patent 3½ years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,220.—SAFES AND LOCKS.—*Thomas Barnes*, Pittsburg, Pa. Application filed November 18, 1887. Used since 1845.

"The words 'BARNES SAFE AND LOCK CO.' arranged within a border."

16,221.—LUBRICATING COMPOUND.—*Edwin Hendry Benners*, Elizabeth, N. J. Application filed November 5, 1888. Used since July 15, 1888.

"An indented oval figure formed by describing a portion of three circles—a larger one in the center and a smaller one on each side—with the word 'LUBRICATING' crossing it at its greatest diameter, with the word 'BENNERS'' in a curve over it and the word 'COMPOUND' in a curve below it."

16,222.—HAIR-WASH MADE OF EXTRACT OF HERBS, ROOTS, AND FLOWERS.—*Richard Binder*, Philadelphia, Pa. Application filed January 8, 1889. Used since January 1, 1888.

"The word 'PHYTALIA.'"

16,223.—RED HEMATITE, A COLORING MATERIAL FOR MORTAR, BRICK, TILES, AND ALL CLAY PRODUCTS.—*Clinton Metallic Paint Company*, Kirkland and New York, N. Y. Application filed September 29, 1888. Used since July 1, 1887.

"A perspective view showing the head and a portion of the body of a barrel, the head having on it the words 'CLINTON HEMATITE RED.'"

16,224.—SOAP.—*Michael H. Duffy*, Paterson, N. J. Application filed November 21, 1888. Used since November 14, 1888.

"The words 'DUFFY'S SECRET' and the representation of a woman holding a towel, on which are the words 'WHITE AS SNOW.'"

16,225.—BLUING-CAPSULES.—*The Electric Chemical Co.*, New Haven, Conn. Application filed December 26, 1888. Used since December 15, 1888.

"The words 'ELECTRIC LAUNDRY BLUE.'"

16,226.—PRESERVED FRUITS, VEGETABLES, MEATS, AND POULTRY.—*Erie Preserving Company*, Brant, N. Y. Application filed May 28, 1886. Used since August, 1885.

"The words 'HONEY DEW' and the pictorial representation of a bear in an upright position resting against a tree and biting into a cake of honey."

16,227.—RAZORS AND RAZOR-STROPS.—*Philip Hahn*, New York, N. Y. Application filed November 28, 1888. Used since August 1, 1884.

"The representation of a rooster."

16,228.—TWINES, ROPES, CORDAGE, NETS, LINES, YARNS, AND THE LIKE.—*Frank B. Hooper*, New York, N. Y. Application filed September 28, 1888. Used since 1886.

"The word 'HOOPER' printed upon the face of a seal associated with the representation of a ball of cord, a strand of the cord being shown as unwound from the ball and fashioned into a letter."

16,229.—WHISKY.—*Fred. J. Kiesel & Company*, Ogden, Utah Ter. Application filed November 23, 1888. Used since July 15, 1881.

"The words 'IMPERIAL CROWN' and the representation of a crown beneath said words and in connection with them."

16,230.—PREPARATION FOR PILES.—*Reuben C. Mooney*, Jasper, Tenn. Application filed October 2, 1888. Used since April 22, 1887.

"A square cut surrounded by an ornamental border and containing a picture of a lamb bearing a long Latin cross with scroll."

16,231.—FLOUR.—*The Muscatine Oat Meal Company*, Muscatine, Iowa. Application filed November 30, 1888. Used since June 1, 1887.

"The word 'HAWKEYE.'"

16,232.—BAKING-POWDER.—*The New York Phosphate Company*, Jersey City, N. J., and New York, N. Y. Application filed December 14, 1888. Used since September 10, 1888.

"The representation of a white Swiss cross and the words 'PHOSPHATE HEALTH BAKING POWDER,' in white letters on a red background."

16,233.—LINIMENT.—*Charles Sands*, Norristown, Pa. Application filed November 17, 1888. Used since July 3, 1876.

"The representation of a soldiers' camp, a soldier lying upon the ground, a surgeon kneeling beside him, and the words 'WONDERFUL PAIN KILLER' arranged around the picture"

16,234.—STOVES, RANGES, AND FURNACES.—*Syracuse Stove Works*, Syracuse, N. Y. Application filed December 5, 1888. Used since January 1, 1880.

"The word 'WELCOME.'"

16,235.—LINIMENT.—*William J. Thompson*, Pittsburg, Pa. Application filed December 6, 1888. Used since November 1, 1886.

"The words 'SEVEN SEALS.'"

LABELS.

5,808.—Title: "THE CELEBRATED LINCOLNSHIRE CHUTNEY."—*Godley Brothers*, Madison, Wis. Application filed December 19, 1888.

5,809.—Title: "BALSAM OF TULU AND WHITE PINE."—*Green & Bentley*, Oskaloosa, Iowa. Application filed January 3, 1889.

5,810.—Title: "BRAND A" (FOR SHEATHING PAPER.)—*Margaret E. Manahan*, New York, N. Y. Application filed January 5, 1889.

5,811.—Title: "P. JAMIESON, ABERDEEN." (FOR HARNESS COMPOSITION.)—*Peter Jamieson*, Aberdeen, Scotland. Application filed December 3, 1888.

5,812.—Title: "P. JAMIESON'S NOTED HARNESS COMPOSITION."—*Peter Jamieson*, Aberdeen, Scotland. Application filed December 3, 1888.

5,813.—Title: "P. JAMIESON'S HARNESS COMPOSITION."—*Peter Jamieson*, Aberdeen, Scotland. Application filed December 3, 1888.

5,814.—Title: "PRACTICALLY INDESTRUCTIBLE" (FOR PIANOS.)—*Albert Riley*, New York, N. Y. Application filed December 29, 1888.

5,815.—Title: "DR. HAMILTON'S LINIMENT."—*John H. Shade* Wellington, Kans. Application filed November 20, 1888.

PATENTS

GRANTED JAN. 29, 1889.

396,721. CAR-WHEEL. RICHARD H. ALLEN, Cleveland, Ohio. Filed June 14, 1888. Serial No. 277,113. (No model.)



Claim.—1. A hollow car-wheel center adapted to receive a tire, consisting of a hub, rim, side plates, and cross-ribs or stays, and composed of two separable main or principal parts or pieces united together by bolts or rivets, substantially as and for the purpose set forth.

2. A hollow car-wheel center adapted to receive a tire, consisting of a hub, rim, side plates, and cross-ribs or stays, and composed of two separable principal parts or pieces secured together by bolts or rivets, one of which parts is of cast metal, while the other is of wrought iron or steel, substantially as and for the purpose set forth.

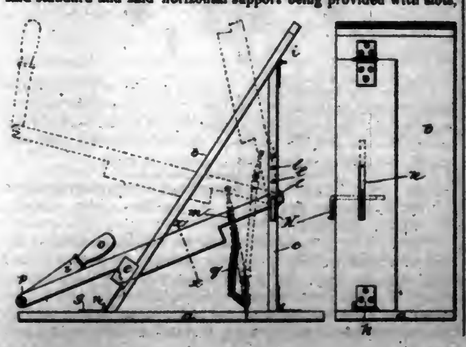
3. A hollow car-wheel center adapted to receive a tire, composed of two separable principal parts secured together by bolts or rivets, one of said parts being of cast metal, and forming the hub, rim, and one side plate with cross-ribs or stays, while the other part is of wrought iron or steel and constitutes the opposite side plate, substantially as and for the purpose set forth.

4. A car-wheel composed of a tire and a substantially hollow center formed in separate parts and united together, the center containing a hub, rim, side plates, and cross-ribs or stays, being composed of two principal parts or pieces secured together by bolts or rivets, substantially as and for the purpose described.

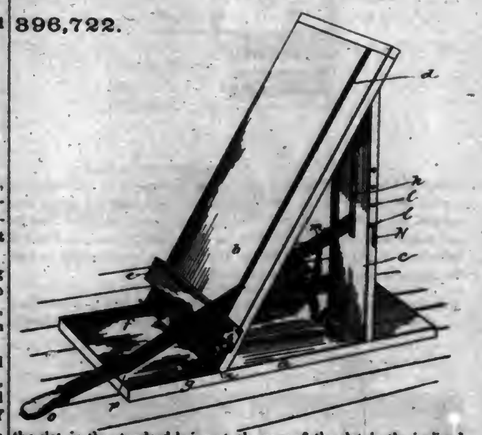
5. A car-wheel composed of a tire and a substantially hollow center formed separately and united together, the center containing a hub, rim, side plates, and cross-ribs or stays, being composed of two principal parts or pieces secured together by bolts or rivets, one of which parts is of cast metal and the other of wrought iron or steel, substantially as and for the purpose set forth.

6. A car-wheel composed of a tire and a substantially hollow center formed separately and united together, the center being composed of two principal parts or pieces secured together by bolts or rivets, one of which parts is of cast metal and contains a hub, rim, and one side plate, and the other part is of wrought iron or steel and is the other side plate, substantially as and for the purpose set forth.

396,722. WOOD-SPLITTING MACHINE. CHARLES BARR, Chicago, Ill. Filed Aug. 24, 1888. Serial No. 284,008. (No model.)



Claim.—1. The combination, with the inclined support provided with a transverse block near its lower end, of the brace or standard, said standard and said horizontal support being provided with slots,



the slot in the standard being at the rear of the slot in the inclined support, and a knife pivoted upon a pin passing through the slot in the standard, said knife extending through the slot in the inclined support and being provided with a weighted pivoted handle and a retractile spring, against the tension of which the knife is lifted when raised, substantially as and for the purpose specified.

2. The combination, with the base *a*, of the upright standard *c*, the inclined support *b*, said support *b* being provided with a transverse block, *e*, and a knife pivoted to the standard and extending through a slot provided in the inclined support, said knife being provided with a pivoted handle, substantially as and for the purpose specified.

3. The combination, with the base *a*, of the inclined support *b* and the back or standard *c*, said pieces *a b c* being rigidly secured together by hinges provided with removable pins, a knife secured to the standard *c* by a pivotal attachment, said knife extending through a slot, *d*, provided in the inclined support, and a retractile spring between the knife and the base, substantially as and for the purpose specified.

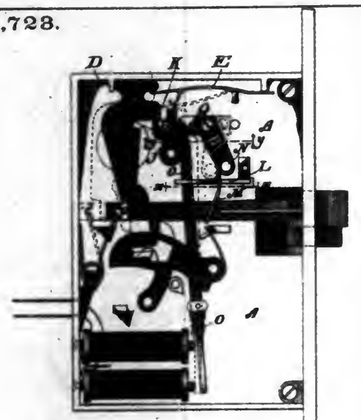
4. In a machine for splitting wood, the combination, with the base, of an inclined slotted support braced or secured in position by a standard extending from the base to the under side of the inclined support near the top of said support, said standard being provided with a slot at the rear of the slot in the inclined support, several pin-holes being provided in the standard, passing through the edge of the standard and through the slot, as described, and a knife extending through the slot in the inclined support and pivoted upon a pin passing through the eye in the end of the knife and one of the pin-holes, said knife being adapted to be adjusted to any desired height by changing the pin or pivot from one pin-hole to another, substantially as and for the purpose specified.

396,723. ELECTRICALLY-OPERATED DOOR-LOCK. CHARLES B. BURNS, Bridgeport, Conn. Filed Mar. 19, 1888. Serial No. 267,663. (No model.)

Claim.—1. The combination of the electro-magnet, the lever O, pivoted to the casing and having at one end an armature within the field of said magnet and at the other end a tongue, P, the sliding bolt I, having a shoulder, Q, and the latch-operating tumbler having a shoulder, K, substantially as shown and set forth.

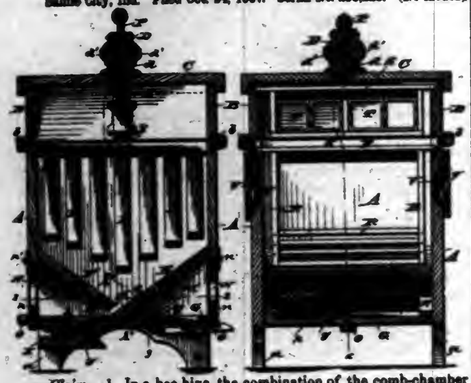
2. In a door-latch, the combination of the latch-operating tumbler, the latch having a shoulder against which said tumbler abuts, a bolt adapted to lock said tumbler as against operation, a pivoted rock-lever carrying said bolt and having upwardly-projecting pin, a vertical

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fin secured to the latch-casing and having its upper edge inclined from a point above said pin to a point below the same, and the spring-arm secured to the latch and extended in normal position across said fin and above said pin, whereby when the latch is retracted said arm will ride down the fin to a position behind said pin, substantially as and for the purposes hereinbefore set forth.

396,724. BEE-HIVE. JONATHAN BENSON and JOHN H. HIRSCHFELD, Saline City, Ind. Filed Oct. 24, 1887. Serial No. 253,226. (No model.)



Claim.—1. In a bee-hive, the combination, with the comb-chamber provided with a hopper-shaped bottom formed of the inclined boards E F, having the space *f* between them, and the board E, having the aperture *e*, a closed bottom below the hopper-shaped bottom and formed of the section G and the reversible section H I, and the screen-doors N, for closing the chambers formed by and between the said bottoms, substantially as herein shown and described.

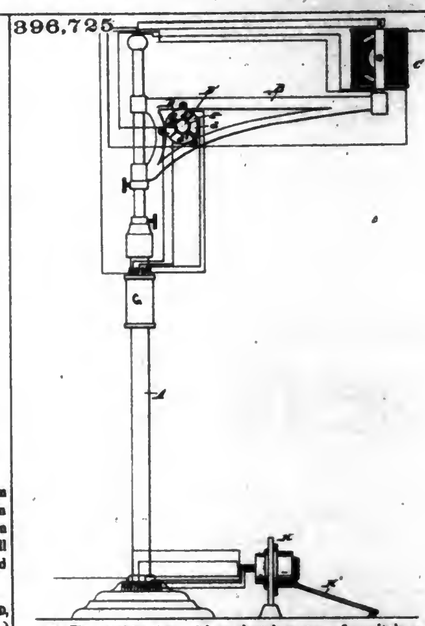
2. A bee-hive made with a reversible floor-section, H I, spaced apart by strips J to form a moth-receiving pocket, K, and said part H provided with a recess, *h*, forming a feed-trough, and the part I serving as an alighting-board, substantially as herein set forth.

3. The combination, with a bee-hive having a hopper-shaped bottom with a space between the boards thereof and provided with cleats secured to the sides below the said bottom, of the recessed board H, the plain board I, and the strips J, arranged between the said boards and forming a central moth-pocket, K, and end grooves to receive the said cleats, the boards H I and strips J forming a removable and reversible box-like structure, substantially as and for the purpose set forth.

396,725. DEVICE FOR CONTROLLING ELECTRIC MOTORS. HARRY H. BLADEN, Detroit, Mich. Filed Mar. 23, 1886. Serial No. 202,223. (No model.)

Claim.—1. The combination, with an electric motor, of a switch mechanism governing a current-regulator and another switch mechanism whereby the current may be short-circuited around the field magnets or armature, turned on through both, or reversed, one of said switches adapted to be operated by the hand and the other by the foot, substantially as and for the purposes described.

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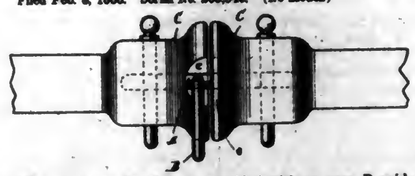


2. The combination, with an electric motor, of a switch connected with a resistance-regulator for governing the amount of current admitted through the motor and another switch constructed to short-circuit the current from the field magnets or armature, turn on or reverse the current, one of said switches adapted for operation by hand and the other by the foot, substantially as and for the purposes described.

3. The combination, with an electric dental motor, of one switch located upon the stand and adapted for operation by hand and another switch located adjacent thereto at the floor and adapted for operation by the foot, one of said switches governing the short-circuiting, the turning on, and direction of the current, and the other governing the resistance-regulator, which determines the amount of current admitted through the motor, substantially as and for the purposes described.

4. The combination, with an electric dental motor, of a switch located upon the stand adjacent to the hands of the operator, said switch adapted to govern the resistance-regulator, whereby is regulated the amount of current admitted through the motor, the same adapted for operation by hand, and in connection therewith another switch located at the floor adjacent to the foot of the operator for short-circuiting and regulating the direction of the current and adapted to be operated by the foot of the operator, substantially as and for the purposes described.

396,726. CAR COUPLING-LINK. FRANK P. BOYCE, Rye, N. H. Filed Feb. 8, 1888. Serial No. 263,346. (No model.)

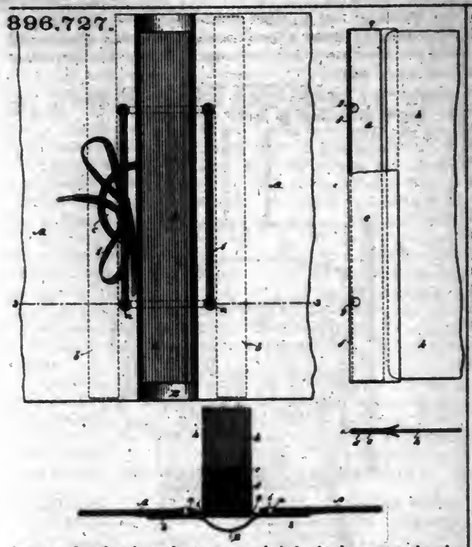


Claim.—A coupling-link, A, provided with an arm, B, said arm being attached to the side of the link at either side of its center, in combination with the ordinary coupling-pin and a draw-head or buffer provided on one side with a recess, *c*, of sufficient depth to receive the arm B, substantially as and for the purposes set forth.

396,727. TEMPORARY BINDER FOR PHOTOGRAPHIC CARDS. IRVING H. BROWN, New York, N. Y. Filed Nov. 4, 1887. Serial No. 254,250. (No model.)

Claim.—1. A holding device for use in binders, consisting of a strip of suitable material, a covering inclosing said strip at its back edge, sides, and front edge, and extending outwardly from the front edge of the strip for uniting to the holding device the article to be bound, and a wire beading along the back edge of the strip between the strip and the inclosing-covering, the said strip and covering having a perforation through them near their back edge next to the wire beading, all substantially as shown and described.

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2. A binder consisting of a pair of covers having perforations at their inner edges, a back-piece uniting the covers and attached to them beyond the perforations, a binding-cord, a recess in the inner end of one cover to receive the knot of the cord, a holding device consisting of a strip of suitable material, a covering inclosing said strip at its back edge, sides, and front edge, and extending outwardly from the front edge of the strip for uniting to the holding device the article to be bound, and a wire beading along the back edge of the strip between the strip and the inclosing-covering, the said strip and covering having a perforation through them near their back edge next to the wire beading, all combined substantially as shown and described.

3. A binder, substantially as shown and described, consisting of a pair of covers having perforations at their inner edges, a back-piece uniting the covers and attached to them beyond the perforations, a binding-cord, a holding device consisting of a strip of suitable material, and a covering inclosing said strip and extending outwardly from its front edge for uniting to the holding device the article to be bound, the said strip and covering having perforations through them at the inner edge of the strip, whereby a double joint is secured between the binding-cord and the article held in the binder.

396,728. FLOW-POINT. MARVIN S. CADWELL and EDWARD L. CADWELL, Lansing, Mich. Filed Sept. 1, 1887. Serial No. 248,500. (No model.)



Claim.—1. The combination, with point B, provided with longitudinal ledge or shoulder *b'*, of an adjustable self-sharpening supplemental point, D, consisting of a long thin narrow piece of plate or spring steel of even width and thickness, adjustably secured and lying flat upon the upper face of said point B, and bolt *d*, substantially as specified.

2. The combination, with point B, provided with longitudinal ledge or shoulder *b'*, of an adjustable self-sharpening supplemental point, D, consisting of a long thin narrow piece of plate or spring steel of even width and thickness, adjustably secured and lying flat upon the upper face of said point B, and bolt *d*, said point B or supplemental point D, one or both, being furnished with a longitudinal slot through which said bolt *d* passes, substantially as specified.

3. The combination, with point B, furnished with bed *b* and longitudinal ledge *b'*, of supplemental self-sharpening point D, adjustably secured thereon, and consisting of a long thin narrow piece of plate or spring steel, said ledge *b'* extending back about two-thirds the length of said supplemental point D, substantially as specified.

4. The combination, with cast-iron point and share B C, cast integrally together and furnished with thickened bed *b*, and longitudinal ledge *b'*, of self-sharpening, reversible, and adjustable supplemental point D, consisting of a long narrow thin piece of plate or spring steel, said point B being furnished with a recess, B', on its under face, and an inclined slotted shank portion, B^2, and the bolt *d* for securing said supplemental point D to said point B, substantially as specified.

5. The combination, in a mold-board plow, of its cast point, share, and landside, with a thin supplemental self-sharpening plate-steel point secured on top of said cast point, with its cutting-edge projecting beyond said cast point and below the horizontal line or lower surface of said cast point and landside, whereby the forward end of the cast point is protected by the overhanging or projecting end of the supplemental point and the cast point is prevented from offering obstruction to the forward movement of the plow, substantially as specified.

396,729. WATER-MOTOR. JOHN COATES, Erie, Pa. Filed Nov. 11, 1887. Serial No. 254,907. (No model.)



Claim.—1. In a water-motor, the combination of a main cylinder, A, having passage-chambers A' A' extending from its ends to its middle point, and then connecting with a breast and an exhaust-passage, a secondary-valve chamber formed within said breast, which is parallel with the cylinder-chamber, and a steam-chest having a main-valve chamber at right angles to said cylinder-chamber fixed on said breast, thereby placing the secondary-valve chamber between the main-valve chamber and the cylinder and at right angles to said main-valve chamber.

2. In a water-motor, the combination of a main cylinder, A, having passage-chambers A' A' extending from its ends to its middle point, a circumferential exhaust-passage, C, located at said middle point, a breast at said middle point, in which said passages terminate, a valve-chest fixed upon said breast, and having therein a main-valve chamber lying at right angles to the main cylinder and a secondary-valve chamber lying parallel with said cylinder and between said main valve and said cylinder, said valve-chambers containing proper valves and having proper ports and passages, as set forth and shown, a mechanical valve-gear for moving said secondary valve from the main piston, and a mechanical valve-gear for giving the main valve an initial impetus in the direction of the fluid-pressure admitted against it by said secondary valve.

3. In a water-motor, the combination of a main cylinder, A, having passage-chambers A' extending from its end to its middle, a breast, A^3, at its middle, an exhaust-passage extending from said breast around to an exhaust-nozzle back of said cylinder, a valve-chest attached to said breast containing a main valve which lies at right angles to the cylinder, and a secondary valve which lies parallel with the cylinder, and between it and the main valve, said secondary valve admitting fluid under pressure to the main valve, and the main valve admitting fluid under pressure to the said cylinder, substantially as set forth.

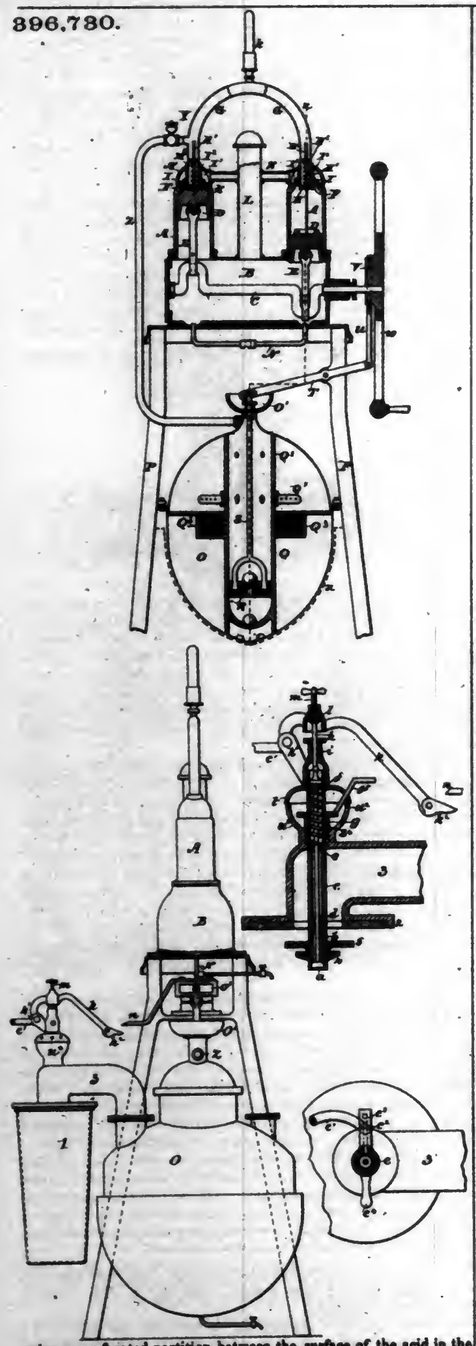
4. In a water-motor, the combination of a main-piston chamber, a main-valve chamber at right angles to said piston-chamber, a secondary valve between the main-valve and the piston chamber, which is at right angles to the main valve, and a lever for communicating motion from said secondary-valve stem to the stem of said main valve.

396,730. REFRIGERATING-MACHINE. ALEXANDER COLACHER, Windsor, County of Berks, England. Filed May 10, 1888. Serial No. 273,494. (No model.)

Claim.—1. In a refrigerating-machine, the combination of a vacuum-pump, a pipe leading from said pump to an absorbing-vessel containing sulphuric acid, a liquid stirrer and elevator within said absorber, a perforated partition between the surface of the acid in the absorber and the air-pipe leading therefrom to the pump, and a porous or liquid-diffusing substance, as described, upon said perforated partition, with an air-sealed vessel having a pipe-connection with the absorber, substantially as and for the purpose described.

2. In a refrigerating-machine, the combination of a vacuum-pump, a pipe leading from said pump to an absorbing-vessel named an "absorber," containing sulphuric acid, a liquid-elevator within said ab-

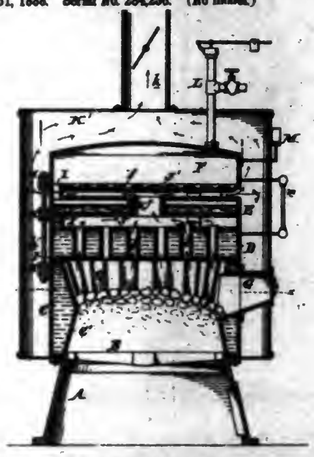
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sorber, a perforated partition between the surface of the acid in the absorber and the air-pipe leading therefrom to the pump, and vapor and a porous or liquid-diffusing material, substantially as described, upon said perforated partition, with an air-sealed vessel having a pipe-connection with the absorber, and means, substantially as described, for automatically admitting intermittently at regular intervals of time conical jets of water projected downward into said air-sealed vessel, substantially as set forth.

3. The combination, with the freezing-vessel, the supply-pipe, and its spring-seated valve, of the hammer above the valve-stem and the trip, constructed and arranged as described, to be actuated by the pump-operating means, whereby the water to be frozen is automatically and intermittently injected in small quantities into the freezing-vessel.

396,731. BOILER. JOHN B. DE BARTHE, North Wales, Pa. Filed Aug. 31, 1888. Serial No. 284,236. (No model.)



Claim.—1. The combination, in a steam-boiler, of a fire-box section having its interior formed with walls inclining inwardly at the top and outwardly at the bottom on descending, and forming a water-back, the upper part of said section having its walls formed with corrugations, steam and water sections above said fire-box section, provided with flues or passage-ways for the passage of water and steam from said water-back into said steam and water sections, flues through said steam and water sections opening into said fire-box section, a superheating-section surmounting said steam and water sections and provided with openings into the topmost of them, and means, substantially as described, to clamp said sections together.

2. The combination, in a steam-boiler, of a fire-box section having its interior formed with walls inclining inwardly at the top and outwardly at the bottom on descending, and forming a water-back, the upper part of said section having its walls formed with corrugations, steam and water sections above said fire-box section provided with flues or passage-ways for the passage of water and steam from said water-back into said steam and water sections, flues through said steam and water sections opening into said fire-box section, a superheating-section having a corrugated lower surface surmounting said steam and water sections and provided with openings into the topmost of them, and means, substantially as described, to clamp said sections together.

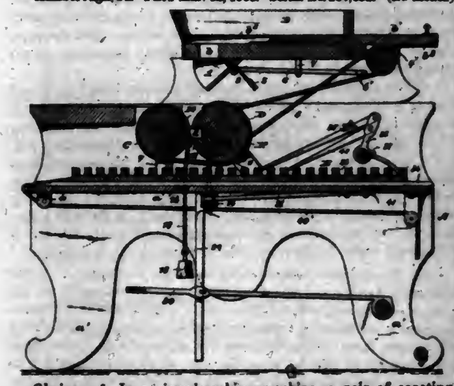
3. In a steam-boiler, the combination of a fire-box section having its interior formed with walls inclining inwardly at the top and outwardly at the bottom on descending and forming a water-back, a water-section opening into said water-back, located above said fire-box, and provided with a series of tubes passing through it opening from said fire-box, a second water-section located above said tube-section and opening into it provided with a central flue for the passage of the products of combustion, said sections having a closed compartment between them, whereby the products of combustion which are divided in passing through said tubes are again collected together in passing through the central flue, and a superheating-section opening into said water or steam sections located above said sections and having a space or compartment between it and the upper of said sections provided with lateral outlets for the products of combustion, and means, substantially as described, to clamp said sections together.

4. The combination, in a steam-boiler, of a fire-box section having a water-back, a water-section opening into said water-back, located above said fire-box section, and provided with a series of tubes passing through it opening from said fire-box and having necks upon its upper surface, a second water-section having a single central flue and provided with necks upon its upper and lower surfaces, and a downwardly-extending flange adapted to rest upon said first section, so that the necks upon its lower edge will rest upon the necks of the first section, forming passage-ways for water and steam from one section to another, but forming by said flange a closed compartment between said sections, and a steam-dome or superheating-section provided with necks upon its lower surface adapted to rest upon the necks on the upper surface of said second section for the passage of steam therefrom into said steam-dome, but having an open space between said steam-dome and second section for the escape of the products of combustion.

5. The combination, in a steam-boiler, of a fire-box section having a water-back, a water-section opening into said water-back, located above said fire-box section, and provided with a series of tubes passing through it opening from said fire-box and having necks upon its upper surface, a second water-section having a single central flue and provided with necks upon its upper and lower surfaces, and a downwardly-extending flange adapted to rest upon said first section, so that the necks upon its lower edge will rest upon the necks of the first section, forming passage-ways for water and steam from one section to another, but forming by said flange a closed compartment between said sections, a steam-dome or superheating-section provided with necks upon its lower surface adapted to rest upon the necks on the upper surface of said second section for the passage of steam therefrom into said steam-dome, but leaving an open space between said steam-dome and second section for the escape of the products of combustion, and means, substantially as described, to clamp said sections together.

6. In a steam-boiler, the combination of a fire-box section having its interior formed with walls inclining inwardly at the top and outwardly at the bottom on descending, forming a water-back, and in which both of the said walls are formed with corrugated or fluted surfaces, steam and water sections above said fire-box section, and means, substantially as described, to clamp said sections together.

396,732. CIGAR-BUNCHING MACHINE. ALEXANDER K. DUNCAN, Millsborough, Pa. Filed Mar. 12, 1888. Serial No. 267,093. (No model.)



Claim.—1. In a cigar-bunching machine, a pair of coacting presser-rolls, one having a longitudinal recess, in combination with an apron passing around both rolls and connected at its ends to the roll having said recess and upon opposite sides thereof and adapted to form a bight between the rolls, and a grasping device, substantially as described, housed within said recess to grasp and retain the bunch therein during the rotation in one direction of said roll, substantially as described.

2. In a cigar-bunching machine, the combination of a pair of coacting presser-rolls, one having a longitudinal recess in its periphery, an apron passing around both rolls and having its ends connected to the recessed roll on opposite sides of the recess therein and adapted to form a bight between the two rolls, and an expelling device, substantially as described, carried by the roll having the recess and located within the latter, to expel the bunch from said recess at the completion of the revolution in one direction of said recessed roll, substantially as and for the purpose set forth.

3. In a cigar-bunching machine, the combination of a pair of coacting presser-rolls, one having a longitudinal recess, an apron passing around both rolls and having its ends secured to the recessed roll on opposite sides of the recess therein and adapted to form a bight between said rolls, a grasping device housed within the recess for holding the bunch therein during the rotation of the roll in one direction, and an expelling device, substantially as described, normally located in the bottom of the recess and at one side of the grasping device, said expelling device being adapted to move laterally to one side of the grasping device for positively expelling the bunch from said recess at the completion of the rotation of the roll in one direction, substantially as and for the purpose described.

4. In a cigar-bunching machine, the combination of a pair of coacting presser-rolls, one having a longitudinal recess in its periphery adapted to receive a cigar-bunch, an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of the recess therein and adapted to form a bight between the rolls, an expelling-bar arranged longitudinally within the recess, and devices connected to a treadle for moving said expelling-bar laterally in the recess at the termination of rotation of the recessed roll in one direction, substantially as and for the purpose described.

5. In a cigar-bunching machine, the combination, with a pair of coacting presser-rolls, one having a longitudinal recess and annular grooves at the ends of the recess, and an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of said recess and adapted to form a bight between the two rolls, of an expelling-bar housed within the recess and having its ends extended into the annular grooves, vertical rods normally fitting in the annular grooves and adapted to engage the ends of the expelling-bar, and a treadle to which said rods are connected, substantially as described.

6. In a cigar-bunching machine, the combination, with a pair of coacting presser-rolls, one having a longitudinal recess, and an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of the recess therein and adapted to form a bight between said rolls, of an expelling-bar housed within the recess, springs fixed to the roller and arranged in the path of the expelling-bar for limiting the play thereof, vertical rods adapted to engage the expelling-bar to move the latter toward the springs, and a treadle to which the rods are connected, substantially as described.

7. In a cigar-bunching machine, the combination of the presser-rolls, one having a recess therein, an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of the recess therein and adapted to form a bight between said rolls, a spring-controlled grasping-bar arranged lengthwise of the recess and having its ends extended beyond the same, and stops arranged in the path of the ends of said bar, substantially as described.

8. In a cigar-bunching machine, the combination of the presser-rolls, one having a recess therein, an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of the recess therein, a spring-controlled presser-bar housed within the recess and having its ends extended beyond the same, stops for limiting the play of said bar in the recess, and fixed stops depending between the rollers and arranged in the path of the ends of the presser-bar, substantially as described.

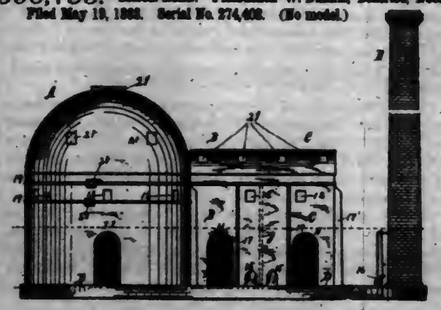
9. In a cigar-bunching machine, the combination of a pair of presser-rolls, one having a longitudinal recess therein, an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of the recess therein, a traveling mold arranged beneath the rolls to receive the bunches therefrom, and devices for feeding the mold with a step-by-step movement, substantially as described.

10. In a cigar-bunching machine, the combination of a pair of presser-rolls, one having a recess, an apron passing around the rolls and connected at its ends to the recessed roll on opposite sides of the recess therein, a grasping device housed in the recess, an expelling device, a traveling mold arranged beneath the rolls and having a series of transverse pockets, and a feeding-pawl for moving the mold with a step-by-step movement, substantially as described.

11. In a cigar-bunching machine, the combination of a pair of presser-rolls, one having a recess, an apron passing around both rolls and connected at its ends to the recessed roll on opposite sides of the recess therein, a traveling mold guided in a direct line beneath the rolls and having a series of transverse pockets, a feeding-pawl carried by a rock-shaft, a pitman intermediate the rock-shaft and one of the presser-rolls, a weighted cord connected with one end of the mold, and a slip-pawl engaging the mold, substantially as described.

12. In a cigar-bunching machine, the combination of a pair of coacting presser-rolls, an apron passing over the rolls, an elevated hopper having an opening in its bottom and an inclined fixed chute arranged to deliver the tobacco between the rolls, a pivoted valve having a depending weighted lip adapted to normally close said opening, a roller belted to one of the presser-rolls, and a pitman connected to the valve and adapted to be moved endwise to open the valve by a pin fixed on the periphery of the roller, substantially as and for the purpose described.

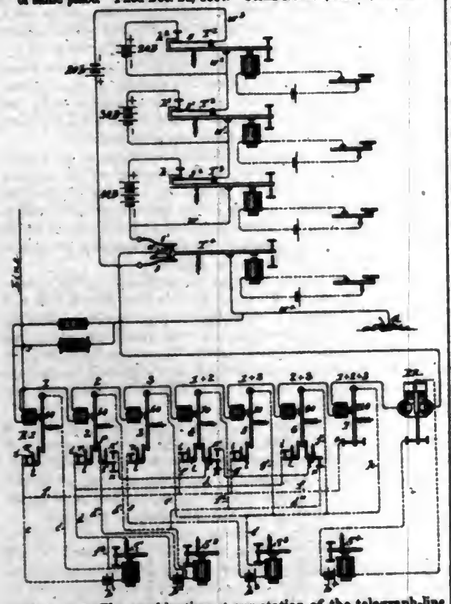
396,733. BRICK-KILN. FREDERICK W. DIETZE, Beatrice, Nebr. Filed May 19, 1888. Serial No. 274,402. (No model.)



Claim.—1. In a kiln, substantially as shown and described, the heavy iron bars 18, built in the cross-wall 23, iron bands 19, their tongue hooking into the eyes of said bars, doubling back on said bands, and secured by bolts and nuts 22, and buckle-nuts 20, all substantially as shown and described, and for the purposes set forth.

2. In combination with the round part A, substantially as described, and having the main flue 6, opening *f'*, and cap *f*, the oblong kiln B C, substantially as described, having the flame-wall *c*, and slanting cap 13, substantially as shown and described, and for the purposes set forth.

396,734. OCTUPLEX TELEGRAPH. MARK W. DEWEY, Syracuse, N. Y., assignor of two-thirds to Emil Lasar and Charles H. Duell, both of same place. Filed Dec. 21, 1887. Serial No. 258,548. (No model.)



Claim.—1. The combination at one station of the telegraph-line with its weak battery in constant circuit of four transmitters, four batteries of different strengths, each of the latter being controlled separately by one of said transmitters, and eight relays at another station controlling four registers or sounders, substantially as specified.

2. The combination at one station of three single-current transmitters, several batteries of different strengths, each of the latter being controlled separately by one of said transmitters, and seven relays at another station controlling three sounders or registers, as set forth.

3. The combination at a receiving-station of seven relays adapted to be operated by currents of different strengths sent from another station through a single line-wire, the levers *l*, and contact-stops *i*, controlling three sounders, and a polarized relay controlling a separate sounder, substantially as specified.

4. In a system of multiplex telegraphy having a single line-wire, the combination at the receiving-station of seven relays differently adjusted and actuated by currents of different strengths, their contact-levers *l*, stops *i*, contact-levers *l'*, stops *n* and *n'*, and their respective local circuits, batteries, and sounders, substantially as specified.

5. In a system of multiplex telegraphy having a single line-wire, the combination at the receiving end of seven relays differently adjusted and actuated by currents of different strengths sent from a distant station, their contact-levers *l*, stops *i*, contact-levers *l'*, stops *n* and *n'*, their respective batteries and sounders, and the polarized relay controlling a separate sounder or register by a separate local circuit, substantially as specified.

6. The combination of three single transmitters at one station, a portion of main line containing on its circuit a section of a battery that forms part of the main line only when two or more of said transmitters are closed simultaneously, the batteries of different strengths, and the neutral relays controlling the sounders at the receiving-station, substantially as set forth.

7. In a multiplex telegraph, a single main line in combination with a series of batteries of different strengths at the transmitting end of the line, a series of transmitting-keys corresponding to said batteries and each of which is adapted to couple its battery in the line-circuit, a series of sounders or registers at the receiving end of the line corresponding to said transmitters, a series of relays in circuit with the main line and corresponding in number to the possible combinations of the transmitting-keys, springs to hold the armatures of the relays back and corresponding in strength to the strength of the possible combinations of the batteries, local batteries for the sounders or registers, and local circuits for said sounders or registers controlled by said relays, whereby the proper sounders or registers will respond for given keys.

8. In a multiplex telegraph, the combination of a main line, a line-battery of low tension always in line, a series of batteries of different strengths at the transmitting end of the line, a series of continuity-preserving single-current transmitters or keys corresponding to the said last-mentioned batteries and adapted to put one or more of said batteries to line, according as to the number of said transmitters or keys put into action at one time, a continuity-preserving double transmitter or key, also at said transmitting end of the line and adapted to reverse the current in the line, a series of sounders or registers at the receiving end of the line and corresponding in numbers to the transmitters or keys, a series of relays arranged in the main-line circuit and corresponding in numbers to the possible combinations of the continuity-preserving single-current transmitters and adapted to respond to currents of different strengths but greater strength than the current which always traverses the main line from the low-tension battery, a polarized relay in series with the relays above mentioned and adapted to respond to the reversals of the low-tension current which normally traverses the main line and which is controlled by the continuity-preserving double transmitter, and a series of local circuits between said sounders or registers and all of the relays and controlled by said relays, whereby the sounder or register corresponding to each transmitter or key shall sound or register upon the operation of said transmitter and irrespective of the operations of the other transmitters.

9. In a multiplex telegraph, the main line, over which a current is normally flowing and which current is varied in strength and polarity, in combination with suitable receiving-instruments at the receiving end and the following transmitting-instruments at the transmitting end, to wit: three continuity-preserving single-current transmitters, three batteries of different strengths, each of which is adapted to be put into the line-circuit by its corresponding transmitter, a continuity-preserving double transmitter for reversing the current passing to line, and a line-battery of less strength than the other batteries always in circuit with the line and controlled as to its polarity by the double transmitter.

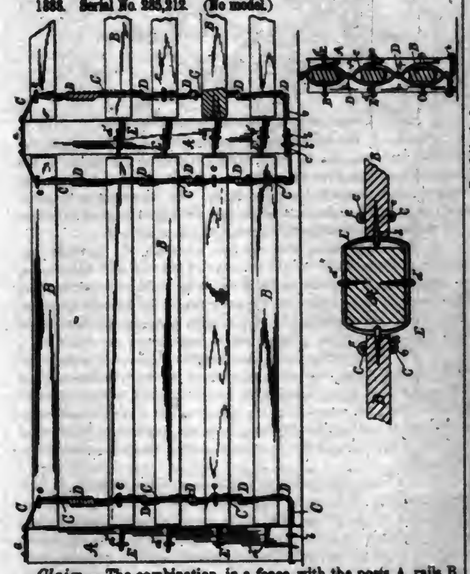
10. In a multiplex telegraph, the main line, over which a current is normally flowing and which current is varied in strength and polarity, in combination with suitable receiving-instruments at the receiving end and the following transmitting-instruments at the transmitting end, to wit: three continuity-preserving single-current transmitters, three batteries of different strengths, each of which is adapted to be put into the line-circuit by its corresponding transmitter, a continuity-preserving double transmitter for reversing the current passing to line, and a line-battery of less strength than the other batteries always in circuit with the line and controlled as to its polarity by the double transmitter, and a fifth battery equal to, or substantially equal to, the strength of the weakest battery controlled by the single transmitters and adapted to be put into line-circuit only when the single transmitters controlling the weakest and one or more of the stronger batteries are simultaneously closed to cause the variations in strength of the current flowing in the line to vary uniformly.

11. In a multiplex telegraph, the main line, over which a current is normally flowing, and transmitting-instruments at the transmitting end of the line, consisting of three single-current transmitters and three batteries of differing strength, each battery adapted to be put into line-circuit by its corresponding transmitter for varying the strength of the current in the line in a predetermined manner, in combination with a series of sounders or registers at the receiving end of the line, a series of relays, also at said end of the line in the line-circuit and equal in number to the possible combinations of the sounders or registers and adapted to respond to currents of different strengths, local batteries, and connecting local circuits including said sounders or registers and batteries and controlled by the relays.

12. In a multiplex telegraph, the main line, over which a current is normally flowing, and transmitting-instruments at the transmitting end of the line, consisting of three single-current transmitters and three batteries of differing strength, each battery adapted to be put into line-circuit by its corresponding transmitter for varying the strength of the current in the line in a predetermined manner, and a double-current transmitter for reversing the current in the line when desired, in combination with a series of sounders or registers at the receiving end of the line, a series of relays, also at said end of the line in the line-circuit and equal in number to the possible combinations of the sounders or registers and adapted to respond to currents of different strengths, local batteries, and connecting local circuits including said sounders or registers and batteries and controlled by the relays, a polarized relay in circuit with the above-mentioned relays and line, a sounder or register for said polarized relay, a local battery, and a local circuit including said sounder or register and battery and controlled by said polarized relay.

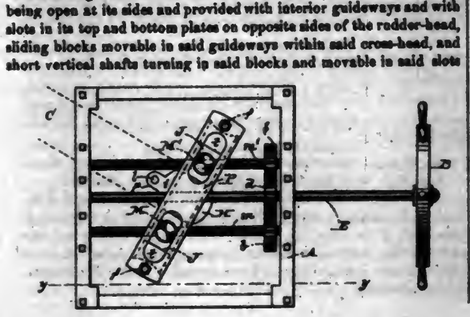
13. The combination at the receiving-station of the line-circuit conveying currents of different strengths with seven relays adapted to be operated by currents of different strengths sent from another station through the line, three sounders or registers having double windings, local batteries, seven local circuits including said batteries and sounders or registers and respectively controlled by said seven relays, levers *l* of said relays adapted to offer different resistances to movement, and stops *i*, connecting, respectively, with one end of the local circuits, the other ends of which circuits connecting with the relay-armature, whereby said seven relays control the three sounders or registers for seven variations in the line-current.

396,735. FENCE. BRENNUS DOUD, Peru, Ind. Filed Sept. 12, 1888. Serial No. 285,212. (No model.)

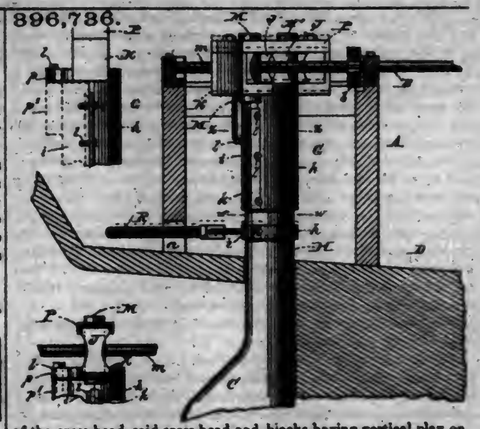


Claim.—The combination, in a fence, with the posts A, rails B, and vertical wires C, said wires C being secured around the foot of the post, then crossed back and forth around the end of each rail and over the top of the post, and secured by staples *c* at each side of the rail, of the short wires E, secured at the ends of the rails by staples *d*, passed around the posts A, and secured thereto by staples *d'*, as described, for the purposes specified.

396,736. STEERING APPARATUS FOR VESSELS. JOAQUIN J. DUARTE, Boston, Mass. Filed Aug. 15, 1887. Serial No. 247,008. (No model.)

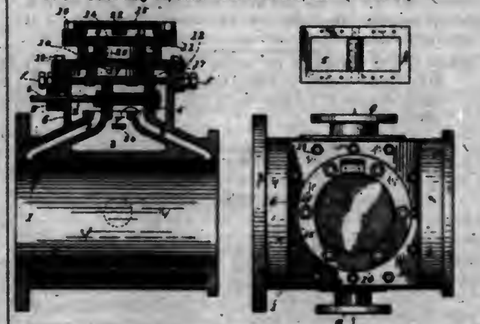


Claim.—In a steering apparatus, the combination of a frame, a central shaft journaled in said frame and provided with a steering-wheel at one end, a screw-shaft at one side of the central shaft provided with a right-hand screw-thread, a screw-shaft at the other side of the central shaft provided with a left-hand screw-thread, intermeshing gears on said shafts, a rudder-head at right angles to said shafts, an oscillating cross-head attached to said rudder-head, said cross-head being open at its sides and provided with interior guideways and with slots in its top and bottom plates on opposite sides of the rudder-head, sliding blocks movable in said guideways within said cross-head, and short vertical shafts turning in said blocks and movable in said slots



of the cross-head, said cross-head and blocks having vertical play on the vertical shafts, and the vertical shafts being provided with horizontal screw-threaded holes, and said screw-shafts passing through said holes of the vertical shafts and through the open cross-head, substantially as described.

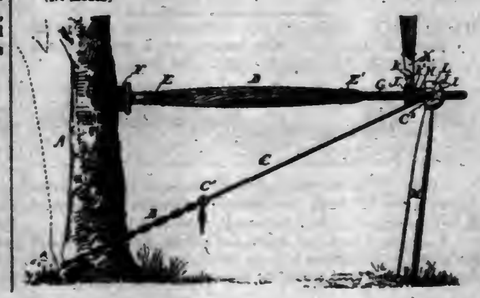
396,737. BALANCED VALVE. CHILION M. FARRAR, Buffalo, N. Y. Filed July 21, 1888. Serial No. 280,848. (No model.)



Claim.—1. In a balanced steam-valve, the combination of a steam-chest having an upper and lower steam-chamber divided by a sheet-metal diaphragm, a valve located in the lower chamber, the usual mechanism for operating it, a plate seated on the top of the valve having an upward portion provided with a top piece adapted to screw up or down on the same, so as to adjust the two parts between the valve and the diaphragm, and a steam-passage connecting the upper and lower chambers, substantially as and for the purposes described.

2. In a balanced steam-valve, the combination, with the steam-chest, of a sheet-metal diaphragm secured steam-tight to the upper portion of the same, a valve having a plate seated thereon and provided with a cylindrical portion projecting upward, and a top piece adapted to screw on said portion, so that the two parts may be adjusted between the top of the valve and the under side of the diaphragm, for the purposes described.

396,738. MACHINE FOR OVERTHROWING TREES. JOHN F. FOULKE, Philadelphia, Pa. Filed Sept. 22, 1887. Serial No. 250,400. (No model.)



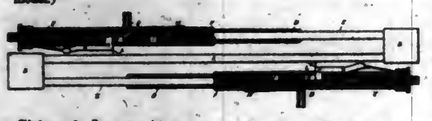
Claim.—1. As a device for overthrowing trees, a triangular truss or frame adapted to rest against or incorporate a tree-trunk on one of its sides, and having its other sides extending away from the tree, the upper one constituting a strut and the lower one a tie, in combination with an unyielding brace or support to prevent downward movement of the strut, a coupling for uniting the ends of the strut and truss, and mechanism whereby the said strut can be lengthened relatively to the tie, all substantially as and for the purpose specified.

2. As a device for overthrowing trees, a triangular truss or frame adapted to rest against or incorporate a tree-trunk on one of its sides, and having its other sides extending away from the tree, the upper one constituting a strut and the lower one a tie, in combination with a screw forming the end of one of the outwardly-extending sides of the truss, a perforated stirrup uniting the ends of said strut and tie, a threaded sleeve secured upon the threaded end of one side of the frame and abutting against the perforated stirrup, by means of which the strut may be lengthened proportionately to the tie, and an unyielding brace supporting the outer end of the truss, all substantially as and for the purpose specified.

3. In a device for overthrowing trees, a strut, D, tie C, and support M, said strut and tie being adapted to be secured to a tree-trunk, substantially as shown and described, in combination with a perforated stirrup, L, a threaded sleeve, H, engaged on a threaded end of one side of the frame and abutting against the socket-piece, and a lever, K, whereby the sleeve can be turned and the form of the truss or frame changed, so as to proportionately lengthen the strut relatively to the tie.

4. In a tree-overthrowing device, substantially as specified, the perforated socket-piece L, having a rounded socket, I, in combination with a threaded sleeve, H, having one rounded end adapted to fit in socket I and the other end provided with a ratchet, J, and a lever, K, secured upon the sleeve by a loose collar, *k'*, and having a pawl, *k*, all substantially as and for the purpose specified.

396,739. MACHINE OR ENGINE FOR THE APPLICATION OF EXPLOSIVE ENERGY TO MECHANICAL POWER. GEORGE C. GILLMER, Brooklyn, N. Y. Filed Oct. 21, 1887. Serial No. 252,967. (No model.)



Claim.—1. In a machine or engine for the application of explosive energy to mechanical power, the combination of a movable explosion-cylinder acting against an abutment-spring and working in an outer cylinder provided with a trigger for holding the working-cylinder at any desired point or points of the stroke, substantially as and for the purpose described.

2. In a machine or engine for the application of explosive energy to mechanical power, the combination of an explosion-cylinder unattached to the working-rod of the engine and working in an outer cylinder provided with a charging-tube for the introduction of explosive material, substantially as described.

3. In a machine or engine for the application of explosive energy to mechanical power, the combination of an explosion-cylinder working in an outer cylinder provided with a charging-tube, as aforesaid, such working-cylinder carrying an imperforated projecting lip or blade traveling through slots in the outer cylinder and charging-tube for the purpose of cutting off and feeding inward a charge of explosive material at each inward stroke of the working-cylinder, substantially as described.

4. The combination of the working-shaft A, cross-heads B, plungers C, reacting explosion-cylinders D, spiral springs E, outer cylinders, F, charging-tubes G, slots H and I, with charging mechanism M, and firing mechanism K and L, substantially as and for the purposes described.

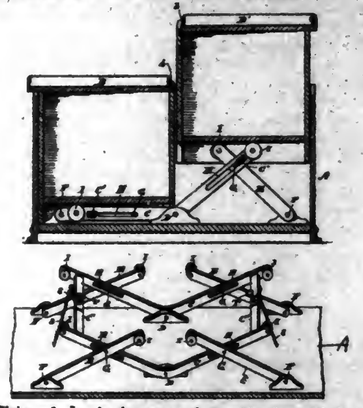
396,740. STRINGING AND TUNING DEVICE FOR PIANOS. GEORGE H. GUILD, Boston, Mass., assignor to H. H. Guild, same place. Filed May 22, 1888. Serial No. 274,674. (No model.)



Claim.—1. The bearers F, having the bearings C D, and the screws H, passing loosely through the bearers, in combination with the bridge E, having the groove and the strings G, as set forth.

2. The pin E, formed as shown, and with the pin A, provided with the spring *i*, in combination with the socket *f*, said pin being arranged therein and to operate therewith, essentially as shown and set forth.

396,741. BOOK-SUPPORT. FRANK H. HEALEY, Morrisville, Vt. Filed Apr. 5, 1888. Serial No. 269,747. (No model.)



Claim.—1. In a book-support, the combination, with the base, the movable supports, and the bent levers pivoted at the center to the base and supporting one side of the movable supports, of co-operating arms or levers pivoted at one end on the base, supported at an intermediate point upon the bent levers, and serving to support the other side of the movable supports, substantially as described.

2. The combination, with the box or casing, the movable supports, and the centrally-pivoted levers provided with slots and serving to support one side of the movable supports, of the co-operating pivoted levers or arms supporting the other side of the movable supports, being themselves supported by pins or studs entering said slots in the centrally-pivoted levers, substantially as described.

3. The combination, with the movable supports and the centrally-pivoted levers supporting one side of the movable supports, of the co-operating pivoted levers or arms supported by the centrally-pivoted levers for supporting the opposite side of the movable supports, and the springs for returning both the centrally-pivoted levers and the co-operating levers or arms to normal position, substantially as described.

4. In a book-support, the combination, with the centrally-pivoted levers carrying the movable supports free to be moved in either direction by the weight of the book, of the co-operating pivoted levers or arms supported by the centrally-pivoted levers, and the adjustable stops for limiting the extent of movement in either direction, substantially as described.

5. In a book-support, the combination, with the levers pivoted at the center and a support carried by each end of the levers, each adapted to be moved down by the weight of the book and cause a corresponding elevation of the opposite support, of adjustable stops for limiting the extent of movement in either direction, whereby the support may be adjusted to accommodate books of different thicknesses, substantially as described.

6. The combination, with the movable supports, the centrally-pivoted levers supporting one side thereof, and the pivoted levers or arms supported by the centrally-pivoted levers supporting the other side, of the springs for returning the parts to normal position when moved in either direction, and adjustable stops for limiting the extent of such movement, substantially as described.

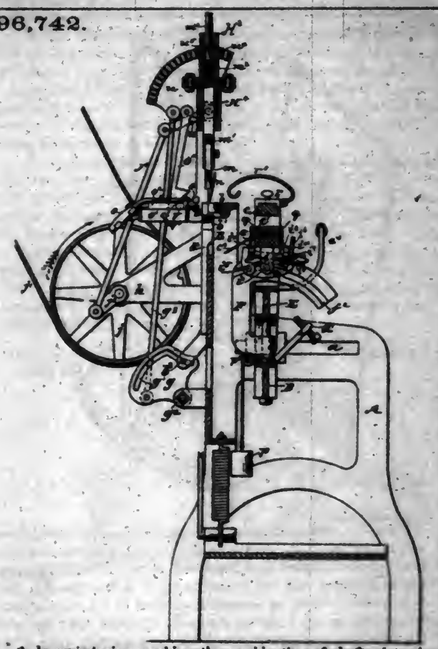
7. The combination, with two supports free to move in either direction and connecting mechanism by which one support is raised when the other is depressed, of springs for bringing said supports to equilibrium when the moving force is removed, and adjustable stops for limiting the downward movement of said supports, substantially as described.

8. In a book-support, the combination, with the casing, the movable supports in the same, and connecting mechanism by which one is raised when the other is depressed, of a lock for rigidly connecting the casing and one of the supports at any desired point of adjustment, but allowing the supports free movement when disengaged, substantially as described.

396,742. INDEXING-MACHINE. FLETCHER W. HEWES, Bloomfield, N. J. Filed Aug. 1, 1887. Serial No. 245,805. (No model.)

Claim.—1. In an indexing-machine, the combination of a cylindrical knife having a screw-thread on its shaft with a supporting-frame, such frame carrying another screw-thread with which the screw upon the knife-shaft gears, by which the same source of power gives both rotation and longitudinal movement to the knife, substantially as described.

396,742.



2. In an indexing-machine, the combination of shaft m', having the screw m^2 and feather-way m^3, and carrying a cylindrical knife, the gear-wheel n^4, carrying the feather n^5, and the frame H, provided with an interior thread with which the screw m^2 gears, by which combination the combined rotary and descending motion is given to the knife.

3. In an indexing-machine, the combination of the book-carriage made in two parts hinged together horizontally, and the table or way upon which it rests, also made in two parts hinged together horizontally to allow of adjustment at various inclinations.

4. In an indexing-machine, the combination of the stationary part F, containing cam-groove f^2, with the rocking bar i^2, attached to the oscillating table which supports the book-carriage, and racks attached to the book-carriage, each rocking bar having pin i^3 to traverse the cam-groove f^2, and catches i^4 to engage alternately with the racks upon the book-carriage.

5. In an indexing-machine, a shaping-stop affixed to the cutting-table near the knife and inclined forward so as to push back from the knife the edges of the upper leaves progressively.

6. In an indexing-machine, the shaping-stop n, adjustably attached to the cutting-table by means of the plate n', having a curved slot, the plate n^2, having a horizontal slot, and the bolt and nut n^3.

7. In an indexing-machine having a cylindrical knife, the cylindrical colorer o', made of some hard material and covered on the side which enters the nick cut out by the knife with an absorbent surface, and also having a well containing coloring-fluid, into which the end of the absorbent surface dips to supply the outer surface of the colorer with fluid by capillary attraction, substantially as described.

8. In an indexing-machine, the combination of the colorer o', having a cylindrical stem, o^2, with the supporting-piece o^3, having a cylindrical stem, o^4, which passes through some supporting part of the sliding carriage o^5, and appropriate set-screws in the supporting-piece o^3 and the stem o^4, such combination affording the various adjustments of the colorer.

9. In an indexing-machine, the combination of sliding carriage o^5, carrying a colorer, bracket o^3, upon which the sliding carriage is supported, spring v^2, and cam-rod o^4, pivoted upon the sector u and operating the sliding carriage.

10. In an indexing-machine, the cutting-block b', arranged as a movable part of the cutting-table, in combination with mechanism, substantially as described, to lower and raise it between each cut.

11. In an indexing-machine, the combination of the movable cutting-block b', attached to the sliding piece b^3, slotted cam g, pivoted upon the frame, and connecting-rod g^3, pivoted to the cam g and to the sector u.

12. In an indexing-machine, the combination of sliding carriage o^5, provided with spring v^2 and carrying the brush o^6 cam-rod o^4, pivoted to and operated by the sector u, and the movable cutting-block b', also operated by the sector u through the connecting-rod g^3, slotted cam g, and sliding piece b^3.

13. In an indexing-machine, a book-clamp adapted to slide upon the top of the book-carriage and be clamped thereto at any point, having the pointed pin r^4 and the pin r^3 to retain the book upon the carriage, and yet allow of flexibility in the back of the book.

14. In an indexing-machine, the combination of shaft m', carrying a knife and operated by the sector u, the sliding carriage o^5, provided with spring v^2 and carrying a colorer, and the cam-rod o^4, such cam-rod being also pivoted to and operated by the sector u.

15. In an indexing-machine, the combination of the shaft m', carrying a knife and operated by the sector u, the sliding carriage o^5, provided with spring v^2 and carrying the brush o^6, the cam-rod o^4, also pivoted to and operated by the sector u, and the movable cutting-block b', also operated by the sector u through the connecting-rod g^3, slotted cam g, and sliding piece b^3.

16. In an indexing-machine, the combination of sliding carriage o^5, provided with spring v^2 and carrying both a colorer and the brush o^6, cam-rod o^4, pivoted to and operated by the sector u, and the movable cutting-block b', also operated by the sector u through the connecting-rod g^3, slotted cam g, and sliding piece b^3.

17. In an indexing-machine, the combination of shaft m', carrying a knife and operated by the sector u, the sliding carriage o^5, provided with spring v^2 and carrying both a colorer and the brush o^6, the cam-rod o^4, also pivoted to and operated by the sector u, and the movable cutting-block b', also operated by the sector u through the connecting-rod g^3, slotted cam g, and sliding piece b^3.

18. In combination with the knife m, the disk m^6, the disk m^7, having stem m^8, passing through and supported upon the other side of the disk m^6, and a coiled spring lying between such disks, substantially as and for the purpose described.

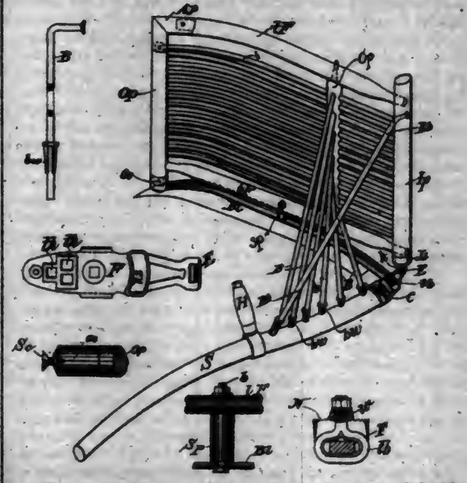
19. In combination with an indexing-machine, the belt-tightening device consisting of lever t, cam t^2, operated by such lever, spring s, carrying the belt-tightening roller t', and roller s^2, lying in the course of the cam t^2, and the stop w, pivoted to the frame.

20. In combination with an indexing-machine, the belt tightening and releasing device consisting of lever t, cam t^2, operated by such lever, spring s, carrying the belt-tightening roller t', the roller s^2, lying in the course of the cam t^2, and the stop s^3, the pulley j, provided with the projection j^2 and pin j^3, and the stop w, pivoted to the frame and connected with a lever or system of levers through which the pin j^3 raises the stop w upon the completion of one revolution.

21. In an indexing-machine to be operated by hand, in combination with the sector u, through which the various parts are operated, the spring z^3, attached to the frame and bearing against a pin affixed to the sector u, substantially as and for the purpose described.

22. In a label-cutting machine, the combination of the shaft m', carrying the knife m^{10} and operated by the sector u, the sliding carriage o^5, provided with springs v^2 and carrying the pusher o^{13}, and the cam-rod o^4, also pivoted to and operated by the sector u.

396,743. GRAIN-CRADLE. HORACE L. HEWITT, Indianapolis, Ind. Filed Aug. 25, 1888. Serial No. 283,780. (No model.)



Claim.—1. A grain-cradle having its outer post provided with a socket with a coned or convex base resting on and secured to the scythe-blade by a screw passing through a hole formed in said scythe-blade, said screw being provided with a head having its bearing-sur-

face coned, and an inner post having a socket with a hook formed at its base, engaging with an eye secured to the end of the snath and arranged to co-operate with said socket, having a coned base, and suitable adjustable braces removably secured at their ends, respectively, to the cradle-post and the snath, all combined substantially as and for the purpose described.

2. A grain-cradle having its outer post provided with a socket having a coned or convex base resting on and secured to the scythe-blade by a screw passing through a hole formed in said scythe-blade, said screw being provided with a head having its bearing-surface coned, said socket-base bearing on and secured to the scythe-blade by a suitable screw, an inner post mounted in a socket with a hook formed on its base, engaging with an eye secured to the snath, an intermediate socket-post having a beveled or rounded base and a bolt passing through it, and suitable braces secured at their ends, respectively, to the cradle-post and snath, all co-operating, combined substantially as and for the purpose described.

3. In a grain-cradle, the combination of the outer post provided with a socket having a coned or convex base, said socket-base bearing on and secured to the scythe-blade by a suitable screw, an inner post mounted in a socket, with a hook formed on its base engaging with an eye secured to the snath and arranged to co-operate with said coned sockets, top and bottom longitudinal bars or fingers secured at their respective ends to the outer and the inner posts, a post interposed between the outer and inner post, to which cradle-braces are swiveled, and suitable braces swiveled to the interposing post and the inner post by bends passing loosely through said interposing and inner posts and removably secured to the snath, for the purpose of adjusting cradle to any desirable angle, substantially as and for the purpose described.

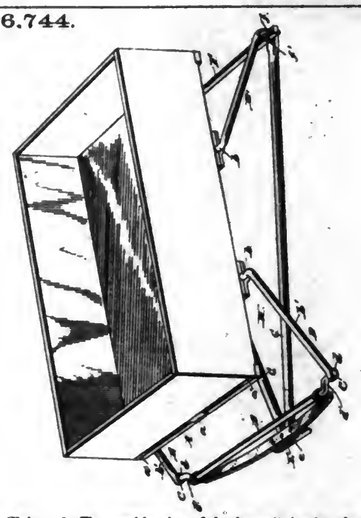
4. In a grain-cradle, the combination of the outer post provided with a socket having a coned or convex base resting on and secured to the scythe-blade by a screw passing through a hole formed in said scythe-blade, said screw being provided with a head having its bearing-surface coned, said socket-base bearing on and secured to the scythe-blade by a suitable screw, an inner post mounted in a socket, with a hook formed on its base engaging with an eye secured to the snath, top and bottom longitudinal bars or fingers secured at their respective ends to the outer and inner posts, a post interposed between the outer and inner posts, to which cradle-braces are swiveled, fingers secured at their outer end to the outer post and extending through holes in the interposing post and secured to the inner post, a socket-post having a coned base and a securing-bolt passing through said socket, scythe-blade, and bottom finger, and suitable braces swiveled to the interposing post and inner post at their top best ends and removable secured to the snath at their opposite ends, all arranged to co-operate substantially as and for the purpose described.

5. The combination, with the snath and the scythe attached thereto, of the upright *Op*, removably and adjustably secured at its lower end to the scythe at or near its outer end, the upright *Ip*, removably secured at its lower end by a hook formed thereon to the snath-fastening eye, the securing post or socket *Sp*, secured at an intermediate point between the outer and inner posts, *Op* and *Ip*, by a bolt passing through them, the socket-piece *Ap*, having its vertical arm arranged on the upper end of the post *Op* and pinned by finger *f*, the top finger, *fF*, secured to the upper end of the post *Op* and inserted at its outer end into the horizontal arm of the socket-piece, said top finger extending inward beyond the post *Op* and secured to the post *Ip* at its inner end, the finger *bF*, secured at its outer end to the post *Op*, said finger extending inwardly beyond the socket-brace *Sp* and the post *Op* and secured to the post *Ip* at its inner end, the fingers *f*, secured at their inner ends to the post *Ip*, extending outward through and beyond post *Op* and secured at their outer ends to the post *Op*, the brace *Bb*, swiveled in and extending from the upper end of the post *Ip* and removably secured to the snath, and the braces B, swiveled at regular intervals in and along the post *Op* and extending therefrom and removably secured to the snath, substantially as and for the purpose described.

6. In a grain-cradle, the combination of the snath and the scythe removably secured thereto, the outer and inner posts, *Op* and *Ip*, removably secured at their lower ends to the scythe and the snath, respectively, the top finger *fF*, connecting the upper, and the bottom finger, *bF*, connecting the lower ends of said posts, the interposing post *Op*, connecting the top and bottom fingers, the socket *Sp*, supporting the bottom finger at an intermediate point along it and removably secured to the scythe, the brace *Bb*, pivotally secured to the inner post, *Ip*, and removably inserted in and secured to the snath by the wedges or tapered sockets *bw*, and the braces B, pivotally secured to the post *Op* and inserted in and secured to the snath by wedges *bw* at intermediate points between the brace *Bb* and snath-catch, substantially as and for the purpose described.

396,744. VEHICLE-SPRING. JOHN T. HOVE, Clintonville, Pa. Filed July 31, 1888. Serial No. 281,501. (No model.)

396,744.

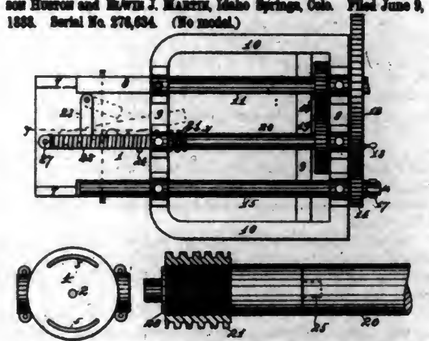


Claim.—1. The combination of the frame A, having the side bars, *a*, and central bar, *a'*, the angle-bars B B', having the transverse arms *b*, provided with the studs *i'*, and longitudinal bars *b'*, forming slightly-obtuse inner angles with the arms *b*, and having the eyes C at their ends for the attachment of connecting portions of the running-gear, and the coiled springs I, having their ends *i* hooked under the studs *i'* and their ends *i²* extended toward the corresponding ends of the frame A and secured to the central longitudinal bar thereof, substantially as specified.

2. The combination, with the frame A, the journaled angle-bars B B', and the coiled springs I, attached at one end to the said bars and at the other end to the frame A, of the transverse crank-bar D, with the journals *d* of its end cranks in the eyes C of the front angle-bars, B, and having bearings in the upturned perforated ends of the front transverse spring, and a frame connecting said springs and the ends of the longitudinal arms of the rear angle-bars, B', substantially as specified.

3. The combination, with the frame A, the angle-bars B B', and the coiled springs I, of the crank-bar D, having the crank-journals *d* at its ends, which journals have bearings in the eyes C of the crank-bars B, the front spring, E, having upturned ends provided with perforations to form bearings for said crank-bar, and the connecting-frame H, formed of the head-block *e*, secured centrally to said spring, the rearwardly-diverging bars G, and the transverse bar F, which bars G and F are secured to the ends of the longitudinal arms of the rear angle-bars, B'.

396,745. MACHINE FOR OPERATING ROCK-DRILLS. HARRISON HUSTON and HAVEN J. MARTIN, Idaho Springs, Colo. Filed June 9, 1888. Serial No. 276,634. (No model.)

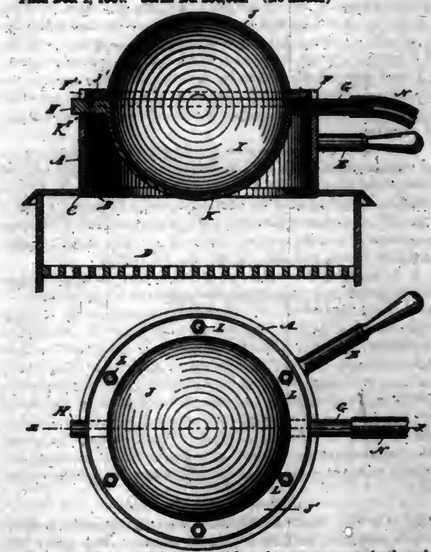


Claim.—1. The combination of a fixed base provided with guideways, a bed or frame upon such base and moving in the guideways, a drill-spindle mounted in or on such bed or frame, mechanism, as described, for rotating the drill-spindle, and a feed mechanism consisting of an interchangeable and removable worm-gear on the moving bed or frame, and a removable and interchangeable rack adapted to mesh therewith and secured upon the fixed base, substantially as set forth.

2. The combination of a fixed base provided with guideways, a bed or frame adapted to move in such guideways, a drill-spindle mounted in or on such frame or bed, mechanism, as described, for rotating the drill-spindle, and a feed mechanism consisting of a worm-gear on the moving bed or frame, and a pivoted rack on the fixed base, and stops upon such base for holding the rack in operative position, substantially as set forth.

3. The combination of the base 1, having grooved guideways and the depending lugs or bolts 3, the bed or frame adapted to move in such guideways, a drill-spindle mounted in or on such bed or frame, mechanism, as described, for rotating the drill-spindle, a feed mechanism consisting of a worm-gear on the moving bed or frame, a rack pivoted on the base 1 and meshing with the worm-gear, and stops for holding the rack in operative position, the turn-table 4, having the curved slots 5, through which take the bolts or lugs 3, having the nutted heads 36, and the pivotal connection 2 between the base 1 and turn-table 4, substantially as set forth.

396,746. GAS-RETORT. WESLEY C. JONES, Waxahachie, Tex. Filed Dec. 1, 1887. Serial No. 256,602. (No model.)



Claim.—1. The combination, with a fire-pot open at both ends, with its lower end constructed to fit the eye or lid-opening of a cook-stove, of a gas-retort made in two halves and provided with trunnions having their bearings in the said fire-pot, one of the said trunnions being hollow and connected with a pipe for leading off the gases generated in the retort, substantially as shown and described.

2. The combination, with a fire-pot open at both ends, with its lower end constructed to fit the eye or lid-opening of a cook-stove, of a spherical gas-retort made in two halves secured together, trunnions formed on the said retort and adapted to turn in bearings on the said fire-pot, one of the said trunnions being hollow and opening into the interior of the said retort, and a tube connected with the said hollow trunnion for leading off the gases generated in the said retort, substantially as shown and described.

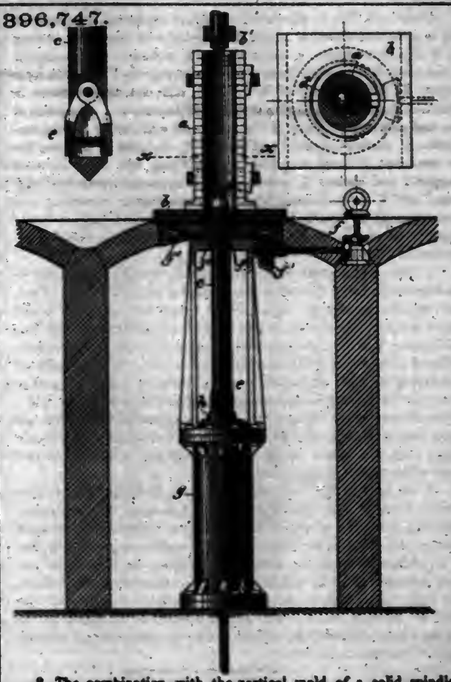
3. A spherical gas-retort made in two halves bolted together at their bases, and trunnions formed on the said retort for turning the same, one of the trunnions being hollow and opening into the interior of the said retort, substantially as shown and described.

4. The combination, with the cylindrical fire-pot A, open at both ends, the lower end being constructed to fit the eye of a cooking-stove, and the upper end having opposite slots F F, of the spherical revolvable retort J, formed of two separable parts having flanges J' K' at their meeting edges, and trunnions H G, turning in said slots, the trunnion G being hollow and communicating with the interior of the retort, and the bolts L, securing the flanges together, substantially as set forth.

396,747. APPARATUS FOR CASTING STEEL PIPES. WALTER R. KOCH, Sharpsburg, Pa. Filed May 3, 1888. Serial No. 273,162. (No model.)

Claim.—1. In an apparatus for casting steel tubes, the combination of a vertical mold, a vertical rotary spindle adapted to be forced into said mold from below, and mechanism for raising and rotating said spindle within the mold, substantially as specified.

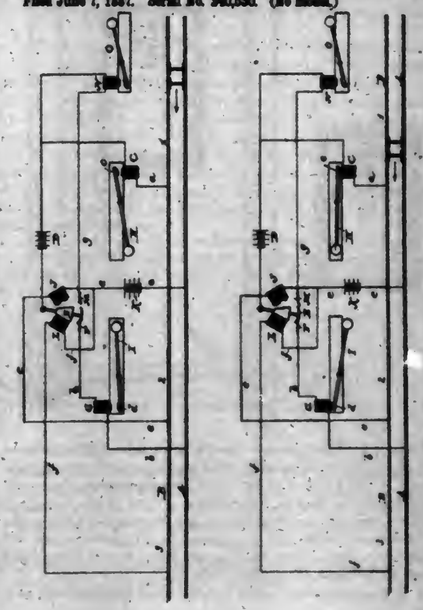
396,747.



2. The combination, with the vertical mold, of a solid spindle which closes the bottom of said mold and is capable of being raised and rotated in said mold, a bearing at the upper end of the mold to receive the upper end of the spindle, and mechanism for raising and rotating the spindle, substantially as specified.

3. The combination, with the vertically movable and rotating spindle *c*, of the spring-flue *e* at the lower end of said spindle, and the horizontal gear-wheel *f²*, having seats in its hub into which the flue enter, whereby a slow rotation is given to the spindle when the same is raised into the mold, substantially as specified.

396,748. ELECTRICAL RAILWAY-SIGNAL. WILLIAM P. KOOKOGEY, Brooklyn, N. Y., assignor to the Keokogey Electric Company. Filed June 7, 1887. Serial No. 240,530. (No model.)

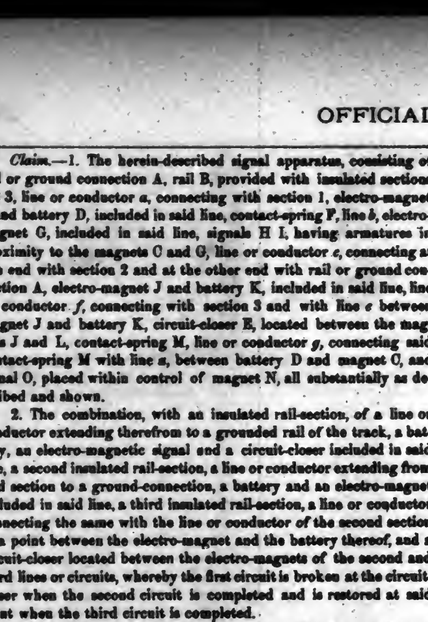


Claim.—1. The herein-described signal apparatus, consisting of rail or ground connection A, rail B, provided with insulated sections 1 2 3, line or conductor *a*, connecting with section 1, electro-magnet C and battery D, included in said line, contact-spring F, line *b*, electro-magnet G, included in said line, signals H I, having armatures in proximity to the magnets C and G, line or conductor *c*, connecting at one end with section 2 and at the other end with rail or ground connection A, electro-magnet J and battery K, included in said line, line or conductor *f*, connecting with section 3 and with line *c* between magnet J and battery K, circuit-closer E, located between the magnets J and L, contact-spring M, line or conductor *g*, connecting said contact-spring M with line *a*, between battery D and magnet C, and signal O, placed within control of magnet N, all substantially as described and shown.

2. The combination, with an insulated rail-section, of a line or conductor extending therefrom to a grounded rail of the track, a battery, an electro-magnetic signal and a circuit-closer included in said line, a second insulated rail-section, a line or conductor extending from said section to a ground-connection, a battery and an electro-magnet included in said line, a third insulated rail-section, a line or conductor connecting the same with the line or conductor of the second section at a point between the electro-magnet and the battery thereof, and a circuit-closer located between the electro-magnets of the second and third lines or circuits, whereby the first circuit is broken at the circuit-closer when the second circuit is completed and is restored at said point when the third circuit is completed.

3. In combination with three insulated rail-sections and three electric circuits, each including one of said sections, an electro-magnetic signal in the first circuit, a circuit-closer adapted and arranged to form part of the first circuit until the second is completed and then to be withdrawn from the first, electro-magnets in the second and third circuits serving to withdraw the circuit-closer from the first circuit while the second is complete and to restore it thereto while the third is complete, and a fourth circuit adapted to be closed by the circuit-closer whenever the second circuit is completed, all substantially as described and shown.

396,749. RAILWAY-SIGNAL. WILLIAM P. KOOGSEY, Brooklyn, N. Y., assignor to the Koogsey Electric Company. Filed June 7, 1887. Renewed June 9, 1888. Serial No. 276,563. (No model.)



Claim.—1. In combination with a local electric circuit containing a light-giving device and located at the station or point to be lighted, a second circuit adapted to be closed by a train passing along the track at a point in advance of the station or light, an electro-magnet included in said second circuit, and a circuit-closer included in the light-circuit, and adapted to be attracted by the electro-magnet and to complete the light-circuit whenever the second circuit is completed through the bridging of the rails by the train.

2. The combination of rails A B, the latter provided with insulated section 1, an electro-magnet, C, and battery D, connected in circuit with insulated section 1 and with ground or rail A, a light-circuit containing the circuit-closer E and contact *c*, and an armature carried by the circuit-closer and placed within the field of magnet C, whereby the circuit-closer is attracted and caused to complete the light-circuit when the rails are bridged at the section 1.

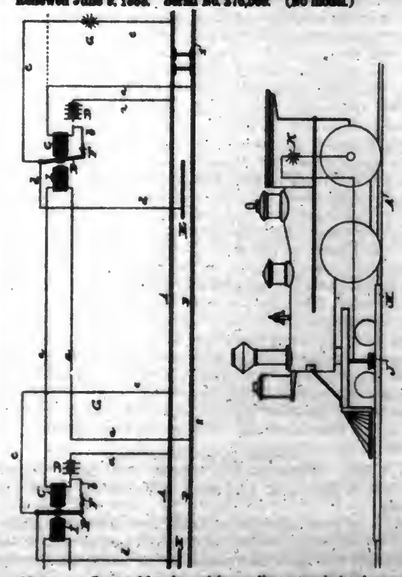
3. In combination with a railway-track having insulated rail-sections, one in advance of the point to be lighted, a local light-circuit, a circuit-closer included in said circuit, electro-magnets arranged to move the circuit-closer in opposite directions, and two independent circuits, each including one of the insulated sections and one of the electro-magnets, substantially as shown, whereby the entrance of a train upon the first insulated section is caused to effect the closing of the light-circuit and the entrance of the train upon the second insulated section is caused to break or destroy the light-circuit.

4. In combination with lines A and B, the latter having insulated sections 1 and 2, wire or conductor *a*, connected at one end with the insulated section 1 and at the other end with rail A or other ground-connection, electro-magnet C, a battery, D, included in said conductor *a*, electro-magnet H, having one end of its helix connected by a line or conductor, *g*, with section 2, and its other end connected by a line or conductor, *h*, with a battery, which is in turn connected with the rail A or other ground, wires *d e f*, lamps F, and battery G, constituting a local light-circuit, a circuit-closer, E, and contact-spring *c*, for completing said light-circuit, the armature *b* of the circuit-closer being located between the magnets C and H, all substantially as shown and described.

5. In combination with an electric lamp and a local circuit therefor, a circuit-closer included in said circuit, an electro-magnet adapted to attract the circuit-closer and to complete the light-circuit, lines or conductors extending from the electro-magnet to an insulated section of the rail in advance of the light, and a ground-connection, whereby the entrance of a train upon the insulated section is caused to energize the electro-magnet and complete the light-circuit.

6. In combination with an electric light and an electric circuit therefor, including a battery or other generator, a circuit-closer included in the light-circuit, electro-magnets arranged to act upon the circuit-closer and move it in reverse directions, and two independent circuits, each including a battery or electric generator and an independent insulated section of the track, one of said sections being located in advance of the lamp, whereby the entrance of a train upon the first insulated section is caused to complete the circuit through one of said electro-magnets, which thereupon attracts the circuit-closer and completes the light-circuit, and the entrance of the train upon the second of the insulated sections is caused to complete the second circuit and move the circuit-closer to destroy the light-circuit, substantially as set forth.

396,750. RAILWAY-SIGNAL. WILLIAM P. KOOGSEY, Brooklyn, N. Y., assignor to the Koogsey Electric Company. Filed June 7, 1887. Renewed June 9, 1888. Serial No. 276,562. (No model.)



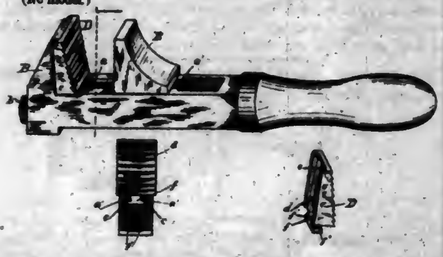
Claim.—1. In combination with a railway-track having a series

of insulated sections, one in each block or division of the road, an electric circuit for each block or division, including the insulated rail-section thereof, a generator or source of electricity, and an electro-magnet, and a local lamp-circuit for each block or division, including a battery or generator, and a circuit-closer adapted to be operated by the electro-magnet, whereby a train entering upon an insulated rail-section is caused to complete the light-circuit and leave a lamp behind it in a luminous condition.

2. In combination with rails A and B, one provided with insulated sections 1 2, &c., one such section in each block or division of the road, an electric circuit for each block or division, including two electric magnets and a source of electricity, local lamp-circuits, one for each block or division, and a circuit-closer included in each lamp-circuit and located between the two electro-magnets, each in the circuit of a different block or division, whereby the circuit-closer of each lamp-circuit in succession is caused to complete such lamp-circuit as the train enters upon the insulated rail-section of the block or division to which said lamp-circuit belongs and to break or open said lamp-circuit as the succeeding one is perfected.

3. In combination with rails A B, one having insulated sections 1 2, &c., a series of circuits, *a*, one for each insulated section and including the same, and two electro-magnets, C and I, the magnet I of each circuit arranged in proximity to the magnet C of the preceding circuit, a series of local lamp-circuits, one for each insulated section, and a series of circuit-closers, one included in each lamp-circuit and located between the magnets C and I, whereby the lamp-circuits are successively perfected as a train enters successively upon the insulated rail-sections.

396,751. WRENCH ATTACHMENT. CHARLES F. LAGANKE, Lorain, and THOMAS E. GAWE, North Amherst, assignors to the Lorain Wrench Company, Lorain, Ohio. Filed Aug. 27, 1888. Serial No. 283,341. (No model.)



Claim.—1. The combination, with a wrench provided with a slot, *a*, adjacent to a jaw, B, and having side walls, *a'*, formed with inner shoulders *e*, of a pipe-wrench attachment, D, having a longitudinal lug formed with a neck, *f*, and two lateral shoulders, *f'*, the base of the attachment having bearing on said walls *a'*, the lug-neck *f* being formed between said attachment-base and the lug-shoulders *f'*, and fitting between said walls *a'*, said lug-shoulders *f'* locking behind said wall-shoulders *e*, the thickness of said entire lug and also the width of the lug-neck being slightly less than the width of said slot, the length of said slot being greater than the width of said entire lug, substantially as set forth.

2. The combination, with a wrench provided with a slot, *a*, adjacent to a jaw, B, and having the two side walls, *a'*, formed with inner shoulders, *e*, in same transverse plane with said walls, of a pipe-wrench attachment, D, provided with the two side flanges, *e*, and having a longitudinal lug formed with the neck *f* and the two lateral shoulders *f'*, the base of the attachment having bearing on said walls *a'*, the lug-neck being formed in a transverse plane between said attachment-base and the lug-shoulders *f'*, and fitting between said walls *a'*, the lug-shoulders *f'* locking under the wall-shoulders *e*, the thickness of said entire lug and also the width of the lug-neck being slightly less than the width of said slot, the length of said slot being greater than the width of said entire lug, substantially as set forth.

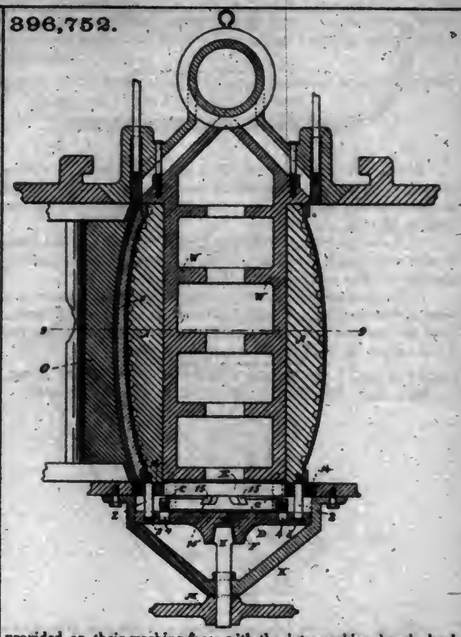
396,752. PAPER-BARREL MACHINE. GEORGE W. LARAWAY, Akron, Ohio, assignor of one-half to John F. Seiberling, same place. Filed Sept. 24, 1887. Serial No. 250,600. (No model.)

Claim.—1. In a paper-barrel machine, the combination, with the main staves and the interstaves, of the toggle-levers, of different lengths, and means, substantially as described, for simultaneously operating said toggle-levers.

2. In a paper-barrel machine, the main staves and the interstaves provided on their working-faces with the bevel-edged plates, in combination with the toggle-levers connected with and acting directly upon both the main and inter staves and the ring for operating said toggle-levers simultaneously, as and for the purpose described.

3. In a paper-barrel machine, the main staves and interstaves

396,752.



provided on their working-faces with the intermeshing bevel-edged plates, in combination with toggle-levers of different lengths for varying the relative speed of the different staves, and an actuating-ring for operating said levers.

4. In a machine for forming paper barrels, &c., the combination of the main staves N, the interstaves O, the longer toggles, 12, the shorter toggles, 13, and the toggle-ring 11, substantially as described.

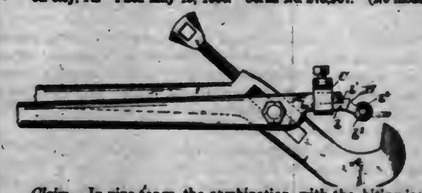
5. The combination of the interstaves O, provided with the projecting beveled plates, the main staves having also correspondingly-beveled plates underlying the beveled projections of the interstave-plates, the short toggles 13, the long toggles 12, both connected with said staves, and the toggle-actuating ring, substantially as and for the purpose set forth.

6. The combination, with the base-plate and the scroll-plate, of the yoke-pieces provided with pins B and slots, and the inner staves, also provided with pins, and means, substantially as described, for operating said scroll-plate, substantially as and for the purpose specified.

7. The combination, with the inner staves having guide-pins and the slotted base-plate having the oblique projections, of the movable yoke-pieces provided with grooves corresponding to the form of said oblique projections, and also provided with guide-pins and slots, and a rotary scroll-plate, and means for actuating the latter for operating the yoke-pieces and staves, all substantially as described.

8. The combination, with the slotted base-plate and the inner staves having guide-pins, of the yokes provided with slots 16 and guide-blocks 19, and also with pins B, and a slotted scroll-plate, and means for actuating the latter for operating the yokes and staves, substantially as described.

396,753. PIPE-TONGS. ROBERT B. MAGEE and FRED C. KNOWLES, Oil City, Pa. Filed May 15, 1888. Serial No. 273,967. (No model.)



Claim.—In pipe-tongs, the combination, with the biting-jaw A', having a shoulder, *a*, of the attachment B, having a shank, *b*, shoulder *b'*, head *b²*, and cutter D, journaled in said head, and a clamp, C, embracing the jaw A and attachment B, substantially as shown.

396,754. CATHETER. REUBEN H. MAYFIELD, Boulder, Colo. Filed Oct. 5, 1888. Serial No. 287,300. (No model.)

396,754.

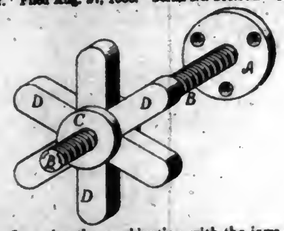


Claim.—1. A catheter having a full open inlet end, a head adapted to be seated thereon and act as a valve, and a wire attached to such head and passing through the body of the catheter, substantially as set forth.

2. A catheter composed of tube 1, with full inlet end 2, a head, 3, with rim or ledge 4, and wire 5, attached to the head and passing through the tube 1, substantially as set forth.

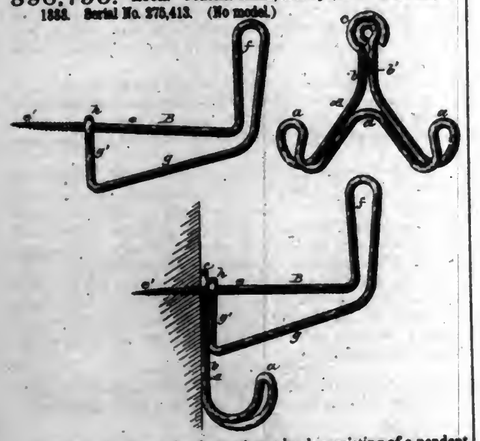
3. The combination of tube 1, with full open end 2, the wire 5, passing therethrough, the head 3, attached to such wire and seating upon the end 2, the wire 10, and the loop 11, surrounding the wire 5 and part of the head 3, substantially as set forth.

396,755. ADJUSTABLE STRUT FOR VISES. FRANK MICHEL, Blair, Nebr. Filed Aug. 27, 1888. Serial No. 283,864. (No model.)



Claim.—In a vise, the combination, with the jaws thereof, of a screw, B, one end of which is riveted to a disk, A, provided with screw-holes, whereby the screw B is attached so as to project at right angles from the inner face of the lower end of the movable jaw E and pass loosely through an aperture in the fixed leg or jaw G, the screw B being provided between the jaws with a revolving nut, C, bearing against the fixed jaw G, and having radial arms by which it may be turned, substantially as described.

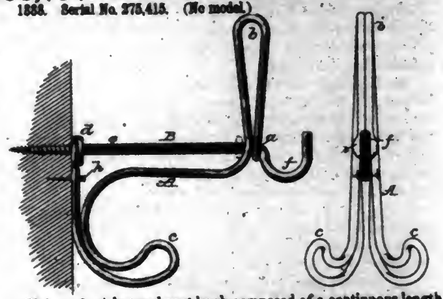
396,756. HOOK. PURCHIS MILES, Brooklyn, N. Y. Filed May 29, 1888. Serial No. 275,413. (No model.)



Claim.—1. A complex hat and coat hook consisting of a pendent wire base-hook having a shank provided with an eye at its upper end, and another separately-constructed wire hook having a brace provided with an eye which is coincident with the eye of the base-hook, and also having a screw-threaded shank which occupies both of said eyes, substantially as described.

2. In a complex hat and coat hook, a pendent wire base-hook having a shank provided with an eye at its upper end, in combination with a wire master-hook having a screw-threaded shank, and also a spring-brace provided with an eye, which is occupied by said shank and is coincident with the eye of the base-hook, the latter eye being also occupied by said screw-threaded shank, substantially as described, whereby in mounting the hook the base-hook may be fixedly held in position while the threaded shank of the master-hook is being driven into the wood on which it is to be mounted, and enabling the spring-brace of the master-hook to firmly engage with the shank of the base-hook, and also enabling each of said hooks to be confined against rotation independently of the other.

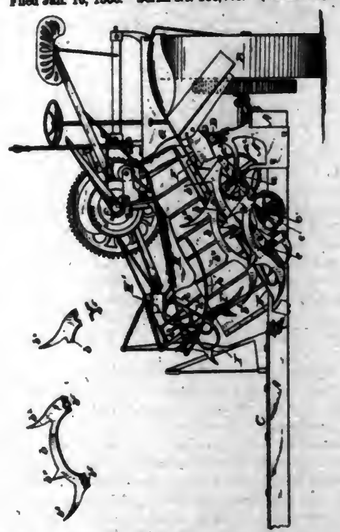
396,757. HOOK. PURCHIS MILES, Brooklyn, N. Y. Filed May 29, 1888. Serial No. 275,415. (No model.)



Claim.—1. A hat and coat hook composed of a continuous length of wire and having a vertical hat-hook arm containing four portions of the wire and provided with an eye at its base, and below and at the rear of said arm coat-hooks containing two portions of the wire and having a vertical shank provided at its top with an eye in line with the eye at the base of the hat-hook arm, substantially as described, said eyes being adapted to receive a supporting-arm for attaching the hook to any suitable foundation.

2. A hat and coat hook composed of a continuous length of wire and having a vertical hat-hook arm composed of four portions of said wire and provided with an eye at its base, and below and at the rear of said arm coat-hooks having a vertical shank provided at its top with an eye in line with the eye at the base of the hat-hook arm, in combination with a supporting-arm which occupies said eyes and has a hook at its outer end, substantially as described.

396,758. GRAIN-BINDING HARVESTER. LEWIS MILLER, Akron, Ohio. Filed Jan. 16, 1886. Serial No. 188,773. (No model.)



Claim.—1. The combination, with the slotted binder-table, of parallel crank-shafts, arched bars connected to cranks on said shafts to pass through the table and act on the grain thereon, and picker or gathering and packing fingers on said bars, substantially as and for purpose described.

2. The inclined and slotted elevating binder-table and the crank-shafts underneath said table, in combination with arched bars connected at their opposite ends to cranks on said shafts to pass through said table, and the picker and packer fingers on said bars, also passing through the table, all substantially as described.

3. The combination, with the needle, of the arched bars carrying gathering and packing fingers, and operating on opposite sides of and in close proximity to the plane of said needle, the parallel crank-shafts having oppositely-arranged cranks in pairs for operating said bars to act alternately on the straw, and oppositely-arranged intermediately-acting cranks, carrying also curved bars having gathering and packing fingers and acting on the ends of the straw, substantially as described.

4. In combination with the slotted binder-table, the needle or needle-guard, the crank-shafts, and the bars connecting said shafts provided with pickers or gathering-fingers and packers, and with spurs arranged between the gathering-fingers and packers, and made short for the purpose of releasing the grain and permitting a rolling motion thereof between the packers and gathering-fingers, substantially as described.

5. The combination, with the slotted binder-table, needle, and compressor, of the parallel crank-shafts, and the arched bars connecting the cranks on said shafts and provided with pickers or gathering-fingers and packers, and the intermediate spurs made shorter than the gathering and picking fingers, all substantially as and for the purpose described.

6. The frame-work supporting the binder-table, in combination with the parallel crank-shafts located underneath said table for operating the gathering-fingers and packers, and the bars or braces connecting said shafts, and in the ends of which said shafts are journaled, substantially as described.

7. The combination, with the inclined elevating binder-table, of the parallel crank-shafts located underneath said table, the connecting bars or braces in which said shafts have their bearings, said bars being provided also with bearings for the crank-shaft actuating the knife-bar, and the arched bars carrying the gathering-fingers and packers connected to and operated by said parallel crank-shafts, substantially as described.

396,759. ROTARY ENGINE. CARL MIETZ, Lisbon, N. H. Filed Apr. 24, 1888. Serial No. 271,709. (No model.)



Claim.—1. As an improvement in rotary engines of the class herein described, the wings or plates composed each of two plates, one of which is slotted, and connected together by notted bolts, substantially as shown and described.

2. The herein-described wings or plates composed each of two plates, one of which is slotted and the other is curved in opposite directions at its outer end, substantially as shown and described, said plates being held together by means of notted bolts.

3. The herein-described rotary engine having the series of separate steam-compartments composed each of plates having oppositely-curved outer ends, and the steam inlet and outlet pipes, substantially as shown and described.

4. The herein-described improved rotary engine comprising the inclosing casing or cylinder having apertured sides, the main shaft, the series of separate steam-compartments composed of adjustable plates having oppositely-curved outer ends, the steam inlet and outlet pipes, the petcock-valves and their chain-connections, the governor, and the steam-supply-regulating throttle, substantially as shown and described.

396,760. CALENDAR. JESSIE M. MOORE, White Sulphur Springs, W. Va. Filed Sept. 20, 1888. Serial No. 286,761. (No model.)



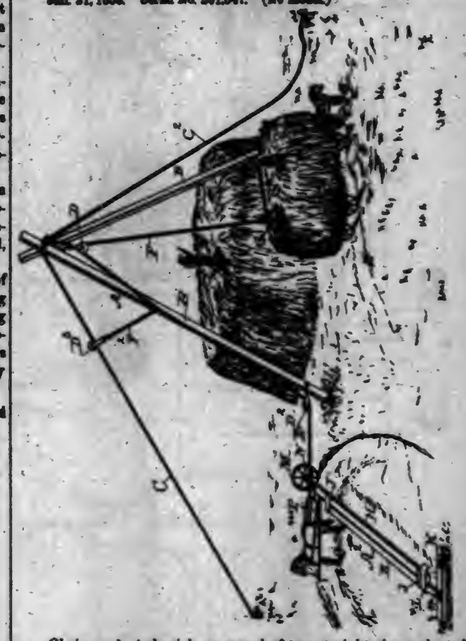
Claim.—1. The combination, with the cylinder having a longitudinal slot, of the ring fitted in said cylinder and adapted to display the number of the year through said slot, as set forth.

2. The combination of the outer cylinder having a longitudinal slot, the inner cylinder displaying the days of the months through said slot, the cap fitted on the inner cylinder and displaying the names of the days of the week through the slot in the outer cylinder, and the cap displaying the names of the months through said slot, as set forth.

3. The combination of the outer cylinder having stops on its inner surface, the cap, and the inner cylinder inserted through the opposite ends of the outer cylinder and resting against said stops, as set forth.

4. The combination of the cylinder having the bayonet-grooves on its inner surface and the caps having lugs engaging said grooves, as set forth.

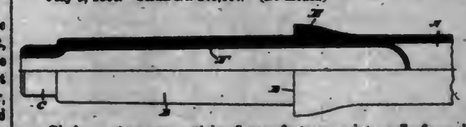
396,761. HAY-STACKER. LUTHER B. MORTON, Stuart, Iowa. Filed Jan. 21, 1888. Serial No. 261,547. (No model.)



Claim.—1. A derrick composed of two straight pieces pivoted together at their top ends, two guy-ropes fixed to the top of the derrick, a pulley attached near the top of the derrick, a pulley attached to the lower end of one of the said pieces in the derrick, and a traveling pulley on one of said guy-ropes, a pivoted sweep, and two ropes arranged and combined in the manner shown and described to operate a hay-fork, as and for the purposes stated.

2. A sweep composed of two straight bars, H, each having a fixed loop, J, a pivot, K, a shield, L, a wheel, M; and a hitching device, P, substantially as shown and described, for the purposes stated.

396,762. VEHICLE-AXLE. ANDREW PATTERSON, McKeesport, Pa., assignor to the National Tube Works Company, Boston, Mass. Filed July 5, 1888. Serial No. 279,067. (No model.)



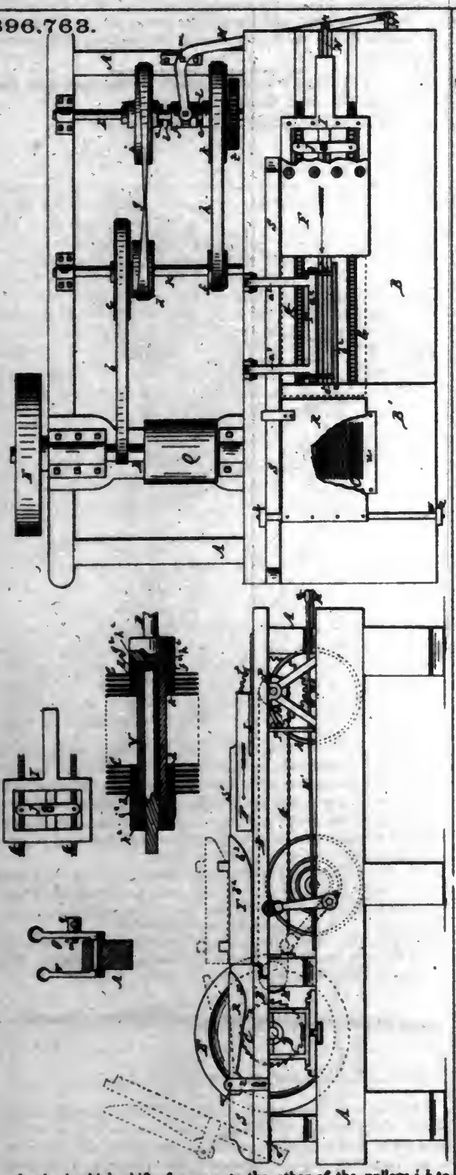
Claim.—As a new article of manufacture, an integrally-formed tubular wrought-metal axle having its bore or tube-cavity of uniform diameter or free from shoulders at the collar-points, and having the collars formed by exteriorly-exposed upsets presenting spindle-shoulders at right angles to the axis of the spindles and sloping from the collar-shoulders inwardly, so as to blend in one with the exterior of the body, the exterior diameter of the body at the point of initial engagement to form the collars corresponding with the exterior diameter of the spindles at the collar-shoulders.

396,763. MACHINE FOR SAWING STAVES. CHARLES R. PENFIELD, Rochester, N. Y. Filed Oct. 13, 1887. Serial No. 252,270. (No model.)

Claim.—1. In a machine for sawing staves, the combination, with a gang of saws, of a follower constructed to run over the saws forward and back, chains with which the follower is connected, and an evener, J, pivoted to the follower and attached to the chains, as herein shown and described.

2. In a machine for sawing staves, the combination of the table B, a gang of saws, C C, at one end of the table, a follower, F, resting on the table and arranged to run over the saws, chains G G, to which the follower is attached, a pivoted rock-lever, M, carrying at one end

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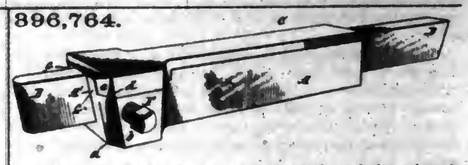


a clutch, *j*, which shifts from one to the other of the pulleys *i k* to reverse the motion, the rods N N', attached to said lever, the rod N being provided with adjustable stops *o o'*, for limiting the throw of the follower, and the weighted shifter O, provided with a swivel-head, *g*, through which the rod N' passes, as shown and described, and for the purpose specified.

3. In a machine for sawing staves, the combination of the table B, a gang of saws, C C, at one end of the table, a follower, F, resting on the table and arranged to run over the saws, chains G G, to which the follower is attached, arranged to reciprocate forward and back, a presser, R, pivoted back of the saws and in longitudinal line with the motion of the follower, and a gage, T, provided with an adjustable face-plate, *b*', located between the presser and follower and pivoted to turn transversely of the machine, said presser and gage being beveled at the ends next the follower, as shown and described, and for the purpose specified.

396,764. TOOL FOR LATHES AND PLANERS. WILLIAM W. PIPER and ADAM L. KELLY, Wheeling, W. Va. Filed Apr. 10, 1888. Serial No. 270,215. (No model.)

396,764.



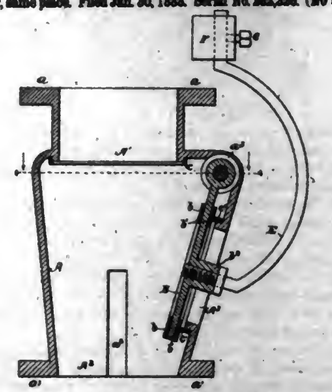
Claim.—1. A tool-stock having an open channel throughout its length, in combination with a set-screw which penetrates its side and a detachable cap-plate, substantially as set forth.

2. The combination, with a tool-stock having an open channel or groove made downwardly in its body to receive a cutter-bar and a set-screw inserted in the side of the tool-stock, of a removable cap-plate adapted to fit the top surface of the tool-stock and permit a tool to slide therein when it is not engaged by the set-screw, substantially as set forth.

3. The combination, with a tool-stock which has a longitudinal groove made throughout its length, thickened side walls formed at one end, and a set-screw or bolt adapted to fit threaded perforations made through these thickened side walls, of a tool or cutter bar made to slidingly fit in the longitudinal groove of the stock, said cutter-bar being of the same width as the depth of the groove in which it sets, and a removable cap-plate which is held in place by the set-screw of a tool post or rest in which the tool-stock is inserted and clamped, substantially as set forth.

4. The combination, with a tool-stock having a rectangular cross-section, a longitudinal slotted body, two thickened side walls at one end, and shoulders produced at this end of the stock by a reduction of each thickened side wall, of a cap-plate adapted to embrace the side walls of the tool-stock and have contact with the shoulders and top surface of this tool-stock, substantially as set forth.

396,765. GAS-TRAP FOR TUYERES AND CONDUCTING-PIPES. AUGUSTUS D. POWER, Akron, Ohio, assignor of one-half to Edward A. Stouffer, same place. Filed Jan. 30, 1888. Serial No. 262,236. (No model.)



Claim.—1. A gas-trap for conducting-pipes and tuyeres, provided with inlet, outlet, and escape ports, in combination with a valve having the curved arm or stem extending outward through the escape-port and provided with an adjustable weight, all arranged and operating substantially as described.

2. The combination, with a gas-trap for conducting-pipes and tuyeres, of a pivoted valve arranged to work automatically under the action of the blast to open one port and close another and a curved and weighted arm or stem attached centrally to and extending outward from said valve through one of said ports, substantially as described.

3. A gas-trap for conducting-pipes and tuyeres, provided with an inclined escape-port, in combination with a valve adapted to be operated by the action of the blast for closing said port and a curved arm or stem attached to said valve and projecting outward through said inclined escape-port for returning said valve to close the inlet-port, substantially as described.

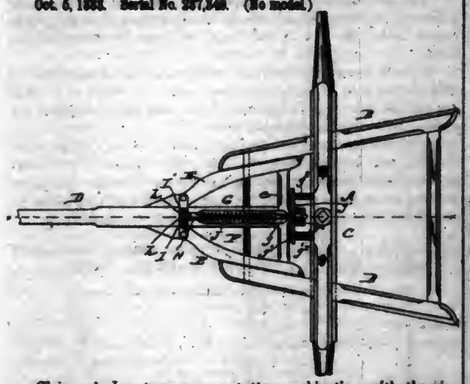
4. The combination, with the gas-trap and the escape-port thereof, of the pivoted valve and the stem or lever projecting through the escape-port and bent or curved in such manner and form that its upper end will lie in approximately the same vertical plane as the hinge or pivotal joint of the valve when the escape-port is closed, said stem or lever being provided at its upper end with an adjustable weight, all as and for the purpose described.

5. The combination, with the gas-trap casing A, provided with the ports A' and A^2, and the integrally-formed inwardly-projecting flanges surrounding said ports, of the packing-rings *c* and *c'*, surrounding said flanges and projecting beyond the inner faces or edges thereof, the double-acting valve provided on both sides with packing *b* and *b'*, and a weighted arm for automatically operating said valve, substantially as and for the purpose described.

6. In a gas-trap for conducting-pipes and tuyeres, the combination, with the valve and its stem, of the eccentrically-perforated weight mounted on and adjustable around said stem, and provided with the set-screw for holding said weight when adjusted on said stem, substantially as described.

7. The gas-trap shell formed in one piece and provided with the inlet, outlet, and escape ports, one of said ports having the grooved extension to admit the valve, substantially as described.

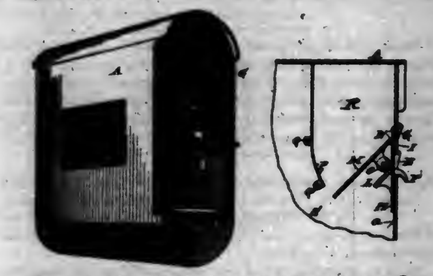
396,766. TONGUE-SUPPORT. GEORGE H. RING, Vermont, Ill. Filed Oct. 6, 1888. Serial No. 287,849. (No model.)



Claim.—1. In a tongue-support, the combination, with the pivoted tongue and the head-block, of a horizontal coiled spring having a threaded pin or bolt fixed to its rear end, a plate fixed to the head-block and supported on the fixed posts, a nut fitted on the threaded pin and bearing against the plate to move said bolt endwise and vary the tension on the spring, and the fixed plates on the tongue to which the front end of the spring is connected, substantially as and for the purpose described.

2. In a tongue-support, the combination, with a pivoted tongue and a head-block, of a coiled horizontal spring, a clevis fixed to the front end of the spring, a pair of vertical plates fixed to the tongue and having the front bifurcated end of the clevis arranged between the upper ends thereof, a longitudinal brace arranged below said spring, and having its rear end fixed to the tongue and its front end arranged in the bifurcated end of the clevis, a coupling-bolt passing through the vertical plates, the clevis, and brace, a threaded pin secured to the rear end of the coiled spring, and a nut fitted on said pin and bearing against a fixed plate on the head-block, substantially as described.

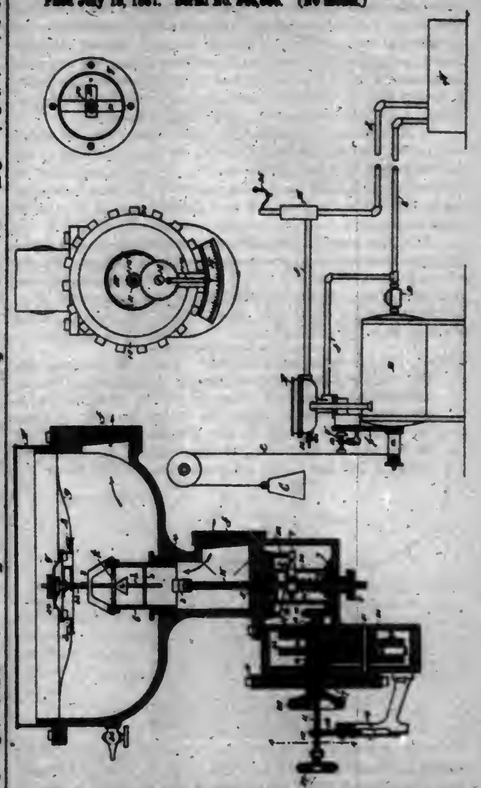
396,767. LETTER-BOX. HENRY S. SCHAADT, St. Louis, Mo. Filed Apr. 3, 1888. Serial No. 269,447. (No model.)



Claim.—1. A letter-box having a compartment or space, R, separated from the main portion S of the interior of the letter-box by means of a valve and a partition, and also having a slide for opening and closing the box-aperture, said slide and valve being connected, and when one is moved to close the box-aperture the other is moved to open the passage from said compartment, as and for the purpose described.

2. The combination, in a letter-box, of the slide H, having the aperture I and the incline L, and the handle F, with the valve M, having the roller O and being journaled, substantially as described.

396,768. GAS-MACHINE. EDWARD D. SELF, South Orange, N. J. Filed July 18, 1887. Serial No. 244,608. (No model.)



Claim.—1. In a gas-machine, the combination, with the carburetor and the apparatus for supplying air thereto, of connections for supplying pure air to the carbureted air or gas, a valve apparatus for controlling the amount of pure air supplied to the gas, a motor the speed of which is controlled by or varies with the amount of gas delivered, and connections between said motor and said valve apparatus for operating the latter to gradually change the amount of air introduced into the gas as the gas-making progresses and the quality of the gas changes, substantially as described.

2. In a gas-machine, the combination, with the carburetor and a pump for supplying air thereto, of connections for supplying pure air to the carbureted air or gas, a valve apparatus for controlling the amount of pure air supplied to the gas, and connections, substantially such as described, between the valve apparatus and the pump, whereby the valve apparatus is operated to gradually change the amount of air supplied to the gas as the gas-making progresses and the quality of the gas changes, the rate of change being controlled by and proportioned to the speed of the pump, substantially as described.

3. In a gas-machine, the combination, with the carburetor and the apparatus for supplying air thereto, of connections for supplying pure air to the carbureted air or gas, a fluid-pressure regulator having a valve which is operated by and controls the pressure of the pure air supplied and having a movable valve-seat, and connections, substantially such as described, whereby the valve-seat may be gradually moved to change the amount of air supplied to the gas as the gas-making progresses and the quality of the gas changes, substantially as described.

4. In a gas-machine, the combination, with the carburetor and the apparatus for supplying air thereto, of connections for supplying pure air to the carbureted air or gas, a fluid-pressure regulator having a valve which is operated by and controls the pressure of the pure air supplied and having a movable valve-seat, and connections, substantially such as described, whereby the valve-seat is automatically moved to gradually change the amount of air supplied to the gas as the gas-making progresses and the quality of the gas changes, the rate of the change being dependent upon and proportioned to the amount of gas made, substantially as described.

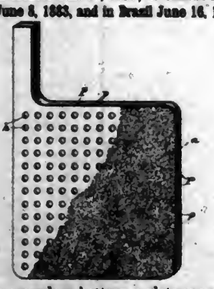
5. In a gas-machine, the combination, with the carburetor and

the pump for supplying air thereto, of connections for supplying pure air to the carbureted air or gas, a fluid-pressure regulator having a valve which is operated by and controls the pressure of the air supplied and having a movable valve-seat, and connections, substantially such as described, between the valve-seat and the pump, whereby the valve-seat is automatically moved so as to gradually change the amount of air supplied to the gas as the gas-making progresses and the quality of the gas changes, the rate of change being controlled by and proportioned to the speed of the pump, substantially as described.

6. In a gas-making machine, the combination, with the carburetor, of the pressure-regulator F, having the valve controlled by the diaphragm and the movable valve-seat for varying the amount of air supplied to the gas, and the train of gears 19 20, &c., for communicating motion to the valve-seat and to the pointer-scale 14 15, substantially as described.

7. In a gas-machine, the combination, with the carburetor, its air-supplying apparatus, and connections for supplying pure air to the gas, of the pressure-regulator F, having the valve controlled by the diaphragm, and the movable valve-seat for varying the quantity of air supplied to the gas, the train of gears 19 20, &c., the shaft 11, having the loose sleeve 16, and the jam-nut 28, substantially as described.

396,769. SECONDARY BATTERY. JOHN S. SELLON, Hatton Garden, County of Middlesex, England, assignor to The Electrical Accumulator Company, of New York. Filed Apr. 26, 1887. Serial No. 236,209. (No model.) Patented in England Dec. 23, 1881, No. 5,631; in Argentine Republic Nov. 21, 1882, No. 364; in British Guiana Dec. 11, 1882, No. 197/3,155; in Mexico Jan. 27, 1883; in Canada Mar. 15, 1883, No. 16,490; in Chili June 6, 1883, and in Brazil June 16, 1883, No. 53.



Claim.—1. In a secondary battery, a plate or support containing inoxidizable material supporting a sheet, plate, or conductor of practically-inoxidizable metal, and combined with an active material or material to be rendered active mechanically applied thereto, substantially as described.

2. In a secondary battery, a plate or support containing a practically-inoxidizable material combined with a practically-inoxidizable conductor supported thereby and an active material or material to be rendered active, substantially as described.

3. In a secondary battery, a support or strip containing a non-conducting material combined with a practically-inoxidizable conductor and an active material, all in substantially continuous mechanical contact, as set forth.

4. In a battery, a support or terminal containing a practically-inoxidizable material, combined with a conductor of platinum and a mechanically-applied active material, substantially as described.

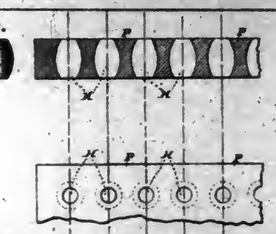
5. In a battery, a plate or support containing a practically-inoxidizable material and a practically-inoxidizable metal having a woven shape, combined with a mechanically-applied active material, substantially as described.

396,770. SECONDARY BATTERY. JOHN S. SELLON, Hatton Garden, County of Middlesex, England, assignor to The Electrical Accumulator Company, of New York. Original application filed Apr. 19, 1887, Serial No. 235,495. Divided and this application filed Sept. 16, 1887. Serial No. 249,355. (No model.) Patented in England June 15, 1882, No. 2,818; in Russia July 23, 1883, No. 6,760; in Argentine Republic Nov. 21, 1882, No. 364; in British Guiana Dec. 11, 1882, No. 197/3,155; in Mexico Jan. 27, 1883; in France Mar. 10, 1883, No. 147,831; in Belgium Mar. 10, 1883, No. 60,714; in Canada Mar. 15, 1883, No. 16,490; in Italy Mar. 30, 1883, No. 15,217; in Chili June 6, 1883; in Brazil June 16, 1883, No. 53; in Spain Aug. 16, 1883, No. 917, and in Austria-Hungary Sept. 20, 1883, No. 20,705.

Claim.—1. In a secondary battery, a plate element or support having a series of holes or perforations the aperture or diameter of which is greater at the center than at the surfaces.

2. In a secondary battery, an element consisting of an active material combined with a plate or support having a series of holes or perforations the aperture or diameter of which is greater at or near the center than at the surfaces, substantially as described.

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3. In a secondary battery, a molded plug or button of active material having the form of two cones or pyramids united at their base.

4. In a secondary battery, a plate element or support containing a series of molded plugs or buttons of active material, each plug or button having the form of two cones or pyramids united at their bases.

5. In a secondary battery, a plate element or support having cells, perforations, or receptacles the diameter of which at or near one or both poles of the major axis is less than the diameter at one or more points intermediate said poles.

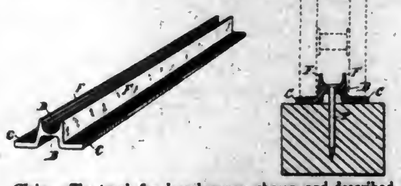
6. In a secondary battery, a plate element or support having a series of holes or perforations the aperture or diameter of which at or near the surface is less than the aperture or diameter at a point between the surfaces of said plate, combined with an active material placed in such holes or perforations, substantially as described.

396,771. WIRE FABRIC. EDWARD P. SHELLABERGER, Beaver Falls, Pa. Filed July 6, 1887. Serial No. 243,508. (Model.)



Claim.—The combination, with the longitudinal strands or cables, of the web-wires, each bent back and forth, forming limbs extending from one strand or cable to another and alternately closed at opposite ends, and arranged with the closed ends of the limbs of one wire opposite the open ends of the limbs of the other wire, and having the wires interlocking at the angles formed at the closed ends of the limbs and held in place by said strands or cables, substantially as set forth.

396,772. TRACK FOR DOOR-HANGERS. SAMUEL SHREFFLER, Jr., Joliet, Ill. Filed Apr. 12, 1888. Serial No. 270,434. (No model.)



Claim.—The track for door-hangers, shown and described, consisting of the two vertically-arranged parallel guide members F F, having the integral web B, provided with perforations D, and connecting said members midway of their height, and each said member having an outwardly-extending flange, *c*, forming wheel-tracks, substantially as and for the purpose set forth.

396,773. ADJUSTABLE CURVED PIPE-SECTION. LYMAN SMITH, Kansas City, Mo. Filed Feb. 17, 1888. Serial No. 264,394. (No model.)

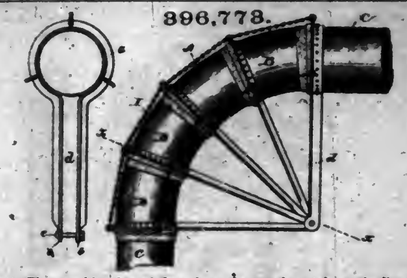
Claim.—1. The herein-described curved pipe section or elbow, consisting, essentially, of a series of movable minor sections and radial supporting-arms, as set forth.

2. In an adjustable curved pipe section or elbow, the combination, with the minor sections telescopically connected, of the radial supporting-arms pivoted at a common center, substantially as described.

3. An adjustable curved pipe section or elbow composed of a series of minor sections, each provided with a radial supporting-arm, substantially as described.

4. The combination, with a movable curved pipe section or elbow, of a series of radial arms secured together at a common center and supporting the elbow or pipe section, substantially as described.

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5. The combination of the minor pipe-sections telescopically connected, the radial supporting-rods, and the stay-chains connecting said sections, substantially as described.

6. A curved pipe-section capable of adjustment and provided with radial arms having rings and packing-rings, substantially as set forth.

7. The combination, in a curved pipe-section, of the minor sections movably connected, and the radial supporting-arms having rings embracing said minor sections, said arms being pivoted and extending from a common center, substantially as described.

8. An adjustable curved pipe-section comprising minor sections, radial supporting-arms having rings formed of angle-iron and embracing the minor sections, and stay-chains connecting the sections and secured to said rings.

9. In an adjustable pipe-section, the combination, with the minor sections and supporting-arms provided with rings formed of angle-iron, of the packing-rings carried by the angle-iron rings.

10. In an adjustable curved pipe-section, the combination of the minor sections and the radial supporting-arms having rings, one of said arms being provided with lugs, between which the remaining arms are pivotally secured by a bolt or pivot.

396,774. PAINT-OIL. ADOLPH SOMMER, Berkeley, Cal. Filed Dec. 31, 1887. Serial No. 259,487. (No specimens.)

Claim.—As a new composition, the solution in hydrocarbons of the sulpho-chlorinated marine-animal oils.

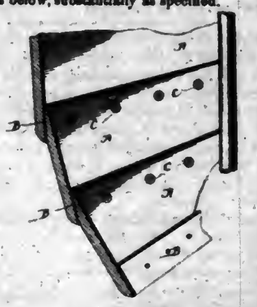
396,775. AUTOMATIC LOCKING-HOOK. FERDINAND SPLITTSTOSSER, North Branch, Minn. Filed Sept. 12, 1888. Serial No. 285,211. (No model.)



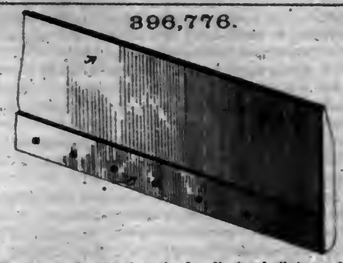
Claim.—An automatic locking-hook consisting of the hook A and the latch L, which latch is constructed of a single piece of looped wire having its two ends brought near together and pivoted in the free end of the hook, the outer or looped end of the latch being formed and adapted to fit upon and engage with the rear or opposite side of the hook, extending down on the sides thereof so as to have a bearing on both sides of this part of the hook to prevent its swinging laterally, substantially as described.

396,776. JOINT FOR BOATS. HERBERT M. SPRAGUE, Parishville, N. Y. Filed Oct. 20, 1888. Serial No. 288,672. (No model.)

Claim.—1. The combination, with the strakes of a clincher-built boat, of the rubber strips permanently secured to the inner sides of the strakes at their lower edges and adapted to bear against the outer sides of the strakes below, substantially as specified.



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2. The herein-described strake for clincher-built boats, having its upper edge beveled on the outer side and provided with the thin rubber packing-strip B, secured to its inner side at the lower edge, substantially as specified.

396,777. STEM WINDING AND SETTING WATCH. OSCAR F. STEDMAN, Ravenna, Ohio. Filed Apr. 12, 1888. Serial No. 270,444. (No model.)

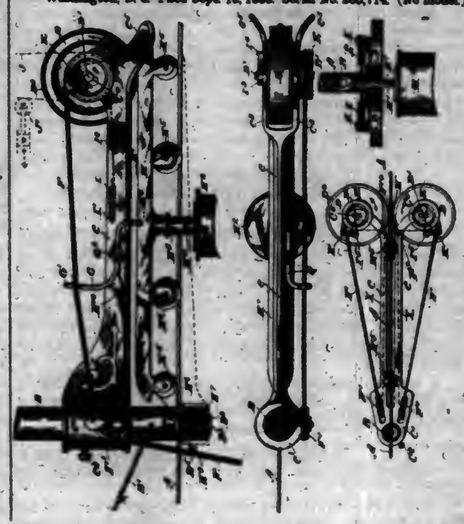


Claim.—1. The combination of the endwise-moving winding-stem, the endwise-moving bar, a spring applied directly to the end of the bar for moving both the bar and the yoke, and the pivoted spring-actuated yoke carrying the winding and setting wheels, the bar being provided with a projection which extends through an opening in the pillar-plate and makes direct contact with the yoke, substantially as shown.

2. The combination of the endwise-moving winding-stem, the spring-actuated endwise-moving bar provided with a projection, the pivoted spring-actuated yoke carrying the winding and setting wheels and provided with an inclined surface, against which the projection upon the endwise-moving bar strikes, substantially as described.

3. The endwise-moving winding-stem provided with a groove near its inner end, in combination with the endwise-sliding bar having a beveled point to catch in the groove and lock the stem in position and provided with a projection at its outer end to operate the yoke, and the spring F, applied directly to the end of the bar, substantially as set forth.

396,778. CASH OR PARCEL CARRIER. EDGAR B. STOCKING, Washington, D. C. Filed Sept. 16, 1888. Serial No. 285,714. (No model.)



Claim.—1. In a cash or parcel carrier, a car provided with a driving-surface, in combination with a driving-wheel adapted to take upon the driving-surface, substantially as specified.

2. In a cash or parcel carrier, a car provided with a driving-surface, in combination with a driving-wheel adapted to take upon the driving-surface and with means for giving motion to the driving-wheel, substantially as specified.

3. A car having oppositely-arranged driving-surfaces, in combination with driving-wheels arranged to bear upon the opposite driving-surfaces, substantially as specified.

4. The combination of a track, a supporting post or standard at the station, a car provided with a driving-surface, a driving-wheel mounted on a bracket, and a cord operatively connected with the drive-wheel and extending therefrom to a point of access, substantially as specified.

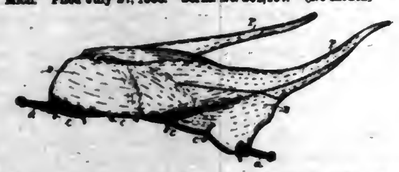
5. The combination of a track, a car having a driving-surface thereon, a drive-wheel, a bracket provided with elongated bearings for the journals of said drive-wheel, and means for moving the wheel toward the driving-surface and for operating said wheel, substantially as specified.

6. The combination of a bracket provided with elongated bearings, a driving-wheel mounted in said bearings, and a car provided with a driving-surface, substantially as specified.

7. The combination of a car having driving-surfaces, a bifurcated bracket having elongated bearings, driving-wheels, pulleys connected therewith, and cords extending from the pulleys to points between said pulleys and from thence to a point of access, substantially as specified.

8. The combination of a supporting post or standard provided with a plug and button, the latter having a spindle with a track-wire, substantially as specified.

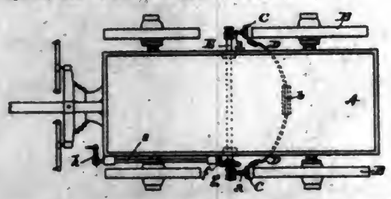
396,779. CASE FOR SULKIES. ROYAL A. STONE, Kalamazoo, Mich. Filed July 27, 1888. Serial No. 281,187. (No model.)



Claim.—1. A flexible case for a sulky, comprising a bag-like portion made in shape to incase the seat, thill cross-bar, and gear of the sulky, and having the long tube-like forward extensions at the front corners for incasing the thills.

2. The case comprising the bag-like portion for incasing the painted part of the sulky-body, gear, and thill cross-bar, and the corner tube-like forward extensions for covering the thills, in combination with the wheel-cases circular in side elevation and flat at the sides, substantially as set forth.

396,780. WAGON-BRAKE. LUDWIG STIFEL, Cumdale, Ohio. Filed Apr. 23, 1888. Serial No. 271,556. (No model.)



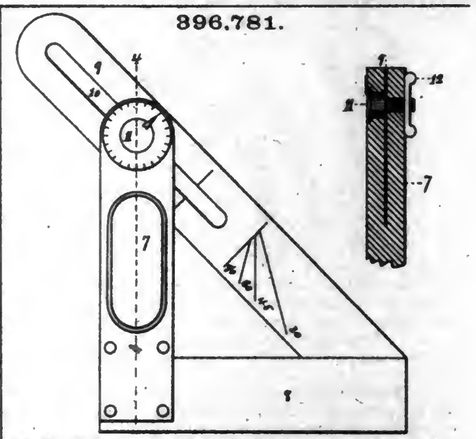
Claim.—1. The combination, with a wagon, of a bow-carrier pivoted between the bearing-wheels and having spring terminals or extensions, drag-shoes pivotally hung upon such terminals, chains connecting each shoe with the wagon-body forward of the bearing-wheels, and a winding-shaft constituting the forward holding element of said chain upon the wagon-body for winding said chain and lifting the drag-shoes from the ground out of engagement with the wheels, substantially as set forth.

2. The combination, in a wagon-brake, of the bowed carrier D, shoes C C, chains *a a*, winding-shaft E, crank-shaft *e*, and gears *f g*, substantially as set forth.

396,781. TRY-SQUARE, BEVEL, AND PROTRACTOR. FRANK S. TALMADGE, Palmer, Mass. Filed Feb. 16, 1888. Serial No. 264,262. (No model.)

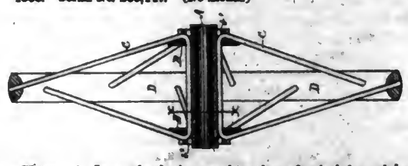
Claim.—The blade 9, cut at one end at an angle of forty-five degrees and provided with slot 10 and degree-markings, in combination

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with the stock 7 and blade 8, shouldered rivet 11, and nut 12, all constructed, arranged, and operating as specified.

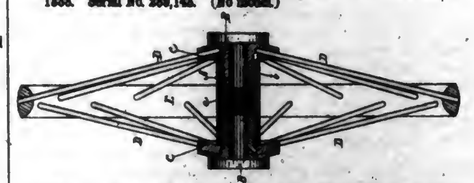
396,782. WHEEL. HORACE H. THAYER, Erie, Pa. Filed Oct. 26, 1888. Serial No. 289,147. (No model.)



Claim.—1. In a wheel, the combination of a hub-barrel having plane ends *a* and longitudinal external ribs, *a'*, flanges B, having notches *b'*, which fit over the plane ends *a* of the barrel, and spoke-wires C, which pass lengthwise of the hub through the openings *b'* in the flanges and between the ribs *a'* on the barrel and are bent out to the rim D over the outer faces of the flanges.

2. In a wheel, the combination of a hub-barrel having plane ends *a* and longitudinal external ribs, *a'*, flanges B, having notches *b'* and radial grooves b^3 on their outer faces, which lead from said notches, fitting over the plane ends of the barrel, and spoke-wires C, which pass lengthwise of the hub through the openings *b'* and between the ribs *a'* and pass out to the rim D through the grooves b^3.

396,783. WHEEL. HORACE H. THAYER, Erie, Pa. Filed Oct. 26, 1888. Serial No. 289,148. (No model.)



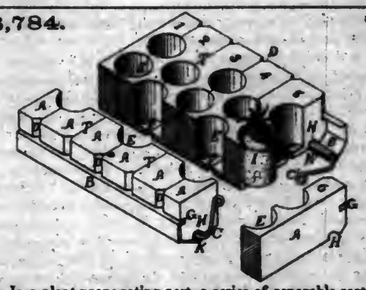
Claim.—In a wheel, the combination of the internally-screw-threaded hub-barrel A, the flanged bushings or boxes B, screwed into the hub-barrel, the spoke-holding flanges C, fitting on the boxes B at the ends of the hub-barrel and having grooves *c* in their inner surfaces to receive the beat ends of the spokes D.

396,784. PLANT-PROPAGATING NEST. LOUIS VAUGHAN, Blair, Nebr. Filed July 31, 1888. Serial No. 281,596. (No model.)

Claim.—1. In a plant-propagating nest, the combination of a series of separable sections, A, forming a nest of cells, E, and having a rectangular groove, G, parallel with the top and bottom at each end, and a semicircular groove, H, across the bottom near each end, with the guides B B', each consisting of a single piece of sheet metal having one end rolled to form a bead, K, seated in groove H, and the remainder of the sheet so bent that the other end will enter the groove G, substantially as described.

2. In a plant-propagating nest, the separable sections A and the sheet-metal guides B B', having the beads K, in combination with the two pieces of spring-wire C C, one passed through each bead and both ends of each wire shaped so as to make a spring-clamp holding said sections together in the guides, substantially as herein shown, and for the purpose specified.

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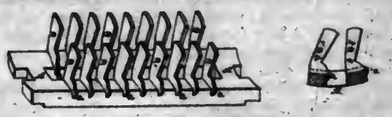


3. In a plant-propagating nest, a series of separable sections, A, having chamfers D at their ends on their sides of contact with each other, in combination with the guides B B' and the spring-wire clamps C C, substantially as shown, and for the purpose specified.

4. In a plant-propagating nest, the separable sections A, in combination with the spring-clamps C C, which elastically bind the sections snugly together, and from which the sections may be released at will and separated from each other, substantially as set forth.

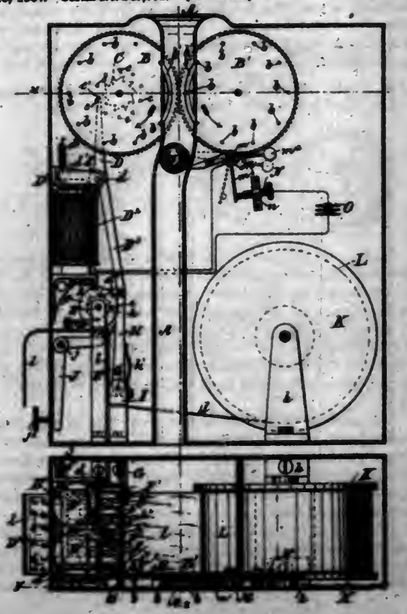
5. The combined guide, foot, and elastic clamp for holding in position, supporting, and binding together the separable sections, consisting of a single piece of sheet metal, one end rolled to form a bead, K, and the remainder of the sheet bent as shown, in combination with a single piece of spring-wire passed loosely through the bead K, the ends thereof being bent to form a spring-clamp, substantially as shown and described.

396,785. THRASHING-MACHINE. AUBERT H. WAGNER, Chicago, Ill., assignor to Abel H. Frost and Chas. L. Ames, both of same place. Filed May 26, 1888. Serial No. 275,129. (No model.)



Claim.—The combination of the cross-piece of a thrashing cylinder or concave having dovetailed grooves formed in its face at right angles to its length, with thrashing-teeth having their inner ends adapted to fit in said grooves and provided with projecting points on their inner ends, which points are to be bent down behind the cross-piece, so as to lock the teeth in place, substantially as shown and described.

396,786. FARE BOX AND REGISTER. OSBAVIS G. WARNER, Mount Vernon, assignor to Virgil A. Kreppe, Kenton, N. Y. Filed Sept. 13, 1887. Serial No. 249,502. (No model.)



Claim.—1. In a counting-machine, a chute adapted to guide a coin, in combination with a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the weight of a coin deposited therein, and a stop to limit the motion of the pins, whereby the said series of pins will permit of the passage of but one coin at a time.

2. In a counting-machine, the combination of a chute adapted to guide a coin, a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the weight of a coin deposited therein, a stop to limit the motion of the pins, whereby said series will permit of the passage of but one coin at a time, a lever having an arm extending within said chute beneath said pins and balanced to be tipped by a coin released from said pins, and electrical contact-pieces and connections for making and breaking circuit, and enumerating-connections, said contact-pieces being adapted to be operated by said lever, whereby an enumeration is effected.

3. In a counting-machine, the combination of a chute adapted to guide a coin, a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the weight of a coin deposited therein, a stop to limit the motion of the pins, whereby said series will permit of the passage of but one coin at a time, a magnet, electrical connections for charging the same, means for making and breaking circuit, an armature in proximity to said magnet, and suitably-disposed numerals having lever-connections with said armature and arranged to be moved in order by the same, whereby said electrical connections are operated and account is made at each deposit of coin.

4. In a counting-machine, the combination of a chute adapted to guide a coin, a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the weight of a coin deposited therein, a stop to limit the motion of the pins, whereby said series will permit of the passage of but one coin at a time, a magnet, electrical connections for charging the same, means for making and breaking circuit, an armature in proximity to said magnet, a lever-arm connecting with said armature, and a figure-wheel for enumerating, said wheel having connection with and being adapted to be rotated by movements of said lever-arm.

5. In a counting-machine, the combination of a chute adapted to guide a coin, a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the weight of a coin deposited therein, a stop to limit the motion of the pins, whereby the said series of pins will permit of the passage of but one coin at a time, a magnet, electrical connections for charging the same, contact-pieces for making and breaking circuit, a lever having an arm projecting in the path of travel of a coin deposited in said chute beneath said pins and balanced to be tipped by a coin released from said pins and operate said contact-pieces, an armature in proximity to said magnet, a lever-arm connecting with said armature, and a figure-wheel for enumerating, having connection with said last-named lever-arm.

6. In a counting-machine, the combination of a chute adapted to guide a coin, wheels provided with a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the pressure of a coin deposited therein, escapement-connections with one of said wheels, a magnet, electrical connections for charging the same, means for making and breaking circuit, an armature in proximity to said magnet and adapted to operate said escapement-connections, and suitably-disposed numerals having lever-connections with said armature and adapted to be moved in order by the same, whereby said wheels are stopped, said electrical connections operated and account made before a succeeding coin passes through the said chute.

7. In a counting-machine, the combination of a chute adapted to guide a coin, wheels provided with a series of pins or projections adapted to pass successively within said chute and to be moved out of the same by the pressure of a coin deposited therein, escapement-connections with one of said wheels, a magnet, electrical connections for charging the same, means for making and breaking circuit, an armature in proximity to said magnet and adapted to operate said escapement-connections, a lever or arm having connections with said armature, and a figure-wheel for enumerating, said figure-wheel having connection with and being adapted to be rotated by movements of said lever.

8. In a counting-machine, the combination of a chute adapted to guide a coin, wheels provided with a series of pins or projections adapted to pass successively within said chute and to be moved out of the same by the pressure of a coin deposited therein, escapement-connections with one of said wheels, a magnet, electrical connections for charging the same, a lever having an arm projecting in the path of travel of a coin deposited in said chute beneath said pins and balanced to be tipped by a coin released from said pins, electrical contact-pieces adapted to be operated by said lever, an armature for oper-

ating said escapement-connections, a lever or arm provided with a pawl and having connection with said armature, and a figure and ratchet wheel for engaging said pawl.

9. In a counting-machine, the combination of a chute adapted to guide a coin, a stop device to permit of the passage of one coin at a time, a magnet, electrical connections for charging the same, a lever having an arm projecting in the path of travel of a coin deposited in said chute beneath said pins and balanced to be tipped by a coin released therefrom, electrical contact-pieces adapted to be operated by said lever, an armature in proximity to said magnet, a lever or arm connecting with said armature, a figure-wheel for enumerating, pawl-and-ratchet connections between said last-named lever and said figure-wheel and adapted to impart motion from said lever to said wheel, and an adjusting screw or stop for limiting such motion.

10. In a counting-machine, the combination of a chute adapted to guide a coin, wheels provided with a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the pressure of a coin deposited therein, escapement-connections with one of said wheels, a magnet, electrical connections for charging the same, means for making and breaking circuit, an armature in proximity to said magnet and adapted to operate said escapement-connections, a wheel provided with a set of figures denoting the digits and ciphers or numbers up to any power of ten less one and the ciphers of such powers, a lever or arm having connection with said armature and adapted to impart motion to said wheel and bringing the numbers thereon *seriatim* into position for counting, one or more of these wheels provided with figures in numerical order and of increasing decimal denominations, the figures upon the several wheels being adapted to imprint numbers therefrom, the said last-named wheels forming with the first a series, the successive wheels of which have connections adapted to engage the wheel with the figures of next lower denomination, receive motion therefrom, actuate the succeeding wheel, and thereby regularly advance the numbers thereon after the higher number of the engaged wheel is each time brought into counting position and before a repetition of the numbers upon such wheel is commenced.

11. In a counting-machine, the combination of a chute adapted to guide a coin, a series of movable pins in said chute, and a stop to limit the motion of the pins, a lever having an arm projecting in the path of travel of a coin deposited in said chute and balanced to be tipped by such coin, suitably-disposed figure-wheels, a carrying device for said figure-wheels, and connections between the same and said lever-arm, said connections being adapted to impart motion to said carrying device and to regularly advance said figures to counting position as often as said arm is tipped, whereby account is made of each deposit of coin.

12. In a counting-machine, the combination of a chute adapted to guide a coin, a series of movable pins in said chute, and a stop to limit the motion of the pins, a lever having an arm projecting in the path of travel of a coin deposited in said chute and balanced to be tipped by such coin, suitably-disposed figure-wheels adapted to imprint numbers therefrom, a carrying device for said figure-wheels, connections between said carrying device and said lever-arm, said connections being adapted to impart motion to said carrying device and to regularly advance said figures to counting positions as often as said arm is tipped, and connections for taking an imprint of numbers counted by such figures.

13. In a counting-machine, the combination of a chute adapted to guide a coin, a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the pressure of a coin deposited therein, a stop to limit the motion of the pins, whereby said series of pins will permit the passage of but one coin at a time, a lever having an arm projecting in the path of travel of a coin deposited in said chute and balanced to be tipped by such coin after being released from said pins, suitably-disposed figure-wheels, a carrying device for said figure-wheels, and connections between the same and said lever-arm, said connections being adapted to impart motion to said carrying device and to regularly advance said figures to counting position as often as said arm is tipped.

14. In a counting-machine, the combination of a chute adapted to guide a coin, a series of movable pins in said chute and a stop to limit the motion of the pins, a magnet, electrical connections for charging the same, a lever having an arm projecting in the path of travel of a coin deposited in said chute and balanced to be tipped by such coin and operate said electrical connections, an armature in proximity to said magnet, a wheel provided with a set of figures denoting the digits and ciphers or numbers up to any power of ten less one and the ciphers of such power, lever-connections with said armature for rotating said wheel and bringing said numbers *seriatim* to counting position, one or more other wheels provided with figures in numerical order and of increasing decimal denominations, and connections for rotating said wheels and regularly advancing the numbers thereon after the highest number upon the preceding wheel is each time brought to counting position and before repetition of the numbers on such wheel is commenced.

15. In a counting-machine, the combination of a magnet, electrical connections for charging the same, means for making and breaking circuit, an armature in proximity to said magnet, a lever-arm connecting with said armature, a wheel provided with a set of figures denoting the digits and cipher or numbers up to any power of ten less one and the ciphers of such power, said wheel having connections with and being adapted to be rotated by movements of said lever-arm and bring said numbers *seriatim* to position for counting, one or more other wheels provided with figures in numerical order and of increasing decimal denominations, the figures upon the several wheels being adapted to imprint numbers therefrom, connections for rotating the said several wheels succeeding the first and regularly advancing the numbers thereon after the highest number upon the preceding wheel is each time brought to counting position and before repetition of the numbers upon such wheel is commenced, a batten or battens adjacent to the figures in counting position, a handle for operating said battens, connections for feeding material upon which an imprint may be taken between said figures and said battens, and a lever adapted to move said battens against said material and press the same against said figures.

16. In a counting-machine, the combination of a chute adapted to guide a coin, a series of pins or projections adapted to pass successively within said chute and be moved out of the same by the pressure of a coin deposited therein, a stop to limit the motion of the pins, whereby said series of pins will admit of the passage of but one coin at a time, a lever having an arm projecting in the path of travel of a coin deposited in said chute and balanced to be tipped by such coin after being released from said pins, suitably-disposed figures adapted to imprint numbers, connections between said figures and said lever-arm, said connections being adapted to regularly advance said figures to counting position as often as said arm is tipped, a batten or battens adjacent to the figures in counting position, connections for feeding material upon which an imprint may be taken between the figures and battens, and a lever adapted to move said battens against said material and press the same against said figures.

396,787. SHOE. HARRIS WARD, Leon, Ill. Filed Feb. 2, 1888. Serial No. 262,797. (No model.)



Claim.—A shoe having the quarters in two sections, A and B, substantially as described, A being provided above the counter with an extension, C, and B cut away to correspond with the extension C, so that when the shoe is completed the seam which unites the quarters above the counter falls on the inner side of the center of the heel.

396,788. EAR-JEWEL. GEORGE W. WASHBURN, West New Brighton, N. Y. Filed July 13, 1888. Serial No. 279,225. (No model.)



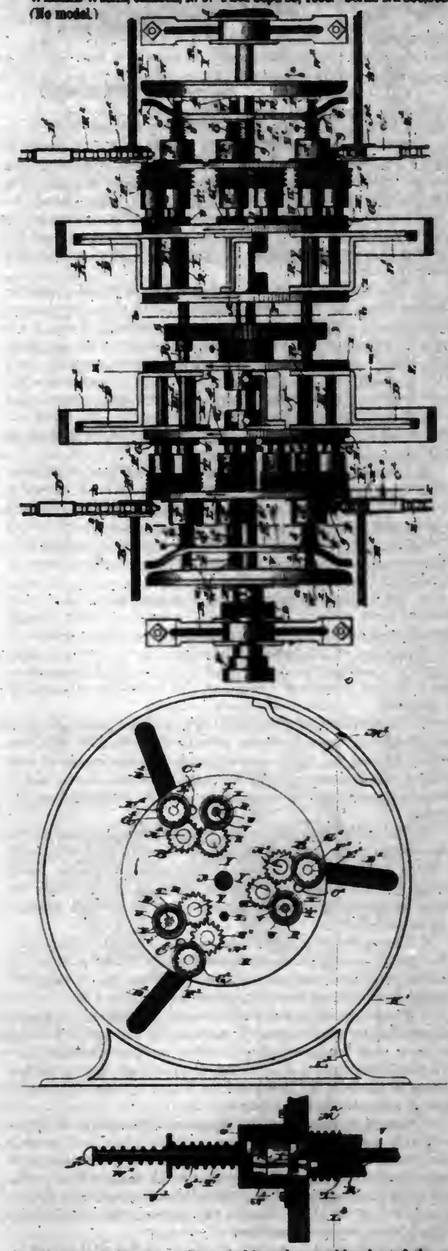
Claim.—1. The combination, with an ear-wire or the like, of a hollow fastening-nut comprising an internal spring-plate in the form of an annular disk having inwardly-projecting and rearwardly-flexible arms which grasp the wire between their ends, and annular front and back plates united at the perimeter of the nut, with the margin of said spring-plate between their margins, said front plate having an abutment for said arms on its inner side and said back plate forming a flexing-space behind said arms, substantially as hereinbefore set forth.

2. In combination with an ear-wire or the like, of plain wire, a hollow fastening-nut comprising an internal spring-plate having inwardly-projecting and rearwardly-flexible arms which grasp the wire between their ends, and a rearwardly-projecting pull-piece connected with said arms for retracting them to release the nut, substantially as hereinbefore set forth.

3. In combination with an ear-wire or the like, a hollow fastening-nut provided with an internal spring-plate having inwardly-projecting arms which grasp the wire between their ends, a pull-piece connected at its inner end with said arms and having at its protruding

rear end a convex-backed head, and a back plate having a convex outer surface opposed to the latter, substantially as hereinbefore set forth.

396,789. MACHINE FOR THREADING SHEET-METAL RINGS. WILLIAM WEBER, Camden, N. J. Filed Sept. 25, 1888. Serial No. 286,263. (No model.)



Claim.—1. In a threading-machine, the combination of the revolving disks H I, the threaded chucks T, journaled therein, the lever-arms pivoted to the disks, the threaded chucks F', journaled in the lever-arms and adapted to close against the chucks T, the cams to operate the lever-arms, and means for positively rotating the chucks T, substantially as described.

2. In a threading-machine, the combination of the revolving disks H I, the threaded chucks T, journaled therein and having the gears U, the lever-arms pivoted to the disks, the threaded chucks F', journaled in the lever-arms and having the gears G', the gears Z, engaging gears U, the gears B', engaging gears Z and G', and cams for moving the lever-arms, substantially as described.

3. The combination of the revolving shaft having the disks H I, the threaded chucks T, journaled in the disks and having the pinions S, the threaded chucks F', mounted so as to move relatively to chucks T, and the gear P, loose on the shaft and engaging said pinions S, and means, substantially as set forth, to rotate the gear P.

4. The combination of the revolving shaft having the disks, two sets of chucks supported by the disks, one set of chucks being movable relatively to the other set, the gears S, the gears O P, loose on the shaft and secured together, said gear P engaging the gears S, the gear D, loose on the shaft, the driving-shaft having the gear G, engaging gear D, the shaft L, journaled in the disks and having the gear M, engaging gear D, and the gear N, engaging gear O, substantially as described.

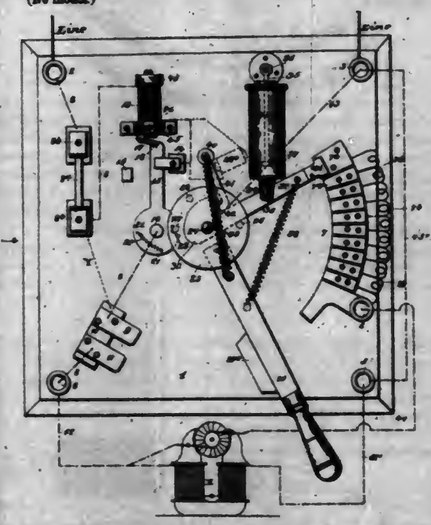
5. In a threading-machine, the combination of the revolving shaft having the disks H I, the gear P, loose on said shaft, the shafts R, journaled in the disks and having the chucks T, the gears U and gears S, the latter engaging the gear P, the shafts Y, journaled in the disks and having the gears Z, engaging gear U, the shafts A', journaled in the disks and having the gears B', engaging gears Z, the lever-arms fulcrumed on the shafts A', the cams to operate said arms, the shafts E', journaled in the lever-arms and having the chucks F' and gears G', the latter being at all times in engagement with the gears B', and mechanism, substantially as described, to rotate the gear P.

396,790. SWAB FOR LIQUID BLACKING. GEORGE S. WOLFF, Philadelphia, Pa. Filed Jan. 6, 1888. Serial No. 257,752. (No model.)



Claim.—The within-described device for applying liquid blacking, said device consisting of a carded web of wool held in the form of an open elastic swab, all substantially as specified.

396,791. AUTOMATIC SWITCH FOR ELECTRIC MOTORS. GEORGE H. WHITTINGHAM, Baltimore, Md. Filed May 12, 1888. Serial No. 273,065. (No model.)



Claim.—1. A switch comprising an operating-lever carrying a circuit-closing plate, a resistance, an arm extending from the operating-lever to the resistance and connected with a dash-pot, and a device connected with the operating-lever for maintaining the arm against movement until said operating-lever is connected with the circuit which it is adapted to close, substantially as specified.

2. The combination, with the lever and resistance, of a switch-bar and a latch arranged in the path of the lever to be operated in one direction and a spring for operating the latch in the opposite direction, a keeper, and a magnet for controlling the keeper, substantially as specified.

3. In a switch, and electrically connected with the conductors thereof, a resistance, a resistance-bar, mechanism, substantially as described, for automatically controlling its movement in one direction,

the switch-lever proper, a latch having mechanical connection with said lever for movement in one direction, a spring or its equivalent for moving it in an opposite direction, and a keeper and magnet for automatically releasing the latch, substantially as specified.

4. In a switch, and in combination with its lever, a resistance-bar mechanically connected with the lever for its operation positively in one direction, and a governor for automatically controlling the operation of the resistance-bar in the opposite direction, substantially as specified.

5. In a switch, the combination of the lever 29, having at its pivoted end a disk, 25, having the lug 26 depending from the disk, standard 24, for supporting the lever, the resistance 7, and the bar 30, independently pivoted to said standard and extending to the resistance, substantially as specified.

6. The combination of the resistance 7, its bar arranged to move over the resistance, a governing device, substantially as described, connected therewith, and the switch-lever 29, terminating in a disk, 25, and having independent movement relative to the bar 30, and provided with means for moving said bar in the opposite direction to that of the movement produced by the governing device, substantially as specified.

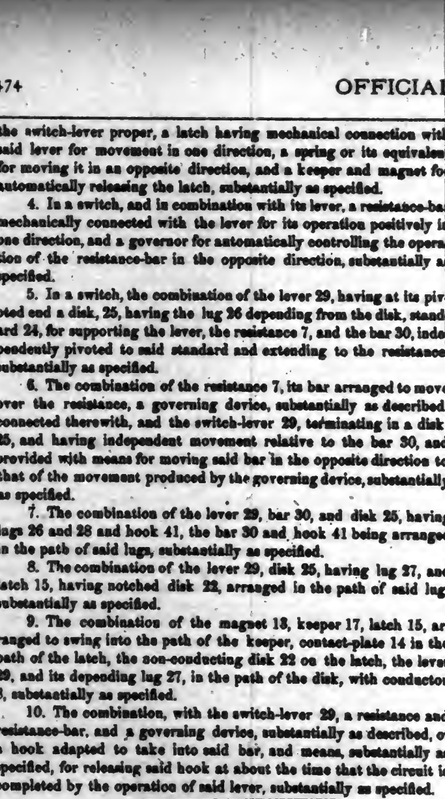
7. The combination of the lever 29, bar 30, and disk 25, having lugs 26 and 28 and hook 41, the bar 30 and hook 41 being arranged in the path of said lugs, substantially as specified.

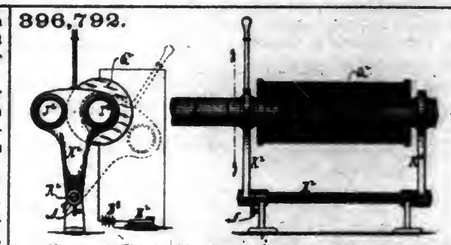
8. The combination of the lever 29, disk 25, having lug 27, and latch 15, having notched disk 22, arranged in the path of said lug, substantially as specified.

9. The combination of the magnet 13, keeper 17, latch 15, arranged to swing into the path of the keeper, contact-plate 14 in the path of the latch, the con-conducting disk 22 on the latch, the lever 29, and its depending lug 27, in the path of the disk, with conductor 8, substantially as specified.

10. The combination, with the switch-lever 29, a resistance and resistance-bar, and a governing device, substantially as described, of a hook adapted to take into said bar, and means, substantially as specified, for releasing said hook at about the time that the circuit is completed by the operation of said lever, substantially as specified.

396,792. ELECTRO-MAGNETIC TRANSMITTER. JOHN T. WILLIAMS, Mount Vernon, N. Y. Filed May 1, 1886. Serial No. 200,944. (No model.)





Claim.—1. The combination, with a series of helices placed at suitable distances apart, and with a tube, trough, or track extending through said helices, of a flexible core or carriage which can freely pass through said helices, a series of independent circuit-closers, one for each helix, consisting of spring-tappets adapted to be actuated by the core or carriage, and contact-pieces and the connections of the helices with a dynamo-machine or other source of electricity, substantially as described.

2. The combination, with a series of helices placed at suitable distances apart, and with a tube, trough, or track extending through said helices, of a flexible core or carriage consisting of two heads and an intermediate flexible magnetizable material which can freely pass through said helices, a series of circuit-closers, one for each helix, detached from said carriage, and their connections with a dynamo-machine or other source of electricity, said circuit-closers being actuated by the passing carriage, and serving to close and break said circuits through the successive helices in the series, substantially as described.

3. The combination, with a series of helices placed at suitable distances apart, and with a suitable tube, trough, or track extending through said helices, of a core or carriage which can freely pass through said helices, two or more anti-heating collars secured to said carriage, a series of circuit-closers, one for each helix, and the connections of said helices with a dynamo-machine or other source of electricity, substantially as described.

4. The combination, with a series of helices placed at suitable distances apart, and with a tube, trough, or track extending through said helices, of a flexible core or carriage which can freely pass through said helices, two or more anti-heating collars secured to said carriage, a series of circuit-closers, one for each helix, and their connections with a dynamo-machine or other source of electricity, substantially as described.

5. The combination of a tube, trough, or track, helices placed at suitable distances apart thereupon, a circuit-closer for each helix, connections between the helices and a dynamo or other source of electricity, a traveling carriage which actuates the circuit-closers, and an electro-magnetic brake for stopping the carriage, substantially as described.

6. The combination, with a tube, trough, or track, of a magnetizable carriage, an electro-magnetic brake mounted on the tube, trough, or track, a battery or other source of electricity having a circuit through the brake, and a circuit-closer connected with the brake for closing the circuit through the latter to stop the carriage, substantially as described.

7. The combination, with a tube, trough, or track, of a magnetizable traveling carriage and an electro-magnetic brake mounted on the tube, trough, or track, and disconnected from the carriage for stopping the latter, substantially as described.

8. The combination, with a tube, trough, or track, of a magnetizable traveling carriage, a tubular brake-helix, through which the tube, trough, or track passes, a battery or other source of electricity having a circuit through the brake-helix, and a circuit-closer connected with the brake-helix for closing the circuit therethrough to stop the carriage, substantially as described.

9. The combination of a tube, trough, or track, a series of helices at suitable distances apart, a series of circuit-closers, one for each helix, connections between the helices and a dynamo-machine or other source of electricity, a traveling carriage which operates the circuit-closers, and a laterally-movable carriage-supporting switch for diverting the carriage out of line with the main portion of the tube, trough, or track, substantially as described.

10. The combination of a tube, trough, or track, a series of helices at suitable distances apart, a series of circuit-closers, one for each helix, connections between the helices and a dynamo-machine or other source of electricity, a traveling carriage which operates the circuit-closers, an electro-magnetic brake for stopping the carriage, and a laterally-movable carriage-supporting switch for diverting the carriage out of line with the main portion of the tube, trough, or track, substantially as described.

11. The combination of a tube, trough, or track, a series of helices at suitable distances, a series of circuit-closers, one for each helix, connections between the helices and a dynamo-machine or other source of electricity, a traveling carriage movable through the helices and which operates the circuit-closers, and a carriage-supporting switch consisting of a movable section of the tube, trough, or track, for moving the carriage out of line with the main portion of the tube, trough, or track, substantially as described.

12. The combination, with a tube, trough, or track and carriage-impelling helices thereupon at suitable intervals, of a carriage consisting of two heads and a flexible magnetizable connection between the heads, substantially as described.

13. The combination of a tube or track, electro-magnets, a traveling carriage impelled by the electro-magnets, an electro-magnetic brake mounted on the tube or track to stop the carriage, and a carriage-supporting switch-section movable into and out of line with the main portion of the tube or track, substantially as described.

14. The combination, with a carriage, G, composed of two heads and a magnetizable flexible connection between the heads, of a helix, G, mounted on said flexible connection, a battery, g^6, located in one of the carriage-heads, and connections between the battery and helix, substantially as described.

15. The combination, with a tube, trough, or track, and with a magnetizable core or carriage adapted to move therein or thereon, of a brake-helix, a circuit-closer connected to the brake-helix and actuated by the moving carriage, a secondary electro-magnet for holding the circuit through the brake-helix closed, and the connections of the brake-helix and the secondary electro-magnet with a battery or other source of electricity, substantially as described.

16. The combination, with a tube, trough, or track, and with a magnetizable core or carriage adapted to move therein or thereon, of the switch-frame K^2, the latch for locking the switch-frame, and the electro-magnet L^2, for opening the latch, substantially as described.

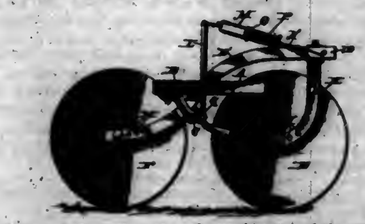
17. The combination, with the carriage G, of anti-heating collars g^4, substantially as described.

18. The combination, with the carriage G, of anti-heating collars g^4 and slots g^5 in the said collars, substantially as described.

19. The combination, with the brake-helix G^2, of the electro-magnet L^2 and the armature M^2, to maintain a circuit in the brake-helix G^2 until the connection is otherwise broken, substantially as described.

20. The frame K^2, mounted on the rock-shaft R^2 and carrying the sections J^2 I^2 of the main tube or track, in combination with a brake-helix and a circuit-closer, substantially as and for the purpose described.

396,793. RIDING-PLOW. HENRY W. WILDMAN, Leon, Ill. Filed Oct. 26, 1888. Serial No. 289,163. (No model.)



Claim.—1. In a wheel-plow, the combination of the axle B, extended laterally from said plow and suitably attached to said plow, and the frame D, supported at each end by carrying-wheels E and F and attached at some point between said wheels to the outer end of said axle, substantially as shown, and for the purpose specified.

2. In a wheel-plow, the combination of the axle B, the frame D, attached intermediately to said axle, wheels E and F, seated, respectively, on the ends of said frame, and suitable means to prevent the inversion of said frame, substantially as shown, and for the purpose described.

3. In a wheel-plow, the combination of the frame A, axle B, rod-straining-bar L, seated intermediately of said axle and attached at its inner end to said frame, arm N, stirrup M, the spring P, and frame D, substantially as shown, and for the purpose specified.

396,794. FODDER-CUTTER. JACOB S. WEIMER, Canton, Ohio. Filed Oct. 8, 1888. Serial No. 287,543. (No model.)

Claim.—1. In a fodder-cutter, the combination of the cutter-bar C, provided with the bent or curved fingers *d*, and the cylinder B, provided with the twisted wings D and having attached thereto the cutting-knives *b*, said cutting-knives being bent or curved to correspond with the curvature of the fingers *d*, substantially as and for the purpose specified.

2. In a fodder-cutter, the combination, with the cutter-bar C, provided with the concaved fingers *d*, of the cylinder B, the wings D, and the cutting-knives *b*, substantially as and for the purpose specified.

3. The cutter-bar C, provided with the bent or curved fingers *d*, the strengthening-rib *c*, the cylinder B, provided with the twisted wings D, and the bent or curved cutting-knives *b*, substantially as and for the purpose specified.

4. The cutter-bar C, provided with the bent or curved fingers *d*, the cylinder B, provided with the wings D, and the cutting-knives *b*, having their outer ends bent below the heels of said knives *b*, substantially as and for the purpose set forth.

396,795. ELECTRIC SIGNALING APPARATUS. JOHN YOUNG, Chicago, Ill., assignor to the Western Electric Company, same place. Filed July 13, 1886. Serial No. 133,011. (No model.)



Claim.—1. The combination, with the wheel or presser *f*, of a series of keys or levers, *b*, normally closed against corresponding contact-points, *c*, and the clock-work and the contact-points *d* of the battery-circuit, whereby the keys or levers *b*, respectively, are disconnected momentarily from their normal contact-points and connected successively to the battery-circuit as the wheel or presser is brought against the said keys or levers, substantially as and for the purpose specified.

2. The combination, with the dial, of a series of double-contact keys and their contact-points, the arm *e*, operated by clock-work, and provided with a wheel or presser at each end, whereby the keys are depressed successively as the arm is rotated by the clock-work, substantially as and for the purpose specified.

396,796. MACHINE FOR MAKING METAL WHEELS. GEORGE J. ZIMMERMAN, La Porte, Ind., assignor to the Niles & Scott Company, same place. Filed Oct. 27, 1888. Serial No. 289,278. (No model.)

Claim.—1. The combination, with a chuck for clamping and centering the wheel, of a revolving tool having a central cutting portion, H', and provided with a depending cutter-flange, *h*, for simultaneously cutting or reaming off the ends of the spokes and cutting holding-notches or tenons therein, substantially as specified.

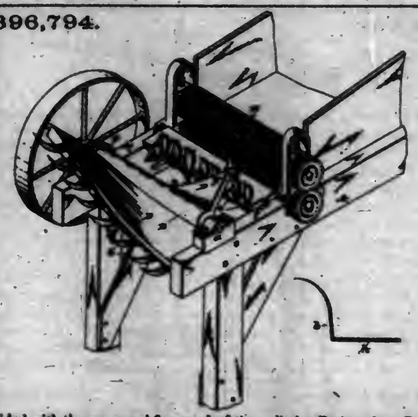
2. The combination, with a chuck for clamping and centering the rim or tire of the wheel, of a support for the hub and a revolving tool or reamer for cutting off the ends of the spokes on a true circle about the axis of the wheel, substantially as specified.

3. The combination, with a chuck for clamping and centering the rim or tire of the wheel, of a support for the hub and a revolving tool or reamer having a central cutting portion, H', for cutting off the ends of the spokes on a true circle about the axis of the wheel, said revolving tool having a cutter flange or shoulder, *h*, for simultaneously cutting holding-notches or tenons in the outer face of the spokes, substantially as specified.

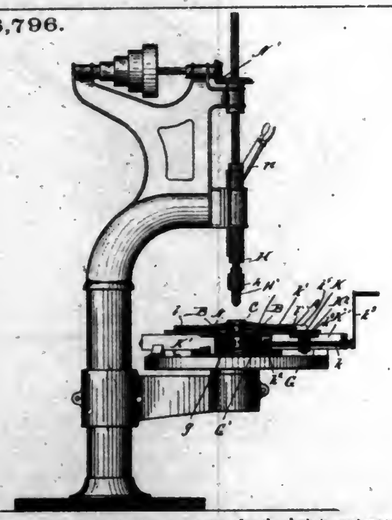
4. The combination, with a chuck for clamping and centering the rim or tire of the wheel, of a support, *g*, for the hub to rest upon, a plate, N, above said support, having an opening for the lower end of the hub to fit in, and a revolving tool for cutting off the ends of the spokes, substantially as specified.

5. The combination, with a chuck for clamping and centering the

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rim or tire of the wheel, of a support, *g*, for the hub to rest upon, a plate, N, above said support, having an opening for the lower end of the hub to fit in, and a revolving tool for cutting off the ends of the spokes, said tool having a cutter flange or shoulder for simultaneously cutting holding-notches or tenons in the outer face of the spokes, substantially as specified.

6. The combination, with the chuck, of a revolving tool, H', having a cutter flange or shoulder consisting of independently-adjustable knives *h*, substantially as specified.

7. The combination, with a revolving tool, H', of independently-adjustable cutters *h* and a clamp-ring, *h'*, for securing said cutters to said revolving tool, substantially as specified.

8. The combination, with a revolving tool, H', furnished with shoulder H^3, of the individual cutters *h*, socket-ring h^3, having shoulders h^5 and screw-threads h^4, and screw-threaded holder-ring h^5, substantially as specified.

9. The combination, with revolving tool H', furnished with shoulders H^3, of the individual cutters *h*, socket-ring h^3, having shoulders h^5 and screw-threads h^4, and screw-threaded holder-ring h^6 and clamp ring *h'*, substantially as specified.

10. The combination, with a revolving reamer or tool, H', of table or bed G, radially-sliding chuck-clamps K, their guides K', adjusting-screws *k*, gears *k'*, and gear k^2, meshing with all said gears *k'*, substantially as specified.

11. The combination, with a revolving tool, of table or bed G, radially-sliding chuck-clamps K, screw-threaded blocks K^3, to which clamps K are adjustably secured, guides K', adjusting-screws *k*, gears *k'*, and gear k^2, substantially as specified.

12. The combination, with radially-sliding clamps K, their guides K', and operating-screws *k*, of an adjustable support, *g*, for the hub of the wheel and a revolving tool, substantially as specified.

13. The combination, with radially-sliding clamps K, their guides K', and operating-screws *k*, of an adjustable support, *g*, for the hub of the wheel and a revolving tool, said tool having a flange or shoulder to cut notches or tenons in the faces of the spokes, substantially as specified.

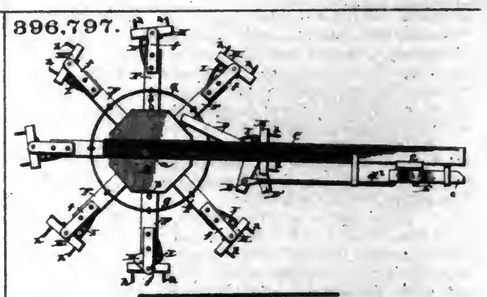
14. The combination, with radially-sliding clamps K, their guides K', and operating-screws, of an adjustable support, *g*, for the hub and a plate, N, having a recess to receive the lower end of the hub, as specified.

396,797. CHECK-ROW PLANTER. SQUIRE B. ALLEY, Selma, Kans. Filed Aug. 2, 1888. Serial No. 281,714. (No model.)

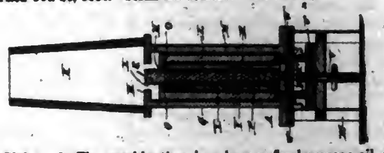
Claim.—The herein-described planter attachment, composed of the frame, the wheel having tappets on each side, the T-lever E, the elbow-levers D and D', connected with the arms of the T-lever, the cross-bars having prongs pivoted midway of their ends to the spokes of the wheel, and the springs secured at one end to the spokes and having their other ends bearing on the said cross-bars throughout their length, substantially as shown.



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396,798. BURNER. RUSSELL P. AMBLER, De Funiak Springs, Fla. Filed Oct. 20, 1887. Serial No. 252,987. (No model.)

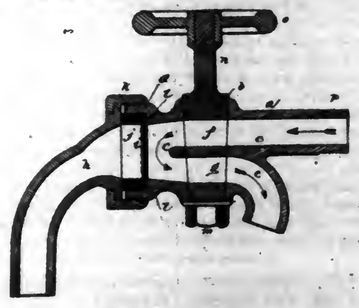


Claim.—1. The combination, in a burner for kerosene-oil, of the base A, having the case G, the vertically-movable gland arranged in the case and having its upper end closed and provided with an opening, N, the wick-tube arranged in the said gland and communicating with the oil-reservoir, channels or spaces M and R being formed between the opposing sides of the case G, the gland, and the wick-tube, the said channels communicating with the outer air, substantially as described.

2. The combination, in a burner for kerosene-oil, of the base A, having the case G, provided at its upper end with the plate H, having the opening I, the vertically-movable gland arranged in the said case and having its upper end closed and provided with the opening N, the wick-tube arranged in the gland and communicating with the oil-reservoir, channels or spaces M R being formed between the opposing sides of the case, the gland, and the wick-tube, and said channels communicating with the outer air, substantially as described.

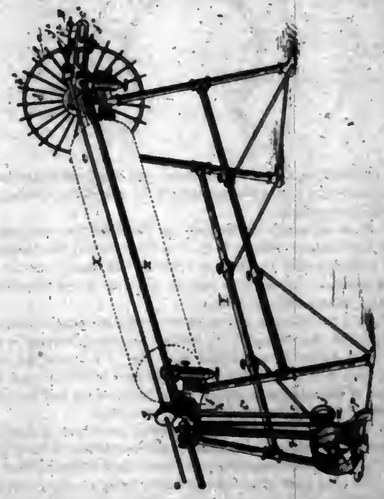
3. The combination, in a burner for kerosene-oil, of the base-plate provided with the openings S, and having the channel B communicating with the reservoir, the wick-tube arranged on the base and communicating at its lower end with the channel B, the vertically-movable gland L, arranged around the wick-tube and having its upper end closed and provided with an opening, N, above the upper end of the wick-tube, the casing G, supported on the base and arranged around the gland, the said casing having the plate H at its upper end provided with the opening I, for the purpose set forth, channels M and R being formed between the opposing sides of the casing, the gland, and the wick-tube, and communicating with the openings S, and the vertically-adjustable plate U, having the wedge-shaped studs W projecting upward through the openings S and supporting the gland, substantially as described.

396,799. AIR-FILTER. NAPOLEON BEAUREGARD, San Francisco, Cal. Filed Dec. 30, 1887. Serial No. 259,433. (No model.)



Claim.—In a faucet-filter, the combination of a body having two longitudinal passages and a plug passing through both passages, said plug having two perforations on the planes of the passages in the body, but askew with reference to each other, a filtering-diaphragm on the side of the plug away from the inlet, and an outlet on the side of the plug away from the diaphragm, all substantially as described.

396,800. FEED DEVICE FOR GIN-SAW SHARPENERS. WILLIAM BERAN and PAUL FRITSCHENER, Texarkana, Tex. Filed May 12, 1888. Serial No. 273,737. (No model.)



Claim.—1. An expanding feed-wheel having a flexible rim notched or provided with openings and made adjustable in the direction of its length, for the purpose of imparting a variable feed, substantially as shown and described.

2. An expanding feed-wheel consisting of a flexible rim notched or provided with openings and made adjustable in the direction of its length, in combination with a series of radial spokes sustaining said rim, and a central expanding hub for tightening said spokes and rim, substantially as shown and described.

3. An expanding feed-wheel, A, consisting of the combination of a flexible notched rim, *a*, radial spokes a^2, with feet b^2 for the rim made adjustable on the spokes, the hub-frame 71, carrying said spokes, and a conical or tapering collar, 70, arranged on the hub to bear against the spokes and adjust them outwardly, substantially as described.

4. The combination, with the expanding feed-wheel A, of the clamp 60, with tightening-screw 64, and the split-ring bushings 61 and 62 for centering the expanding wheel on shafts of different sizes, substantially as described.

5. The combination, with the hub 71 in the expanding wheel, and the conical collar 70, of the tightening-screw 81, the split clamping-frame 80 for said tightening-screw, and the tightening-screw 85 for the split clamping-frame, substantially as and for the purpose described.

6. The combination, with the adjustable screw-threaded conical collar 70, having socket 75, of the turning-handle 77, having pin 76, for turning said collar, substantially as shown and described.

7. The combination, with the spokes in the expanding wheel having forked projections 94, projecting toward each other, of the headed screw 95, secured to the hub of the wheel, and a spiral spring, 96, arranged upon the screw between its head and the forked projections of the spokes to force the latter in toward the center, substantially as shown and described.

8. The combination of the expanding feed-wheel A, having toothed rim *a*, the frame a^3, with slot c^3, the worm-wheel f^2, shaft g^2, bearing h^2, and gear i^2, made together adjustable in the slot of the frame a^3 to correspond with the size of the feed-wheel, the shaft m^2, having gear-wheel j^2 made adjustable thereon, and fixed gear-wheel k^2, and the shaft *e*, having gear-wheel l^2 and connected with the driving mechanism, as described.

9. The combination, with the main frame Y, and rotary shafts Z and *e*, having the variable feed devices at one end, of the bracket-arm *f*, gear *g*, arranged on shaft *e*, cone-pulley *i* and gear *k*, arranged on shaft Z, vertically-adjustable post *q*, carrying shaft Z, band i^2, and cone-pulley *j*, with shaft and drive-pulleys, substantially as and for the purpose described.

396,801. CIGAR-PERFORATING MACHINE. ERNST BERNHARDT, Newport, Ky. Filed Mar. 12, 1888. Serial No. 266,966. (No model.)

Claim.—1. In a cigar-perforating machine, the combination, substantially as specified, of the bed-plate having end-guides, *a* F, leg-bearings *a'*, and a back stop, the reciprocating plate B *b*, movable in

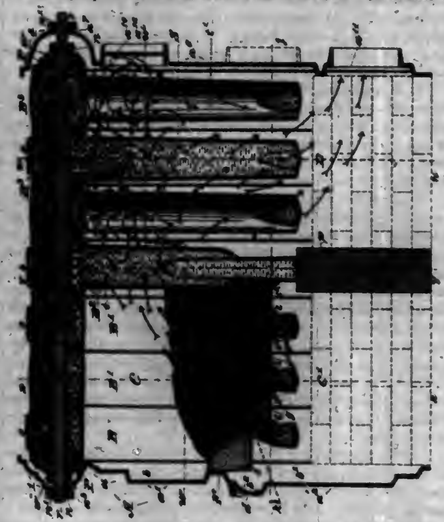
396,801.



said guides, the bar C, and points D, secured in said bar, the buttons *b'*, for securing said bar to the plate B, having a projecting flange, *b*, the rock-shaft E, crank-arms E', and links G, connecting said crank-arms to the plate B, and the lever H, secured upon said shaft for the purpose of rocking the same, and thereby imparting a reciprocating movement to the plate B and the piercing-points carried by it.

2. The combination, substantially as specified, of the bed-plate A, having upwardly-projecting bars *a* a^3, lugs *a'*, and stop-bolt a^5, and the angle-pieces F, secured thereon, the reciprocating plate B, having a projecting flange, *b*, needle-bar C, and needles D, the buttons *b'*, to secure said needle-bar in place, the rock-shaft E, crank-arms E', and links G, connecting said crank-arms, and the plate carrying the piercing-points D, and the lever H, secured upon said shaft for the purpose of rocking the same, and thereby actuating the piercers, the whole constructed to operate in the manner set forth.

396,802. HOT-WATER HEATING APPARATUS. NATHANIEL A. BOYNTON, New York, N. Y., assignor to the Boynton Furnace Company, same place. Filed Oct. 31, 1888. Serial No. 289,617. (No model.)



Claim.—1. A hot-water heating apparatus which is composed, essentially, of transversely-placed intercommunicating water-sections, each of which has vertical side passages, transverse horizontal top and bottom passages, and longitudinal top and bottom passages, the longitudinal top passages being in plane with the transverse horizontal top passages and the longitudinal bottom passages being in plane with the transverse horizontal bottom passages, a front closing-plate or end section which has an opening for supplying fuel, and a rear closing-plate or end section which has a smoke-exit opening, substantially as set forth.

2. In a hot-water heating apparatus, the combination, with the combustion-chamber, the bottom transverse water-passages, and the transverse grate-sections, of the front plate or end section provided with the opening b^3 and door *d*, and the intermediate fire-brick lining having the recess *f'* coincident with the opening b^3 and with the upper surface of the transverse water-passages, and the corresponding grate-sections, substantially as and for the purposes described.

3. A hot-water heating apparatus the fuel-chamber of which has at its bottom transversely-placed water-tubes which connect with the side walls of the chamber, and which are provided upon their sides with longitudinal ledges for the support of the grate-sections of such fuel-chamber, such water-tubes and such grate-sections being arranged in alternation side by side, and constituting together the fuel-support of such heating apparatus.

4. In a hot-water heating apparatus, the combination, with the fuel-chamber thereof, of transverse water-circulating tubes, each of which has a curved upper surface and a longitudinal supporting-ledge, and grate-sections which are provided with transverse bars which have an end bottom-curved overhang which coincides with the curvature of the upper portion of the transversely-extending water-tubes.

5. In a hot-water heating apparatus, the combination, with the lateral walls of the combustion and fuel chamber thereof, of transversely-extending water-circulating tubes, and independent detachable transversely-extending grate-sections, the upper surface of which is in a plane with the upper extremity of the water-circulating tubes, whereby the grate-sections and the water-tubes each constitute a part of the fuel-bearing surface.

6. In a hot-water heating apparatus, a combustion-chamber the fuel-space of which is closed at its sides, at its top, and at its bottom by vertical water-sections which are placed in continuous contact, at the rear by a bridge-wall water-passage, and at the front by an exterior closing-plate and an interior fire-brick lining.

7. In a hot-water heating apparatus, the combination, with the water-sections B, B' B', and B², having inwardly-projecting curved vertical surfaces, of the grate-sections G, having tapered and inwardly-curved ends, substantially as and for the purposes set forth.

8. In a hot-water heating apparatus, a water-section which embraces top transverse water-passages, a top longitudinal water-passage, side vertical water-passages, a bottom horizontal water-passage which constitutes a bridge-wall, and vertical water-tubes which connect the top transverse water-passages with the transverse bridge-wall water-passage.

9. In a hot-water heating apparatus, the combination, with the water-sections B, B' B', and B², having projecting grate-supports, as described, of the cross-barred grate-sections G, adapted to such grate-supports, and the fire-brick lining F', having the slicing recess or passage *f*, coincident with the upper surface of the grate-sections, substantially as and for the purpose described.

10. In a hot-water heating apparatus, the combination of a series of centrally-open combustion-chamber water-sections, a bridge-wall water-section, a series of smoke-chamber water-sections, each having side and intermediate vertical water-tubes, and front and rear closing-plates or end sections, the several water-sections and closing-plates being connected together for operation, substantially as described.

11. In a hot-water heating apparatus, the combination of centrally-unobstructed combustion-chamber water-sections, a bridge-wall water-section and smoke-chamber water-sections, each of which is provided with intermediate vertical water-circulating tubes, each of which is non-coincident with the vertical tubes of the contiguous water-section, thereby forming zigzag smoke-flues, a front closing-plate or door-section, and a rear closing-plate which has an upper direct exit-opening and a lower indirect exit-opening which is in a plane below the lower extremity of the several water-sections, whereby, when the direct exit-opening is closed, the products of combustion are caused to pass first across the surfaces of the vertical water-tubes and then downwardly across the surfaces of the bottom horizontal tubes of the smoke-chamber water-sections, substantially as and for the purposes set forth.

12. The combination, in a hot-water heating apparatus, of front and rear closing-plates or end sections, each having perforations for a securing-rod, intermediate water-sections, each having vertical side passages, transverse and longitudinal horizontal bottom passages, a central longitudinal horizontal top passage, and transverse horizontal top passages which abut upon and discharge into the longitudinal top passage, and securing-rods which extend from end to end of the assembled longitudinal passages and through the perforations in the closing-plates or end sections.

13. In a hot-water heating apparatus, the combination, with a series of transversely-placed water-sections, each having transverse horizontal passages and each having longitudinal water-passages in a plane with and communicating directly with the transverse horizontal passages and with end sections or closing-plates having perforated bosses, as described, of longitudinal holding-rods which extend through the longitudinal water-passages and through the perforations, the securing-plate P, washer *w*, and nut *n*, inside the end sections, for clamping the water-sections, and the securing-nut *n'*, for clamping the closing-plates or end sections to the series of water-sections.

14. A hot-water heating apparatus which embraces a series of vertically and transversely placed water-sections, each of which has right and left vertical water-passages, a bottom transverse water-passage, bottom longitudinal water-passages, a top central longitudinal water-passage, and top transverse water-passages which open directly into the top central longitudinal water-passage, a front closing-plate which has openings for fuel-supply, fuel-agitation, and refuse-discharge, and a rear closing-plate which is provided with a smoke-exit opening, the parts being connected for operation, as described.

396,803. WATER-CLOSET-SEAT PROTECTOR. ROSELLEBY BARNES, Chaska, Minn. Filed Oct. 18, 1888. Serial No. 288,800. (No model.)

Claim.—1. In an adjustable cover such as described, the combination, with the sections A A', of a hinge connecting their proximate ends and a movable pivotal connection between the leaves of the hinge and sections, whereby the sections may be moved longitudinally of the leaves and swung thereon to vary the size of the opening, substantially as described.

2. In an adjustable cover such as described, the combination, with the arc-shaped sections A A', of a hinge having the arc-shaped leaves and adjustable connections between said leaves and the arc-shaped sections, whereby they may be adjusted in the direction of their arcs, substantially as described.

3. In a portable and adjustable cover such as described, the combination, with the sections A A', having the slots or sockets in their ends, of the adjustable connection consisting of a hinge, the leaves whereof are each pivoted and movably secured within the sockets in the ends of the sections to permit of the longitudinal and lateral adjustment of the sections, substantially as described.

4. The combination to form a portable cover such as described, of the two sections A A' and an interposed connection, A³, uniting the ends of the sections, comprising two leaves hinged together and provided with slots, each of said slotted leaves being attached to the end of one of the sections by a pin, whereby the sections are permitted a longitudinal and lateral movement, as set forth.

5. In an adjustable cover such as described, the combination, with the two sections A A', each composed of the hinged sections *a a'*, of the hinge having the two leaves and adjustable connections between the leaves and sections A A', substantially as and for the purpose specified.

6. In combination with the arc-shaped sections A A', each formed of two segments hinged together to fold flat, a hinge having the intermediate connecting-link, A³, interposed between and connecting the proximate ends of said sections, as and for the purpose set forth.

7. In a portable cover such as described, the combination, with the folding sections A A', each provided with a slot, as at a^9, of the hinge-connection A³, consisting of two leaves hinged to an intervening link, and each formed with a slot, said leaves being received in the slots in the ends of the sections and held therein by pins passing through the slots, as and for the purpose specified.

396,804. LINIMENT. WILLIAM R. REID, St. Margaret's Bay, Nova Scotia, Canada. Filed Nov. 30, 1888. Serial No. 292,296. (No specimens.) Patented in Canada June 26, 1887, No. 27,076.

Claim.—The herein-described composition of matter to be used as a preventive against and for the relief of the bites of mosquitoes, black flies, and other insects, consisting of castor-oil, kerosene-oil, glycerine, and essence of peppermint, substantially in the proportions specified.

396,805. CULTIVATOR FOR LISTED CORN. JOSEPH W. BROWN, Miltonvale, Kans. Filed May 26, 1888. Serial No. 276,103. (No model.)

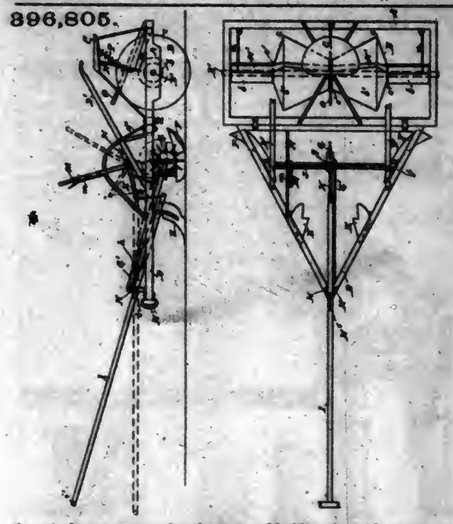
Claim.—1. In a cultivator for listed corn, the combination, with a frame, of a tongue pivoted to the front end of the frame, a hand-lever connected to the rear end of said tongue for raising the front end of the frame, a sectional lister trench-roller journaled at the rear of the frame, and the blades secured to the frame intermediate between the said tongue and roller, substantially as and for the purpose set forth.

2. In a cultivator for listed corn, the combination, with the frame, of the uprights secured to the front end of the frame, the tongue pivoted to said uprights, an arm and a hand-lever pivoted to the frame, and a chain connecting the free end of the arm with the rear end of the tongue, substantially as and for the purpose set forth.

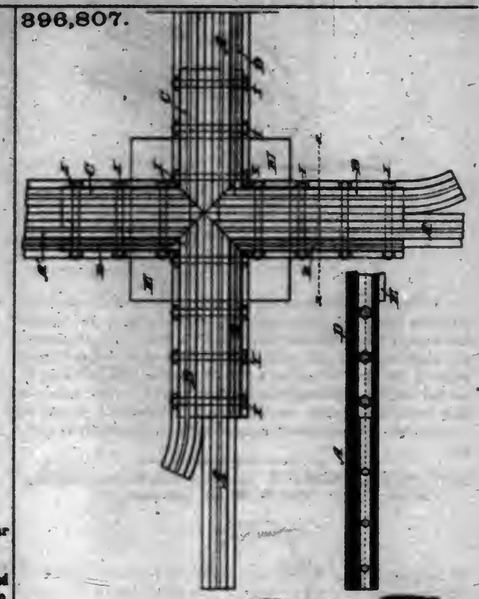
3. In a cultivator for listed corn, the combination, with the frame, of the uprights secured to the front end of the frame, the tongue and the spacing-wheel lever pivoted to said uprights, an arm and a hand-lever pivoted to the frame, and separate chains connecting the said arm with the rear end of the tongue and with the said lever, respectively, substantially as and for the purpose set forth.

4. In a cultivator for listed corn, the combination, with the listing trench-roller, of the scraper bearing against the surface of the roller and provided with a projecting handle, the arms projecting rearwardly at right angles to the scraper and pivoted to the frame, and the spiral spring secured to the seat and holding the said scraper clear of the roller, substantially as and for the purpose set forth.

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396,806. SPRING-BED. EDWARD H. CAYLOR, Columbus, Ohio, and CHARLES H. MCCHESNEY, Belvidere, Ill. Filed June 6, 1887. Serial No. 240,435. (No model.)



Claim.—A bed-bottom consisting of a series of longitudinal slats, each of said slats being independent of the other and bearing a series of longitudinal springs, said springs constituting the support for the bed-mattress, and an independent series of adjusting cross-stays connecting adjacent slats and constituting the only connection between said slats, said cross-stays consisting of connected coils resting, respectively, upon the upper surfaces of adjacent slats, and having retaining-clips biting into the under surfaces of said slats, whereby the width of the bed-bottom may be varied by moving the slats toward or from each other and the bed-bottom may be rolled, substantially as described.

396,807. RAILWAY-CROSSING. JAMES T. CLARK, Milwaukee, Wis.; Mary P. Clark administratrix of said James T. Clark, deceased. Filed Feb. 6, 1888. Serial No. 263,122. (No model.)

Claim.—1. The combination, with the intersecting main rails of a railway-crossing, of lateral re-enforcements having longitudinally-inclined treads which ascend toward the intersections of the main rails to the level of the treads of said main rails, substantially as and for the purposes set forth.

2. The combination, in a railway-crossing, with the main rails, of inclined rails or re-enforcements applied to the sides of said main rails, and having their top faces inclined downwardly toward the approaches to the crossing, substantially as and for the purpose set forth.

3. The combination, with the main rails of a railway-crossing, of inclined rails or re-enforcements, each adapted at the head and base to the head and base of the adjacent main rail and secured to the outer side thereof, and having its top bearing-face inclined downwardly toward its outer end, substantially as and for the purpose set forth.

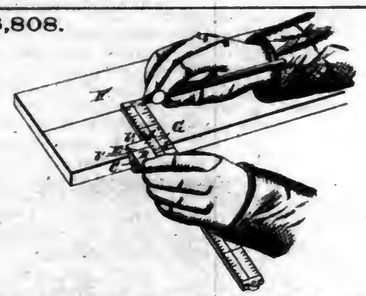
4. The combination, with the intersecting rails of a railway-crossing, of inclined rails or re-enforcements placed outside of and adjacent to said rails, and having their bearing-faces gradually inclined from their outer ends upwardly toward the intersections of the crossing to the level of the top faces of the main rails, substantially as and for the purpose set forth.

396,808. GAGE-HEAD FOR POCKET-RULES. GEORGE W. COBURN, Belleville, Kans. Filed Apr. 26, 1888. Serial No. 271,964. (No model.)

Claim.—1. A gage-head for pocket-rules, consisting of a rectangular plate having a line, E, on its upper surface, and a finger-opening formed vertically through it near one end, and a flange depending from said plate at right angles to its under surface, as set forth.

2. A gage-head for pocket-rules, consisting of a flat plate portion, B, provided with opposite parallel edges *b b'*, an edge, b^9, on its inner end at right angles to said parallel edges, a suitable opening, D, adjacent to its outer rounded edge for the insertion of the point of the index or fore finger, and the flange C, depending from the plate B, at right angles to the edges *b b'* and at a suitable distance from the edge b^9, substantially as described.

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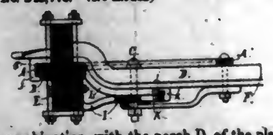
3. The herein-described gage-head for pocket-rules, consisting of the metal plate B, provided with the finger-opening D, the parallel side edges, *b b'*, and the inner end edge, *b²*, at right angles to said parallel edges, and having the score-line E across its upper surface at right angles to the edges *b b'* and at a suitable distance from the edge *b²*, and the flange C, depending from the plate B, with its inner surface at right angles to said plate and aligned with the score-line E, and its outer surface inclining toward its inner surface, substantially as specified.

396,809. RESPIRATOR. HUGH M. COCHRAN, McConnellsville, Ohio. Filed Dec. 10, 1888. Serial No. 293,161. (No model.)



Claim.—A head-protector and breathing-cap consisting of an air-space, *k*, in combination with an oxygen-chamber, an opening, *i*, communicating between said oxygen-chamber and air-space, an opening, *g*, communicating between said air-space and the external air, a stopper for said opening *i*, a stopper for said opening *g*, and a chain or cord connecting said stoppers, substantially as described.

396,810. FIFTH-WHEEL. SAMUEL B. COX and JOHN W. ANDERSON, Lancaster, Pa.; said Cox assignor to said Anderson. Filed Sept. 5, 1887. Serial No. 248,770. (No model.)



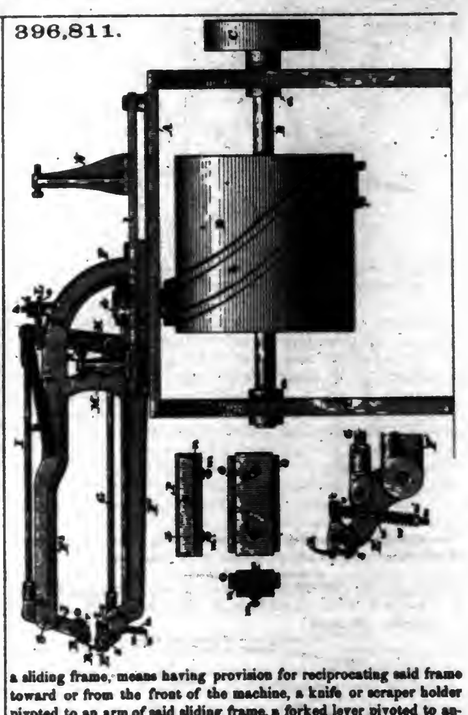
Claim.—The combination, with the perch D, of the plate A, having the rearwardly-extending arm L, provided with a recess, *j*, the axle-plate B, the perch-plate having the clip *f*, which engages the peripheries of the plates A and B, a connection between the axle and king-bolt, located beneath the arm L of the plate A and provided with a flanged lug which engages the recess in the said arm L, and the king-bolt, all constructed and arranged substantially as described.

396,811. MACHINE FOR STRETCHING HIDES OR SKINS. GEORGE B. DANFORTH, Lynn, Mass., assignor of one-half to Anton B. Hoffmann, same place. Filed Sept. 26, 1888. Serial No. 286,446. (No model.)

Claim.—1. In a machine for stretching hides or skins, the combination of a sliding frame, means having provision for reciprocating said frame toward or from the front of the machine, a knife or scraper holder pivoted to an arm of said sliding frame, a forked lever pivoted to another arm of said frame, a block of rubber rigidly secured in the forked end of said lever, means having provision for locking said lever and said knife-holder in position, with the edge of said knife in close proximity with one side of said block of rubber during the rearward movement of said reciprocating frame, means having provision for unlocking said lever and knife-holder when said frame is at or near its rearmost point, and means having provision for locking said lever and knife-holder when said frame is at or near the front of the machine.

2. In a machine for stretching hides or skins, the combination of

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a sliding frame, means having provision for reciprocating said frame toward or from the front of the machine, a knife or scraper holder pivoted to an arm of said sliding frame, a forked lever pivoted to another arm of said frame, a block of rubber rigidly secured in the forked end of said lever, a nearly vertical lever pivoted to said frame near its rear end, rods connecting said lever with said block-holding lever and said knife or scraper holder, means having provision for locking said vertical lever in its rearmost position when said frame is at or near the front end of the machine, a spring for moving the end of said vertical lever toward the front of the machine, and means having provision for unlocking said lever when the said sliding frame is at or near the rear end of the machine.

3. In a machine for stretching hides or skins, the combination of a sliding frame, means having provision for reciprocating said frame toward or from the front of the machine, a knife or scraper holder pivoted to an arm of said sliding frame, a lever pivoted to another arm of said frame and provided upon one end with a fixed rubber surface, means having provision for locking said lever and knife-holder in position, with the edge of said knife in close proximity with said rubber surface during the rearward movement of said reciprocating frame, means having provision for unlocking said lever and knife-holder when said frame is at or near its rearmost point and moving said knife farther to the front and said rubber surface farther to the rear, thus making a more convenient space or opening between said rubber surface and said knife for the admission or removal of the material being operated upon, and means having provision for locking said lever and knife-holder in their original positions when said frame is at or near the front end of the machine preparatory to again moving to the rear and operating upon the material seized between said rubber surface and said knife or scraper.

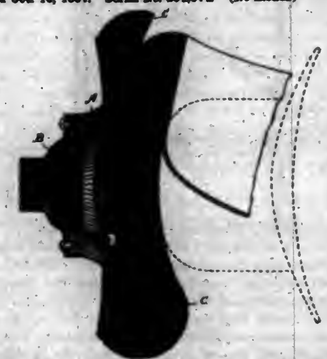
4. In a machine for stretching hides or skins, the combination of a sliding frame, a knife-holder pivoted to an arm of said frame, a lever pivoted to another arm of said frame and provided at one end with a fixed rubber surface, means having provision for locking said knife-holder and said lever when said frame is at or near the front end of the machine, so that the edge of the knife will be in close proximity to the said rubber surface during the rearward movement of said frame, means having provision for unlocking said lever and said knife-holder when said frame is near the rear end of the machine and moving said rubber surface and knife away from each other, a truck or roll secured to said frame, and a cam-wheel so situated and constructed as to engage with said truck and reciprocate said frame toward and from the front of the machine.

5. In a machine for stretching hides or skins, the combination of a reciprocating frame, a forked lever pivoted to the end of an arm of said frame, a box secured in a fixed position in the forked end of said lever and open at both ends, and a block of rubber mounted in

said box in such a manner that it is held in a fixed position therein when the machine is in use, but may be adjusted therein when desired.

6. In a machine for stretching hides or skins, the combination of a reciprocating frame, a knife-holder pivoted to an arm of said frame, a block pivoted to the outer end of said lever and provided with a rearwardly-extending arm, a rod pivoted to said arm and passing through said knife-holder, a nut mounted upon the lower end of said rod, springs interposed between said nut and the under surface of said holder and between the upper surface thereof and said arm, and a knife secured to said lever, all substantially as and for the purposes described.

396,812. HATTER'S BRUSH. WILLIAM A. FABER, Danbury, Conn. Filed Oct. 10, 1887. Serial No. 251,874. (No model.)



Claim.—The rotary brush having its face concaved, the bristles projecting from the edges or sides being longer than those extending from the face, whereby the concaved portion of the brush is adapted to operate on the crown of the hat, and the side or edge portion adapted to brush the brim of the hat, substantially as set forth.

396,813. BOOK-SHELF. JOHN M. D. FRANCE, St. Joseph, Mo. Filed Jan. 30, 1888. Serial No. 262,440. (No model.)



Claim.—In a book-shelf, the combination, with the casing F and the metallic grooved bars C, secured horizontally in mortises formed in the sides of said casing, of the sliding board A, the metallic bars B, secured to the sides of said board A, said bars B provided with a mortise, *b*, to receive the tenon *a* of the board A, and a tongue, *b'*, adapted to fit and slide in the groove *c* of the bar C, substantially as and for the purpose described.

396,814. MACHINE FOR TRIMMING WIRE SPOKES. PETER SWENSON, Toledo, Ohio. Filed Oct. 17, 1888. Serial No. 288,268. (No model.)

Claim.—1. In a machine for the purpose described, the combination of a rotary cutter-head provided with peripheral cutting-teeth, with a stationary knife-block operated in connection therewith, an adjustable wheel-support, and a rotary shaft positively and automatically operated from the mechanism actuating the said cutter-head, substantially as described.

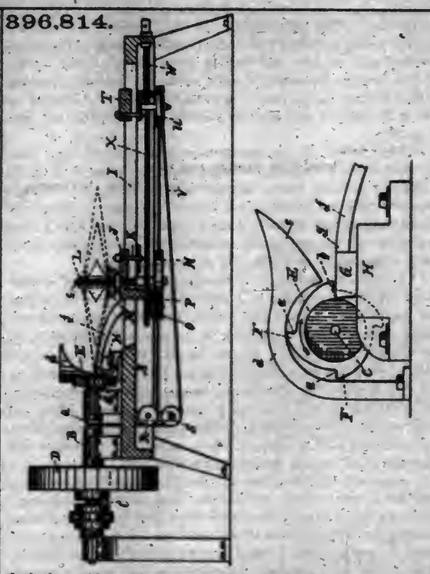
2. In a machine for the purpose described, the combination of the rotary cutter-head, the stationary knife-block operating in connection therewith, and an adjustable wheel-support provided with a rotary shaft and dog to rotate the wheel.

3. In a machine for the purpose described, the combination of the rotary cutter-head provided with peripheral teeth, the stationary cutting-block adjusted in proximity to said teeth, the slidingly-adjustable wheel-support provided with a rotary wheel-carrier, and the guide-rails for guiding the spokes to the rotary knife, all arranged substantially as described.

4. In a machine for the purpose described, the combination, with the bed of the machine provided with a longitudinal slot, I, of the rotary cutter-head mounted at one end of the bed, the stationary cutting-block mounted upon the bed in proximity to the cutter-head, the wheel-support consisting of the bearings J, slidingly adjustably engaging with the slot of the bed and provided with the adjusting-screw X, and the rotary shaft L, provided with a dog, M, substantially as described.

5. In a machine for the purpose described, the combination, with

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the bed provided with the longitudinal slot I, of the rotary shaft C, the rotary cutter-head F, mounted thereon and provided with the peripheral cutting-teeth *a*, the stationary cutting-block G, mounted upon the bed in proximity to the rotary cutter-head, the slidingly-adjustable wheel-support mounted upon the bed and carrying the rotary shaft L and dog M, the guide-rails *d* and *f*, the drive-connection between the shaft C, and the rotary shaft of the wheel-support, all substantially as described.

6. In a machine for the purpose described, the combination, with the bed of the machine and the longitudinal slot I formed therein, of the rotary shaft C, mounted in suitable bearings thereon, the rotary cutter-head E, secured to said shaft and provided with the peripheral cutting-teeth F, the knife-block G, mounted upon the bed, the slidingly-adjustable wheel-support, the shaft L and dog M, mounted upon said wheel-support, the pulleys N and P, carried by the wheel-support, the pulley Q, mounted upon the shaft C, the pulleys R and S, stationarily mounted below the shaft C, the pulley U, adjustably mounted below the bed and provided with the adjusting-screw W, and the endless cord V, all the parts being arranged to operate substantially as and for the purpose described.

396,815. COUNTER. ELIJAH T. HARRIS, Chicago, Ill. Filed Oct. 29, 1888. Serial No. 289,466. (No model.)



Claim.—1. The combination, with two sections of a counter-front, of a casting provided with sockets adapted to receive the opposing ends of said sections, said casting being provided with a wing extending between the ends of the said sections to the rear, said wing extending laterally at the rear in opposite directions and secured by screws to the ends of said sections, substantially as and for the purpose specified.

2. As an article of new manufacture, a counter having a front made up of pieces placed edge to edge, said front being in sections, the different sections being secured rigidly together by castings between the different opposing ends thereof, said castings being each provided with sockets adapted to receive said ends and with a wing extending to the rear and rigidly secured to the opposing ends of the sections, substantially as and for the purpose specified.

3. A device for uniting two opposing ends or sections of a counter-front together, consisting of a casting conforming to the outline of the counter and provided with sockets adapted to receive the said opposing ends, and a wing extending to the rear and extended in opposite directions and rigidly secured to said ends inserted in said sockets by wood-screws, substantially as and for the purpose specified.

4. The combination, with the counter-top having saddles attached to the under side thereof, of an upright counter-front upon which said saddles rest, said front consisting of pieces placed with edges together, said pieces being held in place by braces or castings secured to said front, substantially as and for the purpose specified.

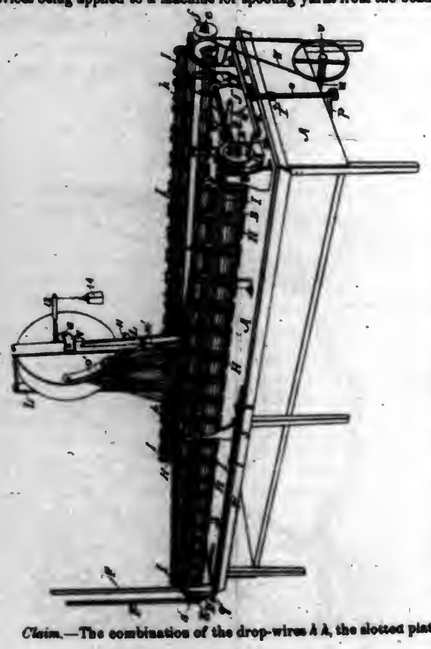
5. As an article of new manufacture, a counter consisting of the top, saddles secured thereto, said saddles being placed in line and resting upon the upper edge of the counter-front, said counter-front being in sections, the different ends of said sections being rigidly secured together by castings, and a brace secured centrally to the different sections of the counter-front, substantially as and for the purpose specified.

6. A counter-front made up in sections, each section consisting of longitudinal pieces placed one above the other and secured or braced by a casting, *a*, which conforms to the surface of the front and which is provided with arms projecting through the front, and a locking device for holding the brace in position, in combination with castings *c*, placed between the different sections and rigidly secured thereto, substantially as and for the purpose specified.

7. A brace, *a*, provided with projecting arms, said brace conforming to the outer surface of a counter-front and being secured thereto by locking devices inserted in the arms at the rear, substantially as shown and described.

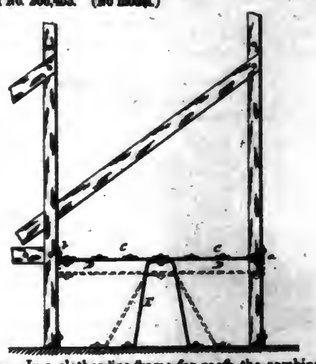
396,816. MACHINE FOR SPOOLING YARN. FRANK HASKELL, Westbrook, Me. Filed Aug. 20, 1887. Serial No. 248,126. (No model.)

Brief.—The object of the invention is to provide improved devices for stopping the machine upon the breaking of a thread, the devices being applied to a machine for spooling yarns from the beam.



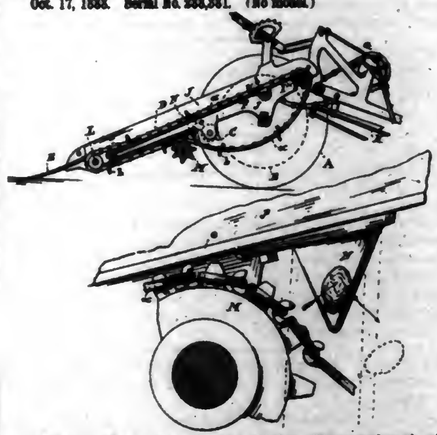
Claim.—The combination of the drop-wires *h h*, the slotted plates *i* and *i'*, plate i^2, having the opening, as described, the rocker *a'*, levers b^1 and *d'*, and guide 10, rod *c'*, gears *f'* and *k'*, catch *m'*, lever *k'*, rod *p'*, lever *q'*, rod *r'*, spring 3, and shipper-guide *s'*, substantially as described.

396,817. CLOTHES-LINE FRAME. FERDINAND W. HOFFLE, New York, N. Y., assignor to Eben S. Allen, same place. Filed Mar. 7, 1888. Serial No. 266,453. (No model.)



Claim.—In a clothes-line frame for roofs, the combination of the outer and inner supporting-frames, path-supports attached thereto, transverse slats attached to said supports, longitudinal slats attached to said transverse slats, and adjustable yokes of inverted-U shape attached at their lower ends to the roof and at their upper parts or bridges to the transverse slats, each of said yokes being composed of a single piece of metal possessing sufficient flexibility for adjustment, substantially as set forth.

396,818. POTATO-DIGGER. ISAAC W. HOOVER, Avery, Ohio. Filed Oct. 17, 1888. Serial No. 288,361. (No model.)



Claim.—1. In a potato-digger, catch-irons N, secured to the side plates of said digger with the face side thereof depending in front of the sprocket-wheels M in an oblique direction to the plane in which said wheels revolve, in combination with the flanges *c* of said plates, constructed and arranged in the manner as shown, and for the purpose described.

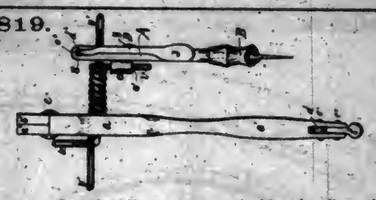
2. In a potato-digger, the endless elevator D, located between the side plates, J, sliding upon the stationary rack F, driven from the sprocket-wheels I I, and guided over the roller L, sprocket-wheels M M, arranged to carry the elevator on the return course and to free the chains thereof from deposits thereon, the catch-irons N, suspended from said side plates to ward off said deposits, and the side-plate flanges *c*, substantially as and for the purpose set forth.

396,819. TOOL FOR SPLICING WIRE. HERBERT G. HUBBELL, Havana, N. Y. Filed Aug. 21, 1888. Serial No. 282,580. (No model.)

Claim.—1. A wire-clamp having a graduated series of grooves between the fulcrum-disks and handles of the clamp, each disk having a radially-slotted opening, *g*, forming a cutting-edge, g^2, and each handle a bifurcated open end and locking mechanism mounted in the bifurcated ends, substantially as described.

2. The stock parts *a b*, having a graduated series of grooves and handles, *a' b'*, in combination with a locking rack and latch, the rack

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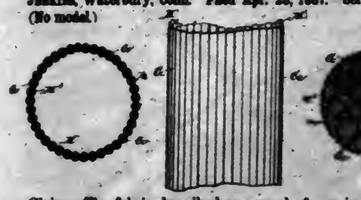
being pivoted within the bifurcated free end of one handle, and the latch pivoted to turn within a like bifurcation of the other handle, substantially as described.

3. A wire-clamp consisting of stock parts united by a fulcrum-pin and having a graduated series of grooves between the fulcrum-disks and handles of the clamp, the largest groove of the series being nearest the fulcrum-pin, and the disks each having a radially-slotted opening forming cutting-edges, in combination with a locking rack and latch of the handles of the clamp, substantially as set forth.

4. A wire-winder consisting of the block A, having a bifurcated end, a laterally-projecting boss having a hole through it, and a latch pivoted in the side of the block to shut across its bifurcated end, substantially as described.

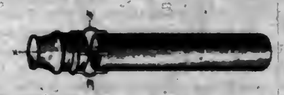
5. A wire-winder consisting of the block A, having a bifurcated end and a hole at right angles to the plane of bifurcation, in combination with a thumb-latch pivoted to shut across said bifurcation, substantially as described.

396,820. STIFFENING FABRIC FOR GARMENTS. NICHOLAS JENKINS, Waterbury, Conn. Filed Apr. 26, 1887. Serial No. 236,412. (No model.)



Claim.—The fabric described composed of a series of compound stiffeners of horse-hair or analogous elastic filaments and rubber, each of said compound stiffeners being covered, and the stiffeners of the series united by a covering of cotton or analogous yarns, G, extended across from one compound stiffener to the next, forming the fabric, as herein specified.

396,821. BICYCLE-WHISTLE. FREDERICK L. JOHNSON, Wallingford, Conn. Filed May 16, 1888. Serial No. 274,077. (No model.)



Claim.—1. The herein shown and described whistle, composed of a barrel, a mouth-piece having its lower edge of exactly the same size as and in direct line with the barrel, exterior arch-shaped stay-pieces connecting the mouth-piece and the barrel, the barrel being wholly unobstructed throughout its length and closed at the end opposite the mouth-piece, and a valve supported entirely in the mouth-piece and having its edge in the plane of the lower edge of the mouth-piece and having a continuous annular space between the edge of the valve and the wall of the mouth-piece, substantially as described.

2. In a whistle, the combination, with the barrel and the mouth-piece, of the exterior arch-shaped stays connecting the mouth-piece with the barrel, substantially as set forth.

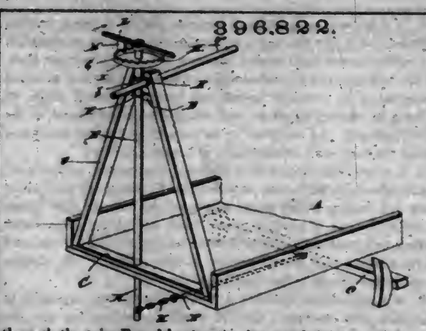
3. In a whistle, the combination, with the barrel and the mouth-piece having its upper end contracted, of the tubular valve fitted in the mouth-piece and having the sides at its upper end dented in, substantially as described, for the purpose specified.

396,822. BRAKE FOR HAY-WAGONS. FRANK E. LATHROP, Wichita, Iowa. Filed Oct. 30, 1888. Serial No. 289,554. (No model.)

Claim.—1. The combination, with a hay-rack, of the tube E, secured thereto in a vertical position and having the rack I at its upper end, the tube or rod K in the tube E, the lever pivoted at the upper end of said tube or rod K, adapted to rotate the same, and having the detent *M* to engage the rack, for the purpose set forth, and the chain or connection between the lower end of said tube or rod K and the brake-beam, substantially as described.

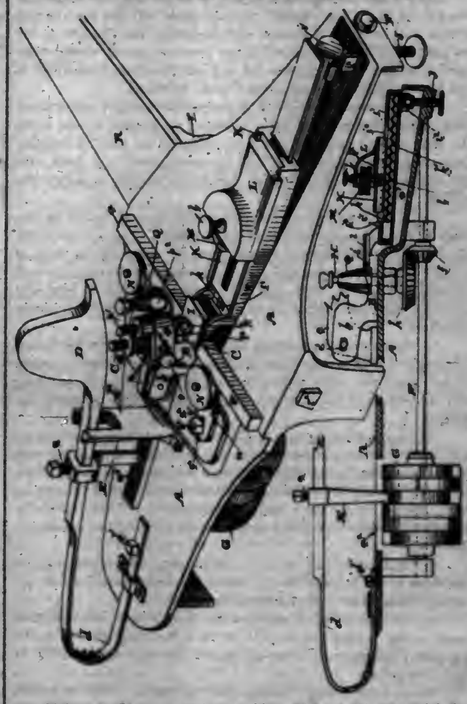
2. In brake attachments for hay-wagons, the combination, with the rack or standard, of the tube E, the clamp-bolt securing the same in a vertical position to the hay-rack, the tube or rod K, extending

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through the tube E and having the lever at its upper end, by which it may be turned, devices, substantially as set forth, to lock the tube or rod K in the tube E, the chain secured to the lower end of the tube or rod and adapted to be connected to a brake bar or beam, and the hook to engage the boom-pole, and having the collar at its inner end movable vertically on the tube E, substantially as described.

396,823. SAW-SETTING MACHINE. ALEXANDER LOGAN, Monterey, Cal. Filed Nov. 10, 1888. Serial No. 290,479. (No model.)



Claim.—1. In a saw-setting machine and in combination with the set-punch and anvil, the hammer having the spring-handle; the rod E, adjustable on the handle, and rotating cams acting on the rod to raise and relieve the hammer, whereby it delivers its blow, substantially as herein described.

2. In a saw-setting machine and in combination with the set-punch and anvil, the hammer having the spring-handle, the rod E, adjustable on the handle, and the series of rotating cams acting on the rod to effect the blow of the hammer, said cams having each a different number of acting-surfaces, whereby the number of blows in a given time is varied by the adjustment of the rod from one cam to another, substantially as herein described.

3. In a saw-setting-machine, a hammer having a spring-handle, an adjustable rod thereon, set-punch, and anvil, in combination with a rotary power-shaft having cams engaging said rod for operating the hammer, and a toothed wheel rotated by the power-shaft and engaging the teeth of the saw to effect its feed, said wheel having a conical shape, whereby its teeth are formed in converging planes to adapt it for different saws, substantially as herein described.

4. In a saw-setting machine, a hammer having a spring-handle, an adjustable rod thereon, and a set-punch and anvil, in combination with a rotary power-shaft having cams engaging said rod and operating the hammer, and a toothed wheel rotated by the shaft mounted and adapted to be vertically moved and having a conical shape, its teeth lying in converging planes, said wheel engaging the teeth of the saw for feeding it, and adapted by its vertical movement to receive and feed different saws, substantially as herein described.

5. In a saw-setting machine, a hammer, a set-punch, and an anvil, in combination with the rotary toothed wheel for engaging the teeth of the saw and feeding it, the spring-handle of the hammer, the adjustable rod E thereon, the rotary power-shaft and power-connections therefrom to operate the toothed feed-wheel, and the pair of reversed cams for acting on the rod alternately as the rotation of the shaft is reversed, substantially as herein described.

6. In a saw-setting machine, a hammer, set-punch, and anvil, in combination with the rotary toothed wheel for feeding the saw, the spring-handle of the hammer, the adjustable rod E thereon, the rotary power-shaft, the vertical shaft carrying the toothed feed-wheel, and the gears for operating it from the power-shaft, and the pair of reversed cams for acting on the rod alternately as the rotation of the shaft is reversed, substantially as herein described.

7. In a saw-setting machine, the anvil having a stem adapted to be moved forward or back and set by a screw, whereby the anvil is adjusted, substantially as herein described.

8. In a saw-setting machine, the set-punch and the adjustable bracket by which it is carried, in combination with the anvil having a stem, the set-screw connected with said stem, and the slot in the set-punch bracket through which the set-screw passes, whereby the anvil is connected with the bracket and may be adjusted both with it and independently, substantially as herein described.

9. In a saw-setting machine, the adjustable anvil, in combination with the blade-supporting plate I, hinged or pivoted to the anvil, the stem of said plate, and the screw engaging the stem by a sliding connection, whereby the plate may be moved back and forth with the anvil and have its inclination varied, substantially as herein described.

10. In a saw-setting machine, the combination of the sliding carriage K, the independently-sliding bearing-plate L on the carriage, the setting-up wheel carried by said plate for engaging the back of the saw-blade, the spring acting continuously on the carriage to hold the wheel up with its work, and the set-screw and nut for primarily adjusting the bearing-plate on the carriage, substantially as herein described.

11. In a saw-setting machine, the blade-supporting plate I, having a slotted hollow stem, in combination with the sliding carriage mounted on said stem, the spring within the stem and acting on the carriage, and the setting-up wheel on the carriage, substantially as herein described.

12. In a saw-setting machine, the blade-supporting plate having a slotted hollow stem, in combination with the sliding carriage mounted on said stem, the spring within the stem and acting on the carriage, the independently-sliding bearing-plate on the carriage, the setting-up wheel carried by the plate, and the set-screw and nut for primarily adjusting the plate and wheel on the carriage, substantially as herein described.

13. In a saw-setting machine, the limiting-rollers acting against the teeth of the saw and having slotted arms with set-screws for adjusting them, substantially as herein described.

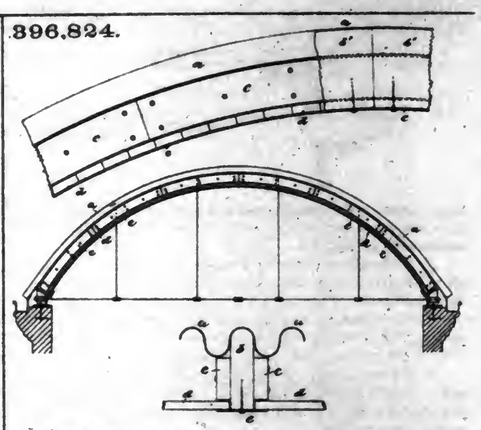
14. In a saw-setting machine, the spring-controlled setting-up wheel acting against the back of the saw, in combination with the adjustable limiting-rollers acting against its teeth, substantially as herein described.

15. In a saw-setting machine, the combination of the set-punch, the anvil, and the flanged roller bearing on top of and against the back of the saw, substantially as herein described.

16. In a saw-setting machine, the bracket and the set-punch carried thereby, and the anvil carried by said bracket, in combination with the slotted bearing-arm carried by and adjustable on the bracket, and the flanged roller having a stem carried by the bearing-arm, substantially as herein described.

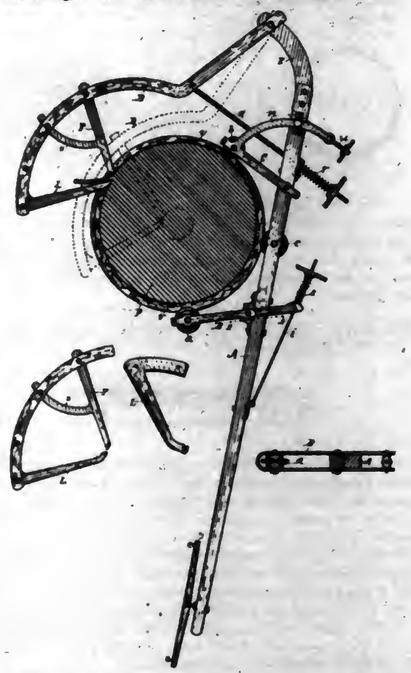
17. In a saw-setting machine, the adjustable bracket and the set-punch carried thereby, and the adjustable anvil carried by said bracket, in combination with the slotted bearing-arm carried by and adjustable on the bracket, and the flanged roller having a stem carried by and vertically adjustable in the bearing-arm, substantially as herein described.

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c, and the lining-boards *d*, inserted in the grooves between *c* and *c*, as herein specified.

396,825. TREE-FELLER. GARRETT W. LOW, Kalamazoo, Mich., assignor to Byron W. Shepardson, same place. Filed July 19, 1887. Renewed Aug. 3, 1888. Serial No. 281,873. (No model.)



Claim.—1. The combination of a lever, a spring-actuated arm pivoted thereto and arranged to project on the opposite side of a tree, said arm being provided with a cutting-tool and a gage to control the depth of cut, and the lever being provided with guides adapted to follow the groove during the operation of cutting, and thus support the machine, substantially as set forth.

2. A lever having a pivoted spring-actuated arm arranged to project on the opposite side of the tree, said arm being provided with a cutting-tool and gage, substantially as set forth.

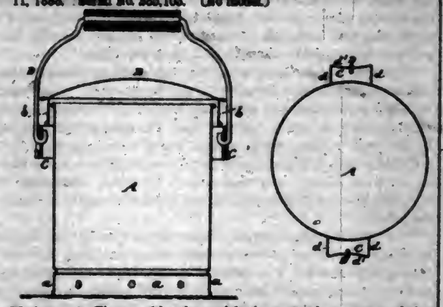
3. The combination of a frame bearing a cutting-tool, an adjustable guide, and a guide adapted to yield against a spring resistance, substantially as set forth.

4. A frame partially or entirely encompassing the tree, having suitable guides to hold it in place, and provided with a cutting-tool and a gage preceding said tool having a sharpened end, substantially as set forth.

396,824. LINING FOR CORRUGATED-SHEET-METAL ROOFS. WILHELM LORENZ, Carlsruhe, Baden, Germany. Filed Nov. 10, 1888. Serial No. 290,474. (No model.)

Claim.—A lining for corrugated-sheet-metal roofs, consisting of bearers *b*, applied in the undulations, with splice-pieces *c c*, band-iron

396,826. MILK-PAIL. JOHN E. MAYER, Muir, Wis. Filed Sept. 11, 1888. Serial No. 285,103. (No model.)



Claim.—1. The combination, with the pail, the cover, and the bail, of the ears having arms to support the cover and having the portion between and connecting the outer ends of the arms deflected inward between its ends, substantially as described, and for the purpose specified.

2. The combination, with the pail and the cover, of the ears secured to the pail and having formed integral therewith the arms *d d*, secured to the pail, with the horizontal portion *d'*, connecting said arms, curved upon its outer edge, as shown, and the bail having its ends secured to the middle of said portions *d'*, substantially as and for the purpose specified.

396,827. REMOVABLE SEAT FOR VEHICLES. JOHN P. MOORE, Fremont, Ohio. Filed Oct. 24, 1888. Serial No. 289,053. (No model.)



Claim.—1. In a seat for vehicles, the combination of the bottom arranged close to the dash and supported on suitable standards and the seat-cover hinged at its edge to the edge of the bottom, substantially as specified.

2. In a seat for vehicles, the combination, with the bottom arranged close to the dash, of the arms at the ends of the bottom, and the seat-cover hinged to the rear edge of the bottom and adapted to be held in a vertical position to form, with the dash and the arms, a suitable luggage-receptacle, substantially as specified.

3. In a seat for vehicles, the combination of the bottom arranged adjacent to the dash, the bowed arms arranged at the ends of the bottom, the aprons M M, arranged on the arms, and the seat-cover hinged to the rear edge of the bottom and provided at its rear edge with an overhanging flange to bear against the rear edge of the bottom when the cover is raised, substantially as specified.

4. In a seat for vehicles, the combination of the bottom arranged adjacent to the dash, the arms provided with aprons arranged at the ends of the bottom, the riser on the rear edge of the bottom, and the seat-cover hinged to the said riser and projecting at its front edge beyond the same, substantially as specified.

5. In a seat for vehicles, the combination, with the bottom provided with a suitable cover, of the standards affixed to the bottom and having the legs C, provided with hooks to engage keepers on the vehicle, and the legs C', provided with eyes engaging bolts on the vehicle, substantially as specified.

6. In a seat for vehicles, the combination, with the bottom provided with a suitable cover, of the standards affixed to the bottom and having the rear legs, C' C', provided at their lower ends with hooks *c' c'*, engaging keepers on the floor of the vehicle, the front legs, C, provided at their lower ends with eyes *c c*, fitting over threaded bolts G on the floor of the vehicle, and the thumb-nuts engaging the bolts above the eyes to hold the latter in position thereon, substantially as specified.

7. A seat arranged close to the dash-board of a vehicle and provided with a hinged cover, which when thrown up into a vertical position forms a space or receptacle for luggage, substantially as specified.

8. The bottom arranged adjacent to the dash-board so that the latter will form a side wall for the bottom, combined with the seat hinged to the bottom, so that when the seat is arranged down on the bottom the dash-board will form the back for the seat, and when the seat is thrown up vertically the dash-board will form one side of the luggage-receptacle while the seat will form the other side, as set forth.

396,828. DENTAL CHAIR. ZACH B. MOORMAN, Honey Grove, Tex. Filed June 21, 1888. Serial No. 277,705. (No model.)



Claim.—1. In a dental chair, the combination of the legs A and B, pivoted together and provided with the extensions A' and B', which are connected at their upper ends by the cross-bars *a'* and *b'*, the seat pivotally connected to the cross-bar *a'* and engaged with the cross-bar *b'*, the foot-rest provided with arms *h h*, pivoted to the inner sides of the legs A A, and having legs I I engaging ratchets on the said legs, the backwardly-folding back D, pivoted to the upper ends of the extensions A', and the flexible and extensible arms E E, connected at their ends, respectively, to the back and the upper ends of the extensions B', substantially as specified.

2. In a dental chair, the legs A and B, pivoted together, the seat and the back, in combination with the foot-rest having the arms *h h*, pivoted to the inner sides of the legs A, the swinging arms I, mounted on the foot-rest and provided at their lower ends with the lateral studs or projections K, adapted to engage ratchets on the legs A to hold the foot-rest at the desired inclination, substantially as specified.

396,829. MACHINE FOR STIFFENING HATS. FRANK J. MURPHY and ANTHONY M. RUSSELL, Danbury, Conn. Filed Apr. 10, 1888. Serial No. 270,172. (No model.)

Claim.—1. The combination, with a stiffening-brush, of a rotary cone by which the hat-bodies are carried and a reciprocating slide upon which the cone is journaled.

2. The combination, with a rotating stiffening-brush, of a rotary cone by which the hat-bodies are carried, a reciprocating slide upon which the cone is journaled, and a spring, 32, acting to hold the cone in contact with the brush.

3. The combination, with a stiffening-brush, of a rotary cone by which the hat-bodies are carried, a spring, 20, by which they are held thereon, and a reciprocating slide upon which the cone is journaled.

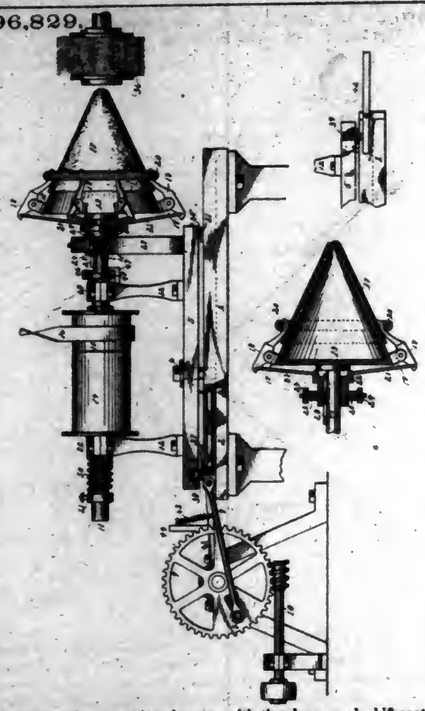
4. The spindle having at its forward end a cone to receive the hat-bodies and a sliding sleeve, 22, in combination with arms 18, pivoted at the rear end of the cone, a spring, 20, at the forward ends of the arms, and rods connected to the rear ends of the arms and to the sleeve, whereby when said sleeve is moved away from the cone the forward ends of the arms are lifted, thereby expanding the spring, so that a hat-body can be removed and another substituted.

5. The spindle having a cone at its outer end to receive hat-bodies, a sliding sleeve, and a spline for holding said sleeve against rotation independently of the spindle, in combination with arms pivoted to the cone, a spring carried by the forward ends of the arms, and rods connecting the rear ends of the arms with the sleeve.

6. The spindle having a cone at its outer end and a sliding sleeve, in combination with arms pivoted to the cone, a spring engaging the forward ends of the arms, rods connecting the rear ends of the arms with the sleeve, and a hand-lever for moving said sleeve.

7. The spindle having a cone at its outer end and a sliding sleeve having a groove, in combination with arms pivoted to the cone, a spring, 20, carried by the arms, half-collars engaging the groove in

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the sleeve, rods connecting the arms with the sleeve, and a bifurcated lever engaging the half-collars, whereby the sleeve is reciprocated to expand the arms.

8. The spindle having a cone at its outer end to receive hat-bodies and a sliding sleeve, in combination with arms pivoted to the cone and curved upward at their forward ends, a spring lying in the curved ends of the arms, and rods connecting the rear ends of the arms with the sleeve.

9. The combination, with the spindle having a cone at its outer end, arms pivoted to said cone, a spring, 20, and a sliding sleeve on the spindle, of rods connecting the rear ends of the arms with the sleeve, a standard having recesses 27ª, and a bifurcated lever pivoted to said standard and engaging the sleeve and having a pin, 29, engaging said recesses, whereby the lever is locked at the extreme of its oscillation.

10. The combination, with the spindle having a cone at its outer end, arms pivoted to said cone, a spring, 20, and a sliding sleeve having a groove, of rods connecting the rear ends of the arms with the sleeve, a spindle having recesses 27ª, and a bifurcated lever loosely pivoted to said standard, the arms of which engage half-collars in said groove, and having a pin engaging said recesses, as and for the purpose set forth.

11. The spindle having cone 13 at its forward end and sliding sleeve 22, in combination with arms 13, pivoted to ears at the rear end of the cone, a spring surrounding the cone and engaging the forward ends of the arms, and rods connecting the rear ends of the arms with the sliding sleeve, whereby the forward ends of the arms are lifted, thereby expanding the spring, so that hat-bodies may be removed and placed in position to be acted upon.

12. The combination, with the brush, cone, and spindle, of longitudinally-reciprocating slide 3, turning plate 5, pivoted thereto and carrying the spindle, spring 32, acting to draw slide 5, the spindle, &c., toward the brush, and spring 39, having a shoulder which acts to lock the turning plate at its retracted position.

13. The combination, with the brush, cone, and spindle, of longitudinally-reciprocating slide 3, the turning plate pivoted thereto and carrying the spindle, spring 32, acting to draw the turning plate, spindle, &c., toward the brush, spring 39, acting to lock the turning plate at its retracted position, and tripping-lever 42, acting to release spring 39, so that spring 32 can act to draw the turning plate forward, thereby placing a hat-body upon the cone in contact with the brush.

14. The combination, with the spindle, cone, and turning plate having standards in which the spindle is journaled, of the reciprocating slide to which the turning plate is pivoted, wheel 9, having a crank-pin, and a link connecting said crank-pin with the slide.

15. The combination, with the spindle, and the turning plate having standards in which the spindle is journaled, of slide 3, to which the turning plate is pivoted, gear-wheel 9, having a crank-pin, a link connecting said crank-pin to the slide, and rotating shaft 10, having a worm engaging wheel 9, substantially as described.

16. The reciprocating slide, the turning plate pivoted thereto, and a spindle and cone journaled on said turning plate, in combination with the stiffening-brush and spring 32, acting to draw the turning plate forward, so that a hat-body upon the cone will be acted upon by the brush, a spring, 39, at the rear end of the turning plate, having a shoulder engaging the edge of the slide to hold the turning plate at its retracted position, and tripping-lever 42, which releases the turning plate, thereby placing the hat-body upon the cone in contact with the brush.

17. The cone and spindle carried by the turning plate, the slide to which the turning plate is pivoted, spring 32, acting to draw the turning plate forward, and spring 39, acting to hold it at its retracted position, in combination with tripping-lever 42, wheel 9, having a crank-pin to which the slide is connected, and a pin, 45, acting upon the tripping-lever to disengage spring 39, as and for the purpose set forth.

18. The reciprocating slide, the turning plate pivoted thereto, spring 32, acting to draw the turning plate forward, and spring 39, acting to lock it at its retracted position, in combination with the tripping-lever acting to release spring 39, spring 43, for returning the tripping-lever to its normal position, and wheel 9, having a pin which engages said lever at each revolution, as and for the purpose set forth.

19. The brush, the reciprocating slide, the turning plate pivoted thereto and carrying the cone and spindle, and spring 32, acting to draw the turning plate forward, in combination with plates 31 and 37, secured to the slide, and rollers in the turning plate which travel on plates 31 and 37.

20. The reciprocating slide having plate 31, the turning plate pivoted to said slide and carrying the spindle and cone, and a spring, 32, whose opposite ends are secured to plate 31 and to the turning plate, in combination with spring 39 upon the turning plate, having a shoulder engaging the slide to lock the turning plate in its retracted position against the power of spring 32.

21. The brush, the reciprocating slide, the turning plate pivoted to the slide and carrying the spindle and cone, and provided with a roller, 33, in combination with plate 34, having an incline, 35, and spring 32, acting to hold said roller in contact with plate 34, so that during the return movement of the parts roller 33 will ride down the incline, thereby placing the tip of the hat in contact with the brush.

22. The reciprocating slide, the turning plate pivoted thereto, and spring 32, acting to draw the turning plate forward, in combination with the spindle journaled on the turning plate, belt 16, and fast and loose pulleys on the spindle, over which said belt passes, whereby said spindle is caused to rotate during the backward movement of the slide and to remain stationary during the forward movement thereof.

23. The combination, with the stiffening-brush, the reciprocating slide, the turning plate, springs 32 and 39, and the tripping-lever, of the spindle journaled upon the turning plate, and fast and loose pulleys, and the cone upon said spindle, whereby when the parts have reached their forward position the turning plate is released and swung forward, placing the hat-body upon the cone in contact with the brush, in which position it remains during the backward movement.

24. The combination, with the brush, the slide, the turning plate, springs 32 and 39, and the tripping-lever, of the spindle and cone journaled on the turning plate, plate 34, having incline 35, and roller 33, engaging plate 34, whereby when the tip of the hat-body is reached during the operation of stiffening the roller will ride down the incline, thereby swinging the turning plate farther forward and placing the tip in contact with the brush.

25. The combination, with the brush, the turning plate, and the spindle journaled in boxes 49 and 52, and having collars 48 and 51, of adjusting-plates 46, adapted to lie between collar 41 and journal-box 49, and spring 50, bearing against collar 51 and journal-box 52, whereby said spindle may be adjusted relatively to the brush to place more or less of the hat-body in contact therewith during the operation of stiffening.

26. The combination, with the brush, the cone, means, substantially as described, for retaining hat-bodies thereon, and the spindle, of the reciprocating slide, the turning plate pivoted thereto and having bearings in which the spindle is journaled, a spring acting to hold the turning plate at its retracted position, a tripping-lever acting to release the turning plate at a predetermined time, and a spring acting to draw the turning plate forward when released, so that the hat-body is placed in contact with the brush.

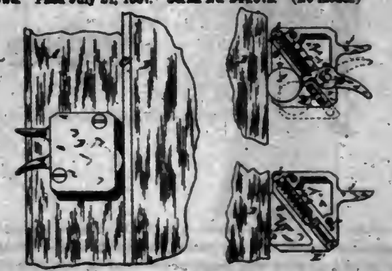
27. The combination, with the brush, the cone, means, substantially as described, for retaining hat-bodies thereon, and the spindle, of the reciprocating slide, the turning plate pivoted thereto and having bearings in which the spindle is journaled, a spring acting to hold the turning plate at its retracted position, a tripping-lever acting to release the turning plate at a predetermined time, and a spring acting to draw said slide forward when released.

28. The combination, with the brush, the cone, means, substantially as described, for retaining hat-bodies thereon, and the spindle, of the reciprocating slide, the turning plate pivoted thereto and having bearings in which the spindle is journaled, a spring acting to hold the turning plate at its retracted position, a tripping-lever acting to release the turning plate at a predetermined time, a spring acting to draw the turning plate forward when released, plate 34, having incline 35, and roller 33, engaging said plate and incline, as and for the purpose set forth.

29. The brush, the reciprocating slide, and the turning plate pivoted thereto and carrying a spindle and cone, in combination with springs 32 and 39, tripping-lever 42, clamping mechanism whereby the hat-body is held upon the cone, and hand-lever 24, for operating said clamping mechanism and for drawing the upper slide to its retracted position against the power of spring 32.

30. The combination, with the brush, the slide, the turning plate, springs 32 and 39, and the tripping-lever, of the cone and spindle, clamping-spring 20, arms for distending said spring, a sliding sleeve upon the spindle, rods connecting said arms with said sleeve, and a hand-lever for operating the sleeve, as and for the purpose set forth.

396,830. SASH-HOLDER. A. GORDON MURRAY, Cedar Rapids, Iowa. Filed July 21, 1887. Serial No. 244,572. (No model.)



Claim.—1. In a sash-fastener, the combination of the case D, the diagonally-moving slide E, having a diagonal face opposite the window stop or jamb, the holder F, and the finger-lever G, all constructed, arranged, and adapted to operate substantially as and for the purpose specified.

2. In a sash-fastener, the combination of the case D, the inclined pin *c*, the diagonally-moving slide E, having lug *e*, adapted to slip on said pin, and slot *g*, adapted to allow the slide to move on the fastening-screw *f*, the holder F, and the finger-lever G, substantially as and for the purpose specified.

396,831. MOLDING DEVICE. MICHAEL O'CONNOR, South Pittsburg, Tenn. Filed Aug. 16, 1888. Serial No. 282,968. (No model.)



Claim.—1. In a molding device, a casing provided with an opening extending inward from its outer edge, substantially as shown, two jaws pivoted within the casing and constructed to form an aperture between them in line with the opening in the casing, and suitable means for opening said jaws, substantially as and for the purposes described.

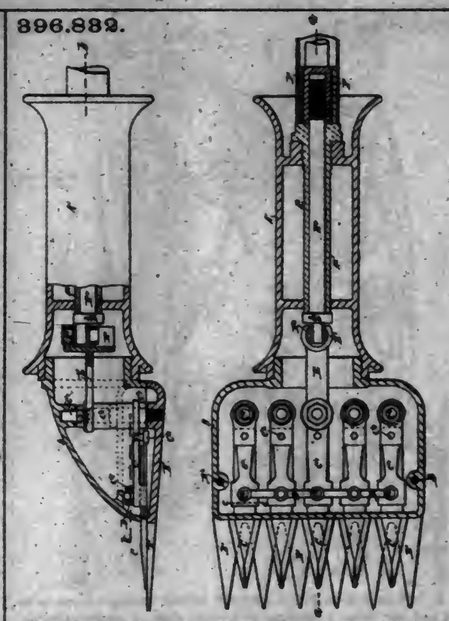
2. The combination, with a casing, A, provided with an opening, *a*, and the plate B, having an aperture with a threaded wall, of the pivoted jaws C, having concavities *c*, bar D, connecting-pieces A, and screw E, substantially as set forth and described.

396,832. ANIMAL-SHEARS. VERNON PETERSEN, Brisbane, Queensland. Filed Dec. 8, 1887. Serial No. 257,243. (No model.)

Claim.—1. The combination, with the tubular handle provided with bearings for the spindle and having the socket formed in its end, of the hollow cutter-head provided with a sleeve to engage the hollow handle for detachably connecting said parts together, substantially as set forth.

2. The combination of a hollow cutter-head, a stationary comb-plate forming the base of said cutter-head, movable cutter-teeth secured to the front ends of pivoted arms, the upstanding sleeve or boss on the central arm, the pin O', having bearings in the upper and lower

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walls of the case, the backwardly-extending arm E, provided with a slot-piece at its rear end, and the rock-shaft or main spindle supported in bearings in the hollow handle-piece and having its crank-pin engaging said slot-piece, substantially as specified.

3. The combination of a tubular handle, a hollow cutter-head detachably connected therewith, a stationary comb-plate detachably connected with and forming the base of said head, cutter-blades connected with said comb-plate and projecting beyond the front wall of said head, movable cutter-teeth pivoted within said head on independent pivots, the pin O', having bearings within the walls of the head, the connecting-bar connecting the movable cutters, the pin O', the backwardly-extending arm E, having the slot-piece at its rear end, and the rocking lever supported within the hollow handle-piece and connected at its front end with the slot-piece on said arm E, substantially as set forth.

4. A cutter tooth or blade for animal-shears, having a shank bent upon itself, and a bearing at the outer end of the bent portion for the body of the tooth, whereby an elastic cutter tooth or blade is obtained, substantially as and for the purpose specified.

396,833. CULTIVATOR. ADELBERT G. POWERS, Hillsborough, N. Y. Filed Sept. 26, 1888. Serial No. 286,650. (No model.)

Claim.—1. In a cultivator, the combination, with the wheeled frame having an arched axle and a draw-bar, of two series of drag-bars, one series mounted upon the draw-bar between the upright portions of the axle and adapted to swing vertically and laterally, and the other series mounted upon the drag-bar and extending between the wheels and the upright portions of the axle and adapted to swing vertically, all substantially as shown.

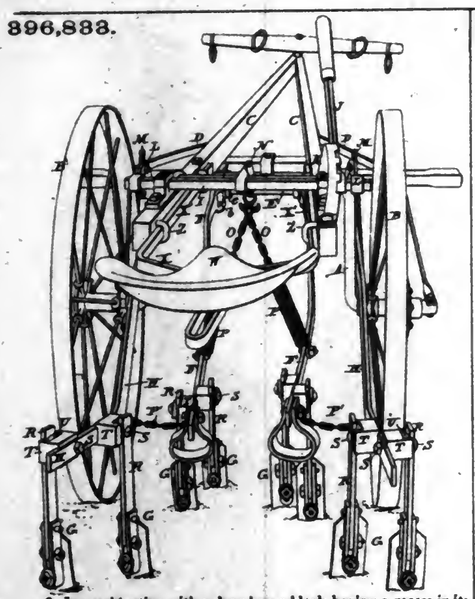
2. In a cultivator, the combination, with a frame and a draw-bar, of two drag-bars pivotally connected with the latter, a rock-shaft located above each drag-bar, and coiled springs connecting the drag-bars with the rock-shaft and adapted to draw the drag-bars equally toward each other, all substantially as shown.

3. In a cultivator, the combination, with a frame and a draw-bar, of two drag-bars, a rock-shaft provided with an arm above and midway between the drag-bars, and springs connecting each drag-bar with the arm.

4. In a cultivator, the combination, with the wheeled frame, of the drag-bars, the rock-shaft, springs connecting the rock-shaft with each of the drag-bars and adapted to draw them toward each other, and stirrups mounted upon the drag-bars.

5. In combination with a drag-bar having a hole or perforation, a tooth-standard having a similar hole or opening and adapted to be applied to the side face of the drag-bar, a perforated beveled plate or washer adapted to be applied to either face of the standard, and a bolt passing through the bar, standard, and washer, all substantially as shown, whereby the standard may be inclined relatively to the line of draft when desired.

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6. In combination with a drag-bar, a block having a recess in its front and rear faces, a tapering or beveled plate or washer, a tooth-standard, and a bolt passing through all of said parts.

7. In combination with a drag-bar, a block recessed to fit thereon, a tapering or beveled plate or washer fitting into a recess in the outer face of the block, a tooth-standard, also mounted within the outer recess, and a bolt passing through all of said parts.

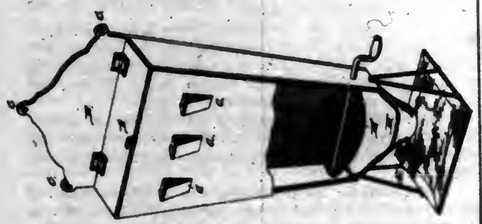
8. In a cultivator, the combination, with the frame, of brackets secured thereto, a tank provided with hooks on its side to engage the brackets, a valved outlet, and means for opening and closing said delivery-valve.

9. In a cultivator, the combination, with the wheeled frame, of a tank mounted thereon and provided with a stirrer, a yielding friction-wheel adapted to bear upon one of the driving-wheels, and connections between the friction-wheel and stirrer.

10. In a cultivator, the combination, with the wheeled frame, of a tank mounted thereon, a stirrer provided with a grooved wheel at its upper end, a shaft mounted upon the frame provided at one end with a friction-wheel and at the other end with a grooved wheel, yielding support for the shaft, and a belt passing about the grooved wheels.

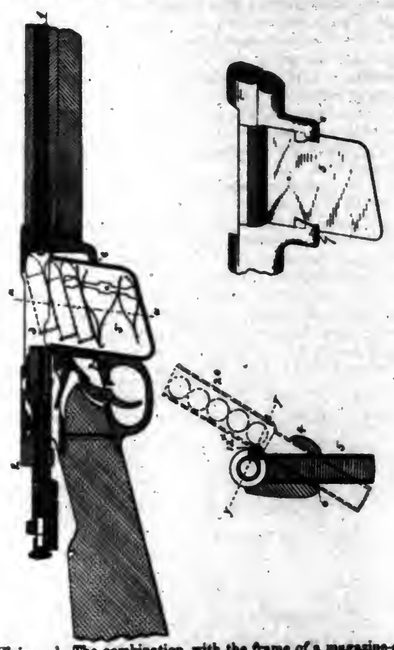
11. In a cultivator, the combination, with the wheeled frame, of a tank mounted thereon and provided with a stirrer having a grooved wheel at its upper end, an upright mounted upon the frame and provided with a slot, a second upright, a shaft mounted in the uprights and provided at one end with a friction-wheel and at the other end with a grooved wheel, a belt passing about the grooved wheels, and spring adapted to hold the shaft to its seat.

396,834. HOUSEHOLD SIFTER. JOHN T. GIBBS, Riverside, Cal. Filed June 13, 1888. Serial No. 276,982. (No model.)



Claim.—In a combined flour or meal bin and sifter, the bin A, the screen in the lower end of the bin, the agitator mounted in the bin above the screen, and the tapering funnel affixed to the lower end of the bin below the screen, in combination with the pan or holder K, arranged under the mouth of the funnel, and the supporting-rods at opposite sides of the said pan or holder and pivotally connecting the same to the lower end of the bin, whereby the pan can be swung back and forth, substantially as specified.

396,835. MAGAZINE-GUN. ANDREW H. RUSSELL, U. S. Army. Filed June 11, 1888. Serial No. 276,675. (No model.)



Claim.—1. The combination, with the frame of a magazine-gun, of magazine-supports near the receiver, a laterally-movable magazine borne on said supports, said magazine having an opening of the length of the cartridge in the direction of the receiver, and a cartridge-follower in the magazine tending to press the cartridges sidewise toward the receiver, whereby the mouth of the magazine may be exposed at the side of the receiver for loading or the magazine may feed directly to the receiver without intervening carrier, substantially as described.

2. The combination, with the receiver of a magazine-gun having a lower opening, of a magazine hung on pivots beneath the receiver, so as to swing laterally, as set forth.

3. The combination, with the receiver of a magazine-gun, of a magazine having a side movement relatively to the receiver, so as to expose the mouth of said magazine, and a feed-case guide in the frame substantially in line with said mouth when opened, whereby the feed-case may be held, substantially as described.

4. The combination, with the receiver of a magazine-gun, of a movable magazine having a plurality of cartridge-chambers, said magazine having a side movement in both directions, so as to present the mouth of a cartridge-chamber at either side of the receiver, substantially as described.

396,836. ELECTRIC LIGHTING AND HEATING CARS. JAMES F. SHAWHAN, Dayton, Ohio, assignor of one-half to James W. Carpenter, same place. Filed Mar. 23, 1888. Serial No. 268,269. (No model.)

Claim.—1. The combination, in a car having a fluid-pressure brake apparatus, of a motor receiving its power from the brake apparatus, an electric generator driven by the motor, and an electric heating apparatus connected with the generator, substantially as described.

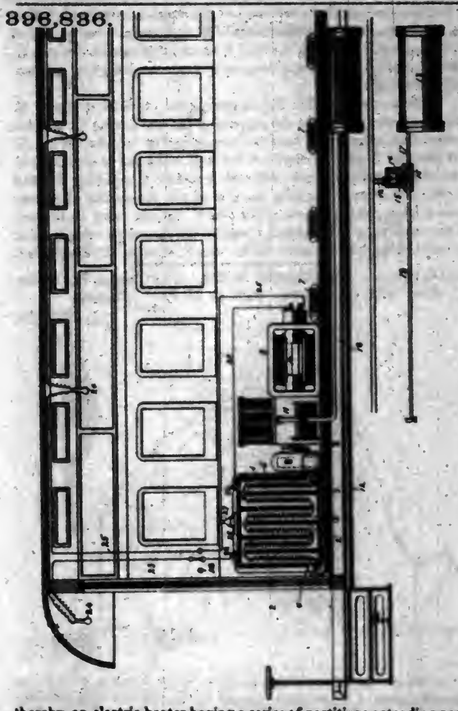
2. The combination, in a car having a fluid-pressure brake apparatus, of a motor receiving its power from the brake apparatus, an electric generator connected to the motor, an electric heating apparatus and electric lights, and circuits and connections between the generator, heater, and lights, substantially as described.

3. The combination, in a car, of a motor, an electric generator, an electric heating apparatus connected with the generator, a fan also connected with the motor, and pipes connected with the heater and distributing the air therefrom throughout the car, substantially as described.

4. The combination, in a car, of a motor, an electric generator connected to the shaft of the motor, a fan also connected to the shaft of the motor, an electric heater connected in circuit from the generator, and pipes leading therefrom to distribute the air throughout the car, substantially as described.

5. The combination of a motor, an electric generator driven thereby, an electric heater having a series of partitions extending partially through the heater, a series of electric conductors of high resistance, and a fan for propelling the air through the heater in contact with the heated conductors, substantially as described.

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6. The combination, with a car provided with a fluid-pressure brake apparatus and a reservoir connected therewith, of a motor, an electric generator, a heater, a number of electric lamps, circuits from the generator, including the heater and lamps, and switches whereby the heater or the lamps, or both the heater and lamps, may be connected in circuit with the generator, substantially as described.

7. The combination, in a car provided with the ordinary fluid-pressure brake apparatus, of a reservoir connected with said apparatus, a valve interposed between the brake apparatus and reservoir, a motor connected with said valve, and an electric generator operated by said motor, substantially as described.

8. The combination, with a car provided with the ordinary fluid-pressure brake apparatus, of a reservoir connected with said brake apparatus, a motor connected with the valve, and a generator driven by said motor, whereby the motor is operated directly from the brake apparatus when the pressure is greater therein than in the reservoir and from the reservoir when the pressure therein is greater than in the brake apparatus, substantially as described.

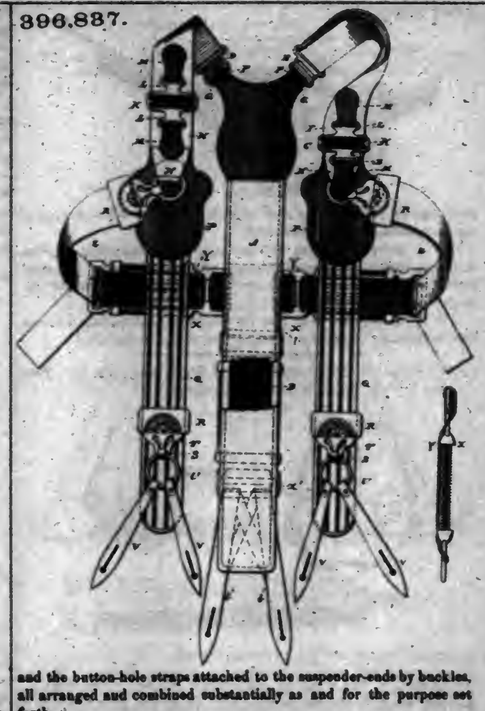
396,837. SHOULDER-BRACE. ROBERT V. SHOCKEY, Hastings, Nebr. Filed Sept. 24, 1888. Serial No. 286,201. (No model.)

Claim.—1. The combination, with the elongated pocket incasing the spring-stay and forming the common back piece, of the pad at the upper end of the same provided with buckle-frames connected thereto by loops, the suspenders engaging said loops and provided with collar-pads and suspender-ends, the laterally-extending spring-buckles, and the inelastic webbing, and clamping-slides for connecting the spring-buckles and suspenders, substantially as described.

2. In combination with the central elongated pocket provided with the spring-stay, the centrally-detachable shoulder-straps, and the suspender-ends, the spring-buckles re-enforced with elastic webbing, and the button-hole straps, substantially as described.

3. The combined shoulder-braces and suspenders, composed of the elongated pocket incasing the spring-stay and forming the common back piece, A, the shoulder-straps composed of the separate sections, each adjustably connected to the back piece and adapted, by means of the ring-loop and clamping-slide on their respective ends, to be instantly connected or disconnected, the collar-pads P, having their upper ends secured to the upper section slightly above the ring loops, and their lower ends to the suspender-ends Q, whereby they form a cushion beneath the connecting ends of the shoulder-straps,

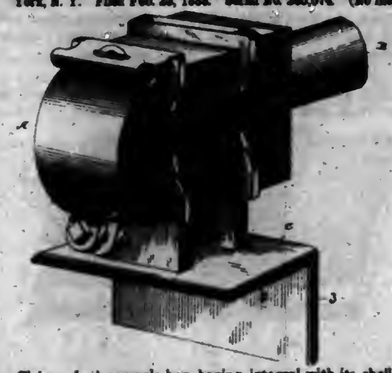
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and the button-hole straps attached to the suspender-ends by buckles, all arranged and combined substantially as and for the purpose set forth.

4. The combination, with the central elongated pocket provided with the spring-stay, the shoulder-straps secured thereto, made in two detachable sections, and the collar-pad, of the spring-buckles re-enforced with elastic webbing, the suspender-ends, and the button-hole straps, substantially as described.

396,838. CABLE-CAR-TRUCK SUPPORT. JOHN STEPHENSON, New York, N. Y. Filed Feb. 23, 1888. Serial No. 265,074. (No model.)



Claim.—1. A car-axle box having integral with its shell an extension of its lowest side in the form of an angle-plate, constituting bearing-faces at an angle to each other to receive and hold the corner of a grip-supporting truck or frame, substantially as described.

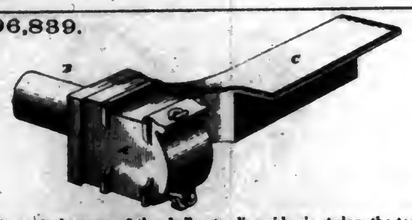
2. A car-axle box having integral with its shell a downward extension of its rear wall, forming a vertical plate, constituting a bearing-face for the attachment of a grip-supporting truck or support, substantially as set forth.

3. A car-axle box having integral with its shell an extension of the lower part, having a horizontal bearing-face extending transversely to the axle-journal and adapted to receive and sustain a corner of a grip-supporting truck, substantially as set forth.

396,839. AXLE-BOX FOR CABLE-CAR TRUCKS. JOHN STEPHENSON, New York, N. Y. Filed Feb. 23, 1888. Serial No. 265,075. (No model.)

Claim.—1. A car-axle-box shell with an integral arm from the

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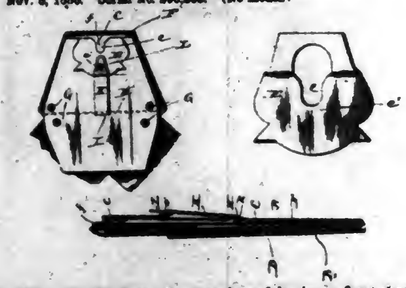


back vertical corner of the shell extending sidewise below the top of the shell, substantially as described.

2. A car-axle-box shell with an integral arm extending sidewise in a plane below the box-top, the end of the arm having a vertical plane and adapted to hold the corner of the cable-grip frame or carriage, substantially as described.

3. A car-axle-box shell with an integral arm extending sidewise and terminating in angle-bar form, substantially as described.

896,840. NECKSCARF. HENRY STERR, Shelbyville, Ky. Filed Nov. 8, 1888. Serial No. 290,263. (No model.)



Claim.—1. The frame for a neckscarf, having a front sheet, B, the rear sheet, C, secured to the front sheet and provided with a transverse slot, I, the elastic tongue K, extending at one end through the said slot and provided at its free end with a loop, L, and the removable pin H, extending transversely between the front and rear plates and engaging the extremity of the tongue K, combined with the cover folded around the front sheet, substantially as specified.

2. The frame for a neckscarf, having a front sheet, a rear sheet provided with a notch to engage the collar-button, and an intermediate sheet interposed between the front and rear sheet and adapted to bear against the head of the collar-button, combined with a cover arranged between the front sheet and the intermediate sheet and folded around the front sheet, substantially as specified.

896,841. PAPER-FILE. ALEXANDER P. ST. JOHN, Mobile, Ala. Filed Oct. 16, 1888. Serial No. 288,223. (No model.)



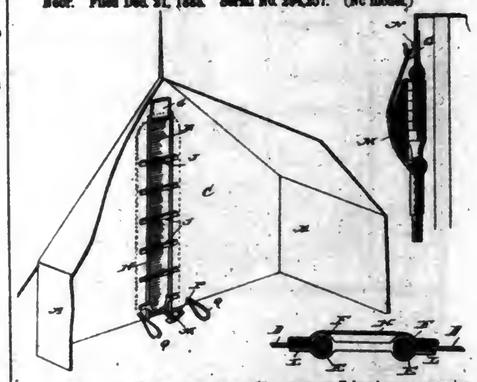
Claim.—1. In a newspaper-file, the folding frame narrower than one leaf of the paper and provided with a supporting-bar to lie in the crease of the paper, in combination with the pins puncturing the paper and the retaining-bar parallel with the supporting-bar and provided with sockets or depressions fitting on the free ends of the said pins, substantially as specified.

2. In a newspaper-file, the folding frame comprising the supporting-bar provided with pins M, the top and bottom bars extending through perforations near the ends of the supporting-bar, and the folding bar connecting the outer ends of the top and bottom bars and parallel with the supporting-bar, in combination with the retaining-bar affixed to the inner extremities of the top and bottom bars and covering the free ends of the said pins, substantially as specified.

3. In a newspaper-file, the supporting-bar provided with pins M, the wire frame having the top and bottom bars, D D', which extend at their free ends through perforations in the supporting-bar, the stud E on the extension of the top bar, and the stop H on the lower end of the supporting-bar, in combination with the retaining-bar provided with a socket, *f*, engaging the stud E and bearing against the stop H, and the catch engaging the lower end of the retaining-bar, substantially as specified.

4. In a newspaper-file, the supporting-bar provided with pins M, the wire frame affixed to the supporting-bar and having its top and bottom bars extended beyond the supporting-bar to form the arm G and the stud E, and the stop H on the supporting-bar, in combination with the retaining-bar provided with a socket, *f*, engaging the stud E, the perforation *g*, engaging the arm G, and the sockets or depressions receiving the free ends of the pins M, and the catch on the end of the supporting-bar engaging a stud on the end of the retaining-bar to hold the latter in contact with the stop H, substantially as specified.

896,842. TENT-CLOSING-DEVICE. HENRY THOMAS, Fort Omaha, Nebr. Filed Dec. 21, 1888. Serial No. 294,357. (No model.)



Claim.—1. In combination with a tent-wall having an opening formed therein, a guide-piece secured to each of the perpendicular edges of said opening, and a flexible curtain secured at its upper end above said opening, and provided at intervals with clips embracing at each end the guide-pieces at the edges of the opening, substantially as specified.

2. In combination with a flexible tent-wall having an opening formed therein, a flexible curtain secured at its upper end so as to cover said opening, a guide-rope combined with each perpendicular edge of the opening, and clips combined with said curtain at intervals, said guide-rope serving as guides for said clips, and a loop, M, placed upon one of the clips, and a hook, N, placed upon the tent-wall above the opening, substantially as specified.

3. In combination, a clip, J, and a tent-curtain, H, said clip being secured to said curtain by its part I, and embracing a guide-rope in the opening of the tent-wall by its part K and overlapping the tent-wall by its part L, substantially as specified.

4. In combination with a flexible tent-wall having an opening formed therein, a guide-rope secured in a hem formed in the edges of the opening of said tent-wall, and a flexible curtain secured at its upper end above said opening, and provided at intervals with clips embracing at each end the guide-rope at the edges of the tent-opening, substantially as specified.

896,843. BAND-CUTTER AND FEEDER FOR THRASHING-MACHINES. JASON W. TURNER, Van Wert, Ohio. Filed May 10, 1887. Renewed Dec. 27, 1888. Serial No. 294,772. (No model.)

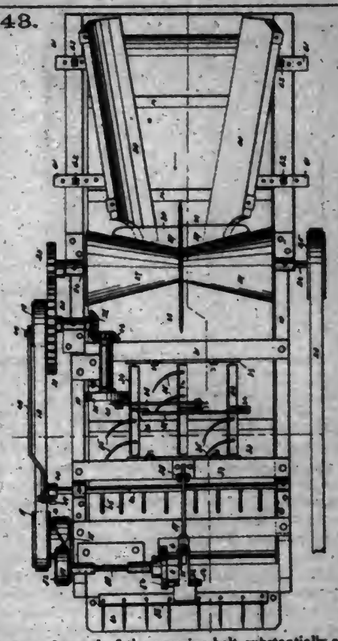
Claim.—1. In a band-cutter and feeder, the combination of a cutter, conical rollers having their ends abutting against said cutter, and blades secured to said rollers, substantially as described.

2. In a band-cutter and feeder, the combination of a cutter, conical rollers having their smaller ends abutting against the said cutter, and blades secured to the rollers and having their outer edges parallel with the axis of the said rollers, substantially as herein shown and described.

3. In a band-cutter and feeder, the combination, with the cutter-shaft 24, of the longitudinal rocking bars 34, provided with the curved spreading prongs 35 and the upwardly-extending arms 36, one of the said arms being longer than the others, the cross-bar 37, loosely connected to the arms 36, the disk 41, provided with crank-pin 40, the rod 38, connected to the crank-pin and to the long arm 36, the shaft 42, carrying the said disk and provided at its other end with the bevel gear-wheel 43, and means for operating the shaft 20 from the cutter-shaft, substantially as herein shown and described.

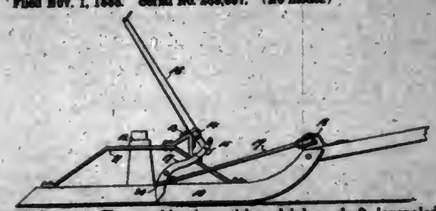
4. In a band-cutter and feeder, the combination, with an endless carrying-belt, of spreading prongs vibrating transversely to the direction of travel of the said belt, and feed-regulating prongs vibrating in the direction of travel of the carrying-belt, substantially as herein shown and described.

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Claim.—5. In a band-cutter and feeder, the combination, with an endless carrying-belt, of spreading prongs vibrating transversely to the direction of travel of the said belt, feed-regulating prongs vibrating in the direction of travel of the carrying-belt, and a vibrating rake in front of the feed-regulating prongs, substantially as herein shown and described.

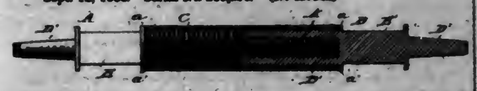
896,844. SLEIGH-BRAKE. WILLIAM R. WILCOX, Portland, Oreg. Filed Nov. 1, 1888. Serial No. 289,697. (No model.)



Claim.—1. The combination, with a sleigh, a shaft journaled transversely of the same, provided with forwardly-extending arms, and a lever attached to one extremity of said shaft, of downwardly-curved ice-hooks pivoted one at each side of the said shaft-arms, an evener pivoted to the body of the sleigh, and rods connecting the ends of the said evener with each set of ice-hooks, substantially as shown and described.

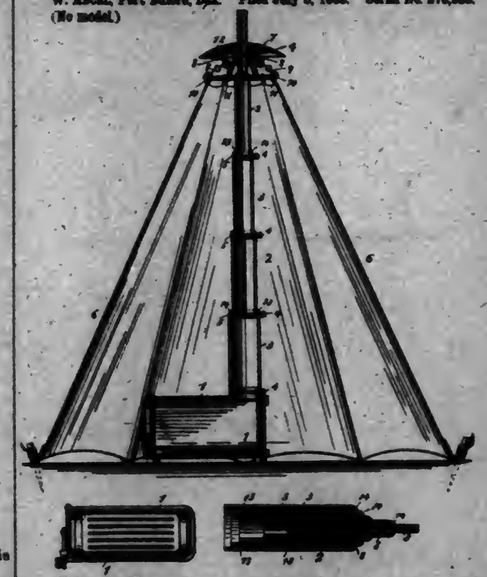
2. The combination, with the runners of a sleigh, a rave attached to each runner, a shaft journaled upon the said raves, provided with forwardly-extending arms, and a lever secured to one extremity of the said shaft, of downwardly-curved ice-hooks pivoted one at each side of the said shaft-arms, an evener pivoted upon the body of the sleigh, links attached at the lower ends of the said ice-hooks, and a bifurcated rod pivoted to each end of the evener and connected with each set of ice-hooks, substantially as and for the purpose specified.

896,845. AXLE. CHARLES H. WILSON, Jersey City, N. J. Filed Sept. 12, 1888. Serial No. 285,251. (No model.)



Claim.—An improved axle consisting of the two sections A B, each having their inner ends externally screw-threaded, the section A being provided with the reduced screw-threaded portion or shank A', and the section B with the internally-screw-threaded cavity B', to receive the said reduced portion or shank, and the internally-threaded sleeve C, fitting on the screw-threaded portions of the said sections, substantially as herein shown and described.

896,846. COMBINED STOVE-PIPE AND TENT-SUPPORT. JOHN W. ASKIN, Fort Buford, Dak. Filed July 3, 1888. Serial No. 278,988. (No model.)

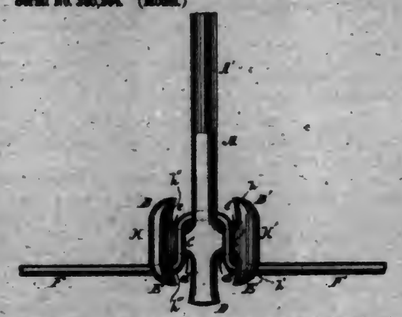


Claim.—1. The combined stove-pipe and tent-support composed of hollow telescopic sections having parallel sides, and means for detachably securing them together when drawn out, in combination with a stove and a tent, as shown and described.

2. The stove 1 and stove-pipe 2, consisting of telescopic sections 3, formed with enlargements 13 at one end and inwardly-bent ends 14 at the other, and secured by pins 4, projecting through their overlapping ends, and having screw-threaded ends 5, engaging screw-holes in the overlapping ends, in combination with the flanged sleeve 7 secured to the top stove-pipe section and having chains 9, and the tent 6, with ring 10 at its top, connected to chains 9, substantially as described.

3. The stove 1 and stove-pipe 2, consisting of telescopic sections 3, with means for detachably securing them in extended position, and the tent 6, detachably secured to the top stove-pipe section projecting above the tent, in combination with the detachable shield 12, adapted to slide over the top stove-pipe section and supported on sleeve 7, substantially as described.

896,847. WIRE HOOK. PETER ASHEIM, New York, N. Y., assignor to Sylvester Y. L'Hommedieu & Co., same place. Filed Sept. 13, 1888. Serial No. 285,204. (Model.)



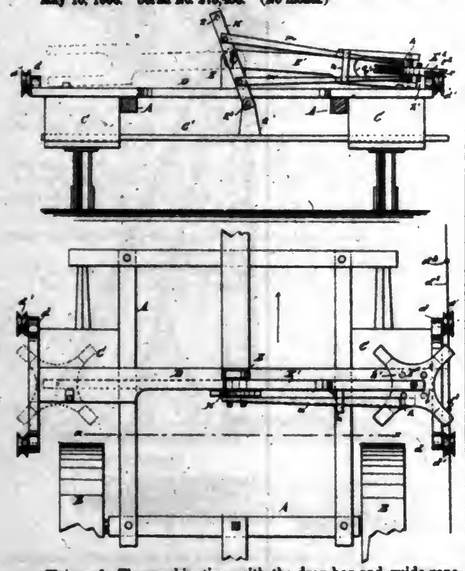
Claim.—1. An insulated hook for supporting electric wires, consisting of two arms arranged parallel to a main stem by means of a cross-bar on each side of which they project.

2. In an insulated hook for supporting electric wires, the combination, with the stem A, of the spurs B B', pointing toward the base of the stem, the spurs E E', pointing in the opposite direction, and the cross-bar C C', substantially as described.

3. In an insulated hook for supporting electric wires, the combination, with the stem A, of the spurs B B', pointing toward its base,

the spurs E E', pointing toward its extension D, the cross-bar C C, and the stem-extension D, as and for the purposes set forth.

396,848. CHECK-ROWING ATTACHMENT. GEORGE I. BAKER, Fall River, Kans., assignor to Leslie Seim Trusler, same place. Filed May 10, 1888. Serial No. 273,488. (No model.)



Claim.—1. The combination, with the drop-bar and guide-rope, of a horizontal arm pivoted above the drop-bar, a rocking bar connected with the latter, a star-wheel pivoted in said arm, and means, substantially as shown and described, for reciprocating the drop-bar from the star-wheel, as and for the purpose specified.

2. The combination, with the drop-bar and guide-rope, of a reversible horizontal arm pivoted above the drop-bar, a rocking bar pivoted to the latter at one end, a star-wheel horizontally pivoted in said arm, and means, substantially as shown and described, for reciprocating the drop-bar from the star-wheel, whereby the star-wheel may be carried from one side of the planter to the other, as desired.

3. The combination, with the drop-bar and guide-rope, of a reversible horizontal arm pivoted above the drop-bar, a rocking bar pivoted at one end of the latter, a star-wheel horizontally pivoted in said arm, having the extremity of its members grooved and slotted to receive the guide-rope, and mechanism, substantially as shown and described, for actuating the rocking bar from the star-wheel, as and for the purpose specified.

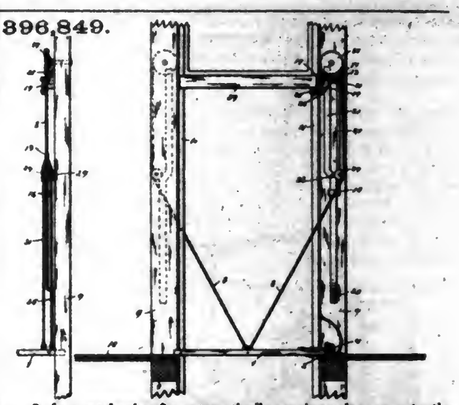
4. The combination, with the drop-bar and guide-rope, of a reversible horizontal arm pivoted above the guide-bar, a rocking bar having one end pivotally connected with the latter, a star-wheel horizontally pivoted in said arm, having the extremity of its members grooved and slotted to receive the guide-rope, projections integral with the top and bottom of the star-wheel, and reciprocating bars pivoted upon the rocking bar alternately engaged by the said projections, substantially as and for the purpose specified.

396,849. HATCHWAY. JAMES A. BARCLAY, St. Paul, Minn. Filed Apr. 21, 1888. Serial No. 271,441. (No model.)

Claim.—1. In a mechanism for automatically operating elevator hatch-doors by means of a cable, the combination, with a frame or traveler consisting of the sleeves 13 and 16, and the bar 27, connecting said sleeves, of the projecting arm 19, pivoted to the traveler and adapted to engage a passing elevator, the sheave 29, upon which said cable is adapted to run journaled upon the traveler, and the door 1, attached to said cable and fitted with a slotted hinge, 3, and a support or stilt, 4, by means of which the door is lifted and tilted laterally, so as to pass the elevator-guide, substantially as described.

2. In a mechanism for automatically opening hatch-doors by means of a cable, the combination, with a suitable support or track, 31, of a traveler or frame connected to said cable and adapted to run upon said track as impelled by contact with a passing elevator, and the sheave 29, on which said cable is adapted to run, journaled upon said traveler, so that when the cable is operated by the traveler the angle at which it pulls upon the hatch-door is greatest when the door is closed, substantially as described.

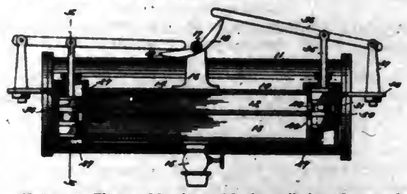
396,849.



3. In a mechanism for automatically opening a door or gate, the combination, with a suitable support or track, of a pulley, 37, a cable attached to said door or gate and passing over said pulley, a traveler or frame attached to said cable and adapted when impelled by contact with a passing body to run upon said track and operate the cable, and the sheave 29, journaled upon said traveler, by means of which the direction in which the cable pulls upon the door or gate is determined, substantially as described.

4. In an elevator, the combination, with the hatch-doors 1 1, of tapering form, hinged at their narrower ends to the floor of the building on opposite sides of the hatchway, with their inner edges meeting each other when closed in a diagonal line from the inner side of one guide-post to the outer side of the other and completely covering the hatchway-opening, of the hook-and-eye hinges 3, attached to the inner corners of each of said doors, having slotted eyes admitting of vertical play in the joints, and supports or stilts 4, by means of which the doors when opened are tilted outwardly and so held by the stilts, substantially as described.

396,850. STEAM-ENGINE. HENRY SHARE, Chester, Ill. Filed July 28, 1888. Serial No. 281,264. (No model.)



Claim.—1. The combination, with the cylinder of an engine, of the steam-chest 10, divided longitudinally into the compartments 12 and 13, the vertical cylindrical casings 27 at the ends of the steam-chest and communicating with the compartments 12 and 13 of the steam-chest and with the steam-cylinder, the valves 30 in the cylindrical casings 27, and means for operating the said valves, substantially as herein shown and described.

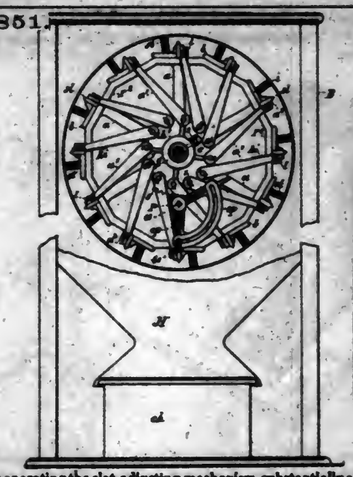
2. The combination, with the steam-cylinder 11 and the drive-shaft 21, provided with the cam 22, of the steam-chest 10, provided with the compartments 12 and 13, the cylindrical casings 27 at the ends of the steam-chest and communicating therewith and with the steam-cylinder 11, the valves 30 in the cylindrical casings 27 and provided with the rods 35, the pivoted levers 36, to which the valve-rods 35 are pivoted, the rock-shaft 17, provided with the curved fingers 18 and the lever 19, the pitman 26, the link 25, the cam-rod 24, and the yoke 23, substantially as herein shown and described.

396,851. FLOUR-BOLT. JAMES B. ALLFREE, Indianapolis, Ind. Filed Jan. 31, 1887. Serial No. 225,991. (No model.)

Claim.—1. In a flour-bolt, the combination, with a reel, of a series of buckets extending lengthwise within it, and adjustable slats connected with their backs for increasing the height thereof, substantially as shown and described.

2. A flour-bolt comprising, in combination, a reel mounted upon a suitable shaft, a series of elevating-buckets within such reel, having adjustable slats connected to their backs for increasing the height thereof, circular frames at each end, also mounted on the main shaft and connected through intermediate arms to such adjustable slats, a counter-shaft having bearings in the reel-head and interior spider, a pinion, a segment-rack gearing with said pinion and connected to the circular frame, and a lever mounted on the outer end of such counter-shaft for operating the slat mechanism, substantially as shown and described.

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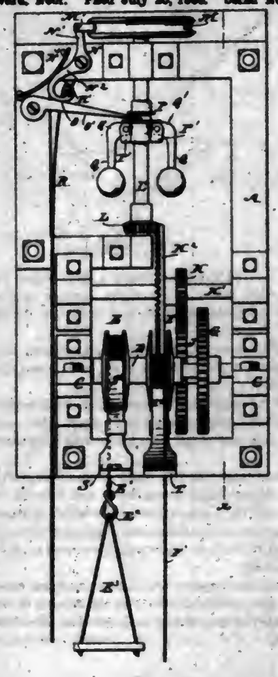
shaft for operating the slat-adjusting mechanism, substantially as shown and described.

3. A flour-bolt comprising, in combination, a reel mounted upon a suitable shaft, and a series of adjustable buckets within it, with means, substantially as described, for setting such buckets closer to the cloth at one end of the reel than at the other.

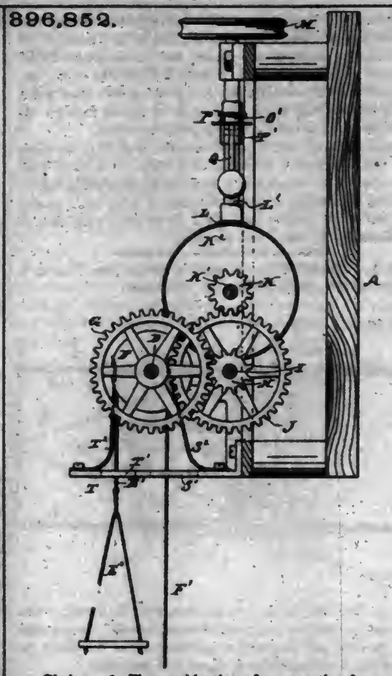
4. In a flour-bolt, the combination of a reel and shaft, spiders secured to such shaft, elevating-buckets carried by the spiders, having adjustable slats secured to the backs of such buckets for increasing the radius thereof, circular frames at each end mounted on the main shaft, a segment-rack on each frame connected through intermediate arms to such adjustable slats, a counter-shaft having bearings in the reel-head and adjacent spider, a pinion carried by such counter-shaft which engages with the segment-rack, and a lever mounted on the outer end of such counter-shaft for operating the slat mechanism, substantially as shown and described.

5. In a flour-bolt, the combination, with a reel, of a series of buckets extending lengthwise within it, set closer to the cloth at the discharging than at the receiving end thereof, substantially as shown and described.

396,852. FIRE-ESCAPE. JAMES G. BERROW and FRANK A. PERRY, Seward, Nebr. Filed July 26, 1888. Serial No. 280,964. (No model.)



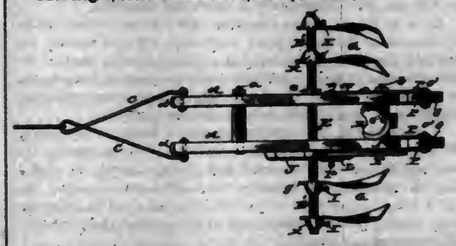
396,852.



Claim.—1. The combination of a supporting-frame, a winding-drum, a descending-cable, a governor-shaft, weighted swinging governor-arms, a pivotal lever in operative connection with the governor-arms, a brake-wheel connected to the winding-gear, and a pivotal brake-lever having a brake-shoe and a cam engaged by the pivotal lever operated by the governor-arms, substantially as described.

2. The combination of a supporting-frame, a winding-drum, a descending-cable, a brake-wheel in connection with the winding-drum, a brake-lever pivoted to the frame and having a curved cam-arm, a cam-lever engaging the cam-arm, speed mechanism by which the said cam-lever is controlled, and a hanging hand rope or cable, also attached to the said cam-arm of the brake and guided on the frame, substantially as described.

396,853. CULTIVATOR. WILLIAM F. BERRY, Blanchard, Iowa. Filed Aug. 7, 1888. Serial No. 282,133. (No model.)



Claim.—1. In a cultivator, the combination, with the runners A A, having each a series of apertures, D D, coincident with each other, of the shaft E, adapted to be journaled in any one pair of said apertures, the ends of said shaft extended beyond the sides of runners A said shaft provided with a series of covering-blades detachably secured to said ends, a collar, *c*, formed on said shaft, and a lever detachably mounted thereon, said lever and collar arranged upon the opposite outer sides of the runners A, whereby said shaft may be held in position in said apertures, substantially as and for the purpose described.

2. In a cultivator, the combination, with the runners A, a transverse shaft journaled thereon, and provided at its outer ends with covering-blades G, of the disks O, arranged to the rear ends of said runners, said disks journaled in ends of the arms P P, pivoted at their front ends to the runners, said disks adapted to be raised and lowered in relation to the lower rear edges of said runners, substantially as and for the purposes hereinbefore described.

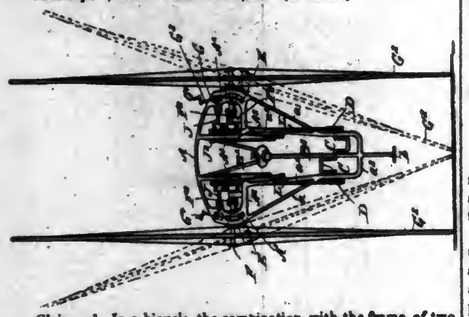
3. In a cultivator, the combination of the runners A, provided with a series of apertures, D D, a transverse shaft, E, adapted to be

adjustably journaled in the apertures, said shaft extended at each side of the runners and provided with covering-blades G, a lever, F, for adjusting the cutting depth of said blades, and the adjustable fender O', consisting of a disk, O, journaled in arms P P, pivoted to the runners A and provided with an aperture, *p*, registering with apertures *s*, formed in the runners, and a pin adapted to be passed through the aperture, substantially as and for the purposes described.

4. In a cultivator, the combination, with the shaft E, of the blade attachment, said attachment consisting of a collar, H, adjustably secured to the shaft E, provided with a downwardly-depending lug, H', having a rabbet, *h*, forming a square shoulder, *h'*, adapted to receive the squared end of the blade G, and means for securing such blade to the lug, substantially as shown and described.

396,854. VELOCIPEDE. RICHARD R. DOWDS, New York, N. Y.

Filed Sept. 1, 1888. Serial No. 284,339. (No model.)



Claim.—1. In a bicycle, the combination, with the frame, of two shafts connected by universal joint, one of the said shafts having a main wheel fixed thereto, and mechanism, substantially as described, for inclining said wheel, substantially as shown and described.

2. In a bicycle, the combination, with a frame having an arc slot, of a movable block in said slot, two shafts connected by universal joint, one of said shafts being mounted in the block aforesaid and having a main wheel fixed thereto, and mechanism, substantially as described, for inclining the said wheel, substantially as shown and described.

3. In a bicycle, a frame having an arc slot, a movable block in said slot, and two shafts connected by universal joint, one of said shafts being mounted in the block aforesaid and having a main wheel fixed thereto, in combination with an internally-screw-threaded sleeve pivotally secured to the frame aforesaid and a screw-threaded rod in said sleeve, substantially as shown and described.

4. In a bicycle, a frame having two shafts, J F', mounted therein, each of said shafts being provided with a friction-wheel, and means, substantially as specified, for lifting one frictional wheel out of contact with the other, substantially as shown and described.

5. In a bicycle, the combination, with a frame, of two shafts, J F', one end of the shaft J being mounted in a pivotal bearing, the other end thereof being mounted in a sliding bearing, each of the shafts aforesaid being provided with a friction-wheel, and means, substantially as specified, for elevating the sliding bearing and connected parts aforesaid, substantially as shown and described.

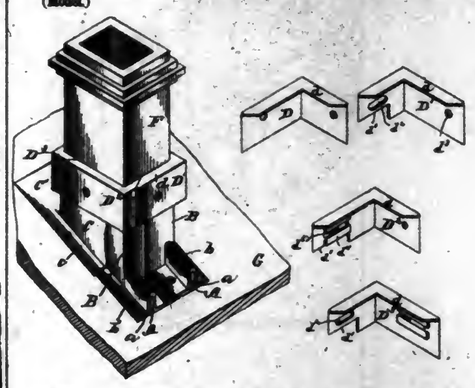
6. In a bicycle, the combination, with a frame, of two shafts, J F', one end of the shaft J being mounted in a pivotal bearing, the other end thereof being mounted in a sliding bearing, the shaft J being also provided with a friction-wheel and a sprocket-wheel, the shaft F' being also provided with a friction-wheel, a rod for lifting the sliding bearing and connected parts, and a sprocket-chain, substantially as shown and described.

7. In a bicycle, a frame provided with two shafts, J F', each having a friction-wheel, the shaft J being mounted in a pivotal and a sliding bearing, as specified, in combination with a segmental rack, lever M, and rod O, one end of said rod being connected to the sliding bearing aforesaid, substantially as shown and described.

8. In a bicycle, a frame provided with two shafts, J F', the shaft J having a sprocket-wheel and a friction-wheel fixed thereto, the shaft F' being also provided with a friction-wheel, a treadle-crank journaled in the frame, a sprocket-wheel fixed to said crank, and a sprocket-chain connecting the two sprocket-wheels aforesaid, in combination with the levers M N, connecting-rod N', and segmental rack N², substantially as shown and described.

9. In a bicycle, a frame consisting of the top piece, A, arms B', supporting the seat, a looped or bottom part, a^6, and a bar, B², the upper end of said bar being fixed to the arm B', the lower part thereof being fixed to the looped part aforesaid, the extreme lower end of said bar being provided with a step, substantially as shown and described.

396,855. PROTECTOR FOR CHIMNEYS. ADAM P. BEBBER and JOHN A. MYERS, Finney, Kans. Filed Feb. 16, 1887. Serial No. 227,836. (Model.)



Claim.—1. The combination, with the base-guards secured to the roof, of the corner-pieces fitted to the chimney and base-guards, and a cap overlapping the tops of the corner-pieces and projecting into the mason-work of the chimney, substantially as set forth.

2. The combination, with the base-guards secured to the roof at the lower side of the chimney, of corner-pieces fitted to the chimney and to the base-guards, and other corner-pieces fitted to the chimney and to the roof at the upper side of the chimney, the latter corner-pieces being provided with flanges overlapping the base-guards, and a cap fitted to the tops of the corner-pieces, substantially as set forth.

3. The combination, with the base-guards at the sides of the chimney, of the corner-pieces forming the body of the protector, and the sectional cap composed of overlapping quarter-sections, the said sections being provided with elongated slots and bolt-holes in their overlapping ends, whereby the cap may be enlarged or contracted, substantially as set forth.

4. The combination, with the chimney and sectional body portion of the protector, of the sectional cap provided with an internal flange entering the chimney-wall intermediate of the roof and top of the chimney, substantially as set forth.

396,856. HOE. ROBERT M. BROWN, Fort Gaines, Ga. Filed Sept. 24, 1888. Serial No. 286,155. (No model.)



Claim.—1. A hand-hoe consisting of a blade whose cutting-edge is curved downward, and a shank which extends rearward in the same plane with the blade, as shown and described, for the purpose specified.

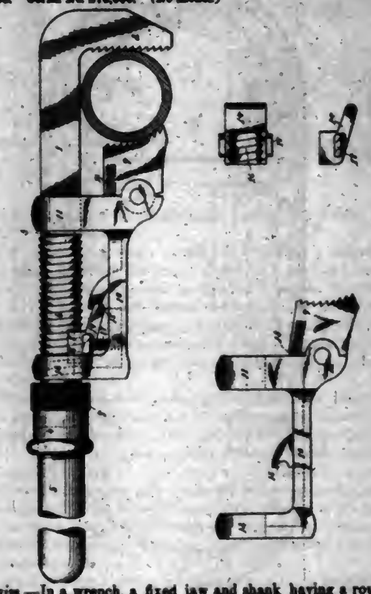
2. A hand-hoe whose blade is curved upward at its rear edge, and whose shank extends from the blade in the same plane therewith, as shown and described.

3. A hand-hoe consisting of a blade whose cutting-edge is curved downward and its rear edge upward, and a shank which extends rearward from the blade and in the same plane with it, as shown and described.

4. A hand-hoe consisting of a blade whose cutting-edge is curved downward, a U-shaped shank whose lower arm extends rearward in the same plane with the blade, and a handle which is attached to the upper and shorter arm of said shank and is placed at an angle of about forty-five degrees to the said blade and lower arm of the shank, as shown and described.

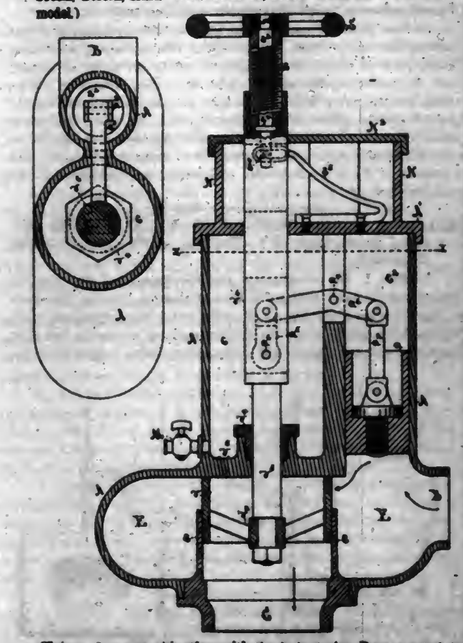
5. The combination, with a hoe-blade and a shank extended rearward, of guard-wires which extend from the corners of the blade to the outer extremity of the shank, as shown and described, for the purpose specified.

396,857. WRENCH. LARS P. CARSTENSEN, Bridgeport, Conn., assignor to the Armstrong Manufacturing Company. Filed June 11, 1888. Serial No. 276,998. (No model.)



Claim.—In a wrench, a fixed jaw and shank having a rounded portion, and a screw having a longitudinal opening to receive said rounded portion and turning freely thereon, in combination with a movable jaw, a carrier therefor which slides freely over the shank and screw, and a spring-actuated dog upon the carrier which is adapted to engage the screw, so that when the latter is turned the carrier and jaw are moved thereby, and when the dog is disengaged the carrier and jaw may be moved independently of the screw.

396,858. RELIEF-VALVE. ALBERT H. CARVER and NORMAN J. STONE, Boston, Mass. Filed June 16, 1888. Serial No. 277,393. (No model.)



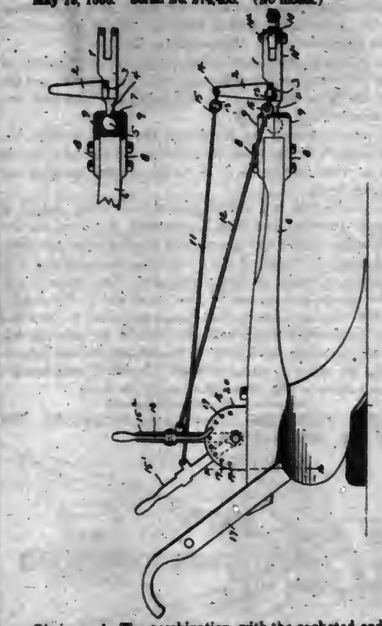
Claim.—1. In combination with the induct-pipe B, connected to the delivery of the pump, and the educt-passage C, connected to its suction, the piston *a*, pivoted lever a^5, and valve V, arranged to allow the water by its pressure to open the valve and permit the water to flow from passage B outward through passage C, substantially as described.

2. In combination with the induct-pipe B, connected to the delivery of the pump, and the educt-passage C, connected to its suction, the piston *a*, pivoted lever a^5, valve V, arranged to allow the water by its pressure to open the valve and permit the water to flow from passage B outward through passage C, and the spring s^3, arranged to close the valve V when the pressure is diminished upon the piston *a*, substantially as described.

3. The combination of the valve V, its valve-stem v^2 v^4, the tubular rod *s*, adjustable within the rod v^2 by its screw-thread, the rod s^2, passing through the same and carried therewith, and the spring s^3, pivoted to the latter rod, substantially as described.

4. The combination of the induct-passage B, the educt-passage C, the chamber E, the tubular walls *c* c^2, and the valve V, fitted to and arranged to move up and down within said walls and connected to its rod v^2 by the vertical strut *o* around its upper edge, substantially as described.

396,859. CLEVIS. MARSHAL T. COLE, Claremont, Minn. Filed May 18, 1888. Serial No. 274,453. (No model.)



Claim.—1 The combination, with the socketed end of a plow-frame, of a clevis having a ball on its end fitted in said socket, laterally-extending vertical and horizontal arms on said clevis, and rearwardly-extending rods connected to said arms, substantially as described.

2. The combination, with a plow-frame, of a clevis connected thereto by a universal joint, lateral arms formed on said clevis, and levers having connections with said arms for adjusting said clevis, substantially as described.

3. The clevis 1, having vertical arm 2, horizontal arm 3, and rearwardly-extending arm 4, with ball 5, substantially as described.

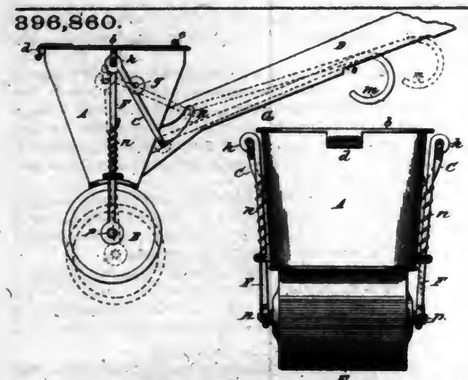
4. The combination, with plow-beam 6, having castings 8, with recessed heads 9, forming socket 7 and secured to plow-beam 6, of the clevis 1, having vertical arm 2, horizontal arm 3, rear arm, 4, with ball 5, located in recess 7, and the rods 11 and 12, connected to arms 2 and 3, with levers 15' and 15², pivoted to plow-beam 6 and having spring-actuated catch-levers 18, and the brackets 20, with series of holes 19, with which catch-levers 18 engage, substantially as described.

396,860. GRIDDLE GREASING AND OILING UTENSIL. SAMUEL R. CORTRIGHT, Scranton, Pa. Filed Jan. 13, 1888. Serial No. 260,643. (No model.)

Claim.—1. In a griddle greasing and oiling utensil, the combination of the supply-can and distributing-roller connected by the spring-supported sliding guides F and roller-bearings, substantially as set forth.

2. The combination, in a griddle greasing and oiling utensil, of the can A, the distributing movable roller B E, connected by the

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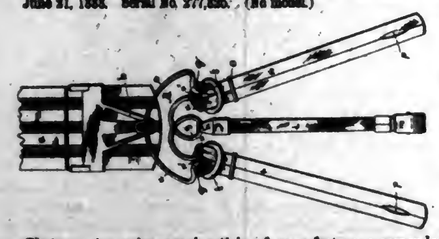
springs *n* and sliding roller-supports F, and means for so connecting them with the roller and can that these are readily separated or brought into pressure-contact, substantially as described.

3. In a griddle greasing and oiling utensil, the combination of the can, the distributing-roller spring-supported and movable, and the lever-acting device or follower C, for separating the roller and can-bottom, as specified and set forth.

4. The combination of the supply-can, the movable roller, the springs and supports for the same, the follower and the rod G, and its finger-hook *m*, within the handle D, all for the purposes specified and substantially set forth.

5. The combination, in a griddle greasing and oiling utensil, of a supplying-can provided with slotted, perforated, or woven concave bottom and hollow handle, spring-supported movable roller journaled in the sliding supports F beneath the can-bottom, and provided with absorbent surface-covering E, spring-controlled roller supports and bearings, the springs *n*, connected by their upper end to the supply-can and to the roller-supports by their lower end, so as to draw the roller up in pressure-connection with the bottom the can, the follower, and the operating-rod G, with its finger-hook, for the purpose of separating the roller, by pressure of the follower C, from contact with the can-bottom at will, all as substantially set forth.

396,861. SUSPENDERS. CARSON P. CRANE, Columbus, Ohio. Filed June 21, 1888. Serial No. 277,226. (No model.)



Claim.—As an improved article of manufacture, a suspender attachment formed of a single piece of material bent to form the curved bar *c*, side loops or eyes formed with recesses *q*, and a loop or eye between said side loops, all of said loops being beneath the curved bar, with the central loop on a higher plane than the side loops, substantially as shown and described.

396,862. TRACTION-WHEEL. LE ROY O. DREW, Carthage, Dak. Filed Sept. 6, 1888. Serial No. 284,709. (No model.)

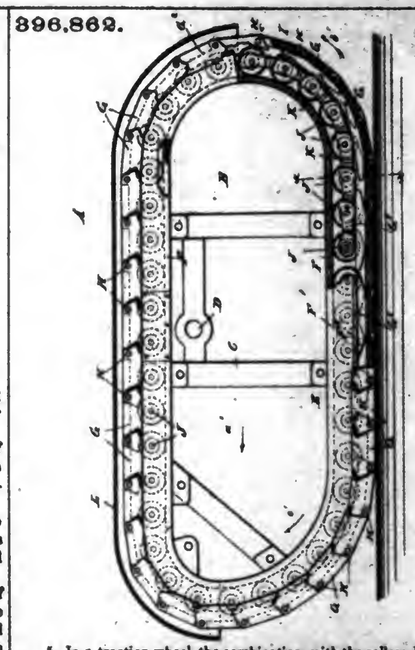
Claim.—1. In a traction-wheel, the endless chain I, consisting of a series of pivoted links, G, each provided with parallel track-plates G^3, projecting beyond the ends of the bottom thereof, substantially as herein shown and described.

2. In a traction-wheel, the endless chain I, consisting of a series of pivoted links, each formed of the side pieces, G^2, having the recessed ends G^2 and the bottom G^4, provided with the parallel track-plates G^3, projecting beyond the ends of the bottom, substantially as herein shown and described.

3. In a traction-wheel, the combination, with the U-shaped track E, provided with the outwardly-extending flanges F^2, of the endless chain I, composed of a series of pivoted links, G, provided with inwardly-projecting flanges G', substantially as described.

4. In a traction-wheel, the combination, with the rollers J, of the links K, each provided with apertures K' for the reception of the trunnions of the rollers, the hub K^2, surrounding the aperture, and the apertures K^3, substantially as described.

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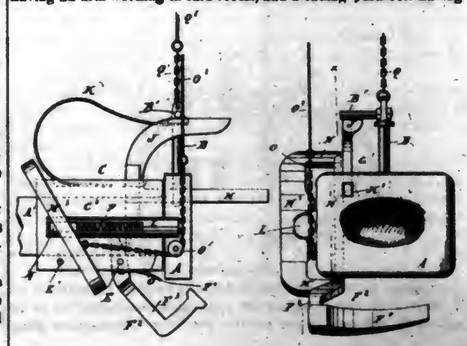
5. In a traction-wheel, the combination, with the rollers J, of the links K, each provided with the apertures K' K^2, the hub K^2, the notch K^3, and the stop K^4, having flange K^5, substantially as herein shown and described.

6. In a traction-wheel, the combination, with an elongated frame forming an inside track and provided with outwardly-extending flanges, of rollers traveling on the said inside track, links for connecting the trunnions of the said rollers to form an endless chain, and a second endless chain provided with flanges fitting on the flanges of the frame and also provided with parallel plates forming an outside track for the said rollers, substantially as shown and described.

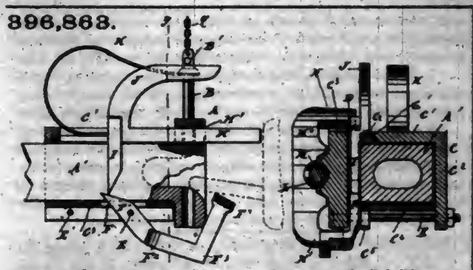
7. In a traction-wheel, the combination, with an elongated frame forming an inside track and provided with outwardly-extending flanges, of links having flanges fitting on the flanges of the said track, bolts for connecting the said links with each other to form an endless chain, bottom plates held on each link and adapted to pass onto the ground, parallel plates held on the said links to form a continuous track, rollers mounted to travel on the said parallel plates and also on the said inside track, and a second set of links for connecting the trunnions of the said rollers with each other, substantially as shown and described.

396,863. ATTACHMENT FOR PIN-AND-LINK COUPLERS. WILLIAM L. DWYER, Albany, N. Y. Filed Aug. 16, 1888. Serial No. 282,868. (No model.)

Claim.—1. The combination, with the draw-head of a pin-and-link car-coupler, of a detachable hood-like casing covering the shank of the draw-head, one side plate of the casing being separated medially from the adjacent side of the shank to form a recess, a link-lifter having an arm working in said recess, and a sliding push-bolt having



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a tappet, also working in said recess and engaging the link-lifter arm, substantially as described.

2. The combination, with a coupler draw-head, of a detachable hood-like casing covering the shank of the draw-head and its side plates projecting below the same, a detachable bottom plate fitted between the projecting lower edges of the casing, bolts passed transversely beneath the bottom plate and through the said projecting parts of the casing, and pin sustaining and releasing devices and link-lifting devices mounted on the said casing and bottom plate, substantially as described.

3. The combination, with a coupler draw-head, of a detachable hood-like casing covering the shank of the draw-head, projecting on opposite sides below the shank, and separated on one side from the shank to form a vertical recess, a detachable bottom plate fitted between the projecting parts of the casing and formed with a slot in range of the vertical recess and a downward-projecting eye-lug inside the said slot, a link-lifting lever mounted in said slot and in the recess thereabove, and a bolt passed transversely through the bottom projecting parts of the casing, the eye-lug, and the link-lifting lever, substantially as described.

4. The combination, with a coupler draw-head, of a pivotal link-lifting lever pivoted by a fixed fulcrum to move in the vertical plane in front of the draw-head, a push-bolt projectible from the front of the draw-head, and operating-connections between the pivotal link-lifting lever and the push-bolt by which the link-lifting lever is raised when the push-bolt is retracted, substantially as described.

5. The combination, with a coupler draw-head, of a swinging link-lifting lever having a cam-arm and a push-bolt projectible from the front of the draw-head and carrying a tappet to strike the cam-arm of and raise the link-lifting lever, and then to pass the said cam-arm and release the link-lifting lever, substantially as described.

6. The combination, with a coupler draw-head and a drop coupling-pin having an arm projecting laterally from its head, of a sliding push-bolt projectible from the front of the draw-head and carrying an upward and forward extending arm to pass beneath the lateral pin-arm and sustain the pin, substantially as described.

7. The combination, with a draw-head, a drop coupling-pin having a lateral arm, and a link-lifting lever, of a sliding push-bolt projecting from the front of the draw-head and carrying both a pin sustaining and releasing arm and a tappet to operate the link-lifting lever, substantially as described.

8. The combination, with a coupler draw-head, of a sliding push-bolt carrying a coupling-pin-head-supporting arm, a link-lifting lever, a coupling-pin-raising device, a sliding presser-bar having arms to strike and project the sliding bolt and to strike and raise the link-lifting lever, and means for operating the said presser-bar from outside the coupler, substantially as described.

9. The combination, with a draw-head, of coupling-pin lifting and sustaining devices, a sliding push-bolt carrying the pin-supporting device, a sliding presser-bar to carry the push-bolt forward, draw devices for sliding the presser-bar forward, and a spring to return the presser-bar automatically, substantially as described.

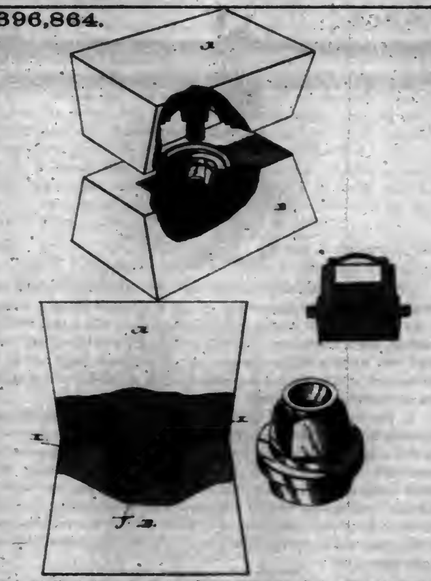
10. The combination, with a draw-head and coupling-pin raising and sustaining devices, of a tubular slotted guide fixed to the draw-head, a block sliding therein having a neck projecting through the slot, and a presser-bar carried by said neck to work the pin-sustaining devices, substantially as described.

11. The combination, with a coupler draw-head, of a detachable hood-like casing covering the shank of the draw-head and having a longitudinal slot provided with an undercut side wall and a correspondingly-beveled bolt mounted to slide on the said shank in the undercut slot and to be projected from the front of the draw-head, substantially as described.

396,864. DIE FOR MAKING AXLE-NUTS. ROWIN FIRTH, ALBERT TOMPKINS, and IRA TOMPKINS, Troy, N. Y. Filed Nov. 14, 1887. Serial No. 255,192. (No model.)

Claim.—1. In an apparatus for making drop-forged steel axle-nuts, the blocks A B, having the dies formed in their opposing sides,

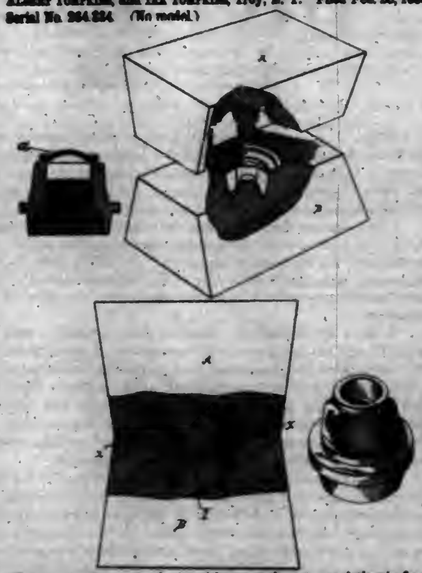
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the said dies being adapted to the contour of an axle-nut, substantially as described.

2. In an apparatus for making drop-forged steel axle-nuts, the blocks A B, having the dies formed in their opposing sides, which dies have the central projecting portions, which do not come together when in operation, but leave a surplus of metal at that point, as set forth.

396,865. METHOD OF MAKING AXLE-NUTS. ROWIN FIRTH, ALBERT TOMPKINS, and IRA TOMPKINS, Troy, N. Y. Filed Feb. 23, 1888. Serial No. 264,834. (No model.)

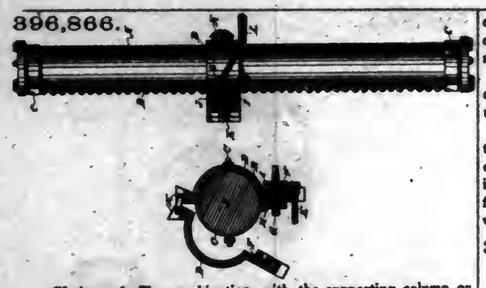


Claim.—1. The method of making an axle-nut, consisting in forging the same from steel or iron, then counterboring the nut to form the oil-chamber, and finally cutting screw-threads on the inner side of the nut, as set forth.

2. The method of making an axle-nut, consisting in forging the same from steel or iron, then counterboring the nut to form the oil-chamber, and then capping the outer end of the nut to complete the oil-chamber, as set forth.

396,866. ADJUSTING AND SUPPORTING DEVICE FOR DRILLS. GEORGE H. FISHER, Pleasant Valley, Cal. Filed Mar. 6, 1888. Serial No. 266,574. (No model.)

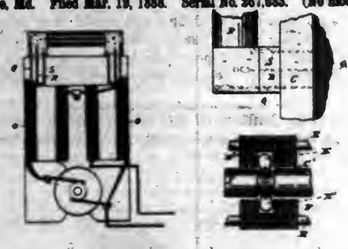
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Claim.—1. The combination, with the supporting column or standard and the independent rack-bar, of the hinged clamp D, fitted to the standard and having the projection K, to which the drill is attached, and a transverse shaft passing through said clamp and provided with a pinion which engages the rack-bar, said clamp having a slot through which the rack-bar passes and in which the pinion operates, substantially as described.

2. The hinged clamp fitted to the supporting standard or column of a rock-drill, and having a projection or arm at one side to which the drill is fixed, a projection upon the opposite side having a transverse shaft carrying a pinion, said clamp having a slot in which the pinion operates, and a ratchet-wheel, and a pawl engaging the ratchet-wheel, in combination with an independent rack-bar passing through the slot in the clamp, and yokes to which the ends of the rack-bar are secured, said yokes turning loosely about the column, substantially as herein described.

396,867. DYNAMO-ELECTRIC MACHINE. PERRIN GRAFF, Baltimore, Md. Filed Mar. 19, 1888. Serial No. 267,633. (No model.)



Claim.—1. In a dynamo-electric machine, the combination, with the frame thereof, the armature and the armature-shaft supported therein, the commutator, and the contact-brushes, of the field-magnets whose cores are composed of a series of disks and an aperture extending throughout the length of said magnets.

2. In a dynamo-electric machine, the combination, with the frame thereof, the armature and the armature-shaft supported therein, the commutator, and the contact-brushes, and the field-magnets having an aperture extending therethrough, of the regulator located in said aperture and constructed to automatically regulate the speed of the armature.

3. In a dynamo-electric machine, the combination, with the frame thereof, the armature and the armature-shaft supported therein, the commutator, and the contact-brushes, and the field-magnets having an aperture extending therethrough, of the regulator located in said apertures and shunt-coils connected therewith, said regulator being so constructed that when the strength of the current of the field-magnets is increased one or more shunt-coils are automatically put into circuit and the speed of the armature regulated.

4. In a dynamo-electric machine, the combination, with the frame thereof, the armature and the armature-shaft, the commutator, and contact-brushes, and the field-magnets having an aperture extending therethrough and shunt-coils wound thereon, of the regulators located in said apertures and having contact-points which correspond with the termination of the shunt-coils, whereby said shunt-coils are thrown into or out of circuit accordingly as the strength of the field-magnets is increased or decreased.

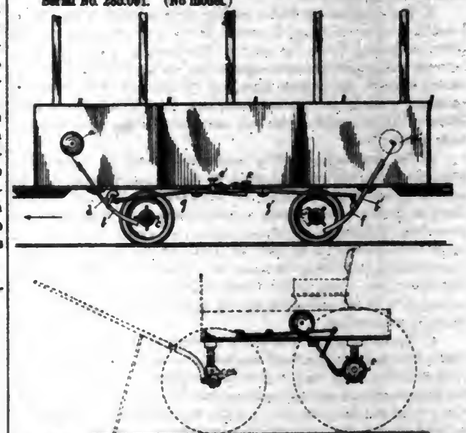
5. The combination, with a magnet having an aperture therein and shunt-coils wound thereon, of a regulator-bar located in the aperture and having contact-points to correspond with the terminals of the shunt-coils, whereby said shunt-coils are thrown into or out of circuit accordingly as the strength of the magnet is increased or decreased.

6. The combination, with a magnet having an aperture therein and shunt-coils wound thereon, and a scale located on its surface, of a regulator-bar having a pointer located in the aperture and provided with contact-points to correspond with the terminals of the shunt-coils, whereby said shunt-coils are thrown into or out of circuit accordingly as the strength of the magnet is increased or decreased, and the pointer indicates the strength of the current upon the scale.

7. The combination, with the contact-brushes united by a cord, of a segment-rack and bar or lever engaging in the same, whereby upon movement of the lever the position of the brushes is regulated.

8. In a dynamo-electric machine, the combination, with an armature-shaft and an armature mounted thereon whose core is composed of disks kept apart from each other by smaller intervening insulating-disks, said armature being partially hollowed out in its center, of fan-blades mounted on the shaft within the hollowed-out portion, whereby a current of air is created within the armature.

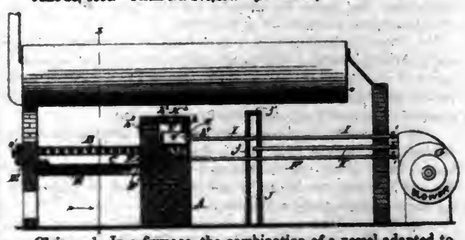
396,868. PEDAL BELL-SIGNAL DEVICE. JOHN R. GRIFFIN, Chicago, Ill., assignor, by direct and mesne assignments, to Julia Frances Griffin and Thomas H. Keefe, both of same place. Filed Sept. 10, 1888. Serial No. 285,091. (No model.)



Claim.—1. The combination, with one or more radial projections rigidly secured to the rotatory axle or hub of a vehicle, of a gong secured to the body or frame-work of the vehicle, a bell-hammer mounted on a pivoted arm and actuated to sound said gong by the pivotal movement of the arm when operated by the revolving of said radial projections, and a pedal device, also secured to the body or frame-work of the vehicle and yieldingly connected with the said pivoted arm, whereby on depressing said pedal device said pivoted arm is brought into the path of the revolving radial projections and operated thereby, substantially as and for the purpose specified.

2. The combination, with the revolving axle or hub of a vehicle, of radial wings or projections thereon rigidly secured thereto, a pedal device, and a pivoted bell-hammer support secured to the body or frame-work of said vehicle, whereby on depressing the pedal one end of the bell-hammer support is moved into the pathway of and actuated by the rotation of the wings or radial projections as said vehicle is propelled, substantially as and for the purpose specified.

396,869. FURNACE. FRADELSSON HARRIS, St. Louis, Mo. Filed June 23, 1888. Serial No. 278,497. (No model.)



Claim.—1. In a furnace, the combination of a vessel adapted to contain water and arranged adjacent to the fire-chamber, and an air-blast pipe arranged to direct a current of air to mingle with and force the vapors arising from said vessel into the fire, substantially as and for the purposes specified.

2. In a furnace, the combination, with the grate, of a water trough or vessel arranged therebelow and an air-blast pipe having its discharge arranged to open above the said trough between the same and the grate, substantially as set forth.

3. The grate and the partitions or plates arranged below the same, forming chambers, combined with the water-trough bottoms for said chambers hinged at one edge, catches for securing the opposite edges of the troughs, and the air-blast pipes arranged to open into said chambers above the troughs, substantially as set forth.

4. The combination, in a furnace, of a vessel adapted to contain water and arranged adjacent to the fire-chamber, and an air-blast pipe extended into the furnace from the rear, whereby the air will be heated in its passage through the pipe, the said pipe being arranged to direct a current of air to mingle with and force into the fire the vapors arising from the vessel, all substantially as and for the purposes specified.

5. In a furnace, the combination of the fire-chamber, the main bridge-wall, a vessel adapted to contain water and arranged adjacent to the fire-chamber, the second or auxiliary bridge-wall arranged in rear of the main bridge-wall and made hollow, and having exit port or ports, the air-blast pipe leading into the second bridge-wall, and the air-blast pipe arranged to direct a current of air to mingle with and force the vapors from the water-vessel into the fire, all substantially as and for the purposes specified.

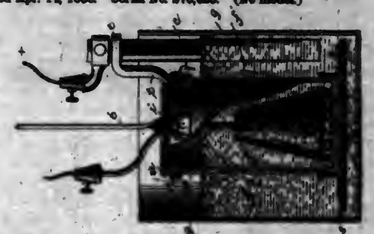
6. A furnace, substantially as herein described and shown, consisting of the casing, the grate, the partitions or plates C, the trough-like bottoms E, the catches for securing said bottoms, the main bridge-wall, the tank located in rear thereof, a cover for said tank, vents or openings being provided leading from the tank, the hollow auxiliary bridge-wall having vents or openings, and the air-pipes I, F, and K, all substantially as and for the purposes specified.

7. In a furnace, the combination of the bridge-wall, the tank located in rear thereof, a cover for said tank, vents or openings being provided leading from the tank, and the air-blast pipe opening into said tank, all substantially as and for the purposes specified.

8. The combination, substantially as herein described and shown, of the bridge-wall, the tank located in rear of said wall, a cover for the tank, openings being provided leading upward through said cover, forward through the bridge-wall, and rearwardly through the back wall of the tank, the blast-pipe opening into the tank, and the auxiliary bridge-wall forming a second combustion-chamber in rear of the main bridge-wall, the combustion in said second chamber operating to heat the water in the tank, substantially as set forth.

9. The combination, in a furnace, of the main bridge-wall, the second or auxiliary bridge-wall arranged in rear of the main bridge-wall, forming a second combustion-chamber, said second bridge-wall being made hollow and having vents leading outward from its interior, the air-blast pipe leading into said second bridge-wall, the water-tank arranged in the rear of the main bridge-wall, a cover for said tank openings being formed through the said cover and through the bridge-wall leading forward from said tank, and perforations being formed in the rear wall of such tank, an air-blast pipe leading into the tank, the grate, the troughs arranged below the grate, and the air-blast pipes arranged to discharge adjacent to said troughs, substantially as set forth.

396,870. ELECTRIC BATTERY. CHARLES F. HEINRICHS, New York, N. Y., assignor of one-half to William F. Whitmayer, same place. Filed Apr. 14, 1888. Serial No. 270,635. (No model.)



Claim.—1. In an electric battery, a flexible and expansible compartment connected with a porous diaphragm, by means of which the fluids may be stored, separated from each other, from the electrodes, and from the porous diaphragm, in combination with the second fluid, by means of which the fluid contained in the expansible compartment is replaced into the porous cup, all substantially as described.

2. In an electric battery, a porous cup (containing one electrode) to which is connected a flexible and expanding non-porous chamber, in combination with the cup and electrode-holder and means by which the cup and the electrode may be lowered in the battery or raised out of the same, all substantially as described.

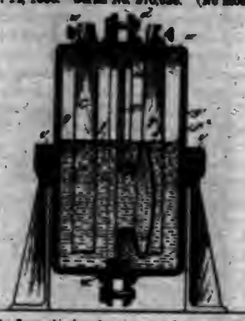
3. In an electric battery, the combination, with the porous cup *p*, of soft-rubber ring and clamp with locking-piece K, electrode-holder extension *t*, studs *i i*, and lifting-bands *b b*, all substantially as described.

4. In combination with the jar of a liquid battery, an interior porous cup containing one electrode and connected with another electrode arranged to dip in the fluid of the cup, and a flexible or expanding non-porous chamber in connection with the porous cup, all substantially as described.

5. In combination, in a liquid battery, a porous cup with connections for raising and lowering it in the cell, an electrode fixed in place in the porous cup, an electrode on the outside thereof, and a flexible non-porous pouch attached to the lower part of the cup and in communication therewith, all substantially as described.

6. In combination, the jar *g*, the porous cup *p*, having a perforated bottom, the non-porous pouch *o*, fixed to its lower end, the holder *r*, having an extension, *t*, carrying an electrode, and an electrode in the porous cup, all substantially as described.

396,871. ELECTRIC BATTERY. CHARLES F. HEINRICHS, New York, N. Y., assignor of one-half to William F. Whitmayer, same place. Filed Apr. 14, 1888. Serial No. 270,636. (No model.)



Claim.—1. In a tipping battery, and in combination, a partition partly porous and partly non-porous, the electrodes arranged in the described relation thereto, and a supplemental chamber connected to an opening in the non-porous part of the partition, all substantially as described.

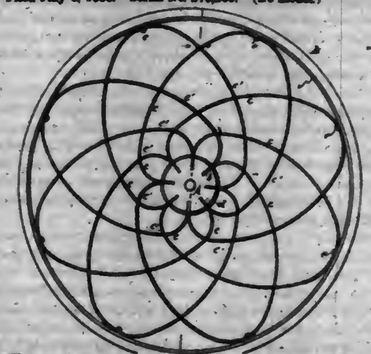
2. In a tipping battery having a partition, *p*, partly porous and partly non-porous, an opening in the non-porous part with an extensible non-porous pouch connected therewith, all in the described relation to the electrodes and substantially as set forth.

3. In an electric tip-battery, the combination of the double cell-inclosures, the two fluids with a partition-plate partly porous and partly non-porous, and the flexible packing-ring, all arranged substantially as described.

4. In an electric tip-battery, the combination of the two cell-inclosures *g* and *g'*, the grooved packing-ring *u*, the partition-plate *p* being partly porous and partly non-porous, with the fluids *f''* and *f'''*, and the two electrodes C and *z*, all substantially as described.

5. In an electric tip-battery, a partition-plate being partly porous and partly non-porous, and a supplemental non-porous expansion-chamber connected to an opening in the partition-plate, all substantially as described.

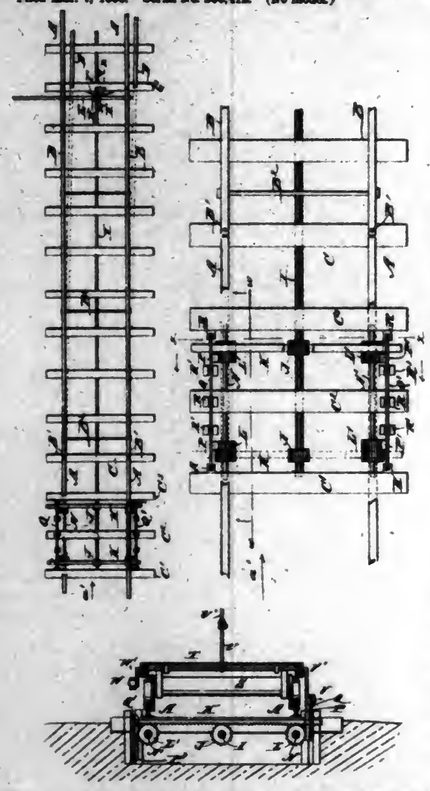
396,872. VEHICLE-WHEEL. HORATIO F. HICKS, Ashland, Oreg. Filed July 6, 1888. Serial No. 279,209. (No model.)



Claim.—1. In a wagon-wheel, the combination, with the hub and rim, of two series of curved spring-spokes, the curves of the spokes of one series being arranged oppositely with reference to the curves of the spokes of the other series, substantially as specified.

2. In a wagon-wheel, the combination of a hub having end flanges and curved spokes inserted in the flanges of the hub and secured to the rim, the curves of one series of spokes being oppositely arranged with reference to the curves of the spokes of the other series, substantially as specified.

396,878. RAILROAD-SWITCH. JOHN HUNTER, Maple Bay, Minn.
Filed Mar. 7, 1888. Serial No. 266,412. (No model.)



Claim.—1. In a railroad-switch, the combination, with the switch-rails pivoted at one end and having a rack connecting their free ends, of a longitudinally-extending rock-shaft having a gear engaging said rack, inclined vertically-movable plates mounted outside of the main rails and connected with said operating-shaft for rocking it in opposite directions, a link pivotally connected with the said rack, a fixed bracket having a slot receiving said link and a spring bearing against the front end of said link.

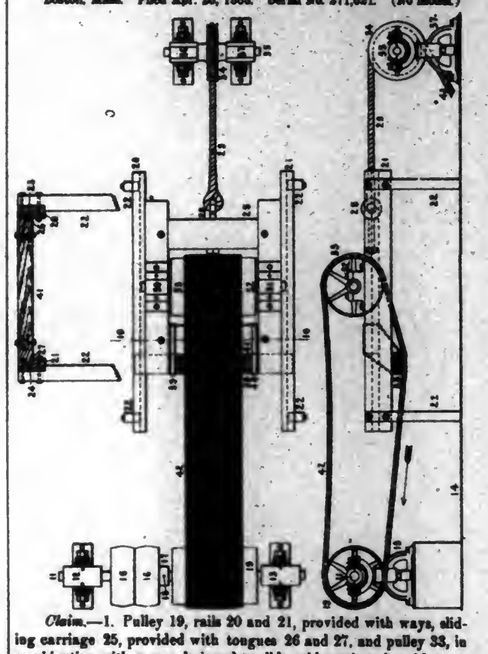
2. In a railroad-switch, the combination, with two plates having inclined top edges and arranged to slide vertically in opposite directions, of vertical racks formed on the said plates, gear-wheels meshing into the said vertical racks, and horizontal transverse racks meshing into the said gear-wheels, so that when one plate is depressed the other rises, substantially as shown and described.

3. In a railroad-switch, the combination, with two plates having inclined top edges and adapted to slide vertically in opposite directions, of vertical racks formed on the said plates, gear-wheels meshing into the said vertical racks, horizontal transverse racks meshing into the said gear-wheels, a second set of gear-wheels meshing into the said horizontal racks, and a shaft carrying the said second set of gear-wheels and connected with the free ends of the pivoted switch-rails, substantially as shown and described.

4. In a railroad-switch, the combination, with two plates having inclined top edges and adapted to slide vertically in opposite directions, being operated from the cab of the locomotive, of vertical racks formed on the said plates, gear-wheels meshing into the said vertical racks, horizontal transverse racks meshing into the said gear-wheels, and a second set of gear-wheels meshing into the said horizontal racks, a shaft carrying the second set of gear-wheels and also provided at its opposite end with a gear-wheel, a rod having a rack meshing into the gear-wheel at the end of the said shaft, and pivoted switch-rails carrying at their free ends said rod having a rack, substantially as shown and described.

5. In a railroad-switch, the combination, with pivoted switch-rails, of a rod secured to the free end of the said pivoted switch-rails, a link connected with the said rod, a keeper in which the said link is pivoted, and a spring for holding the said link in position, substantially as shown and described.

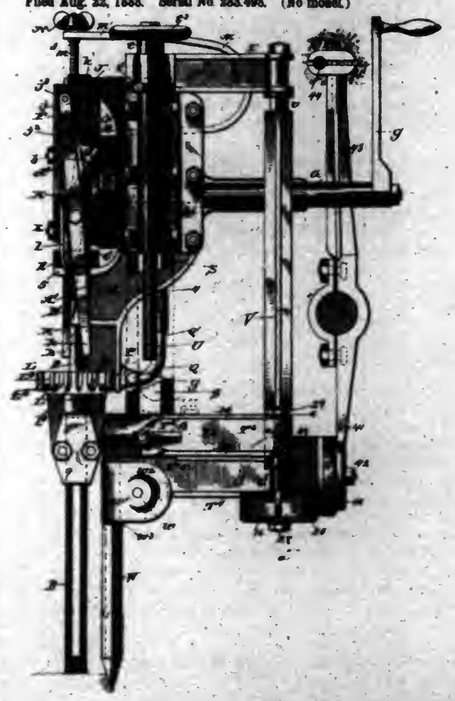
396,874. BELT-STRETCHING MACHINE. CHARLES L. IRESON, Boston, Mass.
Filed Apr. 23, 1888. Serial No. 271,631. (No model.)



Claim.—1. Pulley 19, rails 20 and 21, provided with ways, sliding carriage 25, provided with tongues 26 and 27, and pulley 33, in combination with means designed to slide said carriage in said ways, substantially as described.

2. Pulley 19, rails 20 and 21, provided with ways, sliding carriage 25, provided with tongues 26 and 27, pulley 33, and surfacing-stick 38, in combination with means designed to slide said carriage in said ways, substantially as described.

396,875. MINING-DRILL. WILLIAM H. JENKINS, Philadelphia, Pa.
Filed Aug. 22, 1888. Serial No. 283,498. (No model.)



Claim.—1. The combination, with a drill-rod having a lifting-pin, of a cam for operating the same, said cam consisting of a disk provided with groove or cut-away portion I', having a radial side arranged at one side of the center line of said cam-disk, said radial portion ending short of the center of the disk, and a curved side beginning with its point at the opposite side of the said center line, extending from the periphery toward the center, having a gradually-decreasing radius, said curvature extending over and past the center of said cam-disk and ending at the inner end of the radial portion, substantially as and for the purpose described.

2. The combination, with a cam provided with a cam-groove, I, substantially as shown, one edge of which is formed of a radial straight portion arranged to one side of the center of the cam, of a spring-actuated drill-rod having a lifting-pin formed with an approximately semicircular bearing-face for operation in said groove, and its opposite face formed straight and extended beyond the center of the cam, whereby the pin shall be instantly released by the cam when the said straight portion of the pin and the radial straight side of the groove shall be in coincident planes, substantially as and for the purpose set forth.

3. In a mining-drill, the combination of the drill-supporting frame and the column Z, for supporting said frame, of a series of adjustable friction-disks connecting said frame to the column, said disks consisting of a horizontal disk, 20, adjustably secured to the drill-supporting frame, provided with a vertical portion, 30, having a central pivot bolt, an angle-plate, 33, adjustably secured upon said plate in frictional contact with the portion 30, said plate provided with vertical portion 34 at right angles to the part 33, a disk, 38, secured upon an arm connected with the column Z, and a pivotal bolt passing centrally through said portion 34 and the disk 38, each of said disk portions having independent adjustments, substantially as shown and described.

4. In a mining-drill, the combination, with the main frame, a series of adjustable disks formed thereon, as shown and described, and the column Z, of the bar 41, mounted on the column Z and connected at one end with the adjustable disks, provided with an extended portion, 43, an adjustable brace-bar, 44, journaled in the portion 43, and the adjustable brace-bar W, connected to the front end of the main frame, whereby said frame is securely adjusted to the main walls, substantially as shown and described.

5. In a mining-drill, the combination with the cam I, journaled in the frame A, fixed guides C C', secured in said frame, provided with V-shaped grooves, the cross-head having V-shaped tongues entered in said grooves, and a lifting-pin connecting said cross-head and cam, of the U-shaped spring resting against the upper edge of the cross-head, and its opposite end connected with the frame A, substantially as and for the purpose described.

6. The combination, with the cross-head and the U-shaped spring M, for operating the forward throw of said cross-head, one leaf of said spring connected with and adjustably secured to the frame, the other leaf extending over the cross-head, of the central bearing-plate secured in the upper end of the cross-head and provided with a knife-bearing edge adapted to support the leaf *m* of the spring M, substantially as and for the purpose described.

7. The combination, with the cross-head D, the drill-rod B, secured thereto, a chuck, L, provided with radial projections secured to said drill-rod, and the cam for operating the drill-rod and cross-head, said cross-head formed with cam-recesses in its opposite ends, of the arms K, pivoted to the frame and disposed one to each end of the cross-head D, the upper ends thereof engaging the said cam-recesses, their lower ends engaging the radial projections on the chuck L, said arms adapted to oscillate by the travel of the cross-head, whereby a rotary motion is imparted to the chuck, substantially as and for the purposes shown and described.

8. In a mining-drill, the combination, with the cross-head D, the frame E, secured thereto, having lateral arms d^3 d^3 formed thereon, said arms provided with cam-shaped openings J, arranged in contra-relation to each other, the drill-rod B, connected with the cross-head, and the chuck L, connected to the drill-rod, said chuck provided with radial projections, of the swinging arms K, centrally pivoted to the frame A, and disposed one to the outer face of each of the said arms d^3, connected at their upper ends with the cam-openings J, their lower ends, K, arranged to engage the radial projections on the chuck, said arms adapted to be oscillated by the travel of the cross-head and the cam mechanism for operating the cross-head, substantially as shown and described, as and for the purpose set forth.

9. In a mining-drill, the combination, with the cross-head, the frame F, secured thereto, having arms d^3 d^3 projecting therefrom over the sides of the cross-head, said arms provided with cam-shaped openings arranged in contra-relation to each other, the drill-rod B, secured to the cross-head, and the chuck L, secured to the drill-rod, provided with radial projections, of the arms K, centrally pivoted upon the sides of the frame, said arms provided at their upper ends with roller-bearings engaging the cam-openings J in the arms d^3, their lower ends, *k*, arranged to engage the radial projections, the chuck-springs Z Z', for automatically throwing said arms back to their normal positions, and the cam mechanism, substantially as described and shown, for operating the cross-head, all arranged as and for the purpose described.

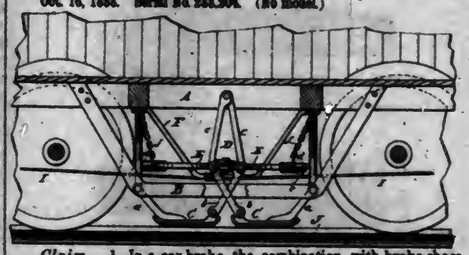
10. The combination, with the cross-head carrying the drill-rod, the chuck attached to the said drill-rod, the cam mechanism I, substantially as shown and described, for operating the upward movement of the cross-head, and the spring for forcing said cross-head down, of the arms centrally pivoted, said arms arranged to oscillate by contact at their upper ends with cam-faces of the cross-head, their lower ends adapted to engage the chuck and revolve the same when said arms are oscillated, substantially as shown and described.

11. In a mining-drill, the combination, with the drill-rod and the chuck secured thereto, provided with radial projections, of the pivotal stop P, said stop adapted to engage the said radial projections, said stop having an extension, Q', provided with a bayonet or other lock joint engaging a stud upon the frame, whereby said stop may be swung out of engagement with said stud and permit of the rotation of said drill-chuck, substantially as and for the purpose specified.

12. In a mining-drill, the combination of the main frame provided with a U-shaped arm, V, forward-extended arms T' and T², and a supplemental arm, T³, the arms T² and T³ supporting the drill-frame, said arm T' pivoted to the outer end of the arm V, and the arm T² pivoted upon the bolt connecting said arm V with the arm T³, said connections of arms T' T² permitting the swinging of the frame T and the drill mechanism away from its working position, substantially as shown and described.

13. In a mining-drill, the combination, with the main frame T, said frame consisting of the arms T' T² and U-shaped arm V, and the supplemental portion T³, said arms having hinged connections at their outer ends to the arm V and part T, respectively, the forward end of the arm T² formed with a reduced portion dovetailed in cross-section, and the arm T³ having an enlarged portion arranged to fit the reduced part of the arm T², said arm provided with an elongated slot, of the U-spring embracing the arm T², its forward end adapted to embrace the ends of the arms T² T³, and an adjusting-bolt passed through the spring-arms and the slot, by the adjustment of which the said spring may be slid back and permit the arms T² and T³ to become disconnected, thereby allowing the frame to be swung upon its pivots, substantially as shown and described.

396,876. CAR-BRAKE. GEORGE O. KANE, Providence, R. I. Filed Oct. 16, 1888. Serial No. 288,204. (No model.)



Claim.—1. In a car-brake, the combination, with brake-shoes pivotally connected at their opposite ends with the frames or supports depending from the car, of the toggle-levers D, the lower bars, *b b*, of which cross each other and are pivotally connected to the adjacent ends of the shoes, brake-beams to the ends of which said toggles pivot at the joints between their upper and lower members, a centrally-pivoted lever between the two bars, rods connected at their inner ends to opposite sides of the lever, and at their outer ends to the centers of said beams, and brake-rods connected with the said lever beyond first-named rods, substantially as set forth.

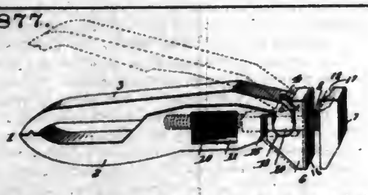
2. The combination, in a car-brake, of the frames B, secured to the car-frame A, arms *a*, pivoted to the frames B, brake-shoes C, secured to the arms *a*, toggle-joints D, connected with the brake-shoes and car-frame, the brake-beams E, and mechanism for moving the beams toward each other for straightening the toggle-joints, substantially as specified.

3. In a car-brake, the combination, with the pivoted brake-shoes C, of the toggle-joints D, brake-beams E, springs *d*, rods H, the lever G, and mechanism for operating the said lever, substantially as specified.

396,877. WRENCH. CHARLES H. KENNEDY, Greenburg, N. Y. Filed Apr. 9, 1888. Serial No. 270,062. (No model.)

Claim.—1. A wrench consisting in a longitudinally-bored stock, 2, the outer part of the bore being squared, the sliding inner jaw, 6, upon the outer side of the upper end of the stock at right angles thereto, a lever pivoted to said stock, and also pivotally connected to the jaw for throwing it positively in opposite directions, the outer jaw,

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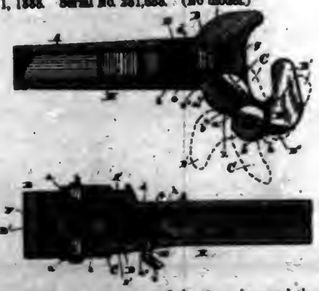
7, having a shank, 8, extended into the bore, the lower end of the shank being threaded and the upper part being squared to fit the squared portion or socket of the bore, and an exposed nut on the said threaded portion, substantially as set forth.

2. A wrench consisting in a longitudinally-bored stock having an opening, 11, communicating with said bore, the inner jaw, 6, sliding on the outer end of the stock and having an aperture in line with said bore and a recess forming a bearing, a lever pivoted to the outer end of the body and having a cam-shaped outer end entering said recess, and the outer jaw having a shank extending through the aperture in the inner jaw into the bore of the body and provided with an adjusting-nut working in the opening 11, substantially as set forth.

3. The combination, with the stock and the outer jaw projecting in front and rear thereof, of an inner sliding jaw also projecting in front and rear of the stock and a lever for forcing it toward the outer jaw, the inner or contacting face of one of said jaws at its rear end being cut away or recessed to form a cutting-edge flush with said inner or contacting face, substantially as set forth, whereby the forward ends of the jaws serve the usual purposes of a wrench and their rear ends form wire-cutting jaws, as described.

4. A wrench constructed with handle 1, consisting of the part 2, formed with square socket 9, opening 11, shoulder 15, and projections 4 5, the jaw 6, with oval recess 13, the lever 3, forming the other part of handle 1 and having cam-shaped forked end 14, pivoted to projection 4 and located in recess 13, and the adjustable jaw 7, formed with recess 17, cutting-edge 18, and shank 8, with screw-threaded portion 12, engaging thumb-nut 10 in opening 11, substantially as shown and described.

896,878. CAR-COUPLING. ISAAC KLINE, Louisville, Ky. Filed Aug. 1, 1888. Serial No. 281,688. (No model.)



Claim.—1. The combination of the draw-bar and the adjustable horizontally-swinging hook thereon with the pivoted oscillating locking-tumbler pivoted in the draw-bar and the depending link for oscillating the same, substantially as set forth.

2. The combination of the draw-bar and swinging hook hinged thereto, and having a locking bevel-faced arm, with a tumbler pivoted in the draw-bar, having a beveled shoulder engaging said arm when locked, and the depending link pivotally connected to said tumbler, substantially as described.

3. In a car-coupler, the combination of the draw-bar, having pin-openings and a slot, a'', in its bottom, with the oscillating tumbler D, pivoted on a rod, d, in rear of the pin-openings and having a rounded front face, and the link E, pivotally connected with the rear end of tumbler D and depending through the slot a'', substantially as described.

4. The combination of the draw-bar, the oscillating tumbler D thereto, and the devices for operating said tumbler with the swinging hook B, having a shank, b', pivoted between lugs a of the draw-bar, and also a locking-arm, C, provided with an inclined guide, F, formed on the lower face of the arm at the junction of the arm and shank, substantially as and for the purpose described.

5. The combination of the draw-bar having pairs of hinge-lugs, the lower one having notches f' f'' in its upper surface, with a swinging hook hinged between said lugs, and having an incline, F, at the junction of its arm and shank, adapted to lift the hook when the latter is locked and to cause it to swing open when released, and also having a depending lug adapted to engage the notch f' when the hook is partially opened, or to engage notch f'' when the hook is thrown back out of engaging position, substantially as and for the purpose described.

6. The combination of the draw-bar and the swinging hook pivoted thereon, having a bevel-faced locking-arm, with a tumbler having an oppositely-beveled shoulder engaging said arm when the hook is locked and a lever-block engaging said tumbler, substantially as set forth.

7. In a coupling, the combination of the draw-bar having hinge-lugs, the lower one of which has notches in its upper surface, and a swinging hook hinged to said lugs and having an incline, F, at the junction of its arm and shank, and a stop-lug adapted to engage said notches, and also having a bevel-faced locking-arm, with a bevel-shouldered oscillating locking-tumbler engaging said arm, and the link-connections for oscillating said tumbler, substantially as set forth.

8. The combination of the draw-bar, its swinging hook, and the oscillating tumbler engaging the same with a depending link pivotally connected to said tumbler and the crank-rods and connections for depressing said link, substantially as set forth.

9. The combination of the draw-bar and the automatically-swinging hook pivoted thereto, having a bevel-faced locking-arm, with the tumbler pivoted in said draw-bar, having a rounded front edge and a bevel shoulder engaging said arm, the pivoted lever-block engaging said tumbler, and the depending link for operating the same, substantially as described.

10. The combination of the draw-bar, the swinging hook pivoted thereto, having an incline, F, and a rounded and bevel-faced locking-arm, with a slotted tumbler pivoted in the draw-bar having a rounded front face and a beveled shoulder for engaging the arm, the depending link passing through a slot in the floor of the draw-bar and pivoted in the slot of the tumbler, and the slotted lever-block engaging the tumbler, substantially as specified.

11. The combination of the draw-bar, its swinging hook, the oscillating tumbler for locking the same, and the depending link connected to said tumbler with the cranked rod below the draw-bar connected to said link and the cranked rod above the draw-bar connected to and operating the lower rod, substantially as set forth.

12. In a car-coupling, the combination of the draw-bar having hinge-lugs at one side, one of which is notched, as described, and the horizontally-swinging block hinged to said lugs and having an incline, F, and a lug, f, substantially as described, and a locking-arm having a rounded and beveled end, with an oscillating locking-tumbler pivoted in the draw-bar beneath a chamber in the upper wall thereof, and having a rounded front end and an inclined side shoulder for engaging and locking the arm of the hook, a depending link passing through an opening in the bottom of the draw-bar and pivotally connected to said tumbler, and a pivoted lever-block engaging said tumbler, all substantially as specified.

896,879. CAR-COUPLING. ISAAC KLINE, Louisville, Ky. Filed Oct. 3, 1888. Serial No. 287,054. (No model.)



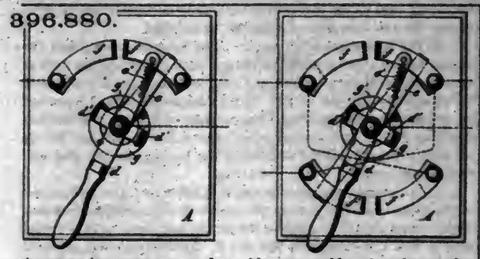
Claim.—1. In a car-coupling, the combination of a tumbler having an angular front face, with a swinging hook having an arm adapted to enter the mouth of the draw-bar when closed, and also having an incline at the junction of the arm and shank of the hook adapted to cause the hook and arm to rise vertically when the hook is closed or the arm swung inward, whereby the end of the arm as it moves under the angular face of the tumbler lifts the tumbler solely by its vertical movement alone, and the use of and necessity for inclined faces on the end of the arm and face of the tumbler are obviated, all substantially as specified.

2. The combination, in a coupler of the character described, of a tumbler pivoted in the throat of the draw-bar and having an angular front face, with the swinging hook B, its arm C, adapted to enter the mouth of the draw-bar, having a shoulder, c, at its end to engage the tumbler, and the incline b at the junction of the arm with the shank of the hook, adapted to engage the mouth of the draw-bar and lift the hook and arm vertically as the latter is swung inward, whereby the lifting of the tumbler is effected without the employment of coacting inclined faces on the tumbler or arm, substantially as described.

896,880. ELECTRIC SWITCH OR CUT-OUT. EDWARD B. KNOWLES, Brooklyn, N. Y. Filed Sept. 14, 1888. Serial No. 285,389. (No model.)

Claim.—1. The manually-operated lever and the circuit-controlling bar pivoted loosely, a circular spring-plate placed concentrically with the pivot of the operating-lever, a pair of lugs attached to

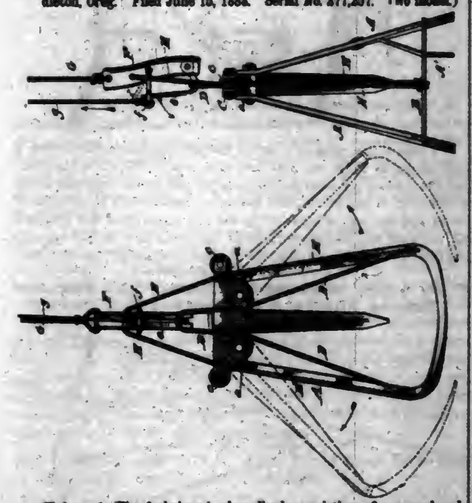
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the operating-lever, arranged to ride upon said spring-plate, and a latch secured to the spring-plate for the circuit-controlling bar.

2. The manually-operated lever and the circuit-controlling bar pivoted loosely and connected by a spring, a circular spring-plate placed concentrically with the pivot of the operated lever, a pair of lugs attached to the operating-lever, arranged to ride upon said spring-plate, and a latch secured to the spring-plate for the circuit-controlling bar.

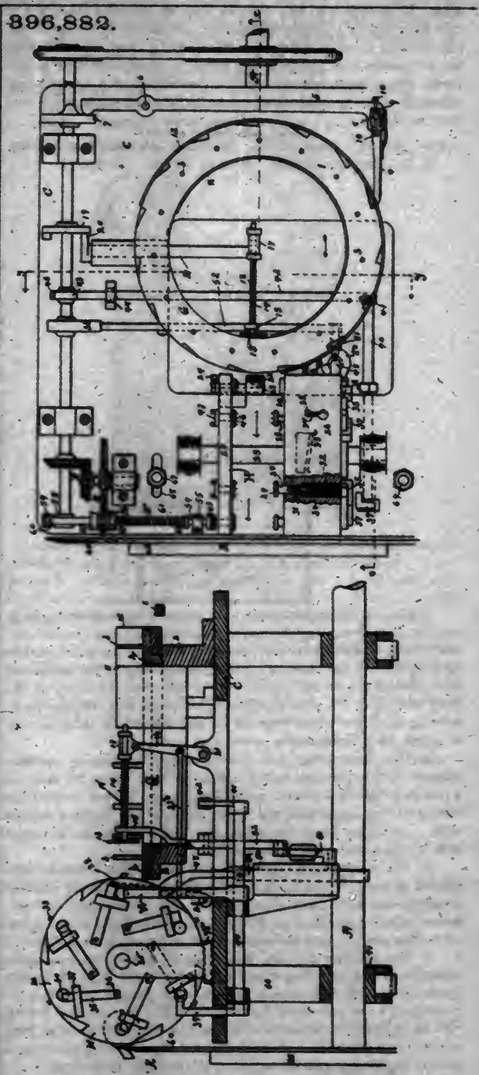
896,881. HAY OR GRAIN FORK. WILLIAM H. LANDER, Pendleton, Oreg. Filed June 15, 1888. Serial No. 277,257. (No model.)



Claim.—1. The fork herein described, consisting of a cross-head with clutch-hooks pivoted to each end, a trip-block above provided with a hook-catch and trigger with trigger-rope, an inner rope extending from the lower portion of the clutch-hooks through the cross-head and adapted to be caught by the hook-catch, and an outer rope extending through the cross-head from the trip-block to the lower portions of the clutch-hooks, substantially as and for the purpose described.

2. The combination of the clutch-hooks A A, with cross-bars B, cross-head C, with prong H and pulleys b b and c c, the trip-block F, with hook-catch e and trigger f, the outer rope, E, extending from the lower part of the clutch-hooks to the trip-block, and the inner rope, D, extending from the lower part of the clutch-hooks through the cross-head and adapted to be caught by the hook-catch on the trip-block, substantially as and for the purpose described.

896,882. CORK-CUTTING MACHINE. HAKON S. LARSEN, Christiania, Norway. Filed June 21, 1888. Serial No. 277,785. (No model.) Patented in Norway Aug. 27, 1887.



Claim.—1. In an automatic cork-machine, the combination, with a turning apparatus, F, consisting of an axially-movable spindle, 54, constantly rotated by suitable gearing, of a carrier-wheel, H, consisting, essentially, of two disks, between which the cork blocks are held, and one of which disks, 27, is provided with a number of spindles provided on one side with a prong-chuck and on the other with a coupling-clutch, said turning spindle 54 being also provided with a coupling-clutch, which coupling-clutches are engaged with each other at intervals by means of the axial movement of the turning spindle, and said disk being mounted on an axle having an intermittent rotary motion at intervals corresponding with the number of spindles in the disk, substantially as herein described.

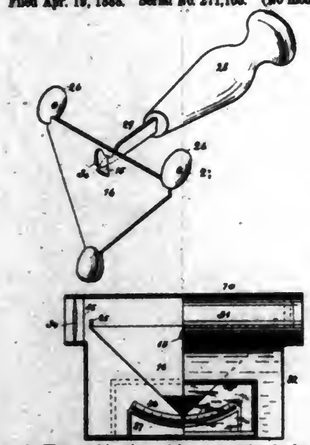
2. In an automatic cork-machine, a carrier-wheel, H, composed of two disks mounted on the same shaft, one of said disks, 27, having a number of spindles at equal distances from each other near the periphery of the disk, the axes of which spindles are parallel to the axis of the disks, said spindles running through the disk, and having on the inside a prong-chuck and on the outside a coupling-clutch, and the other disk, 26, having also near its periphery, opposite to the aforesaid spindles, a corresponding number of spindles with prong-chucks, in combination with spring-boxes inserted from the outer side of said disk, a spring in said spring-boxes acting upon the end of the spindles, and the spring-boxes being at intervals pushed to their inmost position and held there by means of stopper-arms 35 on the outside of the disk, being allowed at intervals to issue from the holes in which they are fitted, and thereby releasing the spring, said intervals being fixed by the movements of two arms, 38 and 39, periodically touching the ends of the spring-boxes, and both disks having at intervals an intermittent rotary movement imparted in one direction, according to the number of spindles at the periphery, substantially as herein described.

3. In combination with the carrier-wheel of an automatic cork-machine, as specified in claim 2, the pin 33 on the spring-box 30, working in a slot, 34, in the periphery of the disk 26, in combination with an angle-piece, 39*, acting as a wedge against the pin 33 under the revolution of the carrier-wheel, substantially as herein described.

4. In an automatic cork-cutting machine provided with a carrier-

wheel, H, composed of two disks mounted on the same shaft, one of said disks having a number of spindles provided with prong-chucks and coupling-clutches and the other disk having a corresponding number of spindles with prong-chucks acting in connection with spring-boxes, the combination, with said carrier-wheel, of a transporting-wheel, G, and devices connected therewith for pushing the cork blocks into the carrier-wheel, substantially as herein described.

396,883. HAND-LEVEL. CHARLES E. LAWRENCE, New Brighton, N. Y. Filed Apr. 19, 1888. Serial No. 271,163. (No model.)



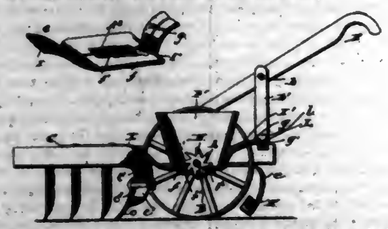
Claim.—1. The combination, with a supporting-body having horizontally-aligned sighting devices, of a counterbalanced pendant pivotally connected at its vertical center to the said support between its sighting devices, the extreme upper surface or edge of the pendant at both sides of the pivotal point being in line with the sights on the body when they are in a true horizontal plane, but interrupting or crossing the line of vision between the sights when the latter are not in such a plane, substantially as set forth.

2. The combination, with the supporting-body having opposite aligned sighting devices, and a segmental scale below the same, of a triangular pendant pivoted to the support on a central vertical line having its base uppermost and in the plane of the sighting devices when they are on a true horizontal line, and provided at its vertex with a pointer, substantially as set forth.

3. The combination, with the open-ended tube provided with aligned sighting devices in its ends, of the counterbalanced pendant pivoted between the said sighting devices, with its extreme upper surface or edge at opposite sides of its pivotal point in line with said sights when they are in a true horizontal plane, substantially as set forth.

4. The combination, with the casing 32, having the graduated segment 36 and glazed aperture therefor, and the tube 31, having lenses and crossed sight-wires in its ends, of the triangular pendant 16, pivoted on a vertical central line near its base in the tube, and having pins 25 in line with the points of intersection of said wires when they are in a true horizontal plane, the vertex of said triangle having a pointer registering with the segment, substantially as set forth.

396,884. PLANTER. STEPHEN A. LOWE, Marion Station, Miss. Filed June 30, 1888. Serial No. 278,068. (No model.)



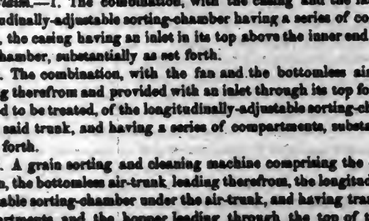
Claim.—1. In a planter, the combination, with the main frame and tongue secured between the front side rails thereof, of the hopper, the spring-plate G, connecting the bottom of the hopper and the tongue, the spring-plate g', connecting the rear ends of the side rails o the main frame, and the spring-plate g, connecting the middle of the plate g' and the bottom of the hopper, substantially as specified.

2. In a planter, the combination, with the main frame having bearing-notches in its side-rails, of the axle resting in said notches, and the spring-arms of the coverer-bar secured to said side rails and completing the axle-bearings, substantially as specified.

3. The herein-described planter comprising the main frame, the tongue having a downwardly-curved and slotted rear end, the furrow-opener adjustably attached to said rear end, the axle, the wheels on the inner side of the side rails of the main frame, the hopper supported by springs upon the main frame and provided with a longitudinal feed-slot in its bottom, and the feed-wheel secured to the axle and having the spring-arms of said bar completing the bearings for the axle, substantially as specified.

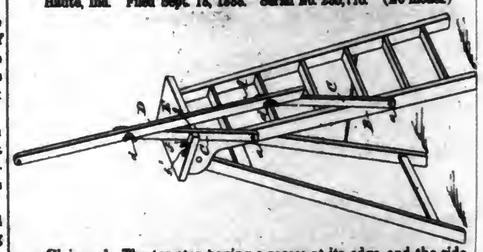
4. In a planter, the combination, with the main frame and tongue, of the hopper having a bottom provided with a longitudinal feed-slot, I', the spring-plate G, connecting the tongue and hopper and provided with a slot, I, running into the slot f', the spring-plate g, provided with a slot, I', running from the slot f' to and out of the rear end of the said spring-plate, the transverse spring-plate g', provided with the slot L, and the set-screw l, engaging a nut below said spring-plate g.

396,885. STOPPER-FASTENER. CHARLES P. MAHER, Allegheny, Pa. Filed June 23, 1888. Serial No. 277,944. (No model.)



Claim.—In a stopper or cover fastener, the combination, with a bail having its upper end provided with eyes or loops and its cross-bar constructed and arranged to surround and protect one side of the bottle-neck or jar, of the lever having connection with the stopper or cover and the eyes or loops of the bail and constructed and arranged to surround and protect the side of the bottle-neck or jar opposite that occupied by the cross-bar of the bail, substantially as set forth.

396,886. GUARD FOR STEP-LADDERS. OTTO J. MEISEL, Terre Haute, Ind. Filed Sept. 18, 1888. Serial No. 285,710. (No model.)



Claim.—1. The top step having a recess at its edge, and the side piece or upright of the ladder having arms pivoted thereto, in combination with a guard-rail pivoted to the said arms and a fastening device for locking the upper arm in the said recess, substantially as and for the purposes set forth.

2. The top step, E, having a recess, g, at its edge, and the side piece, B, of the ladder, having the arms C C pivoted thereto, in combination with the guard-rail D, pivoted to the arms C by set-screws d, and a fastening device or hook, f, for locking the upper arm C in the recess g, substantially as described.

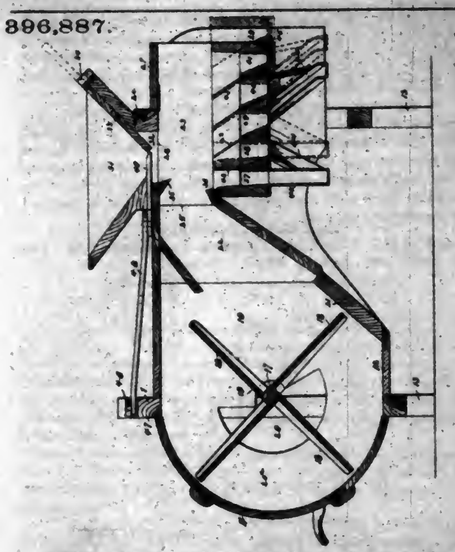
396,887. SEED GRADER AND CLEANER. WILLIAM MERRIS, Bradleytown, Pa. Filed Apr. 24, 1888. Serial No. 271,672. (No model.)

Claim.—1. The combination, with the casing and the fan, of a longitudinally-adjustable sorting-chamber having a series of compartments, the casing having an inlet in its top above the inner end of the said chamber, substantially as set forth.

2. The combination, with the fan and the bottomless air-trunk leading therefrom and provided with an inlet through its top for grain or seed to be treated, of the longitudinally-adjustable sorting-chamber under said trunk, and having a series of compartments, substantially as set forth.

3. A grain sorting and cleaning machine comprising the casing, the fan, the bottomless air-trunk leading therefrom, the longitudinally-adjustable sorting-chamber under the air-trunk, and having transverse compartments, and the hopper leading through the top of the air-trunk over the inner or front end of said chamber, the horizontal sliding gate 49 and the inclined sliding gate 33 meeting at their inner ends in the hopper-outlet, substantially as set forth.

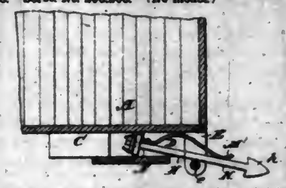
396,887.



4. The combination, with a blast-trunk, a grading-receptacle adjustably supported from said trunk, a vertical transverse partition in said receptacle at the inner end, and a series of spaced essentially-inclined partitions adjacent to the vertical partition, and a hopper supported upon said trunk near the inner end, of a fan and a funnel-shaped conductor uniting the fan-chamber and trunk, substantially as shown and described.

5. The combination, with a blast-trunk, a grading-receptacle adjustably supported from said trunk, a vertical transverse partition in the receptacle at the inner end, and a series of adjacent essentially-inclined partitions, a hopper supported upon the trunk, and gates sliding upon the hopper at an angle to each other, of a vertical metal extension secured to the said vertical partition, similar extensions secured to the remaining partitions inclined in direction of the hopper-opening, a fan, a funnel-shaped conductor connecting the fan-chamber and trunk, a rearwardly-inclined baffle-plate secured to the upper inner surface of the trunk-entrance, and a forwardly-inclined guide-plate attached to the inner bottom surface of trunk below the baffle-plate, substantially as and for the purpose specified.

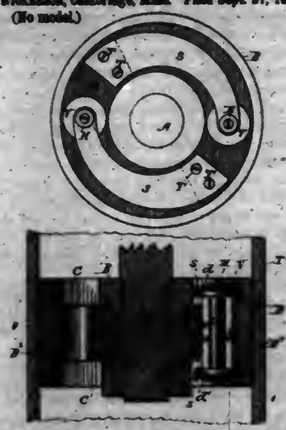
396,888. CAR-COUPLING. JAMES MUTTON, Frisco, Utah. Filed Nov. 3, 1888. Serial No. 290,266. (No model.)



Claim.—1. In a car-coupler, the combination, with the sills of the car, of opposing blocks attached to the said sills a distance from the end of the said car, and equivalent blocks secured to the said sills at the end of the car, of downwardly-extending perpendicular bars or arms secured to the forward end of the forward blocks, a friction-roller journaled in said bars, a link provided with an arrow-shaped head reciprocating between the forward blocks and upon the roller, a guide-plate secured to the inner end of the link reciprocating between the forward and rear blocks, and a base-plate covering the space intervening the said forward and rear blocks, as and for the purpose specified.

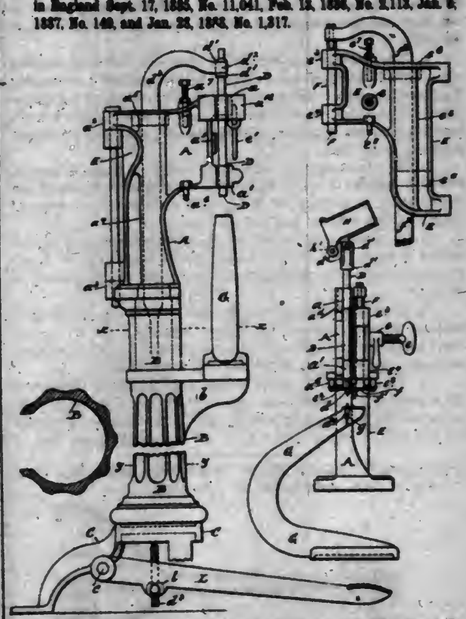
2. In a car-coupler, the combination, with the car-body and longitudinal sills secured to the under surface of the same, opposing blocks secured to the sills a distance from the end of the body, spaced opposing blocks attached to the said sills at the end of the said body, provided with recesses in their forward contiguous faces, downwardly-extending perpendicular bars or arms secured to the recessed surfaces of the forward blocks, and a friction-roller journaled in said bars, of a link reciprocating between the forward blocks, bearing upon the roller, provided with an arrow-like head, a transverse guide-plate attached to the inner end of the link reciprocating in the space intervening the forward and rear blocks, a spring secured to the upper surface of said link, having a bearing against the under surface of the car, and a guide-plate secured to the said blocks and covering the space intervening the same, all combined to operate substantially as shown and described.

396,889. FLUID SPEED-REGULATOR FOR ELEVATORS. WILLIAM H. HINKEMEYER, Cambridge, Mass. Filed Sept. 27, 1888. Serial No. 286,021. (No model.)



Claim.—In a fluid speed-regulator device, the combination of the cylinder T, piston-rod A, and piston B, with a two-seated valve, Y, and springs S S, adapted to hold the valve open and to yield sufficiently to allow the valve to close when the velocity of the fluid in its valve-passage in either direction generates a certain amount of pressure.

396,890. PUNCHING AND EYELETING MACHINE. MARSHALL H. PEARSON and CHARLES BENNER, Leicester, County of Leicester, England. Filed Apr. 24, 1888. Serial No. 271,711. (No model.) Patented in England Sept. 17, 1885, No. 11,041, Feb. 13, 1886, No. 2,113, Jan. 8, 1887, No. 149, and Jan. 28, 1888, No. 1,317.



Claim.—1. The combination of the standard A, the frame E, hinged thereto, the punching-tool and eyelet-clinching die mounted on shafts or spindles reciprocating in the standard A and hinged frame E, the spring for holding together the standard A and frame E, and means for opening and adjusting the distance between the standard A and frame E, substantially as set forth.

2. In a punching and eyeleting machine, the combination of a standard, A, having a vertical eyelet-clinching spindle sliding in bearings on said standard, mechanism, substantially as described, for actuating said spindle, and a work-supporting horn, G, with a pillar, B,

(mounted on legs C,) adapted to connect the said standards together and retain them in their respective positions to each other, substantially as set forth.

3. In a punching and eyeleting machine, the combination of a standard, A, secured to pillar B, a vertical sliding spindle, D, adapted to slide in bearings on said standard and operated by mechanism, as described, with a flat-bottomed radial reciprocating eyelet-box divided into two compartments and hinged to a supporting-bracket secured to said standard, a vertical hopper-ended conducting-chute hinged to said supporting-bracket and box, and mechanism, substantially as described, adapted to actuate and reciprocate the box and chute simultaneously or separately, as set forth.

4. In a punching and eyeleting machine, the combination of the standard A, secured to the pillar B, the vertical spindle adapted to slide in bearings on said standard, the self-feeding eyelet-box and chute, operating mechanism, substantially as described, and work-supporting horn, with an adjustable framing, E, having bearings at one end adapted to receive a vertical sliding spindle carrying the punching-tool and hinged at the other end to the said standard, and the mechanism, substantially as set forth, for adjusting and increasing the distance between the spindles carrying the eyelet-clinching and punching tools, as set forth.

5. In a punching and eyeleting machine, the combination of the standard A, secured to the pillar B, mounted on legs C, the vertical spindle D, carrying the upper clinching-die, adapted to slide in bearings on said standard, the work-supporting horn G, the self-feeding eyelet-box H, chute I, and frame E, hinged at one end to said standard and provided at the other end with bearings to receive the vertically-sliding spindle F, carrying the punching-tool *f*, with the treadles L L', pivoted to the legs C, and intermediate mechanism, substantially as described, connecting said parts to the spindles D and F, whereby the latter may be operated, as set forth.

6. In a punching and eyeleting machine, the combination of the pillar mounted on legs adapted to receive the treadles, the standard adapted to be secured to said pillar and to receive the sliding spindle carrying the upper eyelet-die, and the framing adapted to be hinged at one end to said standard and at the other to receive the vertical sliding spindle carrying the punching-tool, and intermediate mechanism, as described, connecting said spindles to the treadles, whereby either spindle may be operated by its respective treadle, the other at the same time being inoperative, or both operated simultaneously, as set forth.

7. The combination of spindle D, eyelet-box H, divided into two compartments and hinged to a support, A, guiding-shield J, angle-plate K, chute I, hinged to said support and eyelet-box, hopper i^7, guiding-plates i^8 i^9, covering-plate i^2, spring i^3, cam-lever d^{10}, projection a^{10}, against which said cam-lever operates, cam d^9, and roller d^8, all substantially as set forth.

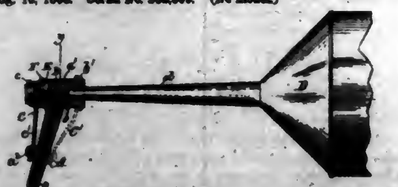
8. The combination of standard A, pillar B, frame E, lever d', screw a^{11}, spindles D and F, nipple d^{11}, adjusting-screw e, pins a^4 and e^4, and spring e^3, whereby the said spindles are adjusted and retained at the required distance apart, as set forth.

9. The combination of the standard A, bearings a a', slotted spindle D, upper die, d, secured in said spindle, headed and slit nipple d^{11}, and pin d^{10}, with which said nipple engages, all substantially as set forth.

10. The combination of standard A, slotted spindle D, sliding in bearings on said standard, upper die, d, nipple d^{11}, pin d^{10}, hinged chute I, spring d^{12}, cam d^9, secured to the chute, and roller d^8, adapted to engage with said cam, all substantially as set forth.

11. The combination, with a punching and eyeleting machine, of the treadles L L', pivoted to the legs C, said treadle L' being partially composed of a flat spring, l^3, rods d^{13} and f^9, trunnion-nuts l l', springs d^{11}, d^{12}, and f^{10}, and spindles D and F, all substantially as set forth.

396,891. OIL-CAN NOZZLE. JOHN S. PEPPER, Lincoln, Nebr. Filed Aug. 16, 1888. Serial No. 282,899. (No model.)

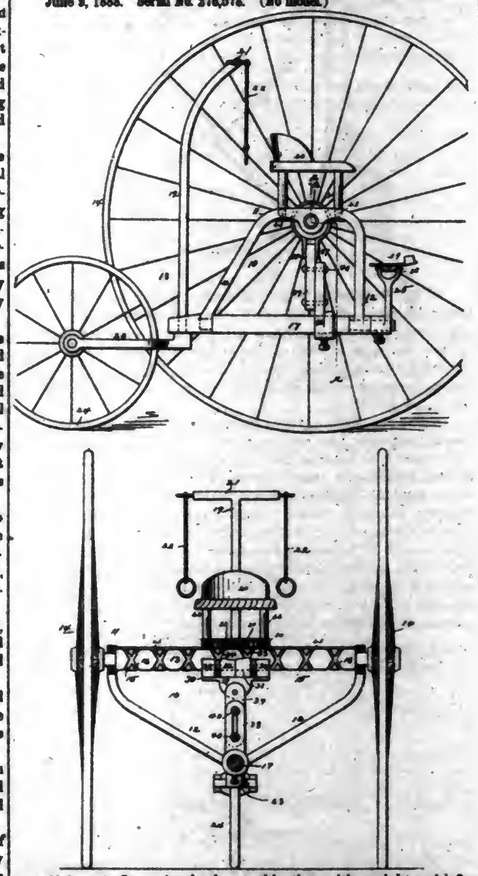


Claim.—1. The combination, with a can-nozzle, of a rotatable discharge-tube fitted thereto and projecting laterally and a spring automatically holding the tube in position to normally cut off the flow of oil or other fluid from the nozzle, substantially as herein set forth.

2. The combination, in a can-nozzle, of a head-piece adapted for attachment to an oil or fluid can or vessel and having an angular or curved interior passage or bore, a rotatable laterally-projecting discharge-tube fitted to the head-piece and having a passage adapted to register with the head-piece passage, and a spring automatically holding the discharge-tube in position to cut off the oil or fluid flow from the nozzle, substantially as herein set forth.

3. The combination, in a can-nozzle, of a tube, A, having a passage, *a*, a head-piece, B, provided with an angular or curved passage, *b*, and fitted to the tube so as to prevent backward movement thereof, said tube projecting laterally from the head-piece, a spring connected to the head-piece and normally throwing the passages *a b* out of line, and a stop device on the head-piece and tube, substantially as described, for the purposes set forth.

396,892. TRICYCLE. FRANCIS W. POST, Norwich, Conn. Filed June 9, 1888. Serial No. 276,578. (No model.)



Claim.—1. In a tricycle, the combination, with a right and left hand spirally-grooved axle, of a rock-shaft at right angles to said axle, a sleeve traveling upon said axle, rings loosely held in the sleeve provided with lugs entering the grooves, and a link connecting the rock-shaft and sleeve, substantially as shown and described.

2. In a tricycle, the combination, with a right and left hand spirally-grooved axle, drive-wheels rigidly secured to the same, and a rock-shaft at right angles to the axle, of a sleeve reciprocating upon the axle, rings loosely held in said sleeve, provided with lugs entering the grooves, a link connecting the rock-shaft and sleeve, and pedal-arms secured upon the rock-shaft, all as shown and described.

3. In a tricycle, the combination, with a right and left hand spirally-grooved axle, drive-wheels rigidly secured to the same, and a rock-shaft at right angles to the axle, of a clutch-carrying sleeve reciprocating upon the axle, rings loosely held in said sleeve, having lugs entering the axle-grooves, a compensating link uniting the rock-shaft and sleeve, and an essentially V-shaped pedal-carrier vertically secured to the said rock-shaft, substantially as shown and described.

4. In a tricycle, the combination, with a right and left hand spirally-grooved axle, drive-wheels fixed upon the same, and a rock-shaft at right angles to the axle, of a sleeve reciprocating upon the axle, toothed rings centrally and loosely held in said sleeve, having lugs entering the axle-grooves, toothed rings secured to the sleeve, compensating links uniting the rock-shaft and sleeve, and an essentially V-shaped pedal-carrier vertically secured upon said rock-shaft, substantially as shown and described.

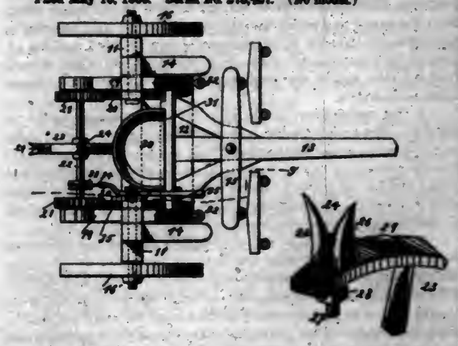
396,893. APPARATUS FOR MAKING MOLDS. EDWARD REMOT, Little Falls, N. Y. Filed Nov. 8, 1888. Serial No. 290,265. (No model.)



Claim.—1. The apparatus for making molds herein shown and described, consisting of inner and top and bottom frames adapted to be placed together, in combination with pattern-plates adapted to hold the patterns and to be held between the frames for forming the mold, and to be removed from the frames for drawing the patterns, substantially as described.

2. The removable and oppositely-placed plates C D, having patterns E F, secured to the plates, formed with coinciding gates E' F', in combination with the separate frames of the flask, substantially as described.

396,894. STALK-PULLER. GEORGE W. ROGERS, Baltimore, Md. Filed May 10, 1888. Serial No. 273,427. (No model.)



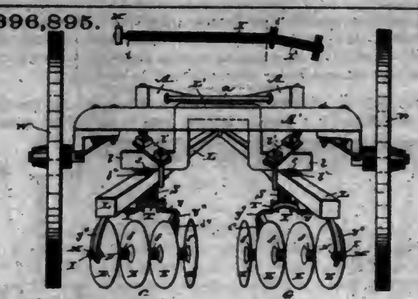
Claim.—1. A stalk-puller comprising a frame having opposite axles carrying drive-wheels and gears, a shaft journaled in rear of said axles and provided with end gears meshing into said axle-gears, a wheel, 23, also on said shaft, and the teeth 24, having threaded shanks 27 extending through the rim of the wheel and provided with nuts, and said teeth being bifurcated to form two outwardly-curved members, 25 26, substantially as set forth.

2. The combination, with the stalk-pulling wheel 23, of the teeth 24, having threaded shanks 27 extending through the rim of the wheel, provided with nuts 26, and the braces 29, secured to the rim and bearing against the rear sides of the teeth, substantially as set forth.

3. In a stalk-puller, the bifurcated tooth 24, formed with outwardly-curved members 25 26 and with a threaded shank at its base, substantially as set forth.

4. The combination, with the main frame having transversely-apertured front bar, 12, and drive-wheels, of the inner frame, having side bars, 19, mounted on the axles to swing vertically independent of the main frame, and connected at their front ends by a cross-bar, 19, having apertures in line with those in bar 12, the shaft 22, mounted in the rear ends of bars 19, the wheel 23 on said shaft and provided with bifurcated teeth 24, having outwardly-curved members 25 26, gearing connecting said shaft with the drive-wheels, pins 32, connecting the bars 12 31, and mechanism for raising the rear end of the inner frame upon the removal of said pins, substantially as set forth.

396,895. DISK CULTIVATOR. HENRY M. ROSE, Watertown, Ill. Filed Sept. 7, 1888. Serial No. 284,908. (No model.)



Claim.—1. A disk cultivator having the inner disks of the gangs set at a different angle to the line of advance from that of the other disks of the gangs, substantially as set forth.

2. In a disk cultivator, the gangs G, having the disks E of the outer or main portion set at an angle to the line of advance and the disk E' at the inner end of the gang set at a less angle to the line of advance, substantially as set forth.

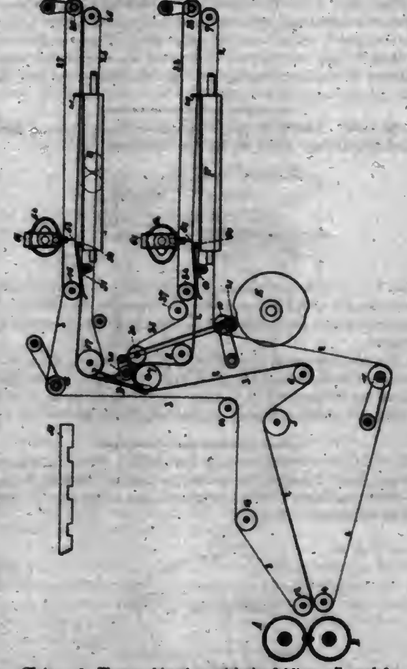
3. The combination, with the gang-yoke or support, of a shaft or journal mounted therein for the outer portion of the gang, a second journal at an angle to the first for the inner disk of the gang, and the disks mounted on said journals, substantially as set forth.

4. In a gang for disk cultivators, the combination, with the other disks, E, and the inner disk, E', of the part I I', forming two journals at an angle to each other for said disks, substantially as set forth.

5. The combination, with the gang, of the arched gang yoke or support and the arch T, supported by the main frame, and clamps for adjusting the gang and securing it in vertical planes, substantially as set forth.

6. The combination, with the gang, of the arched gang yoke or support, the arch T, carried by the main frame, and clamps for securing said arches together, said clamps being also constructed to permit of the swinging of the gang-yoke for adjustment in horizontal planes and to secure said yoke to the arch T with the gang at the desired angle to the line of draft, substantially as set forth.

396,896. SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES. WALTER SCOTT, Plainfield, N. J. Filed Mar. 2, 1888. Serial No. 265,921. (No model.)

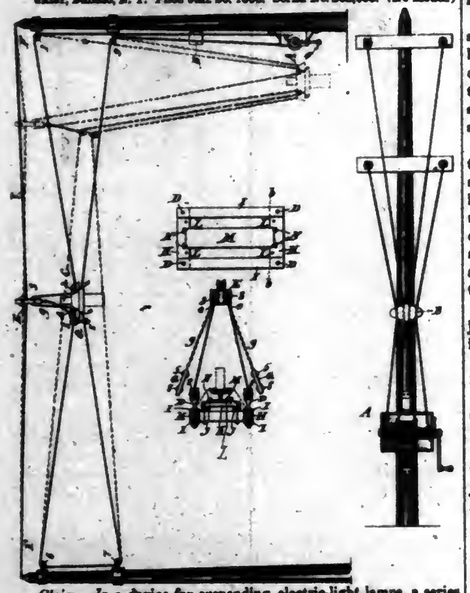


Claim.—1. The combination, with the folding-rolls and fence and the tapes or belts for conveying the sheets to such folding-rolls, of the cross-bar or roller, the stationary guides or rods over which the sheets are passed, the fingers acting adjacent to the cross-bar, and the cams for giving the proper movements to such fingers, substantially as set forth.

2. The combination, with the folding-rolls and the fence for stop-

ping the sheets, and the tapes for conveying such sheets to the folding-rolls, of the cross-bar or roll and the inclined rods or guides, over which one set of the tapes pass for moving along and delivering the sheets over the cross-bar or roller, substantially as set forth.

396,897. SUSPENDING ELECTRIC-LIGHT LAMPS. AUGUST SIEGERT, Buffalo, N. Y. Filed Jan. 26, 1888. Serial No. 262,085. (No model.)



Claim.—In a device for suspending electric-light lamps, a series of cables, in combination with baskets C, carriage E, pulleys 1, 2, 3, 4, 5, 6, 7, 8, and 9, yokes B and G, and windlass A, provided with a single drum divided into parts of which some are, in diameter, many times larger than others, substantially and identically as shown, described, and for purposes set forth.

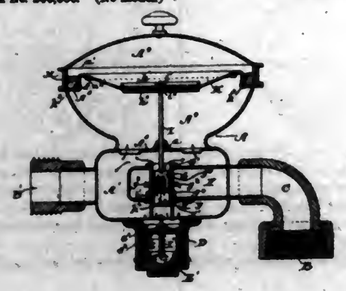
396,898. TOOTH-BRUSH. WILLIAM H. SMITH, Florence, Mass. Filed June 4, 1888. Serial No. 275,948. (No model.)



Claim.—1. The combination, with the brush A, provided with the short shank *c*, of the hollow handle B, formed of the halves *d d'*, connected by hinges and adapted to receive the brush, substantially as described.

2. The combination of the hollow handle B, formed of the similar halves *d d'*, having semicircular grooves *i*, the hinges *s*, connecting the halves, the spring-catch *f*, the push-pin *h*, and the brush A, provided with the shank *c*, pivoted in the half *d'*, substantially as described.

396,899. AUTOMATIC GAS-GOVERNOR. REUBEN H. SPEAKE, Washington, D. C., assignor of two-thirds to Charles A. Mellhuish, Charles R. Eberle, and Henry C. Borden, all of same place. Filed Mar. 10, 1888. Serial No. 266,880. (No model.)



Claim.—1. In a gas-governor, substantially as described, the combination, with the shell, of the inlet-pipe, the cylindrical valve-casing, and a cylindrical valve actuated by the pressure of gas within the pipes leading from the shell to the burners, having circumferential ports to register with similar ports in the casing, and having discharge-openings at both of its ends leading to the service-pipe, substantially as described, for the purpose specified.

2. A gas-governor comprising a shell, a valve-casing located within said shell, having ports to surround the valve, the cylindrical valve having peripheral ports and also having discharge-openings at both of its ends leading to the service-pipe secured in said seat to control the admission of gas to the shell, and the diaphragm for supporting said valve, actuated by the gas within the shell, substantially as described.

3. The combination, with the inlet-pipe and its exterior shell, of the open-ended cylindrical valve-casing passing transversely through said inlet-pipe and opening at both of its ends into the shell, and having peripheral ports opening therein, the cylindrical valve fitted to move longitudinally within said casing, having circumferential induction-ports to register with the ports of the valve-casing and open at both of its ends to discharge into the exterior shell and service-pipe, and a diaphragm arranged within said exterior shell for actuating the valve, substantially as described.

4. The combination, with the exterior shell and inlet-pipe projecting into said shell, of an open-ended cylindrical valve-casing passing transversely through said inlet-pipe, and a cylindrical valve having peripheral ports and discharge-openings at both of its ends leading to the service-pipe, substantially as described.

5. The combination, with the shell, of the inlet-pipe passing into said shell, the cylindrical valve-casing fitted transversely through the inlet-pipe, the cylindrical valve adapted to move longitudinally within the valve-casing and across the inlet-pipe, the diaphragm attached to the valve and actuated by the pressure within the shell, and the adjustable spring-actuated rod secured to the lower end of the valve to hold the valve against the pressure beneath the diaphragm, substantially as described.

6. The combination, within the inlet-pipe, of the open-ended cylindrical valve-casing having a circumferential port or ports and inwardly-projecting valve-seats respectively above and below said ports, and the cylindrical valve fitted to move longitudinally within said casing and having ports to register with those of the casing, and outwardly-projecting circumferential shoulders to fit upon the valve-seat of said casing, substantially as described.

7. The combination of the shell having an inlet-pipe projecting therein, the cylindrical valve and its casing fitted into the inlet-pipe, the diaphragm located in the upper portion of the shell, and the perforated crown-sheet overlying the valve, having the inner rim of its central portion to project outside of the rim of the valve and seat to allow free passage of the gas to the under side of the diaphragm and protect the valve and its seat from tar drip, substantially as described.

396,900. METALLIC FASTENING DEVICE. FERDINAND W. STARR, Springfield, Ohio. Filed Jan. 17, 1888. Serial No. 260,967. (No model.)



Claim.—1. A fastening device having substantially parallel sides, a corrugated body, and parallel zigzag driving and entering edges, substantially as specified.

2. A strip adapted to be cut into fastening devices, the latter having opposite zigzag parallel edges, one of which is beveled, and a series of corrugations extending from one edge to the other, substantially as specified.

3. A fastening device having a corrugated body and zigzag entering edge, substantially as specified.

396,901. WINDOW-VENTILATION. ALFRED C. STEVENSON, Oakdale Station, Pa. Filed June 23, 1888. Serial No. 278,495. (No model.)

Claim.—1. The combination, with a window-frame, of journal-plates set in the upper portion of the grooves for the lower sash, side guides formed in the bead between the two sash-grooves, a spring-roller journaled in the plates in the upper portion of the lower sash-groove, a foraminous diaphragm wound upon the roller and provided with a heavy bar on each side extending beyond the ends of the roller and traveling in the guides, and a rigid strip attached to the lower end of the foraminous diaphragm and connected to the upper end of the upper sash, substantially as and for the purpose described.

2. The combination, with a window-frame, of two spring-rollers arranged side by side, provided with foraminous diaphragms arranged

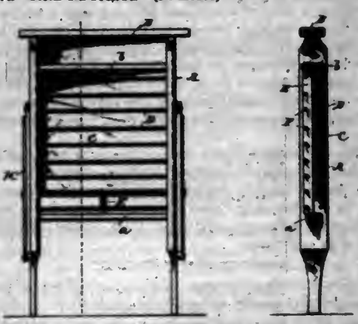
396,901.



to be pulled down across the opening of the window-sash to form a space between, and a support attached to the window-frame and arranged between the diaphragms for the reception of volatile substances for modifying the character of the air admitted to the room through the same, substantially as described.

3. The combination, with a window-frame, of two spring-rollers arranged side by side and provided with foraminous diaphragms arranged to be pulled down across the opening of the sash, supports arranged upon the window-frame between the diaphragms, and a box-frame consisting of top, bottom, and ends held upon said supports and having their edges fitting closely against the two diaphragms to form a receptacle for disinfectants, inhalents, &c., as described.

396,902. COMBINED CORN-SHELLER AND WASH-BOARD. JOHN M. STOKES and OLIVER P. REED, Agnilasco, Tex. Filed July 31, 1888. Serial No. 281,631. (No model.)

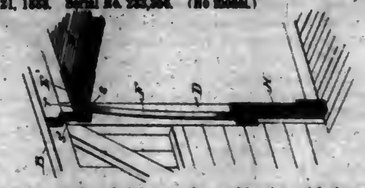


Claim.—1. The combination, with the frame, the backing, and the rods D upon one side of said backing, of the vertical strip E and the rods F, secured thereto near the outer face thereof upon the opposite side of said backing, substantially as and for the purpose specified.

2. The device described, consisting of the frame, the backing, the transverse rods secured to said backing upon one side thereof, the vertical strip upon the opposite side of said strip, and the transverse rods F, secured to the outer edge of said strip, the pivoted legs, and the bars H, pivoted at one end to the side bars of the frame and at the other provided with elongated slots engaging pins on the legs, substantially as shown and described, and for the purpose specified.

3. As an improved article of manufacture, a corn-sheller consisting of a suitable frame and a backing, a strip secured centrally between the side bars of the frame parallel therewith, and the transverse rods F, held in said side bars and strip E at a distance from said backing, substantially as shown and described, and for the purpose specified.

396,903. CAR-DOOR. CONRAD THIES, Chicago, Ill. Filed Aug. 21, 1888. Serial No. 283,366. (No model.)

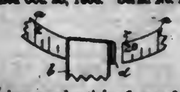


Claim.—1. In a freight-car, the combination, with the grain-door E, of guide-loop hangers E' upon the door and guides F upon the door-casing, provided toward their upper extremities with shoulders *r* and depressed seats *s* on the outer sides of the guides, substantially as described.

2. In a freight-car, the combination, with the grain-door E, of guide-loop hangers E' upon the door, guides F upon the door-casing, provided toward their upper extremities with shoulders *r* and depressed seats *s* on the outer sides of the guides, and catches G, depending from the ceiling of the car in the path of the lateral edges of the door E, substantially as described.

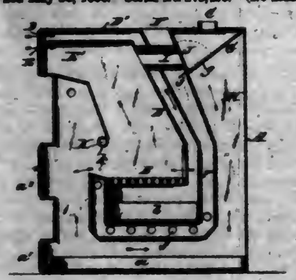
3. In a freight-car, the combination, with the door E, of guide-loop hangers E' upon the door, guides F, provided toward their upper extremities with shoulders *r*, depressed seats *s* on their outer sides to receive the loops E', which slide upon the guides, and recesses *s'* on the inner sides of the latter, catches G, depending from the ceiling of the car in the path of the lateral edges of the door E, and vertical shields H along the lower portions of the sides of the door-casing, provided with retaining-flanges for the door in its lowered position, substantially as described.

396,904. LOT-TICKET AND SIZER. SOLOMON J. WALLACH, New York, N. Y. Filed Oct. 26, 1888. Serial No. 289,160. (No model.)



Claim.—As an improved article of manufacture, a lot-ticket provided with an extension, *k*, and a sizer, *a*, the extension *k* being doubled over the end *p* of the sizer, forming thereby an opening, *d*, on the back of the lot-ticket adapted to allow the sizer to be run through and held therein, and thus to mark the correct size, all constructed as and for the purpose substantially as described.

396,905. HOT-AIR FURNACE. EDWARD W. WELLS, Oskaloosa, Iowa. Filed May 30, 1888. Serial No. 275,469. (No model.)



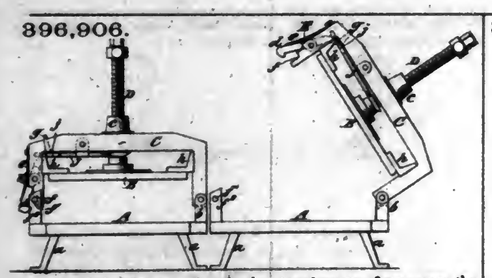
Claim.—1. In a hot-air furnace, the combination, with the shell, the magazine with draft-slide E, and the grate, of the interior flue, D', with draft-slide extended beneath the grate and the flue F, around the flue D', and beneath and up the front side of the grate, and provided with apertures *f*, communicating with the exterior of the shell, substantially as and for the purpose specified.

2. In a hot-air furnace, the combination, with the shell provided with flues D', F, and H, of the inclined plate G, dividing the flue H into two parts and provided with opening *g*, the direct-draft flue I, and the damper J, pivoted at *j*, arranged to alternately close or disclose the opening *g* or the rear end of the flue I, substantially as and for the purpose specified.

396,906. PRESS. FREDERICK F. WHITTAL, Jersey City, N. J., assignor of one-half to John J. Ginger, same place. Filed Aug. 31, 1888. Serial No. 284,342. (No model.)

Claim.—1. In a press, the combination, with a bed-piece, of a frame pivotally connected thereto, a platen, a screw for raising and lowering the platen, a spring-actuated dog for securing the frame and bed-piece, and a lever fulcrumed on the frame and engaging said

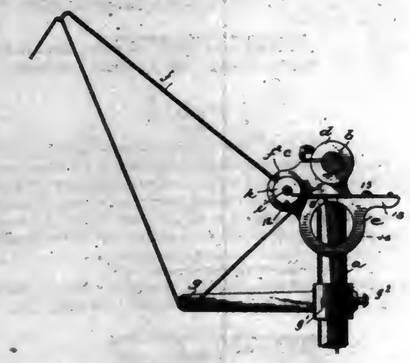
396,906.



screw and dog for operating the dog to release the frame upon the raising of the screw, substantially as specified.

2. In a press, the combination, with a bed-piece, of a frame pivotally connected thereto, a platen, a screw for raising and lowering the platen, a spring-actuated locking device for locking the frame to the bed-piece, a lever pivoted on said frame and having a loose connection with said screw, and also a loose connection with said locking device, whereby, as the said screw is rotated, the lever will be rocked to operate said locking device, and a stop for preventing a too extended upward movement of the platen, substantially as specified.

396,907. TAKE-UP AND TENSION DEVICE FOR KNITTING-MACHINES. FRANK WILCOMB, Providence, R. I., assignor to the Wilcomb Manufacturing Company, same place. Filed Apr. 15, 1887. Serial No. 234,943. (No model.)



Claim.—1. In combination, the take-up sweep pivotally supported, and a spring-pressure plate supported so as to engage with the yarn at all times for applying a tension thereto, said plate being arranged independent of the sweep and adapted to be automatically operated by engagement with a portion thereof for lessening the pressure of said plate on the yarn, substantially as described.

2. In combination, the take-up sweep pivotally supported, a spring-pressure plate for applying at all times a tension to the yarn, arranged independent of the sweep and adapted to be operated thereby to lessen the friction on the yarn, and an adjustable power device for returning the sweep to normal position, substantially as described.

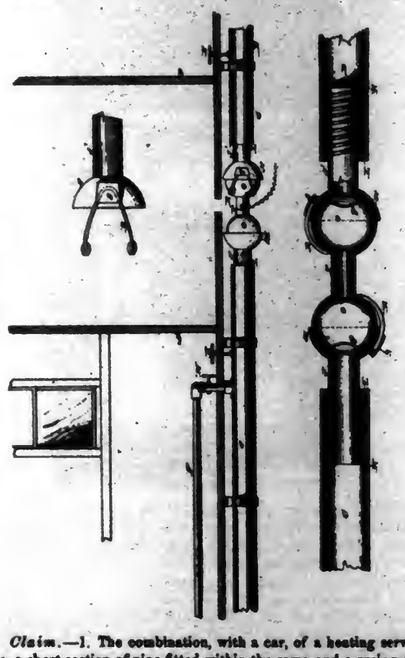
3. In combination, the sweep having a suitable bearing at its end, the spring-plate 5, automatically operated by engagement with a portion of the sweep, the shaft i, for pivotally supporting the sweep, and the spring coiled about said shaft having one end engaging therewith and the other end fixed, substantially as described.

4. In combination, the take-up sweep, an independent tension-plate, an independent spring for giving movement to the sweep, the pull upon the said spring being in the direction of its coils, and means for adjusting the tension thereof in its relation to the sweep, substantially as described.

5. In combination, the sweep, pivotally supported, a shaft, i, for supporting the sweep, and a spring for applying a tension to said shaft, the sweep being loosely fitted to the shaft and held thereto adjustably by a jam-nut, 9, whereby the relative positions of the sweep and shaft may be changed, substantially as described.

6. In combination, the sweep, a support, i, for the sweep, said sweep having a bearing at its end loosely fitted to the support i, and a spring coiled about the support for applying a tension to the parts, said support having a suitable thumb-piece, by which it may be turned to change its position in relation to the sweep, and a jam-nut, 9, substantially as described.

396,908. PIPE-COUPLING FOR RAILWAY-CARS. PHILIP S. WHEMAN, Springfield, Ohio. Filed Dec. 15, 1887. Serial No. 257,968. (No model.)



Claim.—1. The combination, with a car, of a heating service-pipe, a short section of pipe fitted within the same, and a spring connected to the service-pipe and to said section of pipe, and tending to project the latter from the former, the said section of pipe having a hemispherical hollow head, two hollow spheres connected by an intervening neck, one of which fits said head and each of which has an opening opposite the intervening neck, and a spring-clamp secured to the head and embracing the sphere within it.

2. The combination, with a central service-pipe and a tubular section slidingly fitted within it and provided with a hollow hemispherical head, a packing between the service-pipe and said tubular section, and a spiral spring connected with the service-pipe and section, and tending to project the latter from the former, of two hollow spheres connected together by an intervening hollow neck and having openings opposite the ends of said neck, and a spring-clamp connected to each head and composed of two prongs which engage the respective spheres.

3. The combination, with a tubular section having a hollow approximately hemispherical head, and a spring-clamp secured to the head and divided into two prongs, of two hollow spheres connected together by an intervening hollow neck and each having an opening in the end opposite the said neck, one of which is fitted into said head and is held by said clamp.

396,909. FISHING-ROD. JAMES ANNIS, Le Roy, N. Y. Filed May 24, 1888. Serial No. 274,919. (No model.)

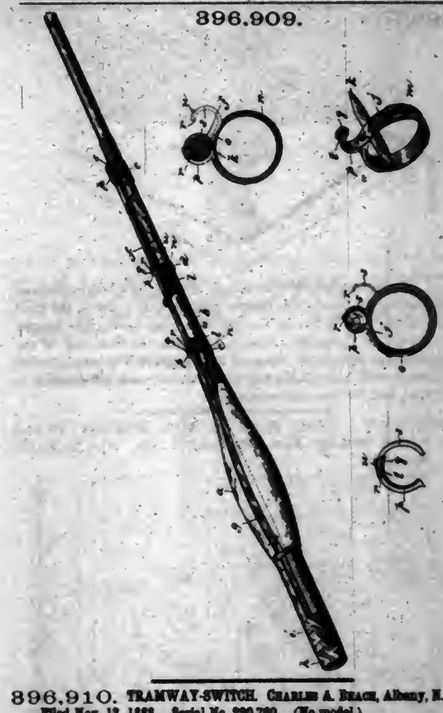
Claim.—1. In a fishing-rod handle or stock having a longitudinal recess therein for the reception of a rod-section, the combination of concentric clasping bands or rings for encircling the rod at intervals, provided with overlapping spring-clasps for engaging the rod-sections, substantially as described.

2. In a fishing-rod, a stock provided with a longitudinal recess for the reception of an extra tip, in combination with one or more eyes or clasps placed in alignment with said recess, in the manner and for the purpose set forth.

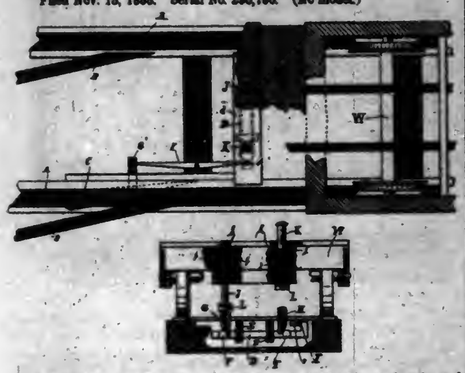
3. In a fishing-rod, one or more double rings arranged to slide within each other and provided with curved arms, the free ends of which lock one with the other by frictional contact, in the manner and for the purpose substantially as described.

4. A clasping-band for fishing-rods, comprising two concentric rings, one of which is fitted to slide within or upon the other, each being provided on its circumference with a reversely-curved spring projection to overlap and clasp a rod-section, substantially as described.

396,909.



396,910. TRAMWAY-SWITCH. CHARLES A. BEACH, Albany, N. Y. Filed Nov. 13, 1883. Serial No. 290,760. (No model.)



Claim.—1. The combination of the switch-block and the pivoted bar connected therewith with the longitudinally-movable frame located in front of the switch-block and connected to said bar, and the vertically-movable blocks having oppositely-inclined faces engaging and operating said frame, and the devices, substantially as described, on the car for depressing either of said blocks, substantially as and for the purpose specified.

2. The combination of the movable frame, the friction-rollers mounted thereon, and the vertical blocks having oppositely-beveled faces engaging the opposite friction-rollers of said frame with the switch-block in rear of said frame and the horizontal pivoted bar having one end pivotally connected with said block and its other end pivotally connected to said frame, substantially as described.

3. The combination of the switch-block, the longitudinally-movable frame located transversely in the main track, and the vertically-movable blocks for shifting said frame with spring-controlled standards mounted on a car and provided with inclined shoes adapted to be brought into contact with the blocks to depress the latter during the passage of a car thereover, and thus shift the switch, all substantially as specified.

4. The combination of the longitudinally-movable frame and its casing, its supports and friction-rollers, and the vertically-movable blocks having oppositely-beveled faces engaging the said rollers and adapted to shift the frame when depressed, with the pivoted bar connected to said frame and actuated thereby, and the switch-block in rear of the frame and connected to the opposite end of said bar, and the devices, substantially as described, for operating either block from a car, substantially as and for the purpose described.

5. The combination of the longitudinally-movable frame and the friction-rollers in the opposite ends thereof, the opposite blocks having beveled faces engaging said rollers and adapted to shift the frame when depressed, with the pivoted bar connected to one end of said frame, the switch-block, the link connecting said bar and switch-block, and the spring-supported standards carrying inclined shoes on their lower ends adapted to engage said blocks when depressed and cause the shifting of the switch, substantially as and in the manner specified.

396,911. PROCESS OF MAKING MOSAICS OF GLASS. HENRY F. BELOMER, Irvington, N. J. Filed May 11, 1887. Serial No. 237,790. (No model.)



Claim.—The process of manufacturing mosaics herein described, to wit: arranging glass or mineral plates in a separated relation to one another, casting a metal frame in the interstices between said plates or pieces, covering the surface edges of said plates with a thin coating of plumbago or other conducting material, and then electro-depositing a film of metal upon said covered edges and the metal frame, so as to form an overlapping flange to hold said plates or pieces in position, as and for the purposes set forth.

396,912. MOLD FOR MAKING MOSAICS. HENRY F. BELOMER, Irvington, N. J. Filed May 11, 1887. Serial No. 237,791. (No model.)



Claim.—1. The mold for casting frame-works for mosaics, which consists of sheets I F, having turned edges to form a top-metal receptacle, and having interposed mosaic plates or pieces arranged in a separated relation to receive the frame-work metal, substantially as and for the purposes set forth.

2. The improved mold for casting frame-works for mosaic plates or pieces, substantially as described, which consists of sheets of uninflammable asbestus having mosaic pieces interposed therebetween, the said sheets having a back-metal receptacle formed on the upper side, and on said upper side having vents and feeds K, projecting up through said receptacle, substantially as and for the purposes set forth.

3. In a mold for casting frames around mosaic plates or pieces, the combination of sheets F I, adapted to receive mosaic pieces, vertical flanges J, forming a back or top metal receptacle, and back or top metal pressing down on said sheets, substantially as and for the purposes set forth.

4. In a mold for casting mosaics of glass, the combination of flexible sheets F I, bent at the edges, as at J, and feeds or vents K, substantially as set forth.

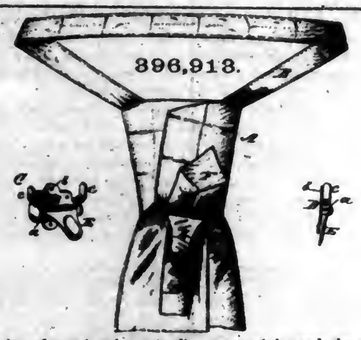
5. In a mold, the combination of flexible sheets F I, having flanges J and partitions L, substantially as and for the purposes set forth.

6. In a mold, the combination of sheets F I with interposed pieces separated from one another, back or top metal, O, perforated pieces G, and vents or feeds K, all said parts being arranged and combined substantially as and for the purposes set forth.

7. In a mold, the combination of the sheet F, wire C, mineral pieces arranged on said sheet F in separated relation to one another and to the said wire, a sheet, I, holding said wire and pieces in proper relation, flanges J, and vents and feeds, substantially as and for the purposes set forth.

396,913. BUCKLE-FASTENER. GEORGE BOMER, Rochester, N. Y., assignor of one-half to Bernhardt R. Kolloski, same place. Filed Oct. 23, 1888. Serial No. 288,947. (No model.)

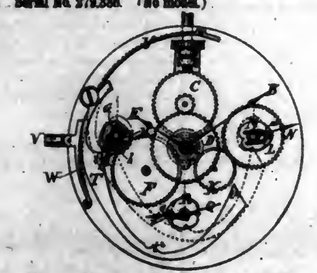
Claim.—1. The combination, with a neck tie or scarf, of a buckle having a pivoted lever, E, with jaw *a*, and the plate D, having guides



c, consisting of metal strips extending outward beyond the pivotal point of the jaw of the lever and edges of the plate and extending upward above said pivotal point, substantially as and for the purpose set forth.

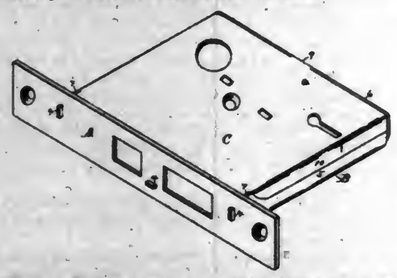
2. The combination, with a neck tie or scarf provided with a neckband and a buckle consisting of the plate D and pivoted lever E, with jaw *a*, of the independent protecting-flap F, substantially as and for the purpose specified.

396,914. STOP-WATCH. FRITZ BOVET and ALBIN R. BESSIRE, Bienne, Switzerland, assignors to H. Bovet, same place. Filed July 9, 1888. Serial No. 279,386. (No model.)



Claim.—The combination of the heart-cams R, H, and M, with a lever, T, having three projections, *f*, *f*², and *f*³, and with a spring, U, a pusher, V, and a lever, W, substantially as shown and described, and for the purpose specified.

396,915. LOCK-CASE. CHARLES M. BURGESS, New Britain, Conn., assignor to the Russell & Erwin Manufacturing Company, same place. Filed Sept. 27, 1888. Serial No. 286,531. (No model.)

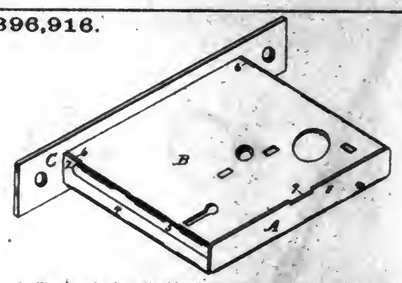


Claim.—The improved lock-case herein shown and described, consisting of the face-plate A and two side plates, B and C, each of the latter having the side flanges, whose edges abut against each other for a part of the length of the case, while the flanges upon one part are widened at the front end, substantially as described, and for the purpose specified.

396,916. LATCH-CASE. CHARLES M. BURGESS, New Britain, Conn., assignor to the Russell & Erwin Manufacturing Company, same place. Filed Oct. 15, 1888. Serial No. 288,070. (No model.)

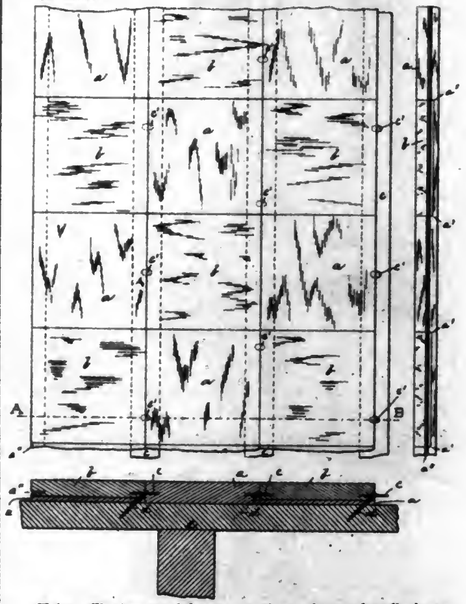
Claim.—1. The herein-described latch-case, the body of which is composed of the main part having side flanges and wings and a cap having side flanges, the front ends of the flanges on the cap and the wings of the flanges on the main part being formed with interlocking projections and recesses, substantially as described, and for the purpose specified.

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2. The herein-described latch-case, the body of which is composed of the main part having side flanges widened into wings at the front end, and the back 8, having a recess, and a cap having side flanges, and a tenon, 9, to fit the recess in the back, the front ends of the flanges on the cap and the wings of the flanges on the main part being formed with interlocking projections and recesses, substantially as described, and for the purpose specified.

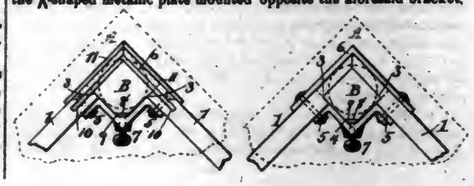
396,917. INLAID FLOOR OR WOOD COVERING. CHARLES BUTCHER, Cambridge, Mass. Filed Aug. 10, 1888. Serial No. 282,437. (No model.)



Claim.—The improved floor or wood covering, as described, consisting of the boards *a a*, having lateral or equivalent recesses *a' a'*, and the blocks *b b*, inserted in said recesses, in combination with the metal tongues *c c* and grooves *a' a'* in the sides of said boards, said grooves passing alternately through the edges of the boards and the blocks *b b*, substantially as and for the purpose set forth.

396,918. KNOCKDOWN TABLE. HENRY A. BUTLER, Syracuse, N. Y., assignor of one-half to William P. Shepard, same place. Filed May 21, 1888. Serial No. 274,392. (No model.)

Claim.—In a knockdown table, in combination, the side rails rigidly secured together at their meeting angles by a metallic bracket of V-shaped form, and having slight projections at right angles thereto, all integral, slots at said extremities for the reception of fastening-bolts that pass through perforations in the side rails into and through the A-shaped metallic plate mounted opposite the aforesaid bracket,

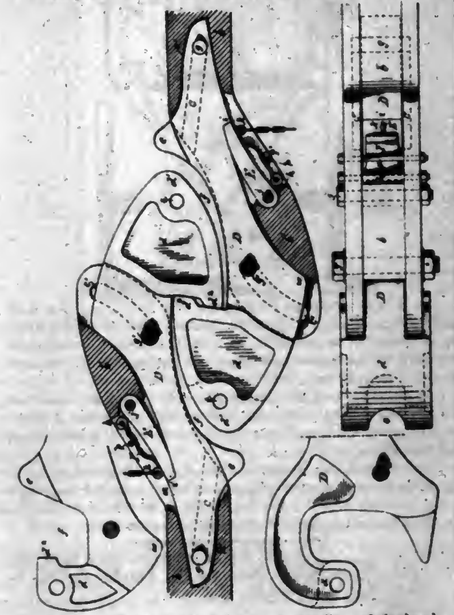


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and the table-leg, squared at its top portion, with a corner thereof faced off, and provided with a flat metallic plate secured thereto, against which the set-screw passing through the bracket is adapted to bear when said leg is inserted in its seat, substantially as shown and described.

396,919. CAR-COUPLING. JOSEPH D. CARL and GRAHAM L. OBLE, Wilmington, Del. Filed Oct. 12, 1888. Serial No. 287,894. (No model.)



Claim.—1. The combination, in a car-coupling, of the head, a coupling-hook, and a retainer therefor, with longitudinal and transverse guides for said hook, by which the hook will have a combined longitudinal and transverse movement on its release from the retainer, substantially as described.

2. The combination, in a car-coupling, of the recessed head having slots therein, as described, with a coupling-hook having pins adapted to said slots, and a spring-dog engaging with the outer face of said coupling-hook, substantially as described.

3. The combination, in a car-coupling, of the coupling-head, the sliding hook having a head, *d*, and an extension or projection, *e*, forming with the head a recess, *f*, for receiving the hook of the opposing head and a retainer for said hook, substantially as specified.

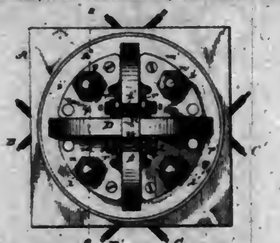
4. The combination, in a car-coupling, of the head, with a hook, and longitudinal and transverse guides for said hook, with a projecting lug, *d*², on the engaging-head of said hook, substantially as and for the purpose set forth.

5. The combination, in a car-coupling, of the recessed head having longitudinal slots *c* at the rear and transverse curved slots *c'* at the outer end, with a coupling-hook having pins working in said slots, substantially as described.

6. The combination of the slotted coupling-head, the locking-dog, and the coupling-hook having pins adapted to the slots in the head, and having a heel bearing against an abutment in the head and serving to relieve the pins from strain, all substantially as specified.

7. The combination of the coupling-head, its hook, the swinging locking-dog, the spring acting thereon, and a pin acting as a backing for the spring and as a stop for the outward movement of the dog, all substantially as specified.

396,920. ELECTRIC CUT-OUT DEVICE. J. CHESTER CHAMBERLAIN, New York, N. Y. Filed June 29, 1887. Serial No. 242,930. (No model.)



Claim.—1. The combination of an insulating-block, safety-catch terminals on one side thereof, and metal hooks extending from said terminals through said block for engagement with circuit-wires on the other side thereof, substantially as set forth.

2. The combination of an insulating-block, safety-catch terminals on one side thereof, metal hooks extending from said terminals through said block for engagement with circuit-wires on the other side thereof, and means for locking said hooks in place, substantially as set forth.

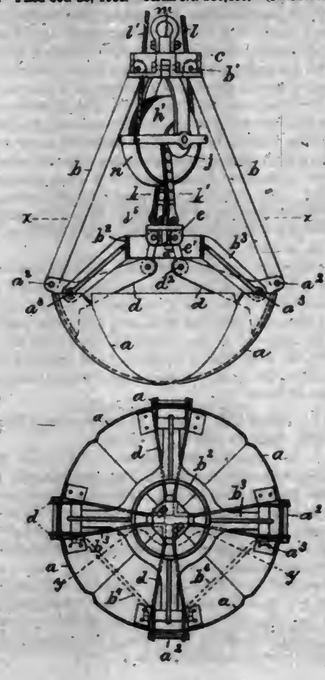
3. The combination of an insulating-block having slots on its lower side for receiving circuit-wires, and safety-catch terminals on its upper side, and the connecting devices passing through said block, having oblique slots at their lower ends for receiving the wires, and clamping-nuts on their upper ends, substantially as set forth.

4. The combination of two blocks placed together, the wires of a circuit passing beneath said blocks, the wires of a crossing or branching circuit between said blocks, connecting devices extending from the wires beneath the blocks through both blocks to safety-catch terminals, connecting devices extending from the wires between said blocks through the upper block to other safety-catch terminals, and safety-catches joining the wires of one pair, respectively, to those of the other pair, substantially as set forth.

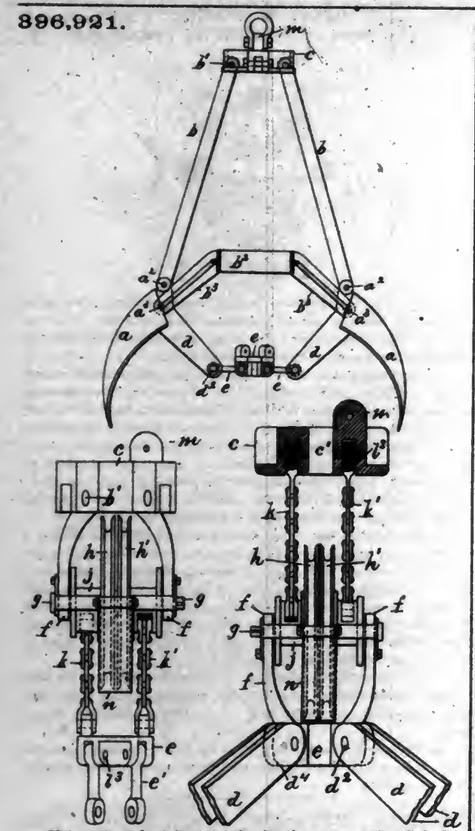
5. The combination, with the safety-catch block and the four terminal plates thereon, of the double insulating-bridge upon said block separating said plates from one another, substantially as set forth.

6. The combination of the block, the four safety-catch terminal plates thereon, the double insulating-bridge, and the cover, substantially as set forth.

396,921. DREDGING-SCOOP. NICHOLS B. CORBIN, Jersey City, N. J. Filed Oct. 25, 1888. Serial No. 289,109. (No model.)



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Claim.—1. A dredging-scoop having the scoop-sections linked to a head-block and provided with lever-arms, a foot-block jointed to the said arms, a pulley-shaft fitted to bearings upon one of the blocks, the pulleys *h h'*, fitted to the said shaft, and the chains *k k'*, attached to the hubs of the pulleys and to the other block, the whole being suspended and operated substantially as herein set forth.

2. In a dredging-scoop, the combination, with the scoop-sections linked to a head-block and provided with lever-arms, of a foot-block jointed by links to the said arms, bearings projected downward from the top block, a shaft fitted to such bearings across the center line of the scoop, two pulleys side by side upon such shaft, provided each with a hub and a chain attached thereto and to the foot-block, and two ropes or chains attached to the opposite sides of the pulley-rims and extended upward through an opening in the head-block, as and for the purpose set forth.

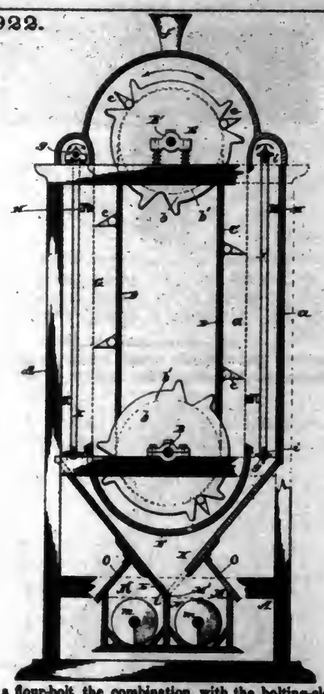
3. In a dredging-scoop, the combination, with the scoop-sections *a*, head-block *c*, links *b*, and lever-arms *d*, of the foot-block *c*, jointed by links to the arms *d*, bearings *f*, attached to the top block, the shaft *g*, the pulleys *h h'*, provided each with hub *j*, the chains *k k'*, attached to the hubs and to the foot-block *e*, and a brace pivotally connected with the arms *d*, as by the bolts a^3, and operating with the bolts to form fulcra for the movements of the scoop-sections, substantially as herein set forth.

396,922. FLOUR-BOLT. JAMES J. FAULKNER, Jackson, Mich. Filed Sept. 1, 1886. Serial No. 212,375. (No model.)

Claim.—1. In a flour-bolt, the combination, with a pair of opposite bolting-cloth walls and an endless belt or chain carrying a set of buckets or lifts, the end of which projects beyond the edges of the belt or chain, of upper and lower shafts on which the endless belt or chain is mounted, said shafts being provided with sprocket-wheels, the notches of which are adapted to receive the projecting ends of the buckets or lifts, substantially as set forth.

2. In a flour-bolt, the combination, with the pair of opposite bolting-cloth walls and the endless-belt flour-elevator, of the endless belts or chains and the adjustable clearing-brushes carried by these belts or chains and adapted to sweep the entire outer surface of the bolting-cloth in their descent, substantially as set forth.

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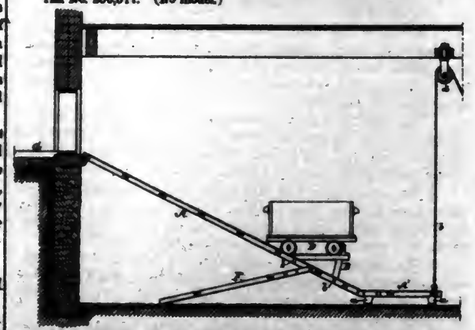


3. In a flour-bolt, the combination, with the bolting-cloth walls and the flour-elevator, of the endless chains or belts adapted to travel up and down on the outside of the bolting-cloth walls, cross-bars attached to the endless belts or chains, and brushes adjustably secured to one of the cross-bars, substantially as set forth.

4. In a flour-bolt, the combination, with the endless chains and bars secured thereto, of metallic strips secured to the bars, brushes, and set-screws for adjustably securing the brushes to the metallic strips, substantially as set forth.

5. In a flour-bolt, the combination of the bolting-cloth walls and the flour-elevator mounted on upper and lower shafts, the lower shaft being provided with a screw-flange adapted to prevent the uneven accumulation of unbolted flour, substantially as set forth.

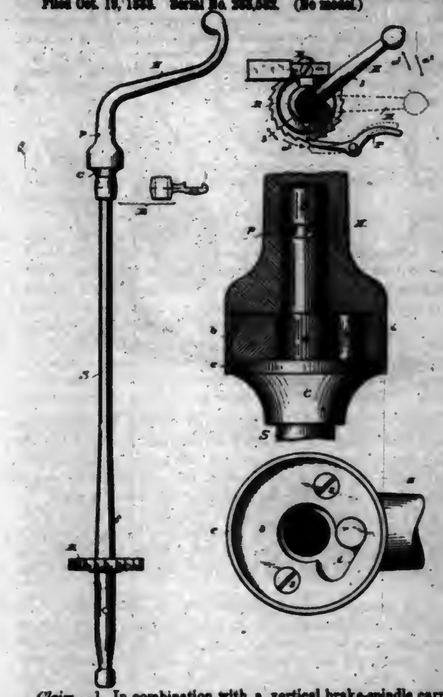
396,923. APPARATUS FOR DELIVERING ASHES FROM CELLARS. MILTON FOREMAN, Philadelphia, Pa. Filed Nov. 30, 1887. Serial No. 256,517. (No model.)



Claim.—1. The combination of a wheeled delivery-truck, a pair of skids pivoted adjacent to the window-opening of a cellar and having horizontal portions providing a support for said truck when the skids are down, and a flexible hoisting device attached at the inner ends of the skids, all substantially as specified.

2. The combination of a pair of skids pivoted adjacent to the window-opening of a cellar and having their inner ends at such an angle that they lie horizontally when the skids are down, angular frames detachably secured to the skids above the inner ends of the same, and a hoisting device attached to the inner ends of the skids, all substantially as specified.

396,924. BRAKE-HANDLE. JOHN W. FOWLER, Brooklyn, N. Y. Filed Oct. 19, 1888. Serial No. 288,582. (No model.)



Claim.—1. In combination with a vertical brake-spindle carrying a collar near its upper end, and having a smooth cylindrical portion immediately above said collar, a handle inclosing a clutch-roller in contact with said cylindrical portion of the spindle and which rests endwise upon said collar, and means, substantially as hereinbefore specified, for wedging the roller against the spindle when the handle is turned in a given direction, whereby the handle is adapted to be moved independently of the spindle to an effective position and the unlocked spindle is rendered free to turn independently of the handle to instantaneously release the brake.

2. In combination with a brake-spindle having at or near its upper end a cylindrical portion, a recessed handle provided with a bored and recessed bushing which encircles said spindle portion, and a clutch-roller confined between an incline in said bushing-recess and the periphery of said spindle portion, substantially as hereinbefore specified.

3. The combination of a brake-spindle having a circular collar fast thereon near its upper end and a short clutch portion immediately above the same, and a handle having its lower end axially bored and concentrically recessed, and provided with a bored and recessed bushing, and a clutch-roller within it, below which the lower edge of the handle-casting encircles said collar to exclude dust, substantially as hereinbefore specified.

4. The combination of a brake-spindle of iron or steel having its upper end lathe-finished and hardened, a recessed handle, which may be of brass, provided internally with a bushing of hardened steel, which encircles a cylindrical portion of said upper end of the spindle, and a clutch-roller within the bushing, substantially as hereinbefore specified.

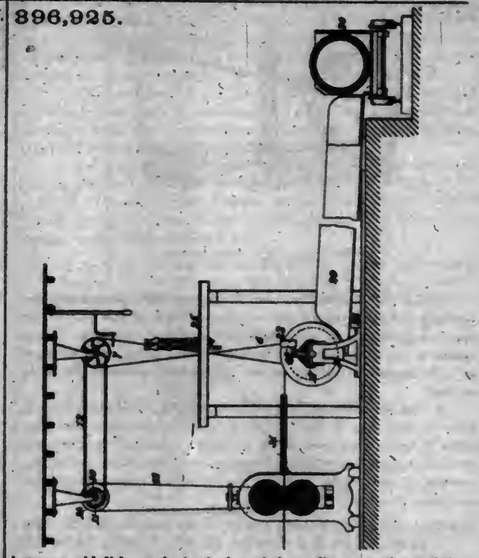
396,925. REEL FOR WIRE RODS. WILLIAM GARRETT, Joliet, Ill. Filed June 25, 1888. Serial No. 278,115. (No model.)

Claim.—1. In an apparatus for reeling wire rods, the combination of two disks mounted in independent shafts, one of said disks being movable toward or from the other for the purpose of discharging the coil of long rod therefrom, substantially as set forth.

2. In an apparatus for reeling wire rods, the combination of two disks mounted upon independent shafts, one of said disks being movable toward or from the other, and flanges or other retaining devices on the outer edges of the disks to prevent lateral displacement of the wire rod, substantially as set forth.

3. In an apparatus for reeling wire rods, the combination of two disks mounted on independent shafts, one of said disks being movable toward and from the other, whereby the rod may be grasped between said disks at the beginning of the reeling operation and the bundle automatically discharged therefrom, substantially as set forth.

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4. In a reeling apparatus, the combination of a continuously-rotating disk and a loosely-mounted disk movable toward and from the rotating disk, said disks having their contiguous faces constructed, as regards their peripheral edges, to receive and hold a length of wire rod, substantially as set forth.

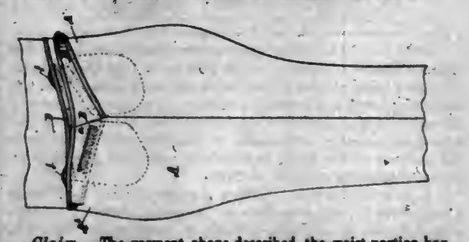
5. In a reeling apparatus, the combination of a continuously-rotating disk and a loosely-mounted disk movable toward and from the rotating disk, said disks having their contiguous faces constructed, as regards their peripheral edges, to receive and hold a length of wire rod, and provided with jaws or other devices for grasping the rod, substantially as set forth.

6. In an apparatus for reeling wire rods, the combination of two disks separable from each other for the purpose of discharging a bundle of rod wrapped around the peripheries of said disks, and a trough for receiving such bundle and conducting the same away from the disks, substantially as set forth.

7. In an apparatus for reeling wire rods, the combination of two disks, one of which is movable toward and away from the other, said disks being provided on the inner faces with a groove and projection, respectively, substantially as set forth.

8. The combination of the delivery-rolls of a rod-train, a pair of separable disks forming a reel, a guide for conducting the rod from the rolls to said disks, and a trough for receiving and conducting away a bundle of rod from the reel, substantially as set forth.

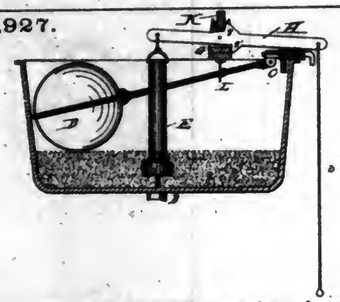
396,926. TROUSERS, OVERALLS, &c. BENJAMIN J. GRESLY, Boston, Mass. Filed July 21, 1888. Serial No. 280,594. (No model.)



Claim.—The garment above described, the waist portion having the front and rear flaps, A' A^2, with their edges *a b c d* forming a placket over each hip and connected by the straps B B', secured to the edges *a b* of the front flap, A^2, from the top of such edges to the bottom of the placket, and by the straps D D', secured to the edges *c d* of the rear flap, A', from the top of such edges to the bottom of the placket, the straps D D' uniting at the front and the straps B B' at the rear, all substantially as described.

396,927. FLUSHING-TANK FOR WATER-CLOSETS. ADOLPH HAARLANDER, Allegheny, Pa. Filed Aug. 3, 1887. Serial No. 246,418. (No model.)

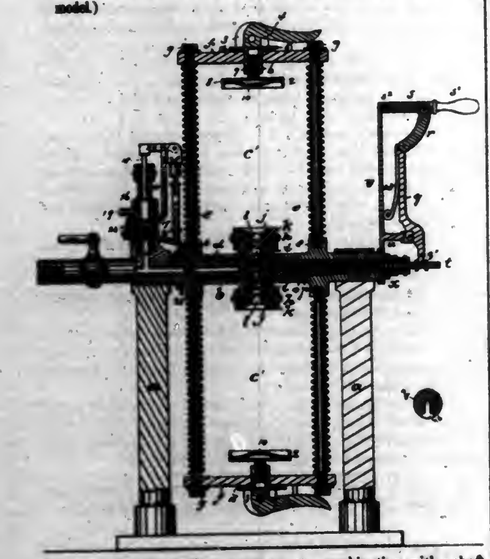
396,927.



Claim.—1. In a flushing-tank for water-closets, the combination, with the induction-valve C and eduction-valve E, of the float D, stirrup L, trigger-lever K, connected to said stirrup, and lever H, connected to the eduction-valve, and chain *b*, said levers being arranged at right angles to each other and interlocking, substantially as described.

2. The combination, with a flushing-cistern, of induction-valve C, lever *m*, and float D, for operating the induction-valve, eduction-valve E, and pivoted lever H, for operating it, having shoulder *g*, and pivoted trigger K, arranged to engage said shoulders, and stirrup connecting said trigger to lever *m*, all combined and arranged substantially as shown and described.

396,928. APPARATUS FOR BOTTLING SODA-WATER, &c. CHAS. C. HALEY, Newark, N. J. Filed Dec. 22, 1887. Serial No. 258,654. (No model.)



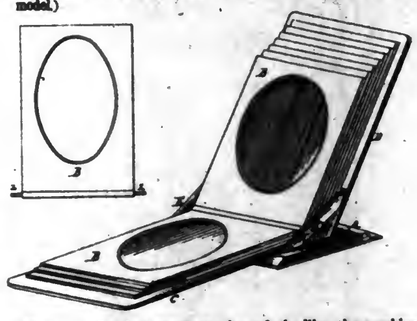
Claim.—1. In a bottling apparatus, the combination, with a shaft having a duct, *n*, a sleeve, *d*, having passages to coincide therewith, said sleeve being adapted to revolve on said shaft, a plurality of bottle-holding frames, and a secondary passage, *r*, across the shaft between the mouth-holding portions of the bottle-frames, and a valve for controlling said passage, substantially as described, whereby the water and gas from a bottle in one frame may be sniffed into a bottle in another, substantially as herein set forth.

2. In combination, in a bottling apparatus, with a shaft having a duct, *n*, heads *h h*, having ducts or passages *l*, adapted to coincide with said ducts *n*, and revolving frames or bottle-holders adapted to hold the heads of the bottles into impervious engagement with said heads *h*, and passages or ducts *r r*, providing open communication between the said heads *h h*, and means, substantially as described, for closing such communication, substantially as set forth.

3. In combination, in a bottling apparatus, posts *a a*, a shaft, *b*, having a duct, *n*, a sleeve, *d*, bottle-holders revolving with said sleeve, heads *h h*, having passages *l l*, ducts or passages *r r*, a valve for closing communication between the same, and means *v* for revolving the sleeve, substantially as set forth.

4. In a bottling apparatus, the shaft having ducts or passage *n*, a rest adapted to be opened to allow the escape of air from the duct or passage *n*, frames revolving on said shaft and adapted to hold two independent bottles, a duct leading from one to the other of said bottles, and a valve for opening closed communication through said ducts, and means for revolving said frames, substantially as set forth.

396,929. PHOTOGRAPH-ALBUM. CARL H. HAMMANN, Offenbach-on-the-Main, Germany. Filed Jan. 11, 1888. Serial No. 260,427. (No model.)

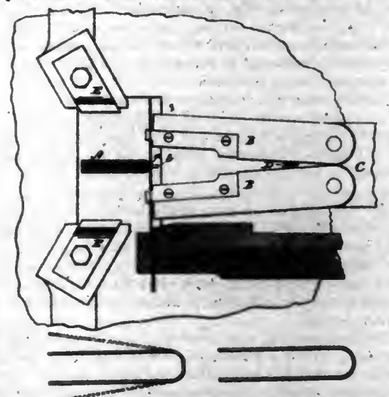


Claim.—1. In photograph-stands and the like, the combination of the leaves having the projecting journals and the stand therefor having slotted bearings for said journals with a movable locking-piece which covers the slots in the bearings, whereby the leaves may be readily inserted or removed from the stand and locked in place.

2. In photograph-stands and the like, the combination of the leaves having journals, and the stand therefor having bearings in which said journals may be inserted with a single movable locking-piece engaging with each leaf and preventing its removal from the stand.

3. In photograph-stands and the like, the combination of the leaves having two projecting journals and the stand having bearings for the same, one set of bearings being slotted, so that the journals may be readily put into place through the slots with a locking-slide similarly slotted and movable over the slotted frame, and thereby opening or closing the journals according to the position of the slide.

396,930. MACHINE FOR BENDING WIRE. ELI HARRIS, New York, N. Y., assignor to the Self Retaining Hair Pin Company, same place. Filed June 11, 1888. Serial No. 276,723. (No model.)



Claim.—In an apparatus for making articles from wire, in which the wire is bent to shape, the combination of a former, corresponding in shape to the shape required for the bent wire except that a portion of the surface of the former is recessed to permit an extra inward bend of the wire, and an auxiliary bender arranged to operate within the bend so made by the principal bender and at the point where the said recess in the former occurs, substantially as described, said supplemental bender being adapted to give to the said inward bend an outward bend into the required shape.

396,931. HORSE-POWER REGULATOR. FREDERICK HART, Poughkeepsie, N. Y. Filed Jan. 21, 1888. Serial No. 261,483. (No model.)

Claim.—1. The combination, with the vertically-movable horse-power tread, of a stationary frame on which the tread can be raised and lowered to change its inclination, and a centrifugal regulator attached to the tread and moving vertically therewith, whereby the vertical movement of the tread on said frame is automatically controlled, substantially as set forth.

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2. The combination, with the vertically-movable horse-power tread, of a stationary frame on which the tread can be raised and lowered to change its inclination, a worm or screw interposed between the movable tread and the stationary frame, whereby the tread is frictionally held in position on the frame, and a centrifugal regulator whereby the vertical movement of the tread on the frame is automatically controlled, substantially as set forth.

3. The combination, with the regulator-frame provided with gear-racks, of a pinion-shaft provided with pinions meshing with said gear-racks and adapted to be attached to the tread of the horse-power, a governor-shaft which is driven from the horse-power, a governor mounted on said shaft, and a ratchet mechanism controlled by said governor and connected with said pinion-shaft, substantially as set forth.

4. The combination, with the regulator-frame provided with gear-racks, of bearing-frames adapted to be attached to the horse-power tread, a pinion-shaft journaled in said bearing-frames and provided with pinions which mesh with said racks, a governor-shaft journaled in said bearing-frames, a governor attached to said shaft, and a ratchet mechanism mounted on one of said bearing-frames which is geared with the pinion-shaft, controlled by the governor, and actuated from the governor-shaft, substantially as set forth.

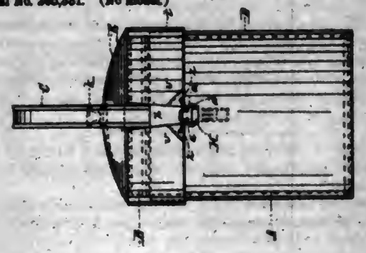
5. The combination, with the regulator-frame C, provided with gear-racks c^4, of the pinion-shaft D, provided with pinions *d d*, meshing with said gear-racks, bearing-frames E E', provided with plates *e e*, a governor-shaft, F, provided with a worm, *g*, a centrifugal governor mounted on said shaft, a worm-wheel, G, mounted on the bearing-frame E, a ratchet-shaft, J, journaled in the bearing-frame E', a ratchet-wheel, J', secured to the shaft J, a shield, L, controlled by the centrifugal governor, a pawl-arm, *j*, connected with the worm-wheel G, a worm, *m*, secured to the ratchet-shaft J, and a worm-wheel, M, secured to the pinion-shaft D and meshing with the worm *m*, substantially as set forth.

396,932. REGULATOR FOR DYNAMO-ELECTRIC MACHINES. ARTHUR J. HOLT, Grand Rapids, Mich.; Frances S. Holt administratrix of said Arthur J. Holt, deceased. Filed May 13, 1884. Serial No. 131,901. (No model.)



Claim.—In a compound-wound dynamo-electric machine, the combination, with the commutator, of commutator-brushes connected to the field-coils included in series with the armature and external circuit, and independently-adjustable commutator-brushes connected with the field-coils in derived circuit and located on the commutator at points intermediate between the points of maximum and minimum potential of the armature, substantially as set forth.

396,933. INSULATING JACKET OR COVERING. WILLIAM J. HOLFORD, Lawrence, Mass., assignor of two-thirds to Daniel F. Fitzgerald and Evan R. Williams, both of same place. Filed Feb. 27, 1888. Serial No. 265,381. (No model.)

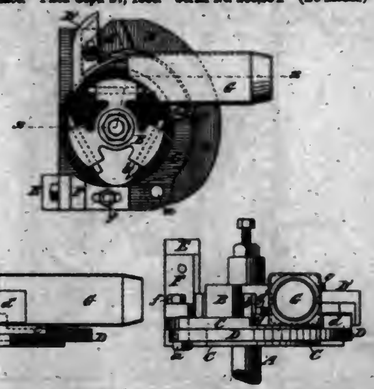


Claim.—1. In a jacket or covering of the character described, the insulating cover E, having the flaps *v v*, provided with the hooks *z*, in combination with the insulating-body A, provided with the loops *d*, and means, substantially as described, for exerting a strain on said loops when engaged with said hooks, substantially as set forth.

2. The insulating-body A, having the elastic straps H, provided with triangular loops *d*, in combination with the insulating-cover E, having the side slots or recesses, *x*, forming flaps *v*, said cover being provided with hooks *z*, substantially as described.

3. In a jacket of the character described, the insulating-cover E, having side slots or recesses forming flaps *v*, said flaps being provided with hooks, in combination with the insulating-body A, provided with a loop for receiving said hooks, whereby the flaps may be drawn together, substantially as described.

396,934. WOOD-PLANING MACHINE. ALFRED B. HUTCHINSON, Brooklyn, N. Y., assignor to the Glen Cove Machine Company, (Limited,) same place. Filed Sept. 27, 1883. Serial No. 288,594. (No model.)

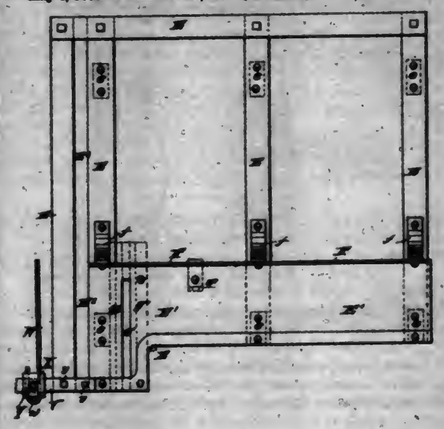


Claim.—1. The combination, in a wood-planing machine, with a side cutter-head, a fixed head-plate below said cutter-head, and a chip-breaker a portion of which is below the level of the upper surface of said plate, of a shaving-hood secured to said plate and lying over the said portion of the chip-breaker, substantially as herein described.

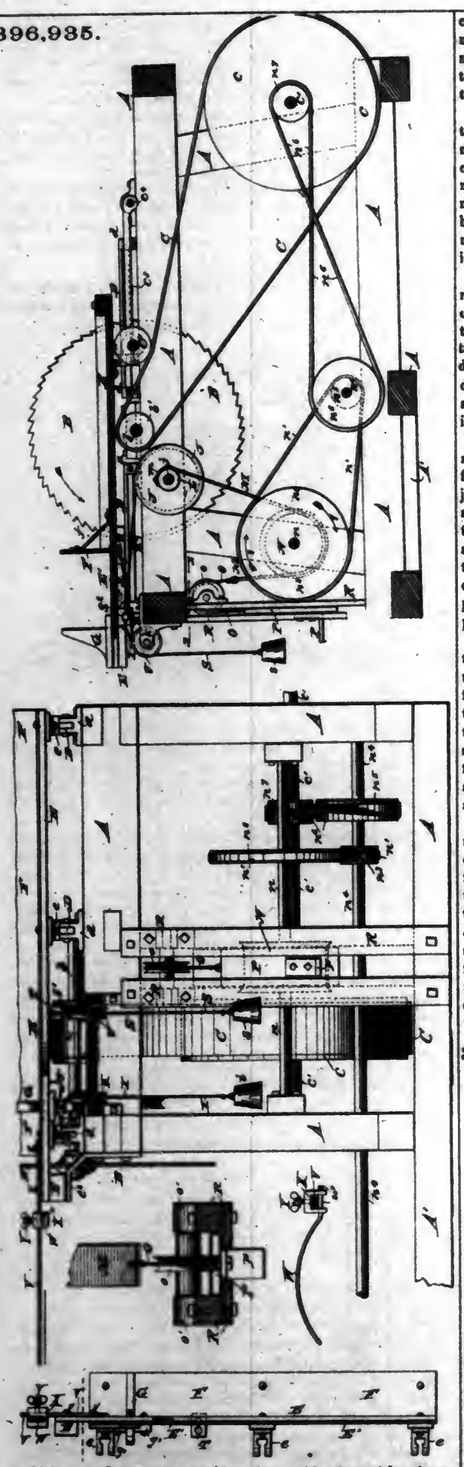
2. The combination, in a wood-planing machine, with the side cutter-head and its cutters, and a shaving-hood opposite the said cutters, of a chip-breaker provided with a tongue which enters the mouth of the said hood for the purpose of guiding thereinto the shavings or chips produced by the said cutters, substantially as herein described.

3. The combination, in a wood-planing machine, with the side cutter-head and its cutters and a fixed head-plate below the said cutter-head, of a chip-breaker a portion of which is below the level of the said head-plate, but the nose of which is above the said head-plate, a shaving-hood which is attached to the head-plate and which overlies the portion of the chip-breaker below the said plate, and a tongue attached to the chip-breaker and entering the mouth of the shaving-hood, substantially as and for the purpose herein set forth.

396,935. SAWING-MACHINE. JAMES R. IVEY, Macon, Ga. Filed May 1, 1883. Serial No. 272,495. (No model.)



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Claim.—1. In a sawing-machine, the combination, with a frame and a table or support thereon provided with a fixed jaw or fence, of a movable jaw fitted to the table, a pulley journaled on the frame, a cord connecting said pulley with the movable jaw, a friction-band connected for turning the cord-pulley, a treadle or operating device connected to the other end of the band, and a friction-drum onto which the band may be tightened to receive motion therefrom for actuating the movable jaw, substantially as described, for the purposes set forth.

2. In a sawing-machine, the combination, with a frame and a table or support thereon provided with a fixed jaw or fence, of a movable jaw fitted to the table, a pulley journaled on the frame, a cord connecting said pulley with the movable jaw, a friction-band connected for turning the cord-pulley, a treadle or operating device connected to the other end of the band, a friction-drum onto which the band may be tightened to receive motion therefrom for actuating the movable jaw, and a weighted cord connected to said jaw for retracting it, substantially as described, for the purposes set forth.

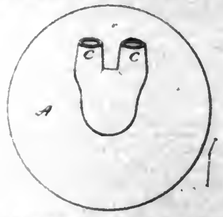
3. In a sawing-machine, the combination, with a frame and a carriage fitted for reciprocation thereon and provided with a fixed jaw or fence, of a movable jaw fitted to the carriage, a pulley journaled on the frame, a cord connecting said pulley with the movable jaw, a friction-band connected for turning the cord-pulley, a treadle or operating device connected to the other end of the band, a rotating friction-drum onto which the band may be tightened for actuating the movable jaw, and a weighted cord connected to the carriage to retract it, substantially as described, for the purposes set forth.

4. In a sawing-machine, the combination, with a supporting-frame and a carriage fitted for reciprocation thereon and provided with a fixed jaw or fence, of a movable jaw fitted to the carriage, a pulley journaled on the frame, a cord connecting said pulley with the movable jaw, a friction-band connected for turning the cord-pulley, a treadle or operating device connected to the other end of the band, a friction-drum onto which the band may be tightened for actuating the movable jaw, and weighted cords connected to both the movable clamping-jaw and reciprocating carriage for retracting either independently or both simultaneously, substantially as described, for the purposes set forth.

5. In a sawing-machine, the combination, with a frame and a table or support thereon provided with a fixed jaw or fence, F, of a movable jaw, G, fitted in the carriage, a shaft, *j*, journaled on the frame, a pulley, J, and drum L on said shaft, a cord, H, connecting the pulley J with the jaw G, a weighted retracting-cord, I, connected to the jaw G, a shaft, *n*, journaled in the frame, gearing operating said shaft, a friction-drum, N, on said shaft, a treadle device, P *p*, fitted to the frame, and a friction-band, M, connected to the drum L and to the treadle and receiving the drum N in its bight, substantially as described, for the purposes set forth.

6. In a sawing-machine, the combination, with a frame and a reciprocating carriage thereon provided with a fixed jaw or fence, of a movable jaw, G, fitted in the carriage, a shaft, *j*, journaled in the frame, a pulley, J, and drum L on said shaft, a cord, H, connecting the wheel *j* with the jaw G, a weighted retracting-cord, I, connected to the movable jaw G, a weighted retracting-cord, S, connected to the carriage, a shaft, *n*, journaled on the frame, gearing for operating said shaft, a friction-drum, N, on said shaft, a treadle device, P *p*, fitted in the frame, and a friction-band, M, connected to the drum L and to the treadle and receiving the drum N in its bight, all constructed and arranged for operation substantially as described, for the purposes set forth.

396,936. FACE-SHIELD FOR ATOMIZERS. SIMEON H. JENNINGS, Deep River, Conn. Filed June 11, 1888. Serial No. 276,722. (No model.)



Claim.—The herein-described face-shield for steam-atomizers, consisting of the shield A, the receiving-tube B, leading therefrom and contracted into flattened shape toward the delivery end, the delivery end terminating in two nipples, C C, the said nipples forming two independent tubular openings at the delivery end of the tube, substantially as and for the purpose described.

396,937. TOP-PROP FOR VEHICLES. JOHN A. KASPAR and WALLACE R. CURTIS, Pomeroy, Ohio. Filed May 7, 1888. Serial No. 273,145. (No model.)

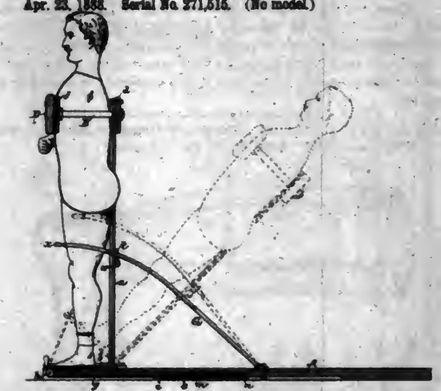
Claim.—In a vehicle-top prop, the combination, with a sleeve, C, adapted to be made to inclose the metal top-prop of a vehicle, said

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sleeve having an external longitudinal groove, *c*, and external shoulders near each end, of the wire support *f*, having its ends coiled about the said sleeve and terminating in the groove *c*, and having its outer supporting portion bent downwardly, substantially as and for the purpose specified.

396,938. EXERCISING-MACHINE. JOHN A. KEMMLER, Philadelphia, Pa., assignor of one-half to Werner Steinmann, same place. Filed Apr. 23, 1888. Serial No. 271,515. (No model.)



Claim.—1. The combination of the base, a yielding frame thereon carrying a representation of a human figure, and a striking-pad connected to said frame, all substantially as specified.

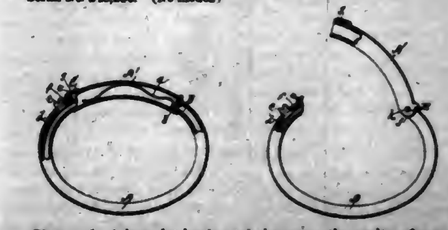
2. The combination of the base, a representation of a human figure mounted thereon, but free to yield in respect thereto, a strike-pad carried by said figure, and a spring acting to maintain the figure in an upright position, substantially as set forth.

3. The combination of the base, the frame pivoted thereto and carrying a representation of a human figure, a spring acting upon said frame and tending to maintain it in the upright position, and a detent-arm engaging with a catch on the frame and serving to retain the latter when thrown back from the upright position, all substantially as specified.

4. The combination of the base, the frame pivoted thereto and carrying a representation of a human figure, a draft cord or chain connected to the frame and passing around a pulley on the base, and a spring acting upon said draft cord or chain, all substantially as specified.

5. The combination of the base, the yielding frame thereon, a representation of a human figure carried by said frame, and a striking-pad occupying a position upon the breast of said figure, but having a rigid connection with the frame, whereby blows upon the pad are transmitted directly to the frame without straining the material of which the figure is composed, all substantially as specified.

396,939. BRACELET. THOMAS KING, Providence, R. I., assignor to himself and William C. Greene & Co., same place. Filed Aug. 20, 1887. Serial No. 248,228. (No model.)

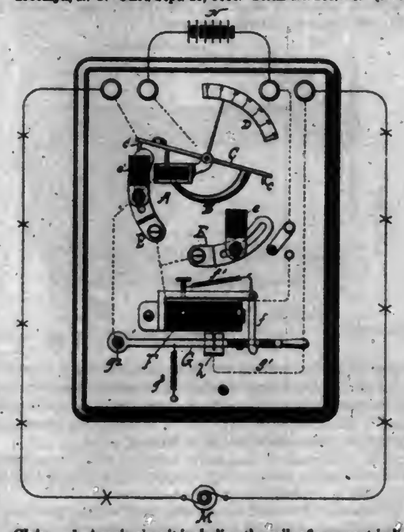


Claim.—1. A bracelet having tubular arms, the cavity of one of which is sufficiently large to receive the end of the opposite arm, and having one end of the smaller arm pivoted within the cavity of the larger and the other end of the smaller arm held within the said cavity, and also in locked engagement by means of the spring-catch and the internal notch, substantially as described.

2. A bracelet having tubular arms which are pivoted to each other, one of the said arms being provided at its free end with an internal notch, and also with a holding-socket adapted to receive the end of the opposite arm, which arm is provided with a projecting spring-catch, which is adapted for engagement with the internal notch upon the entrance of the end of the said arm into its holding-socket, substantially as described.

3. In a bracelet, the combination, with the pivoted arm A, provided with the spring-catch C, having the spring *d*, nail-piece *e*, and catch-hook *c* in one piece, of the arm A', which provides a holding-socket, *i*, for the free end of the arm A, and also has an interior notch or shoulder, *g*, adapted to receive the catch-hook *c* upon the entrance of the end of the arm A into the holding-socket *i*, substantially as described.

396,940. AUTOMATIC ELECTRIC CUT-OUT. EDWARD B. KNOWLES, Brooklyn, N. Y. Filed Sept. 25, 1888. Serial No. 286,238. (No model.)



Claim.—1. A main circuit including the coils of a current-indicator, the movable element of said current-indicator provided with a pair of contacts, both of which connect with the same side of a local generator, a pair of adjustable contacts adapted to connect with said pair of contacts upon the said moving element, said adjustable contacts being connected with the opposite side of said local generator.

2. The combination, with a main circuit and a local circuit, the main circuit including the coils of a current-indicator, and the local circuit including a magnet adapted to open the main circuit, the movable element of the current-indicator carrying two contact-points, forming one terminal of the local circuit, and two adjustable corresponding contacts forming the other terminal of said local circuit.

3. In an automatic cut-out, a pivoted arm carrying a contact on each side of its pivot, a curved support carrying corresponding adjustable contacts, an electro-magnetic device causing movement of the pivoted arm, a main circuit including said electro-magnetic device, and a local circuit including a magnet adapted to open the main circuit, the terminals of said local circuits being the pivoted arm and the curved support, substantially as described.

4. In combination with an electrical indicator carrying a pair of contacts, the said contacts adapted to move in a circular path, a curved track or guide, and a pair of contacts adjustable thereon.

396,941. ARMATURE-WINDING FOR DYNAMO-ELECTRIC MACHINES. EDWARD B. KNOWLES, Brooklyn, N. Y., assignor to the Mutual Electric Manufacturing Company, of New York. Filed Dec. 3, 1886. Renewed Dec. 21, 1888. Serial No. 294,284. (No model.)

Claim.—1. An armature having its coils divided into a number groups, each group consisting of a number of separate bobbins or wires, and one-half of the bobbins in each group wound parallel to each other and parallel to and on one side of a given diameter, alternate bobbins in the several groups starting from opposite sides of the same end of the armature, substantially as described.

2. An armature having its coils disposed around it in groups of parallel wires starting in alternation from opposite sides of the same end of the armature and similarly ending at the same end of the arma-

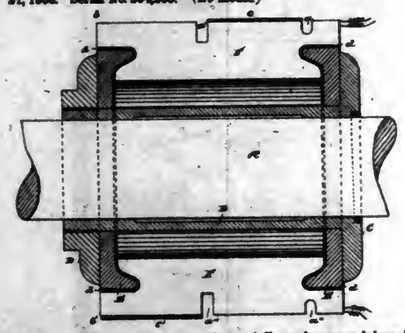
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ture, the ends of the said coils or bobbins of the several groups being connected in alternation, substantially as set forth.

396,942. COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES.

EDWARD R. KNOWLES, Brooklyn, assignor to the Mutual Electric Manufacturing Company, of New York. Filed Aug. 5, 1885. Renewed Dec. 21, 1888. Serial No. 294,285. (No model.)

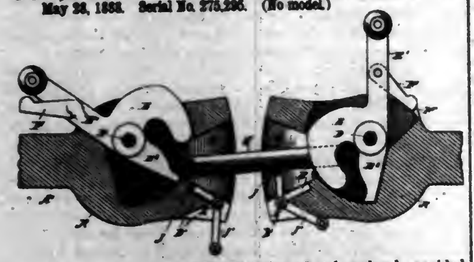


Claim.—1. The combination, substantially as shown and described, of the shaft A, the leaves provided with circumferential grooves dividing the surface of the commutator into brush-segments, and the sleeve B, head C, nut D, and insulating-disks for securing such leaves to and insulating them from the shaft, as set forth.

2. In a commutator, the leaves provided with circumferential grooves dividing the surface of the commutator into brush-segments, substantially as described.

3. In a commutator of the general construction described, the grooves *a a'* in and around the face, as shown, for the purposes specified.

396,943. CAR-COUPLING. JOHN B. MAAS, Negaunee, Mich. Filed May 28, 1888. Serial No. 275,295. (No model.)

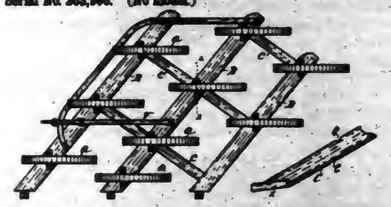


Claim.—1. A car-coupler consisting of a draw-head provided with a jaw for the reception of a link and an inner chamber communicating therewith, and a hook and arm, E', pivotally mounted within said chamber, said arm being provided with the dog F, the draw-head being notched to receive said dog, substantially as described, and for the purposes set forth.

2. A car-coupler consisting of a draw-head provided with a jaw for the reception of a link and an inner chamber communicating therewith, a hook and arm, E', pivotally mounted within said chamber, and the dog F, pivotally attached to said arm, the draw-head being notched for said dog, in combination with the rod H, having arms H', bell-crank L, and the chains *l l'*, connected to the respective arms of said bell-crank, the outer ends of said chains being engaged, respectively, to the dog and arm E' aforesaid, substantially as set forth.

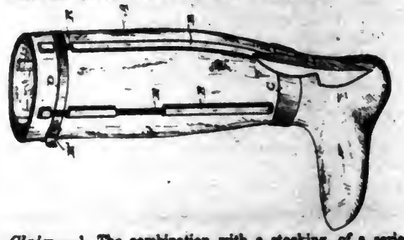
3. A car-coupler consisting of a draw-head provided with a jaw for the reception of a link and an inner chamber communicating therewith, a hook and arm, E', pivotally mounted within said chamber, and the dog F, pivotally attached to said arm, the draw-head being notched for said dog, in combination with the rod H, bell-crank L, and the chains *l l'*, connected to the respective arms of said bell-crank, the outer ends of said chains being engaged, respectively, to the dog and arm E' aforesaid, and the rod M, connected to an arm of the bell-crank, as specified, substantially as described.

396,944. HARROW-FRAME. JAMES MCMAHON, Kalamazoo, Mich., assignor to D. C. & H. G. Reed & Co., same place. Filed Feb. 14, 1888. Serial No. 263,966. (No model.)



Claim.—A float harrow-frame consisting of the wooden draft-beams, the straight solid thin metal cross-bars on the under side of the draft-beams, said cross-bars having the side gains and the upwardly-turned ends projecting beyond the draft-beams at the forward ends, and the clamping-bolts in the gains of said cross-bars, substantially as set forth.

396,945. STOCKING. SIGMUND M. MICHELSON, Milwaukee, Wis. Filed June 8, 1888. Serial No. 276,495. (No model.)



Claim.—1. The combination, with a stocking, of a series of removable strips of stiffening material held against the outside of the leg thereof, and a calf-strap surrounding the upper part of the said stocking-leg and held in place by said removable strips, substantially as set forth.

2. The combination of a stocking and short and long pockets stitched to the outside of the leg thereof in vertical line with each other and separated a short distance with the removable vertical stiffening-strips, a calf-strap held in place thereby, and a continuous counter-strap secured only to the back of the stocking and passing around the ankle portion thereof, substantially as set forth.

3. The combination of a stocking and short and long pockets stitched thereto in vertical line with each other and separated a short distance, the former being adjacent to the top of the stocking, with removable vertical stiffening-strips located in said pockets, and a calf-strap passing around the upper part of the stocking beneath the stiffening-strips, and occupying the space between the adjacent ends of the short and long pockets, substantially as described.

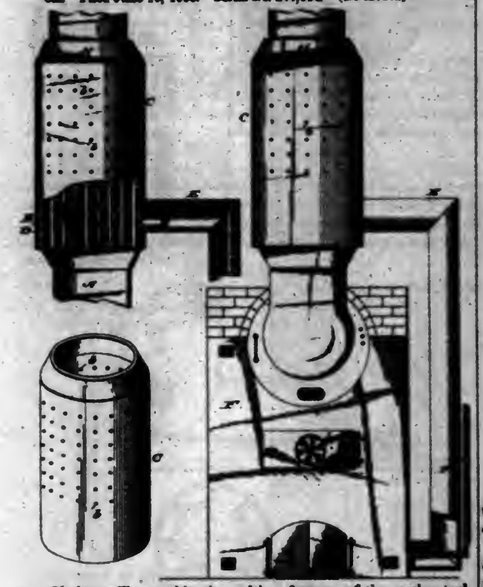
396,946. LAMP-STANDARD. JOHN C. MILLER and AUGUSTUS H. JOHNS, Meriden, Conn., assignors to the Meriden Bronze Company, same place. Filed Aug. 13, 1888. Serial No. 282,622. (No model.)



Claim.—1. In a lamp-standard composed of a stationary tube, with an inner tube or rod working telescopically therein, the said inner tube carrying the lamp, the combination therewith of a sleeve surrounding the inner tube and vertically movable, with a spring arranged to yieldingly support said sleeve, substantially as described, and whereby said sleeve forms an elastic cushion upon which the force of the descending lamp will be met.

2. In a lamp-standard composed of an outer tube, A, and a rod or inner tube, B, telescopically adjustable therein, the said rod or tube B carrying the lamp, a collar, D, fixed to the upper end of the said stationary tube, said collar constructed with an annular spring-chamber upon its inner surface, and a sleeve, E, in said collar surrounding the adjustable rod or tube and projecting above said collar, with a spring in the chamber of the collar below said sleeve, substantially as and for the purpose described.

396,947. HOT-AIR BLAST. WILLIAM G. MILLS, San Francisco, Cal. Filed June 19, 1888. Serial No. 277,004. (No model.)



Claim.—The combination, with a furnace, of the smoke-stack composed of tubes B, for the passage of smoke and particles of combustion, the casing C, surrounding the said tubes and having perforations *b* entirely around the same at its upper portion for the inlet of cold air, which passes around the smoke-tubes, and also having its upper end contracted to approximately bear against the outer surface of the stack, the pipe E, leading from the lower portion of the said casing below the perforations to the ash-pit of the furnace, and the steam-pipe F, entering the said pipe E at its point of connection with the ash-pit, whereby a jet of steam may be thrown to draw the heated air in the smoke-stack or its casing into the ash-pit beneath the fire, substantially as specified.

396,948. GUARD FOR FISH-NETS. JACOB MYERS, Eureka, Cal. Filed Nov. 30, 1888. Serial No. 292,316. (No model.)

Claim.—1. In a fish-net, and in combination with the lead-line at its foot, the guard-line secured to the net at a point above and parallel with the lead-line, and the stiff or rigid guards extending between said lines and attached to both, said guards having a tubular foot portion, through which the lead-line passes, substantially as and for the purpose herein described.

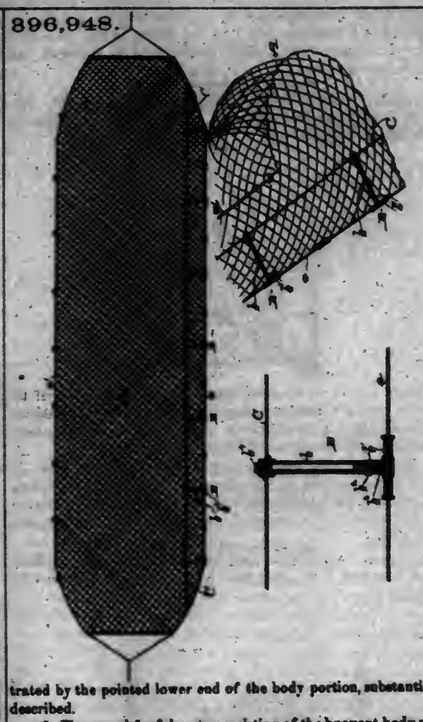
2. In a fish-net, and in combination with the lead-line at its foot, the guards B, having a body portion secured to the net and a tubular T-shaped foot portion secured to said body portion and receiving the lead-line, substantially as described.

3. In a fish-net, and in combination with its lead-line at its foot, the guard-line extending parallel with the lead-line and secured to the net, and the guards consisting of the body portion secured at its upper end to the guard-line, and a T-shaped tubular foot portion secured to the lower end of the body portion and receiving the lead-line in its horizontal portion, substantially as described.

4. The guards for the base or foot of a fish-net, consisting of the buoyant body portion *b* and heavy foot portion *b'*, made of a T shape and tubular to receive the body portion and the lead-line of the net, substantially as herein described.

5. In a fish-net, and in combination with its lead-line and the guard-line attached to the net and running parallel with the lead-line, the guards B, consisting of a body portion, *b*, secured at its top to the guard-line and having a pointed lower end, and the tubular T-shaped foot portion *b'*, into which the pointed lower end of the body portion fits, said foot portion receiving the lead-line of the net, which is penetrated by the pointed lower end of the body portion, substantially as described.

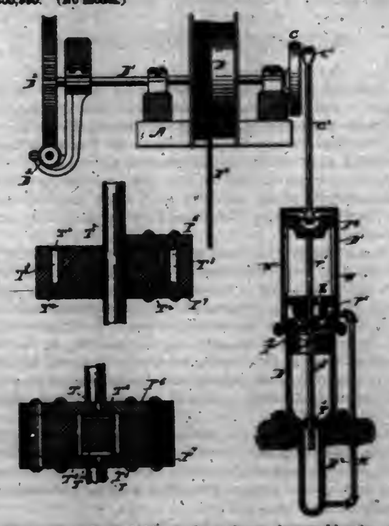
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6. The guard for fish-nets, consisting of the buoyant body portion *b*, having a pointed lower end, and the heavy tubular T-shaped foot portion *b'*, in which the lower end of the body portion is secured, substantially as described.

7. The guard for fish-nets, consisting of the hollow buoyant body portion *b* and the heavy tubular T-shaped foot portion *b'*, secured to said body portion, substantially as herein described.

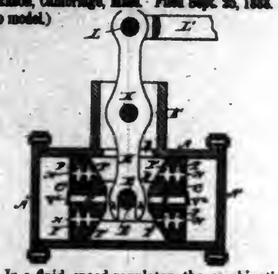
396,949. FLUID SPEED-REGULATOR FOR ELEVATORS. WILLIAM R. MCKERNON, Cambridge, Mass. Filed Sept. 21, 1888. Serial No. 285,995. (No model.)



Claim.—1. In a fluid speed-regulator, the combination of the cylinder D, the piston-rod P' P², and the piston P, having openings whereby the fluid may pass from one side to the other, with the auxiliary chambers D² and P² and reservoir-pipe H, substantially as described, and for the purpose set forth.

2. In a fluid speed-regulator, the combination of the cap P^2, having openings T T, with the body P of the piston, having grooves T^2 T^2 and intermediate openings, T^3 T^3, substantially as described, and for the purpose set forth.

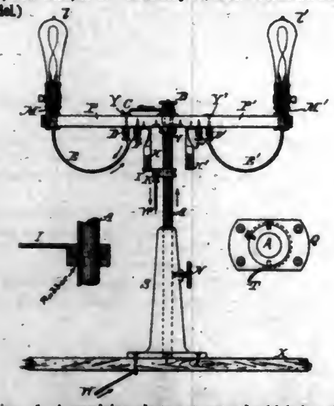
396,950. FLUID SPEED-REGULATOR FOR ELEVATORS. WILLIAM B. HOKENSON, Cambridge, Mass. Filed Sept. 25, 1886. Serial No. 214,322. (No model.)



Claim.—1. In a fluid speed-regulator, the combination of the cylinder A, having a lateral opening, B, with the piston C C', adapted to admit through it a restricted flow of fluid, and an actuating-arm, substantially as described, and for the purpose set forth.

2. In a fluid speed-regulator, the combination of the cylinder A, having a lateral opening, B, with passages for conducting the fluid from one side of the piston to the other, and the piston C C', having automatic valves $V' V^2$, substantially as described, and for the purpose set forth.

396,951. REVOLVING PHOTOMETER-STAND. JAMES W. PACKARD, New York, N. Y. Filed May 19, 1888. Serial No. 274,435. (No model.)



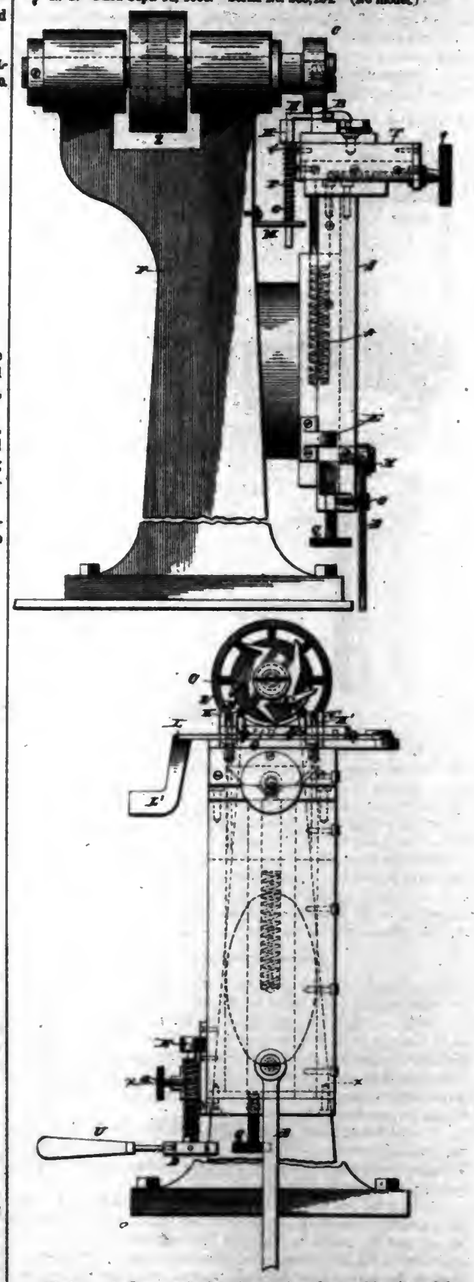
Claim.—1. A revolving photometer-stand which has the following parts in combination: two revolving arms, each of which carries a socket for an electric lamp, a set of two contact-pieces on each arm and connections between the contact-pieces and the electrodes of the lamp-socket, together with a standard which has two stationary contact-pieces insulated one from the other and corresponding to the sets of contact-pieces on the revolving arms, which stationary contact-pieces form the terminals of an external electric circuit, substantially as described.

2. A revolving photometer-stand which has the following parts in combination: two revolving arms, each of which carries a socket for an electric lamp, a set of two contact-pieces on each arm, and connections between these contact-pieces and the electrodes of the lamp-socket, together with a standard which has two stationary contact-pieces insulated one from the other and corresponding to the sets of the contact-pieces on the revolving arms, and a spring-clip for locking the revolving arms in one position when the stationary contact-pieces touch any one of the revolving sets of contact-pieces, substantially as described.

3. The combination, in a photometer, of the stationary standard lamp, the sliding gage, and the revolving photometer-stand, which has sockets for two lamps, whereby while one lamp is being calibrated a second lamp may be removed and a third substituted in its place, substantially as described.

4. The combination, in a photometer, of the stationary standard lamp, the sliding gage, and the revolving photometer-stand, which has sockets for two lamps and electric connections for the same, whereby while one lamp is being calibrated a second lamp may be removed and a third substituted in its place, substantially as described.

396,952. MILLING-MACHINE. JAMES W. PACKARD, New York, N. Y. Filed Sept. 11, 1886. Serial No. 213,124. (No model.)



Claim.—1. In a work-clamping device, the combination of the main frame, the reciprocating table, and the L-shaped clamps, which operate in conjunction with the table and are attached to the main frame by a spring-connection, substantially as described.

2. In a work-clamping device, the combination of the main frame, the vertically-reciprocating table, the vertically-acting clamp, which operates in conjunction with the table and has a restricted movement within guides upon said table, and the spring, one end of which is attached to the clamp, while the other is attached to the main frame, substantially as described.

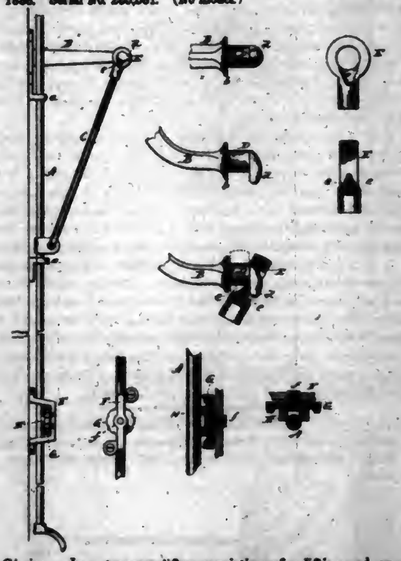
3. In a work-clamping device, the combination of the table with a raised ledge, the lever pivoted to the table, the two-pronged clamp, which is pivoted on the lever and acts in conjunction with the raised ledge, and the spring which is mounted upon the lever and holds the pivoted two-pronged clamp flexibly in its position, substantially as described.

4. In a work clamping device, the combination of the table with a raised ledge, the lever pivoted to the table, a spring which throws the lever away from the raised ledge, the two-pronged clamp, which is pivoted on the lever and acts in conjunction with the raised ledge, and a second spring, which is mounted upon the lever and holds the pivoted two-pronged clamp flexibly in its position, substantially as described.

5. In a work-clamping device, the combination of the main frame, the reciprocating table, and the clamps which slide in guides upon the table and are spring-pressed against the table when it is at or near one extreme of its adjustment, while they are automatically raised from the table when it is at other positions of its adjustment, substantially as described.

6. The combination, with a reciprocating slide and a main frame, of a fine-threaded adjusting-screw, which is attached to the slide and which abuts against a suitable portion of the main frame, together with a coarse-threaded adjusting-screw, which is attached to the slide only and also abuts against a suitable portion of the main frame, substantially as described.

396,953. TRANSOM-LIFTER. ALBERT A. PAGE, New Haven, Conn., assignor to Sargent & Company, same place. Filed Sept. 17, 1888. Serial No. 285,561. (No model.)

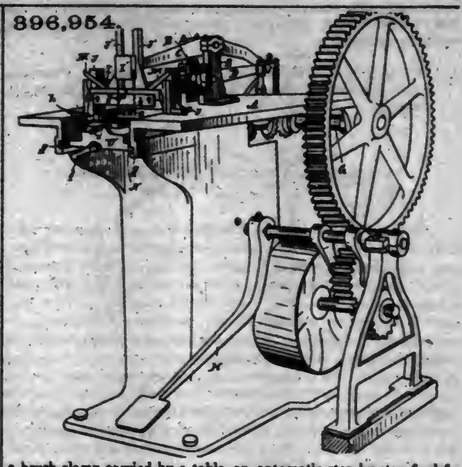


Claim.—In a transom-lifter consisting of a lifting-rod, an arm attached to the transom, and a connecting-rod hung to said lifting-rod and to the outer end of the said arm, the said arm constructed with a trunnion, D, projecting from a shoulder on the arm, and the trunnion constructed with a lateral projection, *d*, upon one side, distant from said shoulder corresponding to the thickness of the head of the rod, with the head of the rod constructed with an opening through it corresponding in diameter to the said trunnion, the face of the head recessed from its opening outward to a point out of line with the said projection *d* on the trunnion when the two parts are set together, substantially as specified, and whereby because of said recess in the head and the said lateral projection on the trunnion the said head may be removably set onto the trunnion over said projection.

396,954. BRUSH-MACHINE. EDWARDS W. PORTER, Detroit, Mich., assignor to the Detroit Patent Brush Company, same place. Filed Dec. 1, 1886. Serial No. 220,264. (No model.)

Claim.—1. In a brush-machine, the combination of the following elements: a clamp for holding and supporting the brush-block in operation, vertically-actuated staple-drivers, horizontally-actuated staple-drivers, automatic staple-feeds for the staple-drivers, and a reciprocating cross-head adapted to carry a detachable follower, all arranged to set and staple-fasten by their joint intermittent action a row of bristles, together with a longitudinal wire, into a longitudinal groove of the brush-block, substantially as described.

2. In a brush-machine, the combination of the following elements:



a brush-clamp carried by a table, an automatic step-by-step feed for said table, vertical staple-drivers, horizontal staple-drivers, automatic staple-feeds for the staple-drivers, and a vertically-reciprocating cross-head adapted to carry a detachable follower, all arranged to set a row of bristles, together with a longitudinal wire which holds said bristles, into each longitudinal groove of the brush-block and staple-fasten the wire, substantially as described.

3. In a brush-machine, the combination of a sliding table secured in a recess of the frame of the machine, of an automatic step-by-step feed for said table, of a clamp for clamping a brush-block upon said table, of two staple-drivers arranged to operate laterally against the opposite ends of the brush-block, of a cross-head carrying a detachable follower and arranged to operate vertically against the top of the brush-block, and of two staple-drivers carried by a second cross-head and arranged to operate vertically against the top of the brush-block through passages provided for the follower and in the cross-head which carries the follower, substantially as and for the purposes described.

4. In a brush-machine, the combination of the sliding table U, which carries the brush-block, the hinged stop *z*, secured to said table, the shaft *t*, the circular stops *u*, having notches *v* and guard-fingers *w*, and the tension-springs *s*, all arranged and operated to form a step-by-step feed, substantially as described.

5. In a brush-machine, the sliding table U, carrying the stationary jaw *h*, with adjusting-screw *i*, the hinged jaw *h'*, the removable bottom plate, *h''*, and the cam-lever *j*, for operating the movable jaw, all arranged to form an adjustable clamp for the brush-block, substantially as described.

6. In a brush-machine, the combination, with the staple-drivers *a* and the cross-head I, having the passages *a'*, of the follower L, having the passages *d*, substantially as described.

7. The staple-holder T, consisting of an outer and inner shell formed with cross-bars and hooks and detachably secured together thereby, and forming a space, *n*, between their respective walls to hold the staples, substantially as described.

8. The combination of the guide-block P, having the horizontal aperture *k*, T-shaped in cross-section, the staple-holder T, detachably secured to the said guide-block and having the vertical space *n*, for holding the staples, and the staple-driver Q, of corresponding cross-section with the aperture *k* in the guide-block and adapted to work therein, substantially as described.

9. In a brush-machine, the combination of the stationary table or frame, a movable table supported in a recess of the frame and adapted to carry the brush-head, horizontally-apertured guide-blocks secured in lateral recesses in the frame upon opposite sides of the movable table, horizontally-movable staple-drivers adapted to work through apertures in the guide-blocks, staple-holders adapted to feed the staples by gravity into the apertures of the guide-blocks, a cross-head movably secured in vertical guides above the movable table, vertical staple-drivers arranged to work through vertical apertures in the cross-head, inclined rails carried by the cross-head and arranged to hold and feed staples by gravity into the vertical apertures of the cross-head, a follower and means for detachably securing it to the cross-head, passages through the follower through which the vertical staple-drivers work, and means for imparting a concerted intermittent movement to the staple-drivers and to the follower, substantially as described.

10. The combination of the apertured guide-blocks P, having the vertical notches *r*, and the staple-drivers Q, T-shaped in cross-section

and adapted to work through the apertures of the guide-blocks, substantially as described.

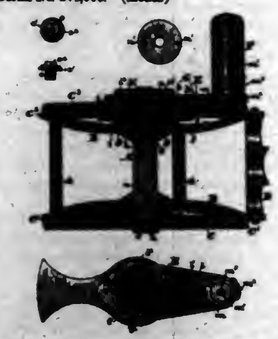
396,955. PNEUMATIC ACTION FOR ORGANS. FREDERICK PETTINARD, Meriden, Conn. Filed Apr. 30, 1888. Serial No. 272,265. (No model.)



Claim.—1. In an orguinette, the combination of pneumatic operators corresponding to each sound-producing device, the said operator consisting of a plate, *d*, hinged at one end, a flexible connection around said plate, with the adjacent surface on which said plate is supported, so as to form a bellows-like chamber, air-inlet passages G, opening to the said operators, each passage terminating in an aperture, *h*, opening to the atmosphere, an exhaust-chamber, a passage, *l*, between said exhaust-chamber and operator, the opening to said passage *l* into the operator being of no greater area than the area of the aperture *h*, a connection from said operators with the respective sound-producing devices, and a flexible strip adapted to move over said apertures *h*, the said strip having series of openings in line with said apertures, the closed spaces between said openings corresponding to the length of the note or sound to be produced, the openings between the said closed spaces corresponding to the time required between the sounding of corresponding notes, substantially as described.

2. In an orguinette having a series of openings corresponding to the respective reeds of the instrument, and having pneumatic operators between the said openings and the said reeds adapted to operate said reeds when said openings are closed, the combination therewith of an operating-strip adapted to be moved over said openings, and the said strip constructed with lines of perforations corresponding to the respective openings over which the strip is adapted to run, the said lines consisting of a series of perforations alternating with closed or solid spaces, the length of the said solid spaces corresponding to the length of note required, and the length of the series of perforations between said solid spaces corresponding to the length of time required between such notes, substantially as and for the purpose described.

396,956. FISHING-REEL. GEORGE W. PROUTY, Boston, Mass., assignor of one-half to Richard O. Harding, same place. Filed Apr. 26, 1888. Serial No. 271,906. (Model.)



Claim.—1. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a handle so mounted upon one of said journals as to be revoluble thereon, and a washer so interposed between said handle and said spool as to create a friction between the same, in order that said spool may be rotated in one direction by said handle for the purpose of winding up the line, while it may be rotated in the opposite direction without turning said handle when the strain upon the line overcomes the friction between said washer and said handle and spool.

2. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a handle so mounted upon one of said journals as to be revoluble thereon, a washer so interposed between said handle and said spool as to create a friction between the same, in order that said spool may be rotated in one direction by said handle for the purpose of winding up the line, while it may be rotated in the opposite direction without turning said handle when the strain upon the line overcomes the friction between said washer and said handle and spool, and a sliding bolt for positively locking said spool and handle when desired to prevent either from being revolved independently of the other.

3. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a handle so mounted upon one of said journals as to be revoluble thereon, a washer interposed between said handle and said spool for the purpose of creating a friction between the same, a sliding bolt located in a recess in said handle, a slot or notch in the hub of said spool, with which said bolt is adapted to engage to positively lock said spool and handle together, a spring for moving said bolt in one direction, a bell-crank lever one arm of which engages with said bolt, and a milled thumb-piece for operating said lever to move said bolt in the opposite direction, which thumb-piece is so located that it may readily be operated by the angler's hand while turning the handle.

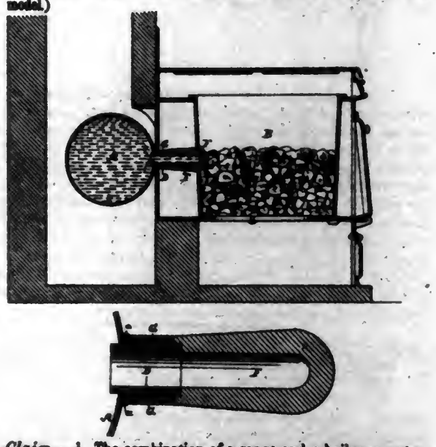
4. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a handle so mounted upon one of said journals as to be revoluble thereon, a washer interposed between said handle and said spool for the purpose of creating a friction between the same, a sliding bolt secured to said handle, a slot or notch in the hub of said spool, with which said bolt is adapted to engage to positively lock said handle and spool together, a bell-crank lever one arm of which engages with said bolt, a disk secured to said handle and provided with a lateral projection, which engages with said lever to release said bolt from said slot or notch in the hub of the spool, and a spring adapted to press said bolt into engagement with said slot when it has been released from engagement with said lateral projection.

5. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a cup-shaped piece secured to the end of one of said journals, a washer located within said cup-shaped piece, and a handle for rotating said spool, so mounted that a portion of its inner side will be pressed or held in close contact with said washer, thus creating a friction between the same, so that said spool will be rotated when said handle is turned in order to wind up the line, but will be revolved in the opposite direction when the strain upon the line is sufficient to overcome the friction between said handle and washer.

6. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a cup-shaped piece secured to the end of one of said journals, a washer located within said cup-shaped piece, a handle for operating said spool, a disk secured to the axis of said handle and rotating therewith with one surface in contact with said washer, and a screw for adjusting said disk toward or from said washer to regulate the friction.

7. In a fishing-reel, the combination of the supporting-frame, a spool provided with journals revoluble in bearings in said frame, a cup-shaped piece secured to the end of one of said journals, a washer located within said cup-shaped piece, a handle for operating said spool and provided with an inwardly-projecting hollow hub which incloses said cup-shaped piece, an inwardly-projecting flange to said hub, and a washer located between said inwardly-projecting flange of the handle and the under side of said cup-shaped end piece.

396,957. RANGE-BOILER. THOMAS W. REES, Philadelphia, Pa., assignor of one-half to Thomas W. Snowden and Richard T. Stockman, both of same place. Filed Dec. 12, 1887. Serial No. 257,649. (No model.)

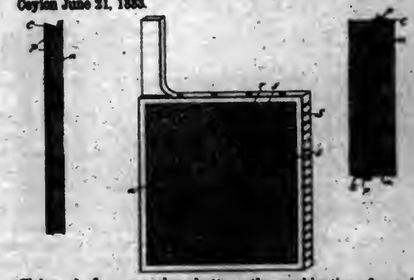


Claim.—1. The combination of a range and a boiler or water-heater located within the structure of the range and fixedly set in respect to the fire-pot of the same, with a plug having a screw-connection with the shell of the boiler and having a closed outer end which projects to or into the fire-pot of the range, all substantially as specified.

2. The combination of a range and a boiler or water-heater located within the structure of the range and fixedly set in respect to the fire-pot of the same, with a nipple screwed directly into the shell of the boiler and projecting therefrom, a hollow plug screwed onto said nipple and projecting into the fire-pot of the range, and a packing-ring for preventing leakage at the shell of the boiler, all substantially as specified.

3. The combination of a range and a boiler or water-heater located within the structure of the range and fixedly set in respect to the fire-pot of the same, with a nipple screwed into and projecting from the shell of the boiler, a hollow plug screwed onto the outer end of the nipple and projecting into the fire-pot of the range, and a collar and packing interposed between the said plug and the shell of the boiler, all substantially as specified.

396,958. SECONDARY BATTERY. JOHN S. SELLON, Hatton Garden, County of Middlesex, England, assignor to the Electrical Accumulator Company, of New York. Filed Apr. 26, 1887. Serial No. 236,206. (No model.) Patented in England Sept. 15, 1881, No. 3,967; in India Aug. 23, 1883, No. 963; in Argentine Republic Nov. 21, 1883, No. 354; in British Guiana Dec. 11, 1883, No. 197/3,155; in Mexico Jan. 27, 1883; in Canada Mar. 15, 1883, No. 16,490; in Straits Settlements Apr. 26, 1883, No. 25; in Chili June 8, 1883; in Brazil June 15, 1883, No. 53, and in Ceylon June 21, 1883.



Claim.—1. In a secondary battery, the combination of a positive element containing lead and antimony combined with an oxide of lead, and a negative element containing lead and antimony combined with an oxide of lead, substantially as described.

2. In a secondary battery, a plate, element, or support containing lead and antimony, in combination with an active material.

3. In a secondary battery, a perforated plate, element, or support composed of lead and antimony, to, in, or upon which is applied an active material.

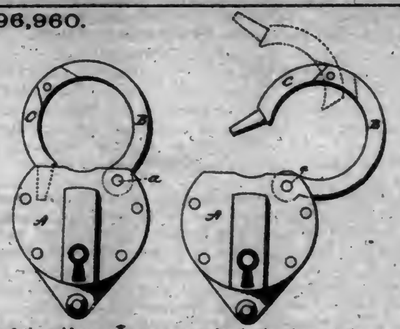
396,959. WATER-CLOSET BASIN. JOHN SHANKS, Barrhead, County of Renfrew, Scotland. Filed May 15, 1888. Serial No. 273,977. (No model.) Patented in England Dec. 12, 1885, No. 15,255.



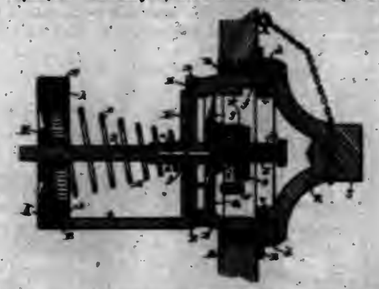
Claim.—A water-closet basin having combined in it a main discharge-outlet at the side leading down into a trap-bend passage below the basin, a concave basin-bottom dipping a little lower than the bottom edge of the main outlet, an upper water-flushing inlet, a hollow slit distributing-rim; a lower water-flushing inlet facing the main discharge-outlet and at the level of the water retained in the basin-bottom, a passage leading to the lower flushing-inlet directly from the horn to which the water-supply pipe is connected, and an after-service pocket with a top opening to receive water from the flushing-stream and with a small bottom orifice or inlet into the basin, the said several parts being all made in one piece, and substantially as herein set forth.

396,960. PADLOCK. HORACE P. SIMS, New York, N. Y., assignor to the Burnes Manufacturing Company, New Haven, Conn. Filed Oct. 15, 1888. Serial No. 288,122. (No model.)

Claim.—In a padlock, a shackle made in two parts, one part hinged by one end to the case, and the second part hinged to the other end of the said one part, so as to swing in the plane of the shackle, the free end of the said second part constructed to engage the mechanism of the lock, substantially as described.



396,961. AUTOMATIC STOP-VALVE BUNG. LEVI F. SMITH, Philadelphia, Pa. Filed May 21, 1888. Serial No. 274,484. (No model.)



Claim.—1. In a stop-valve bung, the combination of the cylindrical shell screw-threaded exteriorly at one end and screw-threaded interiorly at both ends, and having a semi-annular partition, an annular valve-seat at one end, with a valve and a valve-stem carrying said valve and having one end playing through an opening in said partition and screw-threaded, and having its other end playing through a screw-threaded disk in the lower end of the shell, a coiled spring for operating said valve, and the nut on the threaded end of the stem, all constructed and arranged substantially in the manner and for the purpose described.

2. The combination of the shell, its valve-seat, and valve having a valve-stem bored longitudinally to establish communication through the bung when the valve is closed, and having lateral openings communicating with the bore at opposite sides of the valve, with a screw-plug, M, for closing said bore and cutting off communication therethrough, substantially in the manner and for the purpose described.

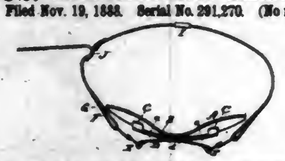
3. The combination of a shell having an annular valve-seat, and a spring-actuated valve, with a valve-stem carrying said valve, having a central bore and openings communicating therewith on opposite sides of the valve, a screw-plug in the outer end of said stem for closing communication through its bore, and a nut on said stem for regulating the movement of the valve, all constructed and arranged substantially in the manner and for the purpose described.

4. In a stop-valve bung, the combination of the shell D, having internal partitions, G, an annular valve-seat below said partition, and an interiorly screw-threaded ring, E, at its opposite end, with the valve I, valve-stem J, nut O, disk K, exteriorly screw-threaded, and spring L, all constructed and arranged substantially in the manner and for the purpose described.

5. The herein-described stop-valve bung, consisting of a cylindrical exteriorly-screw-threaded shell formed with a transverse perforated partition near its outer end, and an annular valve-seat at the inner side of said partition, in combination with a valve-stem, J, carrying a valve, I, and playing through a central opening in said partition and through an opening in a disk, K, secured in the inner end of the shell, the conical spring controlling said valve, and the setting-nut O on the end of the valve-stem outside the said partition, substantially as and for the purpose set forth.

6. The combination of the flanged exteriorly and interiorly screw-threaded bushing B with the stop-valve bung having an exteriorly-threaded portion engaging said bushing, and a perforated partition, G, valve-seat H, a spring-actuated valve, I, its stem J, having bore *j* and openings N *n*, the nut O, and plug M, and key Q, all constructed and arranged to operate as and for the purpose described.

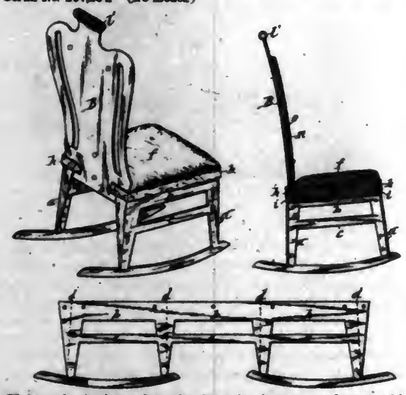
396,962. ABDOMINAL SUPPORTER. BELA ST. JOHN, Torrington, Conn. Filed Nov. 19, 1888. Serial No. 291,270. (No model.)



Claim.—1. In an abdominal supporter, the combination of the pad A, made from leather or other flexible material, combined with the horizontal elastic metal bar B, secured to the pad and provided with vertical springs C, pivoted to its respective ends, the horizontal spring D, fixed to the bar B, and straps adjustably connected to the respective ends of said spring D and adapted to pass around the body, whereby the said pad is secured, substantially as described.

2. The combination of the perforated flexible pad A, the horizontal metal bar B, secured to the pad, vertical springs C at each end of the said bar B, the horizontal springs D, fixed to the said bar B, the straps F G, formed from a single strap, adjustably connected to the respective ends of the said spring D, the said straps connected with a vertical stay, I, at the back, substantially as described.

396,963. TOY FURNITURE. GARDNER H. STONE, Syracuse, N. Y., assignor of one-half to Frank A. Hale, same place. Filed Mar. 15, 1888. Serial No. 267,234. (No model.)



Claim.—1. A piece of toy furniture having its top frame and legs formed of a sheet-metal blank consisting of the elongated straight strip *b b b*, the branches *a a a a*, extending from one of the longitudinal edges of said strip, and bars *c c c* between said branches, said blank being bent approximately at right angles to the plane of the blank on the lines *d d* through the branches *a a a a*, substantially as described and shown.

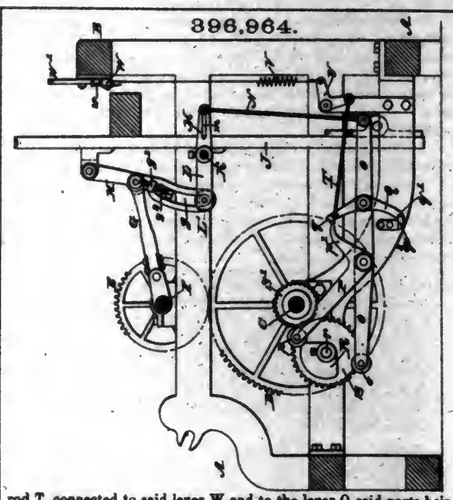
2. A piece of toy furniture composed of a wooden top plate, a frame formed of a blank of sheet metal encompassing the said top plate, cloth covering the wooden top plate and lapping over the exterior of the top portion of the metallic frame, a binding along the marginal portion of the cloth cover, and tacks or brads passing through the binding, underlying cloth, and metallic frame and into the wooden plate, substantially as described.

396,964. LOOM FOR WEAVING TERRY FABRICS. CHARLES STROBEL, Philadelphia, Pa. Filed Apr. 17, 1888. Serial No. 271,000. (No model.)

Claim.—1. The combination of a frame, a driving-shaft journaled therein and having the gear-wheels D and S thereon, a crank-shaft with a gear-wheel meshing with said gear-wheel D, a pitman connected to the said crank-shaft, a lay with a pivoted link having a slotted lower end, the said pitman being pivotally connected to said link, a rock-shaft on the lay having an arm with a roller at one end working in the slot of said link, a second arm secured to the said rock-shaft, a terry-lever pivoted to the frame, a rod connecting said second arm and said terry-lever, the lever P, pivoted to the same stud as the terry-lever, the lever Q, pivoted to the terry-lever and adapted to engage the lever P, and a rotary shaft with a cam adapted to operate the said levers O and P, substantially as described.

2. The pivoted terry-lever O, the lever Q, pivoted to said lever O and having a notched end, the lever P, pivoted on the same stud with the terry-lever and having the nose *p'*, the cam R, adapted to operate the said lever P, the frame A, with the breast-beam B, the levers W W', pivoted to the said beam, the spring V, the elbow-lever U, and

396,964.



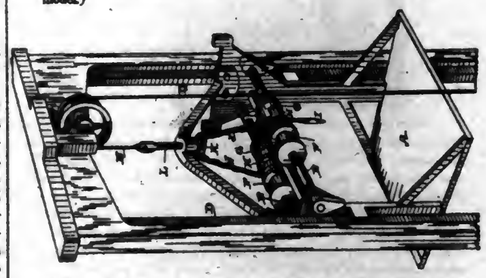
rod T, connected to said lever W and to the lever Q, said parts being combined substantially as described.

3. A loom having a breast-beam and a lay, the lever W, with recessed end, and lever W', with nose or hook end, said levers being pivoted to said beam, a slotted link pivotally connected to said lay, a crank-shaft with pitman connected to said link, a rock-shaft with an arm having a roller working in said slotted link, a terry-lever pivotally secured to the frame of the loom, a rod and arm connecting said terry-lever with the said rock-shaft, a lever pivoted on said terry-lever having a notched lower, a rod, elbow-lever, and spring connecting said lever W with said arm on the terry-lever, a rotary shaft with cam thereon, and a lug secured to the frame adapted to engage the notched lower end of said arm on terry-lever, said parts being combined substantially as and for the purpose described.

4. A loom with a driving-shaft and having the terry-lever O pivotally attached to the frame thereof, the lever P, having the same pivotal stud as the said terry-lever, the lever Q, pivoted to the terry-lever and having an end adapted to engage the end of the lever P, a rotary shaft having the cam R, a lay having the pivoted slotted link H, a crank-shaft with pitman connected with said link, a rock-shaft with an arm having a roller working in said slot, and an arm connected by a rod to said terry-lever.

5. A loom having a driving-shaft, a lay with the slotted pivoted link H, a crank-shaft with pitman connected to said link, the pivoted terry-lever O, a rock-shaft having an arm with a roller working in the slot of said link, and an arm connected by a rod to the said terry-lever, the lever P, with nose *p'*, the shaft *r*, with cam R thereon, the lever Q, with notched end *q*, the breast-beam B, with cossting levers W W', and a spring, elbow-lever, and rod connecting said lever W with the upper part of arm Q, said parts being combined substantially as and for the purpose described.

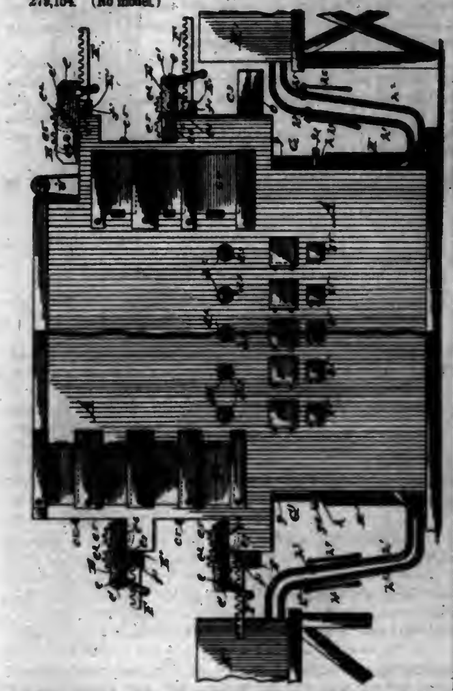
396,965. ELEVATOR SAFETY ATTACHMENT. PHILIP R. SULLIVAN, Tuscarora, Nev. Filed Sept. 5, 1888. Serial No. 284,674. (No model.)



Claim.—The horizontal shafts journaled upon the hoisting or elevator cage, having the cams fixed to the outer ends, so as to engage the guides within which the cage travels, springs acting to rotate the shafts, so as to force the cams into engagement with the guides, and pulleys around which suspending ropes or chains pass and connect with the cable to produce a tension in the opposite direction from that of the springs, in combination with clutch-sections sliding upon feath-

ers upon the shafts and engaging the suspending-pulleys, and a lever by which the clutch is disengaged, so as to allow the springs to act and throw the cams into engagement with the guides, substantially as and for the purpose herein described.

396,966. BRICK-KILN. JOHN TABER, South Wolfborough, N. H., assignor to himself, William Emery, Alfred, Me., and George M. Stearns, Boston, Mass. Filed May 11, 1886. Renewed July 5, 1888. Serial No. 279,154. (No model.)



Claim.—1. In a kiln to burn brick or other articles, the combination of the fire-boxes, the parallel heating-chambers successively approximating the same, but not receiving any of the flame or products of combustion therefrom, and mechanism, substantially as described, whereby the bricks are brought continuously nearer and nearer the fire-boxes and then discharged from the kiln.

2. In a kiln to burn brick or other articles, the combination of the fire-boxes, the parallel heating-chambers successively approximating the same, the racks, gearing, and crank-axles by which the pans bearing the brick are successively moved into the chambers, and mechanism, substantially as described, whereby the pans are lowered from the alternate ends of the heating-chamber to the next lower chamber and brought continuously near the fire-boxes, substantially as specified.

3. In a kiln to burn brick or other articles, the combination of the fire-boxes, the parallel heating-chambers successively approximating the same, the racks, gearing, and crank-axles by which the pans bearing the brick are successively moved into the chambers, the frames reciprocating between the end walls of the kiln and the end walls of the heating-chambers and lowering the pans from one chamber to another, and mechanism, substantially as described, whereby said frames are actuated.

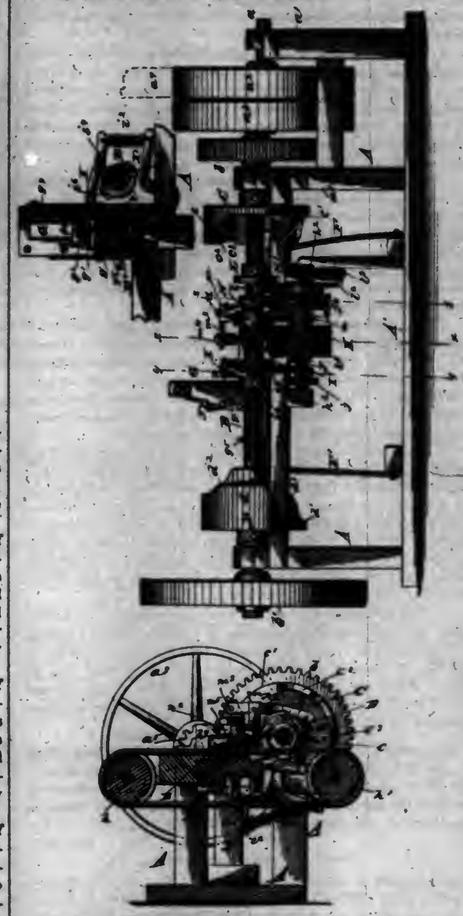
4. In a kiln to burn bricks or other articles, the combination of the fire-boxes, the parallel heating-chambers successively approximating the same, the racks, gearing, and crank-axles to move the brick-carrying pans into the chambers, the vertical reciprocating frames to lower said pans from each chamber to the next lower one, the vertical water-cylinders below said frames, the plungers or pistons moving therein and supporting the reciprocating frames, the reservoir situated sufficiently high above the cylinder, and the pipes k' k^9, connecting the reservoir and cylinders and controlled, respectively, by the valves k^3 k^9, substantially as specified.

5. In a brick-kiln, the combination of the fire-boxes, the parallel heating-chambers C C' C^3 C^9, successively approximating the same, the mechanism, substantially as described, to move the brick continuously through the chambers, and a casing, D, within the chamber C^9 and having around it the fire space or flue *d*, in which the flame and products of combustion of the fire-box penetrate, but not within the casing D, substantially as specified.

6. In a brick-kiln, the combination of the fire-boxes, the parallel heating-chambers successively approximating the same, the fire space or flue *d* in the lower chamber, C^9, the drying-chamber separated by the vertical wall A' from the kiln proper and the flues L, running through said wall A', and the valves *l*, by means of which heat can be admitted into the drying-chambers when the kiln is too hot, substantially as specified.

7. In a kiln for bricks or other articles, the combination of the fire-boxes, the parallel heating-chambers C C' C^3 C^9, all provided with the ways *c*, the pans *c'*, moving on said ways, the pans constructed, substantially as described, to cover the brick on said pans, the crank-axles, the gearing, and racks to move the pans into the chambers, and platforms *f*, on which the racks move, the vertically-reciprocating lowering-frames having upon them the sections of ways c^8 to receive the pans from the ways *c* of the heating-chambers, and mechanisms, substantially as described, to actuate said frames.

396,967. TILE OR BRICK PRESSING MACHINE. JOHN TABER, Wolfborough, N. H., assignor to himself, William Emery, Alfred, Me., and George M. Stearns, Boston, Mass. Filed Feb. 20, 1886. Renewed July 5, 1888. Serial No. 279,155. (No model.)



Claim.—1. The combination of the cam-shaft, the disks secured thereon and provided with cam-flanges, substantially as described, the feeding-frame, the plungers moving in ways on the main frame and actuated by the cam-flanges, the blank-delivering mechanism attached to the feeding-frame, constructed substantially as described and operated by a pin or lug on one of said plungers, the springs to retract the plungers, and mechanism, substantially as described, to rotate the cam-shaft.

2. The combination of the rotating cam-shaft, the disks secured thereon and provided with the cam-flanges, shaped as described, the

feeding-frame, the plungers moving in ways on the main frame and actuated by the cam-flanges, the blank-delivering mechanism attached to the feeding-frame, constructed substantially as described and actuated by a pin or lug on one of said plungers, the springs to retract the plungers, the belt running through the discharge-opening and carried by the end pulleys, and mechanism, substantially as described, whereby the belt is moved at proper intervals of time.

3. The combination of the rotating cam-shaft, the disks thereon provided with the cam-flanges shaped as described, the feeding-frame, the plungers moving in ways on the main frame and actuated by the cam-flanges, the springs to retract the plungers, the belt moving through the discharge-opening, the block m^4 and bar m^7, connected, respectively, with the pivoted levers M M', the spring m^3, connecting the rear ends of said levers, the collar N, secured to the cam-shaft and provided with the cam-lugs n' n, and mechanism, substantially as described, whereby the belt is moved at proper intervals of time.

4. The combination of the rotating cam-shaft, the disks thereon provided with cam-flanges shaped substantially as described, the feeding-frame, the plungers moving in ways on the main frame and actuated by the cam-flanges, the springs to retract the plungers, the belt moving through the discharge-opening, the blocks i^7, provided with the pins i^3, the levers I I', the spring i^3, connecting the rear ends of said levers, the collar i^4 on the cam-shaft, provided with the cam-lugs i^5 i^6, and mechanism, substantially as described, whereby the belt is moved at proper intervals of time.

5. The combination of the rotating cam-shaft, the disk thereon provided with cam-flanges shaped substantially as described, the plungers actuated by said cam-flanges, the feeding-frame, the oscillating shaft g, the rod g', passing therethrough, the pin g^2, entering the feeding-frame to support a brick therein, and the lug g^3 on the plunger E, adapted to strike against the rod g' when the plunger moves inward and draw the pin g^2 outward, substantially as specified.

6. The combination, with the rotating cam-shaft, the cam-disk, the plungers actuated thereby, and the belt H, passing over the pulleys h h', of the shaft J, ratchet j, controlled by the spring-pawl j', the disk j^3, turning loosely on said shaft, the ratchet-wheel j^2, controlled by the spring-pawl j^3, the pivoted T-shaped lever K, link-bar k, the spring j^5, the collar L, secured to the cam-shaft, and the roller l', attached to said collar and acting on the lever K, all constructed substantially as and for the purpose specified.

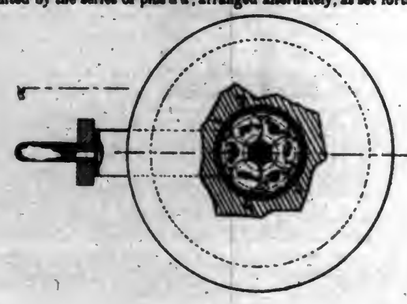
7. The combination of the rotating cam-shaft, the disks secured thereon and provided with cam-flanges shaped substantially as specified, the feeding-frame, the blank-delivering mechanism attached thereto, constructed substantially as described, and actuated by a pin or lug on one of the plungers, and the plungers actuated by the cam-flanges and having their ends adapted to have secured to them removable and interchangeable dies, substantially as specified.

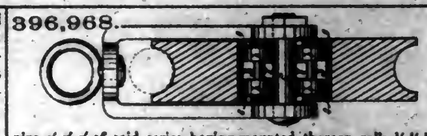
8. The combination of the shaft a, carrying the pulleys a^3 a^5 and the pinion a^6, the cam-shaft B, having upon it the cam-disks C and D, shaped substantially as specified, and the gear-wheel b, meshing with the pinion a^6, the plungers moving in ways on the main frame and actuated by the cam-disks, the belt moving at regular intervals of time through the discharge-opening of the machine, the blank-delivering mechanism, constructed substantially as described, attached to the feeding-frame and actuated by a pin or lug on the plunger E, and mechanism, substantially as described, to actuate said belt.

9. The combination of the reciprocating plungers, the feeding-frame, the automatic blank-delivering mechanism attached thereto, the belt moving at regular intervals of time through the discharge-opening, the rotating cam-shaft, the cam-disk C, provided with the flange c, having the inclined portion c^2 and notches c^3, and the cam-disk D, provided with the flange d, having the inclined portion d^2 and notches d^2, substantially as specified.

396,968. ANTI-FRICTION BEARING. ALFRED W. TERRY, Brooklyn, N. Y. Filed Nov. 3, 1888. Serial No. 289,869. (No model.)

Claim.—1. An anti-friction bearing consisting of the rings A A', united by the series of pins a a', arranged alternately, as set forth, the

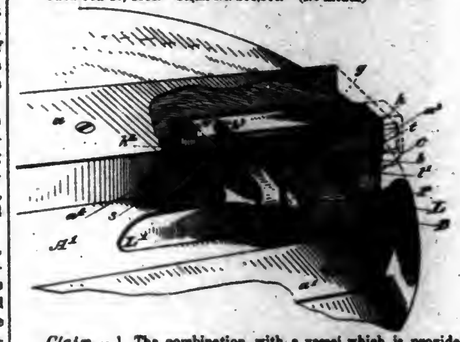




pins a' a' a' of said series having mounted thereon rolls b' b' b', and the remaining pins a a a having mounted thereon rolls b b, each roll b' passing between two of the rolls b b on either side of the same, substantially as and for the purpose described.

2. In an anti-friction bearing, the combination of the rings A A', the series of pins a a', arranged alternately, as set forth, the rolls b b, arranged in pairs, one pair on each of the pins a a a, and the rolls b' b' b', one on each of the pins a' a' a', each roll b' passing between the rolls b b of each of the two pairs on each side of the same, substantially as and for the purpose described.

396,969. BUTTER-TUB. LYMAN K. TEWKSBURY, Brooklyn, Pa. Filed Oct. 17, 1888. Serial No. 288,300. (No model.)



Claim.—1. The combination, with a vessel which is provided with a catch or recess, of a lid which rests upon such vessel, and which is provided with a slidable hook and with a pivoted spring-actuated lever which is in engagement with the slidable hook, the spring operating through the lever to move the hook inwardly into engagement with the recess in the vessel and to maintain it in such engagement.

2. The combination, with a vessel which is provided with two oppositely-placed catches or recesses, of a lid which rests upon such vessel, and which is provided upon one side with a fixed engaging-hook, and which is provided upon the opposite side with a slidable hook and with a pivoted spring-actuated lever which is in engagement with the slidable hook, the spring operating through the lever to move the hook from without inwardly into engagement with the recess in the vessel and to maintain it in such engagement.

396,970. WRENCH. JOHN VAN AUSDALL, Keokuk, Iowa. Filed Nov. 8, 1886. Serial No. 218,341. (Model.)



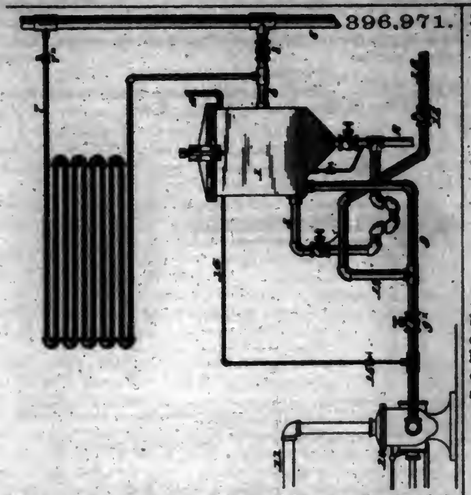
Claim.—The improved wrench herein described, consisting of the single bar of metal bent at one end to form the diverging jaws B C, the portion C being prolonged to form the lever-handle A, and the portion B carrying the movable serrated plate E, all substantially as shown and set forth.

396,971. FEED-WATER HEATER AND PURIFIER. WARREN WEBSTER, Philadelphia, Pa. Filed Sept. 13, 1888. Serial No. 285,227. (No model.)

Claim.—1. In a feed-water heater and purifier, the combination of a tank or receiver, a steam-supply pipe, a supply-pipe leading from the tank or receiver to a pump, and an air-outlet pipe leading from the tank or receiver to the supply-pipe, whereby the action of the pump draws the water and air from the tank or receiver and draws steam into the tank or receiver, substantially in the manner and for the purpose described.

2. In a feed-water heater and purifier, the combination of a purifying and heating chamber, a steam-supply pipe, a supply-pipe, a pump communicating with the delivery-pipe, and an overflow branch pipe communicating with the supply-pipe, substantially as and for the purpose described.

3. In a feed-water heater and purifier, the combination, with a

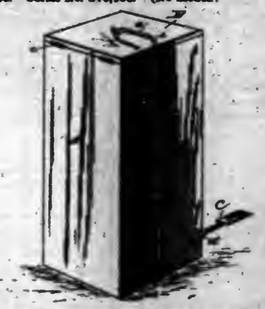


tank or receiver having means for supplying water thereto, of the steam-supply pipe having valves, a supply-pipe provided with a cock or valve, and a discharge-pipe leading from the tank or receiver to the supply-pipe, and provided with a valve, and a pump communicating with the supply, all arranged, combined, and operating substantially in the manner and for the purpose described.

4. In a feed-water heater and purifier, the combination of the tank or receiver, a supply-pipe leading therefrom, and a branch pipe communicating with the supply-pipe, and having a check-valve, substantially as described.

5. In a feed-water heater and purifier, the combination of the heating and purifying chamber, a supply-pipe leading therefrom provided with a valve, an air-outlet pipe provided with a valve and communicating with the heating and purifying chamber and the supply-pipe, and a pump communicating with the supply-pipe, all arranged, combined, and operating substantially in the manner and for the purpose described.

396,972. LID-RAISER. JAMES S. ALDERSON, Crescent Bay, Wash. Filed June 5, 1888. Serial No. 276,138. (No model.)



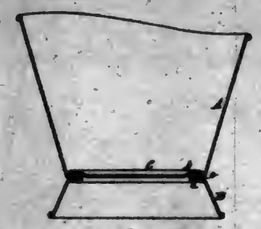
Claim.—In combination with the lid B, hinged to the receptacle, the rod c, extending alongside the receptacle, having a bent upper end attached to the lid, the treadle C, pivoted at d, and attached to the rod a at its lower end, and the eyebolt e, for guiding said rod in its up-and-down movement, substantially as described.

396,973. DEVICE FOR TWISTING FENCE-WIRE. WILLIAM S. BARKER, Troy, Ohio. Filed Nov. 26, 1888. Serial No. 291,533. (No model.)



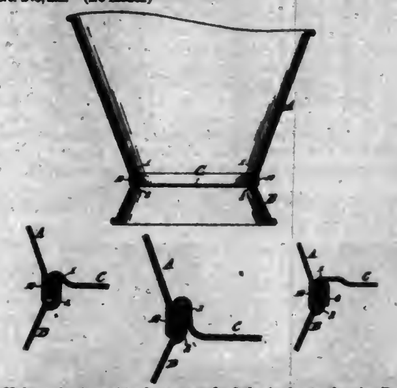
Claim.—In a device for twisting fence-wire, the combination, with a plate having holes for the ends of the wire, of a nipple having spiral grooves, substantially as and for the purpose set forth.

396,974. COAL-HOD. EDWARD BARRATH, Cincinnati, Ohio, assignor to Victor R. Knecht, same place. Filed May 29, 1888. Serial No. 275,490. (No model.)



Claim.—A coal-hod or similar metallic vessel, consisting of the body A, the rim B, and the bottom C, each made out of a single piece of metal and united by a double-hooked seam formed of a double hook integral with one of the parts, into the two hooks of which double hook the other parts are respectively inserted and clamped, substantially as shown and described.

396,975. COAL-HOD. EDWARD BARRATH, Cincinnati, Ohio, assignor to Victor R. Knecht, same place. Filed May 29, 1888. Serial No. 275,492. (No model.)



Claim.—1. A coal-hod composed of the body A, the rim B, and the bottom C, united by hooked flanges with the flanges standing vertically or approximately so to the vertical axis of the hod, substantially as described.

2. A coal-hod composed of the body A, the rim B, and the bottom C, each formed of a separate piece, the bottom having a depending flange standing in a vertical plane, the body having an upward-projecting vertical hooked flange embracing the flange on the bottom, and the rim having a vertical flange clamped between a part of the bottom and the flange on the body, substantially as described.

3. A coal-hod or similar vessel consisting of the body A, having its lower edge turned upward into a vertical hooked flange, the bottom C, having its edge turned downward into a vertical flange, and the rim B, having its upper edge extended around the hooked flange on the body, and, together with the flange on the bottom, clamped in position by said hooked flange, substantially as described.

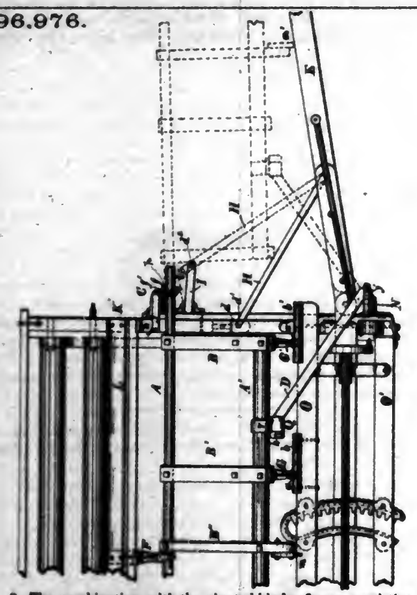
4. A coal-hod consisting of the body A, having its lower edge bent inward and upward to form a vertical hooked flange, the bottom C, having its outer edge bent downward to form a depending vertical flange, which is clamped by the hooked flange on the body, and the base-rim B, having a vertical flange clamped between a part of the bottom and the vertical flange on the body, substantially as described.

396,976. GRAIN-BINDER. FREDERICK G. BECKER, Brockport, N. Y., assignor to D. S. Morgan & Company, same place. Filed May 11, 1888. Serial No. 201,230. (No model.)

Claim.—1. In a harvester-binder, the combination, with the main frame, the binder-frame, the tongue, and a tilting lever mounted on the main frame, of a link, H, pivoted to the tongue and separably connected with the tilting lever, and a bracket on the main frame adapted to receive the link when disconnected from the tilting lever, whereby the link may be caused to tilt the machine or lock it and the tongue rigidly together, substantially as described.

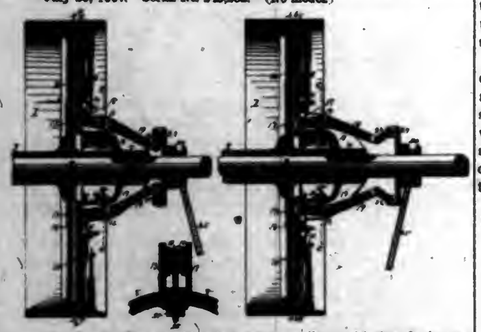
2. The combination, with the pivoted binder-frame, consisting of the rods A A' and braces B B' B'', of the collar c, flanges f f', and bracket J, substantially as described.

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3. The combination, with the pivoted binder-frame, consisting of the rods A A′ and braces B B′ B″, of the collar *c*, flanges *f f′*, bracket J, and pivoted supporting-brace D, substantially as described.

396,977. CLUTCH-PULLEY. EVANS BLAKE, Rockford, Ill. Filed July 25, 1887. Serial No. 245,232. (No model.)



Claim.—1. The combination, with a pulley, a friction device to move into and out of engagement with the pulley, a hub, and an operating-head, of a lever connecting the operating-head with the friction device, and an adjustable fulcrum to the lever, whereby the holding force of the friction mechanism is regulated, substantially as set forth.

2. The combination, with a pulley, a hub, a friction-sector, and an operating sliding head, of a lever connected at one end with the friction-sector and its other end connected to the operating sliding head, and an adjustable fulcrum to the lever to regulate the holding force of the friction mechanism, substantially as and for the purpose set forth

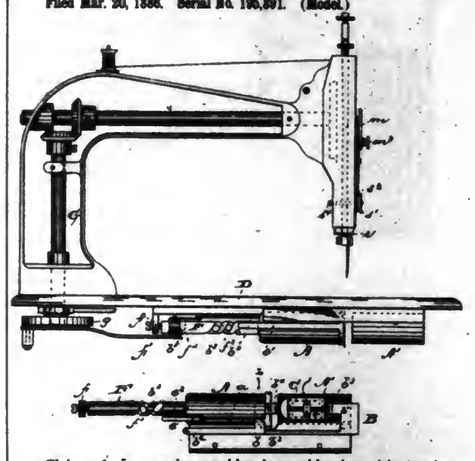
3. The combination, with the pulley, the friction device, the sliding head, the thimble-support, and the thimble, of the lever connecting the friction-sectors and the sliding head, and a fulcrum to the lever, said fulcrum having a screw-connection with the thimble-support, said thimble capable of a rotary movement in its support to adjust the fulcrum, substantially as and for the purpose set forth.

396,978. VEHICLE-GEAR. CHARLES M. BLYDENBURGH, Riverhead, N. Y. Filed Apr. 9, 1888. Serial No. 270,101. (No model.)



Claim.—The combination, with the cranked axle, the spring, and the vertically-hanging link, of the spring-bearing having one partially-raised arm secured to the short portion of the axle, and the partially-raised arm secured to the bent portion of the axle, the said arms diverging above the bend of the axle and forming the interval *a*, substantially as specified.

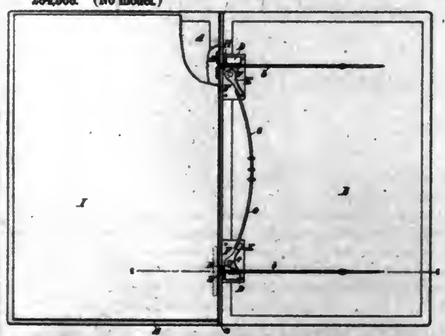
396,979. SEWING-MACHINE. JACOB BOPPEL, Newark, N. J. Filed Mar. 20, 1886. Serial No. 195,891. (Model.)



Claim.—1. In a sewing-machine, in combination with a reciprocating needle, a tubular race, A A′, having an opening between the parts thereof, a reciprocating carriage having arms *b′ b²* extending toward said race, a spool-holder held between said arms, a driving-shaft, G, having a crank-wheel, *g*, connecting-rod *f′*, arm *f⁴*, link *b³*, connecting said arm with the carriage, a spirally-grooved bar, F, arranged at the end of the race and given an oscillating movement by the connecting-rod, and a looping-ring connected with the bar F and moving therewith, all said parts being arranged and adapted to operate substantially as and for the purposes set forth.

2. In a sewing-machine, the combination of a bed, D, a reciprocating needle, a race, A A′, having a needle-opening between its parts, a reciprocating spool-holder and a carriage to give movement to the same, a looping-ring working at said needle-opening and connected with and receiving motion from a spirally-grooved or slotted rod or shaft, F, a revolving plate, *g*, secured to the driving-shaft G, and a connecting-rod, *f′*, connecting said revolving plate and rod F, substantially as set forth.

396,980. BINDER. THEODORE F. BOURNE, Clifton, assignor to Ann L. Shipman's Sons, New York, N. Y. Filed Sept. 1, 1888. Serial No. 284,368. (No model.)



Claim.—1. In a binder, the combination, with a pair of covers and a cord or connection for holding papers, of a catch carried by said covers, said catch having a movable member and being adapted to grasp said cord, substantially as described.

2. In a binder, the combination, with a pair of covers and a cord or connection, *b*, of a head, D, and lever E, carried by one of the covers and adapted to grasp the cord between them, substantially as described.

3. In a binder, the covers A B and a cord or connection, *b*, combined with a catch to grasp said cord and with a loop or eye to prevent raising of the cord from the catch, substantially as described.

4. In a binder, the covers A B and the cord or connection *b*, combined with the head D and spring-pressed lever E to grasp a cord, and with a loop or eye to prevent raising of the cord, substantially as described.

5. In a binder, the covers A B and cord or connection *b*, combined with a catch to grasp said cord, and with a plate, F, to support said catch, substantially as described.

6. In a binder, the covers A B and a cord or connection, *b*, combined with the plate F, head D, and spring-pressed lever E on said head, and with the loop or eye H, substantially as described.

7. In a binder, the covers A B and a cord or connection, *b*, combined with the head D and lever E, the meeting faces of said head and lever being serrated or toothed, substantially as described.

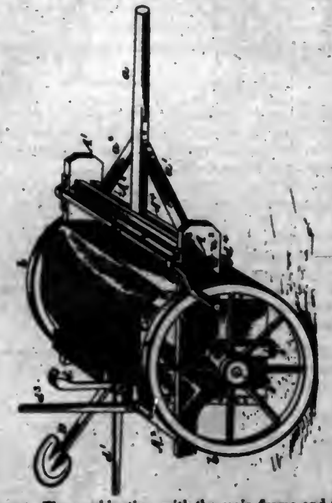
8. In a binder, the covers A B and a cord or connection, *b*, combined with the head D and lever E, said lever having a cam projection, *f*, substantially as described.

9. In a binder, the covers A B and a cord or connection, *b*, combined with the head D and lever E, said lever having a cam projection, *f*, and with a spring, G, substantially as described.

396,981. PROCESS OF DISINTEGRATING FIBROUS SUBSTANCES. ROBERT S. BOYCE, New York, N. Y. Filed Dec. 13, 1888. Serial No. 293,415. (No specimens.)

Claim.—The process of disintegrating fibrous substances, consisting of, first, breaking the straw; second, subjecting the fibers to the action of a boiling neutral soapy solution made by dissolving soap high in fatty matters in water; third, drying the fibers, and, fourth, subjecting the dried fibers to rolling and finishing, as herein described.

396,982. DUMPING-CART. JOHN CAMLE, Cable, Minn. Filed Apr. 11, 1888. Serial No. 270,260. (No model.)

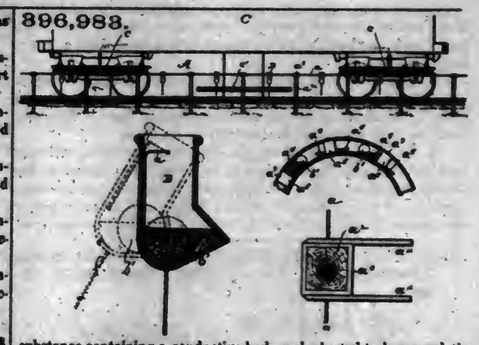


Claim.—1. The combination, with the main frame and the axle, bent as described, of a hopper resting on the axle and rigidly secured thereto, the axle being in the rear of the vertical central line of the hopper, and a hook pivoted to the frame and adapted to engage with the rear side of the hopper, substantially as specified.

2. The combination, with the main frame and supporting-wheels, of an axle bent as described, a hopper resting on the axle and rigidly secured thereto, the hopper being so constructed that it extends a greater distance above its axial line than below it, in order that when it is tilted in either direction the top edge of its front or rear side will come in contact with the ground and cause the wheels and frame to be lifted up and projected forward or backward, for the purpose specified.

3. The combination, with the main frame and supporting-wheels, of an axle bent as described, a hopper resting on the axle and rigidly secured thereto, the hopper being so constructed that it extends a greater distance above its axial line than below it, for the purpose specified, a shaft mounted in bearings on the front of the frame, and a chain attached to the rear side of the hopper near the bottom, and after passing under the hopper adapted to be wound on said shaft, substantially as and for the purpose set forth.

396,983. RAILWAY-TELEGRAPH. BAYLIS CADE, Louisburg, N. C. Filed Mar. 7, 1888. Serial No. 266,421. (No model.)

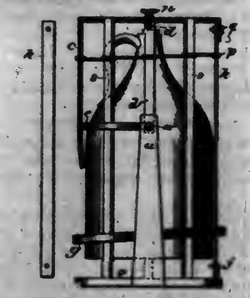


Claim.—1. A conductor of electricity or line, consisting of sections of insulated conductive substance sustained upon suitable supports, in combination with vessels, each vessel consisting of insulating substance containing a conductive body and adapted to be moved, the sections being connected by the vessels and having their ends passing into and fixed in the same, so as to form the support for said vessels, whereby movement of a vessel will throw the conductive body which it contains out of or into direct contact with the sections and thus break or make the circuit, substantially as described.

2. A conductor of electricity or line, consisting of sections of insulated conductive substance sustained upon suitable supports, in combination with vessels and with a movable structure, each vessel consisting of insulating substance containing a conductive body and adapted to be moved, the sections being connected by the vessels and having their ends passing into and fixed in the same, so as to form the support for said vessels, and the movable structure having a projection which comes into contact with and moves the vessels, substantially as described.

3. A conductor of electricity or line, consisting of sections of insulated conductive substance sustained upon suitable supports, in combination with vessels and with a movable structure, each vessel consisting of insulating substance containing a conductive body and adapted to be moved, the sections being connected by the vessels and having their ends passing into and fixed in the same, so as to form the support for said vessels, and the movable structure having a projection which comes into contact with and moves the vessels, and having conductors—such as brushes—for contact with the line, the projection on the movable structure being located between these conductors, substantially as described.

396,984. COMBINED JUG-HOLDING DEVICE AND SHIPPING-CASE. NORRIS S. CHANDLER, Springfield, Mass. Filed Mar. 9, 1888. Serial No. 266,782. (No model.)



Claim.—1. In a jug-holding device, the combination, with the supporting-frame, of a pivoted tilting rack composed, as shown, of angular irons *c* and *d*, bolted to each other and connected by means of bent piece *e*, and the angular piece *c*, having its uppermost end bent in to conform to the shape of the jug, substantially as described.

2. In a jug-holding device and shipping-case, the combination, with the base and standards *a*, of a reversible tilting rack pivoted thereto and a coupling means connecting the inverted rack and the base, whereby the jug-holding device becomes a shipping-case, substantially as described.

3. In a tilting rack and shipping-case, the combination, with the supporting-frame, of a bed-piece, a reversible rack adapted when reversed to contain a jug resting upon said bed-piece, and a coupling means connecting the frame and rack, substantially as described.

4. In a reversible rack and shipping-case, the combination, with the frame and a tilting rack pivoted thereto, of coupling-rod *k*, engaging said frame and rack and holding the rack in a reversed position, substantially as described.

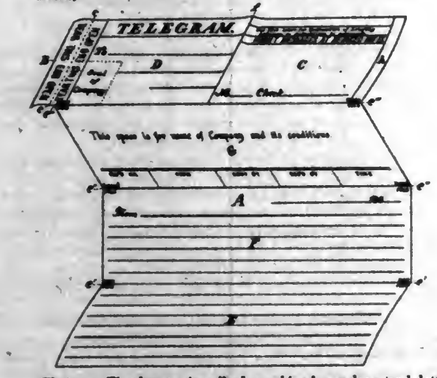
5. In a tilting rack and shipping-case, the combination, with the

frame and rack pivoted thereto, of bent strip *g*, adapted to hold the jug in position when the device is used as a shipping-case, substantially as described.

6. In a tilting rack and shipping-case, the combination, with a supporting-frame, of a rack pivoted thereto, provided in its base with screw *n*, for engaging the stopple or uppermost part of the vessel when the rack is inverted, substantially as described.

7. In a tilting rack and shipping-case, the combination, with the base and standards, the tilting rack, and bent strip secured to the standards adapted to inclose the jug when the device is used as a shipping-case, of staves arranged between the jug and holder, together with means for securing the staves in place, substantially as described.

396,985. COMBINED ENVELOPE AND LETTER-SHEET. CHARLES L. CHURCH, Bangor, Me. Filed Oct. 18, 1887. Serial No. 252,700. (No model.)



Claim.—The herein-described combined envelope and letter-sheet, consisting of the four longitudinal portions, the bottom portions E and F, being, when folded upon line *d*, face to face, the second portion, G, being folded upon line *d'*, with its face upon the back of part E, the top portion being folded upon line *d''*, with its face outward and back to back with part G and the folded sheet being then transversely folded upon line *f*, with the front face of said top portion outside, the latter portion having at one end the flap B, said sheet having spaces for the address and communication upon the same side, substantially as described.

396,986. GUN-WAD. GEORGE CLAFF, Philadelphia, assignor of one-half to Thomas D. Abraham, Upper Merion, Pa. Filed June 14, 1888. Serial No. 277,093. (No model.)

Claim.—A gun-wad consisting of a composition of paper-pulp and bristles, substantially as described.

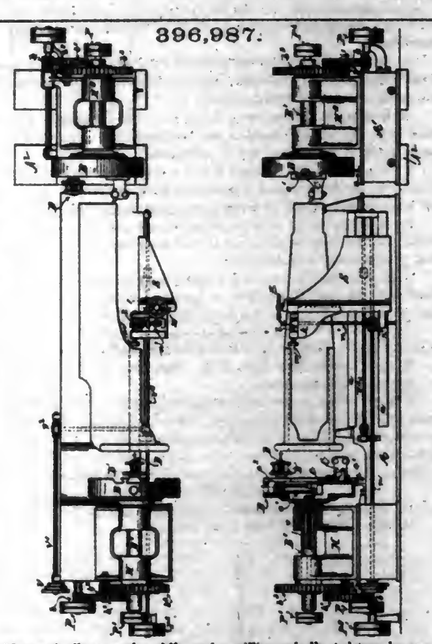
396,987. MACHINE FOR FINISHING ENGINE-BED CASTINGS. GEORGE H. CORLISS, Providence, R. I.; Emily A. Corliss administratrix of said George H. Corliss, deceased. Filed Dec. 3, 1887. Serial No. 256,927. (No model.)

Claim.—1. In a machine for treating the bed-castings of steam-engines and analogous castings, the combination and arrangement in a single machine of the revolving head B and tool-carriage C, the latter traversing radially in such head while being revolved for squaring the ends, with a saddle, S, traversing longitudinally of the bed, a rest, *k*, adjustable vertically on such saddle, and a milling-spindle, *t*, driven by power for milling the guides, adapted to serve interchangeably on the same bed-casting without readjustment thereof, all substantially as herein specified.

2. In a machine for treating the bed-castings of steam-engines and analogous castings, the combination and arrangement in a single machine of the revolving head B and tool-carriage C, the latter traversing radially in such head while being revolved for squaring the ends, with a drill-chuck, D, adjustable radially on the head B; means for adjusting and holding such head in the required positions, and an operating-shaft, *e*, revolving in the interior of a hollow shaft, B', on which the head B is mounted for drilling the holes in the required positions, all adapted to serve as herein specified.

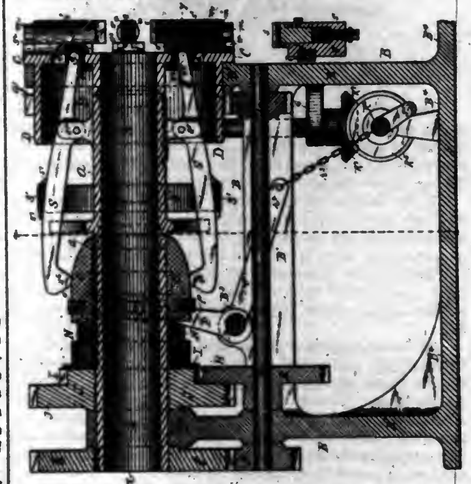
3. In a machine for treating the bed-castings of steam-engines and analogous castings, the combination and arrangement in a single machine of the drill-chuck D, adjustable radially on the head B, means for holding such head in the required positions, and an operating-shaft, *e*, revolved in the interior of the shaft B' for drilling the holes, with a saddle, S, traversed longitudinally of the bed, a rest, *k*, adjustable vertically on such saddle, and a milling-spindle, *t*, driven by power for milling the guides, adapted to serve either simultaneously or independently on the same bed-casting without readjustment of the latter, all substantially as herein specified.

396,987.



4. In a machine for treating the bed-castings of steam-engines and analogous castings, the combination and arrangement in a single machine of the revolving head B and tool-carriage C, traversed radially on such head, with the saddle S, rest *k*, and milling-spindle *t*, the latter driven by power and traversed longitudinally of the bed, and with the drill-chuck D, adjustable radially on the head B, and with means for holding such head in the successively-required positions, and the operating-shaft *e*, revolved in the interior of the shaft B', all substantially as herein specified.

396,988. PIPE-THREADING MACHINE. WILLIAM J. DALY, McKeesport, assignor of one-half to W. S. Foster, Pittsburg, Pa. Filed June 14, 1888. Serial No. 277,065. (No model.)



Claim.—1. In pipe-threading apparatus, the combination of the sliding block *s'*, the sliding gripping-jaw *s*, having a shank threaded interiorly and fitting within said sliding block, and the adjusting-screw *m*, engaging with said gripping-jaw and acting to advance or retract the same, substantially as and for the purposes set forth.

2. In pipe-threading apparatus, the hollow spindle A, having the face-plate C, provided with radial guides, in combination with the sliding blocks *s*, carrying the gripping-jaws and connected to the socket-blocks *s'*, and the operating-levers S, substantially as and for the purposes set forth.

3. In pipe-threading apparatus, the hollow revolving spindle for holding the pipe to be threaded, mounted in the machine-frame B, and having the flange D, forming the journal for the spindle at one end of said frame, in combination with the longitudinal shaft G, gear-wheels E F, gear-wheel *g*, and gear-face *g'* on said flange D, substantially as and for the purposes set forth.

4. In pipe-threading apparatus, the combination, with the hollow revolving spindle mounted in the machine-frame, of the sliding cone-shaped sleeve O, sliding thereon and connected thereto by a feather, and levers S, pivoted to the spindle and operating the sliding gripping-jaws *s*, and the rock-shaft Q, carrying the arm P, connecting with said sliding cone-shaped sleeve, and having the arm connected by chain with the crank-shaft R^3, substantially as and for the purposes set forth.

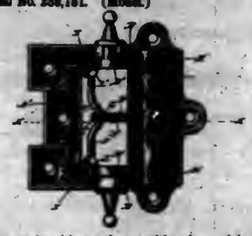
5. In pipe-threading apparatus, the combination of the hollow revolving spindle A, the cone-shaped sleeve O, sliding thereon, the levers S, connected to the sliding gripping-jaws *s*, and the spring *s'*, extending around and bearing upon the several levers and held in place by lugs or projections thereon, substantially as and for the purposes set forth.

6. In pipe-threading apparatus, the combination of the hollow revolving spindle having the cone-shaped sleeve O sliding thereon, and connections between said cone and the sliding gripping-jaws *s*, in combination with the rock-shaft Q, having arm P, engaging with the cone and arm or lever, and the crank-shaft R^3, having its cranks connected to said lever, and mechanism for rotating said crank-shaft connected thereto by a clutch, substantially as and for the purposes set forth.

7. In pipe-threading apparatus, the combination of a hollow revolving spindle adapted to engage with, center, and rotate the pipe, and sliding threading-die in line therewith and having a cutting-die, a holding-die opposite the same, and a holding-die above said cutting-die, substantially as and for the purposes set forth.

8. In a pipe-threading apparatus, sliding gripping-jaws, each having two biting-edges extending longitudinally of the pipe to be threaded, the inner faces of which biting-edges are substantially parallel, substantially as and for the purposes set forth.

396,989. SPRING-HINGE. LEVI M. DEVORE, Freeport, Ill., assignor to the Stover Manufacturing Company, same place. Filed Oct. 26, 1888. Serial No. 289,181. (Model.)



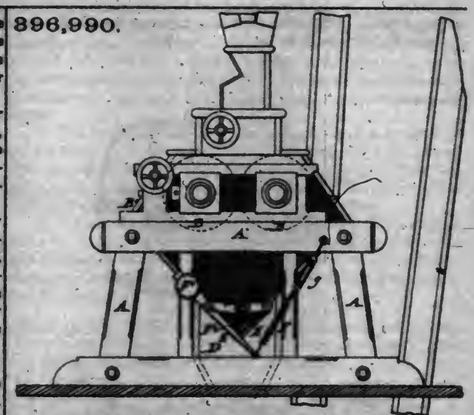
Claim.—1. In a spring-hinge, the combination, with two suitably-connected leaves, of a rod revolubly mounted upon one of said leaves and provided with an offset or crank, and a spring mounted upon the other leaf at one side of the hinge-axis and having its free end extending toward the opposite leaf and engaging said offset or crank, substantially as set forth.

2. The combination, with the leaf A, having at each end an ear, B, of the leaf A', having ears B', falling between the ears B and forming with them a pair of ears at each end of the hinge, the spring mounted upon one of said leaves at one side of the hinge-axis and having its free end projecting toward the other leaf, the notches in the ears B' B', the rod J, resting in said notches and having the crank-like offset K, engaged by said spring end, and the loops L L', retaining the rod in position, substantially as set forth.

396,990. GRINDING-MILL. ANTON DOBLER, New York, N. Y. Filed Apr. 16, 1888. Serial No. 270,796. (No model.)

Claim.—The combination of a pair of crushing-rolls, a collecting-hopper below said rolls, a conveyer-trunk connected to the discharge end of said hopper, two downwardly-inclined hinged valves within said trunk, the lower edges of which meet for closing the trunk, arms fixed at their outer ends to the pintles of said valves and overlapping at their inner ends, one of said arms being provided with a slot and the other with a pin for loosely engaging said slot, a weighted lever attached to the pintle of one of said valves, and a spring connected to said lever for holding the valves in normally-closed position, whereby a passing mass of the ground material is retained in the hopper below the rolls.

396,990.



396,991. WHEEL. RUDOLPH W. DOSMOTER, South Bend, Ind. Filed Nov. 5, 1888. Serial No. 289,982. (No model.)



Claim.—1. The combination of a rim or tire, spokes, and a hub consisting of two semi-tubular sections provided with one or more annular bulges for the reception of the inner ends of the spokes, independent caps or rings secured over the ends of the said sections to clamp them together, and an inner bearing-sleeve, substantially as described.

2. The combination of two semi-tubular hub-sections and two independent caps or rings secured over the ends of said sections, whereby the same are clamped together, substantially as described.

3. The combination of the two semi-tubular sections provided with reduced ends, forming shoulders *d'*, and two independent caps or rings secured over the said reduced ends, substantially as described.

4. The combination of two semi-tubular hub-sections provided with one or more bulges, *b*, and independent caps or rings secured over the ends of the said sections, substantially as described.

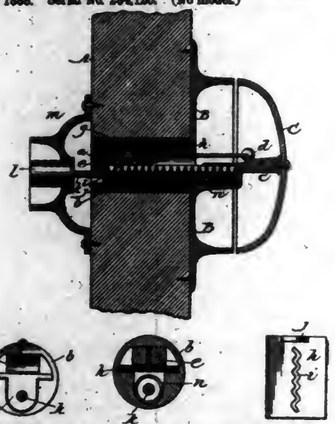
5. In a hub, the combination of the two semi-tubular cast-metal sections, provided upon their opposite ends with external screw-threads, and internally-screw-threaded caps screwed over the ends of the said sections, whereby the same are held or clamped securely together, the contiguous longitudinal edges of the sections abutting against each, substantially as described.

396,992. COMPOUND GRAPHITIC HEARTH FOR METALLURGIC FURNACES. CHARLES J. RAMIN, New York, N. Y., assignor to the Carbon Iron Company, same place. Filed Feb. 3, 1887. Serial No. 226,268. (No model.)



Claim.—A hearth or sole for furnaces for deoxidizing or reducing iron ores, composed of lumps of graphitic carbon and iron sponge between the lumps, the carbon and the sponge being compact and integral with each other, substantially as shown and described.

396,993. DOOR-BELL. WILLIAM H. FAUBER, Chicago, Ill. Filed Aug. 30, 1888. Serial No. 284,120. (No model.)



Claim.—1. The casting B, formed integral with the oppositely-projecting tube *b* and arm *c*, and the gong C, mounted on the arm, in combination with the block *e*, pivoted inside the tube, and having the pin *g* and a striker, and a lengthwise-movable rod extending into the tube, and provided therein with an attached plate, *h*, having a slot, *i*, provided with a zigzagged wall, and into which slot projects the pin on the pivoted block, substantially as described.

2. The combination, with a gong, C, and a casting, B, having a tube, *b*, of the block *e*, pivoted in the tube, and having the pin *g* and a striker, and a lengthwise-movable rod extending into the tube, and having an attached plate, *h*, in the tube, provided with a slot, *i*, having a zigzagged wall, substantially as described.

3. The combination, with a gong, C, and a casting, B, having a tube, *b*, of the block *e*, pivoted in the tube, and having the pin *g* and a striker, the plate *h*, located in the tube, and having an ear, *j*, and a slot, *i*, provided with a zigzagged wall, and a lengthwise-movable rod engaging said ear to move the slotted plate, substantially as described.

4. The combination, with a gong, C, and a casting, B, having a tube, *b*, of the block *e*, pivoted within the tube, and provided with a pin, *g*, and a striker, a plate, *h*, in the tube, having an ear, *j*, and a slot, *i*, provided with a zigzagged wall, and a push-rod, *k*, extending through the tube and engaging the ear to move the slotted plate, substantially as described.

5. The combination, with a base-plate, B, having the oppositely-projecting tube *b* and arm *c*, of the gong C on the arm, the block *e*, pivoted on the tube, and provided with a pin, *g*, and a striker, the plate *h*, having a slot, *i*, provided with a zigzagged wall, and an ear, *j*, provided with a screw-threaded orifice, and the push-rod *k*, having a screw-thread engaging the orifice in the ear, for operating the slotted plate and adapting the parts to different thicknesses of walls, substantially as described.

396,994. SCARF-HOLDER. MALCOLM FORBES, Warwick, N. Y. Filed Sept. 10, 1888. Serial No. 285,057. (No model.)



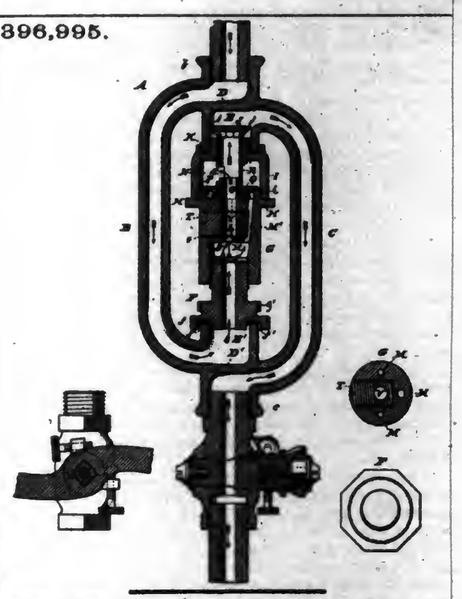
Claim.—1. A breastpin scarf-holder consisting of the breastpin proper, 1, having on its rear the safety-pin 2 and on its face the sharpened downwardly-projecting pin 3, substantially as and for the purposes set forth.

2. A breastpin scarf-holder consisting of the breastpin proper, 1, having on its rear the safety-pin 2 and on its front the sharpened downwardly and outwardly projecting pin 3, substantially as and for the purposes set forth.

396,995. REGULATOR FOR GAS-LAMPS. JOHN FRANKLIN, Cincinnati, Ohio. Filed Dec. 20, 1887. Serial No. 258,491. (No model.)

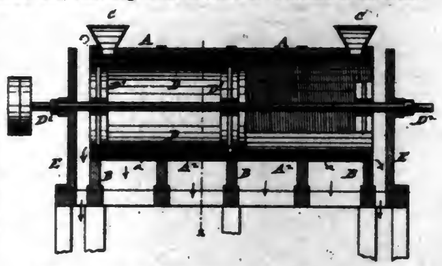
Claim.—The combination, with the yoke, the foot-piece, the cap, and the float, of the cylinder having the central vertical opening and the bores M M', the said bore M' being larger than the bores M, and the screw having the opening V and adapted to partially close the bore M', substantially as specified.

396,995.



396,996. MACHINE FOR DELINTING COTTON-SEED. ERNEST T. GEBHERT, New York, N. Y. Filed Oct. 14, 1887. Serial No. 252,347. (No model.)

Brief.—The machine is composed of a shell or casing, the upper part of which is made of abrading material provided with grooves or furrows having a slight pitch, and the lower part of which is made of longitudinally-slotted plates. A brush revolves within the casing, the latter having open ends, so that the seed can be discharged at either end, according to the direction of revolution of the brush.



Claim.—1. The combination, with a rotary cylindrical brush, of a fixed exterior casing or shell extending around said brush, and composed of an upper part provided with an abrading material having grooves or furrows and of a smooth and slotted bottom part, substantially as set forth.

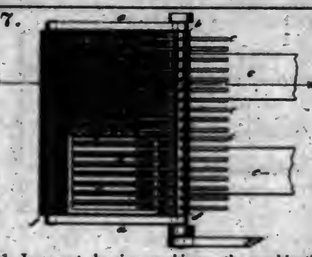
2. The combination of an exterior casing or shell, the upper surface of which is provided with abrading material having grooves or furrows, said casing having a slotted bottom part and being provided with open ends, with an interior cylindrical brush, substantially as set forth.

3. The combination of an exterior shell or casing, the upper surface of which is formed of a series of slabs of abrading material, said casing or shell having a slotted bottom part, and said slabs having spirally-arranged grooves or furrows, with an interior rotary brush central to the casing and standards for supporting the shaft of the brush, substantially as set forth.

4. The combination of an exterior casing or shell formed of the upper part of abrading material and having grooves or furrows, said shell or casing having a slotted bottom part, supporting-standards, and encircling-bands for said casing, with an interior rotary brush supported centrally to the casing, said casing being open at the ends and provided with supply-hoppers at both ends, substantially as set forth.

396,997. CARPET-BEATING MACHINERY. WILLIAM H. HANKINSON, New York, N. Y. Filed Feb. 24, 1887. Serial No. 228,730. (No model.)

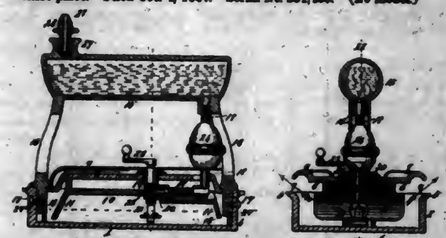
396,997.



Claim.—1. In carpet-cleaning machinery, the combination, with a series of beaters, of a rigid open-slatted bed and an interposed soft and slightly-yielding open support on which the carpet rests in passing under the beaters, substantially as described.

2. In carpet-cleaning machinery, the combination, with a series of beaters, of an open-slatted bed and a cocoa mat mounted thereon, the two forming a compound rigid and soft support for the carpet and sustaining it both laterally and longitudinally under the action of the beaters.

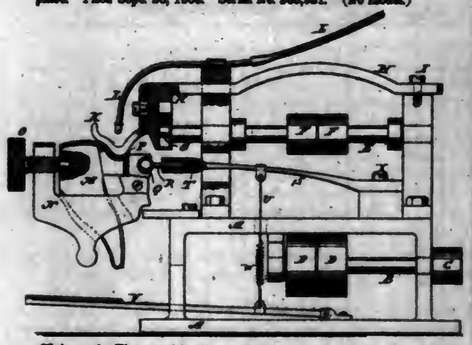
396,998. SELF-HEATING SAD-IRON. GUSTAVUS HEIDE, St. Louis, Mo., assignor to the National Self Heating Sad Iron Company, same place. Filed Oct. 4, 1887. Serial No. 251,469. (No model.)



Claim.—1. In a self-heating sad-iron, the combination of the imperforate bottom 1 2 4, forming a combustion-chamber, top plate arranged over the bottom, with an air-space between them, intermediate plate, 10, having downturned ends 11, said plate being disconnected from the bottom of the iron and being located between the bottom and top plate, with a space between it and the walls of the bottom to provide for a circulation, said intermediate plate deflecting heat from the top plate, the downturned ends of said plate being adapted to deflect heat from the lower ends of the handle, a reservoir, and a pipe leading from the reservoir to the under side of said intermediate plate, substantially as shown and described.

2. In a self-heating sad-iron, the combination of the bottom plate having sides 2 and back 4, top plate having the upwardly, outwardly, and downwardly extending flanges 7, intermediate plate having the end flanges, 11, handle having arms 16, by which it is secured to the sides and back, supply-pipe, and burner provided with a regulating-valve, all substantially as and for the purpose set forth.

396,999. HEEL-BURNISHING MACHINE. CHARLES H. HELMS, Poughkeepsie, N. Y., assignor to himself and Charles H. Goodsell, same place. Filed Sept. 20, 1888. Serial No. 285,921. (No model.)



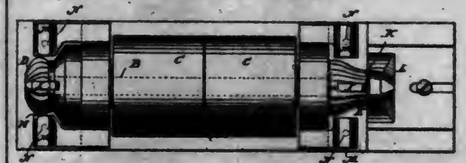
Claim.—1. The combination, with the arm S and the shoe-holder N, connected to the arm by a ball-and-socket joint, of the horizontal arm H, carrying the burnishing-tool, and the shaft E, having the cam G directly engaging the tool-carrying arm and oscillating it in a horizontal plane, substantially as described.

2. The combination of the spring-arm S, having a socket at one end, a ball, Q, having a stem, R, entering the socket, a spring, T, in the socket acting on the stem, a shoe-holder, N, jointed on the ball, a lever, V, connected with the spring-arm, the horizontal arm H, carrying the burnishing-tool, and the shaft E, having the cam G for oscillating the tool-carrying arm in a horizontal plane, substantially as described.

3. The combination, with the frame A and the shoe-holder N, of the driving-shaft B, the counter-shaft E, located above the driving-shaft and having the cam G, and the horizontal arm H, having a burnishing-tool, K, and directly engaged by the cam and oscillated in a horizontal plane by said cam, substantially as described.

4. The combination of the frame A, the spring-arm S, rigidly secured at one end, the shoe-holder N, connected with the spring-arm by a ball-and-socket joint, the pivoted lever V, and the spring W, connecting the lever with the spring-arm, with the oscillating burnishing-tool K, substantially as described.

397,000. HEEL-TRIMMER. CHARLES H. HELMS, Poughkeepsie, N. Y., assignor to himself and Charles H. Goodsell, same place. Filed Sept. 20, 1888. Serial No. 285,922. (No model.)



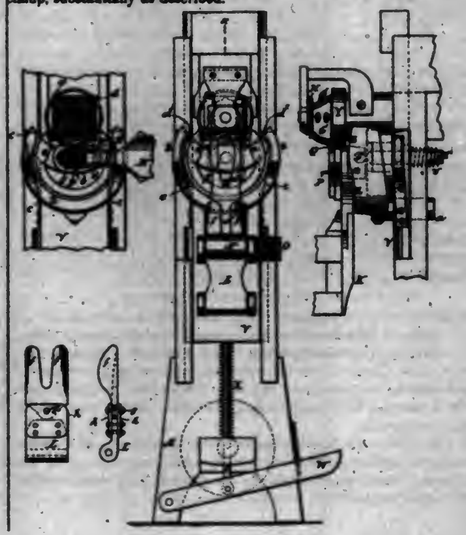
Claim.—1. A heel-trimming machine consisting of a supporting-frame, a rotary shaft, a cutter on the shaft for trimming a heel, a stationary rest at one end of the cutter to support a heel, a fixed guard projecting over the upper side of the cutter, and two swiveled heel-rests pivoted, respectively, to the frame at opposite sides of the cutter beneath the guard which projects above the latter, substantially as described.

2. A heel-trimming machine consisting of a supporting-frame, a rotary shaft, a heel-trimming cutter on the shaft, a heel-rest at one end of the cutter, and two opposite horizontally-swinging heel-rests pivoted, respectively, to the frame at opposite sides of the cutter, substantially as described.

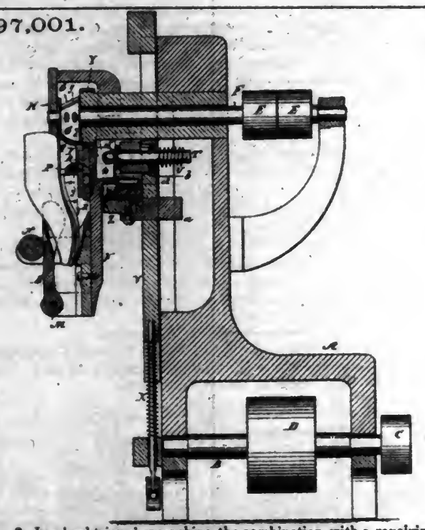
397,001. HEEL-TRIMMER. CHARLES H. HELMS, Poughkeepsie, N. Y., assignor to himself and Charles H. Goodsell, same place. Filed Nov. 8, 1888. Serial No. 290,205. (No model.)

Claim.—1. In a heel-trimming machine, the combination, with a trimming-knife, of a jack or holder composed of a base, K, having prongs to engage the heel, a jointed clamp, L, and a rotating eccentric, N, for locking up the clamp, substantially as described.

2. In a heel-trimming machine, the combination, with a trimming-knife, G, of a jack or holder composed of a base, K', having a detachable holder, Q, provided with prongs, a clamp, L, pivotally connected with the base, and the rotating eccentric N for locking up the clamp, substantially as described.



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3. In a heel-trimming machine, the combination, with a revolving trimming-knife, G, and its shaft F, of the stationary rim Y, located behind the knife, and a jack composed of a base, K, clamp L, lock-up N, and detachable pattern-plate Q, having its edge bearing against and movable around the edge of the stationary rim for guiding the jack, substantially as described.

4. In a heel-trimming machine, the combination, with a revolving trimming-knife, G, and its shaft F, of the stationary rim Y, located behind the knife, and an oscillating jack composed of the base K, the pivoted clamp L, the rotating eccentric for locking up the clamp, and the detachable pattern-plate Q, provided with the prongs R and P, and having its edge bearing against and movable around the edge of the stationary rim for guiding the jack, substantially as described.

5. In a heel-trimming machine, the combination, with a knife or trimmer and a laterally moving and swinging jack, of a guide-arm, *d*, for said jack, and projections *e*, placed in the guideway of said arm for moving the jack in a lateral direction as said jack approaches one extremity or the other of its swing, and causing the knife to act along the entire extent of the heel-surface to be trimmed, substantially as described.

6. In a heel-trimming machine, the combination, with the revolving trimming-knife G, of the slide V, the oscillating jack carried by the slide, and the guiding-flange Z on the slide between the latter and the jack, and against which flange the rear surface of the jack-base bears in its oscillating movements, substantially as described.

7. In a heel-trimming machine, the combination, with a trimming-knife, of a slide, V, an oscillating jack carried by the slide, a guiding-flange, Z, located between the slide and jack, and a stem, *a*, carrying the flange and movable in the slide, substantially as described.

8. The combination, with a knife or trimmer, and jack having a support, T, adjustable toward and from the knife, of a guiding-flange, Z, for the base of said jack, substantially as described.

9. In a heel-trimming machine, the combination, with a knife or trimmer and a laterally moving and swinging jack, of springs *c* for holding said jack in a central position relative to the knife, a guide-arm, *d*, for said jack, and projections *e*, placed in the guideway of said arm for moving the jack in a lateral direction as said jack approaches one extremity or the other of its swing, substantially as described.

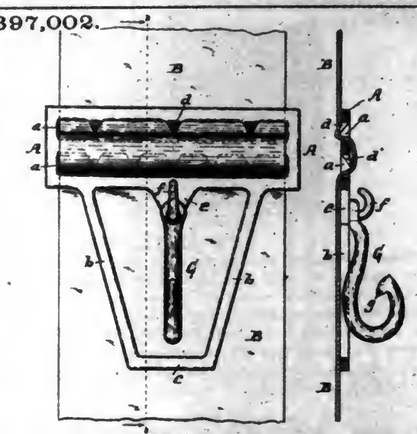
10. In a heel-trimming machine, the combination, with a trimming-knife, of a jack or holder composed of a base, K, having means to engage a heel, a jointed clamp, L, provided with a swinging bearing portion, *f*, and a lock-up for the clamp, substantially as described.

397,002. BACK-BAND HOOK. EDWARD A. ISAACS, Macon, Ga., assignor of three-fourths to John C. Van Syckle and Harry C. Tindall, same place. Filed Aug. 2, 1888. Serial No. 281,794. (No model.)

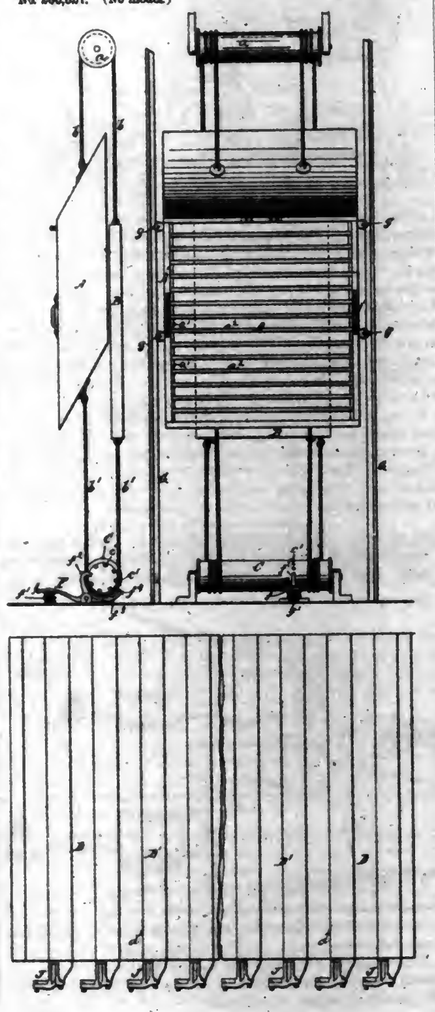
Claim.—1. The back-band hook herein described, consisting of a buckle having a pendent guard-frame integral with the buckle, and a free swinging hook hanging from the bottom of the buckle within the guard-frame.

2. The back-band hook herein described, consisting of a buckle having a pendent guard-frame integral with the buckle, and a free swinging barbed hook hanging from the bottom of the buckle within the guard-frame.

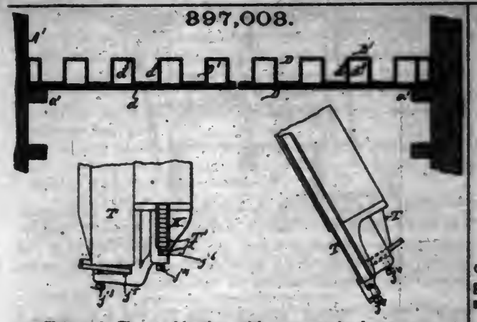
397,002.



397,003. COMPOSITOR'S TYPE-CASE. LOUIS K. JOHNSON and ARNOT A. LOW, Brooklyn, assignors to The Alden Type Machine Company, New York, N. Y. Filed July 3, 1886. Renewed July 23, 1888. Serial No. 280,827. (No model.)



397,008.



Claim.—1. The combination, with a compositor's type-case, A, adapted to hold two or more superposed series or "fonts" of type, substantially as described, of the suspenders *b b'* and counterpoise B, arranged and operating substantially in the manner and for the purpose described.

2. In combination with a compositor's type-case, substantially such as designated, the suspending-ropes *b b'*, drums *a* and C, and counter-weight B, arranged and operating substantially in the manner and for the purpose described.

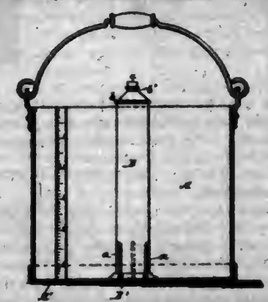
3. In combination with the type-case A, counter-weight B, pulleys *a* C, and suspenders *b b'*, a foot-brake, F, arranged and operating substantially in the manner and for the purpose described.

4. In combination with the type-case A, counter-weight B, pulleys *a* C, and suspenders *b b'*, a pawl adapted to automatically engage with and restrain the motion of the parts and to be disengaged by foot-pressure, substantially in the manner and for the purpose described.

5. In combination with the type-case A, counter-weight B, pulleys *a* C, and suspenders *b b'*, the guides G, for preserving the alignment of the case, substantially in the manner and for the purpose described.

6. In a compositor's type-case, substantially such as described, a duplex finger-piece formed with separate type-channels and type-supports arranged at an angle to each other, substantially in the manner and for the purpose described.

397,004. SAMPLE-CREAM EXTRACTOR. BYRON KANAKE, Marion, Ohio. Filed Mar. 22, 1888. Serial No. 268,316. (No model.)



Claim.—1. In a sample-cream extractor, the combination, with a cream-receptacle having guide-fingers secured to the bottom thereof, of a tubular shell having a removable bottom, the latter adapted to be held in position to engage the open end of the tubular shell by the guide-fingers.

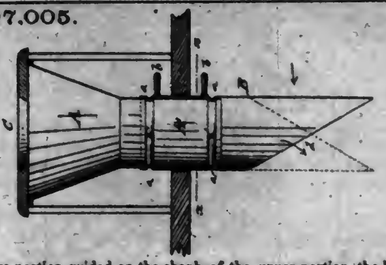
2. In a sample-cream extractor, the combination, with a cream-receptacle that is of known capacity, and guide-fingers attached to the inner surface of its bottom, of a loose bottom which is adapted to engage and become a part of a tubular sample-extractor, and a tubular sample-extractor shell, substantially as set forth.

397,005. CLOSET FOR RAILWAY-CARS. FREDERICK A. KIMBALL and HENRY W. CORY, St. Paul, Minn. Filed June 9, 1888. Serial No. 276,582. (No model.)

Claim.—A closet for railway-cars, consisting of a fixed upper or basin portion having a tubular shank, an axially-turning lower or discharge portion guided on the shank of the upper portion, the lower part having a downwardly-slanting or inclined discharge-opening, substantially as set forth.



397,005.



397,006. REGULATOR FOR DYNAMO-ELECTRIC MACHINES. JESSE F. KNEPP, Terre Haute, Ind., assignor of three-fourths to Joseph H. Briggs, same place. Filed Mar. 15, 1888. Serial No. 267,278. (No model.)



Claim.—1. In a regulator for an electric motor or generator, the combination, with the armature and commutator segments, of a normally-open short circuit connecting two or more such segments, and a speed-governor attached to a rotating part of the machine for closing said short circuit, whereby the armature-coils corresponding to said segments may be thrown from the line into said short circuit when the machine reaches a definite speed.

2. In a dynamo or motor regulator, the combination, with a hollow extension for an armature-shaft, of a circuit-controller located within the extension and comprising a stationary contact and a movable contact, and a speed-governor extending from said extension and connected with and adapted to operate said movable contact of the circuit-controller, substantially as described.

3. In a dynamo or motor regulator, the combination of a regulating-circuit, a circuit-controller in said circuit, and a centrifugal governor comprising a sliding weight, a hollow-slotted guide for said weight extending at right angles from the armature-shaft, a spring bearing on said weight, an adjusting-screw for varying the tension of said spring, and a T-rod located in said guide and connecting the weight and circuit-controller, substantially as described.

4. In a regulator, the combination of the armature-shaft, an extension of insulating material secured thereto, a speed-governor mounted on the extension, and a circuit-controller secured to the extension and connected with the governor, said circuit-controller being in a regulating-circuit, whereby when the machine reaches a definite speed the regulator will be brought into action.

5. A speed-governor for a generator or motor, comprising a hollow slotted support or guide, a sliding weight upon the same, a spring embracing the guide and bearing upon the weight, an adjusting-screw to regulate the tension of said spring upon the weight, a rod engaging the weight through the slots of the guide, and a circuit-closer connected to said rod, substantially as described.

397,007. DYNAMO-ELECTRIC MACHINE. JESSE F. KNEPP, Terre Haute, Ind., assignor of three-fourths to Joseph H. Briggs, same place. Filed Aug. 4, 1888. Serial No. 281,962. (No model.)

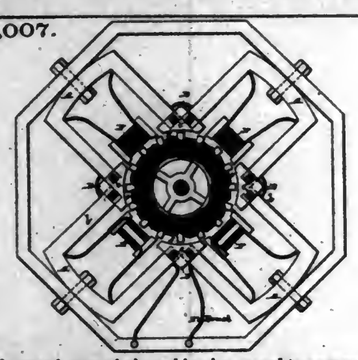
Claim.—1. In a dynamo-electric machine or motor, the combination, with a field-magnet, of a magnetic deflector located between the field-magnet poles, said deflector having polar extremities adjacent to the field-magnet poles similarly polarized, whereby substantially all the lines of force are thrown into the armature-orbit.

2. In a dynamo-electric machine or motor, the combination, with a field-magnet and an armature, of a magnetic deflector, whereby substantially all the lines of force are thrown into the armature-orbit.

3. In a dynamo-electric machine or motor, the combination, with a field-magnet, of a magnetic deflector located between the field-magnet poles and coils on the field-magnet and on the deflector wound and connected in series.

4. In a dynamo-electric machine or motor, the combination of the field-magnet, magnetic deflectors, an armature, opposite coils in said armature connected and terminating in commutator-strips ninety degrees apart, the coils opposite adjacent field-magnet poles being

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oppositely wound, respectively, and brushes spaced to correspond to the terminal commutator-strips.

5. In a dynamo-electric machine or motor, a drum or cylinder armature having its coils longitudinally wound on its outer surface and carried transversely across its ends to form chords of the outer periphery of the armature, said coils being arranged in sets, each set covering approximately the whole circumference of the armature, and the coils of each set being located an equal distance apart, a commutator having a number of strips equal to the number of armature-coils, coils of the same polarity in each set being electrically connected and terminating in commutator-strips, electrical connections between commutator-strips of the same polarity, and a pair of commutator-brushes, substantially as described.

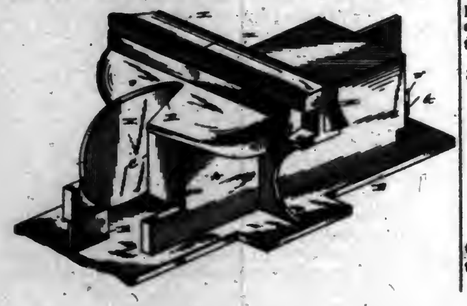
6. In a dynamo or motor, the combination, with a field-magnet, of an armature, a series of coils arranged flat on the circumference of the same in successive sets, the coils being located an equal distance apart and adjacent coils being wound in opposite directions and each set covering approximately the whole circumference of the armature, a series of commutator-strips equal in number to the armature-coils, the coils in the same set and of the same polarity being electrically connected and terminating in commutator-strips, and the terminal commutator-strips of the same polarity and belonging to the same set being electrically connected, and a pair commutator-brushes spaced to correspond to said terminal strips, substantially in the manner and for the purpose described.

7. In a dynamo or motor, the combination, with the field-magnet, of an armature having a series of coils arranged flat on the circumference in successive sets of four located ninety degrees apart and each set approximately covering the whole circumference of the armature, a series of commutator-strips corresponding to the series of armature-coils, the successive pairs of coils on opposite sides of the armature and in each set being electrically connected and terminating in commutator-strips located ninety degrees apart, the diametrically-opposite commutator-strips being electrically connected, and brushes set ninety degrees apart, whereby the coils in one set may be thrown into the generating-circuit and the remaining coils shut out of the circuit.

397,008. RAIL-JOINT. JOHN P. LANCASTER, Goshen, Ind. Filed Apr. 23, 1888. Serial No. 271,514. (No model.)

Claim.—1. In a railroad-rail joint, the combination, with the hollow chair, of a clamp-hook extending through said tie and fish-plates, one of which is formed with a seat for the end of the hook.

2. In a railroad-rail joint, the combination, with the hollow chair provided with slotted end pieces, a standard secured to the tie, and projections or lugs secured to one of the said end pieces, of the fish-plates, one of which is fixed to said chair, a clamp-hook extending through said tie and formed with a transverse slot or aperture, and a key, all of which are arranged in the manner herein set forth.

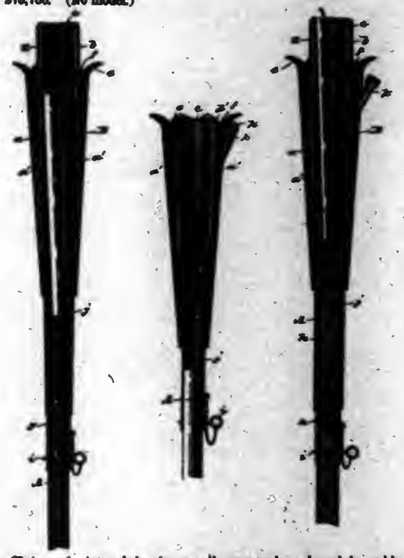


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3. In a railroad-rail joint, the combination, with the hollow chair and the fish-plates, one of which is provided with dowels or laterally-projecting pins adapted to engage the apertures in the web of two meeting rails, of a clamp-hook extending through said tie and having means, substantially as described, for locking it in position.

397,009. TORCH. FREDERICK LEHR, New York, N. Y., assignor of one-half to George Day, same place. Filed June 1, 1888. Serial No. 275,700. (No model.)



Claim.—1. A torch having an oil-receptacle and a wick, and being also provided with a fire-works holder adjacent to said wick, combined with a sliding handle having transverse holes and adapted to be pushed upward in said holder to raise the fire-works to the top of the wick to be ignited, and a pin for securing said handle in different positions, substantially as set forth.

2. The combination, with a hollow torch, the center of which constitutes a fire-works holder which is surrounded with an oil-receptacle, of a circular wick around said fire-works holder, a vertically-adjustable wick-holding tube outside of said wick, a flanged protector, the lower end of which presses against said tube, and a vertically-adjustable handle having transverse holes and adapted to be pushed upward into said fire-works holder and a pin for securing said handle in different positions, substantially as set forth.

3. The combination, with the metallic torch-body having the oil-receptacle *a*, the circular wick *b*, the inner tube, *c*, the wick-holding tube *d*, the flanged protector *e*, and one or more air-inlet holes, *h*, of the sliding or vertically-adjustable handle A, fitting the lower metallic part or tube of the said torch, but that part of the said tube in which said air-inlet holes are formed being of greater diameter internally than said handle, substantially as set forth.

397,010. PLUMB-LEVEL. OLIVER I. LEWIS, Nebraska City, Nebr. Filed July 23, 1888. Serial No. 280,880. (No model.)



Claim.—1. In a plumb-level, the oscillating weighted wheel 20, the pinion 23, the cog-wheel 24, and pinion 25, in combination with the plates 16 and 17, posts 18 and 19, supporting train, hands 12 and 13, sleeve 26, and graduated dial 10, as and for the purposes described.

2. In a plumb-level, the doubly-rabbeted stock 6, in combination with plate 9, carrying glass 11, seated in the outer rabbet, and frame-work composed of plates 16 and 17, connected by the posts 18 19, supported in the inner rabbet by screws 28 through lugs 27, and the actuating mechanism supported by said frame-work, as and for the purposes described.

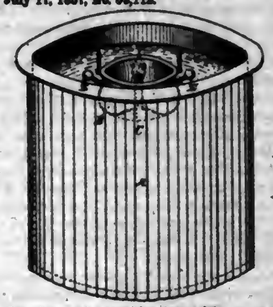
3. In a plumb-level, the hinged sights 36 36, in combination with the level-stock, springs 37, and plate 7, carrying the hinged sights and forming the end plates of the stock.

4. In a plumb-level, the stop 15, in combination with oscillating wheel 24 and plates 16 and 9, having slots in which stop moves, as and for the purposes described.

5. The spring 32, in combination with the bearing-plates 33 33, guides 34 34, the button 8, slot 31, and plate 7, as and for the purpose described.

6. In a plumb-level, the spring 32, the bearing-plates 33 33, guides 34 34, the button 8, slot 31, and plate 7, in combination with the block 6.

397,011. LAMP OR NIGHT-LIGHT. JEAN A. H. LEYNEN-HOUGARDE, Brussels, Belgium. Filed Apr. 5, 1888. Serial No. 269,749. (No model.) Patented in Belgium Feb. 23, 1887, No. 76,513; in England Mar. 3, 1887, No. 3,533; in France July 7, 1887, No. 184,674, and in Germany July 17, 1887, No. 39,112.

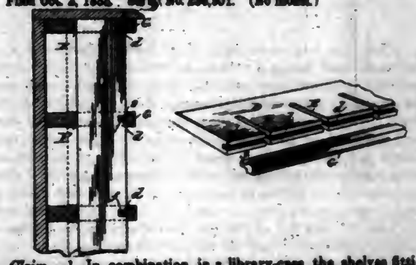


Claim.—1. In a lamp, the combination, with a reservoir and float carrying the burner, of a vertical cylinder in the reservoir surrounding the float for guiding it in its upward and downward movement, substantially as herein shown and described.

2. In a lamp, the combination, with the reservoir, of a float carrying the burner to be supplied by said reservoir, and arms or projections E, for preventing contact of the float with the sides of the reservoir or cylinder, as set forth.

3. In a lamp, the combination, with the reservoir, of a float and two concentric tubes extending from the bottom of the float and forming an annular space in which the oil may rise to be ignited, substantially as shown and described.

397,012. LIBRARY-CASE. JAMES A. LYON, Nashville, Tenn. Filed Oct. 3, 1888. Serial No. 286,951. (No model.)



Claim.—1. In combination, in a library-case, the shelves fitting in grooves in the sides of the case and of less depth than the depth of said case, parallel kerfs cut in said shelves, vertical removable partitions fitting said kerfs, and retaining-strips G, removably secured to the shelves for holding said partitions in place, substantially as described.

2. In combination, in a library-case, the shelves formed with kerfs extending vertically and grooves cut in the front edges, vertical partition-strips formed with notches to register with the grooves in the shelves, and tongues *g*, adapted to fit the grooves and notches of the shelves and partitions, substantially as described.

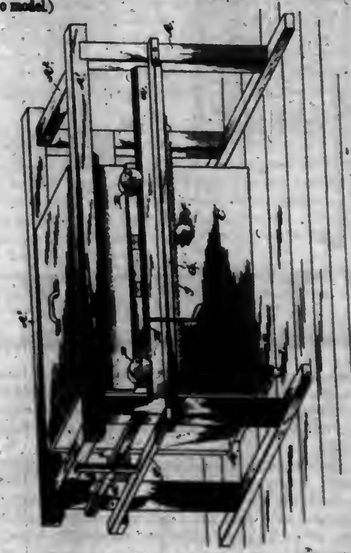
3. In combination, in a library-case, the shelves formed with kerfs and grooves, the vertical partitions formed with notches, and the retaining-strips having the tongues *g*, substantially as described.

397,013. VETERINARY SURGICAL SCRAPER. ALEXANDER MACDONALD, U. S. Army. Filed Oct. 3, 1888. Serial No. 287,457. (No model.)



Claim.—As an improvement in gelding or castrating devices, the herein-described scraper, consisting of a metallic band adapted to be placed upon the thumb and having a cutter integral therewith curved from end to end and edge to edge, substantially as described.

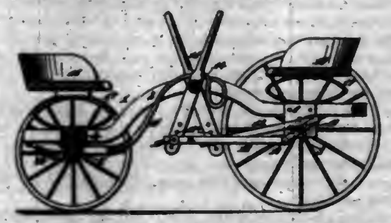
397,014. MACHINE FOR DRESSING MILLSTONES. JAMES L. MAHONEY, Albertville, Ala. Filed Aug. 16, 1888. Serial No. 282,848. (No model.)



Claim.—1. In a stone-dressing machine, the combination of the frame having parallel ways, the yoke pivoted to the frame and provided with racks, the housing provided with rollers mounted to travel on the ways of the frame, the vertical pick-blocks, armed cylinder, and gear-train arranged within the housing, and the pinions *f*, keyed to the projecting ends of one of the shafts of the gear-train, substantially as described.

2. In a stone-dressing machine, the combination, substantially as described, of the frame provided with parallel ways, the housing having rollers mounted to traverse said ways, a series of pick-blocks mounted to slide vertically in the housing, a drive-shaft provided with an armed cylinder adapted to actuate the pick-blocks, a gear-train connected with the drive-shaft and having the ends of one shaft projecting beyond the walls of the housing, pinions *f*, keyed to said shaft, the yoke pivoted at one end of the frame and provided with downwardly-facing rack-bars arranged to engage the pinions *f*, or be lifted free therefrom, and means to hold the yoke parallel with the ways of the frame.

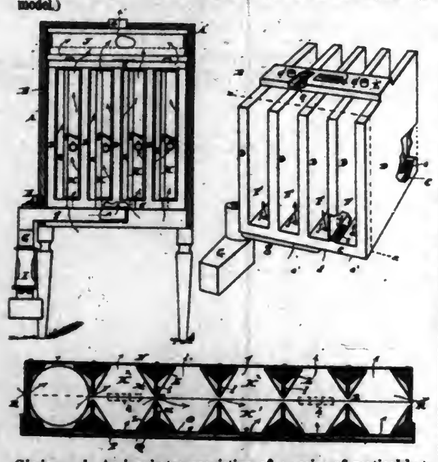
397,015. VELOCIPEDE. JOSEPH MCCOY, Baltimore, Md. Filed Apr. 11, 1888. Serial No. 270,313. (No model.)



Claim.—A four-wheel road-machine consisting of the front and rear wheeled axles, the arched parallel side bars rigidly secured at their rear to the opposite ends of the rear cranked axle and rigidly connected at their front by a transverse beam carrying the swiveled front axle, the transverse bar connecting the arched side bars adjacent to the middle of their length, a pair of hand-levers, both hung

intermediate their upper and lower ends on the transverse bar, a pair of pitmen connected, respectively, at their rear to the cranks of the rear axle and at their front ends pivoted to the lower extremities of the hand-levers, and each provided with a pair of oppositely-projecting treadles, and front and rear seats located, respectively, over the front and rear axles, all substantially as and for the purposes described.

397,016. INCUBATOR. JACOB K. MESSNER, Philadelphia, Pa. Filed May 30, 1886. Renewed July 5, 1888. Serial No. 279,006. (No model.)



Claim.—1. An incubator consisting of a series of vertical hot-water chambers forming corresponding vertical compartments, in combination with egg-trays adapted to fit said compartments and support the eggs in tiers one above the other, substantially as and for the purpose specified.

2. An incubator consisting of a series of vertical hot-water chambers forming corresponding vertical compartments, in combination with egg-trays adapted to fit said compartments and support the eggs in tiers one above the other, and a moisture-containing pad arranged against one of the faces of the egg-tray, substantially as and for the purpose specified.

3. An incubator consisting of a series of vertical hot-water chambers forming corresponding vertical compartments provided with ventilating-apertures for air at the bottom, in combination with egg-trays adapted to fit said compartments and support the eggs in tiers one above the other, substantially as and for the purpose specified.

4. An incubator consisting of a series of vertical hot-water chambers forming corresponding vertical compartments provided with ventilating-apertures for air at the bottom, in combination with egg-trays adapted to fit said compartments and support the eggs in tiers one above the other, and a moisture-containing pad arranged against one of the faces of the egg-tray, whereby air and moisture freely pass over the eggs in their passage upward, substantially as and for the purpose specified.

5. The hot-water circulator for an incubator, consisting of a hollow base connecting with a boiler, a series of upright hot-water chambers supported upon said base and opening into it, and a cross-flue connecting them at the top, into which they open, the said upright chambers forming a series of narrow egg-tray compartments, substantially as and for the purpose specified.

6. The hot-water circulator for an incubator, consisting of a hollow base connecting with a boiler and provided with ventilating-apertures opening through it, a series of upright hot-water chambers supported upon said base and opening into it, and a narrow cross-flue connecting them at the top, into which they open, the said upright chambers forming a series of narrow egg-tray compartments, substantially as and for the purpose specified.

7. The combination of the boiler G with the base C, upright or vertical hot-water chambers D, connecting therewith by openings *c*, and cross-flue E, arranged upon the top of said chambers and connecting therewith by openings *e*, and provided with one or more openings, *e'*, to fill the circulator with water, substantially as and for the purpose specified.

8. The combination of the boiler G with the base C, upright or vertical hot-water chambers D, connecting therewith by openings *c*, and cross-flue E, arranged upon the top of said chambers, connecting therewith by openings *e*, and provided with one or more openings, *e'*, to fill the circulator with water, and a thermometer, *d*, arranged in said cross-flue E, substantially as and for the purpose specified.

9. The incubator egg-tray consisting of the parts K' and K², the backs of which are of a substance impervious to moisture, and provided with perforations and padded egg-supports upon their inner parts, substantially as and for the purpose specified.

10. The incubator egg-tray consisting of the parts K' and K², provided with perforated backs, and egg-supports upon their inner parts, forming the air-passages R from one end to the other of the tray and entirely through the length thereof, substantially as and for the purpose specified.

11. The incubator egg-tray consisting of the parts K' and K², hinged together at *k* and having fastenings to lock them together, provided with perforated backs and egg-supports upon their inner parts, substantially as and for the purpose specified.

12. The combination of parts K' K², each having the triangular ribbed pieces L *l* and padding M, to support the egg, the said ribbed pieces in each of the parts K' K² being arranged to face those in the other part and form the air-passages R, substantially as and for the purpose specified.

13. The combination of parts K' K², provided with perforated backs, and each having the triangular ribbed pieces L *l* and padding M, to support the egg, the said ribbed pieces in each of the parts K' K² being arranged to face those in the other part and form the air-passages R, tray Q, and moisture-pad P, adapted to fit against one of the perforated faces, substantially as and for the purpose specified.

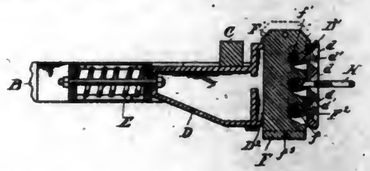
14. The incubator egg-tray consisting of the parts K' and K², provided with perforated backs and egg-supports upon their inner parts, in combination with the tray Q and moisture-pad P, adapted to fit against one of the perforated faces, substantially as and for the purpose specified.

15. The incubator egg-tray consisting of the parts K' and K², forming the air-passages R from one end to the other, provided with perforated backs and egg-supports upon their inner faces, in combination with the tray Q and moisture-pad P, adapted to fit against one of the perforated faces, substantially as and for the purpose specified.

16. The combination of the egg-tray frames K' K², one of which is provided on its back with a screen, N, and the other with a perforated cover, O, of water-proof material, tray Q, and moisture-pad P, adapted to fit against the water-proof face of the tray, substantially as and for the purpose specified.

17. An incubator consisting of a series of vertical hot-water chambers forming corresponding vertical compartments, in combination with egg-trays adapted to fit said compartments and support the eggs in tiers one above the other, the outer case, H, and upper screen-tray, J, substantially as and for the purpose specified.

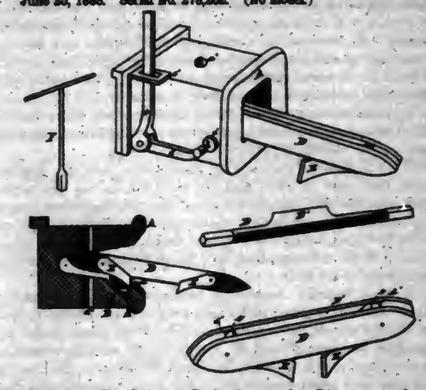
397,017. CAR-COUPLING. WILLIAM METCALF, Lake, Ill. Filed May 25, 1888. Serial No. 275,067. (No model.)



Claim.—1. In a car-coupling, the draw-bar provided with a vertical recess and having a vertical series of mouths communicating therewith, in combination with the coupler arranged in said recess and capable of direct vertical movement therein parallel to the face of the draw-bar, said coupler being provided with a series of downward and rearward extending hooks corresponding in number to the mouths and arranged at distances corresponding to the distances which separate the mouths, and with a corresponding series of downward and forward inclines to the rear of and below said hooks, the relative arrangement being such that in coupling the link first strikes the hook to raise the coupler and then the incline to depress the coupler, substantially as and for the purposes specified.

2. In a car-coupling, the draw-bar provided with a vertical recess, a vertical series of mouths communicating therewith, and lateral guiding-grooves extending rearward from each mouth, in combination with the coupler arranged in said recess and capable of direct vertical movement therein parallel to the face of the draw-bar, the said coupler being provided with a series of downward and rearward extending hooks corresponding in number to the mouths and arranged at a distance apart equal to the distance separating said mouths, and with a corresponding series of downward and forward inclines to the rear of and below said hooks, the relative arrangement being such that in coupling the link first strikes the hook to raise the coupler and then the incline to depress the coupler, substantially as and for the purposes specified.

397,018. CAR-COUPLING. GEORGE MOCK, Springfield, Ky. Filed June 25, 1888. Serial No. 278,202. (No model.)

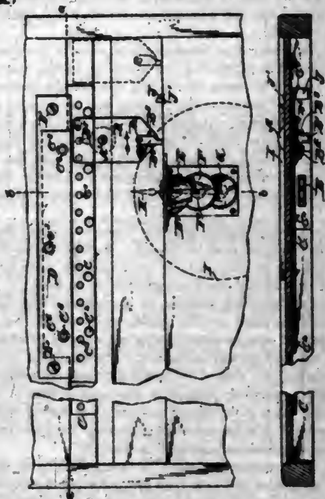


Claim.—1. The link-bar D, having a slot D', recesses *d*, with shoulders *d'* and *d''*, and tongues E, with shoulders *e* and *e'*, pivoted within the slot, substantially as set forth, and for the purpose specified.

2. In a car-coupling, a draw-head, A, having a lip or catch, *a*, in combination with a link-bar provided with tongues pivoted within the ends of the bar to engage with the lip of the draw-head.

3. In a car-coupling, the combination, with a draw-head having a lip or catch, *a*, a recess, A, in its lower wall, holes in its side walls connecting with the recess, and a transverse uncoupling-bar, B, provided with a cam, B', of a link-bar provided with pivoted tongues to engage with the lip of the draw-head and mechanism for operating the uncoupling-bar B to lift the tongue and release the link-bar, substantially as set forth, and for the purpose specified.

397,019. BILLIARD-SCORING BOARD. ROBERT H. MONTGOMERY, Melbourne, Victoria. Filed June 19, 1888. Serial No. 277,607. (No model.)



Claim.—1. In a billiard-scoring board, the combination, with a marker adapted to travel along one side of the board, a slide to which said marker is secured adapted to travel along the opposite side of the board, and a beveled locking-stud projecting rearwardly from said slide, of a spring-actuated lock-plate provided with perforations with which the locking-stud engages, substantially as and for the purposes specified.

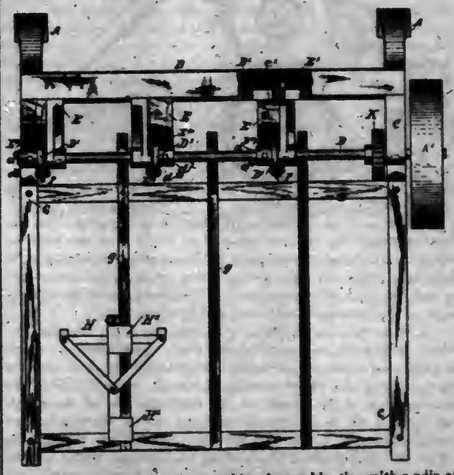
2. In a billiard-scoring board, the combination, with a marker adapted to travel along one side of the board, a slide to which said marker is secured adapted to travel along the opposite side of the board, and a beveled locking-stud projecting rearwardly from said slide, of a spring-actuated lock-plate provided with perforations with which the locking-stud engages and on its rear side with stops having an inclined or beveled face, said plate being shorter than the distance traveled by the slide and marker to enable the slide to move from in front of the lock-plate to the rear thereof, the locking-stud on the slide and the stops on the lock-plate being beveled in reverse directions, substantially as and for the purposes specified.

3. In a billiard-scoring board, the combination, with the marker adapted to travel along one side of the board, a slide to which said marker is secured adapted to travel along the opposite side of the board, a beveled locking-stud projecting rearwardly from and a pawl pivotally connected with said slide, of a spring-actuated lock-plate provided with perforations with which the locking-stud engages, and with beveled stops projecting from the rear face of such plate, the locking-stud on the slide and the stops on the plate being beveled in reverse directions, and said plate being shorter than the distance traveled by the slide and marker, and a registering mechanism adapted to be operated by the pawl on the slide when moved in the proper direction, substantially as and for the purposes specified.

4. The combination, with the slotted scoring-board, the marker A, the slide B thereof provided with the beveled locking-stud B², of the spring-actuated lock-plate C, having perforations C', beveled stops C², and an inwardly-bent end, C³, said plate being shorter than the slot on the scoring-board, substantially as and for the purposes specified.

5. The combination, with slotted scoring-board, the marker A, the slide B thereof provided with beveled locking-stud B², and the pawl B', pivoted to said slide, of the spring-actuated lock-plate C, having perforations C', beveled stops C², and inwardly-bent end C³, said plate being shorter than the slot in the scoring-board, the ratchet-wheel E, arranged in the path of the pawl B', and a train of registering gearing adapted to be operated by said ratchet, substantially as and for the purposes specified.

397,020. MACHINE FOR SHEARING METAL. LA VERNE W. NOYES, Chicago, Ill. Filed Apr. 23, 1886. Serial No. 271,516. (No model.)



Claim.—1. In a shearing-machine, in combination with a pair of shearing-wheels, a bracket having the bearings for said wheels, respectively, the portion of said brackets which connect said bearings being located on the discharge side of the wheels and extending transversely to the plane of their shearing-faces, and completely traversed by said plane produced, so that severance of the bracket in that plane would sever from each other the bearings of said wheels, respectively, substantially as set forth.

2. In a shearing-machine, in combination with a pair of shearing-wheels, a bracket having the bearings for said wheels, the portion of said bracket which connects said bearings being located on the discharge side of the wheels in the plane of their shearing-faces and completely traversed by said plane, said bracket having also two abutments extending, respectively, in opposite directions from said plane and having divergently-sloping faces in planes which intersect beyond the contact of the shearing-wheels, substantially as set forth.

3. In combination with the frame-bar B, a bracket, E, and the shearing-wheels journaled thereon, said bracket having the portion which connects the bearings of the wheels, respectively, located on the discharge side of the wheels in the plane of the shearing-face of the wheels and completely traversed by said plane, the bracket being connected to the frame-bar beyond said portion which connects the bearings, substantially as set forth.

4. In a shearing-machine, in combination with the frame-bar B, two or more brackets, E, a pair of shearing-wheels journaled on each of them, the portion of the brackets which connects the bearings of

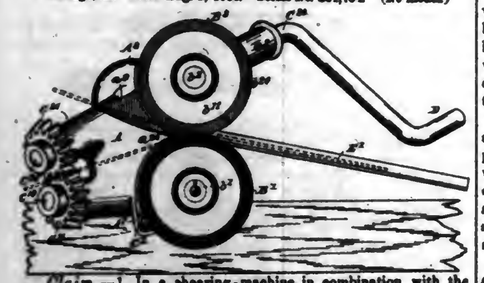
said wheels being located on the discharge side of the wheels and extending across the plane of their shearing-faces and completely traversed by said plane, said brackets being secured to the frame-bar beyond that connecting portion, and one or more of them being adjustable longitudinally with respect to the frame-bar, substantially as set forth.

5. In a metal-shearing machine, in combination with the shearing-wheels, a bed to support the plate or sheet to be cut, a gage-plate upon said bed, and interfitting ways and guides on the bed and gage-plate, parallel to the plane of the shearing-face, and a clamp to bind the plate which is to be cut to the gage-plate, substantially as set forth.

6. In combination, substantially as set forth, the frame, the shearing-wheel shaft D, supported on it, the bed rigid with it, and the gage-plate sliding on the bed and having the clamp-lever H^3 to bind the plate which is to be cut, said lever extending far enough from the bed to collide with the shaft D, whereby the feeding action of the shearing-wheels causes the shaft to unlock the sheet at the end of the cut.

7. In a shearing-machine, in combination, substantially as set forth, the frame-bar B, having elongated bolt-holes b', with intervening necks of metal, B', a bracket, E, having bearings for the shearing-wheels, and having two bolt-holes, e', as far apart as the width of the necks B', and the bolts E', adapted to pass through the holes b' and into one of the holes e'.

397,021. METAL-SHEARING MACHINE. LA VERNE W. NOYES, Chicago, Ill. Filed Aug. 2, 1888. Serial No. 281,754. (No model.)



Claim.—1. In a shearing-machine, in combination with the shearing-wheels, the train of gearing by which they are both revolved, said train being continuous by means of its contacting parts from one wheel to the other, and extending across and being traversed by both the plane of the sheet to be cut and the plane of the cutting-edges of the shearing-wheels, substantially as set forth.

2. In a shearing-machine, in combination with the shearing-wheels, their shafts, and gears on said shafts, respectively, the frame in which said shafts are journaled, having the portion which connects the bearings of said shafts extending across the vertical plane of the shearing-faces of the wheels on the discharge side of the wheels through the rift in the severed sheet, and having bearings for two counter-shafts, one of said counter-shafts extending also through the rift in the severed sheet, intermeshing gears on said shafts, respectively, and a gear on each of them intermeshing with the gears on the shearing-wheel shafts, respectively, substantially as set forth.

3. In a shearing-machine, in combination with the shearing-wheels and the train of gears by which they both are revolved, said train being continuous in and by means of its successively contacting parts from one shearing-wheel to the other, and crossing and being traversed by both the plane of the sheet to be cut and the plane of the cutting-edges of the shearing-wheels, the frame in which the shafts of said train obtain bearings, having the portion which connects the bearings of the two shearing-wheels crossing the plane of the cutting-edges on the discharge side, substantially as set forth.

4. In a shearing-machine, in combination with the shearing-wheels, the frame in which said wheels are journaled, having the part which connects the journal-bearings of said wheels crossing and traversed by the plane of the cutting-edges of the wheels, two counter-shafts journaled in said connecting part, and gear-wheels on them, respectively, and a gear-wheel rigid with each of the shearing-wheels, and intermeshing, respectively, with the said gear-wheels on the counter-shafts, one of said counter-shafts extending across the plane of the cutting-edges of the wheels, substantially as set forth.

5. In a shearing-machine, in combination with the shearing-wheels, the frame having the bearings for said wheels both on the same side of the plane of the cutting-edges and apertured entirely through from receiving to discharging side between said bearings transversely to said plane, each aperture extending in from the side of said plane on which the bearings are located to said plane, substantially as set forth.

6. In a shearing-machine, in combination with the shearing-wheels, the frame having the bearings for said wheels both located on the same side of the plane of the cutting-edges and apertured entirely through from receiving to discharging side between said bearings transversely to said plane, such aperture extending in from the side of the plane on which said bearings are located to said plane, gear-wheels rigid with the shearing-wheels, respectively, and two counter-shafts journaled in the frame, having their axes one above and one below the said aperture, and gears thereon meshing with the shearing wheel gears, respectively, substantially as set forth.

7. In a shearing-machine, in combination with the shearing-wheels, the frame in which they are journaled, having the portion which connects the journal-bearings of the shearing-wheels located beyond the cutting-point of the wheels toward the discharge side, and having two faces, one upon each side of the plane of the cutting-edges, sloped to divert the severed edges of the metal in opposite directions, substantially as set forth.

8. In a shearing-machine, in combination with the shearing-wheels, the frame in which said wheels are journaled, having the bearings for said wheels both on the same side of the plane of the cutting-edges, the gears B^{10} and B^{20}, rigid with said shearing-wheels, respectively, and a train by which said gears are actuated, the housings a^7 a^8 over said gears, respectively, being formed integral with their journal-bearings, and extending over said gears from the receiving side of the shearing-wheels nearly to the vertical plane of the cutting-point, substantially as set forth.

9. In a shearing-machine, in combination with the shearing-wheels and a train which actuates them, an integral frame having the bearings for the shearing-wheels, the portion which connects said bearings crossing and traversed by the plane of the cutting-edges of the wheels on the discharge side, bearings for the driving-train in said connecting portion, housings for the gears, and guiding-surfaces for the discharge of the metal, all substantially as set forth.

10. In combination, substantially as set forth, the shearing-wheels and their driving-train, said train comprising a shaft which, from a point located on one side of the plane of the cutting-edges beyond the vertical plane of the cutting-point toward the discharge side, extends obliquely toward the opposite side of the plane of the cutting-edges and away from the plane of the sheet to be cut and toward the receiving side of the wheels, and a handle on said shaft by means of which it may be rotated.

11. In combination, substantially as set forth, the shearing-wheels and the frame in which they are journaled, having bearings for said wheels both on the same side of the plane of the cutting-edges, and the aperture A^6 between said bearings, the housings A^7 and A^8, adjacent to said bearings, respectively, one above and one below said aperture, the counter-shafts C^{10} and C^{20}, extending one above and one below said aperture and having fixed on them the gears located in said housings, respectively, and the gears B^{10} and B^{20}, rigid with the shearing-wheels and driven by the housed gears, substantially as set forth.

12. In a shearing-machine, the frame comprising the bearings of the shearing-wheels, both on the same side of the plane of the cutting-edges, and the bearings for the counter-shafts, both located on the opposite sides of said plane, substantially as set forth.

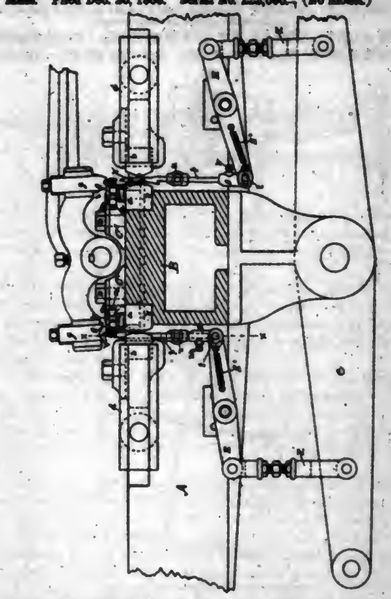
13. In a shearing-machine, in combination with the shearing-wheels and the gears on their shafts, through which they receive motion, a pair of counter-shafts having gears which drive the shearing-wheels, respectively, and having their axes located in a plane oblique to the plane of the axes of the shearing-wheels, intermeshing gears on said shafts respectively located on the opposite sides of the plane of the cutting-edges of the shearing-wheels from that at which the plane of the axes of said counter-shafts intersects the plane of the axes of the shearing-wheels, substantially as set forth.

14. In a shearing-machine, in combination with the shearing-wheels, the frame in which they are journaled, having the bearings for the shearing-wheels on the same side of the plane of the cutting-edges and apertured between said bearings from one side to the plane of the cutting-edges, gears rigid with the shearing-wheels, respectively, counter-shafts journaled in said frame, having on them gears which actuate, respectively, the shearing-wheel gears, said counter-shafts having their bearings on the opposite side of the plane of the cutting-edges from that of the aperture between the shearing-wheel bearings, the axes of said counter-shafts being in the same plane, and that plane being oblique to the plane of the axes of the shearing-wheels and intersecting said plane on the opposite side of the plane of the cutting-edges of the wheels from the bearings of said counter-shafts, substantially as set forth.

15. In a metal-shearing machine, in combination with the shearing-wheels, the center-block F, having its face substantially in the plane of the sheet to be cut, and journaled in a bearing which is adjustable laterally with respect to the plane of the cutting-edges, the axis of said bearing being transverse to the plane of the sheet, said block turning freely in its said bearings, substantially as and for the purpose set forth.

16. In a shearing-machine, in combination with the shearing-wheels, the center-block F and the bearing in which it is journaled, adjustable laterally in respect to the shearing-faces of the wheels, the face of said center-block being substantially in the plane of the sheet to be cut and surfaced with rubber or like material, whereby the sheet may be kept from slipping upon it, substantially as set forth.

397,022. WIRE-NAIL MACHINE. EDWARD B. PARKHURST, Woburn, Mass. Filed Dec. 20, 1886. Serial No. 222,090. (No model.)



Claim.—1. A wire-nail machine having a positively-acting device, as arms *p*, provided with suitable operating mechanism, whereby the section of wire is seized in the position in which it is cut and moved into position to be acted upon by the dies, substantially as shown and described.

2. In a wire-nail machine in which a section of wire of proper length is cut at one point and formed into nails at another, a pair of positively-reciprocated arms having suitable operating mechanism and provided with notches for the reception of the nail-wire, in combination with a device, as the flange *h* and spring-impelled bolts *j*, for holding the section securely in the position in which it is cut until it is seized and carried downward by the hooks on arms *p*, substantially as set forth.

3. In a wire-nail machine, the combination, with the nail-forming dies, of the vertically-moving arms *p*, sliding in holes in the rocker-shaft *u* and beveled, as at *v*, at their upper ends, and secured by sliding pivot and spring *d'* to their actuating-lever E, whereby as said arms are moved upward in line with the wire which is next to be fed to the dies the upper end will move backward out of line of the wire and allow the hook to pass above it, all as set forth.

4. In a wire-nail machine, the combination, with the nail-dies, of a vertically-moving notched arm and its operating mechanism, the notch in said arm moving across the face of the dies in line with the nail and clearing it therefrom, substantially as set forth.

5. In a wire-nail machine, the combination, with the nail-dies, of the rods *o* and spring-actuated arms *k*, set in recesses in the face of one of the dies, for the purposes and substantially as shown and described.

6. In a wire-nail machine, the plate C, provided at its front edge over the face of the fixed die with a downwardly-open recess to receive the length of wire as it is fed into the machine, in combination with the spring-actuated bolts *j*, whereby the section of wire is held substantially in the position in which it is cut until seized by the mechanism by which it is carried to the dies, substantially as set forth.

7. In a wire-nail machine, the combination, with the nail-dies, of the hooked feeding-arms and their actuating mechanism, the rods *o*, arms *k*, bolts *j*, and flanges *h*, substantially as shown and described.

8. In a wire-nail machine, the combination, with the nail-dies, of the vertically-moving positively-actuated hooked feeding-arms *p*, adjustably secured to their actuating-levers by blocks *s* and check-screws *w*, whereby the height of movement of the arms *p* may be regulated, for the purposes and substantially as set forth.

9. In a wire-nail machine, the combination, with the nail-dies, of reciprocating feeding-arms, as *p*, their actuating-levers E and *c*, and the adjustable connecting-rod *z*, whereby the throw of said feeding-arms may be accurately adjusted, all as set forth.

397,023. NUT-CRACKER. FRANCIS J. RABBETH, Boston, Mass. Filed Feb. 24, 1888. Serial No. 265,163. (No model.)

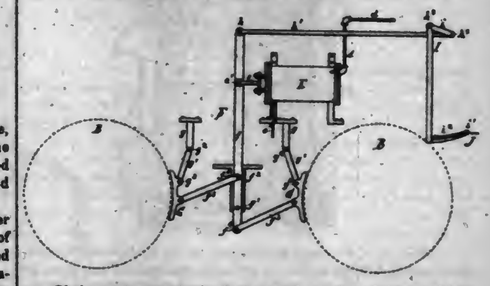


Claim.—1. A nut-cracker comprising two members provided near one end with jaws or faces to engage the nut to be cracked, and a connecting bar or link pivotally connected with one of said members and adjustably connected with the other of said members, as set forth, whereby the distance of the jaw ends from one another may be varied, substantially as described.

2. The combination of the two handled jaw members of a nut-cracker with a threaded bar pivotally connected with one of said members and a nut co-operating with said bar, connected with the other of said members, substantially as described.

3. The combination of the members *a b*, the threaded bar *d*, pivotally connected with one of said members, and the adjusting-nut having external and internal threads of opposite inclination, one co-operating with said bar *d* and the other co-operating with the other of said members of the nut-cracker, substantially as described.

397,024. STEAM-BRAKE FOR LOCOMOTIVES. PATRICK REILLY, Mattoon, Ill. Filed Mar. 19, 1888. Serial No. 267,899. (No model.)



Claim.—A steam-brake for locomotive and tender, comprising, in combination, a horizontal steam-cylinder arranged above the driving-wheels, a vertical brake-lever arranged between the driving-wheels and connected by means of links with the suspended brake-shoes of the driving-wheels, and a pull-rod arranged above the steam-cylinder and connecting the vertical brake-lever with the brake mechanism of the tender, all constructed substantially as described.

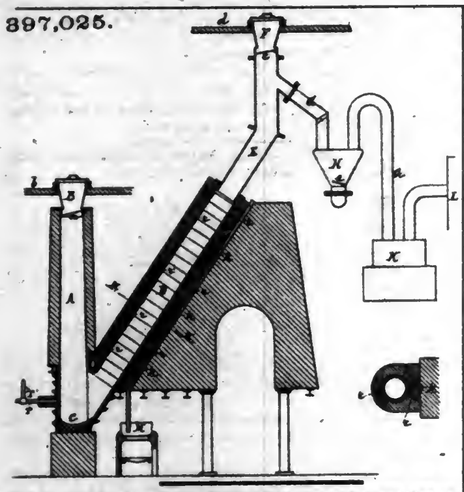
397,025. BLAST-FURNACE FOR REDUCING ZINC. FERNAND RENAUD, Ales, Gard, France. Filed Feb. 2, 1888. Serial No. 262,786. (No model.) Patented in France Dec. 22, 1887, No. 187,763; in England Dec. 27, 1887, No. 17,809; in Belgium Dec. 27, 1887, No. 80,068; in Italy Jan. 3, 1888, XXI, 23,250, XLV, 157; in Norway Jan. 11, 1888, No. 743, and in Spain Mar. 22, 1888, No. 7,730.

Claim.—1. A furnace for the reduction of volatile metals, comprising an ore cupola or reducer and a fuel-cupola connecting with said ore-cupola at the melting-pot in the bottom of the latter, said fuel-cupola being inclined and having suitable grooves in its inner surface for the recovery of the vaporized metal condensed within said cupola, substantially as set forth.

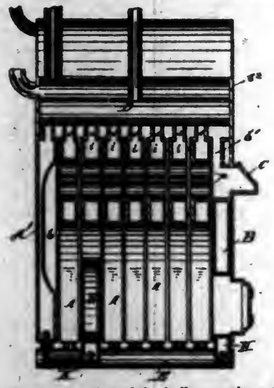
2. In a furnace for reducing the ores of volatile metals, the combination, with the ore cupola or reducer, of the inclined fuel-cupola D, connected with the lower part of the ore-cupola, said cupola D being provided with grooves and channels *r k* for the recovery of the vaporized metal, substantially as set forth.

3. The combination, with the ore-cupola A, provided with a melting-pot, C, and tuyere, of the inclined cupola D, connecting with the cupola A at its lower end, the dust-box H, the washer K, the chamber L, and the pipes G, connecting said box, chamber, and washer with the elevated part of cupola D, substantially as set forth.

397,025.



397,026. SECTIONAL STEAM-BOILER. JOHN J. RUFF and MICHAEL A. RUFF, Doylestown, Pa. Filed June 16, 1888. Serial No. 277,328. (No model.)



Claim.—1. The combination of the hollow sections, the combustion-chamber, the manifolds, and the hollow bridge-wall extending between and secured to the manifolds by means of hollow water-tight joints, whereby the interiors of the sections, manifolds, and bridge-wall are in communication with each other, as set forth.

2. In a sectional boiler, the combination of the combustion-chamber, the sections, the manifolds, the hollow front provided with an opening for the fire-door, and a hollow casting extending between the front ends of the manifolds at the bottom of said opening, said casting being secured to and in communication with the interior of the manifolds, in the manner and for the purpose substantially as described.

3. The combination, with the hollow vertical sections, and the hollow back, of the hollow bridge-wall in communication with said sections, and connections whereby direct communication is established between the bridge-wall and the hollow back.

4. In a sectional boiler, the combination of the hollow vertical sections, the upper edge of each section being concaved, the combustion-chamber, the horizontal flues, a rear flue from combustion-chamber to horizontal flues, the upwardly-curved hood or casing secured to the tops of said sections over said concaved recesses and forming a longitudinal chamber, a flue extending from the front ends of the horizontal flues to said chamber, and the steam-drum longitudinally located in said chamber.

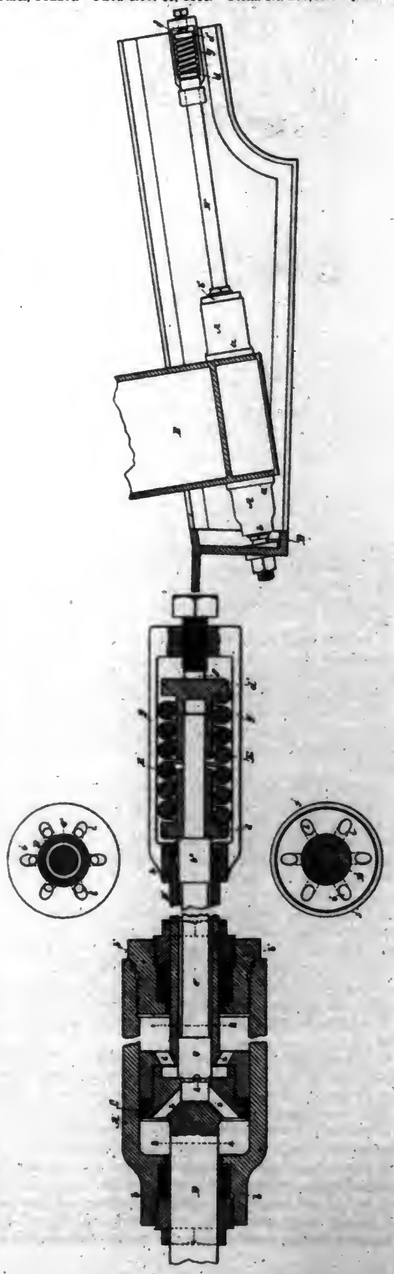
5. In a sectional boiler, the combination of the series of vertical hollow sections, the manifolds located beneath the ends of the sections, the sections and manifolds having registering apertures, packing-rings having beveled edges interposed between said apertures, and vertical rods passing through the manifolds, apertures, packing-rings, and upwardly through the sections, and provided with nuts on their upper ends, whereby the sections are separately and independently secured to the manifolds.

6. In a sectional boiler, the combination of the hollow sections, the manifolds, and the hollow bridge-wall extending between the manifolds and secured to the same by hollow joints, and a rod extending through the manifolds and bridge-wall.

7. In a sectional boiler, the combination of the hollow sections, the hollow bridge-wall, the manifolds, the hollow front provided with an opening in its lower portion, a hollow casting extending between and secured to the manifolds by hollow joints at the bottom of said opening, and a rod extending through the manifolds and said casting.

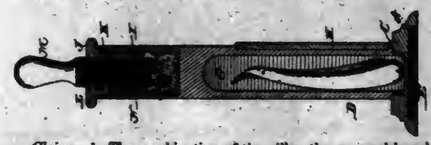
8. In a sectional boiler the combination of the hollow sections, a hollow back, a hollow bridge-wall in communication with the manifolds, and a pipe extending from the bridge-wall to the hollow back.

397,027. BUFFER FOR GUN-MOUNTINGS. HENRI SCHNEIDER, Paris, France. Filed Nov. 10, 1888. Serial No. 290,477. (No model.)



Claim.—In buffers for gun-mountings, and with the object of providing for the movements of recoil, and of placing the gun in battery without any necessity for operating any gear or part of the mechanism by hand, the combination of a hydraulic cylinder, A, with a piston, C, attached to a rod, D D', connected to the lower or fixed part of the frame, and provided with a valve, *e*, acted on by a spring, E, and presenting permanent openings or passages *k*, connecting the two ends of the cylinder through passages *i* in the piston C, said valve serving, according to its position, to open or to close more or less the passages *i*, all arranged and operating substantially as hereinbefore set forth with reference to the accompanying drawings.

397,028. COMBINATION SHAVING UTENSIL. WILLIAM SHAY, Ansonia, Conn. Filed Aug. 15, 1888. Serial No. 283,094. (No model.)



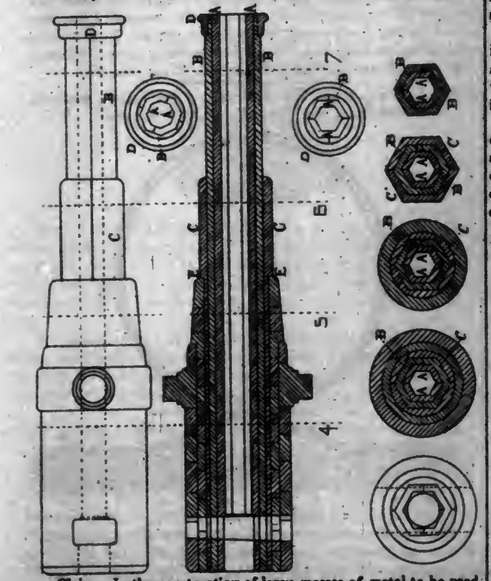
Claim.—1. The combination of the pillar, the recessed base having a central threaded aperture, and the mirror having clamping-arms adapted to engage the sides of the pillar and thereby hold the glass in position, as set forth.

2. The combination of the pillar having a recess adapted to hold one or more razors and provided with a threaded tenon at its lower end, the base or support having a threaded flange fitting the tenon of the pillar, and the sharpening hone and strops fastened upon the sides of the pillar, substantially as set forth.

3. The combination of the pillar provided on its four sides with razor-strops and having a cylindrical recess at its upper end, the soap-cup placed within the said recess, the threaded cover having a central threaded aperture, and the brush having a threaded handle adapted to be screwed into the aperture of the cover, substantially as set forth.

4. The hereinbefore-described combination shaving utensil, the same consisting of the hollow pillar D, having a threaded tenon at its lower end, recessed and removable base A, mirror E, provided with means of attachment to the base and to the pillar, soap-cup I, threaded and apertured cover J, and the brush N, all constructed and combined substantially in the manner and for the purpose shown and set forth.

397,029. MANUFACTURE OF HEAVY GUNS, SHAFTS, &c. JOHN SELLERS, Philadelphia, Pa. Filed July 23, 1888. Serial No. 280,845. (No model.)



Claim.—In the construction of large masses of metal to be used in the manufacture of heavy guns and shafts, tube A and one or more jackets, B, said tube and jackets made each in two parts and so put together that the tube and jacket will make lap and lock joints, in combination with hoops or bands, as shown and described.

397,030. BUTTON. LOUIS SIEVERT, St. Louis, Mo. Filed Nov. 5, 1888. Serial No. 290,366. (No model.)



Claim.—The combination, with the button-head A and shank i, constructed as described, having the flat ends *x x*, of the disk A, having the central perforation, *k*, and the bowed springs *j j*, one end of each secured to the rim of the disk A, and the inner bent ends, *l l*, pivoted to the shank, as at *m*, substantially as described.

397,031. LUMINOUS OIL PROJECTILE. FERDINAND SILAS, Vienna, Austria-Hungary. Filed Oct. 12, 1888. Serial No. 287,830. (No model.)



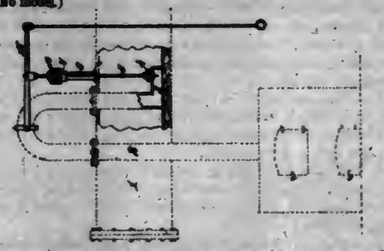
Claim.—1. A projectile consisting of a case inclosing an oil-chamber and adapted to float in an upright position, said case having openings at top and bottom closed by plugs of a material soluble or which disintegrates in water, substantially as described.

2. In a sea-oiling projectile, the combination of the shell or case, a bag of textile material for containing oil, and plugs of sugar or like substance closing holes in said shell or case, substantially as described.

3. A projectile consisting of a case inclosing an oil-chamber, and inclosing also a receptacle or vessel containing calcium phosphide, and having openings for the exit of the oil and openings for access of water to the calcium phosphide and for egress of the self-illuminating gas generated thereby, substantially as described.

4. An oil-projectile comprising a body portion inclosing an oil-chamber, a detachable cap having perforations in its walls for the admission of water and the escape of oil, and a vessel or case for containing calcium phosphide located in said cap, and having a gas-outlet arranged to communicate with one of the perforations in said cap, substantially as described.

397,032. SEAL FOR DIP-PIPES. ORLANDO F. SMITH and GEORGE H. BARBOUR, Washington, D. C. Filed Sept. 4, 1888. Serial No. 284,571. (No model.)



Claim.—1. The combination, with a hydraulic main and with a dip-pipe entering said main, of a gas-valve seating in an opening in the foot of the dip-pipe, said valve being carried by a valve-stem which rises through a short pipe of greater diameter tapped into said main, and provided with a chamber at its end containing two valve-seats, one surrounding the mouth of the short pipe and the other surrounding an opening in the top of said chamber, the valve-stem extending through the latter opening and provided with an adjustable

duplex valve arranged within the chamber to seat and close the short pipe at the same time the gas-valve seats in the foot of the dip-pipe, and to seat around and close the opening in the top of the chamber when the gas-valve is opened, substantially as described.

2. The combination, with a hydraulic main having a short pipe tapped through its walls, of a dip-pipe entering said main, a valve-stem passing loosely through the short pipe and carrying on its end a gas-valve seating in an opening in the foot of the dip-pipe, a duplex valve having two separate valve-faces lying in a chamber formed on the end of the short pipe and provided with a valve-seat surrounding the mouth of said pipe, and a separate seat surrounding an opening in the top of said chamber, through which the valve-stem loosely passes, said duplex valve having a female thread, by which it is adjustable upon a threaded portion of the stem, substantially as described.

3. The combination, with a hydraulic main having a short pipe tapped through its wall and provided upon its end with two separate cups forming a chamber, of a dip-pipe entering the main, a valve-stem passing loosely through the short pipe and its chamber, and having a gas-valve at its end seating upon an opening in the foot of the dip-pipe, a duplex valve adjustably mounted on the valve-stem within the chamber at the end of the short pipe, said duplex valve seating alternately around the mouth of said pipe and around an opening in the top of the chamber, through which the valve-stem loosely passes, and means for raising and lowering said valve-stem, substantially as described.

4. The combination of a hydraulic main, a dip-pipe curved over the main, descending thereinto, and having a foot dipping in the liquid, and provided in its top wall with a gas-valve seat, a pipe secured to the main, rising therefrom, and provided at its top with a sectional cup containing an upper and a lower valve-seat, a rigid valve-stem extending up through the cup-carrying pipe and through the cup thereon, having a valve at its lower end to close on the valve-seat of the foot on the dip-pipe, and provided with a duplex-faced valve located in the cup and adapted to close alternately upon the upper and lower valve-seats thereof, and a lever suitably connected with the valve-stem above the cup for operating said stem and its valves, substantially as described.

397,033. LINIMENT. SAMUEL SOMERVILLE, Cloquet, Minn. Filed Sept. 24, 1888. Serial No. 286,251. (No specimens.)

Claim.—The herein-described composition of matter, consisting of alcohol, camphor-gum, oil of origanum, oil of turpentine, rock-oil, nitrate of potassa, castile-soap, and soft water, mixed in about the proportions set forth.

397,034. CLASP. FREDERICK B. SPOONER, Brooklyn, N. Y. Filed Oct. 2, 1888. Serial No. 287,019. (No model.)



Claim.—1. A clasp for garments, substantially as set forth, comprising two parts, consisting of a slotted plate and a cam-slotted latch pivoted to said plate and adapted to be operated by the stud eye or shank which it secures.

2. A clasp adapted to be operated by a stud, substantially as set forth, comprising a stationary slotted plate with an unattached bent-over end and a cam-slotted latch pivoted thereto, and whose bent-over end incloses the front part of said latch.

3. A clasp adapted to be operated by and secure a stud eye or shank, substantially as set forth, consisting of a plate constructed of a piece of doubled sheet metal having a slot therein for the reception of the stud eye or shank, and a cam-slotted latch pivoted to said plate and inclosed thereby.

4. A clasp adapted to be operated by and secure a stud eye or shank, comprising a doubled sheet-metal plate having a slot therein and a latch pivoted thereto having an operating-guard, a hooked end, and a slot with a cam projection.

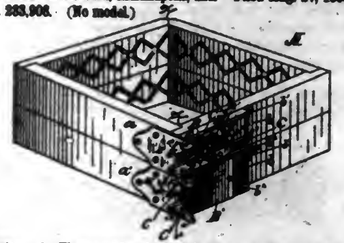
5. A clasp, substantially as described, comprising a slotted plate and a latch pivoted thereto having an open slot with a cam projection, in combination with an adjacently-situated stud for operating and engaging said latch.

6. A clasp adapted to be operated by a stud, substantially as set forth, comprising a slotted plate with a bent-over unattached end and a cam-slotted latch pivoted thereto having an overhanging hooked end provided with a front curved edge.

7. A clasp comprising a slotted plate, a latch having an open slot with a cam projection pivoted to said plate below the slot thereof, and an adjacently-situated stud or its equivalent adapted to engage the slots in said plate and latch and close said latch independent of spring action, substantially as described.

8. A corset-fastening having studs or equivalents on one steel thereof and slotted plates secured to the opposite steel in alignment with the said studs, each plate having a cam-slotted latch pivoted thereto and operating through said slotted plate, adapted to be actuated by and secure said studs, substantially as described.

397,035. SNAP-FLASK LOCK. MARTIN B. SPRINGER, Brightwood, and JOHN C. HIGGINS, Indianapolis, Ind. Filed Aug. 27, 1888. Serial No. 283,908. (No model.)



Claim.—1. The combination, with a cope and drag, of locks, each consisting of notched catches and pivoted notched latch-bars, the catches and latch-bars having their contacting edges beveled longitudinally and transversely, substantially alike but oppositely, as set forth, and for the purpose described.

2. The combination, with the cope and drag, of locks, each consisting of the notched catches a and a', having the compound bevels a^{10} a^{11}, the pivoted notched latch-bars C and C', having the compound bevels c^6 c^7, and a spring to facilitate the engagement of the latch-bars and catches, substantially as and for the purpose described.

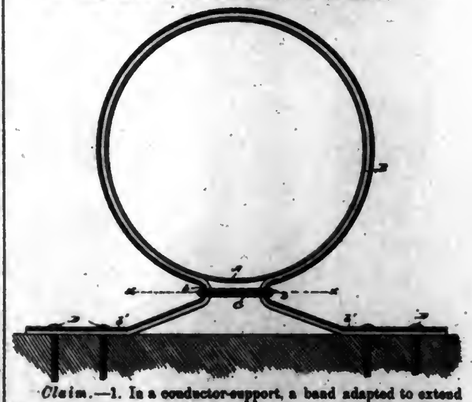
3. In a flask, the plate b, secured to one end of the cope, the latch-bar C, pivoted to said plate and having the compound bevel c^7 at its forward end, and notch c^8, in combination with a similarly notched and beveled catch, e, secured to a plate fastened to the opposite open end of the cope, substantially as and for the purpose set forth.

4. The combination, with a cope and a drag, of locks having the two adjacently-located spring-actuated pivoted latch-bars C, having hand-holds backwardly projected from the pivotal points, whereby said latch-bars may be simultaneously opened by pressing the hand-holds together, substantially as described.

5. The latch-bars C and C', pivotally secured to the case-plate b, the plate b, and the spring H, in combination with the link D, pivotally secured to the plate b and engaging with pin c^5 on bar C', substantially as and for the purpose specified.

6. The combination, with a cope and a drag, of locks, each consisting of the latch-bars C and C', pivoted to the case-plate b, the case-plate b, the link D, connecting the latch-bars, and the latch-bar-actuating spring, the latch-bars C of the cope and drag being adjacent to each other, all arranged substantially as shown and described.

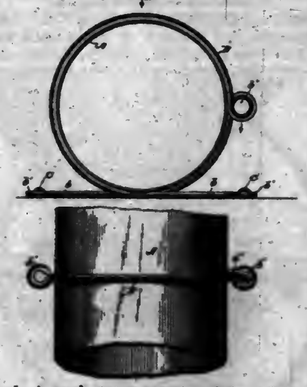
397,036. CONDUCTOR-SUPPORT. DAVID STRUBY, Monticello, Wis. Filed May 8, 1888. Serial No. 273,195. (No model.)



Claim.—1. In a conductor-support, a band adapted to extend nearly about the circumference of a conductor-pipe and having its ends turned outward for attachment to a wall, and a link connecting the bends in said band and adapted to draw them together and clamp the band about the conductor.

2. The band B, having its ends turned outward, forming bends b and feet b', in combination with the open link C, connecting the bends b and adapted to draw them together, substantially as and for the purpose set forth.

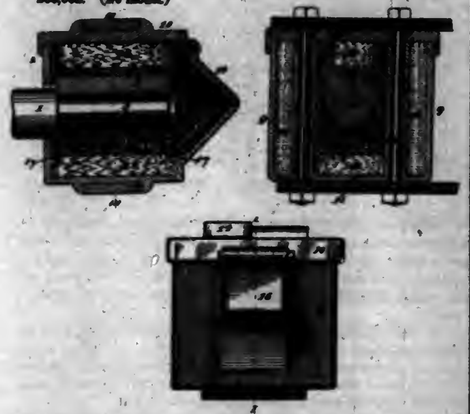
397,037. CONDUCTOR-SUPPORT. DAVID STRUBY, Monticello, Wis. Filed May 8, 1888. Serial No. 273,196. (No model.)



Claim.—1. A conductor-support consisting of a single wire adapted to encircle a conductor-pipe and having ends formed for attachment to a wall, and an intermediate loop or eye adapted to be twisted for shortening the wire after its application to the conductor, substantially as and for the purpose set forth.

2. The conductor-support consisting of the wire B, bent to encircle a conductor-pipe and formed with an eye, b', and having ends b, provided with eyes b' for attaching the support to a wall, substantially as and for the purpose set forth.

397,038. SELF-COOLING JOURNAL-BOX. JULIUS W. STOREY and JOSEPH OLSON, Cotton Gin, Tex. Filed Oct. 15, 1888. Serial No. 288,062. (No model.)



Claim.—1. In a self-cooling journal-box, the combination of the walls 4, having top 6 and bottom 7, supporting the lubricating packing, and the housing 9 10, forming water-chamber 12 below and at the sides of the chamber formed by the walls 4 and bottom 7, and water-chamber 13 above the top 6, substantially as and for the purpose set forth.

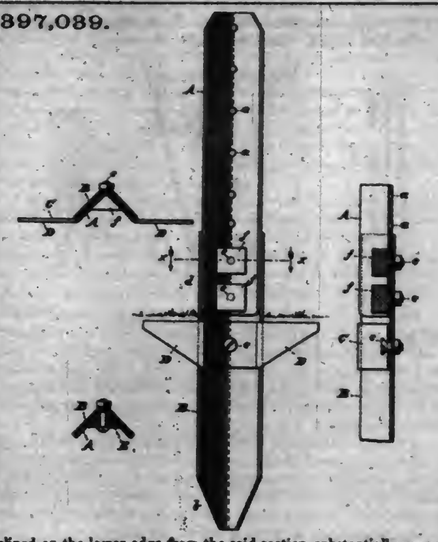
2. In a self-cooling journal-box, the combination of the walls 4, having top 6 and bottom 7, housing 9, cover 10, packing 17, and a funnel on the cover, having perforations 15 at its bottom for filling the respective chambers 12 and 13, substantially as set forth.

397,039. FENCE-POST. JEPTHAH M. TERRELL and CHARLES GARVER, Spring Hill, Ohio. Filed Oct. 4, 1888. Serial No. 287,182. (No model.)

Claim.—1. The combination, with the metal fence-post, consisting of two sections V-shaped in cross-section, of the bolts having the wedge-shaped head and the anchor-plate having its central portion conforming to and secured to the lower section, and having the lateral wings inclined upward and outward, substantially as specified.

2. In a fence-post, the combination of the upper V-shaped section having the openings, the lower V-shaped section lapping thereon and having the pointed lower end, the bolts having the wedge-shaped heads, and the anchor-plate having its central portion conforming to the lower section and bolted thereto, and having the lateral wings inclined on the lower edge from the said section, substantially as specified.

397,089.



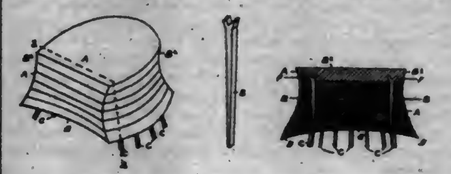
397,040. WEIGHING AND PRICE SCALE. ORVILLE W. VAN DEBOGERT, Schuylerville, N. Y. Filed July 26, 1888. Serial No. 281,116. (No model.)



Claim.—1. The combination of a suitable standard, a rigid frame, B', supported upon the said standard, a balance-frame, D, pivotally supported upon the said frame B', a platform, G, pivotally supported upon the said frame D, a beam, K, secured to the balance-frame, a revoluble indicating-cylinder, M, journaled upon this beam K, a graduated beam, N, secured to the frame D, and extending out parallel with and to one side of the said indicating-cylinder, and a sliding weight upon this beam N, the said cylinder M being graduated and marked off, substantially as shown, and for the purpose described.

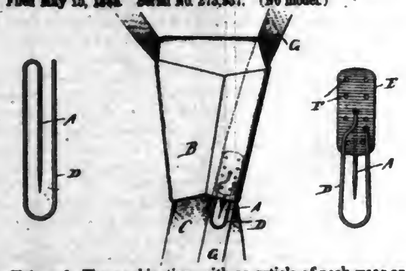
2. The combination of a suitable standard, a stationary frame, a balance-frame supported upon the stationary frame, a platform, G, supported upon the balance-frame, a tabular beam, K, adjustably secured to the said balance-frame, a revoluble indicating-cylinder upon this beam, this cylinder being provided with suitable figures and spaces, a stationary graduated beam, N, secured to the said balance-frame and extending out parallel with and in front of the cylinder, the forward end of this graduated beam being connected to the forward end of the beam K by an arm, a sliding graduated rod, R, inserted in the outer end of the said hollow beam K, and provided with a weight, S, and a sliding weight, P, upon the said graduated beam N, substantially as and for the purpose described.

397,041. HEEL FOR BOOTS OR SHOES. HAROLD A. WEBSTER, Haverhill, Mass. Filed Feb. 18, 1888. Serial No. 264,537. (No model.)



Claim.—A nail-charged heel for boots and shoes and in which the lifts are secured together by nails having V-shaped heads and points severally projected beyond the lifts on opposite sides of the heel, and the top lift secured or sparked on, the nail-heads severally embedded and clinched therein by a spread of their opposite wings or members, substantially as described.

397,042. NECKTIE-FASTENER. JOSEPH WEIL, New York, N. Y. Filed May 15, 1888. Serial No. 273,937. (No model.)



Claim.—1. The combination, with an article of neck-wear and a neck-band, of a pin projecting from the bottom edge of the shield part of said article of neck-wear, and a wire guard surrounding said pin, also projecting from the bottom edge of said shield part and connected with or fastened to the shield part at that end only opposite the one that is adjacent to the point of the pin, substantially as herein shown and described.

2. The combined pin for fastening neck-bands of scarfs and a guard for said pin, composed of a piece of wire bent to form a U-shaped or loop-shaped guard, the upper end of one shank being extended downward between the shanks of the guard and pointed to form a pin, and the other end of the wire being adapted to be attached to the shield or plate, substantially as herein shown and described.

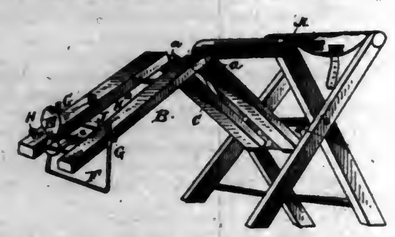
397,043. SPIRIT-LEVEL. RODOLPHUS D. WERDEN, Cincinnati, Ohio. Filed May 18, 1888. Serial No. 274,269. (No model.)



Claim.—1. In a spirit-level, the stock on both sides of the spirit-tube chamfered down at an angle, in combination with the tube and the dividing-plate located centrally over the tube and in close proximity thereto, substantially as herein set forth.

2. In a spirit-level, the stock on both sides chamfered off at an angle, in combination with the tube and the dividing-plate having the central notch, substantially as herein set forth.

397,044. STOOL OR SEAT. CHRISTIAN W. WIENKING, Walhalla, S. C. Filed June 23, 1888. Serial No. 277,963. (No model.)

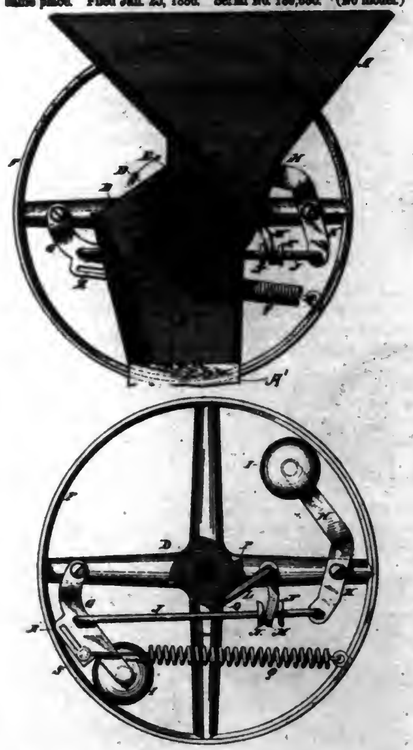


Claim.—1. A folding stool, and a cross-bar secured to the legs of the same at a distance below the seat at or near the center of the legs, in combination with a folding arm composed of two sections hinged together, the inner section hinged to the cross-bar at its inner end to fold upwardly against the stool, or to extend forwardly and upwardly from the same when in operative position, and movably hold the outer section, continuing forwardly and downwardly from their adjoining hinged ends to support the lower half of the leg of an occupant, and a foot-holder hinged to the outer section to fold upon the same and having a stop to hold it in operative position, substantially as described.

2. A portable seat for the use of boot-blacks, comprising a cross-legged folding stool having a flexible seat provided with a receptacle for the blacking implements, a folding arm hinged to a cross-bar of the seat to hold a leg of the occupant, a foot-holder hinged to the outer portion of the arm, and a support to adjustably support the outer end of the arm, substantially as described.

3. A boot-black's folding chair or stool having a flexible seat provided with a flexible pocket or receptacle upon its under side, and a catch for holding the same closed, substantially as described.

397,045. FEED-REGULATING MECHANISM. JAMES F. WINCHELL, Springfield, Ohio, assignor to the Foos Manufacturing Company, same place. Filed Jan. 25, 1886. Serial No. 189,690. (No model.)



Claim.—1. The combination, with a hopper, of a feeding-roller, a ratchet, a wheel, and a governor and a pawl mounted on said wheel, and a spring connecting the governor with the wheel, substantially as described, whereby the feeding-roller is engaged with the wheel and disengaged therefrom according to the speed at which the wheel is revolved.

2. The combination, with a hopper, of a feeding-roller, a wheel, pivoted weighted arms carried thereby, a pitman, a spring, and a pawl and ratchet to engage said wheel with the feeding-roller, whereby when the wheel attains a given speed the material is fed and when the wheel falls below that speed the material is cut off.

3. The combination, with a hopper having a bottom partially across it, a shaft mounted in said hopper, a ratchet, and a feeding-roller mounted on said shaft within the hopper and eccentrically to the bottom thereof, of a wheel mounted on the roller-shaft, arms pivotally attached to said wheel, a connecting-pitman, a pawl actuated by said arms and pitman to engage the wheel with the shaft, and a spring to break said engagement.

4. The combination, with a mill and its hopper, of a feeder co-operating with said hopper, a rotating governor mounted in proximity to said feeder, and clutch devices actuated by the governor to connect the governor and feeder-shaft together when the governor reaches a given speed and disconnect them when the governor falls below said speed, whereby in the one instance the feeder is actuated and the cereals fed and in the other instance the feeder is not actuated and the cereals not fed.

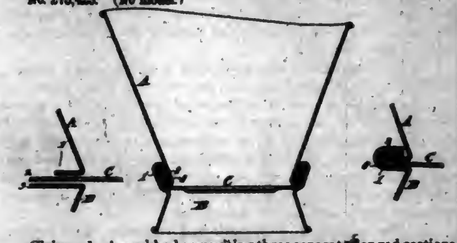
5. The combination, with the hopper consisting of a receiving portion, the throat portion, and a curved bottom located at the juncture of the receiving portion and said throat and extending partly across the latter, of a grooved feeding-roller mounted within the hopper and eccentrically to the bottom thereof and forming a tapering space between the said bottom and its periphery, and adapted to feed the material when rotated and to cut off the feed when stopped, a ratchet, the roller-shaft on which it is mounted, a wheel on said shaft, governor mechanism carried thereby and consisting of pivoted arms having weights and a pitman connecting them, and a pawl controlled by said pitman and thereby made to engage and disengage said ratchet.

397,046. ARTIFICIAL HONEY-COMB. LEWIS A. ASPINWALL, Three Rivers, Mich., assignor, by direct and mesne assignments, to Walter Alexander and Mary E. Bean, same place, and F. E. Aspinwall, Londonville, N. Y. Filed June 12, 1888. Serial No. 276,851. (No model.)



Claim.—An artificial honey-comb composed of an end-grain slab of wood with cells parallel to the grain of the wood, the entire surface being coated and the pores filled with wax, substantially as specified.

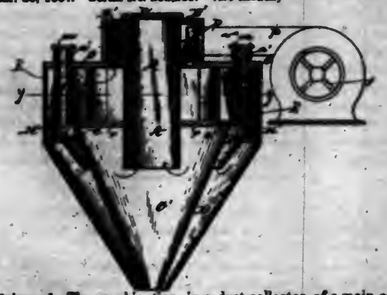
397,047. COAL-HOD. EDWARD BARRATH, Cincinnati, Ohio, assignor to Victor E. Knecht, same place. Filed May 29, 1888. Serial No. 275,623. (No model.)



Claim.—1. A coal-hod comprising three separate flanged sections of metal, the body A, the bottom C, and the base-rim B, one section having a short flange, 1, and the other sections having two longer flanges extending around the outer edge of the short flange to a point behind the latter, substantially as described.

2. A coal-hod consisting of the body A, having its lower edge bent upward to form the short flange 1, and the bottom C and base-rim B, having their edges bent to form the longer flanges, 2 and 3, which extend upward and around the outer edge of the short flange and project down between the latter and the body, substantially as described.

397,048. DUST-COLLECTOR. EUGENE BRETNEY, Indianapolis, Ind., assignor to the Bretney Dust Collector Company, same place. Filed Mar. 23, 1887. Serial No. 232,205. (No model.)



Claim.—1. The combination, in a dust-collector, of a main cylindrical chamber having a series of deflectors and tubes arranged in circular lines within said chamber, partitions or rings forming the bottom of the chamber, conical shells secured to the lower edge of said chamber and said rings, said shells being located one within the other, a tube concentric therewith, having a valve at its upper end, a cylindrical chamber surrounding the upper portion of said tube and having its lower edge attached to the top of the main chamber, and an air-spout leading into the same, substantially as described.

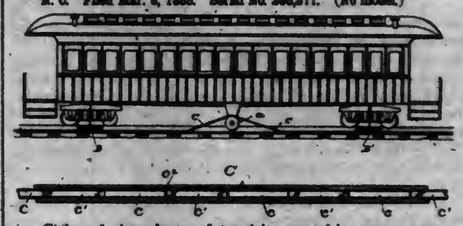
2. In a dust-collector, the combination of the inclosed cylindrical casing E, formed with an air-inlet, the tube A, concentric therewith, a bottom to said casing provided with a series of annular openings, a series of deflectors arranged in circles between said annular openings above said bottom, and the series of conical shells with open bottoms secured to the edge and bottom of said casing E, substantially as set forth.

3. In a dust-collector, the combination of a main separating-chamber, and a cylindrical separating-chamber secured above the same and communicating therewith and provided with a pure-air escape-tube, having an opening and closing cover or valve.

4. The combination, in a dust-collector, of the casing E, provided with the cover C, having a central opening, the casing B, arranged above said opening and provided with the cover B', and an air-inlet, the bottom of said casing composed of the rings r and H, the tube A, extending through said cover B' and said bottom, the series of deflectors c, arranged on the ring r, the series of deflectors d' on the ring H, the tubes d, extending up through said ring H and the cover C, and the series of conical shells D, C, and F, formed with discharge-openings secured to the lower edge of said casing E and to the rings forming its bottom, substantially as set forth.

5. The combination, in a dust-collector, of the main cylindrical casing E, provided with an air-inlet, the bottom therefor being composed of rings leaving annular openings, the series of deflectors above said bottom, and conical shells with open bottoms below said bottom, forming separating-chambers, and pure-air-escape tubes extending from each separating-chamber out through the machine, substantially as set forth.

397,049. RAILWAY-TELEGRAPHY. BAYLIS CABE, Louisburg, N. C. Filed Mar. 6, 1888. Serial No. 266,377. (No model.)



Claim.—1. A conductor of electricity, comprising permanent magnets and pieces of attractable metal placed alternately and in contact with each other and suitably insulated, substantially as set forth.

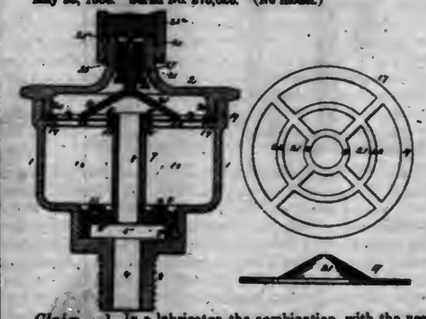
2. In a conductor of electricity, the combination of permanent magnets and pieces of attractable metal placed alternately and in contact with each other and an insulating band or covering inclosing the same, and to which they are suitably fastened, substantially as shown and described.

3. In a conductor of electricity, the combination of permanent magnets and pieces of attractable metal placed in contact with each other, a suitable inclosing band or covering of insulating material, and rivets or other suitable conductible fastenings securing said magnets and attractable metal to the upper portion of the covering, and being exposed above the top of the same, substantially as shown and described.

4. In combination with a car or other movable body carrying an idle-wheel, or described equivalent, a sectional conductor of electricity insulated and resting upon said idle-wheel or the like, whereby movement of the car or movable body will cause the conductor to be raised at that point and its continuity to be broken, substantially as and for the purpose set forth.

5. The combination, with a car or other movable body, of metallic brushes depending therefrom and electrically connected with each other through the car, an idle-wheel, cam, or the like carried by the car between the brushes, and electrical conductor composed of permanent magnets, attractable material placed alternately and in connection with each other, an insulating-covering and conductible fastenings securing said magnets and attractable material to the insulation and extending above the same, all arranged substantially as and for the purpose set forth.

397,050. OILER. DIETMAR J. M. CORNERS, Effingham, Ill. Filed May 25, 1888. Serial No. 275,023. (No model.)



Claim.—1. In a lubricator, the combination, with the vessel 1, having an oil-chamber therein and passages 24 4, for communicating

with the supply of lubricant and with the steam-chest containing the part to be lubricated, respectively, of an inwardly-opening valve for controlling said passage 24, a chamber, 5, in communication with passage 4, having passages 12 leading into said oil-chamber, and a tube extending from chamber 5 up into said vessel, as set forth.

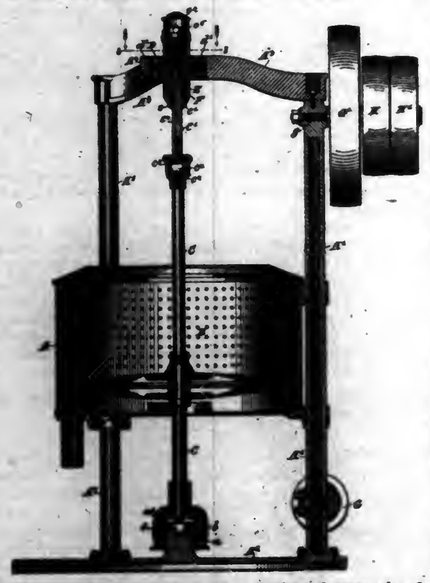
2. In a lubricator, the combination, with the vessel 1, having passages 24 4, for communicating with the supply of lubricant and with the steam-chest containing the part to be lubricated, respectively, of an inwardly-opening valve controlling said passage 24, a pipe communicating with the passage 4 and extending up into said vessel, and a deflector or cone arranged under said passage 24 and over said pipe, substantially as set forth.

3. In a lubricator, the combination, with the vessel 1, having an oil-chamber therein and passages 24 4, for communicating with the supply of lubricant and with the steam-chest containing the part to be lubricated, respectively, of an inwardly-opening valve controlling said passage 24 and extending up into said oil-chamber, a deflector or cone arranged under said passage 24 and over said pipe, and a strainer arranged between said cone and oil-chamber, as set forth.

4. The combination of the vessel 1, having necks 3 and 23, for attachment to a steam-chest and lubricant-reservoir, respectively, and said necks having passages 4 and 24, respectively, therethrough, leading to the interior of said vessel, the flange 6, secured in the bottom of said vessel, the tubes 11, having bores 12 tapped in said flange, the pipe 7, extending from said flange up into said vessel, and having a bore, 8, leading through said flange, flanges on said pipe and in said vessel, a spider, and a screen or strainer supported by said flanges and said spider, having a deflector over the tube 7, and a downwardly-opening valve in said passage 24, adapted to fall by gravity and rest upon said deflector, substantially as set forth.

5. A closed vessel adapted to be interposed between the lubricant-supply pipe and the valve or steam-chest of an engine, said vessel having an oil-chamber, 10, whose upper portion is in free communication with the interior of the steam-chest, and whose lower portion is in communication with said chest through small openings only, and a valve controlling said lubricant-supply pipe adapted to open toward the interior of said vessel, substantially as and for the purposes set forth.

397,051. CENTRIFUGAL MACHINE. GEORGE N. DOWNS, Chicago, Ill. Filed Jan. 14, 1888. Serial No. 260,668. (No model.)



Claim.—1. The combination, with a perforated receptacle, of a rotating shaft supporting the same, said shaft being mounted at one end in a bearing which permits inclination of the shaft and which allows rotary but not longitudinal movement of the shaft, a movable bearing engaging the other end of the shaft and constructed to permit rotary but not longitudinal movement of the shaft, said bearing last mentioned being movable both laterally and in a direction toward and from the bearing first mentioned, and a spring acting upon said laterally-movable bearing to thrust or move the said bearing in a direction away from the other bearing of the shaft, substantially as described.

2. The combination of a perforated receptacle, a rotating shaft sustaining the same, said shaft being mounted at one end in a bearing which permits inclination of the shaft, with a movable bearing for the other end of the shaft, having flexible connection with the machine-frame, and a spring applied to the said movable bearing and acting to move the said bearing in a direction away from the other bearing of the shaft, substantially as described.

3. The combination of a perforated receptacle and rotating shaft sustaining the same, said shaft being mounted at one end in a bearing which permits inclination of the shaft, with a second non-rotating shaft having flexible and longitudinally-movable connection with the machine-frame, said non-rotating shaft being in bearing with the other end of the rotating shaft, and a spring applied to the said non-rotating shaft and acting to move said non-rotating shaft endwise in a direction away from the opposite bearing of the rotating shaft, substantially as described.

4. The combination of a perforated receptacle with a rotating shaft sustaining the receptacle, said shaft being mounted at one end in a bearing which permits inclination of the shaft, and a non-rotating shaft united with the opposite end of the rotating shaft by a ball-and-socket joint or its equivalent, said non-rotating shaft having flexible and yielding connection with the frame of the machine, substantially as described.

5. The combination of a perforated receptacle and a rotating shaft sustaining the receptacle, said shaft being mounted at one end in a bearing which permits inclination of the shaft, with a second non-rotating shaft connected with the other end of the rotating shaft by a ball-and-socket joint or its equivalent, said non-rotating shaft having both sliding and flexible connection with the machine-frame, and a spring applied between the non-rotating shaft and the frame and acting to hold said rotating and non-rotating shafts in alignment with each other, substantially as described.

6. The combination of a perforated receptacle and a rotating shaft sustaining the receptacle, said shaft being mounted at one end in a bearing which permits inclination of the shaft, with a second non-rotating shaft connected with the other end of the rotating shaft by a ball-and-socket joint or its equivalent, a bearing for said non-rotating shaft connected with the frame of the machine by a universal joint, and a spring applied between the said bearing and the non-rotating shaft for moving the latter endwise, substantially as described.

7. The combination of a perforated receptacle, and a shaft sustaining the receptacle, with a second non-rotating shaft, a tubular bearing for the non-rotating shaft connected with the frame by a universal joint, said bearing being provided with an interior shoulder at its lower end, and a spring surrounding the shaft within the tubular bearing, said spring being held in place by a nut upon the shaft, substantially as described.

8. The combination of an outer casing or tank, a perforated receptacle within said tank, and a rotating shaft sustaining the receptacle, said shaft being mounted at one end in a fixed bearing which permits inclination of the shaft, with a laterally-movable bearing engaging the other end of the shaft above the receptacle and having movable connection with the machine-frame, a spring applied to move said bearing in a direction away from the opposite shaft-bearing, and a pulley mounted on the said shaft near the fixed bearing, whereby the said receptacle and shaft may be rotated, substantially as described.

397,052. GUN AND PROJECTILE FOR THROWING HIGH EXPLOSIVES. STEPHEN H. EMMENS, London, England. Filed Jan. 27, 1888. Serial No. 262,173. (No model.)

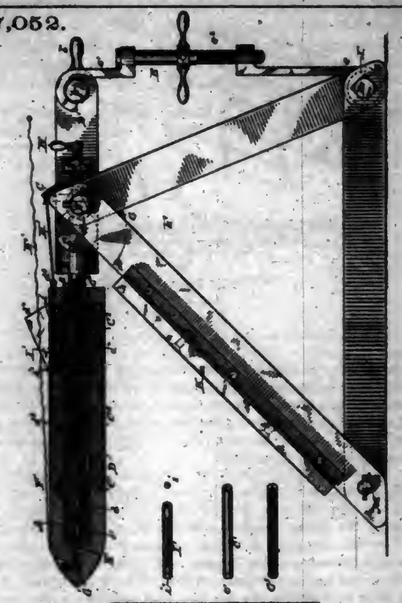
Claim.—1. The combination of a gun having a powder-tube which contains the propelling-charge, and an externally-applied thimble-shaped projectile having an annular charge-space for high explosives, an axial guide-bore fitted to said tube, and a head which masks both the guide-bore and the charge-space in front, substantially as hereinbefore specified.

2. In combination with a gun having a powder-tube which contains the propelling-charge, an externally-applied thimble-shaped projectile having an annular charge-space for high explosives extending rearwardly behind its head, and a guide-bore fitted to said tube extending forward into said head, substantially as hereinbefore set forth.

3. In combination with a gun having a powder-tube which contains the propelling-charge, an externally-applied thimble-shaped projectile having a guide-bore extending forward into its head and provided with a firing device within its head at the front end of said guide-bore for firing the propelling-charge at its front end, substantially as hereinbefore set forth.

4. In combination with a gun having a powder-tube which contains the propelling-charge, an externally-applied thimble-shaped projectile having an axial guide-bore fitted to said tube, an annular charge-space for high explosives, and directing wings or vanes which project from its outermost surface, substantially as hereinbefore specified.

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397,053. FOUNTAIN-PEN. ROBERT C. FRAMPTON, London, assignor to the Consolidated Agency Company of London, England. Filed June 20, 1888. Serial No. 277,644. (No model.)



Claim.—1. In a fountain-pen, the combination, with the reservoir or barrel, the pen, and the cap for covering the same, of the cut-off for preventing the flow of ink and the compressor for operating the same, projecting in the path of the cap, whereby when said cap is on the ink-supply is cut off, substantially as described.

2. In a fountain-pen, the combination, with the reservoir or barrel, the pen, and the cap for covering the same, of the flexible tube within the barrel and the compressor for closing the tube, held in the path of the cap by the resiliency of said tube, whereby when the cap is on the tube will be closed and the ink-supply cut off, substantially as described.

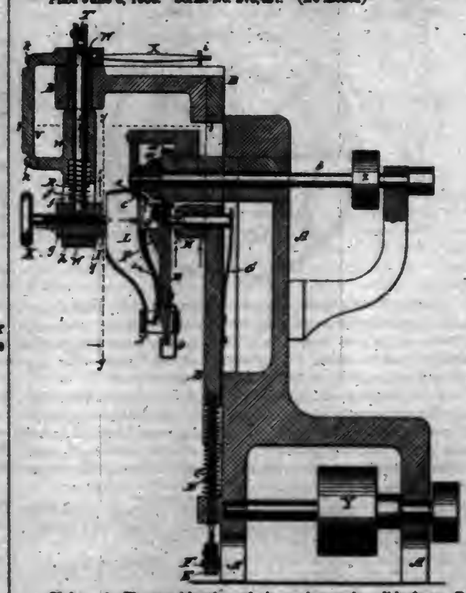
3. In a fountain-pen, the combination, with the point-section and the plug for holding the pen, having the longitudinal perforation at one end, through which the ink passes, opening out into the slot at the opposite or point end, of the cross-perforation in the wall of the plug above said slot for the entrance of air, substantially as described.

4. In a fountain-pen, the combination, with the reservoir and the flexible tube governing the flow of ink, of the compressor having the broad flexible surface bearing on the tube, substantially as described.

397,054. EMBOSSING AND ORNAMENTING PLASTERED WALLS AND OTHER SURFACES. ALBERT HABERSTROH, Boston, Mass. Filed July 13, 1888. Serial No. 279,866. (No specimens.)

Claim.—The process herein described of embossing or otherwise ornamenting wall or other surfaces, the same consisting in first applying a layer of material soluble in water, rendering portions of such layer non-soluble in water, and removing the remaining portions by dissolving the material making them, all substantially as described.

397,055. HEEL-TRIMMING MACHINE. CHARLES H. HELMS, Poughkeepsie, N. Y., assignor to himself and Charles H. Goodsell, same place. Filed June 8, 1888. Serial No. 276,627. (No model.)



Claim.—1. The combination of the reciprocating slide-frame B, having a lengthwise-yielding projecting pivot, H, the shoe-support M, carrying a toe-clamp, N, and jointed to and supported by the projecting end of the pivot, the vertically-adjustable box A, and the lengthwise-adjustable pivot I, extending through the box and adjustable vertically therewith for pivotally engaging the last in the shoe and swinging the shoe-support back and forth to and from the slide-frame, substantially as described.

2. The combination of the reciprocating slide-frame B, having a lengthwise-movable projecting pivot, H, a spring, G, for throwing the pivot outward, a shoe-support, M, carrying a toe-clamp, N, and jointed to and supported by the projecting end of the movable pivot, a vertically-adjustable box, A, and a lengthwise-adjustable pivot, I, extending through the box for pivotally engaging the last in the shoe, substantially as described.

3. The combination of the reciprocating slide frame B, having a projecting pivot, H, the shoe-support having a toe-clamp, N, and universally jointed to the projecting end of the pivot, the laterally-swinging frame W, swiveled to the slide-frame and provided with a handle, V, a box, A, vertically adjustable on the swiveled frame, and a lengthwise-adjustable pivot, I, extending through the box and vertically adjustable therewith for pivotally engaging the last in the shoe and swinging the support to and from the slide-frame, substantially as described.

4. The combination of the reciprocating slide-frame B, having a lengthwise-movable projecting pivot, H, a spring, G, for throwing the pivot outward, a shoe-support, M, having a toe-clamp, N, and universally jointed to the projecting end of the movable pivot, the laterally-swinging frame W, swiveled to the slide-frame and having a handle, V, and slot *f*, a spring-impelled lengthwise-movable arm, R, located in the swiveled frame, a box, A, secured to the arm in the slot of the swiveled frame, and a lengthwise-movable pivot, I, extending through the box for pivotally engaging the last in the shoe, substantially as described.

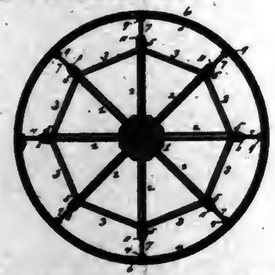
5. The combination of the reciprocating slide-frame B, having a

projecting pivot, H, the shoe-support M, jointed to the projecting end of the pivot, a laterally-swinging frame, W, swiveled to the slide-frame and provided with a handle, V, and a box, A, a lengthwise-adjustable pivot, I, extending through the box for pivotally engaging the last in the shoe, and a spring, X, secured to the swiveled frame, for normally holding the latter and keeping the two pivots in line, substantially as described.

397,056. FERTILIZER. PETER HOGAN, Milton, N. Y. Filed Mar. 26, 1888. Serial No. 268,502. (No specimens.)

Claim.—A new product consisting of a fertilizer composed of dissolved lignine from vegetable substances, and alkaline salts from the digesters in the manufacture of chemical fiber or other similar works, in combination with peat, clay, lime, earth, or other absorbing matter introduced for the purposes described.

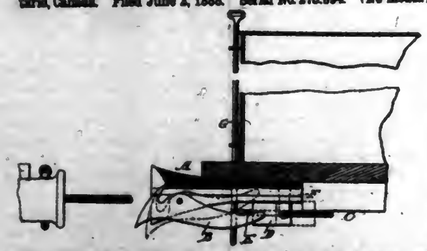
397,057. BOLTING-REEL. HENRY A. HUNTSMAN, Palmer, Ill. Filed Aug. 22, 1888. Serial No. 283,405. (No model.)



Claim.—1. In a bolting-reel, the combination of the central shaft or core, spokes or arms radiating from the central shaft or core, strips 3, fitting on the outer ends of the arms or spokes, bars 5, covering the joints between the strips, rings 4, silk 6, and rods 7 between the rings and bars, substantially as and for the purpose set forth.

2. In a bolting-reel, the combination of the central shaft or core, 1, radiating spokes or arms 2, strips 3, bars 5, covering the joints between the strips, rings 4, silk 6, and rods 7 between the bars 5 and the rings 4, said rods having shoulders 9 on one end and being threaded and having nuts 11 on the other end, substantially as and for the purpose set forth.

397,058. CAR-COUPLING. FREDERICK J. HUSBIS, Watford, Ontario, Canada. Filed June 2, 1888. Serial No. 275,594. (No model.)



Claim.—1. The combination of the draw-head A, having a solid top for the exclusion of snow and ice with the counterweighted dog B, having the bottom of its hook below the level of the pivot, so as to permit of an upward pull by the link and an easy disengagement thereof, substantially as shown and described.

2. In combination with dog B, under shaft with cranks E E bent at each end, with bent center C and adjustable weights D D opposite, which move in a half-circle when uncoupling from side of car, and journals F F, which carry said under shaft, as shown and described.

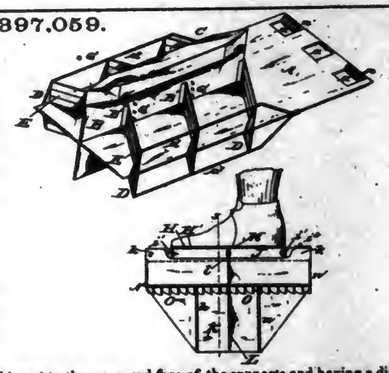
3. In combination with dog B, upright rod G, passing down end of car, with hand-hold at top, with bottom end turned at right angles, which acts on dog for uncoupling from top of car.

4. The combination of the draw-head A, having a beveled mouth or link-guide, and the counterweighted dog B, with inclined curve, as stated above, on the top or part that engages link, with the bottom of its hook below the level of the pivot and coming even with front part of draw-head and projecting upward and forward of beveled mouth of draw-head, substantially as set forth.

397,059. SWIMMING APPARATUS. EDWARD P. JOHNSTON, Washington, D. C. Filed Aug. 8, 1888. Serial No. 282,322. (No model.)

Claim.—1. A swimming device consisting of one or more thin plates or sections provided with suitable supports rigidly attached thereto at right angles and one or more series of narrow thin slats

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hinged to the rearward face of the supports and having a different degree of specific gravity from water, and adapted thereby to be swung against the rearward face of the support and oppose their surfaces to the water when the device is pulled backward, and to swing into planes parallel to the line of movement of the device when it is pushed forward, substantially as set forth.

2. In a swimming device, the combination, with one or more thin plates or sections having hand-holes at the rearward end of one plate, and also provided with suitable supports rigidly attached to one or more of the plates at right angles thereto, of one or more series of narrow thin slats hinged to the rearward face of the support and having a different specific gravity from water, and adapted thereby to be swung against the rearward face of the supports, thus presenting their surfaces against the opposing water when the device is moved backward, and swinging into planes parallel with the line of movement of the device when it is pushed forward, substantially as set forth.

3. A swimming device consisting of two or more thin plates or sections intersecting at right angles, a series of suitable supports attached to one or more of the plates, and one or more series of thin narrow slats having a greater specific gravity than water hinged at their upper edges to the rearward face of the supports, substantially as set forth.

4. A swimming device consisting of two or more thin intersecting plates or sections and provided with one or more series of narrow slats hinged to suitable supports on one or more of the plates and adapted to be brought into parallelism with one another or to be turned into line with one another by the action of the water when the device is moved forward or backward, substantially as set forth.

5. A swimming device consisting of a center-board, a plate intersecting the same at right angles and supporting a series of narrow slats hinged at one edge and in the same plane, and stops to limit the movement of the slats.

6. A swimming device consisting of the plate A, the center-board B, intersecting the plate at right angles, the float C, attached to the upper edge of the center-board, the uprights D, fastened to the outer edges of the plate A, and the series of narrow slats E, hinged upon the uprights D and upon cleats B', attached to the center-board B, substantially as and for the purpose set forth.

7. A swimming device consisting of the combination, with the plate A, having the hand-holes *a*, of the center-board B, intersecting the plate at right angles, the float C, detachably secured to the upper edge of the center-board B, the uprights D, attached to the outer edges of the plate A, the rods *d*, strengthening the uprights, and one or more series of narrow slats, E, hinged to the uprights D and to cleats B' on the center-board, substantially as set forth.

8. The combination, with the plate A and center-board B, of the cleats B', the uprights D, the slats E, hinged to the cleats and to the uprights, and the stops G, to limit the upward movement of the slats.

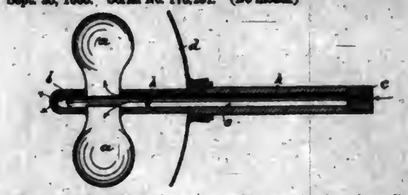
9. The combination, with the plate A and the center-board B, intersecting the same at right angles, of one or more series of slats, E, hinged to suitable supports on each side of the center-board, each series having its inner end nearer to the hand-holes than its outer end, substantially as set forth.

10. In a swimming device, the combination of two or more thin plates intersecting each other at right angles with one or more series of narrow hinged slats adapted to oppose their surfaces against the water when the device is moved backward and permitting the water to pass freely when it is moved forward, substantially as set forth.

11. In a swimming device, the combination, with one or more thin plates or sections constructed of suitable buoyant materials and provided with hand-holes at the rearward end, of one or more series of hinged slats, as and for the purpose set forth.

12. In a swimming device, one or more thin plates or sections provided with one or more hinged slats suitably supported thereon, in combination with a float secured to the upper edge of one of said plates and having its longitudinal axis parallel to the line of movement of the device, substantially as and for the purpose set forth.

397,060. SYRINGE. ALBERT M. KNAPP, Providence, R. I. Filed Sept. 25, 1886. Serial No. 178,131. (No model.)



Claim.—1. In a vaginal syringe, and in combination, the cylinder A, having a passage throughout its length and opening into the vagina at its inner end to receive and conduct the fluid, said cylinder having its sides formed with an opening, and an expansible bulb secured directly on said cylinder at a point between its two ends and about said opening, and having direct communication with the channel through the cylinder, substantially as described.

2. In combination, the syringe-pipe A, having a passage therethrough and openings in its sides, the bulb *a*, secured about said openings and communicating directly with the interior passage, *c*, and the valve *k*, placed over the discharge end of the pipe, substantially as described.

397,061. SUSPENDERS. JULIA R. ATWOOD, Swanton, Vt. Filed Nov. 23, 1888. Serial No. 292,076. (No model.)



Claim.—Suspenders comprising the usual shoulder straps and ends and a connecting-strip, B, formed of two or more pieces united by pivot pins or buttons and pivoted at its ends to the shoulder-straps, substantially as specified.

397,062. CRANK-CASE DOOR. RALPH RAGALEY and FRANCIS M. RIVES, Pittsburg, Pa., assignors to the Westinghouse Machine Company, same place. Filed Oct. 31, 1888. Serial No. 289,614. (No model.)

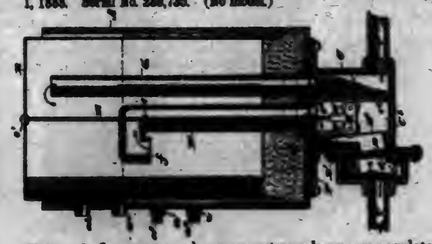


Claim.—1. The combination of a case or receptacle having two openings in one of its walls, a threaded stem fixed to the case between said openings, a nut engaging said stem, a supporting-bar journaled upon the nut, and doors fixed to said bar and adapted to close the opening in the case, substantially as set forth.

2. The combination of a case or receptacle having two openings in one of its walls, a threaded stem fixed to a boss projecting inwardly from a recess in the case between said openings, a nut engaging said stem and provided with a tubular extension, a supporting-bar having a central hub inclosing the tubular extension of the nut and projecting into the recess of the case, and doors fixed to the supporting-bar and adapted to close the openings in the case, substantially as set forth.

3. The combination of a case or receptacle having two openings in one of its walls, a threaded stem fixed to the case between said openings, a nut engaging said stem and provided with a tubular extension, a supporting-bar having a central hub bored out in flaring or tapering form and inclosing the tubular extension of the nut, and doors fixed to the supporting-bar and adapted to close the openings in the case, substantially as set forth.

397,063. PRESSURE-REGULATOR. JACOB BARROW, Windfall, Ind., assignor of one-half to John D. Baker, same place. Filed Nov. 1, 1888. Serial No. 289,735. (No model.)

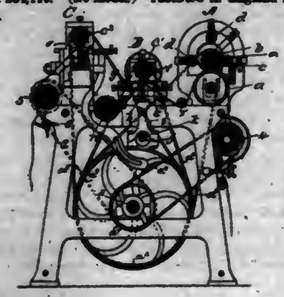


Claim.—1. In a water and gas separator and pressure-regulator, the combination of the outer chamber having inlet and outlet pipes and overflow-vents therein, an open-ended chamber mounted therein, a compartment-chamber secured to the bottom of said outer chamber and communicating therewith, having a gate-valve in one compartment thereof, and a rod secured to the top of the inner chamber, having a frame on its lower end carrying rollers bearing against the said gate-valve and one side of the dividing-wall of the compartment-chamber, substantially as described.

2. In a water and gas separator and pressure-regulator, the combination of the outer chamber having inlet and outlet pipes and overflow-vents, an open-ended chamber mounted therein, a compartment-chamber secured to the bottom of said outer chamber and communicating therewith, having a flange on its dividing-wall, and inlet and outlet openings and connections, a gate-valve hinged at its lower end to the outside wall of said chamber, having an inwardly-projecting enlargement with an upwardly-projecting arm whose inner edge merges into the edge of the said enlargement, and a rod passing centrally through the inlet-pipe of the outer chamber, being secured at its upper end to the top closed end of the inner chamber and provided with a limiting-collar, and having a frame attached to its lower end carrying grooved rollers adapted to engage the flange of the dividing-wall in the compartment-chamber and the edge of the inner projection of the valve-gate and its arm, whereby the said gate and inner chamber are made regulable, substantially as described.

3. In a water and gas separator and pressure-regulator, the combination, with an outer chamber, with its inlet and outlet pipes and overflow-vents adapted to have stoppers removably placed therein, a chamber mounted therein with its open end down, a compartment-chamber secured to the bottom of said outer chamber and communicating therewith, having a hinged gate-valve therein and an outflow-pipe directly connected to one of its chambers, a rod connected at its upper end to the top of the inner chamber, and having friction-rollers on the lower end engaging with one wall of the compartment-chamber and with the gate-valve, and the inflow-chamber secured to the side of the compartment-chamber over the valve-opening thereof, substantially as described.

397,064. APPARATUS FOR BRUSHING UP DESIGNS ON FABRICS. CARL H. BRENDON, Lockenwalde, Prussia, Germany, assignor of one-half to Charles Schreiber, Methuen, Mass. Filed Aug. 30, 1888. Serial No. 284,119. (No model.) Patented in England May 13, 1887, No. 7,094.



Claim.—A machine for teaseling or brushing up designs or figures in the nap on the face of fabrics, consisting of the combination of a frame, drawing and guide rolls mounted therein, a roll, *a*, over which the fabric is passed, a sheet-metal pattern-cylinder arranged above said roll, and a brush or card-cylinder arranged within the pattern-cylinder to make one part of a given design—for example, figures—a slotted bed, a brush or card cylinder arranged above said bed, and a blade arranged beneath the bed, and over which blade the cloth is passed, and means to reciprocate said blade vertically to form another part of the design—say stripes—and a pattern-band and means to move it, a brush or card cylinder arranged above said band, and a stationary blade below said band, and over which the fabric is passed to complete the design—say by the addition of stripes running in a different direction from those first named—and suitable means to rotate the brush or card cylinders and rolls, substantially as set forth.

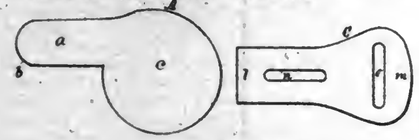
397,065. HAT-BAND. WILLIAM T. BRIGHAM, Baltimore, Md., assignor to Brigham, Hopkins & Co., same place. Filed Oct. 1, 1888. Serial No. 286,850. (No model.)

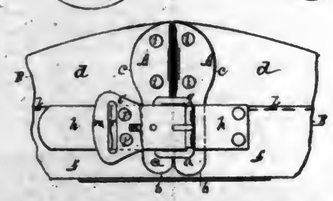




Claim.—As an improved article of manufacture, a hat-band consisting of a strip of suitable material having a stiffener at each end, and fastening devices secured to said stiffeners and strip, and a lacing connected to said fasteners, the said stiffeners with ends of strip overlapping each other, whereby the ends of the band may be adjusted so as to fit different sizes of hats, substantially as specified.

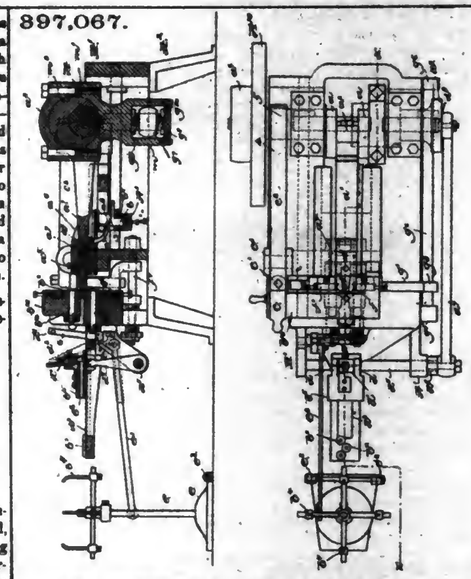
397,066. HORSE-COLLAR. RALPH BROWNSON, St. Paul, Minn., assignor of one-half to Peter R. L. Hardenbergh, same place. Filed June 5, 1888. Serial No. 276,077. (No model.)





Claim.—A horse-collar constructed with binding-pieces A A, each having a narrow end, *a*, adapted to lie upon the body of the collar, and a widened end, *c*, adapted to be doubled around the end of the collar-rim, and with a buckle-piece, C, having a narrow end, *l*, adapted to fit in and be doubled around the bar of the buckle, and having a longitudinal buckle-tongue slot, and a widened end, *m*, having a transverse slot, *o*, to receive the billet after the same is passed through the buckle, substantially as and for the purpose herein set forth.

397,067. WIRE-NAIL MACHINE. FORRESTER BRYANT, New Haven, Conn., assignor to the Bryant Nail Company, Portland, Me. Filed Mar. 12, 1887. Serial No. 230,597. (No model.)



Claim.—1. In a wire-nail-making machine, a wire-feeding mechanism, a cutting mechanism to sever the wire, and a gripping mechanism to hold the wire while being acted upon, combined with a rocker arranged in a carriage and provided with a normally-depressed depending arm, a header carried by said rocker and mechanism to reciprocate the said carriage, and a cam co-operating with the said depending arm to rock the said rocker, substantially as described.

2. In a wire-nail-making machine, a wire-feed mechanism and a cutting mechanism to sever the nail from the wire, a cross-head, a rocker adapted to rock thereon, a normally-depressed projection from said rocker, and a header attached to the said rocker, and means to reciprocate the cross-head, combined with a cam co-operating with the rocker projection to move the rocker out of line with the wire as the cross-head is moved in one direction and to bring the rocker again into line with the wire when the cross-head is moved in the opposite direction, substantially as and for the purpose specified.

3. In a wire-nail-making machine, a wire-feed mechanism and a cutting mechanism to sever the nail from the wire, a cross-head, a rocker adapted to rock thereon, a header, and an arm attached to said rocker, combined with a cam to act upon the said arm to rock the said rocker, and with a spring to keep the said arm in contact with the said cam, substantially as described.

4. In a wire-nail-making machine, a wire-feed mechanism comprising a pivoted lever and a dog to engage the wire, a reel to sustain the wire, and a pivoted stand to support the said reel, combined with a second lever pivoted to the machine and having one arm connected to the said pivoted stand and having its other arm projected in the path of movement of the lever of the feed mechanism, whereby the said second lever acts upon the lever of the feed mechanism to disengage the dog from the wire when the said stand is turned on its pivot, substantially as described.

5. In a wire-nail-making machine, a cutting mechanism comprising cutter-carriers and cutting-dies carried thereby, the sleeves g^{x}, having the arms g^{8}, and means, substantially as described, to connect the said arms and cutter-carriers, and the arms g^{7}, provided each with a threaded opening to embrace a threaded pintle, combined with slippers to engage the ends of the threaded pintles, and with a housing for said slippers, substantially as described.

6. In a wire-nail-making machine, a cutting mechanism comprising cutter-carriers and cutting-dies carried thereby, the sleeves g^{x}, having the arms g^{8}, connected to the cutter-carriers, and the arms g^{7}, provided each with a ball at its end, combined with slippers to co-operate with the said balls to form a universal joint, and with housings therefor, substantially as described.

7. In a nail-making machine, the cutter-carriers, cutters carried thereby, and means to operate said carriers, combined with the journal f^{4}, the threaded stud f^{5}, and sleeve f^{6}, and nut to secure said sleeve on the said stud, substantially as described.

397,068. NAIL-MACHINE. MILTON CRANE and MATTHEW H. FOSTER, Haverhill, Mass., assignors to The Combination Nail Machine Company, same place. Filed Mar. 23, 1888. Serial No. 268,202. (No model.)

Claim.—1. The feed-rolls D D, provided with beveled edges, in combination with the rollers H, mounted in frames I, wedges J, and bolts *i*, substantially as and for the purposes set forth.

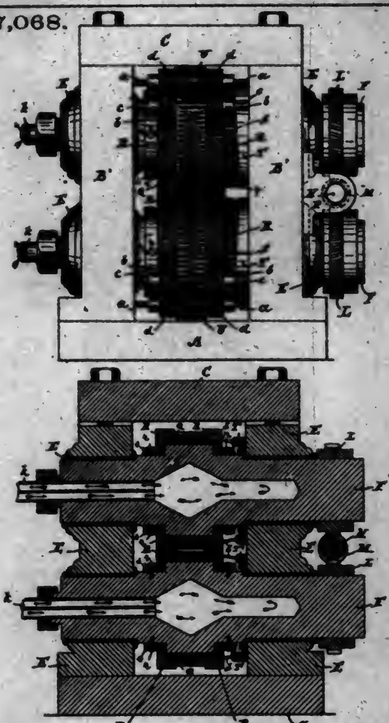
2. The rolls F, in combination with the dies Q and rings or collars R, for securing them in position, substantially as shown and described.

3. The clearers S and cams T, in combination with rolls provided with dies for cutting nails, substantially as shown and described.

4. In a nail-machine, a pair of feed-rolls and side rollers arranged to partly form the head of the nails jointly with the pair of rolls provided on their perimeter with dies arranged alternately with each other, so that the dies on one roll will fit into the spaces between the dies on the other roll, substantially as shown and described.

5. The feed-rolls D D and die-rolls F F, in combination with the

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worm-wheels L, worms M, and shaft N, whereby the feed and the die rolls are driven at the same speed, substantially as shown and described.

6. The brushes U and gears *d b*, in combination with the die-rolls F, dies Q, and collars R, substantially as and for the purposes set forth.

7. In combination with the die-rolls F and dies Q, a pump or fan, W, and pipe *w* for delivering a blast of cold air to the dies, substantially as shown and described.

8. In a nail-machine, a pair of feed-rolls the periphery of which is formed to partly shape nails on a strip of metal passed between them jointly with the pair of rolls provided with dies to cut and form complete nails from said strip of metal, substantially as set forth.

397,069. APPARATUS FOR DYEING AND DRYING TISSUE AND OTHER PAPER. RALPH CROMPTON, Elton, near Bury, County of Lancaster, England. Filed Mar. 7, 1888. Serial No. 266,478. (No model.)

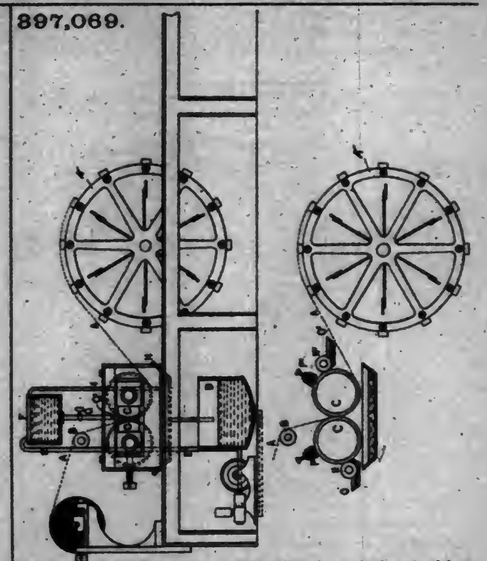
Claim.—1. In an apparatus of the class described, the combination, with a single pair of impregnating-rolls covered with an absorbent material, and means, such as described, for supplying the rolls with the mordant or dye, of a heated drying-cylinder, the endless felt M', and the skeleton air-drums K, substantially as and for the purpose specified.

2. In an apparatus of the class described, the combination, with a single pair of mordanting-rolls covered with an absorbent material and arranged side by side and operating to draw the web of paper between them in substantially a vertical direction, a single pair of dyeing-rolls, also covered with an absorbent material and operating on the paper web like the mordanting-rolls, and means for supplying said rolls with a mordant and dye respectively, of a drying-cylinder arranged between the mordanting and dyeing rolls in a higher plane than either, substantially as and for the purposes specified.

3. In an apparatus of the class described, the combination, with a single pair of mordanting-rolls covered with an absorbent material and arranged side by side and operating to draw the web of paper between them in substantially a vertical direction, a single pair of dyeing-rolls, also covered with an absorbent material and operating on the paper web like the mordanting-rolls, and means for supplying said rolls with a mordant and dye respectively, of a drying-cylinder arranged between the mordanting and dyeing rolls in a higher plane than either, and the endless felt M', substantially as and for the purpose specified.

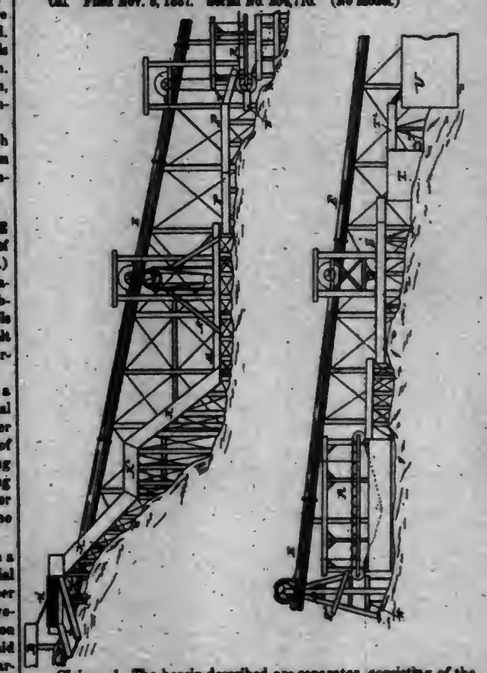
4. In an apparatus of the class described, the combination, with a single pair of mordanting-rolls covered with an absorbent material and arranged side by side and operating to draw the web of paper

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between them in substantially a vertical direction, a single pair of dyeing-rolls, also covered with an absorbent material and operating on the paper web like the mordanting-rolls, and means for supplying said rolls with a mordant and dye respectively, of a drying-cylinder arranged between the mordanting and dyeing rolls in a higher plane than either, the endless felt M', and the series of air-drums K, substantially as and for the purposes specified.

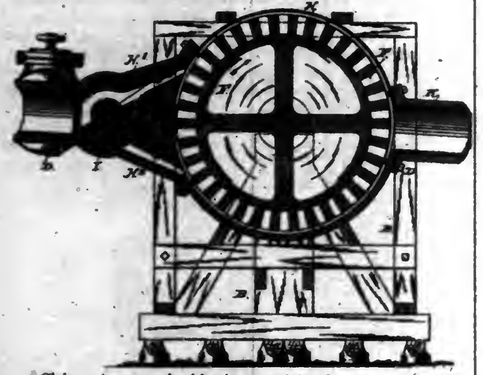
397,070. ORE-SEPARATOR. ETIENNE DEBERRY, San Francisco, Cal. Filed Nov. 9, 1887. Serial No. 254,710. (No model.)



Claim.—1. The herein-described ore-separator, consisting of the reservoir A, sluice B, sluice K, having cascade-wheels, reduction-mill N, concentrator R, amalgamator S, settling-tub T, settling-reservoir V, and the line of hydraulic pipe E, having motor-wheels E^{x}, and branches or taps E^{8}, supplying water to the apparatus at desired points, all arranged and combined for operation substantially as set forth.

2. In an ore-separator, a line of sluice and a line of hydraulic pipe, as E, having incased motor-wheels for supplying power to operate various apparatus at points along the line or system, substantially as described.

397,071. WATER-WHEEL. BYRNES DURBIN, San Francisco, Cal. Filed Jan. 27, 1888. Serial No. 262,181. (No model.)



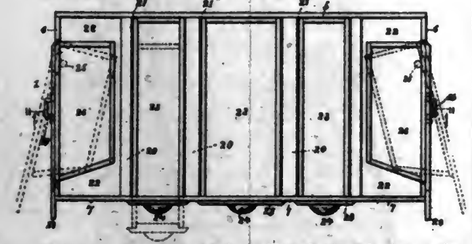
Claim.—A water-wheel having a peripheral water-way or channel and buckets on each side of and opening laterally into said water-way or channel and outwardly on the periphery of the wheel, as set forth.

397,072. TRANSLUCENT SIGN. EDWARD A. DUBBY, Brooklyn, N. Y., assignor of one-half to Thomas B. Rutan, same place. Filed May 9, 1888. Serial No. 273,312. (No model.)



Claim.—A sign constructed substantially as herein shown and described, and consisting of the waterproofed translucent fabric A, having letters or symbols upon it, in combination with the glass, B, and intermediate layer of adhesive and translucent varnish connecting the fabric to the glass, as specified.

397,073. KITCHEN TABLE AND CABINET. JESSE EVERITT, Knoxville, Pa., assignor of one-half to Jerome W. Hathaway, same place. Filed Mar. 16, 1888. Serial No. 267,287. (No model.)



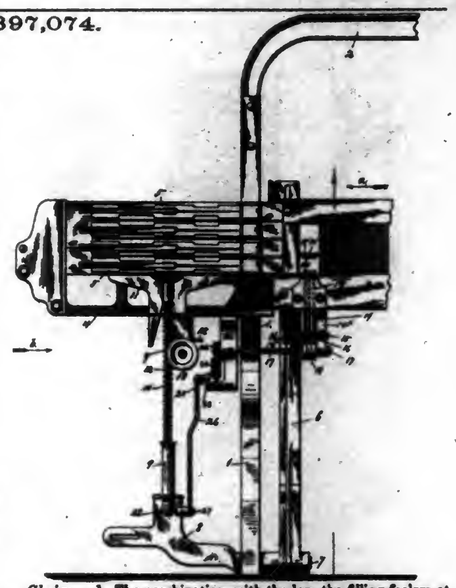
Claim.—1. A combined kitchen table and cabinet having a swinging box pivoted at the end thereof, extending transversely the width of the table beneath the top, and having a handle projecting in front of the cabinet, by which it is swung out and in, substantially as described and shown.

2. A combined kitchen table and cabinet having swinging boxes pivoted at the ends thereof, extending transversely the width of the table beneath the top, and having their sides projecting in front of the cabinet, forming handles, by which they are swung out and in, substantially as described and shown.

397,074. LOOM. JOHN R. FITTON, Worcester, Mass., assignor of one-half to Tom Howard, same place. Filed Feb. 20, 1888. Serial No. 264,663. (No model.)

Brief.—By means of the feelers and their actuating mechanism, as the different boxes are raised from the raceway, the wefts which extend therefrom are raised and held out of the way, thereby preventing their becoming entangled with each other and also being drawn into the cloth by the active shuttle.

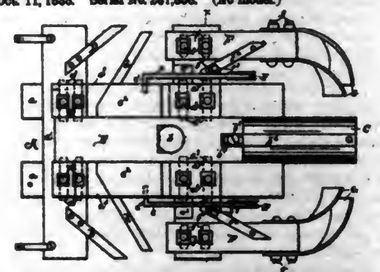
397,074.



Claim.—1. The combination, with the lay, the filling-feelers at the end of the raceway, rods 19, and levers 16, for operating the feelers, of a shaft carrying cam-surfaces for operating said levers 16, and mechanism connecting said shaft with the box-lifter rod to cause the same to be operated therewith, and the box-lifter rod, substantially as shown and described.

2. The combination, with the lay, the filling-feelers 19', supported on the lay at the end of the raceway, rods 19, connected with said feelers, and levers 16, for operating said rods, of a shaft, 17, having cam-surfaces 18 thereon, a pinion, 22, sector-gear 24, arm 25, and rod 26, forming a connection between said shaft 17 and the shuttle-box motion, and said shuttle-box motion, substantially as shown and described.

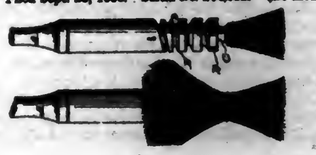
397,075. CULTIVATOR. WILLIAM H. FULLER, Linden, Nebr. Filed Oct. 11, 1888. Serial No. 287,836. (No model.)



Claim.—1. The combination of the adjustable runners, the front and rear cross-bars having slots, the notted bolts a^6, the shield of approximately U shape, the notted bolts b', securing the same to said runners, the strap or bar secured at its rear end to said shield and having a slot in its forward end, and the notted bolt b^2, substantially as set forth.

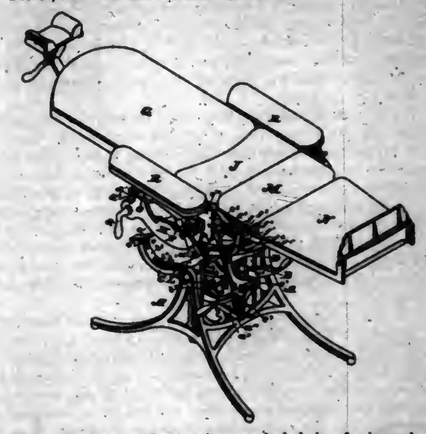
2. The combination, with the adjustable runners, the slotted cross-bars, and the shield, of the inclined cross-bars, the inclined rearwardly-projecting bars having slots, the notted bolts passed therethrough, the brace-plates f^3, having slotted ends, the screws f^4, and the leveling plates or arms G, substantially as set forth.

397,076. CYLINDRICAL BRUSH. GEORGE S. GLADDING, Chester, Conn. Filed Sept. 23, 1888. Serial No. 284,362. (No model.)



Claim.—In a cylindrical brush such as described, the combination of a handle provided at the brush end with grooves passing around the said handle, said grooves being undercut, substantially as described, and small grooves connecting the said undercut grooves, bristles having their centers drawn into the said grooves, and a wrapping-wire rigidly attached to the said handle and wrapped over the said bristles, drawing them into the said undercut grooves and fitting in the said small grooves connecting the said undercut grooves, substantially as set forth and described.

397,077. SURGICAL CHAIR. AARON P. GOULD, Canton, Ohio. Filed Dec. 10, 1887. Serial No. 257,543. (No model.)



Claim.—1. The combination, in a surgical chair, of a base, A, a frame, B, secured in said base and having a vertically-reciprocating movement, a circular way pivotally secured to said frame, a body-support frame having a circular base resting upon and pivotally secured to said way, a locking-rack depending from said way, and a lock pivotally secured to the frame B and adapted to engage the rack at any desired point of adjustment, substantially as set forth.

2. In a chair, the combination of a base, A, a frame, B, secured to said base and having a vertically-reciprocating movement, a circular way pivotally secured to said frame, a body-supporting frame having a circular base pivotally secured to and resting upon the circular way, upwardly-projected arms, a back pivoted to said arms, a seat-section secured to said arms by pivoted links, devices for swinging said back and seat sections into backwardly and upwardly tilting positions about the axis of the pivotal connection, and devices for locking said back and seat sections in their several adjustments and for locking the body-supporting frame against rotation, substantially as set forth.

3. The combination, in a chair, of a base, A, a frame, B, secured in said base and having a vertically-reciprocating movement, devices in connection with the base A and frame B for raising and lowering said frame and locking it in any desired adjustment, a circular way supported by and pivotally secured to the said frame B, to tilt in a plane vertical to that of the way, a body-supporting frame having a circular base adapted to rest and rotate upon said circular way and provided with upwardly-projecting arms, a back pivoted to said arms, and a seat-section hinged to the back and secured to said arms by pivoted links, substantially as set forth.

4. The combination, with a chair-base and a supporting-frame having a vertically-reciprocating movement in said base, of a combined lifting and lowering foot-lever pivoted to the base, a rack pivoted to said lever and connecting the lever with the reciprocating frame, a locking-bolt carried by the said lever, and a rocking part connected with the foot-lever and locking-bolt, whereby the latter is directly subject to the same impulse which operates the lever, substantially as set forth.

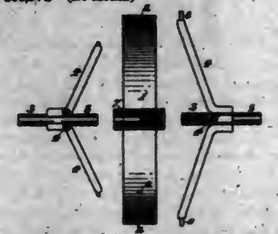
5. The combination, with a chair-base and a supporting-frame having a vertically-reciprocating movement in said base, of a foot-lever, a segmental rack connecting the foot-lever and reciprocating frame, and a locking-bolt having a lengthwise movement relatively to the lever to engage and disengage the said rack and subject to be operated simultaneously therewith, substantially as set forth.

6. The combination, with a chair-base and a supporting-frame having a vertically-reciprocating movement in said base, of a foot-lever, a segmental connection between the foot-lever and vibrating frame, the segmental connection being provided with seats for a locking-bolt and the foot-lever being pivoted to the connection at the center of its segmental arc, a locking-bolt having a movement lengthwise of the lever, and a rocking step connecting the lever and the locking-bolt, substantially as set forth.

7. The combination, in a chair, of a base, A, a frame, B, secured in the said base and having a vertically-reciprocating movement, a circular way pivotally secured to said frame, a chair-body turning on said circular way, and springs, one end of each resting against the frame B and the other against a rack depending from the said way, substantially as set forth.

8. The combination, in a chair, of a base, A, a frame, B, secured in said base and having a vertical movement therein, a body-supporting frame pivotally secured to said frame B, and springs, one end of each resting against the frame B and the other against the body-supporting frame, substantially as set forth.

397,078. VEHICLE-WHEEL. WILLIAM HARLEY, Sidney, assignor of one-half to J. H. Deering, Wapakoneta, Ohio. Filed Nov. 12, 1888. Serial No. 290,574. (No model.)



Claim.—1. A metallic wheel consisting of the wheel-rim, the wheel-shaft composed of two separate sections, each having a series of spokes welded thereupon and formed with tenons entering openings in the wheel-rim at right angles to the axis of the wheel-shaft, and the sleeve connecting the shaft-sections between the two sets of spokes, substantially as described.

2. A metallic wheel consisting of the wheel-rim, the wheel-shaft made of two separate sections, each provided with a series of spokes welded thereupon and secured to the wheel-rim, and the screw-sleeve connecting the shaft-sections between the two sets of spokes, substantially as described.

397,079. POKE. BERRY HEATH, Curtis, Nebr., assignor of one-half to Walter H. Grabb, same place. Filed Aug. 25, 1888. Serial No. 283,762. (No model.)



Claim.—1. The herein-described device for preventing stock leaving an inclosure, composed of the bow, the neck-yoke, the hooks I, the nose-band connected at its rear with the bow, the hook E, and the connection between the front end of the said nose-band and the upper end of the bow, substantially as described.

2. The combination, with the bow having an eye, *c*, at its lower end, of the nose-band having its rear end supported in said eye *c* and provided with a hook, and the rod connected with the front end of the nose-band between its ends, the upper end of the rod having connection with the upper end of the bow, and the lower end of the rod provided with a hook, substantially as and for the purpose described.

3. In a hog-controller, the combination, with the nose-band having lateral arms *d*, of the hook E, journaled on the arms *d*, and provided with the loop *d'*, to limit the movement of the hook, substantially as described.

4. The combination, with the bow having the eye *c* at its lower end and having the series of eyes *c'* at the upper ends of its branches, and the yoke adjustably connected with the bow, of the nose-band supported at its rear in the eye *c* and having a hook, the bracket F, and the rod G, connected with the front end of the nose-band and having its upper end adjustably connected with the said bracket and having its lower end provided with a hook, substantially as described.

5. The herein-described hog-controller, composed of the bow having the eyes *a* and *a'*, the yoke adjustably connected with the bow and having the hooks I, the bracket F, the nose-band supported in the eye *a* at its rear end and having the arms *d*, the rod G, connected with the front end of the nose-band and having its upper end adjustably connected with the bracket F and having its lower end provided with a hook, and the hook E, having the eyes *e*, which receive the arms *d*, and the loop *d'*, which passes over the rear end of the nose-band, substantially as set forth.

397,080. SLED. FERDINAND W. HOWELS, New York, N. Y., assignor to Allen & Co., same place. Filed Apr. 5, 1888. Serial No. 269,665. (No model.)

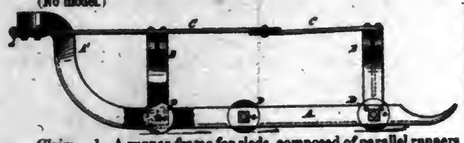


Claim.—1. A runner-frame for sleds and sleighs, composed of runners connected by an upwardly-bent and bow-shaped front, said runners and front being made of T-irons, and U-shaped braces also of T-irons, said braces being slitted at their lower ends and attached at opposite sides to the ribs of the runners, substantially as set forth.

2. A runner-frame for sleds and sleighs, composed of runners connected by an upwardly-bent and bow-shaped front, U-shaped braces attached to said runners, and diagonal pieces attached to the top of the braces and extended to the bow-shaped front, said extensions being provided with eyes for attaching the shafts, substantially as shown and described.

3. A runner-frame for sleds and sleighs, composed of runners connected by an upwardly-bent and bow-shaped front, U-shaped braces attached to the runners, said runners and braces being made of T-irons, and diagonal pieces attached to the braces and to the bow shaped front, substantially as set forth.

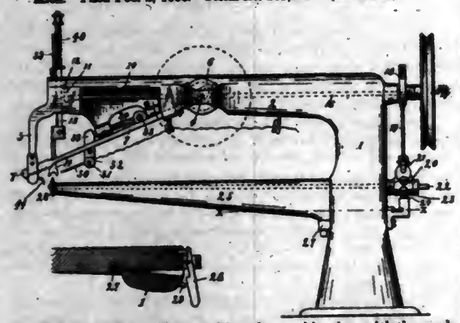
397,081. SLED. FERDINAND W. HOWELS, New York, N. Y., assignor to Allen & Co., same place. Filed Apr. 5, 1888. Serial No. 269,666. (No model.)



Claim.—1. A runner-frame for sleds, composed of parallel runners connected by an upwardly-bent bow-shaped front, said runners and front being made of U-shaped cross-section, yoked-shaped transverse braces attached to said runners and made of double T-shaped cross-section, and diagonal stiffening-pieces connecting the top of the braces and extended to the bow-shaped front, substantially as set forth.

2. The combination of U-shaped runners having openings, transverse T-shaped braces attached to the runners and having recessed webs at their lower ends, and rollers pivoted to transverse bolts and extending into the recesses of the braces and through the openings of the runners, substantially as set forth.

397,082. TUFTING-MACHINE. H. HUBERT HUMPHREY, Detroit, Mich. Filed Feb. 2, 1885. Serial No. 262,731. (No model.)



Claim.—1. In a tufting-machine, the combination, with the work-support and the serrated feed-wheel carried thereon, of an intermittently vertically-reciprocating presser-foot bar, a longitudinally-recessed and transversely-slotted presser-foot carried by the foot-bar, and which at intervals holds the work in contact with the feed-wheel, the needle and means to reciprocate the same through the slot in the presser-foot in a plane inclined to the plane in which the presser-bar reciprocates, and an oscillating loop-retaining hook operating in the path of the needle in advance of the presser-foot, all arranged to operate substantially as described.

2. In a tufting-machine, the combination, with the standard of the frame, provided with an overhanging arm supporting near its free end the needle, presser-foot, and loop-retaining hook in relative operative position, substantially as described, of a work-support pivotally secured to the standard of the frame and the feed-wheel at the free end of said support, substantially as described.

3. In a tufting-machine, the combination, with the standard of the frame, provided with the overhanging arm supporting near its free end the stitch-forming mechanism of the machine, substantially as described, of the work-supporting arm 25, pivotally secured to the standard, and the automatically-operating locking-latch 28, and the pin 29 on the standard, engaging said latch, substantially as described.

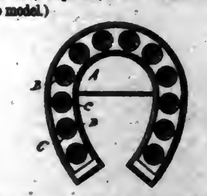
4. In a tufting-machine, the combination, with the reciprocating needle and the rock-shaft 41, of the slotted presser-foot, the feed-disk, and the intermittently-oscillating retaining-hook 44, eccentrically secured to its actuating rock-shaft 41 and adapted to operate in a vertical plane in the path of the needle, substantially as described.

5. In a tufting-machine, the combination, with the reciprocating needle and suitable feeding mechanism, of the retaining-hook 44, the oscillating shaft 41, the eccentric 43, adjustably secured to said shaft and carrying the retaining-hook, the pinion 42, and the reciprocating rack-bar 7, the parts being constructed to operate substantially as described.

6. In a tufting-machine, the combination, with the drive-pulley 17, the hand-wheel 5, and the needle and loop forming hook, of the shafts 10 and 16, the transverse shaft 4, the intermeshing bevel-pinions 8, 9, and 15, secured upon said shafts, respectively, the grooved cam-wheel 6, the reciprocating rack-bar 7 and its actuating-connection with the retaining-hook 44, the crank-disk 37 and its actuating-connection with the reciprocating needle-bar, the crank 11 on the shaft 10 and its actuating-connection with the reciprocating presser-foot bar, and the eccentric 18 and its actuating feed-connection with the feed-wheel 26, substantially as described.

7. In a tufting-machine, the combination, with the transverse shaft 4 and its actuating-connection with the reciprocating needle-bar and needle, and oscillating retaining-hook, of suitable feed mechanism, the bevel gear-wheel 8, secured upon said shaft, the bevel gear-wheel 9, the shaft 10 and its actuating-connection with the presser-foot bar, the bevel gear-wheel 15, the drive pulley 17, and the main drive-shaft 16 and its actuating-connection, substantially as described.

397,083. TIN BRILLIANT ORNAMENT. PHILIPP KNOEPP and GUSTAVE A. MAYER, Stapleton, N. Y. Filed Feb. 6, 1888. Serial No. 263,144. (No model.)



Claim.—An ornament composed of a shell, casing, or plate provided in its face with apertures, a plate provided with a faceted recess below each aperture, and a backing holding said plate in the casing, substantially as herein shown and described.

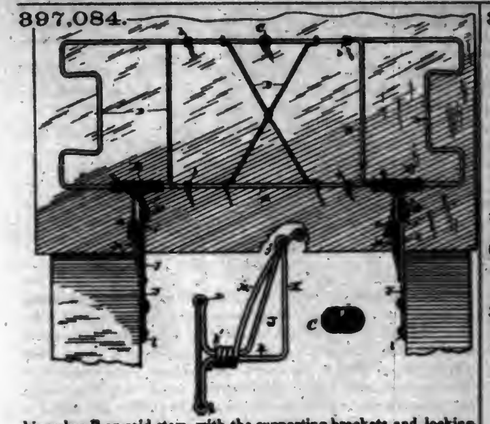
397,084. PILLOW-SHAM HOLDER. GEORGE J. KRAUSHAAR, Cleveland, Ohio, assignor to himself and M. A. Rourke, same place. Filed May 15, 1888. Serial No. 273,981. (No model.)

Claim.—1. The combination of the holder-frame with the T-shaped lock-hinge pieces E E, secured to the holder-frame and having a cross-piece, *c*, and a stem provided with convex and concave grooves on opposite sides, as described, and the brackets and locking-springs engaging said grooves to hold the frame in an elevated or lowered position, all substantially as specified.

2. The combination of the holder-frame and the T-shaped locking hinge-pieces E E, attached thereto, having a curved stem provided with convex and concave grooves on its opposite sides, with the brackets J and springs M, formed of a continuous piece of wire bent as described, the springs engaging said grooves to hold the frame in elevated or lowered position, all substantially as specified.

3. The combination of the holder-frame composed of wire frames B B, united as described, and the hinge locking-pieces E E, secured to the respective frames B B by their cross-piece *c*, and having a stem provided with concave and convex grooves on its opposite sides, and

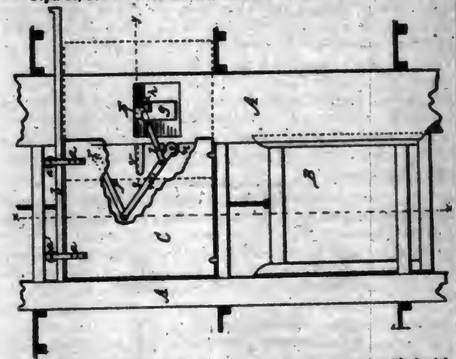
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hinge-leg F on said stem, with the supporting-brackets and locking-springs, substantially as described.

4. The herein-described locking hinge-pieces E E, having a channeled head, *c*, and a curved stem connected centrally to said head and formed with a flange, G, and channels *g* and H on opposite sides thereof, and cam I, and a lug, F, on said stem, substantially as described.

397,085. GUARD FOR ELEVATORS. CHARLES J. LANE, Rochester, N. Y., assignor of three-fourths to Henry L. Becker and Abraham Elliott, same place, and Joseph R. Van Marter, Lyons, N. Y. Filed Sept. 18, 1888. Serial No. 285,750. (No model.)



Claim.—1. The combination, with the elevator-car provided with a tripping device, of the sliding door, a slide provided with journals, a double-acting cam-lever connected with one of the journals and serving to operate the slide as the car goes up or down, a counter-weight connected with the other journal, serving to throw the slide forward, and connections between the slide and the hatchway-door, whereby the door is operated by the slide, as herein shown and described.

2. In a door-guard for elevator-wells, the combination, with the slide E, provided with a journal that extends out through a slot in its case, of the double-acting cam-lever G, provided with curved slots *x x*, which embrace the journal, and a central tongue, *w*, that holds against said journal when the parts are in their normal condition, as herein shown and described.

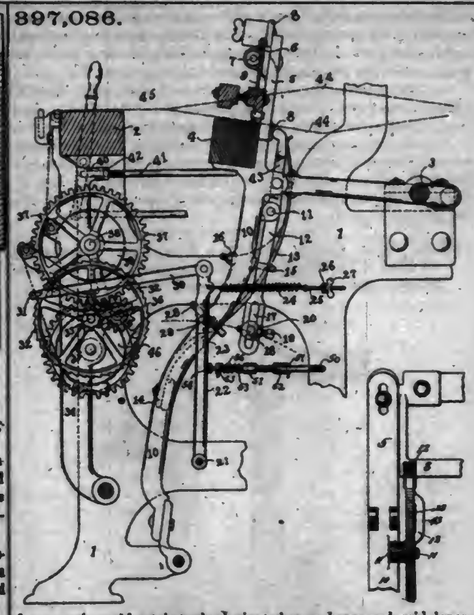
397,086. TAKE-UP MECHANISM FOR LOOMS. WILLIAM J. LORTON, Paterson, N. J. Filed Apr. 30, 1888. Serial No. 272,204. (No model.)

Brief.—By means of the yielding reed and its attached connections the movement of the take-up mechanism is governed and so regulated as to adapt it to varying qualities and textures of the fabric being woven.

Claim.—1. In a spring-reed loom, the combination, with the lay, the reed, and the spring 13, of a lever actuated by said spring, pivoted on the lay-sword, and the lay-sword, rod 41, adjustable hook 28 and means for adjusting said hook, lever 22, spring 24, and a pawl for operating the ratchet-wheel 32, and said ratchet-wheel, for the purpose stated, all combined and operated substantially as shown and described.

2. In a spring-reed loom, the combination, with a ratchet-wheel for operating the gearing that revolves the take-up roll, and a pawl

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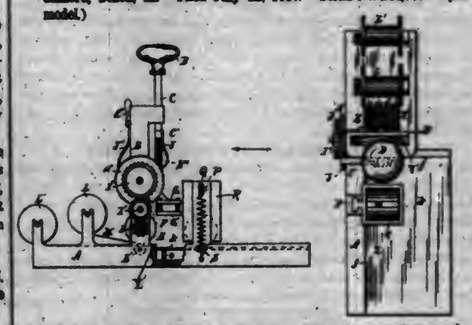


for operating said ratchet-wheel pivoted on a lever, and said lever, and a spring, 24, connected therewith, of the lay, the lay-sword, the reed-springs 13, rods 41, hook 28, and a lever pivoted on the lay-sword and provided with a set-screw adjustable in a slot in the end of said lever, for the purpose stated, substantially as shown and described.

3. In a spring-reed loom, the combination, with the lay, the reed, and the springs 13, of a lever pivoted on the lay-sword, and the lay-sword, rods 41, hook 28, set-screw 19, lever 22, pivoted to the loom-side and attached to a spring, 24, and said spring, and a pawl adapted to operate the ratchet-wheel 32, and said ratchet-wheel to drive the take-up gearing of the loom, substantially as shown and described.

4. In a spring-reed loom, the combination, with the lay, the reed, and the springs 13, of a lever pivoted on the lay-sword, rods 41, hook 28, stop for said lever, and a pawl adapted to operate the ratchet-wheel 32, and said ratchet-wheel to drive the take-up gearing of the loom, substantially as shown and described.

397,087. STAMP-AFFIXING MACHINE. WILLIAM R. MILLER, Polo, assignor of two-thirds to Fernando Sanford, Englewood, and J. F. Sanford, Dixon, Ill. Filed July 22, 1887. Serial No. 244,905. (No model.)



Claim.—1. In machines for affixing postage-stamps to letters, the combination, with rollers for feeding a strip of stamps forward, of a vertically-moving knife for severing the stamps, and a roller adapted to moisten the proper part of the letter while the latter is advancing into position to receive the severed stamp.

2. In machines for affixing postage-stamps, a reciprocating stamp-severing knife, a presser-foot alongside said knife and moving therewith, and a suitable support for the letter to be stamped, said presser-foot being adapted to yield to the extent of the combined thickness of a letter and stamp while the knife continues its motion, whereby the stamp may be simultaneously severed and pressed upon the letter.

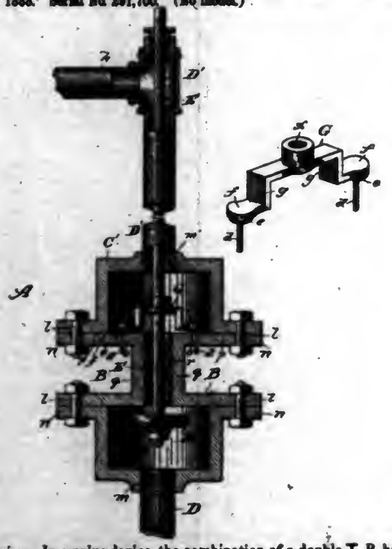
3. The combination, in a machine for affixing stamps, of a plane horizontal letter-support, a water-cup mounted above said support,

and a moistening-roller lying in said cup and projecting through an aperture in the bottom thereof, said cup being adapted to automatically adjust itself vertically to the thickness of the letter passed between said roller and said support.

4. The combination of the bed A, frame B, rollers L L', frame V, sliding in the frame B, roller E, supported by the frame V, cam *a*, and bar C, bearing the yielding plate G', substantially as set forth.

5. The combination, with the bed A and frame B, of the reciprocating knife-bar C, bearing the pawl J, ratchet-wheel H, actuated by said pawl, roller E, actuated by said ratchet-wheel, yielding plate N, and vertically self-adjusting moistening-cup R, substantially as and for the purpose set forth.

397,088. VALVE. MORTIMER B. MILLS, Chicago, Ill., assignor to the Bogue & Mills Manufacturing Company, same place. Filed Nov. 23, 1888. Serial No. 291,700. (No model.)



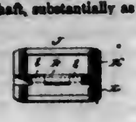
Claim.—In a valve device, the combination of a double T, B, having a passage, *r*, in its shank, and an opening, *o*, in one head, *p*, flanged caps C and C', secured at their flanges, respectively, to the heads, openings *m* and *m'* in the respective caps, a stem, E, extending through the cap C' and passage *r*, and carrying a valve, E', in the cap C, and a valve, *e*, supported on the stem E in the cap C' and extending over the opening *o*, substantially as described.

2. In a valve device, the combination of a double T, B, having a passage, *r*, in its shank, and an opening, *o*, in one head, *p*, flanged caps C and C', secured at their flanges, respectively, to the heads, openings *m* and *m'* in the respective caps, a stem, E, extending through the cap C' and passage *r*, and carrying a valve, E', in the cap C, a bar, G, secured to the said stem in the cap C', and carrying a valve, *e*, over the opening *o*, and a stem, *d*, extending from the valve into the opening *o*, substantially as described.

3. A valve device comprising, in combination, a double T, B, having a passage, *r*, in its shank, and openings *o* in the head at opposite sides of the passage *r*, flanged caps C and C', secured at their flanges, respectively, to the heads, openings *m* and *m'* in the respective caps, a stem, E, extending through the cap C' and passage *r*, and carrying a valve, E', in the cap C, a bar, G, having legs *g* and feet *f* and secured on the stem E in the cap C', to cause the feet to extend over the openings *o*, valves *e* on the feet, and stems *d*, extending from the valves *e* into the openings *o*, substantially as described.

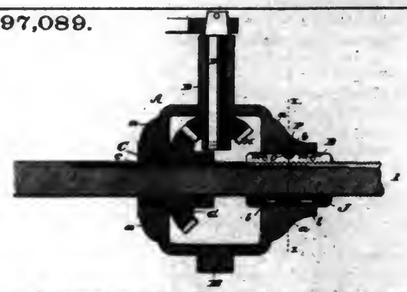
397,089. MINING-MACHINE. ANDREW T. MOATS, Pleasantville, Iowa, assignor to the Black Diamond Mining Tool Company, same place. Filed Mar. 22, 1888. Serial No. 268,149. (No model.)

Claim.—1. A main frame for mining-drills, consisting of a rectangular yoke provided at its ends with openings for the reception of the drive-gear hub and feed-nut and having at its sides trunnions arranged in line, one of which is tubular or hollow to form a bearing for the drive-shaft, substantially as described.





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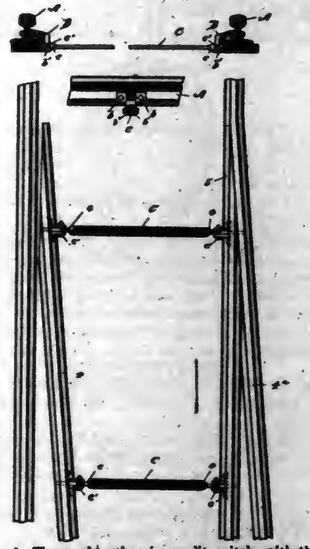


2. In combination with a main frame for mining-drills, consisting of a rectangular yoke provided at one end with a circular opening, at the other end with an angular opening having a transverse groove, and at the sides with tubular and solid trunnions arranged in line, a drive-wheel gear journaled in the circular end opening, a drive-shaft journaled in the tubular trunnion and carrying a gear at its inner end, a two-part feed-nut arranged to fit the angular opening and having a transverse groove at one side, a pin to fit the grooves of the feed-nut and angular opening, and the screw-shaft, substantially as described.

3. The combination, substantially as described, of the frame provided at the sides with a solid and hollow trunnion and at the ends with circular and angular openings arranged in line, the drive-shaft mounted in the hollow trunnion and fitted at its inner end with a bevel gear-wheel, a collar mounted in the circular opening and provided with a bevel gear-wheel, a feed-nut removably secured in the angular opening, and the drill-shaft.

4. The combination, substantially as described, of the solid frame provided at the sides with a hollow and solid trunnion, at one end with a circular opening, and at the other end with an angular opening having one wall grooved transversely, the drive-shaft journaled in the hollow trunnion and provided at its inner end with a bevel gear-wheel, the sleeve journaled in the circular opening and provided exteriorly with a bevel gear-wheel and interiorly with a feather, the two-part feed-nut provided on one face with a transverse groove arranged to register with the groove in the angular opening, the threaded drill-shaft provided with a longitudinal groove, and a pin to fit the grooves in the angular opening and feed-nut to lock the latter against longitudinal movement.

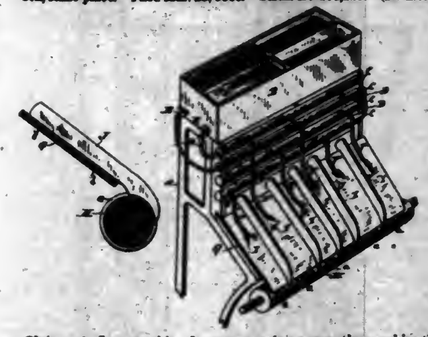
397,090. TIE-BAR FOR RAILROAD-SWITCHES. WILLIAM J. MORDEN, Chicago, Ill. Filed Aug. 1, 1888. Serial No. 281,650. (No model.)



Claim.—1. The combination, in a split switch, with the movable rails, of hangers rigidly secured to said rails and a tie-bar pivotally connecting said hangers, whereby to permit the movable rails to rock upon a horizontal axis, substantially as and for the purpose set forth.

2. In a split switch, the combination, with the movable rails A A, of the hangers B B, rigidly secured thereto, and a tie-bar having its ends turned at right angles to its body portion and pivotally connected, respectively, to said hangers, whereby to permit said rails to rock on a horizontal axis, substantially as described.

397,091. MACHINE FOR ORNAMENTING PAPER. CHARLES G. MORTIMER, New York, N. Y., assignor of one-half to George W. Thompson, same place. Filed Mar. 23, 1888. Serial No. 268,220. (No model.)



Claim.—1. In a machine for ornamenting paper, the combination of the reservoirs, the distributing-tubes C, communicating with the said reservoirs, the stop-cocks in these tubes, the depending tubes attached to these stop-cocks, the inking-felts and shelf for supporting the same, the color-separating plates supported upon the said shelf, and the impression-roller, substantially as described.

2. The combination of the reservoirs, means for supplying the colors to the inking-felts, the shelf G, for supporting the inking-felts, the inking-felts overlapping the impression-roller and applying the colors thereto, the impression-roller having raised ornamenting-rings on its surface, and the color-separating plates supported upon the said shelf and extending down between the ornamenting-rings upon the impression-roller, substantially as described.

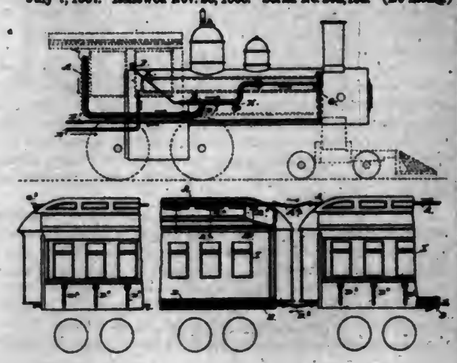
3. The combination of the distributing-tubes C, the depending tubes F', communicating therewith and supplying color to the inking-felts, the inking-felts overlapping the impression-roller and applying the color thereto, the supporting-shelf G, the impression-roller provided with raised elastic ornamenting-rings, and the color-separating plates supported upon the shelf G and extending down in close proximity to the surface of the impression-roller and between the rings thereon, substantially as described.

4. The combination of a shelf, G, the impression-roller provided with raised ornamenting-surfaces, the inking-felts overlapping the impression-roller, means for supplying the colors to said felts, and the color-separating plates mounted upon the said shelf G between the inking-felts and extending down to a point in close proximity to the surface of the impression-roller, substantially as described.

5. The combination of the impression-roller having raised elastic ornamenting-surfaces, the inclined shelf located above the same, the independent inking-felts overlapping the said roller, means for supplying the colors to said felts, and the removable and adjustable color-separating plates inserted between the said inking-felts, whereby the different colors are prevented for blending, substantially as described.

6. The combination of the impression-roller and the inking-felts, the distributing-tubes C, arranged above the said inking-felts, and the depending color-supplying tubes attached to and communicating with the said distributing-tubes C, substantially as described.

397,092. VENTILATING AND WARMING RAILWAY-CARS. ARCHIBALD T. MURRAY and HENRY HARRISON, San Rafael, Cal. Filed July 7, 1887. Renewed Nov. 28, 1888. Serial No. 292,132. (No model.)



Claim.—1. In a heating and ventilating apparatus for railway-trains, air-heating chambers in each car, having air-supply tubes or passages taking air from the outside and air-inlets into the car, in combination with heating-coils connected together and with a heater on the engine, a return-pipe from the last coil in the line, and an air-draft pipe in the cars, connected to the injector, and an air injector or pump in the line of heating-pipes, adapted to force air through the heater and all the coils of the air-chambers throughout the train, substantially as described, for operation as set forth.

2. In a heating and ventilating apparatus for railway-trains, the air-draft pipe A, having draft-tubes controlled by valves, air-chambers D, with heating-coils E, a heater on the engine, and the injector B, to which the draft-pipe and heating-coils are connected, said injector having nozzles *b* and air-apertures *b*', substantially as set forth.

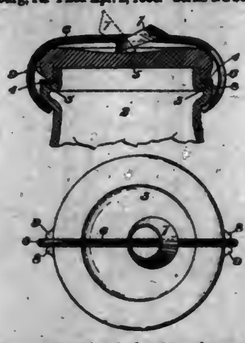
397,093. LOCK-CAP CLEATLESS ROOFING. JOSEPH W. PRALL, Pomeroy, Ohio, assignor of three-fourths to W. G. Downie, same place. Filed Dec. 15, 1888. Serial No. 293,682. (No model.)



Claim.—1. Metallic roofing consisting of the plates or sheets A, each sheet being formed with the bent curved portions B C, each of these portions being made with the substantially semicircular bends *d e f* and inclined portions *g*, the portion C having also the extension A, these portions B C being adapted by reason of the bends to lock each other and to be fastened to a base by means of the portion A.

2. A lock-joint for metallic roofing, consisting of two portions, each of which has substantially semi-cylindrical bends similarly disposed, and also the inclined portions *g*, and adapted to be sprung one upon the other, for the purpose described.

397,094. CLOSURE FOR JAR-CAPS. HENRY ROSANYER, Jr., Rochester, Pa., assignor of one-half to George W. Miller, same place, and John Gripp, Pittsburg, Pa. Filed Apr. 2, 1888. Serial No. 269,276. (No model.)



Claim.—1. As a device for closing jars, the combination of a lid having a concave outer surface, a bail arranged over the lid, and a ring through which the bail passes, the cross-section of that part of the ring which lies between the bail and the lid being greater in one dimension than in the other, substantially as and for the purposes described.

2. As a device for closing jars, the combination of a lid, a bail arranged over the lid, and a ring through which the bail passes, that part of the side of the ring which lies between the bail and the lid being in cross-section greater in one dimension than in the other and being backwardly-inclined from a vertical position when the lid is clamped to its seat, substantially as and for the purposes described.

3. As a device for closing jars, the combination of a lid, a bail arranged over the lid, and a ring through which the bail passes, that part of the side of the ring which is adapted to lie between the bail and the lid being of greater diameter in cross-section in one direction than in the other and being of varying width, whereby it is adjustable, substantially as and for the purposes described.

4. As a device for closing jars, the combination of a lid, a bail arranged over the lid, and a lever placed loosely between the lid and bail and movable to cause a pressure thereon whereby the lid is forced to its seat, said jar having opposite lugs or projections against which the bail fits, and the lid also having opposite lugs or projections, substantially as and for the purposes described.

5. As a device for closing jars, the combination of a lid, a bail arranged over the lid, and a ring through which the bail passes, the

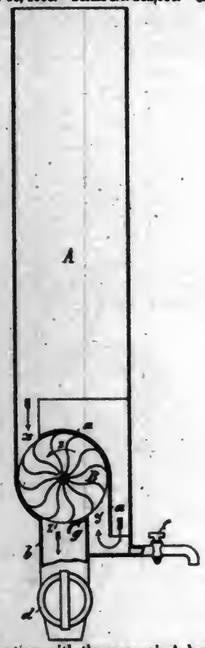
said ring being in the shape of a frustum of a cone, the cross-section of that part of the ring which lies between the bail and the lid being greater in one dimension than in the other, substantially as and for the purposes described.

397,095. BLASTING COMPOUND. RUDOLF SCHMID, Stockholm, Sweden, assignor to Rudolph Bricsson, New Britain, Conn. Filed June 28, 1887. Serial No. 242,718. (No specimens.) Patented in France Apr. 20, 1886, No. 173,483; in England Jan. 11, 1887, No. 448, and Aug. 27, 1887, No. 11,853; in Germany Feb. 1, 1887, No. 36,288; in Sweden Feb. 4, 1887, No. 715, and Aug. 19, 1887, No. 995; in Norway June 8, 1887, No. 403; in Russia June 19, 1887, No. 5,901; in Belgium June 30, 1887, No. 17,794, and Sept. 16, 1887, No. 18,749, and in Spain Nov. 30, 1887, No. 11,794.

Claim.—1. A blasting compound consisting of oxalate of ammonia, a non-nitrated hydrocarbon, as naphthaline, and chlorate of potash, substantially as set forth.

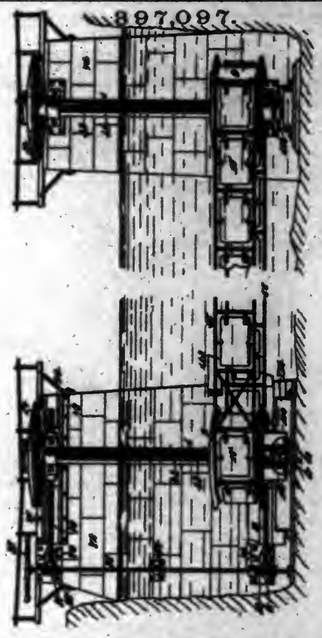
2. A blasting compound consisting of oxalate of ammonia, a liquid non-volatile hydrocarbon, as astral oil, a solid hydrocarbon, as naphthaline, and chlorate of potash, substantially as hereinbefore set forth.

397,096. WATER-MOTOR. HERMANN STUDTE, Saroutty, Prussia, Germany. Filed Aug. 16, 1888. Serial No. 282,980. (No model.)



Claim.—The combination, with the reservoir A, having a casing, *a*, in its base, a cock-controlled pipe, *b*, a casing-strip, *g*, and two water gates or conduits, *x* and *y*, arranged as set forth, of the water-wheel B, arranged in the base of said reservoir and partially inclosed by said casing, substantially as set forth.

397,097. CURRENT-MOTOR. EDMUND SORROW, Buffalo, N. Y. Filed Feb. 27, 1888. Serial No. 265,388. (No model.)



Claim.—1. In a current-motor, a pair of shafts having independent support and carrying drums connected by a belt having vanes capable of a limited outward deflection, the axes of said shafts being inclined contrary to the direction of the current, substantially as described.

2. In a current-motor, the combination, with a pair of shafts mounted upon independent supports and having their axes inclined against the direction of the current and provided with drums keyed upon said shafts, of a belt connecting said drums and provided at intervals with vanes hinged to cross-braces upon the belt and having flexible fastenings connecting the sides of said vanes to the parallel members of the belt, substantially as described.

3. In a current-motor, the combination, with inclined shafts mounted upon independent supports and having drums keyed or mounted thereon, of a belt connecting said drums and formed of parallel cables having cross-braces at intervals and provided with vanes hinged to said cross-braces, substantially as described.

4. In a current-motor, the combination, with two shafts having suitable drums keyed thereon, of screw-shafts tapped through bearings on each drum and having pinions meshing with a central gear loose on the drum-shaft, and with an outer gear-annulus and means for arresting the rotation of either said gear or gear-annulus for revolving said pinions in either direction to raise and lower the drums and the belt carried thereby by the power of the current, substantially as described.

5. In a current-motor, the combination, with the vertical shafts mounted upon independent supports and drums carrying the belt, of movable bearings upon which the lower ends of said shafts are stepped, said bearings swinging in the direction of the flow of the current, and stationary bearings for the upper portions of said shafts to secure an automatic inclination of the shafts against the current, substantially as described.

6. In a current-motor, the combination, with shafts mounted upon independent supports supporting a belt stretched transversely to the current, of a traveling shaft-carriage supporting the lower ends of said shafts and moving with the current, means for imparting a pivotal support to the upper portion of said shafts, and screw-shafts geared to operate in substantial unison to adjust one of said shafts in a direction transverse to the flow of the current to vary the tension of the belt, substantially as described.

7. In a current-motor, the combination, with a pair of inclined shafts having drums which sustain the belt by which power is communicated, of screw-shafts tapped through nuts on said drums, disks keyed on said drum-shafts and giving bearing to the upper ends of said shafts, an intermediate toothed gear-annulus free to revolve on said disk, pinions on the screw-shafts gearing with said annulus, and a central gear, also meshing with said pinions and carried by a loose hub mounted on the shaft and having a disk and friction-clamps independently connected with both disks, whereby either may be arrested while the other revolves, substantially as described.

8. In a current-motor, the combination, with one of the shafts having a drum to carry the motor-belt, of a shaft-carriage in which said shaft has a step-bearing, arms having split rings or collars embracing said shaft below and above and each provided with a slide-plate moving in flanged rails mounted on a suitable support near said shaft, parallel screw-shafts tapped through said arms and having worm-gears at their ends, and a worm-shaft having a hand-wheel, substantially as described.

9. In a current-motor, the combination, with a shaft supporting one of the drums carrying the motor-belt, of screw-shafts tapped through nuts on said drum, a disk rigid on the drum-shaft in which said screw-shafts have bearing, an internally-geared annulus resting on said disk and meshing with pinions on the ends of the screw-shafts, a central pinion meshing with said pinions and carried by a hub loose on the drum-shaft and provided with a disk, an independent friction-clamp on the annulus and another on the disk, and means for operating said clamps alternately to arrest the revolution of said annulus and disk, whereby the drums are raised and lowered by the power derived from the current, substantially as described.

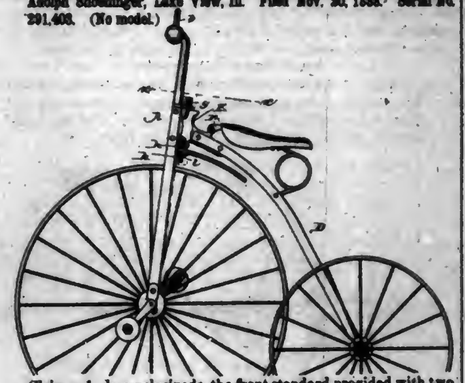
397,098. CULINARY VESSEL. FRANCIS J. TORRANCE, Allegheny, Pa. Filed June 29, 1888. Serial No. 278,564. (No model.)



Claim.—1. As a new article of manufacture, a culinary vessel having an angular or V-shaped flange surrounding its upper edge, and an ear designed and adapted for the attachment of a handle thereto and on top thereof, cast integral with the body of the vessel, its upper edge being on a line with the lower edge of the flange which surrounds the vessel, substantially as shown and described.

2. The combination, with a culinary vessel having a lug or ear on one side thereof and integral therewith, of a handle resting upon and attached to said ear or lug by fastening devices which pass through the handle and into the ear or lug, the inner edge of said handle being beveled, whereby it rests against the outer surface of the flange which surrounds the vessel, substantially as shown and described.

397,099. VELOCIPEDE. OTTO UNRICKER, Chicago, assignor to Adolph Shoeninger, Lake View, Ill. Filed Nov. 20, 1888. Serial No. 291,403. (No model.)



Claim.—1. In a velocipede, the front standard provided with two eye-lugs, the upper one being rearwardly slotted, in combination with the forward reach and having trunnions to its opposing ends vertically in line, and being flat intermediate of these trunnions to enter the slot of the upper eye-lug of the standard for inserting the trunnions into such eye-lugs, and thereby forming a pivotal connection between the standard and reach, substantially in the manner set forth.

2. In a velocipede, the combination, with the saddle pivotally connected with its forward end upon the reach, of a wire spring supporting the rear of the saddle, such spring being spirally twisted at both sides of its connection with the saddle and rectangularly bent at both its extremities to form trunnions inserted into holes of the reach-bars, substantially as set forth.

3. In a velocipede, the manner of securing the reach end to the hind axle by driving the conical parts of the axle into tapering holes of the reach-bar ends and by riveting the projecting shoulders of the axle against such reach-bars, substantially as set forth.

397,100. RETAINING DEVICE FOR BARREL-HOOPS. CLAUDIUS VERHLAUD, Quincy, Ill. Filed July 23, 1888. Serial No. 280,748. (No model.)



Claim.—1. As an improved article of manufacture, a hoop-retaining device consisting of the metal strip having tongues cut therefrom to embrace the hoops when applied to the receptacle, the ends of said tongues being removed from the edges of the strip to prevent interference with the hoop as it is being applied, as set forth.

2. As an improved article of manufacture, a hoop-retaining device consisting of the metal strip having the tongues for embracing the hoops cut from the center thereof, leaving the edges of the strip unbroken, substantially as described.

3. As an improved article of manufacture, a hoop-retaining device consisting of the metal strip having tongues for embracing the hoops, the ends of said tongues being beveled or cut away on one side, as set forth.

4. As an improved article of manufacture, a hoop-retaining device consisting of the metal strip having tongues for embracing the hoops cut therefrom at points removed from the ends and the tongued end for embracing the end hoop and the end of the stave, substantially as described.

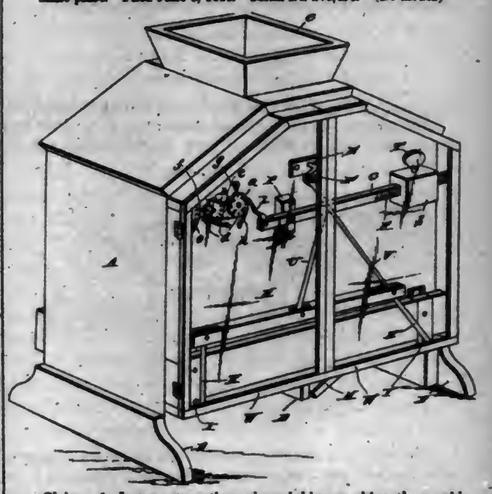
5. As an improved article of manufacture, a hoop-retaining device consisting of the metal strip having tongues for embracing the hoops cut therefrom at points removed from the ends and openings at the ends of such tongues for facilitating the raising of the ends of the tongues, substantially as described.

6. The combination, with the receptacle and the hoops for retaining the same in shape, of a hoop retaining strip having the tongues engaging the hoops to hold them in position, the end of the strip being bent over the edge of the receptacle to hold the strip in position, substantially as described.

7. The combination, with the stave-receptacle and the hoops for retaining the staves in place, of the hoop-retaining strip rigidly secured to the stave and having the tongues cut therefrom for engaging the hoops, substantially as described.

8. The combination, with the stave-receptacle and the stave-retaining hoops, of the hoop-retaining strip having both ends bent over the ends of the stave, the intermediate tongues cut therefrom engaging the hoops, and the ear engaging the handle or bail secured to said strip at a point slightly removed from the end, substantially as described.

397,101. AUTOMATIC GRAIN-WEIGHING MACHINE. CHARLES E. WARNER, Malvern, Kans., assignor of one-half to Chester C. Catlin, same place. Filed June 8, 1888. Serial No. 276,423. (No model.)



Claim.—1. In an automatic grain-weighing machine, the combination of the case having the vertical compartments, the hinge-valves in the bottoms of the compartments and having the cranks K, the link N, to which said cranks are connected, the valve G at the upper end of the partition between the compartments and having the crank F, the rod V, connecting said crank to the link, the weighted scale-beam O, and rod U, connecting link N to the scale-beam, substantially as described.

2. The combination, in an automatic grain-weighing machine, of the case having the compartments, the platforms or valves at the lower ends of the said compartments and having the cranks K, the link connecting the said crank, the scale-beam connected to and operated by the said link, the registering device having the ratchet-wheel *a*, and the dog X, pivoted to the scale-beam and engaging said ratchet-wheel, substantially as described.

397,102. CARPET-SWEEPER. PHILIP H. WIEDERSUM, Newark, N. J., assignor of one-half to Charles G. Campbell, same place. Filed Aug. 19, 1887. Serial No. 247,236. (Model.)



Claim.—1. In a carpet-sweeper, the combination of the box A, end plates, *e e*, each of which has at its opposite ends sweeping-arms 5 5, pivoted on said plates and extending downward therefrom, and carrying the wheels 4 4, and a brush having a stock extending through the sides of said box into engagement with said wheels, substantially as set forth.

2. In combination with the box A of a carpet-sweeper, a brush, dust-pan, and end plates, *e e*, arranged at the outside of the boards *a a*, one on each end of the box A, and connected by a rod or bar, *g*, and wheels carried by said plates *e e*, substantially as and for the purposes set forth.

3. In combination with the box, rollers, and brush of a carpet-sweeper, end plates, *e e*, having rollers thereon, cross-bar *g*, and set-screw *f*, substantially as and for the purposes set forth.

4. In a carpet-sweeper, the combination of the box, rollers, and brush, end plates having eyes *e' e'* and connected by a bar, *g*, studs *q q*, springs i^3, and adjusting-screw *f*, adapted to raise and lower said side plates in their relations to said studs, substantially as set forth.

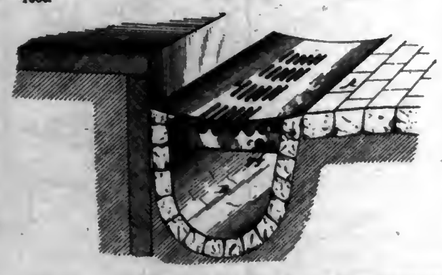
5. In a carpet-sweeper, the combination of a box, A, adjustable end plates and rollers arranged thereon and held in driving relation to the brush by springs 6, said springs 6 having bearings on said side plates, substantially as set forth.

6. In a carpet-sweeper, the combination of a box, bail, driving-wheels, and brush, end plates connected by a bar, and means, as *f*, for raising or lowering the same, and provided with swinging arms 5 5, eyes *e'* providing bearings for springs i^3, and studs *q*, and bearings e^2 for springs 6 and stud *q*, substantially as set forth.

7. In a carpet-sweeper, the combination of a box having openings *w w*, filling-pieces composed of double plates, blocks 9, and a spring-actuated catching mechanism, substantially as set forth.

REISSUES.

10,980. WIRE AND PIPE SUPPORTING AND SNOW-REMOVING APPARATUS. SYLVANUS D. LOCKE, Hoosick Falls, N. Y. Filed Nov. 14, 1888. Serial No. 290,861. Original No. 355,185, dated Dec. 28, 1886.



Claim.—1. A sub-gutter provided with devices for supporting conductors and with a cover having an inclined portion and a perforated portion, whereby said cover serves as a surface-gutter, substantially as specified.

2. In combination with a surface-gutter having lateral inclined imperforate portions and a perforated portion, a sub-gutter provided with means for supporting conductors, substantially as specified.

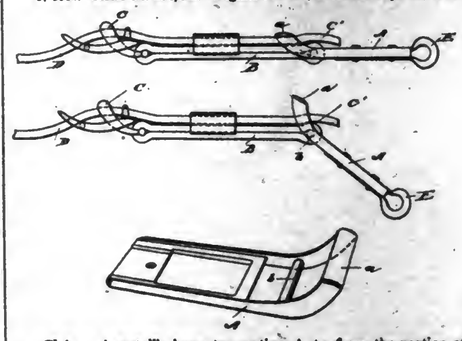
3. A sub-gutter provided with wire and pipe supporting devices and with a cover formed as a surface-gutter, substantially as specified.

4. The combination of a surface-gutter and a sub-gutter provided with removable racks for supporting pipes, cables, and wires, substantially as specified.

5. In a city street, for the purpose of melting the snow therein, a sub-gutter underneath the roadway having a perforated cover, in combination with pipes in the top thereof for melting the snow which is conducted in the bottom of the same into the sewers, substantially as described.

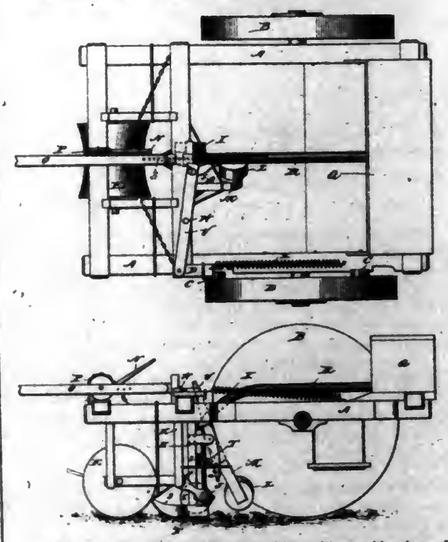
6. In a city street, a sub-gutter with a perforated cover having steam apparatus for melting the snow in the street, in combination with racks for supporting said steam apparatus and other pipes or wires, substantially as described.

10,981. HAME-TUG. JOHN G. MILLER, Champaign, Ill. Filed Nov. 5, 1887. Serial No. 254,443. Original No. 342,967, dated Sept. 14, 1886.



Claim.—A metallic hame-tug section, A, to form the portion of the draft-tug adjacent to the hame, and consisting of a flat rectangular frame or body portion having one of its ends adapted to receive a suitable clip, whereby to secure the section to the hame, the opposite end of said section being bent or curved upwardly to form a rigid loop, *a*, and a transverse bar, *b*, rigidly affixed in the frame or body portion intermediate the loop and the hame-attaching end of the section, which bar affords a means for pivotally attaching to said section the rearward leather portion of the tug, substantially as described.

10,982. TOBACCO-TRANSPLANTER. MAURICE SMITH, Janesville, Wis., assignor, by direct and mesne assignments, of two-thirds to A. Hyatt Smith and Victor P. Richardson, same place. Filed May 7, 1887. Serial No. 237,490. Original No. 336,724, dated Feb. 9, 1886.



Claim.—1. In a transplanting-machine, the combination of a plow for opening the furrow, a scraper for throwing loose earth over the roots of the plant, and a roller for pressing the earth after it has been thrown in, with a watering attachment comprising a tank carried upon the machine, and a pipe to deliver the water from the tank to the furrow as the plant is set, substantially as described.

2. In a transplanting-machine, the combination of a plow for opening a furrow, a scraper to fill the furrow, and a roller to compact the earth about the plant, with a watering-tank carried by the machine, a delivery-pipe for conducting the water therefrom to the plant, a valve in said pipe, and mechanism connecting said valve and a moving part of the machine, whereby water is delivered to the plant at regular intervals as the machine moves forward, substantially as described.

G. PETERS, Photo-Lithographer, Washington, D. C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

CALLAGHAN *et al. v.* MYERS.

Decided December 17, 1888.

1. COPYRIGHT.

Although there can be no copyright in the opinions of judges, or in the work done by them in their official capacity as judges, yet there is no ground of public policy on which a reporter who prepares a volume of law reports, of the character of those in this case, can, in the absence of a prohibitory statute, be debarred from obtaining a copyright for the volume, which will cover the matter which is the result of his intellectual labor.

2. SAME—RIGHTS OF REPORTER OF DECISIONS THERETO.

Even though a reporter may be a sworn public officer, appointed by the authority of the government which creates the court of which he is made the reporter, and even though he may be paid a fixed salary for his labors, yet, in the absence of any inhibition forbidding him to take a copyright for that which is the lawful subject of copyright in him, or reserving a copyright to the government as the assignee of his work, he is not deprived of the privilege of taking out a copyright, which would otherwise exist.

APPEAL from the Circuit Court of the United States for the Northern District of Illinois.

Mr. J. L. High for the appellants.
Mr. G. W. Kretzinger for the appellee.

Mr. Justice BLATCHFORD delivered the opinion of the Court.

This is a suit in equity, brought in the Circuit Court of the United States for the Northern District of Illinois, on the 17th of December, 1877, by Eugene B. Myers against Bernard Callaghan, Andrew Callaghan, Andrew P. Callaghan, and Sheldon A. Clark, composing the firm of Callaghan & Co., Marshall D. Ewell, and Van Buren Denslow.

The bill sets forth that the firm of E. B. Myers & Chandler, composed of the plaintiff and Horace P. Chandler, became the proprietors of volumes 32 to 38, both inclusive, of the reports of the Supreme Court of the State of Illinois, known as "Illinois Reports," prepared by Norman L. Freeman; that, as such proprietors, said firm, desiring to secure a copyright for the several volumes, under the statutes of the United States, deposited in the office of the clerk of the District Court of the United States for the Northern District of Illinois, before publication, a printed copy of the title of the several volumes; and that they afterward, and within three months of the publication of the volume, deposited in said office a copy of the work. The dates of the deposit of the titles of the several volumes were as follows: volume 32, August 12, 1865; 33, April 21, 1866; 34, October 23, 1866; 35, January 28, 1867; 36, October 11, 1867; 37, December 31, 1866; 38, August 22, 1867. The alleged dates of the deposit in said office of a copy of the several volumes were as follows: volume 32, January 17, 1866; 33, June 8, 1866; 34, October 23, 1866; 35, March 5, 1867; 36, November 13, 1867; 37, January 28, 1867; 38, October 10, 1867.

The bill also alleges that the plaintiff became the proprietor of volumes 39 to 46, both inclusive, of the reports of the Supreme Court of the State of Illinois, known as "Illinois Reports," prepared by Norman L. Freeman; that, as such proprietor, he, desiring to secure a copyright for the several volumes under the statutes of the United States, deposited in the office of the clerk of the District Court of the United States for the Northern District of Illinois, before publication, a printed copy of the title of the several volumes; and that he afterward, and within three months of the publication of the volume, deposited in said office a copy of the work. The dates of the deposit of the titles of the several volumes were as follows: volume 39, June 10, 1868; 40, September 18, 1868; 41, December 22, 1868; 42, May 21, 1869; 43, June 21, 1869; 44, September 27, 1869; 45, October 6, 1869; 46, October 14, 1869. The alleged dates of the deposit in said office of a copy of the several volumes were as follows: volume 39, June 12, 1868; 40, November 6, 1868; 41, January 29, 1869; 42, July 7, 1869; 43, July 7, 1869; 44, October 2, 1869; 45, December 8, 1869; 46, December 8, 1869.

The bill further alleges that all the volumes were prepared by Mr. Freeman, and each contained a large amount of matter original with him, and a great number of the decisions and opinions of the Supreme Court of Illinois; that, among other original matter, Mr. Freeman prepared for each case a syllabus or head-notes, and for many cases in each volume a statement of the facts of the case; that also in many of them he copied, or copied and arranged, the instructions ruled upon by the court below; that he also prepared and inserted, or gave, in all or many of them, the stipulations made, or made and filed, therein, and in many of them he gave the errors assigned; that he also prepared, for each of them, a table of the cases cited therein, and a table of the cases decided, and other original matter, and so arranged said decisions and the matter therein contained, or the matter in connection with the decisions, as to make each of the books, or each of the books and the matter therein contained, convenient and valuable to the persons using the decisions; that, in respect of vol-

umes 32 to 38, the firm of E. B. Myers & Chandler, and in respect of volumes 39 to 46, the plaintiff, purchased from Mr. Freeman all his proprietary rights in the volumes, and paid him a large consideration therefor, and for his labor and care in preparing them, and used the labor and matter of Mr. Freeman in publishing the books; that, by the agreements with Mr. Freeman, the plaintiff and his partner were to have the copyright of volumes 32 to 38, and the plaintiff the copyright of volumes 39 to 46; that in respect of volumes 32 to 38, the said firm, and in respect of volumes 39 to 46, the plaintiff, divided the decisions and the matter accompanying them into volumes, and divided and arranged each of the volumes into pages; that the firm published over 1,500 copies of each of the volumes 32 to 38, and the plaintiff over 1,500 of each of the volumes 39 to 46; that, on the 13th of June, 1868, said Chandler sold and assigned to the plaintiff. by a written assignment, all his interest in and to volumes 32 to 38, and the copyrights thereof; and that the plaintiff still has the exclusive right to volumes 32 to 46.

The bill further alleges that about July, 1877, the plaintiff reprinted volumes 37 and 38, and, as he made some changes in the arrangement of their pages, he did, before publication, deposit in the office of the Librarian of Congress a copy of the printed title of each volume, on the 20th of July, 1877; that afterwards, on the 28th of July, 1877, and within one month of the publication thereof, he deposited in said office two copies of each of the volumes as reprinted.

The bill also alleges, as to all of the volumes, that the plaintiff had the exclusive right to the arrangement of each of them, and the exclusive right to publish the head-notes or syllabuses, and to the arrangement of the pages of the books, and to the division of the opinions into separate volumes, and to the table of cases cited and table of cases decided, as published in each of them, and to the arrangement of the decisions, as accompanied with the head-notes, stipulations, errors assigned, instructions, table of cases cited, table of cases reported, and indexes accompanying the same, and the exclusive right to all of said works, except to the matter contained in the opinions of the judges; that the defendants had full knowledge of the exclusive rights of the plaintiff, and attempted to buy them from him, but refused to pay the price charged by him, and thereupon proceeded to reprint and publish volumes 32 to 38, and in doing so, used the decisions of the Supreme Court of Illinois only as published by the plaintiff, and prepared the volumes from the books of the plaintiff, and did not procure the matter from original sources, and, in all of the books, used the works of the plaintiff, and copied the title-pages thereof, and used the division and arrangement of the plaintiff in the volumes and the paging thereof, and copied the table of cases cited and the table of cases reported from each of the books of the plaintiff, and also copied from the same the stipulations, errors assigned, and instructions given by the court; that, in publishing the statements of the cases, and in preparing the syllabuses, the defendants used the books of the plaintiff, and the changes they made were merely colorable, and were made only for the purpose of avoiding the claim of the plaintiff; that the books, as printed and published by the defendants, were all and each merely imitations of the volumes of the plaintiff, corresponding in number; that all and each of said republications by the defendants are piracies on the copyrights of the plaintiff, and the books have been made by them to take the place of, and, as far as they can, to supersede the books of the plaintiff; that the defendants are selling them to the persons who would otherwise buy the books of the plaintiff, to his great damage and loss; that the defendants threaten to republish volumes 39 to 46; and that the aggregate value of the copyrights of the plaintiff is not less than $20,000 and his damage is not less than that sum.

The bill waives an answer on oath, and prays for an injunction perpetually enjoining the defendants from publishing or selling, or offering for sale, any of the books, and for a decree that all of them so published by the defendants are forfeited to the plaintiff, and that they be delivered to him, and for an account of all published and sold, and for a decree for damages.

The members of the firm of Callaghan & Co. put in an answer to the bill. It sets up that a printed copy of volume 32 was not deposited until more than three months after publication. It avers that but a small amount of original matter was prepared by Mr. Freeman for any of the volumes 32 to 46, and that but few statements of cases were prepared by him, and those few were drawn by him from the opinions of the court in the cases reported. It denies that he prepared any tables of cases cited for any of those volumes, and denies that he so arranged the decisions and matter contained in the volumes as to make the volumes convenient and of value to the persons using them. It avers that all matters contained in the volumes are public and common property, forming part of the law of the State of Illinois, and as such not susceptible of copyright, or in any manner literary property, in which a private citizen can have a monopoly under the act of Congress regulating the subject of copyright; that whatever labor, literary or otherwise, was done upon the volumes by Mr. Freeman was done in his official capacity as reporter of the decisions of the Supreme Court of Illinois, a public office then existing under and by virtue of the laws of that State; and to which Mr. Freeman had been duly appointed; and that all labor, literary or otherwise, by Mr. Freeman, in his capacity as official reporter, upon the volumes, was public and common property, not susceptible of copyright or of private literary ownership.

The answer admits that the defendants had negotiations with the plaintiff concerning the purchase of his interest in volumes 39 to 46, consisting of the stereotype-plates and printed stock of those volumes; that, in such negotiations, the plaintiff proposed to sell his copyrights in volumes 32 to 46, but no price or value was ever attached by either party to such copyrights, and they were always treated as a mere incident to the proposed sale, and all offers made and received on either hand were made with reference to such stereotype-plates and printed stock, and it was understood by all parties, that, if such sale were consummated, the copyrights should be "thrown in," without additional charge.

The answer also admits, that, in republishing volumes 32 to 38 the defendants have used the opinions of the Supreme Court of Illinois as published by the plaintiff: but avers that they have corrected errors in names, citations, and other matters therein, and denies that they have prepared the books from those of the plaintiff, or used the work of the plaintiff, except in so far as plaintiff's books are free to the use of any and all persons, or have copied his title-pages, or have used his paging, or have copied his tables of cases cited or reported, or the stipulations, errors assigned, or instructions given. It avers that the statements of cases and syllabuses in the volumes as republished by the defendants are wholly original and entirely different from and unlike those of the plaintiff, except in the few instances where there is an apparent resemblance, owing to the fact that those of the defendants have been drawn from the opinions of the court, and those of the plaintiff in the same cases appear to have been drawn from the same source; and that the volumes so republished by the defendants contain large amounts of new, original, and valuable matter, prepared expressly for those volumes, and not contained in any of the volumes of the plaintiff. It admits that the defendants have under consideration the republication of volumes 39 to 46. It also avers, that, for many years before the filing of the bill, the plaintiff had abandoned volumes 32 to 38; that his stereotype-plates and stock of those volumes were destroyed in October, 1871, and none of them were ever reproduced by him until about July or August, 1877, when he reprinted volumes 37 and 38; that, prior thereto, he had for many years repeatedly announced that he should never reproduce those volumes; that, more than a year before the filing of the bill, the defendants notified the plaintiff of their intention to republish volumes 32 to 38, and frequently thereafter notified him of such intention, and publicly announced the same by advertisement, and from time to time, as such republication progressed, during the spring and summer of 1877, notified him of the progress of the work, and, as the volumes appeared from time to time during the spring and summer of 1877, the plaintiff was constantly apprised thereof, and at divers times during that year, and before, the defendants received various propositions from the plaintiff for an exchange of volumes 32 to 38, so being republished, for volumes 39 to 46, which the plaintiff had for sale; that the plaintiff, down to the filing of the bill, never objected to such republication, but always appeared to acquiesce therein, and encouraged the defendants to proceed therewith, and, from his conduct during such period, the defendants always believed, down to the filing of the bill, that such republication was being done with his acquiescence and consent; and that the plaintiff, by his conduct, is estopped from receiving the relief asked. The answer also denies all the material allegations of the bill.

Ewell and Denslow each put in an answer, disclaiming all interest in the publication of any volumes of the reports by Callaghan & Co., and all interest in such volumes.

Issue was joined and proofs were taken, and, on the 10th of Febuary, 1881, the circuit court entered an interlocutory decree, finding that the plaintiff was the owner of the copyright or exclusive right of publication of volumes 32 to 38; and that Callaghan & Co. had violated such copyright by publishing, offering for sale, and selling copies of said 7 volumes, and Ewell and Denslow by editing the same. The decree awarded a perpetual injunction against all of the defendants, from further publishing or selling, or transferring or removing any of said books, and ordered a reference to a master, Henry W. Bishop, to ascertain and report what number of each of the volumes had been printed, and what number sold, and at what prices; and directed that the members of the firm of Callaghan & Co. might be examined in regard thereto, and might be required to produce their account-books and papers, and that the master ascertain and report what was the market value of each of the books of the plaintiff prior to the illegal publication by the defendants, and what was the actual cost or value of reprinting and binding each of the volumes, and that, upon the making of the report, the plaintiff might apply for a further order in regard to the damages to be allowed to him for the illegal publication and sale of the volumes. The decree also gave leave to the plaintiff to file a supplemental bill, based on the fact that, since the filing of the original bill, Callaghan & Co. had proceeded to publish and sell copies of the books described in the bill as volumes 39 and 41 to 46.

The decision of the circuit court is reported in 10 Biss., 139, and 5 Fed. Rep., 726. The ruling of the court was (1) that the volumes of reports were the proper subject of a copyright under the act of Congress, for at least what was the work of the mind and hand of the reporter, namely, the head-notes, and the statements of facts and of the arguments of counsel, notwithstanding he could have no copyright in the opinions of the court; (2) that there had been a compliance with the act of Congress in the procurement of the several copyrights; (3) that the defendants had, in preparing volumes 32 to 38, used the volumes of the plaintiff so as to interfere with his copyright; (4) that he had not consented to the publications made by the defendants, or abandoned his rights by acquiescence, laches, or otherwise.

On the 14th of February, 1881, the plaintiff filed a supplemental bill against the same defendants, reciting the material allegations of the original bill, and averring that since it was filed the defendants had published and sold large numbers of volumes 39 and 41 to 46, and were threatening to publish volume 40; that, in the volumes they had published, they had used the plaintiff's volumes, and had copied his arrangement or division into volumes of the matter contained in his volumes, and had copied his whole arrangement of each of them, and had used each of them to make, and had made, their books an imitation and copies of his books, and had advertised and sold their books as the same book as his, and had not resorted to the records for the opinions and other matter contained in their books, but had copied the same from his books, using and copying considerable portions of the original matter furnished by Mr. Freeman, in some instances copying exactly, and in others making merely colorable changes; that, before any of the publications of the defendants were made, the plaintiff had advertised his books extensively; that

the decisions of the Supreme Court of Illinois, as divided by the plaintiff into volumes, had, by reason of what was done by him, become known by the name which had been applied to the classification so made by the plaintiff; that such division was the property of the plaintiff, and was valuable, and was covered and protected by his copyright; that the defendants had copied the title or name of each of the books; that each of the books of the defendants was made to supersede and take the place of one of the books of the plaintiff, of corresponding number; and that they were being so sold, to his great damage.

The supplemental bill waives an answer on oath, and prays for a perpetual injunction restraining the defendants from publishing, selling, offering for sale, or removing beyond the jurisdiction of the court, any of said books, and for a decree that they pay to the plaintiff all his damages by reason of such publication and sale.

On the 18th of February, 1881, the members of the firm of Callaghan & Co. filed a cross-bill in the same court against Myers, reciting the proceedings on the original bill and the terms of the interlocutory decree of February 10, 1881. It averred that the discovery and accounting provided for thereby were in progress before the master, Mr. Bishop; that Bernard Callaghan, one of the firm, had been partially examined concerning the number of volumes printed by Callaghan & Co., and on hand, and had already been required to produce before the master, for the examination of Myers and his counsel, books and papers of Callaghan & Co., relating to the volumes and the number thereof printed; that such examination was still progressing; that Callaghan & Co. had in their possession certain copies of volumes 32 to 38, and Myers claimed that he was entitled to a forfeiture of the same and a delivery thereof; that Myers, on the 11th of February, 1881, brought an action of replevin against Callaghan & Co., to recover those copies; that the writ was in the hands of the marshal for service; that Myers was ignorant of the precise number and whereabouts of the copies, but as soon as the examination and discovery then progressing before the master should have disclosed the number and location of the copies, Myers would instruct the marshal to seize them under the writ; that Myers was not entitled to any discovery from Callaghan & Co. in aid of his proceedings for a forfeiture of the copies; that Myers, having taken the decree for a discovery as to the copies, and having obtained a discovery thereunder, and having acquiesced in the publication of the volumes by the defendants, was estopped in equity from claiming any forfeiture or recovery of any of the copies; and that such decree, and the examination and discovery before the master, amounted to a waiver of the forfeiture or recovery by Myers.

The cross-bill waived an answer on oath, and prayed for a perpetual injunction to restrain Myers from further proceeding with the action of replevin, and from instituting any further action for the forfeiture or recovery from Callaghan & Co. of any copies of volumes 32 to 38, and for an injunction to that effect *pendente lite*.

Myers answered the cross-bill, setting forth the interlocutory decree made in the original suit, and admitting that he claimed that the volumes in the possession of Callaghan & Co. became forfeited to him under the act of Congress, and alleging that the interlocutory decree did not provide for a discovery or an accounting, and that he was not seeking any discovery from Callaghan & Co., for the purpose of aiding him in procuring the possession of the books; that the volumes were not published by Callaghan & Co. with his knowledge, acquiescence, or consent; that he claimed the benefit of the forfeiture provided for by section 99 of the act of July 8, 1870, chap. 230, 16 Stat., 214, (now section 4964 of the Revised Statutes;) and that he had done nothing to waive or abandon the right given to him by that statute. A replication was filed to this answer.

The members of the firm of Callaghan & Co. filed an answer to the supplemental bill on the 22d of June, 1881. It admitted that the firm had published and sold volumes 39 and 41 to 46, and denied that in publishing those volumes they had made any other use of the plaintiff's volumes than such fair and legitimate use, by way of reference, consultation, and otherwise, as might be made of any previous publication by a succeeding author or compiler treating of the same subject, and denied that they had copied the plaintiff's arrangement or division of matter, other than that the cases reported in the defendants' volumes followed each other in the same order as in the plaintiff's volumes, and denied that they had used the plaintiff's volumes to make their books an imitation or copies of them, or that their books had been made in imitation of those of the plaintiff. They denied that they had advertised or sold their books as the same books as those of the plaintiff, but admitted that they had used the name "Freeman's Reports" in their catalogues and circulars, and averred that such use was in accordance with the uniform usage of law publishers, in indicating volumes of law reports by the name of the original reporter, and with no intention of announcing the volumes of the defendants as those of the plaintiff; that, as appeared by their catalogues and circulars, the defendants, by a note immediately following the words "Freeman's Reports," directed attention to the fact that the volumes of the defendants were a different, revised, and re-edited edition, and were all re-reported and edited by persons other than Mr. Freeman, whose names were stated in the note; that the plaintiff had no property in the name "Freeman's Reports," yet, as soon as the supplemental bill was filed, the defendants desisted from such use of the words "Freeman's Reports," and had corrected their catalogues and circulars by changing the words "Freeman's Reports" to "Illinois Reports;" and that, although they had used the words "Freeman's Reports" in the manner described for several years prior to the filing of the supplemental bill, the plaintiff had not objected thereto prior to that time.

The answer admitted that the defendants, in making their books, had taken the opinions of the court from the volumes as reported by Mr. Freeman, but stated that in all cases they had carefully compared each of the opinions with the original opinions of the court, on file or recorded in the respective cases, and had made frequent corrections therein, to correspond with the originals; and that, except as to such use of the opinions, the remaining matter in the volumes of the defendants was obtained from the original records of the court, and was arranged, reported, compiled, and edited wholly by the original labor of the editors employed by the defendants for that purpose, and whose names appeared as such editors on the title-page and cover of each of the volumes of the defendants. It also averred that the titles of the volumes of the defendants were so different from those claimed by the plaintiff that they could not be mistaken therefor even by a casual purchaser or observer; and that the volumes of the defendants were new and original productions, with new and original tables of cases, head-notes, statements of facts, abstracts of briefs of counsel, corrected opinions, foot-notes, and indexes, and were in no manner copies of, or infringements upon, the volumes of the plaintiff. It also averred that the plaintiff could not have, under the acts of Congress or otherwise, any exclusive right in the opinions of the court, as published, or in their arrangement or division, or in the titles of the volumes. The answer also denied all the material allegations of the supplemental bill. A replication was filed to this answer.

Ewell and Denslow answered the supplemental bill by an answer disclaiming all interest in the publication of the volumes named in the supplemental bill, and all interest in those volumes.

On the 2d of January, 1883, Myers amended his supplemental bill by averring that the defendants had infringed his copyright by reprinting and publishing volume 40. An answer was put in to such amendment, and a replication to that answer.

Proofs were taken as to the supplemental bill, and on the 3d of March, 1884, the court made an interlocutory decree, that the plaintiff was the owner of the copyright and of the exclusive right of publication of volumes 39 to 46; that the defendants had in some particulars infringed said copyrights; and that the plaintiff recover the profits received or made or accrued therefrom; and referring it to John I. Bennett, a master, to report such profits; and directing that the defendants might be examined in relation thereto, and might be required to produce before the master their books of account and papers relating to the publication and sale of such volumes, and that the master should report also the damages.

The decision of the court is found in 20 Fed. Rep., 441. The only question considered in the decision was that of infringement. The court held that in some respects in each case the Freeman volume had been used by the defendants, in the head-notes, the statements of facts, and the arguments of counsel.

On the 17th of April, 1882, the master, Mr. Bishop, reported that the defendants had printed 4,313 of volumes 32 to 38, and had sold 2,909 of the same, the amount of the sales of the several volumes being as follows: Vol. 32, $1,990.91; 33, $1,971.73; 34, $1,884.24; 35, $1,945.09; 36, $1,933.47; 37, $1,878.68; 38, $1,847.07; being a total of $13,451.19, and an average of $4.62¼ per volume. He stated that no testimony had been offered as to the market value of the volumes before publication by the defendants. He also reported the cost or value of reprinting and binding the several volumes to be as follows: volume 32, $942.88; 33, $782.35; 34, $664.13; 35, $943.50; 36, $835.97; 37, $773.18; 38, $385.78; making a total of $5,727.79, not including the item of proof-reading or the item of expense of selling, or a charge of stereotyping. The defendants excepted to this report because the master had not allowed to the defendants the amount paid by them for proof-reading and editorial work on the volumes, or for stereotyping. The court, on a hearing on the report and exceptions, referred the cause back to the master, Mr. Bishop, to ascertain and report, on the evidence given and on further evidence, the total amount of the damages sustained by the plaintiff in consequence of the illegal publication and sale.

Mr. Bishop made a second report, on the 2d of February, 1884, on the previous proofs and on new testimony. He again reported the total number of copies printed of volumes 32 to 38 to have been 4,313, and the total number of them sold to have been 2,909. He reported the amount of sales, as before, by items, making a total of $13,451.19, and an average of $4.62¼ per volume. Excluding charges for stereotyping, counsel fees, editorial work, and proof-reading, and including 12½ per cent. of the gross sales as a legitimate item of expense in conducting the business of the defendants in the course of the publications, he reported the cost of reprinting and binding the several volumes to have been as follows: volume 32, $1,064.25; 33, $883.06; 34, $749.63; 35, $952.10; 36, $943.59; 37, $872.70; 38, $999.81; making the total cost of reprinting, binding, and disposing of the volumes $6,465.14. Deducting that from the $13,451.19 left a balance of $6,986.05, which he reported as the damages sustained by the plaintiff by reason of the illegal sale and publication.

The plaintiff filed sundry exceptions to the second report of Mr. Bishop, and the defendants filed three exceptions to it. The first exception of the defendants was that the master had not allowed them credit for the cost of stereotyping; the second, that he had not allowed, as part of the expenses of conducting the business of the defendants, salaries paid to them for their services, the same amounting to about twelve thousand dollars a year; the third, that he had allowed to them only 12½ per cent. of their gross sales as expenses incurred in effecting such sales, and had not allowed the salaries as a part of such expenses, whereas he should have allowed credit to them on account of such expenses for such additional percentage over and above 12½ per cent. as the amount of such annual salaries bore to the gross annual sales during the period in question.

On the 24th of October, 1884, the master, Mr. Bennett, filed his report, finding that the defendants had disposed of 2,292 copies of volumes 39 to 46. He stated that the plaintiff claimed that 156 more volumes had been sold, making 2,448 in all. The 156 volumes were volumes which, after being originally sold by the defendants, had again come to their hands and been resold once or oftener. The master disallowed these resales, but reported that, if they were to be allowed, the sum of $696.38 should be added as damages for such resales. He reported the average sale price of the volumes received by the defendants to have been $4,464, making a total sale price of $10,231.48. He reported that the cost of all the volumes sold was

$4,679.55; that the defendants were entitled to a credit of $1,118.49 on account of the general expenses of conducting their business, being 12 per cent. of their gross sales; that the total cost of producing the volumes sold was $5,798.04, and that deducting that amount from the $10,231.48 left $4,433.44 as the total amount of net receipts from sales or damages to the plaintiff.

The plaintiff excepted by his first and second exceptions to the disallowance in respect of the 156 copies resold, and filed other exceptions. The defendants filed exceptions in regard to the number of volumes sold, the number of volumes on hand, the average price of the sales, the total gross receipts from the sales, the cost of the volumes sold, the amount of the credit for general expenses of conducting their business, the net receipts from the sales, the refusal of the master to allow them credit for the cost of producing the volumes unsold and remaining on hand, or credit for the sum expended by them for editorial work in preparing the volumes, or credit for the amount expended by them in stereotyping the volumes, or credit for the amount paid them as compensation for their services, or credit on account of sundry other matters.

The court, on a hearing on the reports of the masters and the exceptions thereto, sustained the first and second exceptions of the plaintiff to the report of the master, Mr. Bennett, and overruled all the other exceptions of both parties to both of the reports.

On the 9th of July, 1885, a final decree was entered, adjudging that the plaintiff recover $340.70, as profits on the resales of the 156 volumes, in addition to the $4,433.44 reported by the master, Mr. Bennett, and the $6,986.05 reported by the master, Mr. Bishop, the three sums amounting to $11,760.19, and the costs of the suit. The decree granted a perpetual injunction as to volumes 32 to 46. It also restrained the defendants from selling or disposing of the stereotype-plates of those volumes, and dismissed the bill as to Denslow and Ewell, without costs. It further adjudged that the right of the plaintiff to recover the additional sum of $896.19, as claimed by the plaintiff and referred to in the second report of the master, Mr. Bishop, in case the cost of composition and press-work should be ratably distributed over the whole edition printed of volumes 32 to 38, and also the rights of all parties under the cross-bill, and the rights of all parties to the said action of replevin for the unsold copies of volumes 32 to 38, be reserved for determination on the hearing of the cross-bill.

The report of the decision of the circuit court on the exceptions to the reports of the masters is found in 24 Fed. Rep., 636. From such final decree the defendants composing the firm of Callaghan & Co. have appealed to this Court.

The volumes of law reports of which the plaintiff claims a copyright are in the usual form of such works. Each volume consists of a title-page, of a statement of the entry of copyright, of a list of the judges composing the court, of a table of the cases reported in the volume in alphabetical order, of a head-note or syllabus to each opinion, with the names of the respective counsel, and their arguments in some cases, and a statement of facts, sometimes embodied in the opinion and sometimes preceding it, and of an index arranged alphabetically and consisting substantially of a reproduction of the head-notes. Of this matter all but the opinions of the court and what is contained in those opinions is the work of the reporter and the result of intellectual labor on his part.

The broad proposition is contended for by the defendants, that these law reports are public property and are not susceptible of private ownership, and cannot be the subject of copyright under the legislation of Congress. It is urged that Mr. Freeman, the reporter, was a public officer, whose office was created by chapter 29 of the Revised Statutes of Illinois of 1845, which enacted as follows in regard to the Supreme Court and the reporter:

> Sec. 20. The court shall appoint some person learned in the law to minute down and make report of all the principal matters, drawn out at length, with the opinion of the court, in all such cases as may be tried before the said court; and the said reporter shall have a right to use the original written opinion after it shall have been recorded by the clerk.
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> Sec. 21. The reporter, before entering upon his duties, shall be sworn by some one of the justices of the Supreme Court faithfully to perform the duties of his said office. He may, for misconduct in office, neglect of duty, incompetency, or other cause shown, to be entered of record, be removed from office.
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> Sec. 22. It shall be the duty of the reporter to deliver to the Secretary of State, as soon as convenient after publication, such number of copies of the respective volumes of the reports of said court as may be necessary to enable the said secretary to distribute the same in the manner provided in the following section, together with one hundred copies in addition, to be deposited in the secretary's office for the use of the State.

Section 23 provided for the distribution of the volumes by the Secretary of State, and section 24 provided, that, upon the delivery of the requisite number of any volume, the Secretary of State should deliver to the reporter a certificate specifying the number of copies which had been so delivered, and that such certificate should entitle the reporter to a warrant drawn by the auditor of public accounts upon the treasury for an amount for those volumes, at the price for which the books should be sold to individuals, provided the price should not exceed the ordinary price of law books of the same description, to be determined by the auditor, treasurer, and Secretary of State. These statutory provisions were amended in 1863 by making the term of office of the reporter six years, and in 1865 it was enacted that the price of the volumes to be delivered to the Secretary of State should be $6 each. The reporter was given a salary, by law, in 1877 of $6,000 a year.

It is further contended, that Mr. Freeman, in preparing the official edition of the reports, was not an author, within the meaning of the act of Congress, and that it was not intended by that act that he should assert a monopoly in the result of his official labors.

But, although there can be no copyright in the opinions of the judges, or in the work done by them in their official capacity as judges, (*Banks* v. *Manchester*, U. S.,) yet there is no ground of public policy on which a reporter who prepares a volume of law reports, of the character of those in this case, can, in the absence of a prohibitory statute, be debarred from obtaining a copyright for the volume, which will cover the matter which is the result of his intellectual labor.

In the present case there was no legislation of the State of Illinois which forbade the obtaining of such a copyright by Mr. Freeman, or which directed that the proprietary right which would exist in him should pass to the State of Illinois, or that the copyright should be taken out for or in the name of the State, as the assignee of such proprietary right. Even though a reporter may be a sworn public officer, appointed by the authority of the government which creates the court of which he is made the reporter, and even though he may be paid a fixed salary for his labors, yet, in the absence of any inhibition forbidding him to take a copyright for that which is the lawful subject of copyright in him, or reserving a copyright to the government as the assignee of his work, he is not deprived of the privilege of taking out a copyright, which would otherwise exist. There is, in such case, a tacit assent by the government to his exercising such privilege. The universal practical construction has been that such right exists, unless it is affirmatively forbidden or taken away; and the right has been exercised by numerous reporters, officially appointed, made sworn public officers, and paid a salary, under the governments both of States and of the United States.

This question was, it is true, not directly adjudged in *Wheaton* v. *Peters*, (8 Pet., 591.) In that case the owners of the copyrights of Wheaton's Reports of the Supreme Court of the United States brought a suit in equity against Mr. Peters for publishing and selling a volume of his Condensed Reports of the Supreme Court. The bill was dismissed by the circuit court. On an appeal by the plaintiffs to this Court one of the points urged by the defendants was, that reports of the decisions of this Court, published by a reporter appointed under the authority of an act of Congress, were not within the provisions of the law for the protection of copyrights. This Court held (1) that the plaintiffs could assert no common-law right to the exclusive privilege of publishing, but must sustain such right, if at all, under the legislation of Congress; (2) that under such legislation there must have been, in order to secure the copyright, a compliance with the provisions of the statute in regard to the publication in a newspaper of a copy of the record of the title of the book, and in regard to the delivery of a copy of it, after publication, to the Secretary of State. The Court remanded the case to the circuit court for a trial by jury, as to whether there had been a compliance with the above-named requisites of the act of Congress. In a note by Mr. Peters, at page 618 of the report of the case, he states that he has been informed that the Court did not consider the point whether reports of the decisions of the Court, published by a reporter appointed under the authority of an act of Congress, were within the provisions of the law for the protection of copyrights.

When the suit was brought, Mr. Wheaton had published the twelve volumes of his copyrighted reports. The allegation of the bill was, that the volume complained of, published by Mr. Peters, contained all the reports of cases found in the first volume of Wheaton's Reports. It appears from the report of the case and the record in it, that Mr. Wheaton had published his first volume in 1816, and his twelfth volume in 1827. From March 3, 1817, for three years, the reporter had a salary of $1,000 a year, and the same salary from May 15, 1820, to March 3, 1826, and for three years from February 22, 1827. The decree of this Court, providing for a trial by a jury (p. 698) covered the entire twelve volumes of Wheaton's Reports.

If this Court had been of opinion that there could not have been a lawful copyright in the volumes of Wheaton's Reports, it would have been useless to send the case back to the circuit court for an inquiry whether the conditions precedent to the obtaining of a lawful copyright, under the act of Congress, had been complied with, especially in view of the fact that the opinion of the Court concludes (p. 668) with this statement:

> It may be proper to remark that the Court are unanimously of opinion that no reporter has or can have any copyright in the written opinions delivered by this Court; and that the judges thereof cannot confer on any reporter any such right.

Therefore, the only matter in Wheaton's Reports which could have been the subject of the copyrights in regard to which the jury trial was directed was the matter not embracing the written opinions of the Court, namely, the title-page, table of cases, head-notes, statements of facts, arguments of counsel, and index. Such work of the reporter, which may be the lawful subject of copyright, comprehends also the order of arrangement of the cases, the division of the reports into volumes, the numbering and paging of the volumes, the table of the cases cited in the opinions, (where such table is made,) and the subdivision of the index into appropriate, condensed titles, involving the distribution of the subjects of the various head-notes, and cross-references, where such exist. A publication of the mere opinions of the Court, in a volume, without more, would be comparatively valueless to any one.

The case of *Wheaton* v. *Peters* was decided at January term, 1834. In *Gray* v. *Russell*, (1 Story, 11,) in 1839, Mr. Justice Story, in speaking of the question as to how far a person was at liberty to extract the substance of copyrighted law reports, says (p. 20):

> In the case of *Wheaton* v. *Peters*, (8 Peters' R., 591,) the same subject was considered very much at large. It was not doubted by the Court that Mr. Peters' Condensed Reports would have been an infringement of Mr. Wheaton's copyright, supposing that copyright properly secured under the act, if the opinions of the Court had been or could be the proper subject of the private copyright by Mr. Wheaton. But it was held that the opinions of the Court, being published under the authority of Congress, were not the proper subject of private copyright. But it was as little doubted by the Court that Mr. Wheaton had a copyright in his own marginal notes, and in the arguments of counsel as prepared and arranged in his work. The cause went back to the circuit court for the purpose of further inquiries as to the fact, whether the requisites of the act of Congress had been complied with, or not, by Mr. Wheaton. This would have been wholly useless and nugatory, unless Mr. Wheaton's marginal notes and abstracts of arguments could have been the subject of a copyright: (for that was the work which could be the subject of a copyright;) so that if Mr. Peters had violated that right, Mr. Wheaton was entitled to redress.

This seems to us to be a proper view of the decision in *Wheaton* v. *Peters;* and that decision is as applicable where a reporter receives a compensation or salary from the Government as where he does not, in the absence of any restriction against his obtaining a copyright.

In the present case, although Mr. Freeman, during the period of his preparation of volumes 32 to 46, received no direct salary from the State, it is contended by the defendants that he received from the State compensation for his services, through the purchase by it, under a statute, of copies of his volume at a stated price of $6 per copy for 553 copies of each volume, and that this was substantially the payment of a salary to him by the State. But, as stated before, in the view we take of the case, the question of a salary or no salary has no bearing upon the subject.

The general proposition that the reporter of a vol-

ume of law reports can obtain a copyright for it as an author, and that such copyright will cover the parts of the book of which he is the author, although he has no exclusive right in the judicial opinions published, is supported by authority. (*Curtis on Copyright*, 131, 132; *Butterworth* v. *Robinson*, 5 Vesey, 709; *Cary* v. *Longman*, 1 East., 358, and note, 362; *Mawman* v. *Tegg*, 2 Russell, 385, 398, 399; *Hodges* v. *Welsh*, 2 Irish Eq., 266, 287; *Lewis* v. *Fullarton*, 2 Beav., 6; *Saunders* v. *Smith*, 3 Mylne & Cr., 711; *Sweet* v. *Benning*, 16 C. B., 491; *Jarrold* v. *Houlston*, 3 Kay & Johns., 708, 719, 720.)

It is further contended by the defendants, that the plaintiff is not entitled to relief in respect to volumes 32 to 46, because he did not comply with the conditions of the statute concerning copyrights. Those volumes were all of them published while the act of Congress of February 3, 1831, c. 16, (4 Stat., 436,) was in force. The fourth section of that act provided that no person should be entitled to the benefit of the act unless he should, before publication, deposit a printed copy of the title of the book intended to be copyrighted in the clerk's office of the district court of the district wherein the author or proprietor should reside. The section also required that the clerk should record such title forthwith, in a book, in words prescribed in the section, giving a copy of the title, under the seal of the court, to the author or proprietor whenever he should require the same. It also provided, that the author or proprietor should, within three months from the publication of the book, deliver or cause to be delivered a copy of the same to the clerk of the district court, and that it should be the duty of the clerk, at least once in every year, to transmit a certified list of all such records of copyright, including the titles so recorded, and the dates of record, and also all the copies of books deposited in his office, to the Secretary of State, to be deposited in his office.

Although, under section 6 of the same act, the exclusive right to the copyright vests upon the recording of the title of the book, and runs for the prescribed period from that date, and although the right of action for infringement, under section 6, also accrues at that time, yet it is quite clear that, under section 4, in respect at least to suits brought after three months from the publication of the book, it must be shown, as a condition precedent to the right to maintain the suit, that a copy of the book was delivered to the clerk of the district court within three months from the publication.

Section 5 of the same act provides that no person shall be entitled to the benefit of the act, unless he shall give information of copyright being secured, by causing to be inserted in the published copies on the title page of the book or the page immediately following, the words:

> Entered according to act of Congress, in the year ——, by A. B., in the clerk's office of the district court of ——.

Undoubtedly the three conditions prescribed by the statute, namely, the deposit before publication of the printed copy of the title of the book, the giving of information of the copyright by the insertion of the notice on the title page or the next page, and the depositing of a copy of the book within three months after the publication, are conditions precedent to the perfection of the copyright. (*Wheaton* v. *Peters*, 8 Pet., 591; *Merrell* v. *Tice*, 104 U. S., 557.)

It is contended by the defendants that the plaintiff has not proved the date of the publication of any of the volumes in question; that the only proof he has offered is in the form of certificates by the clerk of the district court, showing the dates of the filing of the printed titles of the volumes; and that he has failed to show whether such filing preceded or followed the publication of the volumes.

The record shows that the plaintiff, in respect of volumes 32 to 46, offered in evidence fifteen certificates made by William H. Bradley, clerk of the District Court of the United States for the Northern District of Illinois, each of which was in the following form, except as to the number of the volume and its contents, and except that, as to volumes 39 to 43, the name "Eugene B. Myers," and as to volumes 44 to 46, the name "E. B. Myers," was substituted for the names "E. B. Myers & Chandler:"

> United States of America, Northern District of Illinois, *ss:*
>
> CLERK'S OFFICE OF THE DISTRICT COURT OF THE UNITED STATES FOR SAID DISTRICT.
>
> Be it remembered, that on the 12th day of August, A. D. 1865, E. B. Myers & Chandler, of said district, deposited in this office the title of a book as follows, to wit: Reports of cases at law and in chancery argued and determined in the Supreme Court of Illinois, by Norman L. Freeman, counselor-at-law, volume 32, containing the remainder of the cases decided at the April term and a part of the cases decided at the November term, 1863—
>
> The right whereof they claim as proprietors, in conformity with an act of Congress entitled "An act to amend the several acts respecting copyrights."
>
> WM. H. BRADLEY, *Clerk.*
>
> Northern District of Illinois, *ss:*
>
> I, William H. Bradley, clerk of the District Court of the United States for the Northern District of Illinois, do hereby certify the foregoing to be a true copy from the records of said court in the matter of the entry of a copyright by E. B. Myers & Chandler, as the same appears of record in said court and now remaining in my custody.
>
> In testimony whereof I have hereunto set my hand and affixed the seal of said court, at my office, in Chicago, this 12th day of August, A. D. 1865, and of our independence the 90th year.
>
> [L. S.] WM. H. BRADLEY, *Clerk.*
>
> Work deposited January 17, 1866.
>
> WM. H. BRADLEY, *Clerk.*

The certificates show that the dates of the several deposits of the titles and of the works were as hereinbefore stated. The certificate to the copy of the title bears date in each case the same day as the deposit of the title. In each case the memorandum of the deposit of the work was in the same form as that in regard to volume 32, with the necessary change of date, except that in regard to volumes 35, 36, 42, 43, and 44, the memorandum was, "Work deposited in my office," with the date. When the certificates were offered in evidence, the defendants objected to the introduction of that portion of each of the papers, at the bottom thereof, which purported to show the date when the volume was deposited, on the ground that the same constituted no part of the certificate, but was a mere anonymous statement; that it did not appear when or by whom the same was made, and that the evidence was incompetent to show the date of the deposit. The objection was overruled by the court, and the defendants excepted. They also objected to the introduction of the paper pertaining to volume 34, on the ground that, even if the memorandum at the bottom of the paper was competent evidence of the date when the volume was deposited, the deposit was made at the same time with the deposit of the printed title page, namely, October 23, 1866; that it did not appear that the title page was filed in advance of the publication and the work deposited after publication; and that the paper was, therefore, incompetent as evidence. The objection was overruled by the court, and the defendants excepted to such ruling.

The defendants also objected to the introduction of the paper as to volume 35, for the reason that it purported to show that the title of the volume was deposited on the 28th of January, 1867, while the printed notice on the back of the title page of that volume stated that the copyright was entered "in the year 1866;" and that, because of such variance, the paper was incompetent as evidence. The objection was overruled by the court, and the defendants excepted to the ruling. These various objections are now urged by the defendants, and it is contended that the memorandum of the date of the deposit of the work, written on the certificate, and purporting to be signed by the clerk, is not in the form of a certificate by the clerk of the fact and the date of the deposit of the book, and is not competent proof of such fact or date, and is not attested by the official seal of the clerk; and that no proof was offered as to the genuineness of the signature purporting to be that of the clerk.

The statute makes no provision for the keeping by the clerk of a record of the deposit of the book with him after publication. The memorandum of the deposit of the book, signed in each case by the clerk, appears to have been written, in each case, on the certified copy, furnished to the proprietor, by the clerk, of the record of the deposit of the title of the book. The two things were thus connected together by the act of the officer whose duty it was to receive both the deposit of the title and the deposit of the book. The paper amounts to a sufficient certificate by him of the fact and the date of the deposit of the book. In the absence of evidence to the contrary, which it was open to the defendants to introduce, it must be presumed that the deposit of the title was made in each case before publication, and, also, that in every instance where the work purports to have been deposited within three months after the date of the deposit of the title, it was deposited within three months after publication. So, also, in the case of volume 34, it must be equally presumed, in the absence of evidence to the contrary, that the deposit of the title was made before publication, and that the deposit of the work, though made on the same day with the deposit of the title, was not made prior to publication. In the case of volume 32, however, although it is to be presumed that the title was deposited before publication, yet, as the work was deposited five months and five days after the deposit of the title, it cannot be presumed that such deposit of the work was made within three months after publication. The evidence therefore fails as to volume 32; but it is sufficient, *prima facie*, as to all the other volumes.

Section 4 of the act of 1831 requires the clerk to give a copy of the title as deposited and recorded, under the seal of the court, to the author or proprietor who deposits it, whenever he shall require the same. Necessarily such a copy is sufficient *prima facie* evidence of the deposit of the title. Such a copy was given in regard to each of the volumes in question here. On each of these papers the memorandum of the fact and of the date of deposit of the work, signed by the clerk, was written. The clerk was the officer required to receive the deposit of the work. He was not required to keep a record of such deposit, and he was required to transmit the works so deposited to the Secretary of State, at least once a year. The memorandum in the present case of the fact and date of the deposit, purporting to be signed by the clerk, must be regarded as a sufficient *prima facie* certificate of such deposit, and as competent evidence of the fact and of the date, without further proof of the signature of the clerk, that being on the same paper with his signature as clerk to the certificate of the copy of the record of the deposit of the title, and it being open to the defendants to show that his signature to the memorandum was not genuine.

We do not think the present case is governed by the decision in *Merrell* v. *Tice*, (104 U. S., 557.) In that case the librarian of Congress had given a certificate to a copy of the record of the deposit of the title of the book. On that paper was written a memorandum in these words: "Two copies of the above publication deposited" on a date given. This memorandum was not signed by the librarian of Congress. This Court held the memorandum not to be competent as proof of the deposit of the two copies of the book, on the ground that it was not a certificate of that fact. We are of opinion that the memorandum in the present case, purporting to be signed by the same clerk, is substantially a certificate of the fact and date of the deposit of the work, written by him on the same paper with the other certificate; and that it is not open to the objection which obtained in the case of *Merrell* v. *Tice*.

The defendants offered in evidence certificates made by the auditor of public accounts and by the Secretary of State of the State of Illinois, showing that, on the 2d of October, 1865, Mr. Freeman delivered to the Secretary of State, for the use of the State, 553 copies of volume 32, required by law to be furnished by the reporter, and, on the 23d of October, 1866, 553 copies of volume 34. The introduction of this evidence was objected to by the plaintiff, on the ground that the papers constituted no evidence of the publication of either of the volumes, and were incompetent. The objection was sustained by the court, and the defendants excepted to the ruling. The exclusion of these papers is assigned as error. The papers also show the payment by the State, for each set of the copies, at the rate of $6 per volume. As the delivery of the copies of volume 32 to the Secretary of State, for the use of the State, took place on the 2d of October, 1865, and the work was not deposited in the clerk's office until the 17th of January, 1866, it is contended that such delivery of the copies to the State was a publication of the volume, and that the deposit of it did not take place until three months and fifteen days after publication. We think this assignment of error must prevail; that the evidence offered was competent; that the delivery of the copies for the use of the State was a publication of the volume; that the deposit of the work was not made in time; and that the copyright of volume 32 therefore fails. But we do not think the same objection is tenable as to volume 34, although the 553 copies of that volume were delivered on October 23, 1866, and the title and the work were both of

them deposited on that day. It must be presumed, in the absence of evidence to the contrary, that the deposit of the title preceded the publication, and that the delivery of the copies to the Secretary of State preceded the deposit of the work in the clerk's office. Where the three things are prescribed by the statute to be done in consecutive order, and all three appear to have been done on the same day, it will be presumed that the statute was complied with, leaving the *prima facie* evidence open to be rebutted.

In regard to volume 35, the title was deposited January 28, 1867, and the notice printed in the volume purports to show that the copyright was entered in 1866. The statute required that each copy of the book should have inserted in it a statement of the year the copyright was entered. It is sufficient to say, in answer to this objection, that the variance must be regarded as immaterial, inasmuch as the statement that the title was recorded in an earlier year than the actual year, being conclusive on the person taking the copyright, could cause no injury to any other person or to the public, because the copyright would expire in twenty-eight years from the expiration of the year stated in the notice in the book, and not in twenty-eight years from the time of the recording of the title.

In regard to volume 36, it is objected that the certificate of the clerk shows that the printed title was deposited by "E. B. Myers & Chandler," and that the printed notice of the entry of copyright in the volume as published purports to show that the copyright was entered by E. B. Myers alone. We think that, under the circumstances of the case, as the printed notice contained the name of E. B. Myers, the variance was immatarial, and that the statute was substantially complied with, particularly as it is not shown that the defendants were misled by the variance or induced to do or omit anything because of it.

It is also urged by the defendants that the court erred in finding the title to the volumes to be in the plaintiff, because he failed to prove any written assignment or transfer to him from Mr. Freeman as to any of the volumes, or from Chandler as to his alleged interest in volumes 32 to 38, or to prove any means through which he derived title to any of the volumes. By section 4 of the act of 1831 the proprietor of a book, as well as its author, could obtain a copyright, and provision was made, in the form of record given in that section, for a claim by the depositor of the title of the book as its proprietor, and for the deposit of the copy of the book by the proprietor. While, after the obtaining of a copyright, a written assignment may be necessary to convey title to it, or a written license to give a right to reproduce copies of the copyrighted book, we perceive no reason why Myers or Myers & Chandler could not become the owners by a parol transfer of whatever right Mr. Freeman, prior to the taking of the copyright, had to convey. While the work was in manuscript no written transfer of such manuscript from Mr. Freeman was necessary, because the copyright had not yet been taken. Moreover, the defendants, in all their transactions with the plaintiff, recognized his title to the copyrights of volumes 32 to 38, as to which the titles had been deposited by E. B. Myers & Chandler, and parol evidence that the plaintiff owned the copyrights of volumes 32 to 46 at the time the infringements were committed, was introduced without objection, and was sufficient *prima facie* evidence until rebutted. If the defendants had objected to this parol evidence the production of the written assignment from Chandler, set up in the bill, could have been required.

It is also objected that the plaintiff acquiesced in, consented to, and ratified the publication of the volumes by the defendants, and was guilty of laches in bringing his suit. The evidence on this subject is voluminous, and it would not be profitable, either for the purposes of this case or as a guide for any other case, to discuss it at length. We are of opinion that neither of these defenses is established; that the plaintiff did not consent to the republication of the volumes by the defendants; that he never abandoned his copyrights, or consented to surrender them without consideration, or gave the defendants cause to understand that he did so or would do so; that he never acquiesced in any infringement of his copyrights by the defendants; and that he was not guilty of laches in seeking relief. The defendants recognized his copyrights in volumes 32 to 38, by offering to purchase them, and there was considerable negotiation on that subject. This fact is inconsistent with consent and abandonment, and the other evidence in the case is inconsistent with any abandonment.

It is also contended by the defendants, that each of the volumes as published by them was a new and independent work, not copied from that of the plaintiff, but prepared by the original labor of the editors employed by the defendants. While it is admitted that volumes 32 to 38, as published by the defendants, were, with the exception of the foot-notes, prepared entirely from the plaintiff's volumes, it is contended that volumes 39 and 41 to 46 were, with the exception of the opinions of the judges, prepared from the records and files of the Supreme Court of Illinois. The evidence on the subject of infringement is very full and minute. It is impossible for us to discuss it at length, and we must content ourselves with stating, as a general result, that we concur in the views stated by Judge Drummond, in his decision in the circuit court, in regard to volumes 32 to 38. He says, (10 Bissell, 139, 147:)

> In considering the question of infringement of the copyright by the defendants, it must be borne in mind what is the character of the work. They are reports of the decisions of the Supreme Court of this State, to which no one can have a copyright; but he may have to the head-notes, and statements of each case, and of the arguments of counsel. These head-notes and statements which have been made are in themselves an abridgment; the one of the opinions of the court, consisting of the principles of law decided, and the other an abstract of the facts and of the arguments. It should also be stated that the volumes of the defendants, as edited by those employed by them, are very much condensed, as compared with Mr. Freeman's reports, and yet the paging of the volumes is substantially the same throughout, so that the cases in the corresponding volumes appear on the same page. The list of cases which precedes each report is the same. The defendants Ewell and Denslow, who were employed by the other defendants to annotate these decisions or reports, both state, upon examination, that their work was independent of that of Mr. Freeman; but it appears from the evidence that all the volumes of Mr. Freeman were used in thus editing or annotating; and although it may have been their intention to make an independent work, it is apparent from a comparison of the Freeman volumes and those of the defendants, that the former were used throughout by the editors employed by the defendants. It is true that in each volume, perhaps in the majority of cases, there is the appearance of independent labor performed by them, without regard to the volumes of Mr. Freeman; but yet in every volume it is also apparent that Mr. Freeman's volumes were used; in some instances words and sentences copied without change; in others, changed only in form; and the conclusion is irresistible, that for a large portion of the work performed in behalf of the defendants, the editors did not resort to original sources of information, but obtained that information from the volumes of Mr. Freeman. Undoubtedly, it was competent for an editor to take the opinions of the Supreme Court, and possibly from the volumes of Mr. Freeman, and make an independent work; but it is always attended with great risk for a person to sit down, and, with the copyrighted volume of law reports before him, undertake to make an independent report of a case. It is not difficult to do this, going to the original sources of information, to the decisions of the court, the briefs of counsel, the records on file in the clerk's office, without regard to the regular volumes of reports. Any one who has tried it can easily understand the difference between the head-notes of two persons, equally good lawyers, and equally critical in the examination of an opinion, where they are made up independent of each other; and, bearing in mind this fact, it seems to be beyond controversy, that although in many, and perhaps most, instances there is a very considerable difference between the head-notes of the defendants' volumes and those of the plaintiff, the latter have been freely used in the preparation of the former. I conclude, therefore, that the defendants have, in the preparation of those volumes, from 32 to 38, inclusive, of the Illinois Reports, used the volumes of the plaintiff so as to interfere with his copyright.

So, also, we concur with the conclusions of Judge Drummond in regard to volumes 39 to 46. He says, (20 Fed. Rep., 441:)

> The present inquiry is limited to what is alleged to be an infringement by the defendants of volumes 39 to 46, inclusive, of Mr. Freeman's Illinois Reports. Volume 40 seems never to have been regularly published like the other volumes, although the evidence of the infringement of the plaintiff's copyright in that volume is perhaps stronger than that applicable to any of the other volumes named. Upon comparing parts of each of the volumes, those of the complainant and of the defendants, one with the other, I think there can be no doubt that in some respects, in each case, the Freeman volume has been used by the defendants in the head-notes, the statements of facts, and the arguments of counsel. That is, there are certain unmistakable *indicia*, that in every volume prepared by the defendants they have not confined themselves solely to the original sources of information, namely, the opinions of the judges, the records, and the arguments of counsel.

He also says, (p. 442:)

> The fact appears to be, and indeed it is not a subject of controversy, that in arranging the order of cases, and in the paging of the different volumes, the Freeman edition has been followed by the defendants; but, while this is so, I should not feel inclined, merely on that account and independent of other matters, to give a decree to the plaintiff, although it is claimed that the arrangement of the cases and the paging of the volumes are protected by a copyright. Undoubtedly, in some cases, where are involved labor, talent, judgment, the classification and disposition of subjects in a book entitle it to a copyright. But the arrangement of law cases and the paging of the book may depend simply on the will of the printer, of the reporter, or publisher, or the order in which the cases have been decided, or upon other accidental circumstances. Here the object on the part of the defendants seems to have been that there should not be confusion in the references and examination of cases; but the arrangement of cases and the paging of the volumes is a labor inconsiderable in itself, and I regard it, not as an independent matter, but in connection with other similarities existing between the two editions, when I say, taking the whole together, the Freeman volumes have been used in editing and publishing the defendant's volumes.

It may be added, that one of the most significant evidences of infringement exists frequently in the defendants' volumes, namely, the copying of errors made by Mr. Freeman.

The next objection urged is, that the defendants were compelled to produce their books and papers on the accounting before the master, the plaintiff having sought a forfeiture of the copies of volumes 32 to 38; and that the defendants were thereby compelled to produce evidence against themselves in aid of such forfeiture.

The original bill prays for a decree that all of the copies published by the defendants of volumes 32 to 38 be forfeited to the plaintiff, and that the defendants be required to deliver the same to him. The supplemental bill contains no such prayer in regard to volumes 39 and 41 to 46, but contains a prayer for general relief. The cross-bill and the answer to it show that Myers brought an action of replevin against Callaghan & Co., to recover as forfeited the copies of the infringing volumes 32 to 38. The final decree shows that the cross-suit was not brought to a hearing with the original suit. On the contrary, the final decree reserves for consideration and determination, on the hearing of the cross-bill, the rights of the parties thereunder, and their rights in respect to the action of replevin to recover possession of the unsold copies of volumes 32 to 38. Although, under the provisions of the interlocutory decree in respect to volumes 32 to 38, the defendants were required to produce their account-books and papers before the master, and were examined in regard to them, yet the final decree did not award any forfeiture, and so no injury has resulted to the defendants by reason of such provision of the interlocutory decree, or by reason of any action thereunder. Irrespective of this, it is determined by the case of *Stevens* v. *Gladding*, (17 How., 447,) that the penalties given by section 7 of the copyright act of 1831 cannot be enforced in a suit in equity. The provision of the interlocutory decree for an examination of the defendants in regard to the subject of inquiry, and for the production by them of their account-books and papers, is the usual provision in an interlocutory decree in a suit in equity for the infringement of a copyright. As the forfeiture of the volumes could not be obtained by this suit, although prayed for in the bill, the evidence was admissible.

We now come to the question of damages. It is contended that the circuit court erred in disallowing to the defendants a credit for stereotyping volumes 32 to 46. Both of the masters refused to allow credit for the cost of stereotyping. Stereotyping was not a necessary incident of printing and publishing, as typesetting was. It was resorted to by the defendants to enable them the more successfully and profitably to infringe, by dispensing with the necessity of resetting the type for every new edition, and thus reducing the cost of multiplying copies in the future. The stereotype-plates were made without the consent of the plaintiff, and if credit is allowed for them the plaintiff is compelled to buy and pay for them, when they are useless to him, and when he has stereotyped for himself volumes 32 to 46.

It is also contended, that both of the masters erred in disallowing a credit to the defendants for the amount paid to the different members of their firm for their services, in the way of salaries, as a part of the expense of conducting their business, being the amount of about $12,000 a year during the period in controversy. These amounts were drawn by the defendants under the partnership agreement, as family and personal expenses. We do not think that the value of the time of an infringer, or the expense of the living of himself or his family, while he is engaged in violating the rights of the plaintiff, is to be allowed to him as a credit, and thus the plaintiff be compelled to pay the defendant for his time and expenses while engaged in infringing the copyright. If the defendants, instead of employing others to do the work, had chosen to do it themselves, they might as well have made a charge, and claimed to have been credited for it, of so much a month or year for their services in preparing the infringing volumes. (*Elizabeth* v. *Pavement Co.*, 97 U. S., 126, 139.) The case stands on a different footing from that of the salaries of the managing officers of a corporation, as in *Rubber Company* v. *Goodyear*, (9 Wall., 788.)

The defendants also object that the master, Mr. Bennett, should have found the number of volumes sold by the defendants to have been 103 less, and that the total number of bound volumes on hand found by him was erroneous, as also was the total number of volumes found by him to have been on hand unsold. The exceptions to the master's report in these respects substantially complain that the master found too many volumes to have been sold, by 103. We do not perceive any error in the above particulars. The master, Mr. Bennett, rightfully excluded a credit for the cost of producing copies of the volumes which the defendants did not sell. There were no profits from copies not sold, and therefore there could have been nothing to charge against such profits.

In regard to the exceptions to the report of Mr. Bennett, that he found the average selling price of the defendants' volumes to be $4.64 each, instead of $4.34, and that he found their gross receipts from sales of the infringing volumes to have been $10,231.48 instead of $9,459.37, we are of opinion that the selling price found and the gross receipts found were not too high.

We do not concur in the view of the defendants that there were no net receipts or profits on the sales of volumes 39 to 46, or in the view that the master, Mr. Bennett, erred in refusing credit to the defendants for the amount paid by them for editorial work in preparing their volumes, or in the view that the circuit court erred in allowing the $340.70 as profits on the resales of the 156 volumes mentioned in the first and second exceptions of the plaintiff to the report of the master, Mr. Bennett.

In regard to the 156 copies, they were volumes which had been already sold by the defendants, and which they purchased as second-hand books and resold. The master had held that, as he had charged the defendants with the profits on the first sale of these volumes, the profits on their resale could not be charged against them. The circuit court overruled this view, and, as we think, properly. The sale of the volume originally prevented the purchase from the plaintiff of a lawful volume, and the sale of the same infringing volume a second time prevented the purchase from the plaintiff of another lawful volume. The plaintiff was thus twice injured by the acts of the defendants, and the sales of the second-hand volumes must be accounted for as if they were first sales. (*Birdsell* v. *Shaliol*, 112 U. S., 485, 487, 488.)

The circuit court held that the master approximated as nearly as could be done to the true amount in fixing the selling price at $4.64 per volume. We concur in this view.

In regard to the eighth exception of the defendants to the report of the master, Mr. Bennett, that he had credited the defendants, in their expense account, with only 12 per cent. on their gross sales, instead of 17 per cent., the circuit court held that, as Mr. Bennett had allowed 12 per cent. and Mr. Bishop had allowed 12¼ per cent. for such average expenses, and those conclusions were so nearly alike, the court would allow their findings in this regard to stand. We concur in this view, and also in the conclusion of the circuit court sustaining the findings of the two masters as to the average price per volume at which the defendants sold the volumes.

In regard to the general question of the profits to be accounted for by the defendants, as to the volumes in question, the only proper rule to be adopted is to deduct from the selling price the actual and legitimate manufacturing cost. If the volume contains matter to which a copyright could not properly extend, incorporated with matter proper to be covered by a copyright, the two necessarily going together when the volume is sold, as a unit, and it being impossible to separate the profits on the one from the profits on the other, and the lawful matter being useless without the unlawful, it is the defendants who are responsible for having blended the lawful with the unlawful, and they must abide the consequences, on the same principle that he who has wrongfully produced a confusion of goods must alone suffer. As was said by Lord Eldon, in *Mawman* v. *Tegg*, (2 Russell, 385, 391:)

> If the parts which have been copied cannot be separated from those which are original without destroying the use and value of the original matter, he who has made an improper use of that which did not belong to him must suffer the consequences of so doing. If a man mixes what belongs to him with what belongs to me, and the mixture be forbidden by the law, he must again separate them, and he must bear all the mischief and loss which the separation may occasion. If an individual chooses in any work to mix my literary matter with his own, he must be restrained from publishing the literary matter which belongs to me; and if the parts of the work cannot be separated, and if by that means the injunction, which restrained the publication of my literary matter, prevents also the publication of his own literary matter, he has only himself to blame.

The present is one of those cases in which the value of the book depends on its completeness and integrity. It is sold as a book, not as the fragments of a book. In such a case, as the profits result from the sale of the book as a whole, the owner of the copyright will be entitled to recover the entire profits on the sale of the book, if he elects that remedy. (*Elizabeth* v. *Pavement Co.*, 97 U. S., 126, 139.)

In considering the exceptions of the defendants to the masters' reports in matters of fact, questioning the accuracy of their conclusions in respect to the amount of the defendants' profits, we have observed the rule recognized and affirmed in *Tilghman* v. *Proctor*, (125 U. S., 136, 149,) that, in dealing with such exceptions, "the conclusions of the master, depending upon the weighing of conflicting testimony, have every reasonable presumption in their favor, and are not to be set aside or modified unless there clearly appears to have been error or mistake on his part."

On the whole case we are of opinion that the final decree was correct, except in respect of volume 32. The amount of damages reported by the master, Mr. Bishop, as to that volume, and allowed by the final decree as part of the $6,986.05, was $926.66. That sum is disallowed and must be deducted. The other items of recovery in the decree were proper. The injunction as to volume 32 must be vacated, and the appellee will recover his costs of this Court.

The decree of the circuit court is reversed as to volume 32, and is affirmed in all other respects; and the case is remanded to that court, with a direction to correct the decree in the particulars above indicated, and to take such further proceedings as may be according to law and not inconsistent with this opinion.

THE
OFFICIAL GAZETTE
OF THE
United States Patent Office.
[BY AUTHORITY OF CONGRESS.]

VOL. 46—No. 6. TUESDAY, FEBRUARY 5, 1889. PRICE—$5 per year.

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Attorneys.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., January 22, 1889.

SIR: The Secretary of the Interior has ordered that John Lu Taylor, of Chicago, Ill., be not recognized after this date as attorney or agent in the prosecution of any claim or other matter before this Department or any bureau thereof.

Very respectfully,

GEO. A. HOWARD,
Chief Clerk.

The Commissioner of Patents.

The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Indexes to Patents on Electricity.

Appendix No. 2 to the index to patents relating to electricity, covering the period of time from July 1, 1882, to June 30, 1883, has been issued, and is now for sale. These indexes, arranged alphabetically, numerically, and by classes, are completed to June 30, 1883, and comprise the following volumes:

Vol. 1. Index to patents relating to electricity granted by the United States prior to June 30, 1881, with an appendix, July 1, 1881, to June 30, 1882. One volume, 250 pages. In paper covers, $3; bound, $5.

Vol. 2. Appendix No. 2, July 1, 1882, to June 30, 1883. One volume, 50 pages. In paper covers, $1.50.

Vol. 3. Appendix No. 3, July 1, 1883, to June 30, 1884. One volume, 60 pages. In paper covers, $1.50.

Vol. 4. Appendix No. 4, July 1, 1884, to June 30, 1885. One volume, 60 pages. In paper covers, $1.50.

Vol. 5. Appendix No. 5, July 1, 1885, to June 30, 1886. One volume, 54 pages. In paper covers, $1.50.

Vol. 6. Appendix No. 6, July 1, 1886, to June 30, 1887. One volume, 52 pages. In paper covers, $1.50.

Issue of February 5, 1889.

Patents	381—No. 397,103 to No. 397,483,	inclusive.
Designs	26—No. 18,891 to No. 18,916,	inclusive.
Trade-Marks	15—No. 16,236 to No. 16,250,	inclusive.
Labels	4—No. 5,816 to No. 5,819,	inclusive.
Reissues	2—No. 10,983 to No. 10,984,	inclusive.
Total issue	428	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	..	Nebraska	4	1
Arizona Territory	..	..	Nevada	..	..
Arkansas	2	..	New Hampshire	2	..
California	6	..	New Jersey	22	..
Colorado	2	..	New Mexico Territ'y	..	..
Connecticut	13	..	New York	78	3
Dakota Territory	2	..	North Carolina	6	..
Delaware	2	..	Ohio	24	1
District of Columbia	7	..	Oregon	..	..
Florida	1	..	Pennsylvania	40	1
Georgia	1	1	Rhode Island	3	..
Idaho Territory	..	..	South Carolina	1	..
Illinois	28	5	Tennessee	2	..
Indian Territory	..	..	Texas	6	..
Indiana	12	..	Utah Territory	..	..
Iowa	8	..	Vermont	2	..
Kansas	5	1	Virginia	1	..
Kentucky	7	..	Washington Territ'y	..	..
Louisiana	..	..	West Virginia	1	..
Maine	1	..	Wisconsin	11	..
Maryland	5	2	Wyoming Territory	..	..
Massachusetts	31	2	United States Army	..	..
Michigan	10	..	United States Navy	..	..
Minnesota	4	..			
Mississippi	1	..	Total to citizens of the United States	364	18
Missouri	10	1			
Montana Territory	1	..			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic	..	..	Germany	5	..
Australia	..	..	Ireland	..	..
Austria-Hungary	2	..	Japan	..	..
Belgium	1	..	Mexico	..	..
Bermuda	..	..	Netherlands	..	..
Brazil	..	..	New South Wales	..	..
Canada	4	..	Norway	1	..
Chili	..	..	Russia	..	..
Colombia, U. S. of	..	..	Scotland	3	..
Cuba	..	..	Sweden	..	..
Denmark	..	..	Switzerland	2	..
England	23	1			
Finland	..	..	Total to citizens of foreign countries	43	1
France	2	..			

DESIGNS.

18,891.—CENTURY MONUMENT.—*Henry Clay Borgner*, Philadelphia, Pa. Application filed November 27, 1888. Serial No. 292,033. Term of patent 14 years.

18,892 to 18,894, inclusive.—SURFACE ORNAMENTATION OF GLASS.—*Anthony Dixon Brogan* and *Andrew Murray Malloch*, Firhill, Glasgow, county of Lanark, Scotland. Applications filed November 23, 1888. Serial Nos. 291,681 to 291,683, inclusive. Term of patents 14 years.

18,895.—PORTABLE FIRE-PLACE GRATE.—*Edward L. Calely*, Philadelphia, Pa., assignor to *Gilbert Combs*, *John Bawden*, and *John H. Bawden*, same place. Application filed January 9, 1889. Serial No. 295,883. Term of patent 7 years.

18,896.—FIRE-PLACE LINING.—*Edward L. Calely*, Philadelphia, Pa., assignor to *Gilbert Combs*, *John Bawden*, and *John H. Bawden*, same place. Application filed January 9, 1889. Serial No. 295,888. Term of patent 7 years.

18,897 to 18,901, inclusive.—CARPET.—*Edwin Fisher*, New York, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed January 5, 1889. Serial Nos. 295,574 to 295,578, inclusive. Term of patents 3½ years.

18,902.—MEDAL OR BADGE.—*William Friederich*, Washington, D. C. Application filed January 14, 1889. Serial No. 296,347. Term of patent 3½ years.

18,903.—NECKTIE.—*Adolph Hellenberg*, New York, N. Y. Application filed December 22, 1888. Serial No. 294,426. Term of patent 3½ years.

18,904 and 18,905.—CARPET.—*Winthrop L. Jacobs*, East Orange, N. J., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed January 5, 1889. Serial Nos. 295,579 and 295,580. Term of patents 3½ years.

18,906 and 18,907.—RUG.—*William T. Smith*, Philadelphia, Pa. Applications filed January 11, 1889. Serial Nos. 296,109 and 296,110. Term of patents 3½ years.

18,908.—LADY'S HAT.—*Lizzie S. Stewart*, New Castle, Pa. Application filed November 26, 1888. Serial No. 291,913. Term of patent 3½ years.

18,909.—FLOOR-REGISTER.—*William W. Sweetland*, Edwardsburg, Mich. Application filed October 5, 1888. Serial No. 287,338. Term of patent 14 years.

18,910 to 18,916, inclusive.—CARPET.—*Charles W. Swapp*, New York, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed January 5, 1889. Serial Nos. 295,581 to 295,587, inclusive. Term of patents 3½ years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,236.—OYSTERS.—*A. Booth Packing Company*, Chicago, Ill.; Baltimore, Md.; St. Paul, Duluth, and Minneapolis, Minn.; Kansas City and St. Louis, Mo.; Louisville, Ky.; Omaha, Nebr.; Indianapolis, Ind.; Escanaba and Manistique, Mich.; Astoria, Oreg.; Bayfield, Wis., and Port Arthur, Canada. Application filed October 29, 1888. Used since August 1, 1888.

"The representation of a man holding the shell of an open oyster in one hand."

16,237.—LINIMENT AND LIKE COMPOUNDS.—*Denis J. Enright*, Boston, Mass. Application filed December 12, 1888. Used since July 1, 1887.

"The words 'WORLD'S LIFE PRESERVER.'"

16,238.—MEDICINE FOR THE CURE OF HEAVES IN HORSES.—*George T. Hollyday*, Baltimore, Md. Application filed December 27, 1888. Used since November, 1888.

"The word 'JOCKEY.'"

16,239.—MEDICINES FOR DISEASES OF THE BLOOD AND FOR FEMALE DISEASES.—*James William Jones*, Americus, Ga. Application filed December 17, 1888. Used since July 1, 1884.

"A pictorial representation or likeness of the registrant."

16,240.—CONDENSED MINCE-MEAT FOR PIES.—*Merrell & Soule*, Syracuse, N. Y. Application filed July 30, 1888. Used since May 1, 1888.

"The words 'NONE SUCH.'"

16,241.—CANNED OYSTERS, FRUITS, AND VEGETABLES.—*Miller Bros. & Co.*, Baltimore, Md. Application filed November 19, 1888. Used since October 1, 1888.

"The word 'JUMBO.'"

16,242.—MEDICINAL PLASTERS.—*Potter Drug & Chemical Co.*, Boston, Mass. Application filed October 6, 1888. Used since January, 1887.

"The representation of a background on which are lines representing lightning."

16,243.—MEDICINES FOR EXTERNAL USE.—*Soler & Guardias*, New York, N. Y. Application filed November 24, 1888. Used since November 20, 1888.

"The representation of a prostrate human figure and a guardian angel."

16,244.—READY-MADE CLOTHING FOR MEN, BOYS, AND CHILDREN.—*J. & L. Wineman*, Chicago, Ill. Application filed June 28, 1888. Used since June, 1888.

"The representation of a table on which are placed several stacks of coats, through one of which a knife or sword has cut its way nearly through."

16,245.—CHEMICAL ALKALIES.—*William Gossage & Sons*, Widnes and Liverpool, county of Lancaster, England. Application filed December 12, 1888. Used since January 10, 1868.

"A monogram of the letters and character 'G & S.'"

16,246.—RAZORS, POCKET-KNIVES, SCISSORS, SHEARS, AND LIKE ARTICLES OF CUTLERY.—*Andrew J. Jordan*, St. Louis, Mo. Application filed October 31, 1888. Used since February 10, 1888.

"The words 'OLD FAITHFUL.'"

16,247.—GUITARS, MANDOLINS, ZITHERS, AND BANJOS.—*Lyon & Healy*, Chicago, Ill. Application filed July 19, 1888. Used since July 1, 1888.

"The word 'ARION.'"

16,248.—DEGERMINATED MEAL, CORN-FLOUR, CORNMEAL, HOMINY, GRITS, AND FEED.—*Miller, Case & Clausen*, New York, N. Y. Application filed December 24, 1888. Used since December 19, 1888.

"The word 'KRIOZAN.'"

16,249.—LAUNDRY-SOAP.—*Procter & Gamble*, Cincinnati, Ohio. Application filed December 26, 1888. Used since November 15, 1884.

"An irregularly-drawn parallelogram containing the words 'JUST FITS THE HAND,' the representation of an arm, wrist, and hand, the hand holding a cake of soap bearing the word 'LENOX,' and minor matters of ornamentation."

16,250.—METALLIC PENS.—*Turner & Harrison*, Philadelphia, Pa. Application filed December 11, 1888. Used since December 1, 1888.

"The word 'REVE.'"

LABELS.

5,816.—Title: "DR. NANCY A. PIERSON'S CHOLERA SPECIFIC FOR HOGS AND FOWLS."—*Nancy A. Pierson*, Winfield, Kans. Application filed December 3, 1888.

5,817.—Title: "RAMEY'S CELEBRATED GERMAN KIDNEY CURE."—*Alfred Henry Ramey*, Aurora, Ill. Application filed December 29, 1888.

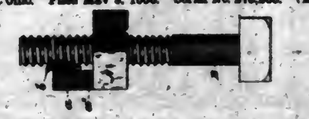
5,818.—Title: "INJECTION ALBA" (FOR A MEDICINAL MIXTURE.) *Rogers & Diamond*, Chicago, Ill. Application field December 24, 1888.

5,819.—Title: "COMPOUND DIGESTIVE POWDER."—*The Searle & Hereth Company*, Omaha, Nebr. Application filed January 7, 1889.

PATENTS

GRANTED FEB. 5, 1889.

397,103. LOCK-NUT. DAVID H. ALLEN and MANFRED LORIS, Miamisburg, Ohio. Filed May 9, 1888. Serial No. 273,283. (Model.)

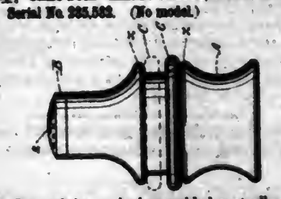


Claim.—1. A nut provided on its outer face with a projecting screw-threaded and inwardly-deflected arm for engaging the bolt and holding the nut thereon, substantially as described.

2. A nut provided on its outer face with an outwardly-projecting yielding arm, threaded on its inner face at its outer end to engage the bolt and lock the nut in position thereon, substantially as described.

3. The combination, with a bolt, of a nut having on its outer face an outwardly-projecting yielding arm, screw-threaded at its outer end on its inner face to engage the bolt, and the interposed sheet-metal strip or plate, for the purpose and substantially as described.

397,104. SALT-BOX. ELLERY S. AYER, Boston, Mass. Filed Sept. 17, 1888. Serial No. 285,562. (No model.)



Claim.—1. In a salt-box, a body provided centrally with two annular flanges and a perforated cover, in combination with a percussion-ring encircling said body between said flanges, substantially as set forth.

2. In a salt-box, a body provided with a perforated cover and two centrally-disposed annular flanges, in combination with a weighted percussion-ring disposed on said body between said flanges and fitted to slide longitudinally thereon, substantially as described.

3. The body A, provided with the perforated cover B, and annular flanges *x*, in combination with the hollow percussion-ring C, provided with the filling *m*, said ring being disposed on said body between said flanges and fitted to slide longitudinally thereon, substantially as and for the purpose set forth.

397,105. PAINT. DAVID BELL, Toronto, Ontario, Canada. Filed Nov. 24, 1888. Serial No. 291,803. (No specimens.)

Claim.—The herein-described composition for paint, composed of the following combination of ingredients: petroleum-tar, crude petroleum, boiled linseed-oil, mineral paint, sodium chloride, rubber, lampblack, and glue, in or about proportions specified.

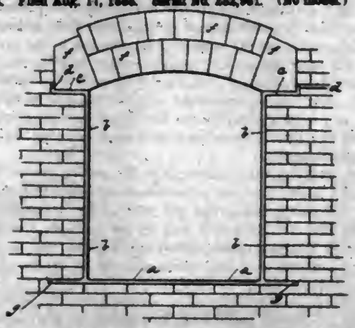
397,106. SURGICAL APPLIANCE. JAMES H. BOWER, Philadelphia, Pa. Filed Dec. 3, 1887. Serial No. 256,902. (No model.)



Claim.—1. A device for the purpose named, consisting of a cap or front portion, A', and a main portion, A^2, the latter of cylindrical form, slotted at one side, and having fastening devices connected to said cap by cords, said parts being combined substantially as described.

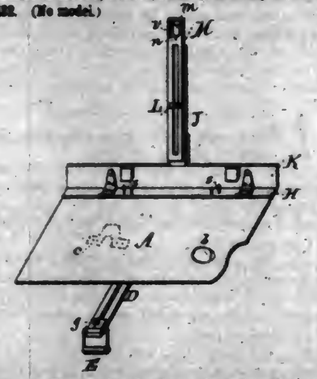
2. A device for the purpose named, consisting of a cap or front portion, A', of skeleton form, a main portion, A^2, rigidly secured to said cap and having a slotted side, non-extensible chain C, secured to said portion A^2, and clasps B, the said cap A' projecting in front of said portion A^2, substantially as and for the purpose described.

397,107. COKE-OVEN FRONT. EDWARD H. BRADLEY, Dayton, Pa. Filed Aug. 17, 1888. Serial No. 282,961. (No model.)



Claim.—A coke-oven door-frame consisting of the base *a*, the vertical sides *b*, formed integral therewith, located a short distance from the ends of the base, the horizontal outwardly-extending portions *c* at the top of the sides *b*, and the vertical flanges *d*, formed on the horizontal portions *c*, as and for the purpose described.

397,108. COMBINED PALETTE AND EASEL. ORADIAH R. BROWN and HENRY L. MOODY, Malden, Mass. Filed May 26, 1887. Serial No. 239,422. (No model.)



Claim.—1. The easel and palette above described, adapted to be placed face to face in substantially parallel planes, and provided with means, substantially as above described, whereby they may be temporarily locked face to face, but at a fixed distance apart, all as and for the purposes set forth.

2. The combined easel and palette above described, hinged together at one edge and provided with a locking-connection of substantially of the kind specified, all as and for the purposes set forth.

3. In combination, a palette and an easel connected thereto in substantially the manner specified, said easel having a support adapted

to receive one or more canvases, and an adjustable member provided with means, substantially as described, for retaining said canvases on said support, all as set forth.

4. The easel and palette combined together, as described, said easel being provided with an adjustable bar, M, and said palette being provided with an adjustable bar, D, arranged together as and adapted for the purposes set forth.

5. The combined palette and easel hinged together, as described, and provided with a handle, E, said easel being provided with a socket, T, and said palette being provided with the means, as described, for holding it in the hand, all as and for the purposes set forth.

397,109. SWITCH AND CUT-OUT FOR ELECTRIC LIGHT AND OTHER ELECTRICAL DEVICES. OSCAR S. DUSSMANN, Somerville, Mass., assignor to the Bernstein Electric Light Manufacturing Company, Portland, Me. Filed Oct. 12, 1887. Serial No. 252,122. (No model.)



Claim.—1. The posts *b b'* and the contact-spring attached to the outer end of one of the said posts and adapted to make contact with the other, as described, combined with the two-part plug-switch *d d'*, adapted to co-operate with the said spring, substantially as described.

2. The posts *b b'* and the contact-spring attached to the outer end of one of said posts and adapted to make contact with the other, and the two-part plug-switch *d d'*, combined with another contact-spring attached to one of the said posts and adapted to make contact with the other, serving as a shunt for the first-named contact-spring, and a switch for moving said contact-spring to open and close the shunt, substantially as described.

3. The posts *b b'*, the contact-spring, as *c*, having the pin 2 passing through a hole in the post, as described, combined with the two-part plug *d d'*, having the beveled end, substantially as described.

4. The posts *b b'*, the arm *b*⁴, and the contact-spring, as *c*, combined with the rotatable cut-out switch having conducting and insulating parts and a resistact, as *n'*, substantially as and for the purposes described.

5. In an incandescent lamp, the two-part plug-switch, the filament supported by it, and the frame or holder in which the said plug-switch is placed, combined with the rotatable cut-out switch for the plug-switch, said rotatable cut-out switch having conducting portions separated by a resistance, as *n'*, to operate substantially as and for the purpose set forth.

6. In an incandescent lamp, the filament and the support, combined with the cut-out switch for the filament, it comprising conducting portions and a material of comparative high resistance, as *n'*, which serves as a shunt of high resistance for the filament, but through which the current may pass should the filament be broken or otherwise destroyed, thereby at all times maintaining the continuity of the circuit in which the lamp is placed, substantially as described.

7. The posts *b b'*, the contact-spring, as *c*, and the locking-spring, combined with the rotatable cut-out switch, substantially as described.

397,110. FENCE. JOHN B. CLEAVELAND, Indianapolis, Ind. Filed Aug. 25, 1888. Serial No. 283,000. (No model.)

Claim.—1. In a fence, the combination, with the post, of an anchor and a guy secured at a point near the summit of the post, said guy passing around the end of the post and through an eye in the anchor and looped or secured to the base of said post, substantially as and for the purpose set forth.

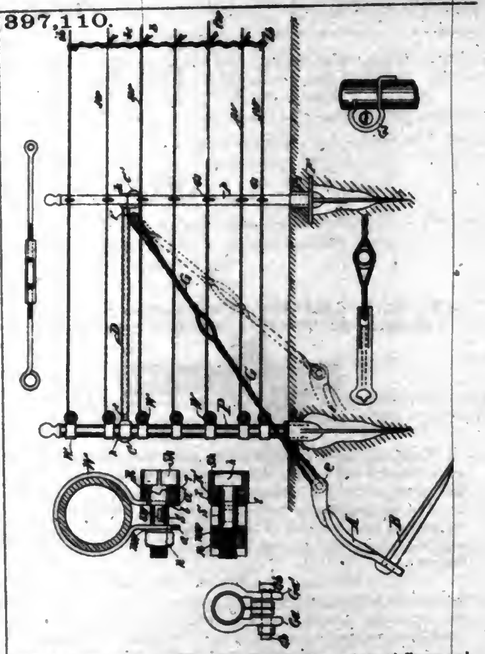
2. In a fence, the combination, with the posts P and *p* and clips C C', secured thereto, of the distance-rod D, engaging said clips, guy G, secured to the clip C', passing around the base of post P, through the eye of anchor, and secured to said post at its base, substantially as and for the purpose set forth.

3. In a fence, the combination, with the posts P and *p* and clips C and C', secured thereto, of the distance-rod D, secured to said clips, an anchor, the latter clip with a wire-winding spindle, and a guy-rod, which, secured to the base of the post P and passing through the eye of the anchor, is also secured to the winding-spindle working in arms A and A', integral with clip C', substantially as and for the purpose described.

4. In a fence, a guide-staple, Gs, bent to form a shoulder, and having one of its legs penetrating partially through posts and the other entirely through, substantially as and for the purpose described.

5. In a fence, the post P, clip C, secured thereto, which clip is engaged by one end of the rod D, rod D, clip C', secured to the post P and engaged by the other end of the rod D, and the arms carrying the windlass-spindle or bolt *b*, around which the flexible guy is wound,

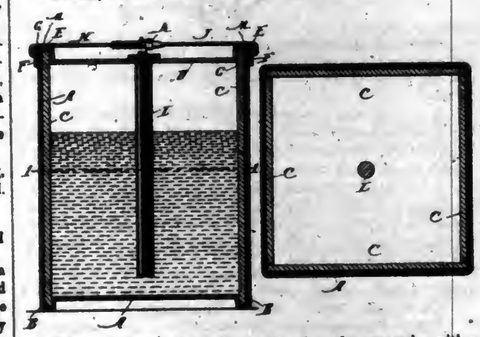
397,110.



a flexible guy and its anchor, all in combination, substantially as and for the purpose set forth.

6. In a fence, the combination of a corner or end post, an intermediate post, and a distance-rod secured to said posts at or near their summits, with a guy secured to said intermediate post at or near distance-rod at its top end and anchored to ground at its bottom end, substantially as and for the purpose described.

397,111. GALVANIC BATTERY. EDWARD J. COLBY, Chicago, Ill. Filed May 21, 1888. Serial No. 274,485. (No model.)



Claim.—1. In a battery, the combination of a square jar with a continuous carbon plate along each inner side thereof and a zinc in the center.

2. In a battery, the combination of a jar with a series of flat carbon plates which extend substantially around its inner surface, one continuous plate on each side of the jar, and a zinc in the center.

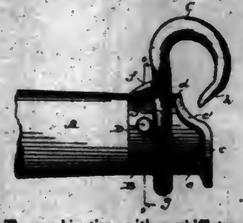
3. In a battery, the combination of carbon plates with a grooved cover to receive such plates and clamps which securely clamp such plates against the inner surface of said groove at their upper ends.

4. In a battery, the combination of carbon plates with a grooved cover, clamping-rods, and a coupling connecting such rods, so that by operating the coupling the rods may be made to clamp the upper edge of such carbon plates against the sides of the groove in the top.

5. In a battery, the combination of carbon plates with a grooved top, clamping-pieces, rods which engage such pieces at one end, and a coupling which connects the clamping-rods at their other extremities, so that by turning such coupling the rods may be drawn together and the carbon plates be clamped along their entire upper edges against the inner sides of the groove in the top.

6. In a battery, the combination of a square jar with grooves in its bottom to receive the carbon plates, with a top grooved in like manner to receive the upper ends of the carbon plates, a central zinc, and a series of clamping-rods and screw-couplings, whereby the said carbon plates may be securely clamped against the edge of the groove in the top.

397,112. WHIFFLETREE-HOOK. JOHN R. DAVIS, Racine, Wis. Filed May 24, 1888. Serial No. 274,936. (No model.)

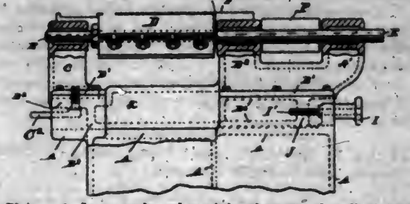


Claim.—1. The combination, with a whiffletree-ferrule having a beveled flange on its outer periphery, of a ring surrounding said ferrule and a hook projecting from said ring and terminating in an angular point conforming to and bearing against the inside surface of the said beveled flange, substantially as and for the purpose set forth.

2. The combination, with a whiffletree end of a ferrule fitted thereto and provided with retaining lugs and perforations, of a hook-ring surrounding said ferrule and malleable-iron pins adapted to be driven through said holes into the wood of the whiffletree end, and to limit the play of said hook-ring between the heads of said pins and said lugs, substantially as shown and described.

3. The combination of a whiffletree end of a ferrule fitted thereto and secured by malleable-iron pins driven through holes in said ferrule into the wood of the whiffletree end, said ferrule being notched or recessed at its periphery for from about one-third to about one-half of its circumference, a beveled flange extending around the said periphery and down alongside the edge of the recess, terminating in lugs on each side thereof, other lugs extending back from said flange and forming the corners of a square with the just-named lugs, a hook-ring surrounding said ferrule and confined between said lugs and pins, and a hook projecting from said ring and terminating in an abrupt angle-point conforming to and bearing against the inner surface of said beveled flange.

397,113. WOOD-WORKER. WILLIAM H. DOANE, Cincinnati, Ohio. Filed July 9, 1888. Serial No. 279,369. (No model.)



Claim.—1. In a wood-worker of the character described, having adjustable platens at the sides of the cutter-head, a supporting frame or bed formed with a guideway or depression beneath and parallel with the cutter-arbor, in combination with a slide-frame adjustable in and guided thereby, and carrying bearings for the cutter-arbor, substantially as set forth.

2. In a wood-worker of the character described, a slide-frame adjustable in guides across the supporting-bed of the machine, parallel with and beneath the arbor, and carrying three bearings for said arbor, two of said bearings being fixed and one removable, substantially as set forth.

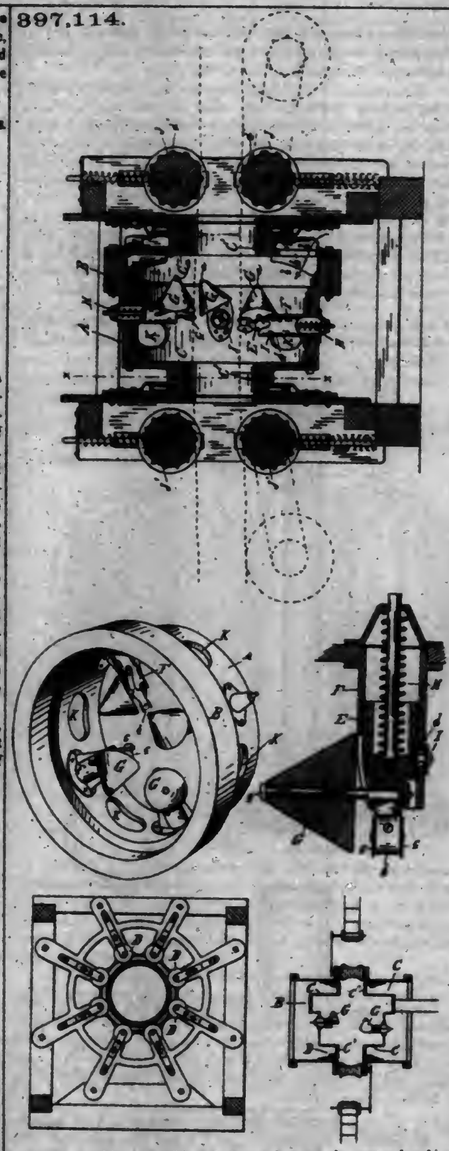
3. In a wood-worker, in combination with the cutter-arbor, its cutter, and driving-pulley, an adjustable slide-frame carried in guides across the supporting-bed beneath the arbor, having bearings integral therewith at both sides of the pulley, and a third or front bearing for the arbor beyond the cutter removably attached thereto, substantially as set forth.

397,114. MACHINE FOR REMOVING BARK FROM TIMBER. NIMIAH H. DOANE, St. Ignace, Mich., assignor to Everett & Connor, same place. Filed Apr. 26, 1888. Serial No. 271,994. (No model.)

Claim.—1. In a machine for the purpose described, a rotary cutter-head centrally apertured and provided with radial self-adjusting knife-holders carrying conical knife-guides and barking-knives, substantially as described.

2. In a machine for the purpose described, a rotary cutter-head centrally apertured and provided with radial self-adjusting knife-

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holders rotatably secured in tubular sockets on the cutter-head, substantially as described.

3. In a machine for the purpose described, a rotary cutter-head centrally apertured and carrying radially-adjustable knife-holders, the knives secured thereto, and the conical knife-guides, substantially as described.

4. In a machine for the purpose described, the combination, with the rotary cutter-head provided with radially-adjustable knife-holders carrying stripping and barking knives and conical knife-guides, of the feed-rollers arranged in yielding bearings in front and rear of the aperture of the cutter-head, substantially as described.

5. In a machine for the purpose described, the combination, with the rotary cutter-head, of the radially self-adjusting knife-holders consisting of the socket F, the knife-holder E, radially adjustable therein, the tension-spring H, the wrist I, and the spiral slot *d*, substantially as described.

6. In a machine for the purpose described, the combination of the following elements: the centrally-apertured rotary cutter-head, the radially-adjustable knife-holders secured thereto and provided with suitable knives for cutting and stripping the bark, the knife-guides secured to the inner ends of the knife-holders in advance of the knives,

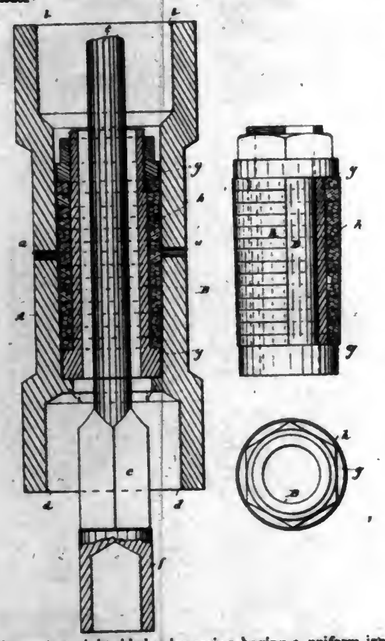
the feed-rollers arranged in front and rear of the apertures, and the blast-generating devices applied to the cutter-head arranged to assist in removing the débris, substantially as described.

7. In a machine for the purpose described, the combination of the following elements: the rotary cutter-head provided with apertured bearings, the anti-friction bearings, the radial self-adjusting knife-holders, the conical guides secured to the knife-holders in advance of the knives, the barking and stripping knives secured to the knife-holders, and the spiral guides, all combined to operate substantially as and for the purpose described.

8. In a machine for the purpose described, the combination, with the rotary cutter-head centrally apertured and provided with radially self-adjusting knife-holders and knives, substantially as described, of the feed-rolls provided with longitudinal flattened spurs for feeding the timber and preventing it from rotating, substantially as described.

397,115. DISCHARGE-VALVE FOR OIL-WELL STAND-PIPES.

ROBERT M. DUFF, Raw, Pa. Filed Aug. 15, 1887. Serial No. 247,035. (No model.)



Claim.—A straight-sided valve-casing having a uniform inner diameter and having an outlet and an internal shoulder formed thereon, in combination with a hollow movable plug or valve which fits within said cylinder and is adapted to rest on said internal shoulder in the cylinder, and a piston-rod which operates said plug, substantially as and for the purposes specified.

397,116. GALVANIC BATTERY.

CHARLES E. BEAN, Columbus, Ohio, assignor of one-fortieth to John D. H. McKinley, same place. Filed July 9, 1888. Serial No. 279,627. (No model.)

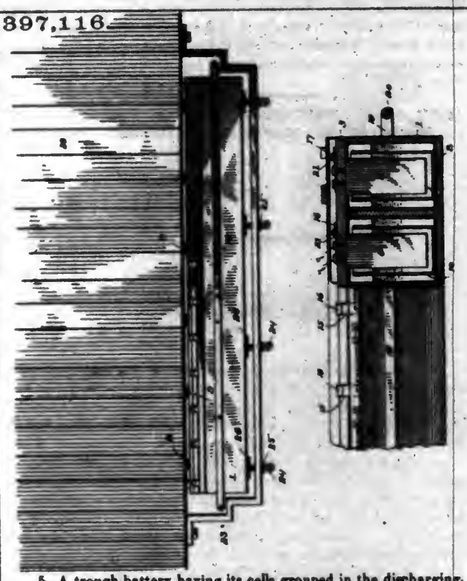
Claim.—1. In a galvanic battery, a combination of a trough divided into cells by transverse partitions, a metallic lining in each cell, negative electrodes secured to the lining, a cover common to the cells, and positive electrodes secured to the cover.

2. In a galvanic battery, a combination of a trough divided into cells by transverse partitions, handles secured to the cells to facilitate transportation, a cover common to all the cells, positive and negative electrodes secured to the cover and the cells, respectively, and contacts on the cover and the trough adapted to throw all of the cells into series when the cover is applied.

3. In a galvanic battery, a combination of a trough divided into cells by transverse partitions, electrodes secured to the sides of the trough, contacts in circuit with the electrodes, a cover common to all of the cells, electrodes attached thereto, and electric connections between the electrodes carried by the cover and the side of the cover, whereby the mere placing of the cover in position will throw all of the electrodes into series relation.

4. In a galvanic battery, a containing-vessel lined with lead and having carbon electrodes secured to the side walls by lead-covered bolts, whereby an extensive negative surface is secured and the fastening devices are protected from corrosion.

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5. A trough-battery having its cells grouped in the discharging-circuit by electrical connections on the outside of the trough, said connections being covered by a protective casing, as and for the purpose set forth.

6. The combination, with a vehicle, of a frame or casing on the under side thereof, a battery within the casing, and adjusting devices for locking the battery against movement in the casing.

7. The combination, with a vehicle, of a frame or casing on the under side thereof, a battery within the casing, a packing between the battery and its cover, and adjusting-screws in the bottom of the casing to press the battery against the bottom of the vehicle and prevent displacement of the battery or spilling of its contents.

8. A depolarizing-liquid for a galvanic battery, consisting of an acid solution to which is added a previously-prepared compound of nitrate of potash and sulphuric acid.

9. A depolarizing-liquid for a galvanic battery, consisting of a mixture of chromic acid, sulphuric acid, and water, and containing granules or lumps of a previously-prepared compound of nitrate of potash and sulphuric acid.

10. A depolarizing-liquid for a galvanic battery, containing a compound formed by the action of sulphuric acid on the granules or lumps of nitrate of potash.

397,117. HAT-BLOCK.

JOHN C. FISHER, Reading, Pa. Filed Oct. 19, 1888. Serial No. 288,582. (No model.)



Claim.—1. A hat-forming ring, substantially as described, having a V-shaped circumferential groove with lining-band C, substantially as and for the purpose set forth.

2. A hat-forming ring, substantially as described, having strengthening-bands around the top and bottom rims, and an intermediate V-shaped groove with lining-band C, substantially as and for the purpose set forth.

3. A hat-forming ring, substantially as described, having a V-shaped groove, E, metallic bands B and C, and metallic binding-strips M, substantially as and for the purpose set forth.

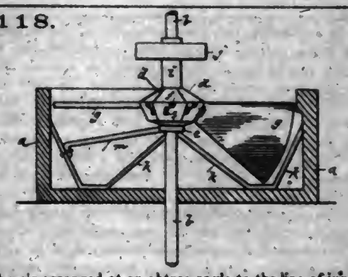
397,118. MEANS FOR OPERATING MOTIVE POWER FROM WATER AND AIR CURRENTS.

JOSIAH B. FOX, Emlenton, Pa. Filed Jan. 14, 1888. Serial No. 260,773. (No model.)

Claim.—1. The combination consisting of the frame *a*, the vertical shaft *b*, the sleeve *i*, and hub *d*, attached thereto, the double paddles *g*, arranged securely about the hub *d*, and the turning device *m*, substantially as set forth.

2. The combination of a fixed central shaft, a sleeve loosely fitted thereon and carrying a hub, the paddles *g*, arranged in pairs and at right angles to one another on opposite ends of horizontal shafts *f*, which are loosely journaled in said hub, each shaft having an oblique

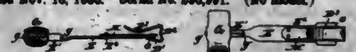
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bend, *l*, therein arranged at an obtuse angle to the line of juncture of the pair of right-angled blades, whereby the shaft and paddles can make a quarter-turn without obstruction from the fixed central shaft, and a fixed turning piece arranged in the path of the paddles, substantially as and for the purpose described.

397,119. CUFF-FASTENER.

HENRY C. FRANK, New York, N. Y. Filed Nov. 16, 1888. Serial No. 290,991. (No model.)

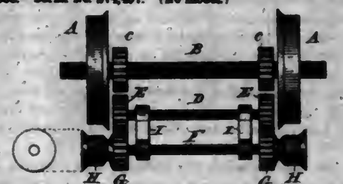


Claim.—1. In a cuff-fastener, the hinged hook D D' D^2 D^3 and shank E, in combination with each other and with the spring M and clasp G, arranged for joint operation as herein specified.

2. In a cuff-fastener, the swivel E', formed on a rigid extension of the shank E, in combination with the hook D D' D^2 D^3 and with the spring-clasp G, the fastener being adapted to serve right or left as will, while holding itself rigid longitudinally as herein specified.

397,120. BRAKE.

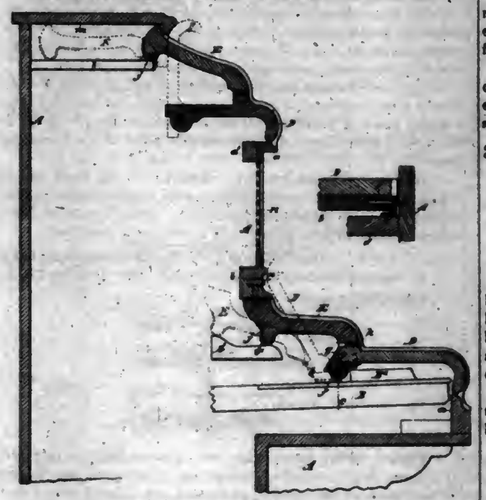
OSCAR L. GILBERT, St. Paul, Minn. Filed May 19, 1888. Serial No. 274,457. (No model.)



Claim.—In a car-brake, the combination of the hanger provided with axle F, having gear-wheels and brake-wheels, and axle D, having gear-wheels, and the car-axle, provided also with gear-wheels, whereby the brake-wheels are made to move in a direction the reverse of that of the car-wheels.

397,121. PIANO-CASE.

PAUL GRENELIN, New York, N. Y. Filed Oct. 4, 1888. Serial No. 287,171. (No model.)



Claim.—1. The front fall, D, having fixed pivots *f f*, combined with the back fall, E, hinged to the front fall, and with a support for the back fall, substantially as described.

2. In a piano, the front fall, D, and key-blocks *d*, having pivot-pins *f*, to which the front fall is attached, combined with the back fall, E, that is hinged to the front fall, and with a support for the inner end of the back fall, substantially as described.

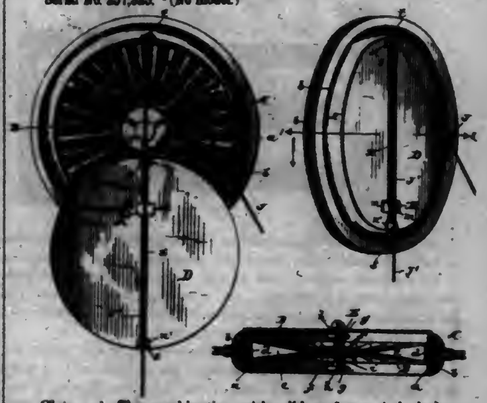
3. The combination, with a front fall that is pivoted so as to lie close to the keys, with a back fall hinged to the front fall and adapted to be pushed inward by said front fall, of a support for the inner end of the back fall, and with a rail, *l*, extending across the front of the piano, and a lock on the rail *l*, for engaging the back fall to lock the piano, substantially as described.

4. The combination of the jointed fall D E and its fixed pivots *f* with the front rail or slip, *a*, and with the upper rail, *l*, having lock *l*, the front edge of the fall being adapted to rest on the highest part of the slip *a*, substantially as described.

5. The front frame, *a*, having the grooved rail *a*, and the extra slip a^4, glued to the inner side thereof, combined with the front fall, D, pivoted at the upper part of the piano and resting at one end upon the slip *a*, and with the back fall, E, hinged to the front fall, and a support for the inner end of the back fall, E, said back fall being pushed under the top of the piano when the front fall is raised, substantially as described.

397,122. VENTILATOR.

BETA A. GOODELL, Chicago, Ill., assignor to the Consolidated Patents Company, same place. Filed Dec. 6, 1887. Serial No. 257,395. (No model.)



Claim.—1. The combination, with a lid or frame, A, inclosing a ventilator-opening, of a cover, D, arranged to slide in a plane parallel to said frame and provided with a transverse slot, *x*, receiving a guiding-stud, E, upon the frame, serving as the sole means of guiding and retaining the cover in permanent sliding connection with the frame, substantially as set forth.

2. The combination of the frame A, guided slide D, eye *t*, arranged above the slide, and operating-cord J, extending through the eye *t* and downward and connected to the slide, substantially as set forth.

3. The combination of the frame A and slide D, having a vertical opening, *x*, guiding-stud E on the frame, extending into said opening, eyes *u u'* upon the slide, eye *t* upon the frame, and operating-cord J, substantially as set forth.

397,123. FOUNTAIN-PEN.

OSCAR F. GRANT, Pittsburg, Pa. Filed July 2, 1888. Serial No. 278,790. (No model.)



Claim.—1. A combined finger-hold and ink-reservoir adapted to be applied to an ordinary pen-holder and consisting of an elastic tube having a hole at one end for the reception of the lower end of a holder, an opening at the opposite end for the passage of the pen, and a bulbous intermediate body forming a reservoir, substantially as described.

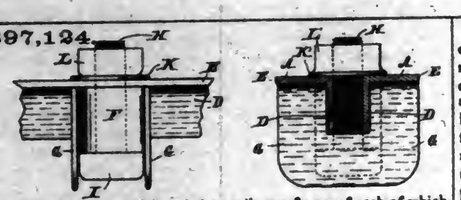
2. A combined reservoir and finger-hold for pens, consisting of a tubular section of elastic material reduced at one end to closely embrace the pen, substantially as described.

397,124. HAY-CARRIER TRACK.

MARIAS G. GRONOUP, Milwaukee, Wis. Filed Oct. 30, 1888. Serial No. 289,526. (No model.)

Claim.—1. The combination of a clamping and supporting block consisting of a U-shaped band having two wings, one at each end, each of which wings projects outwardly laterally from the body of the band as great a distance as the lateral width of the flange of the rail resting

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thereon, with two parallel angle-iron rails, one flange of each of which rails is within and the other upon the end of such band and the wings projecting therefrom, and a bolt and nut whereby the angle-iron rails are secured rigidly to the block, substantially as described.

2. The combination of two angle-iron rails located at a distance apart but parallel to each other, with a U-shaped block within which the two downwardly-projecting flanges of the angle-irons are received, and a bolt and nut whereby the block is clamped to the angle-irons, the bolt being inserted through the band and between the angle-irons, substantially as described.

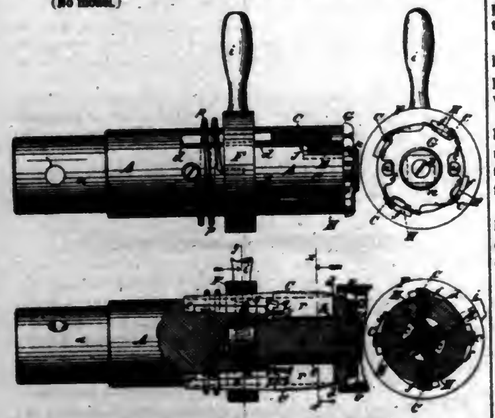
397,125. VALVE FOR FLUID-PRESSURE BRAKES. HERMAN GUHLS, St. Louis, Mo., assignor to the American Brake Company, same place. Filed Aug. 21, 1888. Serial No. 283,332. (No model.)



Claim.—1. The combination, in a valve for fluid-pressure brakes, of a double-seating valve having an exhaust-port, and ports leading to the auxiliary reservoir and cylinder, an air-chamber which communicates with the train-pipe, and a diaphragm arranged in said chamber, having a constant leak and connected with the double valve, substantially as and for the purposes specified.

2. In a fluid-pressure valve, the combination of the bottom section, the plug-valve section and its valve, the shell-section C, forming an air-chamber around the stem of the valve, the diaphragm connected to the valve-stem and having a constant leak, and the cap-section having a port, substantially as and for the purposes specified.

397,126. EXPANSIBLE AND COLLAPSIBLE TAP. THORVALD F. HANNER, Branford, Conn. Filed Sept. 7, 1888. Serial No. 284,317. (No model.)



Claim.—1. In a collapsing tap, the combination, with the sustaining stock or body and radiating movable tapping blades or cutters mounted thereon, and an internal rotary cam-spindle having cams to bear against and project the cutters, of a reamer or reaming-head attached to the end of the cam-spindle in advance of the stock and its cutters, whereby the retardation of the advancing reamer in entering the work will cause the cam-spindle to be arrested while the stock and its blades revolve thereon, and thereby automatically expand the tapping-cutters, with a retracting device to retract the cutters when the revolution is reversed, substantially as herein set forth.

2. In a collapsing tap, the combination of the sustaining stock or body having radially-movable cutters mounted therein, an internal rotary cam-spindle bearing on the cutters, an external cam-ring encircling the stock, connected rotatively with the inner cam-spindle and having inclines bearing externally on the cutters reverse to the inclines of the internal cam-spindle, with a reaming disk or head fixed to the end of the cam-spindle, said cam mechanism having a rotative engagement with the stock, with a limited play in the connection equal to the action of the cams, substantially as and for the purpose set forth.

3. The combination of the stock or body having radially-movable tapping-cutters, the internal cam-spindle acting to diverge the same, the external cam-ring acting to contract the same, and a retracting-spring tending to turn the ring in its contrary or retracting direction, with a reaming disk or head fixed on the end of the spindle, substantially as and for the purpose set forth.

4. The combination of the stock or body having radially-movable tapping-cutters, the internal cam-spindle acting to diverge the same, and an external retracing device acting to converge the same, with a reaming disk or head fixed on the end of the cam-spindle in advance of the stock and its cutters, and a positive rotative stop or engagement between said stock and reamer having a loose rotative play between the two equal to the action of the cams, substantially as and for the purpose set forth.

5. In a collapsing tap, the combination, with a stock or body having radial slots, of movable blades or cutters mounted in said slots and fulcrumed therein by having one extremity abutting directly against and superposed upon the body of the stock at the end of the slots, substantially as set forth.

6. In a collapsing tap, the combination of the slotted stock or body and a series of radially-movable blades or cutters mounted therein, having rocking fulcrum-tips abutting directly upon a fulcrum seat or bearing in the body of the stock at the ends of the slots, an internal cam or diverging device bearing on the swinging ends of the blades to diverge the same, and an external retracting device bearing on the middle portion of the lever-blades between the fulcrum and the swinging or threaded ends, substantially as and for the purpose set forth.

7. In a collapsing tap substantially such as set forth, the combination, with the tap-body, of the lever-like threading blades or cutters C, having the fulcrum projection or rocking tip *c* on the extremity opposite to the threaded end, substantially as and for the purpose set forth.

8. The combination of the slotted stock or body A, having the slots *d* made deeply or entirely through the stock at the front end and partly through the stock at the rear end, leaving a solid base, *m*, with the lever-like blades C, fitting said slots and fulcrumed therein by having their extremities resting or abutting directly upon the solid base *m* at the end of said slots, substantially as set forth.

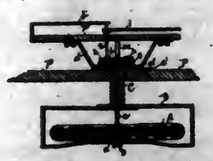
9. In a collapsing tap, in combination with the tap-body, the lever-like threading-blades C, made in two parts, with the threaded parts attachable to and detachable from the fulcrum part, substantially as set forth.

10. In a collapsing tap, in combination with the tap-body, the lever-like threading-blades C, made in two separate parts, *r s*, with a projection on one part to fit a recess on the other, and a fastening device to hold the two parts together, substantially as set forth.

11. In a collapsing tap, the combination, with the stock or body having a series of slots and movable cutters set in said slots, of a chip-resisting guard or shield set into the stock at the edge of the slot in the cutting side of the cutters, substantially as and for the purpose set forth.

12. In a collapsing tap, the combination of the stock having longitudinal dovetailed sockets adjoining the tapping-blades on their cutting side, with the hardened blocks H, having dovetailed edges driven into said sockets, substantially as shown and described.

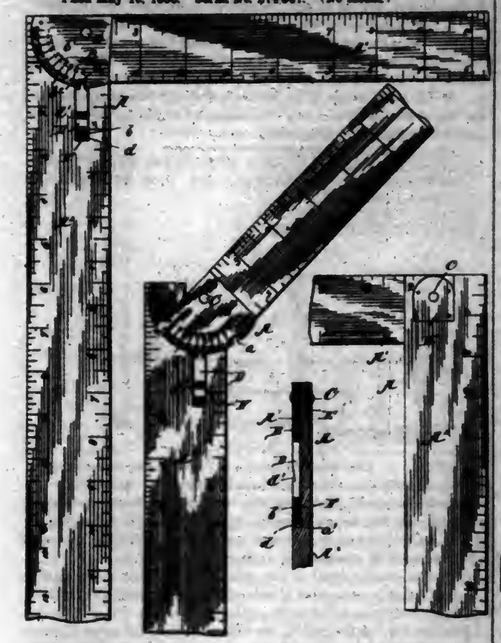
397,127. OVEN-THERMOMETER. HOMER HENDERSON and FRANK H. JOHNSTON, Columbus, Ohio. Filed Apr. 30, 1888. Serial No. 272,376. (No model.)



Claim.—1. The combination, with the air-chamber A, supported in a frame, B, of the spring-actuated pin *c*, bearing against the face of said chamber, and having guide-head *g* and slotted strip *h*, dial-plate F, and twisted hand-post *k*, carrying hand *l* and pivotally supported in the frame of said dial, substantially as and for the purpose specified.

2. The combination, with the air-chamber A, supported within a frame, B, and the hollow screw C, secured to said frame, of a dial-plate, F, having figures and letters thereon, as described, and having its supporting-frame detachably connected with the screw C, pin *c*, passing through screw C and frames *d* and B and having guide-head *g* and slotted strip *h*, and twisted hand-post *k*, carrying indicator-hand *l*, substantially as and for the purpose specified.

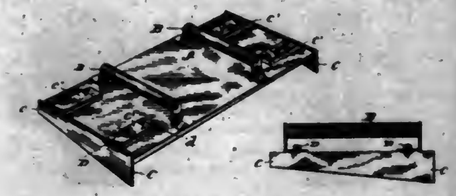
397,128. SCALE-MEASURE. STEPHEN J. HESTER, Fulton, Ky. Filed May 19, 1888. Serial No. 274,267. (No model.)



Claim.—1. A measuring-instrument for marking off the angles at which to cut rafters, consisting of two legs, pivoted together and designed to be provided with suitable scales, one of the legs having a spring-actuated pawl and the other provided with a sector-plate having a recess adapted to be engaged by the pawl to hold the legs perpendicular to each other, and a series of notches to be engaged by said pawl, substantially as described.

2. A measuring-instrument for marking off the angles at which to cut rafters, consisting of two legs pivoted together, one of said legs having a slot terminating in a cylindrical hole and provided with a pawl sliding within the slot and having an extension and a spring coiled around the extension to hold the pawl in an extended position, and the other one of said legs having a sector-plate provided with a recess and a series of notches, substantially as and for the purpose described.

397,129. PLASTERING-TROWEL. ALEXANDER HILL, Kansas City, Mo. Filed June 26, 1888. Serial No. 278,493. (No model.)

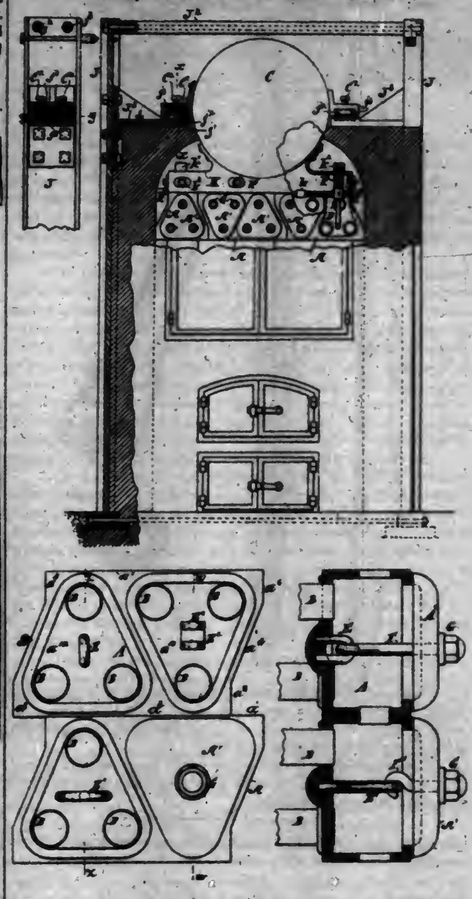


Claim.—1. The herein-described trowel, consisting of the flat-faced body portion provided with end guides secured thereto to regulate the thickness of the coat of plaster, substantially as set forth.

2. In a trowel, the combination, with a flat body provided with a pair of handles secured to its back, of end guides secured to the body and adjustable at right angles thereto, substantially as set forth.

3. In a trowel, the combination, with the body portion provided with a pair of handles secured to its back, of end guides secured to the body and adjustable at right angles thereto, the said end guides being narrower at one end than at the other, substantially as set forth.

397,130. STEAM-BOILER. WILLIAM R. KELLY, New Brunswick, N. J. Filed Sept. 22, 1888. Serial No. 286,101. (No model.)



Claim.—1. In a header, the combination, with the back of the header, of a connection for a removable bolt, said connection being of wrought-iron or similar material fastened to the back of the header by having the metal of the back of the header cast around it, substantially as specified.

2. In a boiler, the combination, with the back of a header, of an eye-connection for a bolt provided with a shank having an enlarged end, said eye being secured to the back of the header by having the metal of the back of the header cast around the shank, substantially as specified.

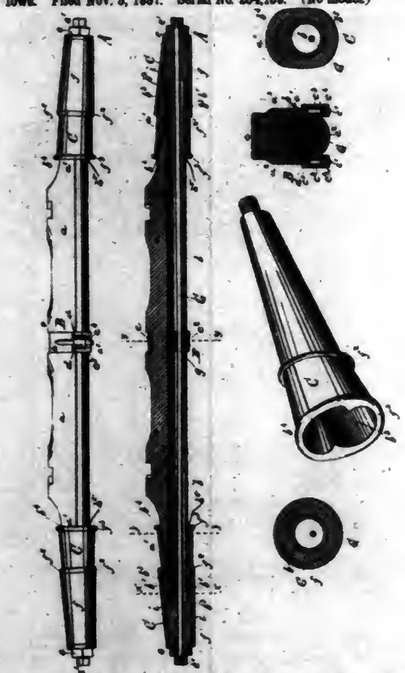
3. In a boiler, the combination, with a header having a detachable cover, of a bolt for securing the cover, an eye at the rear end of the bolt, and crossed hooks secured to the back of the header, substantially as specified.

4. In a boiler, the combination of a longitudinally-extending drum or shell, water-tubes, series of headers at the ends of the tubes, and a transverse saddle arranged between a series of headers and the drum or shell, and provided with openings opposite the headers immediately below and turrets above such openings, substantially as specified.

5. In a boiler, the combination of a longitudinally-extending drum or shell, water-tubes, series of headers at the ends of the tubes, and a transverse saddle arranged between a series of headers and the drum or shell, and provided with openings opposite the headers immediately below, turrets above such openings, hand-holes in the front in line with the turrets, and hand-holes at the ends, substantially as specified.

6. In a boiler, the combination, with a drum or shell provided with laterally-extending brackets or arms, of standards or columns provided with inwardly-extending brackets, rollers between the brackets of the columns and the brackets or arms of the drum or shell, loose plates bearing upon these rollers, and adjusting-screws extending through one pair of brackets or arms and impinging upon the loose plates, substantially as specified.

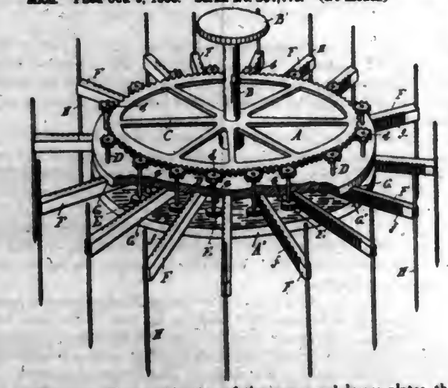
397,131. WAGON-AXLE. NATHANIEL S. KETCHUM, Marshalltown, Iowa. Filed Nov. 3, 1887. Serial No. 254,139. (No model.)



Claim.—1. The combination of the abutments *i* of a wagon-axle skein, the wood stock *a*, metal axle-tube *b*, perforated metal truss-block *g* within the tube, truss-rod G, and tightening-nuts *d'*, substantially as and for the purpose described.

2. A wagon-skein, C, constructed at its inner end with a hood, b^4, a semicircular channel, b^3, and a circular chamber, b^2, substantially as and for the purpose described.

397,132. PIPE-JOINT DELINEATOR. GEORGE S. KIMBALL, Detroit, Mich. Filed Oct. 9, 1888. Serial No. 287,770. (No model.)



Claim.—1. The combination of the upper and lower plates, the means for extending and retracting the extension-arms, the extensible arms, and the delineating-needles, substantially as described.

2. The combination of the upper and lower plates, the mechanism for simultaneously extending or retracting the extensible arms, the extensible arms, and the delineator-needles, substantially as described.

3. The combination of the upper and lower plates, the mechanism for extending and retracting the extensible arms, the extensible arms, the guides for the extensible arms, and the delineating-needles, substantially as described.

4. The combination of the upper and lower plates, the mechanism for extending and retracting the extensible arms, the guides for the extensible arms, the extensible arms, the spring on the arm to retain the needle, and the delineating-needle, substantially as described

5. The combination of the upper and lower plates, the means for extending and retracting the extensible arms, the extensible arms, the flexible jacket, and the delineating-pins, substantially as described.

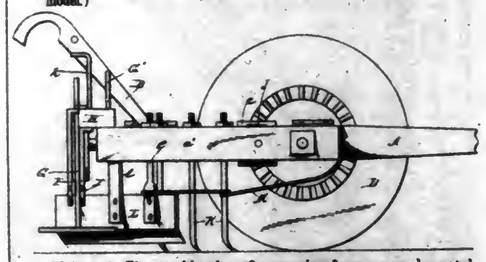
6. The combination of the upper and lower plates, the mechanism for extending and retracting the extensible arms, the guides for the extensible arms, the extensible arms, the flexible jacket, and the delineating-pins, substantially as described.

7. The combination of the upper and lower plates, the arms, the flexible jacket, and the delineating-needles, substantially as described.

8. The combination of the flexible jacket, the delineating-needles, and the means for extending the flexible jacket to a circular form, and means for preserving the alignment of the sections of the flexible jacket when in a circular form, substantially as described.

9. The combination of the flexible jacket, the delineating-needles, and the means for preserving the alignment of the sections of the jacket when unrolled, substantially as described.

397,133. COTTON CHOPPER, SCRAPER, AND HARROW. JOHN M. P. LYON, Leeds, Ala. Filed May 5, 1888. Serial No. 272,964. (No model.)



Claim.—1. The combination of a carrying-frame, a supplemental frame pivotally connected thereto and carrying a ground-wheel, a spring for normally depressing the supplemental frame, a counter-shaft journaled in the supplemental frame and geared to the ground-wheel, a chopper-hoe, and devices connecting the chopper-hoe with the counter-shaft, substantially as described.

2. The combination of the main carrying-frame, an adjustable fulcrum pivotally connected at one end to the frame, a vertical fixed guide carried by said frame in juxtaposition to the free end of the adjustable fulcrum for guiding the fulcrum in a direct vertical line, a chopper-hoe pivoted to the fulcrum, and mechanism for reciprocating the hoe, substantially as described.

3. The combination of the main frame, the slotted fulcrum pivotally connected thereto, vertical guide passing through the slot, a chopper-hoe carried by the fulcrum, the guides between which the chopper-hoe reciprocates, and mechanism, as described, for reciprocating the hoe, substantially as set forth.

4. The combination of the main carrying-frame, a supplemental frame pivotally connected thereto and carrying a ground-wheel and a counter-shaft, which are geared together, a spring for normally depressing the supplemental frame, an adjustable fulcrum carried by the main frame, a chopper-hoe pivoted to the fulcrum and connected with the counter-shaft, the vertical harrow-teeth, and a scraper in rear of said teeth having the cutting-lip and angular end, substantially as described.

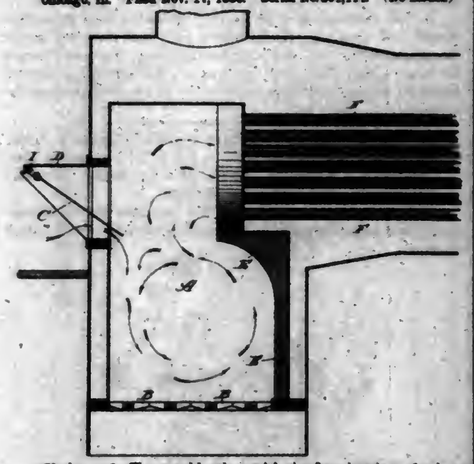
397,134. VALVE. GEORGE A. MATTESON, Gridersville, Ohio. Filed Aug. 31, 1888. Serial No. 284,272. (No model.)



Claim.—1. In a valve, the combination, with the casing A, provided with a longitudinal opening, of the core mounted transversely in the casing and provided with an opening, H, adapted to register with the longitudinal opening, the valve-seat on the side of the core, the removable connection C, bolted to the upper end of the casing over the longitudinal opening thereof, and the check-valve provided with trunnions mounted in bearings at the sides of the said seat, the check-valve being less in width than the longitudinal opening, whereby it may be introduced and removed therethrough when the connection is removed, substantially as specified.

2. In a valve, the combination, with the casing, of the core mounted in a transverse bore in the casing and provided with an opening, H, adapted to register with a longitudinal opening therein, the valve-seat fitted in a recess, I, in the core and having the closed bearing R and the open bearing R' at opposite sides thereof, the check-valve provided with trunnions L' L', mounted in the said bearings, and a transverse rib, *l*, adapted to bear against the side of the bore when the valve is closed, substantially as specified.

397,135. SMOKE-CONSUMING FURNACE. CORNELIUS MCGINNIS, Chicago, Ill. Filed Nov. 17, 1888. Serial No. 291,114. (No model.)



Claim.—1. The combination, with the fire-chamber of a locomotive, of an arch curved at its upper end, an inclined door for directing air against such arch, and an apron secured to the outside of the fire-chamber in which the door is hinged, substantially as described.

2. The combination, with the fire-chamber of a locomotive, of an arch curved at its upper end and extending back of the rearward end of the smoke-flues, an inclined door for directing air against such arch, and an apron secured to the fire-chamber in which the door is hinged, substantially as described.

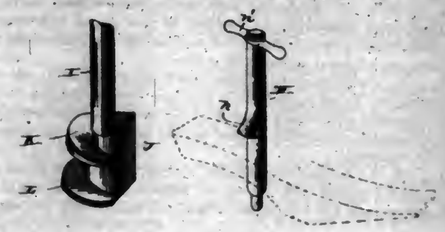
3. The combination of the door C, apron D, levers G G, plate H, and arch E, all arranged and operating substantially as described.

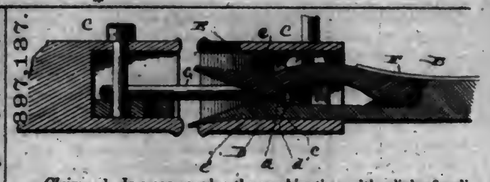
397,136. SNAP-HOOK. HORACE G. MCLEAN, McPherson, Kans. Filed June 21, 1888. Serial No. 277,903. (No model.)



Claim.—In a snap-hook, the shank or body B, having eye A at one end and an open hook at the opposite end, lever D, provided with a hook at one end and with an outwardly-turned elevated portion, E, at the opposite end, and which has hinge lug or lugs *a* formed upon its inner side, said lever being pivoted to one side of shank B, so that the hook will open in a plane at right angles to the flat side of the jaw carried by the shank, pin *b*, which connects lug or lugs *a* to said shank, and spring *c*, located between elevated portion E and the shank of the hook, substantially as described.

397,137. CAR-COUPLING. SIMON P. MICKEY, Wood Lawn, Va. Filed Nov. 1, 1888. Serial No. 289,771. (No model.)





Claim.—1. In a car-coupler, the combination, with a link of ordinary construction, of a pivotal coupling-hook having the face of its point downward and a suitable shoulder between its point and shank, and a cam-block secured to a vertical shaft journaled in the draw-head in rear of the point of the hook and provided with inclined cam-ridges that engage under the hook and the link, substantially as described.

2. In a car-coupler, the combination, with the draw-head having the outer portion of its floor inclined downward and outward and the draw-bar having its outer portion secured in a central longitudinal recess in the said floor, and formed into an upwardly-facing coupling-hook provided with a suitable shoulder between its point and shank, of a downwardly-facing coupling-hook pivoted to the upper edge of the draw-bar and provided with a suitable shoulder between its point and shank, the spring secured to the draw-bar and bearing down on the shank of the pivoted hook, and the quadrant-shaped cam-block secured to a vertical shaft and provided with inclined cam-ridges engaging under the hook and the link, substantially as described.

3. In a car-coupler, the combination, with the link of ordinary construction, the lower fixed upwardly-facing coupling-hook having a vertical shoulder between its point and shank, the upper pivoted downwardly-facing coupling-hook provided with a similar shoulder between the point and shank, and the quadrant-shaped rotatory cam-block provided with two similar inclined cam-ridges, the upper one of which engages under the shank of the pivoted hook and lifts the point thereof out of the link, while the lower one simultaneously lifts the inner end of the link above the shoulder of the lower hook, substantially as specified.

4. The combination, with the draw-head having a flaring mouth, the draw-bar having its outer portion formed into the hook D, seated in a recess in the draw-head and provided with the shoulder *d*, and recess *d'*, the upper pivoted hook, E, provided with the shoulder *e*, and projection *d'*, and the spring F, of the shaft I, journaled in the floor and roof of the draw-head, the hand-wheel *i* on the upper end of said shank, and the quadrant-shaped cam-block secured to said shaft and provided with the inclined cam-ridge K to engage under the shank of the pivoted hook, and the similar cam-ridge, L, to engage under the entered end of the link, substantially as specified.

5. In a car-coupler, the combination of the lower upwardly-facing coupling-hook secured to the floor of the draw-head, the upper downwardly-facing coupling-hook pivoted to the draw-bar, and the shaft H, journaled in the draw-head, having the handle *h'* on its upper end, and provided with the lateral projection *h*, adapted to be turned upon the shank of the upper hook and keep the latter down on the lower hook, substantially as specified.

397,138. COULTER-CLAMP. RIPLEY A. MOORE, Hickory Plains, Ark. Filed Oct. 24, 1888. Serial No. 288,014. (No model.)



Claim.—The combination, with a plow-stock, of the plate *a*, having the perforated flanges a' a^2, the groove *d*, deeper at its lower than at its upper end, and the bolt-holes *e*, the perforated binding-bar *g*, wedge *f*, fitting in said groove *d* and against the rear edge of the colter, bolts *h*, passing through said beam or against the upper and lower faces of the same through said plate *a* and bar *g*, and nuts *h'*, all adapted to be attached to said beam and carry said colter, substantially as shown and described.

397,139. CANVAS-STRETCHER FOR PICTURE-FRAMES. WILLIAM MURPHY, St. John, New Brunswick, Canada. Filed Mar. 26, 1888. Serial No. 268,540. (No model.)

Claim.—1. A tongue or holding-plate, in combination with two contiguous parts of a frame, each part being saw-kerfed to receive one edge of said plate and the latter being bent at the middle in line with their meeting faces, for the purpose set forth.

2. A tongue or holding-plate, D, provided with oblique lateral teeth *d*, in combination with the parts B C of a frame, having in

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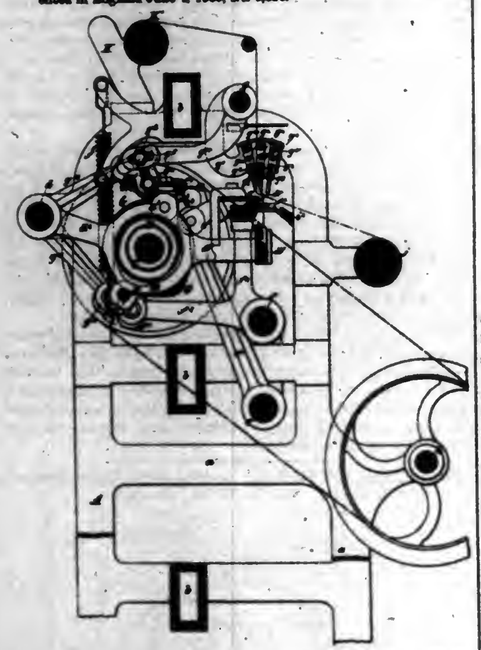
their mitered faces the saw-kerfs *b* to receive said teeth, and the body of said plate, substantially as set forth.

3. In combination with the parts B and C of the frame mitered and saw-kerfed, as described, the holding-plate or tongue D, bent in the middle and arranged with the convex side outward, said tongue or plate having lateral arms or teeth *d*, which enter said saw-kerfs, for the purpose set forth.

4. The wedge E, having slot *c*, in combination with the tongue D, having lateral teeth *d*, and the parts B C of the frame, having saw-kerfs *b*, all arranged and operating substantially as set forth.

5. In combination with two contiguous parts of a frame having corresponding saw-kerfs in their faces, a metallic tongue fitting into said saw-kerfs, and a slotted wedge fitting between said faces and straddling said tongue, substantially as set forth.

397,140. WARP-KNITTING MACHINE. HENRY R. PAYNE and WILLIAM CAMPION, Radford, County of Nottingham, England; said Campion assignor, by mesne assignments, to A. G. Jennings & Sons, Brooklyn, N. Y. Filed Jan. 31, 1888. Serial No. 262,256. (No model.) Patented in England June 4, 1885, No. 6,526.



Claim.—1. The combination of the vertically-movable needle-bar d', having bearded needles, levers d^3, carrying said needle bar and cams D, horisontally-reciprocating independent and separate presser-bar e', rock-shaft e, levers e^3, carried by the shaft e and supporting the separate presser-bar e' and cam E, for actuating the levers e^3, separate and horisontally-movable sinker-bar f', carrying points f^x and the comb-like sley i, that is secured to the bar f' below the point f^x, shaft f, levers f^3, carrying the separate sinker-bar f' and cams F, and the longitudinally and laterally movable guide-bars g^3, with mechanism, substantially as described, for moving said guide-bars, all as specified.

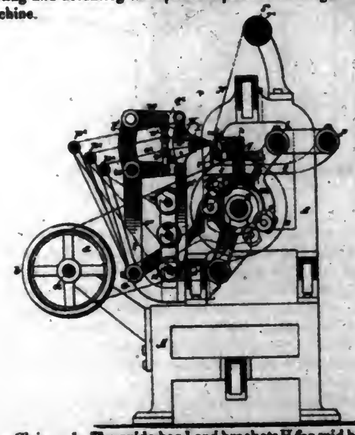
2. The combination of a needle-bar having bearded needles, levers d^3 and cams D, for supporting and moving said needle-bar, a separate and independent presser-bar, rock-shaft e, levers e^3, carried by the shaft and supporting the independent presser-bar and cams E, for giving independent movement to the presser-bar, and a separate sinker-bar carrying the sinkers, and carrying also the sley separate from the said sinkers, shaft f and levers f^3, carrying said sinker-bar and cams F, a shaft carrying the cams and guide-bars, and mechanism, substantially as described, by which an endwise or longitudinally-reciprocating motion and lateral motion is imparted to the guide-bars, substantially as set forth.

3. The combination of the guide-bar rock-shaft g, levers g', having forked arms g^3, guide-bar g^4, guided by said arms and levers, levers g^{14}, having slotted end, elbow-lever g^{16}, having slotted upper end, spindle g^{16}, slide-piece g^{17}, carrying said spindle and guided in the slotted ends of the levers, and cam-shaft C, having cams G G', substantially as set forth.

4. The combination of the levers g', guide-bar arms g^3, carried thereby, said arms having slots, screws g^{21} for said slots, and guide-bars g^4, guided in the arms g^3, and having pins g^5, that pass through the levers g' and arms g^3, all arranged so that the arms g^3 may be turned to tip the guide-bars, substantially as herein shown and described.

397,141. STRAIGHT-KNITTING-MACHINE. HENRY R. PAYNE, Nottingham, England, assignor of one-half to A. G. Jennings & Sons, Brooklyn, N. Y. Filed Mar. 31, 1888. Serial No. 269,104. (No model.) Patented in England June 7, 1886, No. 7,666.

Brief.—The invention consists in the improved devices for supporting and actuating the operative parts of a straight-warp-knitting machine.



Claim.—1. The guide-bar I and brackets H for said bar, combined with the links v w, supporting said brackets, lever a^9, for moving said brackets, the lever L, for actuating said lever a^9, and with the lever t and the cam-shaft, substantially as described.

2. The guide bar I and its brackets H, combined with the links v w, levers t, supporting said links v w, shaft G, and the lever y, for actuating the levers t, and with the lever a^9, and the cam-shaft, substantially as described.

3. The guide-bar brackets H, their supporting-links v w, links v', and rods q^3 for the threads, combined with the levers t, that support the links v w, shaft G, and the lever y, for actuating the levers t, and with the lever a^9 and the cam-shaft, substantially as described.

4. The combination of the guide-bar brackets H, links v w, supporting said brackets, levers t, carrying said links v w, shaft G, lever y, for actuating the levers t, levers a^9 and L, for moving the brackets H, and the cam-shaft, all arranged for operation substantially as herein shown and described.

897,142. CIRCULAR-WARP-KNITTING MACHINE. HENRY R. PAYNE and WILLIAM CAMPION, Nottingham, England, said Campion assignor, by mesne assignments, to A. G. Jennings & Sons, Brooklyn, N. Y. Filed Apr. 30, 1888. Serial No. 272,800. (No model.) Patented in England Feb. 8, 1886, No. 1,824.

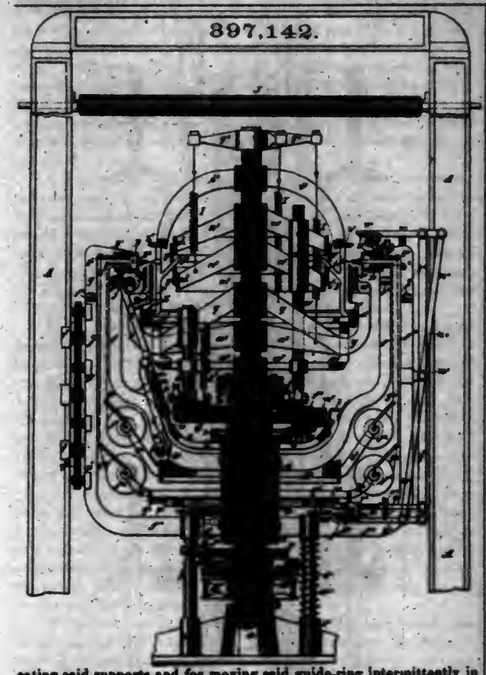
Brief.—The object of the invention is to so improve circular-warp-knitting machines that they may be worked much faster than the ordinary straight-warp machines.

Claim.—1. In a circular-warp-knitting machine, the guide-ring D and means, substantially as described, for moving said ring horizontally, combined with means, substantially as described, for moving said ring up and down, substantially as described.

2. In a circular-warp-knitting machine, the horizontally-movable guide-ring D, having the rack g, combined with the supports f, and with means, substantially as described, for moving said guide-ring, and with means, substantially as described, for reciprocating the supports f, as specified.

3. In a circular-warp-knitting machine, the standard B and supports f, combined with the circular guide-ring D, that is carried by said supports, and with means, substantially as described, for reciprocating said supports and for moving said guide-ring intermittently in either direction, substantially as specified.

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4. The standard B, supports f, and the guide-ring D, carried by said supports and having the rack g, combined with the worm h, pinion i, rack j, lever l, rod m, spring p, and pattern-wheel q, for actuating said lever l, substantially as described.

5. The standard B and bobbin-wheel d^3, that is adapted to carry the bobbins f^3 and to rotate on said standard, and the rack on the wheel d^3, combined with worm b^3, pinion a^3, rack z, lever l, rod m, spring p, and pattern-wheel q, for actuating said lever, substantially as described.

6. In a circular-warp-knitting machine, the standard B, supports f, guide-ring D on said supports, rack g on said ring, worm h, pinion i, rack j, lever l, rod m, and spring p, combined with the bobbin-wheel d^3, having a rack, worm b^3, pinion a^3, rack z, and pattern-wheel q on said standard, all arranged and operated substantially as herein shown and described.

7. In a circular-warp-knitting machine, the combination of the standard B, sleeve b, gear-wheel r on said sleeve, pinion s, meshing with said gear-wheel, pins u on said pinion, pattern-wheel q, and toothed wheel v on said pattern-wheel, all arranged and operated substantially as described.

8. The standard B and guide-ring supports f carried thereby, said supports having pendent rods r^4, the rods r^4 carrying rollers t^4, certain of said rods having springs w^4, combined with the sleeve b on the standard B, disk v^4, secured to said sleeve, and the cam on said disk, said cam engaging the roller t^4, whereby as said cam rotates the supports f will be reciprocated, substantially as described.

9. In a circular-warp-knitting machine, the standard B, sleeve c, guide-ring supports f^{10}, guide-ring D' on said supports, and rack a^4 on said ring, combined with the worm z^3, pinion z^2, rack w^2, levers t^2 u^2, rod g^2, spring r^2, and pattern-wheels v^2, substantially as herein shown and described.

10. In a circular-warp-knitting machine, the standard B and pattern-wheel v^2 carried thereby, said pattern-wheel having studs w^4, combined with the lever b^4, having rack d^5, pinion c^4, worm f^4, bobbin-wheel g^4, having a rack, lever t^3, rod w^4, lever v^3, rack w^3, pinion z^3, worm z^3, and guide-ring D', having rack a^4, substantially as described.

11. In a circular-warp-knitting machine, the standard B, pattern-wheel q, rod m, and lever l, actuated thereby, and rack j on said lever, combined with the sinker-ring arms y and means, substantially as described, for reciprocating said arms, pin x on said arms, that is adapted to engage the lever l, and with the pinion i, worm h, and guide-ring D, having rack g, substantially as herein shown and described.

12. The guide-ring support f^{10}, having brackets p^4, combined with the frame A, having brackets r^4, and with the rod q^4, passing through said brackets and rigidly secured to certain of said brackets, whereby the supports f^{10} are guided in their reciprocating motion and are held from turning in the machine, substantially as described.

13. In a circular-warp-knitting machine, the guide-ring D, means, substantially as described, for moving said guide-ring horizontally, and means, substantially as described, for raising and lowering said ring, combined with the needles g^3, and with means, substantially as described, for reciprocating said needles, as specified.

14. The standard B, having radial arms a^3 and rim a^5, supported by said arms, combined with the needle-jacks F, one end of which rests in the rim a^5, and with vertically-movable blades F^2, for actuating said needle-jacks, and means, substantially as described, for actuating said blades F^2, as specified.

15. The needle-jacks F, having arms f^3, supporting-rim a^5 for said jacks, and the guide-rim h^3, combined with the blades F^2, that contact the arms f^3 on opposite sides, and arms n^2, carrying said blades, which arms project from and slide on the standard B, and with means, substantially as described, for raising and lowering said arms n^2, as specified.

16. The standard B, arms n^2, that slide freely thereon, blades F^2, and rod c^2, carried by said arms, said rod having rollers p^2 and r^2, combined with the disk G, carrying cams g^3 s^3, that contact said rollers and give reciprocating motion to said rod c^2, needle-jacks F, and supporting-rim a^5, substantially as described.

17. In a circular-warp-knitting machine, the standard B, arms a^3 and b^3, and rims a^5 h^3, carried by said arms, combined with the needle-jacks F, that are supported and guided in said rims, and with means, substantially as described, for actuating the jacks, substantially as described.

18. In a circular-warp-knitting machine, the standard B, arms y, projecting therefrom and sliding freely thereon, sinker-ring E, carried by said arms and having sinkers f^2, and means, substantially as described, for actuating the arms y, and ring E, combined with the needles g^3, and with means, substantially as described, for reciprocating the needles, all arranged and operated substantially as herein shown and described.

19. The standard B, arms y, projecting therefrom, and sinker-ring E, carried by said arms, combined with the rod w^5, roller v^5 on said rod, cam w^7, disk G, carrying said cam, and sleeve b, surrounding the standard B and supporting the disk G, whereby the sinker-ring E will be raised and lowered, as set forth.

20. In a circular-warp-knitting machine, the standard B, arms a^3 and presser-ring H, carried by said arms, combined with means, substantially as described, for moving said presser-ring up and down to press the beards of the needles, and with the needles g^3, that are engaged by said presser-ring, and with means, substantially as described, for reciprocating the needles longitudinally, substantially as described.

21. The standard B and arms a^3, projecting therefrom and carrying the presser-ring H, combined with the rotary disk G, having cam f^6, and rod d^5, secured to the arm a^3 and having a roller, c^7, that rides on said cam f^6, whereby as the disk G rotates the presser-bar will be raised and lowered to press the needles, substantially as described.

22. The guide-ring D, means, substantially as described, for actuating the same, needle-jacks F, carrying needles g^3, and means, substantially as described, for actuating said jacks, combined with the sinker-ring E, means, substantially as described, for raising and lowering said sinker-ring, and with the presser H, and means, substantially as described, for actuating said presser, all arranged and operated substantially as herein shown and described, and for the purpose set forth.

23. In a circular-warp-knitting machine, the standard B, arms a^3 and blades F^2 on said arms, arms y and sinker-ring E on said arms, and the arms a^3 and the presser-ring H on said arms, said arms projecting from the standard B, combined with means, substantially as described, for reciprocating said arms n^2, y, and a^3, springs I, that are attached to said arms for relieving the weight carried by said arms, and with the needle-jacks F, and means, substantially as described, for supporting said jacks, substantially as specified.

24. In a circular-warp-knitting machine, the guides D^2 and means, substantially as described, for giving rotary and up-and-down motion to said guides, combined and operating with the reciprocating needles g^3, means, substantially as described, for reciprocating the needles, the sinkers d^3, means, substantially as described, for giving the sinkers up-and-down motion, and the presser-ring H, and with means, substantially as described, for giving said ring up-and-down motion, for the purposes set forth.

397,143. MAGAZINE-GUN. HENRY A. PITCHER, Bellsville, Wis. Filed Apr. 21, 1887. Serial No. 236,714. (No model.)

Claim.—1. The combination, with the lock mechanism, of the cylinder arranged under the barrel and having the vent communicating directly with the bore thereof, the piston in said cylinder in advance of the vent and connected to the lock mechanism, and the

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spring M, arranged in said cylinder and pressing rearward on the piston.

2. In a magazine fire-arm having the cylinder arranged under the barrel, and having the vent communicating directly with the bore of the barrel, the combination, with the lock mechanism, of the piston arranged in the cylinder in advance of the vent, the spring in said cylinder pressing rearward on the piston, the longitudinally-movable drive-rod G, attached to the piston and engaging with the tumbler P, which is pivotally attached to the segment I, and the link J, connecting the segment with the lock mechanism, substantially as set forth.

3. In a magazine fire-arm having the cylinder communicating with the bore of the barrel, the combination of the piston arranged in the cylinder, the drive-rod attached thereto, the tumbler engaging with said rod, the segment, the lock mechanism, the link connecting the latter to the segment, the spring-pressed connecting-rod attached to the segment, and the spring M, bearing rearward on the piston, substantially as described.

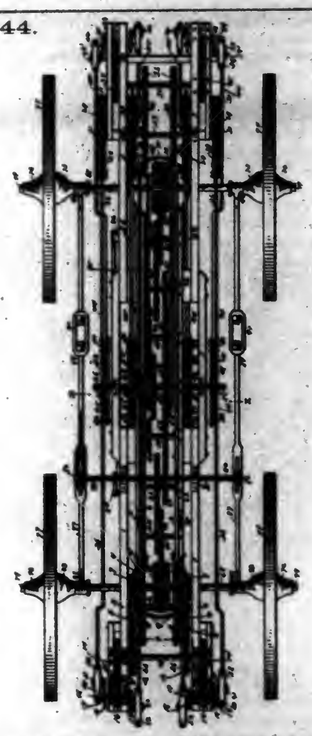
4. In a magazine fire-arm having the cylinder communicating with the bore of the barrel, the combination of the piston arranged in the cylinder, the spring M, pressing rearward on the piston, the drive-rod attached to the latter, the tumbler engaging with the drive-rod, the segment, the lock mechanism, the link connecting the latter to the segment, the follower, the spring S, pressing forward on the latter, and the rod connecting the follower to the segment, substantially as described.

397,144. ROAD-ENGINE. HEZEKIAH K. SAHS, Johnson City, Tenn. Filed Apr. 9, 1888. Serial No. 270,056. (No model.)

Claim.—1. In a road engine or vehicle, the combination of the frame, the wheels, and the axles, with the main or drive shaft provided with one or more central cog-wheels, and also with cog or ratchet wheels, a train of gearing connecting said main shaft and axles, levers fulcrumed upon said main shaft and provided with pawls for engaging said cog or ratchet wheels, cranks pivotally connected for vibrating the ends of said levers, and mechanism for imparting rotary motion to said cranks, substantially as described.

2. In a road engine or vehicle, the combination of the frame, the wheels, and the axles, with a drive-shaft provided with cog or ratchet wheels, gearing for transmitting the motion of said shaft to said axles, levers fulcrumed upon said drive-shaft and provided with pawls for engaging said cog or ratchet wheels, and with slotted frames at their rear ends, crank mechanism for vibrating said frames, a shaft provided with cog or ratchet wheels, gearing between the same and said crank mechanism, levers fulcrumed upon said shaft and provided with pawls for engaging said cog or ratchet wheels and with slotted frames at their front ends, crank mechanism for vibrating said frames and levers, a shaft provided with cog-wheels, and also with cog or ratchet wheels gearing intermediate of the same and said crank mechanism, and levers fulcrumed upon said shaft and operated from their rear ends, substantially as described.

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3. In a road engine or vehicle, the combination, with the frame, the axles, and their wheels, of a drive-shaft provided with four cog or ratchet wheels, gearing for communicating the revolutions of said shaft to said axles, levers fulcrumed upon said drive-shaft and provided with pawls for engaging said cog-wheels or ratchet-wheels and with longitudinally-slotted frames at their rear ends, shafts provided with cranks upon their ends, having pins which revolve and play within the slots of the said frames, a shaft having four cog or ratchet wheels, gearing between the same and said crank-shafts, levers fulcrumed upon said shaft and provided with pawls for engaging said cog or ratchet wheels, and with longitudinally-slotted frames at their front ends, crank-shafts provided with pins which revolve and play within the slots of said frames, a shaft provided with cog-wheels, intermediate gearing between the same and said crank-shafts, said shaft being also provided with two cog or ratchet wheels, and two foot-levers provided with treadles upon their rear ends, and which are fulcrumed upon said shaft, and with pawls engaging said cog or ratchet wheels, substantially as described.

4. In a road engine or vehicle, the combination of the foot-levers 6, the crank-shafts 38, and intermediate gearing between said crank-shafts and foot-levers, with the drive-shaft 46, provided with the cog-wheels 48, and the levers 44, pivoted upon said drive-shaft and provided at their front ends with bifurcated portions 45, having semicircular frames 49, pawls 50 in the ends of said bifurcated portions, and pawls 51 in the upper portions of said semicircular frames, and at their rear ends with longitudinally-slotted frames 40, which are connected to and vibrated by said crank-shafts, substantially as described.

5. In a road engine or vehicle, the combination of the crank-shafts 38, the arms 39, adjustably secured in perforations in the ends thereof and provided with crank-pins 39', the vibratory levers 44, the longitudinally-slotted frames 40, mounted upon said crank-pins and provided with the downwardly-projecting arms 41, having sleeves 42, fitted upon the ends of said levers and adjustable thereon by the set-screws 43, substantially as and for the purpose described.

6. The combination of the frame provided with the sixth-wheel forming part of a circle which is open at the inner side and having a downwardly-projecting flange upon its inner edge, a correspondingly-shaped fifth-wheel fitted within said flanged sixth-wheel and provided with boxes or bearings upon its under side, the wheel-axle journaled in said boxes or bearings, and having a gear-wheel upon its middle, and gearing projecting through the open sides of said fifth and sixth wheels, substantially as described.

7. The combination of the frame provided with the sixth-wheel forming part of a circle which is open at the inner side and having a downwardly-projecting flange upon its inner edge, a cog-wheel and its shaft journaled in bearings in said frame, means for driving said cog-wheel, which partly projects through the open side of said sixth-wheel, a fifth-wheel fitted within said flanged sixth-wheel and having a shape corresponding thereto and provided with boxes or bearings upon its under side, and a wheel-axle journaled in said boxes or bearings and provided with a partly-spherical cog wheel which meshes with said cog-wheel which is journaled in the frame, substantially as described.

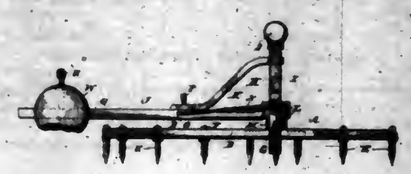
8. The combination of the frame and the wheel-axle journaled in bearings on the under side of said frame and provided with cups at its ends and with spindles projecting through said cups, which are provided with lugs or ribs upon their inner sides, with the wheels journaled upon said spindles and provided with hubs, also having lugs or ribs upon their inner parts which project and fit into said cups, and are adapted to permit their lugs or ribs to bear against those within said cups, substantially as and for the purpose described.

9. The combination of the frame 1, the pivoted axles 68, adapted to turn in one plane beneath said frame, the rock-shaft 80, provided at its ends with the upwardly and downwardly projecting arms 82 and 83, and with the arm 84 near one end, the downwardly and forwardly extending rods 87, having boxes 88 at their forward ends for the front axle and having their rear ends respectively pivoted to one of said upwardly-projecting arms 82 at one end of said rock-shaft and to one of said downwardly-projecting arms 83 at the other end of said shaft, the two rearwardly-extending rods 89, provided with turn-buckles 91 for adjusting their length, and with boxes 90 at their rear ends for the rear axle, and respectively pivoted at their forward ends, one to the upwardly-projecting arm 82 at one end of said rock-shaft and the other to the downwardly-projecting arm 83 at the other end of said shaft, the steering-lever 86, and the connecting-rod 85, pivoted thereto and to said arm 84, substantially as and for the purpose described.

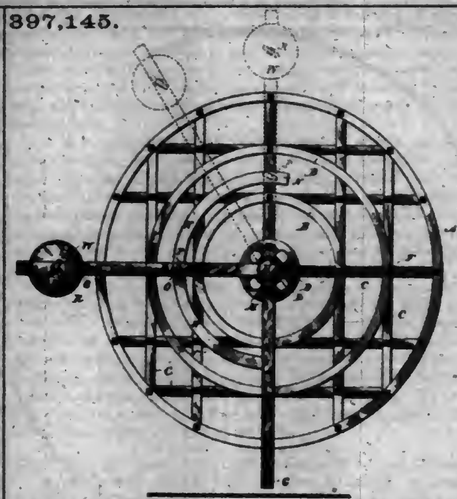
10. A road engine or vehicle provided with the two pivoted axles 68, having cog-wheels 67 at their centers, which have the shape of parts of spheres, the main or drive shaft 46, provided with four cog or ratchet wheels, 48, and cog-wheels 52 and 54, intermediate gear or cog wheels between said cog-wheels upon the drive-shaft and said partly-spherical cog-wheels upon the axles, the levers 44, fulcrumed upon said drive-shaft and provided with pawls 50 and 51, pivoted between their bifurcated ends 45 and between their curved frames 49, and with the longitudinally-slotted frames 40 at their rear ends, the crank-shafts 38, having pins 39', playing and revolving in said longitudinally-slotted frames, the shaft 27, provided with four ratchet-wheels, 29, and with cog-wheels 32, gearing for communicating motion thereto from said crank-shafts, the levers 26, provided at their rear portions with bifurcated ends 30, which straddle said ratchet-wheels, are fulcrumed upon said shaft 27, and have pawls 31, engaging with said ratchet-wheels said pawls being pivoted between the ends of said levers and between frames 30, curving upward from their bifurcated ends, said levers 26 being provided at their forward ends with longitudinally-slotted frames 22, the crank-shafts 18, having their pins 21 moving in said frames 22, the shaft 2, having two cog or ratchet wheels, 4, and cog-gears 5, intermediate gearing between said cog-gears and said crank-shafts, the two foot-levers 6, having treadles 10 upon their rear ends, the springs 11 for raising them, said levers being fulcrumed at their forward parts upon said shaft 2 and provided with bifurcated ends 7, which straddle said cog or ratchet wheels, and are provided with pawls 9 for moving said cog or ratchet wheels, substantially as described.

397,145. HARROW. MATTS SNOW, Omaha, Nebr., assignor of two-thirds to Lawrence C. Enewold and Edward Peterson, same place. Filed Nov. 14, 1887. Serial No. 255,169. (No model.)

Claim.—The combination, in a rotary harrow, of a rotary frame provided with a central pivot, a draft-bar and weighted arm centered upon said pivot, brace-bars rigidly secured to the draft-bar and weighted arm, respectively, and pivoted to the central pivot, a semicircular bar rigidly secured to the draft-bar and in engagement with the weighted arm, and a set-screw for locking the semicircular bar to the weighted arm, all arranged and adapted to operate substantially as described.



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397,146. INDIAN-INK AND COLOR SLAB. EDWARD G. SOLTMANN, New York, N. Y. Filed Feb. 6, 1888. Serial No. 263,131. (No model.)



Claim.—1. An ink or color slab provided with a long and narrow combined grinding cavity and well having a bottom extending in a continuous longitudinal curve from the center to near each end and having converging walls, substantially as described.

2. An ink or color slab having a grinding cavity or well provided with a concave bottom and a secondary cavity or well open at an end of the slab, substantially as described.

3. An ink or color slab having a main grinding cavity or well and a secondary cavity or well comprising a main portion, and an end portion less depressed than the main portion and extending through an end of the slab, substantially as described.

4. An ink or color slab having a main cavity provided with a concave bottom and a secondary cavity extending through both ends, substantially as described.

5. An ink or color slab having a sliding cover, made light at one end and heavy at the other, as and for the purpose specified.

6. An ink or color slab having a sliding cover longitudinally curved in a vertical plane and made heavier at one end than at the other, as and for the purpose specified.

7. An ink or color slab having a sliding cover, made light at one end and heavy at the other and rabbeted in the slab, as and for the purpose specified.

397,147. ROTATABLE DRAWING-BOARD AND MECHANICAL RULER. CHARLES SPERRY, Fort Washington, N. Y. Filed June 22, 1888. Serial No. 277,911. (No model.)

Claim.—1. The combination of a drawing-board pivoted to a frame, graduated scales concentric with the pivot, and pointers for indicating the degrees of any angle at which the board may be placed, substantially as shown and described.

2. The combination of a drawing-board having racks along its sides, and a ruler having pinions gearing with and rolling on said racks to keep the ruler in a parallel direction when moved over the board, substantially as and for the purposes set forth.

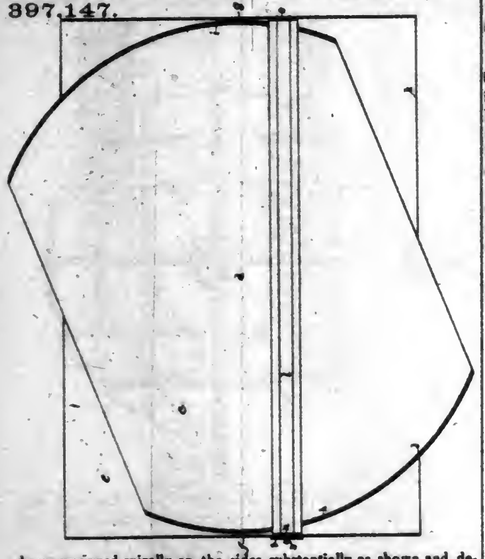
3. The combination of a drawing-board which may be rotated on a frame having a rack at each end alongside of the board and a ruler having pinions working on said racks for drawing lines at all angles and moving the ruler in a parallel direction, substantially as shown and described.

4. The combination of a ruler provided with a pinion at each end, which are connected by a shaft and gear in a rack at each side of a drawing-board, substantially as shown and described, and for the purposes set forth.

5. The combination of a ruler, pinions working on racks at each side of a drawing-board, a shaft, and index-wheels for measuring, shading, section-lining, and moving the ruler as desired, substantially as shown and specified.

6. The combination, with a drawing-board provided with racks, of a ruler provided with pinions, shaft, and index-wheels having in-

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dexes arranged spirally on the sides, substantially as shown and described, and for the purposes set forth.

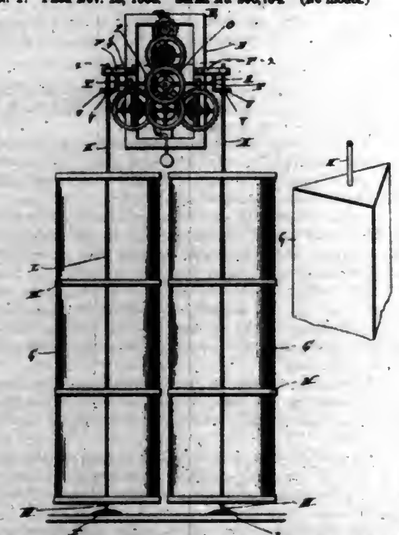
7. The combination, with a drawing-board provided with racks, of a ruler provided with pinions, shaft, and index-wheels having indexes arranged spirally on the periphery, substantially as described, and for the purposes set forth.

8. A drawing-board provided with racks, in combination with a ruler moved and guided by a shaft and pinions working and rolling on said racks, and index-wheels for operating the ruler, substantially as and for the purposes described.

9. A drawing-board provided with graduated scales of degrees, turning on a frame having racks alongside of the board, in combination with a mechanically-moved ruler provided with pinions connected by a shaft and index-wheels, substantially as shown and described, and for the purposes set forth.

10. A rotatable drawing-board, scales, pointers, frame, and racks, in combination with a mechanical ruler, pinions, shaft, and index-wheels, all constructed and arranged for being operated as a T-square, protractor, triangles, parallel-ruler, and section-liner for measuring and drawing all lines at any angle or distance apart, substantially as specified.

397,148. ADVERTISING-CLOCK. ANDREW V. STRAIT, Sidney, N. Y. Filed Nov. 13, 1888. Serial No. 290,734. (No model.)



Claim.—1. In an advertising-clock, the combination of the frame E, the clock mechanism therein, having the gear O, the shaft R, journaled transversely in frame E and having the pinion engaging said gear-wheel, the vertical axially-revoluble barrels, and the gears connecting the same to the shaft R, substantially as described.

2. The combination, with the clock mechanism having the gear O, of the transverse shaft R, having pinion P geared thereto, and having the crown-wheels T, the axially-revoluble barrels having the shafts K, and the pinions on the said shafts and in frictional contact therewith, the said pinions engaging the wheels T, whereby the barrels may be turned without affecting the clock mechanism, substantially as described.

3. In an advertising-clock, the combination of the frame E, the clock mechanism therein, having the gear O, the shaft R, journaled transversely on the frame and having the gear P engaging gear O, and provided at its ends with the gears T, the arms F, projecting from opposite sides of the frame E, the vertical shafts K, having their upper ends journaled in said arms and having the barrels G, and the gears U on said shafts engaging wheels T, substantially as described.

397,149. REVOLVING HANDLE FOR ROLLING-PINS, &c. JOHN H. SUNDERMAN, Quincy, Ill. Filed June 6, 1888. Serial No. 276,211. (No model.)

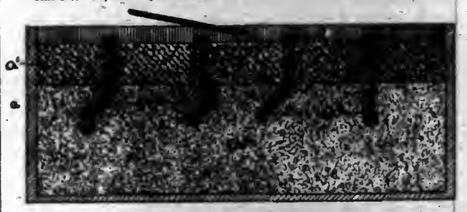


Claim.—1. A solid rolling-pin, A, having the pegs C rigidly secured therein and projecting therefrom, and having the heads *d* at the outer ends, and the revolving handles B, loosely mounted on the pegs and recessed at *b* to entirely receive the heads of the pegs within the handles, so that no portion of the peg-heads will project beyond the handles, as set forth.

2. A solid rolling-pin, A, having the pegs C rigidly secured therein and projecting therefrom, and having the heads *d*, and the revolving handles B, mounted on the pegs and recessed at *b* to receive the heads of the pegs within the handles, and the caps to close the outer ends of the recesses, as set forth.

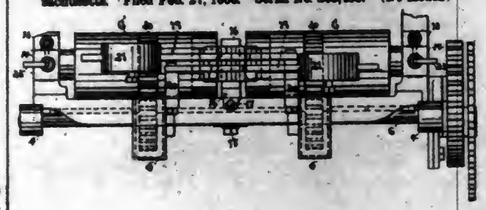
3. As a new article of manufacture, the solid rolling-pin having the bores *a* in its ends, the handles B, having the bores *c* and the countersunk enlargements *b* at their outer ends, the pegs C, passed through the bores *c*, of the handles and secured in the bores *a* of the pin, said pegs having the enlarged heads *d* in the enlargements *b* of the handles, and the plugs D in the outer ends of said enlargements, substantially as described.

397,150. APPARATUS FOR BURNING KEROSENE-OIL FOR FUEL. GREENLEAF L. SWETT, Boston, Mass. Filed Feb. 20, 1888. Serial No. 265,764. (No model.)

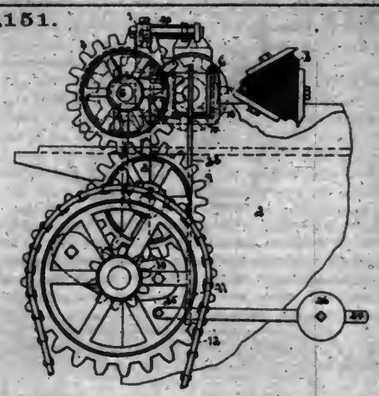


Claim.—The combination of the containing-tank *a*, the mass-wick a^3 therein, the porous block *a'*, covering the top of the mass-wick, said porous block being provided with wick-holes, and individual wicks a^2, extending through said block onto the mass-wick, substantially as described.

397,151. ROLLS FOR PLANING-MACHINES. JOHN R. THOMAS, Boston, Mass., assignor to The S. A. Woods Machine Company, of Massachusetts. Filed Feb. 27, 1888. Serial No. 265,435. (No model.)



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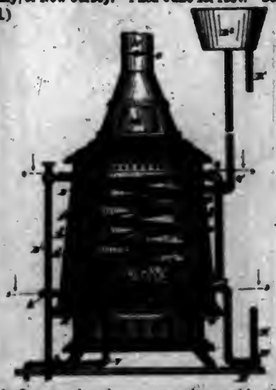
Claim.—1. The combination, in a planing-machine, of a feed-roll, C, provided with the the gear around its periphery intermediate between its ends, and having the bearing-surface of the roll upon each side thereof, and the shaft 6 and its gear 7, engaging with gear 30 and driving the roll, substantially as described.

2. The combination, in a planing-machine, of a feed-roll, C, provided with the gear 30 around its periphery intermediate between its ends, and having the bearing-surface of the roll upon each side thereof and held in guideways which allow it to rise and fall to accommodate itself to the varying thickness of the lumber, and the shaft 6 and its gear 7, placed alongside of the roll in position to engage with gear 30 and allow the roll to rise and fall past the same, substantially as described.

3. The combination, in a planing-machine, of a feed-roll provided with the gear 30 around its periphery intermediate between its ends, and having the bearing-surface of the roll upon each side thereof and held in guideways which allow it to rise and fall to accommodate itself to the varying thickness of the lumber, and the shaft 6 and its gear 7, placed on the feed-in side of the roll in position to engage with the gear 30 and bring a compression upon the roll moving past it by the direction of its rotation, substantially as described.

4. The combination, in a planing-machine, of a divided feed-roll, C C', extending across the bed of the machine, and having its sections independently supported at the ends and over the middle of the bed, and each provided with a gear, 30, around its periphery intermediate between its ends, and having the bearing-surface of the section upon each side thereof, and the shaft 6 and its gears 7 7, respectively engaging with gears 30 and driving the sections of the roll, substantially as described.

397,152. APPARATUS FOR HEATING RAILROAD-CARS. HENRY R. TOWNE, Stamford, Conn., assignor to The Safety Car Heating and Lighting Company, of New Jersey. Filed June 13, 1887. Serial No. 241,187. (No model.)



Claim.—1. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which is located within the combustion-chamber of said heater and the other portion within a transfer-chamber arranged external to said combustion-chamber, and said heating-coil connected to and forming part of the said water-circulating system, substantially as and for the purpose set forth.

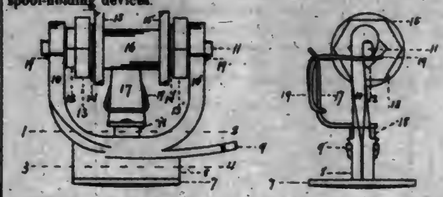
2. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which is located in the combustion-chamber of said heater and the other portion in a transfer-chamber arranged external to said combustion-chamber, said coil connected to said water-circulating system, a main steam-pipe connected to the source of steam, and a branch pipe connected to said main pipe and said transfer-chamber, substantially as and for the purpose set forth.

3. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which is located within the combustion-chamber of said heater and the other portion within a transfer-chamber arranged independently of and separated from that portion of the device containing the combustion-chamber, and said coil connected to the said water-circulating system, substantially as and for the purpose set forth.

4. In a car-heating system, the combination, with a system of water-circulating pipes within a car, of a water-heating device provided with a heating-coil, one portion of which is within the combustion-chamber of said heater and the other portion within an independently-arranged transfer-chamber, said coil connected to the water-circulating system, a gas-heating device in said combustion-chamber, a main steam-pipe connected to the source of steam, and a branch pipe connected to said main pipe and to said transfer-chamber, substantially as and for the purpose set forth.

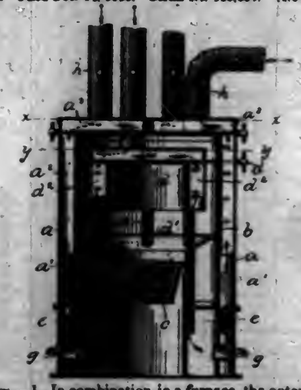
397,153. RACER FOR BRAIDING-MACHINES. JULIUS A. TURNER, Southfield, Mass. Filed May 12, 1888. Serial No. 273,706. (No model.)

Brief.—The invention relates particularly to the tension and spool-holding devices.



Claim.—In combination with the body or frame of the racer having the recessed arms 10 10', the spindle 11, nut 12, blocks 13 13', washers 14 14', chair 17, and bifurcated spring 19 19', all arranged, combined, and operating in the manner and for the purpose specified.

397,154. HOT-AIR FURNACE. LEWIS W. TURNER, Yalesville, Conn. Filed Dec. 14, 1885. Serial No. 185,637. (No model.)

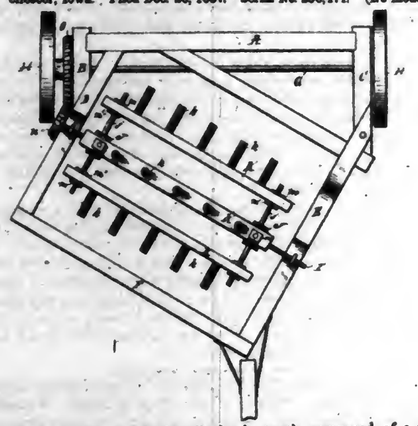


Claim.—1. In combination, in a furnace, the outer heating-chamber, *a'*, having cold-air inlets *g* and hot-air flues *h* connecting therewith, the vertical diaphragms a^5, fixed between the upper part of the walls, but terminating short of the bottom of the heating-chamber, the dampers a^6, extending across the upper part of the furnace in continuation of the diaphragms, and the handles for operating the said dampers, located on the outside of the furnace-wall, all substantially as described.

2. In combination, in a furnace, the heat-circulator *d*, located in the combustion-chamber directly above the fire, the cold-air inlets to said chamber under the lower part, and the hot-air flue leading from the upper part, the vertical diaphragms d^5, that divide the annular heating-chamber, that stop short of the bottom of the annular chamber, leaving a space for the passage of air, and the damper d^6, hinged within the heater in continuation of the diaphragms and having a handle extending to the outside of the furnace, and the outer heating-chamber separated into heating-sections by means of the ver-

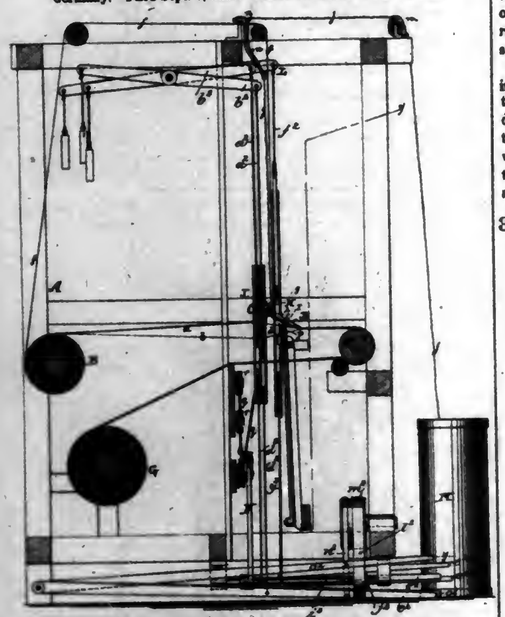
tical diaphragms that are extended by dampers, all substantially as described.

397,155. TOOTH FOR HORSE HAY-RAKES. ELWOOD TUSH, Manchester, Iowa. Filed Dec. 20, 1887. Serial No. 258,471. (No model.)



Claim.—The herein-described rake-tooth, composed of a wire coiled from end to end of the tooth, the coils touching throughout the length of the tooth, substantially as and for the purpose specified.

397,156. LOOM. ALWILL URBAHN, Nagelsbaum, near Burscheid Germany. Filed Sept. 9, 1887. Serial No. 249,205. (No model.)



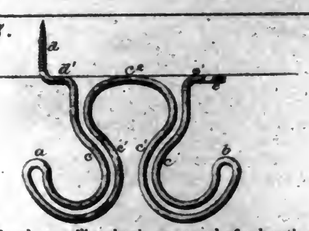
Claim.—1. In a loom, the cord-guide I, having loops *o* and *p*, and its carriage J, combined with the lever N, cord *q*, connecting-carriage J, and lever N, shaft i^3, wheel j^3 on said shaft, wheel m^3, connected with the wheel j^3, and the treadles o^3, connected with the wheel m^3, all arranged and operating substantially as herein shown and described.

2. The combination of the cord-guide I, its carriage J, cord *q*, lever N on shaft i^3, shaft i^3, pulley j^3, treadles o^3, straps i^3 n^3, and wheel m^3, all arranged for operation substantially as described.

397,157. HOOK. CORNELIUS S. VAN WAGONER, Brooklyn, N. Y. Filed May 30, 1888. Serial No. 275,429. (No model.)

Claim.—1. An overhead or ceiling hook composed of a length of wire bent and forming two connected hooks standing back to back, the wire in each being in two lines substantially corresponding in contour, and having at one end of the wire a screw-threaded shank above one of the hooks and an eye at the other end above the other hook, substantially as described.

397,157.



2. An overhead or ceiling hook composed of a length of wire bent and forming two connected hooks standing back to back, and having the wire in each arranged in two lines corresponding in contour, and also having at the top of the hook a central bearing-surface for contact with ceiling, and similar parallel bearing-surfaces in both terminals of the wire above the hooks, substantially as described.

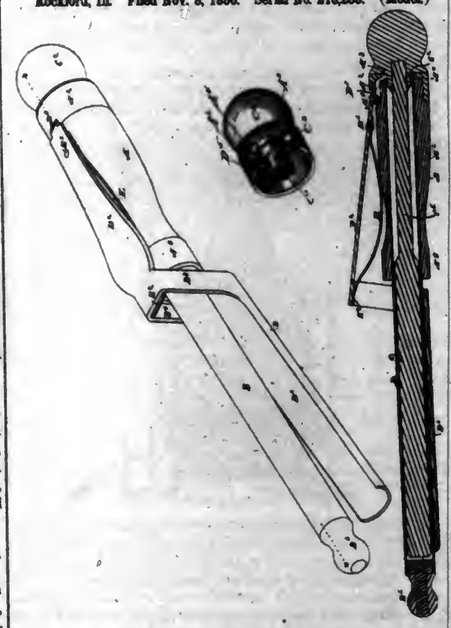
397,158. CAR-STARTER. NICHOLAS V. VIELE, Corning, N. Y. Filed Nov. 9, 1888. Serial No. 290,371. (No model.)



Claim.—1. The combination, with a car having a transverse timber secured thereto beneath the floor of the car, of a hammer pivoted to the car and adapted to automatically impart a blow to the rear face of the timber simultaneously with the starting of the car, substantially as and for the purpose specified.

2. The herein-described improvement in car-starters, comprising, in combination, a car, a transverse timber secured thereto beneath the floor of the car, a hammer, the end of which is attached to a diagonal shaft journaled within boxes secured to the rear face of the timber, and a chain connecting the handle of the hammer with the whiffletree, whereby the hammer is caused to impart a blow to the timber at the moment of starting the car, substantially as described, and for the purpose specified.

397,159. HAIR CRIMPER AND CURLER. RICHARD W. WELDON, Rockford, Ill. Filed Nov. 8, 1886. Serial No. 218,253. (Model.)



Claim.—1. In a hair curler and crimper, the combination, with the handle A, having a tubular opening, A', through the longitudinal center thereof and provided with the combined cap and ferrule A^2, of

the jaws B D, the latter being hinged to the combined cap and ferrule A^2 and provided with the slot D^4, through which the jaw B passes, substantially as set forth.

2. In a hair crimper and curler, the combination, with the handle A, having a tubular opening through the longitudinal center thereof and provided with the combined cap and ferrule A^2, the former being perforated by the central circular opening, A^3, of the tubular jaw B, provided with the swivel-knob B', the cylindrical heating-iron C, of diminished diameter at C', the jaw D, composed of the semi-tubular part D', the flat portion D^2, hinged to the combined cap and ferrule A^2 at D^3, and the portion D^2, perforated by a slot, D^4, through which the jaw B is inserted, and the spring E, substantially as described.

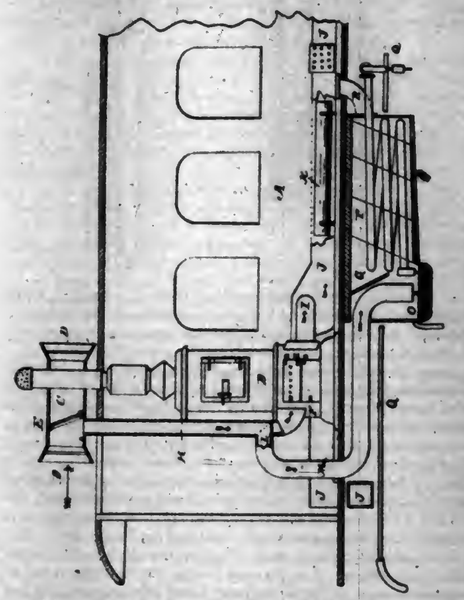
397,160. COIN-CONTROLLED FINGER-PULL. FREDERICK R. WHITE, Boston, Mass. Filed July 14, 1888. Serial No. 279,967. (No model.)



Claim.—1. A finger-pull consisting of a frame or casing, a rod having bearings and longitudinally movable in said casing, said rod being provided with a finger-hook or similar device extending beyond the casing, whereby said rod may be drawn outward, a spring to resist the drawing outward of said rod, a bar provided with ratchet-teeth connected with said rod, a pawl to engage the ratchet-teeth of said bar, a coin-chute to guide a coin into position on said pawl to disengage it from said ratchet-teeth, and a friction-clip having a limited movement on said ratchet-bar between said pawl and the teeth on said bar, as set forth.

2. The combination, in a finger-pull, of the longitudinally-movable rod and its rack-bar, with the friction-clip *k*, having a limited movement on said bar, a pawl to engage and be disengaged from said rack-bar, and a coin-chute to guide a coin into position on said pawl, substantially as hereinbefore set forth.

397,161. APPARATUS FOR HEATING RAILWAY-CARS. FRANCIS M. WILDER, Binghamton, N. Y., assignor, by mesne assignments, to The Safety Car Heating and Lighting Company, of New Jersey. Filed Aug. 29, 1887. Serial No. 248,119. (No model.)



Claim.—1. A car-heater comprising a stove within the car, an air-induction pipe, an eduction-pipe for the heated air, and one or more closed vessels containing a body of heat-absorbing material.

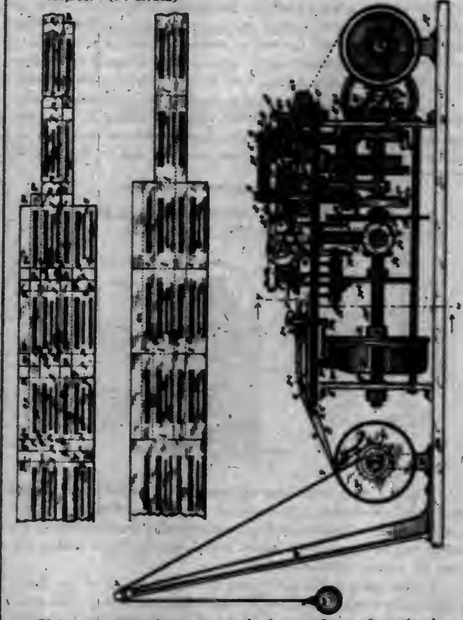
2. The combination, in a car-heater and with the air-heating drum thereof, of an air-induction pipe, an eduction-pipe for the heated air, and one or more closed vessels containing a body of heat-absorbing material.

3. A car-heater comprising a drum containing a steam-conveying pipe or pipes, a pipe or conduit for conveying air to the said drum, an air-flue connected to said drum and within the car for circulating the heated air, and a closed vessel or vessels containing a body of heat-absorbing material within said air flue or flues.

4. A car-heater comprising a stove within a car, an air-heating drum independent of the stove, an air induction and eduction pipe connected to said stove and drum, and a closed vessel or vessels containing a heat-absorbing material, so located as to be heated by the heated air conveyed by the eduction-pipe.

5. A car heater comprising a stove within a car, an air-heating drum independent of the stove, an air-induction and air-eduction pipe connected to said stove and drum, a closed vessel or vessels containing a heat-absorbing material, and a valve in the induction-pipe, whereby the stove or heating-drum may be operated independently of each other.

397,162. ART OF AND MACHINE FOR MAKING BOXES, &c. MCCLINTOCK YOUNG, Frederick, Md. Filed Aug. 30, 1886. Serial No. 212,210. (No model.)



Claim.—1. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of preparing the connected blanks for pasting and folding, consisting in intermittingly advancing the strip, and during intermissions in its advance movement cutting and creasing to successively and completely form the respective blanks of a series of unfolded unpasted blank connected at their ends by narrow necks, substantially as set forth.

2. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of preparing the connected printed blanks for pasting and folding, consisting in intermittingly advancing the strip, successively printing the respective blanks during intermissions in the advance movement of the strip, and cutting and creasing other blanks, also during intermissions in the advance movement of the strip, to successively complete the respective blanks of a series of unfolded unpasted blanks connected at their ends by narrow necks, substantially as set forth.

3. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of producing the connected box-tubes, consisting in intermittingly advancing the strip, during intermissions in its advance movement cutting and creasing it to successively completely form the respective unfolded unpasted blanks of a series, with the narrow necks connecting them at their ends, applying paste to the successive blanks, and during intermissions in the advance movement of the strip folding previously cut and pasted blanks into flattened connected box-tubes, substantially as set forth.

4. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of producing and compactly bundling and compressing the connected box-tubes, consisting in inter-

mittingly advancing the connected cut and creased blanks, applying paste, folding into flattened connected box-tubes, and winding them under tension into a compact roll, substantially as set forth.

5. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of preparing the connected blanks and producing and compactly bundling and compressing the connected box-tubes, consisting in intermittingly advancing the strip, cutting and creasing it to successively form the respective blanks of a series, with the narrow necks connecting them, applying paste to the blanks, folding the blanks, and finally winding them into a compact roll, substantially as set forth.

6. As a new article of manufacture, the series of connected pasted flattened box-tubes, substantially as and for the purpose set forth.

7. A compact roll of connected pasted flattened box-tubes, substantially as and for the purpose set forth.

8. The combination of the paper-supplying roll, the vertically-reciprocating cutters and creasers, their head, the reciprocating frame by which the head is carried, pasting apparatus, substantially such as described, the primary folders carried by said reciprocating frame, the final folders, the springs acting upon them, feeding mechanism, substantially such as described, the spring by which it is moved one way, the main actuating-shaft, by mechanism substantially such as described, connected with which the reciprocating frame and the final folders are actuated and the feeding mechanism moved in opposition to its spring, and the bundling-roll automatically actuated to wind up the connected box-tubes, substantially as and for the purpose set forth.

9. The combination of the former, the vertically-reciprocating primary folders slotted and provided with the folding-lugs, and the final folders provided with the folding-lugs to enter the slots between the lugs of the primary folders, substantially as and for the purpose set forth.

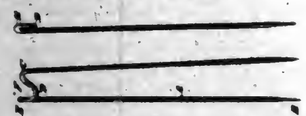
397,163. CAN-JACKET. William Zimmer, Jr., New York, N. Y.
Filed June 7, 1888. Serial No. 276,376. (No model.)



Claim.—1. A removable can-jacket of indented or corrugated sheet metal or other suitable material, comprising a body-section and a neck-section separated by a circumferential strengthening-rib, 10, and having its longitudinal edges joined together by a locked lap-joint, 11, substantially as set forth.

2. The combination, with a can for containing oil or the like, of a removable enveloping-jacket of indented or corrugated sheet metal or other suitable material, provided with a circumferential strengthening-rib between the neck and body sections, a locked lap-joint uniting its longitudinal edges, and a bottom of wood or other suitable material, and a wire confining in place the gathered-in neck-section, substantially as set forth.

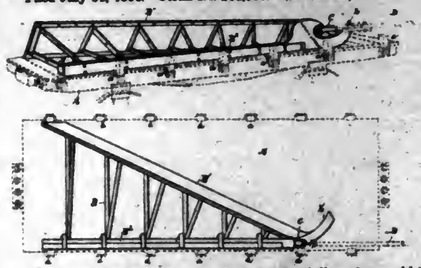
397,164. HAIR-PIN. William B. Basta, Springfield, Ohio. Filed Jan. 23, 1887. Serial No. 225,766. (No model.)



Claim.—1. As an improved article of manufacture, a hair-pin composed of a body pointed at one end, bent near the other end, and extended laterally at an angle to the body portion, and then bent again and extended upwardly, whereby a shoulder or loop is formed between the said bends, which acts to engage the hair when turned crosswise the direction in which the strands are combed, and to disengage from the hair when turned in line with said strands.

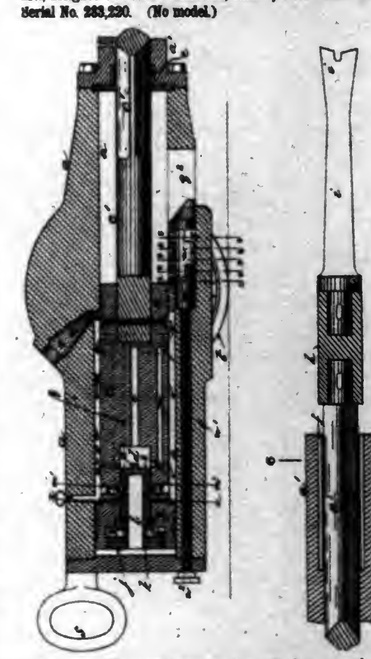
2. As an improved article of manufacture, a hair-pin composed of a pointed body having a loop or shoulder near the upper end, which extends laterally from the body, and which acts to engage the hair when turned crosswise the direction in which the strands are combed, and to disengage from the hair when turned in line with said strands.

397,165. CAR-UNLOADER. Henry M. Barnhart, Marion, Ohio.
Filed July 31, 1888. Serial No. 281,560. (No model.)



Claim.—A car-unloader consisting, essentially, of a mold-board running obliquely across the car for discharging the load to the one side of the car, a runner extending lengthwise of the car for engaging the adjacent side stakes of the car, the point of the plow curving upwardly and curved laterally in the direction away from the adjacent guiding-stakes, substantially as set forth.

397,166. DIRECT-ACTING ENGINE. Gustav A. Barta, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Aug. 20, 1888. Serial No. 283,220. (No model.)



Claim.—1. The combination of a cylinder, *a*, a piston, *b*, fitting therein, a tubular piston-rod, *c*, formed on or secured to said piston and provided with separate inlet and exhaust passages *n* and *q*, respectively, said passages *q* communicating with a circumferential recess or passage, *q'*, on the inner end portion of the piston-rod *c*, a distribution-valve, *k*, fitting within a chamber or cavity, *d*, in said piston-rod and having a central supply-passage, *l*, extending from its open end to lateral ports *m*, and annular passage *m'* adjacent to the inner end of the chamber *d*, the ports *m* and passages *l m'* being so arranged as to communicate alternately with the said inlet and exhaust passages *n* and *q q'*, inlet-passages n^3 in the tubular piston-rod *c* communicating with the chamber *d* between its inner end and the corresponding end of the distribution-valve *k*, an inlet-passage, *o*, in the piston-rod *c*, opening into the chamber *d* at its inner end behind the distribution-valve *k*, and an exhaust-passage, *p*, leading from the side of the chamber *d* and through the piston-rod *c* to the outside of the latter, an exhaust-passage, q^3, in the cylinder *a*, and inlet-passages *x* in the piston-rod *c*, communicating with the chamber *d* above the upper shoulder of the distribution-valve *k* when in its extreme inner position, the whole operating to hold, reverse, and cushion the distribution-valve *k* at the proper times and so govern the supply and exhaust of motive fluid to and from the piston *b* and distribution-valve *k*, substantially as shown and described.

2. The combination of the distribution-valve *k*, having a projection, *a*, with the inlet-passage *o*, substantially as shown, and for the purpose described.

3. The combination of cylinder *a*, piston *b*, and tubular piston-rod *c*, closed at its inner end, and extension piston-rod *c'*, with cylindrical casing *d'* closing the inner end of cylinder *a*, for cushioning the tubular piston-rod *c*, substantially as shown and described.

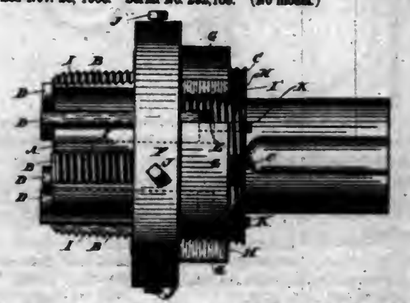
4. The combination of tube or casing *d'* and extension piston-rod *c'* with packing-strips *f*, substantially as shown, and for the purpose described.

5. The combination of exhaust ports or passages and valve *w* with the outlet and exhaust passages from piston and piston-rod, substantially as shown, and for the purpose described.

6. The combination of exhaust ports or passages and valve *w* with the outlet-passage *p*, and exhaust-passages *q q'* from piston *b* and piston-rod *c*, substantially as shown, and for the purpose described.

7. The combination of inlet ports or passages and valve *y* with outlet-passage from cylinder and inlet-passage in piston-rod, substantially as shown, and for the purpose described.

397,167. PIPE-TAP. Horace C. Bradford, Milwaukee, Wis.
Filed Nov. 28, 1888. Serial No. 292,108. (No model.)



Claim.—1. In a pipe-thread-cutting tool, the combination of the head-block A, provided with tap-grooves C and tap-adjusting threads I', cutting-taps B, located in their respective grooves C, inclosing-band F, surrounding said taps, tap-retaining blocks G, interposed between said inclosing-band F and the respective taps B, the threads of said blocks G being adapted to engage at one end in the threads I of the cutting-taps and at their other ends in the tap-threads I', formed upon the head-block A, and adjusting-screws J, operating in said inclosing-band F and engaging at their inner ends against said tap-retaining blocks G, substantially as and for the purpose specified.

2. In a pipe-thread-cutting tool, the combination of the head-block A, provided with reamer-retaining grooves E, reamers D, located in their respective retaining-grooves, adjusting-screws K, operating in screw-threaded apertures provided therefor in the rear end of said head-blocks A, and adapted to bear at their front ends against the rear or inner ends of said reamers D, substantially as and for the purpose specified.

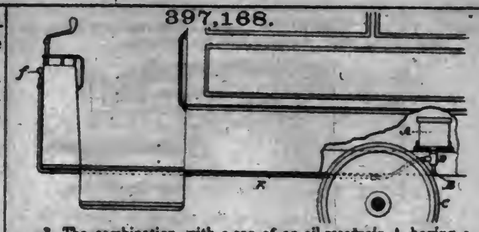
3. In a pipe-thread-cutting tool, the combination of the head block A, provided with tap-adjusting threads I', formed on its periphery at its rear or inner end, tap-retaining grooves C, and reamer-retaining grooves E, formed longitudinally in the periphery at its front end, cutting-taps B, and reamers D, located in their respective grooves C and E, inclosing-band F, surrounding said taps, tap-retaining blocks G, interposed between said inclosing-band F and the respective taps B, the threads of said blocks G being adapted to engage both upon the threads I of the cutting-taps, and the adjusting-threads I', formed upon the head-block A, adjusting-screws J, operating in said inclosing-band F and engaging at their inner ends against said tap-retaining blocks G, and adjusting-screws K, operating in screw-threaded apertures provided therefor in said head-block A and engaging at their inner ends against the rear ends of said reamers D, all substantially as and for the purpose specified.

397,168. DEVICE FOR LUBRICATING CAR-WHEELS. Samuel M. Briggs, Washington, D. C. Filed Oct. 2, 1888. Serial No. 286,944. (No model.)

Claim.—1. The combination, with the wheel of a car, of a lubricator having its discharge-opening located above the wheel and in close proximity to the flange or face thereof, so as to discharge the lubricant thereon, substantially as set forth.

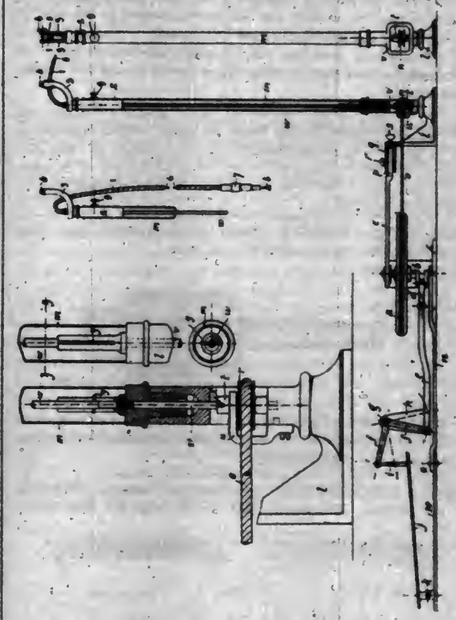
2. The combination, with a wheel of a car, of a lubricator having its discharge-pipe located above the wheel or in close proximity to the flange or face thereof, so as to discharge the lubricant thereon, and an operating-handle conveniently located to be operated by the driver or engineer, substantially as and for the purpose set forth.

397,168.



3. The combination, with a car, of an oil-reservoir, A, having a discharge-pipe, B, located in close proximity to the flange of a wheel, the valve D, and pipe E, with wire or chain F, substantially as and for the purpose set forth.

397,169. DENTAL ENGINE. John S. Campbell, London, England. Filed Apr. 30, 1888. Serial No. 272,226. (No model.) Patented in England Mar. 26, 1888, No. 4,574, and in France May 31, 1888, No. 190,926.



Claim.—1. In combination with a dental engine, a treadle, *j*, connected with the crank of the driving-wheel *a* and centered on the free end of a bar, 10, pivoted to a bar, 12, which is itself pivoted to the axis of said driving-wheel, all as and for the purposes set forth.

2. A dental engine having a horizontal driving-wheel, *a*, fitted in a frame, *c*, the axis of said frame being adjustably connected on one side with a pivoted frame, *l*, carrying a suitable stand, and on the other side with a treadle, *j*, pivoted bars 10 and 12, on one of which the treadle is centered, and intermediate gearing, *i f e d*, substantially as described and shown.

3. A dental engine having its main driving-wheel placed horizontally on a short vertical axis near the floor, said wheel being operated by a treadle fulcramed on a base-bar, 10, pivoted to a bar, 12, pivoted on the axis of said wheel, substantially as shown and described.

4. The combination in a dental engine of two adjusting-frames, *l* and *c*, with a suitable stand, a treadle, *j*, driving-wheel *a*, pulley *n*, and cord, substantially as shown and described.

5. The combination of an extensible stand consisting of an adjustable frame, *l*, pulley *n*, axis *t*, axis *r*, rod *w*, tube *m*, sliding tube 2, cheeks 3 3, set-screw *q*, spring 6, and sheathing 1, with an adjustable frame, *c*, horizontal driving-wheel *a*, treadle *j*, and gears *i f e d b*, all substantially as shown and described.

6. A stand for the spring provided with an adjustable spring-supporter held between two cheeks, 3 3, and provided with a screw, 4, whereby it may be adjusted up or down, substantially as shown and described.

397,170. SLIDE-VALVE. FRANK C. GLEAVER, Terre Haute, Ind. Filed Aug. 14, 1888. Serial No. 282,716. (No model.)



Claim.—1. The combination of the slide-valve formed with a packing-groove about its vertical faces, said groove having a steam-passage in its back wall and steam-ports leading therein, the packing arranged in said packing-groove, the balance-ring with upwardly and inwardly inclined exterior sides, cross-bars to set over the valve-top, and springs disposed between the top of the valve and the cross-bars of the balance-ring, substantially as described, and for the purpose specified.

2. In combination, the slide-valve formed with a balance-ring seat of less exterior diameter than the yoke-seat and formed with a packing-seat, the packing arranged in said seat, steam-ports leading to the back of the packing, the balance-ring formed to set over the top of the valve and having upward and inwardly inclined outer faces and provided with cross-bars, and the springs between the top of the valve and the cross-bars, substantially as described, and for the purposes stated.

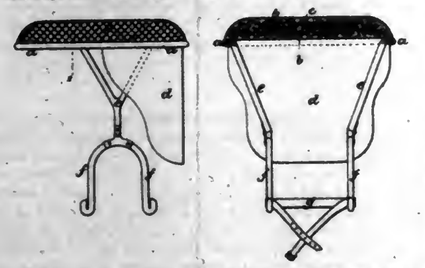
3. The combination, with the slide-valve formed with a packing-seat, said packing-seat having one of its edges formed to incline, as shown, and having steam-passages opening through its back, of a packing arranged in said packing-seat and having one of its edges formed to fit the incline of the seat, substantially as described, and for the purpose specified.

397,171. HOSE-PIPE. EDWARD H. CROSBY, Boston, Mass. Filed Nov. 1, 1888. Serial No. 289,733. (No model.)



Claim.—The hose pipe or nozzle *a* and a support or bracket secured to it, combined with an electric generator held by said support, all as and for the purpose specified.

397,172. SUNSHADE. ELIZABETH DEAN, Hastings, County of Sussex, England. Filed Aug. 21, 1888. Serial No. 283,304. (No model.)

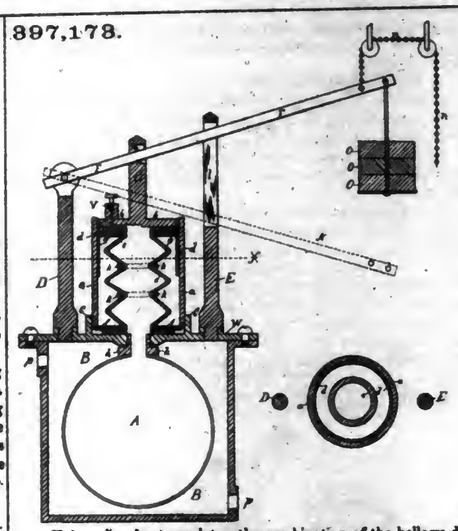


Claim.—1. A sunshade supported above the wearer's head by means of supporting-rods attached to the framing thereof, such supporting-rods being forked at their lower ends, so as to fit over the shoulders of the wearer, and securely held in position by a suitable strap passing around the body, substantially as and for the purpose specified.

2. The combination, with the frame *a*, supporting a cover of suitable material, *b*, of the folding supporting-rods *c*, shoulder-pieces *f*, and attaching-strap *g*, constructed and arranged substantially as and for the purpose specified.

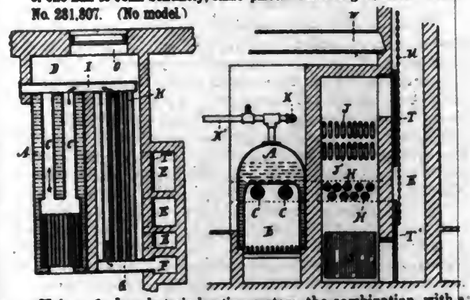
3. The combination, with the frame *a*, net-work *e*, attached thereto, and means—such as a strap—to secure the same to the person, of the cover *b*, stretched over and under such net-work, and filling *b'*, whereby the penetration of heat is more effectually prevented, substantially as specified.

397,173. AUTOMATIC DRAFT-REGULATOR. GEORGE E. DIXON, Chicago, Ill. Filed Oct. 22, 1887. Renewed Dec. 24, 1888. Serial No. 294,565. (No model.)



Claim.—In a heat-regulator, the combination of the bellows diaphragm *e e* and the chamber A, communicating with it, the cylinder *a*, surrounding the bellows diaphragm, the piston *b*, and piston-rod G, and the piston provided with a cock, V, and also with an annular guide, *d*, which closely fits the inside of said cylinder and to which the top portion of the bellows diaphragm is attached, as and the purpose specified.

397,174. FURNACE. JOHN F. DURRAN, Detroit, Mich., assignor of one-half to John Schuloly, same place. Filed Aug. 2, 1888. Serial No. 281,807. (No model.)



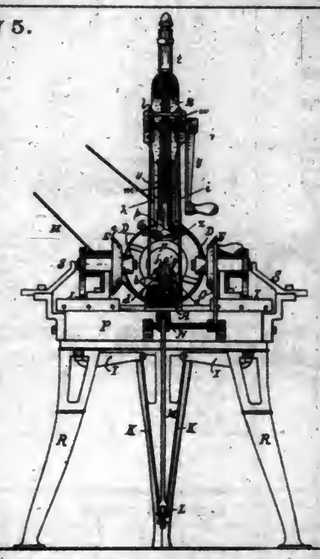
Claim.—1. In a hot-air heating system, the combination, with a steam-generator, of an air-heating chamber located in proximity thereof, a system of horizontal flues carrying the products of combustion from the generator through the lower portion of said air-chamber, a system of steam-heating coils located in the upper portion of said air-chamber, one or more hot-air flues communicating with said air-chamber through inlets located near the top and bottom of said air-chamber, respectively, and a damper for each of said openings, said dampers being connected in pairs to open or close said inlets into the hot-air flues, substantially as described.

2. In a hot-air heating system, the combination of the steam-generator A, provided with the smoke-flue C, the smoke-flue I, communicating therewith, the air-chamber D, located in rear and on one side of the steam-generator, the smoke-flues H, passing through the lower portion of said air-chamber and communicating with the chimney, the steam-coils J, located in the upper portion of the air-chamber, the pipe K, communicating with the steam-generator and the steam-coils J, the return-pipe M to the generator, the hot-air flues E, having inlets R and S, located, respectively, near the top and bottom of the air-chamber, the dampers T and T', connected in pairs to close and open the inlets into the air-flues, and the partition P, dividing the air-chamber and provided with the damper Q and cold-air inlet O, substantially as described.

397,175. MACHINE FOR FORMING INTERLOCKING EYES. ROBERT FARIES, Decatur, Ill. Filed Sept. 29, 1888. Serial No. 286,736. (No model.)

Claim.—1. In a machine for forming interlocking eyes of sections of wire, a stud, a wire-holding device, and bending-levers fulcrumed below the stud and arranged to carry the ends of the wires over the bodies thereof, all in combination, as set forth.

397,175.



2. In a machine for forming interlocking eyes of sections of wire, a stud, a wire-holding device, and bending-levers fulcrumed to swing in vertical frames and carry the ends of the wires over the bodies thereof, all in combination, as set forth.

3. In a machine for forming interlocking eyes of sections of wire, a rotative tubular standard having projections on its upper end, and a stud having longitudinal reciprocating motion in the standard, in combination, as set forth.

4. In a machine for forming interlocking eyes of sections of wire, a tubular rotative standard having projections on its upper end, a stud having longitudinal reciprocating motion in the standard, and levers fulcrumed below the stud in a manner to swing vertically past the same, all in combination, as set forth.

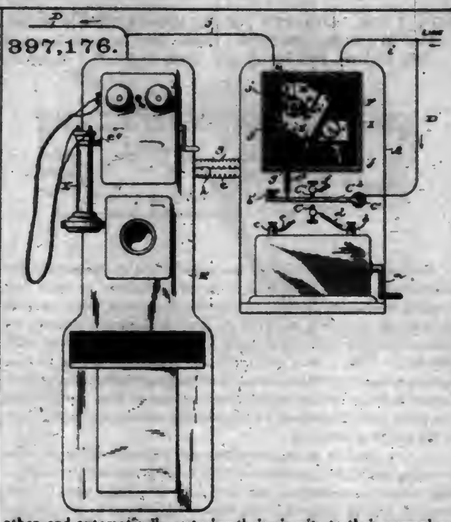
5. In combination, a stud, a wire-holding device, a pair of levers fulcrumed below the stud to swing in vertical planes, and a pair of levers fulcrumed above the stud to swing in vertical planes at right angles to the planes of motion of the lower pair of levers, as and for the purpose set forth.

6. In combination with stud *c* and a wire-cramping device, levers *d* and *e*, having fingers *f* and *g*, respectively, as and for the purpose set forth.

7. In combination, stud *c*, levers *d* and *e*, having fingers *f* and *g*, respectively, crank-lever *y x*, head *l* above the termination of *x*, lateral guides for head *l*, and rods *h i*, connecting the levers with the head, as and for the purpose set forth.

8. In combination, stud *c*, levers *d* and *e*, having fingers *f* and *g*, respectively, crank-lever *y x*, head *l* above the termination of *x*, rods *h* and *i*, connecting head *l* with levers *d* and *e*, levers *o* and *p*, having extensions *q* and *z*, respectively, head *r* below the termination of *x*, rods *m* and *n*, connecting head *r* with levers *p* and *o*, and lateral guides for heads *l* and *r*, as and for the purpose set forth.

397,176. TELEPHONE OR ANALOGOUS ELECTRIC SYSTEM. ANTHONY R. FERDINAND, Oshkosh, Wis. Filed Oct. 3, 1888. Serial No. 287,472. (No model.)



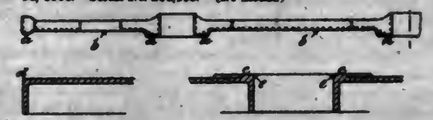
Claim.—1. In a telephone or analogous electric system, the combination, with the main line and instruments or stations thereon, of supplemental generators adapted to be electrically connected to said main line and generating stronger currents than those which operate the instruments, electro-magnets, and armatures attracted thereby under the action of a current from one of said supplemental generators, and mechanism connected to said armatures and adapted for automatically cutting out the instruments or stations on the line other than those which are to communicate with each other and eliminating their resistance, substantially as set forth.

2. In a telephone or analogous electric system, the combination, with the main line and instruments or stations thereon, of supplemental generators adapted to be electrically connected to said main line, and generating stronger currents than those which operate the instruments, electro-magnets, and armatures attracted thereby under the action of a current from one of said supplemental generators, and mechanism connected to said armatures and adapted for automatically cutting out for a predetermined time the instruments or stations on the line other than those which are to communicate with each other, and automatically restoring their circuits to their normal condition at the expiration of said period, substantially as set forth.

3. In a telephone or analogous electric system, the combination, with the main line and instruments or stations thereon, of a supplemental generator adapted to be electrically connected to said main line and capable of generating a current of electricity greater than the ordinary currents used to operate the instruments on said line, electro-magnets normally electrically connected to said main line and the instruments thereon, and armatures within the field of attraction of said electro-magnets only when the latter are acted upon by the said strong current, mechanism mechanically connected to said armatures for automatically cutting out said instruments and bearing a device for making a shorter and more direct temporary circuit on the main line at any point where an instrument is cut out, practically free from resistance at such point, suitable switches and electric circuits and other mechanism mechanically connected to the last-named mechanism, for restoring the normal circuits at such point or points at the expiration of a predetermined time, substantially as set forth.

397,176.

397,177. MANUFACTURE OF FRAME-PLATES FOR ROLLING-STOCK. SAMUEL FOX, Harrogate, County of York, England. Filed Jan. 18, 1888. Serial No. 261,105. (No model.)



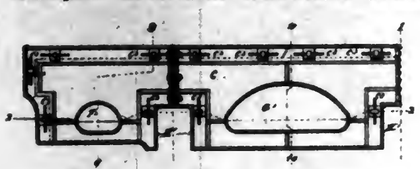
Claim.—1. The method or process of manufacturing frame-plates for rolling-stock with flanges and with square corners and fillets or projections, which consists in cutting a suitable plate to approximately the form, but somewhat larger than the required frame-plate, heating same, producing by pressure the required flange or flanges at one side and bulgings or embossments at the contrary side, reheating the plate, and by pressure forming out of the metal of said bulgings or embossments the desired square corners and fillets or projections, substantially in the manner hereinabove described.

2. As a new article of manufacture, a pressed-steel frame-plate having a flange or flanges at one side and fillets or projections at the other side, formed integral with the body of the frame-plate itself, substantially as described.

3. The method or process of manufacturing frame-plates with flanges and with fillets or projections, which consists in cutting a suitable plate to approximately the form, but somewhat larger than the required frame-plate, heating the same to produce by pressure the flange or flanges at one side and bulgings or embossments at the contrary side, and by reheating and by pressure between two dies forming out of the metal formed by said bulgings or embossments the desired fillets or projections, substantially as described.

4. As a new article of manufacture, a pressed-steel frame-plate for rolling-stock, having fillets or projections on one side and flanges formed on the other side, the fillets and the flanges being integral with the body of the frame-plate itself and of greater thickness at the junction than the body of the plate from which they are formed, substantially as described.

397,178. APPARATUS FOR THE MANUFACTURE OF FRAME-PLATES FOR ROLLING-STOCK. SAMSON FOX, Harrogate, County of York, England. Filed Jan. 18, 1888. Serial No. 261,166. (No model.)



Claim.—1. A machine for the manufacture of frame-plates for rolling-stock, comprising a head, a movable platform or table, and actuating mechanism for the said movable platform or table, comprising hydraulic cylinders and rams or their equivalent, a male die attached to the said head, and a female die attached to the said movable platform or table, a floor within the said female die having recesses therein and openings for the reception of flanging-punches, and punches adapted to flange various required openings and to form embossments on a plate under treatment, all substantially as described and shown, for the purposes specified.

2. In a machine for the manufacture or formation of frame-plates for rolling-stock, the combination of a head, a movable platform or table, actuating mechanism, and male die comprising a part, C, parts C' and C^3, with projections 5, said parts being secured to the principal part C by bolts and cotters C^3, so that they may be quickly released therefrom, substantially as described.

3. In a machine for the manufacture or formation of frame-plates for rolling-stock, the combination of a head, a movable platform or table, actuating mechanism, a male die with openings, a female die, D, floor E, with openings and recesses 6, adapted to be used in conjunction with punches F G H to enter corresponding openings in the male die, so that when a frame-plate is compressed between the male and female dies it will be flanged at one side and be formed with bulgings or embossments at the other side, substantially as described, for the purpose specified.

4. In a machine for the manufacture or formation of frame-plates for rolling-stock, the combination of a head, A, a movable platform or table, B, actuating mechanism, a male die comprising principal part C, parts C' and C^3, with projections 5, cotters C^3, and openings at F', G', and H', a female die, D, a table or floor, E, recessed at 6, and punches F G H, all substantially as described, for the purpose specified.

5. In a machine for the manufacture or formation of frame-plates for rolling-stock, the combination of a head, a movable platform or table, actuating mechanism, male die I, female die J, and floor K, adapted to receive parts L and mandrels M and N, so as to convert the bulged or embossed parts of a frame-plate previously flanged and bulged or embossed into fillets and square corners, substantially as described, for the purpose specified.

6. The combination, in a machine for flanging metal, of a male die and a female die, the said male die having an adjustable outer surface or surfaces, consisting of an independent surface or surfaces normally fitting the metal and pressing the same against the female die, but capable of withdrawal therefrom, thus allowing for the shrinkage of the surrounding metal in the process of cooling, substantially as described.

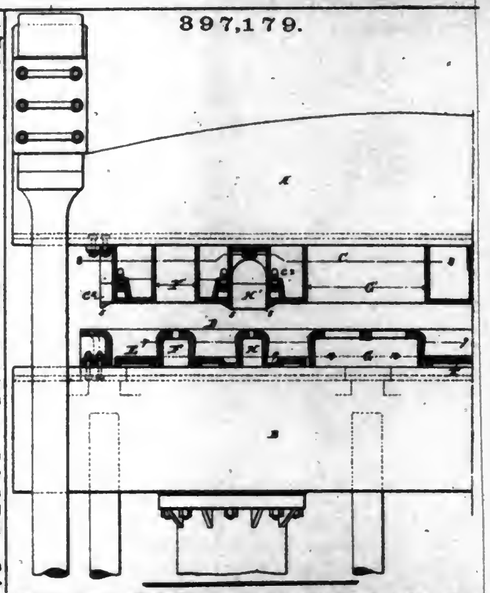
7. In a machine for flanging metal, the combination of a male and female die for flanging metal, and the punch F, forming part of the female die, and having a greater diameter on the plane 7 7, first passing through the metal, than it has on the plane 19 19, where the metal ultimately rests, substantially as described.

397,179. PROCESS OF MANUFACTURING FRAME-PLATES. SAMSON FOX, Harrogate, County of York, England. Original application filed Jan. 18, 1888, Serial No. 261,166. Divided and this application filed Nov. 21, 1888. Serial No. 291,470. (No model.)

Claim.—1. The process of forming a flanged metal plate in which the flanges are practically at right angles to the plate without permitting the said plate to warp or bind upon the pressing-dies, which consists in pressing the same between a properly-shaped male and female die and in gradually withdrawing the lateral pressure of the male die upon the flange during the process of cooling, and simultaneously with said cooling, substantially as described.

2. The process of forming a flanged metal plate in which the flanges are practically at right angles to the plate without permitting the said plate to warp or bind upon the pressing-dies, which consists in pressing the same between a properly-shaped male and female die and in gradually withdrawing the vertical and lateral pressure of the male die upon the flange during the process of cooling, and simultaneously with said cooling, substantially as described.

397,179.

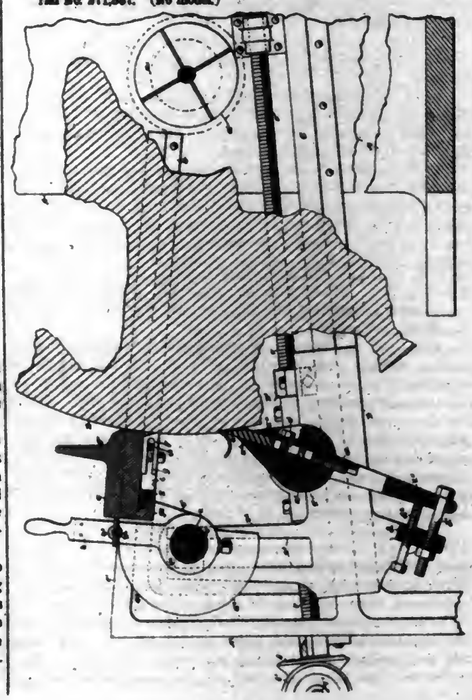


397,180. HOSE-STRAP. ISAAC N. GLAUBER, Cleveland, Ohio. Filed Sept. 29, 1888. Serial No. 286,745. (No model.)

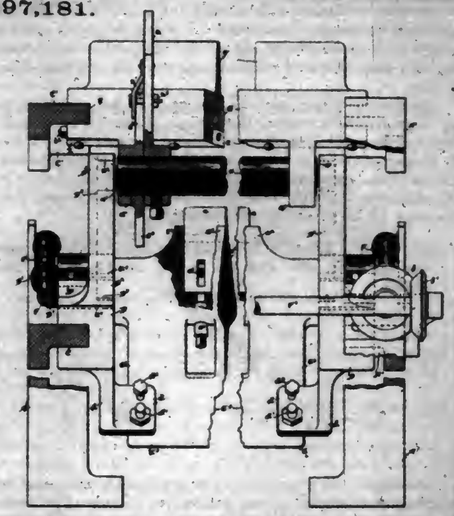


Claim.—A hose-strap consisting of an endless wire ring of greater diameter than the hose and embracing the hose, the slack portion of the ring being crossed and twisted to form an endless hose-strap and an endless loop, substantially as set forth.

397,181. ROTARY-CUTTING VENEER-MACHINE. ELIAS S. GORHAM and CHESTER R. GORHAM, Euclid, Ohio. Filed Apr. 21, 1888. Serial No. 271,387. (No model.)



397,181.



Claim.—1. In a rotary-cutting veneer-machine, the combination, with a knife and mechanism for pivotally supporting, adjusting, and feeding the same, of ways for such knife-supports to travel on, said ways being so disposed that the edge of the knife in its movement describes a plane making an angle with the plane of the beveled face of the knife greater than a right angle, substantially as set forth.

2. In a rotary-cutting veneer-machine, the combination, with presser-bar, knife, and mechanism for supporting and feeding each in unison, of ways, respectively, for the presser-bar and knife mechanism to travel on, such ways converging in the direction toward the axis of the log, substantially as set forth.

3. In a rotary-cutting veneer-machine, the combination, with converging ways, substantially as indicated, of knife and presser-bar operating, respectively, on the different ways, the said knife and presser-bar being operatively connected, so as to move in unison by means of one set of feed mechanism, substantially as set forth.

4. In a rotary-cutting veneer-machine, the combination of inclined ways, sliding blocks mounted on such ways, knife-head having trunnions journaled in the sliding blocks, bolts, and adjusting-screws for turning the knife-head on its axis and rigidly holding the adjustment of the knife-head, substantially as set forth.

5. In a rotary-cutting veneer-machine, the combination, with knife and knife-stock, the latter being pivotally mounted on sliding blocks, of ways for such sliding blocks to travel on, such ways being so disposed that the edge of the knife in its movement describes a plane making an angle with the plane of the bevel face of the knife greater than a right angle, substantially as set forth.

6. In a rotary-cutting veneer-machine, the combination, with knife and supporting mechanism and presser-bar, of converging ways, substantially as indicated, whereby the knife-head and presser-bar are fed along different radial lines of the log, substantially as set forth.

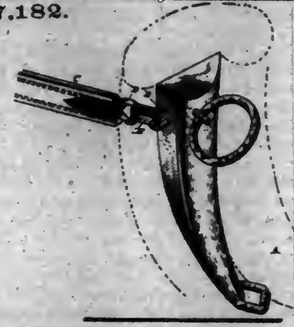
7. In a rotary-cutting veneer-machine, the combination, with two sets of ways, knife and supporting mechanism, presser-bar, and supporting cross-head operating, respectively, on such ways, substantially as indicated, of upright ways connected with the knife mechanism, and sliding blocks operating in such upright ways, the sliding blocks being connected with the cross-head of the presser-bar, the parts being arranged substantially as described, whereby the presser-bar is actuated by the movement of the knife mechanism, substantially as set forth.

8. In a rotary-cutting veneer-machine, the combination, with presser-bar and cross-head, substantially as indicated, of shaft journaled in boxes connected with such cross-head, said shaft having eccentric-wrists and sliding blocks journaled on such wrists, and ways for embracing such sliding blocks, said ways being connected with the knife-supporting mechanism, the parts being arranged substantially as indicated, whereby the presser-bar is adjusted toward or from the log by rotating such shaft, substantially as set forth.

397,182. HAME AND TUG COUPLING. JOHN GRAY, Jefferson, Iowa. Filed Aug. 22, 1888. Serial No. 283,411. (No model.)

Claim.—The combination, with the hame-staple and with the tug-clip twisted at right angles, as set forth, of an elongated draft-link interposed between the staple and clip to insure a direct draft, and a flexible double-jointed connection.

397,182.



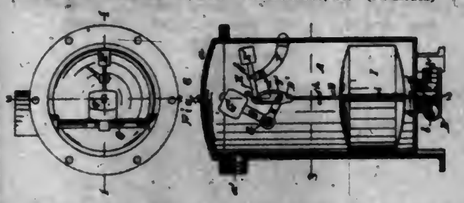
397,183. FOLDING BEDSTEAD. WILLIAM J. GRIBBEL, Fort Wayne, Ind. Filed Feb. 3, 1888. Serial No. 262,904. (No model.)



Claim.—1. The combination, with the main frame having the offset, as described, and provided with the dovetailed grooves in the tops of the side walls, of the movable bars F, having their ends tenoned to enter the said groove, the rocking bearings notched at their upper ends to receive journals of the bed-frame, having the rollers L on the upper outer sides of the side rails, and the vertically-curved guides H, arranged in the stationary frame and having the offsets P at their upper ends, substantially as specified.

2. In a folding bed, the combination, with the main frame having the offset, as described, of the horizontal bearings *b*, provided with apertures *c*, the guard-bar *e*, the rocking bearings D, having the bearing-notch at their upper ends and prongs at their lower ends to enter the apertures of the fixed bearing *b*, the vertically-curved guides H, secured to the side walls of the stationary frame and having the offsets P at their upper ends, and the bed-section B, having the lateral studs E, to enter the notches of the rocking bearings, and the rollers L, to enter the curved guideways H of the main frame, substantially as specified.

397,184. MEASURING STEAM-TRAP. GEORGE GUPTE, Wilkesbarre, Pa. Filed Mar. 20, 1888. Serial No. 268,516. (No model.)



Claim.—1. In a steam-trap, the combination, with an inclosing-case, of a discharge-valve, a bell-crank lever pivoted in the case and provided with a weight, a slotted plate, and pin-connection interposed between said valve and lever, whereby the valve may be operated suddenly by said weight, a float, a rod provided with collars and arranged intermediate between the said float and bell-crank lever, whereby the said weight may be overbalanced each time said float reaches its highest and lowest positions, and a register actuated at each discharge of liquid from the case.

2. In a steam-trap, the combination of an inclosing-case, a float in the case, a discharge-valve, a slotted plate secured to the said valve, a weighted bell-crank mounted on a rock-shaft and provided with a pin engaging with the slot in the said plate, a register operated by the motion of the rock-shaft simultaneously with the opening of the valve, and a rod provided with collars above and below the float and

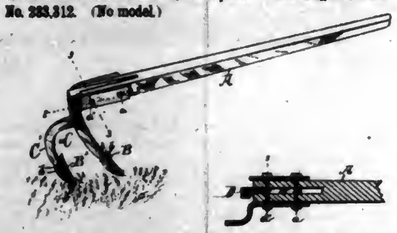
connected to the bell-crank, whereby an equal volume of water may be discharged at each opening of the valve.

3. In a steam-trap, the combination of an inclosing-case, a float in the case, a discharge-valve at the bottom of the case, a slotted plate, and a stem secured to the valve, a counter-balance for the weight of the said valve, its stem, and the plate, a weighted bell-crank mounted on a rock-shaft and provided with a pin engaging with the slot in said plate, a register operated by the motion of the rock-shaft simultaneously with the opening of the valve, and a rod provided with collars above and below the float and connected to the bell-crank, so that the water may be discharged intermittently in equal volumes.

4. In a steam-trap, the combination of an inclosing-case, a float in the case, a discharge-valve, a slotted plate secured to the said valve, a weighted bell-crank lever pivotally supported in the case and provided with a pin engaging with the slot in the said plate, and a rod connected to the said pin and provided with collars above and below the float, whereby the said valve may be intermittently opened and closed.

5. In a steam-trap, the combination of an inclosing-case, a float, a discharge-valve, a slotted plate, and a valve-stem secured to the valve, a counterbalance for the weight of the valve, its stem, and the plate, a weighted bell-crank lever pivotally supported in the case and provided with a pin engaging with the slot in the said plate, and the rods pivoted on the ends of the said pin and provided with collars above and below the float, so that the said valve may be opened and closed suddenly when the float reaches its highest and lowest points, substantially and for the purpose set forth.

397,185. CULTIVATOR. JOSEPH B. HIMES, Ladoga, Ind., assignor of one-half to John C. Himes, same place. Filed Aug. 21, 1888. Serial No. 283,312. (No model.)



Claim.—1. In a hand hoe or cultivator, the combination of the handle A, formed bifurcated at the end to which the hoes are fastened, the shanks C C', with the blades thereon, secured to said handle by the bolts *a* and *a'*, and the wedge D, slotted and mounted astride said bolts *a* and *a'* in the bifurcated end of the handle, said wedge being formed with a series of shoulders, *d''*, substantially as described, and for the purpose specified.

2. The combination, in a hand hoe or cultivator, of the bifurcated handle, the shanks bolted thereto by the bolts *a* and *a'*, the hole through which one of said bolts passes being formed elongated, as described, the blades adjustably secured on said shanks, and the wedge D, adjustably secured between the parts of the bifurcated end of said handle, substantially as set forth.

397,186. GLASS-MOLD. STEPHEN HIPKINS, Jr., Martin's Ferry, Ohio. Filed Sept. 11, 1888. Serial No. 285,104. (No model.)



Claim.—1. In a mold, the combination, with the body portion and the plunger, of the die-block adapted to work through and extend across the side of the said mold and having its inner end touching or approaching close to the said plunger, whereby a spout or mouth piece is formed on the article cast below its upper edge, which edge is continuous.

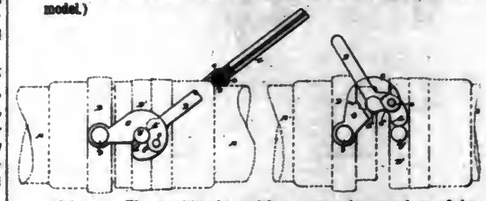
2. The combination, with the section A of the mold, having a recess in its upper edge, and the ring, of the plunger and the pivoted die-block, substantially as described.

3. The combination, with the sections A and B, having their inner edges chamfered, the section A having a recess, *a*, in its upper edge, and the ring D, having a corresponding recess, of the pivoted die-block adapted to fit in the said recess, substantially as set forth.

4. The combination, with the sections A and B, having their upper edges chamfered outward, and the ring D, having an annular groove, *d'*, in its lower edge and an inner flange, *d*, of the pivoted die-block adapted to form a spout or mouth-piece, substantially as described.

5. The combination, with the sections A and B, having their upper edges chamfered outward, the section A having a notch, *a*, in its edge and the recess *a'*, of the ring D, having an inner flange, *d*, and an annular groove, *d'*, in its lower edge, the plunger, and the die-block pivoted to the section A, and having its former constructed to fit in the notch *a*, and having a recess, *f*, in its under side, substantially as described, for the purpose specified.

397,187. HOSE-COUPLING. JOHN I. HOLTON and LOUIS H. BRITTON, New Lisbon, Ohio. Filed Sept. 20, 1888. Serial No. 286,767. (No model.)



Claim.—1. The combination, with two opposing members of the coupling, hooks pivoted to one member, the free end of the hooks being adapted to engage fastenings on the other member of the coupling, of a bail pivoted to the free end of such hooks and provided with hooked ends, which latter project beyond the free ends of the hooks for drawing the hook ends to and off of such fastenings, substantially as set forth.

2. The combination, with hooks and fasteners for engaging the free end of the hooks in holding the coupling together, substantially as indicated, of a bail pivoted to the free end of such hooks, such bail having seats on either side of the fulcrum thereof for respectively engaging the hook-fasteners with the reverse movements of the bail, substantially as set forth.

3. The combination, with coupling, hook, and bail, substantially as indicated, of a lever having a forked end adapted to engage the periphery of the bail, the prongs of the lever having inwardly-projecting lugs set in pairs to embrace laterally the wire or body of the bail, substantially as set forth

397,188. PEDAL FOR VELOCIPEDES. THOMAS R. JEFFERY, Ravenswood, Ill. Filed Dec. 27, 1887. Serial No. 258,963. (No model.)



Claim.—1. A velocipede-pedal comprising a yielding foot-block and a metal foot-support, the latter formed of two pieces of sheet metal united for a portion of their width to form a vertical ridge, the other portions forming a trough to receive the yielding foot-block, substantially as set forth.

2. A velocipede-pedal comprising a yielding foot-block and a metal foot-support, the latter formed of two pieces of sheet metal united for a portion of their width to form a vertical ridge, the other portions forming a trough to receive the yielding foot-block, the edges of said trough being bent inwardly to secure the block, substantially as set forth.

3. In a velocipede-pedal, in combination with the end pieces, C, a metal foot-support, one side trough-shaped to receive a foot-block, the other side a vertical ridge, and ears in the angles formed by the trough and the ridge, by means of which the foot-support is secured to the end pieces, substantially as set forth.

397,189. PROCESS OF FORMING VEHICLE-WHEELS. THOMAS R. JEFFERY, Ravenswood, Ill. Filed Jan. 20, 1888. Serial No. 261,267. (No model.)



Claim.—The hereinabove-described process of forming vehicle-wheels, which consists of, first, forming a strip of metal into a trough; second, bending the trough to the circumference of the rim; third, inserting the spokes and securing them to the hub; fourth, mounting the hub upon bearings; fifth, revolving the wheel upon such bearings with the rim in contact with forming-tools, whereby the channel or shoulder is turned upon each of its edges; sixth, applying to the rim another strip of metal adapted to engage with the channels or shoulders, whereby the channels of the trough are connected, substantially as set forth.

397,190. SPRING-HINGE. JOSEPH KEEBE, Chicago, Ill. Filed Aug. 20, 1888. Serial No. 283,232. (Model.)



Claim.—1. In a spring-hinge, the combination, with two or more leaves pivoted together, of a torsion-spring, a projecting arm connected therewith and having a free outer end, and a bearing-piece upon one of said leaves, against which the free end of said projecting arm can ride during the operation of the hinge, substantially as described.

2. In a spring-hinge, the combination, with the leaves for attachment to the door and jamb, respectively, and the intermediate leaf pivoted to said door and jamb leaves, of a torsion-spring, a projecting arm connected therewith and having a free outer end, and a bearing-piece upon said intermediate leaf, said arm and said bearing-piece being movably sustained with respect to each other, and one of said parts being provided with an irregular surface, against which the other is held in a manner free to ride, whereby a varying spring-pressure in the action of the hinge is secured, substantially as described.

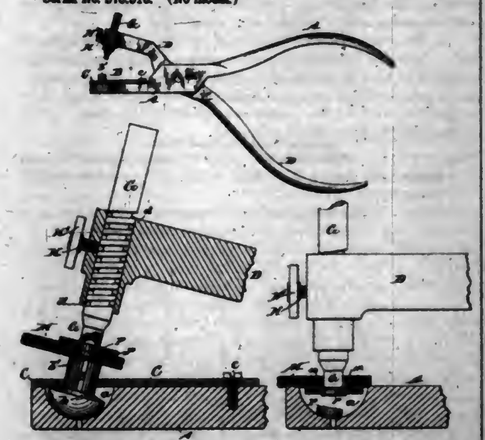
3. In a spring-hinge, the combination, with an upper and lower set of leaves for attachment to the door and to the jamb, respectively, and intermediate leaves pivoted to said door and jamb leaves, of a torsion-spring located intermediate of said upper and lower sets of leaves, a projecting arm at each end of said spring, and a bearing-piece located upon each of the intermediate leaves, against which said arms are held in a manner free to ride, substantially as described.

4. In a spring-hinge, the combination, with two or more leaves connected together, one of said leaves being provided with a cut-away space, of a spring located within said cut-away space of one of the leaves and extending beyond the face of the leaf with which it is connected, said spring having its ends held against outward movement, a projecting arm connected to the spring, and a bearing-piece upon one of said leaves, with which said arm engages, substantially as described.

5. In a spring-hinge, the combination, with two or more leaves pivoted together, of a spring, an arm projecting therefrom, one of said leaves being provided with a bearing-piece having a wearing-face, over which said arm freely rides, said wearing-face extending across the plane of said leaf, substantially as described.

6. In a spring-hinge, the combination, with several leaves pivoted together, of a spring, an arm projecting therefrom having an angular end, one of said leaves being provided with a bearing-piece, over which the angular end of said arm freely rides, substantially as described.

397,191. WATCH-MAKER'S TOOL. FREDERICK LEACH, New York, N. Y., and VINCENT L. FIORAVOTTA, Jersey City, N. J. Filed June 2, 1888. Serial No. 276,518. (No model.)



Claim.—1. In a jeweler's tool, the levers A D and pivot E, in combination with the freely-rocking abutting piece B and punch G, arranged for joint operation as herein specified.

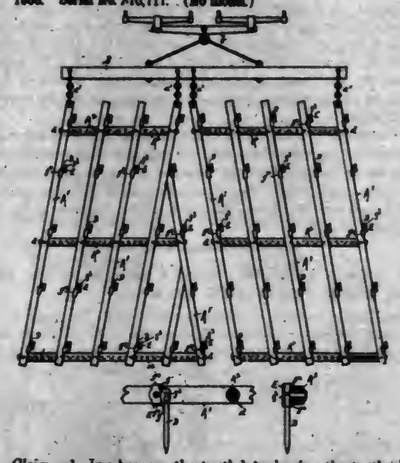
2. In a jeweler's tool, the levers A D, pivoted at E, abutting piece B, having a convex base, a contraction, *b*, and bearing-face *b'*, in combination with the swinging plate C, having the slot *c'*, as herein specified.

3. In a jeweler's tool, the punch G, screw-threaded as shown, and the screw H H', standing at an angle thereto, adapted to engage and release the threads of the punch at will, in combination with each other and with the levers A D, pivoted at E, as herein specified.

397,192. REMEDY FOR RHEUMATISM, &c. JOHAN F. LINDGREN, Crookston, Minn. Filed Oct. 15, 1888. Serial No. 288,058. (No specimens.)

Claim.—The herein-described medicinal compound, composed of water, senega (*Polygala senega*) root, castor-oil, cooking-soda, sirup, saltpeter, lemon-juice, blue-berry juice, (*Vaccinium corymbosum,*) red pepper, and essence of peppermint, substantially as set forth.

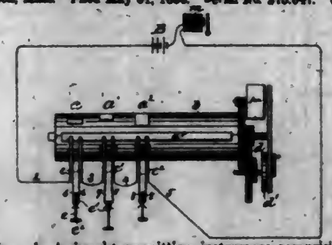
397,198. HARROW. OSMON LUSH, St. Paul, Minn. Filed Apr. 16, 1888. Serial No. 270,717. (No model.)



Claim.—1. In a harrow, the tooth-bars having the teeth pivoted thereon and adapted to project beyond either side thereof, in combination with keepers E, having stop-surfaces *g'* *g''* and stop-lips *g''*, adapted to keep said teeth in place, substantially as and for the purpose set forth.

2. In a harrow, the tooth-bars having the teeth pivoted thereon and adapted to project beyond either side thereof, in combination with keepers E, having stop-surfaces *g'* *g''*, stop-lips *g''*, and ribs *g''*, whereby said teeth are held in place and said keepers secured to said bars by one bolt only in each, substantially as and for the purpose set forth.

397,194. MULTIPLE-SIGNAL TRANSMITTER. MORRIS MARTIN, Malden, Mass. Filed May 31, 1888. Serial No. 275,647. (No model.)



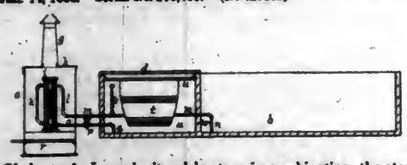
Claim.—1. A signal-transmitting instrument comprising a number of distinct signaling-surfaces or break-wheels connected to move simultaneously, the co-operating members of each of said break-wheels being permanently connected in series with one another, combined with a shunt-circuit around the co-operating members of each break-wheel and circuit-controllers in said shunts, whereby any desired one of said shunts may be retained open and the remainder closed during the simultaneous movement of said break-wheels, substantially as described.

2. The combination of a motor and drum moved thereby with a series of contact-surfaces on said drum and pairs of springs co-operating therewith, constituting independent break-wheels, one of said surfaces being continuous under all said springs, and the different

pairs of springs being connected in series with one another, and shunts around each pair of springs, substantially as described.

3. A signal-transmitting instrument comprising a motor and a number of distinct signaling-surfaces or break-wheels moved simultaneously thereby, the co-operating members of each of said break-wheels being permanently connected in series with one another, combined with separate shunt-circuits around each of said break-wheels, substantially as and for the purpose described.

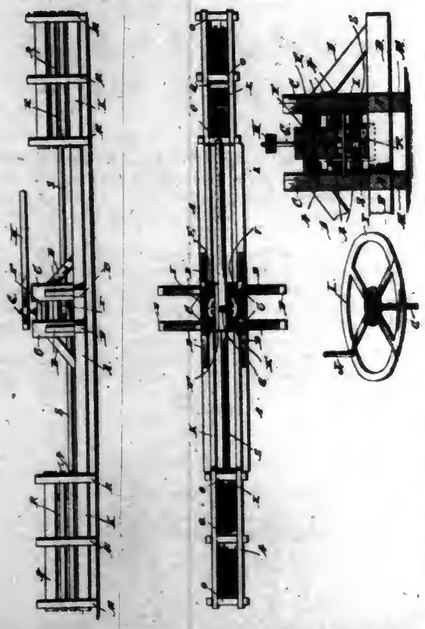
397,195. AGRICULTURAL HEATER. CARSON A. MASTERSON, Decatur, assignor of one-half to Jeremiah M. Duncan, Lintner, Ill. Filed Jan. 14, 1888. Serial No. 260,735. (No model.)



Claim.—1. In agricultural heaters, in combination, the steam-chamber *a*, containing the feed-receptacle *t*, the water-tank, the heater, the pipe *m*, having branches *o* and *n*, the one in the steam-chamber, the other in the water-tank, and the pipe *o*, terminating in the steam-chamber, the water-tank and steam-chamber being separated by a partition having an opening smaller than the pipes, as and for the purpose set forth.

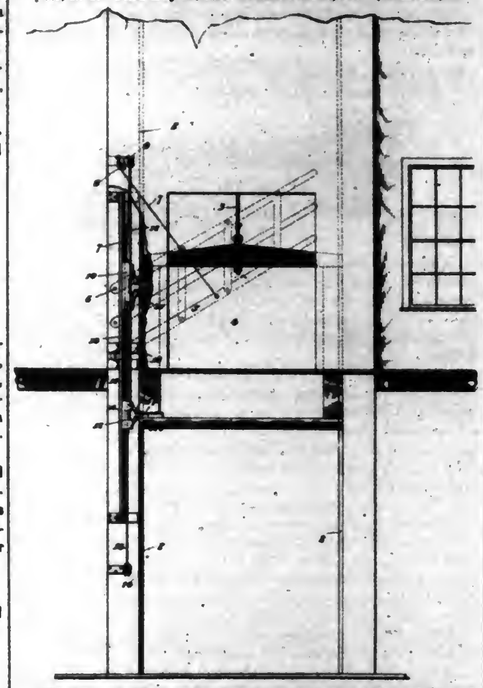
2. In agricultural heaters, in combination, the steam-chamber and the water-tank separated by a partition provided with a small opening, the heater separate from the tank and steam-chamber, and pipes larger in internal diameter than the opening in the partition connecting the heater with the steam-chamber and with the tank, as and for the purpose set forth.

397,196. HAY-PRESS. THOMAS T. MAYES, Belton, Tex. Filed Aug. 16, 1888. Serial No. 282,847. (No model.)



Claim.—The improved hay-press herein described and shown, comprising the parallel beams A A, the standards C, erected on said beams near the centers thereof, the transverse bars E, connecting the standards in pairs, the longitudinal bearing-bars F, secured to and between the said transverse bars, the king-bolt journaled in said bearing-bars, the sweep secured to the upper end of the king-bolt, the drive-wheel secured to the lower end of the king-bolt and having a single depending crank-pin, the press-boxes at the ends of the beams A A, the plungers in said press-boxes, and the pitmen having their outer ends pivoted to the plungers and their inner ends pivoted on the crank-pin of the drive-wheel, all combined and operating substantially as specified.

397,197. ELEVATOR-HATCHWAY. CYRUS A. MCALLISTER, Rochester, N. Y. Filed May 26, 1888. Serial No. 275,089. (No model.)



Claim.—1. The combination, in an elevator, of the weight and gate with a counterbalancing-weight, pulleys, and cords passing over said pulleys and connected each to both weights, a weight-lifting plate, and a releasing-plate, all constructed and arranged substantially as specified, whereby one weight may be made to overbalance the gate, and may subsequently be itself overbalanced by the other weight acting with the gate.

2. In combination with a movable gate or door, a cord and pulleys, a counterbalancing-weight provided with two spring-actuated catches, 15, a lifting-plate secured to the elevator-car, and a releasing-plate secured to the well-frame, substantially as specified, whereby the weight may be lifted or depressed positively, as desired.

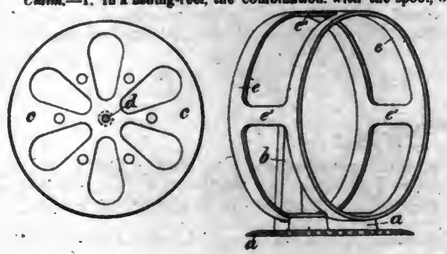
3. A weight for use in counterbalancing an elevator-door, consisting of a body provided with pivoted catches, and a spring, 16, secured to the body and having its free ends arranged to normally press against the catches, substantially as specified.

4. The combination of the pivoted gate, the swiveled pulley-block near the front of the elevator-well, a counterbalancing-weight, a fixed pulley, a cord connecting the gate and the weight, the cord running over both the fixed and movable pulley, a second weight, fixed pulley, and connecting-cord, all substantially as specified.

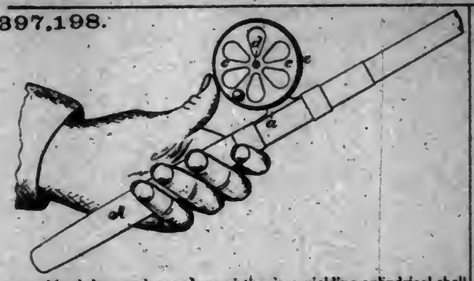
5. The combination of the elevator-car, spring-plate, weights 10 and 11, provided with spring-actuated catches 15 and constructed and arranged to move on guides, cords connecting the weights, the pulleys, and a gate connected by a cord with one of the weights, substantially as specified, whereby the weights may be alternately raised and depressed and the gate opened and closed.

397,198. FISHING-REEL. AUGUST F. MEISSELBACH and WILLIAM MEISSELBACH, Newark, N. J. Filed Oct. 27, 1888. Serial No. 289,322. (No model.)

Claim.—1. In a fishing-reel, the combination, with the spool, of



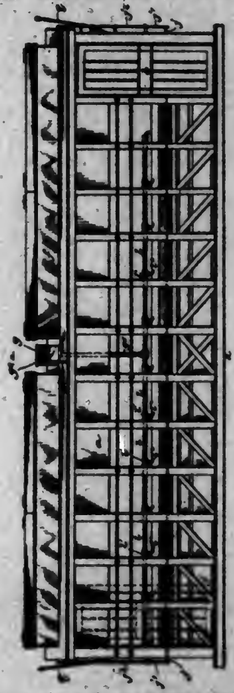
397,198.



a combined drag and guard, consisting in a yielding cylindrical shell encircling the flanges of the spool, with its inner face adjacent to their peripheries, and adapted, when pressed by the operator, to make a frictional contact with the rotating flanges, substantially as shown and described.

2. In a fishing-reel, the combination, with the support of the spool-stud and the spool, of the leaf-spring *e*, secured at one end to the said support, and having at its opposite end an inwardly-projecting pin, *p*, the said spring being provided with a slot, *o*, having a sliding button therein and inclined in relation to the said support for the spool-stud, as and for the purpose set forth.

397,199. STOCK-CAR. JAMES MONTGOMERY, East Millstone, N. J. Filed Apr. 4, 1888. Serial No. 269,697. (No model.)



Claim.—1. In a stock-car, the water-tank *g*, straddling the ridge-pole substantially midway between the ends of the car and provided with distributing-pipes g^2 g^3, terminating in outlets composed of horizontal openings leading from opposite sides of such pipes over the drinking-troughs, combined with such troughs, substantially as described.

2. In a stock-car, water-tanks *g*, straddling the ridge-pole substantially midway between the ends of the car and provided with distributing-pipes g^2 g^3, each having the opposite openings, *n' n'*, and closed by screw-caps *n*, and arranged over the drinking-troughs, combined with such drinking-troughs, substantially as described.

3. The gutter composed of the vertical protection-board k', slanting bottom k^2, and braces k^3, connecting the protection-board and bottom and securing them to the side of the car, in combination with the tilting drinking-trough arranged wholly within such gutter and of a width and depth relatively to its journal to fill the spaces between the protection-board and sides of the car both when in use and when not in use, and means for tilting the troughs, substantially as described.

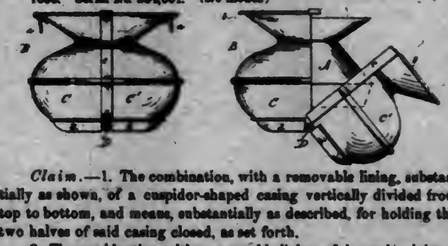
4. The gutter composed of the vertical protection-board k', slanting bottom k^2, and braces k^3, connecting the protection-board and bottom and securing them to the side of the car, in combination with the tilting drinking-trough arranged wholly within such gutter and of a width and depth relatively to its journal to fill the spaces between the protection-board and sides of the car both when in use and when not in use, and having its journal extended through and outside of the end of the car and connected with the crank j', from which the operating-rod j^3 extends up to the roof, substantially as described.

5. A folding hay-rack fixedly hinged at its lower end to the side of the car and adapted to be folded up flat against the side of the car, and provided with a lip to engage stationary stops depending from the upper part of the car when the rack is inclined for use, substantially as described.

6. The hay-rack hinged at its lower end to the side of the car and adapted to fold up against the side of the car, and having a lip to engage stationary stops depending from the top of the car, combined with a shutter-board and means to move it to open and close such rack, substantially as described.

7. A hay-rack for stock-cars having a main slatted portion behind which the hay is placed, combined with a shutter-board hinged to the upper portion of the car and adapted to close and open the rack by a pivotal movement, substantially as described.

397,200. SPITTOON. ALBERT E. MOORE, St. Albans, Vt., assignor to Isaac S. Boricy and Alvin F. Bullard, same place. Filed Aug. 23, 1888. Serial No. 284,001. (No model.)

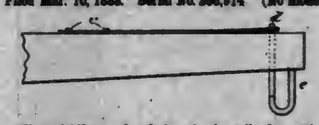


Claim.—1. The combination, with a removable lining, substantially as shown, of a cuspidor-shaped casing vertically divided from top to bottom, and means, substantially as described, for holding the two halves of said casing closed, as set forth.

2. The combination, with a removable lining, of the spring-jointed casing, each half of said casing being provided with a ring or bail for pulling said halves apart, as set forth.

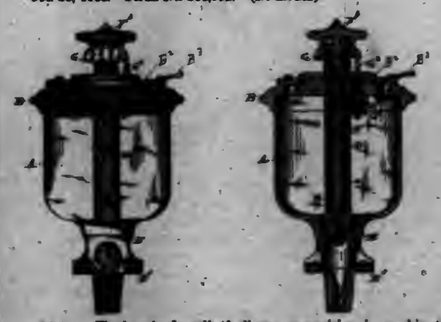
3. The combination, with a removable lining, of a jointed casing, a spring-hinge for automatically closing said casing, and the bottom guard-pieces for keeping the hinge from touching the floor, as set forth.

397,201. WHIFFLETREE-HOOK. SAMUEL O. NICHOLS, Weare, N. H. Filed Mar. 10, 1888. Serial No. 266,914. (No model.)



Claim.—The whiffletree-hook herein described, consisting of the hook E, the movable pin *d*, in combination with the strap-spring *e*, constructed in the manner and for the purpose specified.

397,202. OIL-CUP. CHARLES H. NUHN, Rochester, N. Y. Filed Oct. 23, 1888. Serial No. 288,962. (No model.)



Claim.—The herein-described oil-cup, comprising, in combination, an oil-chamber provided with a central vertical tube formed near its lower end with apertures for the passage of oil from the chamber, and having its lower end contracted, a valve-stem within said tube

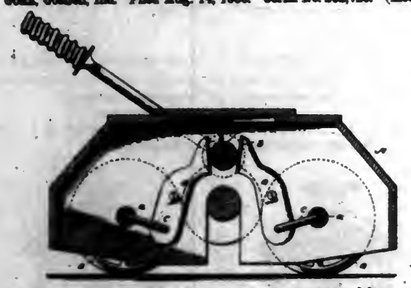
having its lower end contracted to fit the contracted lower end of the tube, and its upper end provided with a cap the depending lower edge of which is cam-shaped and provided with a series of notches and a corresponding series of indicating-characters, and a vertically-moving spring-actuated catch seated within a chamber formed in the cover of the oil-chamber and adapted to engage the notches in the cap upon the valve-stem, substantially as for the purpose described.

397,208. SAWING-MACHINE. WILLIAM R. PATTERSON, Cologne, Minn. Filed Aug. 25, 1888. Serial No. 283,725. (No model.)



Claim.—In a sawing-machine, the combination of the standard provided with a vertical slot, *a*, the beam B, provided with a bolt, *b*, which passes through the slot *a* and is engaged by a thumb-nut, *b'*, the inclined support C, provided with a guide-slot, *c*, and an engaging-hook, M, the hanger D, comprising the parallel bars *d d*, projecting at their ends above and below the beam, the swinging arm E, pivoted near its rear end between the extremities of the said bars and provided at its front end with a guide-block, F, having a slot, *f*, the adjusting-bolt I, arranged in the beam between the hanger and the standard and connected to the rear end of the swinging arm by the coiled spring L, the saw G, operating in the slots *c* and *f*, and provided at its rear end with a block, H, sliding on the swinging arm, and the guiding-arm O, pivoted to the block F and bearing on the beam B, to prevent sagging of the swinging arm, substantially as specified.

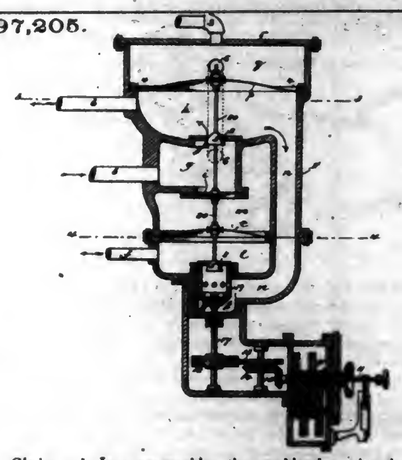
397,204. CARPET-SWEEPER. HIRAM W. RU TOB and HENRY A. GOAR, Goshen, Ind. Filed Aug. 14, 1888. Serial No. 282,729. (Model.)



Claim.—1. The combination, in a carpet-sweeper, of levers pivoted to the end walls of the case, and having one end connected with the driving-wheels by means of angular rods or journals, and a cam adapted to engage the opposite ends of the said levers to move the driving-wheels, substantially as specified.

2. The combination, with a sweeper-case, of the cam, such as E, having a central aperture and lugs, the handle-bail engaging said aperture and lugs, and pivoted levers connected with the journals of the driving-wheels and adapted to engage the said cam, whereby the driving-wheels may be moved with respect to the case, substantially as specified.

397,205. GAS-MACHINE. EDWARD D. SELF, South Orange, N. J. Filed Jan. 9, 1888. Serial No. 260,131. (No model.)



Claim.—1. In a gas-machine, the combination, with the carburetor and the pipe for supplying air thereto, of the pipe for supplying pure air to the gas, a regulating-valve for controlling the amount of pure air admitted, and a diaphragm connected to said valve and subjected to and operated by the pressure of the air passing to the carburetor, substantially as described.

2. In a gas-machine, the combination, with the carburetor and the pipe for supplying air thereto, of the pipe for supplying pure air to the gas, a regulating-valve for controlling the amount of air admitted to the carburetor, a regulating-valve for controlling the amount of pure air admitted to the gas, and a diaphragm subjected to and operated by the pressure of the air admitted to the carburetor and connected to and controlling both of said valves, substantially as described.

3. In a gas-machine, the combination, with the carburetor and the pipe for supplying air thereto, of the pipe for supplying pure air to the gas, a regulating-valve for controlling the amount of air admitted to the carburetor, a regulating-valve for controlling the amount of pure air admitted to the gas, a valve-rod carrying both of said valves, and a diaphragm connected to said rod and subjected to and operated by the pressure of the air admitted to the carburetor, substantially as described.

4. In a gas-machine, the combination, with the carburetor and the pipe for supplying air thereto, of the pipe for supplying pure air to the gas, a regulating-valve for controlling the amount of air admitted to the carburetor, a regulating-valve for controlling the amount of pure air admitted to the gas, a valve-rod carrying both of said valves, a diaphragm connected to said rod and subjected to and operated by the pressure of the air admitted to the carburetor, and a second diaphragm, also connected to said rod and subjected to and operated by the pressure of the pure air admitted to the gas, substantially as described.

5. In a gas-machine, the combination, with a carburetor and the pipe for supplying air thereto, of the pipe for supplying pure air to the gas, a regulating-valve for controlling the amount of air admitted to the carburetor, a regulating-valve for controlling the amount of pure air admitted to the gas, a valve-rod carrying both of said valves, a diaphragm connected to said rod and subjected to and operated by the pressure of the air admitted to the carburetor, and a second diaphragm, also connected to said rod and subjected to and operated by the pressure of the pure air admitted to the gas, substantially as described.

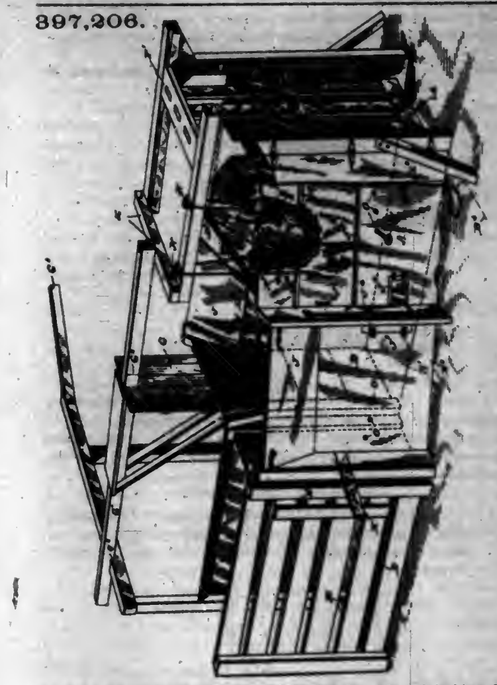
6. In a gas-machine, the combination, with a carburetor, the pipe *b*, for supplying air thereto, and the pipe *f*, for supplying pure air to the gas, of the regulating apparatus having the chambers *g h*, communicating with the two parts of the pipe *b*, the chamber *l*, communicating with the pipe *f*, the duct *n*, and chamber *k*, affording communication between the chambers *h l*, the diaphragm *p*, the rod 20, connected to the diaphragm, and the valves 3 5, connected to said rod and controlling the passages between the chambers *g h* and *k l*, respectively, substantially as described.

397,206. COMBINED STALL AND STOCK-HANDLING APPARATUS. CHARLES F. SEEDS, Fairfield, Nebr. Filed Mar. 12, 1888. Serial No. 267,013. (No model.)

Claim.—1. A stall provided with a side, B, hinged at the front corner of said stall opposite to chute D to open outwardly, in combination with the chute located outside the plane of the closed position of the hinged side, substantially as specified.

2. A stall provided with a side, B, hinged at the front corner of said stall opposite to chute D to open outwardly, in combination with the chute located outside the plane of the closed position of the hinged side, and provided with the door C, substantially as specified.

397,206.



3. A stall provided with a side, B, hinged at the front end of the stall opposite to chute D to open outwardly, in combination with the chute provided with the door C, located outside the plane of the closed position of the hinged side, and a locking-pole, substantially as specified.

4. In a stall provided with the downwardly and backwardly inclined series of holes O, located in each side near the front of the stall, the combination of a bar or rod fitting said holes and removable planks H for the rear of the stall, substantially as specified.

5. A stall provided with removable planks H, sliding door F, and adjustable doors J J, in combination with a vertically-adjustable platform and gangway, substantially as specified.

6. For use in harnessing, haltering, bitting, and saddling, the stall provided with the sliding front door and with doorways in a side, and having oppositely-placed series of holes O near its rear, and a rod, O', fitting said holes, substantially as specified.

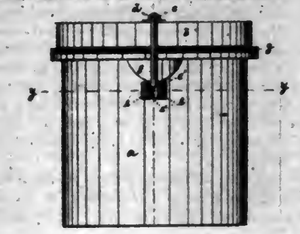
7. The stall provided with doorways in its sides, having the front sliding door, F, and removable planks H at the rear, for use in roaching and trimming mules, substantially as specified.

8. In a stall provided with sides oppositely perforated near the rear, the combination of a bar or rod adapted to fit the perforations, and a sliding removable door, F, whereby the animal may be held to have his teeth or mouth operated on or to be drenched, substantially as specified.

9. The stall provided with the front door, F, movable lengthwise of the stall, and with separately-removable planks H H for use in administering injections, substantially as specified.

10. In a stall having a removable side provided with small doorways, slinging-belts, and a rope, L^3, having ring L^4, said rope being secured to the stall near its front, substantially as specified.

397,207. COVER-FASTENER. GUSTAV STAIB, Tompkinsville, N. Y. Filed Dec. 11, 1888. Serial No. 293,236. (No model.)



Claim.—The combination of can *a*, having grooves *d* and curved guards *f*, with cover *b*, and with spring-bail *c*, having inwardly-bent arms *c'*, substantially as specified.

397,208. TOOL FOR NICKING HEADS OF SCREWS. JAMES F. THAYER, Providence, R. I. Filed Sept. 14, 1888. Serial No. 285,439. (No model.)

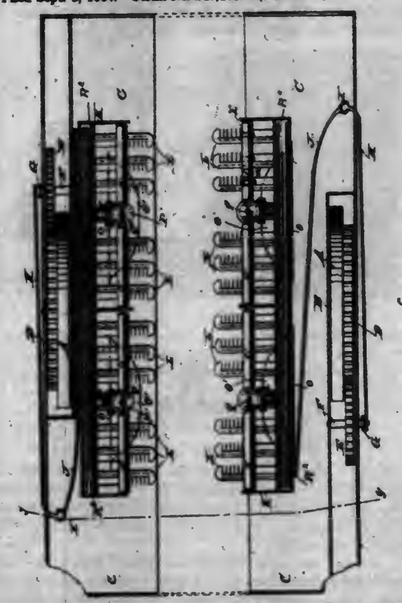


Claim.—1. The herein-described hammer for forming the nick hereinbefore described, the same comprising a shank provided with a projecting tongue, having the salient angles rounded and the re-entrant angles filleted, substantially as specified.

2. The hammer herein described, having a cup-shaped recess at one end provided with a projecting tongue, having the salient angles rounded and the re-entrant angles filleted, substantially as and for the purpose specified.

3. In combination with a screw-blank-forming die, a hammer for making a screw head and nick simultaneously, the same having one end thereof corresponding in shape to the face of the head of the screw to be formed, said end being provided with a projecting tongue the salient angles of which are chamfered or rounded and the re-entrant angles filleted, substantially as and for the purpose specified.

397,209. COTTON-PICKER. JAMES W. WALLIS, Birmingham, Ala. Filed Sept. 5, 1887. Serial No. 249,165. (No model.)



Claim.—1. In a cotton-harvester, the combination, with the frames carrying the pickers, of wheels on which said frames are supported, and a track for said wheels, which is composed of a straight section and a curved section placed opposite each other and meeting at their corresponding ends, substantially as shown and described, whereby the reciprocating frames make the circuit of the track and thus have a laterally and longitudinally swinging motion, as specified.

2. In a cotton-harvester, the combination, with the main driving-wheels, of frames carrying the pickers, and devices connecting said wheels and frames for reciprocating the latter, wheels for supporting said frames, a track on which these wheels run, vertical shafts mounted in the frames and having gears fixed thereon, means for rotating said shafts, pickers carried by the frames, and means for imparting motion to the pickers from the gears on the said shaft, as shown and described.

3. In a cotton-harvester, the combination, with frames carrying sets of pickers, of wheels on which said frames travel, a track for these

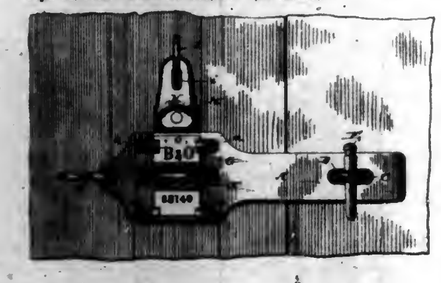
wheels which describes an irregular orbit, the section O' of the track nearest the center of the machine being convex toward the center of the machine and the opposite section O straight, as shown and described, whereby the picking-frames have a laterally-swinging and also longitudinal movement, as and for the purpose specified.

4. In a cotton-harvester, the combination, with frames carrying the pickers, and means connected with the driving-wheels for reciprocating the frames, of grooved wheels on which these latter travel, tracks on which the grooved wheels run, vertical shafts which derive motion from said grooved wheels, rollers arranged horizontally and deriving motion from said vertical shafts, and pickers supported on the picking-frames and operated by said rollers, substantially as shown and described.

5. In a cotton-harvester, the combination, with a frame, C, and the main driving-wheels, of a gear-wheel secured to each of the latter, a second gear-wheel, E, meshing with the first, and a crank-shaft whereon it is mounted, reciprocating frames K, carrying the pickers, tracks composed of sections arranged opposite each other and meeting at their corresponding ends, whereon said frames travel, and the pitman H and link J, jointed together and loosely connected with the crank-shaft and reciprocating frames, for imparting motion to the latter, as shown and described.

6. In a cotton-harvester, the combination, with the main driving-wheels and frame C, supported by the same, of a gear-wheel secured to each of said driving-wheels, a second gear-wheel meshing into the first and secured to a shaft mounted in said main frame, a crank-arm secured to the said shaft, a pitman pivotally connected with said crank-arm, a link which is connected to the pitman by a universal joint, frames carrying the pickers connected with the link, wheels supporting said frames, and tracks on which said wheels travel in an irregular orbit, the said tracks being composed of straight and curved sections placed opposite each other and meeting at their corresponding ends, as shown and described.

397,210. SEAL-LOCK. ORRIN T. WELCH, Topeka, Kans. Filed Sept. 21, 1888. Serial No. 285,960. (No model.)



Claim.—1. In a seal-locking device, the combination, with a hasp having projections on the face thereof for holding the seal between the hasp and projections, of a locking device arranged at the side of the hasp and adapted to hold the seal in position on the face of hasp, substantially as described.

2. In a seal-locking device, the combination, with a hasp having a longitudinal slot, of a loop projecting through said slot, a breakable seal secured upon the hasp and passing through the loop, and a locking device arranged at the side of the hasp to secure the seal, substantially as described.

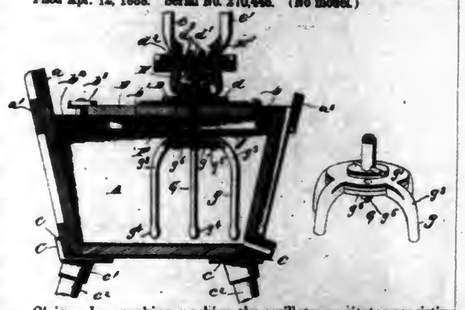
3. In a seal-locking device, the combination, with a hasp supporting a breakable seal, of a locking device arranged at the side thereof, the said device being provided with a bolt and projections to engage with the hasp, substantially as described.

4. In a seal-locking device, the combination, with a hasp carrying a seal, of a locking device arranged at the side thereof and adapted to engage with the hasp, and provided with a blind-bolt to engage with a fixed seat, substantially as described.

5. In a seal-locking device, the combination, with a hasp carrying a seal, of a locking device having a recess in the base thereof, a spring-bolt supported in said recess, and a fixed block provided with a seat for said bolt and adapted to be embraced by the locking device, substantially as described.

6. In a seal-locking device, the combination, with a hasp carrying a seal and having recesses in the under side, of a seal-locking device provided with projections O, adapted to engage the said recesses and to be held in locking position thereby, substantially as described.

397,211. WASHING-MACHINE. EDGAR E. WILLIS, Decatur, Ill. Filed Apr. 12, 1888. Serial No. 270,442. (No model.)



Claim.—In a washing machine, the oscillatory agitator consisting of the disks g' g^4, of equal diameter, each having the integral opposite depending arms g curving outwardly from the disk and extending vertically downward, and the bolts to connect the disks then together, substantially as specified.

397,212. APPARATUS FOR HEATING RAILWAY PASSENGER CARS. MARSHAL WOOD, Alderson, W. Va., assignor to himself and ALEX. McVEY MILLER, same place. Filed Feb. 14, 1888. Serial No. 264,017. (No model.)

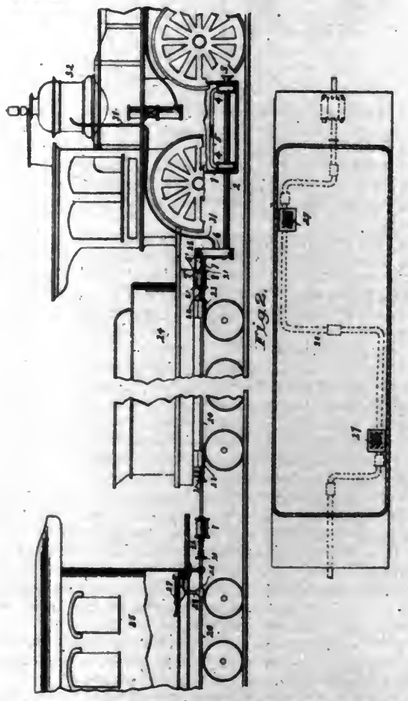


Fig 2.

Claim.—1. An apparatus for heating railway passenger-cars, consisting of air-tubes having open ends projecting in front of the fire-box of the locomotive, passing through reservoirs in the fire-box connected by hollow tubes serving as grate-bars, and passing to a hot-air drum beneath the cab of the locomotive, said hot-air drum being connected by a tube and flexible coupling with an air-pipe beneath the tender, which is connected in turn with air-pipes suspended beneath the cars of the train and provided with branch pipes and perforated openings in the floors of the said cars, said pipes being connected together between the cars by suitable flexible couplings, substantially as described.

2. In an apparatus for heating railway passenger-cars, the combination, with register-openings in the bottoms of the said cars connected with a main hot-air pipe leading to a hot-air drum located beneath the cab of the locomotive, which in turn is connected by hot-air pipes passing through the fire-box of the locomotive, with open ends projecting beyond the same, of a steam-pipe connecting the hot-air drum beneath the locomotive with the steam-drum, substantially as described.

3. In an apparatus for heating railway passenger-cars, the combination, with open end air-pipes passing through the fire-box of the locomotive and beneath the cars of the train and connected with suitable openings in the said cars, of reservoirs located in the fire-box of the locomotive and connected by tubular bars forming the grate-bars of the fire-box, substantially as shown and described.

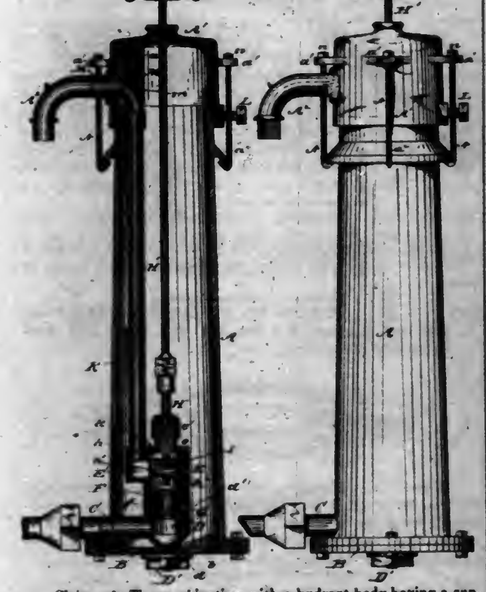
4. In an apparatus for heating railway passenger-cars, the combination, with the fire-box 1, of the air-pipes 2, having funnel-shaped ends 3, and the reservoir-boxes 4, connected by tubular grate-bars 5, substantially as described.

5. In an apparatus for heating passenger railway-cars, the combination, with the V-shaped heating-drum 6, located beneath the cab of the locomotive and having a pipe, 7, connecting with the main heating-pipe located beneath the cars of the train, of air-pipes 2, passing through the fire-box 1, having open ends 3 and connected with the reservoirs 4, joined by hollow grate-bars 5, located in the fire-box 1, substantially as described.

6. In an apparatus for heating railway passenger-cars, the combination, with the heating-drum 6, the air-pipes 2, connected with said heating-drum, passing through the fire-box 1, and having open ends 3, and the reservoir-boxes 4 and grate-bars 5, connected with the said air-tubes 2, of the steam-pipe 31, connecting the hot-air drum 6 with the steam-dome 32, substantially as shown and described.

7. An apparatus for heating passenger-cars of a railway-train, consisting of the air-pipes 2, with openings 3, passing through the fire-box 1 of the locomotive, connecting with reservoir-boxes 4 and hollow grate-bars 5, and the hot-air drum 6, having pipe 7, with coiled springs 22 and spring-hook 6', and freely resting in the lug 7 of coupling 8, and a series of air-pipe sections, 20, connected by couplings 8, and with registers 27 in the cars 25, substantially as shown and described.

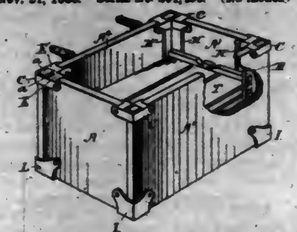
397,213. HYDRANT. EDWARD ZWIEBEL, Pottsville, Pa. Filed June 15, 1888. Serial No. 277,171. (No model.)



Claim.—1. The combination, with a hydrant-body having a supply-pipe and a centrally-arranged block containing a chamber communicating with the supply-pipe, of a valve-casing provided with a tubular plug fitting into the block and communicating with the chamber, a valve seating upon the upper end of the plug, a discharge pipe and nozzle, a rotatable and vertically-movable cap bearing upon the upper end of the discharge-pipe, and means for drawing the cap downward over the hydrant-body, substantially as described.

2. The combination, with the body A, rotatable cap A', valve-casing E, and discharge-pipe K, of the T-shaped piece M, inserted between the upper end of the pipe K and the under side of the cap A' and provided with a passage, m, substantially as described.

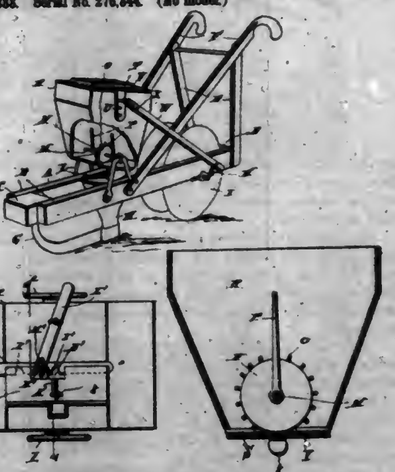
397,214. SHIPPING-CASE. BENJAMIN S. ATWOOD, Whitman, Mass. Filed Nov. 21, 1888. Serial No. 291,490. (No model.)



Claim.—1. In a shipping-case, the combination of the side and end pieces, A A' A^3 A^3, having tenons a a', with the socket-clasps C C, having exterior and interior angle-pieces, K K', and cross-bars E E', substantially as described, and for the purpose set forth.

2. In a shipping-case, the combination of the side and end pieces, A A' A^3 A^3, with a bracing and staying device consisting of the corner attachments C and L, and the rods H H, passing through the corner attachments and riveted to them, substantially as described, and for the purpose set forth.

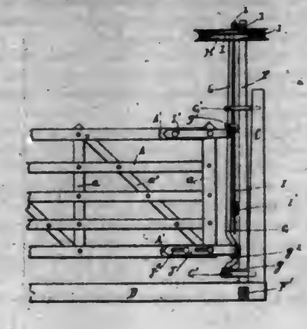
397,215. PLANTER. JOHN J. BALLARD, Terrell, Tex. Filed June 12, 1888. Serial No. 276,844. (No model.)



Claim.—1. The combination, in a planter, of the oscillating hopper having the opening S in its lower side, the slides Y on the bottom of the hopper, the seed-slide guided between said slides Y, the operating-lever L', pivoted on the bottom of the hopper, and the rigid arms secured to the frame of the planter or other fixed point and arranged in the path of the lever, substantially as described.

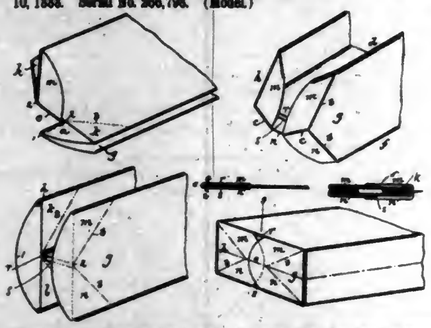
2. The combination, in a planter, of the oscillating hopper having the opening S in its lower side, the slides Y on the bottom of the hopper, having the slots A', the set-screws Z, engaging said slots and securing the slides in place, the seed-slide guided between the opposing edges of the slides Y, and the operating-lever L', pivoted on one of the screws Z and engaging the seed-slide, substantially as described.

397,216. GATE. EDWARD H. BAUER, Carbon Centre, Pa. Filed May 10, 1888. Serial No. 273,473. (No model.)



Claim.—The gate A, having latch B pivotally secured thereto, and provided with hinges J J', the former of which has slots J^2 to vary the angle of its suspension, as illustrated, in combination with the upright C, having a catch, E, with a central pin, *e*, the upright C, having bearings G', the bent spindle G, having stops g g^2, respectively above and below the hinges J J', the former having a depending lip, for the purpose set forth, the terminal grooved wheel H, mounted on said spindle, the lateral extensions F', having uprights F, in which pulleys *i* are secured, and the cord I, whose middle portion is secured circumferentially, at one place only, to the wheel H, passing one turn in the groove, and whose ends traverse the pulleys *i*, terminating in weights I', in the manner specified and illustrated.

397,217. PAPER BAG. LORENZO D. BENNER, Peoria, Ill., assignor to the Union Paper Bag Machine Company, Philadelphia, Pa. Filed Mar. 10, 1888. Serial No. 266,796. (Model.)



Claim.—1. The herein-described square bag, having a bottom formed of the opposite side portions, g k, extending from the bellows sides toward the center of the bag-bottom, so as to overlap each other and the opposite portions r s of the other sides of the bag, substantially as described.

2. The herein-described square bag, having a bottom formed of the opposite side portions, g k, extending from the bellows sides toward the center of the bag-bottom, so as to overlap each other and the opposite portions r s of the other sides of the body of the bag, said opposite side portions having diagonal fold-lines *b*, substantially as described.

3. A bellows-sided bag having a bottom formed of opposite side portions, g k, extending from the bellows sides toward the center of the bag-bottom and overlapping each other, and the opposite portions r s of the other side of the bag-body extending therefrom toward the center of the bag-bottom, the portions k l of the portions r s being folded back thereupon on diagonal lines extending from the sides of the bag, substantially as described.

397,218. INSULATING PIPE-COUPLING. SIGMUND BERGMANN, New York, N. Y. Filed June 12, 1888. Serial No. 276,835. (No model.)



Claim.—1. A coupling-piece comprising metallic portions provided with communicating gas-passages, and insulating material between said metallic portions extending inwardly beyond the walls of the gas-passages, said gas-passages comprising an enlarged cavity adjacent to the insulating material, substantially as specified.

2. A coupling-piece comprising metallic portions provided with communicating gas-passages, and insulating material between the metallic portions extending inwardly beyond the walls of the gas-passages, the walls of the gas-passages adjacent to the insulating material being chamfered off, substantially as specified.

3. A coupling-piece comprising metallic portions provided with communicating gas-passages, pieces of insulating material between said metallic portions, and mica between said pieces of insulating material, substantially as specified.

4. A coupling-piece comprising metallic portions having communicating gas-passages enlarged at their inner ends, and insulating material between said metallic portions, substantially as specified.

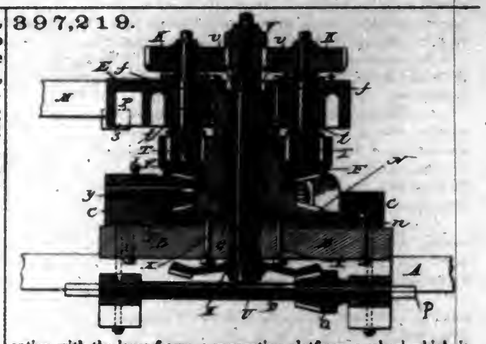
397,219. HORSE-POWER. DANIEL BERLEW, Springfield, Ohio. Filed Feb. 13, 1888. Serial No. 263,913. (No model.)

Claim.—1. In a horse-power, the wheel F, provided with an internal and an external set of teeth, in combination with master-wheel N, having a vertically-extended hub, pinions T J K V, and gear U, substantially as described.

2. A central vertical shaft and a hollow post thereon, in combination with the lever-frame, a supporting-platform, a wheel which is internally and externally toothed, a master-wheel, and gearing connecting said wheels with the tumbling-shaft, substantially as described.

3. In a horse-power, the combination of a wheel having internal and external teeth, a master-wheel having an extended hub, on which said first-mentioned wheel is mounted, pinions between said wheels, and gearing connecting said wheels with the tumbling-shaft, substantially as described.

397,219.



397,220. TENNIS-RACKET. ROBERT B. BROWN, Washington, D. C. Filed Sept. 29, 1888. Serial No. 286,748. (No model.)



Claim.—The combination, with the solid frame of a racket, of a thin short re-enforcing strip of metal secured to the frame at its throat.

397,221. JUNCTION-BOX FOR ELECTRICAL CONDUCTORS. WILLIAM M. CALLENDER, New York, N. Y. Filed Mar. 10, 1888. Serial No. 266,802. (No model.)



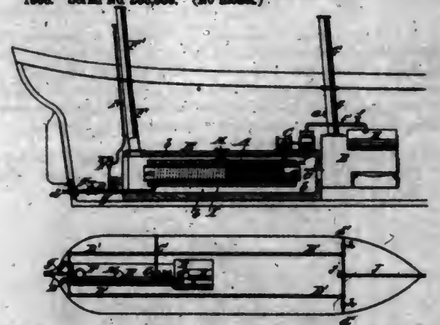
Claim.—The combination, with tubes containing insulated electrical conductors, such tubes being threaded at their ends, of internally-threaded junction-boxes fitting around the said ends, the said junction-boxes being made in halves and being provided with means for attachment to the tubes, substantially as set forth.

397,222. PREPARATION OF PEPTONIZED FOODS. DENISON W. CHAPMAN, South Park, Ill. Filed Nov. 9, 1888. Serial No. 290,403. (No specimens.)

Claim.—1. The process of manufacturing peptonized foods, which consists in removing the fats from albuminoids, heating the remaining portion to the boiling-point, coagulating the albumen by the addition of hydrochloric acid, separating the liquid portion from the coagulated albumen, washing such albumen, adding such washings to the liquid portion already separated, evaporating such liquid portion to the condition of a soft extractive, meanwhile digesting the coagulated albumen into solution, as above described, adding sodium carbonate to the solution, evaporating it to the condition of a soft extractive, finally mixing the two extractives, evaporating the mixture to dryness, and powdering the same, substantially as described.

2. The process of manufacturing peptonized foods, which consists in boiling the soluble and insoluble constituents of an albuminoid for time sufficient to extract the soluble constituents and coagulate the soluble albumen, separating the fats, separating the insoluble fiber and coagulated albumen from the liquids, washing the insoluble parts, adding sodium carbonate to the liquid parts and evaporating them to the condition of a soft extractive, meanwhile artificially digesting the fiber and coagulated albumen into solution, as above set forth, neutralizing such solution by the addition of sodium carbonate and evaporating it to the condition of a soft extractive, finally mixing the two extractives, evaporating such mixture to dryness, and powdering the same, substantially as described.

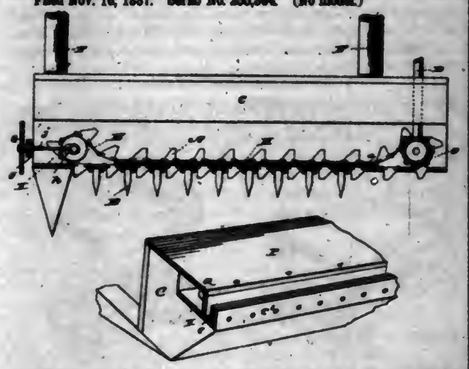
397,223. PNEUMATIC PROPELLING AND STEERING APPARATUS. ROBERT A. CHESBROUGH, New York, N. Y. Filed Oct. 19, 1888. Serial No. 288,032. (No model.)



Claim.—1. The combination, in an apparatus for propelling a ship or other vessel, of a steam-generator consisting of a hollow coil and a furnace for heating it, a force-pump connected with one end of said coil to force water thereinto, and a pipe or nozzle proceeding from the other end of the said coil into the outside water for the ejection therefrom of steam generated in said coil from the water forced thereinto by the pump, substantially as herein described.

2. The combination, in an apparatus for propelling and steering a ship or other vessel, of a steam-generator consisting of a hollow coil and a furnace for heating it, a force-pump connected with one end of the said coil for forcing water thereinto, two or more pipes or nozzles proceeding in different directions from the other end of said coil into the outside water for the ejection of steam therefrom, and stop-valves in said pipes or nozzles for closing either of them at pleasure, substantially as and for the purpose herein described.

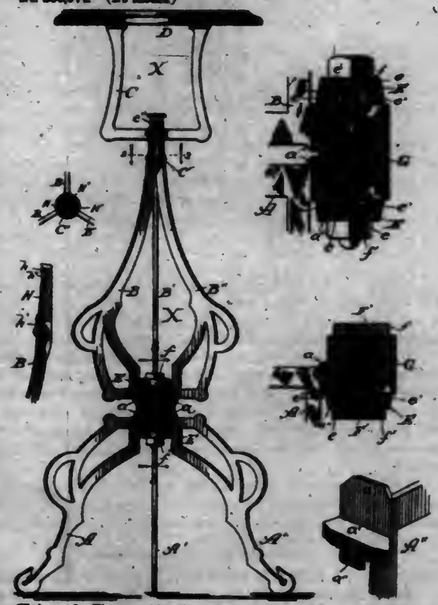
397,224. ENDLESS CUTTING APPARATUS. ASA CLARK, ROBERT A. ASHLEY, and CHARLES ASHLEY, Stockton, Cal., assignors to said Asa Clark and Robert A. Ashley, and Lucius E. Ashley, same place. Filed Nov. 16, 1887. Serial No. 255,364. (No model.)



Claim.—1. The bar C, having its forward upper side recessed, as shown, in combination with the angle-iron secured in the said recess, the vertical strip *a*, secured to the angle-iron a short distance behind its vertical flange, the metallic strip P, secured upon the top of the bar C and extending over the strip *a*, the guard-fingers having perforated attaching-flanges, the endless chain composed of the links and alternately-arranged perforated plates upon which the cutters are secured, and means for driving the endless chain, substantially as specified.

2. The combination, with the bar C, having its forward upper side recessed, as shown, of the angle-iron secured in the said recess and having the vertical flange perforated, the vertical strip *a*, secured to the angle-iron a short distance behind the vertical flange, the chain composed of the links and alternately-arranged perforated plates, the cutters, the sprocket-wheel O at one end of the finger-bar, the bevel-gear on the shaft D, meshing with the sprocket-wheel, and the pulley E at the opposite end of said bar, substantially as specified.

397,225. DETACHABLE LEG AND STANDARD FOR STOOLS OR TABLES. GILBERT R. GLOW, Chicago, Ill. Filed July 25, 1888. Serial No. 280,974. (No model.)



Claim.—1. The combination of legs adapted for use in a chair, stool, or table, having at one end thereof a vertical face and a web having a horizontal face on one side thereof and a lug on the other side thereof, a central piece against the side of which said vertical face may be placed and against one end of which the horizontal face of said web may come in contact, a cap fitting over the lugs on said web, and a bolt whereby the said cap and legs and central piece may be rigidly secured together, all substantially as described.

2. The combination of legs adapted for use in a chair or stool, having at one end thereof a vertical face and a horizontal web having a lug on one side thereof, a central piece against the sides of which said vertical face may be placed and against one end of which the face of said horizontal web will be in contact, a cap fitting over the lugs on said horizontal web, and a bolt adapted to secure said cap, legs, and central piece rigidly together, the said bolt being hollow and having a screw-thread cut therein adapted to receive a threaded spindle secured to the seat of said chair, all substantially as described.

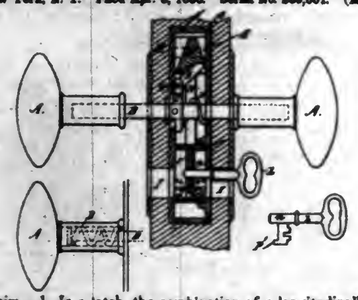
3. The combination of legs adapted for use in a chair or stool, having at one end thereof a vertical face and a horizontal web with a lug on one side thereof, a central piece against the sides of which said vertical face may be placed and against one end of which the face of said horizontal web will be in contact, a cap fitting over the lugs on said horizontal web, and a bolt adapted to secure said cap, legs, and central piece rigidly together, the said bolt being hollow and adapted to receive a spindle secured to the seat of said chair or stool, all substantially as described.

4. In a table, the combination of legs having a vertical face at one end thereof and a horizontal web having a lug thereon, a central piece against the sides of which said vertical face may be placed and against the end of which said horizontal web comes in contact, a standard consisting of three or more pieces, having at one end a like vertical face and a horizontal web with lugs thereon, caps fitting over the lugs on said legs and pieces forming said standard, and a bolt passing through said caps and central piece, whereby the said several pieces may be rigidly secured together, all substantially as described.

5. In a table, the combination of legs having a vertical face at one end thereof and a horizontal web having a lug thereon, a central piece against the sides of which said vertical face may be placed and against the end of which said horizontal web comes in contact, a stand-

ard consisting of two or more pieces, each of said pieces having at one end thereof a like vertical face and horizontal web with lug thereon, and the other end of said pieces forming a part of a spindle, upon which may be placed a rotary frame, caps fitting over said lugs on said horizontal web, and a bolt passing through the said caps and said central piece, whereby the said legs and the said pieces forming the standard may be rigidly secured to said central piece, all substantially as described.

397,226. COMBINED LATCH AND LOCK. MIGUEL E. DE AGUERO, New York, N. Y. Filed Apr. 6, 1888. Serial No. 269,881. (Model.)

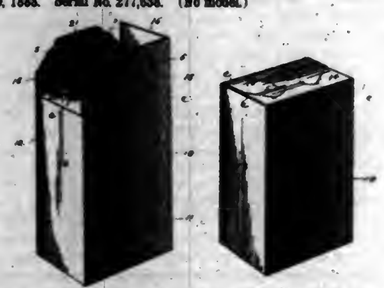


Claim.—1. In a latch, the combination of a longitudinally-movable knob-shaft, B, collar C thereon, spring D, push-lever E, jointed to said collar, a lever fulcrumed at G, having arms F and H, latch R, and spring P, substantially as described.

2. In a combined lock and latch, the combination of a knob-shaft movable in the direction of its length, a spring to resist the movement, a push-piece jointed to the shaft, a two-armed latch-lever operated by said push-piece, and a spring to close the latch, with a cam projection on the latch-lever and a revoluble key-tumbler for co-operating with said cam in locking said latch, substantially as described.

3. The combination of a revolving tumbler, J, having rim *r* and slot *d*, a lock-casing having projections *a b c*, and a suitable key having corresponding projections and indentations, whereby the tumbler may be revolved, substantially as described.

397,227. LOCK FOR PAPER BOXES. FRANK E. DE LOSE, Philadelphia, Pa., assignor to Charles L. Lockwood, same place. Filed June 20, 1888. Serial No. 277,638. (No model.)

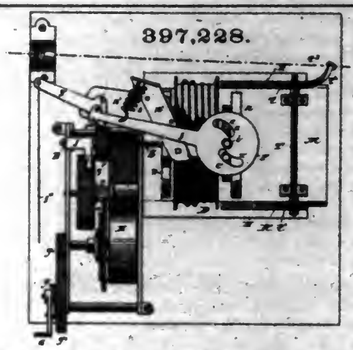


Claim.—A box or tray provided with opposite closing-flaps adapted to lie one over the other, one flap provided with a tongue on its end and with a pair of slots between its hinged and tongued ends, and the other tongue formed by an incision within the body of the flap, providing oppositely-extending enlargements 6, and a slot at the base of said tongue, the first-mentioned tongue and its flap adapted to underlie the other tongue and said tongue to enter the slot at its base, and the enlargements of said other tongue adapted to enter the slots in said underlying flap, whereby the said flaps are locked together, substantially as described.

397,228. MECHANISM FOR OPERATING DUMB-WAITERS. GARRETT M. BERRICK, Brooklyn, N. Y. Filed June 16, 1888. Serial No. 277,319. (No model.)

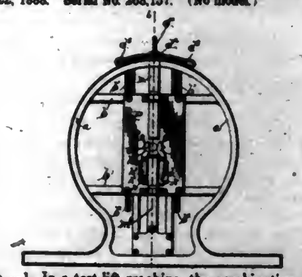
Claim.—1. In a mechanism for operating dumb-waiters or elevators, a hoisting-drum, in combination with a coiled spring and a train of two or more gear-wheels interposed between said motor and the drum, one of which gears is adapted to be moved laterally for throwing it into and out of mesh with the rest of the train to connect or disconnect the motor and the drum, a pawl for holding said gearing and motor stationary when the drum is disconnected from the motor, and a brake for controlling the movements of the drum, substantially as described.

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2. In a mechanism for operating dumb-waiters or elevators, the combination of a hoisting-drum, D, a spring, H, and the train of gear-wheels *o p q r*, with the sliding sleeve K, upon which the gear *r* is mounted, the pawl *j*, connected to said sleeve by means of an arm, *j''*, the lever *t* and rope *t'*, for operating said sleeve, and a brake for controlling the movement of the drum D, substantially as described.

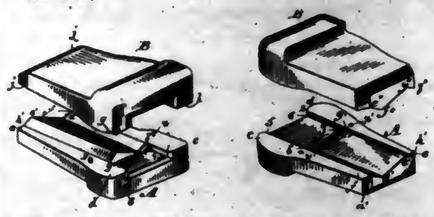
397,229. COIN-CONTROLLED LIFTING-MACHINE. BERNHARD FÜCHTER, Syracuse, N. Y., assignor to John Lighton, same place. Filed Mar. 22, 1888. Serial No. 268,157. (No model.)



Claim.—1. In a test-lift machine, the combination, with the lifting-bar provided with locking-studs and a coin-chute, of a pair of spring-actuated locking-dogs pivoted below the end of the coin-chute and provided in their upper ends with a curved seat for the coin, and having their lower ends notched and formed with inclines both above and below the notches, substantially as and for the purpose set forth.

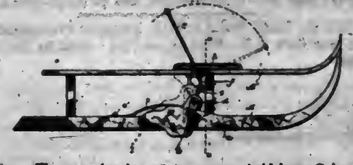
2. In a test-lifting machine, the combination, with the lift-bar and its springs, the bar being formed with locking-studs and provided with a rack-bar, and an adjustable hand-hold, the indicator-hand, the graduated dial-plate, and the connecting-spindle between the indicator-hand and the lift-bar provided with a pinion and a bent arm, of a coin-chute for delivering the coin to the locking-dogs, a pair of spring-actuated locking-dogs engaging the lift-bar at one end and formed to receive the coin in their other end, and a second coin-chute for delivering the coin to the receiver, all constructed and arranged to operate substantially as and for the purpose set forth.

397,230. DEVICE FOR SHARPENING ROCK-DRILLS. FREDERICK A. GRACE, Hickory, N. C. Filed June 2, 1888. Serial No. 275,823. (No model.)



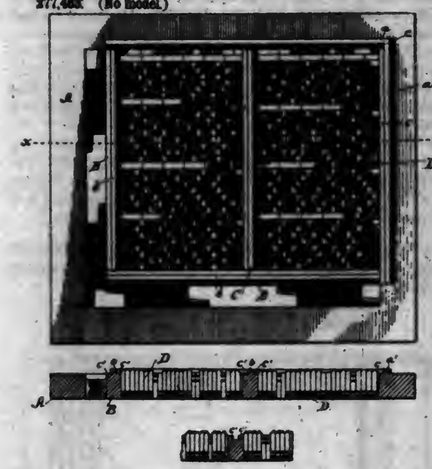
Claim.—A swage divided in two parts, having in one half, A, the plane *a' b' c' d'*, parallel to the plane *e' f' g' h'*, and the two, forming equal angles with the plane *d' c' f' e'*, made to correspond to and fit into the opposite plane surfaces of the half B, and having a rectangular cavity in the side A, bounded on the lower side by the triangular plane figure *b' c' 9*, placed at an oblique angle with the planes which it intersects, and the irregular plane *c' f' g' 7*, also at oblique angles with the planes which it intersects, the planes *b' c' 9* and *c' f' g' 7* corresponding with planes of similar shape and formed upon the side B, so that the base of the triangular facet in B shall be *f' g'* and the base-lines of the irregular facet in B shall correspond to *b' c' f'* in A.

397,231. BRAKE FOR SLEDS. FREDERICK GRITTNER, Bennington, N. Y. Filed Apr. 24, 1888. Serial No. 271,960. (No model.)



Claim.—The combination of the runner A A', lever C, bent rod *f*, connecting-piece *e*, and shoes B B, the latter being curved at the bottom and having the inclines *b b* on their outsides, with the springs *a a* working in connection therewith, and also the central spring, *c*, all substantially as and for the purpose specified.

397,232. MATRIX IMPRESSION-GUARD FOR TYPE-FORMS. ROBERT B. HASTIE, Washington, D. C. Filed June 16, 1888. Serial No. 277,462. (No model.)



Claim.—1. The matrix guard-chase having guard-strips formed upon its upper side, as and for the purpose set forth.

2. The matrix guard-chase having upon its upper side type-high guards formed near its inner edge, having low margins e between the guards and said edge, substantially as described.

3. The matrix guard-furniture consisting of the low body having upon it a central longitudinal guard-strip type-high, substantially as described.

4. The matrix guard-furniture consisting of the low body having upon it a central longitudinal guard-strip type-high, said guard-strip extending beyond the end of the body to form a close joint with an adjacent guard, substantially as described.

5. In a matrix type-form, the middle strip or stick of low body having a central longitudinal groove to define the dividing-line between the pages of the plate, substantially as described.

6. The combination, in a matrix type-form, of a matrix guard-chase having guard-strips upon its upper side with matrix guard-furniture having a central guard-strip upon it, substantially as described, said guard-strips surrounding the form, as and for the purpose set forth.

7. The combination, in a matrix type-form, of a matrix guard-chase having guard-strips upon its upper side with matrix guard-furniture having a central guard-strip upon it and a middle strip having a central longitudinal groove, substantially as described.

397,233. CAR-AXLE BOX. WILLIAM R. HEFFNER, Huntingdon, Pa. Filed Oct. 31, 1888. Serial No. 289,613. (No model.)

Claim.—1. The combination, with the car-axle box having an opening in its outer end, of the cover formed with a flange, and an asbestus ring around the body of said cover beneath said flange, substantially as described.

2. The combination, with the car-axle box having an opening in its outer face, of the cover formed with lugs on its inner face, and an asbestus ring around the body of said cover and retained in place by said lugs, substantially as described.

3. The combination, with the car-axle box having an opening in its front or outer end, of a cover for said opening formed with a flange, a cross-bar on the inner face of said cover and extended beyond the periphery thereof to form lugs, as shown, and an asbestus ring around the body of the cover between said flange and lugs, substantially as shown and described.

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4. The combination, with the car-axle box formed on its inner face with the cam-surfaces, of the cover provided on its inner face with lugs, as described, and the spring-bar on the outer face of said cover and engaging the lug G, substantially as described.

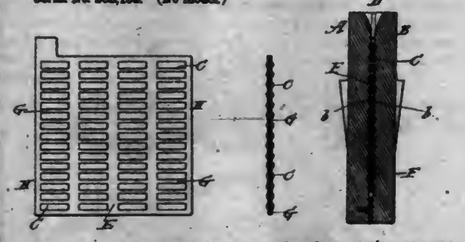
5. The combination, with the car-axle box formed on its inner face with the cam-surfaces, and with the stop K between said cam-surfaces, and having a notch, *f*, of the cover, the cross-bar on the inner face thereof, and forming the lugs *h* and *i*, the inclined lug G on the outer face of the box, and the spring-bar on the outer face of the cover engaging the lug G, substantially as shown and described.

397,234. SPRING-BED OR UPHOLSTERED SPRINGS. CHARLES B. HOWELL, Wilmington, N. C. Filed July 2, 1888. Serial No. 278,235. (No model.)



Claim.—The combination, with the mattress having an open bottom, of a covering for said bottom secured thereto by a suitable glue or adhesive substance, whereby access of vermin to the interior of the mattress is prevented, substantially as described.

397,235. METHOD OF FORMING SECONDARY-BATTERY ELECTRODES. RUDOLPH M. HUNTER, Philadelphia, Pa. Filed Jan. 27, 1888. Serial No. 262,132. (No model.)



Claim.—The method of forming secondary-battery elements, consisting in warming the mold, arranging previously-formed pieces of active material close together and holding them rigidly in said mold, setting the mold on end, so that the active material pieces are located one above the other, and finally casting the fluid-conducting metal around said active material pieces while so held.

397,236. ROAD-CART SPRING. RICHARD E. JOHNS, Goldsborough, N. C. Filed Oct. 25, 1888. Serial No. 289,091. (No model.)

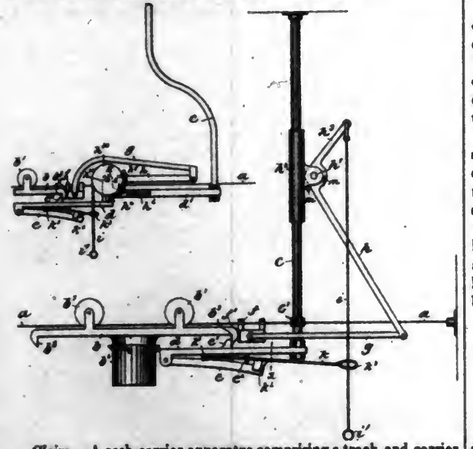
Claim.—The thill 1, in combination with the spring 4, consisting of the overlapping layers 5, 6, and 7, the former provided with an eye, 8, and connected with the shackle 10 by the bolt 9, and the latter provided with the forward-bent portion 12, and connected by the bolt 13 to the thill, the clip 15, having the nuts 16, for connecting the spring with the thill, and having the interposed block 14, and the clip 17, having the tie-plate 21, nuts 23, wood block 22, interposed between the plate and spring, and the rubber roll 20, having the spindle

397,236.



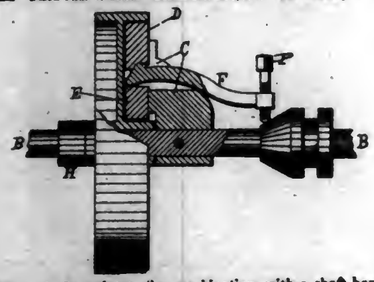
19, passing through the slotted openings formed in the clips, substantially as specified.

397,237. CASH-CARRIER. THOMAS M. KENNEY, Cambridge, Mass. Filed May 24, 1888. Serial No. 274,903. (No model.)



Claim.—A cash-carrier apparatus comprising a track and carrier movable thereon, combined with a lock that engages a carrier at the station, and releasing-arm provided with a cam co-operating with said lock, a propelling-lever having a long arm that acts upon the carrier, and an operating-cord connected with the short arm and passing through an eye in the releasing-arm for the lock of the carrier to operate the same by the lateral pressure of said cord, substantially as described

397,238. CLUTCH MECHANISM. CHARLES A. KIRK, Meriden, Conn. Filed Jan. 7, 1888. Serial No. 260,037. (No model.)



Claim.—1. In a clutch, the combination, with a shaft having a pulley loosely mounted thereon, of a carrier rigidly secured to said shaft, said carrier comprising a hub or body provided with an arm recessed upon its face, said arm extending at right angles to said shaft and having two movable blocks or shoes mounted within said recess, and a lever arranged to impart a separating motion to said blocks or shoes, all arranged and operating substantially as shown and described.

2. In a clutch, the combination, with a shaft having a pulley loosely mounted thereon, of a carrier rigidly secured to said shaft, said carrier having two movable blocks or shoes mounted therein, and an actuating-lever interposed between and adapted to impart a separating motion to such blocks or shoes, causing them to contact simultaneously, one with the rim and the other with the hub of said pulley, and a spring adapted to retire said shoes from contact when the actuating-lever is released, all arranged and operating substantially as shown and described.

3. In a clutch, the combination of the wheel A, the shaft B, and the carrier C, having perforations *a a* and slot L, the shoes D and E, mounted within said slot, and the spring G, the lever F, adjusting-screw P, and cone K, all constructed and arranged to operate substantially as herein shown and described, and for the purpose specified.

397,239. PIANO-FORTE ACTION. HELLMUTH KRAMICH and JACQUES RAGE, New York, N. Y. Filed Oct. 16, 1888. Serial No. 288,266. (No model.)



Claim.—1. The combination, with a damper-lever and damper-head, of a clip secured to the damper-head and adapted to be adjusted lengthwise of the damper-lever, substantially as specified.

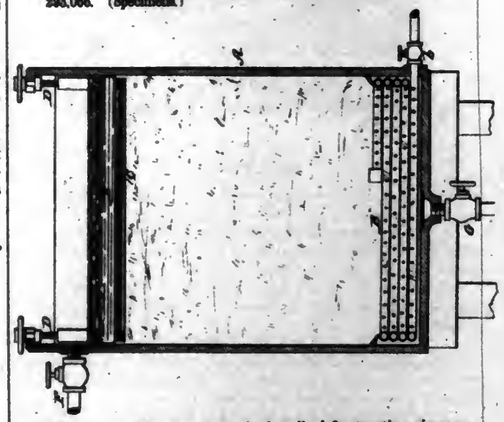
2. The combination, with a damper-lever and damper-head, of a clip consisting of a strip of metal bent between the ends in a cylindrical form and having the ends lapped, substantially as specified.

3. The combination, with a damper-lever and damper-head, of a clip consisting of a strip of metal bent between the ends in a cylindrical form and having the ends lapped, and a screw passing through the lapped ends and entering the head, substantially as specified.

4. The combination, with a damper-lever and damper-head, of a screw passing through an extension from the damper-lever into the damper-head, and constructed to permit the oscillation of the head relatively to the damper-lever upon the axial line of said screw, substantially as specified.

5. A damper-lever having a cylindrical portion of wire, a clip having a cylindrical portion fitting the cylindrical portion of the lever, a damper-head, and a screw for tightening the clip upon the damper-lever, all being so combined that the clip and the damper-head may be rotated around the damper-lever, substantially as specified.

397,240. PROCESS OF MAKING FIBER FROM PINE-NEEDLES. WILLIAM LATIMER, Wilmington, N. C. Filed Dec. 10, 1888. Serial No. 293,066. (Specimens.)



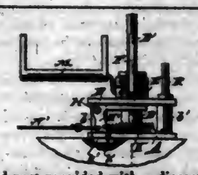
Claim.—1. The process herein described for treating pine-needles for making fiber for spinning and weaving into textile fabrics for bagging and for other purposes, which consists in first actively boiling the needles for a few minutes in an alkaline solution until a head of foam is raised, then lowering the temperature to below the boiling-point and slowly digesting the mass for a period of ten hours, more or less, and then drawing off the solution, and washing the mass with pure water, substantially as shown and described.

2. The process herein described of treating pine-needles for making fiber for spinning and weaving into textile fabrics for bagging and other purposes, which consists in first actively boiling the needles for a few minutes in an alkaline solution until a head of foam is raised, then lowering the temperature below the boiling-point and slowly digesting the mass for ten hours, more or less, and then draining off the solution and subjecting the cooked needles to a series of successive washing and steeping or soaking operations in clean water, each of said washing and soaking operations being at a lower temperature than the preceding one, substantially as specified.

397,241. MUSIC-LEAF TURNER. FRANK H. LOUGHLIN, Syracuse, N. Y. Filed June 13, 1888. Serial No. 276,926. (No model.)

Claim.—1. The combination, with a base, a spring-actuated elbow-lever pivoted to the same, and an upwardly-extending vertical post secured to the upper surface, of a series of spring-actuated drums

397,241.

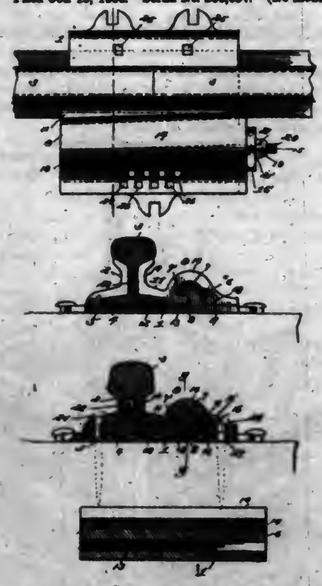


revolving upon said post provided with a diametrical peripheral slot, arms horizontally projected from said drum, and a perpendicular latch provided with an offset upon one edge and notches in the opposite edge, all combined to operate substantially as shown and described.

2. The combination, with a base, a spring-actuated elbow-lever pivoted to the same, and an upwardly-extending vertical post or bar, of a series of spring-actuated drums revolving upon said post provided with a diametrical peripheral slot, slitted arms horizontally projected from the drums, a perpendicular latch provided with an offset upon one edge and notches in the opposite edge, a foot-lever, and connections between said foot-lever and elbow-lever, substantially as shown and described.

3. The combination, with a supporting-block provided with a dovetail groove, a base provided with a dovetail rib adapted to enter said groove, a spring-actuated elbow-lever pivoted upon said base, and a vertical post or bar extending upward from the same, of a series of spring-actuated drums revolving upon said post provided with a diametrical peripheral slot, slitted arms horizontally projected from the drums, a perpendicular latch provided with an offset upon one edge and notches in the opposite edge, a stop-pin secured upon the base, a foot-lever, and connections between said foot-lever and elbow-lever, all combined to operate substantially as set forth.

397,242. RAIL-JOINT. IVES LYND and WALTER T. LYND, Troy, N. Y. Filed Oct. 15, 1888. Serial No. 288,057. (No model.)



Claim.—1. A rail-joint consisting of a bed-plate having a flange on one edge and a tapering flange adjacent to its opposite edge, with a groove in the inner side of the tapering flange, which extends from end to end of the flange and is tapering vertically and laterally, in combination with a pair of abutting rails resting in the bed-plate and bearing at one side against the first-named flange, and a key-plate bearing at one edge against the opposite side of the rails and having its other edge engaging the tapering groove in the tapering flange, the key-plate being wedge-shaped laterally and vertically, substantially as described.

2. In a rail-joint, a key-plate constructed to lie lengthwise between the abutting ends of a pair of rails held in a bed-plate and an inclined flange of the bed-plate, the key-plate being wedge-shaped laterally and vertically, substantially as described.

3. A rail-joint consisting of a bed-plate having a flange on one edge and a tapering flange adjacent to its opposite edge, with a groove on its inner side extending from end to end of the tapering flange and tapering laterally and vertically, in combination with a pair of abutting rails resting in the bed-plate and bearing at one side against the first-named flange, and a key-plate wedge-shaped laterally and vertically and having one edge bearing against the opposite side of the rails and its other edge engaging the tapering groove, with a locking-bolt for holding the key-plate to the bed-plate, substantially as described.

4. A rail-joint consisting of the bed-plate 1, formed with the raised flange 2 at one edge and the tapering flange 6 adjacent to the opposite edge, with the inside groove, 8, tapering from end to end of flange 6 both laterally and vertically, in combination with abutting rails 3, resting on bed-plate 1 and bearing against flange 2, with their flange 4 located in recess 5, and a key-plate, 9, formed with the raised flange 10, bearing against the side of rails 3, the horizontal portion 11 resting on the flange 12 of rails 3, the flange 13 resting on bed-plate 1 and projecting into and fitting tapering groove 8, and the portion 14 extending over flange 6, with a bolt, 15, extending through a groove, 16, in plate 9, and a lug, 16', on bed-plate 1 and secured by a nut, 19, on the threaded end 20 of bolt 15, held by a nut-lock, substantially as described.

5. A key-plate for rail-joints, formed with a horizontal portion to bear against the flange of a rail and a bed-plate, and a raised flange at one edge to rest against the side of a rail and having its opposite edge tapering laterally and vertically, substantially as described.

6. In a rail-joint, the combination, with a bed-plate having a tapering flange adjacent to one edge extending from end to end of the bed-plate, and having an inside groove tapering laterally and vertically, of a key-plate having one edge tapering laterally and vertically and fitting into the tapering groove, the key-plate being adapted to be wedged between the tapering flange and a pair of abutting rails resting on the bed-plate, substantially as described.

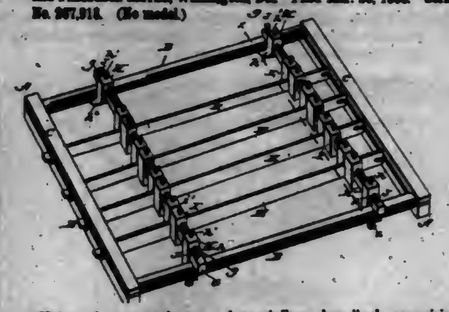
397,243. HOISTING-MACHINE. VOLNEY W. MASON, Providence, R. I. Filed Mar. 31, 1888. Serial No. 268,113. (No model.)



Claim.—1. In a hoisting-machine, the combination, with the eccentrically-mounted hoisting-drum, its wheel, and operating-bar, of the driving-wheel arranged directly above the drum-wheel, and the brake arranged directly below the drum-wheel, as herein shown and described, whereby the weight of the drum, its wheel, and lever will all coact by gravity to hold the load when the lever descends, as set forth.

2. In a hoisting-machine, the combination, with a hoisting-drum provided with a driving-pulley, of the slotted standards A, in which the said drum is mounted, a rod, O, passing through the slots in the said standards, set-screws screwing in the said standards and against the under side of the said rod, and a brake-shoe on the said rod, substantially as shown and described.

397,244. STONE-SAWING-MACHINE GAGE. LEWIS MELSHEIMER and FREDERICK MEYER, Wilmington, Del. Filed Mar. 30, 1888. Serial No. 267,918. (No model.)



Claim.—1. An attachment, substantially as described, comprising a cross-bar, guides thereon, and clamps having near one end sockets in which the ends of the cross-bar may be secured, and having their lower ends curved outward and provided with a clamping-screw, substantially as set forth.

2. In a stone-sawing apparatus, the combination, with the frame having side bars, of the cross-bar having guides for the saws, the

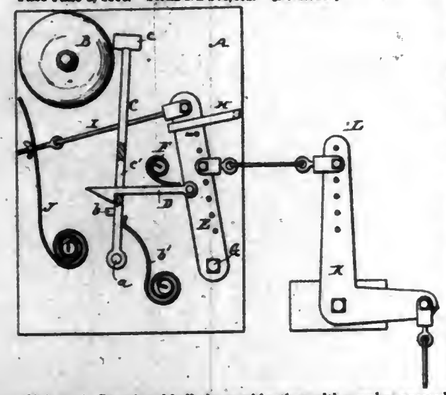
clamps having openings fitted to receive the cross-bar, such clamps being adjustable along the side bars of the frame, and set-screws for securing the clamps in any suitable adjustment along said side bars, substantially as set forth.

3. The herein-described improvement in stone-sawing apparatus, comprising a cross-bar provided with guides for the saws, and clamps connected adjustably with the ends of said cross-bar, said clamps being provided with set-screws, whereby they may be secured in any suitable adjustment along the side bars of the saw-carrying frame, substantially as set forth.

4. In a stone-sawing apparatus, a cross-bar provided with guides secured on and adjustable thereabong, such guides being provided on their sides with downwardly-facing shoulders, substantially as and for the purposes specified.

5. The improved stone-sawing apparatus consisting of the frame having side bars, B, the cross-bars, the clamps having openings fitted to receive the cross-bars and provided with set-screws, whereby they may be secured in any suitable adjustment along bars B, and the guides having on their sides downwardly-facing shoulders, substantially as set forth

397,245. SIGNAL-BELL. ENGELBRECHT OLSEN, Walkerville, Mont. Filed June 8, 1888. Serial No. 276,462. (No model.)

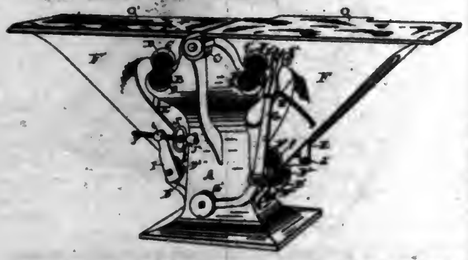


Claim.—1. In a signal-bell, the combination, with a spring-pressed striking-lever, of an operating-lever having a series of perforations set to scale for the attachment of the pull-cord, a tension-spring, a rod secured to the operating-lever and tension-spring, and a spring-pressed trip-lever pivoted to the operating-lever and engaging the striking-lever, substantially as herein shown and described.

2. The combination, with the bell B, attached to a base-plate, the striking-lever C, having a slot, c', and head c, and the trip-lever D, having a hooked end to engage with slot c', of the spring b', the spring F, the lever E, tension-rod I, and spring J, substantially as shown and described.

3. The combination, with the base A, the bell B, the striking-lever C, and the spring b', of the trip-lever D, operating-lever E, provided with perforations, the tension-rod I, and the spring J, having apertures in its free end, substantially as shown and described.

397,246. CYLINDER PLANER. FRANK B. PHILBRICK, Waterville, Me., assignor of one-half to Frank B. Webber, same place. Filed Aug. 1, 1888. Serial No. 281,699. (No model.)



Claim.—1. In a cylinder planer, the combination of a standard or support, a bed or table supported by brackets, cams for forming a vertically-adjustable connection between said brackets and said standard, each of said cams having two cylindrical bearings eccentric with each other, bearings in said support each formed to surround or inclose more than the lower half and less than the whole of one of the cam-bearings, and bearings in the bracket formed to surround more than the upper half and less than the whole of the other cam-bearing, whereby the said cam may be inserted endwise into its position, substantially as described.

2. In a cylinder planer, the combination of a standard or support, a bed or table supported by brackets, cams for forming a vertically-adjustable connection between said brackets and said standard, each of said cams having two cylindrical bearings eccentric with each other, bearings in said support and formed integral with it and so formed as to inclose or surround more than the lower half and less than the whole of one of the cam-bearings, and bearings in said brackets formed integral therewith and formed to surround more than the upper half and less than the whole of the other cam-bearing, substantially as shown.

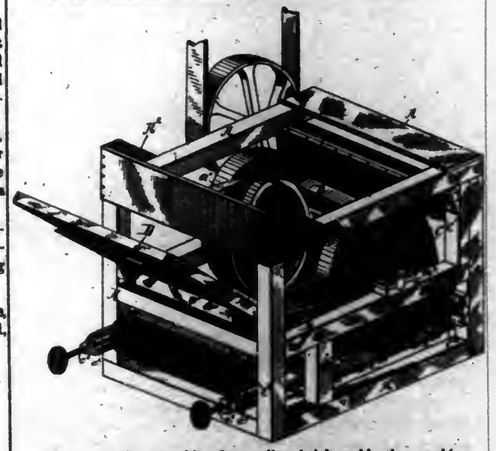
3. In a cylinder planer, the combination of a base or support, a bed or table supported by brackets, cams for raising and lowering said brackets and having bearings in said support and in said brackets, a lever attached to said cams for rotating the same, and means for clamping the same in any desired position, substantially as shown.

4. In a cylinder planer, the combination of a base or support, a bed or table supported by brackets, an upper and a lower set of cams for connecting said brackets with said support, arms connected with said cams and a link connecting said arms, a hand-lever connected with one set of cams, and means for clamping the same in place, substantially as shown.

5. In a cylinder planer, the combination of a support, a rear table and a front table supported by brackets, cams for forming a vertically-adjustable connection between said standard and said brackets, a lever for rotating said cams, a rigid handle and a pivoted handle at the upper end of said lever, a segment passing through an opening in said pivoted handle, a pinching-surface above and below said segment, and a spring for forcing said handles apart and clamping said lever, substantially as shown.

6. In a cylinder planer, the combination of a base or support, a front table, a rear table supported by brackets, cams for raising and lowering said brackets and having bearings in said support and in said brackets, a lever for rotating said cams, a nut pivoted to the end of said lever, a screw working in said nut and having one end secured to a stud pivoted to said support, and a hand-wheel for rotating said screw, whereby said bed or table may be accurately adjusted for small vertical distances, substantially as shown.

397,247. MOLD-SANDING MACHINE. GEORGE POTTS, Indianapolis, Ind. Filed July 20, 1888. Serial No. 280,537. (No model.)



Claim.—1. In a machine for sanding brick-molds, the combination of the frame-work, a large wheel arranged at each side of the frame-work and having rests for the molds on their inner adjacent sides a short distance from their peripheries, and an endless apron mounted upon suitable rollers journaled on said frame-work and arranged to bear against the under and rear sides of said large wheels, substantially as set forth.

2. The combination, in a machine for sanding molds, of the frame-work, the wheels B, formed with the annular flanges b and mounted upon the shaft B', which is journaled in suitable bearings on said frame-work, and the apron C, mounted upon suitable rollers and arranged to bear against the under and rear sides of said wheels B, one of said rollers being journaled in adjustable bearings, whereby the tension of said apron may be regulated, substantially as set forth.

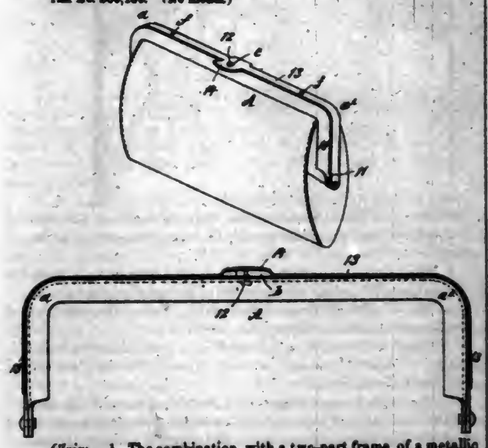
3. In a machine for sanding molds, the combination of the frame-work, the wheels B, the apron C, arranged as described, the chute A',

for guiding the molds into the machine, and the arms a', for receiving them from said machine, substantially as set forth.

4. The combination, in a machine for sanding molds, of the frame, the wheels B, arranged to receive the molds between their adjacent sides and provided with the annular flanges b, upon which said molds may rest, and the apron C, mounted upon the rollers C' C^2 C^3 and arranged to bear against the rear and under sides of said wheels B, the shaft of one of said rollers being provided with a gear-wheel by which power may be applied for driving the machine, substantially as set forth.

5. The combination, in a machine for sanding molds, of the wheels arranged to receive and support the molds, and the endless apron C, mounted on suitable rolls and formed of a width to extend across the machine from one wheel to the other and provided with the reinforcing stripe c, substantially as described, and for the purposes specified.

397,248. FASTENING FOR POCKET-BOOK, PURSE, OR SATCHEL FRAMES. LOUIS B. FRANAB, Brooklyn, N. Y. Filed Oct. 25, 1888. Serial No. 289,139. (No model.)



Claim.—1. The combination, with a two-part frame, of a metallic spring-strip secured at each end to one of the frame members, said spring-strip being adapted to engage the other frame member, as and for the purpose stated.

2. The combination, with a two-part frame, of a metallic spring-strip secured at each end to one of the frame members, said spring-strip being provided with a thumb-piece adapted to engage the other frame member, as and for the purpose stated.

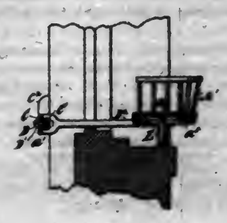
3. The combination, with a two-part frame, of a stud carried by one of the frame members and a metallic spring-strip secured at each end to the other frame member, said spring-strip being adapted to engage the stud, as and for the purpose stated.

4. The combination, with a two-part frame, of a stud carried by one frame member and a spring-strip secured at each end to the other frame member, said spring-strip being provided with an aperture adapted to receive the stud, as and for the purpose stated.

5. The combination, with a two-part frame, of a stud carried by one of the frame members, a spring-strip secured at each end to the other frame member and formed with an aperture adapted to receive the stud, and with an upwardly-flaring thumb-piece, as and for the purpose stated.

6. The combination, with a two-part frame, bent as described, of a metallic spring-strip secured to one of the frame members and adapted to engage the other frame member, the strip being continued over the bends of the frame, substantially as described.

397,249. SUPPORT FOR PERSONS CLEANING WINDOWS. WILLIAM PROUT, Brooklyn, N. Y. Filed Aug. 16, 1888. Serial No. 282,824. (No model.)

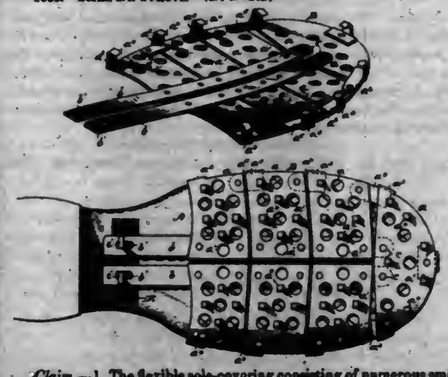




Claim.—1. The combination, with a seat, of arms or brackets extending rigidly therefrom and having bifurcated ends, a bar rigidly secured within said bifurcated ends, an adjustable bar movable in said bifurcated ends, one of said bars having a longitudinal slot, a clamping-bolt, a bearing-piece on the outer bar extending beyond the inner face of the inner bar, and a bearing-piece on the inner bar substantially flush with its face, substantially as specified.

2. The combination of a seat, arms extending rigidly from the seat, bars connected to the arms, one of said bars having an adjustable connection thereto, and the other bar having a rigid connection, a slotted bar extending across the seat-frame, and a flexible support adjustable in the slot of said bar, substantially as specified.

397,250. SOLE-PROTECTOR FOR BOOTS OR SHOES. EVAN ROWLANDS and DAVID J. ROWLANDS, Youngstown, Ohio. Filed May 23, 1888. Serial No. 274,371. (No model.)



Claim.—1. The flexible sole-covering consisting of numerous small metallic wearing-plates grouped edge to edge in suitable form and number to cover the sole, and flexible metallic connections between said plates, substantially as described, whereby a shoe-sole may be covered and protected from destruction in walking on coals or highly-heated substances, and at the same time permitted to bend freely under the weight of the wearer.

2. The toe-plate, the two spring-arms pivoted thereto, the series of plates attached to the spring-arms and provided with lips to engage the edges of the sole, and the fastening-plate e, said elements combined for joint operation, as described.

3. In a sole-protector for a shoe, the longitudinal pivoted strips b, and the series of plates or sections a, secured to said strips and provided with the arms a^4 and with the lips a^5.

4. A sole-protector consisting of the series of small plates united by flexible strips, as described, each plate provided with a series of perforations with studs on the under face and with lips to engage the edges of the sole.

397,251. ADJUSTABLE SHELF-SUPPORT. LOUIS SCHMITT, New York, N. Y. Filed Sept. 20, 1888. Serial No. 286,736. (No model.)



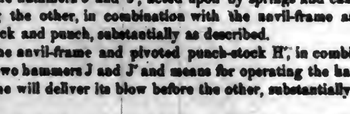
Claim.—1. A shelf support or bracket formed, substantially as described, with an upper member, as d, to bear against the end of the shelf, a second central member, as c, projecting from the first at an angle more or less acute to pass under the shelf, and a third lower member, as b, forming, substantially, an extension of the first, and terminating in sharp points projecting in a direction opposed to the

second member to engage the standard provided for the support of the shelf.

2. The shelf-bracket constructed of a wire doubled and closed upon itself to form one end of the bracket, and having its two free ends pointed and bent at an angle with the length of the bracket to form its opposite end, and its central portion bent outwardly in a loop to project in a direction opposed to that of the pointed ends and at an angle inclined more or less toward its closed end, substantially in the manner and for the purpose herein set forth.

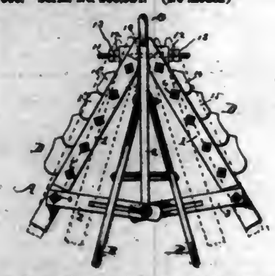
3. The shelf-bracket constructed of an upper member to bear against the end of the shelf, a central member projecting therefrom at an angle more or less acute to pass under the shelf, and a lower member forming, substantially, an extension of the first, and consisting of two elastic laterally-expanding arms terminating in sharp points projecting therefrom in a direction opposed to the central member of the bracket, substantially in the manner and for the purpose herein set forth.

397,252. LACE-HOLE PROTECTOR FOR DRIVING-BELTS. GEORGE W. SOUTHWICK, Stamford, Conn. Filed May 21, 1888. Serial No. 274,694. (No model.)



Claim.—The lace or eyelet hole protector herein described, consisting of flat U-shaped metal body portion having prongs B formed on its two branches adapted to penetrate the solid material of the belt back of the eyelet, and having on the inner side of the bend a flange, C, projecting in the same direction as the prongs and adapted to form a flat bearing at one side of the eyelet-hole, substantially as and for the purpose described.

397,253. CULTIVATOR. ELIJAH H. SPENCER, Winona, Miss. Filed Oct. 20, 1888. Serial No. 289,061. (No model.)



Claim.—1. In a cultivator-frame provided with side beams, 1 1, and central draft-beam, 2, the combination of front wheel, E, adjustable slotted rear connecting-bars, 3 3, and a series of plows or cultivator-teeth properly secured in said side beams and of gradually-increased size from the front ends to the rear of said beams, all as herein shown and described.

2. A cultivator provided with a series of plows or cultivator-teeth of gradually-increased size from the front to the rear of the same, as herein shown and set forth.

397,254. RASP-CUTTING MACHINE. PHILIP S. STORER, Tremont, N. J. Filed Oct. 6, 1888. Serial No. 287,286. (No model.)

Claim.—1. The punch-stock held in the anvil-frame and pivoted at or about its center, in combination with a spring or springs applied to its upper end above the pivot, the cutter or punch being held in the stock with its point below the pivot, substantially as shown and described.

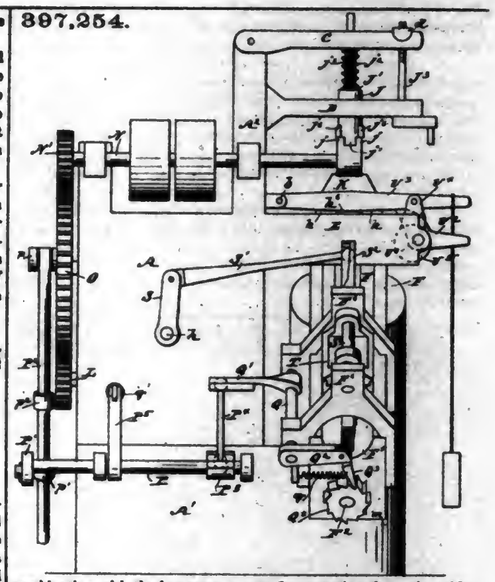
2. The hammers J and J', acted upon by springs and cams, one preceding the other, in combination with the anvil-frame and the punch-stock and punch, substantially as described.

3. The anvil-frame and pivoted punch-stock H', in combination with the two hammers J and J' and means for operating the hammers so that one will deliver its blow before the other, substantially as described.

4. The anvil-frame and pivoted punch-stock and the plate d', acted upon by springs for returning the punch-stock, in combination with the hammers, substantially as described.

5. The anvil-frame having the pivoted rod H^9 passed therethrough, in combination with the punch-stock H', secured to the said shaft H^9, the sliding plate H^6, and means, substantially as described, for moving the said plate, substantially as described.

6. The punch-stock H', attached to rod H^9 and the anvil-frame K, and means for moving the rod H^9 and punch-stock laterally, in



combination with the hammers, means for operating them, the table F, feed-table F', and means for moving the same, substantially as described.

7. The combination, with the rod H^3, punch-stock H', anvil-frame K, sliding plate H^6, rod H^9, and lever H^4, of the spirally-grooved cam H^5 and means, substantially as described, for turning the said cam intermittently, as and for the purposes set forth.

8. The pinion N', crank w, and rod W', in combination with walking-beam W^2, pawl L^4, ratchet L^5, shaft M', cam H^2, and plate H^6, substantially as described.

9. The pinion L, connecting-rod L^2, shaft M, and arms L' L^3, connected to the shaft, and the arm L^3 and pawl L^4, pivoted to the upper end of the same, in combination with the shaft M', ratchet L^5, cam H^2, lever H^4, connecting-rod H^8, sliding plate H^6, shaft H^9, punch-stock H', and anvil-frame K, substantially as described.

10. The inclined table F, the punch-stock, means for operating the same, the hammers, and means for operating them, in combination with the feed-table F', held in the inclined table F, and means for intermittently moving the same longitudinally, substantially as described.

11. The inclined table F, made concaved at its upper surface, the feed-table F', the rock-shaft S^2, elongated segmental rack T, secured to the said shaft, and the segmental rack T', secured to the said table and meshing with the said elongated rack T, in combination with worm-shaft P^2, connected to the said table F, the rock-shaft Q, pawl Q^3, and ratchet-wheel Q^4, attached to the worm, substantially as and for the purposes set forth.

12. The large gear-wheel O, provided with crank-pin p and rod P^4, in combination with the shaft P, arm P', opposite arm, P^5, connecting-rod P^4, opposite arm, Q', shaft Q, arm Q^2, pawl Q^3, ratchet-wheel Q^4, feed-shaft P^2, and the feed-table F', connected thereto, substantially as described.

13. The lever H^4, attached to the shaft A, the cam H^2, and means for intermittently turning the same, in combination with the arm S, attached to the shaft A, the connecting-rod S', arm S^2, shaft S^3, elongated segment T, and segment T', attached to the feed-table F', for rocking the same, substantially as described.

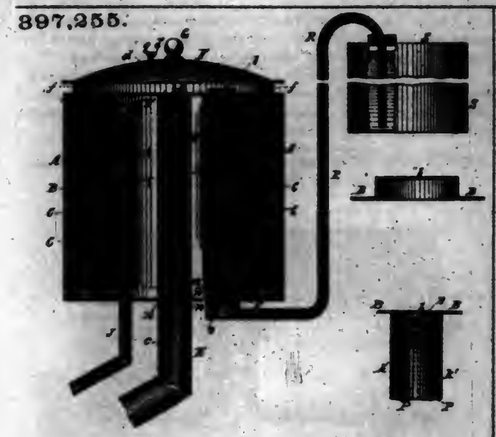
14. The anvil-frame K, formed with shoulder or projection U', and the pivoted lever U, engaging with said projection, in combination with the weighted lever U^2, connected to the presser-foot, the cam-lever U^3, acting on lever U, and the eccentric U^5, connected to said cam-lever and acting on the weighted lever U^2, substantially as described.

15. The combination, with the anvil-frame, the hammer, and punch, of supporting-springs for the said frame arranged to lift it and the punch out of contact with the blank, substantially as described.

16. The vertically-movable anvil-frame K, in combination with the hammers J J', adapted to be connected together and to the anvil-frame to operate as one, substantially as described.

397,255. GASOLINE APPARATUS FOR ILLUMINATING AND HEATING PURPOSES. JOSEPH STRASSER, Cincinnati, Ohio. Filed May 26, 1887. Serial No. 239,236. (No model.)

397,255.



Claim.—1. In a gasoline apparatus, the combination of the storage or gasoline reservoir, tube or conduit *l*, and expansible gas-storage chamber connected to the gas-space of the storage-tank B by said intervening tube or conduit *l* and receiving the gas in the storage-chamber while the latter is filling, substantially as and for the purposes specified.

2. In a gasoline apparatus, the combination of the storage gasoline and gas reservoir and an automatic expansible receiving-chamber connected to the gas-space of the storage-reservoir for receiving the gas of the storage-chamber while the latter is filling, substantially as and for the purposes specified.

3. In a gasoline apparatus, the combination of the siphon-tube R and the storage-chamber B, provided with expansible chamber formed by the cover F of the tank, having downwardly-extended sides within the vessel A and outside of the tank B and connected to the tank B by conduit *l*, substantially as and for the purposes specified.

4. In a gasoline apparatus, the combination of the storage gasoline and gas reservoir and an expansible gas-receiving chamber connected thereto by tube *l*, and oil-delivery pipe E, connected to the fluid-space of said reservoir and to a burner, and gas-delivery pipe J, communicating with the gas-space of said reservoir and with an auxiliary burner, and a gas-tight conduit connecting the reservoir with a vessel from which the supply of gasoline is drawn, substantially as and for the purposes specified.

5. In a gasoline apparatus, the combination of the siphon-tube R, one end of which is adapted to be inserted into an oil-supply receptacle, as S, and the other end connected to the storage-chamber B, provided with expansible storage-chamber formed by the cover F of the tank, having downwardly-extended sides within the vessel A and outside of the tank B, and connected to the tank B by conduit *l*, and oil-delivery pipe E, connected to the said fluid-space of said reservoir and to a burner, and gas-delivery pipe J, communicating with the gas-space of said reservoir and with an auxiliary burner, substantially as and for the purposes specified.

6. In a gasoline apparatus, the combination of the reservoir and the feed pipe or siphon, vertical tube P, and its valve and float for controlling the flow of gasoline into the reservoir, and an expansible air-chamber located in conjunction with tube P, and the said reservoir adapted to draw oil from the siphon into the tube P, and the reservoir A, substantially as and for the purposes specified.

7. In combination with a gasoline-reservoir, vaporizing-burner, and an expansible air-chamber connected with said reservoir, an auxiliary heating-burner arranged in suitable relation to the main burner, and a pipe connecting the auxiliary burner to the air-space of the reservoir and provided with capillary material holding gasoline, and through which the air is forced on its way from the air-chamber to the auxiliary burner, substantially as and for the purposes specified.

8. In a gasoline apparatus, the combination of an expansible air-chamber and connections, the reservoir B, lying beneath said expansible chamber and directly connected therewith, capillary material, *k'*, and vertical tube I, likewise located in said reservoir, provided with auxiliary burner J', located below said reservoir, substantially as and for the purposes specified.

9. The construction and arrangement of the reservoir B, provided with outlying wall or casing A, cover F, having wall C, stem *c*, for guiding the cover in its vertical movement, vertical tube D, located in the said reservoir, provided with aperture *n*, and extending below into the reservoir-pipe E and connected to the burner lying below the reservoir, substantially as and for the purposes specified.

10. In a gasoline-reservoir, the combination of an oil-inlet pipe located at the bottom of the reservoir, inlet-valve opening into the said bottom of the reservoir and affording means of communication between said inlet-pipe and reservoir, valve *v*, located in said pipe and preventing the reservoir from overfilling and connected to the vertical rod passing up and connected to the vertically-movable float, substantially as and for the purposes specified.

11. In combination with a reservoir, B, the upright casing P, orifice *l*, inlet-pipe located at the bottom of said casing, valve-opening located at or near the bottom of said casing and forming the means of communication between the said inlet-pipe R and said casing, and valve *v*, for regulating the inflow of oil through said valve-opening, and connected to a vertical stem provided at its top with float *x*, moving vertically in said casing and guided thereby, the said reservoir surrounding and inclosing said casing P, valve *v*, float *x*, the space of said reservoir being connected with the casing P and delivery-pipe E, communication in said reservoir being established between the reservoir and perforations of casing P and the delivery-pipe E, substantially as and for the purposes specified.

12. In a gasoline-reservoir, capillary covering *k'*, located in said reservoir, vertically-moving float *x*, and valve *v*, located at the lower end of the tube P and, in conjunction with said float, preventing the said reservoir from being overflowed with gasoline, substantially as and for the purposes specified.

13. The combination of the reservoir B, provided with aperture *l*, located above the capillary material *k'*, inclosing float *x* and valve *v*, said capillary material being located within said reservoir, vertically-moving cover F, forming roof of said reservoir, and siphon R, forming the connection between the filling-reservoir and the storage-reservoir, substantially as and for the purposes specified.

14. In a gasoline apparatus, the construction and arrangement of the vertical tube I, located in the reservoir and having its sides and inlet covered with capillary covering *k'*, the other end of said tube communicating with the auxiliary burner, and an expansible chamber opening directly onto the surface of the gasoline in said reservoir, substantially as and for the purposes specified.

15. In a gasoline apparatus, the construction and arrangement of the vertical tube I, located in the gasoline-reservoir, having its side and flared inlet *n* covered with capillary covering *k'*, the other end of said tube communicating with the burner, and an expansible air-chamber opening directly onto the surface of the fluid which surrounds said tube I, substantially as and for the purposes specified.

16. In a gasoline apparatus, the oil-reservoir, conduit E, conveying the oil from the reservoir to the vaporizing-burner, outlet-tube I, located in said reservoir and projecting in part above the surface of the oil therein, and provided with capillary covering *k'*, covering the inlet end of said tube and extending down the sides of said tube into the oil and terminating in the pipe J, connected with the auxiliary burner arranged to heat the vaporizing-burner, and expansible air-chamber for forcing air through the capillary covering *k'* over the mouth of said tube I on through said tube to the auxiliary burner, substantially as and for the purposes specified.

17. In a gasoline apparatus, the oil-reservoir, conduit E, conveying the oil from the reservoir to the vaporizing-burner, outlet-tube I, located in said reservoir and projecting in part above the surface of the oil therein, provided with capillary covering *k'*, covering the inlet end of said tube and extending down the sides of said tube into the oil and terminating in the pipe J, and cover g', for holding the covering *k'* in place over the opening *g*, connected with the auxiliary burner arranged to heat the vaporizing-burner, and expansible air-chamber for forcing air through the capillary covering *k'* over the mouth of said tube I on through said tube to the auxiliary burner, substantially as and for the purposes specified.

18. In a gasoline apparatus, the oil-reservoir, conduit E, conveying the oil from the reservoir to the vaporizing-burner, outlet-tube I, located in said reservoir and projecting in part above the surface of the oil therein, and provided with capillary covering *k'*, covering the inlet end of said tube and extending down the sides of said tube into the oil and terminating in the pipe J, connected with the auxiliary burner arranged to heat the vaporizing-burner, and expansible air-chamber for forcing air through the capillary covering *k'* over the mouth of said tube I on through the said tube to the auxiliary burner, and inlet oil-controlling valve *v* and float *x*, substantially as and for the purposes specified.

19. In a gasoline apparatus, the combination of the reservoir B, expansible air-chamber F, oil-inlet valve *v*, float *x*, controlling the passage-way between the inlet-pipe and the reservoir, casing P, with capillary covering *k'*, and having orifice *l*, opening into the air-chamber F, tube I, having capillary skirt *k'* on its sides and over its open inlet end, the latter communicating with the air-space of the reservoir, the other end of tube I communicating with the auxiliary burner, and tube E, connected at one end with the oil-space of the reservoir

and at the other end with the vaporizing-burner, substantially as and for the purposes specified.

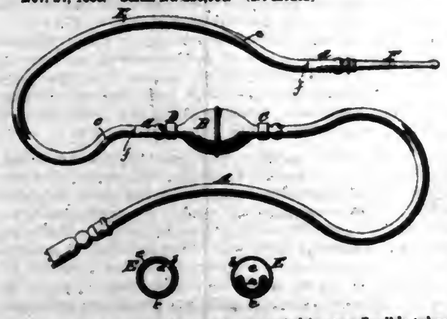
20. In a gasoline apparatus, the combination of the reservoir for oil, expansible air-chamber, opening *l* at the upper end of tube or casing P, the siphon-pipe connected with the lower end of said tube or casing, and the passage-way between said tube and said pipe being controlled by a valve, the said orifice or opening *l* connecting with the expansible air-chamber, substantially as and for the purposes specified.

21. The combination of a gasoline-reservoir provided with opening *l* to receive the air and pipe leading from the gasoline-space of the reservoir to the vaporizing-burner located at a lower level, textile material, tube I, and pipe J, to convey the gas to the auxiliary gas-burner, suitably arranged to heat the vaporizing-burner, substantially as and for the purposes specified.

22. In a gasoline apparatus, the combination of the reservoir B and cylindrical vertical perforated casing P, inlet feed-pipe R, connected to the interior of the casing at the bottom of the latter, and valve *v*, located between the feed-pipe R and the interior of said casing and controlling the communication between said feed-pipe and the interior of said casing, float *x*, located within said casing, and rod connecting valve *v* and float *x* and capillary material *k'* against the sides of the casing P, said casing P being at the same time a support for the capillary material and a guide for the float, substantially as and for the purposes specified.

23. In a gasoline apparatus, the combination of the liquid-supply pipe E, connecting the liquid-space of the reservoir with a vaporizing-burner located at a lower level, the air or gas supply pipe J, and tube I, connecting the air or gas space of the reservoir with an auxiliary heating-burner suitably arranged to heat the vaporizing-burner, the conduit *l*, connecting the air or gas space of the reservoir with the expansible chamber, and capillary material suitably arranged between tube I and conduit J, substantially as and for the purposes specified.

397,256. SYRINGE. BENJAMIN F. SUTTON, Brooklyn, N. Y. Filed Nov. 27, 1886. Serial No. 220,061. (No model.)



Claim.—1. A conduit for a syringe, comprising two flexible tubes, one within the other, the space between the two being the conduit-passage, substantially as and for the purpose herein described.

2. A syringe having in its discharge-conduit a flexible air-chamber contracting under pressure and expanding on cessation of pressure applied in working the syringe, substantially as and for the purpose herein set forth.

3. The combination, with the discharge-conduit of a syringe, of a flexible tube or chamber arranged within said conduit and communicating with the outer air, substantially as and for the purpose herein described.

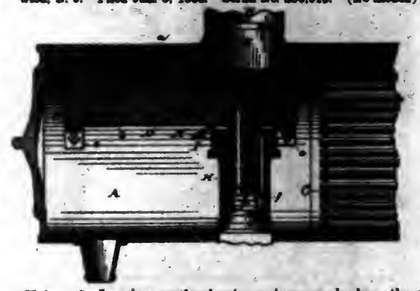
397,257. HOLDER FOR STRAINERS. LIDA A. TARRING, Baltimore, Md. Filed Mar. 21, 1888. Serial No. 268,019. (No model.)



Claim.—1. The holder for the strainer, composed of a ring of metal extended laterally to form couples of spiral springs, and three tongues on opposite sides of said ring, substantially as set forth.

2. The combination, with the strainer and the vessel upon which it is supported, of the holder formed of a metallic ring extended laterally on opposite sides into spirals, and tongue-shaped bearings adapted to take hold onto said vessel, as and for the purpose set forth.

397,258. SPARK-ARRESTER. GEORGE B. TAYLOR, New Brunswick, N. J. Filed Jan. 5, 1888. Serial No. 259,915. (No model.)



Claim.—1. In a locomotive having a long smoke-box, the combination, with the stack and exhaust, of a protecting-screen constructed as a complete inclosing-body, with which the stack and exhaust are connected, such screen-body having greater horizontal than vertical dimensions and provided with extended top and bottom screen-surfaces, and such screen-body being further located in the upper portion of the smoke-box, so as to leave the lower portion of the smoke-box free for holding cinders, substantially as set forth.

2. In a locomotive having a long smoke-box, a protecting-screen constructed as a complete inclosing-body, with which the stack and exhaust are connected, such screen-body having greater horizontal than vertical dimensions and provided with extended top and bottom screen-surfaces, and such screen-body being further located in the upper portion of the smoke-box, so as to leave the lower portion of the smoke-box free for holding cinders, in combination with a pipe in the bottom of the smoke-box for discharging the cinders, substantially as set forth.

3. In a locomotive having a long smoke-box, the combination, with such long smoke-box and with the stack and exhaust, of a protecting-screen located in the upper portion of such smoke-box and extending lengthwise thereof, such screen being a complete inclosing semi-cylindrical body conforming to the shape of the walls of the upper portion of the smoke-box, from which it is separated by a uniform space, the stack and exhaust being connected, respectively, with the upper and lower sides of such screen-body, substantially as set forth.

4. In a locomotive, the combination, with a short exhaust-nozzle, of a directing-pipe rising from the nozzle and having an open lower end, and a pipe inclosing the directing-pipe, such inclosing-pipe being closed at its bottom and open at its top, substantially as set forth.

5. In a locomotive, the combination, with a short exhaust-nozzle, of a directing-pipe rising from the nozzle and having an open lower end, a pipe inclosing the directing-pipe, such inclosing-pipe being closed at its bottom and open at its top, and a screen protecting the open upper end of the inclosing-pipe, substantially as set forth.

6. In a locomotive, the combination, with a short exhaust-nozzle, of a directing-pipe rising from the nozzle and having an open lower end, a pipe inclosing the directing-pipe, such inclosing-pipe being closed at its bottom and open at its top, and a hood over the open upper end of the inclosing-pipe, substantially as set forth.

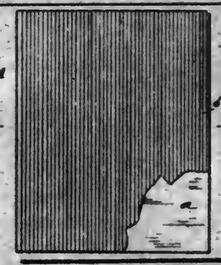
7. In a locomotive, the combination, with the stack and a protecting-screen, of a short exhaust-nozzle, a directing-pipe rising from the nozzle and having an open lower end, and a pipe inclosing the directing-pipe and closed at its lower end and open at its upper end, substantially as set forth.

8. In a locomotive, the combination, with the stack and a protecting-screen constructed as a complete inclosing-body, of a short exhaust-nozzle, a directing-pipe rising from the nozzle and having an open lower end, and a pipe inclosing the directing-pipe and closed at its lower end and open at its upper end, substantially as set forth.

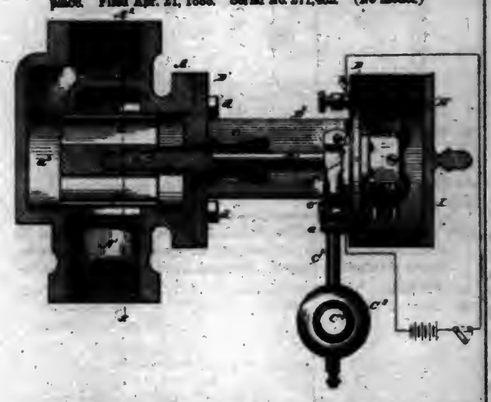
397,259. NAPHTHALINE PAPER. ADOLPH THIEPEN, New York, N. Y. Filed Apr. 21, 1887. Serial No. 235,630. (No specimens.)

Claim.—As a new article of manufacture, the sheet *a*, having a coating, *b*, of naphthaline in two or more superposed layers, the first presenting a rough appearance, the second filling up the interstices of the first layer and presenting a hard, compact, porcelain-like appearance with a smooth surface, substantially as described.

397,259.



397,260. ELECTRIC STOP-VALVE. ROBERT WELLER, Pittsburg, Pa., assignor to himself, Joseph Weller, and Hugh Ferguson, all of same place. Filed Apr. 21, 1888. Serial No. 271,462. (No model.)

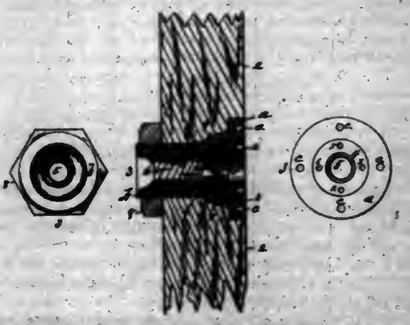


Claim.—1. The combination, with an oscillating valve and its case having arms D^2 and plate D, of a valve-stem extending from the valve to the plate D and having a weighted arm attached, a notched disk connected to and operated by the valve-stem, an armature provided with a tooth for engaging the notch of the disk, and an electro-magnet for operating the armature, the said armature and electro-magnet being supported upon plate D, substantially as and for the purpose described.

2. The combination, with the steam-valve and its weighted arm, of the diminishing gear E F', the notched disk F^2, the toothed armature, and its electro-magnet, substantially as and for the purpose described.

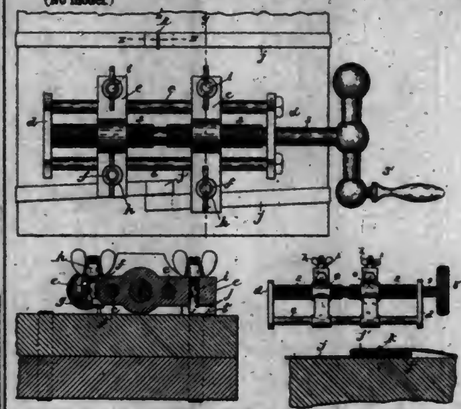
3. The combination of the valve-chamber having ports *a'* and a^2, the valve C, with stem C', the detachable head D', with arms D^2 and plate D, the toothed segment E, pinion E', and notched disk F^2, the toothed armature G, and the electro-magnet, substantially as and for the purpose described.

397,261. BUSHING-CASING FOR CASKS. PETER J. WIESTHAL, Holyoke, Mass. Filed July 16, 1883. Serial No. 280,108. (No model.)



Claim.—A bushing-case for casks, consisting of the tubular metallic case S, having a bushing-socket in its outer end, one or more spurs projecting from the base of said socket, combined with a bushing of soft material fitting said socket and engaging with said spurs, a ring screwing into said socket against said bushing, and a nut screwing onto the shank of said case, substantially as set forth.

397,262. MEANS FOR SECURING METALLIC BANDS TO BOXES. JOHN H. WILLIAMS, Boston, Mass., assignor of one-half to J. C. Hooper and J. A. Hooper, same place. Filed July 2, 1887. Serial No. 243,226. (No model.)

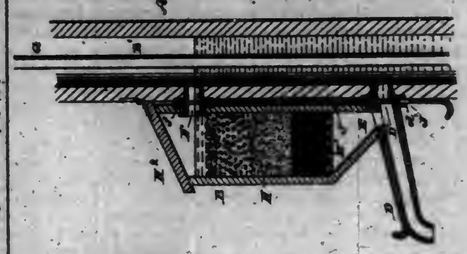


Claim.—1. The combination, with the shaft having the right and left hand screw-threads thereon, means for turning said shaft, and the two blocks mounted on and adapted to be moved by said right and left hand screw-threads, whereby they are adjusted with relation to each other, of band-clamps carried by said blocks, thumb-pieces for engaging or disengaging said clamps with the band, and guide-rods for holding the clamps in alignment with each other, substantially as described.

2. The combination of the blocks *c c*, each having at one end a wire-band-clamping device and at the other end a flat-band-clamping device, a right and left screw engaged, as described, with said blocks, and a guide rod or rods to guide the blocks in the movements imparted to them by the screw-shaft.

3. The wire-clamp composed of a block, *c*, having a socket, and a bolt adapted to work in said socket and having a head or enlargement containing a groove formed to receive a wire band, said head arranged to pass within the socket a distance sufficient to bite and firmly hold the wire at the edge, substantially as described.

397,263. FILTER-PUMP. ORSON H. WOODWORTH, Columbia City, Ind. Filed Aug. 26, 1888. Serial No. 283,953. (No model.)



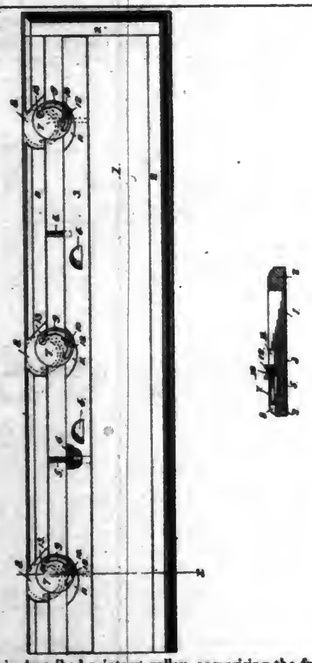
Claim.—1. The pump-stock A, having spout D, fitted in the stock, and the filter-chamber B, connected to the stock by tube F and to the spout D by opening E, in combination with the valve J, formed with opening J' and fitted in the spout D and tube F, substantially as and for the purposes set forth.

2. The pump-stock A, spout D, connected to the pump-stock and formed in its upper surface with the opening E, and the filter-chamber B, connected with the pump-stock bore by passage F, in combination with the sliding plate J, having aperture J' and fitted in channels *d f* in the spout and passage F, substantially as and for the purposes set forth.

397,264. SELF-LOCKING GALLEY. J. HATFIELD YOUMANS, Asbury Park, N. J. Filed Nov. 16, 1887. Serial No. 255,302. (No model.)

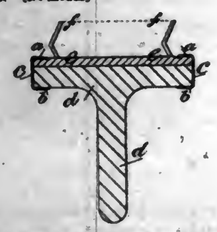
Claim.—1. A printer's galley comprising the rectangular frame, the movable bar or stick therein, and the disks or plates pivoted eccentrically to the frame and having curved slots extending to or beyond points diametrically opposite the pivots, and pins extending through the slots into the bar or stick, said pivots and pins being in alignment with each other and with the direction or line of movement of the bar or stick, whereby the bar or stick will be automatically locked when thrown fully forward, substantially as set forth.

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2. The herein-described printers' galley, comprising the frame 2, sliding bar or stick 3 therein, the disks 7, pivoted at 13 eccentrically to the frame, and having curved slots 9, extending at their outer ends to points in line with or beyond diametrical lines through the points' greatest eccentricity of said disks, the pins 10, projecting from the bar or stick 3 through the slots 9, and the binding-nuts 12 on said pins, the said pivots, outer terminals of the slots, and the pins 10 being, when the bar is thrown fully forward, in approximate alignment with each other and with the direction or line of movement of the bar, substantially as and for the purpose herein set forth.

397,265. DEVICE FOR SECURING CARD-CLOTHING TO THE FLATS OF CARDING-ENGINES. GEORGE ASHWORTH and ELIJAH ASHWORTH, Manchester, County of Lancaster, England. Filed Feb. 23, 1888. Serial No. 264,973. (No model.)



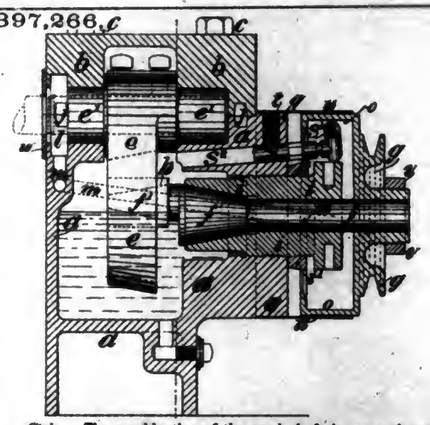
Claim.—1. The herein-described clamp for securing strips of card-clothing to carding-engine flat-bars, and consisting of a spring-clip adapted to grip the edge of the bar and the foundation material of the card fillet, and to cover and conceal the edge of the latter and the bar, all substantially as described.

2. The combination of a carding-engine flat-bar and card-clothing to be secured thereto, with spring-clips gripping the edges of the bar and the foundation material of the card-fillet, substantially as set forth.

397,266. DOFFER-COMB HEAD FOR CARDING-ENGINES. GEORGE ASHWORTH and ELIJAH ASHWORTH, Manchester, County of Lancaster, England. Filed Feb. 27, 1888. Serial No. 265,461. (No model.) Patented in England Jan. 5, 1887. No. 144.

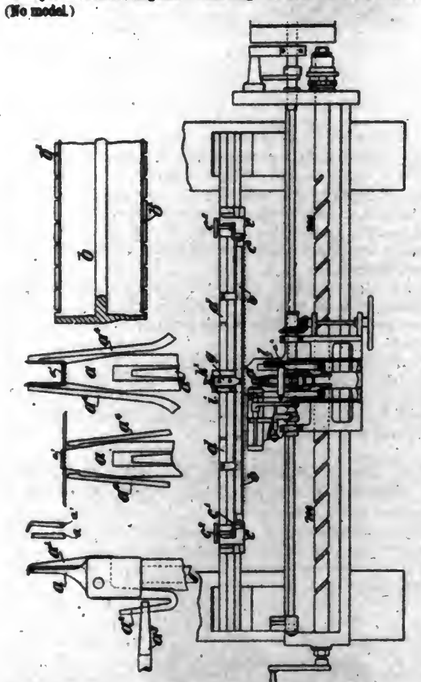
Brief.—The driving-pulley is provided with a drip-catcher, into which empties a pipe communicating by a passage in the box with a channel formed at the joint between the box and cover and common to both. A pipe having a mouth-piece inside of the drip-catcher conveys the drippings back to the oil-chamber through a passage in the box. The oil exuding from the bearing of the comb-shaft is thus intercepted and prevented from passing along the comb-shaft.

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Claim.—The combination of the comb-shaft, its operating-spindle, and connecting devices with the comb-motion box, having a channel, *j*, in the box and its cover to intercept the exuding oil, a passage, *m*, and a spout, *n*, leading therefrom, and a drip-catcher carried by the operating-spindle and into which the spout empties, all substantially as described.

397,267. APPARATUS FOR ATTACHING CARD-CLOTHING TO FLAT-BARS. GEORGE ASHWORTH and ELIJAH ASHWORTH, Manchester, County of Lancaster, England. Filed Aug. 21, 1888. Serial No. 283,305. (No model.)



Claim.—1. In a machine for wiring card-clothing to flat-bars, the setting-tool *e f*, provided with a finger or fingers to enter nicks in the flat-bar, in combination with the seating in the frame, into which the said tool slides, substantially as set forth.

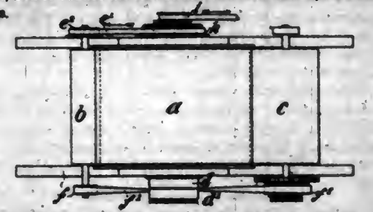
2. The setting-tools provided with fingers to enter into nicks in the flat-bars, in combination with the dog apparatus to receive and hold the flat-bar, substantially as set forth.

3. The setting-tools *e f*, the seatings for such setting-tools, the bar-holders, the wire-gripping jaws, and the clamping-tool to bend up the wire points, in combination with the sliding carriage provided with ordinary mechanism for cutting lengths of wire, bending such wire into staples, and forcing such staples through the card-clothing foundation and the nicks in the flat-bar, substantially as set forth.

4. The carriage provided with ordinary mechanism for cutting lengths of wire, bending such wire into staples, and forcing such staples through the card-clothing foundation and the nicks in the flat-bar, in combination with a clamping-tool, *g g'*, connected to the carriage to bend up and clamp the wire points, all substantially as described.

397,268. MEANS FOR DRIVING CARDING-ENGINE CYLINDERS. GEORGE ASHWORTH and ELIJAH ASHWORTH, Manchester, County of Lancaster, England. Filed Aug. 21, 1888. Serial No. 283,306. (No model.) Patented in England May 5, 1887, No. 6,566.

Brief.—The object of the invention is to simplify the mechanism for driving the cylinders of a carding-engine, to render the same more compact, and to reduce the side strains and side wear upon shafts and bearings.



Claim.—The combination of the frame, the main cylinder and its shaft having at one side of and close to the frame the ordinary driving-pulley and at the other side a pulley, *h*, with the doffer-cylinder having a pulley, and the taker-in having pulleys c^3 and *f* at opposite sides of the frame, a belt for transmitting motion from the pulley *h* to the pulley c^3, and a belt to transmit motion from the pulley *f* to the pulley on the doffer, all substantially as set forth.

397,269. SHUTTLE FOR SEWING-MACHINES. CHARLES H. REMOUT, San José, Cal. Filed Sept. 16, 1887. Serial No. 249,579. (No model.)



Claim.—1. The tension-spring *j*, provided with the tongue *j* within the body of the spring, the hook *l*, projecting from the rear of the spring and having its end bent downward and forward, and the tongue *k*, projecting from the rear end of the spring over the hook *l*, substantially as herein shown and described.

2. The combination, with a recessed shuttle, of the spring *j*, provided with the tongue *j'* within the body of the spring, the hook *l*, projecting from the rear end of the spring and having its end bent downward and forward into the recess of the shuttle, and the tongue *k*, projecting forward over the hook *l*, substantially as herein shown and described.

397,270. ELECTRIC RAILWAY-SIGNAL. ANNA E. BODA, Columbus, Ohio. Filed Aug. 22, 1888. Serial No. 283,431. (No model.)

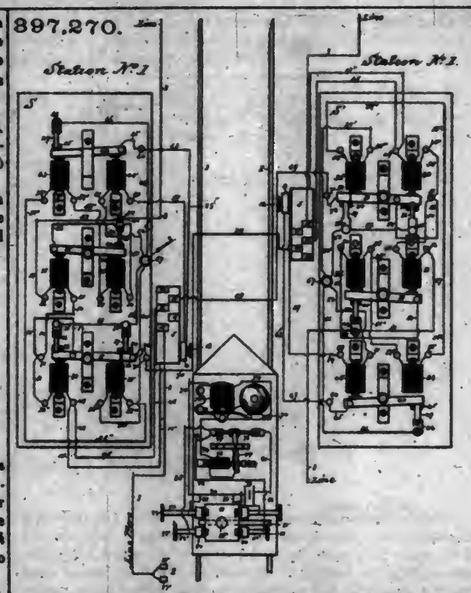
Claim.—1. A series of electric-railway-signal stations arranged upon both sides of a railway and at suitable distances apart, in combination with two independent series of contact-points at said stations, a main-line wire, a moving train, an audible alarm, conducting-arms, and a battery located on said moving train, an electro-magnet in circuit with said battery, an armature-lever and contact-points in circuit therewith and with said battery, and an armature-lever located on said moving train, whereby an audible alarm may be sounded thereon, substantially as described.

2. In an electric signal, the combination, with a series of electro-magnets, their armature-levers, a main-line wire and suitable ground-connections, of a signal-post provided with two separate series of contact-points connected to said line-wire, a reversely-arranged system of signals, a battery mounted upon a moving train, an audible alarm connected with one pole of said battery, a switch-lever, and conducting-arms extending from said moving train and electrically connected with one pole of said battery, and a contact-point intermediate of said switch-lever and conducting-arms, substantially as described.

3. In an electric railway-signal, the combination, with a duplicate reversely-arranged system of signals, of a signal-post provided with a pivotally-mounted bridge or plate carrying a double series of independent alternating contact-points, a spring normally holding said bridge in an inclined position, a main-line wire, two contact-points connected therewith, and a battery and conducting-arms mounted upon a moving train, whereby electrical impulses are sent over said main line to the signals, substantially as described.

4. In a system of electric signals, the combination, with a series of electric circuits, of a signal-post having a pivotally-mounted bridge

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provided with contact-points, connecting-wires leading to the respective circuits, a bracket connected to said bridge, a main-line wire, and a spring which normally draws said bridge into inclined position for making electrical contact between said bracket and a wire leading to one of said signal-circuits, substantially as described.

5. An electric railway-signal consisting of two contact-points, 87' 88', a main-line wire, 3, which is electrically connected therewith, an electro-magnet, 30, which is normally in circuit with said line-wire, an armature-lever, 31, in the same circuit, and a wire, 53, leading to the earth, in combination with a conducting-arm, 82, and a suitable battery on a moving train, whereby said armature-lever is operated to shunt the circuit transmitted to it from said battery when said conducting-arm comes in contact with said contact-points, substantially as described.

6. The combination, in an electric signal, of an electro-magnet, 30, a contact-point, 15, and wires connecting said point with the coil of said magnet, an armature-lever, 31, which is normally in circuit with said magnet and the earth, an electro-magnet, 38, and wires connecting the same with said magnet 30, the line-wire 3, connecting with the signals of another station, and a conducting-arm, 82, and a battery, B, mounted upon a moving train, whereby the signals of the stations are simultaneously set, substantially as described.

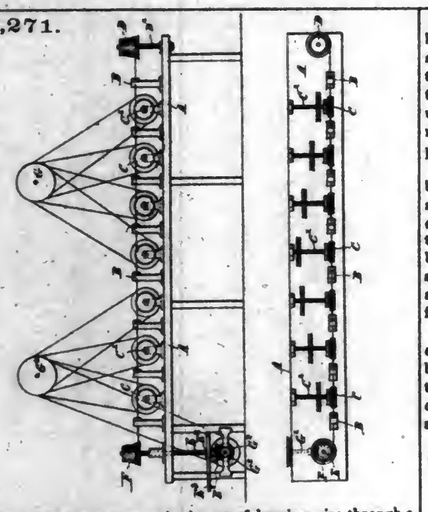
7. The combination, in an electric signal, of a contact-point, 16, an electro-magnet, 30, and wires connecting the coil thereof with said contact-point, an armature-lever, 31, which is normally in circuit with said magnet and the ground and provided with an insulated end, 32, a connecting-wire, 72 and 70, a contact-point, 19, on the opposite side of the track, a moving train, the conducting-arms 82 and 82', and the battery B and the connections mounted on said train, substantially as and for the purpose described.

8. The combination, in an electric signal, of a contact-point, 17, an electro-magnet, 48', connecting therewith by suitable conducting-wires, an armature-lever, 44, operated by said magnet, a contact-point, 47, connecting-wires 63 66, extending therefrom to ground, contact-point 18, conducting-arms 82 82', battery B, alarm 75', alarm-magnet 75, magnet 76, armature-lever 77, contact-points 78 79, and their electric connections, whereby an alarm is sounded upon a moving train, substantially as described.

9. The combination, in an electric signal, of the pivoted bridge 5, the post 4, the bracket 7, the contact-point 15, the connecting-wire 12', and line-wire 3 with the binding-post 58, contact-point 41, armature-lever 39, wire 53, electro-magnet 38', wire 55', electro-magnet 48, wire 58', electro-magnet 30', wire 34', leading to the earth, a moving train, and the conducting-arms 82 82', and the battery B, carried by said train, whereby the signals are returned to normal position, substantially as described.

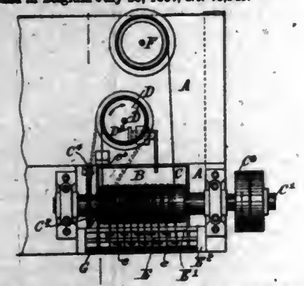
397,271. METHOD OF DRAWING WIRE. ALFRED S. BOLTON and THOMAS BOLTON, Cakemore Mills, near Cheadle, County of Stafford, England. Filed June 26, 1887. Serial No. 242,726. (No model.) Patented in England July 8, 1886, No. 8,977; in Germany May 13, 1887, No. 42,610; in France July 21, 1887, No. 184,923, and in Belgium July 25, 1887, No. 76,943.

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Claim.—The improvement in the art of drawing wire through a successive series of dies at one operation, consisting in subjecting the wire between the several dies to the action of successive pulling surfaces running at a velocity in excess of the maximum rate of speed imparted to the wire and permitting the draft between the successive dies to regulate itself by the slipping of the wire on said surfaces, substantially as herein described.

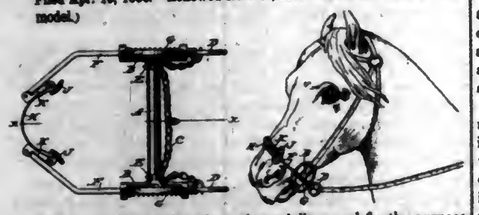
397,272. APPARATUS FOR DRAWING WIRE. ALFRED S. BOLTON and THOMAS BOLTON, Oakamoor Mills, near Cheadle, County of Stafford, England. Filed Sept. 17, 1888. Serial No. 285,606. (No model.) Patented in England June 6, 1887, No. 8,133; in France July 21, 1887, No. 184,923, and in Belgium July 25, 1887, No. 78,343.



Claim.—1. In a wire-drawing apparatus, a row or rows of dies arranged between and parallel with a fixed guide-bar and a rotary draft cylinder or drum, such cylinder or drum serving to impart to the wire under treatment rates of draft varying with the elongation of the wire, as and for the purpose above described.

2. In a wire-drawing apparatus, a row or rows of dies arranged between and parallel with a fixed guide-bar and a rotary draft cylinder or drum, in combination with a lubricating-trough into which the draft cylinder or drum dips for the purpose of lubricating the passing wire under treatment preparatory to each successive drawing.

397,273. SAFETY BRIDLE-BIT. LUCAS P. BRITT, New York, N. Y. Filed Apr. 10, 1888. Renewed Nov. 10, 1888. Serial No. 290,453. (No model.)



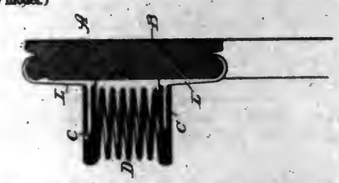
Claim.—1. The combination, substantially as and for the purpose set forth, of a bridle-bit, lateral movable rods supported by the bit to extend forward upon the horse's nose, a flexible band connecting their ends, and pads hinged to said ends to bear inward upon the nose when the rods are drawn back.

2. The combination of a bridle-bit, lateral movable rods supported by the bit to play in bearings formed in its cheek-pieces, springs actuating said rods to force them forward, bridle rings or loops attached to the rods by which to draw them back, a flexible band connecting the forward ends of said rods, and pads hinged to said ends to bear upon the horse's nose when the rods are drawn back against the resistance of the springs, substantially in the manner and for the purpose herein set forth.

3. The combination of a bridle-bit, lateral movable rods supported by the bit to play in bearings formed in its cheek-pieces, springs actuating said rods to force them forward, bridle rings or loops at the rear ends of the rods by which to draw them back, a curb-chain attached to said ends and passing through rings on the cheek-pieces, a flexible band connecting the forward ends of said rods, and pads hinged to said ends to bear upon the horse's nose when the rods are drawn back against the resistance of the springs, substantially in the manner and for the purpose herein set forth.

4. The combination, with the bridle-bit, its cheek-pieces, the lateral rods supported by and moving in said cheek-pieces, the flexible band connecting their forward ends, and the pads pivoted thereto, of the springs fitted in the cheek-pieces to actuate said rods and hold open the pads, substantially in the manner and for the purpose herein set forth.

397,274. SPRING ATTACHMENT FOR ROCKING-CHAIRS. WILLIAM I. BUNKER, Chicago, Ill. Filed Sept. 1, 1888. Serial No. 284,379. (No model.)



Claim.—1. In a platform rocking-chair, the combination of a base-rail, a rocker resting and rocking thereon, a spring-bracket having an arm or arms extending to the top of the rocker and clasping or hooking onto the same, a spring-bracket attached to the base-rail, and a coiled spring connecting the spring-brackets together, substantially as described.

2. In a platform rocking-chair, the combination of a base-rail, a rocker resting and rocking thereon, a spring-bracket having an arm or arms extending to the bottom of the base-rail and clasping or hooking onto the same, a spring-bracket attached to the rocker, and a coiled spring connecting the spring-brackets together, substantially as described.

3. In a platform rocking-chair, the combination of a base-rail, a rocker resting and rocking thereon, spring-brackets having an arm or arms extending to the top of the rocker and to the bottom of the base-rail, respectively, and clasping or hooking onto the same, and a coiled spring connecting the spring-brackets together, substantially as described.

4. In a platform rocking-chair, the combination of a base-rail, a rocker resting and rocking thereon, a spring-bracket having an arm or arms extending to the edge of the rocker or base-rail and clasping or hooking onto the same, a spring-bracket attached to the member of the chair which is unclasped by the arm or arms, and a coiled spring connecting the spring-brackets together, whereby the rocker and base-rail are adjustable longitudinally to secure the proper location and leverage for the spring, substantially as described.

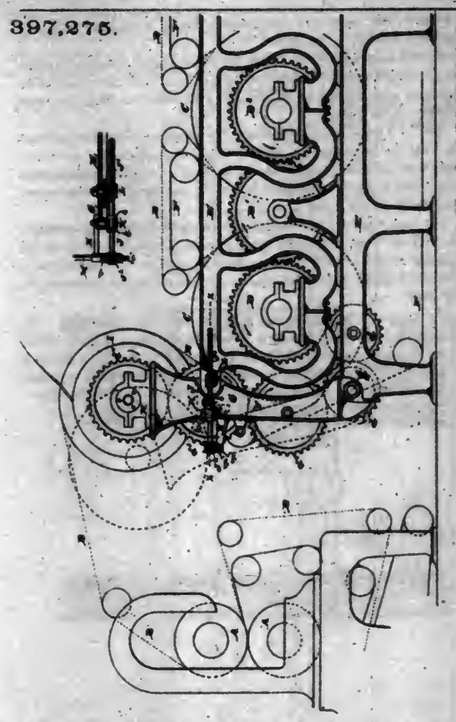
397,275. PAPER-MAKING MACHINE. HENRY L. CARTER, Philadelphia, Pa., and THOMAS H. SAVERY, Wilmington, Del. Filed June 4, 1888. Serial No. 275,962. (No model.)

Claim.—1. In a paper-making machine, the combination, with the drying-rolls and the frame supporting said rolls, of a guide-cylinder supported on the front of said frame, and driving-gear connecting said guide-cylinder with the mechanism actuating the drying-rolls, so as to rotate it with the same peripheral velocity, all substantially as and for the purpose specified.

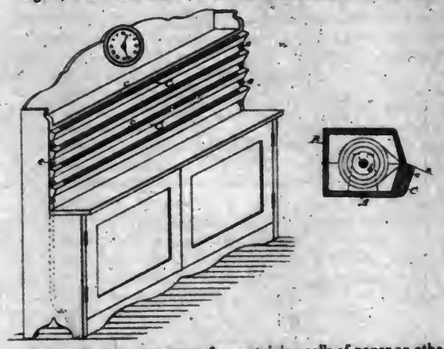
2. In a paper-making machine, the combination, with the drying-rolls and the frame supporting said rolls, of an adjustable guide-cylinder, said cylinder being supported on movable bearings connected with the front of the frame of the drying-cylinders, and driving-gear connecting said guide-cylinder with the mechanism actuating the drying-rolls, so as to rotate it with the same peripheral velocity, all substantially as and for the purpose specified.

3. In a paper-making machine, the combination, with the drying-rolls and the frame supporting said rolls, of an internally-heated guide-cylinder supported on the front of said frame, and driving-gear connecting said guide-cylinder with the mechanism actuating the drying-rolls, so as to rotate it with the same peripheral velocity, all substantially as and for the purpose specified.

397,275.



397,276. CONSERVATORY FOR PAPER. ISAAC M. CHASE, Washington, D. C. Filed Dec. 10, 1887. Serial No. 257,561. (No model.)



Claim.—1. A conservatory for containing rolls of paper or other fabrics, provided with a cutting-rail having a groove in its upper face, and bearings for revolving the rolls, all constructed and arranged as shown, and substantially as herein described.

2. In a conservatory for rolls of paper or other fabrics, a cutting-rail provided with a groove for the insertion of a knife, and an adjustable partition for different lengths of rolls, substantially as set forth.

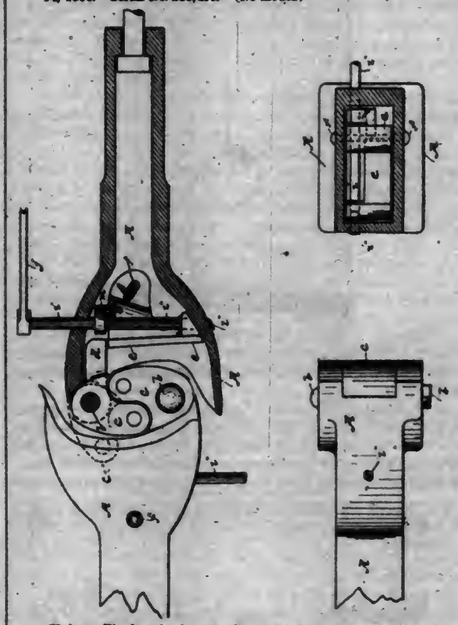
3. In a conservatory for rolls of paper or other fabrics, a cutting-rail provided with a groove and a tension device for the paper, substantially as specified.

4. The combination of one or more receptacles for containing rolls of paper or other fabrics, and having a cutting-rail provided with a groove for the insertion of a knife, and arranged on a stand or cabinet, substantially in the manner shown and herein specified.

5. A conservatory for rolls of paper or other fabrics, consisting of a receptacle, A, having a movable part for inserting said rolls, and a cutting-rail, C, with a groove, *c*, for the insertion of a knife, and provided with adjustable journals, all arranged substantially as and for the purpose set forth.

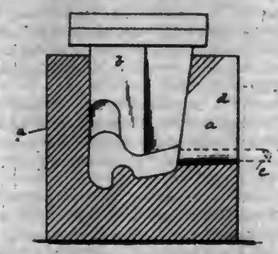
6. The conservatory herein described, consisting of the receptacle A, the movable cover or front for inserting the rolls of paper or other fabrics, and provided with a cutting-rail, C, having groove *c* for the insertion of a knife, and an adjustable partition, D, all constructed and arranged substantially as and for the purpose specified.

397,277. CAR-COUPLING. EVANDER H. COLWELL, Allegheny, Pa., assignor of one-half to Christian F. Kennewag, same place. Filed Sept. 14, 1888. Serial No. 285,409. (No model.)



Claim.—The herein-described car-coupler, consisting of the draw-head A, having an enlarged open head, in which is hinged, by means of a bolt, *b*, a hook, *c*, the inward extension, *d*, of the said hook *c* adapted to engage with and be locked by a latch-piece, *e*, the shaft *i*, for operating the latch *e*, the crank *m*, attached to said shaft *i*, and the bolt or pin *f*, passed through a slot, *g*, in the latch-piece *e*, for confining the same in a proper position, substantially as set forth and described.

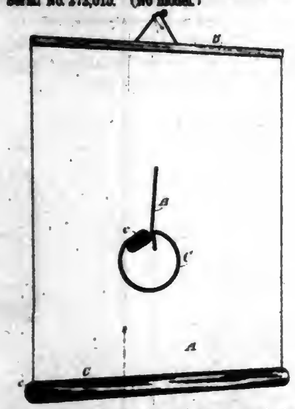
397,278. METHOD OF PRODUCING FORGED ARTICLES FROM SCRAPS OF METAL. EVANDER H. COLWELL, Allegheny, assignor of one-half to Christian F. Kennewag, Allegheny County, Pa. Filed Sept. 14, 1888. Serial No. 285,410. (No model.)



Claim.—1. The herein-described method of forming forgings from wrought iron, steel, &c., consisting of placing a bundle of scrap or small pieces of iron into a female die, *a*, the said bundle being at a welding heat, and subjecting the same to a pressure brought against a male die, *b*, whereby forgings from wrought-iron, wrought-steel, &c., may be formed.

2. The improvement in the art of making forgings of the class described, consisting in assembling small or scrap pieces of metal into a bundle, heating the bundle to a welding heat, placing the bundle within a female die constructed to give one part of the bundle the desired external contour, and finally forcing a male die upon the bundle within the female die, whereby the bundle is subjected to a heavy pressure and forged into a homogeneous body of the external contour corresponding to the particular dies used, substantially as described.

397,279. SHEET-METAL BINDING. WILLIAM DUNCAN, Hinsdale, assignor to himself, and ALEXANDER S. JOHNSTON, Chicago, Ill. Filed Apr. 27, 1888. Serial No. 272,015. (No model.)



Claim.—1. A binding for the edges of maps and the like, consisting of a tubular strip of metal, one edge thereof being permanently united with the edge of the sheet by a folded seam, substantially as described.

2. A binding for the edges of maps, curtains, and the like, consisting of a strip of sheet metal of tubular form, one edge thereof being permanently united to the edge of the sheet by a folded seam, the other edge of said strip bearing against the opposite side of the sheet, whereby additional hold is had on the sheet, substantially as described.

397,280. PHONOGRAPH RECORDER AND REPRODUCER. THOMAS A. EDISON, Llewellyn Park, N. J. Filed Sept. 27, 1888. Serial No. 286,552. (No model.)



Claim.—1. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point connected therewith and capable of a retarded movement independent of the movement of the diaphragm, substantially as set forth.

2. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point connected with said diaphragm and capable of movement independent thereof, and provided with a retarding device for controlling such independent movement, substantially as set forth.

3. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point pivotally connected therewith, so as to have a movement independent thereof, and provided with a retarding device controlling such movement, substantially as set forth.

4. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point connected therewith and capable of a retarded movement independent of the diaphragm, and a spring for holding said point against the sound-record, substantially as set forth.

5. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point connected therewith and capable of a retarded movement independent of the diaphragm, and a spring connected with said diaphragm for holding said point against the sound-record, substantially as set forth.

6. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point pivotally connected therewith, a sprig for holding said point against the sound-record, and a retarding device for controlling the movement of said point on its pivot, substantially as set forth.

7. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point pivotally connected therewith, a spring connected with the diaphragm for holding said point against the sound-record, and a retarding device for controlling the movement of said point on its pivot, substantially as set forth.

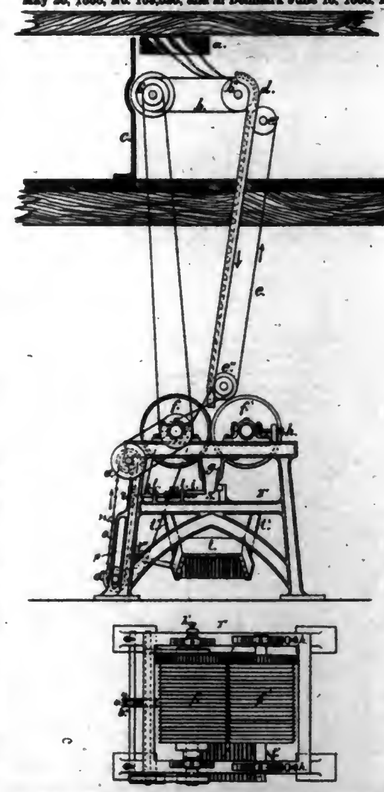
8. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of a lever pivoted upon said diaphragm so as to have a movement independent thereof, and carrying the recording or reproducing point, and a retarding device connected with said lever, substantially as set forth.

9. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of a lever pivoted thereto and carrying the recording or reproducing point, and a fan attached to said lever, substantially as set forth.

10. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of the recording or reproducing point connected with said diaphragm and capable of movement independent thereof, and a fan or equivalent device for retarding such movement, substantially as set forth.

11. In a recorder or reproducer for phonographs, the combination, with the diaphragm, of a lever pivoted thereto and carrying the recording or reproducing point, a fan attached to said lever, and a spring for holding said point against the sound-record, substantially as set forth.

397,281. MACHINE FOR MAKING PACKING-SHAVINGS. OLE EVENSTAD and OLAUS SUNSTAD, Rasten, Storelvedalen, Norway. Filed Oct. 2, 1888. Serial No. 287,008. (No model.) Patented in Germany Mar. 21, 1888, No. 45,685; in Belgium Apr. 16, 1888, No. 81,134; in France May 23, 1888, No. 189,823, and in Denmark June 13, 1888, No. 430.



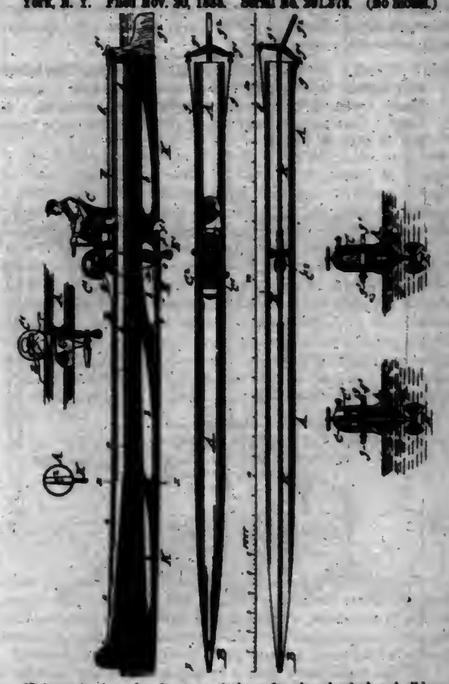
Claim.—1. The combination, with rotary slitting-rolls provided with annular beveled ribs, the faces of the ribs of one roll being placed in contact with the faces of the ribs of the other roll, of screws for adjusting one of the rolls in longitudinal and the other roll in lateral direction, substantially as set forth.

2. In a machine for making narrow shavings for packing purposes, the combination of rotary rolls provided with annular beveled ribs, the faces of which are arranged in contact with each other, a hopper below said rolls, and an intermittently-actuated cutting device below the hopper for cutting off the narrow shavings in the proper length, substantially as set forth.

3. In a machine for making narrow shavings for packing purposes, the combination, with rotary slitting-rolls having annular ribs beveled at the circumference, the faces of the ribs of one roll being in contact with the faces of the ribs of the other roll, of a hopper below said rolls, an intermittently-actuated cutting device below said hopper, and an inclined oscillating screen suspended below the cutting device, substantially as set forth.

4. The combination, with a pair of slitting-rollers and a planing-machine, of a horizontal conveying-belt located below the cutter of the planing-machine, and a conveyer extending from said belt to the slitting-rollers, substantially as herein shown and described.

397,282. TUBULAR RACING-BOAT. FRANK FERRIER, Jr., New York, N. Y. Filed Nov. 20, 1888. Serial No. 291,573. (No model.)



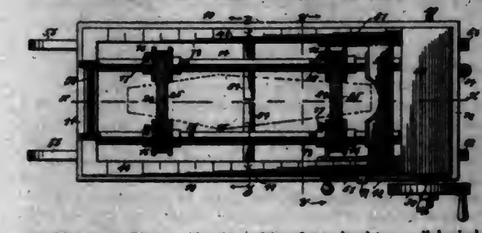
Claim.—1. A racing-boat consisting of a closed tubular shell having a sharply-pointed bow and longitudinal balancing-keel below said shell, a shaft supported in bearings of said keel, a propeller-screw on said shaft, and mechanism, substantially as described, for imparting rotary motion to the propeller-shaft, substantially as set forth.

2. A racing-boat composed of a closed tubular shell having a sharply-pointed bow, a longitudinal balancing-keel having openings, a propeller-shaft supported in bearings of the keel, a propeller on said shaft, a crank-wheel supported on bearings at the top of the shell, and a belt-and-pulley transmission for imparting rotary motion from the crank-wheel to the propeller-shaft, substantially as set forth.

3. A racing-boat composed of a closed tubular shell having a tapering bow and a longitudinal balancing-keel secured rigidly to the shell at the under side of the same, substantially as set forth.

4. A racing-boat composed of a closed tubular shell having a tapering bow, a longitudinal balancing-keel having openings for the lateral passage of water, and a propeller the shaft of which is supported in bearings of the keel, substantially as set forth.

397,283. BURIAL APPARATUS. GEORGE I. GERRISH, Rapid City, Dak. Filed Oct. 9, 1888. Serial No. 287,670. (No model.)



Claim.—1. The combination, with a frame having parallel winding-shafts, of drums on said shafts, a pin, 21, secured to each of the drums of one shaft, and a yielding hood, 22, extending over the end of each pin, an uncovered pin projecting from each of the opposite drums, and slings having apertures at their ends to receive said pins, whereby when the slings are unwound from the drums having the uncovered pins they will become detached and may then be wound upon the opposite drums.

2. The combination, with a frame, legs supporting the same, and longitudinal winding-shafts journaled in said frame, of adjustable drums sliding upon the said shafts, a pin and spring-hood secured to the drums on one shaft, and a pin attached to the drums of the opposite shaft, slings rigidly secured to one set of drums and detachably attached to the opposite set of drums, bevel-gears 31 on the ends of said shafts, a transverse shaft, 29, a bevel-gear, 32, thereon, meshing with the gear 31 on the shaft to which the slings are detachably connected, the sliding gear 33, also on the shaft 29, and means for throwing it into and out of engagement with the other gear, 31, substantially as and for the purpose specified.

3. The combination, with a frame, legs supporting the same, and longitudinal winding-shafts journaled in said frame, of adjustable drums sliding upon the said shafts, a pin and spring-hood secured to the drums on one shaft, and a pin attached to the drums of the opposite shaft, slings rigidly secured to one set of drums and detachably attached to the opposite set of drums, racks attached to the sides of the frame, an adjustable guide-plate supported by said racks, and means, substantially as shown and described, for rotating the winding-shafts, as and for the purpose specified.

4. The combination, with a frame, legs supporting the same, winding-shafts journaled longitudinally in the said frame, drums adjustably secured to the said shafts, the drums upon one shaft being provided with a pin and apertured spring-hood, and the drums upon the opposite shaft provided with a pin only, of slings clamped to one set of drums by the said hood and pin and provided with a ferrule engaging the pin upon the opposite set of drums, racks secured to the inner side face of the frame, a guide-bar supported by said racks, a transverse drive-shaft connecting with the winding-shafts, a shifting mechanism, and means, substantially as shown and described, for rotating the drive-shaft, as and for the purpose specified.

5. The combination, with a frame, legs supporting the same, winding-shafts journaled longitudinally in the said frame, drums adjustably secured to the said shafts, the drums upon one shaft being provided with a pin and apertured spring-hood, and the drums upon the opposite shaft provided with a pin only, of slings clamped to one set of drums by the said hood and pin and provided with a ferrule engaging the pin upon the opposite set of drums, racks secured to the inner side face of the frame, a guide-bar supported by said racks, a transverse drive-shaft connecting with the winding-shafts, a shifting mechanism, a brake-lever pivoted to the frame and engaging the drive-shaft, a hand-wheel secured to one outer end of the drive-shaft, and means, substantially as shown and described, for manipulating the brake-lever, as and for the purpose specified.

6. The combination, with a frame, winding-shafts journaled in said frame provided at one end with a bevel-gear, winding-drums adjustably held on said shafts, and slings held to the drums of one shaft and detachably held to the drums of the other shafts, of a transverse shaft provided with a fixed bevel-gear engaging the bevel-gear of one winding-shaft, a second bevel-gear mounted to slide on said transverse shaft and turn with the same, a spring on said shaft between said gears, and a shifting-lever engaging the sliding gear, substantially as shown and described.

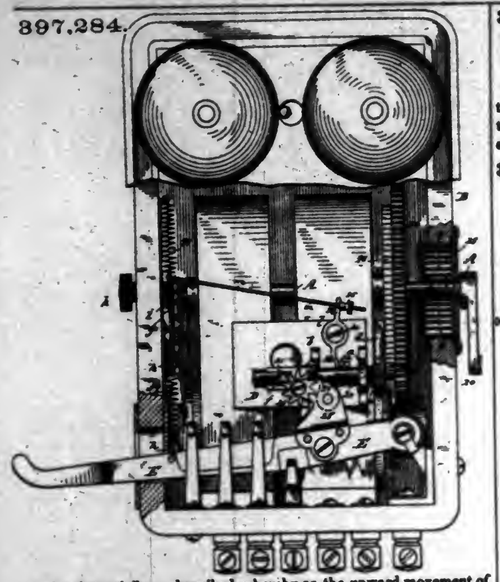
397,284. TELEPHONE CALL-BOX. ARMIRO GRIFFITH, Springfield, and HENRY A. DURFEE, Westfield, Mass. Filed Nov. 6, 1888. Serial No. 290,126. (No model.)

Claim.—1. In a telephone call-box, the combination, with the magneto-operating shaft provided with the ratchet-wheel, the enlarged wall surrounding a portion of said shaft, and the swinging receiver holder-arm, of an involute spring by its inner end secured to said shaft and having its outer end free for a spring-bearing on said wall, substantially as described, and a pawl normally located for engagement with said ratchet-wheel, and means actuated by said holder-arm whereby on the downward movement thereof said pawl will be thrown out of engagement with said ratchet, for the purpose described.

2. In combination, the magneto-shaft adapted to have a spring-reversed rotation and detent devices adapted normally to prevent such reversal, the short-circuit spring and its contact-pin, the swinging receiver holder-arm, and movable connections actuated by the said holder-arm and in engagement with said arm and said short-circuit spring, and also with said detent devices, whereby on the downward movement of the said holder-arm said spring will be drawn from its contacting-pin, and said magneto-shaft will be freed for its reverse rotation, substantially as described.

3. In a telephone call-box, the combination, with the magneto-operating shaft having the ratchet-wheel thereon, the enlarged surrounding wall, and the swinging receiver holder-arm, of an involute spring by its inner end secured to said shaft, and having its outer end free for a spring-bearing on said wall, a sliding shaft having a spring-pawl thereon normally located for engagement with said ratchet and provided with a stud, 22, and a toothed wheel and spring-pawl therefor carried by said swinging arm and located in relation to said shaft-

397,284.



stud, substantially as described, whereby on the upward movement of the said holder-arm said toothed wheel will produce no effect on said slide-shaft, but on the downward movement thereof said shaft will be moved longitudinally to carry said pawl out of a position for engagement with said ratchet, substantially as described.

4. The combination, with the magneto-shaft having the ratchet, the surrounding circular wall and the involute spring, substantially as described, and the holder-arm, of the slide-shaft having the stud 22 and pin 18 thereon, and guiding-lugs therefor, the pawl loosely fitted on the end portion of the slide-shaft, having the slot 19 engaging said slide shaft, the spiral spring 20, applied between and secured to a guide-lug and said pawl for exerting an outward pressure on said pawl and slide-shaft, and a pressure on said pawl for a partial rotation thereof on its shaft, and the toothed wheel and spring-pawl therefor carried by said holder-arm and arranged for operation on and with relation to said shaft-stud 22, substantially as and for the purpose described.

5. The combination, with the guiding-lugs *a* and *b*, the latter having the right-angled extension with the longitudinal slot therein, of the slide-shaft D, for carrying the spring-pawl provided with the pin 23, and the sleeves 21 and 22, the former bearing on the walls of said slot, substantially as and for the purposes described

6. The combination, with the short-circuit contact-spring *g* and the contacting part *i* therefor, and the swinging receiver holder-arm, of the slide-shaft D, having an abutment, 32, mechanism, substantially as described, interposed between said holder-arm and said slide-shaft to secure a longitudinal slide of the latter on the downward movement of the former, an intermediately-pivoted tilting lever having one end in engagement with said abutment for being swung thereby, and a connecting-rod between the other end of said lever and said contact-spring *g*, for drawing same away from its contacting part on the swinging of said lever in one direction, substantially as described.

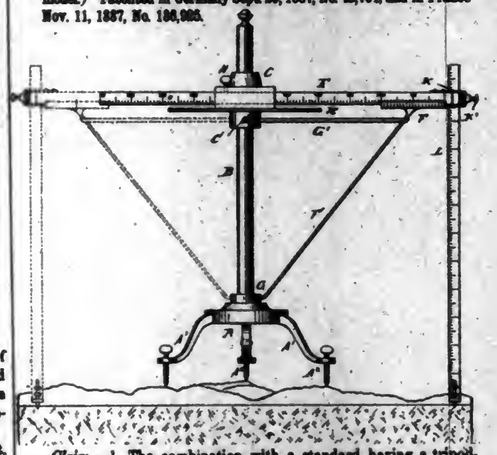
7. The combination, with the contact-spring *g*, having an aperture, 37, therein, and the tilting lever *l*, intermediately pivoted and having an aperture, 34, in one arm thereof, of the connecting-rod *m*, by one end portion passing through the spring-aperture 37 and headed thereat, and at its other end portion passing through the lever-arm aperture 34 and screw-threaded, and the adjusting check-nut 35, substantially as and for the purposes described.

8. In a telephone call-box, the magneto-shaft A, provided with the ratchet-wheel and the enlarged circular wall surrounding a portion of said shaft, the involute spring by its inner end secured to said shaft, and by its outer end in spring bearing on said wall, the swinging receiver holder-arm, and the short-circuit contact-spring *g* and its contacting button *i*, combined with a sliding shaft having a spring-pawl normally located for engagement with said ratchet and provided with a stud, 22, and abutment 32, a toothed wheel and spring-pawl therefor carried by said swinging arm and located in relation to said shaft for the operation on said slide-shaft, as described, an intermediately-pivoted tilting lever, *l*, by one arm in position to be engaged by said slide-rod abutment 32, and a connecting-rod, *m*, between and in engagement with the other arm of said lever and said contact-spring *g*, all substantially as and for the purpose described.

397,285. PREPARING DYNAMITE. GUSTAV R. F. GUTER, Unterlüss, Prussia, Germany. Filed Dec. 13, 1887. Serial No. 257,666. (No specimens.) Patented in France Feb. 1, 1887, No. 181,183; in Belgium June 9, 1887, No. 77,763, and in England June 23, 1887, No. 8,970.

Claim.—The herein-described method of manufacturing cartridges, consisting in pressing kieselguhr into the form of cartridges, then carbonizing them, and finally saturating them with nitro-glycerine, substantially as set forth.

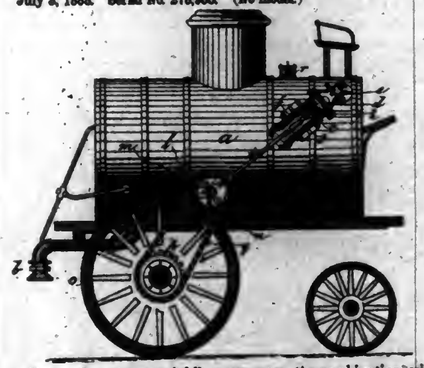
397,286. APPARATUS FOR LEVELING AND SQUARING STONE. MAX HÄNSEL, Christianstadt, Prussia, Germany, assignor to Richard Hänsel, Breslau, N. Y. Filed Nov. 20, 1888. Serial No. 291,380. (No model.) Patented in Germany Sept. 29, 1887, No. 43,761, and in France Nov. 11, 1887, No. 186,925.



Claim.—1. The combination, with a standard having a tripod-base, of a sleeve mounted to turn on said standard, a rule mounted to slide in said sleeve, a rule mounted to slide in the end of said sliding rule, and a graduated disk on the sleeve and below the rule mounted to slide in said sleeve, substantially as herein shown and described.

2. The combination, with a standard, of a sleeve mounted to rotate on said standard, the rule E in said sleeve, the guide F, an arm, F', supporting said rule, and the rule I, mounted to slide in the end of the rule E, substantially as herein shown and described.

397,287. STREET-SPRINKLING APPARATUS. MICHEAL HAUGHEY, St. Louis, Mo., assignor of one-half to James Griffin, same place. Filed July 3, 1888. Serial No. 278,935. (No model.)

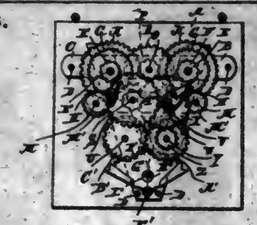


Claim.—In a street-sprinkling apparatus, the combination, with a carriage, of a water-tank mounted thereon, an air-pump mounted on the tank and delivering thereinto, a floating sprocket-wheel journaled on one arm of a counterbalanced bell-crank lever fulcrumed on the tank, a crank on said sprocket-wheel for operating a piston-rod which is pivotally connected to the piston of the pump, a sprocket-wheel on the hub of the carriage-wheel, and a chain belt for communicating motion from said sprocket-wheel to the floating sprocket-wheel, substantially as and for the purposes described.

397,288. MOTOR. ERNST T. HEINRICH and JOHN HOFFMANN, Fredsburg, Tex. Filed Aug. 23, 1888. Serial No. 283,515. (No model.)

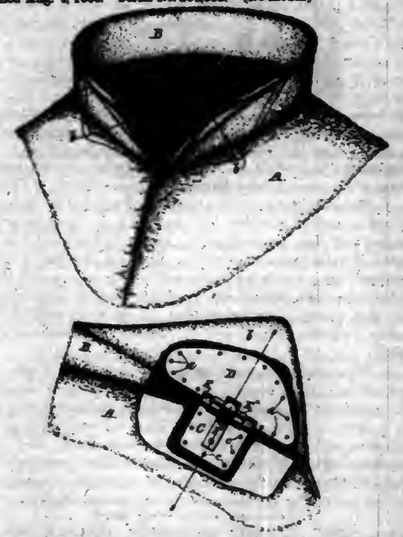
Claim.—In a fan-motor, the V-shaped frame B, the shafts E, journaled in the upper corners thereof, the ratchet-wheels F and spur-wheels G, secured to said shafts, the spring-actuated pawls pivoted to the frame and engaging the ratchet-wheels, sleeves loose on shafts E,

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and having the spur-wheels K fast to said sleeves, the volute springs L, with their inner ends fast to shafts E and their outer ends fast to wheels K, the winding-shafts M, having the pinions M', engaging wheels G, the shaft O between shafts E, having the pinion P, engaging wheels K, and provided further with the spur-wheel R, the shaft S, having pinion T, engaging wheel R, and provided with the spur-wheel U, the shaft V, having the pinion W and spur-wheel X, the former engaging wheel U, the shaft Y, having the pinion Z, engaging wheel X, and provided also with the wheel A', the counter-shaft C', having wheel B', of the same size as wheel A' and engaging the latter, the spurred sectors D' E', secured to said shafts Y C', the rock-shaft having the spurred sector G', provided with opening H' and engaging sectors D' E' alternately, the screw I, engaging the frame and adapted to engage the opening H', for the purpose set forth, and the fan-shaft detachably secured to the rock-shaft, all in combination, substantially as described.

397,289. GARMENT-COLLAR. CHARLES F. HENNING, Chicago, Ill. Filed Aug. 4, 1888. Serial No. 281,982. (No model.)



Claim.—The combination, with the main part or body of a garment and the collar thereof, of hinged plates attached to the body and the collar, one of said plates being provided with a flat surface or surfaces adjacent to its pivotal axis, and the other with a spring-actuated part bearing upon said flat surface, substantially as described.

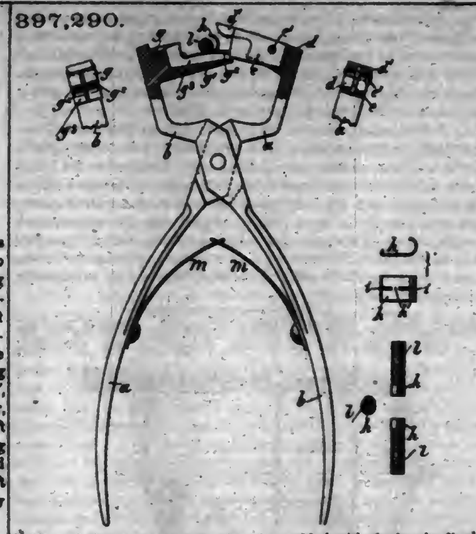
397,290. TOOL OR INSTRUMENT FOR CUTTING CORDS AND TYING STRIPS OF SHEET METAL. GUSTAV HELLER, Zittau, Saxony, Germany. Filed Apr. 2, 1888. Serial No. 270,046. (No model.)

Claim.—1. A tool or instrument for simultaneously cutting and binding cords, consisting of two arms or branches, *a b*, pivoted to each other and having their jaws *d g* provided with tongues or extensions *d' g'*, the tongue *d'* being divided by a slit and carrying a removable knife, *c*, and the tongue *g'* being provided with ribs or flanges g^2 and having a groove, g^3, between said ribs, substantially as and for the purpose herein described.

2. In a tool or instrument for simultaneously cutting and binding cords or similar fabrics, the combination, with the pivoted arms or branches *a b* and the jaw *d*, having the divided tongue or extension *d'*, of the removable knife *c*, secured in place by the screw *i*, substantially as herein described.

3. In a tool or instrument for simultaneously cutting and binding cords or similar fabrics, the combination, with the pivoted arms or branches *a b* and the divided tongue or extension *d'*, carrying the

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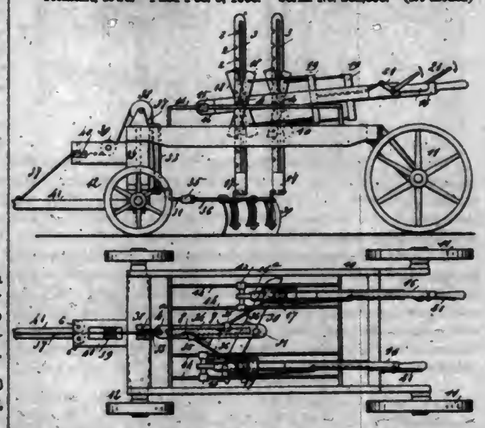


knife *c*, of the tongue or extension *g'*, provided with the longitudinal groove g^3, for engagement with said knife, substantially as herein described.

4. In a tool or instrument for simultaneously cutting and binding cords or similar fabrics, the combination, with the tongue or extension *d'*, of the tongue or extension *g'*, having the longitudinal ribs or flanges g^2, for guiding the extension *d'* and preventing lateral displacement thereof, substantially as herein described.

5. A tool or apparatus for simultaneously cutting and binding cords or similar fabrics, consisting of pivoted arms *a b*, having jaws *d g* and tongues or extensions *d' g'*, engaging with each other, so that they may be pressed nearer to or farther from each other, whereby provision is made for cutting and binding either thin and light or thick and heavy cords, substantially as herein described.

397,291. ROAD-GRADING MACHINE. JAMES M. HOLLAND, Mount Pleasant, Iowa. Filed Feb. 3, 1888. Serial No. 262,853. (No model.)



Claim.—1. In a road-grading machine, the combination, with the main frame, of a double-toothed rack connected thereto, a blade adjustably connected to the double-toothed rack, and braces extending forward from the blade to blocks which engage the rack-teeth, substantially as described.

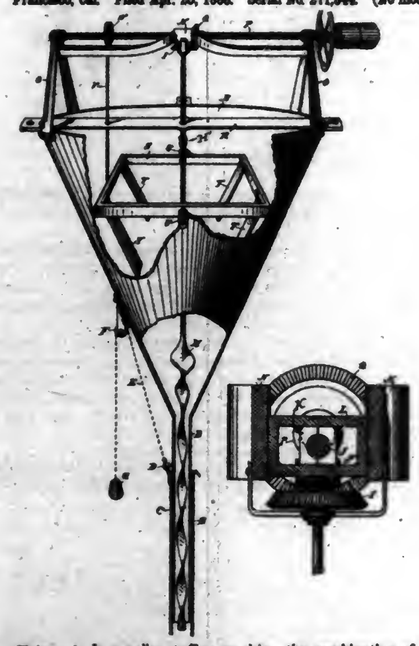
2. In a road-scraper, the combination, with the main frame, of a bar having its forward end loosely connected to the main frame, a blade pivoted at about its center to the said bar, braces having one end connected to the blade and the other ends adjustably connected to the said bar, independent standards adjustably secured in the frame and having their lower ends pivotally connected to the blade, and catches for locking the standards in the position to which they have been adjusted, substantially as described.

3. In a road-grading machine, the combination, with the main frame, of levers adjustably mounted thereon, catches carried by the

, levers, standards formed with notches that are engaged by the catches, a blade or shovel connected to the lower ends of the standards, a double-toothed rack connected to the frame of the machine and centrally connected to the blade or shovel, blocks engaging the rack-teeth, and diagonal braces extending from the blocks to the ends of the blade or shovel, substantially as described.

4. In a road-scraper, the combination, with the frame 10, of levers adjustably mounted thereon, catches 18, carried by the levers, equalizers to which the catches are connected, rods connected to the equalizers, handle-levers connected to the rods, and spiral springs arranged in connection with the rods, slotted standards formed with recesses 2, the pintles or pins of the catches passing through the standard-slots, a double-toothed bar connected to the main frame of the machine and to the shovel, blocks carried by said bar, and diagonal braces connected to the blocks and to the ends of the shovel, all substantially as described.

397,292. COLLAR-STUFFING MACHINE. GEORGE E. HOYT, San Francisco, Cal. Filed Apr. 25, 1888. Serial No. 271,844. (No model.)



Claim.—1. In a collar-stuffing machine, the combination of the receiver or hopper having an extension from its lower end, over which the collar-tube slips, and a hook and counter-balance, by which the collar-tube is held in place upon the filling-tube, and the auger and its actuating mechanism, substantially as described.

2. The packing screw or auger having the upper end of its shaft polygonal and sliding loosely through the gear I, by which the rotary motion of the auger is produced, in combination with the head L, to which the upper end of the auger-shank is connected, the guides N, within which the head slides, and the box K, in which the crank J turns, said box sliding transversely in the head L, substantially as herein described.

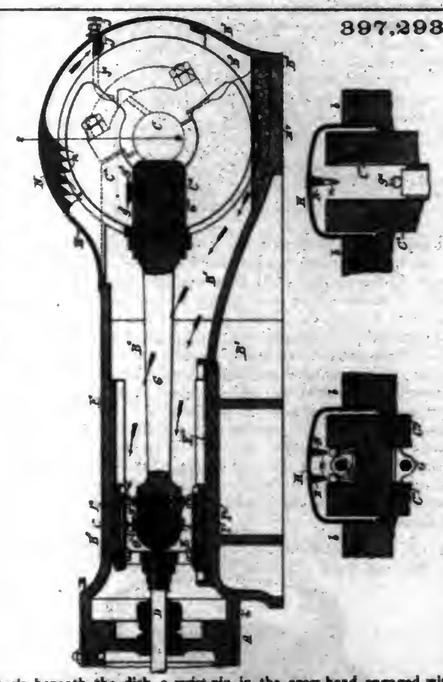
397,293. LUBRICATING DEVICE FOR ENGINES. ALBERT L. IDE, Chicago, Ill. Filed Aug. 4, 1888. Serial No. 281,944. (No model.)

Claim.—1. The combination, with an engine crank-shaft and a crank-disk connected therewith, of a casing or housing surrounding the disk, having an oil tank or basin beneath said disk, said casing or housing being provided with a depending pointed projection, by which the oil flowing from the inner surface of the casing or housing may be directed or carried to a part to be lubricated.

2. The combination of an engine crank-shaft, a crank-disk connected therewith, and a housing or casing surrounding the disk and provided with depending pointed projections upon the said housing or casing, and having an oil tank or basin beneath said disk, an oil-receptacle secured to the connecting-rod and arranged beneath said pointed projections, and having a pipe and a passage leading from said oil-receptacle to the bearing-surface to be lubricated.

3. The combination, with an engine crank-shaft, a crank-disk, connecting-rod, and cross-head, of a casing or housing surrounding the disk, connecting-rod, and cross-head, and having an oil tank or

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basin beneath the disk, a wrist-pin in the cross-head engaged with the connecting-rod, and an oil-cup upon the said connecting-rod communicating with the bearing-surface of the wrist-pin, said oil-cup being located in position to receive the lubricant thrown upon the surface of the cross-head by the crank-disk, substantially as described.

4. The combination, with a crank-shaft, crank-disk, connecting-rod, and cross-head of hollow box form, of a casing or housing surrounding said disk, connecting-rod, and cross-head, and having an oil tank or basin located beneath the crank-disk, a wrist-pin upon the cross-head engaging the connecting-rod, and an oil-cup upon the connecting-rod communicating with the bearing-surface of the wrist-pin, said hollow cross-head being provided upon its upper wall with a depending projection located over the said oil-cup, substantially as described.

5. The combination, with an engine crank-shaft, a crank-disk, crank-pin, and connecting-rod, of a casing or housing surrounding the disk and having an oil tank or basin beneath the same, and provided with pointed projections, an oil-cup upon the connecting-rod communicating with the bearing-surface of the crank-pin, said pointed projections depending from the top of said housing or casing over the oil-cup for the purpose of delivering to the said oil-cup oil thrown upon the housing by the disk, substantially as described.

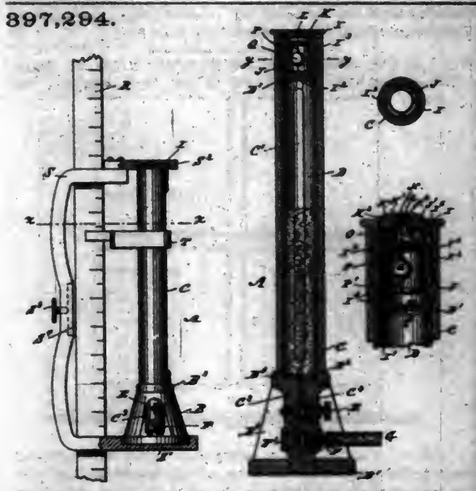
397,294. LEVELING-INSTRUMENT. CHARLES A. KARR, Green Elm, Kans. Filed June 4, 1888. Serial No. 275,963. (No model.)

Claim.—1. In a hydrostatic leveling-instrument, standards, and a tube for connecting the bases of the standards with each other, in combination with a cap secured to the upper end of each standard and provided with an air-inlet, a valve held to slide in the said cap and adapted to be raised and lowered, a plug held adjustably on the said cap, a chain supported by the said plug and connected with the said valve, and a weight held on the said chain inside of the said valve, substantially as shown and described.

2. In a hydrostatic leveling-instrument, the combination, with the standards, of a cap secured to the upper end of the standards and provided with an air-inlet, a valve held to slide in projections on the inside of the said cap, a plug provided with a spiral projection fitting into a similar offset on the said cap, a rod held yieldingly in the said plug, a chain connected with the said rod and passing through the open mouth of the valve into the interior of the latter, said chain being also connected with the bottom of the valve, and a weight held on the said chain in the said valve, substantially as shown and described.

3. In a hydrostatic leveling-instrument, the combination, with the base B, provided with the flanged ring B^2, of the tube C, fitting into the said flanged ring B^2, and provided with the reduced end C^2, secured to the bottom of the said base and having a central recess, a cock held in the said reduced end C^2 to open and close the said recess,

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and an outlet-plug screwing into the said reduced end and adapted to be connected with a flexible tube, substantially as shown and described.

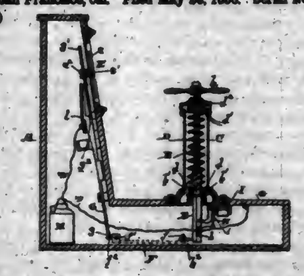
4. In a hydrostatic leveling-instrument, the combination, with the base B, provided with the flanged ring B^2, of the tube C, fitting into the said flanged ring B^2 and provided with the reduced end C^2, secured to the bottom of the base and having a central recess, a cock held in the said reduced end C^2 to open and close said recess, an outlet-plug screwing into the said reduced end and adapted to be connected with a flexible tube, and a filling-plug, F, screwing in the said reduced end, substantially as shown and described.

5. The combination, with the liquid-containing standard, of a clamp having horizontal arms recessed on their adjacent faces to receive the ends of the standard and provided with vertically-aligned apertures, a leveling-rod passing through said apertures, a block on the inner side of the clamp, and means for pressing the block against the leveling-rod, substantially as set forth.

6. In a hydrostatic leveling-instrument, the combination, with the standard A, of the clamp S, supporting said standard A, a leveling-rod on which the said clamp is held to slide, and a pointer held adjustably on the said standard and indicating on the graduations of the said standards and the said leveling-rod, substantially as shown and described.

7. In a hydrostatic leveling-instrument, the combination, with the leveling-rod, of a standard held to slide on the said leveling-rod, and the pointer T, held to slide on the said standard, being provided with the plate T', the L-shaped arm T^4, and the spring T^5, substantially as shown and described.

397,295. COIN-CONTROLLED LIFTING-MACHINE. JOSEPH G. KRABBET, San Francisco, Cal. Filed May 26, 1888. Serial No. 275,203. (No model.)



Claim.—1. In a lifting-machine, the pull-rod and the locking-lever holding it normally inoperative, in combination with a normally-open electric circuit, separated contacts in said circuit for receiving a temporary conductor to close the circuit, one of said contacts being pivoted, an electro-magnet in the circuit for disengaging the locking-lever from the pull-rod, and the mechanism for relieving the temporary conductor to open the circuit again, consisting of a weighted lever on the pivoted contact, said lever having a spring, and the vertically-movable rod G, operated by the pull-rod and having an enlarged portion for binding on the spring of the weighted lever, thereby swinging the pivoted contact, substantially as herein described.

2. In a lifting-machine, the box or casing having a platform, the dial or register on the face of the box and the pointer moving over it, and the spring-resisted pull-rod B, in combination with the mechanism for transmitting the movement of the pull-rod to the pointer, consisting of the pin on the base of the pull-rod, the rock-shaft F, having the end arms, the vertically-movable rod G, having a rack on its upper end, and the pinion, substantially as herein described.

3. In a lifting-machine, the box or casing having a platform, the dial or register on the face of the box and the pointer moving over it, and the spring-resisted pull-rod B, in combination with the mechanism for transmitting the movement of the pull-rod to the pointer, consisting of the pin on the base of the pull-rod, the rock-shaft having the adjustable arm over the pin and the arm on its other end provided with an adjustable pin, the vertically-movable rod G over the adjustable pin and having a rack on its upper end, and the pinion on the pointer-shaft, substantially as herein described.

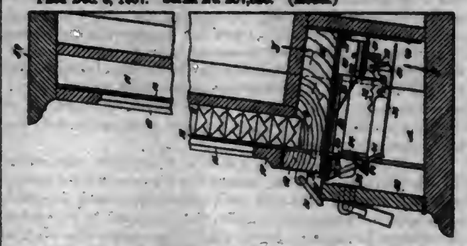
4. In a lifting-machine, the spring-resisted pull-rod having a pin in its lower end, the dial or register having a pointer moving over it, and the mechanism for operating the pointer, consisting of the rock-shaft having end arms and operated by the pin of the pull-rod, the vertically-movable rod G, operated by the rock-shaft and having a rack on its upper end, and the pinion on the pointer-shaft, in combination with the locking-lever engaging the pull-rod and holding it normally inoperative, a normally-open electric circuit having a fixed contact and a pivoted contact normally separated and adapted to receive a temporary conductor to close the circuit, an electro-magnet in the circuit for releasing the locking-lever, the weighted lever on the pivoted contact, the movable rod G, having a spring, and the enlargement for swinging the pivoted contact and releasing the temporary conductor, whereby the circuit is opened again, substantially as herein described.

397,296. COMPOUND TO RESTRAIN THE SETTING OF PLASTER, &c. GEORGE R. KING, New Brighton, N. Y. Filed Sept. 17, 1888. Serial No. 285,634. (No specimens.)

Claim.—1. The above-described composition of matter, composed, essentially, of animal gelatinous or vegetable glutinous matter and hydrated lime, substantially as set forth.

2. The above-described composition of matter, composed, essentially, of animal gelatinous or vegetable glutinous matter and hydrated lime combined and reduced to a finely-divided condition, substantially as set forth.

397,297. VENDING APPARATUS. FRANK M. LEAVITT, Brooklyn, N. Y., assignor to The Automatic Selling Machine Company, same place. Filed Dec. 8, 1887. Serial No. 257,323. (Model.)



Claim.—1. A stationary toothed rack, a reciprocating slide, and a gravity-pawl pivoted to said slide, which engages said rack, said slide having a reciprocating movement greater than the length of said rack, whereby when said slide reaches its limit of motion in either direction said pawl will, under the influence of gravitation, swing clear of said rack, in combination with a pawl-tripping slide located at the rear of said rack in the path of said gravity-pawl, said slide normally holding said pawl in engagement with said rack, substantially as set forth.

2. A stationary toothed rack, a reciprocating slide, and a gravity-pawl pivoted to said slide, which engages said rack, said slide having a reciprocating movement greater than the length of said rack, whereby when said slide reaches its limit of motion in either direction said pawl will, under the influence of gravitation, swing clear of said rack, in combination with a gravity-pawl-tripping slide in the rear of said rack, said pawl in its lowermost position being in the path of said gravity-pawl so as to hold said pawl in engagement with said rack, but when said pawl-tripping slide is in its upper position it is disengaged from said pawl, whereby said pawl is free to swing clear of said rack, substantially as set forth.

3. A stationary toothed rack, a reciprocating slide, and a gravity-pawl pivoted to said slide, which engages said rack, said slide having a reciprocating movement greater than the length of said rack, whereby when said slide reaches its limit of motion in either direction said pawl will, under the influence of gravitation, swing clear of said rack, in combination with a pivoted lever and a pawl-tripping

slide resting upon one end of said lever and co-operating with said gravity-pawl, substantially as set forth.

4. A stationary toothed rack, a reciprocating slide, and a gravity-pawl pivoted to said slide, which engages said rack, said slide having a reciprocating movement greater than the length of said rack, whereby when said slide reaches its limit of motion in either direction said pawl will, under the influence of gravitation, swing clear of said rack, in combination with a pivoted lever, a pawl-tripping slide resting upon one end of said lever and co-operating with said gravity-pawl, and a coin-chute for directing a coin onto the other end of said lever, substantially as set forth.

5. A stationary toothed rack, a reciprocating slide, and a gravity-pawl pivoted to said slide, which engages said rack, said slide having a reciprocating movement greater than the length of said rack, whereby when said slide reaches its limit of motion in either direction said pawl will, under the influence of gravitation, swing clear of said rack, and said slide having a laterally-projecting pin, in combination with a pawl-tripping slide in the rear of said rack and in the path of said projecting pin, substantially as set forth.

6. The combination, with a slide, of a pawl carried thereby and provided with a pin or projection, a rack with which the pawl engages, a pawl-tripping slide formed with an inclined face against which the pawl-pin normally rests, a lever arranged in connection with the tripping-slide, and a coin-chute arranged in connection with the lever, substantially as described.

7. The combination, with a slide, of a pawl connected thereto and provided with a pin or projection, a rack with which the pawl engages, a pawl-tripping slide formed with a bearing-face, 7, against which the pawl pin or projection normally rests, a lever arranged in connection with the tripping-slide and formed with fingers 9, and a chute arranged above the lever-fingers, substantially as described.

8. The combination, with a slide, of a pawl connected thereto and provided with a pin or projection, a rack with which the pawl engages, a pawl-tripping slide formed with a bearing-face, 7, against which the pawl pin or projection normally rests, and with a second bearing-face, 7ª, a lever arranged in connection with the tripping-slide, and a chute arranged above the lever, substantially as described.

9. The combination, with a slide, of a pawl connected thereto and provided with a pin or projection, a rack with which the pawl engages, a pawl-tripping slide formed with a bearing-face, 7, and a flange, *c*, a lever arranged in connection with the tripping-slide, and a coin-chute arranged in connection with the lever, substantially as described.

10. The combination, with a slide, of a base-plate upon which the slide is mounted, a casting connected to the base-plate and formed with a side flange or rib, a rack, and a vertical way, a block connected to the slide and formed with a recess that is entered by the casting rib or flange, a pawl pivotally connected to the block and provided with a pin or projection, a pawl-tripping slide mounted in the vertical way and formed with an inclined face against which the pawl pin or projection bears, a lever arranged to bear against the lower end of the tripping-slide, and a coin-chute arranged in connection with the lever, substantially as described.

11. The combination, with a slide, of a base-plate upon which the slide is mounted, a casting connected to the base-plate and formed with a side flange or rib, a rack and a vertical way, a block connected to the slide and formed with a recess that is entered by the casting rib or flange, an angular arm, 46, which bears against the block, a spring arranged in connection with the arm, a pawl pivotally connected to the block and provided with a pin or projection, a pawl-tripping slide mounted in the vertical way and formed with an inclined face against which the pawl pin or projection bears, a lever arranged to bear against the lower end of the tripping-slide, and a coin-chute arranged in connection with the lever, substantially as described.

12. The movable slide, in combination with a pivoted arm, the swinging portion of which is in retractive engagement with said slide only when said slide is at and near its rear-ward position, and a retracting-spring acting upon said pivoted arm, substantially as set forth, whereby said spring acts to pull back said slide only during the latter portion of its rearward movement.

13. The reciprocating slide, in combination with the pivoted angular arm 46 and the spring 48, substantially as set forth.

14. A coin-chute having a lateral slot and being bent to form a recess having a horizontal shelf or bottom, in combination with an escapement-lever the two ends of which alternatively engage said slot and recess, respectively, substantially as set forth.

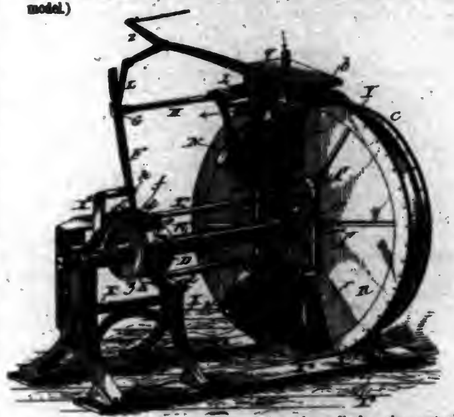
15. A vending-machine having a package-receptacle for containing the packages to be sold, in combination with a sliding package-drawer having a recess which constitutes a continuation of said package-receptacle when said drawer is closed, the front portion of said drawer extending above the bottom of said recess to a distance substantially equal to the thickness of one of the packages, and the rear portion of said drawer, which constitutes a platform upon which the packages in said package-receptacle rest when the drawer is open, extending above the bottom of said recess a distance less than the front portion of said drawer, substantially as set forth.

397,298. METAL SHEET FOR SURFACING WALLS, &c. HENRY A. LEE, Glen Ridge, N. J. Filed July 30, 1888. Serial No. 281,436. (No model.)



Claim.—A metallic wall or ceiling plate having two intersecting beads or ribs near and parallel to two of the edges of the sheet, with flat portions between the beads or ribs and the adjacent edges of the sheet, substantially as specified.

397,299. REVOLVING-PISTON STEAM-ENGINE. WILLIAM R. LEONARD, Lincoln, Nebr. Filed Dec. 12, 1887. Serial No. 257,694. (No model.)



Claim.—1. In a rotary-piston engine, the cylinder, the central rotary shaft and its pistons, and the pivoted gates movable axially across the cylinder, in combination with the grooved cam on the central shaft and the gate-operating pitman connected with said cam.

2. In a rotary-piston engine, the cylinder, the central shaft and its three pistons, the two gates pivoted near the center of the cylinder and arranged to swing across its interior in the direction of its axis, the steam-chest with ports leading to the cylinder, the slide-valve, cams on the main shaft, and connections from one cam to the gates and from the other cam to the valve, whereby the gates are opened in advance of and closed behind the pistons and the steam admitted to and delivered from the cylinder at the required times.

3. In combination with the cylinder, pistons, gates, and steam-chest provided with ports leading to the cylinder on opposite sides of the gates, the slide-valve adjustable at right angles to its working-path that it may be brought over either series of ports at will, and a second valve, substantially as shown, for closing those ports which are for the time being out of use, whereby the motion of the engine may be reversed at will.

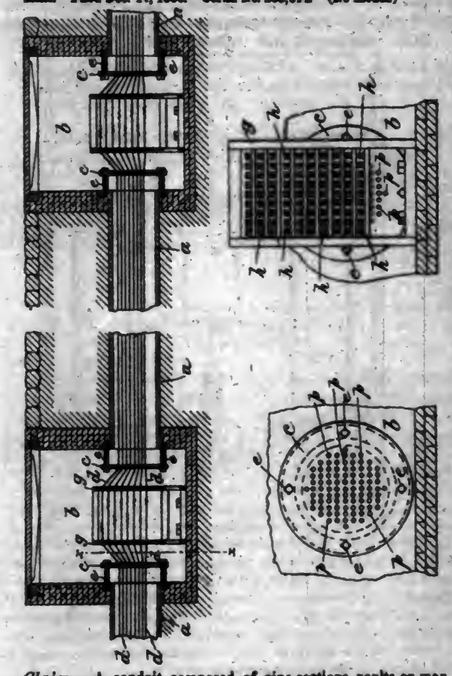
4. In a rotary engine, and in combination with the two independent series of ports to permit reversal of the engine, the main sliding valve K, adapted to close the two series of ports alternately, and the slide-valve mounted in the valve K and adjustable laterally therewith, whereby it may be caused to operate with either series of ports at will.

5. In a rotary engine, the cylinder having the concave heads, in combination with the central shaft and its pistons, the gates pivoted to swing through and across the cylinder in the direction of its axis, and the external gate-receiving chambers, N.

6. The cylinder, the shaft and its pistons, and the gates, in combination with the steam-chest and its connecting-ports, the slide-valve,

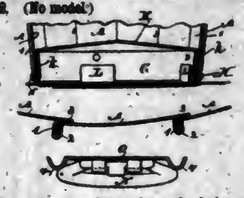
the rod H, connected thereto, the slide G, to which the rod is connected, the lever F, the cam on the main shaft to actuate the lever, and the lever Z, to move the slide.

397,300. ELECTRIC-WIRE CONDUIT. WILLIAM B. MACK, Boston, Mass. Filed Dec. 17, 1888. Serial No. 293,514. (No model.)



Claim.—A conduit composed of pipe-sections, vaults or man-holes communicating with said sections, insulating-plates secured within the man-holes opposite the ends of the pipes, said plates being perforated for the passage of the wires and separated from the ends of the pipes, and frames within the vaults provided with insulating-wire supports, all arranged substantially as set forth.

397,301. ASH OR GARBAGE CAN. TIMOTHY W. MCKENYER, Brooklyn, and JOHN M. SMITH, New York, N. Y. Filed Oct. 5, 1888. Serial No. 287,302. (No model.)



Claim.—1. The sheet-metal can formed of the stripe A, having returned folds 1 and folds 2, interlocking to form double seams, and the folds 3, lying flat against the adjacent sheets at the inside of the can, substantially as set forth.

2. The combination, in the sheet-metal can having the vertical strips A, double-seamed together at the edges, of the sheet-metal bottom K, the hoop G, having a wired edge, and clips L, passing below and around the wired edge of the hoops G and extending up the body of the can and riveted, substantially as set forth.

3. The combination, with the sheet-metal can formed of stripe A, double-seamed together at the edges to form ribs, of the handles N and loop-frames O, having clips that receive the ribs of the double seams, substantially as set forth.

397,302. CUT TOY FIGURE. JOHN MCLOUGHLIN, New York, N. Y. Filed Aug. 20, 1888. Serial No. 284,033. (No model.)

Claim.—1. A cut toy figure made from stiff paper or the like, comprising the object represented and a ground, as *d*, both in one piece, the lower part or legs of the object extending into the ground, and the ground cut through along the outlines of the legs, so as to free them, whereby the object and the ground may be turned or bent to stand at right angles, and the ground be made to form a broad base to support the object in an erect position, as set forth.

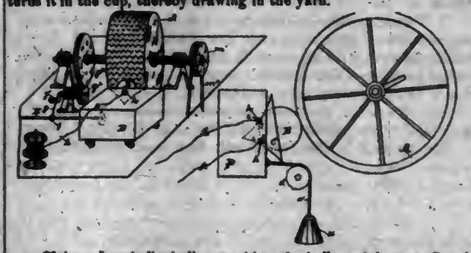
397,302.



2. A cut toy figure made from stiff paper or the like, comprising the object represented and a ground, as *d*, both in one piece, the lower part or legs of the object extending into the ground, and the ground cut through along the outlines of the parts of the objects that extend into it, and the ground having printed or marked on it a design in elevation, as described.

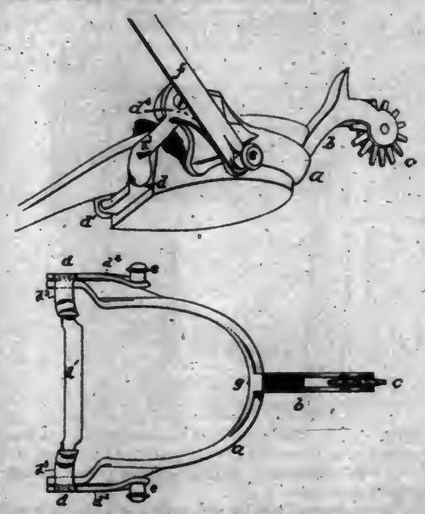
397,303. BASE-BALL WINDING AND ROLLING MACHINE. BENJAMIN B. NEWELL, Boston, assignor to Henry C. Harwood and Harrison Harwood, Natick, Mass. Filed July 29, 1882. Serial No. 67,895. (No model.)

Brief.—The objects of the invention are to secure uniform tension in the winding of base-balls, to obviate the necessity of pounding and rewinding, and to save time; and the main features are a bell-shaped cup which holds the ball and allows for its increase in size, and a wide-faced friction-wheel which comes in contact with the ball and turns it in the cup, thereby drawing in the yarn.



Claim.—In a ball-winding machine, the ball-receiving cup C and ball-winding wheel A, combined and operating substantially as and for the purpose set forth.

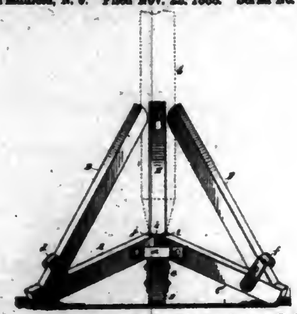
397,304. SPUR. WALTER NICHOLLS, New Britain, Conn., assignor of one-half to James H. Francis, same place. Filed Aug. 16, 1888. Serial No. 282,879. (No model.)



Claim.—1. In a spur, the combination of the spur-bow, the lever-clamp pivoted to the inner ends of the bow and formed with the oppositely-turned arms and clamping-bar *d'* to engage the shank and heel of the boot, and the fastening-strap attached to the ends of the lever-clamp, substantially as described.

2. In a spur, the combination of the spur-bow having the inwardly-projecting pin *g*, the lever-clamp pivoted to the inner ends of the bow and formed with the oppositely-turned arms and clamping-bar *d'* to engage the shank and heel of the boot, and the fastening-strap attached to the free ends of the lever-clamp, substantially as described.

397,305. STAND FOR CHRISTMAS-TREES, &c. THEODORE B. OSBORNE, Plainfield, N. J. Filed Nov. 22, 1888. Serial No. 291,533. (No model.)

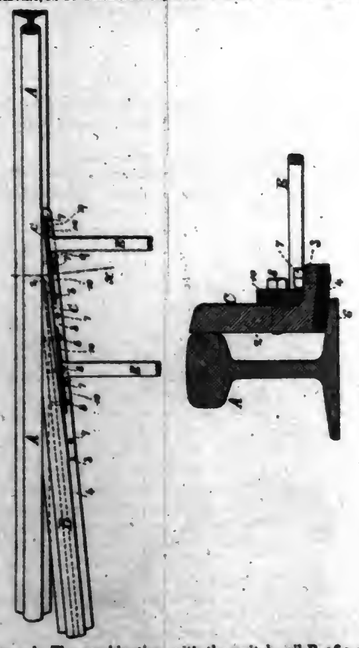


Claim.—1. The combination, with the legs A B C, pivoted to form a toggle-joint, of the gripping-arms D E F, pivoted to and converging above said legs, substantially as described.

2. The combination, with the legs A B C, pivoted to form a toggle-joint, of the gripping-arms D E F, connected to said legs by knuckle-joints and converging above said legs, substantially as described.

3. The combination, with the legs A B C, pivoted to form a toggle-joint, of the gripping-arms D E F, connected to said legs by knuckle-joints, and the lazy-tongs device consisting of the levers *q r s*, pivoted to said legs and pivotally connected beneath the converging ends of said legs, substantially as described.

397,306. POINT FOR SWITCH-RAILS. TIMOTHY G. PALMER, Schultzville, N. Y. Filed Nov. 17, 1888. Serial No. 291,115. (No model.)

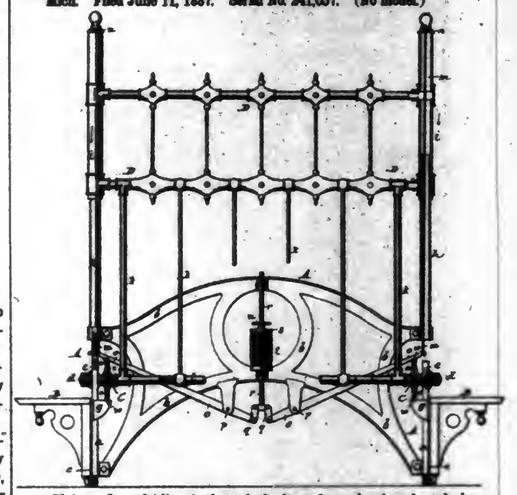


Claim.—1. The combination, with the switch-rail B, of a removable point having an inclined side adjacent to the main rail of the track, and bolts for connecting the removable point to the switch-rail, substantially as set forth.

2. The combination, with the switch-rail B, of a removable point, C, having a vertical flange, 2, one side of which is beveled and adapted to set against the main rail of the track, and a flange, 3, resting upon the flange 4 of the switch-rail, and bolts for securing the removable switch-point to the flange and body of the switch-rail, substantially as set forth.

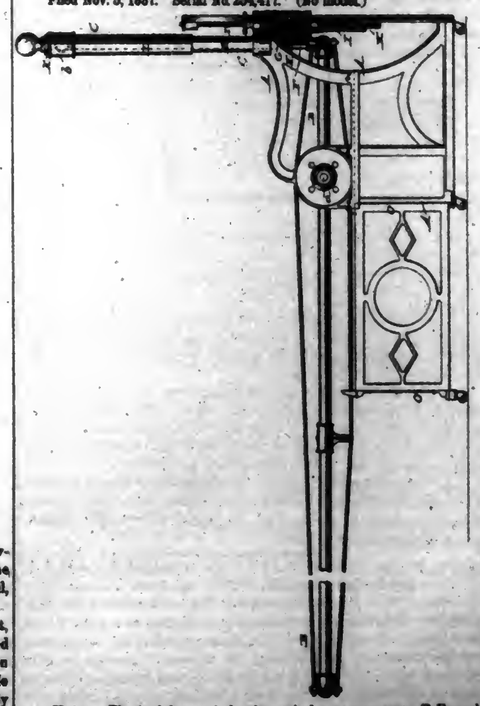
3. The combination, with the switch-rail B and the tie-rods E, having T-heads, of the removable switch-point C, adapted to rest upon the flange 4 of the rail B, and the bolts 7, 8, and 9, for connecting the removable point to the switch-rail and for connecting the bars E to the removable point and switch-rail, substantially as set forth.

397,307. FOLDING BEDSTEAD. JOSEPH PERRET, Grand Rapids, Mich. Filed June 11, 1887. Serial No. 241,057. (No model.)



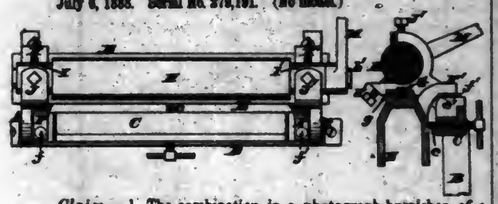
Claim.—In a folding bedstead, the base-frame having the tubular posts *h h*, and the head-frame having sleeves to slide over the base-frame posts, in combination with the bed-bottom frame pivoted on journals of the base-frame, pitmen to connect the bed-frame with the head-frame, the rods *m*, concealed within the posts and connected to the head-frame, the spring *l*, mounted in the base-frame, and levers O, connecting the spring to the rods, substantially as shown and described, and for the purpose set forth.

397,308. FOLDING BED. JOSEPH PERRET, Grand Rapids, Mich. Filed Nov. 5, 1887. Serial No. 254,417. (No model.)



Claim.—The bed-frame A, having tubular corner-posts B E, and the bed-bottom frame B, pivoting on journals of the base-frame, in combination with the head frame or board having tubes D D, whereby it is adapted to slide vertically along the posts of the base-frame, pitmen F, connecting the head-board with the inner end of the bed-bottom frame, the spring J, levers H, connected therewith, the pitmen G, connecting the levers with the head-board, the momentum-opposing springs M M, and the capped rods connecting the sliding head-frame therewith, substantially as shown and described.

397,309. PHOTOGRAPH-BURNISHER. SILAS H. RANDALL, Wyoming, Ohio, assignor of one-half to James D. Randall, same place. Filed July 6, 1888. Serial No. 278,191. (No model.)



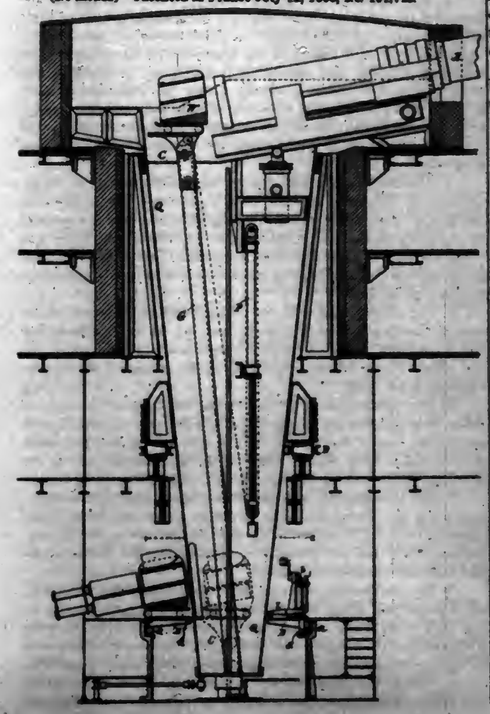
Claim.—1. The combination, in a photograph-burnisher, of a feed-roll, H, two vertically-adjustable journal-boxes, I I', held by opposing set-screws J K J' K' against bearings L of the main frame, as herein described.

2. The combination, in a photograph-burnisher, of an adjustable burnishing-bar holder, E, swung upon the main frame, and a screw, C, whereby said holder is adjusted, which screw projects from the main frame against the holder on the side of its attachments to said holder and below them, as herein described.

3. The combination, in a photograph-burnisher, of a burnisher swung upon a pair of pivots, an intermediate regulating-screw by which said burnisher is raised and lowered, and a feed-roll journaled in independently vertically-adjustable boxes, the axis of said roll being normally parallel to the axis of said pivots, as herein described.

4. The combination, in a photograph-burnisher, of a main frame, a vertically-adjustable feed-roll, a burnishing-bar, a swung burnishing-bar holder, and a screw whereby the holder is adjusted, which screw projects from the main frame against said holder upon the side of its attachments to the main frame and below them, as herein described.

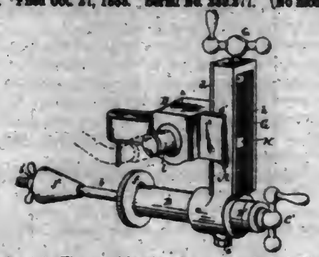
397,310. LOADING APPARATUS FOR TURRET-GUNS. HENRI SCHNEIDER, Paris, France. Filed Nov. 14, 1888. Serial No. 290,854. (No model.) Patented in France July 12, 1888, No. 191,743.



Claim.—1. The combination, with the turret and well, of an elevator cage or cages, guides for the same located in said well, means for raising and lowering the cage or cages, and a platform near the bottom of the well rotatable independently of the turret and well, substantially as described.

2. The combination, with the rotatable turret and well, and with the trolley-carrying elevator or elevators, of the platform near the bottom of the well rotatable independently thereof, mechanism for rotating said platform, and clutch mechanism for locking said platform temporarily to said turret and well, and for disengaging it therefrom, as desired, substantially as described.

397,311. DRILLING-MACHINE. FREDERIC SCHOFF, Philadelphia, Pa. Filed Oct. 27, 1888. Serial No. 289,877. (No model.)



Claim.—1. The combination, in a pulley-hub-drilling machine, of the mandrel B, adapted to be secured to the hub of the pulley, and a screw-shaft in said mandrel, with a standard, A, carrying the drill-carriage, and a nut detachably secured to said standard and meshing with the threads on the screw, substantially as described.

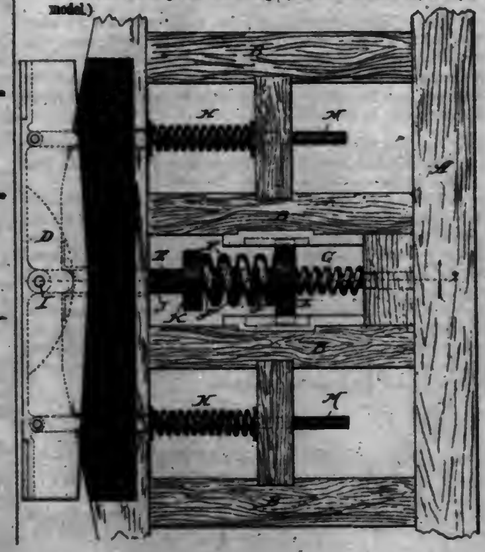
2. The combination of the mandrel carrying the drilling mechanism, having a screw-spindle, *b*, and a nut thereon, with a cone-sleeve on said spindle and acting with the mandrel to clamp the hub of the pulley to the frame, substantially as described.

3. The combination of the mandrel B, the screw-shaft C, sliding standard A, having a nut engaging with the screw-shaft C, said standard having guideways, and a carriage adapted to said guideways and provided with a nut, with a vertical screw-shaft in said standard engaging with the nut, so that by turning the shafts C and G the carriage may be moved both from or toward the pulley and from or toward the center of the pulley, substantially as described.

4. The combination, in a drilling and tapping machine, of the standard having a screw, and a nut adapted to the screw, with a drill-carriage adapted to be raised or lowered by said screw, and means for securing the carriage to and detaching it from the nut without disturbing either the nut or the carriage, substantially as set forth.

5. The combination of the standard A, screw-shaft G, and a nut, H, adapted to said screw, with a carriage, D, having a T-slot in which the shank of the nut H is confined, substantially as described.

397,312. SPRING-BUFFER FOR RAILWAY-CARS. CHARLES A. SCHROYER, Chicago, Ill. Filed Aug. 7, 1888. Serial No. 282,188. (No model.)



Claim.—1. In connection with an extensible platform, a spring-buffer comprising a buffer-stem, buffer-springs, a follower, and an auxiliary spring compressible before the buffer-springs, substantially as described.

2. In connection with an extensible platform, a spring-buffer comprising a buffer-stem, buffer-springs F and *f*, an auxiliary spring, G, a follower between the springs F and *f* and G, all the springs being supported upon the buffer-stem and the auxiliary spring being first compressed when the cars are brought together, the buffer-springs being somewhat compressed when the cars are brought near enough to couple, and being still further compressible to take up the buffing strain, substantially as described.

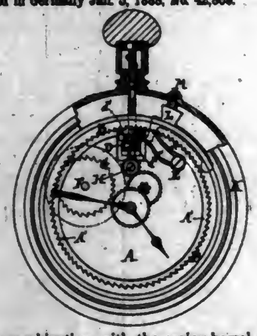
3. The combination of a vestibule angle-plate, a buffer-stem, buffer-springs F and *f*, a follower, L, and an auxiliary spring, G, compressible before the buffer-spring, substantially as described.

4. The combination of a vestibule angle-plate, a buffer-stem, buffer-springs, a weaker auxiliary spring, and a follower between the springs, all the springs being supported on the stem, and the auxiliary spring being first compressed when the cars are brought together, the buffer-springs being somewhat compressed when the cars are brought near enough to couple, and being still further compressible to take up the buffing strain, substantially as described.

5. The combination of a vestibule angle-plate, a buffer-stem, buffer-springs F and *f*, a weaker auxiliary spring, G, a follower, L, and springs H H, mounted on rods M M, which aid the spring G in forcing out the angle-plate and keep it in proper position, substantially as described.

6. The combination of the face-plate of the extensible hood of a vestibule-car, a buffer-stem connected therewith, buffer-springs, a follower, and an auxiliary spring compressible before the buffer-springs, substantially as described.

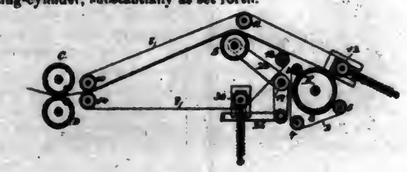
397,313. STEM WINDING AND SETTING WATCH. HIPPOLYTE SCHÜTZ, Reconvillier, Switzerland, assignor to Kuhn & Fleche, same place. Filed June 21, 1888. Serial No. 277,749. (No model.) Patented in France Feb. 10, 1887, No. 187,194; in Belgium Oct. 15, 1887, No. 79,123, and in Germany Jan. 5, 1888, No. 42,809.



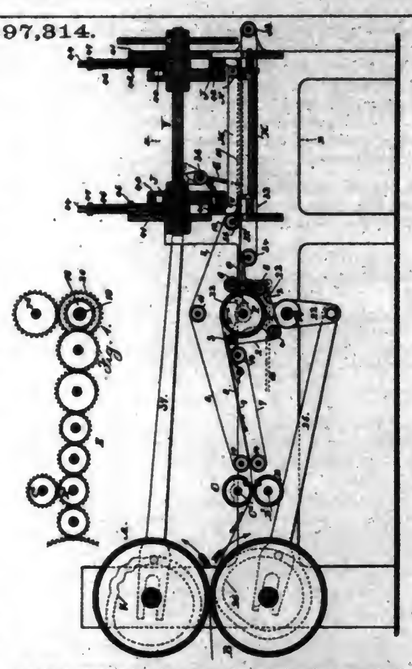
Claim.—The combination, with the spring-barrel and the wheel G, of the ring B, having inclined or ratchet teeth on the inner edge thereof, the stem C and pinion D, having inclined or ratchet teeth at one end gearing with the teeth on the ring B and gear-teeth on the other end, and the train of gear-wheels to the hands, and the spring E, substantially as set forth.

397,314. MEANS FOR COLLECTING AND EVENING UP SHEETS FOR PRINTING-MACHINES. WALTER SCOTT, Plainfield, N. J. Filed Nov. 21, 1887. Serial No. 255,714. (No model.)

Claim.—1. The combination, with the type and impression cylinders and the cutting-cylinders, of the collecting-cylinder and the rollers and tapes or belts for conveying the sheets from the cutting-cylinders to the collecting-cylinder, and mechanism, substantially as specified, for discharging the groups of sheets successively from the collecting-cylinder, one of the rollers or cylinders being movable laterally during the gathering of each group of sheets to lessen the time occupied in the travel of the respective sheets of the group from the cutting-cylinders to the collecting-cylinder, so as to bring the ends of all the sheets in the group of sheets in line with each other upon the collecting-cylinder, substantially as set forth.



397,314.



2. The combination, in a press for printing from a web of paper, of cutting-cylinders for perforating the paper, a collecting-cylinder, and belts for conveying the paper from the cutting-cylinder to the collecting-cylinder, the swinging lever-frames 22 and shaft 19, carrying the same, the connecting-rod 25, and cam 26, for swinging such frames progressively during the delivery of each group of sheets and varying the delivery of the respective sheets in the group to bring their ends into line with each other upon the collecting-cylinder, substantially as set forth.

3. The combination, with the cutting-cylinders C D and the delivery-belts 8 and 9 and their rollers, of a collecting-cylinder, F, the belts 2, passing partially around the same, the rollers for carrying such belts 2, the lever-frames 22 and their shaft 19, for supporting the collecting-cylinder, and mechanism, substantially as specified, for swinging the lever-frames gradually during the collection of each group of sheets to bring the collecting-cylinder nearer to the cutting-cylinders, and thereby insure the proper position of the sheets one upon the other in the group of sheets around the collecting-cylinder, substantially as set forth.

4. The combination, with the cutting-cylinders, the collecting-cylinder, the conveying-belts and rollers, and a switch for delivering the groups of sheets from the collecting-cylinder, of conveying-belts for receiving the sheets from the collecting-cylinder, a stop, N, against which the front edges of the sheets are arrested, and vibrating fingers acting against the rear edges of the sheets to even up the same, substantially as set forth.

5. The combination, with the belts 32 and their rollers, of the stop N, vibrating fingers G, shaft 36, carrying the same, connecting-rod 37, and cam K, for vibrating the fingers, and a folding-blade, M, and rollers H, for folding and delivering the groups of sheets, substantially as set forth.

6. The combination, with the folding-blade M, of the pair of slides 40, supporting the folding-blade, and the pair of slideways 41 on opposite sides of the frame of the machine, and the revolving shaft and cams, also upon opposite sides of the machine, for moving the slides and blade, and the folding-rollers H, substantially as set forth.

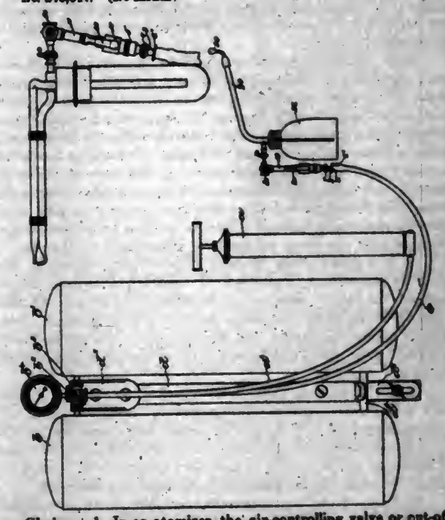
7. The combination, with the folding-blade M, of the slides 40, supporting the folding-blade, the slideways 41 on the frame of the machine, the cams J, and revolving shaft 36, for moving the folding-blade, and the rods and springs for counterpoising the folding-blades and slides, substantially as specified.

8. The combination, in a paper-folding machine, of the rollers H H, the folding-blade M, the parallel line of vibrating fingers G, acting on one edge of the sheets, and mechanism, substantially as specified, for giving motion to the parts, and the stop N, whereby the sheets after being superimposed are evened up and folded, substantially as set forth.

9. The combination, with the type and impression cylinders and the cutting-cylinders, of the collecting-cylinder and the rollers and tapes or belts for conveying the sheets from the cutting-cylinders to the collecting-cylinder, and mechanism, substantially as specified, for discharging the groups of sheets successively from the collecting-cylinder, one of the rollers or cylinders being movable laterally during the gathering of each group of sheets to lessen the time occupied in the travel of the respective sheets of the group from the cutting-cylinders to the collecting-cylinder, so as to bring the ends of all the sheets in the group of sheets in line with each other upon the collecting-cylinder, substantially as set forth.

10. The combination, with mechanism, substantially as specified, for collecting and superimposing sheets of paper, of the folding-blade and rollers, a vibrating evener acting at the front and back edges of the sheets after they are superimposed to cause said sheets to coincide with each other, substantially as set forth.

397,315. ATOMIZER. ASAHEL M. SHURTLEFF, Boston, Mass., assignor to Codman & Shurtleff, same place. Filed June 2, 1888. Serial No. 275,817. (No model.)



Claim.—1. In an atomizer, the air-controlling valve or cut-off comprising the valve-case and spring-controlled valve and valve-stem, and the bent lever, as 20, for moving said valve-stem, substantially as described.

2. In an atomizer, the air-controlling valve or cut-off comprising the valve-case, valve, and valve-stem, combined with the operating-lever and the adjusting-screw 23, which engages the valve-stem when the lever is moved, substantially as described.

3. In an atomizer, the air-controlling valve comprising the valve-case, valve, and valve-stem, combined with the coupling connecting the tube *c* with the air-controlling valve and upon which the said air-controlling valve is free to be turned, substantially as described.

4. In an atomizer, the air-controlling valve comprising the valve-case 10 and air-filter connected with it at its lower end, the valve, and the operating-lever therefor, combined with the coupling 2, upon which the said air-controlling valve is free to be revolved, substantially as described.

5. In an atomizer, the air-controlling valve connected with the air-pipe *c* by a coupling upon which the said air-controlling valve is free to revolve, combined with the frictionally-jointed coupling or nozzle comprising a tapering nozzle, 26, flange 27, and an interiorly-screw-threaded nut connecting said air-controlling valve with the atomizing-tube, substantially as described.

6. In an atomizer, the air-controlling valve comprising the valve-case and valve, combined with the air-filter rigidly connected to the valve-case, and the air-tube leading to the filter, substantially as described.

7. In an atomizer, the air-tube 30, combined with the liquid-tube 34, placed in said air-tube 30, and the spring 37, supporting said liquid-tube, and the longitudinally-movable nozzle, substantially as described.

8. In an atomizer, the air-controlling valve having the operating-lever 20, and tube or cylinder 19, to which the said valve is connected, combined with a coupling or nozzle connected with the opposite end of the tube or cylinder 19 by and rotatable upon a hub, 24, extended at right angles to the said cylinder, substantially as described.

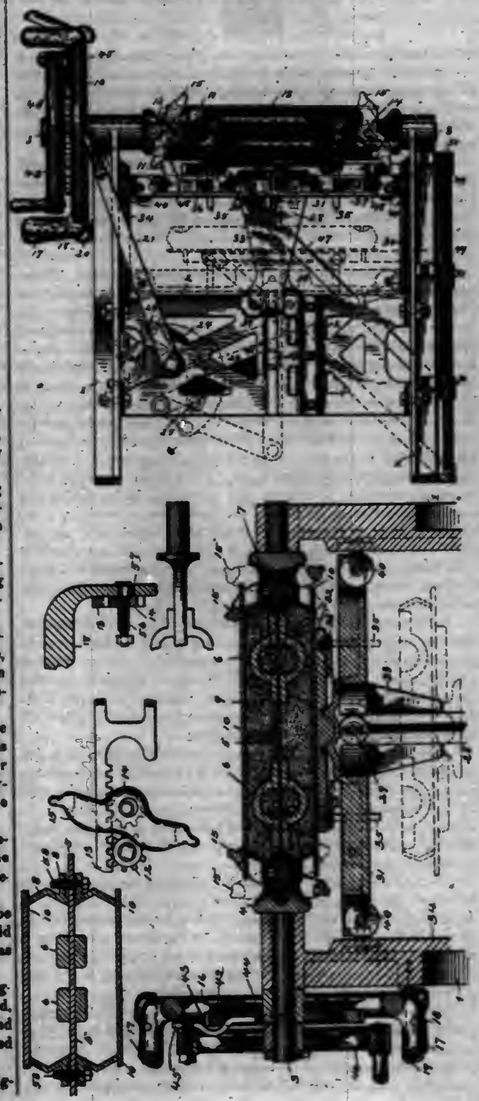
9. In an atomizer, the air-controlling valve having the operating-lever 20, and the tube or cylinder 19, combined with the jointed or reversible coupling or nozzle 26, attached to one end thereof, substantially as described.

10. In an atomizer, the tube or cylinder, as 19, combined with the coupling or nozzle 26, and with a thumb-rest, 60, at its rear end, substantially as described.

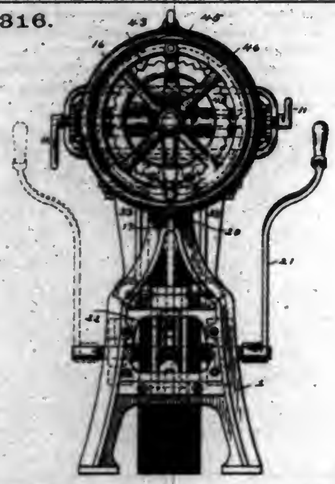
397,316. SAND-MOLDING MACHINE. ABRAHAM L. TEETOR, Indianapolis, Ind., assignor of one-half to William C. Whitehead, same place. Filed June 16, 1888. Serial No. 277,304. (No model.)

Claim.—1. A sand-molding machine comprising, in combination, a reversible molding-table mounted in bearings at the top of the machine, a pair of clamps connected by a rack-bar which is operated by means of a lever and pinion at one end of the table, whereby the upper clamps are thrown in position for holding the board upon the flask, a frame-work providing bearings for the axle of such reversible molding-table, and a hand-wheel mounted on such axle provided with latches engaging with projections connected to the uprights of the frame for locking the reversible molding-table in a horizontal position, substantially as shown and described.

2. A sand-molding machine comprising, in combination, a reversible molding-table mounted in bearings at the top of the machine, a frame-work supporting and providing bearings for the axle of such molding-table, a hand-wheel mounted on such axle and provided with



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latches engaging with projections on the frame for locking such table in a horizontal position, and a vertically-movable table resting upon self-adjusting center and corner bearings below the reversible molding-table, mounted on guides in the frame and connected by suitable rods and links to a shaft provided with a lever for operating the elevating mechanism, substantially as shown and described.

3. A sand-molding machine comprising, in combination, a reversible molding-table mounted at the top of the machine, a frame-work providing bearings for the axle thereof, and vibrating mechanism for jarring such table and the pattern supported by it, said mechanism being mounted on and constructed and arranged to strike upon such axle, substantially as shown and described.

4. A sand-molding machine comprising, in combination, a frame-work, a reversible molding-plate mounted in bearings at the top thereof, a pair of clamps connected to each end of such molding-plate, a rack-bar for operating such clamps, a pinion whose inner face bears against the inner face of such clamp, provided with an eccentric hub mounted upon a stud-pin passing through such clamp and connected to the frame, a pinion mounted on a transverse shaft, a lever for operating such pinion, whereby motion is communicated to the rack-bar and the clamps thrown down so as to bind the top of the flask placed upon the molding-plate, a table mounted on self-adjusting bearings for supporting the lower half of the flask when the table is reversed, a vertically-moving cross-head carrying such table and mounted on guides in the frame and connected by suitable links or rods to a shaft provided with a lever for operating the lifting mechanism, and a swinging crane hinged to a rod connected with one side of the frame-work, and provided with fingers resting upon the cross-head beneath the adjustable table which carries the flask-section, such fingers adapted to support the flask, whereby the latter may be swung back out of the machine, substantially as shown and described.

5. In a sand-molding machine, a self-adjusting vertically-moving table for supporting and lowering the lower half of the flask, mounted upon a universal bearing at its center and provided at or near its edges with universally-jointed steadying-pins having an adjustable frictional resistance, and supported by a cross-head mounted on guides in the frame and adapted to be raised or lowered by means of suitable mechanism, substantially as shown and described.

6. In a sand-molding machine, a reversible molding-plate provided with trunnions having bearings in the top of the frame and carrying a pair of pivoted double clamps at each end, a rack-bar on each side connected to such clamps at each end, operated by suitable pinions, and lever mechanism, whereby the clamping of the upper bail of the clamp will release the grip of the lower by the same movement, substantially as shown and described.

7. In a sand-molding machine, the vibrating mechanism herein described, comprising a wheel, 46, loosely mounted upon the axle 3, which carries the reversible molding-frame 4, the double cam-lever 44, pivoted at 45 to the rim of such wheel, its middle arm depending to strike the axle, its other end terminating in a fork provided with two lateral arms forming a pallet, 43, and the cam-wheel 42, keyed upon the axle 3, substantially as shown and described.

8. In a sand-molding machine, a swinging crane, 47, having fingers 48, loosely hinged to the rod 50 by eyes 49, the upper one of which carries a friction-wheel, 55, engaging with the cam-block 53, secured to the rod 50, and the reverse-cam 54, having one end secured to an arm of the cross-head 31, substantially as shown and described.

9. A sand-molding machine comprising, in combination, a frame composed of the uprights 1, connected by the bridge-plate 2, having the cross-head 31 moving therein by friction-wheels 40 upon guides 34, the reversible plate or frame 4, provided with trunnions 3, having bearings in the top of the frame, a hand-wheel, 16, mounted upon one of such trunnions for revolving the same, provided with latches 17, pivoted at 18 in recesses 19, such latches engaging with a projection, 20, upon the outside of the frame, the pattern-plate 5, carried in strips 7, for supporting the pattern 6, the double reversible clamps 15, having frictional contact with the pinion 14, and being eccentrically mounted thereon, the latter engaging with the rack-bar 13, the pinion 12, having a lever for revolving the same, such pinion also engaging with the rack-bar for operating the clamps at each end, the adjustable table 32, for supporting the lower section of the flask, carried in self-adjusting bearings at the top of the cross-head, the casting 33, link 28, pivoted at 27 to link 26, the latter pivoted at 25 in the side of the frame and connected by a wrist with the curved link 24, the latter connected with the crank or arm 22, whose other end is connected with a shaft upon which a lever, 21, is mounted for operating the elevating mechanism, and counteracting springs, substantially as shown and described.

10. A sand-molding machine comprising, in combination, a frame-work supporting in bearings upon its top a reversible molding-plate, means for locking such molding-plate in a horizontal position, a table resting upon self-adjusting bearings for supporting the flask-section carried upon a cross-head movable vertically within the frame, mechanism, substantially as described, for raising and lowering such table, a crane hinged to the frame and carried up and down by the movement of such cross-head, and means for automatically swinging the crane when it has reached its lowest point, carrying the flask away from the machine and closing it into the machine by the elevation of the cross-head, operating and arranged substantially as described.

11. In a sand-molding machine, a crane having fingers for carrying the flask-section, hinged to a rod connected to the frame of such machine, the fingers resting, when closed, upon a cross-head movable vertically in the frame, such crane provided with an automatic opening and closing mechanism, and means whereby this mechanism is actuated by the ascent and descent of the cross-head, substantially as shown and described.

12. A sand-molding machine comprising, in combination, a frame-work carrying a reversible molding-plate in bearings upon its top, such molding-plate having a pair of double clamps connected at each end with mechanism for operating such clamps, whereby the bringing of the upper pair in position to lock them upon the flask releases the grip of the lower clamps, substantially as shown and described.

13. In a sand-molding machine, the combination, with a reversible molding-plate journaled in a frame-work, and means for locking such molding-plate in a horizontal position, of a self-adjusting vertically-moving table for supporting or lowering the lower flask-section, mounted upon a universal bearing at its center and provided at or near its edges with universally-jointed steadying-pins having an adjustable frictional resistance for lowering such flask evenly at all points from the pattern, substantially as shown and described.

897,817. FLOW. MARGUM J. TODD, Corning, N. Y. Filed Apr. 21, 1888. Serial No. 271,429. (No model.)

Claim.—1. As an improvement in plows of the class herein described, the arm pivotally secured to the reversible mold-board, and having a double-hooked or arrow-head-like end formed therewith for latching said mold-board on either side of the plow-standard, substantially as shown and described, said arm being secured to the mold-board or to its crotch, as set forth.

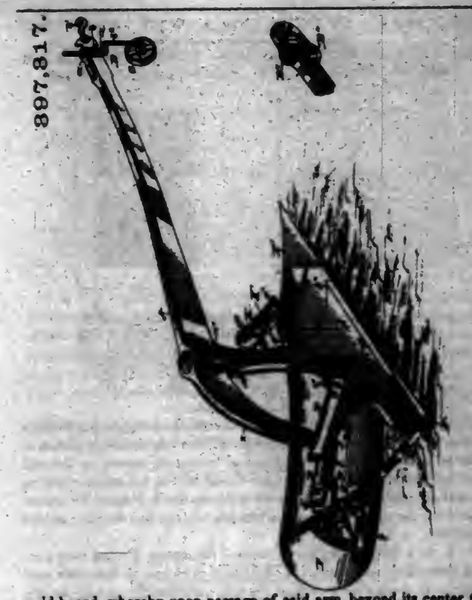
2. As an improvement in plows of the class herein described, the combination, with the mold-board and reversing-arm, of the spring having a pivotal bearing on a direct line with the axis of the pivoted arm and that of the revolving mold-board of the plow, substantially as shown, and for the purpose stated.

3. As an improvement in plows of the class herein described, the hooked arm pivotally secured to the reversible mold-board and the spring having a pivotal bearing at one end on a direct line with the rear pivotal stud of the mold-board and the axis of said arm, to which it is pivotally secured at its other end, substantially as shown and described.

4. As an improvement in plows of the class herein described, the arm pivotally secured to the reversible mold-board, and having a double-hooked or arrow-head-like end, and the spring pivotally secured to said arm at one end, and having a pivotal bearing on a line with the pivoted connection of said arm and of the mold-board pivot, substantially as shown and described.

5. As an improvement in plows of the class herein described, an arm pivotally secured at one end to the reversible mold-board and having a spring-pressure applied thereto, the pivotal center of which spring-pressure is on a line with the axis of said arm and that of the

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mold-board, whereby upon passage of said arm beyond its center to the right or left said spring-pressure will force the same in its movement, as shown and described.

6. As an improvement in plows of the class herein described, the arm pivotally secured to the mold-board for locking the same on either side of the plow-standard, and having a spring-pressure applied thereto capable of having a central point of greatest pressure over which said arm passes in describing its circle in reversing said mold-board, thus throwing said spring on either side of the pivot of the arm and forcing the same into position, as set forth.

7. The combination, with the reversible mold-board, of the arm having the double-hooked or arrow-head-like end and the toe-plate secured to the rear side of said arm, substantially as shown and described.

8. As an improvement in plows of the class herein described, the pivoted beam having sliding plates secured to its rear end and operated by means of an arm secured to the mold-board or crotch, said beam being held at its rear ends by means of the depending lugs of said sliding plates bearing one against a lug of the plow-standard and the other held by the end of the hooked arm or sliding finger, substantially as shown and described.

9. The shifting beam having the slotted plates secured to its rear end by means of a set-screw, said plates being held against the under side of a cross-bar of the standard and operated by the securing-arm of the reversible mold-board, substantially as shown and described.

10. As an improvement in plows of the class herein described, the pivoted beam having the sliding plates provided with depending lugs, and the arm having a sliding finger secured thereto, substantially as shown and described.

11. As an improvement in plows, the herein-described pivotally-secured slicer and turner, having a wing or plate at an angle to and operated by the mold-board, with which it comes in contact, substantially as shown and described.

12. The slicer and turner comprising the concaved outwardly-projecting wing or plate, the head-block, and the pivotal rod, in combination with the reversible mold-board, by which said slicer and turner is operated, substantially as shown and described.

13. The rod adjustably secured at one end in the plow-standard, and having the slicer and turner at its outer forward end, and capable of being operated by the reversible mold-board, substantially as shown and described.

14. The combination, with the standard and mold-board, of the rod, the slicer and turner, and the spring connected thereto and to said rod, substantially as shown and described.

15. The combination, with the reversible mold-board, of the pivotally-secured slicer and turner operated by said mold-board and having a relative position thereto, substantially as shown and described.

16. The combination, with the reversible mold-board, of the slicer and turner, the head-block having the grooved sides, and the rod, substantially as shown and described.

17. The combination, with the shifting beam having the adjustable sliding plates, of the arm secured to the reversible mold-board and the finger attached thereto for forcing said beam from side to side to the extent to which the sliding plates are secured with relation to the beam, substantially as shown and described, whereby more or less movement is given to the beam by the end of the finger being lengthened or shortened to correspond with the joint length of the sliding plates, substantially as shown and described.

18. As an improvement in plows, the herein-described standard of skeleton formation having grooved sides, the landside-plates fitting flush in said grooved sides, and a shoe having its projecting walls bearing against the lower edges of said landside-plates, substantially as shown and described.

19. As an improvement in plows, the standard having landside-plates secured to the sides thereof and independent of the shoe, substantially as shown and described.

20. The standard having landside-plates disposed on the sides thereof and secured to each other by a bolt passing through apertured ears or lugs, substantially as shown and described.

21. As an improvement in plows, the standard having the hooks formed in its under side near the toe end thereof, the shoe provided with a groove or recess wherein said hook projects, and having its under side curved or hollowed, and the nutted bolt passed through said shoe and standard, substantially as shown and described.

22. As an improvement in plows, the standard having the grooved sides, the landside-plates fitting said grooved sides and provided with lower beveled ends, and the tapering shoe having upwardly-projecting beveled side walls, substantially as shown and described.

23. As an improvement in plows, the standard of skeleton formation having grooved sides, the landside-plates having right-angular lugs or bars secured to their inner sides, the overlapping apertured ears or lugs, the shoe, and the securing-bolt, substantially as shown and described.

24. The combination, with the standard having grooved sides and the hook near its forward end, of the landside-plates fitting said grooved sides and provided with lower beveled edges, the inwardly-projecting apertured ears or lugs, the short right-angular plates, the shoe having the outwardly beveled or inclined side walls and curved or hollowed on its under side, and the securing-bolt, substantially as shown and described.

25. As an improvement in plows of the class herein described, the rocking section or block secured to the front edge of the plow-standard, in combination with the mold-board, substantially as shown and described.

26. As an improvement in plows having the standard and a reversible mold-board, the rocking section or block having beveled sides and secured to said plow-standard so as to be in alignment with one side thereof when moved by the said mold-board, substantially as shown and described.

897,818. CROSS-HEAD FOR STEAM-ENGINES. JOHN J. TURKIS, Oswego, N. Y., assignor to Thomson Kingsford, same place. Filed Oct. 10, 1888. Serial No. 287,751. (No model.)



Claim.—1. A cross-head provided with a transversely-convexed bottom bearing and with longitudinal top bearings on opposite sides of the cross-head, in combination with a correspondingly-concaved guide, and gibs secured to the said guide and projecting over the top bearings of the cross-head, as set forth.

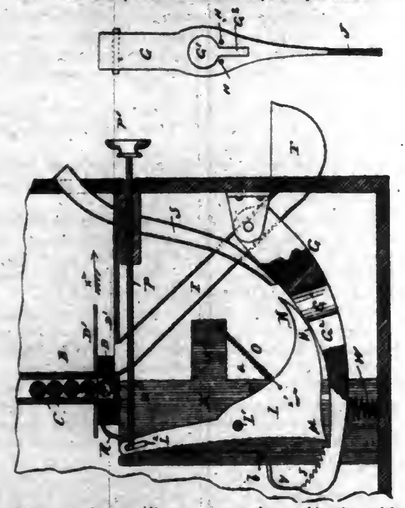
2. A cross-head composed of a bottom plate formed convex in cross-section on its under side and with horizontal longitudinal top bearings on opposite sides of the cross-head, and ears projecting from said bottom plate, all formed in one piece, in combination with a correspondingly-concaved guide, gibs secured to the guide and projecting over the horizontal top bearings of the cross-head, and the wrist-pin connected to the said ears, substantially as described and shown.

3. In connection with the wrist-pin P, the cross-head formed with the ears D D, having seats for the wrist-pin and split transversely from said seats through the tops of the ears, and formed with longitudinal sleeves *b b* at the upper ends of the split portions, and bolts *c c*, passing through the sleeves and provided with nuts for adjustably clamping the split parts of the ears together, substantially as described and shown.

4. In combination with the piston-rod I, the cross-head provided with the bridge *d*, having the eye *d'* for the reception of the end of the

piston-rod and split longitudinally vertically from said eye through the top of the bridge, and the bolt *c*, clamping the split portions of the bridge together, substantially as described and shown.

397,319. VENDING APPARATUS. JOHN W. VADNER, Jersey City, N. J. Filed Oct. 1, 1888. Serial No. 286,875. (No model.)



Claim.—1. In a vending apparatus, the combination, with a pivoted lever, of a coin-chute for conducting a coin to said lever, an additional lever adapted to operate the coin-receiving lever, a slide-rod connected with said additional lever, and a feeding device for delivering the article to be sold, which feeding device is operated from the slide-rod, substantially as herein shown and described.

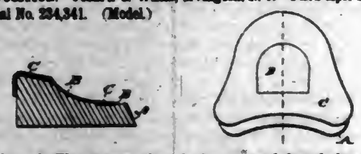
2. In a vending apparatus, the combination, with a pivoted lever provided with ratchet-teeth, of a coin-chute for conducting a coin upon said lever, a spur-lever adapted to engage said ratchet, a rod for manipulating the spur-lever, and an article-delivery slide connected with said manipulating-rod, substantially as herein shown and described.

3. In a vending apparatus, the combination, with an article-delivery slide, of a spur-lever connected with the same, a coin-receiving lever engaging the spur-lever, and a coin-chute adapted to direct the coin between the spur-lever and the coin-receiving lever, substantially as herein shown and described.

4. In a vending apparatus, the combination, with the lever G, having an opening, G', slot G^2, and teeth J, of the lever L, having the spur M and prong N, a delivery-slide connected with the lever L, a rod for manipulating said lever L, a coin-chute for directing the coin between the prong N on the lever L and the upper surface of the lever G, and a spring for pressing the lever G toward the lever L substantially as set forth.

5. In a vending apparatus, the combination, with a delivery-slide, of a rod for moving the same, a pivoted lever, L, connected with said rod and provided with the spur M and prong N, the lever G, having the aperture G' and slot G^2, pins H, and teeth J, a coin-chute for directing the coin upon the upper surface of the lever G, and a spring for pressing the lever G toward the lever L, substantially as set forth.

397,320. PROCESS OF MAKING DENTAL PLATES BY ELECTRO-DEPOSITION. JOSEPH G. WARD, Irvington, N. J. Filed Apr. 11, 1887. Serial No. 234,341. (Model.)

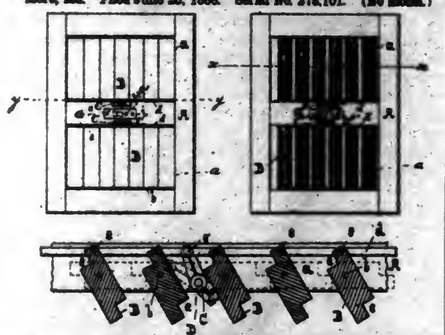


Claim.—1. The process of producing a metal dental plate, which consists in first casting a form from the mouth of the patient and then depositing a substantially rigid plate thereon, substantially as set forth.

2. The process of forming a complete metal dental plate ready for the setting of the teeth, which consists in casting a form from the mouth of the patient, electro-depositing a substantially rigid plate thereon, stripping the plate from the form, and then trimming and adjusting the shape, as set forth.

397,321. WITHDRAWN.

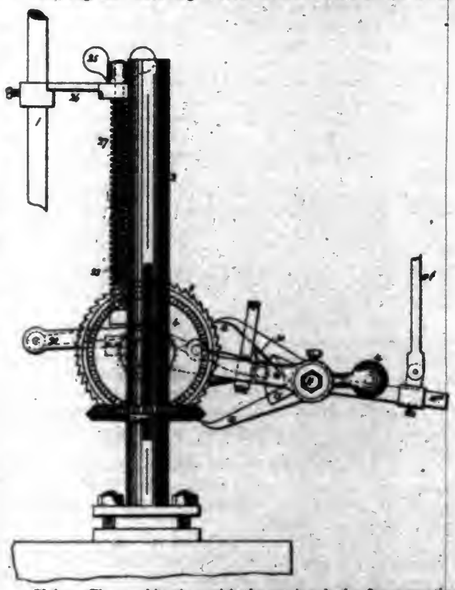
397,322. FREIGHT-CAR DOOR. EDWARD H. WHITAKER, Baltimore, Md. Filed June 25, 1888. Serial No. 278,101. (No model.)



Claim.—1. In a freight-car door having a ventilation-opening, a series of pivoted slats situated in the said opening united by means of pins to a bar, combined with a crank connected loosely to the said bar and having on its shaft a toothed segment, and a worm-wheel on a shaft in gear with the said toothed segment and adapted for operation from the outside of the door, substantially as and for the purpose specified.

2. In a freight-car door, a series of ventilating pivoted slats having their edges rabbeted to one-half their thickness, so that they may overlap to form a plain or flush surface, substantially as and for the purpose specified.

397,323. VALVE-GEAR. RICHARD WILEY, Mirfield, County of York, England. Filed Aug. 9, 1888. Serial No. 282,392. (No model.)

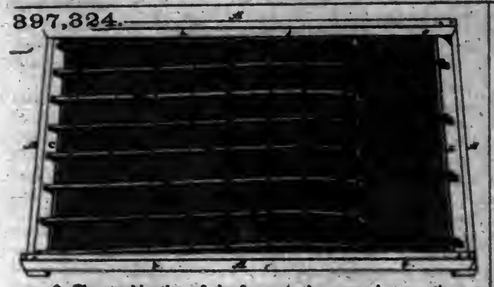


Claim.—The combination, with the ratchet device for converting vibratory into intermittent rotary motion, the governor-rod 1, and the controlling mechanism intermediate between the pawls of said ratchet device and rod, whereby the engine-governor is made to control the rotation of the ratchet-wheel shaft, of the stem 2 of the cut-off valve, the wheel 3 thereon, and the wheel 4 on the ratchet-wheel shaft meshing with the wheel 3, substantially as set forth.

397,324. SPRING BED-BOTTOM. EDWARD YEOMAN, Chicago, Ill. Filed May 23, 1888. Serial No. 274,830. (No model.)

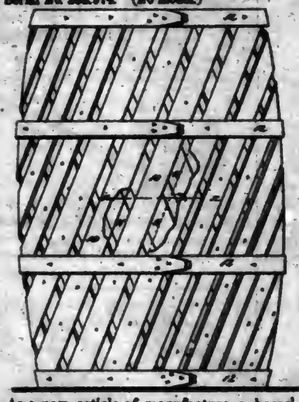
Claim.—1. The combination of the frame A, the woven bottom B, and springs F with the strips D, castings G, to which the strips are secured, the rods G, which connect the castings laterally, and the adjustable rods which connect the castings with the frame in a line with the strips, and which rods are located at one end of the bed, substantially as shown.

397,324.



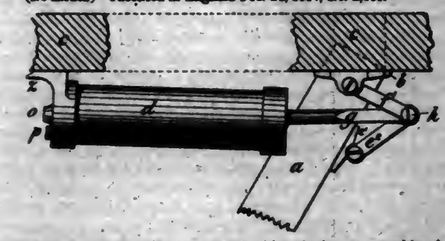
2. The combination of the frame A, the woven bottom, the supporting-strips, and the springs placed between the bottom and the strips, with the triangular castings to which the strips are secured in pairs, the adjustable rods H J, and the swivels I, the rods and swivels being located at one end of the bed, and the rods J being secured at their outer ends to the end rail of the frame, substantially as shown.

397,325. BARREL. ISAAC J. W. ADAMS, Laurel, Del. Filed Dec. 3, 1888. Serial No. 292,974. (No model.)



Claim.—As a new article of manufacture, a barrel made up of supporting-hoops and outer and inner sets of splints, said splints crossing each other diagonally, and being nailed to each other and to the supporting-hoops, substantially as described.

397,326. PNEUMATIC DOOR-CHECK. ROBERT ADAMS, Southwark, County of Surrey, England. Filed July 23, 1888. Serial No. 280,735. (No model.) Patented in England Feb. 21, 1887, No. 2,685.



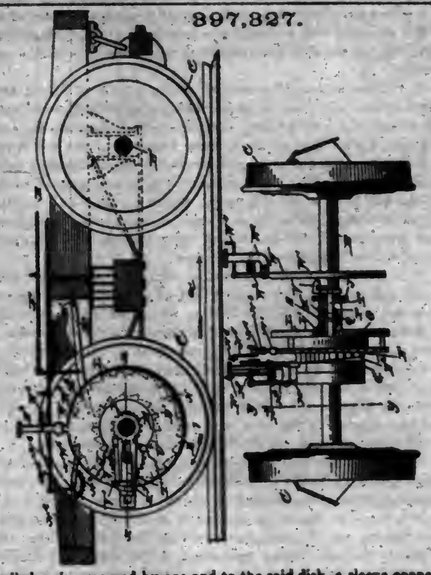
Claim.—In a door closing and checking device, the combination, with the cylinder, the vibratory piston-rod, and a single-armed link, of the pivoted double-armed link *f' f'*, connected to the piston-rod and single-armed link, one of said links being attached to the door and the other to the door-frame, substantially as described.

397,327. CAR-STARTER. WILLIAM P. AKERS and JOHN C. LEDBETTER, Jr., Jacksborough, Tex. Filed May 28, 1888. Serial No. 275,390. (No model.)

Claim.—1. In a car-starter, the combination, with a crank-arm held rigid on the axle, of a notched disk adapted to be engaged by the said crank-arm, a coiled spring secured by one end to the said disk, and a sleeve connected with the axle on which the other end of the said spring is secured, said disk being held to rotate loosely on the said sleeve, substantially as shown and described.

2. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a

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coiled spring secured by one end to the said disk, a sleeve connected with the axle, and on which the other end of the said spring is secured, a ratchet-wheel connected with the said disk, and a pawl engaging the said ratchet-wheel, substantially as shown and described.

3. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel formed on the said sleeve and provided with a spiral cam, and a wheel secured on the axle and carrying a sliding block adapted to engage the said spiral cam, substantially as shown and described.

4. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet wheel formed on the said sleeve and provided with a spiral cam, a wheel secured on the axle and carrying a sliding block adapted to engage the said spiral cam, and a lever connected with the said sliding block to move it in and out of contact with the said spiral cam, substantially as shown and described.

5. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel formed on the said sleeve and provided with a spiral cam, a wheel secured on the axle and carrying a sliding block engaging the said spiral cam, and a pawl adapted to engage the ratchet-wheel on the said sleeve, substantially as shown and described.

6. In a car-starter, the combination, with a crank-arm provided with an adjustable wrist-pin and held rigidly on the axle, of a notched disk adapted to be engaged by the wrist-pin of the said crank-arm, a coiled spring secured by one end to the said disk, a sleeve on which the said disk is held to rotate, and on which is also secured the other end of the said spring, a ratchet-wheel connected with the said disk and engaged by a fixed pawl, a ratchet-wheel formed on the said sleeve and provided with a spiral cam, a wheel secured on the axle and carrying a sliding block engaging the said spiral cam, a pawl adapted to engage the ratchet-wheel on the said sleeve, and a lever connected with the said sliding block to move it in and out of contact with the said spiral cam, substantially as shown and described.

7. In a car-starter, the combination, with an axle, of a crank-arm secured on the said axle, a wrist-pin held to slide radially in the said crank-arm, a spring for pressing the said wrist-pin inward in the said crank-arm, a plate held on the extreme inner end of the said wrist-

pin, a spring provided with a notch adapted to engage the said plate, and also provided with a bevel, and a lever having a ring adapted to engage the said bevel of the said spring, substantially as shown and described.

8. In a car-starter, the combination, with an axle, of a crank-arm secured on the said axle, a wrist-pin held to slide radially on the said crank-arm, a spring for pressing the said wrist-pin inward in the said crank-arm, a plate held on the extreme inner end of the said wrist-pin, a spring provided with a notch adapted to engage the said plate, and also provided with a bevel, a lever having a ring adapted to engage the said bevel of the said spring, a disk provided with a notch adapted to be engaged by the said wrist-pin, and a coiled spring connected with the said disk and wound up by the rotation of the said disk, substantially as shown and described.

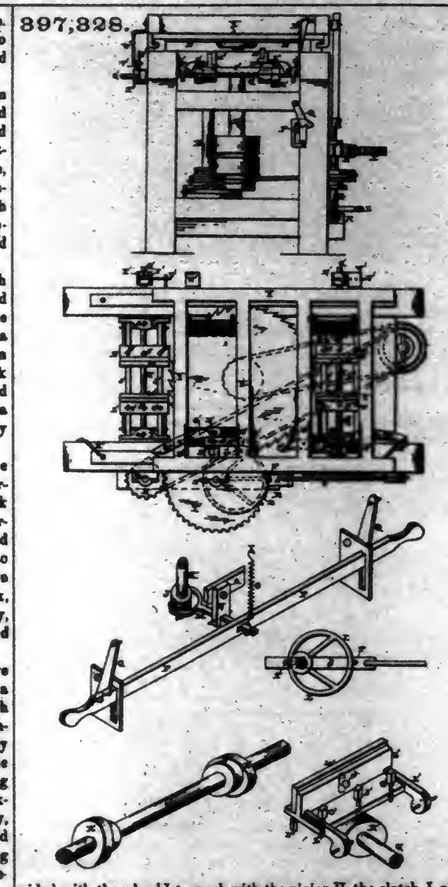
9. In a car-starter, the combination, with a sleeve connected with the axle and provided with a gear-wheel, of a coiled spring secured by one end to the said sleeve, a disk on which the other end of the said spring is secured, said disk turning loosely on the said sleeve, a second gear-wheel meshing into the gear-wheel on the said sleeve, a screw-rod operated by the said second gear-wheel, a threaded block held to slide on the said disk and screwing on the said screw-rod, and a wrist-pin adapted to engage the said disk and held to slide in a crank-arm secured to the axle, said wrist-pin being operated on by the said threaded block, substantially as shown and described.

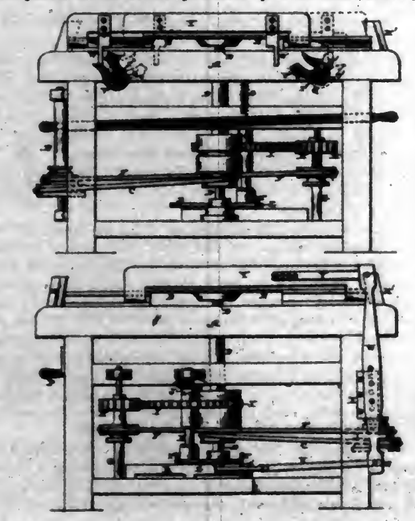
10. In a car-starter, the combination, with the axle and a sleeve connected with the said axle, said sleeve being provided with a gear-wheel, of a coiled spring secured by one end to the said sleeve, a disk on which the other end of the said spring is secured, a second gear-wheel meshing into the said gear-wheel on the sleeve, a screw-rod operated by the said second gear-wheel, a threaded block held to slide on the said disk and screwing on the said screw-rod, a wrist-pin engaging the said disk and operated on by the said threaded block, and a crank-arm on which the said wrist-pin is held to slide radially, said crank-arm being secured to the axle, substantially as shown and described.

11. In a car-starter, the combination, with the axle and a sleeve connected with the said axle and provided with a gear-wheel, of a coiled spring secured by one end to the said sleeve, a disk on which the other end of the said spring is secured, a second gear-wheel meshing into the said gear-wheel on the sleeve, a screw-rod operated by the said second gear-wheel, a threaded block held to slide on the said disk and screwing on the said screw-rod, a wrist-pin engaging the said disk and operated on by the said threaded block, a crank-arm carrying the said wrist-pin and in which it is held to slide radially, said crank-arm being secured to the axle, a spring secured to the said crank-arm and supporting the said wrist-pin, and a lever having a ring adapted to operate on the said spring, substantially as shown and described.

397,328. SHINGLE-SAWING MACHINE. EDWIN ANDERSON, Tryon City, N. C. Filed May 23, 1888. Serial No. 274,773. (No model.)

Claim.—1. The combination of the driving-shaft, the belts F C extending therefrom, the saw-shaft journaled in the frame, provided with the saw D at its upper end and operated by the belt C, the shaft G, journaled upon the frame A, operated by the belt F, and provided with a pinion, H, the shaft K, journaled upon the frame A and provided with the wheel I to mesh with the pinion H, the clutch J, placed upon the shaft K, for locking the wheel I to the shaft, the lever M, pivoted in the frame N and connected to the clutch at one end, the spring O, connected to the other end of the lever, the operating-lever P, extending endwise of the frame A and connected to the lever M, and suitable notches, Q, upon the ends of the frame for locking the lever in place while the clutch is out of gear, substantially as shown.





2. In a sawing-machine, the combination of the saw and the reciprocating carriage with the shaft K, journaled in the frame A, and means for operating said shaft, the cam L, secured to its lower end, the guide R, secured upon the frame, the slide S, placed in the guide R and provided with the projections T, between which the cam revolves, the connecting-rods U V, the lever W, provided with a series of perforations and placed in a vertical position on the frame, perforated plate X, secured to one end of the frame, and the pivot which passes through the plate and lever, and which pivot is adapted to be changed from one hole to another, so as to vary the distance the carriage shall move, substantially as described.

3. The combination of the carriage provided with a stationary dog, the movable dog provided with the projections D', the guide E, through which the projections pass, the guides B', secured to the carriage and between which the dogs A' move, the lever F, pivoted upon the carriage and made to catch over one of the projections D' at its inner end, the spring C', the pivoted lever G', which catches over one of the projections upon the sliding dog at its inner end, and the inclined plate secured to the frame for moving the lever G' and the movable dog, so as to drop the block, substantially as described.

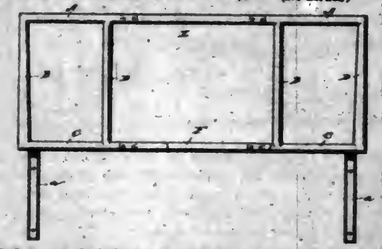
4. The combination of the supporting-frame J', located at one end of the frame A, the tilting frames pivoted at their outer ends to the supporting-frames, the slotted plates M, attached to the free ends of the tilting frames, the screws a^2, for holding the plates in position, and the set-screws N', which pass through the frames and bear against the edges of the plates, substantially as set forth.

5. The combination of the supporting-frame J', the guides I', adjusting-screws, and the saw with the carriage for reciprocating the block back and forth over the saw, and the mechanism for holding the block, whereby the supporting-frame with its attachments can be adjusted in relation to the saw as the saw becomes worn away, substantially as described.

6. The combination of the supporting-frame J', the tilting frames attached thereto, the vertically-adjustable slotted plates M', attached to their free ends, screws a^2, for securing them in position, and the set-screws O', which pass through the tilting frames, the shaft Q', provided with cams R', and a mechanism operated by the carriage for causing the shaft to revolve at each forward movement of the carriage, substantially as shown.

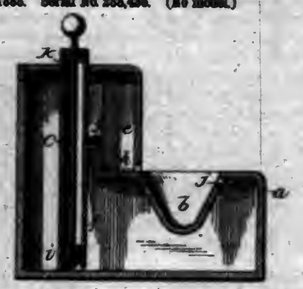
7. The combination of the cam-shaft, the supporting-frame, and the tilting frames pivoted thereto, the ratchet rigidly secured to the end of the shaft, the frame U', carrying a pawl loosely placed upon the shaft, the carriage, and the arm which projects downward from the carriage and operates the frame, substantially as described.

397,329. DASH-BOARD FOR VEHICLES. CLAYTON I. BAKER, Englewood, assignor of one-half to the Abbott Buggy Company, Chicago, Ill. Filed Mar. 26, 1888. Serial No. 268,466. (No model.)



Claim.—A dash-frame for wheeled vehicles of cast malleable metal, comprising end sections of rectangular form having at the outer corners thereof integral attaching shanks or feet provided with bolt-holes, whereby to adapt the frame to be secured to the vehicle-body, and connecting-bars whereby to secure the end sections together, substantially as described.

397,330. INKSTAND. STEPHEN G. BALDWIN, Marion, Ind. Filed Oct. 18, 1888. Serial No. 288,426. (No model.)



Claim.—1. An inkstand comprising a hollow body forming a normally-closed supply-reservoir, an ink-well in the upper portion of the same, and a pump or elevator in the body to raise the ink from the reservoir to the well, substantially as set forth.

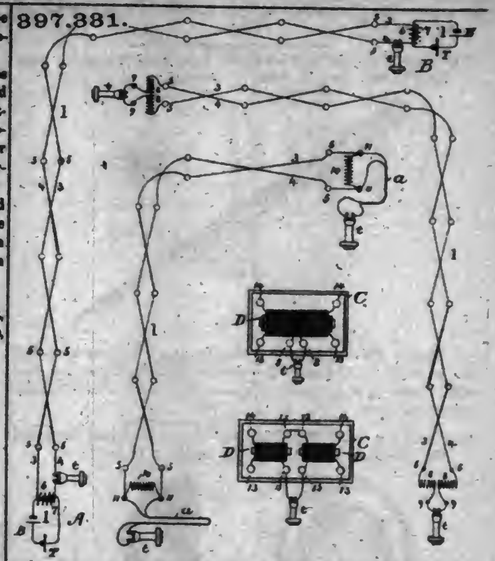
2. An inkstand comprising a hollow body to form an ink-supply reservoir, an ink-well depending from the top wall of the same into its interior, and a pump or elevator to raise the liquid from the reservoir to the well, comprising a vertical tube opening into the reservoir and extending up through the body and provided with a discharge-mouth to discharge onto a channel exteading to the well, and a piston in the tube provided with an operating-rod above the body, as set forth.

3. An inkstand comprising a body having an internal ink-supply reservoir, an ink-well in the body depending into the reservoir and provided with one or more apertures in its upper portion to allow the overflow from the well to pass back into the reservoir, and means for raising the ink from the reservoir to the well when and in quantities as desired.

397,331. TELEPHONE CIRCUIT AND APPARATUS. JOHN A. BARRETT, Brooklyn, N. Y., assignor to the American Telephone and Telegraph Company, of New York. Filed May 9, 1888. Serial No. 273,204. (No model.)

Claim.—1. The combination, with a telephonic circuit, of a transmitter having the secondary or line circuit of its induction-coil divided into two substantially equal parts, and a receiving-telephone connected to line between the parts of said coil, as set forth.

2. The combination, with a telephonic circuit, of a telephone-transmitter, an induction-coil, whereby the electrical changes produced by the action of said transmitter are propagated through said circuit, and a telephone-receiver connected in approximately the middle of the secondary or line helix of said induction-coil, said helix being the source of electrical energy for said circuit, substantially as described.

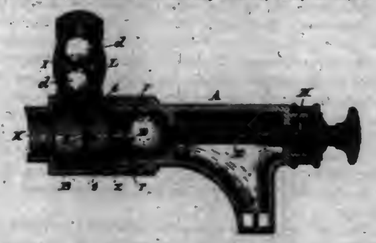


3. The combination, with a telephonic circuit, of a telephone-transmitter, an induction-coil therefor, having its secondary or line helix, which constitutes the source of energy in said circuit, divided at or about its center of resistance, and a receiving-telephone looped or connected to the severed terminals, substantially as described.

4. The combination of a metallic or double conductor telephone-circuit having its two sides cross-connected or transposed at one or more points with a transmitter induction-coil having its secondary helix included in the said circuit and divided at its center, and a receiving-telephone interposed between the two halves of the said coil, substantially as and for the purposes specified.

5. A metallic or double wire telephone-circuit having its two conductors cross-connected or transposed at any number of suitable points, a receiving-telephone at the stations thereof included in the said circuit, and a transmitter, also at the said stations, the secondary helix of the induction-coil whereof is also included in the said circuit on both sides of the said receiving-telephone helix, substantially as specified, whereby the two conductors are equalized and a balance between them maintained.

397,332. STOP-COCK. HERBERT R. BEAUVALET and LÉON C. BEAUVALET, Paris, France. Filed Sept. 21, 1888. Serial No. 286,054. (No model.) Patented in France May 24, 1887, No. 183,750; in Belgium Dec. 9, 1887, No. 73,838; in Spain Dec. 12, 1887, No. 12,376; in England Dec. 15, 1887, No. 17,276, and in Italy Dec. 23, 1887, No. 22,747.

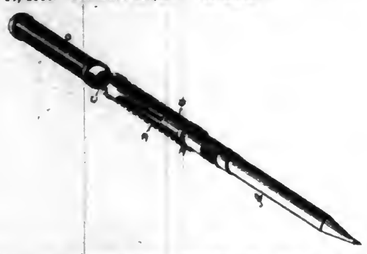


Claim.—1. In a stop-cock or valve, and in combination with the pusher and the rubber ball, the ball-chamber having on its inlet side a hollow plug or closing-piece, in which are backwardly-inclined inlet-holes, substantially as described.

2. In a stop-cock or valve, and in combination with the rubber ball and pusher, the ball-chamber having the end away from the ball-seat formed by a hollow plug with backwardly-inclined holes in the side walls of the central chamber in said plug, and a central hole from said central chamber into the ball-chamber, the said plug being also

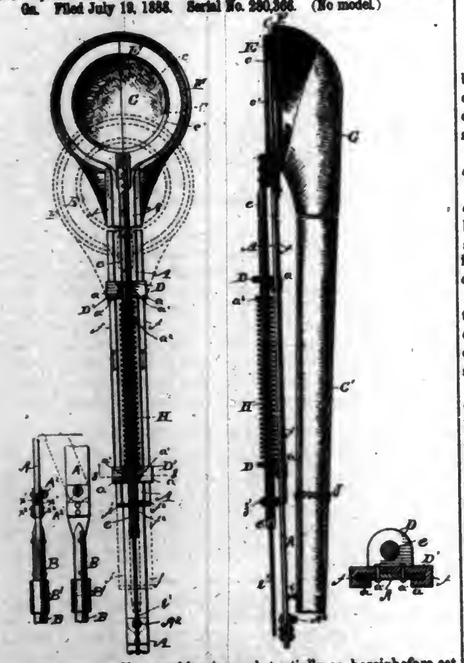
provided with grooves extending from said central hole, substantially as described.

397,333. ENVELOPE-OPENER. JOHN BIRD, Warren, Ill. Filed Oct. 17, 1888. Serial No. 288,361. (No model.)



Claim.—The combination of a metallic cap, which is to be applied to a pencil or pen, and which is cut away or flattened upon one side, with a cutter or blade, which is secured rigidly to the cap, substantially as set forth.

397,334. FRUIT-GATHERER. WESLEY S. BROOKS, Bainbridge, Ga. Filed July 19, 1888. Serial No. 280,366. (No model.)

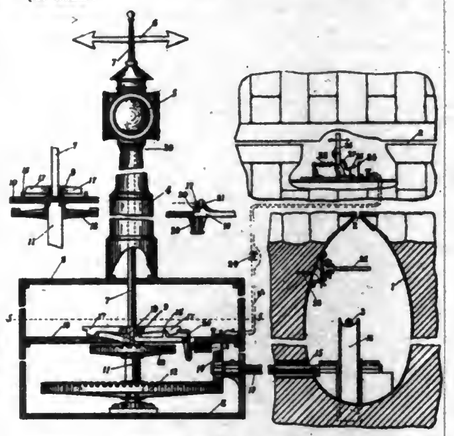


Claim.—1. The combination, substantially as hereinbefore set forth, of the frame, the annular cutting-jaw secured thereto, the annular reciprocating cutting-jaw, and the bag-holder and bag connected with the reciprocating jaw and moving coincidently therewith.

2. The combination, substantially as hereinbefore set forth, of the frame, the handle-sections therefor, the annular cutting-jaw secured to the frame, the annular reciprocating cutting-jaw, the stem of the reciprocating jaw, the guideways on the frame in which the stem moves, the spring secured to the stem of the cutting-jaw for returning it to its normal position, the bag-holder, the bag secured thereto, the chute leading from the bag, and connections between the bag-holder and the reciprocating jaw, whereby they are caused to move coincidently.

3. The combination, substantially as hereinbefore set forth, of the frame A, the annular cutting-jaw C, secured thereto, the annular reciprocating cutting-jaw E, adjacent to the cutting-jaw C, the stem *e* of the cutting-jaw E, the guides secured to the frame, through which the stem extends, the spring for returning the reciprocating cutting-jaw E to its normal position, the annular frame F, the bag G, secured thereto, the chute G', secured to the bag, the arms *f*, secured to the frame F, the guides *a* on the frame A, through which the arms *f* extend, and connections between the lower ends of the arms and the stem *e*.

397,335. SIGNALING DEVICE FOR CABLE RAILWAYS. WILLIAM M. BULKLEY, St. Louis, Mo. Filed Mar. 5, 1888. Serial No. 266,254. (No model.)



Claim.—1. A signaling device for cable railways, consisting of a body interposed within the conduit in the path of the travel of the cars, a cross-road, a rotary signal at said cross-road, and electrical connections, whereby when said body is operated upon by a car a signal is given, for the purpose set forth.

2. A cable-railway system having a signal connected with and operated from one of the cable-pulleys, for the purpose described.

3. A signaling device for cable railways at crossings, consisting of a body arranged within the path of the cars, a signal at a crossing, a system of gearing connected with the cable-supporting wheel at said signal, and a coupler controlled by the aforementioned body for temporarily connecting the signal to the system of gearing to operate said signal.

4. The combination, as hereinbefore set forth, of the signal 5 6, the shaft 7, operating said signal, the pawls carried thereby, a system of gearing operated by the cable, a body interposed in the path of the cars and within the conduit, and a lever controlled by said body and supporting one of said pawls, as and for the purpose described.

5. The combination, as hereinbefore set forth, of the signal 5 6, the post 4, the shaft 7, controlling said signal, the box 8 beneath the level of the way, a system of gearing rotated by the cable and within said box, a series of pawls pivotally secured to the signal-shaft 7, the rim 18 upon a platform, 10, within said box and having a cut-away part, as described, an inclined nose, 19, extending from said rim, the stop 21, an armature-lever, 20, for holding one of said pawls from action, a circuit and source of electrical supply, and a lever arranged in the path of the cars to control said circuit, for the purpose described.

6. The combination of a lever in the path of the cars and arranged within the conduit of a cable railway at one side of an intercepting railway, a second lever arranged similar to the first, but upon the opposite side of said intercepting railway, a rotary signal at the crossing, and electrical connections between the first and second levers and the signaling device, whereby said signal is operated upon the approach and departure of a car.

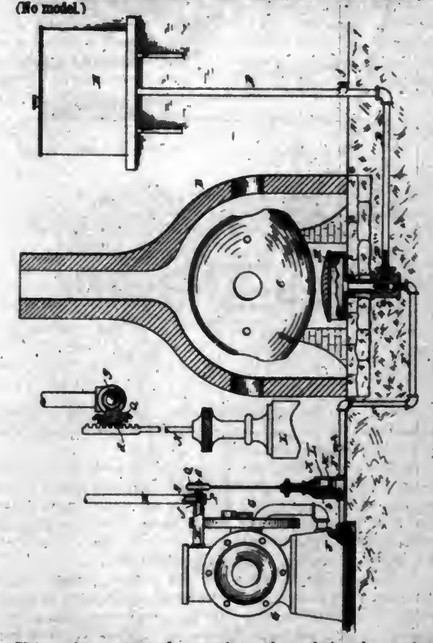
7. The combination of a body arranged within the path of the cars traveling upon a cable railway and arranged within the conduit at one side of a cross-road, a second body similarly arranged upon the other side of said cross-road, a return-track having two bodies arranged within the path of the cars and similarly disposed as the foregoing, rotary signaling devices at said crossing, and electrical connections between the aforementioned bodies and the signaling devices, whereby a signal is given and withdrawn when a car approaches and recedes from the crossing on the main track in either direction.

8. A signaling device for a double-track cable railway, consisting of two signals, substantially as 5 6 and 5' 6', a shaft controlling the former signal, a hollow shaft surrounding the aforesaid shaft and controlling the latter signal, couplers for connecting either signal to a constantly-rotating gearing controlled by the cable, levers and stops governing said couplers, and bodies arranged within the path of a direct and return track for actuating said levers.

9. The combination of the signals 5 6 and 5' 6', the shafts 7 and 7', the pawls 17 and 17', pivotally affixed to said shafts, the rims 18 and 18', having downwardly-projecting noses 19 and 19', the ratchets 13 and 13', geared to the cable, armature-levers 20 and 20' and stops, the electro-magnets, a double track, and circuit-controlling levers arranged within the conduits of said double tracks upon each side of a cross-road near the signaling devices.

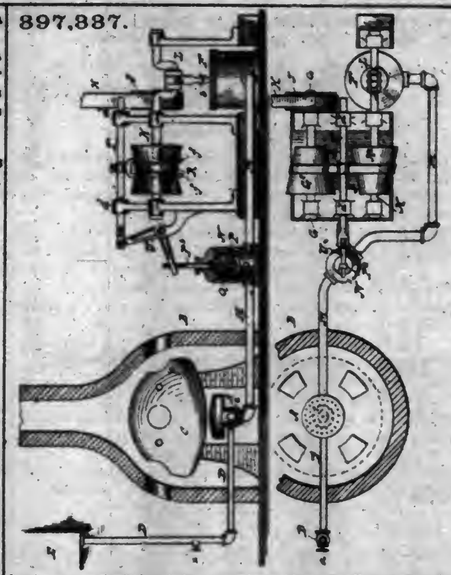
10. The combination, with a cable railway and cross-road, of a rotary signal at said cross-road, gearing rotated by the cable, a coupler intermediate of the latter and the signal, and electrical connections on each side of said cross-road arranged within the path of the cars controlling said coupler, for the purpose described.

397,336. APPARATUS FOR BURNING HYDROCARBONS. JAMES H. BULLARD, Springfield, Mass. Filed Dec. 21, 1887. Serial No. 258,579. (No model.)



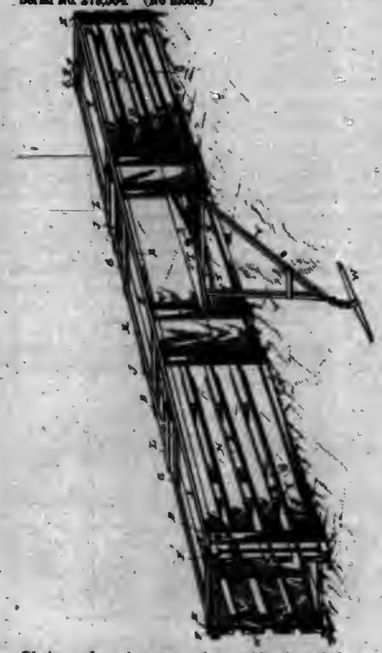
Claim.—An apparatus for securing and regulating the combustion of liquid fuel in glass-melting and analogous furnaces, consisting of a burner, a liquid-fuel tank, a pipe connecting said fuel-tank and burner, an air-compressor having a steam-pipe for conveying steam thereto for driving the same provided with a valve, a pipe connecting said air-compressor and said burner, a regulator connected to and actuated by the pressure in said air-pipe, and a connection between a movable part of said regulator and said steam-valve, whereby the feeding of steam to said air-compressor is regulated and a consequent regulation of the air-pressure to the burner is secured, substantially as and for the purpose described.

397,337.



having a cone-pulley, a belt connecting said cone-pulleys, and a shaft, T, capable of sliding longitudinally, provided with the belt embracing and shifting arms *f f*, a pipe connecting said air-pump and burner, and a regulator in communication with said air-pipe, having a reciprocating piston-rod, P³, and a pivoted bell-crank lever by its one end engaging said regulator piston-rod and by its other end engaging said sliding shaft T, substantially as and for the purpose described.

397,338. HAY-PRESS. WILLIAM S. CHAMPION, Goliad, assignor of one-half to Barton Peck, Goliad County, Tex. Filed July 10, 1888. Serial No. 279,504. (No model.)



Claim.—In a hay-press, the combination of the two feed and baling chambers, the reciprocating plunger-beam provided with a plunger-head at each end, the pivoted segment provided with a lever, and the cables connected to the inner ends of the segment and passing in opposite directions parallel to the length of the plunger and connected to the opposite ends of the plunger, as and for the purposes set forth.

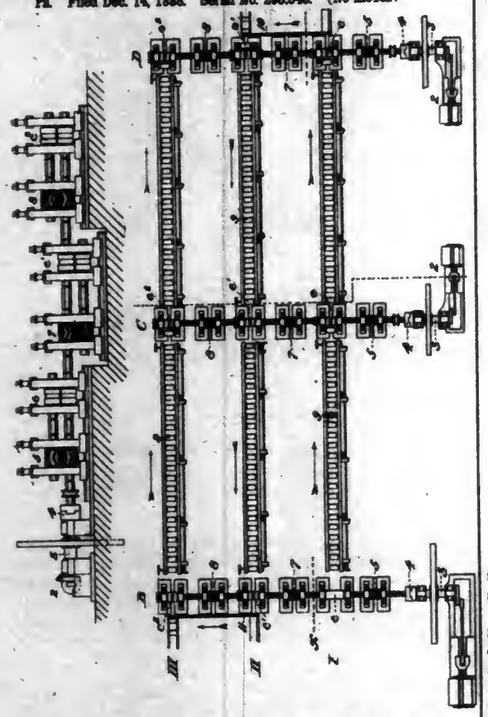
397,337. APPARATUS FOR BURNING HYDROCARBONS. JAMES H. BULLARD, Springfield, Mass. Filed Dec. 21, 1887. Serial No. 258,580. (No model.)

Claim.—1. An apparatus for securing and regulating the combustion of liquid fuel, comprising a hydrocarbon-burner, a liquid-fuel tank, a pipe connecting said tank and burner, an air-pump, a driving-shaft, and intervening movable driving-connections between said driving-shaft and said air-pump capable of variable speed, a pipe connecting said air-pump and burner, and a regulator in communication with said air-pipe having a reciprocating piston-rod, and a connection between said regulator piston-rod and said movable driving-connections between said driving-shaft and air-pump, substantially as and for the purpose described.

2. An apparatus for securing and regulating the combustion of liquid fuel, comprising a hydrocarbon-burner, a liquid-fuel tank, a pipe connecting said tank and burner, an air-pump, a driving-shaft provided with a cone-pulley, a counter-shaft connected with said air-pump, having a cone-pulley, a belt connecting said cone-pulleys, a pipe connecting said air-pump and burner, and a regulator in communication with said air-pipe, having a reciprocating piston-rod, and a connection between said regulator piston-rod and the belt connecting said cone-pulleys, substantially as and for the purpose described.

3. An apparatus for securing and regulating the combustion of liquid fuel, comprising a hydrocarbon-burner, a liquid-fuel tank, a pipe connecting said tank and burner, an air-pump, a driving-shaft provided with a cone-pulley, a counter-shaft connected with said air-pump,

397,339. ROLLING-MILL PLANT. EDWARD L. CLARK, Pittsburg, Pa. Filed Dec. 14, 1888. Serial No. 293,542. (No model.)



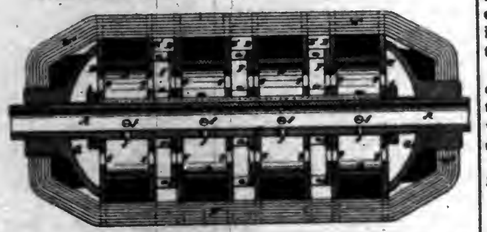
Claim.—1. A continuous reversing rolling-mill plant comprising sets of rolls arranged in lines extending side by side and acting in opposite directions, substantially as and for the purposes described.

2. A continuous reversing rolling-mill plant comprising sets of rolls arranged in substantially parallel lines, the adjacent sets of rolls of the different lines being connected with the same driving-engine, and being geared to rotate in opposite directions, substantially as and for the purposes described.

3. A continuous reversing rolling-mill plant comprising sets of rolls arranged in lines extending side by side and acting in opposite directions, and driven feed-rollers arranged between the sets of rolls in each line, substantially as and for the purposes described.

4. A continuous reversing rolling-mill plant comprising sets of rolls arranged in lines extending side by side and acting in opposite directions, and transfer devices arranged at the end or ends of the lines to shift the metal from one line to the next in order of use, substantially as and for the purposes described.

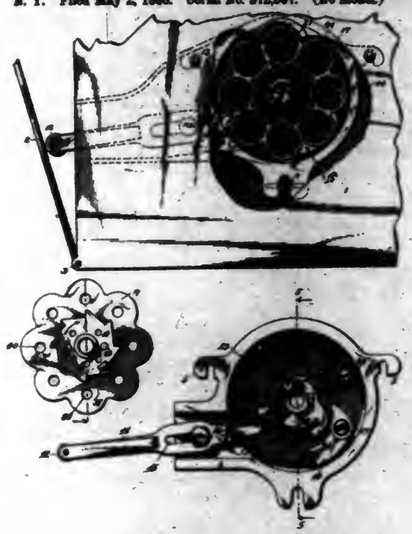
397,340. DYNAMO. ROBERT L. COHEN, Camden, N. J., assignor of one-half to William F. Anderson, Philadelphia, Pa. Filed Sept. 27, 1888. Serial No. 286,556. (No model.)



Claim.—1. The combination of the shaft of an armature with the shell comprising hollow bobbins and interposed spacing-pieces, each hollow bobbin consisting of opposite end disks and an interposed tubular shell, all substantially as specified.

2. The combination of the hollow perforated shaft, the hollow perforated bobbins, and the interposed filling-pieces forming chambers between the bobbins, through which air entering the hollow shaft and bobbins can escape outwardly, all substantially as specified.

397,341. LETTER-BOX INDICATOR. GEORGE A. COLTON, Phœnix, N. Y. Filed May 2, 1888. Serial No. 272,597. (No model.)



Claim.—1. The combination, with a box and its cover, of a ratcheted dial carrying a lug, an interposed ratchet-operating lever, and a reversing-plate, substantially as specified.

2. The combination, with a box and its cover or door, of a ratcheted dial provided with a circular series of apertures, a ratchet-operating lever extending from the dial to the door or cover, a screw adapted to fit any hole in the circular series, a reversing-plate, and means, substantially as described, for giving the dial and reversing-plate backward rotation, substantially as specified.

3. The combination, with a box and its door or cover, of a reciprocating lever, a ratcheted dial connected with its pivot by a spring and provided with a reversing-plate-operating lug or screw, a reversing-plate having a pawl-releasing cam, and a pivoted pawl arranged to co-operate with the ratchet of the dial, substantially as specified.

4. In an indicator of the class described, the combination, with a dial having a ratchet provided with a lug, of a reversing-plate having a pawl-operating cam and a projecting lever-disengaging lug, a gravity-pawl, and a ratchet-operating lever, substantially as specified.

5. In an indicator of the class described, a case for the operating parts, extended to cover the operating-lever thereof and provided with slots or notches adapted to take upon the bodies of screws, one of said screws being provided with a thumb-nut, substantially as specified.

6. In an indicator of the class described, a dial having a series of circular recesses for sub-dials, as 41, a central recess for a spring and the head of the dial-pivot, and having on its rear side a ratchet, and through the body of the dial a series of holes communicating with the dial-recesses, and an inner series of holes for a removable reversing-plate-operating screw or lug, substantially as specified.

7. In an indicator of the class described, a case provided with notched suspension-lugs, and having a main annular recess for the reception and operation of the movable parts of the indicator, and an interior lug, as 36, serving as a stop for a reversing-plate, substantially as specified.

8. In an indicator of the class described, the combination of a case carrying a rigid pivot, as $10^{\times}$, a reciprocating lever mounted thereon and notched, as at 35, a pivot-bolt, as 10, a dial, 17, and reversing-plate 26, mounted thereon, a pawl, 18, and a detent, 28, substantially as specified.

9. The reversing-plate 26, provided with a pawl-operating cam, 31, the lugs 32 33, and the tooth 34, substantially as specified.

397,342. HARROW AND ROLLER. ALBERT H. DAVIS and JOHN H. DAVIS, Loveland, Colo. Filed May 23, 1888. Serial No. 274,706. (No model.)

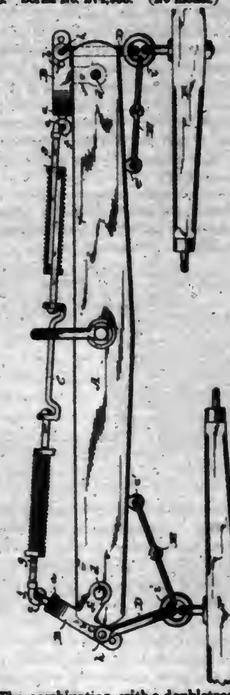
Claim.—1. The combination of the frame A, the roller B, journaled therein and provided with sprocket-wheels C, the revolving cultivator G, the axle of which is provided with the sprocket-wheels E, the sprocket-chains D, for transmitting the rotary motion of the roller to the harrow, adjustable boxes in which the harrow or cultivator is journaled, and the arched connecting-rod L, secured to the frame A at its rear end, and connected to the axle N at its front end by means of a ball-and-socket joint, substantially as shown and described.

2. The combination of the frame A and the curved connecting-rod L, having the seat P secured thereto, and having its front end formed into a ball, with the axle N, supported upon the wheels O, and having a socket to receive the ball, whereby the axle can be turned independently of the frame, substantially as set forth.

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397,343. DRAFT-EQUALIZER. JOHN R. DAVIS, Racine, Wis. Filed May 24, 1888. Serial No. 274,935. (No model.)



Claim.—1. The combination, with a doubletree and clevis having a yielding connection therewith, of a singletree, a link connecting it with the doubletree-clevis, and a guard-link connecting it with the doubletree at a point nearer the center of the doubletree than the clevis-pivot, substantially as described.

2. The combination, with the clevises, of a yielding connection between them, a singletree, and draft and guard links, substantially as set forth.

397,344. WITHDRAWN.

397,345. TRUSS-PAD. OWEN BOBBET, Hickory Run, Pa. Filed Apr. 12, 1887. Serial No. 234,509. (No model.)

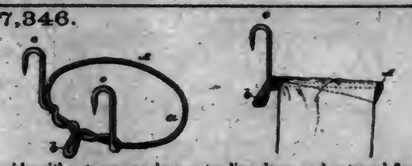


Claim.—An improved pad for a truss, consisting of a closed hollow body the top, bottom, and side walls of which are of rubber and integral, the side walls being of sufficient thickness to distend the body and having V-shaped recesses allowing said sides to yield without bulging, substantially as described.

397,346. BAG-HOLDER. BENJAMIN F. BELL, Wayne, Ill. Filed July 19, 1888. Serial No. 280,205. (No model.)

Claim.—1. A bag-holder consisting of a band or hoop provided

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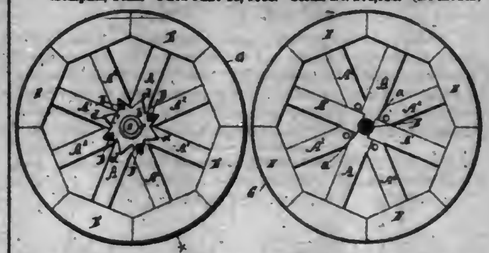
at one side with a tongue or loop extending down and outward from the hoop and having on either side of said tongue vertical shanks, each terminating at top in a hook, substantially as described.

2. A bag-holder consisting of a band or hoop provided at one side with a tongue extending down and outward from the hoop and having on either side of said tongue a vertical shank terminating in a sharp-pointed hook, substantially as described.

3. A bag-holder constructed of a single length of metal and consisting of a hoop provided at one side with a tongue extending down and outward and having on either side of said tongue a vertical shank terminating at top in a hook, substantially as described.

4. A bag-holder constructed of a single blank of metal bent to form the hoop *a* and the doubled tongue *b*, projecting down and outward from the hoop, the end of the blank being coiled around the hoop at each side of the tongue and terminating in vertical shanks having hooks at their upper ends, substantially as described.

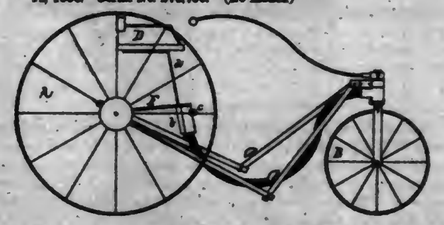
397,347. WHEELBARROW-WHEEL. CHARLES P. FARNSWORTH, Memphis, Tenn. Filed June 13, 1888. Serial No. 276,963. (No model.)



Claim.—1. In a wheelbarrow-wheel, the combination of the spokes A A, having notches *a a* in their inner ends, spokes A′ A′, having square inner ends fitting in the said notches of the first spokes, and the spokes A^2 A^2, having their inner ends formed to fit into the angles between the other spokes, substantially as and for the purpose herein set forth.

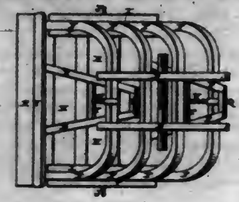
2. In combination with the spokes A A′ A^2 and spindle B, the iron flanges C C, having hollow extensions *b b*, and tubular bearings *c c*, fitting around the spindle, and formed with peripheral projections *d d*, and the bolts D D, passed through the said projections *d d* and the spokes, substantially as and for the purpose herein specified.

397,348. TRICYCLE. WINSLOW L. FAY, Elyria, Ohio. Filed June 11, 1888. Serial No. 276,766. (No model.)

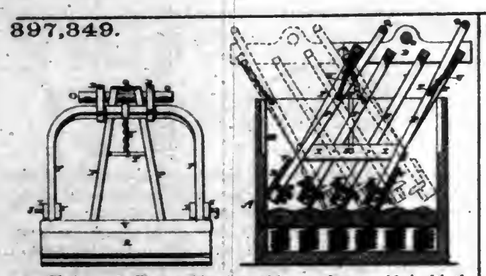


Claim.—In a tricycle, the upright spring *a*, supporting the seat, in combination with the circular spring F and reach *d*, all for the purposes above set forth, and substantially as described.

397,349. WASHING-MACHINE. ISAAC F. FIELD, Sandy Lake, Pa. Filed Apr. 16, 1888. Serial No. 271,261. (Model.)



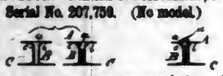
397,349.



Claim.—1. The combination, with a washer provided with the bent rods F, having the rubbing-boards secured to their lower ends, of the levers P, provided with the boards R, and the springs U, substantially as set forth.

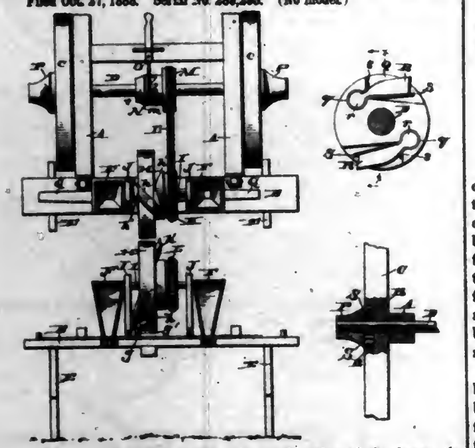
2. The combination of the parallel journals or bearings D, provided with a handle, the bent rods F, journaled in the bearings, the boards secured to the lower ends of the rods F, the connecting-strips carrying journals upon which the washers turn, the levers P, provided with the boards R, and the springs U, substantially as specified.

397,350. BUTTON. DANIEL P. FITZGERALD, Newark, N. J. Filed July 12, 1888. Serial No. 207,750. (No model.)



Claim.—A collar or sleeve button consisting of a single piece of metal wire having the head and an enlargement at the junction of the head and post both made integral with the post and upset from the same wire blank, a socket or cavity in the said head and enlargement to receive a precious stone, and a perforation transversely to the said socket or cavity to admit light underneath the said stone.

397,351. CORN-PLANTER. JASPER D. FITZGERALD, Eldon, Iowa. Filed Oct. 27, 1888. Serial No. 289,268. (No model.)

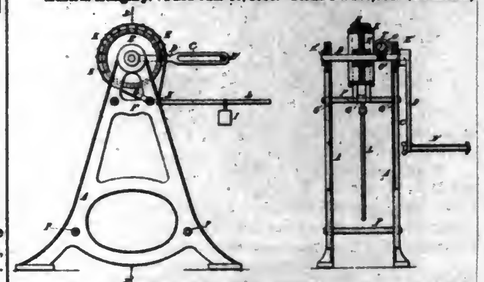


Claim.—1. In a corn-planter, the combination of the frame, the driving-axle, the sprocket-wheel on the said axle, the shaft I, driven from the sprocket-wheel on the axle, the cam-wheel having oblique grooves across its periphery and lateral projections, as *k'*, having their front ends inclined outwardly and forming a prolongation of the rear walls of the said oblique grooves, the seed-slide, and the arm projecting from the seed-slide and adapted to be engaged by the said projections *k'* and carried through the oblique grooves, substantially as and for the purpose described.

2. In a corn-planter, the combination, with the seed-slide having an arm, as *g*, of the wheel H, having oblique grooves *k* and lateral projections *k'*, which have their front ends inclined outwardly and forming a prolongation of the rear walls of the said grooves *k*, substantially as and for the purpose described.

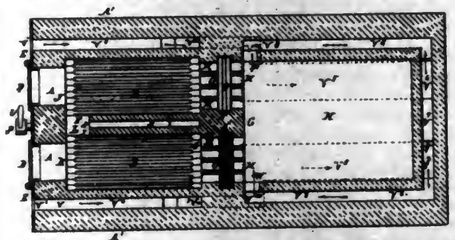
3. In a planter, the combination, with the frame, the seed-slide, the cam-wheel for operating the seed-slide, the axle, and the wheels loosely mounted on the axle and having recesses in their sides, of the hubs keyed to the axle, and having their ends fitted in the said recesses in the wheels, and having recesses Q and circular depressions *q*, the pawls R, having circular heads *r*, and the springs S, having their ends *e* fitted about the circular heads *r* of the said pawls, substantially as described, for the purpose specified.

397,352. EXERCISING-MACHINE. GUSTAVUS GAERTNER, Vienna, Austria-Hungary. Filed Jan. 16, 1888. Serial No. 260,901. (No model.)



Claim.—The combination, with the frame A, the bars P and P, holding the two sides of said frame together, the shaft B, journaled at E' E' in said frame, the wheel E, mounted on said shaft B, and the winch D, attached to said shaft B, having adjustable handle D', and slot C, of the band-brake H, attached by one end to the said frame at N and by the other to the collar G, the blocks K K, attached to said band-brake and bearing upon the face of said wheel, the revolvable bar F, mounted on said frame A, the collar G, mounted on said bar F, the lever L, attached to said bar, and the movable weight I, adapted to be moved along the graduations of the lever L, all substantially as and for the purpose set forth.

397,353. SMOKE-CONSUMING FURNACE. JAMES GILBERT, Omaha, Nebr., assignor of one-half to Charles R. Lee, same place. Filed Mar. 24, 1888. Serial No. 268,384. (No model.)

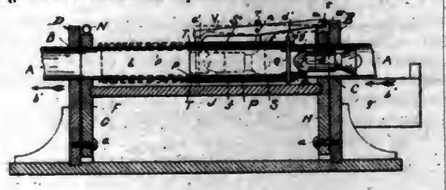


Claim.—1. In a smoke-consuming furnace, the combination, with connected fuel-chambers by an opening in the partition-wall between them and an alternate connected combustion-chamber with said fuel-chamber for passing the hot gases from the fresh-supplied fuel-chamber over the bright fire of the other fuel-chamber, of an upward air-flue, X, from a portion below the grates supplying additional oxygen to said hot gases while passing the bright fire, and also providing air-flues V in the side walls of the furnace delivering air by natural draft at the rear of the bridge-wall for furnishing heated air into the combustion-chamber to said gases, substantially for promoting combustion and the heat of the furnace, as herein set forth.

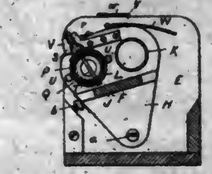
2. In a smoke-consuming furnace, the combination, with its combustion-chamber H and alternate connected and supplied fuel-chambers, of the hot-air flue X for the fuel-chambers supplied independent from a portion of the furnace below its grates, and the air-flues V in the furnace-walls, supplied, as set forth, and delivering beyond the bridge-wall into the combustion-chamber H, and the dampers O, arranged to slide between the front and rear of the double-walled bridge-wall, all combined and within the walls of the furnace.

397,354. PNEUMATIC CASH-CARRIER APPARATUS. JOHN L. GIVEN, Melrose, Mass. Filed Nov. 7, 1888. Serial No. 290,238. (No model.)

Claim.—1. The combination, with a pneumatic tube for the transmission therethrough of a carrier or other article, of intermediate sectional tubes suitably supported and arranged to be moved transversely back and forth for each of said intermediate tubes to be placed in or out of line with the main tube, one of said intermediate tubes being arranged to be locked or held in position when in line with the main tube,



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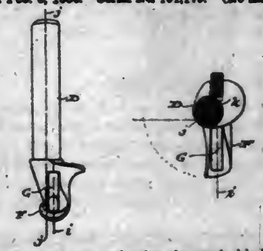
and having a slide arranged to move therein and to be moved as the carrier makes connection therewith in its transmission through the tube to release or unlock said intermediate slide-tube for its return to its normal position, for the purpose specified.

2. The combination, with a pneumatic tube for the transmission therethrough of a carrier or other article, of intermediate sectional tubes suitably supported and arranged to be moved transversely back and forth for each of said intermediate tubes to be placed in or out of line with the main tube, one of said intermediate tubes being arranged to be locked or held in position by a latch when in line with the main tube, and having a slide arranged to move therein and to be moved as the carrier makes connection therewith in its transmission through the tube to unfasten said latch for said intermediate slide-tube to return to its normal position, for the purpose specified.

3. The combination, with a pneumatic tube for the transmission therethrough of a carrier or other article, of intermediate sectional tubes, one provided with a slide arranged to move back and forth therein and adapted to receive the carrier, said intermediate tubes being carried by a frame or support arranged to move transversely back and forth for each of said intermediate tubes to be placed in or out of line with the main tube, said intermediate slide-tube being provided with a latch or locking device arranged to engage with the frame or support when in line with the main tube and in position to be operated by the slide when moved into proper position therefor as the carrier makes connection therewith to release or unlock said locking device, for the purpose specified.

4. The combination, with a pneumatic tube for the transmission therethrough of a carrier or other article, of intermediate sectional tubes secured in a frame pivoted to a suitable support provided with a spring and arranged to be moved transversely back and forth to place either one or the other of said intermediate tubes in or out of line with and between the two contiguous ends of the main tube, one of said intermediate tubes having a pivoted spring-latch or locking device arranged to engage with a stop or shoulder on said support when said intermediate tube is in line with the main tube, and said intermediate tube having an internal slide with which the carrier engages in its transmission through the tube to be moved therewith, and provided with a pin or projection to operate said latch, for the purpose specified.

397,355. KNOT-TYER FOR GRAIN-BINDERS. JAMES A. GRAHAM, Milwaukee, Wis., assignor to the Milwaukee Harvester Company, same place. Filed Feb. 8, 1886. Serial No. 191,179. (No model.)



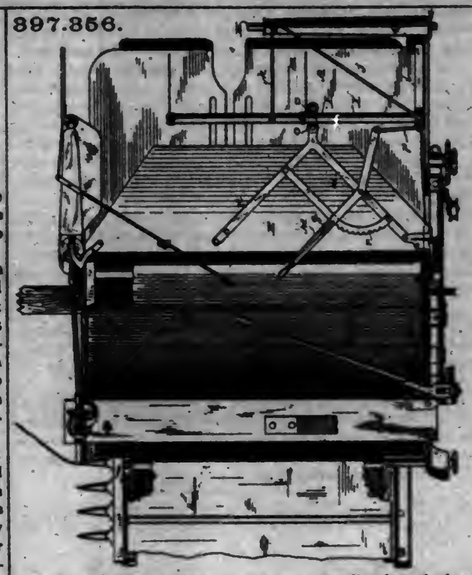
Claim.—In a knotting mechanism for grain-binders, a knotter having the lower jaw of its bill arranged with relation to the shank so that a longitudinal line drawn through the center of this jaw forms a tangent to a circle struck from the axis of the knotter and the working side of said jaw is offset from the adjacent side of said shank a distance approximately equal to that between the longitudinal line and axis, substantially as and for the purpose set forth.

397,356. BINDER-SHIFTING MECHANISM. JAMES A. GRAHAM, Milwaukee, Wis., assignor to the Milwaukee Harvester Company, same place. Filed Nov. 14, 1887. Serial No. 255,090. (No model.)

Claim.—1. The combination, with the binder-frame and deck, of the elevator-frame, and braces extending therefrom over the binder-deck and forming a bearing, a guide-bar braced to the binder-frame and adapted to slide in said bearing, and a lever pivoted on the harvester and connecting it with the binder-frame, substantially as described.

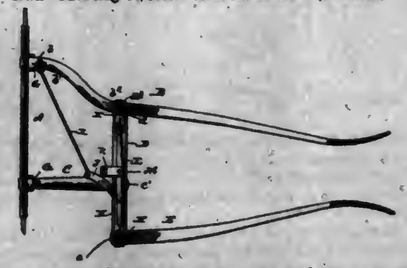
2. The combination, with the binder-frame and deck, of a hood

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extending from the elevator-frame, braces extending from the hood and forming a bearing, a guide-bar braced to the binder-frame and adapted to slide in said bearing, and a shifting-lever pivoted to the hood and connecting it with the binder-frame, substantially as described.

397,357. THILL FOR VEHICLES. ELIJAH J. HAGAN, Bayard, Iowa. Filed Aug. 18, 1888. Serial No. 283,066. (No model.)



Claim.—The combination of the curved thill, the cross-piece, the curved heel secured to the cross-piece at a point near its center, the equalizing-lever having one end pivoted to the cross-piece and at its other end formed into a loop, a singletree pivoted in the said lever, a link pivoted to the lever at a point intermediate its length, and a brace-rod secured to the link and to a lip on the curved thill, substantially as and for the purpose described.

397,358. DOUBLE-DECK HARROW. WILLIAM H. HALL, Tiffin, Ohio. Filed Sept. 15, 1888. Serial No. 285,544. (No model.)



Claim.—1. In a double-deck harrow, the upper deck divided longitudinally into independent sections removably supported over the lower deck, for the purpose set forth.

2. In a double-deck harrow, the upper deck divided longitudinally into independent swinging sections arranged to swing, respectively, to

opposite sides of the barrow, whereby said sections may be brought into position to conjointly form a completed upper deck or swung out of the way, so as to leave an unobstructed space over the lower deck.

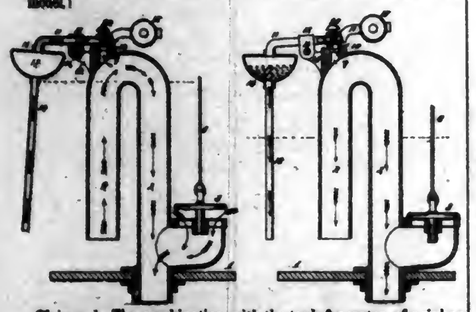
3. The combination, substantially as hereinbefore set forth, with the body-frame adapted to afford a lower deck, of the longitudinally-arranged independent bars *d*, connected with the body-frame by laterally-swinging arms, and stands by which said bars can be supported in position over the lower deck to provide a completed upper deck.

4. The combination, substantially as hereinbefore set forth, with the body-frame adapted to afford a lower deck, of the longitudinally-arranged independent bars *d*, connected with the body-frame by laterally-swinging arms, and stands or legs adapted for supporting said bars in position over the lower deck to provide a completed upper deck, said swinging arms being pivoted at points that are farther toward the sides of the barrow than the points whereat the stands are positioned, for the purpose described.

5. The combination, substantially as hereinbefore set forth, with the lower body-frame adapted to afford a lower deck, of the stands F, arranged at the front and rear ends of said body-frame, and the independent lateral bars *d*, removably supported upon said stands, for the purpose described.

6. The combination, substantially as hereinbefore set forth, with the wheel-supported frame A, of the upper deck divided longitudinally into independent sections, and the swinging arms E, secured to said sections of the upper deck and pivotally attached to the end cross-bars of the wheel-supported frame.

397,359. SIPHON-VALVE FOR WATER-CLOSETS. CHARLES H. HARKINS, St. Louis, Mo. Filed Sept. 17, 1888. Serial No. 285,835. (No model.)



Claim.—1. The combination, with the tank for water, of a siphon having an air-passage leading thereinto, a movable chamber communicating with the water in said tank and with said siphon, and a valve for controlling said air-passage connected to said movable chamber, substantially as set forth.

2. In combination with a water-tank and a siphon having a port, a valve controlling said port, and a chamber having communication with the siphon and with the water in the tank and connected to said valve, whereby the action of the siphon exhausts the air from said chamber, and the latter is loaded with water to operate said valve, substantially as and for the purposes set forth.

3. The combination of the tank, the siphon having a port, a pivoted valve controlling said port, a chamber having communication with said siphon and connected to said valve for operating it, and a pipe connected to the chamber and extending into the tank, substantially as and for the purposes set forth.

4. The combination of a tank, a siphon having a perforation, a valve controlling the perforation of the siphon, a hollow pivoted lever to which the valve is secured, a chamber on the lever, and a pipe secured to the chamber and extending into the tank, substantially as set forth.

5. The combination of a tank, a siphon having a perforation, a valve controlling the perforation of the siphon, a weighted pivoted lever to which the valve is secured, a chamber communicating with said siphon secured to the lever, and a pipe secured to said chamber, substantially as and for the purpose set forth.

6. The combination, with a tank, of a siphon having a perforation, a hollow valve controlling the perforation of the siphon, a hollow pivoted and weighted lever, a chamber communicating with the hollow lever, a pipe communicating with the chamber and extending into the tank, and a regulating-valve, all substantially as and for the purpose set forth.

397,360. MINDING SHEET-MUSIC. ELBRIDGE HARRIS, Boston, Mass. Filed July 13, 1888. Serial No. 307,792. (Model.)

Claim.—1. The combination, with folded leaves and a leaf of sheet-music or other sheet material disposed between the folded leaves, of a longitudinally-folded strip of suitable flexible sheet material secured

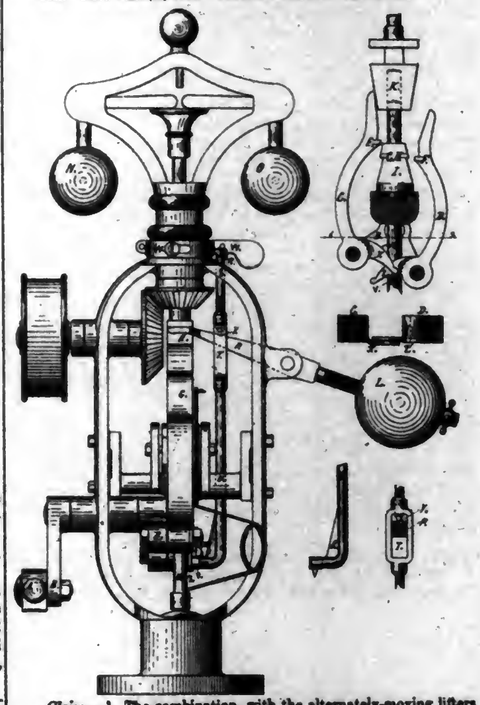


397,360.

by one fold to the inside and at the fold of one of said folded leaves, and by the other fold of said strip to the intermediate leaf, by paste or other suitable adhesive material, for the purpose specified.

2. The combination, with two sets of folded leaves of sheet-music or other sheet material, of a longitudinally-folded strip of suitable flexible sheet material secured to said leaves at their folded edges by paste or other suitable adhesive material, one set of such folded leaves within the other set of folded leaves, and each set of folded leaves secured to a separate fold of the strip, for the purpose specified.

397,361. CUT-OFF AND GOVERNOR. EMIL HARTUNG, Denver, Colo. Filed June 26, 1888. Serial No. 278,233. (No model.)



Claim.—1. The combination, with the alternately-moving lifters C and D and lifting-block I, of levers or thumbs connected with said lifters and means automatically brought into play on derangement of governor or belting to act on said levers to throw the lifters away from the beater, so as not to engage therewith in the movement of the stem carrying the beater, substantially as and for the purposes set forth.

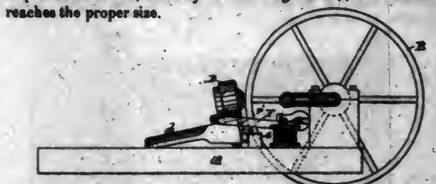
2. The combination, with the alternately-moving lifters C and D and lifting-block I, of levers or thumbs X and Z, connected with said lifters, a reciprocating rod constructed to engage with said levers or thumbs, and means for automatically moving said rod on derangement of governor or belting to engage with said levers to throw the lifters away from the beater, so as not to engage therewith in the movement of the stem carrying the beater, substantially as and for the purposes set forth.

3. The combination, with the alternately-moving lifters C and D and lifting-block I, of levers or thumbs X and Z, connected with said lifters, a reciprocating rod constructed to engage with said levers or thumbs, means for holding said rod out of engagement with said levers or thumbs, and means for automatically moving said rod on derangement of governor or belting to engage with said levers to throw the lifters away from the beater, so as not to engage therewith in the movement of the stem carrying the beater, substantially as and for the purposes set forth.

4. The combination, with the beater I, lifters C D, and lever P, of the levers or thumbs X and Z, connected with said lifters, a rod constructed to engage with said levers or thumbs, when moved in line therewith, to throw said lifters out of line with said beater, and adapted to have said lever P engaged with it to bring it to bear against said thumbs, and a locking device, W, to hold said rod out of engagement with said thumbs while the engine is being started, said rod being free to be moved by said lever P after the engine is started, whereby the engine may be automatically stopped should the necessity therefor arise, substantially as set forth.

397,362. MACHINE FOR WINDING BALLS. HARRISON HARWOOD, Natick, Mass. Filed Mar. 2, 1885. Serial No. 157,663. (No model.)

Brief.—The invention is an improvement upon that class of machines for winding balls in which the ball is held against the winding-wheel by a conical or bell-shaped cup. In this case the cup has a spherical interior, whereby the winding is stopped when the ball reaches the proper size.



Claim.—In a ball-winding machine, a ball-winding wheel, B, and cup D, having a spherical interior, arranged and operating substantially as set forth.

397,363. SPARK EXTINGUISHER AND ARRESTER. CLINTON J. HOKE, Yorkville, assignor to himself, William J. Herron, Winnsborough, and J. Robert Lindsay and Samuel L. Miller, both of Yorkville, S. C. Filed Aug. 13, 1888. Serial No. 282,608. (No model.)



Claim.—1. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle and imparting a gyratory motion to said jets, substantially as and for the purposes specified.

2. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam at an inclination to a vertical into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle and imparting a gyratory motion to said jets, substantially as and for the purposes specified.

3. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam in the form of sheets into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle, substantially as and for the purposes specified.

4. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam in the form of sheets increasing in volume or density in a radial direction into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle, substantially as and for the purposes specified.

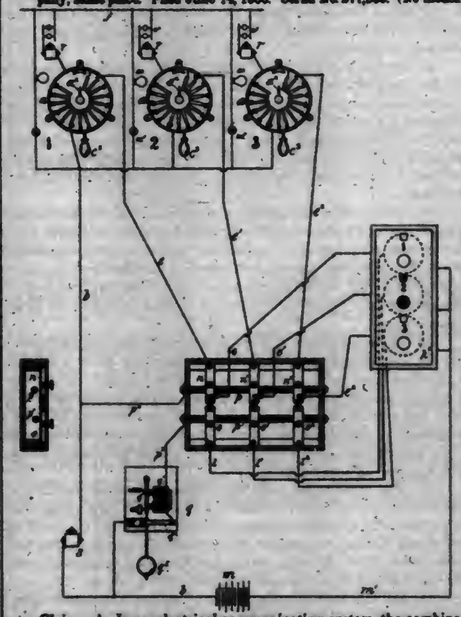
5. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam in the form of sheets into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle and imparting a gyratory motion to the jets, substantially as and for the purposes specified.

6. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam in the form of a sheet and at an inclination to the vertical into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle, substantially as and for the purposes specified.

7. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion through the smoke-stack of a steam-engine, which consists in injecting jets of steam at an inclination to a vertical and in the form of a sheet increasing in volume or density in a radial direction into the base of the stack from points on a circle concentric with the axis of the stack and on lines tangential to the said circle, substantially as and for the purposes specified.

8. The herein-described method of extinguishing and arresting incandescent particles carried along with the products of combustion, through the smoke-stack of a steam-engine, which consists in injecting jets of steam at an inclination to a vertical and in the form of a sheet increasing in volume or density in a radial direction into the base of the stack from points on a circle concentric with the axis of said stack and on lines tangential to the said circle and imparting a gyratory motion to the jets, substantially as and for the purposes specified.

397,364. ELECTRIC COMMUNICATING SYSTEM. ALFRED G. HOLCOMBE, New York, N. Y., assignor to the Equitable Electric Company, same place. Filed June 14, 1888. Serial No. 277,069. (No model.)



Claim.—1. In an electrical communicating system, the combination, with a source of electric energy, signaling devices located at a central and sub stations, and circuit-connections uniting said stations, of electric lamps located in branch lines at the sub-stations and having suitable circuit-closing devices, whereby they may be lighted at the will of the operators at the sub-stations, substantially as set forth.

2. The combination, substantially as set forth, with the all-around battery-wire, of the collective wire, the sub-station signaling devices located between said wires, the individual lines leading from said signaling devices to the central station, and an electric lamp and its switch at each sub-station placed in a shunt around the signaling devices.

3. In an electrical communicating system, the combination, with the sub-stations, the individual lines, and the step-by-step indicators of each line, of a sub-circuit for each indicator including the operating-magnet thereof, an automatic rheotome or vibrator, and a circuit-completing switch or key, whereby, after a signal is registered upon the indicator, it may be automatically returned to zero by closing the vibrator-circuit, substantially as set forth.

4. The combination of the central and sub stations, the individual lines leading from the sub-stations to the keys $n\ n'\ n^2$ at the central station, through which they are normally closed through the magnets of their respective indicators, sub-circuits also including said magnets, a rheotome and normally-open keys, $o\ o'\ o^2$, and connecting bars or devices between the keys $n\ n'\ n^2$ and $o\ o'\ o^2$, whereby, when the latter keys are operated to close the sub-circuits to bring the indicator to zero the normally-closed individual lines are opened at the former keys, substantially as set forth.

5. The combination, with a battery located at the central station, of an all-around battery-wire connected therewith and leading to all the sub-stations, individual lines running from said stations to the central station, where each one passes through its indicator to the opposite pole of the battery, and a normally-open sub-circuit for each indicator connected with one pole of said battery and including an automatically-acting rheotome and connected through the indicator with the opposite pole of said battery, substantially as set forth.

6. The combination of the indicator-disk marked to correspond with the predetermined signals to be received, and also having portions of its face differently marked to indicate when it is at zero and when not, (as, for instance, a white spot to indicate zero and the remainder black,) of a face-plate having two apertures—one through which the received signal is read and another through which the face of the disk is seen—to indicate conspicuously when the disk has been moved from zero, substantially as and for the purpose set forth.

7. The combination of the indicator or annunciator, its individual line in which its actuating-magnet is included, a sub-circuit normally open at two points, contacts operated by the movement of the indicator which automatically close said sub-circuit at one point when the indicator is moved from the zero-point, a circuit opener or insulator which opens said contacts at the same point when the indicator is returned to zero, and a circuit-closing key or switch for closing the circuit at the other point at will to return the indicator to zero, substantially as set forth.

8. The combination of the indicator-disk, its actuating-magnet, ratchet and pawl, its individual line in which the magnet is included, the sub-circuit containing the automatically-acting rheotome and also including said actuating-magnet, the contacts l^2 l^3 l^4, included in the sub-circuit, and the insulator which opens said contacts when the indicator-disk is at zero, and a circuit-closing key or switch for closing said sub-circuit at will to return the indicator to zero, substantially as set forth.

9. The combination, with the rotating indicator-disk, its driving-ratchet, actuating-magnet, and armature-lever, of the pivoted lever j^3, having a stop located out of a line drawn from its pivot perpendicular to the armature and against which the armature-lever strikes when retracted to force the end of the lever j^3 between the teeth of the ratchet and rectify the position of the disk, substantially as set forth.

10. The combination, with the rotating indicator-disk, its driving-ratchet, actuating-magnet, and armature-lever and pawl, of the pivoted elbow-lever normally drawn by its spring against the driving-ratchet to prevent its false movement and a stop carried by the elbow-lever and located out of a line drawn from the pivot of said lever perpendicular to the armature, against which the armature-lever falls when retracted to operate the elbow and rectify the position of the disk, substantially as set forth.

11. The combination, with the indicator-actuating magnet and the sub-circuit in which it is included, of an automatically-acting rheotome consisting of an electro-magnet, its vibrating armature-lever, an independent circuit-completer operated by the armature-lever and loosely connected therewith, and a key for closing said circuit, substantially as and for the purpose set forth.

12. In a call-box, the combination of the rotating spindle carrying the pointer and the notched circuit-making wheel, the winding-sleeve, the movable contact-arm d, contacts d' d^2, the insulated stop on the winding-sleeve which normally holds said arm on one of said contacts, the lever a^4, connected with the other of said stops and operated by the notched circuit-making wheel, and locking devices interposed between the spindle and winding-sleeve, whereby when the pointer is set and the sleeve released the required signal is transmitted, substantially as set forth.

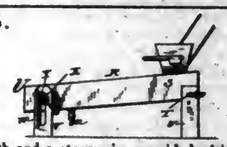
13. The combination, with the spindle carrying the notched signaling-wheel and pointer, of the winding-sleeve, the notched flange thereon, the catch or dog a^7, the stop or pin a^6 on the wheel, and the stop a^5, against which it works, whereby the pointer and notched signaling-wheel may be freely rotated in either direction, but are carried around when the sleeve is released in transmitting a signal.

14. The combination of the collective wire f, the stop d', with which it is connected, the contact-arm d, connected with the individual line and normally resting against said stop, the stop d^2, connected with the all-around battery-wire, against which the arm d rests when a signal is being transmitted, the notched transmitting-wheel and its spindle, the winding-sleeve and drum, and the locking devices between the sleeve and signal-transmitting devices, consisting of the pawl a^7, for engaging the sleeve, and the stops a^6 a^5, substantially as set forth.

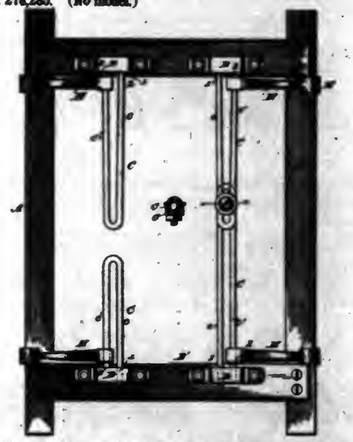
397,365. APPARATUS FOR CONVERTING CAST-IRON. LEOPOLD LANER, Louisville, Ky. Filed Nov. 19, 1887. Serial No. 255,623. (No model.)

Claim.—The apparatus for converting iron or steel, consisting of the inclined trough or receiver having a series of uniform steps traversing its length and a steam-pipe provided with a series of branch pipes or arms rising vertically through said steps, one at each riser of a step, and having their discharging ends stopping a short distance below the higher steps and a short distance above the lower steps, substantially as shown.

397,365.



397,366. VEHICLE-SPRING. EDWIN JARRELL, Harper, Kans., assignor to Harry W. McMunn, same place. Filed June 26, 1888. Serial No. 278,285. (No model.)

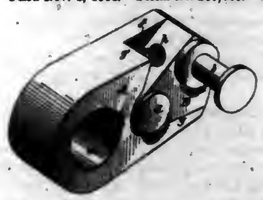


Claim.—1. The combination of the framing, the clip or bracket secured to said framing, and the torsion-spring, consisting of a plurality of arms united or joined together, the free end of one arm being rigidly clamped in the clip or bracket, and the free end of the other arm being journaled in the bracket, the latter arm being provided close to the bracket and between the same and its juncture with the other arm with the connecting-arm, substantially as set forth.

2. A vehicle-spring formed of a plurality of arms united together at one end, one of such arms being bent outward near its free end to form a connecting-rod, and provided beyond such connecting-rod with a trunnion-like extension, substantially as set forth.

3. The combination of the framing, the torsion-springs arranged at the opposite sides of the ends thereof, secured to the framing and projected inwardly toward each other, the front and rear springs on the same side being lapped together at their inner ends, and connections for uniting the inner lapped ends of said springs, substantially as set forth.

397,367. CRANK FOR MACHINERY. WILLIAM H. KAYE, Wenonah, N. J. Filed Nov. 1, 1888. Serial No. 289,705. (No model.)

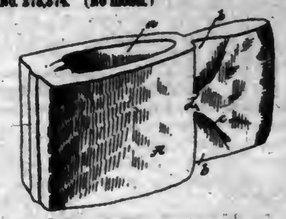


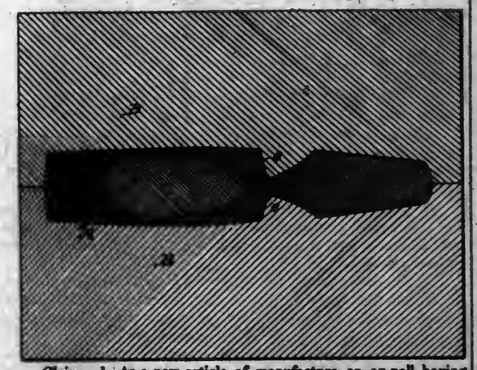
Claim.—1. The combination of the crank, the crank-pin carried by a block pivoted to the crank at a point offset in respect to a line between the centers of the crank-shaft opening and crank-pin, and a spring acting upon the block to preserve it in its normal position, all substantially as specified.

2. The combination of the crank-arm, the crank-pin carried by a block pivoted to the crank-arm at a point offset in respect to a line between the centers of the crank-shaft opening and crank-pin, and a spring interposed between said pivoted block and a bearing on the crank-arm, all substantially as specified.

3. The combination of the crank-arm having a recessed face, a block carrying the crank-pin and pivoted in said recess at a point offset in respect to a line between the centers of the crank-shaft opening and crank-pin, and a spring interposed between said block and a shoulder on the crank-arm, all substantially as specified.

397,368. AX-POLL. WILLIAM C. KELLY, Louisville, Ky., assignor to the Kelly Axe Manufacturing Company, same place. Filed June 27, 1888. Serial No. 278,374. (No model.)

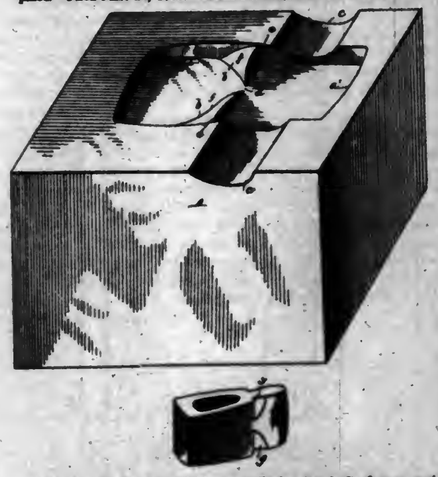




Claim.—1. As a new article of manufacture, an ax-poll having in each side thereof two corresponding recesses or depressions slightly beveled inwardly or toward each other and diverging in a taper in the direction of the corners of the thinnest portion of the poll, substantially as described.

2. As a new article of manufacture, an ax-poll having the eye slightly tapering in direction of its length, the same having in each side thereof two corresponding recesses or depressions slightly beveled inwardly or toward each other and diverging in a taper in the direction of the corners of the thinnest portion of the poll, substantially as described.

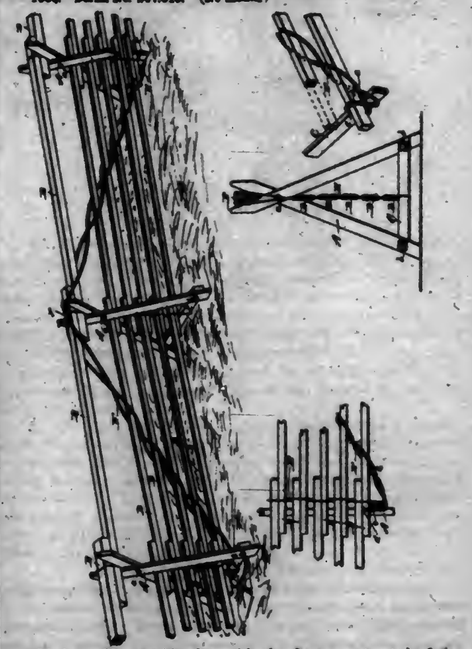
397,369. DIE FOR MAKING AX-POLLS. WILLIAM C. KELLY, Louisville, Ky., assignor to the Kelly Axe Manufacturing Company, same place. Filed June 27, 1888. Serial No. 278,375. (No model.)



Claim.—1. A die for making ax-polls, having in its face a cavity or recess and formed with the projections b b, substantially as described.

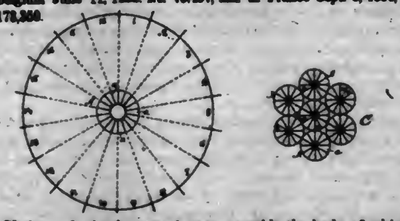
2. A die for making ax-polls, having in its face the cavity slightly curved between the points a a' and formed with the projections b b, the boundary lines of which intersect each other in curvilineal angles, substantially as described.

397,370. FENCE. JACOB C. KEEP, Tiffin, Ohio. Filed Mar. 30, 1888. Serial No. 267,815. (No model.)



Claim.—The combination, with the fence constructed of the crossed supporting-stakes A, the cross-bars C, secured to the said stakes near their lower ends, the overlapping rider-rails, the overlapping fence-rails, and a tie-wire, E, securing the overlapped ends of the said rails together, of a double wire brace, F, having formed in one end a loop, c, looped over the projecting end of the lower fence-rail, the two portions of the brace being passed down under the cross-rail C and crossed again at c, and then up diagonally across the panel and again crossed at f directly over the overlapped ends of the rider-rails, the two portions of the wire being then passed down diagonally across the adjacent panel and under another cross-rail C and looped up over the end of the lower fence-rail, the two wires of the brace being drawn taut and intertwined between the rails of both panels, substantially as and for the purpose set forth.

397,371. WIRE ROPE OR CABLE. WILLIAM H. LAIDLAW and THOMAS LAIDLAW, Maiden House, No. 9 Leopold Street, Burdett Road, Bow, County of Middlesex, England. Filed Dec. 9, 1886. Serial No. 221,022. (No model.) Patented in England May 9, 1885, No. 5,755; in Belgium June 11, 1886, No. 73,457, and in France Sept. 6, 1886, No. 178,360.

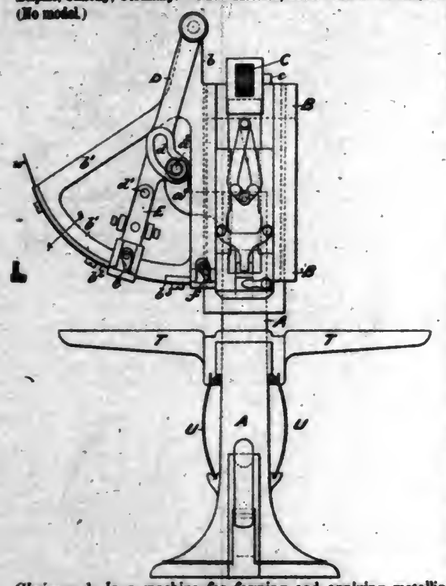


Claim.—1. A wire strand, rope, or cable the body of which is composed of a number of twisted sectoral wires disposed around a common center with their radial faces abutting, said sectoral wires extending inward approximately to the center of the strand, rope, or cable, substantially as described.

2. A wire strand, rope, or cable the body of which is composed of a number of twisted truncated sectoral wires disposed around a common center, with their radial faces abutting, said sectoral wires extending inwardly approximately to the center of the strand, rope, or cable, substantially as described.

3. A wire rope or cable composed of a number of strands twisted together, the body of each strand being composed of a number of twisted sectoral wires disposed around a common center, with their radial faces abutting, said wires extending inward approximately to said center, substantially as described.

397,372. WIRE-STITCHING MACHINE. CARL L. LASCH, Reudnitz, Leipsic, Saxony, Germany. Filed Mar. 16, 1887. Serial No. 231,167. (No model.)



Claim.—1. In a machine for forming and applying metallic staples, the combination, with the main frame or machine stand, of a feed-lever, D, having a movable gripping-piece, E, a slide, B, carrying a guide, *b'*, and pawl *f* for the wire, as well as the fulcrum-support *b* and the stops *b² b²* for the lever D, mechanism, substantially as described, for producing a pivotal motion of the lever D by the up-and-down motion of the slide B, operating-lever C, adapted to press the slide B downward until the lever D has completed its travel, and means for automatically replacing the lever C into its starting position.

2. In a machine for forming and applying metallic staples, mechanism for operating the cutting-slide J in unison with the staple-driver H, said mechanism comprising a double knee-joint formed by links K K' L L', a pair of lateral guides, N N', provided with recesses *n n'*, and a pair of friction-rollers adapted to slide along the said guides, substantially as described.

3. The combination of the base-plate M, with bending-slide or staple-driver H, cutting-slide J, links K K' L L', pivots *k k' l*, guide-plates N N', having recesses *n n'*, and brake mechanism R S, the whole constructed and adapted to operate substantially as described.

397,373. MANUFACTURE OF CEMENT. ROBERT W. LESLEY, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,009. (No specimens.)

Claim.—1. In the manufacture of cement from slags, the method of incorporating with the slag lime or other ingredients in the proportions necessary to bring the slag to a composition of Portland cement, which consists in injecting into slag heated to fluid condition the lime or other ingredients in finely-divided condition and at a high heat, substantially as specified.

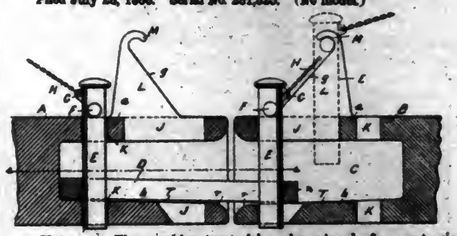
2. The described process of making Portland cement, which consists in taking the molten slag drawn off from iron-furnaces, injecting into the slag while still fluid highly-heated and finely-divided lime or other ingredients, the mass being maintained at the temperature at which said heated ingredients will chemically combine or unite with the slag, then running this fluid product or mixture into water or sprinkling it with water, so as to bring it to granular condition, and finally reducing this granular material to a powder, substantially as hereinbefore set forth.

397,374. FAUCET. CHARLES O. MADDOX, Belle View, Fla. Filed July 12, 1888. Serial No. 279,778. (No model.)



Claim.—The combination, with the cylinder B, adapted to be screwed into the head of a cask, of the integrally-formed guard-cup C, adapted to rest against the wall of the cask and to lie entirely within the plane of the ends of the staves, the tube D, sliding in said cylinder and provided at each end with a screw-thread for engagement therewith, the valve H in the outer end of said tube, the handle J, lying wholly within the cup, and the stop M, for securing simultaneous rotation of the handle and tube when the former is turned beyond a certain limit in either direction.

397,375. CAR-COUPLING. HORACE H. MANSFIELD, Boston, Mass. Filed July 26, 1888. Serial No. 281,225. (No model.)



Claim.—1. The combination, with a draw-head of a car having an opening, C, a socket, J, and inclined edges *g* at the sides of said socket, of a pin, E, provided with cross-arms F, for the purpose specified.

2. The combination, with a draw-head of a car having an opening, C, a socket, J, inclined edges *g*, and a stop or hook, M, at the sides of said socket, of a pin, E, provided with cross-arms F, for the purpose specified.

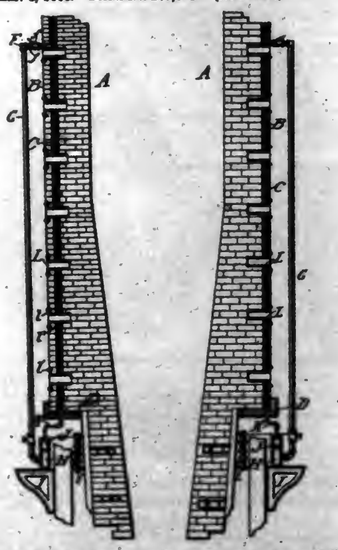
3. The combination, with a draw-head of a car having an opening, C, a socket, J, and inclined edges *g* at the sides of said socket, of a pin, E, provided with cross-arms F and connected by chains or cords H Q R to the end of the car, for the purpose specified.

4. The combination, with a draw-head of a car having an opening, C, a socket, J, inclined edges *g* at the sides of said socket, and a socket, K, of a pin, E, provided with cross-arms F, for the purpose specified.

5. The combination, with a draw-head of a car having an opening, C, an inclined bottom surface, T, socket J, inclined edges *g*, and stops or hooks M at the sides of said socket, of a pin, E, provided with cross-arms F, for the purpose specified.

6. The combination, with a draw-head of a car having an opening, C, an inclined bottom surface, T, socket J, inclined edges *g*, stops or hooks M, and socket K, of a pin, E, provided with cross-arms F, for the purpose specified.

397,376. DEVICE FOR PROTECTING FURNACES OR LIKE STRUCTURES. SAMUEL MCCLURE and CHARLES F. PHILLIPS, Sharon, Pa. Filed Mar. 1, 1888. Serial No. 265,873. (No model.)

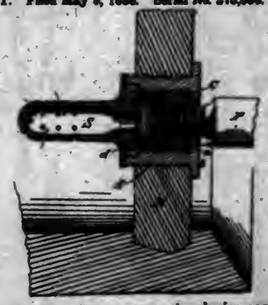


Claim.—1. In a furnace having a space in its wall filled with gravel or like material, a horizontal water-pipe embedded in said filling and perforated on its lower side, an external supply-pipe, as H, to contain water under pressure, and vertical pipes, as G, to supply water to the said horizontal water-pipe to fill said space by percolation, substantially as described.

2. In a furnace having a space in its wall filled with gravel or similar material, a horizontal water-pipe composed of disconnected sections having closed ends, said pipe being embedded in said filling and perforated, a supply-pipe, as H, and a series of external vertical pipes connecting said pipe H to each section of the horizontal water-pipe, substantially as described.

3. In a furnace having a space in the wall filled with gravel or like material, and also having a water-pipe embedded in said filling for supplying water thereto by percolation, a series of observation-boxes in the furnace-wall open at their outer ends and having a slot registering with the filled space in the wall, substantially as and for the purpose set forth.

397,377. TAPPING-BUSH FOR BARRELS. JOHN MCKENZIE, West Troy, N. Y. Filed May 9, 1888. Serial No. 273,330. (No model.)



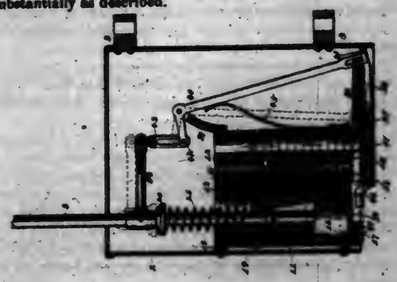
Claim.—1. A tapping or connecting device consisting of an internally-threaded bushing with valve-seats at its inner and outer ends and a double-ended valve fitted to screw in said bushing, and having a socket in its outer end communicating with ports in said valve between the ends thereof, said socket having a thread of opposite character to that of the valve, whereby the screwing of a faucet fitting into said socket or out of same acts to seat or unseat one of the other of the valves.

2. The tapping or connecting device consisting of the internally-threaded bushing A, having the two internal valve-seats *a* and *d* wholly within said bushing, and the valve-piece C, threaded internally and externally, and having at its ends the respective valve-faces *v* and *v'*, and intermediate ports, *e*, communicating with the outer end of valve-piece C, the said valve-piece being shorter than the interior of the bushing and adapted to move back and forth therein.

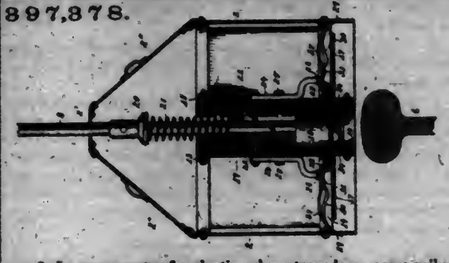
3. The tapping or connecting device consisting of the internally-threaded bushing A, having seat *a*, plug or strainer S, having counter-ported seat *d* and externally-threaded valve-piece C, having the valve-faces *v* and *v'* and intermediate ports, *e*, and constructed at its outer end with the socket D, reaching to said ports *e* and having an internal thread of opposite character to that in the bushing, substantially as described.

397,378. APPARATUS FOR DEPOSITING TORPEDOES UPON RAILWAY-TRACKS. JAMES P. MCLAUGHLIN, Philadelphia, Pa. Filed Nov. 15, 1888. Serial No. 290,912. (No model.)

Claim.—1. In an apparatus for planting alarm-torpedoes upon a railway-track from a moving train, the combination of a hopper containing suitably-shaped torpedoes, a discharging-cylinder parallel with the hopper, and a plunger for transferring a torpedo from the hopper into the discharge-cylinder, with a piston for expelling the torpedo from the discharge-cylinder, and pivoted arms actuated by the piston or piston-rod for fastening the discharged torpedo to the head of the rail, substantially as described.



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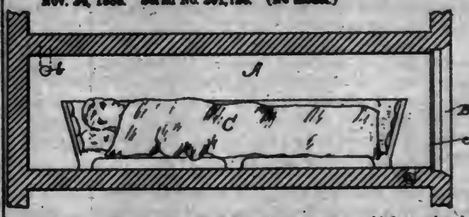


2. In an apparatus for planting alarm-torpedoes upon a railway-track from a moving train, the combination of a torpedo-hopper secured behind the rear wheels of a railway-car, and a discharge-cylinder parallel with said hopper extending within close proximity of a rail of the track, with a piston fitted into the discharge-cylinder for expelling torpedoes therefrom, spring-supported binding-arms pivoted to diametrically-opposite sides of the discharge-cylinder, and reciprocating rods carried by the piston-rod for actuating the binding-arms to secure the discharged torpedo to the head of the rail, substantially as described.

3. In an apparatus for planting alarm-torpedoes upon a railway-track from a moving train, the combination of a torpedo-hopper and a discharge-cylinder parallel therewith and in close proximity to one rail of the track, with mechanism for transferring the torpedoes one by one from the hopper to the discharge-cylinder, and mechanism, substantially as described, actuated from the car to expel the transferred torpedoes from the discharge-cylinder and to bind them to the head of the rail, substantially as described.

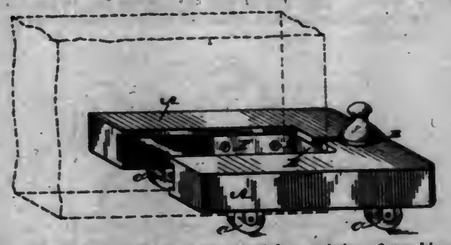
4. In an apparatus for planting alarm-torpedoes upon a railway-track from a moving train, the combination of a torpedo-hopper and a discharge-cylinder parallel therewith, both being cut away near their lower ends, whereby communication is established between the same, with a plunger for transferring torpedoes from the hopper into the discharge-cylinder, springs for supporting the torpedo during the transfer and sustaining the same in the discharge-cylinder, and means, as described, for actuating the plunger and for expelling the torpedoes from the discharge-cylinder, substantially as described.

397,379. PRESERVING CORPSES. JOHN G. MEYERS, Washington, D. C., assignor to the New Mausoleum Company, Alexandria, Va. Filed Nov. 24, 1888. Serial No. 291,736. (No model.)



Claim.—The process of desiccating a corpse, which consists in placing the same in a vault or cell of a mausoleum, hermetically sealing the same, except as to inlet and outlet passages for air, then passing through the cell a current of dried or atmospheric air, substantially as and for the purpose set forth.

397,380. DOOR-CHECK. BENJAMIN A. MITCHELL, Jr., Philadelphia, Pa. Filed Oct. 27, 1888. Serial No. 289,282. (No model.)



Claim.—1. A door check or weight consisting of two hinged jaws forming a separating-yoke adapted to embrace a door, substantially in the manner and for the purpose described.

2. A door check or weight consisting of two hinged jaws and a spring having its ends connected to the jaws for causing the same to

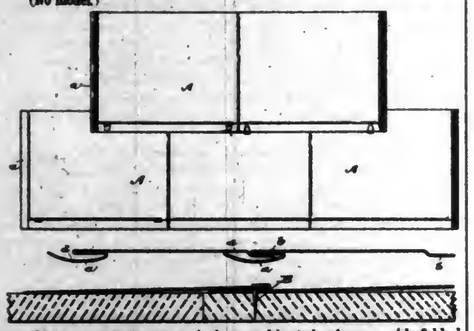
close against the door, substantially in the manner and for the purpose described.

3. A door check or weight consisting of jaws for embracing the door and a wedge for binding against the lower edge thereof, substantially as described.

4. A door check or weight consisting of two hinged jaws, a spring carried by said jaws for causing the same to close against the door, and a wedge carried by the check for binding against the lower edge of the door, substantially in the manner and for the purpose described.

5. A door check or weight consisting of two hinged doors, and means carried by and connected with the jaws for causing them to close inward against the door, substantially in the manner and for the purpose described.

397,381. METALLIC ROOFING OR SIDING. LEVI H. MONTROSS, Toronto, Ontario, Canada. Filed Sept. 12, 1888. Serial No. 285,173. (No model.)



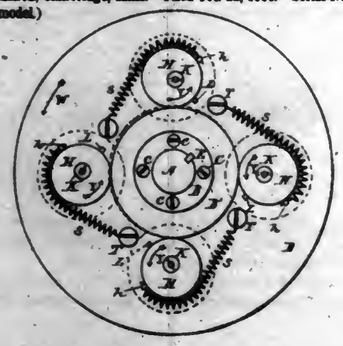
Claim.—1. A sheet-metal plate or shingle having one side folded to form a pocket below the level of its bottom surface, the portion of the said plate or shingle extending beyond the fold being bent upwardly toward the bottom surface of the adjoining plate, the edge of which fits into the pocket, substantially as and for the purpose specified.

2. A sheet-metal plate or shingle having one side folded to form a pocket below the level of its bottom surface, the portion of the said plate or shingle extending beyond the fold being depressed and its edge upwardly curved toward the bottom surface of the adjoining plate, the edge of which fits into the pocket, substantially as and for the purpose specified.

3. A series of sheet-metal plates or shingles having a joint formed by the upper plate or shingle overlapping the bottom plate or shingle, the two being secured together and to the roof or structure by pins having one end only inserted in the structure to which the shingles are secured and the other end bent parallel with the body of the shingle, so as to clasp and secure in position the said plates or shingles, substantially as and for the purpose specified.

4. A series of plates or shingles having the vertical joints connecting them formed by folding one side to form a pocket below the level of its bottom surface, the portion of the said plate or shingle extending beyond the fold being depressed and its edge upwardly curved toward the bottom surface of the adjoining plate, the edge of which fits into the pocket, and the horizontal joints formed by the upper plate or shingle overlapping the bottom plate or shingle, the two being secured together and to the roof or structure by pins bent so as to clasp and secure in position the said plates or shingles, substantially as and for the purpose specified.

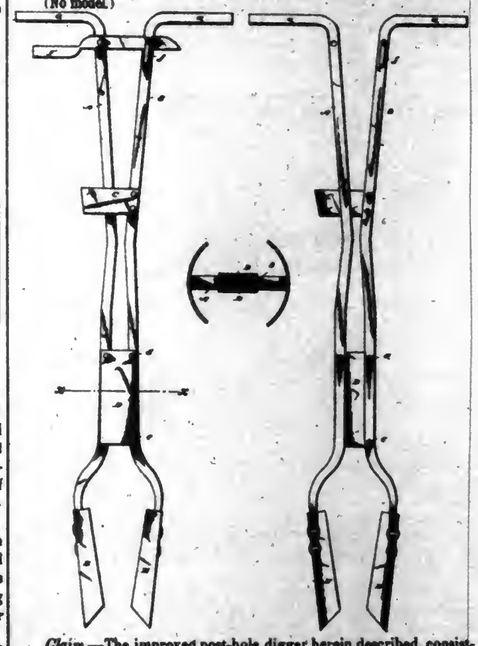
397,382. GRIP DEVICE FOR ELEVATORS, &c. WILLIAM E. NICKERSON, Cambridge, Mass. Filed Oct. 22, 1888. Serial No. 288,803. (No model.)



Claim.—1. In a grip device, the combination of the shaft A and bushing B, having cams B' B', with the eccentric-pawls H and drum D, all operating together substantially as described, and for the purpose set forth.

2. In a grip device, the combination of the shaft A and bushing B, having cams B' B', with the eccentric-pawls H, check-lugs L, springs S, and drum D, all operating together substantially as described, and for the purpose set forth.

397,388. POST-HOLE MACHINE. WILLIAM W. NIVISON and GEORGE F. NIVISON, Lester, Mich. Filed Sept. 3, 1888. Serial No. 284,443. (No model.)



Claim.—The improved post-hole digger herein described, consisting, essentially, of the two angular levers A B, having their upper ends bent laterally to form handles, and their lower ends curved outwardly and inwardly to receive pods, the loop C, secured to one of the levers and receiving through it the other lever, the long plates D, pivoted at their upper corners to the respective levers, and also pivoted at their lower corners to the lever B only, whereby stability will be rendered in the operation, the pivoted gravitating lever F, having a notch, as shown, and the stud on the lever B, adapted to receive the said notch, substantially as specified.

397,384. METALLIC SEAL. ANDREW J. PHELPS, Syracuse, N. Y. Filed June 11, 1888. Serial No. 276,714. (No model.)

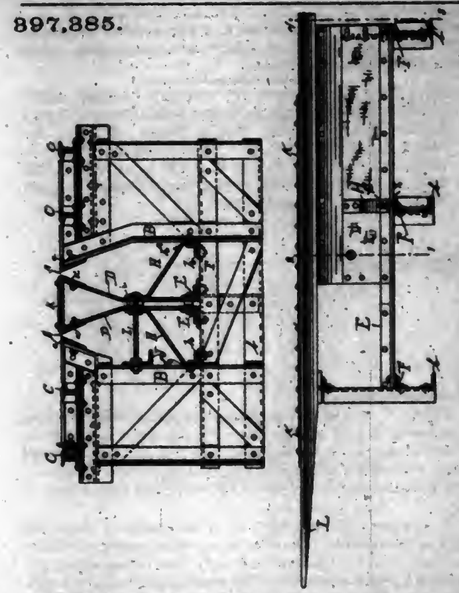


Claim.—The improved seal consisting of a soft-metal case having opposite open ends and an aperture in its top, the binder passing through the case at the open ends thereof, and a separate soft-metal plate inserted into the case over the binder and forming with the top of the case two thicknesses of metal over the binder, substantially as described and shown.

397,385. CABLE OR ELECTRIC STREET-RAILWAY. WILLIAM S. PHELPS, San Francisco, Cal. Filed Aug. 4, 1888. Serial No. 282,003. (No model.)

Claim.—1. In street-railways having subways for the passage of the mechanism of the car—such as the grip in a cable road or collector in an electric road—the substructure of the points which are bounded on each side by the diverging slots of either cross or branch lines, as herein described, consisting, essentially, of a vertical plate-iron point-support secured to the yoke-frames, braced in a perpendicular position by diagonal braces and being adjustable horizontally and vertically, substantially as and for the purpose herein set forth and described.

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2. The point-support herein described, consisting of a vertical plate, D, bars E and F, braces H, and rod I, in combination with the yoke-frames B, the whole arranged and connected substantially as and for the purpose described.

397,386. EXERCISING APPARATUS. ROBERT REACH, Philadelphia, Pa. Filed Oct. 30, 1888. Serial No. 289,537. (No model.)



Claim.—1. In combination, the oar, the bracket pivotally supporting said oar, a support for the bracket, and a pivotal connection between said support and the bracket, adapted to permit tilting movement of the bracket, substantially as described.

2. In combination, the oar, the bracket pivotally supporting said oar, a support for the bracket, projecting ears on the support and bracket, and a connecting-rod for the two passing through the ears, substantially as described.

3. In combination, the oar, the bracket pivotally supporting said oar, a support for the bracket, a spring acting upon the bracket, and a pivotal connection between said support and the bracket, substantially as described.

4. In combination with an oar, a friction ring or plate, wearing-shoes adapted for contact with the friction-ring, a clutch-connection between the oar and friction-ring, a bracket for supporting these parts, a support, B, and a pivoted connection between said bracket and support B, arranged to permit said bracket to have a tilting movement, substantially as described.

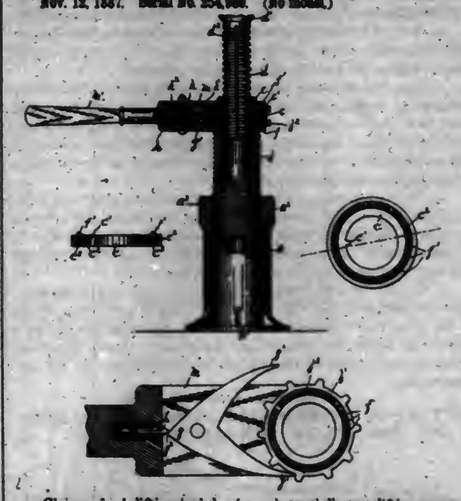
5. In combination, a supporting-bracket, the vertically-arranged friction-ring, the curved wearing-shoes adapted to the outer periphery thereof, the oar, and a clutch-connection between the oar and the friction-ring, substantially as described.

6. In combination, the supporting-bracket having vertical flanges, the vertically-arranged friction-ring, the wearing-shoes fixed to the outer periphery, the adjusting-screws extending through the flanges, the oar, and a clutch-connection between the oar and the friction-ring, substantially as described.

7. In combination, the bracket, the friction-ring, the oar casting having the socket, and the clutch-piece held loosely therein and provided with a stud for engaging the ring, substantially as described.

8. In combination, the bracket, the friction-ring, the oar casting having the socket, the clutch-piece held loosely therein, and the spring, substantially as described.

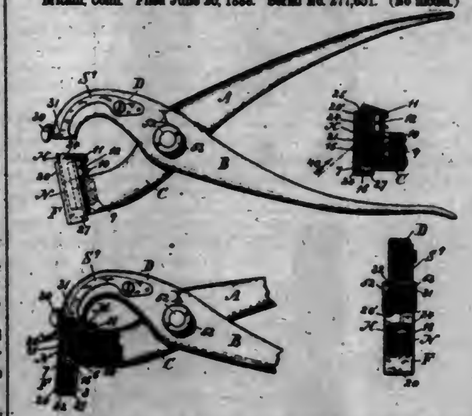
397,387. JACK-SCREW. MICHAEL REICH, Buffalo, N. Y. Filed Nov. 12, 1887. Serial No. 254,969. (No model.)



Claim.—1. A lifting-jack having substantially two lifting-screws, *b d*, separate and independent of each other, each screw having an independent ratchet-wheel, *b' e*, adapted to be operated by plates having separate pawls *g' k'*, an intervening washer, *c*, and two series of balls, *f f'*, running in grooves above and below the washer *c*, inclosed in a common casing, *m*, and a single lever-handle, *m'*, substantially as shown and described.

2. In a lifting-jack, the combination, with the screw *b*, having integral ratchet-wheel *b'*, adapted to be moved up and down in the tubular standard *a*, the screw *d*, adapted to be moved up and down in the screw *b*, the ratchet-wheel *e*, engaged therewith, and the washer *c*, engaging with the vertical slot in the screw *d*, of the double spring-pressed dogs and plates having pawls *k'* and *g'*, engaging independently with each ratchet-wheel, the series of balls *f*, playing between the annular groove c^2 of the washer and annular groove b^2 of the ratchet-wheel *b'*, and the series of balls *f'*, playing between the annular groove c^3 of the washer and annular groove *d'* of the ratchet-wheel *e*, substantially as shown and described.

397,388. BUTTON-SETTING IMPLEMENT. FRANCIS H. RICHARDS, Hartford, assignor to The American Button Fastener Company, New Britain, Conn. Filed June 20, 1888. Serial No. 277,651. (No model.)



Claim.—1. In a button-setting instrument, the combination, with the jaw C, formed substantially as described, to receive the presser-slide and the laterally-movable driver, of the slide comprising two fixed members or plates with a driver-channel between them, and having an opening in the front plate or member, through which to insert a fastener into said channel, and the laterally-movable driver arranged to be pushed back at the top by said fastener and to drive the fastener through said channel, substantially as described.

2. In a button-setting instrument, the combination, with the fastener-driving member thereof, of the slide comprising two fixed plates or members with a driver-channel between them carried on said driving member, and the driver pivoted at its lower end to said member and laterally movable at its upper end, all substantially as described.

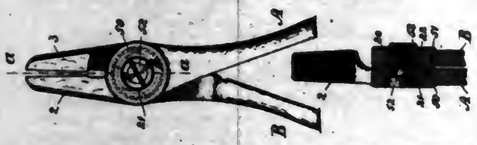
3. In a button-setting instrument, the combination, with the pivotally-supported driver having the arm 16, of the spring-actuated slide F, having the pin 27, substantially as described.

4. In a button-setting instrument, the combination, with the fastener-driving member thereof and with the slide having the longer front plate, 20, the shorter back plate, 24, and the opening 21, formed in said plate 20, of the driver pivoted to said slide and constructed and arranged to have a lateral movement under said shorter plate, substantially as described.

5. In a button-setting instrument, the combination, with the member C, grooved to carry the slide F and having the chamber or recess 9, and with the slide F, having guides 3 and 5 and having the arm 11, of the spring 10, set in said recess and actuating said slide through said arm, substantially as shown and described.

6. In a button-setting instrument, the combination, with the member C, grooved to receive spring-actuated slide F and having slot 6, of the slide F, constructed substantially as described and having a stop-pin, 27, below said member, and the driver N, pivoted in said slot 6 and having the arm 16, substantially as described, and for the purpose specified.

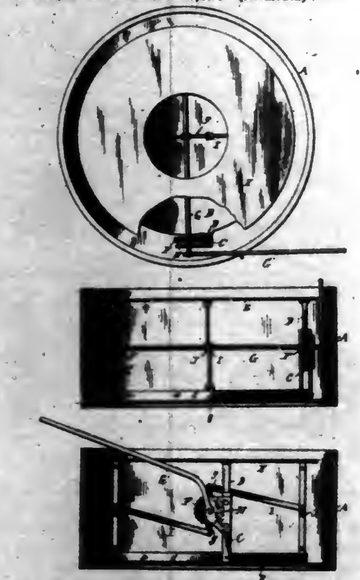
397,389. IMPLEMENT-JOINT. FRANCIS H. RICHARDS, Hartford, Conn. Filed July 6, 1888. Serial No. 279,237. (No model.)



Claim.—1. The implement-joint herein described, consisting of two members pivotally connected and having a central bolt uniting them together, one member having a groove and the other member a raised track fitting into said groove, the groove and track being circular and concentric to said bolt, all substantially as described.

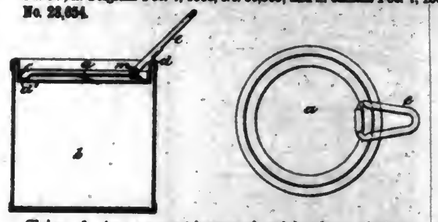
2. The implement-joint herein described, consisting of the members A B, having, respectively, the groove 50 and track 51 and bored to receive the bolt 52, combined with the bolt 52, turning freely in the one member and screwed into the other, and having the check-nut, all substantially as shown and described.

397,390. TIRE APPARATUS. PETER SCHLOSSER, Defiance, Ohio. Filed June 28, 1888. Serial No. 278,464. (No model.)



Claim.—The combination, in a tire apparatus, of the table E, having racks D, the base B, having hollow posts C, receiving the racks D, and the toggle-joints connected to the base and table, with the shaft G, mounted on the posts C, and having the pinions F, crank-arms *g*, and lever G', and the connection between the toggle-joints and the arms *g*, substantially as described.

397,391. LID OR COVER FOR METALLIC OR OTHER RECEPTACLES. WILLIAM T. SEYMOUR, Stockton-on-Tees, County of Durham, England. Filed Mar. 24, 1888. Serial No. 268,445. (No model.) Patented in England Feb. 7, 1887, No. 1,876; in France Aug. 12, 1887, No. 185,201; in Germany Aug. 26, 1887, No. 43,733; in India Jan. 10, 1888, No. 97; in Belgium Feb. 7, 1888, No. 80,565, and in Canada Feb. 7, 1888, No. 23,654.



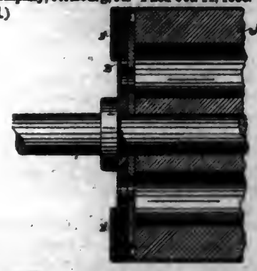
Claim.—1. As a new and improved article of manufacture, a can or box having its sides continued above its top, a seat formed in the top thereof, and a cover resting therein provided with a lever pivoted thereto, whereby the said continued portion of the sides of the said can or box acts as a fulcrum for the said lever in the operation of the same.

2. As a new and improved article of manufacture, a can or box having its sides continued above its top and strengthened, a conically-shaped seat formed in the top thereof, and a cover resting therein provided with a lever attached thereto and bearing upon the said strengthened portion of the sides, whereby the cover may be withdrawn from its seat.

3. The combination, in a cover, of a flange, *a'*, extending over the outer periphery thereof, a bar pivoted to the cover, the outer end of the said bar being held by the said flange, and a lever pivotally attached to said bar, as and for the purpose described.

4. The combination of a cover having a flange, *a'*, extending over the outer periphery thereof, a bar pivoted thereto, the outer end of the said bar being held by the said flange, a can having its sides continued above its top and strengthened, a seat formed in the top of the said can in which the said cover rests, and a lever pivotally attached to the said bar and adapted to raise the cover, as and for the purpose described.

397,392. ARMATURE FOR DYNAMO-ELECTRIC MACHINES. OLIVER B. SHALLENBERGER, Rochester, assignor to the Westinghouse Electric Company, Pittsburg, Pa. Filed Oct. 11, 1888. Serial No. 287,845. (No model.)



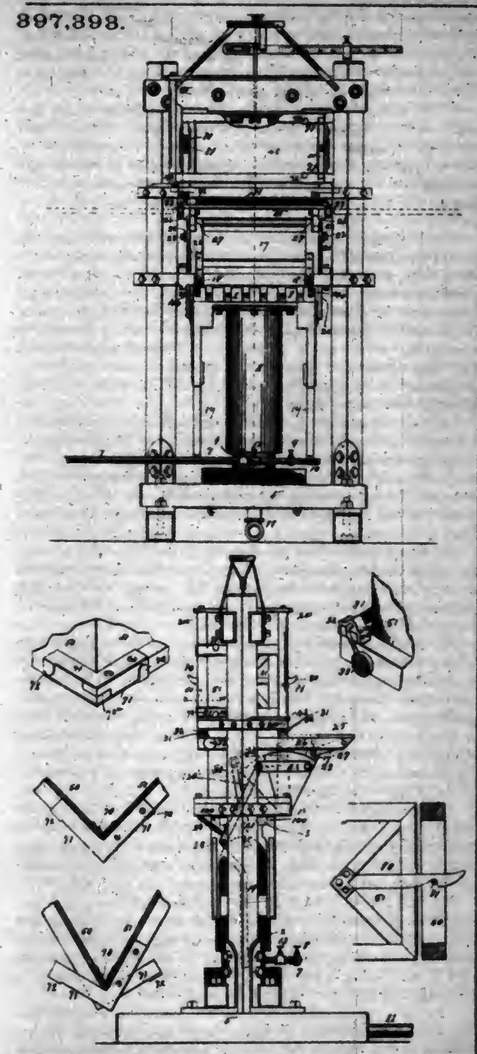
Claim.—1. The combination of an armature-core, two sets of winding-clips for receiving the two sets of coils, one set of clips being secured to the body of the armature, and a plate at each end of the armature to which the other sets of winding-clips are secured.

2. In an armature for electric machines, a cylindrical core of soft iron, a set of armature-coils wound along the face and down upon the ends of the core, overhanging clips for retaining the coils in position secured to the ends of the armature, plates covering the clips and the wire upon the ends of the armature, a second set of armature-coils wound upon the face of the armature in the spaces left vacant by the first set, and down upon the outer surfaces of the respective insulating-plates, and winding-clips secured to the respective plates for retaining the second set of coils in position.

397,393. BALING-PRESS. HIRAM H. SHADER, Little Rock, Ark. Filed June 14, 1888. Serial No. 277,043. (No model.)

Claim.—1. In a baling-press, the combination of the platen, the outer movable cylinder to which the platen is secured, the inner stationary cylinder, a fixed piston located on the stationary cylinder within the movable cylinder, a pipe for admitting steam or compressed air into the chamber of the movable cylinder between the platen and

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piston, and a receiving and baling chamber over the platen, substantially as and for the purpose set forth.

2. In a baling-press, the combination of a platen, movable cylinder to which the platen is secured, and a fixed piston, a pipe for admitting steam or compressed air into the chamber between the platen and piston, a receiving and baling chamber over the platen, and a tube for supporting the piston, and which forms a chamber for the compressed air, substantially as and for the purpose set forth.

3. In a baling-press, the combination of a platen secured to a movable cylinder, a receiving-chamber over the platen, a hinged door to the receiving-chamber, a cam on the cylinder, and mechanism located between the cam and door, whereby the latter is automatically closed as the platen rises, substantially as and for the purpose set forth.

4. In a baling-press, the combination of the platen, a movable cylinder to which the platen is secured, a receiving-chamber over the platen, a hinged door to the chamber, and means for automatically closing the door, consisting of a cam on the cylinder, a pivoted spring-lever, against the lower end of which the cam bears, and a link connecting the upper end of the lever to the door, substantially as and for the purpose set forth.

5. In a baling-press, the combination of a platen secured to an operating-cylinder, the receiving-chamber over the platen, hinged door to the receiving-chamber, means, substantially as described, for closing the door as the platen rises, a sliding table, and links connecting the table to the door, whereby the table is moved in and out as the door is closed and opened, substantially as and for the purpose set forth.

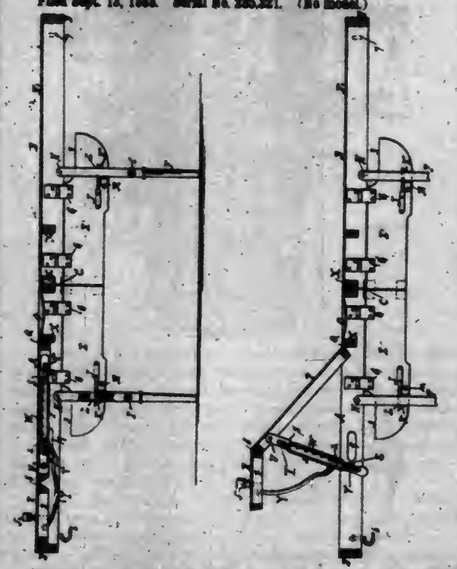
6. In a baling-press, the combination of the platen, receiving-chamber over the platen, and baling-chamber over the receiving-chamber, consisting of sides having ends secured thereto and hinged to the frame so as to be swung out or opened horizontally to expose the baling-chamber, substantially as and for the purpose set forth.

7. In a baling-press, a baling-chamber composed of sides hinged to the frame of the press so as to be opened out horizontally to expose both sides of the baling-chamber, and ends hinged to the sides, substantially as and for the purpose set forth.

8. In a baling-press, the baling-chamber composed of sides hinged to the frame of the press, ends hinged to the sides, and plates 71, having lugs 72 secured to the sides and ends, substantially as and for the purpose set forth.

9. In a baling-press, a baling-chamber composed of sides hinged to the frame of the press and ends hinged to the sides, the ends being provided with hooks 80 to engage pins 81 on the sides, substantially as and for the purpose set forth.

397,394. EMBALMING-BOARD. LEVI K. SWEET, New York, N. Y. Filed Sept. 13, 1888. Serial No. 285,221. (No model.)



Claim.—1. The divided embalming-board A B, and the folding legs F, pivoted to the main frame D and adapted to be folded up within the frame, in combination with the folding divided side rails, E E', hinged to the frame D and provided with recesses 3 3 and spring-catches J, substantially as shown and described.

2. The combination, with an embalming-board and its frame, of the adjustable hinged back P, the swinging ratchet-frame T, pivoted to the back and having ratchets S and W, the stationary detent V, secured to the frame of the board, the adjustable hinged head-piece R on the back, and the detent Y, pivoted to the head-piece, substantially as described.

397,395. SPEED-INDICATOR. EUGENE C. SMITH, St. Louis, Mo., assignor of one-half to Clifton C. Scudder, same place. Filed Feb. 13, 1888. Serial No. 263,856. (No model.)



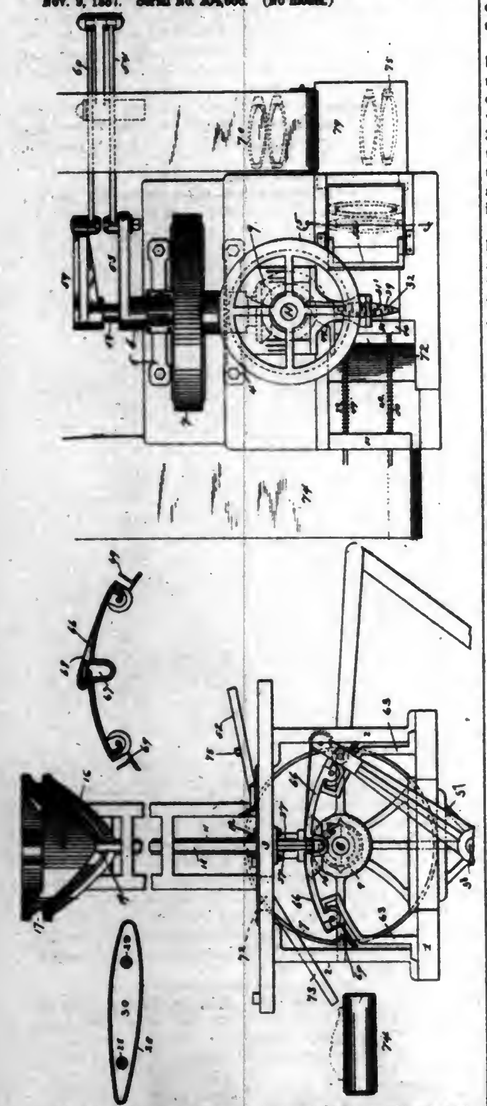
Claim.—1. A speed-indicator having a rotary portion, and a soft friction-surface at the outer end of said rotary portion adapted for application to the object whose speed is to be determined, said friction-surface being transverse to the axis of rotation of said object, substantially as set forth.

2. A speed-indicator having a rotary portion, a retreating pin whose point is on the axis of rotation of said rotary portion, and a

soft friction-surface at the end of the rotary portion through which the retreating pin passes, substantially as set forth.

3. The combination of the piece 8, having a socket, 7, containing a spring and giving bearing to a center pin, against which the outer end of the spring bears, and a soft friction-disk surrounding the center pin, substantially as and for the purpose set forth.

397,396. **MACHINE FOR BUNCHING CIGARS.** JAMES E. SMITH, New York, N. Y., assignor, by direct and mesne assignments, of two-thirds to Adolph Moncels and Benjamin Lichtenstein, same place. Filed Nov. 9, 1887. Serial No. 254,606. (No model.)



Claim.—1. In a cigar-bunching machine, the combination of a main table having an opening therein, as 32, a reciprocating carriage sliding on the table and remaining normally at rest while in juxtaposition to the opening therein, an open mold independent of the carriage and adapted to be fed thereto while the carriage is at rest, so that the mold aligns with the opening in the table, said mold being detachably connected to the carriage to be automatically discharged therefrom at the limit of movement of the carriage away from the opening, a vertically-reciprocating plunger adapted to pass through the mold and opening, and mechanism for moving the carriage and mold away from the opening to discharge the mold from the carriage, substantially as described.

2. In a cigar-bunching machine, the combination of a table having an opening therein, as 32, a reciprocating carriage working on said table, a feeding-table, an open mold adapted to slide on the feeding-table and rest on the carriage in line with the opening in the table, and mechanism for moving the carriage to convey the mold away from the opening, substantially as described.

3. In a cigar-bunching machine, the combination of a table having an opening, 32, and a discharge-opening, 72, at one side of said opening 32, a reciprocating carriage, an open mold normally held by the carriage over the opening 32, a plunger adapted to pass through the mold and opening 32, and mechanism for moving the carriage to convey the mold to the discharge-opening 72, substantially as described.

4. In a cigar-bunching machine, the combination of a main table having an opening, 32, therein, a reciprocating carriage sliding on the main table, an independent open mold adapted to be placed in the carriage, a rolling-table beneath the main table and having a transverse pocket or depression therein arranged in line with the opening 32, an apron connected to the rolling-table, a rocking arm having the pressure-rollers, and a hollow plunger adapted to pass through the aligned mold and opening to receive the contents of the mold and deposit the same on the apron within the depression of the rolling-table, substantially as described.

5. In a cigar-bunching machine, the combination of a main table having an opening, 32, a reciprocating carriage sliding on the table, an independent open mold adapted to be fed to the carriage when the latter is at rest, devices on the carriage for detachably holding the mold thereon, a plunger, and mechanism for moving the carriage away from the opening 32 to discharge the mold at its limit of movement away from said opening, substantially as described.

6. In a cigar-bunching machine, the combination of a carriage having the retaining-springs on the opposing edges of the sides thereof, an open mold adapted to be placed in the carriage and be held in position therein by the springs, a plunger, and devices for reciprocating the carriage, substantially as described.

7. In a cigar-bunching machine, the combination of a main table having an opening, 32, and a discharge-opening at one side thereof, a reciprocating carriage sliding on the table and having the retaining-springs arranged to receive a mold between the same, an independent open mold adapted to be fed to the carriage when the latter is at rest and to be held in line with the opening 32 by the retaining-springs, and devices for forcing the carriage away from the opening 32 to discharge the mold into the discharge-opening, into which it drops by gravity, substantially as described.

8. In a cigar-bunching machine, the combination of a table having an opening therein, a plate fixed to the table over the opening and having the projecting stops 33 and 34 at one side thereof, a carriage, a mold adapted to be placed in the carriage, a plunger, and mechanism for reciprocating the carriage, substantially as described.

9. In a cigar-bunching machine, the combination of a table having an opening therein, a carriage fitted to slide on the table, an open mold, devices for holding the mold in the carriage and in line with the opening in the table, the yielding stops 33 and 34, arranged at one side of the opening in the table to prevent retrograde movement of the mold, and a plunger, substantially as described.

10. In a cigar-bunching machine, the combination of a table having an opening therein, a carriage, a mold, a reciprocating plunger adapted to pass through the mold and opening in the table, and the spring-fingers supported below the table and arranged across the opening therein to enter the plunger as it descends and force the filler therein, substantially as described.

11. In a cigar-bunching machine, the combination of a table having an opening therein, a carriage, an open mold, a reciprocating plunger having an open-bottom shell at its lower end, and a series of fingers supported on the table below the opening therein and arranged across the latter in the path of the plunger, the two series of fingers being alternately arranged with respect to each other and carried by independent supports on opposite sides of the opening, substantially as described.

12. In a cigar-bunching machine, the combination of a table having an opening therein, a carriage, an open mold, a reciprocating plunger provided at its lower end with a shell having vertical incisions around its edges, and a series of fingers arranged across the opening in the table and adapted to enter the incisions in the shell as the plunger descends, substantially as described.

13. In a cigar-bunching machine, a reciprocating plunger having a shell at its lower end, said shell being shaped to conform substantially to the longitudinal contour of a bunch and having the vertical incisions at its lower edge, substantially as described.

14. In a cigar-bunching machine, a reciprocating plunger having an open-bottom shell formed with vertical incisions which extend upwardly from the open end thereof, substantially as described.

15. In a cigar-bunching machine, the combination of a table having an opening therein, the depending slotted guides fixed to the table on opposite sides of said opening, the spring-fingers fitting in the slots of said guides and extending across the opening, a carriage, an open mold, and a plunger, substantially as described.

16. In a cigar-bunching machine, the combination of a table having an opening, 32, and a discharge-opening, 72, at one side thereof, a reciprocating carriage, an open mold adapted to be held in the carriage, an inclined feeding-table at one side of the opening 32, upon which the molds are placed, a discharge table or chute, 73, on the opposite side of said opening and below the discharge-opening, and mechanism for reciprocating the carriage, substantially as described.

17. In a cigar-bunching machine, the combination of a table having the openings 32 and 72, a reciprocating carriage having a laterally-extended projection at one side, an open mold adapted to enter the carriage, a vertical shaft having a cam, 12, for striking the projection on the carriage to force the latter away from the opening 32, a plunger operated by a cam at the upper end of the vertical shaft, and springs for returning the carriage in juxtaposition to the opening 32 after the empty mold has been discharged through the opening 72, substantially as described.

18. In a cigar-bunching machine, the combination of a table having the openings 32 72 arranged in different vertical planes, an open mold, a carriage having the side pieces between which the mold is fitted when in line with the opening 32, a plunger, devices impinging against the mold and connected to the carriage for holding the mold in position therein while being conveyed from the opening 32 to the discharge-opening 72, and devices for moving the carriage and mold over the discharge-opening 72, through which opening the empty mold falls by gravity when in line therewith, substantially as described.

19. In a cigar-bunching machine, the combination of a main table having an opening, 32, therein, a stationary rolling-table beneath the main table and having a transverse depression or pocket arranged in line with the opening, a reciprocating carriage having an open mold, an apron connected to the rolling-table, a rocking arm having two spaced pressure-rollers, over which the apron passes, a hollow plunger adapted to pass through the mold and opening 32 to receive the contents of the mold, and a movable platen housed within the hollow plunger and adapted to positively eject the contents of the plunger when the latter enters the transverse depression of the rolling-table, substantially as described.

20. In a cigar-bunching machine, the combination, with the main table having an opening therein, the rolling-table having an apron, a carriage carrying an open mold, and a rocking arm provided with the pressure-rollers, of a hollow reciprocating plunger, a movable platen housed within the plunger, and a rod connected to the platen and controlled by suitable devices to depress the platen as the plunger rises and positively eject the contents of the same, substantially as described.

21. In a cigar-bunching machine, the combination of the main and rolling tables, the main table having a vertical opening therein, a carriage having an open mold on the main table, an apron on the rolling-table, a rocking arm having pressure-rollers, and a hollow plunger having a movable follower or platen therein for positively ejecting the filler therefrom upon the rolling-apron, substantially as described.

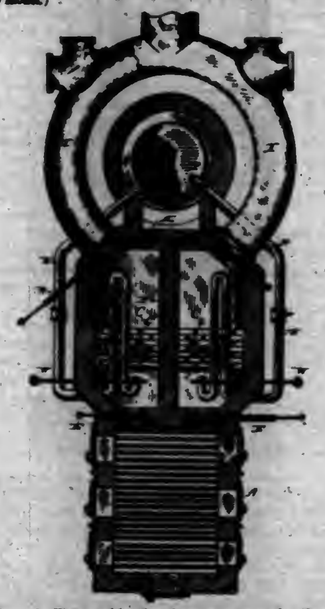
22. In a cigar-bunching machine, the combination, with a main table having an opening therein, a carriage, an open mold, a rolling-table provided with an apron, and a rocking arm having the spaced pressure-rollers, of a hollow plunger having a series of vertical incisions in its lower edge, a series of fingers arranged below the opening in the main table in the path of the plunger and adapted to enter the incisions as the plunger descends, a movable platen normally housed with the plunger at a point above the termination of the incisions thereof, a rod connected to the platen, and devices for retarding the upward movement of the rod and platen when the plunger is elevated to thereby depress the platen upon the tobacco below the same and positively eject it from the plunger, substantially as described.

23. In a cigar-bunching machine, the combination of a hollow reciprocating plunger having an open lower end, a fixed guide in the plunger, a movable platen housed therein, a rod connected to the platen, and a spring-cap secured to the machine and normally pressing on the rod to retard the upward movement thereof and depress the platen in the plunger as the latter begins its upward movement, substantially as described.

24. In a cigar-bunching machine, the combination of a table, 3, having an opening therein, a rolling-table provided with a transverse depression in line with the opening, an apron connected at its ends to the rolling-table, a rocking arm carrying a pair of spaced pressure-rolls which are adapted to ride on the rolling-table beneath the apron, and a plunger, substantially as described.

25. In a cigar-bunching machine, the combination of the main and rolling tables, the main table having a vertical opening therein, a carriage, an open mold, an apron connected to the rolling-table, a plunger, a rock-shaft journaled beneath the rolling-table and carrying a swinging arm, a main driving-shaft, and devices intermediate the main driving-shaft and rock-shaft for transmitting and conveying the motion of the main shaft to the rock-shaft, substantially as described.

397,397. **APPARATUS FOR THE MANUFACTURE OF GAS.** ROLAND H. SMITH, Pittsburg, Pa. Filed Dec. 15, 1887. Serial No. 258,609. (No model.)



Claim.—1. The combination, in a gas-generating furnace, of the furnace, the horizontal generating-chambers, and the exhaust-pipe leading to the holder, the said generating-chambers being provided with valve-passages leading from the fuel-chamber and to the smoke-stack, and the exhaust-pipe being provided with suitable valves, whereby the generating-chambers may be alternately heated and alternately employed for the generation of the gas in an uninterrupted volume, substantially as specified.

2. In a gas apparatus, the combination of a furnace, the horizontal generating-chambers communicating by valved passages with the fuel-chamber of the said furnace and the smoke-stack, the exhaust-pipe communicating with the generating-chambers by means of valved passages, and the tubular sections B and H and their covers, these tubular sections leading into the furnace and generating-chambers, substantially as and for the purpose set forth.

3. In a gas-generating apparatus, the combination of a furnace, the generating-chambers communicating with the said furnace by means of valved passages, the exhaust-pipe communicating with the respective generating-chambers by means of valved passages, the smoke-stack communicating with the generating-chambers by means of valved passages, the steam-boiler in the smoke-stack, and the steam-pipe R, leading from the boiler to the respective generating-chambers, substantially as described.

4. The combination of a furnace, gas-generating chambers communicating with the furnace by means of valved passages, the exhaust-pipe communicating with the generating-chambers by means of valved passages, the smoke-stack communicating with the generating-chambers by means of valved passages, a steam-generator, and steam-pipes leading from the generator into the respective generating-chambers, the portions of the pipes within the generating-chambers being coiled back and forth, substantially as described.

5. The combination of a furnace, independent gas-generating chambers communicating with the furnace by means of valved passages, an exhaust-pipe communicating with the generating-chambers by means of valved passages, a smoke-stack also communicating with the generating-chambers by means of valved passages, the said generating-chambers each being provided with outlet-passages for the refuse, and slanting hearths leading to the passages, substantially as described.

397,398. **AUTOMATON.** WILLIAM G. STRONG, New York, N. Y., assignor to James William Patterson, same place. Filed Feb. 16, 1888. Serial No. 264,225. (No model.)

397,398.



Claim.—1. An automaton having a pivoted arm carrying a box, dice in said box, and a projecting operating-arm connected to the upper part of said pivoted arm for oscillating the same, whereby the dice are thrown from said box, said parts being combined substantially as described.

2. An automaton having a pivoted forearm carrying a box containing dice, and a rod connected to said forearm for imparting an oscillating motion thereto, so as to shake said dice within said box, said parts being combined substantially as described.

3. An automaton having a pivoted arm with a forearm pivoted therein, the forearm carrying a box containing dice, a projecting operating-arm connected to the upper part of said arm for oscillating the same, and a rod connected to said forearm, said parts being combined substantially as described.

4. An automaton having a pivoted arm carrying a box containing magnetic dice, a projecting arm attached to the upper part of said pivoted arm for oscillating the same, a table with a piece of magnetic material therein, and an electro-magnet for magnetizing said magnetic material, said parts being combined substantially as described.

5. An automaton having a pivoted arm carrying a box containing magnetic dice, a projecting arm connected to the upper part of said pivoted arm for oscillating the same, a table with a piece of magnetic material therein, an electric battery and circuit including an electro-magnet, a wheel with a contact-spring, and electric contact-surfaces having an insulated space, said parts being combined substantially as described.

6. An automaton having an arm with a forearm pivoted therein and carrying dice, a projecting arm for oscillating said arm and a rod for oscillating said forearm, a pivoted arm with a magnetic hand, and an electric battery in circuit with an electro-magnet for energizing said magnetic hand, said parts being combined substantially as described.

7. An automaton having a starting mechanism consisting of a tube adapted to receive a coin, a pocket, a chute leading from said pocket, a split pocket, a weighted lever to which said split pocket is attached, and an upright carrying an electrical contact-maker secured to said lever, said parts being combined substantially as described.

8. An automaton having a starting mechanism consisting of a pocket, a coin-retaining lever in said pocket, a chute leading from said pocket, a weighted lever with a split pocket at one end, and provided with an upright having an electric contact-maker, said parts being combined substantially as described.

9. An automaton having a starting mechanism consisting of a pocket with a coin-retaining lever, a chute, a weighted lever with standard thereon, a split pocket having a lug on its pivoted part, the fixed part of said pocket being secured to said weighted lever, a spring connected to said standard and lug, and an upright on said lever having an electrical contact-maker, said parts being combined substantially as described.

10. An automaton having a tube, a pocket with chute leading therefrom, a split pocket with the lug 16, a starting-lever to which said split pocket is attached, the electrical contact-maker 1, secured to said starting-lever, the star-wheel K, a train of gearing, and the wheel 10, having on its upper face concentric cams, a pivoted arm with forearm carrying box with dice, and rods, arms, cords, and levers connected to said arm and operated by said cams for oscillating the arm, substantially as described.

11. An automaton having a starting mechanism consisting of a tube, a pocket with coin-retaining lever F therein, a chute, the split pocket E E', the pivoted starting-lever D, having the part E of the split pocket secured thereto, and part E' being pivoted to part E and having the lug 16, the standard 18, secured to the lever D, spring 17, connected to standard 18 and lug 16, and the springs 20 and 21, bearing against the lever F, said parts being combined substantially as described.

12. In an automaton, a tube with pocket, a chute leading therefrom, a starting-lever with split pocket having the lug 16 secured thereto, the contact-maker 1, secured to said starting-lever, the standard 8^a, with contact-maker 2, electric batteries and connecting-wires, and the star-wheel K, said parts being combined substantially as described.

13. In an automaton, a starting-lever with split pocket having the lug 16, the contact-maker 1, secured to said starting-lever, a standard with contact-point 2, an electric motor, the star-wheel K, the magnet M, with armature-lever A', and battery B A, with circuit, said parts being combined substantially as described.

14. The combination of the rotary wheel K, the train of gearing 7, 8, and 9, the cog-wheel 10, with concentric cams thereon, pivoted levers operated by said cams, and the arms O O', operated by said levers, said parts being combined substantially as described.

15. In an automaton, the pivoted arm O, having a box carrying dice, the arm 31, connected to said arm O, a cord and a rod connected to said arm 31 and to a pivoted lever, and the wheel 10, having on its upper face a cam adapted to operate said pivoted lever, said parts being combined substantially as described.

16. The pivoted arm O, having the forearm 29 pivoted thereon and carrying the hand H, with the cup having dice therein connected to said arm 29, the rod 32, pivotally connected to said arm 30, the pivoted lever 26, the rod *b*, connected to said lever and to pivoted lever *b'*, the wheel 10, having on its upper face a cam adapted to operate the lever *b'*, and a motor for operating said wheel 10, said parts being combined substantially as described.

17. The pivoted arm O', with metallic hand H', in combination with the lever R, secured to said arm O', and a cord, *y*, the rod *d*, secured to cord *y* and to pivoted lever *d'*, and the wheel 10, with cam thereon adapted to operate said wheels, said parts being combined substantially as described.

18. The combination of the arm O', having the metallic hand H', with the cord *f*, secured to said arm, the rod *e*, attached to said cord, and a pivoted lever adapted to impart a rising motion to said rod *e*, whereby the said arm is oscillated, substantially as and for the purpose set forth.

19. The wheel 10, having concentric electric surfaces a^4 a^5, with an insulated space between the same, a motor for said wheel, a pivoted arm with a box carrying dice, arms, levers, and rods connected to said pivoted arm and operated by cams on said wheel, a table with a piece of magnetic material located therein, and a magnet for magnetizing said magnetic material, said parts being combined substantially as described.

20. An automaton having a head connected to the rod L, the coiled spring V, with bearing 35, attached to the frame N, the arm 34, attached to the rod L, the cord Z, running over a pulley and attached to the pivoted lever *e*, the wheel 10, with cam on upper surface thereof, adapted to actuate said lever *e*, and a motor for said wheel, said parts being combined substantially as described.

21. An automaton with arm having a forearm pivoted therein, a box carried by said forearm and containing dice, a rod connected to said forearm for oscillating the same, and the spring 25, secured to the forearm and to the frame of the automaton, said parts being combined substantially as described.

22. An automaton having a starting and stopping mechanism controlled by the weight of a coin, arms pivotally connected to a frame, one of said arms having a pivoted forearm carrying a box with dice and the other arm having a magnetic hand for restoring said dice to the box, levers, cords, and rods connected to said arms, pivoted levers operating said rods, a wheel with cams operating said pivoted levers, a motor for operating said wheel, a table with a piece of iron therein on which dice is thrown, and a magnet for magnetizing said piece of iron at predetermined periods, said parts being combined substantially as described.

23. An automaton having a pivoted arm with a forearm pivoted therein and carrying a box containing dice, a projecting arm for oscillating said arm and a rod for oscillating said forearm, a pivoted arm with a magnetic hand, an electric battery, wires and magnet for energizing said magnetic hand, and rods, cords, and levers for operating said magnetic hand, said parts being combined substantially as and for the purpose set forth.

397,399. LATCH FOR MATCH-FLASKS. MARTIN R. SPRINGER, Indianapolis, Ind. Filed Nov. 15, 1888. Serial No. 290,904. (No model.)



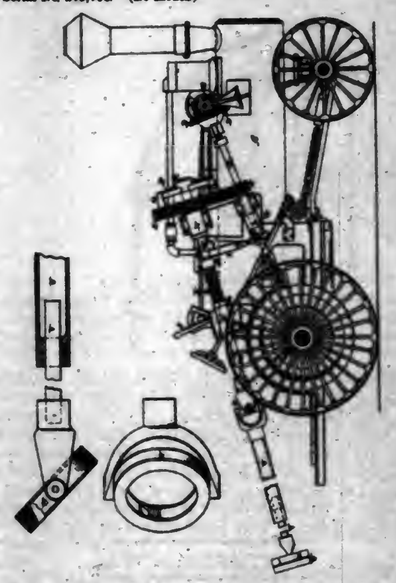
Claim.—1. The combination, with the hinged frames of a match-flask, of the plates on the one side of each frame, having apertured angularly-bent ends, and carrying spring-actuated latches, and the plates on the adjacent sides of said frames, having similarly-bent ends carrying catches, as and for the purpose set forth.

2. The combination, with the hinged frames of a match-flask, of the plates on two adjacent sides thereof, having abutting angularly-bent ends, one of which has an aperture and the other a catch adapted to pass through said aperture, and the oppositely-situated spring-actuated latches, substantially as described.

3. The combination, with the hinged frames of a match-flask, of the plates on one side thereof, having angularly-bent ends with apertures therein and ears at the rear ends thereof, the spring-actuated latches adapted to be forced against one of said ears, and the plates on adjacent sides of the frames, having similarly-bent ends abutting against the bent ends of the aforesaid plates, and having catches passing through the apertures in the latter plates, substantially as described.

4. A latch or holder for match-flasks, comprising a plate having an outer bent end with a catch, and an adjacently-situated plate having a spring-latch and an outward-bent end with an aperture therein, through which the said catch passes, adapted to abut against the aforesaid plate and form a miter therewith, substantially as described.

397,400. STEAM-POWER APPARATUS FOR SCREWING PIPES TOGETHER. LEWIS A. STANFORD, Bradford, Pa. Filed June 1, 1888. Serial No. 275,788. (No model.)



Claim.—1. The combination, with an engine, of a driving-shaft secured thereto and provided with a driving-pinion, the driven shaft provided with a wheel to gear with the said pinion, and a cap or clutching device which is to be applied to the pipe or pipe-coupling, and which is loosely connected to the driven shaft, substantially as shown.

2. The combination of a traction-engine with the shaft E, which is made in two parts and provided with the collar G, a clutch, and a lever for moving the clutch, with a pinion, a driven shaft, a wheel applied to the said shaft, and a cap or clutching device loosely connected to the said driven shaft, the shaft E being adapted to both propel the engine and to operate the driven shaft, substantially as described.

3. The combination, with the engine, of the shaft E, applied thereto and provided with a pinion, the driven shaft provided with arms at one end, and which is adapted to have an endwise movement, the wheel applied to this driven shaft and provided with projections to engage with the arms, and a cap or clutching device which is loosely connected to said shaft, substantially as set forth.

4. The combination of the engine, the shaft E, provided with a pinion, H, the wheel which meshes with the pinion, and the driven shaft which has an endwise movement through its boxes and the wheel placed thereon, the projections secured to the wheel, the arms upon the end of the shaft, the collar upon the shaft, the spring for returning the shaft to position after having been moved, and the cap or clutching device which is loosely connected to the shaft, substantially as specified.

5. The combination of the shaft M and its operating mechanism, the universal joint T, the shaft U, the extension-rod V, and the clutching device connected to its lower end, substantially as shown.

6. The combination of a clutching device, W, connected by a universal joint with the rod V, and a revolving shaft connected with the rod V for causing the clutch to revolve, substantially as described.

7. The combination of the shaft M, the universal joint T, the hollow shaft U, the extension-rod V, a universal joint at the lower end of the rod V, and a clutching device that passes over the end of a pipe or pipe-coupling, substantially as set forth.

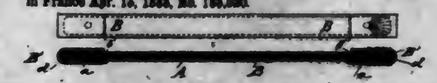
8. The combination of the clutching device W, provided with dogs which engage with the pipe or coupling, the extension-rod V, and a universal joint between the rod and the clutch, substantially as specified.

9. The combination of the shaft M, a universal joint, T, the shaft U, a connecting-rod which loosely makes connection with the shaft U and which slides back and forth in the shaft, a universal joint at the end of the rod, and the clutching device, substantially as shown.

10. The combination of the clutching device W, provided with recesses Y on its inner side, the automatically-acting ratchets A', the operating-rod for causing the clutching device to revolve, and the universal joint between the clutching device and the rod, substantially as described.

11. The combination of the driving-shaft E, a pinion applied thereto, the shaft M, provided with the wheel L, for meshing with the pinion, a universal joint, T, the shaft U, the rod P, clutch W, provided with ratchets A', and a universal joint between the rod V and the clutch, substantially as set forth.

397,401. CORSET-STAY. REINHOLD TREILER, Lucerne, Switzerland. Filed Aug. 13, 1888. Serial No. 283,008. (No model.) Patented in France Apr. 13, 1888, No. 186,580.

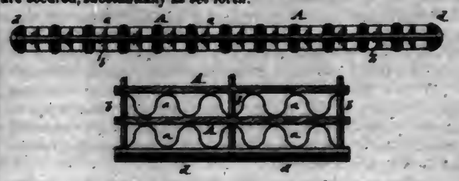


Claim.—1. The herein-described stay for corsets, consisting of a stiffener of suitable material having a covering of textile fabric upon both faces, the ends of which covering extend beyond and fold over the ends of the stiffener in two thicknesses, substantially as and for the purpose set forth.

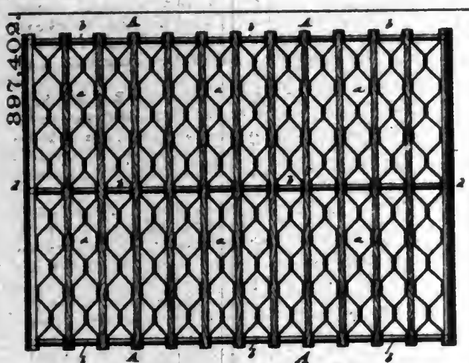
2. In a corset-stay, the combination, with the stiffener having apertures at each end, of a covering of textile fabric provided at its ends with transverse slits, through which the apertured ends of the stiffener extend, the ends of which covering extend beyond and fold over the ends of the stiffener in two thicknesses, substantially as and for the purpose specified.

397,402. DOOR-MAT. SIMON TOPPLER, New York, N. Y. Filed Oct. 1, 1887. Serial No. 251,191. (No model.)

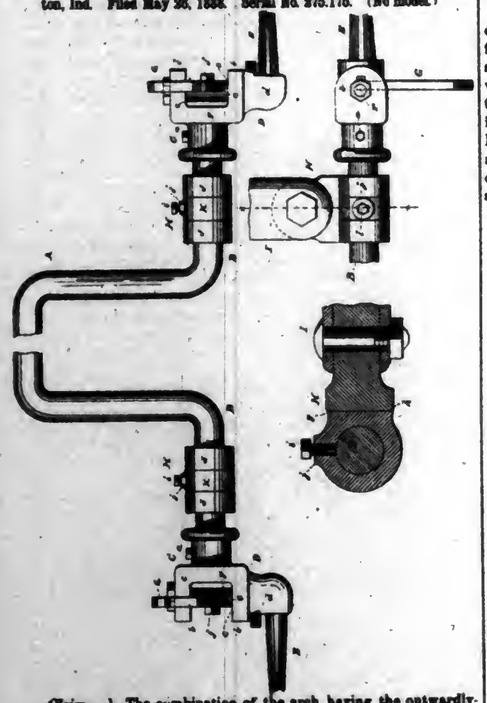
Claim.—A door-mat composed of a series of bent strips of hoop-iron, wooden strips alternating therewith, said strips projecting beyond the edges of the iron strips, connecting-rods passed through holes of the iron and wooden strips, and end bars to which the connecting-rods are secured, substantially as set forth.



397,402.



397,403. CULTIVATOR ATTACHMENT. BENTON WAGNER, Milton, Ind. Filed May 26, 1888. Serial No. 275,175. (No model.)



Claim.—1. The combination of the arch having the outwardly-turned ends B, the spindle-head D, having the lugs provided with the vertical aligned openings, the sockets C on said spindle-heads engaging the outwardly-turned ends B, and the set-screw, substantially as specified.

2. The combination, with the arch, of the wheel-spindle having the enlarged head and the socket, the journal-bolt passing through vertical aligned openings in the spindle-head and having the recess *e*, and the draft-bar having its rear squared end seated in said recess and secured by a set-screw, substantially as specified.

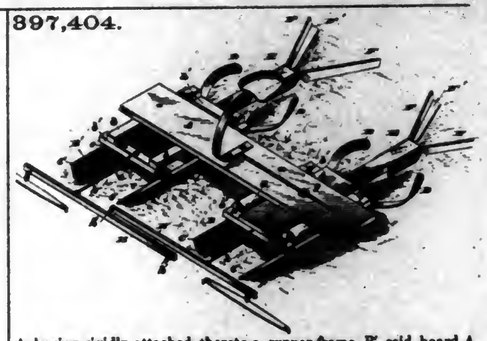
397,404. CULTIVATOR. THOMAS S. WARNER, Frankfort, Kans. Filed Nov. 1, 1888. Serial No. 289,769. (No model.)

Claim.—1. In a lister-cultivator, the combination, substantially as described, of a platform, a runner-frame, B', rigidly secured to one end of said platform, a runner-frame, B, provided at top with longitudinal rollers to support the other end of the platform, and means for connecting the frame B loosely to the platform to permit of the automatic lateral movement of said frame with relation to frame B'.

2. In a lister-cultivator, the combination, with the frame, runners adjustably secured thereto so that they will incline inwardly, blades D D, secured to the rear ends of the runners, and a rearwardly-extending beam carrying diverging blades F', substantially as shown, and for the purpose set forth.

3. The combination, in a lister-cultivator, of a board or platform,

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A, having rigidly attached thereto a runner-frame, B', said board A being provided with a slot for adjustably securing a runner-frame, B, thereto, said runner-frame having rollers G G, substantially as shown, and for the purpose set forth.

4. In a lister-cultivator, the runner-supporting frames B and B', one of said frames being adjustably secured to a slotted board or platform, A, said frames being provided with runners C, the rear ends of said runners having attached thereto blades D, the front edges of which adjacent to the runners are bent downwardly to enter the soil, the rear ends of said blades being curved upwardly to throw the soil inwardly, and rearwardly-extending beams F, carrying runner-blades F F', the rear portions of which are bent so as to provide horizontal and vertical portions, said blades diverging rearwardly from each other and the whiffletree attachments, the parts being organized substantially as shown, and for the purpose set forth.

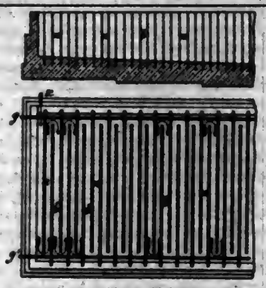
397,405. PROCESS OF FORMING BACKBONES AND REAR FORKS OF BICYCLES FROM A SINGLE BLANK. GEORGE T. WARWICK, Springfield, Mass., assignor to the Warwick Cycle Manufacturing Company, same place. Filed Mar. 23, 1888. Serial No. 268,297. (No model.)

Claim.—The within-described process for making the backbone and the rear-wheel fork of a bicycle from a single piece of sheet metal, which consists in cutting a blank of proper form from said sheet metal, having a part to form said backbone and parts to form the two legs of said fork, and then imparting a cylindrical tubular form to said backbone part and rigidly uniting the meeting edges thereof, and imparting a curved form in cross-section to said fork parts, and finally perforating the fork-legs to receive an axle and shaping and finishing the sheet-metal piece so made, substantially as set forth.

397,406. WITHDRAWN.

397,407. APPARATUS FOR PURIFYING SEWAGE BY ELECTRICITY. WILLIAM WEBSTER, Jr., Lee Park, Lee, County of Kent, England. Filed Apr. 18, 1888. Serial No. 271,104. (No model.) Patented in England Jan. 27, 1887, No. 1,383; in France Dec. 9, 1887, No. 187,497; in Cape of Good Hope Jan. 26, 1888, No. 426; in Natal Feb. 2, 1888; in Victoria Feb. 8, 1888, No. 5,615; in New South Wales Feb. 10, 1888, No. 466; in South Australia Feb. 10, 1888, No. 961; in Tasmania Feb. 12, 1888, No. 640/10; in New Zealand Feb. 20, 1888, No. 2,817, and in India Apr. 12/38, 1888, No. 16/522.

397,407.



Claim.—1. An apparatus for purifying sewage, consisting of a tank forming a channel of considerable length for the passage of the sewage, and comprising oxidizable positive and negative electrodes of iron, connected, respectively, with the poles of an electrical generator, substantially as and for the purposes described.

2. An apparatus for purifying sewage, consisting of a tank forming a channel of considerable length for the passage of the sewage, and comprising positive electrodes and oxidizable electrodes of iron, said electrodes connected, respectively, with the poles of an electrical generator, substantially as and for the purposes described.

3. An apparatus for purifying sewage, consisting of a tank and positive and negative electrodes located therein and constituting partitions which form a channel of considerable length for the passage of the sewage, the negative electrodes being of iron and oxidizable, and said positive and negative electrodes connected, respectively, with the poles of an electrical generator, substantially as and for the purposes described.

4. An apparatus for purifying sewage, consisting of a tank and oxidizable positive and negative electrodes composed of iron plates arranged alternately, as set forth, to form a channel of considerable length for the passage of the sewage, said positive and negative electrodes connected, respectively, with the poles of an electrical generator, substantially as and for the purposes described.

397,408. KNITTING-MACHINE. FRANK WILCOMB, Providence, R. I., assignor to the Wilcomb Manufacturing Company, San Francisco, Cal. Filed Feb. 20, 1888. Serial No. 265,723. (No model.)



Claim.—1. The combination, with latch-needles, of movable sinkers for measuring off the yarn for the new loops, and movable knock-over bits for casting off the old loops from the needles, and means for operating the sinkers and knock-over bits, substantially as described.

2. The combination, with latch-needles, of movable sinkers for measuring off the yarn to form the new loops, operating means for giving said sinkers independent and successive action, knock-over bits for casting off the old loops, and operating means therefor to move them independently and successively, substantially as described.

3. The combination, with latch-needles, of movable sinkers for measuring off the yarn to form the new loops, operating means for said sinkers to retract them from their normal position, knock-over bits for casting off the old loops, and means for retracting said bits, whereby the needles and loops are left properly exposed to allow the operation of fashioning the fabric to be performed, substantially as described.

4. The combination, with latch-needles, of the sinkers for measuring off the yarn, and movable knock-over bits for casting off the old loops, and means for operating the sinkers and knock-over bits, the said bits being supported in an inclined position, substantially as described.

5. In combination with latch-needles, the movable sinkers, and the movable knock-over bits provided with inclined faces, and means for operating said sinkers and knock-over bits, substantially as described.

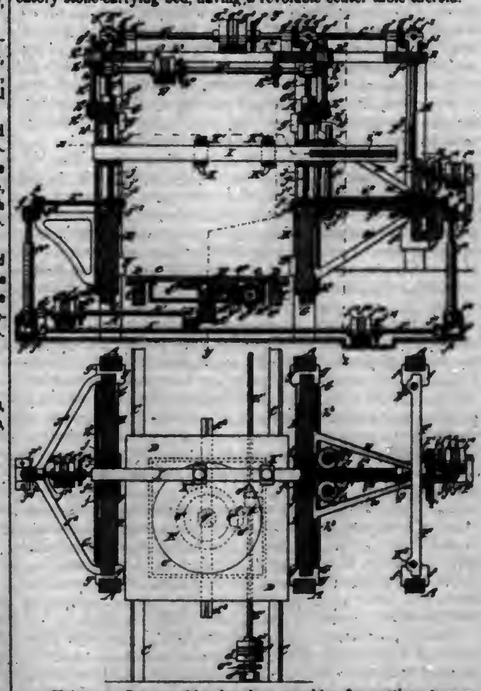
397,409. METHOD OF TREATING FIBERS OR YARNS. WILLIAM J. WILLIAMS, Camden, N. J. Filed May 24, 1888. Serial No. 274,260. (No specimens.)

Claim.—1. The mode herein described of keeping fibers or yarns moist in textile manufactures, said mode consisting in subjecting the fibers or yarns to the action of a solution of phosphate of soda, substantially as set forth.

2. The mode herein described of keeping fibers or yarns moist in textile manufactures, said mode consisting in subjecting the fibers or yarns to the action of a solution of trisodium phosphate, substantially as described.

397,410. MACHINE FOR CUTTING STONE. HUGH YOUNG, New York, N. Y. Filed July 5, 1888. Serial No. 278,080. (No model.)

Brief.—Reciprocating cutter-carrying bar is carried by two simultaneously-rotating heads, H, toward and from whose center the bar may move radially, and around which center it revolves with the heads, and in which it (carrying the cutters) reciprocates over the reciprocatory stone-carrying bed, having a revoluble center table therein.



Claim.—1. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar support, a cutter-bar revolving laterally around the axis of said support and operatively movable upon said support in a path parallel to said axis, and a tool adjustable upon said bar, substantially as described.

2. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar support, a cutter-bar revolving laterally around the axis of said support, said bar being operatively movable upon said support in the line of its own length and operatively and laterally movable nearer to and farther from the said axis, and a tool adjustable upon said bar, said tool being set radially to the axis of said support, substantially as herein described.

3. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar support, a cutter-bar operatively revolving laterally around the axis of said support, said bar being also operatively movable upon said support in the line of its own length and operatively and laterally movable nearer to or farther from the said axis, and a tool adjustable upon said bar, said tool being set at an angle to a radial line drawn to the axis of said support, substantially as herein described.

4. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar support, a cutter-bar revolving laterally around the axis of said support, said bar being operatively movable upon said support in the line of its own length and operatively and laterally movable nearer to or farther from the said axis, and a tool adjustable upon said bar, said tool being set at an angle to the length line of said bar, substantially as herein described.

5. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar support, a cutter-bar revolving laterally around the axis of said support, said bar being operatively movable upon said support in the line of its own length and operatively and laterally movable nearer to or farther from the said axis, and a tool adjustable upon said bar, said tool being set inward toward the axis of said rotary support, substantially as herein described

6. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar carrier and a cutter-bar movable within said carrier in the direction of its own length in lines parallel to the axis of rotation of said carrier, and a cutter adjustable on the said cutter-bar, substantially as described.

7. The combination, in a machine for cutting stone or other substance, of a rotary cutter-bar carrier, a frame in which the said carrier is contained and within which it rotates, and a cutter-bar movable within said carrier in the direction of its own length in lines parallel to the axis of rotation of said carrier, and a tool adjustable on the said cutter-bar, substantially as described.

8. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same in the line of its own length, a cutter-bar having a lateral revolving movement and a movement toward and from the axis of said revolving mechanism for producing the rotary movement of the cutter-bar, and mechanism for producing the movement of the cutter-bar toward and from the axis of rotation, the three said mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

9. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a cutter-bar having a lateral revolving movement, and also having a lateral vertical movement, mechanism for producing the lateral revolving movement, and mechanism for producing the lateral vertical movement, all the three said mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

10. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a cutter-bar having a lateral revolving movement and a horizontal movement in the line of its own length and parallel with the axis of its revolution, mechanism for producing the rotary movement of the cutter-bar, and mechanism for moving the cutter-bar in the line of its own length, all the three said mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

11. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a rotary bed or table, mechanism for rotating the rotary table, a cutter-bar, and mechanism for laterally revolving said cutter-bar, all the three said mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

12. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a cutter-bar having a vertical movement, a lateral revolving movement, and a movement toward and from the center of its revolution in any direction, mechanism for producing the said vertical movement of the cutter-bar, mechanism for producing the said revolving movement of the cutter-bar, and mechanism for producing the movement of the cutter-bar toward and from the center of its revolution, all the said mechanisms being so organized that any three may be subordinated, while the other maintains a primacy, substantially as described.

13. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a cutter-bar having a lateral revolving movement, a horizontal movement in the line of its own length, and a movement toward and from the center of its revolution, mechanism for producing the said revolving movement of the cutter-bar, mechanism for producing the movement in the direction of the length of the cutter-bar, and mechanism for producing the movement of the cutter-bar toward and from the center of its revolution, all the said mechanisms being so organized that any three may be subordinated, while the other maintains primacy, substantially as described.

14. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a rotary table, mechanism for rotating the table, a cutter-bar having a lateral revolving movement and a movement toward and from the center of its revolution, mechanism for producing said revolving movement of the cutter-bar, and mechanism for producing the movement of the cutter-bar toward and from the center of its revolution, all the said mechanisms being so organized that any three may be subordinated, while the other maintains a primacy, substantially as described.

15. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a cutter-bar having a lateral vertical movement and a movement horizontally in the line of its own length, mechanism for producing the lateral vertical movement of the cutter-bar, and mechanism for producing the movement of the cutter-bar in the line of its own length, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

16. The combination, in a machine for cutting stone or other substance, of a horizontally-movable bed or table, mechanism for moving the same horizontally in the line of its own length, a rotary table, mechanism for imparting a rotary movement to this table, a cutter-bar laterally movable in a vertical direction, and mechanism for producing said movement of the cutter-bar, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

17. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral revolving movement, a movement toward and from the center of its revolution, and a vertical movement, mechanism for producing the revolving movement, mechanism for producing the movement toward and from the center of revolution, and mechanism for producing the vertical movement, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

18. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral revolving movement, a movement toward and from the center of its revolution, and a movement in the direction of its own length and parallel with the axis of its revolution, mechanism for producing the rotary movement, mechanism for producing the movement toward and from the center of its revolution, and mechanism for producing a movement of the cutter-bar in the line of its own length, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

19. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral revolving movement and a movement toward and from the center of its revolution, mechanism for producing the said revolving movement, mechanism for producing the movement toward and from the center of its revolution, a rotary table, and mechanism for producing the movement of this table, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

20. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral revolving movement, a lateral vertical movement, and a movement horizontally in the line of its own length parallel with the axis of its revolution, mechanism for producing the lateral revolving movement, mechanism for producing the lateral vertical movement, and mechanism for producing said horizontal movement of the cutter-bar in the line of its own length parallel with the axis of its revolution, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

21. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral revolving movement and a lateral vertical movement, mechanism for producing the lateral revolving movement, mechanism for producing the lateral vertical movement, a rotary table, and mechanism for rotating the table, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

22. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral revolving movement and a horizontal movement in the line of its own length parallel with the axis of its revolution, mechanism for producing the lateral revolving movement, mechanism for producing said horizontal movement, a rotary table, and mechanism for rotating the table, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

23. The combination, in a machine for cutting stone or other substance, of a cutter-bar having a lateral vertical movement and a movement horizontally in the line of its own length, mechanism for producing the lateral vertical movement, mechanism for producing the horizontal movement, a rotary table, and mechanism for rotating the table, all the said three mechanisms being so organized that any two may be subordinated, while the other maintains a primacy, substantially as described.

24. The combination, in a machine for cutting stone or other substance, of a bed or table for supporting the work, a rotary cutter-bar carrier, a frame in which the said carrier is contained and within which it rotates, and the cutter-bar movable within said carrier in the direction of its own length and parallel with the axis of rotation of the said carrier, and a cutter adjustable on said bar, substantially as described.

25. The combination, in a machine for cutting stone or other substance, of a bed or table for supporting the work, a rotary cutter-bar carrier, a frame in which the said carrier is contained and within which it rotates, and a cutter-bar laterally movable within the said carrier toward and from the center thereof, and a cutter adjustable on said bar, substantially as described.

26. The combination, in a machine for cutting stone or other substance, of a bed or table for supporting the work, a rotary cutter-bar carrier, a frame in which the said carrier is contained and within which it rotates, and a cutter-bar movable within said carrier in the direction of its own length and laterally in a direction radial to the axis of said carrier, and a cutter adjustable on said bar, substantially as and for the purpose herein described.

27. The combination, in a machine for cutting stone or other substance, of a bed or table for supporting the work, a reciprocating carriage, a rotary cutter-bar carrier fitted to rotate within the said reciprocating carriage, and a laterally-revolving cutter-bar fitted to move operatively in the direction of its own length within said rotary carrier in lines parallel to the axis of said carrier, substantially as described.

28. The combination, in a machine for cutting stone or other substance, of a bed or table for the work, a reciprocating carriage, a rotary cutter-bar carrier fitted to rotate within the said carriage, and a laterally-revolving cutter-bar fitted to move operatively within the said rotary carrier in a direction radial to the axis thereof, and a tool adjustable on said bar, substantially as herein set forth.

29. The combination, in a machine for cutting stone or other substance, of a bed or table for supporting the work, a reciprocating carriage, a rotary cutter-bar carrier fitted to rotate within the said carriage, and a laterally-revolving cutter-bar fitted to said rotary carrier to move operatively therein in the direction of its own length in lines parallel to the axis of said carrier and laterally in a direction radial to said axis, and a tool adjustable on said cutter-bar, substantially as herein set forth.

30. The combination, in a machine for cutting stone or other substance, of a reciprocating table or bed for carrying the work, a carriage movable in a direction perpendicular to the reciprocating movement of the said bed, and a laterally-revolving cutter-bar operatively movable in the direction of its own length and parallel with the axis of its revolution within said carriage and in a direction toward and from the reciprocating table or bed, and a tool adjustable on said bar, substantially as described.

31. The combination, in a machine for cutting stone or other substance, of a rotary table for carrying the work, a carriage movable in a direction perpendicular to the plane of rotation of said table, and a laterally-revolving cutter-bar operatively movable in the direction of its own length parallel with the axis of its revolution within said carriage, and a tool adjustable on said bar, substantially as described.

32. The combination, in a machine for cutting stone or other substance, of a reciprocating bed for carrying the work, a carriage movable in a direction perpendicular to the reciprocating movement of the said bed, a rotary cutter-bar carrier fitted to rotate within said carriage, and a laterally-revolving cutter-bar operatively movable in the direction of its own length within said rotary cutter-bar carrier, substantially as herein set forth.

33. The combination, in a machine for cutting stone or other substance, of a reciprocating bed for carrying the work, a carriage movable in a direction perpendicular to the movement of the said bed, a rotary cutter-bar carrier fitted to rotate within said carriage, and a laterally-revolving cutter-bar operatively movable within said rotary cutter-bar carrier toward and from the center thereof, substantially as described.

34. The combination, in a machine for cutting stone or other substance, of a reciprocating bed for carrying the work, a carriage movable in a direction perpendicular to the reciprocating movement of the said bed, a rotary cutter-bar carrier fitted to rotate within said carriage, and a cutter-bar operatively movable within said rotary carriage both in the direction of its own length and in a direction radial to the axis of said rotary carrier, substantially as described.

35. The combination, in a machine for cutting stone or other substance, of a reciprocating-moving supporting-bed, a table fitted to the said bed to rotate therein, a carriage movable vertically toward and from said bed, and a laterally-revolving cutter-bar operatively movable within said carriage in the direction of its own length, substantially as described.

36. The combination, with the reciprocating bed D and the rotary table E contained therein, of the driving-shaft E', the bevel-gear e, fitted to slide on but to turn with the said shaft and fitted to turn in a bearing, e^2, on the said bed, the bevel-gears e', carried by said bed and gearing with that, e, on the shaft, the bevel-gear e^3, secured to e', and the bevel-gear e^4 on the bed, gearing with e^3, all substantially as herein described, for driving the table E in all positions of the bed D, as herein set forth.

37. The combination, with the reciprocating carriage G G F and the rotary cutter-bar carrier H H, fitted to rotate in said carriage, of the driving-shaft H', furnished with bevel-gears h, the bevel-gears h', having fixed bearings and gearing with h, the shafts h^2, fitted to and longitudinally confined in bearings on said reciprocating carriage and sliding through but turning said bevel-gears h', and the bevel-gears h^3 on the rotary cutter-bar carrier, gearing with said bevel-gears h^2, all substantially as herein described, for driving the rotary cutter-bar carrier in all positions of the vertically-moving carriage, as herein set forth.

38. The combination, with the reciprocating carriage G G F, the rotary cutter-bar carrier H H contained therein, the sliding cutter-bar boxes J, movable within the cutter-bar carrier to and from the center thereof, and the cutter-bar I, having a longitudinal movement within said boxes, of the driving-shaft I', arranged in bearings movable with the said carriage, of the shaft i^2, working in bearings carried by the cutter-bar carrier H H, geared with said driving-shaft I', and furnished with an endless screw, i^4, and the shafts i^5, working in bearings on the cutter-bar carrier H H and furnished with worm-gears i^6, gearing with the endless screw i^4, and with spur-gears i^3, gearing with a rack, i^{10}, on the cutter-bar, the said gears i^3 being movable with the cutter-bar boxes and capable of sliding on the shafts i^5, all substantially as herein described, for driving the cutter-bar in all its positions relatively to the cutter-bar carrier H and in positions of the said carrier and carriage, as herein set forth.

39. The combination, with the reciprocating carriage G G F, the rotary cutter-bar carrier H H contained therein, the sliding cutter-bar boxes movable within the said carrier H H toward and from the center thereof, and the screws j', fitted to said carrier H and boxes J, of the driving-shaft J', working in fixed bearings, telescopic shafts j^6 j^{6a}, geared with the said driving-shaft by bevel-gears j^5 j^5, and having each a fixed bearing near one end and a bearing near the other end and carried by the reciprocating carriage, and the shafts j^7 j^{7a}, geared with said shafts j^6 j^{6a} by bevel-gears j^8 j^8, and being furnished with endless screws j^9, gearing with worm-gears j^{10} on the said screws j', all substantially as herein described, for producing the said movement of the boxes J in all positions of the reciprocating carriage and rotary cutter-bar carrier, as herein set forth.

40. The combination, with the rotary cutter-bar carrier H H and the sliding cutter-bar boxes J and reciprocating cutter-bar working therein, of the shaft j^7 and its gearing for producing the movements of the said boxes, and the shaft i^2 and its gearing for producing the longitudinal movement of the cutter-bar, both having bearings in and concentric with the said carrier, and the said shaft j^7 passing centrally through the shaft i^2, substantially as herein described.

397,411. MACHINE FOR PACKING FLOUR. SAXTON T. AYERS, Philadelphia, Pa. Filed May 3, 1888. Serial No. 272,652. (No model.)

Claim.—1 In a flour-packing machine, the combination of a hopper, a conveyer-box with a conveyer therein, and having in its discharge end a sifter or screen, a brush carried by the said conveyer and rotating against said screen, a packer connected with the conveyer-shaft, and a discharge-chute in which said packer operates, substantially as and for the purpose set forth.

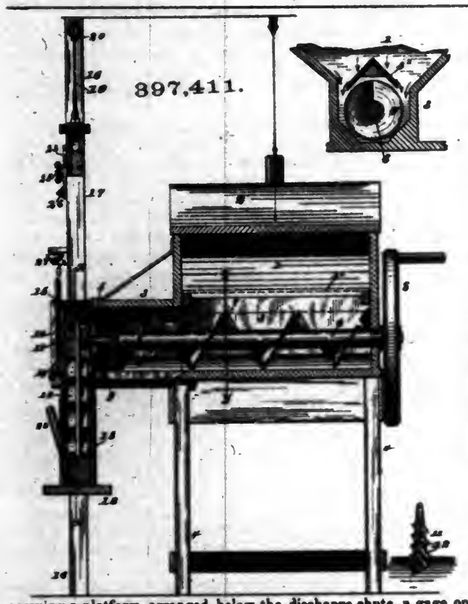
2. In a flour-packing machine, a frame having a hopper with conveyer-box, a conveyer in said box, a screen at the discharge end of said box, a discharge-chute, a reciprocating packer in said discharge-chute, standards with pulleys connected therewith, cords connected to said frame and passing over said pulleys, and a box with weights therein secured to said cords, said parts being combined substantially as and for the purpose set forth.

3. In a flour-packing machine, the combination of the conveyer-box having a sifter or screen in the discharge end thereof, a discharge-chute communicating with said end, a conveyer arranged in the conveyer-box, and a packer on the conveyer-shaft arranged and operating in the discharge-chute, substantially in the manner and for the purpose described.

4. In a flour-packing machine, a conveyer-box with a rotary conveyer therein, a chamber at the end of said box, provided with a discharge-chute, a rising and falling packer connected to said conveyer in said chamber and operating in said discharge-chute, and a rising and falling frame, said parts being combined substantially as and for the purpose set forth.

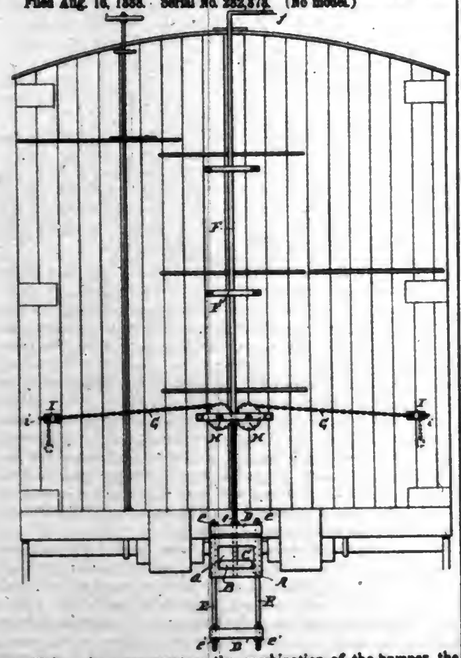
5. In a flour-packing machine, the combination of the conveyer-box, a shield or guard arranged above said box, a conveyer in said box, a discharge-chute communicating with the conveyer-box, a packer on the shaft of the conveyer arranged in the discharge-chute, a frame

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carrying a platform arranged below the discharge-chute, a gage on the frame, and a bell adapted to be sounded by the gage, substantially in the manner and for the purpose described.

397,412. CAR-COUPLING. DEWITT C. BARNETT, Woonsocket, Dak. Filed Aug. 16, 1888. Serial No. 282,573. (No model.)

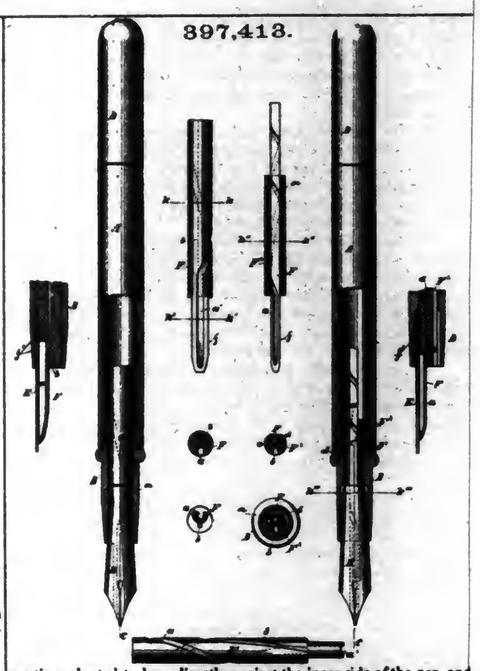


Claim.—In a car-coupling, the combination of the bumper, the vertical guide-rods working in the sides of the said bumper, the upper and lower cross-bars connected to said guide-rods, the coupling-pin attached to and depending from the upper one of said cross-bars, the stud *g*, projecting from said pin, the chains connected at their inner ends to said stud, and the rod secured to the upper end of said pin, substantially as described.

397,413. FOUNTAIN-PEN. THEODORE F. BOURET, Clifton, assignor to Ann L. Shipman's Sons, New York, N. Y. Filed Sept. 1, 1888. Serial No. 284,369. (No model.)

Claim.—1. An ink-feeder for a fountain-pen having the flattened

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portion adapted to bear directly against the inner side of the pen, and the groove or channel made spirally around the feeder and extending to the flattened portion thereof, and thereby adapted to feed ink to the pen, substantially as described.

2. An ink-feeder having the extended arm, against which the pen is adapted to press, and the groove or channel made spirally around the feeder and extending longitudinally on the arm on the side next the pen, and the longitudinal air-inlet aperture extending through the feeder and communicating with the interior of the barrel, substantially as described.

3. In a fountain-pen, the combination of the barrel or reservoir, the neck or tube therein at one end, the feeder extending through and fitting in the neck or tube and entering the barrel, said feeder having the exterior spiral groove and channel, and the pen clamped in a recess in one side of the feeder between the latter and the neck, and having its inner side communicating with the groove or channel, substantially as described.

4. In a fountain-pen, the combination, with a barrel and pen, of a feeder carried by said barrel and consisting of a bar having a groove that is straight on the side next to the pen and that extends from thence in a spiral along the bar toward the ink, substantially as described.

5. In a fountain-pen, the barrel A, having tube B and the independent and removable pen E, combined with a separate feeder-bar, F, having a spiral groove or channel for conducting ink from the barrel to the pen, said groove or channel lying close against the inner walls of its support, substantially as described.

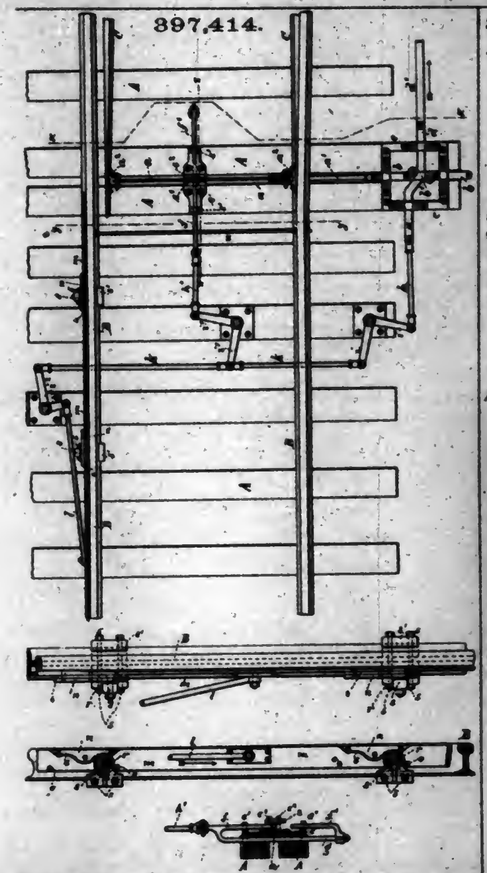
6. An ink-feeder for a fountain-pen consisting of a bar having a groove that is straight at the part that is beneath the pen and that extends in a spiral along the bar toward the ink, substantially as described.

397,414. DEVICE FOR OPERATING AND LOCKING SWITCHES. THOMAS W. BURLEY, Long Island City, N. Y. Filed July 16, 1888. Serial No. 280,065. (No model.)

Claim.—1. The combination, with a switch and a locking device and a detection-bar, of a frame composed of a top and bottom plate, and pairs of rollers between the plates at the central portion of each side, the bar *b* from the switch passing through the frame and between two pairs of its rollers, and having a top plate, *b'*, and rollers, the bar *d*, having bends or inclines and passing through said frame and between the other two pairs of its rollers and at right angles to the bar *d* and beneath the top plate, *b'*, and between the rollers on said bar *b*, and adapted to operate said bar *b* by its movement, the arms *k*, *k'*, and *l*, the bell-crank levers *i*, *i'*, and *i''*, and the cross-bar *k*, passing beneath the rails of the track and connecting the bell-crank levers, substantially as set forth.

2. The combination, with the switch, of the detection-bar *m*, com-

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pound curved inclines or plates *n*, secured to the same, flanged rollers *r*, and supporting-frames *s s'* for the same, and devices, substantially as set forth, for moving the same, substantially as specified.

3. The combination, with the switch, of the detection-bar *m*, compound curved inclines or plates *n*, secured to the same, flanged rollers *r*, and supporting-frames *s s'* for the same, the pins *o* upon the inner surface of the detection-bar, to prevent its being raised off of the rollers, the frames *s s'* having projecting edges adapted to grasp the lower edges of the rail, and bolts 5, which pass through the parts *s s'*, to clamp the same to the rail, and devices, substantially as set forth, for moving the detection-bar, substantially as specified.

4. The combination, with the switch-rails and the bar *a*, connecting the same, of the locking device having perforated uprights between which the rod *a* passes, the locking-bars passing through the frame of the locking device at right angles to the bar *a*, and mechanism, substantially as specified, for operating the locking-bars to lock the switch, substantially as set forth.

5. The combination, with the switch-rails and the bar *a*, connecting the same, of the frame *c*, having perforated uprights *c' c''*, a central pin, 2, the locking-bars *f f'*, passing through said frame, the rod *g*, formed with and connected to the locking-bars *f f'*, and mechanism, substantially as specified, for operating the locking-bars *f f'* so that they alternately lock the switch in its various positions, substantially as set forth.

397,415. MOLD-BOARD OR BREAKING PLOW. MARVIN S. CADWELL and EDWARD L. CADWELL, Lansing, Mich. Filed Jan. 28, 1888. Serial No. 261,573. (No model.)

Claim.—1. The share B, having a supplemental thin self-sharpening point, D, adjustably secured on the upper face of said part B, and a thin self-sharpening supplemental share, C, secured on the under face of said part B, substantially as specified.

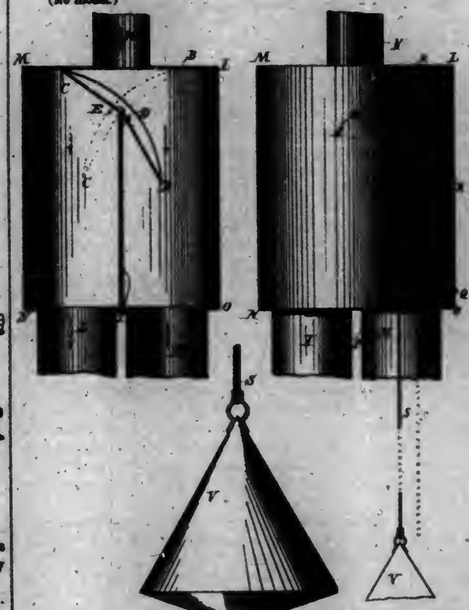
2. The combination, with a mold-board plow, of a cast share, B, having a thin supplemental self-sharpening share, C, and a thin supplemental self-sharpening point, D, both secured to said share B, substantially as specified.

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3. The combination, with a mold-board plow and its part B, of a slightly twisted or curved thin plate-steel reversible and adjustable supplemental point, D, secured on the top face of said part B, said point D having two cutting-edges lying in different planes, substantially as specified.

397,416. AUTOMATIC CUT-OFF FOR CISTERN-PIPES. EDWARD CAWTHORNE, Darlington, Wis. Filed Aug. 11, 1887. Serial No. 246,735. (No model.)



Claim.—In an automatic cut-off, the combination, with the receptacle provided with the central vertical partial partition, T, the inlet-pipe opening centrally in the top thereof, the outlet-pipes opening into the bottom of the receptacle on opposite sides of the partition T, the shaft A, journaled in the sides of the receptacle at the top of said partition and provided with the crank-arm E outside of the receptacle, and the deflector-plate provided with the transverse re-entrant angle E and side flanges, D, and secured to said shaft within said angle, of the float V, having a conical form and provided with a small aperture in its bottom, the rod S, pivoted at its upper end to the end of the crank-arm K, and the horizontally-extended guard rail or staple P Q, preventing the rod S from leaving the receptacle and bending or breaking its pivot, yet not obstructing the free motion of the parts, substantially as specified.

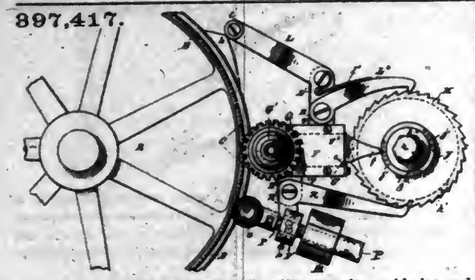
397,417. CIRCULAR-KNITTING MACHINE. GEORGE COOPER, Bennington, Vt., assignor of one-half to Charles Cooper, same place. Filed Jan. 13, 1888. Serial No. 260,670. (No model.)

Brief.—The object of the invention is to produce an improved attachment for circular-knitting machines for making the tuck-stitch and slack course, and consists in the construction of the pressers and of the means for moving the stitch and presser wheels to and from the needles.

Claim.—1. The combination of two pressers arranged one above the other, one of said pressers having an unexposed oblong slot formed in its inner contacting face, and the other presser having an oblong stud secured thereon adapted to work in said slot, as set forth.

2. The combination of two pressers having their inner contacting faces recessed and provided with removable linings, one of said linings having an unexposed oblong or radial slot therein and the other an

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oblong stud secured thereto of smaller diameter than said slot and adapted to work therein, as set forth.

3. The combination, with two pressers having their inner contacting faces recessed, of removable linings in said recesses, one of said linings having an unexposed oblong slot and the other having a pivoted stud therein working in said slot, as set forth.

4. The combination, with a needle-cylinder, a ratchet-wheel, a lever and pawl, spring-actuated presser-slides, and pressers one above the other having inner contacting faces, of a removable collar having a series of slots formed therein on different planes registering with the slides for controlling the movement of the pressers, as set forth.

5. The combination, with a needle-cylinder, a lever and pawl, a ratchet-wheel, and a revolving slotted collar, of spring-actuated presser-slides having cam-shaped fingers alternately working in the slots of said collar, a post on the under slide working through an opening in the upper slide, an upper presser carried by said post, a collar on the upper slide, and a lower presser carried by said collar, as set forth.

6. The combination, with a pawl and ratchet, a slotted collar, and means for actuating the pawl, of spring-actuated slides one above the other, a vertical collar on the upper slide, a vertical post on the under slide of less diameter than the opening in the collar and extending through the same, a presser secured on the post, and a presser mounted on the collar, whereby an independent longitudinal movement of the pressers is permitted, as set forth.

7. The combination, with a needle-cylinder having a cam projection thereon, of a horizontal ratchet-wheel and a lever and pawl for rotating the same, a removable circular collar having elongated slots formed therein secured to said wheel, spring-actuated slides coming in contact with said collar, and independently-moving pressers secured to the upper sides of said slides and located above the same, as set forth.

8. The combination, with a needle-cylinder having a cam projection thereon, of a bed-piece with a flanged arm projecting therefrom, independent spring-actuated slides on the arm between the flanges, a removable cap-plate, pressers mounted on said slides and located above the same, a ratchet-wheel having a removable collar secured thereto, with slots formed therein on different planes, and a pawl and lever for actuating said wheel, as set forth.

9. The combination, with a needle-cylinder having a cam projection thereon, of a bed-piece provided with an inwardly-extending slotted arm having flanges formed on its upper side, spring-actuated slides between the flanges, a cap-plate secured to the flanges of the arm, a ratchet-wheel secured to said bed-piece having a removable slotted collar attached thereto, a lever and pawl for actuating said ratchet, and pressers, as set forth.

10. The combination, with a needle-cylinder having a cam projection thereon, of a horizontally-arranged ratchet-wheel provided with a cam-block, a lever and pawl for actuating said wheel, a bell-crank lever, a stitch-wheel connected therewith, said bell-crank lever coming in contact with the cam on the ratchet-wheel and operating the stitch-wheel, and a spring secured on said bell-crank lever for forcing back the stitch-wheel, as set forth.

11. The combination, with a needle-cylinder having a cam projection thereon, of an inwardly-projecting bed-piece formed with a flanged top, a ratchet-wheel having a hub projection, a slotted collar arranged on said hub, spring-actuated presser-bearing slides secured between the flanges having cam-shaped fingers working independently in the slots of said collar, shoulders formed on said slides, and a projection on the bed-piece limiting the movement of the slides, and a lever and pawl for actuating said ratchet-wheel, as set forth.

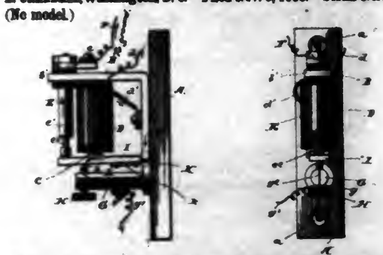
12. The combination, with a needle-cylinder having a cam projection thereon, of an inwardly-extending arm formed with a slotted bottom and flanges on its upper side, and having an arm projecting out from its side supporting a pawl-actuating lever, spring-actuated slides having pressers thereon secured between said flanges, said slides having pins extending downwardly through and working in the slot of the said inwardly-extending arm, a horizontally-arranged ratchet-wheel having a hub projection, a grooved collar secured to said hub, and a lever and pawl for actuating said ratchet-wheel, as set forth.

13. The combination, with a needle-cylinder having a cam projection thereon, of a bed-piece having an inwardly-extending arm formed with a slot in its lower side and flanges on its upper side, spring-actuated slides having pressers thereon secured between said flanges, the lower slide having a slot therein and a downwardly-projecting pin, and the upper slide having a pin projecting downwardly and through the slot in the lower slide, both of said pins working in and extending through the slot in the arm of the bed-piece, and having springs connected therewith for moving the slides, a bell-crank lever secured to the side of said bed-piece, a pawl connected to said lever, a spring coiled on a post on said lever having its ends placed against the bed-piece and the pawl, and a ratchet-wheel having a slotted collar thereon, as set forth.

14. The combination, with a ratchet-wheel, pawl, a slotted collar, and means for actuating the pawl, of a pair of longitudinally-movable slides having downwardly-extending pins, a vertical post formed on one of the slides and a vertical collar formed on the other slide, pressers situated on said collar and post, and springs acting against the pins for forcing the slides back, as set forth.

15. The combination, with a ratchet having a cam thereon and a pawl, of a bell-crank lever having a slot in its short arm, a collar having a downwardly-extending pivot-pin in said slot, a spindle having a stitch-wheel on its end extended through and secured in said collar, and means for actuating the pawl, as set forth.

397,418. PROTECTOR FOR ELECTRICAL INSTRUMENTS. JOSEPH R. CRANDALL, Washington, D. C. Filed Nov. 6, 1888. Serial No. 290,109. (No model.)



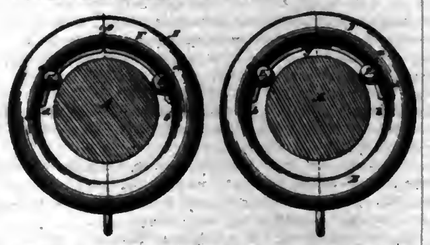
Claim.—1. In a protector for electrical instruments, the combination of the bent plate, one limb of which supports an electro-magnet and to the other limb of which is attached the armature, and contacts arranged on each side of the armature, one connected to the main and the other to the ground line, substantially as described.

2. In a protector for electrical instruments, the combination of a bent bar, one limb of which supports a magnet and the other limb of which supports an armature, contacts arranged on each side of the armature, and a connector between the armature and bar biased to tend to hold the armature in equilibrium between the contacts, substantially as described.

3. In a protector for electrical instruments, the combination of a bent iron bar, one limb of which supports a magnet and the other limb of which supports an armature, a standard attached to but insulated from the bar and connected to the ground-circuit, and another standard connected to the main circuit and arranged in normal electric contact with the armature, substantially as described.

4. A protector for electrical instruments, consisting, essentially, of an insulating-base, a bent iron bar secured thereto, one arm of which extends laterally and supports an electro-magnet and an adjustable contact connected with the ground, and the other arm of which is electrically connected to the armature, and a standard having a contact-piece normally supporting the armature when in operative position, substantially as described.

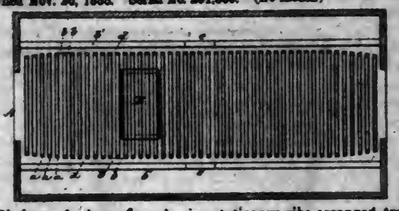
397,419. CURTAIN-RING. JOHN DAY, New York, N.Y. Filed Oct. 17, 1888. Serial No. 288,236. (No model.)



Claim.—1. The curtain-ring B, having recesses *a* and holes *d*, combined with the curved wire F and with the rollers E, through which said wire passes, said rollers being aligned with the recesses *a*, the free ends of the wire F being sprung into the holes *d* in the ring B, the middle portion of the wire F being rigidly held to the ring B, substantially as described.

2. The ring B, having recesses *a*, holes *d*, and slot *f* on its inner side, combined with the curved wire F, said wire having the eye or bead *e*, that enters the slot *f*, the free ends of the wire F being sprung into the holes *d*, and with the rollers E, through which the wire F passes, said rollers being aligned with the recesses *a* and held upon the ring B by the wire F, substantially as described.

397,420. CAR-FLOOR. WILLIAM L. EVERITT, New Haven, Conn. Filed Nov. 26, 1888. Serial No. 291,869. (No model.)

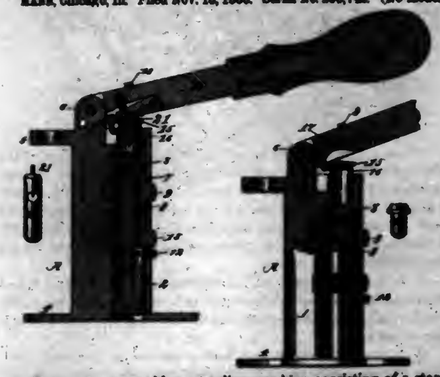


Claim.—1. A car-floor having stationary ribs arranged transversely thereon and distant from each other, so as to form grooves on the floor-level between the said ribs, the said ribs terminating short of the width of the floor of the car and so as to leave clear longitudinal spaces at the ends of the ribs, substantially as described.

2. A car-floor provided with stationary transverse ribs forming transverse grooves on the floor, the said ribs stopping short of the full width of the floor and so as to leave a clear longitudinal space, *d*, at the ends of the ribs, the said longitudinal space recessed to form a channel inclining from each end of the car downward toward the center, combined with a trap at the center through which said channels may discharge, substantially as and for the purpose described.

3. In a car-floor having ribs arranged transversely across it and so as to form transverse grooves between said ribs, the said ribs stopping short of the full width of the floor, so as to leave a clear longitudinal space at each side, the floor constructed with an opening through to the trucks beneath, a cover, B, provided for said opening, the said cover having ribs on its upper surface corresponding to the ribs of the floor, and the said opening provided with a packing, substantially as described.

397,421. CARTRIDGE-RELOADING IMPLEMENT. HENRY PUEHMANN, Chicago, Ill. Filed Nov. 13, 1888. Serial No. 290,742. (No model.)



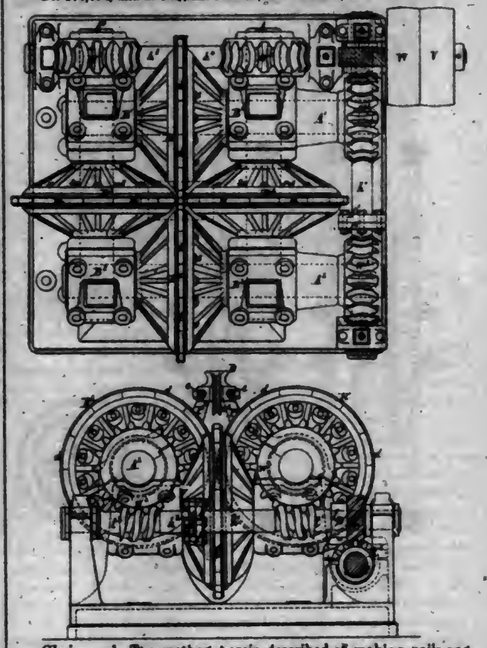
Claim.—1. A cartridge-reloading machine consisting of a standard tubular frame bored for a bullet-supporting stem and for a cartridge-shell-contracting tube surrounding the supporting-stem, both vertically adjustable inside of such standard tube by separate screw-nuts, in combination with a lever pivoted to such standard frame and provided with a cartridge-extracting hook, all substantially as described, to operate as specified.

2. A cartridge-reloading machine consisting of a standard tubular frame bored for a bullet-supporting stem and for a cartridge-shell-contracting tube surrounding the supporting-stem, and of an eyed flange to one side of such standard frame to hold a cartridge-shell for seating the primer, in combination with a lever pivotally connected with the standard frame centrally between the tube and eyed flange thereof, and provided at one side with a cartridge-extracting hook and on its other side with a concaved die for seating the primer, all substantially as set forth, to operate as specified.

3. A cartridge-reloading machine consisting of a standard tubular frame bored for a bullet-supporting stem and for a cartridge-shell-contracting tube surrounding the supporting-stem, both vertically adjustable in the tubular frame by separate screw-nuts, and of a lever pivoted to such standard frame and provided with a cartridge-extracting hook, in combination with a plug to be seated in such tube to rest upon such bullet-supporting stem and entering the cartridge-shell, and provided with a projecting pin for displacing the exploded primer, all substantially as described, to operate as specified.

4. A cartridge-reloading machine consisting of a standard tubular frame bored for a bullet-supporting stem, vertically adjustable in the tubular frame by a screw-nut, and of a lever pivoted to such standard frame and provided with a cartridge-extracting hook, in combination with a conical plug to be seated in such standard tube upon such bullet-supporting stem for expanding the cartridge-shell previously to reloading the same, all substantially as set forth, to operate as specified.

397,422. METHOD OF ROLLING NAILS. HIRAM E. FULLER, London, England. Filed Jan. 5, 1888. Serial No. 259,909. (No model.) Patented in England July 5, 1887, No. 9,513; in France Dec. 30, 1887, No. 187,894, and in Belgium Dec. 30, 1887. No. 80,115.



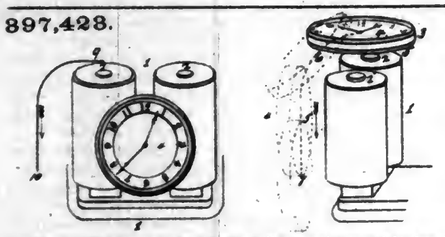
Claim.—1. The method herein described of making nails and similar articles from a continuous length of wire or rod, which consists in passing the continuous wire or rod between die-rollers, forming the primary blank by such rollers, holding and advancing the said blank to a pair of finishing-die rollers, entering the blank between and engaging it with the dies of the finishing-die rollers prior to releasing said blank from the primary blank-forming-die rollers, squeezing the blank in the finishing-die rollers in a direction transverse to that in which it was squeezed by the primary blank-forming-die rollers, and finishing and severing the nail from the wire or rod by the finishing-rollers, as set forth.

2. The method herein described of making nails and like articles, which consists in passing a continuous wire or rod between traveling primary blank-forming dies, and while each blank is held by said dies advancing it between and grasping it by traveling finishing-dies, pressing it in a direction transverse to that in which it was first pressed, and finishing and severing the nail from the wire or rod by the finishing-dies, as set forth.

3. The method herein described of making nails and like articles, which consists in seizing a continuous wire or rod by traveling dies and forming it into primary nail-blanks, holding each separate blank by said dies, and while so held advancing it to and seizing it by traveling finishing-dies, pressing it transversely to the direction in which it was first pressed, and finishing and severing the nail from the wire or rod by the finishing-dies, as set forth.

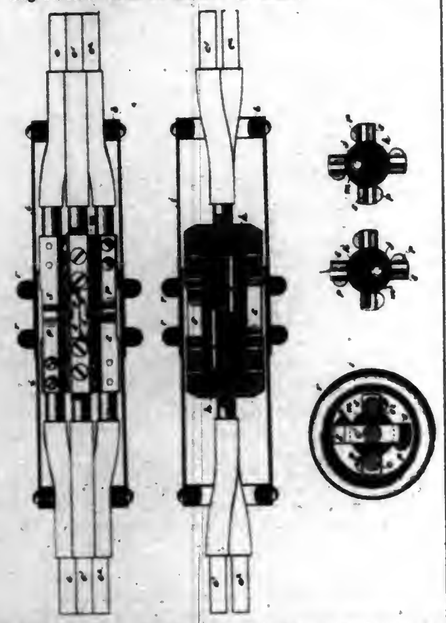
397,423. METHOD OF DEMAGNETIZING WATCHES, &c. JOHN GREAVES, St. Louis, Mo. Filed May 14, 1888. Serial No. 273,765. (No model.)

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Claim.—The improved method of demagnetizing articles herein shown and described, consisting in placing the article in the magnetic field and then passing it through the angles of magnetic force to a neutral point, as specified.

397,424. CONNECTION OF ELECTRICAL CIRCUITS. WILLIAM W. GIBSON, Haverford College, and HENRY N. WELDNER, Philadelphia, assignors to the Electro Dynamic Company, Philadelphia, Pa. Filed Aug. 27, 1888. Serial No. 283,804. (No model.)



Claim.—1. In a connecting device for electric conductors, the combination of two sections of insulating material, each section having located thereon a rigid projecting strip of conducting material with a notch or depression in its surface, a flat spring separated therefrom, but parallel thereto, with a projection upon its surface, the strip and spring of each section forming a complementary contact for the strip and spring of the other section, the rigid strip of one section entering between the strip and spring of the other, whereby both are locked together.

2. In a connecting device for electric conductors, the combination of two sections of insulating material, each section having located thereon a rigid projecting strip of conducting material, a flat spring separated therefrom, but parallel thereto, the strip and spring of each section forming a complementary contact for the strip and spring of the other section, the rigid strip of one section entering between the strip and spring of the other, and means for locking or catching the two sections in such position, substantially as described.

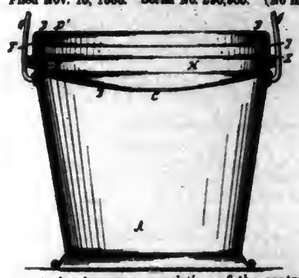
3. The combination, in a connecting device for car or train circuits, of two sections of insulating material, each having fixed thereto the terminals of three circuits, the terminal of the first and second circuits being composed of two projecting strips of conducting material located at diametrically-opposite points, and the terminal of the third circuit composed of two projecting strips of conducting material in two parallel branches located at diametrically-opposite points midway between the terminals of the two first-named circuits.

4. In a connecting device for car or train circuits, the combination of two sections of insulating material, each having fixed thereto the terminals of two or more circuits, the terminals on one section registering with the terminals on the other, a hole, and an insulated pin on the meeting surfaces of each section, the pin of one section entering the hole in the other, whereby erratic junction is rendered impossible.

5. In a car-circuit connector, the combination of a series of fixed registering conducting-terminals in two separate divisions and two cylindrical casings of insulating material united by a lap-joint, whereby dust, dirt, and moisture are excluded.

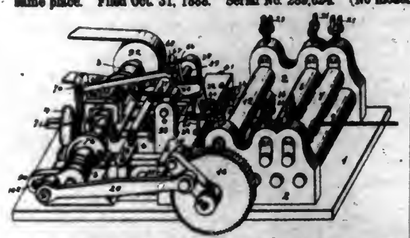
6. A series of railway-cars, a circuit composed of three wires extending from end to end of each car, and a pair of connectors between each car, each connector having one contact-point for two of the said wires and two parallel contacts for the third wire, all arranged substantially as described.

397,425. SLOP-JAR COVER. FREDERICK HARRIMAN, New York, N. Y. Filed Nov. 15, 1888. Serial No. 290,905. (No model.)



Claim.—A slop-jar cover consisting of the centrally-apertured bottom wall, B, the vertical rim portion H, to closely fit the internal surface of a jar-mouth, the lateral flange E, to rest on the jar, and the vertical rim portion F, having the inwardly-projecting rim D, extended downward to form the internal annular pendent flange, D', overhanging the bottom wall, substantially as described.

397,426. WIRE-NAIL MACHINE. JOHN B. HASTINGS, Jackson, Ohio, assignor of two-thirds to James M. Tripp and James M. Lively, same place. Filed Oct. 31, 1888. Serial No. 289,624. (No model.)



Claim.—1. A wire-nail machine having the combination of the following elements, to wit: straightening-rollers 8, 9, 10, and 11, feeding-rollers 12 and 13, grippers 23 and 24, pointers 25 and 26, cleaner 93 and the header 83, and the cutting mechanism consisting of the crank 60, cutter-stock 61, cutting-blade 62, and rod or pitman 69, all constructed and operating substantially as described, and for the purposes set forth.

2. In a wire-nail machine, a bed-plate having standards 2 2, and the die-seat 5, attached rigidly to the said bed-plate, and the standards 3 3 and 4 and sliding-block seat 6, cast integrally with said bed-plate, as set forth.

3. In a wire-nail machine, a feeding mechanism consisting of the rollers 12 and 13, to one end of which rollers is attached a cog-wheel, the roller being provided with a cog-wheel, 15, gearing with the aforesaid cog-wheel, a ratchet-wheel, 16, a vibrating arm, 17, loosely fulcruming upon said roller and carrying at its upper end the ratchet 19, and the annular groove 89 upon the roller, for the purposes set forth.

4. In a wire-nail machine, a die-seat, 5, having in its upper surface excavations 31 31, in which rest and operate the grippers 23 and 24, the pointers 25 and 26, the steel blocks 39 and 40, the levers 28 and 29, and the liner 27, the excavated projection 57, in which is inserted the steel anvil or die 30, standards 49 49, cast integrally with the bed-plate, and the set-screws 34, 41, 42, and 48, for taking up the wear of the steel liner, the grippers and the pointer, respectively, and the steel blocks 39 and 40, and the steel die 30, substantially as described, and for the purposes set forth.

5. In a wire-nail machine, the grippers 23 and 24, both having the surfaces 33 33 inclined slightly to a vertical longitudinal plane of the machine, and the lugs 49 and 50, to which are attached the springs 43 and 44, while the gripper 23 is provided with the groove 95, for the purposes set forth:

6. In a wire-nail machine, the pointers 25 and 26, having the inclined surfaces 33 33 parallel with the inclined surfaces of the grippers, and the lugs 55 and 56, to which are attached the springs 45 and 46, said springs being secured to lugs 53 and 54 on the plates 32 32 and operating to keep the pointers within near proximity to the cam-pins upon the levers 28 and 29, for the purposes set forth.

7. In a wire-nail machine, the levers 28 and 29, fulcruming in sockets in the steel blocks 39 and 40, having at one end the friction or wearing pins 35 and 36 and the friction or cam pins 37 and 38, and in the other end the cone-shaped wheels, for the purposes set forth.

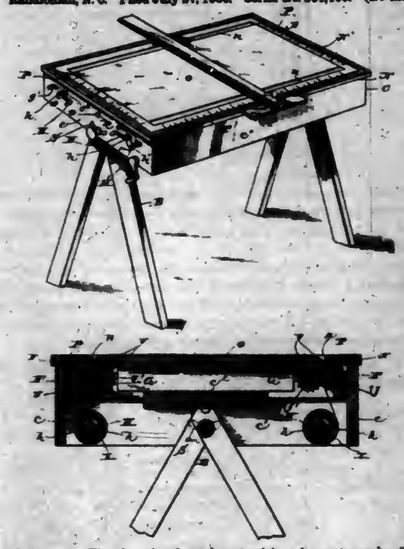
8. In a wire-nail machine, the combination of the following elements, to wit: the header-block 80, sliding in a channel, 79, provided for it in the upper surface of the said sliding-block seat 6, a steel header, 83, in an excavation in the forward part of the said header-block, a plate placed over the header and screwed to the header-block, set-screws 82, 84, and 86, a wedge, 85, liner 81, and the cam-yoke 72, operated by the cam 87 and having the tongue or projection 74, adapted for playing in a tunnel, 88, in the standard 4, and the standard 70, projecting from said tongue, for the purposes set forth.

9. In a wire-nail machine, a cutting or shearing mechanism consisting of a crank, 60, the cutter-stock 61, with the cutting knife or blade 62, the standard 70 of the tongue 71, and the rod or pitman 69, connecting the said standard with the said crank, all operating as described, and for the purposes set forth.

10. In a wire-nail machine, a cutting mechanism having the following means of adjustment: the crank 60, fulcruming upon the shaft 59, (which journals in the standards 58 58,) having the identically-similar arms, (bifurcations,) between whose upper ends is secured a block, 67, which receives a set-screw, 68, and between which arms also slides a movable block, 66, said movable block having the rod or pitman 69 attached thereto, and also receiving the set-screw 66, whereby said sliding block may be raised or lowered, for the purposes set forth.

11. In a wire-nail machine, a cleaner, 93, fulcruming upon a rod, 94, which journals in the standards 58 58, and whose forward end is adapted for playing in the groove 95 in the gripper 23, and to whose rear end is attached the knuckle-joint 96, which is also attached to the cam-yoke 72, so that when the cam-yoke travels rearward the said knuckle-joint will operate to force the rear end of the said cleaner up, thereby causing the forward end to be depressed, and thereby forcing out the nail, as set forth.

397,427. DRAWING BOARD OR TABLE. THOMAS C. HENLEY, Randleman, N. C. Filed July 27, 1888. Serial No. 281,169. (No model.)

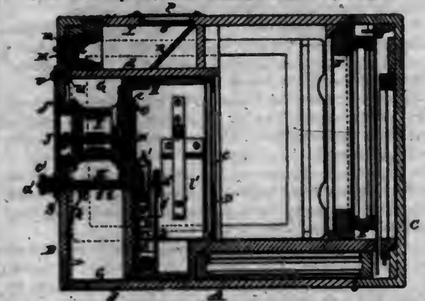


Claim.—1. The drawing-board comprising the rectangular frame C, having side and end strips, and the face-board arranged in the said frame and separated at its side edges from the side strips to form slots *n n*, in combination with stationary rollers F, journaled in the end strips beneath the board, the sliding spring-actuated blocks sliding in grooves in the end strips, the rollers G, journaled in the said blocks and normally held in contact with the stationary rollers, and cam-levers H, adapted to engage studs or projections on the sliding blocks to press them back, substantially as specified.

2. The drawing-board provided near its side edges with longitudinal slots *n n*, through which to pass the ends of the drawing-paper, in combination with stationary rollers F, journaled beneath the board parallel with the slots *n*, the sliding spring-actuated blocks D, normally pressed toward the said rollers, the rollers G, mounted in the said blocks and geared to the rollers F, whereby they rotate simultaneously therewith, and cams H, adapted to engage studs or projections on the sliding blocks to press the latter back and disengage the said rollers, substantially as specified.

3. The drawing-board provided near its side edges with slots *n*, in combination with the relatively-adjustable rollers F G, arranged below the said slots and geared together, and the corrugated rubber sleeves V, surrounding the said rollers, substantially as specified.

397,428. PHOTOGRAPHIC CAMERA. JOHN J. HUSSNER, New York, N. Y. Filed Apr. 21, 1888. Serial No. 271,269. (No model.)



Claim.—1. In a photographic camera, the combination, with the sliding focusing-box and its attached lens or lens-tube, of a forwardly exteriorly extending actuating post or rod, operated substantially as shown and described.

2. In a photographic camera, the combination, with the sliding focusing-box and its attached lens or lens-tube, of a forwardly exteriorly extending actuating post or rod having gradations thereon to indicate alterations of focus and operated substantially as shown and described.

3. In a photographic camera, the combination, with the sliding focusing-box and its attached lens or lens-tube, of an actuating post or rod having graduations or grooves for indications of alterations of focus and a click-spring engaging in said graduations to give audible or sensible expression thereof, essentially as described.

4. In a photographic camera, the spindle forming the axis of the shutter and actuating the same, said spindle being also connected with and actuating the sliding lens or focusing-box, as herein shown and described, whereby alteration of the focus and adjustment of the shutter to required position are effected by said spindle, as set forth.

5. In a photographic camera provided with a rotary shutter controlling the lens, the combination of a forwardly-attached shutter spindle or rod attached to said shutter, and a hollow post or tube through which the spindle passes and by which it is supported, substantially as specified.

6. In a photographic camera, the combination, with a sliding focusing-box having an attached lens or lens-tube and rotary shutter controlling said lens, of a forwardly-attached shutter spindle or rod and a hollow post or tube affixed to the sliding box through which the spindle passes and by which it is supported, substantially as described, whereby the same knob or handle of spindle serves to adjust the focus of lens by the movement of lens-box, and also to set the shutter ready for exposure and likewise adjust, as may be desired, the velocity of shutter for less or greater exposure and again enable a change of diaphragms or stops to be made by the withdrawal of lens from inside of box, as set forth.

7. In a photographic camera provided with a finder, the combination, with a slide or cover applied to the exposing-aperture of the lens proper of the camera, of a slide or cover applied to the exposing-aperture of the finder, and a locking mechanism organized to lock the closed cover of the main exposing-aperture when the cover of the finder exposing-aperture is closed, essentially as herein set forth.

8. In a photographic camera provided with a finder, the combination, with the front or forward cover of the camera-case provided with both focusing and finder exposing apertures, of a sliding focusing-box with attached lens-tube adapted to move in and through said focusing-aperture, the slides or covers applied to both of said apertures, and a locking mechanism organized to lock the closed cover of the focusing-aperture when the cover of the finder exposing-aperture is closed, substantially as specified.

9. The combination, with the front or cover B, having focusing and finder exposing apertures *f m*, of the slides or covers J M, the strip or attachment *s*, secured to the cover M, and the spring-catch *u*, adapted to engage with the cover J, when both slides or covers J M are closed, essentially as described.

10. In a photographic camera provided with a rotary shutter adapted to control the lens tube or opening of the instrument, and which when released is shot or operated by a spring, the rotary shutter, provided with a stop-tooth or projection, *d'*, in combination with a cushioning attachment, R, having a wedge-shaped slot adapted to receive the stop-tooth within it and operating to smoothly and gradually arrest the shutter after it has been shot, substantially as specified.

11. The rotary shutter, constructed with a graduated series of ratchet-teeth or notches, *d'*, additional to and arranged beyond the usual single tooth or notch for holding the shutter on tension, in combination with the lever-catch O, means for setting or adjusting the shutter as desired, and the spring with attached connecting means for actuating the shutter when released, essentially as specified.

12. The combination of the button *k'*, the spring-controlled plate *l'*, the spring-controlled lever-catch O, the rotary shutter N, having ratchet teeth or notches *d'*, the spring P, the cord *g'*, and the pulley *k'*, substantially as shown and described.

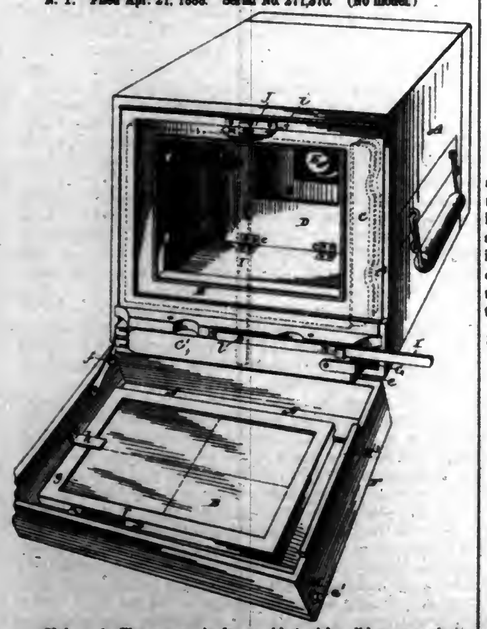
13. In combination with the apertured rotary shutter N, the adjustable auxiliary shutter S, having one or more apertures of varying size and shape, and means for holding said auxiliary shutter in position as required, essentially as specified.

14. In a photographic camera, the combination, with the shutter, of a series of springs connected therewith, said springs being arranged to come into successive operation as further rotation or progression of said shutter is made, as set forth.

15. In a photographic camera, the arrangement in conjoined operation, substantially as herein described, of the shutter, its holding device, and driving-spring, so that the velocity of the shutter and the consequent quickness of the exposure of the sensitive plate may be increased or diminished at the will of the operator by the act of setting the shutter and according to the position in which the shutter is placed, all as set forth.

16. In a photographic camera, the combination, with the rotary shutter having a series of teeth or notches and a lever-catch engaging therewith, of a spring composed of a series of leaves of different lengths, which are operated in conjunction with the rotary shutter, substantially as described, whereby on the rotation of the shutter the force of one or more of said springs will be brought to act upon the shutter according to the number of notches or degrees of rotation given to the shutter, as set forth.

397,429. PHOTOGRAPHIC CAMERA. JOHN J. HIGGINS, New York, N. Y. Filed Apr. 21, 1888. Serial No. 271,370. (No model.)



Claim.—1. The camera-body provided with a lid or cover in its rear and constructed between inner and outer walls with pockets adapted to form storage-chambers for plate-holders out of the field of view of the instrument, substantially as specified.

2. The combination, with the camera-body open in its rear and the hinged lid closing the same, of the plate-holder frame hinged to said body at its back within or under cover of said lid, substantially as specified.

3. The combination, with the body of the camera constructed to open in its rear and the plate-holder-carrying frame hinged to said body in its rear, of pockets forming storage-chambers for plate-holders arranged between inner and outer walls of the camera-body back of said plate-holder-carrying frame, essentially as described.

4. The combination, with the camera-body opening in its rear and the plate-holder frame hinged thereto, of the pivoted locking-bar and a locking-plate with which said bar when closed is made to engage, substantially as specified.

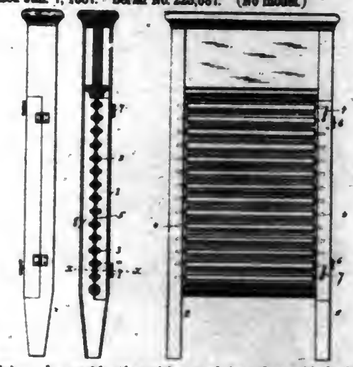
5. The combination, with a locking plate or device attached to the camera in its rear, and the locking-bar I, of the hinged lid F, provided with a spring bolt or rod, M, arranged to project through the side of said lid, and having an attached nose-piece adapted to engage with said locking-bar when said lid is closed, essentially as described.

6. The frame *g* of the focusing ground glass, provided with a catch or bolt, in combination with the hinged or swinging plate-holder-carrying frame, and a locking-plate attached thereto, with which said catch or bolt is made to engage, essentially as described.

7. The combination, with the body of the camera constructed to open in its rear, of the hinged plate-holder-carrying frame H, having an attached locking-plate, J, provided with slots *m s*, the pivoted locking-bar I, the rear hinged lid, F, the spring-bolt M, and the focusing ground glass having its frame provided with a catch or bolt, substantially as specified.

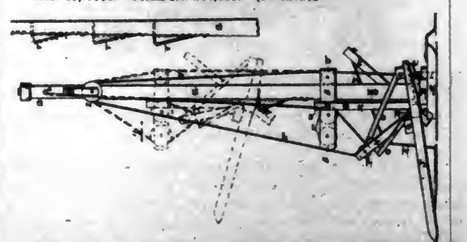
8. The combination, with the camera having one or more side pockets, G, adapted to carry plate-holders, of a spring within either pocket arranged to bear on the inserted plate-holder, substantially as and for the purpose specified.

397,430. WASH-BOARD. ALONZO B. KIBBE, New Richmond, Wis. Filed Jan. 7, 1887. Serial No. 223,687. (No model.)



Claim.—In combination with a wash-board provided with rollers, a movable portion, 5, coextensive with the rollers, whereby the removal and replacement of the rollers is facilitated, hinges 6, connecting the portion 5 at the side to the wash-board so that it may be swung to one side of the wash-board, and thumb-screws 7, screwing into portion 5 and the wash-board, and adapted to adjust the tension of the portion 5 on the rollers, and whereby the rollers may be permitted to rotate at different degrees of speed or be rigidly secured to the wash-board, substantially as shown and described.

397,431. HAY-STACKER. OBED H. KING, Houghton, Iowa. Filed Mar. 13, 1888. Serial No. 267,103. (No model.)

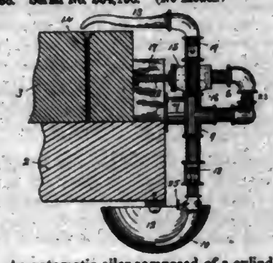


Claim.—1. The combination of a single standard, G, the vertically-moving fork, a single elevating-rope for operating the fork, a support fastened to the side of the standard, a lever pivoted upon the fork for operating in connection with the support, and a cord, X, for operating the lever, substantially as shown.

2. The combination of the standard, a vertically-moving fork placed thereon, the elevating-rope F, a spring-support, V, secured to the side of the standard, the lever W, pivoted upon the fork, and the cord X, fastened at one end of the lever and at the other to one of the teeth of the fork, substantially as described.

3. The combination of the standard G, the elevating-rope F, pulleys I, over which the rope passes, the fork J, placed upon and adapted to move vertically upon the standard, the post N, provided with guiding-pulleys P, the guide S, supported above the fork by the support Q, and pulleys T in the guide, the fork being pivoted to the support R, so that it can be freely tilted without interfering with the guide, substantially as set forth.

397,432. AUTOMATIC OILER. ARIEL KINNEY, Lowell, Mass. Filed Aug. 30, 1888. Serial No. 284,160. (No model.)



Claim.—1. An automatic oiler composed of a cylinder, a plunger which reciprocates therein, an air-pipe extending from said cylinder to the feed-pipe, and a feed-pipe having two valves working oppositely to each other and arranged on opposite sides of the point of junction of said air-pipe with the feed-pipe, combined with an oil-reservoir which receives one end of said feed-pipe, the other end being directed to the spot where the oil is to be applied, and a cross-head or other moving part of the machine, which actuates the plunger, substantially as set forth.

2. In combination with a plunger, 16, operated by the reciprocations of the machine to be lubricated, its inclosing-cylinder 15, and pipe 23 therefrom, the feed-pipe 9, and its valves 19 18, the valve 18 operating to close the passage to the oil-reservoir upon inward travel of the plunger and its rod for discharge of the lubricant, as herein specified.

3. The plunger 16, operated intermittently by its actuating-spring 28, the inclosing-cylinder 15, and pipe 23 therefrom to the feed-pipe, combined with the oil-reservoir 12, the feed-pipe 9, and its valves 18 19, the valve 19 operating to close upon outward movement of said plunger and its rod to fill the oiler with lubricating-fluid, substantially as described.

397,433. EAR-RING. LOUIS KRUS, Brooklyn, N. Y. Filed Mar. 16, 1886. Serial No. 195,727. (No model.)



Claim.—1. An article of jewelry consisting of a loop or base having a knife-edge, C, and a suspended setting, B, having a knife-edge, D, extending across and bearing on the other knife-edge, substantially as described.

2. The combination, with the loop A, the eye *c* thereon, and the knife-edge C in said eye, of the setting B, the eye or staple thereof, and the knife-edge D in said eye or staple, which bears on the knife-edge of the eye *c*, substantially as shown and described.

3. The combination, with a loop or base and a setting, of the interlocking eyes provided with knife-edges in contact at right angles, one eye being secured to the loop or base and one to the setting, substantially as shown and described.

397,434. SETTING FOR JEWELRY. LOUIS KRUS, New York, N.Y. Filed May 1, 1886. Serial No. 200,832. (No model.)

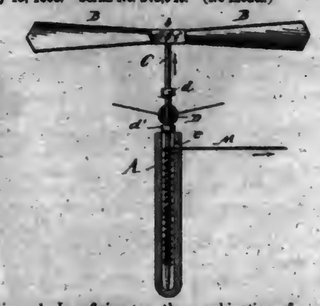


Claim.—1. A suspension device in which the parts capable of relative movement are formed or provided, where they come into contact, with knife-edges, substantially as and for the purpose hereinbefore set forth.

2. In a suspension device in which the parts in contact are formed or provided with knife-edges, the formation of one or both of such edges in curves, substantially as hereinbefore set forth.

3. In a suspension device for jewelry, composed of two links or rings, the internal portions of which present angles or edges at the locality of contact between the two rings, the combination, with the gold or other metal of which such parts are usually manufactured, of plates of steel or other harder and more durable material than that composing said rings inserted at the localities of the bearing portions of the two rings and reduced to knife-edges at their adjacent portions, all substantially as and for the purposes hereinbefore set forth.

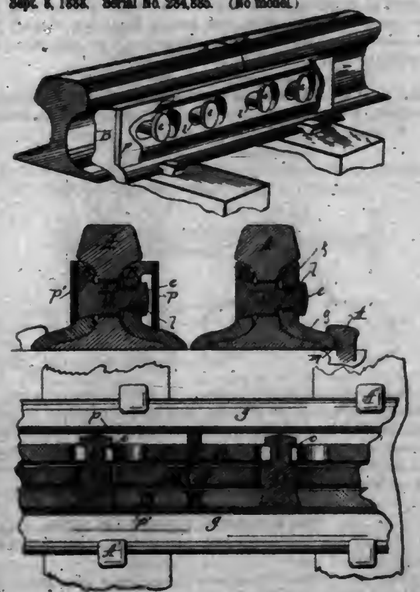
397,435. FLYING TOY. FREDERICK J. LUTZ, Brooklyn, N.Y. Filed May 15, 1888. Serial No. 273,940. (No model.)



Claim.—1. In a flying toy, the combination of a socket-shaped handle having a guide-eye at its upper end, a spindle loosely inserted in said handle, propeller-blades fixed to the upper end of said spindle, two collars on the spindle, and a steadying-body on the spindle between the collars and adapted to turn loosely in a plane at right angles to the spindle.

2. In a flying toy, the combination of a socket-shaped handle having a guide-eye at its upper end, a spindle loosely inserted in said handle, propeller-blades fixed to the upper end of said spindle, two collars on the spindle, and a steadying-body on the spindle between the collars and adapted to turn loosely in a plane at right angles to the spindle, said steadying-body having upwardly-inclined wings.

397,436. NUT-LOCK. JAMES C. MORRHEAD, Greencastle, Pa. Filed Sept. 8, 1888. Serial No. 284,885. (No model.)



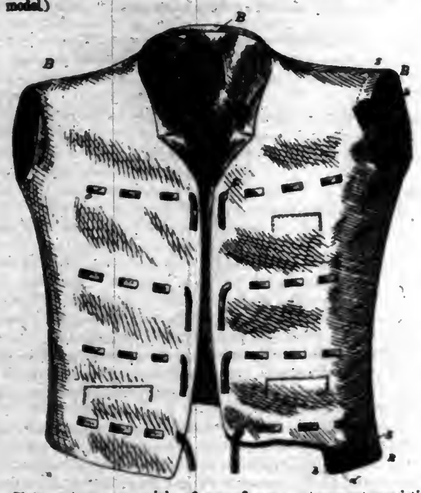
Claim.—1. In combination with rail ends having holes for the bolts, bolts having heads fitted to pass through these holes, a splice-piece formed with a web, and a flange adapted to bear on the tie or ties, with holes in the web fitted to the heads of the bolts, and slots

fitted to the necks of the bolts, and with holes or notches in the flange, whereby it may be spiked to lock the piece, all substantially as described.

2. In combination with the rail ends having holes for the bolts, bolts having tapering heads fitted to tapering holes in a splice-piece, and heads adapted to pass through the holes in the rail ends, a locking splice-piece with holes fitted to the heads of the bolts, and slots fitted to the necks of the bolts, the locking splice-piece being made hollowed or covered, substantially as described.

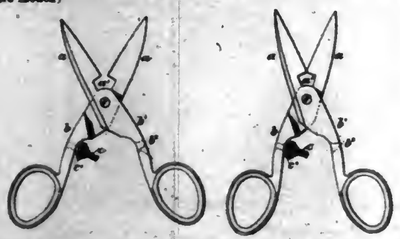
3. In combination with the rail ends and with the bolts and locking splice-piece, a splice-piece, B, having tapering holes fitted to the tapering bolts, and with a covering-piece for the tapered bolts, secured to the splice-piece B, substantially as described.

397,437. PAPER GARMENT. RICHARD C. MUDGE and EDGAR M. WARREN, Detroit, Mich. Filed July 2, 1888. Serial No. 278,877. (No model.)



Claim.—As a new article of manufacture, a garment consisting of layers of cloth and flexible sized paper, having its outer edges inclosing a binding-tape, and stitched as described, and provided with approximately-horizontal rows of perforations, and tapes secured to the garment at or near the perforations of each row farthest from the front opening of the garment, and passing alternately through the said series of perforations, whereby the said tapes are adapted to act as gathering ends, substantially as described.

397,438. BUTTON-HOLE CUTTER. ERNEST HOWELL, West Dulwich, County of Surrey, England. Filed Oct. 31, 1888. Serial No. 289,998. (No model.)

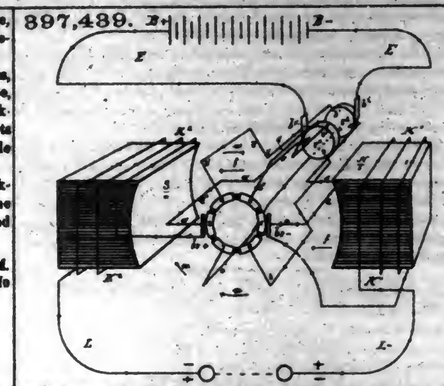


Claim.—In button-hole scissors, the employment of a nut, *d*, formed with a bore of two different diameters, the smaller diameter being threaded to work upon a screwed spindle, *c*, projecting from the inner side of one of the shanks *b* and passing into a hole or recess, *b*⁴, in the shank *b'*, all constructed and arranged in manner substantially as herein shown and described, and for the purpose stated.

397,439. DYNAMO-ELECTRIC MACHINE AND MOTOR. FRANCIS J. PATTEN, New York, N. Y. Filed July 13, 1888. Serial No. 279,861. (No model.)

Claim.—1. A motor provided with a reversing-commutator, the circuit in the motor reversed by said commutator being broken at a point between its terminals and provided with an external loop-circuit, the ends of the loop being in continuous electrical connection with the two sides of the break.

2. A motor provided with an armature-circuit open at an intermediate point between its terminals and in continuous electrical connection with an external loop in which suitable electrical devices may be inserted, and a commutator for reversing current in said armature-circuit.



3. A dynamo-electric machine or motor having connected field-magnet and armature circuits and provided with an external loop in addition to the main external circuit, said loop being connected at its ends, through continuous rubbing contacts, to a break in the internal circuit of the machine, said machine being provided with a reversing-commutator.

4. A dynamo-electric machine or motor provided with a segmental commutator for producing current changes in its internal circuits, the commuted circuit having connected in series with it at a point intermediate of its terminals an external loop, in which the same changes of current will be produced as occur in the commuted circuit.

5. A dynamo-electric machine or motor provided with a commutator for producing a suitable magnetic relation between its field-magnet and armature and having each of its armature-coils connected to two sets of terminals, one set being the reversing-commutator referred to and the other a pair of insulated rings, whereby if a source of alternating current or a source of direct current be connected between one set of terminals and the other set closed the machine will operate as a motor, and whereby alternating or direct currents may be taken from one set or the other of said terminals when the machine is driven as a generator.

6. In a dynamo-electric machine or motor, an armature having its coil or coils provided with two sets of terminals that form parts of a single continuous circuit, one pair connected to insulated ring-contacts and the other pair to the opposite diametral segments of a reversing-commutator, the armature-circuit being closed through two independent external circuits connected to brushes that bear upon the separate pairs of terminals.

7. In a dynamo-electric machine or motor having a number of open armature-coils connected to two sets of terminals that are in continuous circuit, one such set being insulated rings and the other set the opposite segments of a reversing-commutator, both pairs of terminals connected through separate brushes to separate external circuits.

8. In a dynamo-electric machine or motor, the armature construction described, comprising an armature-coil the terminals of which are connected to the opposite diametral segments of a reversing-commutator, the circuit of said armature-coil being open at a point midway between said terminals, the open extremities connected to separate insulated ring-contacts, separate brushes bearing on said rings, and the armature-circuit closed through an external loop connected to said brushes.

9. In a dynamo-electric machine or motor, separate independent armature-coils, each having its terminals connected to the same pair of insulated ring-contacts, each coil open at a point midway between said terminals, the open extremities in each coil connected to a separate independent pair of segments of a reversing-commutator, the separate armature-circuits closed successively and in rotation through an external field-circuit as the opposite pair of commutator-segments for each separate armature-coil comes under the brushes bearing thereon, and to which the external field-circuit is connected.

10. In a dynamo-electric machine or motor, an armature-circuit having its terminals connected to separate insulated ring-contacts and midway between said terminals to the opposite diametral segments of a reversing-commutator, a source of direct current connected in the external circuit attached to the brushes bearing on the insulated rings, whereby a current of one direction is maintained in the armature-circuit proper, and an alternating or reversed current is maintained in an external circuit connected to the brushes bearing upon the segments of said reversing-commutator.

11. In a dynamo-electric machine or motor, an armature-coil having its terminals connected to separate insulated ring-contacts, brushes bearing on said ring-contacts that are connected to the poles of a source of direct current, said armature-coils being open at a point midway between the ring-terminals, the midway terminal points of said armature-circuit being connected to the opposite segments of a reversing-commutator, brushes bearing on said commutator, and an external loop-circuit connected to said brushes and including between its terminals the field-coils, whereby the current in said coils and the magnetism of the field are reversed alternately at each half-revolution of said armature.

12. In a dynamo-electric machine or motor, the construction described, comprising an armature-circuit provided with a number of open coils connected all to the same pair of insulated ring-contacts, like ends or terminals of each in reverse order successively, all of said coils open at a point midway between the aforesaid terminals and connected there to the opposite segments of a reversing-commutator, each coil closed in succession as the armature turns through an external field-circuit connected to brushes bearing on said commutator, whereby the field-circuit is supplied with an alternating current when the armature is supplied with a direct current through brushes bearing on the insulated rings and the circuit connected thereto.

13. In a dynamo-electric machine or motor, a ring-armature provided with a number of coils all connected in a single continuous series and a corresponding number of field coils or circuits, also connected with a single series, and all included in an external loop of said armature-circuit included between its two halves and joined thereto through the segments of a reversing-commutator and brushes bearing thereon, the armature-circuit being connected to a pair of insulated ring-contacts.

14. In a dynamo-electric machine or motor, a ring-armature provided with an even number of coils, all connected in a single circuit, the main terminals of said armature-circuit connected to two insulated ring-contacts, and the armature-circuit led from these two ring-contacts through alternate coils of the ring to a pair of midway terminals, the even-numbered coils all joined in a continuous series in one set, and the odd-numbered coils all in series in another set, the remaining terminal of one such set of coils being connected to all the even and that of the other to all the odd numbered divisions of a segmental commutator having as many segments as there are coils on the armature.

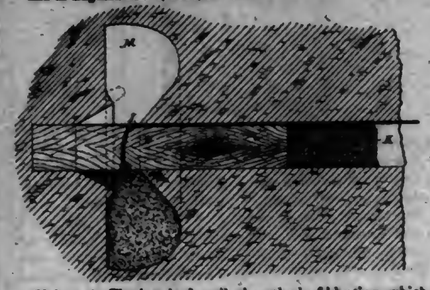
15. In a dynamo-electric machine, an even number of field-poles of alternate polarity arranged radially upon an axis of revolution, the field-coils of one polarity all connected in one series and those of the opposite polarity in a second series, each such series or circuit being connected to a separate insulated ring-contact at one end, and one of said circuits to all the even and the other to all the odd numbered divisions of a segmental commutator at the other end, the two forming a single continuous series circuit and connected to each other through a continuous armature-circuit, the terminals of which are connected to a pair of brushes bearing upon opposite points of the segmental commutator, the alternate even-numbered coils of said armature-circuit being connected to one brush and the odd-numbered coils in series to the other brush, the remaining terminals of said armature-circuit being connected through an external alternating-current circuit, and the two brushes bearing on the insulated ring-contacts being connected to each other through an external direct-current circuit.

16. A dynamo-electric machine or motor having its armature-circuit connected to two continuous ring-contacts, the even-numbered coils all connected in one series and the odd-numbered coils in another, said armature-circuit being broken at a midway point, so as to form intermediate terminals, and the field-coils of said machine similarly connected in two alternating series and connected through a reversing-commutator to the midway terminals of said armature-circuit.

17. In a dynamo-electric machine or motor, an open armature-circuit connected at main terminals to insulated ring-contacts, and a field-circuit included between the two halves of said armature-circuit and connected thereto through fixed brushes bearing upon the opposite segments of a reversing-commutator, to all the alternate segments of which the inner terminal of one half the armature-coils is connected, the terminal of the other half of said armature-coils being connected to all the remaining segments of said commutator.

18. A dynamo-electric machine or motor having an open point in its field-magnet or armature-circuit and a fixed external loop-circuit connected thereto, a series of fixed consequent poles in one of its elements, and a commutator for producing alternate polarity in the other element and electrically connected with another external circuit, whereby when the machine is operating alternating currents will circulate in one external circuit and direct currents in the other.

397,440. METHOD OF BLASTING. LEOPOLD PLOM, Rotinne, and JULIEN D'ANDREMONT, Liege, Belgium. Filed Jan. 26, 1887. Serial No. 225,486. (No model.) Patented in Belgium Dec. 23, 1886, No. 5,616; in France Jan. 3, 1887, No. 167,827; in Luxemburg Jan. 3, 1887, No. 703, and in England Jan. 4, 1887, No. 120.



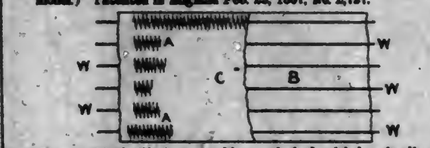
Claim.—1. The herein-described method of blasting, which consists in forming a cavity having an outlet of smaller diameter, charging the cavity, and then fitting a plug in the outlet, extending through the cavity, whereby the force of explosion cannot be exerted longitudinally of the plug, as fully explained.

2. The herein-described method of blasting, which consists in boring a hole forming an enlarged cavity communicating with but not so deep as the bore-hole, charging the cavity, and inserting a plug into the bore-hole extending a distance in front and behind the cavity, so that the force of explosion will not be exerted longitudinally on the plug, as explained.

3. The herein-described method of blasting, which consists in forming an enlargement in the cavity and extending the bore-hole beyond said enlargement, charging the cavity, and then inserting a tamping carrying a fuse, said tamping extending into the prolongation beyond the enlargement, as herein explained.

4. The herein-described method of blasting, which consists in boring a hole, forming an enlargement, *M*, around said bore-hole, charging said enlargement, inserting a plug, *N*, carrying a fuse and extending in front and behind the enlargement, and applying a tamping, *K*, over the plug, all substantially as explained.

397,441. FOUNDATION OF CARD-CLOTHING. SOUTER ROBERTS, Cleckheaton, County of York, England, assignor of one-half to John Vesper Curry, same place. Filed Jan. 13, 1888. Serial No. 261,133. (No model.) Patented in England Feb. 23, 1887, No. 2,727.



Claim.—Cloth-filleting of rubber and cloth with longitudinal metallic wires between the layers and with card teeth or dents passing through this filleting, substantially as described.

397,442. MICROMETER-GAGE. CHARLES H. REMSEN, Springfield, Ill. Filed June 25, 1888. Serial No. 278,190. (No model.)



Claim.—1. An expansible adjusting-nut for micrometers, lying wholly within the micrometer-tube, having its upper end tapered and in its opposite sides longitudinal slits, substantially as shown and described, and for the purpose stated.

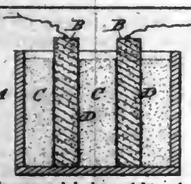
2. The combination, in a micrometer, of the micrometer-screw having its upper end tapered and fitting into a corresponding tapering hole in the top of the outer shell, with the tube sliding within said shell and the micrometer-frame, substantially as shown and described, and for the purpose stated.

3. The combination, in a micrometer, of an independent slotted expansible adjusting-nut and a conical screw-thimble, with the shell, the tube, the frame, and the micrometer-screw, substantially as shown and described, and for the purpose stated.

397,443. SECONDARY BATTERY. WILLIAM A. SHAW, Brooklyn, assignor to The Electrical Accumulator Company, New York, N. Y. Original application filed Apr. 14, 1882, Serial No. 58,313. Divided and this application filed Sept. 22, 1882. Serial No. 72,901. (No model.)

Claim.—1. The method of making electrodes for secondary batteries by melting or softening by heat a suitable metal or metallic com-

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pound, mixing active material therewith, and allowing the mass to harden, substantially as described.

2. The method of making electrodes for secondary batteries by mixing active material with molten or plastic metal or metallic compound and casting the mixture, substantially as described.

3. The method of making electrodes for secondary batteries by mixing active material with molten or plastic metal or metallic compound, casting the mixture into the form of an electrode, and applying to the surface thereof a coating of a suitable active material, substantially as described.

4. The method of making electrodes for secondary batteries by melting or softening by heat a suitable metal or metallic compound, combining active material therewith, and allowing the mass to harden.

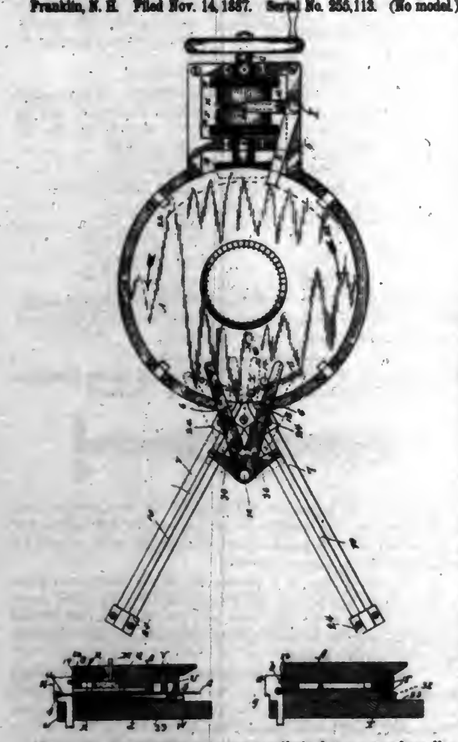
5. An electrode for secondary batteries having a conducting-support containing galena, substantially as described.

6. An electrode for secondary batteries, consisting of lead, combined with galena, and having active material distributed throughout its mass, substantially as described.

7. An electrode for secondary batteries, comprising a suitable conducting-support and an active coating containing a chromium compound, substantially as described.

8. An element or electrode for secondary batteries, comprising a conducting-support, such as described, and an active coating comprising a mixture of chromate of lead and bichromate of potash, substantially as described.

397,444. CIRCULAR-KNITTING MACHINE. WALTER H. STEWART, Franklin, N. H. Filed Nov. 14, 1887. Serial No. 255,113. (No model.)



Claim.—1. A rotary cam-plate, a needle-bed, two sets of needles, *a b*, the former set provided with extensions or tails, a movable chain supported by the bed and adapted to form a support for the tails of said needles, means for moving the chain, a grooved or slotted slide attached to the said chain to engage the tails of said needles to lower or depress the same, and a bracket provided with a support or way upon which said chain may be moved and by which it may be guided from the bed, combined and arranged substantially as hereinbefore set forth.

2. The combination, with the rotary cam-plate, the grooved needle-bed, and two sets of needles, *a b*, the former needles provided with tails *c*, of chains S and attached grooved slides T, supported and movable in ways in the bed, said slides being adapted to engage the tails of said needles *a* to raise and lower the same in their grooves in the bed, ways or brackets 7, in which said chains are adapted to move, rack-bars movable in and guided by said brackets, a two-armed pawl on each of said chains adapted to be engaged by said rack-bars, and means for reciprocating said rack-bars, as set forth.

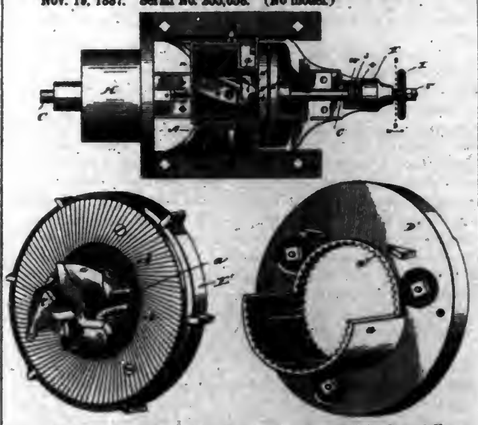
3. The combination, with the needle-bed, the needles *a b*, slides T, and attached chains S, bearing the two-armed pawls 9, of brackets 7, rack-bars 10, lever 30, pivoted at its ends to said rack-bars, two-armed lever 13, connected with the fulcrum of said lever 30, and the rotary cam-plate provided with the pin 14, as set forth.

4. The combination, with the needle-bed, needles, and rotary cam-plate, of a rotary arbor, C, a gear connecting said arbor with said cam-plate, pulleys D E, loose on said arbor, clutch-collar F, splined on said arbor to be moved longitudinally thereon, but to rotate therewith, levers G K and their fulcrum-pin I, and pin L, removably secured to the cam-plate, as set forth.

5. The combination, with the needles *a*, provided with the tails *c*, of the rotary cam-plate, the needle-bed provided with grooves in which said needles operate, said grooves being deeper at their outer or rear than their inner or forward ends, chain S, on which the tails of said needles are adapted to rest, slide T, provided with a groove, 25, adapted to engage the tails of said needles, said slide being attached to said chain, a bracket provided with a support or way upon which said chain may be moved and by which it may be guided from the bed, and means for moving said chain, as set forth.

6. The combination, with the rotary cam-plate, needle-bed, needles, slide T, and chain S, of the roller 6 on the needle-bed, block S, and two-armed pawls 9, attached to the chain, bracket 7, reciprocating rack-bar 10, and means for reciprocating said rack-bar, as set forth.

397,445. GRINDING-MILL. HERBERT F. STONE, Appleton, Wis., assignor to the Appleton Manufacturing Company, same place. Filed Nov. 19, 1887. Serial No. 255,658. (No model.)



Claim.—In grinding-mills, the combination of disks D and E, rotatable hub *a*, provided with plates *b*, stationary plates *d d'*, conveyer-flanges *c*, and knives *e*, all arranged to operate substantially in the manner set forth.

397,446. LACE FOR CONFECTIONERS' USE. JOHN R. STOUT, Brooklyn, N. Y. Filed Mar. 24, 1887. Serial No. 232,236. (No specimens.)

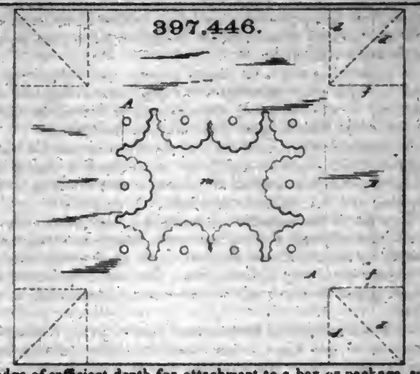
Claim.—1. The combination, with a box or package, of a combined continuous lace and liner, and an auxiliary protecting-sheet of paper or other material, arranged within said box or package, substantially as and for the purpose described.

2. As a new article of manufacture, a combined continuous lace and liner, substantially as herein shown and described, made without break or open joint from a single piece of paper or other suitable material, and adapted for use in boxes or packages that are packed from the bottom, as set forth.

3. A liner for boxes in one piece, having a central opening bordered with lace-work, substantially as described.

4. The combination, with a box or package, of a sheet of lace in one piece with central opening, and being continuous with a border

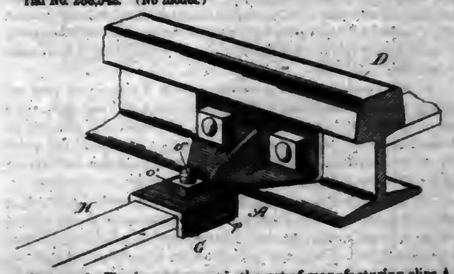
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or edge of sufficient depth for attachment to a box or package, substantially as set forth.

5. The combination, with a box or package, of a combined continuous lace and liner whose central opening is bordered by the lace portion, and whose liner portion is of sufficient depth to wholly or partially line a box or package, substantially as set forth.

397,447. MANUFACTURE OF CLIPS FOR CONNECTING TIE-BARS WITH SWITCH-RAILS. AXEL A. STROM, Austin, assignor to the Strom Manufacturing Company, Chicago, Ill. Filed Oct. 19, 1886. Serial No. 288,542. (No model.)



Claim.—1. The improvement in the art of manufacturing clips A, which consists in forming a sheet-metal blank, B, with a head and a cross-piece, r^3, then bending the head to fit against a rail and the cross-piece to form a socket, substantially as described.

2. The improvement in the art of manufacturing clips A, which consists in forming a sheet metal blank, B, with a head, C, comprising the parts r and r', and with a cross-piece, r^3, then bending the parts r, r', and r^3, respectively, into a head, E, to fit against the web of a rail, a neck, F, to fit upon the rail-flange, and a socket, G, to receive a tie-bar, substantially as described.

3. The improvement in the art of manufacturing clips A, which consists in forming a sheet-metal blank, B, with a head, C, comprising the part r and tapering part r', and with a cross-piece, r^3, then bending the parts r, r', and r^3, respectively, into a head, E, to fit against the web of a rail, a neck, F, to fit upon the rail-flange, and a socket, G, and striking up a ridge, *n*, on the head and neck portions, substantially as described.

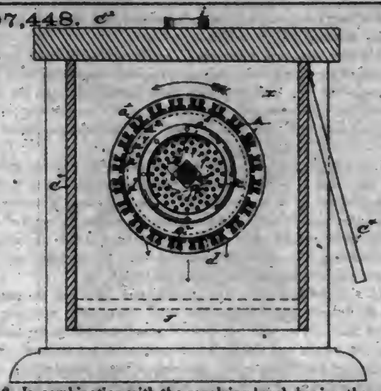
397,448. MACHINE FOR DELINTING COTTON-SEED. THOMAS P. SULLIVAN, St. Louis, Mo. Filed Mar. 2, 1888. Serial No. 265,937. (No model.)

Brief.—The lint is removed from the machine by an exhaust fan, the air being drawn in at both ends of the revolving brush and passing out radially between its lags and through the surrounding net-work. The air-current thus moves in a favorable direction for stripping the brush and is evenly distributed throughout the length of the brush.

Claim.—1. The combination of the revolving brush having the air inlets and outlets, as described, the perforated concave, the casing having the inlet for the lint-bearing seed and the outlet for the denuded seed, and the exhaust-fan, substantially as described.



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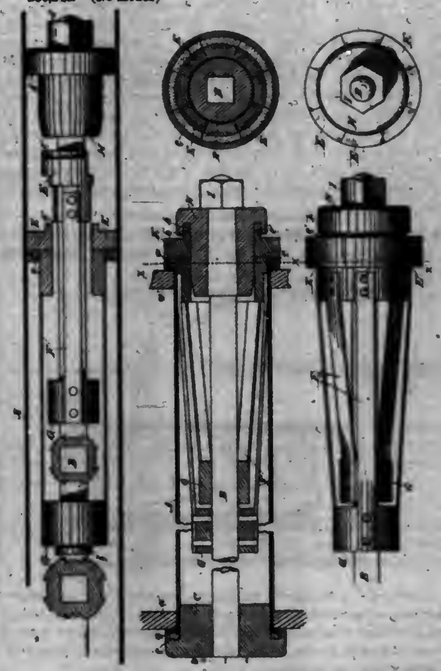
2. In combination with the revolving brush having the air inlets and outlets, as described, the casing having the inlets for the lint-bearing seed and the air-current and the outlets for the lint and the denuded seed, the packer, the perforated concave, and the exhaust fan, substantially as described.

397,449. BOTTLE-STOPPER. JUSTUS A. TRAUT, New Britain, Conn. Filed Nov. 17, 1888. Serial No. 291,067. (No model.)



Claim.—The combination of the upper section, 4, having a lower conical face, 12, the rod 5, cam 6, perforated cylindrical block of soft rubber, and the nut 9, screw-threaded upon the lower end of the rod 5 and having a flat upper face, substantially as described, and for the purpose specified.

397,450. BOILER-TUBE PLUG. EDWIN W. TUCKER, San Francisco, Cal. Filed Mar. 26, 1887. Renewed July 17, 1888. Serial No. 280,240. (No model.)



Claim.—1. A boiler-tube plug comprising an expansible and contractible ring or band composed of independent sections connected with independent spring-arms adapted to pass through the tube and to expand upon emerging from its inner end and embrace and cover

the bead of said tube, and a core fitting within said ring and holding it to place, substantially as herein described.

2. A boiler-tube plug comprising a sectional ring or band, spring-arms attached to sliding hubs and carrying and supporting each section, whereby the ring is contractible while passing through the tube and expansible upon emerging from its end, and a core fitting within the ring or band and holding it to place, substantially as herein described.

3. In a boiler-tube plug, the combination of a rod for passing through the tube, a sectional ring or band connected with spring-arms and adapted to be contracted as it passes through the tube and to be expanded upon emerging from its end to cover the bead of said tube, and a core carried upon said rod and fitting within the ring or band and holding it to place, said core having a lip engaging tongues on the sections, substantially as herein described.

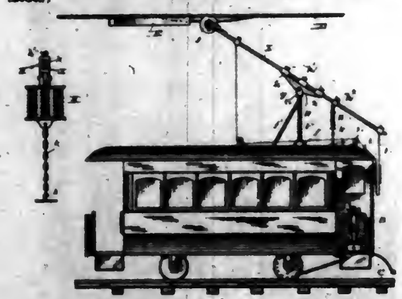
4. In a boiler-tube plug, the combination of a rod for passing through the tube, a sectional ring or band, spring-arms carrying the sections of said ring or band, whereby it is contractible or expansible, a sliding hub on the rod and to which said arms are secured, and a core on the rod for fitting within the ring or band and holding it to its place against the end of the tube, substantially as herein described.

5. In a boiler-tube plug, the combination of a rod for passing through the tube, a ring or band formed of independent sections, and spring-arms for carrying and supporting said sections, independent sliding hubs on said rod, to each of which some of the spring-arms are secured, whereby the ring or band formed by said sections may be broken and contracted to pass through the tube and expanded to a perfect circle upon emerging at the inner end, whereby the bead of said inner end is covered, and a core on said rod for fitting within the ring or band and holding it to place, substantially as herein described.

6. In a boiler-tube plug, the combination of a rod for passing through the tube, a ring or band formed of independent sections, and spring-arms for carrying and supporting said sections, independent sliding hubs on said rod, to each of which some of the spring-arms are secured, whereby the ring or band formed by said sections may be broken and contracted to pass through the tube and expanded to a perfect circle upon emerging at the inner end, whereby the bead of said inner end is covered, a core on said rod for fitting within the ring or band and holding it to place, a plug on the forward end of the rod for closing the forward end of the tube, and a nut on each end of the rod for tightening up the plugs, substantially as herein described.

7. In a boiler-tube plug, the combination of a rod passing through the tube, a plug with packing upon the forward end of said rod, and a nut for tightening said plug against the forward bead of the tube, a ring or band with packing and composed of independent sections, spring-arms carrying and supporting said sections, and independent hubs sliding on the rod and to which the spring-arms are secured, whereby the plug may be contracted as it passes through the tube and expanded upon emerging therefrom to fit its packing over and against the inner bead of the tube, a core with packing carried by the rod and adapted to fit within the ring and press its packing against its forward edge, and a nut on the inner end of the rod for tightening up the core, all arranged and adapted to operate substantially as herein described.

397,451. OVERHEAD CONTACT AND SWITCH. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Nov. 12, 1888. Serial No. 290,563. (No model.)



Claim.—1. A switch for suspended electric-railway conductors, comprising a box attached to the conductor and formed with two or more branching compartments leading therethrough, one or more of the compartments having a contracted portion adjacent to its extremity, substantially as described.

2. A switching device for electric railways, consisting of an open-bottom metallic box or frame secured to and depending from the under side of a suspended conductor and formed with two or more branching compartments leading therethrough, the extremities of such compartments flaring outwardly toward the conductor to form lateral guides and inwardly to facilitate the passage of the contact device, substantially as described.

3. A switching device for electric railways, comprising an open-bottom box, conductors connected to the upper portion of the box, and a guide rib or ribs connecting the extremity or extremities of the switch-box with the conductor, substantially as described.

4. A switching device for electric railways, comprising an open-bottom box, conductors leading to the upper closed portion of the box, and a guide-rib connecting the interior of each extremity of the switch-box with the conductor, substantially as described.

5. A switch for suspended electric-railway conductors, comprising a downwardly-open frame or box having passages extending therethrough, the main conductor attached to the upper portion thereof, and a guide rib or strip extending from the inner under side of the box and against the under side of the conductor, substantially as described.

6. A switching device for suspended electric-railway conductors, comprising an open frame or box having branching compartments extending therethrough and suspended from the main conductor, and fixed guides at the extremities of said passages, substantially as described.

7. A switching device for suspended electric conductors, comprising an open-bottom box or frame formed with branching compartments and depending from the conductor, a rib or ridge at the under side of the conductor and extending into the switch-box, and lateral guides on each side of the rib, substantially as described.

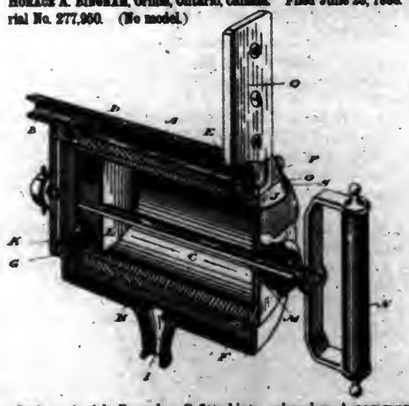
8. In an electric railway, the combination, with the car, of a post extending upward therefrom, a frame hinged and pivoted upon said post, and a longitudinally-adjustable arm secured in said frame and provided at one end with a grooved contact-wheel for engagement with a suspended conductor and at the other with a tension-spring for maintaining the contact-wheel in operative position, substantially as described.

9. The combination of a moving vehicle, a support or post extending upward therefrom, a frame hinged and pivoted therein, an arm longitudinally adjustable in the pivoted frame and provided at its outer end with a contact-wheel arranged to bear against the under side of the conductor, and tension-springs acting against the arm for holding the contact-wheel in position, substantially as described.

10. In an electric railway, the combination, with the car, of a post extending upwardly therefrom, a contact-carrying arm hinged and pivoted upon said post, and a tension-spring adjustably secured to the lower part of said arm and connected with the car, said spring acting to hold the outer extremity of the arm and the contact carried thereby upward against a suspended supply-conductor, substantially as described.

11. In an electric railway, the combination, with a car, of a post extending upwardly therefrom, a contact-carrying arm hinged and pivoted upon said post and provided at one end with a grooved contact-wheel for engagement with the supply-conductor suspended above the line of travel of the car, and a rope or other flexible connection secured near the outer end of said arm and connected with the car, and a rope or flexible connection secured at or near the lower end of said arm, whereby the outer extremity of the arm may be lowered by one rope and the arm moved into the desired position by the other rope, substantially as described.

397,452. LIQUID-MEASURING DEVICE. FRANK WINTERS and HORACE A. BINGHAM, Orillia, Ontario, Canada. Filed June 23, 1888. Serial No. 277,260. (No model.)

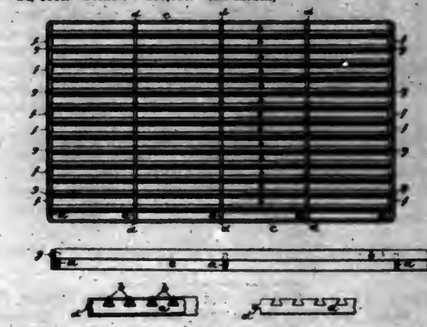


Claim.—1. A hollow plug, C, fitted into a chamber, A, communicating with a liquid-reservoir through the passage-way B, and the ports D, E, F, and G and passage-way H, arranged in relation to each other, as specified, in combination with the piston L, connected to the handle N by the piston-rod M, arranged to operate substantially as and for the purpose specified.

2. A hollow plug, C, fitted into a chamber, A, communicating with a liquid-reservoir through the passage-way B, the ports D, E, F, and G and passage-way H, arranged in relation to each other, as specified, and the handle N, designed to revolve the plug C, in combination with the piston L, the cam-plate O, fixed to the plug, and the adjustable frame P, actuated by the cam-plate O, and designed to operate the counter Q, substantially as and for the purpose specified.

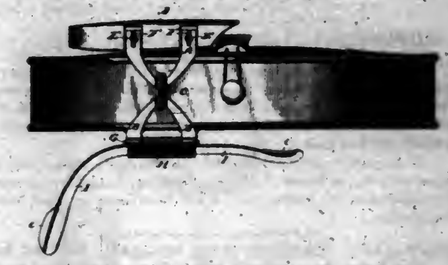
3. A hollow plug, C, fitted into a chamber, A, communicating with a liquid-reservoir through the passage-way B, the ports D, E, F, and G and passage-way H, arranged in relation to each other, as specified, and the piston L, provided with a piston-rod, M, which connects it to the handle N, designed to revolve the plug C, in combination with the cam-plate O, operating between the pins R and S, so as to impart a vertical movement to the frame P, which operates the counter Q, substantially as and for the purpose specified.

397,453. MAT. CLAYTON WOLCOTT, Hartford, Conn. Filed Feb. 24, 1888. Serial No. 265,156. (No model.)



Claim.—The herein-described mat, consisting of a surrounding band, a series of transverse bars having notches which are open at the top and enlarged downwardly, and a series of longitudinal bars or wires with their lower parts shaped in cross-section to the form of said notches, while their upper portions, which project therefrom, are contracted into a longitudinal ridge, substantially as described, and for the purpose specified.

397,454. VIOLIN-REST. JOSEPH BOEHMER, Chicago, Ill. Filed June 6, 1888. Serial No. 276,183. (No model.)



Claim.—1. The combination, with a violin, of an arched strip, as I, the ends of which are adapted to rest upon the shoulder and chest, respectively, of the player.

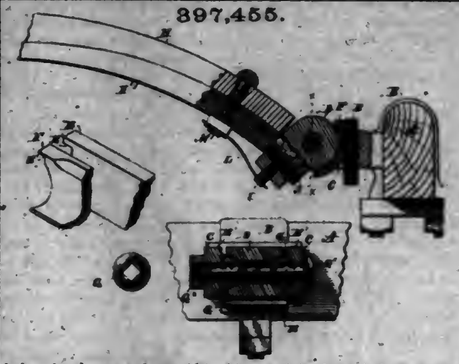
2. The combination, with a violin, of an arched strip, as I, attached pivotally thereto, and adapted when turned down to rest upon the chest and shoulder of the player, and having a curvature corresponding approximately to that of the ribs of the violin, so that when folded up it may permit the violin to go into an ordinary case.

3. The combination, with clamp-frame of a violin chin-rest, of an arched strip, as I, the ends of which are adapted to rest upon the shoulder and chest, respectively, of the player.

4. The combination, with the clamp A and chin-rest D, of screws E E and slots F F, whereby the rest D may be adjusted, as described.

397,455. THILL-COUPLING. WILLIAM H. BOWMAN, South Salem, Ohio, assignor to Alexander B. Lukens, Charles T. Bowers, and C. P. Pancake, all of same place. Filed Apr. 26, 1888. Serial No. 271,951. (No model.)

Claim.—1. In a thill-coupling, the combination, with the axle-clip having jaws, of a bolt mounted therein, tapering bushings on the bolt, a head mounted on said bushings and having a hole to receive the shaft-iron, and anti-rattling devices interposed between the clip and the said head, and a shaft whose iron is provided with a tenon adapted to fit said hole in the head, and means to secure the tenon therein.



2. In a thill-coupling, the combination, with the axle-clip having jaws, and a rubber cushion and a metallic plate mounted between said jaws, of a bolt mounted in the jaws and having angular portions, tapering bushings fitted upon said bolt and matching said portions, a head mounted on the said bushings and having a hole to receive the shaft or pole iron and provided with a set-screw, and a shaft or pole-iron adapted to fit said hole and to be engaged by said screw.

3. A thill-coupling containing the following instrumentalities: an axle-clip having jaws, an india-rubber block and a curved metallic plate fitted between said jaws, a bolt fitted to the jaws and having angular portions, tapering bushings fitted upon said bolt, a head fitted upon said bushings and having an inclined hole, and a shaft or pole iron constructed with a tenon fitting said hole and provided with a transverse pin, a set-screw carried by the head and adapted to engage said tenon, and a locking-spring carried by the shaft or pole and arranged to lock said screw.

4. In a thill-coupling, the combination, with a clip having jaws, of a bolt fitted in said jaws and having angular portions, two bushings having angular holes fitted upon said portions, and a head having two holes therein, one of which is horizontal and mounted upon said bushings and the other of which is adapted to receive the shaft or pole iron.

5. In a thill-coupling, the combination, with the clip having jaws, of a bolt fitted to said jaws, a head having a horizontal hole arranged to turn on the said bolt as its axis, and another hole at right angles to the first-named hole, and a shaft or pole iron constructed with a tenon which fits said latter hole, and devices to hold said tenon therein.

6. In a thill-coupling, the combination, with a head having a hole adapted to receive a shaft or pole iron and a set-screw, of a shaft or pole iron constructed with a tenon adapted to fit said hole and to be engaged by the said screw, and provided with a transverse pin, and a spring-lock carried by the shaft or pole and arranged to lock said screw.

397,456. WHIP. HENRY A. COWLES, Westfield, Mass., assignor to the Bay State Whip Company, same place. Filed June 8, 1888. Serial No. 276,482. (No model.)



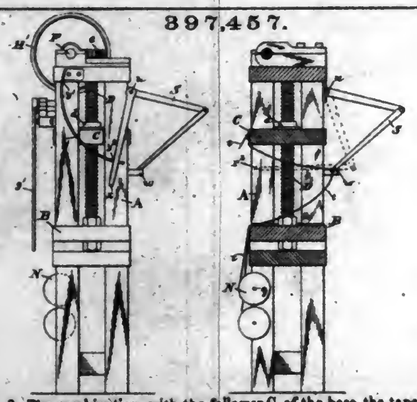
Claim.—A whip having a central steel core-piece surrounded by parallel longitudinal strands of catgut or fibrous material, a plaited core-covering, and a surrounding whip-cover of usual material connected to said whip-core, substantially as described.

397,457. MACHINE FOR COMPRESSING AND BUNDLING GOODS. WILLIAM O. CRAIG, Baltimore, Md., assignor of two-thirds to Wise Brothers, same place. Filed Aug. 13, 1888. Serial No. 282,671. (No model.)

Claim.—1. The combination, with the press-frame and the curved plate *y*, provided with stop-shoulders y' y^2, of the rock-shaft *x*, jointed arms S, attached thereto and having spring-actuated hooks *r*, the bar *w*, and the lever *x*, substantially as shown and described.

2. The combination, with the base B and the follower C, having clamps *z*, of the tape or cord spools N, mounted on rods *q* below the base, the arms S, and the spring-actuated hooks *r*, pivoted to said arms, substantially as shown and described, and for the purpose set forth.

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3. The combination, with the follower C, of the base, the tape or cord spools, the tape or cord clamps to hold the tape stretched across the space between the follower and base, a rock-shaft, *u*, a bar, *w*, extending along the machine, jointed arms attached to the rock-shaft and having their free ends resting upon the said bar, and a spring-actuated hook secured to each arm, substantially as set forth.

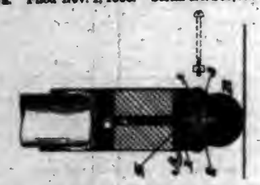
397,458. TIRE FOR VEHICLE-WHEELS. HOWARD M. DU BOIS, Philadelphia, Pa. Filed Nov. 1, 1888. Serial No. 289,749. (No model.)



Claim.—1. In a tire, an inner metallic tire and a cushion, in combination with an outer upset tire, substantially as described.

2. A tire consisting of inner metallic tire and outer upset metallic tire with an interposed cushion, the inner tire having side flanges, forming a channel receiving said cushion and outer tire, substantially as described.

397,459. TIRE FOR VEHICLE-WHEELS. HOWARD M. DU BOIS, Philadelphia, Pa. Filed Nov. 1, 1888. Serial No. 289,750. (No model.)



Claim.—1. A metallic tire with side flanges having an elastic tread within the same, a transverse tubular plug passing through said tread and having its ends contiguous to said flanges, and a pin passing through both the plug and side flanges and secured to the latter, said parts being combined substantially as described.

2. An elastic tread having a tubular plug contained therein, in combination with a pin passing through said plug and secured to the sides of the tire, substantially as described.

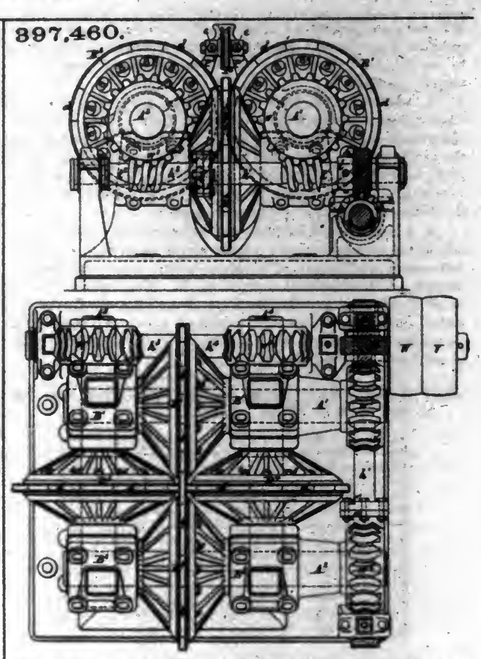
3. A tread for a tire having therein a plug with a head on the periphery thereof, said plug being adapted to be secured to the said flanges of the tire, substantially as described.

4. A metallic tire having flanges forming a circumferential channel or groove, an elastic tread within said channel, a tubular plug having a peripheral head within said tread and having its ends contiguous to the flanges of the tire, and a pin passing through said tube and flanges, said parts being combined substantially as and for the purpose set forth.

397,460. MACHINE FOR ROLLING NAILS. HIRAM R. FULLER, London, England. Filed Jan. 5, 1888. Serial No. 259,910. (No model.) Patented in England July 5, 1887, No. 9,513; in France Dec. 30, 1887, No. 187,894, and in Belgium Dec. 30, 1887, No. 80,115.

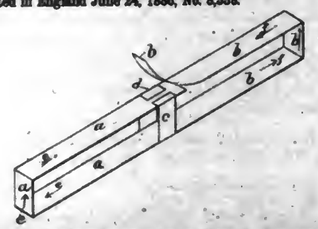
Claim.—In a nail-rolling machine, the combination of two pairs of die-rollers of conical form, so arranged that the axes of the one pair are in a plane a little below the plane of the others and at right angles to them, all the rolls revolving in a vertical plane, and each having a series of dies in their greatest diameter and arranged as described, whereby the bite of the lower rolls is near the bite of the upper rolls to seize the blanks directly therefrom before the blanks have left the

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dies of the upper rolls, substantially as and for the purpose herein set forth.

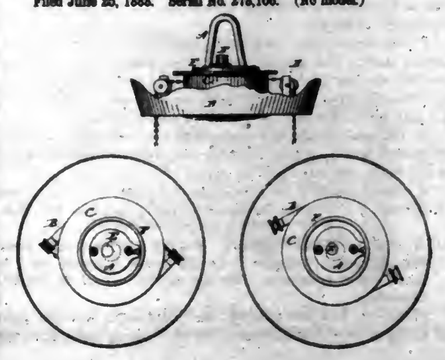
397,461. ELECTRIC CONVERTER. LUDWIG GUTMANN, Fort Wayne, Ind. Filed May 16, 1888. Serial No. 274,029. (No model.) Patented in England June 24, 1886, No. 8,338.



Claim.—1. An electric converter in which the iron core is made of superposed iron cross-shaped sheets whose arms are bent into two rectangular figures at right angles to each other, and the ends of whose arms all lie in the same or substantially the same plane and in contact with one another.

2. An electric converter in which the iron core is made of superposed cross-shaped sheets of iron whose ends are brought into metallic contact with one another, the several sheets being insulated from one another.

397,462. SUSPENSION DEVICE FOR LAMPS. WILLIAM C. HOMAN, Meriden, Conn., assignor to Edward Miller & Company, same place. Filed June 25, 1888. Serial No. 278,106. (No model.)



Claim.—1. The combination of a frame, a stationary hanger, a spindle forming a connection between the frame and hanger, but so as to permit a limited rotation of said frame in a horizontal plane while the hanger remains stationary, a spring-drum arranged in said frame upon said spindle, one or more chains extending from said drum, the drum provided with a flange concentric with said spindle, an eccentric on the spindle between the hanger and frame, and a dog in connection with said eccentric, the nose of the dog being adapted to engage said flange on the drum, substantially as described, and whereby under a rotation of said drum in one direction disengagement between said flange and dog will be produced by the said eccentric, or the frame turned in the opposite direction will produce an engagement between said flange and dog.

2. The combination of the stationary hanger A, the frame B, having a vertical spindle, D, extending therefrom, the upper end of the spindle constructed with an eccentric extension, E, into said hanger, and which eccentric extension forms a pivot in the hanger for the horizontal rotation of the frame, a spring-drum, C, arranged upon said spindle as its axis of revolution, one or more chains extending from said spring-drum, the head of the drum next the hanger constructed with a flange, F, concentric with the spindle, but eccentric to the said extension or pivot E, the hanger constructed with a dog, G, within said flange, the nose of the said dog adapted to engage or disengage said flange on the drum, substantially as and for the purpose described, and whereby under the rotation of the frame in a horizontal plane in one direction the dog and flange of the drum are disengaged, but under a rotation of the frame in the opposite direction the said flange and dog are brought into engagement.

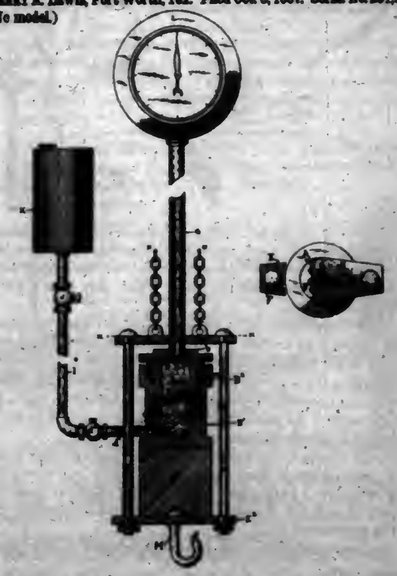
397,463. MANUFACTURING DOLLS AND BUSTS. JOSEF KIENELKA, Vienna, Austria-Hungary. Filed Jan. 12, 1888. Serial No. 260,559. (No model.) Patented in Germany Oct. 1, 1884, No. 31,189; in Austria-Hungary Oct. 6, 1884, No. 20,966 and No. 46,457, and in France Oct. 23, 1884, No. 165,094.



Claim.—1. As a new article of manufacture, a head or bust of hard material, wherein are formed recesses at those places which are intended to be ornamented with hair, substantially as described.

2. A head or bust of hard material provided with a recess, C, in combination with a plastic material filling the said recess, and hair secured in the said plastic material, substantially as described.

397,464. HYDROSTATIC INDICATOR FOR WEIGHING-SCALES. HENRY A. LEWIS, Fort Worth, Tex. Filed Oct. 8, 1887. Serial No. 251,808. (No model.)

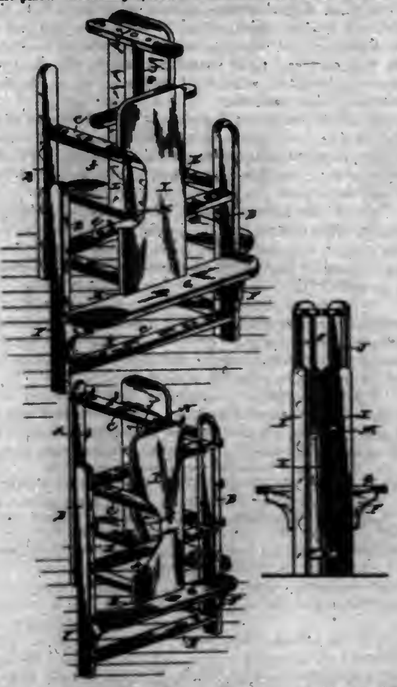


Claim.—1. In a hydrostatic indicator for scales, a hollow inner cylinder, and a second outer cylinder, within which the inner cylinder slides, said inner cylinder being provided with a vertical stand-pipe directly over it, in combination with a registering-dial attached to the top of the stand-pipe, all constructed to operate substantially as and for the purposes specified.

2. In a hydrostatic indicator for scales, a hollow inner cylinder, and a second outer cylinder, within which the inner cylinder slides, a stand-pipe attached to said inner cylinder, and a registering-dial, in combination with a bearing-bar, side rods, and under bar, forming a frame bearing upon the top of said inner cylinder, all constructed to operate substantially as and for the purposes specified.

3. In a hydrostatic indicator for scales, a reservoir, an outer cylinder, a hollow inner cylinder, an attached stand-pipe, and registering-dial, said inner cylinder being surrounded by and sliding within said outer cylinder, said outer cylinder being provided with an attached inlet-pipe communicating with said reservoir, said pipe being provided with two valves, in combination with a bearing-bar, side rods, and under bar, forming a frame bearing upon the inner cylinder, substantially as described.

397,465. COMBINED BULLETIN-BOARD AND BROOM-HOLDER. MICHEL W. MAHAR, Dayton, Ohio, assignor of one-half to George Rembe, same place. Filed May 3, 1888. Serial No. 272,709. (No model.)



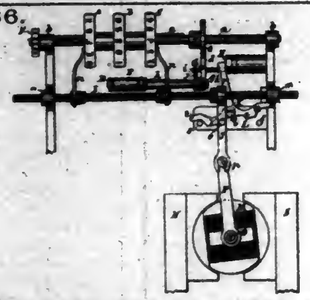
Claim.—A combined bulletin-board and broom-holder consisting of two frames hinged together, the cross-pieces of which are apertured to receive the handles of the brooms, a shelf upon the front of each frame, a post secured to the frame, and each post having an apertured cross-piece at its top, vertical bulletin-boards secured to said frames, brackets, and posts, a hook secured in the rear edge of one of the cross-pieces of one of the frames, and an eye secured in the rear edge of the cross-piece of the other frame, and a connecting-rod formed with eyes at each end adapted to engage the hook and the eye of the cross-pieces, substantially as set forth.

397,466. PRINTING-TELEGRAPH. ANDREW T. MCGUT, Boston, Mass., assignor to John Anderson, New York, N. Y. Filed Oct. 17, 1887. Serial No. 252,841. (No model.)

Claim.—1. In an electric printing-machine, three type-wheels having the same axis, one of the wheels provided with type required for printing on either of two parallel lines and each of the other wheels provided with type required for printing on one only of said lines, substantially as set forth.

2. In an electric printing-machine, three type-wheels, one provided with type for printing on one of two parallel lines, and each of the others provided with type required for printing on one only of

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said lines, the wheels being adapted to rotate together, and also to be moved endwise, substantially as and for the purposes set forth.

3. In an electric printing-machine, three type-wheels, one provided with type for printing on one of two parallel lines, and each of the others provided with type required for printing on one only of said lines, the wheels being on the same shaft, which shaft has also a pin or projection, *d*, at the unison-point for each of the type-wheels, substantially as set forth.

4. In an electric printing-machine, three type-wheels, one provided with type for printing on one of two parallel lines, and each of the others provided with type required for printing on one only of said lines, the wheels being located on one shaft, in combination with a device, substantially as the rod I and arms *n*, for moving the type wheels endwise, as specified.

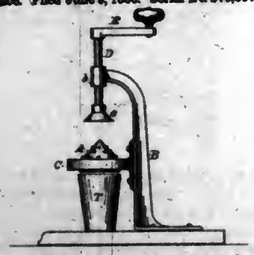
5. In an electric printing-machine, the combination of a type-wheel, a permanent magnet, an armature provided with a helix and adapted to oscillate between the poles of the magnet, and means, substantially as the arm P, rod I, and arms *n* and J, for moving the type-wheel endwise, substantially as set forth.

6. The combination of the press-lever, a pin, *d*, or projection on the type-wheel shaft, a lever, G, pivoted to the press-lever, provided with a pin, *k*, a pivoted arm, H, and a piece, K, which is formed to provide a stop to limit endwise motion of the type-wheel, substantially as specified.

7. The combination, in an electric printing-machine, of a permanent magnet, an armature provided with a helix and adapted to oscillate between the poles of the magnet, an arm, J, adapted for moving the type-wheel endwise, and a pivoted piece, K, to act as a stop for said arm, substantially as set forth.

8. In an electric printing-machine, the combination of a permanent magnet, a pivoted armature therefor provided with a helix, an arm, P, an arm, J, a pivoted piece, K, provided with stops *v* and *x*, and an arm, *r*, and arm H, or locking-piece, substantially as specified.

397,467. FRUIT-JUICE EXTRACTOR. JOHN A. NEIGHTER, Akron, Ohio, assignor of two-thirds to Harry R. Loomis and Lewis D. Seward, both of same place. Filed June 9, 1888. Serial No. 276,807. (No model.)



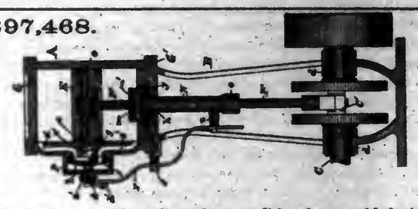
Claim.—The combination, with the perforated cone A, of the standard B, the ring C, attached to the standard, and the shaft D, journaled in said standard and provided with cup *c* and crank E, substantially as described.

397,468. STEAM-ENGINE. GEORGE W. PRICE, Baltimore, Md., assignor to John D. Pinto, same place. Filed Apr. 23, 1888. Serial No. 272,177. (No model.)

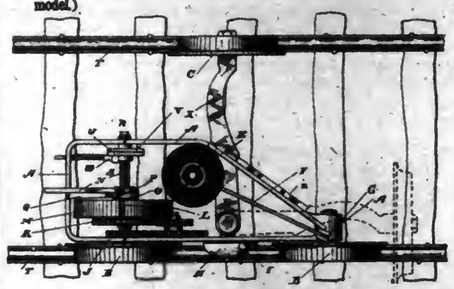
Claim.—1. The combination, with the head of a steam-cylinder, through which the piston-rod works, of a dovetailed slide-block moving in a dovetailed slideway in said head, and the sleeve having a T-shaped head resting in a concave seat in the block and provided with a packing at the lower end, through which the piston-rod works, the sleeve extending through a slot in the piston-head, substantially as specified.

2. A steam-engine having, in combination, the cylinder provided with a piston, and having at one end a slide-block, J, which reciprocates crosswise of the cylinder-head, a disk-valve provided with a crank, *d'*, a sleeve, N, projecting from the slide-block, provided with a pivot-stud, *t*, and capable of vibrating, a main crank, C', a rod connecting the piston and main crank and extending through the said sleeve, and a lever, *r*, having one end attached to the valve-crank, the other end attached to the said pivot-stud, and pivoted at *s* between its ends.

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397,469. DANGER-SIGNAL FOR RAILWAYS. JEROME PRINCE, Milford, Mass., assignor to William E. Morris, Boston, Mass., and John C. Bates, Aspen, Colo. Filed Apr. 26, 1888. Serial No. 271,934. (No model.)

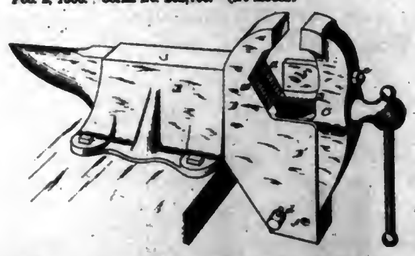


Claim.—1. The car A, wheels B C, with driving spring and gearing suitably connected thereto, in combination with the folding signal apparatus D E F carried on said car, substantially as set forth.

2. The car, the driving spring and gearing, and the gong automatically sounded during movement of the car, in combination with a visible-signal device and with a self-acting stop apparatus, for the purpose set forth.

3. The car A, having one or more driving-wheels, B, and a swinging arm, X, carrying wheel C, in combination with the driving spring and gearing suitably connected to the wheel B, and with fastenings for the arm C, for the purpose set forth.

397,470. VISE. WILLIAM H. REEDER, Cedar Rapids, Iowa. Filed Feb. 2, 1888. Serial No. 262,709. (No model.)



Claim.—1. A vise-jaw having angled and serrated pieces of steel cast integral therewith and below the holding-face of said jaw proper, whereby said pieces of steel are adapted to form the angled face of a pipe-vise, and to strengthen the jaw of which they form a part, substantially as specified.

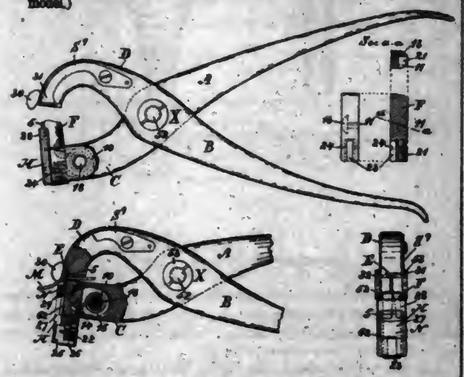
2. The combination, in a hinged vise, of the fixed jaw B, having pipe-gripping jaws *a a* cast therein between the main holding portion and the screw, and the pivoted jaw C, provided with the removable pipe-gripping jaw *b* between its main holding-jaw and the screw, said jaw *b* having a practically straight inner face, whereby the pipe is forced into the angle of the jaws *a a*, notwithstanding variations in the angle of the jaw C, substantially as set forth.

3. In a hinged vise, the combination of the fixed jaw B, having the parallel flanges B' B', connected at the bottom by the web B'', and the pivotal jaw C, having parallel flanges C' C', similarly connected by the web C'', and the pivot-pin *d*, all constructed substantially as and for the purpose set forth.

4. The combination, with an anvil, A, adapted to serve as a support for the vise, of a vise composed of a fixed jaw, B, having angled and serrated pieces of steel *a a* cast into the neck thereof, a hinged jaw, C, having the removable jaw *b*, with a straight inner face, and the pivot-pin *d*, substantially as and for the purpose set forth.

5. In a vise, the combination, with an inner jaw having pipe-gripping jaws *a a*, of an outer jaw, C, having a socket in the neck thereof, and a pipe-gripping jaw, *b*, with a vertically-wide gripping portion, and a reduced shank adapted to be rigidly secured in said socket, whereby said removable jaw may be attached to said jaw C without increasing the outward projection of the upper portion of said jaw C, substantially as specified.

397,471. BUTTON-SETTING IMPLEMENT. FRANCIS H. RICHARDS, Hartford, assignor to the American Button Fastener Company, New Britain, Conn. Filed June 5, 1888. Serial No. 276,000. (No model.)



Claim.—1. In a button-setting instrument, the combination, with the jaw C, formed to receive the presser-slide and the slide-actuating spring, of the slide F, and the coiled spring 10, the slide having a notch for receiving the projecting end of said spring, all substantially as described.

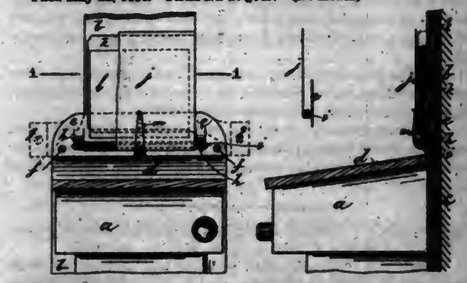
2. In a button-setting instrument, the combination, with the fastener-driving member thereof, of the slide F, passing through said member, and the spring-actuated plate pivoted in said slide and having a projecting arm acted upon by a spring carried by said slide, all substantially as described.

3. In a button-setting instrument, the combination, with the driver having slot 62, of the slide F, having slot 23, and the plate H, having a rib or arm, 25, pivoted to said slide in said slot 23 and adapted to enter said slot 62, substantially as described.

4. In a button-setting instrument, the combination, with the fastener-driving member thereof, of the slide F, having slot 23, and the chamber 21, the plate H, pivoted to said slide and having arm 26, and the push-spring 22, contained in said chamber and acting on said arm, as set forth.

5. The combination of the member C, carrying the slide F, and having the chamber or recess 15, opening to said slide within said member, of the spring 10, connecting with and actuating said slide, and the guide-screw 18, having the head 19, forming a cover for said recess, as set forth.

397,472. TELEPHONE PAPER-PAD HOLDER. JOHN P. SEYMOUR, Jr., St. Louis, Mo., assignor of one-half to Stephen G. Adams, same place. Filed May 23, 1888. Serial No. 274,645. (No model.)



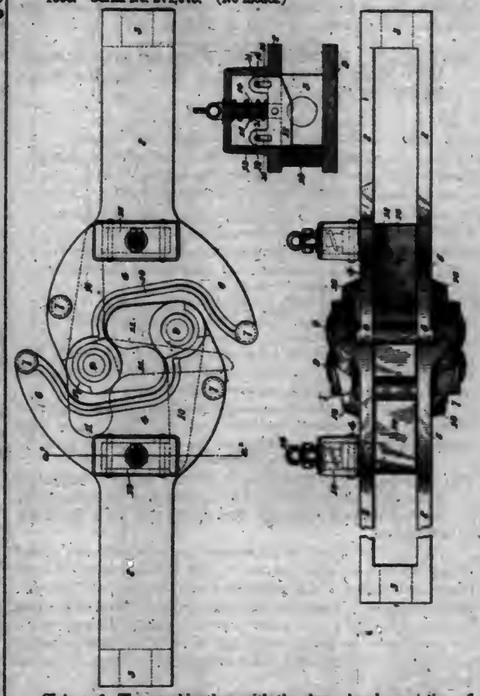
Claim.—1. The combination of a bar or frame, *c*, having lugs *h*, a flap or cover, *j*, hinged to said lugs and having spring wing or clip *k*, carrying paper pad *l*, and spring *m*, with a telephone-box and frame, substantially as shown, and for the purpose described.

2. The combination of a bar or frame, *c*, having lugs *h*, a flap or cover, *j*, hinged to said lugs and having spring wing or clip *k*, carrying paper pad *l*, with a telephone-box and frame, substantially as shown, and for the purpose described.

3. The combination, with a telephone-box, of a frame, *c*, lugs *h*, flap *j*, with paper pad, and a spring arranged so as to normally press the flap against the upright bracket of the telephone-box, substantially as described.

4. The combination, with a telephone-box, of lugs *h*, flap *j*, hinged to said lugs, and spring *m*, the whole arranged so as to carry a pad of paper, and so that the flap will be normally held against the upright bracket of the telephone-box, substantially as described.

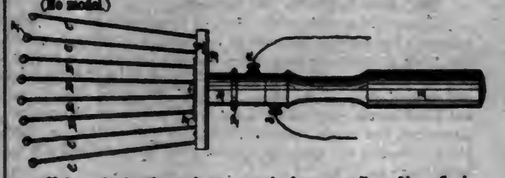
397,473. CAR-COUPLING. JAMES H. SIMPSON, Pittsburg, Pa., assignor to Carnegie, Phipps & Co., (Limited,) same place. Filed Apr. 26, 1888. Serial No. 271,975. (No model.)



Claim.—1. The combination, with the draw-head consisting of two parallel separated wrought-iron side bars having heads at the ends thereof, said heads being rigidly connected together at a suitable interval, of a locking-tongue pivoted between said heads, a box or case on the head, and a movable spring-actuated latch-block arranged within said box or case and adapted to engage said tongue, substantially as and for the purposes specified.

2. The combination, with the draw-head consisting of two parallel separated wrought-iron plates connected together at a suitable distance apart, of a locking-tongue pivoted between said plates, a box or case on the head, and a vertically-movable spring-actuated latch-block sliding upon pins in said case and adapted to engage the pivoted tongue, substantially as and for the purposes specified.

397,474. THERAPEUTICAL ELECTRODE. LOUIS T. STANLEY, Brooklyn, N. Y., assignor to the Stanley Electric Company, Philadelphia, Pa. Filed Sept. 14, 1887. Renewed Jan. 8, 1888. Serial No. 265,803. (No model.)



Claim.—1. An electrode composed of a row or line of long flexible metallic teeth with blunt or rounded ends secured to a backing or base, and provided with circuit-connections, as set forth.

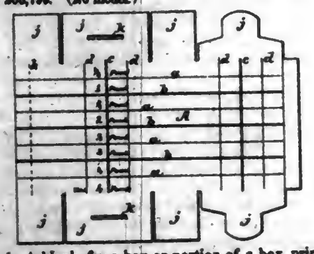
2. An electrode consisting of the combination, with a handle, of a row or line of flexible metallic teeth formed with rounded knobs at the end and secured to a back or base and provided with circuit-connections, as set forth.

3. The combination, with an insulating-handle having terminals *a b*, of the insulating-plate A, the line or row of flexible teeth, and the metal plates B D, clamped to the plate A, and securing the teeth in position, the said plates being respectively connected electrically with the terminals *a b*, as set forth.

4. The combination, with the line or row of metal teeth, of the clamping-plates B and D, securing said teeth to the insulating-base or plate A upon opposite sides, as described, the back H, ferrule K, and screw G, and the handle provided with the socket M and ferrule N, for making electrical connection with the teeth, as set forth.

5. The combination, with the teeth or electrodes secured in two insulated groups, of the screw G and ferrule K, attached to the plate or back carrying the teeth and forming concentric terminals, of the handle L, formed with corresponding terminals, and the metal disk or button O, insulated on one face, as set forth.

397,475. GRADUATED BLANK FOR PAPER BOXES OR WRAPPERS. WALTON C. TIFFANY, New York, N. Y. Filed Mar. 20, 1888. Serial No. 268,799. (No model.)



Claim.—1. A blank for a box or portion of a box printed with alternate light and heavy numbered parallel lines and light and heavy lines at right angles thereto, as shown and described.

2. A box having the alternate light and heavy parallel lines numbered and printed thereon, with the heavy and light lines at right angles thereto, as shown and described, for the purpose set forth.

397,476. MANUFACTURE OF STEEL. ROBERT J. TILFORD and HENRY M. REDEMANN, Louisville, Ky., assignors to the Redemann-Tilford Steel Company, same place. Filed July 25, 1888. Serial No. 281,018 (Specimens.)

Claim.—The process of converting low-grade steel into refined or high-grade steel, which consists in first heating the metal to be treated to a degree of heat represented by white heat, and then subjecting the metal so heated to a previously-prepared liquid bath, which by contact with the heated metal gives out hydrocarbon gases which are taken up by the heated metal, and allowing the metal to remain in such bath till practically cooled, substantially as hereinbefore set forth.

397,477. MANUFACTURE OF STEEL. ROBERT J. TILFORD and HENRY M. REDEMANN, Louisville, Ky., assignors to the Redemann-Tilford Steel Company, same place. Original application filed July 25, 1888, Serial No. 281,018. Divided and this application filed Nov. 13, 1888. Serial No. 290,737. (No specimens.)

Claim.—The process herein described for converting lower-grade steel into refined or higher-grade steel, which consists in heating the metal to be treated to a white heat, and then submerging the heated metal in a liquid bath of glycerine and water in the proportion of three (3) ounces of the former to one-half (½) gallon of the latter, substantially as hereinbefore set forth.

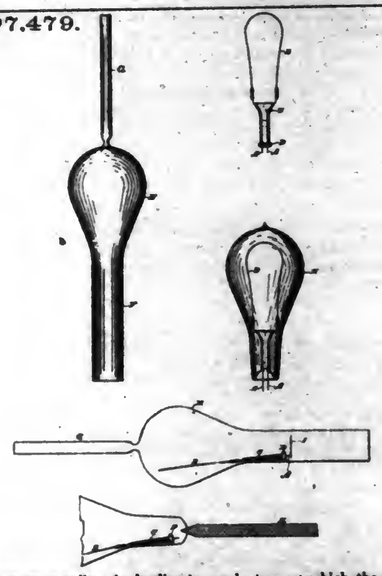
397,478. MANUFACTURE OF STEEL. ROBERT J. TILFORD and HENRY M. REDEMANN, Louisville, Ky., assignors to the Redemann-Tilford Steel Company, same place. Original application filed July 25, 1888, Serial No. 281,018. Divided and this application filed Nov. 13, 1888. Serial No. 290,738. (No specimens.)

Claim.—The process herein described for converting steel, which consists in first heating the metal to be treated to a white heat, and then while so heated submerging the same in a liquid bath consisting of glycerine and water in the proportion of three ounces of the former and one-half gallon of the latter, combined with spirits of niter, one and a half ounce; aqua-ammonia, one and a half ounce; chloride of ammonium, two ounces; sulphate of zinc, one and a half ounce; sulphate of alumina and ammonia, one and a half ounce, substantially as hereinbefore set forth.

397,479. INCANDESCENT-LAMP MANUFACTURE. JAMES A. VANDERPOEL, Newark, N. J. Filed Nov. 10, 1888. Serial No. 290,443. (No model.)

Claim.—1. The improvement in the art of making incandescent lamps, which consists in introducing into a glass globe the glass base

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or stem surrounding the leading-in conductors on which the carbon is mounted, then closing the globe or neck, and then perforating the same for the passage of the leading-in conductors and fusing or sealing in the glass base or stem, as set forth.

2. The improvement in the art of making incandescent lamps, which consists in introducing the mounted carbon and its glass base or stem into the globe, then drawing off the neck of the globe and closing the same, then perforating the closed end of the neck and sealing the glass stem over or in such perforation, as set forth.

3. The improvement in the art of making incandescent lamps, which consists in introducing the mounted carbon and its glass base or stem into the globe through its open neck, then heating and drawing off the end of the neck and perforating the closed end attached to the globe while out of the gas flame, and then sealing the end of the glass stem to the neck, as set forth.

4. The improvement in the art of making incandescent lamps, which consists in introducing the mounted carbon, with its glass base or stem, into the open neck of the globe, heating the neck and drawing off a portion of its end and rounding off the closed end attached to the globe, perforating the said rounded end, and then sealing the end of the stem over the opening, with the ends of the leading-in wires projecting through the same, as set forth.

5. The improvement in the art of making incandescent lamps, which consists in uniting the glass base or stem surrounding the leading-in wires to the globe or its neck over the inside edges of a contracted opening in the same, through which the ends of the leading-in wires project, as and for the purpose set forth.

397,480. PROCESS OF TONING BLUE PRINTS. HAROLD WHITING, Cambridge, Mass. Filed July 5, 1888. Serial No. 279,108. (No specimens.)

Claim.—1. The process of toning blue prints by treating them with a solution containing two parts of the concentrated ammoniacal solution of nitrate of copper, thirty-two parts of water, and one part of ammonia, in or about the proportions specified, essentially as described.

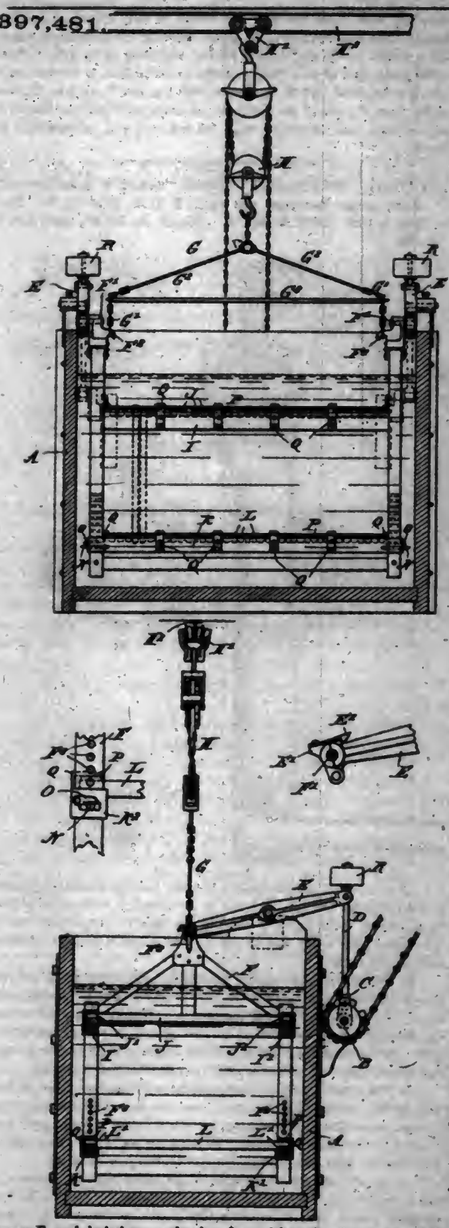
2. The process of toning blue prints by decomposing the ferro-prussiate of iron contained therein by means of a solution of copper containing free alkali, as hereinbefore set forth.

3. The process of toning blue prints by neutralizing the bluish color due to the ferro-prussiates of iron by substituting for a portion of the same a red pigment consisting, essentially, of ferro-prussiate of copper.

397,481. DYEING-MACHINE. THOMAS WOLSTENHOLME, Camden, N. J. Filed Sept. 5, 1888. Serial No. 284,616. (No model.)

Claim.—1. The combination, with the tank and the yarn-stick-supporting frame having opposite trunnions, F', of the vertically-rocking levers E, pivoted between their ends at opposite sides of the tank, and having two-part bearings receiving the said trunnions and provided with latches F^2, the main-shaft pitmen D, operated by the said shaft and connected at their upper ends to the outer ends of the

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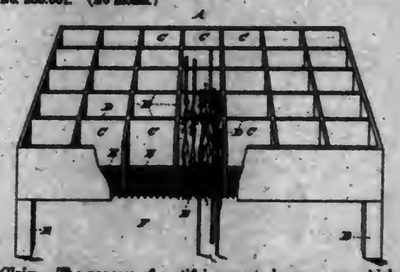
levers E, and hoisting mechanism for raising the frame out of the tank when the said bearings are unlatched, substantially as set forth.

2. The combination, with stick-supporting frame F, having the vertical bars provided with apertures F^2, and the upper stick-supporting beams, I I', of the vertically-adjustable beams K K', having sleeves K^2, sliding upon the said vertical bars, pins N, passing through said sleeves into the said apertures, and latches O, holding the pins in place, substantially as set forth.

3. In a dyeing-machine, the combination, with a tank containing the dye-stuffs, of a frame adapted to pass in the said tank and supporting the yarns, a tackle supporting the said frame, and a carriage supporting the said tackle and mounted to travel horizontally, substantially as shown and described.

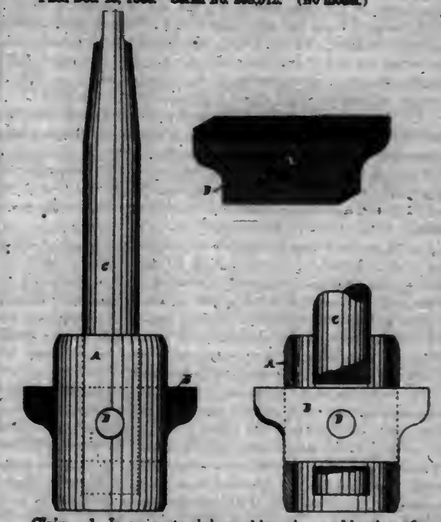
4. The combination of the rectangular frame F, having upper and lower stick-supporting beams, I F K K', and the angular keepers Q, the horizontal arms of which project upwardly across the upper faces of said beams, the sticks resting at their ends on said upper faces, and the strips P, placed between the said horizontal arms of the keepers and the ends of the sticks, substantially as set forth.

397,482. DEVICE FOR UTILIZING WASTE BROOM-CORN. RADFORD M. YOUMANSON, Amsterdam, N. Y. Filed Nov. 12, 1887. Serial No. 255,001. (No model.)



Claim.—The process of rectifying waste broom-corn, which consists in placing the mixed corn in a vertical position in a suitable receptacle having openings in its bottom, percussing the receptacle to forcibly extract through the said bottom those stems which have their butts directed downward, withdrawing from the receptacle those stems which remain having their butts directed upward, and, finally, disposing the latter with the former, butts to butts, and points to points, substantially as specified.

397,483. COUNTERSINK. ADOLPH LEITNER, Grand Rapids, Mich. Filed Dec. 12, 1888. Serial No. 293,512. (No model.)



Claim.—1. In a countersink-machine, the combination of a cutting-tool or cutter, a spindle, and a cylindrical guide, said cutter passing loosely through the guide and held in position by means of a pin passing through the cutter at right angles thereto, fitting loosely within the cylindrical guide, substantially as described.

2. In a countersink-machine, the combination of a slotted guide and cutter, said cutter passing loosely through the slot in said guide, and both guide and cutter attached by a pin to the revolving mechanism, said cutter adapted to adapt itself to the form of the boiler-head, substantially as described.

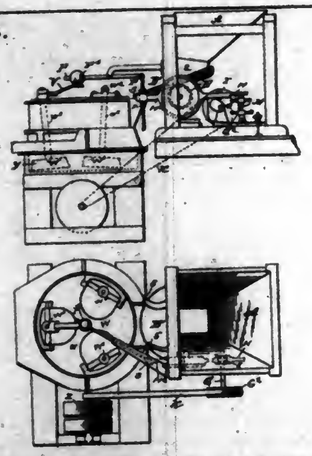
3. In a countersink-machine, a cylindrical guide adapted to fit into the hole to be operated upon, in combination with a cutter passing loosely through a slot in said guide, and the tapering pin passing through both guide and cutter at right angles to the cutter, thereby allowing a flexible adjustment for the cutter, substantially as described.

REISSUES.

10,983. ORE-FEEDER. JOSHUA HENDY and JOHN H. HENDY, San Francisco, Cal. Filed Apr. 18, 1888. Serial No. 271,101. Original No. 305,516, dated June 26, 1857.

Claim.—1. In an ore-feeder, the combination, with the hopper and feeding cylinder, of the cam-shaft having the cam *g* mounted

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thereon, a friction-clutch comprising a loose disk having arms H H°, projecting therefrom, the weighted lever P, a connection between said lever and arm H°, a spring attached to the arm H, and an arm connected with said lever, the arm V, and the grinding-wheels of a rotary mill, substantially as set forth.

2. In an ore-feeder, the combination, with the hopper and feeding-cylinder, of the cam-shaft having the cam *g* thereon, a friction-clutch having a loose disk with arms H and H° extending therefrom, a spring connected with one of said arms, the weighted lever P, a rod connecting one end of said lever with the arm H°, the stops S and T on said rod, and an arm attached to the grinding wheels or disks of a rotary mill and operated thereby, substantially as described.

3. In combination with the hopper and its rotary feeder, the cam-shaft having the cam *g* mounted thereon, a friction-clutch comprising a loose disk on the shaft which drives the feeding device, having arms H H°, projecting therefrom, the weighted lever P, a connection between said lever and arm H°, a spring attached to the arm H, the arm V, and the grinding-wheel of a rotary mill, substantially as described.

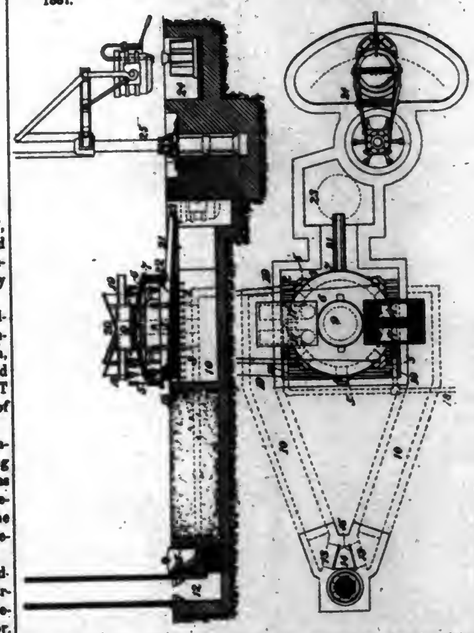
4. In an ore-feeder, the combination, with the hopper, of a feeding device therefor, an actuating-shaft for said feeder, a clutch carried by said shaft, a continuously-operating shaft, a connection between said shaft and the clutch, a mill, a main driving-shaft therefor, a direct and positive connection between said main driving-shaft and the continuously-operating shaft, an arm, V, connected to the spindle of the grinding-disk, and an operating connection between said arm V and the said clutch, substantially as described.

5. In an ore-feeder, a hopper, a feeding device therefor, a shaft for operating the feeder, a clutch carried by said shaft, means for operating said shaft through the clutch, a mill, grinding-surfaces therefor, an arm, V, connected to the spindle of the grinding-disk, and intermediate operating connections between said arm V and the clutch on the shaft of the feeder, whereby the rotation of the feeder-shaft is automatically controlled by the grinding-surfaces, substantially as described.

6. In an ore-feeder, a hopper, a feeding device therefor, a shaft for operating the feeder, a clutch carried by said shaft, means for operating said shaft through the clutch, a mill, grinding-surfaces therefor, and a controlling connection between the grinding-surfaces and the clutch on the shaft of the feeder, consisting of an arm, V, fixed to the upper end of the spindle of the grinding-disk, a pivoted lever having a weighted end in connection with the arm V, and a connection between the inner end of said lever and the clutch, substantially as described.

7. In an ore-feeder, a hopper, a feeding device therefor, a shaft for operating the feeder, a clutch carried by said shaft, means for operating said shaft through the clutch, a mill, grinding-surfaces therefor, and a controlling connection between the grinding-surfaces and a clutch on the shaft of the feeder, consisting of an arm, V, fixed to the upper end of the spindle of the grinding-disk, a pivoted lever having a weighted end in connection with the arm V, an arm, H', projecting from the rim of the clutch, a connecting-rod between the lever and the arm, and adjustable stops on the said rod, substantially as described.

10,984. OPEN-HEARTH FURNACE. HORACE W. LASH, Pittsburg, HENRY AIKEN, Homestead, and DAVID R. PARK, Pittsburg, Pa. Filed Aug. 6, 1888. Serial No. 282,107. Original No. 365,906, dated July 5, 1887.



Claim.—1. An open-hearth furnace having its charging-doors accessible from the ground-level, in combination with underground flues leading from opposite sides of the furnace downward clear of the walls of the same and converging to a common stack, substantially as set forth.

2. An open-hearth furnace having an underlying pit, 3, suitably proportioned to the diameter of the hearth to provide an open air-space which extends beneath the hearth and up its sides, and having its charging-doors accessible from the ground-level, in combination with underground flues leading from opposite sides of the furnace and converging to a common stack, substantially as set forth.

3. The combination of an open-hearth furnace circular in form and having its tapping-hole at or near the ground-level, a ladle-pit located in convenient proximity to the tapping-hole, a casting-pit located in convenient proximity to the ladle-pit, and a crane located between the ladle and casting pits, substantially as set forth.

4. An open-hearth furnace, in combination with an underlying pit, 3, proportioned to the diameter of the hearth to provide an open air-space which extends beneath the hearth and up its sides, underground flues located on opposite sides of the hearth and converging to a common stack, air-inlets connecting with the flues, and valves arranged to connect the flues alternately with the stack and with the air-inlets, substantially as set forth.

PHOTO LITH NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

BATE REFRIGERATING COMPANY *v.* HAMMOND *et al.*

Decided January 21, 1889.

1. BATE—PRESERVING MEATS DURING TRANSPORTATION AND STORAGE.

Letters Patent No. 197,314, granted to John J. Bate November 20, 1877, for the term of 17 years, did not expire with the term of the first Canadian patent obtained for 5 years, but continued in force till the end of the extended term of 15 years—to wit, January 9, 1892—said Canadian patent having never ceased to exist, but having been in force continuously from January 9, 1877.

2. TERM OF PATENT AS AFFECTED BY THE TERM OF A CANADIAN PATENT.

Where the Canadian statute under which the extensions of the Canadian patent were granted was in force when the United States patent was issued, and also when that patent was applied for, and where, by the Canadian statute, the extension of the patent for Canada was a matter entirely of right, at the option of the patentee, on his payment of a required fee, and where the 15 years' term of the Canadian patent has been continuous and without interruption, the United States patent does not expire before the end of the 15 years' duration of the Canadian patent.

3. TERM OF PATENT AS LIMITED BY THE UNITED STATES STATUTES BY REASON OF FOREIGN PATENT PREVIOUSLY OBTAINED.

The provisions of the act of 1870 and of the Revised Statutes mean that the United States patent shall not expire so long as the foreign patent continues to exist, not extending beyond 17 years from the date of the United States patent, but shall continue in force, though not longer than 17 years from its date, so long as the foreign patent continues to exist. Under section 4887, although the United States patent may on its face run for 17 years from its date, it is to be so limited by the courts, as a matter to be adjudicated on evidence *in pais*, as to expire at the same time with the foreign patent, not running in any case more than 17 years; but, subject to the latter limitation, it is to be in force as long as the foreign patent is in force.

4. NOT NECESSARY THAT THE UNITED STATES PATENT SHOULD ON ITS FACE BE LIMITED IN DURATION TO THE DURATION OF THE FOREIGN PATENT.

While it may be proper in a case where the date of a foreign patent issued prior to the granting of a United States patent to the same patentee for the same invention is made known to the Patent Office prior to the granting of the United States patent, to insert in that patent a statement of the limitation of its duration, in accordance with the duration of the foreign patent, it does not affect the validity of the United States patent if such limitation is not contained on its face.

APPEAL from the Circuit Court of the United States for the District of Massachusetts.

Mr. John Lowell, *Mr. Paul H. Bate*, *Mr. R. M. Dyer*, *Mr. William M. Evarts*, and *Mr. C. A. Seward* for the appellant.

Mr. B. F. Thurston, *Mr. G. H. Lothrop*, and *Mr. John R. Bennett* for the appellees.

Mr. Justice BLATCHFORD delivered the opinion of the Court.

This is a suit in equity, brought in the Circuit Court of the United States for the District of Massachusetts, December 16, 1886, by the Bate Refrigerating Company, a New York corporation, against George H. Hammond and Company, a Michigan corporation, founded on the alleged infringement of Letters Patent No. 197,314, granted to John J. Bate, November 20, 1877, for the term of 17 years from that day, on an application filed December 1, 1876, for an "improvement in processes for preserving meats during transportation and storage."

The plaintiff is the assignee of the patent. The bill alleges infringement, within the district of Massachusetts and elsewhere in the United States, by the making, using, and vending of the patented process, and alleges that the defendant has been engaged in the business of shipping fresh meat from the port of Boston to ports in Great Britain, by means of the process claimed in the patent. The claim is as follows:

The herein-described process of preserving meat during transportation and storage, by enveloping the same in a covering of fibrous or woven material, and subjecting it when thus enveloped to the continuous action of a current of air of suitably low and regulated temperature, substantially as and for the purpose set forth.

The defendant filed a plea, setting up, among other things, that, on the 9th of January, 1877, Letters Patent of the Dominion of Canada, No. 6,988, for the same invention as that described and claimed in No. 197,314, were granted to the same John J. Bate, for the term of 5 years from the 9th of January, 1877; that, after No. 197,314 had expired, at the end of the term of 5 years for which such Canadian patent was granted, the Circuit Court of the United States for the District of New Jersey, upon being advised of the grant of such Canadian patent, vacated and set aside an injunction which it had theretofore granted, by an interlocutory decree made in a suit in equity founded on No. 197,314, brought by the Bate Refrigerating Company against Benjamin W. Gillett and others; that thereafter Bate and the Bate Refrigerating Company procured the rendition of a judgment by the Superior Court for Lower Canada, declaring the Canadian patent to have been void *ab initio*, and vacating it and setting it aside; that such judgment of the Superior Court for Lower Canada being brought to the attention of the Circuit Court of the United States for the District of New Jersey, that court reinstated said injunction; and that afterward the Superior Court for Lower Canada, in a suit brought by Sir Alexander Campbell, Minister of Justice and Attorney-General for the Dominion of Canada, against Bate and the

Bate Refrigerating Company and others, adjudged that its said prior judgment had been "arrived at through the fraud to the law and collusion" of Bate, the Bate Refrigerating Company, and another person, "deceiving the Attorney-General, the advocates, and the court, employing and paying counsel on both sides, as well, seemingly, against themselves as on their apparent behalf," and revoked and annulled its said prior judgment. The plea concluded by averring that No. 197,314 expired on the 9th of January, 1882, and that the circuit court, sitting as a court of equity, had no jurisdiction to hear and determine an action in equity for the infringement of the patent. The bill was then amended by averring that the application for the Canadian patent was not made until December 19, 1876, while the application for No. 197,314 was made December 1, 1876; and that the Canadian patent was not actually or legally issued until on or about June 26, 1878, on or about which date a model of the invention, as required by law, was filed in the Canadian Patent Office. The amendment to the bill also set forth the two judgments of the Superior Court for Lower Canada, and averred that, by virtue of an act of the Parliament of the Dominion of Canada, assented to May 25, 1883, (46 Victoria, chap. 19,) the original term of the Canadian patent was actually 15 years, instead of 5 years, and it would not terminate before the 9th of January, 1892.

Subsequently the defendant filed an answer to the bill, setting up, among other defenses, want of novelty in the patented invention, but not denying that it had used the invention subsequently to the granting of the patent; and also setting up the granting of the Canadian patent for 5 years from January 9, 1877; that No. 197,314 was void, because it was issued for 17 years, and its term was not limited by the Commissioner of Patents to 5 years from January 9, 1877; that the Canadian application was not made until after the application for No. 197,314 was filed; that Bate did not file a model in the Canadian Patent Office until after the grant of the Canadian patent; and that the Canadian patent was actually patented to Bate on the 9th of January, 1877, and took effect on that date, although not actually delivered to the patentee until after the filing of the model. It also sets forth the two Canadian judgments, and avers that, on the 30th of November, 1881, Bate made a petition to the Commissioner of Patents for Canada, for the extension of No. 6,938, in which he averred that on the 9th of January, 1877, he "obtained a patent for the period of five years from the said date, for new and useful improvements on apparatus and process for ventilation, refrigeration, &c.," and that he was the holder of that patent in trust for the Bate Refrigerating Company, and prayed that it might be extended "for another period of ten years;" that, on the filing of that petition, an extension of the patent was granted, on December 12, 1881, "for a second period of five years" from January 9, 1882; that a further extension of the patent was granted, December 13, 1881, "for a third period of five years" from January 9, 1887; that the plaintiff is thereby estopped from denying the fact that No. 6,938 was legally granted, January 9, 1877, for a period of 5 years; that, by virtue of the act of 46 Victoria, chapter 19, the original term for which No. 6,938 was granted was not 15 years instead of 5 years; that said act can have no effect on the duration of No. 197,314; that, by reason of the prior patenting of the invention by Bate in Canada for 5 years from January 9, 1877, No. 197,314, if valid at all, expired on January 9, 1882; and that, therefore, this court, sitting in equity, has no jurisdiction to hear and determine an action for its infringement.

Without the filing of any replication to this answer, the parties entered into a written stipulation, setting forth as follows:

Whereas the answer of the defendant corporation in this cause sets up, in addition to other defenses, that the patent on which this suit is brought, being number 197,314, granted to John J. Bate, complainant's assignor and president, on the twentieth day of November, A. D. 1877, expired on the ninth day of January, A. D. 1882, by reason of the prior grant to said John J. Bate of a patent in the Dominion of Canada for the same invention, and prays the same benefit of said defense as if the same had been pleaded to the bill of complaint; and whereas both parties desire to have said matter of defense argued and decided without incurring the great expense of taking testimony necessary to present for final hearing all the defenses raised in said answer: It is, therefore, stipulated and agreed by and between the parties, that the defense above named shall be submitted to the court, as on plea set down for argument, upon the following agreed state of facts.

The facts so agreed to were substantially as follows:

(1.) The patent in suit, No. 197,314, was granted to John J. Bate on November 20, 1877, and the application therefor was filed in the United States Patent Office, December 1, 1876; and said patent was assigned to complainant before this suit was brought, the said Bate being a citizen of the United States at the time of said application, and the said invention having been made and reduced to practice by him therein.

(2.) On December 19, 1876, said John J. Bate filed in the Patent Office of the Dominion of Canada an application for a patent for improvements in apparatus and processes for ventilation, refrigeration, &c., including therein, as one feature, the process described and claimed in said Patent No. 197,314.

(3.) In pursuance of said application the Commissioner of Patents for the Dominion of Canada caused Letters Patent of the Dominion of Canada, No. 6,938, for the invention set forth in said application, and granting to said John J. Bate, his executors, administrators, and assigns, the exclusive right, privilege, and liberty of making, constructing, using, and vending to others to be used, the said invention, to be signed and sealed with the seal of the Patent Office on January 9, 1887, and to be registered on January 11, 1887, and that the period of said grant expressed in said patent was 5 years from and after January 9, 1877.

(4.) On January 12, 1877, said Commissioner of Patents called upon said John J. Bate to furnish to the Patent Office a model of his said invention, and such model was furnished by said Bate on June 26, 1878, on which day said Patent No. 6,938 was mailed to said John J. Bate.

(5.) On December 5, 1881, said John J. Bate filed a petition in the Canada Patent Office, setting forth—

that on the 9th day of January, A. D. 1877, your petitioner obtained a patent for the period of five years from the said date, for new and useful improvements on apparatus and process for ventilation, refrigeration, &c.; that he is the holder of the said patent in trust for the "Bate Refrigerating Company," and therefore prays that it may be extended for another period of ten years.

(6.) On December 12, 1881, said Patent No. 6,938 was extended for 5 years from January 9, 1882, under renewal No. 13,812, and, on December 13, 1881, said patent was further extended for 5 years from January 9, 1887, under renewal No. 13,813, in pursuance of the above-named petition.

(7.) On or about July 9, 1883, and June 30, 1886, the Superior Court for Lower Canada rendered two judgments affecting said Canada patent, to the purport set forth in the plea and the answer.

The stipulation further provided, that, if the decision of the circuit court should be in favor of the plaintiff, it should have a reasonable time thereafter to file a replication to the answer, and the cause should proceed in the ordinary manner; that, if the circuit court should decide the cause in favor of the defendant, a decree should be entered dismissing the bill, so that the plaintiff might take an appeal therefrom to the Supreme Court of the United States; and that, if the circuit court should decide the cause in favor of the defendant, and the Supreme Court of the United States should, on appeal, reverse that decision, the defendant should have a right to proceed in the circuit court, under its answer, as to all defenses set up therein, except the one mentioned in the stipulation, as it might have proceeded if the stipulation had not been made.

The cause was heard on the pleadings and stipulation, and the circuit court entered a decree dismissing the bill, from which decree the plaintiff has appealed to this Court. The circuit court gave no opinion on the merits of the case, but in deciding it followed, as it stated, the decision of the Circuit Court of the United States for the District of New Jersey, held by Mr. Justice Bradley, in August, 1887, made in the case of *Bate Refrigerating Co.* v. *Gillett*, (31 Fed. Rep., 809.)

The questions discussed at the bar arise under section 4887 of the Revised Statutes, which is as follows:

No person shall be debarred from receiving a patent for his invention or discovery, nor shall any patent be declared invalid, by reason of its having been first patented or caused to be patented in a foreign country, unless the same has been introduced into public use in the United States for more than two years prior to the application. But every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term, and in no case shall it be in force for more than seventeen years.

Two propositions as to the construction of this section are contended for by the appellant: (1) that the words "first patented or caused to be patented in a foreign country" do not mean "first patented or caused to be patented" before the issuing, or granting, or date, of the United States patent, but mean "first patented or caused to be patented" before the date of the application for the United States patent; (2) that the declaration of the section, that "every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term," does not mean that the patent so granted shall expire at the same time with the term to which the foreign patent was in fact limited at the time the United States patent was granted; but that it means that it shall expire when the foreign patent expires, without reference to the limitation of the term of such foreign patent in actual force at the time the United States patent was granted. We do not find it necessary to consider the first of these questions, because we are of opinion that the proper construction of section 4887, upon the second question, is, that the patent in the present case does not expire before January 9, 1892, the time when the Canadian patent, No. 6,938, will expire.

The Canadian patent was extended for the two periods of 5 years each, under the provisions of section 17 of the Canadian act assented to June 14, 1872, (35 Victoria, chap. 26,) which was in force when the United States patent, No. 197,314, was applied for and granted, and which read as follows:

17. Patents of invention issued by the Patent Office shall be valid for a period of five, ten, or fifteen years, at the option of the applicant, but at or before the expiration of the said five or ten years the holder thereof may obtain an extension of the patent for another period of five years, and after those second five years may again obtain a further extension for another period of five years, not in any case to exceed a total period of fifteen years in all; and the instrument delivered by the Patent Office for such extension of time shall be in the form which may be from time to time adopted, to be attached, with reference to the patent and under the signature of the Commissioner or of any other member of the Privy Council in the case of absence of the Commissioner.

This statute appears to have been strictly complied with in the present case. The Canadian patent, No. 6,938, ran, on its face, for 5 years from January 9, 1877; and, prior to the expiration of that time, and on the 5th of December, 1881, Bate applied for its extension for 10 years; and it was, before the 5 years expired, and on the 12th of December, 1881, extended for 5 years from January 9, 1882, and, on December 13, 1881, for 5 years from January 9, 1887. The Canadian patent, therefore, has never ceased to exist, but has been in force continuously from January 9, 1877. It was in force when No. 197,314 was issued; and it has, by virtue of a Canadian statute, in force when the application for No. 197,314 was filed, continued to be in force at all times since the latter patent was granted. This is true, although the Canadian patent, No. 6,938, as originally granted, stated on its face that it was granted "for the period of five years" from January 9, 1877; and although the instrument granting the first extension of 5 years states that it is granted "for another period of five years, to commence and be computed on and from the ninth day of January, which will be in the year one thousand eight hundred and eighty-two;" and although the instrument granting the second extension of 5 years states that it is granted "for another period of five years, to commence and be computed on and from the ninth day of January, which will be in the year one thousand eight hundred and eighty-seven." By the language of section 17 of the Canadian act of 1872, what was granted under it was "an extension of the patent"—of the same patent—for a further term. Therefore the Canadian patent does not expire, and it never could have been properly said that it would expire, before January 9, 1892; and hence No. 197,314, if so limited as to expire at the same time with the Canadian patent, cannot expire before January 9, 1892.

Section 6 of the act of March 3, 1839, (5 Stat., 354,) provided that a United States patent for an invention patented in a foreign country more than 6 months prior to the application of the inventor for the United States patent, should be limited to the term of 14 years from the date or publication of the foreign patent. Section 25 of the act of July 8, 1870, (16 Stat., 201,) provided that the United States patent for an invention

"first patented or caused to be patented in a foreign country" should "expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term; but in no case shall it be in force more than 17 years." Section 4887 of the Revised Statutes provides, that "every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term, and in no case shall it be in force more than 17 years."

These provisions of the act of 1870 and of the Revised Statutes mean that the United States patent shall not expire so long as the foreign patent continues to exist, not extending beyond 17 years from the date of the United States patent, but shall continue in force, though not longer than 17 years from its date, so long as the foreign patent continues to exist. Under section 4887, although, in the case provided for by it, the United States patent may on its face run for 17 years from its date, it is to be so limited by the courts, as a matter to be adjudicated on evidence *in pais*, as to expire at the same time with the foreign patent, not running in any case more than 17 years; but, subject to the latter limitation, it is to be in force as long as the foreign patent is in force. A contrary view to this has been expressed by several circuit courts of the United States.

In October, 1878, in the Circuit Court for the District of Rhode Island, in *Henry* v. *Providence Tool Co.*, (8 Ban. & Ard., 501,) it was held that the 25th section of the act of July 8, 1870, meant that the United States patent should expire at the same time with the original term of a foreign patent for the same invention, without regard to any prolongation of the foreign patent which the patentee might procure from the foreign government. In that case, the United States patent was granted October 10, 1871. A British patent for the same invention had been granted to the patentee on the 15th of November, 1860, for 14 years, and expired November 15, 1874. Thirteen days after the latter date an order was made for the extension of the British patent for 4 years, the extension bearing date as of the day after the expiration of the original term; but the court held that the United States patent expired on the 15th of November, 1874.

That decision was followed by the Circuit Court for the Southern District of New York, in *Reissner* v. *Sharp*, (16 Blatchf., 383,) in June, 1879, which case arose under section 4887 of the Revised Statutes. In that case, the United States patent, granted October 20, 1874, for 17 years, was held to have expired on the 15th of May, 1878, because a patent was granted in Canada, under the authority of the patentee, for the same invention, on the 15th of May, 1873, for 5 years from that day, although in March, 1878, the Canada patent was extended for 5 years from the 15th of May, 1878, and also for 5 years from the 15th of May, 1883.

In *Bate Refrigerating Co.* v. *Gillett*, (13 Fed. Rep., 553,) in the Circuit Court for the District of New Jersey, in August, 1882, and in the same suit, in the same court, in August, 1887, (31 Fed. Rep., 809,) in regard to the patent in question in the present suit, and on the same facts here presented, it was held, on the strength of the two circuit court cases above referred to, that the United States patent expired when the original term of the Canadian patent expired.

But we are of opinion that, in the present case, where the Canadian statute under which the extensions of the Canadian patent were granted was in force when the United States patent was issued, and also when that patent was applied for, and where, by the Canadian statute, the extension of the patent for Canada was a matter entirely of right, at the option of the patentee, on his payment of a required fee, and where the 15 years' term of the Canadian patent has been continuous and without interruption, the United States patent does not expire before the end of the 15 years' duration of the Canadian patent. This is true, although the United States patent runs, on its face, for 17 years from its date, and is not, on its face, so limited as to expire at the same time with the foreign patent; it not being necessary that the United States patent should, on its face, be limited in duration to the duration of the foreign patent.

In *O'Reilly* v. *Morse*, (15 How., 62,) the patent to Morse was issued June 20, 1840, for 14 years from that day, while section 6 of the act of March 3, 1839, (5 Stat., 354,) was in force, which required that every United States patent for an invention patented in a foreign country should be "limited to the term of 14 years from the date or publication of such foreign Letters Patent." Morse applied for his United States patent April 7, 1838. He obtained a patent in France for his invention October 30, 1838. The objection was taken in the answer that the United States patent was void on its face because not limited to the term of the French patent. The circuit court held that the patent was not void, but that the exclusive right granted by it must be limited to 14 years from October 30, 1838. The same objection was urged in this court, and the same ruling was made. In *Smith* v. *Ely*, (15 How., 137,) which was a suit on the same patent, under the same facts, the same question arose and was decided in the same way. A full and interesting discussion of the question is to be found in *Canan* v. *The Pound Mfg. Co.*, (23 Blatchf., 173,) in regard to section 4887, which contains the same word "limited" found in section 6 of the act of 1839, which word is not found in section 25 of the act of July 8, 1870, from which section 4887 was taken. Under this view, the time of the expiration of the foreign patent may be shown by evidence *in pais*, whether the record of the foreign patent itself, showing its duration, or other proper evidence; and it is no more objectionable to show the time of the expiration of the foreign patent, by giving evidence of extensions such as those in the present case, and thus to show the time when, by virtue of such extensions, the United States patent will expire.

We find in the record in this case, among the papers which it states were submitted to the Court under the stipulation above referred to, a certificate of the Commissioner of Patents, dated July 3, 1883, appended to a certified copy of the United States patent, stating that the term thereof is limited so that it shall expire with the patent obtained by the patentee in Canada, No. 6,938, dated January 9, 1877, for the same invention; that the proper entries and corrections have been made in the files and records of the Patent Office; that it had been shown that the original patent had been lost; and that the certificate is made because that patent was issued without limitation, as required by section 4887 of the Revised Statutes. While it may be proper, in a case where the date of a foreign patent issued prior to the granting of a United States patent to the same patentee for the same invention is made known to the Patent Office prior to the granting of the United States patent, to insert in that patent a statement of the limitation of its duration, in accordance with the duration of the foreign patent, it does not affect the validity of the United States patent if such limitation is not contained on its face.

It results from these views, that the decree of the circuit court must be reversed, and the case be remanded to that court, with a direction to take such further proceedings as shall be in accordance with law and with the stipulation between the parties, above referred to, and not inconsistent with this opinion.

Supreme Court of the United States.

SARGENT *et al.* v. BURGESS.

Decided January 7, 1889.

1. GORHAM—WASH-BOARD FRAMES.

Letters Patent No. 223,838, granted January 6, 1880, to John M. Gorham, for an improvement in wash-board frames, construed and *Held* not to cover a protector which does not have the yielding, elastic, or resilient function described in claim 3, and is not accompanied by a spring or constructed substantially as described in the specification.

2. SAME—INFRINGEMENT.

Said patent is not infringed by a protector constructed in accordance with the description contained in Letters Patent No. 255,555, granted to Charles H. Williams March 28, 1882, having no spring and no elastic or resilient quality, and which does not yield to pressure, and has no capacity of returning automatically to its normal position.

APPEAL from the Circuit Court of the United States for the Eastern District of Pennsylvania.

Mr. George H. Christy and *Mr. J. Snowden Bell* for the appellants.

Mr. James Parsons and *Mr. Furman Sheppard* for the appellee.

Mr. Justice BLATCHFORD delivered the opinion of the Court.

This is a suit in equity, brought by the administrators of John H. Gorham, deceased, against Edwin K. Burgess, in the Circuit Court of the United States for the Eastern District of Pennsylvania, to recover for the alleged infringement of Letters Patent No. 223,838, granted to John M. Gorham, January 6, 1880, for an improvement in wash-board frames.

The following is a copy of the specification and drawings of the patent:

To all whom it may concern:

Be it known that I, JOHN M. GORHAM, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Wash-Board Frames; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to wash-boards, particularly to the combination, with a wash-board, of a protector constructed to bend or yield to pressure and to return to position when said pressure is removed. This protector is to shield the person of the washer from splashing water or suds.

Protectors have been heretofore employed in connection with wash-boards, and they have been of but two general types—one wherein the protector is rigid and rigidly attached to the wash-board frame. A protector thus constructed and attached is not capable of yielding or moving from its position when the body of the operator presses against it; and it is on this account frequently objected to. The second type is when the protector is attached to the wash-board frame by a joint or pivot, and is allowed a swinging movement; but it possesses no elastic or resilient quality or function, and, when moved by pressure, has no power to return again to normal position when said pressure is removed. My invention is designed to overcome the objections and defects presented in these two old types of protectors; and as said invention broadly comprehends any wash-board protector constructed to bend or yield to pressure and to return to position when said pressure is removed, it is apparent that I am not to be confined to any specific form or mere construction of device, inasmuch as a variety of modified mechanical structures may be adopted in embodying my said invention. I will, however, illustrate and describe one or two effective forms of device according to this invention.

In the drawings, Figure 1 illustrates a wash-board and its protector made according to my invention. This figure is in longitudinal vertical section, and it represents the protector as laid down upon the face of the board as packed for shipment. Fig. 2 is a similar view of the same device, only the protector is shown as freed and sprung out into operative position. Fig. 3 is a front view of the device as shown in Fig. 2. Fig. 4 represents a modified form of my device, wherein the protector, instead of being formed from a rigid piece and elastically pivoted to the frame, as shown in Figs. 1, 2, and 3, is made from a piece of rubber, spring metal, or equivalent material susceptible of itself yielding and returning to position, and this is rigidly fixed to the wash-board frame, as shown. Fig. 5 shows another modified embodiment of my invention, merely illustrating a different spring-coupler, C', from that shown in Figs. 1, 2, and 3.

A is the wash-board frame, which may be of any size, description, or material. B is the rubbing-surface, which may also be of any character.

C is the protector, and C' a spring, which may be either a coupler between the protector and wash-board frame, as shown in Fig. 5 of the drawings, or the protector may be pivoted to the frame and the spring C' act to push or pull the protector into the position illustrated in Figs. 2 and 3.

The construction of the device shown in Fig. 4 I have already sufficiently specified in the preceding explanation of the drawings.

The operation of my device is readily understood. The spring C', or the elastic character of the thing itself, as shown in Fig. 4, serves always to keep the protector in operative position. (See Figs. 2 and 3.) When the body of the operator presses against it, it yields in such a way as at the same time to press snugly against her person, and also to return at all times to position when said pressure is removed. It thus becomes very effective as a protector, while at the same time it is not wearing to the person or clothes of the operator.

Fig. 1.



Fig. 2.



Fig. 3.

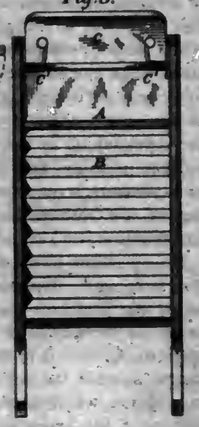


Fig. 4.



Fig. 5.



Another peculiar feature of my wash-board is the flat manner in which it can be packed, as shown in Fig. 1 of the drawings. This is a great convenience and advantage in packing for shipment; and moreover, when thus packed, the protector is itself

protected from injury to which it would otherwise be exposed. This is accomplished by locating the protector, as shown in Figs. 1, 2, and 3 of the drawings, below the crown-piece and between the side pieces of the frame.

The claims of the patent are three in number, as follows:

1. In combination with a wash-board, a protector constructed substantially as described, so as to yield to pressure and to return to position when said pressure is relieved, substantially as and for the purpose shown.
2. The combination, with a wash-board, of a protector and a spring, said spring interposed between the wash-board and protector, and constructed to operate in retaining said protector in its open position and to return it to that position when moved therefrom.
3. In combination with a wash-board, a protector located below the crown-piece and between the side pieces of the wash-board frame, and constructed to fold down into or upon said wash-board even with or below the general plane of said wash-board frame, substantially as and for the purpose shown.

Only claim 3 is alleged to have been infringed.

The defenses set up were want of novelty and non-infringement. Several prior patents were introduced in evidence, as bearing upon the question of the proper construction of claim 3, and upon the question of infringement. They are No. 8,161, to William T. Barnes, June 17, 1851; No. 127,325, to John Epeneter and Bernhardt Grahl, May 28, 1872; No. 146,433, to James A. Cole, January 13, 1874; No. 150,315, to Anna Frike, April 28, 1874; and No. 222,846, to Wyatt M. Stevens, December 23, 1879. The circuit court dismissed the bill and the plaintiffs have appealed.

The specification of the Gorham patent clearly shows that the protector whose combination with a wash-board is the subject of the invention, is a protector constructed to bend or yield to pressure, and to return to its position when such pressure is removed, in contradistinction to a protector which is rigid and is rigidly attached to the wash-board frame; and also in contradistinction to a protector which is attached to the wash-board frame by a joint or pivot, and is allowed a swinging movement, but possesses no elastic or resilient function, and, when moved by pressure, has no power to return again to its normal position, when such pressure is removed. The specification states that the invention of Gorham is designed to overcome the defects presented in those two old types of protectors. The invention does not comprehend a protector which is not constructed so as to bend or yield to pressure, and to return to its position when such pressure is removed. The description and drawings of the Gorham protector are limited to such a construction, and do not show or indicate any other.

The operation of the device is stated in the specification to be such, that the spring, or the elastic character of the protector itself, serves always to keep the protector in operative position, because it yields to pressure against it in such a way as always to press snugly against the person, and to return at all times to position when such pressure is removed. This feature of the protector is not claimed to have been infringed by the defendant. The defendant's protector, constructed in accordance with the description contained in Letters Patent No. 255,555, granted to Charles H. Williams, March 28, 1882, has no spring and no elastic or resilient quality, does not yield to pressure, and has no capacity of returning automatically to its normal position.

In the defendant's structure, the ordinary cap-piece of the wash-board has a rounded exterior surface, and its inner surface performs the function of a protector. Upon the upper edge of such cap-piece is mounted a supplemental protector, the two parts being locked rigidly together by a tongue-and-groove joint. From the ends of the supplemental protector are extended rigid arms, which are slotted and connected to the side pieces of the frame by means of pins, one of which passes through each slot. By removing the supplemental protector from the cap-piece, it can be placed between the side pieces of the frame, so as to stand edgewise therein, by drawing it slightly backward, by then raising it slightly, by then advancing it to the front, and by then dropping it and placing it edgewise within the frame. In this latter position, the structure is adapted for packing. Not only is the defendant's protector without any yielding or resilient function, but it is not pivoted after the manner of the Gorham protector, nor does it fold down in the manner of the Gorham protector, in the sense of the words "fold down," as used in claim 3 of the Gorham patent.

The contention of the plaintiff is, that claim 3 of the patent does not require, as an element of the combination covered by it, that the protector should have any yielding, elastic, or resilient function, or should be accompanied by a spring; but that it is sufficient if, by any mechanism, it can be so disposed of as to be packed away for convenience in shipment, or for other purposes, in a flat manner, in the vacant space in which it is packed; and that, as the defendant's protector is to a large extent packed away in the same vacant space, claim 3 is infringed. It may be questionable whether, if the claim were to be construed thus broadly, it would not be for merely a new use of a device before used in many things besides wash-boards. But, in view of the state of the art, as shown by the patents above referred to, and in view of the course of proceeding in the Patent Office on the application for the Gorham patent, we are of opinion that claim 3 of that patent cannot be so construed as to cover a protector which does not have the yielding, elastic, or resilient function of the Gorham protector, and is not accompanied by a spring or constructed substantially according to the description in the Gorham specification. Gorham evidently had no idea of such a construction as that of the Williams patent, found in the defendant's wash-board; and no person could, by following the description in the Gorham specification, arrive at the defendant's structure.

Claim 3 of the Gorham patent requires that the protector shall be "constructed to fold down," "substantially as" "shown." The defendant's protector is not constructed to fold down in the manner of the Gorham protector, and is not constructed substantially as shown in the Gorham specification.

The decree of the circuit court is affirmed.

THE
OFFICIAL GAZETTE
OF THE
United States Patent Office.
[BY AUTHORITY OF CONGRESS.]

VOL. 46—No. 7. TUESDAY, FEBRUARY 12, 1889. PRICE—$5 per year.

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Sub-Class Abolished.

(ORDER No. 594.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., February 6, 1889.

It is hereby directed that sub-class 2, Bobbin-winders, in Class 112, Sewing-Machines, Division XXIV, be abolished.

BENTON J. HALL,
Commissioner.

The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Fraudulent Practices by Attorneys.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., April 18, 1888.

The attention of this Office having frequently been called to circulars and communications of persons pretending to have access to the records of this Bureau, and claiming to possess information of the pendency of applications for patents, notice is hereby given the public that all such persons in so advertising themselves are acting under false representations and are guilty of unprofessional conduct, and should not be entitled to credit.

The Office has also received information that certain attorneys disbarred from practice under section 487 of the Revised Statutes are continuing to prosecute applications for patents under the names of other persons.

Hereafter a list will be published in the OFFICIAL GAZETTE containing the names and addresses of all such persons, and the public warned against employing them or intrusting applications or interests to their charge.

BENTON J. HALL, *Commissioner.*

The Office has information that *Isaac S. McGlehan, No. 155 Broadway, New York*, a disbarred attorney, has been practicing under the name of *Alexander Melhado.*

Issue of February 12, 1889.

Patents	401—No. 397,484 to No. 397,884, inclusive.
Designs	12—No. 18,917 to No. 18,928, inclusive.
Trade-Marks	26—No. 16,251 to No. 16,276, inclusive.
Labels	4—No. 5,820 to No. 5,823, inclusive.
Reissues	1—No. 10,985.
Total issue	444

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	.....	Nebraska	3	.....
Arkansas	2	.....	Nevada	.....	.....
California	7	.....	New Hampshire	7	.....
Colorado	2	.....	New Jersey	18	1
Connecticut	19	.....	New Mexico Terr'y	.....	.....
Dakota Territory	2	.....	New York	88	8
Delaware	.....	.....	North Carolina	.....	.....
District of Columbia	.....	.....	Ohio	25	2
Florida	1	.....	Oregon	1	.....
Georgia	4	1	Pennsylvania	35	9
Idaho Territory	.....	.....	Rhode Island	2	.....
Illinois	30	2	South Carolina	1	.....
Indian Territory	.....	.....	Tennessee	1	.....
Indiana	5	1	Texas	6	.....
Iowa	6	.....	Utah Territory	.....	.....
Kansas	2	.....	Vermont	.....	.....
Kentucky	3	.....	Virginia	3	.....
Louisiana	2	.....	Washington Terr'y	.....	.....
Maine	3	.....	West Virginia	1	.....
Maryland	7	2	Wisconsin	14	.....
Massachusetts	40	1	Wyoming Terr'y	.....	.....
Michigan	11	.....	U. S. Army	.....	.....
Minnesota	3	.....	U. S. Navy	.....	.....
Mississippi	.....	.....			
Missouri	20	2	Total to citizens of the United States	364	29
Montana Territory	1	.....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Austria-Hungary	.....	.....	Germany	5	.....
Barbadoes	.....	.....	India	1	.....
Belgium	.....	.....	Ireland	1	.....
Bermuda	.....	.....	New Zealand	1	.....
Brazil	.....	.....	Queensland	.....	.....
Canada	4	.....	Russia	.....	.....
Canary Islands	.....	.....	Scotland	3	.....
Colombia, U. S. of	.....	.....	Sweden	.....	.....
Cuba	.....	.....	Switzerland	.....	.....
Denmark	1	.....	Victoria	.....	.....
Ecuador	.....	.....			
England	12	.....	Total to citizens of foreign countries	29	1
France	1	1			

DESIGNS.

18,917.—KNOB.—*John H. Allen*, St. Louis, Mo., assignor to *Meyer Bros. & Co.*, same place. Application filed November 28, 1888. Serial No. 292,134. Term of patent 14 years.

18,918.—ORNAMENT FOR SHIELDS.—*Feodore A. Bernhard*, New York, N. Y. Application filed December 24, 1888. Serial No. 294,543. Term of patent 7 years.

18,919 to 18,923, inclusive.—ORNAMENTATION OF CORSETS.—*Catharine A. Griswold*, New York, N. Y. Applications filed January 4, 1889. Serial Nos. 295,473 to 295,477, inclusive. Term of patents 14 years.

18,924.—BOOK AND COVER.—*David R. Niver*, Oak Park, Ill., assignor to *Richard S. Thain*, same place. Application filed October 8, 1888. Serial No. 287,584. Term of patent 7 years.

18,925.—COLLAR.—*James K. P. Pine*, Lansingburg, N. Y. Application filed December 24, 1888. Serial No. 294,553. Term of patent 7 years.

18,926.—CURLING AND CRIMPING COMB.—*George A. Scott*, New York, N. Y. Application filed December 11, 1888. Serial No. 293,302. Term of patent 7 years.

18,927.—KNITTED FABRIC.—*Spencer Spooner*, Brooklyn, N. Y., assignor to *A. G. Jennings & Co.*, same place. Application filed December 6, 1888. Serial No. 292,835. Term of patent 14 years.

18,928.—ORNAMENTATION OF STRAPS.—*Edwin B. Stimpson*, Brooklyn, N. Y. Application filed January 3, 1889. Serial No. 295,352. Term of patent 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,251.—CORK AND CORK ARTICLES.—*Armstrong, Bro. & Co.*, Pittsburg, Pa. Application filed January 3, 1889. Used since December 14, 1888.

"The letter 'A' inclosed by a circle."

16,252.—CANNED OYSTERS.—*A. Booth Packing Company*, Chicago, Ill.; Baltimore, Md.; St. Paul, Duluth, and Minneapolis, Minn.; St. Louis, Mo.; Louisville, Ky.; Omaha, Nebr.; Indianapolis, Ind.; Bayfield, Wis.; Astoria, Oreg.; Manistique, Mich., and Port Arthur, Canada. Application filed January 7, 1889. Used since 1867.

"The words 'OVAL BRAND' and the representation of an oval band in color."

16,253.—SEDLITZ POWDER.—*Charles Chanteaud*, Paris, France. Application filed December 20, 1888. Used since January 5, 1886.

"The representation of two medallions, one containing a wreath, on the exterior of which are the words 'LA DOSIMÉTRIE S'IMPOSE COMME UN DEVOIR,' and on the interior the words 'CITO TUTO ET JUCUNDE,' and the other medallion containing a representation of the sun with rays radiating therefrom, below which is a representation of the earth or planet floating upon or above clouds."

16,254.—COMPOUNDED SPICES AND HERBS FOR FLAVORING MEATS, PUDDINGS, HEAD-CHEESE, &c.—*James Horner*, Pittsburg, Pa. Application filed December 5, 1888. Used since July 1, 1888.

"The word 'FLAVORWELL.'"

16,255.—PRESERVING-SALT FOR CURING AND PRESERVING MEAT, &c.—*James Horner*, Pittsburg, Pa. Application filed December 5, 1888. Used since May 1, 1888.

"The word 'SAVITSURE.'"

16,256.—ORNAMENTAL JEWELRY.—*Mosbacher & Co.*, New York, N. Y. Application filed December 19, 1888. Used since July 1, 1887.

"The words 'BON MARCHÉ' and a floral design placed in a circle."

16,257.—PATENT MEDICINE FOR CURING GONORRHŒA AND GLEET.—*Charles W. Poole*, St. Louis, Mo. Application filed November 23, 1888. Used since November 1, 1888.

"The word 'MASCOT.'"

16,258.—WHITE LEAD.—*Robert Shoemaker & Co.*, Philadelphia, Pa. Application filed December 13, 1888. Used since February 6, 1880.

"The word 'IMPERIAL.'"

16,259.—READY-MIXED PAINTS.—*Robert Shoemaker & Co.*, Philadelphia, Pa. Application filed December 17, 1888. Used since September 1, 1882.

"The word 'IMPERIAL.'"

16,260.—MEDICINE FOR INFANTS.—*The Southern Company of New York*, New York, N. Y. Application filed December 27, 1888. Used since July 22, 1888.

"The word 'INFANTINA.'"

16,261.—SALVE.—*Henry C. Stewart*, Cincinnati, Ohio. Application filed December 31, 1888. Used since November 1, 1888.

"A dark background and an oblong white spot in the center and a fac-simile of the registrant's signature."

16,262.—LAGER-BEER.—*George Bauernschmidt*, Baltimore, Md. Application filed July 9, 1888. Used since January 1, 1888.

"A letter 'B' of any appropriate design, a dove passing through the upper loop, a bare arm and hand passing through the lower loop, and a ribbon entwined in the letter 'B' and held in the beak of the bird and by the hand."

16,263.—SHOTGUN-CARTRIDGES.—*The Chamberlin Cartridge Company*, Cleveland, Ohio. Application filed December 24, 1888. Used since October 1, 1888.

"The words 'BLACK SWAN' and a representation of a black swan."

16,264.—TONIC BEVERAGE.—*Eureka Manufacturing Company*, Baltimore, Md. Application filed October 24, 1888. Used since September 1, 1888.

"The representation of the head of a bull having the word 'BEEF' across the nose, adjacent to which are arranged a hop-vine and a wisp of barley."

16,265.—CHEWING-GUM.—*Asa M. Fitch*, Seymour, Ind. Application filed September 3, 1888. Used since May 1, 1888.

"The word 'JAVA' on a band arranged diagonally across a rectangular inclosure."

16,266.—BOOTS AND SHOES.—*Irwin N. Horrell*, Latrobe, Pa. Application filed December 29, 1888. Used since October, 1886.

"The word 'LATROBE.'"

16,267.—SPECIAL PREPARATIONS OF EXTRACT OF HAMAMELIS.—*Humphreys Homeopathic Medicine Company*, New York, N. Y. Application filed December 18, 1888. Used since 1874.

"The representation of a girl running with arms held up holding branches which are crossed above her head."

16,268.—HOMEOPATHIC SPECIFICS.—*Humphreys Homeopathic Medicine Company*, New York, N. Y. Application filed December 18, 1888. Used since 1868.

"The representation of a lady seated upon a lion."

16,269.—TYPE, PRINTERS' RULES, PRINTERS' LEADS, AND OTHER PRINTERS' FURNITURE.—*Mather Manufacturing Co.*, Philadelphia, Pa. Application filed September 18, 1888. Used since June 1, 1888.

"'KEYSTONE,' whether expressed pictorially or in word."

16,270.—METAL LINK PUZZLE.—*Maurice Jacobs*, New York, N. Y. Application filed December 13, 1888. Used since November 1, 1888.

"The words 'MISSING LINK PUZZLE,' coupled with the figures of a man and a monkey grasping a puzzle."

16,271.—COPYING-BOOKS.—*Henry E. Pratt*, Lambertville, N. J. Application filed December 20, 1888. Used since January 3, 1887.

"The word 'CHADWICK.'"

16,272.—STOVES AND STOVE WARE AND FURNITURE.—*Quick Meal Stove Company*, St. Louis, Mo. Application filed December 22, 1888. Used since September 15, 1886.

"The representation of a chick leaving the shell and pursuing an insect."

16,273.—SHOE-POLISH.—*C. E. Robinson & Bro.*, Philadelphia, Pa. Application filed December 6, 1888. Used since December 26, 1887.

"The word 'SUNBEAM' and the representation of the sun partially obscured by clouds above and the lower portion shown with radiating beams."

16,274.—PERFUMERY.—*Albert L. Smith*, Palatine, Ill. Application filed November 23, 1888. Used since November 24, 1880.

"The word 'LOVINE.'"

16,275.—WHISKY.—*Charles E. Stults & Co.*, Savannah, Ga. Application filed January 11, 1889. Used since May 1, 1888.

"The words 'OLD OAKEN BUCKET.'"

16,276.—CONFECTIONERY.—*Philip Wunderle*, Philadelphia, Pa. Application filed September 14, 1887. Used since July 1, 1884.

"The words 'THE BEST' in capital letters of white and yellow colors, with a red background."

LABELS.

5,820.—Title: "SWISS STOMACH BITTERS."—*Frederick Eppinger*, New York, N. Y. Application filed January 17, 1889.

5,821.—Title: "GLADDING'S WHALE OIL AND TAR HOOF DRESSING AND LINIMENT."—*William J. Gladding*, New York, N. Y. Application filed January 3, 1889.

5,822.—Title: "CALEDONIA MILLS" (FOR ENVELOPES AND PAPER.) *Logan, Swift & Brigham Envelope Company*, Worcester, Mass. Application filed December 19, 1888.

5,823.—Title: "HOUSEHOLD SALVE."—*Mary M. Woodman*, New York, N. Y. Application filed January 15, 1889.

PATENTS

GRANTED FEB. 12, 1889.

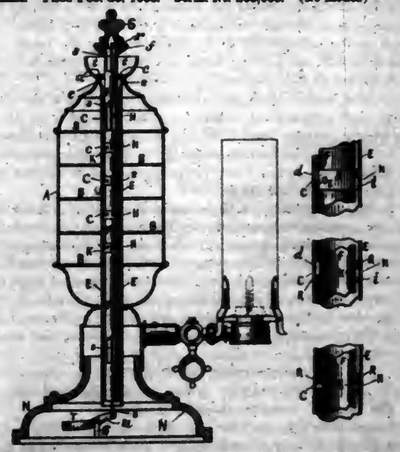
397,484. CULTIVATOR. CHARLES B. ATKINSON, Pennsville, N. J. Filed Nov. 2, 1888. Serial No. 289,902. (No model.)



Claim.—1. In a cultivator, the combination of the beam A, the beams R on opposite sides thereof and having their front ends pivotally connected thereto, the clip movable longitudinally on beam A, the links connecting the clip to the rear ends of beams R, the standard G, the clamping-bolt H, pivoting said standard to the beam A, the lever K', pivoted to said standard, the link connected to said lever, and the pivotal clamp-bolt connecting said link to the clip, all arranged and adapted to operate substantially as described.

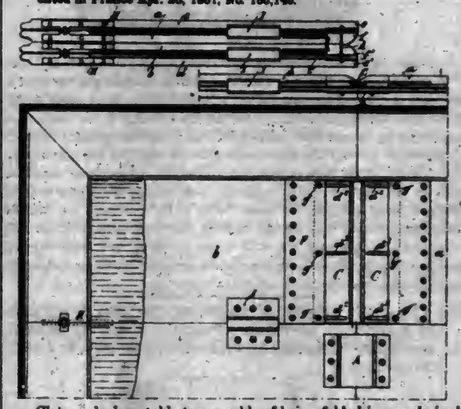
2. In a cultivator, the combination, with the central beam having the horizontal arm B projecting from its front end, of the inclined colter-arm K, having its upper end bolted to arm B, the standard B', bolted to and depending from the arm B, the circular cutter-wheel journaled at the lower end of the standard, and having its lower edge extending through a slot, M, in the colter-arm, the laterally-adjustable beams R, having their front ends pivoted to the beam A, and the fender-rods having their rear ends pivotally connected to the beams R and their front ends pivoted to the arm K, substantially as described.

397,485. CARBURETING-LAMP. WILLIAM W. AUSTIN, Lowell, Mass. Filed Feb. 29, 1888. Serial No. 265,653. (No model.)



Claim.—A vapor-lamp consisting of a shell, A, having a burner, P, and provided with a series of partitions, B, and having a perforated filling-tube, E, provided with a perforated annular flange, *a*, an inner perforated air-tube, F, having a series of projections or rings, R, which fit within the outer tube and are each provided with holes C and H and openings *d* and *i*, and the top having a screw-plug, S, the said air-tube being provided with an indicating-wire, *s*, connected to the arm of the pivoted balance-cup T, as shown and described.

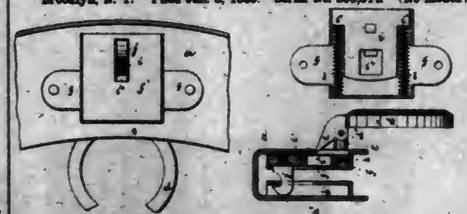
397,486. FOLDING TABLE-TOP. ARMAND C. F. BALEY, Paris, France. Filed Feb. 28, 1888. Serial No. 265,616. (No model.) Patented in France Apr. 23, 1887, No. 183,142.



Claim.—1. In a table-top capable of being folded in any desired number of superposed leaves or sections, the combination of the leaves *c d*, connected on their meeting edges by hinges A, formed in three parts, with the leaves *a b*, the leaf *a* being connected to the leaf *c* by a hinge, I, between the meeting edges of the leaves *a c*, and the leaf *b* being connected to the leaf *d* by a hinge, I, between the meeting edges of the leaves *b d*, the hinges I being formed in three parts, the middle parts of the hinges A being broader than the middle parts of the hinges I, whereby the parts may be folded upon each other, substantially as described.

2. In a table-top capable of being folded in any desired number of superposed leaves or sections, the leaves *c d*, having connecting-hinges A between their meeting edges, said hinges being formed in three parts, combined with the leaves *a b*, the leaf *a* being connected to the leaf *c* by a hinge, I, and the leaf *b* being connected to leaf *d* by a hinge, I, the hinge I being formed in three parts, the middle part of the hinges A being broader than the middle parts of the hinges I, and with an extension-hinge, C, connecting the leaves *a b* between their meeting edges, said hinges having grooves d^9, that receive pins *g*, thereby permitting a sliding movement to the hinge, whereby the parts may be folded successively upon each other, substantially as described.

397,487. LOCK FOR SATCHELS, &c. FRANCIS F. BRAILLARD, Brooklyn, N. Y. Filed Jan. 3, 1889. Serial No. 295,314. (No model.)



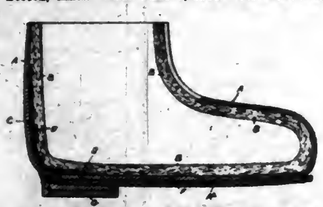
Claim.—1. The combination of a slotted jaw with a vibrating

pendant that has a nose passing through said slotted jaw, and with a slide carrying the locking-catch and adapted to be engaged by the nose, substantially as specified.

2. The combination of slotted jaw *a* with outwardly-projecting posts *c c*, carrying a swinging pendant, *d*, having nose *e*, and with slide *i*, having catch *j* and slot i^3, the nose *e* passing through slotted jaw *a* and into engagement with slot i^3, substantially as specified.

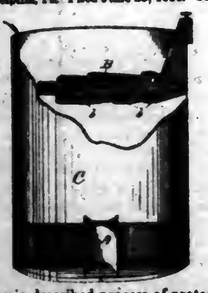
3. The combination of slotted jaw *a* with outwardly-projecting posts *c*, carrying pendant *d*, that has nose *e*, and with the slide *i*, having shoulders i^2 and slot i^3, and with the catch *j*, secured to the slide, and with the spiral springs *k*, placed between shoulders i^2 and the bottom of the lock-case, substantially as specified.

397,488. METHOD OF MANUFACTURING SHOES. GEORGE W. CARTER, Boston, Mass. Filed June 9, 1888. Serial No. 276,547. (No model.)



Claim.—For the manufacture of shoes having an upper and sole of fibrous material braided, woven, or felted, constituting in itself a complete foot-covering, and having a fleece lining and an inside counter or heel-stiffener separated from the fleece lining by an interposed flexible lining, the method, substantially as herein described, the same consisting in turning the shoe inside out and applying but not attaching thereto at its heel portion a covering of india-rubber or other suitable material, and then applying over this covering the flexible lining, suitably securing the fleece lining to the shoe and the flexible lining, and slitting said linings, turning the shoe right side out and removing through said slit said rubber covering, and inserting the counter or heel-stiffener between the shoe and flexible lining and securing it to the shoe-sole, substantially as described.

397,489. METHOD OF PROTECTING THE NEGATIVE PLATES OF ELECTRICAL BATTERIES. FRANCIS J. CLARKE and JOSEPH G. HENDRICKSON, Philadelphia, Pa. Filed June 23, 1888. Serial No. 278,017. (No specimens.)



Claim.—1. The herein-described process of protecting the negative plate of an electrical battery, which consists in coating the surface of said plates with lead.

2. The herein-described process of protecting the negative plate of an electrical battery, which consists in first subjecting lead to the action of sal-ammoniac, arsenic, and phosphate of lead, and then coating the surface of said negative pole with the lead thus prepared, as set forth.

397,490. LUMBER-PILER. CHARLES D. CLARKE, Merrill, Wis. Filed Sept. 22, 1888. Serial No. 286,119. (No model.)



Claim.—1. A device for use in piling lumber, consisting of a base-board, suspending-hooks at the upper end of said board, and a roller supported at the upper end of said board on the front side of the same, as set forth.

2. A device for use in piling lumber, consisting of a base-board, suspension-hooks at the upper end of the same, spurs at the lower end thereof, and a roller supported on the front side of the board at its upper end, as set forth.

3. The combination of the base-board, the brackets E, secured to the front side thereof at the upper end of the same, the supporting-arm F, secured to said brackets, and the roller supported by said arm, as specified.

4. The combination of the standard having the spurs *b* and hooks *d*, the base-board mounted on the standard, and the roller carried by said base-board, as set forth.

397,491. PROCESS OF MANUFACTURING IRON OR STEEL. EUGENE H. COWLES, Cleveland, Ohio. Filed Dec. 24, 1887. Serial No. 258,920. (No specimens.)

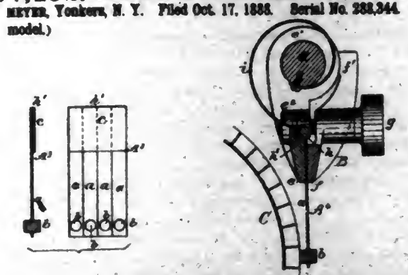
Claim.—1. The herein-described step in the process of manufacturing iron and steel, consisting in the admixture with the molten iron or steel of an alloy of silicon and aluminium in about the proportions specified, substantially as set forth.

2. The herein-described step in the process of manufacturing iron and steel, consisting in melting together iron or steel with an alloy of silicon, aluminium, and iron, substantially as set forth.

3. The herein-described step in the process of manufacturing iron and steel, consisting in melting together iron or steel with an alloy of silicon and aluminium.

4. The herein-described step in the process of manufacturing iron and steel, consisting in the admixture with the molten iron or steel of an alloy of silicon, aluminium, and iron, substantially as set forth.

397,492. BRUSH FOR ELECTRIC GENERATORS. RUDOLF EICKEMEYER, Yonkers, N. Y. Filed Oct. 17, 1888. Serial No. 288,344. (No model.)



Claim.—1. In an electric brush, the combination of a conducting-spring and a carbon contact-block integrally united thereto, substantially as described.

2. In an electric brush, the combination of a conducting-spring and a set of carbon contact-blocks arranged in line crosswise of the spring, substantially as described.

3. In an electric brush, the combination of a conducting-spring and one or more carbon contact-blocks projecting from opposite sides of said spring, substantially as described, whereby the brush is rendered reversible, and enabling both ends of said carbons to be alternately applied to duty and used up in service.

4. In an electric brush, the combination of a series of conducting-springs, each independently resilient and arranged side by side, and each having a carbon block at its free end, substantially as described.

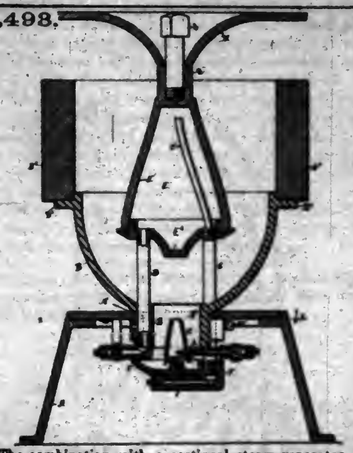
5. In an electric brush, the combination, with a conducting-spring, of a metal-plated carbon block integrally secured to the free end of said spring, substantially as described.

6. The combination, with a commutator-hub, of a brush holder or clamp provided with a brush-adjusting gage and a brush-spring having a carbon contact-block at its free end, and also having a length between its rear end and the center of said block which exactly corresponds with the distance between the brush-adjusting gage in the holder and the commutating-point on said hub, substantially as described, whereby the perfect electric adjustment of the brush is accomplished by merely placing the brush in the holder against the gage and clamping it.

397,493. OIL-BURNER. WILSON R. FACER, Cleveland, Ohio. Filed Nov. 14, 1887. Serial No. 255,151. (No model.)

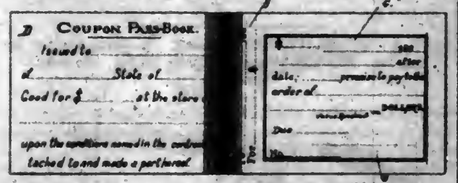
Claim.—1. The combination, with a steam-generator, a steam-discharging pipe leading therefrom, and a water-supply pipe in open communication therewith, said steam and water pipes forming a rigid support for the generator, of oil-discharging orifice in the line of the steam-jet approximately at right angles thereto, and a lighting-cup located below the burner, said cup having a duct therein out of which the discharge-orifice leads, this duct being in open communication with the steam-pipe, substantially as set forth.

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2. The combination, with a sectional steam-generator, a water-supply pipe, and a steam-discharge pipe leading in and out of the said generator, of oil-discharging orifice located in line of the steam-jet approximately at right angles thereto, and a lighting-cup attached to and supported by the steam-pipe, said cup having a duct therein in open communication with the steam-pipe and out of which the discharge-orifice leads, substantially as set forth.

397,494. COUPON PASS-BOOK. MARION O. FISHER, Dayton, Ohio, assignor to Samuel C. McClure, same place. Filed Aug. 18, 1887. Serial No. 247,267. (No model.)



Claim.—As a new article of manufacture, a coupon pass-book, a title or certificate, D, a leaf containing a detachable promissory note, G, and a stub, *g*, each provided with blank spaces, as set forth, including the blank space for the insertion of the amount represented by the coupons in the book at the time of delivery of the same to the customer, a contract, F, and the intermediate leaves, each divided into a series of detachable coupons, C, which are inscribed with numerals, figures, or other characters to denote the value and nature of the same, substantially as and for the purpose described.

397,495. METHOD OF STITCHING FABRICS. WILLIAM C. FOSTER, Jersey City, N. J., assignor to Mari A. Cuming, New York, N. Y. Filed Oct. 26, 1887. Serial No. 253,205. (No model.)

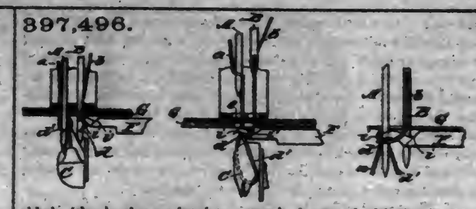


Claim.—The method herein described of forming a seam of two threads in connection with a fabric, which consists, first, in passing two loops of thread through the fabric at a short distance apart, one to be formed into a chain-stitch, the other into a transverse loop, then carrying the transverse loop across the space between the loops at the under surface of the fabric and retaining it there, and then passing a second chain-stitch loop down through the fabric and first through the transverse loop, and then through the previous chain-stitch loop, this operation being repeated to form the seam, the transverse loop occupying a position between the chain-stitch loops and the fabric, substantially as described.

397,496. SEWING-MACHINE. WILLIAM C. FOSTER, Jersey City, N. J., assignor to Mari A. Cuming, New York, N. Y. Filed Apr. 14, 1888. Serial No. 270,633. (No model.)

Claim.—The needle-bar N, provided with two needles, and the cloth-plate G, having the needle-hole or slot *e* for both needles, in combination with stitch-forming hook C, the bar F, placed beneath the cloth-plate in line with the needles, and means, substantially as described, for reciprocating said bar F, the same being formed or provided with a hook or point, *i*, to enter the loop, and with the shoulder i^2, to shift the loop, substantially as described.

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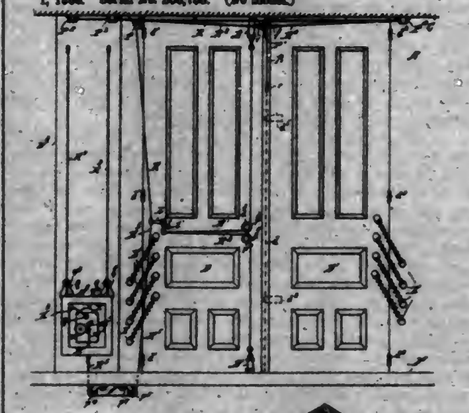
397,497. COMBINED FEED-TROUGH AND HAY-RACK. CHARLES R. HANNA, Middleburne, Ohio. Filed Sept. 14, 1888. Serial No. 285,289. (No model.)

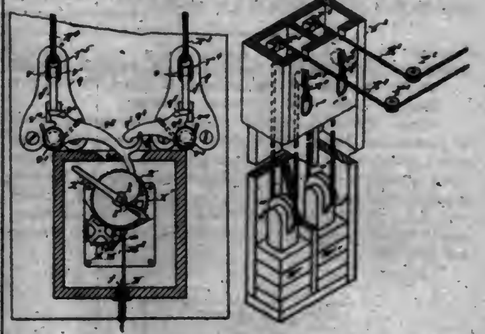


Claim.—1. In combination, the rack, the cleats and buttons having coinciding beveled edges attached to the inner sides of the legs of the rack, the sliding troughs having notches in their edges, and the buttons to engage said notches, as set forth.

2. In combination, the rack, the cleats secured to its legs and having lower beveled edges, the buttons with ends oppositely beveled and of unequal weight—the inner the heavier—the troughs having notches in their ends, and the buttons pivoted to the front of the legs in position to engage the notches or the upper beveled ends of the other buttons, as desired.

397,498. DEVICE FOR OPENING AND CLOSING DOORS. CHARLES F. HERRWAY, Lowell, Mass., assignor, by direct and mesne assignments, of two-thirds to James F. McKissock, same place. Filed July 1, 1886. Serial No. 206,755. (No model.)





Claim.—1. The combination of a self-closing door, a rope connected at one end to said door, one or more guide-pulleys over which

said rope is carried, a weight sliding freely on said rope, a link or loop attached to the other end of said rope, a pivoted hook adapted to engage said link and to be turned upon its pivot by the draft of said rope to release said link or loop therefrom, a locking-lever arranged in front of the open end of said hook to prevent said hook from turning on its pivot, a spring to turn said lever on its fulcrum, and clock-work arranged to prevent said lever from turning on its fulcrum for a definite time and thereafter to release said lever, whereby said door may be opened by the falling of said weight and allowed to close thereafter, as and for the purpose specified.

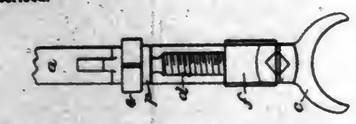
2. The combination of a self-closing door, suitable guide-pulleys, a rope connected at one end to said door, a weight provided with a pulley, said rope passing under said last-named pulley and over said guide-pulley, a link or loop attached to the other end of said rope, a pivoted hook adapted to engage said link and to be turned upon its pivot by the draft of said rope to release said link or loop therefrom, a locking-lever having a short arm adapted when placed in front of the open end of said hook to prevent said hook from turning on its pivot, a spring to turn said lever upon its fulcrum, and a cam provided with a cam-notch and rotated by clock-work, the longer arm of said lever resting upon said cam and holding said short arm in front of said open end of said hook until the free end of said long arm enters said cam-notch, as and for the purpose specified.

3. The combination of two self-closing doors, the inner edge of one of said doors being adapted to overlap the inner edge of the other of said doors when the same are closed, suitable guide-pulleys, two ropes, each connected at one end to one of said doors, two weights, each sliding freely on one of said ropes, two links, one attached to the other end of each rope, two pivoted hooks, each adapted to engage one of said links and to be turned upon its pivot by the drawing of the rope to which said link is attached to release said link therefrom, a locking-lever having a short arm, adapted, when placed in front of the open end of one of said hooks, to prevent said hook from turning on its pivot, a spring to turn said lever upon its fulcrum, a cam provided with a cam-notch and rotated by suitable clock-work, the longer arm of said lever resting upon the periphery of said cam and holding said short arm in front of said open end of said hook until the free end of said long arm enters said cam-notch, and another locking-lever having a short arm adapted to prevent the other of said hooks from turning on its pivot when placed in front of the open end of said last-named hook, the free end of the long arm of said last-named locking-lever resting upon the long arm of said first-named locking-lever or upon a projection which said last-named long arm is provided with and pressed upon the same by a spring, and adapted to release its hook before the other hook is released by said first-named locking-lever to allow one of said doors to close before the other of them, and said last-named spring, as and for the purpose specified.

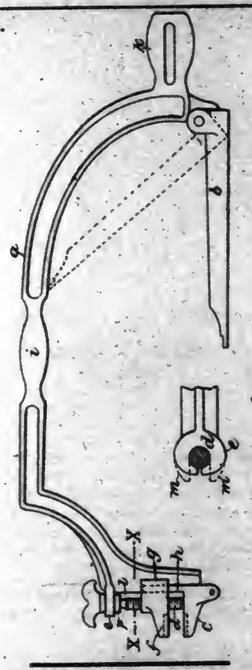
4. The combination of two self-closing doors, the inner edge of one of said doors being provided with one or more latches to engage with the other of said doors, two ropes, each connected at one end to one of said doors, one or more guide-pulleys over which said ropes are carried; two weights, one of which slides freely on each of said ropes, links or loops attached to the other ends of said ropes, respectively, pivoted hooks adapted to engage said links and to be turned upon their pivots by the draft of said ropes to release said links or loops therefrom, and locking-levers, each arranged in front of the open end of one of said hooks to prevent the same from turning, springs to turn said levers upon their fulcrums, and clock mechanism arranged to prevent said levers from turning on their fulcrums for a definite time and thereafter to release said levers one after the other to allow said ropes to slip through said weights, whereby said doors may be opened by the falling of said weights and allowed to close one after the other, as and for the purpose specified.

397,499. COMBINED CARRIAGE-JACK, WRENCH, AND BIT-STOCK. FRANKLIN K. HINSON and ROBERT M. LAMBE, New York, N. Y. Filed Apr. 5, 1888. Serial No. 269,889. (No model.)

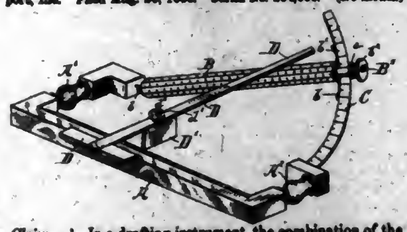
Claim.—The herein-described compound tool, comprising the cow or goose-neck *a*, the axle-bearing *b*, fulcrumed to one end thereof and having serrations *n* at its forward end, the fixed jaw and bearing portion *c*, arranged at the forward end of the said goose-neck *a*, the screw *d*, permanently held by the collar *e*, the adjustable jaw *f*, provided with ears *g*, the latter engaging with the beads *h*, the cylindrical portion *i* of the said goose-neck, and the handle K, substantially as shown and described.



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397,500. DRAFTING-INSTRUMENT. SILVESTER HOADLEY, Goshen, Ind. Filed Aug. 28, 1888. Serial No. 284,000. (No model.)

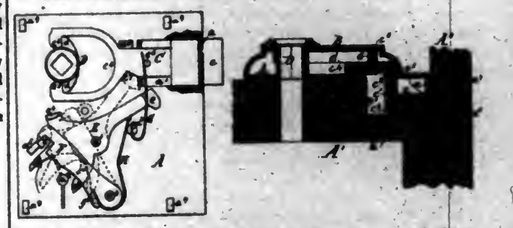


Claim.—1. In a drafting-instrument, the combination of the base A, provided with the arms A' and A², the bar B, hinged to said arm A', the curved arm C, extending out from said arm A², said bar B being mounted to slide thereon, and the draftsman's square D, all arranged and operating substantially as set forth.

2. The combination, in a drafting-instrument, of a base or frame, a curved arm extending out therefrom, and a graduated bar having graduations of different lengths upon several sides hinged to said base or frame and revolvable upon its own axis, whereby either of its sides may be brought into use, substantially as set forth.

3. The combination, in a drafting-instrument, with the main structure thereof, of a draftsman's square extending across it, the blade of which is provided with a wing extending down to the surface on which the instrument rests, said wing being pivoted as described, whereby the markings can be made at an angle with the direction in which the square is moved over the instrument, substantially as set forth.

397,501. LOCK. HILAND A. HOLT, Nashua, N. H. Filed May 25, 1888. Serial No. 275,101. (Model.)

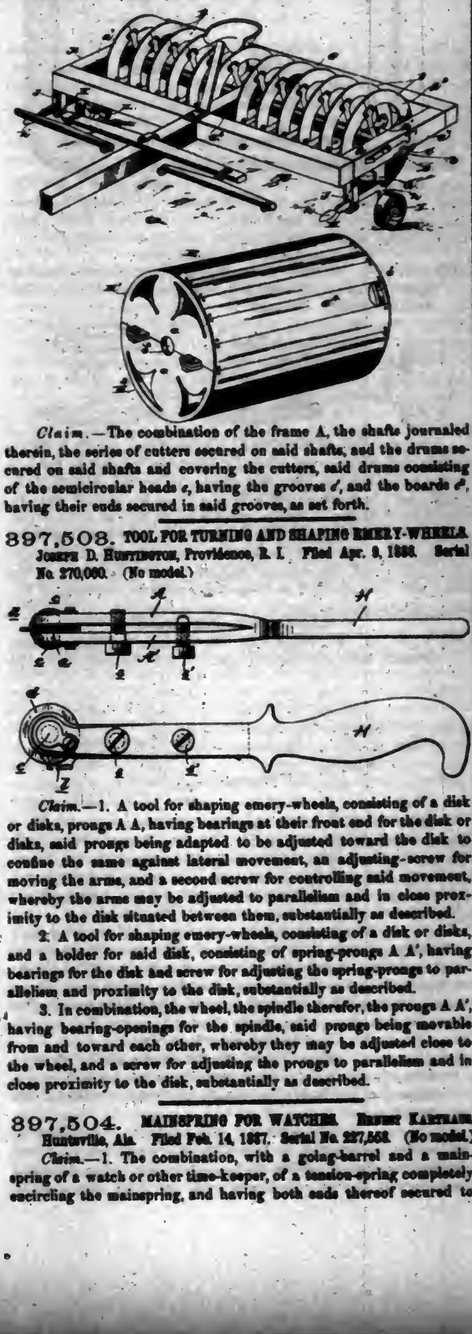


Claim.—1. A door-lock adapted to be placed on either the inner or outer side of a door, comprising a lock-case, A, having an angular chamber, a sliding bolt having an offsetting fastening portion, which is about on a line central with the edge of the door and adapted to engage with an ordinary striker or keeper inserted in the casing or framing of the door, and a locking-tumbler mechanism comprising tumbler E, substantially as and for the purpose described.

2. The combined rim and mortise lock comprising a locking-tumbler mechanism, a sliding latch-bolt, C, having an angular portion, c^3 and a latching-nose, *c*, and a case having a main plate, A, provided with an angular rim-plate portion, *a*, and an angular protecting portion, *a'*, and a locking-tumbler mechanism comprising tumbler E, substantially as and for the purpose described.

3. The combination of the latch-bolt C, having notch c^3, the tumbler E, having branches e^3 e^4 and lug e^5, and the tumbler F, having notch *f* and spring H, substantially as described.

397,502. SOD-CUTTER, STALK-CUTTER, AND ROLLER. THOMAS HORTON and JOSEPH P. WHITEHOUSE, Garrett, Ill. Filed May 9, 1888. Serial No. 273,282. (No model.)



Claim.—The combination of the frame A, the shafts journaled therein, the series of cutters secured on said shafts, and the drums secured on said shafts and covering the cutters, said drums consisting of the semicircular heads *c*, having the grooves *c'*, and the boards c^2, having their ends secured in said grooves, as set forth.

397,503. TOOL FOR TURNING AND SHAPING EMERY-WHEELS. JOSEPH D. HUNTINGTON, Providence, R. I. Filed Apr. 9, 1888. Serial No. 270,060. (No model.)

Claim.—1. A tool for shaping emery-wheels, consisting of a disk or disks, prongs A A, having bearings at their front end for the disk or disks, said prongs being adapted to be adjusted toward the disk to confine the same against lateral movement, an adjusting-screw for moving the arms, and a second screw for controlling said movement, whereby the arms may be adjusted to parallelism and in close proximity to the disk situated between them, substantially as described.

2. A tool for shaping emery-wheels, consisting of a disk or disks, and a holder for said disk, consisting of spring-prongs A A', having bearings for the disk and screw for adjusting the spring-prongs to parallelism and proximity to the disk, substantially as described.

3. In combination, the wheel, the spindle therefor, the prongs A A', having bearing-openings for the spindle, said prongs being movable from and toward each other, whereby they may be adjusted close to the wheel, and a screw for adjusting the prongs to parallelism and in close proximity to the disk, substantially as described.

397,504. MAINSPRING FOR WATCHES. REUBEN KARTHAUS, Huntsville, Ala. Filed Feb. 14, 1887. Serial No. 227,853. (No model.)

Claim.—1. The combination, with a going-barrel and a mainspring of a watch or other time-keeper, of a tension-spring completely encircling the mainspring, and having both ends thereof secured to

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the outer coil of the mainspring and to one another in such a manner as to prevent the ends of the tension-spring from sliding past one another, said tension-spring being fitted tightly in the going-barrel to be held by frictional contact against the inner periphery of the barrel and capable of a radial movement inwardly upon the mainspring by an excessive strain upon the latter, substantially as described, for the purpose set forth.

2. The combination, with a going-barrel and a mainspring, of a tension-spring completely encircling the mainspring and having one end permanently united to the outer coil of the mainspring, the unattached or free end of the tension-spring being detachably connected to the united ends of the tension-spring and mainspring to prevent the ends of the tension-spring from sliding past one another, the coiled friction-spring being capable of a radial movement inwardly upon the mainspring when an excessive strain is exerted upon the latter, substantially as described, for the purpose set forth.

3. The combination, with the going-barrel and a mainspring, of a tension-spring encircling the mainspring, said tension-spring having one end thereof secured to the outer coil of the mainspring by a transverse rivet, which passes through the tension-spring and mainspring at a suitable distance from the ends of the same to form a seat or fork, the unattached or free end of the said tension-spring being fitted in the fork or seat, and thereby held against sliding past the same, substantially as described, for the purpose set forth.

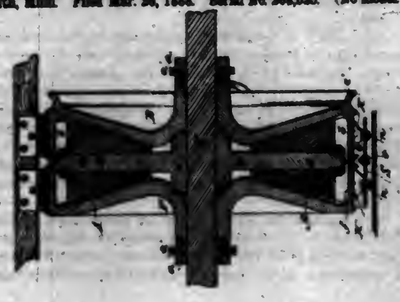
397,505. METHOD OF INSERTING MAINSPRINGS AND REMOVING THE SAME. REUBEN KARTHAUS, Huntsville, Ala. Filed Apr. 25, 1888. Serial No. 271,903. (No model.)



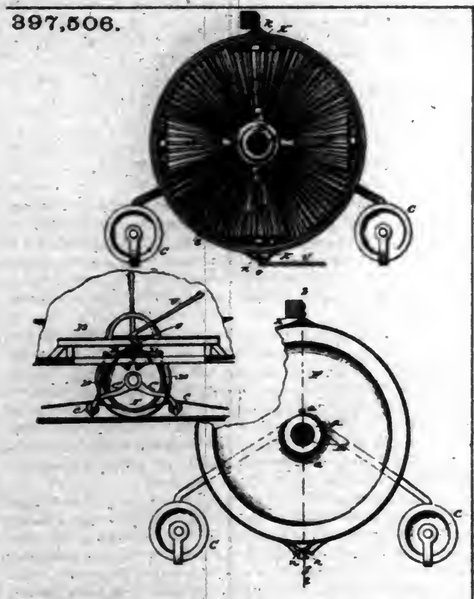
Claim.—1. The herein-described method of inserting mainsprings into the going-barrels of watches and other time-keepers, which consists, first, in placing a non-expansible clasp around the mainspring to be inserted, the interior diameter of said clasp being of corresponding or slightly smaller diameter than the barrel into which the mainspring is to be inserted, and then forcing the mainspring into the barrel and causing the clasp to strike the end of the barrel, whereby the clasp is removed from the mainspring by the operation of forcing the mainspring into the barrel, substantially as described, for the purpose set forth.

2. The herein-described method of inserting and removing mainsprings into and from the going-barrels of watches and other time-keepers, which consists, first, in placing a non-expansible clasp-ring around the mainspring to be inserted, the interior diameter of said clasp-ring being of corresponding or slightly smaller diameter than the barrel into which the mainspring is to be inserted, then partially forcing the mainspring into one end of the barrel and partially forcing another mainspring already fitted in the barrel from the opposite end thereof, and finally forcing the first mainspring completely into the barrel and entirely expelling the second mainspring therefrom, the clasp-ring being removed from the first mainspring, when the latter is forced completely into the barrel, by striking against one end thereof, as and for the purpose described.

397,506. TRANSMITTING POWER. TIMOTHY W. LARIMER, Duluth, Minn. Filed Mar. 26, 1888. Serial No. 268,525. (No model.)



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Claim.—1. In a device for transmitting a reversible motion to a car from a continuous running cable, the combination, with a shaft journaled below the car-body and having a hub keyed on said shaft provided with radial pivot-bolts D, and beveled gears mounted on said bolts D, of the band-wheels B and F, loosely mounted on said shaft and having internal beveled cogged surfaces, said wheel B adapted to be engaged by the cable, substantially as described.

2. In a device for transmitting a reversible motion from a continuous running cable, the combination, with shaft E and the band-wheels B and F, loosely mounted thereon, of the hub H, having radial arms D and beveled gears A mounted thereon, said hub adapted to be secured to said shaft and disposed between the wheels F and B, substantially as and for the purpose described.

3. In a device for transmitting reversible motion, the combination, with the shaft having radial arms D, carrying beveled gears A, of the band-wheels B and F, having internal beveled cogged surfaces and disposed one at each side of the radial arms D and meshing with the gears A, said wheels B and F having circumferential flanges adapted to receive the brake-bands, substantially as shown and described.

4. In a device, substantially as described, for transmitting a reversible motion, the band-wheel B, provided with an internal beveled cog-surface, a brake-flange, *e*, and a groove, *d'*, adapted to receive the cable, substantially as described, and for the purpose specified.

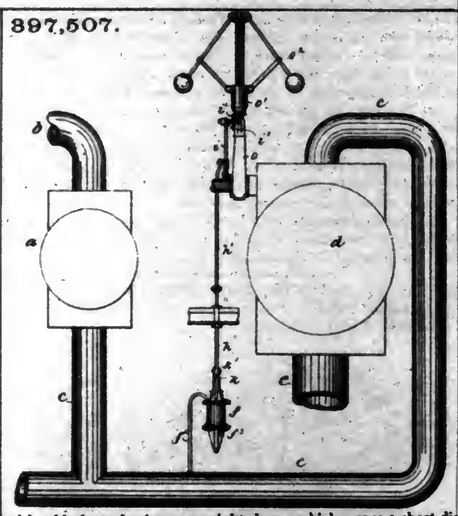
5. In a device for transmitting a reversible motion, the combination, with the shaft E and the hub H, having radial arm D, provided with beveled gears A, of band-wheels B and F, the wheel B adapted to frictional contact with the cable, said wheels having beveled inner cogged surfaces meshing with the gears A, said wheels provided with flanges *e* and *f*, adapted to receive the brake-bands K K', and means for operating said brakes, substantially as described, all arranged as and for the purpose set forth.

897,507. REGULATOR FOR COMPOUND ENGINES. CHARLES T. MAIN, Lawrence, Mass. Filed July 5, 1888. Serial No. 279,056. (No model.)

Claim.—1. A regulator for compound engines, comprising a pressure-gage or pressure-chamber connected with the receiver and having a part movable by changes in the pressure in said receiver, the said moving part of the pressure-gage being connected with the cut-off controller for the valves of the low-pressure engine, and by its movement changing the cut-off for said valves, as set forth, whereby the quantity of steam admitted to the low-pressure engine from the receiver is increased as the pressure in the receiver rises and is diminished as the pressure in the receiver falls, substantially as and for the purpose described.

2. A regulator for compound engines, comprising a cylinder and piston therein, said cylinder communicating with the receiver of the engine, and said piston being connected with the cut-off controller of the low-pressure engine combined with a weighted lever connected with said piston, having one weighted arm which moves a short distance above and below the horizontal position, and a second weighted arm that moves toward and from the vertical position in the stroke of said piston, substantially as and for the purpose described.

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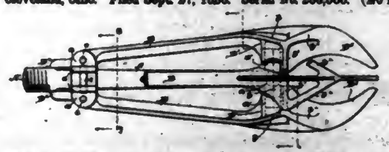


897,508. BUTTON. JAMES MCKERSEY, Attleborough, Mass., assignor to Wheaton, Richards & Co., same place. Filed Oct. 15, 1888. Serial No. 288,092. (No model.)



Claim.—The combination of a button-shank having a narrow portion and lateral arms projecting therefrom at its end, which is turned to one side and offset with relation to the main portion of the shank, and a button-head consisting of a cap or top plate, c^3, and bottom plate, c^4, having an opening through which the end of the shank passes, and a holding-plate, *d*, inclosed in said button-head, having an integral tongue, d^3, and projections d^3 d^4, extending from the plane of the plate, said projections d^3 co-operating with the arms of the shank and said projection d^4 co-operating with the extremity of the shank, substantially as and for the purpose described.

897,509. FLUE-CLEANER. JOHN T. MEAD and JOHN THOMSON, Cleveland, Ohio. Filed Sept. 27, 1888. Serial No. 286,500. (No model.)



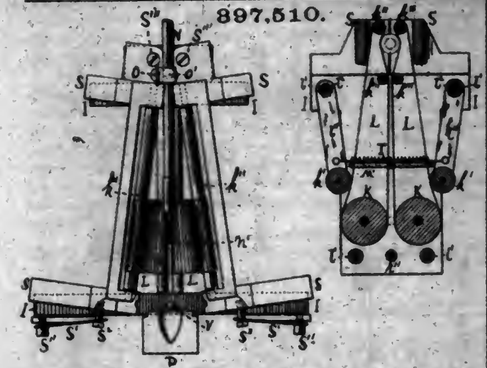
Claim.—1. In a flue-cleaner, the combination, with a central rod and arms, substantially as indicated, pivoted at their rear ends to said rod and supported upon yielding bearings near the front ends, of ribs extending spirally in opposite directions from each arm, each rib having a scraping-edge adapted to fit a flue of given size, substantially as set forth.

2. In flue-cleaners, the combination, with a central rod having a series of projections on its front end, of arms pivoted at their rear ends to said rod and provided with scraping-ribs extending spirally in opposite directions from each arm, and springs interposed between the projections on the rod and the arms for yieldingly supporting the free ends of the latter, substantially as set forth.

897,510. CIGAR-BUNCH-WRAPPING MACHINE. HENRY C. MYERS, New York, N. Y., assignor to the United States Cigar Machinery Company, of New York. Filed Feb. 21, 1887. Serial No. 228,302. (No model.)

Claim.—1. In a cigar-bunch-wrapping machine, the combination of a holding-pin on which the butt of the cigar-bunch can be pressed, mounted with bearings in the machine in which it revolves, a recessed head-piece for forming and supporting the tip of the cigar movably

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attached to the machine, so as to be adjustable vertically, an endless traveling apron on each side of the pin and support, rollers to support the aprons, rollers bearing against the aprons to tighten the same, and springs for pressing the tightening-rollers against the aprons, movable jaws pivoted vertically at one end, so as to swing horizontally, and carrying two of the supporting-rollers, guide-rollers on opposite sides of the pin and support, and mechanism for revolving the rollers and operating the jaws, substantially as shown and described.

2. In a cigar-bunch-wrapping machine, the combination of a holding-pin onto which the butt of the cigar-bunch can be pressed, mounted with bearings in the machine in which it revolves, a recessed head-piece for supporting and forming the tip of the cigar movably attached to the machine, so as to be adjustable vertically, two endless traveling aprons, one on each side of the holding devices, rollers to support the aprons, rollers bearing against the aprons to tighten the same, and springs for pressing the tightening-rollers against the aprons, a movable jaw pivoted vertically at one end, so as to swing horizontally, carrying one of the supporting-rollers, guide-rollers on the opposite sides of the pin and head-piece, and mechanism for revolving the rollers and operating the jaw, whereby one of the aprons may be moved toward or from the other apron and opened out from or closed upon the holding devices, substantially as shown and described.

3. In a cigar-bunch-wrapping machine, in combination with devices for holding the cigar-bunch at each of its ends, endless traveling aprons, rollers for supporting the aprons, and devices for tightening the aprons, a jaw pivoted vertically at one end, so as to swing horizontally, and carrying one of the rollers, and guide-rollers on opposite sides of the holding devices, and mechanism for revolving the rollers and operating the jaw, whereby one of the endless aprons can be opened out from the holding devices, substantially as shown and described.

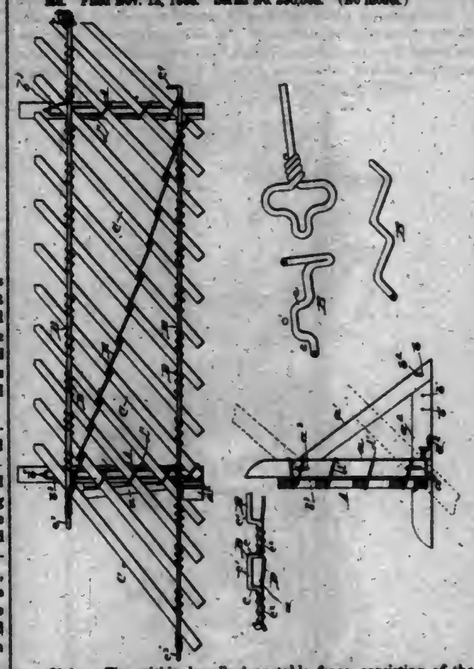
4. In a cigar-bunch-wrapping machine, the combination of a holding-bar for the cigar-bunch, having a revolving sleeve on its end, and a supporting-pin attached to the sleeve, said bar being mounted adjustably in bearings in the machine, two endless traveling aprons, one on each side of the holding-bar, rollers to support and tighten the endless traveling aprons, movable jaws pivoted at one end and carrying the upper supporting-rollers, an adjustable head piece opposite the holding-bar, guide-rollers on opposite sides of the holding-bar and head-piece, a shifting rod and yoke for moving the aprons, and mechanism for revolving the rollers and operating the jaws, substantially as shown and described.

5. In a cigar-bunch-wrapping machine, a device for holding the cigar-bunch during the operation of wrapping, consisting of a long slender pin adapted to penetrate the cigar-bunch to a considerable distance to hold the bunch in place, and suitable means for supporting the pin so that it can revolve, substantially as shown and described.

6. In a cigar-bunch-wrapping machine, a device for holding the cigar-bunch during the operation of wrapping, consisting of a holding-bar having a revolving sleeve on its end, and a long slender pin attached to the sleeve and adapted to penetrate the cigar-bunch to a considerable distance, sufficiently to hold the bunch in place, said bar being mounted adjustably in bearings in the machine, substantially as shown and described.

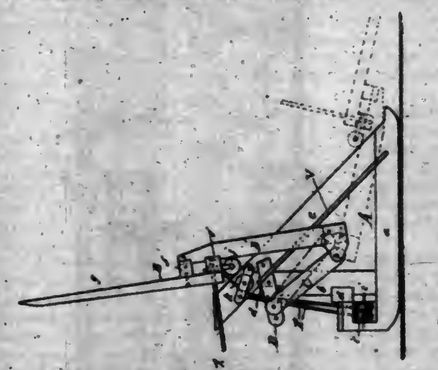
7. In a cigar-bunch-wrapping machine, the combination of a cigar-bunch-holding device mounted in bearings in the machine in which it revolves, and adapted to enter the butt-end of the bunch, a head-piece for supporting the tip of the cigar-bunch, two endless traveling aprons, one on each side of the holding devices, rollers to support and rollers to tighten the endless traveling aprons, movable jaws pivoted at one end and carrying the upper supporting-rollers, guide-rollers on opposite sides of the holding devices, a treadle for operating the jaws, and links, levers, rods, and chains connecting the treadle and the jaws, and springs connected with the jaws to act in the reverse direction to the treadle, and mechanism for revolving the aprons and rollers, substantially as shown and described.

897,511. PORTABLE FENCE. PEARRE M. MEMELAR, Hagerstown, Md. Filed Nov. 12, 1888. Serial No. 290,502. (No model.)



Claim.—The within-described portable fence, consisting of the post composed of three parts—to wit, the vertical portion, inclined bar, and base—all pivoted to one another and capable of being folded, as described, the upper and lower rails having depressions, the palings secured in these depressions by the tie-wire wound around them, the diagonal brace-wire, the wire shield on the face of the post, and the serpentine wire having loops at its lower end to receive a stake, the whole arranged substantially as described.

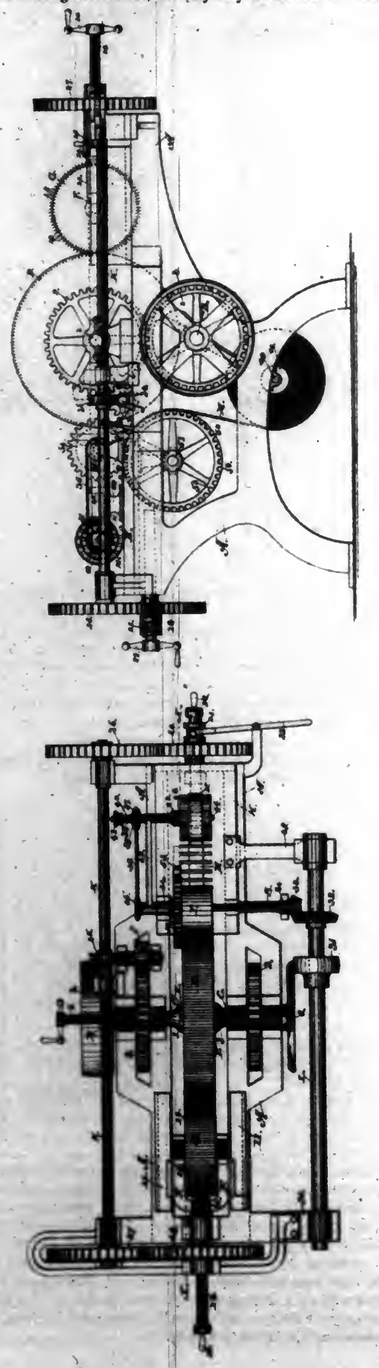
897,512. HAY-STACKER. JAMES MOREN, Sioux Rapids, Iowa. Filed Jan. 14, 1888. Serial No. 260,778. (No model.)



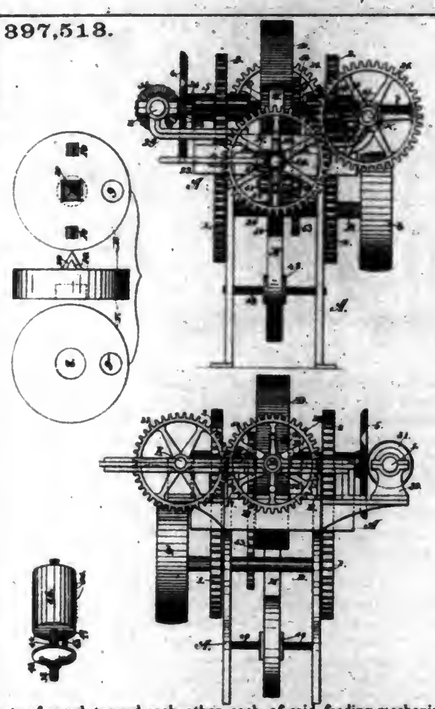
Claim.—In a hay-stacker, the combination, with the main frame composed of the sills *a a*, vertical posts *b b*, inclined beams *c c*, and the cross-bars *d d*, the fixed projections D D, projecting rearwardly from the upper edge of the beams *c c*, and the connecting-links C, pivoted at their outer ends to the projections D, of the fork B, said fork consisting of the side arms, F, the rear ends thereof pivoted to the inner ends of the links C, the bars *f f'*, tines *g g*, the rods *h h*, friction-rollers *j j*, connected to the rear of the bar *f*, adapted to travel on the beams *c c*, and means for raising and lowering the fork B, substantially as shown and described.

397,513. MACHINE FOR MAKING MATCH-SPLINTS. GEORGE R. HORAN, Troy, assignor of one-half to Alonzo P. Adams, Albany, N. Y. Filed Apr. 28, 1887. Serial No. 236,442. (No model.)

Claim.—1. In a machine for making match-splints from a revolving block, the combination of a scoring-wheel provided with a series of scoring-knives, and a slicing-knife secured to a sliding bed which carries a tape-winding mechanism, the said scoring-wheel being disconnected from the slicing-knife and each being provided with an independent feeding mechanism, whereby they can be fed at a uniform



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rate of speed toward each other, each of said feeding mechanisms being provided with a disengaging device, whereby the feeding movement of either or both can be suspended and resumed, and both having hand-operating appliances by which they can be manipulated during disengagement, as and for the purpose herein specified.

2. In a machine for making match-splints, the combination of a scoring-wheel provided with a series of scoring-knives and fitted to rotate in a carrier moving on guides and a feeding-screw for imparting a positive feeding movement to said carrier, said feeding-screw having a disconnecting attachment, whereby said feeding movement can be suspended and resumed, and also having a hand-operating attachment, whereby said feeding-screw can be manipulated during its disengagement, as and for the purpose herein specified.

3. In a machine for making match-splints, the combination of a scoring-wheel provided with a series of scoring-knives for scoring a revolving block, a slicing-knife for removing the splints from said block, a concave bed directly behind said slicing-knife, and an elastic roller which bears against the splints as they are removed from said block and by which said splints are separated from each other, substantially as and for the purpose herein specified.

4. In a machine for making match-splints from a revolving block, the combination of a scoring-wheel provided with a series of scoring-knives actuated to score a revolving block across its periphery, a slicing-knife for removing the splints from said block, a concave bed directly behind said slicing-knife, an elastic roller arranged to rotate in said concave bed at a greater peripheral speed than the revolving block, and a single tape or web moving directly under said elastic roller, substantially as and for the purpose herein specified.

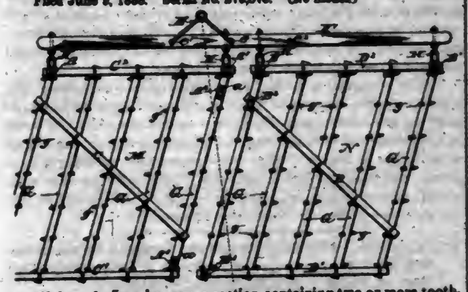
5. In a machine for making match-splints from a revolving block, the combination of a splint-cutting mechanism, a block-revolving shaft provided with a friction-disk, a sliding shaft provided with a friction-wheel whose periphery bears upon the flat face of said friction-disk to produce a variable speed for the sliding shaft, a transverse shaft geared to said sliding shaft, a single tape or web, and a tape-spool spindle actuated by said transverse shaft and having a variable rate of speed that corresponds to the peripheral speed of the constantly-increasing bundle of splints that is formed on the spool attached to said spindle, substantially as and for the purpose herein specified.

6. In a machine for making match-splints from a revolving block, the combination, with a block-revolving mechanism, a scoring-wheel provided with a series of scoring-knives, a slicing-knife oppositely located to said scoring-wheel, said slicing-knife and scoring-wheel being fed toward each other at the same rate of movement, a concave bed directly behind said slicing-knife, and an elastic roller revolving in the hollow of said concave bed, of a longitudinal shaft having a transverse shaft geared thereto, a single tape or web, and a tape-spool

spindle, said shafts and spindle being rotated at a speed that is variable in respect to time, but uniform in respect to each other, substantially as and for the purpose specified.

7. In a machine for making match-splints, the combination of a splint-cutting mechanism, a concave bed directly behind said cutting mechanism, an elastic roller rotating in said concave bed, a single flat tape or web which moves directly under said elastic roller, and a tape-winding mechanism, the splints being passed directly between the periphery of said elastic roller and the face of the tape and being retained on said tape-winding mechanism by their involvement between the successive convolutions of said tape, as and for the purpose herein specified.

397,514. HARROW. GUSTAVUS A. PADDOCK, Beaver Dam, Wis. Filed June 9, 1888. Serial No. 276,573. (No model.)



Claim.—1. In a harrow, a section containing two or more tooth-bars rigidly secured together, with slanting teeth and semi-reversing attachments, substantially as described.

2. In a harrow, two sections with slanting teeth and semi-reversing attachments, substantially as and for the purposes described.

3. In a harrow, two independent sections attached to a draw-bar, the teeth of each slanting directly out from the other, substantially as shown.

4. In a harrow, a draw-bar adjustable to two adjacent sides of a section, said section containing two or more tooth bars rigidly connected, substantially as described.

5. In a harrow, the combination, with a draw-bar, of two sections having slanting teeth and semi-reversing attachments, substantially as described.

6. In a harrow, the combination, with two sections, M and N, having their teeth slanted outward from each other, of semi-reversing attachments A and B, fronting two adjacent sides, substantially as described.

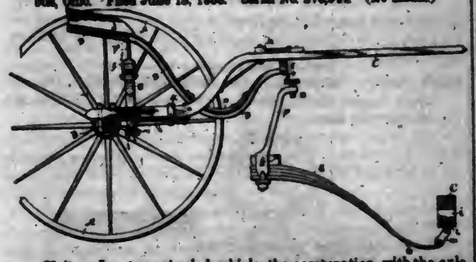
7. In a harrow, the combination of two sections, M and N, having semi-reversing attachments A and B, with a draw-bar, F, adjustable to two adjacent sides of each section, substantially as described.

8. In a harrow, the combination, with a button, of a link adjustable to said button, the whole forming a drawing attachment, substantially as described.

9. In a harrow, two sections, each containing two or more tooth-bars rigidly connected, with slanting teeth and semi-reversing attachments, substantially as described.

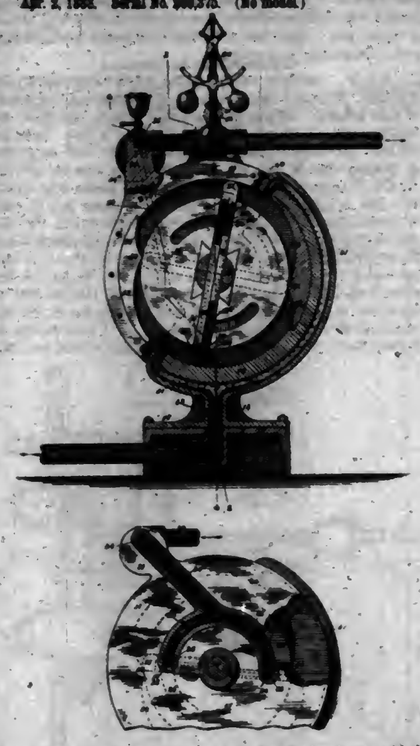
10. In a harrow, two sections, each containing two or more tooth-bars secured together without joints, and each having its teeth slanted outward from the other, and a draw-bar adjustable to two adjacent sides of each section, substantially as described.

397,515. TWO-WHEELED VEHICLE. JOHN G. PARSONS, Columbus, Ohio. Filed June 13, 1888. Serial No. 276,944. (No model.)



Claim.—In a two-wheeled vehicle, the combination, with the axle, shafts, and seat, of a transverse spring, G, pivotally supported beneath the seat, as described, and the springs *i*, held at their front ends against the under sides of the shaft-bars, and pivotally connected at their remaining ends with the spring G, substantially as and for the purpose specified.

397,516. ROTARY STEAM-ENGINE. DANIEL R. POWERS, New York, N. Y., assignor of one-half to George W. Fuller, same place. Filed Apr. 2, 1888. Serial No. 269,575. (No model.)



Claim.—1. The combination of a cylindrical casing provided with fixed cams and with steam inlet and exhaust ports, a rotary disk concentric with said casing and provided with arc-shaped channels at diametrically-opposite points, which pass the inlet-port during the rotation of the disk, and with a radial slot or slots in communication with said arc-shaped channels, and piston-slides within said radial slots provided with heads having steam-channels, substantially as described.

2. The combination of a cylindrical casing provided with fixed cams, and with steam inlet and exhaust ports, a rotary disk concentric with said casing and provided with arc-shaped channels at diametrically-opposite points which pass the inlet-port during the rotation of the disk, and with a radial slot or slots in communication with said arc-shaped channels, and piston-slides within said radial slots provided with heads having steam-channels, said slides having grooves on their outer faces, substantially as described.

3. The combination of a cylindrical casing provided with fixed cams and with steam-inlet and exhaust ports, a rotary disk concentric with said casing and provided with short arc-shaped channels at diametrically-opposite points which pass the inlet-port during the rotation of the disk, said channels serving to admit and cut off steam, and with a radial slot or slots in communication with said arc-shaped channels, and piston-slides within said radial slots provided with heads having steam-channels, substantially as described.

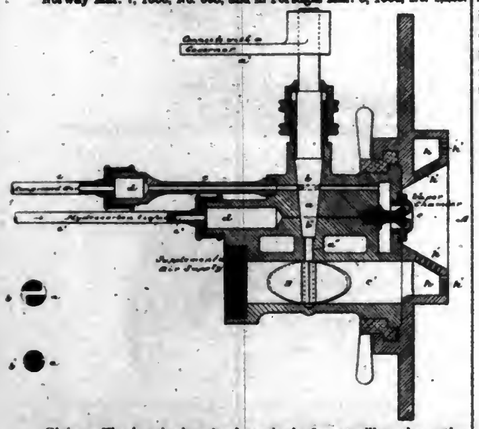
4. The combination of a cylindrical casing provided with fixed cams, each of which has a short and a long curved face, and with steam inlet and exhaust ports, a rotary disk provided with arc-shaped channels, which pass the inlet-port during the rotation of the disk, and with a radial slot or slots in communication with said arc-shaped channels, and piston-slides within said radial slot provided with heads having steam-channels, substantially as described.

5. The combination of a cylindrical casing provided with interior peripheral fixed cams and with steam inlet and exhaust ports, a rotary disk provided with arc-shaped channels which pass the inlet-port during the rotation of the disk, and with a diametrical slot in communication near its opposite ends with said arc-shaped channel, and overlapping piston-slides within said diametrical slot provided with heads having steam-channels, substantially as described.

6. The combination of a cylindrical casing provided with interior peripheral fixed cams, the heads of said casing being provided with steam inlet ports at diametrically-opposite points, and with an arc-

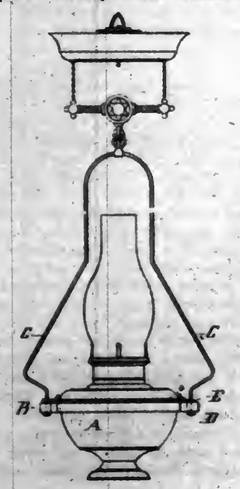
shaped channel connecting said ports, a rotary disk within said casing provided with arc-shaped channels which pass the inlet-ports during the rotation of the disk, and with a radial slot or slots in communication with said arc-shaped channels of the disk, and piston-slides within said radial slots provided with heads having steam-channels, substantially as described.

397,517. METHOD OF WORKING HYDROCARBURETED-AIR ENGINES. WILLIAM D. PRIESTMAN and SAMUEL PRIESTMAN, Hull, County of York, England. Original application filed July 20, 1887, Serial No. 244,808. Divided and this application filed Mar. 9, 1888. Serial No. 266,682. (No model.) Patented in England Dec. 21, 1886, No. 16,779; in Germany June 8, 1887, No. 43,273; in France June 26, 1887, No. 184,434; in Belgium June 28, 1887, No. 77,995; in Sweden July 6, 1887, No. 1,396; in Italy July 7, 1887, No. 421; in Cape Colony July 12, 1887; in Victoria July 19, 1887, No. 5,188; in Queensland July 22, 1887, No. 298; in New Zealand July 27, 1887, No. 2,449; in South Australia July 29, 1887, No. 849; in New South Wales Aug. 2, 1887, No. 37; in Canada Aug. 4, 1887, No. 44,936; in India Aug. 15, 1887, No. 140; in Tasmania Sept. 23, 1887, No. 498; in Brazil Sept. 29, 1887, No. 504; in Spain Nov. 15, 1887, No. 7,137; in Austria-Hungary Dec. 3, 1887, No. 34,061 and No. 56,741; in Argentine Republic Jan. 4, 1888, No. 634; in Norway Mar. 7, 1888, No. 695, and in Portugal Mar. 8, 1888, No. 1,223.

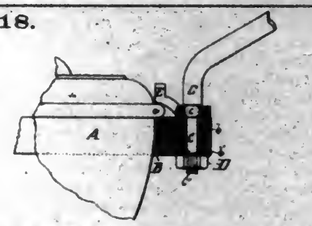


Claim.—The herein-described method of controlling the action of a motor-engine operated by the combustion of inflammable charges composed of air permeated with liquid hydrocarbon and mixed with an additional quantity of air, substantially as described, said method consisting in automatically and simultaneously regulating the aforesaid three separate streams anterior to the vaporizing of the liquid hydrocarbon, whereby the resulting tri-part working charge is, when necessary, attenuated without being diluted with a disproportionate quantity of air.

397,518. SUSPENSION DEVICE FOR LAMPS, &c. FRANK REIND and GEORGE L. COOPER, Meriden, Conn., assignors to Edward Miller & Company, same place. Filed July 24, 1888. Serial No. 280,922. (No model.)



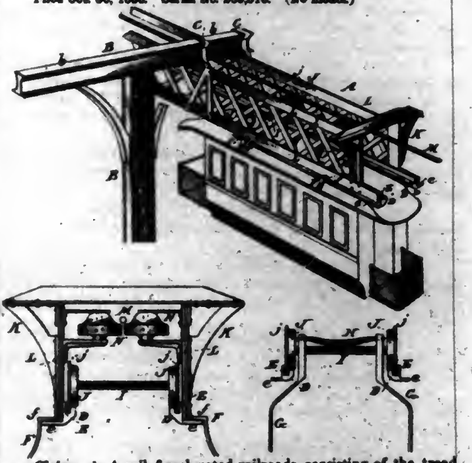
397,518.



Claim.—1. In a suspension device, the combination of a supporting-ring, a harp or frame attached to said ring, and a button pivotally attached to said harp or frame and adapted to engage with the upper surface of a lamp or other article supported in said ring, so as to prevent the disengagement of said article from said ring when in its normal position, and to be turned out of said normal position to permit such disengagement, substantially as described.

2. In a suspension device, the combination of a supporting-ring, a harp or frame, the ends of which pass through openings in lugs of said ring, and a button capable of rotary motion on said harp or frame in a plane parallel with said ring, and adapted to engage with a bead or projection on a lamp or other article suspended in said ring so as to prevent the disengagement of said article from said ring when in its normal position, and to be turned out of said normal position to permit such disengagement, substantially as described.

397,519. ELEVATED RAILROAD. ROBERT F. ROBSON, Kansas City, Kans., assignor of one-half to Howard A. Williams, same place. Filed Oct. 30, 1888. Serial No. 289,518. (No model.)



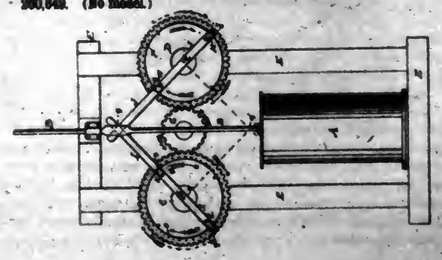
Claim.—1. A rail for elevated railroads, consisting of the tread D, guard-rail E, and flange *e*, to adapt it to be used as described.

2. The combination, with an elevated track having the flanges *e* exteeding on the outside of the rails, of the safety-guards F, having the end flanges, *f*, as and for the purpose set forth.

3. The combination, with an elevated railroad-track, of the braces K and lattice-girders, to prevent the track-rails from spreading apart, as set forth.

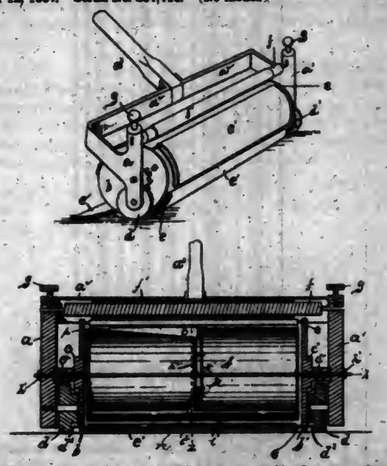
4. The combination, with an elevated railway-track, of the car provided with straps F G, the former overlying an outer flange of the track and the latter supported on a superposed axle-spring, as shown and described.

397,520. MECHANISM FOR CONVERTING MOTION. FRANCIS ROURK, London, Ontario, Canada. Filed Jan. 13, 1888. Serial No. 260,649. (No model.)



Claim.—The combination, with a piston, a shaft, and a pinion thereon, of spur-wheels engaging said pinion on opposite sides, arms connected to the piston-rod and pivoted to the spur-wheel centers, and devices carried by said arms to engage and partially rotate each spur-wheel alternately, substantially as described.

397,521. ROTARY MOP. JOHN ROURKE, Norwich, Conn. Filed Dec. 12, 1887. Serial No. 257,718. (No model.)



Claim.—1. In combination with the supporting-frames *a a'*, traction-wheels journaled thereto, a cylinder rotatably journaled in said frames and connected with said traction-wheels by gears, as set forth a series of mop-cloths carried by said cylinder, a wringer-roll journaled in said frames in the path of said mop-cloths, and a water-receptacle within said cylinder, said receptacle being fixedly supported by a shaft extending outward through frames *a a'* and secured by nuts at each end, all substantially as and for the purpose specified.

2. In combination with frames *a a'*, traction-wheels journaled thereto, a cylinder rotatably journaled in said frames and connected with said traction-wheels by gears, as set forth, a series of mop-cloths carried by said cylinder, a wringer-roll journaled in said frames in the path of said mop-cloths, a fixed water-receptacle supported within said rotatable cylinder by a shaft extending outward through frames *a a'*, said fixed receptacle being divided by lateral and longitudinal partitions into three compartments, the lowest of which is perforated to discharge the water, as set forth, said discharge-compartment being connected with one of the adjacent compartments by a valve formed of a pivoted plate having a slot, as at *h'*, that may be brought into coincidence with openings leading from one of the upper or storage compartments to said lower or discharge compartment, all being substantially as and for the purpose specified.

397,522. OIL-DISTRIBUTING ROCKET. WILLIAM RUFF, Fort Lee, N. J., and AUGUST GEBE, Brooklyn, N. Y. Filed May 1, 1888. Serial No. 272,496. (No model.)



Claim.—1. The combination of the rocket A with the separate oil-chamber B, carried by said rocket and having one or more discharge-openings, said chamber being constructed to discharge oil continuously during the flight of the rocket, substantially as herein shown and described.

2. The rocket A, combined with a perforated oil-chamber, and with a valve or cover placed over the discharge-opening of said oil-chamber, and with a hood connected with said valve or cover for actuating said valve by the pressure of the air during the flight of the rocket, substantially as specified.

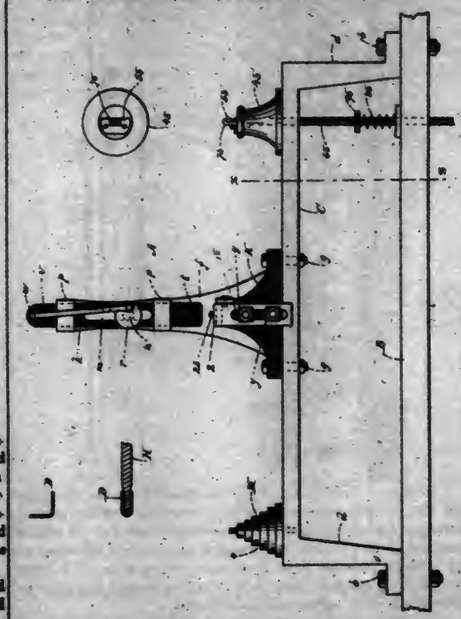
3. The combination, with the rocket A, of the oil-chamber B, having openings *b g*, valves or covers *d h* for said openings, rod *c*, carrying said valves, and hood D on said rod, which hood is actuated by the pressure of the air to open said valves, substantially as described.

397,523. COMPOUND FOR PREVENTING BOILER INCRUSTATION. ALBERTUS J. SMITHLEY, Beloit, Wis., assignor to William A. Knapp, same place. Filed June 30, 1888. Serial No. 278,701. (No specimens.)

Claim.—1. A compound for clarifying water, composed of flaxseed or flaxseed compounds and glue, substantially as set forth.

2. A compound for preventing and removing incrustation in steam-boilers, composed of flaxseed or flaxseed compounds, glue, and barley-sprouts, in substantially the proportions stated.

397,524. BINDING-MACHINE. LEW K. STRAUB, Haverhill, Mass., assignor to himself and John D. Weldon, same place. Filed Sept. 20, 1883. Serial No. 286,726. (No model.)



Claim.—1. In a device of the character described, the combination of a body, a horizontally-arranged shaft journaled in said body and bearing a driving-pulley at one end and a circular disk on the opposite end, a hammering-plate fitted to slide vertically on said body and provided with a slot for said shaft, a crank-rod pivoted to said disk and the upper end of said plate, and a vertically-adjustable bed-plate secured to said body below said hammering-plate, substantially as set forth.

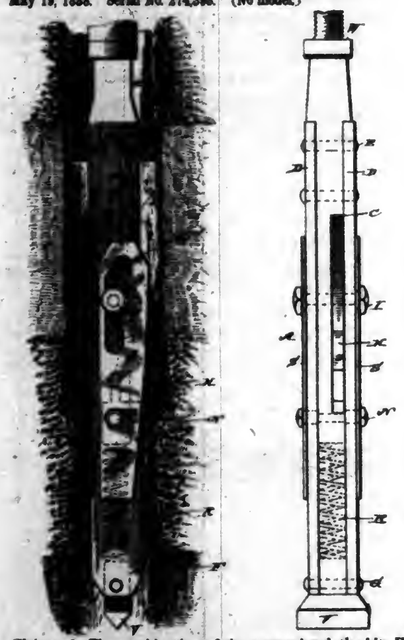
2. In a device of the character described, the combination of a body comprising two longitudinally-arranged arms, a horizontally-arranged shaft journaled in the upper arm of said body and bearing a disk on its forward end, a hammering-plate fitted to slide vertically on the forward end of said upper arm and provided with a slot for said shaft, a crank-rod pivoted to said disk and plate, a vertically-adjustable bed-plate secured to the forward end of the lower arm of said body in alignment with said hammering-plate, and a guide-roll journaled on said lower arm, substantially as specified.

3. In a device of the character described, the combination of the table B, provided with the stand C, the bed-piece 45, the rod 65, fitted to slide vertically in said stand and provided with the spring 85, the bed-die 55, adapted to receive the edges of the binding-strip D, the V-shaped cutting-die 75 secured to said rod and fitted to slide vertically in said bed-die, and treadle mechanism for operating said rod, substantially as set forth.

4. In a device of the character described, the combination of the body A, having the arms H K, the shaft *h*, journaled in the arm H and bearing the pulley *i* and disk *r*, the hammer-plate *k*, fitted to slide vertically on said arm and provided with the slot *m*, the crank-rod *v*, pivoted to said disk and plate, and the vertically-adjustable bed-plate *z*, secured to the arm K in alignment with the plate *k*, substantially as and for the purpose set forth.

5. In a device of the character described, the combination of the body A, having the arms K H, the stand C, the shaft *h*, journaled in the arm H and bearing the pulley *i* and disk *r*, the plate *k*, fitted to slide vertically in rings *p* on the arm H and provided with the slot *m* and bore *t*, the crank-rod *v*, pivoted to said disk and plate, the vertically-adjustable bed-plate *z*, secured to the arm K in alignment with said hammer-plate, and the guide-roll 26, journaled in said arm K, all being arranged to operate substantially as specified.

397,525. REAMER. WILLIAM W. SWAN, Andover, Dak. Filed May 19, 1888. Serial No. 274,398. (No model.)



Claim.—1. The combination of the reamer-head, the bits H, pivoted therein and adapted to have their lower ends extended laterally therefrom, the spring-actuated follower-block guided in the reamer-head and adapted to lock the bits when the same are extended, and the vertically-movable plates S, pivotally connected to the follower-block and having their upper ends adapted to engage the lower end of the well-tubing, substantially as described.

2. The combination of the reamer-head having the vertical recess B in its lower side, the vertical slots C at the upper end of said recess and having the vertical slots K in its sides, the bits H, arranged in the slots C, the bolt I, extending through the sides of the reamer and through the bits H to pivot the latter in the reamer, the spring-actuated follower-block M, adapted to engage the lower ends of the bits and lock the same in their extended position, said block having bolt N working in the slots K, and the plates S, pivoted on the ends of the bolt N, bearing against opposite sides of the reamer, and having the slots T engaging the ends of bolt I, the upper ends of said slots being inclined in opposite directions, and said plates S being further provided with the inclined upper corners, U', on their outer edges, substantially as described.

397,526. GALVANIC BATTERY. COLIN M. THOMPSON, Brooklyn, N. Y. Filed Oct. 7, 1887. Serial No. 251,753. (No model.)

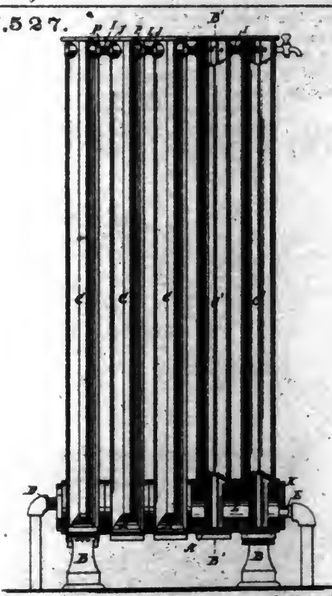
Claim.—A galvanic battery the electro-positive electrode of which is immersed in a solution of a suitable chloride, preferably chloride of magnesium, for an exciting-fluid, and the electro-negative electrode of which is immersed in a solution of chromic acid with sulphuric acid, preferably a solution containing twenty per cent. of crystallized chromic acid in fifty per cent. of water, with thirty per cent. of sulphuric acid to diminish the internal resistance and act gradually to decompose the chloride and release chlorine to unite with the zinc for a depolarizing agent, substantially as described.

397,527. STEAM OR HOT-WATER RADIATOR. SAMUEL D. TOMPKINS and THOMAS H. WILLIAMS, Jersey City, N. J. Filed Jan. 16, 1888. Serial No. 260,911. (No model.) Patented in Canada June 14, 1887, No. 26,988.

Claim.—1. A compound radiator composed of interchangeable sections united at their bases by screw-nipples, and having at their tops coincident screw-threaded openings, in combination with corresponding continuous screw-thread nipples, exhibiting a lug which forms a shoulder nearer one end than the other thereof, substantially as described.

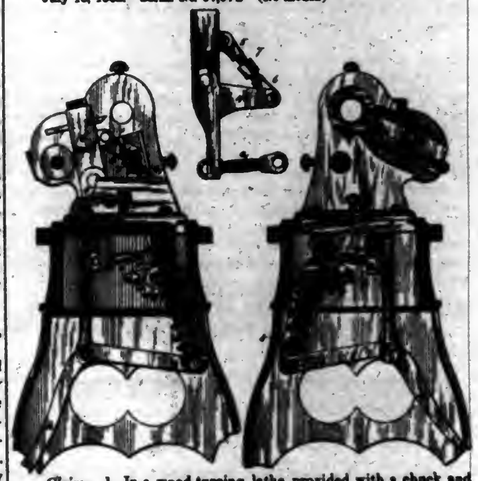
2. The combination, with a radiator composed of interchangeable sections, of a removable plug at the inlet end having an eccentric hole above its center and a removable plug at the outlet end having a hole below the center, substantially as described.

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3. A compound sectional radiator composed of sections having openings of equal sizes at their bases, in combination with nipples extending into the openings of the adjacent sections, the outlet and inlet sections having plugs with eccentric openings, which plugs are of the same size as the nipples, substantially as described.

397,528. LATHE. AUGUSTUS D. WAYBOTH, Fitchburg, Mass. Filed July 18, 1882. Serial No. 67,074. (No model.)



Claim.—1. In a wood-turning lathe provided with a chuck and a series of cutting-tools secured to a sliding carriage, the combination, with a pivoted tool-holder supported upon a ledge, of an adjusting-screw whereby the tool may be given more or less lead, substantially as and for the purpose set forth.

2. In a wood-turning lathe provided with a series of cutting-tools operating in combination with a sliding carriage, the combination, with one or more guideways for supporting said carriage, of one or more adjusting-screws adapted to force apart the said ways or guides, substantially as and for the purpose set forth.

3. In a wood-turning lathe, the combination, with a sliding carriage provided with a pivoted supporting-ledge carrying a tool-holder, of an adjusting-screw connecting with said holder and operating through a slot with which the carriage is provided, whereby the rake of the cutting-tool is passed, substantially as and for the purpose set forth.

4. The combination, in a wood-turning lathe, of a pivoted tool-holder, constructed substantially as described, with a clamping device

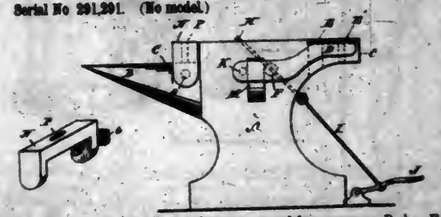
provided with an overhanging flange or ear adapted to hold the cutting-tool by contact with its side, and an adjusting-screw for changing the position of said tool-holder for regulating the slant of the cutting-tool, substantially as set forth.

5. In a wood-turning lathe provided with a chuck and sliding carriage and a series of cutters, the combination, with a jointed tool-holder capable of adjustment by means of a right-and-left threaded screw, of a connecting rack and pinion, and operating-levers, such as described, whereby the cutting-tool may be adjusted while operating substantially as and for the purpose set forth.

397,529. MATERIAL FOR THE TREATMENT OF WALLS. GEORGE H. WOOSTER, New York, N. Y. Filed May 10, 1888. Serial No. 273,507. (No specimens.)

Claim.—The herein-described composition of matter, comprising a prepared mixture of sand heated or dried, plaster-of-paris, and a carbonate or hydrate of lime, substantially as described.

397,530. ATTACHMENT FOR BLACKSMITHS' ANVILS. HUMPHREY B. YOUNG, Brockville, Ontario, Canada. Filed Nov. 19, 1888. Serial No. 291,291. (No model.)



Claim.—1. An anvil attachment, comprising an arm, D, leg F, finger K, wedge H, and spring M, in combination with an anvil having a horizontal transverse perforation, G, through the body and a hole, L, in the side, as set forth.

2. The combination, with a blacksmith's anvil having beveled depressions E E' and perforation G through the side, of the arm D, having a leg, F, provided with a longitudinal slot near the end, a wedge-key, H, in said slot and in frictional contact with the side of the anvil, and a spring, M, as set forth.

3. The saddle N, having a flat surface at top flush with the face of the anvil, and provided with a slot, P, and clamping-screw o, in combination with an anvil having a beak or horn, B, provided with a square portion, C, as set forth.

397,531. BLOTTER-BATH. HENRY F. ARNOLD, Manchester, Iowa. Filed Feb. 3, 1888. Serial No. 263,230. (No model.)



Claim.—1. The combination, with a blotter-bath, of a lining or inside covering of an absorbent material above and out of contact with the pads within the bath.

2. The combination, with a blotter-bath, of a piece of absorbent material secured in the lid with one edge passed down one side to the bottom of the pan.

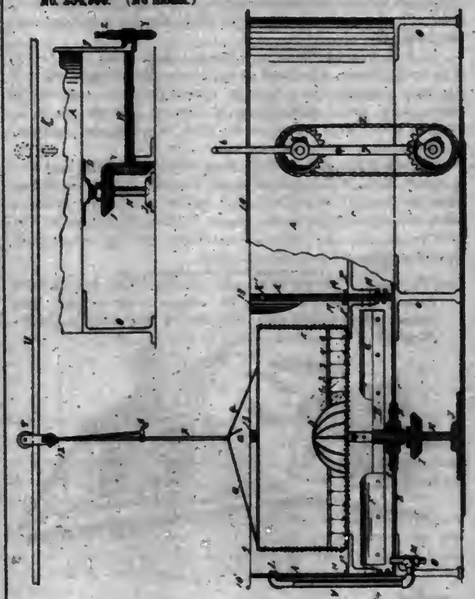
3. The combination, with a blotter-bath, of a frame detachably secured within the cover, and a piece of cloth upon the frame, one edge of which is passed down to the bottom of the pan.

397,532. PUMP-SPOUT. LEO A. BRIGEL, Cincinnati, Ohio. Filed Oct. 15, 1888. Serial No. 288,092. (No model.)



Claim.—A well-curb having a hole therein and a notch adjacent thereto, a pump-spout with a top outside lug, E, smaller than the notch G of the hole F in the curb, and a bottom inside lug, B, larger than the notch G of the said hole F in the curb, both lugs B and E acting, in combination with the receptacle B' and receiver J, to hold the spout firmly in its proper position in the hole F of the curb.

397,533. DISH-WASHER. WILLIAM BUTTS, Chicago, Ill., assignor of one-half to James F. Somes, same place. Filed Apr. 16, 1887. Serial No. 234,999. (No model.)



Claim.—1. In dish-washing machines, the tanks A B A B, provided with the rotating agitators E G F, deflectors 13, and brackets P, in combination with the open wire-work dish-basket K, which is provided with the elevated center support, N, and surrounding partition-wires 1 2 3 4 5, as and for the purpose specified.

2. In a dish-washing machine, the tank A B, provided with a rotating agitator, E G F, deflectors 13, and brackets P, in combination with an open net-work dish-basket, which may be placed in said tank and suitable for the reception of dishes, all substantially as and for the purpose specified.

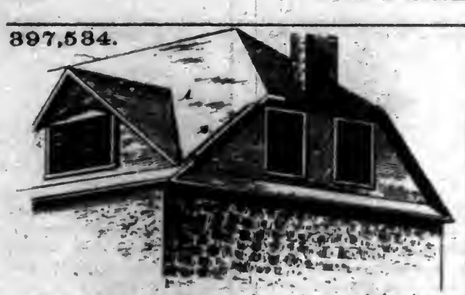
3. In a dish-washing machine, the combination of a tank having a rotating agitator therein, deflectors arranged to break or change the direction of the current created by the movement of said agitator in the liquid contained in said tub and deflect said liquid or current toward the center of the tub, with an open net-work dish basket or receptacle, in which dishes or other like articles may be placed and alternately exposed to said currents, or removed therefrom and from said tub, as and for the purpose specified.

397,534. GABLE-END FINISH FOR ROOFING. JOHN E. CARROLL, Philadelphia, Pa., assignor to the Cortright Metal Roofing Company, same place. Filed Dec. 22, 1888. Serial No. 294,380. (No model.)

Claim.—1. As a gable-end finish for roofing, a sheet-metal plate bent so as to have a flange, E, adapted to extend over the edge of the roofing-plates, a gutter, D, arranged to extend below the ends of said roofing-plates, and a nailing-flange, C, by which it is secured to the edge of the gable, all substantially as shown and described.



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2. As a gable-end finish for roofing, a sheet-metal plate bent so as to have a flange, E, adapted to extend over the edge of the roofing-plates and having a turned-in edge, a gutter, D, arranged to extend below the ends of said roofing-plates, and a nailing-flange, C, by which it is secured to the edge of the gable, all substantially as shown and described.

3. As a gable-end finish for roofing, a sheet-metal plate bent so as to have a flange, E, adapted to extend over the edge of the roofing-plates, a gutter, D, arranged to extend below the ends of said roofing-plates, and a nailing-flange, C, with rib C' formed on it, by which it is secured to the edge of the gable, all substantially as shown and described.

4. As a gable-end finish for roofing, a sheet-metal plate bent so as to have a flange, E, adapted to extend over the edge of the roofing-plates and having a turned-in edge, a gutter, D, arranged to extend below the ends of said roofing-plates, and a nailing-flange, C, with rib C' formed on it, by which it is secured to the edge of the gable, all substantially as shown and described.

397,535. HIP-COVERING AND CORNER-FINISH FOR ROOFING. JOHN E. CARROLL, Philadelphia, Pa., assignor to the Cortright Metal Roofing Company, same place. Filed Dec. 22, 1888. Serial No. 294,381. (No model.)



Claim.—1. As a hip-covering and corner-finish for roofing, a sheet-metal plate bent at C to form the covering sides D D, and again bent on one or both sides at C', so that the edge D' will lie substantially against and on the inside of side D, the said edge or edges D' being prolonged at one end to form a nailing flange or flanges, E, substantially as and for the purpose specified.

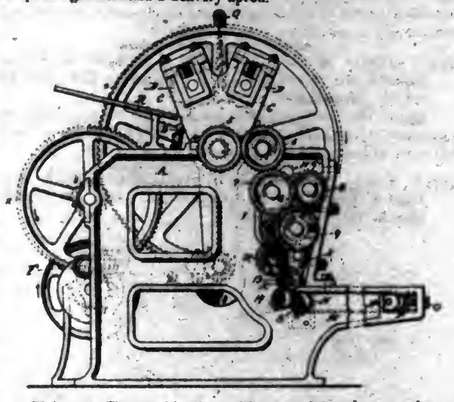
2. As a hip-covering and corner-finish for roofing, a sheet-metal plate bent at C to form the covering sides D D, and again bent on one or both sides at C', so that the edge D' will lie substantially against and on the inside of side D, the said edge or edges D' being prolonged at one end to form a nailing flange or flanges, E, and the corner or corners of the upper end being cut away at F, substantially as and for the purpose specified.

3. As a hip-covering and corner-finish for roofing, a sheet-metal plate bent at C to form the covering sides D D, and again bent on one or both sides at C', so that the edge D' will lie substantially against and on the inside of side D, the said edge or edges D' being prolonged at one end to form a nailing flange or flanges, E, the corner or corners of the upper end being cut away at F, and the lower corners of the flanges E cut away at F', substantially as and for the purpose specified.

4. As a hip-covering and corner-finish for roofing, a sheet-metal plate bent at C to form the covering sides D D, and again bent on both sides at C', so that the edge D' will lie substantially against and on the inside of sides D, the said edges D' being prolonged at one end to form nailing-flanges E, substantially as and for the purpose specified.

397,536. MACHINE FOR DECORTICATING FIBROUS PLANTS. ROBERT H. COLLYER, New Orleans, La. Filed Feb. 13, 1888. Serial No. 263,823. (No model.) Patented in England Apr. 6, 1887. No. 5,097.

Brief.—A rotating corrugated drum has a pair of corrugated rollers oscillating upon its upper side and in contact therewith. This mechanism is followed by two pairs of plain rollers, the rollers of each pair having differential speeds, these rollers being followed by a pair of squeezing-rollers and a delivery-apron.



Claim.—1 The combination, with a revolving drum having a series of flat tangential faces across its periphery, of a roller having corresponding faces, mechanism, substantially as described, for giving reciprocating motion to said roller, and a water-supply pipe, substantially as described.

2. The combination, with a rotary beetling device, as the rollers B D, of rollers running at different speeds arranged to act on the fibers as they leave the beetling device, and means for giving said rollers a differential speed, substantially as described.

3. The combination, with a rotary beetling device, as the rollers B D, of two sets of differential speed-rollers, one set having the faster roller arranged to act on one side of the stream of fibers and the other set having its faster roller arranged to act on the opposite side of the stream, and means for giving said rollers a differential speed, substantially as described.

4. The combination, with a rotary beetling device, as the rollers B D, of a pair of rollers running at different speeds, and means for giving said rollers at differential speed, and a grip-roller arranged to press on the slower roller to hold the material for the action of the faster roller, substantially as described.

5. The combination, with the roller B and reciprocating rollers D, of the differential speed-rollers G G' and J J', the grip-rollers H I, rubber wringing-rollers K K, and means for giving all of said rollers the motion described, all constructed and arranged substantially as shown and described.

397,537. ELECTRICAL STOP-MOTION MECHANISM FOR KNITTING-MACHINES. EDWARD G. COMER, Valatie, assignor to Tompkins Brothers, Troy, N. Y. Filed Jan. 30, 1885. Serial No. 154,421. (No model.)

Brief.—The invention has for its object to provide improved electrically-actuated devices for stopping the knitting-machine upon the breaking of a thread.

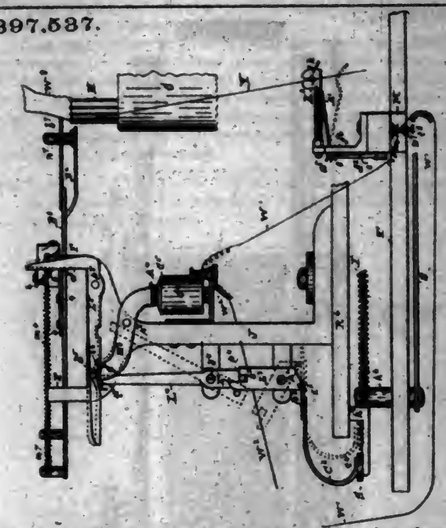
Claim.—1. The combination of the arm A', the drop-lever A^2, the wire-holders w^6 and w^7, and the circuit-closing plate D, arranged substantially as described, and for the purpose specified.

2. The combination of the bracket M, formed with the inclosure E, the drop-lever A^2, mounted on the bracket and provided with a tappet on its pivotal rod within the said inclosure, the hinged arm A', constructed and arranged to engage with the lever A^2, the wire-holders w^6 w^7, and the plate D, all substantially as described.

3. The combination of the belt-shipping lever S, provided with a catch, C^2, and spring I, the pivoted latch L^2, formed to engage with the catch C^2 at its lower end, and formed with a slot, s^2, in the upper end, the latch L^4, having a pin, p^4, to engage the slot in the latch L^2, the latch L^5, formed to engage with and hold the latch L^4 in vertical position, the pivoted armature A^4, having a lever-arm, N^2, the magnet C^4 C^3, wires in connection with the said magnet, and a circuit-closing mechanism interposed in said wires and arranged to normally hold the circuit broken and to close the circuit when a break occurs in the yarn, substantially as and for the purpose specified.

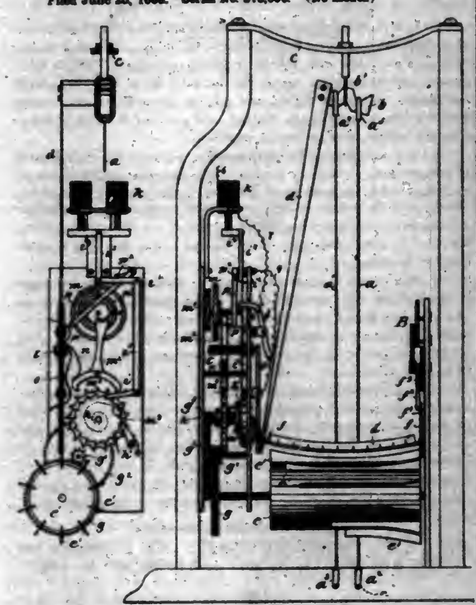
4. The combination, with the spring-actuated belt-shipping lever, catch C^2, and a latch mechanism, L^2, L^4, and L^5, to hold said lever in

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position with the belt in place to turn the machine, of an electro-magnet provided with an armature having a lever-arm to engage the latch of the belt-shipping lever in connection with said magnet, and a circuit-closing mechanism interposed in the wires of the circuit and arranged to close said circuit when a break occurs in the yarn, all substantially as described, and for the purpose stated.

397,538. ELECTRIC METER. HENRY H. CUTLER, Newton, Mass. Filed June 25, 1888. Serial No. 278,096. (No model.)



Claim.—1. An electric-current indicator composed of two substantially similar and equal wires, each made fast at one end, and one forming a part of the circuit for the current to be measured, combined with a lever connected with the opposite ends of said wires and a tension device connected with the said lever, which is provided with a pointer that is moved by the contraction or expansion of one of said wires relative to the other, substantially as described.

2. A current-measurer comprising a pointer moved to different positions by currents of different quantity, combined with an indicating-train and an actuating-drum having a uniform time movement provided with projections of different length that co-operate with said pointer to give the same indefinite periods of time a number of movements proportional to the quantity of current indicated by said pointer, which actuates the said indicating-train by said movement, substantially as described.

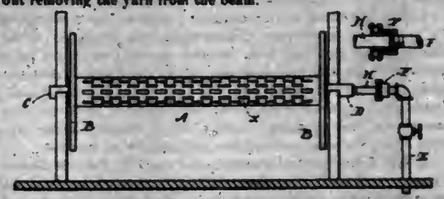
3. The combination of a pointer moved to different positions for currents of different quantity with a train of wheel-work and actuating-magnet therefor, and circuit-closer for said magnet operated by said pointer in going to and leaving its zero position, and a time-measuring regulator actuated by said magnet and spring connecting same with said train of wheel-work, and a circuit-closer for said actuating-magnet controlled by said time-regulator for opening and closing the circuit of said magnet at definite periods of time, substantially as described.

4. The combination of the pointer moved to different positions for currents of different quantity with a train of wheel-work and actuating-magnet therefor, and time-measuring regulator for said wheel-work, provided with a circuit-closer controlling said magnet, a starting-arm for said regulator operated by the armature of said magnet and a support for said starting-arm operated by said pointer, substantially as described.

5. The combination of the pointer moved to different positions for currents of different quantity with a train of wheel-work and actuating-magnet therefor, and time-measuring regulator for said wheel-work, provided with a circuit-closer controlling said magnet, a starting-arm for said regulator forming a portion of the circuit of said magnet when the regulator is at rest, and a circuit-closer in said circuit through the magnet and starting-arm operated by the said pointer, substantially as described.

397,539. YARN BEAM OR SPOOL. ADOLF DAHLBERG, Nashville, Tenn. Filed May 12, 1888. Serial No. 273,673. (No model.)

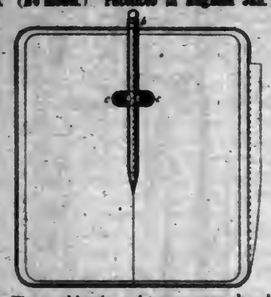
Brief.—The object of the invention is to provide an improved yarn-beam on which the yarn may be steamed, dyed, dried, &c., without removing the yarn from the beam.



Claim.—1. A hollow perforated yarn-beam having closed ends provided with central screw-threaded openings, a solid plug screwed into one end, and a hollow plug screwed into the other end, substantially as described.

2. A hollow perforated yarn-beam having closed ends provided with central screw-threaded openings, a solid plug screwed into one end, and a hollow plug screwed into the other end, said plugs being round at their outer ends to serve as journals, substantially as described.

397,540. NOTE-BOOK. WILLIAM J. DOWNES, Springfield, Burnt Ash Hill, Lee, County of Kent, England. Filed Sept. 19, 1888. Serial No. 285,704. (No model.) Patented in England Jan. 31, 1888, No. 1,456.



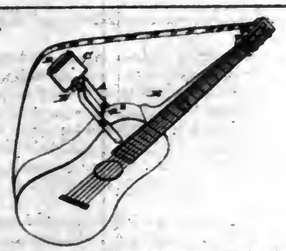
Claim.—1. The combination, with a memorandum-book provided with a slot in the center portion of its leaves, of a metallic spring-clip secured to the back of the book within the said slot and adapted to receive a marker, substantially as set forth.

2. The combination, with a memorandum-book provided with a slot in the center of its leaves, of a metallic spring-clip secured to the back of the book within the said slot, and a pencil adapted to engage with said clip and serve as a place-marker, substantially as set forth.

397,541. HARMONICA-HOLDER. AUGUST H. GARTNER, St. Louis, Mo. Filed May 10, 1888. Serial No. 273,380. (No model.)

Claim.—1. A harmonica-holder consisting of a combination of two U-shaped parts, A C, united by a clamp, B, substantially as and for the purpose herein described.

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2. The combination of the U-shaped parts A C, the clamp B, and the bolt *b* and nut *b'*, substantially as described.

3. In a harmonica-holder, the combination of the U-shaped part A with the U-shaped part C, said parts being united by a universal joint, for the purpose described.

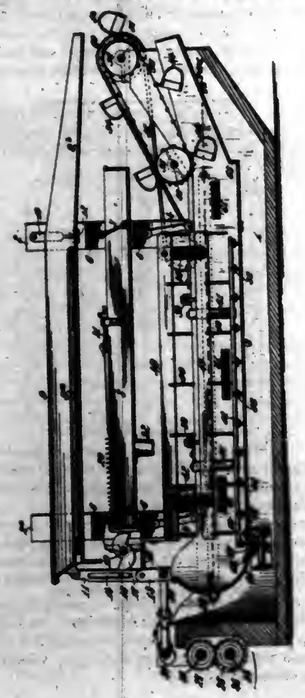
4. The combination of the U-shaped part A, the bolt a^2, nut a^3, the clamp B, bolt *b*, nut b^2, and the U-shaped part C, substantially as described.

397,542. ORE SEPARATOR AND AMALGAMATOR. EUGENE L. GIROUX, Albina, Oreg. Filed Nov. 11, 1887. Serial No. 254,914. (No model.)

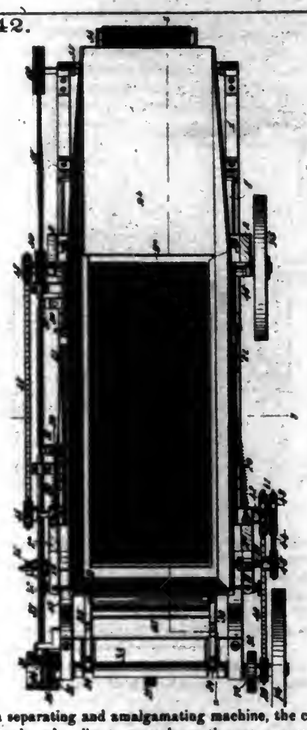
Claim.—1. In a separating and amalgamating machine, the combination of a water-tank, a longitudinally and laterally vibratory amalgamating-pan suspended in the water-tank and provided with screened openings to permit the passage of water and prevent the placer material in the pan from passing into the tank, and a vibratory hopper suspended above the amalgamating-pan, substantially as described.

2. In a separating and amalgamating machine, the combination of a water-tank, a vibratory amalgamating-pan suspended in the water-tank and provided with screened openings, stationary rakes supported by the tank and extending across the amalgamating-pan slightly above its bottom, a number of hoes suspended in the amalgamating-pan, a pair of crank-shafts, and a series of horizontal bars for supporting and actuating said hoes, and a vibratory hopper supported above the amalgamating-pan, substantially as described.

3. In a separating and amalgamating machine, the combination of a water-tank, a vibratory amalgamating-pan suspended in said tank and having lateral screened openings for the passage of water and lateral pipes for conveying water from the tail end of the pan and discharging it into the head of said pan, and a vibratory hopper supported above the amalgamating-pan, substantially as described.



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4. In a separating and amalgamating machine, the combination of a water-tank and a vibratory amalgamating-pan suspended in said tank and provided with lateral screened openings 61, incline 62, a sunken bottom having a transverse shoulder, 65, at the inner end of said incline, transverse slot 64, and exterior pipes, 63, communicating with the interior of the pan through said slot and through openings near the incline, substantially as described

5. In a separating and amalgamating machine, the combination of a water-tank, a vibratory amalgamating-pan suspended in said tank, stationary rakes supported independently of the pan and transversely therein near its bottom, several sets of hoes suspended in the amalgamating-pan, a vibratory hopper supported above the amalgamating pan, and an elevator located in the tail end of the machine, substantially as described.

6. In a separating and amalgamating machine, the combination of the tank having standards 2 and 2^a, the vibratory amalgamating-pan 3, the vibratory hopper 8, the vibratory screening-box 9, crank shaft 33, pitman 35, slotted levers 11, adjustable fulcrum-rod 15, shaft 19, cam 18, springs 20, tension-bolts 21, and gearing connecting shafts 33 and 19, substantially as described.

7. In a separating and amalgamating machine, the combination, with a freely-suspended amalgamating-pan, of the longitudinal shaft 37, having eccentrics 38, the hinged levers 39, connecting said shaft with one side of the pan, the transverse shaft 28, the bevel-gears 31 and 36, the eccentrically-placed elliptic gears 30 and 32, the transverse shaft 33, having eccentrics 34, and the hinged pitmen 35, connecting with the head of the amalgamating-pan, substantially as described.

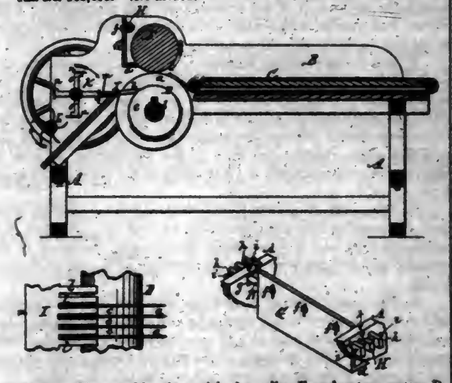
397,543. VENTILATED GARMENT. JOHN S. GOLDSMITH, New York, N. Y. Filed Aug. 29, 1887. Serial No. 248,233. (No model.)



Claim.—1. A body-garment having ventilating-holes at its armpits and provided with imperforate covers for the same fitted externally to the armpits approximately in loose surface contact with the body and sleeves attached thereto at front and rear, and having free lower edges at both extremities on the body and sleeve, respectively, substantially as hereinbefore specified.

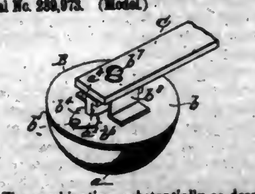
2. In combination with a body-garment having ventilating-holes at its armpits, the within-described water-proof cover for each armpit fitted thereto externally, attached to the body and sleeve at front and rear, and provided with a marginal spring-wire which is arched outwardly with reference to the underlying surfaces at those points of the cover which are its lower edges beneath the lowered arm, substantially as hereinbefore specified.

397,544. MACHINE FOR CUTTING TOBACCO. ALEXANDER GORDON and DANIEL DE GARMO, Rochester, N. Y. Filed May 11, 1885. Serial No. 165,055. (No model.)



Claim.—The combination, with the roller E and rotary cutter D, of the slotted guide-plate G, provided with a flange, *d*, the bar H, to which the guide-plate is adjustably attached by bolts, the hopper having elongated slots *g g*, the lugs *h h*, between which the ends of the bar rest, and the set-screws *i i* in the lugs and hopper for adjusting the bar longitudinally of the machine, as set forth.

397,545. TRUSS. HARRIS S. GREENO, St. Louis, Mo. Filed Nov. 5, 1883. Serial No. 289,973. (Model.)



Claim.—1. The combination, substantially as described, of the air-pad and the pad-holder, said air-pad having the rubber shank a^3, integral with the pad, and said pad-holder having the slotted plate *b*.

2. The combination, substantially as described, of the air-pad and the pad-holder, said air-pad having the shank a^3 and flange a^4, and said pad-holder consisting of the plate *b*, slotted at *b' b²*, the bridge b^3, and the pivoted notched catch b^4.

3. The combination, substantially as described, of the air-pad having the convex back and the shank having the flange, with the pad-holder composed of the plate *b*, slotted at *b' b²*, the bridge b^3, and the pivoted notched catch b^4.

4. The combination of the air-pad having the convex back and the shank, the pad-holder having the slotted plate and the bridge, and the clamp-screw, said shank being of rubber and integral with said pad, substantially as described.

5. The combination of the air-pad having the convex back and the shank having a head, the pad-holder composed of the slotted plate, the bridge, and the pivoted notched catch, and the clamp-screw, substantially as described.

397,546. AUTOMATIC DANGER-SIGNAL. JOHN HANN, New York, N. Y. Filed May 1, 1888. Serial No. 272,462. (No model.)



Claim.—1. The cylinders B, having pistons C and heads I, in combination with the bridge A and a signal, as and for the purpose specified.

2. The cylinder B, provided with means to operate the signal, in combination with the bridge A and said signal, as and for the purpose specified.

3. The cylinder B, having piston C, to operate the lever D, in combination with the bridge A and a signal, as and for the purpose specified.

4. The cylinder B, having piston C, operating the lever D, and cable E, in combination with the bridge A and a signal, as and for the purpose specified.

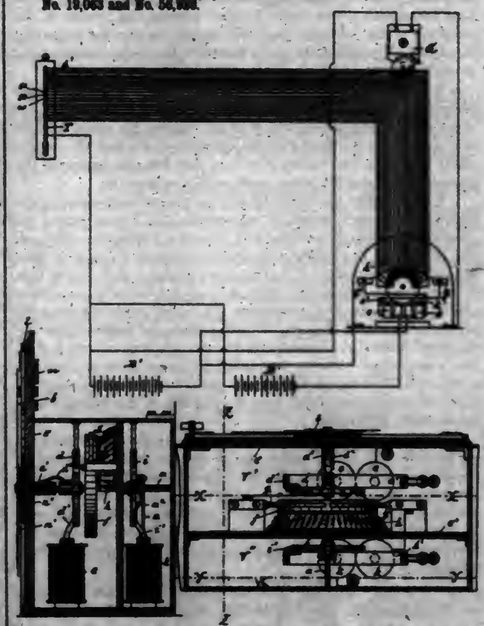
5. The receptacle B, provided with means to operate the whistle K when in combination with a bridge, as and for the purpose specified.

6. The receptacle B, provided with safety-valve J and having piston C, in combination with the bridge A and the signal, as and for the purpose specified.

397,547. INCRUSTATION PREVENTIVE. ROBERT M. HENNEY, Springfield, Ill. Filed May 24, 1883. Serial No. 274,943. (No specimens.)

Claim.—A steam-boiler-purger compound composed of kerosene and walnut-bark juice or extract, as described and set forth.

397,548. TELETHERMOMETER. CARL G. HOFFMANN, Leipsic, Saxony, Germany. Filed Aug. 14, 1886. Serial No. 210,864. (No model.) Patented in Germany June 12, 1886, No. 39,390; in Belgium Sept. 28, 1886, No. 74,600; in France Sept. 30, 1886, No. 178,779; in England Oct. 1, 1886, No. 12,480, and in Austria-Hungary Dec. 2, 1887, No. 19,063 and No. 56,988.



Claim.—1. In combination, with a thermometer, T, connected through wires at various points with metal plates *f'*, attached to a wheel, *f*, fast to a shaft, *a*, the loose wheels *d i*, with means of connecting the same with the shaft *a*, pawls d^2 *i'*, armature-levers *c' k'*, springs c^2 k^2, and electro-magnets *c* and *k*, and indicator-hand *b*, attached to shaft *a*, arranged to operate in combination with batteries B B', in the manner and for the purpose described.

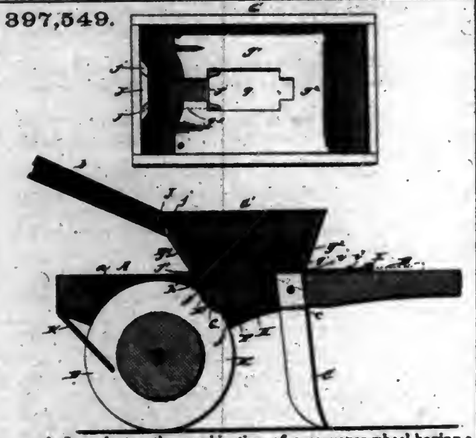
2. In combination with wheel *f*, provided with metal plates *f'* around its circumference, connected through wires with a thermometer, the spring-levers *g g'*, electro-magnets *c k*, and batteries B B', substantially as and for the purpose specified.

3. The combination of bar *l* and metal plates *m* on the face of the casing, the connecting pins or stops *r*, hand *b*, with spring *n*, in contact with said plates *m*, with an alarm, G, and battery B, substantially as specified.

397,549. PLANTER. DAVID W. HOSKALL, Little Rock, Ark. Filed July 26, 1888. Serial No. 281,017. (No model.)

Claim.—1. In a planter, the combination of a conveyer-wheel having a peripheral groove and a wheel having planting-recesses in its periphery, and with its edge inserted into the groove in the periphery of the conveyer-wheel and bearing therein, so that the said conveyer-wheel rotates the planting-wheel by friction, substantially as specified.

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2. In a planter, the combination of a conveyer-wheel having a peripheral groove V-shaped in cross-section, a hopper secured to the main frame, and a wheel with its edge entering the groove in the periphery of the conveyer-wheel and rotated thereby, and projecting through a longitudinal slot in the bottom of the hopper, substantially as specified.

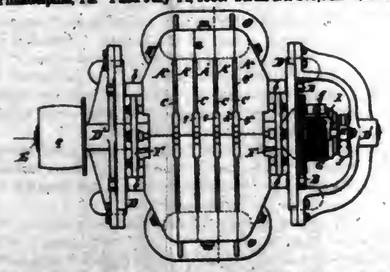
3. In a planter, the combination of the conveyer-wheel having the peripheral groove E, V-shaped in cross-section, the hopper G', provided with a longitudinal slot, g, in its bottom, the wheel with its edge entering in the groove of the conveyer-wheel, and the spring-plates H, having the bearing-loops h on their free ends to support the journals of the planting-wheel, substantially as specified.

4. In a planter, the combination of the conveyer-wheel having the peripheral groove V-shaped in cross-section, the hopper having the metal-plate bottom g', provided with the slot g, having the extensions g^2 g^2, the wheel F, provided with the conical recess f and screw-arms H', and the spring-plates H, having bearing-loops h at their free ends to support the journals of the planting-wheel, substantially as specified.

5. In a planter, the combination of a conveyer-wheel having the peripheral groove E, V-shaped in cross-section, the hopper G', having the metal bottom g', provided with the slot g, having extensions g^2 g^2, the feeding-wheel F, having the conical peripheral recesses f and the screw-arms H', the adjustable slides I and J, and the spring-plates H, provided with bearing-loops h for the journals of the feeding-wheel, substantially as specified.

6. The herein-described planter, comprising the main frame having the side rails, a, the furrow-opener with its standard secured to the front portion of said frame, the hopper provided with the slot g, having the extensions g^2 g^2, the conveyer-wheel having the peripheral groove F, the feeding-wheel provided with the recesses f and arms H', the adjusting-slides I and J, and the spring-plates H, having the bearing-loops h at their free ends for the journals of the feeding-wheel, substantially as specified.

397,550. DYNAMO-ELECTRIC MACHINE. RUDOLPH M. HUNTER, Philadelphia, Pa. Filed July 14, 1888. Serial No. 279,942. (No model.)



Claim.—1. In a motor or dynamo-electric machine, the combination of stationary field-magnets, a rotating armature, and internal field-magnets located and secured within the armature, so as to rotate therewith.

2. In a motor or dynamo-electric machine, the combination of stationary field-magnets, a rotating armature, internal field-magnets located and secured within the armature, so as to rotate therewith, and a commutator common to both the armature and internal field-magnets.

3. In a motor or dynamo-electric machine, the combination of stationary field-magnets, a rotating armature, internal field-magnets located and secured within the armature, so as to rotate therewith, and connections between the coils of the armature and internal field-coils, whereby they are coupled in parallel.

4. In a dynamo-electric machine or motor, the combination of a shaft, an armature secured to said shaft, concentric supplemental field-magnets also secured to said shaft and having a fixed mechanical relation with respect to the armature, and electrical connections between the coils of the armature and field-magnets.

5. The combination of a shaft, an armature secured to said shaft, concentric field-magnets also secured to said shaft and having a fixed mechanical relation with respect to the armature, electrical connections between the coils of the armature and field magnets, and a stationary field-magnet independent of the armature, having one or more of its coils in series with the armature.

6. In a dynamo-electric machine or motor, the combination of a ring-armature, a circular supplemental field-magnet core having the same number of magnetizing-coils as the armature, a commutator having as many sections as coils in the field-magnet or armature, and connecting-circuits between the commutator-sections, armature, and said field-coils, whereby the poles of the field-magnet shall be at right angles or substantially at right angles to the poles of the armature.

7. The combination of stationary field-magnets, a rotating armature, and rotating field-magnets concentric with said armature, connecting-circuits, and a commutator for changing the poles of the rotating field-magnets with a speed commensurate to that of its revolution.

8. The combination of a shaft, an armature-core, and internal field-magnets secured to and carried by said shaft, a stationary external field-magnet, and coils on said armature-core and internal field-magnets in which the resistance of the armature-coils is very low and the resistance of the internal field-coils is relatively very high.

9. The combination of a shaft, an armature-core, internal field-magnets secured to and carried by said shaft, a stationary external field-magnet, coils on said armature-core in which the resistance is very low, coils on the internal field-magnets in which the resistance is relatively high, and a commutator having its sections connected each to one of the high and one of the low resistance coils.

10. In a dynamo-electric machine or motor, the combination of a shaft, non-magnetic frames secured to said shaft, an armature-core and a supplemental internal field-core, both secured to and between said non-magnetic frames so as to be rigid with respect to each other, and coils upon each of said cores.

11. The combination of an armature and internal field-magnets built as one structure and rotating at the same speed, in combination with a supporting-shaft, two external field-magnets of the horseshoe type, having their poles arranged toward each other, non-magnetic standards at each end of the machine, having bearings for the shaft, and bolts for uniting the external field-magnets to the standards and in fixed relation to the armature and internal field-magnets.

12. The combination of an armature and internal field fixed thereto and having their coils arranged in parallel, and an external field having a coil also arranged as a shunt with respect to the armature-coils.

13. The combination of an armature and internal field fixed thereto and having their coils arranged in parallel, an external field having a coil also arranged as a shunt with respect to the armature-coils, and a second coil connected in series with the armature.

14. The combination of an armature and internal field fixed thereto and having their coils connected in parallel and the internal field-coil arranged as a short shunt with respect to the armature, an external field having a coil connected in series with the armature, and a second coil connected as a long shunt around the armature and series field-coil.

15. In a dynamo or motor, the field-magnets having two coils, with a third coil of magnetic metal wound upon the field and interposed between said field-coils.

16. In a dynamo or motor, the field-magnets having two coils, with a third coil of magnetic metal wound upon the field and interposed between said field-coils, and a circuit for passing part of the current which energizes the machine through said coil of magnetic metal.

17. In a dynamo or motor, the field-magnets having two coils, with a third coil of magnetic metal wound upon the field and interposed between said field-coils, a circuit for passing part of the current which energizes the machine through said coil of magnetic metal, and a switch to cut said coil out of circuit.

18. In a dynamo or motor, a field-magnet formed of a series of U-shaped sections separated to form air-spaces between them, in combination with an armature and its shaft, end standards having bearings for said armature-shaft, and bolts for clamping said sections together and to the end standards.

19. In a dynamo or motor, a field-magnet formed of a series of U-shaped sections separated by distance-pieces formed integral with them to form air-spaces between them, in combination with an armature and its shaft, end standards having bearings for said armature-shaft, and bolts for clamping said sections together and to the end standards.

20. A field-magnet consisting of the heavy cast sections A' A^3, having the distance-pieces a a', forming ventilating-spaces C, in combination with the bolts B, passing through the polar extensions to unite said sections together.

21. In a dynamo or motor, the combination of two oppositely-arranged horseshoe-shaped magnets brought close together in the central line of the poles of the machine, standards at each end, and long clamping-bolts to unite the magnets rigidly together and to the standards.

22. In a dynamo or motor, the combination of two oppositely-arranged horseshoe-shaped magnets formed of a series of heavy sections and having their polar extensions brought close together in the central lines of the poles of the machine, standards of non-magnetic metal at each end, and long clamping-bolts to unite the magnet-sections rigidly together and to the standards.

23. In a dynamo or motor, the combination of two oppositely-arranged horseshoe-shaped magnets brought close together in the central lines of the poles of the machine, standards at each end, long clamping-bolts to unite the magnets rigidly together and to the standards, an armature, and an armature-shaft journaled in said standards.

24. The combination of two oppositely-arranged horseshoe-shaped magnets having integral polar extensions made long and brought together in a line corresponding to the center of the two poles of the machine and a frame or frames for uniting said field-magnets together to form the armature-space.

25. The combinations of two horseshoe-shaped field-magnets having integral polar extensions and brought together to form continuous or practically continuous north and south poles for the armature, end frames or standards having bearings for the armature-shaft, long bolts which extend through the four polar extensions and unite the standards thereto into a rigid structure, an armature rotating within the space bounded by the polar extensions, and an armature-shaft journaled in the standards.

26. The combination of two horseshoe-shaped field-magnets formed of cast sections divided in the direction of their length and having their polar extensions made integral and brought together to form continuous or practically continuous north and south poles for the armature, end frames or standards having bearings for the armature-shaft, long bolts which extend through the sections of the four polar extensions and unite the standards thereto into a rigid structure, an armature rotating within the space bounded by the polar extensions, and an armature-shaft journaled in the standards.

27. The combination of two oppositely-arranged horseshoe-shaped field-magnets without yoke-joints and formed in sections of ductile magnetizable metal and having their polar extensions made integral and brought together in the central line of the poles of the completed machine, thereby forming a substantially continuous magnetic band around the armature, with two joints diametrically opposite and in line with the centers of the poles of the machine.

28. A field-magnet section formed of horseshoe shape and of magnetizable metal, with the separating projections a a' and the curved face A^3 to form the armature-space.

29. An integral field-magnet section formed of horseshoe shape and of malleable iron, with the separating projections a a' and the curved face A^3 to form the armature-space.

30. The combination of two horseshoe-shaped field-magnets formed in sections of malleable iron and uniting to form the armature-space, two end standards of non-magnetic material, bolts for holding the sections of the field-magnets and standards rigidly together, and an armature and its shaft journaled in the standards.

31. The field-magnets A A, made horseshoe shape and formed of sections A A^3, having air-spaces C c between them and having their polar ends brought together, as set out, end standards, D, of non-magnetic material, having bearings, bolts B, extending through the sections A' A^3, and standards to unite them all into a rigid structure, an armature, and its shaft journaled in the standard-bearings.

32. The combination of an armature and an internal field-magnet with a wrapping of magnetic metal between the armature and field windings.

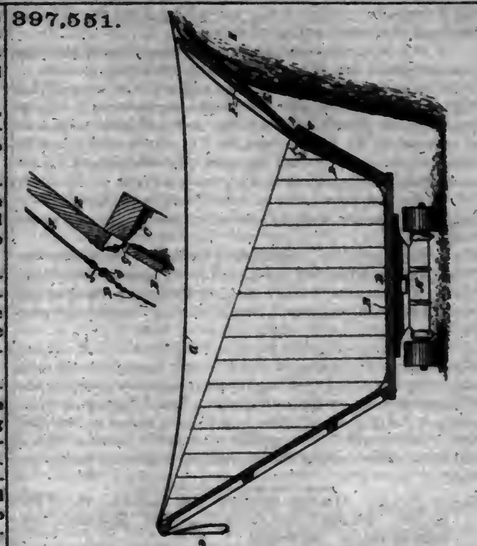
397,551. HAY OR GRAIN UNLOADER. WILLIAM G. HUNTER, Traver, Cal. Filed June 29, 1888. Serial No. 278,586. (No model.)

Claim.—1. In a grain or hay unloader, and in combination with the wagon-bed and the net therein, the poles or bars connected with the top of one side of the wagon-bed and adapted to rest against the stack, and the ropes connected with the top of the poles or bars and with one edge of the net, substantially as herein described.

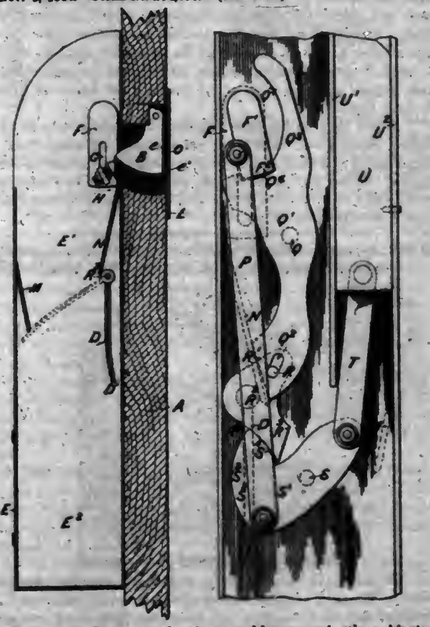
2. In a grain or hay unloader, and in combination with the wagon-bed and the net therein, the poles or bars hinged to or flexibly connected with the top of one side of the wagon-bed and adapted to rest at any angle against the stack, and the ropes connected with the tops of the poles or bars and with the edge of the net, substantially as herein described.

3. In a grain or hay unloader, and in combination with the wagon-bed having straps, and the net in said bed having snaps along its edge, the separate poles or bars connected with the straps and adapted to rest against the stack, and the ropes connected with the tops of the poles or bars, and having rings on the lower ends engaging the snaps on the edge of the net, substantially as herein described.

397,551.



397,552. LETTER-BOX. JEAN A. JACOB, London, England. Filed Nov. 5, 1887. Serial No. 254,656. (No model.)



Claim.—1. In receptacles for postal-letters and other objects, the combination of an upper chamber, E', a lower chamber, E^2, a flap, D, between said chambers, an orifice, O, opening into the upper chamber, a wing, b, substantially as set forth, beneath said orifice, a pivoted flap, B, adapted to close said orifice, and mechanism connecting said flaps B and D, whereby the initial stage of the opening of the

flap B causes the complete closing and locking of the flap D before the flap B has passed the edge of the wing *b*.

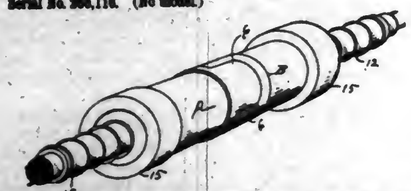
2. In a receptacle consisting of two superposed parts, E E', the combination of a flap, D, adapted to separate said parts, an orifice, O, in the upper part, E, plates *b c d* about said orifice, as set forth, flap B, adapted to close said orifice, said flap having plates *f g h*, adapted to engage with plates *b c d*, as set forth, and mechanism adapted to be operated by the lifting of said flap B to raise the flap D into its closed position and there lock the same before the plates *f g h* are disengaged from plates *b c d*, for the purpose set forth.

3. The combination, with an orifice closed by a hinged flap, of a flange, O', above said hinge, substantially as and for the purpose set forth.

4. The combination, with the flaps B and D, of mechanism comprising the lever F', adapted to be raised by the opening of the flap B, lever Q', having recess Q^4, with noses Q^7 Q^8 and horn Q^5, slot Q^6 in said lever Q', rod R^3, carrying flap D, lever R', fixed on said rod and having pin R, engaging in slot Q^6, substantially as set forth.

5. The combination, with the flaps B and D, of lever F', adapted to be raised by the opening of flap B, lever Q', having recess Q^4, with noses Q^7 Q^8 and horn Q^5, the edge Q^4 being shaped as described, slot Q^6 in said lever Q', rod R^3, carrying flap D, lever R', having pin R, engaging in slot Q^6 and nose R^2, the edge R^4 being shaped as described, lever S', having nose S^2 with edges S^3 S^4, shaped as described, rods P and T, and counter-weight U, substantially as and for the purpose set forth.

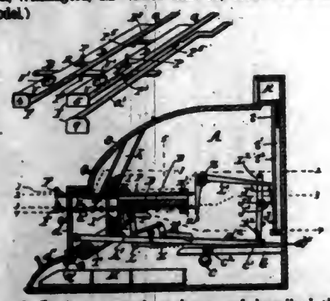
397,553. ELECTRIC COUPLING FOR RAILWAY-TRAIN SIGNALING. WILLIAM C. JOHNSTON, Jr., Lynn, Mass. Filed Mar. 5, 1888. Serial No. 266,116. (No model.)



Claim.—1. The combination of the two-part separable conductor A B, having the conducting-rings 7 7, the pivoted levers *a b* 4 4, pivotally supported in the parts of the coupling, an electric conductor attached to each pivoted lever, the levers *a b* being adapted to engage with levers 4 4 when the coupling is closed, thus establishing electric connection between the conductors attached to one part of the coupling and those attached to the other part, and means for automatically establishing connection between the conductors and metallic rings 7 when the parts of the coupling are separated, substantially as described.

2. In a coupling for uniting the detached sections of a direct and return conductor constituting a railway-train signaling-circuit, the combination of a shell or case, as A, and with the conducting-wires, a flanged tubular section of flexible material, as 12, for inclosing the wires, and a screw-cap, as 15, for securing said tubular section to the casing, substantially as described.

397,554. CASH INDICATOR AND REGISTER. CLARENCE H KAHLER, Wilmington, Ill. Filed Mar. 10, 1888. Serial No. 266,876. (No model.)



Claim.—1. In the cash-register shown and described, the combination of the key-slides *a a'*, register-slides D, having apertures V', the means shown for connecting said slides, the tally-check receptacles *h h'*, adapted to register with said apertures, and the means for returning said slides after being pushed in, substantially as and for the purpose set forth.

2. In the cash-register shown and described, the combination of the key-slides *a a'*, having laterally-extending arms and numbered keys, the register-slides D, having apertures V' and pins on both upper and lower sides for being engaged by said arms, the tally-check receptacles *h h'*, arranged to register with the apertures V' of said register-slides, bell-cranks L', tablet-rods t^3, having indicating-tablets *t* on their upper end and having the detent-pins J, swinging detent-bar J^3, and detent-strip J', arm L^2, having the gravity-dogs D^2, arms d^3, bar d^5, cord C', and weight C, door *d*, dogs D', links O, levers L, springs E, and yielding cross-bar B, substantially as and for the purpose set forth.

3. In the cash-register shown and described, the combination of the key-slides *a a'*, register-slides D, having the pins P', yielding bar B, levers L, coil-springs E, links O, detent-dogs D', arms d^3, cross-bar d^4, arms L^2, detent-bar J^3, detent-strip J', weight C, and cord C', substantially as and for the purpose set forth.

4. In the cash-register shown and described, in combination with the key-slides *a a'*, register-slides D, having the pins P', bell-cranks L', cords or chains J^5, and tablet-rods t^3, having the indicating-tablets *t*, and the means shown and described for holding supported said tablet-rods and tablets, substantially as and for the purpose set forth.

5. In the cash-register shown and described, having its key and register slides arranged in separate numerical sections, as specified, the combination, in any one of said sections, of a key-slide having its key provided with denominational characters or numbers, and having laterally-extending arm or arms, and two or more register-slides of said section having combination pin or pins for engaging said arms in such manner that the register-slides operated by said key-slide will register tally-checks having numbers or characters the aggregate of which correspond with that of the key by which they are operated, substantially as and for the purpose set forth.

397,555. CAN-FASTENER. CALVIN KEELER and HARVEY LEWIS, Hobart, N. Y. Filed May 31, 1888. Renewed Jan. 18, 1889. Serial No. 296,793. (No model.)



Claim.—1. The combination, with a slotted casting, A, provided with grooves *b*, of the hook B, having flanges *c*, fitted to the grooves *b*, and the cam-lever E, adapted to operate the hook, substantially as described.

2. The combination of the casting A, having the slot *a* and grooves *b*, the hook B, provided with flanges *c*, fitted to the grooves *b*, and furnished with a stud, F, having a head, *f*, and the cam-lever E, pivoted in the casting A and provided with a slot, *d*, and grooves *e*, substantially as described.

397,556. DENTAL ENGINE. JAMES H. KIDDER, Lawrence, Mass. Filed July 30, 1888. Serial No. 281,992. (No model.)

Claim.—1. In a dental engine, the combination, with a stationary upright or standard and a driving-pulley supported thereby, of the swinging arm a^x, pivotally secured to the said standard near the said pulley, to move in a horizontal path with the standard as a center, a tool-shaft, a tool connected thereto, a rod to support said tool-shaft, a pulley on the tool-shaft connected to the driving-pulley and secured to the swinging arm, to move with the said arm to permit the said tool-shaft and tool to be brought into different operative positions while the standard or upright remains unchanged, whereby the tool-shaft and tool may be brought nearer the patient without moving the standard or upright, substantially as described.

2. In a dental engine, the combination, with an upright and a driving shaft a^x, of a foot-treadle connected to said shaft, a rod, f', connected to the foot-treadle and hinged or pivoted to the said upright, and a post, f^3, connected to the rod f', whereby the foot-treadle may be moved into elevated position out of the way by pressure upon the post f^3, substantially as described.

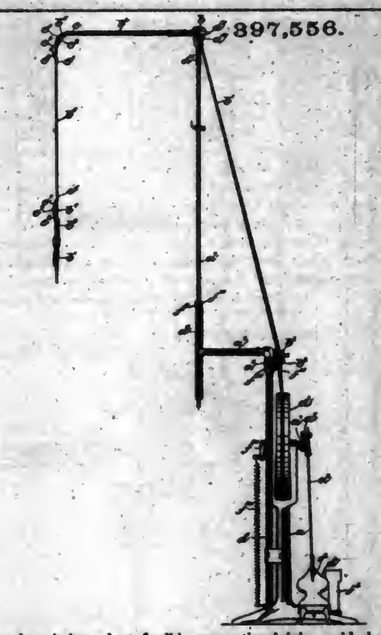
3. In a dental engine, the combination, with a driving-shaft, a^x, having a crank, of a foot-treadle provided with a rod, *f*, a rod, a^9, secured to said crank, and through an opening in which the rod *f* is extended, and a rod, f'', secured to the under side of the treadle, as and for the purpose specified.

4. In a dental engine, the combination, with the shaft a^{12} and rod b^4, of a spring, b^5, and a guard for said spring, consisting of sleeves *c c'*, a shield, c^3, and a hinged connection, substantially as described, hinged to said sleeves and connected to said shield, substantially as described.

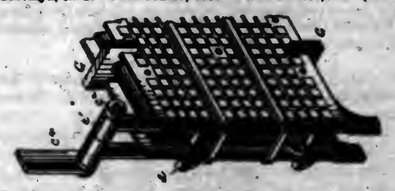
5. In a dental engine, the combination, with a tool-shaft and a rod joined to said shaft by a flexible connection, of a tool-holder and a spring, b^5, between said rod and tool-holder, a sleeve, c^3, loose on said rod, and an independent flexible connection joining said sleeve and tool-holder, and consisting of rods c^2 c^3 and spring c^5, whereby buckling of the said spring is prevented, substantially as described.

6. In a dental engine, the combination, with a tool-shaft, a^{12}, a sleeve, b^4, to support said shaft, a lug, *c'*, on said sleeve, a rod, b^5, a spring, b^5, and a guard for said spring, consisting of sleeves *c c'*, a shield, c^3, and links connected to said shield and jointed to said sleeves, and a lug, *c*, on the sleeve *c*, to co-operate with the lug *c'*, substantially as and for the purpose specified.

7. In a dental engine, the combination, with a driving-shaft, a^x, having a crank, of a foot-treadle provided with a rod, *f*, a rod, a^9, secured to said crank, and through an opening in which the rod *f* is extended, and a rod, f'', secured to the under side of the treadle, and a foot-post, f^3, as and for the purpose set forth.



397,557. SECONDARY-BATTERY PLATE. EDWARD B. KNOWLES, Brooklyn, N. Y. Filed Oct. 20, 1883. Serial No. 289,613. (No model.)



Claim.—1. A plate for secondary batteries, consisting of two halves, one half provided with pins or lugs and the other half with holes to receive the same for securing the parts together.

2. A plate for secondary batteries, formed in two parts, one part having feet formed thereon and the other part having the connecting-leg formed upon it.

3. A plate for secondary batteries, having feet enveloped in insulating material.

4. The combination, with a series of secondary-battery plates, of a series of grooved nuts attached to the connecting-lugs of the plates, said nuts having a groove in one face and a projecting ridge on the other.

5. The combination, with a series of secondary-battery plates, of a series of grooved nuts attached to the connecting-lugs of the plates, said nuts having a groove in one face and a projecting ridge on the other, in combination with a bolt and nut for clamping all of said nuts together.

6. A separating-comb for the plates of a secondary battery, composed of a soft flexible non-conducting material.

7. In a secondary battery, the combination of a series of positive plates provided with side extensions, a series of negative plates provided with side extensions, and a cross-bar of flexible insulating material interposed between the extensions of each series of plates.

8. In a secondary battery, the cross-bar *d*, for supporting adjacent plates, having a series of flanges thereon.

9. In a secondary battery, the cross-bar *d*, of flexible non-conducting material, for supporting adjacent plates.

10. In a secondary battery, the cross-bar *d*, for supporting adjacent plates, made of flexible non-conducting material having a series of flanges thereon.

11. In a secondary battery, two sets of plates, one having upturned side brackets and the other having reversed brackets, in combination with a detached cross-bar adapted to rest upon the upturned brackets and to support the reversed brackets and their plates.

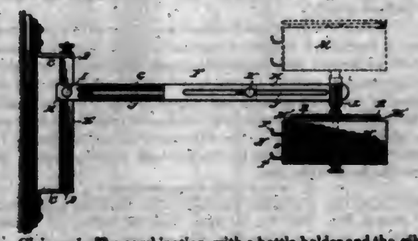
12. A plate for secondary batteries, provided with feet or legs and a number of projections for connecting up and supporting said plate in the cell, said plate being formed or cast in two parts, one of said parts having formed upon it the said connecting-up and supporting projections and the other part having formed upon it the feet or legs, as set forth.

13. As a connecting device for the plates of a secondary battery, a nut secured to each plate having a slot or groove therein, which is adapted to register with the slots in the nuts upon the plates to which it is to be attached in such a manner as to form one continuous straight slot.

14. A series of secondary-battery plates, each provided with a connecting-leg, each of said legs provided with a notch, groove, or slot adapted to register with all of the slots or grooves in the other plates.

15. A series of secondary-battery plates, each provided with a connecting-leg, each of said legs provided with a notch, groove, or slot adapted to register with all of the slots or grooves in the other plates, in combination with a bolt adapted to pass into said slots when they are in alignment, and a nut upon said bolt for binding the lugs together.

397,558. ADJUSTABLE BRACKET FOR INK-BOTTLES. WILLIAM LUBLEY, Chicago, Ill. Filed Aug. 9, 1888. Serial No. 282,318. (No model.)



Claim.—1. The combination, with a bottle-holder and the gibbet-arm supporting the same, of a vertical spindle or gibbet-post and a sliding friction-connection between said post and arm, whereby the latter may be adjusted vertically upon the former and locked by friction only at any point of its adjustment, substantially as described.

2. The combination, with a bottle-holder, a gibbet-arm, and a pivot-connection between said arm and holder, of a vertical spindle or gibbet-post, and a sliding connection between said arm and post of such a character that said arm will bite or lock by friction at any point upon said post, substantially as described.

3. The combination, with a bottle-holder, an extensible gibbet-arm, and a pivot-connection between said arm and holder, of a gibbet-post and a sliding friction-lock between said arm and post, substantially as described.

4. The combination, with a bottle-holder and a gibbet-arm supporting the same, of a vertical gibbet-post, a sliding friction-lock between said arm and post, and pivot-bearings for said post, whereby the latter may revolve upon a longitudinal axis, substantially as described.

5. The combination, with a bottle-holder, an extensible gibbet-arm, and a pivot-connection between said arm and holder, of a gibbet-post, a sliding friction-lock between said arm and post, and pivot-bearings for said post, whereby it may revolve upon a vertical axis, substantially as described.

6. The combination, with the gibbet-arm composed of sections having a sliding connection with each other, a vertical spindle attached to one end of said arm, and a bottle-holder loosely journaled on said spindle, of a vertical gibbet-post and a sliding friction-lock between the opposite ends of said arm and the post, substantially as described.

7. The combination, with the gibbet-arm, composed of sections having a pin-and-slot connection therebetween, a vertical spindle attached to one end of said arm, and a bottle-holder loosely journaled on said spindle, of a vertical gibbet-post, pivot-bearings therefor, and an eye on the opposite end of said arm fitting and sliding upon said post, substantially as described.

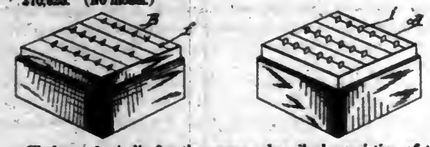
8. The combination, with a rotatable bottle-holder, a vertical pivot therefor, and a support for said pivot, said holder having two or more bottles arranged circumferentially about its pivot, of a cover for said bottle pivoted upon the pivot of the bottle-holder and free to revolve independently of the bottle-holder, substantially as set forth.

9. The combination, with a rotatable bottle-holder, a pivot therefor, and a support for said pivot, said holder having four bottles arranged circumferentially about its pivot, of a cover for said bottles, consisting of a plate having three radial arms constituting covers for three of said bottles, journaled on the pivot of the bottle-holder, and free to revolve independently of said holder, substantially as described.

10. The combination, with a rotatable bottle-holder, of a pen-rack secured thereto and composed of a single sheet of metal, formed by striking out therefrom lips P, bent outwardly at the detached edge, substantially as set forth.

397,559. DIE FOR FORMING TEETH IN VEGETABLE-GRATERS.

WILLIAM MARX, Beaver Falls, Pa. Filed Apr. 14, 1888. Serial No. 270,623. (No model.)



Claim.—1. A die for the purpose described, consisting of two parts, one of which is formed of a number of grooved and ribbed sections, the ribs projecting from the face thereof and presenting points *f*, the other or female part also formed of a number of removable grooved and ribbed sections, but having the ends of the ribs removed to form cavities into which the points *f* are adapted to fit.

2. A sectional die for the purpose described, composed of two parts, having grooved and ribbed faces of corresponding contour, the ribs of the sections of the male die projecting so as to form sharp vertical faces and sloping diamond or oval backs and means for holding the sections together.

3. A die for the purpose described, consisting of two parts, one of which is formed of a number of removable oval or angularly-grooved and ribbed sections, the ribs projecting from the face thereof and presenting points or teeth *f*, the other or female part also formed of a number of removable grooved and ribbed sections of contours similar to the male die, but having the ends of the ribs removed to form cavities into which the points *f* are adapted to fit, and the points *f* or teeth and the corresponding cavities arranged to lie in diagonal lines across the faces of the dies.

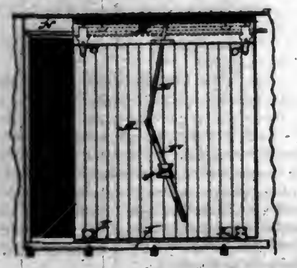
397,560. SHIELDED SLIDING DOOR. EDWARD Y. MOORE, Milwaukee, Wis. Filed Oct. 16, 1888. Serial No. 288,294. (No model.)

Claim.—1. The combination, with a sliding door provided with hangers and a track on which said hangers run, of a shield attached to said door and turned inwardly at its upper edge over the top of said door and over said track and hangers, substantially as and for the purposes set forth.

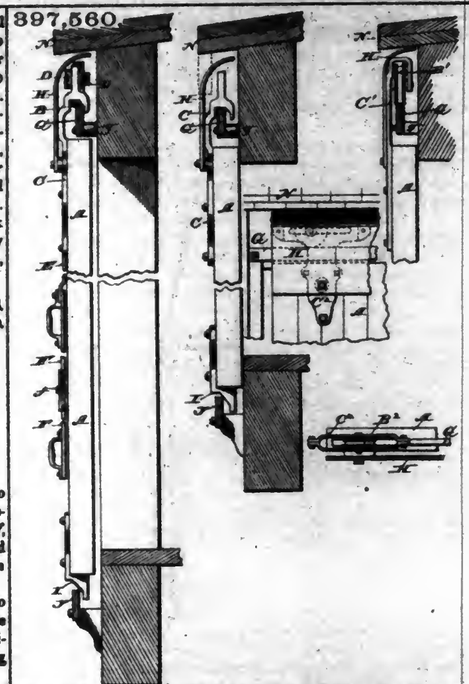
2. The combination, with a sliding car-door provided with hanger-sheaves and a track on which said sheaves run, attached to the side of the car and held away from the same at intervals by blocks or washers, of a shield attached to and overhanging at its upper edge the top of said door and its hangers, substantially as and for the purposes set forth.

3. The combination, with the sliding door, the track on which it is suspended, and hangers arranged to raise and lower said door, of a shield attached to and extending across said door and bent inwardly at its upper edge, so as to overhang the top of the door, its hangers, and the track-rail adjacent thereto, substantially as and for the purposes set forth.

4. The combination, with a sliding car-door, a track attached to the side of the car, hangers provided with sheaves which run on said track, means for raising and lowering said door slightly, and inclines



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for carrying said door when lowered snugly against the side of the car, of a shield attached to and partaking of the various movements of said door and bent at its upper edges over the top of the door and its hangers, substantially as and for the purposes set forth.

5. The combination, with a sliding door suspended by sheaves running on a fixed track by the door-opening, of a shield attached to and extending the width of the door, and bent along its upper edge over the top of said door and its hangers, substantially as and for the purposes set forth.

6. The combination, with a sliding door capable of a slight vertical movement and provided with hangers by which it is suspended from a fixed track adjacent to the door-opening, and by means of which it is raised and lowered slightly, of a shield attached thereto, so as to partake of its several movements, and bent along its upper edge inwardly over the top of said door and its hangers, substantially as and for the purposes set forth.

397,561. CLEANING-DOOR FOR BOILERS. DOCTOR F. MORGAN, Akron, Ohio. Filed Aug. 20, 1888. Serial No. 283,177. (No model.)



Claim.—1. In a boiler of the class specified, the combination, with water-sections provided with depressions in contiguous faces, of a door-casing arranged to fit said sections and surround said depressions, having horizontal partitions which register with the sections, and a door to close said casing, all constructed substantially as shown, and for the purpose specified.

2. The combination, with the sections C and casing F, having partitions *f*, of the adjustable plates *f'* F', for fitting the casing and partitions to the sections, substantially as shown and described.

397,562. BUCKLE. JOHN HAIR, Syracuse, N. Y. Filed Oct. 6, 1888. Serial No. 287,447. (No model.)

Claim.—1. A buckle consisting of the plate A, provided with slotway in its front end, a plate, B, provided with a flange, S, on its front end, and a finger-lever provided with a cross-bar, 11, fitting between the plates and behind the flange S, substantially as described.

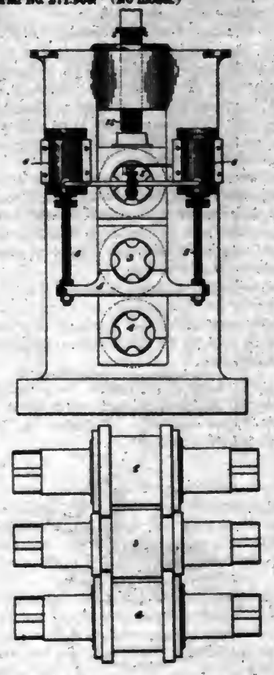
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2. A buckle consisting of the plate A, constructed with a plane inner face, a plate, B, secured beneath the plate A and provided with a transverse recess in its outer end, and a finger-lever provided with a cross-bar, 11, fitting within the recess, substantially as described.

3. In a buckle, a lower plate bent at its outer end to form a transverse rectangular recess, a plate, A, secured upon the plate B, and having a plane inner face and closing the recess, and a lever slotted across its inner end to form a cross-bar, and the cross-bar mounted in said recess, in combination, substantially as described.

397,563. ROLL. DAVID R. OLIVER, Allegheny, Pa. Filed Apr. 26, 1888. Serial No. 271,969. (No model.)



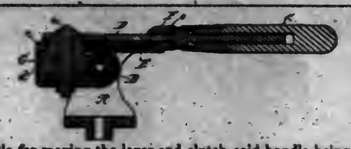
Claim.—1. In a three-high mill, the combination of the housings, a roll set in stationary bearings in the housings, two rolls set in vertically-movable bearings therein, a lifter acting on one of the vertically-movable rolls to raise the same in the housings, and adjusting-screws connected with the bearings of the other of said movable rolls, said rolls being tongued and grooved to form working and reducing passes, having the tongues oppositely placed in the reverse passes, whereby the plate or slab to be rolled is continuously reduced, and the flash or fin formed at one pass is effaced at the reverse pass without reversing such plate or slab, substantially as and for the purposes described.

2. In a three-high mill, the combination of the housings, a roll set in stationary bearings in the housings, two rolls set in vertically-movable bearings therein, hydraulic cylinders, the piston-rods of which act on the bearings of one of the vertically-movable rolls to raise the same in the housings, and adjusting-screws connected with the bearings of the other of said movable rolls, said rolls being tongued and grooved to form working and reducing passes, having the tongues oppositely placed in the reverse passes, whereby the plate or slab to be rolled is continuously reduced, and the flash or fin formed at one pass is effaced at the reverse pass without reversing such plate or slab, substantially as and for the purposes described.

397,564. TAIL-STOCK FOR LATHES. REUBEN R. CORNER, Columbus, Ohio. Filed May 31, 1888. Serial No. 275,636. (No model.)

Claim.—1. In a tail-block for lathes, a lever, a segment of the block having a circular face, a clutch-piece bearing on said face, and

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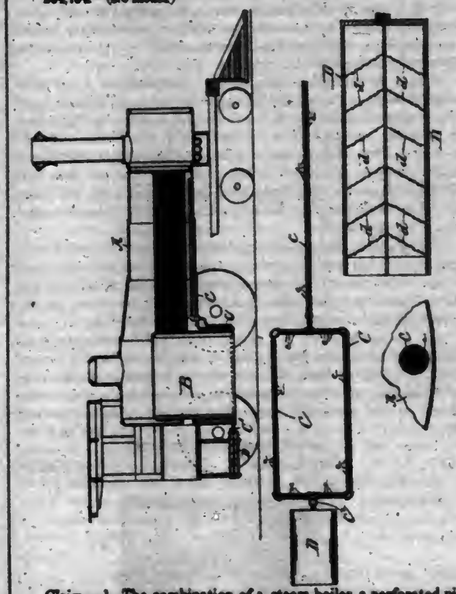
a handle for moving the lever and clutch, said handle being mounted upon the lever, combined substantially as shown and described.

2. In combination with the spindle, a pinion having an attached lever, a collar and a clutch-piece bearing on a segment of the lathe-block, and the operating-lever, substantially as shown, and for the purposes set forth.

3. In an attachment for lathes, a spindle, a pinion, a lever connected with the pinion, the threaded handle mounted on the lever, and the collar and clutch-piece for clamping the segment, combined and arranged substantially as shown, and for the purposes set forth.

4. In combination with the tail-block carrying the pinion and spindle, the collar, and its apron, substantially as shown, and for the purposes set forth.

397,565. BLOW-OFF APPARATUS FOR STEAM-BOILERS. ANDREW W. QUACKENBUSH, Moberly, Mo. Filed Sept. 6, 1888. Serial No. 284,734. (No model.)



Claim.—1. The combination of a steam-boiler, a perforated pipe extending inside said boiler, a blow-off cock, and a retarding drum or trap secured at the discharging end of said pipe.

2. The combination, with a blow-off pipe extending inside of a boiler, of a retarding drum or trap consisting of a shell and a number of perforated partitions inside said shell, substantially as set forth.

3. The combination, with a blow-off pipe, of a retarding drum or trap secured to its discharging end and provided with inclined or cone-shaped partitions for breaking the force of the discharge, substantially as shown and described.

4. The combination of a steam-boiler, a blow-off pipe extending along the bottom and inside of said boiler, provided with perforations which enter it at an angle with a vertical line, a blow-off cock inserted in the discharging end of said pipe outside of said boiler, and a drum or trap secured to said discharging end, and containing angular or cone-shaped partitions, all substantially as set forth.

397,566. TEMPORARY CASE FOR MAINSPRINGS. JACOB W. REMLINGER, New York, N. Y. Filed Aug. 20, 1888. Serial No. 284,156. (No model.)

Claim.—1. The combination, in a receptacle for springs, of a case having oppositely-arranged slots in its wall and means arranged to slide in said slots for ejecting the spring, substantially as described.

2. The combination, in a receptacle for springs, of a case having slots in its wall, and a spring-ejector projecting beyond the exterior of the wall of the case and arranged to slide in said slots to eject the spring, substantially as described.

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3. The combination, in a receptacle for springs, of a case having slots formed in its wall and a depression in its bottom, and means for ejecting the spring, substantially as described.

4. The combination, in a receptacle for springs, of a case having slots formed in its wall and a depression in its bottom, and a spring-ejector constructed and arranged to enter said slots and depression and project beyond the exterior of the wall of the case, substantially as described.

5. The combination, in a receptacle for springs, of a case having oppositely-arranged slots formed in its wall, a spring-ejector adapted to enter said slots, and ears or clips formed on the case for securing the same to a card, substantially as described.

6. The combination, in a receptacle for springs, of a case having oppositely-arranged slots formed in its wall and a depression in its bottom, a spring-ejector, and ears or clips formed on the case for securing the same to a card, substantially as described.

7. As a new article of manufacture, a receptacle for watch-mainsprings, consisting of a case having oppositely-arranged slots in its wall, a spring-ejector, and identifying symbols or letters upon its bottom, substantially as described.

8. As a new article of manufacture, a receptacle for watch-mainsprings, consisting of a case having oppositely-arranged slots in its wall and a depression in its bottom, a spring-ejector, and identifying symbols or letters upon its bottom, substantially as described.

9. As a new article of manufacture, a receptacle for watch-mainsprings, consisting of a case having oppositely-arranged slots in its wall, a spring-ejector, identifying symbols or letters upon its bottom, and ears or clips formed on the case for securing the same to a card, substantially as described.

10. As a new article of manufacture, a receptacle for watch-mainsprings, consisting of a case having oppositely-arranged slots in its wall and a depression in its bottom, a spring-ejector, identifying symbols or letters upon its bottom, and ears or clips formed on the case for securing the same to a card, substantially as described.

11. The combination, in a receptacle for watch-mainsprings, of a case adapted to contain a spring and an ejecting-bar located beneath the spring within the case, the ends whereof project beyond the sides of the said case, whereby the spring may be forced from the case by pressure on the projecting ends of the said bar, substantially as set forth.

397,567. TILTING DRAWER. EDWARD C. ROBERTS, Broadford, Va. Filed Apr. 21, 1886. Renewed May 4, 1888. Serial No. 272,868. (No model.)



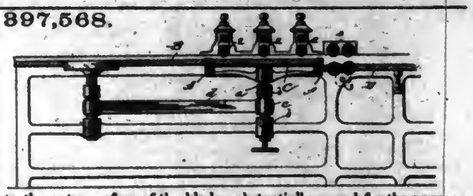
Claim.—The combination, with the casing A, provided with the side recesses and the vertical front having openings therein, the ledges *b b'*, and the pivot-bolts, of the tilting drawers B C D, having end boards bounded by circular edges and secured to the pivoted arms, substantially as specified.

397,568. REVOLVING SURFACE-PLANER. JUSTUS H. RUDOLPH, Elmira, N. Y., assignor to the Sterling Slate Company, Walnutport, Pa. Filed Mar. 23, 1888. Serial No. 268,122. (No model.)

Claim.—1. A planer consisting of a circular band having a toothed edge, each of said teeth being provided with two cutting-edges, said edges being formed in different planes, substantially as described.

2. A planer for leveling or making smooth rough and uneven surfaces, consisting of a circular band having a serrated edge forming teeth, said teeth having a cutting-edge in one plane, as horizontal, and an angular cutting-edge extending from the horizontal edge outwardly

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to the outer surface of the blade, substantially as and for the purpose set forth.

3. The described planer, consisting of a curved band having teeth on its edge, said teeth being provided with cutting-edges formed in different planes, in combination with a suitable table to support the work, substantially as described.

4. In combination, a planer having teeth on its edge provided with cutting-edges formed in different planes, a shaft for supporting the planer, means for rotating it, and a table having one part thereof adjustable, substantially as described.

5. In combination, a planer consisting of a circular band having teeth on its edge provided with cutting-edges formed in different planes, a shaft for supporting the planer in horizontal position, a table arranged above the saw having a depression or groove within the diameter of the planer and raised ledges on either side thereof, curved slots for the teeth of the blade to work in, an adjustable table to direct the work to the angular cutting-teeth, and suitable pressure and power rollers, substantially as described.

6. In combination, a planer having teeth on its edge provided with cutting-edges formed in different planes, a shaft for supporting the same, a table for the work, suitable power and pressure rollers, and a disk covered with sand-paper or the like, arranged in line with the same and adapted to finish the work as it passes from the said planer, substantially as described.

7. In combination, a planer consisting of a blade having teeth, said teeth having one cutting-edge extending from one side of the blade partially across the edge of the same, and a second cutting-edge extending at an angle to the first and the other side of the blade, substantially as described.

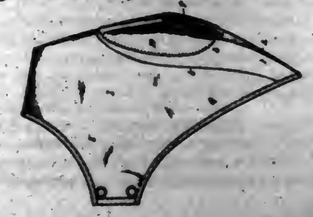
397,569. LAMP ATTACHMENT. JOHN H. SCHENKEL and RICHARD B. MAGRUDER, Baltimore, Md., assignors, by direct and mesne assignments, to Francis Cope Adler, Philadelphia, Pa. Filed Nov. 25, 1887. Serial No. 256,100. (No model.)



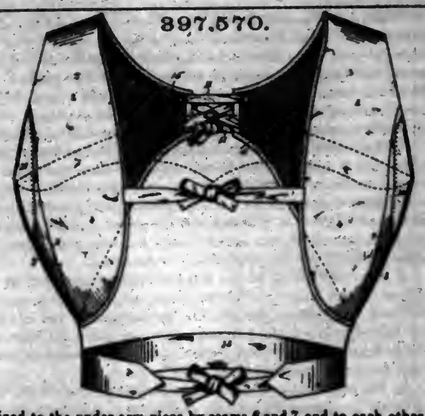
Claim.—The combination, in a lamp, of a collar, D, having the depending inner and outer short tubes, *d* and *D'*, with a collar, C, having its aperture substantially in line with the inner wall of the tube *d*, and a vertical tube engaging with and hinged to the tube *D'*, whereby an annular space is formed around the inner junction of the collars C and D, substantially as described.

397,570. UNDER-ARM PAD. CLARA M. SOUTHWORTH, Bridgeport, Conn. Filed Nov. 10, 1883. Serial No. 290,440. (No model.)

Claim.—An under-arm pad formed of two plies, each consisting of front and back pieces, 4 and 5, concave on their inner side edges, a central or under-arm piece, 3, convex on its outer side edges, and suitable filling between the said plies, said front and back pieces being

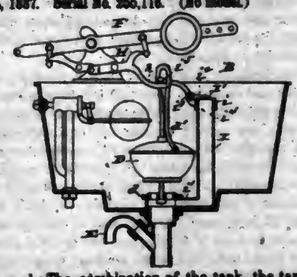


397,570.



joined to the under-arm piece by seams 6 and 7 and to each other by a seam, 8, and the said back piece having a rear or inward extension, 15, for a connection with a similar extension of a companion pad, whereby is secured a pad which is adapted to give the desired fullness at the edge of the shoulder-blade and between the bust and shoulder, and to be connected with a companion pad, substantially as set forth.

397,571. WATER-CLOSET. PETER WHITE, St. Louis, Mo. Filed Nov. 14, 1887. Serial No. 255,116. (No model.)



Claim.—1. The combination of the tank, the tank discharge pipe, the tank-valve and lever operating the same, the pipe I, cap and cap-arm, and the connection uniting said cap-arm and tank-valve to move said cap and open said pipe I to the outer air as said tank-valve is seated, the air-pipe E, the closet-bowl, and the trap, substantially as described.

2. A water closet bowl having in its bowl-chamber *a* a partition, a^4, combined with the air-pipe E, connecting with said chamber *a* by means of the chamber *c'* at the lower end of said pipe and its outlet a^3 below the level a^2 of said partition a^4, substantially as and for the purposes set forth.

397,572. GATE. WILLIAM R. WHITE, Hooge, Ill. Filed Feb. 2, 1888. Serial No. 262,764. (No model.)



Claim.—The combination of a gate with a supporting-arm and a guide-arm pivoted to the gate at points unequally distant from its ends, and extending from the gate substantially parallel to each other and swinging on parallel vertical axes, substantially as described.

397,573. VOLUMETRIC GAS-REGULATOR. MORRIS G. WILDER, Philadelphia, Pa. Filed Mar. 22, 1888. Serial No. 268,112. (Model.)



Claim.—1. The combination, with the outer and inner shell of a gas-regulator, of a bridge spanning the gas inlet or outlet hole and furnished with a boss adapted to be riveted to and to secure the inner shell, substantially as described.

2. The combination, with the lower part of the outer case or shell of a gas-regulator, of the post R and inner shell, B', said post being furnished with a shoulder adapted to be riveted over and to hold said shell in place.

3. In a gas or fluid regulator, and in combination, the screw H, made as described, the fibrous or yielding packing wound upon it, and the threaded thimble or drilled seat, when formed, fitted, and operating to securely pack the said screw against leakage and to permit adjustment as required, substantially as set forth.

4. In a gas or fluid regulator, the herein-described regulating-screw, the upper part of which is turned off and which is furnished with a slot in which the ends of the packing-thread may be placed in order to secure them, substantially as set forth.

5. A float, substantially as described, consisting of a punched disk, the center of which is perforated and raised to support and strengthen the joint, combined with a tubular valve passed up through said disk and secured thereto by soldering or swaging the metal of the disk about it.

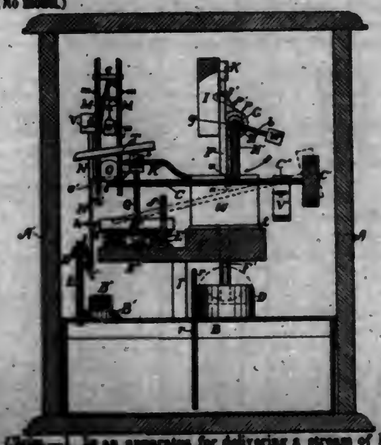
6. The upper or lower shell of a volumetric regulator, combined with and centrally supported on a bridge attached to the shell or body and extending over the inlet or outlet, so as to allow the gas-passages to be formed by turning or drilling through the central hole in said shell, substantially as described.

7. In a volumetric gas or fluid regulator, the base, working-cylinder and float, and an annular gas-passage extending under the working-cylinder toward the center thereof, when so combined as to permit the gas to act upon the float through said annular gas-passage and suitable perforations in the bottom of the working-cylinder, substantially as described.

8. In a volumetric gas or fluid regulator, the base, working-cylinder, central post and float, gas-passage, and adjusting-screw, when so combined with perforations in the working-cylinder as to permit the gas to enter the cylinder to act upon the lower part of the float through said perforations and afterward to pass the adjusting-screw, and said passage to act upon the upper part of the float, substantially as described.

9. The upper and lower shells of a volumetric regulator, combined with a cup of sheet metal attached to the upper shell and the working-cylinder upon the lower shell, arranged and operating substantially as described, so that the cup forms a cover for the working-cylinder.

397,574. COIN-OPERATED PERFUMING APPARATUS. HERMAN M. WILSON, Cambridge, Mass. Filed Sept. 24, 1888. Serial No. 286,173. (No model.)



Claim.—1. In an apparatus for delivering a stream of liquid, a spindle provided with a mutilated pinion fixed thereon, in combination

with a rack gearing with said pinion, a weight secured to said rack, a vessel provided with a discharging-tube, and a flexible bulb connected with said vessel and with said weight, all arranged and operated substantially as and for the purposes described.

2. In an apparatus for delivering a stream of liquid, a spindle provided with a crank-handle and having a mutilated pinion secured to said spindle, in combination with a rack gearing with said pinion, a bulb-operating weight connected with said rack, and a locking device whereby the said crank-handle is prevented from turning, all constructed and arranged substantially as and for the purposes described.

3. In a coin-operated apparatus for delivering a stream of liquid, a spindle provided with a crank-handle and having an arm secured thereto, in combination with a mutilated pinion fixed on said spindle, a rack gearing with said pinion, a weight connected with said rack, and a pivoted coin-actuated lever provided with a counter-weight, and having a stop whereby the spindle is prevented from turning, all constructed, arranged, and operated substantially as described.

4. In a coin-operated apparatus, a spindle provided with a crank-handle, an arm, and a counter-weight, all rigidly secured to said spindle, in combination with a counterbalanced coin-operated pivoted lever provided with a stop, whereby, when the lever is depressed, the said handle may be turned through one revolution, substantially as and for the purposes described.

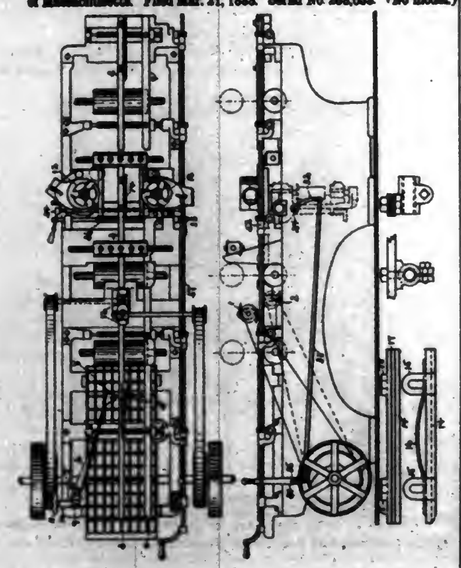
5. In an apparatus for delivering a stream of liquid, a spindle, H, having a ratchet-wheel, P, and a mutilated pinion, G, in combination with the rack F, engaging with said pinion, the weight W, secured to said rack, and the spring-actuated pawl P', engaging with said ratchet-wheel, all arranged and operated substantially as and for the purposes described.

6. In an apparatus for delivering a stream of liquid, a vessel provided with a weight-operated flexible bulb and having a liquid-discharge tube passing nearly to the bottom of the said vessel in combination with an air-admitting tube provided with a valve and a suitable regulating device operating said valve, whereby the amount of discharged liquid is determined, substantially as described.

7. In an apparatus for delivering a stream of liquid, a closed vessel provided with a flexible bulb and a liquid-discharge tube, in combination with a weight operating said bulb, a weighted bellows provided with an air-discharge passage, and an air-admitting tube communicating with said vessel and provided with a valve operated by said bellows, in the manner and for the purpose substantially as described.

8. In an apparatus for delivering a stream of liquid, in combination with the weight W, provided with the rod R, the bellows E, provided with the rod Q, bent at right angles at its upper end and having an air-discharging tube, *f*, the weight W', having the pin A, and the vertically-reciprocating valve-operating rod N', having stops *K' K'*, engaging with said pin, all constructed, arranged, and operated substantially as and for the purposes described.

397,575. PLANING-MACHINE. SOLOMON A. WOODS and JOHN R. THOMAS, Boston, Mass., assignors to The S. A. Woods Machine Company, of Massachusetts. Filed Mar. 21, 1888. Serial No. 268,038. (No model.)



Claim.—1. The combination, in a wood-planing machine, of the matcher-heads 1 and 2, mounted upon horizontal shafts above and below the path of the lumber, the matcher-head 13, mounted upon a vertical shaft outside the path of the lumber, the side guide, 4, and the central longitudinal guide-strip, 3, having attached upon the side thereof, toward said side guide and opposite matcher-head 13, an adjustable supplemental guiding-strip, 14, substantially as described.

2. The combination, in a wood-planing machine, of the matcher-heads 1 and 2, mounted upon horizontal shafts above and below the path of the lumber, the matcher-head 13, mounted upon a vertical shaft outside the path of the lumber, the side guide, 4, and the longitudinal central guide, 3, provided with the elastic spring 5, attached to the side thereof opposite said side guide and arranged to press the lumber against the latter, substantially as described.

3. The combination of the polygonal-shaped cross-girt 18, secured at its ends to the frame of the planing-machine, with one corner uppermost, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing its upper angle and faces, and a clamp attached to said yoke and arranged to bind said girt between it and the saddle, substantially as described.

4. The combination of the polygonal-shaped cross-girt 18, with one corner uppermost, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing its upper angle and faces, the clamp-piece 25, embracing the girt on its sides opposite to the saddle, and a cam, 29, arranged to bind against said clamping-piece, substantially as described.

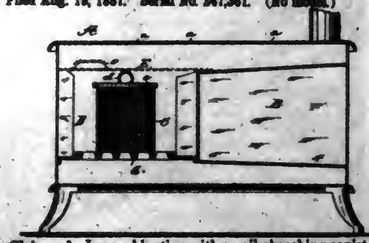
5. The combination of the polygonal-shaped girt 18, secured with one corner uppermost, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing its upper angle and sides, the clamping-piece 25, embracing the girt on its sides opposite to the saddle, the cam 29, and an elastic or yielding medium intervening between said cam and the embracing part of clamping-piece 25 and arranged to transmit the pressure of the cam to the clamping-piece, substantially as described.

6. The combination of the girt 18, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing the same on one side, the clamping-piece 25, embracing the same on the opposite side, the cam 29, arranged to compress the clamping-piece against the girt, the splined rod 24, passing through said cam and arranged to revolve the latter and allow it to be slid over it, the screw 52, journaled in the frame and arranged to move yoke 21 along the girt by means of its sleeve-nut attached to the yoke, and the crank 32, rod 33, and lever 34, connected to the splined shaft 24, leading to the feed-in end of the machine, and the gear 38 and shaft 37 with its crank at the same end of the machine, whereby the operator is enabled, without leaving that end of the machine, to release the yoke 21 and adjust and secure the same to the girt 18 to suit different breadths of lumber, substantially as described.

7. The combination of the matcher-spindle 20 and its head, and the chip-breaker 40, surrounding the same and made in the shape of an inclosing-funnel around said head terminating in the exit-spout 42, the said inclosing-funnel having its upper portion in the form of a detachable cover secured to the lower portion by lugs or fastenings, substantially as described, whereby said cover portion may be removed and the head exposed, substantially as described.

8. The combination of the chip-breaker 40, pivoted to the table of the vertical matcher-head by pivot 41, swinging in a curved path around said head and provided with spout 42, and the cover part of the same, 44, extending over said head and secured to the lower portion by lugs 45 and turn-button 46, substantially as described.

397,576. FIRE-KINDLER. JOHN ABTERDAM, New York, N. Y. Filed Aug. 19, 1887. Serial No. 247,361. (No model.)



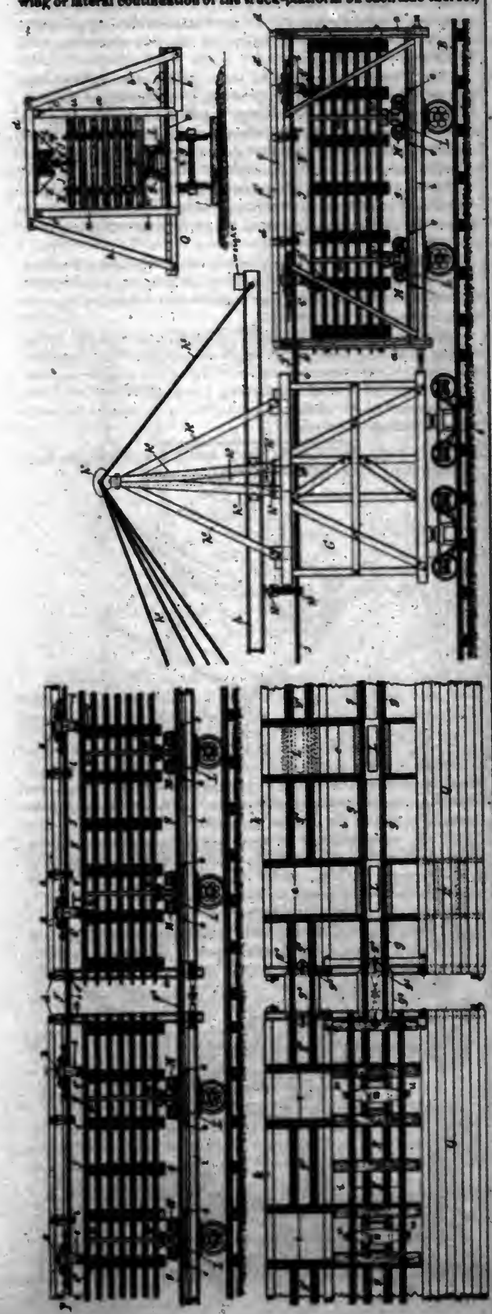
Claim.—1. In combination with an oil-absorbing canister, a reticulated metal screen surrounding said canister and separated therefrom, whereby a free air-space will be left between said canister and screen, substantially as described.

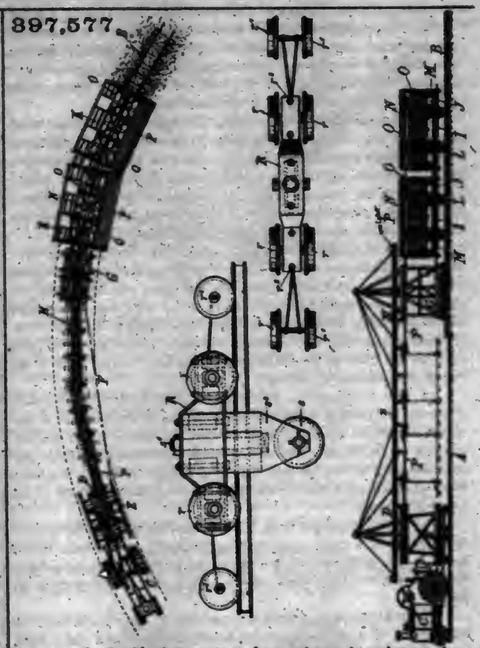
2. A fire-kindler consisting of an oil-absorbing canister having draft-passages through it, and a reticulated metal screen surrounding said canister and separated therefrom, whereby a free air-space will be left between said canister and screen, substantially as described.

397,577. PLANT FOR LAYING TRACKS. GEORGE ANDERSON, Madras, India. Filed Oct. 18, 1887. Serial No. 252,712. (No model.) Patented in England Aug. 31, 1887, No. 11,630.

Claim.—1. In a track-laying plant, the combination of a construction-train adapted for the transit therealong of loads of track-sections, an overhead carrier, a siding and traverser for the return of the empty track-section bogies, engines adapted to move the construction-train forward and to operate the overhead carrier on their respective tracks, and suitable winding or other gear for operating the various members of the construction-train and overhead carrier.

2. The combination, with the truck of a construction-train, of a wing or lateral continuation of the truck-platform on each side thereof,





one or both of said wings or lateral extensions adapted to receive a siding with traversers operating between the main track and siding, substantially as and for the purpose set forth.

3. The combination, with the truck of a construction-train, of a wing or lateral continuation of the truck-platform on each side thereof, one of said wings or lateral extensions adapted to receive a siding and the other to be fitted as a workshop, store, or cabin, substantially as described.

4. The combination, with the truck of a construction-train, of traversers adapted to run upon rails laid transversely upon the platform of said truck and upon a wing or lateral extension of said platform, upon which traversers are laid sections of the main track of the construction-train, and which sections are adapted to make continuations with either a siding of the same gage as the main track laid upon the wing or lateral extension or with the main track upon the platform, according to the position of the traversers.

5. The combination, with the trucks of a construction-train having a track secured to the platform thereof, of track-sections forming continuations of the main lines, pivotally connected to the said trucks in manner to permit the traverse thereon of the wheels treading the main line, substantially as and for the purpose set forth.

6. The combination, with the trucks of a construction-train having a siding laid upon wings or lateral extensions of the platform of said trucks, of bridge-pieces uniting the tracks forming the sidings of two or more connecting-trucks, and traversers operating between the main track and sidings, substantially as and for the purpose set forth.

7. The combination, with the trucks of a construction-train having a siding laid upon wings or lateral extensions of the platforms of said trucks, of bridge-pieces pivotally connected to the trucks and sidings, respectively, adapted to make continuous the main line from one truck of the construction-train to the adjoining one, and the siding from one wing to the adjoining one, with traversers for connecting, substantially as and for the purpose set forth.

8. The combination, with the platform or floor of a truck forming a member of a construction-train provided with tracks thereon, of two bogies having suitable uprights forming side supports for sections of completed track carried thereby, substantially as set forth.

9. The combination, with the platform of the truck of a construction-train, of vertical posts at the corners of said platform, longitudinal and transverse beams connecting the tops of said vertical posts, and braces connected to said longitudinal or transverse beams and to a wing or lateral extension of said platform.

10. The combination, in a construction-train of one or more trucks, of a superstructure supported over the platform of the said truck or trucks, and an overhead carrier suspended from said superstructure and adapted to transport a load from one part of said construction-train over the track below to the front thereof, substantially as and for the purpose described.

11. The combination, with a construction-train, of a superstructure supported over the platform of all the trucks of said construction-train, and an overhead carrier suspended from said superstructure extending the whole length of the train and adapted to transport the load of said construction-train to the front thereof.

12. The combination of a construction-train having a main track on the platform thereof, wings or lateral extensions of said platforms on one or both sides thereof, a siding upon said wings, and traversers adapted to move between the main line and siding and make connection between the two, said combination adapted for the transport of loaded trucks along the main track to the front of the construction-train and for the return of the empty trucks along the siding.

13. The combination of a construction-train having a main track laid on the platforms thereof, wings or lateral extensions of said platforms on one or both sides thereof, sidings upon said wings, and duplex traversers adapted to move between the main line and the said sidings and make connection between them, respectively, said combination adapted for the transport of loaded trucks along the main track to the front of the construction-train and for the return of the empty trucks along the siding.

14. The combination, with longitudinal and transverse beams supported by vertical posts over the platforms of the trucks of a construction-train, of an overhead carrier connected thereto and adapted to allow loaded bogies to be moved under said carrier along the construction-train and to be used for the purposes of raising the loads from off said bogies and to transport them toward the front of the construction-train.

15. In a construction-train, the combination, with a suitable overhead frame, of a track supported longitudinally over a main line secured to the platform below and one or more carriers adapted to traverse said overhead track, substantially as and for the purpose set forth.

16. In a construction-train, the combination, with a suitable overhead frame, of a track supported longitudinally over a main track upon the platform of the car below, uniting with a like track, a connecting-truck, and a carrier adapted to traverse said track from one truck to another, substantially as described.

17. In an overhead carrier supported over the truck or trucks of a construction-train, holes formed in the foot and web of the rails, adapted to receive one end of the bolt by which the rail is connected to its support and to allow the rail to slide upon the said support as the construction-train is moving on a curve.

18. In a construction-train, the combination, with a bogie adapted to travel upon an overhead track supported longitudinally over the main track secured to the trucks thereof, of a pair of wheels pivotally connected to each end of the frame of said bogie, constructed, arranged, and operating substantially as and for the purpose described.

19. The combination, with a bogie adapted to travel upon the rails of an overhead track supported longitudinally over the main track laid along the truck of a construction-train, of a pair of wheels pivotally connected to the frame of said bogie at each end of it and adapted to lead the wheels of said bogie over the joints and round the bends in the rails of said overhead track.

20. The combination, with the trucks of a construction train, of an overhead carrier supported longitudinally over the main track laid along said trucks, and bridge-pieces pivotally connected to the opposite ends of the rails of the overhead carrier and adapted to make the several sections of the overhead carrier over the several trucks of the construction-train continuous for the length of the construction-train.

21. In a construction-train, the combination, with a bogie adapted to traverse an overhead track supported longitudinally over the main line of said construction-train, of a loop pendent therefrom, a grooved pulley pivoted in said loop, and a suitable connection guided by the latter terminating in a gripper operated by a winding-drum, substantially as and for the purpose set forth.

22. The combination, with a bogie adapted to travel upon an overhead carrier supported longitudinally over the main line of a construction-train, of a loop pendent therefrom, a chain-pulley pivoted in said loop, and a chain terminating in a gripper and led away over said pulley to a winding-drum.

23. The combination, with a construction-train of a track-laying plant, of a cantalever supported upon a truck and pivoted thereon and an overhead track extending along the arm thereof, substantially as set forth.

24. The combination, with the construction-train of a track-laying plant, of a cantalever adapted to turn upon a pivot, and an overhead track fixed to the projecting or front part of said cantalever, substantially as above described.

25. The combination, with the construction-train of a track-laying plant, of two cantalevers adapted to turn upon their respective trucks, and overhead tracks fixed to the projecting parts of said cantalevers, substantially as above described.

26. The combination, with the construction-train of a track-laying plant, of a traction-engine adapted to travel on the road-bed, and a cantalever having fixed upon it an overhead arm provided with a track adapted to operate between the engine and the connecting-train, substantially as and for the purpose described.

27. The combination, with a construction-train of a track-laying plant, of a traction-engine provided with and carrying thereon a cantalever, said engine being adapted to operate the train and the track-laying apparatus, substantially as and for the purpose described.

28. In a track-laying plant, the combination, with one or more trucks provided with means for lifting, carrying, and laying sections of track, of an engine or motor adapted to advance the train as required, said engine or motor being provided with a track thereupon, by means of which sections of track may be advanced along and above the said engine or motor from a supply to the construction-train, substantially as set forth.

29. A locomotive adapted for the propulsion of the construction-train of a track-laying plant, and having a continuation of the main track of said train of the same gage as said main track laid upon it at the same level, whereby it is adapted to admit of the bogies being moved from the transport-train along it on the main track of the construction-train, substantially as described.

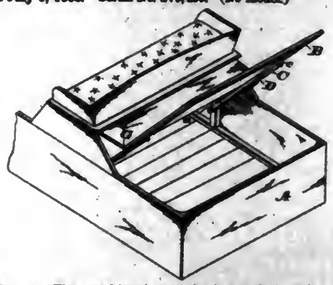
30. The combination, in a construction-train consisting of one or more trucks provided with tracks upon their platforms and traversers above, of an engine-power adapted to operate them, substantially as set forth.

31. The combination of an overhead carrier extending the whole length of the construction and transport train, having a main track thereupon, traversers, sidings, and engine-power adapted to operate them, substantially as described.

32. The apparatus, substantially as herein described, for laying railway-track by a plant, consisting of one or more trucks provided with railway-tracks thereon, cantalever, and engines, whereby sections of track are lifted and advanced along a suspended track from the carrying-truck to the cantalever and lowered to position on the road-bed, substantially as set forth.

397,578. BUGGY-BOOT. PHILIP BOSCHE, New Philadelphia, Ohio.

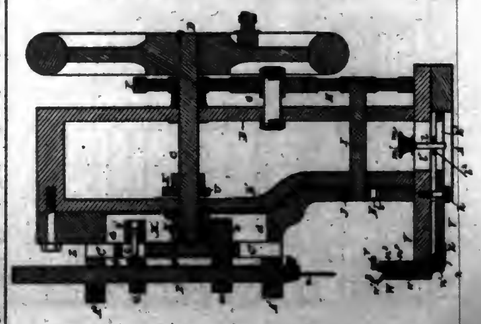
Filed July 9, 1888. Serial No. 278,429. (No model.)



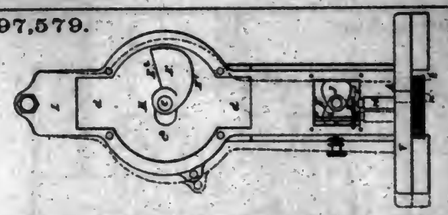
Claim.—1. The combination of the buggy-box A, having hinged thereto the frame B, the bars C, pivotally attached to the frame B, the recesses *b*, adapted to engage the staples *a*, and the springs D, substantially as and for the purpose specified.

2. The combination of the buggy-box A, having hinged thereto the frame B, mitered ends of the frame B, provided with the grooves *d*, and the metal plates E, adapted to be folded over the ends of said frame B, substantially as and for the purpose specified.

397,579. SEWING-MACHINE. JONATHAN BARTLETT, Epping, and GEORGE B. WIGGIN, South New Market, N. H., assignors of one-half to John W. Heard, Providence, R. I. Filed July 23, 1887. Serial No. 245,561. (No model.)



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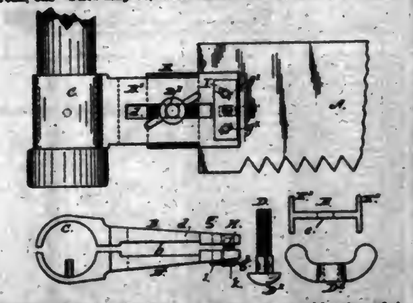
Claim.—1. The vibratory frame L, pivoted at its upper end, and the projecting base V, which supports the thread-looping mechanism carried by and vibrating with said frame, combined with the needle-bar arranged to move in right lines vertically lengthwise of such frame and also to vibrate with it and said base, substantially as shown and described.

2. In combination, the vibratory frame L, pivoted at its top and having a projecting base, V, as described, the looping mechanism supported on such vibrating bed or base, cover O, brackets A' A^3 on said cover, needle-bar P, needle, and a cam for vibrating the frame L, substantially as shown and described.

3. In combination, the vibratory frame L, having a casing, M, and opening N, shafts C and I and their respective cams or eccentrics, removable cover O, needle-bar P, supported on frame L, brackets A' A^3, and blocks *b b'*, substantially as shown and described.

4. In combination, the vibratory frame L, having a casing, M, and opening N, and cam E, the cam or eccentric J, adjustable three-sided piece *i*, and its adjusting-screw *I'*, substantially as shown and described.

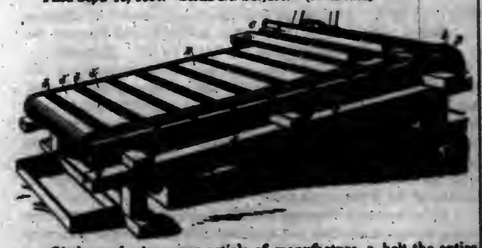
397,580. HANDLE FOR CROSSCUT-SAWS. MARTIN BENNETT, Eureka, Cal. Filed May 11, 1888. Serial No. 273,587. (No model.)



Claim.—1. In a handle for crosscut-saws, the combination of the slotted clamp-plates having sockets at one end, jaws to take the saw-blade at the other end, provided with a stud or studs to take through the saw-blade, and the sliding bearing-block and clamp-screw, arranged, substantially as described, for operation as set forth.

2. In a handle for crosscut-saws, the combination, with the clamp-jaws having the inclined slots or grooves, of the studs or pins movable therein, the bearing-block, and the clamp-screw, all arranged to operate substantially as described.

397,581. ORE-WASHER. HENRY G. BLAISDELL, San Francisco, Cal. Filed Sept. 10, 1887. Serial No. 249,400. (No model.)



Claim.—1. As a new article of manufacture, a belt the entire surface of which is divided into zones or strips of alternate corrugated or rifled portions and plane or smooth portions, substantially as herein described.

2. In an ore-concentrator, and in combination with the belt-supporting frame and its drums over which the belt passes, and the water and pulp distributing apparatus, an endless traveling belt having its entire working-surface divided into zones of alternate corrugated or rifled portions and plane or smooth portions, substantially as herein described.

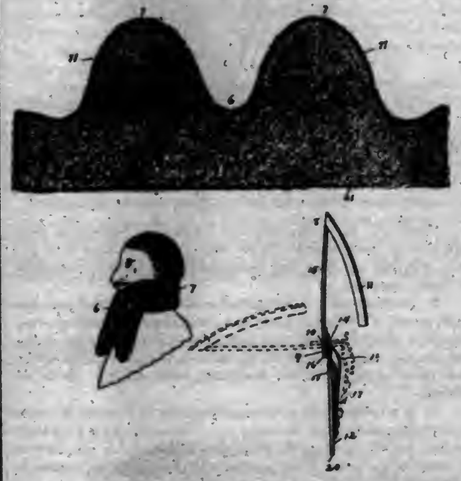
397,582. WALKING-PLOW. DAVID W. GEBERT, Sparta, Wis., assignor of one-half to Timothy O. Thorbus, same place. Filed Nov. 14, 1888. Serial No. 290,812. (No model.)



Claim.—1. The combination, with the brackets F and F', having the vertical extensions I and I', which are roughened on their opposing faces, and which are vertically slotted, of the blocks C and C', roughened on their outer ends, and the bolt G, substantially as and for the purpose described.

2. The combination, with the landside and mold-board of a plow, of the brackets F and F', having vertical extensions which are roughened on their opposing faces, and which are vertically slotted, the block C and C', having their inner ends rounded and having heads H and H' at their ends, which heads are roughened on their outer ends, the bolt G, and the roller D, mounted on the rounded portions of the blocks and held between the heads H and H', substantially as described.

397,583. EAR-PROTECTOR. REUBEN COHN, New York, N. Y. Filed May 2, 1888. Serial No. 272,611. (No model.)



Claim.—1. As an improvement in folding ear-protectors, a spring device consisting of a hinged vertical member having an elastic appliance secured thereto, against the tension of which said hinged vertical member is adapted to fold, and provided at one of its ends with a rigidly-fixed curved member which projects outward and downward at both sides of said vertical member, and which when covered provides a concave surface adapted to snugly fit over the ear, substantially as set forth.

2. As an improvement in folding ear-protectors, a spring device embodying a vertical member consisting of two parts, 12 and 15, one of which, 12, is broadened, as at 13, and has its center cut away, the ends of the two arms thus produced forming journal-bearings, as shown, and the other part, 15, provided with journals 14 and lug 16, and an elastic device, 17, secured to part 12 and co-operating with lug 16, substantially as set forth.

3. A garment for ladies' or gentlemen's wear provided with an ear-protecting attachment consisting of a pair of spring devices, each comprising a single vertical member having an elastic appliance secured thereto and hinged near its center, so as to fold backward or downward against the tension of said elastic appliance and provided at one end with a rigidly-fixed curved member which projects outward and downward at both sides of said vertical member and provides a concave surface adapted to snugly fit over the ear, substantially as set forth.

4. A garment for ladies' or gentlemen's wear provided with an ear-protecting attachment consisting of the metallic piece 21, which gives shape to the garment, in combination with a pair of spring devices appropriately secured to said garment-shaping piece and each consisting of a hinged vertical member provided at one of its ends with a curved member which projects outward and downward at both sides of said vertical member, substantially as set forth.

397,584. TRACK-CLEARER. GEORGE W. COOK, Mountain View, Cal. Filed Mar. 22, 1888. Serial No. 268,137. (No model.)



Claim.—1. The frame-strip C of the swather, having the prow-like front, in combination with the sliding extension-plate c^4 on said front, whereby said front may be extended as to height, substantially as herein described.

2. The frame-strip C of the swather, having an inclined prow-like front provided with a face-plate, in combination with a sliding extension-plate fitted by a side guide to said prow-like front of the frame, and adapted, also, when not in use to be turned over and serve as a face-plate for the top of the frame-strip, substantially as herein described.

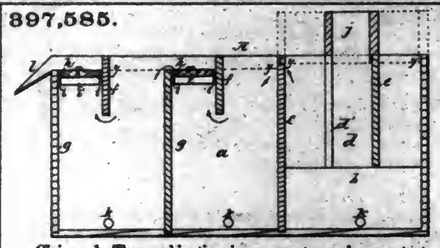
3. In a swather and in combination with its frame-strip having perforations, an inclined directing arm or arms having a head-piece, and the bolts for securing the head-piece of said arm or arms forward or back on the frame of the swather and changing their vertical inclination, substantially as herein described.

4. In a swather and in combination with the swather-frame strip having a series of adjusting-holes, a directing-arm, a head hinged thereto, and bolts passing through said head and into the adjusting-holes, whereby the arm is secured to the frame-strip and its inclination to the frame-strip varied, and means to secure said arm in its inclination, substantially as herein described.

5. In a swather and in combination with the frame having perforations, the inclined directing-arm F, having a head, bolts to enter said perforations, by which said head is secured in different positions on the frame, and the head hinged to said arm, whereby said arm may be moved forward or back, according to the position of the head, and means to secure said arm in its adjustment, substantially as herein described.

6. In a swather and in combination with the frame-strip having perforations, the upper arm, E, having a fixed head, and bolts passing into said perforations and adjustably securing the head, a lower directing-arm having a head hinged thereto, bolts adapted to adjustably secure the head, and means for securing said lower arm after the adjustment of its head, substantially as herein described.

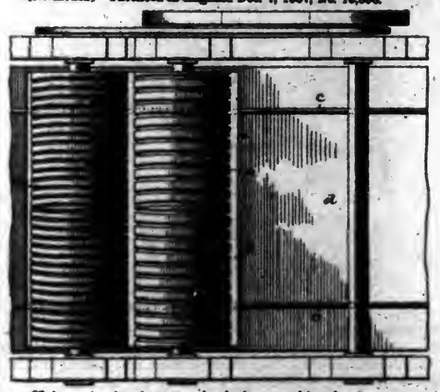
397,585. COMBINED SEPARATOR AND CONCENTRATOR. JOHN D. COPLIN, Denver, Colo. Filed Apr. 15, 1887. Serial No. 234,872. (No model.)



Claim.—1. The combination, in a separator and concentrator, of a receiving-chamber having grooved semi-partitions, a movable hopper located therein, one or more float-saving chambers, each having an upwardly-extending semi-partition and downwardly-extending semi-partitions, and screens located between such semi-partitions, consisting of upper and lower gauzes with an interposed packing of filtering material, whereby the water is caused to pass upward through the screens, leaving its suspended material below the screens, substantially as set forth.

2. A combined concentrator and separator, consisting of compartment *b*, provided with grooved semi-partitions *d d*, a movable hopper, *j*, sustained thereby, compartment *a*, having one or more upwardly-extending semi-partitions, *g*, one or more depending semi-partitions, *f*, and screens *h*, located between partitions *f* and *g*, and formed each of an upper and a lower wire-gauze with an interposed filtering material, substantially as set forth.

397,586. IRONING OR CALENDERING MACHINE. ROBERT CRAWFORD, Belfast, Ireland. Filed July 11, 1888. Serial No. 279,686. (No model.) Patented in England Dec. 7, 1887, No. 16,536.



Claim.—An ironing or calendering machine having a pressing roller or cylinder with its surface grooved, substantially as described, whereby there are formed continuous pressing-surfaces arranged spirally around the cylinder and divergent from the center thereof, whereby the article being operated upon is both stretched and pressed, substantially as set forth.

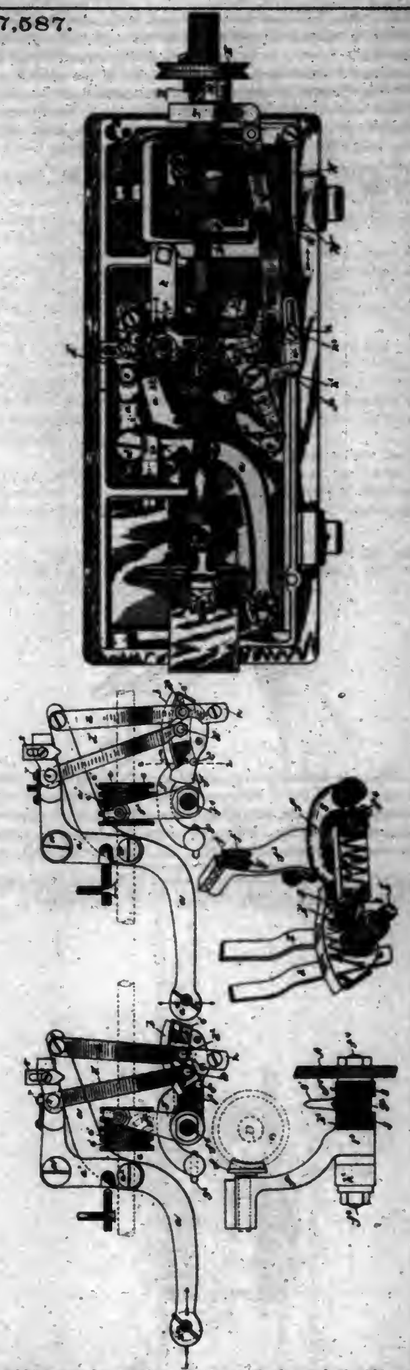
397,587. BUTTON-SEWING MACHINE. HENRY H. CUMMINGS, Malden, assignor to the Union Button Sewing Machine Company, Boston, Mass. Filed May 12, 1887. Serial No. 237,207. (No model.)

Claim.—1. In a button-sewing machine, the combination, with the machine-bed, a sewing mechanism, and a button-holder, of a button-holder-operating lever, *a*, and an angular arm or branch lever, *a'*, said arm or branch being pivoted to the bed and at one end pivotally connected with said lever, whereby either the pivotal connection of the lever with the arm or branch or the pivotal connection of the branch with the bed may be employed as the fulcrum of the lever in the operation of the latter, as set forth.

2. In a button-sewing machine, the combination, with the machine-bed, a sewing mechanism, and a button-holder, of a button-holder-operating lever, *a*, an angular arm or branch lever, *a'*, said arm or branch being pivoted to the bed and at one end pivotally connected with said lever, rods or bars pivotally connected with the free ends of said lever and arm or branch, an oscillating quadrant, and a block movable or adjustable on said oscillating quadrant to which the other ends of the rods or bars are pivoted, as set forth.

3. In a button-sewing machine, the combination, with the machine-bed, a sewing mechanism, and a button-holder, of a button-holder-operating lever, *a*, an arm or branch lever, *a'*, said arm or branch being pivoted to the bed and at one end pivotally connected

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with said lever, and a cam for operating on the free end of said branch lever, as set forth.

4. In a button-sewing machine, the combination, with the machine-bed, a sewing mechanism, and a button-holder, of a button-holder-operating lever, *a*, an angular arm or branch lever, *a'*, said arm or branch being pivoted to the bed and at one end pivotally connected with said lever, rods or bars *d d'*, the former pivotally connected with the free end of lever *a* and the latter detachably pivoted to the free end of branch *a'*, an oscillating quadrant, and a block movable or adjustable on said quadrant to which the other ends of rods or bars *d d'* are pivoted, as set forth.

5. In a button-sewing machine, the combination, with the bed of the machine, a sewing mechanism, and a button-holder, of a button-holder-operating lever, *a*, branch *a'*, rods or bars *d d'*, the former pivoted to one end of said lever and the latter pivoted to one end of said branch, an oscillating quadrant, a block movable or adjustable on said quadrant, mechanism, substantially as described, for locking said block in one position on said quadrant, and devices, substantially as described, for unlocking or releasing said block to permit it to be moved to another position on said quadrant, as set forth.

6. In a button-sewing machine, the combination, with the machine-bed, a sewing mechanism, a button-holder, and a button-holder-operating lever, of a quadrant pivoted on the bed, a rod or link connecting the quadrant with the button-holder-operating lever, and means for oscillating said quadrant, each means consisting of a rotary cam, a pivoted switch-lever adapted to engage said cam and be oscillated thereby, and an arm, f^2, rigidly connected with said switch-lever and loosely connected with said quadrant, as set forth.

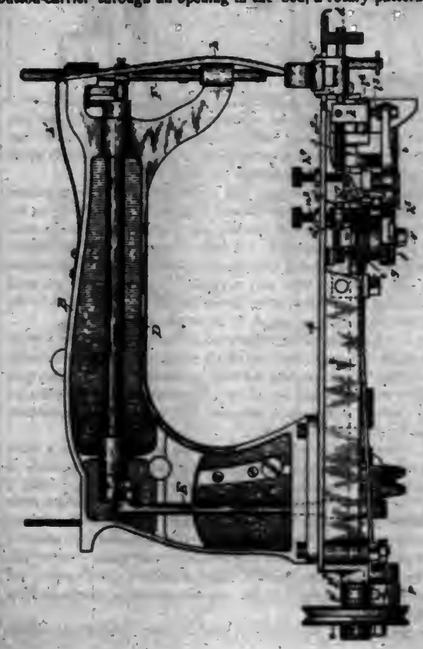
7. In a button-sewing machine, the combination, with a sewing mechanism, a button-holder, and button-holder-operating lever, of an oscillating grooved quadrant, a rod or link connecting the quadrant with the button-holder-operating lever, an oscillating switch-lever provided with a grooved arm, f^3, the bed of the machine provided with a slot, g^3, arm g', adjustably pivoted in said slot g^3, and blocks *g g*, adapted to slide in the groove of the said quadrant and arm f^3, to which blocks the other end of arm g' is pivoted, as set forth.

8. In a button-sewing machine, the combination, with the sewing mechanism, a button-holder, and button-holder-operating lever, of a quadrant, *b*, provided with a groove, b^3, a slide, *c*, in said groove, a rod or link connecting said slide with said button-holder-operating lever, and means for locking said slide in said groove and releasing the same, consisting of pin *o* and spring *o'*, a stud or bolt, *b'*, connected with said quadrant, in a hole or bore of which stud or bolt said pin and spring are arranged, pin *p*, a lever at one of its ends in contact with said pin, and a cam or wiper to act upon the other end of said lever, adapted to operate in slide *c*, as set forth.

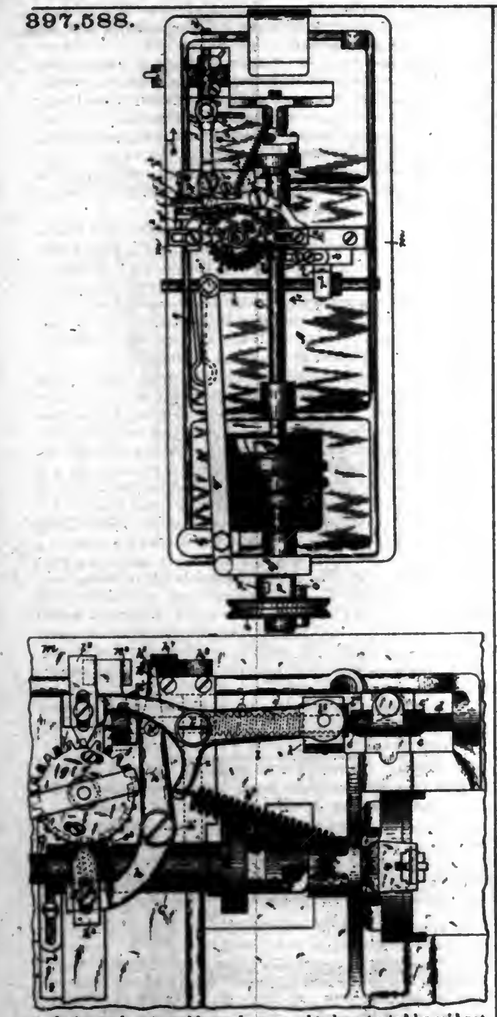
9. In a button-sewing machine, the combination, with a button-holder-operating lever, of plate *v*, button-holder lever w_2, duplex button-holder *z*, thumb-pin *z'*, and spring w^3, as set forth.

397,588. BUTTON-SEWING MACHINE. HENRY H. CUMMINGS, Malden, assignor to the Union Button Sewing Machine Company, Boston, Mass. Filed May 16, 1887. Serial No. 238,263. (No model.)

Claim.—1. A sewing-machine bed and a sewing mechanism, combined with a button-carrier constructed and arranged to reciprocate on the bed, a shaft, *d*, and its bearings beneath the bed, said shaft being longitudinally movable in its bearings and connected with the button-carrier through an opening in the bed, a rotary pattern disk



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or device, and a pivoted lever, *A*, arranged to be actuated by said pattern device and connected with said shaft, whereby the latter may be operated and the button-carrier moved in line with the axis of the shaft, substantially as hereinbefore set forth.

2. A sewing-machine bed and a sewing mechanism, combined with a button-carrier constructed and arranged to reciprocate on the bed, a rock-shaft, *d*, beneath the bed and connected with the button-carrier through an opening in the bed, a rotary pattern disk or device, and a pivoted lever, *l*, arranged to be actuated by said pattern device and connected with said rock-shaft, whereby the rock-shaft may be operated and the button-carrier moved at right angles to the axis of the rock-shaft, substantially as hereinbefore set forth.

3. A sewing mechanism, combined with a button-carrier, a rock-shaft and its bearings, said rock-shaft being longitudinally movable in its bearings and connected with the button-carrier, two rotary pattern disks or devices, and two pivoted levers arranged to be actuated by said pattern device and connected with said rock-shaft, substantially as hereinbefore set forth.

4. A sewing mechanism, combined with a button-carrier, a rock-shaft and its bearings, said rock-shaft being longitudinally movable in its bearings and connected with the button-carrier, a rotary shaft, a worm thereon, a worm-gear actuated by said worm, interchangeable pattern-disks connected with said worm-gear, levers intermediate of said pattern-disks and longitudinally-movable rock-shaft and actuated by said disks, said levers being connected with said shaft, whereby said shaft may be rocked and moved longitudinally in one direction, and springs to move said shaft in the opposite direction, substantially as hereinbefore set forth.

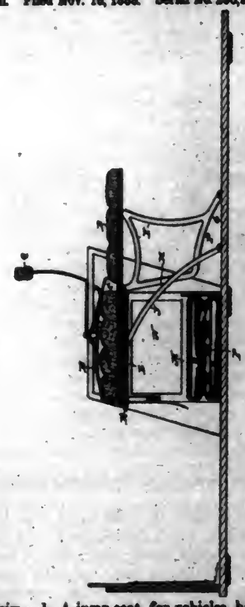
5. The bed of a button-sewing machine and a sewing mechanism, combined with a button-carrier located upon or above the bed, a rock-shaft and its bearings located below the bed, said rock-shaft being longitudinally movable in its bearings, and connections between the rock-shaft and button-carrier, whereby the bed of the machine may be left free of means for operating the button-carrier, and by rocking said shaft and moving it longitudinally in its bearings the button-carrier may be moved to properly present the button to the needle of the sewing mechanism, substantially as hereinbefore set forth.

397,589. SAIL. WILLIAM P. CUTLER, Baltimore, Md. Filed Sept. 6, 1888. Serial No. 284,702. (No model.)



Claim.—A reversible diagonal-cut two-part sail formed of widths or strips of cloth, C and D, the seams of which run in reverse or diverging directions from the middle line of the bolt-rope H or completed sail to the leech-rope E and foot-rope F of the sail, the diverging seams in the respective portions of the sail being parallel, as set forth.

397,590. VEHICLE-SEAT. JOSEPH F. GOODRICH, New Haven, Conn. Filed Nov. 16, 1888. Serial No. 290,985. (No model.)



Claim.—1. A jump-seat for vehicles, having an independently-movable back and means for supporting such back in a horizontal position independent of the adjustments of other parts of the vehicle, substantially as set forth.

2. A jump-seat for vehicles, having an independently-movable back and means for supporting such back in a horizontal position and disconnected from it to permit it to be used as a seat or as a back independent of the adjustments of the other parts of the vehicle, substantially as set forth.

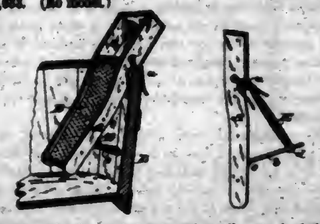
3. The combination, in a vehicle, with a seat, of a jump-seat adapted to be used by itself and to be jumped over and upon the other seat and having a movable or hinged back, and means for supporting such back in a horizontal position to form a seat, substantially as set forth.

4. A jump-seat for vehicles, having a hinged back and a frame pivoted to the seat and to the vehicle-body and supporting the seat in its ordinary position and the seat-back when the seat is jumped forward and the back turned down to form a seat, substantially as set forth.

5. A jump-seat for vehicles, having a hinged back and pivotal frames pivoted to the seat and to the vehicle-body, and having seat-bearings upon which the seat rests when in its normal position, and arms which support the seat in such position and the seat-back when the seat is jumped forward and the back turned down to form a seat, substantially as set forth.

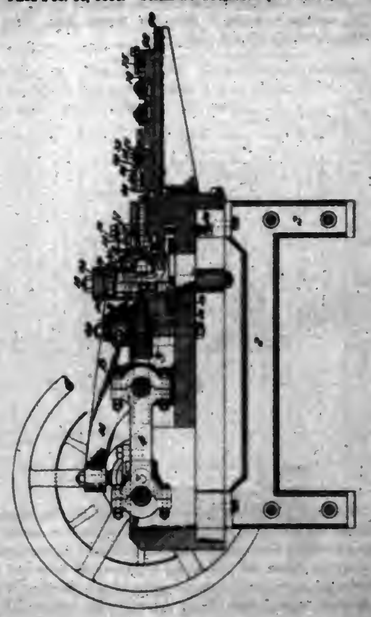
6. A jump-seat for vehicles, having a hinged back and two light skeleton metal frames pivoted to such seat and to the vehicle-body and adapted to support the seat when in its ordinary position and its back when the same is turned down to form a seat, substantially as set forth.

397,591. WASH-BOARD. HENRY C. HALL, Canton, Ohio, assignor of one-half to E. L. Vickers, same place. Filed Mar. 8, 1888. Serial No. 266,653. (No model.)



Claim.—The side pieces, A, having pivotally attached thereto the embracing-hoops *a*, the pivoted brace *b*, and the link E, substantially as and for the purpose specified.

397,592. WIRE-NAIL MACHINE. HENRY B. HAPPS, Pittsburg, Pa. Filed Feb. 16, 1888. Serial No. 264,302. (No model.)



Claim.—1. In a wire-nail machine, the combination, with the driving-shaft, of a pillow-block, boxes in the pillow-block, and a key, substantially as and for the purposes described.

2. In a wire-nail machine, the combination, with cutters, of a housing whereon they are mounted, said housing being adjustably movable, and a sliding key bearing on the housing for moving the same, substantially as and for the purposes described.

3. In a wire-nail-cutting machine, the combination, with a longitudinally-adjustable housing for the cutter-heads, of cutter-heads mounted thereon, one of said cutter-heads being longitudinally adjustable thereon, substantially as and for the purposes specified.

4. In a wire-nail-cutting machine, the combination, with a longitudinally-adjustable housing for the cutter-heads, of cutter-heads mounted thereon, one of said cutter-heads being longitudinally adjustable on the housing, and laterally and vertically adjustable cutters mounted on the cutter-heads, substantially as and for the purposes specified.

5. In a wire-nail machine, the combination, with a lever, a cam having an incline and a groove, said lever being secured to one end of a rock-shaft, of two arms secured to the other end of said rock-shaft and provided with anti-friction rollers which bear upon said cam, whereby a positive motion is imparted to the rock-shaft, substantially as and for the purposes specified.

6. In a wire-nail machine, the combination, with a feed-carriage, of a movable feed-dog mounted thereon in an inclined slideway, substantially as and for the purposes described.

7. In a wire-nail machine, the combination, with a moving feed-carriage, of a feed-dog mounted thereon in a way inclined to the course of the wire, substantially as and for the purposes described.

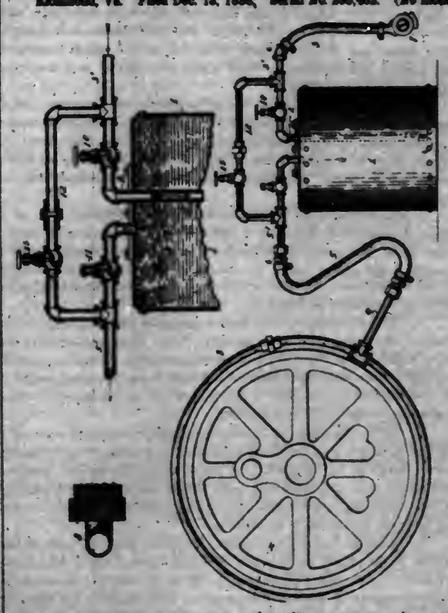
8. In a wire-nail machine, the combination, with a movable feed-carriage, of a feed-dog mounted thereon in a way inclined to the course of the wire, and a spring which bears on the dog, substantially as and for the purposes described.

9. In a wire-nail machine, the combination, with a moving feed-carriage, of a feed-dog mounted thereon in a way inclined to the course of the wire, and a rod, 75, whereby the dog is moved, substantially as and for the purposes described.

10. In a wire-nail machine, the combination, with the two jaws of the feed-dog, of set-screws bearing on the jaws, whereby the opposite jaws are adjustable to and from a common center, substantially as and for the purposes specified.

11. In a wire-nail machine, the combination, with a moving feed-carriage, of a feed-dog mounted thereon in a way inclined to the course of the wire, a rod, 75, whereby the dog is moved, and an eccentric acting on the rod, substantially as and for the purposes described.

397,593. TIRE-HEATING APPARATUS. WILLIAM HANSHAW, Richmond, Va. Filed Dec. 13, 1888. Serial No. 293,402. (No model.)

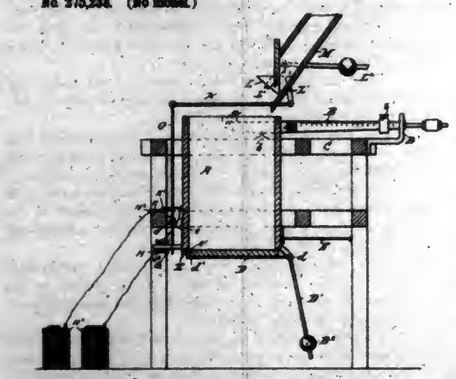


Claim.—1. In a tire heating and cooling apparatus, the combination of a reservoir or tank, a valved air-supply pipe communicating therewith and adapted to be connected with an air-pump, an annular

distributing-pipe, a valved outlet-pipe intermediate of the tank and distributing-pipe, and a valved branch pipe connected to said air supply and outlet pipes at points on opposite sides of the valves thereof, as and for the purpose described.

2. In a tire heating and cooling apparatus, the combination of a tank or reservoir having an absorbent porous filling adapted to contain a liquid hydrocarbon, an air-supply pipe passing through said filling within a short distance from the base of the tank, and having a cock or valve, 10, an air-pump connected to said pipe, an annular distributing-pipe, an outlet-pipe connected to said distributing-pipe and the tank, and having a check-valve, 11, and a branch pipe, 12, connected to the air supply and outlet pipes on opposite sides of the valves 11 12 thereof, and having a cock, 13, substantially as and for the purpose described.

397,594. ELECTRO-MAGNETIC GRAIN-SCALE. WILLIAM A. HOLLEY and ULRIK MALIE, Holland, Mich. Filed May 26, 1888. Serial No. 275,233. (No model.)



Claim.—1. The combination, in an electro-magnetic weighing-scale, of a frame, a scale-beam, a hopper supported thereby, a counterbalanced discharge-valve, a detent upon the hopper, electro-magnets, an armature secured to said detent, an electric circuit, and contact-points located, respectively, upon said hopper and frame, substantially as described.

2. The combination, in an electro-magnetic weighing-scale, of a frame, a scale-beam, a vertically-movable hopper supported thereon, a discharge-valve hinged to said hopper, a stay-hook connecting one side of said vertically-movable hopper with said frame, a discharge-valve detent and electro-magnets located upon the opposite side of said hopper, and an armature held within the field of said magnets, substantially as described.

3. The combination, in an electro-magnetic weighing-scale, of a frame, C, a scale-beam, B, a hopper, A, supported upon said scale-beam, a supply-spout, M, a counterbalanced supply-valve, L, crank-arms L', upright lever O, link N, electro-magnets H, and contact-plates K K', located, respectively, upon said frame and hopper, substantially as described.

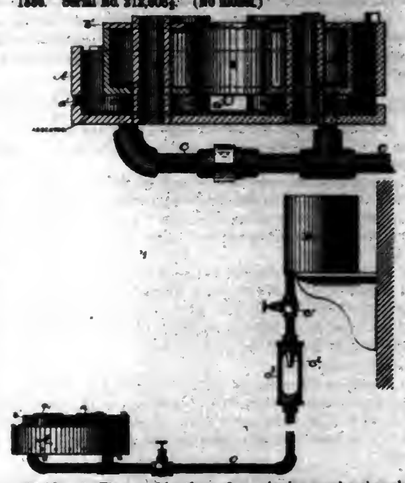
4. The combination, in an electro-magnetic weighing-scale, of a frame, a scale-beam, a hopper, a supply spout and valve, a discharge-valve upon the hopper, a discharge-valve detent, electro-magnets for operating said detent, and a lever-connection between the armature of said electro-magnets and supply-valve for electrically actuating the same, substantially as described.

5. The combination, in an electro-magnetic weighing-scale, of the frame C, the hopper A, the scale-beam B, the discharge-valve D, the valve-detent E, the armature I, secured thereto, the electro-magnets H, arranged in a circuit controlled by said scale-beam, the supply-valve L, the crank-arms L', the link N, and the rod O, all arranged for joint operation substantially as described.

6. The combination, in an electro-magnetic weighing-scale, of a hopper, a supply-valve, a discharge-valve, a discharge-valve detent, electro-magnets for operating the same, a lever-connection between said supply-valve and discharge-valve detent, and a lock-lever adapted to lock said supply-valve until the discharge-valve detent is in working position, substantially as described.

7. The combination, in an electro-magnetic weighing-scale, of the hopper A, the supply-valve L, the discharge-valve D, the detent E, the armature I and stud e', arranged to form the angular recess i, the electro-magnets H, the lever-connections O, N, and L', the plate Q', having arms Q and inclined recesses g the rod P', and the lock-lever P, consisting of the front transverse portion, p, and the rearwardly-extending arms p', substantially as described.

397,595. BURNER FOR LIQUID HYDROCARBONS AND VAPORS THEREOF. WARREN T. KELLOGG, Lansingburg, N. Y. Filed Sept. 3, 1886. Serial No. 212,603. (No model.)

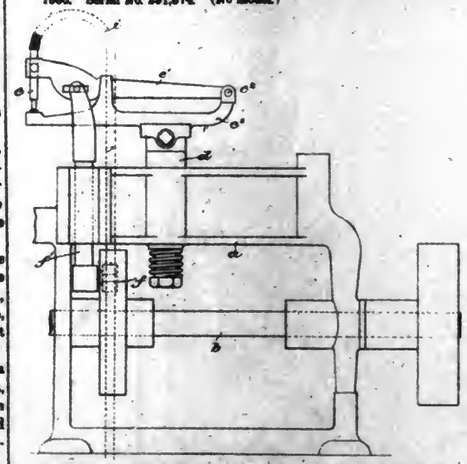


Claim.—1. The combination of a primary combustion-chamber provided with a series of vertical air-tubes which have a free opening through them from top to bottom, a vaporizing-chamber fixed within said combustion-chamber so as to leave a clear space between the sides and bottoms of the two chambers, the air-tubes of said combustion-chamber passing loosely through the top and bottom plates of said vaporizing-chamber, and an oil-pipe arranged to deliver its supply of oil primarily into the vaporizing-chamber, as and for the purpose herein specified.

2. The combination, with a casing, A, provided with standing air-tubes a, and having a bottom layer of asbestus or other absorbent material, of a vaporizing-chamber, B, contained in said casing, and having the air-tubes a passing therethrough, so as to leave leaky joints around said tubes at the top and bottom of said chamber, and an oil-supply pipe, C, adapted to primarily feed the supply of oil into the vaporizing-chamber B, all being arranged to operate as herein specified.

397,596. WITHDRAWN.

397,597. EYELETING-MACHINE. HARRY S. LYLE, North Brookfield, assignor to Alfred H. Batcheller, Boston, Mass. Filed Nov. 20, 1888. Serial No. 291,374. (No model.)



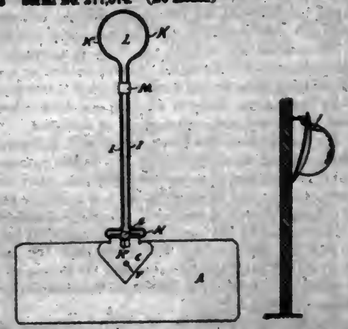
Claim.—In an eyeleting-machine, the tubular eyelet-punch and mechanism for moving it, combined with a delivery or conveying tube of spirally-wound wire attached to and forming a continuation of the tubular eyelet-punch, for delivering or conveying from the machine the eyelet-pieces punched from the material, the vibration of the tube moving said eyelet-pieces freely therethrough, substantially as described.

397,598. CARPET-FASTENER. CARSON L. MCCLEARY, Jerusalem, Ohio. Filed Oct. 3, 1888. Serial No. 287,101. (No model.)



Claim.—The herein-described binder and fastener for carpets, composed of a strip having a groove or channel in its under side and having bearing-faces on each side of the said groove or channel to rest upon and clamp the carpet between them and the floor, and a binding-strip adapted to be inserted in the said groove or channel and come flush with the said bearing-faces and clamp the carpet between it and the walls of the said groove or channel, substantially as described.

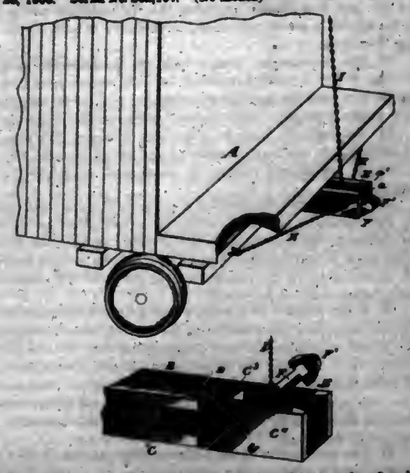
397,599. HAT-HANGER. THEODORE R. MCDONALD, Northville, Mich., assignor to George W. Huntley, same place. Filed June 14, 1888. Serial No. 277,074. (No model.)



Claim.—1. In a hanger for hats, a plate for attachment to the hat, a clip embracing the edge of said plate, provided with hinge-bearings and a spring, and a hanger pivoted in said bearings, provided with a projection on its heel for engagement with the spring, and at its opposite end with a clasping device for suspending the hat, as and for the purpose set forth.

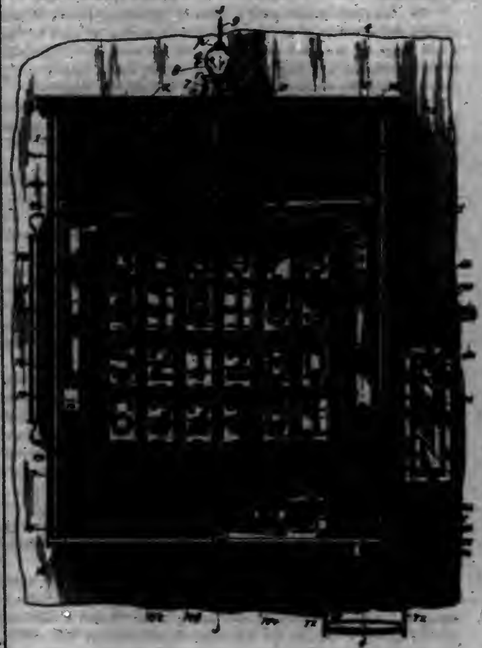
2. In a hanger for hats, a plate, a clip embracing the edge of said plate, provided with hinge-bearings and a spring, and perforations in the plate, in combination with a pin adapted to be inserted in the perforations and through the hat, with a hanger pivoted in the hinge-bearings, provided with a projection upon its heel for engagement with the spring on the clip, as and for the purpose set forth.

397,600. CAR-COUPLING. ARTHUR MCLEAN, Bettington, assignor of one-half to Jefferson Valentine Knight, Orpha, W. Va. Filed Nov. 28, 1888. Serial No. 292,107. (No model.)



Claim.—The combination, with a car and its truck, of a draw-head secured to the truck and having its free end rounded and provided with a horizontal recess, a bumper cast in a single piece and provided with a horizontal tenon adapted to fit within the horizontal recess in the draw-head, a chamber open at its top and end formed within the bumper, a latch pivoted at one of its ends within said chamber and provided at its free end with an arrow-shaped head, chains H, connecting the bumper with the truck, and chain I, connecting the latch with a point upon the roof of the car, substantially as described.

397,601. FARE-REGISTER. JOHN W. MEAKER, Chicago, Ill., assignor to the Railway Register Company, same place. Filed Jan. 19, 1888. Serial No. 261,220. (No model.)



Claim.—1. The combination, with the chains of a fare-register, of a pull-bar, 10, having side arms, sliding blocks connected with said arms, a bar carried by the sliding blocks, and pawls on the bar for advancing the chains, substantially as described.

2. The combination of a pull-bar, 10, having side arms, connecting-pins 17, tapered both ways, sliding blocks 18, connected with the side arms by the pins, a supporting-bar carried by the blocks, and actuating-pawls on the bar, substantially as described.

3. The combination of a pull-bar, 10, having side arms, sliding blocks connected with the arms and tubes 20 and 21, and posts 23, affording supports and guides for the blocks, substantially as described.

4. The combination of the pull-bar 10, side arms, 11 and 12, pins 17, tapered both ways from the center, and sliding blocks 18, with the tubes 20 and 21 and posts 23, substantially as and for the purpose specified.

5. The combination, with the fare-register chains and their pivot-pins, of the plates 24, connected by transverse tubes 26, and having flanges 25 and 26, forming a trackway for the chain-pivots, substantially as described.

6. The combination, with the chains of a fare-register, of the actuating-pawls, each formed with side flanges and a perforated head, the pivot-wire 45, passing through the heads, and the reciprocating bar carrying the pivot-wire, substantially as described.

7. The combination, with the chains of a fare-register, of reciprocating bar 47, having recesses 49, provided with inclined faces, the pivot-wire 45, carried by the bar, and chain-actuating pawls carried by the pivot-wire, substantially as described.

8. The combination, with the chains of a fare-register, of the reciprocating bar 47, having recesses 49, provided with inclined faces, the pivot-wire 45, carried by the bar, a series of actuating-pawls having side flanges and mounted on the pivot-wire, and a spring, 46, for each pawl, arranged on the pivot-wire and bearing on the bar, substantially as described.

9. The combination, with the chain-links and the pivot-pin 35, therefor, of a catch, 50, having a flange, 51, with a recess, 52, having

a straight wall, 53, and a curved wall, 54, for engaging the end of the pin 35 and locking the chain against back rotation, substantially as specified.

10. The combination, with the chain-links and the pivot-pin 35 therefor, of a catch, 50, having on each side a flange, 51, with recesses 52, for engaging the end of the chain-pivot and holding the chain against back rotation, substantially as specified.

11. The combination, with the chain-links, the pivot-pin 35 therefor, the catch 50, having a flange, 52, and pivot-rod 55, of a spring, 56, and a stop-rod, 57, for holding the catch 50 engaged, substantially as described.

12. The combination, with a series of registering-chains formed of links connected by pivots 35, of a series of catches, 50, each having a side flange, 51, provided with a notch, 52, a pivot-wire, 55, common to all the catches, a spring, 56, for each catch, and a stop-wire, 57, for the springs 56, substantially as and for the purpose specified.

13. The combination, with the chain-links, the pivot-pin 35 therefor, and the main pull, of a stop-finger, 58, rock-shaft 59, and means for rocking the shaft from the main pull to release the finger, substantially as specified.

14. The combination, with the chain-links, the pivot-pin 35 therefor, and the main pull, of a stop-finger, 58, a rock-shaft, 59, an arm, 60, carrying a pin, 61, and a cam, 62, on the arm of the pull-bar for operating the stop-finger, substantially as and for the purposes specified.

15. The combination, with a series of registering-chain links, pivots 35 therefor, and the pull-bar 10, having arms, of a series of stop-fingers, 58, a rock-shaft common to all the fingers, an arm, 60, carrying a pin, 61, and a cam, 62, on an arm of the pull-bar for releasing and engaging the stop-fingers and pivots 35, substantially as and for the purpose specified.

16. The combination of the chain-links having the pivot-pins 35, the rock-shaft 59, having stop-fingers 58, and provided at one end with an arm, 60, having a cam, 63, and lateral pin 61, the pull-bars 10 and 65, a set of pawls connected with each pull-bar, and means, substantially as described, for acting on the cam and pin of the arm by the movements of the pull-bars to turn the rock-shaft and swing the fingers, substantially as described.

17. The combination, with the chain-links and the pivot-pin 35 therefor, of a pull-bar, a stop-finger, 58, rock-shaft 59, arm 60, having a cam, 63, and a cam, 64, on the pull-bar for resetting a trip-register, substantially as and for the purposes specified.

18. A rod, 59, carrying a series of stop-fingers, 58, and an arm, 60, carrying a pin, 61, and having a cam, 63, in combination with a main pull-bar provided with an arm having a cam, 62, and a resetting pull-bar having a cam, 64, for operating the stop-fingers from either pull, substantially as described.

19. The combination, with the chains, the supporting-frames 24, and the projecting pivot-pins 35, of pivoted stop-catches 50, composed of plates having notched side flanges to engage the projecting ends of the pivots, substantially as described.

20. The combination, with the chains, the supporting-frames 24, and pivot-pins 35, of the pivoted catches 50, each having notches provided with the straight face 53 and curved face 54, substantially as described.

21. The combination, with the frames 24, the chains, and the projecting pivot-pins 35, of the catches pivoted above the chains and having side flanges, 51, provided with notches having straight faces 53 and curved faces 54, substantially as described.

22. The combination, with the casing, the chains, the resetting pull-bar 65, and its pawls for resetting the trip-chains, of a slotted tube located in the casing and inclosing and forming a bearing for the said pull-bar, substantially as described.

23. The combination, with the chains of the trip-register, of the pull-bar 65, the pawl-supporting bar 77, projecting at right angles therefrom and provided with recesses 78, and the resetting-pawls 80 and 81, pivoted in said recesses of the supporting-bar, substantially as described.

24. In combination with the pull-bar 65, bearing tube 66, bar 77, provided with recesses 78, having inclined faces, and pawls 80 and 81, with the pivot-wire 82, springs 83, and the chains of a trip-register for resetting the chains, substantially as specified.

25. The combination, with the trip-chains and the canceler therefor, of the tube 66, having the slot 84, the pull-bar inclosed and guided by the tube, the plate 87, having the stop 88 and the lateral arm 86, projecting through the slot in the tube, the shaft 97, having the arm 96 and connected with the canceler, the spring 97, and the resetting-pawls connected with said pull-bar, substantially as described.

26. The combination, with the trip-chains having pins 102 and 103, the pull-bar 65, and the resetting-pawls, of the cancelers 100 and 105, the shafts 97 and 106, having arms 96 and 108, the plate 93, having the stop 94, the plate 87, having the stop 88 and arm 86, and springs 95, substantially as described.

27. The combination, with the trip-chains having pins 102 103, the tube 66, having the slot 84, the pull-bar 65, inclosed by the tube, and the resetting-pawls connected with the pull-bar, of the plate 92, carrying the pivot 90, the cancelers 100 and 105, the shafts 97 and 106, having arms 96 and 108, the pivoted plate 93, the pivoted plate 87, having the ear 110, and the arm 86, extending through the slot in the tube, and the springs 95, substantially as described.

28. The plate 87, having the ear 110, and plate 93, having the stop 94, in combination with the trip-chains, a stop-arm, 108, shaft 106, and canceler 105, for operating the canceler, substantially as specified.

29. The arm 86, plate 87, having a stop, 88, and ear 110, in combination with the cancelers, the trip-chains, and the plate 93, having the stop 94, for operating the cancelers for a trip-register chain by the movement of the arm 86, substantially as described.

30. The plates 87 and 93, each having a stop, a spring, a pivot for the plates, and a connection between the two plates, in combination with the cancelers 100 and 105, and a connection between each canceler and the stop of the plate for operating the cancelers, substantially as specified.

31. The pull-bar 65, having the incline 85, tube 66, having the slot 84, arm 86, plate 87, having the stop 88, ear 110, plate 93, having the stop 94, pivot 90, and spring 95, in combination with the stop-arms 96 and 108, shafts 97 and 106, springs 98 and 107, and cancelers 100 and 105, substantially as and for the purpose specified.

32. The combination, with the trip-chain, of a canceler movable across the chain, a shaft carrying the canceler and having a stop-arm, a pivoted swinging plate having a stop to engage the stop-arm, and a stop-pin for limiting the throw of the stop-arm when released from the stop of the pivoted plate, substantially as described.

33. The combination, with the cancelers, the trip-register chains, the resetting pull-bar for a trip-register, and an arm operated by the movement of the pull-bar, of pivoted swinging stop-plates, one engaging the other by a lip, and actuated by the arm to release the cancelers for the chains of the trip-register, substantially as specified.

34. The pull-bar 65 and bar 114, having pin or pivot 115, in combination with the cancelers, the chains, the plate 116, having the groove 117, and the guide 118, for preventing the turning of the plate without operating the canceling devices for the chains of a trip-register, substantially as specified.

35. The combination, with the chains, the actuating-pawls, and the pull-bar for moving the pawls, of the stop-pins 123 and 124, and the vibrating arm 119, pivoted on the pull-bar, and having recesses 122 at one end and hooks 121 at the other end, substantially as described.

36. The combination, with a pull-bar, 10, and a vibrating arm, 119, having hooks 121 and recesses 122, of a series of pins 123 and a series of pins 124, for locking the pull-bar against return until the full travel has been made, substantially as specified.

37. The combination, with a pull-bar, 10, and vibrating arm 119, having hooks 121 and recesses 122, of a series of pins 123 and a series of pins 124, and stops for engaging the end of the vibrating arm at the limit of the pull for turning the arm, substantially as and for the purposes specified.

38. The combination, with the pull-bar 10, of a vibrating arm, 119, having a frictional contact for holding the arm against movement by a jar, and stop-pins for engaging the vibrating arm and locking the bar against a return movement, substantially as and for the purposes specified.

39. The combination, with a bell, 130, hammer 131, cam 135, and stem 136, of a pull-bar, a sliding bar, 141, carrying the stem, and a connection between the sliding bar and the pull-bar for sounding an alarm at the completion of the registry, substantially as specified.

40. The bell 130, hammer 132, roller 134, cam 135, stem 136, and shaft 137, in combination with the spring 138, bracket 140, sliding bar 141, pin 143, and pull-bar 10, substantially as and for the purposes specified.

41. A fare-register comprising a casing having the edge opening 155, and containing numeral-bearing devices and means for operating said devices to register the fares, and provided with the seal 153, the sliding cover 3, carrying spring-pawls 147, and the pivoted lever-arm 149, extending across the seal and having the plate 148 to move the pawls, substantially as described.

42. A fare-register comprising a casing having the edge opening 155, and containing numeral-bearing devices and means for operating said devices to register the fares, and provided with the seal 153, the sliding cover 3, carrying the spring-pawls 147, the pivoted lever-arm 149, extending across the seal, the bar 152 behind the seal, and the screw 151, passing through the bar, to hold the seal and prevent the unlocking movement of the lever-arm until the seal is broken, substantially as described.

43. The combination, with a fare-register having its face-plate provided with a sight-opening and key-holes, of a vertically-sliding plate having a notched locking-bar, 163, the recessed spring-fingers 165, and the recessed bar 168, substantially as described.

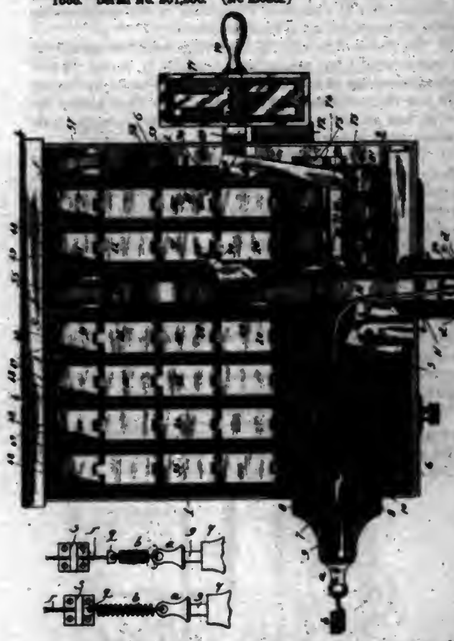
44. The combination, with the casing of a fare-register having an edge opening and a frangible seal, of a sliding face-plate or cover provided with locking devices located on its inner side to engage behind the edge of the said opening, and an adjustable plate mounted on the casing and concealed behind the seal to move the locking devices into line with said edge opening, substantially as described.

45. A face-plate having a sight-opening and carrying a covering-plate for the sight-opening having a locking-bar, in combination with spring-fingers coacting with the locking-bar to lock the covering-plate in a closed or open position, substantially as specified.

46. A face-plate provided with a sight-opening and with key-slots having a larger diameter at one end than at the other, and a covering-plate carried by the face-plate and having a locking-bar, in combination with spring-fingers having notches and coacting with the locking-bars and keys having unlocking-pins of different diameters, substantially as and for the purpose specified.

47. A face-plate having an opening, in combination with a covering-plate for the opening, a locking-bar, 163, having slots 164, spring-fingers 165, having recesses 166, and support 168, having recesses 167, for locking the covering-plate either open or closed, substantially as and for the purposes specified.

397,602. FARE-REGISTER. John W. Meaker, Chicago, Ill., assignor to the Railway Register Company, same place. Filed Jan. 19, 1888. Serial No. 261,230. (No model.)



Claim.—1. The combination of a casing, the traveling chains therein, a pull-bar, 15, having a direct reciprocating movement, and actuating-pawls carried by said pull-bar to advance the chains, and a side pull-bar, 9, sliding lengthwise in the casing and connected with the pull-bar carrying the pawls, substantially as described.

2. The combination, with a casing, traveling register-chains therein, a pull-bar, 15, having a direct reciprocating movement, and pawls carried by said pull-bar to advance the chains, of a wheel, 12, mounted in bearings located inside the casing, a side pull-bar, 9, sliding lengthwise through the casing, and a strap, 11, passing over the wheel and connecting the two pull-bars, substantially as described.

3. The combination, with registering devices and a casing inclosing the same, of a lengthwise-reciprocating rigid pull-bar arranged and guided in the casing and carrying actuating-pawls, and a rigid side pull-bar sliding lengthwise through the side of the casing, a flexible connection, 11, between the pull-bars, and a support for the flexible connection inside the casing, substantially as described.

4. The combination, with the casing and the traveling chains of a register, of a reciprocating pull-bar, 15, having longitudinal slots, grooved wheels having the hubs between the flanges arranged, respectively, in the slots of the pull-bar for carrying and guiding the latter, pawls for advancing the chains, a side pull-bar, and a connection between the pull-bars, substantially as described.

5. The combination, with registering devices of a register, of a lengthwise-reciprocating pull-bar having slotted ends, and grooved carrying-wheels having the hubs between their flanges extending through the slots in the bar, substantially as described.

6. The combination, with the register-chains, of a lengthwise-reciprocating pull-bar having a slot at each end, grooved wheels having hubs respectively extending through the slots of the bar, and pawls for advancing the chains, substantially as described.

7. The combination, with the registering-chains, of a reciprocating pull-bar having a solid portion, 18, and a slot in each end, grooved wheels having the hubs between their flanges respectively extending through the slots, bearings for the wheels, a pawl-carrying bar secured to the solid part of the pull-bar, and the pawls on the said carrying-bar, substantially as described.

8. The combination, with the registering devices of a register, of a longitudinally-slotted pull-bar, carrying and guide wheels, each comprising two flanges embracing the bar and connected by a hub extending through the slot, bearings passing through the hubs, and pawls operated by the pull-bar, substantially as described.

9. The pull-bar 15, having a slot at each end, and grooved wheels 20 and 22, in combination with the tubes 23, 24, and 25, for supporting the grooved wheels, substantially as set forth.

10. The tubes 23, 24, and 25, in combination with the frame-plates 26, grooved wheels 20 and 22, and pull-bar 15, substantially as and for the purposes specified.

11. The combination, with the chains of a register, of the rock-shaft 51, having stop-fingers 50 and arms 55 and 57, the pull-bar 15, having a cam, 56, and the pull-bar 60, having a cam, 58, for releasing the stop-fingers by the movement of either bar, substantially as described.

12. The combination, with the trip-chains of a register, of the resetting-bar 60, having the lateral bar 69, provided with a handle, 70, the guide-plate 72, and the plate 71, journaled on the lateral bar, substantially as described.

13. The bar 60, having a slot at each end, and a groove, 63, in its side face, in combination with the grooved wheels having one flange of a diameter to fit within the groove 63, for guiding and supporting the pull-bar 60, substantially as and for the purpose specified.

14. The combination of the register-chains, the pawls, the pull-bar 60, having a slot at each end, the grooved wheels carrying and guiding the bar, the tubes 68, and the tubes 25, substantially as described.

15. The tubes 23, 24, 25, and 68, in combination with the frame-pieces 26, pull-bars 15 and 60, and grooved guiding and carrying wheels for the pull-bars for securing the several parts together, substantially as described.

16. The combination, with the pull-bar and bell of a register, of a bell-hammer having an engaging projection and a cam having steps coacting with the projection to prevent the return of the pull-bar until the limit of the pull is reached, substantially as described.

17. The bell-hammer 101, having a cam, 102, and stepped cam 103, in combination with a bell, a pull-bar, 15, the stem 104, and spring 106, substantially as and for the purposes specified.

18. The combination, with the pull-bar of a register and a bell, of a bell-hammer having an engaging projection, and a fixed stepped cam, 103, having engaging-notches *m*, coacting with the projection to prevent the return of the pull-bar in either direction until the limit of the pull is reached, substantially as described.

19. The pull-bar 15, bushing 106, ring 107, spring 108, and pin 109, in combination with the stem 104, stepped cam 103, cam 102, bell-hammer 101, and bell 99, substantially as and for the purposes specified.

20. The combination, with the bell and pull-bar of a register, of a swinging stem connected with the pull and having a hammer provided with a projection, a stepped cam coacting with the projection, and a coiled spring connected at one end with the pull-bar and at the other end with the swinging stem to throw the hammer and sound the alarm and to restore the hammer to its normal position after the alarm has been sounded, substantially as described.

21. A fare-register consisting of a casing having edge notches, *o*, and containing numeral-bearing devices and means for operating the same to register the fares, and provided with a frangible seal, 120, a sliding face-plate, 110, having spring-catches 112, a slotted slide-plate behind the seal for releasing the catches, and a set-screw, 116, to secure the sliding plate in a fixed position behind the seal and hold the latter in place, substantially as described.

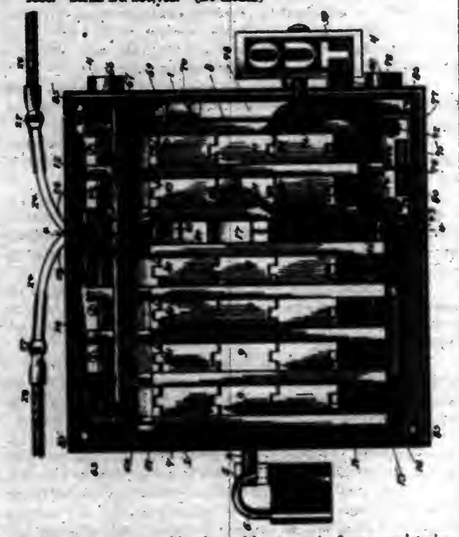
22. The combination, with the pull-bar 15 and a bell of a register, of a stem, 104, having a bell-hammer, 101, provided with a projection, 102, a stepped cam having notches *m*, a lengthwise-sliding side pull-bar, 9, a connection, 11, between the two pull-bars, the pull-cord *r*, and the spring *b*, connecting the cord and side pull-bar to relieve strain when the bell-hammer engages the notches of the stepped cam, substantially as described.

23. A fare-register comprising a casing having a notched edge *o*, and a frangible seal, 120, and provided with numeral-bearing de

vices, means for operating the same to register the fare, the sliding face-plate having spring-catches 112, the support 116 behind the seal, the slotted sliding plate 114, and the set-screw 113 in said support passing through the sliding plate and bearing upon the seal, substantially as described.

24. The combination, with the casing and the registering-chains of a register, of an air-cushion cylinder secured on and carried by the casing, and a pull-bar carrying chain-actuating pawls and having a disk entering the cylinder to prevent a quick return of the pull-bar after its advance to move the chains, substantially as described.

397,608. FARE-REGISTER. JOHN W. MEAKER, Chicago, Ill., assignor to the Railway Register Company, same place. Filed July 23, 1888. Serial No. 280,782. (No model.)



Claim.—1. The combination, with the main frame, registering chains, and chain-actuating mechanism of a fare-register, of a supporting-piece, 16, having a chamfer, 15, the chain-frames having flanges 14, seated on the chamfer, and the clamping-plates 12, secured to the chamfered piece and bearing against the flanges of the chain-frames, substantially as described.

2. The combination, with the frame and the numeral-bearing devices of a fare register, of a main pull-slide, 17, located in the frame, and a pull-strap, 24, divided longitudinally into parts of equal length, each extending into the frame through an opening and connected to said slide, substantially as described.

3. The combination, in a fare-register, of a main frame having an opening, 25, numeral-bearing chains, and chain-frames, of a guided main pull-slide, 17, for actuating the chains, and a pull-strap, 24, divided longitudinally into two parts of equal length, each extending into the frame through said opening and secured to the said slide, substantially as described.

4. The combination, in a fare-register, of the bell and the main pull-slide 17, having a pull-strap connected with one side thereof, a bell-hammer secured to the slide in a direct line with the pull-strap, and a stepped cam, 33, located in a direct line with the bell-hammer and pull-strap, and with which cam the bell-hammer engages in said direct line, substantially as described.

5. The combination, with the bell, the main pull-slide, and the pull-strap of a fare-register, of a stepped cam and a bell-hammer connected with the slide in a direct line with the pull-strap and stepped cam, said strap acting in direct line with said bell-hammer and cam, substantially as described.

6. The combination, in a fare-register having a bell, of a main pull-slide, 17, provided with a bell-hammer, 29, having a friction-roller, 32, and a beveled pin, 37, and the stepped cam 33, having a notch, 36, to receive the roller and permit the pin to engage the cam, substantially as described.

7. The combination, in a fare-register having a bell, of a fixed stop-pin, 39, located near the bell, a main pull-slide, and a bell-hammer, 29, carrying an attached cushion, 38, which strikes the stop-pin on the return movement of the slide and prevents the hammer rebounding and double ringing the bell on a single registration, substantially as described.

8. The combination, in a fare-register, of a main pull-slide, 17, a bell-hammer having a pin, 37, roller 32, and cushion 38, a stepped cam, 33, having a notch, 36, a bell, 31, and a stop-pin, 39, near the bell, substantially as described.

9. The combination, with the frame of a fare-register having a guide-slot, 23, and the registering-chains, of a slide for actuating the chains, having a lateral guiding projection, 22, extending into the slot and provided at each end with a buffer to strike the ends of the slot and limit the motion of the slide, substantially as described.

10. The combination, in a fare-register, of the total-registering chains, the main pull-bar having a cam, a rock-shaft having stop-fingers for the total-chains and an arm to engage with the cam, the trip-register chains, the resetting-slide having a cam, and a second rock-shaft having stop-fingers for the trip-register chains, an arm to engage the cam on the main pull-slide, and an arm to engage the cam on the resetting-slide, whereby the chains for both registers may be simultaneously operated for counting and the trip-register separately released for resetting, substantially as described.

11. The combination, with the registering-chains, of the chain-frame, the tubes secured in the chain-frame, the rollers mounted on the tubes, the locking-pins passing through the tubes, and the slide moving on the rollers and having overhanging edges which prevent the withdrawal of the pins, substantially as described.

12. The combination, with the registering-chains and chain-actuating mechanism of a fare-register, of the canceler 71, having the projections 74, the spring for throwing the cancelers across the chains, the resetting-slide, and a stop-arm, 76, actuated by the resetting-slide to release the cancelers, substantially as described.

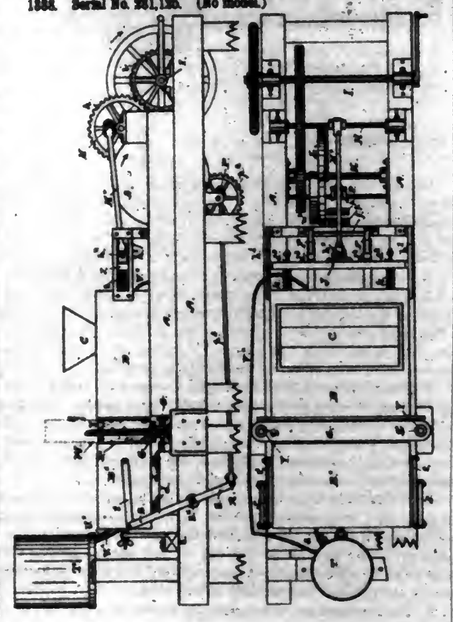
13. The combination, with the registering-chains and chain-actuating mechanism of a fare-register, of the canceler 71, having the projections 74, the spring 73, the stop-arm 76, the cross-bar 77, having the arm 78, and the resetting-slide 48, having a notch, 79, to receive the end of the arm on said cross-bar when the parts are in normal position, substantially as described.

14. The combination, with the registering-chains and chain-frame of a fare-register, of a main pull-slide, 17, having a cross-bar, 44, provided with a pin, 45, and a plate, 47, secured in the chain-frame and having a slot, 46, receiving the end of said pin to secure a correct movement of the outer end of the cross-bar, substantially as described.

15. A fare-register composed of a main frame containing the registering mechanism and provided with a front case, 83, having a sight-opening, 87, containing a glass, 88, the surrounding frame 89, holding the glass, and the spring-plate 90, having the lip 91, closing one end of the said surrounding frame, substantially as described.

16. A fare-register comprising a main frame provided with the registering-chains and their actuating mechanism, and having the projecting bar 3 at one side and two holes at the opposite side, and the base-plate 4, having a staple, 5, receiving said pin, and two pins, 2, entering said holes, substantially as described.

397,604. BRICK-MACHINE. JOSEPH MORHARD, San Francisco, Cal., assignor of one-half to Adolph Both, same place. Filed July 26, 1888. Serial No. 281,125. (No model.)



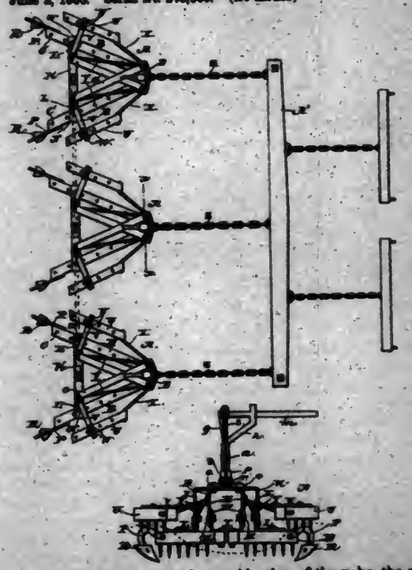
Claim.—A machine for molding bricks, building-blocks, and like articles, having a two-part separable mold, of which one part is fixed and has a moving head or presser and the other part is movable and has a fixed head, as described, a cutting device adapted to work between the said two parts when separated to cut off that portion of material lying between the line of separation and the said fixed head, a movable table or elevating device adapted to receive and raise the cut-off portion clear of the mold, and mechanism, substantially as described, in combination therewith, to operate the movable part of the mold, the cutter, and the table with respect to one another, as set forth.

2. In a brick-molding machine, the combination of the two-part mold having one part fixed with a movable head or plunger in it and an opening for the introduction of the material, and the other part movable and separable from the said fixed part with a fixed head set therein, a cutting device placed for operation at the line of separation of the said parts and adapted to work between them when separated, an elevating-table also placed for operation at the same point to pass between the said parts when separated, and mechanism whereby the said plunger, movable part of the mold, cutter, and elevating-table are operated with respect to one another and in time, as set forth.

3. In combination with the plunger or movable head, the stop device consisting, essentially, of the cross-head having connection with the crank-shaft, the rods, springs, notched bars, pawls, and connecting-rod, applied for operation substantially as described.

4. In combination with the fixed part B and the movable head D working therein, the movable part B^x, and the fixed head D^x, which is adjustable therein, substantially as and for the purpose described.

397,605. HARROW. HUGH A. MURPHY, Elk City, Kans. Filed June 2, 1888. Serial No. 275,908. (No model.)



Claim.—1. In a harrow, the combination of the yoke, the right-angled coupling-irons bolted to the vertical arms of the yoke and having the adjusting-openings in the horizontal arms, and the beams bolted to and laterally adjustable on horizontal arms of the coupling-irons, substantially as described.

2. The combination of the harrow, and the side beams or wings arranged above the beams of the harrow and adapted to play vertically, substantially as set forth.

3. The combination of the yokes, the harrow-beams secured thereto, the arms and link-rods flexibly secured to the yokes and projecting laterally therefrom, and the side beams or wings secured to the outer ends of said arms and link-rods and supported thereby above the harrow-beams, as set forth.

4. The combination of the harrow-sections having the U-shaped connecting-yokes, the side wings or beams, the arms hinged to the rear yoke and projecting outwardly therefrom, the link-rods loosely connected to the front yoke, the side beams or wings being secured to the said link-rods, and secured to and laterally adjustable on the arms, substantially as described.

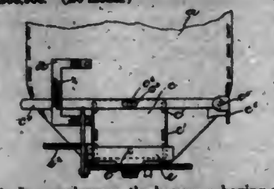
5. The combination of the harrow-section, the evener-bar attached thereto, the standards *c*, having their lower ends pivotally secured to the harrow-sections, and the jointed rods *m*, connecting the upper ends of the said standard, substantially as described.

6. The combination, with the harrow-sections, of the standards *c*, pivotally connected thereto and adapted to vibrate laterally, and the rods *m*, having their inner ends connected to the central standard, *a*, by the ball-and-socket joint, and their outer ends pivotally attached to the outer standards, *c*, substantially as described.

7. The combination, with the harrow-sections, of the standards *c*, having their lower ends pivotally attached thereto, the vertically-adjustable boxes or straps *o*, arranged on the standards and having the arms *r* adapted to engage the upper sides of the harrow-sections, for the purpose set forth, and means, substantially as specified, connecting the upper ends of the standards, substantially as described.

8. The combination, with the harrow-sections, of the standards *c*, having their lower ends pivotally connected thereto, the brackets *g* at the upper end of the outer standards, having the inwardly-extending arms *h*, provided with the vertical guides *i*, the stirrup *k*, pivoted to the upper ends *c* of the said outer standard, and the rods *m*, having their inner ends secured to the upper ends of the central standard by ball-and-socket joints and their outer ends passed through the guide-ways *i* and secured to the stirrups *k*, substantially as described.

397,606. SEED-SOWER. WILLIAM A. C. OAKE, Antrim, N. H., assignor to the Goodell Company, same place. Filed Oct. 20, 1888. Serial No. 288,908. (No model.)

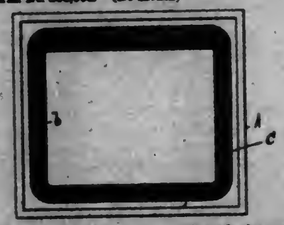


Claim.—1. In a seed-sower, the hopper *a*, having an exit-orifice, and the rotatable distributer for scattering the seed delivered from the said orifice, combined with a valve-plate movable to vary the width of the said orifice from end to end, substantially as described.

2. In a seed-sower, the hopper *a*, having an exit-orifice, and the rotatable seed-distributer, combined with a movable valve-plate for the said orifice, and the pivoted valve-plate *e* thereon, for varying the width of the orifice from end to end unequally, substantially as described.

3. In a seed-sower having an exit-orifice, the rotatable seed-distributer, combined with the sliding valve-plate *e* and hand-lever for moving it, and the movable plate *e* and hand-lever for moving it at an angle with relation to the lower edge of the said valve-plate, substantially as and for the purposes set forth.

397,607. PROCESS OF PREPARING ELECTRODES FOR SECONDARY BATTERIES. LEONARD PAGE, New York, N. Y., assignor to the Maxtaem Storage Battery Company, same place. Filed Oct. 23, 1888. Serial No. 288,503. (No model.)



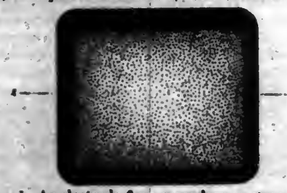
Claim.—1. The described process of producing an electrode for use in a secondary or storage battery, consisting in fusing a metallic substance which possesses electrical storage properties, and then subjecting this fused substance to the action of a properly-disposed reducing agent, which causes the metallic base to assume the position of a grid, frame, or support carrying the residual substance in the nature of active material, or material adapted to become active, substantially as described.

2. The described process of producing an electrode for a secondary or storage battery, consisting in fusing a metallic substance which possesses electrical storage properties, as lead oxide, and then subjecting this fused substance to the action of a reducing agent, as carbon mixed with niter, said reducing agent being placed in a mold in such position that as the fused substance is poured into the mold metallic lead is produced by the reducing agent and the residual substance assumes the position of active material, or material adapted to become active, and held in place by its union with the metallic base, substantially as described.

3. The described process of producing an electrode for use in a secondary or storage battery, which consists in forming the grid, frame, or support and the active material, or material adapted to become active, at one and the same operation, substantially as described.

4. The described process of producing an electrode for use in a secondary or storage battery, consisting in fusing active material, or material adapted to become active, and then subjecting this molten material to the action of a reducing agent, whereby an electrode is formed consisting of a support and active material, or material adapted to become active, so intimately united that there is no line of demarkation between the two, substantially as described.

397,608. ELECTRODE FOR SECONDARY BATTERIES. LEONARD PAGET, New York, N. Y., assignor to the Macrucon Storage Battery Company, same place. Filed Nov. 3, 1888. Serial No. 289,893. (No model.)



Claim.—1. An electrode for a secondary or storage battery, in which the active material, or material adapted to become active, and the grid, frame, or support merge into each other, substantially as described.

2. An electrode for a secondary or storage battery, in which the active material, or material adapted to become active, and the grid, frame, or support are merged into each other, the active material being held in place by the surrounding frame, substantially as described.

3. An electrode for a secondary or storage battery, in which the grid, frame, or support is of lead and the active material of a salt of lead, the two being merged into each other, so that it is not possible to distinguish any definite line of demarkation between them, substantially as described.

397,609. VEHICLE-AXLE STOCK. ANDREW PATERSON, McKeesport, Pa., assignor to the National Tube Works Company, Boston, Mass. Filed Aug. 1, 1888. Serial No. 281,613. (No model.)



Claim.—A hollow metallic axle-stock comprising the body A, having side walls, and the longitudinally-grooved lower surface or bottom, D, integrally united to the side walls of the body and forming the edges H, substantially as and for the purpose set forth.

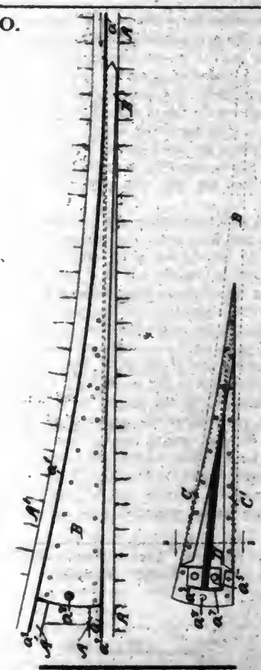
397,610. AUTOMATIC SWITCH FOR CABLE RAILWAYS. WILLIAM PERRIX, Chicago, Ill. Filed Aug. 21, 1888. Serial No. 283,306. (No model.)

Claim.—1. In an automatic switch for cable roads, the combination, with a supporting-standard, of the base-plate a^4, the fixed spring-head a^5, the cap a^6, cut out as described, the angle-plates C C', the composed spring D, the switch-plate secured to said angle-plates, and the pivot-bolt a^7, whereby the loose end of said switch-plate is adapted to have a lateral movement in a horizontal plane, substantially as and for the purpose set forth.

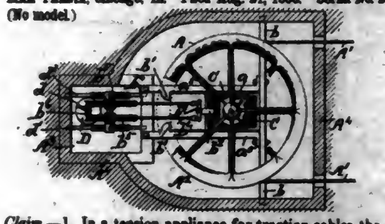
2. The combination, with a conduit-yoke having the bifurcated standard formed integral therewith, of the base-plate a^4, the fixed spring-head a^5, the cap a^6, provided with the recess a^7, the angle-plates C C', secured at their back ends to said cap, the spring D, having one end inserted in said head a^5 and the opposite end bearing alternately against the inner sides of said angle-plates, and the switch-plate loose at one end and pivoted at the other, the loose end being adapted to normally cover the grip-slot of the main line, whereby a train coming in one direction is thrown onto the turn-out and the main line automatically opened by a train passing in the opposite direction, substantially as set forth.



397,610. (Image)



397,611. TENSION APPLIANCE FOR TRACTION-CABLES. WILLIAM PERRIX, Chicago, Ill. Filed Aug. 21, 1888. Serial No. 283,304. (No model.)



Claim.—1. In a tension appliance for traction-cables, the combination, with the slide C, the hub whereof is rigidly mounted on the shaft B and provided on the upper end with the vertical annular rim a^3, of the tension-wheel A, loosely mounted on the upper end of the shaft B, the hub whereof is provided with an annular recess, with which the rim a^3 loosely engages, substantially as set forth.

2. In a tension appliance, the combination, with the traction-cable, of a tension sheave-wheel arranged in an inclined horizontal position, the shaft B, upon the upper end of which said wheel is loosely mounted, the slide C, arranged underneath said tension-wheel and rigidly mounted on the lower end of said shaft, means for supporting said slide, the draw-bar b^2, the evener-bar b^3, the weight-cables b^4 b^4, connected by their upper ends to the respective ends of the evener-bar b^3, the vertical companion sheaves b^5 b^5, the evener-bar b^6, to the respective ends of which are connected the lower ends of the weight-cables b^4 b^4, and the weight D, suspended from the longitudinal center of said evener-bar, substantially as and for the purpose set forth.

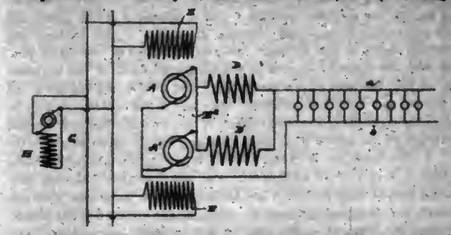
3. In a tension appliance for traction-cables, the combination, with the slide C, of the guides a^9 a^9, provided near one end with the stop-lugs, and the angle-bar b, supporting the opposite ends of said guides, substantially as and for the purpose set forth.

397,612. COMPOSITION FOR MAKING ARTICLES OF COMMERCE AND ART. FRANKLIN S. RANDALL, Philadelphia, Pa., assignor, by direct and mesne assignments, of two-thirds to Franklin S. Gibson and Theodore C. Avis, both of same place. Filed Aug. 9, 1888. Serial No. 282,345. (No specimens.)

Claim.—1. A composition formed of the intermixture of two parts of sawdust, four parts asbestus, one part alum, two parts dextrine, and six parts of glue mixed with one part of acetic acid.

2. A composition formed of the intermixture of sawdust, asbestus, alum, dextrine, and glue and acetic acid, substantially as and for the purposes described.

397,613. REGULATION OF DYNAMOS. EDWIN W. RICE, Jr., Lynn, Mass. Filed July 26, 1888. Serial No. 281,057. (No model.)

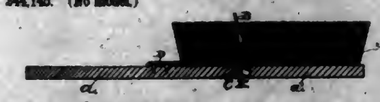


Claim.—1. The improved bank or battery of dynamos herein described, comprising two or more dynamos having their armatures connected in multiple arc to the mains through field exciting-coils, an equalizing connection or connections, E^2, between the armature-circuits, and separate field exciting-coils E of constant effect supplied from a common separate source, as described.

2. The improved bank or battery of dynamos herein described, comprising two or more dynamos having their armatures connected in multiple to the main through exciting-coils, equalizing-connections between the armature-circuits, and separate field exciting-coils of constant effect supplied in multiple from wires fed by the separate generator.

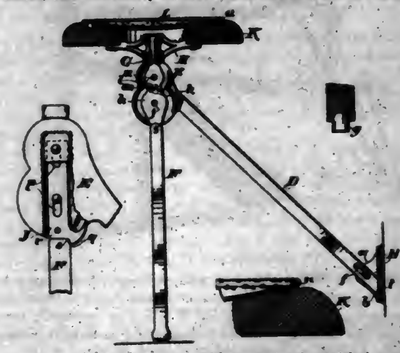
3. The improved bank or battery of dynamos herein described, comprising dynamo-machines having their armatures connected in multiple to the mains through field exciting-coils D D', &c., an equalizing-connection, E^2, between the armature-circuits, field exciting-coils E of constant effect for each dynamo, and a common supply-generator for the latter having a shunt-field, H, as described.

397,614. COMBINED HAIR-BRUSH AND COMB. WILLIAM J. SCOTT, Albany, N. Y., assignor to Jacob C. R. Scott, Helen M. Scott, and Martha J. Scott, all of same place. Filed July 13, 1887. Serial No. 244,145. (No model.)



Claim.—A comb combined with a hair-brush in the manner herein described, said comb being fixed amid the bristles of the brush and attached to springs, whereby the points of the comb-teeth will be normally held to project beyond the outer ends of the tufts of bristles and in such manner that the operations of combing and brushing can only be effected conjunctively, as and for the purpose herein specified.

397,615. COUNTER-STOOL FOR STORES. ALBERTUS O. SLEETH, Canton, Ohio. Filed May 22, 1888. Serial No. 274,716. (No model.)



Claim.—1. In a counter-stool, the combination, with the seat, of the reach adapted to be pivotally connected to the counter with one end and provided with a chambered head at its opposite end, the seat-supporting stem, the standard, and the latch, the said seat-supporting stem and the standard being geared together and having their gear portions inclosed within said chambered head, substantially as set forth.

2. The combination, in a counter-stool, of a reach pivoted at one end and provided at its opposite end with a chamber or inclosure, a seat-supporting stem pivoted in said inclosure, a seat journaled upon said stem, and a standard pivoted in said inclosure and having a geared engagement with said seat-supporting stem, substantially as set forth.

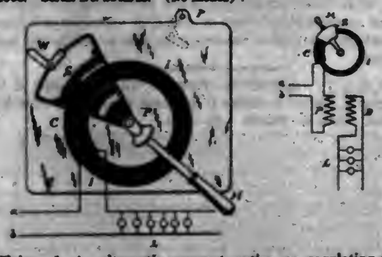
3. The combination, in a counter-stool, of a reach having one of its ends pivoted to the counter and provided at its opposite end with a chamber or inclosure, said chamber or inclosure constructed with a recess or depression in its side, a seat-stem pivoted in said inclosure and provided with a cogged head, a standard provided with a cogged head and a projection, a, said standard pivoted in said inclosure and having its cogged head meshing with the cogged head of the seat-supporting frame, and a latch sliding and concealed within the depression of the chamber, substantially as set forth.

4. The combination of the plate B, having lugs a, rib b, reach D, having a beveled end, t, elongated perforation f, and chambered head E, seat-supporting stem G, standard F, seat-support H and seat, and the latch J, substantially as described, and for the purpose set forth.

5. The combination, with a seat for a counter-stool adapted to be pivoted to and folded against the counter, of an elastic bead located upon the face of said seat, substantially as set forth.

6. The combination, in a counter-stool, of a reach pivoted at one end to the counter and provided with a chamber or inclosure at its opposite end, a seat-support pivoted within said inclosure, a standard pivoted within said inclosure and provided with a shoulder, s, and having a geared engagement with the supporting-stem, and a sliding latch concealed and sliding within said inclosure and adapted to engage the shoulder s and lock the stool in its normal position, substantially as set forth.

397,616. REGULATING AND MOTIVE DEVICE FOR ALTERNATING CURRENTS. ELIHU THOMSON, Lynn, Mass. Filed July 26, 1888. Serial No. 281,242. (No model.)



Claim.—1. An alternating-current motive or regulating device consisting of an iron core of endless form or inclosed magnetic circuit and two electric conductors encircling the same, the parts being properly mounted, as described, to permit change in the inductive relation of the two circuits or conductors, as and for the purpose set forth.

2. The herein-described device for use on alternating-current circuits, consisting of two or more circuits placed on a core whose magnetic circuit is closed and movable to a greater or less extent from the position where one is superposed upon another.

3. As a means of varying the self-inductive resistance in an alternating-current circuit, a closed coil or band adjustable over or under another coil or band placed on a core of iron of endless form included in the circuit whose self-induction resistance is to be varied.

4. The herein-described alternating-current motive or regulating device, consisting of a core on closed magnetic circuit, a coil or conductor on said core placed in an alternating-current circuit, and a second coil, conductor, or band movable over the same core or closed magnetic circuit and having its electric circuit closed on itself, as and for the purpose described.

5. The alternating or varying current motive or regulating device herein described, consisting of two or more conductors encircling a closed-circuit core and movable with relation to one another, as described, so that they may either produce a neutralization of one another's magnetic effects, or when removed from proximity may have each a self-induction due to their magnetizing action on the core.

6. The combination, with an alternating-current circuit containing translating devices—such, for instance, as incandescent lamps—of an adjustable reactive device consisting of a coil on a closed-circuit magnetic core, and a closed-circuit conductor applied to the same core and adjustable with relation to the coil.

7. The combination, with translating devices in an alternating-current circuit, of a regulator of the current flowing to the translating devices, consisting of a reactive coil connected to the circuit of said translating devices and placed on an iron core, and a coil or band on closed circuit and inductively related to the first-named coil, one or the other of said coils being partially counterbalanced and movable with relation to the other under the repulsive action to positions where a balance of repulsive and counterbalancing action may be established.

8. The combination, with the coil placed in an alternating-current circuit and surrounding an iron core, of a second closed band or coil whose inductive relation to the first is variable or adjustable, and

an electric switch connected to the circuit of the closed band or coil, as and for the purpose described.

9. The combination, with a reactive coil in an alternating-current circuit, of a second adjustable closed-circuit conductor in inductive relation to the core for the first coil, and an electric switch for interrupting the circuit of the adjustable conductor on a movement thereof to a predetermined extent.

10. The combination, with the core and coil in an alternating-current circuit, of a second conductor or band through and beyond which the said core or the magnetic extension thereof passes and adjustable in its inductive relation to the alternating-current coil, and a mass of iron external to both coils or conductors and parallel to or in close proximity to the portion of core beyond the second coil.

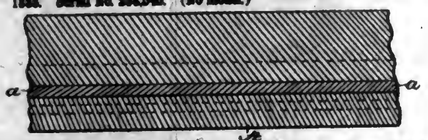
11. The combination, with the two coils or conductors movable with relation to one another on the same core, of an armature for one coil connected or movable with the other coil, as and for the purpose described.

12. The combination, with two or more circuits in parallel and each containing one or more translating devices, of a self-adjustable reactive coil in each branch and in the circuit with the translating device or devices of said branch, for the purpose described.

13. The combination, with a core and coil, I C, of a closed-circuit band or conductor let into a notch or depression in the iron mass parallel to said core, so as to bring the core and the part of the iron mass to either side of the closed-circuit band or conductor into close proximity.

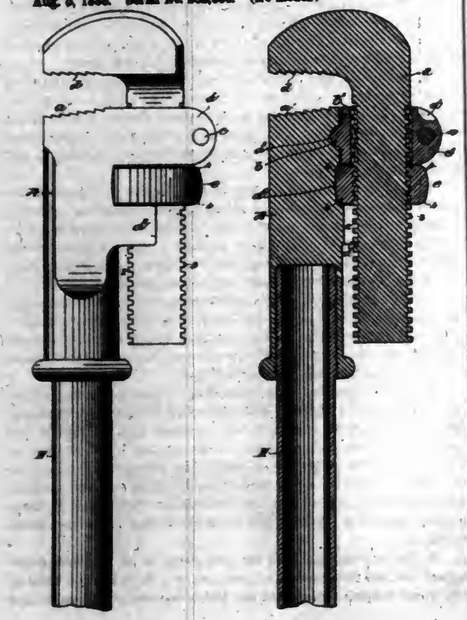
14. The combination, with the coil in one alternating-current circuit, of an iron core having a recess or depression to receive the coil, and a second circuit band or conductor encircling said core and adjustable in its inductive relation to the first, as and for the purpose described.

397,617. SLED-SHOE. FRANK W. TILDEN, Hinsdale, N. H., assignor of one-half to Charles D. Mortiman, same place. Filed Oct. 19, 1888. Serial No. 288,545. (No model.)



Claim.—As a new article of manufacture, the herein-described sled-shoe, consisting of cast-iron or other metal having bars cast within it during the operation of casting, one of which is provided with a dovetail groove for receiving a dovetail formed upon the runner, substantially as herein shown and described.

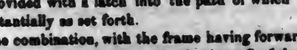
397,618. PIPE-WRENCH. JOHN H. VIETOR, Boston, Mass., assignor to the Trimont Manufacturing Company, Portland, Me. Filed Aug. 5, 1888. Serial No. 282,066. (No model.)



Claim.—1. The fixed jaw A of the wrench, it having a serrated portion, *a*, ears *a' a'* and *a² a²*, and a seat, *a³*, and the movable ⅂-shaped jaw having the serrated portion *d* and a threaded shank, combined with the rocker *b'*, mounted between the ears *a' a'* and between the threaded shank of the movable jaw and one edge of the fixed jaw, and with the ring-nut applied to the threaded shank of the movable jaw outside the said ears *a'* and at one end of the said rocker *b'*, all as shown and described, whereby one end of the said nut is free to take bearing entirely about the shank of the movable jaw and against the edges of the ears *a' a'*, as described, and for the purposes set forth.

2. The fixed jaw A of the wrench, it having the serrated portion *a*, ears *a' a'* and *a² a²*, and seat *a³*, and the movable ⅂-shaped jaw having the serrated portion *d* and threaded shank, combined with the rockers *b' b'*, mounted between the ears *a' a'*, the rocker *b'* being placed between the inner threaded edge of the movable jaw and the fixed jaw, and with the ring-nut applied to the threaded shank of the movable jaw outside the said ears *a'* and at the ends of the said rockers, the combination being in operation as shown and described.

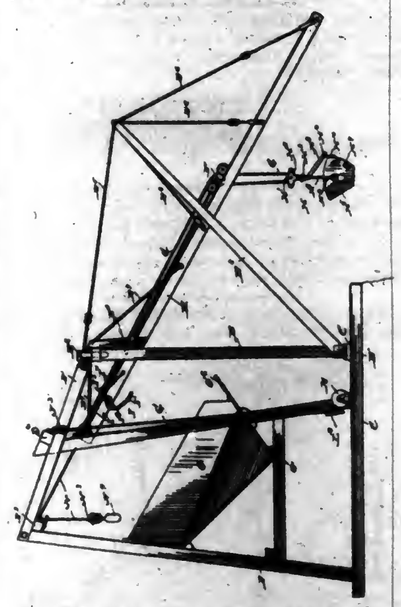
397,619. NEEDLE FOR SEWING-MACHINES. LEGRAN C. WING, Boston, Mass., assignor to the Union Button Sewing Machine Company, same place. Filed Dec. 19, 1887. Serial No. 258,333. (Model.)



Claim.—A sewing-machine needle having an abruptly-tapered conical point, *c d*, and a less abruptly-tapered portion above said point and below the eye, as set forth.

397,620. WITHDRAWN.

397,621. HOISTING-MACHINE. GEORGE J. ANDERSON, West Superior, Wis. Filed May 8, 1888. Serial No. 273,180. (No model.)



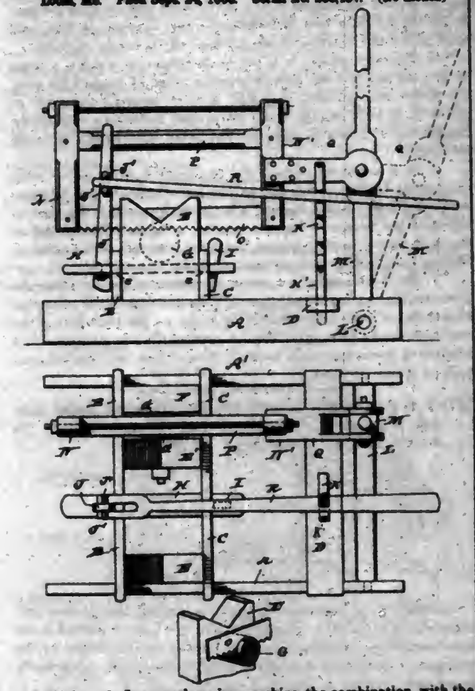
Claim.—1. The combination, with the frame D, having a hopper, O, of the vertical mast journaled in said frame in front of the hopper, and having an inclined boom, E, extending rearwardly beyond the mast into the frame over the hopper, and a carriage traveling on the boom past the mast, substantially as set forth.

2. The combination, with the supporting-frame, the vertical mast adapted to rotate and having an inclined truck-boom extending in rear of the mast at its upper end, and provided with a trip at said rear end, of a carriage traveling on the boom and carrying a dumping-bucket provided with a latch into the path of which said trip projects, substantially as set forth.

3. The combination, with the frame having forwardly-projecting top beams, D', and a forwardly-projecting base, C, of the vertical mast journaled in the said projecting parts of the beams and base, and having an inclined boom projecting at its rear or upper end beyond the mast, the carriage traveling on the boom, the rope N, passing over pulleys on the frame secured at its ends to the frame and having a weighted pulley, N³, suspended from it, the hoisting-rope G, secured to the carriage and having a traveling pulley, H', under the carriage, passing thence over a pulley on the carriage to a pulley on the frame, and the rope L, for turning the boom, substantially as set forth.

4. The combination, with the inclined boom and the carriage traveling thereon, of the tripping-lever I, pivoted at the upper end of the boom projecting forwardly thereunder, provided at its ends with upwardly-extending projections I², springs I³, connected to the boom and said projections, links I⁴, extending rearwardly from said projections, and the blocks I⁵, sliding on the boom in the path of the carriage and connected to said projection, whereby when the carriage forces the blocks rearwardly the lever I' will be operated, substantially as set forth.

397,622. WOOD-SAWING MACHINE. THOMAS J. BALDWIN, St. Louis, Mo. Filed Sept. 24, 1888. Serial No. 286,157. (No model.)



Claim.—1. In a wood-sawing machine, the combination, with the frame and the reciprocating saw, of a support for the wood to be sawed, and a vertically-rotating roller to one side of the said support below the saw, with its axis at right angles thereto and having a peripheral groove to receive the saw after it passes through the piece of wood, substantially as set forth.

2. In a wood-sawing machine, a base, A A', connecting cross-pieces B C D, each provided with an opening, a bar, H, provided with two openings, said bar being engaged in the openings in the cross-pieces B C aforesaid, a notched standard, J, provided with pins, and a wedge, I, said standard and wedge being engaged in the respective openings in the bar H, a notched bar, K, and wedge K', engaged in the opening in the cross-bar D, in combination with a support for receiving a stick of wood, a saw, and a lever jointed thereto, substantially as shown and described.

397,623. CARRIAGE FOR DIRECT-ACTING ROCK-DRILLS. GUSTAV A. HABTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Oct. 13, 1888. Serial No. 288,201. (No model.)

Claim.—1. The combination of a bed-plate having rollers *j* and supported thereby on planking *k*, screw-bolt (or bolts) *m*, having hook *n*, and nut *o*, means for rotating said nut, and a block or cradle, *a*, having bearings *b*, with a direct-acting steam or pneumatic engine provided with pivots or trunnions, substantially as shown, and for the purpose described.

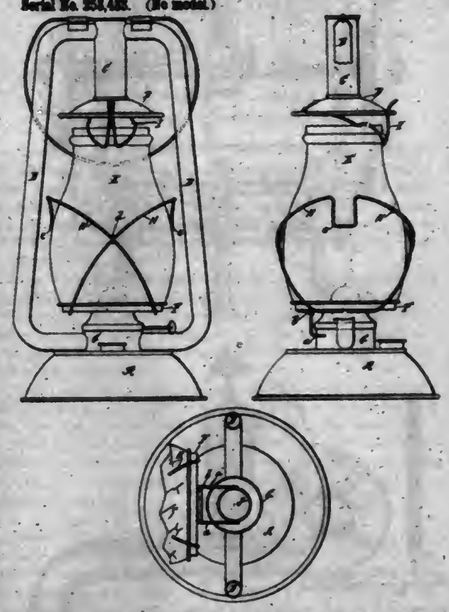
2. The combination of a bed-plate having rollers *j* and supported thereby on planking *k*, screw-bolt (or bolts) *m*, having hook *n*, collar *q*, and nut *o*, means for rotating said nut, and a block or cradle, *a*, having bearings *b*, with a direct-acting steam or pneumatic engine, provided with pivots or trunnions, substantially as shown, and for the purpose described.

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3. The combination of a bed-plate having rollers *j* and supported thereby on planking *k*, screw-bolt (or bolts) *m*, having hook *n*, collar *q*, nut *o*, and lever *p*, and a block or cradle, *a*, having bearings *b*, with a direct-acting steam or pneumatic engine provided with pivots or trunnions, substantially as shown, and for the purpose described.

397,624. LANTERN. LEWIS F. BEITS, New York, N. Y., assignor of two-thirds to The R. E. Dietz Company, same place, and to the Steam Gauge and Lantern Company, Rochester, N. Y. Filed Dec. 20, 1887. Serial No. 258,482. (No model.)



Claim.—1. In a lamp or lantern, the combination of the air-chamber, burner-collar located therein, the hinged bottom plate, and the support for the hinge, the said support passing through the wall of the air-chamber and being secured upon the burner-collar, substantially as explained.

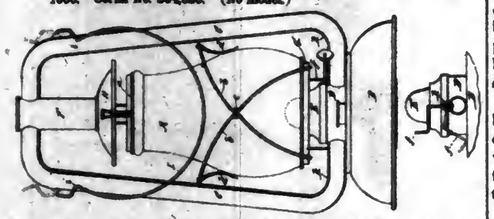
2. In a lamp or lantern, the combination of the oil-pot, burner-

collar, air-chamber, hinged bottom plate, and support for the hinge thereof, said support comprising horizontal and vertical portions of which the horizontal portions extend through the air-chamber and are located above the top of the oil-pot, and the vertical parts supporting the hinge axis, substantially as and for the purposes set forth.

3. In combination with the hinged bottom plate and the globe resting thereon, the crossed guard-wires bearing upon the globe at points above the swell therein, and arranged to hold the globe upon the bottom plate as the latter is moved upon the hinge, substantially as and for the purposes set forth.

4. In combination with the globe, the guard-wires crossing each other and secured together at the crossings, as explained, said wires bearing upon the globe at points above the swell therein, and arranged to yield above their points of union to permit the withdrawal and insertion of the globe, substantially as explained.

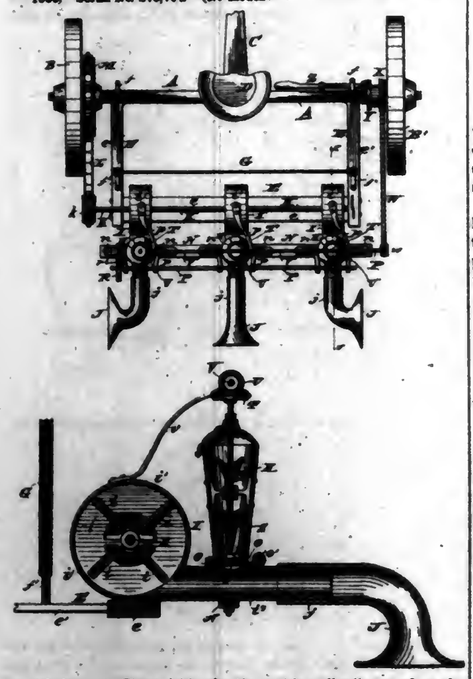
397,625. TUBULAR LANTERN. LEWIS F. BURR, New York, N. Y., assignor of two-thirds to The R. E. Dietz Company, same place, and the Steam Gauge and Lantern Company, Rochester, N. Y. Filed Feb. 21, 1888. Serial No. 264,826. (No model.)



Claim.—1. In a lantern, the combination, with the guard-wires, of the metal bearing pieces or projections bent upon and secured to the wires and arranged to bear against the globe, substantially as and for the purposes set forth.

2. In a lantern, the combination, with the globe and removable base-plate connected therewith and bearing the guard-wires, of the bent-wire catch provided with the gage passing through an aperture in the base-plate, substantially as shown, and for the purposes set forth.

397,626. MACHINE FOR DISTRIBUTING POISON ON PLANTS. GEORGE R. BROWN and JOHN W. BROWN, Pledger, Tex. Filed July 2, 1888. Serial No. 278,764. (No model.)



Claim.—1. The combination, in a poison-distributer, of an air-blast apparatus, a hopper for holding the poison and conducting it to the air-blast pipe, and an axially-adjustable bent discharge-nozzle fitted to said pipe, substantially as described, for the purposes set forth.

2. The combination, in a poison-distributer, of an air-blast apparatus, a hopper for holding the poison, and fitted with a valve controlling discharge of the poison into an air-blast pipe, and an agitator operating in the hopper to prevent clogging of the poison therein, substantially as herein set forth.

3. The combination, in a poison-distributer, of a sulky air-blast apparatus mounted thereon, a series of hoppers for holding the poison and discharging it into the air-blast pipes, a series of agitators journaled in the hoppers, a shaft to which all the fans are fixed, and belt-and-wheel connections from said shaft to one of the sulky-wheels, a shaft geared with the agitators of all the hoppers, and belt-and-wheel connections from said shaft to one of the sulky-wheels, substantially as described, for the purposes set forth.

4. The combination, in a poison-distributer, of a sulky, a series of air-blast fans thereon, a corresponding series of hoppers for holding poison and discharging it into the air-blast pipes, a shaft common to all the air-blast fans, and belt-and-wheel connections from said shaft to one of the sulky-wheels, substantially as herein set forth.

5. The combination, in a poison-distributer, of a sulky, a series of air-blast fans thereon, a corresponding series of hoppers for holding poison, and provided each with a valve controlling passage of poison to an air-blast pipe, and a worm-shaft connecting with all the hopper-valves to actuate them simultaneously, substantially as herein set forth.

6. In a poison-distributer, the combination, with one or more hoppers for holding poison, and having a discharge-opening, of a pivoted valve fitted to said opening, a worm-shaft to which the valve or valves of the hopper or hoppers connect, a notched hand-wheel on the shaft, and a pawl engaging the notches of said wheel, substantially as described, for the purposes set forth.

7. The combination, in a poison-distributer, of a sulky, three air-blast fans thereon, a poison-hopper communicating with the blast-pipe of each fan, a rearwardly-discharging nozzle on the blast-pipe of the central fan, and a bent nozzle fitted to each of the side blast-pipes and adapted to discharge poison to both sides of the machine, substantially as herein set forth.

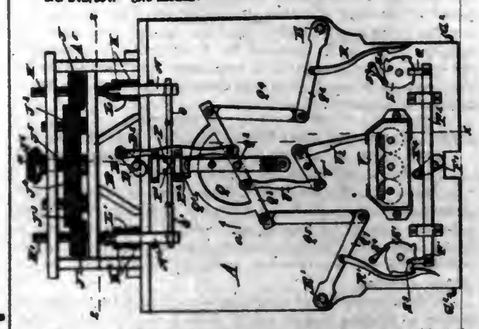
397,627. MUSIC OR BOOK HOLDER. HERBERT O. BROWN, Auckland, New Zealand. Filed Nov. 21, 1887. Serial No. 255,752. (No model.) Patented in Canada May 7, 1888, No. 28,100.



Claim.—1. A leaf-holder consisting of an attaching portion provided with spring-arms to engage the shelf, and a finger pivoted at the outer end of said attaching portion to swing at right angles to the spring-arms, and provided on its lower end with a weight, substantially as set forth.

2. As an improved article of manufacture, a music and book holder consisting of the spring-clip A, formed of a strip of metal bent twice at right angles, forming the outwardly-curved arms *a b* and the plain surface *c*, and the finger D, pivoted to the surface *c*, and provided with the weight A on its short arm, as set forth.

397,628. GRAIN WEIGHING AND REGISTERING MACHINE. WILLIAM H. H. BRUNTON, Elk City, Kans. Filed May 1, 1888. Serial No. 272,407. (No model.)



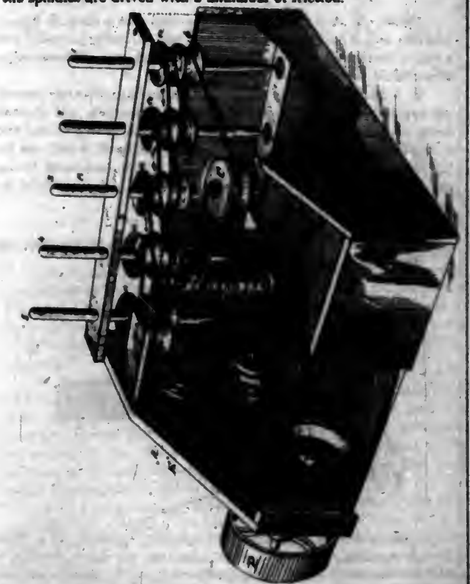
Claim.—1. In a grain measuring and registering-machine, the combination, with a box provided with two compartments and swinging bottoms held in the said compartments, of arms operated by the said swinging bottoms, hooks pivoted on the said arms, ratchet-wheels operated by the said hooks, a longitudinal bar receiving a sliding motion by the said ratchet-wheels, a shaft receiving a turning movement by the said bar, and a gate secured on the said shaft and onto which open the said swinging bottoms, substantially as shown and described.

2. In a grain measuring and registering machine, the combination, with a box provided with two compartments and swinging bottoms held in the said compartments, of arms operated by the said swinging bottoms, hooks pivoted on the said arms, ratchet-wheels operated by the said hooks, a longitudinal bar receiving a sliding motion by the said ratchet-wheels, a shaft receiving a turning movement by the said bar, and a gate secured on the said shaft and onto which open the said swinging bottoms, and hoppers located below the said swinging bottoms and carrying the bags to be filled, the said gate opening alternately in the said hoppers, substantially as shown and described.

3. In a grain measuring and registering device, the combination, with two hoppers and a gate secured to a shaft and opening alternately into the said two hoppers, of a crank-arm secured to the said gate-shaft, a longitudinally-sliding bar pivotally connected with said crank-arm, lugs projecting from the said bar, and ratchet-wheels having a turning movement and each provided with a pin operating on the said lugs so as to impart an alternate forward and backward sliding movement to the said bar to change the position of the said gate, substantially as shown and described.

397,629. DRIVING MECHANISM FOR SPINNING-SPINDLES. THOMAS L. BUTLER, Blackstone, Mass. Filed Oct. 18, 1888. Serial No. 288,509. (No model.)

Brief.—The object of the invention is to provide an improved construction and arrangement of the spindle-driving devices, whereby the spindles are driven with a minimum of friction.

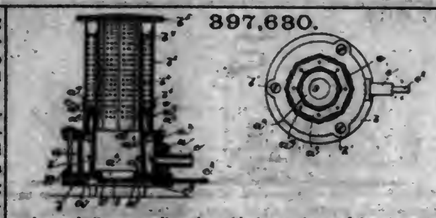


Claim.—1. The combination, with a series of spindles having double whirls, of a single continuous driving-belt wound around the whirls of the spindles in pairs, so as to have a double lap, as described, and a pair of multiple grooved drums arranged at one end of the series and having the belt wound around the same in multiple convolutions to positively actuate the belt, as described.

2. The combination, with a series of spindles having double whirls, of a single continuous driving-belt wound around the whirls of the spindles in pairs, so as to have a double lap, as described, a spring tension-pulley for the belt, a pair of multiple grooved arms having the belt wound around the same in several convolutions, and a pair of lead-pulleys for directing the course of the belt to and from the spindles, as described.

397,630. BURNER. ROBERT R. CARSLEY, New Bedford, Mass., assignor to the Triumph Heat and Light Company, Portland, Me. Filed May 22, 1888. Serial No. 274,668. (No model.)

Claim.—1. In a burner, the combination, with an inner and outer foraminous tube, of a base to support said tubes and composed of an outer shell provided with openings for the admission of gas and air, an inner shell surrounding the said air-opening and forming with the outer shell a gas-chamber, and a cap for said gas-chamber having gas-outlets to admit gas between the said tubes, substantially as described.



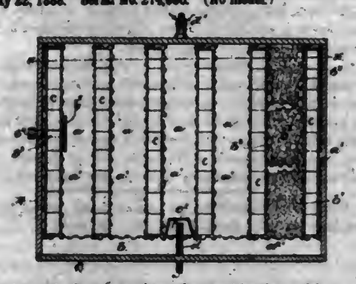
397,680.

2. In a burner, the combination, with an inner and outer foraminous tube, of a muffle covering said tubes, and a base provided with a gas-outlet to admit gas between the said tubes, and an air-passage to admit air to the inner tube, the products of combustion being caused by the said muffle to pass through the sides of the outer tube, substantially as and for the purpose set forth.

3. In a burner, the combination, with an inner and outer foraminous tube, of a muffle covering said tubes, and a base composed of an outer shell provided with openings for the admission of gas and air, an inner shell surrounding the said air-opening and forming with the outer shell a gas-chamber, and a cap for said gas-chamber having gas-outlets to admit gas between the said tubes, substantially as described.

4. In a burner, the combination, with an inner and outer foraminous tube, of a muffle covering said tubes, and a base composed of an outer shell provided with openings for the admission of gas and air, an inner shell surrounding the said air-opening and forming with the outer shell a gas-chamber, and a cap for said gas-chamber having gas-outlets to admit gas between the said tubes, and with a damper to regulate the supply of air to the burner, substantially as described.

397,631. VAPORIZER. ROBERT R. CARSLEY, New Bedford, Mass., assignor to the Triumph Heat and Light Company, Portland, Me. Filed May 22, 1888. Serial No. 274,669. (No model.)



Claim.—1. In a vaporizer, the combination, with a vessel provided with a liquid-inlet and a vapor-outlet, of a series of substantially-vertical double partitions forming vapor-ways and arranged within said vessel to form chambers, absorbent material in said chambers, and a plate or wall to support said double partitions, the said plate or wall forming, with the bottom of the vessel, a vapor-receiving chamber, substantially as described.

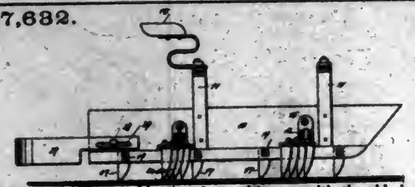
2. In a vaporizer, the combination, with a vessel provided with a liquid-inlet and a vapor-outlet, of a series of double partitions forming vapor-ways, and arranged within said vessel to form chambers, absorbent material in said chambers, a plate or wall to support said double partitions, and shelves b^2 to support the absorbent material, substantially as described.

3. In a vaporizer, the combination, with a vessel provided with a liquid-inlet and a vapor-outlet, of a series of double partitions forming vapor-ways, and arranged within said vessel to form chambers, absorbent material in said chambers, a plate or wall to support said double partitions, and shelves to support the absorbent material, and an inverted trough or cap located above the outlet-pipe of the vessel, substantially as described.

4. In a vaporizer, the combination, with a vessel provided with a liquid-inlet and a vapor-outlet, of a series of double partitions forming vapor-ways, and arranged within said vessel to form chambers, absorbent material in said chambers, a plate or wall to support said double partitions, and shelves to support the absorbent material, and an inverted trough or cap located above the outlet-pipe of the vessel, and a check-valve secured to the top of the vessel and adapted to open to admit air to the vessel when the vapor is being withdrawn from the said vessel, substantially as described.

397,632. CULTIVATOR AND HARROW. THOMAS R. CARTER, Augusta, Kans. Filed Oct. 31, 1888. Serial No. 289,695. (No model.)

397,632.



Claim.—1. The combination, in a cultivator, with the side bars having vertically-slotted toothed plates, of transverse eyebolts projecting therethrough, and vertically-swinging teeth carrying arms having their inner ends provided with hooks or bends entering the eye of said bolts, the hooks or bends having teeth or projections interlocking with said toothed plates, substantially as set forth.

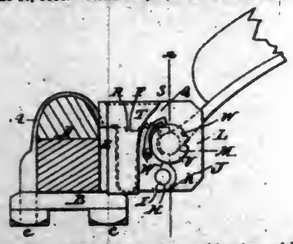
2. The combination, with the side bars of the cultivator, of the plates 18, extending longitudinally along the lower outer edges of said side bars, the teeth projecting up between plates and bars, and the bolts passing through the teeth and bars and securing both in place, substantially as set forth.

3. In a combined cultivator and harrow, the combination, with the side pieces, adjustable and sectional yokes or arches connecting the same, cultivator-teeth attached to the under face of the side pieces, and adjustable scrapers attached to the rear end of the said side pieces curving inward, of adjustable arms attached to the outer face of the said side pieces extending rearward at an inclination therefrom, and adjustable harrow-teeth attached to the said arms, substantially as and for the purpose specified.

4. In a combined cultivator and harrow, the combination, with side pieces provided with a series of vertical spaced slots, laterally adjustable and sectional yokes or arches connecting the same, teeth attached to the under face of the side pieces, scrapers adjustably secured to the rear ends of the said side pieces curving inward, and a toothed or notched plate surrounding the outer edge of the slots in the side pieces, of a bolt projected through the said slot provided with an eye at the outer end, arms supported by the said bolt, having an inclination to the rear and provided with a hooked extremity having a roughened surface, and harrow-teeth adjustably attached to the said arms, substantially as shown and described.

5. In a combined cultivator and harrow, the combination, with the side pieces of a cultivator provided with a series of vertical spaced slots and toothed plates surrounding the outer edges of the said slots, of a bolt projected through the slots beyond the plate, arms supported by the said bolt and held at their inner ends against the toothed plates, and teeth adjustably secured to the under side of the said arms, all combined to operate substantially as shown and described.

397,633. THILL-COUPLING. ISAAC CLARK, Morris Plains, N. J. Filed June 19, 1888. Serial No. 277,502. (No model.)



Claim.—1. In a thill-coupling, the combination, with an axle-clip, A, having forward-projecting parallel lugs E, formed with front half-bearings, G, and pivot-holes H, of a block, J, pivoted to the holes H and formed with rigid upward-projecting jaws L, having inner half-bearings, M, and with rigid rearward-projecting bearing-arms Q, a T thill-iron, O, pivoted and embraced between the jaws L, and a locking-connection for the arms Q and lugs E, substantially as shown and described.

2. In a thill-coupling, the combination, with an axle-clip formed with coupling-lugs E, of a pivoted block, J, having beveled stop-shoulders K, and jaws L and arms Q, forming thill-iron hooks, substantially as shown and described.

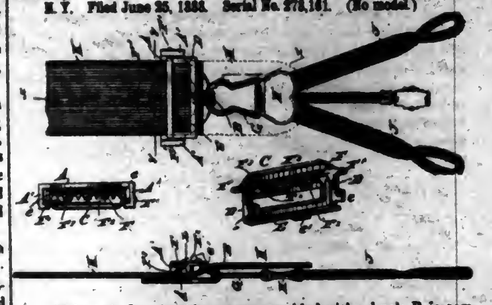
3. In a thill coupling, the combination, with an axle-clip formed with coupling-lugs E, having top mortises, F, and front half-bearings G, of pivotal jaws L, having half-bearings M, and formed with rearward-projecting arms Q, having bottom tenons, R, a locking-connection for the arms Q and lugs E, and a thill-iron, O, substantially as described.

4. In a thill-coupling, the combination, with clip-lugs E and movable jaws L, having corresponding sectional bearings, G M, of a T thill-iron, N, having a cross-head, P, adapted to the bearings G M, and formed on its opposite ends with lateral bracing-disks V, substantially as described.

5. In a thill-coupling, the combination, with parallel clip-lugs E, having corresponding bearings, of a T thill-iron pivoted to and between said bearings, and having a notched disk, V, on an end outside the bearing, and a dog, W, pivoted to the outside of the corresponding lug, E, substantially as described.

6. In a thill-coupling, the combination, with an axle-clip, A, having forward-projecting parallel lugs E, formed with front half-bearings, G, and pivoted holes H, of a block, J, pivoted to the holes H, and formed with rigid upward-projecting jaws L, having inner half-bearings, M, and with rigid rearward-projecting bearing-arms Q, and a locking-connection for the arms Q and lugs E, substantially as shown and described.

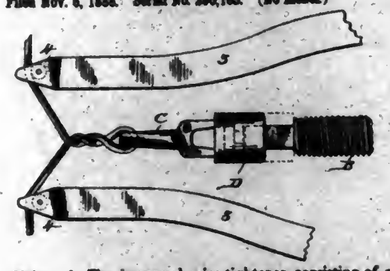
397,634. SUSPENDER-BUCKLE. JAMES ROSLAND, New York, N. Y. Filed June 25, 1888. Serial No. 278,161. (No model.)



Claim.—1. In a buckle, a plate provided with a hook, B, in combination with a bar pivoted to said plate, said bar being provided with a lug, *c*, and also provided with teeth inclined at a different angle, substantially as shown and described.

2. A buckle consisting of a base-plate having outwardly-extending apertured ears, a bar provided with side journals, said journals being mounted in the ears aforesaid, said bar being also provided with a longitudinal row of teeth, one or more of the teeth in said row being inclined at a different angle from the others, each tooth having the same axis and each movable in the same arc, substantially as described.

397,635. WIRE-TIGHTENER. LOUIS S. PLATAU, Pittsburg, Tex. Filed Nov. 6, 1888. Serial No. 290,165. (No model.)



Claim.—1. The improved wire-tightener consisting of a frame having opposite guides and a central bearing, the screw threaded in said bearing, the hook swiveled on said screw, and the shackle whereby to key the hook to the screw, substantially as set forth.

2. In a wire-tightener, the combination of guides for the wire and a looper movable longitudinally and rotatably, whereby to draw the wire into a loop between said guides and twist it, substantially as set forth.

3. A wire-tightener comprising a frame having two guides fixed with relation to each other and adapted to guide the wire, and a rotatable looper movable longitudinally between the said fixed guides, whereby it may draw the wire between the same and twist it to secure the portion so drawn, substantially as set forth.

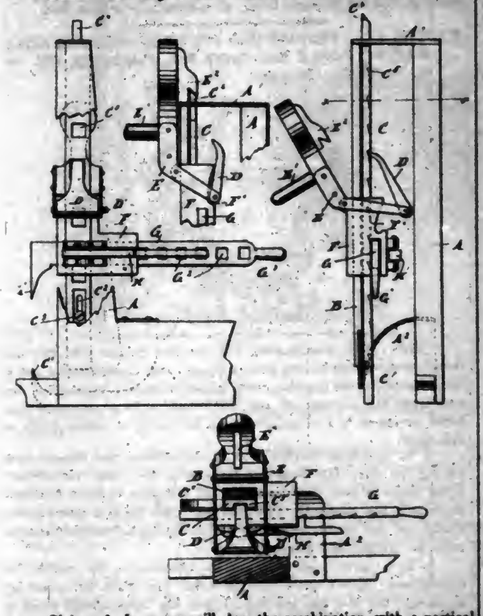
4. In a wire-tightener, substantially as described, the combination of a frame having a threaded bearing, a screw turning in said bearing, a hook swiveled on said screw, and a shackle by which to key said hook on the screw, substantially as set forth.

5. In a wire-tightener, the combination of a frame having a threaded bearing, a screw turning in said bearing, a hook swiveled on said screw, such hook and screw having adjacent non-circular portions, and a sleeve having non-circular bores or openings fitted to said portions and constituting a shackle whereby to key the hook on the screw, substantially as set forth.

6. An improved wire-tightener comprising an approximately U-shaped frame having at the ends of its arms guides for the wire and provided centrally with a threaded bearing, and the screw turning in said bearing and provided with a hook, substantially as set forth.

7. The improved wire-tightener herein described, consisting of the U-shaped frame having guides for the wire and provided centrally with a threaded bearing, the screw-turning in said bearing, the hook swiveled on said screw, and the sleeve forming a shackle by which to key the hook to the screw, all substantially as and for the purposes specified.

397,636. SAW-MILL DOG. JOHN FLEMING, Eagington, Ontario, Canada. Filed Aug. 4, 1888. Serial No. 281,962. (No model.)



Claim.—1. In a saw-mill dog, the combination, with a vertical guide-post, of a bar held to slide vertically on the said guide-post and carrying a hook on its lower end, a sleeve held to slide vertically on both the post and the said bar, and a second bar having a hook and held to slide transversely in the said sleeve, substantially as shown and described.

2. In a saw-mill dog, the combination, with a vertical guide-post, of a bar held to slide vertically on the said guide-post and carrying a hook on its lower end, a sleeve held to slide vertically on both the post and the said bar, a second bar having a hook and held to slide transversely in the said sleeve, and a spring-pawl fulcrumed on the said sleeve and adapted to engage the said second bar to lock it in place, substantially as shown and described.

3. In a saw-mill dog, the combination, with a vertical guide-post, of a toothed or notched bar held to slide on the said post, and provided with a hook at one end, a sleeve fitted to slide on the said bar and guide-post, a lever pivoted to the sleeve, a spring-pawl carried by the lever and engaging the teeth or notches of the bar, a toothed or notched bar sliding transversely in the sleeve, and provided with a hook at one end, and a spring-pawl pivoted to the sleeve and engaging the teeth or notches of the transversely-sliding bar, substantially as herein shown and described.

4. In a saw-mill dog, the combination, with a vertical guide-post, of a bar held to slide thereon and carrying a hook at its lower end, being also provided with a pointed top end, a sleeve held to slide on both the said bar and the said post, a second bar having a hook held to slide transversely on the said sleeve, a lever fulcrumed on the said sleeve, and a spring-pawl adapted to engage notches in the first-named bar, and a catch formed on the said lever and adapted to engage the upper pointed end of the said first-named bar, substantially as shown and described.

397,637. CAR-AXLE BOX. JOHN C. FRENCH, Concord, N. H. Filed May 31, 1888. Serial No. 275,500. (No model.)

Claim.—1. The combination, with a car-axle box having a dust-guard chamber, of hollow side flanges forming extensions for said chamber, covered openings formed partly in said extensions or flanges at each side of the journal-bearing, and a dust-guard formed in two

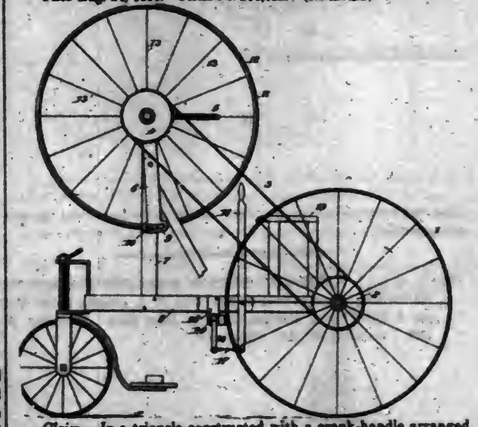
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segments, each adapted to enter either of said covered openings, having slots to facilitate their removal and springs for maintaining continuous contact with the journal.

2. The combination of a dust-guard formed in two segments, and a chamber in the car-axle box exceeding beyond the side walls of said box into flanges formed for this purpose on its sides, having openings in its top for admitting either segment of said dust-guard on opposite sides of the journal, and one or more threaded openings at its bottom closed by screw-plugs, and covers for said top openings provided with suitable fastenings and springs for maintaining continuous contact of the dust-guard segments with the journal.

397,638. TRICYCLE. PATRICK GALLAGHER, New York, N. Y. Filed Aug. 24, 1888. Serial No. 283,622. (No model.)



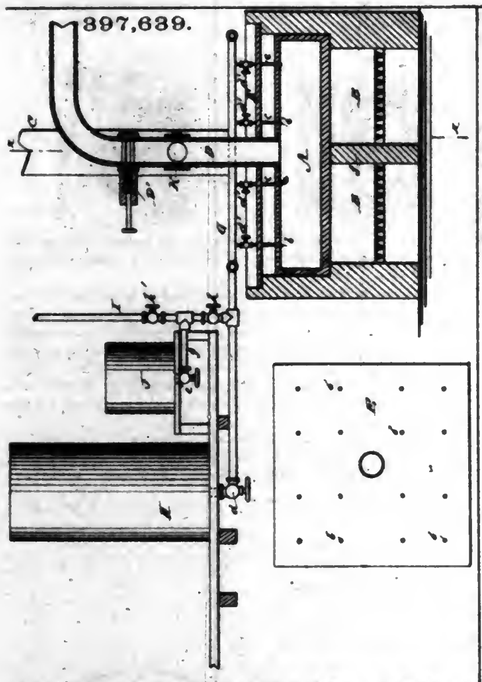
Claim.—In a tricycle constructed with a crank-handle arranged in front of and above the level of the seat of the vehicle, and having its bearings in adjustable arms pivoted to uprights on the frame of the machine, and an endless chain connecting a chain-wheel on the crank-handle shaft with a similar wheel on the driving-wheel shaft, the combination, with the pivoted adjustable arm 6 and the crank-handle 5, having its bearing therein, of a fly-wheel, 11, on the shaft of said adjustable crank-handle, the vehicle-seat 19, the driving-wheels 1, a brake adapted to bear on said driving-wheels, and a hand-lever, 18, operating said brake and arranged for manipulation from one side of the seat and in front of the latter and out of line with the operating crank-handle, substantially as shown and described, and for the purposes herein set forth.

397,639. APPARATUS FOR THE MANUFACTURE OF GAS. JOHN C. GARVIN and HENRY MOODY, Leadville, Colo. Filed Mar. 31, 1888. Serial No. 269,124. (No model.)

Claim.—1. In an apparatus for the manufacture of gas, the combination, with the furnace, of the retort A, arranged above said furnace, provided with a series of perforations, *b*, in its top, and an exhaust-pipe, D, connected therewith, the perforated slab E, arranged over the retort and forming a cover for the furnace, the oil-tank H, the oil-supply pipe G, connected to said tank H, provided with a valve and the series of feed-pipes *c*, said pipes connected with the supply-pipe G at one end and passed through the perforated slab E and entered through the perforations *b* into the retort, substantially as and for the purpose described.

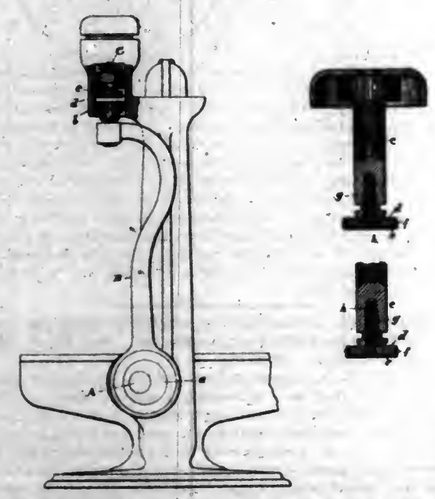
2. In an apparatus for the manufacture of gas, the combination, with the furnace, the retort A, mounted in the top of said furnace, the oil-tank H, a supply-pipe, G, connected therewith, provided with a valve, *d*, the series of oil-feed pipes *c*, having valves *d'*, connecting the supply-pipe with the retort, the gas-exhaust pipe D, provided with a valve, D', and the furnace-flue K, provided with a valve, *k*, of the liquid-detergent-holding receptacle J, and the steam-pipe I, connected with said receptacle, and oil-supply pipe and valves controlling said steam-

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pipe and receptacle J, all arranged substantially as and for the purpose specified.

397,640. AUTOMATIC TENSION APPARATUS FOR SEWING-MACHINES. JAMES S. GORTON, New York, N. Y., assignor to the Wilcox & Gibbs Sewing Machine Company, same place. Filed Nov. 20 1888. Serial No. 291,326. (No model.)



Claim.—1. In a tension apparatus, the combination, with the tension-stud and tension-rod for actuating the same, of the thrust-washer interposed between the two and suspended from the tension-stud by a frictional spring-connection, substantially as described.

2. The combination, with the tension-stud and tension-rod for actuating the same, of the thrust-washer suspended from the tension-stud by a spring friction-pin, substantially as described.

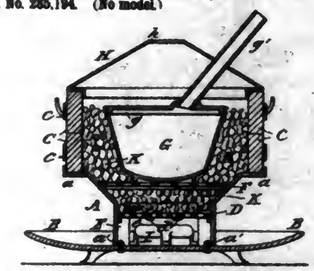
3. The combination, with the tension-stud and actuating tension-rod, of the thrust-washer suspended from the former by a ball-ended split friction-pin, having its split ball end expanded in a hole in said washer, substantially as described.

397,641. METHOD OF MAKING METAL ARTICLES WITH A GLASS LINING. THOMAS R. HALFORD and ROBERT MORANT, London, County of Middlesex, assignors to Dan Rylands, Stairbot, England. Filed Oct. 4, 1887. Serial No. 251,477. (No model.) Patented in England Mar. 15, 1887, No. 3,907.

Claim.—1. The process of making metal articles with a glass or other lining, which consists in coating the said lining with a suitable non-conducting substance and casting the metal around the prepared lining, all substantially as described.

2. The process of making metal articles with a glass or other lining, which consists in coating the said lining with a suitable non-conducting substance, thoroughly drying the same, and casting the metal around the prepared lining, all substantially as described.

397,642. PORTABLE KILN FOR FIRING DECORATED CHINA, GLASS, &c. FANNY R. HALL, Catskill, N. Y. Filed Sept. 12, 1888. Serial No. 285,194. (No model.)

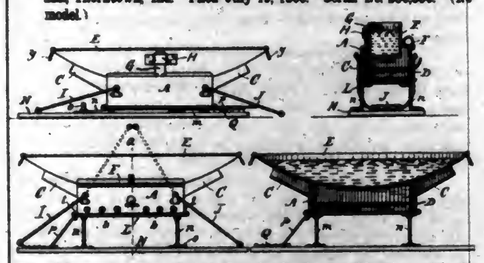


Claim.—1. In combination, in a portable ceramic kiln, the sectional furnace-grate having grate-supports, with draft-chamber below the lower grate, the hearth underlying and extending beyond the furnace-walls, the pot-support, and the furnace-walls of refractory material arranged in a series of sections vertically, all substantially as described.

2. In a portable ceramic kiln, in combination, the furnace-base having the removable sectional grate, with the center section narrower than the door of the furnace, the firing-pot support, the shelf supporting the refractory walls, the said walls made in sections vertically, and the hearth underlying and extending beyond the furnace-walls, all substantially as described.

3. In a portable ceramic kiln, in combination, the hearth, the furnace-base, with a draft-chamber below the grate, the grate for supporting the fuel, the pot-support, and the furnace-walls made in sections vertically, all substantially as described.

397,643. PORTABLE OIL-BATH FOR WHEELS. HENRY C. HANDLER, Thorntown, Ind. Filed July 19, 1888. Serial No. 280,356. (No model.)



Claim.—1. In an oil-bath for wheels, the combination, with the oil-trough and the furnace supporting said trough and having extensions *l l*, of the table having grooves *s s*, the bed-plate, and two pairs of legs connecting said table and bed-plate, said legs being hinged at one end to the table and at the other end to the bed-plate, whereby the oil-trough may be placed beneath a wheel and then raised into engagement therewith, substantially as and for the purpose specified.

2. In an oil-bath for wheels, the bed-plate, the table having folded legs hinged to the bed-plate and provided with an arm which engages the bed-plate when the legs are perpendicular thereto, the pawl hinged to the table and arranged to engage the bed-plate, the furnace mounted on said table and having the flues C C, and the segmental trough adapted to receive oil and the rim of a wheel and mounted on the furnace, all arranged to co-operate substantially as specified.

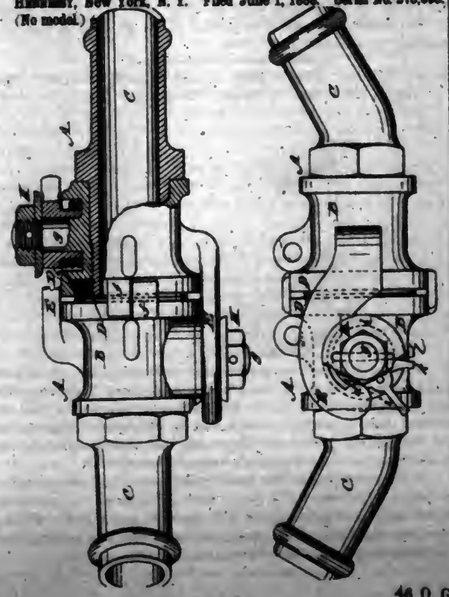
397,644. FISH-WEIR. SILAS H. HARDING, Chatham, Mass. Filed Dec. 17, 1888. Serial No. 293,232. (No model.)

Claim.—1. In a fish-weir, a bowl comprising a side net secured to the weir-stakes and a bottom net secured to said side net, said bottom net being in two sections, adjacent edges of which are detachably secured to a centrally-arranged latchet-rope, substantially as described.

2. In a fish-weir, the bowl A, comprising the side net, H, secured by its upper edge to weir-stakes *b*, its lower edge being detachably secured to said stakes by lines *d*, passing through openings in the lower ends thereof, and a bottom net, K, secured to said side net and formed in two sections, adjacent edges of said sections being detachably secured to a rope, P, by latchets *p*, substantially as set forth.

3. In a fish-weir, the combination of the side net, H, secured to stakes *b*, and provided with lines *d*, running in eyes in the lower ends of said stakes, the bottom net, K, constructed in sections *l m*, and secured to the lower edge of said side net, the centrally-arranged latchet-rope P, provided with latchets *p*, and the thimbles *t*, disposed in adjacent edges of said net-sections, all being arranged to operate substantially as described.

397,645. HOSE-PIPE COUPLING FOR RAILWAY-CARS. DAVID HERSHEY, New York, N. Y. Filed June 1, 1888. Serial No. 275,695. (No model.)

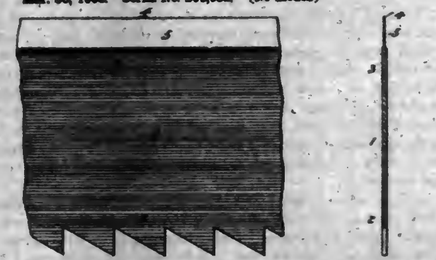


Claim.—1. In a hose-pipe coupling for railroad-cars and other purposes, the two half-couplings provided each with a locking side arm on opposite sides, respectively, of said half-couplings, and with a rotating notched locking device on reverse sides of the half-couplings to those occupied by the side arms and adapted to engage with the side arms, substantially as specified.

2. The combination, with the head or body portions B B of the two half-couplings and the facially-projecting elastic packings or rings D D, of the forwardly-projecting side arms, E E, arranged on opposite sides of the two half-couplings, respectively, and constructed with engaging nose ends *d*, and the rotatable notched locking devices G G on reverse sides of the half-couplings to those occupied by the side arms, essentially as shown and described.

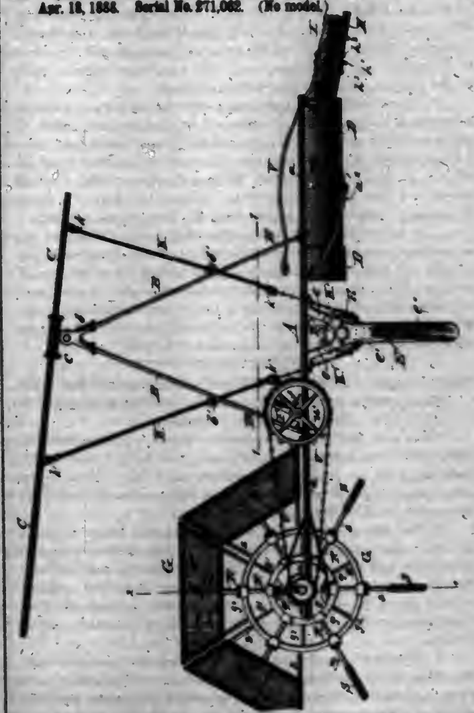
3. The combination, with the head or body portion B of either half-coupling and the facially-projecting elastic packing or rings D D and locking side arms, E, of the rotatable notched locking device G on either half-coupling, and the spring *h*, controlling said rotatable locking device, substantially as specified.

397,646. SAW. GEORGE H. HOLMES, Ogdensburg, N. Y. Filed Mar. 30, 1888. Serial No. 268,952. (No model.)



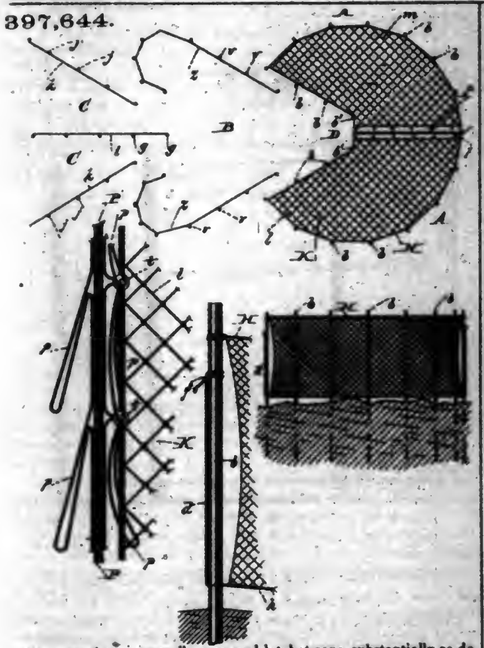
Claim.—A band-saw for cutting wood, having an annealed back, and the rest of the blade and cutting-edge tempered with the ordinary temper of wood-saws, the back of the blade being thin and the rest of the blade of even thickness, substantially as shown and described.

397,647. AIR-SHIP. JOHN P. HOLMES, Oak Valley, Kans. Filed Apr. 18, 1888. Serial No. 271,062. (No model.)



Claim.—1. An air-ship consisting of the horizontal frame having upwardly-extending supports between its ends, the vertically-rocking aero-plane mounted on the upper ends of said supports, the vertical propeller at the front end of the frame, the aeronaut's support be-

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tween the rear ends of the frame, and the propeller and aero-plane-operating mechanisms within reach of the front end of said support, and the rudder-sail extending from the rear end of the aeronaut's support for operation by the legs of the operator, substantially as set forth.

2. An air-ship consisting of the horizontal frame having upwardly-extending supports or suspension-rods between its ends, the aero-plane pivoted to rock vertically on the said supports, the propeller mounted at the front end of the frame, the support at the rear end of the frame, upon which the aeronaut may lie, the horizontal crank-shaft journaled between the propeller and front end of the aeronaut's support within reach of the operator, gearing connecting said shaft and propeller, a second horizontal crank-shaft journaled on the frame adjacent to the said aeronaut's support, and having connections with the aero-plane fore and aft of the fulcrum, locking-bolts at opposite ends of the said second shaft engaging parts of the frame to lock the plane in position, and operating-levers at the cranked or hand-hold part of the shaft connected with said bolts, whereby the aeronaut may rotate the first-named shaft with one hand and release and operate the second shaft with the other, substantially as set forth.

3. In an air-ship, the combination, with an aero-plane and a frame suspended therefrom and carrying an aeronaut's support, and to which frame the plane is fulcrumed to rock fore and aft, of a transverse tubular cranked shaft, E, journaled on the frame or in brackets held thereto, latch-bolts L, fitted to and within the ends of the shaft and adapted to engage any one of a series of notches, *m*, formed in casings M on the frame, levers and links N O P, fitted in the shaft, and the two levers P, extended at *p p* through the center of the crank-wrist in reach of the aeronaut, substantially as described, for the purposes set forth.

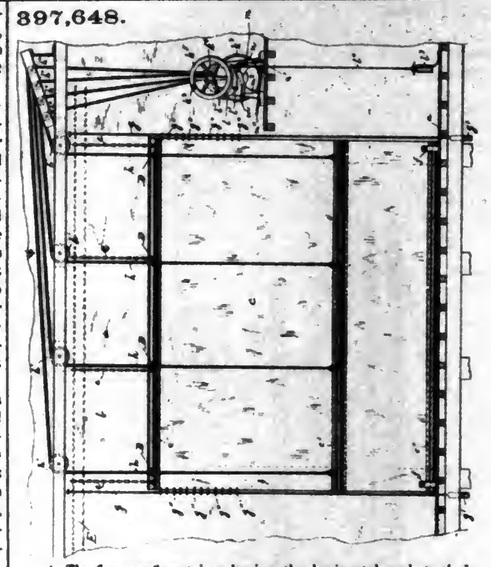
4. In an air-ship, the combination, with a frame suspended from an aero-plane and carrying an aeronaut's support, of a propeller consisting of a shaft, J', journaled on the frame, and blades or wings pivoted by their radial shafts to the propeller hub or body, sleeves J J, held to the shaft one above and the other below it and one at each side of the propeller, and said sleeves having cam-faces *f f* and trip-levers T on the propeller-blade shafts and operating on the cam-faces to turn and hold the blades into and out of the wind as the propeller rotates, substantially as herein set forth.

5. In an air-ship, the combination, with a frame suspended from an aero-plane and supporting a propeller and its operating mechanism, of a support for the aeronaut at the stern of the frame, a rudder-sail connected thereat and behind the aeronaut's support, and sacks held to the rudder and adapted to receive the legs of the aeronaut lying on the support, substantially as herein set forth.

6. In an air-ship, the combination, with the main frame carrying an aeronaut's support and a propeller and its operating mechanism, all suspended from an aero-plane, of a rudder, H, consisting of side bars, *h h*, a cross-bar, *h'*, having end eyes, h^3, receiving the bars *h* loosely, a fabric, h^4, held to and between the bars *h h h'*, and sacks I I, held one to each side bar of the rudder and adapted to receive the legs of the aeronaut, substantially as described, for the purposes set forth.

7. In an air-ship, the combination, with the main frame carrying an aeronaut's support and a propeller and its operating mechanism, of a rudder, H, held to the aeronaut's support, sacks I I, held one to each side bar of the rudder and adapted to receive the legs of the aeronaut, and straps or cords V, connected to the sacks and adapted for attachment at their forward ends to the aeronaut's support or the frame, substantially as described, for the purposes set forth.

397,648. FIRE-PROOF CURTAIN. LUKE E. JENKINS, East Boston, Mass., assignor, by mesne assignments, to Louisa Maria Jenkins. Filed Jan. 9, 1888. Serial No. 260,126. (No model.)



Claim.—1. The fire-proof asbestus curtain *c*, having horizontal upper and lower pockets, c' c'', and metal pipes *d d'*, inserted therein, combined with one or more intermediate horizontal pockets, c^3, and metal pipe or pipes *d''*, and hoisting-ropes connected to the latter, substantially as and for the purpose set forth.

2. The fire-proof asbestus curtain *c*, having lower horizontal pocket, c'', and metal pipe *d''*, one or more intermediate horizontal pockets, c^3, and pipe or pipes *d''*, hoisting-ropes *h h h h*, secured at their lower ends to the said pipe *d''*, and upper horizontal pocket, c' with its pipe *d*, provided with eyes or guides D D, through which the hoisting-ropes are passed loosely, substantially as set forth and described.

3. The fire-proof asbestus curtain *c*, having the upper intermediate and lower horizontal pockets, c', c^3, and c'', and corresponding metal pipes *d*, *d''*, and *d'*, arranged in said respective pockets, as described, combined with the hoisting-ropes *h h h h*, guides D D on the pipe *d*, and chains *e e*, attached to the upper pipe, *d*, and to the metal beam E or other portion of the proscenium-wall, substantially as and for the purpose set forth.

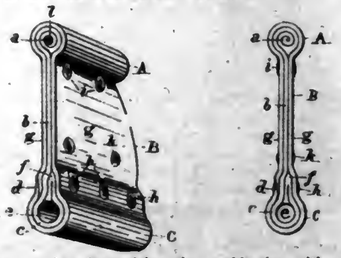
4. The fire-proof curtain *c*, having the horizontal pockets c', c^3, and c'', and the metal pipes *d*, *d''*, and *d'*, placed therein, and having the hoisting-ropes *h h*, arranged and connected for operation as described, in combination with the guide-wires *g g* and rings or ferrules g'' g', secured to the vertical edges of the curtain, substantially as and for the purpose set forth.

5. The fire-proof asbestus curtain *c*, having the horizontal pockets c', c^3, and c'', and corresponding metal pipes *d d''* *d'*, supporting-chains *e e*, and hoisting-ropes *h h*, arranged as described, in combination with the hoisting device having the wheel k^5, friction-lever and shoe *l l''*, adjustable spring *n*, releasing-lever *m*, adapted to be actuated by the lever *m''* and the weight *P* and rope P^1, substantially as and for the purpose set forth.

6. The fire-proof curtain *c*, having the horizontal pockets and metal pipes arranged therein, as described, and having the supporting-chains and hoisting-ropes connected to it, as described, combined with a hoisting apparatus having a brake lever and shoe *l l''*, the adjustable spring *n*, and rope P^1, attached to said brake-lever and provided with a weight, *P*, substantially as and for the purpose set forth.

7. The fire-proof curtain *c*, having the horizontal pockets and metal pipes arranged therein, as described, and having the supporting-chains and hoisting-ropes connected to it, as described, combined with the guides *f f*, for guiding and holding the lower edge of the curtain in close proximity to the rear portion of the proscenium-wall, substantially in a manner as set forth.

397,649. LOOM-PICKER. HAROLD KELLY, Biddeford, Me. Filed July 20, 1888. Serial No. 280,505. (No model.)

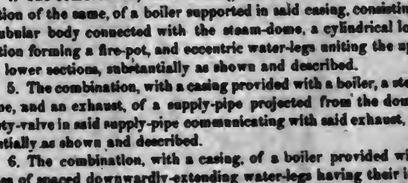


Claim.—1. In a loom-picker, the combination, with an outside jacket, of an inside filling made from a siegle piece of material, one end being rolled into a coil for the head, a straight middle part extending down through the shank and the other end folded around the rod-hole, said jacket and filling being held together by rivets, substantially as and for the purposes hereinbefore set forth.

2. In a loom-picker, the combination, with an outside jacket, of an inside filling made of a siegle piece of material, one end being rolled into a coil for the head and the other or free end extending down into the shank within the jacket, and rivets holding the jacket and filling together, substantially as set forth.

3. In a loom-picker, the combination, with an outside jacket, of an inner filling made of a siegle piece of material, one end being rolled into a coil for the head, the middle part extending down through the shank and the other end folded around the rod-hole, extending back a short distance, and then turned back upon itself in front of the rod-hole, said jacket and filling being held together by rivets, substantially as and for the purposes set forth.

397,650. SECONDARY BATTERY. WILLIAM KINGLAND, Gunnersbury, County of Middlesex, England. Filed June 4, 1888. Serial No. 275,944. (No model.) Patented in England Apr. 22, 1887, No. 5,967.



Claim.—1. In secondary batteries, the anodes B and platinum-foil contact-pieces A, in combination with the clamping washers or strips D, of similar material to the anode, and bolts and nuts C, as set forth.

2. The combination, with two or more anodes, B, and platinum-foil contact-pieces A, of the distancing washers or strips D, of similar material to the said anodes, and bolts and nuts C, as set forth.

3. The combination, with two or more anodes, B, cathode or cathodes B', and platinum-foil contact-pieces A, of the distancing strips or pieces D, of the same material as the anodes B, insulating-washers D', and nuts and bolts C, as set forth.

397,651. STEAM-HEATER. DANIEL D. G. LANGLANDS and OTIS E. MOULTON, Dover, N. H. Filed May 18, 1888. Serial No. 274,248. (No model.)

Claim.—1. A steam-heater comprising a casing, its grate, ash-pit, and smoke-outlet, a boiler within the casing and forming the fire-pot, flues through the upper part of the boiler, vertical spaced water-legs in the upper end of the fire-pot, and a steam-dome above the flues and communicating with the boiler, all constructed and combined substantially as set forth.

2. The combination, with a casing, of a boiler provided with a series of spaced downwardly-extending water-legs and connected with a circular eccentric fire-pot and flues projected through the upper or body portion of the boiler, and a steam-dome connected with and supported above the boiler within the casing, substantially as shown and described.

3. The herein-described boiler, comprising the fire-pot 11, having vertically-projecting spaced water-legs 12, vertical flues through its top, and a steam-dome over said flues and communicating with the boiler, substantially as set forth.

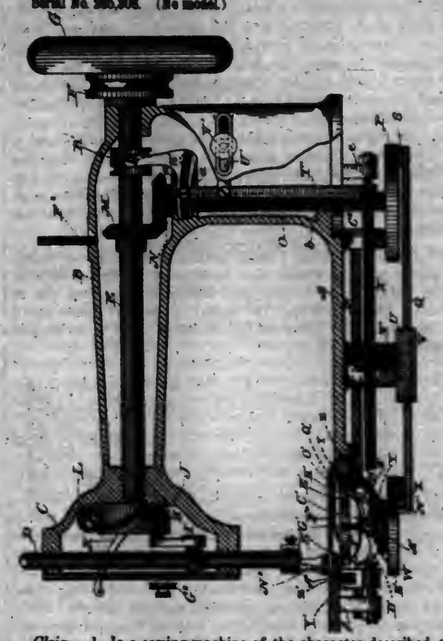
4. The combination, with a casing and a steam-dome forming a portion of the same, of a boiler supported in said casing, consisting of a tubular body connected with the steam-dome, a cylindrical lower portion forming a fire-pot, and eccentric water-legs uniting the upper and lower sections, substantially as shown and described.

5. The combination, with a casing provided with a boiler, a steam-dome, and an exhaust, of a supply-pipe projected from the dome, a safety-valve in said supply-pipe communicating with said exhaust, substantially as shown and described.

6. The combination, with a casing, of a boiler provided with a series of spaced downwardly-extending water-legs having their inner and outer walls eccentric, and flues projected through the upper or body portion of the boiler, and a steam-dome connected with and supported above the boiler within the casing, substantially as shown and described.

7. The combination, with a casing, of a boiler provided with a series of spaced downwardly-extending water-legs having eccentric inner and outer walls and flues projected through the upper or body portion of the boiler, a steam-dome connected with and supported above the boiler, a steam-gage connected with the dome, a water-gage connected with the boiler, and a safety-valve and outlet-pipe connected with the said steam-dome, substantially as shown and described.

397,652. ROTARY-SHUTTLE SEWING-MACHINE. FRANCIS T. LESLIE, Bridgeport, Conn. Filed Oct. 8, 1885. Renewed Feb. 25, 1888. Serial No. 265,308. (No model.)



Claim.—1. In a sewing-machine of the character described, the combination, with the needle, the needle-bar, and the main shaft and crank-connection for producing a vertical reciprocation therein, of the horizontal rotary shuttle provided with driver-recesses, as described, the pivoted shuttle-driver, the cam-surface formed within the race-casting, the driver-shaft and vertical connecting-shaft, the disks secured upon said driver-shaft and vertical shaft, and the transversely-oscillating lever-pitman connecting said disks and adapted to effect in the driver-shaft a variably-speeded rotary motion, substantially as set forth.

2. In a sewing-machine, the combination of the main shaft, the needle-bar, and the needle carried thereby, the vertical shaft geared to the main shaft, the transversely-oscillating lever-pitman and the disks at either end thereof, the horizontal rotary shuttle, the cam-surface formed within the race, the vertical driver-shaft, and the two-armed shuttle-driver pivoted upon its upper extremity, the latter adapted to drive the shuttle and to receive a variably-speeded rotary motion from the driver-shaft and a vertical oscillation from the contour of the cam-surface, substantially as shown and described.

3. In a sewing-machine of the character described, the combination of the horizontal rotary shuttle, the circular shuttle-race, the cam-surface within the latter, the variably-speeded vertical driver-shaft, and the two-armed shuttle-driver pivotally mounted thereon, the vertically-reciprocating needle-bar and needle, the main shaft journaled in the arm and its link-connection with the needle-bar, the cam-actuated take-up lever operated from the shaft, and the mechanism, as shown, for imparting the variable rotation to the driver-shaft, whereby each loop is thrown, opened, cast off, and drawn tight in the fabric before the commencement of another stitch, substantially as specified.

4. The combination of the main shaft, the grooved cam mounted thereon, the bell-crank lever pivoted within the arm and actuated by the cam, the vertical connecting-rod adjustably secured to the bell-crank, the thumb-nut binding on the arm and securing the connecting-rod in its adjustment, the rock-shaft pivoted beneath and extending longitudinally of the bed-plate, and the arms mounted thereon, the carved and pivoted lever, the connecting-rod, the inclined and adjustable bracket, and the feed-bar pivoted to the vertical rock-arm and with its free end resting upon the bar D^9, all arranged as described and for the purpose specified.

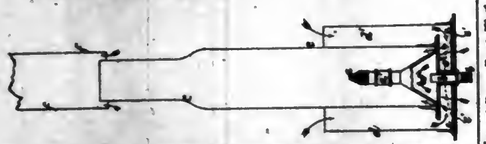
5. The combination, with the main shaft and the needle-bar carried thereby, of the peripherical cam fixed thereon, the pivoted bell-crank lever, the vertically-reciprocated connecting-rod, the rock-shaft

operated thereby, the transverse feed-bar actuated by said rock-shaft, the cam-actuated pivoted lever, and the longitudinally-reciprocating bar inclined at its free end, and the inclined adjustable bracket engaging with the incline on the bar upon which the free end of the feed-bar rests, all arranged as described and adapted to give to the feed-dog both a to-and-fro movement and a vertical throw, substantially as set forth.

6. The combination, in a rotary-shuttle sewing-machine, with the main shaft, of the bell-crank lever and the cam on said main shaft, whereby it is actuated, the vertical connecting-rod, the rock-shaft and the arms upon the latter, the curved and pivoted lever, the bar at right angles thereto, said bar having an inclined surface thereon, and the feed-bar pivotally attached to the rock-shaft arm and resting upon the bar D^3, all arranged as and for the purpose specified.

7. In combination with the race, the rawhide pencils P', set in the metal, their peripheries cutting the periphery of the race, said pencils being inserted at an angle and so spaced each from the next that the vertical plane of the bottom of each shall be a little in advance of the plane of the next succeeding pencil, substantially as specified.

397,653. BURNER. JAMES LEWIS, Brockley, County of Surrey, assignor to George Matthey, John Scudamore Sclfon, Edward Matthey, and Richard Davies Matthey, all of London, England. Filed Sept. 10, 1884. Serial No. 142,588. (No model.) Patented in France Apr. 7, 1883, No. 154,737; in England Feb. 26, 1884, No. 3,964, and in Germany May 15, 1884, No. 31,188.



Claim.—1. In an incandescent burner, the combination, with a gas-supply pipe, of an air and gas chamber having an imperforate wall of conical form, into which air and gas chamber said gas-supply pipe extends, passages for air beneath said air and gas chamber and communicating therewith, an imperforate portion constituting a passage for the mixed air and gas, connected with and extending above said air and gas chamber, incandescing material arranged upon said imperforate portion, near the upper end thereof, a chimney inclosing said air and gas chamber, and a support for said chimney provided with perforations inward of the chimney, substantially as specified.

2. In an incandescent gas-burner, the combination, with a gas-supply pipe, of an air and gas chamber having an imperforate wall of conical form, into which air and gas chamber said gas-supply pipe extends, passages for air beneath said air and gas chamber communicating therewith, an imperforate portion constituting a passage for the mixed air and gas, connected with and extending above said air and gas chamber, incandescing material arranged upon said portion, near the upper end thereof, a chimney inclosing the said air and gas chamber, and a second chimney of cylindrical form having an open upper end and inclosing the chimney first named, said second-named chimney being supported below the chimney first named in such manner as to form an air-passage downwardly through said second-named chimney and beneath the air and gas chamber, substantially as specified.

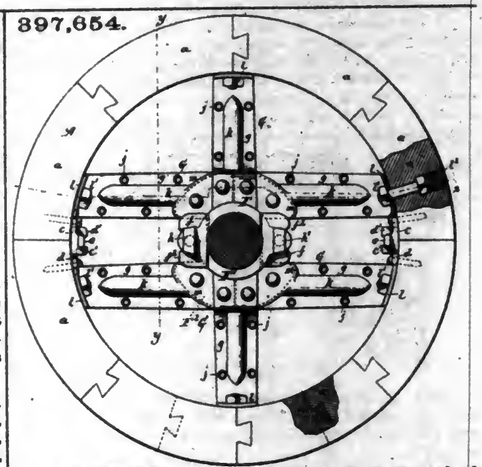
397,654. SPLIT PULLEY. JOHN A. MACKINNON, Brooklyn, N. Y. Filed Mar. 30, 1888. Serial No. 267,820. (No model.)

Claim.—1. In a pulley, the combination, with the rim composed of rings provided in their contiguous sides with oblique dovetail grooves, of dovetail keys or locking-bars arranged in said grooves, the planes of the keys connecting one pair of rings intersecting the plane of the keys connecting the adjacent pair of rings, substantially as set forth.

2. In a split pulley, the combination, with two pulley-sections, of a plate secured to one of said sections and provided with two hooks or lugs separated by an open space, a plate secured to the opposing section and provided with a hook or lug projecting into the space between the hooks or lugs of the first-mentioned plate, and a key or wedge engaging between the inner faces of said interlocking hooks or lugs, substantially as set forth.

3. In a split pulley, the combination, with two pulley-sections, of a plate secured to one of said sections and provided with two hooks or lugs having beveled inner faces and separated by an open space, a plate secured to the opposing section and provided with a hook or lug projecting into the space between the hooks or lugs of the first-mentioned plate and having a beveled inner face, and a key or wedge having beveled sides engaging between the inner beveled faces of said interlocking hooks or lugs, substantially as set forth.

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4. In a split pulley, the combination, with the meeting ends of the rim, of a plate, *e*, secured to one of said meeting ends and provided with two hooks or lugs, e' e^2, a plate, *d*, secured to the opposing end of the rim and provided with a hook or lug, d', and a key or wedge, *e*, engaging between the hooks e' e^2 d' and provided with a screw-shank, e^3, and clamping-nut e', substantially as set forth.

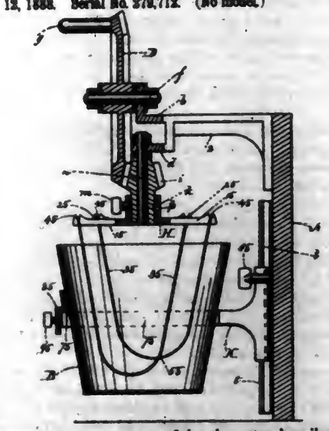
5. In a split pulley, a divided hub composed of two semicircular sections or halves, F F', each provided on one side with two lugs or hooks, f' f^3, and on the opposite side with a single hook, *f*, the hook *f* of one section engaging in the space between the hooks f' f^3 of the other section, and keys or wedges *h h'*, engaging between the hooks f f' f^3, substantially as set forth.

6. In a pulley, the arms G, each composed of two plates, *g g'*, one plate being provided with eyelets *j*, formed integral therewith and passing through openings in the other plate, against which the eyelets are headed, substantially as set forth.

7. The combination, with the rim and the divided hub composed of two parts, each provided with an external flange, F^3, of the arms G, each composed of two bent plates, *g g'*, secured with their outer ends to the rim and with their inner ends to the flanges F^3 of the hub-sections, substantially as set forth.

8. The combination, with the rim and the divided hub composed of two parts, each provided with an external flange, F^3, of the arms G, each composed of two bent plates, *g g'*, provided at their outer ends with lips or flanges *l*, whereby they are secured to the rim, and having their inner ends provided with shoulders *m* and resting against the flanges F^3, substantially as set forth.

397,655. EGG-BEATER. JOHN J. MCDOWELL, Boston, Mass. Filed July 12, 1888. Serial No. 279,712. (No model.)

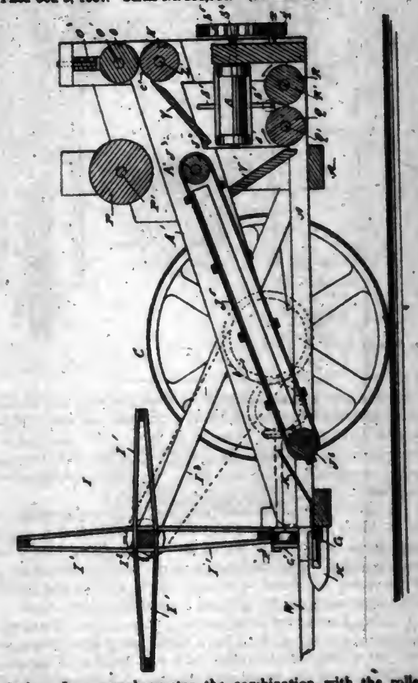


Claim.—1. In an apparatus of the character described, the combination of the standard A, provided with the track *l*, the bracket K, fitted to slide on said track and provided with the holder or loop 75, the bracket *z*, secured to said standard and provided with the arms *b d*, the gear D, journaled in the arm *b*, and the pinion *i*, journaled in the arm *d* and provided with the hub *k*, adapted to receive and revolve a beating or mixing disk when said gear D is rotated, substantially as set forth.

2. In an apparatus of the character described, the combination of the standard A, provided with the vertical track *l*, the bracket K, fitted to slide on said track and having the holder or loop 75, the pan B, provided with the lugs 85 and thumb-screws 95, the bracket *z*, secured to said body and provided with the arms *b d*, the gear D, journaled in the arm *b*, the pinion *i*, journaled in the arm *d* and having the hub *k*, and the disk H provided with the fingers 15 and 25 and looped wires 35, said disk being adapted to be detachably secured to said hub and revolved as the gear D is rotated, substantially as specified.

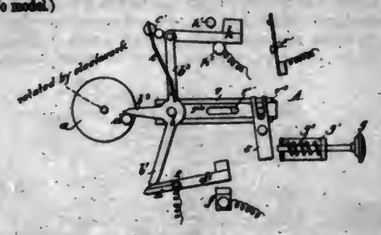
3. The disk H, provided with the long arms 15 and short arms 25, said arms being provided with slots or recesses 45, to receive the wires 35, and said wires respectively looped from the short arms to the opposite long arms, substantially as described.

397,656. CORN-HARVESTER. JAMES MCKIVETT, Garrison, Iowa. Filed Oct. 5, 1887. Serial No. 251,516. (No model.)



Claim.—In a corn-harvester, the combination, with the rollers N O, the operating-faces of which rotate toward each other, and the endless carrier J^3, said rollers N O arranged at the upper discharging end of said carrier, of the lower rollers, Q R, the operating-faces of which rotate toward each other, the endless belt S, traveling above the rollers Q R in the direction of their lengths and provided with pins to enter the space between said rollers, the inclined board V above said belt receiving the corn from rollers N O, and the lower inclined board, V', receiving from the inclined board V and delivering upon the upper surface of the rollers Q R, substantially as set forth.

397,657. AUTOMATIC ALARM APPARATUS. EMIL MEYER, Ottleben, Prussia, Germany. Filed Nov. 3, 1888. Serial No. 290,094. (No model.)



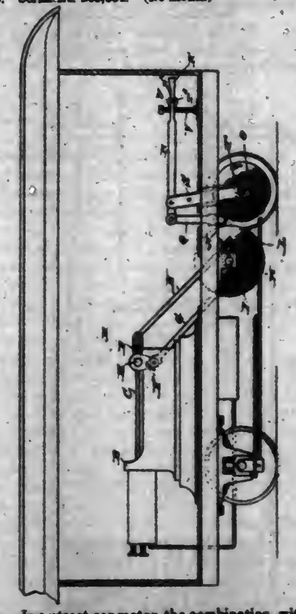
Claim.—1. An automatic alarm apparatus comprising a three-armed lever fulcrumed on a plate horizontally movable in a fixed support, a rotary stud-carrying disk intermittently engaging said lever, contact-levers above and below said plate and actuated by said lever, two electric circuits, each containing a battery and alarm-bell and closed and opened by said levers, and means for automatically restoring the levers to normal position, substantially as shown and described.

2. In an automatic alarm apparatus, the combination, with a three-armed lever fulcrumed on a plate horizontally movable in a fixed support, of a rotary stud-carrying disk intermittently engaging the horizontal arm of said lever, a contact-lever fulcrumed below said support and actuated by a vertical arm of said lever, an electric circuit containing a battery and alarm-bell, said circuit being closed and opened by said levers, and means for automatically restoring said levers to normal position, substantially as shown and described.

3. In an automatic alarm apparatus, the combination, with a three-armed lever fulcrumed on a plate horizontally movable in a fixed support, a rotary stud-carrying disk intermittently engaging the horizontal arm of said lever, and a contact-lever fulcrumed below said support and actuated by a vertical arm of said lever, of a horizontal contact-lever connected to and actuated by the other vertical arm of said lever, two electric circuits each containing a battery and alarm-bell and closed and opened by said levers, and means for automatically restoring said levers to normal position, substantially as shown and described.

4. In an automatic alarm apparatus, the combination, with a plate horizontally movable in a fixed support and having a pin fixed in its face at one extremity; a three-armed lever fulcrumed on the other extremity of said plate, a rotary stud-carrying disk intermittently actuating said lever, contact-levers above and below said support and actuated by said three-armed lever, and two electric circuits opened and closed by said levers, each circuit containing a battery and alarm-bell, of a vertical lever fulcrumed below said support and engaging the pin in said plate, a horizontally-movable pin adapted to engage said vertical lever, and means for automatically restoring said sliding pin and levers to normal position, substantially as shown and described.

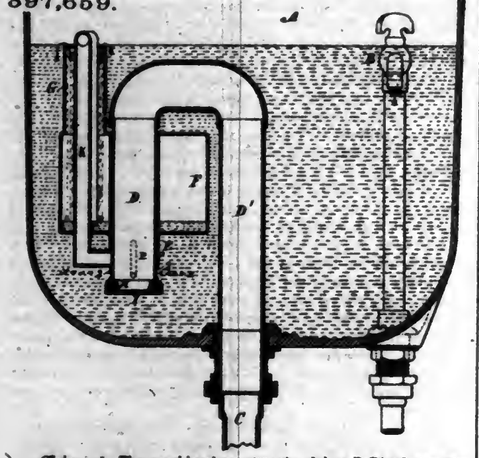
397,658. STREET-CAR MOTOR. BURDETT B. MOORE and CHARLES D. MONTANYE, Kansas City, Kans. Filed Apr. 6, 1888. Renewed Jan. 9, 1889. Serial No. 295,881. (No model.)



Claim.—In a street-car motor, the combination, with the friction-wheel L, the means for rotating it, and the friction-wheel O on the car-axle, of the pivoted lever R, having a downwardly-extending arm or link, Q, the friction-wheel N on the lower end of said arm or link between the wheels L O, the vertical worm V near the outer end of the lever R, the sliding worm U on said lever and meshing with the vertical worm, the hand-lever T, pivoted on lever R and having a pin, T^3, at its forward end, carrying the said worm U and extending through a slot in the lever R, substantially as set forth.

397,659. CISTERN FOR WATER-CLOSETS. JORDAN L. MOTT, Jr., New York, N. Y., assignor to The J. L. Mott Iron Works, same place. Filed Aug. 16, 1882. Serial No. 282,852. (No model.)

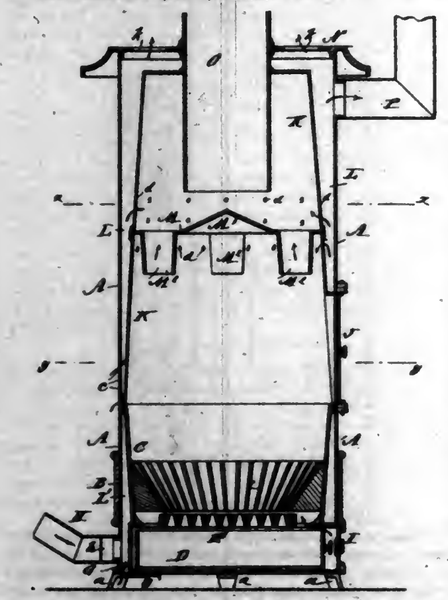
397,659.



Claim.—1. The combination, with the siphon D D', of the tube E, sliding freely upon the same and having openings 2 near the lower end thereof, the valve H, connected with the said tube and acting to close the lower end of the siphon, the float F, around and connected to the tube E and having an overflow-dam, G, and the secondary siphon K within the float and passing through the bottom thereof and opening through the tube E, substantially as set forth.

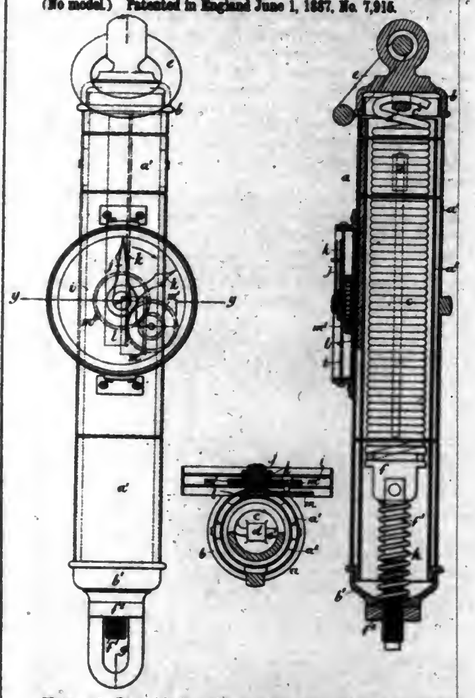
2. The combination, with the cistern for a water-closet and the flushing-pipe thereof, of a siphon-pipe within the cistern, a valve for closing the end of the siphon-pipe, and a float for moving the said valve, and a secondary siphon connected with the float and opening at its lower end into the main siphon for discharging water out of the float, substantially as set forth.

397,660. HOT-AIR FURNACE. BENJAMIN F. PRICE, Bloomington, assignor of one-half to Joseph Ewing Porter, Ottawa, Ill. Filed May 7, 1888. Serial No. 273,134. (No model.)



Claim.—The conical inner casing, K, the bottom casing, C, and outer casing, L, surrounding the inner casing and made upright to form an air-space between the outer casing and the casing K, there being openings e formed in the outer casing and openings d in the inner conical casing, K, in combination with the pipe O, entering the tops of the two casings K L, and the horizontal plate M, held in casing K below the pipe O, the cone M' in said plate, and the short tubes M², fitted in the plate M, near its outer edge, substantially as described.

397,661. REGISTER FOR SHIPS' LOGS. RICHARD ROOD, Portswood, Southampton, England. Filed Apr. 12, 1888. Serial No. 270,409. (No model.) Patented in England June 1, 1887, No. 7,916.



Claim.—1. In a ship-log, the combination, with two telescoping tubes, one of which is provided with a dial and indicator, of a spring secured to the closed end of one of the tubes, a rod attached to said spring and passing through the closed end of the other tube, and a spring-connection between said closed end and rod, substantially as described.

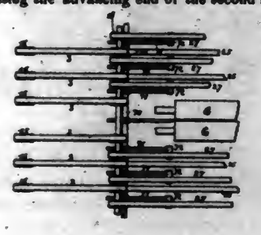
2. In a ship-log, the combination, with two telescoping tubes, one of which is provided with a dial and indicator, of a spring secured to the closed end of one of the tubes, a plate provided with a screw-threaded rod which passes through the closed end of the other tube, a spring interposed between the plate and the said closed end of the tube, and a nut for said rod, substantially as described.

3. In a ship-log, the combination, with two telescoping tubes, of a dial attached to one of the tubes, a shaft passing through said dial in gear with a rack upon the other tube, and two hands mounted on said shaft, one of said hands being capable of movement in one direction only, substantially as described and shown.

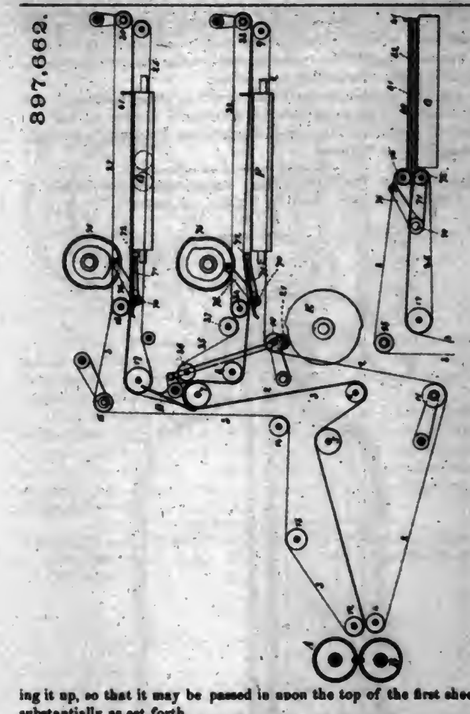
397,662. SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES. WALTER SCOTT, Plainfield, N. J. Filed Mar. 2, 1888. Serial No. 265,922. (No model.)

Claim.—1. The combination, with the folding-rolls and the ranges of tapes or belts for conveying the sheets to and over the folding-rolls, of the rolls or bars 72, a rock-shaft for moving the same periodically and lifting the advancing end of the second sheet, and also raising the upper tapes at such rolls or bars to give the proper space for passing the second sheet freely in above the first sheet by the movement of the tapes, substantially as specified.

2. The combination, with the folding-rolls and a stationary fence for stopping the sheet above the rolls, and tapes or rods for supporting the sheets as they pass over the folding-rolls, of lifting rolls or bars 72, for raising the advancing end of the second sheet and holding it up, so that it may be passed in upon the top of the first sheet, substantially as set forth.



397,662.



397,663. COMBINED MATCH-BOX AND CANE. SIMON B. SIMON, New York, N. Y. Filed Feb. 24, 1888. Serial No. 265,099. (No model.)



Claim.—1. A cane-head formed of a tube having a diametrical track across its upper or outer end and a lid sliding upon said track substantially as set forth.

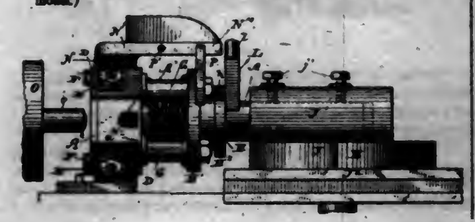
2. A cane-head formed of a tube having a recessed central diametrical track across its upper or outer end and a lid having a central diametrical rib on its under or inner face entering said recess substantially as set forth.

3. A cane-head formed of the inner tube, a, to enter a socket in the upper end of a cane, having opposite notches in its upper end, the outer concentric tube, B, having a recessed track across its upper end resting in said notches, and the lid having a rib on its under side sliding in track-recesses, substantially as set forth.

4. The combination, with a cane or similar stick, of a match-box consisting of a body provided with a diametrical track and a lid sliding upon said track, substantially as shown and described.

5. The combination, with a cane or similar stick, of a match-box consisting of a body provided with a diametrical track, a lid sliding on said track, and a stop limiting the movement of the lid, substantially as and for the purpose specified.

397,664. DIE-CARRYING HEAD FOR BOLT-THREADING MACHINES. JOHAN M. SIMPSON, Chicago, Ill., assignor to William Deering & Company, same place. Filed Sept. 20, 1883. Serial No. 286,731. (No model.)



397,664.



Claim.—1. In combination with the head having the chamber a', the cams reciprocating longitudinally therein, the cutter-holding blocks engaged by said cams, the cams and blocks having the one a tongue and the other a groove oblique to the reciprocation of the cams, and the collar H, sliding on the stem of the head and connected to all the cams, whereby they may all be reciprocated longitudinally simultaneously and equally, substantially as set forth.

2. In combination with the head having the chamber a', the cams reciprocating longitudinally therein, and the cutter-holding blocks engaged by said cams, the cams and blocks having the one a tongue and the other a groove oblique to the reciprocation of the cams, the collar H, connected to the rear protruding end of the cams, and the spring I, interposed between the head and said collar and tending to force the collar away from the head, whereby the cutters are held normally removed from the center of the cutter-head, substantially as set forth.

3. In combination with the cutter-head, cams G, and cutter-holding blocks D, constructed substantially as described, the collar H, secured to the rear end of the cams, and the spring I, reacting between the collar and the head to force them apart, and the latch L, pivoted to the stem of the head and adapted to be moved into position behind the collar H when it is forced forward to compress the spring, substantially as and for the purpose set forth.

4. In combination with the cutter-head, the cutter-holding blocks D, and their actuating-cams G, the collar H, secured to the rear end of the cams, and the spring I, interposed between the collar and the head, and the latch L, pivoted to the stem of the head, the collar H, having the notch h in its rear edge adapted to receive the latch, and the spring L', actuating the latch to hold it normally aside from the notch h, whereby when the collar is forced forward to actuate the cams and the cutter-blocks the latch L is caused to engage behind the collar and detain it forward, substantially as set forth.

5. In combination with the cutter-head and cutter-holding blocks therein, and the cams G, by which they are actuated, the collar H, which actuates said cams longitudinally with respect to the shaft and having the notch h in its rear edge, the turret to which the cutter-head is secured, the fixed cam K, eccentric to the axis of said turret and in position to engage the collar H at the rear as the turret is revolved, the latch L, pivoted to the stem A, and the spring L', tending to actuate the latch aside from the notch h, whereby the revolution of the turret forces forward the collar H and the cams G and the latch L locks them forward, substantially as set forth.

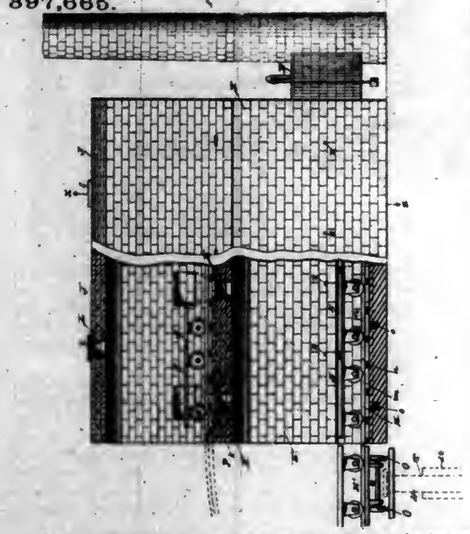
6. In combination with the cutter-head having the devices which force the cutters toward the center, and the collar H, which actuates them, provided with a notch, h, the latch L, which locks said collar in the position in which it holds the cutters toward the center and adapted to enter said notch, the bracket N, fixed with respect to the bolt-holding chuck, and having the cam-faces n', located in the path of the latch L as the cutter-head advances toward the chuck, whereby the latch is tipped into position to enter the notch h, substantially as and for the purpose set forth.

7. In combination with the cutters having the aperture e, the bolt E, having the head adapted to enter said aperture, and its stem adapted to extend out through the same, the block D, having the rectangular aperture to receive the cutter, and the hole d' to admit the bolt, and the nut F, screwed onto the end of the bolt, substantially as and for the purpose set forth.

397,665. BRICK-KILN. BENJAMIN F. SHAKESPEARE and SAMUEL J. ROSE, Chester, Pa.; said Rose assignor to said Shakespeare. Filed Apr. 19, 1887. Serial No. 235,205. (No model.)

Claim.—1. The herein-described kiln, consisting of a single structure providing an upper horizontal chamber and two lower horizontal chambers, having flues connecting the lower chambers with the upper chamber, flues connecting each of said lower chambers with a stack or chimney, and a valve for alternating the connection with said chimney, heating means for heating the lower chambers alternately, and means for removing the brick from the upper chamber to either of the lower chambers, substantially as described.

397,665.

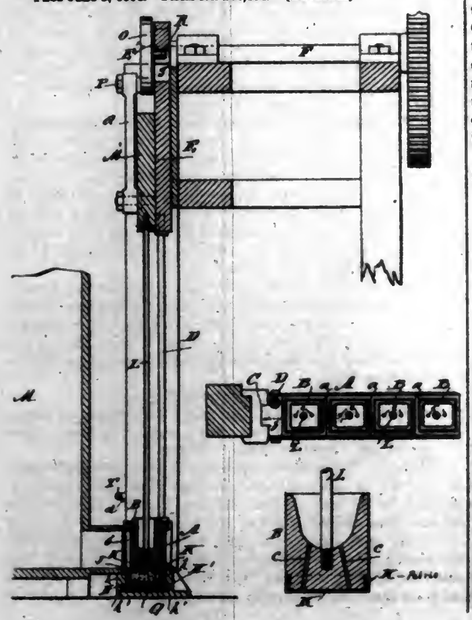


2. The combination, with a horizontally-extending kiln having an open bottom and an end opening, tracks below the bottom extending the length of the kiln, trucks with platforms for supporting the brick to be burned, adapted to be moved into and out of the kiln with the brick through the end opening and to be lifted to close the bottom of the kiln, and a lever for lifting said platforms against the bottom, substantially as described.

3. The herein-described kiln, consisting of a drying-chamber and two burning-chambers, each having flues communicating with the drying-chamber and provided with open bottoms, platform-cars for closing the bottoms of said chambers, rail-sections supporting said cars, and means for raising the sections and cars, substantially as described.

4. The combination, with a chamber of a kiln having side ledges, 22, of platform-cars supporting the bricks, adapted to be raised against said ledges to close the bottom of the chambers, track-sections supporting said cars, and levers for raising the cars and track-sections, substantially as described

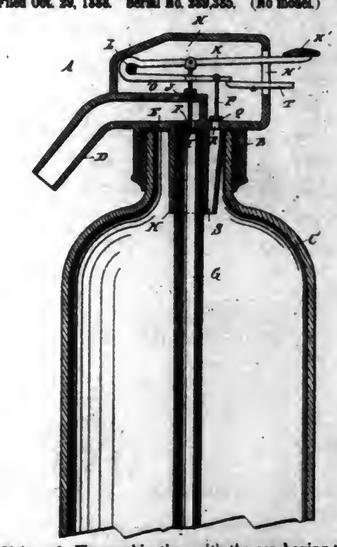
397,666. BRICK-PRESS. JAMES H. STEELE, Butte City, Mont. Filed June 5, 1888. Serial No. 276,131. (No model.)



Claim.—1. The vertically-reciprocating molds A, head in the main frame in ways C C and formed with the openings *b* at one side, in combination with the vertically-reciprocating followers B, fitted in the said molds, substantially as described.

2. The vertically-reciprocating molds A, having openings *b*, and the flange J, made wider than the thickness of a brick, in combination with the vertically-reciprocating followers B, fitted in said molds, substantially as described.

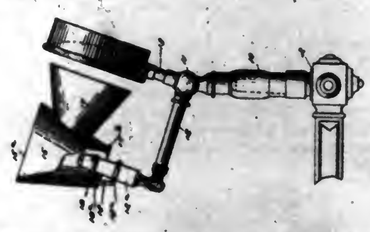
397,667. BOTTLE-FAUCET. FELIX STEFANY, New York, N. Y. Filed Oct. 29, 1888. Serial No. 289,585. (No model.)



Claim.—1. The combination, with the cap having two openings, F R, in its top E, and the pipe D, leading from the opening F, of the upwardly-closing valve I, having a stem extending up through opening F and pipe D, the downwardly-closing valve over opening R, the stem P, parallel with stem J, and the two horizontal spring-arms, one connected to stem J and pressing it up, and the other connected to stem P and pressing it down, substantially as set forth.

2. The combination, with the cap B, having a top, E, provided with two openings, F R, a casing, N, upon the top, having a vertical slot, N', in its side, and a pipe, D, leading from the opening F out through the casing N, of the parallel valve-stems J P, provided with valves I Q, closing said openings F R upwardly and downwardly, respectively, the horizontal two-armed spring K, rigidly secured at L within the casing, with its long arm projecting through the slot therein and connected with stem J to press it upward, the shorter arm, O, being connected to stem P and pressing it down, and the lever T, pivoted in the casing, extending at its inner end under the short arm O, and projecting at its opposite end through slot N', substantially as set forth.

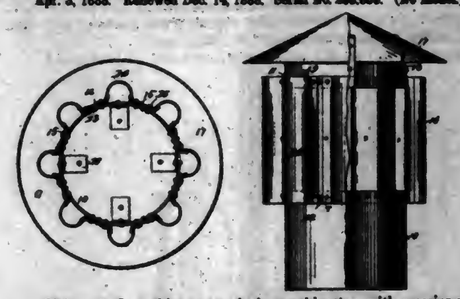
397,668. SHADE FOR BURNERS. JAMES STRATTON and WILLIAM J. STRATTON, Brooklyn, N. Y. Filed June 21, 1888. Serial No. 277,764. (No model.)



Claim.—1. The combination, with a shade formed with an elliptical top and provided at one side with a funnel-shaped ray-conductor, of a wire coil or ring carried by the shade and adapted to receive a burner-tip, substantially as described.

2. The combination, with a shade formed with an elliptical top and provided at one side with a funnel-shaped ray-conductor, of the holder consisting of a ring and an aligning-coil, both being supported from and carried by the shade, substantially as described.

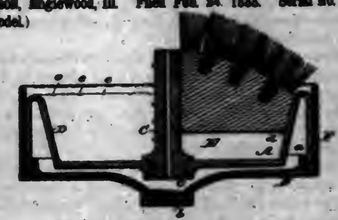
397,669. CHIMNEY-COWL. DAVID TERRY, New York, N. Y. Filed Apr. 3, 1888. Renewed Dec. 14, 1888. Serial No. 293,668. (No model.)



Claim.—1. In a chimney-cowl, the combination, with a series of vertical equidistant stripe seperated by slots, of a series of semi-cylindrical plates arranged vertically, covering said slots, and serving as smoke-conductors, as shown and described.

2. In a chimney-cowl, the combination, with the lower cylinder, 12, the upper ring, 11, and the equidistant essentially U-shaped plates 15, which connect them, of a series of semi-cylindrical conductors attached to the connecting-plates and spanning the space intervening said plates, and a cap attached to but separated from the upper ring, substantially as and for the purpose specified.

397,670. FOUNTAIN BRUSH AND SPONGE HOLDER. SAMUEL THORNTON, Englewood, Ill. Filed Feb. 24, 1888. Serial No. 265,135. (No model.)

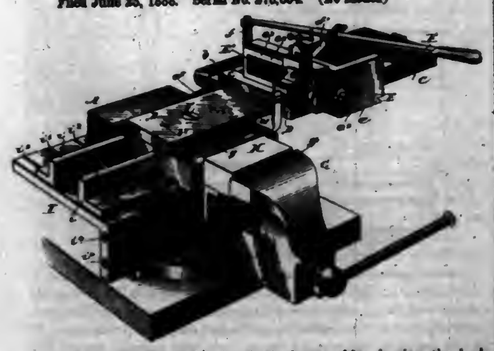


Claim.—1. A head for fountain-brushes provided with the inner and outer walls, A B, the central cavity, D, the nozzle C within the cavity, and the handle-receiving neck *b*, substantially as described.

2. A head for fountain-brushes provided with the inner and outer walls, A B, the apertures *c*, the central cavity, D, the nozzle C, projecting from the bottom of the cavity, and the threaded handle-receiving neck *b*, substantially as herein shown and described.

3. In a fountain-brush, the combination, with the hollow head provided with the inner and outer walls, A B, the threaded neck *b*, the threaded aperture *c*, and the apertures *c*, of the externally-threaded nozzle C, and the brush E, received on the nozzle C, substantially as described.

397,671. PLANING-MACHINE. THOR A. THORSEN, Chicago, Ill. Filed June 23, 1888. Serial No. 278,064. (No model.)



Claim.—1. A portable hand planing-machine having the body portion constructed hollow, with the recess *d'* at the top, whereby it is adapted to receive and fit upon one of the jaws of a vise, and provided with a reciprocating tool-holder arranged to permit the tool to set upon work held by the vise when said body portion is fitted upon one of the vise-jaws, substantially as described.

2. A portable hand planing-machine comprising the hollow body A, constructed to fit upon one of the jaws of a vise and provided with screws to screw it thereto, the reciprocating carriage guided upon the hollow body, and an adjustable tool-holder supported upon the carriage, said members being combined substantially as described.

3. In a hand planing-machine, the guide-plate B, arranged upon a portable body, the reciprocatory carriage arranged to work upon said guide-plate, the slide E, arranged upon and adjustable transversely to the line of movement of the carriage, a suitable tool-holder applied to said slide, and means, substantially as set forth, for securing the portable body to one of the jaws of a vise, all combined substantially as and for the purpose described.

4. In a hand planing-machine, the reciprocatory carriage arranged to work upon a guide, the hand-lever applied for operating the reciprocatory carriage, the slide adjustably held upon the said carriage and provided with a tool-holder, and a feed device for automatically adjusting the slide, substantially as described.

5. In a hand planing-machine, the combination, with a reciprocating carriage and adjustable tool-holder supported thereon, of the guide B, supporting the reciprocatory carriage and adjustably held upon the stationary body of the machine, substantially as set forth, whereby the work may be planed from different directions or at different points, substantially as described.

6. In a hand planing-machine, the combination, with the stationary body and a reciprocating carriage arranged thereon and provided with a tool-holder, of a work-holding bracket, such as set forth, attached to said body, for the purpose described.

7. In a hand planing-machine, the combination of the hollow body portion A, provided at one side with a jaw and constructed to fit upon one of the jaws of a vise, a reciprocatory tool-holder supported upon said body, and a screw arranged for holding the said body portion of the machine to the stationary jaw or body of the vise, substantially as and for the purpose described.

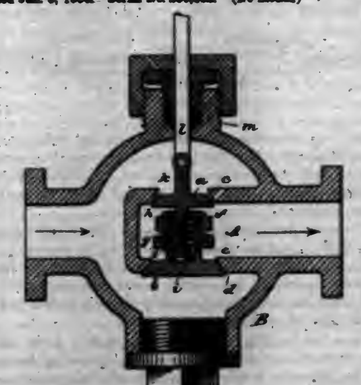
8. In a hand planing-machine, the combination, with the stationary body portion, substantially as set forth, of one or more screws, a^4, arranged at one side of the said stationary body portion as a means for adjusting the same.

9. In a hand planing-machine, the combination, with the guide-plate B, of the carriage C, provided along its under side with a groove adapted to receive the guide-plate and across its upper provided with a groove, *c'*, wherein a portion of the slide for a tool-holder is received, substantially as described.

10. In a hand planing-machine, the combination, with the reciprocating carriage, of the slide E, provided with a tool-holder, the feed-screw supported by the carriage and engaging the slide, and the pawl-and-ratchet device for actuating the feed-screw, and the cam or incline c^3, for effecting the operation of the pawl, substantially as described.

11. In a hand planing-machine, the combination, with the guide-plate B and the reciprocating carriage C, of the bracket *b*, attached to the guide-plate, and the hand-lever fulcrumed upon said bracket and connected with the carriage, substantially as described.

397,672. THROTTLE-VALVE. JOHN TOWER, Minneapolis, Minn. Filed Jan. 5, 1888. Serial No. 259,883. (No model.)

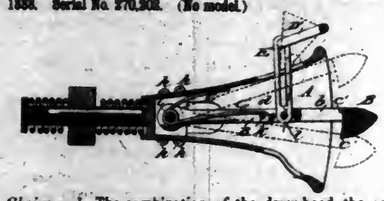


Claim.—1. The combination, with the valve *b*, provided with the tubular stem *c*, of the screw-cap *f*, the valve *a*, provided with the stem *h*, and the spiral spring *j*, surrounding the tubular stem and compressed between the cap *f* and the flange *i* of the valve-stem, substantially as described.

2. As an improved article of manufacture, a valve formed of the valve-casing B, provided with the valve-seats *c d*, the valve *b*, having the perforated tubular stem *c*, the screw-cap *f*, fitted to the valve-stem *c*, the jam-nut *g*, the valve *a*, provided with the stem *h*, having

the flange *i*, the spring *j*, interposed between the flange *i* and the screw-cap *f*, and the rod *l*, jointed to the valve-stem *k*, substantially as described.

397,673. CAR-COUPLING. WILLIAM C. WATSON, Paterson, N. J., assignor of one-half to Theodore Y. Kinne, same place. Filed Apr. 10, 1888. Serial No. 270,202. (No model.)

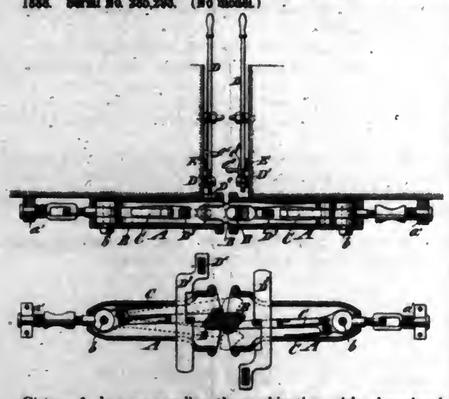


Claim.—1. The combination of the draw-head, the coupling-hook provided thereon and the spring provided between them, substantially as herein described, a slotted link connected with the coupling-hook, an operating-shaft provided with a crank engaging the slotted link, and means, substantially as described, for locking the shaft in different positions, as and for the purpose set forth.

2. The combination of the draw-head, the coupling-hook provided thereon and the spring provided between them, substantially as herein described, whereby when the coupling-hook is unlocked and left free it is thrown over by the spring with its back beyond the central position, substantially as and for the purpose herein set forth.

3. The combination of a coupling-hook provided with upper and lower integral pivots, a draw-head having formed in it a bearing for the upper pivot, a removable plate fitted to and secured in the opening in the lower part of the draw-head and containing a bearing for the other pivot, a spring applied within the draw-head between it and the coupling-hook, and the removable pin for holding said spring inserted in the coupling-hook and secured therein by said removable plate, all substantially as herein set forth.

397,674. CAR-COUPLING. WILLIAM C. WATSON, Paterson, N. J., assignor of one-half to Theodore Y. Kinne, same place. Filed Sept. 13, 1888. Serial No. 285,283. (No model.)



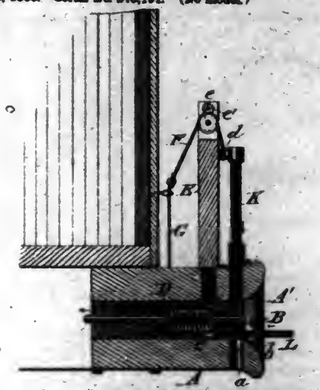
Claim.—1. In a car-coupling, the combination, with a draw-head, of a coupling-hook within the draw-head, a spring for moving the coupling-hook in one direction, a slider-bar, a pull-rod, a connection between the slider-bar and the pull-rod, and a lever for moving the slider-bar, substantially as specified.

2. In a car-coupling, the combination, with a draw-head, of a coupling-hook within the draw-head, a spring for moving the coupling-hook in one direction, a slider-bar, a pull-rod, a connection between the slider-bar and the pull-rod, a lever for operating the slider-bar, and a stop for maintaining the slider-bar in a position into which it may be adjusted, substantially as specified.

3. In a car-coupling, the combination, with a draw-head, of a coupling-hook within the draw-head, a spring for moving the coupling-hook in one direction, a slider-bar, a pull-rod, a connection between the slider-bar and the pull-rod, a lever for operating the slider-bar, and a stop having portions extending to opposite sides of the car and adapted to engage either of the end portions of the slider-bar to maintain the latter in position into which it may be adjusted, substantially as specified.

4. In a car-coupling, the combination, with a draw-head, of a coupling-hook within the draw-head, a spring for moving the coupling-hook in one direction, a slider-bar, a pull-rod, a connection between the pull-rod and the slider-bar, and a lever for operating the slider-bar, said lever having projections extending to opposite sides of the car and a projection extending above the car, substantially as specified.

397,675. CAR-COUPLING. CHESES WELLS, Newberry, S. C. Filed May 5, 1888. Serial No. 273,191. (No model.)



Claim.—1. In a car-coupling, the combination, with the slotted draw-head, of a pin-supporting device contained therein and consisting of a skeleton frame having solid ends, a central longitudinal rod located in said frame, a coiled spring around the rod within the frame, and a stationary transverse rod fixed in the draw-head and through the skeleton frame, and against which the spring bears, all substantially as described.

2. In a car-coupling, the combination, with the slotted draw-head, of a pin-supporting device consisting of a rod adapted to slide in said head and carrying a block attached to its forward end, so as to lie across the pin-hole, a spring coiled about said rod, and a stationary transverse bar located in the head and against which the spring bears, substantially as described.

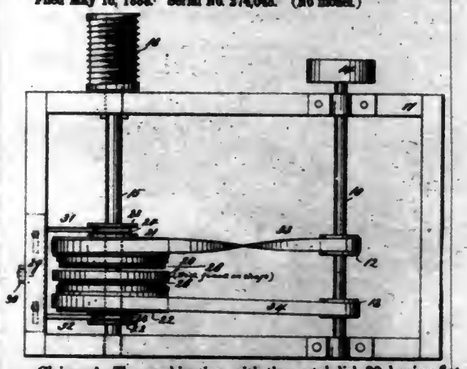
3. The herein-described coupling-link inclined or beveled at one end and square at the other end, substantially as described.

4. The herein-described coupling-link L', beveled at one end, as at *l*, substantially as and for the purpose described.

5. The combination, with the coupling-pin K, of the rectangular frame *n*, surrounding the draw-head, and having a spring, *o*, tensioned between its lower cross-piece and the under surface of the draw-head, and the cords *m m*, whereby the pin K is lifted, substantially as described.

6. The herein-described coupling-link beveled at one end, substantially as described.

397,676. REVERSING-GEAR. SAMUEL J. WHITE, Bearden, Ark. Filed May 16, 1888. Serial No. 274,048. (No model.)

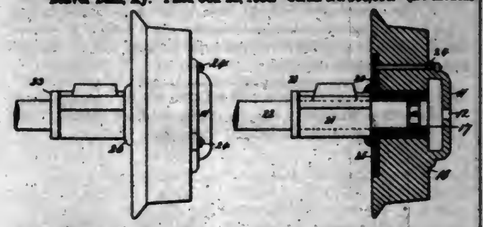


Claim.—1. The combination, with the metal disk 20, having flat sides, of a shifting pulley arranged parallel thereto and provided with a laterally-projecting annular flange, 25, and the friction-ring 26, made of soft material and secured to and projecting laterally beyond the said flange, whereby it is adapted to bear against the side of the disk when the pulley is shifted toward the latter, as shown and described.

2. The combination of the frame 11, main shaft 10, the counter-shaft 15, the metal disk 20, rigidly secured upon the latter, friction-drums mounted loosely on the counter-shaft and having peripherally-grooved hubs 23, the parallel arms 31 32, shifting-bar 29, and lever 30, the open belt 34, crossed belt 33, and a spirally-grooved

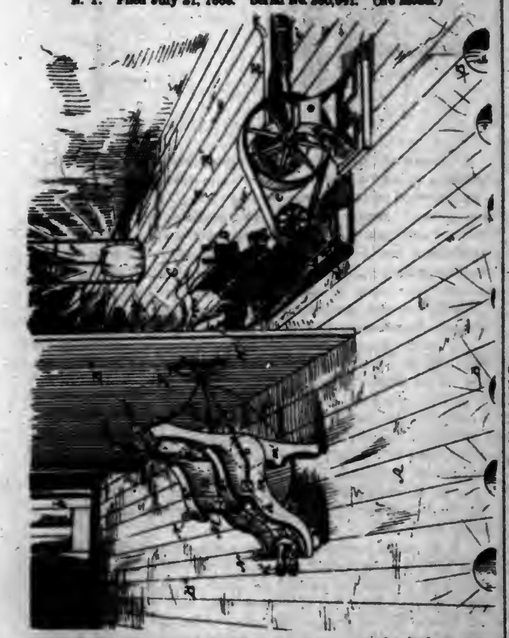
spool, 16, on one end of the counter-shaft, the pulleys 18, and a rope, 17, wound on said spool, and the shifting carriage 19, with which the rope is connected, all as shown and described.

397,677. CAR-WHEEL AND BEARING. JESSE S. WILLIAMS, Beaver Dam, Ky. Filed Oct. 22, 1888. Serial No. 288,810. (No model.)



Claim.—The hereinbefore-described improvement in car-wheels and bearings, consisting of an axle formed with a fixed collar and a circumferential groove, a wheel provided with an outer apertured cap formed integral therewith, recesses formed in the hub, brakes arranged within said wheel-hub having projections fitting the recesses in the hub and flanges adapted to enter the groove of the axle, an inner cap, and bolts by which the cap is secured to the wheel, all arranged substantially as shown and described.

397,678. THEATRICAL APPLIANCE. FRED WILSON, New York, N. Y. Filed July 21, 1888. Serial No. 280,641. (No model.)



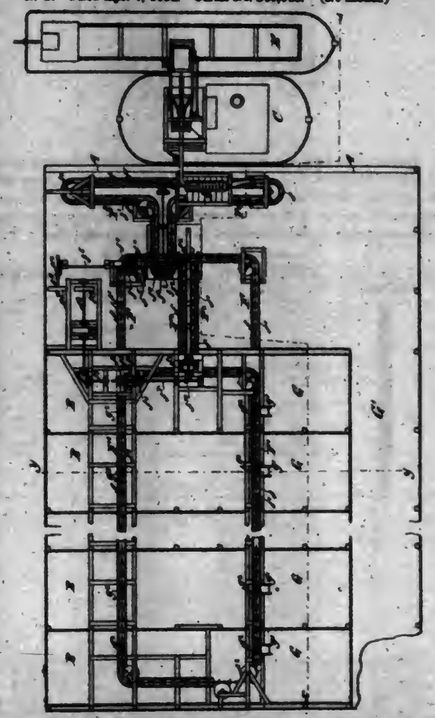
Claim.—1. The combination of a stage, a mechanical structure representing the interior of adjoining compartments, a chair in one compartment having electric lamps mounted thereon, a push-button adjacent to said chair, a battery in the adjoining compartment, wires connected with said battery and push-button, and wires connected with said lamps engaging said button, all arranged to operate substantially in the manner and for the purpose specified.

2. The combination of a stage, a mechanical structure representing the interior of adjoining compartments, a chair having a balanced pivoted body; electric lights mounted upon the chair-body, a push-button adjacent to said chair, a battery, wires connected with said battery and push-button, and wires connected with the lamps engaging the button, all arranged to operate substantially as shown and described.

3. In a theatrical appliance, a chair provided with a head-support, electric lamp attached to said chair, a generator of electricity, wires establishing a circuit between the generator, the chair, and the lamps, and a switch or button controlling said circuit, all arranged substantially as shown and described.

4. In a theatrical appliance, a chair having a pivoted and balanced body, electric lamps attached to said chair, a generator of electricity, wires establishing a circuit between the generator and lamps, and a device, substantially as shown and described, to open or close the circuit, as and for the purpose specified.

397,679. APPARATUS FOR HANDLING AND DISTRIBUTING GRANULAR OR LUMPY SUBSTANCES. EDGAR J. WOOD, Brooklyn, N. Y. Filed Apr. 7, 1888. Serial No. 269,913. (No model.)



Claim.—1. The combination, with the frame-work, as D', having slideways, as d^{10}, of an endless chain of buckets, wheels journaled in boxes fitting said slideways and arranged to rotate in the same plane, whereby the chain of buckets is caused to travel in a straight line in passing between the said wheels, and a pair of toggle-levers having their end joints connected with the wheel-journals, and an adjusting-screw connected with the middle joint of the toggle-levers for adjusting them to vary the distance of the wheels apart, substantially as herein described.

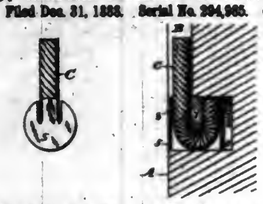
2. An apparatus for handling and distributing granular or lumpy substances, comprising a series of bins and a series of pockets each having a delivery-outlet, and a substantially-horizontal endless chain conveyer having two parallel intercommunicating runs extending one over the series of bins and the other over the series of pockets, the said conveyer being reversible and its runs having delivery-outlets, those of one run being over the several bins and those of the other run being over the several pockets, substantially as herein described.

3. An apparatus for handling and distributing granular or lumpy substances, comprising a series of bins and a series of pockets, each having a delivery-outlet, and a substantially-horizontal endless chain conveyer having two intercommunicating runs extending one over the series of bins and the other over the series of pockets, the said conveyer being reversible and its runs having delivery-outlets, those of one run being over the several bins and those of the other run being over the several pockets, and an inclined conveyer for receiving the material and delivering it to the said horizontal conveyer, to be thereby delivered to any one of the bins or to any one of the pockets, substantially as herein described.

4. An apparatus comprising a series of bins arranged side by side and a series of elevated pockets similarly arranged, and each having a delivery-outlet, a lower substantially-horizontal conveyer having two runs for taking material from any bin and reversible in its direction of movement, an upper substantially-horizontal conveyer having two runs or arms, respectively, over the bins and pockets, also reversible in its direction of movement, and having outlet-openings, those of one run being into the bins and those of the other run into the pockets,

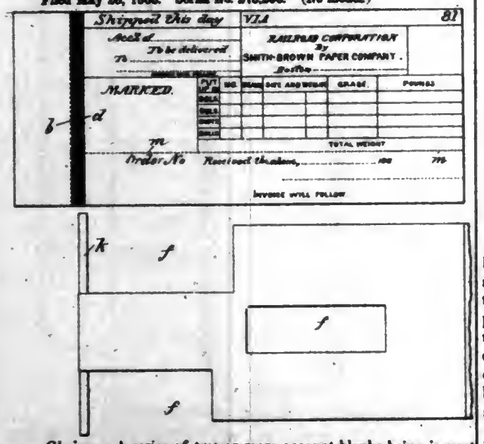
and an inclined conveyer into which material is delivered by the lower conveyer, and by the inclined conveyer delivered to the upper conveyer, substantially as herein described.

397,680. **SASH-CORD FASTENER.** EDWIN W. ABBE, New Britain, Conn. Filed Dec. 31, 1888. Serial No. 294,985. (No model.)



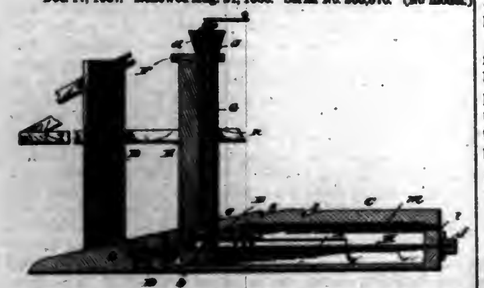
Claim.—The herein-described sash-cord fastener, consisting of the end plates connected by a shell or frame, the cross-bar between said end plates for doubling the cord over, and a fastening tongue formed integral with one or both of said end plates for impinging upon the cord, substantially as described, and for the purpose specified.

397,681. **ACCOUNT-BOOK.** EDWARD G. ALBREE, Boston, Mass. Filed May 28, 1888. Serial No. 275,290. (No model.)



Claim.—A series of two or more account-blanks being in part duplicates, the duplicate portions being in the same relative positions on each blank, combined with one or more sheets of carbon-paper, which are cut away or have their surfaces covered throughout those parts which correspond with the portions of the account-blanks which are not duplicates, substantially as shown and described.

397,682. **MOLE-PLOW.** JOHN C. ALLEN, Brookston, Ind. Filed Dec. 17, 1887. Renewed Aug. 21, 1888. Serial No. 283,870. (No model.)



Claim.—1. The combination, with the front and rear moles connected as described, of the front and rear vertical cutters, the plat form mounted thereon, the feed-tube communicating to the rear mole with the hopper thereon, and the auger therein, and the crank-shaft and agitator, all adapted to operate substantially as specified.

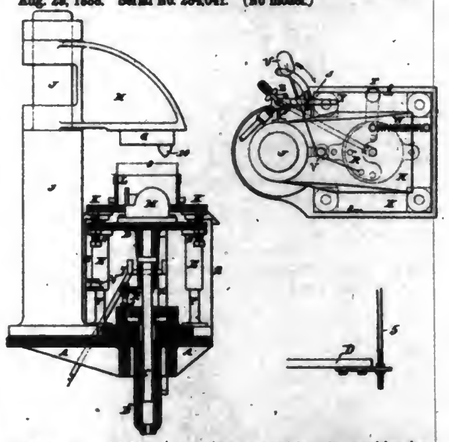
2. A mole formed in two longitudinal sections, the upper one of which has its forward end tapered and its outer side grooved transversely, and also recessed to form outlet-apertures, and a plate interposed between the two sections and extended laterally, substantially as specified.

3. The combination, with a mole, of a feed-tube, a rotative shaft therein, and an agitator in the mole and connected with the rotative rod, whereby a reciprocation may be imparted thereto, substantially as specified.

4. The combination, with the mole having a vent-aperture in its rear end, of the agitator, and a clearing-rod secured to the agitator and passing through the vent-aperture, substantially as described.

5. The combination, with the mole, of the vertical feed-tube having a hopper, the rotative rod therein, the auger secured to the rod, and the agitator connected with the lower cranked end of the said rod, substantially as specified.

397,683. **APPARATUS FOR MAKING MOLDS.** STEPHEN ALLEY and JOHN A. MACLELLAN, Glasgow, County of Lanark, Scotland. Filed Aug. 29, 1888. Serial No. 284,041. (No model.)



Claim.—1. Molding apparatus comprising, in combination, a hydraulic cylinder with its ram extending upward and having a platen, a pattern fixed on the platen, a parting-plate with a contour opening through which the pattern can project, adjusting-pins screwed in the platen to determine the position of the parting-plate when lifted by the platen, a mold-box, a resisting-block above the platen, a movable chock-plate for temporarily supporting the platen at a point in its descent, and a valve for controlling the action of the water in the hydraulic cylinder, the several parts being arranged and operating substantially as herein set forth.

2. Molding apparatus comprising, in combination, a hydraulic cylinder with its ram extending upward and having a platen, a pattern fixed on the platen, a parting-plate with a contour opening through which the pattern can project, adjusting-pins screwed in the platen to determine the position of the parting-plate when lifted by the platen, a mold-box, a resisting-block above the platen and fixed upon a bracket upon a pillar at the back of the machine, a movable chock-plate for temporarily supporting the platen at a point in its descent, and a valve for controlling the action of the water in the hydraulic cylinder, the several parts being arranged and operating substantially as herein set forth.

3. In molding apparatus having a rising platen with a pattern fixed on it, a parting-plate adjustable in relation to the platen, combined with a device for guiding the platen and stopping the parting-plate when the platen has partly descended, such device consisting of rods fixed to the bed-plate and extending up through guide-tubes fixed to the platen, with their upper ends acting as stops for the parting-plate, substantially as herein set forth.

397,684. **TURN-TABLE FOR MOLDERS.** STEPHEN ALLEY and JOHN A. MACLELLAN, Glasgow, County of Lanark, Scotland. Filed Oct. 5, 1888. Serial No. 287,346. (No model.)



Claim.—1. A turn-table constructed to turn on a central fixed pillar and comprising, in combination, a frame-work, a platform, a raised annular ledge or table, a central small table adapted to carry cores, &c., and gearing connecting the said central table with the turn-table, whereby a person standing on the turn-table may revolve the latter by turning the central table, substantially as herein set forth.

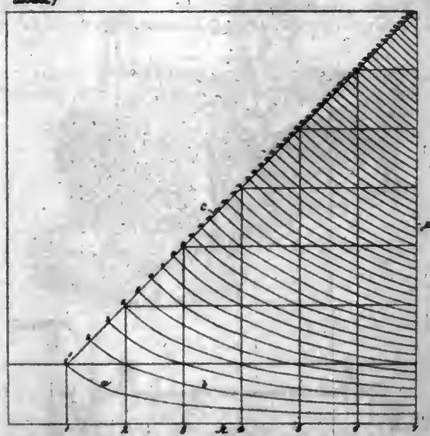
2. A turn-table with the gearing for turning it, consisting of a central rimmed table or disk, a pinion fixed to the center bon of the table or disk, a vertical shaft carried by the turn-table and having on it a spur-wheel gearing with the said pinion, and a pinion on the vertical shaft gearing with a fixed spur-wheel, substantially as herein described.

397,685. **MOWING-MACHINE CUTTER-BAR.** ISAAC F. RAMSDEN, Springfield, Ohio, assignor of one-half to Daniel Young, same place. Filed July 16, 1888. Serial No. 280,110. (No model.)



Claim.—The combination of a cutter-bar having a vertical flange on its rear portion and a dovetailed channel extending its entire length, a dovetailed bar fitting in the said channel and carrying the cutter-blades, the rear ends of which rest against the said flange, and screws d' engaging threaded openings a^2 in the cutter-bar for holding the bars together, substantially as described.

397,686. **SCALE FOR SURFACE MEASUREMENTS.** GEORGE H. BENEDICT, Chicago, Ill. Filed May 19, 1888. Serial No. 274,358. (No model.)

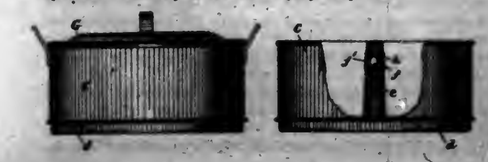


Claim.—1. A scale for ascertaining the number of units of square measure in a square or rectangular surface containing a multiplicity of such units, the same consisting of a series of curved or angular lines projected in successive order upon a diagram divided by vertical and horizontal lines into a number of the square units to be ascertained, the vertical lines bounding one side of each square being subdivided between each pair of horizontal lines into as many parts as the numbered position of the line from the measuring-corner of the scale indicates, and each curved or angular line intersecting all the vertical lines at the same point of subdivision in said lines, substantially as described.

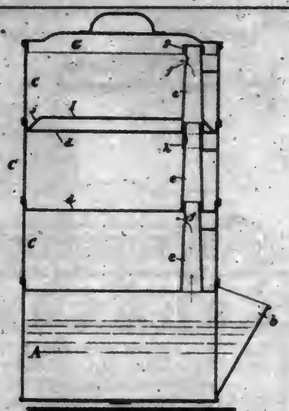
2. A scale for ascertaining the number of units of measure in a square or rectangular surface containing a multiplicity of such units, the same consisting of a diagram squared by one of such units, one side of each of which squares is divided into a successive series of parts, beginning with unity and progressing in consecutive order, and having curved lines projected across said diagram, intersecting each series of divisions in successive or progressive order, substantially as described.

397,687. **STEAM-COOKER.** WINFIELD S. BEVERIDGE, Baltimore, Md. Filed May 26, 1888. Serial No. 275,151. (No model.)

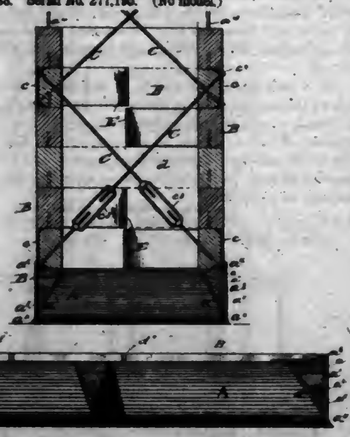
Claim.—The steam-cooker herein described, consisting of a base-boiler having arranged above the same a series of receptacles provided with perforated pipes having perforated collars mounted thereon, a removable cap on the upper end of the upper tube, and a removable flanged bottom having a notch which surrounds the pipe of the receptacle, substantially as and for the purpose specified.



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397,688. **MINING-CAISSON.** SILAS A. BOWE, Huron, Dak. Filed June 15, 1888. Serial No. 277,196. (No model.)



Claim.—1. A base for a mining-caisson, consisting of a series of metallic and wooden frames incased in a metallic jacket having a flange extending around and projecting beyond its lower end to prevent the earth coming in contact with the side of the base, and a flange extending beyond its upper end in which the lower frame of the caisson rests, substantially as described.

2. A base for a mining-caisson, consisting of a series of metallic and wooden frames having their outer sides vertical and their inner sides slanting, in combination with the jacket having its lower end bent out to form a flange and its upper end extended to form a flange in which the lower frame of the caisson rests, substantially as described.

3. The combination, with the base, of metal sheets secured to the inner and outer surfaces of the frames, the inner sheet being bent out to form a flange to prevent the earth coming in contact with the sides of the caisson, and the outer sheet extended up to form a flange in which the lower frame of the caisson rests, substantially as described.

4. The combination of the base, the frames seated thereon and held in position against lateral displacement by means of projections on the frame engaging corresponding openings on the base, and the truss-rods secured to the frames by means of plates and nuts, substantially as described.

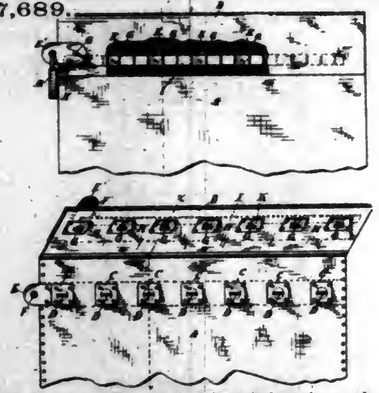
5. The combination of the base, the frame secured thereto, the truss-rods for connecting a number of the frames securely together, and the turn-buckles on the truss-rods for drawing the frames in line and also for clamping the frames to prevent the entrance of water to the shaft, substantially as described.

6. The combination, with the frames, of the grooves formed therein, designed for the reception of partitions for dividing the caisson into compartments, substantially as described.

397,689. **MAIL-BAG FASTENING.** HOMER L. BOYLE, Grand Rapids, assignor of one-half to Horace B. Peck, Allegan, Mich. Filed Aug. 1, 1888. Serial No. 281,688. (No model.)

Claim.—1. In combination with the body of a mail-bag and the plates C, attached thereto and slotted at D, the flap B, provided with

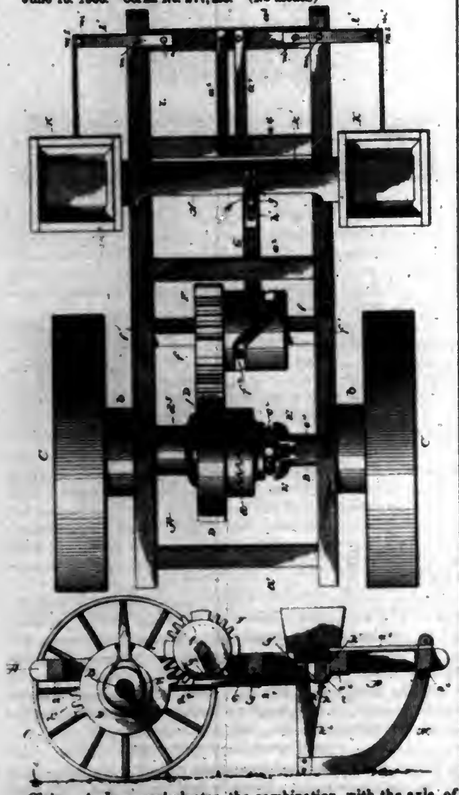
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plates H, the T-bolts G G, extending through these plates and adapted to enter said slots, the arms K, attached to said bolts, the bar I, attached to said arms, the plate E, pivoted on said flap and attached to the end of said strap, the plate E, attached to the body of the bag, and the padlock M, for locking said plates together, substantially as set forth.

2. A mail-bag having a body, A, and flap B, the latter provided with an interior chamber or space, of a bar moving longitudinally in said space, a series of arms attached to said bar, a series of inwardly-extending T-bolts attached to and operated by said arms, and the body of the mail-bag adapted to be engaged by said T-bolts, the above fastening devices being wholly covered when the bag is closed, substantially as set forth.

397,690. CORN-PLANTER. JAMES BRADY, Neuvoo, Ill. Filed June 18, 1888. Serial No. 277,423. (No model.)

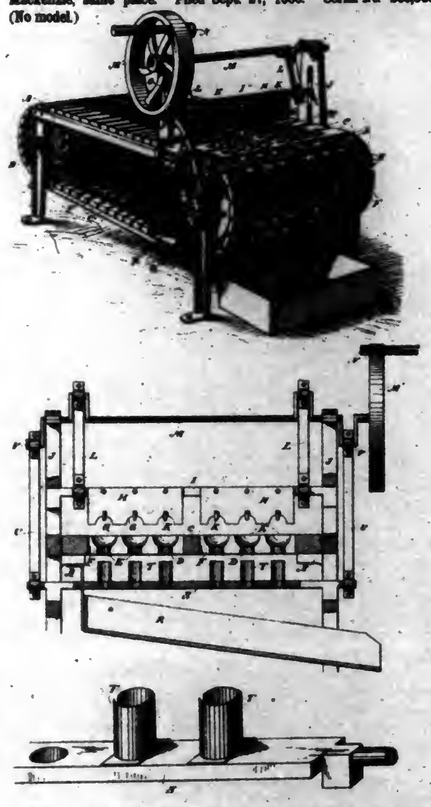


Claim.—1. In a seed-planter, the combination, with the axle, of the mutilated gear-wheel mounted loosely on the axle, the clutch adapted to connect the axle and mutilated gear, the second gear-wheel mounted contiguous to the first and rigidly connected to the wheel having the cam-groove, and the valve-rod connected to and receiving motion from the second gear-wheel, substantially as described.

2. In a seed-planter, the combination, with the axle, of the mutilated gear mounted loosely on the axle, the supporting-wheels, the pawls and ratchets connecting the wheels and the axle, the clutch connecting the axle and the gear, the second gear arranged contiguous to the first, the wheel having the cam-groove rigidly connected to the second gear-wheel, the sliding valve-rod, and the lever connected at one end to the valve-rod and having its other end projecting into the cam-groove, substantially as described.

3. In a seed-planter, the combination of a frame constructed in two parts, one supported by the axle having the mutilated gear-wheel and carrying the second gear having the cam-grooved wheel connected thereto, and the lever communicating motion from the cam-grooved wheel to the valve-rod, and another part carrying the hoppers and valve-rods, the two portions being connected by the angular joining-pieces, and the runners connected, substantially as described.

397,691. FRUIT-PITTER. JOHN G. BRIGGS and FRANK CAVALLARO, San José, Cal.; said Cavallaro assignor of one-half his right to A. S. Mackenzie, same place. Filed Sept. 27, 1888. Serial No. 286,669. (No model.)



Claim.—1. A fruit-stoning machine consisting of the endless belt formed of transverse bars linked together and drums around which they pass and by which they are driven, said bars having the concave depressions or chambers upon their surfaces, holes through the bottom of the chambers, and slots extending through their sides, in combination with the vertically-reciprocating cutters or knives and the pins or spurs by which the pits are forced out, substantially as herein described.

2. The endless traveling belt formed of transverse bars having concave depressions to hold the fruit, holes through the bottom of each depression for the escape of the stone, and slots extending out at each side, in combination with the vertically-reciprocating concave knives or blades having projecting points or spurs in the center of the arch, substantially as herein described.

3. In a fruit-pitting machine, the endless intermittingly-traveling belt with perforations and concave depressions in the surface, the vertical reciprocating concave knives with central projecting spurs or points, the crank-shaft, and connecting-rods, in combination with the ratchet-wheel, pawl, and actuating mechanism, whereby the belt is moved forward simultaneously with each reciprocation of the knives, substantially as herein described.

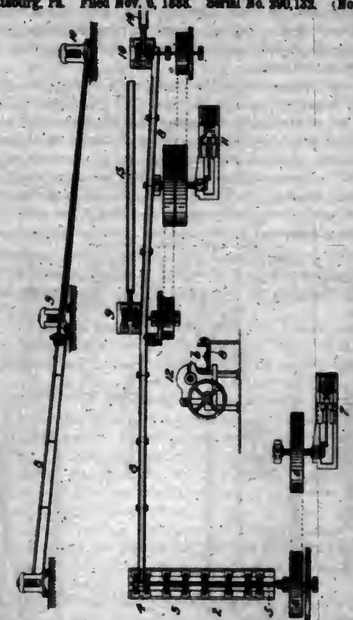
4. In a fruit-pitting machine, the endless traveling fruit-carrying belt, the pawl-and-ratchet mechanism by which it is advanced, and the vertically-reciprocating concave knives or cutters with the central projecting points or spurs, in combination with a second bar beneath the belt, mechanism whereby it is caused to reciprocate in the opposite direction from the cutters, and the elastic upwardly-projecting curved knives or cutters fixed to its upper surface, substantially as herein described.

397,692. KNIFE-BLADE. ABBIE I. CLARK, Easton, Pa. Filed Oct. 26, 1887. Serial No. 253,640. (No model.)



Claim.—The herein-described knife having a fixed handle and a blade provided with a series of transverse corrugations extended from top to bottom throughout, causing the edge to have a larger and smaller series of curves on each side, respectively, the members of one of which series alternate with those of the other, substantially as specified.

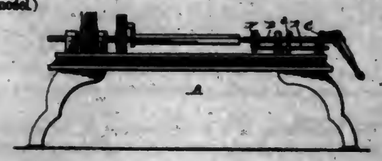
397,693. ART OF ROLLING METAL STRIPS. EDWARD I. CLARK, Pittsburg, Pa. Filed Nov. 6, 1883. Serial No. 290,132. (No model.)



Claim.—1. The method of rolling metal strips, which consists in forming a strip by rolling and elongation of a billet, stopping the progress of the strip, dividing the strip, scaling it, and passing the separated sections through finishing-rolls at about the same time, substantially as and for the purposes described.

2. The method of rolling metal strips, which consists in forming a strip by rolling and elongation of a billet, stopping the progress of the strip, dividing the strip, scaling it, and passing the separated sections forward, ends first, at about the same time through separate sets of finishing-rolls, substantially as and for the purposes described.

397,694. LATHE ATTACHMENT. FRED CLARKE and HERBERT H. RASSETT, Piqua, Ohio. Filed July 26, 1888. Serial No. 281,068. (No model.)



397,694.



Claim.—1. The combination of the tail-block and dead-spindle of a lathe with a movable cutter-block supported on said spindle and adapted to be moved in contact with the end of the blank supported by said spindle, substantially in the manner and for the purpose described.

2. The combination of the tail-block and dead-center spindle of a lathe with a sliding cutter-block mounted on said spindle, the rod mounted on said tail-block and connected to said cutter-block, and its operating-handle, all substantially as described.

397,695. LEVELING-INSTRUMENT. EDWIN R. GLOOSE and EDWARD M. EARLEY, Lebanon, Mo. Filed May 16, 1888. Serial No. 274,050. (No model.)



Claim.—In a leveling-instrument, the combination, with metal base and the flexible connecting-tube, of the glass tubes having the longitudinal openings *a*, and having the graduated scale on the outer surface, the metal caps B, having the internally-threaded flange and the small opening *c*, the hinged cover C, the spring-latch, and the metal band, substantially as specified.

397,696. FIRE-KINDLER. EDWIN R. GLOOSE and FRANKLIN JOURN, Lebanon, Mo. Filed May 26, 1888. Serial No. 275,191. (No model.)

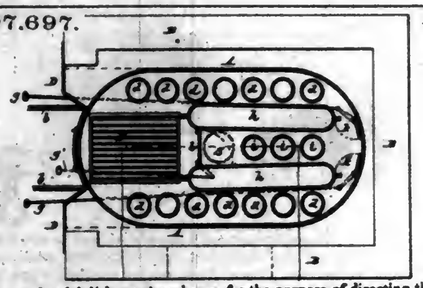


Claim.—A fire-kindler composed of the oil-chamber, located centrally and having the openings *f*, the absorbent packing completely surrounding said chamber, the outer casing, and the handle, substantially as specified.

397,697. FURNACE. REUBEN C. CORDT, Kansas City, Mo. Filed May 22, 1888. Serial No. 274,672. (No model.)

Claim.—1. A furnace consisting of the body A, having the two oblong air-pipes *h h* arranged therein in rear of the fire-box, and the

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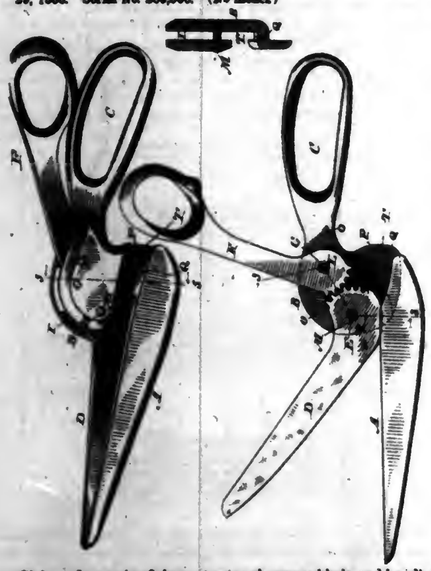


dampers *l* and *k' K'*, located as shown, for the purpose of directing the products of combustion and thereby heating more or less of the furnace, as herein set forth.

2. The combination, in a heating-furnace, of the body A, the oblong air-pipes *h h*, with the two exterior rows of air-tubes, *d*, and the valves *k*, *K'*, and *l*, all arranged substantially as shown and described.

3. The combination, in a furnace, of the body A, having the oblong air-pipes *h h*, the two rows of air-tubes *d*, and the central air-tubes, *i*, located therein as shown, with the valves *k*, *K'*, and *l*, all arranged to operate as set forth.

397,698. SHEARS. FRANK J. COOPER, Emporia, Kans. Filed Oct. 29, 1888. Serial No. 289,360. (No model.)



Claim.—In a pair of shears having the upper blade and handle in two parts, the horizontal shank of the lower blade at P projecting from the upper heel part of the blade and leaving a plain surface, Q, upon the heel part of the blade offering no obstruction to the cut edge of material on that side, in combination with the block H, forming, with the shank P, the recess at T, so as to leave no obstruction to the passage of the cut edge of material on the other side, whereby all lateral strain upon the cut edges of material is prevented, substantially as set forth

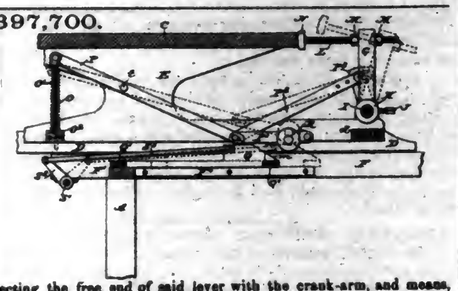
397,699. ALLOY. EUGENE H. COWLES and ALFRED H. COWLES, Cleveland, Ohio. Filed July 5, 1886. Serial No. 171,011. (No specimens.)

Claim.—A metallic alloy consisting of a proportion of copper, nickel in about half the proportion of the copper, and a percentage of aluminium, substantially as set forth.

397,700. IRONING-MACHINE. WILLIAM F. CREVERT and JOHN CLAUS, New York, N. Y. Filed Apr. 23, 1888. Serial No. 271,542. (No model.)

Claim.—1. The combination, in an ironing-machine, with its ironing-table, of the movable carriage supporting the same, the clamping-plates engaging the edge of the table, the transverse rock-shaft mounted upon the carriage and upon which said plates oscillate, a crank-arm projecting upward from the rock-shaft, a horizontal lever pivoted at one end to the carriage below the rock-shaft, a link connecting the free end of said lever with the crank-arm, and means, substantially as described, for producing an upward movement of the horizontal lever by the movement of the carriage, substantially in the manner and for the purpose herein set forth.

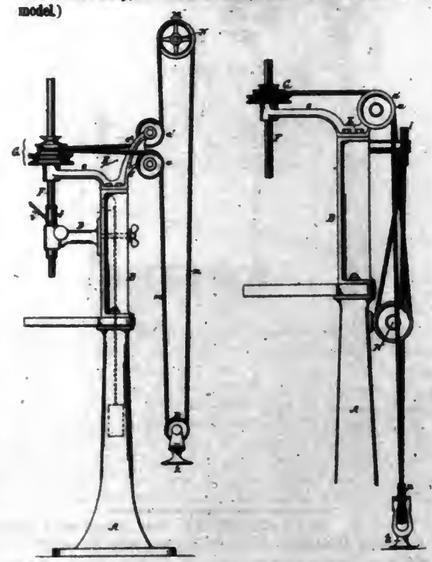
397,700.



2. The combination, in an ironing-machine, with the ironing-table and the carriage upon which the table is mounted, of a pair of movable clamping-plates engaging the edge of the table, a transverse rock-shaft upon the carriage, arms projecting radially from said shaft, transverse rods at the ends of said arms to which the clamping-plates are secured, a crank-arm projecting upward from the rock-shaft, a lever pivoted at one end to the carriage below the rock-shaft to rest normally in a horizontal position, a link connecting the end of said lever with the crank-arm, and a horizontal slide provided with an incline formed and located substantially as described with relation to the free end of the lever, whereby, when said incline strikes the lever, the lever shall be swung upward and thereby throw back the clamps from the ironing-table, substantially in the manner and for the purpose herein set forth.

3. In an ironing-machine, the combination, with the ironing-table, the clamps engaging its edge, the rock-shaft supporting and actuating the same, its crank-arm, the clamp-supporting arms and rods, and the horizontal lever pivoted at one end and coupled at the other to said crank-arm, of an inclined lever pivoted at its inner end to the free end of the horizontal lever, and a spring actuating the outer end of said lever, whereby the power of the spring is made to close and hold the clamps automatically against the edge of the table, substantially in the manner and for the purpose herein set forth.

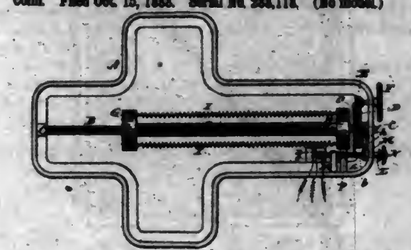
397,701. DRILLING-MACHINE. WILLIAM P. DALLETT, Philadelphia, assignor to himself, and Thomas H. Dallett and George A. Dallett, both of Thornbury, Pa. Filed Nov. 12, 1888. Serial No. 290,606. (No model.)



Claim.—1. The combination, in a drilling-machine, of the drill-spindle, a rack thereon, and two independent pinions, both engaging with said rack, one pinion adapted to be moved by hand to force the drill to its work and the other pinion acted on by a spring or weight to counterbalance said spindle, substantially as and for the purpose specified.

2. The combination, in a drilling-machine, of the cone-pulley splined directly to the spindle with a belt adapted to pass around guiding-pulleys and around a pulley on a suspended friction-weight and over a stationary driving-pulley, substantially as described.

397,702. ELECTRIC MOTOR. JULIAN P. DEMING, New Haven, Conn. Filed Oct. 15, 1888. Serial No. 288,118. (No model.)



Claim.—1. The combination of the rotating resistance for electric motors with a disk arranged upon its axis and so as to revolve therewith, a key arranged to slide parallel with the axis of the resistance and by which the circuit may be opened or closed, the said key standing within the line of the periphery of the said disk, the said disk constructed with a notch in its periphery corresponding to the surface of said key, and the key also constructed with a notch corresponding to the thickness of the disk, and which notch is brought into line with the disk when the circuit is closed, substantially as described, and so that the rotation of the said disk causes it to interlock with the said key, substantially as and for the purpose described.

2. In an electric motor, the combination therewith of a resistance consisting of several coils arranged upon an axis within the base of the machine and so as to rotate thereon, an independent contact for each coil of the resistance, the said contacts being of segment shape and arranged in line with each other, and so as to form a broken cylindrical surface concentric with the axis of rotation of the resistance, a contact stationary in the frame, against which the said contacts of the resistance will work, a key arranged to slide in the base parallel with the axis of rotation of the resistance, the said key being adapted under its sliding movement to close or open the circuit through the resistance, a disk on the axis of said resistance and so as to revolve therewith, the said key standing within the line of the periphery of the said disk, the said disk constructed with a notch corresponding to the said key when the resistance is fully applied, and the key constructed with a notch with which the said disk may interlock under the rotation of the resistance when the circuit is closed, substantially as and for the purpose described.

3. In a electric motor, the combination of a shaft supported in bearings in the base, a resistance consisting of several coils arranged upon said shaft and so as to revolve therewith, an independent contact for each coil, the said contacts of segment shape and together forming an interrupted cylindrical surface concentric with said shaft, a stationary contact arranged to bear upon the contacts of the resistance, a key supported in bearings in the base and adapted to slide longitudinally to close and open the circuit, a disk on said shaft and so as to revolve therewith, the said disk and key constructed to be interlocked only upon the closing of the circuit or disengaged only upon the opening of the circuit, a gear upon said shaft and so as to revolve therewith, with a pinion supported in said base arranged to work into said gear, the said pinion provided with a hand-wheel outside the base, whereby rotation may be imparted to said pinion, substantially as and for the purpose described.

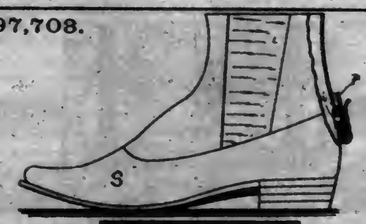
4. A resistance for electric motors, composed of several coils, each coil having a contact independent of the contacts of the other coils, the several contacts adapted to move in the same path and so as to present a broken or interrupted surface, a stationary contact against which the several resistance-coil contacts will successively bear as the said contacts move, a key arranged to slide at right angles to the path of movement of said resistance-coil contacts, and mechanism, substantially such as described, between said resistance-contacts and said key to interlock said contacts with said key, substantially as specified, and whereby the key can only be moved to open or close the circuit when the resistance is fully applied.

397,708. PANTALOONS-PROTECTOR. ABRAHAM DIAMOND and OTTO KOMMERS, New York, N. Y. Filed Feb. 20, 1888. Serial No. 264,656. (No model.)

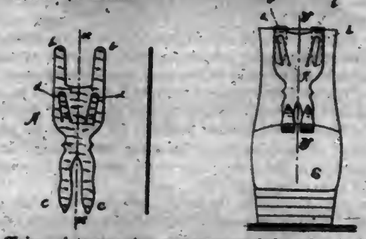
Claim.—In combination, with a boot or shoe, the pantaloons-supporter consisting of the hook A and eyelet B, the latter having its tube slotted to receive the back seam, substantially as shown and described.



397,708.



397,704. PANTALOONS-PROTECTOR. ABRAHAM DIAMOND and OTTO KOMMERS, New York, N. Y. Filed Feb. 20, 1888. Serial No. 264,657. (No model.)



Claim.—A trousers-leg supporter consisting of a single piece of metal having two bent prongs, *b b*, at one end, and two bent prongs, *c c*, at the other end, and two tongues, *d d*, which project toward the prongs *b b*, substantially as shown and described.

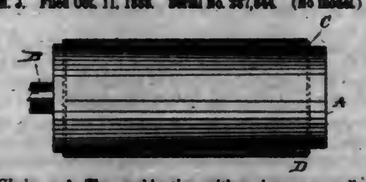
397,705. METHOD OF WINDING FIELD-MAGNETS. THOMAS A. EDISON, Llewellyn Park, N. J. Filed Sept. 15, 1888. Serial No. 285,235. (No model.)



Claim.—1. The method of winding a magnet, which consists in placing a cylinder on the magnet-core and turning said cylinder to wind the wire thereon, substantially as set forth.

2. The method of winding a magnet-core, which consists in placing on the core a cylinder made in two halves and turning said cylinder so as to wind the wire thereon, substantially as set forth.

397,706. PHONOGRAPH. THOMAS A. EDISON, Llewellyn Park, N. J. Filed Oct. 11, 1888. Serial No. 287,644. (No model.)



Claim.—1. The combination, with a phonogram-cylinder, of a false shell for receiving the phonogram-blank, substantially as set forth.

2. The combination, with a tapering phonogram-cylinder, of a false shell having a tapering bore for receiving a phonogram-blank, substantially as set forth.

3. The combination, with a phonogram-cylinder, of a false shell having a tapering bore, and a less tapering outer surface for receiving the phonogram-blank, substantially as set forth.

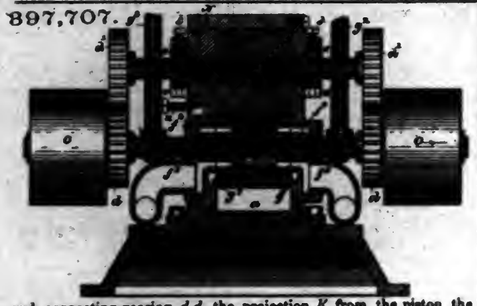
4. The combination, with a tapering phonogram-cylinder, of a false shell having a tapering bore and a less tapering outer surface, and a phonogram-blank having a slightly-tapering bore, substantially as set forth.

397,707. ROTARY STEAM-ENGINE. SILAS B. FARRINGTON, Portland, Me. Filed Aug. 13, 1888. Serial No. 282,603. (No model.)

Claim.—1. In a rotary steam-engine, the combination of the recessed abutment C, the piston B, having the projection *b'*, exhaust-passage F, steam-inlet g^3, and the opening and exhaust-passages $f f$, extending through the piston, and having also the steam-supply passages g^4, with the casing A, having the ports f^2 f^2 and the curved supply-passages g^2, substantially as described.

2. In a rotary engine, the combination of the casing having the chambers *a a'*, the piston B in the chamber *a*, the abutment C in the chamber *a'*, having the recess *c'*, the piston-shaft *b*, abutment-shaft *c*,

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and connecting-gearing *d d*, the projection *b'* from the piston, the steam-exhaust passage upon one side of said projection extending through the cylinder to its ends, the steam-supply passage upon the other side of said projection extending through the piston to its ends, and the uncontrolled exhaust-outlets through the ends of the casing arranged in line with the exhaust-outlets in the ends of the piston, and the curved supply-passages in the casing ends arranged in line with the openings in the piston ends in the steam-supply passages, substantially as described.

3. The combination, with the rotary piston having a supply-port, g^4, and radial guides for the segment-shaped valve H, of said valve H and springs A, fitted in recesses in the piston and bearing on said valve, substantially as described.

4. The combination, in a rotary engine, of the casing A, piston-chamber *a*, piston B, having a projection, *b'*, and the steam-supply passages g^3, extending from the ends of the piston and opening back of the projection *b'*, with the segment-shaped spring-balanced valves H, fitted to radial guides in said piston, substantially as described.

897,708. BEDSTEAD-TIE. MAGNUS FENNAU, Fintonia, Tex. Filed Aug. 31, 1888. Serial No. 284,258. (No model.)

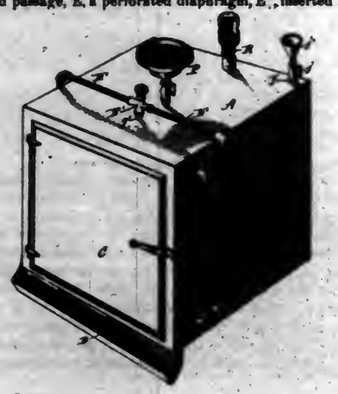


Claim.—1. The bedstead-tie keeper consisting of the bent strap D, slotted near its inner end and bent downward and outward from the slotted portion, the upturned hook at its outer end, and the upturned tooth at its inner end, in combination with a bolt adapted to pass through an opening in the slat, and a thumb-nut, substantially as specified.

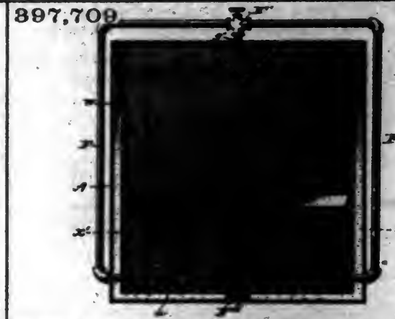
2. The combination, with a bedstead and the perforated slats thereof, of the bent metal keeper D, having a slot, E, a downward and outward bend from said slot, the upturned hook at its outer end, and the bolt and thumb-nut fastening, substantially as specified.

897,709. STEAM COOKING APPARATUS. WILLIAM H. FILER, Grove City, Pa. Filed June 2, 1888. Serial No. 275,339. (No model.)

Claim.—1. The combination of the casing A of the cooker, the oven B, somewhat smaller than the casing and inserted in one side of the said cooker, whereby a water and steam space is formed around the oven, the said casing and oven having formed through their bottoms a flanged passage, E, a perforated diaphragm, E", inserted in the said



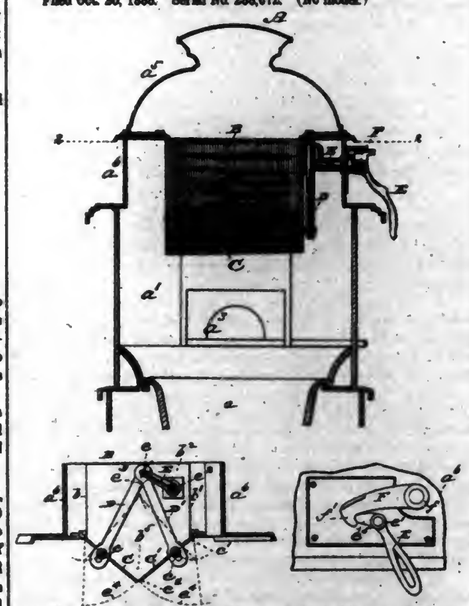
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passage, a flanged removable cover, E", placed over the said passage, and valved steam-conducting pipes connecting the steam-space of the cooker with the oven, substantially as described.

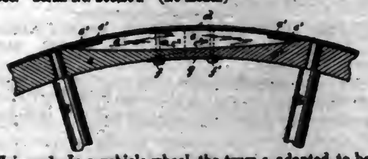
2. The combination of the casing, the oven B, smaller than the casing and inserted in one side of the cooker, whereby a water and steam space is formed around the oven, the said casing and oven having formed through their bottoms a flanged passage, a removable cover placed over the said passage, and valved steam-conducting pipes connecting the steam-space of the cooker with the oven, substantially as described.

897,710. HEATING-STOVE. GILES F. FILLEY, St. Louis, Mo. Filed Oct. 20, 1888. Serial No. 288,672. (No model.)



Claim.—The combination of the stove, the fuel-hopper, the bottom parts, C C, the links, and the crank-lever, said links at the lower end thereof being jointed to said parts C C, respectively, and at the upper end thereof being both jointed to said crank-lever, and said crank-lever being journaled as described, as and for the purpose set forth.

897,711. VEHICLE-WHEEL. JOHN R. FISHER, Boston, Mass., assignor of one-third to Whitfield W. Baxter, same place. Filed Nov. 5, 1888. Serial No. 290,264. (No model.)



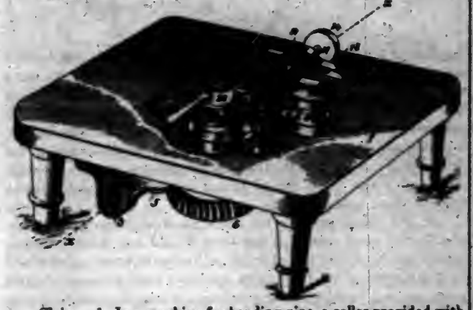
Claim.—1. In a vehicle-wheel, the truss *e*, adapted to be placed within a recess in the felly of the wheel, and having the bearing-plates *d' d'* made at or near the extreme end of said truss, for the purpose set forth and described.

2. In a vehicle-wheel, the combination of the truss *e*, bearing-plates *d' d'*, made at or near the extreme ends of said truss, and one or more rivets or bolts, c^5 c^5, as and for the purpose set forth.

3. In a vehicle-wheel, the truss *e*, having bearing-plates *d' d'* made at or near the extreme ends of said truss, as described, placed within a recess in the felly of the wheel, in combination with the clasp *g* and bolts *f f'*, as and for the purpose set forth.

4. In a vehicle-wheel, the hub *a*, spokes *b b*, felly *c c'*, tire *d*, truss *e*, having bearing-plates *d' d'* made at or near the extreme ends of said truss, rivets c^5 c^5, clasp *g*, and bolts *f f'*, all combined and arranged in a manner and for the purpose set forth.

897,712. MACHINE FOR BENDING PIPE. HERBERT H. FOWLER, New Haven, Conn. Filed May 12, 1888. Serial No. 273,723. (No model.)



Claim.—1. In a machine for bending pipe, a roller provided with a gripping clamp or eye projecting radially from its periphery, in combination with an opposite roller having a groove or recess to receive the said gripping clamp or eye, substantially as specified.

2. In a machine for bending pipe, a bending-roller comprising two separable sections, each carrying a part to form a gripping clamp or eye, in combination with a bending-roller having a groove or recess adapted to receive the said clamp or eye, substantially as specified.

3. In a machine for bending pipe, a bending-roll formed in two separable sections, and each having a circumferential curvilinear groove at their adjacent sides, and also having respectively a part which forms a gripping clamp or eye, in combination with a bending-roll having a groove or recess to receive the said clamp or eye, and also a circumferential curvilinear groove to match the corresponding groove in the opposite roll, substantially as specified.

4. In a machine for bending pipe, the combination of a shaft formed with a shoulder and with a reduced and screw-threaded upper end, a roller which consists of two halves, formed with grooved or recessed edges, which form a nearly semi-cylindrical groove in the periphery of said roller, provided with two registering hook-shaped clamping-jaws in their peripheries, which form a projecting eye, and with a registering pin and hole in their facing sides, a washer upon said shaft and supported upon the top of said roller, and a nut upon the screw-threaded end of said shaft and clamping said washer and roller-halves against the shoulder upon said shaft, substantially as described.

5. In a machine for bending pipe, the combination, with a bending-roller provided with a projecting eye at its periphery, of an opposite bending-roller formed in its periphery with a notch or recess which registers with and receives said eye, substantially as described.

6. In a machine for bending pipe, the combination, with a bending-roller provided with a projecting and adjustable clamp or grip at its periphery, of an opposite bending-roller formed in its periphery with a notch or recess which registers with and receives said eye, substantially as described.

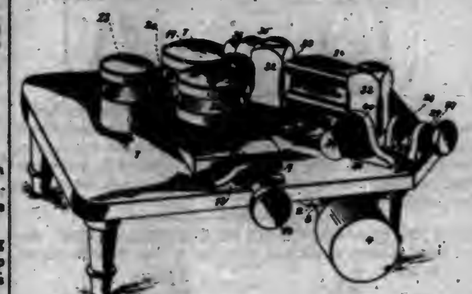
7. In a machine for bending pipe, the combination, with a bending-roller formed with a slightly less than semi-cylindrical and circumferential groove and provided with projecting and adjustable clamping-jaws at its periphery, of an opposite bending-roller formed with a similar circumferential groove and in its periphery with a notch or recess which registers with and receives said eye, substantially as described.

8. In a machine for bending pipe, the combination of a frame or table formed with a transverse slot and with a bearing at the inner end of said slot, a spindle or shaft journaled in said bearing, a block which slides in said slot, and is formed with a lip at its outer end and a bearing at its inner end, a screw which fits through a screw-threaded perforation in a lip upon said table at the outer end of said slot and bears against the lip upon said sliding block, a shaft or spindle journaled in the bearing in said sliding block, two meshing cog-wheels which are of the same diameter, provided with long cogs and secured upon said spindles or shafts, means for revolving one of said spindles or shafts, and interchangeable bending-rollers upon said spindles or shafts, substantially as described.

9. In a machine for bending pipe, the combination of a circumferentially-grooved bending-roller provided with a projecting clamping or gripping eye, a circumferentially-grooved bending-roller formed with a notch or recess in its periphery which registers with said eye, and a circumferentially-grooved guide-roller arranged in a line with the space between the bending-rollers and at right angles to a line drawn through the centers of said rollers, substantially as described.

10. In a machine for bending pipe, the combination of the machine frame or table formed with the slot 9, the drive-shaft 3, formed with the worm 4, the shaft or spindle 7, formed with the threaded end 23 and with the worm-wheel 6 and cog-wheel 18, and journaled in said frame or table, the divided and grooved roller 20 21, formed with the jaws 27 and 28, the washer 25 and handled nuts 23 24, the sliding block 8, having the adjusting-screw 11, the shaft or spindle 15, journaled in said sliding block and provided with cog-wheel 17, the roller 31 upon said shaft and formed with the groove 32 and notch or recess 33, and the guide-roller 34, substantially as described.

897,713. MACHINE FOR BENDING PIPE. HERBERT H. FOWLER, New Haven, Conn. Filed May 12, 1888. Serial No. 273,724. (No model.)



Claim.—1. In a machine for bending and coiling pipe, the combination, with a pair of feed-rollers, of a pair of bending-rollers formed with molded ends journaled one above the other and arranged to project into the space between said feed-rollers, and, together with one of said rollers, to force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, and to form a continuation of the periphery of said first-named roller, substantially as described.

2. In a machine for bending and coiling pipe, the combination, with a pair of feed-rollers, of a pair of bending-rollers formed with molded ends journaled one above the other and arranged to project into the space between said feed-rollers, and, together with one of said rollers, to force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, and to form a continuation of the periphery of said first-named roller, and means for adjusting said rollers toward and from said feed-rollers, substantially as described.

3. In a machine for bending and coiling pipe, the combination, with a pair of feed-rollers, of a pair of bending-rollers formed with molded ends journaled one above the other and arranged to project into the space between said feed-rollers, and, together with one of said rollers, to force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, and to form a continuation of the periphery of said first-named roller, said a slide which forms bearings for said bending-rollers, and is provided with a feed-screw for adjusting it toward or from said feed-rollers, substantially as described.

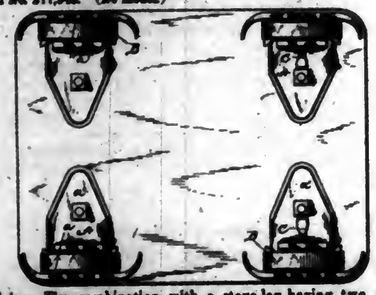
4. In a machine for bending and coiling pipe, the combination, with a pair of feed-rollers, of a slide provided with a screw for adjusting it toward and from the space between said feed-rollers, a plate or frame pivoted upon said slide, a screw for tilting or laterally adjusting said plate or frame, and a pair of bending-rollers which are journaled one above the other at the inner end of said plate or frame and formed with molded ends, and, together with one of said feed-rollers, force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, substantially as described.

5. In a machine for bending and coiling pipe, the combination of a pair of grooved feed-rollers, a slide provided with a screw for adjusting it toward and from the space between said feed-rollers, a plate or frame pivoted upon said slide, a screw for laterally adjusting said plate or frame, and a pair of bending-rollers which are journaled upon said plate or frame and formed with molded ends which correspond to the grooves in the feed-rollers, and, together with one of said feed-rollers, force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, substantially as described.

6. In a machine for bending and coiling pipe, the combination of the machine frame or table formed with the diagonal slot 24, the

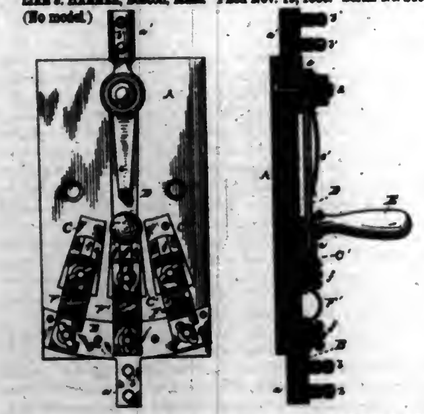
feeding-rollers 19 and 21, formed with the registering circumferential grooves 20 and 22, the guide-rollers 23, the guide 41, the slide 25 in said slot 24, the screw 27, for adjusting said slide, the plate or frame 31, pivoted upon said slide and formed with the uprights 32, which are provided with the horizontal bearings 33, the screw 38, which bears against the outer upright, 32, the shafts 34 in said bearings 33, and the bending-rollers 35, upon the inner ends of said shafts and formed with the molds, grooves, or rabbets 36, which correspond in shape to the grooves in said feed-rollers, substantially as described.

397,714. STOVE-FOOT. JOSEVILLE F. FOWLER, Alliance, assignor of one-half to Homer M. Silver, Salem, Ohio. Filed June 23, 1888. Serial No. 277,942. (No model.)



Claim.—The combination, with a stove-leg having two downwardly-extending arms, of a roller mounted therein provided with a number of inwardly-extending teeth, and a thumb-screw working in a threaded opening in one of the arms, the inner end of the said screw being designed to engage the teeth on the roller to lock the same in place, substantially as described.

397,715. SAFETY DEVICE FOR ELECTRICAL CIRCUITS. WILLIAM J. HANNER, Boston, Mass. Filed Nov. 19, 1886. Serial No. 219,268. (No model.)



Claim.—1. The combination, with a broken conductor of an electrical circuit, of two or more fusible safety-catches, all connected in parallel circuit with one terminal of said conductor, and a switching device for connecting the other end of any one of said safety-catches with the other terminal of said conductor, substantially as set forth.

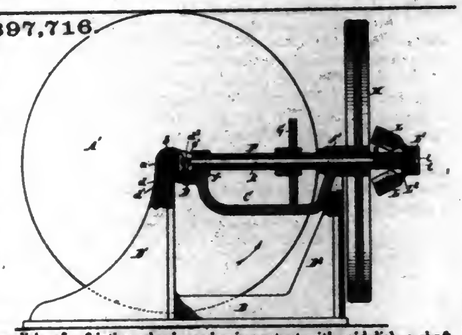
2. The combination, with a broken conductor of an electrical circuit, of two or more fusible safety-catches, all connected in parallel circuit with one terminal of said conductor, and a pivoted switch-arm connected with the other terminal and adapted to be brought into connection with any one of said safety-catches, substantially as set forth.

3. The combination of the insulating-base, a circuit-terminal at one end thereof, two or more separate contact-plates on the base, fusible safety-catches joining said contact-plates with said terminal, another terminal at the other end of the base, and a switching device for connecting said last-named terminal, substantially as set forth.

4. The combination, with the conductor of an electrical circuit, of two or more fusible safety-catches of different conducting capacities, and a switching device for interpolating any one of them in the circuit of said conductor, substantially as set forth.

397,716. SPEED-REGULATOR. FREDERICK HART, Poughkeepsie, N. Y. Filed Apr. 12, 1888. Serial No. 270,442. (No model.)

Claim.—1. In a speed-regulator, the combination, with the driving-disk, of a friction-wheel running in contact with said disk, a shaft which is rotated by said wheel and on which the wheel can move toward and from the center of the driving-disk, and a frame in which said shaft is mounted and which is movable in a plane parallel with the working-face of the driving-disk on one side of the center thereof, whereby said shaft can be placed at an angle to the radius of the driving-disk and the friction-wheel can be placed at an angle to the direction of motion of the driving-disk at its point of contact with the friction-wheel, substantially as set forth.



2. In a speed-regulator, the combination, with the driving-disk, of a friction-wheel running in contact with said disk, a shaft which is rotated by said wheel, and on which said wheel can move toward and from the center of the driving-disk, a pivoted bearing supporting said shaft near the periphery of the driving-disk, and a movable bearing supporting the shaft near the center of the driving-disk and capable of movement toward and from the radial line of the driving-disk, substantially as set forth.

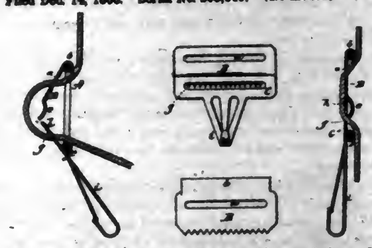
3. In a speed-regulator, the combination, with the driving-disk, of a friction-wheel running in contact with said disk, a shaft which is rotated by said wheel and on which the wheel can move toward and from the center of the driving-disk, a movable frame in which said shaft is mounted, and whereby said shaft can be placed at varying angles, and a governor whereby the position of the frame is automatically adjusted, substantially as set forth.

4. The combination, with the driving-disk A', of a stationary frame, B, an elbow-lever, D, supported in said frame, a movable frame, C, pivoted at one end in said frame and attached at its opposite end to said elbow-lever, a hollow shaft, F, journaled in said frame, a shifting-rod, *k*, arranged in said shaft and connected at one end with said elbow-lever, a governor connected with the opposite end of the shifting-rod, and a friction-wheel, G, mounted on the shaft F, substantially as set forth.

5. The combination, with the driving-disk A', of the movable frame C, a hollow shaft, F, journaled in the same and provided with a feather, *h*, and a friction-wheel, G, mounted on the shaft F and provided in its hub with an anti-friction roller, *i*, bearing against said feather, substantially as set forth.

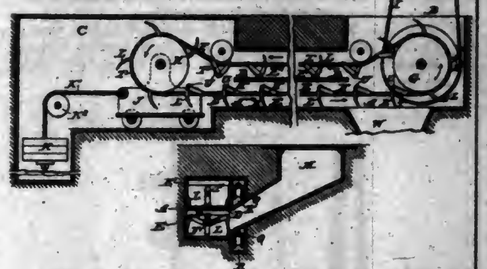
6. The combination, with the driving-disk A', of the stationary frame B, the movable frame C, the elbow-lever D, the hollow shaft F, journaled in the frame C, the shifting-rod *k*, arranged in the shaft F, the governor-weights L, pivoted to the shaft F, the head L', arranged in said shaft and connected with the governor-weights, and the washers *m*, interposed between the shifting-rod *k* and the head L', substantially as set forth.

397,717. BUCKLE. HENRY A. HARTSHORN, West Haven, Conn. Filed Dec. 14, 1888. Serial No. 293,619. (No model.)



Claim.—The herein-described buckle, consisting of the wire frame A, forming an upper and lower bar, the sheet-metal part B, constructed with the lip closed around the upper bar of the frame as a hinge, and the said part B constructed to form a jaw at its lower edge, and with a longitudinal slot, *a*, above the jaw edge combined with the part C hinged to the lower bar of the frame, and constructed with a longitudinal slot, *g*, forming a bar, *h*, upon the upper edge of the said part C, the said part C in its closed position adapted to overlap the jaw edge of the part B and present the jaw edge of the part B to the said slot in the part C, substantially as described.

397,718. APPARATUS FOR COLLECTING AND CONVEYING ASHES, &c. FREDERICK H. HAWKINS, New York, N. Y. Filed Aug. 16, 1888. Serial No. 282,983. (No model.)



Claim.—1. The combination, in an apparatus for collecting and conveying street-sweepings, snow, and other refuse material in cities, of an underground main conduit, an endless carrier moving through said conduit, one or more lateral conduits communicating with said main conduit, an endless carrier moving through each lateral conduit, chutes communicating from the street-level with said main and lateral conduits, conveying-blades attached to the carriers, and mechanism, substantially as described, connecting the main and lateral carriers with a common motor to obtain a synchronous movement thereof, all substantially in the manner and for the purpose herein set forth.

2. The combination, in an apparatus for collecting and conveying street-sweepings, snow, and other refuse material in cities, of an underground main conduit longitudinally divided into two compartments, an endless conveying-cable moving forward through the lower compartment and returning through the upper compartment, conveying-blades attached to said cable, means, substantially as described, for operating said cables, and chutes communicating from the street-level with the lower compartment of the conduit, substantially in the manner and for the purpose herein set forth.

3. The combination, in an apparatus for collecting and conveying street-sweepings, snow, and other refuse material in cities, of an underground main conduit, an endless cable moving through said conduit, conveying-blades carried by said cable, lateral conduits communicating with said main conduit, an endless cable moving through each lateral conduit, conveying-blades carried thereby, a motor actuating the main cable, an endless auxiliary driving-cable carried in a conduit parallel with the main conduit and driven by said motor, and gearing, substantially as described, connecting said auxiliary cable with the driving-pulley of each lateral cable, substantially in the manner and for the purpose herein set forth.

4. The combination, substantially as described, with an endless cable, of a conveying-blade having a central slot to embrace the cable, and a connecting-yoke pivoted to the cable.

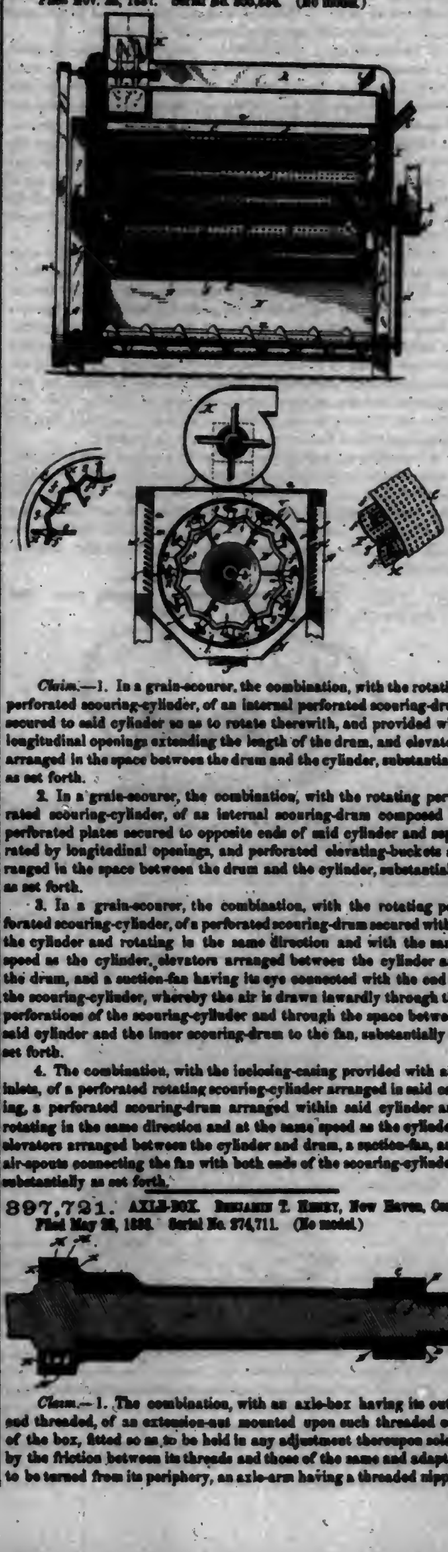
5. The combination, substantially as described, with an endless cable, of a conveying-blade having a central slot to embrace the cable, a connecting-yoke pivoted to the cable, and a spring attached to the yoke to bear upon the blade, substantially in the manner and for the purpose herein set forth.

397,719. GUN HAND-PROTECTOR. ROLLA O. HERRIN, Dayton, Ohio. Filed Sept. 12, 1888. Serial No. 285,181. (No model.)



Claim.—A double-barreled-gun hand-protector comprising a spring metal handle lined with a non-conductor of heat, the edges of which bear against the upper surfaces of said barrels, thereby admitting of longitudinal adjustment, substantially as shown and described.

397,720. GRAIN-SCOURER. ANDREW HEINS, Silver Creek, N. Y. Filed Nov. 28, 1887. Serial No. 256,234. (No model.)



Claim.—1. In a grain-scourer, the combination, with the rotating perforated scouring-cylinder, of an internal perforated scouring-drum secured to said cylinder so as to rotate therewith, and provided with longitudinal openings extending the length of the drum, and elevators arranged in the space between the drum and the cylinder, substantially as set forth.

2. In a grain-scourer, the combination, with the rotating perforated scouring-cylinder, of an internal scouring-drum composed of perforated plates secured to opposite ends of said cylinder and separated by longitudinal openings, and perforated elevating-buckets arranged in the space between the drum and the cylinder, substantially as set forth.

3. In a grain-scourer, the combination, with the rotating perforated scouring-cylinder, of a perforated scouring-drum secured within the cylinder and rotating in the same direction and with the same speed as the cylinder, elevators arranged between the cylinder and the drum, and a suction-fan having its eye connected with the end of the scouring-cylinder, whereby the air is drawn inwardly through the perforations of the scouring-cylinder and through the space between said cylinder and the inner scouring-drum to the fan, substantially as set forth.

4. The combination, with the inclosing-casing provided with air-inlets, of a perforated rotating scouring-cylinder arranged in said casing, a perforated scouring-drum arranged within said cylinder and rotating in the same direction and at the same speed as the cylinder, elevators arranged between the cylinder and drum, a suction-fan, and air-spouts connecting the fan with both ends of the scouring-cylinder, substantially as set forth.

397,721. AXLE-BOX. BENJAMIN T. HENRY, New Haven, Conn. Filed May 28, 1888. Serial No. 274,711. (No model.)

Claim.—1. The combination, with an axle-box having its outer end threaded, of an extension-nut mounted upon such threaded end of the box, fitted so as to be held in any adjustment thereupon solely by the friction between its threads and those of the same and adapted to be turned from its periphery, an axle-arm having a threaded nipple,

and a nipple-nut screwing over such nipple and bearing against the outer end of the extension-nut, whereby the said extension-nut may be adjusted to take up the wear without the removal of either of the nuts or the use of washers, substantially as set forth.

2. The combination, with an axle-box having its outer end threaded, of an extension-nut mounted upon such threaded end of the box, fitted so as to be held in any adjustment thereupon solely by the friction between its threads and those of the box, an axle-arm having its nipple threaded in an opposite direction from the threads on the axle-box, and a nipple-nut screwing over such nipple and bearing against the outer end of the extension-nut, whereby the said extension-nut may be adjusted without the removal of either of the nuts or the use of washers, and whereby and owing to the opposite threading of the box and nipple damage is prevented in case the nuts should get bound together, substantially as set forth.

3. The combination, with an axle-box having its outer end threaded, of an extension-nut mounted upon such threaded end of the box, fitted so as to be held in any adjustment thereupon solely by the friction between its threads and those of the same, having a circular recess in its outer end and adapted to be turned from its periphery, an axle-arm having a threaded nipple, and a nipple-nut screwing over such nipple and having at its inner end a flange adapted to enter the circular recess in the extension-nut, whereby the said extension-nut may be adjusted to take up wear without the removal of either of the nuts or the use of washers, and whereby, also, dust is excluded from the wearing-surfaces of the device, substantially as set forth.

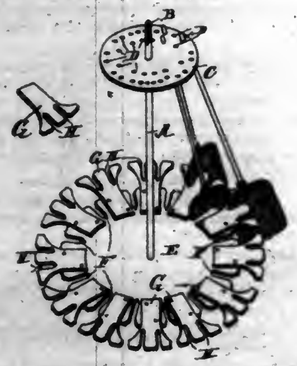
4. An axle-box the inner end whereof is provided with an annular retaining-chamber, an annular intercepting-passage leading from the bore of the box into such chamber, and one or more flanges located within the chamber and closing the said passage to the inner portion thereof, whereby foreign matter gaining access to the box is intercepted by the said passage and thence conveyed to the chamber, where it is retained, substantially as set forth.

397,722. HOPPLE. THOMAS HERRIN, Stockville, Nebr. Filed June 26, 1888. Serial No. 278,223. (No model.)



Claim.—The herein-described pig-hopple, composed of the band A and the similar band, C, secured together to form a strap, which is provided at one end with a buckle and at the other end with eyelets therefor, and the points or pricks B, with the hooks *e* at their lower ends, secured between the bands A and C, having their upper ends curved outwardly from the leg when in place thereon and provided just above the strap with the outward-extending loops *b*, substantially as and for the purpose specified.

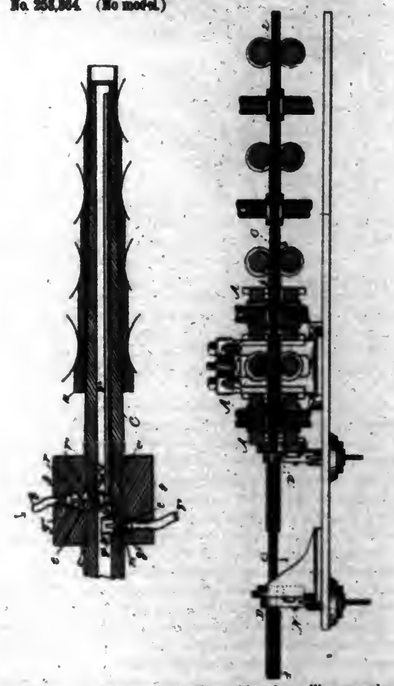
397,723. BROOM-RACK. WESLEY C. JONES, Waxahachie, Tex. Filed Nov. 27, 1888. Serial No. 292,025. (No model.)



Claim.—1. A broom-rack comprising a central supporting-rod, a pair of circular plates secured to the ends of the said rods, and radial tongues secured to the lower plate, the upper plate being provided with perforations to receive the broom-handles, and the lower plate and the tongues secured thereto being provided with notches to receive the broom-heads, as set forth.

2. A broom-rack comprising a central supporting-rod provided at its upper end with a loop or ring, a circular disk secured to the upper end of said rod and provided with concentric series of perforations, a circular disk secured to the lower end of the supporting-rod and having radial notches in its edge, and a series of radial tongues secured to the upper side of the said plate between the notches in the same and projecting beyond the edge of the said plate, the said tongues being provided with notches in their outer ends, as set forth.

397,724. MACHINE FOR ROLLING SEAMLESS TUBING. CHARLES KELLOGG, Buffalo, N. Y., assignor to the Kellogg Seamless Tube and Manufacturing Company, Boston, Mass. Filed Dec. 24, 1887. Serial No. 258,804. (No model.)



Claim.—1. In an organized machine for rolling seamless tubes and similar articles, the combination, with a series of pairs of rolls arranged for progressively rolling an ingot into a tube or similar article, of the stationary tapering or conical mandrel projected between said rolls, and suitable supports for said mandrel, substantially as specified.

2. In an organized machine for rolling seamless tubes and similar articles, the combination, with the grooved rolls of said machine, of the tapering or conical mandrel projected between said rolls and centered in the grooves thereof, and suitable supports for the said mandrel, substantially as specified.

3. The combination, with a series of pairs of positively-driven rolls provided with suitable grooves and arranged for progressively rolling an ingot into a tube or similar article, of a tapering or conical mandrel projected between and centered in grooves in the said rolls, and suitable grips or holders that grasp the mandrel at several points and are susceptible of being separately released from the mandrel to permit an ingot to be passed onto the mandrel and thence to and through the rolls without removing the mandrel from the machine, substantially as specified.

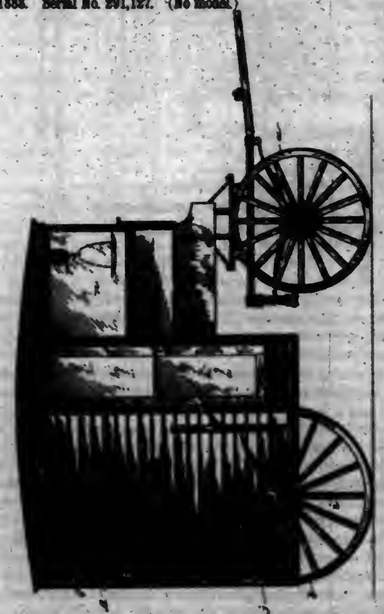
4. The combination, with a mandrel of a rolling-machine, of grippers for grasping and supporting the same, a cylinder and piston for operating each of said grippers, suitable pipes and valves for conducting the operating agent to and away from said cylinder and controlling its movements, and brackets or standards for operating in connection with said grippers, substantially as described.

5. A gripper for grasping the end of the mandrel of a rolling-machine, consisting of two levers pivoted together near their middles and provided in their upper ends with recesses of the same shape as the mandrel, combined with a steam-cylinder, a piston fitted to operate therein, suitable pipes and regulating devices for controlling the flow of steam or other actuating agent to and from said cylinder, and connecting devices between the lower ends of the levers composing the gripper and the piston, substantially as described.

6. The combination, with a hollow mandrel and a gripper for grasping the same, of devices carried by said gripper for conducting water to and away from the mandrel when said mandrel is grasped by the gripper, and mechanism for cutting off the supply of water and preventing the escape of the same from said supply or from the interior of the mandrel when the gripper is released from the mandrel, substantially as described.

7. The gripper D, consisting of the two levers *f f*, pivoted together near their centers and provided in their upper ends with recesses *i i* and $f' f'$, combined with their hollow mandrel C, provided with the orifices c^3 c^3, tubes g^1 g^2, pipes g g^4 g^5, the valves r r' r^6, springs *s*, and means for opening and closing the grippers, substantially as described.

397,725. BUTCHER'S WAGON. GEORGE R. KENT, Burlington, Wis., assignor of one-half to A. J. Hannan, same place. Filed Nov. 17, 1888. Serial No. 291,127. (No model.)



Claim.—1. A butcher's wagon the body of which has central and rear parts, the bottoms of which are depressed below the centers of the rear wheels, and a front part, having side and front windows, and the floor or bottom of which is elevated above the tops of the forward wheels and is of suitable height to sustain a chopping-block, said rear part having a meat-compartment closed at its sides and rear end, but provided with a door in front, and said central part (which is for the driver or attendant) being closed by side doors, substantially as set forth.

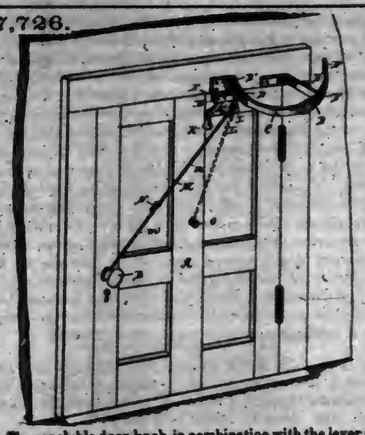
2. A butcher's wagon having a bent rear axle, *i*, a wagon-body, A, the central and rear parts of which are depressed below the center of the rear wheels, springs *j* at the sides of the rear part of said body, on which the latter is suspended, a rear meat-compartment, *c*, having a door, *f*, at its front, an ice-chamber, *h*, above said meat-compartment, and a driver's space, *d*, with a depressed floor and with side doors and a closed front, the floor of which is raised above the tops of the forward wheels, and which thus affords a suitable support for the chopping-block *m*, substantially as set forth.

397,726. COMBINATION DOOR-CHECK AND ALARM. CHARLES R. KING, Lampasas, Tex. Filed Mar. 22, 1888. Serial No. 268,179. (No model.)

Claim.—1. The combination, with a curved notched bar, C, secured to the door-frame above the upper edge of the door, of the latch G, pivoted on the door and adapted to engage the notches in the bar C, and having a guide-slot, H, operating on a stationary pin, I, to limit the movement of the catch, the operating-arm L, depending from the shorter arm of the latch, the cord, wire, or chain connecting the lower end of this operating-arm to the door-knob, and the swinging or jingle bell depending from the longer arm of the latch, substantially as specified.

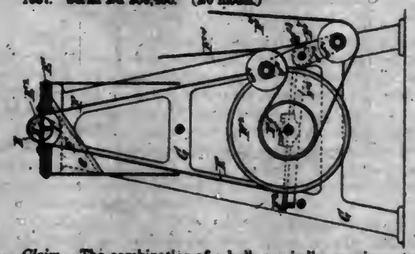


397,726.



2. The revoluble door-knob, in combination with the lever mounted on the door and having a swinging or jingle bell attached to its longer arm, and the cord, wire, or chain affixed at one end to the shorter arm of the lever, and connected at the other end to the said door-knob, whereby when the latter is turned the shorter arm of the lever is depressed and the bell is rung, substantially as specified.

397,727. MACHINE FOR MAKING CYLINDRICAL PINS AND TUBES OF WOOD. ROBERT KIDD, Brooklyn, N. Y. Filed Dec. 31, 1887. Serial No. 259,460. (No model.)



Claim.—The combination of a hollow spindle carrying a tubular cutter, a driving-belt which in passing around the spindle describes an arc less in radius than the radius of said cutter, and a table for the work, having a tongue-like prolongation into or through the hollow spindle, substantially as herein described.

397,728. SLEIGH. FREDERICK C. KLIPSTEIN, Leland, Wis. Filed Nov. 7, 1888. Serial No. 290,301. (No model.)



Claim.—1. In a sleigh-knee, the standard secured at its lower end to the runner and having a concavity in its upper end, combined with the rocking block secured to the beam and having a rounded under side bearing in the concavity of the standard, the convexity of the block being more abrupt than the concavity of the standard, whereby the block is allowed a free rocking motion, substantially as specified.

2. In a sleigh-knee, the standard secured at its lower end to the runner and provided with a concavity in its upper end, in which is arranged a transverse rounded rib, *d'*, combined with the rocking block secured to the beam and provided with a convex under side fitting loosely in the concavity and a rounded transverse recess, *f'*, fitting upon the said rib, substantially as specified.

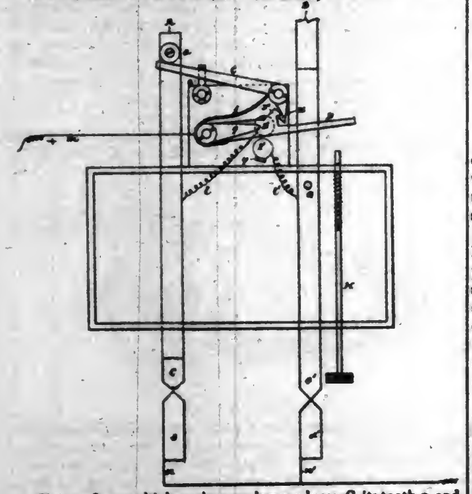
3. In a sleigh-knee, the combination of the hollow standard C, secured at its lower end to the runner and provided at its upper end with a concavity and a rib, *d'*, the rocking block I, secured to the beam of the sleigh and having a lower convex surface and a recess, *f'*, fitting on the transverse rib, and the bolt H, with its head fitting in the bore of the standard and its shank extending through vertically-aligned perforations in the upper end of the standard, the rocking block, and the beam, and engaged by a suitable bolt, substantially as specified.

4. In a sleigh, the combination, with the beam and runner, of the standard provided at its upper end with a concavity and at its lower end with the arms D, having depending flanges *d* at their sides, which engage the runner, the rocking block secured to the beam and having a convex under surface bearing in the concavity of the standard, and the bolt H, fitting loosely in registering perforations in the standard, the rocking block, and the beam, substantially as specified.

5. In a sleigh, the combination of the runner, the rave secured at its front end to the runner and connected thereto at its rear end by the brace *b*, the hollow standard secured at its lower end to the runner and provided at its upper end with a concavity intersected by a transverse rib, the beam arranged under the rave, the rocking block bolted to the under side of the beam and having a convex under surface intersected by a transverse recess fitting over the rib on the standard, the bolt H, passing through registering perforations in the upper end of the standard, the rocking block, and the beam, and the bolster swiveled on the upper side of the beam above the rave, substantially as specified.

397,729. AUTOMATIC SWITCH FOR ELECTRIC-ARC LAMPS.

EDWARD R. KNOWLES, Brooklyn, N. Y., assignor to the Mutual Electric Manufacturing Company, of New York. Filed Sept. 24, 1885. Renewed Dec. 21, 1888. Serial No. 294,263. (No model.)



Claim.—In a multiple-carbon arc lamp, a lever, C, its tooth *x*, and a stop, *c*, for limiting the upward movement of said lever, the lever D, having a tooth, *x'*, to engage the tooth of the other lever, the connecting and operating spring *f*, common to both levers, the contacts E and F, and the spring *g*, to hold the lever D in electrical contact therewith, combined with the carbon-holder A, provided with means to operate the lever C, all arranged in electric circuit and adapted to operate substantially as shown and described.

397,730. HYDRAULIC BRICK-MACHINE.

JULIUS J. KOCH, St. Louis, Mo. Filed May 22, 1888. Serial No. 274,768. (No model.)

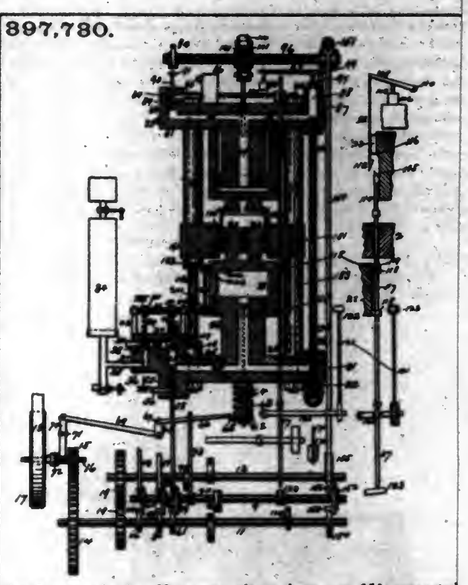
Claim.—1. In a brick-machine, the combination, with the upper plunger having a cylinder and a piston, of two fluid-chambers, 32 33, one of which is in communication with said cylinder and the other with a source of fluid under pressure, a rod, 33, projecting into both of said chambers, a valve, 47, for shutting off said fluid-pressure, and cam 54, adapted to open said valve, substantially as set forth.

2. A brick-machine having an upper and lower plunger, the upper plunger having a piston with ports, in combination with a chamber connected with one of said ports, a valve, 97, closing an opening in said chamber, and the rod 33, adapted to enter said chamber, substantially as and for the purpose set forth.

3. In a brick-machine, the combination, with the upper and lower plungers having cylinders, pistons in said cylinders, and a source of fluid under pressure connected with the lower cylinder, of two chambers, 33 32, connected with said upper and lower cylinders, respectively, a rod, 33, projecting into said chambers, a valve between said source of pressure and the lower cylinder, cams 154 155, for raising and lowering said upper plunger, and mechanism for operating said valve, substantially as set forth.

4. In a brick-machine, the combination, with the upper plunger having a cylinder and a piston therein and a pipe for fluid under pressure, of two chambers, 33 32, communicating with said cylinder and pressure-pipe, respectively, a rod, 33, projecting into both of said

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chambers, a valve in said pressure-pipe, a lever-arm, 151, connected with said plunger, cams 154 155, acting upon said crank-arm alternately in opposite directions, and a cam, 54, for opening said valve, substantially as set forth.

5. In a brick-machine, the combination, with the upper plunger having a cylinder and a piston therein, and a pipe for fluid under pressure, and a lower plunger having a cylinder and a piston and a source of fluid under pressure, of two chambers communicating with said upper and lower cylinders, respectively, a rod projecting into both of said chambers, a valve, 47, in said pressure-pipe, a lever-arm, 140, connected with said upper plunger, cams acting upon said lever-arm alternately, and a cam, 54, for opening and a spring, 64, for closing said valve, substantially as set forth.

6. In a brick-machine, the combination of the upper plunger provided with a cylinder, a fixed piston fitting in the cylinder of the plunger, provided with ports, and a water-chamber connected with the cylinder, a rod for displacing the water in the chamber and remaining normally withdrawn, and suitable mechanism for reciprocating said rod, substantially as set forth.

7. In a brick-machine, the combination of the upper and lower plungers having cylinders, fixed pistons having ports for the passage of water into the chambers between the respective cylinders and pistons, chambers communicating with the respective ports of the upper and lower pistons, and a rod fitting in said chambers and adapted to be forced into the upper chamber by the water in the lower chamber, substantially as and for the purpose set forth.

8. In a brick-machine, the combination of the upper and lower plungers provided with cylinders, fixed pistons having ports and chambers, a rod extending into the respective chambers at its upper and lower ends, and a weight connected to the rod, substantially as and for the purpose set forth.

9. In a brick-machine, the combination of the lower plunger provided with a cylinder, a fixed piston having ports 23, 24, 28, and 29, valves 37 and 47, and mechanism for operating the valves, consisting of levers 40 and 50 44 and 60, connecting-rods 43 and 51, and cams 46 and 54, mounted on an operating-shaft, substantially as and for the purpose set forth.

10. In a brick-machine, the combination of the lower plunger provided with a cylinder, a fixed piston having ports 23, 24, 28, and 29, valves 37 and 47, and mechanism for operating the valves, consisting of levers 40 and 50, connecting-rods 43 and 51, levers 44 and 60, and cams 46 and 54, connected to an operating-shaft, and additional means for operating the valve 37, consisting of a shaft, 41, and lever 200, connected to the cylinder of the plunger by means of a rod, 201, substantially as and for the purpose set forth.

11. In a brick-machine, the combination of the lower plunger provided with a cylinder, a fixed piston having ports 23, 24, 28, and 29, valves 37 and 47 in port 29, provided with means for operating them, and tank 34, connected with port 29, substantially as and for the purpose set forth.

12. In a brick-machine, the combination of the lower plunger provided with a cylinder, a piston having ports 23, 24, 28, and 29,

valves 37 and 47, provided with means for operating them, and a shaft, 41, to which the valves are connected, the valve 37 being loosely connected to the shaft, substantially as and for the purpose set forth.

13. In a brick-machine, the combination of the lower plunger adapted to be raised hydraulically, and mechanism for lowering the plunger, consisting of rods 63, a cross-head, 62, and springs 64, substantially as and for the purpose set forth.

14. In a brick-machine, the combination of a lower plunger, a shaft provided with a sliding clutch, and a lever for operating said clutch, said lever being oscillated by the movement of the plunger, substantially as set forth.

15. In a brick-machine, the combination of the lower plunger, a shaft provided with a sliding clutch, and mechanism for operating the clutch by the movement of the plunger, consisting of an arm, 70, link 69, a lever, 66, and a cross-head, 62, connected to the plunger by means of rods 63, substantially as and for the purpose set forth.

16. In a brick-machine, the combination of a lower plunger, a counter-shaft provided with a sliding clutch, mechanism for moving the clutch to engage it by the action of the plunger, and mechanism for disengaging the clutch, consisting of an arm, 70, link 69, lever 66, link 73, arm 74, and cam 75, substantially as and for the purpose set forth.

17. In a brick-machine, the combination of an upper plunger provided with a cylinder, a fixed piston fitting in the cylinder, provided with ports 79 and 80, means for forcing water through the ports into the chamber between the piston and cylinder, and means for allowing the escape of water, consisting of a valve, 103, fitting in a port, 101, communicating with the port 80, and passing through a chamber, 106, provided with a pipe, 107, communicating with a tank, 86, substantially as and for the purpose set forth.

18. In a brick-machine, the combination of an upper plunger provided with a cylinder, a piston fitting in the cylinder and having ports 79 and 80, means for forcing the water through the ports into the chamber between the cylinder and piston, and means for allowing the escape of water, consisting of a perforated pipe controlled by suitable mechanism, and a valve, 88, operated by a cam, 94, in one direction and a spring, 97, in the other direction, substantially as and for the purpose set forth.

19. In a brick-machine, the combination of the upper plunger provided with a cylinder, a fixed piston fitting in the cylinder and having ports 79 and 80, mechanism for forcing water through the ports into the chamber between the cylinder and piston, and mechanism for allowing the escape of water, consisting of a valve, 103, a latch for holding said valve closed, and a trip for lifting said latch, the valve 88, and a cam for unseating said valve, substantially as and for the purpose set forth.

20. In a brick-machine, the combination of the upper plunger provided with a cylinder, fixed piston fitting in the cylinder, having ports 79 and 80, and chamber 101, a valve fitting in the chamber, lever 106, connected to the valve, and hook 112, secured to the lever, the lower plunger, means for raising the lower plunger, and rods 114 117, operated by the lower plunger and having an incline, 115, adapted to come against an incline, 116, to disengage the hook 112 from a projection, 113, on the cylinder of the upper plunger, substantially as and for the purpose set forth.

21. In a brick-machine, the combination of the upper and lower plungers, rod-valve 103, lever 106, rods 111 117, hook 112 on the rod 111, incline 115 on the rods 114 117, incline 116, and projection 113 on the upper plunger, and connection between the rod 117 and the lower plunger, substantially as and for the purpose set forth.

22. In a brick-machine having upper and lower plungers operated to do the pressing hydraulically, a valve for releasing the upper plunger, and mechanism for releasing the valve, consisting of a lever, 106, rod 111, having hook 112, rods 114 117, having incline 115, adapted to bear against an incline, 116, on the upper plunger, to disengage the hook 112 from the projection 113 on the upper plunger, and lever 123, operated by the cam 123½, substantially as and for the purpose set forth.

23. In a brick-machine, the combination of the upper and lower plungers operated hydraulically to press the bricks, a valve for releasing the pressure on the upper plunger, and mechanism for relieving the valve, consisting of rods 111 114 117, one having a hook and the other an incline, as specified, and means for moving the rod by hand, consisting of a lever, 120, and rod 121, substantially as and for the purpose set forth.

24. In a brick-machine, the combination of the upper and lower plungers operated hydraulically to press the bricks, a valve for relieving the pressure on the upper plunger, a latch holding said valve closed, and a trip-clutch operated by the lower plunger for disengaging said latch, substantially as set forth.

25. In a brick-machine, the combination of an upper plunger adapted to be lowered mechanically the first part of its downward movement and to be raised mechanically by mechanism consisting of a shaft, 96, lever 140, cross-head 142, rod 143, lever 151, rod 150, lever 152, and cams 154 155, mounted on an operating-shaft, substantially as and for the purpose set forth.

26. In a brick-machine, the combination of the mold and frame, the latter having grooves to receive the former, cross-pieces 184, and keys 185 186, substantially as and for the purpose set forth.

27. In a brick-machine, the combination of the mold and frame, the latter having grooves to receive the former, cross-pieces 184, and screws 187, substantially as and for the purpose set forth.

397,731. ROLLER FOR MARKING DESIGNS IN ARTIFICIAL STONE.

JAMES LAIRD and WILLIAM MERCHAN, Philadelphia, Pa. Filed Apr. 19, 1888. Serial No. 271,133. (No model.)



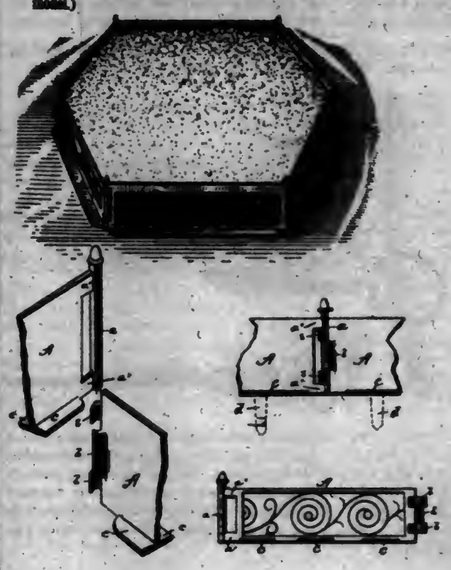
Claim.—1. The combination, with the roller for marking designs upon cement pavements or walls, of the body having longitudinal grooves therein, detachable ribs adapted to said grooves, and detachable screw-rings adapted to be screwed upon each end of said roller and over the ends of the ribs, substantially as described.

2. The combination, with the roller for marking designs upon cement pavements or walls, of the body having longitudinal grooves therein, design-plates having ends adapted to said grooves, retaining-ribs for said plates, and retaining-rings adapted to the body of the roller and to the ribs, substantially as set forth.

3. The combination, with the roller for marking designs upon cement pavements or walls, of the body having longitudinal grooves therein, concave plates the ends of which are adapted to said grooves, retaining-ribs for said plates, and retaining-rings for the ribs, said rings and ribs forming the dividing-lines for the said designs, substantially as set forth.

397,732. BORDER-PLATE FOR FLOWER-BEDS.

ISRAEL I. LANDIS, Lancaster, Pa. Filed Sept. 26, 1888. Serial No. 286,443. (No model.)



Claim.—1. A border for flower-beds, consisting of a series of vertical plates detachably hinged together at their adjacent ends by means of vertical pintles formed integral with or rigidly attached to the ends of the plates, whereby a chain-like arrangement is formed, the said pintles being embraced by curved lugs formed integral with the adjacent plates, substantially as described.

2. The confining-border herein described, consisting of a series of vertical plates detachably hinged together and provided at their lower edges with angular flanges *c* on one or both sides, substantially as described.

3. As a new article of manufacture, a border-plate, A, having cast integral with it at one end a vertical pintle, and on its other end curved embracing-lugs, substantially as described.

4. As a new article of manufacture, a border-plate provided on its respective ends with a vertical pintle and curved embracing-lugs, and on its lower edge with an angular flange or flanges, substantially as described.

5. The confining-border for flower-beds herein described, consisting of a series of plates adapted to set upright on the surface of the ground, the said plates being detachably hinged together by means of vertical pintles formed integral or rigidly attached to the plates, substantially as described.

6. The combination of two or more border-plates detachably hinged together at their adjacent ends and provided with notched angular flanges *c* on their lower edges, substantially as described.

397,738. HORSE-DETACHER. HEZEKIAH LATHAW, Batavia, N. Y. Filed Oct. 11, 1888. Serial No. 287,797. (No model.)

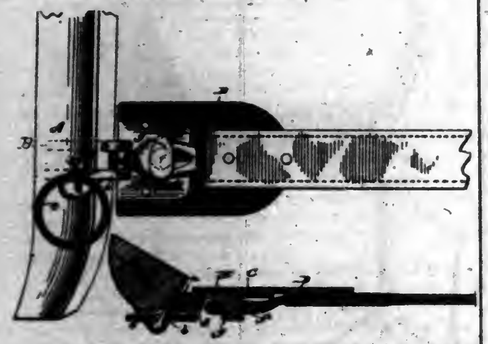


Claim.—1. The combination of a singletree, the trace-hooks pivoted to the ends thereof and provided with the inwardly-extending arms, these arms being provided with curved notches on their inner ends, casings secured to the singletree, the sliding locking-bars, these bars being kept pressed normally against the top of the said casing by means of an inclosed spring, and the operating-straps, substantially as described.

2. The combination of the singletree, trace-hooks C, pivoted in the ends thereof and constructed as described, the slotted casings, the elastic blocks E, the slotted sliding locking-bar, and the spring *j*, substantially as described.

3. A holdback consisting of the following parts: a main plate, a forwardly-extending hook, *d'*, formed integral with the main plate and extending parallel therewith, a slotted cylinder formed integral with the main plate and terminating near the forward end of the hook *d'*, forming a throat, *d'*, and a spring-actuated bolt working in said cylinder and adapted to close the said throat *d'*, substantially as described.

397,784. HAME. HEZEKIAH LATHAW, Batavia, N. Y. Filed Oct. 11, 1888. Serial No. 287,798. (No model.)



Claim.—The combination, with a hame provided with a pair of eyebolts, of a plate, C, provided on its front edge with an eye and on its face with a flanged or capped post, *f*, the said eye being pivotally secured between the said eyebolts on the hame, a trace-iron provided with an eye, and a trace attached to this iron whereby the trace may move both vertically and laterally, substantially as and for the purpose herein set forth.

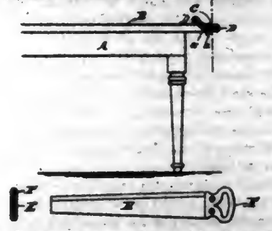
397,785. WEEDING-MACHINE. JAMES B. MARSFIELD, Milbridge, Me. Filed Sept. 24, 1888. Serial No. 286,214. (No model.)



Claim.—1. In a weeding machine or implement, the combination of the light metal frame having an operating-handle and formed with the downwardly bent and curved lower ends, the light curved metal plate, the side stops formed at their rear ends, as described, the cutter-blade beveled and sharpened on both its front and rear edges, and the transverse pivot-rod, substantially as set forth.

2. In a weeding implement, the combination of the metal frame having the upper rear socket and the lower bent and curved ends, the light curved metal plate, the side stops, formed at their rear ends as described, the cutter-blade beveled on both its front and rear longitudinal edges, the transverse pivot-rod, and the wooden handle, substantially as and for the purpose set forth.

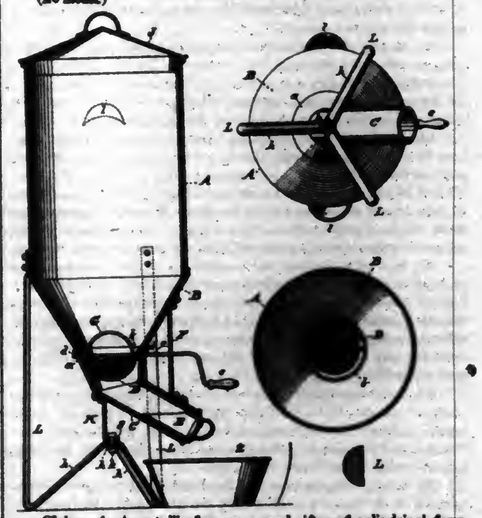
397,786. WALL-PAPER CUTTER. JAMES MARES, Bayonne, N. J. Filed Sept. 24, 1885. Serial No. 177,961. (No model.)



Claim.—1. In a paper-cutter, the combination of a free flexible blade having plane parallel faces and straight knife-edges, each knife-edge being formed by a chamfer on one face of the blade, and the two chamfers being on opposite faces of the same, with a handle at one end of the blade, substantially as described.

2. In a paper-cutter, the combination of a free flexible blade having plane parallel faces and a straight knife-edge, with a handle at the end of the blade, and a board or table provided with a fixed knife-edge, substantially as shown.

397,787. FLOUR HOLDER AND SIFTER. CHARLES H. MARSHALL, Wood River, Nebr. Filed Sept. 20, 1888. Serial No. 286,370. (No model.)

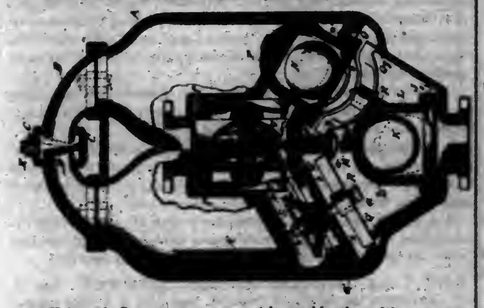


Claim.—1. A metallic flour case and sifter of cylindrical form, having its lower portion a cone frustum let into an angular spout,

front and rear braces to the spout, and angle-legs having short ends, turned inward and upward and secured to each other and to the rear brace of the spout, substantially as specified.

2. In a metallic flour-case, the combination, with the cylinder-case and its angular spout, of the lateral angle-legs bent inward and upward, the receiving-case secured to the lateral legs, the rear angle-leg, and the short brace-iron connecting said angle-legs to the spout, substantially as specified.

397,788. STEAM-PUMP. JOHN MARIN, Jersey City, N. J. Filed Mar. 6, 1888. Serial No. 266,371. (No model.)



Claim.—1. In a steam-pump, and in combination with a removable valve-seat, as O, set on the under side of the inlet-port, a cross-bar resting on a stationary portion of the shell, and a screw passing through said cross-bar and pressing the valve-seat to its place and away from the cross-bar, substantially as described.

2. In a steam-pump, and in combination with a removable valve-seat set on the under side of the inlet-port, a cage, a cross-bar resting on a stationary part of the shell, and a screw passing through said cross-bar and forcing the valve-seat to its place and away from the cross-bar, substantially as described.

3. In a steam-pump, the shell of which is divided into two parts by a diaphragm, *a'*, and in combination with removable valve-seats, as O O', the cross-bars resting on stationary parts of the shell and bolts for securing them in position on the under side of said diaphragm, substantially as described.

4. The combination, in a pump, of a diaphragm dividing said pump into two chambers and having openings for the inlet-valves, with an inlet into the lower chamber, and three valve-seats, one being on the inlet into said chamber and the others secured to the under side of the diaphragm, substantially as described.

5. The combination, in a pump, of a diaphragm dividing said pump into two chambers and having openings through the same for the inlet-valves, with an inlet into the lower chamber and three valve-seats, one being on the inlet into said chambers and the other secured to the under side of the diaphragm, and a single hand-hole constructed to give access to all of said valves, substantially as described.

6. The combination, in a pump, of a valve-chamber having opposite inlets with two movable valve-seats facing each other, and a fastening device, as the bolt X and nut or sleeve Y, pressing the said seats in opposite directions, substantially as described.

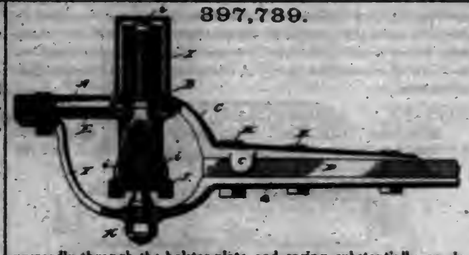
7. The combination, in a pump, of a valve-chamber having opposite inlets and a ball-valve therein, with two movable valve-seats facing each other, and fastening devices, as the bolts X and sleeves Y Y', arranged above and below said valve, and the lower sleeve provided with a projection, *y'*, substantially as and for the purpose specified.

8. The combination, in a steam-pump, of a neck-casting, as B, having a double-seated valve-chamber provided with openings above and below the same, and a double-acting disk-valve vibrating within said chamber, with two caps closing said openings, and one forming a support for the bottom of the valve and the other having an opening for the connection of a steam-pipe, substantially as described.

9. The combination, in a pump, of a valve-chamber, a valve-seat resting against the walls of an opening therein, a cage, L, resting on the valve-seat, and a bolt, M, pressing against a stationary part of the pump, and the nut *m*, resting in a recess in the cage and constructed to firmly hold the valve-seat in its place, substantially as described.

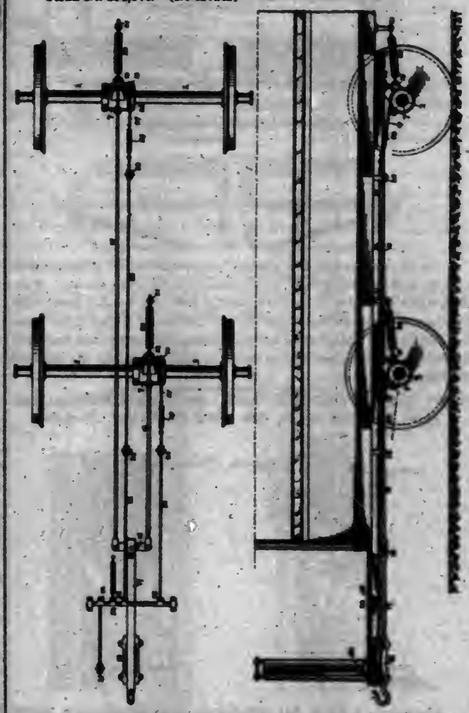
397,789. FIFTH-WHEEL FOR VEHICLES. JAMES MCCASLEY, Auburn Park, assignor to the Abbott Buggy Company, Chicago, Ill. Filed Oct. 26, 1888. Serial No. 289,177. (No model.)

Claim.—In a running-gear for vehicles, the combination, with a lower fifth-wheel plate clipped to the axle, of an upper fifth-wheel plate having a bolster-plate and curved reach constructed integrally therewith, and a clip king-bolt secured to the axle and extended



upwardly through the bolster-plate and spring, substantially as described.

397,740. STARTING AND DRAFT MECHANISM FOR STREET-CARS. FRED C. MCDONALD, New York, N. Y. Filed Dec. 22, 1887. Serial No. 258,678. (No model.)



Claim.—1. The combination of the axle, pawl-and-ratchet starting mechanism, a box hung to the axle and carrying one of the elements of said mechanism, a draft-bar connected to said box, and anti-friction-roller bearings interposed between the box and the axle, all substantially as specified.

2. The combination of the two axles of a car, a draft-box with pawl-and-ratchet starting mechanism on each axle, and a draft-bar connected to both of said boxes and having a whiffletree-connection at the front end, all substantially as specified.

3. The combination of the two axles of the car, each having a draft-box with pawl-and-ratchet mechanism, a draft-rod, an evener carried thereby, and rods extending from said evener to the draft-boxes of the axles, all substantially as specified.

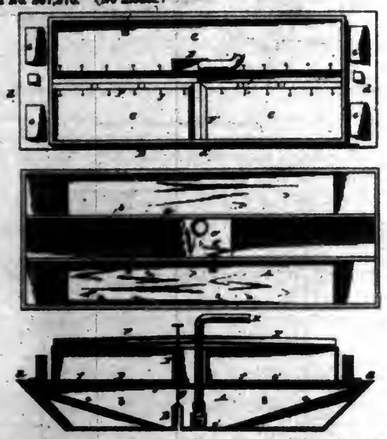
4. The combination of the axle, the ratchet-wheel secured thereto, the draft-box hung to the axle and having a pawl engaging with said ratchet-wheel, and a rock-shaft carried by the box and having a toe for acting upon the pawl to throw it out of gear, all substantially as specified.

5. The combination of the axle, the ratchet-wheel secured thereto, the draft-box having a pawl engaging with said axle, the draft-rod connected to said box, a releasing-shaft carried by the box, an operating-slide on the platform of the car independent of the draft-rod, and means for connecting said slide to the releasing-shaft of the draft-box, all substantially as specified.

6. The combination of the two axles of a car, the draft-boxes,

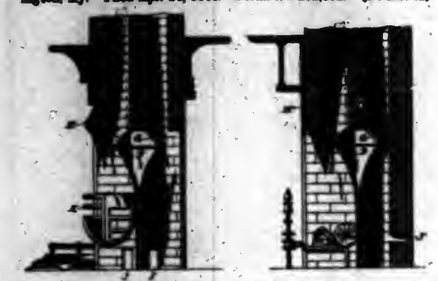
each having pawl-and-ratchet mechanism, and a releasing-shaft for the pawl, an operating-slide on the platform of the car, and connections between said slide and the releasing-shaft of each draft-box, each of said connections having an interposed spring, all substantially as specified.

397,741. METHOD OF TRANSPORTING SAND, &c. ALEXANDER MCDOUGALL, Duluth, Minn. Original application filed Apr. 26, 1888, Serial No. 272,185. Divided and this application filed Oct. 5, 1888. Serial No. 287,278. (No model.)



Claim.—The method, substantially as described, for raising, transporting, and delivering sand, which consists in pumping the same from the bottom of a river or harbor upon the deck of a scow, transporting the same in such position to the place of discharge, dropping the same into the hold of the scow or barge, diluting with water, and pumping the sand and water out of the hold through a pipe to the place of discharge.

397,742. FIRE-BACK PLATE. MAGDALENE H. MCDOWELL, Lexington, Ky. Filed Apr. 26, 1888. Serial No. 272,162. (No model.)



Claim.—1. A double-flue chimney, in combination with a double fire-back arranged between the flues and flattened at top and adapted to form a support for the bricks between the flues, substantially as described.

2. A double fire-back having its lower part vertical and resting upon the floor, its upper part inclined outward at D and then inclined inward again to form an air-chamber, and having a flat surface above said inwardly-inclined part to form a support for the bricks of the flue, substantially as described.

3. The combination, with a chimney arranged between two chambers and having substantially equal openings into the opposite chambers, of a double radiating fire-back and a heating apparatus, as the grate K, arranged in one of said chambers, whereby one chamber is heated by the grate and the other by direct radiation from the opposite side of the fire-back, substantially as described.

4. The combination, with a chimney arranged between two chambers on the same floor, and having two flues and also two substantially equal openings into the opposite chambers, of a double radiating fire-back and a heating apparatus, as the grate K, arranged in one of said chambers, whereby the two chambers on the same floor and one or more chambers above may be heated by a single fire, substantially as described.

5. The combination, with a chimney having side air-flues, of a hollow fire-back open at each end and two plates built into the masonry of the flues and extending into the interior of the fire-back, substantially as and for the purpose specified.

6. The combination, with a chimney and a hollow fire-back, of air-flues leading into and out of said fire-back, and a movable partition arranged between the opposite ends of said fire-back, constructed to vary the size of the air-passage through said fire-back, substantially as and for the purpose specified.

397,743. PROCESS OF MANUFACTURING STEEL. JAMES J. MOTHERS, Pittsburg, Pa. Filed Mar. 5, 1884. Serial No. 122,126. (No specimens.)

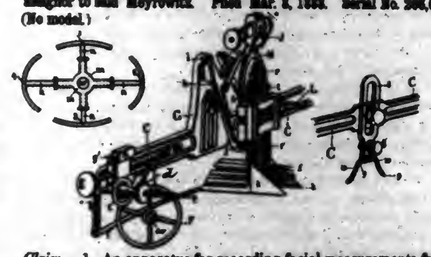
Claim.—1. The process of manufacturing steel, consisting in desiliconizing, decarburizing, and oxidizing molten iron by air or oxygen, then deoxidizing, desulphurizing, and dephosphorizing by commercial marsh-gas, commonly known as "natural gas," and finally recarburizing to any degree desired by the dissociating carbon of the same marsh or natural gas.

2. The process of manufacturing steel, consisting in subjecting iron while in a molten state to the action of natural gas or methane, substantially as described.

3. The process of manufacturing steel by first melting cast-iron, then burning out its silicon and carbon with air, and finally, while still molten, recarburizing the iron by subjecting it to the action of natural gas or methane, substantially as described.

4. In the manufacture of steel, the process of recarburizing decarburized iron by forcing natural gas or methane through the iron while the latter is in its molten state, substantially as described.

397,744. OPTICIAN'S MEASURING-INSTRUMENT. EMIL R. MEYROWITZ and CHARLES H. DRESSLER, New York, N. Y.; said Dressler assignor to said Meyrowitz. Filed Mar. 8, 1888. Serial No. 266,627. (No model.)



Claim.—1. An apparatus for recording facial measurements from which to make spectacles or eyeglasses, consisting of a box or two-part frame, one part provided with a measuring-instrument having registering points, and the other part provided with a templet counterpart for said registering-points and adapted to receive one or more papers or blanks, whereby the measurements are transferred to such paper or blanks when placed in position by the closing of the box or frame, substantially as and for the purposes set forth.

2. A measuring and registering instrument for opticians' use, consisting of a skeleton frame provided with adjustable temple bars or rods having secured thereto registering pins or points, substantially as and for the purposes set forth.

3. A measuring and registering instrument for opticians' use, consisting of a skeleton frame provided with lens-gages, as F, adjustable to bring central holes therein opposite the pupils of the eyes of the face measured, in combination with adjustable pins, as *y*, whereby said pins are adjusted to register the positions of said holes, substantially as and for the purposes set forth.

4. A measuring-instrument for opticians' use, consisting of a frame provided with an adjustable secondary frame or carriage containing a templet adjustable to the bridge of the nose, from and by means of which the contour of the same may be transferred, substantially as and for the purposes set forth.

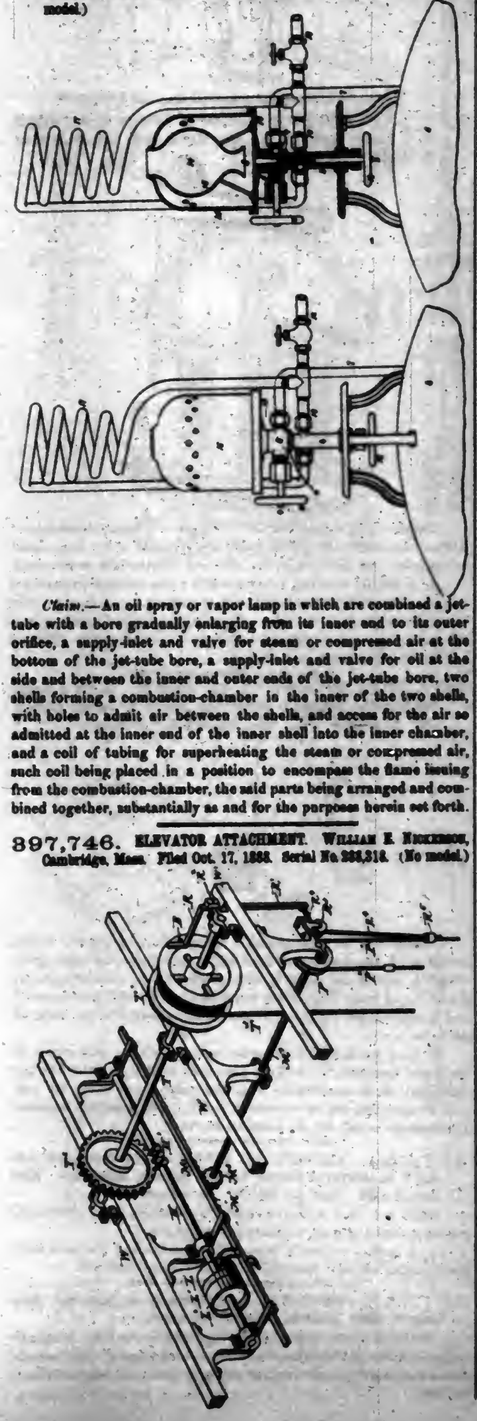
5. A measuring-instrument for opticians' use, consisting of a skeleton frame provided with a nose-measuring device consisting of an adjustable carriage containing adjustable measuring-rods for obtaining the bridge-contour of the nose and preserving such contour after the withdrawal of the instrument from the parts measured by it, substantially as and for the purposes set forth.

6. A measuring and registering instrument for opticians' use, consisting of a skeleton frame provided with a nose-measuring device consisting of an adjustable carriage containing adjustable measuring-rods for obtaining the bridge-contour of the nose, provided with registering pins or points which preserve the contour after the withdrawal of the instrument from the parts measured by it, substantially as and for the purposes set forth.

7. A measuring and registering instrument for opticians' use, consisting of a skeleton frame provided with a nose-measuring device consisting of an adjustable carriage, as H, containing registering-knives which preserve the measurements effected by them after the withdrawal of the instrument from the parts measured by it, substantially as and for the purposes set forth.

8. A measuring-instrument for opticians' use, consisting of a skeleton frame carrying lens-gages, as F, provided with perimeters adjustable to varying sizes of eyes, substantially as and for the purposes set forth.

397,745. OIL SPRAY OR VAPOR LAMP. ALEXANDER NEILSON, Inkermann, County of Renfrew, and JAMES TAYLOR, Linlithgow, County of Linlithgow, Scotland. Filed July 24, 1888. Serial No. 280,883. (No model.)



Claim.—An oil spray or vapor lamp in which are combined a jet-tube with a bore gradually enlarging from its inner end to its outer orifice, a supply-inlet and valve for steam or compressed air at the bottom of the jet-tube bore, a supply-inlet and valve for oil at the side and between the inner and outer ends of the jet-tube bore, two shells forming a combustion-chamber in the inner of the two shells, with holes to admit air between the shells, and access for the air so admitted at the inner end of the inner shell into the inner chamber, and a coil of tubing for superheating the steam or compressed air, such coil being placed in a position to encompass the flame issuing from the combustion-chamber, the said parts being arranged and combined together, substantially as and for the purposes herein set forth.

397,746. ELEVATOR ATTACHMENT. WILLIAM E. NICKERSON, Cambridge, Mass. Filed Oct. 17, 1888. Serial No. 288,318. (No model.)

Claim.—1. The combination of the hoisting-drum, provided with the spring-pressed latch and a latch-holding jack adapted to hold the latch inoperative by the pressure of the hoisting-rope, with the lever R R' and the belt-shifting devices, all substantially as described.

2. The combination of the drum T, jack B', and latch B with the lever R R', rope R', roller R', and shifting-rope P', all operating together substantially as described, and for the purpose set forth.

397,747. BOB-SLEIGH. RICHARD H. OLIVE, Wayland, Mich. Filed Sept. 26, 1888. Serial No. 286,440. (No model.)

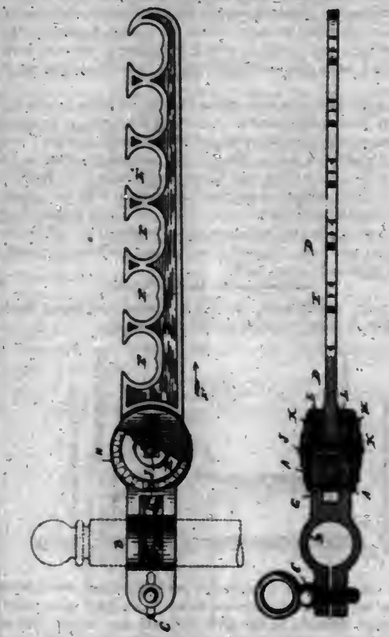


Claim.—1. As an article of manufacture, the combined sleigh beams and knees, consisting of a horizontal piece provided with the end tongues and the downwardly-diverging and curved knee parts, all integral with each other, substantially as set forth.

2. The combination of the combined beams and knees, consisting of the single piece provided with the integral end tongues and downwardly-diverging curved knee parts, and the combined runners, raves, and rear brace end of the raves, all associated together, substantially as set forth.

3. The combination of the combined beams and knees, consisting of the single piece provided at the ends with the integral downwardly-diverging and curved knee parts and the integral end tongues, and the runners and raves of a sleigh, the lower ends of the knee parts being attached to the runners and the raves being attached to said end tongues, substantially as set forth.

397,748. BRACKET. RAYMOND P. PALMENBERG, New York, N. Y. Filed Dec. 8, 1888. Serial No. 293,044. (No model.)

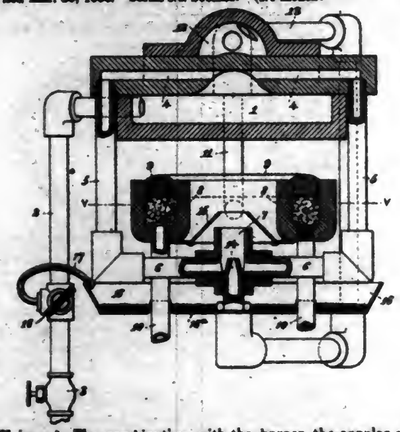


Claim.—1. The combination, with a pair of ears or jaws, of a bracket having one end pivoted between said ears or jaws, which bracket is provided on its pivoted end with a series of teeth, a pin held by said jaws and adapted to engage the teeth on the pivoted end of the bracket, and springs acting on the bracket and keeping the teeth on the pivoted end of the bracket in engagement with the above-mentioned pin held by the jaws, substantially as set forth.

2. The combination, with a pair of jaws having slots extending toward the front ends, of a bracket having one end between said jaws, a pivot passed through the bracket and the slots in the jaws, springs placed in said slots between the front ends of the same and the pivot, teeth formed on the pivoted end of the bracket, and a pin on the

jaws with which the bracket-teeth can engage, said bracket being provided in its top edge with notches, substantially as set forth.

397,749. HYDROCARBON-BURNER. JEFFERSON PATTEN, Green Point, N. Y., assignor of part to Charles Kennedy Hamilton, Jr., Summit, Ivers A. Gard, Bergen Point, and Charles H. Mundy, Metuchen, N. J. Filed Mar. 23, 1883. Serial No. 269,265. (No model.)



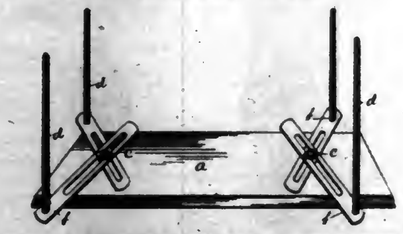
Claim.—1. The combination, with the burner, the annular generator 8, the hydrocarbon-vaporizer 1, and steam-dome 12, of a pipe connecting said dome and generator and pipes connecting said dome and hydrocarbon-vaporizer with the burner, substantially as set forth.

2. In a hydrocarbon-burner, the combination, with the mixing chamber or nozzle 7 and the vaporizing-chamber 1, and the steam-generating chamber 8, arranged above said chamber 7, of the pan 16, for containing oil, arranged below said generating-chamber 8, and a superheating-chamber arranged above the burner, connected with the chamber or nozzle 7 and also with the chamber 8, and said chamber or nozzle 7 being also connected with the vaporizing-chamber, as set forth.

3. In a hydrocarbon-burner, the combination, with the vaporizing-chamber and the mixing-chamber 7, connected therewith, of an annular steam-generating chamber arranged around said chamber 7 and connected therewith, a porous filling in said annular chamber, and a screw-cap, 9, for compressing said filling, substantially as set forth.

4. In a hydrocarbon-burner, the combination, with the steam-generating chamber and the mixing-chamber connected therewith, of the vaporizing-chamber, the radial passages 4, leading from said vaporizing-chamber, and pipes connecting said passages with said mixing-chamber, substantially as set forth.

397,750. GOODS-RACK. NATHAN D. PHINNEY, New Bedford, Mass. Filed Nov. 13, 1888. Serial No. 290,757. (No model.)

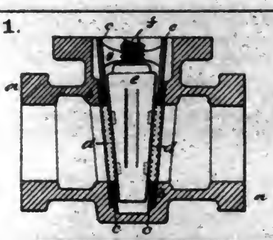


Claim.—A goods-rack consisting of suitable uprights attached to slotted arms, which arms are secured to a suitable base by a screw passing through the slots in the arms and into the base in such a manner that the uprights may be adjusted to or from each other by means of the slots in said arms, as may be desired, in order to support the goods to be displayed, as shown and described.

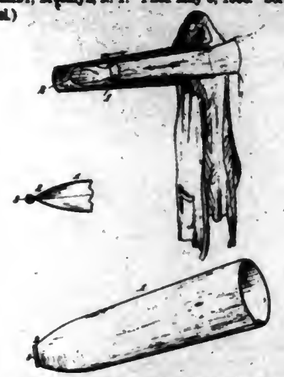
397,751. VALVE. RUFUS H. PRATT, Hartford, Conn., assignor to the Pratt & Cady Company, same place. Filed July 7, 1888. Serial No. 279,394. (No model.)

Claim.—In combination with the herein-described valve, thin metallic plates, each provided with an opening larger than the port-opening in the body, the walls of said opening being beveled outwardly, and a non-metallic ring thicker than the plate loosely placed in the opening, substantially as described.

397,751.



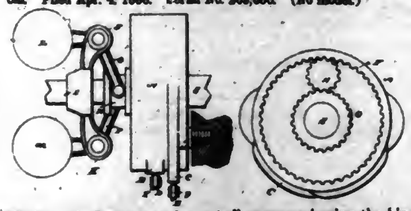
397,752. DEVICE FOR ASSISTING IN PUTTING ON GARMENTS. IDA V. READY, Brooklyn, N. Y. Filed May 3, 1888. Serial No. 272,602. (No model.)



Claim.—1. A sheath or casing to assist in dressing, consisting of a thin sleeve of the substantial contour and length of the arm, closed at the lower end and open at the other end, substantially as described.

2. A sheath or casing, 1, composed of a thin inexpensive material of the substantial contour and length, or nearly so, of the arm, said sheath being closed at the sides and one end by a line of stitching and left open at the other end, and having at its closed end an attached hand-pull, substantially as described.

397,753. GOVERNOR FOR GAS-ENGINES. DANIEL S. REGAN, San Francisco, assignor to himself, and Sanford S. Bennett, Alameda, Cal. Filed Apr. 4, 1888. Serial No. 269,630. (No model.)



Claim.—1. In a gas-engine, a ball-governor having the hinged arms J and K attached to the fixed collar I, the sleeve and inside gear-wheel, A, having the collar Q, with groove R, the connecting-levers O and P, and cams B and C, in combination with the valve-levers D and E, constructed and operated substantially as and for the purposes set forth.

2. In a gas-engine, a governor having a sliding gear-wheel, A, the inside spur-gear, F, the fixed gear G on shaft S, and the intermediate gear, H, in combination with the cams B and C, for the purpose of operating the valve-levers D and E, constructed and operated substantially as and for the purposes set forth.

397,754. ELECTRIC-LIGHT CARBON. HENRY S. REBNER, Camden, N. J., assignor of one-half to David K. Joslin, same place. Filed Dec. 10, 1888. Serial No. 293,173. (No specimens.)

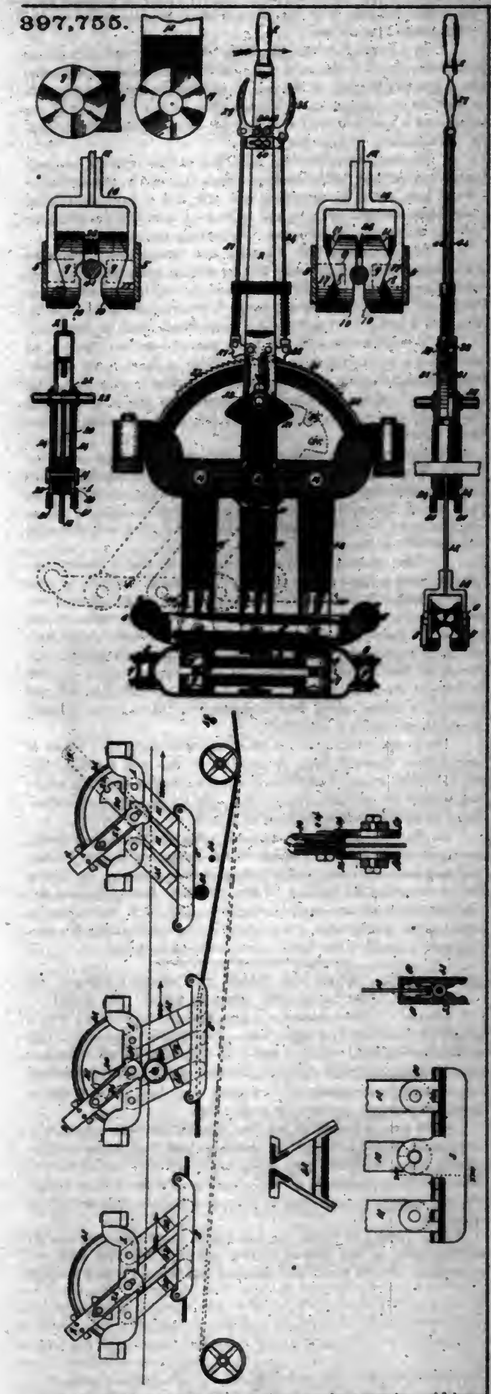
Claim.—1. In a carbon electrode, the combination of carbonized cocoanut-shell and marl, substantially as described.

2. A carbon electrode composed of carbonized cocoanut-shell, marl, and an adhesive material, substantially as described.

397,755. CABLE-GRIP. FRED SCHELP, Jr., St. Louis, Mo. Filed July 11, 1888. Serial No. 279,022. (No model.)

Claim.—1. In a cable-grip, plates pivoted to the main frame carrying the jaws, and allowing the same to swing parallel with the main frame and cable to close the jaws and grip the cable, substantially as set forth.

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2. In a cable-grip, the jaws and means for operating said jaws, having duplicate pivoted inclined cams moving upon each other, and thereby closing the jaws and grasping the cable.

3. In a cable-grip, the combination of the main frame, jaws, a frame in which the jaws are located, plates pivoted at their upper ends to the main frame and at their lower ends to the jaw-frame, cams on the plates and jaws, respectively, and a lever for moving the jaw-frame, substantially as and for the purpose set forth.

4. In a cable-grip, the combination of the main frame, jaws, a frame to which the jaws are pivoted, plates pivoted to the main frame at their upper ends and to the jaw-frame at their lower ends, cams having a number of inclined faces secured to the jaws, cams having a number of inclined faces secured to the plates, and a lever for moving the jaw-frame, substantially as and for the purpose set forth.

5. In a cable-grip, the combination of the main frame, jaws, a frame to which the jaws are secured, links pivoted at their upper ends to the main frame and at their lower ends to the jaw-frame, cams secured to said jaws and links, respectively, a central plate pivoted to the main frame and to the jaw-frame, and a lever engaging said central plate, substantially as and for the purpose set forth.

6. In a cable-grip, the combination of the main frame, jaws, a frame to which the jaws are secured, outer plates pivoting the main frame to the jaw-frame, cams on the jaws and said outer plates, respectively, a central plate pivoted to the jaw-frame and to the main frame, an extension on said central plate, and a lever pivoted to the main frame and engaging the extension of the central plate, substantially as and for the purpose set forth.

7. In a cable-grip, the combination of the main frame, jaws, a frame to which the jaws are secured, pivoted plates connecting the frames together, an extension on one of said plates, and a lever engaging said extension, substantially as and for the purpose set forth.

8. In a cable-grip, the combination of the main frame, jaws, a frame to which the jaws are secured, links connecting said frames, a notched extension on one of the links, a lever pivoted to the main frame, and a movable pin on the lever engaging the notch of the extension, substantially as and for the purpose set forth.

9. In a cable-grip, the combination of the main frame, jaws, a frame carrying said jaws, plates pivoted to the main frame and to the jaw-frame, and an extension on one of said plates forming part of an operating-lever for moving the jaws, substantially as set forth.

10. In a cable-grip, the combination of the main frame, jaws, a frame to which the jaws are secured, plates connecting the frames together, a notched extension on one of the plates, a pin engaging said notch, and links secured to the pin, said links being adapted to bear against an obstruction and raise the said pin out of the said notch to automatically disconnect the lever, substantially as and for the purpose set forth.

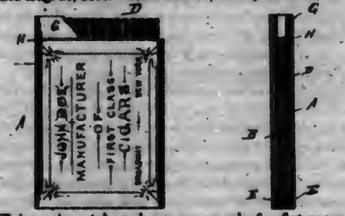
11. In a cable-grip, the combination of the main frame, jaws, a frame in which the jaws are located, plates pivoting the main frame to the jaws, a lever for operating said jaws, and an obstruction, 52, for throwing the jaws in an upward direction, substantially as and for the purpose set forth.

12. In a cable-grip, the combination of the main frame, jaws, connection between the jaws and main frame, an operating-lever provided with pawls, and a rack or bar having a toothed and a plain or smooth surface on each side of the center, substantially as and for the purpose set forth.

13. In a detachable cable-grip, the vertically-moving link adapted to be raised by an obstruction in the road, and thereby automatically detaching the lever from its connection, and an extension pivoted to the main frame and connected to the lever, substantially as set forth.

14. In a cable-grip, the combination of the jaws, a detachable lever for operating the jaws, and links 24 for coming against an obstruction and disconnecting said lever, substantially as and for the purpose set forth.

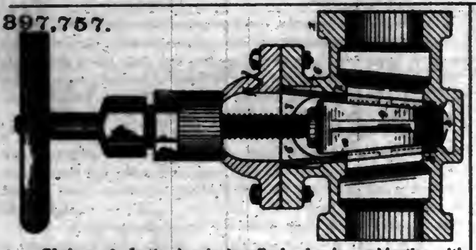
397,756. MATCH-PACKAGE. FRANK SCHILD, Milwaukee, Wis. Filed Aug. 23, 1888. Serial No. 283,589. (No model.)



Claim.—A match-package composed of a flat paper casing provided with a longitudinal partition extending from one end to within a short distance of the other end, said partition having its faces roughened at the upper end of the package and its faces inclined toward each other at the lower end of the package, the casing having a line of perforations extending around it at the top edge of the partition and matches placed between the sides of the partition and the sides of the package, the heads of the matches being at the beveled end of the partition, substantially as herein shown and described.

397,757. VALVE. FRANK W. SEAVER, Hartford, Conn., assignor to the Pratt & Cady Company, same place. Filed Aug. 23, 1888. Serial No. 283,591. (No model.)

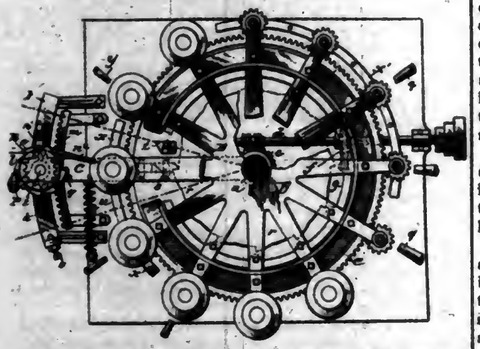
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Claim.—1. In the herein-described valve, in combination with the body having plane inclined seat-faces adjacent to each port, grooves cut in the body underneath the seat-faces concentric with the port-openings, seats supported by said grooves, a frame-work loosely placed in the opening in the body with a portion of its lower edge resting upon the upper edges of the seats and holding them against the body, and the bonnet resting upon the frame-work and holding it down upon the top of the seats, substantially as described.

2. In the herein-described valve, in combination with the body having flat inclined seat-faces adjacent to each port and grooved rims cast integral with the body underneath the seat-faces concentric with the port-openings, seats supported by said grooved rims, a rectangular frame-work with two of its sides resting upon the upper edges of the seats and holding them against the body, and the bonnet resting upon the frame-work and holding the frame-work down upon the top of the seats, substantially as described.

397,758. SOLDERING-MACHINE. JOHN SOLTER, Baltimore, Md. Filed Dec. 7, 1888. Serial No. 292,895. (No model.)



Claim.—1. In combination with a revolving table carrying a series of revolving can-carriers, solder devices arranged in proximity to the line of movement of the carriers, a tube for directing the solder to the can, feeding devices for the solder, vertically-movable can-seats for the cans, and a cam-track opposite the solder devices for raising the can-seats to present the edge of the can to the solder-tube, substantially as described.

2. In combination with a revolving table carrying a series of revolving can-carriers, an oscillating arm, solder-feeding devices carried by said arm, intermediate connections between the main driving-shaft and the arm for moving the same, and intermediate connections between the table of the machine and the feeding devices for operating the same, substantially as described.

3. In combination with a revolving table carrying a series of revolving can-carriers, an oscillating arm supported from and operated by the machine, solder-feeding devices carried on said arm, a vertical shaft for operating the feeding devices, and rack-and-gear connections between said shaft and a stationary part of the frame, whereby said shaft is rotated in the oscillation of the arm, substantially as described.

4. In combination with a revolving table carrying a series of revolving can-carriers, an oscillating arm, means for oscillating said arm in the movement of the machine, a vertical shaft carried by the arm, rack-and-gear connections for said shaft, whereby it is rotated in the oscillation of the arm, a solder-feeding pulley carried loosely by said arm, and pawl-and-ratchet connections between the shaft and pulley, whereby the solder is fed in the oscillation of the arm in its forward movement only, substantially as described.

5. In combination with the table and carriers thereon, an oscillating arm, a vertical shaft carried thereby, rack-and-gear connections for moving said shaft, a pulley carried loosely by the shaft, pawl-and-ratchet connections between the shaft and pulley, and a spring pressure-roller for keeping the solder pressed against the periphery of the pulley, whereby it is fed forward in the rotation of the pulley, substantially as described.

6. In combination with the table and the carriers thereon, an oscillating arm, bearings on its outer end for a vertical shaft, a bracket for supporting the end of the arm, a rack on the table in mesh with a gear on the vertical shaft, a feed-pulley on the upper end of the shaft, and a pawl-and-ratchet connection between the shaft and pulley, substantially as described.

7. In combination with the table and carriers thereon, an oscillating arm carrying solder-feeding devices operated by the oscillation of said arm, means for retracting said arm, and a pawl-and-ratchet connection between said arm and a revolving part of the machine for moving the arm in one direction, substantially as described.

8. In combination with the table and can-carriers thereon, an oscillating arm carrying solder-feeding devices operated by the forward movement of the said arm, a pawl-and-ratchet connection between said arm and the driving-power for moving the arm in one direction, and a spring for returning said arm, substantially as described.

9. In combination with the table and can-carriers thereon, an oscillating arm carrying solder-feeding devices, a sleeve, *b*, the ratchet-wheel carried thereby, and a pawl on the oscillating arm projecting into the path of the ratchet-wheel, whereby the said arm is carried forward by said ratchet, and means for retracting said arm, substantially as described.

10. In combination with a table and can-carriers, the sleeve for driving the parts, a ratchet-wheel carried thereby, an oscillating arm carrying solder-feeding devices, a spring-pawl on the arm adapted to engage with the ratchet-wheel, a releasing-stud on the table for releasing said pawl from the ratchet, and means for retracting said arm, substantially as described.

11. The combination, in a soldering-machine, of a central supporting-post, a sleeve thereon, said sleeve being driven from a main driving-shaft, a table connected with and driven by said sleeve, can-carriers supported from said table, gears on the lower ends of said carriers, a gear-wheel loosely mounted on the sleeve and driven from the main shaft, heating means for the cans, and solder devices, with means for automatically feeding solder to the cans, a raised cam-track in front of the solder devices for lifting the supporting-disks and cans thereon, whereby solder may be applied to the cans, and cooling means, substantially as described.

12. In combination with a revolving table carrying a series of can-carriers, vertically-movable can-seats for the cans, means for lifting said seats, and solder devices having a solder-directing tube above the level of the can-carrier and in line with the edge of the can when lifted by its seat, substantially as described.

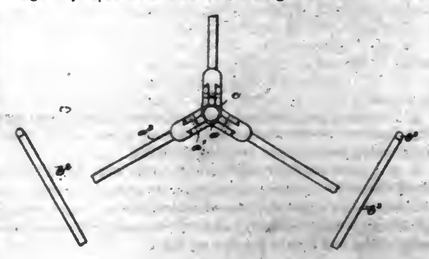
13. In combination, the movable table, the can-seats thereon, arranged to be raised and lowered, the can-holders and devices for raising and lowering them, solder-feeding devices, a device for raising the can-seats at the position of the said solder-feeding devices, the said can-seats and cans being arranged to drop back automatically after passing said devices, and a second device for elevating the seats and cans for cooling the latter, substantially as described.

397,759. STAND FOR CHARTS, &c. LORENZO B. SOMERBY, Boston, Mass. Filed Oct. 18, 1888. Serial No. 288,446. (No model.)

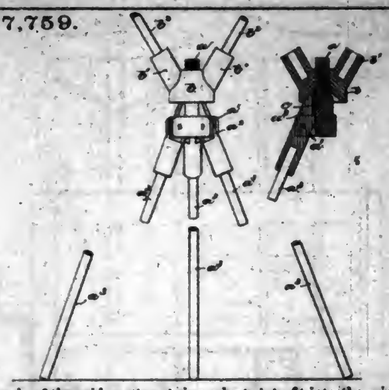
Claim.—1. In a stand for charts, &c., the combination, with a spindle, *a*, provided with lugs or ears, of castings pivoted to said lugs or ears and provided with legs, and a rod-supporting sleeve, *b*, secured upon said spindle against vertical movement, substantially as described, and engaging said castings to lock them and their attached legs in operative position, substantially as described.

2. In a stand for charts, &c., the combination, with a spindle, *a*, of castings pivoted thereto and provided with legs, and a rod-supporting sleeve, *b*, secured upon said spindle against vertical movement, substantially as described, and cup-shaped at its under side to engage the said castings to lock them in operative position, substantially as described.

3. In a stand for charts, &c., the spindle *a*, provided with ears, an annular collar or hub secured thereto and provided with slots, and castings a^4, pivoted to the said ears, and legs secured to said castings,



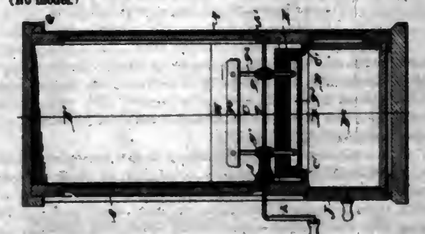
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the ends of the said castings being adapted to fit into the said slots, combined with a sleeve cup-shaped at its under side and screwed upon said rod and provided with arms to receive chart-sustaining rods, substantially as described.

4. In a stand for charts, &c., a spindle, *a*, provided with screw-threads, and castings provided with legs pivoted to said spindle, combined with a threaded sleeve, *b*, cup-shaped at its under side, screwed upon said spindle, and having its bottom cup-shaped to fit over the ends of said castings, and rods to sustain the chart or like object secured to said sleeve, substantially as described.

397,760. FLOUR-BIN. CHRISTIAAN TANGENBERG, Grand Rapids, Mich. Filed Sept. 15, 1886. Renewed Jan. 16, 1889. Serial No. 296,791. (No model.)



Claim.—A flour-bin comprising a shell or case, the bearing-plates F, secured to the ends of the case, the false bottom having the concave screen and the converging sides resting on the bearing-plates, an agitator-shaft journaled in a bearing on one of the plates and passing through the shell, the arms affixed to the shaft and carrying the blades, and a shouldered stop, I, fitted loosely on the agitator-shaft and forming a cap for the bearing thereof, resting on and bearing at one end against one of the arms, as and for the purpose set forth.

397,761. FLOUR-BOLT. JAMES THOMAS, Darlington, assignor of one-half to William E. Carter, Platteville, Wis. Filed Jan. 30, 1886. Renewed Dec. 24, 1886. Serial No. 222,527. (No model.)



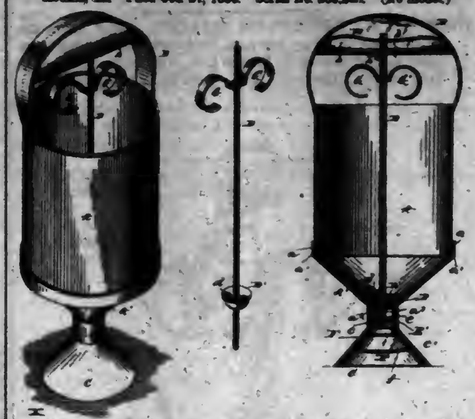
Claim.—1. In a flour-bolt, the combination of a vertical bolting-cloth and an endless-belt elevator for raising the unbolted material in contact with the said bolting-cloth and pressing the said material gently thereupon, substantially as and for the purpose set forth.

2. In a flour-bolt, the combination of an inclosing-case, a bolting-cloth arranged within the said case, and an elevator having a series of slats so related that the unbolted material is raised upward and pressed gently upon the surface of the bolting-cloth, substantially as and for the purpose set forth.

3. In a flour-bolt, the combination of an inclosing-case, a bolting-cloth, an elevator comprising a series of slats and endless bands, the partition C, and the elevator-rollers journaled in the casing above and below the said partition, substantially as and for the purpose set forth.

4. In a flour-bolt, the combination of the outer casing having openings b^3 and b^4 therein, the bolting-cloth, the elevator E, the partition C, the floor G, and the conveyer F, communicating with the opposite side of the bolting-cloth away from the elevator by the passage *g*, substantially as and for the purpose set forth.

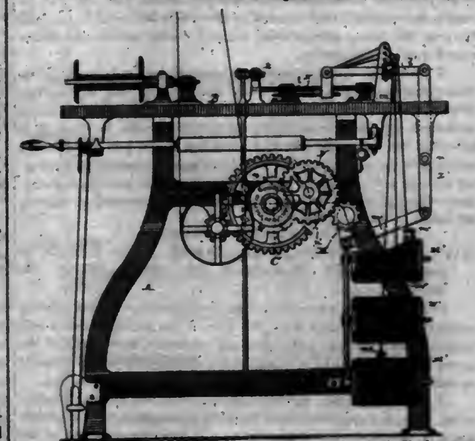
397,762. HAND WATER-SPRINKLER. GEORGE W. TRAHAN, Houma, La. Filed Oct. 27, 1888. Serial No. 289,263. (No model.)



Claim.—1. The combination, in a hand water-sprinkler, of the apertured reservoir, the rose, valve-rod, and valve for controlling the flow of water, the bail having a chamber formed therein, and the spring secured within said chamber and attached to the valve-rod, substantially as and for the purpose set forth and described.

2. In a hand water-sprinkler, the combination of the apertured reservoir consisting of the cylindrical screw-threaded body, and the screw-threaded cone-shaped bottom adapted to be removably secured to the cylindrical body, the rose removably secured to the screw-threaded end of the bottom of the reservoir, the valve-rod, valve, and collar for controlling the outward flow of the liquid from the reservoir to the rose, the valve-rod guide, the spring situated within the chamber formed upon the handle of the reservoir, and the finger-pieces secured upon the valve-rod for raising the valve, collar, and valve-rod, substantially as herein shown and described.

397,763. MACHINE FOR LACING JACQUARD CARDS. WILLIAM P. UHLINGER, Philadelphia, Pa. Filed Jan. 3, 1888. Serial No. 259,601. (No model.) Patented in England Sept. 7, 1886, No. 11,966.

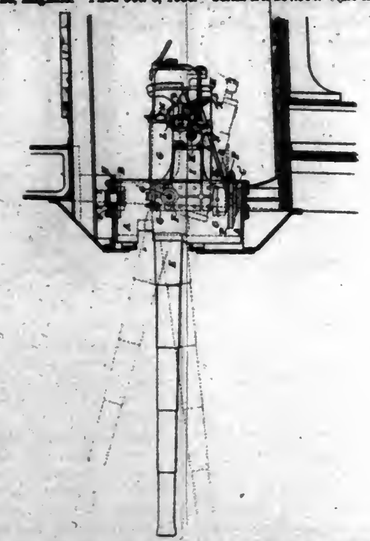


Claim.—1. The combination of the frame, the shaft C, the gear N, having the series of sector-shaped projections P, having concavities in their outer or wider ends, the disk N', having the studs engaging with the side walls of the projections P, and the crank-gear, together with the needle-bars, and means connecting together said needle-bars and the crank-gear, said disk N' also having a convex portion, *a'*, contacting with the concave surface of the sector-shaped projections P, substantially as set forth.

2. The combination of the frame, the shaft C, the gear N, having the series of sector-shaped projections P, having concavities in their outer or middle ends, the disks N', having the studs engaging with the side walls of the projections P', the crank-gear, the needle-bars, means connecting together said needle-bars and the crank-gear, said disk also having a convex portion contacting with the concave surface of the sector-shaped projections P, the grooved cam D, also carried by shaft C, the rock-shaft F, having the arms E and G, the

arm E' engaging said grooved cam, the looped lever, and link *g*, connecting said looped lever to the arm G', substantially as set forth.

397,764. MOUNTING FOR ORDNANCE. JOHAN VAVASSEUR, London Ordnance Works, Bear Lane, Southwark, County of Surrey, assignor to W. G. Armstrong, Mitchell & Co., (Limited,) Newcastle-upon-Tyne, England. Filed Oct. 8, 1883. Serial No. 287,537. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the semi-cylindrical armor plate or shield, the top and bottom cross-pieces secured thereto, the vertical pivots connected to said cross-pieces, the gun, the cradle in which it is mounted, and the horizontal pivots or trunnions of the gun supported in bearings in the armor plate or shield.

2. The combination, substantially as hereinbefore set forth, of the semi-cylindrical armor plate or shield open at the rear, the gun, its cradle, the recoil-cylinder, carried by the cradle beneath the gun, and the gear for raising and lowering the gun, cradle, and recoil-cylinder together or simultaneously.

3. The combination, substantially as hereinbefore set forth, of the semi-cylindrical armor plate or shield open at the rear, the top and bottom cross-pieces secured thereon, the vertical pivots of the shield connected with said cross-pieces, the gun, the cradle in which it is mounted, the horizontal pivots or trunnions of the gun supported in bearings in the armor plate or shield, the gear for raising and lowering the gun and cradle and recoil-cylinder together, and the training-gear engaging with the armor plate or shield for training or moving the shield on its vertical pivots.

397,765. CAR BRAKE AND STARTER. PHILIP WEILBACH, Copenhagen, Denmark. Filed Aug. 18, 1888. Serial No. 283,162. (No model.)

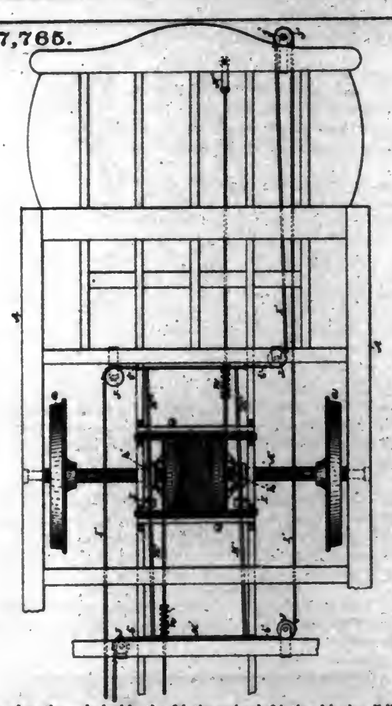
Claim.—1. In a car-starter, the combination, with the winding ratchet-wheels journaled upon the axle, of the spring between said ratchet-wheels and the pawls pivotally connected to the ends of the spring and engaging with the teeth of the ratchet-wheels, substantially as and for the purpose set forth.

2. In a car-starter, the combination, with the winding ratchet-wheel journaled upon the axle, of the spring circumjacent to the ratchet wheel, a ring at the end of the spring, a link pivoting the end of the spring to said ring and permitting said spring to contract in diameter when being wound up, and a pawl pivoted to the said ring and engaging with the teeth of the ratchet-wheel, substantially as and for the purpose set forth.

3. In a car-starter, the combination of the internal friction-wheels journaled upon the axle, the spring between said friction-wheels with its ends connected thereto, the ratchet-teeth upon the outer peripheries of the friction-wheels, the pivoted stop-pawls engaging with said ratchet-wheels, the clutch-disks secured to the axle inside the friction-wheels, and the friction-blocks sliding in said clutch-disks for transmitting the rotary motion to and from the axle and spring, substantially as and for the purpose set forth.

4. In a car-starter, the combination of a revoluble internal friction-wheel journaled upon the axle, a spring having one end connected to said friction-wheel and the other end held stationary, a clutch-disk

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secured on the axle inside the friction-wheel, friction-blocks sliding in said clutch-disk for communicating its motion to the friction-wheel, a collar splined to the axle, and the adjustable arms pivotally connecting the collar with the friction-blocks, substantially as and for the purpose set forth.

5. In a car-starter, the combination, with two friction-wheels having ratchet-teeth upon their outside peripheries and winding ratchet-wheels secured against their adjacent faces, of a spring between said wheels, pawls pivotally connected to the ends of the spring and engaging with the winding ratchet-wheels, friction-clutches revolving with the axle and adapted to engage alternately with the friction-wheels, and pivoted stop-pawls supported by the car-frame and adapted to engage with the ratchet-teeth upon the friction-wheels, substantially as and for the purpose set forth.

6. In a car-starter, the combination, with a wheel journaled upon the axle and provided with ratchet-teeth upon its periphery, of a cam pivoted to the car-frame and provided with a counter-balance pressing its lower end toward the ratchet-teeth, and a stop limiting the motion of the cam toward said teeth, a pawl pivoted to the lower end of said cam and engaging with the ratchet-teeth, and a disengaging-rod for operating said cam and pawl, substantially as and for the purpose set forth.

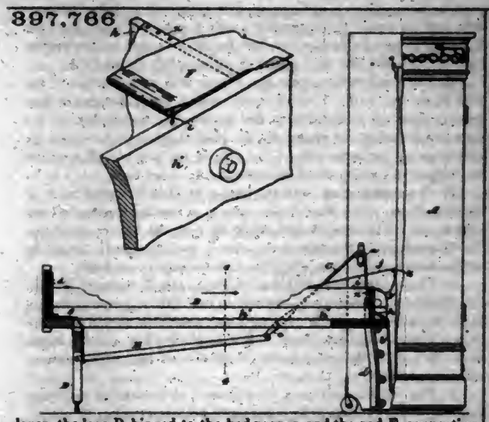
7. In a car-starter, the combination, with a wheel journaled upon the axle and provided with ratchet-teeth upon its periphery, of a cam mounted on a shaft journaled in the car-frame and provided with a counter-balance pressing its lower end toward the ratchet-teeth, and an adjustable stop limiting the motion of the cam toward the teeth, a pawl pivoted to the lower end of the cam and engaging with the ratchet-teeth, a weight pivoted to the cam and pressing said pawl against the ratchet-teeth, and a disengaging-rod for operating said cam and pawl, substantially as and for the purpose set forth.

8. In a car-starter, the combination, with a wheel journaled upon the axle and provided with two alternating rows of ratchet-teeth upon its periphery, of a stationary pivoted cam provided with a counter-balance pressing its lower end toward the ratchet-teeth, and a stop limiting its motion toward the teeth, a rod for operating the cam, and two pawls pivoted to the lower end of the cam and engaging with the ratchet-teeth, substantially as and for the purpose set forth.

397,766. FOLDING BED OR BEDSTEAD. LYMAN W. WELCH, Sparta, Mich. Filed Feb. 21, 1888. Serial No. 264,799. (No model.)

Claim.—1. The combination, with the standard and bed proper, of the crank-lever *c*, pivotally mounted at its middle to the face of the bed-rail, the suspending chain or connector C, secured at one end to the bed proper and at the other end to one end of the said crank-

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lever, the legs D, hinged to the bed proper, and the rod E, connecting the other end of said crank-lever with the legs D, said parts being respectively arranged as shown, whereby said crank-lever is held at all times aligned with that portion of the connector to which it is attached.

2. The combination, with the standard and bed proper, of the pillow-apron, secured at one end to the bed proper, and provided with cords *j* or the like, which pass over sheaves on the standard and are attached at their other ends to the bed, substantially as set forth.

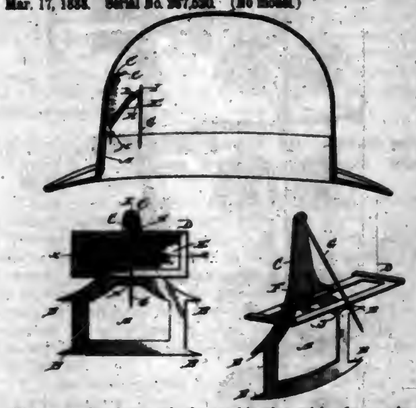
3. The combination, with the standard provided with sheaves *a* and *k*, of the bed proper, B, suspended from the sheaves *a* by chains or the like, of the apron E, secured to the bed proper at *x*, and also by hooks *i*, and provided with cords *j*, which pass over the sheaves *k* and are secured to the bed proper at their ends, as set forth.

397,767. METALLIC POLE FOR VEHICLES. FRANCIS H. WELLS, Racine, Wis. Filed Nov. 22, 1883. Serial No. 291,551. (No model.)



Claim.—A tubular vehicle-pole formed of one or more pieces of metal having longitudinal strengthening-ribs rolled therefrom and projecting inwardly the entire length of said pole, the edges of said metal pieces overlapping and being united by bolts or rivets.

397,768. HAT-MARK. HENRY H. WRIGHT, Paola, Kans. Filed Mar. 17, 1888. Serial No. 267,530. (No model.)



Claim.—1. In a hat-mark, the combination, with a frame adapted to be secured to the inside of a hat, of a hinged and spring-pressed name-plate carried by the said frame, and a pin for locking the name-plate in an approximately vertical position, substantially as herein shown and described.

2. In a hat-mark, the combination, with a frame provided with pins for securing the said frame on the inside of a hat, of a name-plate hinged on said frame, a spring pressing against the back of the said plate, a pin pivoted on the said name-plate and provided with a projection adapted to engage a slot in the said frame, and a hook secured on the said frame, and under which the said pin is passed, substantially as shown and described.

3. In a hat-mark, the combination, with a frame provided with pins adapted to be secured to the inside of a hat, of a name-plate hinged on the said frame, a spring pressing against the back of the said name-plate, a pin pivoted on the said frame and passing through a loop on the said name-plate, and a hook secured to the said frame, and under which the said pin is passed.

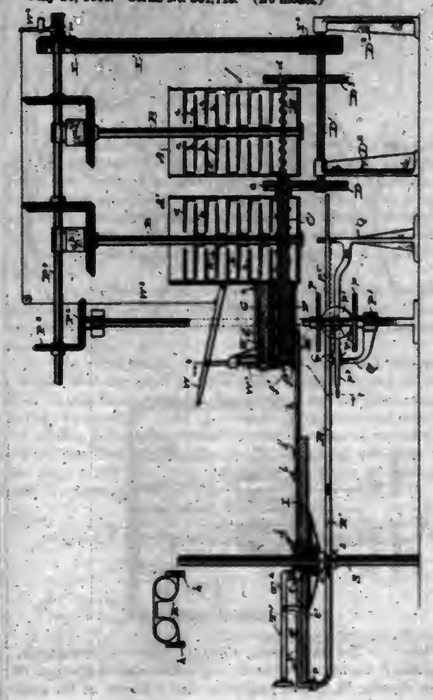
397,769. DRILL-HEAD. WILLIAM R. WRIGHT, Port Huron, Mich. Filed Sept. 28, 1888. Serial No. 286,699. (No model.)



Claim.—1. In a drill-head for removing incrustations from tubes or flues, made tapering from its point to its middle part and cylindrical in rear of the middle part, said drill-head being formed with reaming-flanges extending spirally from the point to the butt, and the said reaming-flanges being provided with bevels or treads on their outer surfaces extending from the middle part to the butt of the drill-head and of gradually increasing width toward the butt, substantially as set forth.

2. The herein-described drill-head A, having the central threaded recess, *a*, in its butt, tapered from its point to its middle part, and of equal diameter in rear of said part, and provided with the reaming-flanges D, increasing in width from the point to the middle part of the drill, and provided with the cutting-edges *d*, the undercut shoulders *d'*, and the bevels *d*², substantially as specified.

397,770. TILE-MACHINE. HENRY Z. YOUNG, Seville, Fla. Filed July 30, 1888. Serial No. 281,113. (No model.)



Claim.—1. In a tile-machine, the combination, with a pug-mill for the material of which the tiles are to be formed, of a hollow conveyer running through it, a conveyer for the core running through the first-named conveyer, a former inclosing the conveyers outside of the pug-mill, a barrel for receiving the tiles as they are formed, and a yielding gate for closing the formers during the formation of a tile, substantially as described.

2. The combination, with the conveyer and former, of the barrel, a revolving table, and an arm extending from the barrel to and upon the table, substantially as described.

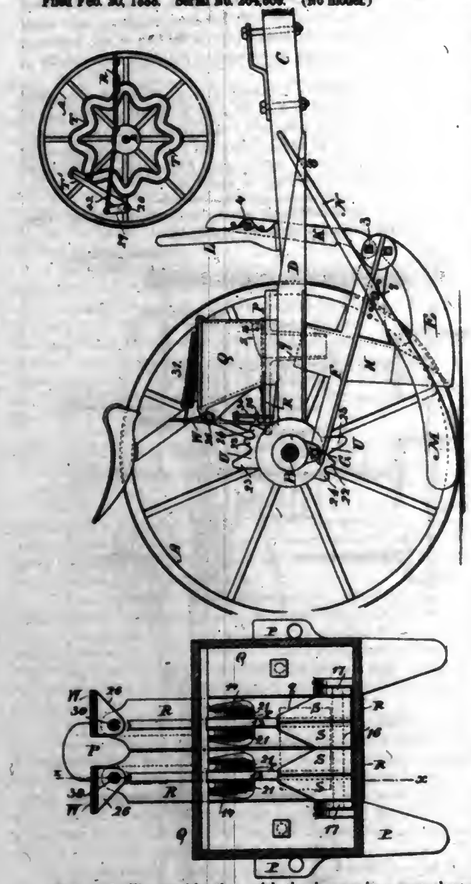
3. The combination, with the former or formers of a tile-machine, of a barrel or barrels, a turn-table, an arm or arms connecting the barrel or barrels with the turn-table, and a reaming-frame and reamers adapted to receive the barrel or barrels while carried by the table, and mechanism for driving the reamers.

4. The combination, with the barrel or barrels, of the revolving table, a pusher or pushers carried thereby, a bar adapted to engage an arm of the pusher or pushers, and mechanism, substantially as described, for operating said bar to cause it to advance and withdraw the pusher or pushers at the proper times, substantially as described.

5. The combination, with the conveyers, formers, and barrels, of arms connecting the barrel with the table, and catches carried by the table and adapted to engage catch-heads on the arms, substantially as described.

6. The combination, with a pug-mill and conveyers, of a lever pivoted thereto, a knife carried by said lever, driving mechanism for the conveyers, and connections between said lever and driving mechanism, whereby when it is depressed it will throw said mechanism out of gear, substantially as described.

397,771. CORN-PLANTER. LEWIS A. ASPINWALL, Three Rivers, Mich., assignor to the Aspinwall Manufacturing Company, same place. Filed Feb. 20, 1888. Serial No. 264,609. (No model.)



Claim.—1. The combination, with the hopper in a corn-planter, of the slide R, having an incline, 14, and a downward projection, 10, with an opening, 21, in said projection that is largest on the under side, and the plate P, upon which the slide R rests, said plate having a V-shaped groove in its upper surface for the reception of the projection on the under side of the slide R, substantially as set forth.

2. The combination, with the hopper in a corn-planter, of the slide R, having a rib, 12, on its upper surface and a downward projection, 10, on the under surface, and the hole 21, passing through the slide and largest at the under side, the plate P, grooved to receive the projection on the under side of the slide R, and the cut-off S within the hopper and above the slide, substantially as set forth.

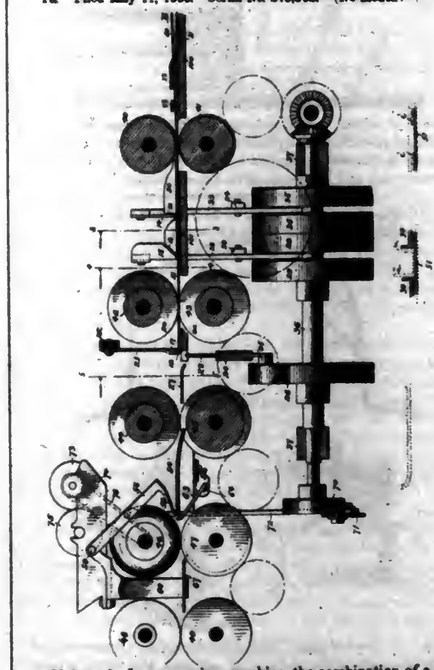
3. The combination, with the hopper Q, plate P, and chute 9, of the slide R above the plate P and passing across the bottom of the hopper, the rocker-arm W, pivoted at 25 upon the hopper, the drop-pin 30, passing into the hole in the slide R, and the cam U, for giving motion to the rocker-arm and slide, substantially as set forth.

4. The combination, with the wheels A, axle B, frame D, hopper Q, and slide R, of the cam U, secured to said axle and having fingers 22 23 24 formed therein of varying length and radial to said axle, the fingers 22 and 24 to give the slide R a rapid vibration, and the finger 23 to move the slide to the point of delivery of the grain, substantially as set forth.

5. The combination, in a corn-planter, of mechanism for dropping the corn, the plow E, for opening the furrow, the bar F, hinged to the axle of the corn-planter, a coverer, M, pivoted at about its middle to the frame F, and having a lever end passing through an opening or support in the frame of the corn-planter, a support upon said frame for the lever end of said coverer, and a movable pin for connecting the coverer with the bar F of the plow for varying the depth of the furrow, substantially as set forth.

6. The combination, with the wheels, axle, tongue, and frame in a corn-planter, of the hopper for the corn, a slide for dropping the same, a plow for opening the furrow, a bar, F, to which the plow is fastened, which bar is hinged at its rear end to the axle, a link, K, lever L, for raising or lowering the plow, a coverer, M, pivoted at about its middle to the bar F and having a forward extension or lever, N, a support for the lever portion N upon the frame, and a movable bolt for connecting the coverer to the bar F, substantially as and for the purposes set forth.

397,772. PAPER-BAG MACHINE. LORENZO D. BENNER, Peoria, Ill., assignor to the Union Paper Bag Machine Company, Philadelphia, Pa. Filed May 11, 1888. Serial No. 273,562. (No model.)



Claim.—1. In a paper-bag machine, the combination of a former adapted to form a web of paper into a bellows-sided tube, guides for turning the opposite upper plies of the tube at right angles to the remainder of the tube, and severing devices for severing both the upturned and flat portions, substantially as described.

2. In a paper-bag machine, the combination of a former adapted to form a web of paper into a bellows-sided tube, guides for turning the opposite upper plies of the tube at right angles to the remainder of the tube, transverse severing devices for severing said upturned portions, and diagonal creasing or folding devices for creasing or folding the ends of said severed upturned portions of the tube, substantially as described.

3. In a paper-bag machine, the combination of a former adapted to form a web of paper into a bellows-sided tube, guides for turning the opposite upper plies of the tube at right angles to the remainder of the tube, transverse severing devices for severing said upturned portions, diagonal creasing or folding devices for creasing or folding the ends of said severed upturned portions of the tube, a second severing device for severing bag-lengths from the tube, and bottom-folding devices for forming the bag-bottoms, substantially as described.

4. The combination of a former adapted to form a bellows-sided tube, guides for turning the opposite upper plies of the tube at right angles to the remainder of the tube, severing devices for severing said upturned portion, primary folders in advance of said severing devices for creasing or folding the corners of said upturned portions, and a second severing device in advance of said primary folders for completing the severing of bag-lengths from the tube, substantially as described.

5. The combination of guides for turning the opposite upper plies of a bellows-sided tube at right angles to the remainder of the tube, a pair of cutters coacting with said guides to sever said upturned portions transversely, diagonal creasing or folding devices for creasing or folding the ends of said severed upturned portions, a transverse severing device for severing bag-lengths from the tube, and folding devices for completing the formation of the bag-bottom, substantially as described.

6. The combination of guides for turning the opposite upper plies of a bellows-sided tube at right angles to the remainder of the tube, transverse severing devices for severing said upturned portions, a pair of angular creasing-edges and creasers coacting therewith for diagonally creasing or folding the ends of said severed upturned portions, a transverse severing device for severing bag-lengths from the tube, and folding devices for completing the formation of the bag-bottoms, substantially as described.

7. The combination of the former, the guides 30, independent of said former and terminating in cutting-edges, and laterally-vibrating cutters coacting with said edges, substantially as described.

8. The combination of the guides 30, severing devices, angular creasing-edges 13, and laterally-vibrating creasers or folders coacting with said edges, substantially as described.

9. The combination of the guides 30, terminating in cutting-edges, laterally-vibrating cutters coacting with said cutting-edges, angular creasing-edges 13, and laterally-vibrating creasers or folders coacting with said creasing-edges, substantially as described.

10. The combination, with tube-feeding devices and guides for turning the opposite upper plies of the tube at right angles to the remainder of the tube, of a transverse cutter provided with vertical openings 17, and a severing-blade coacting with said cutter, substantially as described.

11. The combination, with tube-feeding devices and transverse severing devices, of an oppositely-inclined table, 54, folding-rollers, and a folding-blade coacting therewith, substantially as described.

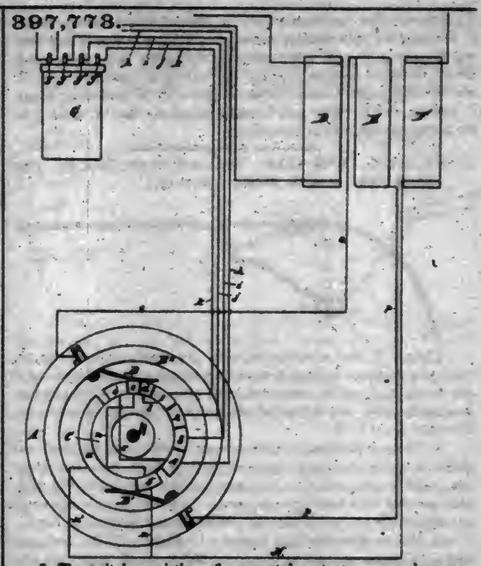
12. The combination, with tube-feeding devices and transverse severing devices, of an oppositely-inclined table, 54, folding-rollers, and a folding-blade having wings 61, coacting with said table and rollers, substantially as described.

397,773. REGULATING-SWITCH FOR ELECTRIC MOTORS. HARRY H. BLADES, Detroit, Mich. Filed Mar. 23, 1888. Serial No. 268,222. (No model.)

Claim.—1. In a manipulating-switch for electric motors, a series of contacts connected and arranged in the order of their operation, as follows: first, contacts adapted to sever the circuit through the motor or short-circuit its armature or field-magnets; second, a series of contacts, each successive one adapted to admit an increased current to the motor; third, contacts adapted to reverse the current through the armature or field-magnets while at its maximum, and, in connection with said switch, means for instantly returning the switch to its starting-point when released, substantially as and for the purpose described.

2. A manipulating-switch for motors, made in the form of a cylinder with segmental contacts and concentric sweep provided with spring-contacts adapted to ride over said segments, and a spring for returning them to the starting-point, said segmental contacts connected and arranged in the order of their operation, as follows: first, contacts adapted to break the circuit through the motor; second, a series of contacts, each successive one adapted to admit increased current to the motor; third, contacts adapted to reverse the current through the armature or field-magnets while at its maximum, substantially as described.

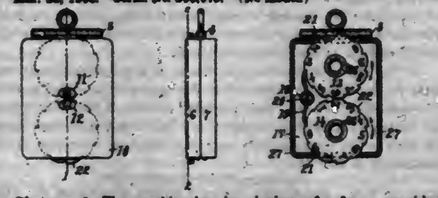
397,773.



3. The switch consisting of segmental contacts arranged upon a surface of a stationary cylinder, a cylindrical shield surrounding the same and having spring-contacts upon its interior surface adapted to ride over said segments, a spring for retracting the same to its initial position, and a band and treadle whereby motion may be communicated to the switch by the foot of the operator, substantially as described.

4. The combination, with a dental motor, its stand and switch mechanism, of a resistance-regulator, G, the same being in the form of a spool sleeved over the upright of the stand, substantially as described.

397,774. LOCKET. GEORGE D. BRIGGS, Providence, R. I. Filed Mar. 22, 1888. Serial No. 268,073. (No model.)



Claim.—1. The combination, in a locket, of a frame provided with two openings, one opposite the other, and a plate having integral tubular bearings, on which are mounted the ratchet-disks, part of said disks extending through the openings in the frame, a spring mounted in the boss for engaging the teeth of the ratchet-disks, and the plate having the two openings through which the face of the ratchet-disks may be seen, substantially as and for the purpose described.

2. The combination of the part 7 of a locket with the part 6, provided with the plate 17, the disks 13 and 14, and plate 10, having the openings 11 and 12, substantially as and for the purpose shown and described.

3. The combination of the part 7 of a locket with the part 6, provided with the plate 17, having the bearings 15 and 16, of the disks 13 and 14, mounted on said bearings, and the front plate, 10, having the openings 11 and 12, substantially as shown and described.

4. In a locket, the combination, with the plate 17, provided with the bearings 15 and 16, and the boss 18, for holding the spring 19, of the disks 13 and 14 and the front plate, 10, having the openings 11 and 12, substantially as set forth.

397,775. LAWN-SPRINKLER. DAVID D. BUICK, Detroit, Mich. Filed May 5, 1888. Serial No. 273,212. (No model.)



Claim.—The combination, in a lawn-sprinkler, of a hollow body, C, having a top opening, D, a rotary cap, A, open at its top and having the corrugations K and bearing on the hollow body, and a plug, L, secured in the said top opening and having a vertical passage, E, and lateral passages G, and formed integral with the projecting flange F, bearing directly upon and loosely holding the base of the cup on the body, substantially as described.

397,776. ROAD-CART. WILLIAM S. BULEIT, Delta, Pa. Filed July 25, 1888. Serial No. 280,958. (No model.)



Claim.—1. The combination, in a two-wheel vehicle, with the body and shafts, of springs pivotally connected with the front end of the former and rigidly connected with the latter, and hangers connecting the body and shafts and adjustable in bearings therefor, substantially as set forth.

2. The combination, in a two-wheel vehicle, with the body and shafts, of springs pivotally connected with the front end of the former and rigidly connected with the latter, springs secured to the body and provided with bearings, and hangers adjustable in said bearings and adjustably connected with the shafts, substantially as set forth.

3. The combination, in a two-wheel vehicle, with the body and shafts, of springs secured to the latter and pivotally connected with the front end of the former, springs secured to the body and provided with bearings, bearings connected with the shafts, and hangers adjustable in said bearings, substantially as set forth.

4. The combination, in a two-wheel vehicle, with the body and shafts, of springs pivotally connected at their free ends with the front end of the body and having their other ends rigidly connected with the shafts, springs secured to the body and provided with bearings, brackets upon the shafts provided with bearings, and hangers connecting the body and shafts and adjustable in said bearings, substantially as set forth.

5. The combination, in a two-wheel vehicle, with the shafts, of the body pivotally connected therewith, springs secured to said body and provided with bearings at their outer ends, brackets provided with bearings, and hangers connecting the shafts and body adjustable in said bearings, substantially as set forth.

6. The combination, with the shafts, of the body pivotally connected therewith, springs secured to the body and provided at their outer ends with bearings, and hangers provided at their lower ends with rollers for adjustably engaging said bearings and at their upper ends with hooks for adjustably engaging bearings upon the shafts, substantially as set forth.

397,777. ROAD-CART. AARON S. BULGER, Martinsburg, Pa. Filed June 23, 1888. Serial No. 278,415. (No model.)

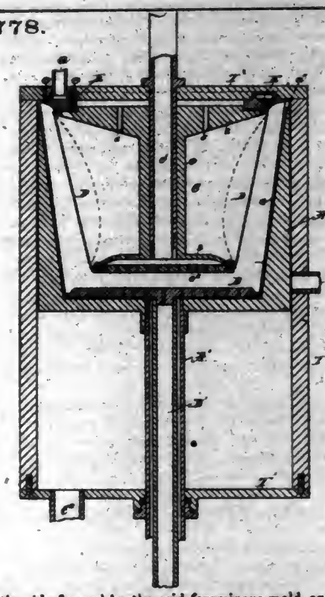


Claim.—In a road-cart, the combination of the iron axle having the downwardly-cranked ends, the shaft-clips, the rod N, secured by said clips, the blocks E on the upper main portion of the axle, the C-springs having the long arm resting on said blocks, the links *b*, the leaf-spring F, the seat, and the side bars bolted to the seat and having a hinge-connection with the cross-bar, substantially as specified.

397,778. MACHINE FOR MOLDING FIBROUS WARE. HENRY CARMICHAEL, Malden, Mass. Filed May 16, 1887. Serial No. 238,227. (No model.)

Claim.—1. In a machine for making hollow articles from pulp, a vessel or cylinder, a foraminous mold for forming one side of the article to be shaped, an independent chine or bottom plate having a stem, the said plate being movable and forming the exterior of the bottom of the article, a flexible diaphragm disconnected from the said chine or bottom plate and adapted to press that side of the article

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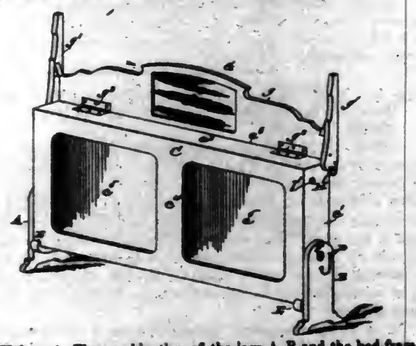
opposite the side formed by the said foraminous mold, and a foraminous plate for forming the interior surface of the bottom of the article, the said parts being in combination, as and for the purpose set forth.

2. In a machine for forming hollow articles from pulp, the combination of the following instrumentalities: a vessel or cylinder provided with a pulp-port, a foraminous mold, a former, and a chine or bottom plate adapted to be moved in the said mold and shaped to form on the bottom of the article a raised edge or chine, substantially as described.

3. The combination, with a vessel or cylinder, a foraminous mold for forming the outer side of the article to be shaped, and an independent bottom plate having a stem made movable in the said former or mold, of a former having a foraminous drainage foot or plate to come against the bottom of the article being formed opposite the bottom plate, to operate substantially as described.

4. The combination, with a vessel or cylinder having a pulp-port, of a mold fitting fluid-tight therein and having a hollow stem extended through the head of the said vessel or cylinder, the latter having an opening for the passage into it of a fluid to actuate the said mold or former, substantially as described.

397,779. FOLDING BED. THOMAS J. CHERRY, St. Louis, Mo., assignor to the Economy Folding Bed Company, East St. Louis, Ill. Filed Apr. 23, 1888. Serial No. 271,560. (No model.)



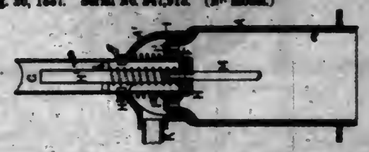
Claim.—1. The combination of the legs A B and the bed-frame C, made as described, and having bottom c^4, said legs having stops E, provided with the lips *c*, and said bed-frame being pivoted at F to said legs and having the projections c^3, which engage the stops E between the lips *c* and the sides of the leg, as and for the purpose set forth.

2. In a swinging and folding bed, the bed-frame C, having the end rails perforated at c^2, combined with the perforated legs A and B, having stops E, and pin D, adapted to engage the perforation in the

leg and bed to hold the bed in an unfolded position, substantially as and for the purposes set forth.

3. The combination of the bed-frame, the irons K, each of said irons made in two parts, *k k'*, the part *k* fastened to end rail and the part *k'* to the side rail, the tenon of one part secured in the mortise of the other by bolt k^4, and the bed-bottom, said bottom having projections *l*, which engage in slots in said irons, whereby said bottom is adjustably connected with the end rails of said frame, substantially as described.

397,780. AIR-PUMP. ALEXANDER CHARTERS, Augusta, Ga. Filed Aug. 20, 1887. Serial No. 247,913. (No model.)



Claim.—1. The combination of the air-exhausting pumps A, a chamber, B, carrying and connected with said pumps, the pump-barrels having the longitudinal passage *a*, the connecting-rods E, and the crank-shaft C, having its bearings in said chamber, the suction-valves H, having their upper face recessed, the hollow stem H', secured to said valves and having the guide-collar *h* and spring H^3 thereon, the suction-pipes G, having the internal stops, *g*, the rod M, secured to the piston and having springs on the side thereof, the perforated diaphragm F, the annular valves I and springs thereon, the delivery-pipes K, and oil-trap L, substantially as set forth.

2. The combination of the pumps A, a chamber carrying them, a crank-shaft having its cranks therein, a perforated diaphragm in the upper end of the pump, a discharge-valve on top, and a suction-valve under said diaphragm, a hollow stem upon said suction-valve, a piston having its upper face recessed to receive the suction-valve, a rod secured to the top of said piston, and springs secured to said rod, substantially as and for the purpose described.

3. The combination of the pump-barrel and its piston, a perforated diaphragm in the upper end of said barrel, a discharge-valve or top, and a suction-valve under said diaphragm, a hollow stem upon said suction-valve, a piston, a rod secured to the top of said piston, and springs secured to said rod, substantially as and for the purpose described.

397,781. WATER-CLOSET. HOSE H. CRAMER, Stamford, Conn. Filed Aug. 20, 1887. Serial No. 247,405. (No model.)



Claim.—1. A water-closet bowl or receptacle formed with an open channel or gutter sunk in its inner surface, and extending from or near the rim to the base of the bowl and directed toward the discharge-aperture, with a water-duct arranged to discharge into said channel, substantially as set forth.

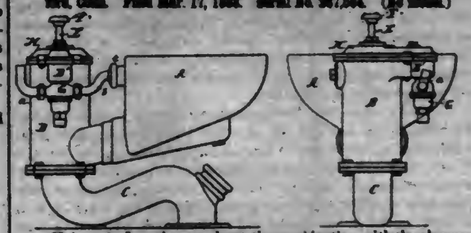
2. A water-closet bowl having a hollow flushing-rim at the top and a discharge-aperture with an open water-channel sunk in the inner surface of the bowl, and descending from the rim to the base and directed toward the discharge-aperture, with a water-supply conduit connecting to the hollow rim and a discharge-aperture leading from said rim to said channel, substantially as set forth.

3. A water-closet bowl or receptacle formed with an open vertical channel on the inner wall of the bowl descending from or near the rim, directed toward the discharge-aperture, and made of a depth increasing toward its lowest point in the bowl, substantially as shown and described.

4. In a water-closet, the combination, with the bowl or receptacle having a discharge-aperture at the base and a siphonic discharge tube or trap leading therefrom, of a water channel or gutter on the inner wall of the bowl descending the same toward and into the discharge-aperture and in line with the limb of the siphon or trap and open on the face of the bowl from end to end, substantially as herein set forth.

5. A water-closet bowl having the discharge-aperture *b*, the curved discharge-tube *c*, and the open channel *k*, arranged substantially as shown, with the bottom of the channel of continuous and coincident curve with the bottom of the tube *c*, and blending into and crossing the aperture *b*, substantially as shown and described.

397,782. PLUNGER WATER-CLOSET. HOSE H. CRAMER, Stamford, Conn. Filed Mar. 17, 1888. Serial No. 267,564. (No model.)



Claim.—1. In a plunger-closet, the combination, with the plunger-chamber and its cover and the plunger and its lifting-rod, of a self-closing flushing-valve and an operating-lever for transmitting movement to said valve, arranged within the plunger-chamber with its long arm over the plunger to be vibrated by the lifting thereof and pivoted to the under side of the cover, whereby it is removable therewith.

2. In a plunger-closet, the combination, with the plunger-chamber and its cover and the plunger and its lifting-rod, of a self-closing flushing-valve and an operating-lever for transmitting movement to said valve, arranged within the plunger-chamber with its long arm over the plunger to be vibrated by the lifting thereof, and a fulcrum-support to which the lever is pivoted, fastened to the under side of the cover and adjustable thereon in a direction longitudinal of the lever.

3. In a plunger-closet, the combination of a plunger-chamber formed with an open-topped lateral branch or pocket at its top, the cover thereof formed to close said pocket, the plunger and its lifting-rod, a self-closing flushing-valve attached to said plunger-chamber with its stem projecting into the pocket thereof, and an operating-lever arranged within the plunger-chamber with its long arm over the plunger to be vibrated by the lifting thereof and its short arm in said pocket arranged to transmit motion to said valve-stem.

4. In a water-closet, the combination, with a self-closing flushing-valve in the supply-pipe, with a plunger-chamber formed with a lateral branch or pocket into which the stem of said valve projects, and with the lifting handle and rod, of an operating-lever in said plunger-chamber arranged with its long arm over the plunger to be vibrated by the lifting thereof and its short arm in said pocket arranged to transmit movement to the stem of said valve, substantially as set forth.

5. In a water-closet, the combination, with the plunger-chamber, a self-closing flushing-valve in the supply-pipe, the plunger, and its lifting-rod, of an operating-lever having its long arm over the plunger to be vibrated by the lifting thereof and its short arm arranged to transmit movement to the stem of said flushing-valve, and a fulcrum-support to which said lever is fulcrumed, and which support is adjustable in a direction longitudinal of the lever, whereby, by the adjustment of said support, said lever is moved bodily, and the leverage with which and extent to which it acts upon the valve are correspondingly varied, and whereby any desired adjustment of the length of the flush between its extreme limits may be effected.

6. In a water-closet, the combination, with a self-closing flushing-valve in the supply-pipe, with a plunger-chamber into which the stem of said valve projects, and with the lifting handle and rod, of an operating-lever in said chamber arranged to be vibrated by the lifting of the handle, and when so vibrated to transmit motion to the stem of said valve, and a longitudinally-adjustable support for the fulcrum of the lever, whereby, by moving said support, the lever is moved bodily endwise, so that the movement for pressing in said valve-stem is derived from a point closer to or farther from its fulcrum, so that the extent to which the stem shall be pressed in by a given vibration of the lever may be varied.

7. In a water-closet, the combination, with a self-closing flushing-valve in the supply-pipe, and with the lifting handle and rod, of an operating-lever arranged to be vibrated by the lifting of the handle, a pivoted dog arranged to bear on the valve-stem and to receive motion from said lever, and the lever and dog constructed to be adjustable relatively to each other, so that a given vibration of the lever can be made to impart more or less movement to the dog, whereby the duration of the wash can be varied.

8. In a water-closet, the combination, with a self-closing flushing-valve in the supply-pipe, and with the lifting handle and rod, of an operating-lever arranged to be vibrated by the lifting of the handle, and having its shorter arm constructed when thus vibrated to stand at an incline, a pivoted dog arranged to be depressed by said shorter arm and to transmit the motion thereof to the valve-stem, and the lever and dog constructed to be adjustable relatively to each other

to bring a higher or lower point on the inclined face of said arm into engagement with the dog, and thereby to impart less or more movement to the valve-stem.

9. In a water-closet, the combination, with a plunger-chamber and its cover and the lifting handle and rod, of a self-closing flushing-valve in the supply-pipe arranged with its stem entering said chamber, an operating-lever within said chamber arranged to be vibrated by the lifting of the handle, and a pivoted dog within said chamber arranged to be depressed by the vibration of said lever to transmit the motion thereof to the valve-stem.

10. In a water-closet, the combination, with the plunger-chamber, the plunger, and its lifting-rod, of a self-closing flushing-valve in the supply-pipe, a pivoted dog or lever arranged to rest against the stem of said valve and approximately perpendicular thereto, whereby the pressure imparted to the stem is always in the same direction, an operating-lever arranged with its long arm extending over the plunger to be tilted by the lifting thereof and its short arm arranged to move in the plane occupied by said dog, and when so tilted to encounter and displace said dog and thereby press in the valve-stem, and an adjustable fulcrum for said operating-lever, whereby the distance between its fulcrum and its point of contact with the dog may be adjusted, thereby correspondingly varying the extent to which the stem is pressed in, and consequently the duration of the flush.

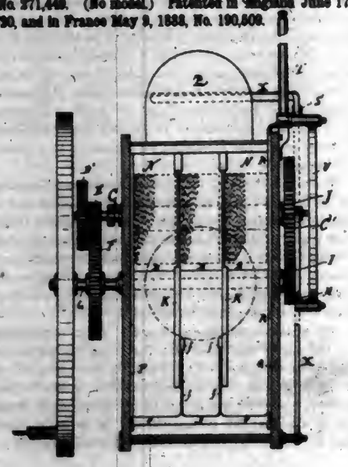
11. The combination, with the plunger-chamber and the self-closing flushing-valve arranged with its stem entering the chamber, of an operating-lever within said chamber arranged, when vibrated, to press in said valve-stem, a fulcrum-support for said lever, and the cover of said chamber having a slot in which said fulcrum-support is adjustably fastened, whereby, by an adjustment of said support in said slot, the position of the lever may be altered and the length of the flush varied.

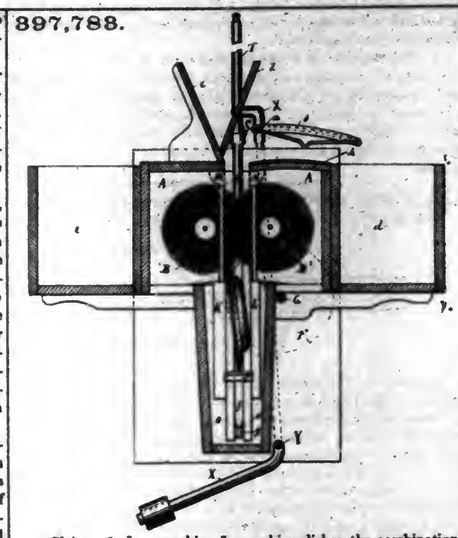
12. The combination, with the plunger-chamber having a laterally-projecting pocket and the self-closing flushing-valve attached thereto with its stem entering said pocket, of an operating-lever arranged within the chamber and a pivoted dog bearing on the valve-stem and arranged to transmit the movement of the lever thereto and constructed of U shape, whereby the operating-lever is admitted between its legs.

13. In a valve-flushed water closet, the combination with the self-closing flushing-valve and its operating-lever, of a pivoted dog bearing on the stem of the valve and arranged to transmit the movement of the lever thereto, constructed of U shape, with pivotal lugs projecting in opposite directions from its legs, and the standard for said dog having perpendicular arms perforated for the reception of said lugs.

14. The combination of the plunger-chamber constructed with a lateral pocket, the self-closing flushing-valve attached to said pocket with its stem projecting into the same, the operating-lever within the chamber having its shorter arm arranged, when vibrated, to transmit motion to said stem, the standard to which said lever is fulcrumed, the cover of the plunger-chamber having a longitudinal slot for the connection of said standard, and a screw accessible from the upper side of the cover for fastening said standard to the cover, whereby, by the adjustment of said standard in said slot, the position of the lever may be altered and the flush varied by an exterior manipulation of the parts.

397,788. MACHINE FOR WASHING DISHES, &c. GEORGE W. R. CARR, Wingfield, County of Wilts, England. Filed Apr. 21, 1888. Serial No. 271,449. (No model.) Patented in England June 17, 1887, No. 8,730, and in France May 9, 1888, No. 190,509.

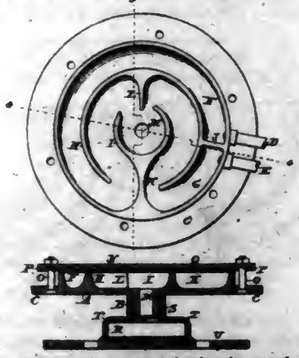




Claim.—1. In a machine for washing dishes, the combination of a box, rotary brushes supported therein, guides in said box, a dish-frame movable in said guide, and means for reciprocating said frame.

2. In a machine for washing plates, dishes, or similar articles, the combination of fixed guides, such as K L, rotating brushes, such as B B', mounted in a washing trough or receptacle, reciprocating frame, such as O, fixed guide, such as *c*, and traveling plate, such as Z, substantially as and for the purposes described.

397,784. HYDROCARBON-BURNER. JOSEPH DARBY, Springfield, Ohio, assignor of one-fourth to Elijah F. Darby, same place. Filed Feb. 25, 1888. Serial No. 265,282. (No model.)



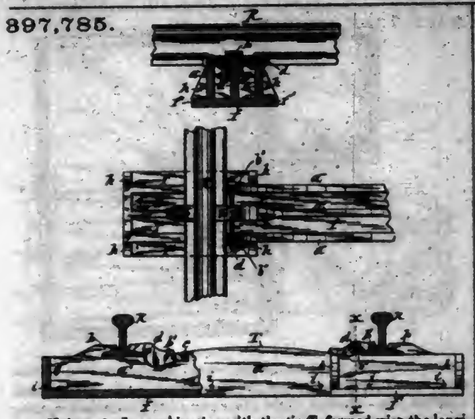
Claim.—1. The circular retort A, having the cap-plate N and the upright curved flange H, with its ends separated, flange K, extending from the wall of the retort inward between the ends of the flange H, a central discharge-outlet, a web, J, joining the wall of the retort with the flange H, and inlets D and E on opposite sides of the web J.

2. In a retort having the circular wall, an inner ring-like flange, H, having its ends separated, a ring-like wall, I, within but separated from the flange H, and having its ends separated, webs K and L, extending, respectively, from the retort-wall and flange H inwardly between the open ends of the ring-like walls or flanges H and I, a central discharge-outlet within the space inclosed by the wall I, a web, J, connecting the wall of the retort with the flange H to form passages F and G, inlets D E on opposite sides of said web, a cap-plate, and a burner.

3. The retort herein described, comprising body A, concentric walls H I, webs J and K, connecting, respectively, the walls H and I with the main body A, a web, L, projecting from the inner face of wall H inward between the separated ends of the curved wall J, a central discharge-outlet, M, cap N, and a burner secured to the under face of the retort, all substantially as shown.

397,785. RAILROAD-TIE. JOHN M. DAVIS, Marathon, N. Y. Filed Dec. 22, 1887. Serial No. 258,761. (No model.)

397,785.



Claim.—1. In combination with the tie T, formed with the longitudinal ribs *a a a'*, the jaws *b b*, formed integral with the central rib, *a'*, at one side of the rails, the jaws *b' b'*, detachably connected to and riding on the central rib at the opposite side of the rails and provided with the downwardly-extending flanges *c'* at opposite sides of the rib, the bolts *d d*, passing transversely through said flanges and ribs, and the shoulders *e e* on the central rib at the heels of the jaws *b' b'*, and shoulders *b''* upon ribs *a*, substantially as described and shown.

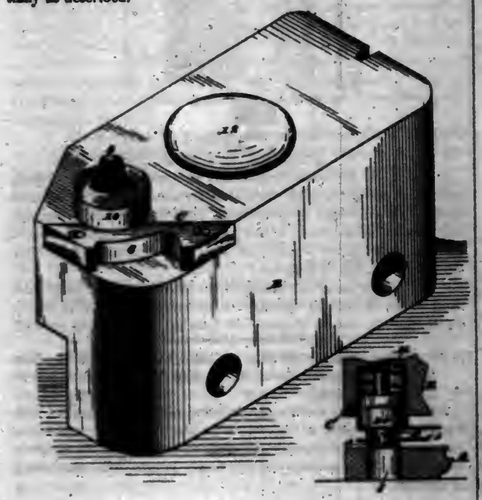
2. The tie T, composed of the base-plate *f*, formed with the widened end portions, *f' f'*, longitudinal side ribs, *a a*, rising from the base-plate, transverse ribs *g g* between the ribs *a a*, and braces *h h* on the end portions *f' f'* outside of the longitudinal ribs, all rigidly united, substantially as described and shown.

3. The improved tie T, composed of the base-plate *f*, formed with the widened end portions, *f' f'*, longitudinal side ribs, *a a*, and central rib, *a'*, rising from said base-plate, transverse ribs *g g*, uniting the longitudinal ribs and braces *h h* on the end portions, *f' f'*, outside of the ribs *a a*, all formed in one piece, the jaw *b*, rigidly secured to the rib *a'* at one side of the rail, the jaw *b'*, riding on said rib at the opposite side of the rail and having downwardly-extending flanges *c c* embracing said rib, the bolt *d*, passing transversely through said flanges and rib, and the shoulders *e e* on the rib *a'* at the heel of the jaw *b'*, substantially as described and shown.

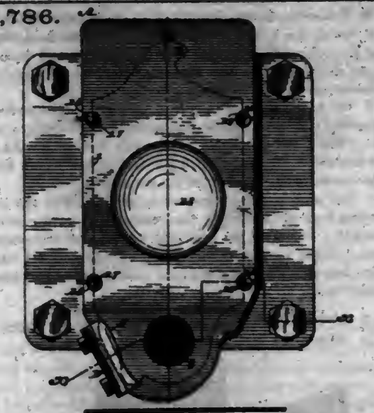
397,786. DIE FOR THE MANUFACTURE OF LIDS FOR JOURNAL-BOXES. NATHAN H. DAVIS, Philadelphia, Pa. Filed Dec. 10, 1888. Serial No. 293,155. (No model.)

Claim.—1. Dies provided, respectively, with the shoulders C D, having the working-faces 6 and 7, for forming the lip of the lid, said parts being combined as described.

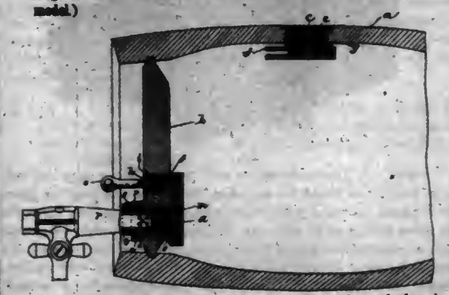
2. Dies provided, respectively, with the opening 8 and punch 9, for forming the flanged opening of the lid, and the wiper 10, for stripping the plate from said punch, said parts being combined substantially as described.



397,786.



397,787. DEVICE FOR OPENING AND CLOSING THE APERTURES OF KEGS, &c. WILLIAM DUNCAN, East Somerville, Mass. Filed Aug. 13, 1888. Renewed Dec. 11, 1888. Serial No. 293,327. (No model.)



Claim.—A keg or cask having an aperture formed therein, a bushing for said aperture, a plate on the interior of the cask provided with a neck extending into said aperture and connected with said bushing, an aperture formed in said cask to one side of said first-mentioned aperture, a gate pivoted in said plate and having its pivot extending into said second-mentioned aperture, whereby the gate may be operated, said flanged bushing being constructed to extend out from the outer surface of the keg or cask and provided exteriorly with a screw-thread, and a faucet provided with an internally screw-threaded rim, *p*, constructed to be screwed upon said exteriorly screw-threaded bushing, all constructed, combined, and arranged substantially as and for the purposes hereinbefore set forth.

397,788. MEASURING MILK-CAN. RICHARD RAGAN, Syracuse, N. Y. Filed May 21, 1888. Serial No. 274,544. (No model.)



Claim.—1. The combination of the can A, provided with measuring-receptacles depending below the bottom of the can, a valve mechanism, substantially as described, operated from the top of the can to control the flow of the milk from the can into the receptacles and from the receptacles, and a detachable cap for inclosing the measuring-receptacles, substantially as and for the purpose set forth.

2. The can A, having rim A' and pins *m*, in combination with the cap C, having rim *o*, slots *n n*, and steps G, and the measuring-receptacles F, having valves for controlling the flow of milk from the can into the receptacles and from the receptacles from the top of the can, all, substantially as and for the purpose set forth.

3. The combination of the can A, handle H, rings *a*, having stems *b*, extending through holes *a'* in the handle H, spiral springs *s*, mounted on the stems *b*, valve-stems *c*, provided with valves *f g* in the measuring-receptacle F, the stem *c*, having ends *d* stepped in the discharge-nozzles *e*, substantially as and for the purpose set forth.

4. The combination of the can A, provided with the thread *r*, depending from the bottom B', the receptacle F, having corresponding thread, *t*, valves *f g*, the combined air-tube and valve-stem *c*, the operating-ring *a*, located in convenient proximity to the handle H, and the detachable inclosing-cap C, all constructed and arranged substantially as and for the purpose set forth.

397,789. END-GATE FOR WAGONS. SAMUEL T. BLAIR, Asterin, Ill. Filed Nov. 3, 1888. Serial No. 290,207. (No model.)



Claim.—1. The combination, with the sides of a wagon and end-gates therefor, of hinges for mounting the gates, comprising the plates for the sides, provided with projecting perforated lugs, top plates for the gates having perforated ends and provided near their other ends with downturned flanges adapted to rest and be secured against the face of the gates, bottom plates for the gates, provided with perforations in one end and having their other ends upturned and beveled, and a rod or bolt passing through the lugs and perforations in the top and bottom plates, substantially as set forth.

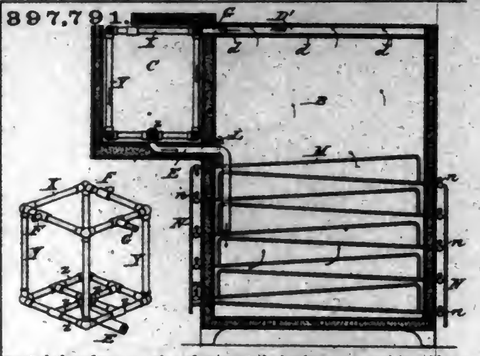
2. The combination, with a wagon provided upon opposite sides with vertically-disposed parallel cleats forming grooves and with oppositely-disposed vertical plates F F, having top and bottom lugs, of an extension-board provided with lugs bearing in said grooves and removable therefrom, and with lugs adapted to engage staples upon the rear cleats, and end-gates provided with top and bottom plates, G H, the outer ends of which project between the lugs of the plate F, said plates F G H, in connection with the bolts I, forming hinges, corresponding inclined plates secured to the inner faces of the gates at their lower edges and provided with lugs adapted to engage perforations in the extension-board, and plates K K', respectively secured to the gates, the former overlapping the adjoining gate, said gates being adapted to be locked against the extension-board, all arranged and adapted to operate substantially as and for the purpose set forth.

397,790. ELECTRO-MAGNETIC ATTACHMENT FOR EYE-GLASSES. FREDERICK FEAR, New York, N.Y. Filed May 1, 1888. Serial No. 272,567. (No model.)



Claim.—The combination, with the metallic frame of eyeglasses or spectacles, of the springy metallic nose-guards having their lower ends secured to and insulated from the frame and their upper ends free therefrom, each spring of said nose-guards having an insulated electrical conductor wound thereon and electrically connected therewith, and the metallic plates, one electro-positive to the other and electrically connected to their respective nose-guards, substantially as shown and described.

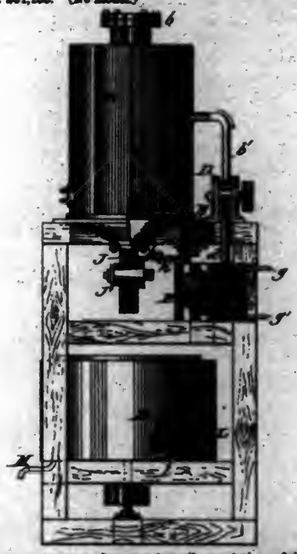
397,791. REFRIGERATOR. WALTER T. FORBES, Atlanta, Ga. Filed May 16, 1888. Serial No. 274,114. (No model.)



Claim.—1. The combination, in a refrigerator, of a provision-chamber provided with flues in its ceiling communicating through a series of perforations with the interior of the chamber, of an ice-receptacle attached to the upper portion of said chamber, but completely separated therefrom, a series of connected air-pipes arranged in said receptacle and communicating at the upper part thereof with said flues, a curved pipe connected to the lower part of said series and opening into the provision-chamber near the bottom thereof, and a tortuous drip-pipe leading from the ice-receptacle through the provision-chamber.

2. In a refrigerator to drain the ice-chamber and utilize the refrigerating properties of the water so drained from said ice-chamber, the inclined pipes M, connected to the ice-chamber, each pipe being bent downwardly at its higher end and connected to the lower end of the pipe next below, and the stop-cocks *n* on the outside of the chamber and connected with the lower ends of the pipes M, substantially as shown and described, and for the purpose specified.

397,792. PROCESS OF EXTRACTING OIL. WALTER T. FORBES, Atlanta, Ga., and GEORGE LEDER, Demopolis, Ala. Filed July 26, 1888. Serial No. 281,155. (No model.)



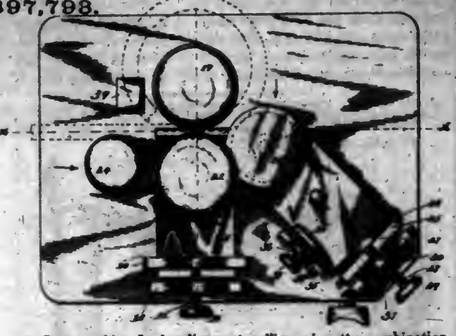
Claim.—1. A process of extracting oil, consisting of the following operations, namely: heating the oil-bearing material in oil of the same kind as that contained in the material, constantly circulating through said material from bottom to the top, the point of disintegration of the integument of the oil-cells, and afterward separating the oil from the refuse material by filtration.

2. In a process of extracting oil, the disintegration of the integument of the oil-cells by heating the oil-bearing material in an upwardly-flowing current of heated oil from the same kind of material.

397,793. MACHINE FOR BENDING AND COILING PIPE. EMMET R. FOWLER, New Haven, Conn. Filed June 20, 1888. Serial No. 277,269. (No model.)

Claim.—1. In a machine for bending and coiling pipe, the combination, with a grooved feed-roll, of a feed-roll having a groove of greater depth and a bending and shaping roll having its periphery extending into the periphery of said deeply-grooved roll, substantially as specified.

397,793.



2. In a machine for bending and coiling pipe, the combination, with a grooved feed-roll, of a feed-roll having a groove of greater depth and an adjustably-arranged bending and shaping roll having its periphery extending into the periphery of said deeply-grooved feed-roll, substantially as specified.

3. In a machine for bending and coiling pipe, the combination, with a pair of feed-rollers, of a bending-roller which projects into the space between said feed-rollers to a point within the periphery of one of them, and a slide which forms a bearing for said roller and is provided with a feed-screw for adjusting it toward and from said feed-rollers, substantially as described.

4. In a machine for bending and coiling pipe, the combination, with a pair of feed-rollers, of a slide provided with a screw for adjusting it toward and from the space between said feed-rollers, a plate or frame pivoted upon said slide, a screw for tilting or laterally adjusting said pivoted plate or frame, and a bending-roller which is journaled upon the inner end of said plate or frame, and, together with one of said feed-rollers, forces the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, substantially as described.

5. In a machine for bending and coiling pipe, the combination of a feed-roller, an opposite feed-roller formed with a deep groove in its periphery, and a bending-roller which is journaled to project with its edge into the deep groove of said feed-roller, and, together with said roller, to force the pipe to follow the contour of said other feed-roller for a portion of its periphery, substantially as described.

6. In a machine for bending and coiling pipe, the combination of a feed-roller formed with a circumferential groove, a feed-roller formed with a circumferential groove and a deeper groove in the bottom of said groove, and a narrow bending-roller which is journaled to project into said deeper groove and formed with a circumferential groove of the same diameter as the grooves in said feed-rollers, and which, together with said deeply-grooved roller, forces the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, substantially as described.

7. In a machine for bending and coiling pipe, the combination of a circumferentially-grooved feed-roller, an opposite feed-roller formed with a circumferential groove and with a deep groove in the bottom of said circumferential groove, a circumferentially-grooved bending-roller which is journaled to project into said deep groove, and, together with said deeply-grooved feed-roller, to force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, and means for adjusting said bending-roller to project more or less into said deeply-grooved roller and toward said opposite feed-roller, substantially as described.

8. In a machine for bending and coiling pipe, the combination of a circumferentially-grooved feed-roller, an opposite feed-roller formed with a corresponding circumferential groove and with a deep groove in the bottom of said groove, a slide which projects with its inner end toward the space between said feed-rollers, a screw for adjusting said slide toward or from said rollers, and a circumferentially-grooved bending-roller which is journaled at the inner end of said slide to project into the deep groove of said feed-roller, and, together with said feed-roller, to force the pipe to follow the contour of the opposite feed-roller for a portion of its periphery, substantially as described.

9. In a machine for bending and coiling pipe, the combination of the machine frame or table formed with the diagonal slot 25, the circumferentially-grooved feed-roller 19, the opposite feed-roller, 21, formed with the corresponding circumferential groove, 22, and with a deep groove, 23, in the bottom of said groove, the guide-roller 24, the oblique guide 30, the slide or block 26 in said diagonal slot, the screw 28, for adjusting said slide, the plate or block 32, pivoted upon said slide, the screw 36, for laterally adjusting said plate or block, and the narrow bending-roller 33, which is journaled at the inner end of said pivoted plate or block and projects into the groove 23 of said feed-roller 21, substantially as described.

397,794. MANUFACTURE OF WRENCHES. ALFONSO D. GATES, Cleveland, Ohio. Filed June 6, 1883. Serial No. 276,305. (No model.)



Claim.—1. In the manufacture of wrenches, the method herein described, consisting, first, in cutting the metal from which the parts are made into suitable blanks, then drop-forging or hammering the blanks into the shape of sections of the complete wrench, and then uniting the said sections, and thus finishing the wrench, substantially as set forth.

2. In the manufacture of wrenches, the method of making the same, consisting in drop-forging or hammering the blanks, forming each part of the wrench into sections having the form of longitudinal sections of the part when complete, the sections constituting the body of the wrench having cavities to form the inside chamber and projections to form the fixed jaw, substantially as set forth.

397,795. STOPPER FOR BUNGS, TAP-HOLES OF CASKS, &c. HENRY L. GATES, Milwaukee, Wis., assignor, by direct and mesne assignments, of one-half to Matthew H. Root, same place. Filed Sept. 3, 1887. Serial No. 248,678. (No model.)



Claim.—1. In a closure for bungs, tap-holes of casks, &c., the combination, with a bushing fixed in the bung or tap-opening, of a housing removably fitting therein and provided with a stop on its outer end to prevent it from being forced through the bushing into the cask, a stopper fitting in and attached to said housing, and a screw-cap for confining the housing in place, formed with an inwardly-extending peripheral flange, substantially as and for the purpose set forth.

2. The combination, in a closure for bungs, tap-holes of casks, &c., of a screw-threaded bushing, a housing loosely fitting therein and having a stop to prevent it from being forced into the cask, a stopper attached to the housing, an annular screw-cap for confining the housing in place, and a washer interposed between the screw-cap and housing, substantially as described.

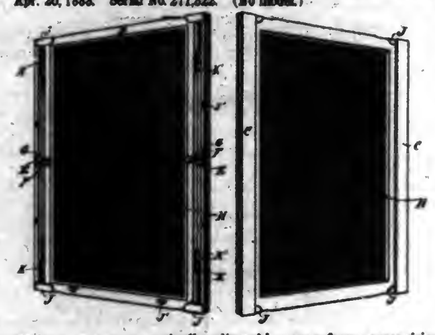
397,796. STORAGE-BATTERY PLATE. CHARLES D. P. GIBBON, New York, N. Y. Filed Oct. 18, 1888. Serial No. 288,423. (No model.)

Claim.—1. A storage-battery plate consisting of a sheet of metal having portions thereof raised above its surface in the form of loops.

2. A storage-battery plate consisting of a sheet of metal having loops raised from its surface and active material covering the surface of said plate and extending under the loops.

3. The combination of the plate A, having the rim B, the loops D, and the active material U, covering the plate and secured thereto by extending under said loops, as described.

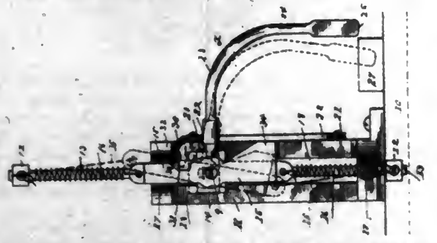
397,797. SCREEN-FRAME. HIRAM F. HALL, Toledo, Ohio. Filed Apr. 20, 1888. Serial No. 271,322. (No model.)



Claim.—1. An automatically-adjustable screen-frame comprising a rectangular screen-frame, side bars held in parallel relation therewith, and corner-pieces having winged portions secured at each side of the side bars, and which overlap and embrace the frame upon each side thereof, in combination with springs interposed between the screen-frame and side bars, as and for the purpose set forth.

2. As a new article of manufacture, a screen-frame consisting of a rectangular frame having a screen attached thereto, side bars having a portion parallel with the sides of the frame and an overlapping wing portion, springs interposed between the side bars and frame, guides secured to each end of the side bars, which cover the ends of the side bars and the corners of the frame, and a central stay and retaining-piece connected rigidly to the bars and movably to the frame, as and for the purpose set forth.

397,798. GUMMING DEVICE FOR ENVELOPE-MACHINES. ALONZO JOHNSON, Springfield, Mass., assignor, by mesne assignments, to the Springfield Envelope Company, of Massachusetts. Filed May 25, 1888. Serial No. 275,071. (No model.)



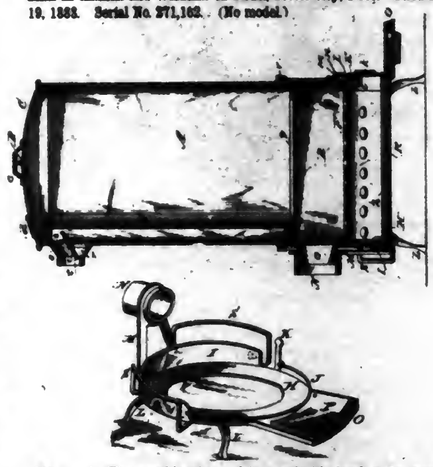
Claim.—1. The combination, with an upright, of a vertically-reciprocating slide-block moving thereon, a spring-sustained gummer pivotally hung on said slide-block, an abutment on said upright arranged in the line of travel of said gummer to secure on the upward movement of said gummer a swing or dipping motion thereof, and the gum-box, substantially as and for the purpose described.

2. The combination, with the rocker-shaft G and crank-arm 20 thereon and a supporting-upright, 11, of a slide-block, 14, vertically movable on said upright and linked to said crank-arm, a spring-sustained gummer, *x*, pivotally hung on said block 14, an abutment on said upright arranged in the line of travel of said gummer to secure on the upward movement of said gummer a swing or dipping motion thereof, and the gum-box, substantially as described, for the purpose set forth.

3. The combination, with the rocker-shaft G, the crank-arm 20 thereon, and the upright 11, provided with the slide-bearing lugs 17, and having the flange 21, provided with the vertical slot 22, and also provided at its upper end with the inward projection 30, of the slide-block 14, vertically movable on said upright and linked to said crank-arm, the slide-rod 13, centrally embraced by said block and guided in said lug-bearings 17 and having the end lugs, 12, the bar 15, intermediately pivoted to said slide-block and provided with the inclined edge 32, the springs 16 between the ends of said bar and said lugs 12, the gummer *x*, rigidly attached to said bar 15 near its pivoted point and projecting through said slot, and the gum-box, all arranged for operation substantially as and for the purpose described.

4. The combination, with the rocker-shaft G and crank-arm 20 thereon and a supporting-upright, 11, provided with the slide-bearing lugs 17 and having the vertically-slotted flange 21, of the slide-block 14, vertically movable on said upright and linked to said crank-arm, the slide-rod embraced by said block and guided in said lug-bearings 17 and having the end lugs, 12, the bar 15, intermediately pivoted to said slide-block and having the flange 34, the springs 16 between the ends of said bar and said lugs 12, the gummer rigidly attached to said bar 15 near its pivotal point, and the gum-box, all combined and arranged for operation substantially as and for the purpose described.

397,799. BUCKET FOR STORING AND BURNING TRASH. WILLIAM H. HARRIS and WILLIAM H. RYER, Steele City, Nebr. Filed Apr. 19, 1888. Serial No. 271,162. (No model.)

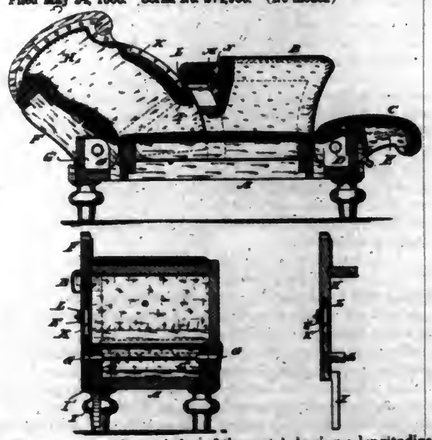


Claim.—1. The combination, with a suitable bucket for storing and burning trash, of a base for supporting said bucket, consisting of the skeleton plate supported upon legs and provided with a pivoted bail and lever for fastening the bucket in position, substantially as and for the purpose specified.

2. The combination, with a bucket for storing and burning trash provided with an opening and collar, *o*, of the supporting-base consisting of the skeleton plate H, flange I, bracket M, and pipe-section N, substantially as and for the purpose described.

3. The combination, with the detachable bucket-section A B, of the base for supporting the bucket, consisting of the skeleton plate H, supported upon legs, and the circular plate R, resting over the opening in the skeleton plate, and means for holding the bucket stationary on the base, substantially as and for the purpose set forth.

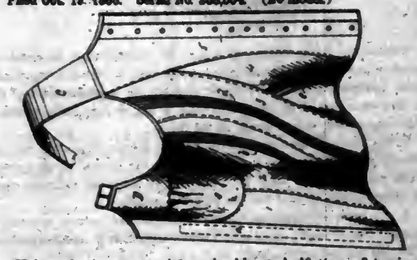
397,800. SOFA. FRIEDRICH W. HERINGHAUSEN, New York, N.Y. Filed May 24, 1888. Serial No. 274,980. (No model.)



Claim.—1. A sofa consisting of the seat A, having a longitudinal slot or recess, I', at its head, a sofa-back, B, provided with a segmental cavity in its edge nearest the sofa-head, and an adjustable pivoted head, F, having a rigid back-piece, H, provided at its base with an extension, I, offset at the front of said rigid back-piece to be substantially flush with the upholstering thereupon depending downward through the longitudinal slot or recess in the sofa-seat, and having a segmental projecting edge fitting the segmental cavity in the adjacent edge of the sofa-back, substantially as described.

2. A sofa consisting of the seat A, having a sofa-back, B, and a longitudinal slot or recess, I', near its head, and a pivoted head, F, having a rigid back-piece, H, and an extension, I, offset in front of said rigid back-piece to be substantially flush with the upholstering thereupon and depending downward through the longitudinal slot or recess in the sofa-seat when the pivoted head is swung back, substantially as described.

397,801. CORSET-WAIST. CHARLES W. HIGBY, Jackson, Mich. Filed Oct. 19, 1888. Serial No. 288,554. (No model.)



Claim.—1. A corset-waist each side or half thereof having in combination a front section extending from the top to the bottom of the waist, provided with fastenings, the oblong yoke D, attached at one end to the front section and extending across the upper side of the breast-piece, the sections 1 and 2, the former having its lateral edges substantially straight and parallel to each other and the concave upper edge, and the latter having the concave edge extending from a point near the middle of one side of the section to its top and the scroll-shaped edge at the other side, and the breast-piece *c*, with the convex lower edge, the breast-piece being inserted between the concave edges of the sections 1 and 2 and the yoke and stitched to said sections and yoke, substantially as and for the purpose described.

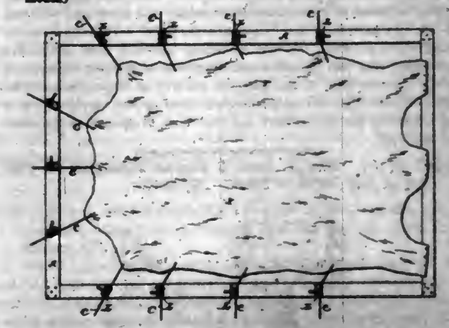
2. A corset-waist each side or half thereof having in combination a front section provided with fastenings, the oblong yoke D, extending across the upper side of the breast-piece, sections 1, 2, 3, 4, and 5, and the breast-piece *c*, with the convex lower edge, sections 3 and 5, extending from the top to the bottom of the waist, and sections 1 and 4 from the bottom part way to the top of the waist, section 1 having the concave upper edge and section 2 the concave edge extending from a point near the middle of one side of the section to its top, the breast-piece being inserted between the concave edges of the sections 1 and 2 and the yoke and stitched to said sections and yoke, substantially as and for the purpose described.

397,802. PAWL-AND-RATCHET CLUTCH MECHANISM. JOSEPH W. HOSSON, Bergen Point, N. J. Filed Feb. 7, 1888. Serial No. 263,204. (No model.)



Claim.—The combination, with the arbor *b*, having ratchet-teeth the engaging-faces of which lie parallel with said arbor, of the wheel *c*, turning on said arbor and having the recess 3, and the pawl sliding in said recess parallel with the arbor and engaging with said ratchet-teeth, substantially as described.

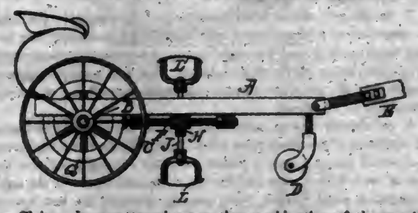
397,803. PROCESS OF JAPANNING LEATHER. SAMUEL C HOWELL, Newark, N. J. Filed July 3, 1888. Serial No. 278,891. (No model.)



Claim.—1. The process herein described of japanning leather, consisting of attaching to a stretching-frame a hide, stretching the same, applying a dressing or coating to the hide, stretching the same and drying it, applying another dressing or coating, and stretching the hide and drying the same, substantially as specified.

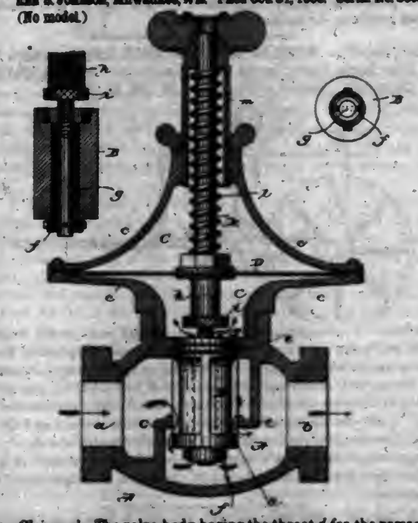
2. The process herein described of japanning leather, consisting of attaching to a stretching-frame a hide, stretching the same, applying a dressing or coating to the hide, stretching the same, and drying it, substantially as specified.

397,804. COTTON-CHOPPER. WILLIAM H. HOWELL, New York, N. Y. Filed June 16, 1888. Serial No. 277,263. (No model.)



Claim.—In a cotton-chopper, the combination of the revolving arm J, the forked heads K, and the curved knife L, secured diagonally to said forked head and having its ends projecting beyond the arms of the forked head and beveled, so as to form additional cutting-edges, as and for the purpose specified.

397,805. AUTOMATIC PRESSURE-REGULATING VALVE. WARREN S. JOHNSON, Milwaukee, Wis. Filed Oct. 31, 1888. Serial No. 289,667. (No model.)



Claim.—1. The valve-body having the throat *d* for the passage of the fluid therethrough, and also an independent throat, *e*, leading from the inlet side directly to the outside of the body, the diaphragm-chamber communicating with the throat *e* on the outside of the body, the diaphragm, the valve having its upper end adapted to constantly close the throat *e* and its lower end adapted to open and close throat *d*, and having also a passage through its interior from the delivery side of the valve-body to the diaphragm-chamber, and a stem connecting the valve and diaphragm, said parts combined for joint operation, as described and shown.

2. The body, the balanced tubular valve applied, as described and shown, the diaphragm-chamber, and the diaphragm, in combination with the adjustable screw-connection to change the relations of the diaphragm and valve, and the independent adjustable spring to depress the diaphragm.

397,806. BATTERY FOR ELECTRIC BELTS. WILLIAM G. JOHNSON, London, England. Filed Oct. 9, 1888. Serial No. 287,634. (No model.) Patented in England Mar. 14, 1888, No. 3,979.



Claim.—1. An electric belt or band consisting of the folded negative elements, each having an eye or loop and inclosing a positive ele-

ment having a projecting lug, and the spiral wires connecting the lugs with the eyes or loops and serving to articulate the elements, to conduct the electric current and permit the pairs of elements to move to and fro and assume various positions, substantially as described.

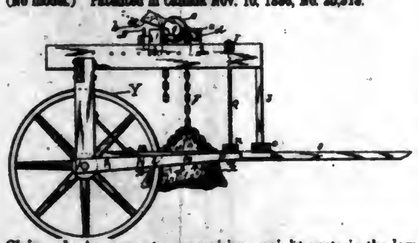
2. An electric belt or band consisting of the folded negative elements strung on flexible cords and each inclosing a positive element, and the spiral wires articulating the negative elements to the adjacent positive elements, and serving to conduct the electric current and permit the pairs of elements to move to and fro and assume various positions, substantially as described.

3. An electric belt or band consisting of the negative elements, each composed of a plate folded upon itself along its median line and strung upon cords D, and the negative elements arranged respectively between the leaves of the folded plates, with the positive elements articulated to the adjacent negative elements throughout the series, substantially as described.

4. An electric belt or band consisting of the negative elements, each composed of a slotted plate folded upon itself to form two leaves, one of which has end eyes, a positive element arranged between the leaves of each folded plate and having a lug articulated to the adjacent negative plate, flexible cords passing through the end eyes of the negative elements, and terminals connected respectively with the end negative and positive elements and secured to the cords, substantially as described.

5. An electric belt or band composed of a series of negative elements, each having a positive element, and strung upon flexible cords and spiral wires connecting the positive elements with the adjacent negative elements throughout the series, and serving as conductors, and to permit the pairs of elements to move to and fro and assume various positions, substantially as described.

397,807. WHEELED STUMP OR STONE LIFTER. JOSEPH S. KEEP, Magog, Quebec, Canada. Filed June 6, 1888. Serial No. 276,179. (No model.) Patented in Canada Nov. 10, 1886, No. 26,313.



Claim.—1. An apparatus comprising upright posts, in the lower ends of which the axles *y* are mounted, a lower frame composed of the bars *l m n o*, to which the pole is connected, an upper frame mounted upon the posts K and J, and consisting of the bars *p* and *i i*, and the hoisting mechanism mounted on the bars *i*, substantially as described.

2. A wheeled stump and stone lifting apparatus comprising longitudinal bars mounted upon supporting-posts which carry the axles of the supporting-wheels, and a supporting-post, J, and straining-rod Q, mounted upon a frame connected to the axles and pole, substantially as described.

397,808. SEWING-MACHINE. CHARLES F. LITTLEJOHN, Bridgeport, Conn., assignor of one-half to R. B. Welch, Cambridge, Mass. Filed Mar. 20, 1886. Serial No. 196,098. (No model.)



Claim.—1. In a sewing-machine, the combination, with the shuttle having a central cavity and a stud or pin projection therein, of the case *f*, secured in said cavity on said stud or pin, and the holder comprising the parallel arms *i i*, and the bar *j*, connecting the outer ends of said arms, the other ends of which are pivoted in apertures in the shuttle, substantially as shown and described, said bar being designed to bear against said case, as set forth.

2. In a sewing-machine, the combination, with the shuttle having the central cavity and two small slots or apertures and the case *f*, disposed in said cavity, of the holder comprising the parallel arms *i i*, having thickened ends pivoted in said slots or apertures, the bar *j*, connecting the outer ends of said arms and extending across said case *f*, and the springs secured to the inner side of said shuttle and having their ends bearing against the thickened ends of said arms, which project through said slots or apertures, substantially as shown and described.

397,809. DIVIDER-SHOE. CHARLES W. LOVE, Fairpoint, Ohio. Filed May 3, 1888. Serial No. 273,721. (No model.)



Claim.—1. As an improved article of manufacture, an outer divider-shoe having a detachable point, and a seat, G, for the finger-bar, narrow upwardly-projected lugs or ribs at the opposite sides of the seat, and provided at its rear end with a lug or lugs for supporting the divider-board, substantially as set forth.

2. An outer divider-shoe having a seat for the finger-bar, narrow upwardly-projected ribs or lugs, whereby by the partial cutting away of such ribs the shoe may be conveniently fitted to different-sized bars, substantially as and for the purpose specified.

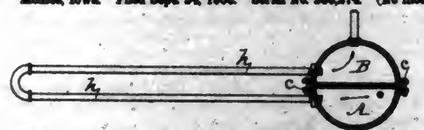
3. An outer divider-shoe having a seat, G, and narrow upwardly-projected ribs or lugs *g* on the said seat, stepped at *g'*, substantially as and for the purposes specified.

4. An outer divider-shoe having a lug or lugs at its rear end, said lugs having a plurality of bearing-faces against which the forward end of the divider-board may be secured, such faces being formed at different angles to the line of draft, substantially as described, whereby the divider-boards may be set at different angles relative to the shoe, substantially as set forth.

5. An outer divider-shoe having at its rear end vertical lugs K K', separated from each other, forming a bearing between them for the front portion or lug of the divider-board, the outer faces of lugs K K' and the inner faces or bearing between said lugs being formed at different angles to the line of draft or travel, substantially as set forth.

6. The improved outer divider-shoe herein described, consisting of the main body portion provided with a socket at its forward end, and having lugs K K', separate from each other, and heel or rest L at its rear end, and having its seat G formed with lugs *g g*, stepped at *g' g'*, and the detachable point having its stem fitted to the socket of the body portion, all substantially as and for the purposes specified.

397,810. FEED-WATER PURIFIER. FRED. V. MEHRING, Des Moines, Iowa. Filed Sept. 24, 1888. Serial No. 286,574. (No model.)

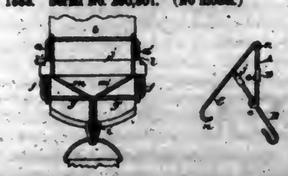


Claim.—1. A water feeder and purifier for steam-boilers, comprising a steam-tight vessel composed of two mating parts having coinciding perforated ears at their edges, integral coinciding partitions, and coinciding bearings for the ends of tubes, a series of bent tubes having their ends fastened in said bearings, a water-supply pipe having an automatic check-valve, and a branch or blow-off pipe having a stop-cock arranged and combined with a boiler to operate in the manner set forth, for the purposes stated.

2. The under part of a vessel, A, having perforated ears *c*, a partition, *d*, and bearings *g*, and the upper mating part, B, having coinciding ears *c*, partition *d*, bearings *g*, a recess, *k*, and a series of perforations, 1 2 3 4, and the tubes *h*, constructed and combined substantially as shown and described, for the purposes stated.

3. A water feeder and purifier composed of a steam-tight vessel made of two mating parts clamped together with bolts and provided with a partition, an induction-tube or supply-pipe connected with one of the apartments of the vessel and provided with an automatic check-valve, a series of tubes extending outward from one of the apartments and into the other apartment, one or more edection-ports on the opposite side of the partition relative to the induction-tube, and a branch tube having a stop-cock fixed to the supply-pipe at a point between the check-valve and the vessel, to operate in the manner set forth.

397,811. BUCKLE. HENRY R. MERRIKEN, Williamsport, Pa. Filed Nov. 14, 1888. Serial No. 290,807. (No model.)

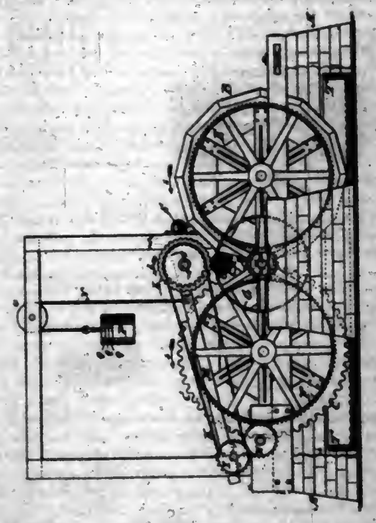


397,811.



Claim.—As an improved article of manufacture, a buckle composed of the toothed bar and support A, the supporting-hook and pressure-plate B, pivoted thereto, and the locking-hook C, also pivoted to said friction or toothed bar support, substantially as and for the purposes mentioned.

397,812. FULLING APPARATUS. JOHN W. MILLER, Dolgeville, N. Y., assignor to Alfred Dolge, same place. Filed June 7, 1888. Serial No. 276,261. (No model.)



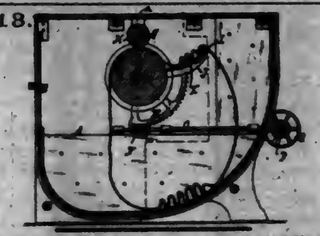
Claim.—1. In a fulling-machine, the combination of the lower rollers, B C, geared together, the gear-wheel I, driven by one of said rollers, the rising and falling frame M, pivoted at one end, the upper roller, L, journaled in the other end of the pivoted frame and suspended over and between the lower rollers, a cord or chain, K, operated by the shaft of said gear-wheel and driving the upper roll, a guide-pulley, O, and a weighted cord, N, passing over the pulley and connected with the pivoted frame to raise or lower the latter, substantially as described.

2. In a fulling-machide, the combination of the lower rollers, B C, having their shafts provided, respectively, with the gears E F, the gear D, interposed between and engaging both of said gears and having its shaft provided with a driving-pulley, G, the gear-wheel I, driven by the gear of one roller, the rising and falling frame M, pivoted at one end, the upper roller, L, journaled in the other end of the pivoted frame and suspended over and between the lower rollers, the connecting chain or cord K, the pulley O, and the weighted suspension-cord N, passing over the pulley and connected with the pivoted frame, substantially as described.

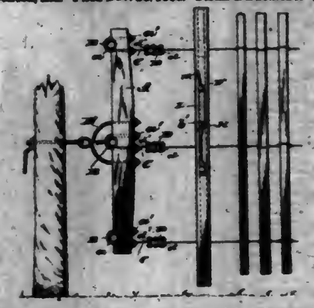
397,813. FULLING-MACHINE. JOHN W. MILLER, Dolgeville, N.Y., assignor to Alfred Dolge, same place. Filed Aug. 30, 1888. Serial No. 284,136. (No model.)

Claim.—In a fulling-machine, the combination, with the drum C and feed-roller G, of a movable plaiting-apron, and mechanism, substantially as described, for adjusting the position of the plaiting-apron according to the desired intensity of the fulling action to be produced upon the material passing through the apparatus.

397,818.



397,814. FENCE-MACHINE. FRANK NICOLAI and MICHAEL NICOLAI, Benton, Ind. Filed Nov. 26, 1888. Serial No. 292,122. (No model.)



Claim.—1. In a machine for making picket fences, the combination of a bar, F, carrying brackets between which cog-wheels are supported, said bar having a slot through which an operating-handle passes, said handle being attached to a reciprocating bar having rack-teeth which engage with the cog-wheels, substantially as shown, whereby the reciprocating movement of the rack-bar is limited by the length of the slot, substantially as shown, and for the purpose set forth.

2. The combination, in a wire and-picket-fence machine, of a wire-twisting device, consisting of a bar, F, having a longitudinal slot, H, a spring latch-bar having catches adjacent to the upper and lower end of the slot, with which the handle-bar engages, brackets supporting cog-wheels attached to the bar F, and a reciprocating bar, I, carrying rack-bars K, and a handle having a flat shank which passes through the slot in the bar F, substantially as shown, and for the purpose set forth.

3. The combination, in a fence-machine, of a tension device consisting of a tension-bar, A, provided with semicircular recesses at its rear edge, tightener-bars B, bails *a*, embracing the bars B, eveners D, having pulleys *d* and *d'*, and a bail or loop, E, at the center of the tension-bar A, substantially as shown, and for the purpose set forth.

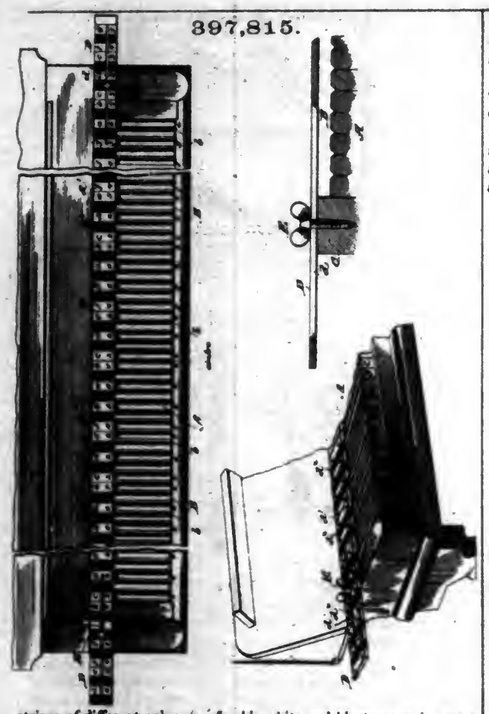
4. In a tension device for constructing wire fences, a tension-bar, A, provided on its rear face with semicircular recesses, tighteners B, bails *a*, passing through the tension-bar on each side of said tighteners B, and looped to hold in position the tightening-bars B, the wire or connection C, secured to the rods B on each side of the bar A, and an evener, D, secured to the loop of the wire C, the bars B being adapted to be turned by a suitable lever and held against rotation by frictional contact with the tension-bar by the bails *a*, substantially as and for the purpose set forth.

397,815. KEY-BOARD ATTACHMENT FOR PIANOS. ENOCH L. S. CROCKER, Waxahachie, Tex., assignor of two-thirds to David Monroe Neuman, same place. Filed Aug. 3, 1888. Serial No. 281,980. (No model.)

Claim.—1. The combination, with the key-board A, provided with a series of keys of uniform shape and size provided with numerals or letters on their faces, the upper ends thereof being in the same horizontal plane, of the movable plate D, arranged at the rear and above the key-board, said plate provided with stripes of different colors (preferably white and black) representing the chromatic scale, one of said stripes (white) provided with numerals or letters adapted to be brought in line with the numerals or letters on the keys, said stripes and keys being of equal width, substantially as and for the purpose described.

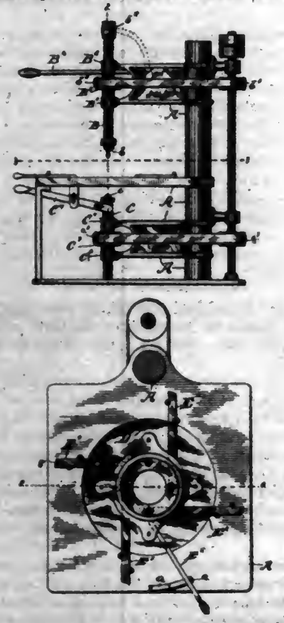
2. The combination, with the key-board A, provided with a series of keys of uniform shape and size, having numerals and letters placed upon the faces of said keys at intervals to indicate their position in the octaves, of the movable plate D, arranged at the rear and slightly above the key-board, said plate provided with elongated slots in its ends and thumb-screws, whereby said scale-plate may be adjusted upon the frame of the instrument, said plate provided with

397,815.



stripes of different colors (preferably white and black) upon its upper face, said stripes arranged to represent the chromatic scale, one set of said stripes (white) provided with numerals and figures, said stripes formed of a width equal to the keys B, all arranged substantially as and for the purposes described.

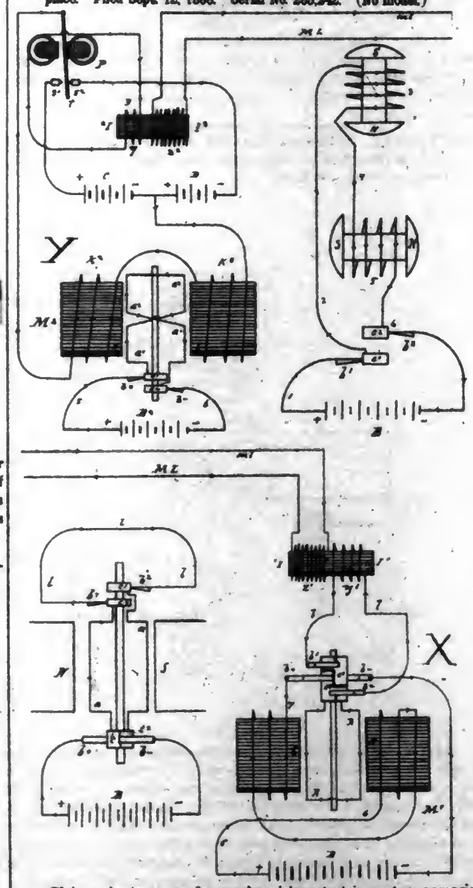
397,816. HUB-BORING MACHINE. DAVID M. PARRY, Indianapolis, Ind. Filed Apr. 21, 1888. Serial No. 271,408. (No model.)



Claim.—1. The combination, in a hub-boring machine, with the boring-tools and means for operating the same, of a clamp for centering and holding the wheel, consisting of a revoluble center having several arms tangentially secured thereto, the outer ends whereof are adapted to engage with the periphery of the wheel, an operating handle or lever, and means for securing it in operative position, substantially as set forth.

2. The combination, in a hub-boring machine, of the frame-work, the shaft for the boring-tool, bearings on said frame-work for said shaft, a pulley loosely mounted on said shaft between said bearings and held thereon by a spline, an operating-lever for moving said shaft, and the wheel-clamp consisting of the revoluble center having several arms adapted to engage with the wheel tangentially secured thereto, all substantially as set forth.

397,817. SYSTEM OF SYNCHRONIZING ELECTRIC MOTORS. FRANCIS J. PATTEN, New York, N. Y., assignor to J. M. Seymour, same place. Filed Sept. 12, 1888. Serial No. 285,242. (No model.)



Claim.—1. A system for synchronizing electric motors comprising two or more motors at different stations, a line-circuit connecting the stations, a transformer having one of its circuits connected to line, a current-changer for periodically changing said current on line, and a pole-changer at a station periodically actuated by the line-currents, said pole-changer reversing the current in one of the elements of a driven motor, the other element of such motor being influenced by a current of constant direction.

2. In a system for synchronizing electric motors, the combination of the line-circuit carrying a periodically-changing current, a series of motors at different stations along said line-circuit, and an induction-transformer controlled by the line-currents, the induced circuit of said transformer controlling one of the magnetic elements of a driven motor and producing periodical reversals in said element corresponding to the changes in the line-current, the other element of said motor being excited by a current of constant direction.

3. In a system for synchronizing electric motors, the combination of the line-circuit carrying a periodically-changing current, a series of motors at different stations along said line-circuit, an induction-transformer having its induced circuit connected to the line, and a pole-changer controlled by the induced current of said transformer, one of the magnetic elements of each driven motor having its current reversed by the pole-changer, the other element of said motor being excited by a current of constant direction.

4. In a system for synchronizing electric motors, the combination of a line-circuit connecting different stations, an induction-coil having its induced circuit connected to the line, and its inducing-current periodically varied by a current-changer, and a series of electric motors at different stations having the current exciting one magnetic element reversed at periods corresponding to the changes in the line-current and the other element excited by a current of constant direction.

5. In a system for synchronizing electric motors, the combination of a line-circuit connecting different stations, an induction-coil having its induced circuit connected to the line, and its inducing-current periodically varied by a current-changer, a pole-changer controlled by the induced currents, and a driven motor or motors, each having the current exciting one of its magnetic elements reversed by the pole-changer at periods corresponding to the changes in the line-current and the other element excited by a current of constant direction.

6. In a system for synchronizing electric motors, the combination of a line-circuit connecting different stations, an induction-coil having its induced circuit connected to the line and its inducing-current periodically varied by a current-changer, an induction transformer controlled by the line-current, a pole-changer operated by the induced currents of the transformer, and a driven motor or motors, each having the current exciting one of its magnetic elements reversed by the pole-changer at periods corresponding to the changes in the line-current and the other element excited by a current of constant direction.

7. A direct-current electric motor, in which the armature is provided with a reversing-commutator, to the segments of which continuous insulated ring-contacts are secured, brushes bearing on said segments connected in the motor-circuit, and independent brushes bearing on said rings connected to an external shunt-circuit to said armature, said shunt-circuit forming the primary of an induction-coil, the secondary of which is connected to an independent circuit.

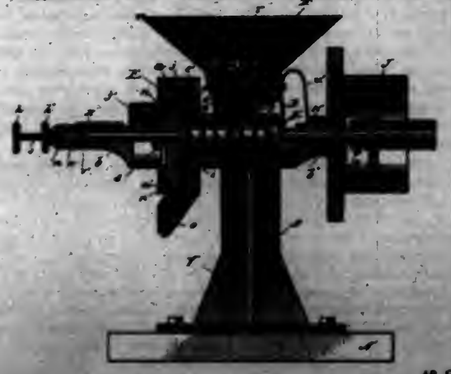
8. An induction-coil having its primary circuit connected in a shunt-circuit around the armature-circuit of an electric motor, the secondary thereof constituting an independent circuit whereby alternating or pulsatory currents are caused to traverse said independent circuit, having the same period or rate of change as the reversals of current in the said armature-circuit.

9. In a synchronizing device for electric motors at different stations, a main-line circuit connected to the high-resistance circuit of induction-coils at the stations, the low-resistance circuit of one such coil being connected to the motor, the low-resistance circuit of the other to the coils of a polarized relay at its station, whereby said relay is caused to vibrate in unison with the reversals of current in the armature-circuit of said distant motor.

10. In a synchronizing system, an electric motor at one station provided with an ordinary two-pole armature and field-magnet, means for transmitting periodic pulsations in a line-circuit to a distant station, said pulsations corresponding in time to the half-revolutions of said motor-armature, a current-changer at said distant station controlled by said pulsations for reversing the field-magnetism of a motor at said distant station, a four-pole armature in said motor with two coils connected both to the same insulated continuous ring-contacts, and a source of direct current in circuit with said ring-contacts.

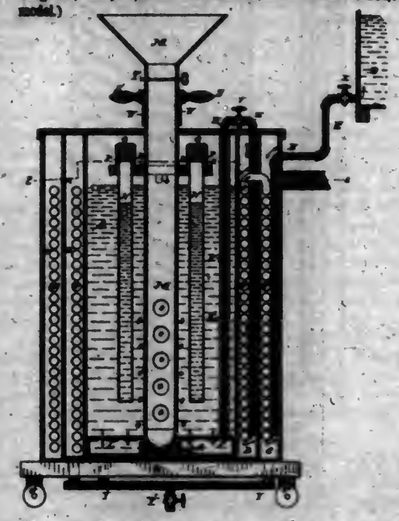
11. In a synchronizing system for electric motors, a controlling or governing motor, and a series of governed motors at distant stations having four-pole armatures excited by a continuous current of one direction and revolving in a single magnetic field the polarity of which is periodically reversed by changes in the line-circuit produced by the controlling-motor.

397,818. GRINDING-MILL. GEORGE RAYMOND and ALBERT RAYMOND, Chicago, Ill., assignors to the Appleton Manufacturing Company, Appleton, Wis. Filed June 11, 1887. Serial No. 241,002. (No model.)



Claim.—In a grinding-mill, the combination, with a suitably-channeled superstructure, A, of a removable hollow cylinder, B', one end of which is flanged and thereby adapted to support the stationary grinding-disk, said cylinder being also provided with an upper feed-opening, substantially as set forth.

397,819. MACHINE FOR MANUFACTURING ICE. JAMES C. ROSS, Perth Amboy, N. J., assignor, by mesne assignments, to John T. Ferguson, Memphis, Tenn. Filed June 9, 1888. Serial No. 204,573. (No model.)

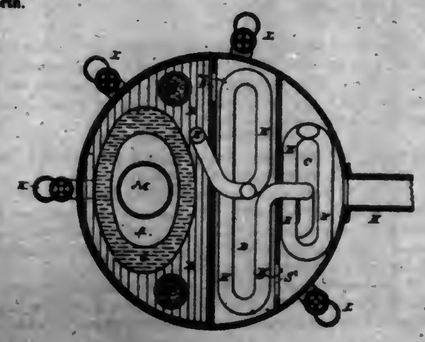


Claim.—1. In an ice-machine, the combination of the freezing-vessel A, provided with the can-holder R, resting upon supports *b* and adapted to be oscillated, the salt-feeder secured to the can-holder and provided with handles S, the block M', for supporting the lower end of the can-holder in its socket, so that the oscillation of the can-holder and cans can be effected, substantially as set forth.

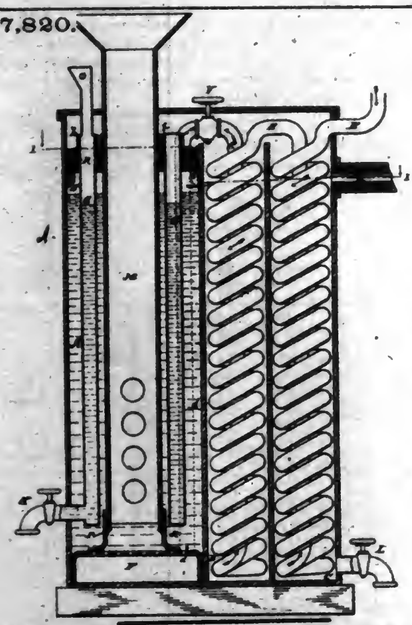
2. In an ice-machine, the combination of a central freezing-vessel, A, provided with a can-holder, R, resting upon supports *b* and adapted to be oscillated, the salt-feeder secured to the can-holder and provided with handles S and block M' and surrounded by vessels B C, containing coils F F', the latter being continuations of the water-supply pipe and terminating in the pipe K at the bottom of the freezing-vessel A, with the overflow-outlets *p*, *n*, and *m*, substantially as set forth.

397,820. MACHINE FOR MANUFACTURING ICE AND FOR COOLING PURPOSES. JAMES C. ROSS, Perth Amboy, N. J., assignor, by mesne assignments, to John T. Ferguson, Memphis, Tenn. Filed June 9, 1888. Serial No. 204,575. (No model.)

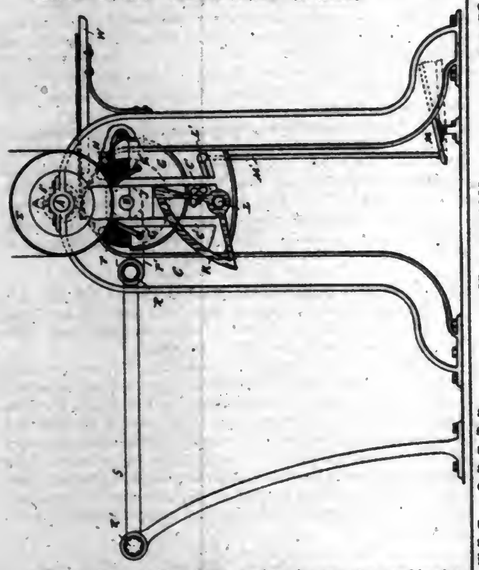
Claim.—An ice-making device consisting of a vessel having an outlet-pipe near the top, a central vertical partition therein apertured near its top, a plate or can-holder upon one side of said partition, carrying a salt-feeder, a water-receptacle surrounding the same and the freezing-cans, the connected pipe-coils for the incoming water upon the other side of said partition, extending from top to bottom of the vessel, and delivering through a perforated plate at the bottom of the salt-feeder, and a vertical partition having an overflow-aperture near its top and separating said coils from each other, substantially as set forth.



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397,821. MACHINE FOR SMOOTHING LEATHER. FERDINAND STORCH, Chicago, Ill., assignor of one-half to John Moss, same place. Filed Nov. 30, 1888. Serial No. 291,341. (No model.)



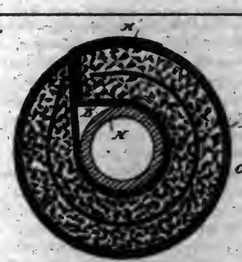
Claim.—In a machine for smoothing leather, the combination, with the threaded roller A', of the rubber roller F, the vertically-adjustable boxes J, the rock-shaft L, the cams K on the same, the cranks L' on said shaft C, the connecting-rods M', and the treadle M, substantially as herein shown and described.

397,822. COVERING. WILLIAM M. SOHR, New York, N. Y. Filed Apr. 17, 1888. Serial No. 270,936. (No model.)

Claim.—1. A pipe-covering comprising an inner and outer wall between which is placed a filling, said inner and outer walls each being made of a fire-proof material, a water-proof material, and gauze between said fire-proof material and water-proof material, substantially as shown and described.

2. In a covering, an inner and an outer wall, each made of a fire-proof material, a water-proof material, and a connecting-gauze between the two, in combination with a filling placed between the

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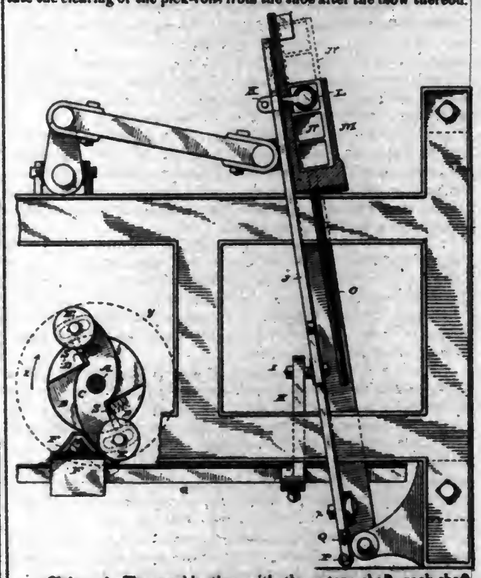


two said walls and a fabric secured on the outer wall and provided with an overlapping end, substantially as shown and described.

3. In a covering, an inner wall and an outer wall, each made of a fire-proof material, a water-proof material, and a gauze between the two, in combination with a filling placed between the said two walls and a stiffener placed in the said filling, substantially as shown and described.

397,823. SHUTTLE-MOTION FOR LOOMS. WILLIAM TUCKER, East Brookfield, Mass. Filed Aug. 1, 1888. Serial No. 281,678. (No model.)

Brief.—The yielding connections between the arms and disk permit of a "lost-motion" movement of the picker-stick and facilitate the clearing of the pick-rolls from the shoe after the blow thereon.

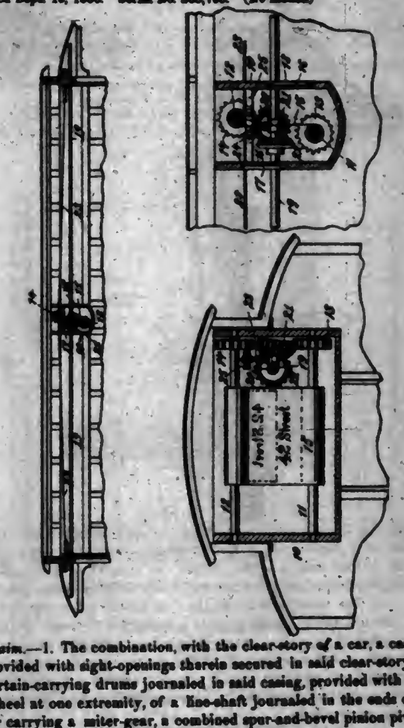


Claim.—1. The combination, with the rotary shaft, rock-shaft, and shoe, of a face-plate fast on said rotary shaft and provided with spring-abutments, an arm-piece carrying a pick-roll or pick-rolls and movable angularly on said shaft, and an interposed spring or springs acting in the direction of the revolution of said roll or rolls at each end of the loom, substantially as hereinbefore specified.

2. The combination, with the rotary shaft A, the rock-shaft G, a shoe, F, and a pick-roll or pick-rolls, E, of a face-plate fast on said shaft and having diagonally-opposite bosses provided with chambers in their driving-surfaces to form spring-abutments, a pair of spiral springs in said chambers, an arm-piece provided with roll-studs for said rolls and movable angularly upon said shaft as a fulcrum, means for adjusting said roll-studs, and means for preventing the longitudinal displacement of said arm-piece and for limiting its angular movement, substantially as hereinbefore specified.

3. In combination with a picker, a pick-shoe, means for re-elevating said shoe, its rock-shaft, and suitable connections, as those ordinarily employed at each end of the loom, the rotary shaft A, having at each end a face-plate, B, fast thereon and provided with spring-abutments, an arm-piece, C, movable angularly on said shaft and provided with roll-studs which carry the pick-rolls, and springs S, interposed between said abutments and the pick-arms and acting in the direction of the revolution of the pick-rolls, substantially as hereinbefore specified, whereby the clearance of the shoe by each pick-roll after each driving stroke may be more expeditiously effected, as set forth.

397,824. STATION-INDICATOR. JULIUS TALLIS, New York, N. Y. Filed Sept. 19, 1888. Serial No. 285,795. (No model.)



Claim.—1. The combination, with the clear-story of a car, a casing provided with sight-openings therein secured in said clear-story, and curtain-carrying drums journaled in said casing, provided with a spur-wheel at one extremity, of a line-shaft journaled in the ends of the car carrying a miter-gear, a combined spur-and-bevel pinion pivoted upon the line-shaft in the casing between the spur-wheels, and a pull-cord attached to the spindle of the combined pinion extending outward through the ends of the car, substantially as shown and described.

2. The combination, with the clear-story of a car, a casing provided with opposing non-aligning sight-openings secured in said clear-story, and non-aligning curtain-carrying drums journaled in said casing, provided with a spur-wheel at one end, of a line-shaft journaled in the ends of the car carrying a miter-gear, a combined spur-and-miter pinion pivoted upon the line-shaft between the spur-wheels, a pull-cord attached to the spindle of the combined pinion extending to the ends of the car, a notched bar sliding in the car-body connected with the pull-cord, and a latch engaging the notches of said bar, substantially as shown and described.

397,825. BALANCED VALVE. MORRIS WUERPEL, St. Louis, Mo. Filed Apr. 30, 1888. Serial No. 272,202. (No model.)



Claim.—1. The combination of the valve 11, having a disk, 15, working upon the seat 16, and having a port, 17, adapted to be brought in line with the port 18 of the seat-piece, and having a head, 12, with packing-ring bearing against the plate 7, which has apertures 9 outside the line of bearing, substantially as and for the purpose set forth.

2. The valve 11, having bearing upon its seat 16, and an expanding head, 12, with ring-packing against the plate, a cog-sector, 19, upon the valve, a cog-wheel, 20, engaging the cog-sector, and a hand-shaft carrying the cog-wheel and passing through a stuffing-box, 22, as set forth.

397,826. ELECTRIC SWITCH. A. BOWER ANDREWS, Hartford, Conn., assignor of one-half to George I. Cornwall, same place. Filed June 16, 1888. Serial No. 277,480. (No model.)

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Claim.—1. In combination with the herein-described switch, the tilting switch-block with a central perforation, from the walls of which perforation project pins, a lever passing through the perforation, and bearing lugs that during part of the movement of the lever come in contact with the pins on the block and prevent the latter from movement, substantially as described, and for the purpose specified.

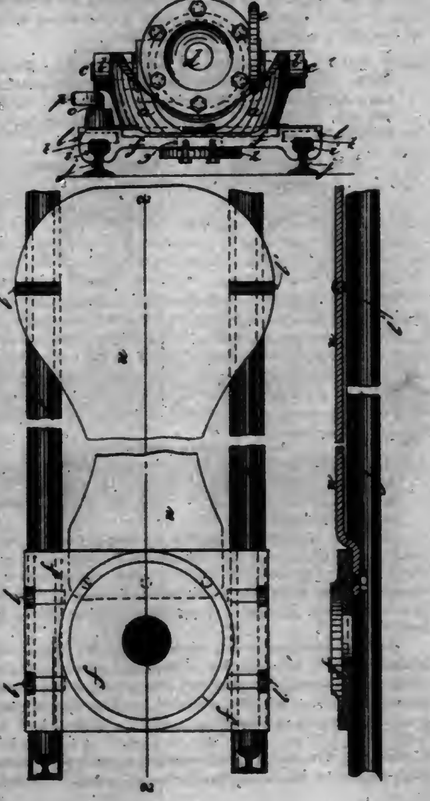
2. In combination, in the herein-described switch, the tilting switch-block pivoted to one set of brushes and adapted to be tilted into contact with other brushes by means of a bent lever, one end of which terminates in a handle, while the other supports a spring whose upper end is attached to the switch-block, substantially as described.

3. In combination with the herein-described switch, the tilting switch-block with a central perforation, from the walls of which perforation project pins, a bent lever passing through the perforation, and bearing lugs that during a portion of the movement of the lever come in contact with the pins on the block and prevent the latter from movement, and a spring interposed between the end of the lever and the tilting block, substantially as described, and for the purpose specified.

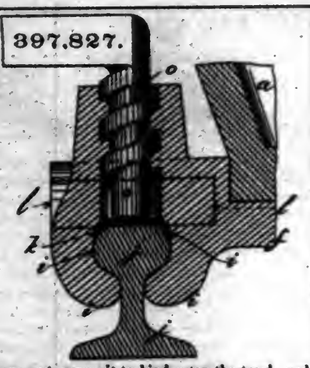
4. In combination, base *a*, connections *b c*, bearing brushes *b' c'*, connections *f* and *g*, pivoted to brushes *b' c'*, block *h*, bearing pins *s*, lever *k*, bearing lugs *o*, spring *m*, attached to the lever and block, connections *d* and *e*, bearing brushes *d'* and *e'*, stop *i*, cover *r*, and storm-protector *t*, substantially as specified, and for the purpose described.

397,827. CARRIAGE FOR DIRECT-ACTING ROCK-DRILLS. GUSTAV A. BARTH, St. Louis, Mo., assignor to PIERRE CHOUTEAU, same place. Filed June 25, 1888. Serial No. 278,135. (No model.)

Claim.—1. In a coal-mining machine, the combination, with a carriage having a cylinder mounted thereon, of an operator's platform attached to and projecting from the rear thereof back of the fulcrum or center of gravity, whereby the weight of the operator



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overweights the carriage and causes it to bind upon the track and neutralize the recoil, substantially as and for the purposes described.

2. The combination of bed-plate *f*, formed with grooves or channels *i*, embracing the heads of rails *j*, rollers *l*, screw *o*, having lever *p*, and a block or cradle, *a*, having bearings *b*, with direct-acting steam or pneumatic engine provided with pivots or trunnions, substantially as shown, and for the purpose described.

3. In a coal-mining machine, the combination, with a carriage and a track therefor, of a clamp for binding the carriage to the rail to neutralize the recoil, a cylinder-cradle pivotally mounted thereon to allow of horizontal rotary movement of the cylinder independent of the carriage, said cradle having trunnion-bearings, and a cylinder having trunnions mounted on said cradle, whereby the said cylinder is capable of vertical and horizontal oscillatory motion independent of the carriage, substantially as and for the purposes described.

4. In a coal-mining machine, the combination, with a carriage and a track therefor, of a clamp for binding the carriage to the rail to neutralize the recoil, a cylinder-cradle pivotally mounted thereon to allow of horizontal rotary movement of the cylinder independent of the carriage, and an operator's platform attached to and projecting from the rear thereof back of the fulcrum or center of gravity, whereby the weight of the operator overweights the carriage and causes it to bind upon the track and assist in neutralizing the recoil, substantially as and for the purposes described.

397,828. ATTACHMENT FOR ROCKING-CHAIRS. WILLIAM I. BUSKIRK, Chicago, Ill., assignor, by direct and mesne assignments, to the Rocker Spring Company, same place. Original application filed Nov. 3, 1884, Serial No. 147,067. Divided and this application filed Jan. 2, 1886. Serial No. 187,379. (No model.)



Claim.—A bracket for platform-rocking-chair attachments, comprising a main piece and a projecting portion or web extending substantially at right angles therefrom, the projecting portion being provided with a groove or channel in one of its faces, into which the end coil of a close-coiled spring may be inserted by springing it over the front edge or inclosing side of the groove or channel, the spring being secured and retained therein when in place by its own elasticity, substantially as described.

397,829. MEANS FOR RAISING AND LOWERING VALVES. WILLIAM BUSTINS, Jr., Brooklyn, assignor to the Meyer-Sniffen Company, (Limited,) New York, N. Y. Filed Aug. 15, 1888. Serial No. 282,906. (No model.)

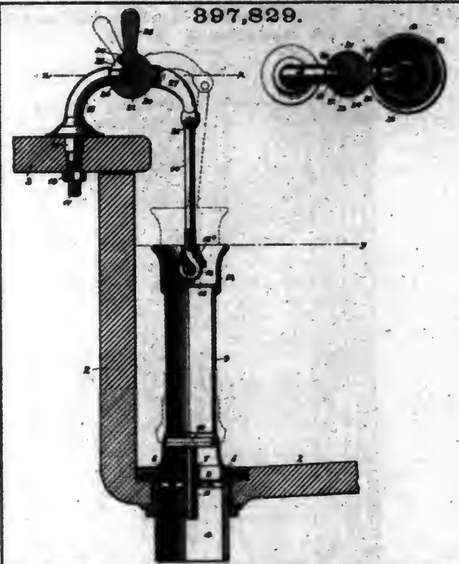
Claim.—1. The combination, with a combined overflow-pipe and valve, of the vertically-mounted bracket 16, terminating in a horizontal direction, the horizontal plug 21, arranged transversely of said bracket and connected thereto, the shell or casing 20, mounted to turn on said plug, the arm 27 on said shell, and the link 14, as set forth.

2. The combination, with a combined overflow-pipe and valve, of the bracket 16, terminating in a horizontal direction, the horizontal plug 21, arranged transversely of said bracket and connected thereto, the shell or casing 20, having the cut-away 25 and mounted to turn on said plug, the arm 27 on said shell, and the link 14, as set forth.

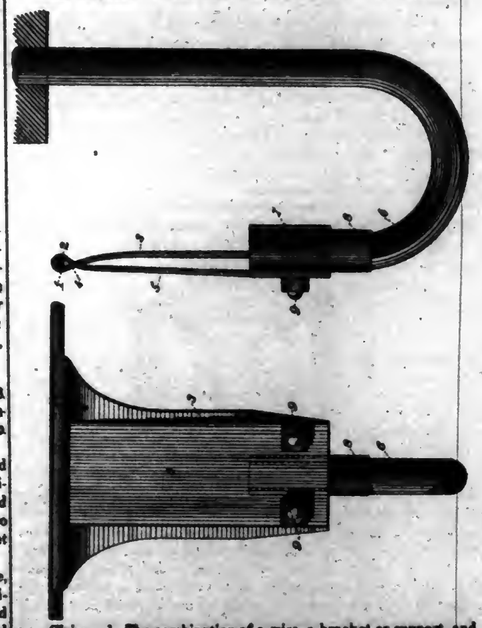
3. The combination, with the combined overflow-pipe and valve, of the bracket 16, terminating in a horizontal direction, the horizontal plug 21, arranged transversely of said bracket and connected thereto, a shell or casing, 20, having the cut-away 25 and mounted to turn on said plug, a handle, 26, and an arm, 27, on said shell, and a link, 14, connected to the arm and to the overflow-valve, as set forth.

4. The combination, with the combined overflow-pipe and valve, of the bracket 16, terminating in a horizontal direction, the horizontal plug 21, arranged transversely of said bracket and connected thereto, a shell or casing, 20, having the cut-away 25 and mounted to turn on said plug, the arm 27, the link 14, and a frictional packing between said plug and shell to overcome the weight of the suspended parts, as set forth.

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397,830. WIRE-SUPPORT. ROBERT C. CAUGHEY, Lodi, assignor of three-fourths to John F. S. Boyd, James R. Williamson, and Daniel R. Zinn, Allegheny, Pa. Filed Aug. 4, 1888. Serial No. 281,947. (No model.)

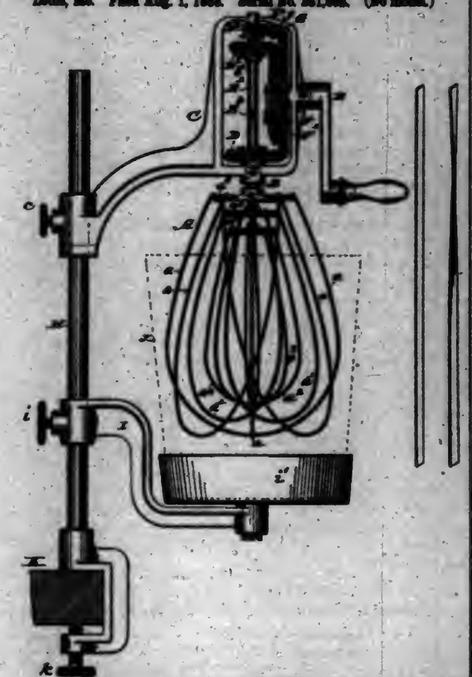


Claim.—1. The combination of a wire, a bracket or support, and a clamp provided with two pairs of movable jaws constructed to engage the wire and bracket, substantially as set forth.

2. The combination of a wire, a bracket or support, and a clamp provided with two pairs of spring-jaws formed at opposite ends of the clamp and constructed to engage the wire and bracket, substantially as set forth.

3. The combination of a wire, a bracket or support, and a clamp formed of two parts or members pivoted one upon the other, the opposite ends of said parts being constructed to engage the wire and bracket, respectively, substantially as set forth.

397,831. EGG OR CAKE BEATER. ROBERT S. CHARLES, St. Louis, Mo. Filed Aug. 1, 1888. Serial No. 281,662. (No model.)



Claim.—In an egg and cake beater, the combination, with the bracket, of a crank-shaft journaled therein provided with two bevel-gears of different diameters, a bevel-gear or idler, and three concentric shafts also journaled in said bracket, each shaft being provided with a bevel-gear at one end and a head at the other end, and each head having attached thereto wire loops forming a whip composed of three distinct sets of loops, the bevel-gears upon the crank-shaft and the bevel-gear journaled in the bracket meshing with the bevel-gears upon the concentric shafts, substantially as described.

397,832. WAGON-BOLSTER SPRING. JAMES CLOY, Scriba, assignor of one-half to Llewellyn R. Todd, Oswego, N. Y. Filed June 15, 1888. Serial No. 277,208. (No model.)



Claim.—1. The combination, with the bolster A, of the spring-hanger attachment *a*, having the adjustable jaw *c*, and a spring, *f*, secured to the attachment *a*, substantially as and for the purpose set forth.

2. The combination of the spring-hanger attachment *a*, having the angular arms *a' a''*, projections *b b*, provided with flanges 1, and opening 2 in said flanges, with the torsion-springs *f*, having the eye *f'*, secured between the flanges 1 and projecting through the opening 2, all substantially as and for the purpose set forth.

3. The combination of the spring-hanger attachment *a*, mounted on the bolster A and provided with projecting arms *b*, the said arms *b* having flanges 1 and openings 2 for the reception of the eyes *f'* of the torsion-springs *f*, the torsion-springs *f f*, having eyes *f'*, bolted to the arms *b*, and eyes *f'*, bolted to the angular cross-tie *f*, and the cross-tie *f*, all substantially as and for the purpose set forth.

397,833. BRACELET. CALEB K. CLEY, Brooklyn, and WILLIAM CONVERMYER, New York, assignors to themselves and Arthur Coley, Brooklyn, N. Y. Filed Mar. 1, 1888. Serial No. 265,906. (No model.)



Claim.—1. A bracelet or the like comprising an open elastic band with overlapped ends, the one end, as *b*, being provided with a loop or keeper, as *d*, and with one or more shoulders, as *g*, and the other end, as *c*, provided with a pivotally-attached bail, as *e*, the end *b* being threaded through said bail, and the end *c* being threaded through said keeper, substantially as set forth.

2. The combination, with the band, as *c*, of a bracelet or the like having overlapping ends and a shoulder and keeper, substantially as described, of a setting mounted on the band at its middle opposite to the overlapping ends, said setting consisting of a body portion, slide-loops or keepers on said body portion through which the bracelet is threaded, and stop-collars on the band to hold said setting in place, substantially as set forth.

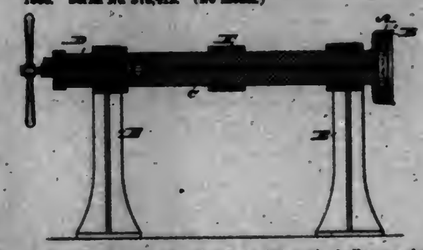
397,834. CHIP-BREAKER. FRANCIS H. CRAPO, Buffalo, N. Y., assignor to H. & R. Holmes, same place. Filed Nov. 17, 1887. Serial No. 255,265. (No model.)



Claim.—1. In a chip-breaker, the combination of a pivoted curved holding-bar provided with a curved groove, a curved adjustable chip-breaker adapted to fit in and be moved around in said groove to adjust it as it wears away, and bolts for securing it at any point when so adjusted, substantially as and for the purposes described.

2. In a chip-breaker, the combination of a pivoted curved holding-bar having a curved groove, a curved adjustable chip-breaker adapted to fit in and be moved around in said groove to adjust it as it wears away, bolts for securing it at any point when so adjusted, and a means for holding it up to its work, consisting of a weight connected with a cord passing up and over a grooved friction-roller and secured to a lug, 13, substantially as described.

397,835. PNEUMATIC CHUCK. GEORGE GUTEKUNST, Philadelphia, Pa., assignor of one-half to Robert P. Hotz, same place. Filed June 28, 1888. Serial No. 278,412. (No model.)



Claim.—1. A pneumatic chuck consisting of a hollow cup having an inner beveled edge, a tube leading from said cup, and an air-exhausting device, said parts combined substantially as described.

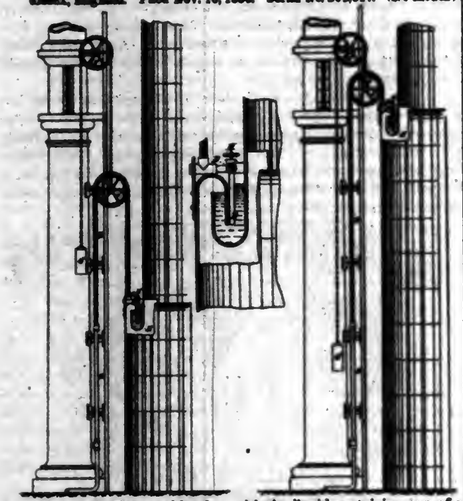
2. A cup or socket and an air-exhausting pump connected therewith, the inner side of the upper edge of said cup being beveled and having a gasket thereon, said parts being combined substantially as described, forming a pneumatic chuck for holding work or tools, as stated.

3. A pneumatic chuck consisting of a cup or socket with the inner side of its upper edge beveled or rounded, a tube connected with said cup, and a pumping device, said tube being rotatable with said cup, said parts being combined substantially as described.

4. A pneumatic chuck consisting of standards, and a tube freely mounted on said standards and having a cup or socket at one end thereof and an air-exhaust device at the other end, both cup and air-exhaust device being rotatable with said tube, said parts being combined substantially as described.

5. A pneumatic chuck consisting of a tube with a cup at one end having inner beveled edges, a gasket resting on said edges, and an air-exhaust device at the other end of the tube, said parts being combined substantially as described.

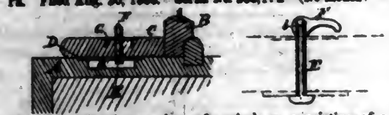
397,836. APPARATUS FOR SUPPLYING STEAM TO CUPS OF TELESCOPIC GAS-HOLDERS. SAMUEL CUTLER, Millwall, County of Middlesex, England. Filed Nov. 16, 1888. Serial No. 291,017. (No model.)



Claim.—1. The combination, with the liquid-containing cup of a rising and falling telescopic gas-holder, of a vertical pipe, A, for conveying a heating-fluid, a flexible pipe, B, connected with the upper end of said pipe and communicating with the cup, and a rising and falling pulley, C, supporting the flexible tube and taking up the slack thereof as the gas-holder rises, substantially as described.

2. The combination, with the liquid-containing cup of a rising and falling gas-holder, of a vertical pipe for conveying a heating-fluid, a flexible tube connected with the upper end of the pipe and communicating with the cup, a sheave or pulley carrying a chain or rope having a weight at one end, and a pulley at the other end, which sustains the flexible tube and takes up the slack thereof as the gas-holder rises, substantially as described.

397,837. WINDOW-HEAD STOP. MARTIN A. COTTER, Allegheny, Pa. Filed Aug. 20, 1888. Serial No. 283,174. (No model.)



Claim.—A bead-stop clamp for windows, consisting of a slotted keeper, D, embedded in the window-frame, a T-headed bolt, E, a cam, F, pivoted in said bolt, and a wear-plate, G, embedded in the stop, all combined and arranged substantially as and for the purpose set forth.

397,888. ELECTRIC SIGNALING AND ALARM APPARATUS. WILLIAM L. DENIO, Rochester, N. Y. Filed Dec. 1, 1887. Serial No. 256,653. (No model.)



Claim.—1. A button for circuit-changers laterally extended at one end and containing a spring, a finger pressed by said spring, and a fusible seal normally holding the finger against the tension of the spring.

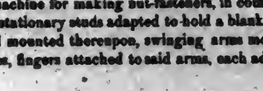
2. A perforated button for push-buttons flanged at one end and containing a spring and a finger pressed by said spring, said finger being held under tension by a fusible seal on the outer face of the button, whereby said button may be substituted for the customary porcelain button and automatically transmit an alarm on a definite rise in temperature.

3. In a fire-alarm or heat-detector, the combination of a barrel internally flanged at one end, a spring seated against said flange, a pin within the barrel engaging the spring, and a fusible seal for holding said spring under tension, whereby on the outbreak of a fire the seal will melt and the pin will be thrust out of the barrel.

4. The combination, with circuit electrodes, of the barrel 5, provided with flange 9, spring 6, seated in said barrel, said springs when free extending out of the barrel, and pin 7, one end of which engages the free end of the spring, the other end being secured by a fusible seal to the other end of the barrel, whereby on the outbreak of a fire the seal will melt and the pin will be thrust out of the barrel and the circuit will be changed.

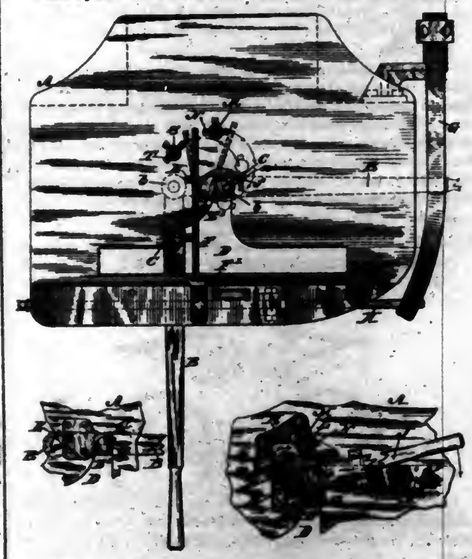
5. The combination of the casing, the hollow button movably secured in the casing, a pin in said barrel, a spring held under tension by said pin, a fusible seal for holding the spring, and the electrodes engaged by the button, whereby the device may normally be operated as a push-button and on the outbreak of a fire will automatically turn in an alarm.

397,889. TAP-HOLE PLUG. CHRISTOPHER G. DODGE, New York, N. Y., assignor to John D. Brown, same place. Filed May 23, 1888. Serial No. 274,307. (No model.)



Claim.—A tap-hole plug made of wood tubular at one end and with a solid web at the other end, the side wall of the tubular portion and the central portion of the web being compressed, while the circumferential portion of the web is left in uncompressed state, substantially as set forth.

397,840. MACHINE FOR MAKING NUT-LOCKS. WILLIAM DUNN, Philadelphia, Pa. Filed Oct. 31, 1888. Serial No. 289,625. (No model.)



Claim.—1. In a machine for making nut-fasteners, in combination, a supporting-table, a stud provided with a swinging lever, means for holding a blank in such position that it lies in the path of said stud, fingers each adapted to travel in an independent path and so situated as to each operate upon one of the respective ends of the blank, a link connecting said fingers, and a handle adapted to operate said fingers, substantially as set forth.

2. In a machine for making nut-fasteners, in combination, a supporting-table, stationary studs adapted to hold a blank between them, a lever, a stud mounted thereupon, swinging arms mounted upon independent axes, fingers attached to said arms, each adapted to, when

the stud is in its innermost position, move partly around the same in planes inclined to the horizon and in paths eccentric both with respect to said stud and to each other, a link connecting said swinging arms, and a handle mounted in connection therewith, substantially as set forth.

3. In a machine for making nut-fasteners, in combination, a supporting-table, stationary studs which lie on opposite sides of a blank fed to the machine, a movable stud adapted, when in its outer position, to lie adjacent to the free end of a straight blank fed to the machine and when in its inner position to lie adjacent to the blank when said blank has been bent to a V shape, a lever-arm upon which said movable stud is mounted, and means for bending the extremities of the blank about said movable stud, substantially as set forth.

4. In a machine for making nut-fasteners, in combination, a supporting-table, a stationary stud adapted to lie adjacent to one side and near the center of a blank fed to the machine, a retaining device adapted to lie adjacent to the opposite side of the blank, a movable stud the path of travel of which intersects the blank fed to the machine, a lever-arm upon which said movable stud is mounted, a pivot beneath the table for said lever-arm, an opening in said table through which said movable stud projects, and means for bending the extremities of the blank about said movable stud, substantially as set forth.

5. In a machine for making nut-fasteners, in combination, a supporting-table, a movable stud, a lever-arm upon which said stud is mounted, projecting arms mounted upon independent axes, an arm and a finger depending from each of said projecting arms, a link connecting the projecting arms, and a lever-handle attached to one of said arms or its axis, substantially as set forth.

6. In a machine for making nut-fasteners, in combination, a supporting-table, a movable stud, a lever-arm upon which said stud is mounted, projecting arms mounted upon independent inclined axes, an arm and a finger depending from each of said projecting arms, a link by which the projecting arms are coupled, and a lever by which they are rotated, substantially as set forth.

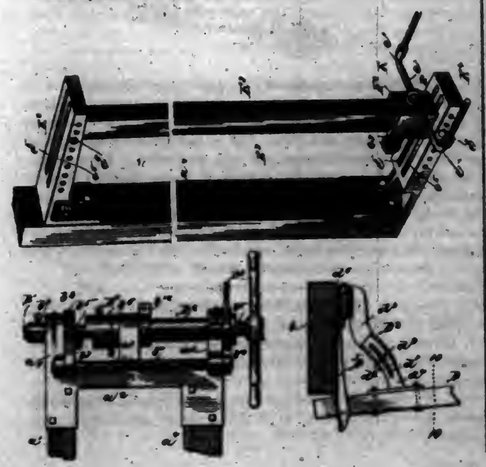
7. In a machine for making nut-locks, in combination, a supporting-table, a movable stud, a lever-arm upon which said stud is mounted, arms mounted upon independent inclined axes in such position that they overhang the point occupied by the stud when it is moved in to its innermost position, an arm and a finger depending from each projecting arm, and a lever-arm connected to the axis of one of said arms, substantially as set forth.

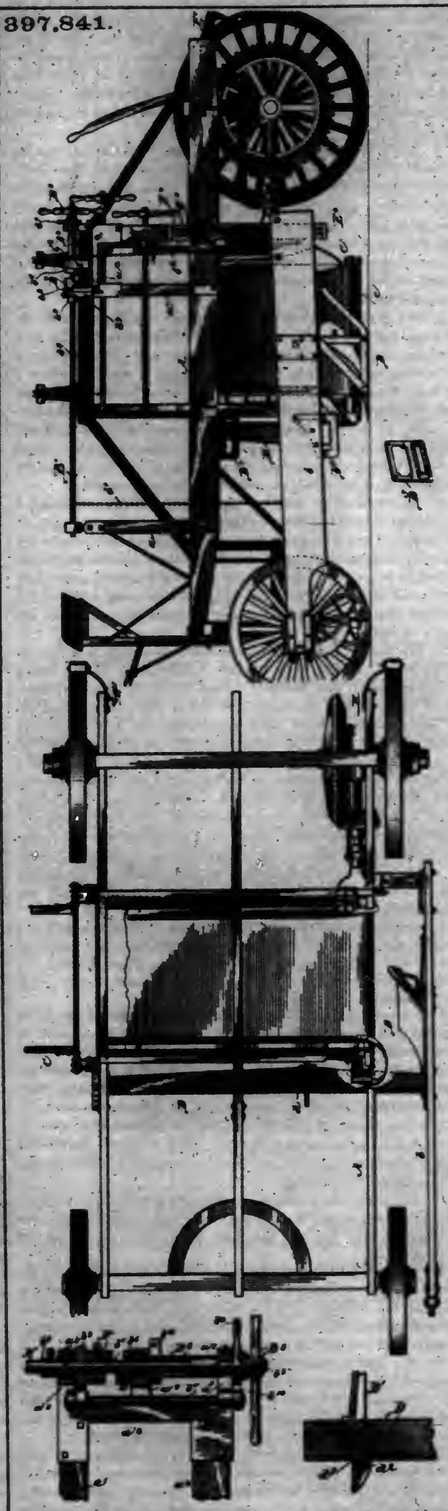
8. In combination with the lever B and the stud mounted thereupon, the latch and latch-operating handle, substantially as set forth.

9. In a machine for making nut-locks, in combination, a projecting arm mounted upon an inclined axis, a projecting arm mounted upon a separate inclined axis, depending arms and fingers attached to said arms, a link connecting said projecting arms, and a lever-handle connected to one of said axes, substantially as set forth.

10. In a machine for making nut-locks, in combination, a projecting arm mounted upon an inclined axis, a projecting arm mounted upon a separate inclined axis, depending arms and fingers attached to said arms, a link connecting said projecting arms, a lever-handle connected to one of said axes, the arrangement being such that upon the throw of the handle said fingers are caused to describe arcs of circles in planes inclined to the horizon, substantially as set forth.

397,841. GRADING AND DITCHING MACHINE. GEORGE B. DURKEE, Chicago, Ill., assignor to Frederick C. Austin, same place. Filed June 11, 1888. Serial No. 276,746. (No model.)





Claim.—1. In a grading and ditching machine, the combination, with the suspended plow-beam and the suspending cords or chains

therefor, of a raising and lowering mechanism consisting of a couple of rotary winding-shafts, respectively, for one and the other of the suspending cords or chains, and a clutch adapted to connect and disconnect the winding-shafts, whereby the shafts may be either connected in order to simultaneously wind or unwind the cords or chains, or disconnected, so as to permit either chain to be wound or unwound separately from the other, as set forth.

2. In a grading and ditching machine, the combination, with the suspended plow-beam and the suspending cords or chains therefor, of separate winding-shafts for the suspending-chains, and a shaft which is both rotative and longitudinally movable, provided with a clutch device arranged to engage either of a couple of clutch portions with which the two winding-shafts are respectively provided, whereby the shaft carrying the clutch may be connected with either winding-shaft and then turned, so as to operate the same, substantially as and for the purpose set forth.

3. In a grading and ditching machine, the combination, with the plow-beam carrying a plow and the suspending-chains therefor, of a line of sectional shafting comprising a rotary shaft, B', which serves as a winding-shaft for one of the chains, and a shaft, b^3, which is both rotative and longitudinally movable, a rotary winding-shaft from which the other suspending-chain is hung, and a double clutch member carried by the said rotary and longitudinally-movable shaft and arranged to be thrown into engagement with either of the two clutch members, respectively, upon one and the other of the said two chain-winding shafts, substantially as and for the purpose described.

4. The combination, with the suspended plow-beam carrying a plow and the suspending cord or chain b', of the rotary winding-shaft B', for said cord or chain, the shaft b^3, which is both a rotative and a longitudinally-movable shaft, and a clutch member or portion fixed upon the shaft B' in position to be engaged by a clutch member on shaft b^3, whereby the latter may by an end-thrust be either connected or disconnected from said chain-winding shaft, substantially as and for the purpose set forth.

5. The combination, with the suspended plow-beam and the suspending-chains therefor, of the rotary winding-shaft B', the rotary and sliding shaft b^3, provided with a hand-wheel, the rotary winding-shaft B^3, sleeved upon the rotary and sliding shaft, clutch members upon the opposite ends of the winding-shafts, and a double clutch member upon the rotary and sliding shaft, for the purpose described.

6. The combination, substantially as hereinbefore set forth, in a grading and ditching machine, of the suspended plow-beam carrying a plow and the two cords or chains by which the plow-beam is suspended, with the two winding-shafts, one for each winding-chain, a clutch arranged to alternately connect the winding-shafts with a rotary shaft, which can be operated by an attendant on the machine to actuate either winding-shaft, according to the position of the clutch, and pawl-and-ratchet devices, substantially as set forth, to lock the winding-shafts against rotation.

7. In a ditching and grading machine, the combination, with the suspended plow-beam and suspending-chains therefor, of a couple of separate rotary chain-winding shafts arranged in alignment with one another and supported so as to lie over and substantially parallel with the plow-beam, for the purpose described.

8. In a grading and ditching machine, the combination, with the suspended plow-beam and suspending-chains therefor, of a couple of winding-shafts, both arranged on a line substantially over and parallel with the plow-beam, one of said shafts being hollow, whereby the power may be transmitted through the hollow shaft by shafting which can turn independently of the hollow shaft, for the purpose set forth.

9. In a grading and ditching machine, the combination, with the suspended plow-beam and the draft-bar D, of a hanger attached to the plow-beam and a knuckle-joint, such as set forth, pivotally attaching the draft-bar to the hanger.

10. In a grading and ditching machine, the combination, with the suspended plow-beam and the draft-bar D, of an extensible hinged arm connecting the draft-bar with the beam, substantially as and for the purpose set forth.

11. In a grading and ditching machine, the combination, with the suspended plow-beam and the draft-bar, of the extensible hinged arm connecting the draft-bar with the plow-beam and a pivotal connection between the draft-bar and a hanger attached to the plow-beam, substantially as and for the purpose set forth.

12. In a grading and ditching machine, the combination, with the suspended plow-beam and the draft-bar D, of a bracket, D', secured to the plow-beam and having a slot wherein one end of the draft-bar is received, and a pivotal connection between the said bracket and the draft-bar, substantially as and for the purpose set forth.

13. In a grading and ditching machine, the combination, with the plow-beam, of a pivot connected with the plow-beam in the rear of the plow and movable longitudinally in a bearing connected with the body-frame, whereby both a lateral movement and tilting motion of the plow-beam is permitted, substantially as and for the purpose set forth.

14. In a grading and ditching machine, the combination, with the plow-beam, of a pivot connected with the plow-beam in the rear of the plow and movable longitudinally in a bearing connected with the body-frame, and a spring to which said pivot is subject in its movement, substantially as and for the purpose set forth.

15. In a grading and ditching machine, the combination, with the plow-beam, of a hinge-pintle attached to and parallel with the plow-beam in the rear of the plow, and an eyebolt supported from the body-frame and affording a bearing through which the said pintle is arranged to slide, substantially as and for the purpose set forth.

16. In a grading and ditching machine, the combination, with the suspended plow-beam, of a vertically-movable bearing connected with the plow-beam, with a hinge-joint and arranged to slide upon a guide that is carried by the body-frame, substantially as and for the purpose set forth.

17. In a grading and ditching machine, the combination, with the suspended plow-beam, of a vertically-movable bearing having a hinge-connection with the plow-beam, and a guide for said bearing adjustable in position toward or from the body-frame, substantially as and for the purpose set forth.

18. In a grading and ditching machine, the combination, with the suspended plow-beam, of the pintle *e*, secured to the plow-beam, the vertically-sliding bearing carrying an eyebolt that is connected with said pintle, and a guide, E^3, for said vertically-sliding bearing, substantially as and for the purpose set forth.

397,842. CULTIVATOR. WILLIAM A. DUTTON and CHARLES J. MEEK, Rural Retreat, Va. Filed Oct. 3, 1888. Serial No. 287,077. (No model.)



Claim.—1. In a cultivator, the combination, with the center beam and outwardly and rearwardly extending arms projecting from the center beam near its forward end, of side beams pivotally connected with said arms, a shovel-standard adjustably secured to each side beam near its rear end, a shovel adjustably attached to the side beams near the front ends thereof, and adjustable stay-bars for uniting the rear ends of the side beams, substantially as set forth.

2. The combination, with the side beam, D, provided with a transverse slot at its rear end and a rectangular key or plate, *m*, secured within the slot, said key having a rib, *m'*, formed on its outer face, of a shovel-standard having its upper end constructed with a series of radial grooves, and a bolt, *k*, for securing the parts together, substantially as set forth.

397,843. EDGE-TRIMMER FOR GRASS BORDERS. CHAR EVERENDEN, Branford, Conn. Filed Nov. 5, 1888. Serial No. 289,968. (No model.)



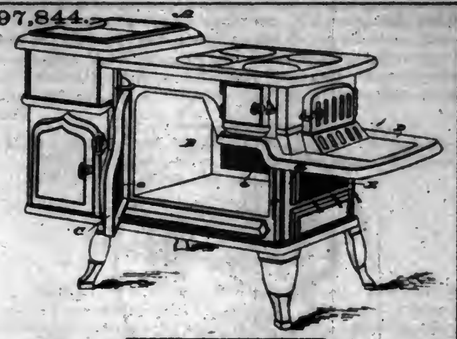
Claim.—The combination of the handle A, terminating in a hub, *b*, a disk-cutter, B, having an opening through its center, a collar, *a*, of a diameter corresponding to the opening through the disk and so as to rest against the face of the hub of the handle, while the disk surrounds the said collar as an axle, the said collar *a* being thicker than the disk-cutter, and the collar *d*, of larger diameter than the collar *a* and arranged outside of said collar *a*, with the bolt *c*, extending through the said two collars into the hub of the handle and so as to hold the said collars firmly to the handle, the said collar *d* on one side and the hub of the handle on the other side forming the support to hold the disk upon the axle, substantially as described.

397,844. COOKING-STOVE. CHAS F. FILLEY, St. Louis, Mo. Filed May 19, 1884. Serial No. 132,104. (No model.)

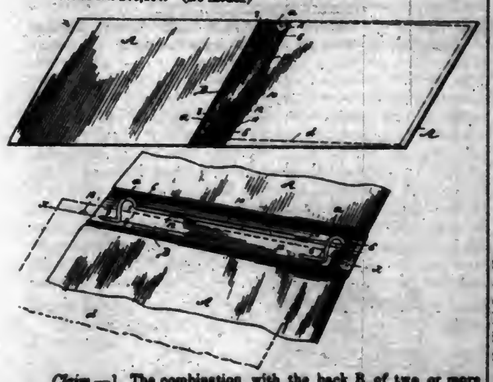
Claim.—1. A cooking-stove having an opening beneath the stove-hearth leading into the oven and filled with gauze, *c*, as and for the purpose described.

2. A cooking-stove having the gauze-filled opening E beneath the hearth and the gauze-filled oven door or doors, substantially as described.

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397,845. TEMPORARY BINDER. ALFRED G. PERRIN, Springfield, Mass., assignor to Mary D. Gotting, same place. Filed June 6, 1888. Serial No. 276,197. (No model.)



Claim.—1. The combination, with the back B, of two or more transversely-arranged arch-shaped hooks, *a*, which by their one end portions are rigidly confined upon said back, and at their other end portions are provided with the angular projections 8, extending at a slight distance from and parallel with the inner surface of said back in the direction of the length and with their points toward one and the same end thereof, substantially as and for the purpose described.

2. The combination, with the back B, of two transversely-arranged arch-shaped hooks, *a a*, which by their one end portions are rigidly confined upon said back, and at their other end portions are provided with the angular projections 8, one of which is longer than the other, extending at a slight distance from and parallel with the inner surface of said back in the direction of the length and with their points toward one and the same end thereof, substantially as and for the purpose described.

3. The hook device for temporary binders herein described, the same being integrally formed and consisting of the intermediate shank-wire 10, the arch-hooks *a a* at the end portions of said shank-wire, each extended in planes at right angles thereto, and each at its end provided with a projection, 8, extending parallel with said shank and from or toward one and the same end thereof, substantially as described.

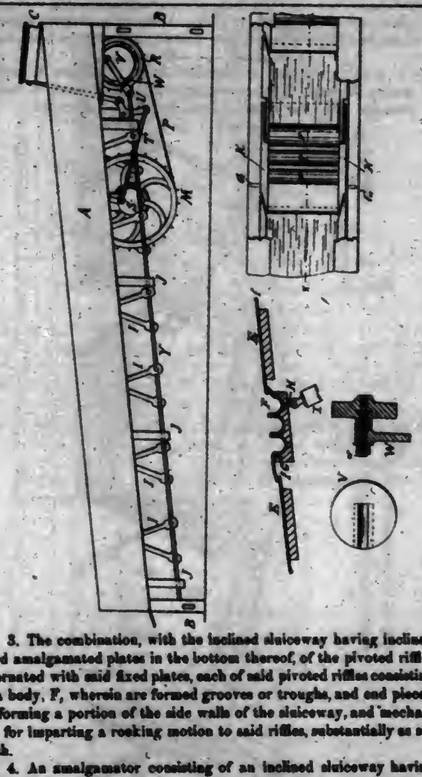
4. The hook device herein described, the same being integrally formed and consisting of the intermediate shank-wire, 10, having the flattened and perforated portions 12, the arch-hooks *a a* at the end portions of said shank-wire, each extended in planes at right angles thereto, and each at its end provided with a projection, 8, each extending parallel with said shank and from or toward one and the same end thereof, combined with and riveted to the back B, all substantially as shown and described, for the purpose specified.

397,846. AMALGAMATOR. THOMAS F. FREEMAN, Brooklyn, N. Y. Filed Feb. 3, 1887. Serial No. 226,206. (No model.)

Claim.—1. In an amalgamator, an inclined sluiceway consisting of inclined fixed amalgamated plates and movable riffles, said plates and riffles alternating with each other, in combination with means for imparting motion to said riffles, substantially as set forth.

2. In an amalgamator, the combination, with the inclined sluiceway, of the riffles supported upon pivots in the main frame at each side, arms I, pivoted to the under side of each set of riffles, and a sliding bar engaging with said arms, and mechanism for imparting a longitudinal movement to said bar, substantially as set forth.

397,847.



3. The combination, with the inclined sluiceway having inclined fixed amalgamated plates in the bottom thereof, of the pivoted riffles alternated with said fixed plates, each of said pivoted riffles consisting of a body, F, wherein are formed grooves or troughs, and end pieces, K, forming a portion of the side walls of the sluiceway, and mechanism for imparting a rocking motion to said riffles, substantially as set forth.

4. An amalgamator consisting of an inclined sluiceway having side walls, A, the bottom of said sluiceway being provided with inclined fixed amalgamated plates E and pivoted riffles F, alternating with said fixed plates, a sieve, C, at the upper end of said sluiceway, connected with a bell-crank, U, driven by a rod, T, crank-wheels S and V, spur-wheels N and R, chain P, rods Y, and arms I, the whole combined and arranged substantially as set forth.

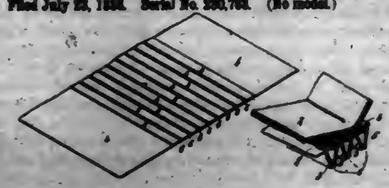
397,847. COOKING UTENSIL. JOHN H. PFEIFFENBERG, Lost Haven, Pa., assignor of one-half to the St. Louis Stamping Company, St. Louis, Mo. Filed Jan. 16, 1888. Serial No. 296,402. (No model.)



Claim.—1. As a new article of manufacture, a culinary vessel having a double bottom and having an interposed sheet of non-combustible material secured at its circumferential edge between the lower bottom and the vessel, as described.

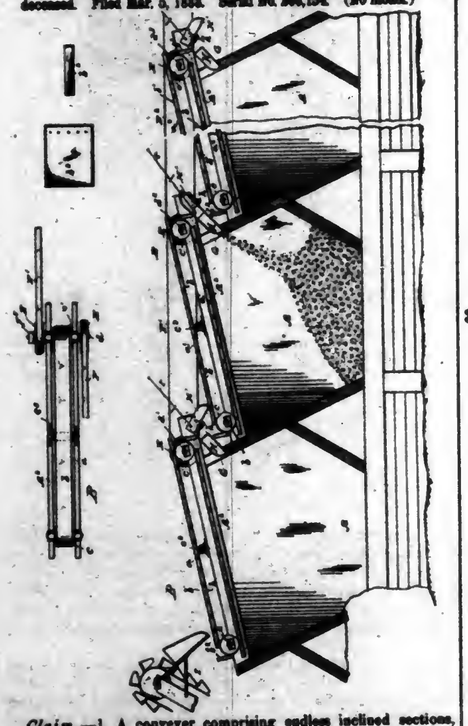
2. As a new article of manufacture, a culinary vessel provided with the double bottom and double lower sides and having an interposed sheet of non-combustible material secured at its circumferential edge between the double side and the vessel and covering the bottom and part of the sides of the latter, substantially as described.

397,848. BOOK-BINDING. RUDOLPH E. FREY and JOHN ROSENER, St. Louis, Mo., assignors of one-third to Gustave Frey, same place. Filed July 23, 1888. Serial No. 280,763. (No model.)



Claim.—A sewing-band for books having strips secured thereto at suitable intervals, forming folding-spaces, substantially as described.

397,849. STONE OR ORE CONVEYER. PHILETUS W. GATES, Chicago, Ill.; Ralph I. Gates administrator of said Philetus W. Gates, deceased. Filed Mar. 5, 1883. Serial No. 266,154. (No model.)



Claim.—1. A conveyer comprising endless inclined sections, every two having a discharging-space between them, and a guiding-chute arranged to swing on pivots or pins placed crosswise of the sections, said chute being adapted to close a discharging-space between two of the sections, when it is desired to carry the substances being conveyed beyond the first section of the conveyer, and adjustable on its pin or pivot to an inclined position, so as to open the discharging-space between two of the sections, and turn, guide, and discharge the said substances between and below the sections, substantially as described.

2. The combination, with a series of adjoining bins arranged beneath an endless conveyer, of a series of endless sections having a discharging-space between every two, and a series of swinging, separately-adjustable, connecting, and directing chutes constructed to lie longitudinally with the sections and occupy positions between the said sections, whereby they are adapted to close the said discharging-spaces, and also to be adjusted to backwardly-inclined positions, and thereby open said spaces and discharge the substances into bins beneath the sections, substantially as described.

3. The connecting and guiding chute formed of two parts, H H', one of which is hung on a pivot and swings and is adjustable thereon, in combination with the endless sections of a conveyer, having a space between their lower and higher pulleys, *c d*, which space is occupied by a connecting and guiding chute, substantially as described.

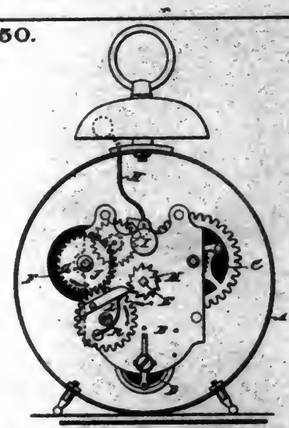
397,850. ALARM-CLOCK. ROBERT F. GAYLORD, New York, N.Y., assignor to James Gwathkin, same place. Filed Apr. 17, 1888. Serial No. 270,264. (No model.)

Claim.—1. In an alarm-clock, the combination of the time mechanism, the alarm mechanism, and a spring-pawl carried upon or attached to the alarm mechanism and arranged to engage an oppositely-revolving part of the time-train, substantially as set forth, whereby the alarm is alternately arrested and released as it runs down.

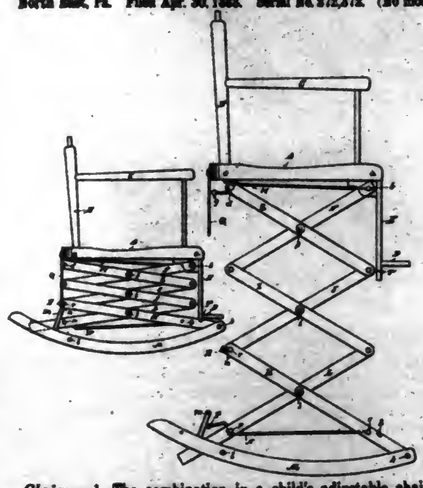
2. In an alarm-clock, the combination of the arbor E, carrying the detent-wheel M, and the arbor G, connected with and revolving the spring-pawl L, the said pawl being arranged to engage the said detent-wheel, as and for the purpose set forth.

3. In combination, the arbors E and G, the gears I and K, the spring-pawl L, and the detent-wheel, arranged substantially as and for the purpose set forth.

397,850.



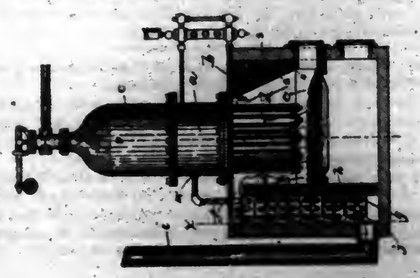
397,851. CHILD'S ADJUSTABLE CHAIR. CYRUS P. GIFFORD, North East, Pa. Filed Apr. 30, 1888. Serial No. 272,372. (No model.)



Claim.—1. The combination, in a child's adjustable chair, of adjustable braces pivoted together for supporting the chair-seat, the upper ends of one pair of said braces being pivoted to the front of the chair-seat and the upper ends of the other engaging with a catch at the rear of the chair-seat, with rockers the front ends of which are pivoted to the lower ends of one pair of said braces and the lower ends of the other pair engaging with a catch at the rear of the rockers, and a foot-rest suspended by arms from the front end of the chair-seat and adapted to engage with notches in the braces when the chair is closed together, substantially as and for the purpose set forth.

2. The combination, in a child's adjustable chair, of a foot-rest, D, suspended from the front end of the seat A, having projecting catches T thereon, with notches S in the braces K, substantially as and for the purpose set forth.

397,852. FIRE-BOX FOR STEAM-GENERATORS. ASTON GRAF, Georgetown, assignor of two-thirds to Augustus McDuffee and Roswell Carleton, both of Haverhill, Mass. Filed Mar. 13, 1888. Serial No. 267,060. (No model.)



Claim.—The fire-box having its walls thickened at their upper ends and inclined on their inner sides, and the non-conducting material—as fossil meal—disposed within said walls, substantially as shown and described, whereby an increased thickness of the non-conducting material is obtained at the point where the heat is greatest, as set forth.

397,853. WATCH-MOVEMENT BOX. CHARLES T. GRAHAM, Philadelphia, Pa., assignor to George W. Plumley, same place. Filed Oct. 15, 1888. Serial No. 288,195. (No model.)



Claim.—1. In a watch-movement packing-box, in combination with the outer casing, A A', and the inner metal box, C, a ring or shoulder, *a*, secured to the bottom of the casing A, adapted to secure the box C in position and protect projecting parts, the internal diameter of which ring or shoulder is at least as much less than its external diameter than is the length of the stem-winding shank or other protruding parts of the watch-movement incased in the casing C, substantially as hereinbefore set forth and described.

2. In a watch-movement packing-box, in combination with the outer casing, A A', and the inner casing, C, a ring or shoulder, *a*, provided in the inside of the casing A, having an inside diameter equal to the outside diameter of the casing C, and the outside diameter of the said ring or shoulder *a* at least as much greater than its internal diameter than is the length of the stem-winding shank or other protruding part of the watch-movement incased in the casing C, and a ring or washer, *b*, provided on the inside of the lid A', the thickness of which is equal to the length of the hand-spindle or other part of the watch-movement protruding beyond the face of the dial, and the inside diameter of the said ring or washer being greater than the diameter of the said spindle and of sufficient diameter to accommodate other protruding parts beyond the face of the dial, in the manner and for the purpose as hereinbefore substantially set forth and described.

397,854. MEASURING-FAUCET. ROBERT M. GREEN and FRANK D. GREEN, Philadelphia, Pa. Filed Sept. 13, 1888. Serial No. 285,312. (No model.)



Claim.—1. In a measuring-faucet, a shell, a plug therein, and a lug connected with said plug, and a cap, said shell having a segmental flange to which the cap is screwed, and provided with shoulders at the ends thereof, substantially as described.

2. A measuring-faucet consisting of a shell having an inlet and an outlet port and an air-vent, and provided with a segmental flange, a cap secured to said flange, a hollow plug located in said shell, and having ports and vent registering with said ports and vent in said shell, and provided with a stem having a bearing in said cap, a handle on the outer end of said stem, and lugs on the stem end of said plug, said parts being combined substantially as described.

397,855. PLOW-POINT. JAMES HAWES, Long Run, Ohio, assignor of one-half to R. F. Dusk, Rino place. Filed Feb. 18, 1888. Serial No. 264,498. (No model.)



Claim.—A plow-point whose extended share *A* is slightly rounded and having a slotted socketed opening, the edges being flanged and contracted, and having a tapering sole or base extending the full length of the extended share, by means of which the point is more securely held in place, substantially as described.

397,856. METHOD OF RECORDING SPEECH. GEORGE H. HERRINGTON, Wichita, Kans., assignor to himself, and Edward H. Johnson, New York, N.Y. Filed June 13, 1887. Serial No. 241,706. (No model.)

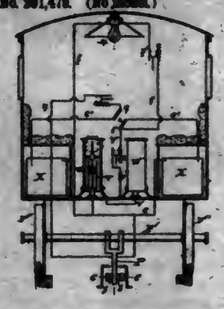
Claim.—1. The method herein described of making a permanent record of vibrations, which consists in softening a body of material by a chemical solvent, passing the same through the recording-instrument while it is in a softened condition, and then allowing it to harden.

397,856.



2. The method of recording phonetic vibrations, which consists in covering a strip of material with a substance capable of being softened by a chemical solvent, subjecting said substance to the action of such solvent, passing it in its softened condition under the vibrating point of a phonograph, and afterward allowing it to harden to fix the phonogram, substantially as set forth.

397,857. APPARATUS FOR HEATING CARS BY ELECTRICITY. RUDOLPH M. HOSKINS, Philadelphia, Pa. Original application filed Jan. 12, 1887, Serial No. 224,150. Divided and application filed Sept. 27, 1887, Serial No. 250,542. Again divided and this application filed Nov. 21, 1888. Serial No. 291,478. (No model.)



Claim.—1. In an electric railway, an electrically-propelled vehicle, an electric motor to propel said vehicle, an electric heater to heat said vehicle, a source of electric energy, and electric circuits including said motor and heater in multiple-arc connection.

2. In an electric railway, an electrically-propelled vehicle, an electric motor to propel said vehicle, an electric heater to heat said vehicle, a source of electric energy, electric circuits including said motor and heater in multiple-arc connection, and means to control the current passing through the heater independently of the motor.

3. In an electric railway, a line-working conductor, a traveling vehicle, an electric motor to propel said vehicle, an electrical connection between said motor and working-conductor, a shunt-circuit around the motor on the vehicle, and an electric heater in said shunt-circuit.

4. In an electric railway, a line-working conductor, a traveling vehicle, an electric motor to propel said vehicle, an electrical connection between said motor and working-conductor, a shunt-circuit around the motor on the vehicle, an electric heater in said shunt-circuit, and means to regulate the current flowing through the shunt-circuit.

5. In an electric railway, a line-working conductor, a traveling vehicle, an electric motor to propel said vehicle, an electrical connection between said motor and working-conductor, a shunt-circuit around the motor on the vehicle, an electric heater in said shunt-circuit, and means to cut the heater out of circuit.

6. In an electric railway, a line-working conductor, a traveling vehicle, an electric motor to propel said vehicle, an electric heater carried by the vehicle, and an electrical connection carried by the vehicle and making contact with the working-conductor to supply electricity to both the heater and motor.

7. The combination of a source of electric energy, a circuit therefrom, and an electric heater included in said circuit and consisting of an arc lamp, a close heater-casing surrounding the arc, and an outer draft-casing to guide air around said heater-casing.

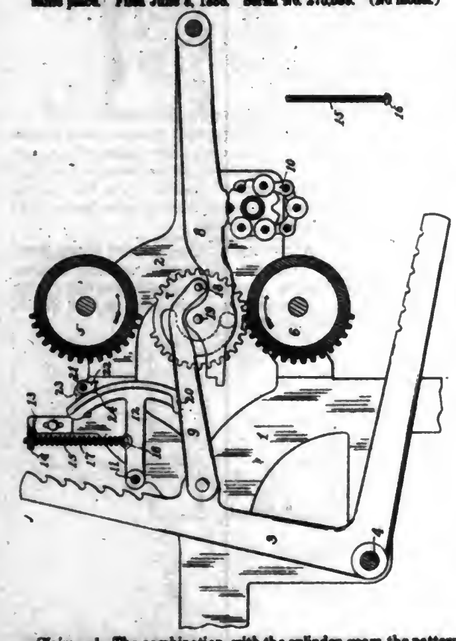
8. The combination of a source of electric energy, a circuit therefrom, and an electric heater included in said circuit and consisting of an arc lamp, a close heater-casing surrounding the arc, an outer draft-casing to guide air around said heater-casing, a circuit-breaker, and a regulator to control the current flowing through the heater.

9. In an electric railway, the combination of an electrically-propelled vehicle, two secondary batteries on the vehicle, a motor-circuit

a local heater-circuit, including a heater, and switches for coupling the motor-circuit with one battery and heater-circuit with the other battery.

10. The combination of a car, a source of electric energy, a heater-circuit, and an electric heater consisting of an arc lamp surrounded by a draft-casing.

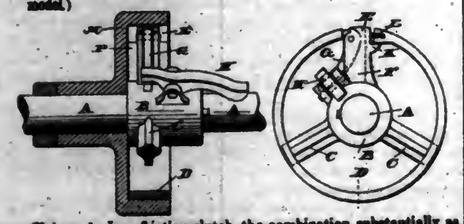
397,858. SHEDDING MECHANISM, &c., FOR LOOMS. George F. Hutchins, Worcester, Mass., assignor to the Knowles Loom Works, same place. Filed June 4, 1888. Serial No. 276,599. (No model.)



Claim.—1. The combination, with the cylinder-gears, the pattern-chain, the vibrator-lever, gear, and connector, and the harness-lever connected therewith, of the follower provided with a socket, the spring-rod provided with a head adapted to work in the follower-socket, coil-spring, and retaining-plate, substantially as shown and described.

2. The combination, with the cylinder-gears, the pattern-chain, the vibrator-lever, gear, and connector, and the harness-lever connected therewith, of the pivoted follower with notched face, and the retaining-latch, substantially as shown and described.

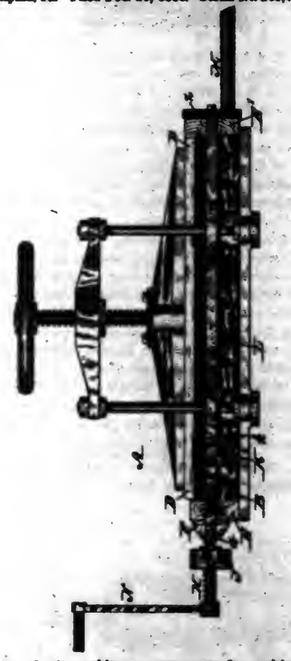
397,859. FRICTION-CLUTCH. Willis G. Jones and Winfield S. Rogers, Cincinnati, Ohio. Filed Apr. 30, 1888. Serial No. 272,385. (No model.)



Claim.—1. In a friction-clutch, the combination, substantially as set forth, of a spider-hub provided with arms, a friction-ring carried by said arms and having a gap or opening at one of said spider-arms, one wall of said gap abutting against one side of such arm, a lever pivoted to the spider-arm which is located at the gap of the friction-ring and engaging with its outer end the free wall of the gap of the friction-ring, while the other and longer end of the lever projects inwardly near the spider-hub, a lever pivoted to the spider-hub and engaging its shorter end over the longer end of said first-mentioned lever, while the longer end of said hub-spider projects outwardly beyond the spider-hub and is adapted to be engaged by a sliding cone, and a rim-piece encircling and fitting the friction-ring, and having a hub adapted to engage a shaft whose axis is coincident with the axis of the spider-hub.

2. In a friction-clutch, the combination, substantially as set forth, of spider-hub B, having arms C terminating in tenons, and having arm F, friction-ring D, provided with mortises engaging said tenons and having a gap, one wall of which engages the arm F, lever G, pivoted to the arm F and engaging the free wall of the gap of the friction-ring, lever H, pivoted to the spider-hub and engaging with one end the lever G, and having its other end projecting outwardly beyond the hub and adapted to be engaged by a cone, a rim-piece, M, encircling and fitting the friction-ring, and having a hub with its axis coincident with the axis of the spider-hub.

397,860. MACHINE FOR MOLDING TUBES OR CYLINDERS. Henry G. Kearney, Ambler, assignor of one-half to Richard V. Mattison, Philadelphia, Pa. Filed Feb. 20, 1888. Serial No. 265,741. (No model.)



Claim.—1. A machine or apparatus for making plastic tubes, having a press with a mold therein, a reservoir, a supply-pipe leading from said reservoir to said mold, a pumping device for forcing tube material from the said reservoir to said mold, and an air-chamber communicating with said supply-pipe and between the pumping device and the mold, said parts being combined substantially as described

2. A press with a mold therein, a tail-piece with arms secured thereto, bars pivoted to said arms, a cross-bar secured to said bars, a head-piece with a plate having a socket, and a screw passing through the cross-bar and working in said socket, said parts being combined substantially as described.

3. In a machine for making plastic tubes, the combination, with the press having the mold arranged in a case therein, of the head and tail pieces closing the ends of the mold, the head-piece being capable of a swinging movement, substantially as and for the purpose described.

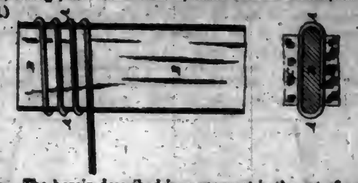
4. In an apparatus for making plastic tubes, a mold consisting of an upper or top portion having the flat part *d*, the depending curved ridge *e*, and the inclined projection *f*, and a bottom portion with a curved inner face and cut-out portion *c*, said parts combined substantially as and for the purpose set forth.

5. In a machine for making plastic tubes, pipes, or cylinders, the press containing the mold, and the head and tail pieces connected together for closing the ends of the mold, in combination with the feed-pipe provided with a cock or check for supplying material to the mold, substantially as described.

6. In a machine or apparatus for making plastic tubes, the combination, with the press containing the mold, of the head and tail pieces connected together and closing the ends of the mold, devices in the head-piece for pressing the head and tail pieces firmly against the ends of the molds, and an opening in the tail-piece to receive the feed or supply pipe, substantially as and for the purpose described.

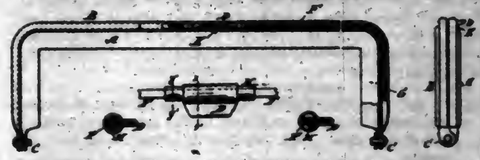
7. In a machine for making plastic tubes, the mold comprising the upper and lower part, said lower part being hinged, and both provided with longitudinal grooves or channels, substantially as described.

397,861. METHOD OF MAKING FLAT COILED SPRINGS. George Kelly, Chicago, Ill. Filed June 2, 1888. Serial No. 275,940. (No model.)



Claim.—The herein-described improvement in the art of making flattened spiral springs, the same consisting in winding the spirals upon a flat mandrel and then setting the same in their proper shape by pressure between a pair of pressure-imparting heads while such spirals are still upon the mandrel, substantially as set forth.

397,862. FRAME FOR POCKET-BOOKS OR OTHER ARTICLES. Michael Koehn, New York, N. Y., assignor to Simon Rinn, same place. Filed Nov. 30, 1888. Serial No. 292,195. (No model.)

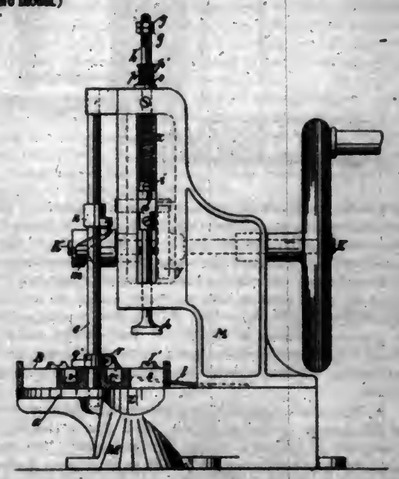


Claim.—1. The combination, with a tubular frame and a torsional spring housed in said frame, of a catch provided with a tube extended at each end beyond the catch into a cylindrical journal adapted to turn with the catch in a part of the tubular frame, said spring extending through and secured to said tube, substantially as described.

2. The combination, with the tubular frame B of a bag or similar article, of the torsional spring F in the tubular frame, the tube H, flattened on the spring, and the catch D, mounted on the tube to leave the latter project at each end of the catch in the form of cylindrical journals, which are located and turn in parts of the tubular frame, substantially as described.

3. In combination with frame A, the frame B, formed with two parallel tubes extending down the sides, one tube containing the catch carrying torsional spring, having brace-arm G extending down one tubular side, and the other tube adapted to overlie the top and sides of frame A, substantially as described.

397,863. MACHINE FOR CRACKING AND SHELLING NUTS. Heinrich Kuhlmann, Carl Kuhlmann, and Heinrich R. Kuhlmann, Ginchstadt, Prussia, Germany. Filed Nov. 26, 1888. Serial No. 291,868. (No model.)



Claim.—The combination, substantially as herein specified, in a machine for cracking and shelling nuts, of a table, *a*, a frame or disk, B, containing chambers for the nuts, arranged upon said table, a hammer, A, the two springs *p x*, applied to the hammer, and means, substantially as herein described, for producing the rotation of the said disk or frame and for raising the hammer.

397,864. STENCIL-FRAME. Oscar W. Lindsey, Baltimore, Md., assignor of one-third to Oscar Frommel & Brother, New York, N. Y. Filed Nov. 10, 1888. Serial No. 290,453. (No model.)



Claim.—1. The combination, with the body A, having a slot, *b*, and longitudinal grooves *c* at each side thereof, of the guide-strips *d*, covering the grooves, and the hinged frame F, whereby the stencil-plates are pressed outwardly against the strips *d* and rigidly held, substantially as specified.

2. The combination, with the body A, having a slot, *b*, and grooves *c* at each side thereof, of the stencil-plates *a*, having flanges *a'*, adapted to fit in the grooves, the strips *d*, extending over the grooves, and the pressing-frame F and its fastening device, whereby the stencil-plates are confined in their seats, substantially as specified.

397,865. BOOK-BINDING. Thomas C. Love, Jr., Philadelphia, Pa. Filed Apr. 16, 1887. Serial No. 235,060. (Model.)



Claim.—1. In book-bindings, stitches passing obliquely through the signatures of a book from the side thereof to the back of the body and alternately on said side and back, substantially as described.

2. A book provided with stitches passing obliquely through the signatures from the sides thereof to the back of the body and alternately along said back and sides in parallel rows, substantially as described.

3. In book-bindings, stitches passing obliquely from the side of one outside signature through the same into the adjacent signature and out at the back of said adjacent signature, thence along the back of said signature and into the same, and obliquely passing through the same and the first signature and out at the side thereof, the said stitches alternating on the back and side, respectively, of said signatures and in the direction of their length, substantially as described.

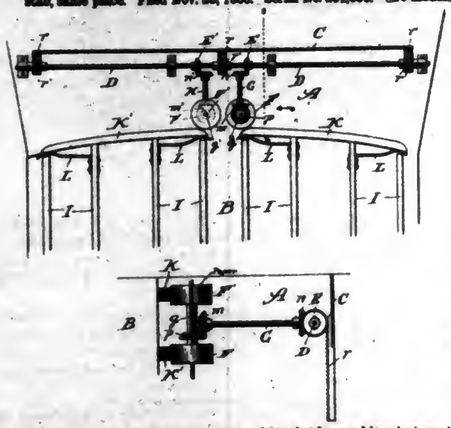
397,866. PARTITION-SUPPORT FOR PIGEON-HOLES AND DRAWERS. William Lumley, Chicago, Ill., assignor to Frances Lumley, same place. Filed Aug. 9, 1888. Serial No. 282,230. (No model.)



Claim.—1. The combination, with a desk, of a partition-support composed of sheet metal having parallel ribs struck up thereon, said ribs being flattened or struck down at the ends thereof, so as to close the spaces formed by said ribs without obstructing the grooves between the same, substantially as and for the purpose specified.

2. The combination with a desk the walls of which are provided with angular grooves, of partition-supports having ribs struck up thereon, said ribs being flattened or struck down at the ends thereof, so as to close the spaces formed by said ribs, but not obstruct the grooves therebetween, said flattened portion of the support being bent at an oblique angle thereto for insertion into the grooves in the desk-walls, substantially as described.

397,867. AUTOMATIC SAFETY-GATE FOR DRAW-BRIDGES. FERDINAND MARQUE, Austin, Ill., assignor of one-fourth to William Bodenstab, same place. Filed Nov. 23, 1888. Serial No. 291,638. (No model.)

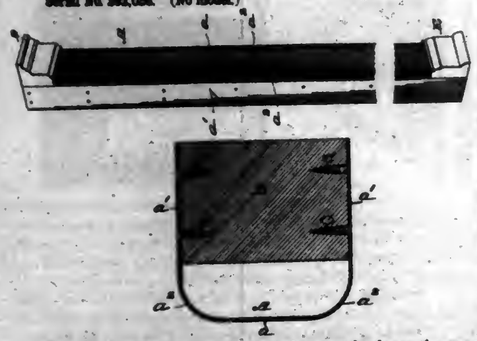


Claim.—1. In combination with a draw-bridge and its abutment, a safety-gate, and means for opening and closing it by the swinging of the bridge, comprising a barrier, C, transverse of the abutment, and having a rack, *r*, on one side, a rotary shaft, D, carrying a cog-wheel, *r'*, in mesh with the rack, friction-wheels F and F' at different horizontal planes on the abutment and geared to the shaft D, and convex plates K and K', supported on an end of the bridge, respectively at planes corresponding with those of the wheels F' and F, substantially as described.

2. In combination with a draw-bridge and its abutment, a safety-gate, and means for opening and closing it by the swinging of the bridge, comprising a barrier, C, transverse of the abutment, and having a rack, *r*, on one side, a rotary shaft, D, carrying a cog-wheel, *r'*, in mesh with the rack, friction-wheels F and F' at different horizontal planes on the abutment and geared to the shaft D, and yielding convex plates K and K', supported on an end of the bridge, respectively at planes corresponding with those of the wheels F' and F, substantially as described.

3. In combination with a draw-bridge and its abutment, a safety-gate, and means for opening and closing it by the swinging of the bridge, comprising a barrier, C, transverse of the abutment, and having at intervals on one side racks *r*, a rotary shaft, D, carrying cog-wheels *r'*, in mesh with the racks, and beveled gear-wheels E and E', friction-wheels F and F', supported on vertical axes on the abutment at different horizontal planes, beveled pinions *p* and *p'* on the same plane on the said axes, rotary shafts G and H, each carrying at opposite ends beveled gear-wheels, respectively engaging with the wheel E and pinion *p* and the wheel E' and pinion *p'*, and convex plates K and K', supported on an end of the bridge against springs and respectively at planes corresponding with those of the wheels F' and F, substantially as described.

397,868. PLATE-METAL COLUMN. FRANK MERKER, St. Louis, Mo., assignor to Merker & Brother, same place. Filed Nov. 27, 1888. Serial No. 292,026. (No model.)



Claim.—1. The herein-described plate-metal column, the same consisting of the single plate A and the piece B, said plate forming the front and the sides of the column, and being shaped to form the rounded corners a^2 a^2.

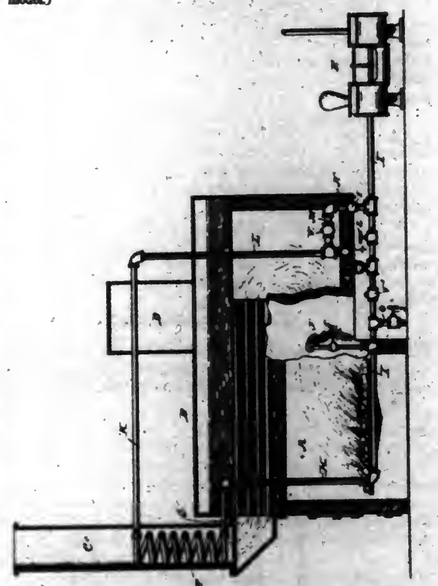
2. The herein-described plate-metal column, the same consisting of the single plate A and the piece B, said plate being shaped to form the front and sides and rounded corners, as described, and said piece B being made to form the back of the column and to occupy the principal portion of the interior of the column, and being united to the column-sides, as set forth.

397,869. BAKING AND ROASTING PAN. JOHN R. MUNSON, Scranton, Pa. Filed May 25, 1888. Serial No. 275,083. (No model.)



Claim.—The combination, in a baking and roasting pan, with the pan *b*, having a turned-over edge, *d*, of the pan *a*, having an L-shaped flanged edge, *d'*, and a turned-over edge at a^2, and provided with an opening at 2, the rigid wire-loop d^3, formed from the continuous stiffening-wire of the edge *d*, and a catch, *f*, substantially as specified.

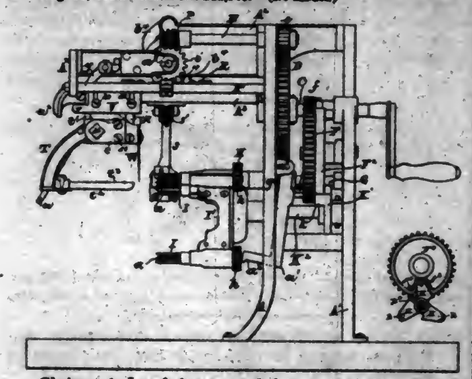
397,870. FEED-WATER HEATER. WILLIAM HOSLE, Milwaukee, Wis., assignor of one-half to William H. Wolf and Thomas Davidson, both of same place. Filed July 27, 1888. Serial No. 281,317. (No model.)



Claim.—1. The combination, with the smoke-stack or chimney, the boiler, and the pump, of the coil so located in the stack or chimney as that its lower end will be below the water-line in the boiler, the main pipe leading from the pump, the feed-pipe connected with the main pipe and entering the boiler below the water-line, the pipes connecting the main pipe with the lower end of the coil, the pipe-connection placing the upper end of the coil in communication with the main pipe between the pump and the feed-pipe, a check-valve located in said pipe-connection, and a globe-valve located in the main pipe between the feed-pipe and the pipe-connection, for the purpose set forth.

2. The combination, with the smoke-stack or chimney, the boiler, and the pump, of the coil so located in the stack or chimney as that its lower end will be below the water-line in the boiler, the main pipe provided with a globe-valve and a check-valve between the feed-pipe and pump, the pipes connecting the main pipe with the lower end of the coil, the feed-pipe connected to the main pipe and entering the boiler below the water-line, and a series of pipes connecting the upper end of the coil with the main pipe between the globe-valve in said main pipe and the pump, one of the pipes of said series being provided with a check-valve and another with a globe-valve below the check-valve, for the purposes set forth.

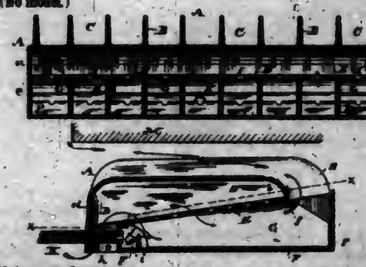
397,871. APPLE-PARER AND CORER. WILLIAM A. C. OARR, Antrim, N. H., assignor to the Goodell Company, same place. Filed Aug. 13, 1888. Serial No. 282,575. (No model.)



Claim.—1. In a fruit-parer, a fork, a paring-knife, and knife carriage, combined with the pivoted slotted cam-lever b^4 and a link, means to connect it with the knife-carriage, and with an arm or cam, *b'*, having a projection to act on the said cam-lever to move the knife-carriage positively in both directions of its movement, the return movement being the faster, substantially as described.

2. The rotating fork and the push-off rod therein, combined with the lever *a'*, having an inclined surface, as a^3, adapted to come into contact with the end of the push-off rod, and a cam to move the said lever and hasten the action of the rod, substantially as described.

397,872. HYDROCARBON-OIL BURNER FOR STOVES, &c. CHARLES H. PRENTISS, Cleveland, Ohio. Filed Jan. 3, 1888. Serial No. 259,731. (No model.)



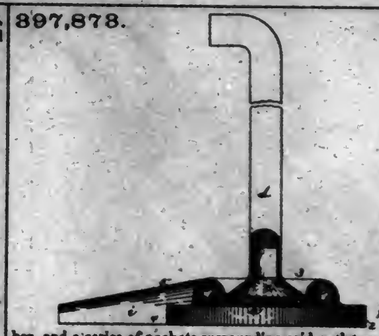
Claim.—1. In an oil-burner, the top plate, A, central perforated plate, E, the two forming an air-passage, D, said plate E having one or more partitions, G, forming flues H, in combination with the lower plate, F, having the trough J extending up therefrom, and an oil-supply pipe, substantially as described and shown.

2. In an oil-burner, the combination of the top plate, A, central plate, E, and bottom plate, F, said top plate provided with ribs B and flanges *a a* and *d*, forming a conduit, D, between A and E, said central plate perforated to form an open relation between said conduit D and an oil-trough at the inner front side of plate F, arranged substantially as and for the purpose set forth.

3. In an oil-burner, the top plate, A, central plate, E, having a series of partitions forming combustion-flues, and openings I, formed in said plate E, arranged as described, in combination with the lower plate, F, having the trough J extending up therefrom, in the manner and for the purpose substantially as set forth.

397,873. WASH-BOILER. THOMAS G. ROBINSON, Boston, Mass. Filed Apr. 2, 1888. Serial No. 269,222. (No model.)

Claim.—1. The improved fountain attachment composed of a base containing a chamber, a central outlet in the dome of said chamber, and a series of pockets surrounding said outlet and having their inner edges higher than their outer edges, whereby the pressure of steam in said pockets is directed inwardly on the water in said outlet, as set forth.



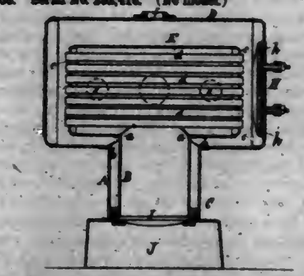
2. The improved fountain attachment composed of a base containing a chamber, a central outlet in the dome of said chamber, a series of pockets surrounding said outlet, and an elongated covered inlet-passage having its outer end lower than the inner sides of said pockets, as set forth.

3. The improved fountain attachment composed of the dome having the marginal supporting-flange, the annular arch, and the outlet surrounded by said arch, as set forth.

4. The improved fountain attachment composed of the dome having the marginal supporting-flange, the annular arch, the central outlet surrounded by said arch, and the inlet having its receiving end lower than the lower portion of said outlet, as set forth.

5. The improved fountain attachment composed of the dome having the marginal supporting-flange, the annular arch divided by partitions *g* into a series of pockets, the central outlet surrounded by said arch, and the inlet having its receiving end lower than the lower portion of said outlet, as set forth.

397,874. BOILER. ERGOM RUTHER, Brooklyn, N. Y. Filed Dec. 1, 1888. Serial No. 292,416. (No model.)



Claim.—The combination, in a boiler, of two upright cylinders, one of which, arranged within the other, constitutes a fire-chamber, two horizontal cylinders arranged one within the other, with the inner one in communication with the inner upright cylinder and the outer one in communication with the outer upright cylinder, a series of tubes running through the inner horizontal cylinder and opening into the outer horizontal cylinder, and an outlet-flue from the inner horizontal cylinder, the spaces between each inner cylinder and each outer cylinder and the interiors of said tubes all constituting water-spaces and the space within the inner horizontal cylinder and between the tubes constituting a combustion-chamber, substantially as herein specified.

397,875. OVERHEAD LINE FOR ELECTRIC RAILWAYS. FRANK J. SPRAGUE, New York, N. Y., assignor to the Sprague Electric Railway and Motor Company, same place. Filed Sept. 27, 1888. Serial No. 286,553. (No model.)

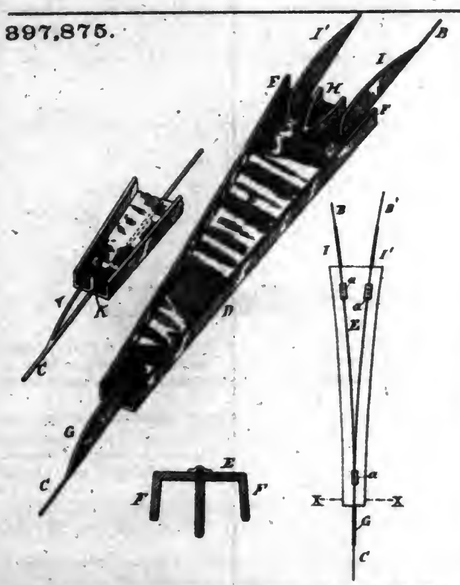
Claim.—1. In an electric railway, the combination, with crossing or branching overhead lines, of a switch-plate provided with depressing-ribs at its extremities, substantially as set forth.

2. In an electric railway, the combination, with crossing or branching overhead lines, of a switch-plate having guiding or deflecting ribs, and depressing-ribs at its extremities, substantially as set forth.

3. In an electric railway, the combination, with crossing or branching overhead lines, of a switch-plate having guiding-ribs at its sides and depressing-ribs at its extremities, substantially as set forth.

4. In an electric railway, the combination, with crossing or branch-

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ing overhead lines, of a switch-plate having side ribs which close it, except at points of admission or outlet for the traveling contact-wheel and depressing-ribs at such points, substantially as set forth.

5. In an electric railway, an overhead conductor having, in combination, a wire and a plate to which the wire is connected, and depressing-ribs at the ends of said plate, substantially as set forth.

6. In an electric railway, the combination, with a continuous overhead wire, of a plate secured to said wire and provided with depressing-ribs, substantially as set forth.

7. In an electric railway, the turn-out plate for overhead conductors, consisting of a tapering flat plate having side ribs, a V-shaped deflecting-rib at its wide end, a depressing-rib at its narrow end, and two depressing-ribs at its wide end, substantially as set forth.

8. In an electric railway, the combination, with an overhead conductor for receiving an underneath contact, of a depressing-rib, substantially as set forth.

9. In an electric railway, the overhead switch-plate having deflecting-ribs which close it, except at openings for admission or outlet for the trolley and depressing-ribs at such openings, such openings being of about the same width as the trolley, substantially as set forth.

10. In an electric railway, the combination, with an overhead wire for receiving an underneath contact, of a switch-plate attached to said wire in about the same horizontal plane as said wire, and depressing-ribs at the extremities of said plate, substantially as set forth.

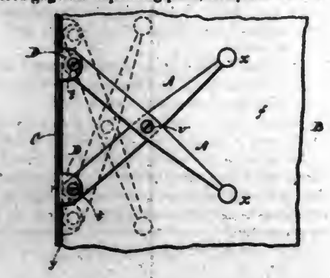
11. In an electric railway, the combination, with an overhead conductor for receiving an underneath contact, of a depressing-rib in line with said conductor, substantially as set forth.

12. In an electric railway, the combination, with an overhead conductor for receiving an underneath contact, of a depressing-rib below said conductor and in line therewith, substantially as set forth.

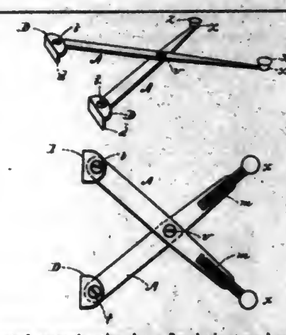
397,876. PRINTER'S GAGE. CHARLES I. STORER, Boston, Mass., assignor to himself and Frank E. Fisk, same place. Filed May 7, 1888. Serial No. 273,090. (No model.)

Claim.—1. A feed-gage for a printing-press, composed of two arms centrally pivoted to each other by a fixed pivot and provided with attaching devices for securing them to the press.

2. A feed-gage for a printing-press, composed of two arms con-

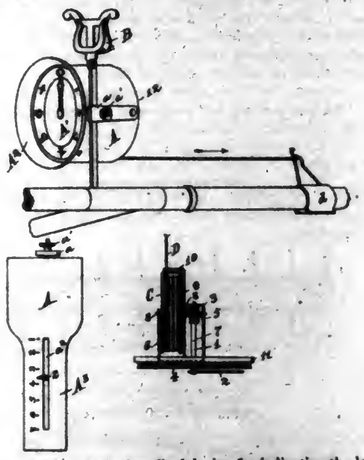


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trally pivoted to each other by a fixed pivot and provided with pivoted flanged lugs at their inner ends for attaching them to the press.

397,877. ATTACHMENT FOR MUSICAL INSTRUMENTS. EMIL W. SYLVAN, Savannah, Ga. Filed Sept. 27, 1888. Serial No. 286,624. (No model.)



Claim.—1. The within-described device for indicating the length of the withdrawal of the sliding tube of a trombone, which consists of a boxed volute spring connected to and inclosed within a drum, said spring being connected at its inner turn to the spindle of a pointer, in combination with an operating-cord wound round the periphery of the drum, said cord having a terminal clutch adapted to grasp the sliding tube of the instrument, whereby as extended the pointer will move along an indicating-scale on the face of the device, as and for the purpose intended, substantially as described.

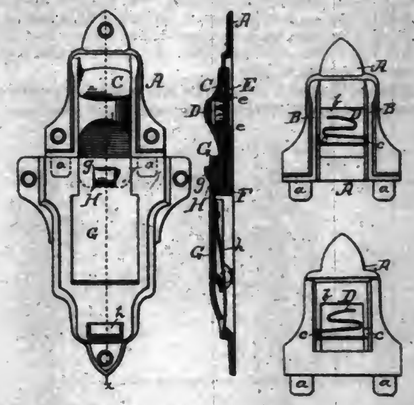
2. As a new article of manufacture, a trombone-note indicator having on its face a visual scale and a pointer adjusted to point out on said scale the length that the sliding tube of the instrument is extended, said pointer operated by a cord having at one end a terminal clutch adapted to grasp the sliding tube externally, the opposite end of said cord being wound round an incased drum inclosing a boxed volute spring, whereby as said cord is distended the pointer will move along the indicating-scale, as and for the purpose intended, substantially as described.

3. The within-described device for measuring the notes of a trombone by means of an indicating-scale, consisting of a casing, A, inclosing a drum, C, which surrounds a boxed volute spring, *c*, one end of said spring secured to the drum, the opposite end being fastened to the spindle 1 of a pointer, 2, said drum having wound round its periphery an operating-cord, D, led from thence outside of the casing, and having a terminal clutch, *d*, adapted to grasp the sliding tube of the instrument, all in combination with a face-scale having inscribed thereon suitable ordinals or analogous symbols that indicate the proper position the tube should rest in in order to produce a given perfect note, substantially as described.

4. The within-described device for removable attachment to a trombone, consisting of the following members, constructed, arranged, and adjusted as illustrated and described: a tubular casing, A, having an outer clip, *a*, supplied with a screw-nut, *a'*, said casing being supplied at one end with a dial, A', having peripheral indicating-scale covered with a transparent panel, A^2, and provided with a pointer. 2.

extending from the terminal end of a spindle, 1, a volute spring, *c*, inclosed within a box which is surrounded by a circumferentially-flanged drum, C, said spring fastened at its inner turn to an axial shaft, 8, screw-threaded at one end, meshing with a worm-wheel, 5, of the spindle 1, and plate 4, having parallel uprights 6 7, orificed for journaling therein the opposite ends of the axial shaft 8, substantially as described.

397,878. TRUNK-FASTENER. CHARLES A. TAYLOR, Chicago, Ill., assignor to John H. Sessions, Bristol, Conn. Filed Sept. 15, 1888. Serial No. 285,551. (No model.)



Claim.—1. In a trunk-fixture, the combination, with plate A, reciprocating bolt C, having a lug, *g*, projecting from its lower end, and a spring, D, of plate F and oscillating hasp G, having an opening, H, in the free end thereof.

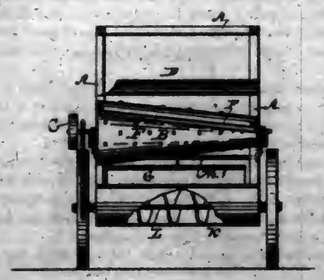
2. In a trunk-fixture, the combination, with plate A, reciprocating bolt C, having a lug, *g*, projecting from its lower end and having a recess in its inner surface, and spring D, secured to plate A and located within said recess, so operating on said bolt as to push it toward the limit of its upward movement, of plate F and spring-actuated hasp G, hinged in the lower part thereof and having an opening in the upper end thereof, as set forth.

3. In a trunk-fixture, the combination, with plate A, having opening *b* therein, bolt C, having lug *g* projecting therefrom and having a recess in its under surface, spring D, secured to plate A and located within said recess, and plate E, connected to bolt C, as set forth, of plate F, hasp G, fulcrumed in the lower part thereof and having an opening, H, in its upper end, and spring A, as set forth.

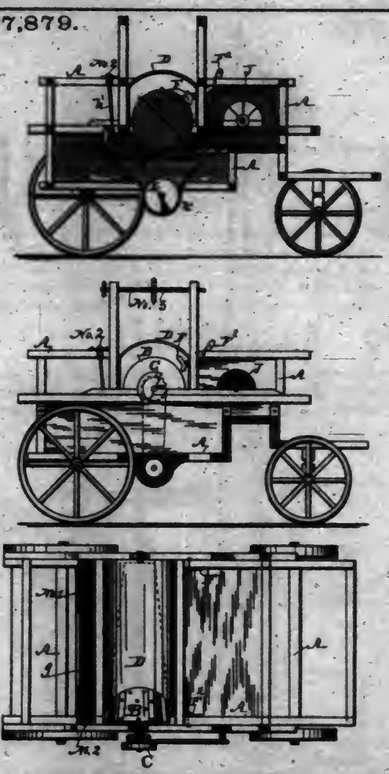
4. The combination, with plate A, provided with walls B B and a rectangular opening between them, bolt C, having lug *g* projecting from its lower end, and a recess, *d*, in the under surface thereof, spring D, secured to plate A, located within recess *d* and pressing said bolt upward, and plate E, connected to said bolt, of plate F and hasp G, fulcrumed in said plate and having an opening, H, in its upper end, and spring A, as set forth.

397,879. PORTABLE CORN THRASHER AND SEPARATOR. JAMES W. TIBBAN, New Sharon, assignor to Deere, Wells & Co., Council Bluffs, Iowa. Filed Mar. 1, 1888. Serial No. 265,894. (No model.)

Claim.—A carriage-frame having fixed sides and openings in the sides, a tapering toothed cylinder connected with said frame and the openings in said sides, an adjustable concave, and a fixed cover, arranged and combined to operate in the manner set forth, for the purposes stated.

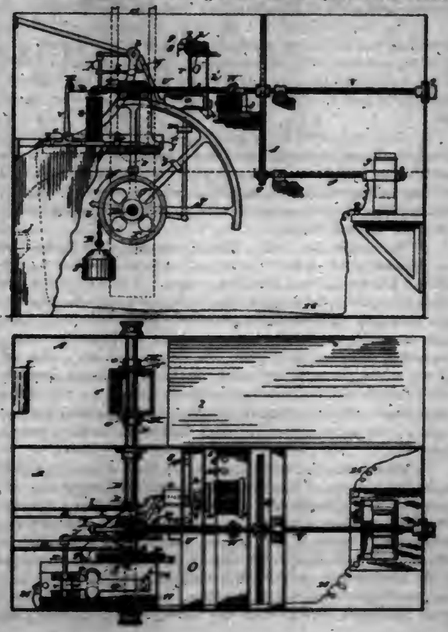


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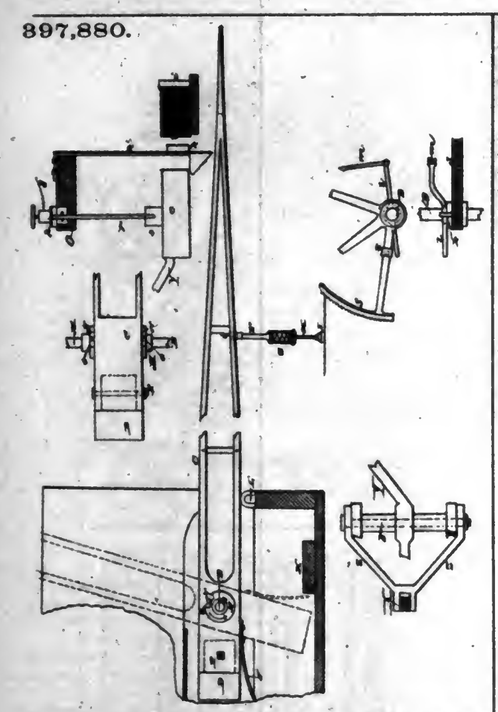


397,880. ELECTRICAL RAILWAY-GATE. MORTON TOULMIN, Baltimore, Md., assignor to the Toulmin Electric Railway Gate Company, same place. Filed Nov. 4, 1887. Serial No. 254,945. (No model.)

Claim.—1. The combination, with a pivoted gate-arm having a normal tendency to descend, of an electric motor, intermediate gearing connecting the motor with the gate-arm and controlling its descent and ascent, and an electric generator, circuits, and circuit-closers



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which control said gearing and motor, whereby upon closing one of said circuits the gate-arm descends and upon closing the other the motor is actuated.

2. The combination, with the pivoted arm and means which normally tend to close it, an electric motor, and an electric generator, of gearing between the motor-shaft and the gate-shaft which elevates the gate when the motor is in operation and locks it against descent, a primary circuit, its magnet, and circuit-closer which unlock the locking parts of the gearing, a motor starting circuit and a magnet therein, a motor-circuit of which the armature of said magnet forms a part, a detent which engages said armature to maintain the motor-circuit, and cam mechanism to disengage them when the gate-arm rises.

3. The combination, with a gate-shaft, a pivoted detent, and intermediate cam mechanism which acts on the detent through the turning of the gate-shaft, of an electro-magnet, its armature, and an electric circuit maintained by said armature after its magnet has been momentarily energized until the cam mechanism releases it from the detent.

4. The combination, with a gong, a generator, and a gong-circuit, an electro-magnet, its circuit, its circuit-closer, and devices between said magnet and the gong-circuit which hold the latter open until said magnet is energized, of a pivoted gate and return mechanism actuated by said gate on its descent to act upon said intermediate devices and break the bell-circuit.

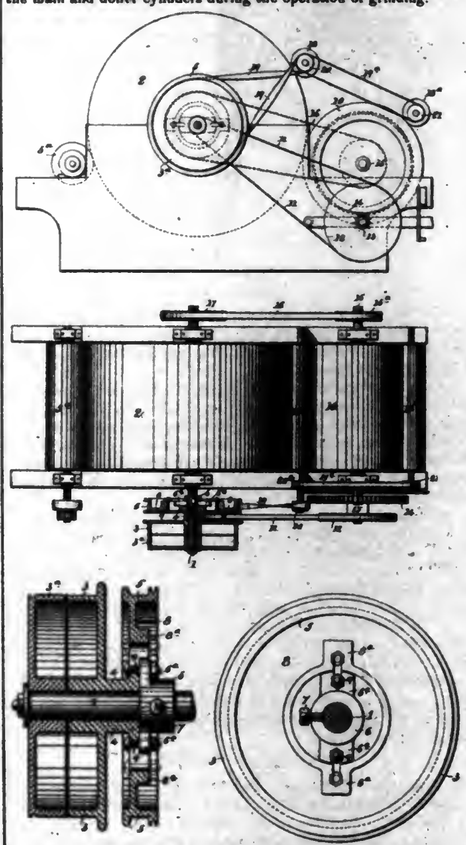
5. The combination, with a pivoted gate-arm, of an electric motor, a jointed worm-shaft, one section of which is geared to the motor-shaft and the free end of the other section of which is connected with a pivoted weighted arm, an electro-magnet whose armature sustains said arm and maintains the worm in engagement with a segment on the gate-shaft until said magnet is energized, mechanism actuated by said segment to return said arm to its position after the opening of the gate, a pivoted detent in the motor-circuit, provided with a cam-lever, an electro-magnet whose armature is also in the motor-circuit, which it completes when said magnet is energized, and a cam on the worm-segment to break said circuit as the gate-arm rises.

6. The combination, with a pivoted gate-arm and means normally tending to close it, of an electric motor, intermediate gearing connecting its shaft with the gate-shaft, devices which maintain said connection, an electro-magnet which, when energized, breaks said connection, allowing the gate to descend, a circuit and circuit-closer of said magnet in advance of the crossing, return mechanism actuated by the descent of the gate which re-establishes said connection, a detent, an electro-magnet whose armature, when said magnet is energized, electrically contacts with said detent, cam mechanism which breaks said contact as the gate-arm rises, a circuit-closer beyond the crossing, a motor-starting circuit between said closer and the last-named magnet, and a motor-circuit composed in part of said armature and detent, the circuit-closers being located near a railway-track, and an electric generator for said circuits.

7. The combination, with a pedestal and a pivoted gate-arm mounted therein, of an electric motor and intermediate gearing between the said motor and the gate arranged to actuate the gate-arm through the motor by the application of electric currents to the motor, whereby the movements of the gate are controlled by electro-motive force through mechanical instrumentalities.

397,881. DRIVING APPARATUS FOR CARDING-ENGINES. EDMUND TWEEDALE, SAMUEL TWEEDALE, and CHARLES MILLS, Accrington, County of Lancaster, England, assignors to John Bullough, same place. Filed July 9, 1888. Serial No. 279,383. (No model.) Patented in England Apr. 27, 1886, No. 5,671.

Brief.—The object of the invention is to impart a slow motion to the main and doffer cylinders during the operation of grinding.



Claim.—1. In combination, the cylinder 2, the main driving-shaft 1, a pulley, 3, a detachable connection between said pulley and the main shaft 1, said pulley having a supplemental pulley, 4, a pulley, 17, rigidly secured to the shaft 1, and the intermediate driving-connections between the pulleys 4 and 17, whereby the main shaft and cylinder may be driven indirectly and at a slow rate of speed through the pulleys 4 and 17 and intermediate connections, substantially as described.

2. In combination, the main shaft, the pulleys 3 and 5, with the connecting boss or pulley between them, a fixed collar or boss, 6, on the main shaft having slots, and the movable bolts 9, the pulley 5 being slotted to receive the bolts, substantially as described.

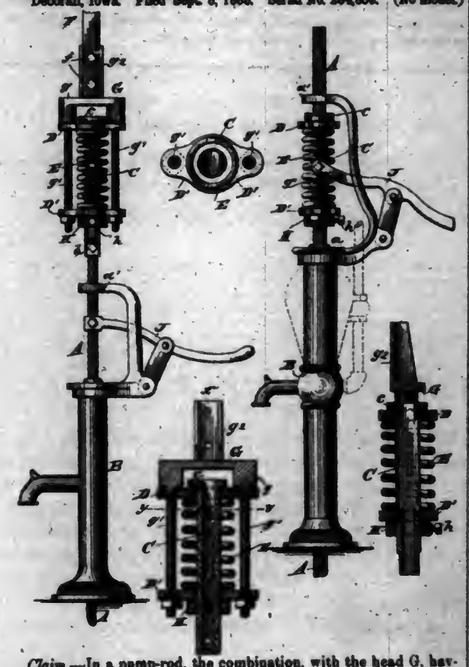
3. In combination, the main shaft, the cylinder 2, the pulley 3, a detachable connection between said pulley and the main shaft, a supplemental pulley, 4, the doffer-shaft 15, and driving-connections between the doffer-shaft and the pulley 4 and between the doffer-shaft and the main shaft 1, substantially as described.

4. In combination, the main shaft, the cylinder 2, the pulleys 3 and 5, a detachable connection between said pulleys and the main shaft, and a supplemental pulley, 4, the doffer-shaft 15, driving-connections between the doffer-shaft and the pulley 4 and between the doffer-shaft and the main shaft 1, the roller 18, and belt 19, substantially as described.

5. In combination, the main shaft 1 and shaft 15, the pulleys 3 4 5, a detachable connection between said pulleys and the main shaft, the belt 11, the pulley 12, gear-wheels 13 14, the grinding-roller 18, the belt 19, the pulleys 15ª and 17, and the belt 16, substantially as described.

6. In combination, the main shaft, the cylinder 2, the pulleys 3, 4, and 5, a detachable connection between said pulleys and the main shaft, a pulley, 17, fixed on the main shaft, the doffer-shaft and doffer, connections between the pulleys 4 and 17 and the doffer-shaft, the grinding-rollers 18 and 18ª, and the belts 19 and 19ª, substantially as described.

397,882. PLUNGER-ROD FOR PUMPS. WALTER C. WESTAWAY, Decorah, Iowa. Filed Sept. 3, 1888. Serial No. 284,859. (No model.)

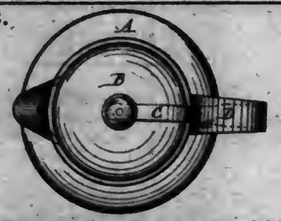


Claim.—In a pump-rod, the combination, with the head G, having a recess in its lower face and two depending rods, g' g', of the two plates D D', having end apertures through which said rods pass, and also having aligned central apertures, the nuts on the lower ends of rods g', the section C, extending up through said central apertures and having a flange, *c*, on its upper end above the top plate, D, and within the recess in the head, the collar on the section C under plate D', and a single coiled spring on the section C, between the two plates D D', and alternately compressed thereby, substantially as set forth.

397,883. COFFEE OR TEA POT. LUTHER S. WRIGHT, Groton, N. Y., assignor of one-half to Duncan McLachlan, same place. Filed Feb. 15, 1888. Serial No. 264,147. (No model.)

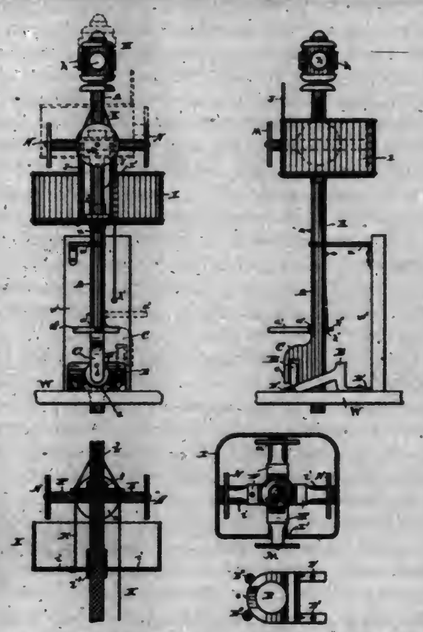


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Claim.—The combination, with the pot A and lid B, hinged thereto, of the handle D, fastened at both ends to the pot and provided with the slot *a*, and the lever C C', rigidly secured to the lid, passing through the aforesaid slot and curved to correspond to the under side of the handle and lie in proximity thereto when the lid is closed.

397,884. RAILWAY-SIGNAL. JOHN D. YARRINGTON, Lexington, and HENRY D. SHANKLIN, Clark County, Ky., assignors to said John D. Yarrington. Filed Sept. 29, 1888. Serial No. 286,738. (No model.)



Claim.—1. The combination of a vertically-movable rod, a supporting-roller therefor, and a cam-block, B, upon which said roller moves, with the safety and danger semaphores mounted on said rod, and the vertically-movable shield adapted to cover the danger-semaphores when raised, all constructed and arranged substantially in the manner and for the purpose described.

2. The combination of a supporting-rod and the semaphores mounted thereon, the roller supporting said rod, and the annular cam-block B, supporting said roller and having a locking-notch, *e*, with a vertically-movable shield adapted to be shifted to cover the danger-semaphores, all constructed and arranged substantially in the manner and for the purpose described.

3. The combination of the movable rod, its supporting-roller and cam-block B, substantially as described, with the semaphores on said rod, and the vertically-movable shield, all constructed and arranged substantially in the manner and for the purpose described.

4. The combination of a vertically-movable rotatory rod and its supporting-roller with a cam-block traversed by said roller, and having a notch engaging said roller to hold the rod in normal position, all constructed and arranged substantially in the manner and for the purpose described.

5. The combination of the rod A, its roller and the cam-block, with the semaphores mounted on said rod, the shield mounted thereon and having guide-rods, and the devices for operating said shield, all constructed and arranged to be operated substantially in the manner and for the purpose specified.

REISSUES.

10,985. GAS-BURNER. CORNELIUS B. TODD, Pittsburg, Pa., assignor to the Campbell Burner Company, (Limited,) same place. Filed June 19, 1888. Serial No. 277,595. Original No. 370,107, dated Sept. 20, 1887.



Claim.—1. In an illuminating-gas burner, the combination of a burner comprising a pipe for supplying gas without air, and having lateral jet-openings, and a reticulated or perforated plate situated below the jet-openings of the burner, the mesh or perforations being sufficiently fine to break the ascending currents of air and heat the same, substantially as and for the purposes specified.

2. In a gas-burner, the combination of the burner *b*, having lateral jet-openings *c*, and an air-chamber having a perforated top situate below the jet-openings of the burner, so that the air-chamber shall be adjacent to the burner and arranged to heat the air, substantially as and for the purposes described.

3. In a gas-burner, the combination of the burner *b*, having a central deflector, *i*, and jet-openings *c*, situate below the deflector, and cup-shaped perforated disks *e* and *h*, arranged below the jet-openings of the burner and the deflector, so as to form an air-chamber adjacent to the burner and arranged to heat the air, substantially as and for the purposes described.

4. In a gas-burner, the combination of the burner *b*, having a central deflector, *i*, and jet-openings *c*, situate below the deflector, separated perforated disks *e* and *h*, and interposed disk *g*, arranged below the jet-openings of the burner and the deflector, so as to form an air-chamber adjacent to the burner and arranged to heat the air, substantially as and for the purposes described.

PHOTO LITH NORRIS PETERS WASHINGTON D.C.

ANNUAL REPORT

OF THE

COMMISSIONER OF PATENTS

TO CONGRESS,

FOR THE YEAR ENDING DECEMBER 31, 1888.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., January 31, 1889.

To the Senate and House of Representatives of the United States of America in Congress assembled:

It is provided by section 494 of the Revised Statutes that—

The Commissioner of Patents shall lay before Congress in the month of January, annually, a report giving a detailed statement of all moneys received for patents, for copies of records or drawings, or from any other source whatever; a detailed statement of all expenditures for contingent and miscellaneous expenses; a list of all patents which were granted during the preceding year, designating under proper heads the subjects of such patents; an alphabetical list of all the patentees, with their places of residence; a list of all patents which have been extended during the year, and such other information of the condition of the Patent Office as may be useful to Congress or the public.

Since the date of my last report there has been little or no change in the conditions under which this Bureau existed. The country has passed through an exciting Presidential election, which, together with the consideration of political and economical questions involved, invariably attracts not only the attention of the people, but Congress itself, for months before as well as after the event, from matters of serious import in relation to many matters of public importance. Such appears to have been the result with reference to many needs of the Patent Office in relation to its business affairs as well as changes and modifications in the patent laws. The suggestions I then made were deemed pertinent to the condition of the Office, and as the conditions have changed only in becoming more pressing and urgent, I feel authorized in renewing them.

There are certain subjects which I regard as of paramount importance, to which the attention of Congress should be directed in order that appropriate legislation may be enacted, with a view to improving the law applicable to patent property and the condition of the Patent Office for the commodious and expeditious transaction of the public business.

ROOM IN THE PATENT OFFICE.

For several years past the annual reports of my predecessors have called the attention of Congress to the utter inadequacy of room and facilities for conducting the business of the Patent Office. This building, I am advised, was constructed from the fund of the Patent Office—a fund which was not raised by taxation upon the people, but was an accumulation from fees paid in by the inventors of the country, and it may not be inappropriate to say that the inventors themselves, as well as their representatives, attorneys, and others, are properly insisting upon the idea that this building ought to be at least so far devoted to the business of the Patent Office that ample room will be provided for its conduct, and facilities afforded which will secure the consideration of applications for patents and the issuance of the same without unnecessary delay, expense, or inconvenience. But the building is now occupied by the Secretary of the Interior, the Commissioner of the General Land Office, and the Commissioner of Patents. The result is, owing to the increase in business of the Government in each of these various branches, that neither the Secretary of the Interior, the Commissioner of the General Land Office, nor the Commissioner of Patents has sufficient room to conduct the business with the dispatch and promptness which the public is entitled to expect. The various divisions of the Patent Office are crowded into narrow, inconvenient, and, in many instances, unhealthy limits. The records and drawings and other material, which should be conveniently arranged and made accessible in proper rooms, are stored in corridors and by-way places, where classification is almost impossible, and where access can only be had to the particular subjects desired after long search and delay. Not only this, but great quantities of valuable records, descriptions, specifications, and drawings are constantly exposed to the danger of conflagrations involving the safety of the entire building. It needs only an examination or investigation to demonstrate the absolute necessity that exists for making some change in the arrangement between the bureaus occupying this building in order that each shall have proper room and facilities to discharge its respective functions. The force under the control of the Commissioner of Patents is scattered and located in remote parts of the building on different floors to such an extent that in order to communicate with the various divisions, transfer records back and forth, and conduct the business, much more time and a greater amount of labor are required than would otherwise be involved. If some arrangement could be made by which the force could be located conveniently and compactly, in my judgment almost if not quite enough could be saved in the curtailment of expenses and saving of time to provide for the rental of another

building which would meet the demands of either one of the other bureaus mentioned.

The Commissioner of Patents is not possessed of sufficient information to suggest what arrangement should be made, or whether it would be advisable for the Government to rent other buildings in which to locate any one of the bureaus, or whether such bureau should be transferred to some other of the public buildings; but the fact is pointed out that the Commissioner of Patents ought at least to be furnished in a building constructed out of the patent fund with sufficient room to conduct the business of the Patent Office conveniently, expeditiously, and without delay to its patrons.

I most urgently call the attention of Congress to this subject and request consideration.

OFFICIAL GAZETTE.

Under the present statute the Patent Office publishes 6,500 copies of the OFFICIAL GAZETTE, of which 2,265 copies are sold and delivered upon subscription at the price of $5 per year. Under the provisions of the act of May 18, 1872, 3,221 copies are distributed to public libraries, members of Congress, and public officers. This publication is one of the most useful and complete of the kind which has ever been published. Its usefulness and importance are well known to Congress, and need not be dwelt upon. It will not be inappropriate, however, to call attention to the mechanical features of the publication, the requirements involved for photolithography, and the method of printing the same. This work contains a complete illustrated and defined history of art, so far as covered by patents, in the United States, from the time of its first publication down to the present day. As is well known, the drawings which accompany every application for a patent are necessarily required to be reproduced and made a part of the patent itself when it is issued. Under the present system this photolithographic copy of the drawing, reduced in size, is published by the Office to meet a demand for copies coming from all parts of the United States and from foreign countries. It is not within my power at present to state the number of copies of patents, specifications, and drawings which are called for; but the demand is great, and the charges made for these copies furnish an important source of revenue to the Office. In order to meet this demand it is necessary, as just stated, that the drawing be reproduced of a size requisite to be made a part of the patent and to be conveniently sent to persons requiring copies. This involves the necessity of employing photolithography. It may not be generally known that the OFFICIAL GAZETTE, excepting the front and closing pages, containing opinions and decisions of the courts and the Commissioner and the index, is a purely photolithographic production. The pages containing the drawings and the claims in type are photolithographed.

For several years Congress has appropriated about one hundred and thirty thousand dollars per year to provide for the production of copies of patents, designs, trade-marks, pending applications, and for the reproduction of exhausted copies. This photolithographing is required by statute to be done by contract. On several occasions experiments have been made to have this work done elsewhere than in the city of Washington; but in every instance of which I am aware the experiment proved a failure, the work either not being up to the required standard of excellence or being so delayed as to practically interfere with the work of the Office and prevent the prompt issuing of patents. The inconvenience attending these experiments has been so serious that for several years Congress has inserted in the appropriation bills the requirement found in the act approved March 3, 1885, as follows:

> Said photolithographing or otherwise producing plates and copies referred to in this and the two preceding paragraphs to be done under the supervision of the Commissioner of Patents, and in the city of Washington, if it can be there done at reasonable rates; and the Commissioner of Patents, under the direction of the Secretary of the Interior, shall be authorized to make contracts therefor.

The contracts entered into for the performance of this work have generally been made to run from the beginning to the expiration of the fiscal year. Prior to the 30th of June, 1887, the present Commissioner directed an inquiry to be made, and sent an agent to the principal Eastern cities to ascertain at what rates work of this character could be done in those cities, and received what is believed to be entirely reliable and satisfactory information that the rates fixed by the present contract for doing this work are below those which would be demanded elsewhere.

To explain in greater detail the usefulness and manner of conducting this photolithographic work, I quote from the report of my immediate predecessor:

> Under the practice which now obtains in this Office, on Friday morning of each week preparations are begun for the patenting of all applications which have been allowed and in which the final Government fee has been paid during the week next preceding. To secure a proper reproduction of such cases, it is necessary that the original drawings be transmitted to the Office where the work of photolithographing is performed. On each Friday morning the drawings which are ready are sent to the photolithographer, where the proof-sheets are prepared. At noon of the same day these are returned to this Office and another lot of drawings taken. About four o'clock of the same day proof-sheets of these last-mentioned drawings are returned, and other drawings again taken; and so this work of photolithographing continues day by day. Upon the return of the proof-sheets to this Office careful comparison with the original drawing must be made by the employés here, and imperfect sheets (which amount to about five per cent. of the whole) must be corrected and returned without delay.
>
> From the fact that the *original* drawings must be sent to the photolithographer for reproduction, and when it is considered that these drawings constitute the only illustrated record in the Patent Office of the inventions involved—as under the present rules of the Office models are dispensed with—it is apparent that any loss or damage thereto would not only greatly embarrass the Office, but result in serious injury to inventors. Doubtless, in view of these considerations, a requirement was inserted in the present contract that the original drawings and corrected proofs must be returned to the Patent Office within one and one-half day from the delivery to the contractor of such original drawings.
>
> It is not absolutely impracticable that the work of preparing the OFFICIAL GAZETTE be performed elsewhere than in this city, provided the place be not too remote. This undoubtedly would be attended at times with serious inconvenience. For manifest reasons, however, the work of preparing the current issues of patents must be done in this city, and the proper reproduction elsewhere is simply impracticable, if not impossible. Inasmuch as proof-sheets of the photolithographs of the current issues are used in the preparation of the OFFICIAL GAZETTE, it need hardly be said that this work *entire* can probably be more cheaply performed by one firm than by several independent firms or contractors.
>
> I have no doubt that all this work should and will in time be done by the Patent Office itself. It should not be dependent upon contractors. When the patent system is revised, corrected, and improved, as it probably should and doubtless will be in the not distant future, this important subject will be at least carefully considered.

The appropriation of Congress for the present fiscal year was—

For OFFICIAL GAZETTE	$44,000
For copies of patents, designs, trade-marks, exhausted copies, &c.	90,000

LABORATORY.

The attention of Congress has been in former reports of the Commissioners of Patents repeatedly called to the need in this Bureau of a laboratory containing the necessary apparatus for testing inventions relating to electricity, and to conduct experiments pertaining to processes and products involving chemical results. This necessity is one which scarcely needs illustration or explanation when it is considered that many of the most important and valuable inventions relate to these two classes of art. Electrical processes and apparatus—such as the telephone and improvements in telegraphy—are so well recognized in importance and value as to require no comment, and yet the determination of whether a new invention has been made in these arts, or an improvement involving novelty and utility, can be reached only by means of proper testing apparatus. This is also especially true in the field of chemistry—processes for the treatment of iron, producing by chemical means new qualities, and resolving crude iron into fine steel. Such subjects are being continually presented, and the examiner in charge is called upon to determine whether these results are accomplished by the processes claimed. The assertions of the applicants are supported by affidavits of parties in interest and by statements which appear to be reliable, and yet, in the absence of some means of testing the truth of the facts claimed, it is impossible for the Office to determine with that degree of certainty which should exist whether the invention is novel and useful and should be covered by a patent.

I recommend that some reasonable appropriation be made to provide for the purchase, from time to time, of apparatus and material suitable for a laboratory for these purposes.

EMPLOYÉS.

The business of the Patent Office is constantly increasing. Occasionally there is a slight falling off in the number of applications for patents; but this continues for a time only, when the increase begins again. The number of patents issued, however, is not an accurate criterion of the amount of business done in the Office. The examination of an application for a patent involves an examination of the state of the art for the entire world. The issuance of patents, as well as other publications, constitute *prima facie* a bar to an application the same as the issuance of a patent for the same invention in this country does. Consequently the mass of matter to be examined by the examiner in each class of art is increased each year by the patents and publications of the year. The field to be investigated and examined grows in extent year by year, increasing the time and labor requisite for a proper examination of an application for a patent. Besides this, the demands upon the Office for certified copies of records and drawings and for copies of patents are constantly increasing. The number of assignments and other instruments sent to the Office for record is also increasing, and the correspondence is accordingly increased. The number of applications requiring examination which were received during the last year was 41,351, which, in round numbers, averages 800 per week. The number of patents and certificates of registration of labels and trade-marks during the same period was 21,892, averaging 421 per week, showing a percentage of not quite fifty per centum of rejected applications. It is evident that the number of applications will hereafter increase, as well as the general business of the Office. To transact this large and important business requires the necessary force and the requisite room and facilities. I have already referred to the crowded condition of the force in the Patent Office. The model-room, which originated in the suggestions of Thomas Jefferson, who insisted that the Government should establish a museum showing and illustrating the progress and advance of art from the beginning of the Government, has been curtailed and limited by the construction of rooms for examiners. The scientific library is packed and crowded within such narrow limits that its usefulness is greatly impaired. By the last appropriation made by Congress for the Patent Office the Commissioner was authorized to appoint two additional Principal Examiners to enable the organization of new divisions in the Office. It was not until the latter part of November that a room could be secured for carrying into effect this provision.

In my last annual report, resting under the confident expectation that the Bureau of the Land Office would be removed and additional room and facilities extended to the Patent Office, I expressed the belief that, with the increased advantages, the present force would be competent to transact the business and keep up the work; but the changes contemplated did not occur, and to-day the conditions are less favorable than before. The necessity for largely-increased room is not limited alone to the business, but the health and ordinary comfort of the employés are seriously involved. As heretofore stated, a great number of the rooms occupied by the employés are poorly ventilated, unhealthy, and are only adapted for storage.

LEGISLATION.

Attention was called in the Commissioner's last report to Congress to certain changes and modifications of the statutes relating to patents. Since such time experience has only confirmed me in the propriety of my former suggestions, and I herewith renew them in connection with others.

1. *Date of the patent.*

Section 4885 Revised Statutes provides—

> Every patent shall bear date as of a day not later than six months from the time at which it was passed and allowed and notice thereof was sent to the applicant or his agent; and if the final fee is not paid within that period the patent shall be withheld.

This provision enables an applicant who fails to pay the final fee within six months after the allowance of his application to prolong the monopoly of his patent the period of six months, and it not infrequently occurs that parties having what they regard to be valuable inventions permit their applications to forfeit in order that they may avail themselves of section 4897, which allows them to make a renewal application for the same invention upon the payment of a new fee, but without filing any new papers, the original application, specification, and drawings being used. A new allowance is thus obtained of an application for the same invention, and this allowance may remain for six months after the expiration of the intervening two years before the party takes out his patent. The result of this practice is that, unless the

application is barred by a public use which may intervene, an applicant has it in his power under these statutes to prolong the term of the patent which he may secure for an almost indefinite period.

I respectfully suggest that section 4885 be amended so as to require that the term of the patent when issued shall begin with the date on which the application was passed and allowed, and notice thereof sent to the applicant or his agent, applicant of course being allowed six months within which to pay the final fee and take out his patent, and that all renewals authorized in case of a forfeiture for non-payment of final fee be limited to the same claims, except in case of inadvertence or mistake, and that when so renewed the term of the patent begin with the date of the original allowance. The justice of this provision, as well as its wisdom, will be apparent from a consideration of the fact that in issuing the patent there arises by implication a contract between the Government on the one hand and the patentee on the other that the latter shall have the exclusive enjoyment of the patented property for a definite period, at the expiration of which period the property becomes that of the public. The United States extends to patentees more liberal protection and for a longer time than any other Government—17 years—and it is neither just nor right to the public which is thus liberal and generous that there shall be found under this legislation methods by which the inventor can defeat the provisions which contemplate a termination of the monopoly, and be able to prolong its enjoyment for many years beyond the period contemplated by law.

2. *Limitation of term of United States patent by foreign patent.*

Section 4887, after declaring that no person shall be debarred from receiving a patent in this country for his invention or discovery, nor shall any patent be declared invalid by reason of the invention having been first patented or caused to be patented in a foreign country, provides—

> But every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term, and in no case shall it be in force more than seventeen years.

It is understood that the object of this legislation orginally was to prevent an inventor from allowing the people of foreign nations to come into the free enjoyment of his invention at an earlier period than was permitted the people of our country, which earlier enjoyment resulted from the fact that the term of American patents, as just stated, is much longer than any allowed by foreign governments, so that it was impossible for an American inventor to take out a foreign patent without disclosing and making public his invention after the expiration of the shorter term in such foreign country. In the meantime the American people were excluded from the free enjoyment of the invention during the period intervening between the expiration of the foreign patent and the American patent. But I believe those conversant with the subject have never seen any wisdom in this provision of the law. A great deal of trouble and annoyance have resulted from it to inventors, both American and foreign, without, so far as is known, advantaging any one.

It is evident that the American patentee is entitled to 17 years of protection under the patent granted him by this Government. There ought to be no distinction between an American inventor who takes out a patent at home but none abroad and one who takes out patents in both his own and some other country. Yet the American patentee who omits to take out a patent abroad makes his invention public and free in all the countries of the world during the entire period, because his American patent becomes a publication which discloses the invention and prevents him from taking out any patents in foreign countries under the systems existing there, so that in such cases the people of foreign countries acquire the free use of an invention from the date of its publication in America, while the people of America submit to the monopoly enjoyed by the patentee during the entire period of 17 years. The consequence of these conditions is that if the American patentee takes out his foreign patent first his domestic patent is limited in term to the short duration of the patent abroad. If, on the other hand, he takes out his American patent first, he is barred from taking out any patent under the foreign systems, which provide that any publication of a patent shall bar a patent in those countries. This inequity of the law has forced inventors both in America and abroad, at much trouble and expense, to arrange, wherever it was possible, to have their foreign and domestic patents issue on the same day, so that neither of the conditions alluded to could attach.

It is also suggested, in view of the fact that the number of Americans taking out patents abroad very largely exceeds the number of foreigners who take out patents in this country, that these conditions of law have operated much more disadvantageously to Americans than to foreigners, and that therefore there should be some modification in the law.

These difficulties and others which need not be elaborated in this connection have become so well recognized, for they not only exist between Americans and foreigners, but between the different nations of Europe as well, that for some years past representatives of various governments have met together for the purpose of adopting and establishing articles of an International Union for the Protection of Industrial Property. Conventions were held in Rome and at Paris, and finally articles of a union were adopted on the 20th of March, 1883, acceded to by Belgium, Brazil, Spain, France, Guatemala, Italy, the Netherlands, Portugal, Salvador, Servia, and Switzerland, the latter state being assigned the position of intermediary, through whom those adhering to the Union were to communicate with other States in relation to its objects. Subsequently other states gave their adhesion and became members of the Union, viz: Great Britain, Tunis, Norway, Sweden, the Dominican Republic, and the United States. (A copy of the articles and protocols constituting this Union is attached to the last annual report of the Commissioner of Patents to Congress.)

The adhesion of the United States to this Union was ratified on March 29, 1887. The purpose of this Union is to provide that persons who have made applications for patents in one of the States of the Union shall have a definite period thereafter within which to file their applications in other countries as of the same date at which their original applications were filed, and that no publication or use of the invention during that period can deprive the applicants of their right of priority in all the States in which such applications were filed. It will be seen that this provision was intended to meet one of the very difficulties existing under section 4887 of the Revised Statutes, and which was heightened by the requirement that the term of the American patent should be limited by any patent issued to the patentee in foreign countries.

The advantages to American citizens under this Union are set forth in Article 4 of the Convention, to the effect that any person who has filed an application for a patent, or who has applied for the registration of a Trade-Mark in the United States, shall be entitled to priority in other countries of the Union as against persons making similar applications within a period defined. A person having applied for a patent in this country is entitled to have his case considered, if filed in another country, the same as if filed simultaneously with the application here.

There is great advantage in this in all countries where the patent is granted to the first applicant, which is generally the case in Continental Europe and England; but it unfortunately happens under section 4887 that every patent granted in this country for an invention which has been previously patented in a foreign country is limited to expire with the foreign patent having the shortest term. It is well known that under the American system an examination of all applications must be made before the patent issues, and generally five, six, or seven months elapse after an application is filed before patent issues. The result is that the American inventor who desires to avail himself of the advantages of the treaty is in danger of having his foreign patent granted first, for the reason, as just stated, that such foreign patent issues almost immediately after the application is filed, and therefore necessarily the term of his domestic patent is abridged by it.

This is the manner in which this condition of things affects the American inventor; but the foreign inventor who comes to this country for a patent is not thus injuriously affected, because there is no provision under the European system that their patents shall be limited by the duration of an American patent; and if there were such, it would produce no limitation, because the American term, as already stated, is generally much longer than the terms provided by most of the European States. In my opinion, there is no reason for continuing this limitation contained in the last clause of section 4887. While it stands it is almost a complete bar to the enjoyment of the privileges of this Union between the various States named and the United States. The repeal of this clause has been suggested in the reports of the Commissioners heretofore. It is a source of much vexation to the inventors and of trouble to the Patent Office; it is out of harmony with the spirit of our patent law, and, in my judgment, it ought to be repealed.

3. *Caveats.*

Under section 4902 of the Revised Statutes, relating to caveats, it is provided that any citizen of the United States may file a caveat; also, that "an alien shall have the privilege herein granted if he has resided in the United States one year next preceding the filing of his caveat, and has made oath of his intention to become a citizen." Here is a denial by implication of the right of an alien who has not been a resident and made oath to file a caveat. But under the treaty or International Union, above mentioned, there is an express provision giving to citizens and subjects of foreign States the same rights and privileges with respect to industrial property that are by such foreign States, members of the Union, extended to the citizens of other States members thereof. It may well be doubted whether this treaty can effectuate itself as a law and authorize the citizen of one of these foreign States who has not resided here one year and made the oath to file a caveat, although by the law of such foreign State the privilege is freely extended to an American citizen. I recommend that section 4902 be so amended as to provide that so long as the United States remains a party to said International Union and said provision remains in force citizens of the States members of said Union which extend the same privilege to American citizens may be allowed to file caveats in the Patent Office without regard to residence or oath.

4. *Assignments of patents.*

Section 4898 provides that an assignment, grant, or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration without notice unless such instrument be recorded in the Patent Office within three months from the date thereof. In my opinion, this requirement operates unjustly in providing that an assignment, if recorded after three months from the date thereof, shall have no effect as constructive notice to a subsequent purchaser or mortgagee for a valuable consideration. This provision, in my judgment, should be modified so as to declare that while the assignment should be valid without recording for the period of three months from and after its date, thereafter it should be void against any subsequent purchaser or mortgagee for a valuable consideration without notice, unless it be recorded in the Patent Office prior to the date of such subsequent purchase or mortgage, so that should the assignee fail through forgetfulness or accident to file his instrument of assignment within three months he might still file it for record at a subsequent period, and it should then give constructive notice from the date of its actual filing.

5. *Money paid into the Treasury by mistake.*

Section 4935 provides for the payment of fees to the Commissioner of Patents, or to the Treasurer, or any of the Assistant Treasurers of the United States, or to any of the designated depositories, national banks, &c. All moneys received at the Patent Office from every source whatever are required to be paid into the Treasury as received, without any deduction for any purpose. Section 4936 provides that the Treasurer of the United States is authorized to pay back any sum or sums of money to any person who has through mistake paid the same into the Treasury or to any receiver or depository to the credit of the Treasury, as for fees accruing at the Patent Office, &c.

The Commissioner of Patents has the unquestioned

authority to correct a mistake occurring in his Office, and to refund to any individual who has paid money to the financial clerk through mistake or accident if such correction be made before the money has been covered into the Treasury or placed in a depository of the Treasury. Such corrections are occurring constantly by reason of mistakes in making change and from demands made on account of applications which either are not filed or are withdrawn on account of some impropriety or irregularity in their presentment; but when the money has been covered into the Treasury the Commissioner of Patents no longer has the power to correct such mistakes, and as it frequently occurs that the mistake is not discovered until after the money has been covered into the Treasury the party in interest is required to go through the somewhat tedious process of applying to the Treasury and furnishing proofs before he can obtain the correction of the mistake. Generally all evidence of the mistake is disclosed by the records of the Patent Office, and the Secretary of the Treasury is uniformly required to make examination and reference of the matter to this Office before acting on the application. The Patent Office is thus put to the same trouble of inquiry and examination as it would be were the whole matter in the hands of the Commissioner of Patents. The amounts involved are always small sums—either the first filing-fee of $15 or the $20 final fee, or some small sum involved in making change. I can see no reason why the Commissioner of Patents should not be authorized to make all corrections of mistakes of this character which occur in his Office and to refund the money, and I recommend that authority be given for that purpose.

6. *The attorneys' fund.*

In this connection I desire to call attention to what may be regarded as equitable claims on behalf of a number of patent attorneys against the Patent Office resulting from a defalcation on the part of the late financial clerk, Mr. Levi Bacon. The claims grew out of the following facts and practice formerly prevailing in this Office: The statutes of the United States require that all payments to be made into the Patent Office for copies, records, or work to be done, shall be tendered in advance or simultaneously with the delivery of the copies, records, or work; but persons were constantly sending for such copies of records from remote parts of the country, not knowing what the cost would be, and the Office had been in the habit of responding to such requests with an estimated cost of the work. Thus the delivery of the copies or other work desired was considerably delayed. On the other hand, many parties were in the habit of remitting a larger sum of money than would be required, and directing the Office to furnish the copies of records immediately and return the change. There grew up in the Office, in consequence of the difficulties attending this method of transacting the business, the practice of extending a credit to patent attorneys in good standing and requiring them to remit the amount of their accounts once each month; but after some years' experience considerable sums of money were lost in consequence of the death, disappearance, or inability of the attorneys to pay. In 1878 Mr. Commissioner Spear issued an order authorizing persons dealing with the Office to deposit with the financial clerk a special fund, to be drawn against as they saw proper. After the issuance of this order it was the practice of the financial clerk to receive the money thus deposited and place it in envelopes, upon the back of which was kept the account between the Office and the attorney. This fund was regarded as a private fund, at all times the property of the attorney, no part of which went into the public funds or into the Treasury except as it was drawn against, and the sum then so drawn was applied and paid over into the Treasury. The balance on hand was always regarded as the money of the individual, subject to his order and liable to be withdrawn at any time he might desire to have it returned. On the death of the financial clerk, Mr. Bacon, in June, 1887, it was found that the various balances which should have been in these envelopes were gone, and that no account could be given of this so-called "attorneys' fund," or "miscellaneous fund," as it was sometimes termed. At the same time it appeared that the Office had these various attorneys charged with copies, records, and other material furnished which should have been, and but for the defalcation would have been, paid for by the sums of money in the various envelopes to the credit of the parties in interest; but the money not being found, these accounts were regarded as just and valid claims against attorneys, and it was held that the fact that each at some previous time had had in the hands of the financial clerk sufficient money to provide for the payment of these accounts could not be regarded as liquidating the same. The Commissioner of Patents entertained the view that an officer of the Government could not incur a liability without the express provision of law, and that he had no authority to receive private deposits and make the Government liable for them, or to secure such deposits either by the money of the Government or by their equivalent in work, copies, &c. In his opinion the case was very much the same as though the attorneys had come to the financial clerk with a bill of large denomination, and, instead of tendering the exact sum which was due, intrusted him with the bill, allowing him to make change, and upon his failure to return the change should attempt to hold the Government liable for the difference. No doubt there were a number of these attorneys who deposited their money without much consideration. They find themselves now indebted in small sums of money to the Office, and they naturally insist that they understood they were dealing with the Government, and that the Government ought to indemnify them for their loss. These claims have certainly strong equitable features. The practice grew up out of the order of Commissioner Spear, the money deposited by the attorneys was always made payable to the Commissioner of Patents, and all the correspondence, receipts, &c., were conducted in the name of the Commissioner. In my judgment, Congress should authorize the Commissioner of Patents to adjust these claims, subject to the approval of the Secretary of the Interior, and to pay them by the recognition of orders for copies, records, assignments, &c. This would restore the parties to all their rights without the payment of any cash by simply supplying these attorneys with what it was originally contemplated they should receive. The amount involved is about five thousand dollars.

It will not be improper in this connection to call attention to the fact that since the defalcation alluded to was discovered the Commissioner has taken careful steps to guard against any possible misappropriation of the public moneys. All money deposited by attorneys or others is now required to be at once transferred to the Treasury and placed beyond the control of the Patent Office. When this defalcation was disclosed, it was also ascertained that during the long period of Mr. Bacon's possession of the office, though millions of dollars had passed through his hands, there had never been a settlement of his accounts. The practice now prevails of requiring a quarterly and annual adjustment of the accounts of the financial clerk. In addition, an entirely new system of receiving and accounting for the funds received has been adopted, with checks and counter-checks, so that it is believed to be now practically impossible for any mistake or misappropriation to occur without being at once detected. The importance of the subject will be seen when the fact is considered that the daily receipts average about three thousand dollars.

7. *Delay in prosecuting applications.*

I desire to call especial attention to the subject of the delays which occur in the Patent Office on the part of applicants in the prosecution of their applications for patents.

Section 4894 provides—

> All applications for patents shall be completed and prepared for examination within two years after the filing of the application, and in default thereof, or upon failure of the applicant to prosecute the same within two years after any action therein, of which notice shall have been given to the applicant, they shall be regarded as abandoned by the parties thereto, unless it be shown to the satisfaction of the Commissioner of Patents that such delay was unavoidable.

Under this section applicants who desire to prolong their applications and postpone action therein have an ample opportunity to do so. There are two classes of persons who apply for patents—*one* composed of those who are exceedingly anxious to obtain their patents at the earliest practicable moment, the *other*, of those who desire to prolong the issue of their patents and to keep the application pending in the Patent Office to the very latest date possible. The second class embraces the more powerful, rich, and influential parties, who are either the inventors or the assignees of the inventors. This section of the statute enables the second class of persons to keep their applications pending in the Office for years before their patents issue. In the meantime they are engaged in manufacturing and putting upon the market the article or improvement, but warning the public that the patent is applied for, the effect of which is to give them the absolute control and monopoly of the invention and to deter all other inventors from entering upon the same field of invention and from manufacturing the article. The manner in which this delay is effected may be briefly explained: The applicant files his application and is allowed 2 years within which to complete or perfect it. Any action of the Office requiring change or modification or some formal correction can be followed under this section by a further delay of 2 years before the applicant is required to take any action in response. At the expiration of the two years he perhaps makes some amendment or change in the character of his claims. This involves a corresponding action on the part of the Office, and however prompt and speedy this action may be the applicant is permitted another 2 years before any responsive action can be compelled from him. And so the matter may be continued. There are applications now in the Office which have been kept alive nine or ten years, and the Office is powerless to compel speedier or earlier action on the part of the applicants.

These repeated actions and these long-continued delays cannot fail to suggest that a great deal of useless and unnecessary labor and consumption of time in the Patent Office are involved. Every application stands in its proper place upon the calendar of the Office, and when reached in its order it must be examined carefully to see whether any action has been had since the last-recorded action of the Office, so that a case which has remained for 2 years without responsive action from the applicant may probably be examined twenty or thirty times simply to ascertain that nothing has been done. When it is considered that this labor is multiplied by the number of applications which are thus delayed, the amount of useless and unnecessary labor expended can be appreciated.

While calling attention to the fact that this 2 years' period in the case of original applications is too long, it will be a matter of surprise to know that in applications for reissues Congress has omitted to fix any period (except the duration of the original patent) within which they become abandoned for want of prosecution. A reissue application is always alive, and the applicant may file an amendment 10 years after it was required by the Office to be made and be entitled to have it considered and acted upon.

I earnestly recommend that section 4894 be so modified that there shall be vested in the Commissioner of Patents a discretion to declare any application forfeited for want of prosecution whenever he shall be satisfied that such order should be entered. This power is possessed by all tribunals who have the control of litigation and matters of this character. Of course the exercise of this power should be guarded by proper restrictions, so that injury or wrong cannot be done, and no order of this kind should be made by the Commissioner until ample notice had been given to the applicant to show cause why his application should not be declared forfeited. The power to reinstate a case after it had been declared abandoned should and would be preserved under section 4894 whenever, in case of death, insanity, or other good and sufficient cause, it should be made to appear to the satisfaction of the Commissioner that the want of prosecution was unavoidable, and that the party was incapable of showing cause why the case should not be declared abandoned.

8. *Renewal application where case was forfeited for non-payment of final fee.*

Section 4885 provides that after the Office has passed and allowed an application and nothing remains but the payment of the final fee to complete the issuance of a patent, if the fee be not paid within the period of 6 months the patent shall be withheld. I have al-

ready called attention to the fact that very frequently the payment of this final fee is purposely omitted in order to permit the applicant to extend the period of his monopoly; but of course this is not always the case. The provision of section 4897, which enables a party who has failed to make such payment to file a renewed application within two years from the date of the allowance of the original application and obtain his patent, is a wise and just provision; but there is very much doubt and uncertainty as to the meaning of this section, in so far as it requires that "such second application must be made within two years after the allowance of the original application." It has been held by high authority that the effect of this provision is by construction to bar the *invention* as well as the *application* if the renewed application be not filed within 2 years. On the other hand, there is also high authority that such is not the effect, and that even if 2 years have elapsed after the allowance of the original application the new application may be made and may go to patent, notwithstanding the existence of the original application, its allowance, and its forfeiture for non-payment of the final fee. This section should be amended to remove this uncertainty. I am of the opinion that the limitation should be to the invention; and not only this, but that when an application for a patent has been allowed by the Office and the applicant has failed to pay the final fee within 6 months, and has also failed to renew the application within 2 years, the invention should be made public and become public property as of the date of the original allowance. I think this should be the result from a proper consideration of the relations between the Government and the inventor. The inventor has conceived and presented a new invention. He comes into the Office for the purpose of donating that invention to the public after he shall have first enjoyed its exclusive use for the period provided by law. The Office has made a careful and thorough examination, has discharged all its part of the contract, and extended to the applicant the right to take out his patent upon paying the charges required. The public from this moment is entitled to its part of the consideration of the contract, and ought not to be deprived of it upon the failure of the inventor to fulfill his. The invention has become so far public as to be made known to the Patent Office. The law extends to the applicant the full period of 2 years within which to avail himself of all his rights and to enjoy his property. Failing in this, he ought not to have it in his power to conceal the invention as a lost art and to deprive the public of it. On the other hand, other inventors may invent the same thing and come into the Office, and by patenting the invention deprive the public of what they have already acquired the right to by virtue of the allowance of the first application. In other words, when an invention has been made and disclosed to the Office, and the application has been passed to issue, that invention should be taken out of the field of patentability as to all future inventors, and ought not to be regarded as a concealed or abandoned invention. I therefore recommend the modification of the statute so as to provide that such second application must be filed within 2 years after the allowance of the original application, and if not so filed the invention shall be regarded as abandoned to and as the property of the public.

9. *Joint inventors.*

Under the present statutes a patent may issue to a sole inventor or joint inventors, to an inventor and his assignee of a part interest, or to the assignee or assignees of the entire interest. Every patent issued to a sole inventor or to an inventor and his assignee of an undivided part, or to the assignees of the whole interest, is beyond challenge so far as an improper union of persons as patentees is concerned—that is to say, the law authorizes the patent to issue to the inventor or to any person or persons to whom he desires that it shall issue, and this is the principle which underlies the statute authorizing the assignment, grant, or conveyance, either of the original invention before patent has been granted or of the patent after it is issued; but while there is no express provision of law declaring that a patent issued to joint inventors is void, should it appear that they were not joint inventors, yet that is the well-settled law as announced by the courts. The statute also requires that the assignees of the inventor shall be such by virtue of a written formal legal assignment; but in the case of a patent to joint inventors, when it turns out that by mistake or error of law one of them was not a joint inventor, but the sole inventor, the other does not become a patentee as an assignee under a formal legal assignment, although he does become one of the joint patentees with the full consent and wish of his co-patentee. Inasmuch as it is often one of the most perplexing and difficult questions coming before the Office or before the courts to determine whether an invention is actually a sole invention or a joint invention which two or more persons contributed, there seems no reason why a patent which is thus issued to persons who supposed themselves to be joint inventors should be invalid. Under all other systems within my knowledge the patent is allowed to issue in the name of those persons who demand it in whatever capacity or relation they may make the demand, and it is only requisite that one or more of the patentees shall have been the true inventor. I am aware of no reason why such should not be the law in the United States; and when there is taken into consideration the amount of time, labor, and trouble involved in investigating the question as to whether there was or was not an actual joint invention, and other incidental questions which are constantly arising, as well as the injustice to the patentees themselves of having their patents declared void, I find ample reason for recommending a provision of law expressly providing that patents shall not be held to be invalid by reason of the fact that the persons described as joint inventors were not joint inventors, provided that either one of them thus described was in fact the true and sole inventor.

10. *Examination of applications.*

There is no occasion to refer at any length to the distinctions between the English patent system and the American. The principal and important difference consists in the examination given to an application filed in this Office to ascertain the novelty and utility of the alleged invention, the object being to secure to the inventor for a limited period the precise

subject-matter—no more and no less—of his invention, and also to protect the public against fraud and imposition which may be practiced in imposing upon them worthless and invalid patents, and in securing them against vexatious and oppressive litigation founded upon that class of patents. A patent issued under the American system gives to the inventor and the public an assurance as to its validity which cannot be secured under any other system. In the courts the patent constitutes the highest *prima facie* evidence. The Patent Office contains a vast collection of information on the state of the art which is inaccessible and unattainable elsewhere. Resort must be had to this establishment whether the examination be had before or after the patent is granted. The applicant secures this examination and the issuance of his patent for $35. It is not required that he shall be represented by attorney, though in all complicated inventions, and especially valuable ones, prudence would suggest such representation.

Under the British system the English Patent Office is little more than a registration office. The patent when issued is but a certification, and is of no value as property. No one would invest in it until it should be submitted to learned and skilled experts, who, outside of the office, bear the same relation to the merits of inventions as the examiners of this Bureau sustain. Such examinations and opinions based upon them by English lawyers are far less safe and reliable and much more expensive to the inventor than the procedure in the United States Patent Office. When it is called to mind how easily associations and corporations can be formed to promote the introduction of patent property and to foist the same upon the public, and how easily legal opinions can be secured urging and supporting the validity of the patents involved in the scheme, the danger and disadvantages of the system become apparent, so that it is beneficial neither to the inventor nor to the public. The disadvantages are not so great to a compact people occupying a limited territory like England as to our own people. A patent granted in this country without examination would be practically valueless to the inventor. He could never introduce his invention or place it on the market. The opinion of eminent counsel at Washington would not be accepted in Chicago; that of New York attorneys would not avail in San Francisco. The inventor would need a fortune to begin with in order to secure the opinions or "examination" of counsel known and recognized in every district and locality before he could succeed in availing himself of the value of his patent. However, it is believed the system is too well established and too thoroughly understood and appreciated to be shaken by any objections that can be urged against it.

It may not be out of place to call attention to the practice in the Office relating to the subject of these examinations, for there appears to exist no little misapprehension relative to it. An impression prevails that the questions of utility and novelty of an invention are passed upon and finally determined by the various assistant examiners who make the preliminary search and examination. This is erroneous. There are 30 examining divisions in the Office, to each of which are assigned certain classes of invention and art. Each division is presided over by a Principal Examiner, selected and retained in view of his long experience and supposed capacity. Under him are a certain number of assistant examiners, to whom he distributes the applications assigned to the division under his charge. These assistants make the examination and report the result to the chief. All actions affecting an application, whether of rejections, allowance, or the requirement for amendments, are submitted to the Principal Examiner for his supervision and approval, and whatever action is had is that of the head of the division. If he allows the application, it goes to patent. From his requirement for amendment, or other action relating to the form of the application, an appeal lies to the Commissioner in person, without fee. If he rejects the application, an appeal lies to the Board of Examiners-in-Chief—a board composed of three experienced persons—and they review the rejection. Should they affirm the decision of the examiner, an appeal lies to the Commissioner, and thence to the Supreme Court of the District of Columbia. Cases are argued in full before these appellate tribunals, whose action is not in any sense perfunctory. The records will show reversals by the appellate tribunals in the Office to occur with greater relative frequency than in the courts of law and equity.

It must be confessed that great power is lodged in the hands of the Principal Examiner. If he allows the patent, it issues without further question. It is certainly true, however, that the inventor, as a general rule, secures the benefit of this exercise of power. As already stated, ample provision is made for appeal if the rejected applicant feels aggrieved and believes his application has merits; but the unlimited power of the examiner is in the direction of allowing patents. If there should be any restriction, it should be in guarding against its improper or irregular use. This might be done by organizing a board of review, to revise and inspect the allowed applications, with the view of preventing the issuance of improper patents.

11. *Compensation of examiners.*

There is no doubt that the compensation allowed the corps of examiners is insufficient. Promotions are not rapid, and there is little temptation for examiners to remain in the service after mastering the practice and business of the Office. With this acquisition a bright active man can at once secure business or employment elsewhere which is much more remunerative. The members of the examining corps who have secured promotion, as a general rule, are men of education and high attainments, especially in the requisite knowledge of the sciences and the arts. In my judgment, the public interest, as well as justice to this class of employés, would be well subserved by increasing their salaries, so that they shall be commensurate with the character of their services and the responsibilities of their duties. Such an increase would tend to secure and retain men possessing high qualifications.

12. *Interference proceedings.*

There is some reasonable ground for complaint against the present system of interferences as it exists and is conducted under the statutes and Rules of

Practice of the Patent Office. An interference necessarily occasions delay, for such a proceeding is not instituted until the question of patentability has been favorably determined. In the Patent Office, just as in the courts, poor and uninfluential suitors are frequently confronted by the powerful and rich. There are the same opportunities for procuring false evidence, corruption, and exercising other evil influences which exist in other departments and in the courts. Such conditions can hardly be said to be defects, however, in the American patent system. All that can be said is that there are 30 organized divisions in the Office composed of a body of assistant examiners and clerks presided over by a principal, and consequently in the examination, allowance, and rejection of applications, or in the declaration of interferences, there are more persons who may be approached and affected by such influences. But the requirement and necessity for the number of divisions depend upon our patent system. The vast number of applications that are presented and the labor and research involved in their examination make necessary the number. These conditions are essential, or else the system itself must be abandoned. Not only this, but so long as this system is retained there must exist as incidental to it some procedure of interference. When there are pending in the Office two applications for patents for the same invention, what must be done? The very purpose of an examination is to prevent two patents being granted for the same invention, or the issuance of a patent for that which is old in the arts. Not only this, but in the supposed case, if a patent issue to the applicant who first filed his application and is denied to the later one, absolute injustice may be done. The first may have pirated the invention from the other. So, also, if an applicant is confronted by a patent already issued, he may insist that he was the first original inventor, or that the patentee stole the invention. Without some reliable mode of determining the question the later applicant would be remediless. If a remedy were to be provided which would enable him to go into courts of equity and file a bill against the patentee, vacate the patent, and then renew his rejected application and obtain a patent, this would impose hardships as great as, if not greater than, those now endured. The rejected applicant might have to prosecute his bill in equity in Maine or California—the defendant's home—while, himself a poor man, he might have to contest with powerful corporations. In the meantime the invention is made public and an opportunity afforded for the patentee, as well as others, to make a case, and the chances for fraudulent evidence, antedating his invention, and defeating him, would be greatly increased.

In every interference there are necessarily two or more persons, each claiming to be the original inventor. Their claims may be false or fraudulent, but each is entitled to the same treatment and consideration until the facts are established. Each is in the sense of the law an "inventor," and entitled to equal consideration, even though one of them may have secured the aid of a corporation or powerful assignee. Precisely the same conditions would arise if the contest were in the courts. It is doubtful if any system can be devised that would be more friendly and beneficial to poor inventors than the present. The truth is, the present system of declaring and conducting interferences, with all the objections to it and defects in it, is not the creation of any one mind, but it has been evolved from years of actual and practical experience. It is always the case in such matters that it is much easier to criticise and point out defects, selecting the rare and exceptional cases where the system has miscarried, and ignoring the infinite multitude of cases where it has succeeded, than to present a remedy or propose a better system.

It has been suggested by some who are eminent for their familiarity with procedure in the Office that instead of retaining the present interference system, which proceeds, as far as is possible, according to contested proceedings in the courts, upon pleadings and evidence, subject to cross examination, the *ex parte* procedure of the Patent Office be extended to this subject; that each applicant be required when he files his application to deposit with it his preliminary statement, under seal, not to be opened or inspected unless his application shall be put in interference; the form of the preliminary statement to be prescribed by the Office calling for a full and exact account of the applicant's conception of the invention, disclosure to others, names, places, dates, models, experiments, reduction to practice, &c. All such preliminary statements should be lodged with a single officer and kept unopened in the secret archives until called for in consequence of the declaration of an interference. Such proceedings when declared would go, as now, to be tried and determined by the Examiner of Interferences upon the preliminary statements filed by the parties, no preliminary statement to be amended except when the issue of the interference was so framed that the original statement was insufficient or not specific, when amended, to be so amended by answers to interrogatories propounded by the Examiner of Interferences and not otherwise. The decision of the Examiner of Interferences would be made without any hearing of parties, but reserving to them the right of appeal to the Board of Examiners-in-Chief and the Commissioner, and of full argument and hearing, and also reserving to the defeated party the right within a reasonable time to file a bill in equity in such United States court as might be indicated, to establish that he was the first, true, and original inventor, annul the patent issued by the Patent Office, and secure a decree adjudging him entitled to the patent. This suggestion is submitted, not recommended, as coming from persons of great experience. But here evidently, while some of the defects of the present system might be obviated it would compel the serious contests to be carried into the courts and subject the inventor to all the expense, annoyance, vexatious delays, and anxieties that attend litigations in the courts.

13. *Trade-Marks and interstate commerce.*

After the decision of the Supreme Court of the United States in the Trade-Mark cases, (100 U. S., 82,) which held that the acts of Congress approved July 8, 1870, and August 14, 1876, were unconstitutional, and that Congress had no power to legislate upon the subject of Trade-Marks *per se*, the act of March 3, 1881, was enacted under the provisions of the Constitution conferring upon Congress the power to regulate commerce. That power, it is conceded, extends to commerce with foreign nations, commerce with the Indian tribes, and interstate commerce; but for some cause not apparent in the enactment approved March 3, 1881, Congress saw proper to authorize the registration of only such Trade-Marks as were used in commerce with foreign nations or with the Indian tribes and left Trade-Marks which might be used in commerce between the States wholly unprovided for. If there be any reason why the latter class of Trade-Marks should be excluded from the protection of Federal legislation, or left to the regulations prescribed by the States, or wholly omitted, it is not apparent. The attention of Congress has been called to this subject by my predecessors, and I respectfully renew the suggestion that the provisions of that act be enlarged so as to cover Trade-Marks used in interstate commerce. This question has become more important in view of the union hereinbefore referred to for the protection of industrial property. Some additional legislation by Congress is necessary in view of the new situation resulting from this treaty. Article 6 of the Convention declares that "every trade or commercial mark deposited in the country of origin shall be admitted to deposit and so protected in all other countries of the Union." It is evident from this declaration that if the article were to be fully carried out in this country it would probably admit to registration Trade-Marks which otherwise would not be admissible under the existing laws of Congress. In other words, the provision is more liberal than the act of March 3, 1881. It is more liberal than was the common law, because under each there were limitations which excluded Trade-Marks, which were not regarded as lawful in some sense and which were calculated to mislead or were regarded as in contravention of religious ideas, morals, &c. The definition of a Trade-Mark is substantially the same in all commercial countries, but practice varies in the application of these definitions and in respect to the character of marks which may be protected. For instance, the usage in southern Europe in respect to the employment of sacred names and symbols warrants their adoption as Trade-Marks in relations which would be offensive and perhaps sacrilegious to much of the American sentiment. In a case where a representation of the Virgin Mary was claimed for soap this Office held that its use in such a connection was offensive to a great proportion of the people of the United States, and therefore that it was not entitled to protection; yet it is actually protected in France, where a different sentiment prevails. Instances of this kind are rare; but the statute should be framed to cover all cases likely to arise. If Congress, therefore, is inclined to make the law of Trade-Marks conform to the provision of the Convention, the act of March 3, 1881, should be amended so as to admit to registration any Trade-Mark already lawfully registered in any of the countries of the International Union, subject, of course, to the conditions which require preliminary examination as to prior use and employment in the class of commerce over which the legislation of Congress extends.

Another question in connection with Trade-Marks which will suggest appropriate legislation relates to the coercive features of the provisions of the treaty intended to give Trade-Mark property a protection which would be unknown to the common law or to the statutes of this country. These provisions will be found in articles 9 and 10 of the Convention, and may be briefly stated to include seizure upon importation of any article of merchandise bearing an illicit Trade-Mark or a false or fraudulent intimation of origin. Of course, it is to be understood that the practical operation of such legislation would apply in this country to goods imported from abroad, and would authorize the seizure in this country of such goods. The act of August 14, 1876, provided for the seizure by United States marshals of all appliances used for counterfeiting or the fraudulent imitation of registered Trade-Marks. Section 2496 of the Revised Statutes, as amended March 3, 1883, refuses entry at the custom-house to foreign goods bearing simulations of the Trade-Marks of domestic manufactures. Those two acts contain all the protection afforded by the United States statutes to our citizens so far as coercive measures are concerned. Of course, the common law and statutes afford a simple remedy for infringement; but in view of the fact that as between the owner of a Trade-Mark in one country and the infringer of it in another the civil remedy is so expensive it practically constitutes no protection. Every country seems to have felt the necessity of employing coercive measures to prevent fraud of this character. No act of Congress has ever contemplated the seizure of merchandise bearing counterfeit or simulated Trade-Marks, and under the present laws the courts of Federal jurisdiction have no jurisdiction to enforce such seizures. Whether such legislation should be made is submitted to the consideration of Congress.

Under Article 6 of the Constitution of the United States this Convention is now a part of the supreme law of the land. The Government may withdraw from it when inclined to do so; but until such withdrawal its provisions must be recognized, and ought to be enforced by appropriate legislation empowering the proper officers to make the required seizures and determining the due proceedings in our courts which are necessary to enforce the provisions of the treaty and protect the rights of individuals. It is true that under the general provisions of this treaty, as set forth in article 2, there is only contemplated giving to the citizens and subjects of foreign States the same protection that our own citizens enjoy; but it is to be apprehended that while it is not expected the same procedure and method will be employed, yet the same ample protection will be afforded to citizens of foreign countries which would be demanded for our own citizens.

14. *Restriction of some of the evils of the patent system.*

The growth and development of the patent system of the United States, and of inventive genius stimulated by the rewards and prospects of rewards growing out of that system, are the subjects of constant comment and public consideration. That this system has been useful and beneficial is beyond question; but it is impossible that it should not be accompanied by greater or less evils. The attention of the public has been for

years constantly called to the fact that the inventor himself rarely secures the real reward of his invention. This undoubtedly proceeds from the fact that quite as much genius is required to develop a property or manufacture and place it advantageously upon the market in so great a country as this, and to make it remunerative, as is required to make the invention, and it is the misfortune of inventors, as a general rule, not to be possessed of business habits and business faculties. The result has been that nearly all the great and most useful inventions of modern times have fallen into the hands of men of capital or corporations, who alone have the means to bring them before the public, develop their useful qualities, and enable the people directly to see that they are useful and can be produced at prices which remunerate. This condition of things cannot be remedied, and perhaps ought not to be. There should be no legislation which interferes with the right of property which is vested in the inventor from the moment he has created a new subject of invention. The entire system and theory of patent property rest upon the idea that that which a man invents, in the sense of its being a new and novel creation, is his individual property, which he owns by the right of creation and discovery. It is not the theory of the patent law that when the Government grants a patent to an inventor it confers upon him any such property as it does in the case of a patent for land, which, belonging to the Government at one moment, becomes the property of the patentee upon the execution of the instrument. But the patent in the former case recognizes the existence of the property in the individual; but in consequence of its intangible and incorporeal nature it is incapable of protection from invasion by other persons, unless some distinct and specific remedy is afforded the inventor against such invasion and infringement. Letters Patent are mere evidence of the fact that, in the opinion of the Government, the patentee has invented a new, useful, and original invention, and the Government undertakes to protect him in the exclusive enjoyment of that property for a definite term. Now, any legislation which departs from this theory and proceeds upon the idea that the patentee should not be entitled to full protection is a mistake. Many suggestions have been made as to the best method of protecting the inventor and enabling him to realize as far as possible the value of his invention, and at the same time protecting the public against vast and powerful corporations in patent property exacting greater values than can be justified upon any fair or reasonable consideration, and which by buying in all the succeeding improvements in a certain line of invention are enabled for generations to perpetuate a monopoly which ought to have more reasonable limits. It must be understood that a monopoly which erects and locates itself all over the country in every business center under the provisions of a patent is able in nearly all cases to prolong its life after the patent expires by reason of the possession which it has taken of the market. New manufactures are unable for years after the expiration of the patent to come into the market and compete with an organization which thus has such complete possession of the field of manufacture.

It has been recommended that some legislation should be had looking toward the restriction of the extension of patents and patented property. In this direction I suggest for the consideration of Congress the propriety of providing that all patents hereafter issuing shall contain a condition that they may be extinguished by the Government at any time upon the payment to the owners of the property, whether the patentee or his assigns, of a reasonable sum of money, such sum to be determined by arbitration or otherwise, as may seem appropriate to Congress. It is probably safe and accurate to say that patent property as a rule is not as valuable as is popularly estimated. The profits which are enjoyed by the owners of property of this character are rather the result of having control of the market and being everywhere firmly established in the business of manufacturing the patented article. It is well known that the licensees under patents make enormous profits in the manufacture of such articles as the barb-wire, after having paid the royalty to the patentee, and it is probably true of all the great concerns engaged in manufacturing patented articles that they would still be able to conduct a large and profitable business were the patent to be extinguished. In view of the fact already suggested that in rare instances only do the original patentees obtain any adequate remuneration for their inventions, it seems entirely proper that the Government at any time should have the power in its discretion to extinguish the patent by paying such sum as would be a reasonable consideration for the appropriation of private property for public purposes. Of course, but few inventions would be extinguished in this way, as their importance generally is not such as to justify interference by the Government.

15. *Abridgment of patents.*

I desire to call the attention of Congress to the necessity of making provision for the compilation and publication of a classified abridgment of patents. The necessity for this publication has been earnestly set forth in the annual reports of this office since 1848, when Mr. Commissioner Ewbank first called the attention of Congress to the subject. Year by year the need and demand for such a work are more and more forcibly felt. Each field of invention broadens, and the necessary examination to determine the utility, novelty, and usefulness of the invention presented becomes more intricate and difficult. No better illustration need to be cited to show that such an abridgment is almost indispensable than the publication of patents relating to electricity. Copies of all patents on this subject from the year 1790 to July, 1880, were compiled and bound for the Electrical Congress, held at Paris in 1880. This publication has since been continued. It is doubtful whether the work of the Office could keep pace with the vast number of applications which have been filed since the impetus given to inventive genius by the electric light and telephone, were it not for these volumes, whereby examinations are facilitated and accuracy secured. In 1881 Congress appropriated $10,000 to begin this work. Fourteen thousand patents relating to agricultural implements were abridged and the briefs made ready for publication. The appropriation, however, was not continued, and the material was boxed and stored away. An appropriation of not less than $20,000 will be required to continue the work of abridging patents and to publish the material already prepared. The ready sale to manufacturers and inventors of such an abridgment would speedily reimburse the Government for all moneys expended in compiling and publishing such a work, and it is believed that the revenues resulting from such sales would largely increase the receipts of the Office.

16. *Exchange of publications.*

Some provision should be made by Congress by which this Office can be furnished for publication in the OFFICIAL GAZETTE with certified copies of all decrees, decisions, and judgments made by the Federal courts in patent cases. I recommend that authority be conferred upon the Commissioner of Patents to furnish the OFFICIAL GAZETTE to the clerk of any Federal court, or to the library belonging to the court, in exchange for the decisions rendered by such Federal court.

I further recommend that the Commissioner be invested with authority to exchange the OFFICAL GAZETTE for any publication of a scientific or useful character published in this or any foreign country, which, in his judgment, would be desirable and valuable to the scientific library of the Patent Office.

17. *Charge for certified copies.*

I recommend that paragraph 12 of section 4934 of the Revised Statutes be amended so as to read:

For certified copies of patents and other papers when written copies are required, 10 cents per 100 words; but when certified printed copies of patents are required, 25 cents for the printed copy and 25 cents for the certificate thereof.

The Office now sells a printed copy of a patent at the rate of 25 cents for one copy and 10 cents each, if twenty or more are purchased at one time. There does not appear any reason why the addition of a certificate should increase the expense to the patrons of the Office, except so far as the cost of the certificate increased it.

BUSINESS OF THE PATENT OFFICE.

The following statements exhibit in detail the business received and transacted by the Office during the last calendar year:

RECEIPTS.

*Detailed statement of all moneys received for patents, for copies of records or drawings, or from any source whatever.**

Applications:		
Cash received		$902,096 13
Cash refunded		5,066 80
Net cash		956,957 33
Certificates of deposit		44,239 00
Total cash and certificates		1,001,196 33
Copies:		
Cash received		81,142 62
Cash refunded		2,190 18
Net cash		78,952 44
Certificates of deposit		366 40
Total cash and certificates		79,318 84
Recording assignments:		
Cash received		20,729 28
Cash refunded		1,518 06
Net cash		19,211 22
Certificates of deposit		271 00
Total cash and certificates		19,482 22
Subscription to Official Gazette:		
Cash received		15,577 23
Cash refunded		96 72
Net cash		15,480 51
Certificates of deposit		153 70
Total cash and certificates		15,634 21
Registration of labels:		
Cash received		4,392 00
Cash refunded		1,591 50
Net cash		2,800 50
Certificates of deposit		84 00
Total cash and certificates		2,884 50
Aggregates.		
Cash received		$1,083,867 26
Cash refunded		10,465 26
Net cash		1,073,402 00
Certificates of deposit		45,114 10
Total cash and certificates		1,118,516 10

*A large number of copies of patents are furnished to co-ordinate branches of the Government for which no charge is made. The receipts would be considerably increased if the Office received payment for these copies.

EXPENDITURES.

Amount expended by this Office under the several appropriations from January 1, 1888, to December 31, 1888.

Salaries	$635,300 28
Official Gazette	42,271 30
Photolithographing	72,856 59
Scientific library	2,336 58
Transportation of publications to foreign governments	390 80
Total	753,154 50

*Approximate amount expended by the Department of the Interior on account of this Office from January 1, 1888, to December 31, 1888.**

Stationery	$8,572 44
Postage on foreign matter	1,049 00
Printing and binding	183,921 21
Watch force	16,090 00
Furniture	2,139 84
Carpets	510 69
Ice	536 67
Telephones	468 00
Washing towels	142 71
Sundries	3,623 72
Total	219,954 28
Aggregate amount of expenditures	973,108 78

*A literal compliance with the provisions of the statute requiring "a detailed statement of all expenditures for contingent and miscellaneous expenses" is not possible, for the reason that the contingent fund for the several bureaus of this Department was consolidated by the act of March 3, 1883, and hence no part of that fund is disbursed by the Patent Office, and I am furnished only with an approximate sum, expended on behalf of the Patent Office.

RECEIPTS OVER EXPENDITURES.

Total receipts	$1,118,516 10
Total expenditures	973,108 78
Receipts over expenditures	145,407 32

Statement of balance in the Treasury of the United States on account of the Patent fund.

Amount to the credit of the fund January 1, 1888	$3,257,490 91
Amount of receipts during the year 1888	1,118,516 10
Total	4,376,007 01
Deduct expenditures for the year 1888	973,108 78
Balance January 1, 1889	3,402,898 23

SUMMARY OF THE BUSINESS OF THE PATENT OFFICE.

Number of applications for patents for inventions	34,713
Number of applications for patents for designs	971
Number of applications for reissues of patents	113
Total number of applications relating to patents	35,797
Number of caveats filed	2,251
Number of applications for registration of trade-marks	1,314
Number of applications for registration of labels	729
Number of disclaimers filed	8
Number of appeals on the merits	1,252
Total	5,554
Total number of applications requiring investigation and action	41,351
Number of patents issued, including designs	20,490
Number of patents reissued	86
Number of trade-marks registered	1,059
Number of labels registered	327
Total	21,892
Number of patents expired during the year	11,687
Number of patents withheld for non-payment of final fee	2,881

PATENTS ISSUED.

Patents issued to citizens of the United States, with the ratio of population to each patent granted.

States and Territories.	Patents and designs.	One to every—
Alabama	64	19,726
Arizona Territory	10	4,044
Arkansas	69	11,630
California	445	1,943
Colorado	153	1,270
Connecticut	759	880
Dakota Territory	89	1,518
Delaware	33	4,442
District of Columbia	214	830
Florida	39	6,910
Georgia	122	12,640
Idaho Territory	12	2,717
Illinois	1,061	1,853
Indian Territory	5	.....
Indiana	494	4,004
Iowa	368	4,414
Kansas	330	3,018
Kentucky	218	7,562
Louisiana	98	9,591
Maine	152	4,209
Maryland	288	3,303
Massachusetts	1,887	944
Michigan	693	2,302
Minnesota	277	2,818
Mississippi	48	23,574
Missouri	647	3,351
Montana Territory	31	1,363
Nebraska	137	3,302
Nevada	17	3,662
New Hampshire	141	2,460
New Jersey	963	1,810
New Mexico Territory	23	5,198
New York	3,634	1,996
North Carolina	55	25,450
Ohio	1,353	2,363
Oregon	66	2,648
Pennsylvania	1,990	2,152
Rhode Island	209	1,323
South Carolina	42	23,704
Tennessee	131	11,773
Texas	239	6,660
Utah Territory	21	6,895
Vermont	89	3,734
Virginia	97	15,593
Washington Territory	36	2,889
West Virginia	62	9,975
Wisconsin	461	2,853
Wyoming Territory	6	3,464
United States Army	9	.....
United States Navy	12	.....
Total	18,884	.....

Patents issued to citizens of foreign countries.

Austria-Hungary	30
Belgium	20
Brazil	1
Canada	281
Canary Islands	1
Central America	3
Chile	1
Colombia, United States of	2
Cuba	5
Denmark	8
England	523
France	131
Germany	355
Hawaii	2
Ireland	12
Italy	4
Mexico	7
Netherlands	4
Newfoundland	1
New South Wales	6
New Zealand	5
Norway	6
Queensland	1
Russia	18
Scotland	33
South Australia	4
Spain	2
Sweden	13
Switzerland	44
Turkey	1
Victoria	11
Wales	1
Total	1,536

Comparative statement of the business of the Office from 1837 to 1888, inclusive.

Year.	Applications.	Caveats filed.	Patents and reissues.	Cash received.	Cash expended.	Surplus.
1837	.....	.....	436	$20,290 08	$33,506 98	.....
1838	.....	.....	520	42,123 54	37,402 10	$4,721 44
1839	.....	.....	325	37,260 00	34,543 51	2,716 49
1840	735	228	473	38,056 51	39,020 07	.....
1841	847	312	495	40,413 01	52,666 87	.....
1842	761	291	517	36,505 68	31,241 48	5,264 20
1843	819	315	510	35,315 81	30,776 96	4,538 85
1844	1,045	380	495	42,509 26	36,244 73	6,264 53
1845	1,246	432	504	51,076 14	39,395 65	11,680 49
1846	1,272	448	638	50,364 16	46,158 71	4,105 45
1847	1,531	553	569	63,111 19	41,878 35	21,232 84
1848	1,088	607	652	67,576 69	58,905 84	8,670 85
1849	1,955	595	1,008	80,752 98	77,716 44	3,036 54
1850	2,193	602	993	86,967 05	80,100 95	6,816 10
1851	2,258	760	872	95,738 61	86,916 93	8,821 68
1852	2,639	996	1,019	112,656 34	95,916 91	16,739 43
1853	2,673	901	961	121,527 45	132,869 83	.....
1854	3,228	868	1,844	163,789 84	167,146 32	.....
1855	4,435	906	2,012	216,459 35	179,540 33	36,919 02
1856	4,900	1,034	2,506	192,588 02	199,981 02	.....
1857	4,771	1,010	2,996	196,132 01	211,582 09	.....
1858	5,364	934	3,095	203,716 16	193,193 74	10,522 42
1859	6,225	1,097	4,504	245,942 15	210,278 41	35,663 74
1860	7,653	1,084	4,778	256,352 59	252,820 80	3,531 79
1861	4,643	700	3,329	137,354 44	221,491 91	.....
1862	5,098	834	3,582	215,754 99	182,810 39	32,944 60
1863	6,014	787	4,184	195,593 29	189,414 14	6,179 15
1864	6,932	1,083	5,025	240,919 78	229,868 00	11,051 98
1865	10,664	1,937	6,616	348,791 84	274,199 34	74,592 50
1866	15,289	2,723	9,458	495,665 38	361,724 28	133,941 10
1867	21,276	3,597	13,026	646,581 92	639,263 32	7,318 60
1868	20,420	3,705	13,410	691,565 86	628,679 77	62,886 09
1869	19,271	3,624	13,997	693,145 81	486,430 78	206,715 03
1870	19,171	3,573	13,353	669,456 76	557,149 19	112,307 57
1871	19,472	3,366	13,056	678,716 46	560,595 08	118,121 38
1872	18,246	3,060	13,613	699,736 39	665,591 36	34,135 03
1873	20,414	3,248	12,864	703,191 77	691,178 98	12,012 79
1874	21,602	3,161	13,599	738,378 17	679,298 41	58,969 76
1875	21,638	3,094	14,837	743,453 36	721,657 71	21,795 65
1876	21,425	2,997	15,595	757,987 65	652,542 60	105,445 05
1877	20,308	2,809	14,187	732,342 85	613,152 62	119,190 23
1878	20,260	2,755	13,444	725,375 55	598,082 89	132,292 66
1879	20,059	2,620	13,213	703,931 47	529,938 97	174,292 50
1880	23,012	2,490	13,947	749,695 32	538,865 17	210,830 15
1881	26,029	2,403	16,564	853,065 89	605,173 28	248,492 61
1882	31,922	2,553	19,267	1,009,219 45	683,867 67	325,351 78
1883	35,577	2,741	22,338	1,146,240 00	675,224 86	471,006 14
1884	35,600	2,582	20,413	1,075,798 80	970,579 76	105,219 04
1885	35,717	2,552	24,228	1,188,098 15	1,084,378 85	103,710 30
1886	35,968	2,513	22,506	1,154,551 40	992,503 40	162,047 95
1887	35,619	2,622	21,477	1,144,509 60	994,472 22	150,037 38
1888	35,797	2,251	20,490	1,116,576 10	973,106 78	145,407 32

Statement showing the number of the first patent, Design patent, and reissued patent, and the number of the first certificate of registration of a Trade-Mark and a Label issued in each calendar year since July 28, 1836, when the present series of numbers of Letters Patent commenced, together with the total number of each issued during the year.

[The number of patents granted prior to the commencement of this series of numbering (July 28, 1836) was 9,957.]

Year.	Number of first patent and certificate issued in each calendar year.					Number of patents and certificates of registration issued during each calendar year.						
	Patents.	Designs.	Reissues.	Trade-Marks.	Labels.	Patents.	Designs.	Reissues.	Total patents.	Trade-Marks.	Labels.	Total certificates.
1836 (July 28)	1	.....	.....	.....	.....	109	.....	.....	.....	.....	.....	.....
1837	110	.....	.....	.....	.....	436	.....	.....	.....	.....	.....	.....
1838	546	.....	1	.....	.....	515	.....	6	.....	.....	.....	.....
1839	1,061	.....	7	.....	.....	404	.....	18	.....	.....	.....	.....
1840	1,465	.....	20	.....	.....	458	.....	10	.....	.....	.....	.....
1841	1,922	.....	30	.....	.....	490	.....	6	.....	.....	.....	.....
1842	2,413	.....	36	.....	.....	488	.....	13	.....	.....	.....	.....
1843	2,901	1	49	.....	.....	494	14	11	519	.....	.....	.....
1844	3,395	15	60	.....	.....	477	12	7	496	.....	.....	.....
1845	3,872	27	67	.....	.....	476	17	11	504	.....	.....	.....
1846	4,348	44	78	.....	.....	566	59	13	638	.....	.....	.....
1847	4,914	103	91	.....	.....	495	60	14	569	.....	.....	.....
1848	5,409	163	105	.....	.....	583	46	23	652	.....	.....	.....
1849	5,992	209	126	.....	.....	989	49	30	1,068	.....	.....	.....
1850	6,961	258	158	.....	.....	884	83	26	993	.....	.....	.....
1851	7,965	341	184	.....	.....	757	90	25	872	.....	.....	.....
1852	8,622	431	209	.....	.....	890	109	20	1,019	.....	.....	.....
1853	9,512	540	229	.....	.....	846	86	29	961	.....	.....	.....
1854	10,358	626	258	.....	.....	1,759	57	28	1,844	.....	.....	.....
1855	12,117	688	296	.....	.....	1,801	70	51	2,012	.....	.....	.....
1856	14,008	753	337	.....	.....	2,316	107	83	2,506	.....	.....	.....
1857	16,324	860	420	.....	.....	2,696	113	97	2,896	.....	.....	.....
1858	19,010	973	517	.....	.....	3,467	142	126	3,695	.....	.....	.....
1859	22,477	1,075	643	.....	.....	4,165	108	231	4,504	.....	.....	.....
1860	26,642	1,188	874	.....	.....	4,363	183	232	4,778	.....	.....	.....
1861	31,005	1,366	1,106	.....	.....	3,040	142	147	3,329	.....	.....	.....
1862	34,045	1,508	1,253	.....	.....	3,221	195	116	3,532	.....	.....	.....
1863	37,266	1,708	1,369	.....	.....	3,781	176	227	4,184	.....	.....	.....
1864	41,047	1,879	1,596	.....	.....	4,638	139	248	5,025	.....	.....	.....
1865	45,685	2,018	1,844	.....	.....	6,099	221	296	6,616	.....	.....	.....
1866	51,784	2,239	2,140	.....	.....	8,874	294	290	9,458	.....	.....	.....
1867	60,658	2,583	2,430	.....	.....	12,901	325	400	13,626	.....	.....	.....
1868	72,959	2,858	2,630	.....	.....	12,544	446	420	13,410	.....	.....	.....
1869	85,508	3,304	3,250	.....	.....	12,957	506	534	13,997	.....	.....	.....
1870	98,460	3,810	3,784	.....	.....	12,157	737	439	13,333	121	.....	121
1871	110,617	4,547	4,223	122	.....	11,667	905	464	13,056	496	.....	496
1872	122,304	5,442	4,667	608	.....	12,200	884	529	13,613	491	.....	491
1873	134,504	6,386	5,216	1,099	.....	11,616	747	501	12,864	492	.....	492
1874	146,120	7,088	5,717	1,591	1	12,230	866	483	13,599	559	232	791
1875	158,320	7,999	6,200	2,150	233	13,291	915	631	14,837	1,138	232	1,370
1876	171,641	8,894	6,831	3,288	465	14,172	802	621	15,595	959	472	1,431
1877	185,918	9,696	7,452	4,947	937	12,980	699	508	14,187	1,216	308	1,908
1878	198,723	10,395	8,020	5,463	1,329	12,345	590	509	13,444	1,453	492	1,947
1879	211,078	10,975	8,589	6,018	1,821	12,133	592	488	13,213	673	555	1,227
1880	223,211	11,567	9,017	7,790	2,176	12,996	515	506	13,947	349	203	552
1881	236,137	12,092	9,523	8,139	2,379	15,548	565	471	16,584	936	302	1,033
1882	251,695	12,647	9,994	8,973	2,581	16,135	961	371	19,267	947	304	1,251
1883	269,980	13,508	10,305	9,980	2,885	21,196	1,020	167	22,383	902	906	1,808
1884	291,016	14,528	10,422	10,922	3,791	19,147	1,150	116	20,413	1,021	513	1,534
1885	310,163	15,678	10,548	11,843	4,304	23,331	773	129	24,233	1,007	391	1,458
1886	333,494	16,451	10,677	12,910	4,695	21,797	595	116	22,508	1,029	378	1,407
1887	355,221	17,046	10,783	13,989	5,073	20,429	949	99	21,477	1,133	380	1,513
1888	375,730	17,996	10,892	15,072	5,453	19,595	833	86	20,506	1,059	327	1,386
1889	395,305	18,850	10,978	16,131	5,780	.....	.....	.....	.....	.....	.....	.....

Herewith accompanying this report are lists or indexes, arranged in yearly form, of all patents granted during the calendar year 1888, properly classified under subjects of invention, and alphabetical lists of all patentees, with their places of residence. No patents were extended during the year.

Very respectfully, your obedient servant,

BENTON J. HALL, *Commissioner.*

THE

OFFICIAL GAZETTE

OF THE

United States Patent Office.

[BY AUTHORITY OF CONGRESS.]

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Fraudulent Practices by Attorneys.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., April 18, 1888.

The attention of this Office having frequently been called to circulars and communications of persons pretending to have access to the records of this Bureau, and claiming to possess information of the pendency of applications for patents, notice is hereby given the public that all such persons in so advertising themselves are acting under false representations and are guilty of unprofessional conduct, and should not be entitled to credit.

The Office has also received information that certain attorneys disbarred from practice under section 487 of the Revised Statutes are continuing to prosecute applications for patents under the names of other persons.

Hereafter a list will be published in the OFFICIAL GAZETTE containing the names and addresses of all such persons, and the public warned against employing them or intrusting applications or interests to their charge.

BENTON J. HALL, *Commissioner.*

The Office has information that *Isaac S. McGiehan, No. 135 Broadway, New York*, a disbarred attorney, has been practicing under the name of *Alexander Melhado.*

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of February 19, 1889.

Patents	482	No. 397,885 to No. 398,366, inclusive.
Designs	7	No. 18,929 to No. 18,935, inclusive.
Trade-Marks	18	No. 16,277 to No. 16,294, inclusive.
Labels	6	No. 5,824 to No. 5,829, inclusive.
Reissues	2	No. 10,986 to No. 10,987, inclusive.
Total issue	515	

TO CITIZENS OF THE UNITED STATES.

States	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama			Nebraska	4	
Arizona Territory			Nevada		
Arkansas	3		New Hampshire	1	
California	7	2	New Jersey	22	
Colorado	5		New Mexico Terri'ty	1	
Connecticut	23	4	New York	85	6
Dakota Territory	4		North Carolina	1	
Delaware			Ohio	37	
District of Columbia	3		Oregon	2	
Florida	2		Pennsylvania	37	2
Georgia	1	1	Rhode Island	3	
Idaho Territory			South Carolina	1	1
Illinois	47		Tennessee	1	
Indian Territory			Texas	6	1
Indiana	11		Utah Territory		
Iowa	11		Vermont	1	
Kansas	5		Virginia	2	
Kentucky	4		Washington Territ'y	2	
Louisiana	8		West Virginia	4	
Maine	4		Wisconsin	11	
Maryland	7		Wyoming Territory		
Massachusetts	39	5	United States Army		
Michigan	15	1	United States Navy		
Minnesota	6				
Mississippi	1		Total to citizens of the United States	445	23
Missouri	18				
Montana Territory					

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic			Germany	9	
Australia			Ireland	1	
Austria-Hungary			Italy	1	
Belgium			Mexico		
Bermuda			Netherlands		
Brazil			New Zealand	1	
Canada	8		Norway		
Chili			Russia		
Colombia, U. S. of			Scotland		
Cuba			Spain	1	
Denmark	1		Switzerland		
England	17	1			
Finland			Total to citizens of foreign countries	44	1
France	5				

DESIGNS.

18,929.—BROOCH.—*Meyer Ballin*, Chicago, Ill. Application filed June 28, 1888. Serial No. 278,472. Term of patent 14 years.

18,930.—TRIMMING.—*Johann C. F. Edelmann* and *Alphonse H. Kursheedt*, New York, N. Y., assignors to *The Kursheedt Manufacturing Company*, same place. Application filed January 21, 1889. Serial No. 297,104. Term of patent 7 years.

18,931.—SYRINGE.—*Percival Everitt*, New York, N. Y. Application filed January 14, 1889. Serial No. 296,295. Term of patent 14 years.

18,932.—FLASK.—*Le Roy W. Fairchild*, New York, N. Y. Application filed January 21, 1889. Serial No. 297,006. Term of patent 3½ years.

18,933.—ORNAMENTATION OF TEXTILE FABRICS.—*George W. T. Harley*, Frederick, Md. Application filed January 17, 1889. Serial No. 296,653. Term of patent 14 years.

18,934.—LAMP.—*Franz Iffland*, Berlin, Germany, assignor to *Carl Rakenius & Co.*, same place. Application filed November 16, 1888. Serial No. 291,067. Term of patent 7 years.

18,935.—PINNACLE.—*Herbert Symonds*, St. Louis, Mo., assignor to *Mesker & Brother*, same place. Application filed November 27, 1888. Serial No. 292,032. Term of patent 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,277.—PLUG-TOBACCO FOR CHEWING AND TOBACCO FOR SMOKING. *Arnold, Carlton & McCord*, Atlanta, Ga. Application filed December 28, 1888. Used since April, 1886.

"The words 'JEFFERSON DAVIS.'"

16,278.—OIL OR LINIMENT.—*George T. Atkins*, Dallas, Tex. Application filed February 21, 1888. Used since September, 1880.

"The pictorial representation of a rattlesnake."

16,279.—LAUNDRY ARTICLES, SUCH AS CLOTHES WRINGERS AND DRIERS.—*Empire Wringer Company*, Auburn, N. Y. Application filed January 18, 1889. Used since November 10, 1888.

"The representation of a horseshoe."

6,280.—WIRE FENCING.—*The Gilbert & Bennett Manufacturing Company*, Georgetown, Conn., and New York, N. Y. Application filed December 28, 1888. Used since December 1, 1881.

"The word 'WORLD'S.'"

16,281.—WIRE FENCING.—*The Gilbert & Bennett Manufacturing Company*, Georgetown, Conn., and New York, N. Y. Application filed December 28, 1888. Used since December 1, 1884.

"The word 'COTTAGE.'"

16,282.—WINDOW-SCREEN WIRE-CLOTH.—*The Gilbert & Bennett Manufacturing Company*, Georgetown, Conn., and New York, N. Y. Application filed December 28, 1888. Used since January 1, 1887.

"The word 'PEARL.'"

16,283.—LAXATIVE MEDICINE.—*Robert M. Green* and *Marshall E. Ogborn*, San Francisco, Cal. Application filed December 13, 1888. Used since December 4, 1888.

"The words 'FIG REMEDY' and the representation of a single green leaf with a blue fig suspended centrally in front of it."

16,284.—KEROSENE.—*Shipton Green*, New York, N. Y. Application filed January 5, 1889. Used since July 2, 1888.

"The word 'RESPLANDOR.'"

16,285.—LADIES' AND MISSES' HATS AND BONNETS.—*Frank F. Hodges*, Boston, Mass. Application filed January 9, 1889. Used since May, 1883.

"The words 'RUSSIAN HAIR.'"

16,286.—PHOTOGRAPHIC CAMERAS.—*Edward I. Horsman*, New York, N. Y. Application filed January 2, 1889. Used since December 1, 1886.

"The word 'ECLIPSE.'"

16,287.—CHURNS.—*John C. Kearns*, Maitland, Pa. Application filed January 3, 1889. Used since December, 1888.

"The representation of a cow."

16,288.—PLAYING-CARDS.—*James W. Lewis & Co.*, New York, N. Y. Application filed January 4, 1889. Used since November 1, 1887.

"The representation of crossed fasces and the letters 'N P C Co' superimposed upon a single spot of spades."

16,289.—BANK-CHECK PUNCHES.—*Frederick J. Lockwood*, Bridgeport, Conn. Application filed December 26, 1888. Used since July 5, 1888.

"The word 'LIGHTNING.'"

16,290.—ILLUMINATING-OIL.—*Mather Brothers*, Albany, N. Y. Application filed January 14, 1889. Used since 1887.

"The word 'MONARCH' and a stag's head set in a landscape and surrounded by a circle."

16,291.—KEROSENE-OIL.—*Henry W. Peabody & Co.*, Boston, Mass. Application filed January 7, 1889. Used since October 26, 1888.

"The words 'SOUTHERN LIGHT.'"

16,292.—KEROSENE-OIL.—*Henry W. Peabody & Co.*, Boston, Mass. Application filed January 7, 1889. Used since October 26, 1888.

"The words 'DAY DAWN.'"

16,293.—KEROSENE-OIL.—*Henry W. Peabody & Co.*, Boston, Mass. Application filed January 7, 1889. Used since October 26, 1888.

"The words 'GOLDEN RAY.'"

16,294.—FINE WRITING-PAPER.—*Wauregan Paper Company*, Holyoke, Mass. Application filed January 9, 1889. Used since December 7, 1888.

"The representation of a woman seated in a chair and spinning flax from a distaff."

LABELS.

5,824.—Title: "MRS JULIA A. ACHARD'S LINIMENT."—*Julia A. Achard*, Lodi, Cal. Application filed January 26, 1889.

5,825.—Title: "PROF. JENROUX'S INDIAN HERBAL TONIC."—*Joseph Jenroux*, Detroit, Mich. Application filed December 17, 1888.

5,826.—Title: "ROCK CANDY."—*A. H. Stillwell*, trading as *William Lang & Son*, Philadelphia, Pa. Application filed January 28, 1889.

5,827.—Title: "SUNLIGHT SOAP."—*Lever Bros.*, Warrington, county of Lancaster, England. Application filed November 20, 1888.

5,828.—Title: "MINERALIZED RUBBER" (FOR RUBBER GOODS.)—*Mineralized Rubber Company*, New York, N. Y. Application filed January 24, 1889.

5,829.—Title: "RIVER'S LINIMENT."—*Frank Edward Rivers*, Charleston, S. C. Application filed December 22, 1888.

PATENTS

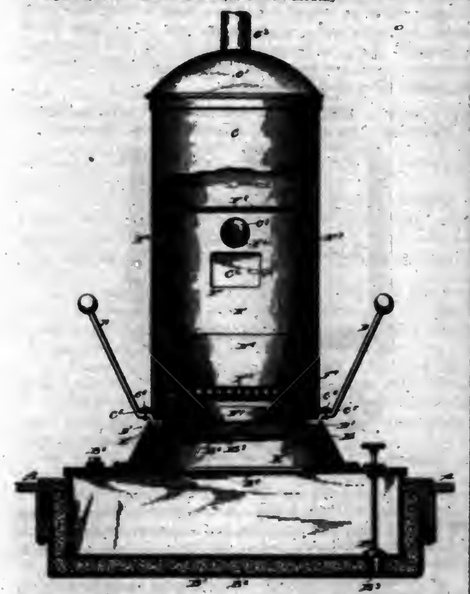
GRANTED FEB. 19, 1889.

397,885. SPOON-REST. HORATIO H. ABER, East Hampton, Conn. Filed Feb. 13, 1888. Serial No. 263,847. (No model.)



Claim.—The detachable spoon-rest herein described, consisting of the standard *b*, having a foot, *c*, and formed at its top with the rest-plate *f*, having on its side edges the clips *d*, adapted to receive and hold the handle of the spoon, substantially as specified.

397,886. CAR-HEATER. HENRY R. ALBRIGHT, Moline, Ill. Filed Apr. 11, 1887. Serial No. 234,385. (No model.)



Claim.—1. In a car-heater, the combination of a water-tank having an outer heating-cylinder mounted thereon provided with a fuel-poke and uptake, with a fire-cylinder mounted for longitudinal movement in said heating-cylinder, and provided with apertures or openings communicating with said fuel-poke and uptake, whereby by reason of said longitudinal movement of the fire-cylinder the communication may be broken, substantially as specified.

2. In a car-heater, the combination of an outer heating-cylinder having pivoted weighted levers projecting therein, said cylinder being mounted upon and communicating with a water-tank, with an annular casting, as E, provided with a valve-seat and connecting-flange mounted on said weighted arms, and a fire-box mounted on said casting, substantially as specified.

3. In a car-heater, the combination of an outer heating-cylinder having loosely-pivoted weighted arms, as D, projecting therein, with an annular casting provided with a flange mounted on said arms, and a fire-cylinder mounted on said casting and provided with perforations at its top, substantially as specified.

4. The cylinder C, having the lugs C^3 and bolt C^4 and weighted arms D, in combination with the casting E, having the opening E^2, formed with a valve-seat, and the valve-plate E^3, substantially as specified.

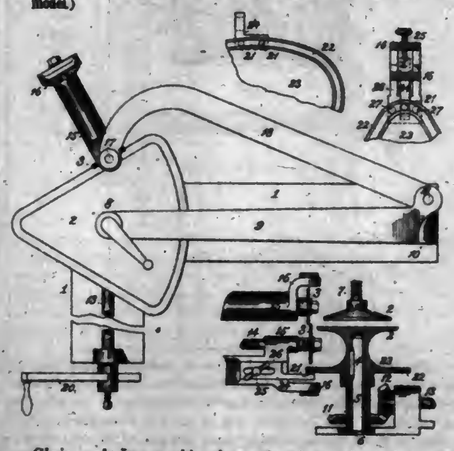
397,887. ATTACHMENT-HOLDER FOR SEWING-MACHINES. RUSSEL S. BARNUM, Chicago, Ill., assignor to HARRY C. Goodrich, same place. Filed Apr. 26, 1887. Serial No. 234,941. (No model.)



Claim.—1. The combination of plate A, having hole *d*, the plate C, provided with ear *c*, fitting in the hole *d* to render said plate C detachable and adjustable, the lever B, pivoted to plate A and struck up or recessed to overlap the plate C, means for connecting the lever B and plate C, whereby said plate may be adjusted, and means for securing the lever B in the position to which it may be turned, substantially as described.

2. The combination of plate A, having hole *d* and notched edge *d'*, the plate C, provided with ear *c*, fitting in the hole *d*, said plate being also provided with pin *d'*, and the lever B, pivoted to plate A and having an opening, *b'*, to receive the pin *d'*, whereby said lever is connected with the plate C, said lever being struck up or recessed to be swung over upon and overlap the plate C, and provided with a tooth, *e*, to engage the notched edge *d'* of the plate A, whereby the lever is held in the position to which it may be turned, substantially as described.

397,888. PROFILE-CUTTING MACHINE. SAMUEL T. BARRAS, Philadelphia, assignor of one-half to William A. Cheyney, Thornbury, Delaware County, Pa. Filed May 3, 1888. Serial No. 272,656. (No model.)



Claim.—1. In a machine for cutting sheets of metal, &c., the combination of the bed-plate, the articulated frame pivoted thereto, the bearing-frame supported thereon, a pair of cutters mounted in

suitable bearings, the work-holder, the grooved pattern, and the guide-pin adapted to engage the groove of said pattern, substantially as set forth.

2. In a machine for cutting sheets of metal, &c., the combination of the bed-plate, the articulated frame pivoted thereto, the bearing-frame supported thereon, a pair of cutters mounted in suitable bearings, the work-holder, the grooved pattern, and a pair of guide-pins fixed adjacent one to the other and engaging the groove of the pattern, these members being combined for joint operation to maintain a line of direction for the cutter tangential to the cut, substantially as set forth.

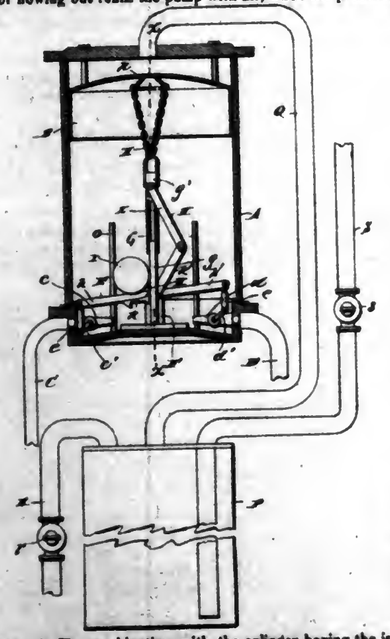
3. In a machine for cutting sheets of metal, &c., the combination of the bed-plate, the articulated frame pivoted thereto, the bearing fixed thereon, a pair of journaled clamping-plates, a pair of cutters mounted in suitable bearings, the grooved pattern, and the guide-pin engaging the groove of said pattern, substantially as set forth.

4. In a machine for cutting sheets of metal, &c., the combination of the bed-plate, the articulated frame pivoted thereto, the bearing-frame fixed thereon, a pair of cutters mounted in bearings in the articulated frame, the work-holder fitted to move in the fixed frame, the driving-shaft imparting movement to the work-holder, the grooved pattern connected to the work-holder, and the guide-pin connected to the cutter-bearings and engaging the groove of said pattern, substantially as set forth.

5. In a machine for cutting sheets of metal, &c., the combination of the bed-plate, the articulated frame pivoted thereto, the bearing-frame fixed thereon, a pair of cutters mounted in suitable bearings, the work-holder, the driving-shaft imparting movement to the work-holder, the grooved pattern connected to the work-holder, the guide-pin fixed to the frame of the cutter-bearings and engaging the groove of the pattern, and a pair of guide-pins fixed to a block fitted to slide on the frame of the cutter-bearings toward and from the work-holder and engaging the groove of the pattern on opposite sides of the fixed guide-pin, substantially as set forth.

397,889. WATER OR LIQUID ELEVATOR. DAVID C. BATTEY, Florence, Kans. Filed Aug. 13, 1888. Serial No. 282,591. (No model.)

Brief.—By shifting the weight I the inlet and outlet valves are closed and opened, so that water entering forces the air into a water-elevator or flowing out refills the pump with air, when the process is repeated.



Claim.—1. The combination, with the cylinder having the inlet and discharge pipes C D, provided with valves *c d*, of the operating-lever connected at its opposite ends to the said valves *c d*, the weighted arm adapted to bear on either arm of the said lever, the trip-lever adapted to throw the said weight from one arm of the operating-lever to the other, and the plunger or float connected to the said trip-lever, substantially as specified.

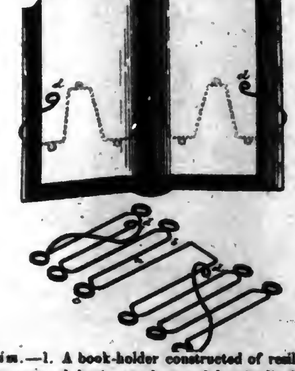
2. The combination, with the compressing-cylinder provided with inlet and outlet pipes C D, having valves *c d*, and the plunger or float operating in the cylinder, of the operating-lever pivoted at its center and connected at its ends to the said valves, the swinging arm H, provided with a weight, I, adapted to bear on either arm of the operating-lever, and the trip-lever K, connected to the plunger or float and provided with the arms *k k'*, adapted to alternately engage the weight as the plunger or float ascends and descends, to throw the same from one arm of the operating-lever to the other, substantially as and for the purpose specified.

3. The combination, with a cylinder provided with inlet and outlet pipes C D, having valves *c d*, and the plunger or float operating in the cylinder, of the operating-lever E, connected at its ends to the said valves, the weighted arm H, adapted to bear alternately on the arms of the said lever, the extensible shaft G, connected at its upper end to the plunger or float, and the trip-lever connected to the extensible shaft and adapted to engage the weighted arm to change its position, substantially as specified.

4. The combination, with the cylinder provided with the pipes C D, having valves *c d*, of the operating-lever E, connected to the said valves, the arm H, provided with a weight, I, adapted to bear alternately on the arms of the lever E, the extensible shaft G, the trip-lever connected to the said shaft and adapted to engage to change its position from one arm of the lever to the other, the weighted arm, and the plunger or float B, connected to the upper end of the extensible shaft by means of a chain or flexible connection, H, and provided with a socket, *n*, to bear on the upper end of said shaft, substantially as specified.

5. The cylinder provided with the inlet and outlet pipes C D, having valves *c d*, the operating-lever E, connected to the said valves, the weighted arm H, adapted to operate the said lever, the extensible shaft G, and the trip-lever connected to the said shaft and adapted to operate the weighted arm, in combination with the inverted-cup-shaped plunger or float B, operating snugly in the cylinder and connected to the upper end of the extensible shaft by a chain or other flexible connection, the central socket, *n*, adapted to bear on the upper end of the extensible shaft, and the vertical bars or supports O O, arranged within the cylinder and adapted to limit the downward movement of the plunger, substantially as specified.

397,890. BOOK HOLDER AND MARKER. JACOB A. BRIDLER, Lanark, Ill. Filed Apr. 9, 1888. Serial No. 270,143. (No model.)



Claim.—1. A book-holder constructed of resilient material or substance arranged in sinuous form and longitudinally extensible, so as to provide for adaptation to books of different widths, substantially as described.

2. A sinuous wire having its ends *d* elevated above the body and returned upon and over the body, substantially as described, and adapted for use as a book-holder.

3. A book-holder constructed of a longitudinally-extensible sinuous wire, having its ends returned and elevated above the body of the wire, and rendered smooth to permit the leaves to be moved freely under them, substantially as described.

4. A book-holder constructed of wire bent back and forth upon itself with integral coils interposed and extensible longitudinally, to adapt it to books of different widths, and terminating in leaf-engaging fingers, substantially as described.

5. A book-holder constructed of wire having sinuosities, the middle one of which is larger than the others, to engage the back of a book, and extensible lengthwise to fit books of different widths, and leaf-engaging terminals, substantially as described.

6. A book holder and marker constructed of resilient material or substance arranged in sinuous form, and thereby adapted to be extended lengthwise to be applied to books of different widths, and having fingers rising therefrom at each end in planes substantially at right angles to its sinuosities, substantially as described.

7. A book holder and marker constructed of resilient material or substance arranged in sinuous form and extensible lengthwise to fit books of different widths, and provided with loosely-applied non-abrading substance or material, substantially as described.

8. A book-holder constructed of coiled resilient material or substance arranged in sinuous form and provided with a cord or other non-abrading material or substance reeved through its coils, substantially as described.

9. A book holder and marker constructed of resilient material or substance arranged in sinuous form and provided with end fingers returned upon and over the body of the holder, and having non-abrading material or substance applied thereto, substantially as described.

397,891. PLOW. ADOLF P. BÜRKNER, Kansas City, Mo. Filed Oct. 18, 1888. Serial No. 288,456. (No model.)



Claim.—1. In a plow, the combination, with the landside, of the adjustable guide-plate pivoted at its front side to the landside and adjustably secured thereto at its rear end, and provided with a laterally-projecting knife-plate extending under the landside, substantially as specified.

2. In a plow, the combination, with the landside, of the adjustable guide-plate pivoted at its front end to the inner side of the landside, and provided with a laterally-projecting knife-plate which extends under the landside, the said guide-plate being further provided at its rear end with a vertically-slotted arm which is arranged adjacent to a horizontally-slotted stationary arm on the plow, and the adjusting-bolt engaging the said horizontal and vertical slots, whereby the rear end of the guide-plate may be vertically and horizontally adjusted, substantially as specified.

3. In a plow, the combination, with the stationary landside, of the adjustable guide-plate pivoted thereto, and provided with a supplemental removable knife-plate, *f*, secured to its lower edge and projecting under the lower edge of the landside, substantially as specified.

4. In a plow, the combination, with the mold-board, of a wear-plate, I, pivoted at its front end to the mold-board, and provided at its rear end with a vertically-slotted ear, G, engaged by a suitable adjusting-bolt, substantially as specified.

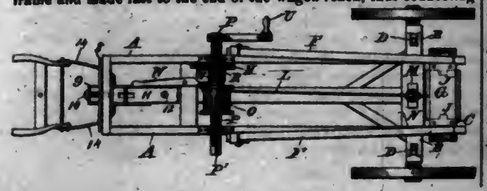
5. The combination, with a plow, of the colter-holder U, arranged on the beam thereof, and comprising the frame U', the grooved block V, and the grooved wedge V', and the colter provided with a rounded shank fitting between the block and the wedge and held in place thereby, substantially as specified.

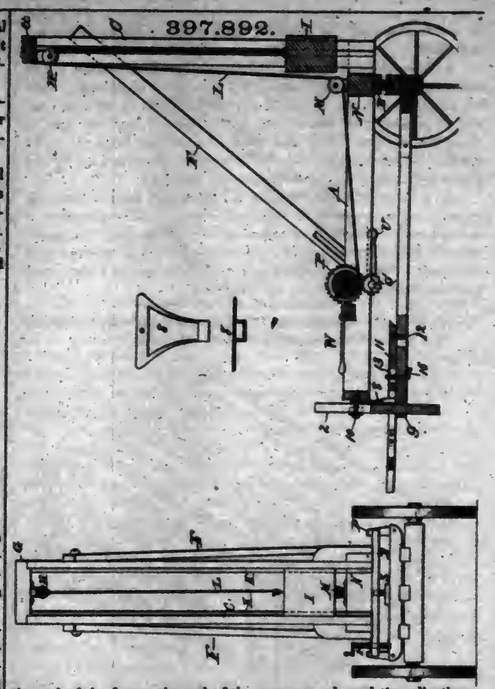
6. The colter-holder comprising the frame U', embracing the beam of a plow, and provided with a set-screw, *n*, the grooved block V and the grooved wedge V', arranged in the frame with their grooved sides opposed to each other, and the set-screws W W, bearing against the outer side of the said wedge, in combination with the colter provided with a rounded shank fitting between the block and the wedge, substantially as specified.

397,892. POST-DRIVER. IRA W. BRADSHAW, Richland Centre, Wis. Filed Aug. 16, 1888. Serial No. 282,906. (No model.)

Claim.—1. The combination, in post-drivers having a pivoted rack, clutch-windlass, trip-lever, ratchet-wheel, and pawl, of the rocking pin with the upper end secured to the false or frame bolster, while the lower end rests in the socket secured to the wagon-bolster, and the screw-bolt swiveled in a journaled plate and threaded in a journaled nut and provided with a small crank, for the purposes set forth.

2. In post-drivers having pivoted racks, the combination of the adjusting-standard and triangular brace pivoted to the end of the frame and made fast to the end of the wagon-reach, thus connecting

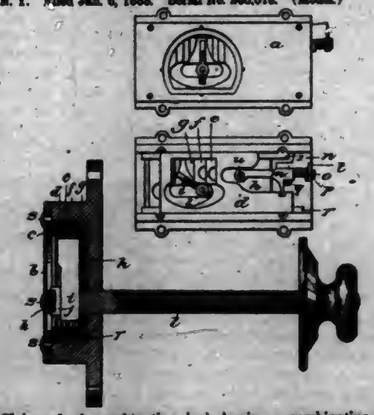




the end of the frame, the end of the wagon-reach, and the adjusting-standard securely together in such a way that the end of the frame may be raised or lowered or rocked to either side at will, as set forth.

3. In post-drivers mounted on two wheels, the thill-connector, in combination with the iron pin in front end of the wagon-reach and the reversible T on the upper end, all substantially as set forth.

397,898. COMBINATION-LOCK. HENRY C. BROWN, Jr., Brooklyn, N. Y. Filed Jan. 6, 1888. Serial No. 260,018. (Model.)



Claim.—1. A combination-lock having a combination of independent tumblers with unequal and irregular openings or apertures within or near their centers, through which openings a detached and independent spindle passes and operates upon the tumblers within the openings by means of an adjustable arm attached to the spindle, substantially as herein shown and described.

2. A combination-lock having tumblers operating independently of each other, which tumblers are operated upon and adjusted individually by means of an arm connected with a spindle and acting upon each tumbler directly and independently, substantially as herein shown and described.

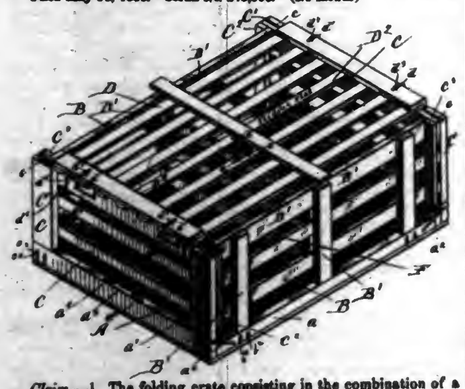
3. A combination-lock having a thin plate or cap, *b*, in combination with the independent spindle *l*, adjustable arm *i*, independent tumblers *d e f g*, and dog *m*, the thin plate or cap being arranged and adjusted upon the back of the case of the lock, as described, whereby the spindle *l* and arm *i* may be driven in, removing the thin

plate or cap without destroying or injuring the other parts of the lock or case or displacing the tumblers, substantially as herein shown and described.

4. A combination-lock having an independent spindle, *l*, and arm *i*, held in position by means of the set-screw *k*, and keeper *j*, having a ratchet or teeth interlocking with like teeth in the arm *i*, arranged as described, whereby the combination of the lock may be changed and regulated by shortening or extending the arm *i* in the spindle *l*, in combination with the independent tumblers *d e f g* and dog *m*, substantially as herein shown and described.

5. A combination-lock having a dog, *m*, and head *n*, carrying-screw *p*, and set-screw *q*, as described, whereby the combination of the lock may be changed by extending or drawing back the head *n* upon the dog *m* by means of the carrying-screw *p* and set-screw *q*, in combination with the sliding tumblers *d e f g*, spindle *l*, and arm *i*, substantially as herein shown and described.

397,894. FOLDING CRATE. WILLIAM H. CADWELL, Chicago, Ill.
Filed May 31, 1888. Serial No. 275,598. (No model.)



Claim.—1. The folding crate consisting in the combination of a bottom, A, with folding sides B B, folding ends C C, and folding top D, having sliding hinges connecting the same with said ends C C, and provided with under cross-bars D^2 D^2, for the folding ends C C to abut against when the crate is folded, substantially as specified.

2. In a folding crate, the combination, with bottom A, having side and end rails, *a a'*, of folding sides B B, wire staple-form hinges $b\ b'\ b^2\ b^3$, uniting said parts, the free ends b^2 of the wire hinge part b^3 being folded around said rails *a*, folding ends C C, and wire staple-form hinges $c\ c'\ c^2\ c^3$, uniting said parts, the free ends c^2 of the wire hinge-piece c^3 being folded around said rails *a'*, substantially as specified.

3. The combination, with the bottom of a folding crate, of a folding side and a wire staple-form hinge of two pieces, *b* and b^3, said part *b* having eyes *b'* at its free end and the free ends b^2 of the part b^3 being folded around a rail on the bottom of said crate, substantially as specified.

4. The combination, with bottom A, of folding sides B B, folding ends C C, folding top D, wire hinge-rod *d*, extending longitudinally under one of the slats of said top to form a slot for the sliding hinge-pin to fit in, and a removable hinge-pin, d^2, secured to said folding end C near the top edge thereof, substantially as specified.

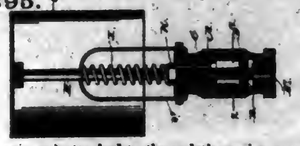
5. In a folding crate, the sliding hinged top D, having movable slat D^2, and upper and lower cross-bars, between which said slat D^2 slides, and provided with a wire hinged catch, E, consisting of two right-angled portions, one of which is stapled to an adjoining slat and the other of which is provided with a downwardly-bent end, substantially as shown, to enter a hole in said movable slat D^2, and staples *e*, substantially as specified.

6. The combination, with bottom A, having side and end rails, *a a'*, of folding hinged sides B B, folding hinged ends C C, top D, having sliding hinges connecting the same at both ends with said ends C C, partition F, formed of upright posts and cross-slats, with spaces between, and having hooks *f*, pins *f'*, and slotted guides f^2 f^3 secured to said sides B B, said partition being of less height than the crate, so that said partition may be set up or taken down without removing said folding top D, substantially as specified.

397,895. FLOAT-VALVE FOR WATER-WORKS. SHERWOOD M. CRANE, Navarre, Ohio. Filed Jan. 20, 1888. Serial No. 261,261. (No model.)

Claim.—The combination of the valve-case having the guide-yoke on its upper end, the float having its upper end closed and its lower end open, the rod depending from the top of said float and guided in the yoke, the vertically-movable downwardly-opening valve arranged

397,895.



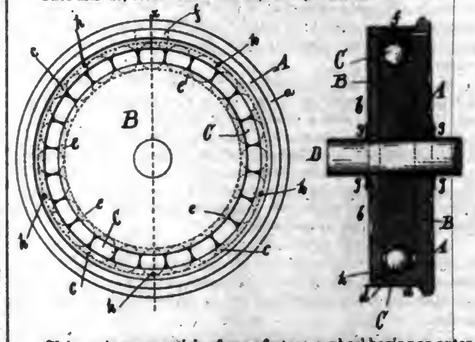
in the valve-case and attached to the rod, the spring arranged on the latter, and bearing against the under side of the yoke, and the adjusting-nut on the said rod bearing against the lower end of the spring, substantially as described.

397,896. HORSESHOE-NAIL. JOHN A. COLEMAN, Providence, R. I.
Filed Apr. 21, 1887. Renewed July 25, 1888. Serial No. 281,022. (No model.)



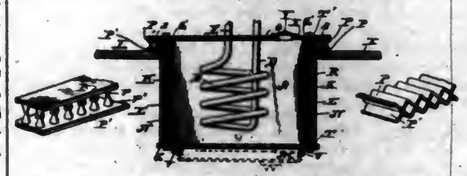
Claim.—As a new article of manufacture, a horseshoe-nail formed of drawn wire by the process of striking up and enlarging the head of the nail therefrom and drawing down the shank and hardened-point portion therefrom without substantially impairing the hardened shell of the wire which surrounds the ductile central core portion of the nail, substantially as described.

397,897. VEHICLE-WHEEL. HERMAN R. CROSS, Jersey City, N. J.
Filed Mar. 23, 1888. Serial No. 268,201. (No model.)



Claim.—As a new article of manufacture, a wheel having an outer hollow shell-like portion, as A *b*, an inner portion, as B, balls or equivalent devices working between a groove on the periphery of the portion B and a groove on the inner periphery or circumference of the shell A, and means whereby said balls may be placed in position, substantially as specified.

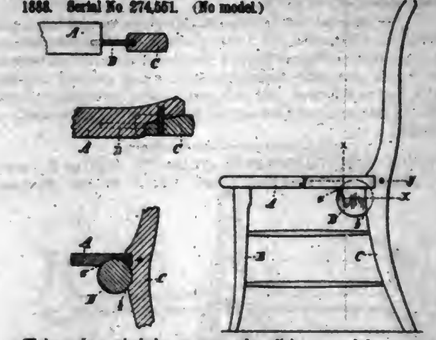
397,898. HEATING APPARATUS FOR STREET-CARS. LEWIS K. CURLETT, Chicago, Ill. Filed Jan. 6, 1888. Serial No. 295,734. (No model.)



Claim.—1. In a pendent car-heater, a combustion-chamber composed of an inner casing, an outer jacket, a bottom, and a top plate extending beyond the walls of the outer jacket, so as to form a circumferential flange, said bottom and top plate being connected by bolts passing through the air-space between the inner and outer casings, substantially as set forth.

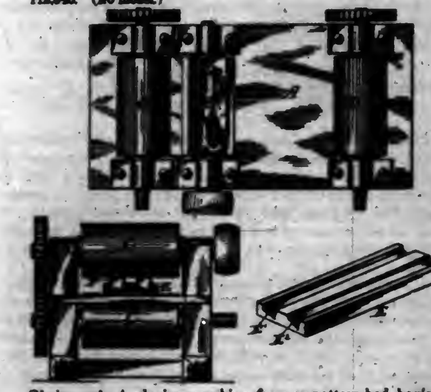
2. In a pendent car-heater, a combustion-chamber composed of an inner casing, an outer jacket, a bottom, and a top plate extending beyond the walls of the outer jacket, so as to form a circumferential flange, the whole connected by bolts, as described, said bottom and top plate being provided with openings registering with the air-space between the inner casing and outer jacket, in combination with a pair of supporting rings or guards fitting around the outer jacket under the flange of the top plate, and provided with studs or corrugations, the apices of which are placed in contact, substantially as and for the purpose set forth.

397,899. JOINT FOR CHAIRS. THEODORE CURTIS, Reading, Mich., assignor of one-half to Samuel N. Curtis, same place. Filed May 21, 1888. Serial No. 274,551. (No model.)



Claim.—In a chair-brace, a wooden disk secured in segmental circular mortises in the corners of a chair-frame, substantially as and for the purpose described.

397,900. MACHINE FOR THE MANUFACTURE OF FELLIES. JESSE W. DARK, Columbus, Ohio. Filed Nov. 21, 1883. Serial No. 112,340. (No model.)

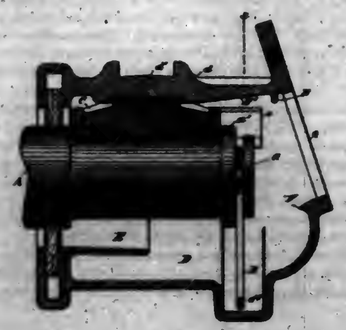


Claim.—1. A planing-machine form or pattern-bed having a series of grooves, the bottoms and walls of each of which are inclined at different angles to each other in each groove, substantially as specified.

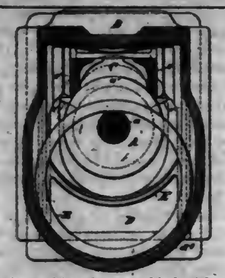
2. The combination, with a wood-planing machine, of a form or pattern-bed having a groove deeper on one side than on the other and an inclined bottom, and adapted to present one side of a square strip, and also a groove having a less inclined bottom and adapted to present a beveled strip angularly to the cutter thereof, substantially as shown and described.

3. The combination of the cutter-head B, feed-rolls C, bed A, and between said feed-rolls the form or pattern-bed E, having the grooves E' E^2, the angles formed by the sides and bottom of which differ in inclination, substantially as shown and described.

397,901. AXLE-LUBRICATOR. WILLIAM U. DUNBAR, Altoona, Pa. Filed June 6, 1888. Serial No. 276,942. (No model.)



397,901.



Claim.—1. A journal-bearing provided with shelves or troughs along its lower outer edges and with supplemental shelves or troughs for co-operation therewith, substantially as described.

2. A journal-bearing provided with shelves or troughs along its lower outer edges, and with an extension upon its front end which has supplemental shelves or troughs thereon for co-operation with the first-mentioned troughs, substantially as described.

3. A journal-bearing having shelves or troughs along its lower outer edges and an extension upon its front end which is divided into two projections, each of which is provided with supplemental shelves or troughs for co-operation with the first-mentioned shelves or troughs, substantially as described.

4. A journal-bearing having shelves or troughs along its lower outer edges, which are inclined on their under side from the front to the rear of said journal-bearing, substantially as described.

5. A journal-bearing having shelves or troughs along its lower outer edges and an extension upon its front which is provided with supplemental shelves or troughs for co-operation with the first-mentioned shelves, and with an orifice formed through such extension, substantially as described.

6. The combination, with a journal and a lubricating-ring mounted thereon, of a bearing having shelves or troughs formed along its lower outer edges, and with an extension upon its front end which is provided with supplemental shelves or troughs for co-operation with the first-mentioned shelves, and also with an orifice located above the lubricating-ring, substantially as described.

7. The combination, with a journal-bearing, a journal arranged within such bearing, and a lubricating-ring mounted loosely upon the journal, of a box in which the journal-bearing is disposed, provided with a chamber or well in its bottom, substantially as described.

8. The combination of a journal, a lubricating-ring loosely mounted thereon, and a journal-bearing, with a box in which the journal-bearing is arranged, provided with a chamber or well in its bottom, an orifice in its front, and a flange projecting inward beneath such orifice, substantially as described.

9. The combination of a journal, a lubricating-ring loosely mounted thereon, and a journal-bearing, with a box in which the journal-bearing is arranged, provided with a chamber or well in its bottom, and a flange extending inward from its back beneath the journal, substantially as described.

10. The combination of a journal, a lubricating-ring loosely mounted thereon, and a journal-bearing, with a box in which the journal-bearing is arranged, provided with a chamber or well in its bottom, an orifice in its front, a flange projecting inward beneath such orifice, and a second flange extending inward from the back of said box beneath and partially surrounding the journal, substantially as described.

11. A box for the reception of the journal-bearing, provided with an orifice or opening in its front, and with a flange or splash-guard located above said opening and depending in rear thereof independently of the cover to said orifice, substantially as described.

12. A box for the reception of a journal-bearing, provided with an orifice or opening in its front, a flange or splash-guard depending from its top, and with an inclined surface extending from the rear side of each flange or splash-guard backward toward the center of said top, substantially as described.

13. The combination, with a journal, a lubricating-ring mounted thereon, and a journal-bearing provided with an extension upon its front end for engaging with said journal, of a box in which such journal-bearing is arranged, having in its top a depending flange or splash-guard, and an inclined surface extending from the rear of said flange or splash-guard backward toward the center of said box, substantially as described.

14. The flange or splash-guard H, constructed with the supporting-strip *h* and depending portion *h'*, as and for the purposes set forth.

15. The combination, with the box D and the journal-bearing C, constructed with the projections *c c*, of the flange or splash-guard H, having the supporting-strip *h* and depending portion *h'*, as and for the purposes set forth.

16. A journal-bearing having its lower outer edges inclined on their under side from front to rear, and also having on its front an extension, substantially as described.

17. A journal-bearing having its lower edges inclined on their under side from front to rear, and also having on its front an extension which is provided with supplemental shelves or troughs for co-operation with the said inclined lower edges, substantially as described.

18. A journal-bearing having its lower edges inclined on their under side from front to rear, and also having on its front an extension which is provided with an orifice formed through the same, substantially as described.

19. A journal-bearing having its lower edges inclined on their under side from front to rear, and also having on its front an extension which is provided with an orifice formed through the same, and also with supplemental shelves for co-operation with the said inclined lower edges, substantially as described.

397,902. RAILROAD-CAR. WILLIAM R. ELLIOTT, Chicago, Ill. Filed May 29, 1888. Serial No. 275,479. (No model.)



Claim.—1. The combination, with the adjacent cars, of a yielding connection between and secured at both extremities to said cars and extending obliquely to their length, substantially as and for the purpose described.

2. The combination, with the adjacent cars, of a continuous yielding connection between and attached directly to said cars at both extremities and extending obliquely to their length, substantially as and for the purpose described.

3. The adjacent cars and the coupling-plates secured to the ends thereof, in combination with a pair of rods extending between said coupling-plates and connecting said cars, a sliding connection between said rods, lugs or collars on said rods, and a coiled spring sleeved upon said rods and confined between the collars thereon, substantially as described.

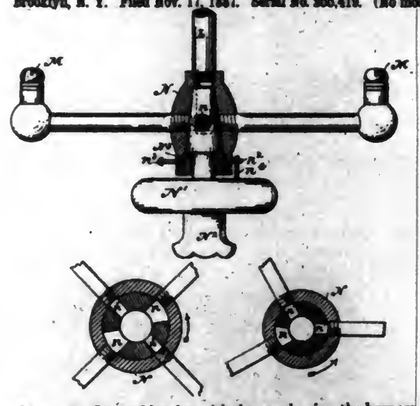
4. The adjacent cars and the coupling-plates secured to the ends thereof at opposite sides of the center, in combination with rods connecting said coupling-plates and extending obliquely between said cars, a sliding connection between said rods, lugs or collars upon said rods, and a coiled spring sleeved upon said rods and confined between said collars, substantially as described.

5. The adjacent cars and the coupling-plates secured to the ends thereof at each side of the center, in combination with rods connecting each pair of coupling-plates on opposite cars and extending obliquely to said cars and to each other, a sliding connection between said rods, lugs or collars on each of said rods, and coiled springs sleeved on each of said rods and confined between the said collars, substantially as described.

6. The adjacent cars, the coupling-plates secured to the ends thereof, and rods connected to said coupling-plates and extending obliquely between said cars, in combination with a pair of lugs on each of said rods, disks sleeved upon and constituting a sliding connection between said rods, said disks being confined between each pair of lugs, and a coiled spring sleeved upon said rods and confined between the disks, substantially as described.

7. The adjacent cars and the coupling-plates secured to the ends thereof, in combination with a pair of rods extending between said coupling-plates and connecting said cars, a sliding connection between said rods, a detachable connection between said rods and coupling-plates, lugs or collars on said rods, and a coiled spring sleeved upon said rods and confined between the collars thereon, substantially as described.

397,903. ILLUMINATING APPARATUS. WILLIAM F. FOLKER, Brooklyn, N. Y. Filed Nov. 17, 1887. Serial No. 255,419. (No model.)



Claim.—1. In combination with the supply-pipe, the burners, and the shell, the plug having the central vertical recess communicating directly with the supply-pipe, opposite ports of a capacity equal to the burner-pipes, and a port between the opposite ports of a greater capacity than the burner-pipe, whereby the two opposite ports may be turned out of communication with their burner-pipes, and the wider port having communication with its burner-pipe, substantially as specified.

2. In combination with the supply-pipe, the burners, and the shell, the plug provided with a central vertical recess communicating directly with the supply-pipe, the opposite ports having a capacity equal to the burner-pipes, the intermediate opposite ports having a greater capacity, whereby two or more alternate burner-pipes may be supplied with gas, or all of the burner-pipes may be supplied, substantially as specified.

3. The combination, with the shell and the plug having the hand-piece provided with a pin or projection, of the hollow screw-plug in the lower end of the shell, securing the plug in place, and the stop-screw passing through a portion of the shell and impinging against the screw-plug and locking the same, substantially as specified.

4. The combination, with the supply-pipe, the burner-pipes, and the shell, of the hollow plug having ports equal to the capacity of the burner-pipes and intermediate ports of a greater capacity than the first-named ports, whereby one or more ports may be turned out of communication with their burner-pipes, leaving others in full communication when the plug is turned in one direction, and whereby all of the burner-pipes may receive a full or a reduced supply of gas, substantially as specified.

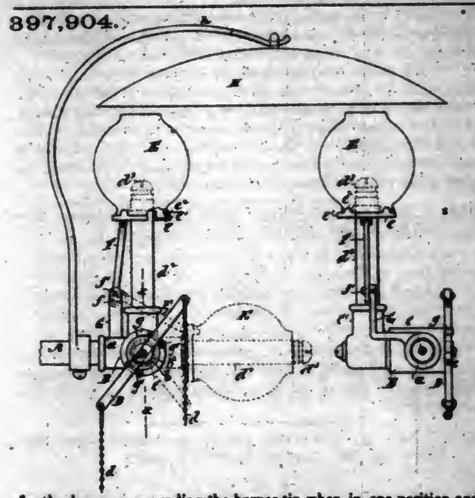
397,904. GAS-BURNER FOR BILLIARD-TABLES. WILLIAM F. FOLKER, New York, N. Y., assignor of one-half to Walter E. Schwing, same place. Filed July 27, 1888. Serial No. 281,209. (No model.)

Claim.—1. The combination, with a gas-supply pipe, of a gas-cock having a rotary plug, and a gas-burner secured to said plug and moving therewith to occupy substantially vertical and horizontal positions, and a globe connected to said gas-cock and sliding on the burner as it is moved from one position to the other, substantially as specified.

2. The combination, with a gas-supply pipe, of a gas-cock having a rotary plug, a gas-burner secured to said plug and having a movement therewith to occupy approximately vertical and horizontal positions, a globe for the burner, a rigid support, and a swinging connection between the globe and said support, whereby when the burner occupies a vertical position the globe will surround the burner-tip, and when the burner occupies a horizontal position the globe will be moved from over the burner-tip, substantially as specified.

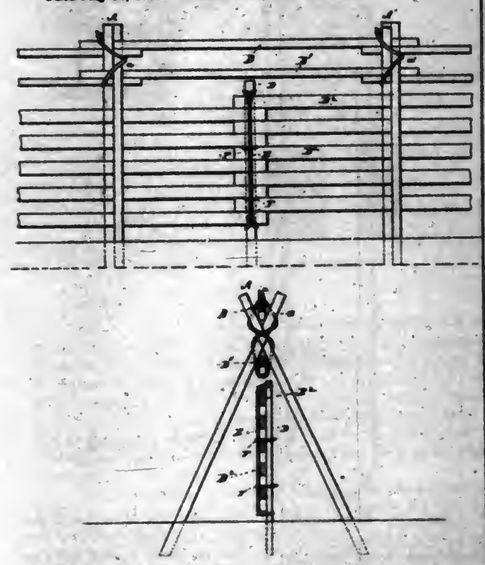
3. The combination, with a gas-supply pipe, of a gas-cock having a rotary plug, a gas-burner secured to said plug and moving therewith to occupy approximately vertical and horizontal positions, a globe

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for the burner surrounding the burner-tip when in one position and removed from said tip when in its other position, a rigid support, and a link having a pivotal connection with said globe near one end and having a slotted connection with said support near the other end, substantially as specified.

397,905. FENCE. CHARLES F. FOWLER, North Springfield, Mo. Filed July 30, 1888. Serial No. 281,262. (No model.)

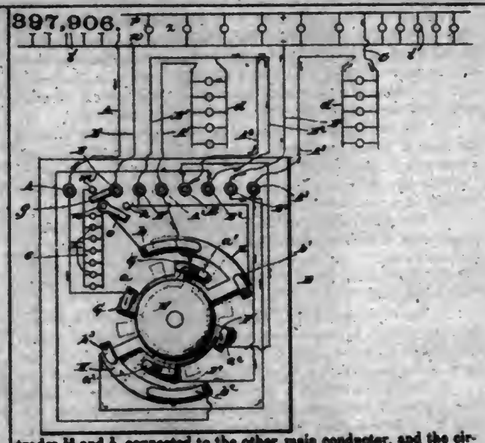


Claim.—In a fence, the combination, with the driven posts, the lapped fence-rails, the binding-wires secured at their upper and lower ends to the driven posts, and the tie-wires engaging the binding-wires and driven fence-posts, of the crossed stakes having their lower ends seated in the ground intermediately of the driven posts, the riders resting in the crotches of said crossed stakes, the auxiliary rails, and the crossed wires *a a'*, connecting the crossed stakes, riders, and auxiliary rails together, substantially as specified.

397,906. ELECTRIC-LIGHTING SYSTEM. JAMES A. GALVIN, Stockton, Pa. Filed Apr. 16, 1888. Serial No. 270,790. (No model.)

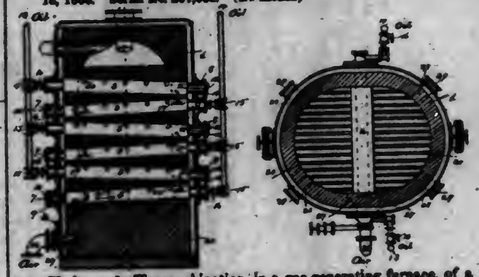
Claim.—1. The combination of the main conductors having the lamps in multiple arc, the branch conductors having the lamps in multiple arc, and having one terminal connected to one main conductor and the other connected to an electrode, a^3, the similar branch conductor with multiple-arc-lamps, and having one terminal provided with an electrode, a', and the other connected to electrodes b', b^2, and a^3, the electrode a, connected to the same main conductor, the electrodes b^2 and b, connected to the other main conductor, and the circuit-closers between the electrodes $b\,b'\,b^2\,b^2$ $a\,a'\,a^3\,a^3$, substantially as described.

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2. The combination of the main conductors having the lamps in multiple arc, the branch conductors having the lamps in multiple arc and having one terminal connected to one main conductor and the other terminal connected to an electrode, a^3, the similar branch conductors with multiple-arc lamps and having one terminal provided with an electrode, a', and the other connected to electrodes b', b^2, and a^3, the electrode a, connected to the same main conductor, the electrodes b^2 and b, connected to the other main conductor, the circuit-closers between the electrodes $b\,b'$, $b^2\,b^2$, $a\,a'$, and $a^3\,a^3$, and the shunt-circuit with multiple-arc lamps, and the switches to connect the terminals of said shunt-circuit to the electrodes $b\,b'$, for the purpose set forth, substantially as described.

397,907. GAS-GENERATING FURNACE. JAMES GILBERT, Omaha, Nebr., assignor of one-half to Charles R. Lee, same place. Filed Mar. 12, 1888. Serial No. 267,063. (No model.)



Claim.—1. The combination, in a gas-generating furnace, of a central partition having fire-grates upon its opposite sides, a series of inclined retorts being made to communicate with each other and each being provided with a separate oil-supply pipe at its upper end, a gas-tight cover at its opposite end and having orifices extending into the furnace-chamber along their upper parts, a valve located in each of said oil-supply pipes, an air-blast located below said grates, outlet-pipes located at the top of the furnace, and the valves for sealing the furnace, all arranged and adapted to operate substantially as described.

2. The herein-described gas-generating furnace having a central partition provided with inclined retorts communicating with each other, each retort having a separate oil-supply pipe at its upper end and a gas-tight cover at its lower end, and a series of openings leading into the furnace-chamber along the upper part, in the manner and for the purpose substantially as described.

397,908. RUFFLER AND GATHERER FOR SEWING-MACHINES. HARRY C. GOSSMER, Chicago, Ill. Filed Jan. 24, 1887. Serial No. 225,272. (Model.)



Claim.—1. The combination, with the presser-foot and ruffling-blade, of the plate B, located on the under side of the presser-foot and having on its under side a projection, *b*, and the compensating-block C, connected with said plate B, and having an apex, *c*, and inclines *c'*, said apex being in contact with the projection *b* of plate B, whereby said block can rock transversely, substantially as described.

2. The combination, with the presser-foot and ruffling-blade, of the plate B, having projection *b*, and the compensating-block C, provided with an apex, *c*, and inclines *c' c'* on its upper face, and having its lower face provided with inclines *c² c²*, bearing-point *c³*, and a front bearing-edge, substantially as and for the purpose specified.

3. The combination, with a reciprocating ruffling-blade and the presser-foot, of the compensating-block C, having apex *c*, inclines *c' c'*, inclined faces *c² c²*, and apex *c³*, and a connecting-screw, D, for attaching the compensating-block to the presser-foot to rock in all directions, substantially as and for the purpose specified.

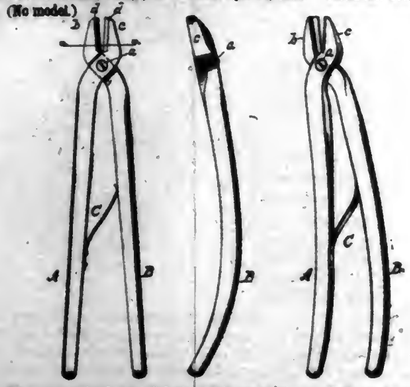
4. The combination of a reciprocating ruffling-blade, a presser-foot, the plate B, having a bearing-point, *b*, and ears *b'*, the compensating-block C, having apex *c*, inclines *c' c'*, inclined faces *c² c²*, and apex *c³*, and the pivot D, substantially as and for the purpose specified.

5. The combination of a reciprocating ruffling-blade, a presser-foot, a plate, B, having an extension, B', provided with a turned portion, B'', to form a guide for the upper band, the compensating-block C, and the pivot D, substantially as and for the purpose specified.

6. The combination of the presser-foot, the swinging arm J, having an opening, J', provided with leaves *j'*, the ruffling-blade G, the plate K, the ring K', having leaves *k'* and arms *k² k³*, the plate L, having ears *l' l³*, and the actuating-lever M, substantially as and for the purpose specified.

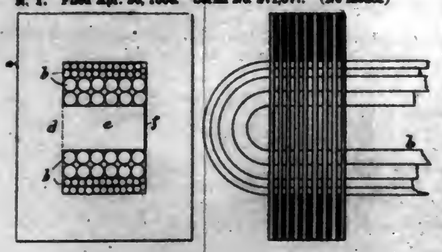
7. The combination of the presser-foot, the ruffling-blade, the swinging arm J, having an opening, J', provided with leaves *j'*, the plate K, having a ring, K', provided with leaves *k'* and arms *k² k³*, the plate L, having slot *l*, recess *l'*, and ears *l' l³*, the lever M, having notched extension N, and the plate O, having point *o'* and catch *o²*, for changing the position of the plate L to regulate the throw of the ruffling-blade, substantially as described.

397,909. NIPPERS FOR CUTTING PEGS FROM BOOTS OR SHOES. JOHN C. GREEN, Peoria, Ill. Filed Apr. 14, 1888. Serial No. 270,643. (No model.)



Claim.—A nipping-tool designed for removing nails from the interior of boots or shoes, consisting of two sections pivoted together, forming handle and jaw portion, the jaw portion being provided with side cutting-edges, each section being curved from the handle end to the pivot on a long arc of a circle, and the jaw portion being curved on a short arc of a circle, whereby the introduction of the tool is facilitated and a bearing-surface for the cutting-jaws readily obtained, substantially as described.

397,910. ELECTRIC CONVERTER. LUDWIG GUTMANN, New York, N. Y. Filed Apr. 26, 1888. Serial No. 271,577. (No model.)



Claim.—1. An element for the core of an electric converter, consisting of an iron plate provided with two openings which contain the coil and with a cut or slit which connects the two openings.

2. An electric converter consisting of the combination of a coil surrounded by an uncut iron plate perpendicular to the axes of the conductors forming the coil and an iron cross-piece passing through the center of the coil and connected at one end to the said iron plate.

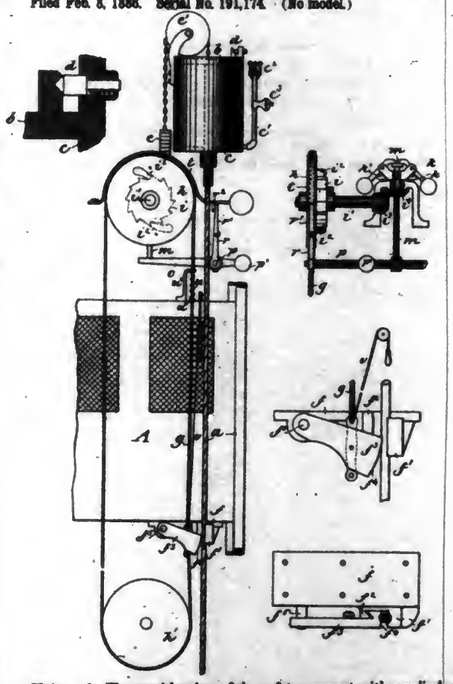
3. An element for an electric converter, consisting of a sheet of iron suitably perforated and provided with a single cut between the perforations for the entrance of the converter's coil.

397,911. CAR-MOVER. JOSEPH P. HALPIN, Wyandotte, Mich. Filed May 21, 1888. Serial No. 274,523. (No model.)



Claim.—In a car-mover, a gripper-wheel formed with circumferential groove having inclined gripping-walls, and with sprocket-teeth upon each side of said groove, substantially as and for the purpose specified.

397,912. ELEVATOR. MELANCTHON HANFORD, Malden, Mass. Filed Feb. 8, 1888. Serial No. 191,174. (No model.)



Claim.—1. The combination of the safety-support with a cylinder and piston therein connected with said support, and a clutch or gripping device for connecting the car with the safety-support, and a retaining device by which the piston is held at one end of the cylinder until operated upon by the weight of the car applied to the safety-support, substantially as described.

2. The combination of the safety-support and yielding cushion for said support, and for the car and its load when connected with said support, with a clutch or gripping device connected with the elevator-car, and the automatic actuating mechanism therefor, comprising a rope or band, a speed-governor actuated thereby, and a checking device for said rope or band controlled by the said governor, substantially as described.

3. The safety-support and a cylinder and piston therein connected with said support, the said cylinder being provided with an escape-passage, combined with a safety-valve in said passage, and a clutch for connecting the car with the safety-support, substantially as described.

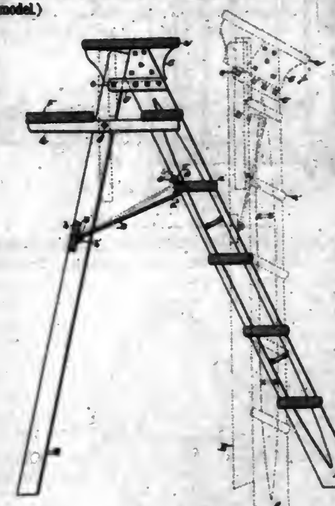
4. The combination of a safety-support with a clutch or gripping device connected with the elevator-car, a rope or band connected with and actuated by the elevator-car, a speed-governor actuated by said band, a checking device for said rope, and a detent for the check-

ing device, and connecting mechanism between it and the speed-governor, arranged to be operated only by an increase of speed of the said governor, substantially as described.

5. The combination, with a safety-support, of the clutch or gripping device consisting of a plate provided with a shoulder forming one member of the gripping device, and with a shoulder for engaging the co-operating movable member of the gripping device, combined with the movable member consisting of the pivoted arm provided with an eccentric gripping-face, and a shoulder which receives the pressure when the gripping device is engaged with the safety-support, substantially as described.

6. The combination of the safety-support and clutch or gripping device and its operating rope or band, with a governor and operating-shaft therefor, and pulley loose on said shaft that supports and is operated by the said rope or band, and a ratchet and pawl, one connected with said governor-shaft and the other with the pulley loose thereon, as set forth, whereby the pulley operates the governor-shaft when rotated in one direction, but turns upon said governor-shaft when rotating in the other direction, substantially as described.

397,913. STEP-LADDER. GEORGE W. HATCHER and SUMLETON D. HATCHER, Cleveland, Ohio. Filed May 25, 1888. Serial No. 275,048. (No model.)



Claim.—1. In a step-ladder, the combination, with side rails and treads, of legs pivoted or hinged to the side rails or an attachment of the latter, the sections of the side rails and legs above the pivotal line of the legs engaging each other when the legs are distended to limit such distention, a rod pivoted to a cross-bar on the legs, the opposite end of this bar having an offset extending loosely through a notch in one of the treads, said offset having a hook on its end to limit its downward movement, and a staple spanning the notch of the tread, substantially as set forth.

2. In a step-ladder, the combination, with sides, treads, strap projecting from the sides, and legs pivoted to the ends of the strap with their ends in position to abut against the ends of the sides when the ladder is distended, of a rod pivoted to a cross-bar between the legs, said rod having an offset at the opposite end and a hook on the end of the offset, the latter adapted to pass through a notch in one of the treads, a staple to hold said offset slidingly within the notch, and a folding shelf secured to arms, the latter being pivoted near their center to the legs with their opposite ends extended beneath one of the treads, all of these parts being arranged to operate simultaneously with the opening or closing of the ladders, substantially as set forth.

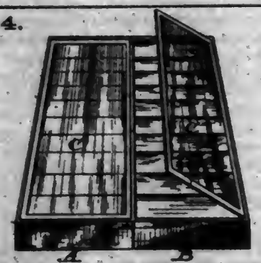
397,914. FOLDING CASE OR PACKAGE. CHARLES T. HESSE, Cleveland, Ohio. Filed Sept. 28, 1886. Serial No. 206,607. (No model.)

Claim.—A folding case or package consisting of two halves, A and B, hinged so as to fold together, and provided with glass lids C C,

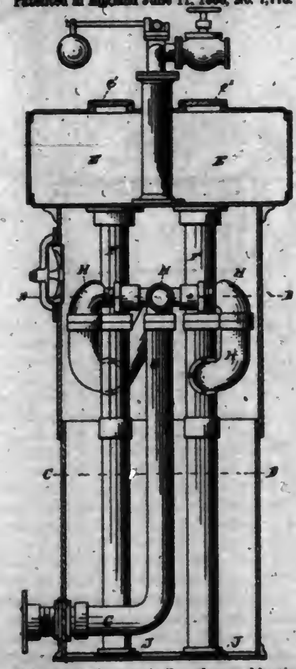


hinged to shut within their margins, which rest on the ledges *a*, whereby the package and contents form protecting-cushions to the glass lids, substantially as and for the purpose specified.

397,914.

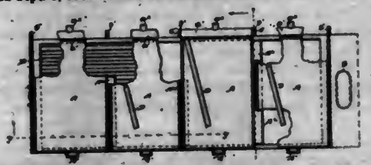


397,915. BOILER. REGINALD W. HEWETT, Birmingham, County of Warwick, England. Filed Dec. 1, 1887. Serial No. 256,672. (No model.) Patented in England June 11, 1886, No. 7,773.



Claim.—In a vertical steam-boiler, the combination of the fuel-chamber E, having doors or lids *e'* and *e²*, the fire chambers or flues F, leading from said fuel-chamber and provided with the perforated plates J, the branch pipes H, and the air-chamber G, all arranged and operating as herein shown and described.

397,916. EVAPORATOR. HENRY HILL, Chester Cross Roads, Ohio. Filed Sept. 5, 1888. Serial No. 284,606. (No model.)



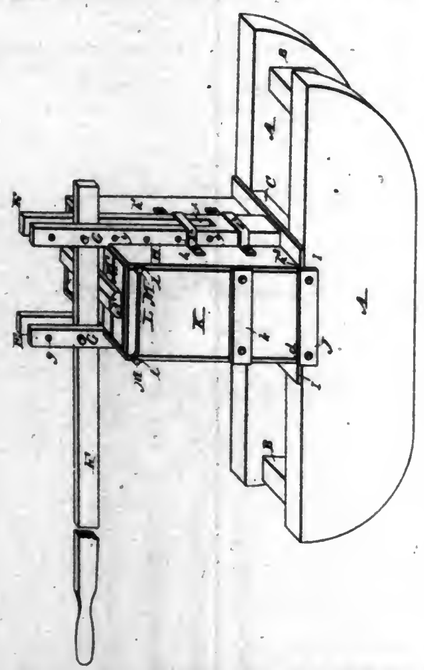
Claim.—1. The combination, with a series of evaporating-pans, of hollow trunnions projecting from said pans, the trunnions of one pan telescoping with the trunnions of the next adjacent pan, and a tube passing through the trunnions and projecting at one end into the pan, substantially as set forth.

2. The combination, with a series of evaporating-pans, of hollow internally-tapering trunnions projecting from said pans, the trunnions of one pan telescoping with the trunnions of the next adjacent pan, and a bent tube having its short arm adjustably secured within said trunnions, substantially as set forth.

3. The combination, with a series of evaporating-pans, of hollow trunnions projecting from said pans, the trunnions of one pan telescoping with the trunnions of the next adjoining pans, and flanges projecting from one bottom edge of each pan and extending beneath the bottom of the next adjacent pan, substantially as set forth.

4. The combination, with evaporating-pans connected by hollow trunnions, substantially as indicated, of circulating-tubes adapted at one end to fit and turn in the respective hollow trunnions, such circulating-tube having an elbow, the free end of said tube extending toward the end of the pan opposite the hollow trunnions, substantially as set forth.

397,917. BALING-PRESS. WILLIAM HILLMAN and JOSEPH P. RIFFLE, Schulenburg, Tex. Filed Aug. 4, 1888. Serial No. 281,962. (No model.)



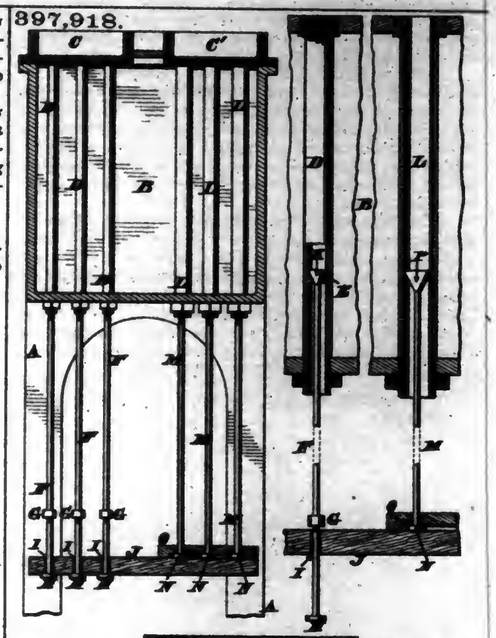
Claim.—1. The combination, substantially as hereinbefore set forth, of the runners, the bed-plate mounted thereon, the bifurcated uprights having apertures, as described, the pins that fit in the apertures, the independent removable side pieces H, and the independent removable side pieces K, the removable connections for securing the side pieces, H and K, together at the top, the follower, and the lever extending centrally across the follower for depressing it and projecting laterally through the bifurcated uprights and bearing upon the pins.

2. The combination, substantially as hereinbefore set forth, of the bed-plate, the side pieces H, made in two parts, *h h'*, the straps h^3, for securing them together, the uprights straddled by the straps h^3, the side pieces K, the tie-rods for securing the side pieces, H and K, together at the top, the follower M', the cross-bar N, secured to the top of the follower and made narrow at the top to form a bearing for the operating-lever, the bifurcated uprights, the operating-lever extending through the bifurcated uprights centrally across the cross-bar N, and the pins against which the operating-lever bears.

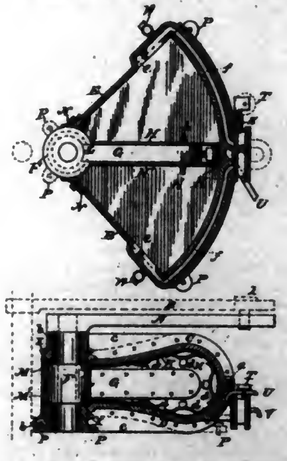
397,918. CANDLE-MOLDING MACHINE. LOUIS HOMAN, Cincinnati, Ohio, assignor to Homan & Co., same place. Filed Aug. 31, 1888. Serial No. 284,382. (No model.)

Claim.—The combination, in a candle-molding machine, of chest B, provided with two sets of molds, D L, traversed, respectively, by pistons F K and M P, the pistons M P being connected to the follower J, so as to travel therewith, and the pistons F K being passed loosely through holes I in said follower, and being provided with bearings G and heads H, and stops, as E, being arranged within the short-candle molds D, for the purpose described.

397,918.



397,919. STEERING APPARATUS. JULIUS L. HORNIG, Jersey City, N. J. Filed Apr. 9, 1888. Serial No. 270,041. (No model.)



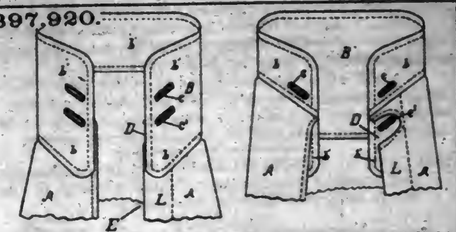
Claim.—1. In steering apparatus, the combination, with the rudder, of a motor consisting, essentially, of a stationary inclosing-case; a fan or piston swinging within such case, and means for varying fluid-pressure within such case, said fan or piston being connected with the rudder, whereby the rudder is moved positively in either direction, substantially as set forth.

2. In steering apparatus, the combination, with the rudder, of a pivoted body connected therewith, a stationary case inclosing said body, and means for varying fluid-pressure within said case, whereby said body is made to swing within the case and move the rudder, substantially as set forth.

3. In steering apparatus, the combination of the motor, consisting, essentially, of an inclosing-case, a fan or piston pivoted within said case, and means for varying fluid-pressure within said case with the arm connected with the pivot of said fan or piston, the tiller-arm connected with said pivot-arm, and the rudder connected with said tiller-arm, substantially as set forth.

397,920. SHIRT-WRISTBAND. WILLIAM R. HOWELL, Los Angeles, Cal., assignor of one-half to George S. Marygold, same place. Filed Aug. 16, 1888. Serial No. 282,876. (No model.)

397,920.



Claim.—The combination of the double wristband provided with the four button-holes *c c' c' c'*, and the sleeve provided with the slit and having its end attached to one side of the double wristband between the button-holes *c c* and *c' c'*, and provided with an opening, D, in the outside lap of the slit arranged at such a distance from the point of attachment of the sleeve with the wristband that when the wristband is folded upon the outside of the sleeve the button-holes in the wing of the wristband folded against the sleeve will coincide with the opening D.

397,921. CHURN. JOHN C. KEARNS, Maitland, Pa. Filed Oct. 20 1888. Serial No. 288,613. (No model.)



Claim.—The herein-described churn, consisting of a rectangular body or receptacle having the bearings *C e* fixed to its end walls at points below the horizontal center of said body, a flat imperforate rectangular dasher arranged horizontally and longitudinally therein and corresponding in width nearly to the transverse diameter of the body, as described, a flat plate fixed to one end of said dasher and having a flanged trunnion which is journaled in the bearing C, and another flat plate, D, fixed to the opposite end of said dasher and having an integral shaft, E, which passes through the bearing *e*, all arranged and combined for service as described.

397,922. HIP REIN-SUPPORT. AUGUSTUS KEMPLEY, San Francisco, Cal. Filed Dec. 3, 1888. Serial No. 292,564. (No model.)



Claim.—A rein-support consisting of a bar bent upward at its middle portion and at each end bent upon itself to form open spaces for the reception of the reins, the end bent upward, leaving a space between said ends through which the reins may be passed to said open spaces, the under side of said bar being also provided with loops, for the purpose set forth.

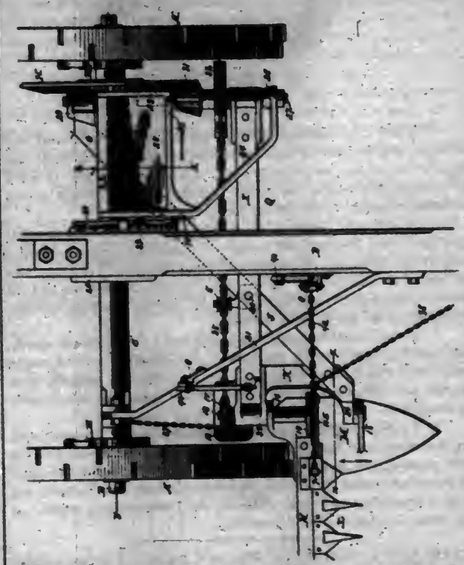
397,923. LAMP-LIGHTING DEVICE. HENRY LANDON, Massillon, Ohio. Filed Sept. 12, 1888. Serial No. 285,196. (No model.)



Claim.—1. In a lamp-lighting device, the combination of the tubular case A, having inwardly-bent and serrated jaws at one end and a radial pin, a^2, at the other, and a tubular case, D, having a socket and angular groove at one end and a head, D^2, at the other, with a plunger, E, permanently retained in said case, and a removable plunger, B, within the case A, substantially as and for the purpose described.

2. In a lamp-lighting device, the combination of the tubular case A, having inwardly-bent and serrated jaws at one end, a tubular case, D, a socketed joint uniting said cases, a plunger, E, permanently retained in the case D, and a removable plunger in the case A, substantially as and for the purpose described.

397,924. MOWER. SAMUEL D. MADDIN, Sarnia, Ontario, Canada, assignor to Mary Maddin, same place. Filed Mar. 31, 1887. Serial No. 233,202. (No model.)

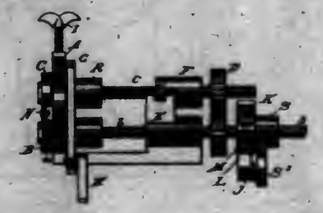


Claim.—1. The combination of a main frame supported upon the main axle, the rocking frame, also supported thereon independently of the main frame, the cutting apparatus, the yoke in which is supported the inner end of the cutting apparatus, having the bearings 33 34 therefor, the intermediate frame consisting of the bar I, pivotally connected with the rocking frame in front of the main axle at one end and at its opposite end connected to the rear end of the yoke, and the bar J, pivotally connected to the rocking frame in rear of the main axle and to the yoke near the front end thereof, the said bars I and J crossing each other and being connected at their point of intersection, and the adjusting devices for the rocking frame and for the intermediate frame, substantially as described.

2. The combination, with the yoke K, provided with a recessed bearing, 33, and a separate bearing, 34, in line with the bearing 33, of a shoe pivotally supported in said bearings and carrying a sleeve, 19, adapted to the recess in the bearing 33, and with a bearing for the crank-shaft for driving the pitman, substantially as described.

3. The combination, with the yoke K, provided with bearings 33 34 for pivotally supporting the shoe, and the shoe provided with a sleeve adapted to one bearing and an ear for the other, so as to be detached from both by a forward movement of the crank-shaft supported by the bearing 33, and having secured to its opposite ends a sprocket-wheel and a crank-disk, whereby the shoe and frame are held together, substantially as described.

397,925. BARB-FEEDING MECHANISM FOR BARB-WIRE MACHINES. GEORGE W. MCKINNEY, Marshalltown, Iowa. Filed Sept. 19, 1887. Serial No. 250,059. (No model.)



Claim.—A barb-feed mechanism for barb-wire machines, which consists of feed-rolls, one of which is grooved to receive the barb-wire and the other of which is provided with a broken periphery, which forces the wire during the process of feeding into the shape desired for forming the barb, and mechanism for operating the same, substantially as described, and for the purposes specified.

397,926. CURRY-COMB. HENRY MCPHERSON, Troy, N.Y., assignor to the Sweet & Clark Manufacturing Company, same place. Filed Mar. 2, 1888. Serial No. 265,898. (No model.)



Claim.—1. A comb-bar having two of its edges bent down and serrated, and the portion between said edges provided with three contiguous intersecting incisions, two of which are parallel and the other at right angles thereto, and the portion thus loosened turned up and serrated, substantially as and for the purpose described.

2. A curry-comb having one of its parts provided with two edges bent down and serrated, and the portion adjacent to one of said bent down edges provided with three contiguous intersecting incisions, two of which are parallel and the other at right angles thereto, and the portion loosened by said incisions turned up and serrated, substantially as and for the purpose described.

3. A curry-comb having a side handle and a forked frame branching therefrom and loops at the ends of its branches, in combination with comb-frames, each having a pivot-pin projecting centrally from its side and concave receivers at the ends of said side, substantially as described.

4. A curry-comb having a side handle and a forked frame branching therefrom and loops at the ends of its branches, in combination with comb-frames, each having a pivot-pin laterally projecting from its center and concave receivers projecting laterally from its ends, and a carrying-surface on the top different from the carrying-surface on the bottom, substantially as described.

397,927. CAR-WHEEL. WILLIAM H. MELANEY, Pittsburg, assignor of one-half to Robert C. Totten, Allegheny, Pa. Filed May 19, 1888. Serial No. 274,364. (No model.)

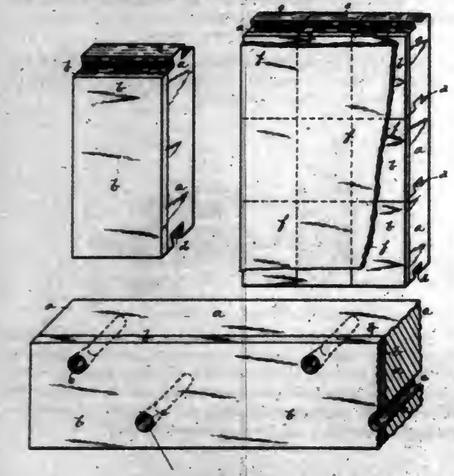


Claim.—1. A car or locomotive wheel having the rim or tire thereof formed of steel and a facing of chilled cast-iron formed on the wearing-surface of the tire, substantially as and for the purposes set forth.

2. A car or locomotive wheel having the rim or tire and the flange thereof formed of steel and a facing of chilled cast-iron formed on the wearing-surfaces of the tire and flange, substantially as and for the purposes set forth.

3. A car-wheel having the body, the rim or tire, and the flange formed of steel, and a facing of chilled cast-iron formed on the wearing-surfaces of the rim and flange, substantially as and for the purposes set forth.

397,928. SAFE OR ARMOR PLATE. WILLIAM H. MELANEY, Pittsburg, assignor of one-half to Robert C. Totten, Allegheny, Pa. Filed June 9, 1888. Serial No. 276,594. (No model.)



Claim.—1. As a new article of manufacture, a safe or armor plate having a body of steel and a facing of chilled cast-iron united thereto by fusion, substantially as and for the purposes set forth.

2. A safe or armor plate having a body of steel and a facing of chilled cast-iron united thereto by fusion, said plate being formed in sections connected by interlocking joints formed of and in the steel body of the plate, substantially as and for the purposes set forth.

397,929. HAMMER OR LIKE DIE. WILLIAM H. MELANEY, Pittsburg, assignor of one-half to Robert C. Totten, Allegheny, Pa. Filed June 13, 1888. Serial No. 276,963. (No model.)

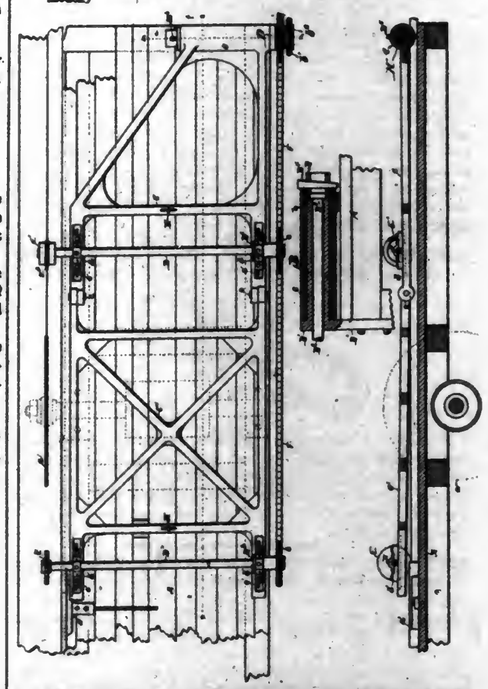


Claim.—1. As a new article of manufacture, an anvil, hammer, or like die having a body of cast-steel and a facing of chilled cast-iron united thereto, substantially as and for the purposes set forth.

2. As a new article of manufacture, an anvil having its body and horn formed of cast-steel and a facing of chilled cast-iron on the face of the anvil united to the body, substantially as and for the purposes set forth.

3. As a new article of manufacture, the anvil having its body formed of cast-steel and a facing of chilled cast-iron on the face thereof united to the body, and a horn or beak formed of forged steel, substantially as and for the purposes set forth.

397,930. FEED MECHANISM FOR SAW-TABLES. CHARLES B. MORGAN, Akron, Ohio. Filed Apr. 30, 1888. Serial No. 272,241. (No model.)

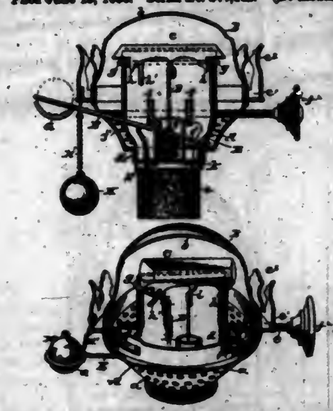


Claim.—1. The combination, with a saw-table, of a jointed frame pivotally connected at one end to the table, shafts journaled in each section away from the joining-point, and rollers on said shafts, substantially as set forth.

2. The combination, with upright arm rigidly connected with the saw-table, said arm being integral with an overhanging sleeve extending crosswise of the table, of jointed frame removably mounted on the said sleeve, and feed mechanism journaled in said jointed frame, substantially as set forth.

3. The combination, with upright arm, a laterally-projecting sleeve integral therewith, a jointed frame mounted on the sleeve, and feed mechanism journaled in said jointed frame, of a shaft journaled in the bore of such sleeve, said shaft being operatively connected with the feed mechanism and with the jointed frame, substantially as set forth.

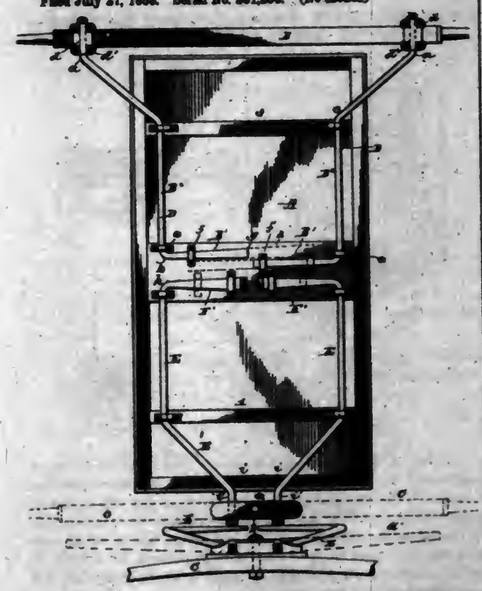
397,931. LAMP-EXTINGUISHER. JAMES H. PAINE, Louisville, Colo. Filed June 15, 1888. Serial No. 277,123. (No model.)



Claim.—1. In a lamp, the combination, with an air-chamber and a wick-tube, of a wire bent around the latter near its top, a cap pivotally supported by said wire, a tube secured in the chamber and having a spring therein, a lever pivoted above said spring and extended outside the chamber, a weight-receptacle at the outer end of the lever, a rod connecting said lever and cap, and a weight adapted to be inserted in the receptacle at the end of the lever, substantially as set forth.

2. In a lamp, the combination, with an air-chamber and a wick-tube, of a wire bent around the latter near its top, a cap pivotally supported by said wire, a tube secured to the chamber, an integral arm projecting from the tube and serving as a pivotal bearing for a lever, a weight-receptacle at the free end of said lever, a weight to be inserted in the receptacle, a spring in the tube beneath the lever, and a rod connecting said lever and cap, substantially as set forth.

397,932. VEHICLE-GEAR. FRANKE L. PERRY, Brooklyn, N. Y. Filed July 27, 1888. Serial No. 281,230. (No model.)



Claim.—1. The combination, with a body and a rear axle, of two torsional rod-springs that are bent diagonally outward in a plane to properly engage the rear axle, and are flattened in their bodies nearer the front ends, where they are loosely clipped to the vehicle-body, and coact by flexure with the torsional springs to yieldingly support load strains, substantially as set forth.

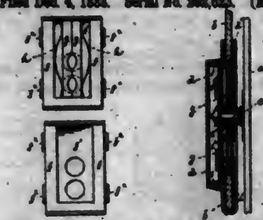
2. The combination, with a vehicle-body and a front axle, of two torsional springs loosely held to the body, and having their forward ends bent diagonally forward and inward to engage a center plate, and their bodies flattened nearer their other ends to afford integral plate-springs, which are adapted to flex when weight is thrown on the torsion-springs, substantially as set forth.

3. The combination, with a vehicle-body and a front axle, of two torsional rod-springs loosely held to the body, and having their forward ends bent to engage a center plate and their other ends flattened to produce plate-springs, which are bent at an angle to the integral rod-springs, and a center plate secured to the ends of the rod-springs and swivel-connected to the axle, substantially as set forth.

4. The combination, with a vehicle-body and a front axle, of two torsional springs loosely secured to the lower side of the body, having their forward portions bent diagonally to engage a cross-bar, a cross-bar, and a swivel-connection for the cross-bar to the axle, substantially as set forth.

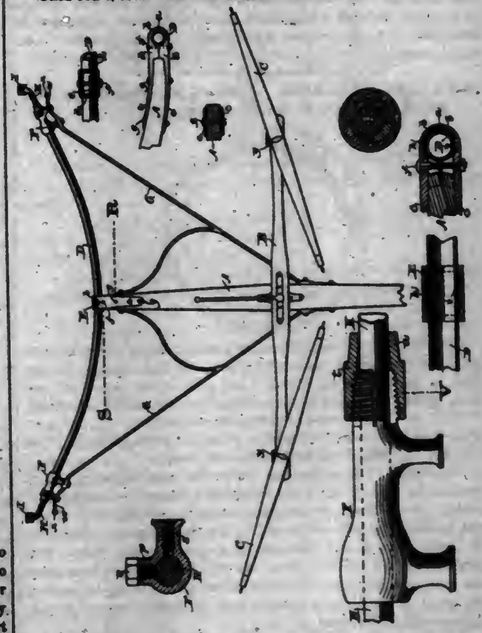
5. The combination, with a vehicle-body, a rear axle, a front axle, and a center plate, of two torsional rod-springs bent to form braces and be engaged to the center plate, having their other ends flattened to produce flexible plate-springs, and a second set of torsional rod-springs bent outward and rearward near their rear ends to engage the rear axle, and having their other ends flattened and bent inwardly to afford flexing plate-springs, the flattened ends of both sets of springs being loosely clipped to the under side of the vehicle-body, substantially as set forth.

397,933. POCKET-BOOK CLASP. CARL G. PFINGSTEN, New York, N. Y. Filed Dec. 4, 1888. Serial No. 292,623. (No model.)



Claim.—The combination of pocket-book with stud *c*, having double conical head *c'*, and with a lock secured to flap *b* of the pocket-book, and consisting of box-shaped clasp *d d'* and of notched spring-plates *g*, the flap *b* being perforated for the admission of the stud-head, substantially as specified.

397,934. VEHICLE-POLE. THOMAS W. PORTER, Chelsea, Mass. Filed Oct. 6, 1888. Serial No. 287,364. (No model.)



Claim.—1. In a vehicle-pole, a metallic coupling formed to receive the end of the cross-bar, and with an axial passage therethrough to

receive the shank of the draft-eye, and having a locking device to rigidly secure said shank in position as adjusted, substantially as specified.

2. The metallic coupling F, formed to receive a cross-bar, and with a diminished axial passage to receive shank H, and having a transverse passage consisting of slot *l* and hole *m* to receive an eye-bolt, substantially as specified.

3. The combination of bar D, coupling F, having an axial passage, draft-eye I, having shank H, adjustable in the coupling, and a locking device whereby the draft-eye is rigidly secured in said coupling when adjusted, substantially as specified.

4. The combination of cross-bar D, coupling F, draft-eye shank H, and eyebolt *k*, provided with nut *n*, all substantially as specified.

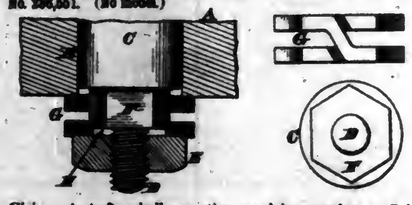
5. In a vehicle-pole, the combination, with cross-bar D and stays G, of a tubular coupling the axis of which is an extension of that of said bar, and having an offset or offsets to receive said stays, substantially as specified.

6. The combination, with bar D and stays G, of coupling F, having the hollow threaded offsets to receive the stays and securing-bolts, substantially as specified.

7. The combination, with pole A and cross-bar D, of coupling E, formed in two parts, with an eye, *b*, to receive said bar, a recess or chamber, *c*, to receive the rear end of the pole, the perforated securing-strape *e* to receive bolts *g*, and a transverse passage near eye *b* to receive the bar-clamping bolt *d*, substantially as specified.

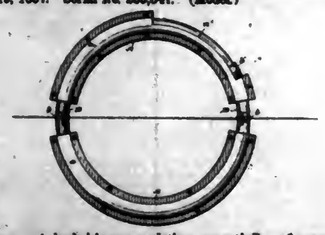
8. The divided coupling E, formed to receive the pole, and with a circular transverse passage to receive bar D, as described, and pin *i*, formed integrally with one of the halves of said coupling and adapted to interlock with and secure said bar D from rotary or lineal displacement, substantially as specified.

397,935. DEVICE FOR PREVENTING THE LOOSENING OF NUTS. JAMES POWELL, Cincinnati, Ohio. Filed Sept. 27, 1888. Serial No. 286,551. (No model.)



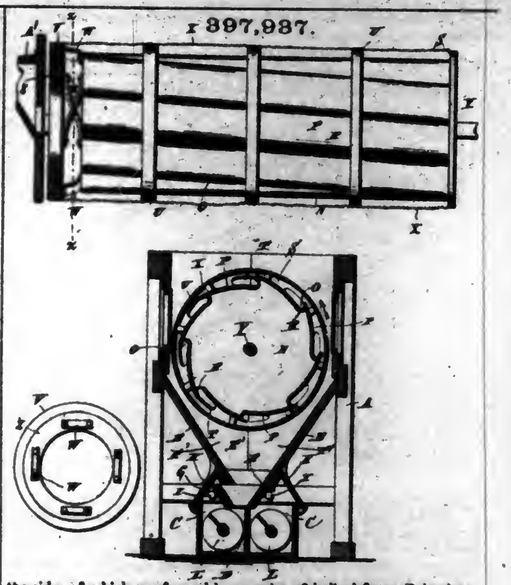
Claim.—A shaft, spindle, or other revolving member, as C, journaled within a suitable bearing, as A B, and having a screw-threaded stem, D, and non-circular shank F, which shank is located between said shaft and stem, in combination with a nut, E, and split spring-ring washer G, which washer has a non-circular eye, H, engaged with said shank F, for the purpose of compelling said spring-washer G to turn in unison with said revolving member C, as herein described.

397,936. LOCK-HINGE. THADDEUS C. READ, Fostoria, Ohio. Filed Apr. 19, 1887. Serial No. 235,347. (Model.)



Claim.—A lock-hinge consisting, essentially, of separate plates adapted to be fastened, respectively, to the door and casing, and a ring made to turn circumferentially in a seat made in said plates, said ring being made of two members hinged together, substantially as set forth.

397,937. BOLTING-REEL. DANIEL G. REITZ, Berlin, Pa. Filed Mar. 13, 1888. Serial No. 267,117. (No model.)

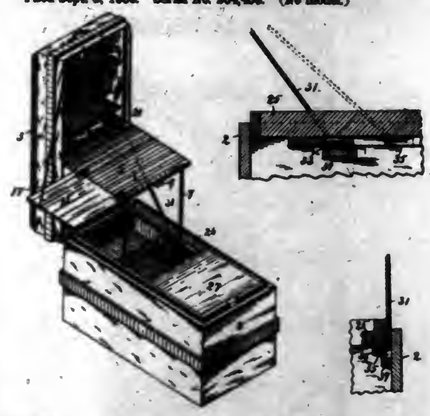


Claim.—1. The bolting-reel having the imperforate cylindrical portion, the sides of which are formed by a series of helical flutes, P, having the curved convex tangential sides P, extending in the direction in which the reel rotates, and having the concave shoulders R at the inner edges of said convex sides, the convex side of each flute merging into the concave side of the next adjacent flute throughout the series, the said imperforate cylindrical portion being arranged in the center of the reel at a distance from the head of the cylindrical portion of the reel, substantially as described.

2. The bolting-reel having the imperforate cylindrical portion the sides of which are formed by a series of helical flutes, P, having the curved convex tangential sides P, extending in the direction in which the reel rotates, and having the concave shoulders R at the inner edges of said convex sides, the convex side of each flute merging into the concave side of the next adjacent flute throughout the series, substantially as specified.

3. The reel having the imperforate cylindrical portion arranged within the screen or bolting-cloth and provided on its sides with the helical flutes having the convex tangential sides P and the concave shoulders R, the ring V, arranged at a distance from the head of the cylindrical portion of the reel and revolving therewith, and the curved arms W, connecting said ring V with the head of the cylindrical portion of the reel, substantially as described.

397,938. TRUNK. INGRAHAM G. RICHARDSON, Minneapolis, Minn. Filed Sept. 3, 1888. Serial No. 284,453. (No model.)



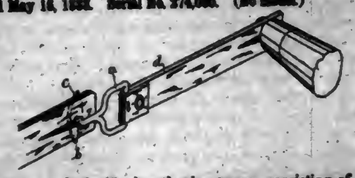
Claim.—1. The combined trunk and writing-desk comprising, in combination, the body 2, the lid 3, hinged to the end thereof, the leaf 5, hinged to the under side of said lid and provided with a suitable support adapted to hold it in a horizontal position, the auxiliary leaf 15, hinged to the side of the leaf 5 and adapted to be turned over upon said leaf when the lid is in an upright position, the drawer 19, and the compartments 21 and 23, arranged in the lid 3 above the leaf 5, all substantially as described.

2. The combined trunk and writing-desk comprising, in combination, the body 2, the lid hinged to the end thereof and provided with the folding leaf 5, and the auxiliary leaf 15, hinged to the edge of the leaf 5 and adapted to fold over upon said leaf, and the sliding seat 27, arranged upon the body 2, substantially as described.

3. In a combined trunk and writing-desk, the lid 3, the leaf 5, hinged thereto, the U-shaped support 7, pivoted to the under side of said leaf, and the sliding bolt 9, provided with a hook, 13, adapted to engage the support 7, for the purpose specified.

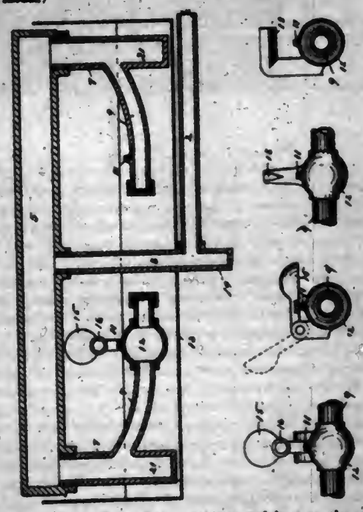
4. In a combined trunk and writing-desk, the combination, with the lid 3, having the folding leaf 5, of the brace-rod 31, pivoted to said lid and having its opposite end pivoted to the sliding block 33, and the runway 35, having a slot in the bottom thereof, for the purpose set forth.

397,939. TUG ATTACHMENT. FRED A. ROBBINS, Waterville, Me. Filed May 16, 1888. Serial No. 274,026. (No model.)



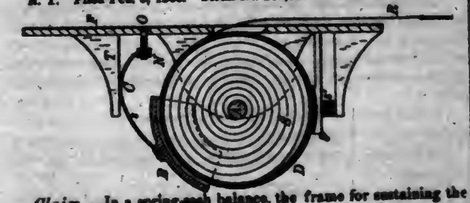
Claim.—A device for lengthening traces, consisting of a strap provided at or near one end with an eye and at the opposite end with a loop, a shank projecting from said loop and extending at right angles, or nearly so, to its face, and an oblong button at the end of said shank extending transversely to the length of said strap and at right angles to said shank, in combination, substantially as shown.

397,940. HYDROCARBON VAPORIZER AND BURNER. CHARLES G. ROLLINS, Minneapolis, Minn. Filed May 23, 1888. Serial No. 274,549 (No model.)



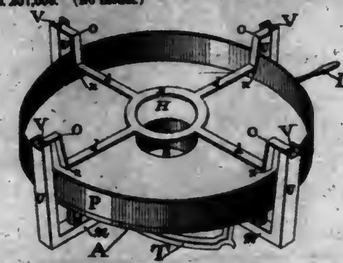
Claim.—In a hydrocarbon vaporizer and burner, the combination, with the retort, of the burner-pipe arranged beneath said retort and provided with the hollow globe having the nipple, as shown, and the weighted lever hinged upon said globe and provided with a cap adapted to cover the end of the nipple, substantially as shown and described.

397,941. SASH-BALANCE. FRANK L. ROSENFELDER, Cleveland, Ohio, assignor, by mesne assignments, to Wm. H. Caldwell, Rochester, N. Y. Filed Feb. 3, 1888. Serial No. 262,886. (No model.)



Claim.—In a spring-sash balance, the frame for sustaining the parts in their proper relations, the spring-drum and spring contained therein for rotating the same, and the sash-supporting ribbon attached to both drum and sash, in combination with a brake acting upon the sides of the drum and a secondary brake acting upon the ribbon, one of said brakes being actuated by an adjustable spring, substantially as shown and described.

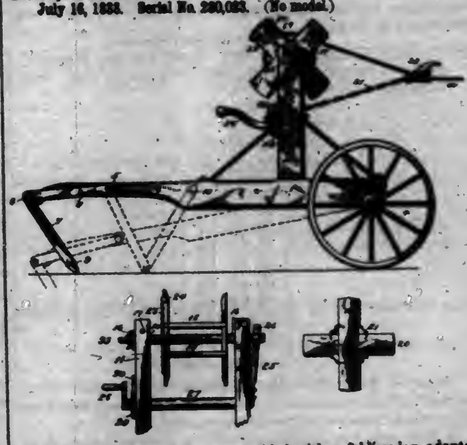
397,942. MACHINE FOR COOLING WAGON-TIRES. WILLIAM X. RUFF and KIMRY RAMSBURG, Ills, W. Va. Filed Dec. 5, 1887. Serial No. 257,059. (No model.)



Claim.—1. The combination of the base having the central socket, F, the rollers mounted on the base, the tank, the pin depending from the tank and engaging the said socket, the inclined rails secured to the tank and bearing on the rollers, and the bench supported on the base and over the tank, as set forth.

2. The combination of the base having the radial arms and the standards at the ends of the arms, the rollers on said arms, the vertically-movable tank arranged over the arms, the inclined rails secured to the tank and bearing on the rollers, the lever secured to the tank and projecting beyond the side of the same, and the bench arranged over the tank and having radial arms, the ends of said arms being secured to the standards and provided with vertical portions adjacent to said standards, as specified.

397,943. WIRE-REEL. OTTO SAAR, Council Bluffs, Iowa. Filed July 16, 1888. Serial No. 280,093. (No model.)



Claim.—1. A truck-frame provided with a folding leg adapted to be driven in the ground to form an anchorage, substantially as specified.

2. A truck-frame provided with a folding leg adapted to be driven in the ground to form an anchorage and to be bent to form a support, substantially as specified.

3. The combination, with a shaft, of a removable wire-reel, and a reel-embracing pin inserted through the shaft, substantially as specified.

4. The combination of a truck-frame having opposite standards with a removable shaft, a removable wire-reel mounted on the shaft, and a reel-embracing pin inserted through the shaft, substantially as specified.

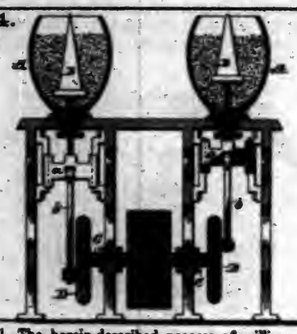
5. The beams 1, in combination with the links 6, pivoted as at 5, and the legs 7, pivoted to the links, as at 8, substantially as specified.

6. The beams 1, having the pin 10, in combination with the links 6, pivoted, as at 5, to the beams, and the legs 7, pivoted to the links, as at 8, and provided with the perforation 9, adapted to take over the pin 10, substantially as specified.

7. The shaft 15, perforated, as at 22, in combination with the reel-sections 19 and 20, and the pin 23, inserted through the shaft and having the head 22 for embracing one of the sections, substantially as specified.

397,944. PROCESS OF MILLING RICE. JOHN L. SHEPPARD, Charleston, S. C., assignor of one-half to Wilmot D. Parsons, same place. Filed Nov. 16, 1888. Serial No. 291,044. (No model.)

397,944.



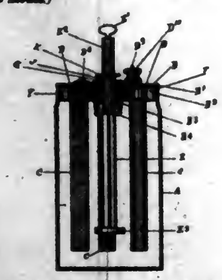
Claim.—1. The herein-described process of milling grain, consisting in mixing salt with the grain and then pounding the mixture, substantially as set forth.

2. The herein-described process of milling rice, consisting in removing the hull some time in advance of further milling, then mixing in common salt, and finally pounding the mixture, substantially as set forth.

3. The herein-described process of milling rice, consisting in removing the hull some time in advance of further milling, then mixing in common salt, pounding the mixture, and finally polishing it, substantially as set forth.

4. The herein-described process of milling rice, consisting in removing the hull some time in advance of further milling, then mixing in a quantity of common salt when the hulled rice is sufficiently hardened, beating and pounding the mixture, separating the meal or flour from the rice, and finally separating the salt from the polished rice, substantially as set forth.

397,945. ELECTRIC BATTERY. ELMER A. SPERRY, Chicago, Ill., assignor to Frank S. Terry, same place. Filed Mar. 24, 1888. Serial No. 268,447. (No model.)



Claim.—1. In a battery, the combination of a jar with a cover, a series of carbons, and carbon-securing rings, said carbons and rings being secured to and entirely beneath the cover.

2. In a battery, the combination of a jar with a cover, a series of carbons, carbon-securing rings attached to the lower side of the cover, and a body of insulating material on the under side of said cover, in which the carbon-securing rings are entirely submerged.

3. In a battery, the combination of a jar with a cover provided with a pendent rim, a series of carbons, carbon-clamping rings secured to said cover within the rim, and a body of insulating material filling the space inclosed by the rim and submerging the clamping-rings.

4. In a battery, the combination of a jar with a cover provided with a pendent rim and a somewhat longer pendent zinc-guide, a series of carbons, and carbon-supporting rings secured to the cover in the space between the rim and the guide.

5. In a battery, the combination of a jar with a cover provided with a pendent rim and a somewhat longer pendent zinc-guide, a series of carbons and carbon-supporting rings secured to the cover in the space between the rim and the guide, and a body of insulating material in the space between the rim and the guide and submerging the clamping-rings.

6. In a battery, the combination of a jar, a cover provided with a pendent rim inside the jar, and a zinc-guide internally enlarged at its lower end, with a series of carbons and clamping-rings secured to said cover, a zinc passed through the guide, and a body of insulating material between the cover and guide and submerging the carbon-clamping rings.

7. In a battery, a carbon-clamping device consisting of a series of contractible rings.

8. In a battery, a carbon-securing device consisting of a series of contractible rings provided each with a clamping device.

9. In a carbon-securing device, a series of contractible rings provided each with a clamping device and all secured to a central supporting-piece.

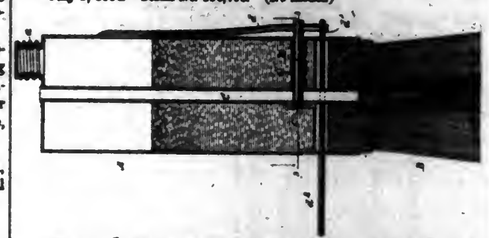
10. In a battery, a carbon-securing device consisting of a central ring with a series of contractible rings secured thereto, in combination with a jar-cover, on the lower side of which such carbon-securing rings are secured.

11. In a carbon battery, the combination of a jar with a cover provided with a pendent rim and a somewhat longer central pendent zinc-guide, the inner surface of which is enlarged toward its lower end, carbon-securing rings attached to the cover between the rim and guide, insulating material in which rings are submerged, and a zinc of such size as to engage the cover near the top of the guide only, so as to prevent the liquid in the jar from making a short circuit on the lower side of the cover between the zinc and carbons.

12. In a carbon battery, the combination of a carbon-securing device with a cover, said cover provided with apertures and said carbon-securing device with projecting chambered pieces which pass through said apertures, so as to provide a long bearing for the securing-screws on top of the cover.

13. In a carbon battery, a zinc, round at its upper end, provided with straight longitudinal corrugations extended along its lower portion to afford increased contact-surface with the liquid.

397,946. FOUNTAIN-BRUSH. JOHN STEVENS, Neenah, Wis. Filed July 5, 1884. Serial No. 136,798. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, in a fountain-brush, of a reservoir, a brush or distributer, a fluid-tube passing from the reservoir into the body of the brush or distributer, and having an inwardly-flaring opening through its wall within the reservoir to admit the contents of the latter, a lateral tube entering the fluid-tube opposite said opening, and extending thence through the wall of the reservoir, a valve and valve-plunger playing in said lateral tube and across the fluid-tube, and a spring pressing upon the valve-plunger to force the valve against said feed-opening.

2. The combination, substantially as hereinbefore set forth, in a fountain-brush, of a reservoir, a brush or distributer, a fluid-tube leading from the external air through the reservoir into the brush or distributer, and having a lateral feed-opening into the reservoir, a guide-tube connecting said fluid-tube opposite the feed-aperture with the wall of the reservoir, and a spring-pressed valve-plunger within said guide-tube adapted to normally close the feed-aperture and fluid-tube.

3. The combination, substantially as hereinbefore set forth, in a fountain-brush, of a reservoir, a brush or distributer, a straight fluid-tube passing entirely through the reservoir and into the body of the brush, open at one end to admit air and receive a clearing-rod and at the other to discharge fluid, and having a lateral feed-aperture opening into the reservoir, a guide-tube entering the fluid-tube opposite said aperture and extending through the exterior wall of the reservoir, a valve-plunger playing through said guide-tube and across the fluid-tube to close it and the feed-aperture, a spring connected to said plunger to hold the valve closed, and means whereby the valve may be opened by the finger.

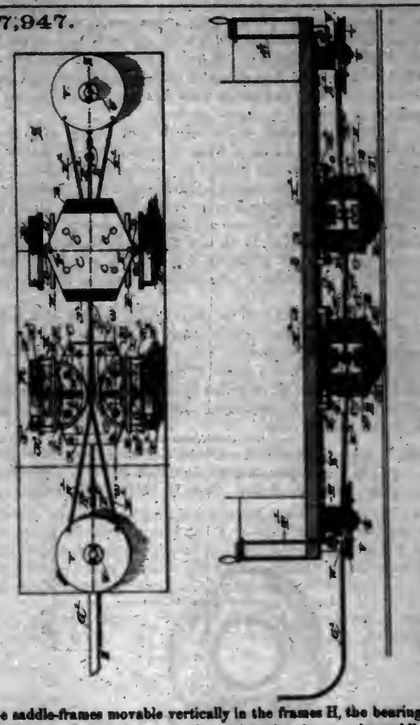
4. The combination, substantially as hereinbefore set forth, in a fountain-brush, of a reservoir, a brush or distributer, the tube C, with aperture *c*, the cross-tube C', valve-plunger D, spring *d*, and rod *d'*, passing from said spring across the under side of the reservoir to the opposite side thereof, whereby the pressure of a finger may open the valve.

397,947. STREET-CAR. EDWARD R. TAYLOR and WILLIAM S. TAYLOR, Newport, R. I. Filed Nov. 28, 1883. Serial No. 291,591. (No model.)

Claim.—1. The combination, in a car-truck, of the curved guides E, the pivoted truss-frames H, having the bearings N, the axles journaled in the bearings N and in the bearings O, and means, substantially as set forth, to turn the truss-frames on their pivots, for the purpose set forth, substantially as described.

2. The combination, in a car, of the trucks having the pivoted frames H, the curved guides E, the bearings O, movable on the guides

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E, the saddle-frames movable vertically in the frames H, the bearings N, pivoted in the saddle-frames, the springs bearing on the saddle-frames, and the independent axles journaled in the bearings N and having their inner ends journaled in the bearings O, substantially as described.

3. The combination, in a railway-car, of the trucks having the pivoted bearings for the axles, the pivoted tongue, the disk V, connections between the latter and the inner ends of the axles, and means, substantially as set forth, to lock the tongue to the disk V, whereby the latter may be operated by the tongue, substantially as described.

4. The combination, in a car, of the trucks having the pivoted axles, the disk V, connections between the same and the inner ends of the axles, whereby the latter may be turned on their pivots, for the purpose set forth, the disk W, having the notch Z, the tongue secured to the said disk, the bolt Y, guided on the disk V and adapted to engage the notch Z, the notched arms D', rigidly secured to the car, the pivoted plate A', adapted to engage and operate the bolt Y, and devices to operate the said plate, substantially as described.

5. The combination, in a car, of the truck having the pivoted axle-bearings, the brake-levers pivoted to the said bearings, the endwise-movable rod, and connections between the latter and the brake-levers, substantially as described.

6. The combination, in a car, of the truck having the pivoted axle-bearings, the brake-levers pivoted to the said bearings, the endwise-movable rod, and the chains connecting the said rod to the brake-levers, and guiding-sheaves for the said chains, substantially as described.

7. In a car, the plates A B, arranged apart and having the guides E, the frames H, pivoted between the plates, the independent axles, and the bearings O for the axles, turning on the guides E, as set forth.

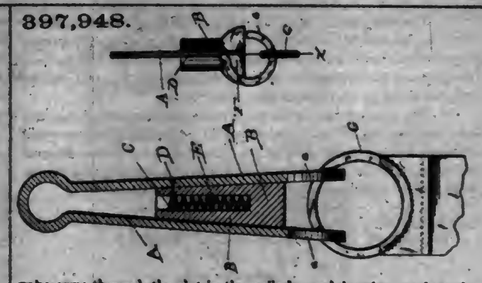
8. In a car, the trucks having the pivoted frames H, the curved guides E, the bearings O, movable on the guides, and the independent axles journaled in the bearings O and also connected to the frames H, as set forth.

9. In a car, the frames having the guides E, the pivoted frames H, the bearings N in the frames H, the bearings O, turning on the guides E, and the independent pivoted axles journaled in the bearings N O, as set forth.

397,948. SNAP-HOOK. ROBERT R. WADDELL, Hillsborough, Ohio. Filed May 23, 1888. Serial No. 274,780. (No model.)

Claim.—1. A snap-hook comprising a wire yoke, the lower ends of which are reversely turned, forming hooks, a hollow side grooved cylinder fitted between the yoke-arms, a spring fitted in said hollow portion of the cylinder, and a pin extending inwardly from one of the

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yoke-arms through the slot in the cylinder and bearing against the spring, substantially as described.

2. A snap-hook comprising a wire yoke, the lower ends of which are turned up, forming reversed hooks, and a cylinder fitted between the yoke-arms, a spring suitably situated in said cylinder, and a pin extending inwardly from the yoke-arms through the slot in the cylinder and bearing against the spring.

397,949. HANDLE FOR SURGICAL INSTRUMENTS. WILHELM WALB, Heidelberg, Germany. Filed Oct. 17, 1888. Serial No. 288,206. (No model.)



Claim.—1. In a separable haft or handle for bistouries or other surgical instruments, the combination of the two halves or scales provided at their upper ends with suitable means for holding a blade and having at their lower ends, respectively, a longitudinal opening, A, and a projection for engaging therein to form the combined hinge and slide joint, substantially in the manner and for the purpose described.

2. In a separable haft or handle for bistouries or other surgical instruments, the combination of the two halves or scales provided at their upper ends, respectively, with the headed pin S and the corresponding slotted aperture, F, whereby the blade is held, and having at their lower ends, respectively, a longitudinal opening, A, and a projection for engaging therein to form the combined hinge and slide joint, substantially in the manner and for the purpose described.

397,950. VACUUM-ARROW. FRANK WHITE, Philadelphia, Pa., assignor to Philip W. Pratt, Boston, Mass. Filed July 30, 1888. Serial No. 281,485. (No model.)



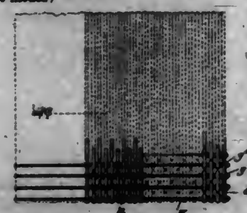
Claim.—1. The combination of an arrow-shaft and a vacuum (or pneumatic) arrow-head secured to one end thereof.

2. The combination of a vacuum arrow-head, an arrow-shaft, and a connecting-shank fixed in one end of the arrow-shaft and having a disk-head secured in the vacuum arrow-head, as set forth.

3. The combination of a vacuum arrow-head, an arrow-shaft, a shank connecting the same, and a ferrule surrounding the head of the arrow-shaft, as set forth.

4. An elastic arrow-head having a concave front side, a yielding level edge and an attaching device whereby it may be secured to a shaft, as set forth.

397,951. SLACK-BURNING FURNACE. THOMAS WILKINSON and JOHN GLENDENNING, Kansas City, Mo. Filed July 30, 1888. Serial No. 281,368. (No model.)



Claim.—1. The combination, with a suitably-mounted endless carrier-grate, of an endless carrier ash-remover mounted beneath said grate and provided with scoops, substantially as set forth.

2. The combination, with a grate-supporting frame and the endless carrier-grate mounted in the frame, of an endless carrier ash-remover supported in the frame beneath the grate, substantially as set forth.

3. The combination, with the grate-supporting frame and the inclined ash-pit wall at the rear of the grate, of the endless carrier-grate supported in the frame, and the ash-remover consisting of a series of traveling scoops arranged to travel in proximity to the said inclined wall below the grate, substantially as set forth.

4. The combination, with the grate-supporting frame, the endless grate supported therein, and means for actuating the endless grate, of an ash-remover supported by the frame, and a connection between the ash-remover and the grate, whereby the motion of the grate imparts motion to the ash-remover, substantially as set forth.

397,952. CHALK-HOLDER. DAVID WILLIAMSON, New York, N.Y.

Filed Sept. 12, 1888. Serial No. 285,218. (No model.)



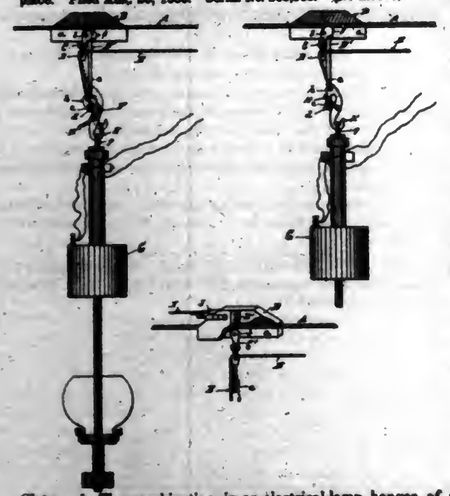
Claim.—1. The combination, with a marking substance, as crayon, in the form of a plate or tablet, of a pair of clamping-plates between which the said marking substance is held, and a spring pressing the clamping-plates against the substance, as set forth.

2. In combination with a marking substance, as crayon, in the form of a plate or tablet, a pair of clamping-plates between which the said marking substance is held, and a spring pressing the clamping-plates against the substance, the said clamping-plates being pressed upon the marking substance to their extremities and along the whole width of the substance, as and for the purpose set forth.

3. The combination, with a pair of spring clamping-plates hinged to each other and a marking substance between the two, of a screw-piece behind the said marking substance, the said screw-piece having an incline at one portion, the said incline co-operating with a projection on one of the clamping-plates to press the two apart, as set forth.

4. The combination, with a pair of clamping-plates and a spring forming the hinge thereof, of a screw-rod having a bearing in the said spring and extending along a groove in one of the clamping-plates, the said screw-rod also traversing a movable screw-piece, as and for the purpose set forth.

397,953. ELECTRIC-LAMP HANGER. MONTRAVILLE M. WOOD, Erie, Pa., assignor of one-half to the Erie County Light Company, same place. Filed Aug. 23, 1888. Serial No. 283,585. (No model.)



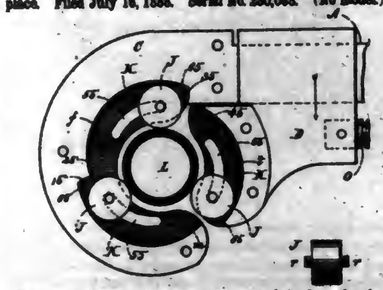
Claim.—1. The combination, in an electrical-lamp hanger, of a block adapted to slide and rest upon a supporting-cable with a hook having a cam-shaped shank pivoted in said block and adapted to be turned on its pintle so as to clamp the supporting-cable against said block, a pulley suspended from said hook, and a rope operating in said pulley for raising and lowering a lamp suspended therefrom, substantially as and for the purpose set forth.

2. The combination, in an electric-lamp hanger, of a block adapted to slide and rest upon a supporting-cable, a hook pivoted in said block, and a pulley suspended thereon with a stirrup secured to said block and projecting downward therefrom, a rope passing through said pulley and downward through said stirrup, and an S-hook on the lower end of said rope adapted to support a lamp, and a tongue pivoted to said S-hook so as to close the upper half of said S-hook and prevent its engagement with said stirrup when the lamp is being lowered, substantially as and for the purpose set forth.

3. The combination, in an electric-lamp hanger, of a grooved supporting-block, B, having a hook, C, pivoted therein, with a rigid stirrup, B', secured to said block B and having an insulator, *d*, in the lower end thereof, a lamp raising and lowering rope, E, passing through a pulley suspended from said hook C and through the stirrup B', an S-hook, F, secured to said rope and adapted to suspend a lamp to the stirrup B', and a tongue, H, on said S-hook F, adapted to close up against the upper half of the hook F when it is lowered past the lower part of the stirrup B', substantially as and for the purpose set forth.

4. The combination, in an electric-lamp hanger, of a grooved block, B, adapted to rest upon a supporting-cable, A, having a lamp-supporting stirrup, B', thereon, with an eccentric clamping-hook, C, pivoted in said block B, a pulley, D, and an S-hook, F, thereon, provided with a tongue, H, supported by said hook C, and a lamp raising and lowering rope, E, operating in said pulley D, substantially as and for the purpose set forth.

397,954. WRENCH. WILLIAM C. WORTHEN and GORDON PRENDERGAST, Jr., Boston, Mass., assignors of one-third to John D. Walworth, same place. Filed July 16, 1888. Serial No. 280,068. (No model.)



Claim.—1. The combination of a wrench-body, a fixed segmental jaw attached thereto, a movable segmental jaw thereon, said jaws being provided with evolute recesses in their inner faces, and movable projections disposed within said recesses and extending beyond the inner faces of the jaws.

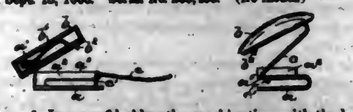
2. The combination of a wrench-body, a fixed segmental jaw attached thereto, a movable segmental jaw thereon, said jaws being provided with evolute recesses in their inner faces and with arc-shaped grooves, and movable projections disposed within said recesses and provided with trunnions which move in said grooves, said projections extending beyond the inner faces of the jaws.

3. The combination of a wrench-body, a fixed segmental jaw attached thereto, a movable jaw thereon, said jaws being provided with evolute recesses in their inner faces and with arc-shaped grooves, movable projections within said recesses provided with trunnions which move in said grooves, said projections extending inward beyond the inner faces of the jaws, and springs which tend to force said projections toward the narrow ends of said recesses.

4. The combination of a wrench-body, a fixed segmental jaw attached thereto, a movable jaw thereon, said jaws being provided with evolute recesses in their inner faces and with arc-shaped grooves, roll-shaped projections within said recesses provided with trunnions which move in said grooves, the peripheries of the roll-shaped projections extending beyond the inner faces of the jaws, and springs which tend to force said projections toward the narrow ends of said recesses.

397,955. SCARF-HOLDER. GEORGE B. ADAMS, Irvington, N. J.

Filed Sept. 15, 1888. Serial No. 285,452. (No model.)



Claim.—1. In a scarf-holder, the combination, with the body portion consisting of clamping-jaws having arms on each side thereof, of a claw-plate pivotally secured between said arms and co-operating with said jaws to grasp the bosom-band of a shirt, a head or button pivotally arranged on an arm extending up from said body portion, and a spring operating to cause the holding-contact of said head and body portion, for the purposes set forth.

2. In a scarf-holder, the combination, with the body portion consisting of holding-jaws to grasp the bosom-band of a shirt, of a head

or button secured to said body portion by means of an arm projecting up into the upper clamping-head, which consists of a casing, as set forth, and engaging with a spring arranged in said casing and operating to cause the holding-contact of the head and body portion, for the purposes set forth.

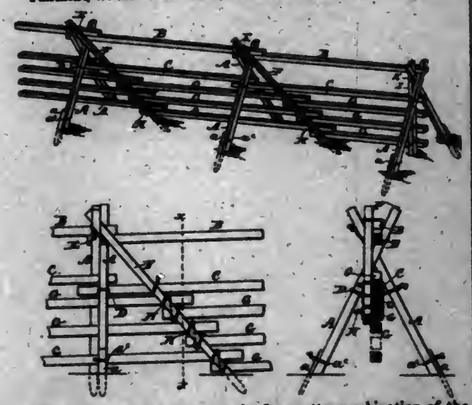
3. In a scarf-holder, the combination, with the body portion consisting of clamping-jaws having arms on each side thereof, of a claw-plate pivotally secured between said arms and co-operating with said base-plate to grasp the bosom-band of a shirt, and a head or button arranged on the opposite end of the claw-plate, said head consisting of a casing, as set forth, into which the end of the claw-plate extends and engages with a spring arranged in said casing and operating to cause the holding-contact of the head and body portion.

4. A scarf-holder composed of a body portion consisting of holding-jaws having arms on each side thereof, a claw-plate pivotally secured at one end thereof between said arms to grasp the bosom-band of a shirt, and a head or button pivotally arranged on said claw-plate at the opposite end thereof, for the purposes set forth.

5. In a scarf-holder, the combination, with the body portion consisting of a pair of jaws, of a claw-plate hinged to one of said jaws, so as to act upon the other jaw to grasp the bosom-band of a shirt, and a head or button pivotally arranged on the opposite end of said claw-plate, for the purposes set forth.

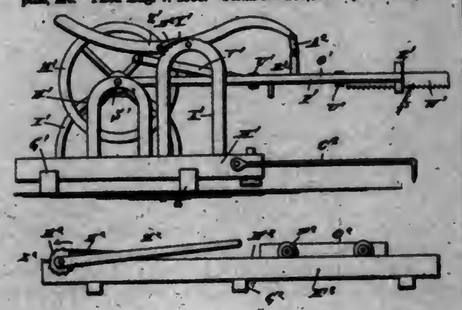
6. In a scarf-holder, the combination, with the body portion consisting of a pair of jaws, of a claw-plate hinged to one of said jaws, so as to act upon the other jaw to grasp the bosom-band of a shirt, a head or button pivotally arranged on the opposite end of said claw-plate, said head consisting of a casing, as set forth, into which the end of the claw-plate extends and engages with a spring arranged in said casing and operating to cause the holding-contact of the head and body portion, substantially as and for the purposes set forth.

397,956. FENCE. WILLIAM R. ARNETT and GEORGE M. PRICE, Fairmont, W. Va. Filed Jan. 3, 1889. Serial No. 295,236. (No model.)



Claim.—As an improvement in fences, the combination of the crossed stakes A and short inclined posts *a*, lying upon the outer inclined face of said stakes, the wire lashings uniting said posts and stakes, the under crotch-rails, C, the upper crotch-rails, B, the lashings E, surrounding the ends of the rails B and of the stakes A, the diagonal lever-brace F, having its lower end driven in the ground, the rails G, having their spliced portions opposite said brace F, and the lashings H, passing around and between the rails, uniting the rails G in pairs and to the lever-brace, substantially as shown and described.

397,957. FIRE-WOOD DRAG-SAW. FRANCIS M. ATLWARD, Memphis, Mo. Filed Aug. 7, 1888. Serial No. 282,131. (No model.)

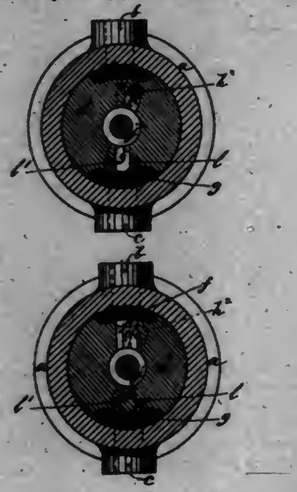


Claim.—1. The combination, in a drag-saw, of the supporting-frame having the brackets or standards, the shaft K', journaled therein and having the crank-wheel, the frame O', having one end pivoted in line with the axle of shaft K', the cross-head guided in the said frame, the pitman connecting the cross-head to the crank-wheel, the saw attached to the cross-head, the bracket X', having ratchet-teeth Y', the lever fulcrumed to the said bracket, the link A^3, connecting the lever to the free end of frame O', and the pawl B^3, pivoted to the lever and engaging the teeth Y', for the purpose set forth, substantially as described.

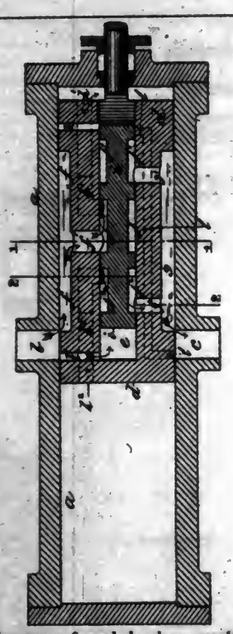
2. The drag-saw having the driving-shaft K', provided with the knuckle L', and the coupling-shaft D^2, secured to the knuckle L' and having the sleeve or socket F', said sleeve or socket F' being designed to be coupled to the end of either shaft of a horse-power, so as to run the drag-saw at a greater or less speed, as set forth.

397,958. DIRECT-ACTING STEAM OR PNEUMATIC ENGINE. GUSTAV A. BAETZ, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Aug. 27, 1888. Serial No. 283,995. (No model.)

Claim.—The combination of a cylinder, *a*, having inlet and exhaust ports *b c*, a piston, *d*, having an internal chamber, *e*, and inlet and outlet spaces or pockets *f g*, communicating-ports *f'* and *g' g²*

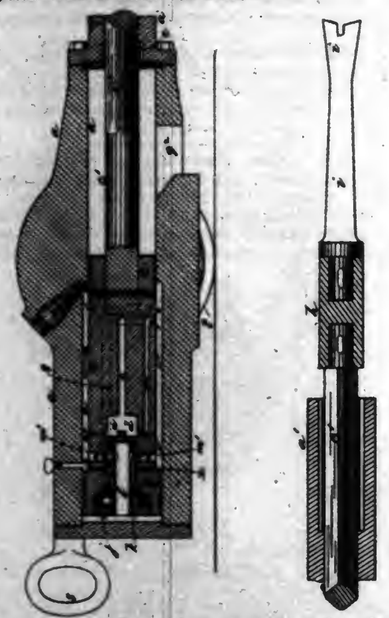


397,958.



between the respective spaces *f g* and chamber *e*, combined inlet and outlet passages *k' k²* in piston *d* between chamber *e* and cylinder *a*, inlet relief-passages *k k'*, and outlet relief-passages *l l'* in piston *d*, opening into each end of the chamber *e* and on the outside of piston *d*, with the distribution-valve *i*, having circumferential depressions or passages *j j j³*, substantially as shown, and for the purpose described.

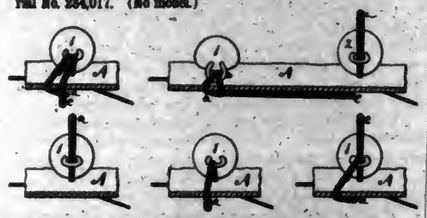
397,959. DIRECT-ACTING ENGINE. GUSTAV A. BARTH, St. Louis, Mo., assignor to Pierre Ghoutean, same place. Original application filed Aug. 20, 1888, Serial No. 283,220. Divided and this application filed Nov. 27, 1888. Serial No. 291,950. (No model.)



Claim.—1. In a direct-acting steam or pneumatic engine, the combination of the cylinder having inlet ports or passages and an outlet port or passage, said passages opening into a chamber closed at both ends and containing a valve, with the inlet-passage in piston-rod to the chamber containing the distribution-valve, substantially as shown, and for the purpose described.

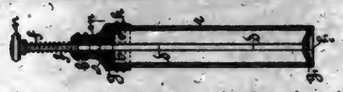
2. The combination of inlet ports or passages and valve *y* in closed chamber *z*, with outlet-passage *b'* from cylinder *a* and inlet-passage *c* in piston-rod *c*, substantially as shown, and for the purpose described.

397,960. METHOD OF ATTACHING SHANK-BUTTONS TO FABRICS. WALTER H. BENNETT, Boston, Mass. Filed Aug. 28, 1888. Serial No. 284,017. (No model.)



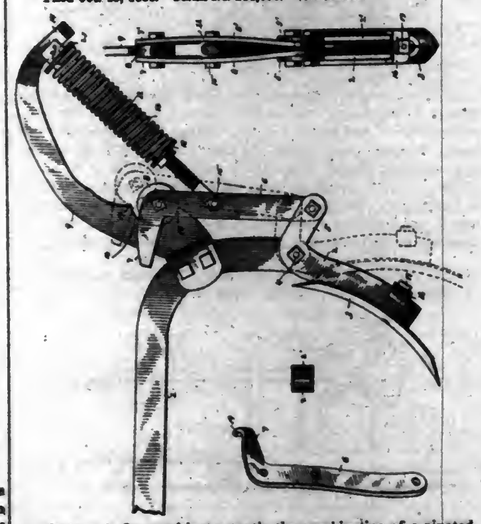
Claim.—The method of attaching shank-buttons to fabrics herein described, the same consisting in first forcing a loop of thread up through the fabric and button-eye, then bending it over the shank of the button, then drawing said loop down through a second hole in the fabric outside the button-eye, then forcing a loop of a second thread up through a third hole in the fabric and through the button-eye, then bending it over the shank of the button, then drawing the loop of the second thread down through a fourth hole in the fabric outside the button-eye, then passing it through the loop of the first thread under the fabric, and then exerting sufficient strain upon the first thread and said second loop under the fabric to bring the shank of the button in contact with the fabric to draw all the threads snugly through the button-eye and holes in the fabric and to make the loop of second thread long enough to receive and interlock with the first loop of the succeeding button-stitch, as shown and set forth.

397,961. ASSAYING-GLASS FOR TESTING WINE. THEODOR F. BERNHARD, Lilienstein, near Konigstein, Saxony, Germany. Filed Oct. 10, 1888. Serial No. 287,721. (No model.)



Claim.—In an assaying-glass for proving the purity and genuineness of wine, the tube *r*, perforated cap *k*, carried by said tube and apertured, threaded stem *s*, and the cover *m*, that is carried by the stem *s* and adapted to close the apertures in the cap, combined with the rod *d*, that passes through the cover *m*, cap *k*, and tube *r*, spring *s*, button *n*, and cap *h*, carried by the rod *d*, substantially as described.

397,962. CULTIVATOR-TOOTH. JOSEPH C. BIRD, Rising Sun, Md. Filed Oct. 13, 1888. Serial No. 288,050. (No model.)



Claim.—1. In a cultivator-tooth, the combination of a pivoted plow-support, a bar pivotally connected to said support, a guide-roller secured to the bar, a fixed guide co-operating with the roller, an obstruction on the guide over which the roller must ride when the plow yields, and a spring engaging the bar and holding the roller and plow in their normal positions.

2. The combination of the drag-bar 1, angle-lever pivoted thereto, bar 6, roller 8, guide 9, retaining-hook on bar 7 to prevent dislodgement of the roller, and a spring co-operating with bar 6 for maintaining the parts in their normal positions.

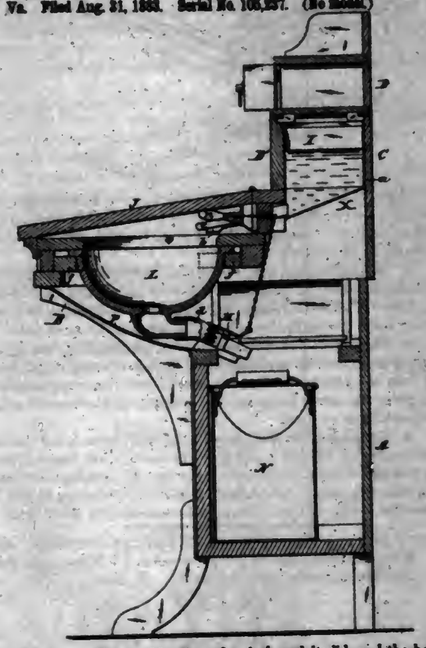
3. In a cultivator-tooth, the combination of drag-bar 1, plow-support pivoted thereto, a crank-arm on said support, bar 6, pivoted thereto, said bar being provided with a retaining-hook co-operating with a guide, 9, a roller carried by the arm engaging the guide, rod 11, adapted to pass through a slot in guide 9, and spring 13, co-operating with said rod.

4. The combination of a pivoted plow, pivoted bar 6, co-operating therewith, roller 8, guide 9 for said roller, a spring to hold the roller and plow in their normal positions, and a recess in the guide in which the roller normally rests.

5. The combination of the elbow-lever 2, a plow carried by one arm, bars 6 6', pivotally secured to the other arm, guide 9, arms 7 7', bent to meet over the guide, roller 8, pivoted between the bars, and a spring for holding the roller against the guide.

6. The combination of a slotted guide-bar, 9, rod 11, having one end mounted on a movable pivot, 15, the other end entering the slot of the guide-bar, spring 13, washer 21, against which the spring is seated, and lugs 20, on which the washer bears, as and for the purpose set forth.

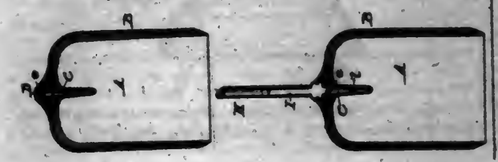
397,963. WASH-STAND. NATHAN O. BOSH, Fairfax Court-House, Va. Filed Aug. 31, 1888. Serial No. 285,237. (No model.)



Claim.—1. The combination of a desk and its lid, and the back portion, C, above and at the rear of the lid and consisting of the lower fixed case, D', the water-receptacle located therein, and the upper case, D, the two cases being constructed substantially as described, whereby the upper portion may slide across the desk to uncover the lower portion, substantially as described.

2. The combined desk and wash-stand provided with the back portion, C, having the detachable backing-plate *a*, in combination with receptacle I, attached to the same, as set forth.

397,964. SHOVEL. HARRISON BEARD, Elon, N.Y., assignor of one-half to Albert M. Rose, same place. Filed Dec. 12, 1888. Serial No. 293,251. (No model.)



Claim.—1. As an improvement in shovels, the blade A, having the loop D formed integral therewith by cutting a slit in the metal and then swaging or bending the severed portion of the metal outward or backward, as shown and described.

2. The shovel-blade A, provided with the loop D at its upper end, and the longitudinal groove or recess C for the reception of the handle, substantially as herein set forth.

3. In combination with the blade A, provided with the loop D, the strap I, provided with the lateral projections *e* and the longitudinal projection *a*, substantially as shown and described.

397,965. ELECTRICAL BATTERY. WILLIAM BERKLEY, North East, assignor of two-thirds to Samuel A. Davenport, Erie, and Charles A. Hitchcock, North East, Pa. Filed June 11, 1888. Serial No. 276,771. (No model.)



Claim.—1. The combination, in an electrical battery, of a permeable sack secured to and suspended from an opening in the jar-cover, with carbons and depolarizing material inclosed within said permeable sack, and non-conducting material filling and sealing the opening in the jar-cover and the mouth of said sack around the carbons therein, substantially as and for the purpose set forth.

2. The combination, in an electrical battery, of the carbon element having a metallic head or collar thereon, with a screw-threaded plug passing through said metal head and contacting with the carbon element, substantially as and for the purpose set forth.

3. The combination, in an electrical battery, of a permeable sack sealed into an opening in the jar-cover with a non-conducting material, and containing the carbon and depolarizing elements of said battery, and non-conducting material filling and sealing the mouth of the sack around the carbon element, with a cylinder of zinc surrounding said permeable sack, and a jar inclosing and containing said zinc cylinder and said elements, and an attacking-liquid, substantially as and for the purpose set forth.

4. The combination, in an electrical battery, of a negative element consisting of a number of carbon pencils secured together at their upper ends by passing through a metallic disk or plate, and a metallic screw-plug passing transversely through said disk or plate and contacting with all of the pencils secured therein, a permeable sack for retaining the depolarizing material between and surrounding the said carbon pencils, and non-conducting material filling and hermetically sealing the mouth of said sack around said carbons with a positive element consisting of a cylinder of sheet-zinc surrounding the negative element of said battery, thereby presenting the maximum surface for the generation of electrical currents, substantially as and for the purpose set forth.

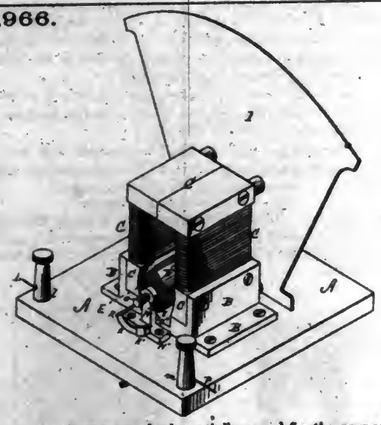
5. The combination, in a hermetically-sealed electric battery, of an outside jar, A, provided with a screw-cap, C, and gasket *b*, with a cover, B, adapted to fit the top of the jar A, and having openings D and H therein, and non-conducting material, P and A, filling and sealing said openings around the carbons I and the binding-post N therein, substantially as and for the purpose set forth.

6. The combination, in an electrical battery, of a retaining-jar, A, with a cover, B, having openings H and D therein, and a downwardly-projecting sleeve, *d*, surrounding the opening D, and a groove, *c*, around said sleeve *d*, substantially as and for the purpose set forth.

397,966. ELECTRIC-CURRENT INDICATOR. WILLIAM A. CAREY, Malden, Mass. Filed Oct. 20, 1887. Serial No. 253,570. (No model.)

Claim.—The hereinbefore-described improved instrument for measuring electrical currents, consisting, essentially, of the electro-magnet C, support A', core D, and armature E, pivotally secured in the standards H H', spindle E', dial I, and pointer J, spindle E'', and weighted lever or arm K, bent into substantially the shape shown, said instrument being provided with suitable electrical connections

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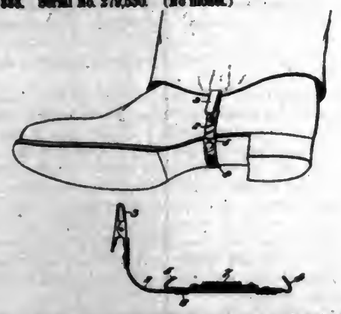
and arranged and constructed substantially as and for the purpose set forth.

397,967. SANDAL. ALFRED L. CARROLL and BRADNER J. CARROLL, New Brighton, N. Y., assignors to the American Patents Company, of Pennsylvania. Filed Oct. 20, 1888. Serial No. 289,417. (No model.)



Claim.—As an improved article of manufacture, a sandal consisting of a flat sole, A, flexible from end to end and provided with a toe-piece and a heel-piece and having a fastening-strap connected with the heel-piece and with the sole in front of the heel, whereby when the sandal is applied to the shoe the said strap will bend the sole up under the instep and thus shorten and retain it in place, substantially as set forth.

397,968. TROUSERS-STRAP. GEORGE T. CARTER, Pittsburg, Pa., assignor of one-half to Wendell M. Smith, Rochester, N. Y. Filed July 10, 1888. Serial No. 279,530. (No model.)



Claim.—1. An improvement in trousers-straps herein described, which consists in a strap or band which detachably engages the trousers, and a detachable fastening which engages the sole of the shoe and connects the band therewith, substantially as and for the purposes described.

2. An improvement in trousers-straps, which consists in the combination, with a clamp which is adapted to clasp the under side of the sole of the shoe and to engage the opposite edges of the sole, of a strap or band which extends from said clamp, and a clasp which detachably engages the strap with the trousers, substantially as and for the purposes described.

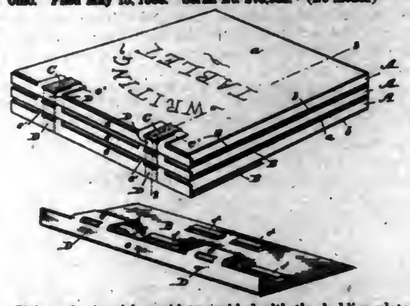
3. An improvement in trousers-straps, which consists in the combination, with a clamp which is adapted to clasp the under side of the sole of the shoe, of a strap or band which extends from said clamp, a clasp which detachably engages the strap with the trousers, said clamp consisting of two hooks adapted to engage the opposite sides of the sole of the shoe and connected by a spring by which they are rendered separable, substantially as and for the purposes described.

397,969. SALVANIC BATTERY. EBEN D. CROSS, Chicago, Ill. Filed Dec. 10, 1888. Serial No. 293,216. (No model.)



Claim.—In a galvanic battery, the combination, substantially as hereinbefore set forth, with a couple of cells and suitable electrodes and excitants therein contained, of a third supply-cell, a fume-conducting passage arranged to conduct the fumes from one of said cells and discharge the same into the supply-cell, and a fluid contained within the supply-cell and capable of being charged by said fumes, for the purpose described.

397,970. WRITING-TABLET. JOHN C. CRESPENING, Springfield, Ohio. Filed May 15, 1888. Serial No. 273,923. (No model.)



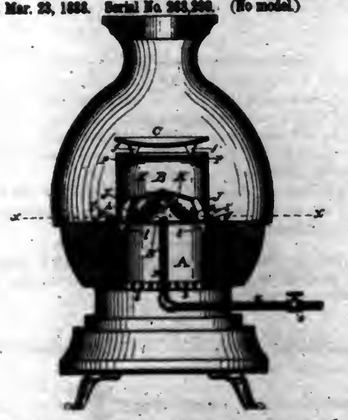
Claim.—1. A writing-tablet provided with the holding-plate and the laterally-extending retaining piece or pieces D on the back of the holding-plate, and forming an opening or openings closed at each end, substantially as set forth.

2. The combination, with two or more writing-tablets having the holding-plates and the retaining-pieces D, of the flexible strip C, passing from one tablet to another and beneath said retaining-pieces, the tablets being detachable from the strips, substantially as set forth.

3. The combination, with two or more writing-tablets having the holding-plates and the retaining-pieces D, of the flexible strip C, passing from one tablet to another and beneath said retaining-pieces, and the protecting-covers P, the tablets being detachable from the strips, substantially as set forth.

4. A writing-tablet provided with the back cover, *b*, and the stiff holding-plate B, secured to said cover by means of the fingers *f*, passing through and bent down upon the cover, the holding-plate being provided with means, substantially as described, whereby it may be connected and hinged with other tablets, substantially as set forth.

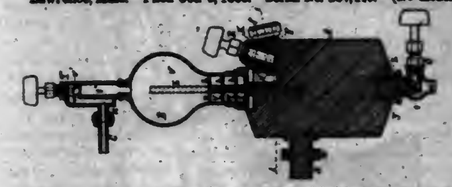
397,971. COAL-OIL BURNER OR HEATING APPARATUS. JOHN M. CLARK, Dayton, Ohio, assignor of one-half to C. L. Hinton, same place. Filed Mar. 23, 1888. Serial No. 268,298. (No model.)



Claim.—The combination, with a stove or furnace, of a coal-oil burner consisting of a shell, A B, provided with outside rim, *g*, inside

rim, *p*, and lugs *l*, a cone, E', having upturned rim A, with lugs *l'*, and corrugated circular depressions K, surrounding the same, said cone forming an oil-receptacle, D, the jokers J, and hood C, with lugs *f* and oil-supply pipe, as shown and described; and for the purpose set forth.

397,972. STEAM-ENGINE LUBRICATOR. WARREN H. CRAIG, Lawrence, Mass. Filed Oct. 6, 1888. Serial No. 287,449. (No model.)



Claim.—1. A sight-feed lubricator provided in its water-space with one or more partitions, each having a small opening or hole, whereby pulsation is prevented, as set forth.

2. A lubricator provided with a duplex oil-reservoir, a water-pocket located at the upper part thereof, the tubular projections F F, and the conduits I I, leading from the pocket into the projections and each projection communicating with one side of the duplex oil-reservoir, whereby each part of the oil-reservoir is supplied with condensed-water independent of the other, as set forth.

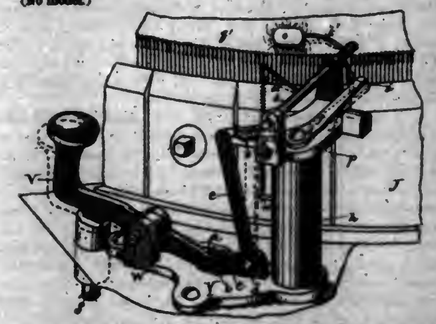
3. A lubricator provided with a duplex oil-reservoir, a water-pocket located at the upper part thereof, the projections F F, provided with a glass pane or window, and the conduits I I, leading from the pocket into the projections and having the passages close to the panes or windows and leading into each side of the oil-reservoir, as set forth.

4. A lubricator provided with a duplex oil-reservoir, a water-pocket, a sight-feed for each part of the oil-reservoir, and a conduit connecting the pocket with each sight-feed chamber and being connected with each part of the oil-reservoir, as set forth.

5. In a sight-feed lubricator, the sight-feed chamber and projection, in combination with the conduit I, having its outer end located close to the glass of the projection, such outer end being widened and concaved at its top, front, and bottom, forming a chamber, as set forth.

6. A lubricator provided at the top of its condenser with the trap consisting of the chamber *s'* and passage *t*, alongside each other and communicating with each other, the chamber having the branch pipe *x*, and the passage being adapted to the top of the condenser, as set forth.

397,973. STOPPING DEVICE FOR KNITTING-MACHINES. JOHN S. CRANE, Lake Village, N. H. Filed Aug. 9, 1883. Serial No. 103,234. (No model.)

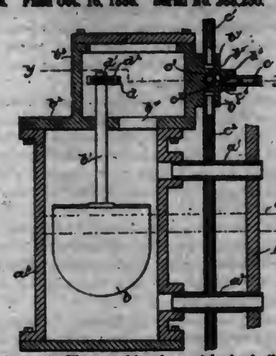


Claim.—1. The combination, with a needle-cylinder having one or more stops projecting from its periphery, of a block turning on a vertical pivot secured to a stationary part of the machine, a lever mounted on the said block, turning on a horizontal pivot of the same, and weighted to tilt outward and downward, a thread-guide mounted upon the said lever and adapted to tilt with the same, a ring or hoop adapted to be engaged and moved by the pivoted block, and a belt-shipping mechanism constructed to be operated by the said ring or hoop, substantially as herein specified.

2. The combination of a needle-cylinder, J, having stops *k' k'* upon its periphery, horizontally-swinging block *b'*, vertically-tilting lever *d'*, mounted on the swinging block, thread-guide *f'* mounted on the tilting lever and tilting with the same, ring or hoop *i'*, adapted to engage with the said swinging block and provided with the arm *o'*, lever *f*, adapted to engage with the said arm, lever *c*, adapted to engage with the said lever *f*, lever V, adapted to engage with the said lever *c*, stop S, bearing on the said lever V, springs R and T, lever O, and clutch B, substantially as and for the purpose herein specified.

3. The combination of a needle-cylinder provided with one or more stops or projections, a block pivoted vertically on a bed or stationary part of the machine near the cylinder, a lever pivoted horizontally upon the said block, a thread-guide mounted upon the said lever, a presser-wheel, a lifting device connected with the standard which carries the presser-wheel, and means connecting the said lifting device and the said lever, the lever being adapted to be tilted when the thread breaks or runs out and to engage with the connection between it and the presser-wheel lifter, for the purpose herein set forth.

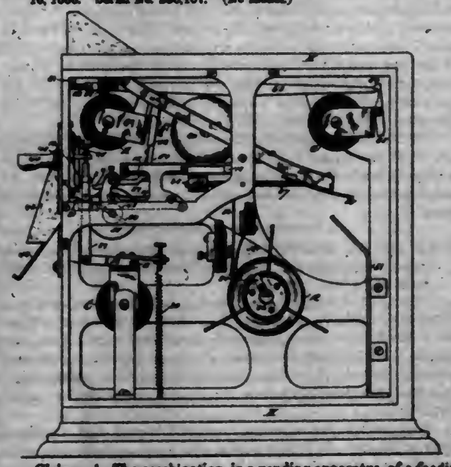
397,974. FEED-WATER REGULATOR. JOHN P. CUMMINS, Beverly, Mass. Filed Oct. 16, 1888. Serial No. 288,230. (No model.)



Claim.—1. The combination, with the boiler, of an automatic feed-water regulator to control the supply of water to the boiler, it consisting of a vessel independent of but connected to the boiler, a float in said vessel, a valve-casing provided with a water-inlet port, a water-outlet port communicating with the boiler, and a second water outlet or discharge port, and a valve operatively connected to the float in said vessel to control the said inlet and outlet ports, the inlet-port by one movement of the float being connected to the boiler, and by the movement of the float in the opposite direction being connected to the discharge-port, substantially as and for the purpose specified.

2. The combination, with the boiler, of an automatic feed-water regulator to control the supply of water to the boiler, it consisting of a vessel connected by its upper and lower ends to the boiler, a float in said vessel, a valve-casing provided with a water-inlet port, *c*, a water-outlet port, c^2, communicating with the boiler, and a second water outlet or discharge port, *c'*, connected to the storage-tank, and a hollow valve operatively connected to the said float and provided with ports c^4 c^5 c^6 to register with the ports of the valve-casing, the said valve-ports being arranged with relation to each other, as described, whereby the water-inlet pipe is alternately connected to the water-outlet pipe leading to the boiler and the discharge-outlet leading to the storage-tank, substantially as described.

397,975. VENDING APPARATUS. CONSTANT F. DE REDON, New York, N. Y., assignor to Francis L. Wellman, same place. Filed July 16, 1888. Serial No. 280,107. (No model.)



Claim.—1. The combination, in a vending apparatus, of a feeding

mechanism for advancing a strip comprising the articles to be vended, a feeding-magnet for controlling said feeding mechanism, an electric circuit including said feeding-magnet and controlled by a coin, and a chute for receiving a coin and directing it into proper position to control the circuit, substantially as described.

2. The combination, in a vending apparatus, of a pin arranged to enter an opening in a strip comprising the articles to be vended, a releasing-magnet for withdrawing said pin, and an electric circuit controlled by the deposit of a coin to control the releasing-magnet, substantially as described.

3. The combination, in a vending apparatus, of a feeding mechanism for advancing a strip comprising the articles to be vended, a pin arranged to enter an opening in the strip, a releasing-magnet for withdrawing the pin, a feeding-magnet for operating the feeding mechanism, and an electric circuit controlled by the deposit of a coin to energize said magnets, substantially as described.

4. The combination, in a vending apparatus, of a feeding mechanism for advancing a strip comprising the articles to be vended, a feeding-magnet for controlling said feeding mechanism, an electric circuit including said feeding-magnet, a circuit-closer for said circuit arranged to be operated by the deposit of a coin, and a chute for receiving a coin and directing it to said circuit-closer, substantially as described.

5. The combination, in a vending apparatus, of a pin arranged to enter an opening in a strip comprising the articles to be vended, a releasing-magnet for withdrawing said pin, an electric circuit including said magnet, and a circuit-closer for said circuit operated by the deposit of a coin, substantially as described.

6. The combination, in a vending apparatus, of a feeding mechanism for advancing a strip comprising the articles to be vended, a pin arranged to enter an opening in the strip, a releasing-magnet for withdrawing the pin, a feeding-magnet for operating the feeding mechanism, and a circuit-closer operated by the deposit of a coin to control said magnets, substantially as described.

7. The combination, with the case having the opening 41, of the gate 61, for closing the opening, the magnet G, for controlling the position of the gate, and a circuit-closer controlled by the strip comprising the articles to be vended to operate the magnet and close the opening when the strip is nearly or quite exhausted, substantially as described.

8. The combination, with the case having the opening 41, of the gate 61, for closing the opening, the magnet G, for controlling the position of the gate, the spool B, having the spring 24, the ring 66, co-operating with the spring to form a circuit-closer, and an electric circuit including the spring, ring, and magnet, substantially as described.

9. The combination, with the pins 5, adapted to pass through openings in the strip comprising the articles to be vended, of the springs 15, arranged to be engaged by said pins and forming a number of circuit-closers in an electric circuit, substantially as described.

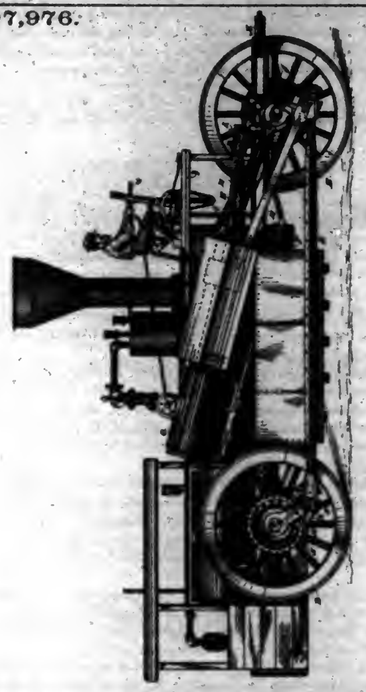
10. The combination, with feed-rolls 47 48, of the blade 45, the feeding-magnet for operating the rolls, the chute 40 and tilting table 38, and the circuit-closer 33, operated by said table to energize the feeding-magnet, substantially as described.

11. The combination, with the feed-rolls for advancing the strip comprising the articles to be vended, of the pins 5, arranged to pass through perforations in said strip, the springs 15, acted on by said pins and forming circuit-closers, the plate 26 and magnet C, for simultaneously raising all of the pins, the magnet E, for operating the feed-rolls, electric circuits including the magnet C, the magnet C and springs 15, and the springs 15 and magnet E, and the circuit-closer 33, normally closing the circuit through the magnet E and springs 15, and operated by the deposit of a coin to temporarily close the circuit through the magnet C, substantially as described.

12. The combination, with the springs 15, of the pins 5, the feed-rolls 47 48, the magnet C, for raising the pins, the magnet E, for operating the feed-rolls, and an arm, 20, carried by one of the rolls, for releasing the pins after the feeding has commenced, substantially as described.

397,976. ROAD-ENGINE. RILEY R. DOAN, Sacramento, Cal., as signor of one-half to John H. Roberts, same place. Filed Oct. 11, 1888. Serial No. 287,980. (No model.)

397,976.



Claim.—1. A traction-engine having rear wheels mounted upon the ends of a driving crank-shaft journaled upon the engine-frame, and a single front wheel fitted with a ball-and-socket joint, with grooves and keys, upon the center of a second driving crank-shaft journaled upon the engine-frame parallel with the first shaft, and having power transmitted to it from the engine, substantially as herein described.

2. A traction-engine having parallel horizontal shafts turning in boxes at the front and rear ends of the frame, respectively, cranks upon the ends of the shaft through which motion is transmitted from an engine carried upon the frame, loosely-turning wheels fitted upon the rear shaft, and a pawl-and-ratchet mechanism by which they are connected therewith, in combination with a front wheel fitted to the front shaft by means of a ball-and-socket joint and driving-keys, and a steering mechanism connected with said front wheel, so that it may be turned from side to side independent of the rotary motion of its shaft, substantially as herein described.

3. A traction-engine having its rear end supported upon bearing-wheels, the shaft of which turns in boxes upon the engine-frame, a forward shaft parallel therewith, and cranks by which power is transmitted to said shafts from the engine, in combination with a ball fixed to the center of the forward shaft, having keys projecting from its periphery, a forward wheel having the hub formed with a socket, and transverse channels which fit to the ball any keys and allow the wheel to be moved from side to side while power is transmitted to it from the shaft, substantially as herein described.

4. In a traction-engine, the parallel crank-shafts journaled upon the engine-frame and receiving power through the cranks from an engine carried upon said frame, wheels fitting the outer ends of the rear crank-shaft and connected therewith by pawl-and-ratchet mechanism, a front wheel, the hub of which forms a globular socket fitting a corresponding ball secured to the front shaft, keys projecting from the periphery of said ball and entering transverse slots in the hub, through which power is transmitted to drive said wheel, and disks fitting in circular grooves in the outer ends of the hub, with horizontal openings from side to side, having boxes through which the shaft passes, said boxes traveling from side to side on guides with the horizontal openings of the disks, substantially as herein described.

5. An engine-frame having the parallel bearing and driving shafts at the front and rear of the frame, wheels mounted upon the rear axle with pawl-and-ratchet connections, as shown, and a single front wheel having the spherical socket with transverse channels, a ball secured to the shaft fitting said socket and having radial keys projecting and fitting into the channels, funnel-shaped hubs projecting outwardly from the spherical socket and having concentric grooves or channels with curved guides *b*, and boxes *z*, within which the wheel-shaft turns, said boxes having groove *a*, fitting upon the guides *b*, substantially as and for the purpose herein described.

6. The forward driving-shaft journaled upon the frame, the ball-and-socket connection, and driving-keys and channels, whereby the wheel is propelled by the shaft, the projecting funnel-shaped hubs having the disks C, fitted to turn in concentric channels in their outer ends, and the guiding-boxes Z, fitting the shaft and traveling on horizontal guides within the disks, in combination with the arms *c*, the segmental rack *g*, and the steering-wheel and pinion, substantially as herein described.

7. The forward driving-shaft journaled in boxes upon the engine-frame and having the ball fixed to its center with projecting keys, as shown, the wheel having the spherically-socketed hub with transverse channels fitting the ball and the keys, the horizontal traveling guiding-boxes, and guides in the outer ends of the funnel-shaped hub of the wheel, in combination with the horizontal sliding doors *j*, whereby the openings at the ends of the hubs are kept closed, substantially as herein described.

8. The doors *j*, traveling in guides and having their inner ends secured to the segments *k*, which fit the driving-shaft, said segments having grooves or channels *l*, in combination with the clasps or latches *m* and the links *n*, substantially as herein described.

9. The ball or sphere secured to the forward driving-shaft having the countersunk holes made radially in its periphery, in combination with the keys U, having the shanks W, and the enlargements or heads X, fitting into the radial holes and countersunk openings, substantially as herein described.

10. The wheel-hub composed of two sections bolted together, having the spherical channeled socket formed between said sections to fit and inclose the ball secured to the driving-shaft, with keys fitting the channels in the hub, radial semi-sockets upon the exterior of the hub-sections, into which the inner ends of the wheel-spokes are introduced, and bolts whereby the sections are secured over the ball and spokes locked in place, substantially as herein described.

11. An engine-frame having the forward shaft journaled upon it, a forward guiding and driving wheel with ball and socket, keys and horizontal guides and steering mechanism, the rear wheel-shaft journaled upon the frame parallel to the front shaft, and the wheels D, fitting loosely upon the ends of said shaft, having their outer ends countersunk to fit over the hubs of the cranks J, in combination with the ratchet-wheels M, clamped to the wheel-spokes, as shown, the pawl R, and the springs S, substantially as herein described.

12. The rear wheels of a traction-engine, turning loosely upon the rear crank-shaft, which is journaled upon the engine-frame, and the ratchet-rims clamped to the wheels, as shown, in combination with cranks having crank-pins projecting outwardly to receive the ends of the connecting-rods from the engine and the inner ends projecting inwardly and carrying pawls R, together with the springs S, fixed to the cranks and acting upon the pawls, substantially as and for the purpose herein described.

13. The side and connecting rods composed of angle-iron bars riveted together, with the angles meeting on a common axial line, substantially as herein described.

14. The side and connecting rods composed of angle-iron bars riveted together, with the interior angles upon a common axial line, the filling-pieces, and the stub ends welded thereto, substantially as herein described.

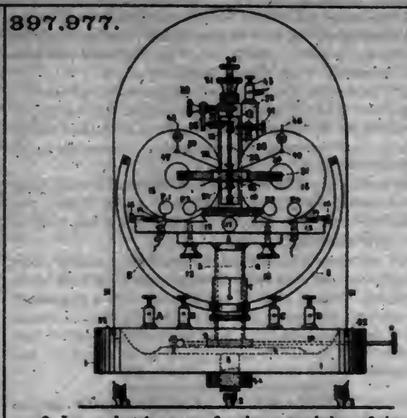
15. A road-locomotive consisting of a frame having rotary parallel axles and rigid connections between them, whereby said axles may be driven in unison and remain parallel, wheels on said axles, and a pivotal connection between a wheel or wheels and one of the axles, whereby the former may be turned from side to side on the axle to guide the machine while still receiving power and being driven by the axle, substantially as herein described.

16. A road-locomotive consisting of a frame with parallel shafts or axles journaled thereto, cranks, and connecting-rods by which said axles receive power from the engine and are united to move in unison, wheels mounted upon said axles so as to be propelled by them, and a mechanism whereby the steering-wheel may be turned from side to side upon one of the axles, so as to guide the machine, while receiving motion from the axle whose plane of rotation is unchanged, substantially as herein described.

17. A road-locomotive consisting of a frame having rotary parallel axles, cranks, and connecting-rods uniting the axles, whereby they may be driven in unison and remain parallel, a wheel on each end of one axle, a single wheel pivotally connected with the other axle, whereby it may be turned from side to side to guide the machine, and a power-connection between said single wheel and its axle, whereby the wheel is driven by the axle without regard to its angle with said axle, substantially as herein described.

397,977. TELEGRAPHY. CHARLES R. DREHER, New York, N. Y. Filed May 28, 1887. Serial No. 239,476. (No model.)

397,977.



Claim.—1. In an electric system for the transmission of sign or sound communications, whether graphic, vocal, or articulate, in combination with a primary voltaic battery, a second or relay voltaic battery, and a receiving-instrument operated by said relay-battery, a galvanometer consisting of a coil or coils of insulated wire and a magnetic needle pivoted to oscillate between the terminals of said relay-battery and provided with a spring or springs forming the conducting element between said needle and one terminal of the relay-battery when the needle closes circuit with the other terminal of said battery, whereby said needle is caused to transmit said communications through the circuit of said relay-battery, substantially as and for the purposes set forth.

2. In an electric system for the transmission of sign or sound communications, whether graphic, vocal, or articulate, in combination, with a transmitting-instrument for controlling its operation, a galvanometer consisting of a coil or coils of insulated wire and a magnetic needle provided with a torsional spring secured to said needle and with a spring radially secured to said needle, and a receiving-instrument in a relay-circuit, whereby said needle is caused to transmit the signals or sounds affecting it to said receiving-instrument through the relay-circuit, substantially as and for the purposes set forth.

3. A magnetic galvanometer-needle mounted in insulated bearings and provided with an electric terminal, in combination with an electric conductor-spring opposed to said needle's movement from its neutral position, and electric terminals in a relay-battery circuit, whereby when the circuit is closed between said terminals said spring-conductor forms part of the circuit between the poles of the relay-battery, substantially as and for the purposes set forth.

4. A curved magnetic galvanometer-needle provided with an electric terminal, in combination with an electric terminal in a relay-circuit and a spring opposed to said needle's movement from its neutral position, substantially as and for the purposes set forth.

5. In combination with a galvanometer consisting of a coil or coils of insulated wire devoid of magnet-cores and a magnetic needle provided with a spring opposed to said needle's movement from its neutral position, a horseshoe-magnet, all combined and arranged so that the resistance of said spring to said needle's movement is diminished by the field energy of said magnet and the field energy of said coil or coils augmented by the field energy of said magnet, substantially as and for the purposes set forth.

6. The combination of a magnetized galvanometer-needle provided with an electric terminal, a positive field-energy coil, and a negative field-energy coil, said coils devoid of magnet-cores and energized the one by a main circuit and the other by a different circuit, and an electric terminal in a relay-circuit, whereby should said terminals in the relay-circuit stick or adhere after the main circuit is broken one of said coils is thereby immediately energized to break said contact by its opposing field force, substantially as and for the purposes set forth.

7. The combination of a magnetized galvanometer-needle, a positive field-energy coil or coils, and a negative field-energy coil or coils, said needle pivoted to oscillate within the magnetic fields of said coils, and said coils devoid of magnet-cores and energized by different voltaic circuits and annularly located one within the other, substantially as and for the purposes set forth.

8. A magnetized galvanometer-needle provided with a spring of conducting material and with one or more contact-terminals in a relay-circuit, in combination with one or more field-coils positively energized and one or more field-coils negatively energized, all of said coils devoid of magnet-cores, whereby said needle is adapted to operate in the magnetic fields of said coils, substantially as and for the purposes set forth.

9. A laminated galvanometer-needle built up of separate magnetized lamine of like polarity superposed upon each other and secured together, as and for the purposes set forth.

10. In combination with galvanometer-coils, a curved magnetized galvanometer-needle composed of two laminated arcs built up of magnetized lamine superposed upon each other and secured together with their poles facing each other, and said coils between said facing-poles, whereby a galvanometer-needle of increased magnetic power is obtained for deflection by the united field force of said coils, substantially as and for the purposes set forth.

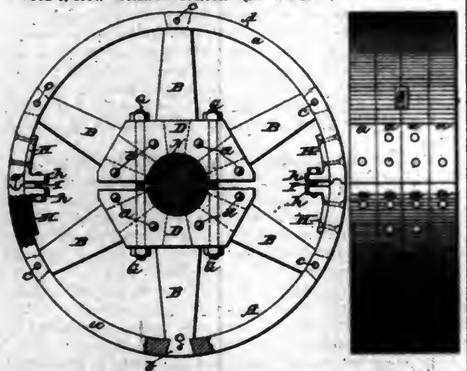
11. A magnetized galvanometer-needle composed of curved arcs adjustably connected to the arms of an oscillatory shaft, whereby the leverage of said arcs and the equilibrium of the needle are accurately adjusted, substantially as and for the purposes set forth.

12. In combination with a magnetized galvanometer-needle a friction apparatus, whereby said needle is prevented from moving by the brake action of said apparatus until the force of the field energy acting upon the needle exceeds such brake action, substantially as and for the purposes set forth.

13. In combination with the oscillatory shaft of a magnetized galvanometer-needle, one or more friction rods or bars, whereby the oscillations of said needle are steadied and controlled, substantially as and for the purposes set forth.

14. In a machine for transmitting electric energy, one or more adjustable galvanometer-coils of insulated wire provided each on its periphery with a dovetail piece, in combination with a magnetized needle composed of two curved arcs and a supporting frame or frames dovetailed to receive said piece or pieces, whereby said coil or coils are adjustably set in position relatively to the opposite poles of said arcs, substantially as and for the purposes set forth.

397,978. PULLEY. WALLACE I. FIELD, Menasha, Wis., assignor, by direct and mesne assignments, to John Strange, same place. Filed Oct. 8, 1887. Serial No. 251,861. (No model.)

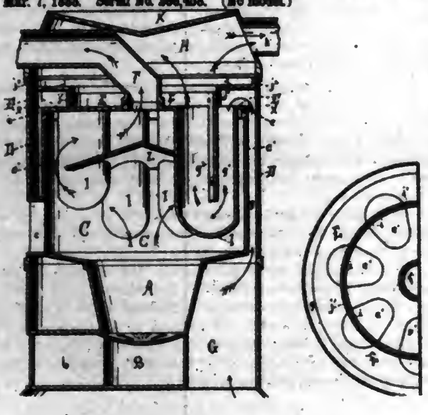


Claim.—1. The combination, in a separable wooden pulley, of semicircular rim-sections formed with dovetailed mortises, hub-sections formed with dovetailed mortises and divided transversely to the axis of the pulley through said mortises, spokes formed at the ends with dovetailed tenons, which are inserted and secured in the mortises of the hub and rim sections, tie-bolts passing through and connecting said hub-sections transversely to the axis of the pulley, and coupling-bolts connecting the ends of the rim-sections, substantially as and for the purposes set forth.

2. The combination, with a pulley, of a sectional bushing composed of independently-removable concentric cylindrical sections of paper, substantially as and for the purposes set forth.

3. The combination, with a pulley composed of separable sections, of a sectional bushing composed of independently-removable concentric cylindrical sections divided to correspond with the sections of said pulley, substantially as and for the purposes set forth.

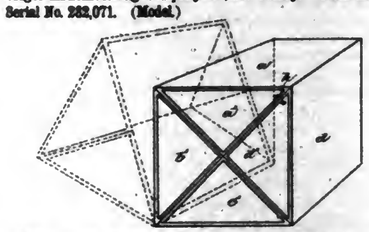
397,979. HOT-AIR FURNACE. JOSEPH GRAY, Chicago, Ill. Filed Mar. 7, 1888. Serial No. 266,458. (No model.)



Claim.—1. In a hot-air furnace, the combination of the combustion-chamber, with a series of pockets projecting into the same through which the air circulates, and with a deflector located above the fire-pot and between these pockets to throw the heated products of combustion out between and around the same before passing off up the chimney, as and for the purpose stated.

2. In a hot-air furnace, a series of pockets through which the air circulates projecting downward into the combustion-chamber, in combination with a deflector located above the fire-pot and between these pockets, and an escape-flue for the smoke centrally located above said deflector, whereby the greater portion of the heated gases from the fire will be made to pass outward between said pockets and back again between the same before passing off up the chimney, as and for the purpose stated.

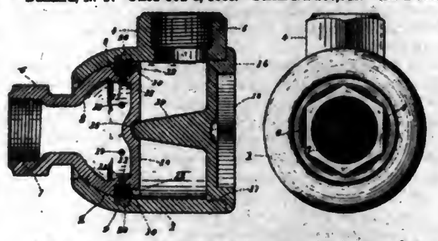
397,980. BOX. JOHN M. GRIBBY, Bayonne, N. J., assignor to The Singer Manufacturing Company of New Jersey. Filed Aug. 6, 1888. Serial No. 282,071. (Model.)



Claim.—1. A box composed of a plurality of side pieces flexibly jointed together so as to fold out flat, and end pieces or heads each composed of matched segments equal in number to the number of side pieces and secured to such side pieces, the adjacent edges of such segments abutting to form the heads of the box when folded, substantially as set forth.

2. A box composed of a plurality of side pieces flexibly jointed together so as to fold out flat, and end pieces or heads each composed of matched segments equal in number to the number of side pieces and secured to such side pieces, the adjacent edges of such segments abutting to form the heads of the box when folded, combined with a fastening device to keep the box closed, substantially as set forth.

397,981. UNIVERSAL METAL JOINT. JOTHAM C. HAGGETT, Dunkirk, N. Y. Filed Oct. 8, 1888. Serial No. 287,549. (No model.)



Claim.—1. The combination of the case 1, having a socket-seat, 2, a cover, 16, adapted to screw onto the head of the case, and having an inwardly-projecting piece, 19, and a semi-spherical hollow portion, 3, adapted to fit the seat 2 and provided with a cross-bar having a depression, 15, to receive the end of the projecting portion 19, and having a screw-thread at the opposite end for attachment to a pipe, substantially as described.

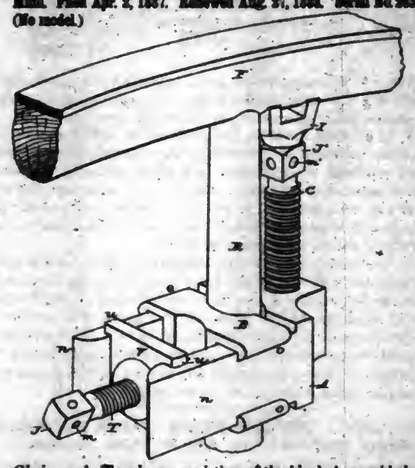
2. In a universal metal joint, the combination of a socket-case having a socket-seat at one end and a cover at the opposite end provided with a projecting piece, 19, to keep the ball portion in place, a ball portion having at the large end a cross-bar provided with a depression to receive the projecting piece from the cover, and a packing-ring secured in a groove surrounding the ball portion, substantially as and for the purposes described.

3. In a universal metal joint, the combination of a socket-case having a projecting internal screw-threaded portion on one side, a socket-seat at one end, and a screw-threaded portion at the opposite end to receive the cover, a semi-spherical ball portion adapted to fit the socket-seat, having at one end an internal screw-threaded portion and at the ball end a cross-bar provided with a recess or depression, and a cover having an inner projecting portion reaching down into the recess in the cross-bar, substantially as described.

4. In a universal metal joint, a socket-case having a socket-seat at one end and a cover at the opposite end provided with a projecting piece to keep the ball portion in place, in combination with a ball portion having at the large end a cross-bar provided with a depression

to receive the projecting piece from the cover, and a packing-ring secured in a circular groove between the seat and the ball portion, a supplementary groove leaving an opening between the side of the packing-groove and packing, and holes for admitting steam thereto, substantially as and for the purposes described.

397,982. TIRE-TIGHTENER. CLARENCE D. HARMON, Delavan, Minn. Filed Apr. 2, 1887. Renewed Aug. 27, 1888. Serial No. 283,995. (No model.)



Claim.—1. The clamp consisting of the block A, provided with the arms a a, having recesses w w, the sliding block B, provided with the projections o, to hold it in place on the arms a, and the detachable nut V, provided with the screw T, all arranged to operate substantially as and for the purpose set forth.

2. In a tire-tightener, a clamp for securing the device to a spoke, provided with a reversible clamping-block, B, having concavities of different sizes in its opposite faces, and the detachable nut V, provided with a screw, T, all arranged to operate substantially as shown and described.

3. The combination, in a tire-tightener, of the clamp consisting of the bifurcated concave block A, with the concave movable block B and screw T, with the screw-rod C, provided with a square or holes for turning it, and the concave push-block I, swiveled upon the end of the same, all arranged to operate substantially as described, whereby the device can be held upon a spoke without bruising the same, and the spoke be forced to its seat in the hub with the same degree of force that is used to raise the felly from the spoke.

397,983. INKSTAND. BENJAMIN F. HEBKLE, Woodensburg, Md. Filed Sept. 5, 1887. Renewed Oct. 11, 1888. Serial No. 287,857. (No model.)



Claim.—1. In an inkstand, the combination, with the reservoir and top having a dip-opening, of a gage-plate situated beneath the opening and within the ink-reservoir proper above its bottom and held from rotation, a nut carrying said plate, a screw-shaft engaging the nut by its thread, and having a bearing in a portion of the stand in which the shaft rotates and is held from vertical movement, and an external thumb-nut or handle for rotating the shaft, whereby the plate may be adjusted vertically within the body of the fluid, substantially as set forth.

2. The combination, with the reservoir and top having a dip-opening, of a gage-plate situated within the reservoir and beneath the opening and held from rotation, a nut carrying said plate, a screw-shaft engaging the nut by its thread, and having a bearing in a portion of the stand in which the shaft rotates and is held from vertical movement, a gear-wheel carried by the shaft, and a toothed sleeve surrounding the dip-opening and engaging said wheel, the outer end of the sleeve being adapted to be turned to actuate and adjust the gage-plate, substantially as described.

3. The combination, with the reservoir and top having a dip-opening, of a gage-plate within the reservoir and beneath the opening, a plurality of nuts carrying said plate, corresponding screw-shafts engaging said nuts by their threads, and having bearings in a portion of the stand in which they may revolve but are held from vertical movement, gear-wheels carried by the shafts, and a toothed sleeve situated in the opening and engaging said wheels, substantially as set forth.

4. The combination, in an inkstand, with the reservoir, of a vertically-adjustable gage-plate situated beneath the dip-opening and having one or more nuts secured therein, and forming also projections upon its under surface, whereby it is arrested at a predetermined distance above the bottom of the reservoir, substantially as set forth.

397,984. REFRIGERATOR. EDWARD B. HEIS, New York, N. Y., and WILLIAM K. STEVENS, Washington, D. C.; said Stevens assignor to said Heis. Filed Sept. 1, 1888. Serial No. 284,255. (No model.)

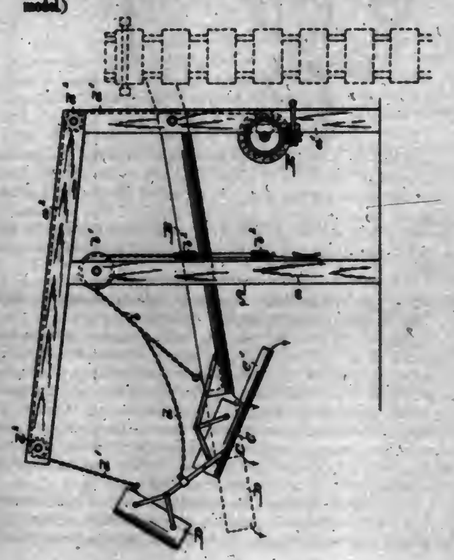


Claim.—1. The combination of a chamber having openings, a perforated support for ice in the upper portion of the chamber, grooved pans located in the chamber below the ice-support and in line of the drippings therefrom, and close covers fitted to the grooves in the pans, substantially as shown and described.

2. The combination of a chamber having openings, a series of vertical sockets secured to the inner face of the walls of the chamber, and a series of bracket-shelves provided with vertical pivots to engage the said sockets independent of the chamber-door, substantially as shown and described.

3. The combination of a refrigerator-chamber having a series of vertical sockets on the inner face of its walls, a series of grooved bracket-shelves provided each with a vertical pivot to fit the said sockets, and a series of covers fitted to the said shelf-grooves, substantially as shown and described, whereby one shelf may be swung to one side from over another within the chamber to permit the removal of covers within the chamber, as set forth.

397,985. CHUTE FOR DREDGING-MACHINES. MICHAEL HERRON, Bordentown, N. J., assignor of one-half to John Herron and James Herron, same place. Filed July 2, 1888. Serial No. 278,289. (No model.)



Claim.—1. In a delivery-chute, the combination, with the vertically-adjustable main section, of a section hinged thereto having an inwardly-extending tail or guide, substantially as described.

2. In a delivery-chute, the combination of a main section, a section hinged thereto having a tail or guide, and a section hinged to said section, all of said sections being adjustable with relation to each other, substantially in the manner and for the purpose described.

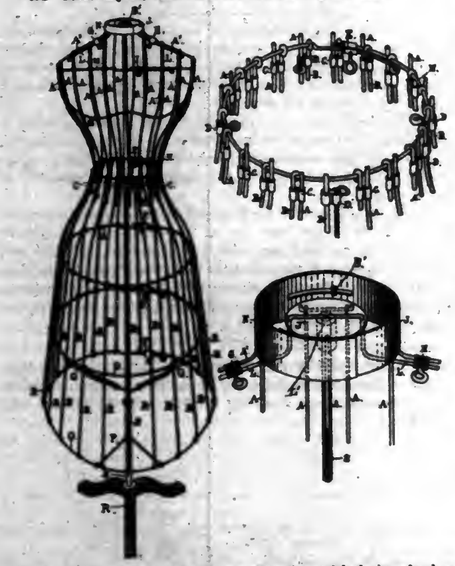
3. In a dredging-machine, a sectional chute having its main part pivoted at or near one end, a section pivotally connected to the main part and having a tail portion, C', mechanism for raising and lowering the main portion, and a chain connected to the section and to the said raising and lowering mechanism, said parts being combined substantially as and for the purpose set forth.

4. In a dredging-machine, a sectional chute having a main portion pivotally secured to standards, a section with a tail portion pivotally connected to the main portion, and an end section pivotally secured to the section having the tail portion, and independent mechanisms for raising and lowering said main portion and sections, said parts being combined substantially as described.

5. A delivery-chute composed of hinged sections, one of said sections being provided with a tail below the main body of the chute, substantially as and for the purpose described.

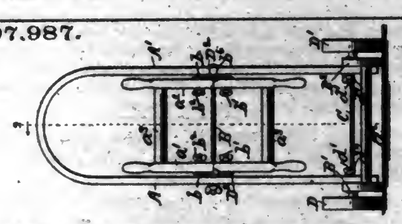
6. A delivery-chute for a dredging-machine, consisting of a main portion and sections, the main portion and adjacent section having projecting arms, to which projecting arm of the main section the adjacent section and its arms are pivotally attached, and mechanism for raising and lowering said sections, said parts combined substantially as described.

397,986. DRESS-FORM. WILLIAM A. JOHNSON, San Francisco, Cal. Filed July 22, 1887. Serial No. 244,967. (No model.)



Claim.—In a dress-form, the combination, with the standard and the adjustable bust and skirt wires, of the adjustable collar-band, the adjustable shoulder-wires, the wire L, carried along said shoulder-wires and connected thereto by the brackets G H, the plate sustaining said wire L, and the loose sleeve connected to the said plate and carried by the upper end of the said standard, substantially as described.

397,987. HOSE-REEL. CHARLES W. KIMBALL, Chicago, Ill. Filed Mar. 27, 1888. Serial No. 268,647. (No model.)



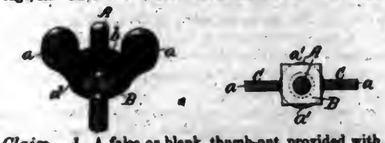
Claim.—1. In a folding hose-reel, the combination, with the side standards, of an axial or pivot shaft having the respective ends inserted in said standards, the continuous cross arm or arms *a*, mounted on said shaft, the divided arms $a' a^2$, abutting against said cross-arms, the connecting-plates D^2, provided with the curved lugs b^2 b^3, and the clamping-bolts adjustably securing said plates to the short arms $a' a^2$, whereby said latter arms may be folded parallel to the standards and cross-arms or secured in a fixed position at right angles to said cross-arms, substantially as and for the purpose set forth.

2. In a folding hose-reel, the combination, with the divided arms $a' a^2$, of the joining plate or plates D^2, provided with lugs which are adapted to overlap the inner ends of said arms, and the pivotal clamping-bolts b b', whereby the two parts comprising said arms may be secured in a fixed rigid position to form a continuous arm or folded in a parallel plane, substantially as and for the purpose set forth.

3. In a folding hose-reel, the combination, with the side standards, of the horizontal foot-pieces adjustably secured to the lower ends of said standards, the truck-axle upon which one end of said foot-pieces is mounted, and the truck-wheel mounted on the respective ends of said axle, whereby said axle and truck-wheels may be set at right angles to said standards or folded in a plane parallel therewith, substantially as and for the purpose set forth.

4. In a folding hose-reel, the combination, with the side standards provided with slots in the lower ends, of the horizontal foot-pieces, the bolt or bolts d', inserted in said slots and adjustably securing said standards and foot-pieces, and the rounds d^3 d^3, connecting said foot-pieces and arranged closely to and on each side of said standards, said slots providing for a vertical movement of said standards for the purpose of throwing the same into and out of engagement with said rounds, substantially as and for the purpose set forth.

397,988. THUMB-NUT WRENCH. CHARLES W. KIMBALL, Chicago, Ill. Filed June 5, 1888. Serial No. 276,134. (No model.)

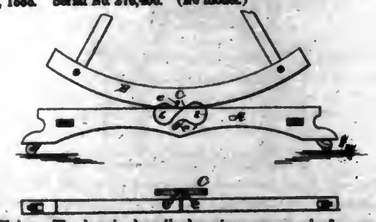


Claim.—1. A false or blank thumb-nut provided with a rectangular aperture opening in from the two sides at right angles to the wings for the loose insertion therein of a screw-threaded nut from either side, substantially as set forth.

2. A false or blank thumb-nut consisting of the wings *a a* and the body *d'*, said body being provided with an aperture extending through from side to side and adapted to loosely retain a screw-threaded nut therein, substantially as and for the purpose set forth.

3. A false or blank thumb-nut provided with a rectangular opening extending through from side to side, in combination with a screw-threaded nut, whereby the threaded nut may be loosely inserted and removably retained in said thumb-nut, substantially as and for the purpose set forth.

397,989. SPRING. FREDERICK LATOUR, Syracuse, N. Y., assignor to Charles S. Hutting and Lucy A. Williams, same place. Filed June 7, 1888. Serial No. 276,408. (No model.)



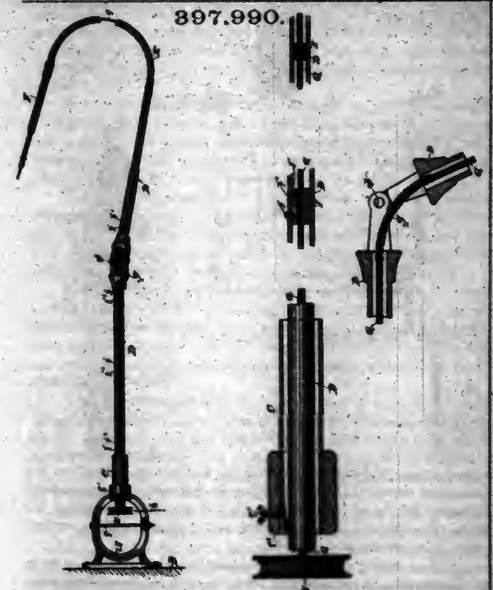
Claim.—The herein-described spring, composed of a continuous spring metal bar curved in the shape of an S, and having its opposite ends turned at right angles on the same side of the bar and bent laterally into a plane beyond the edge of the bar, each turned end being provided with one or more transverse apertures, as set forth.

397,990. DENTAL ENGINE. IRA G. LEEK, San Francisco, Cal. Filed Feb. 16, 1888. Serial No. 264,235. (No model.)

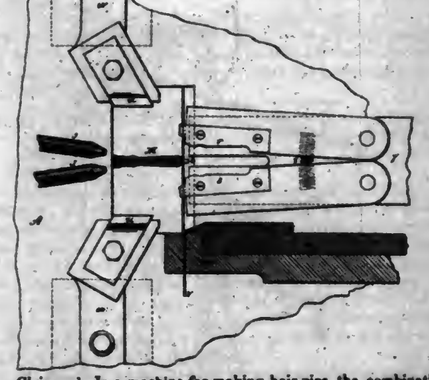
Claim.—1. In a dental engine, the hand-piece and flexible power-conveyer, in combination with the fixed bracket, the sleeve connected therewith by a vertical pivot, the arm carrying the hand-piece and conveyer at one end and fitted at the other end in the sleeve and axially rotary therein, and the hinge-joint in the arm, substantially as described.

2. In a dental engine, the hand-piece and the flexible power-conveyer, in combination with the fixed bracket, the vertically-pivoted sleeve, the tubular axially-rotary arm fitted in the sleeve and carrying the hand-piece and power-conveyer, said arm having a hinge-joint, *d*, the rods G within the tubular arm, connected with the power-conveyer at one end and having a pulley at the other end, and the flexible coil or piece connecting the rods at the hinge of the arm, substantially as described.

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397,991. MACHINE FOR MAKING HAIR-PINS. GEORGE W. MARSH, New York, N. Y., assignor to the Self Retaining Hair Pin Company, same place. Filed June 11, 1888. Serial No. 276,704. (No model.)

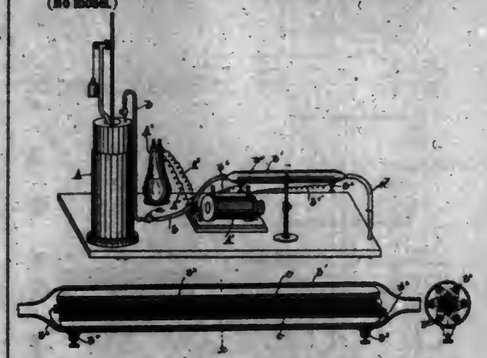


Claim.—1. In a machine for making hair-pins, the combination of the former M, around one edge of which the blank is adapted to be bent, the sides of the former near the opposite edge of like irregular shape, and the said sides of the said irregular shape toward the said opposite edge diverging, the sliding swinging jaws *r s*, arranged to pass one each side of said former, and the sides of the said jaws adjacent to the said former of a shape corresponding to the sides of the said former, and transverse side pressers, *u u*, arranged to bear said jaws toward said former, with a pair of revolving mandrels, 3 3, the said mandrels diverging and in line with the diverging sides of the said former, with mechanism, substantially such as described, to impart longitudinal movement to said mandrels, substantially as and for the purpose described.

2. The combination of the former M, the clamp *l*, the sliding and swinging jaws *r s*, side pressers, *u u*, and diverging, revolving, and longitudinally-reciprocating mandrels 3 3, all substantially as and for the purpose described.

3. The combination of the former M, mechanism, substantially such as described, to impart a vertical reciprocating movement to said former M, a feed mechanism adapted to deliver the wire to the machine, clamp *l*, sliding and swinging jaws *r s*, transverse side pressers, *u u*, and diverging, revolving, and longitudinally-reciprocating mandrels 3 3, all substantially as and for the purpose described.

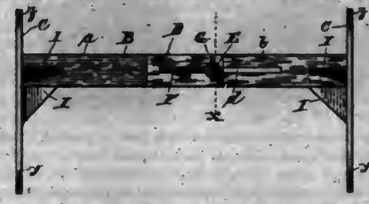
397,992. APPARATUS FOR MANUFACTURING OZONE. GOTTFRIED H. MERKEL, Boston, Mass. Filed May 23, 1888. Serial No. 275,377. (No model.)



Claim.—1. In an apparatus for the production of ozone, the combination, with an ozonizing-chamber, *b'*, of the herein-described continuous electric conductor bent or coiled to extend longitudinally the length of the said chamber two or more times to form through the said chamber a complete continuous circuit of substantially high resistance, the said coils being insulated from one another, substantially as and for the purpose specified.

2. In an apparatus for the production of ozone, a gasometer to contain oxygen, an ozonizing-chamber, *b'*, connected thereto, the herein-described continuous electric conductor or wire and carrier therefor located in said chamber and composed of coils or tubes of glass or non-conducting material, through which the said continuous wire is passed, combined with an induction-coil connected to the opposite ends of the said electric conductor, and a current-generator connected to said induction-coil, substantially as described.

397,993. PILLOW OR HEAD-REST. WALTER L. MILLER, Winneconne, Wis. Filed July 5, 1888. Serial No. 279,050. (No model.)



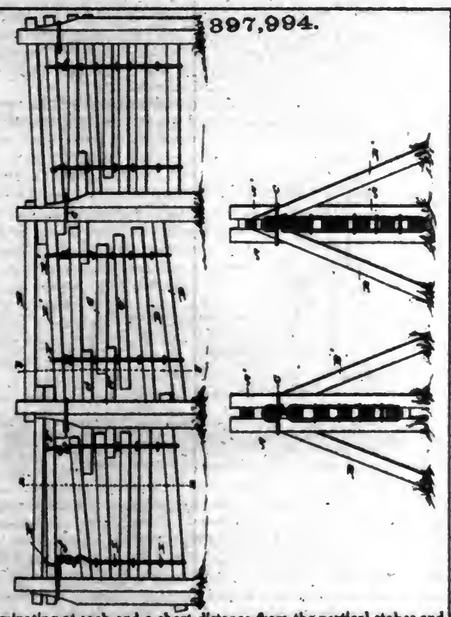
Claim.—In a head-rest or pillow, the combination of the endless apron or fabric A, fabric-supporting pieces C C, adjustable connecting-pieces *a* and *b*, said piece *a* being rigidly connected with one of the cross-pieces C and provided with an adjusting-screw, E, and a guide-stud, F, said connecting-piece *b* being provided with an elongated slot, *d*, for the reception of said screw E, hand-nut G, operating upon said screw E and adapted by turning to secure said connecting-pieces *a* and *b* firmly together at any desired point of adjustment, all substantially as and for the purpose specified.

397,994. FENCE. JOHN P. MOSHETT, Bucyrus, Ohio. Filed June 27, 1888. Serial No. 278,265. (No model.)

Claim.—1. A fence consisting of the vertical stakes, the top and bottom rails fitted at their ends between said vertical stakes, the inclined stakes, the binding-wires C, passing around the vertical and inclined stakes to cause the vertical stakes to bind tightly on said rails, two vertical wire loops, F, for each panel of the fence, located near the vertical stakes and passing around the bottom and top rails, the intermediate rails, G G', varying in length with respect to the top and bottom rails and fitted in the vertical loops, and the filling-in pieces H H, fitted between the intermediate rails of two adjoining panels of the fence and passing between the vertical stakes, substantially as and for the purpose described.

2. A fence consisting of the top and bottom rails fitted at their ends between vertical stakes, wires C, clamping said stakes tightly upon the ends of the rails, two vertical wire loops, F, for each panel of the fence, located in close juxtaposition to said vertical stakes and passing around the top and bottom rails, the intermediate rails, G G',

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terminating at each end a short distance from the vertical stakes and fitted in said vertical loops, the open links I, fitted around the vertical loops, between the rails, to draw the loops tightly upon said rails, and the filling-in pieces H H', arranged between adjoining panels of the fence and passing between the vertical stakes, with their ends fitted in adjoining vertical wire loops, substantially as described.

397,995. SPOKE-TENON. WILLIAM P. MORTON, New Haven, Conn., assignor of one-half to Holcomb Brothers & Co., same place. Filed Apr. 4, 1888. Serial No. 269,577. (No model.)



Claim.—1. A compressed spoke-tenon made to gradually increase in thickness from the shoulders of the spoke to a point about midway of its length, and made straight from that point to its outer end, whereby a bulky parallel-sided retaining end remains after the outer end of the tenon has been cut away in boxing the hub, substantially as set forth.

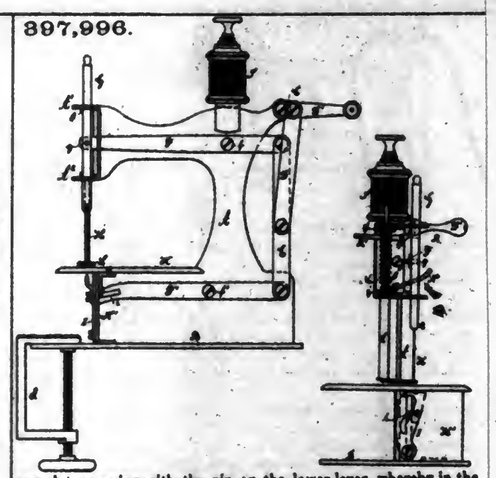
2. The combination, with a mortised hub in which one of the end walls of each mortise is inclined inward, of a compressed spoke-tenon having a straight edge and a beveled edge, one or both edges of the tenon being corrugated for forming retaining-points which are forced into the hub, when the tenon is driven, by the leverage secured by the beveled edge of the tenon and the inclined wall of the mortise, and form corresponding retaining-points therein, the retaining-points of the tenon interlocking under its edgewise expansion with those of the hub and forming a long series of interlocking points holding the tenon in place, substantially as set forth.

397,996. SEWING-MACHINE. FRIEDRICH W. MÜLLER, Jr., Berlin, Germany. Filed June 16, 1888. Serial No. 277,411. (No model.)

Claim.—1. In a sewing-machine, in combination with the frame, an upper lever pivoted thereto, a needle-bar secured to the front end of said lever, a lower lever, also pivoted to the frame, a thread-catcher pivoted to the supporting-frame and oscillated by one end of the lower lever, a connecting-rod between the upper and lower levers, and means for operating the same, whereby said levers are simultaneously operated in vertical plane, substantially as described.

2. In a sewing-machine, in combination with the frame, a lower supporting-plate, H', having a vertical slot formed therein, an upper lever pivoted to said frame, a needle-bar secured to the front end thereof, a lower lever, also pivoted to said frame, having a pin attached to its forward end projecting through the vertical slot in the plate H', a thread-catcher pivoted to said plate and provided with a

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cam-slot engaging with the pin on the lower lever, whereby in the movement thereof the thread-catcher is oscillated, a connecting-rod between said upper and lower levers, and means for operating the same, whereby said levers are operated simultaneously in vertical plane, substantially as described.

3. In a sewing-machine, in combination with the frame, a lever pivoted thereto, a needle-bar secured to the front end thereof and actuated thereby, a presser-bar carrying a feed-plate, a swinging plate pivoted to the frame of the machine and bearing against the presser-bar, a lever, N, pivoted to said plate, and having one end projecting into the path of the needle-bar-actuating lever and the other in engagement with the presser-bar, a spring for keeping said presser-bar normally down, and a shoulder secured to the swinging frame and projecting into the path of the needle-bar-actuating lever, whereby on the upward movement of the same the presser-bar is swung forward to feed the work, substantially as described.

397,997. TILE-DITCHING MACHINE. ROBERT R. NEVIN, Enon Valley, Pa. Filed Sept. 30, 1886. Serial No. 214,963. (No model.)



Claim.—1. In a ditching-machine, the combination of a vertically-adjustable plow, a vertically-adjustable sled pivotally secured to the

beam of the plow and supported by means of bell-crank levers, mechanism for adjusting the plow and the sled, a trough pivotally secured to the plow at its front end and to the rear axle of the machine, and an endless belt provided with swinging buckets, substantially as described.

2. In a ditching-machine, the combination of a plow, a trough, a longitudinally-adjustable beam above and parallel with the trough, and an endless belt having elevators attached thereto provided with friction-rollers which engage with the under side of said beam while passing through the trough, substantially as described.

3. In a ditching-machine, the combination of a plow, a trough, an endless belt having buckets provided with pintles on their sides and an arm supporting a friction-roller, and a beam above and parallel with the trough, against which the rollers bear to hold the buckets in working position in the trough, substantially as described.

4. In a ditching-machine, the combination of a plow, a trough, an endless belt provided with buckets, a beam separate from the trough and seated at one end on a frame, and having a shaft supporting the front wheels over which the belt passes connected to the other end, and means for adjusting the beam longitudinally, substantially as described.

5. In a ditching-machine, the combination of a plow, a trough, an endless elevator, a beam above, parallel with, and supported by the trough at its front end and supporting the front wheels over which the elevator travels, a socket on the rear frame to receive one end of the beam, and an adjusting-screw for moving said beam longitudinally, substantially as described.

6. In a ditching-machine, the combination of a plow, a trough, an endless belt provided with pivoted buckets, a scraper supported by the rear frame, extending across the path of the buckets, and constructed to clean their working-surfaces and turn them in the plane of the belt as they cross the rear supporting-wheels, substantially as described.

7. In a ditching-machine, the combination of a plow, a trough, an endless chain elevator, a beam above the trough and supporting a track at its front end, and front and rear chain-supporting wheels, substantially as described.

8. In a ditching-machine, the combination of a plow, a trough, an endless chain elevator, a beam above the trough and supporting a track at its front end, and an arm for turning the elevator-blades into position for crossing said track, substantially as described.

9. In a ditching-machine, the combination of a plow, a sled or wheel secured to the beam thereof, rocking levers connected by a link, a screw, and an operating-rod for adjusting said sled, substantially as described.

10. In a ditching-machine, the combination of a plow, a sled attached to the front end thereof, rocking levers pivotally connected to the sled and to a link, an adjusting-screw, a swivel connected to one end of said screw, and a rod surmounted by an operating medium, substantially as described.

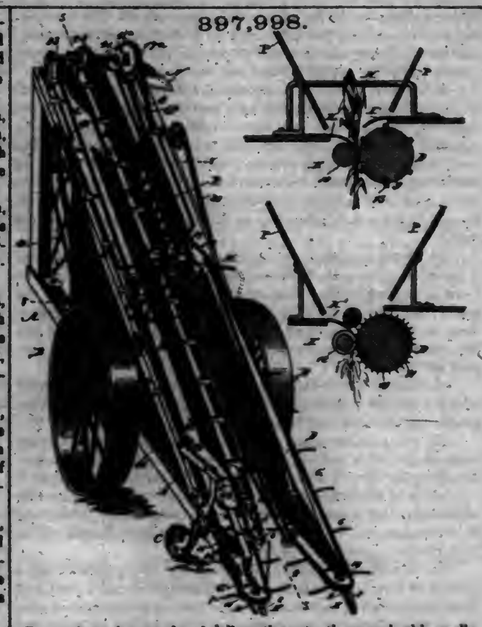
397,998. CORN HARVESTER AND HUSKER. LUKE W. OSBORN, Joliet, Ill., assignor to Daniel Robertson, Irving D. Stevens, and Lloyd Eberhart, all of same place. Filed Aug. 17, 1887. Serial No. 247,167. (No model.)

Claim.—1. In a corn harvesting and husking machine, the combination, substantially as hereinbefore set forth, of a pair of parallel rotary snapping-rolls for drawing the stalks between them and snapping off the ears in an unhusked condition, a pair of parallel rotary husking-rolls for husking such snapped-off ears, arranged in alignment with and extended back from the rear terminals of the snapping-rolls, and an endless conveyer chain or belt provided with fingers to take the ears at points where they are snapped off along the snapping-rolls and convey them back to and along the rear husking-rolls, where the ears are finally stripped of their husks.

2. The combination, substantially as hereinbefore set forth, with a pair of forwardly-arranged parallel rotary snapping-rolls, of a guard or shield extending along and parallel with the rolls at such a distance from the rolls as to provide between the rolls and the guard a stalk-passage of a width to pass the stalks, but not the ears, and a pair of rearwardly-arranged parallel rotary husking-rolls which from their forward ends extend back from the rear terminals of the snapping-rolls, one of said husking-rolls being uncovered to husk such ears as have been snapped off along the snapping-rolls and brought back to the husking-rolls.

3. The combination, substantially as hereinbefore set forth, with a pair of forwardly-arranged parallel rotary snapping-rolls and a pair of rearwardly-arranged parallel husking-rolls extending back from the rear terminals of the snapping-rolls, of a guard or shield extending along and parallel with the rolls at such a distance from the rolls as to provide between the snapping-rolls and the guard a stalk-passage of a width to pass the stalks, but not the ears, and an endless conveyer chain or belt provided with fingers to take the ears at points where they are snapped off along the snapping-rolls and carry such snapped-

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off ears along the guard and deliver them to the rear husking-rolls, one of which said husking-rolls is uncovered to husk the ears.

4. The combination, substantially as hereinbefore set forth, with a pair of parallel rotary snapping-rolls, of a guard or shield extending over and along one roll and having one edge portion depressed toward the line of separation between the rolls to provide between said depressed edge portion and the opposite roll a stalk-passage which is of sufficient width to admit the stalks, but not the ears, and which is within such close proximity to the line of separation between the two rolls as to permit the rolls to pinch the stalks close up to the butt-end of the ears, for the purpose set forth.

5. The combination, substantially as hereinbefore set forth, with a pair of parallel rotary snapping-rolls having relatively-different diameters, of a guard or shield extending over and along the larger roll and having its longitudinal edge portion that is nearest the smaller roll bent downwardly both toward the line of separation between the rolls and toward the smaller roll, so as to leave a stalk-passage which is of sufficient width to admit the stalks, but not the ears, and which is within such close proximity to the line of separation between the rolls as shall permit them to pinch the stalks close up to the butt-ends of the ears, for the purpose set forth.

6. The combination, substantially as hereinbefore set forth, with a pair of rotary snapping-rolls whereof one is ribbed and both arranged for conjointly operating to draw the stalks between them, of a guard or shield, I, extending over and along the ribbed roll, and having one edge inclined downwardly toward the line of separation between the rolls to an extent to provide between its lower longitudinal edge portion and the roll that is alongside said ribbed roll a stalk-passage which permits the passage of the stalks and allows the ribs of the roll to engage the same close up to the butt-ends of the ears, but which prevents the ears from being engaged by said ribs, for the purpose set forth.

7. The combination, substantially as hereinbefore set forth, with a pair of rotary snapping-rolls, of the guard or shield I, arranged over and along one roll, and having one edge depressed toward the line of separation between the rolls and extended toward the opposite roll to an extent to provide between its depressed edge and the said roll that is opposite the roll covered by the guard or shield a stalk-passage somewhat to that side of a vertical plane coincident with and passing through the line of separation between the two rolls opposite the guard, whereby when the stalks are drawn between the rolls the ears will be deflected to one side by the guard, and the snapping off of the ears thereby facilitated.

8. The combination, substantially as hereinbefore set forth, with a pair of rotary snapping-rolls for drawing the stalks between them, of a pair of inclined guards or shields respectively arranged over and along the two rolls, and having their opposing longitudinal edge portions depressed toward the line of separation between the rolls, but leaving between their depressed edge portions a stalk-passage of sufficient width to admit the stalks, but not the ears, and within such

close proximity to the line of separation between the rolls as to permit the rolls to pinch the stalks close up to the butt-ends of the ears, said guards being also arranged to provide between their inclined sides a trough for the snapped-off ears, for the purpose described.

9. The combination, substantially as hereinbefore set forth, with a pair of rotary snapping-rolls, of a pair of guards or shields respectively arranged over and along the two rolls, and having their opposing longitudinal edges depressed to form a trough, but leaving space between their edges to form a bottom passage in the trough of sufficient width to admit the stalks, but not the ears, and an endless elevator-chain or belt provided with fingers which traverse the trough formed between the sloping sides of said guards, for the purpose set forth.

10. The combination, substantially as hereinbefore set forth, with a pair of snapping-rolls of relatively-different diameters, of the guards I and K, depressed along their opposing longitudinal edges, with the guard I standing higher than the guard K, and an endless conveyer chain or belt provided with fingers which during the travel of the belt traverse a path over and adjacent to the guard K, for the purpose set forth.

11. In a corn-harvester, a pair of parallel rotary snapping-rolls whereof one roll is provided with spring-backed ribs arranged with relation to the other roll to pinch the different sizes of stalks.

12. In a corn-harvester, a pair of parallel rotary snapping-rolls whereof one roll is provided with a series of longitudinally-arranged flexible spring-ribs, 13, substantially as and for the purpose described.

13. In a corn-harvester, a pair of parallel rotary snapping-rolls whereof one roll is provided with a series of longitudinal grooves and flexible spring-ribs, 13, backed by springs that are arranged within such grooves, substantially as described.

14. In a corn-harvester, a pair of parallel rotary rolls having a portion of their length constructed as snapping-rolls and a portion of their length adapted as husking-rolls for husking the snapped-off ears, one of said rolls having its snapping portion provided with ribs, and one of said rolls being along its husking portion provided with husking-teeth, for the purpose set forth.

15. In a corn harvesting and husking machine, the roll D, provided along a portion of its length with longitudinal ribs and along another portion of its length with annular rows of husking-teeth, combined with the roll E, having along a portion of its length grooves for receiving the teeth of the oppositely-arranged roll, for the purpose set forth.

16. The combination, substantially as herein set forth, with a pair of husking-rolls whereof one roll is provided with sets of husking-teeth alternating with grooves 22 and the opposite roll provided with peripheral projections which register with the grooves of the toothed roll, of the guard or shield K', arranged over the untoothed roll and provided with gaps for the passage of the peripheral projections upon such roll, for the purpose described.

17. The combination, substantially as herein set forth, with a pair of husking-rolls, one of which is provided with husking-teeth and made larger in diameter than the opposite roll, of a guard or shield arranged over the smaller roll and depressed along one edge toward the line of separation between the two rolls, for the purpose described.

18. The combination, substantially as herein described, with the roll D, ribbed along the forward portion of its length, and along the rear portion of its length provided with husking-teeth, and the roll E, arranged parallel with said ribbed and toothed roll, of a guard extending along and over the ribbed-roll portion, but terminating short of the toothed-roll portion, so as to expose the husking-teeth, and a guard arranged over the length of the roll E, that is alongside the toothed-roll portion, for the purpose described.

19. The combination, with a pair of parallel rotary snapping-rolls and a pair of parallel rotary husking-rolls extending back from the snapping-rolls, of a raised check or stop, H, arranged over the rolls adjacent to the point of separation between the husking-rolls and the snapping-rolls and in position to insure the snapping off of ears from stalks of unusual height, substantially as described.

20. The combination, substantially as herein set forth, with a pair of parallel rotary snapping-rolls, of an endless conveyer chain or belt provided with fingers arranged to traverse a path adjacent to the line of separation between the rolls, so as to engage and carry back the snapped-off ears, and an endless chain or belt, G, provided with stalk gathering and conveying fingers which traverse a plane parallel with and above the plane traversed by the fingers of the conveyer L, for the purpose described.

21. The combination, substantially as herein set forth, with a pair of snapping-rolls, of an endless chain or belt, G, on one side, provided with stalk-gathering fingers which traverse a path in advance of and back over the snapping-rolls, a short oppositely-arranged endless chain or belt, G', provided with gathering-fingers which co-operate with such of the gathering-fingers of the chain G as are in advance of the snapping-rolls, and an endless conveyer, L, which is arranged on the same side of but in rear of the belt or chain G', and provided with gathering-fingers to take the snapped-off ears and convey the same up along the snapping-rolls, said conveyer L being arranged so that at the point where the stalk-gathering fingers of the endless belt or chain G' leave the stalks the fingers of said conveyer L shall engage the stalks and prevent the fingers of said chain or belt G' from drawing the stalks away from the fingers of the opposite chain or belt, G, substantially as described.

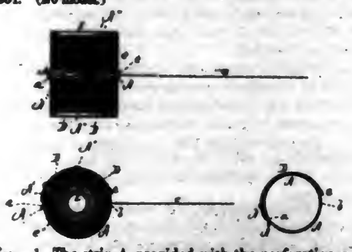
22. In a corn-harvester, the combination, with a wheel-supported main body-frame, of a frame or support carrying devices for harvesting the corn and adjustably held upon an inclined support with which the main body-frame is provided, whereby the height of such corn-harvesting devices may be varied without change of angle relatively to the ground.

23. In a corn harvester and husker, the combination, with the main body-frame, of a frame carrying husking-rolls and adjustably held upon an inclined support with which said main body-frame is provided, whereby the height of the husking-rolls can be varied without change of angle relatively to the ground, substantially as set forth.

24. In a corn harvesting and husking machine, the husk-gathering receptacle R, combined with and arranged below the husking rolls and having its bottom formed with a longitudinally-extending raised middle portion providing along the under side of such receptacle a passage for the upper ends of the standing stalks, substantially as set forth.

25. The husk-gathering receptacle R, combined with and arranged below the husking-rolls and having its bottom formed with a longitudinally-extending raised middle portion, combined with the tilting husk-deflector 29, for deflecting the husks into either of the receptacle-spaces between the raised bottom portion and the sides, substantially as set forth.

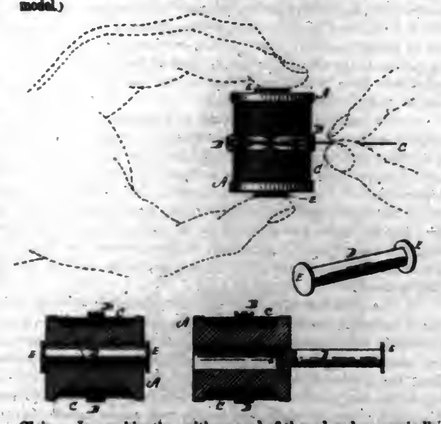
397,999. THREAD-HOLDER FOR SPOOLS. SAMUEL B. PRATT and CLARA B. PRATT, Boston, Mass. Filed Oct. 12, 1888. Serial No. 287,881. (No model.)



Claim.—1. The strip A, provided with the perforation *a*, hook *c*, narrow hooked end A', and perforation *b*, in combination with an elastic connection secured to said strip by means of said hooks *c* and A', substantially as and for the purpose described.

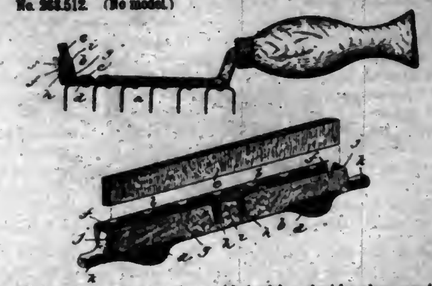
2. The strip A, provided with the perforation *a*, hook *c*, narrow hooked end A', lips A'', and perforation *b*, in combination with a double-looped elastic connection, D, secured to said strip by means of said hooks *c* and A', substantially as and for the purpose set forth.

398,000. SPINDLE FOR SPOOLS OF THREAD. SAMUEL B. PRATT, Boston, Mass. Filed Nov. 17, 1888. Serial No. 291,175. (No model.)



Claim.—In combination with a spool of thread and an unwinding attachment, the spindle D, placed in the spool-hole and extending through the same, and the end pieces, E E, larger in diameter than said spool-hole, rigidly secured to the ends of the spindle, substantially of disk shape, whereby they are adapted to be held between the thumb and finger of one hand, as shown, and one of said disk-shaped end pieces being flexible, whereby it will fold upon itself sufficiently to be drawn through the spool-hole, all constructed substantially as and for the purpose set forth.

398,001. CURRY-COMB. WILLIAM RAINWHELER, Akron, Ohio, assignor to Nathan H. Bennett, same place. Filed Mar. 26, 1888. Serial No. 268,512. (No model.)



Claim.—1. A curry-comb provided with a shedder-clasp consisting of a single piece of metal, having knockers and pliable jaws cast integral therewith, substantially as described.

2. In a curry-comb, a shedder-clasp composed of a single piece of metal provided with securing-flanges, knockers, and pliable jaws cast integral therewith, substantially as described.

3. The combination, in a curry-comb, of a shedder-clasp consisting of a single piece of cast metal provided with clamping-jaws, knockers at the opposite ends of said clasp, flanges provided with holes for securing it to the body portion of the comb, and an elastic shedder held between said jaws, in the manner and for the purpose described.

398,002. BOBBIN. JOHN SCOTT, Willimantic, assignor to the Willimantic Linen Company, Hartford, Conn. Filed July 13, 1888. Serial No. 279,908. (No model.)

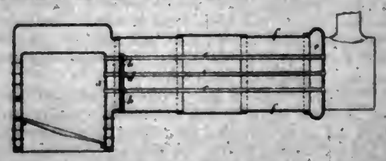
Brief.—The object of the invention is to produce a paper bobbin simple and cheap in construction, and strong enough for use in the mill and for transportation with the thread on it.



Claim.—1. A spool or bobbin consisting of a central tube of paper, a conical base of like material secured to the center, and the disk-shaped crosswise-brace that extends across the lower part of the base and is secured to the tube and the base, all substantially as described.

2. As an improved article of manufacture, a paper cone-bobbin made up of a central tube of paper, a paper cone into which the said tube extends to a plane near the bottom of the base, and the disk-shaped braces extending transversely of and within the base and secured to the base and to the tube, all substantially as described.

398,003. TUBULAR BOILER. JEAN P. SERVE, Givors, France. Filed Dec. 4, 1888. Serial No. 292,610. (No model.)



Claim.—1. In a multitubular boiler, the combination, with the fire-box tube-plate and the boiler-tubes, of a rigid abutment plate or plates, *b*, pierced with holes for the passage of the tubes, and of a series of ferrules or projections, *d*, fixed to the said tubes and each adapted to abut against the inner face of the said abutment plate or plates, whereby the strain of the longitudinal expansion of the tubes on the fire-box tube-plate is transferred to the rigid abutment plate or plates, substantially as described.

2. In a multitubular boiler, a series of boiler-tubes furnished with rings or projections abutting against a fixed abutment plate or plates, *b*, at the fire-box end of the boiler, in combination with a smoke-box tube plate of a different diameter from that of the body of the boiler and fixed to the said body by curved or arched flanges arranged around its inner or outer circumference and capable of permitting a certain amount of elasticity in the said tube-plate, substantially as described.

3. In a multitubular boiler, the combination, with the fixed abutment plate or plates *b* and the tubes *c*, having projections abutting against the same at the fire-box end, of a boiler-shell provided at the smoke-box end with a slightly-elastic circumferential collar united with the smoke-box tube-plate, substantially as set forth.

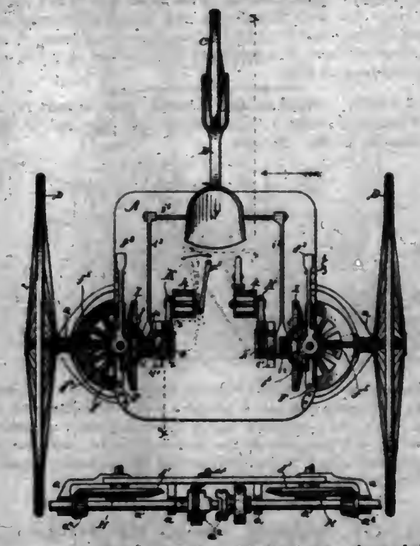
398,004. METALLIC RAILROAD-TIE. ROBERT U. SMITH, Chatham, N. Y., assignor of one-half to Alonzo I. Wilcox, same place. Filed Dec. 9, 1887. Renewed Aug. 22, 1888. Serial No. 283,512. (No model.)



Claim.—1. A metallic tie provided with a projection over which an expansion-bar rests, the said bar having two lips and two horizontal extensions leading therefrom which rest in boxes in the outer ends of the tie, within which legs are fastened against the rails, as and for the purpose described.

2. A metallic tie provided with a projection over which an expansion-bar rests, the said bar having lips and horizontal extensions leading therefrom and resting in boxes in the ends of the tie, and legs having their rear edges beveled, which fit corresponding bevels in the said box, as and for the purpose described.

398,005. TRICYCLE. WILLIAM R. SMITH, near May, Ark. Filed Nov. 1, 1888. Serial No. 289,777. (No model.)



Claim.—1. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinion a^4, rigidly secured to the driving-axles a', gearing-frame G, secured to the frame A, shafts F, their upper ends working in sockets in said gearing-frame, and their lower ends working in bars H under said frames, drive-wheels f', rigidly secured on the lower ends of said shafts, meshing with said pinions, ratchet-wheels f^2, rigidly secured on the upper ends of said shafts, and hand-levers and pawls f^3, operating said ratchet-wheel and driving said gearing, substantially as shown and described.

2. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinions a^4, rigidly secured to the driving-axles, gearing-frames G, secured to the frame A, shafts F, their upper ends working in sockets in said gearing frames and their lower ends in bars H, secured to the under side of said frame, drive-wheels f', rigidly secured on the lower ends of said shafts, meshing with said pinions, ratchet-wheels f^2, rigidly secured on the upper ends of said shafts, hand levers and pawls f^3, operating said ratchet-wheel, pinion f, rigidly secured on said shaft, drive-wheel I, journaled in the gear-frame G and meshing with said pinion f, axle i, rigidly secured in the neck of said drive-wheels I and journaled in the boxing in the posts i', ratchet-wheels i^2, secured on said shaft, sent levers and pawls i^3, operating said ratchet-wheels and having

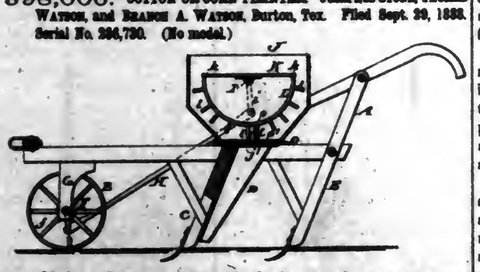
secured on their cross-rod i^4 a seat, J, and spring j, its lower half secured to the frame A and its upper half to the lower part of the said seat, substantially as shown and described.

3. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinions a^4, rigidly secured to the driving-axles, gearing-frames G, secured to the frame A, shafts F, their upper ends working in sockets in said gearing-frames and their lower ends in bars H, secured to the under side of said frame, drive-wheels f', rigidly secured on the lower ends of said shafts, meshing with said pinions, ratchet-wheels f^3, rigidly secured on the upper ends of said shafts, hand levers and pawls f^5, operating said ratchet-wheel, pinion f, rigidly secured on said shaft, drive-wheel I, journaled in the gear-frame G and meshing with said pinion f, axle i, rigidly secured in the neck of said drive-wheels I and journaled in the boxing in the posts i', ratchet-wheels i^3, secured on said shaft, seat levers and pawls i^5, operating said ratchet-wheels and having secured on their cross-rod i^4 a seat, J, and spring j, its lower half secured to the frame A and its upper half to the lower part of the said seat, ratchet-wheel k', rigidly secured to the inner ends of said axle i', foot levers and pawls K, bearing the pedals k, and springs k^3, set in proper openings in the post i', one end secured to said posts and the other to said foot-levers, substantially as shown and described, and for the purposes set forth.

4. The combination, with the frame, axles, and drive-wheels of a tricycle, substantially as shown, of the beveled cog-pinions a^4, rigidly secured to the driving-axles a', gearing-frames G, secured to said frame A, braces f^2, their lower ends secured to the bearings a, and their upper ends receiving shafts F and bracing the same, shafts F, their upper ends working in said braces f^2 and in sockets in said frames, and their lower ends working in bars H, drive-wheels f', rigidly secured on the lower ends of said shafts, meshing the said pinions, ratchet-wheels f^3, rigidly secured on the upper ends of said shafts, hand levers and pawls f^5, operating said ratchet and driving said gearing, circular brace f^6, secured to gear-frame G and brace f^2, and supporting said lever f^5, substantially as shown and described, and for the purposes set forth.

398,006. COTTON OR CORN PLANTER.

JOSEPHUS STONE, THOMAS WATSON, and BRANCH A. WATSON, Burton, Tex. Filed Sept. 29, 1888. Serial No. 286,730. (No model.)



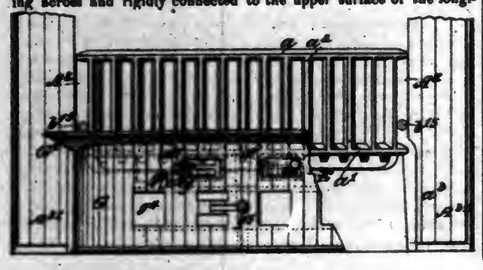
Claim.—In combination with the hopper of a corn or cotton planter, a vibrating sector, K L, provided with two median pins, l l, on the part L, and a seed-slide having the vertical stud o projecting up between said pins, whereby the seed-slide will be intermittently and alternately struck by the two pins and reciprocated in opposite directions, as set forth.

398,007. FIRE-GRATE.

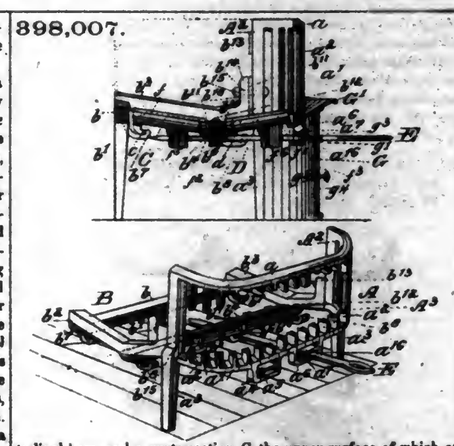
EPHRAIM J. STORY, Washington, D. C. Filed Aug. 6, 1888. Serial No. 173,099. (No model.)

Claim.—1. The combination, in a grate, of a rear longitudinal supporting-bar, a longitudinal supporting-bar opposite to and parallel with the rear longitudinal supporting-bar, transverse end bars which overlap such longitudinal supporting-bars and are rigidly connected thereto, and a grate-section which at its ends is overlapped by the transverse end bars.

2. The combination of the rear longitudinal supporting-bar, b, the central longitudinal supporting-bar, b^4, the end bars, b^3 and b^5, extending across and rigidly connected to the upper surface of the longi-



398,007.



tudinal bars, and a grate-section, C, the upper surface of which at its ends is overhung by the end bars, substantially as and for the purposes set forth.

3. A grate-frame which consists of a front longitudinal bar, a rear longitudinal bar, an intermediate longitudinal bar, and end bars which extend across each rear and intermediate longitudinal bars, in combination with grate-sections which are supported by bottom projections upon the rear and intermediate longitudinal bars and by rear projections upon the front and intermediate longitudinal bars, whereby when the grate-sections are reciprocated coals, clinkers, and ashes are cleared from the sections at their ends.

4. The combination of the grate-frame embracing bar a', having a support, f^2, bar b, having support b^1, bar b^4, having supports b^2 and b^6, and end bars, b^3 and b^5, with the grate-sections C and D, provided, respectively, with the bottom hooks, c and d, for the purposes specified.

5. A rear longitudinal supporting-bar, transverse end bars which rest upon and are rigidly connected to the rear longitudinal supporting-bar, a longitudinal supporting-bar which at each end is connected to the under surface of the transverse end bars, hooks or sockets which project from the under surface of the longitudinal supporting-bars, and a grate-section having engaging-hooks, in combination, substantially as described.

6. A fire-place grate the frame of which embraces a longitudinal supporting-bar, b, transverse end bars, b^3 and b^5, which rest upon and are rigidly connected to the longitudinal supporting-bar, a longitudinal supporting-bar, b^4, which at each end is connected to the under surface of the transverse end bars, b^3 and b^5, and downwardly and upwardly turned hooks or sockets b^7 b^7, which project from the under surface of the longitudinal supporting-bars b and b^4, as and for the purposes set forth.

7. A front grate-section which consists of end vertical standards the lower portions of which are curved outwardly, as described, an upper curved horizontal connecting-bar, and a series of vertical bars which extend from the upper horizontal connecting-bar to the lower horizontal connecting-bar, in combination with a rear grate-frame which embraces two lower longitudinal supporting-bars and two upper transverse bars, the rear longitudinal supporting-bar having a single bottom support placed at about its mid-length, as described.

8. The front grate frame or section, A, which consists of the standards A^2, curved outwardly, as shown, the upper connecting-bar, a, the lower connecting-bar, a', and the series of vertical bars a^3, in combination with the rear grate-frame, B, which embraces the two longitudinal supporting-bars b and b^4, the transverse superposed bars b^3 and b^5, and the single bottom support, b', upon the longitudinal supporting-bar b, substantially as set forth.

9. The combination of a front grate-frame and grate-section embracing a vertical basket portion and vertical outwardly-bent end standards, and a rear horizontal grate-frame, the front vertical grate-frame and grate-section and the rear horizontal grate-frame being secured together, substantially as described.

10. The combination, with the rear horizontal grate-frame and grate-section, of the front vertical grate-frame or basket-section provided with the left and right operating-loops, a^4 and a^6, substantially as and for the purposes set forth.

11. A fire-place grate which embraces a rear horizontal grate frame and grate-section and a front vertical grate-frame or basket-section which is provided with the right operating-loop, a^6, and with left operating-loop, a^4, whereby the grate-section upon such rear horizontal grate-frame may be dumped, as described.

12. In a fire-place grate, a front vertical grate-frame or basket-section, A, which is provided with left and right operating-loops, a^4 and a^6, as and for the purposes described.

13. The combination of the front section, A, having vertical portions a^3, longitudinal portions a and a', and operating-loops a^4 and a^6, with the rear section, B, having grate-supporting hooks and connected to the front section, substantially as described.

14. The front section, A, having vertical bars a^3, longitudinal bars a and a', and loops a^4 and a^6, in combination with the rear frame, B, and with the rear and front grate-sections, C and D, substantially as and for the purposes specified.

15. A fire-place grate which embraces a front section, A, which has vertical portions a^3, longitudinal portions a and a', and operating-loops a^4 and a^6, a rear grate-supporting frame, B, and rear and front grate-sections, C and D, which are provided with engaging-lugs.

16. The combination, with the front frame and section, A, having the loops a^4 and a^6, of the pivoted locking-stops a^8 and a^7, whereby the limit of movement of the operating-lever may be either enlarged or restricted at the will of the operator, substantially as and for the purposes specified.

17. The combination, with the front section, A, of the grate-frame, of the outwardly-bent supports or standards A^2, located at the extremities of the grate, as described, and curved beyond the planes of such extremities, whereby space is afforded in a self-supporting grate for the insertion and removal of an ash-pan which has greater width than the grate.

18. The front A, having connecting-bar a', provided with loops a^4 a^6, the casing G, having openings g and g', and the grate having bottom lugs, in combination, as set forth.

19. The combination, with a fire-place grate, of a detachable air casing, G, provided with an ash receiving and discharging chute, G' and resting upon the hearth or floor, substantially as shown and set forth.

20. The combination, with a fire-place grate, of a detachable air-casing, G, having at the top a chute, G', for receiving and discharging ashes, and having also a series of registered openings, g^3, for the admission of draft-air.

21. The combination, with a fire-place grate, of the detachable air-casing or dust screen G, provided with ash-chute G', operating-openings g and g', and registered draft-openings g^4, substantially as and for the purposes specified.

22. The combination, with the front section, A, having connecting-bar a' and loops a^4 and a^6, of the dust-screen or air-casing G, having operating-openings g and g', provided with closing-plates g^6 and g^5 and corresponding with the loops a^4 and a^6, substantially as set forth.

23. The combination, with the grate consisting of the self-supporting frame-sections and the front and rear grate-sections, of the detachable air-casing G, having openings g, g', and g^4, and closing-plates g^6, g^5, and g^3, substantially as and for the purposes specified.

24. The combination, in a fire-place grate, of a front vertical grate-frame and a rear horizontal grate-frame, which is fitted to the front grate-frame, an arm or knee upon one of the grate-frames extending along the other grate-frame, and a securing-bolt extending through one of the grate-frames and through the arm or knee upon the other grate-frame.

25. The combination of the front grate-frame and basket-section, A, the rear grate-frame, B, having upwardly-extending arm or knee b^{10}, and the securing-bolt b^{11}

26. The combination, with the grate, of the grate-frame having the outward bend in the plane of the grate and the inward projection extending over the ends of the grate, substantially as shown and described, and for the purposes set forth.

27. The combination, with the grate, of the rear grate-frame having end bars, b^3, overhanging the rear grate-section and a portion of the front grate-section, and the front grate-frame having projection A^2, overhanging a portion of the front grate-section, substantially as and for the purposes specified.

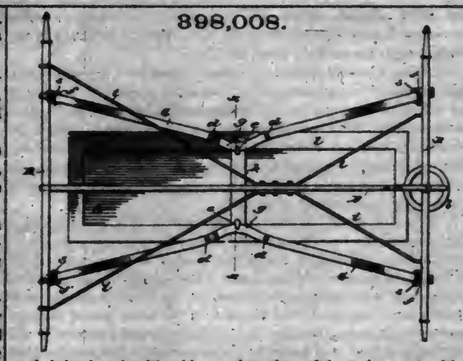
28. The front grate-frame having the outward bend and the inward projection, in combination with the rear grate-frame having overhanging end bars in continuation of the inward projection upon the front grate-frame, the rear grate-section supported upon the rear grate-frame, and the front grate-section supported in part upon the rear and in part upon the front grate-frame.

398,008. SIDE SPRING FOR VEHICLES.

JAMES F. THOMAS, Alexandria, Ky. Filed Nov. 3, 1888. Serial No. 289,916. (No model.)

Claim.—The combination, with the vehicle-body and its front and rear axles, of the side springs, G G, bowed laterally inward and constructed with an inwardly-curving central portion, g, thence diverging in straight lines outward and clipped to the head-block and rear axle, the bolts d d, and the central hook-shaped bolts, e e, arranged upon the exterior of the apex sides of the curved portions g g and engaging

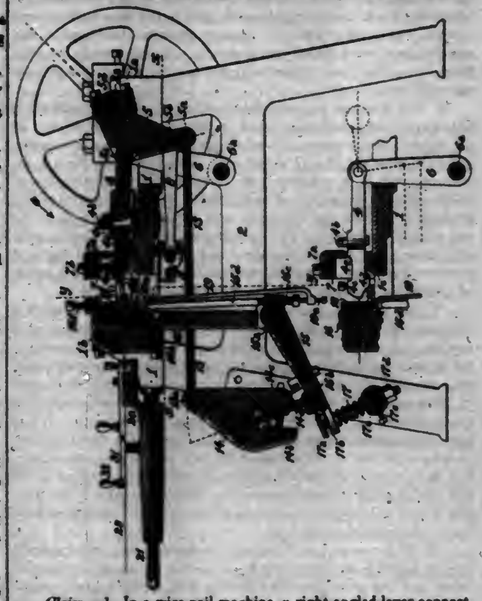
398,008.



at their hook ends with said curved portions of the springs and uniting them with the frame-work of the body of the vehicle, substantially as and for the purposes specified.

398,009. NAIL-MACHINE.

JOSEPH W. THOMPSON, Salem, Ohio, assignor of one-half to the Buckeye Engine Company, same place. Filed Sept. 3, 1888. Serial No. 284,933. (No model.)



Claim.—1. In a wire-nail machine, a right-angled-lever connecting-block having a bearing for a heading-ram connecting-rod at the junction of its arms, and having bearings for a crank-pin and for a gripping-lever connecting-rod, respectively, at the opposite ends of its arms, substantially as set forth.

2. In a wire-nail machine, the combination of a driving-shaft, a gripping-die, a pair of cutting-levers, each carrying a cutting and pointing knife, a heading-ram, a right-angled-lever connecting-block having one of its arms coupled to a crank-pin on the driving-shaft and to the heading-ram, and suitable known mechanical connections coupling the gripping-die and cutting-levers to the other arm of the connecting-block, substantially as set forth.

3. In a wire-nail machine, the combination of a driving-shaft, a gripping-die, a heading-ram, a right-angled-lever connecting-block having one of its arms coupled to a crank-pin on the driving-shaft and to the heading-ram, suitable known mechanical connections coupling the gripping-die to the other arm of the connecting-block, and a pair of cutting-levers, each carrying a cutting and pointing knife and actuated by suitable known mechanical connections to which movement is imparted by the driving-shaft, substantially as set forth.

4. In a wire-nail machine, the combination of a driving-shaft, a pair of cutting-levers, each carrying a cutting and pointing knife, a right-angled-lever connecting-block having one of its arms coupled to a crank-pin on the driving-shaft and to the heading-ram, suitable known mechanical connections coupling the cutting-levers to the other

arm of the connecting-block, and a gripping-die actuated by suitable known mechanical connections to which movement is imparted by the driving-shaft, substantially as set forth.

5. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a guide adapted to control the direction of traverse of said upper arm, and a suitable known mechanical connection coupled to the lower arm of the connecting-block and transmitting power therefrom to a pressure-exerting member of the machine, substantially as set forth.

6. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a fixed gripping-die, a movable gripping-die, a gripping-lever coupled to the movable die, an intermediate lever coupled to and vibrated by the lower arm of the connecting-block, and a vibrating lever coupled to and actuated by the intermediate lever and adapted to intermittently transmit pressure therefrom to the gripping-lever, substantially as set forth.

7. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a fixed gripping-die, a movable gripping-die, a gripping-lever coupled to the movable die, an intermediate lever coupled to and vibrated by the lower arm of the connecting-block, a vibrating lever coupled to the intermediate lever and adapted to intermittently transmit pressure therefrom to the gripping-lever, and a spring acting upon the gripping-lever in opposite direction to the pressure imparted thereto by the vibrating lever, substantially as set forth.

8. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a fixed gripping-die, a movable gripping-die, a gripping-lever coupled to the movable die, an intermediate lever coupled to and vibrated by the lower arm of the connecting-block, a vibrating lever coupled to the intermediate lever and adapted to intermittently transmit pressure therefrom to the gripping-lever, and a cam or eccentric device for increasing the degree of pressure applied to the gripping-lever during a portion of each period of application of pressure thereto, substantially as set forth.

9. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a fixed gripping-die, a movable gripping-die, a double-armed gripping-lever having one of its arms coupled to the movable die, an intermediate lever coupled to and vibrated by the lower arm of the connecting-block and provided with a pair of oppositely-inclined lower jaws or bearing-faces, and a vibrating lever or tongue pivoted to the intermediate lever between its jaws in position to be alternately pressed against and moved off a bearing on the arm of the gripping-lever opposite that which is coupled to the movable die in and by the movements of the jaws of the intermediate lever, substantially as set forth.

10. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a fixed gripping-die, a movable gripping-die, a double-armed gripping-lever having one of its arms coupled to the movable die, an intermediate lever coupled to and vibrated by the lower arm of the connecting-block and provided with a pair of oppositely-inclined lower jaws or bearing-faces, and a vibrating lever or tongue pivoted to the intermediate lever between the jaws and eccentrically to the pivotal axis thereof in position to be alternately pressed against and moved off a bearing on the arm of the gripping-lever opposite that which is coupled to the movable die in and by the movements of the jaws of the intermediate lever, substantially as set forth.

11. In a wire-nail machine, the combination of a driving-shaft, a right-angled-lever connecting-block having its upper arm coupled at one end to a crank-pin on the driving-shaft, a heading-ram coupled to the opposite end of said upper arm, a fixed gripping-die, a movable gripping-die, a double-armed gripping-lever having one of its arms coupled to the movable die, a friction-roller mounted in the opposite arm of the gripping-lever, an intermediate lever coupled to and vibrated by the lower arm of the connecting-block and provided with a pair of oppositely-inclined lower jaws or bearing-faces, a vibrating lever or tongue pivoted to the intermediate lever between its jaws in position to be alternately pressed against the friction-roller of the gripping-lever in line with the pivot of said roller and relieved from pressure thereon in and by the movements of the jaws of the intermediate lever, a fixed stud passing freely through the arm of the gripping-lever which carries the friction-roller and having a stop to limit the movement of said lever, and a spring bearing against said arm in opposite direction to the vibrating lever or tongue, substantially as set forth.

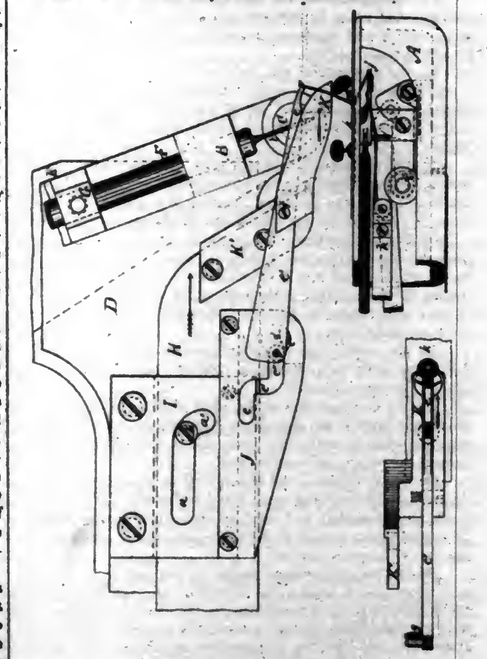
12. In a wire-nail machine, the combination of a driving-shaft, a heading-ram coupled to a crank-pin thereon and provided with a lower sole or projection, a heading-punch fixed in the ram, and a fixed lower bearing over which the sole of the ram is adapted to traverse during a portion of each of its reciprocating movements, the face of said bearing being located in a plane above that in which the face of the sole traverses during the remaining portion of the movements of the ram, substantially as set forth.

13. In a wire-nail machine, the combination of a driving-shaft, a heading-ram coupled to a crank-pin thereon and provided with projections on its upper and lower sides, a heading-punch fixed in the ram, a fixed lower bearing over which the lower projection of the ram is adapted to traverse during a portion of each of its reciprocating movements and below which it is free to traverse during the remainder of said movements, and an upper guide fixed to the frame of the machine in position to abut against the upper projection of the ram near the terminal of the working stroke of the ram, substantially as set forth.

14. In a wire-nail machine, the combination of a driving-shaft, a rock-shaft having an arm coupled to a crank-pin on the driving-shaft, a cutting-lever pivoted to the frame of the machine and carrying a cutting-knife adjacent to its free end, and a removable link coupling the cutting-lever to an arm on the rock-shaft, said link having cylindrical ends fitting freely in segmental recesses in the cutting-lever and arm, respectively, substantially as set forth.

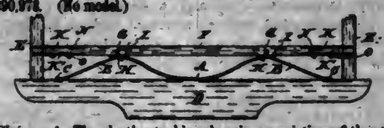
15. In a wire-nail machine, the combination of a driving-shaft, a feed-carriage fitted to reciprocate on guides fixed to the frame of the machine, a feed-dog and a releasing-lever journaled on independent pivots on the feed-carriage, and a spring bearing at its ends against the feed-dog and releasing-lever, respectively, substantially as set forth.

398,010. LOOP REMOVING AND SPREADING MECHANISM FOR BUTTON-SEWING MACHINES. ROSEWELL THOMPSON, Bridgeport, Conn. Filed Apr. 13, 1888. Serial No. 270,555. (No model.)



Claim.—In a button-sewing machine, and in combination with its double-barbed needle and complementary stitch-forming mechanism, the loop-spreading device K, consisting of two substantially-parallel plates united at one end to form a point and having an opening at that end to receive the button, the loop-removing device *e*, pivoted between the plates of the loop-spreading device, and also consisting of two plates united at one end to form a point, the space between said plates being wide enough to receive the needle, and suitable mechanical means for operating these devices, all substantially as set forth.

398,011. VEHICLE-SPRING. ELLIS M. VAN VALKENBURG and FRANK L. WOOD, Union Grove, Wis. Filed Nov. 16, 1888. Serial No. 290,978. (No model.)

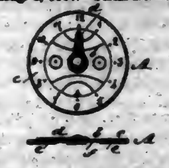


Claim.—1. The elastic steel band-spring consisting of the straight flat part A, secured movably at its ends to a false bolster which rests thereon throughout the entire length of the flat part of the spring in its normal condition, and the downwardly-bent or thereto-inclined ends B B, resting at their free extremities movably on a bolster, the ends B B being each about one-half the length of the straight part A, substantially as described.

2. The flexible band-spring consisting of a straight part, A, and thereto-inclined ends B B, in combination with a false bolster, F, and clevises G G, pivoted in the false bolster and located and retaining the spring at or near the extremities of the straight part A, substantially as described.

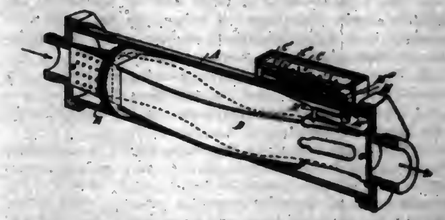
3. A flexible band-spring having a straight part, A, provided with recesses H H, and the thereto-inclined ends B B, in combination with the false bolster F, the clevises G G, and the bolster D, substantially as described.

398,012. INDICATOR FOR BOTTLES. HENRY R. WEAVER, Burlington, N. J. Filed Aug. 6, 1887. Serial No. 246,260. (No model.)



Claim.—A dial or label for a bottle, consisting of a body portion with dial thereon, and an index or pointer rotatably connected therewith, and a gasket or annulus secured to the outer back portion of said body and having an adhesive substance on its face, the said gasket being of sufficient thickness to permit the rotation of the index-fastener therewith, said parts being combined substantially as described.

398,013. LIQUID OR GAS METER. LOUIS G. WELKE, Toledo, Ohio. Filed May 3, 1888. Serial No. 272,968. (No model.)



Claim.—1. In a fluid-meter, a casing, a shell inclosed within the same, and a spring immovably secured to the shell at each end, secured in the path of the passing fluid, and adapted to measure the same in compartments formed by the undulatory movement of the spring, as and for the purpose set forth.

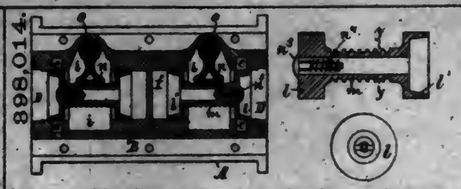
2. In a fluid-meter, a shell having a spring of greater length immovably secured at each end thereof, in combination with a casing inclosing the shell, as and for the purpose set forth.

3. In a fluid-meter, a spring connected with a fluid-receptacle, undulations formed therein by the rigid attachment of each end of the spring, and a lever connected with the spring and indicator mechanism, as and for the purpose set forth.

4. In a fluid-meter, an outer casing having egress and ingress ports for liquid, a shell within the casing provided with openings for admission of fluid, and a spring immovably attached at each end to the shell and impinging upon opposite sides of the shell, in combination with an indicator mechanism connected with the spring, as and for the purpose set forth.

398,014. TRIP-VALVE GEARING. WILBUR M. WHITLOCK, Newark, N. J. Filed Oct. 11, 1883. Serial No. 267,942. (No model.)

Claim.—1. A cylindrical valve having one end applied to an annular cylinder induction-port and the other end fitted to a compression-chamber provided with a steam-inlet in its side to introduce the steam under pressure, and the induction-port and the steam-inlet being arranged in relation to the valve so that the steam-inlet is closed as the induction-port is opened, as and for the purpose set forth.



2. A cylindrical valve having one end applied to an annular cylinder induction-port, an opposite end of smaller diameter fitted to a compression-chamber provided with a steam-inlet in its side, a rock-shaft for shifting the valve to open the induction-port and compress the steam in the compression-chamber, and cut-off mechanism to release such rock-shaft at a suitable point, substantially as herein set forth.

3. A cylindrical valve having one end applied to an annular cylinder induction-port and the other end fitted to a compression-chamber provided with a steam-inlet in its side to introduce the steam under pressure, and the induction-port and the steam-inlet being arranged in relation to the valve so that the steam-inlet is closed as the induction-port is opened, and an outlet-valve from the compression-chamber to limit the pressure therein, as and for the purpose set forth.

4. A cylindrical valve having one end applied to an annular cylinder induction-port and the other end fitted to a compression-chamber provided with a steam-inlet in its side to introduce the steam under pressure, and the induction-port and the steam-inlet being arranged in relation to the valve so that the steam-inlet is closed as the induction-port is opened, a passage leading from the compression-chamber through the piston-valve, and a relief-valve seated upon the outer side of such passage, as and for the purpose set forth.

5. The combination, with a steam-cylinder valve-chest, of two cylindrical compression-chambers in the middle of the chest with steam-inlets in their sides, two cylindrical valve-seats with annular induction-ports near the ends of the chest, a steam-supply to such valve-seats and steam-inlets, an exhaust-passage intermediate to each of the said compression-chambers and valve-seats, and two valves provided at their opposite ends with pistons fitted, respectively, to such chambers and valve-seats, the whole arranged and operated substantially as herein set forth.

6. The combination, with a steam-cylinder valve-chest, of two cylindrical compression-chambers in the middle of the chest, with steam-inlets in their sides, two cylindrical valve-seats with annular induction-ports near the ends of the chest, a steam-supply to such valve-seats and steam-inlets, an exhaust-passage intermediate to each of the said compression-chambers and valve-seats, two valves provided each with pistons at their opposite ends, and with an intermediate shank having a rack formed thereon, and rock-shafts provided with segments to reciprocate such valves, and cut-off mechanism for actuating such rock-shafts, substantially as herein set forth.

7. In a steam-engine, the combination, with a port operating as an induction and eduction port, of a piston-valve fitted thereto and connected with a rock-shaft, an eccentric arm fitted loosely upon said shaft, a dog to engage the arm in one direction and a crank-arm attached to the shaft and provided with a latch to engage the arm in the opposite direction, and mechanism for tripping the latch, as and for the purpose set forth.

8. In a steam-engine, the combination, with a balanced piston-valve, of a steam dash-pot and a relief-valve discharging from the interior of such dash-pot into the steam-space of valve-chest, as and for the purpose set forth.

398,015. MACHINE FOR WRAPPING ORANGES, &c. HUMPHREY J. WILLIAMS, New York Mills, N. Y., assignor, by mesne assignments, of one-half to Grace C. Warner, Pasco, Fla. Filed May 13, 1884. Serial No. 131,494. (No model.)

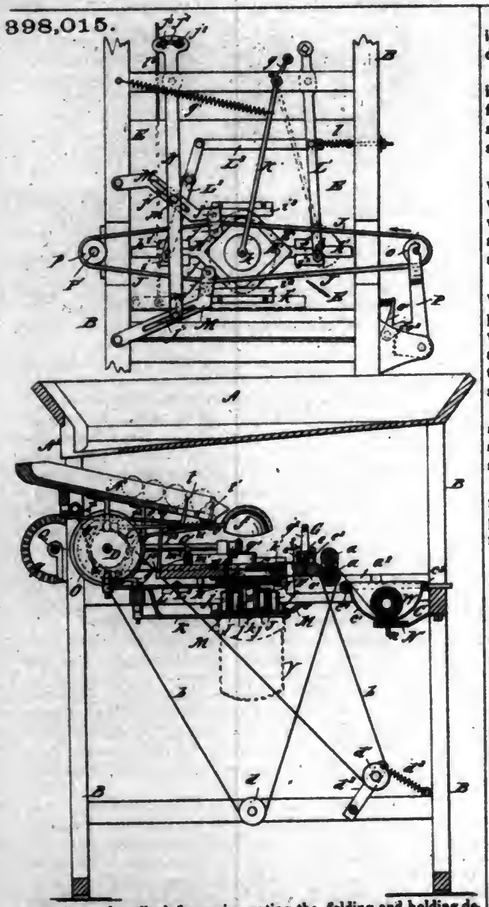
Claim.—1. In a wrapping and twisting machine, a contracting and expanding folder and holder, in combination with a contracting and expanding twister for twisting and releasing the article wrapped.

2. In a wrapping and twisting machine, an automatically contracting and expanding folder and holder, in combination with an automatically contracting and expanding twister for twisting and releasing the article wrapped.

3. In a wrapping and twisting machine, the platform having an aperture, in combination with a contracting and expanding folder and holder and a contracting and expanding twister for twisting and releasing the article wrapped.

4. In an orange-wrapping machine, the folding and holding devices H H' and an orange revolver or twister, J, arranged below the folding and holding devices H H', in combination with means, sub-

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stantially as described, for reciprocating the folding and holding devices for gathering the paper over the orange and holding the folded portions of the paper, and means, substantially as described, for revolving the revolver or twister J while the wrapping-paper is so held for forming the twist to the paper, substantially as described.

5. The combination, in an orange-wrapping machine, of an apertured table for supporting the wrapping-paper, folding and holding devices H H' below the table, revolver or twister J, arranged below the folding and holding devices H H', and a support, *k*, below the revolver or twister J, substantially as and for the purpose set forth.

6. In an orange-wrapping machine, the combination, with the horizontally-placed twister J, of the support *k* and folding and holding devices H H', the twister J being placed between the said support and folding and holding devices and held upon pulleys connected with the main shaft by shaft and gears for revolving the twister J, substantially as described.

7. In an orange-wrapping machine, the twister J, being a horizontally-placed elastic belt, in combination with opening devices M, applied to the twisting-belt, and means, substantially as described, for operating the devices M to and from each other, the twister being placed upon the vertically-arranged pulleys *o p*, substantially as described.

8. The folding and holding forks H H', in combination with the cam L and intermediate levers and connections for reciprocating the forks simultaneously to and from each other, substantially as and for the purposes set forth.

9. The combination, with the twisting or traveling belt J, of the cam O, lever N, and arms M, connected to the lever N and to the opposite sides of the belt J, for opening and closing the belt, substantially as described.

10. The combination, with the devices H H', for folding and holding the wrapping-paper over the orange, and twisting-belt J, for revolving the orange, of the platform E, having aperture E' formed in it, through which the orange and wrapping-paper may be dropped, substantially as described.

11. The combination, with the paper-folding and orange-revolving mechanism, of the pivoted arm K, for receiving the oranges when dropped into the machine, substantially as described.

12. The combination, with the apertured platform E, paper-folding devices H H', and traveling belt J, for revolving the orange, of feed-rollers *a*, for feeding the wrapping-paper upon the platform E, and paper-cutter G, for cutting the paper into sheets, substantially as and for the purposes described.

13. In an orange-wrapping machine, the apertured table E, through which the orange is dropped, and feed-rollers *a a*, arranged parallel with the table for feeding the wrapping-paper thereon, in combination with the jointed cutter G, blade *c*, and slotted bar or cross-piece F, arranged between the feed-rollers and the table E, substantially as and for the purposes described.

14. In an orange-wrapping machine, the apertured table E, through which the orange is dropped, the feed-rollers *a a*, for feeding the wrapping-paper upon the table, and the jointed cutter G, in combination with the slotted bar or cross-piece F, arranged between the table E and rollers *a a*, the spring G', attached to the bar F, the circular cutting-blade *c*, and the rollers c^2, all arranged to operate substantially as and for the purposes set forth.

15. The combination, in an orange-wrapping machine, of the apertured platform E, rollers *a a*, pivoted cutter G, shaft R, crank a^3, spring *r*, pinion *r'*, and mutilated worm R', all arranged to operate substantially as and for the purposes described.

16. The combination, with the feed-rollers *a*, and apertured platform E, of the reciprocating bar *k'*, for folding down the wrapping-paper below the upper surface of the platform E, substantially as and for the purposes set forth.

17. The bar *k'*, placed in the slot f^3 of the apertured platform E, in combination with the spring k^3, rod k^2, arm k^1, and eccentric J', all arranged to operate substantially as and for the purposes set forth.

18. The belt J, for revolving the orange placed upon vertically-pivoted pulleys, in combination with the pivoted arm P, holding one pulley, and pawl *o'*, adjusted to engage with ratchet o^3, formed upon arm P, substantially as and for the purposes set forth.

19. The combination, with the feeding-rollers *a* and cutter G, of the apertured platform E, folding and holding forks H H', traveling belt J, and reciprocating lever and plate K *k*, all arranged to operate substantially as and for the purposes set forth.

20. The combination, with apertured platform E, devices H H', for folding and holding the wrapping-paper over the orange, and the device J, for revolving the orange, of the dropping-cups *f*, held above the platform E, for dropping the oranges one by one into the machine, substantially as described.

21. The dropping-cups *f*, arranged over the aperture E' and adapted to receive the oranges one by one from the trough A', in combination with means, substantially as described, for opening and closing the cups, as and for the purposes set forth.

22. The cups *f f*, secured upon the spring-actuated rods *v v*, in combination with the cam T and the projections *v' v'*, secured upon the rods *v* to run against the edges of the cam, substantially as and for the purposes set forth.

23. The trough A', to which the oranges are fed, in combination with the alternately-reciprocating rods t^3 t^3, provided with vertical fingers *t t'*, extending up through the trough one in advance of the other, and the cam T, the rods t^2 exteading across the upper surface of the cam and the rods t^2 being bent to rest against the under side of the cam, substantially as set forth.

24. The trough A', combined with the alternately-reciprocating fingers *t t'* and the opening and closing dropping-cups *f f*, arranged to operate substantially as and for the purposes set forth.

25. The cam T, formed with the toe *a*, and the rods t^3 t^3, having fingers *t t'* and arranged to bear upon the upper and lower edges of the cam T, in combination with the spring-actuated rods *v v*, having cups *f f* and pins *v' v'*, arranged to come against the cam T, whereby this cam operates both the fingers *t t'* and the cups *f f*, substantially as described.

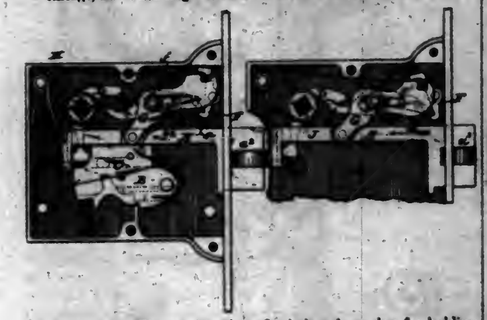
26. The tray C, formed of the two separate parts *c' c²*, arranged adjustably upon the rod c^4 and frame c^3, substantially as and for the purposes set forth.

27. The parts *c' c²*, hinged upon the rod c^4 and formed with the pins *n n*, in combination with the plate N', formed with the diverging slots *n' n'*, which act as cams for opening and closing the parts *c' c²*, substantially as and for the purposes set forth.

28. The tray C, composed of the parts *c' c²* and frame c^3, hinged upon rod c^4, the parts *c' c²* being provided with the pins *n n*, in combination with the stationary plate N', having the diagonal slots *n' n'* formed in it, substantially as and for the purposes set forth.

29. The bars a^6 a^3, tied together by the cross-piece F and carrying the feed-rollers *a a*, and adapted to be moved to and from the platform E, in combination with the sectional tray C and plate N', the plate being formed with the diagonal slots *n' n'*, in which the pins *n n* move, substantially as and for the purposes set forth.

398,016. COMBINED LATCH AND LOCK. GEORGE WERRELL, Chicago, Ill. Filed Aug. 19, 1887. Serial No. 247,349. (Model.)



Claim.—1. The combination of a bolt, a lever-dog for holding the bolt in its outermost position of projection, a catch-piece for holding the lever-dog out of engagement with the bolt, and a trip-lever connected with the bolt and provided with a projection to engage the catch-piece, substantially as described.

2. The combination of a bolt, a lever-dog for holding the bolt in its outermost position of projection, a catch-piece for holding the lever-dog out of engagement with the bolt, a trip-lever connected with the bolt and provided with a projection to engage the catch-piece, and a follower for operating the bolt, said follower having a projection for engaging the lever-dog to lift it out of engagement with the bolt, substantially as described.

3. The combination of a bolt and a lever-dog for holding the bolt in its outermost position of projection, a catch-piece for holding the lever-dog out of engagement with the bolt, a trip-lever connected with the bolt and provided with a projection to engage the catch-piece, a follower for operating the bolt, said follower having a projection for engaging the lever-dog to lift it out of engagement with the bolt, and a tumbler and a tumbler-plate engaging said follower, substantially as described.

4. The combination of the bolt A, the sliding trip-lever G, having the slot *g'*, the pivot g^2, having an extension or projection working within the slot *g'* and against its projection g^2, the catch-piece F, having the lug f^3, the spring lever-dog E, and the projection *a* or its equivalent on the bolt A, substantially as and for the purpose described.

5. The combination of the bolt A, having the projection *a* thereon, the sliding trip-lever G and its spring *g* and slot, *g'*, a pivot, g^2, secured to the casing H, with its other end forming a projection within the said slot, the dog catch-piece F, having a spring, *f*, and lug f^3, the lever-dog E and its spring *e*, and means for reciprocating the bolt A, substantially as and for the purpose described.

6. The combination of the bolt A, having the anti-friction roller a^3, the projection *a*, and spring *a'*, the trip-lever G, pivoted to the bolt and provided with a slot, *g'*, enlarged at its rear end, the pivot g^2, and the lever-dog E, working thereon, the spring *e*, the extension of the pivot g^2 projecting within the slot *g'* of lever G, the catch-piece F, having a spring, *f*, and lug f^3, the cranked follower D, and means for operating said follower, substantially as and for the purpose described.

7. The combination of the spring-actuated bolt A, having a projection, *a*, thereon, a sliding lever, G, pivoted at its rear end to the bolt A, having a slot in its middle portion and notched or otherwise provided with a catch at its upper front end, a dog catch-piece, F, having a lug, f^3, at its upper end and a catch part at its lower end, a lever-dog, E, a cranked follower, D, and means for operating the same, substantially as and for the purpose described.

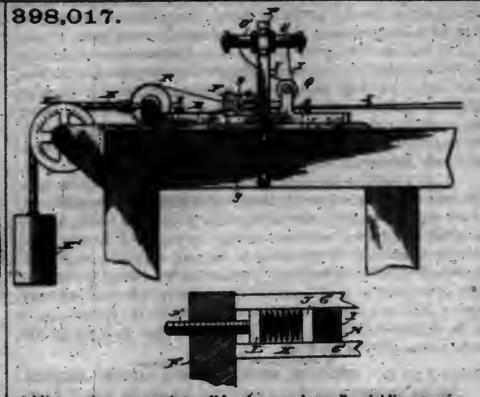
398,017. WARP-TENSION-REGULATING DEVICE FOR LOOMS. JOHN L. ALDRIDGE, Syracuse, N. Y., assignor to E. C. STEARNS & Co., same place. Filed Dec. 21, 1887. Serial No. 258,542. (No model.)

Claim.—1. The combination, with the casing open at the front and rear for the passage of the threads, of parallel plates mounted in said casing at right angles to its length, a spring pressing the plates together, a set-screw extending through the end of the casing, and a bearing block or plate between the inner end of said screw and the outer end of the spring, substantially as set forth.

2. The combination, with a casing having carriages or slides at its ends and ways therefor, of tension-plates within the casing at right angles to its length, and means for pressing the plates together, substantially as set forth.

3. The combination, with the loom-frame, of the longitudinally-

398,017.

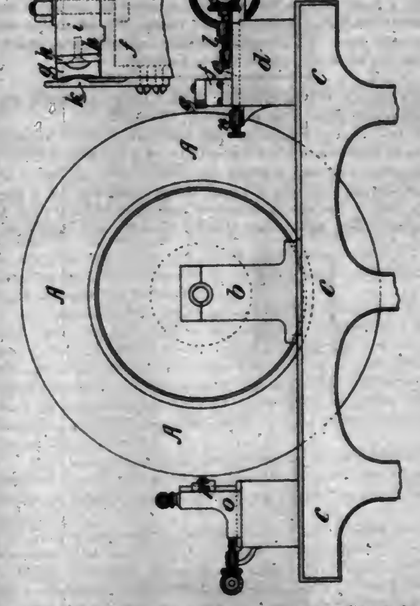


yielding casing mounted to slide thereon, laterally-yielding tension-plates within said casing, a spring pressing said plates together, and a weight exerting rearward strain on said casing, substantially as set forth.

4. The combination, with the loom-frame, its spool or bobbin supports and guide-rollers, of the sliding casing mounted on the said frame parallel with the rollers, tension-plates in said casing, means for pressing the plates together, and a weight exerting rearward strain on said casing, substantially as set forth.

5. The combination, with the loom-frame, of the sliding casing mounted thereon and provided with laterally-yielding tension-plates, a spiral spring within the casing and pressing the plates together, a set-screw extending through the end of the casing and regulating the tension of the spring, and a weight exerting rearward strain on the said casing, substantially as set forth.

398,018. APPARATUS FOR TRUING BARS FOR CARDING-ENGINE FLATS. GEORGE ASHWORTH and ELIJAH ASHWORTH, Manchester, County of Lancaster, England. Filed Feb. 22, 1888. Serial No. 264,974. (No model.) Patented in England Apr. 20, 1886, No. 5,462.



Claim.—1. In an apparatus for acting upon carding-engine flat-bars to form or finish the curved surfaces which slide upon the flexible bends or curved guides, two revolving grinding-surfaces, the radius from the axis of motion to the grinding-surfaces corresponding with the radius of the flexible bends or curved guides of the carding-engine, in combination with a bar-carriage for holding the flat-bar and con-

nected feed-screws for moving it toward the grinders to obtain uniformity at the two ends of the bar, substantially as set forth.

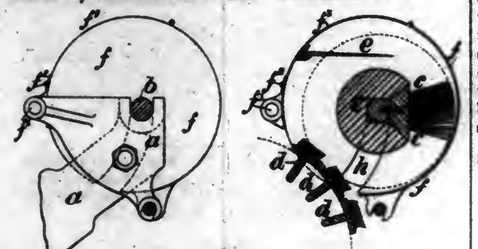
2. In a machine for forming the curved surfaces or working-faces on the two ends of a carding-engine flat-bar, two circular grinders fixed upon one shaft, each grinder being constructed by attaching grinding blocks or plates to revolable disks or carriers and by turning the projecting edges of such blocks or plates to make the periphery of the grinder correspond in curvature with the bends or guides upon which the flats are to travel, substantially as set forth.

3. In a machine for grinding or cutting the curved surfaces upon the ends of carding-engine flat-bars, the back-rest A, having the indicated angular position, the bar-carriage *f*, the two carriages *e e*, mounted in slides and coupled together by means of the screws *l l*, the cross-shaft and bevel-gearing *m*, and the adjustable stops *n*, in combination with two revolving grinders having about the same radius as the bend or guide upon which the flats are to slide, and fixed upon a shaft at a distance apart corresponding to the distance apart of the two curved surfaces which are to be formed upon the flat-bar ends, substantially as set forth.

398,019. STRIPPING MECHANISM FOR CARDING-ENGINES.

GEORGE AINSWORTH and ELIJAH AINSWORTH, Manchester, County of Lancaster, England. Filed Mar. 16, 1888. Serial No. 267,284. (No model.) Patented in England May 15, 1883, No. 2,452.

Brief.—A shaft mounted to rotate in brackets on the framing carries a brush which at each revolution sweeps across the flat at that time in range. Fibers removed from the flats are delivered by the brush to hackles mounted within the casing, so that they can be turned away from the brush to remove accumulations of fiber.

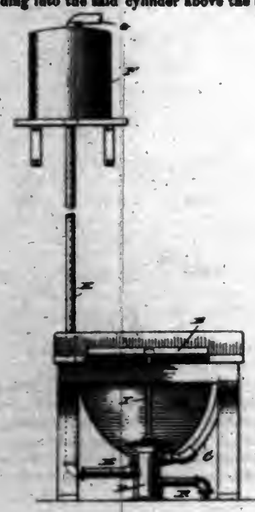


Claim.—The combination of the side framing of a carding-engine, brackets *a*, fixed thereon, and the shaft mounted to revolve in the brackets and carrying a brush, *c*, with a casing, *f*, hinged at one side to expose the brush, and a hinged door to the casing carrying hackles *e* to clear the brush, all substantially as described.

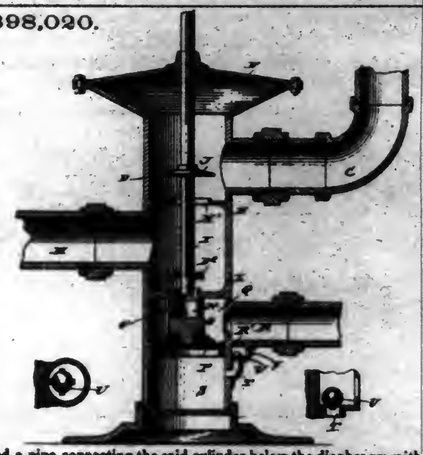
398,020. WATER-CLOSET.

JOHN J. RALLS, Jacksonville, Fla. Filed Oct. 30, 1888. Serial No. 289,514. (No model.)

Claim.—1. In a water-closet, the combination, with a cylinder and a valve-seat formed in the said cylinder, of a rod held to slide in the said cylinder through the said valve-seat, a valve adapted to be seated on the said valve-seat and operated on by the said rod, a diaphragm held in the said cylinder and supporting the said valve, a supply-pipe leading into the said cylinder above the said diaphragm,



398,020.

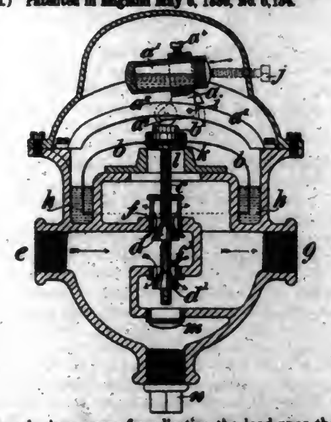


and a pipe connecting the said cylinder below the diaphragm with the said supply-pipe, substantially as shown and described.

2. In a water-closet, the combination, with a cylinder and a valve-seat formed in the said cylinder, of a rod adapted to slide in the said cylinder through the said valve-seat, a valve adapted to be seated on the said valve-seat and operated on by the said rod, a diaphragm arranged in the said cylinder below the valve-seat and supporting the said valve, a supply-pipe leading into the said cylinder above the said diaphragm, and having a branch, T, which extends down and connects with the cylinder below the valve, and has a grooved valve-seat, a ball-valve held in the said pipe, and a reservoir connected with the said cylinder above the valve-seat, as shown and described.

398,021. GAS-REGULATOR.

JAMES HARDLEY, Oldham, County of Lancaster, England. Filed June 25, 1888. Serial No. 278,089. (No model.) Patented in England May 6, 1886, No. 6,134.



Claim.—1. As a means for adjusting the load upon the bell of a gas-regulator, the lever *a*, having in the horizontal arm a^3 a wheel, a^5, resting upon the bell *b*, and a tubular chamber, *a'*, screwed into the vertical arm *a* and charged with mercury or fluid, the said part *a'* being adjustable in the arm by turning the said part in the direction for screwing or unscrewing, substantially as set forth.

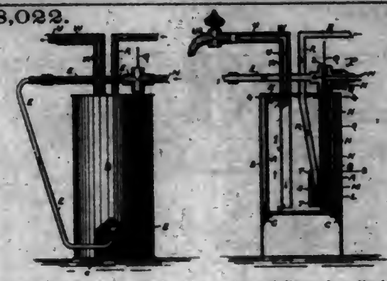
2. In a gas-regulator, the lever $a\ a^3$, mounted upon a fulcrum, *i*, provided with a wheel, a^5, and with an adjustable tube, *a'*, containing mercury, in combination with the bell *b*, the spindle *c*, the valves *d d'*, and the valve-seatings *f f'*, substantially as set forth.

398,022. APPARATUS FOR HEATING WATER.

ROBERT P. BARNSDALL, Boston, Mass., assignor, by direct and mesne assignments, of part to Rufus H. Spalding, same place, and John C. Ballard, Cambridge, Mass. Filed Feb. 18, 1888. Serial No. 264,530. (No model.)

Claim.—1. The combination of boiler A, gas-burner D, to heat boiler, pipe E, to supply gas to burner, and pipe H, branching from pipe E and leading into water of boiler, and at its lower portion adapted to contain mercury and along its height divided into two separate gas-passages at their lower ends both open to mercurial chamber L and at their upper ends open to opposite end portions of gas-pipe E, and between their ends having a supplemental communicating gas-passage,

398,022.



a, located above mercurial chamber, substantially as described, for the purpose specified.

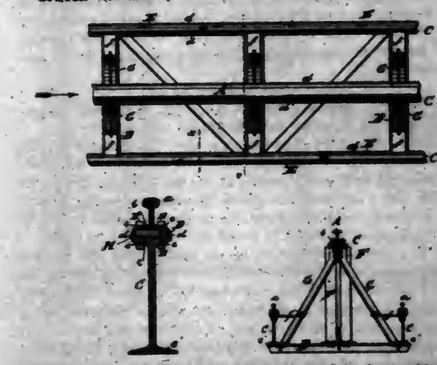
2. The combination of boiler A, gas-burner to heat boiler, pipe E, to supply gas to burner, pipe H, branching from pipe E and leading into water of boiler, and at its lower portion adapted to contain mercury and along its height divided into two separate gas-passages at their lower ends both open to mercurial chamber L and at their upper ends open to opposite end portions of gas-pipe E, and between their ends having a supplemental communicating gas-passage, *a*, located above mercurial chamber, and a plunger, Q, stationary in mercurial chamber and extended to outside of chamber, to be raised and lowered from the outside thereof, substantially as described, for the purpose specified.

3. The combination of boiler A, gas-burner to heat boiler, pipe E, to supply gas to burner, pipe H, branching from pipe E and leading into the water of boiler, and at its lower portion adapted to contain mercury and along its height divided into two separate gas-passages, and at their lower ends both open to mercury of pipe H, and at their upper ends open to the opposite end portions of gas-pipe E, and between their ends having a supplemental communicating gas-passage, *a*, located above the mercurial chamber, and a water-supply pipe, R, entering boiler and arranged to discharge against walls of mercurial chamber of pipe H, substantially as described, for the purposes specified.

4. The combination of boiler A, gas-burner to heat boiler, pipe E, to supply gas to burner, pipe H, branching from pipe E and leading into the water of boiler, and at its lower portion adapted to contain mercury and along its height divided into two separate gas-passages at their lower ends both open to mercurial chamber L and at their upper ends open to opposite end portions of gas-pipe E, and between their ends having a supplemental communicating gas-passage, *a*, located above the mercurial chamber, a water-supply pipe, R, entering boiler and arranged to discharge against walls of mercurial chamber of pipe H, and a shell, T, surrounding water-supply pipe at its discharge N and open to the water of the boiler, substantially as described, for the purposes specified.

398,023. RAIL-SUPPORT FOR ELEVATED ROADS.

FRANCIS A. BARTHOLOMEW, Bloomfield, N. J. Filed Nov. 3, 1887. Serial No. 254,141. (No model.)



Claim.—1. In a rail-support for elevated roads, the combination of a stringer-beam having the edges *d* of its top flange, *c*, turned up, forming between them a groove or recess, H, with the rail *a*, having foot *b* confined within the said recess, a bed, D, being interposed between the rail-foot and the bottom of the recess, and the rail-foot *b* and top flange, *c*, being secured together, substantially as hereinbefore set forth.

2. As a rail-support for elevated railroads, a stringer consisting of a web-beam, C, having bottom flange, *c'*, resting on the structure, and head or top flange, *c*, provided with a continuous groove or recess, H, for the reception of the rail-foot, substantially as specified.

3. In a center-rail elevated railroad, the combination of the central and side stringers, C, consisting of T-beams provided with recesses or grooves H for the reception of the rail-foot, the side stringers having bottom flange, *c'*, with the supporting cross-beams B and uprights F, and with the inclined braces G, bolted to the web of the central stringer, and the braces *f*, connecting the said inclined braces to the webs of the side-rail stringers, substantially as hereinbefore set forth.

398,024. LINIMENT.

DAVID BATES, Bonham, Tex. Filed Dec. 19, 1888. Serial No. 294,602. (No specimens.)

Claim.—The liniment herein described, consisting of linseed-oil, turpentine, sulphuric acid, oil of winter-green, oil of osage-orange, tincture of button-snake root, and tincture of wild indigo, in about the proportions described.

398,025. INSULATOR.

WARREN C. BROWN, Tarrytown, N. Y. Filed Dec. 28, 1888. Serial No. 294,892. (No model.)

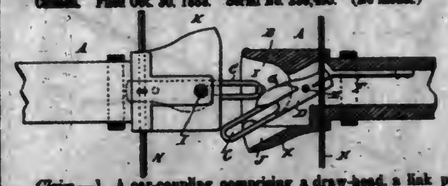


Claim.—1. An insulator formed of the two halves A B, bored axially and adapted to receive the screw *d*, one half being furnished with the recess *f* and the other half being provided with a projection, *g*, fitted to the recess and adapted to shut off leakage from the wire to the screw, substantially as specified.

2. As an improved article of manufacture, an insulator formed of the halves A B, provided with the semicircular grooves *c*, the part B being provided with a recess, *f*, and the part A having a projection, *g*, which extends beyond the screw-hole *c*, substantially as specified.

398,026. CAR-COUPLING.

SAMUEL BYERS, Toronto, Ontario, Canada. Filed Oct. 30, 1888. Serial No. 289,495. (No model.)



Claim.—1. A car-coupling comprising a draw-head, a link pivoted in the said draw-head in the middle of the draw-head opening, and a curved plate secured vertically on one side of the said link and extending essentially the height of the draw-head opening, substantially as shown and described.

2. A car-coupling comprising a draw-head, a link pivoted in the said draw-head in the middle of the draw-head opening, a curved plate secured vertically on one side of the said link and extending throughout the height of the draw-head opening, a flange formed on the upper end of the said curved plate, and a pin held to slide in the draw-head and adapted to be supported on the said flange, substantially as shown and described.

3. A car-coupling comprising a draw-head, a link pivoted in the said draw-head in the middle of the draw-head opening, a curved plate secured vertically on one side of the said link and extending throughout the height of the draw-head opening, a flange formed on the upper end of the said curved plate, a pin held to slide in the draw-head and adapted to be supported on the said flange, and a spring or weight for holding the coupling-link in a normal position, substantially as shown and described.

4. In a car-coupling, the link pivoted in the draw-head and provided on one side with a curved plate extending vertically essentially the height of the draw-head opening, substantially as shown and described.

5. In a car-coupling, the combination, with a draw-head, of a link pivoted horizontally in the said draw-head, a curved plate secured vertically on one side of the link and extending throughout the height of the draw-head opening, and a spring for holding the said link in a normal position out of line with the axis of the draw-head, substantially as shown and described.

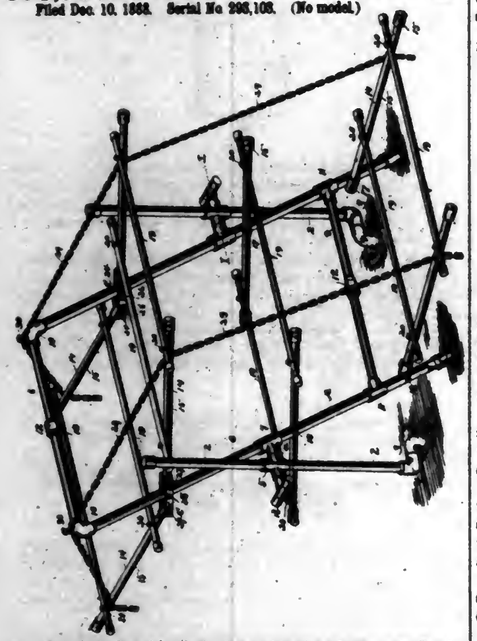
6. In a car-coupling, the combination, with a draw-head provided on one side with an offset having an interior recess, of a link pivoted in the said draw-head and mounted to swing horizontally, a curved plate secured vertically on one side of the said link and extending throughout the height of the draw-head opening, a flange formed on

the upper end of the said curved plate to support the coupling-pin, and a spring for holding the said link in a normal position, substantially as shown and described.

7. In a car-coupling, the combination, with a draw-head provided on one side with an offset having an interior recess, of a link pivoted in the said draw-head and mounted to swing horizontally, a curved plate secured vertically on one side of the said link and extending throughout the height of the draw-head opening, a flange formed on the upper end of the said curved plate to support the coupling-pin, and a rod connected with the inner end of the said link to swing the same horizontally, said rod extending through the said draw-head to the sides of the car, substantially as shown and described.

8. In a car-coupling, the combination, with a draw-head, of a link pivoted in the said draw-head and mounted to swing horizontally, and a coupling-pin held in the said draw-head and adapted to pass through the said link to hold the same in line with the longitudinal axis of the draw-head, substantially as shown and described.

398,027. SHOW-RACK. BENJAMIN G. CAMLER, Cleveland, Ohio.
Filed Dec. 10, 1888. Serial No. 293,103. (No model.)



Claim.—1. In a show-rack, the combination of two vertically-pivoted uprights, 2 2, each having a bend or crank, 3, slides 5 5, arranged on said uprights, and a main frame, A, pivoted on said slides 5 5, substantially as and for the purposes specified.

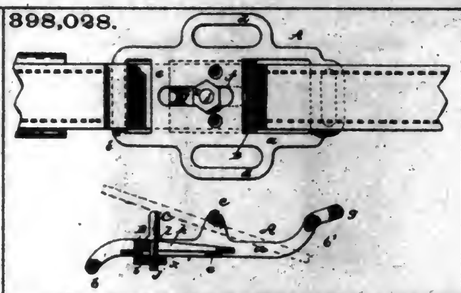
2. In a show-rack, the combination of two vertically-pivoted uprights, 2 2, each provided with a bend or crank, 3, slides 5 5, and main frame A, pivoted on said slides, said main frame having the adjustable cross-bars 8 and 9, substantially as and for the purposes specified.

3. In a show-rack, the combination, with pivoted adjustable uprights, of a main frame pivoted thereon, said main frame having side bars, 6 6, cross-bars 8 and 9, which connect the side bars, and turnbuckles 12, for adjusting the cross-bar, substantially as and for the purposes specified.

4. In a show-rack, the combination of two vertically-pivoted uprights, 2 2, each provided with a crank or bend, 3, slides 5 5, arranged on said uprights, side bars, 6 6, pivoted on the slides, adjustable cross-bars 8 and 9, which connect the side bars, and shelf-bars 14 14, pivoted on the side bars, substantially as and for the purposes specified.

5. In a show-rack, the combination, with the main-frame bars 6, of clamp-plates 24 24, pivoted on said main-frame bars, two sets of shelf-bars, 14, pivoted on the clamp-plates 24, and guys 29, substantially as and for the purposes specified.

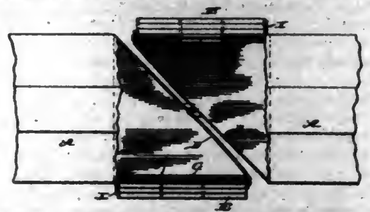
398,028. BUCKLE. GEORGE P. COLE, Johnstown, N. Y. Filed Aug. 18, 1888. Serial No. 283,067. (No model.)



Claim.—1. The combination, with a buckle-body, A, provided with the slotted web *e*, of the slotted wedge B, and the buckle-tongue C, having the shank *j* inserted in the slots of the said wedge and web, substantially as shown and described.

2. The combination, with the buckle-body A, having its end curved in opposite directions and provided with the slotted web *e*, substantially as described, of the slotted wedge B, provided with a stud, *i*, and the buckle-tongue C, having the shank *j*, and furnished with the shoulder *l* and nut *k*, substantially as shown and described.

398,029. RAILWAY-CAR. WILLIAM L. COVEL, Micol, Miss. Filed Sept. 17, 1888. Serial No. 285,662. (No model.)



Claim.—1. A car or locomotive having at its end a three-sided platform made at its base or side next the car-body of the full width of such body, having one side formed in line with the side of such body, and its other side or edge inclined to the direction of motion and extended from side to side the full width of the car, substantially as set forth.

2. A car having a triangular platform and provided at the wide side thereof with steps adjustably connected with such platform, whereby they may be turned down for use as steps or up to serve as a guard-rail for the platform, substantially as set forth.

3. A car-platform combined with steps hinged to the side thereof, whereby they may be turned up or down at will, a spring engaging said steps and adapted to assist in elevating the same, and a fastening whereby the steps may be secured in elevated position, substantially as set forth.

4. A car having its end platform and the roof overhanging the same formed with surfaces or bearings at an angle inclined to the direction of motion, substantially as set forth.

5. The car having at its end a platform and an overhanging roof formed with angles inclined to the direction of motion, steps hinged to the wide side edge of the platform, whereby it may be turned up or down, the spring for assisting in elevating the steps, and a fastening for securing the steps elevated, all substantially as and for the purposes specified.

398,030. SAW-SHARPENING MACHINE. MILO COVEL, Chicago, Ill. Filed Oct. 18, 1888. Serial No. 288,454. (No model.)

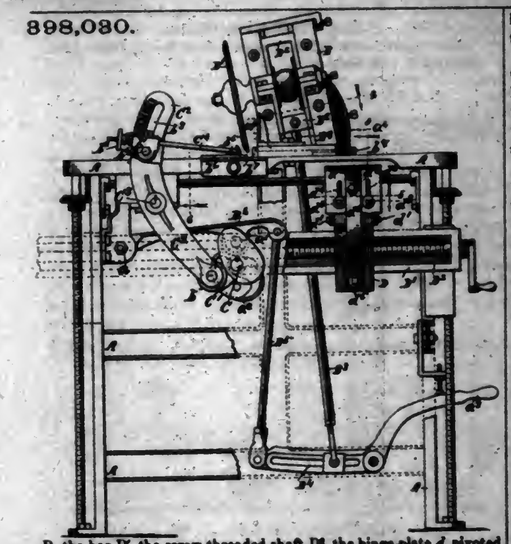
Claim.—1. In a saw-sharpening machine, the combination, with the supporting-frame, of the head-piece B, the bracket a^4, said head-piece being pivoted to said bracket at one side and provided in the other side with a segmental slot, and an adjusting-bolt passing through said slot, whereby said head-piece may be given a greater or less degree of inclination, substantially as and for the purpose set forth.

2. In a saw-sharpening machine, the combination, with the cam C, rigidly mounted on the driving-shaft, of a curved feed-arm having a roller journaled in the lower end, which has frictional contact with said cam, and provided in the upper end with an elongated slot, a feed-finger secured to said arm and adjustable in said slot, a rock-shaft upon which said feed-arm is rigidly mounted, and a spring coiled on said rock-shaft, whereby the lower end of said feed-arm is normally held in contact with the cam C and the feed-finger brought into engagement with the teeth of the saw in regular order of succession, substantially as and for the purpose set forth.

3. In a saw-sharpening machine, the combination, with a feed-finger, of the bracket a^4, the adjustable stop b^3, and the adjusting-bolt b^2, having a screw-threaded engagement with said stop, substantially as and for the purpose set forth.

4. In a saw-sharpening machine, the combination of the bracket

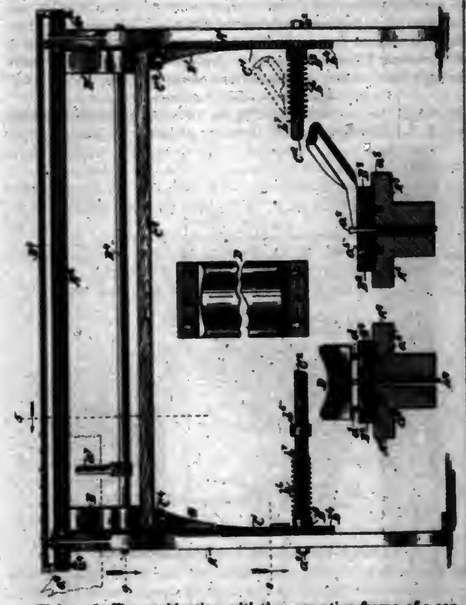
398,030.



D, the bar D', the screw-threaded shaft D^2, the hinge-plate *d*, pivoted at its lower end to said bracket, the clamping-plate d^3, provided with elongated slots and adjustably secured to said hinge-plate, and the spring d^5, substantially as and for the purpose set forth.

5. In a saw-sharpening machine, the combination, with the bracket D, of the cam locking-lever D^3, pivoted to said bracket, the back plate, d^6, and the spring *g*, whereby the saw is locked against a back movement only, substantially as set forth.

398,031. DEVICE FOR HOLDING AND DRESSING SAWS. MILO COVEL, Chicago, Ill. Filed Oct. 18, 1888. Serial No. 288,455. (No model.)



Claim.—1. The combination, with the supporting-frame, of a cap-plate rigidly mounted on one side of the frame, the vertical levers pivoted at their lower ends to said frame, a cam-shaft journaled in both said levers and frame, a second cap-plate rigidly mounted on the upper ends of said levers, and the clamping-bars mounted on the top of the respective cap-plates, whereby the movement of the cam-shaft throws the clamp into or out of a clamping position, substantially as and for the purpose set forth.

2. In a device of the character described, the combination, with the cap-plates and the clamping-bars, of the bolts a^4, whereby said bars may be sprung or forced upward at the ends, substantially as and for the purpose set forth.

3. In a device of the character described, the combination, with the supporting-frame, of the rack-bars notched in the upper end and having a vertical movement, a rock-shaft journaled in the frame, and the pinions mounted on the rock-shaft and engaging with the lower toothed end of said rack-bars, substantially as and for the purpose set forth.

4. The combination, with the rack-bars and the rock-shaft, of the pinions mounted on the latter, and the springs coiled on the respective ends of said shaft, whereby the rack-bars are automatically forced upward when the hand clamping-screws are relaxed, substantially as and for the purpose set forth.

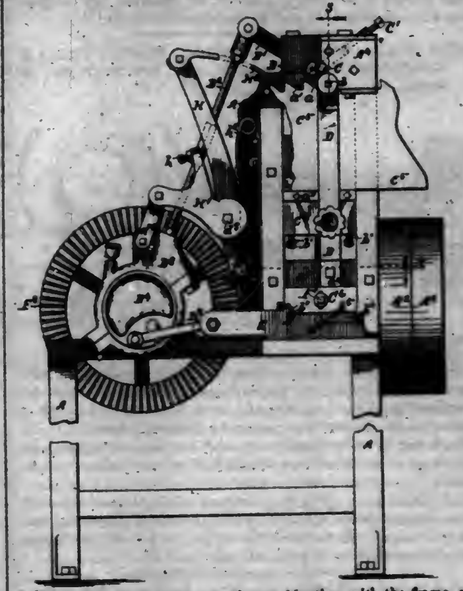
5. The combination, with the frame having openings b^3 in the upper part, of the rack-bars, and provided on their upper ends with guide-lugs which fit into said openings, the guide-brackets b^4 b^5, and the hand-screws C^4, substantially as and for the purpose set forth.

6. Jointly with the clamping device herein shown and described, the supplementary hand-gage tool consisting of the plate D, provided in each corner with an adjustable screw-bolt, *d*, substantially as and for the purpose set forth.

7. Jointly with the clamping device herein shown and described, the supplementary hand-tool consisting of the plate D', grooved in the under side and provided with ledges d^1, and the screws d^4 for clamping the file in place, substantially as and for the purpose set forth.

8. Jointly with the clamping device herein shown and described, the supplementary hand-tool D^2, designed to hold a three-cornered file and consisting of the side plate, d^6, the top plate, d^7, grooved to receive one corner of the file, and the bottom or clamping plate, d^8, and screws for adjustably securing said plate, whereby a three-cornered file may be held to bring the cutting-face against the side of the saw-teeth at an oblique angle, as set forth.

398,032. SAW-SWAGING MACHINE. MILO COVEL, Chicago, Ill. Filed Oct. 18, 1888. Serial No. 288,456. (No model.)



Claim.—1. In a saw-swage, the combination, with the frame, of the head-block, the rocking or rolling die inserted in said head-block, the link connected at the inner end to said die, the connecting-rod pivoted to the outer end of said link, the eccentric-strap, in which the lower end of the connecting-rod is inserted, the cam or crank wheel, and the counter-shaft upon which the same is mounted, whereby the required motion is transmitted to the roller-die, substantially as and for the purpose set forth.

2. In a saw-swage, the combination, with the frame, of the head-block supported thereon, the rocking or roller die inserted horizontally in said head-block and provided with a recess in the line of the saw, the adjustable die-point seated in said recess, the stationary die passing diagonally through said head-block, and the screw-bolt having a threaded engagement with the rear end of said stationary die, whereby the same may be adjusted with reference to the roller-die, and the die-point inserted therein, substantially as and for the purpose set forth.

3. In a saw-swage, the combination, with the frame, of the vertical guides bolted thereto, a cross-head moving between said guides and provided with a seat-rest for a saw, the saw-clamping bars secured to and moving with the cross-head, a cross-bar having beveled shoulders on the under side, as described, and arranged between said guides below the cross-head, the plate c^4, bolted to the cross-bar, the slide-bar E engaging with the under side of the cross-bar and having beveled shoulders, the connecting-rod D^3, the crank-wheel B^4, and the counter-shaft upon which the same is mounted, whereby a vertical movement is transmitted to the cross-head and the saw raised to bring the teeth in position to be operated upon by the swaging-dies once in each revolution of the crank-wheel, substantially as set forth.

4. In a saw-swage, the combination, with the head-block, of the saw-clamping bars having beveled upper ends, the spring-jaws rigidly secured at one end, the opposite beveled ends bearing loosely against the outer beveled surfaces of the clamping-bars, and the adjusting-screws inserted through the head-block and having contact with said jaws, substantially as and for the purpose set forth.

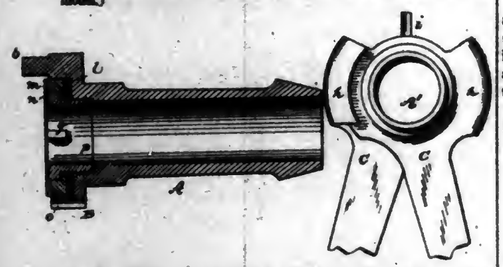
5. In a saw-swage, the combination, with the cross-head C^3 and the cross-bar C^3, of the adjusting screw-bolts b' b', inserted in the under side of said cross-head and adapted to rest on the upwardly-projecting flange a^3, forming a part of said cross-bar, substantially as and for the purpose set forth.

6. In a saw-swage, the combination, with the frame, of the cross-head, the cross-bar C^3, the vertical screw-shaft F, the pinion-wheel d, the horizontal shaft F', and the pinion d', whereby the saw may be raised by hand for the purpose of securing the proper adjustment of the same relative to the swaging-dies, substantially as and for the purpose set forth.

7. In a saw-swage, the combination of the feed-lever H, the bell-crank lever H', the eccentric-strap B^2, the link a^3, and the feed-finger H^2, whereby the saw-teeth are automatically presented to the swaging-dies in regular order of succession, substantially as set forth.

8. In a saw-swage, the combination of the feed-lever, the feed-finger pivoted to the upper end thereof, the bell-crank, and the gage-bolts h h', substantially as and for the purpose set forth.

398,033. PIPE-COUPLING FOR CAR-BRAKES. WILLIAM M. DARROW, Salem, N. Y. Filed May 21, 1888. Serial No. 274,584. (No model.)



Claim.—1. In a pipe-coupling for cars, the combination, with the sleeves A A', provided with the flanges B, having studs b, notches c, and seat m, of the removable cam-levers C, each provided with an aperture, a beveled ear, g, and inclined and inwardly-turned lip h, the said ear and lip being opposite each other and adapted to engage the lip and ear of the other lever, substantially as herein shown and described.

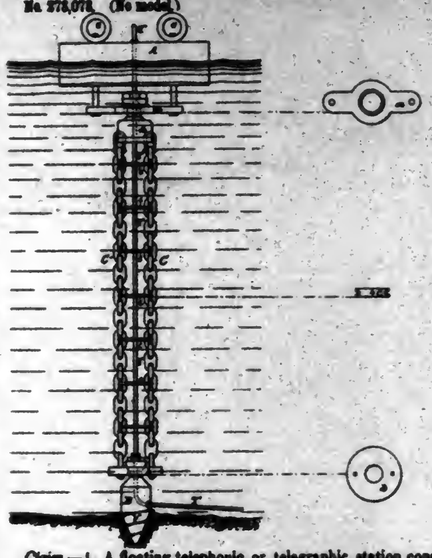
2. In a pipe-coupling, the combination, with a sleeve internally screw-threaded at one end, of the packing l, the seat m, provided with the rabbet n, and the threaded thimble p, provided with the flanged end o, substantially as herein shown and described.

398,034. OX-SHOE. JOHN DEBBLE, Southington, Conn., assignor to the Scranton Forging Company, Scranton, Pa. Filed Sept. 27, 1888. Serial No. 286,515. (No model.)



Claim.—As a new article of manufacture, the herein-described ox-shoe, having at the junction of the toe and body portions on the inside the web 7, and the shoulder 5 a short distance from the edge of said web, while the other parts of the shoe are of ordinary form, substantially as described, and for the purpose specified.

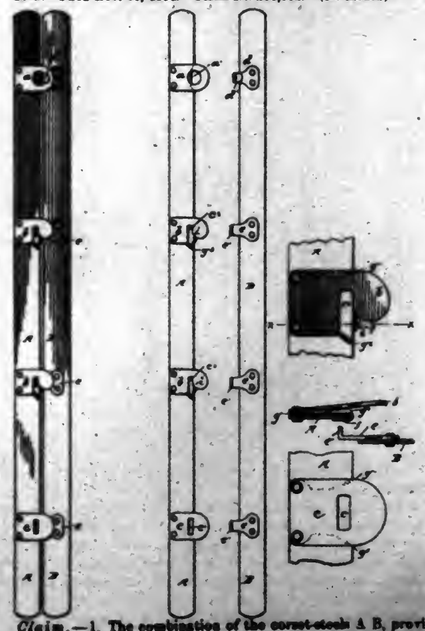
398,035. FLOATING TELEGRAPH-STATION. URBAIN DIEULOUARD, Tréguier, Côtes-du-Nord, France. Filed June 25, 1888. Serial No. 278,078. (No model.)



Claim.—1. A floating telephonic or telegraphic station consisting of a buoy and anchoring-shoe, chains connecting the anchoring-shoe and buoy, distance-pieces connecting the chains with each other at intervals, and a cable passing down through the center of the buoy, the distance-pieces and the anchoring-shoe forming the axis about which these parts may turn without danger of entanglement, substantially as herein described.

2. A floating telephonic or telegraphic station consisting of a buoy, an anchoring-shoe, and a chain having connecting-disks a and b, and universal joints between the buoy and disk a and between the anchoring-shoe and disk b, to enable the parts to turn and oscillate freely in all directions without entangling or fouling the cable T, which passes through their centers, substantially as herein set forth.

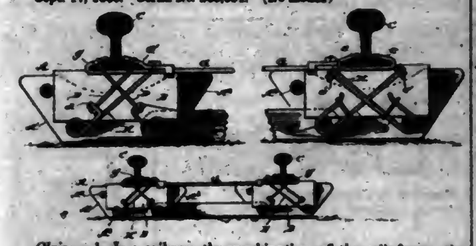
398,036. CORSET-FASTENING. WILLIAM M. DUCKER, New York, N. Y. Filed Nov. 16, 1888. Serial No. 290,992. (No model.)



Claim.—1. The combination of the corset-steels A B, provided with the eye a and hook d catch, at one extremity, and the closed slot c and engaging-piece e catch, at the other extremity, and having between such catches one or more catches consisting of an engaging part, e, and spring-piece b, having an open slot, c^3, a rounded cut-away part, i, a guide-plate, g, with turned-under part f, shoulder g', and downwardly-flaring shoulder g^3, adapted to permit the engaging part e to be withdrawn by a downward and outward movement, substantially as described and shown.

2. The corset-fastening described, consisting of the spring catch-piece b, provided with the open slot c^3, and having a rounded edge, i, a supporting guide-piece, g, provided with a turned-under portion, f, the upturned supporting part g', and outturned supporting part g^3, flaring away from the rounded edge i, in combination with the engaging part e and catch d, adapted to enter between the guide-piece g and spring-piece b, to engage in the slot c^3, and to be disengaged by being drawn downward and outward, substantially as described as shown.

398,037. RAILWAY. ROBERT P. FARISH, SCIOTO, M. MEX. Filed Sept. 17, 1888. Serial No. 285,651. (No model.)



Claim.—1. In a railway, the combination of the crib-frame, the rail seat or seats therein, the rails on said seats, and the anchor-rods passed through openings in and secured to the base of the rail at the opposite sides of the latter, and extended thence and secured to the lower portion of the crib-frame, substantially as set forth.

2. In a railway, the combination of the rail, the crib-frame having lower or base connecting-rods, and the anchor-rods connected at one end with the rail at the opposite sides thereof, and extended thence and connected with the base-rods, substantially as set forth.

3. In a railway, the combination, with the crib-frame and the rails, of the connecting-rods connected with the rail at the opposite sides of same and extended diagonally downward and inward, substantially as and for the purposes set forth.

4. In a railway, the combination of the crib-frame having base connecting-rods A^3 and the rail seat or seats in said frame, the rail and the anchor-rods extended diagonally between and connected with the base connecting-rods and the rail, substantially as set forth.

5. In a railway, the combination of the crib-frame, the rail seat or seats, the cross-bar G, having hook g, the plate G', and the rod H, all constructed and arranged substantially as and for the purposes specified.

398,038. MACHINE FOR FINISHING DECORATIVE NAILS. HENRY P. PERIN, Waterbury, Conn., assignor to the American Ring Company, same place. Filed Aug. 4, 1888. Serial No. 281,927. (No model.)



Claim.—1. The combination, with the gate B and block C, of a slotted frame, c, a pivoted guide-plate, b, a spring, b', and a finger for raising the plate b, substantially as and for the purposes set forth.

2. The combination, in a machine for forming decorative nails, with the head-block E, of the slotted plate 7, the die N, connected therewith, and bolts 8, for securing said plate 7 adjustably to the head-block E, substantially as set forth.

3. The combination, in a machine for forming decorative nails, with the head-block E, of the slotted plate 7, the die N, connected therewith, and bolts 8, for securing said plate 7 adjustably to the head-stock E, and a projecting finger, 9, secured to the slotted plate 7, substantially as set forth.

4. The combination, in a machine for forming decorative nails, with the reciprocating gate B and the block C, of the die N and matrix M, the slide-block f'' within the matrix M, the slide-rod f within the block C, and mechanism, substantially as specified, for imparting an endwise movement to the slide-block and slide-rod, whereby the blank cut by the die and matrix and struck up is pushed out of the matrix, substantially as set forth.

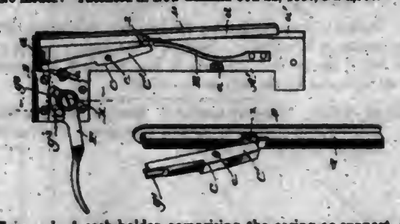
5. The combination, with the reciprocating gate B and dovetailed block C and the matrix M, of a vertical bar pivoted to the block C, a projecting finger for moving said vertical bar, and a block or rod moving through the block C and through the matrix M, whereby the blank is pushed out of the matrix M, substantially as set forth.

6. The combination, with the reciprocating gate B and dovetailed block C and the matrix M, of a vertical bar pivoted to the block C, a projecting finger for moving said vertical bar, and a block or rod moving through the block C and through the matrix M, whereby the blank is pushed out of the matrix M, and a pivoted plate adapted to set across the opening in the matrix M, so that when the blank is pushed out of said matrix said plate insures its vertical fall, substantially as set forth.

7. The combination, with the reciprocated gate B and the dovetailed block C and the matrix M, of the stud c on the back of the block C, the vertical bar d, pivoted to the stud c, the spring c, the adjustable screw-bolt h, the projecting finger-bar i, the slide-rod f and slide-block f', and the pivoted guide-plate b, substantially as and for the purposes set forth.

8. The combination, with the reciprocated gate B and dovetailed block C and the matrices C and M, of the slotted frame c, pivoted guide-plate b and spring b', and the vertical guide-bars k, substantially as and for the purposes set forth.

398,039. SASH-HOLDER. HENRY A. PLATMAN and JAMES REED, Southbrook, New Zealand. Filed June 20, 1888. Serial No. 278,588. (No model.) Patented in New Zealand Oct. 22, 1887, No. 2,597.



Claim.—1. A sash-holder comprising the casing or support, the friction-piece, the lever pivoted to the casing and supporting the friction-piece on one of its ends, and the spring engaging the friction-piece, substantially as set forth.

2. The combination, in a sash-holder, with the casing and a lever pivoted thereto, of the friction-piece pivotally suspended at a point midway between its ends on the said lever, whereby said piece may fulcrum at one end against the casing, and the spring engaging said friction-piece, substantially as set forth.

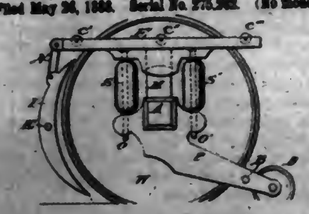
3. The combination, with the casing, of the friction-piece arranged to fulcrum at one end against said casing, a spring whereby to force the opposite end of said piece outward, and a retractor connected with said friction-piece between its ends, whereby it may be drawn in opposition to the action of its spring, substantially as set forth.

4. In a sash-holder, the combination of the casing having side plates, the friction-piece having on its inner side a narrow rib fitting between the said side plates, a spring engaging said friction-piece, and a retractor connected therewith, substantially as set forth.

5. A sash-holder comprising the casing formed with inner and outer side plates, and having the outer edge of the outer plate extended, forming a guard, and having the top or crown plate fitted on said side plates, the friction-piece, the spring engaging the same, and the retractor, substantially as set forth.

6. The combination, in a sash-holder, of the casing, the friction-piece, the spring engaging said piece, the lever C, connected at its lower end with the friction-piece, the handle-lever, and the rod connecting said handle-lever with the lever C, all substantially as and for the purposes specified.

398,040. STREET-CAR TRUCK. JOHN D. GRACE, New Orleans, La. Filed May 24, 1888. Serial No. 275,262. (No model.)



Claim.—1. In combination with an axle-box, the inwardly-curved shaft P, provided with the seats for the springs S S', and jointed at J, substantially as described herein.

2. In combination with an axle-box, the inwardly-curved shaft P, provided with the seats for the springs S S', substantially as and for the purpose set forth.

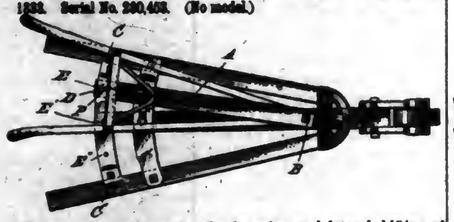
3. In combination with an axle-box, the straight and rigid shaft P, provided with the seats for the springs S S', and with wheel D, all substantially as described.

4. In combination with an axle-box, the straight shaft P, provided with the seats for the springs S S', and with wheel D, and said shaft jointed at J, substantially as described.

5. The frame herein described, consisting of the ends F F', containing rollers or blocks d' d'', and forming also a support for brake-blocks I, substantially as described.

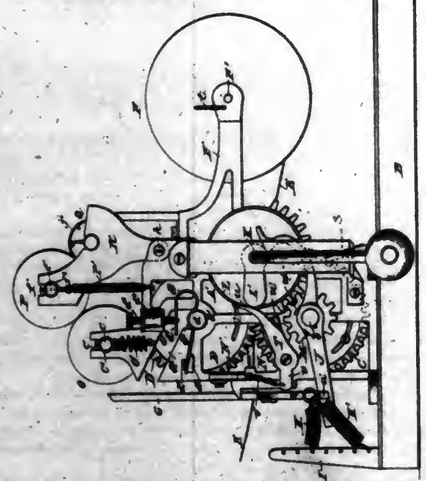
6. The bar M, in combination with the shaft P, substantially as and for the purpose set forth.

398,041. CULTIVATOR. FRED R. GRISWOLD, Naples, N. Y., assignor of one-half to Lucien R. Munsell, same place. Filed July 19, 1888. Serial No. 280,463. (No model.)



Claim.—An appliance for the fastening and lateral shifting of the handles of a cultivator, consisting of the piece or handle-beam A, the bolt B, the arc C C', the plate D, and the pin P, all substantially as set forth, and for the purposes specified.

398,042. PRINTING-MACHINE. HENRY H. HARRISON, New York, N. Y., assignor to Aaron R. Harrison, same place. Filed Jan. 20, 1888. Serial No. 261,349. (No model.)

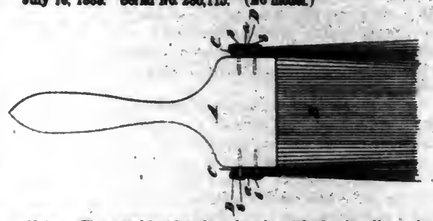


Claim.—1. In a printing-machine, the standards A A', having the open bearings d' and diagonal slots d^3, reaching to the same, in combination with the type-roller D, lower roller, C, gudgeons d, springs d^2, pivoted to the standards and arranged to rest upon the gudgeons d, and the screws d^3, held in studs attached to the standards and adapted to hold the springs d^2, substantially as described.

2. In a printing-machine, the standards A A', formed with a rearwardly-projecting arm having sleeve F^4, containing rod F^5, spring F^6, and small rod F^8, attached to the rod F^5 and reaching to the outside of the machine, in combination with the disk g', placed upon the rod F^8, and the cord F^9, recessed at g, and the stud s, secured to the arm of the opposite standard A, substantially as described.

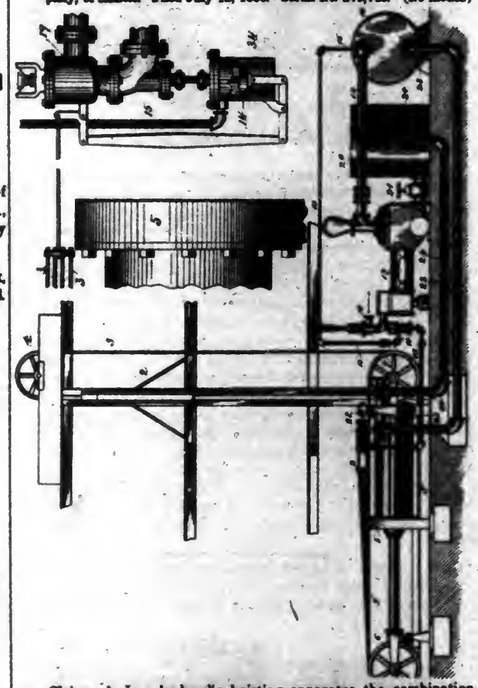
3. In a printing-machine, the lower roller, C, and gudgeon b thereof, in combination with the pinion M, placed on said gudgeon, the projection w^2, formed on said pinion, the pawl T, formed with the arm w and toe w', the wheel L, cam L', and the crank K, substantially as and for the purposes set forth.

398,043. BRUSH. HARVEY W. HASEY, New York, N. Y. Filed July 16, 1888. Serial No. 280,115. (No model.)



Claim.—The combination, in a brush, with the handle or head and the bristles attached thereto, of a cap, disk, or filler, against which the bristles abut, surrounding the handle or head, and having a multiplicity of recesses in its under face for receiving the butts of a part of said bristles, substantially as specified, and for the purpose set forth.

398,044. VARIABLE-PRESSURE HYDRAULIC ELEVATOR. THADDEUS W. HERRMANN, Chicago, Ill., assignor to the Crane Elevator Company, of Illinois. Filed July 12, 1888. Serial No. 279,740. (No model.)

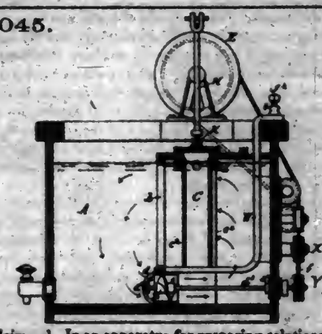


Claim.—1. In a hydraulic hoisting apparatus, the combination of a tank or reservoir for containing the water-supply, a steam-pump pumping therefrom direct to the main cylinder, a valve controlling said pump, a piston exposed on one side to the pressure from the main cylinder and on the other to pressure produced by tension of the lifting-cables, said piston being so connected to said valve that the pressure from the main cylinder tends to close and the pressure produced by the lifting-cables tends to open said valve, and a valve controlled by the operator and adapted to admit water to the main cylinder from the pump or to permit the water to escape from the main cylinder to said tank, substantially as described.

2. The combination, with a control-valve, as 19, operated by a piston, 14, exposed on one side to pressure from the main cylinder and on the other side to pressure produced by the tension of the lifting-cables, of a regulating-spring, 28, and a piston, 27, the pressure of said spring being opposed by fluid-pressure from the main cylinder, as and for the purpose set forth.

398,045. APPARATUS FOR BLEACHING BY ELECTROLYSIS. EUGÈNE HERMITE, EDWARD J. PATTERSON, and CHARLES F. COOPER, London, England. Filed Oct. 26, 1887. Serial No. 253,474. (No model.) Patented in England Nov. 12, 1886, No. 14,673; in France Dec. 15, 1886, No. 180,201; in Belgium Mar. 3, 1887, No. 76,560, and in Spain May 5, 1887, No. 10,747.

398,045.



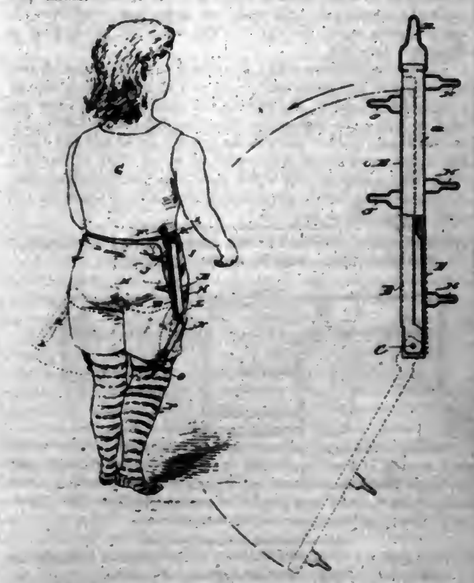
Claim.—1. In an apparatus for preparing solutions for bleaching by electrolysis, the combination of a vessel or tank with a partition dividing it into two compartments, a group of electrodes on one side of the partition, and a propeller to maintain a circulation from one compartment to the other and through the group of electrodes.

2. The tank and its partition having a tubular opening at its lower end and the two compartments communicating at the upper part of the partition, in combination with a propeller in said tubular opening and electrodes on one side of the partition, all substantially as described.

3. The combination of the plate K, carrying one set of electrodes, with a plate, *m*, carrying the other set of electrodes, and through which the electrodes of the plate K pass, and the insulating material between the plates, substantially as described.

4. A bleaching apparatus comprising an electrolyzing vessel or tank containing electrodes with scrapers to remove the deposits from the negative electrodes, a bleaching-compartment, and means to circulate the liquid and freed deposits to the bleaching-point and to return the solution to the electrodes, as and for the purpose set forth.

398,046. GARMENT FASTENER AND SUPPORT. CHARLES B. HOLLIS, Pittsfield, Mass. Filed Nov. 10, 1883. Serial No. 290,495. (No model.)



Claim.—1. In a garment-fastener, two levers pivoted together at their lower ends, the forward lever having a suspension device at its upper end, and both levers having fastenings or attaching devices whereby they may be secured on the drawers along the edges of the side openings thereof, and means for holding the levers in their closed positions, substantially as set forth.

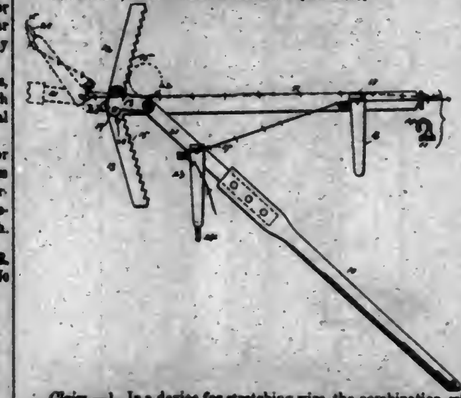
2. A combined garment-fastener and stocking-support consisting in two levers pivoted together at their lower ends and there provided with a depending stocking-support, a suspension device at the upper end of the forward lever, a spring holding the levers in their closed position, and means for securing the front and rear levers to the drawers along the front and rear edges, respectively, of their side openings, substantially as set forth.

3. A garment fastener and supporter comprising a jointed pair of levers carrying a spring and adapted to be supported from the waist, and loops extending from the backs of the said levers on opposite sides and adapted to be fastened to the front part and seat of the drawers, substantially as shown and described.

4. A garment fastener and supporter comprising a jointed pair of levers carrying a spring, a loop held on the upper end of one of the said levers to support the device from the waist, and loops extending from the backs of the said levers on opposite sides and adapted to be secured to the front part and seat of the drawers, substantially as shown and described.

5. A garment fastener and supporter comprising a jointed pair of levers carrying a spring, a loop held on the upper end of one of the said levers to support the device from the waist, and loops extending from the backs of the said levers on opposite sides and adapted to be secured to the front part and seat of the drawers, and an elastic band held on the lower end of one of the levers and carrying at each end a loop adapted to be fastened to the stocking, substantially as shown and described.

398,047. WIRE-STRETCHER. GEORGE R. HUGHES, Savoy, Tex. Filed Oct. 1, 1888. Serial No. 286,906. (No model.)



Claim.—1. In a device for stretching wire, the combination, with an essentially T-shaped body having the members of the head inclined in direction of the straight member and provided with a series of teeth, of a lever pivoted to the straight member of the body contiguous to the head and clamping-jaws pivoted upon the said lever, substantially as shown and described.

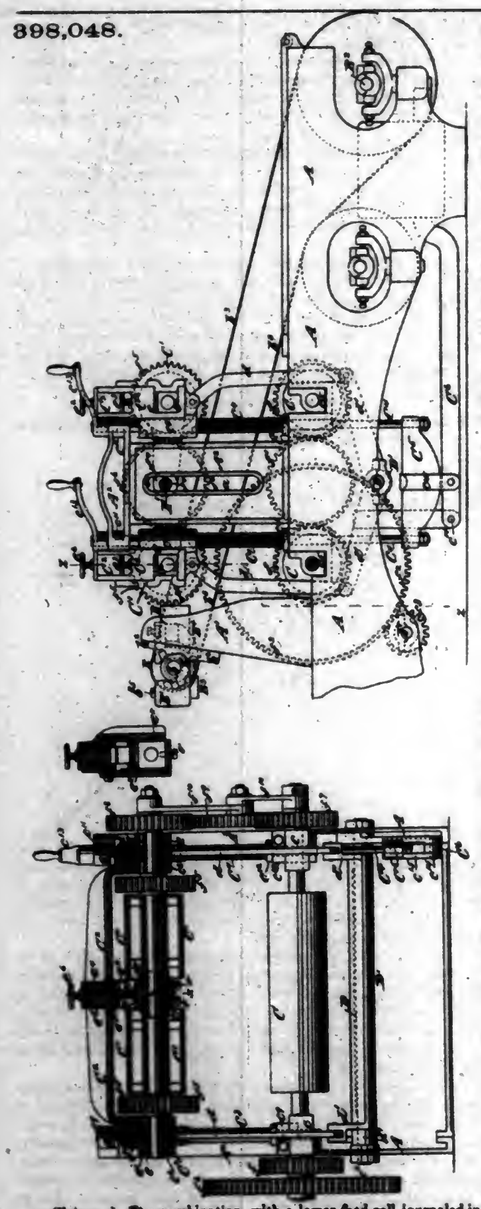
2. In a device for stretching wire, the combination, with an essentially T-shaped body having the members of the head inclined in direction of the straight member and provided with a series of teeth, and a hook formed at the extremity of the straight member, of a lever pivoted to the straight member of the body contiguous to the head and clamping-jaws pivoted upon the said lever, substantially as shown and described.

3. In a device for stretching wire, the combination, with an essentially T-shaped body having the members of the head inclined in direction of the straight member and toothed upon the inner edge, and the said straight member provided with a hook at the extremity, of a short lever having clamping-jaws pivoted upon the straight member of the body near the hook, a long lever also pivoted to the straight member of the body contiguous to the head, and a second short lever provided with a clamping-jaw at one extremity and a hook at the other pivoted upon the said long lever, all combined to operate substantially as shown and described.

4. In a device for stretching wire, the combination, with an essentially T-shaped body having the members of the head toothed upon the inner edge and inclined in direction of the extremity of the straight member, and provided near the straight member with an aperture, and having a hook integral with the extremity of said straight member, of a short lever pivoted to the body contiguous to the hook and provided with clamping-jaws, a plate adjustably attached to the body, a long lever pivoted to the straight member of the body by the same pivot as the adjustable plate, and a second short lever provided with clamping-jaws at one end pivoted upon the said long lever, all arranged to operate substantially as shown and described.

398,048. WOOD-PLANING MACHINE. ALFRED B. HUTCHINSON and HENRY F. ANTHONISEN, Brooklyn, N. Y., assignor to the Glen Cove Machine Company, (Limited,) same place. Filed Jan. 30, 1888. Serial No. 262,206. (No model.)

398,048.



Claim.—1. The combination, with a lower feed-roll, journaled in stationary bearings, of an upper roll composed of two sections arranged end for end, an upper roll-frame in which both sections of the upper rolls are journaled at each of their ends, said frame comprising sockets at the ends thereof and made integral therewith, one of said sockets forming a nut, two vertical rods, one at each side of the machine, and one of which is a screw engaging said nut, a crank for rotating said screw so as to bodily raise and lower the roll-frame and the upper roll-sections journaled therein, journal-boxes for the upper roll-sections supported wholly in said frame and capable of a limited vertical movement therein, said journal-boxes being acted upon by springs to press them downwardly in the frame, substantially as specified.

2. The combination, with the lower roll, C, and the upper roll-section, C', of the upper roll-frame, C^2, the boxes for the roll-sections having a limited vertical movement in said frame, the springs c^4, whereby the outer boxes are held down, and the springs c^5, and a saddle whereby the two inner boxes are held down, substantially as herein described.

3. The combination, with two pairs of upper and lower rolls, the lower rolls being journaled in stationary bearings, and the upper rolls being each composed of two sections, of an upper roll-frame for the sections of each roll, and boxes for the roll-sections having a limited vertical movement in said frame, a shaft intermediate between the upper rolls and geared with the two sections of each upper roll, and journaled in bearings projecting from one of the roll-frames, gearing connecting the lower rolls of the two pairs, and expansion-gearing connecting one of said lower rolls with the said intermediate shaft, substantially as herein described.

4. The combination, with the lower feed-roll journaled in stationary bearings, of an upper feed-roll composed of two sections arranged end for end, an upper feed-roll frame in which both sections of the upper roll are journaled at each of their ends, said frame comprising sockets c^6, made integral therewith and at the ends thereof, one of said sockets forming a nut, two vertical rods, one upon each side of the machine, extending through said sockets, one of said rods being a screw and engaging a screw-thread in its coacting socket, a crank whereby said screw-rod may be moved up and down in order to bodily raise and lower the frame and the upper feed-roll section, a rock-shaft having arms connected by rods with the ends of said upper roll-frame, a weight applied to said rods, and boxes for the upper roll-section having a limited vertical movement in said frame, and which are acted upon by springs to press them down in the frame, substantially as specified.

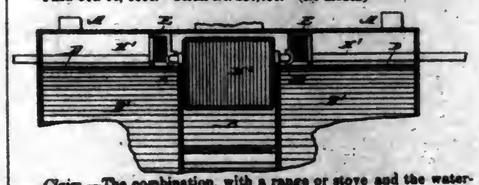
398,049. PRINTER'S BRUSH. JOSEPH C. ISRAEL, New York, N. Y. Filed July 9, 1888. Serial No. 278,406. (No model.)



Claim.—1. The combination, with a brush, of a liquid-receptacle secured to the back thereof and formed with an opening in its bottom, a valve-plate secured to one end of a fulcrumed operating-rod and arranged to close said opening, a spring at the opposite end of said rod, and a capped tube held to the said spring and to the valve-rod and projecting above the cover of the receptacle, substantially as shown and described.

2. The combination, with a brush, of a liquid-receptacle secured to the back of said brush and formed with an opening in its bottom, a valve-plate located at said opening and provided with a softer material, as cork, on its under side, a fulcrumed operating-rod secured at one end to said plate, a spring at the opposite end of said rod, a tube held to the upper end of said spring and to the valve-rod, and provided with a washer or collar of soft material, as cork, below the cover of the receptacle, and a screw-cap on the said tube above the said cover, substantially as described.

398,050. STOVE OR RANGE. HENRY E. JAMES, New York, N. Y. Filed Oct. 10, 1888. Serial No. 287,799. (No model.)



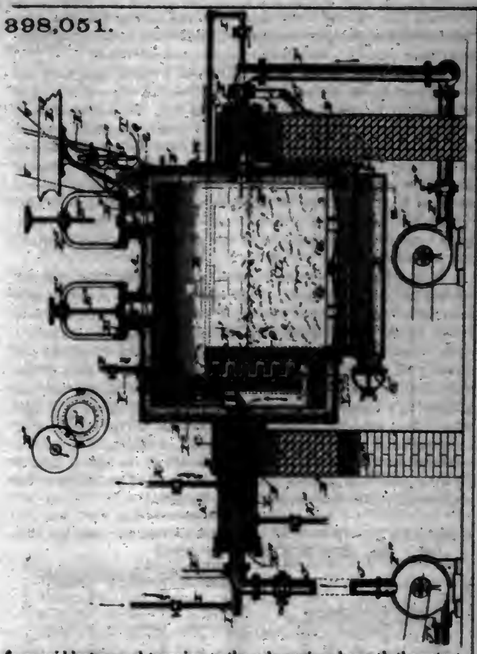
Claim.—The combination, with a range or stove and the water-back thereof, of a grating located at each side of the grate between the upper oven-plate and the top of the stove, and provided with a concavity in the rear edge adapted to embrace the pipes of the water-back, substantially as shown and described.

398,051. GAS-GENERATOR. JOSEPH JORDAN, Bridgeport, Pa. Filed Nov. 14, 1888. Serial No. 290,781. (No model.)

Claim.—1. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, an air-entrance pipe opening into one of said trunnions, a branch air-pipe leading from said last-named trunnion to the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the hollow trunnion, an automatic rocking mechanism consisting of a shaft provided with a worm, fast and loose pulleys on said shaft, and a belt-shifter and pivoted bars, and a rack with which the worm engages, all operating substantially as described.

2. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, an air-entrance pipe opening into one of said trunnions, a branch air-pipe leading

398,051.



from said last-named trunnion to the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, an automatic rocking mechanism consisting of a rack provided with adjustable lugs, a shaft having a worm mounted upon it, pivoted bars and belt-shifter, and fast and loose pulleys mounted on said shaft, substantially as described.

3. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, whereby it is adapted to be rocked, an air-entrance pipe opening into one of said trunnions, a branch air-pipe leading from said trunnion to the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, and an ash-receiver with its grate-bars set beneath and attached to said retort, whereby the ash-receiver moves with it, substantially as described.

4. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, whereby it is adapted to be rocked, air-entrance pipe opening into one of said trunnions, a branch air-pipe leading from said last-named trunnion to the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, a steam-pipe entering through one of the trunnions to inject steam into the retort, and an ash-receiver and grate-bars set beneath and attached to said retort, whereby the ash-receiver moves with it, substantially as described.

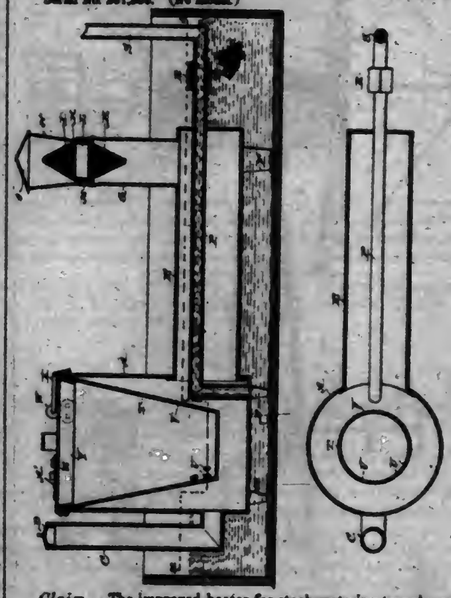
5. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, whereby it is adapted to be rocked, an air-entrance pipe opening into one of said trunnions and passing to the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, an ash-receiver with its grate-bars set beneath said retort and attached to it, a tortuous fixing-chamber set within the shell of the retort, and an oil-injection pipe, substantially as described.

6. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, whereby it is adapted to be rocked, an air-entrance pipe opening into one of said trunnions and connected with the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, an ash-receiver with its grate-bars set beneath and attached to said retort, a steam pipe entering through the exit-trunnion of the retort into the interior of the latter, whereby the steam is superheated, said pipe thence passing out of the retort, leading around into the entrance-trunnion of the retort to inject steam into the latter, that portion of said pipe which is within the retort being protected by a wall from direct contact with the fuel, substantially as described.

7. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, whereby it is adapted to be rocked, an air-entrance pipe opening into one of said trunnions and connected with the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, an ash-receiver provided with grate-bars set beneath said retort and attached to it, a steam-pipe entering through the exit-trunnion of the retort into the interior of the latter, where it is formed into a coil, whereby the steam is superheated, said pipe thence passing out of the retort around to and into the entrance-trunnion of the retort to inject steam into the interior of the latter, that portion of said pipe which is in the retort being protected by a wall from direct contact with the fuel, substantially as described.

8. A gas-generator consisting of a horizontal fire-brick-lined retort provided with hollow trunnions set in bearings, whereby it is adapted to be rocked, an air-entrance pipe opening into one of said trunnions, a branch air-pipe leading from said trunnion to the ash-receiver beneath the retort, a gas-exit main or pipe inserted into the other hollow trunnion, which latter is elongated and provided with a water-chamber formed by a shell enveloping the trunnion and leaving a space between it and the said trunnion, the said space being supplied with water by a pipe, as shown, the water being carried off by another pipe, whereby the products of combustion are cooled, and an ash-receiver provided with grate-bars set beneath said retort and attached to it, whereby it moves with the retort, substantially as described.

398,052. HEATER FOR STOCK-WATERING TROUGHS. HENRY A. KEEP and JOHN KEEP, Greensborough Bend, Vt. Filed Mar. 31, 1888. Serial No. 267,960. (No model.)



Claim.—The improved heater for stock-watering troughs, consisting of the vertical cylindrical vessel A, the vertical flue C, and the horizontal flue E, communicating therewith at diametrically-opposite points near the bottom thereof, and the smoke-flue leading upward from the end of the flue E, the fire-box removably supported in the vessel A and having diametrically-opposite openings in its sides near its lower end, and adapted to be turned so as to bring said openings into or out of line with the flue E, and the pipe P, having one end extending through the bottom of the vessel A, thence extending vertically upward to near the fire-box, and thence horizontally through the flue E and projecting through the end of the same, as specified.

398,053. SECURING DIAMONDS IN CUTTING-TOOLS. HUGO KELLER, New York, N. Y., assignor to Henry A. Parr, same place. Filed Apr. 26, 1888. Serial No. 271,911. (No model.)

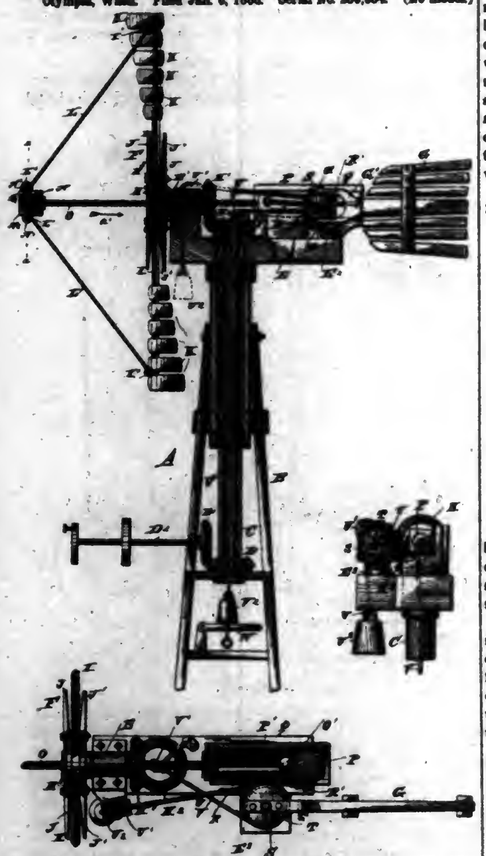


Claim.—1. That improvement in the art of setting diamonds in

cutting-tools which consists in longitudinally dividing the cutting-edge of the tool, forming registering recesses in the contiguous faces of the sections, inserting the diamonds in said recesses, and brazing the said contiguous faces, substantially as shown and described.

2. The method herein described of setting diamonds in cutting-tools, which consists in providing the body of the tool A at its cutting-edge with a longitudinal rectangular recess, B, and a clamping-plate, B', adapted to fit said recess, said clamping-plate B' and the vertical wall of the recess being provided with registering hemispherical recesses D, formed at a slight distance from the lower edge of the tool A, said recesses forming sockets to receive the stones, said stones being retained in said sockets by means of the clamping-plate B being detachably secured to the body of the tool, substantially as shown and described.

398,054. WINDMILL. FRANKLIN B. KENDALL, Tumwater, Wash., assignor to himself, George Gelbach, same place, and Royal S. Western, Olympia, Wash. Filed Jan. 6, 1888. Serial No. 259,854. (No model.)



Claim.—1. In a windmill, the combination, with a wind-wheel provided with spokes carrying blades, of rods connected with said spokes, a sliding rod connected with said rods, and a vane connected with said sliding rod, substantially as shown and described.

2. In a windmill, the combination, with inclined rods connected with the spokes of the wind-wheel, of a sliding rod connected with the said inclined rods and passing through the shaft of the wind-wheel, a drum connected by ropes with the said sliding rod, and a vane held on the said drum, substantially as shown and described.

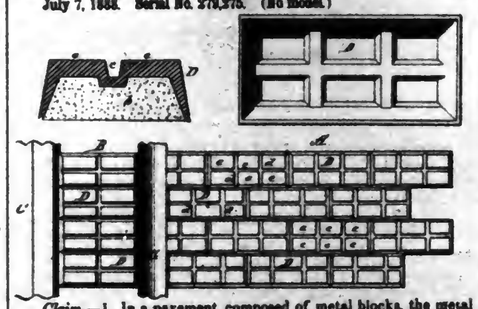
3. In a windmill, the combination, with a wind-wheel consisting of a hollow shaft supporting spokes carrying blades, of spokes having inclined faces and held in the front and rear of said wind-wheel spokes, rods secured to the outer ends of said wind-wheel spokes and extending in front of the wind-wheel in an inclined position, a block in which the inner ends of said rods are secured, and a rod carrying said block and passing through said hollow shaft, being connected with the tail-vane, substantially as shown and described.

4. In a windmill, the combination, with a sliding rod, of ropes connected with the said sliding rod, a drum on which said ropes are wound, a vane secured to the said drum and turning with the same, and a second set of ropes connected with said drum and carrying counterbalance-weights, substantially as shown and described.

5. In a windmill, the combination, with a hollow main shaft and a frame turning on the same, of a wind-wheel having a hollow shaft mounted on the said frame and connected with the said main shaft, rods connected with the upper ends of the spokes of said wind-wheel, a block in which the inner ends of said rods are fastened, a sliding rod carrying the said block and passing through the hollow shaft of the wind-wheel, a slide held on the inner end of said sliding rod and mounted in a suitable guide, ropes connected with the ends of said slide, a drum mounted on a vertical shaft and carrying the said ropes, and a counterbalanced vane held on said drum, substantially as shown and described.

6. In a windmill, the combination, with a hollow main shaft and a frame turning on the same, of a wind-wheel having a hollow shaft mounted on said frame and connected with said main shaft, rods connected with the upper ends of the spokes of the said wind-wheel, a block on which the inner ends of said rods are fastened, a sliding rod carrying the said block and passing through the hollow shaft of the wind-wheel, a slide held on the inner end of said sliding rod and mounted in a suitable guide, ropes connected with the ends of said slide, a drum mounted on the vertical shaft and carrying said ropes, a counterbalanced vane held on said drum, counterbalance-weights connected with said drum, and spokes secured to the hollow shaft of the wind-wheel and adapted to limit the bending of the spokes of the wind-wheel, substantially as shown and described.

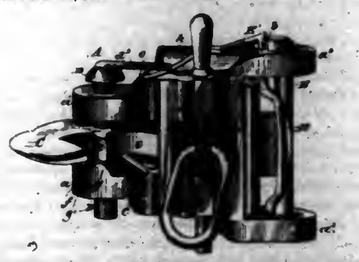
398,055. PAVEMENT. JOHANN B. KNOCHE, San José, Cal. Filed July 7, 1888. Serial No. 279,275. (No model.)



Claim.—1. In a pavement composed of metal blocks, the metal blocks D, of shell-like construction, open at their base but having closed checkered or grooved tops and tapering downwardly-diverging sides of diminishing thickness toward their bases, substantially as specified.

2. In a street or road having a carriage-way, A, gutter B, and sidewalk C, the carriage-way and gutter pavements each composed of metal shell-like blocks D, constructed as described, and metal flanged supports G, extending from the gutter-blocks up to the tops of the adjacent carriage-way blocks and arranged to bear against the sides of the latter and to brace them and the gutter-blocks, essentially as shown and described.

398,056. CAR-COUPLING. EPHRAIM H. B. KNOWLTON, Watertown, Dak., assignor of three-fourths to Arthur C. Mellette, John J. Owsley, Sr., and Otis E. Dewey, same place. Filed Feb. 2, 1888. Renewed Dec. 20, 1888. Serial No. 294,247. (No model.)



Claim.—1. The car-coupling having its draw-head provided with a recess in its one side and with a vertical bead or rib in its other side, and its coupling-hook provided with an arm standing in alignment with said recess, substantially as specified.

2. The car-coupling having its coupling-hook provided at its inner pivoted end with an arm struck by the opposite draw-head, and which hook is also provided with a stud arranged adjacently to said arm and adapted to be acted upon by the uncoupling contrivance, substantially as set forth.

3. In a car-coupling, the draw-head having the pivot-pin and the coupling-hook riding upward and laterally upon said pivot-pin and provided with a stud upon its under side and a stud at its inner end, one stud riding upon and resting in a recessed elevation of the draw-head, while the other stud is struck or acted upon by an uncoupling contrivance, substantially as set forth.

4. The car-coupling comprising the draw-head provided at one side with a coupling-hook having a stud intermediately of its beak and armed end, the opposite side of said draw-head having an uncoupling bail-shaped contrivance, substantially as set forth.

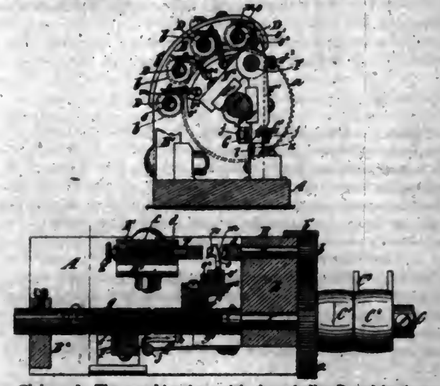
5. In a car-coupling, the draw-head having at its one side a recess, and at one side of said recess an elevation, and the coupling-hook having at its inner pivoted end an arm about at a right angle to its body and a stud upon its under side, substantially as set forth.

6. In a car-coupling, the draw-head having at its one side a recess, and at one side of said recess an elevation provided in its upper surface with a recess, and the coupling-hook locked to its pivot-pin and provided with a stud upon its under side and at its inner pivoted end with an arm about at a right angle to its body, and with a stud facing said arm, substantially as specified.

7. In a car-coupling, the draw-head having at its one side a recess and at one side of said recess an elevation provided in its upper surface with a recess, and a coupling-hook provided at its inner pivoted end with an arm and a stud, and also upon its under side with a stud, said draw-head having at its opposite side a coupling-pin and an uncoupling contrivance or cranked rod, substantially as specified.

398,057. MACHINE FOR WINDING SEWING-MACHINE BOBBINS, &c. WILLIAM R. LANEHAR, Brooklyn, N. Y., assignor to the Willimantic Linen Company, Willimantic, Conn. Filed Feb. 7, 1884. Serial No. 120,068. (No model.)

Brief.—The object of the invention is to produce a simple and compact machine for winding several bobbins at once.



Claim.—1. The combination, with the spindles D and back-centers E, arranged in the arc of a circle, of the spindle-driving shaft C, concentric with said arc and provided with right and left hand threads *g g'*, gearing for driving said spindles from said shaft, the traverse-rod F, with its arms F' F², and their nuts *f f'*, engaging with said threads on the said driving-shaft, and guides, one for each spindle, all carried by the single traverse-rod, substantially as herein described.

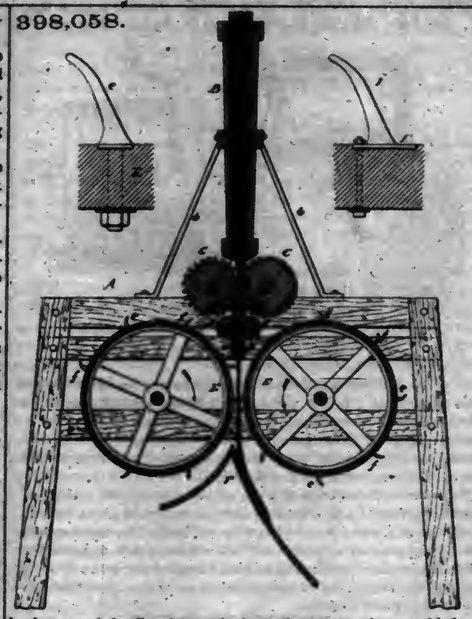
2. The combination, with the spindles and back-centers D E, arranged in the arc of a circle, of the concentric right and left hand threaded driving-shaft, the traverse-rod F, and its arms F' F², having nuts *f f'*, engaging each respectively with one of the threads of the driving-shaft, thread-guides, one for each spindle, all carried by the one traverse-rod, the projection *h*, having cam-surfaces *i i'*, and a tongue, *k*, all carried by one of the arms of the traverse-rod, the springs G G', and the stationary cam or abutment *l*, all substantially as herein described.

398,058. ROTARY BRAKE. PAUL LANGUAMMER, New Orleans, La. Filed Feb. 10, 1888. Serial No. 263,605. (No model.)

Claim.—1. In a machine for extracting fibers, the combination of a pair of rotary crushing-rolls, a pair of rotary holding-rolls, a pair of rapidly-revolving cylinders provided with rows of teeth having rounded-off points and alternating scraper bars or blades having rounded-off edges, and guide-boxes located between the crushing and holding rolls and between the latter and the scraping-cylinders, substantially as set forth.

2. In a machine for extracting fibers, the combination of a tapering feed box or hopper, a pair of rotary crushing-rolls, a pair of rotary holding-rolls, a pair of rotary cylinders having rows of teeth

398,058.



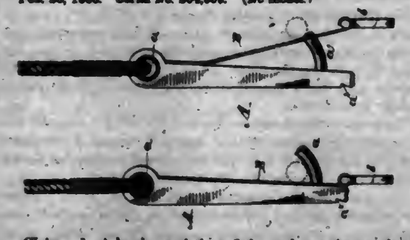
having rounded-off points and alternating scraper bars or blades having rounded-off edges, guide-boxes interposed between the feeding and holding rolls and between the latter and the cylinders, and an inclined conducting-plate for the fibers, substantially as set forth.

398,059. BRAKE-HOSE COUPLING. EDWIN A. LELAND, Brooklyn, N. Y., assignor to Leonard Richardson, same place. Filed Oct. 18, 1888. Serial No. 288,474. (No model.)



Claim.—In a brake-hose coupling, two separable and similar members, each having a semi-cylindrical exterior shell, 5, inclosing a cylindrical section, 6, having its open end part way between the extremity of said shell and a shoulder, 5ª, formed by removing the exterior to leave the half-shell, each member being also provided with a lug, 17, having a beveled end extending over the shoulder 5ª and a cam-surface, 18, plug-valves 12, opening and closing the air and steam passages in the parts, levers 15, mounted on the stems of said valves 12 and having weights 16 and cam projections 18ª, and chains or similar connections 21, uniting the free ends of said levers to the car-platforms, said chains being of such length as to draw taut as the cars separate before the hose-pipes are drawn straight, the whole being constructed and combined substantially as described.

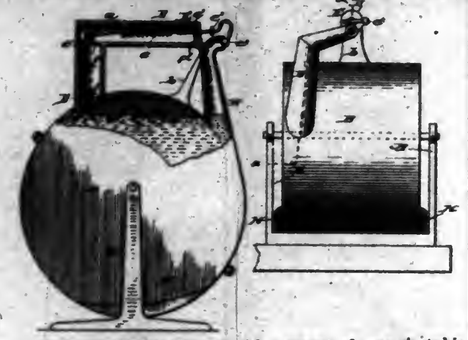
398,060. HOOK. ANDREW M. LEWELLEN, Rosendale, Mo. Filed Feb. 20, 1888. Serial No. 264,669. (No model.)



Claim.—1. A hook consisting of the main portion or shank, the projection forming the hook, and the spring attached to the shank extending beyond and embracing the projection, the said spring being arranged, substantially as described, to be in the rear of and bear upon any object to which the hook is attached.

2. A hook comprising a shank, a projection therefrom serving as a hook, and a spring arranged contiguous to the projection and provided with a loop attached to the free end of the spring, designed to engage the end of the shank, substantially as described

398,061. LIQUID-HOLDING VESSEL. STEWART R. MACK, Moulton, Iowa. Filed Mar. 23, 1888. Serial No. 268,215. (No model.)



Claim.—1. The combination, with a support, of a can pivoted in said support and provided with a hollow handle communicating with the can, and an upwardly and rearwardly projecting spout having its end in alignment with the handle, a valve for closing the spout, and a second valve for establishing or closing communication between the handle and can, substantially as described.

2. The combination, with a support, of a can pivoted in said support and provided with a hollow handle communicating with the can, and a spout at one side carved upward and inward in alignment with the handle, a spring secured to the inside of the handle and provided with a valve, and a spring-rod secured to said spring and projecting through the handle and carrying a valve on its end, substantially as herein shown and described.

398,062. WOOD-BLOCK FLOORING OR PAVING. MALCOLM MACLEOD, Philadelphia, Pa. Filed Nov. 30, 1888. Serial No. 292,211. (No specimens.)



Claim.—1. The combination of wooden blocks B B' B'' B''' B^{IV}, secured laterally one to another by double-shanked nails M, which latter are provided with middle flanges or rims, concrete substratum A, mastic E, intermediate between the concrete and the said blocks, anchor-iron clip L, embedded in and surrounded by the concrete, screw K, passing through block B''' and engaging in a screw-threaded hole in anchor-clip L, and grooves F F in the lower faces of the blocks to engage with the mastic, substantially as described.

2. The combination of wooden blocks B B' B'' B''' B^{IV}, secured laterally one to another by double-shanked nails M, which latter are provided with middle flanges or rims, concrete substratum A, mastic E, intermediate between the concrete and the said blocks, anchor-iron clip L, embedded and surrounded by the concrete, screw K, passing through block B''' and engaging in a screw-threaded hole in anchor-clip L, grooves F F in the lower faces of the blocks to engage with the mastic, and opposite <-shaped grooves G G, the lower edges of which are separated to receive the mastic to bind the blocks to the latter, substantially as described.

3. The combination of wooden blocks B B' B'' B''' B^{IV}, concrete substratum A, intermediate layer of mastic, E, double-shanked nails M, to unite the blocks laterally one with the other, and serrated bar D, passing through wooden block B'', through the mastic, and into the concrete, with which it engages, and is held fast by its serrations, substantially as described.

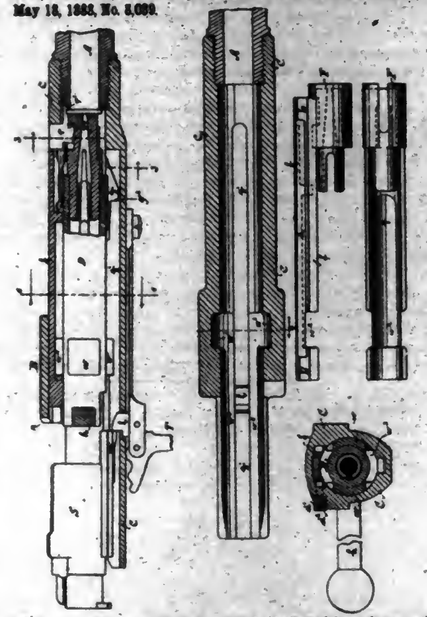
4. The combination of wooden blocks B B' B'' B''' B^{IV}, concrete substratum A, and intermediate layer of mastic, E, the said blocks being provided with saw-grooves F F upon their lower surfaces, as shown, to engage them with the mastic, substantially as described.

5. The combination of wooden blocks B B' B'' B''' B^{IV}, united laterally by double-shanked middle flanged or rimmed nails M, concrete substratum A, and intermediate mastic, E, substantially as described.

6. The combination of wooden blocks B B' B'' B''' B^{IV}, concrete substratum A, intermediate mastic, E, metallic anchor-clip L, embedded in and surrounded by the mastic, and screw K, passing through one of said wooden blocks and engaging in a screw-threaded hole in the said clip, substantially as described.

7. The combination of wooden blocks B B' B'' B''' B^{IV}, substratum A, intermediate mastic, E, and screw D, passing through one of said blocks and the mastic and engaging beneath with the substratum to hold the blocks down, substantially as described.

398,063. BREECH-LOADING FIRE-ARM. PAUL MAUSER, Oberndorf-on-the-Neckar, Würtemberg, Germany, assignor to the Waffenfabrik Mauser, same place. Filed June 27, 1888. Serial No. 278,321. (No model.) Patented in Belgium Mar. 8, 1888, No. 80,962; in Italy Mar. 31, 1888, No. 23,906/479; in England Apr. 9, 1888, No. 5,244, and in Spain May 16, 1888, No. 8,089.



Claim.—1. The combination, with the bolt and breech-case, the latter formed with the bridge over the rear portion of the bolt and with a longitudinal guideway extending beneath said bridge, of the bolt-head made in a separate piece from the bolt and swiveled thereto, so that it is moved longitudinally with the bolt, but does not partake of the oscillatory movement thereof, and a guide-plate arranged over the bolt and beneath said bridge, movable longitudinally in said guideway, and fastened to the bolt-head, whereby it derives longitudinal motion from the latter and prevents oscillatory movement thereof.

2. The combination, with the breech-case formed with a longitudinal guideway and the bolt formed with a recoil projection, of a guide-plate arranged over the bolt in said guideway and having a recess into which said projection enters as the bolt is oscillated to unlock it.

3. The combination, with the bolt having a recoil projection, of the breech-case having a recess entered by said recoil projection when the bolt is in the locked position and a guide-plate mounted to slide longitudinally and having a recess entered by said recoil projection when the bolt is in the unlocked position.

4. The combination, with the bolt and its locking-lever, of the breech-case formed with a bridge over the rear portion of the bolt, and having an inclined face, *n*, at the rear of this bridge in position to be engaged by the locking-lever while the latter is being turned up to unlock the bolt, and thereby to draw back the bolt sufficiently to start the extraction of the cartridge-shell.

5. The combination, with the bolt and the longitudinally-sliding guide-plate connected to and moving with it, of the reciprocal stops for limiting the rearward movement of the bolt, consisting of a shoulder on said guide-plate and a stop-tooth or projection stationary relatively to the breech-case in the path of said shoulder.

6. The combination, with the breech-case and the bolt, of a longitudinally-sliding guide-plate connected to the bolt to be moved thereby, and formed with a groove, *a*, terminating in a shoulder, *b*, and a stop-tooth, *d*, arranged in said groove and mounted on a lever, *d'*, pivoted to the breech-case.

7. The combination, with an oscillatory bolt and a bolt-head restrained from oscillation, of an ejector consisting of a sliding piece working in a longitudinal guideway in the bolt-head and projecting beneath the same, the breech-case having a longitudinal groove in which said projecting portion moves when the bolt is retracted, and a stop projecting into said groove for arresting said ejector.

8. The combination, with an oscillatory bolt and a bolt-head restrained from oscillation, of an ejector consisting of a slide-piece mounted in a longitudinal guideway in said bolt-head and having a rearward shoulder, and a trigger-beak arranged in position relatively to said shoulder to be encountered thereby and arrest the ejector during the retractile movement of the bolt.

398,064. CARTRIDGE-EJECTOR FOR BREECH-LOADING FIRE ARMS. PAUL MAUSER, Oberndorf-on-the-Neckar, Würtemberg, Germany, assignor to the Waffenfabrik Mauser, same place. Filed July 2, 1888. Serial No. 278,759. (No model.) Patented in Belgium Mar. 8, 1888, No. 80,963; in Italy Mar. 31, 1888, No. 23,905/473; in England Apr. 17, 1888, No. 5,709, and in Spain June 12, 1888, No. 8,054.



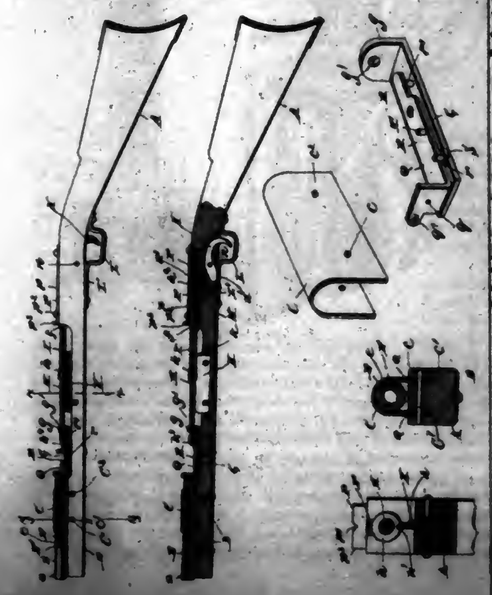
Claim.—1. The combination, with the breech case and bolt, of the bolt-head formed with a recess in one side, and an ejector consisting of a bar arranged to slide longitudinally in a groove in the breech-case and having a ledge entering said recess, an ejector-pin fixed to said ledge and sliding in a hole in the bolt-head, a spring in said recess pressing backwardly against said ledge, and a stop for limiting the rearward movement of the ejector.

2. The combination, with the breech case and bolt, of the bolt-head formed with a recess in its side, an ejector consisting of a bar arranged to slide longitudinally in a groove in the breech-case and having a ledge entering said recess, and bored out on the front side to form a cup, an ejector-pin in said recess working through a hole in the front of the bolt-head and fastened to said ledge, and a spring confined within said recess in the bored-out portion of said ledge, with a stop for limiting the backward movement of the ejector.

3. The combination, with the bolt, of the breech-case having a longitudinal groove on one side, an ejector-bar arranged to slide in said groove and formed with a groove on its outer side terminating in a shoulder, a stop projecting from the breech-case into said groove for limiting the rearward movement of the bar, an ejector-pin fastened to said bar, and a spring for retracting said pin.

4. The combination, with the bolt, of the breech-case having a longitudinal groove on one side, an ejector-bar arranged to slide in said groove and formed with a groove on its outer side terminating in a shoulder, a stop consisting of a lever pivoted to the exterior of the breech-case, and formed with a tooth projecting through a slot in the side of the breech-case and entering said groove in the bar, and a spring pressing against said lever and holding it normally with said stop entering said groove, an ejector-pin fastened to said bar, and a spring for retracting said pin.

398,065. BREECH-LOADING GUN. WILLIAM C. MAYNARD, Mount Pleasant, Mich. Filed Aug. 1, 1888. Serial No. 281,859. (No model.)



Claim.—1. In a rifle, the combination, with the stock, of the barrel arranged thereon, the clasp or sleeve passing over the barrel and secured at its edges in the stock, and the set-screws passing vertically up through the stock and bearing against the lower side of the barrel to clamp it firmly in the clasp or sleeve, substantially as and for the purpose specified.

2. In a rifle, the combination of the stock, with the barrel, the clasp or sleeve C, passing over the barrel and inserted at its edges in parallel grooves in the stock, the transverse pin passing through registering apertures in the stock and the front end of the clasp or sleeve, the screws engaging apertures in the rear ends of the clasp or sleeve, and the set-screws bearing against the under side of the barrel at its front and rear ends, respectively, to hold the same firmly clamped in the clasp or sleeve, substantially as specified.

3. In a rifle, the combination, with the stock, the barrel thereon, and the spring-actuated firing-rod provided with a groove, h^2, of the trigger-guard provided with an extension or arm, L', the engaging-pin connected to the free end of the said extension or arm and adapted to normally engage the groove h^2 in the firing-rod, and the trigger provided with an arm, *x'*, bearing on the said extension or arm and adapted when operated to depress the same and release the firing-rod, substantially as specified.

4. In a rifle, the combination, with the barrel having an open breech, of the firing-rod provided with an actuating-spring, and a knob or handle, *h*, on the rod provided with a notch operating on a guiding-web, K, substantially as specified.

5. In a rifle, the combination, with the stock having the bearings *f* and *g'*, of the firing-rod mounted in the said bearings and provided with the knob or handle *h*, the spring coiled on the firing-rod between the bearing *f* and the knob or handle, and the guiding-web attached to the stock under the firing-rod and fitting at its upper edge in a notch in the under side of the said knob or handle, substantially as and for the purpose specified.

6. In a rifle, the combination, with the breech-guard covering the breech of the barrel and the firing-rod, of the safety-pin connected to the breech-guard and adapted when the breech is opened to assume a position between the breech and the end of the firing-rod, substantially as specified.

7. In a rifle, the combination, with the barrel and the firing-rod, of the breech-guard adapted to close the breech of the barrel, and having a pivoted plate, R, provided with a vertical safety-pin, T, adapted to assume a position between the firing-rod and the breech when the guard is removed from the breech, substantially as and for the purpose specified.

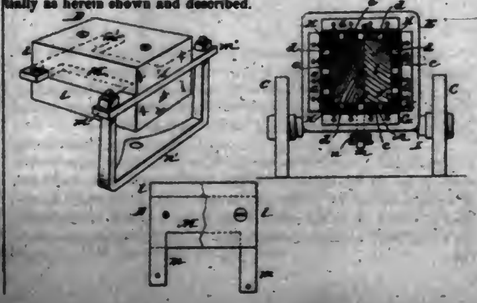
8. In a rifle, the combination, with a barrel having an open breech, of the breech-guard having a pivoted plate, R, adapted to cover the breech of the barrel, and a friction-spring located under the said pivot-plate to hold the guard from accidental movement, substantially as specified.

9. In a rifle, the combination, with the breech-guard having a pivoted plate, R, provided with a safety-pin, T, of the stud *r*, arranged in the path of the front end of the plate and adapted to stop the same when the breech is closed, and the tail or projection on the rear end of the plate adapted to strike a stud, *r'*, when the breech is open, substantially as and for the purpose specified.

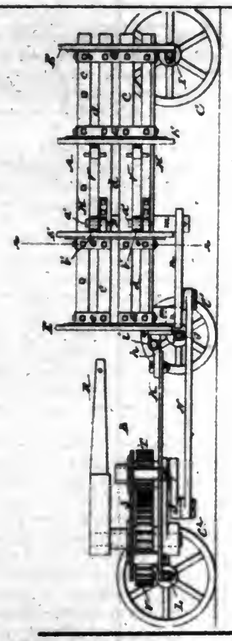
398,066. HAY-PRESS. MICHAEL MCCARTY, Montrose, Colo. Filed May 9, 1888. Serial No. 273,301. (No model.)

Claim.—1. In a hay-press, a plunger consisting of two sections, a bar arranged between the said sections and provided with arms adapted to project through the press-box, and a connecting bar or rod for the arms outside of the press-box, substantially as herein shown and described.

2. In a hay-press, the combination, with the press-box A, having a slotted bottom, of the plunger D, provided with the arms *m*, projecting through the slot of the bottom of the press-box, the bar *n*, connecting the arms of the plunger, the connecting rod or bar N, the crank S, the pinion T, the spur-wheel U, and the sweep R, substantially as herein shown and described.



398,066.



398,067. SIGNALING DEVICE FOR RAILWAY-TRAINS. MICHAEL MCCORMICK and FREDERICK FARISH, Toronto, Ontario, Canada, assignors of one-third to Michael Donnelley, same place. Filed May 21, 1888. Serial No. 274,557. (No model.)



Claim.—1. A signal placed at some conspicuous point on a railway-car, in combination with a chain having detachable connection with another car and connected with the signal-board of said signal, a hook connected with one end of said chain, and a weight carried by said hook, substantially as and for the purpose specified.

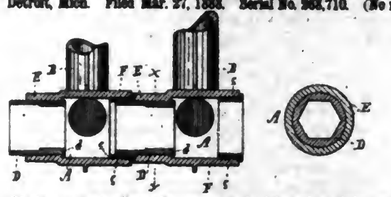
2. A box, A, fixed in some conspicuous part of a car, and having a signal-board, C, fixed to its hinged door E, in combination with a chain, G, having detachable connection with another car, and one end of which is connected to the signal-board C and its other end to the head of a hook, L, on the shank of which the weight K is suspended, the whole being arranged substantially as and for the purpose specified.

3. A box, A, fixed in some conspicuous part of a car, and having a signal-board, C, fixed to its hinged door E, on which the weight F is attached, in combination with a chain, G, having detachable connection with another car, and one end of which is connected to the door C and its other end connected to the head of a hook, L, on the shank of which the weight K is suspended, the whole being arranged substantially as and for the purpose specified.

4. A box, A, fixed in some conspicuous part of a car, and having a signal-board, C, fixed to its hinged weighted door E, and a door, E', hinged to the door E, in combination with the chain G, having detachable connection with another car, and one end of which is connected to the door C and its other end connected to the head of a hook, L, on the shank of which the weight K is suspended, the whole being arranged substantially as and for the purpose specified.

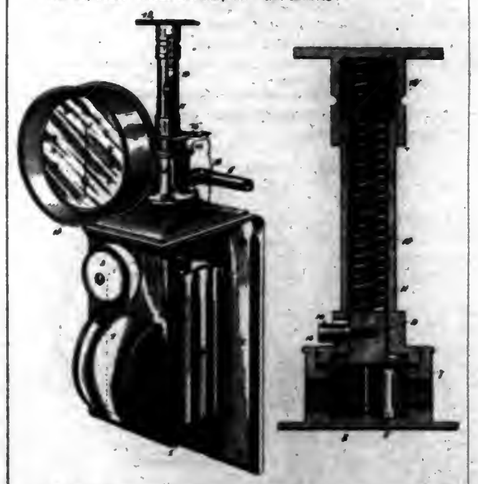
5. A box, A, fixed in some conspicuous part of a car, and having a lamp, D, suspended from it, and a hinged portion, E', of the door E, in combination with a chain, G, having detachable connection with another car, and one end of which is connected to an inner projection on the door E and its other end connected to the head of a hook, L, on the shank of which the weight K is suspended, the whole being arranged substantially as and for the purpose specified.

398,068. COUPLING FOR PARALLEL PIPES. JAMES MCEWAN, Detroit, Mich. Filed Mar. 27, 1888. Serial No. 268,710. (No model.)



Claim.—A coupling-pipe connected with and at right angles to the main or circuit pipe, said coupling-pipe being screw-threaded interiorly on both ends but having the interior diameter at one end larger than at the other, combined with a bushing screw-threaded on the outside and on the inside, the interior diameter of the bushing being equal to the interior diameter at the smaller end of the coupling-pipe, and a nipple screw-threaded on its outside to fit the interior of said bushing and the smaller end of the coupling-pipe, substantially as and for the purposes described.

398,069. SAFETY-GAGE. AUGUSTUS F. NAGLE, Chicago, Ill. Filed Oct. 20, 1888. Serial No. 288,708. (No model.)



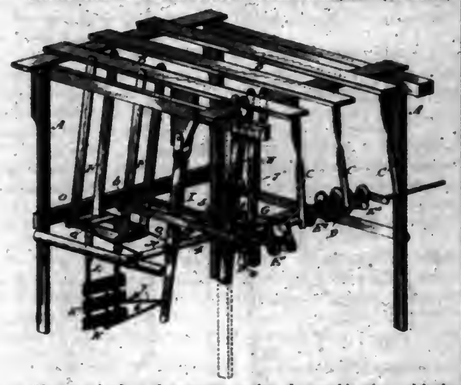
Claim.—1. In an electrical pressure-indicator, the combination, with the chamber 5 and the contact-arm 15, of the shell 11, the movable plug 9, provided with a contact-point, 14, a spring, 10, bearing upon the plug, a diaphragm, 7, mounted in the chamber 5 and adapted to actuate the plug, which is independent of the diaphragm, a pipe, 6, adapted to convey fluid to the chamber beneath the diaphragm, and electric connections, all arranged for operation substantially as shown.

2. In an electrical pressure-indicator the combination, with the chamber 5 and the contact-arm 15, of the shell 11, provided with a spring, 10, a diaphragm, 7, mounted in the chamber 5, a plug, 9, provided with a contact-point, 14, and resting upon the diaphragm, a stem, 8, adapted to support the diaphragm, and electrical connections,

3. In an electrical pressure-indicator, the combination, with the hollow shell 11 and the chamber 5 and diaphragm 7, of the movable plug 9, resting upon the latter and adapted to complete the circuit, a spring, 10, inserted into the shell and resting upon the plug to act in opposition to the pressure of the fluid, and an adjustable cap, 12, upon the end of the shell adapted to vary the tension of the spring.

4. The combination, with the chamber 5, provided with a diaphragm, 7, and a plug, 9, of the shell 11, provided with a spring, 10, and with a scale, 18, and a graduated adjustable cap, 12, secured to the shell 11 and adapted to vary the tension of the spring.

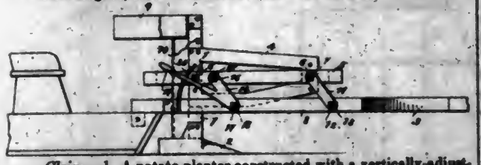
398,070. RIVER-POWER ENGINE. ADOLPHUS F. W. ESTHAMER, Detroit, Mich. Filed Dec. 16, 1887. Serial No. 258,081. (No model.)



Claim.—1. In a river-power engine, the combination, with the swinging frames F and L and the blades K and connecting-bar M, of a swinging arm, I, connections between said arm and the bar M, and connections between a motor-shaft and the swinging frames F, whereby a plane perpendicular surface is presented by the blades to receive the impulse of the current on the downstream movement of the said swinging frames, and the blades are feathered, so as to present only their edges to the current on the upstream movement thereof, substantially as described.

2. In a river-power engine, the combination, with the swinging frames F and L, the blades K, and connecting-bar M, of the swinging arms I, H, and J, connecting-rods 6 and 7 between said arms I and the bar M, the bar 5, connecting arms I and H, the bar G, connecting arms I and J, and pitman 4, connecting the swing-frames F with a motor-shaft, all substantially as described and set forth.

398,071. POTATO-PLANTER. JOHN R. CHILSON, Rockford, Wash. Filed Aug. 30, 1888. Serial No. 284,159. (No model.)



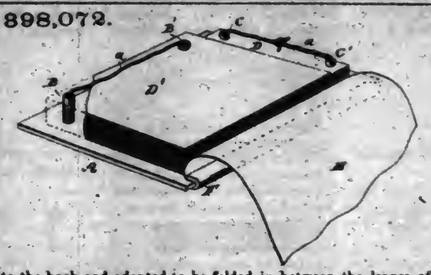
Claim.—1. A potato-planter constructed with a vertically-adjustable frame and standard mounted on the forked end piece of the pole of the machine, a seed-box and discharge-chute on the standard, a plow on the lower end of the standard adjacent to the lower end of the discharge-chute, and pivoted links connecting the vertically-adjustable frame with the forked end of pole, a curved toothed bar on the latter, and a lever on one of the links engaging the curved toothed bar, substantially as shown and described.

2. A potato-planter constructed with a vertically-adjustable standard, 1, extending between the arms 8 of the forked end of pole 5, a plow, 2, at its lower end, a seed-box, 9, at its upper end, with a discharge-chute, 10, and forwardly-projecting frames 4, having their lower portion projecting between the arms 8 of the forked end of a pole, 3, horizontal strips 5, bolted to standard 1 and frames 4, and connected by pivoted links 11 and 14 with arms 8, a curved toothed bar, 20, mounted on one of the arms 8, and a lever-handle, 19, on one of the links 14, engaging the toothed bar 20, substantially as shown and described.

398,072. DUPLICATING-TABLET. WILLIAM H. PARKER, Columbia, Dak. Filed May 17, 1888. Serial No. 274,146. (No model.)

Claim.—1. In a duplicating-tablet, the combination, with a back, of two books secured to the back by independent fastenings, with their leaves alternating with each other, and a carbon-paper secured

398,072.

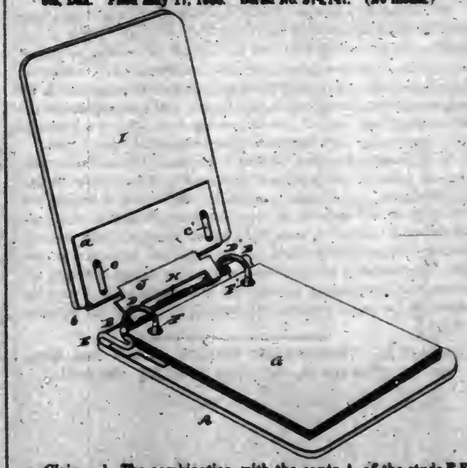


to the back and adapted to be folded in between the leaves of the said books, substantially as described.

2. In a duplicating-tablet, the combination of the back A, provided with the tubes B B' C C, the books D D' on the said tubes, the strings *a*, passing through said tubes, and the carbon-paper E, secured to the back, substantially as described.

3. In a duplicating-tablet, the combination of the back A, provided with the tubes B B' C C, the strings *a*, the carbon-paper E, and the carbon-paper fastener F, substantially as specified.

398,073. TEMPORARY BINDER. WILLIAM H. PARKER, Columbia, Dak. Filed May 17, 1888. Serial No. 274,147. (No model.)



Claim.—1. The combination, with the cover A, of the studs F F' and the rock-shaft C, provided with the curved arms D D', substantially as specified.

2. The combination of the cover A, provided with the studs F F', the spring-actuated rock-shaft C, provided with the curved arms D D' and lever E, the cover I, and the link J, connecting the covers A I, substantially as specified.

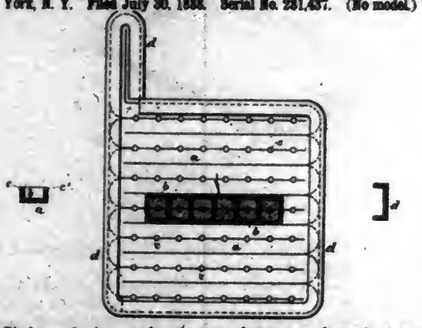
398,074. COMBINED CURB AND GUTTER. AUGUSTUS G. PARKHURST, Minneapolis, Minn. Filed Oct. 15, 1888. Serial No. 288,076. (No model.)



Claim.—1. A combined curb or gutter of artificial stone or cement, having its facing or exposed surface of harder and more durable material than its mass and fitted with the rear projections, 11 and 13, by means of which it is anchored and held in position by the surrounding and superincumbent earth.

2. In combination, the street-pavement 1, sidewalk 3, the combined curb and gutter 7, having the rear projections, 11 and 13, and a facing or outer surface, 17, composed of harder and more durable material than the mass of the structure.

398,075. SECONDARY BATTERY. JOHANNES T. PEDERSEN, New York, N. Y. Filed July 30, 1888. Serial No. 281,437. (No model.)

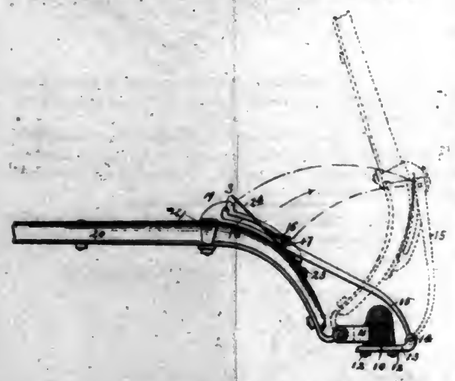


Claim.—1. A secondary-battery element or electrode formed from a strip or bar of rolled or cast lead bent upon itself to form a series of flattened horizontal convolutions, and having pockets or holes formed or pressed into or through the surface of said strip to contain the active material of the battery, and having grooves or openings through which access is obtained to the active element, substantially as set forth.

2. A secondary-battery element or electrode formed from a strip or bar of rolled or cast lead bent upon itself to form a series of flattened horizontal convolutions, and having pockets or holes formed or pressed into the surface of said strip to contain the active material of the battery, and having grooves or openings through which access is obtained to the active element, and a strip passing around the bent or convoluted ends of the strip or bar and confining the same to place, and forming a homogeneous plate, substantially as set forth.

3. A secondary-battery element or electrode formed from a strip or bar of rolled or cast lead bent upon itself to form a series of flattened horizontal convolutions, pockets or holes formed or pressed into or through one or more of the opposing surfaces of said strip, said pockets being adapted to receive the active element of the battery, there being cross-grooves which, when brought into opposition to each other, form openings through the surface of the convoluted strip, the pockets in said strip being also brought into opposition to connect the surfaces of the active material, substantially as and for the purposes set forth.

398,076. VEHICLE-SHAFT SUPPORT. JAMES A. PEEL, Springport, Ky. Filed Nov. 19, 1888. Serial No. 291,946. (No model.)

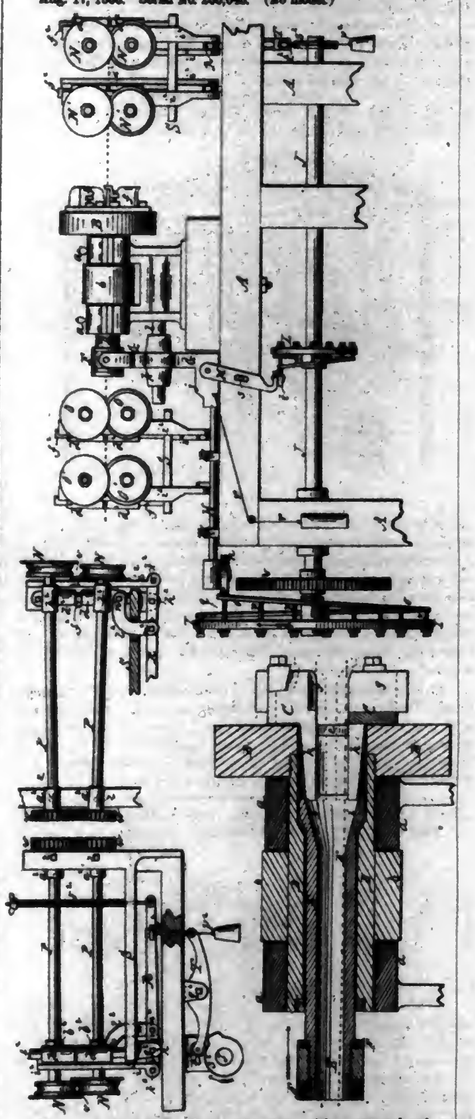


Claim.—1. The combination, with an arm arranged for pivotal connection with a vehicle running-gear and provided with a stud, of a plate arranged for connection with the shafts of said vehicle and formed with an L-shaped slot, the shorter slot being at the forward end of the longitudinally-extending slot and at an angle thereto to form a shoulder to engage said stud, substantially as described.

2. The combination, with an arm arranged for pivotal connection with a vehicle running-gear and provided with a stud, of a plate formed with an L-shaped slot and arranged for connection with the vehicle-shafts, and a spring carried by the plate and arranged to bear upon the arm, the arm-stud riding in the plate-slot, as and for the purpose specified.

3. The combination, with an arm arranged for pivotal connection with a vehicle running-gear and provided with a thumb-piece and a stud, of a plate arranged for connection with the vehicle-shafts and formed with an L-shaped slot in which the arm-stud rides, and a spring carried by the plate and arranged to bear against the arm, as and for the purpose stated.

398,077. LATHE. SANFORD A. PERRY, Rochester, N. Y. Filed Aug. 17, 1888. Serial No. 283,043. (No model.)



Claim.—1. In a lathe, the combination, with a cutter-head provided with a central hole for the passage of the article to be turned, of a set of knife-stocks pivoted to the face of the cutter-head and provided with guide-arms that extend inward through the hole and are operated upon by a mandrel to close the cutters to their work, as set forth.

2. In a lathe, the combination, with a cutter-head provided with a central hole for the passage of the article to be turned, of a set of knife-stocks pivoted to the head, a set of knives attached to said stocks and standing tangentially to the opening, and a set of gages attached to said stocks standing radially to the hole, as and for the purpose specified.

3. In a lathe, the combination of a cutter-head provided with a center hole, a set of knife-stocks carrying knives pivoted to said head and provided with guide-arms that extend into the hole, and a mandrel provided with a beveled end against which the guide-arms rest and by which they are operated, as herein shown and described.

4. The combination of the cutter-head B, mounted on a shaft and provided with the central hole, *c*, the set of knife-stocks C C, pivoted to the head and provided with the guide-arms *h h*, extending into the hole, the sliding mandrel E, provided with a beveled end that engages with the guide-arms, the lever G, connecting with the mandrel, the plunger H, connected with the lever, the cam *o*, for giving motion to the plunger, and the weighted cord *r*, for producing reaction on the lever, all operating in the manner and for the purpose specified.

5. In a lathe, the combination of the cutter-head provided with a central hole, a set of knife-stocks carrying knives and provided with guide-arms and pivoted to said cutter-head, a mandrel with a beveled end connecting with the guide-arms for operating the same, and feed-rollers for feeding the article to be turned through the cutter-head, as herein shown and described.

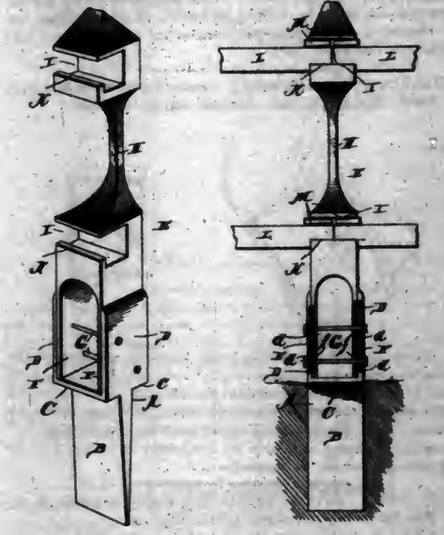
6. In a lathe, the combination of the grooved feeding-rollers N N, their shafts P P, boxes a^3 a^3, pivoted to their supports to allow the shafts to spread, the spindle f^3, sockets d^3 d^3, resting and sliding thereon, and the boxes b^3 b^3, pivoted to said sockets, as shown and described, and for the purpose specified.

7. In a lathe, the combination, with the shafts P P, carrying feed-rollers N N, of the spindle f^3, the sockets d^3 d^3, sliding thereon, the boxes b^3 b^3, pivoted to said sockets and supporting the shafts, the lever R, the link i^3, connecting the said lever with the upper box, and the link l^3, connecting said lever with the lower box, as shown and described, and for the purpose specified.

8. The combination, with the shafts P P, carrying feed-rollers N N, of the spindle f^3, the sockets d^3 d^3, sliding thereon, the boxes b^3 b^3, pivoted to said sockets, the lever R, the links i^3 and l^3, connecting said lever with the sockets, the lever T, connected with the lever R by link r^3, the cam s^3, and the reacting spring-rod o^3, as and for the purpose specified.

9. In a lathe, the combination, with the slide *j*, plunger H, and cam *o*, of the lever M, pivoted to the slide, the cam L, for operating the lever, and the weighted cord *r*, for producing reaction of the slide, as shown and described, and for the purpose specified.

398,078. FENCE-POST. ALBIN G. PETERSON, Arvada, Ia., assignor of one-half to Thomas J. Brooks, same place. Filed Nov. 21, 1888. Serial No. 291,419. (No model.)

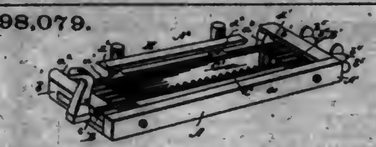


Claim.—In a fence-post, the combination, with the anchor secured in the ground and provided with the vertical ears D D at right angles to the line of the fence, of the upright provided with the depending parallel ears F F, fitting between the ears D D and provided with apertures *f f*, registering with apertures *d d* in the ears D D, and the bolts or screws engaging the said registering apertures, substantially as specified.

398,079. SAW. HERMILAS PETRY, Rockport, Mo. Filed July 20, 1887. Serial No. 245,030. (No model.)

Claim.—1. A saw-frame consisting of the parts A' A^2, the part A' being provided with grooved end pieces, *b b'*, and the part A^2 provided with flanges a^2, fitting in the grooves of the said end pieces, and saw-heads carried by the end pieces of the part A', one of the said heads being movable and the other stationary, substantially as herein shown and described.

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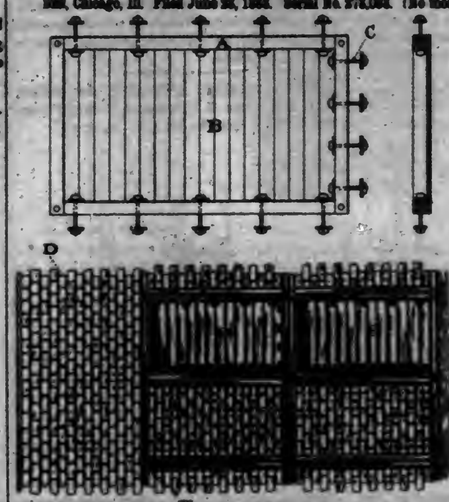


2. The combination, with a saw-frame consisting of the part A', provided with the grooved and slotted end pieces, *b b'*, and the part A^2, provided with the flanges a^2, of the saw-heads B B', the head B being rigidly secured to the end piece *b* of the part A', and the head B' having the shank fitting loosely in the slot of the end piece *b'*, and provided with means for movably supporting it in the said slot, whereby provision is made for adjusting the tension of the saws and locking the parts of the frame together, substantially as herein shown and described.

3. The combination, with the frame A, composed of the parts A' A^2 and having slotted end pieces, *b b'*, of the saw-heads B B', provided with a series of slits, b^2, the head B being rigidly secured to the end piece *b*, and the head B' having its shank fitting loosely in the slot of the end piece *b'* and provided with the screw-threaded rods b^4 and the nuts b^5 on the said rods, substantially as herein shown and described.

4. The combination, with a saw-frame having apertures in one of its side bars, of the gage E, provided with shanks adjustably secured in the apertures of the said side bar, substantially as herein shown and described.

398,080. DEVICE FOR PROTECTING SHORES. JOSEPH M. REARDEN, Chicago, Ill. Filed June 26, 1888. Serial No. 278,093. (No model.)



Claim.—1. A device for protecting shores, constructed of a series of cribs made of a stout and durable substance, firmly bolted together and filled with rubble-stones grouted and cemented so as to form one solid mass, substantially in the manner herein set forth.

2. A device for protecting shores, built and constructed of a series of cribs made of a stout and durable substance, firmly bolted together and filled with rubble-stones or other similar substance grouted and cemented so as to form one solid mass, substantially as herein described, as a foundation for and in combination with a rubble-stone or other pavement, substantially as described.

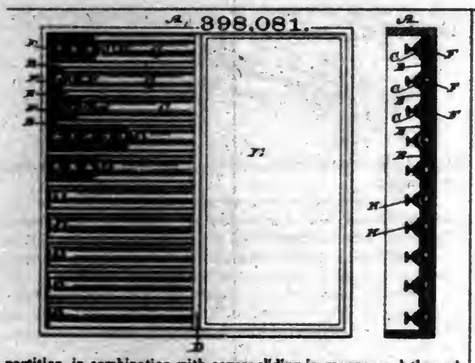
398,081. POOL-REGISTER. HOWARD R. ROBBINS, Sacramento, Cal. Filed Oct. 15, 1888. Serial No. 288,142. (No model.)

Claim.—1. A pool-registering device consisting of a case having horizontal channels with balls fixed permanently therein to one-half their length, slides traveling in guides, so as to conceal or expose the balls, and an inclosed or uncovered chamber into which the slides run when the balls are exposed, substantially as herein described.

2. A registering device for ball-pool, consisting of a case having channels, within half of which balls are fixed, slides traveling in guides over said channels, and having numbered disks fixed to them, substantially as herein described.

3. A case having a vertical central partition, horizontal channels extending across the case and containing balls upon one side of the

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partition, in combination with covers sliding in grooves and through the central partition, and having numbered disks or knobs upon them, substantially as herein described.

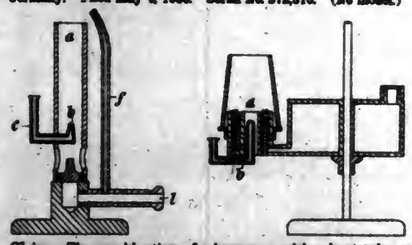
398,082. COCOANUT COMPOUND. LEOPOLD SCHEPP, New York, N. Y. Filed Dec. 15, 1888. Serial No. 293,718. (No specimens.)

Claim.—The herein-described food compound in dry and granulated form, consisting of cocoanut, sugar, tapioca, baked corn, cream of tartar, gelatine, salt, and a flavoring extract, the ingredients being in the proportions substantially as set forth.

398,083. COCOANUT COMPOUND. LEOPOLD SCHEPP, New York, N. Y. Filed Dec. 15, 1888. Serial No. 293,720. (No specimens.)

Claim.—The herein-described food compound in dry and granulated form, consisting of cocoanut, sugar, kiln-dried starch, gelatine, a flavoring extract, cream of tartar, and salt, the ingredients being in the proportion substantially as set forth.

398,084. MAGNESIUM LIGHTING APPARATUS FOR TAKING PHOTOGRAPHIC PICTURES. JOHN W. C. G. SCHIRN, Breslau, Prussia, Germany. Filed May 4, 1883. Serial No. 272,816. (No model.)



Claim.—The combination of a burner, *a*, with a bent tube entering said burner and adapted for the reception of the magnesium, and with an air-blast pipe, substantially as specified.

398,085. SUPPOSITORY. HIRAM SCHEELE, New York, N. Y. Filed Dec. 20, 1888. Serial No. 294,326. (No specimens.)

Brief.—To prevent exudation of glycerine from glycerine-soap suppositories, dips the molded suppository in a concentrated solution of soap, thus forming a shell of soap which prevents oozing.



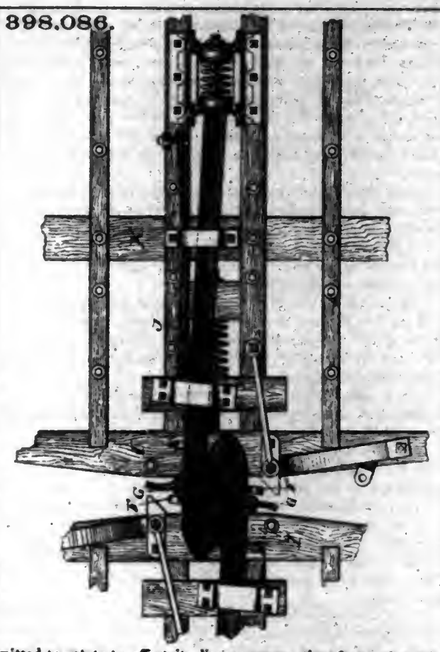
Claim.—A suppository composed of a mixture of glycerine and a concentrated soap solution and of a protective layer or coating of soap, substantially as set forth.

398,086. CAR-COUPLING. CHARLES A. SCHROTER, Chicago, Ill. Filed Aug. 17, 1888. Serial No. 283,051. (No model.)

Claim.—1. In automatic car-couplings, the combination of a coupling-head having an oblique face or engaging-surface, and a rotating hook arranged therein and held in a fixed position while in engagement with an opposing hook and permitted to rotate to effect its disengagement therefrom, substantially as described.

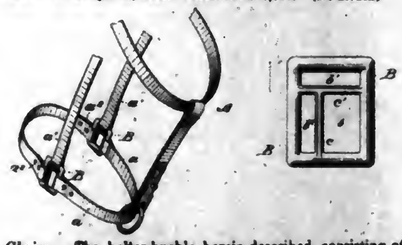
2. In automatic car-couplings, the combination of a coupling-head having an oblique face or engaging-surface having a recess therein rounded or curved at its forward portion and a rotating hook rounded or curved at its forward portion and fitted to the recess and held in a fixed position while in engagement with an opposing hook and permitted to rotate to effect its disengagement therefrom, substantially as described.

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3. In automatic car-couplings, the combination of a coupling-head having an oblique face or engaging-surface, a rotating hook arranged therein and held in a fixed position while in engagement with an opposing hook, and permitted to rotate to effect its disengagement therefrom, and means for holding the hook in its fixed position and for releasing it therefrom for engagement and disengagement, substantially as described.

398,087. HALTER-SQUARE. CHRISTIAN C. SCHWANER, Winterset, Iowa. Filed Apr. 16, 1888. Serial No. 270,833. (No model.)



Claim.—The halter-buckle herein described, consisting of the rectangular frame B, having rectangular openings *b b' b²*, formed by means of a cross-bar, *c'*, connected to the side walls of the frame, and a vertical bar, *c*, connected to the lower wall of said frame and to the cross-bar *c'*, said opening *b* being double the size of the openings *b' b²*, whereby it is adapted to receive the chain-strap and a bridle-bit attachment, substantially as specified.

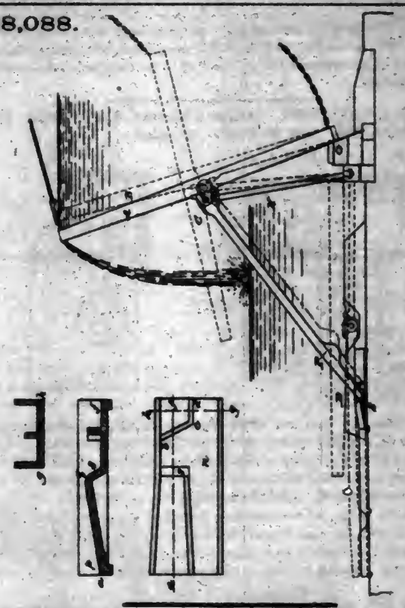
398,088. MOVABLE DAM. ADDISON M. SCOTT, Charleston, W. Va. Filed May 3, 1888. Serial No. 272,733. (No model.)

Claim.—1. An improved heurter having a seat or bearing for the lower end of the prop, and provided in advance of said seat with a guide or deflector arranged for engagement by the prop as the latter is moved upstream or forward from its seat, substantially as set forth.

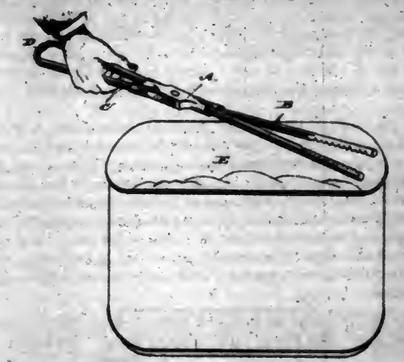
2. An improved heurter having a seat or bearing for the prop, and provided in advance of said seat with a guide or deflector curved or inclined forward and laterally, such guide or deflector being arranged for engagement by the prop as the latter is moved upstream and forward from its seat, substantially as set forth.

3. An improved heurter having a seat or bearing for the lower end of the prop, and provided with a guide or deflector arranged for engagement by the prop as the latter is moved upstream and forward from its seat, and having its upper side and its face next the seat or bearing curved or inclined, substantially as set forth.

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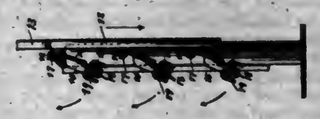


398,089. CLOTHES-STICK. WILLIAM H. SCOTT, Toronto, Canada, assignor of one-half to Hester Veale Hardy, same place. Filed July 7, 1888. Serial No. 279,274. (No model.)



Claim.—The clothes-stick described, consisting of the stocks A, pivotally connected together and formed with sockets, the sticks B, fitted into the sockets at one end of said stocks, the shorter sticks, C, fitted into the sockets at the other end of said stocks, and the spiral spring connecting the ends of said shorter sticks, substantially as and for the purpose specified.

398,090. FENCE-MACHINE. JOHN SORNSON, Brayton, Iowa. Filed Dec. 21, 1888. Serial No. 294,304. (No model.)



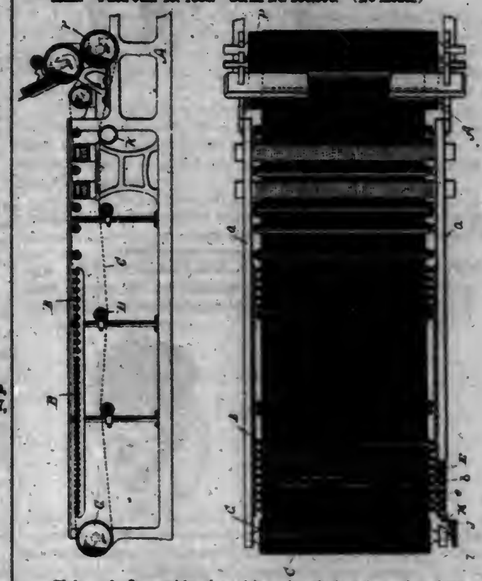
Claim.—1. As a means for wiring fence-pickets, a twister comprising a body portion, arms hinged upon one face of the body, grooved to receive the wire strands, and a clamping-fork attached to the free extremity of the said arms, substantially as shown and described.

2. As a means for wiring fence-pickets, a twister comprising a body portion, arms hinged at intervals upon one face of the body, said arms being provided with a transverse groove in opposite sides near their free end, and a clamping-fork extending across the said grooves, all combined for operation, as and for the purpose specified.

3. The combination, with fence-posts and strands of wire secured to said posts and arranged in parallel pairs, of a twisting device comprising a body portion, arms hinged at intervals upon one face of the body, said arms being provided with a transverse groove in opposite sides to receive the wires, and an adjustable clamping-fork attached to the arms and extending across the grooves therein, substantially as shown and described.

4. As a means for wiring fence-pickets, a twister comprising a body portion, arms hinged at intervals upon one face of the body, said arms being provided with a transverse groove in opposite sides near their free end, and a revoluble U-shaped fork pivoted in the free end of said arms, the members of which fork extend across the grooves produced in the arms, substantially as shown and described.

398,091. PAPER-MAKING MACHINE. RICHARD SMITH, Boston, Mass. Filed Jan. 13, 1888. Serial No. 260,506. (No model.)



Claim.—1. In combination with a wire-cloth and a series of tube-rolls which support it, the driving-shaft and gearing which connects said driving-shaft with said series of rolls, substantially as set forth.

2. In Fourdrinier paper-making machines, the combination, with an endless wire-cloth and the series of independently-mounted removable tube-rolls, of the intermediary driving-shaft and the series of socketed shafts which interconnect the tube-rolls with said intermediary shaft, whereby each tube-roll is independently and positively rotated, substantially as stated.

3. In combination with the drive-roll P, the driving-shaft E, provided with gears, the series of tube-rolls *a a*, and the wire-cloth C, resting thereon, the shafts *d d*, socketed at *f* at one end and furnished with the gears *e e* on the opposite end, said sockets engaging the shafts of the tube-rolls and the gears meshing with said gears upon the driving-shaft E, substantially as set forth.

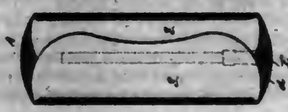
4. The combination, with the main shaft E, its gears *b b*, and the independently-mounted tube-rolls B B, having shafts *i i*, with lugs *j j*, of the interconnecting gear-furnished shafts *d d*, socketed at *f*, whereby the tube-rolls are connected and disconnected, and the wire-cloth carried by said tube-rolls, as and for the purposes specified.

398,092. FOLDING FAN. FRIEDMAN SCHEINEMANN, New York, N. Y. Filed Mar. 29, 1888. Serial No. 268,856. (No model.)

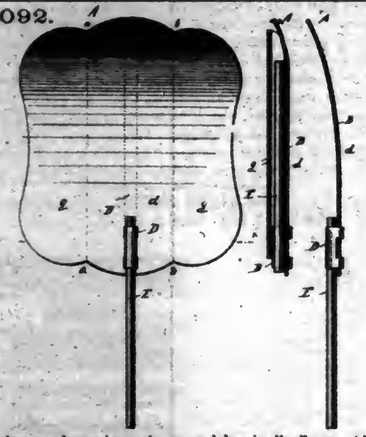
Claim.—1. In a fan, the combination, with a sheet creased or jointed longitudinally, of a handle-socket on the said sheet and a sliding handle in said socket, substantially as herein shown and described.

2. In a fan, the combination, with a sheet creased or jointed to fold, of a spring mounted longitudinally on the central section of the sheet, a socket held longitudinally on the central section of the sheet, and a sliding handle in said socket mounted to slide longitudinally over the central section of the folding sheet, substantially as herein shown and described.

3. In a fan, the combination, with a sheet, of a handle secured



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on said sheet, and a spring-strip secured longitudinally on said sheet, substantially as herein shown and described.

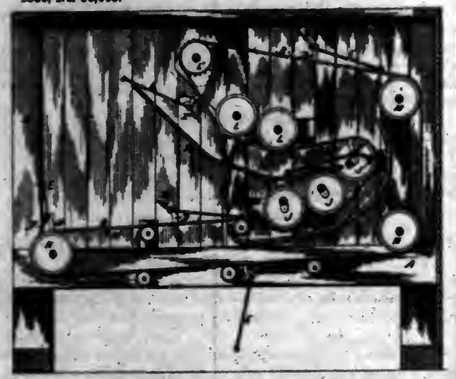
398,093. MOUTH-PIECE FOR BAGS OR RECEPTACLES. WARREN H. TAYLOR, Stamford, Conn., assignor to The Yale & Towne Manufacturing Company, same place. Filed Aug. 10, 1888. Serial No. 282,411. (Model.)



Claim.—1. In combination with a mouth-piece of a bag or receptacle, a lock having a rotary key-plug and an arm rigidly connected to the plug at one end, whereby the mouth-piece is opened and closed by turning the key-plug, substantially as set forth.

2. In a mouth-piece for a bag or receptacle having two parts, a fastening for securing these parts together, a rotary plug-lock, and an arm secured to the key-plug of the lock and covering the fastening when the lock is locked, substantially as set forth.

398,094. CLEANING METAL PLATES OR SHEETS. RICHARD R. THOMAS, Lydbrook, County of Gloucester, England. Filed Nov. 22, 1887. Serial No. 255,896. (No model.) Patented in England Dec. 8, 1886, No. 16,065.

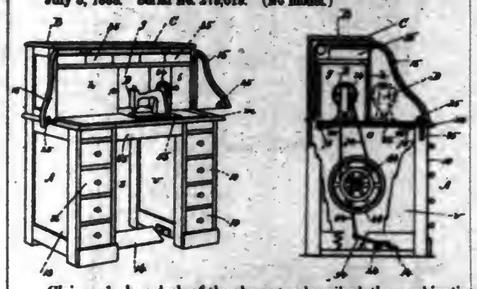


Claim.—1. The herein-described apparatus for cleaning metal plates or sheets, said apparatus comprising platforms containing cleaning material, a traveling band to carry the plates, and rollers carrying the band, one side up over one platform and the reverse side up over the next platform, as and for the purpose set forth.

2. The herein-described apparatus for cleaning metal plates or sheets, said apparatus comprising curved platforms containing cleaning material, a traveling band having rigid and pivoted holding-fingers for the plates, and rollers carrying the band, one side up over one platform and the reverse side up over the next platform, as and for the purpose set forth.

3. The herein-described plate-carrying band, comprising endless bands with connecting stretchers, ringers and standards on the stretchers, and counterbalanced fingers pivoted to the standards, substantially as described.

398,095. DESK. HERBERT I. THOMPSON, Waltham, Mass. Filed July 5, 1888. Serial No. 279,019. (No model.)



Claim.—1. In a desk of the character described, the combination of a body, a sliding carriage in the top of said body, a sewing-machine secured to said carriage, a case hinged to the rear of said body and adapted to conceal said machine, and treadle mechanism for said machine disposed in said body, substantially as set forth.

2. In a desk of the character described, the combination of the body A with the case B, provided with the pigeon-holes *d f*, drawers 35, cover C, wings 15, and doors *h i*, said case being hinged to said body and adapted to form a table therewith, substantially as specified.

3. In a desk of the character described, the combination of a body provided with a foot-space, drawers on one side of said space and a case on the opposite side thereof, a case hinged to said body, wings hinged to said case and adapted to be secured to said body, a rolling cover in said case, a rolling carriage in the top of said body, a sewing-machine secured to said carriage and adapted to be concealed in said case, and treadle mechanism for said machine disposed in the case in said body in such a manner that said machine may be operated when withdrawn from said hinged case, substantially as set forth.

4. In a desk of the character described, the combination of the body A, provided with the case *v* and top *m*, the crank-shaft 54, journaled in said case at the rear of the center thereof and carrying the driving-wheel 44, the shaft 24, provided with the treadle 14, and rocking arm 34, connected by a pitman-rod, 64, with the shaft 54, the carriage 55, fitted to slide in the top *m*, the machine D, secured to said carriage, the belt 74, and the case B, hinged to the body A and provided with the wings 15, drawers 35, pigeon-holes *d f*, opening *g*, and doors *h i*, all being constructed and arranged to operate substantially as specified.

398,096. CUFF OR COLLAR BUTTON. GEORGE S. TIFFANY, Tecumseh, Mich. Filed July 30, 1888. Serial No. 281,363. (No model.)



Claim.—1. The combination, with a collar or cuff button having a head and shoe each formed with oppositely-arranged and registering apertures, of a reciprocable fastening-pin arranged in said apertures, and adapted to lie with its point over the face of the head when thrust to the limit of its forward movement, substantially as described, and for the purpose specified.

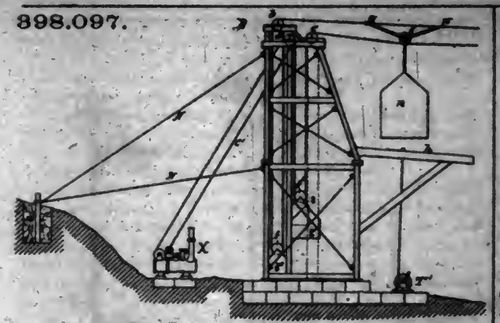
2. The combination, with a collar or cuff button having a head and shoe formed with oppositely-arranged and registering apertures and a stem formed with a groove on its edges, of a reciprocable fastening-pin arranged in said groove and through the said apertures, and adapted to move with its point back and forth over the face of the head, substantially as described, and for the purpose specified.

3. The collar-button herein described, consisting of a head and shoe formed with apertures, a stem having a groove in its edges, and a fastening-pin having a finger-lug arranged in said groove and through the apertures, and adapted to move back and forth over the face of the head, substantially as described, and for the purpose specified.

398,097. SUSPENDED ROPEWAY. LEONARDO TORRES, Portella, Spain. Filed Oct. 12, 1887. Serial No. 252,157. (No model.)

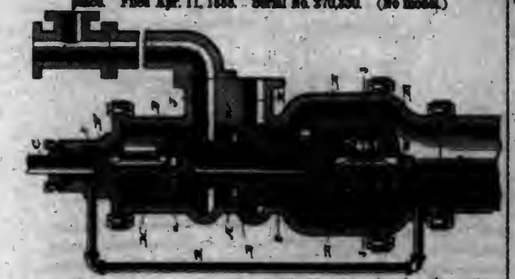
Claim.—1. An aerial wire or rope way having stations, pulleys, and multiple wires provided with tension-weights and a carriage to travel on all of the multiple wires and attached to some of them.

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2. An aerial wire or rope way having at one end a tower-station and at the other an elevated station, pulleys, and multiple wires passing over them, tension-weights at the tower-station to which some of the ropes are connected, and other tension-weights with pulleys over which other ropes pass, and a carriage to travel on all of the said ropes and also attached to some of them.

398,098. HYDRAULIC ELEVATOR-VALVE. ISAAC H. VEBB, Yonkers, N. Y., assignor of one-half to Elbridge G. W. Bartlett, same place. Filed Apr. 11, 1888. Serial No. 270,330. (No model.)



Claim.—1. The combination, with the main pipe for the motor-fluid, the main valve and its casing, of a tube carrying the main valve between its ends, pistons at the ends of said tube fitting the casing, and an auxiliary adjustable valve consisting of a rod extending through said tube and provided with two ports in proximity to each piston, and passages connecting the said ports, substantially as described.

2. The combination, with the main valve and the casing, of the tube to which the main valve is secured, provided at its ends with piston-heads and having a port, P, through which the interior of the tube communicates with the fluid-feed supply, and an auxiliary valve having fluid-passages provided with two ports adapted to be moved to opposite sides of the said piston-head or to be covered thereby and arranged to deliver the fluid from the interior of the pipe to one or the other of the outer faces of the piston-heads, substantially as described.

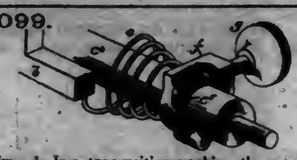
3. The combination of the main valve, a tube carrying the main valve between its ends, pistons at the ends of the tube, the casing in which the main valve and the pistons are fitted, having the cross-plate E adjacent to one of the pistons, and the discharge-passages L L passing around the said head, and an auxiliary valve arranged to deliver the motor-fluid to opposite sides of the said pistons to move the main valve, substantially as described.

4. The combination, with the main valve, of the tube to which is secured the main valve, provided with a piston and having a port through which it communicates with the motor-fluid, a casing-head opposite the piston-head, a discharge-passage beyond the casing-head, and an auxiliary valve passing through the tube and the head and having a fluid-passage in proximity to the head, adapted as said valve is moved either to make communication between the tube and the space between the piston and casing heads or between said space and the discharge-passage, substantially as described.

5. The combination, with the main valve and the casing, of the tube O, to which the main valve is secured, provided at its ends with piston-heads, and having a port, P, through which the interior of the tube communicates with the fluid-feed-supply pipe, and an auxiliary valve, C, having the fluid-passages M and N, and the discharge-passages situated, respectively, adjacent to the two piston-heads, substantially as described.

398,099. TENSION-ADJUSTER. GEORGE B. WYNN, Newark, N. J., assignor to Wyckoff, Seamans & Benedict, New York, N. Y. Filed Apr. 6, 1887. Serial No. 233,893. (No model.)

398,099.



Claim.—1. In a type-writing machine, the combination, with a shaft and a collar mounted thereupon, of a spring coiled loosely around the shaft and secured at one end to a fixed part of the machine and at the other end to the collar, and a screw for varying the position of the collar and adjusting the tension of the spring.

2. In a type-writing machine, the combination, with a rock-shaft provided with feed-dogs, of a returning-spring therefor, a movable support carrying one end of said spring mounted upon the rock-shaft, and an adjusting-screw serving to move the support, all substantially as shown.

3. In a type-writing machine, the combination, with the rock-shaft having a peripheral threaded groove, of a collar encircling the shaft, a screw journaled in the collar and engaging the shaft, and a spring secured at one end to the collar and at its other end to a fixed part of the machine.

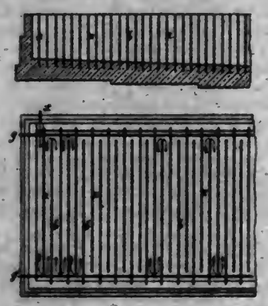
4. In a type-writing machine, the combination, with a shaft and a collar mounted thereon, of a spring secured at its ends to the collar and a fixed part of the machine, and a screw for varying the position of the collar and adjusting the tension of the spring.

398,100. ORNAMENTING GLASS. THOMAS W. WEBB, Stourbridge, County of Worcester, England. Filed Feb. 20, 1888. Serial No. 264,591. (No specimens.)



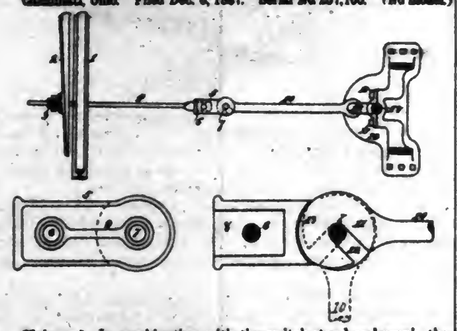
Claim.—The herein-described process in producing articles in glass in imitation of old carved ivory, consisting in painting or printing the pattern with an acid-resist upon the opaque glass article, then submitting the article to the action of acid to remove the surface of the uncovered portions, then completing the pattern with a cutting-wheel, then tinting the ground and parts of the pattern with glass-color, and fixing the same by firing, substantially as set forth.

398,101. PROCESS OF PURIFYING SEWAGE BY ELECTRICITY. WILLIAM WEBSTER, Jr., Lee Park, Lee, County of Kent, England. Filed Dec. 22, 1887. Serial No. 258,724. (No model.) Patented in England Jan. 27, 1887, No. 1,333; in France Dec. 9, 1887, No. 187,697; in Cape of Good Hope Jan. 28, 1888, No. 426; in Natal Feb. 2, 1888; in Victoria Feb. 8, 1888, No. 5,615; in New South Wales Feb. 10, 1888, No. 405; in South Australia Feb. 10, 1888, No. 961; in Tasmania Feb. 12, 1888, No. 540/10; in New Zealand Feb. 20, 1888, No. 2,317, and in India Apr. 13/26, 1888, No. 16/888.



Claim.—The process herein described of purifying sewage and other impure water, which consists in passing the same in contact with electrically-excited positive and negative electrodes of iron, whereby salts of iron are produced at the positive electrode, which, in reacting with the alkalies produced at the negative electrode, form a flocculent precipitate of ferrous hydrated oxide, which, together with the gases generated, effect the precipitation of the solid matter and the purification of the impurities held in solution.

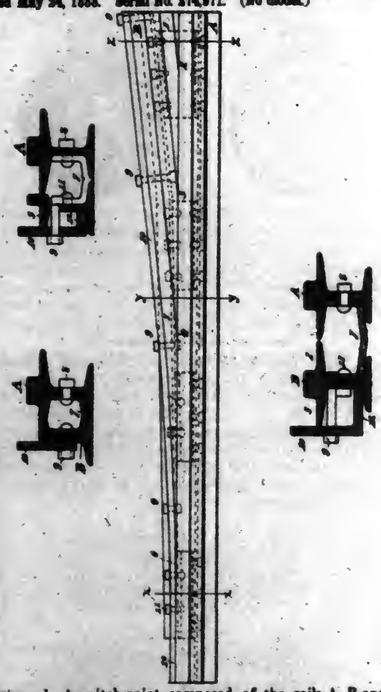
398,102. CONNECTING-ROD FOR SWITCHES. FREDERIC C. WEIR, Cincinnati, Ohio. Filed Dec. 6, 1887. Serial No. 257,160. (No model.)



Claim.—1. In combination with the switch-stand and crank, the connecting-rod 10, provided with a circular end, 11, having the slot 12, and the coupling-box 5, provided with the pivot-bolt 7, attached to the switch-bar, substantially as specified.

2. A connecting-rod and joint composed of the coupling-box 5, provided with the circular slot and pivot-bolt 7, the connecting-rod 10, provided with the enlarged end 11, and the slot 12, to engage over the pivot-bolt, substantially as specified.

398,103. BLIND-SWITCH. FREDERIC C. WEIR, Cincinnati, Ohio. Filed May 24, 1888. Serial No. 274,971. (No model.)



Claim.—1. A switch-point composed of the rails A B and the angle and guard iron 10, secured thereto by bolts 9, said guard-iron having its web beveled off along a part of its length, for the purpose set forth.

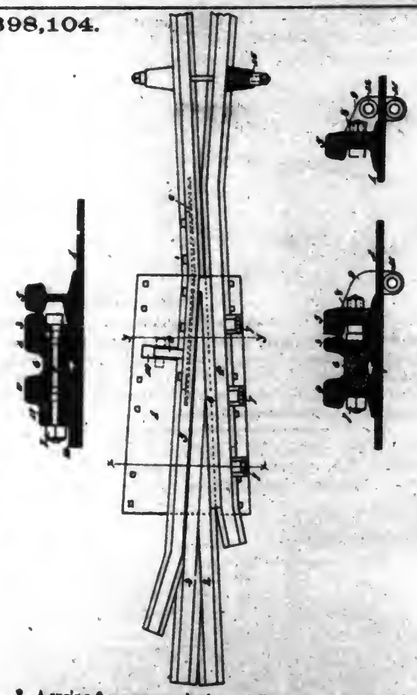
2. In combination with the rails A B, secured together by the U-iron 7, the angle and guard iron 10, said parts being secured together by the bolts 8, 9, and 11, substantially as herein specified.

398,104. SPRING-FROG. FREDERIC C. WEIR, Cincinnati, Ohio. Filed June 19, 1888. Serial No. 277,543. (No model.)

Claim.—1. In combination with the spring-rail 5, the arm 9, bent and projected through the slot in the base-plate, having a movable bearing upon the under side of said plate, substantially as specified.

2. In combination with the spring-rail 5, resting on the base-plate 1, the arm 9, attached to said rail and bent through the slot in said base-plate, and provided with one or more friction-rollers bearing against said plate, substantially as herein specified.

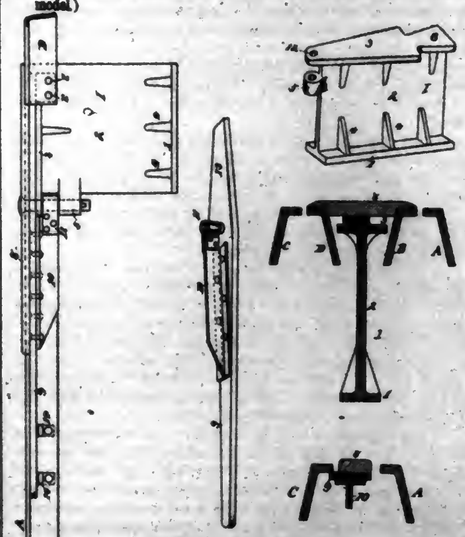
398,104.



3. A spring-frog composed substantially of the point-rail, the base-plate 1, and fish-plate 16, secured together by through-bolts having spring-rail 5, moving on said base-plate and provided with a frictional bearing-support, substantially as herein specified.

4. In combination with the spring-rail 5, the supporting fish-plate 8, provided with the arm 9, passing through the base-plate, with a holding-down device bearing on the under side of said plate, substantially as specified.

398,105. SLOT-RAIL SWITCH. FREDERIC C. WEIR and NATHANIEL C. GOLDSMITH, Cincinnati, Ohio, assignors to the Weir Frog Company, same place. Filed Nov. 15, 1888. Serial No. 290,909. (No model.)



Claim.—1. The abutment I, provided with base 1 and journal-support for the tongue, and having the top flange, 3, for supporting the rear end of the tongue 13, substantially as set forth.

2. In a slot-rail switch, the combination of the abutment I, the bracket 7, the slot-rails B D, bolted firmly to said bracket, and the cover-piece 8, supported by the bracket and said slot-rails to form a space for the tongue, substantially as herein specified.

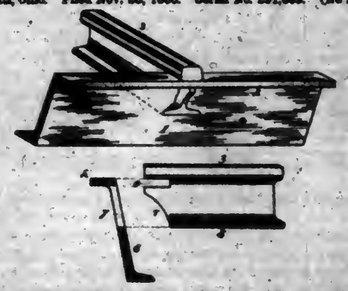
3. In combination with the tongue 9, the T-iron bolted to the under side of said tongue and forming a brace and hinge-journal, 11, substantially as specified.

4. In combination with a slot-rail switch, the abutment I, supporting the inner slot-rails and provided with a journal support or ear, 5, for the journal of the tongue 9, and a top flange, 3, for supporting the rear end of said tongue, substantially as described.

5. In a slot-rail switch, the combination of the outer slot-rails, A C, the inner slot-rails, B D, the abutment I, supporting said inner rails and provided with base 1, top flange, 3, and ear 5, the tongue 9, journaled to said abutment and having its rear end supported on the top flange of said abutment, and the lugs 14, secured to the outer slot-rails to form a support for the forward end of the tongue, substantially as described.

6. In a slot-rail switch, the combination of the outer rails, A C, the inner rails, B D, the abutment I, supporting the inner rails, the tongue 9, journaled to said abutment and provided with T-iron 10 and eye 11, and the lugs 14, for supporting the forward end of the tongue, substantially as described.

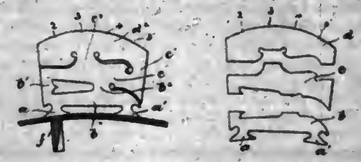
398,106. CABLE-RAILWAY CROSSING. FREDERIC C. WEIR, Cincinnati, Ohio. Filed Nov. 23, 1888. Serial No. 291,689. (No model.)



Claim.—1. In a cable-crossing, the crossing-rail 3, provided with slot 4, which embraces the head 2 of the slot-rail, substantially as herein specified.

2. The combination of the slot-rail 1, provided with mortise 7, formed below the head of the rail 2, and the crossing-rail 3, provided with slot 4, for embracing the head of the slot-rail and resting in said gain, substantially as herein specified.

398,107. BRIDGE FOR STRINGED INSTRUMENTS. MAURICE W. WHITE, Boston, Mass., assignor of one-half to George W. Ross, same place. Filed July 9, 1888. Serial No. 279,434. (No model.)



Claim.—1. A bridge for stringed instruments, formed to present three horizontally-arranged bars, *b c d*, connecting parts $b' c'$, and the waists $b^2 c^2$, to act as a set of compound levers, substantially as described.

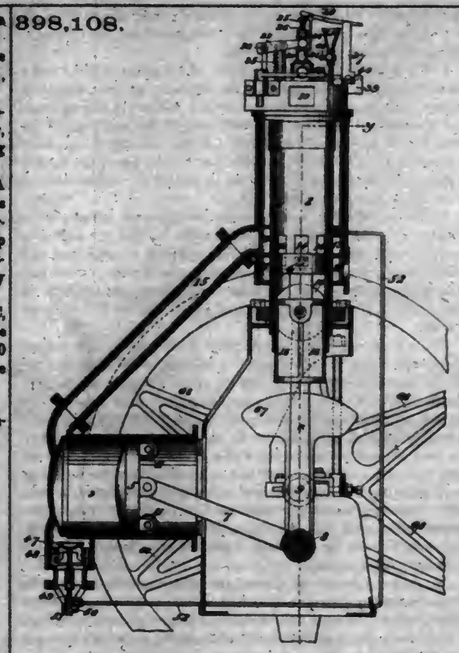
2. A bridge for stringed instruments, formed to present the bar *b*, having feet *a a'*, the bar *c*, the part b', and waist c^2, said bars being arranged substantially horizontal and the waists being slightly offset from the middle, thereby leaving one end of the bar *d* and the opposite end of the bar *c* free, substantially as and for the purposes set forth.

3. A bridge for stringed instruments, formed to present the horizontal bar *b*, having feet *a a'*, the foot *a* resting directly above the base-bar, and a crown portion, the connecting part b', and waist b^2, as described, whereby the entire bridge may vibrate or rock on the foot *a'*, substantially as described.

398,108. GAS-MOTOR. CARL T. A. H. WIESLING, New York, N. Y., assignor to John S. Connelly, Plainfield, N. J., and Thomas R. Connelly, Brooklyn, N. Y. Filed Dec. 22, 1887. Serial No. 258,736. (No model.)

Claim.—1. A gas-engine having a primary cylinder and a secondary cylinder, said cylinders having pistons and being connected, and the piston of the primary cylinder being driven in advance of the piston of the secondary cylinder, whereby the propelling energy of the charge acts first on the primary cylinder and then through the connecting-channel on the secondary cylinder, the said secondary cylinder being made of such capacity that the outstroke of the secondary piston shall reduce the tension of the exploded gases below that of the charge of the explosive gas and air which is supplied to the primary cylinder, thereby creating a suction by which the explosive charge shall be drawn into the primary cylinder, substantially as and for the purposes described.

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2. In a gas-engine, a lift disk-valve controlling an air-inlet port, a gas-channel passing through the disk of the lift-valve, and a second disk-valve seated on the disk of the air-valve and controlling the gas-inlet, substantially as and for the purposes described.

3. In a gas-engine, an air-inlet valve worked mechanically by action of the driven parts of the engine, and a gas-inlet valve, and an adjustable lever which is connected to the air-valve and arranged to move the gas-valve when the air-valve is moved, substantially as and for the purposes described.

4. A gas-engine having a primary cylinder and a secondary cylinder, said cylinders having pistons and being connected, whereby the propelling energy of the charge acts first on the primary cylinder and then through the connecting-channel on the secondary cylinder, the said secondary cylinder being made of such capacity that on the outstroke of the piston of the secondary cylinder the exploding gases, which first act expansively upon the said piston, shall afterward be reduced thereby to a tension below that of the charge of explosive gas and air which is supplied to the primary cylinder, thereby creating a suction by which the explosive charge shall be drawn into the primary cylinder, substantially as and for the purposes described.

5. In a gas-engine having a primary cylinder which is charged by suction of another cylinder, the combination of the primary cylinder and a secondary cylinder, said cylinders having pistons and being connected by a channel which is opened during the outstroke of the primary cylinder, the secondary cylinder being of such capacity that on the outstroke of the secondary piston the exploded gases, which first act expansively upon the said piston, shall afterward be reduced thereby to a tension below that of the explosive charge while the said cylinders are in communication, and an exhaust through which the gases are expelled by the return-stroke of the piston of the secondary cylinder, substantially as and for the purposes described.

6. In a gas-engine, the combination, with a primary explosion cylinder which is charged by suction of another cylinder, and a primary driving-piston, of a secondary cylinder and its piston, said cylinders communicating, and the piston of the primary cylinder in its passage opening and closing said communication, the piston of said primary cylinder being set to move in advance of the other piston, substantially as and for the purposes described.

7. In a gas-engine having a primary explosion-cylinder which is charged by the suction of another cylinder, the combination, with the primary cylinder and its piston, of a secondary cylinder and its piston, a port or channel which affords communication between the cyl-

inders and which is controlled by the primary piston, an exhaust-port, and a sliding valve on the piston which connects these ports, substantially as and for the purposes described.

8. The combination, in a gas-engine, of a primary cylinder and a secondary cylinder communicating therewith, so that the exploding gas shall exert its energy on the cylinders in succession, and an opening to the external air which is opened before the beginning of the entrance of the gases to the secondary cylinder, and also at the end of the action of the gas therein, whereby the burned gas in the secondary cylinder is interposed between layers of cold air, substantially as and for the purposes described.

9. The combination, in a gas-engine, of a primary cylinder and a secondary cylinder communicating therewith, so that the exploding gas shall exert a propelling force on the cylinders in succession, said cylinders having an air-inlet which is opened positively at each outstroke of the piston of the secondary cylinder to admit air to be mingled with the burned gas, substantially as and for the purposes described.

10. In a gas-engine, the combination of the primary and secondary cylinders which are connected by a passage, an inlet into the primary cylinder for the explosive charge, and a piston in the primary cylinder which on its outstroke opens communication between the cylinders and maintains the same until the gases in the cylinders, having first acted with propulsive force on the secondary piston, shall have been reduced in tension below that of the explosive charge, and which on its back-stroke cuts off said communication after the admission of the charge, as aforesaid, and during the remainder of its back-stroke compresses the charge, said secondary cylinder being in free communication with the atmosphere immediately before the communication between the cylinders is established, substantially as and for the purposes described.

11. A gas-engine having a valve operated by suction and a special cylinder communicating with the engine-cylinder, and having a piston connected with the stem of the valve, whereby the valve is shut through the pressure in the engine-cylinder, substantially as and for the purposes described.

12. A gas-engine having a primary cylinder and a secondary cylinder connected therewith and acting to create a suction in the primary cylinder for the indraft of the charge, and a suction-valve in the secondary cylinder which is opened when the pressure in the secondary cylinder falls below a certain limit, substantially as and for the purposes described.

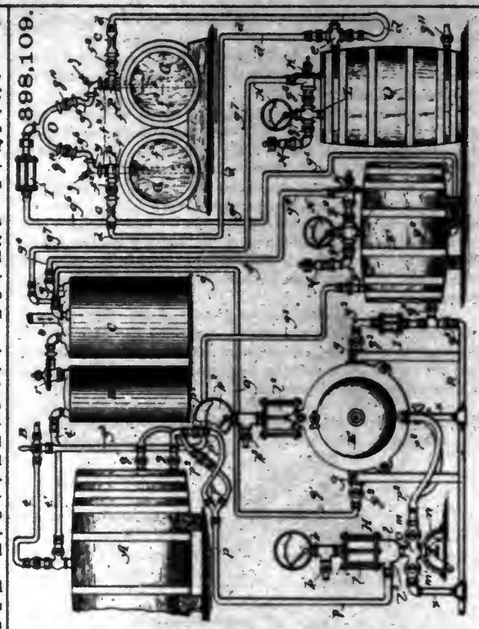
13. A gas-engine having a speed-governor, a primary cylinder provided with a valve for the admission of the explosive charge, which valve is controlled by action of the speed-governor, and a secondary cylinder which charges the primary cylinder with explosive mixture by suction when the said valve is opened, and an automatic inlet-valve in the secondary cylinder which opens by suction to admit air when the inlet-valve of the explosive charge is not opened, substantially as and for the purposes described.

14. A gas-engine having a primary high-pressure cylinder provided with an inlet for the explosive charge and a secondary low-pressure cylinder communicating therewith, said cylinders being provided with pistons, the piston of the latter expanding the partially-spent gases from the primary cylinder during the first part of its stroke and charging the primary cylinder by suction during the termination of its stroke, substantially as and for the purposes described.

15. In a gas-engine, the combination of a primary explosion-cylinder, a secondary cylinder connected therewith by a port, an exhaust-port, and a slide-valve on the piston of the primary cylinder, which in its passage connects the said ports, said slide-valve being separated from the piston by an intervening space which affords access of air to the first-named port before its connection with the exhaust-port by the slide-valve, substantially as and for the purposes described.

16. A gas-engine having a primary cylinder and a secondary cylinder which communicate with each other and are provided with pistons, the primary cylinder being in communication with the secondary cylinder during the outstroke of the piston of the latter and arranged so that the exploding gas shall exert a propelling force on the cylinders in succession, and that the gases shall then be so expanded in the secondary cylinder as to create a suction in the primary cylinder, an inlet for the explosive charge, a valve controlling the same, and mechanism which holds the said valve open at the time when the piston has moved sufficiently to create a suction in the primary cylinder, substantially as and for the purposes described.

398,109. APPARATUS FOR FILTERING AND FILLING LIQUIDS UNDER PRESSURE. Otto Zwietusch, Milwaukee, Wis. Filed Jan. 18, 1888. Serial No. 260,473. (No model.)



Claim.—1. In an apparatus for filtering liquids under pressure, the combination, with the vessel containing the liquid and with the outlet-pipe and filter, of a reservoir for containing an aeriform fluid under pressure controllably communicating with the filter, whereby the filter and its connections with the vessel containing the liquid may be supplied with such aeriform fluid under pressure to afford a yielding resistance to the advancing liquid, substantially as described.

2. In an apparatus for filtering and filling liquids under pressure, the combination, with the supply-vessel, discharge-conduit, and filter, of a vessel, F, interposed in the discharge-conduit between its outlet end and the filter and provided with a suitable vent, and a reservoir for an aeriform fluid under pressure controllably communicating with the interposed vessel, whereby the liquid in its progress enters the said vessel against a counteracting pressure of aeriform fluid, substantially as described.

3. In an apparatus for filtering and filling liquids under pressure, a filter and an intermediate vessel interposed in the conduit leading from the supply-vessel to the ultimate receptacles, and each provided with a suitable vent and communicating controllably with a reservoir for an aeriform fluid under pressure, substantially as described.

4. In combination with the vessel A and conduit leading therefrom to the ultimate receptacle, a filter interposed in the said conduit, a vessel also interposed in the said conduit, a suitable vent upon the said vessel, a reservoir for aeriform fluid under pressure controllably communicating with the said vessel, and counter-pressure mechanism between the said vessel and ultimate receptacle, substantially as described.

5. The combination, with the vessel A, of the main air-reservoir C, auxiliary reservoir D, a conduit connecting the two reservoirs, a pressure-reducing valve, *r*, in the said conduit, a conduit connecting the reservoir D with the upper part of the vessel A and provided with a valve, the discharge-conduit for beer leading from the vessel A, filter E, interposed in said discharge-conduit, and counter-pressure mechanism acting upon the filter, substantially as described.

6. The combination, with the vessel A, air-reservoir for forcing compressed air upon the surface of the beer in the vessel A, and discharge-conduit for beer leading from the vessel A, of the filter E, interposed in the said discharge-conduit, a vessel, F, beyond the filter and communicating therewith by means of the discharge-conduit and provided with a vent, and counter-pressure mechanism operating to retard the flow of liquid to and through the filter, substantially as described.

7. In an apparatus for filtering and filling liquids under pressure, a transparent receptacle interposed in the discharge-conduit between the supply-vessel and the filter and provided with a branch outlet, both the branch outlet and conduit being provided with stop-cocks, substantially as described, whereby the flowing liquid may be inspected on its way to the filter and diverted therefrom, if desired.

8. The foam-indicator H, comprising, in combination, the receiver *l l'*, in part transparent and provided with the upper and lower seats, h^3 and *h'*, for the ball-valve *h*, and with the pressure-gage and air-outlet *k k'* and liquid-inlet l^2, and the four-way casting *o*, having its lateral branches provided with cocks *n n'*, and the rod i^2, entering the vertical branches through a stuffing-box, *i*, substantially as described.

9. The four-way bung L, provided on its three upper branches with a pressure-gage, a pressure-reducing valve, and a pressure-relief valve, and having stop-cocks q^6 and q^5, substantially as described.

10. The combination, with the vessel A, air-reservoir, filter, and connecting-pipes suitably provided with stop-cocks, of the pipe g^7, connecting the filter with the air-reservoir and provided with a valve for controlling the flow, substantially as described.

11. The vessel F, interposed in the discharge-conduit of the vessel A and provided with a pressure-relief valve, in combination with a pipe, g^8, connecting the vessel F with the common conduit B of the bunging apparatus and provided with a valve for controlling the flow, substantially as described.

12. In combination with the vessel A and its discharge-conduit and with the air-reservoir communicating with the vessel A, the vessel F, interposed in the discharge-conduit and provided with a pressure-relief valve and pressure-gage, and the pipe g^9, connecting the vessel F with the air-reservoir and provided with a pressure-regulating valve, substantially as described.

13. The filling-bung P, comprising the body *f*, having its internal passage enlarged below a point, f', packing f^2, screw-collar f^3, and outlet f^{12}, provided with a stop-cock, in combination with the tube f^{13}, having the air-cock *z*, substantially as described.

14. In combination with the discharge-conduit of the vessel A, the T-cock O, branches g^8 and g^9 of the discharge-conduit, filling-bungs P upon the separate branches, vessel Q, provided with the T-cock *e* and with the pressure-gage N and the pressure-relief valve M, and pressure-reducing valve K, having suitable stop-cocks, pipes *c d*, connecting the filling-bungs with the T-cock *e*, air-reservoir C, and pipe g^9, leading from the air-reservoir to the pressure-reducing valve K, substantially as described.

15. The discharge-conduit *p*, having at its ingress end the branches p', provided with stop-cocks p^3, whereby separate supply-vessels may be successively emptied without interruption of the flow, substantially as described.

16. The combination of the cask A, a receptacle into which the beer in the cask A is to be transferred, and a discharge-conduit, *p*, connecting the cask A with the said receptacle, and provided at its ingress end with two branches, p', having stop-cocks p^3, whereby one of said branches may be connected to an adjacent cask before the other is detached from the cask A, and the discharge thus rendered continuous, substantially as described.

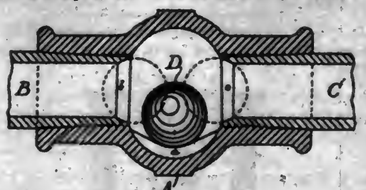
17. The vessel A, provided with discharge-cocks *q q'* at different levels, in combination with the discharge-pipe *p*, having separate branches p', provided with stop-cocks p^3, substantially as described.

398,110. FILTERING MATERIAL. Otto Zwietusch, Milwaukee, Wis. Filed July 16, 1888. Serial No. 280,065. (No specimens.)



Claim.—As a new article of manufacture for filtering purposes, a compressed block of comminuted and purified wood fiber, substantially as described.

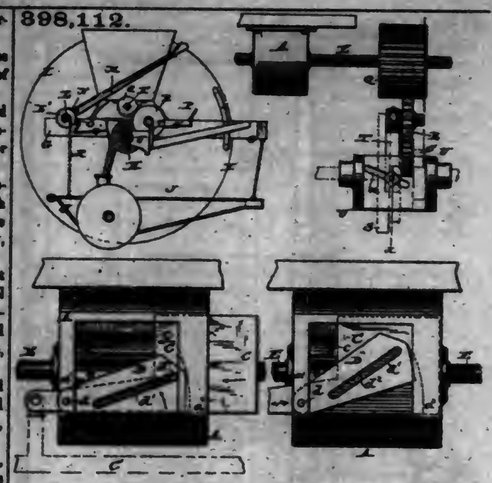
398,111. AUTOMATIC VALVE AND COUPLING. Arthur V. Ador, Chester, N. J., and Frank C. F. Kraak, New York, N. Y., assignors, by mesne assignments, to the National Heating Company, New York, N. Y. Filed July 30, 1887. Serial No. 245,677. (No model.)



Claim.—1. The combination, with a coupler having a central globular chamber provided with inclined or concave ribs or ways extending longitudinally of the lower part of said chamber, of a ball-valve, substantially as described.

2. The combination, with a coupler having a central globular chamber provided with inclined or concave ribs or ways extending longitudinally of the lower part of said chamber and guides *c'* extending laterally and upwardly from the outer side of each rib or way, of a ball-valve, substantially as described.

398,112. SEEDING-MACHINE. William D. Arney, Springfield, Ohio. Filed May 19, 1888. Serial No. 274,257. (No model.)



Claim.—1. The feed-roll and the feed-cup having the delivery-opening *c*, in combination with the gate C, to reduce the width of the opening, and the co-operating gate D, to vary the angle of the lower edge of the opening, substantially as described.

2. In a seeding-machine, the axle and its cone-gear and the feeder-shaft and its cylindrical gear, in combination with the intermediate idle-pinion, R, the slotted block U, loosely mounted on the axle, and the pinion-supporting arm T, connected with the block U by means of the rib and groove, as shown.

3. In a seeding-machine, the main frame whereon the driver rides, as usual, and the drag-bars hinged thereto, in combination with the winding-roll and chains at the rear end of the frame, the ratchet-wheel on said roll, its actuating-pawl, the pawl-carrying hand-lever extended forward in reach of the rider, the locking-dog engaging the ratchet-wheel, the rod extending thence forward, and the foot-lever for operating the rod, located on the forward end of the frame, whereby the driver is enabled to lift the drag-bars by short vibrations of the lever.

398,113. MACHINE FOR SAWING STONE. Armand Absolye, Paris, France. Filed Feb. 23, 1888. Serial No. 264,917. (No model.) Patented in France Mar. 30, 1888, No. 174,886; in Belgium Mar. 30, 1888, No. 73,843; in England May 6, 1887, No. 6,804, and in Italy May 12, 1887, No. 21,672.

Claim.—1. The combination, in a stone-sawing machine, of the foundation-plate, the vertical supports, the horizontal cutting-frame, and gearing for adjusting the cutting-frame vertically with the elevated platforms fixed upon the standards above the cutting-frame, the grit and water boxes on said platforms, and flexible distributing-tubes leading therefrom to the cutting mechanism.

2. The combination, in a stone-cutting machine, of the cutting-band and adjustable guides located at either side of the stone to be cut, with the longitudinally-moving rods carrying the guides and gearing for adjusting the rods at will.

3. The combination of a cutting-band, a drum around which the band passes, and an adjustable guide on each side of the drum with a shaft and operating-connections between the shaft and guides, whereby both guides are adjusted simultaneously.

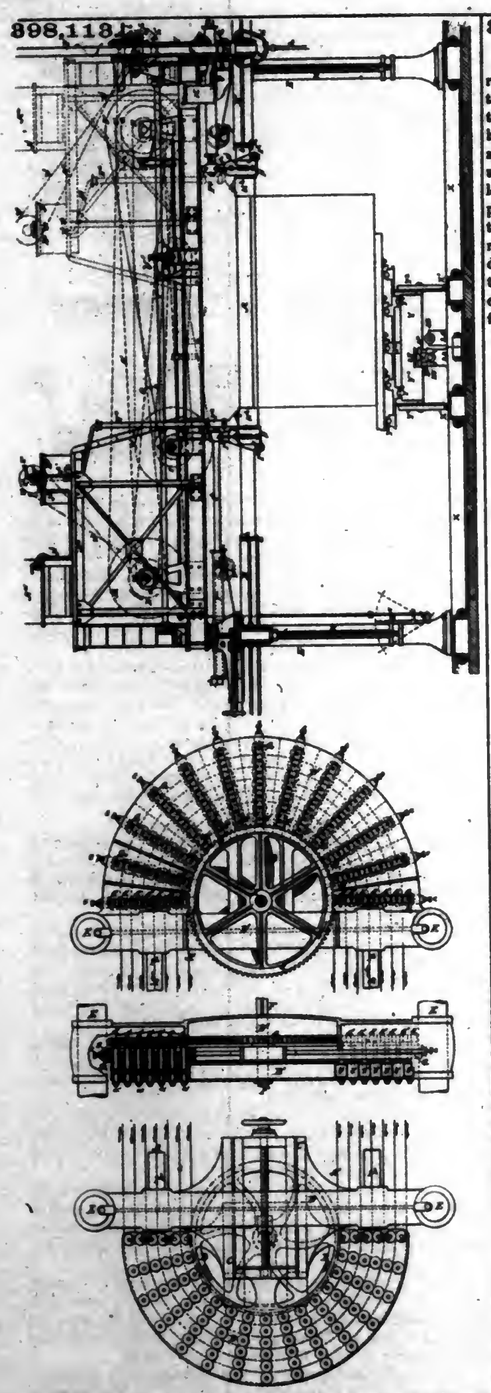
4. In a stone-sawing machine, the combination of the drum B', which drives the cutting-blade, and the support therefor, provided with cap-bearing G, with a cistern, H, containing a suitable lubricant, and pipes conveying the lubricant to and away from the bearing, substantially as described.

5. In a stone-sawing machine, the combination of the cutting-band and the horizontal drums around which the band passes with separate flanges upon the drums projecting beyond the band and holding it in place, and fastening devices attaching the flanges to the drums, whereby the removal of the band is facilitated.

6. In a stone-cutting machine, the combination of the truck movable relatively to the cutting-blade and carrying the stone to be operated upon with the traveling nut and gear for moving said nut, and a suitable lock, one member of which is carried by the truck and the other by the nut, whereby the truck may be secured to the nut and be controlled in its movement thereby.

7. In a stone-sawing machine, the combination of the supports carrying the main driving-drum and a plurality of smaller rollers suitably journaled thereupon with a plurality of cutting bands or blades passing around and driven by the said drum and rollers, and power-

398,113.

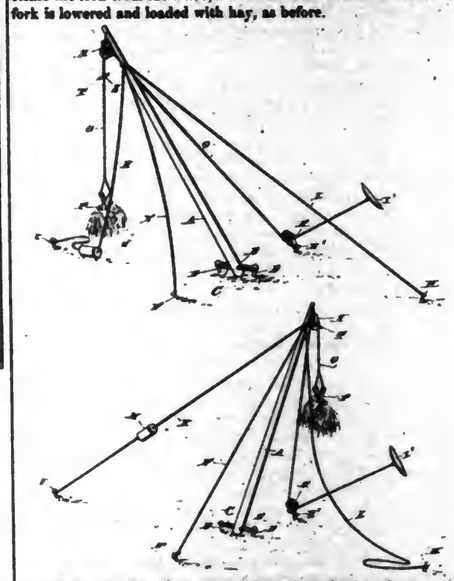


transmitting gear between the drum and the rollers, substantially as described.

3. In a stone-sawing machine, the combination of a plurality of cutting bands or blades with a series of supporting-rollers arranged concentrically, around which the blades pass, and power-transmitting gear between the different rollers, whereby they are all driven by a single power-shaft, and adjacent blades moving in opposite directions, substantially as described.

398,114. HAY-STACKER. HENRY A. BARKELEW, Williamstown, Mo. Filed Oct. 31, 1888. Serial No. 289,992. (No model.)

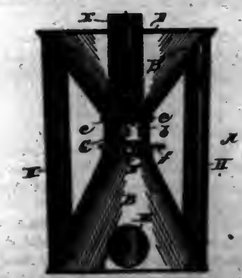
Brief.—When the pole is in the position shown, Fig. 1, with the rope L taut and the rope K slack, the block N is over the point where the fork is loaded. The elevating-rope is then drawn outward from the block R until gage T strikes the block N and the loaded fork has been elevated a sufficient distance to clear the top of the stack, and as the elevating-rope continues to be drawn outward it swings the upper end of the pole toward the stake-pin H, and thereby carries the loaded fork over the stack. By stopping the horse the fork may be poised at any desired point above the stack. As the pole moves in this direction the rope L slackens and the rope K becomes taut and raises weight M. The hay is discharged from the fork at any point desired on the top of the stack, and the horse is then backed, when the weight M swings the pole backward to its initial position and clears the fork from the stack, and as the horse continues to back the fork is lowered and loaded with hay, as before.



Claim.—1. In a hay-stacker, the pole A, having the transverse opening in its lower end, the rope-loop C in the said opening, and the stake-pins D, driven into the ground on opposite sides of the lower end of the pole and engaging the said loop, substantially as described.

2. The combination, in a hay-stacker, of the leaning pole A, having the transverse opening in its lower end, the loop C in said opening, and the stake-pins D, driven in the ground on opposite sides of the lower end of the pole and engaging the loop, the guy-ropes connected to the pole, whereby it is adapted to be swung in either direction, one of said guy-ropes having the weight M, the block suspended from the upper end of the pole, and the elevating-rope engaging the block, said rope having the gage T secured thereto at a suitable point and adapted to come in contact with the block, for the purpose set forth, substantially as described.

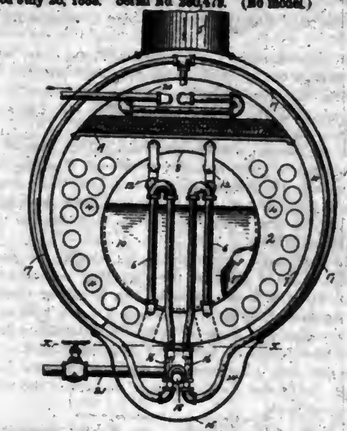
398,115. HEATING DRUM OR RADIATOR. NEBRASKUS H. BARBER, Wahoo, Nebr. Filed Oct. 30, 1888. Serial No. 289,551. (No model.)



Claim.—1. In a heating drum or radiator, the combination of the casing comprising the lower conical section and the inverted conical upper section, the spaces of the said sections being connected by neck *b*, the outlet-pipe passing through the closed upper end of the upper section and extending into the said neck, whereby an annular passage, *c*, is formed, the valve G, arranged in the neck below the lower end of the outlet-pipe, and the approximately vertical fines H H, connecting the bases of the said sections, substantially as and for the purpose specified.

2. In a heating drum or radiator, the combination of the upper and lower conical sections, having their adjacent apexes connected by a neck in which is arranged a valve, the vertical central pipe extending downward into the said neck and terminating above the valve, and the outside vertical fines connecting the remote ends of the sections, substantially as specified.

398,116. STEAM-BOILER. ANDRIAN I. BARRANOFF, Bangor, Me. Filed July 20, 1888. Serial No. 280,479. (No model.)

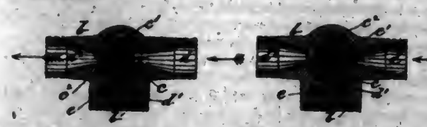


Claim.—1. In an annular boiler, as described, the combination, with said boiler 2, its fines 4 4, the bridge-wall 10 interiorly thereof, and the circulating-pipe 6, which connects the upper and lower water-spaces, and having the horizontal extension 12 in rear of and above the bridge-wall, of the injector 16 and its steam-pipe 17, substantially as specified.

2. The combination, with the boiler 2, bridge-wall 10, the circulating-pipes 6 in rear thereof, which connect the upper and lower water-spaces, and the injectors 16, co-operating with said circulating-pipes, of the jacket 15 and the steam-pipes 17 exteriorly of the boiler, each of which supplies an injector, for purposes substantially as herein set forth.

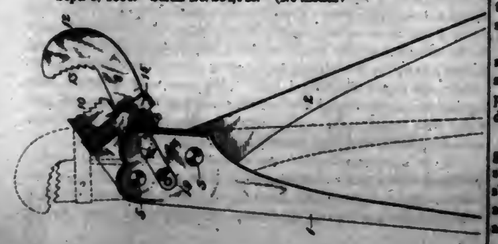
3. The boiler 2, provided with the fines 4 4, bridge-wall 10, partition 19, and jacket 15, combined with the steam-pipes 17, leading from the steam-space and exteriorly of the boiler to the injectors, and the circulating-pipes 6, which connect the lower and upper water-spaces of said boiler, substantially as herein set forth.

398,117. COCK. GUSTAV A. BARTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Dec. 6, 1888. Serial No. 292,823. (No model.)



Claim.—In a cock, the combination of a plug, *c*, having openings c c^2, and shell *b*, having openings d d^2 d^3, with a pocket, *e*, and outlet-passage e^2, formed in said shell, substantially as shown, and for the purpose described.

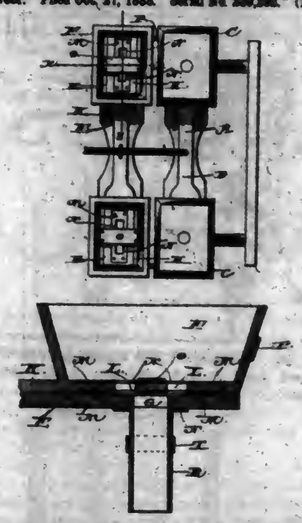
398,118. PIPE-WRENCH. MARTIN V. BARTON, Bath, N. Y. Filed Sept. 5, 1888. Serial No. 284,640. (No model.)



Claim.—1. In a pipe-wrench, a pair of pivoted jaws arranged side by side and having curved shoulders disposed in the same direction, in combination with a pivoted lever having a central cam adapted to remain between the two jaws when closed, and having an end cam, the two being adapted for operation against their respective shoulders when in the act of opening, substantially as specified.

2. The lever 1, having the transverse opening and having the lever 2, formed with the cams 16 and 17, and pivoted, as at 3, in said opening, in combination with the jaws 7 and 8, pivoted, as at 5 and 6, and having the shoulders 9 and 14, and having the band 15, fixed to the jaw 7 and loosely embracing the jaw 8, substantially as specified.

398,119. POTATO-PLANTING ATTACHMENT. OLLIE BAUGH, Tobias, Nebr. Filed Oct. 27, 1888. Serial No. 289,262. (No model.)



Claim.—1. In a potato-planter, the hoppers having the discharge-opening and the plates O, arranged above said opening, said plates being arranged transversely in the hopper and having their edges sharpened, in combination with the reciprocating slide-bar K, having the openings L, adapted to register with the discharge-opening of the hopper, and the plates M, secured on the upper and lower sides of said slide-bar, and having the openings N coincident with the openings L, substantially as described.

2. A potato-planting attachment to corn-hoppers, comprising the board E, the hoppers F on the ends thereof, said board having the openings G in its ends, the spouts depending from said board and registering with said openings, the cutter-plates O, arranged transversely in the hoppers above the openings G, the slide-bar K in the bottoms of the hoppers under the cutter-plates and having the openings L, adapted to register with the openings G, the bracket-arms adapted to be bolted to the hoppers F and to the corn-hoppers to secure the former in rear of the latter, and the clip-bolts to secure the spouts to the depending corn-spouts, substantially as described.

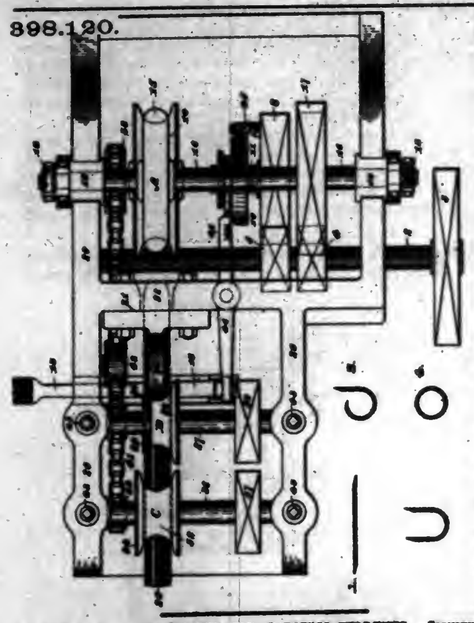
398,120. MACHINE FOR FORMING SKELP-IRON. CHRIST BERGER, Pittsburg, Pa., assignor of one-half to Ebenezer R. Matthews, same place. Filed Feb. 27, 1888. Serial No. 265,463. (No model.)

Claim.—1. In a machine for forming skelp-iron, the combination of tongue and groove rollers, a mandrel, a pair of single-flange rollers at one end of the mandrel, and a pair of double-flanged rollers at the other or delivery end, the mandrel being arranged between the upper and lower members of the two pairs of rollers and sustaining the skelp as it is formed about it by the rollers, substantially as described.

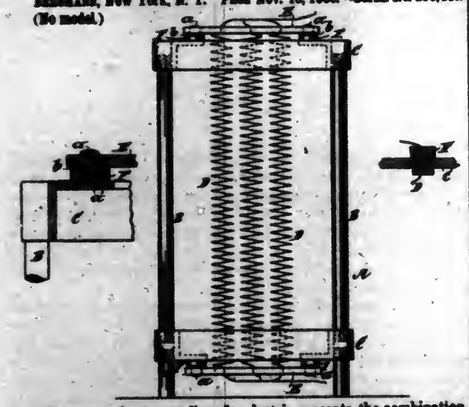
2. In a machine for forming skelp-iron, the combination of tongue and groove rollers, a shaft for the tongue-roller, movable bearings for said shaft, and crank-connections for said shaft, with a rotary shaft periodically to raise and lower the tongue-roller shaft, substantially as described.

3. In a machine for forming skelp-iron, the combination of a grooved roller, a tongued roller mounted on a vertically-movable shaft, cam crank-arms connected with the movable shaft, a power-shaft, a clutch for connecting the power-shaft with the power mechanism, and a cam for throwing the clutch out of gear, substantially as and for the purposes specified.

398,120.



398,121. EQUALIZER FOR ELECTRIC CURRENTS. SIGMUND BERGMANN, New York, N. Y. Filed Nov. 10, 1888. Serial No. 290,447. (No model.)



Claim.—1. In an equalizer for electric currents, the combination, with the coils, of the metal frame comprising the uprights having the threaded ends, the end castings or plates having threaded openings engaging the uprights, and the insulators in said end castings or plates, substantially as specified.

2. In an equalizer for electric currents, the combination, with the coils, of the metal uprights, the metal end plates secured thereto having the openings, and the perforated insulators in said openings receiving the ends of the coils, substantially as specified.

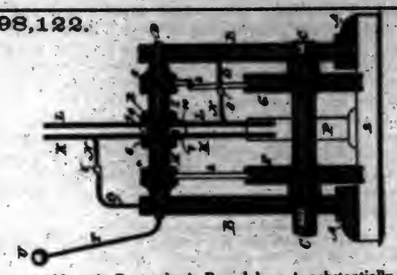
3. In an equalizer for electric currents, the combination, with the resistance-coils and the metal frame, of the transverse metal strips, the insulators between said strips and the frame, and disks of flexible material interposed between the insulators and the transverse strips substantially as specified.

4. In an electrical equalizer, the combination, with the coils and the metal frame, of the transverse strips having the openings, the insulators between the strips and the frame having the projection, and the flexible washer surrounding said projection below the lower face of the transverse strips, substantially as specified.

398,122. STATIC-INDUCTION GENERATOR. EDWARD T. BIRGE, New York, N. Y. Filed Nov. 14, 1888. Serial No. 290,788. (No model.)

Claim.—1. The glass disks K and L, having varnished surfaces and provided with strips of foil and each having a central notched opening, in combination with the wooden hubs H I, fitting into the central openings in the respective disks and secured by screws, and

398,122.



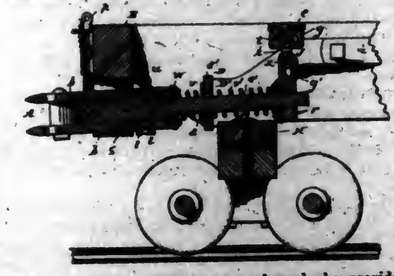
the removable axis D, standards B, and base A, substantially as set forth.

2. The knobs R, combs S, and cylinders 10, cast in one and having holes through the knobs, in combination with the glass rods Q, around which the cylinders 10 are cast, and the wires T, passing through the holes of the knobs R and provided with knobs or electrodes U upon their ends, substantially as set forth.

3. The combination, with the glass disks and the respective tubular hubs to which they are connected, of the axis D, passing through the hubs, the base A, and standards B, and the arms O and brushes N, the standards being slotted or saw-cut diagonally for the reception of the arms, and the arms being perforated for the passage of the axis, substantially as set forth.

4. The combination, in the electric machine, of the glass disks K L, wooden hubs H I, to which the glass disks are connected, the base A and standards B, the removable axis D, passing through the hubs and standards, the shaft C, belt-wheels F G, and belts to pulleys upon the respective hubs, the arms O within diagonal slots in the standards, the brushes N upon the ends of the arms, the knobs R and combs S, and the glass rods Q, for supporting the same, the wires T, passing through the knobs, and the electrodes at the ends of the wires, substantially as set forth.

398,123. CAR-COUPLING. JOHN M. BOOUR, Gouverneur, N. Y. Filed June 5, 1888. Serial No. 276,119. (No model.)



Claim.—1. In a car-coupler, a recessed coupler-bar provided with a nut, *r*, having a rigid piece, *g*, secured thereto, in combination with a link, *i*, and a second rigid piece, *g'*, secured to a supporting-bar, *c*, a rigid piece *f* having an oblong perforation, the longer axis of said rigid pieces *f* having an oblong perforation, the longer axis of which extends in the direction of the track, said link *i* being pivoted to said rigid piece *g* and *g'* by one pivot-pin extending through said oblong perforation, substantially as and for the purposes specified.

2. In a car-coupler, a recessed coupler-bar provided with a nut, *r*, having a rigid piece, *g*, secured thereto, in combination with a link, *i*, and a second rigid piece, *g'*, secured to a supporting-bar, *c*, said rigid piece *f* having an oblong perforation, the longer axis of which extends in the direction of the track, said link *i* being pivoted to said rigid pieces *g* and *g'* by one pivot-pin extending through said oblong perforation, and a pair of levers, L and L', the inner ends of which bear against the under side of the coupler-bar and the outer ends provided with handles, substantially as and for the purposes specified.

3. In a car-coupler, a recessed coupling-bar provided with a nut, *r*, having a rigid piece, *g*, secured thereto, in combination with a link, *i*, and a second rigid piece, *g'*, secured to a supporting-bar, *c*, said rigid piece *f* having an oblong perforation, the longer axis of which extends in the direction of the track, said link *i* being pivoted to said rigid pieces *g* and *g'* by one pivot-pin extending through said oblong perforation, and a pair of levers, L and L', the inner ends of which bear against the under side of the coupling-bar and the outer ends provided with handles, one of said levers having an auxiliary foot-post extending up through the platform, substantially as described.

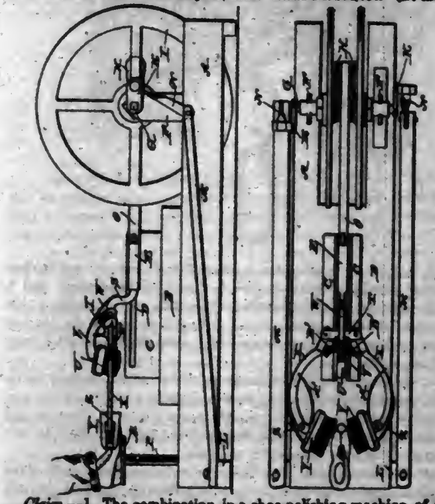
4. In a car-coupler, the combination of a recessed coupler-bar provided with a nut, *r*, having a rigid piece, *g*, secured thereto, with a link, *i*, and a second rigid piece, *g'*, secured to a supporting-bar, *c*, said rigid piece *f* having an oblong perforation, the longer axis of

which extends in the direction of the track, said link *i* being pivoted to said rigid pieces *g* and *g'* by one pivot-pin extending through said oblong perforation, and a buffer-guard having perforated lips, which are adapted to embrace the perforated jaws of the coupling, the perforations in the buffer registering with those of the coupling, substantially as described.

5. In a car-coupler, a pair of coupler-bars supported at their rear ends by a toggle-joint and supported near their jaws by saddles, and free to move vertically and horizontally within predetermined limits, in combination with bridle D, and coiled springs encircling the coupler-bars and abutting against the bridle from opposite sides, substantially as and for the purposes specified.

6. In a car-coupler, a pair of coupler-bars supported at their rear ends by toggle-joints and supported near their jaws by saddles, and free to move vertically and horizontally within predetermined limits, in combination with bridle D, and a disk, W, loosely mounted on the coupler-bar, and a coiled spring between said disk and bridle, and a second coiled spring between said bridle and the toggle-joint, all constructed and combined to operate substantially as described.

398,124. MACHINE FOR POLISHING SHOES. JOSEPH D. EBERT, Lampasas, Tex. Filed May 28, 1888. Serial No. 274,787. (No model.)



Claim.—1. The combination, in a shoe-polishing machine, of the reciprocating slide or cross-head, the pivoted arms connected thereto, the springs bearing on the said arms, and the brushes attached to the free end of the said arms by pivotal connections, substantially as described.

2. The combination, in a boot and shoe polishing machine, of the support for the boot or shoe, the reciprocating cross-head or slide, the arms pivoted thereto and arranged with relation to the support, the springs bearing on the said arms, for the purpose set forth, and the brushes connected to said arms, substantially as described.

3. The combination, in a machine for polishing boots and shoes, of the reciprocating slide or cross-head E, the arms X, pivoted thereto, the springs keeping said arms normally pressed toward each other, the brushes Y, hinged or pivoted to the rear free end of the arms, and the springs Z and A', extending from the arms X and bearing against the backs of the brushes at points in front and rear of the pivots thereof, substantially as described.

398,125. SHAWL-STRAP. DARIUS W. BROKAW, Dover, Me. Filed Dec. 26, 1888. Serial No. 294,841. (No model.)



Claim.—1. In a shawl-strap, the combination, with the bundle-inclosing straps and a handle, of a base-rod circular in cross-section, made in three parts, arranged end to end, and connected together by dowel-pins or tenons and sockets, and provided with circumferential grooves to receive the bundle-inclosing straps, and having spaces between the ends or shoulders of the several parts to receive the ends of the handle.

2. In a shawl-strap, the combination of a base-rod composed of three parts arranged end to end and connected together by dowel-pins or tenons and sockets, a plurality of bundle-inclosing straps secured in fixed positions longitudinally on said base-rod, and a bent handle having a hole in each end, through which the dowel-pins or tenons pass to connect said handle and rod.

3. In a shawl-strap, the combination of a base-rod made circular in cross-section and provided with a plurality of annular grooves, a plurality of bundle-encircling straps, each having one end thereof wrapped around said rod in one of said grooves, with the end secured to the main body of said strap, thus forming a loop freely movable about said rod, and a buckle attached to the looped end of each of said straps and held in place by having its bar confined between said rod and the surrounding loop of the strap.

398,126. EAR-RING. LUTHER P. BROOKS, Boston, Mass. Filed June 21, 1886. Serial No. 205,303. (No model.)

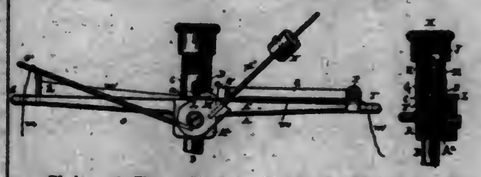


Claim.—1. The combination of the loop and drop and the connection or bearing between them, consisting of two opposed pieces of hard metal having their straight horizontal bearing-edges arranged transversely to each other.

2. The combination of the loop and drop and the connection or bearing between them, consisting of two opposed pieces of steel or other hard metal having straight horizontal knife-edges arranged transversely to each other.

3. In an ear-ring setting, the combination of a supporting ring or loop having a slot formed therein, and a hard-metal plate or bearing-piece secured in said slot having a straight horizontal bearing-edge which extends across the opening in the ring or loop parallel with the chord of its curve.

398,127. TENSION DEVICE FOR KNITTING-MACHINES, &c. FREEMAN A. CALLET, Pawtucket, R. I., assignor to the H. Jenks Manufacturing Company, same place. Filed July 27, 1887. Serial No. 245,416. (No model.)



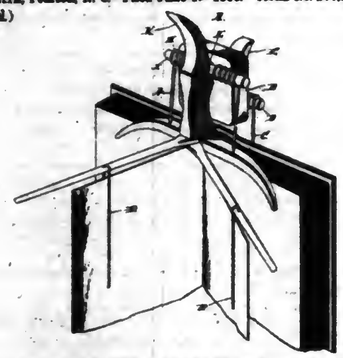
Claim.—1. The combination, with a bar having thread-guiding eyes, of a tubular standard on the bar, a tubular sliding block in the standard, which block has a bottom aperture, and a packing-piece—such as felt or cotton waste—in said block, substantially as set forth.

2. The combination, with a bar having thread-guiding eyes, of a tubular standard provided with apertures for the passage of the thread, a sliding block in said standard, a pin projecting from the block through a slot in the standard, a cam pivoted on the side of the bar, which cam can act on the pin of the sliding block, a weighted arm on the cam, and an arm provided with an eye on the cam, substantially as set forth.

3. The combination, with a bar having thread-guiding eyes, of a tubular standard provided with apertures for the passage of the thread, a sliding block in the standard, a lever pivoted on one end of the bar and having its swinging end resting on the top of the bar, a cam acting on said lever and on the sliding block, which cam is provided with a weighted arm, and an arm having an eye, substantially as set forth.

4. The combination, with a bar, A, having opposite thread-guiding eyes, the leg P on one end of the arm, the lever Q, pivoted on said leg and provided with a laterally-projecting lug, Q', on its swinging end, the cam M, pivoted to the side of the bar and provided with a weighted arm, M', and the arm O, having an eye, the tubular standard C on the bar, a sliding block in said standard, and a pin projecting from the sliding block through a slot in the standard, which pin rests on cam M, substantially as set forth.

398,128. MUSIC-BOOK HOLDER. JAMES P. CASTON and LEONIDAS C. SMITH, Polkton, N. C. Filed June 19 1888. Serial No. 277,573. (No model.)

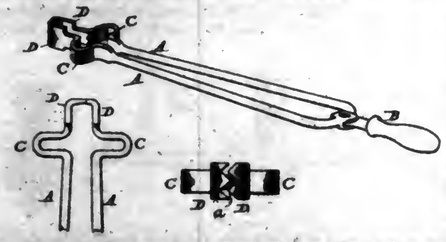


Claim.—1. In a music-book holder, the combination, with a suitable block or body, of the front spring-actuated pressure-lever pivoted to the block near its upper edge, and the rear spring-actuated lever pivoted to the block near its lower edge, substantially as specified.

2. In a music-book holder, the combination of the block, the registering spring-coils B B, secured to the rear side of the block near its lower edge and provided with the integral arms C C, the registering spring-coils H H, arranged on the front side of the block near its upper edge and provided with integral arms N, the transverse spindles D and I, engaging the coils B and H, respectively, and the pressure-levers E and K, mounted, respectively, on the said spindles and provided with transverse pressure-bars, to which are attached the extremities of the arms C and N, respectively, substantially as specified.

3. In a music-book holder, the combination of the block A, the registering spring-coils B B on its rear side, having arms C C, the registering spring-coils H H on its front side, having the arms N, the revoluble spindles D I, arranged, respectively, in the said registering coils, the front and rear pressure-levers provided with loops engaging the said spindles and connected to the arms C and N, the swinging arms O, pivoted to the lower end of the front lever, and the depending parallel wire fingers P P, attached to the swinging arms and adapted to engage on opposite sides of a page, substantially as specified.

398,129. COMBINATION-TONGS. JOHN H. COOK, Washington, D. C. Filed Feb. 23, 1888. Serial No. 264,902. (No model.)



Claim.—1. The tongs herein described, comprising a pair of pivoted levers, each having a lateral U-shaped arm near its end and an extension, D, beyond the lateral arms provided with teeth or notches.

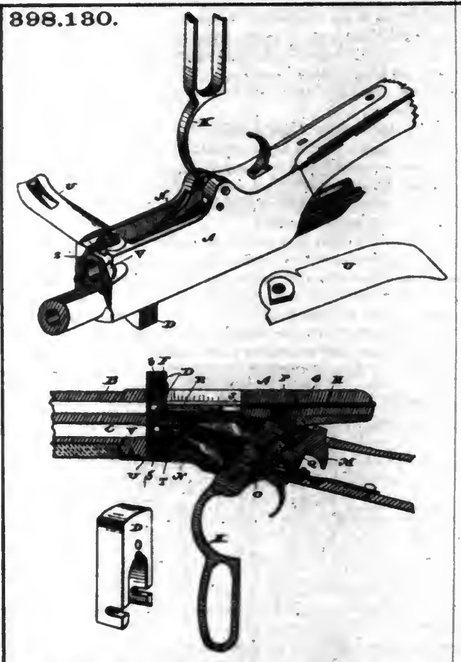
2. The tongs herein described, comprising the pivoted levers A A, provided with the U-shaped arms C C, one of said arms being provided with a curved arm or extension, D.

398,130. MAGAZINE FIRE-ARM. WILLIAM M. COOPER and EDWIN J. CASHMORE, Toronto, Ontario, Canada; said Cashmore assignor to said Cooper. Filed July 7, 1883. Serial No. 279,360. (No model.) Patented in England July 17, 1883, No. 10,394; in Canada Aug. 1, 1883, No. 20,615; in Belgium Aug. 31, 1883, No. 63,254; in Italy Sept. 20, 1883, XXII, 23,856, XLVII, 130, and in France Sept. 25, 1883, No. 160,053.

Claim.—1. In a rifle having a magazine beneath the barrel, a recoil-block cut away to form vertical legs, and an opening between said legs for the passage of the cartridge from the magazine to the carrier when the block is in its normal position and from the carrier to the barrel when the block is elevated, as set forth.

2. The combination, with the barrel of a repeating-rifle, of a bifurcated recoil-block located between the end of the barrel and the case containing the action of the repeater, and a pivoted carrier having its forward end within the vertical slot in the breech-block and guided by the vertical portions of said block, substantially as described.

3. A vertically-adjustable recoil-block fitted into the case immediately behind the inner end of the barrel of the rifle, in combination with an inclined firing-needle inserted into the recoil-block, and a plunger disconnected from the block, movable at right angles to the movement of the recoil-block, and arranged to convey the blow of the hammer to the cap of the cartridge, substantially as and for the purpose specified.



4. A cartridge-magazine made parallel with and forming an integral part of a rifle-barrel, in combination with a half-round bayonet having a shank formed to fit onto the magazine, and a clip arranged to connect the neck of the bayonet with the barrel of the rifle, substantially as and for the purpose specified.

5. The combination, with the barrel and the sliding bolt G, of the extractor endwise movable through a portion of said bolt, and the trigger-guard lever engaging said bolt and extractor to move the same forward, substantially as described.

6. The combination, with the sliding bolt G, formed with horn P, of the extractor J, endwise movable in the forward portion of said bolt, and the pivoted trigger-guard lever K, having its inner end arranged to engage said horn to throw the bolt in one direction and to engage and throw the extractor and bolt in the opposite direction, substantially as described.

7. The combination, with the trigger-guard lever formed with the lug O, of the recoil-block D, forward of the pivot of said lever, and the lever N, pivoted forward of the trigger-guard lever and at the rear of and engaging said block, with its short arm arranged in the path of and designed to be operated by said lug to raise the block, substantially as described.

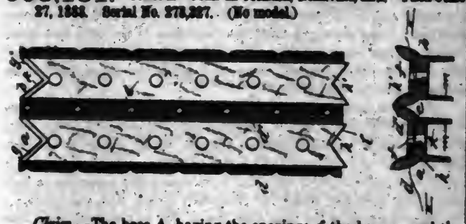
8. The combination, with the barrel, the recoil-block, and the pivoted carrier beneath said block, of the lever N, engaging and acting on said block to raise the same, and the pivoted trigger-guard lever having bearings which engage first with the lever N to throw up the block and then with the carrier, substantially as described.

9. The pivoted carrier R, having a tail, Q, formed on it, in combination with the recoil-block D, the pivoted lever N, and the pivoted trigger-guard lever K, having bearings at different distances from its pivot, one engaging said lever N and the other said tail, both of said levers being pivoted forward of the pivot of the carrier, substantially as and for the purpose specified.

10. The combination, with the rifle body or case having an opening in its bottom in front of the trigger-guard lever, of a cover, U, pivoted to said body on a vertical pivot and arranged to swing horizontally and completely close such opening, substantially as described.

11. The combination, with the rifle body or case provided with a magazine having an opening in its bottom in front of the trigger-guard lever, of a cover, U, for closing said opening, formed with a vertical angular hub, and a spring-plate, 2, on the body acting on said hub, substantially as and for the purpose specified.

398,131. GRATE. JOHN A. CHERRY, Rockville, Ark. Filed June 27, 1888. Serial No. 278,227. (No model.)



Claim.—The base A, having the openings *f*, the bars *m*, and the solid flanges *d* and *d'*, said flanges having openings only in the outer edges thereof, in combination with the sliding damper A, provided with openings communicating with the openings *f'*, and adapted to close the same, substantially as described, and for the purpose set forth.

398,132. GALVANIC BATTERY. REES D. CROSS, Chicago, Ill. Filed Aug. 2, 1888. Serial No. 281,830. (No model.)



Claim.—1. In a galvanic battery, the negative electrode separated into two parts, which are electrically connected together and respectively arranged in separate cells, whereof one contains an excitant, in combination with a tube arranged to conduct the fumes from the cell that contains the excitant and discharge the same into the remaining one of said two cells, substantially as set forth.

2. In a galvanic battery, the negative electrode separated into two parts, which are electrically connected together and respectively arranged in separate cells, whereof one contains an excitant, in combination with a tube arranged to conduct the fumes from the cell that contains the excitant and discharge the same into the other cell, which latter contains a vehicle capable of being impregnated with the fumes, so as to provide therein an excitant due to the fumes from the cell wherein they are first generated, substantially as set forth.

3. In a galvanic battery, a carbon electrode consisting of two sets of carbon tubes, which are electrically connected together and respectively arranged in separate cells, whereof one contains an excitant, in combination with a tube arranged to conduct the fumes from the cell that contains the excitant and discharge the fumes into the other cell, substantially as set forth.

4. In a galvanic battery, the negative electrode separated into two parts, which are electrically connected together and respectively arranged in separate cells, whereof one contains an excitant, in combination with a tube arranged to conduct the fumes from the cell containing the excitant and discharge such fumes into the other cell, and a packing of charcoal and asbestus in the latter cell, substantially as and for the purpose set forth.

5. In a galvanic battery, a carbon electrode formed of carbon tubes, each having a longitudinally-formed slot or opening, for the purpose set forth.

6. In a galvanic battery, the combination, with a couple of cells, each having a carbon cover, of a couple of sets of carbon tubes respectively arranged within one and the other of said cells and attached to the carbon covers, said covers being electrically connected together, substantially as set forth.

7. In a galvanic battery, the combination, substantially as hereinbefore set forth, of three concentric cells, a carbon electrode separated into two parts, which are electrically connected together, with one part arranged in the central cell and the other in the extreme outer cell, a zinc electrode arranged within the intermediate cell, and a tube leading from one to the other of the two cells which contain the said parts of the carbon electrode, substantially as set forth.

8. In a galvanic battery, a carbon electrode formed of carbon tubes, each having a longitudinal slot or opening and combined with a filling consisting of a tube or lining of porous material packed with asbestus, substantially as and for the purpose described.

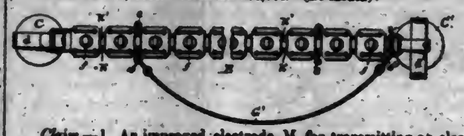
9. In a galvanic battery, a zinc electrode consisting of a set of zinc rods attached to a metal plate by screws which engage in the upper ends of the zinc rods, substantially as and for the purpose described.

10. In a galvanic battery, the negative electrode, combined with a solution of nitric acid and nitrate of ammonium.

11. In a galvanic battery, the negative electrode composed of carbon and combined with a solution of nitric acid and nitrate of ammonium.

12. In a galvanic battery, a carbon electrode composed of carbon tubes, each having a longitudinal opening and containing a filling of asbestus packed in a tube of porous material, combined with a solution of nitric acid and nitrate of ammonium, substantially as set forth.

398,133. ELECTRIC BELT. SAMUEL DE BARS, Kansas City, Mo. Filed Nov. 22, 1888. Serial No. 291,560. (No model.)

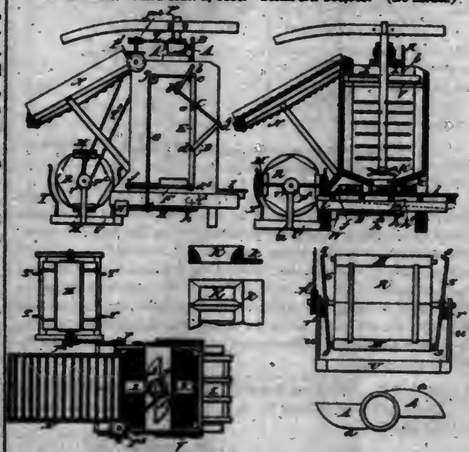


Claim.—1. An improved electrode, M, for transmitting an electrical current to the forehead or back of the neck, composed of an exterior metallic plate, a porous pad, Q', secured to the plate, and an elastic band, Q, also secured to said plate and arranged to encircle the wearer's head, in combination with the battery and an electrical connection between said plate and said battery, substantially as set forth.

2. In an electro-galvanic body-belt, the combination, with a copper and zinc element, of a porous pad placed between them, a split key, *f*, a sleeve, *m*, and washer *n*, substantially as set forth.

3. In an electro-galvanic body-belt, the combination of an outer casing that permits the removal of a flexible electro-galvanic battery, a pliable electro-galvanic battery which is made up of a series of individual galvanic piles, each of which piles is composed of a zinc and copper plate having a porous or fibrous pad inserted between these elements, a split key, a sleeve or ferrule, an da washer over which the ends of the key are bent, substantially as set forth.

398,134. BRICK-MACHINE. CONRAD DOERFLER and EDWARD DOERFLER, Springfield, Ill.; said Edward Doerfler assignor to said Conrad Doerfler. Filed Mar. 3, 1888. Serial No. 266,005. (No model.)



Claim.—1. The combination, in a brick-machine, of a system of levers, cords, pulleys, and weights, consisting of the revolving arms A A, the levers B and D, the rods C and F, with the roller-bar *f*, the levers E and H, the cord G, and pulley *g*, the movable mold-slide frame I, supported at *i* and i^2, all for delivering the molds under and from under the die, substantially as described, and for the purposes set forth.

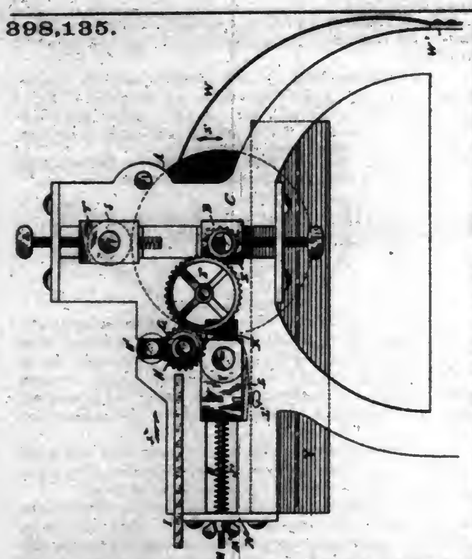
2. The combination, in a brick-machine, of a mold-sanding box consisting of the hexagonal box R, revolving on a center rod in the frame U and *u u*, the guides T T, the clamp-hooks S S, the inclined semicircular slides *r r*, the pulleys *p* p^2, and chain belt q^2, all for the purposes described and set forth.

398,135. MACHINE FOR APPLYING ADHESIVE MATERIAL. EMMOR DEETTHS, New York, N. Y. Filed Aug. 1, 1888. Serial No. 281,683. (No model.)

Claim.—1. In a machine for applying adhesive material on sheets of paper, the combination, with a frame, of a roller, a receptacle for the adhesive material, into which receptacle said roller extends, a doctor-roller made adjustable toward and from the same, a cleaning-doctor resting on the cylindrical surface of said doctor-roller, and a pair of feed-rollers, substantially as herein shown and described.

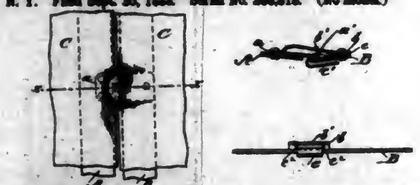
2. In a machine for applying adhesive material on sheets of pa-

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per, the combination, with a frame, of the roller A, the receptacle V for the adhesive material, the doctor-roller K, the feed-rollers H H', the pressure-roller S, and the guide-wires W, substantially as herein shown and described.

398,136. CORSET-FASTENING. WILLIAM M. DUNKER, New York, N. Y. Filed Sept. 25, 1888. Serial No. 286,313. (No model.)



Claim.—A corset-fastening consisting of a stiff catch, *a*, and hook portion *a'*, adapted to be secured to one corset-steel, in combination with a spring-catch, *b*, adapted to be secured to the opposite corset-steel, such spring-catch *b* being provided with a centrally-located slot as *b'*, a guide-plate, *c*, disposed between the spring-catch and the steel having a turned-back portion, *c'*, and ears c^2 c^2, supporting the spring-catch above the guide-plate and forming a suitable opening adapted to receive the stiff catch and to be disengaged therefrom by bringing the outer ends of the catches toward each other, substantially as described and shown.

398,137. EXTENSION-STRIP FOR WINDOW-SHADE ROLLERS. ABRAM R. DUNKLE, Steelton, Pa. Filed Feb. 23, 1888. Serial No. 264,913. (No model.)



Claim.—1. In an extension-strip for window-shade rollers, the wooden sections B B, having inclined grooves or channels along their upper and lower edges, and the metallic extension or face plate D, secured rigidly to one section and having inclined flanges at its upper and lower edges working in the inclined grooves of the other section, said extension or face plate spanning the space between the adjoining separated ends of the two sections, so as to cover this space and make the strip have all the appearance of an ordinary one.

2. In an extension-strip for window-shade rollers, the wooden strip divided into sections B B', carrying the roller-brackets at the ends, and the metallic extension or face plate D, rigidly affixed to one section and having flanges along its upper and lower edges to engage the upper and lower edges of the other section, and said extension or face plate being arranged along the front face of the strip and spanning the space separating the adjoining ends of the sections, whereby this space is concealed and the strip is given the appearance of an ordinary one, as set forth.

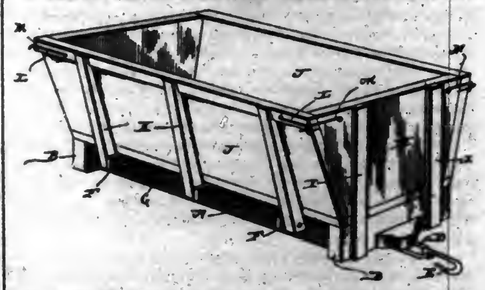
3. In an extension-strip for window-shade rollers, the wooden strip divided into sections B B', carrying the roller-bracket at the ends, and the metallic extension or face plate D, rigidly affixed to one section and having flanges along its upper and lower edges to engage the upper and lower edges of the other section, and said extension or face plate being arranged along the front face of the strip and spanning the space separating the adjoining ends of the sections, whereby this space is concealed and the strip is given the appearance of an ordinary one, and the clamp *a* or locking device arranged on the section over which the extension-plate slides, so as to clamp the free end of the said plate, as set forth.

4. The combination, in a shade-roller strip, of the grooved or channeled section B', the section B, having an extension or face plate provided with flanges engaging in the grooves of the section B', and the catch or clamp *a*, pivoted to the section B', and having a spring-jaw, *c*, engaging the upper edges of the section and the extension or face plate mounted thereon, whereby they are locked together, substantially as and for the purpose specified.

5. The strip for shade-rollers, having rabbets or recesses in its ends, flanges on the sides of the rabbets or recesses, and the projecting plates overhanging the rabbets or recesses, substantially as and for the purpose specified.

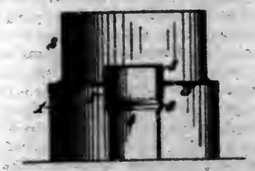
6. The strip for shade-rollers, having rabbets or recesses in its ends, the straps G G, embracing the ends of the strip and projecting outward to form the flanges H H on the outer and lower sides of the rabbets or recesses, and the plates I I, secured to the face of the strip and projecting outward over the said rabbets or recesses to form the pockets K K and the slots L L, all constructed and arranged substantially as specified.

398,138. CAR FOR CARRYING SUGAR-CANE. ZACK T. EARLE, White Castle, La. Filed Nov. 21, 1888. Serial No. 291,464. (No model.)



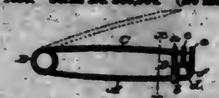
Claim.—The improved car herein described and shown, comprising the longitudinal beams A A, the transverse sills B B, secured to the ends of said beams, the longitudinal brace-rods C C, connecting the said sills, the cross-bars F, secured on the upper sides of the beams A A, the ends of said cross-bars projecting beyond the ends of the sills B, the cylindrical rods G G, secured in the ends of the cross-bars, the floor G', rigidly secured upon the cross-bars F and the sills B, the standards I, rigidly secured to the sills D, the end pieces, H, secured rigidly to said standards, the standards K, pivoted on the rods G, the sides J, secured to said standards, the hooks M, secured to the upper corners of the ends H, and the hooks L, secured to the corners of the sides J and engaging the hooks M, as specified.

398,139. CAKE, BISCUIT, AND DOUGHNUT CUTTER. WILLIAM H. EATON, Fitchburg, Mass. Filed Sept. 11, 1888. Serial No. 285,131. (No model.)



Claim.—The combination, with a double-ended biscuit or cake cutter having an internal double-ended socket, of a removable and replaceable tubular cutter having one extremity to fit either end of the socket for reversing the tubular cutter, substantially as described.

398,140. SAFETY-PIN. GEORGE P. FARRER, Montclair, N. J. Filed Aug. 25, 1888. Serial No. 283,504. (No model.)



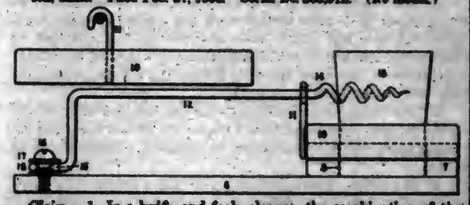
Claim.—A safety-pin having its shield made integral with the wire of the pin and consisting of two lateral folds, as *b* and *d*, on each side of the central plane of the body and point of the pin parallel therewith, and of three transverse loops, as *a*, *c*, and *e*, connecting the lateral folds with each other and with the outer end of the shield, and terminating in a guide-post at the inner end of the shield, substantially in the manner and for the purpose herein set forth.

398,141. SAFETY-PIN. GEORGE P. FARRER, Montclair, N. J. Filed Aug. 31, 1888. Serial No. 283,565. (No model.)



Claim.—The combination, with the retaining and protecting shield for the point of a safety-pin, of a dividing bar or post extending centrally from the inner side of the transverse arch of the shield to the opposite member of the pin, whereby the hood or recess under the shield is divided into two lateral pockets, and the pin-point is positively prevented from passing from the one to the other within the shield, substantially in the manner and for the purpose herein set forth.

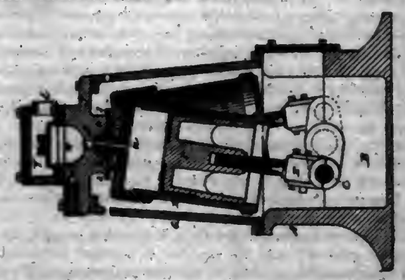
398,142. KNIFE AND FORK CLEANER. HENRY R. FAY, Boston, Mass. Filed Feb. 27, 1888. Serial No. 265,512. (No model.)



Claim.—1. In a knife and fork cleaner, the combination of the cork-holder 8, provided with the cork 9, with the cork 13, provided with the cork-carrier 12, which is loosely pivoted and is provided with the cork-screw end, thereby permitting the cork 13 to be operated in lines radial, vertical, and curvilineal, substantially as and for the purposes set forth.

2. In a knife and fork cleaner, the combination of the tank 7 adapted to be used as a holder of supplies to be used in the cleaning of knives and forks and to be conveyed therefrom by the use of cork 13, and provided with the cork-holder 8 and cork 9, with the cork-carrier 12, provided with the cork 13, said carrier 12 being loosely pivoted and provided with the cork-screw end, thereby permitting the cork 13 to be operated in lines radial, vertical, and curvilineal, substantially as described.

398,143. STEAM-ENGINE. HERBERT N. GALE, Bristol, Conn., assignor of one-half to Fred A. Dennett, Sheboygan, Wis. Filed July 16, 1887. Serial No. 243,075. (No model.)



Claim.—1. In a piston steam-engine, the cylinder-head opposite the crank end constructed with a cylindrical rocker or rib diametrically across its outside, combined with a stationary seat in shape corresponding to said rib and so as to support said cylinder by said rib, gibs 2 2, arranged longitudinally in said seat and so as to bear upon said rocker or rib below its axis, and set-screws arranged to bear upon said gibs, substantially as and for the purpose described.

2. In a piston steam-engine consisting of two or more single-acting cylinders, the pistons from the respective cylinders connecting directly to oppositely-turned cranks on the driving-shaft, the head of each cylinder opposite the crank end constructed with a cylindrical rocker diametrically across it and in a plane parallel with the driving-shaft, each of said rockers constructed with a longitudinal steam-passage leading into its cylinder, a steam-chest constructed with inlet and exhaust ports in a plane at right angles to the plane of the said passage through said rockers, and a passage between said ports corresponding to and communicating with said passage through the rockers, and a valve arranged to work upon said ports, substantially as described, and whereby steam is first admitted to one cylinder while exhausting from another, and vice versa.

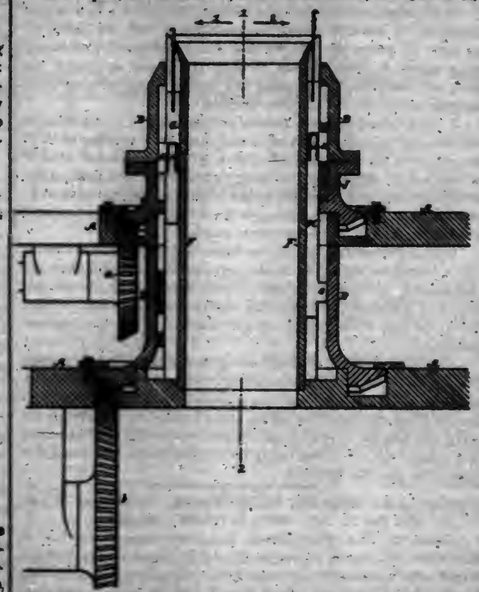
3. In a piston steam-engine consisting of two or more single-acting cylinders, the pistons from the respective cylinders connecting directly to oppositely-turned cranks on the driving-shaft, the head of each cylinder opposite the crank end constructed with a cylindrical rocker diametrically across it and in a plane parallel with the driving-shaft, each of said rockers constructed with a longitudinal steam-passage leading into its cylinder, a steam-chest with two ports, from one of which a passage leads to the said passage through the rocker of one cylinder, and from the other port a passage leads to the steam-passage through the rocker of the other cylinder, with an escape-cock, *n*, from each of the passages between the ports and the rockers, substantially as and for the purpose described.

398,144. DOOR-SPRING CONNECTION FOR ELECTRIC BURGLAR-ALARMS. JOHN GRANT, Philadelphia, Pa., assignor to Shaw & Geary, same place. Filed Aug. 22, 1888. Serial No. 283,416. (No model.)



Claim.—In a door-spring connector for electric burglar-alarms, the combination of movable plug F, contact-piece G, carried thereby, spring contact-piece E, plate C, through which the movable plug F works, and insulating-block D, with the supporting-arms B B, having lugs *b b*, whereby the insulating-block D and plate C are supported, substantially as described.

398,145. CIRCULAR-KNITTING MACHINE. GEORGE H. GILBERT, Philadelphia, Pa. Filed Jan. 3, 1888. Serial No. 260,294. (No model.)



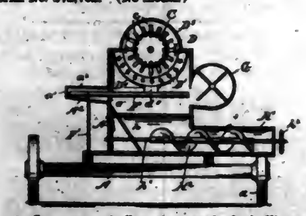
Claim.—1. The combination of the two cam-rings, one above the other, with a needle-cylinder having needles, all of which have bits engaging with the cams of one ring, a portion only of the needles

having secondary bits engaging with the cams of the other ring, and these latter needles being movable in the cylinder, whereby their secondary bits can be moved into and out of range of the operating-cams therefor, all substantially as specified.

2. A knitting-machine in which are combined two cam-rings, one above the other, a needle-cylinder having needles, all of which have bits engaging with the cams of one ring, a portion only of the needles having secondary bits engaging with the cams of the other ring and being movable into and out of range of said cams, mechanism for rotating the cam-ring which controls all of the needles, and mechanism for reciprocating the cam-ring which controls only a portion of the needles, all substantially as specified.

3. The combination of the needle-cylinder and its needles, a cam-ring having cams whereby each needle is operated two or more times on each rotation of said ring, a supplementary cam-ring whereby certain of the needles are operated once on each reciprocation of said ring, and devices for rotating the main cam-ring and reciprocating the supplementary cam-ring, the needles being movable in the cylinder independently of the supplementary cams, whereby they may be removed from and restored to the influence of said cams, all substantially as specified.

398,146. CORN-SHELLER. JOHN H. GILMAN, Ottawa, Ill., assignor to the King & Hamilton Company, same place. Filed May 3, 1888. Serial No. 272,702. (No model.)



Claim.—1. In a corn-sheller, the toothed shelling-cylinder, in combination with a series of square or angular bars parallel to the cylinder and set at an angle to each other somewhat less than forty-five degrees, substantially as and for the purposes specified.

2. In a corn-sheller, the shelling mechanism, in combination with a vertical shaft arranged at the end thereof and provided with a throwing disk or wheel upon which the cobs are discharged, substantially as and for the purposes specified.

3. In a corn-sheller, the shelling-cylinder, in combination with the cylinder-casing having a cob-discharge aperture, a^3, the vertical shaft E, provided with a throwing-wheel, J, arranged at said aperture, and the casing J', substantially as and for the purposes specified.

4. In a corn-sheller, the main casing A', provided with a lateral opening, a', in one side thereof, in combination with the incline A^3 and cover a^3, projecting from the side of said casing, and the reciprocating screen F, extending out through said lateral opening in the casing and reciprocating between the incline A^3 and cover a^3, substantially as and for the purposes specified.

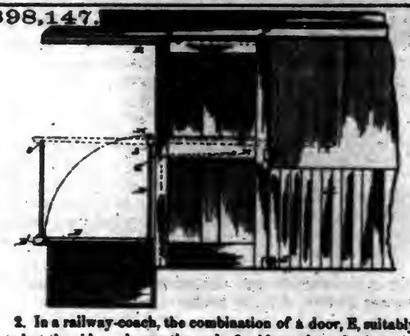
5. In a corn-sheller, the vertical driving-shaft E, in combination with the shelling-cylinder geared to said shaft, the transverse shaft I^3, also geared to the shaft E, the feed-elevator B, the sprocket-wheel i^3 on the shaft I^3, and chain I^2, running thence to the feed-elevator, the shelled-corn elevator I, and the sprocket-wheel i^2, also on the shaft I^3, and the chain I^1, running thence to the driver of the said elevator, substantially as and for the purposes specified.

6. In a corn-sheller, the main or supporting frame, in combination with a casing containing the shelling mechanism mounted thereon and a cob-stacker pivoted to the main frame at one corner thereof and outside of the casing, whereby the stacker may be turned around against the side of the casing, substantially as and for the purposes specified.

7. In a corn-sheller, the main or supporting frame, in combination with the casing A', mounted thereon and containing the shelling mechanism, the cob-stacker mounted on a pivotal support at one corner of the frame and outside of the casing, and a bracket, k', mounted on the casing and adapted to receive and retain the cob-stacker when turned back against the side of the casing for transportation, substantially as and for the purposes specified.

398,147. DOOR FOR RAILWAY-CARS. JACOB HAHN, De Kalb Ill. Filed Feb. 22, 1888. Serial No. 265,038. (No model.)

Claim.—1. In a railway-coach, the combination of the door E, adapted to slide in line therewith, the lid D, hinged on the platform of said coach perpendicular to said door, the pitman G, connecting the top of lid D with the side of door E, and the latch H, projected within said coach, whereby said door E can be operated from within said coach and said lid raised and lowered coincidently with the sliding of said door, substantially as described.



2. In a railway-coach, the combination of a door, E, suitably supported at the side and near the end of said coach, and adapted to be slid back and forth, a lid, D, hinged to said coach at or near the lower outer corner thereof, and pitman G, connecting said door and lid, whereby the shifting of the door E to and from the side of the end platform of said coach will coincidently raise and lower the lid D, so as to open and close the step-space at the side of said platform, the pitman being drawn between the car side and door when the door is slid back, substantially as shown, and for the purpose described.

3. In a railway-coach having a rail, 3, in front of the platform, a door adapted to be slid to and fro at the side, combined with a latch pivoted at its inner end to the inner side of the door and adapted to be wholly withdrawn between the car side and door when the door is open, and having a knob on its pivot, whereby it can be lifted either from the outside or inside of the coach.

4. The combination, in a railway-coach, of a sliding door at the end, a hinged lid to cover the car-steps, and a pitman pivoted at one end to the door and at the other near the top of the hinged lid, whereby the door and lid can be simultaneously operated, for the purpose set forth, and when the door is open the pitman is concealed from view, substantially as set forth.

5. In a railway-coach, a sliding door and a hinged lid for covering the car-steps, and connections between the lid and door, whereby simultaneously the door and lid can be operated, substantially as described.

6. In a railway-coach, a sliding door and a hinged lid to cover the car-steps, and means, substantially as described, for connecting the two, so that they can be operated simultaneously, and a lock or latch for securely holding the door closed and the lid down, all substantially as described.

398,148. VEHICLE-HUB. JACOB HAHN, De Kalb, Ill. Filed Sept. 27, 1888. Serial No. 286,612. (No model.)

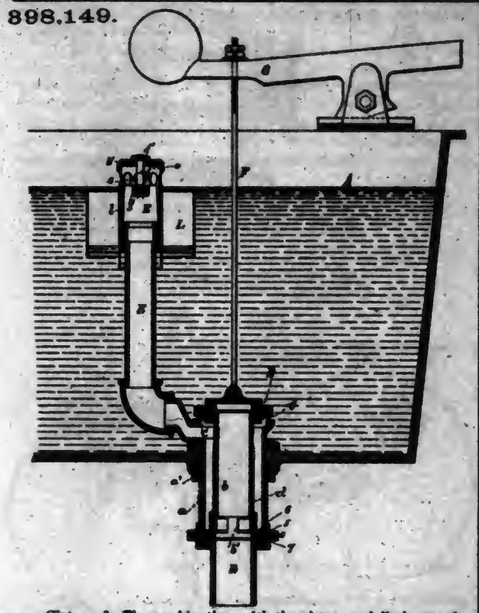


Claim.—1. The combination of the parts D' and D^2, one or both of said parts being provided with dovetailed recesses F, spokes E, provided with conformable dovetailed inner ends, adapted to be moved laterally into said recesses F, pipe-box G, provided with external annular flange G' with exterior thread, 7, and with thickened ends 10, ring J, provided with interior threads, 12, and the skein B, provided with peripheral spiral grooves P, substantially as shown, and for the purpose described.

2. The combination of the skein B, provided with the interior end threads, 2, and with the flange 6 and annular recess 5 therein, the rubber ring 13, the cap H, provided with flange 3 and threads 4, and hub D, provided with the pipe-box G, substantially as shown, and for the purpose described.

3. The combination of the skein B, provided peripherally with the spiral grooves P, and the pipe-box G, provided with thickened ends 10 and central oil-recess, N, whereby the bearing-surface of the axle is reduced and the rotation of said hub tends to carry the oil under the bearing portions of said axle, substantially as shown, and for the purpose described.

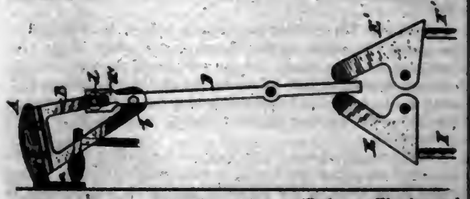
398,149. VALVE FOR WATER-CLOSETS, &c. EDWARD HAHN, Brooklyn, assignor to The J. L. Mott Iron Works, New York, N. Y. Filed Nov. 12, 1888. Serial No. 290,894. (No model.)



Claim.—1. The combination, with the cistern and discharge-pipe to the closet, of a tubular thimble passing through the bottom of the cistern and having a valve-seat at its upper edge and connected to the discharge-pipe at its lower end by a coupling-ring, a stand-pipe and perforated ring-base within and secured to the thimble, a valve, and an open-ended pendent pipe from said valve, said pipe surrounding the stand-pipe, substantially as and for the purpose set forth.

2. The combination, with the cistern-valve and discharge-pipe, of the thimble attached to the discharge-pipe and to the cistern and having the valve-seat at the upper end and an inward flange, 6, at the lower end, and the tubular stand-pipe closed at its upper end and having holes through its base, and a flange, 5, to pass below the flange 6, and the hanging pipe attached at its upper end to the valve and surrounding the stand-pipe, substantially as set forth.

398,150. MUFFLER FOR UPRIGHT PIANOS. SIGMUND HAHNE, New York, N. Y. Filed Nov. 8, 1888. Serial No. 290,209. (No model.)

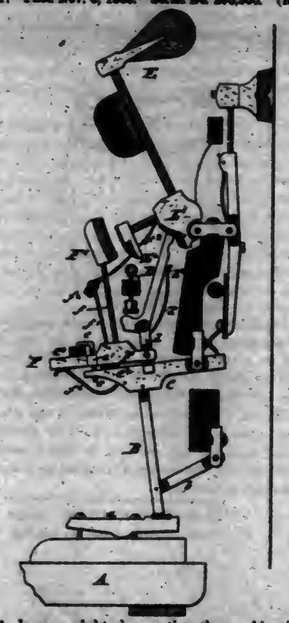


Claim.—1. The combination, with an oscillating muffling bar and apron pivoted to the supporting action-frame, of a fulcrumed lever engaging one of the supporting-arms of the muffling-bar, a muffler-pedal, a soft pedal, and intermediate lever mechanisms between the fulcrumed lever and said pedals for applying or removing the muffling-bar to or from the strings, substantially as set forth.

2. The combination, with an oscillating muffling bar and apron, of an oscillating lever engaging the supporting-arms of the same, pivoted elbow-levers engaging the lower end of said oscillating lever, a separate muffler-pedal, a soft pedal, and mechanism between said pedals and the elbow-levers for applying the muffler to the strings or returning the same to its normal position of rest, substantially as set forth.

3. The combination, with a muffling bar and apron, of pivoted bracket-arms supporting the muffling-bar, a pin applied to one of said arms, a fulcrumed lever having a forked upper end for engaging said pin, elbow-levers engaging the lower end of the actuating-lever, pusher-rods for raising the elbow-levers, a muffler-pedal, a soft pedal, and pedal-levers between the muffler and soft pedals and the pusher-rods, whereby the elbow-levers and muffler-bar are alternately operated and the latter either applied to or removed from the strings, substantially as set forth.

398,151. UPRIGHT-PIANO ACTION. SIGMUND HAHNE, New York, N. Y. Filed Nov. 8, 1888. Serial No. 290,203. (No model.)



Claim.—1. In an upright-piano action, the combination, with the fulcrumed jack-lever having an adjustable check-wire and a cushioning-spring at its front end, of a hammer-check lever pivoted to a fixed post of the jack-lever, said hammer-check lever being provided with a slotted opening for the check-wire, and a cushion for the same, substantially as set forth.

2. In an upright-piano action, the combination, with a fulcrumed jack-lever having an adjustable check-wire and a cushioning-spring at its front end, of a fixed post secured to the check-lever, a hammer-check lever pivoted to said post and provided with a slot for the passage of the check-wire and a cushion for the same, a hammer-check secured by a wire shank to the hammer-check lever, a bridle-wire, also secured to the hammer-check lever and a hammer the butt of which is provided with a shoe, and a bridle connected to the upper end of the bridle-wire, substantially as set forth.

398,152. LEVER. ROBERT W. HAMER, Albany, N. Y. Filed Aug. 30, 1888. Serial No. 284,186. (No model.)



Claim.—1. The combination, with a notched sector, of a pivoted bar, a longitudinally-movable spring-actuated latch, a handle pivoted to said bar, movable independently in the same plane as the bar or in a parallel plane, limited in said independent movement by means of stops, and provided with arms extending in opposite directions, and connections between said arms and the aforesaid latch, substantially as shown and described.

2. The combination, with a notched sector, of a pivoted bar, a longitudinally-movable spring-actuated latch, a handle provided with offsets adapted to serve as stops, and with arms extending in opposite directions, said handle being movable independently on its pivot in the same plane as the bar or in a parallel plane, and connections between said arms of the handle and the aforesaid latch, substantially as shown and described.

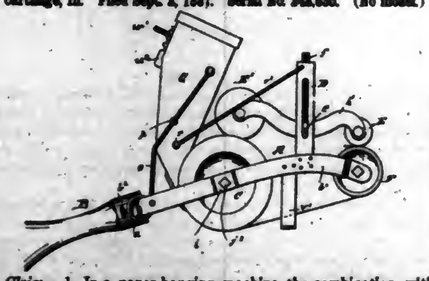
3. The combination, with a notched sector, of a pivoted bar, a longitudinally-movable spring-actuated latch, a handle pivoted to said bar, movable independently in the same plane as the bar or in a parallel plane, limited in said independent movement by means of stops, and provided with arms extending in opposite directions, and flexible connections between said arms and the aforesaid latch, substantially as shown and described.

398,153. BARREL-COVER. JOHN P. HARP, Donaldsonville, La. Filed July 31, 1888. Serial No. 281,597. (No model.)



Claim.—The improved barrel-cover herein described, consisting, essentially, of the fixed section composed of the semicircular plates G G, arranged so as to form an interspace, *a*, the hoop H, bound around the curved margin of the said fixed section and depending from the under side thereof, the ledge H', secured to the inner side of the hoop, as shown, the semicircular frame B, the glass A, secured therein, the said glass frame being pivoted at its straight portion to the straight portion of the fixed section, so that it may turn within the plates G thereof, and the flanges K, adapted to embrace a barrel-mouth, substantially as specified.

398,154. PAPER-HANGING MACHINE. JOSEPH R. HARTFORD, Carthage, Ill. Filed Sept. 2, 1887. Serial No. 248,636. (No model.)



Claim.—1. In a paper-hanging machine, the combination, with the frame provided with a handle, of the paper and distributing rollers journaled in said frame, and the rollers E and E', bearing against the aforesaid rollers, substantially as set forth.

2. In a paper-hanging machine, the combination, with the frame provided with a handle, of the paper and distributing rollers journaled in said frame, the frame V', secured between the said rollers, and the spring-knife blade and cutting-off block supported in said frame V', substantially as and for the purpose set forth.

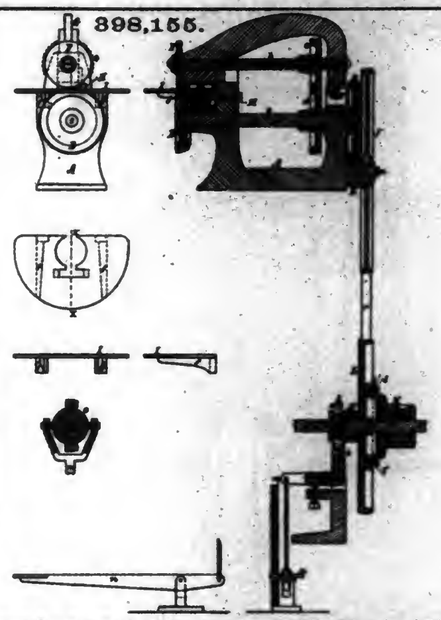
3. In a paper-hanging machine, the combination, with the frame A, of the paste-box provided with adjustable outlets and a brush, the rods pivotally securing the paste-box to the frame, the paper-roller journaled in the said frame, and the springs pressing the paste-box and brush against the paper on the roller, substantially as and for the purpose set forth.

4. In a paper-hanging machine, the combination, with a paste-box provided with internal guides *d* and *f*, and apertures for the paste, and the brush at its lower end, of the regulating-slide inside the box, and the cranked rod for adjusting said slide, substantially as and for the purpose set forth.

5. In a paper-hanging machine, the combination, with the frame V', having upper and lower members, of the block secured to the lower member, the spring-pressed cutting-off blade, and the retaining-arm V, pivoted to an extension on the back of the blade, and passing through a hole in the said upper member, substantially as and for the purpose set forth.

6. In a paper-hanging machine, the combination, with the frame A, of the rollers C and F, journaled in said frame, the slotted arms D, secured to said frame, the bars *h'*, provided with pins sliding in said arms D, the rollers E and E', journaled in said bars, and the springs pressing the pairs of rollers together, substantially as and for the purpose set forth.

398,155. CHANNELING-MACHINE. WILLIAM H. HAVEN, Jr., Oxford, assignor of one-half to John Rhodin, Brookline, Mass. Filed July 31, 1888. Serial No. 281,606. (No model.)



Claim.—1. In a channeling-machine, the combination of a feed-wheel, B, a presser-wheel, F, and an edge-wheel, H, with a plane-table, I, substantially as described.

2. The combination, in a channeling-machine, of a feed-wheel, B, a presser-wheel, F, an edge-wheel, H, with the hub K, having a conical surface, *l*, and the hub N, with a conical surface, *l'*, for the purpose and substantially as set forth.

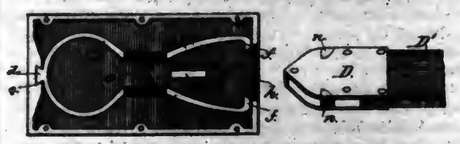
398,156. VEHICLE-SPRING. CHARLES C. HAYES, Penn Yan, N. Y. Filed Oct. 13, 1888. Serial No. 288,008. (No model.)



Claim.—1. The combination, with the axle, of the central concave spring, C, a single section clipped to the center of the axle near the center of its length, with the ends free of the axle, the caps D on the free ends of said spring, and the convex side springs, E E, having their ends pivoted in said caps, said springs being disconnected from each other and from the central spring, substantially as shown and described.

2. The combination, with the axle and the block B thereon near the center thereof, of the central bowed spring, C, a single section clipped to the block by the same clips that secure the said block to the axle, with the ends free, the hangers or caps D, pivoted on the free ends of said spring and each formed with four ears, *a*, at equal distances apart, and the two bowed side springs, E E, independent of each other and of the central spring and secured between the outer ears, *a*, of said caps, substantially as shown and described.

398,157. MAIL-BAG LOCK. THEODORE W. IVORY, Glenwood, Iowa. Filed Aug. 28, 1888. Serial No. 283,960. (No model.)



Claim.—1. The combination, with a mail-pouch having the strap D', provided with a metallic pointed head having recesses formed in its sides, of the casing B, permanently secured to the pouch and having an opening in one end, a curved spring secured at its center to the casing and having its ends formed with hooks for engaging the recessed sides of the metallic head, whereby the latter is secured, substantially as herein described.

2. The combination, with a mail-pouch having the strap D', provided with a recessed and pointed metallic head or harp, of a casing having projecting pins for securing the casing permanently to the pouch, a curved spring secured in the casing and provided with hooked ends adapted for automatic engagement with metallic head, and the springs F within the casing bearing against the inserted head to automatically eject the same when the locking mechanism is released, substantially as herein described.

398,158. VELOCIPEDE. THOMAS B. JEFFERY, Ravenswood, Ill. Filed Mar. 16, 1888. Serial No. 267,374. (No model.)



Claim.—1. In a velocipede, in combination with a rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to the forward part of the driving-wheel frame, and extending thence forward and upward to the steering-head and to the seat, the former being at the forward part and the latter at the rear upper part, and the spring reacting between the rear upper portion of the seat-supporting frame and the rear driving-wheel frame, substantially as set forth.

2. In a velocipede, in combination with a rear driving-wheel and the frame in which it is journaled, the seat-supporting frame pivoted to the forward part of said driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, the mud-guard secured to the rear driving-wheel frame, and extending thence rearward over the wheel to a point in the vicinity of the rear part of the seat-supporting frame, and a spring reacting between said mud-guard and said rear part of seat-supporting frame, substantially as set forth.

3. In a velocipede, in combination with the rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to the forward part of said driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, and a spring mud-guard secured to the rear driving-wheel frame, and extending back over the wheel to the vicinity of the rear part of the seat-supporting frame, and connected to said seat-supporting frame at the said rear part, whereby it acts as a spring reacting between the seat-supporting frame and the rear driving-wheel, substantially as set forth.

4. In a velocipede, in combination with the rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to said rear driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, a spring mud-guard secured to the rear driving-wheel frame, and extending over the wheel to the vicinity of the rear part of the seat-supporting frame, and a spring connecting said spring mud-guard with the said rear part of the seat-supporting frame, substantially as set forth.

5. In a velocipede, in combination with the rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to the forward part of said rear driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, and a spring connected to the said rear driving-frame and to the seat-supporting frame and reacting between said frames, its connection with one of them being adjustable to vary the tension of the spring, substantially as set forth.

6. In a velocipede, in combination with the rear driving-wheel frame, the seat-supporting frame hinged thereto and having a seat-supporting bracket overhanging the rear driving-wheel and vertically adjustable with respect to the remainder of the seat-supporting frame, and a spring secured to said seat-bracket and to the rear driving-wheel frame, substantially as set forth.

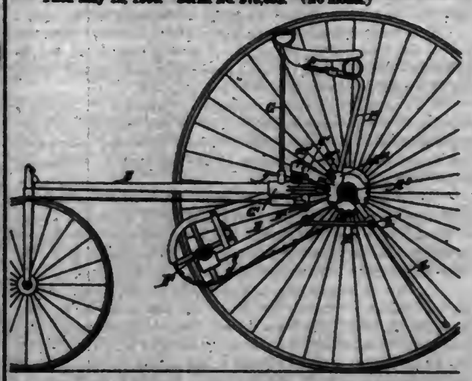
7. In a velocipede, the seat-supporting frame in the form of a bow convex forward and open rearward, and having its two branches, in a vertical plane and diverging rearward, and the steering-head located at the apex of said bow, substantially as set forth.

8. In a velocipede, the seat-supporting frame in the form of a bow convex forward and having its two arms diverging rearward and in the same vertical plane, and having a re-enforcing piece secured to it at the vicinity of the apex of its curvature, substantially as set forth.

9. In a velocipede, the seat supporting frame in the form of a bow convex forward and having its two arms diverging rearward and in the same vertical plane, and having the steering-head formed with the flanges K, fitting the bow, whereby said steering-head constitutes a re-enforcement of the bow at its apex, substantially as set forth.

10. In combination with the pedal-crank shaft, the pedal-crank provided with a hub, by which it is secured to the shaft, and with arms for securing the power-communicating wheel, such power-communicating wheel having no hub, but having an opening about its center large enough to permit the crank-hub and its arms to pass through, whereby said power-communicating wheel may be passed over the crank and its arms, and secured behind or within the same without detaching the crank from the shaft, substantially as set forth.

398,159. VELOCIPEDE. THOMAS B. JEFFERY, Ravenswood, Ill. Filed May 12, 1888. Serial No. 273,652. (No model.)



Claim.—1. In a velocipede, in combination with two rear supporting-wheels which have a common axis, the rear frame in which such wheels are journaled, the pedal-crank-shaft bearings secured to the rear frame and located forward of the vertical plane of the rear wheel-axle, and a forward frame or reach to the steering-head pivoted to the rear frame on a horizontal frame located rearward of the vertical plane of the pedal-crank-shaft bearings, whereby cross-bars forward of the pedal-crank-shaft bearings may be avoided, substantially as set forth.

2. In a velocipede, in combination with two rear supporting-wheels which have a common axis, the rear frame in which such wheels are journaled, the pedal-crank-shaft bearings secured to the rear frame and located forward of the vertical plane of the rear wheel-axle, and a forward frame or reach to the steering-head provided at its rear end with a bracket-like extension in a horizontal plane, which constitutes a horizontal pivot for said reach, whereby it is connected to the rear frame, said bracket-like extension being located wholly rearward from the vertical plane of the pedal-crank-shaft bearings, substantially as set forth.

3. In a velocipede, in combination with two rear supporting-wheels having a common axis, the rear frame in which such wheels are journaled, the pedal-crank-shaft bearings secured to the rear frame and located forward of the rear wheel-axle, a forward frame or reach to the steering-head, connected to the rear frame by a horizontal pivot which is located rearward of the vertical plane of the pedal-crank-shaft bearings, said forward frame or reach consisting of an arm extending forward from its pivot outside of the vertical plane of the nearest pedal, and a horizontal bracket-like extension proceeding from the rear end of said forwardly-reaching arm laterally toward the opposite side of the machine and located wholly rearward of the vertical plane of the pedal-crank-shaft bearings, whereby the frame is rendered entirely open above and forward of the pedals, substantially as set forth.

4. In a velocipede having two rear driving-wheels which have a common axis, the frame in which said wheels are journaled, consisting of a cross-bar, A^1, and a side bar extending forwardly therefrom at the extremity thereof, a front frame or reach to the steering-head, pivoted to said rear frame upon a horizontal pivot and extending forwardly therefrom, and a spring reacting between said side bar and

said reach to depress the reach with respect to the side bar, substantially as set forth.

5. In a velocipede, in combination with the rear frame, comprising the cross-bar A^3 and a side bar, as A', extending forwardly therefrom, the forward frame or reach to the steering-head, pivoted to the rear frame upon a horizontal pivot parallel with the axis of the driving-wheels and extending forwardly from said pivot, the said side bar, A', having a portion extended laterally and overhanging the reach, and a spring reacting between said overhanging extension and tending to depress the reach with respect to the side bar, substantially as set forth.

6. In combination, substantially as set forth, the rear frame having the journal-bearings for the pair of driving-wheels and the front frame pivoted to said rear frame, its pivot being parallel with the axis of said wheels, a spring reacting between the two frames and tending to depress the forward frame relatively to the rear frame, and a check to limit the action of said spring and retain the frames against too great separation, substantially as set forth.

7. In a velocipede having two rear driving-wheels which have the same axis, the rear frame having the journal-bearings for said wheels, and side bars projecting forwardly from the lateral extremities of said frame, and the forward frame or reach pivoted to said rear frame between said side bars, and a spring reacting between one of the side bars and the reach to depress the latter, substantially as set forth.

8. In combination, substantially as set forth, the rear frame comprising the cross-bar A^3, having the projecting lugs A^4 A^4, and the pedal-crank-shaft-bearing arms D, connected to said lugs and extending forwardly therefrom, substantially as set forth.

9. In combination with the transverse frame-bar A^3, the clip or bracket A^6, secured upon the forward side of said frame-bar, and having a pivot-bearing for the reach or forward frame and an upwardly and downwardly extending socket for the seat-support, substantially as set forth.

10. In a velocipede, in combination with a shaft-bearing comprising two parts longitudinally separated by an interval, a handle-rod journaled in said bearings and having secured upon it and located in said interval a stop-collar, whereby said stop-collar stops the bar from movement in both directions, substantially as set forth.

11. In a velocipede, in combination with the rear frame comprising the cross-bar A^3 and the side bar A^2, said side bar having in its forward end the bearing for the brake-rod, comprising the parts A^{20} A^{20}, longitudinally separated, the brake-rod journaled in said bearing and having secured upon it and located in said interval the stop-collar H', having the crank-arm H^{10}, the brake-lever pivoted to the frame on a horizontal pivot, and the brake-connecting rod H^9, joined to said lever and to the crank-arm H^{10}, substantially as set forth.

12. In combination with the frame-bar A^3, the trailing arm pivoted thereto, the clamp E', adapted to slide and be set fast in said arm, and the link E^2, connecting said clamp to the frame, whereby said arm may be caused to extend more or less directly rearward, and may be adjustably secured at any desired position between horizontal and vertical, substantially as set forth.

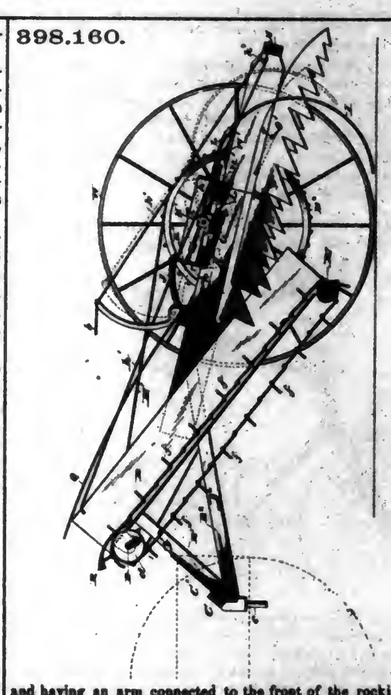
13. In combination with the frame, the telescoping trailing arm E E^2, having one part connected to the frame, the said part E being tubular and split at its rear end and provided with lugs clamped upon the part E^2, substantially as set forth.

398,160. HAY RAKE AND LOADER. OLE K. KAASA, Oslo, Minn. Filed May 3, 1888. Serial No. 273,041. (No model.)

Claim.—1. In a hay rake and loader, the combination, substantially as described, of the main frame having a transverse pivot-rod, the rectangular rocking frame having its end sills pivoted on said rod, spiders secured to the rear sill of the rocking frame and having spring-arms extending in front and rear thereof, rake-teeth fulcrumed on the pivot-rod and each connected to the front and rear ends of one of the spring-arms of a spider, a lever fulcrumed on the main frame and connected at one end to the rocking frame, and flexible connections secured to the other end of the lever to control its position.

2. In a hay rake and loader, the combination, substantially as described, of the main frame, the elevator-frame and endless elevator, the supporting-wheels, to the hub of one of which is secured a gear-wheel, multiple crank-shafts O and O', journaled on the main frame at opposite sides of the carrying-wheel axles, and each provided with a pinion meshing with the gear-wheel on the wheel-hub, rake-teeth carried by a rocking frame pivoted to the main frame, means for tilting the rocking frame to raise the rear ends of the rake-teeth, and rake-blades carried by the cranks of shafts O O' and extending between and to the rear of the rake-teeth, whereby the rake-blades serve as clearers for the rake-teeth when the latter are raised.

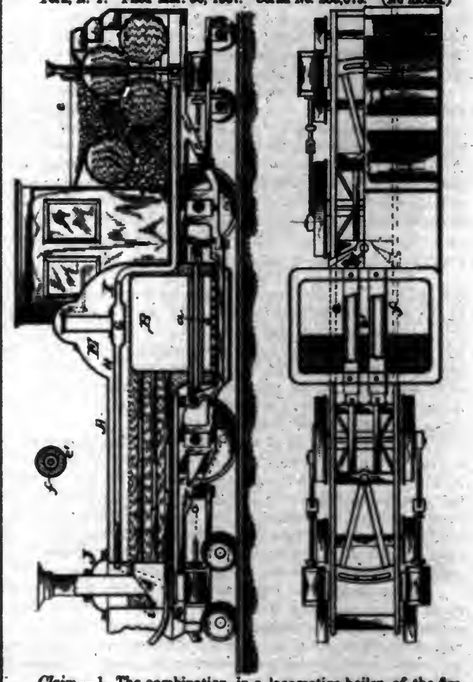
3. In a hay rake and loader, the combination, substantially as described, of the main frame, the inclined elevator-frame and its endless elevator, a rocking frame pivoted to the main frame and carrying rake-teeth, an elbow-lever fulcrumed at its end on the main frame



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and having an arm connected to the front of the rocking frame, a flexible connection, *k*, secured at one end to the vertical arm of the lever and at its other end to the front of the elevator-frame, and a flexible connection, *k'*, also secured to said arm of the lever and passing thence over a pulley in rear of said lever and thence forward and secured to the front of the elevator-frame.

398,161. LOCOMOTIVE-BOILER. GUSTAVUS A. KARWISER, New York, N. Y. Filed Mar. 30, 1887. Serial No. 233,079. (No model.)



Claim.—1. The combination, in a locomotive-boiler, of the fire-box, the smoke-box connected by flues with the fire-box, and a top extension over the smoke-box, forming a part of the boiler and having a downwardly-inclined bottom forming a deflecting-plate at the top of the smoke-box, substantially as described.

2. The combination, with a locomotive-boiler, of an extension over the smoke-box forming a part of the boiler, the bottom of said extension forming a deflector for the sparks, an upward guide for the smoke, and a pocket for the collection of sediment in the boiler, substantially as described.

3. A locomotive having a boiler substantially T-shaped in longitudinal section and the fire-box extending down between and beyond the two sets of the driving-wheels, in combination with a dome at the fire-box end of the boiler, as set forth.

4. The combination, in a locomotive-boiler, of the fire-box extending down between and beyond the two sets of the driving-wheels, the horizontal flues, brace-rods extending through the fire-box, and water-tubes surrounding the same and communicating with the main water-chamber of the boiler, substantially as described.

398,162. BOTTLE-TAP. M. JOSEPH KRAMS, New Haven, Conn. Filed July 18, 1888. Serial No. 280,241. (No model.)



Claim.—1. A bottle-tap having an inner tube provided near its lower end with an induction-port, a point located in the lower end of such tube and provided with a shoulder offsetting from it, and an outer tube provided with a corresponding port and engaging at its lower end with the offsetting-shoulder of the said point, substantially as set forth.

2. A bottle-tap having an inner tube provided near its lower end with an induction-port, a point located at the lower end of such tube and provided with a shoulder offsetting therefrom, and an outer tube provided with a corresponding port and having means to resist torquing in the cork, substantially as set forth.

3. A bottle-tap having an inner tube provided near its lower end with an induction-port, a point located in the lower end of such tube and provided with a shoulder offsetting therefrom, an outer tube provided with a corresponding port, and a fin offsetting from the outer tube for preventing the same from turning in the cork, substantially as set forth.

4. A bottle-tap having an inner tube provided near its lower end with an induction-port, a point located in the lower end of such tube and provided with a shoulder offsetting therefrom, an outer tube provided with a corresponding port and with a fin or point for preventing it from turning in the cork, and a faucet having means at its lower end to close over the fissure made in the cork by the said point, substantially as set forth.

5. A bottle-tap having an inner tube provided near its lower end with an induction-port, a point located in the lower end of such tube and provided with a shoulder offsetting therefrom, and an outer tube provided with a corresponding port and with a fin to prevent it from turning in the cork, and a cap entering the cork above the fin to close the fissure made thereby, substantially as set forth.

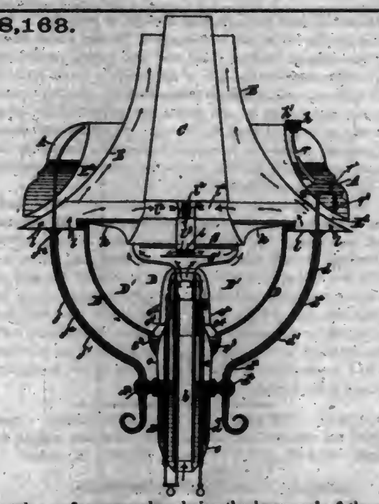
398,163. OIL-LAMP. ERNEST A. KENT, Kingsland, County of Middlesex, England. Filed May 20, 1886. Serial No. 276,420. (No model.) Patented in England Nov. 25, 1887, No. 16,268.

Claim.—1. In an oil-lamp, the combination, with the oil-reservoir above the burner and small oil-receptacle below the same, of a chimney and a casing between the oil-reservoir and chimney, said casing being perforated at the bottom, so that air can pass up between it and the chimney, and being separated from said reservoir by a free space, so that air can enter at the bottom of the reservoir between it and said casing and pass upward to keep the oil in the reservoir cool, substantially as described.

2. The combination, with the oil-reservoir above the burner, of an inclosing glass globe, a burner, a chimney having transverse air-tubes and a vertical air-tube, and a casing interposed between the chimney and reservoir and having air-inlets on its under side, so that air heated by contact with the globe may pass up inside the casing and to the burner through the chimney-tubes, while cool air passes outside said casing between it and the reservoir, substantially as described.

3. The combination of the casing having air-inlets on its under side, the globe beneath the casing, the chimney within the casing provided with air-tubes for supplying air to the upper side of the flame, the flame-spreader and air-distributer, the central air-tube passing through said globe, and the perforated casing surrounding said air-tube, substantially as described.

4. The combination of the chimney having transverse and vertical air-tubes, a flame-spreader closing the lower end of the vertical tube, a second flame-spreader above the first and extending beyond the same, said vertical tube having air-openings between said flame-spreaders, the central air-tube for supplying air from below, the oil-chamber inclosing the same, the perforated casing, and the inclosing-globe, substantially as described.

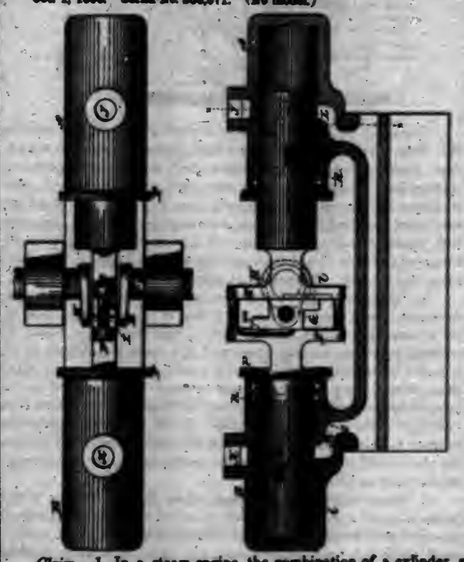


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5. The combination of the burner, the glass globe beneath and around the burner, the oil-reservoir above the burner, the chimney provided with air-passages, the air-tube passing centrally through said globe, the casing inclosing said air-tube and forming therewith a small oil-chamber, a pipe connecting this chamber with the upper oil-reservoir, and the perforated casing for supplying air to the under side of the flame, substantially as described.

6. The combination of the upper reservoir, the chimney, the casing between said reservoir and chimney, the glass globe, and the reflector extending from said chimney to the rim of said globe, said casing overhanging said globe and being provided with perforations on its under side, so that air heated by contact with said globe may pass within said casing, substantially as described.

398,164. DIRECT-ACTING STEAM-ENGINE. FREDERICK H. LAFORCE, Waterbury, Conn., and HUGH J. BARKER, Philadelphia, Pa. Filed Oct. 1, 1888. Serial No. 286,671. (No model.)

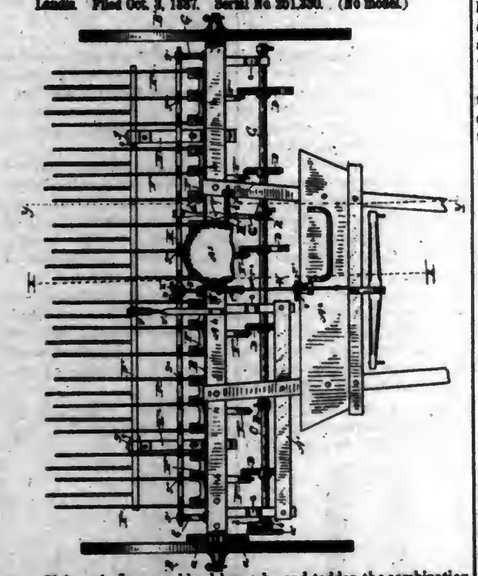


Claim.—1. In a steam-engine, the combination of a cylinder, a reciprocating piston, the cylinder constructed with inlet and exhaust passages terminating in ports into the cylinder distant from that end of the cylinder with which they are adapted to communicate greater than the stroke of the piston, a piston greater in length than its stroke,

with inlet and exhaust ports opening through its periphery to the cylinder through the active end of the piston, the said piston extending outside the cylinder and provided with two guides parallel to each other at right angles to the axis of the piston, a crank, a crank-pin extending between said guides, a crank-block on said crank-pin working between and guided by said guides, grooves in the face of one or both of said guides, and studs on the said crank-block corresponding to said grooves, the said studs equidistant from the central line of the crank pin, and the said grooves curved from the center, substantially as and for the purpose described.

2. In a steam-engine in which the cylinder is constructed with inlet and exhaust passages opening through ports into the cylinder, and in which one end of the cylinder is open, and in which the piston works through the said open end of the cylinder, and having a stuffing-box in the said open end of the cylinder around the said piston, the cylinder constructed with an annular groove upon its inner surface and inside the said stuffing-box, with an outlet from said annular groove directly to the steam-exhaust passage of the cylinder, substantially as described, and whereby the water arising from condensation in the said annular groove may flow directly to the steam-exhaust passage and there escape.

398,165. COMBINED HAY RAKE AND TEDDER. ISRAEL I. LANDIS and ALBERT ESHLEMAN, Lancaster, Pa.; said Eshleman assignor to said Landis. Filed Oct. 3, 1887. Serial No. 251,330. (No model.)

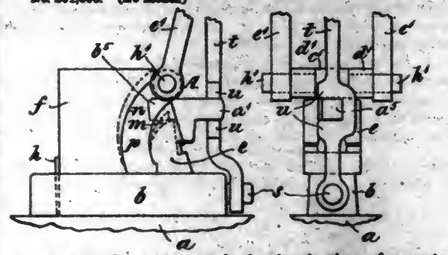


Claim.—1. In a combined hay rake and tedder, the combination of a frame mounted upon driving-wheels, an endwise-movable tappet-shaft, gearing for rotating this tappet-shaft, a rake-shaft, oscillating rake-sections journaled upon this rake-shaft and provided with rearwardly-extending rake-teeth, tappets upon the said tappet-shaft for oscillating these rake-sections, an endwise-movable rod, H, provided with hooks adapted to engage the said rake-teeth, a pivoted lever, G', connecting the rod H and the tappet-shaft, and a hand-lever for operating this lever G', substantially as described.

2. The combination of the frame of the machine mounted upon driving-wheels, a spur-wheel, *a*, upon one of the driving-wheels, an endwise-movable tappet-bearing shaft, C, provided with a pinion, *a'*, adapted to engage the said spur-wheel *a*, a transverse rake-shaft, E, mounted in bearings on the frame and provided with arms G, rake-teeth pivoted upon said shaft E and adapted to be operated by the tappets upon the shaft C, an endwise-movable rod, H, mounted in bearings in the arms G on the shaft E, and provided with hooks adapted to engage the said rake-teeth, a pivoted lever, G', connecting the shaft C and rod H, and a lever for operating this connecting-lever, substantially as described.

3. In a combined hay rake and tedder, the combination of the frame mounted upon driving-wheels, an endwise-movable tappet-shaft provided with tappets, gearing for rotating this tappet-shaft, a rake-shaft, oscillating rake-sections upon this rake-shaft, these sections being adapted to be oscillated by the tappets upon the tappet-shaft, rake-teeth secured to these rake-sections, an endwise-movable rod, H, provided with hooks adapted to engage the said rake-teeth, a pivoted lever, G', connecting the endwise-movable rod H with the endwise-movable tappet-shaft, the rear end of this lever being bifurcated, a curved arm, *i*, secured to the endwise-movable rod H and engaging with the rear bifurcated end of the lever G', a hand-lever for operating the lever G', and a lever connected to the rod H for raising or lowering the rake-teeth, substantially as described.

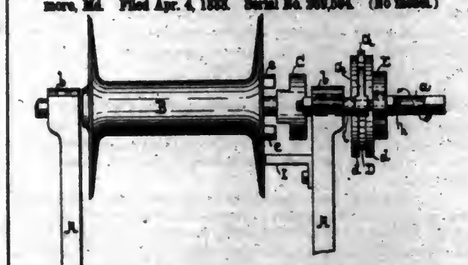
398,166. DIE FOR SHAPING THE CLAWS OF HAMMER-HEADS. ANDREW LAMBERT, Montreal, Quebec, Canada, assignor of one-half to Henry Harrison Warren, Massena, N. Y. Filed Nov. 17, 1888. Serial No. 291,066. (No model.)



Claim.—1. In an apparatus for forming the claws of carpenters' hammers, the combination of the die *c*, having curved surfaces *g* and *l*, also having projection *m*, with guide *f*, having curved surfaces *n*, and roll A, arranged to be guided by the curved surfaces *g* and *n*, the whole substantially as and for the purposes set forth.

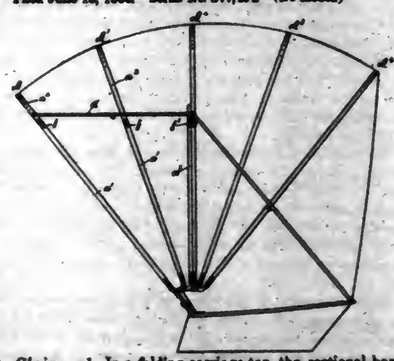
2. In an apparatus for forming the claws of carpenters' hammers, the combination of the die *c*, having surfaces *g* and *l*, guide *f*, having surfaces *n*, and roll A, arranged to be guided by the surfaces *g* and *n*, the whole substantially as and for the purposes set forth.

398,167. OYSTER-DREDGE WINDLASS. HENRY LAWSON, Baltimore, Md. Filed Apr. 4, 1888. Serial No. 269,594. (No model.)



Claim.—In an oyster-dredge windlass, the combination of the frame A, sliding shaft *a*, having the feather *g*, barrel B, placed loosely on the shaft *a* and provided with lugs *e* on one of its faces, clutch C, secured to the said sliding shaft, ratchet-disk D, fitted with flanges *d* and provided with the hub *e* and having the inclined groove *f*, plate E, with a central hole in which the hub of the ratchet-disk is supported and held to the said frame by means of the bolts A, and pawls *g*, hinged to the said bolts and adapted to rest on the periphery of the said ratchet-disk, substantially as and for the purpose specified.

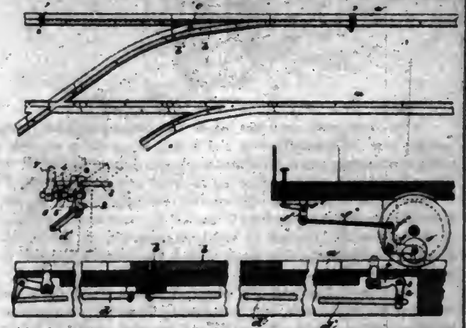
398,168. VEHICLE-TOP. GEORGE D. W. LESSER, Boston, Mass. Filed June 18, 1888. Serial No. 277,404. (No model.)



Claim.—1. In a folding carriage-top, the sectional bow above described, having the part a^6 in a separate piece from the part a^5, substantially as and for the purpose specified.

2. In a folding carriage-top having one or more sectional bows, A A', the auxiliary brace *g*, substantially as and for the purpose specified.

398,169. AUTOMATIC RAILWAY-SWITCH. JAMES W. LESLIE, Everett, Mass. Filed Nov. 1, 1888. Serial No. 289,743. (No model.)

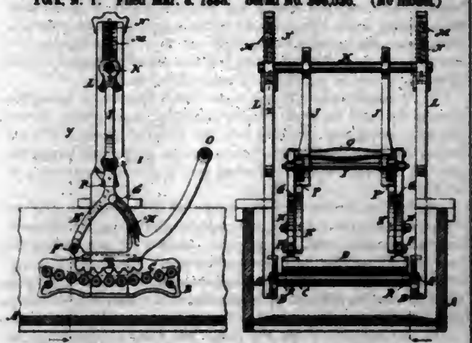


Claim.—1. The switch or tongue and the longitudinally-movable rods *d d'* for moving it in opposite directions, combined with two vertically-movable studs for each rod *d d'*, pivotally-arranged cross-bars connected with the said rods and to which the studs are connected, the roller *f'*, and means, substantially as described, for effecting its movement, all substantially as and for the purposes specified.

2. The switch or tongue, the longitudinally-movable rods *d d'*, and the pivoted cross-bars 5, connected with the rods or bars *d d'*, combined with the studs downwardly movable independently or simultaneously, substantially as described.

3. The switch or tongue, the longitudinally-movable rods *d d'*, the bell-crank levers and pivoted cross-bars, and the independently or simultaneously movable studs, combined with the roller *f'* and means for moving it to co-operate with the car-wheel to effect the simultaneous movement of the studs, substantially as described.

398,170. WASHING-MACHINE. EDWARD R. LEVERICH, New York, N. Y. Filed Mar. 8, 1888. Serial No. 266,536. (No model.)

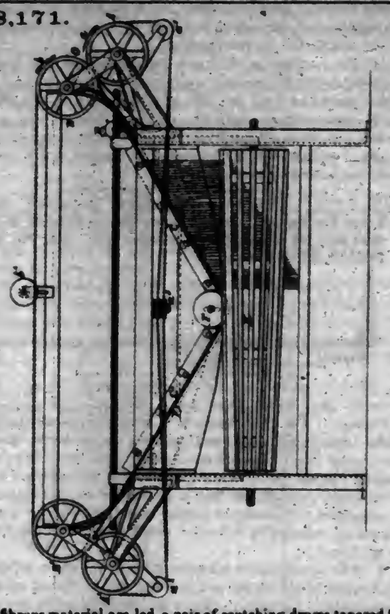


Claim.—1. The combination, with the uprights L, having slotted upper ends, the vertically-movable spring-pressed horizontal bar K, having its ends arranged in the slots, the swinging arms J, suspended upon the bar, and the frame E, pivoted to the lower ends of the swinging arms, of the rubber D, pivoted at one side to the lower end of the pivoted frame and provided at its opposite side with upwardly-projecting arms G, adjustably secured to the pivoted frame, substantially as described.

2. The combination, with the tub A, having the attached frames B, and the rollers C, mounted in said frames, of the uprights L, the swinging arms J, the frame E, suspended from the swinging arms, the rubber D, pivoted at one side to the frame and provided at the other side with upwardly-projecting arms G, having curved slots, and screws H, adjustably connecting the slotted arms with the suspended frame, substantially as described.

398,171. APPARATUS FOR SCUTCHING FLAX, &c. JOHN MCGRATH, Lavagh, County of Monaghan, and EDWARD MANNEY, Dundalk, County of Louth, Ireland. Filed Oct. 13, 1887. Serial No. 252,262. (No model.) Patented in England Sept. 13, 1887, No. 13,099; in France June 30, 1888, No. 191,536, and in Belgium July 5, 1888, No. 82,457.

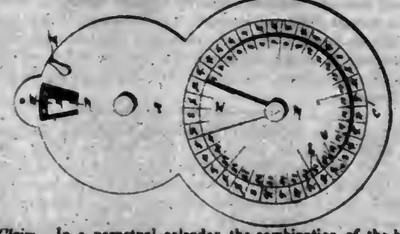
Claim.—1. In a machine for scutching, hackling, or similarly treating flax and other fibrous material, in combination with a guide inclined first downward, then upward, along which the grasped parts



of the fibrous material are led, a pair of scutching-drums tapered from a larger diameter at the entering end to a smaller diameter at the leaving end, substantially as and for the purpose herein set forth.

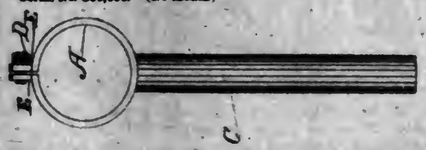
2. In a machine for scutching or hackling flax and other fibrous material, the combination, with the driving and guide wheels and the stationary guide, of the four traveling chains, one crossing another, and the star-wheel and skid-rail for effecting and maintaining said position of the chains, all operating to grasp and hold the upper ends of the fiber while the lower portions are being operated on, substantially as described.

398,172. PERPETUAL CALENDAR. THOMAS A. MCKEE, Beloit, Kans. Filed May 29, 1888. Serial No. 275,507. (No model.)



Claim.—In a perpetual calendar, the combination of the body provided with a circular day-table, C, and an opening, B, the revolubie month-disk concentric with the day-table and containing thirty-one days, the segment of a disk, E, concentric with and arranged on the month-disk, and adapted to cover the extra days in months containing less than thirty-one days, the year-disk mounted on the rear side of the body and provided with spaces containing the names of the months, which spaces are partly darkened to indicate the relation between the night and day in the indicated month, one of said spaces being adapted to be exposed through the opening B at all times, substantially as specified.

398,173. BRUSH-HOLDER. GEORGE E. MERRICK, Meriden, Conn., assignor of one-half to Selah A. Hull, same place. Filed Jan. 14, 1888. Serial No. 260,696. (No model.)



Claim.—1. As an article of manufacture, a brush-holder formed of metal and comprising a circular clamping-band or frame-piece provided with a projecting hand-piece and two projecting parallel lugs

slightly separated from each other, and a set-screw for drawing such lugs together and contracting said band or frame, all arranged as described, and for the purpose specified.

2. The combination, with two dashing-brushes, of a detachable holder consisting of a circular clamping frame-piece provided with a handle projecting from one side and two projecting parallel lugs slightly separated from each other, and a screw for drawing such lugs together and contracting said frame-piece, thereby causing it to clasp and retain the bodies of said brushes, all arranged as described, and for the purpose specified.

398,174. APPARATUS FOR SANDING RAILWAYS. HENRY C. NOBLE, New York, N. Y., assignor of two-thirds to William F. Monaghan, same place, and Charles W. Swan, Brooklyn, N. Y. Filed Feb. 25, 1888. Serial No. 265,323. (No model.)



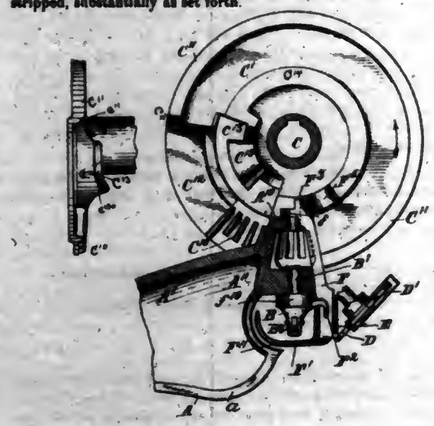
Claim.—1. The combination of a hopper for containing sand, a cylinder beneath said hopper and provided with a slotted opening, a valve adapted to rest upon the top of said cylinder and having a stem extending therein, a lever-arm connected with said stem and extending outwardly through said slot, a shaft to which said lever-arm is also connected, and means for turning said shaft, whereby a vertical movement is imparted to said valve, substantially as and for the purpose set forth.

2. The combination of a hopper for holding sand, a cylinder arranged beneath said hopper and provided with a slotted opening, a valve adapted to rest upon the top of said cylinder and having a stem extending downward therein and also upward into said hopper, and the upper portion of said stem being provided with fingers or cross-pieces for loosening the sand, a lever-arm connected with the lower portion of said stem and extended outwardly through the slot in said cylinder, a shaft to which said lever-arm is also connected, and means for turning said shaft, substantially as and for the purpose set forth.

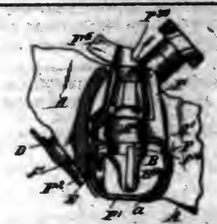
3. The combination of a hopper for holding sand, a cylinder arranged beneath said hopper and provided with a slotted opening, a valve adapted to rest upon the top of said cylinder and having a stem extending downward therein and also upward into said hopper, the upper portion of said stem being provided with fingers or cross-pieces for loosening the sand, a lever-arm connected with the lower portion of said stem and extended outwardly through the slot in said cylinder, a shaft to which said lever-arm is also connected, means for turning said shaft, another lever also connected with said shaft, and a retractive spring having connection with the free end of said second lever, all arranged and operating substantially as and for the purpose set forth.

398,175. CORD-KNOTTER FOR GRAIN-BINDERS. LA VERNE W. NOYES, Chicago, Ill. Filed Apr. 13, 1886. Serial No. 198,673. (Model.)

Claim.—1. In combination with the knotter-actuating wheel, the looper, and the breast-plate, a frame pivoted about the looper-spindle engaged directly and actuated positively by the knotter-actuating wheel and bent across the line of the axis of the looper at the end thereof, obstructing the rift in the breast-plate while the looper forms the knot and swung aside by the said wheel when the knot is to be stripped, substantially as set forth.



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2. In combination with the looper and breast-plate, the frame rocking over the spindle thereof, and having at one end a projection or finger extending across the line of the looper-axis at the end of the looper, and having at the other end the lever projections F^3 and F^4 at right angles to each other, the knotter-actuating wheel having the sectoral cams and delay-surfaces C^{13} and C^{14} in planes on opposite sides of the knotter-axis, the ends of said tracks engaging the projections F^3 and F^4, respectively, alternately to rock the frame in opposite directions, substantially as set forth.

3. In combination with the knotter-actuating wheel, the looper reversing its revolution to strip the knot, the frame pivoted about the looper-spindle and engaged directly and actuated positively by the knotter-actuating wheel independently of the looper, and having the cam which opens the looper-jaws, said frame rocked by the knotter-actuating wheel and accompanying the looper in its reverse movement, substantially as set forth.

4. In combination with the looper, the bill-opening cam having the undercut shoulder f^{12}, over which the heel of the vibrating jaw drops to allow the bill to close, said looper reversing its revolution after the heel passes said shoulder, whereby the heel is crowded under the shoulder and the bill is forced shut, substantially as set forth.

5. In combination with the looper reversing its revolution to strip the knot, the bill-opening cam having the undercut shoulder f^{12}, over which the heel of the vibrating jaw drops to allow the bill to close before reversing, the said cam remaining stationary when the looper first reverses, but afterward rocking with it in its reverse motion, substantially as set forth.

6. In combination with the knotter-actuating wheel, the looper reversing its revolution to strip the knot, the frame pivoted about the looper-spindle, engaged directly and actuated positively by the knotter-actuating wheel independently of the looper, and having the cam which opens the looper-jaws provided with the undercut shoulder f^{12}, to engage the heel of the vibrating jaw, said frame accompanying the looper in its reverse movement, substantially as set forth.

7. In combination with the looper which reverses its revolution to strip the knot, the frame pivoted about the looper-spindle having the bill-opening cam provided with the undercut shoulder f^{12}, and having the lever-arm F^3, and the knotter-actuating wheel having the cam C^{14}, to engage the lever-arm and rock the frame, substantially as set forth.

8. In combination with the looper which reverses to strip the knot, the frame pivoted about the looper-spindle having the bill-opening cam provided with the undercut shoulder f^{12}, and having the lever-arm F^4, and the knotter-actuating wheel having the gear-segment engaging the looper-pinion, and the delay-surface C^{15}, engaging the lever-arm F^4 until after the pinion clears the segment, substantially as and for the purpose set forth.

9. In combination with the looper, the frame F, pivoted on the looper-spindle and rocked thereabout by direct engagement with the knotter-actuating wheel, and having the bill-opening cam and the cord-receiving hook F^5, substantially as set forth.

10. In combination with the knotter-actuating wheel and the looper, the frame F, pivoted on the looper-spindle and rocked thereabout by direct engagement with the knotter-actuating wheel, which engages it directly and actuates it positively, and having the bill-opening cam and the cord-obstructing gate both integral with it, substantially as set forth.

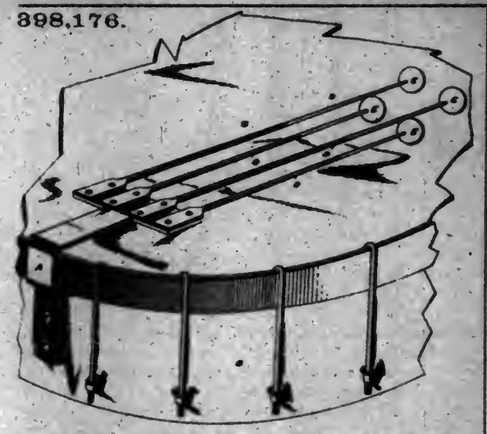
11. In combination with the looper, the frame F, pivoted about the looper-spindle and rocked thereabout by the knotter-actuating wheel, and having integral with it the cord-obstructing gate and the cord-receiving hook F^5, substantially as and for the purpose set forth.

398,176. DRUM ATTACHMENT FOR BANJOS. ROBERT OEHLER, New Orleans, La. Filed July 25, 1888. Serial No. 280,977. (No model.)

Claim.—1. The combination, with a banjo, of a bracket attached to the frame thereof and spring-arms secured to said bracket and carrying weights or beaters in close relation to the banjo-head, substantially as specified.

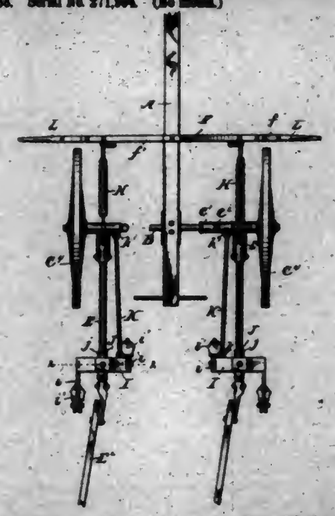
2. A drum attachment for musical instruments, consisting of a suitable holder and spring-arms of different lengths, and carrying

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weights or beaters, said arms being attached to said holder, substantially as specified.

398,177. CULTIVATOR. WILLIAM H. PARLIN, Canton, Ill., assignor to the Parlin & Orendorff Company, same place. Filed Apr. 26, 1888. Serial No. 271,994. (No model.)



Claim.—1. In a cultivator, the combination, with the gangs, free to move longitudinally independently of each other, and the pivoted arms to which said gangs are attached, of the centrally-pivoted evener arranged in front of the same and having the horses connected to its ends, and a single draft-rod for each gang, forming the sole draft-connection between said gang and the evener, and having its rear end attached immediately in front of the beam of the gang and its front end connected to the evener at a point about midway between its pivot and its ends, whereby the longitudinal motion of the gangs is reduced, substantially as and for the purposes specified.

2. The combination, with the main frame, of the pivoted arms connected thereto, the gangs connected to said arms, the centrally-pivoted evener arranged in front of the same, and draft-rods, each having its rear end connected to one of the arms immediately in front of the point of attachment of the gang and its front end connected to the evener and adjustable laterally in relation to the same, substantially as and for the purposes specified.

3. In a cultivator, the combination, with the main frame, the pivoted arms, the gangs connected to said arms, the evener arranged in front of the same, and the draft-rods connecting the arms and the evener, of constantly-acting coiled springs having their rear ends connected to the gangs and their front ends connected to the evener, substantially as and for the purposes specified.

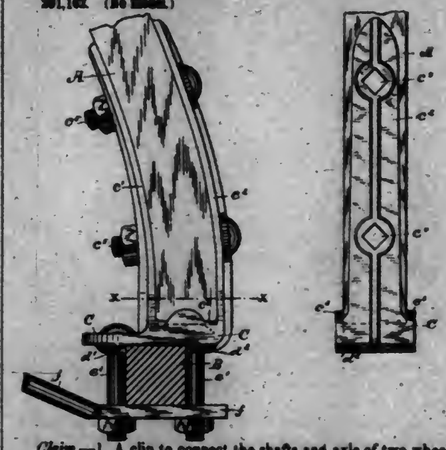
4. In a cultivator, the combination, with the vertically and horizontally movable gang, of an evener arranged in advance of the same, a yoke or loop pivoted to the beam of the gang and provided with a series of notches, h^3, and a spirally-coiled spring having its front end connected to the evener and its rear end connected to the loop, and provided with a hook to engage with any one of the notches h^3, substantially as and for the purposes specified.

5. The combination, with the evener, of the notched bars H', connected thereto, the vertically-swinging gangs, and the springs H, having their rear ends connected to the gangs and their front ends provided with loops to engage any one of the notches of the bars H', substantially as and for the purposes specified.

6. In a cultivator, the combination, with the vertically and horizontally swinging gangs, the evener arranged in front of the same, and the draft-rods connecting the evener and the gangs, of coiled springs having their rear ends connected to the gangs and laterally adjustable at said connection, and their front ends connected to the evener and longitudinally adjustable at that point, substantially as and for the purposes specified.

7. The combination, with the cross-head I, having conical sockets I', of the beam E, the semi-cylindrical saddle-pieces J, secured thereon and provided with conical bearings f' to enter the sockets I', and the bolt I^2, passing through the same, substantially as and for the purposes specified.

398,178. TWO-WHEELED VEHICLE. DAVID M. PARRY and THOMAS H. PARRY, Indianapolis, Ind. Filed Nov. 17, 1888. Serial No. 291,162. (No model.)



Claim.—1. A clip to connect the shafts and axle of two-wheeled vehicles, comprising the base-plates C, each having the two upwardly-extended arms c' c^2 to engage the front and rear sides of the shaft, as shown, and having the flanges d' d^2 to embrace the upper edges of the axle, the strap f to engage the lower part of the axle, and the bolts to secure the said parts together, substantially as set forth.

2. In a two-wheeled vehicle, the combination of the clip, consisting of the horizontal plate C, having the socket d at its upper face, the transverse vertical flanges d' d^2 at its lower face, and the upwardly-projecting curved arms c' c^2, the shaft A, secured by bolts between the inner faces of the arms c' c^2, the strap f, and the axle B, secured between the strap, lower face of the plate C, and between the inner walls of the flanges d' d^2, with its rear edge in a line, or approximately so, with the center of the lower end of the shaft, and secured in place by the vertical bolts extended through the plate C, and strap f, substantially as shown, and for the purpose set forth.

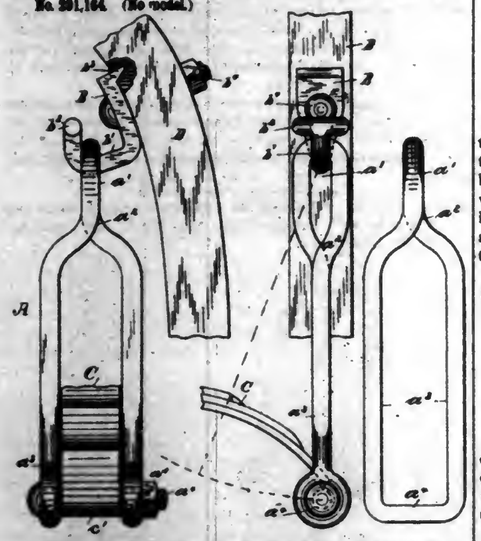
398,179. VEHICLE-SEAT. DAVID M. PARRY and THOMAS H. PARRY, Indianapolis, Ind. Filed Nov. 17, 1888. Serial No. 291,163. (No model.)



Claim.—1. In a vehicle-seat, the combination of the front and back rails, A B, grooved longitudinally on their inner faces their entire length, the end rails, C D, secured thereto, the resilient slats F, secured at their ends in said grooves, and the spacing-blocks G, interposed between said slats at their ends, substantially as shown and described.

2. The combination, in a vehicle-seat, of the longitudinally-grooved front and back rails, A B, the end rails, C D, the guard-rail E, secured thereto, the resilient slats F, having their ends secured in the groove in the front and back rails by nails or otherwise, and the spacing-blocks G, interposed between the slats at their ends and secured in the grooves aforesaid in the manner and for the purpose substantially as shown and described.

398,180. SPRING-SUPPORT FOR VEHICLES. DAVID M. PARRY and THOMAS H. PARRY, Indianapolis, Ind. Filed Nov. 17, 1888. Serial No. 291,164. (No model.)



Claim.—1. In combination, the hanger A, constructed from a single piece of wrought metal, having an elongated vertical eye at its upper end and a spring-supporting leg at its lower end, and the plate B, having the headed hook to engage the hanger, and the burr or flange to enter the shaft, said plate being secured by a bolt or otherwise, substantially as set forth.

2. In a spring-support for vehicles, a hanger constructed from a single piece of wrought metal, having an elongated eye at its upper end and a removable spring-support at its lower end, as described.

398,181. DRAWER-PULL. GEORGE S. PEARSON, Waterbury, Conn. Filed Dec. 15, 1888. Serial No. 293,696. (No model.)



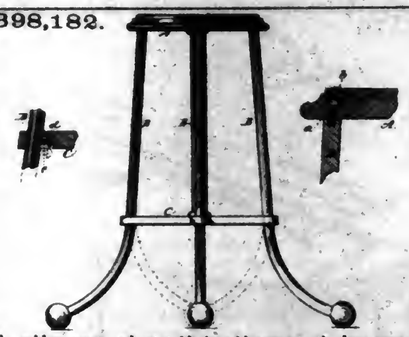
Claim.—1. A drawer-pull comprising a shank having a flange near its outer end, an inner shell having cut-away portions, and a central opening through which the shank is passed and then headed down, said shell resting upon the flange, and an outer shell having holes which register with said cut-away portions, and which are adapted to receive a pull, the edge of said outer shell being closed inward over the edge of the inner shell, substantially as described.

2. In combination, a shank having a flange near its outer end, an inner shell having cut-away portions, and an opening through which the shank is passed and headed down, an outer shell having openings which register with the cut-away portions, and a pull whose ends pass through said holes and openings and rest under the flange, so that the entire strain in use is upon the shank.

3. In a drawer-pull, a shank having a flange, 3, and an inner shell through which the shank passes, and which is secured by heading down the shank, in combination with an outer shell closed inward over the inner shell, as and for the purpose set forth.

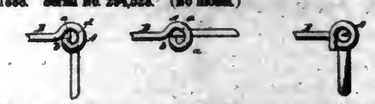
398,182. METAL TABLE. ROBBIE H. PECK and AUGUSTUS H. JOHNS, Meriden, Conn., assignors to the Meriden Brass Company, same place. Filed Nov. 26, 1888. Serial No. 291,582. (No model.)

Claim.—The herein-described improvement in metal tables, consisting of a top combined with several legs, a support below the table-top and through which the legs pass, the legs curved outward below



the said supports and rotatable in said supports, the legs connected to the table at their upper ends by an extensible pivot, and the supports below constructed with a notch upon their under side, and the legs with a corresponding stud, the said studs and notches adapted to interlock when the legs are in the turned-out position, substantially as described, and whereby the said legs upon being withdrawn from the top may be turned to bring the curve inward.

398,183. DRAWER-PULL. ROBBIE H. PECK, Meriden, Conn., assignor to the Meriden Brass Company, same place. Filed Dec. 24, 1888. Serial No. 294,523. (No model.)



Claim.—1. The herein-described improvement in drawer-pulls, consisting of a socket made from wire bent to form an eye at the outer end to receive the pivot, the end of that portion of the wire which forms the eye serving as a stop against which the handle may rest, substantially as described.

2. A socket for drawer-pulls, made from wire, its end bent to form an eye to receive the pivot of the handle, the end of the wire turned into the eye and so as to form a shoulder within the eye, the pivot of the handle being non-cylindrical in transverse section, substantially as described, and whereby the said end of the wire within the eye forms a stop both for the up and down swing of the handle.

3. A drawer-pull consisting of the ornamental base, constructed with holes through which the shank of the sockets may be introduced, combined with sockets made from wire, the outer end of the wire bent to form eyes, the shank of the sockets inserted through the holes in the base and so as to bring the eye against the front of the base, and the shank spread inside and close up to the base, forming projections on the shank on the inside of the base and whereby the base is clamped between the said projections on the inside and the eye upon the outside, substantially as specified.

398,184. PNEUMATIC WATER-ELEVATOR. THOMAS O. PERRY, Tecumseh, Mich. Filed Aug. 13, 1886. Serial No. 210,761. (No model.)

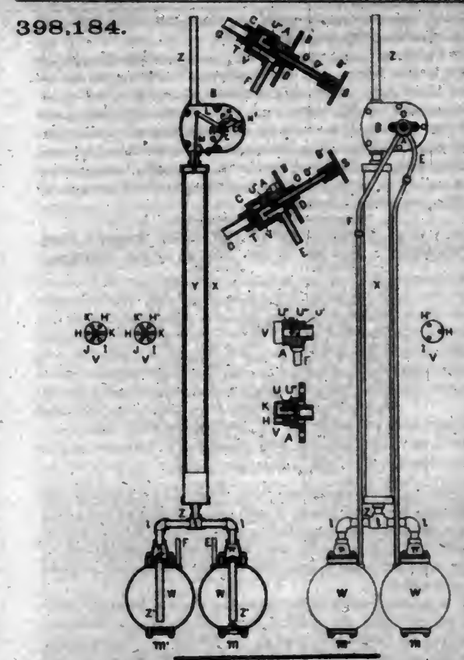
Claim.—1. In a pneumatic water-elevator, a pair of submerged water-chambers, air-ducts opening into them, a common discharge-pipe leading from them, and within said discharge-pipe and operating together a reciprocating float and revolving air-valve adapted to be opened and closed by the reciprocation of the float, so as to feed each duct alternately, all combined substantially as and for the purpose set forth.

2. In a pneumatic water-elevator, a pair of submerged water-chambers, air-ducts opening into them, a common discharge-pipe leading from them, and within said discharge-pipe a reciprocating float, revolving air-valve, and a ratchet-wheel and pawl connected to the oscillating float, whereby the valve is opened and closed, so as to feed each duct alternately, all combined substantially as and for the purpose set forth.

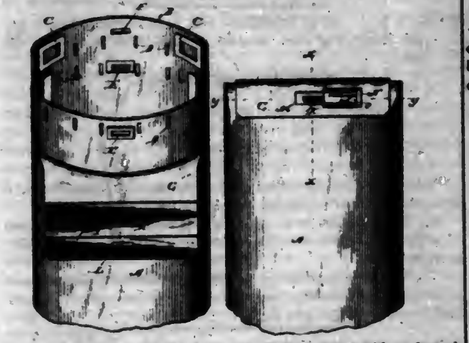
3. In a pneumatic water-elevator, a revolving air-valve having the cap C, valve-seat A, having apertures I and J, forming terminals of the air-ducts E and F, and the hollow stem U of the air-valve, having an aperture, U', always communicating through the semicircular recess U'' in the valve-seat A with the aperture U''', whereby the ducts E and F are alternately relieved of air-pressure, substantially as and for the purpose set forth.



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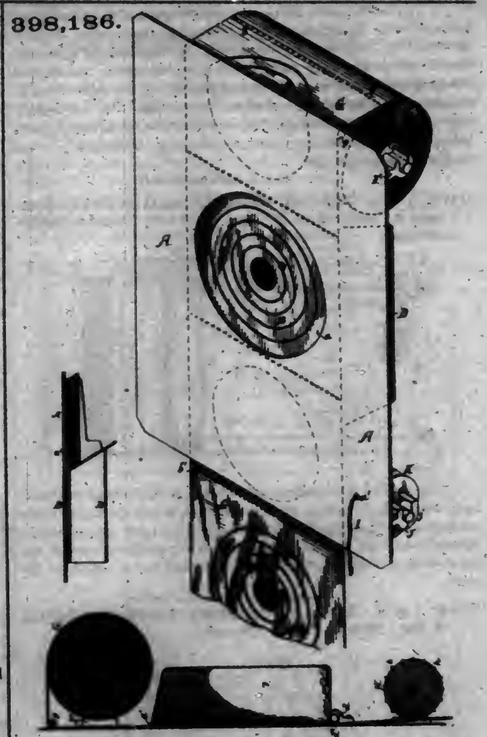


398,185. MAIL-BAG. ALLEN B. GORHAM, Baltimore, Md. Filed Dec. 6, 1888. Serial No. 292,795. (No model.)



Claim.—The bag having the openings E on opposite sides, adapted to register when the bag is closed, the flap B, adapted to fold over the mouth of the bag and provided with the opening F, to register with openings E, and provided, further, with the stiffening metallic plates C at its corners, for the purpose set forth, the supplemental flap G, secured to one side of the bag and adapted to fold over the flap B, the stiffening-plates H I, secured to the inner side of said supplemental flap, said plate H having the staple K, adapted to extend through the registering openings E F, and said plate I having the opening L, adapted to receive the projecting end of the staple, substantially as described.

398,186. TARGET. MARTIN O. REHFUSS, Philadelphia, Pa., assignor to himself, George Rehfuss, and J. George Rehfuss, same place. Filed May 4, 1888. Serial No. 272,700. (No model.)

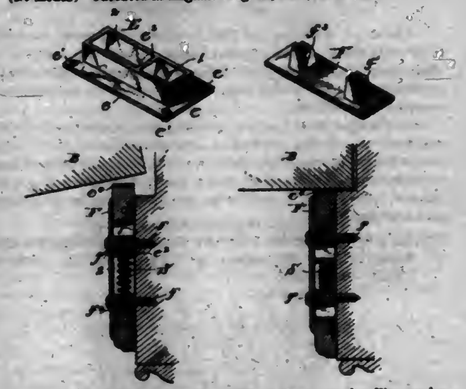


Claim.—1. The combination of the target-plate having an opening therein, a box located in the rear of said opening and forming a shot-receiving chamber, and a perforable target-sheet closing the opening in the target and serving to prevent the escape of shot rebounding from the back of the box, all substantially as specified.

2. The combination of the target-plate having an opening therein and a slotted shot-collecting box in the rear of the opening, a roll of target-sheets mounted on the plate above and outside of the box, and means for drawing the sheet of targets down through the slots of the box and past the opening in the target-plate.

3. The combination of the target-plate having an opening therein, a target-sheet roll, and a feed-roller mounted on opposite sides of the opening, and a shot-collecting box located back of the opening and between the target-sheet roll and feed-roll and slotted for the passage of the target-sheet, all substantially as specified.

398,187. WEATHER-STRIP. JOHN C. REED and JAMES REED, Leeds, County of York, England. Filed Apr. 7, 1888. Serial No. 270,000. (No model.) Patented in England Aug. 22, 1887, No. 11,410.

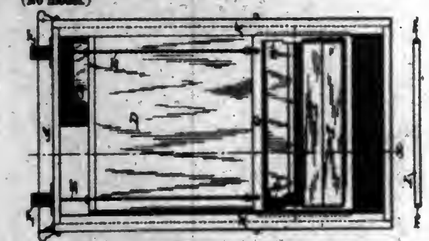


Claim.—1. The combination, with a door or the like and a weather-strip, of a casing rigidly connected therewith and having its open chamber divided by a partition, of a guide-plate provided with perforated lugs extending into said chamber on opposite sides of the partition, said guide-plate being rigidly secured to the door by screws passing through said perforated lugs, and a coiled spring arranged in said chamber to exert its power upon one of the lugs, substantially as and for the purposes specified.

2. The combination, with a door or the like and a weather-strip, of a casing rigidly connected therewith and having its open chamber made tapering inwardly and divided by a partition, of a guide-plate provided with correspondingly-tapering perforated lugs extending into said chamber on opposite sides of the partition, said guide-plate being rigidly secured to the door by screws passing through said perforated lugs, and a coiled spring arranged in said chamber to exert its power upon one of the lugs, substantially as and for the purposes specified.

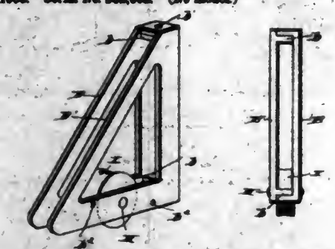
3. The combination, with a movable element and a stationary element, of means for forming a tight joint along the meeting edges of said elements, comprising a weather-strip, the flanged casing E, secured thereto, said casing being made tapering in cross-section and divided into two unequal parts by a stationary partition, the guide-plate F, connected with the movable element and provided with correspondingly-tapering perforated lugs f' f^2, and the coiled spring S, said parts being constructed and arranged for co-operation substantially as and for the purposes specified.

398,188. BOOK-CASE. GEORGE H. ETTENGER and GEORGE J. RHEINGART, Jr., New York, N. Y. Filed Nov. 5, 1888. Serial No. 289,949. (No model.)



Claim.—The combination, substantially as set forth, of the book-case, the vertically-sliding set of shelves, the counterbalancing-frame moving in vertical ways formed in the case, the cords connecting the shelves and frame, the pulleys over which the cords are carried, and the detachable weights fitting edgewise in said frame, one above the other.

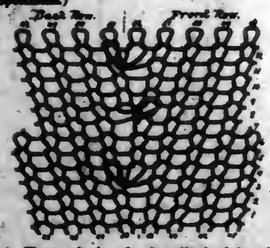
398,189. GATE. JACOB T. SARGENT, Carlinville, Ill. Filed Aug. 16, 1888. Serial No. 282,962. (No model.)



Claim.—1. A hanger for sliding and swinging gates, consisting of the side pieces secured together and provided in their lower sides with a series of holes arranged at different heights, and a roller adapted to be secured in any of the holes to raise and lower the gate, substantially as described.

2. A hanger for sliding and swinging gates, consisting of the side portions provided with overlapping lugs adapted to receive a bolt to secure the portions together and to a post and having a series of holes arranged at different heights along their lower sides, and a roller adapted to be secured in said holes, substantially as and for the purpose described.

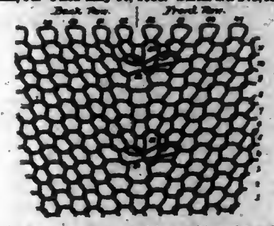
398,190. ART OF KNITTING WIDENED TUBULAR FABRICS. ROBERT W. SCOTT, Philadelphia, Pa. Filed May 10, 1888. Serial No. 273,409. (Specimens.)



Claim.—1. The mode herein described of forming additional widening-wales in knitted fabrics, said mode consisting in knitting the narrow portion of the fabric on two opposite rows of needles, throwing additional needles into operation in succession alternately at the finishing end of one row and at the starting end of the other row, drawing a new loop on each fresh needle thrown into action, and interrupting the regular run of the thread in some of the courses by forming next to a fresh loop an extra loop on the last acting needle of the row opposite that in which the new needle is brought into action, all substantially as specified.

2. The mode herein described of forming additional widening-wales in knitted fabrics, said mode consisting in knitting the narrow portion of the fabric on two opposite rows of needles, throwing additional needles into operation in succession, first at the starting end of one row and then at the finishing end of the other row on completing the course, and interrupting the regular run of the thread by forming immediately after the fresh loop on the new needle at the starting end of one row an extra loop on the end acting needle of the opposite row, all substantially as specified.

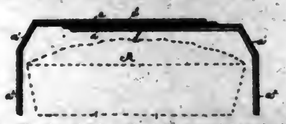
398,191. WIDENED TUBULAR KNIT FABRIC. ROBERT W. SCOTT, Philadelphia, Pa. Filed May 10, 1888. Serial No. 273,410. (Specimens.)



Claim.—1. A tubular knitted fabric widened by the introduction of additional wales and having at each such widening an extra loop drawn in one of the adjacent standing wales, the thread being carried from said extra loop across the space formed by the widening-wale to the standing wale on the opposite side of said widening-wale, substantially as specified.

2. A tubular knitted fabric widened by the introduction of additional pairs of wales, the wales of each pair starting in successive courses, and the thread, after starting the first wale of the pair, being drawn into an extra loop in a standing wale at one side of the said widening-wale, and then crossed to a standing wale on the opposite side of the same, all substantially as specified.

398,192. HEAT-PROTECTOR FOR BAKE-OVENS. JOHN J. SHUPERT, Gilmore City, Iowa. Filed Oct. 20, 1888. Serial No. 289,281. (No model.)



Claim.—1. The herein-described improved bread shield or protector, composed of adjustable sections, substantially as set forth.

2. The herein-described improved bread shield or protector, composed of adjustable sections having lower vertical ends, substantially as set forth.

3. The herein-described improved bread shield or protector, composed of adjustable sections, one of which has guideways for the other section, substantially as set forth.

398,193. RUFFLING AND GATHERING ATTACHMENT FOR SEWING-MACHINES. EDWARD SMITH, Peoria, Ill. Filed Jan. 25, 1888. Serial No. 261,880. (Model.)



Claim.—1. The combination, with a base-plate and an operating-lever, of a reciprocating slide carrying the ruffling-blade and provided in its upper side with the herein-described recess having a pair of engaging-faces, respectively, for the backward and forward throw of the ruffling-blade, said engaging-faces slanting upwardly, the face for the backward throw of the blade having a greater degree of inclination than the face for the forward throw, and a vertically-adjustable operating-bar carried by and operating with said lever, and having its lower end confined in said recess, whereby the blade is reciprocated when the lever is operated, and by which the backward throw of the blade is regulated, while the limit of its forward throw remains the same, substantially as described.

2. In a ruffling attachment, the combination of the ruffling-blade, an operating-lever, the vertically-adjustable operating-bar provided with ratchet-teeth, a graduated scale, and an indicating-finger operating over the scale and provided with teeth meshing with the teeth of said bar, whereby the finger and bar operate simultaneously when the bar is adjusted.

3. In combination, a reciprocating ruffling-blade slide, the pivoted operating-lever, a vertically-adjustable operating-bar carried by said lever to actuate said slide, a graduated scale upon the operating-lever, and an indicating-finger operating over said scale and pivoted to the operating-lever at one side of its pivotal point and connected at one end with the vertically-adjustable operating-bar, so that said finger and bar operate simultaneously when the bar is being adjusted.

4. In a ruffling attachment, the combination of the base-plate, the operating-lever, a vertically-adjustable operating-bar, the reciprocating ruffler-blade slide, the ruffler-blade, an upwardly-extending block on the upper face of said slide provided with engaging-faces, respectively, for the backward and forward throw of the ruffler-blade, and between which the lower end of said bar is confined, the face for the backward throw of the blade slanting upwardly at a greater degree of inclination than the face for the forward throw, a stationary horizontal guide-track held parallel with said slide by ears secured to the base-plate, and sleeves secured to the slide and loosely embracing said stationary track.

5. In a ruffling attachment, the combination of the reciprocating slide carrying the ruffling-blade, an operating-lever pivoted at one end, an operating-bar to actuate the ruffling-blade slide and secured to the pivoted end of the operating-lever in vertical adjustment and provided with ratchet-teeth, an indicating-lever pivoted to the operating-lever and provided at one end with a toothed sector engaging the teeth of the operating-bar, and with a pointer or finger at its opposite end, and a graduated plate carried by the operating-lever and over the face of which said pointer or finger operates, for the purpose substantially as set forth.

6. The combination of the base-plate, the reciprocating ruffling-blade, a detachable separator-blade, a plate carrying the same and provided with an upwardly-extending arm or flange at one end, having an inwardly-projecting lug, a corresponding upwardly-bent arm at the outer edge of the base-plate, having an aperture for the passage of said lug, and a locking-lever pivoted to said arm of the base-plate.

7. The combination, with the base-plate and the reciprocating ruffling-blade, of a plate extending transversely beneath the base-plate, a separator-blade secured to one end of said plate, an arm provided with flanges and a lug extending upwardly from the opposite end of said plate, a corresponding arm extending upwardly from the outer edge of the base-plate and provided with an aperture, said before-mentioned arm of the separator-blade plate engaging the arm of the base-plate and its lug extending through said aperture in the same, and a lever pivoted to the arm of the base-plate to engage said lug and detachably lock the separator-blade to the base-plate, as set forth.

8. In a ruffling attachment, the combination, with a base-plate and the reciprocating ruffling-blade, of a laterally-adjustable guide comprising a body portion extending over the upper face of the base-plate, a laterally-bent arm adjustably secured to the base-plate, and an arm at the opposite end of the body portion and extending downwardly between the edges of the base-plate and the inner edge of the ruffling-blade and adapted to engage and guide the cloth operated upon, substantially as described.

9. The combination, with the base-plate and the reciprocating ruffling-blade, of the herein-described adjusting blocks or bars pivoted or journaled at one end in the base-plate to turn on a longitudinal axis and extending from the pivotal end transversely across and bearing upon the upper face of the ruffling-blade, as set forth.

10. The combination, with the base-plate and the reciprocating ruffling-blade, of an adjusting bar or block journaled or pivoted at one end to turn on a longitudinal axis and extending transversely across and bearing upon the upper surface of the ruffling-blade, said bar or block being provided with an eccentric outer surface, whereby the downward pressure of the ruffling-blade is regulated by rotating said bar or block so that its outer surface will bear with greater or less pressure upon said blade.

11. The combination, with a base-plate and an operating-lever, of a reciprocating slide carrying the ruffling-blade, and provided in its upper face with a recess having a pair of engaging-faces, respectively, for the backward and forward throw of the ruffling-blade, the face for the backward throw of the blade slanting upwardly at a greater degree of inclination than the face for the forward throw, a vertically-adjustable operating-bar carried by said lever and having its lower end confined in said recess, a graduated scale on the operating-lever, and an indicating-finger pivoted to said lever, connected with said operating-bar, and operating over said scale.

398,194. SECONDARY BATTERY. ELIHU A. THOMSON, 2 Great George Street, Westminster, County of Middlesex, England. Filed Oct. 1, 1888. Serial No. 286,963. (No model.)

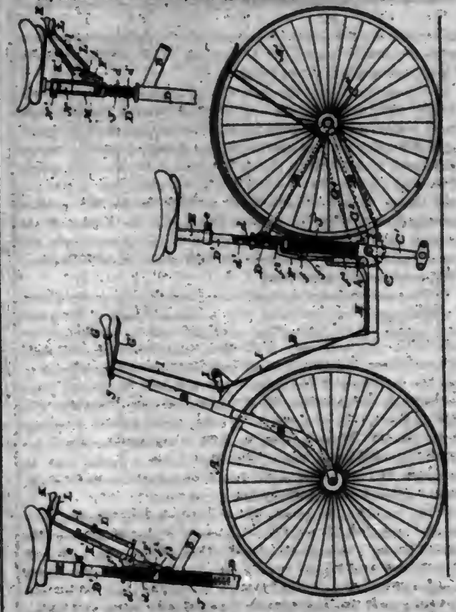


Claim.—1. An element for secondary batteries, consisting of a plate composed of litharge and a solution of sulphate of ammonia, and a supporting-frame, substantially as described.

2. An element for secondary batteries, consisting of a plate composed of litharge and sulphate of ammonia, and a supporting-frame of ebonite, substantially as described.

3. An element for secondary batteries, consisting of a plate composed of litharge and a solution of sulphate of ammonia, and a supporting-frame of inoxidizable material, substantially as described.

398,195. BICYCLE. EDWARD THUEMLER, Chicago, Ill. Filed Aug. 16, 1888. Serial No. 282,982. (No model.)



Claim.—1. In a bicycle, a seat having a supporting device whereby the seat may be adjusted vertically by the rider when mounted thereon, with means under his control for locking it at any desired elevation, substantially as hereinbefore set forth.

2. The combination of a seat-supporting post, D', provided with notches d', the sleeve or standard in which it is fitted, the spring detent-catch F, taking into the notches, and means whereby the rider when mounted on the seat may withdraw the catch from the notches, substantially as and for the purpose hereinbefore set forth.

3. The combination of the seat-supporting post D', provided with a notched rack or series of recesses, the tubular sleeve in which it is fitted, the detent-catch pivoted to the sleeve and taking into the notches of the rack, and a spring pressing upward to raise the seat when the detent is withdrawn from the rack, substantially as hereinbefore set forth.

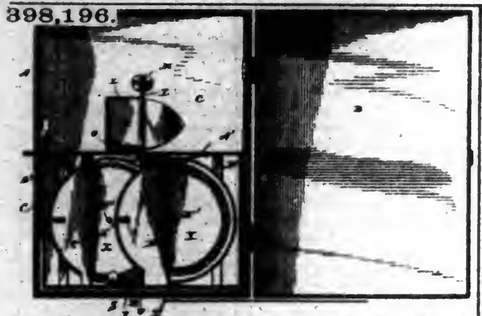
4. The combination of the seat-supporting post provided with a groove, d, and notches d', the tubular sleeve in which it is fitted, the spring detent-catch pivoted to the sleeve and taking into the groove and notches, and the spring pressing upward to raise the seat, substantially as hereinbefore set forth.

5. In a bicycle, the combination of the seat-supporting post D', with its series of notches, the sleeve-standard into which it is fitted, the spring detent-catch pivoted to the sleeve and taking into the notches in the post, and the trip-lever G', pivoted on the steering-handle G of the bicycle and connected by suitable mechanism to the detent-catch, whereby the latter may be withdrawn from engagement with the notches in the seat-post, substantially as and for the purpose hereinbefore set forth.

398,196. VOTING-MACHINE. GEORGE W. TRAHAN and TELESPHORE BABIN, Houma, La. Filed Sept. 22, 1888. Serial No. 286,086. (No model.)

Claim.—1. In a registering device for ballot-boxes, &c., the combination, with the outer box or casing, of the inner tray provided with a suitable deposit-opening, the deposit-lid above said opening having

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a shaft rigidly secured thereto, and the toothed registering mechanism mounted in suitable bearings in the bottom of the tray actuated by said shaft, substantially as set forth.

2. The combination of the outer casing having inner corner-pieces, the hinged inner tray provided with a deposit-opening, the deposit-lid having a transverse shaft rigidly secured thereto, said shaft being provided with cranks, the side apartment, the spring adapted to engage the innermost of said cranks, the sliding plate or bar having a spring-pawl secured thereto, the sleeves in which this sliding bar moves, one of said sleeves having a spring-pawl secured thereto, the toothed registering-dials mounted in suitable bearings in the bottom of the apartment, one of said dials being provided with an eccentric-pin, and the spring-pawl adapted to engage the teeth of the rearmost registering-dial, substantially as set forth.

3. The combination of the outer casing having inner corner-pieces, the hinged inner tray provided with a deposit-opening, the guard located beneath said opening and provided with an alarm-bell, the deposit-lid having a transverse shaft rigidly secured thereto, said shaft being provided with cranks, the side apartment, the spring adapted to engage the innermost of the cranks upon the shaft, the sliding plate or bar having a spring-pawl secured thereto, the sleeves in which this sliding bar moves, one of said sleeves being provided with a spring-pawl, the toothed registering-dials mounted in suitable bearings in the bottom of the apartment, one of said dials being provided with an eccentric-pin, and the spring-pawl adapted to engage the teeth of the rearmost registering-dial, substantially as set forth.

4. The combination of the outer casing having inner corner-plates, the hinged inner tray provided with a deposit-opening, the deposit-lid having a transverse shaft rigidly secured thereto, said shaft being provided with cranks, the side apartment, the spring adapted to engage the innermost of said cranks, the sliding plate or bar having a spring-pawl secured thereto, the sleeves in which this sliding bar moves, one of said sleeves having a spring-pawl secured thereto, the flat spring adapted to engage the forward end of said sliding plate or bar, the toothed registering-dials mounted in suitable bearings in the bottom of the apartment, one of said dials being provided with an eccentric-pin, and the spring-pawl adapted to engage the rearmost registering-dial, substantially as set forth.

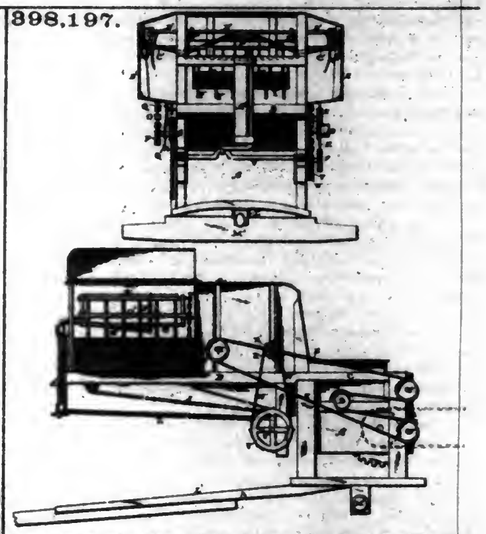
5. The combination of the outer casing having inner corner-pieces, the hinged inner tray provided with a deposit-opening, the guard located beneath said opening and provided with an alarm-bell, the deposit-lid having a transverse shaft rigidly secured thereto, said shaft being provided with cranks, the side apartment having a hinged cover, said cover being provided with suitable openings having pivoted covers above the same, the spring adapted to engage the innermost of the cranks located upon the transverse shaft, the sliding plate or bar having a spring-pawl secured thereto, the sleeves in which this sliding bar moves, one of said sleeves being provided with a spring-pawl, the flat spring adapted to engage the forward end of said sliding plate or bar, the toothed registering-dials mounted in suitable bearings in the bottom of the apartment, one of said dials being provided with an eccentric-pin, the slitted curved plates having the slits therein registering with the openings in the cover of the side apartment, and the spring-pawl adapted to engage the teeth of the rearmost toothed dial, substantially as set forth.

398,197. RAKE-CUTTER AND FEEDER. HENRY A. UNDERWOOD, Lamoure, Dak. Filed Sept. 11, 1888. Serial No. 285,133. (No model.)

Claim.—1. The combination of the crank-shaft U, connecting-rod Z, partially-rotating shaft A', provided with a crank at each of its ends, an endwise-moving frame operated by the shaft, and a pivoted rake which is carried by the frame and also operated by the shaft, substantially as shown.

2. The combination of an endless carrier or apron, an endwise-moving frame which is made to reciprocate over the outer end of the carrier, a pivotal double-ended rake placed in and carried by the

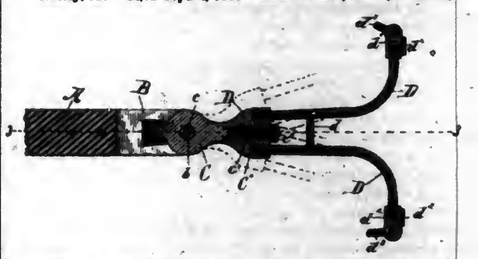
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frame, an operating-crank, chains for connecting the ends of the rake to the crank, and an operating mechanism, substantially as described.

3. The combination of the frame B, the endless carrier, the endwise-moving frame, the pivoted double-ended rake, the operating-crank, chain or strap for connecting the two ends of the rake to the crank, means for operating the crank, and the pivoted doors on opposite sides of the frame to form platforms, substantially as specified.

398,198. BREAST-YOKE. GILBERT VAN CAMP, Geneva, Jennings County, Ind. Filed Sept. 4, 1888. Serial No. 284,541. (No model.)



Claim.—1. The combination, in a breast-yoke, of a joint-block mounted pivotally in a housing upon the end of the tongue or pole, and the breast-yoke proper mounted and adapted to swivel upon a stem forming part of said joint-block.

2. The combination, in a breast-yoke, of a housing secured to the end of the pole, and a joint-block supporting the yoke mounted therein on a pivot-bolt, and a sleeve surrounding said pivot-bolt slightly longer than the thickness of said joint-block, substantially as described, and for the purposes specified.

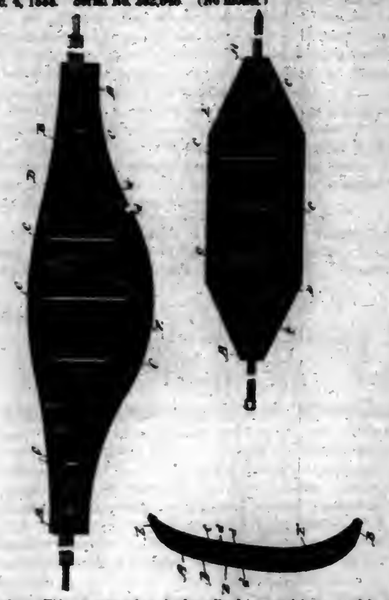
3. The combination, in a breast-yoke, of a joint-block secured to the tongue, the stem portion of which extends through the base portion of the neck-yoke proper, said stem portion being surrounded by a sleeve slightly longer than the distance through the portion through which it extends, substantially as shown and described.

4. The combination of a breast-yoke adapted to move pivotally upon the end of the pole or tongue, and a pin whereby it may upon occasion be secured to position, said pin being provided with a small projection upon one side of its head, whereby by reversing said pin said movable portion may be either left free or secured rigidly in position and the openings for the pin at the same time kept covered, substantially as set forth.

5. The combination of the pole A, the housing B, the joint-block C, and the breast-yoke proper, D, said several parts being constructed and operating substantially as shown and described.

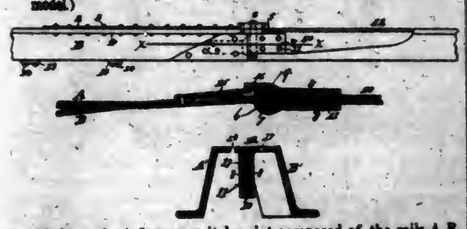
6. The combination of the pole, a housing thereon, and a breast-yoke secured in said housing, that portion which connects the breast-yoke to the housing having a rearward projection, and the housing having an opening larger than said projection, and a pin adapted to pass down through said housing and either through or alongside said projection, thus securing the breast-yoke either directly in line with the pole or to one side thereof, substantially as set forth.

398,199. COMPRESS. MARTIN V. WAGNER, Marshall, Mich. Filed Dec. 4, 1888. Serial No. 292,645. (No model.)



Claim.—The compress herein described, comprising a pad having a fibrous filling and a casing having two thicknesses of rubber cloth, and a series of transverse tapes having their ends attached to the top and bottom edges thereof, whereby the casing is adapted to securely hold the pad in position, either in the pocket formed between the two thicknesses of the casing or on one side thereof, and thus the action of the pad be graduated as desired, substantially as described.

398,200. CABLE-RAILWAY SWITCH. FREDERIC C. WEIR and NATHANIEL G. GOLDSMITH, Cincinnati, Ohio, assignors to the Weir Frog Company, same place. Filed May 24, 1888. Serial No. 274,910. (No model.)



Claim.—1. A frog or switch point composed of the rails A B, fitted to each other, said rails being secured at the bottom by means of a brace-plate, 13, and rivets 14, and also secured at the top by means of a brace-plate, 2, and rivets 3, substantially as described.

2. In combination with the slot-rails forming two slots, 17 and 18, the tongue 10, hinged to the heel rails by means of the plate 5, substantially as herein specified.

3. In combination with the rails A B, secured together, the tongue 10, hinging-plate 5, and the spring 15, secured to the webs of the rails A B and engaged with the lug 16 of the tongue-rail, substantially as specified.

4. In combination with the slot-rails A B, secured together, the tongue 10, made of T-iron, hinging-plate 5, and pivot 6, the journal-arm 7, having an eye, 9, which encircles the pivot 6, and arms 8, which embrace the web of the tongue 10 and are united thereto, substantially as shown and described.

398,201. RAILWAY-FROG. FREDERIC C. WEIR and NATHANIEL G. GOLDSMITH, Cincinnati, Ohio, assignors to the Weir Frog Company, same place. Filed May 24, 1888. Serial No. 274,911. (No model.)

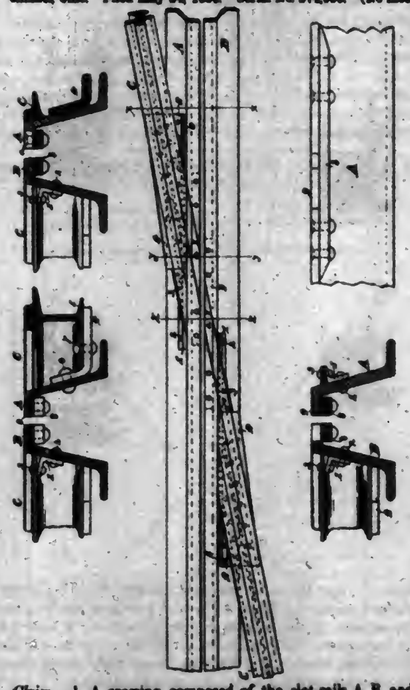


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Claim.—A frog composed of point-rails A A, having their flanges 1 bent to overlap the inclined flanges 2 of the wing-rails B B, and secured together by rivets 3, and the bottom flanges of said rails secured to the base-plate D, substantially as specified.

398,202. CABLE-RAILWAY CROSSING. FREDERIC C. WEIR, Cincinnati, Ohio. Filed May 24, 1888. Serial No. 274,909. (No model.)



Claim.—1. A crossing composed of the slot-rails A B, and the girder-rail C, beveled to fit said slot-rails, and secured to them by the brace-plate 4 and the rivets 6 and 7, substantially as herein specified.

2. A crossing formed of slot-rails A B, and the girder-rail C, beveled to fit said slot-rails, and secured thereto by means of the brace-plates 1 and 4, bolted to the flange and web of said rails, substantially as specified.

3. In combination with the rails A B, having the gains *a*, the guide-plates 8, secured to the under side of the flanges 9 of the rails A B, substantially as herein set forth.

398,203. RAILWAY-FROG. FREDERIC C. WEIR, Cincinnati, Ohio. Filed May 24, 1888. Serial No. 274,910. (No model.)



Claim.—1. A frog consisting of the pointed T and girder rails, the interposed filling-block 1, the fish-plates 2, and the tie-bolts 3 and 5, extending through the T and girder rails, the filling-block, and the fish-plates, substantially as described.

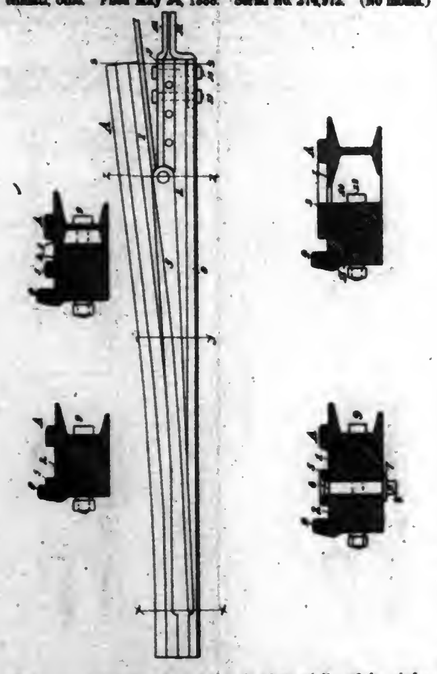
2. A frog consisting of the pointed T and girder rails, the latter having laterally-extending flanges resting against the sides of the former, the interposed filling-block, the fish-plates 2, and the tie-bolts 3 and 5, extending through the T and girder rails, the filling-block, and the fish-plate, substantially as described.

3. A frog composed of T-rails A B, the girder-rails C, the filling-

blocks 1 and 7, and through-bolts 3 5 10, passing through the webs of said rails and said filling-blocks, substantially as herein specified

4. A frog-point composed of the T-rails A B, the filling-block 1, the bent fish-plates 2, projecting beyond the said rail, and the parts secured by bolts 3, substantially as specified.

398,204. STREET-RAILWAY SWITCH. FREDERIC C. WEBB, Cincinnati, Ohio. Filed May 24, 1888. Serial No. 274,972. (No model.)



Claim.—1. A switch-point composed, substantially, of the girder-rail and guard and spacing block 2, provided with guard-flange 4, and secured together by means of through-bolts, substantially as specified.

2. A switch-point composed, substantially, of the girder-rail and spacing and guard block 2, provided with flanges 3 and 4, secured together by through-bolts 9, substantially as herein specified.

3. In combination with the girder-rail A and guard and spacing block 2, the fish-plates 10 and 11 for connecting the girder-rail to said casting-block 2, substantially as specified.

4. In combination with the girder-rail A, guard and spacing block 2, provided with flange 4, the switch-tongue 5, pivoted to said guard and spacing block, substantially as herein specified.

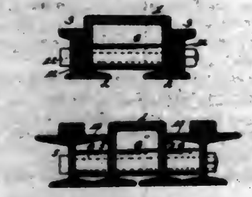
398,205. RAILWAY-FROG. FREDERIC C. WEBB, Cincinnati, Ohio. Filed May 24, 1888. Serial No. 274,973. (No model.)

Claim.—1. The point of a railway-frog, composed of U-rail 1, provided with the base-support 2 and side flanges, 3, substantially as herein specified.

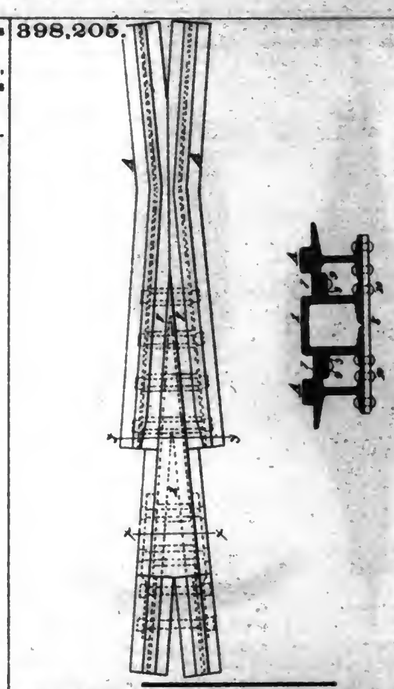
2. A railway-frog composed of the U-shaped point 1 and the side flanges, 3, in combination with the guard-rails A A, secured together by rivets or bolts, substantially as herein specified.

3. A railway-frog composed of the guard-rails A, having side flanges, the U-shaped point 1, having the lateral side flanges, 3, the through-bolts 5, and the spacing-blocks 6, located on the bolts between the point and guard-rails, substantially as described.

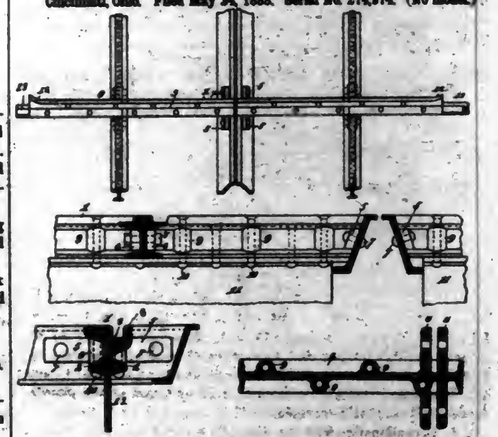
4. A railway-frog composed of the guard-rail A A, the U-point rail 1, provided with flanges 3, the side rails being secured together by through-bolts 5, substantially as herein specified.



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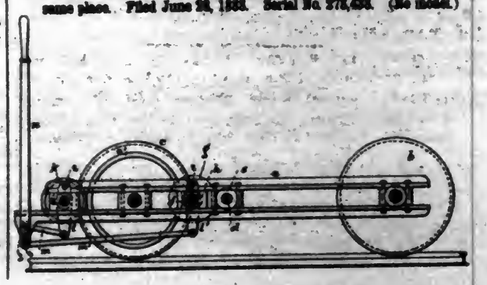
398,206. CABLE AND RAILWAY CROSSING. FREDERIC C. WEBB, Cincinnati, Ohio. Filed May 24, 1888. Serial No. 274,974. (No model.)



Claim.—1. The crossing-rail 1, provided with base 2, tramway 3, flange 4, and the ears 5, substantially as herein set forth.

2. The crossing-rail 1, provided with bosses 9, ears 5 and 6, with the tramway 3, and guard 4, substantially as herein specified.

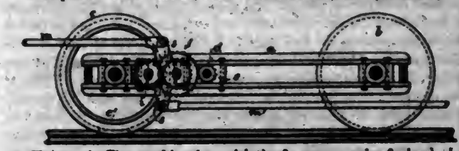
398,207. DRIVING MECHANISM FOR CARS. FRANCIS J. WEBB, Jersey City, N. J., assignor to the United States Machine Company, same place. Filed June 28, 1888. Serial No. 278,436. (No model.)



Claim.—1. The combination, with the pair of wheels *b* and a supporting-frame and the electrically-rotated shaft, of the pair of wheels *c*, having flanges *c'*, a pair of friction-wheels, *k*, adapted to engage the annular flanges at one side, and a pair of friction-wheels, *h*, adapted to engage the opposite side of the annular flanges, and mechanism, substantially as herein shown and described, for imparting motion to the friction-wheels, substantially as set forth.

2. The combination, with the pair of wheels *b* and a supporting-frame and an electrically-rotated or motor-shaft, of a pair of wheels, *c*, having flanges *c'*, the pairs of friction-wheels *h k*, adapted to engage the opposite sides of the annular flanges, the swinging levers *l l'*, the pull-levers *m m'*, and a lever, *n*, by which the same are operated, substantially as and for the purposes set forth.

398,208. DRIVING MECHANISM FOR CARS. FRANCIS J. WEBB, Jersey City, N. J., assignor to the United States Machine Company, same place. Filed June 28, 1888. Serial No. 278,439. (No model.)



Claim.—1. The combination, with the frame *a*, a pair of wheels, *b*, the pair of wheels *c*, having flanges *c'*, and an electrically-rotated or motor shaft, of pairs of friction-wheels adapted to grasp the outer and inner peripheries of the flanges *c'*, the rocking frame in which the shafts of said friction-wheels are mounted, gearing connecting said shafts with each other and with the electrically-rotated shaft, and mechanism, substantially as specified, for operating the pairs of friction-wheels for driving the wheels *c*, substantially as and for the purposes set forth.

2. The combination, with the frame *a*, the pair of wheels *b*, the pair of wheels *c* and their flanges *c'*, and an electrically-rotated motor-shaft, of the shafts *f i*, the rocking frames *s d'*, forming bearings for said shafts, short shafts by which the rocking frames are pivoted to the frame *a*, pairs of friction-wheels *h k*, mounted upon the respective ends of the shafts *f i*, and the gears *i'*, *f'*, and *e*, substantially as and for the purposes set forth.

398,209. DRIVING MECHANISM FOR CARS. FRANCIS J. WEBB, Jersey City, N. J., assignor to the United States Machine Company, same place. Filed June 28, 1888. Serial No. 278,440. (No model.)



Claim.—1. The combination, with the frame *a* and the pair of wheels *b* and an electrically-rotated motor-shaft, of a pair of wheels, *c*, having grooved flanges *c'*, the grooved pulleys *k*, and mechanism, substantially as herein shown and described, for moving the driving-wheels *c* to engage their flanges *c'* and the pulleys *k*, substantially as set forth.

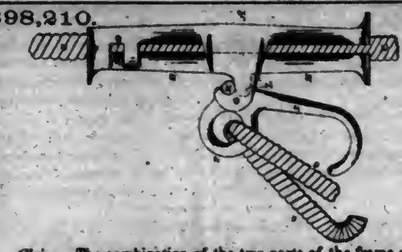
2. The combination, with the frame *a*, the pair of wheels *b*, and an electrically-rotated motor-shaft, of the pair of wheels *c*, the flanges *c'* upon the same, said flanges having V-shaped grooves across their faces, with channeled bases to said grooves, the friction-wheels *k*, having V-shaped grooves, the shaft *f* for said friction-wheels, the gears *e* and *g*, and mechanism, substantially as specified, for moving the driving-wheels to engage the flanges and friction-wheels, substantially as set forth.

3. The combination, with the frame *a*, the pair of wheels *b*, and an electrically-rotated motor-shaft, of the driving-wheels *c*, having grooved flanges *c'*, the grooved friction-wheels *k*, the rocking frames *s s'*, pivoted at 4, the yokes *o o'* and levers *n n'*, pivoted at 5, and the rods *m m'*, for operating the same, substantially as set forth.

398,210. FIRE-ESCAPE. FRANK A. WHITMORE, Port Jervis, N. Y. Filed July 16, 1888. Serial No. 280,221. (No model.)

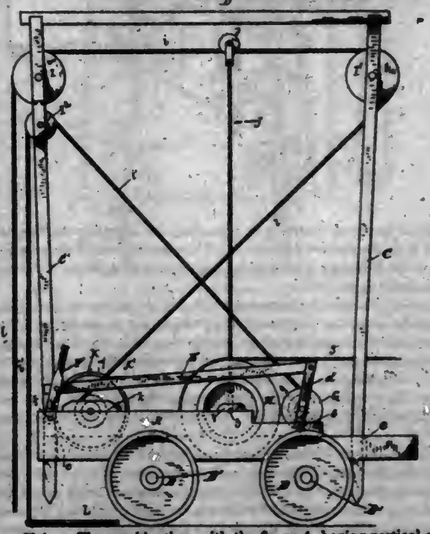


398,210.



Claim.—The combination of the two parts of the frame applied to opposite sides of the rope, one of the parts being provided with ears and the other with a projection upon its outer side, the operating-lever provided with journals or bearings to catch in the ears, and a ring or loop at its upper corner through which the suspending strap or belt is passed, said lever bearing against the projection upon one of the parts of the frame, substantially as shown and described.

398,211. WELL-BORING MACHINE. SAMUEL ADAMS, Denver, Pa. Filed July 7, 1887. Serial No. 243,614. (No model.)



Claim.—The combination, with the frame A, having vertical end standards, C C, the wheel K, mounted on the frame, and the drive-wheel H, provided with a crank-arm, of the sheaves I and I', pivotally mounted on the respective end standards of the frame, the cable *i*, anchored to the wheel K and carried over the sheave on the standard at the opposite end of the frame, thence carried horizontally between the standards and over the sheave I, and the cable J, provided with a sheave on its upper end to run on the drill-cable and having its lower end connected to the crank of the drive-wheel, substantially as described.

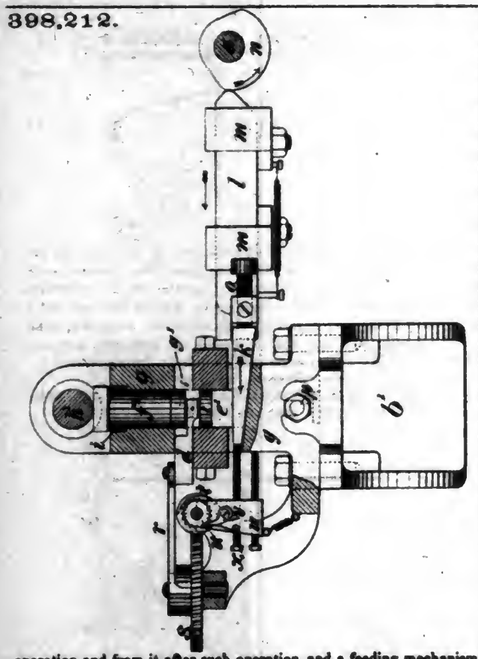
398,212. APPARATUS FOR FLATTENING CARD-WIRE AT INTERVALS. GEORGE ASHWORTH and ELIJAH ASHWORTH, Manchester, County of Lancaster, England. Filed June 26, 1888. Serial No. 278,096. (No model.)

Claim.—1. In a machine for flattening or altering the section of card-wire by pressure, a rapidly-vibrating presser and an anvil, in combination with parts for decreasing the mean distance between the presser and anvil during each flattening operation and increasing the distance after the operation, and with a feeding mechanism timed to be inoperative while that distance is so diminished, whereby the wire is flattened or shaped by a succession of squeezes or blows, substantially as set forth.

2. In a machine for flattening or altering the section of card-wire, a rapidly-vibrating presser and an anvil, in combination with the wire-guide, the eccentric-link, the worm-wheel carrying an eccentric, the worm, the ratchet-wheel and catch, and a moving part of the machine to act on the latter at each flattening operation, substantially as and for the purpose set forth.

3. In a machine for flattening or altering the section of card-wire, the rapidly-vibrating presser and the anvil, in combination with parts for gradually moving the said anvil toward the presser during the

398,212.



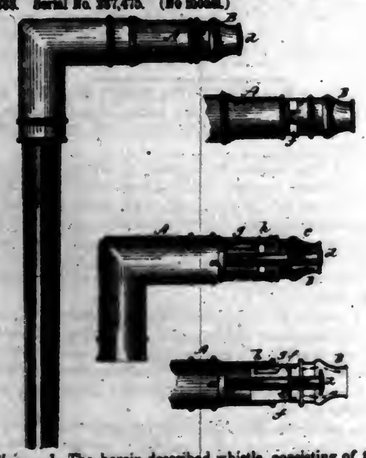
operation and from it after such operation, and a feeding mechanism timed to be inoperative while the anvil is so moved toward the presser, so that the flattening is effected by a succession of squeezes or blows, substantially as set forth.

4. In a machine for flattening or altering the section of card-wire, the rapidly-revolving eccentric *k'*, the presser-piece *f'*, the spring *l*, the presser, and the movable anvil, in combination with the sliding wedge for moving the anvil toward the presser, substantially as set forth.

5. As applied to a card-setting machine, the rapidly-vibrating presser, the movable anvil, the sliding wedge, the sliding bar *l*, and the cam for acting upon the said bar, substantially as and for the purpose set forth.

6. As applied to a card-setting machine, the wire-guide traversed to and fro, the rapidly-vibrating presser or hammer, and the anvil, the last two parts shorter on the face than the length of wire cut off to form a card-staple, combined with means for rapidly vibrating the said presser, and with means for lessening the distance between the presser and the anvil during the times when the wire is at rest, substantially as set forth.

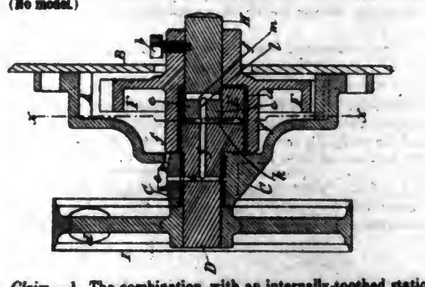
398,213. WHISTLE. HERBERT ATKINSON and GORDON W. HULL, Wallingford, Conn.; said Atkinson assignor to said Hull. Filed Oct. 8, 1888. Serial No. 287,475. (No model.)



Claim.—1. The herein-described whistle, consisting of the combination of the tubular body A, the tip B, arranged to slide longitudinally in said tubular body, the outer end of the tip open but contracted, an extension from the body within said tip and terminating at its outer end in a head corresponding to the contracted opening through the outer end of the tip, and so as to close the outer end of the tip when the tip is in the closed position, the tip constructed with one or more openings through it in such relation to the body that the openings in the tip are exposed only when the tip is drawn from the body, and the extension from the body provided with a disk of less transverse area than the interior of the tip at the openings and at a point corresponding to the outer edge of the opening when the tip is withdrawn, substantially as described.

2. The combination of the tubular body A, open at one end and closed at the opposite end, the tubular tip B, arranged to slide in the said tubular body and project through the open end, the body constructed with a spindle, *b*, projecting therefrom through the tip and terminating at its outer end in a head, *d*, of less diameter than the internal diameter of the tip, and the outer end of the tip contracted to an internal diameter corresponding to the said head, and so that in the closed position the said head will close the outer end, the spindle also constructed with a disk, *e*, in a plane at right angles to its axis within the tip and outside the open end of the body, the said disk of less diameter than the internal diameter of the tip, and the tip constructed with circumferential slots *f* in such relation to the said disk *e* that when the tip is drawn out the outer edge of the slots will come into the plane of the disk, and a stop to arrest the outward movement of the tip when the slots of the tip have reached their proper position in relation to the disk, substantially as described.

398,214. MECHANICAL MOVEMENT. ERNST F. AUTENRIETH, New York, assignor to the Glen Cove Machine Company, (Limited,) Green Point, Brooklyn, N. Y. Filed Nov. 13, 1888. Serial No. 290,662. (No model.)



Claim.—1. The combination, with an internally-toothed stationary gear, a driving-shaft concentric with said gear and an eccentric carried by said driving-shaft, of a second shaft arranged in line with the driving-shaft, a gear having fewer teeth arranged within and gearing with said stationary gear and secured fixedly on the second shaft in eccentric relation thereto and containing a concentric bearing fitted loosely to the eccentric on the driving-shaft, substantially as herein described.

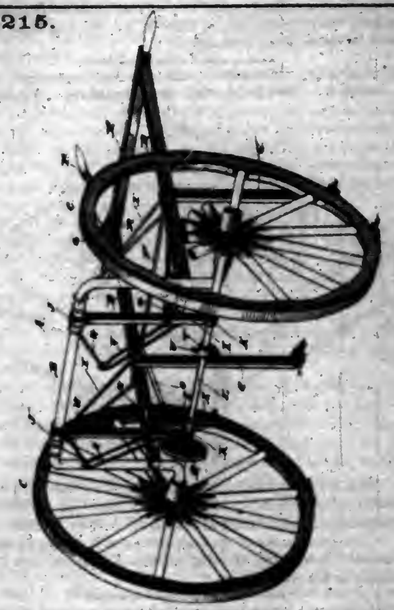
2. The combination of an internally-toothed stationary gear, a driving-shaft concentric therewith and an eccentric carried by said driving-shaft, a second shaft arranged in line with the driving-shaft, a gear internal to and gearing with said stationary gear secured fixedly on the second shaft in eccentric relation thereto and fitted to the eccentric on the driving-shaft, and a bearing within said eccentric for the end of the second shaft, substantially as herein described.

3. The combination, with a driving-shaft, a stationary internally-toothed gear, and a journal-box for said driving-shaft secured concentrically upon said toothed gear, of an eccentric fast upon the said driving-shaft, a second shaft in line with the driving-shaft, and an eccentric gear fast on the second shaft and fitting loosely to the eccentric on the driving-shaft, substantially as herein described.

4. The combination of an internally-toothed stationary gear, a driving-shaft concentric therewith, a stationary journal-box for said shaft, an eccentric carried by said shaft, a second shaft arranged in line with the driving-shaft, an eccentric gear secured to said second shaft in eccentric relation thereto and fitted to the eccentric on the driving-shaft, and a bearing within said eccentric for the end of the said second shaft, the said driving-shaft and eccentric having longitudinal and transverse oil-passages, and the said second shaft having longitudinal and transverse oil-passages, substantially as herein described, whereby oil is to be delivered from said stationary journal-box to the exterior of the eccentric, and also to the bearing provided within the eccentric for the second shaft, all substantially as herein described.

398,215. FENCE-WIRE-WINDING MACHINE. ARTHUR BALDWIN and JOHN CLEMENT, Prairie du Sac, Wis. Filed Nov. 7, 1888. Serial No. 290,214. (No model.)

398,215.



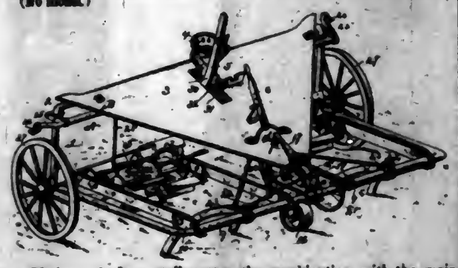
Claim.—1. In a machine for winding fence-wire, the combination of the axle, the swinging reel-arms having their upper ends hung thereon, the reel-shaft supported by said arms, and mechanism for rotating the reel-shaft, as set forth.

2. The combination of the axle, the push-bars secured thereto, the reel-arms hung on the axle, the pawls secured to the push-bars and engaging the reel-arms, the reel-shaft supported by said arms, and mechanism for rotating said shaft, as set forth.

3. The combination of the axle, the push-bars secured thereto, the reel-arms hung on the axle, the guides for said arms supported by the push-bars and the axle, the pawls secured to the push-bars and engaging said arms, the reel-shaft supported by said arms, and mechanism for rotating said shaft, as set forth.

4. The improved machine for winding fence-wire, comprising the axle, the push-bars secured thereto, the reel-arms hung on the axle, the pawls secured to the push-bars and engaging said arms, guides for said arms supported by the axle and the push-bars, the reel-shaft supported by said arms, the driving-shaft mounted on one of the push-bars and geared to the reel-shaft, the cross-bar connecting the push-bars, and the supporting-legs pivoted to said cross-bar, as specified.

398,216. CORN OR COTTON STALK CUTTER. MATHIAS B. BADGWEIT, Brown's Station, Iowa. Filed Sept. 10, 1888. Serial No. 285,083. (No model.)

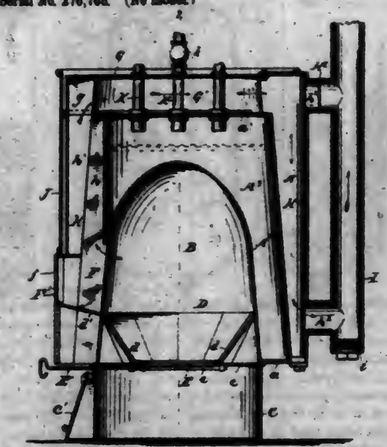


Claim.—1. In a stalk-cutter, the combination, with the main frame, the cutter-frames, the collars or sleeves 9, the stalk-cutters journaled in said frames, and each consisting of three hubs, 12, the spokes 13, and blades 14, and the mechanism, substantially as described, whereby the said cutter-frames and collars are moved laterally on the main frame, of the lever 30, journaled on the main frame, the shaft B, provided with the brake-shoes 26, the wires 28, connecting the arms of said shaft B with the rears of the cutter-frames, and the detent mechanism for said lever, constructed substantially as described, and situated upon the top of the main frame, as specified.

2. In a stalk-cutter, the combination, with the main frame, the cutter-frames, rendered adjustable laterally on the main frame by means of the collars 9, the lever 17, and rods connecting said lever and collars, and the vertically-adjustable drags secured to said collars, of the stalk-cutters, each consisting of the three hubs 12, the spokes 13, and blades 14, and having their shafts journaled in the corresponding cutter-frames, as specified.

3. In a stalk-cutter, the combination, with the guide-wheel having its shank or standard journaled in the front portion of the main frame and flattened on opposite sides between its bearings, of the springs 33, secured to the main frame and bearing on said flattened sides, substantially as and for the purpose specified.

398,217. APPARATUS FOR HEATING AND CIRCULATING WATER. WILLIAM J. BARNSTEAD, Galesburg, Ill. Filed June 11, 1888. Serial No. 276,766. (No model.)



Claim.—1. In an apparatus for heating and circulating water, the combination, with the boiler, of the centrally-located combustion-chamber having an opening at the front thereof and a flue arranged in the space between the casing and the boiler and extending upward from said opening to the top of the boiler, substantially as and for the purposes specified.

2. In an apparatus for heating and circulating water, the combination, with the boiler, of the centrally-located combustion-chamber having an opening at the front thereof and a flue arranged in the space between the casing and the boiler and extending upward from said opening to the top of the boiler, and thence rearward over the top of the boiler, substantially as and for the purposes specified.

3. In an apparatus for heating and circulating water, the combination, with the boiler and the centrally-located combustion-chamber having an opening arranged at the front thereof and serving both as a charging and flue opening, of a suitable door or damper at the front of said opening, and a flue arranged in the space between the casing and the boiler, leading upward from said opening to the top of the boiler and thence rearward over the top of the boiler, substantially as and for the purposes specified.

4. In an apparatus for heating and circulating water, the combination, with the boiler and the centrally-located combustion-chamber having an opening at the front of the same, of a flue arranged in the space between the casing and the boiler, extending upward from said opening along the boiler and thence rearward and downward along the boiler, substantially as and for the purposes specified.

5. In apparatus for heating and circulating water, the combination, with the boiler and the centrally-located combustion-chamber having an opening at the front of the same, of a flue arranged in the space between the casing and the boiler, extending upward from said opening along the boiler and thence rearward across the top of the boiler and thence downward along the boiler, substantially as and for the purposes specified.

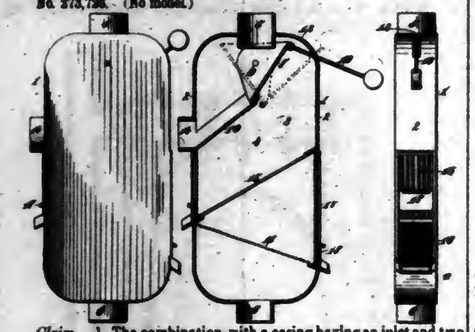
6. In an apparatus for heating and circulating water, the combination, with the boiler and the centrally-located combustion-chamber, of the hood arranged on top of the boiler and forming a second inclosed chamber within the main chamber between the casing and the boiler, an opening at the front of the combustion-chamber, and a flue leading upward from said opening to the second chamber, substantially as and for the purposes specified.

7. In an apparatus for heating and circulating water, the combination, with the boiler A, of the centrally-located combustion-chamber B, the opening F at the front thereof, and outer casing, J, the hood G, forming the chamber G' on top of the boiler within the space between the casing J and the boiler A, the flue H, leading from the

opening F to the chamber G', and the water-pipes K, leading upward from the boiler through the chamber G', substantially as and for the purposes specified.

8. In an apparatus for heating and circulating water, the combination, with the frusto-conical outer shell, A', of the similarly-formed inner shell, A^2, forming the combustion-chamber, and having a domed conoidal top and an opening, F, in the front thereof communicating with the space between the outer casing and the boiler, substantially as and for the purposes specified.

398,218. WATER FILTER AND CUT-OFF. WILLIAM C. BAYLISS and JAMES C. NICHOLS, Mossy Creek, Tenn. Filed May 12, 1888. Serial No. 273,726. (No model.)



Claim.—1. The combination, with a casing having an inlet and two outlets, and provided at its top with a longitudinal slot arranged in a vertical plane, of a tilting chute pivoted at or near its center in the casing, and a swinging and lengthwise-movable lever extending through and resting on the lower edge of the slot, and having its inner extremity pivoted to one end of the tilting chute, said lever provided at its outer end with a weight, serving to force the lever down upon the lower edge of said slot to hold the chute in its adjusted position, substantially as described.

2. The combination, with a casing having a slot in its top, a top inlet, a lateral side outlet, and a bottom outlet, of an inclined duct rising from the side outlet and extending inward and upward, a tilting chute pivoted at or near its center above the upper end of the inclined duct, and a swinging and lengthwise-movable lever extending through and resting on the lower edge of the slot and having its inner extremity pivoted to one end of the tilting chute and its outer end carrying a weight for forcing the lever into contact with the lower edge of the slot, substantially as and for the purposes described.

3. The combination, with a casing having an inlet, a lateral side outlet, and a bottom outlet, of inclined strainers located between the lateral side outlet and the bottom outlet, an inclined duct rising from the side outlet and extending upward and inward above the strainers, a tilting chute pivoted at or near its center above the strainers and duct, and a lever for tilting the chute, substantially as described.

4. The combination, with a casing, 1, having an inlet, 5, a lateral side outlet, 14, a bottom outlet, 6, and lateral side orifices, 17, of oppositely-inclined strainers 15 and 16, rising from the lateral side orifices, an adjustable gate, 18, located in each of said orifices at the lower end of the strainer rising therefrom, an inclined duct, 19, rising from the lateral side outlet and extending upward and inward above the strainers, a tilting chute, 8, pivoted above the upper end of the chute, and a lever for tilting the chute, substantially as described.

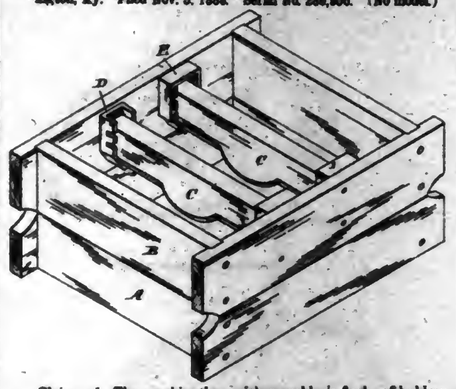
5. The combination, with the casing 1, having a top inlet, 5, a bottom outlet, 6, and a series of lateral outlet-openings, 17, provided at their sides with vertical guideways, a series of inclined strainers arranged in the casing and having their lower edges extending down to the lower edges of said lateral outlets, and a series of vertically-sliding gates, 18, having their vertical edges arranged in said guideways, said gates when raised permitting the water passing down the strainers to flow laterally to the outside of the casing, and when lowered to the edges of the strainers intercepting the downflow and forcing it back upon the strainers, substantially as described.

6. In a water filter and cut-off, the combination, with a casing having an upper and a lower outlet, of an inclined strainer composed of parallel straight bars, and an oppositely-inclined straight strainer composed of a foraminous plate, substantially as described.

7. In a water filter and cut-off, the combination, with a casing having an upper inlet and a lower outlet, and provided with a series of inclined bars and with an oppositely-inclined foraminous plate, of vertically-movable gates mounted in the edges of the casing at the foot of the inclined bars and at the foot of the foraminous plate, substantially as described.

8. The combination, with the casing 1, having an inlet, 5, and outlet 6, and provided with the inclined chute 19, of the pivoted chute 8, gravity-lever 10, the inclined bars 15, and the oppositely-inclined screen 16, substantially as described.

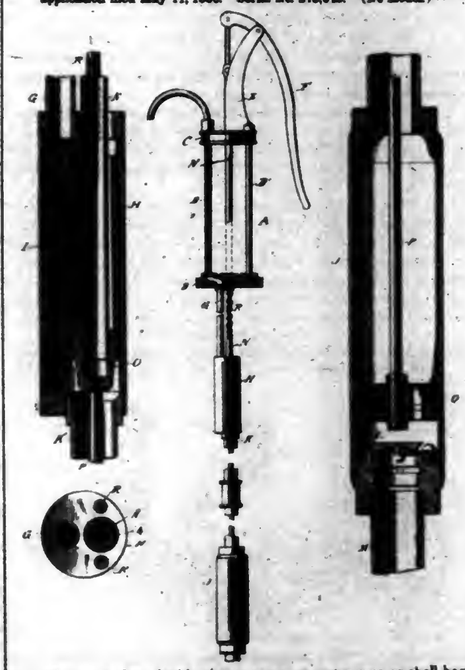
398,219. MOLDER'S FLASK. CHARLES BOERSCHUTZ, Jr., Covington, Ky. Filed Nov. 5, 1888. Serial No. 289,856. (No model.)



Claim.—1. The combination, with a molder's flask, of holders, a cross-bar or cross-bars supported thereby, and caps provided with locking devices, substantially as and for the purpose specified.

2. The combination of the flask, holders D D, having recesses *d d*, cross-bars C C, supported thereby, and caps E E, having lugs *e e*, substantially as described.

398,220. PUMP. JOSEPH H. BRANSON, Belmont, N. Y. Original application filed Sept. 7, 1885, Serial No. 176,412. Divided and this application filed May 11, 1888. Serial No. 273,643. (No model.)



Claim.—1. In a double-piston pump, an outer case or shell having the upper cylinder depending therein, and provided with separate openings at its upper end for the discharge-pipe and piston-rod, in combination with a pump-standard having a passage for the piston-rod, and a connection for the discharge-pipe, the discharge-pipe being turned outwardly from the piston-rod above the base-line of the pump-standard, substantially as shown and described.

2. In a double-piston pump, an outer case or shell having the upper cylinder depending therein, and provided with separate openings at its upper end for the piston-rod and discharge-pipe, and supporting-rods, in combination with a pump-standard having a passage for the piston-rod, and connections for the discharge-pipe and supporting-rods, whereby the case or shell is suspended, the discharge-pipe being turned outwardly from the piston-rod above the base-line of the pump-standard, substantially as shown and described.

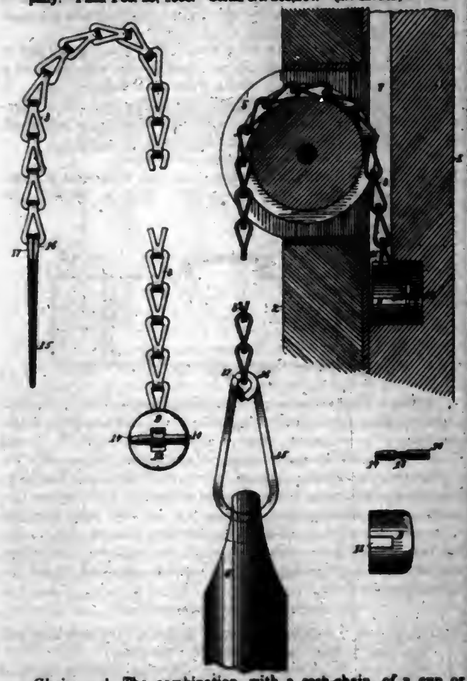
3. In a double-cylinder pump, an outer case or shell having the upper cylinder depending therein, and suspended below the platform by a discharge-pipe, and provided at its upper end with separate openings for the piston-rod and discharge-pipe, in combination with a pump-standard having a passage for the piston-rod and a separate opening for the discharge-pipe, the discharge-pipe communicating with the pump-spout through a passage cast in the pump-standard, substantially as shown and described.

4. In a double-cylinder pump, an outer case or shell having the upper cylinder depending therein, and suspended below the platform by a discharge-pipe, and provided at its upper end with separate openings for the piston-rod, discharge-pipe, and supporting-rods, in combination with a pump-standard having a passage for the piston-rod, a separate opening for the discharge-pipe, and connections for the supporting-rods, the discharge-pipe communicating with the pump-spout through a passage cast in the pump-standard, substantially as shown and described.

5. In a double-piston pump, an outer case or shell having the upper cylinder depending therein, and suspended below the platform by a discharge-pipe, said shell having separate openings at its upper end for the piston-rod and discharge-pipe, the discharge-pipe and piston-rod being substantially parallel with each other to the bottom line of the pump-base, the discharge-pipe communicating with the discharge-spout above said bottom line of base through a passage leading outwardly from said piston-rod, substantially as shown and described.

6. In a double-piston pump adapted for drilled wells, an outer case or shell having the upper cylinder depending therein and suspended below the platform by a discharge-pipe, said shell having separate openings for the piston-rod, discharge-pipe, and supporting-rods, the discharge-pipe, piston-rod, and supporting-rods being substantially parallel with each other below the bottom line of the platform, the discharge-pipe communicating with the discharge-spout above the said platform line through a passage leading outwardly from said piston-rod, substantially as shown and described.

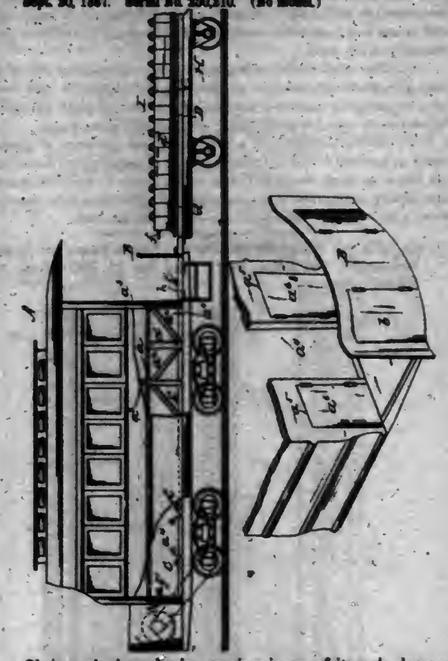
398,221. CHAIN ATTACHMENT FOR SASH-BALANCES. REINHARD A. BEIHL, Bridgeport, Conn., assignor to the Bridgeport Chain Company. Filed Feb. 25, 1888. Serial No. 265,267. (No model.)



Claim.—1. The combination, with a sash-chain, of a cup or thimble having an opening at the back, through which the loop of the last link passes, and a slot at the top, which receives the loop of the second link, and a pin passed between the loop of the last link and the back of the cup or thimble, whereby the chain end is held without lost motion.

2. An approximately oval loop for connecting sash weights and chains, formed from a single piece of wire and having at its upper or narrower end two hooks lying side by side and parallel to each other, either of which will pass through the usual opening in the weight, the ends of said hooks being curved inward past each other, so that an eye, 17, is formed, which incloses the chain in use and prevents jumping of the weight.

398,222. RAILWAY-CAR. JOHN A. BELL, Philadelphia, Pa. Filed Sept. 20, 1887. Serial No. 250,210. (No model.)



Claim.—1. A car having openings in one of its ends, doors or covers for said openings, and roller-guides C, having bearings in the floor of the car, in combination with movable platforms or planks D, having rails *d* on their under sides, substantially as set forth.

2. A car having openings in one of its ends, doors or covers for said openings, dasher B, having hinged sections *b* in line with said car-end openings, and roller-guides C, having bearings in the floor of the car, in combination with movable platforms or planks D, having rails *d* on their under sides, substantially as set forth.

3. A car having longitudinally-arranged seats, end dashers, openings in one of the car-body ends and in the dasher adjacent thereto in line with the spaces below said seats, doors or covers for said openings in the car end, and dasher for effecting the transfer of storage-batteries to and from the car, substantially as set forth.

4. A car having longitudinally-arranged seats, end dashers, openings in one of the car-body ends and in the dasher adjacent thereto in line with the spaces below the seats, and doors or covers for the openings in said car-body end and dasher, in combination with movable platforms or planks D in said spaces and guide rails and rollers between said planks D and the floor of the car, substantially as set forth.

5. A car having longitudinally-arranged seats, end dashers, openings in one of the car-body ends and in the dasher adjacent thereto in line with the spaces below the seats, and doors or covers for the openings in said car-body end and dasher, in combination with a removable platform or plank, D, substantially as set forth.

6. A car having end platforms, dashers thereon, longitudinally-arranged seats, with spaces between the seats and the car-floor, and openings in one end of the car and in one of the dashers in line with said seat-spaces for effecting transfer of storage-batteries to and from said seat-spaces across the end platforms, substantially as set forth.

7. A car having openings in one of its ends, removable doors or covers therefor, and removable or hinged dasher-sections in line with said doors, substantially as set forth.

8. A car having longitudinally-arranged seats, end dashers, guideways on the floor below said seats, and openings in one end of the car and in one of the dashers in line with the space below the seats, in combination with movable planks or platforms D, adapted to said guideways, substantially as set forth.

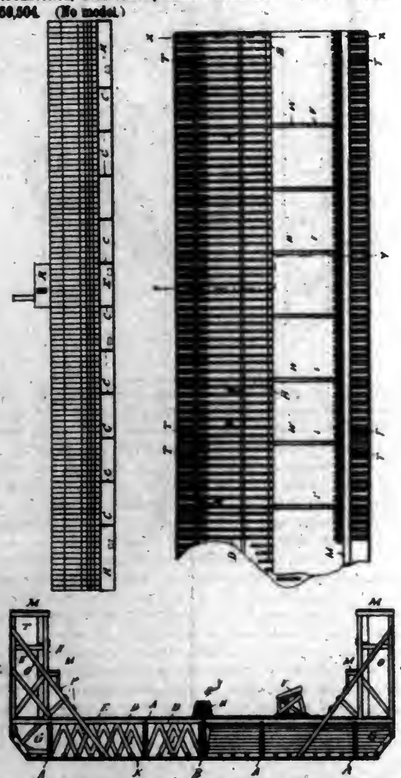
9. The combination, in a car having seats and spaces beneath the seats, of the fixed binding-post sections *f'* at one end of said spaces, openings at the opposite ends of said spaces, and removable covers or doors for said openings, with traveling planks or storage-battery trucks having at one end binding-post sections *f*, for engagement with and disengagement from said sections *f'* when the trucks are inserted into and withdrawn from said seat-spaces, substantially as set forth.

10. The combination, with a car having openings in one of its ends and track-rails for said car, of narrow-gage track-rails bridging the car-track rails and a transferring-truck having on it guideways and at one end a movable or adjustable guide-plank or platform, substantially as set forth.

11. The combination, with a car having openings in one of its ends and track-rails therefor, of narrow-gage track-rails with turn-outs bridging the car-track rails and a transferring-truck having an adjustable or movable guide-plank, substantially as set forth.

12. In combination with a car having end openings, *a'*, dasher doors or sections *b*, and coupling-sections *f'*, located at one end of the car below its seats, movable planks or platforms C, supporting storage-battery sections having at one end coupling-sections *f*, for engagement with coupling-sections *f'*, substantially as set forth.

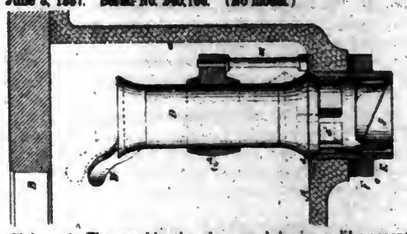
398,223. FLOATING DRY-DOCK. CHARLES BROWN and THOMAS RIDDLECOMBE, Port Huron, Mich. Filed Dec. 31, 1887. Serial No. 258,504. (No model.)



Claim.—1. The combination, in a floating dock, of the inclosed buoyant caisson or vessel of substantially rectangular shape, the series of transverse and the series of longitudinal solid timber division-walls dividing the hold into compartments, of outside and inside openings to admit the water into the compartments of the hold, valves controlling the outside openings, valves controlling the inside openings into the side and end or trimming compartments, the scaffolds on the deck of the caisson, the inclined anchoring-brace O, the longitudinal stringers P, secured to said brace, the vent-shafts extending through such scaffolds, and the pump apparatus housed on top of such scaffolds, all arranged substantially as described.

2. The combination, in a floating dock, of the buoyant caisson or vessel of substantially rectangular form, the series of longitudinal and transverse solid timber walls dividing the hold into compartments, the intermediate transverse trusses, the openings at the bottom of the outside and inside walls to admit the water into the different compartments, the valves for controlling such openings, the side and end compartments, the keel-block in the center of the deck, the lateral brace-shores movably supported upon lateral guides, the scaffolds extending along the sides of the deck and supporting the platforms, the anchoring-braces of the scaffolds, and the air or vent shafts extending through the scaffolds, all substantially as described.

398,224. COMBINED WASTE AND OVERFLOW TUBE FOR SANITARY STRUCTURES. GEORGE F. BROWN, Philadelphia, Pa. Filed June 3, 1887. Serial No. 240,166. (No model.)



Claim.—1. The combination, in a wash-basin or like receptacle having a top slab overhanging said basin, of a combined waste and overflow tube, D, with an operating-cam for the tube, said cam being below the top of the tube, all substantially as set forth.

2. The combination, in a wash-basin or like receptacle, of the overhanging top slab, the waste and overflow tube, and valve with a cam below the top of the overflow-tube to raise the tube as it is turned, all substantially as specified.

3. The combination, in a wash-basin or like receptacle, of the combined waste and overflow tube with a waste-pipe provided with a cam on which the tube rises when it is turned, substantially as set forth.

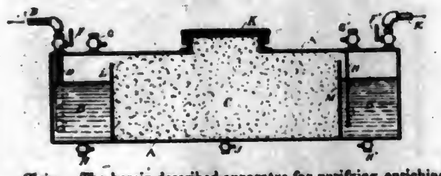
4. The combination, in a wash-basin or like receptacle, of the combined waste and overflow tube and a raising-cam below the top of the same with a jointed rod squared at its lower end to fit into a squared opening in the tube and extending above the level of the slab, and provided with a suitable handle, whereby on turning said handle the tube will turn with and slide on the jointed rod, substantially as described.

5. The combination of a waste and overflow tube having legs, a guide for said tube, and an outlet-tube provided with cams forming bearings for said legs, whereby the tube is raised when it is turned, as and for the purpose set forth.

6. The combination of a waste and overflow tube having legs, a waste-pipe provided with cams forming bearings for said legs, and a removable guide for the tube, substantially as set forth.

7. The combination of the waste and overflow pipe and an operating-cam below the top of the pipe upon which said pipe is supported, but from which it is removable, all substantially as specified.

398,225. CARBURETOR. RICHARD A. BURT and ROBERT M. BIDELMAN, Adrian, Mich. Filed Apr. 15, 1887. Serial No. 234,980. (No model.)



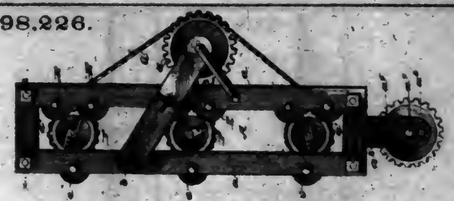
Claim.—The herein-described apparatus for purifying, enriching, and controlling the pressure of natural gas and other aeriform fluids, consisting of a rectangular box, A, having compartments B, B', and C, each provided with means for ingress and egress, the parts B B' being filled with an alkaline solution, and the part C filled with a densely-packed absorbent material impregnated with liquid hydrocarbon, two partition-walls dividing the box at one end, one wall rising from the bottom to near the top and the other extending from the top to near the bottom, with a space between them, and a single wall rising from the bottom to near the top dividing it at the other end, as and for the purpose set forth.

398,226. FENCE-MACHINE. HENRY G. CADY, Pine Bluff, Ark. Filed Sept. 8, 1888. Serial No. 284,898. (No model.)

Claim.—1. As an improvement in fence-machines, the series of twisting-heads having opposite slits and the plates pivotally secured to said twisting-heads and having a series of oppositely-projecting short arms, substantially as shown and described.

2. As an improvement in fence-machines, the frame having the small grooved rollers secured thereto, the twisting-heads resting in

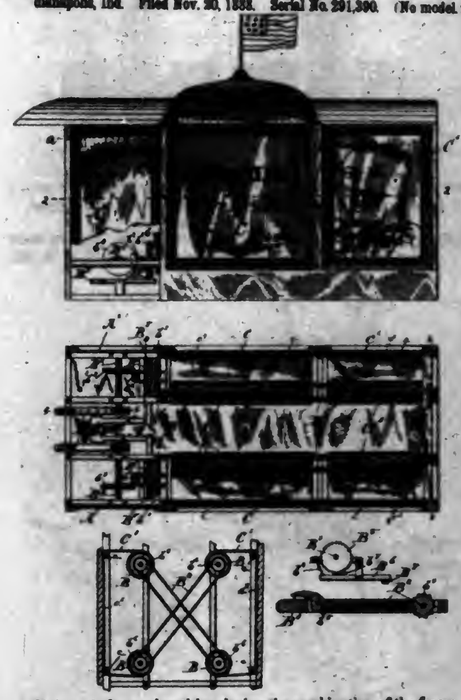
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the grooves of said rollers and between the latter, the operating chain or belt passed around said twisting-heads and rollers, and the means for operating said chain or belt to which the same is secured, substantially as set forth.

3. The combination, with the frame having the rollers arranged in pairs and the centrally-disposed opposite rollers, of the operating-wheel, the adjustable arms therefor, the series of twisting-heads located between said rollers, and the chain or belt, passed around said twisting-heads and operating-wheel, substantially as shown and described

398,227. ADVERTISING DEVICE. WILLIAM L. CALDWELL, Indianapolis, Ind. Filed Nov. 20, 1888. Serial No. 291,390. (No model.)



Claim.—1. In an advertising device, the combination of the frame-work, four reels or rollers arranged two at the top and two at the bottom of said frame-work, each top roller being geared to the opposite bottom roller, suitable mechanism for operating the same, and display-curtains mounted on said reels or rollers, substantially as set forth.

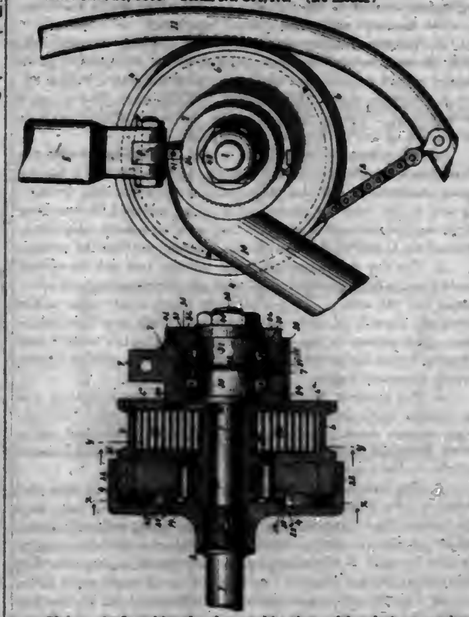
2. The combination, in an advertising device, of the frame-work, the bulletin-boards A', mounted thereon, the four reels arranged therein, two at the top and two at the bottom of said frame-work, the gearing for operating said reels, and separate display-curtains attached to the reels on each side of the device, substantially as set forth.

3. The combination, in an advertising device, of the frame-work A, the reels B, arranged two at the top and two at the bottom of said frame-work, and geared together, each top to the opposite bottom reel, the display-curtain C, mounted thereon and bearing a series of advertisements, the display-curtain C', also mounted thereon and bearing a series of pictures calculated to attract attention to the advertisements on the curtain C, and the operating mechanism, substantially as set forth.

4. In an advertising device, the combination of the frame A, the reels B, arranged therein substantially as described, the curtains C and C', mounted upon said reels and passing over the idler-rolls *c*, mounted close to the sides of said frame-work, and the gearing for operating said reels, consisting of the levers B^6, having the cam-pawls arranged to engage with the ratchet-wheels b^4, the pinion upon the end of the journal to said reels, the intermediate gearing and the ratchet-wheel B^5, and pawl engaging therewith, substantially as shown and described.

5. The combination, in an advertising device, of the frame-work provided with open sides, as described, the bulletin-boards arranged in the front openings, the four reels B, journaled inside said frame-work, and geared together, the top roll on each side to the bottom roll on the opposite side, the curtains C and C', carrying a series of advertisements and pictures mounted on reels and arranged to fill the middle and rear open spaces on the sides of said frame-work, and passing over the idler-rolls *c*, and the back C, mounted behind said curtains to steady them in position, substantially as set forth.

398,228. BICYCLE. LARUS F. CARPENTER, Bridgeport, Conn. Filed Nov. 21, 1888. Serial No. 291,473. (No model.)



Claim.—1. In a bicycle, the combination, with a hub, a ratchet within the hub, and a spring-controlled drum having an extension within the hub to which the pawls are pivoted, of a ball-case and fulcrum outside of the drum, and a fork attached to the ball-case, so that the bearings are placed at the greatest possible distance apart and the weight is placed directly upon the bearings.

2. In a bicycle, a rotating axle, hub, and ratchet, a drum turning on the axle, and a ball-case placed outside of the hub and drum, and having a fulcrum made integral therewith and a fork attached thereto.

3. The combination, with the hub and drum, of the ball-case placed outside of both and a fulcrum and fork connected to the ball-case, as and for the purpose set forth.

4. A ball-case having incline 34 and ring 36, threaded to engage the interior of the ball-case, and having an incline, 37, in combination with the axle having reversed cones and a duplicate series of balls connected by cross-bars which engage said cones and inclines.

5. The combination, with the ball-case having incline 34 and ring 36, threaded to engage the ball-case, and having incline 37, of the axle threaded at its outer end and having a shoulder, 33, a cone, 30, resting against said shoulder and having an outward incline, a cone, 31, engaging the screw-thread and having an inward incline, and pairs of balls connected by cross-bars engaging said inclines and cones.

6. The ball-case having incline 34, ring 36, threaded to engage the ball-case, and having incline 37, in combination with the cones having reversed inclines, as shown, balls connected by cross-bars engaging said inclines and cones, and means, as a check-nut, engaging the axle, and a key engaging the ring, whereby the parts are secured in place after adjustment.

7. The axle having a shoulder, 33, and a screw-thread, 32, the ball-case having an incline, 34, and the fork secured to the ball-case, in combination with ring 36, having incline 37, inner and outer cones having reversed inclines, the inner cone engaging shoulder 33, and a

duplicate series of balls connected by cross-bars and engaging the inclines and the cones.

8. The ball-case and ring 36, having inclines, as shown, the ring being threaded to engage the ball-case, in combination with the axle having a screw-thread, inner and outer cones engaging the axle, a duplicate series of balls connected by cross-bars which engage the inclines and cones, said ring having notches, as shown, which are engaged by a key, 41, to lock it in position, and a check-nut engaging the outer cone to lock that in position.

9. The axle and the inner and outer cones, the latter being adjustable, the ball-case having an incline, and the adjustable ring engaging the ball-case, and also having an incline, in combination with a duplicate series of balls connected by cross-bars, the bearing being adjusted by turning the outer cone and ring inward, as described.

10. In a bicycle, the combination, with a rotating axle and hub, and ratchet and pawls within the hub, of a drum having lugs 18 on its inner periphery, spring 16, engaging either of said lugs, and an angle-plate secured to the ball-case and extending within the drum, to which the inner end of the spring is connected.

11. The drum having extension 13 and a spring, 16, within the drum, in combination with the rotating axle, hub, and ratchet, pawls pivoted to said extension and engaging the ratchet, and a friction device to which the pawls are connected, whereby when the backward movement of the drum commences the pawls are disengaged from the ratchet, as and for the purpose set forth.

12. The rotating axle, hub, and ratchet, in combination with the drum, pawls pivoted thereto and engaging the ratchet, and a friction device consisting of a holder, 25, pivoted to the drum, links connecting said holder with the pawls, and a spring-actuated friction-piece which engages the ratchet when the backward movement takes place, whereby the holder is tilted and the pawls disengaged from the ratchet.

13. The hub rigidly secured to the rotating axle and the ratchet secured to the hub, in combination with the drum and extension 13, turning on the axle, a spring within the drum, whose outer end is connected thereto, its inner end being connected to a fixed angle-plate, pawls pivoted to the extension and engaging the ratchet, and a friction device within the hub, which disengages the pawls when the reverse movement begins.

14. The ball-case having angle-plate 19, connected thereto and the fulcrum made integral therewith, in combination with the hub, drum, ratchet, pawls, and friction device acting as described, and a spring within the drum, whose outer end is adjustably connected thereto, its inner end being connected to the angle-plate.

15. The ball-case and fulcrum made integral and the fork connected to the ball-case, in combination with the rotating axle, hub, and ratchet, the drum turning on the axle, the spring within the drum, and the pawls and friction devices, arranged as described, whereby the entire weight is supported by the bearings which are placed at the greatest possible distance apart, as and for the purpose set forth.

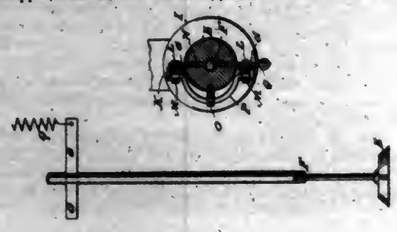
16. The drum having extension 13 and flange 14 and the hub and ratchet, in combination with the pawls pivoted between said flange and the drum and a friction device carried by a holder pivoted to the drum, and links connecting said holder with the pawls, as and for the purpose set forth.

398,229. DRAWING-PRESS. MATTHEW C. CHAMBERS, Brooklyn, N. Y. Filed Nov. 17, 1888. Serial No. 291,121. (No model.)

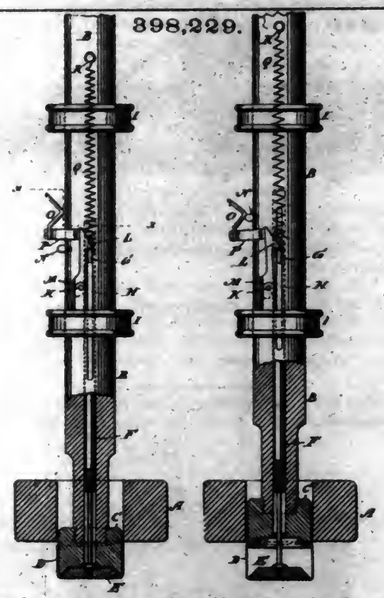
Claim.—1. The combination, with the presser and a die, of an internal stripper having a guided stem, mechanism, substantially as described, for holding the stripper and stem while the presser recedes from the die and automatically releasing the stripper and stem during such receding movement, and a retractor-spring connected with the presser and stem for retracting the stripper toward the presser when released by the holding mechanism.

2. The combination, with a hollow presser, of a stripper adapted to slide in said presser, a pin-and-slot connection between the presser and the stripper, a detent, L, for said stripper, a release, N, for said detent, and a retractor, Q, for the stripper, substantially as described.

3. The combination, with a hollow presser, of a stripper adapted to slide in said presser, a pin-and-slot connection between the presser and stripper, a detent, L, for said stripper, a release, N, for said detent,

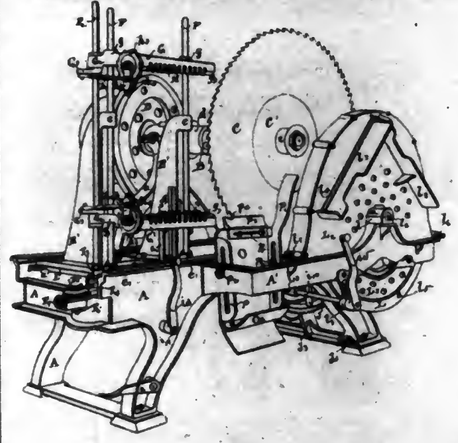


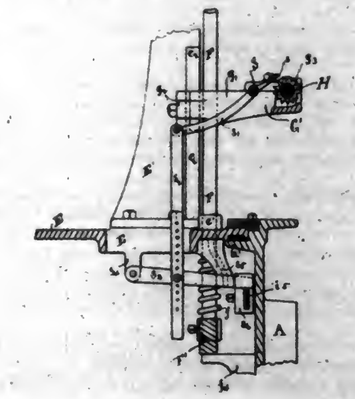
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and a retracting-spring connected to said stripper and to the presser for drawing the stripper to the presser, substantially as described.

398,230. MACHINE FOR SAWING SHINGLES. DENISON CRASE, Orange, and WILLIAM L. CRASE, Worcester, Mass. Filed Aug. 29, 1885. Serial No. 175,628. (No model.)



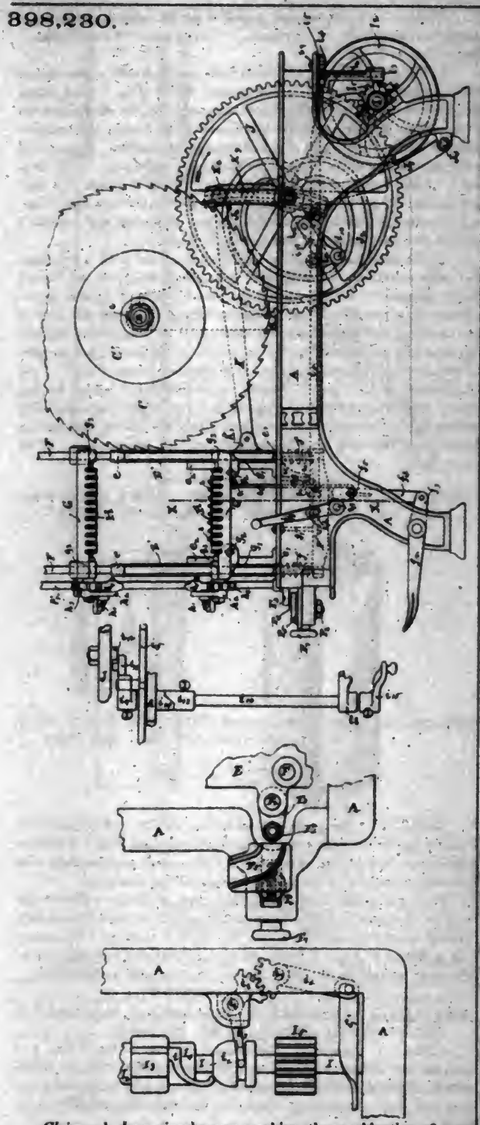


Claim.—1. In a circular-saw machine, the combination of a reciprocating carriage, the cam J^3, constructed substantially as described, the oscillating lever J^2, having in its upper arm a slot, K^3, which is curved so as to lie in a circle, the center of which is at or near the pivot connecting the pitman to the carriage, and the rod or pitman K, pivoted at one end to the carriage and having the other end adjustable in the curved slot K^4, substantially as and for the purpose described.

2. In a circular-saw machine, the combination of the driving gear-wheel J, with the shaft I, a driving-pulley free to revolve on said shaft, a friction-clutch coupling, 13, a tooth-pinion, 15, fast on the shaft I, said gear-wheel J being provided with a cam, J^3, constructed substantially as described, and connected to the reciprocating carriage by means of rod or pitman K, and the oscillating lever J^2, having in its upper arm a slot, K^3, which is curved, so as to lie in a circle, the center of which is at or near the pivot connecting the pitman to the carriage, all substantially as described.

3. In a circular-saw machine, the combination, with the reciprocating carriage and its driving-gear, of the shipper-shaft i^{10}, and the arm i^9, having complementary spiral lugs i^{12} i^{13}, the arm i^9, having a slot which engages a lug upon the shipper-rod i^3, the arm i^9 being also provided with the arm i^{11}, carrying a lug adapted to be tripped by a lug, i^{15}, upon the driving gear-wheel, all so arranged that the inward motion of the shaft i^{10} operates by means of the lugs i^{12} i^{13} to

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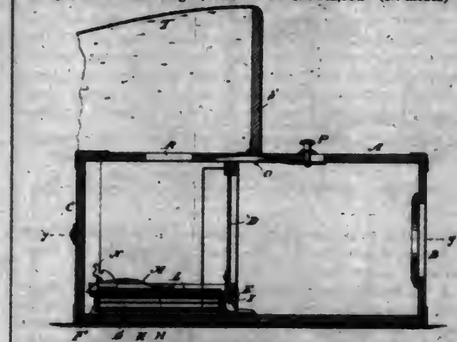
throw the lug upon the arm i^{11} in the path of the moving lug i^{15}, for the purpose of throwing the shipper-rod i^3 and stopping the carriage, substantially as described.

4. In a circular-saw machine, a shaft, S, having the fingers *s* so arranged as to be automatically depressed by the presence of a block between the set-rolls, in combination with the arm S^7, link S^8, arm S^9, and the sliding shipper-rod i^3, carrying the lug S^{10}, all so arranged that as soon as the pressure is removed from the fingers the arm S^9 is allowed to fall in the path of the lug S^{10}, upon the return-stroke of the carriage, thereby throwing the shipper-rod i^3, and stopping the carriage, substantially as described.

5. In a circular-saw machine, the set-rolls provided with ratchet-wheels A^3, secured to the hubs of the rolls, the pawls A^4, operating the ratchets by means of the splined shaft F^9, feathered sleeves G^3, and their connections, in combination with the adjustable curved set-plate F^8, all so arranged as to set the rolls upon the forward stroke of the carriage, substantially as described.

6. In a circular-saw machine, the vertically-adjustable shingle-box consisting of the slotted side flanges, *p p'*, bolts p^3, the plate O, and the removable bottom O^2, in combination with the adjustable slide p^2, arranged to guide the shingles into the box and separate them from the dust, substantially as described.

398,231. PHOTOGRAPHIC CAMERA. LOUIS CHEVALLIER, Brooklyn, N. Y. Filed Aug. 9, 1888. Serial No. 282,304. (No model.)



Claim.—1. The combination, with the case of a photographic camera, of a rotating frame, E, located therein and provided with a handle outside the case for rotating the frame from the exterior, and a plate-holder, F, and a sight-plate, D, both rigid on the rotating frame and arranged substantially at right angles to each other, so that by rotating the frame in one direction the sight-plate swings into the field to focus the object and the plate-holder swings out of the field, and by rotating the frame in the opposite direction the sight-plate swings out of the field and the plate-holder into the field, substantially as described.

2. The combination, with the case of a photographic camera, of a swinging sensitized-plate holder, F, having a cover, L, hinged thereto and provided with a spring which normally holds the cover closed over a plate, and a lug or catch in the camera-case which acts on the cover and automatically opens it when the plate-holder is swung into the field, substantially as described.

3. The combination, with the case of a photographic camera, of a pivoted swinging sensitized-plate holder having a cover normally held closed over the plate, and a device inside the camera-frame which acts on the cover and automatically opens it when the holder is swung in the arc of a circle into the field, substantially as described.

4. The combination, with a camera-case, of the pivoted swinging sensitized-plate holder F, the cover L, hinged to said holder and having the projecting lug N, the spring M, acting to press the cover closed on the holder, and the catch O on the camera-case, arranged to strike the lug of the cover and open the latter when the holder is swung into the field, substantially as described.

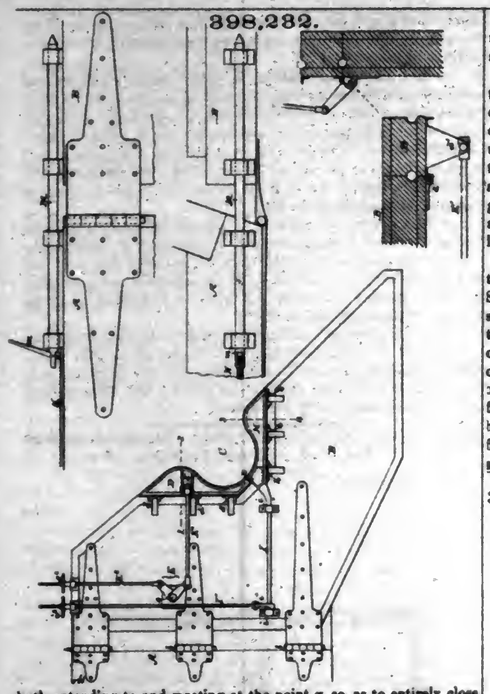
5. A camera having a swinging sight-plate, D, a sight-opening, R, in its top wall between its rear end and the sight-plate, a hinged shield, S, adapted to stand upright, and the hood T, secured to the shield over the sight-opening, substantially as shown and described.

398,232. COFFER-DAM FOR VESSELS. GEORGE CLARKE, Jersey City, N. J., assignor to Horace G. Phillips, Wilmington, Del. Filed Dec. 14, 1888. Serial No. 293,562. (No model.)

Claim.—1. The combination of the main gates of a coffer-dam, of auxiliary gates hinged thereto, and mechanism for moving said gates into and out of position, substantially as described.

2. The combination of the main gates of a coffer-dam, of the vertical hinged auxiliary gate, and a longitudinal hinged auxiliary gate,

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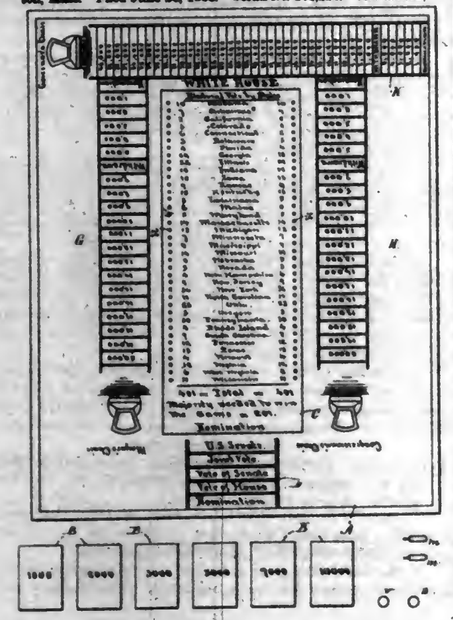


both extending to and meeting at the point *x*, so as to entirely close the irregular opening for the screw-shaft projections of the vessel, substantially as described.

3. The combination of the main gate, an auxiliary gate hinged thereto, the two-armed lever, one arm connected to said gate and the other arm connected to a vertically-movable screw-shaft, and a handled nut for said shaft, on turning which the gate will be opened or closed substantially as described.

4. The combination, with the coffer-dam, of the hinged main gate, a bolt on one and adapted to pass into keepers in the other, a lever on said bolt, and a rack with which the lever engages, substantially as and for the purpose described.

398,233. GAME. JEANIE P. CLARKE and JAMES W. CLARKE, Boston, Mass. Filed June 26, 1888. Serial No. 278,227. (No model.)

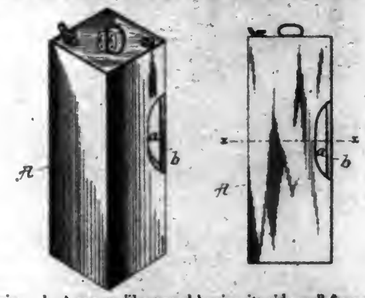


Claim.—1. A game-board provided with a number of divisions marked, respectively, "U. S. Senate," "Joint Vote," "Vote of Senate," and "Vote of House."

2. The game-board herein described, provided with a presidential table containing the names of the several States of the United States disposed in a vertical column, figures representing the electoral votes of the States disposed opposite the names of the States, and two columns of scoring-points also disposed opposite said names; a senatorial table having a number of divisions marked, respectively, "U. S. Senate," "Joint Vote," "Vote of Senate," and "Vote of House;" a congressional ladder having figures representing votes between each rung; a gubernatorial table having figures between each rung, and a mayor's ladder, also having figures between each rung.

3. The game-board herein described, provided with a presidential table containing the names of the several States of the United States disposed in a vertical column, two columns of figures representing the electoral votes of the States disposed on opposite sides of the names of the States, and two columns of scoring-points disposed opposite said columns of figures; a senatorial table having a number of divisions marked, respectively, "U. S. Senate," "Joint Vote," "Vote of Senate," and "Vote of House;" a congressional ladder having figures representing votes between each rung; a gubernatorial table having figures between each rung, and a mayor's ladder, also having figures between each rung, in combination with scorers and a set of game-cards.

398,234. CAN OR SIMILAR VESSEL. JAMES K. CLEARY, Washington, D. C. Filed Dec. 1, 1888. Serial No. 292,370. (Model.)



Claim.—1. A can or like vessel having its side wall formed with a cavity for the reception of the hand and provided with a handle or grip located before such cavity and in a plane flush or coincident with the sides or surface of the vessel, substantially as described.

2. A can or like vessel having a portion of its side walls cut out to form an opening, and having a handle or grip located before such opening in a plane coincident with the sides or surface of the vessel, and a dished or curved piece set into the opening and soldered or otherwise secured to the edges thereof, substantially as described.

398,235. VEHICLE-AXLE. AMASA CORBIN, Jr., Gouverneur, N. Y. Filed Nov. 15, 1888. Serial No. 290,900. (No model.)

Claim.—1. A wagon-axle formed of a wrought-metal T-bar, A *a*, with the flat web *a* uppermost, and provided with cast-metal skeins, each having forked re-enforcements E E on opposite sides of the vertical web and immediately below the flat web, substantially as set forth.

2. A wagon-axle formed of a wrought-metal bar, in combination with a cast-metal skein, and re-enforcements integral with the skein projecting inward therefrom and welded to the steel bar, substantially as set forth.

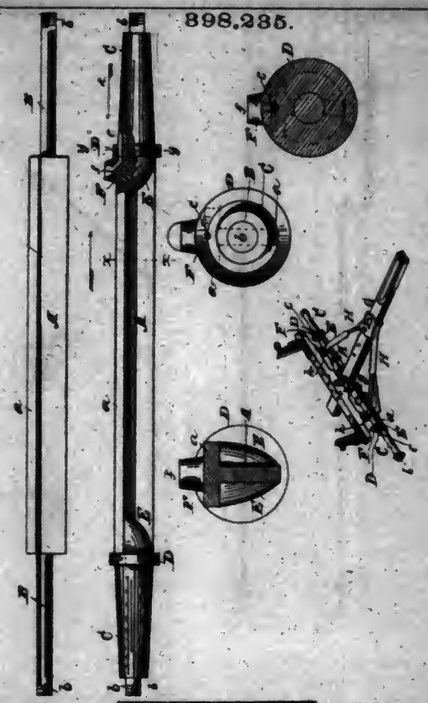
3. A wagon-axle having a wrought-metal core projecting at both ends of the skein, in combination with a cast-metal skein provided with re-enforcements projecting from the inner end of the skein and welded to the wrought-metal bar, substantially as set forth.

4. A wagon-axle formed of a wrought-metal bar having a vertical web, in combination with a cast-metal skein provided with forked re-enforcements welded to opposite sides of the vertical web, substantially as set forth.

5. A wagon-axle having a wrought-metal core and a shoulder, D, and provided with an oil-cup of cast metal welded to the upper surface of the wrought-metal core inside of the shoulder, and having also an oil-duct extending from the oil-cup through the shoulder to the skein, substantially as set forth.

6. A wagon-axle provided with a metal skein cast thereon and having at its inner end a shoulder to receive the wheel-hub, a metal oil-cup on the upper surface of the bar inside of the skein, and an oil-duct extending from the oil-cup to a point between the shoulder and the outer end of the skein, substantially as set forth.

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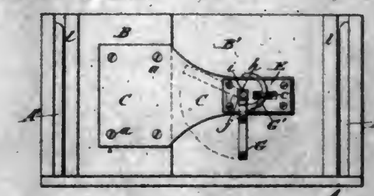


398,236. EGG-TESTER. NICHOLAS COUNT, Will's Creek, Ohio. Filed Aug. 6, 1888. Serial No. 282,067. (No model.)



Claim.—In an egg-tester, the combination, with the stationary bottom provided with set-screws passing through the openings in the same, of the adjustable bottom carrying a mirror mounted within the casing and engaging the said screws, whereby the said bottom may be moved to any desired angle, substantially as described.

398,237. END-GATE. WILLIAM H. CREED, Manilla, Ind., assignor of one-half to John T. Jones, same place. Filed Oct. 27, 1888. Serial No. 289,260. (No model.)



Claim.—1. In an end-gate, the combination of the tail-board consisting of hinged sections, the plate secured to one of said sections and overlapping the other, said overlapping end being slotted, a bolt on said other section entering said slot, and a catch on the plate adapted to engage said bolt for the purpose of securing this end of the plate to the tail-board, substantially as described.

2. In an end-gate, the combination, with the tail-board composed of two sections hinged together, of a plate suitably secured at one end to one of the hinged portions and provided at its other end with a wearing-plate and latch, said wearing-plate being provided with a slot coincident with a slot in the large plate, said slot adapted to receive the projecting end of the bolt on the end-gate, the whole being firmly secured together by means of the extension on the latch, which enters the eye of the receiving-bolt, substantially as described.

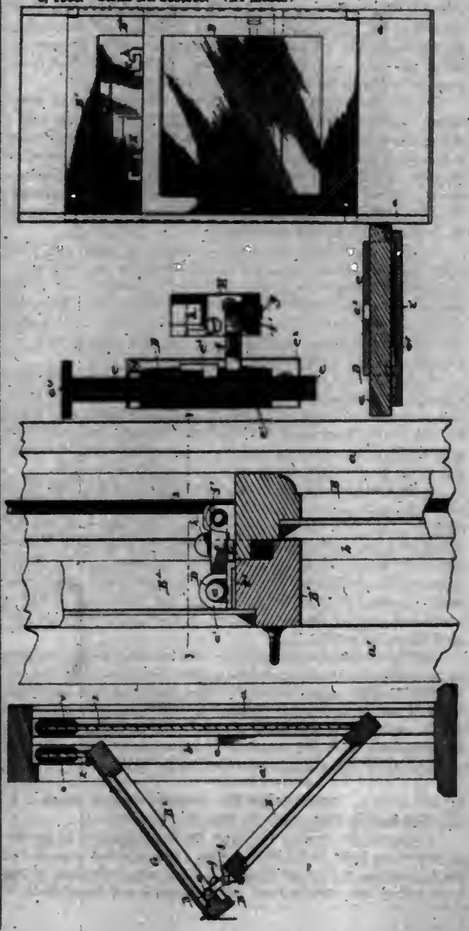
3. The combination of the sectional tail-board, the plate secured to one section thereof and overlapping the other, a bolt on the other section projecting through a slot in the overlapping end of the plate, and a fastener on the plate, consisting of a pivoted arm having the curved extension adapted to engage the receiving-bolt, substantially as described.

4. The combination of the end-gate having the hinged sections B B', plate C, secured to the section B, the wearing-plate E, secured to the overlapping end of the plate, said wearing-plate E and overlapping plate being slotted, the fastener on the wearing-plate, consisting of the looped and pivoted arm G, having a curved extension, G', and the receiving-bolt on the section B', having eye *k*, substantially as described.

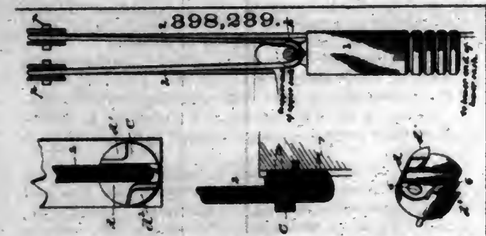
398,238. DRAWER-PULL. CHARLES I. DAYTON, Meriden, Conn. Filed Dec. 24, 1888. Serial No. 294,533. (No model.)

Claim.—The herein-described drawer-pull, consisting of the plate A, made from sheet metal, constructed with recesses *b* from the inside outward, producing corresponding projections *a* upon the outside, combined with socket-eyes having a shank projecting therefrom, the said eyes of a shape corresponding to the recesses in the plate and set into said recesses, the metal of the plate closed upon the said eyes as a means for securing the said eyes to the plate, and with a U-shaped handle having pivots on the ends of its legs extending through the opening in the said projections into the eyes, substantially as described.

398,239. WINDOW. BENJAMIN F. DEITZ and GEORGE R. ROTH, Reading, assignors to William W. Lesher, Mossville, Pa. Filed Aug. 8, 1888. Serial No. 282,213. (No model.)



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Claim.—1. The combination, with a window-frame, of sashes mounted therein to slide past each other, and a detachable hinge-connection secured to the meeting-rails of the sashes, substantially as set forth.

2. The combination, with a window-frame, of sashes mounted therein to slide past each other, a weighted cord attached to each sash, and a detachable hinge-connection between the meeting-rails of the sashes, substantially as set forth.

3. The combination, with a window-frame, of sashes mounted therein to have a swinging movement and also to slide past each other, and a detachable hinge connecting the meeting-rails of said sashes, and consisting of a locking-plate secured to the meeting-rail of one sash and a sliding lug mounted in bearings secured to the meeting-rail of the other sash and adapted to be interlocked with said locking-plate, substantially as set forth.

4. The combination, with a window-frame, of sashes mounted therein to have a sliding movement past each other, a detachable hinge-connection between the meeting-rails of said sashes, a cord attached at its ends to said sashes, and a weight supported by said cord at a point between its ends, substantially as set forth.

5. The combination, with a window-frame, of upper and lower sashes mounted therein to have a swinging movement and also to slide past each other, and a detachable hinge connected to the meeting-rails of the sashes, and consisting of a sliding bolt mounted on the meeting-rail of one sash, a locking-plate secured to the meeting-rail of the other sash, and a locking-lug carried by the bolt to engage the locking-plate, substantially as set forth.

6. The combination, with a window-frame, of upper and lower sashes mounted therein to have a swinging movement and also a sliding movement past each other, and a detachable hinge connected to the meeting-rails of the sashes, and consisting of bolts mounted on the meeting-rail of one sash and provided with locking-lugs, springs bearing against said bolts, and locking-plates secured to the meeting-rail of the other sash and adapted to be engaged by the locking-lugs on the bolts, substantially as set forth.

7. The combination, with a window-frame and upper and lower sashes mounted therein to have a sliding movement past each other, of detachable hinge-connections between the meeting-rails of the sashes, each hinge-connection consisting of a sliding lug, a spring for holding the lug against accidental displacement, and a locking-plate secured to the meeting-rail of the other sash and adapted to be engaged by the locking-lug, substantially as set forth.

8. In a window, the combination, with a frame, of an upper sash, a lower sash, weights flexibly connected to these sash to balance them, sash-cord clamps secured to the sash to produce pivotal centers therefor, and two duplicate sash-locks which are adapted to secure the sash from lateral and vertical movement, and also afford a hinged connection to the meeting-rails of the sash, substantially as set forth.

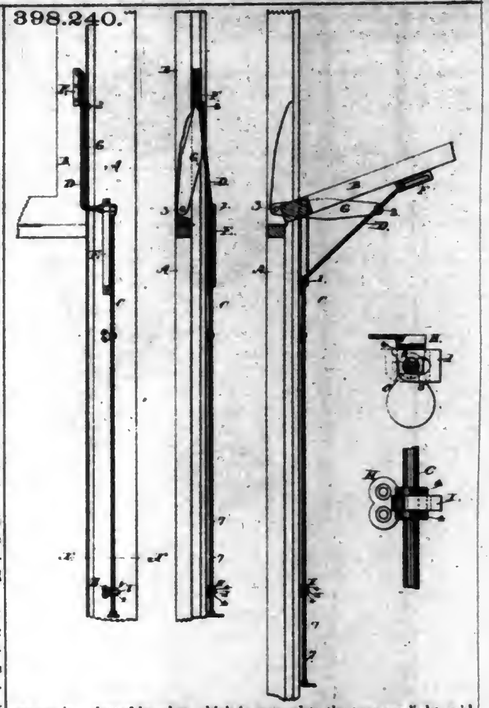
9. In a window, two duplicate sash-locks secured to the lower rail of the upper sash, having sliding bolts projecting beyond the side surfaces of the sash-frame, levers projecting from said bolts and furnished with locking-lugs, and two locking-plates attached to the top rail of the lower sash and provided with perforated ears for the reception of the locking-lugs of said levers, thus affording a hinged connection to the meeting edges of the upper and lower sash, as well as a means of securing the sash from vertical and lateral movement, substantially as set forth.

10. The combination, with a window-frame, sashes mounted therein to have sliding movement past each other, cord-clamps secured, respectively, to the upper side edges of the upper sash and lower side edges of the lower sash and forming trunnions on which the sashes can be swung outwardly, cords secured to said clamps, and weights attached to the cords, of a detachable hinge-connection secured to the meeting-rails of the sashes, substantially as set forth.

398,240. TRANSOM-LIFTER. GILBERT J. DICKSON, Albany, N. Y. Filed Sept. 18, 1888. Serial No. 285,729. (No model.)

Claim.—1. In a transom-adjuster, the combination of an operating-rod whose upper end is fitted to slide on a guide that is secured to the door-casing, a joint-bar having its lower end articulated to the upper end of said operating-rod, and its opposite end being fitted to

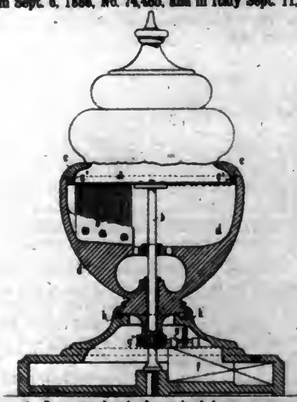
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engage in a slotted bracket which is secured to the transom-light, said joint-bar being provided with a pivot-pin arranged intermediately between its ends, and a swinging arm having one end pivoted to a fixed point on the door-casing and the opposite end pivoted to the pivot-pin of said joint-bar, as and for the purpose herein specified.

2. In a transom-adjuster, the combination of an operating-rod having a series of notches formed therein, a bracket which guides said operating-rod and is provided with a locking-piece which moves in a direction transversely to the movement of said operating-rod, said locking-piece being provided with a slotted opening which has at one end an enlargement through which the body of said operating-rod can slide freely, and at the opposite end a lip which is fitted to engage in any one of said notches, as and for the purpose herein specified.

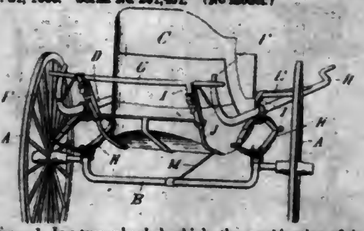
398,241. MUSICAL BOX. FRIEDRICH E. P. EHRLICH, Gohlis, near Leipsic, Saxony, and GUSTAV A. F. MÜLLER, Berlin, Germany, assignors to the Fabrik Leipziger Musikwerke, vormals Paul Ehrlich & Co., Gohlis, near Leipsic, Germany. Filed Jan. 17, 1887. Serial No. 224,629. (No model.) Patented in Germany June 16, 1885, No. 33,761; in France July 24, 1886, No. 180,196; in England July 28, 1886, No. 9,742; in Belgium Sept. 6, 1886, No. 74,465, and in Italy Sept. 11, 1886, XI, 376.



Claim.—1. In a mechanical musical instrument or musical box, the combination of a music-sheet having pins or projections, the comb of tuned tongues revolubly mounted in position, means for revolving said comb of tuned tongues, and the cover or lid having a circumferential-projecting rim resting upon said music-sheet, substantially as and for the purpose set forth.

2. In a mechanical musical instrument or musical box, the combination of a music-sheet having pins or projections with a cover or lid, *c*, having a circumferentially-projecting rim, *c'*, substantially as and for the purposes described.

398,242. ROAD-CART. SETH C. FELT, New Boston, Mich. Filed Nov. 21, 1888. Serial No. 291,481. (No model.)



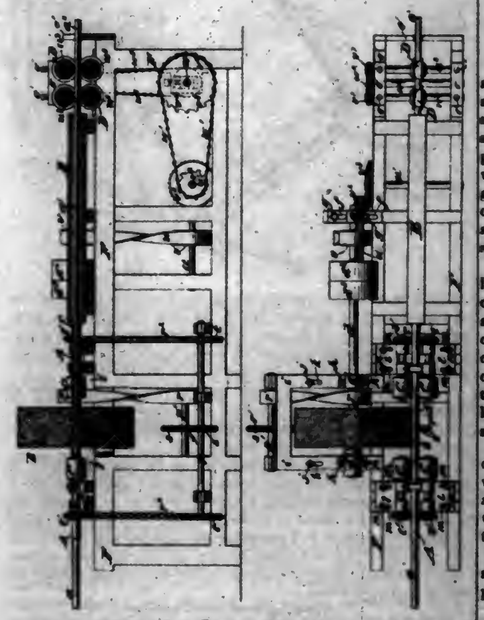
Claim.—1. In a two-wheeled vehicle, the combination of the shafts having front and rear cross-bars, the body suspended between springs connecting the shafts and axle, and direct draft connections to the axle substantially as described.

2. In a two-wheeled vehicle, the combination of the shafts having an upward and rearward extension and connected by front and rear cross-bars, a body suspended by thorough-braces upon said cross-bars; elliptical springs connecting the shaft and axle, a whiffletree suspended from the forward cross-bar, and a draft-bar connecting the whiffletree and the axle, substantially as described.

3. In a two-wheeled vehicle, the combination of the wheels connected by a crank-axle, springs clipped thereon at the straight end portions thereof at an angle to the line of draft, and shafts and a body supported upon said springs parallel therewith, substantially as and for the purpose described.

4. In a two-wheeled vehicle, the combination of the shafts D, having the upward and rearward extension F, the cross-bars E and G, the springs H, secured to the axle at an angle with the line of draft, the body C, the thorough-braces I, metallic straps J, whiffletree K, strap L, and draft-rod M, the parts being arranged to operate substantially as described.

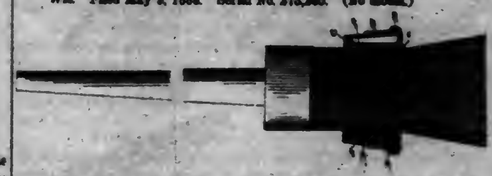
398,243. MACHINE FOR FINISHING POLES OR RODS. HARRY FERGUSON, New York, N. Y. Filed July 11, 1888. Serial No. 279,650. (No model.)



Claim.—1. In a machine for finishing poles or rods, the combination, with a fixed holder guide-tube for the pole or rod, of a finishing-wheel on one side of said tube and driving-rolls for producing the rotary motion of said pole or rod, the said tube having lateral openings, through which the said finishing-wheel and driving-rolls may operate upon the pole or rod therein, substantially as described and set forth.

2. In a machine for finishing poles or rods, the combination, with the fixed holder guide-tube A, the finishing-wheel B, and the driving-rolls C, for producing the rotary motion of said pole or rod, of the grooved guiding feed-rollers distant the length of a rod or pole from the nearest driving-rollers, substantially as herein described, for the purpose of producing the feed of the pole or rod which is being turned by the pressure behind it of the following pole or rod, which is being pushed forward without turning, as herein set forth.

398,244. PAINT-BRUSH ATTACHMENT. JOHN B. PLANTZ, Sparta, Wis. Filed May 9, 1888. Serial No. 273,305. (No model.)



Claim.—1. The combination, with the combined drip-guard and bridle, of the flexible rim secured to the upper end of the outer wall and having its inner edge extending over the mouth of the guard, substantially as and for the purpose specified.

2. The hereinbefore-specified combined drip-guard and bridle, composed of the wall A, having parallel sides and an inner flange, *a*, the flaring wall B, united at its lower end to the wall A, and the flexible rim D, having its outer edge secured to the wall B, having the end of the wall bent over it, substantially as set forth.

398,245. VENDING-MACHINE. EDWARD S. FORD, Heaton, County of Middlesex, England, assignor to Oscar Uhlman, Bavaria, Germany. Filed Oct. 16, 1888. Serial No. 288,260. (No model.)



Claim.—1. In an automatic coin-freed or coin-actuated apparatus, a coin-slide comprising an inclined side against which the coin leans and a bottom ledge or flange upon which the edge of the coin runs, said inclined side having an opening of such height that a coin of smaller diameter than that of the prescribed coin will not be supported by the inclined side, but will fall into said opening, and of such width that its lower side shall form a shoulder beneath the center of gravity of the coin, over which shoulder the coin on falling into the opening shall rock, so that its lower edge will be thrust off the ledge and the coin will drop out on the side opposite to said opening, substantially as set forth.

2. In an automatic coin-freed or coin-actuated apparatus for delivering goods in exchange for coin, the combination, with a goods carrier or drum having radial goods-compartments around its periphery and caused to rotate to the extent of one compartment for each action of the apparatus, of a separator or divider which enters the goods-compartments as they successively reach or approach the delivery-outlet and separates the outermost article in the compartment from the other article or articles therein, whereby only one article is delivered from a compartment containing more than one article, substantially as set forth.

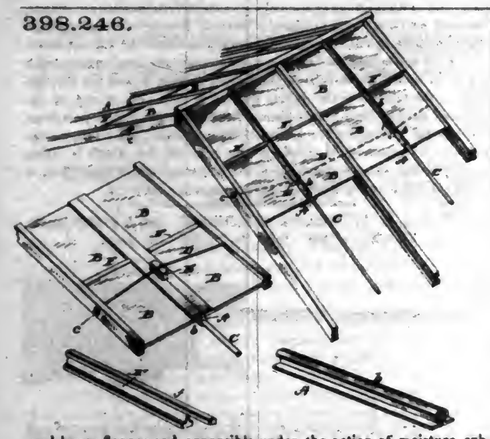
3. The combination, with the rotating drum *t*, having radial goods-compartments *v v*, formed with openings A A in their partitions, and with the fixed casing *w*, having an opening, *x*, of the stationary fingers *z*, arranged to enter the openings A in the sides of the compartments, whereby the latter are caused to clear or pass said fingers, substantially as set forth.

4. The combination of the plate B, having the fingers *z*, with the adjusting-screw C and distance-piece E, substantially as and for the purpose set forth.

398,246. METALLIC ROOFING. SAMUEL C. FREDERICK, Arcadia, Kans. Filed Sept. 22, 1888. Serial No. 286,671. (No model.)

Claim.—1. The roof comprising the series of roof-plates and the packing-bars placed between the edges of the same and having upper

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and lower flanges and expansible under the action of moisture, substantially as and for the purpose set forth.

2. The roof comprising the series of roof-plates and packing-bars placed between the edges of said plates and having upper and lower flanges, said packing-bars being expansible under the action of moisture and each having one end of its upper flange extending beyond its other portion, substantially as set forth.

398,247. PLANE. HENRY FRY, Eugene City, Oreg. Filed Sept. 13, 1888. Serial No. 285,311. (No model.)



Claim.—1. In a plane, the combination, with a stock having a bit-well therein, of an elongated shoe hinged thereto and solid throughout with the exception of a slot therein for the passage of the bit therethrough, a screw-rod for adjusting said shoe, and a casting composed of a horizontal member secured to the bottom of the stock adjacent to the bit-well, and a front integral member arranged at an angle to said horizontal member, and against which the bit has bearing at its lower end, substantially as described.

2. A plane comprising a stock with a bit-well, an elongated shoe hinged to the rear end of the stock and having a flanged set-nut secured therein near the front end, a revoluble screw-rod in the stock engaging the set-nut, and a casting, F, having a horizontal member *f*, secured to the bottom of the stock, and integral oblique member *f'* bearing against the lower end of the bit, substantially as described.

398,248. STREET-RAILWAY SWITCH. NATHANIEL O. GOLDSMITH, Cincinnati, Ohio, assignor to the Weir Frog Company, same place. Filed May 24, 1888. Serial No. 274,921. (No model.)

Claim.—1. A side guard-rail for a switch, composed of the irons B C, bolted together and to the girder-rail A, substantially as herein set forth.

2. In combination with the girder-rail A and switch-rail formed of the T-irons B C, the filling-blocks 11 12, and the through-bolts 13, for securing the said parts together, substantially as herein specified.

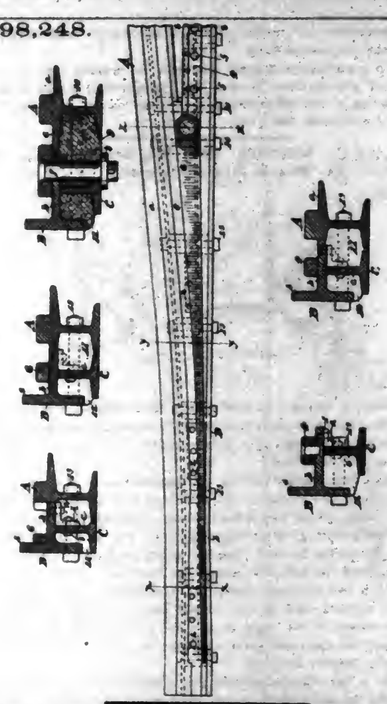
3. The combination, with the girder-rail A, of the switch-rail B C, built-up head 4, and the angle-arm 1, for joining the said parts together, substantially as specified.

4. In a switch-point, the guide-rail composed of the T-irons B and C, having their webs placed at right angles to each other, and the flange forming the guard-rail, and the flange *b*, forming the base for the built-up rail 4, substantially as herein specified.

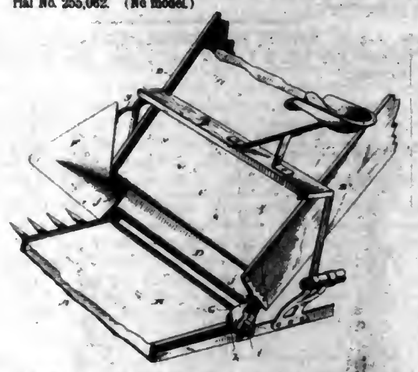
5. In a switch, the guard-rail composed of the T-irons B and C, secured together by means of the angle-iron 1, bolted to webs, filling-block 12, and the flange *s*, forming a guard for the tongue-rail 6, substantially as herein specified.

6. A switch-rail composed, substantially, of the T-irons B and C, placed at right angles to each other, the web of the iron B resting upon the web of the T-iron C, and secured together by angle-plates 1 and rivets and bolts and united to said girder-rails by filling-blocks and bolts, substantially as herein specified.

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398,249. HARVESTER. JAMES A. GRAHAM, CHARLES MARTINCOURT, and HENRY F. CRANDALL, Milwaukee, Wis., assignors to the Milwaukee Harvester Company, same place. Filed Nov. 14, 1887. Serial No. 255,062. (No model.)



Claim.—1. The combination of the front side timber of the elevator-frame of a harvester having the upper portion of its lower end above the plane of the grain-platform, and provided with a concavity in its grainward edge, with a guard formed at an angle to said side timber and fitting into said concavity at its rear end.

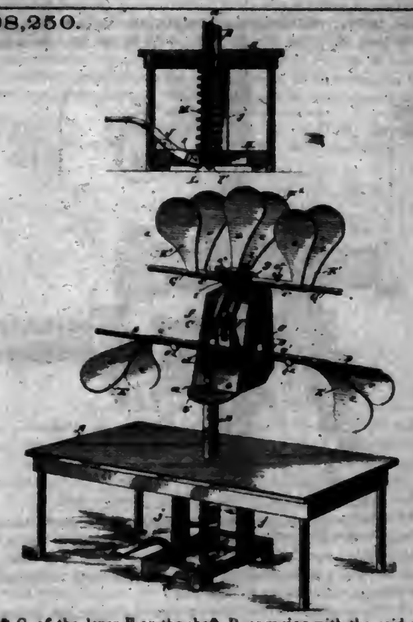
2. The combination, in a harvester, of the rear side timber of the elevator-frame and the rear sill of the grain-platform, with a casting having a concavity in its grainward edge above the plane of the grain-platform and connecting the said parts.

3. The combination, in a harvester, of the rear side timber of the elevator-frame, the grain-platform having a grain-apron and a driving-shaft therefor carrying a sprocket-wheel at its rear end, and a casting having a concavity in the grainward edge above the plane of the grain-platform and connecting the said rear side timber with the rear sill of the said grain-platform and provided with a rearwardly-projecting flange partially encircling and forming a guard for the said sprocket-wheel.

398,250. DINING-TABLE FAN. DAVID J. GREGORY, Scranton, Pa. Filed July 12, 1888. Serial No. 279,822. (No model.)

Claim.—1. In a fly-fan, the combination, with the supports, the shafts D and G, each having fans, and the arm projecting from the

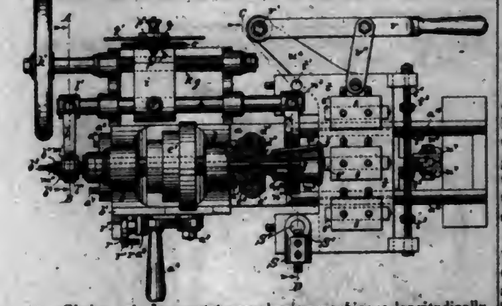
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shaft G, of the lever F on the shaft D, engaging with the said arm, the rod *a*, and the treadle, substantially as described.

2. The combination of the table, the tubular standard having the block *b* on its upper end, the shaft D, journaled in brackets on the block, the uprights C, the shaft G, journaled in brackets on the said uprights, fans on the said shafts, the arm I, the bell-crank lever F, the rod *a*, the treadle J, the frame K, connected with the table, and the spring M, substantially as specified.

398,251. WATCH-CASE-SHAPING MACHINE. HENRI L. HALBY, Waltham, Mass., assignor of one-half to John Stark, same place. Filed Nov. 24, 1888. Serial No. 291,728. (No model.)



Claim.—1. In a watch-case-shaping machine, a longitudinally-movable head-stock having a rotary spindle journaled therein and the cup-shaped expansive work-holder, as described, combined with the longitudinally-adjustable shaft *A*, the lever *n*, secured to said shaft, and the ring n^6, connected to said lever for the purpose of compressing said work-holder, substantially as specified.

2. In a watch-case-shaping machine, a longitudinally-movable head-stock having a rotary tubular spindle journaled therein and the cup-shaped expansive work-holder, as described, combined with the longitudinally-adjustable shaft *A*, the lever *l*, secured to said shaft, and the central spindle, *m*, adjustably connected to said lever and having secured to it within the expansive work-holder the block or expander m^3, substantially as specified.

3. In a watch-case-shaping machine, a longitudinally-movable head-stock having a spindle journaled therein and provided with the expansive work-holder, as described, combined with the longitudinally-adjustable shaft *A*, and connecting mechanism, substantially as described, for expanding or contracting said work-holder, the block *i*, secured to said shaft *A*, and the screw-shaft *k*, substantially in a manner and for the purpose as specified.

4. In a watch-case-shaping machine, a longitudinally-movable head-stock having a spindle journaled therein and provided with the expansive work-holder, as described, combined with the longitudinally-adjustable shaft *A*, and connecting mechanism for clamping the work, and the indicator device, as described, consisting of the rack *o*, secured to the block *i*, the graduated dial q', secured to the head-stock *b* or its connections, and the pinion *p*, meshing into the teeth of said rack and having secured to it the index-pointer p^6, substantially as and for the purpose set forth.

5. In a watch-case-shaping machine, a longitudinally-movable head-stock and a rotary work-holder spindle journaled therein, combined with the adjustable stop-screw b^2 on the said head-stock and the stop-screw carrying disk a^4 on the bed *a*, said disk being adapted to turn around its axis and to be locked in position, substantially as and for the purpose set forth.

6. In a watch-case-shaping machine, a longitudinally-movable head-stock and a rotary work-holder spindle journaled therein, combined with the stop projection a^5 on the said head-stock, and the adjustable disk r', mounted on a bracket secured to the bed *a*, and provided with adjustable stop-screws *r r*, substantially as and for the purpose set forth.

7. In a watch-case-shaping machine, a longitudinally-movable head-stock and a rotary work-holder spindle journaled therein, combined with the bed *u*, adjustably secured to the main bed *a*, and the tool-post carrier *t*, adapted to slide on the bed *u*, and provided with a series of shaping-tools adjustably secured to tool-posts on said carrier, substantially as and for the purpose set forth.

8. In a watch-case-shaping machine, the bed *u* and the tool-post carrier *t*, adapted to slide thereon and provided with a series of tools and tool-posts, combined with the lever *v*, connected to the said bed and tool-post carrier, as described, and the adjustable stop device consisting of the screws t^5 t^6, secured to the part *t*, and having adjustable stop-nuts t^8 t^9, and the notched levers u^7 u^8, pivoted to a bracket or extension of the bed *u*, substantially as and for the purpose set forth.

398,252. WAGON-SEAT. DALLAS F. HEAD, Arcadia, assignor of one-half to Nathaniel W. Warren, Mount Lebanon, La. Filed Sept. 19, 1888. Serial No. 285,804. (No model.)

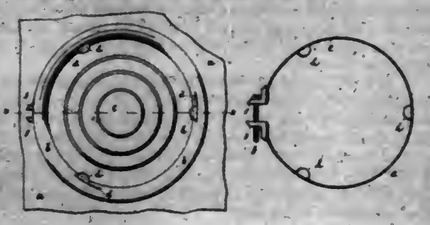


Claim.—1. The combination, with the wagon-seat having the bottom frame provided with the countersunk recess F on its inner side, of the detachable bottom board, G, adapted to fit in said recess and having the cleats H on its lower side, and the steps or rungs I, secured to said cleats and to the bottom board, said cleats and steps being gradually reduced in width toward the upper end of the board, and the hook or catch secured to the upper end of the board and adapted to engage one side of the wagon-bed, for the purpose set forth, substantially as described.

2. The wagon-seat having the removable bottom board, G, provided on one side with the rungs or steps, and having the hook pivoted at its upper end adapted to engage one side of the wagon-bed and suspend the board therefrom, for the purpose set forth, said hook having the U-shaped end portions, L, the straight central portion, M, and the inwardly-extending pivotal arms N, substantially as described.

3. The combination, with the wagon-seat having the bottom frame provided with the countersunk recess F on its inner side, of the detachable bottom board, G, adapted to be inserted in the said recess and provided on one side with the steps or rungs I, and the hook K, pivoted to the upper end of the board G, substantially as described.

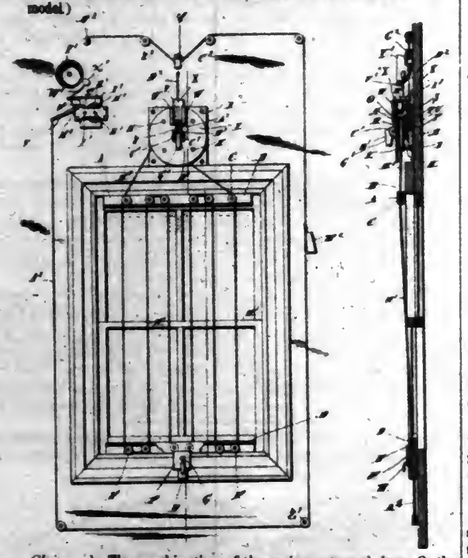
398,253. LENS-HOLDER FOR SIGNAL-LAMPS. CHARLES W. HELME, New York, N. Y., assignor to George C. Drumel, same place. Filed Aug. 1, 1888. Serial No. 281,830. (No model.)



Claim.—1. The combination of a lamp having slotted hood *b* and lens *c*, with the elastic band *e*, having lugs *h* and eyes *f*, and with the screw *g*, passing through said eyes, substantially as specified.

2. The combination of a lamp having hood *b*, that is provided with inclined slots *d*, with an elastic band that surrounds the hood and is adapted to be tightened up, and with the lugs *h*, secured to such band and projecting through the inclined slots *d*, substantially as specified.

398,254. BURGLAR AND FIRE ALARM. CHARLES C. HENDERSON, Jamestown, N. Y. Filed Nov. 6, 1888. Serial No. 290,107. (No model.)



Claim.—1. The combination of the spring-actuated drum O, the detent operated by the drum, the cords attached to the drum and adapted to be wound thereon, the plate X, engaged by the detents, the alarm mechanism having detaining-arm V', and the cord A^3, connected to said arm and to plate X, and normally drawn taut by the latter, for the purpose set forth, substantially as described.

2. The combination of the alarm mechanism having the arm V', the cord A^3, attached to the said arm, the weight attached to the cord, the drum O, the spring to rotate the same in one direction, the cords H', attached to the drum and adapted to coil thereon in the opposite direction, the detent engaging the drum, the plate X, engaged by the detent, and connections between the said plate and the cord A^3, substantially as described.

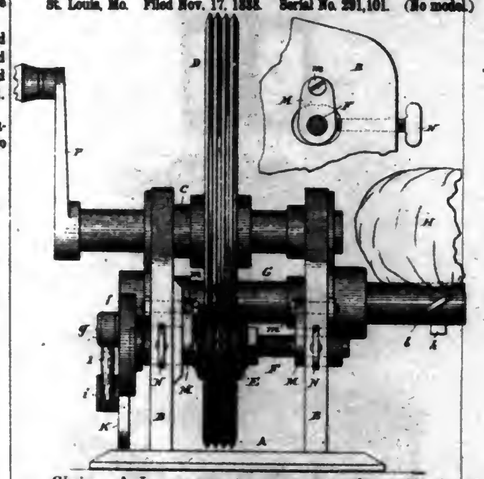
3. The combination of the drum O, having the teeth or serrations O^2, the spring and gears to rotate the drum in one direction, the slide-plate X, the detent having the arm E', engaging the teeth O^2, and the arm F', engaging the plate X, the cords H', attached to and adapted to be coiled on the drum, the alarm mechanism, and connections, substantially as set forth, between the plate X and the alarm mechanism, substantially as described.

4. The combination of the drum O, the spring to rotate the same in one direction, the detent to engage the drum, the plate X to trip the detent, the bar D, having the pulleys E, the pulleys C, journaled to a fixed point, the cords H', attached to the drum and connecting the pulleys E C, the alarm mechanism, and connections between the same and the plate X, substantially as described.

5. The combination, with the alarm mechanism, of the shaft M and bearings therefor, the spring to rotate the shaft, the wheel N, rigid with the shaft, the drum O, loose on the shaft, having the teeth or serrations O^2, and the pinion R, the shaft T, journaled in suitable bearings and having the wheel S, and pinion U, engaging the pinion R and wheel N, respectively, the plate X, the detent having the arm engaging said plates and the arm engaging the teeth O^2, the cords H', attached to the drum and adapted to be wound thereon, the alarm mechanism, and connections between the same and the plate X, substantially as described.

6. In a fire and burglar alarm, the bar A, secured at the top of the window, the bar D, secured at the bottom of window, the bar A, having the pulleys C, and the bar D, having the pulleys E, and the continuous cord H', passed backward and forward between the bars A D, around the pulleys C E, the spring-actuated revoluble drum to which the ends of the cord are directly attached, and the alarm mechanism, and connections, substantially as specified, between the same and the drum, substantially as described.

398,255. MOVEMENT-CURE MACHINE. MARY F. HENDERSON, St. Louis, Mo. Filed Nov. 17, 1888. Serial No. 291,101. (No model.)

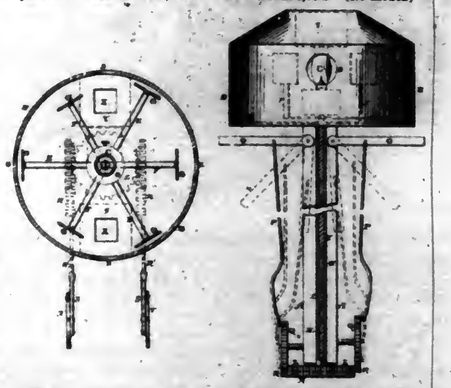


Claim.—1. In a movement-cure apparatus, the combination of the large and small friction-wheels and their respective shafts, the vibrator having a socket for the insertion of a rubber or other attachment, and a connection-rod for imparting a rapid oscillation to said vibrator, substantially as described.

2. The combination, with the vibrator and main shaft, of means, including a large and small friction-wheel, for transmitting motion from the latter to the former, the shaft of one of said friction-wheels having bearings adjustable toward and away from the other friction-wheel, substantially as described.

3. In a movement-cure apparatus, the combination of a portable supporting-frame, a main shaft having bearings at the middle part of the frame and carrying a large friction-wheel, a crank-shaft carrying a small friction-wheel engaging the large wheel, said crank-shaft having bearings in adjustable brackets, adjusting-screws for said brackets, a vibrator-shaft, a connection-rod for communicating motion thereto from said crank-shaft, and an adjustable connection between the end of said rod and an arm secured to said vibrator-shaft, substantially as described.

398,256. RAILROAD BLOCK-SIGNAL. JAMES M. HEVERLY, Coalport, Pa. Filed Nov. 22, 1888. Serial No. 291,554. (No model.)

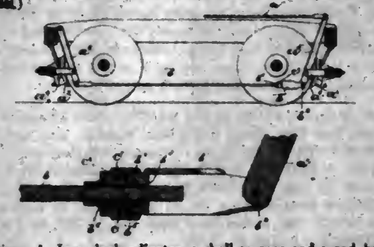


Claim.—1. The combination of the revolving frames carrying colored glasses placed inside of the signal-box, the operating mechanism connected thereto, wheels provided with wrist-pins, toothed slides which mesh both with the wheels and the operating mechanism of the revolving frames, connecting-rods, the signal-arms, and the levers for operating the slides, substantially as shown.

2. The combination of the signal-box, the revolving frames placed therein and provided with colored glasses, the shaft and the sleeve connected to these revolving frames, wheels connected to the sleeve and shaft, an operating-wheel placed at an angle to the said wheels, a slide which meshes with two of the wheels, a connecting-rod, signal-arms, and a lever for moving the slides, and thus operating both the signal-arms and the colored glasses at the same time, substantially as described.

3. The combination of the tower, the signal-arms pivoted thereto, and a mechanism for operating them, with the signal-box placed upon the top of the tower and provided with openings through its bottom, and reflectors placed in the top of the box, so as to reflect the light of the lamp downward upon the signal-arms, substantially as set forth.

398,257. SLACK-ADJUSTER FOR CAR-BRAKES. CHARLES C. HUBBAR, Rome, N. Y. Filed May 7, 1888. Serial No. 273,123. (No model.)

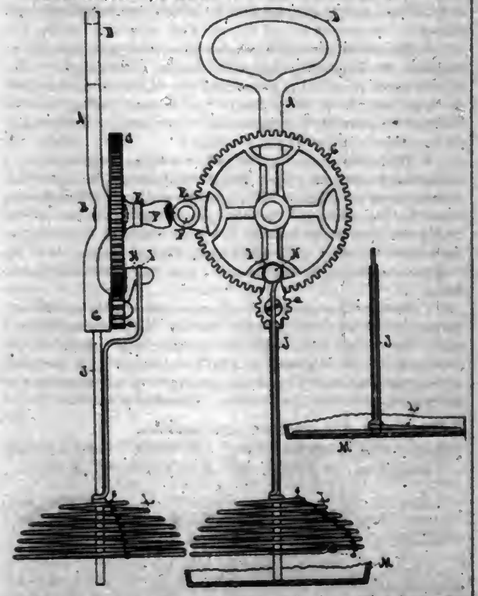


Claim.—1. In a slack-adjuster, a shell or case and a rod having its end threaded and extended into said shell or case, combined with an adjusting-nut mounted on said rod and by which the said rod is moved with relation to the said shell or case, and with a locking-nut to secure said rod in adjusted position, substantially as described.

2. In a slack-adjuster, a rod, *b*, having one end threaded, and a shell or case having a projecting flange or lip, b^4, and provided with an opening through which is extended the threaded end of the said rod, the said opening being of greater diameter than the threaded end of the said rod, combined with an adjusting-nut having a shoulder, and with a locking-nut, the shoulder of the adjusting-nut and a part of the said locking-nut bearing against the said flange or lip and by the rotation of the locking-nut seating the shoulder firmly against the said flange or lip, substantially as described.

3. In a slack-adjuster, a rod, *b*, having one end threaded, and a shell or case having a flange or lip, b^4, recessed to form a socket, and provided with an opening through which is extended the threaded end of the said rod, the said opening being of greater diameter than the threaded end of the said rod, combined with an adjusting-nut and with a locking-nut, substantially as described.

398,258. EGG-BEATER. FREDERICK W. HUDSON, Leominster, assignor to William S. Brown, Boston, Mass. Filed Nov. 26, 1887. Serial No. 256,350. (No model.)



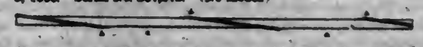
Claim.—1. An egg-beater consisting of a supporting-frame, the depending guide-rod J, connected thereto, the dasher mounted axially upon said guide-rod, composed of a helical coil of wire, and the pitman-rod attached to one end thereof, and adapted to reciprocate it thereon and cause its inner coils successively and respectively to pass to and fro through its outer coils by its reciprocation, substantially as described.

2. An egg-beater consisting of a supporting-frame, the depending guide-rod J, connected thereto, the dasher mounted axially upon said guide-rod, composed of a helical coil and the cross-struts 6 6, and the pitman-roll attached to one end of said coil, and adapted to reciprocate it upon said guide-rod and cause its inner coils successively and respectively to pass to and fro through its outer coils by its reciprocation, substantially as described.

3. An egg-beater consisting of a supporting-frame, the depending guide-rod J, connected thereto, the dasher mounted axially upon said guide-rod, composed of a helical coil of wire, and the pitman-rod attached to one end thereof, and adapted to reciprocate it thereon and cause its inner coils successively and respectively to pass to and fro through its outer coils by its reciprocation, and operative mechanism connected to said pitman-rod, adapted to reciprocate the same, substantially as described.

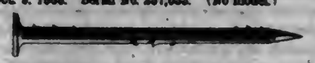
4. An egg-beater consisting of a supporting-frame, the depending guide-rod J, connected thereto, the dasher mounted axially upon said guide-rod, composed of a helical coil of wire, and the pitman-rod attached to one end thereof, and adapted to reciprocate it thereon and cause its inner coils successively and respectively to pass to and fro through its outer coils by its reciprocation, and the gear-wheels C *a*, the latter carrying crank-arm H, connected to said pitman-rod and adapted to reciprocate the same, substantially as described.

398,259. WIRE. PETER V. HUSTED, New York, N. Y. Filed Oct. 5, 1888. Serial No. 287,272. (No model.)



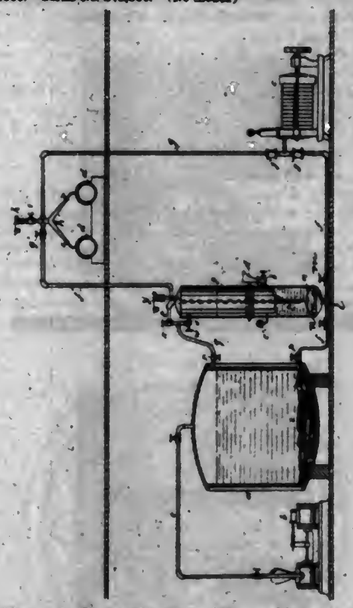
Claim.—A spirally-threaded wire in which the thread is made nearly parallel with the length of the wire, substantially as shown and described.

398,260. BARBED NAIL. PETER V. HUSTED, New York, N. Y. Filed Oct. 9, 1888. Serial No. 287,633. (No model.)



Claim.—A barbed or roughened nail provided with a smooth shank and a row of barbs or roughnesses arranged around the shank in a spiral direction, substantially as shown and described.

398,261. RACKING-OFF APPARATUS FOR BEER, WINE, AND OTHER LIQUIDS. JOHN JOHNSON, Brooklyn, N. Y. Filed Apr. 30, 1888. Serial No. 272,366. (No model.)



Claim.—1. The combination, with a racking-cask and filter, of the intermediately-placed filtering-material distributer connected with the delivery-pipe from the cask to the filter for discharging thereinto, and also connected with the cask for circulation of the compressed air above the beer-level, substantially as described.

2. The combination, with a racking-cask, air-compressor or force-pump, and filter, of the intermediately-placed filtering-material distributer connected with the delivery-pipe from the cask to the filter

for discharging thereinto, and also connected with the cask for circulation of the compressed air above the beer-level, substantially as described.

3. The combination, with a racking-cask, air-compressor or force-pump, and filter, of the intermediately-placed filtering-material distributer connected with the delivery-pipe from the cask to the filter for discharging thereinto, also connected with the cask for circulation of the compressed air above the beer-level, and the discharge-pipe of the filter connected with the cask or distributer for establishing back-pressure on the beer, substantially as described.

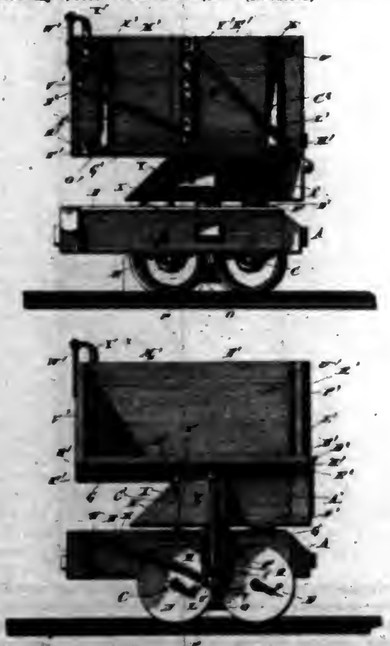
4. The combination, with the racking-cask, air-compressor or force-pump, and filter, of the intermediately-placed filtering-material distributer connected with the delivery-pipe from the cask to the filter for discharging thereinto, also connected with the cask by the dip-pipe for the inflow of air from the cask through the beer in the distributer, and also having direct connection with the cask above the beer-levels in the cask and distributer, substantially as described.

5. The combination, in apparatus for racking beer and other liquids, of the racking-cask, air-compressor or force-pump, filtering-material distributer, filter, discharge-pipe of the racking-cask and distributer connected with the filter, filter discharge-pipe, air-pipe connecting the distributer or cask and the discharge-pipe of the filter, safety-valve in said filter discharge-pipe, and the stop-valves in the racking-cask and distributer discharge-pipe and in the filter discharge-pipe safety-valve, substantially as described.

6. The combination, in apparatus for racking beer and other liquids, of the racking-cask, air-compressor or force-pump, filter, and filtering-material distributer, said distributer having the charging-hopper and foraminous false bottom, and being connected with and so as to discharge into the discharge-pipe from the racking-cask to the filter, and also connected with the racking-cask above the beer-levels in each, substantially as described.

7. The combination, in apparatus for racking beer and other liquids, of the racking-cask, air-compressor or force-pump, filter, and filtering-material distributer, said distributer being connected with and so as to discharge into the discharge-pipe from the racking-cask to the filter, also connected with the racking-cask above the beer-level in it by the dip-pipe discharging below the beer-level in said distributer, and having the relief or safety valve to accelerate the mixture of the filtering material with the beer in said distributer, substantially as described.

398,262. DUMPING-CAR. CARLOS G. KING, Montezuma, Ind. Filed July 6, 1888. Serial No. 279,167. (No model.)

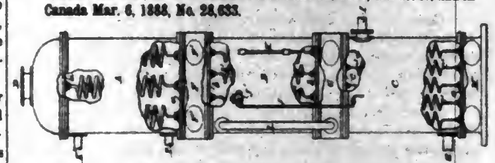


Claim.—1. The combination of the frame, the car box or body thereon and adapted to incline or tilt, the end-gate pivoted or hinged at its upper side to one side of the car box or body, and connections, substantially as described, between the said end-gate and the fixed portion of the frame, whereby when the box or body is tilted the end-gate will be automatically opened, substantially as described.

2. The combination of the frame, the car box or body hinged thereon and adapted to tilt or incline, the end-gate hinged or pivoted to one side of the car box or body, the lever Y', fulcrumed on the car box or body, the link-rod A^2, connecting the same to the end-gate, and the link-rod C^2, connecting the opposite end of the lever to a fixed point on the frame, for the purpose set forth, substantially as described.

3. The combination of the truck having the circle, the turn-table frame pivoted on the truck and having the rollers bearing on the circle, and the car box or body hinged to the turn-table frame and adapted to tilt or incline thereon, and the catch or lock for holding the car box or body from tilting, substantially as described.

398,263. FEED-WATER HEATER. JOHN KIRKALDY, 40 West India Dock Road, County of Middlesex, England. Filed Aug. 27, 1888. Serial No. 283,829. (No model.) Patented in England Apr. 3, 1886, No. 4,707; in France Dec. 4, 1886, No. 180,073; in Belgium Dec. 6, 1886, No. 75,497; in Italy Dec. 31, 1886, No. 20,949; in Victoria Jan. 12, 1887, No. 4,891; in South Australia Jan. 24, 1887, No. 763; in Queensland Feb. 2, 1887, No. 246; in New South Wales Mar. 31, 1887, No. 2,047, and in Canada Mar. 6, 1888, No. 28,633.



Claim.—1. The combination, substantially as hereinbefore set forth, of the feed-water heater, the condenser, the evaporator interposed between the feed-water heater and the condenser, and exhaust-steam pipes passing through the heater, the evaporator, and the condenser, the inlet and outlet openings for feed-water in the feed-water heater, the inlet and outlet openings for cooling-water in the condenser, and the pipes connecting the condenser with the evaporator.

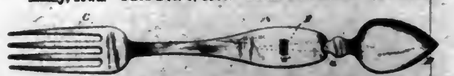
2. The combination, substantially as hereinbefore set forth, of the condenser, the evaporator arranged above the condenser and communicating therewith, the feed-water heater arranged above the evaporator, the exhaust-steam pipes extending through the heater, the evaporator, and the condenser, the inlet and outlet openings in the condenser for cooling-water, the inlet and outlet openings in the heater for feed-water, a pipe leading from the condenser to the evaporator conveying warmed water from the condenser to the evaporator, and the vapor-pipe leading from the top of the evaporator to the condenser.

3. The combination, substantially as hereinbefore set forth, of the condenser, the evaporator arranged above the condenser, the coiled exhaust-steam pipes in the evaporator, the vapor-pipe leading from the upper part of the evaporator to the condenser, and a pipe connecting the evaporator with the condenser, whereby water warmed in the condenser is carried to the evaporator.

4. The combination of a feed-water heater, an evaporator, and a surface condenser having pipes passing through each, through which exhaust-steam is passed successively, a feed-pipe leading from the condenser to the evaporator for supplying water which has become heated in the condenser from the condenser-casing to the casing of the evaporator, and a vapor-pipe passing from the upper part of the evaporator-casing to the interior of the condenser, substantially as set forth.

5. The combination of an evaporator and a surface condenser having pipes passing through each, through which exhaust-steam is passed successively, a feed-pipe for supplying water which has become heated in the condenser from the condenser-casing to the casing of the evaporator, and a vapor-pipe passing from the upper part of the evaporator to the interior of the condenser, substantially as set forth.

398,264. COMBINED FORK AND SPOON. DAVID P. KIEWER, Manly, Iowa. Filed Dec. 3, 1888. Serial No. 292,499. (No model.)

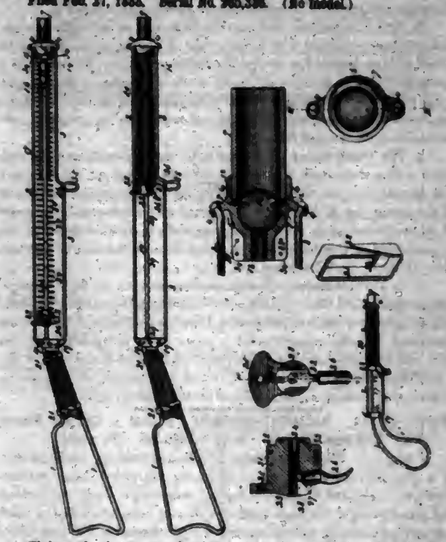


Claim.—1. The combination, with the handle A, having an article of table-cutlery, as C, formed on one end, and having the keepers *a* and *a'* at its other end, of the article D, having a shank, B, which is adapted to be inserted in the keepers *a* and *a'*, whereby the handle A is common to both of the said articles C and D, substantially as shown and described.

2. In an article of table-cutlery, the combination, with the handle having its end bent down to form the keeper *a*, and having a portion swaged therefrom to form the keeper *a'*, of the shank B, adapted to

be held in the said keepers, substantially as and for the purpose described.

398,265. SPRING-GUN. JOHN F. KLEINSCHMITT, St. Louis, Mo. Filed Feb. 27, 1888. Serial No. 265,396. (No model.)



Claim.—1. A toy gun having a barrel provided with a flexible annular lip, 9, to prevent the accidental escape of the ball, as explained.

2. The combination, in a toy gun having a barrel, of a pin working through the breech of the barrel, a trigger-block arranged to impinge upon the rear end of the pin, a trigger in said block adapted to hold and release the block, and a spring forcing the trigger-block against the pin, substantially as set forth.

3. The combination, in a toy gun, of a barrel, a pin extending through the breech of the barrel, a trigger-block sliding on a guide-rod and arranged to impinge upon the pin, a spring arranged to force the trigger-block against the pin, and a trigger working in the block and adapted to engage the guide-rod, for the purpose set forth.

4. The combination, in a toy gun, of a pin working endwise and adapted by impinging upon the ball to force it from the gun, a trigger-block forced against the pin by a spring, a guide-bar on which the trigger-block slides, provided with recesses for the engagement of the trigger, and a trigger adapted to engage said recesses, substantially as set forth.

5. The combination, in a toy gun, of the movable pin 15, having a reduced end, 14, working through the breech of the barrel, the guide-rod 17, entering an axial bore of the pin and forming at once a guide and a back stop to the pin, a trigger-block having a trigger engaging the guide-rod, a spring forcing the trigger-block against the pin 15, and a stock to which the rear end of the guide-rod is attached.

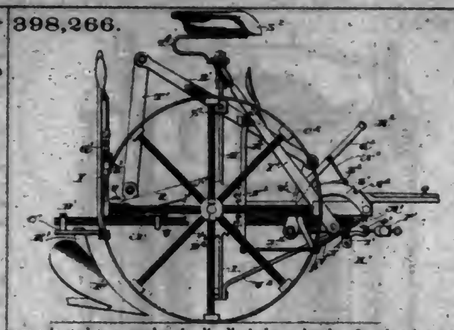
6. The combination, in a toy gun, of the frame having a continuous bar having parts 1, 2, and 3, forming the frame of the stock and connecting it to the barrel, a guide-rod secured at the rear end to the stock, a pin passing through the breech of the barrel and having an axial bore receiving the forward part of the guide-rod, a trigger-block sliding on the guide-rod and the upper frame-bar, 2, a trigger working in the trigger-block and engaging the guide-rod, and a spring acting to force the trigger-block against the pin, for the purpose set forth.

398,266. SULKY-PLOW. IRA M. LINDERMAN, Elmira, N. Y. Filed Aug. 7, 1888. Serial No. 282,139. (No model.)

Claim.—1. The combination, in a sulky-plow, of the frame, the arms R, pivoted thereto, the plows supported by the said arms, the levers R', pivoted to the frame, the links T, connecting the rear ends of said levers to the plows, the rock-shafts V', having the arms X', the links U', connecting said arms to the front ends of the levers R', and the levers Y', attached to the rock-shafts, for the purpose set forth, substantially as described.

2. The combination, with the frame of a sulky-plow, of the pivoted arms R, the plows connected to and supported by said arms and adapted to play longitudinally independently of each other, means, substantially as set forth, to raise and lower the plows, and the clevis having the arms I' pivoted together and provided with openings or guides for the front ends of the plow-beams, and in which the latter

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are adapted to move longitudinally independently of each other, substantially as described.

3. The combination of the plows adapted to move longitudinally independent of each other, and having the beams or bars A', and the arms I', pivoted together and having the guides through which the front ends of the beams or bars extend, and in which the latter are adapted to reciprocate, substantially as described.

4. The clevis having the arms I', pivoted together and adapted to rock independently of each other, in combination with the plow beams or bars having their front ends movable longitudinally and guided through said arms, and a draft hook or device pivotally connected to the fulcrum of said arms I', substantially as described.

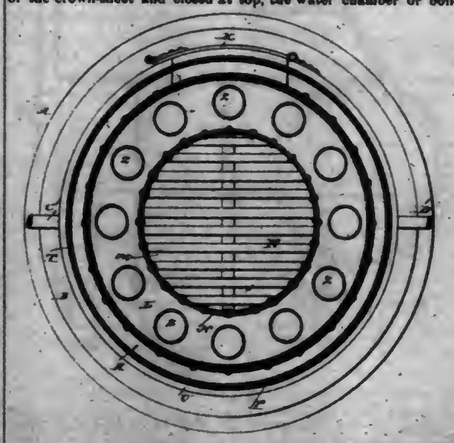
5. The combination, with the frame of a sulky-plow, of the arms R, pivoted thereto, the rods S, connecting the rear ends of said arms in pairs, the frames U, having the longitudinal openings through which the rods S extend, whereby said frames are movable longitudinally, the plow-beams secured to the said frames and the clevis having the guides for the front ends of the guide-beams, the latter being adapted to move in a longitudinal direction in said guides independently of each other, substantially as described.

6. The combination, in a sulky-plow, of the levers R', connected to the plows and adapted to raise and lower the same, the gear-wheels D^4, revoluble with the supporting-wheels, and the links E^3, connected to the levers R' and adapted to engage the gear-wheels, the levers G^3, connected to the said links, and the springs to normally move the links out of engagement with the gear-wheels, substantially as described.

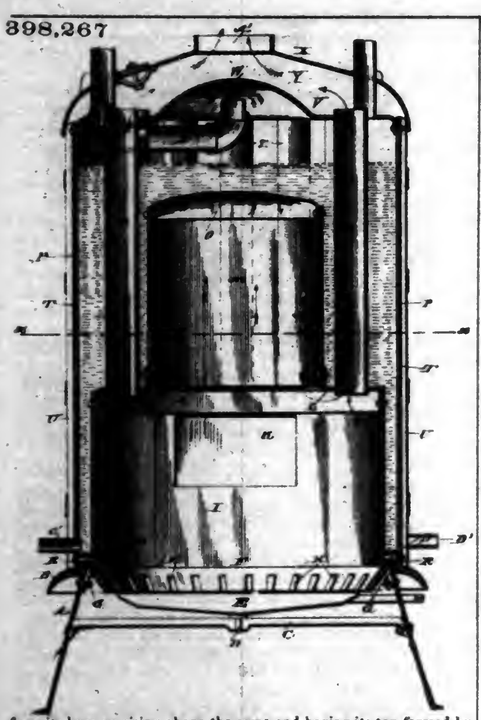
7. The combination, in a sulky-plow, of the gear-wheels, the levers to raise the plows, the links E^3, attached to said levers and adapted to engage the gear-wheels, the levers G^3, connected to said links, the plates Z', having the notches A^1, the levers Y', connected to and adapted to operate the elevating-levers, the spring-actuated bolts on said levers Y' to engage the notches A^1, the trip-levers K^3, pivoted to the plates Z', and the levers L^3, also pivoted to said plates and adapted to operate the trip-levers, said levers L^3 being connected to and operated by the levers G^3, substantially as described.

398,267. STEAM-GENERATOR. HARRY H. LINDENUTH, Mount Joy, assignor of one-half to Peter L. Kreiss, Florin, Pa. Filed May 18, 1888. Serial No. 274,296. (No model.)

Claim.—A steam-generator having a fire-box, I, the crown-sheet L of which has an upright flange around its central opening, the heated gas-chamber having its lower edge bolted within and to each flange of the crown-sheet and closed at top, the water chamber or boiler

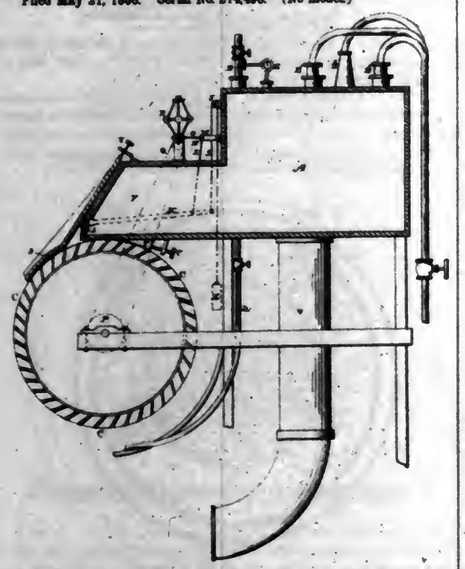


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from its base up rising above the same and having its top formed by the flue-sheet V, provided at its center with the integral steam-dome W, the flues Z, extending between the crown-sheet and flue-sheet, the chamber Y, to receive the products of combustion from the said flues surrounding the steam-dome and discharging vertically above the same, so that there will be a constant passage of hot gases thereover, and the pipe B, receiving steam downward at its inner end from the central upper part of the steam-dome, passing thence downward into the boiler and horizontally therein, and thence extending upward through the top of the chamber Y at one side, substantially as specified.

398,268. WATER-POWER. LOUIS LOEHAR, Jacksonville, Fla. Filed May 21, 1888. Serial No. 274,496. (No model.)



Claim.—1. In a water-motor, the combination, with an air-tight storage compartment provided with an opening for the outward flow of water, of a number of pipes conducting water to the compartment under varying pressures, whereby the flow of the water from the wells is automatically regulated according to the amount of water used, and a water-wheel which is operated upon by the water flowing from the compartment, substantially as shown and described.

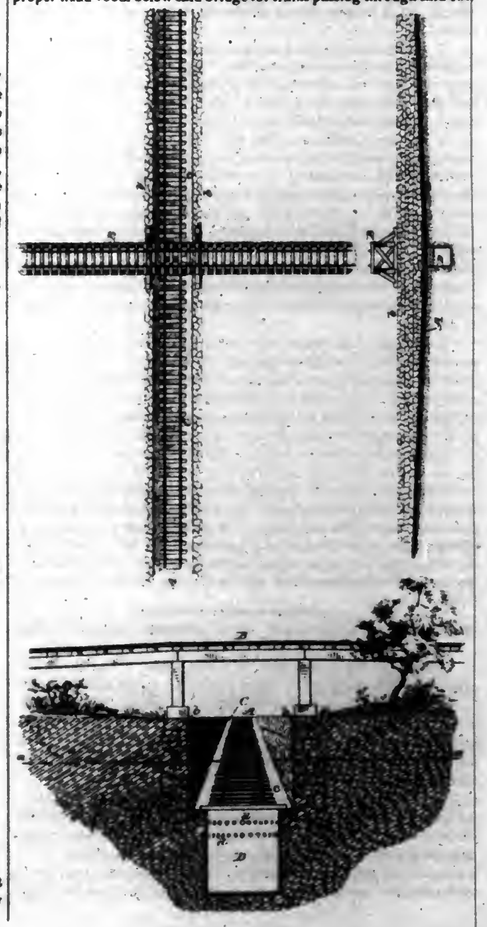
2. In a water-motor, the combination, with an air-tight storage-compartment provided with a water-way, F, having an opening in its closed end, of a gate for closing the opening, a water-wheel which is operated upon by the flow of water from the compartment, a governor connected with the gate, and pipes conveying water from Artesian wells into the storage-compartment under varying pressures, substantially as shown and described.

3. The combination of the air-tight storage-compartment provided with a water-way, the pipes B, extending from an Artesian well and discharging into the compartment, the gate G, applied to the end of the water-way F, the rods H, supported at their free ends by means of the weighted cords I, the connecting-rods L, pivoted levers M, rod O, connected to the governor, the pulley P, and the belt Q, substantially as shown and described.

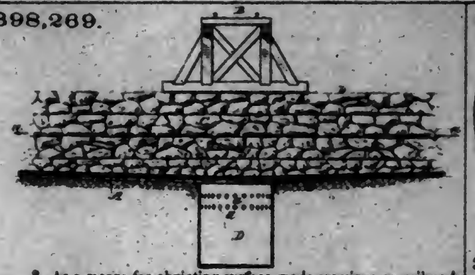
4. In a water-motor, the combination, with an air-tight storage-compartment provided with the way F, having an opening in its closed end, of a gate for closing the opening, pipes leading from Artesian wells connected with the compartment, a water-wheel journaled under the way, and an apron secured at its upper end to the closed end of the way and its lower end extending down over a portion of the circumference of the wheel, substantially as shown and set forth.

398,269. RAILROAD-CROSSING. HARVEY C. LOWRIE, Denver, Colo. Filed Sept. 22, 1888. Serial No. 286,063. (No model.)

Claim.—1. The improvement in railroad-crossings, which consists in a gradually-developed cut or road-bed depression below surface-grade to a required depth, and having water-tight walls and bottom and also having a drainage tank or well, in combination with a road-way-bridge crossing said cut at such a point thereof as will best afford proper head-room below said bridge for trains passing through said cut.



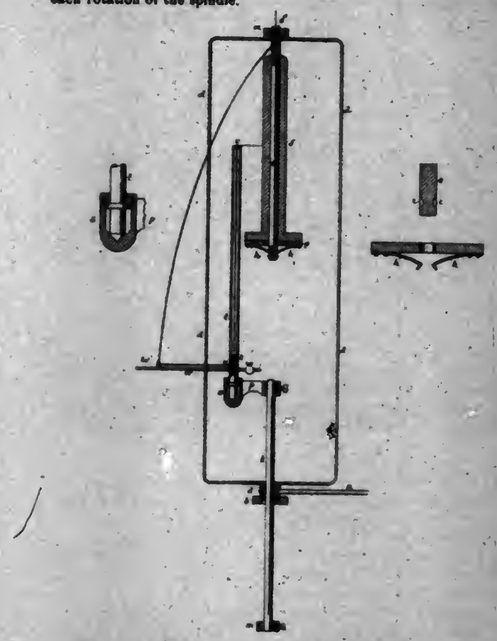
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2. As a means for obviating surface-grade crossings on railroads traversing low-level wet localities, a gradually-developed cut or road-bed depression, in combination with side walls and a bottom for said cut which exclude water from entering said road-bed depression from the adjacent ground, substantially as described.

398,270. MACHINE FOR SPINNING AND TWISTING YARN. GEORGE B. LOCKE, Camden, N. J. Filed July 5, 1887. Serial No. 243,371. (No model.)

Brief.—The object of the invention is to provide simple and efficient means for effecting a double twist of the strands or fibers for each rotation of the spindle.



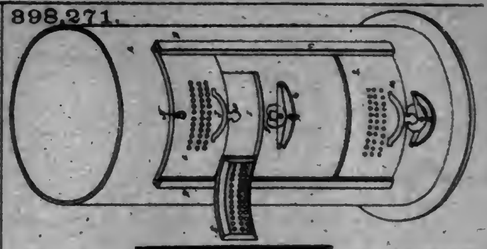
Claim.—1. The combination of the flier, the bobbin-carrier thereon, a tubular spindle located at one side of the axis of the flier and having an axial delivery-eye at its upper end, an arm projecting from said spindle and engaging with the flier, a bearing for the spindle, and a rod carrying said bearing and passing through one of the spindles of the flier, all substantially as specified.

2. The combination of the flier, the bobbin-carrier thereon, a tubular spindle located at one side of the axis of the flier and having an axial delivery-eye at the upper end, an arm projecting from said spindle and engaging with the flier, a guide-eye on said arm, a bearing for the spindle, and a rod carrying said bearing and passing through one of the spindles of the flier, all substantially as specified.

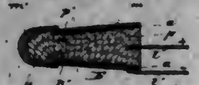
398,271. SAFETY-DOOR FOR HEATERS. JAMES H. MASON, Detroit, Mich. Filed May 3, 1888. Serial No. 272,991. (No model.)

Claim.—The combination, with a heater having an opening and closing door, of a vertically-sliding plate on the heater, which is supported in its elevated position by the door when the latter is open, and drops down in front of the door whenever the latter is closed, and an automatic locking device for holding the sliding plate in its lowest position when it drops down in front of the closed door, substantially as described.

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398,272. ELEMENT FOR THERMO-ELECTRIC BATTERIES. MAX MEITZER, Turin, Italy. Filed Nov. 22, 1888. Serial No. 291,545. (No model.) Patented in France Feb. 16, 1888, No. 183,764; in Belgium Feb. 16, 1888, No. 80,665; in Italy Apr. 12, 1888, XXI, 23,090, and in Spain June 30, 1888, No. 963/7,963.



Claim.—1. An element for thermo-electric batteries, comprising a positive and negative electrode in contact with each other, a metallic inclosing-casing of greater refractory power than that of the electrodes, and a fire-proof non-conductive lining arranged to isolate one of said electrodes from the casing, substantially as and for the purposes specified.

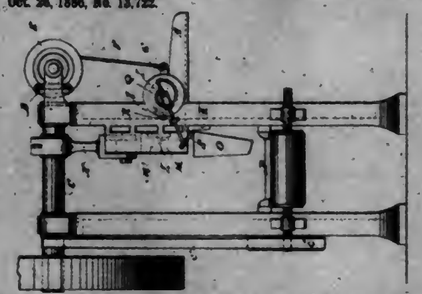
2. An element for thermo-electric batteries, comprising a positive and negative electrode in contact with each other, a metallic inclosing-casing of greater refractory power than that of the electrodes, a cap or plug of greater thickness than the casing for the smaller end of the element, and a fire-proof non-conductive lining arranged to isolate one of said electrodes from the casing, substantially as and for the purposes specified.

3. An element for thermo-electric batteries, comprising two electrodes composed of alloys of metals of varying refractory power, that electrode more directly exposed to the heat being formed of an alloy of greater refractory power than that of the other electrode, in combination with a conductive sheathing constructed of a metal of greater refractory power than either of the electrodes, and a fire-proof lining interposed between said sheathing and the more fusible electrode, substantially as and for the purposes specified.

4. An element for thermo-electric batteries, comprising two electrodes composed of alloys of metals of varying refractory power, that electrode more directly exposed to the heat being formed of an alloy of greater refractory power than that of the other electrode, in combination with a conductive sheathing constructed of a metal of greater refractory power than either of the electrodes, said sheathing being re-enforced at that point which is more directly exposed to the heat, and a fire-proof lining interposed between said sheathing and the more fusible electrode, substantially as and for the purposes specified.

5. An element for thermo-electric batteries, comprising a positive electrode formed of an alloy of antimony and zinc, and a negative electrode formed of an alloy of copper and nickel, in combination with an inclosing-casing of a conductive metal of greater refractory power than that of either of the electrodes, and a fire-proof insulating-lining interposed between said casing and the positive electrode, substantially as and for the purposes specified.

398,273. MACHINE FOR CUTTING RAGS OR OTHER MATERIALS. JAMES NUTTALL, Bury, County of Lancaster, England. Filed Oct. 26, 1887. Serial No. 253,313. (No model.) Patented in England Oct. 26, 1886, No. 13,722.

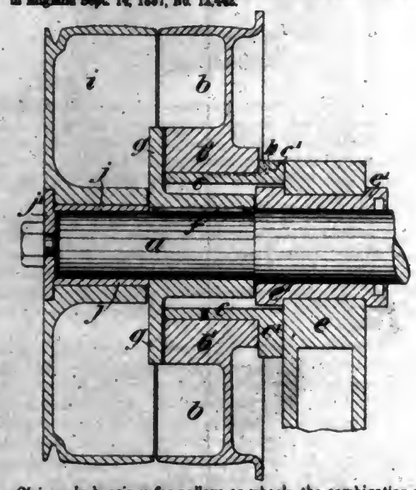


Claim.—1. In a machine for cutting rags and other material suitable for the manufacture of paper, the combination, with the cutting-blades for dividing the material in one direction, of the hopper or

receiver into which the strips of material severed by the said blades fall, mechanism for vibrating the said hopper or receiver by which they are automatically deposited side by side, a second cutting device, which divides the strips in another direction, and a feed to conduct the strips to the second cutter, substantially as described.

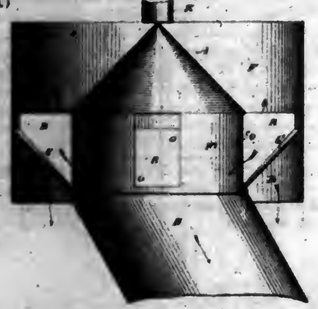
2. In machines for cutting rags or other materials suitable for the manufacture of paper, the combination, with the cutting-instrument for severing the material into strips, of the vibrating hopper, mechanism for moving the latter synchronously with the movement of the cutting device to deposit the cut pieces in a determined order, a traveling feed-belt on which they are deposited, and a second cutting device, which divides the strips in another direction, substantially as described.

398,274. BEARING FOR PULLEYS OR WHEELS. BENJAMIN ORMEROD and GEORGE HAWORTH, Blackburn, County of Lancaster, England, assignors to George Ashworth and Elijah Ashworth, both of same place. Filed Mar. 16, 1888. Serial No. 267,314. (No model.) Patented in England Sept. 14, 1887, No. 12,442.



Claim.—In bearings for pulleys or wheels, the combination of a cylindrical boss which surrounds the bearings of the shaft without touching the outer surface of such bearing, a pulley or wheel which revolves upon said boss, and the coupler engaging with the hub of the pulley and fixed on the shaft, substantially as set forth.

398,275. APPARATUS FOR SAMPLING ORES. CORTLANDT E. PALMER, Rico, Colo. Filed Sept. 13, 1888. Serial No. 285,708. (No model.)

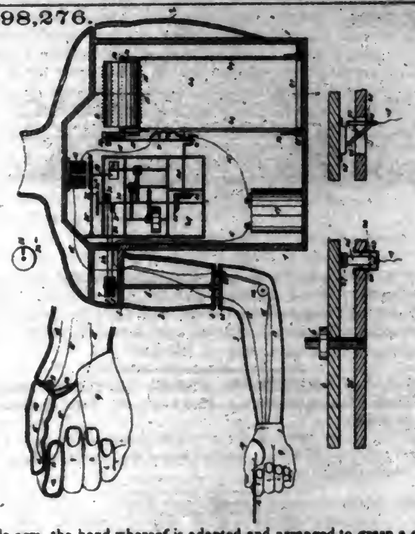


Claim.—In a sampling apparatus, the combination, substantially as hereinbefore described, of an exterior cylinder open at the bottom, forming the outer walls of the sampler, an interior cylinder placed within the outer cylinder and concentric therewith, a cone surmounting said inner cylinder of equal diameter therewith, a supply-pipe for delivering ore on the apex of the cone, a series of inclined pockets of suitable size formed in the space between the two cylinders and opening into the interior of the inner cylinder, and a discharge-pipe for carrying off the material discharged by the pockets.

398,276. AUTOMATON. ARTHUR M. PIERCE, Lyndhurst, N. J. Filed Aug. 27, 1887. Renewed July 21, 1888. Serial No. 280,686. (No model.)

Claim.—1. An automaton having an electrically-controlled movable arm, the hand whereof is adapted and arranged to grasp a card or its equivalent and hold the hand in an extended position until the card is removed therefrom, when the contact is established and the electric circuit completed, substantially as shown and described.

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2. In an automaton representing a human being provided with a single movable arm, the hand thereon being adapted and arranged to grasp a card or its equivalent, in combination with a device located within said automaton for feeding the cards to said hand, substantially as shown and described.

3. In an automaton of the character herein specified, an actuating-motor, in combination with a fixed upper arm, a movable forearm the hand thereon being provided with a movable thumb, a card-holder located in the body of the figure, and a chute leading to a receiver grasped by the stationary hand of the figure, toward which said movable arm is carried when the electric circuit is completed and the motor set in operation, substantially as shown and described.

4. In an automatic card-distributer consisting of a figure provided with a swinging forearm, the combination, with a hand adapted and arranged to grasp and hold a card, of a card receiver and holder provided with an intermittently-moved feeding-roller, and a motor for imparting motion to the whole, substantially as shown and described.

5. In an automaton of the character herein specified, the combination, with a hand the thumb whereof is made movable, of a swinging arm, electrical conductors passing through the arm and hand to contact-pieces upon the thumb and forefinger, by means of which the electric circuit may be completed or broken, an electro-magnet and battery located in the circuit of which said conductors form a part, the armature of the magnet bearing an arm adapted and arranged to control the movement of the actuating mechanism of the automaton, substantially as shown and described.

6. In an automaton, the combination, with an actuating-motor provided with a regulating fly-fan, and the bar or lever 35, pivoted above the same and provided at its free end with an armature, 36, and with a downwardly-projecting arm, 38, of an electro-magnet arranged in juxtaposition to said armature, and a battery, 17, situated below the whole, and provided with conducting-wires 15, leading to contact-pieces 16 16, situated in the forefinger and thumb, respectively, of the figure, substantially as and for the purposes herein set forth.

7. In an automaton of the character herein specified, the combination, with the electric circuit and magnet controlling the movement of the actuating mechanism, of a switch located in said electric circuit and composed of an immovable contact-piece, 19, and swinging contact 20, provided with an arm, 21, on the same, whereby the circuit is automatically opened when the cards are exhausted from the holder, substantially as and for the uses and purpose shown and described.

8. In an automaton, the combination, with an actuating-motor the main shaft of which being provided at its upper end with a slotted disk, 32*, and an arm or lever pivoted above the same and provided with the two downwardly-projecting arms 37 and 38, and at its free end with an armature, 36, of an electro-magnet, 18, situated above said armature, and the battery located below said magnet and provided with conducting-wires 15 15, leading to contact-pieces 16 16 in the thumb and forefinger of the figure, substantially as described.

9. The combination, with the motor having a regulating fly-fan, 39, and the main driving-shaft bearing a slotted wheel, 32*, of a bar, 35, pivoted above the same and provided with inwardly-projecting arms 37 and 38 and with an armature, 36, on its free end, conductors 15, leading from the battery 17 to contact-pieces 16, situated in the thumb and forefinger, respectively, of the figure, and an electric switch composed of a fixed contact, 19, and swinging contact 20, the movement of which is controlled by the support 48 within the card-holder, substantially as shown and described.

10. The combination, with the hand 9, of the movable thumb 10, mounted upon a pivot, 11, and normally held against the forefinger 12 by a spring, 14, a cord or wire, 13, passing to a slide, 23, mounted in disk 25, the movement of said slide being controlled by a pivoted arm, 26, and a step, 27, fixed on disk 4, substantially as shown and described.

11. In an automaton, the combination, with the main driving-shaft, of the cranks 31 and 32, formed on the same, and the cords or wires 34, connecting said cranks with the wheel 7, rigidly attached to the shaft 6, to the extreme lower end of which is fastened the movable forearm, substantially as and for the purposes set forth.

12. In an automaton, the combination, with the main driving-shaft, of the actuating-motor provided with cranks 31 and 32, formed thereon, to which are attached the ends of the cords or wires 34, wound oppositely around the periphery of the wheel 7, rigidly attached to the upper end of the shaft 6, to the lower end of which is fastened the swinging forearm and hand provided with the vertically-movable thumb, substantially as and for the purposes set forth.

13. In an automaton of the character described, an actuating-motor, 29, the driving-shaft 30 of which is provided with the cranks 31 and 32, formed thereon, to which are attached the cords or wires 34, wound oppositely around the periphery of the wheel 7, attached to the upper end of the shaft 6, to the lower end of which is fastened the swinging forearm provided with an integral hand, 9, having a vertically-movable thumb normally held in a lowered position by means of a spring, 14, and to which is attached the cord or wire 13, leading therefrom to a slide, 23, the movements of which are controlled by means of a swinging arm, 26, and stop 27, substantially as described, and as herein set forth.

14. In an automaton of the character described, the combination, with the driving-shaft 30, provided near its lower end with a bevel gear-wheel, 43, meshing with a similar gear-wheel, 42, rigidly attached to one end of an axle, 40, near the other end of which is a crank, 41, of a pitman, 58, connecting this crank 41 with the ratchet-bar 57, to which is attached the separate ratchet 56, acting in conjunction with the ratchet-wheel 55, to the axle of which is rigidly fastened the feeding-drum 51, substantially as and for the purposes set forth.

15. An automaton representing a human being, and in combination with the same, a card-holder containing cards, a spur feeding-roller above and adapted to intermittently remove the cards from the same, and an actuating-motor within said automaton and adapted to operate said spur feeding-roller, substantially as described.

16. In an automaton of the character described, the combination, with the card-holder hopper 61, and chute 62, located near the same and leading to a card-receiver, from which the cards are removed by the hand 9 on the movable forearm, of a feeding-roller located above them and adapted to transfer the cards singly from said holder to said chute, with an intermittent movement corresponding with the motions of said hand 9, substantially as and for the purposes set forth.

17. The combination, with the card-receiver to which the cards are intermittently fed, of a hand mounted upon a swinging arm adapted and arranged to automatically remove the cards from said receiver, and mechanism for moving said arm, substantially as shown and described.

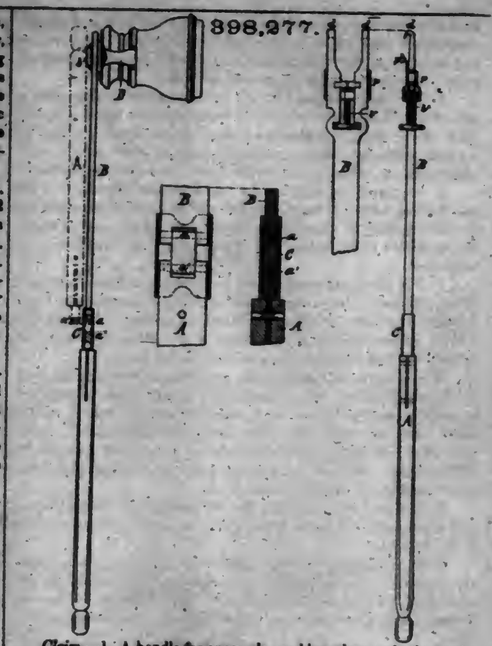
18. In an automaton, the combination, with the card-holder 44 and feed-roller 51, located above the same, of the hopper 61, with chute 62, leading from its lower end to a receiver, 63, provided with a screw-actuated adjustable back, 67, substantially as described, and for the purposes herein set forth.

19. In an automaton, a card-receiver located in the stationary hand, to which cards are intermittently fed as fast as removed by the other and swinging hand attached to an oscillating forearm, the whole being operated by a motor situated in the body of the device and adapted to be automatically stopped and started by electrical means, substantially as and for the purposes set forth.

20. The combination, with a card-holder, 44, a supporting-platform, 47, being mounted in said holder, and to which are attached springs 50, exerting a constant pressure upward, of the movable lining 45, inside of said holder, provided with adjusting-screws 46, substantially as shown and described.

398,277. HANDLE FOR OPERA-GLASSES. GABRIEL PLENEY, Paris, France. Filed Sept. 11, 1888. Serial No. 285,142. (No model.) Patented in France Aug. 3, 1888, No. 192,212.

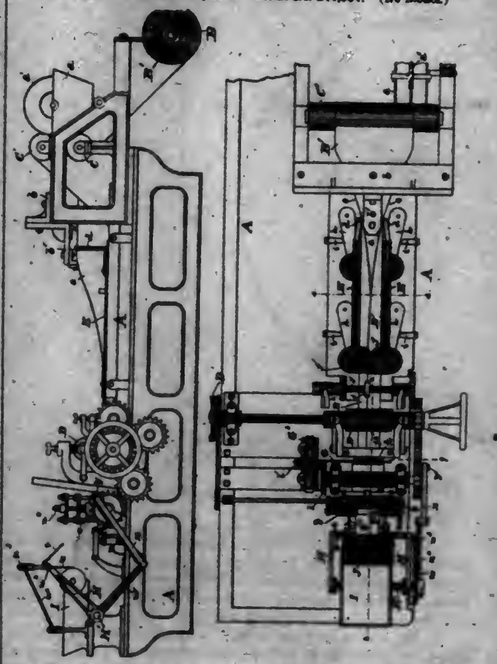
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Claim.—1. A handle for opera-glasses, binoculars, and other articles or instruments, consisting of two parts with a double hinge, *a a'*, connecting the two parts, and a sliding piece to extend over and hold the double hinge when in use, substantially as described.

2. The combination of an opera-glass or like instrument with a handle having a clamp composed of hooks, a movable extension or jaw acting with said hooks to clamp the opera-glass, and a thumb-screw to fasten the clamp, as set forth.

398,278. PAPER-BAG MACHINE. FREDERICK E. PORTER, Baltimore, Md. Filed June 19, 1888. Serial No. 277,537. (No model.)



Claim.—1. The combination of a paper-tube-former plate having tuck-grooves c^2 at each edge, two tucker-plates, E, the front end of

each of which is rounded off and thence to the rear end has a straight longitudinal edge which projects into one of said tuck-grooves, and two links or pivoted arms jointed to the table and to each tucker-plate, whereby the tucker-plates move parallel.

2. In a paper-bag machine, the combination of a cutter-plate, *k*, two rollers, F, the bite or space between which is higher than the plane of the said cutter-plate, an inclined board, *k*, between the cutter-plate and rollers, and a revolving breaker, G, which turns in an inclined plane at right angles with the plane of the said inclined board.

3. In a paper-bag machine, the combination of a breaker-bar and two holding-rollers, F, each provided with a longitudinal raised surface or grip-face, *m*, whereby the paper tube will be gripped during the revolution of the rollers only when the said two raised faces are coincident.

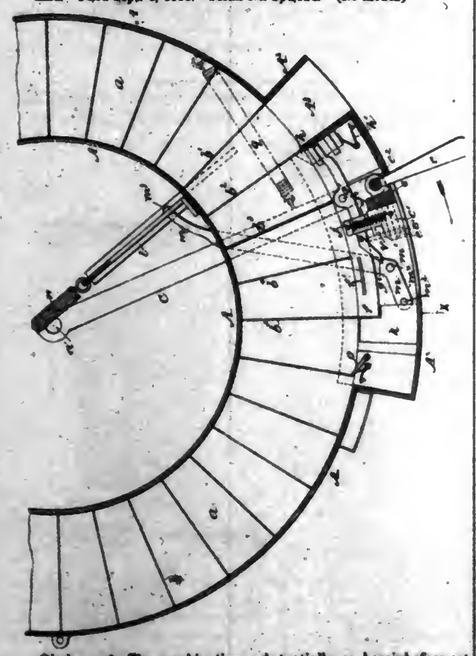
4. In a paper-bag machine, the combination of a breaker-bar, a folder, and paster-plate, and two holding-rollers, F, each provided with a longitudinal raised surface or grip-face, *m*, whereby the paper tube will be gripped during the revolution of the rollers only while the breaker-bar and folder-plate are at work on the paper.

5. In a paper-bag machine, the combination of two holding-rollers, F, each provided with a longitudinal raised surface or grip-face, *m*, a fixed bearing for the lower roller, a movable bearing for the upper roller, two screw-rods, *o*, connected by a bridge-bar, *o'*, a central rod, *n'*, attached to the upper bearing and passed through the said bridge-bar and having a nut, and a spring, p^3, pressing upon the upper bearing, for the purpose set forth.

6. In a paper-bag machine, the combination of a folder-plate, *f*, and a paster-plate, *u*, both carried by the same pivoted arms or yoke, H, as set forth.

7. In a paper-bag machine, the combination of a paste-receptacle, I, roller J, a rock-shaft, H', arms or yoke H, carried on the said rock-shaft, a folder-plate rigidly fixed to the said arms or yoke, and a paster-plate, *u*, on a cross-bar which is pivoted on the same arms or yoke.

398,279. APPARATUS FOR DELIVERING GOODS IN EXCHANGE FOR COIN. EDWARD POWELL, Newtown, County of Montgomery, England. Filed Sept. 3, 1888. Serial No. 284,921. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the casing, the goods-carrier having partitions or dividing plates, the operating-arm, the coin-holder carried thereby, and the locking mechanism operated by a coin in the coin-holder to engage with the goods-carrier and move it forward with the operating-arm.

2. The combination, substantially as hereinbefore set forth, of the casing, the goods-carrier having partitions dividing it into compartments, the operating-arm, the locking-lever carried thereby, the bolts operated by said lever and engaging at times to prevent the forward movement of the goods-carrier and at times to move it forward, and the coin-holder carried by the operating-arm and bringing the coin into engagement with the locking-lever to operate it.

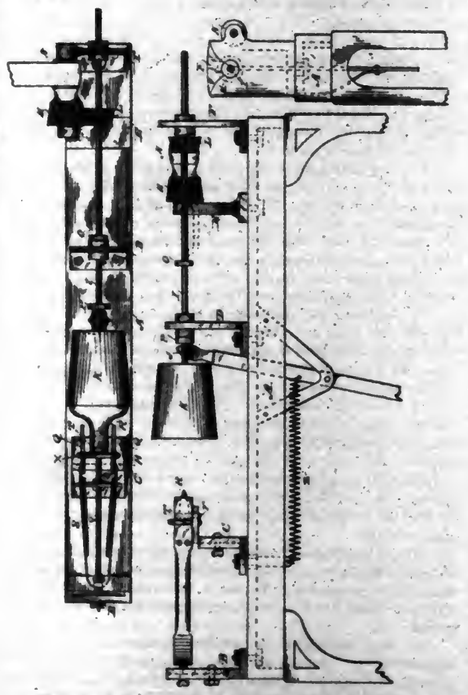
3. The combination, substantially as hereinbefore set forth, of the casing, the goods-carrier contained therein and having the partitions or plates dividing it into a series of compartments, the operating-arm, the locking-lever carried by said arm, the coin-holder secured to the operating-arm, and the guide-plate secured to the casing opposite the coin-holder.

4. The combination, substantially as hereinbefore set forth, of the casing, the goods-carrier contained therein and having partitions or plates dividing it into a series of compartments, the operating-arm, the locking-lever carried by said arm, a coin-holder secured to the operating-arm, the guide-plate secured to the casing opposite the coin-holder, the pawl or dog engaging with the goods-carrier to prevent its backward movement, and the spring for drawing back the operating-arm to its original position.

5. The combination, substantially as hereinbefore set forth, of the casing, the goods-carrier having partitions dividing it into a series of compartments, the pusher, the operating-arm, and connections between the pusher and the operating-arm, whereby the pusher is forced into a compartment for the delivery of goods from the carrier.

6. The combination, substantially as hereinbefore set forth, of the casing, the goods-carrier, the operating-arm, the lever *m*, engaging with the pusher, and the forked arm on the handle *c*, pivoted to the operating-arm and engaging with the lever *m*.

398,280. MACHINE FOR FINISHING BOTTLES. MAURICE M. POWELL, Kerrtown, Pa. Filed Jan. 20, 1888. Serial No. 261,253. (No model.)



Claim.—1. In a machine for finishing open-mouth vessels, the combination of a holder for the vessel, suitable means for revolving the same, a stationary bearing for the end of the vessel, consisting of a disk mounted upon a spindle, and spring forming-plates for finishing the exterior of the neck of the vessel, substantially as described.

2. In combination, a clamp for holding the vessel to be finished, suitable means for revolving the same, a stationary bearing for the opposite end of the vessel, a centering-point on said bearing for directing the vessel to its seat thereon and for finishing the interior of the neck, and spring forming-plates, normally open, adapted to be compressed by hand to be brought into contact with the vessel to finish the same, substantially as described.

3. In a machine for finishing open-mouth vessels, a suitable base-plate, a shaft operated in suitable standards thereon, beveled gears in connection with a power device for rotating said shaft, a clamp for the articles to be acted on, secured to said shaft, a pivoted lever, J, for throwing said shaft out of connection positively, automatic means for engaging said shaft, a bearing-disk for the end of the vessel, and spring forming-plates to act upon the same.

4. In combination with a revolving clamp, a central spindle with its collar and the spring forming-arms, the arms and the spindle being mounted on vertical adjustable standards, all substantially as described.

5. In combination, a longitudinally-movable clamp for holding one end of the vessel to be finished, a bearing for the other end of said vessel situated opposite the clamp, and neck-forming mechanism situated at the bearing opposite the clamp, substantially as described.

398,281. FENCE-MACHINE. ROSS E. REX, Pueblo, Colo. Filed Dec. 3, 1888. Serial No. 292,845. (No model.)

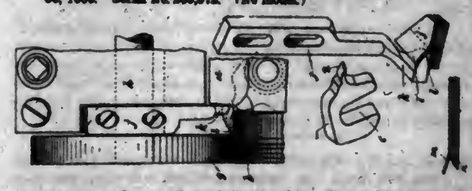


Claim.—1. A twisting-spindle for fence-making machines and analogous purposes, adapted to be revolved by suitable gearing, having an enlarged slotted tubular head, in combination with two plates removably held in said slotted head, one of which has a series of apertures therein opening out from one side thereof, and the other adapted to bear against said apertured side of the aforesaid plate and close the opening of the apertures, substantially as described.

2. A tension device for fence-making machines, comprising two parallel horizontally-arranged grooved rollers extending entirely across the machine-bed, and having adjustable blocks or strips located above and below said rolls and engaging with grooves near the ends thereof, adapted to regulate the tension of said rolls, substantially as described.

3. A winding-roll for fence-making machines, having a double ratchet on one end thereof, in combination with double levers or extended pawls having metallic plates on their front ends bent into shape from a single piece of sheet metal to form an extended guard to engage with the inside of each ratchet, and a downward-bent lip to engage the teeth of said ratchet, substantially as described.

398,282. MACHINE FOR FEATHER-EDGING SOLES FOR BOOTS AND SHOES. AUSTIN B. RUDDOCK and EPHRAIM R. E. BAILEY, Haverhill, Mass., assignors to T. S. Ruddock & Son, same place. Filed Oct. 30, 1888. Serial No. 289,572. (No model.)



Claim.—1. In a feather-edging machine, the combination, with the work feeding and supporting rolls, of the guide formed to enter the channel cut in the edge of the sole and keep the channel-flap elevated and the curved or slanted knife arranged behind said guide and formed to cut from the bottom of the channel to and through the flesh side of the sole, and to remove a part of the outer edge of said flesh-sole, all arranged and operating as described.

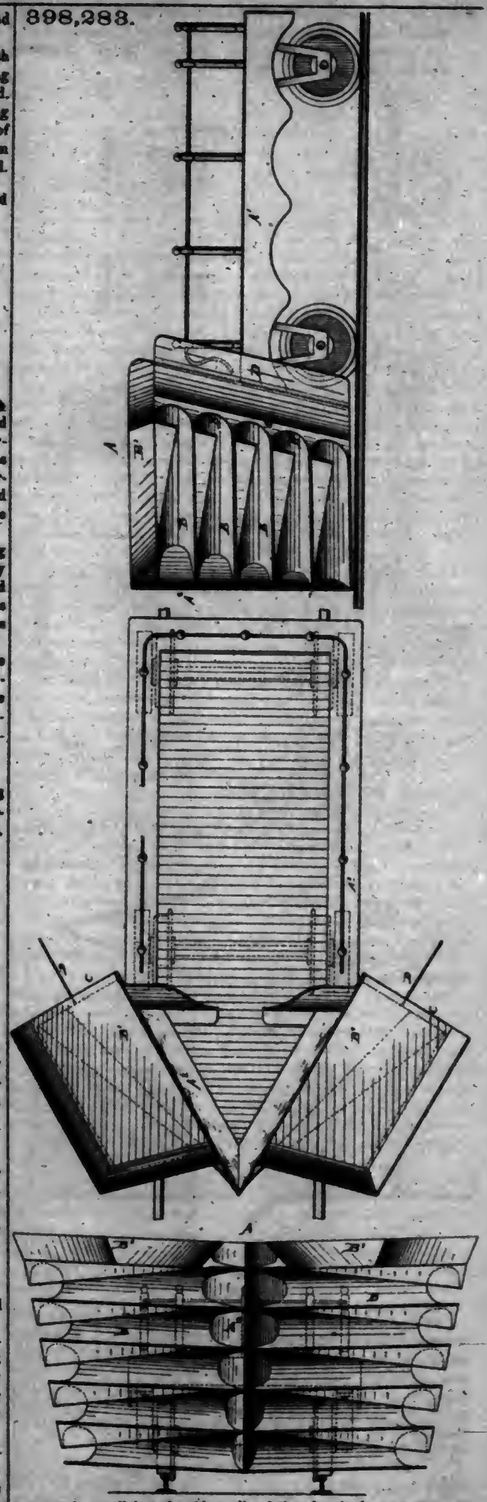
2. In a feather-edging machine having suitable work supporting and feeding devices, the guide having a projection to enter the channel in the sole and elevate the flap thereof, combined with the knife having a curved and beveled cutting-edge, and arranged behind the guide and adapted to enter the work below the flap and feather-edge the sole, substantially as described.

398,283. SNOW-PLOW. JOSEPH REBHANN, Union, N. J. Filed Oct. 10, 1888. Serial No. 287,706. (No model.)

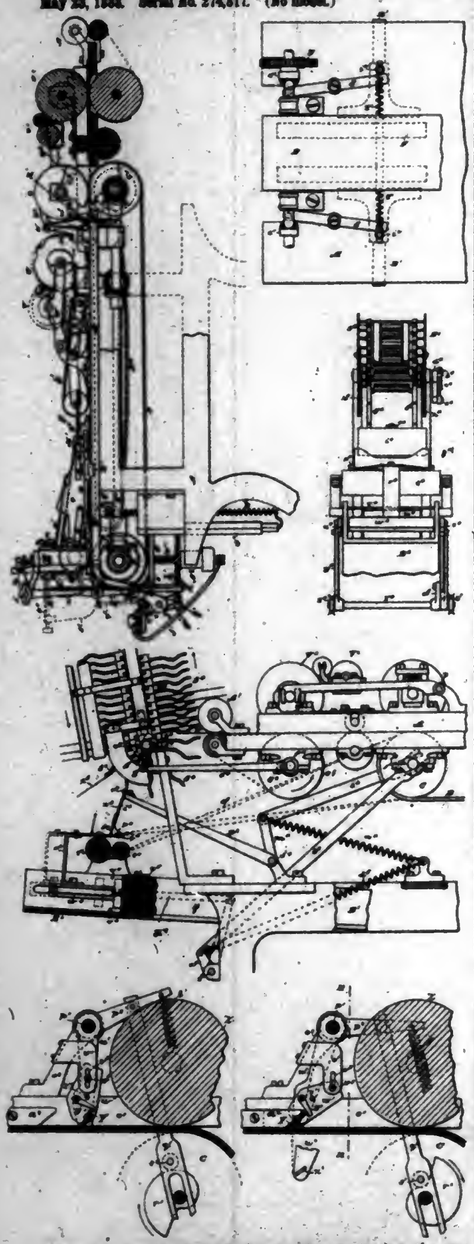
Claim.—1. A snow-plow for railways, consisting of a centrally-tapering cutter having a continuous vertical cutting-edge at its front end, and a number of superposed cutter-blades extending laterally from said cutter at an inclination to the axis of the cutter and being outwardly curved at their upper and rear ends, substantially as set forth.

2. A snow-plow formed of a supporting-frame having a centrally-tapering cutter, and a series of superposed cutter-blades that extend from the cutter laterally at a suitable angle of inclination to the axis of the same, said cutter-blades being bent over or curved at their upper rear ends and provided with guard-plates or wings at their outer ends parallel to the side walls of the plow-body or cutter, substantially as set forth.

398,283.



398,284. MACHINE FOR MAKING ENVELOPES OR SIMILAR RECEPTACLES. GERARD SICKELS, Jr., Brooklyn, N. Y., assignor of one-half to Abel T. Howard, same place. Filed Jan. 29, 1887. Renewed May 23, 1888. Serial No. 274,817. (No model.)



Claim.—1. In a blank or sheet separating mechanism, the combination, with a blank-platform, of two presser-feet, c c', mechanism, substantially as described, for imparting alternate oscillations or vibrations to same, a sucker, i, pivotally attached to presser-foot c' and connected to an air-exhausting mechanism, and said air-exhausting mechanism, substantially as described, the said pivoted sucker being arranged in the path of said presser-foot c, substantially as and for the purposes set forth.

2. In a blank or sheet feeding mechanism, the combination, with means, substantially as described, for lifting and separating the blank or sheet from the pile, of a vibrating frame, K, curved feeders s s, carried by said frame, a curved guide, u, carried by said frame and its free end resting on the carrying-belt, said carrying-belt, and means, substantially as described, for vibrating said frame K and for driving said carrying-belt, substantially as set forth.

3. In a blank or sheet feeding mechanism, the combination of the blank-platform and means, substantially as described, for upholding it, the alternately-oscillating presser-feet and means, substantially as described, for actuating same, the sucker pivotally connected to one of said presser-feet and adapted to be raised by the other presser-foot, the air-exhausting mechanism, substantially as described, connected with said sucker, and the vibrating feeder and its operative mechanism, substantially as set forth.

4. The combination, with the main carrying-belt B and its drums C, of the shaft L, the pulley M, carried thereby, the frame O, connected to the main frame by links, the pulley M', mounted in frame O, the belt N, carried by pulleys M M', and the spring a', arranged to press belt N down upon the carrying-belt B.

5. The combination, with the main carrying-belt, the folding-blades F, and the lateral folders, of the two endless belts k', arranged over the carrying-belt and in line with the folding-blades, and the guides j' j', for leading the lateral folds of the envelope under the said belts k', substantially as set forth.

6. The combination, with the shaft g', provided with pendent arms u', and an arm, g^3, of means for imparting oscillating movements to said shaft, a tumbler, Y, mounted in slotted bearings in said arms u', the fixed brackets v', the plates w', connected to said brackets by studs and slots, as described, and said tumbler journaled in said plates w', and a latch, y', pivotally mounted on the plates w', and arranged to hook over the edge of the tumbler, substantially as set forth.

7. The combination, with the machine-bed, provided with grooves a^2 to receive them, of the endless chains D'', arranged under the carrying-belt, the sprocket-roller E'', over which said chains pass, the main carrying-belt B, and its drums C C, and gearing, whereby said belt and chains are driven in unison, substantially as set forth.

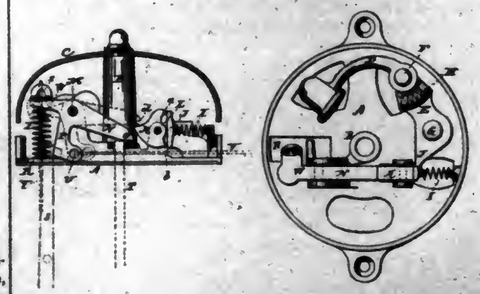
8. The combination of the frame K, provided with a bar, q, the frame K', mounted in frame K on rod p, and provided with concave feeders s s and rollers t, the spring or springs r, connecting frames K and K', the curved guide u, mounted in frame K', and its spring w substantially as set forth.

9. The combination, with the carrier B', of the side plates, A^4, lined with plush or similar soft material and arranged at each side of the carrier at the delivery-point, substantially as and for the purposes set forth.

10. The combination, with the carrier B', of the vibrating folder provided with a folder-blade, i^3, and a gage or pusher, o^4, of a reciprocating deflector arranged to deflect the flap of the envelope across the path of the folder-blade and rollers t^4, arranged substantially as set forth.

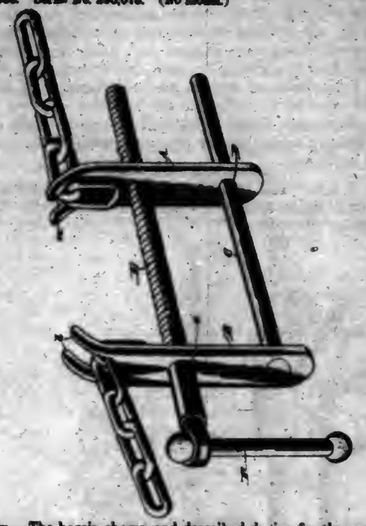
11. The combination, with the intermittently-moving carrier B', of the vibrating hoe-like folder, the reciprocating deflector, comprising the bar p^4 and plate o^4, the rotating rollers t^4, arranged under said deflector and the folder-blade, the box or receptacle E', arranged below said rollers, and the reciprocating ram n^4, arranged in said box, substantially as and for the purposes set forth.

398,285. GONG-BELL. WILLIAM E. SPARKS and HENRY J. LABOLT, New Haven, Conn., assignors to Sargent & Company, same place. Filed Dec. 24, 1888. Serial No. 294,595. (No model.)



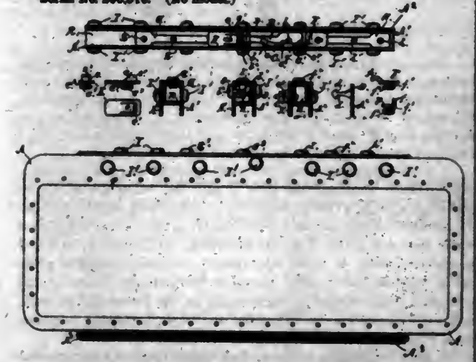
Claim.—The combination of a base, a bell supported thereon, open side toward the base, an operating-lever hung upon the base and so as to swing in a plane at right angles thereto, the said operating-lever consisting of three arms, N P W, each of said arms being adapted to be engaged with mechanism for imparting the swinging movement to said lever, and a hammer mechanism between the hammer and said operating-lever, substantially as described, and whereby the swinging movement of the lever will impart a corresponding swinging movement to the hammer.

398,286. LOAD-BINDER. JOHN S. STARR, Dubois, Pa. Filed Nov. 6, 1888. Serial No. 290,073. (No model.)



Claim.—The herein shown and described device for the purpose specified, composed of the jaws A and B, having their ends slotted and curved inward or toward one another, the guide-bar projecting from the side of one jaw and working in an opening in the other jaw, and the screw passing loosely through one jaw and screwing in an opening in the other jaw, substantially as described, and for the purpose set forth.

398,287. LOCKING-CLASP FOR TRAVELING-BAGS, POCKET-BOOKS, &c. CHARLES A. STARK, Buffalo, N. Y. Filed Nov. 12, 1888. Serial No. 290,516. (No model.)



Claim.—1. In a locking-clasp, the recess R in the upper edge of the portion A', having in its faces or walls the slots a, a', a^3, and a^3, and the holes for the passage of the push-pins g' and k', and on its outer faces or walls the system of rosettes or bosses I and I', similar in size and form to the push-buttons b^3, c^3, c^3, and f^3, and its interior adapted to contain the following elements: the mainspring B, riveted to the top at b, adapted to engage and hold the catch-lug D, and operated by the pin b' through the slot a by means of the push-button b^3, the lever C, having the arms c and c' and the spring c^3, pivoted to the side at c^3, the arm c adapted to engage and hold the catch-lug D, the arm c' adapted by means of the spring c^3 to engage constantly the cam C', attached to the pin c^3, and through the second slot, a, operated by the push-button c^3, the central slide-bolt, E, adapted to lock the mainspring B to the catch-lug D, and operated by the pin c^2 through the slot a^2 by means of the push-button c^2, the slide-bolt F, having the side projection, f, adapted to engage the arm c', and the spring c^3, locking the arm c of the lever C to the catch-lug D, and operated by the pin f' through the slot a^3 by means of the push-button f^3, the locking-spring G, riveted to the top at g, adapted to lock the central slide-bolt, E, and operated by the push-pin g' from the outside, where it forms the center of a rosette, and the locking-spring H, riveted to the top at h, adapted to lock the slide-bolt F, and operated by the push-pin h' from the outside, where it forms the center of a rosette, with the right-hand portion, A^3, provided with the catch-lug D, having the notches d and d', adapted to engage, respectively, through the slot a', the mainspring B, and the arm c of the lever C, holding the portions A' and A^3 firmly together or closed, substantially as set forth, and for the purpose described.

3. The combination, in a locking-clasp, of the portions A' and A^3, as described, with the mainspring B, riveted to the top of the recess R at b, operated by the pin b' through the slot a by means of the push-button b^3, and adapted to engage the notch d in the upper edge of the catch-lug D, holding the portions A' and A^3 firmly closed, substantially as set forth.

4. The combination, in a locking-clasp, of the mainspring B in the recess R, attached to the portion A' at b, and operated by the pin b' through the slot a by means of the push-button b^3, with the catch-lug D, having notches d and d' and attached to the portion A^3, and the notch d, adapted to engage the mainspring B, holding the portions A' and A^3, firmly closed, substantially as described.

5. The combination, in a locking-clasp, of the lever C, having the arms c and c' and the spring c^3, pivoted against a side of the recess R, as at c^3, the arm c adapted to engage the notch d' in the catch-lug D, the spring c^3 resting on the rear end of the mainspring B, adapted to keep the arm c constantly in the notch d', and the arm c' adapted to engage, and by means of the spring c^3 be kept constantly against, the cam C', with the catch-lug D, having the notches d and d', the notch d', adapted to engage and hold the arm c of the lever C, keeping the portions A' and A^3 firmly closed, substantially as set forth, and for the purpose specified.

6. The combination, in a locking-clasp, of the mainspring B and the catch-lug D, both as above described, with the lever C, having the arms c and c' and the spring c^3, and pivoted to a side in the recess R, as at c^3, the arm c adapted to engage the notch d' in the catch-lug D, the spring c^3 resting on the rear end of the spring B, adapted to keep the arm c constantly in the notch d', and the arm c' adapted to engage, and by means of the spring c^3 being kept constantly against, the cam C', together with the mainspring B, engaging the notch d, furnishing means for doubly securing or holding the portions A' and A^3 firmly closed, all substantially as specified, and for the purpose set forth.

7. The combination, in a locking-clasp, of the lever C, having the arms c and c' and the spring c^3, pivoted against a side of the recess R, as at c^3, said spring c^3 resting on the rear end of the spring B, adapted to keep the arm c' constantly against the cam C', with the cam C', attached to the pin c^3, furnished with the button c^3, adapted to be used either as a push or turn button to detach the arm c of the lever C either permanently or temporarily from the notch d' of the catch-lug D, substantially as set forth, and for the purpose described.

8. The combination, in a locking-clasp, of the mainspring B, riveted to the top of the recess R at b, furnished with mechanism to operate the same, and adapted to engage the notch d in the catch-lug D, and holding it with the slide-bolt E, having the projection e, furnished with the notch d', adapted to engage the forward end of the mainspring B, preventing it from being depressed or detached from the notch d in the catch D, and operated by the pin c^2 through the slot a^2 by the push-button c^2, substantially as set forth, and for the purpose specified.

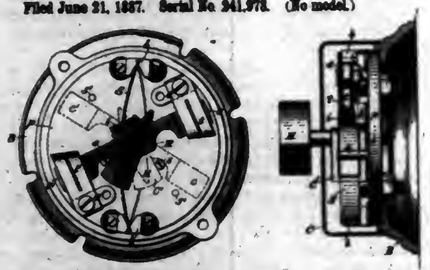
9. The combination, in a locking-clasp, of the mainspring B, riveted to the top of the recess R at b, furnished with mechanism to operate it, and adapted to engage the notch d in the catch-lug D,

holding the same, the slide-bolt E, having the projection *e*, and in it the notch *e'*, adapted to engage the forward end of the spring B, preventing it from being depressed and supplied with mechanism to operate it, with the locking-spring G, riveted to the top of the recess R at *g*, its forward end adapted to engage the rear end of the slide-bolt E, and when behind it locking the same, and furnished with the push-pin *g'*, passing through the top of the recess R, its extremity rounded and adapted to form a nipple or center to a rosette, all substantially as described, and for the purpose set forth.

10. The combination, in a locking-clasp, of the lever C, having the arms *c* and *c'* and the spring *c³*, pivoted against a side of the recess R, as at *c²*, and furnished with mechanism to operate the same, with the slide-bolt F, having the downward and forward side projection, *f*, adapted to form a wedge between the arm *c'* and the spring *c³*, adapted to keep the arm *c* in engagement with the notch *d'* of the catch-lug D, and operated by the attached pin *f'* through the slot *e³*, and joined to the push-button *f³*, substantially as and for the purpose set forth.

11. The combination, in a locking-clasp, of the lever C, having the arms *c* and *c'* and the spring *c³*, and pivoted against a side of the recess R, as at *c²*, furnished with mechanism to operate it, and the slide-bolt F, having the downward and forward side projection, *f*, forming a wedge between the arm *c'* and the spring *c³* of the lever C, and adapted to keep the arm *c* of the lever C in engagement with the notch *d'* of the catch-lug D, and furnished with mechanism to operate the same, with the locking-spring H, riveted to the top of the recess R at *h*, its forward end adapted to engage the rear end of the slide-bolt F, and when behind it locking the same, and furnished with the push-pin *h'*, passing through the top of the recess R, its extremity rounded and adapted to form a nipple or center to a rosette, all substantially as set forth, and for the purpose specified.

398,288. SWITCH FOR ELECTRIC CIRCUITS. CLARENCE C. STERLING, Hartford, Conn., assignor to Charles E. Dustin, same place. Filed June 21, 1887. Serial No. 241,973. (No model.)



Claim.—1. A switch for an electric circuit, embodying a spring plate secured at each end, a double crank embracing and directly acting upon said spring, and circuit-completing means operated by said spring for controlling electric terminals.

2. A switch for an electric circuit, consisting of a spring secured at each end and mounted upon an insulating-base, a double crank swiveled in said base and embracing said spring and acting directly upon it, circuit-completing means operated by the latter, and circuit-terminals arranged in co-operative position thereto and controlled by the aforesaid circuit-completing means.

3. A switch for electric circuits, embodying, essentially, an elastic spring secured at each end, circuit-controlling devices operated by said elastic spring, and a handle embracing and directly manipulating the latter to govern the electrical connections.

4. A switch for electric circuits, consisting of an elastic spring secured at each end, a handle embracing said spring, a circuit-completing arm actuated solely by the movements of said spring, and circuit terminals arranged in the path of said circuit-completing arm.

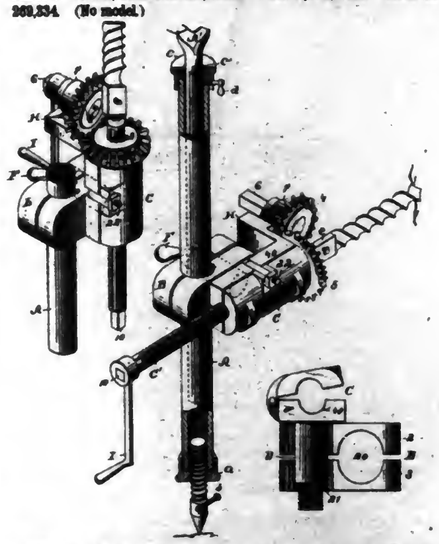
5. A switch for an electric circuit, consisting of an elastic spring secured at each end, a double crank swiveled in an insulating-base embracing and directly governing said spring, an arm carrying circuit-completing devices journaled on the pivot of said crank, directly actuated by the aforesaid spring, and circuit-terminals arranged in co-operative position to said circuit-completing devices upon the arm for controlling the circuit-terminals when the spring is manipulated.

6. A switch for an electric circuit, consisting of an elastic spring secured at each end, a handle embracing said spring, an insulating-arm carrying circuit-completing devices at the ends actuated solely by the movements of said spring, and two sets of circuit-terminals arranged in the path of said arm.

7. A switch consisting of an elastic spring secured at each end and mounted upon an insulating-plate upon a base, a double crank swiveled upon said plate and embracing said spring for directly operating the same, with a handle upon its outer end for manipulation, circuit-completing means controlled by said spring, electric terminals for co-operation with said circuit-completing means, and a casing for housing the apparatus.

8. A switch for electric circuits, consisting of an elastic spring secured at each end and mounted upon an insulating-plate upon a base, a double crank swiveled upon said plate and embracing said spring for directly operating the same, with a handle upon its outer end for manipulation, an arm carrying circuit-completing means at each end operated by said spring and journaled about the pivot of the aforesaid crank, electric terminals for co-operation with said circuit-completing means upon the arm, and a casing for the apparatus carried by the base.

398,289. COAL-DRILLING MACHINE. CHARLES O. SUMNER and JAMES J. PULLEN, Scammonville, Kans. Filed Apr. 2, 1888. Serial No. 269,534. (No model.)

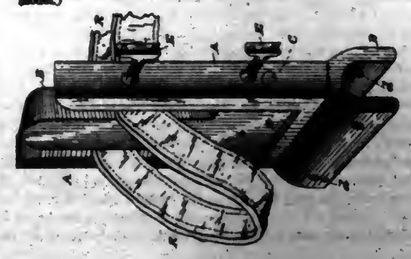


Claim.—1. In a drilling-machine, the internally-threaded feed-box attached to the externally-threaded wrist-bolt D, in combination with separated jaws 2 and 3, which are provided with passages 20 and 21, said passage 21 being located at right angles to the first-named passage, hand-nut F, which is located on said threaded wrist-bolt, and a suitable standard, substantially as specified.

2. In a drilling-machine, the combination of the two-part internally-threaded feed-box, one part of said box being provided with lateral extension H, which is formed integral therewith, shaft 6, mounted in a suitable bearing carried by said extension, bevel-wheel 4, mounted on the inner end of this shaft, the drill-stock, bevel-wheel 5, feathered on said drill-stock to mesh with wheel 4, externally-threaded wrist-bolt D, separate jaws 2 and 3, provided with passages 20 and 21, the passage 21 being located at right angles to the first-named passage, hand-nut F, located on said threaded wrist-bolt, a suitable standard, and a hand-crank, substantially as specified.

3. In a coal-drilling machine, the tubular standard A, constructed of piping and screw-threaded at opposite ends, in combination with perforated caps *a* and *c*, which are internally threaded and located on the threaded ends of said standard, extension-rod A', located in perforation *c'* in cap *c* and provided with a fish-tail at its outer end, set-screw *d*, which is threaded through said standard and engages said bar, and jack-screw *b*, located in the perforation of cap *a*, substantially as specified.

398,290. REIN-HOLDER FOR WAGONS. PETER S. TRAMBLE, Delaware Water Gap, Pa. Filed Jan. 23, 1888. Serial No. 261,811. (No model.)

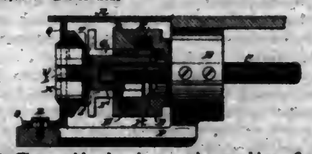


Claim.—1. In a holder for reins, the combination, with the longitudinal prongs A A, having the transverse flat connection *a*, substantially at right angles thereto, of a tongue or wedge, B, pivoted between the prongs, with its lower end slightly above the connection *a*, the end and sides of the wedge being substantially parallel to the adjacent connection and sides of the prongs, whereby the reins are gripped when inserted and the wedge is kept accessible for use, as set forth.

2. In a rein-holder, the combination, with the two jaws A, having a square connection, *a*, at bottom, of a tongue or wedge, B, having a head, *b*, with a square bottom, pivoted between the jaws, and slightly above and parallel to the connection *a*, by means of a pin passed through said jaws and wedge, whereby the wedge is free to move backward and forward until the square edges of the end contact with the connection between the jaws on each side to limit the forward and rearward movement, as explained.

3. The combination, with the parallel straight-sided prongs A, of the tongue or wedge B, having offsets, and a rivet passed through the prongs and end having offsets, whereby a space is left on each side for the reins, substantially as and for the purposes set forth.

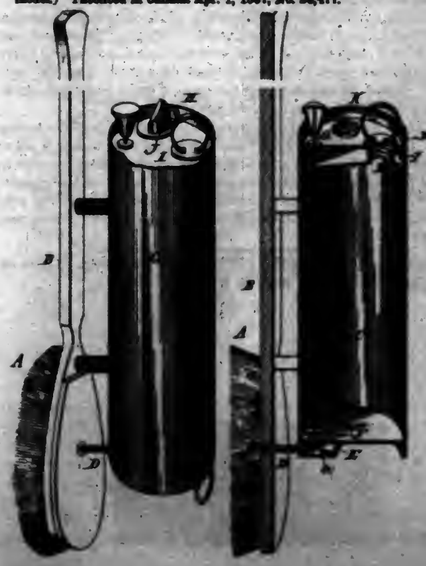
398,291. SHUTTLE-OPERATING MECHANISM FOR SEWING-MACHINES. JAMES TRIPP, New York, N. Y. Filed May 31, 1888. Serial No. 275,642. (No model.)



Claim.—1. The combination, in a sewing-machine, of a shuttle-shaft, two plungers mounted upon the same and each provided with two or more pins to engage and carry the shuttle, with a shuttle provided with holes to receive the plunger-pins, a face-plate to hold the shuttle against the thrust of its carrying-pins, and a cam for alternately reciprocating the plungers to and from engagement with shuttle to permit the loop to pass, the plungers and the cam being arranged so that one of the plungers will at all times be advanced with its pins engaging and carrying the shuttle.

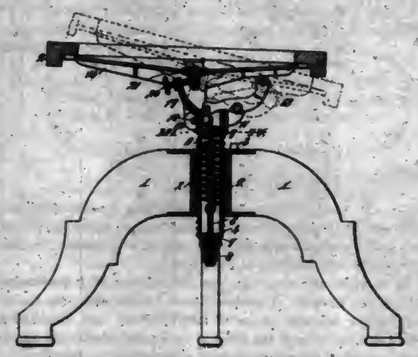
2. In a sewing-machine, the combination, with the shuttle-shaft carrying plungers which are each provided with two or more shuttle-supporting pins, a shuttle provided with holes to receive the plunger-pins, a shuttle face-plate, a cam constructed and arranged to alternately hold one of the plungers in engagement with the shuttle while the other plunger is being withdrawn from the shuttle to let the loop pass its pins and again inserted therein, and a cushion arranged between the shuttle and the plungers.

398,292. ATTACHMENT FOR FLESH OR BATH BRUSHES. WILLIAM J. TURRINGTON, Aurora, Ontario, Canada, assignor to William Stevenson, same place. Filed June 20, 1887. Serial No. 241,881. (No model.) Patented in Canada Apr. 1, 1887, No. 26,477.



Claim.—The convertible brush and sprinkler described, consisting of the brush, the water-reservoir connected therewith and provided at one end with openings L and cap K, the plug I, and rose J, all arranged and operating substantially as described.

398,293. OFFICE-CHAIR. CHARLES H. TYLER, St. Louis, Mo. Filed May 3, 1887. Serial No. 236,979. (No model.)



Claim.—1. In a chair, the combination of a base, a hollow screw-stem supported thereon, a spider or support pivoted to said stem, a seat carried by said spider or support, a spring within the said hollow stem, and a lever pivoted to said stem, having one end bearing on the spider or support and its other end connected to said spring, substantially as set forth.

2. The combination of a chair-base, a hollow screw-stem supported thereon, a spider or support pivoted to said stem, a seat carried by said spider or support, an extensible spring within said hollow stem, having its lower end fixed to the stem, and a lever having one end connected to the spring and operated by the movement of the chair-seat, substantially as described.

3. The combination of a chair-base, a hollow screw-stem supported thereon, a spider or support pivoted to said stem, a seat carried by said spider or support, a lever pivoted to said stem and having at one end an anti-friction roller bearing against said spider or support, and an adjustable and extensible spring within the hollow stem connected to the other end of said lever and adapted to operate substantially as set forth.

4. The combination of a chair-base, a hollow screw-stem supported thereon, a spider or support pivoted to said stem, a seat carried by said spider or support, a spring within the hollow screw-stem, a lever having one end connected to the spring and operated by the movement of the chair-seat, a screw-rod secured to the lower end of said spring and projecting below the screw-stem, and a nut for adjusting said rod, and consequently the tension of the spring, substantially as set forth.

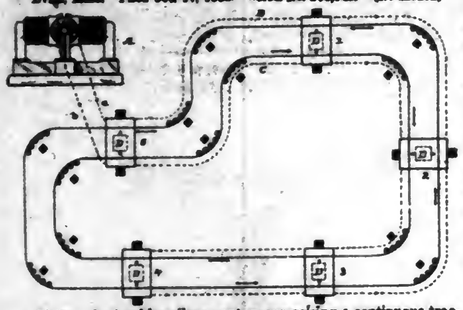
5. The combination of the chair-base, a screw-stem mounted thereon, an extensible spring connected to said stem, a seat, a spider supporting the seat and pivoted to the stem, a set-screw mounted on the stem and stopping the spider in one direction, and a lever pivoted to the stem, bearing under the spider at one end and connected to the spring at the other, and adapted to come in contact with the spider and stop it in the other direction, substantially as set forth.

6. The combination of the chair-base, a screw-stem mounted thereon, an extensible spring connected to said stem, a seat, a spider supporting the seat and pivoted to the stem, a set-screw mounted on the stem and stopping the spider in one direction, a lever pivoted to the stem, bearing under the spider at one end and connected to the spring at the other, and a strap on the spider, wherewith the spring end of the lever comes in contact to deaden the blow in the other direction of movement of the spider, substantially as set forth.

7. The combination of base 1, screw-stem 4, having arm 19, set-screw 20 in said arm, spider 14, pivoted to stem 4 and adapted to be stopped by set-screw 20, extensible spring 5, connected to stem 4, lever 12, pivoted to stem 4, connected to said spring at one end and supporting the spider at its other, and strap 21 on the spider, with which the spring end of said lever is adapted to contact, substantially as set forth.

8. The combination of base 1, screw-stem 4, set-screw 20 thereon, spider 14, pivoted to stem 4, adapted to be stopped by set-screw 20, and having notches 22, extensible spring 5, connected to stem 4, lever 12, pivoted to stem 4, connected to said spring at one end and supporting the spider at its other, and strap 21 in notches 22 on the spider, with which the spring end of the lever is adapted to contact, substantially as set forth.

398,294. CABLE-RAILWAY SYSTEM. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Oct. 17, 1888. Serial No. 288,343. (No model.)



Claim.—1. A cable-railway system comprising a continuous traction-cable and a plurality of power-stations located along the line of the cable, and a motive-power device at each of said stations for propelling the cable, substantially as described.

2. In a cable-railway system, the combination of a continuous traction-cable, a plurality of power-stations located along the line of the cable, and a separate source of motive power, and mechanism connecting said power with the cable at each power-station for simultaneously imparting movement thereto, substantially as described.

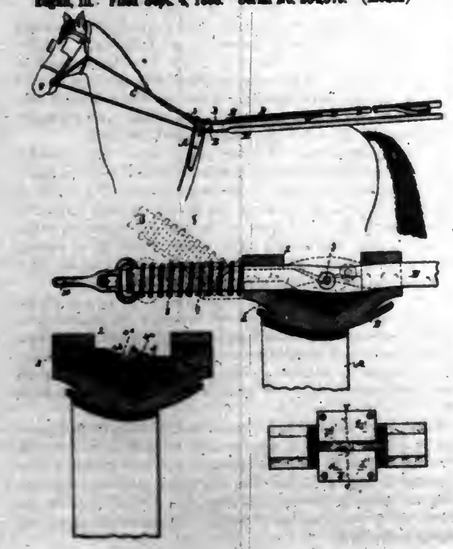
3. In an electric cable-railway system, the combination of a traction-cable, two or more separate sets of winding-drums engaging said cable at different points along its line, a source of electricity, and electro-dynamic motors in circuit with said source of electricity and connected to the winding-drums for supplying motive power to said drums to move the cable, substantially as described.

4. An electric cable-railway system, comprising a traction-cable, two or more power-stations located at suitable intervals along the line of said cable, winding-drums engaging the cable, and means for simultaneously operating said winding-drums located at each of said stations, substantially as described.

5. In an electric cable-railway system, the combination of a traction-cable, power-stations located at suitable intervals along the line of the cable, a conduit for the cable formed with openings along its bottom where it passes the power-stations, and winding-drums having grooved peripheries located below each downward opening in the conduit, substantially as described.

6. In an electric-railway system, the combination, with a traction-cable, of power-stations located at suitable intervals along the line of said cable, a conduit for the cable, said conduit being formed with an opening or slot along its bottom portion where it crosses each power-station, winding-drums G H, and guiding-sheaves *g f*, and a suitable motor, as D, mechanically connected to the winding-drums, substantially as described.

398,295. HARNESS ATTACHMENT. FRANCIS WAYLAND, Waukegan, Ill. Filed Sept. 4, 1888. Serial No. 284,579. (Model.)



Claim.—1. In a check-controlling device, the combination of a strap, D, for controlling the check, a fixed plate, B, having a socket which embraces the strap to guide it, a notched cam on the plate, and a projection on the strap which engages the cam and is deflected in opposition to the elasticity of the strap and opposes the forward movement of the strap by engaging behind the notch in the cam when drawn past it, substantially in the manner explained.

2. In a check-controlling device, the combination of a strap, D, for controlling the check, a fixed plate, B, having a socket, 1, the ends of which embrace the strap and prevent its movement transversely, a cavity, 3, where a portion of the strap has play transversely in at least one direction, and a cam located in the cavity of the socket, a projection or pin on the strap engaging the cam, whereby the projection and strap are deflected by the cam and the pin opposes forward movement by springing up and engaging behind a notch, 4^a, in the cam when drawn past it, and a spring for projecting the strap forward, substantially in the manner herein set forth.

3. In a check-controlling device, the combination of the strap D, connected to the check, a fixed plate, B, having a socket in which the strap engages, and a spring, 8, operating at one end on the strap, and having a fixed bearing for its other end, whereby it tends to project the strap forward, for the purposes explained.

4. In a check-controlling device, the combination, with the saddle, of a socket on the saddle, a strap working in the socket and having a rivet or pin and a projecting spring, and a cam, 4, having a notch, said cam being located beneath the middle line of the socket, whereby the strap is deflected and its pin forced into engagement with the notch, as explained.

5. In a check-controlling device, the combination, with the saddle, of socket-plate B, having socket 1, side channels, 2, cams 4, strap D, and a projecting spring, 8, said cams being located in line with the strap and guides, and having beveled faces at an angle to the strap and guides, and the strap having projection 7 engaging the cams, whereby the strap is depressed and then raised, for engaging and releasing, as explained.

6. In a check-controlling device, the combination of the strap D, connected to the check C, and having a projection, 7, a fixed plate, B, having a socket in which the projection 7 engages by a rearwardly-opening notch, and a spiral spring, 8, carried by the strap and confined between the plate and check, whereby it tends to project the strap, and thereby keeps the strap in engagement in the socket, in the manner explained.

7. In a check-controlling device, the combination of the strap D for controlling the check, the plate B, having socket 1, cavity 3, and plates 6, carrying cams located in said cavity, a pin, 7, passing transversely through the strap and engaged by the cams, and a projecting spring, substantially as herein set forth.

8. In a check-controlling device, the combination of the strap D, attached to the check, a fixed plate, B, having a socket in which the strap engages, and a beveled end, 9, and a spring, 8, carried and confined at one end on the strap and seating at the other on the inclined end 9, said socket and strap having corresponding engaging notch and pin, whereby it gives an upward set to the check and affords an elastic tension on the animal's mouth, in the manner explained.

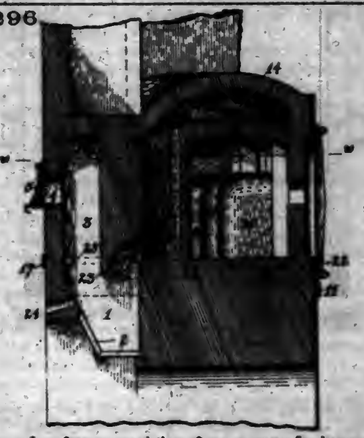
9. The combination, with the saddle, of the plate B, having socket 1, side channels, 2, hollow 3, and plate 6, carrying cam 4 over said hollow, said cam lying out of line with the socket, and having bevel-faces 4^b 4^c and notch 4^d, a strap, D, controlling check C, and having a pin, 7, guided by and engaging the cams 4, and a projecting spring, 8, all arranged substantially as set forth.

10. In a check-controlling device, the combination of the socket-plate, a check-controlling strap working in the socket-plate, a pin or projection on the strap, a two-sided cam in the socket adapted to guide the projection on one side when drawn in and on the opposite side when let out, said cam having an engaging-notch on one side, and a projecting spring, arranged in the manner and for the purpose explained.

398,296. GLASS-POT FURNACE. ADOLF WEYER, Atlanta, Ga. Filed May 30, 1887. Serial No. 239,906. (No model.)



398,296



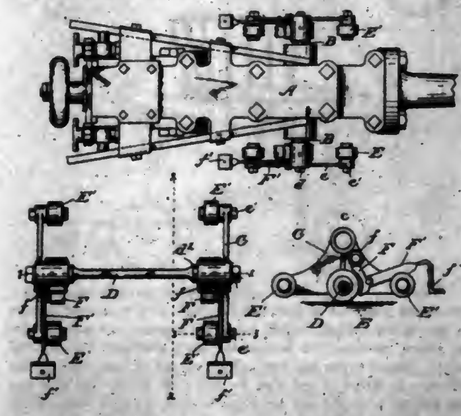
Claim.—In a furnace consisting of one or more fire-boxes and a reverberatory chamber, the combination of air-flues in the wall of the side opposite the fire-box, registers at the outer end of these flues, the heating-chamber over the arched roof of said furnace, the columns which extend from said chamber to the bench near the ducts from the fire-boxes, these columns containing hot-air ducts which open into the reverberatory chamber just above the bench, and the bench, substantially as shown and described, for the purpose specified.

398,297. IRONING-BOARD AND STEP-LADDER. JOHN H. WHELER, Broadway, Va. Filed July 21, 1888. Serial No. 280,623. (No model.)



Claim.—The combination of the legs or supports A, the cross-pieces B, which project at their ends beyond the sides of the legs, the side bars, between which the legs or support are pivoted, the ironing-board pivoted at one end between one of the pair of legs, the hooks I, the brace-rod fastened to the board at one end and hooked at the other, and the eyes in which the hook catches, substantially as shown.

398,298. MINING-MACHINE. ERWIN W. WHITCOMB, Chicago, Ill., assignor to George D. Whitcomb, same place. Filed Aug. 10, 1888. Serial No. 282,471. (No model.)

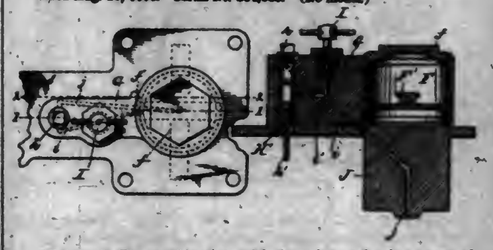


Claim.—1. The combination, with the mining-machine A and its central axle, B, of the brackets C, mounted loosely on said axle, and each provided with a central main supporting-roller, E, and with an auxiliary roller, E', at each end, said main roller projecting farther downward than the auxiliary rollers, substantially as and for the purposes specified.

2. The combination, with the mining-machine A and its central axle, B, of the brackets C, mounted loosely on said axle, the transverse rod D, connecting said brackets, the main supporting-rollers E, mounted on said rod, and the auxiliary supporting-rollers E', mounted at the ends of each bracket, said supporting-rollers having their axes of revolution in the same plane, and the auxiliary rollers being of smaller diameter than the main supporting-rollers, substantially as and for the purposes specified.

3. The combination, with the mining-machine and its supporting brackets and rollers, of the brakes F, pivoted on the brackets, springs *f* for holding said brakes normally away from the rollers, and operating-rods F', provided with treadles or foot-rests *f'*, substantially as and for the purposes specified.

398,299. LUBRICATOR FOR MINING-MACHINES. ERWIN W. WHITCOMB, Chicago, Ill., assignor to George D. Whitcomb, same place. Filed Aug. 28, 1888. Serial No. 284,060. (No model.)



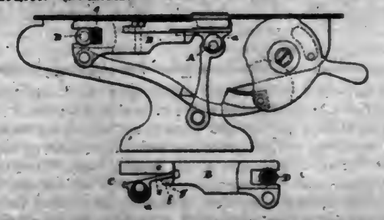
Claim.—1. The combination, with the valve and valve-motor of a pneumatic mining-machine, of a lubricator provided with an oil-chamber having a piston located therein, and with an air duct or passage to supply compressed air to operate said piston, and an oil duct or passage through which the oil is discharged, substantially as and for the purposes specified.

2. The combination, with the valve and valve-motor of a mining-machine, of a lubricator provided with an oil-chamber having a piston arranged therein, an air-duct leading from the valve-chest to said chamber on one side of the piston, a pump actuated by the valve-motor, an oil-duct leading from the oil-chamber to said pump, and a second oil-duct leading from the pump to the point of connection between the valve and valve-motor, substantially as and for the purposes specified.

3. The combination, with the valve and valve-motor, of the lubricator provided with an oil-chamber having a piston arranged therein, a duct to admit compressed air to one side of said piston, a pump actuated by the valve-motor, an oil-duct leading from the oil-chamber to said pump, a valve arranged in said oil-duct to control the passage of the oil, and a second oil-duct leading from the pump to the point of discharge, substantially as and for the purposes specified.

4. The combination, with the valve and valve-motor, the latter provided with the vertically-reciprocating gate D^2, of the lubricator provided with a pump-chamber, H, a piston, H', arranged in said chamber and having its rod or stem *h'* resting on the gate D^2, an oil-chamber, F, having piston F', an air-passage, *f'*, for admitting air above said piston, and suitable ducts or passages leading from the oil-chamber below the piston therein to the pump-chamber and from the pump-chamber to the point of discharge, substantially as and for the purposes specified.

398,300. FEED MECHANISM FOR SEWING-MACHINES. CHARLES H. WILSON, New York, N. Y., assignor to the Wilson & Gibbs Sewing Machine Company, same place. Filed Nov. 20, 1888. Serial No. 291,330. (No model.)

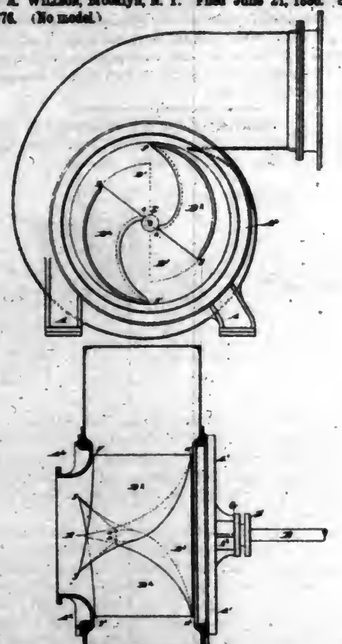


Claim.—1. The combination, with the feed-bar and feed-eccentric, of a shoe surrounding said eccentric and communicating motion therefrom to said feed-bar, said shoe having a tail-piece or extension resting upon a projection of said feed-bar, upon which it can rock sufficiently to permit the descent of said eccentric and shoe, leaving said feed-bar in the highest position, substantially as described.

2. The combination of the feed-bar, the feed-eccentric, and the shoe interposed between the two and having a tail-piece projecting into a recess or slot in said feed-bar, said recess or slot having a con-

tracted portion about the width of said tail-piece, and having divergent walls on each side of said contracted portion, substantially as and for the purpose set forth.

398,301. COMBINED CENTRIFUGAL AND SCREW PUMP. ALBERT A. WILLSON, Brooklyn, N. Y. Filed June 21, 1886. Serial No. 205,776. (No model.)



Claim.—1. In a centrifugal and screw-pump, in combination with a suitable casing, the series of blades D^2, curved backward, as shown, and also screw-formed throughout, with the delivering-edge parallel to the axis and with the entering-edge at right angles to the axis, changing the form uniformly from the receiving-edge to the delivering-edge, as herein specified.

2. The casing A, with its bearing A^3 extended forward, in combination with a hollow conoidal wheel, D', having the series of blades D^2, curved backward, as shown, and also screw-formed throughout, with the delivering-edge parallel to the axis and with the entering-edge at right angles to the axis, changing the form uniformly from the receiving-edge to the delivering-edge, as herein specified.

398,302. SAW. WILLIAM T. WILSON, Marshfield, Oreg. Filed Aug. 23, 1888. Serial No. 283,536. (No model.)



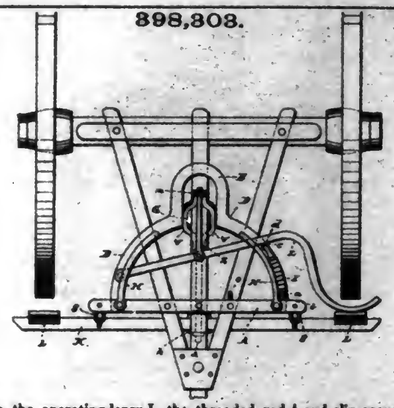
Claim.—In a saw, a central double tooth, A, having opposite cutting-edges *a*, in combination with a series of double teeth, A', having cutting-edges *a'* and rounded edges *b'*, and intervening clearing teeth B, occupying one part of the saw, and another series of double teeth, A^2, having cutting-edges a^2 and rounded edges b^2, and intervening clearing-teeth B', occupying another part of the saw, the teeth of the two series being constructed, respectively, to cut from the center in opposite directions, substantially as set forth and described.

398,303. WAGON-BRAKE. FREDERICK A. YOUNG, Aurora, Ind. Filed July 2, 1888. Serial No. 278,068. (No model.)

Claim.—1. A brake-lever attachment consisting of the transverse bar A and the loop-plate B, a pivoted link-lever spanning the coupling-pole, the rod *k*, the brake-bar, the main lever L, and the connection *z* from the main lever to the link-lever, substantially as specified.

2. The combination, with the rear bounds and the coupling-pole, of the plate B, carrying a pivoted link-lever spanning said coupling-

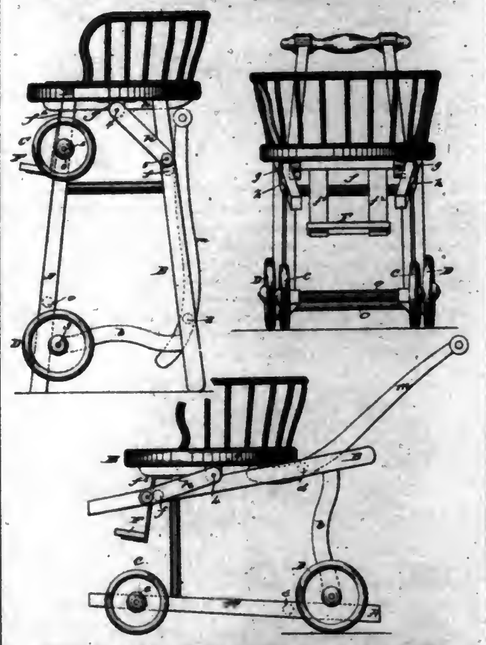
398,303.



pole, the operating-lever L, the threaded rod *k* and clip around the brake-bar, and the connection *z*, substantially as specified.

3. In a brake-lever attachment, the combination, with the lever L and the perforated plate B, having a ring, *b*, of the adjustable ratchet-catch I, engaging said ring at one end and provided at its other end with a stud, *c*, to engage the perforation of the plate B, substantially as specified.

398,304. CHILD'S CHAIR OR CARRIAGE. LUTHER J. ADAMS, Melrose, assignor to Thompson, Perley & Watts, Baldwinsville, Mass. Filed May 4, 1885. Serial No. 164,267. (No model.)



Claim.—1. A convertible child's chair and carriage comprising a base-frame composed of front and rear legs, A B, connected in pairs by rounds, and the pairs rigidly connected together, and one pair having rollers, combined with the seat, the ears *g*, secured to the seat, and links A, jointed to the said ears and to one pair of legs, whereby the seat may be shifted to rest upon the legs when upright and upon one side thereof when the legs are supported sidewise upon their rollers, substantially as described.

2. The combination of the two pairs of legs A B, rigidly connected by rounds, including rounds *e* and *f*, the seat E, the ears rigidly attached to the under side of the seat-bottom, the links A, pivoted to said ears and to the legs B, for adjusting the seat from the upper ends of the legs when upright to one of their sides when the base-frame is laid down lengthwise, and the foot-rest co-operating with the round *e* to hold the seat in position with the base-frame upright, and also co-operating with the round *f* and the ears *g* in the engagement of the

latter with the legs to hold the seat in position when the base-frame is horizontal, substantially as described.

3. A convertible high chair or carriage composed of a rigid base-frame provided at its front side with wheels or rollers and a seat and foot-rest, the seat being connected with the base-frame by links, whereby the seat may be turned into position to rest either directly upon the ends of the base-frame or upon the rear side of said base-frame placed uppermost by turning the base-frame over with the rollers at its front side on the floor, substantially as described.

4. The base-frame and the attached rollers and the seat, combined with the links connecting the seat with the rear part of the base-frame below its upper end, substantially as described.

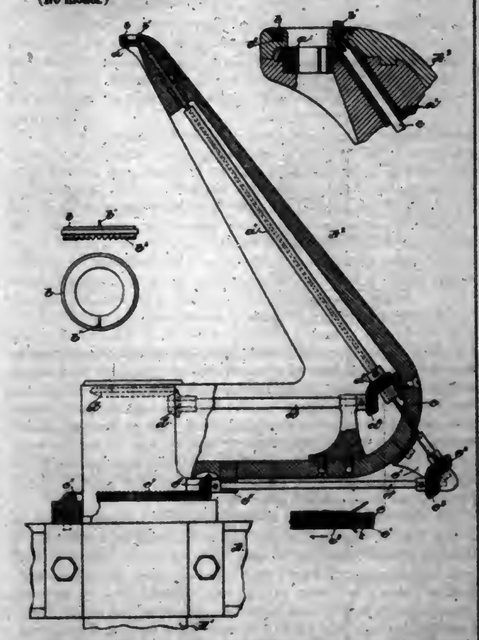
5. The base-frame, its attached rollers, and the seat provided with depending ears, combined with the links connecting the said ears with the base-frame, substantially as described.

6. The base-frame, its attached rollers, and the trundling-handle pivoted to the base-frame near its lower end, and the seat, combined with the links joining the seat and base-frame, the links being connected with the said base-frame at a point below its upper end, to operate substantially as described.

7. The base-frame having the rounds *e* and *f* and the seat and its attached arms f^3, combined with the links A, connecting the seat with the base-frame, the arms f^3, resting against the round *e* while the base-frame is upright and against the round *f* when the base-frame is turned over, substantially as described.

8. A convertible chair composed of a base-frame constructed of pairs of front and rear legs of substantially equal height rigidly connected, and a seat joined to said frame by links, and thereby adapted to be placed in position upon the upper ends of said base-frame when it is upright and to be turned over and supported upon one of the pairs of legs when said base-frame is turned down lengthwise, combined with wheels or rollers to support the base-frame when in this last-named position, substantially as described.

398,305. CHANNEL-CUTTING DEVICE FOR SOLE-SEWING MACHINES. EDWARD R. ALLEN, Portland, Me., assignor of one-half to Walter R. Sawyer, same place. Filed Nov. 24, 1888. Serial No. 291,794. (No model.)



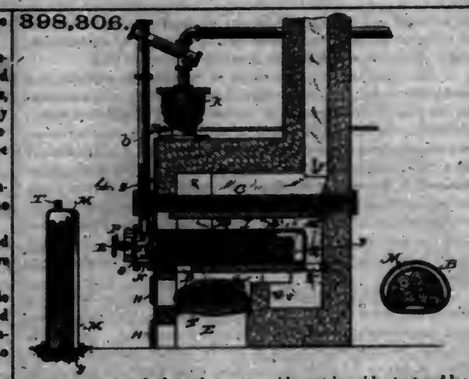
Claim.—1. The combination, with a rotating horn, of a channel-cutter mounted in the tip of the horn, substantially as described.

2. The combination, with a rotating horn and a channel-cutter mounted in the tip of the horn, of gearing to rotate the said channel-cutter, substantially as described.

398,306. APPARATUS FOR THE MANUFACTURE OF GAS. JOHN D. AVERELL, Brooklyn, N. Y., assignor, by mesne assignments, to Joel F. Tevis, Philadelphia, Pa. Filed Oct. 23, 1886. Serial No. 216,993. (No model.)

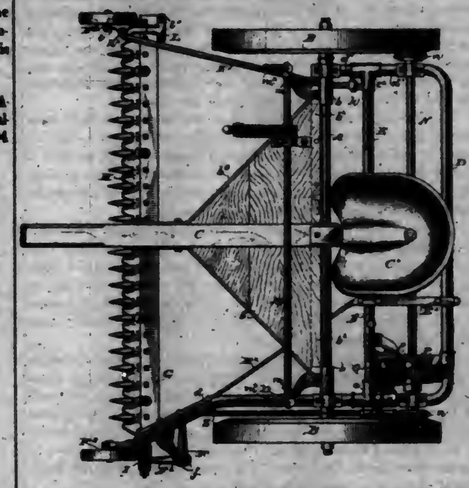
Claim.—In a wood-gas-generating apparatus, the combination, with a closed retort, of an imperforate wood-cartridge case having an

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open inner end and adapted to removably rest in said retort and leave heating-spaces between the cartridge and inner wall of the retort, and a steam-supply pipe extending into said retort between its inner wall and the cartridge to discharge steam at or near the inner open end of the cartridge, for the purpose set forth.

398,307. MOWER. WILLIAM B. BAKER, Chicago, Ill., assignor to the McCormick Harvesting Machine Company, same place. Filed Mar. 12, 1883. Serial No. 153,631. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, in a center-draft mower, of a main frame having one long arm connected to the rear of the finger-bar at its heel end by a universal joint, and a link or thrust-bar connected to the rear of the finger-bar at the other end by a hinge-joint, and to the main frame by a universal joint.

2. The combination, substantially as hereinbefore set forth, in a center-draft mower, of a main frame having one long arm connected to the rear of the finger-bar at its heel end by a universal joint, and a link or thrust-bar having an upwardly-treading pivotal connection with the finger-bar at its forward end.

3. The combination, substantially as hereinbefore set forth, in a center-draft mower, of a main frame having one long arm connected to the rear of the finger-bar at its heel end by a universal joint, and a link or thrust-bar having an upwardly-treading pivotal connection with the finger-bar at its forward end, and universally jointed to the main frame at its rear end.

4. The combination, substantially as hereinbefore set forth, in a center-draft mower, of a main frame having one long arm connected with the rear of the finger-bar at its heel end by a universal joint, and a casting in which the other end of the finger-bar is carried, a hinge-joint between said casting and the rear of the finger-bar at that end and a link or thrust-bar connected with said casting by a practically-upright pivot.

5. The combination, substantially as hereinbefore set forth, in a center-draft mower, of a main frame having one long arm connected with the rear of the finger-bar at its heel end by a universal joint, a casting in which the other end of the finger-bar is carried, a hinge-

joint between said casting and the rear of the finger-bar at that end, and a link or thrust-bar connected with said casting by a practically-upright pivot and with the main frame by a universal joint.

6. The combination, substantially as hereinbefore set forth, in a center-draft mower, of a main frame having one long arm connected with the rear of the finger-bar at its heel end by a universal joint, a bell-crank in bearings rigid with said arm adjacent to the finger-bar, and a short pitman connecting a ball-stud in one end of said bell-crank with a ball-stud on the heel of the cutter-bar, and a link or thrust-bar connected to the rear of the finger-bar at the other end by a hinge-joint and to the main frame by a universal joint, whereby the finger-bar is permitted to tilt or rock to follow the sinuosities of the ground and to rise and fall at the link-connected end irrespective of the motion of the main frame and without interfering with the driving of the cutter.

7. The combination, substantially as hereinbefore set forth, in a center-draft mower, of the main frame, thrust-bar, the castings connected, respectively, to the long arm of the main frame and to the thrust-bar, the finger-bar hinged at its rear to said castings, the subtending flanges or ledges on said castings upon which the toes of the shoes rest, and the lead-wheels secured to said castings in advance of the finger-bar.

8. The combination, substantially as hereinbefore set forth, in a center-draft mower, of the main frame, the thrust-bar, the castings connected, respectively, to the long arm of the main frame by a rigid joint and to the thrust-bar by a practically-upright pivot, and the finger-bar united at its rear with the first casting by a universal joint and with the second by a hinge-joint.

9. The combination, substantially as hereinbefore set forth, in a center-draft mower, of the main frame, the thrust-bar, the castings connected, respectively, to the long arm of the main frame by a rigid joint and to the thrust-bar by a practically-upright pivot, the finger-bar united at its rear with the first casting by a universal joint and with the second by a hinge-joint, and the subtending ledges or flanges from said castings upon which the toes of the shoes rest.

10. The combination, substantially as hereinbefore set forth, with the long arm of the main frame, of a casting having ears for the reception of the bell-crank and a forward-projecting ball to form a universal joint with the heel of the shoe, a subtending flange or ledge in front to support the toe of said shoe, and provision for the attachment of a lead-wheel in advance of said shoe.

11. In a center-draft mower, the main frame formed of a single bar extending from the axle at one side toward the rear parallel with the wheel, then bent at right angles to itself and carried to the other side, and again bent and passing alongside the wheel on that side to its forward tread, and there flaring outwardly to its point of connection with the finger-bar, combined with a through-axle, to which both arms of the frame are bolted.

12. In a center-draft mower, the main frame, consisting of a single bar of pipe metal bolted to the axle at one side adjacent to the wheel and extending rearwardly parallel with said wheel to near its tread, then bent at right angles to itself and carried to the other side adjacent to the wheel on that side, and again bent and carried parallel with the inner side of that wheel past the axle, to which it is bolted, to near the front tread of the wheel, and finally flaring outwardly to its point of connection with the finger-bar.

13. The combination, substantially as hereinbefore set forth, in a center-draft mower, of the main-frame bar, of a single length of pipe metal bent into the form described, the tie-bar, also of pipe metal and having its ends respectively right and left screw-threaded, and the T-couplings which unite the frame-bar and the tie-bar.

14. The combination, substantially as hereinbefore set forth, in a center-draft mower, of the main-frame bar bent into the form described and a diagonal brace bolted to its flaring longer arm and to the rear arm.

15. The combination, substantially as hereinbefore set forth, in a center-draft mower, of the tubular main-frame bar bent into the form described, the tubular tie-bar and T-couplings, and the diagonal brace.

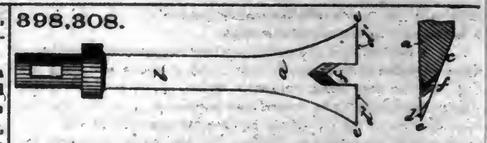
16. The casting F, having bearings *f* for the journal of the bell-crank, and slotted at its forward end to adjustably receive the shank of a stub-axle for the lead-wheel.

17. The casting F, having near its rear an outwardly-projecting ball-stud and at its front a subtending ledge or flange and cut away therebetween to form a bridge.

18. The casting F, formed, substantially as described, with bearings *f*, a ball-stud, *f'*, and subtending flange *f²*, and an upright slot for the reception adjustably of the shank of a stub-axle for the lead-wheel.

19. The T-coupling *c'*, formed with a web in one of its angles having a ball-socket for the rear end of the thrust-bar.

398,308. TOOL FOR MINING PURPOSES. GUSTAV A. BARTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed July 23, 1888. Serial No. 280,692. (No model.)

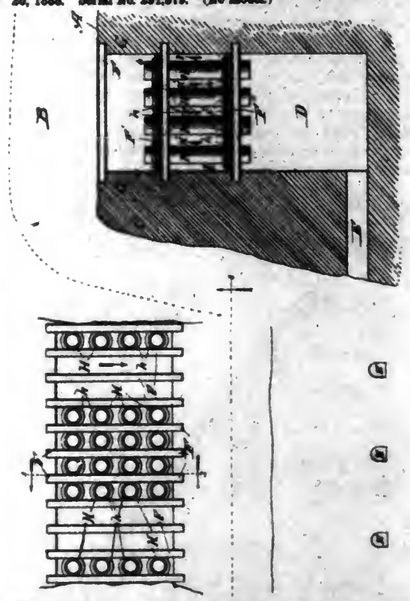


Claim.—1. A chipping or cutting tool of chisel form, or having only one side splayed, said tool having a longitudinal slot with parallel sides, which slot divides the cutting-face of the tool centrally, substantially as and for the purposes described.

2. A chipping or cutting tool of chisel form, or having only one side splayed, said tool having a flared cutting-edge and a longitudinal slot with parallel sides, which slot divides the cutting-face of the tool centrally, substantially as and for the purposes described.

3. A chipping or cutting tool of chisel form, or having only one side splayed, said tool having a flared cutting-edge, and a longitudinal slot which divides the cutting-edge centrally, said slot having parallel sides and a cutting-edge at its base, substantially as and for the purposes described.

398,309. WHEEL-PIT AND MECHANISM FOR THE ADMISSION OF WATER THERETO. CHARLES M. BARTLETT, Chicago, Ill. Filed Nov. 26, 1888. Serial No. 291,879. (No model.)



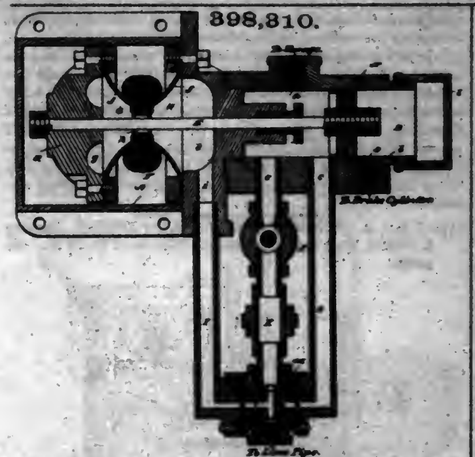
Claim.—1. The combination, in a wheel-pit placed underneath the bed of a river, lake, or pond, of a water-tight deck or flooring underneath a series of girders located at or near the level of the bottom of the said river, lake, or pond, whereby a pool is formed above said water-tight deck or flooring, a second deck or flooring placed underneath such water-tight deck or flooring, and vertical pipes or cylinders extending through and above said water-tight deck or flooring and through and below said second flooring and into the wheel-pit below the same, substantially as described.

2. The combination, in a wheel-pit placed underneath the bed of a river, lake, or pond, of a water-tight deck or flooring underneath a series of girders located at or near the level of the bottom of said river, lake, or pond, whereby a pool is formed above said water-tight deck or flooring and below said girders, a second deck or flooring placed underneath such water-tight deck or flooring, and vertical pipes extending through and above said water-tight deck or flooring and through and below said second flooring and into the wheel-pit below the same, and valves or gates in said vertical pipes or cylinders, by which the admission of water through said vertical pipes or cylinders may be controlled, substantially as described.

398,310. AIR-BRAKE. ALFRED R. BOLDS, Norwood, Ohio, assignor to the Bolds Air Brake Company, Jersey City, N. J. Filed Aug. 27, 1888. Serial No. 283,690. (No model.)

Claim.—1. In a fluid-pressure brake, the combination of a cylinder having ports for attachment with a brake-cylinder and storage cylinder, respectively, a flexible diaphragm arranged in a case, a piston-rod having one end secured to a diaphragm and having its opposite end secured to a piston-head in the cylinder, a pipe connecting the case with the cylinder and carrying a three-way cock, and a pipe connecting the cylinder with the pipe leading from the cylinder to the diaphragm-case, and having a check-valve, substantially as specified.

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2. The combination, with a case, such as A, of a cylinder, such as B, the latter being of much less internal area than the former, the piston-rod working in the respective chambers, having at one end a head and at the opposite end within the case A a flexible device for driving the same, a pipe, such as K, having a check-valve, and a pipe, such as L, both leading from the cylinder B, and a pipe, such as I, connected with the main case A, the said pipes communicating at their outer ends and also communicating with the line-pipe, and a three-way cock arranged at the junction of the respective pipes, substantially as specified.

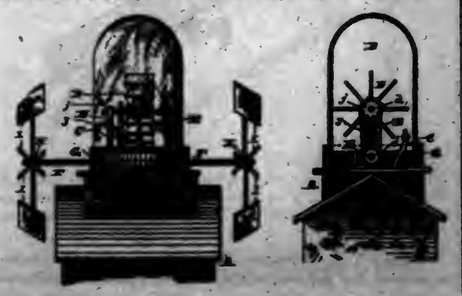
3. The combination, in a fluid-pressure brake, substantially as described, of the cylinder B, having the exhaust-ports at its outer end, and the port connecting with the brake-cylinder, the latter port having graduated apertures *s*, and the piston-rod having a head whereby the action of the brake in releasing will be rapid at the start and then gradual.

4. In a pneumatic brake, the combination, with the main case having a single communicating aperture, of the piston-cylinder having a less internal area than said case, a rigid piston-rod passing through a gland in the case, so that one end will extend into the cylinder, a flexible device, constructed as shown, secured to the end of the piston-rod within the case and a head secured to the opposite end thereof, a pipe leading from the only port of the case to the interior of the cylinder, so that fluid may be carried to and from the case by the same pipe, and a three-way cock arranged in the pipe at a point where the same connects with a line-pipe, substantially as specified.

5. In a fluid-pressure brake, a piston-cylinder, such as described, having an exhaust at its outer end and a port in rear of the exhaust to connect with a brake-cylinder, said port having a plurality of apertures which vary in size, whereby in the backward stroke of the piston or valve rod the largest port will be first uncovered to the exhaust, so that the action of the brake will be rapid at the start and then gradual, substantially as specified.

398,311. AUTOMATIC FAN. FRANKLIN T. BUSBY and ALFRED H. SNYDER, South Bend, Ind.; said Busby assignor to said Snyder. Filed May 4, 1888. Serial No. 272,770. (No model.)

Claim.—1. In a dispensing-fountain provided with a glass dome and a water-jet therein, the combination of a water-wheel in said dome driven by said jet, its shaft and supporting-brackets, with the



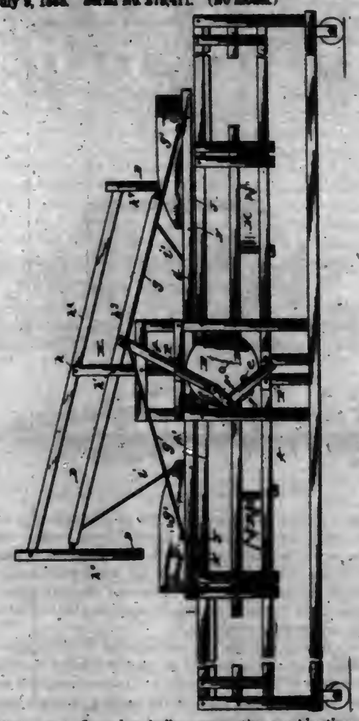
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horizontal shaft journaled in fixed bearings below said dome and wheel and extending outside the same, the fans on the ends of said shaft, and the mechanism, substantially as described, whereby motion is imparted from said water-wheel shaft to the fan-bearing shaft, all substantially as and for the purpose specified.

2. The combination of the casing A, the dome B and its supporting-rim G, and the water-jet and water-wheel D, its shaft *d*, and brackets E, supporting the same, arranged within dome B, with the horizontal shaft F passing through rim G and below dome B, the fans on the ends of said shaft, and the gearing and connections between shafts *d* and F within dome B, all constructed and arranged substantially in the manner and for the purpose described.

398,312. BALING-PRESS. JOSEPH K. BUTWORTH, Paris, Tex. Filed July 9, 1888. Serial No. 278,411. (No model.)

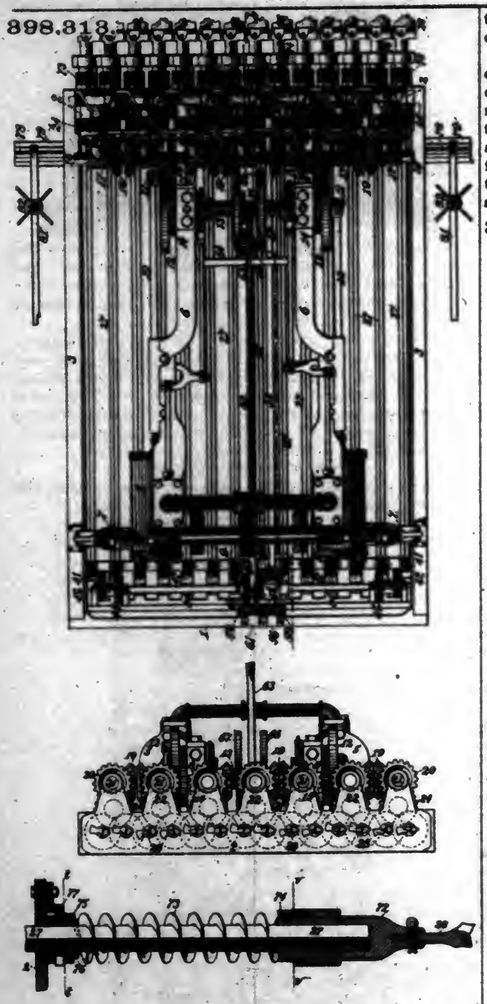


Claim.—1. In a hay-baling press, the combination, with the frame, of the crank-shaft, arms secured thereto, the plungers, the wheel mounted upon the shaft and carrying a wrist-pin, the levers pivotally secured to the frame, the link pivoted to the levers, the sliding frame and condensers, and means for connecting the lever *f* with the sliding frame, substantially as described.

2. In a hay-baling press, the combination, with the frame, of the crank-shaft, arms secured thereto, the plungers, the wheel mounted upon the shaft and carrying a wrist-pin, the levers pivotally secured to the frame, the link pivoted to the levers, the sliding frame and condensers, and means for connecting the lever *f* with the sliding frame, and the forcing device connected with and operated by the movement of the plunger-arms, substantially as described.

398,313. MINING-MACHINE. EDWIN R. CARTER, Pittsburg, Pa., assignor to John S. Scully, same place. Filed Oct. 26, 1888. Serial No. 289,209. (No model.)

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Claim.—1. In a mining-machine, the combination of a series of revoluble cutter bars or spindles, a movable cross-head or carriage having the bars or spindles connected thereto, a system of gearing at each end of said cross-head or carriage for moving the same, a central system of gearing engaging the systems of gearing at the ends of the carriage, and a frictional gearing for operating the central system of gearing, substantially as set forth.

2. In a mining-machine, the combination of an angular cutter bar or spindle, a gear-wheel having an angular opening therethrough for the reception of the bar or spindle, and rollers interposed between the bar or spindle and the sides of the opening through the gear-wheel, substantially as set forth.

3. In a mining-machine, the combination of a series of cutter bars or spindles, and a like series of gear-wheels for revolving such bars or spindles, said gear-wheels being arranged in different vertical planes and overlapping one another, whereby a practically-continuous cut may be formed with comparatively small cutters, substantially as set forth.

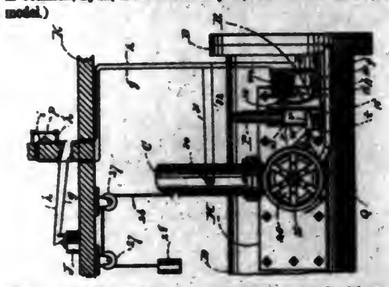
4. In a mining-machine, the combination of a revoluble and longitudinally-movable cutter bar or spindle and an extensible conveyer arranged in the rear of the cutter, substantially as set forth.

5. In a mining-machine, the combination of a revoluble and longitudinally-movable cutter bar or spindle and a flat strip of metal wound spirally around said bar or spindle and secured only at its ends to the cutter-bar, substantially as set forth.

6. In a mining-machine, the combination of a series of revoluble cutter bars or spindles, a cross-head or carriage for moving said bars or spindles longitudinally, rotating friction-disks, and a friction-wheel mounted on a horizontally-movable shaft arranged between the friction-disks and adapted through suitable gearing to shift the cross-head or carriage forward and backward, substantially as set forth.

7. In a mining-machine, the combination of a series of revoluble cutter bars or spindles, a cross-head or carriage for moving said bars or spindles longitudinally, rotating friction-disks, and a friction-wheel mounted on a horizontally-movable shaft and longitudinally adjustable therealong, said shaft being arranged between the friction-disks and adapted through suitable gearing to shift the cross-head or carriage forward or backward at different speeds in accordance with the position of the friction-wheel as regards the axis of the friction-disks, substantially as set forth.

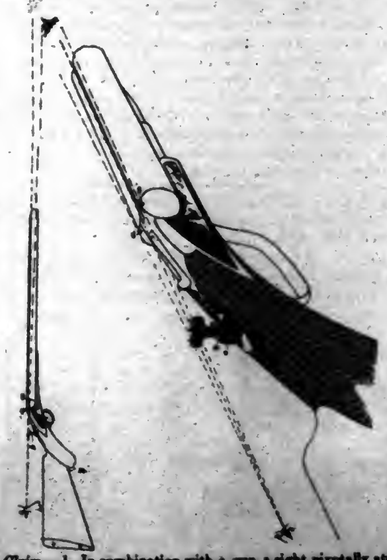
398,314. STOP MECHANISM FOR STEAM-ENGINES. HERBERT L. CURRIER, Lynn, Mass. Filed May 14, 1888. Serial No. 273,763. (No model.)



Claim.—1. The combination of a tube provided with a perforation, a weight within said tube, an electro-magnet in proximity thereto, an electric circuit in connection therewith, an armature provided with a stop-pin normally projecting through the perforation in said tube for sustaining said weight in elevated position, an automatic valve-closer, and adjunctive mechanism actuated by said weight for releasing the valve-closer.

2. In a device of the character described, the combination of the engine B, having the steam-pipe C, a throttle-valve for said pipe having the stem *z*, the reel 25, and wheel *x*, provided with the notch *b*, disposed on said stem, the cord 26, wound on said reel and provided with the weight 28, the tube *r*, provided with the slot *w*, the weight P, disposed in said tube, the pivotal pawl Q, having the arms *y* and *v*, the arm *v* being inserted in said slot and the arm *y* adapted to engage the notch in the wheel *x*, the spring 15 for the pawl Q, the pivoted lever R, having the arms 17 and 19, the armature 16, and stud 21, mounted on the arm 17, said stud being adapted to pass through a hole in the side of said tube and engage the weight P, the spring 20 for the lever R, the magnet *m*, the battery J, the wires *g h*, and push-button *i*, substantially as specified.

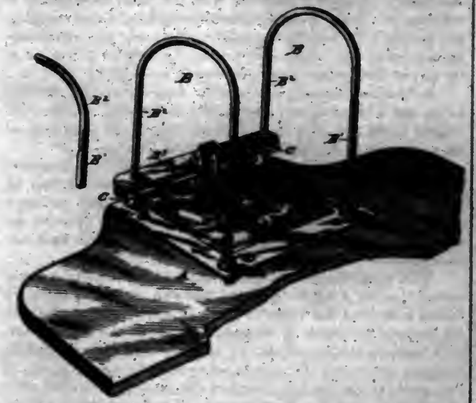
398,315. SIGHT FOR FIRE-ARMS. ERSK J. CUTLER, Cleveland, Ohio. Filed Nov. 17, 1888. Serial No. 291,113. (No model.)



Claim.—1. In combination with a gun, a sight pivotally attached to the stock and provided with three sighting-points, a center point on the normal sight-line of the barrel or barrels, and one sighting-point on either side of said normal sight-line, substantially as set forth.

2. In combination with a gun, a pair of sights at the breech of the gun at opposite sides of the normal sight-line of the barrel or barrels, and a sight pivotally attached to the stock and having a set of sighting-points, two of which are at the side of the normal sight-line, substantially as set forth.

398,316. PAPER-FILE. MELVILLE E. DAYTON, Chicago, Ill., assignor to Carl F. Lamb, Rochester, N. Y. Filed Feb. 10, 1887. Renewed Oct. 27, 1888. Serial No. 289,342. (No model.)



Claim.—1. In a file having two severally-separable parallel wire arches, the combination, with a base and two receiving-wires, of two arched transfer-wires rigidly joined by a cross-piece, guides for the lower ends of the transfer-wires, which permit vertical movement of said transfer-wires, and which retain them in a vertical position at all points in their vertical movement, substantially as described.

2. In a file having two severally-separable parallel wire arches, the combination, with a base and two receiving-wires, of two arched transfer-wires rigidly joined by a cross-piece above their lower ends, and vertical guides on the base fitted to the lower ends of the transfer-wires below the cross-piece, substantially as described.

3. In a file having two severally-separable parallel wire arches, the combination, with a base and two receiving-wires, of two rigidly-connected arched transfer-wires, vertical guides for said connected transfer-wires, which retain the latter in an upright position, and a catch having two notches or corresponding points of engagement, and which is adapted to hold the connected transfer-wires in two positions, substantially as described.

4. The combination, with a base and two receiving-wires of a double-arch file, of two rigidly-joined arched transfer-wires, means for guiding said connected transfer-wires in a vertical direction, a spring or springs arranged to exert a lifting force on the transfer-wires, and a catch arranged to hold the transfer-wires down in opposition to the action of the spring, substantially as described.

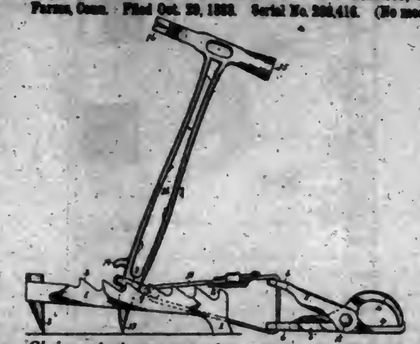
5. The combination, with a base and two receiving-wires of a double-arch file, of two rigidly-connected arched transfer-wires, means for guiding the connected transfer-wires in a vertical direction, a spring arranged to bear upwardly upon the connected transfer-wires, and a double-notched spring-catch constructed to retain the transfer-wires in two positions in opposition to the action of the spring, substantially as described.

398,317. PEN-HOLDER. FRANK H. DURELL, Bay City, Mich., assignor of one-half to John W. Cupit, same place. Filed July 9, 1888. Serial No. 279,408. (No model.)



Claim.—In a pen-holder, the combination of the central socket, *b*, provided with a closed outer end, the sleeve *d*, surrounding and rigidly secured by its inner end to the said socket and provided on its outer end with longitudinal slits *f*, and having the pieces *g* between the slits spring outwardly and away from the socket, and the movable band *i*, surrounding the sleeve for clasping and retaining the said spring-pieces *g* upon the pen and socket, substantially as set forth.

398,318. CARPET-STRETCHER. EVERETT C. ELLWOOD, Green's Farms, Conn. Filed Oct. 20, 1888. Serial No. 288,416. (No model.)



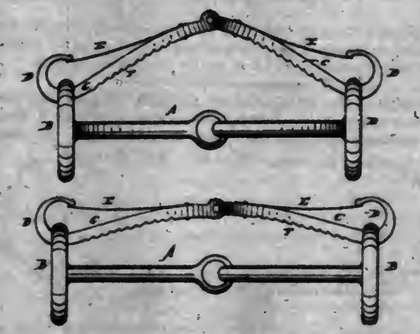
Claim.—1. A carpet-stretcher consisting, essentially, of a base having racks and a prong for engagement with the floor, jaws which engage the carpet, a link having lugs which engage the racks, a flexible connection between the jaws and the link, and a lever adapted to pass through the link, thereby stretching the carpet when the free end is forced forward.

2. The base having racks and a prong for engagement with the floor, and jaws which grip the carpet and are provided with shanks *b*, in combination with a link having lugs which engage the racks, a flexible connection engaging the link and the shanks of the jaws, and a lever adapted to pass through the link and engage the floor, whereby when said lever is forced forward the jaws are tightened upon the carpet and the latter is drawn forward, thereby stretching it.

3. The base having racks and the jaws having shanks, as shown, in combination with the links having lugs engaging the racks, a flexible connection engaging the link and the shanks of the jaws, and a pointed lever adapted to pass through the link, and having a lug, 14, on its face, which engages the link, as and for the purpose set forth.

4. The combination, with the base having racks, the jaws, and the link having lugs engaging the racks, of a flexible connection engaging the link and the shanks of the jaws, and a combined lever, tack-drawer, and hammer, acting as described, and for the purpose set forth.

398,319. BRIDLE-BIT. SAMUEL FISHER, Mount Washington, Md., assignor of one-half to William James Carthers, Purdham, N. Y. Filed Oct. 20, 1888. Serial No. 288,063. (No model.)

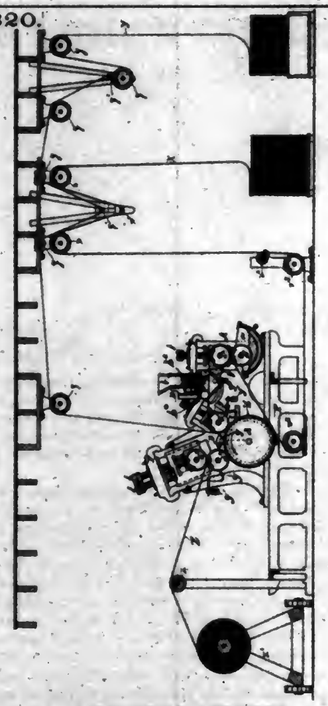


Claim.—The combination, with a bridle-bit composed of two end rings, and links pivoted on said end rings and to each other, of two rods or bars having serrations, and hinged to each other at the meeting ends and having snap-hooks on their outer ends, which snap-hooks engage the end rings of the bit, substantially as set forth.

398,320. MACHINE FOR MAKING COMPOUND FABRICS. GEORGE A. FULLERTON, Boston, Mass. Filed Apr. 3, 1887. Serial No. 234,102. (No model.)

Claim.—The herein-described combination of glue-distributing device A, powder-distributing device B, and compressing device D with two sets of guides, one set guiding material to the glue-distributing device and another set guiding material to the compressing device, the powder device being mounted between the glue-distributing device and the compressing device, and that set of guides which directs the material to the compressing device being mounted to direct the fabric to meet the powdered surface of the other sheet, substantially as and for the purpose set forth.

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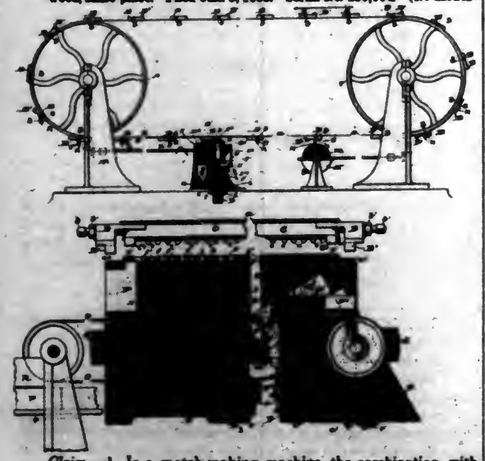


398,321. METALLIC JOINT. FRANK FUNK, Decatur, Ill. Filed July 18, 1888. Serial No. 280,296. (No model.)



Claim.—The joint comprising the part *a*, having rim *a'*, the part *c*, riveted to the rim, the part *b*, bent over on part *a*, and the packing *c*, interposed between *a* and *b*, as and for the purpose set forth.

398,322. MATCH-MAKING MACHINE. WILLIAM GUEE, Kent, Ohio, assignor of two-thirds to James B. Miller and Vernon B. Underwood, same place. Filed Jan. 3, 1888. Serial No. 259,604. (No model.)



Claim.—1. In a match-making machine, the combination, with a suitable motor, wheel, or endless belt, as the case may be, of a knife-head pivotally connected with the motor, so as to fold against the motor or turn on its axis by gravity to a depending position perpendicular to the face of the motor, said knife-head having one or more knives adapted to cut match-splints from an opposing wooden block, with the knife-head in position folded against the motor, substantially as set forth.

2. In a match-making machine, the combination, with a motor and a knife-head pivotally connected with the motor, said knife-head having one or more knives, substantially as indicated, of inclines and a feed-box adapted to engage the passing knife-head and by such engagement fold and retain the knife-head against the motor during the cutting operation, substantially as set forth.

3. In a match-making machine, the combination, with a motor and folding knife-heads connected with the motor, substantially as indicated, of a feed-box having attached a spring-actuated clamping-jaw, the said knife-heads having attachments for engaging such clamping-jaw and by such engagement turning the latter on its axis out of the way of the passing knives, substantially as set forth.

4. In a match-making machine, the combination, with traveling knives and a clamping-jaw, substantially as indicated, of a feed-box inclined to the axis of the clamping-jaw, whereby the latter engages the wooden block diagonally, substantially as set forth.

5. In a match-making machine, the combination, with suitable feed mechanism, substantially as indicated, of a motor having attached a series of folding knife-heads, each knife-head bearing a series of separate knives, the knives of one knife-head following between the tracks of the knives of the next preceding knife-head, substantially as set forth.

6. In a match-making machine, the combination, with a motor having a series of yokes connected therewith, each yoke bearing a folding knife-head, the knives of alternate heads following between the tracks of the knives of the intervening heads, of a feed-box having a clamping-jaw pivoted thereto, attachments of the knife-head for engaging and turning the clamping-jaw on its axis out of the way of the passing knives, and attachments of alternate yokes for still further depressing the clamping-jaw to actuate the feed mechanism, substantially as set forth.

7. In a match-making machine, the combination, with a motor, yokes, knife-heads, clamping-jaw, and mechanism, substantially as indicated, for giving the latter alternate longer and shorter movement on its axis, of feed mechanism connected with the clamping-jaw, such connection having a slip-joint, whereby the feed mechanism is actuated only with the longer movement of the clamping-jaw, substantially as set forth.

8. In a match-making machine, the combination, with a motor, of a series of folding knife-heads mounted on the motor, each knife-head having a series of transverse slits for receiving the knives, a series of jaws connected with the knife-heads, and a bolt extending longitudinally through a hole in the knife-head for clamping the series of jaws connected with a knife-head, substantially as set forth.

9. In a match-making machine, the combination, with a motor and folding knife-heads mounted on the motor, each knife-head having a series of transverse slits, substantially as indicated, of a series of substantially U-shaped knives mounted on each knife-head, the legs of the knives being inserted in the aforesaid slits with approximately equal lateral spaces respectively between and inside the knives, substantially as set forth.

10. In a match-making machine, the combination, with a motor and a folding knife-head having knives adapted to cut and retain match-splints, of apparatus, substantially as described, for applying chemicals to the match-splints, such apparatus being in the path of the depending splints, substantially as set forth.

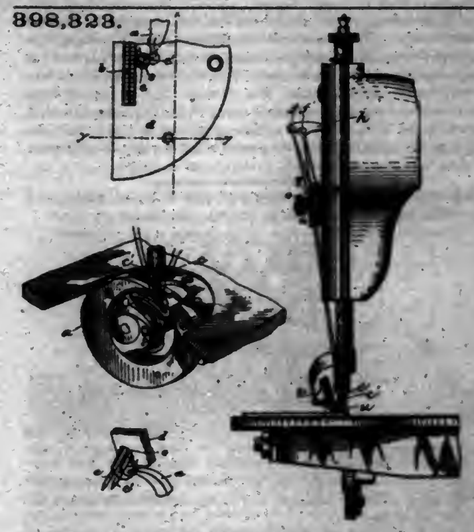
11. In a match-making machine, the combination, with a motor, folding knife-heads, and knives, the latter being adapted to cut match-splints and carry the splints in an upright position, substantially as indicated, of a container for chemicals, and a revolving wheel operating in such container for feeding the chemicals to the match-splint, the top portion of such wheel being located in the pathway of the depending match-splints, substantially as set forth.

12. In a match-making machine, the combination, with mechanism, substantially as indicated, for cutting match-splints, carrying the splints in contact with the chemicals, and discharging the dried matches from the cutting-knives, of an endless belt for carrying the matches from the machine, and a series of bars triangular in cross-section, with intervening spaces between the bars, such bars being arranged crosswise of the discharging-belt, substantially as set forth.

398,323. SEWING-MACHINE. JOHN H. GRIFFIN, Brockton, Mass., assignor of one-half to Churchill & Alden, same place. Filed Apr. 9, 1888. Serial No. 270,022. (No model.)

Claim.—1. The combination, in a sewing-machine, of a shuttle whose movement is substantially parallel with the feed, two undeflected needles arranged diagonally with relation to the movement of the said shuttle, one of the said needles being thus always nearer to the path of movement of the shuttle than the other, and suitable auxiliary stitch-forming devices co-operating with the said shuttle and diagonally-arranged needles, as set forth.

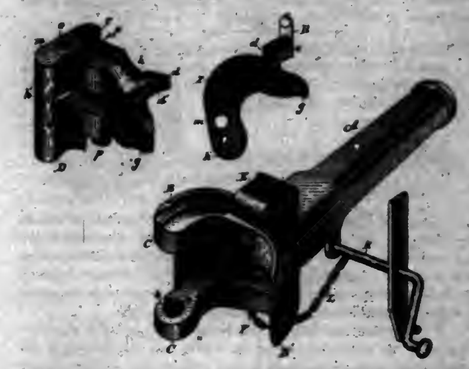
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2. In a sewing-machine, the combination, with a shuttle whose movement is substantially parallel with the direction of the feed and with suitable auxiliary stitch-forming mechanism co-operating therewith, of two undeflected needles diagonally arranged with relation to the movement of the shuttle, and having their eyes arranged at different heights, as set forth.

3. In a sewing-machine, the combination of a shuttle whose movement is substantially parallel with the direction of the feed, two needles diagonally arranged, as described, one of said needles being nearer the path of the shuttle than the other, and two take-ups engaging the threads of the respective needles, the eye of the take-up which delivers thread to the needle farthest from the shuttle being farther from the fulcrum of its take-up lever than the other take-up eye, as set forth.

398,324. CAR-COUPLING. JAMES A. HINSON, Des Moines, Iowa, assignor to the Hinson Car Coupler Company, same place. Filed Sept. 26, 1888. Serial No. 286,431. (No model.)



Claim.—1. The combination, in a car-coupler, of the draw-bar, the hollow hood cast therewith, the enlarged head having the recess *e* therein, the latch pivotally suspended in said hood and having the projection *e*, the spring adapted to move said latch forward, the movable jaw having the branches *h h'* journaled to said enlarged head, and said branch *h* having the projection *d* cast integral therewith, substantially as described.

2. The combination, in a car-coupler, of the draw-bar having an enlarged head provided with the recess *e*, the arms B B', cast integral with said head, the latch pivotally suspended with said head and having the projection *a*, the movable jaw having the branches *h h'* journaled to one of said arms, and a spring for moving the latch forward, substantially as described.

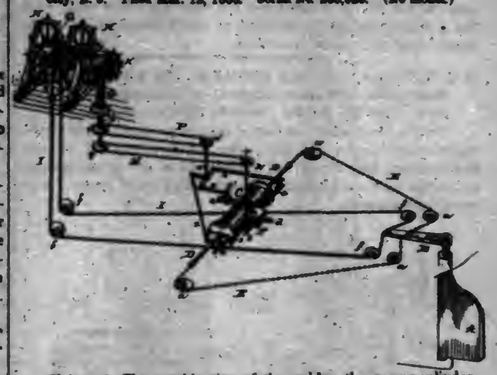
3. The combination, in an automatic car-coupler, of the pivoted latch having the projection extending therefrom at an acute angle, and the movable jaw having branches *h h'*, the former having a projection, *d*, cast integral therewith, substantially as described.

398,325. CAR-WHEEL. ISRAEL HOOSLAND, Indianapolis, Ind. Filed Aug. 2, 1888. Serial No. 281,721. (No model.)



Claim.—In a car-wheel, the combination of the body A, formed with the shoulder *a*, having pins or projections around its periphery, and an annular flange, *a'*, extending out from its edge, the tire B, having an inwardly-extending annular flange, *b'*, provided with notches to receive the pins or projections around the shoulder *a* of the body, the ring of packing material interposed between said two parts, the ring C, arranged over the joint between said two parts, and the bolts *c*, for securing them together, substantially as set forth.

398,326. STEERING APPARATUS. JULIUS I. HORNIG, Jersey City, N. J. Filed Mar. 12, 1888. Serial No. 266,969. (No model.)



Claim.—1. The combination of the rudder, the power-cylinder, and piston for moving it, the hand steering-wheel connected with the rudder, the power steering-wheel, a bevel-gear on the shaft of said hand steering-wheel, a bevel-gear on the shaft of said power steering-wheel, a bevel-gear engaging with both said gears, a gear-wheel carrying said last-mentioned bevel-gear, another gear-wheel with which said carrying-wheel engages, and connections from the shaft of said last-mentioned gear-wheel to the valve of the power-cylinder, substantially as set forth.

2. The combination of the rudder, the power-cylinder, and piston for moving it, the power steering-wheel connected with the valve of said cylinder, the hand steering-wheel connected with the rudder, the epicyclic gearing between said wheels, the relief-cocks in the ends of said cylinder, a cock in the inlet of the cylinder, and connections from said cocks to a handle at the place where the steering is performed, substantially as set forth.

3. The combination of the rudder, the power-cylinder and piston for moving it, relief-cocks in the ends of the cylinder, and a valve in the inlet of the cylinder, whereby the use of hand steering apparatus is permitted, substantially as set forth.

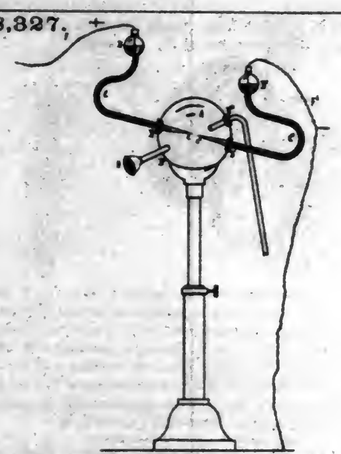
4. The combination of the rudder, the power-cylinder and piston for moving it, relief-cocks in the ends of said cylinder, a cock in the inlet of the cylinder, and connections from said cocks to a handle situated at the place where the steering is performed, whereby all said cocks may be operated simultaneously, substantially as set forth.

5. The combination of the rudder, the power-cylinder for moving it, the hand steering-wheel, the shaft *p*, connected with said wheel and with the valve of the cylinder, the relief-cocks for the cylinder, the hollow shaft inclosing shaft *p*, connections from said hollow shaft to said relief-cocks, and a handle for turning said hollow shaft, substantially as set forth.

398,327. ELECTRIC SPRAY-PRODUCING APPARATUS. HILARION A. B. HUGUET DE VARS, Paris, France. Filed Nov. 30, 1888. Serial No. 292,151. (No model.)

Claim.—In a spray-producing apparatus, a globe, A, provided with openings B B', in which are placed two tubes, C C, (terminating in capillary tubes *c c'* and containing wires F F' for conducting elec-

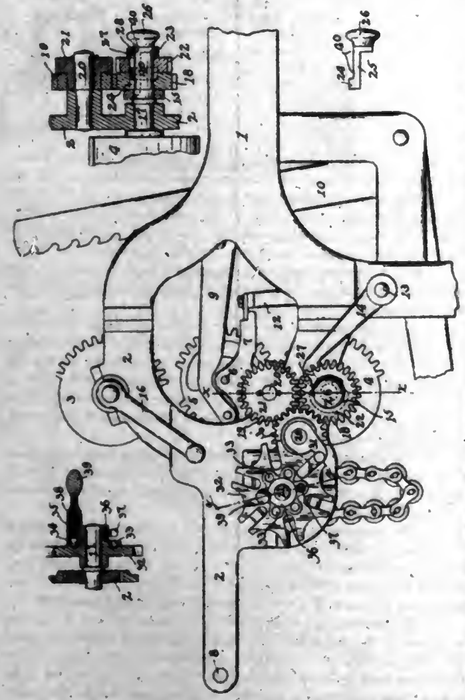
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tricity,) and with openings B' B'', the one for receiving a ventilating-tube and the other a mouth-piece, the entire apparatus being fitted into a sliding support, substantially as above described, and represented in the accompanying drawing.

398,328. PATTERN MECHANISM FOR LOOMS. GEORGE F. HUTCHINS, Worcester, Mass., assignor to the Knowles Loom Works, same place. Filed Nov. 10, 1888. Serial No. 290,412. (No model.)

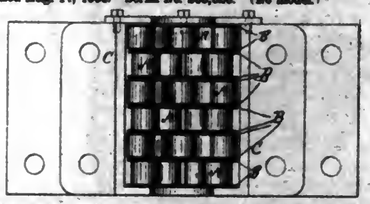
Brief.—The pattern mechanism may be reversed without reversing the cylinder-gears by simply pulling out the sliding key, and thus throwing into gear directly an idle member of the actuating-chain, and at the same time rendering idle the gears which formerly were operatively engaged.



Claim.—1. In a loom of the class described, the combination, with the cylinder-gears, vibrator-gear, connector, vibrator-lever, and harness-lever, and gears 18 and 22, loose on the lower cylinder-shaft, sliding key 25, compound gears 19 and 21, loose on a stud supported in the loom-frame, of a pin-wheel gear, and pin-wheel driven by said gears, and adapted to drive a star-wheel connected with the pattern-cylinder, and said star-wheel and pattern-cylinder, all constructed and arranged substantially as shown and described.

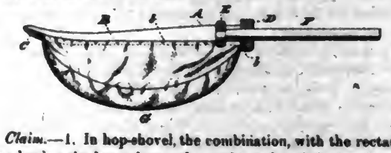
2. In a loom of the class described, the combination, with the pattern-chain cylinder, a star-wheel, 32, loose on said cylinder, hub 36, fast thereon, and a spring-actuated plunger supported in said hub and adapted to enter into and be withdrawn from sockets in said star-wheel, for the purpose stated, of a pin-wheel, 31, and gear 30, loose on a stud, compound intermediate gears, 19 and 21, loose on a stud, gears 18 and 22, loose on the cylinder-gear shaft, and said shaft, sliding key 25, cylinder-gears, connector, vibrator-gear, vibrator-lever, and harness-lever, substantially as shown and described.

398,329. ROLLER-BEARING. JOHN W. HYATT, Newark, N. J. Filed Aug. 17, 1888. Serial No. 283,020. (No model.)



Claim.—In a roller-bearing, two or more independently-rotating series of rolls held in position around the shaft by means of loose washers provided with suitable elevations adapted to fit into corresponding depressions in the rolls, and allowed to rotate independently of the other series, all arranged in a casing, substantially as and for the purposes described.

398,330. HOP-SHOVEL. BENJAMIN F. JACOBS, Milford, assignor of one-half to Marcus Luther, Hartwick, N. Y. Filed June 19, 1888. Serial No. 277,542. (No model.)



Claim.—1. In hop-shovel, the combination, with the rectangular frame having the lower inner edges rabbeted, and the handle, of the bag, of light close material, having its edges secured within the rabbeted portion, substantially as specified.

2. A hop-shovel consisting of the frame composed of the sides having the upwardly-curved ends, the transversely-beveled front bar, the rear bar and the bar E, the bag secured to the lower side of the said frame, and the handle, substantially as specified.

398,331. NECK-BAND-SHAPER AND SHIRT-BOSOM BOARD. WILLIAM H. JACOBY and CHARLES A. FULLER, Minneapolis, Minn.; said Charles A. Fuller assignor to Frank R. Fuller, same place. Filed Oct. 24, 1887. Serial No. 253,189. (No model.)



Claim.—1. The combination, with the bosom-board and the shoulder-clamps, of the expanding spring 44, arranged upon said board and secured by one end only to the board at the point in the spring that is nearest to the shoulder-clamps, whereby the distance between the front of the spring and the shoulder-clamps is varied as the spring is expanded and contracted, substantially as described.

2. The combination, with the bosom-board and the shoulder-clamps, of the expanding spring 44, having one end secured to the board at a point substantially central between the shoulder-clamps and having its other end free and arranged within said fixed end, and a clamp for securing said free end, whereby the distance between the front of the spring and the shoulder-clamps is varied as the spring is expanded and contracted, substantially as described.

3. The combination, with the bosom-board, of the frame 38, secured thereon, the expanding spring 44, having one free end and having the other end secured to said frame, the slide 48, arranged within said spring, and the eccentric lever 52, pivoted upon said frame and adapted to hold said slide in any position, substantially as described.

4. The combination, with a neck-band-shaper and a bosom-board having the recess 36, of a covering stretched over said recess to form a cushion, and the shoulder-clamps 16, arranged to be brought in contact with said cushion at either side of the neck-band-shaper and clamp the yoke of the shirt between them, substantially as described.

5. The combination, with the bosom-board having a recess, 36, at its forward end, of the shoulder-clamps 16 and the steady-pin 12, the said pin engaging the board upon its under side to hold it against the shoulder-clamps, substantially as described.

6. The combination, with a bosom-board having a recess and cushion at its forward end and having the recess 12 in its under side, of the steady-pin 10, adapted to enter said recess 12 and secure the said board in position, and the stretching device for the lower portion of the shirt, consisting of the cross-piece provided with a spring-clamp and held in position by the serrated plate 24 and pawl 26, all substantially as described.

398,332. MACHINE FOR COATING AND SANDING SHINGLES. JULIUS JAQUET, Milwaukee, Wis., assignor of one-half to John L. Mather, Lanark, Ill. Filed Sept. 24, 1888. Serial No. 286,200. (No model.)



Claim.—1. The combination of one or more pairs of pressure-rollers and a pair of paint-distributing brushes located and adapted for the passage of shingles between them, with an endless apron traveling on rollers located and adapted to receive and carry forward a shingle after it leaves the pressure-rollers, and a sand-box located above the endless apron and provided with apertures in its bottom, substantially as described.

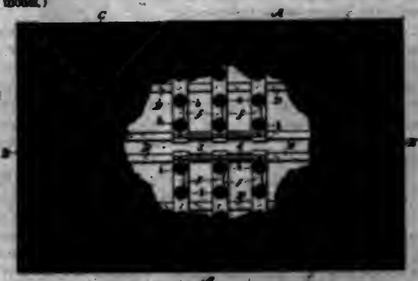
2. The combination of one or more pairs of pressure-rollers and a pair of paint-distributing bars or brushes located and adapted for the passage of shingles between them, with an endless apron located and adapted to receive such shingles from the pressure-rollers and carry them forward, a sand-box having an aperture for the discharge of sand therefrom, located above the apron, and a pressure-roller above and bearing yieldingly against a roller carrying the endless apron, between which rollers the shingles are carried on the apron after the shingles have received sand from the box, which rollers are adapted to distribute the sand and force it into the paint on the shingles, substantially as described.

398,333. DAMPENING-MACHINE. JOSEPH M. JOHNSTON, Allegheny, Pa. Filed Feb. 16, 1888. Serial No. 264,215. (No model.)



Claim.—In a dampening-machine, the combination of the body *a*, having the tanks *c c'*, one on each side of the same, belts *f* and *f'*, of some absorbent material, mounted on a triangular frame of rollers, so that the belts dip down into said tanks, and the adjustable rollers for pressing the excess of moisture from said belts, substantially as and for the purpose set forth.

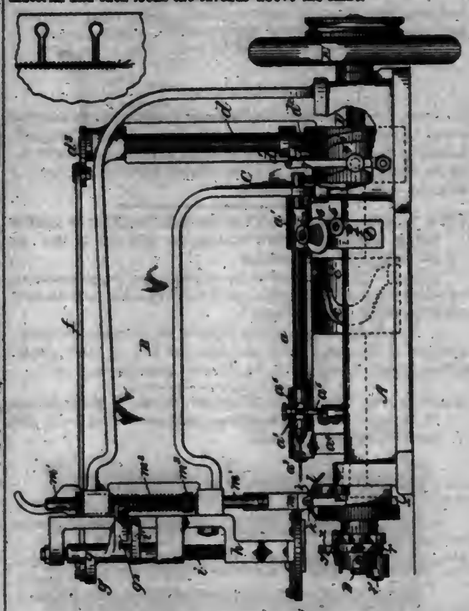
398,334. SPRING BED-BOTTOM. JOHN R. JOHNS, Battle Creek, Mich., assignor to Benjamin S. Hollister, Loyal C. Kellogg, and Busk & Hoyt, all of same place. Filed May 31, 1887. Serial No. 239,771. (No model.)



Claim.—The combination of the frame, the longitudinally-adjustable straps, the upper fabric continuous from one side of the frame to the other, the sets of spring-supporting slats located transversely and end to end on the straps, said ends disconnected and separated a little space from each other beneath the center of the fabric, and the staples or loops attached to the spring-supporting slats and loosely surrounding the straps upon which said slats rest, substantially as set forth.

398,335. BUTTON-HOLE FINISHING AND STAYING MACHINE. JOHN A. KNOX and THEODORE J. EISENDRATH, Lynn, Mass., assignors to P. P. Sherry, same place. Filed Oct. 17, 1887. Serial No. 252,573. (No model.)

Brief.—The presser-foot has a groove on the under side, which corresponds in shape with an upwardly-projecting rib on the work-plate. The button-hole piece is fed between these parts, so that the piece is bent just at the throats. The work-plate is raised at each alternate stitch made by the horizontal needle, which thus pierces the material and then locks the threads above the same.



Claim.—1. The combination, with the shuttle, of a horizontally-reciprocating needle, a vertically-reciprocating work-plate provided with a rib, a presser-foot provided with a slot or groove into which the rib extends, and a feed mechanism, substantially as set forth.

2. The combination, with a horizontally-operating shuttle, of a horizontally-reciprocating needle, a feed mechanism, a vertically-reciprocating work-plate provided with a rib or raised portion, and a presser-foot provided with a slot or depression to co-operate with said rib or raised portion of the work-plate, substantially as set forth.

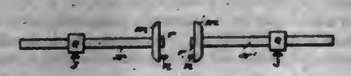
3. The combination, with a shuttle, a horizontally-reciprocating needle, a work-plate, a feed mechanism, and a presser-foot, of a shaft, D, and a cam on said shaft for intermittingly raising the work-plate as set forth.

4. The combination, with a shuttle, a work-plate, and feed mechanism, of a horizontally-reciprocating needle and needle-bar, a rotary shaft, a cam, *c*, on said shaft, means connecting said cam with said needle-bar to reciprocate the same, a cam, *c'*, also on said rotary shaft, and means connecting said latter cam, with the work-plate, whereby the latter may be raised and lowered intermittingly, as set forth.

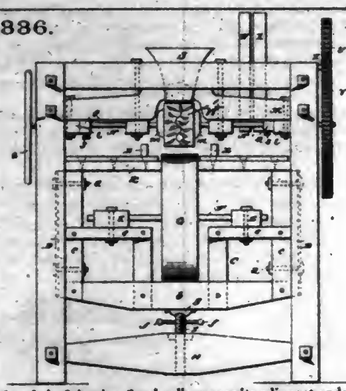
398,336. WOOD-ENGRAVING MACHINE. WILLIS W. KNOWSON, Fort Scott, Kans., assignor of one-half to Samuel A. Van Buskirk, same place. Filed Oct. 3, 1888. Serial No. 287,453. (No model.)

Claim.—1. In a machine for the purpose described, the combination, with an engraving-roll having central journal-apertures and eccentrically-arranged apertures, of the sectional shaft for the said roller, having journals to enter the aperture and studs or pins to fix the said roller with respect to the shaft, substantially as specified.

2. In a machine for the purpose described, the combination, with the main frame, of the horizontal beam M, carrying journal-bearings,



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the sectional shaft having fixed collars near its adjacent ends, and studs or pins on the said collars to receive interchangeably engraving-rolls, the sliding sleeves on the said collars, shaft, and thumb-screws for fixing the sleeves to the shaft, so as to prevent lateral displacement of the latter, substantially as specified.

398,337. COMPOSITION FOR THE MANUFACTURE OF TARRED PAPER. WILLIAM B. LUPTON, Pittsburg, Pa. Filed Apr. 23, 1888. Serial No. 271,577. (No specimens.)

Claim.—1. A composition for treating paper or felt in making tar-paper, composed of pine-tar and a coloring-matter, substantially as and for the purposes set forth.

2. A composition for treating paper or felt in making tar-paper, composed of pine-tar, a coloring-matter, and lime or other suitable stiffening agent, substantially as and for the purposes set forth.

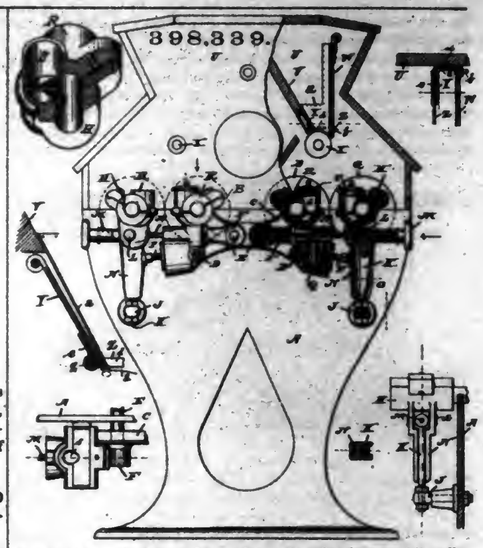
398,338. FOLDING POULTRY-COOP. MICHAEL T. MALOY, Chicago, Ill., assignor to James H. Batchelder, same place. Filed Dec. 4, 1888. Serial No. 292,606. (No model.)



Claim.—1. In a folding coop, the combination, with the bottom, of the folding sides, the brace and hinge rods E E, the top, the brace or guide rods F F, secured to the under side of said top, the folding ends, and the brace and hinge rods H H, adjustably securing said ends to said bottom, whereby all the parts are adapted to fold in a horizontal position, substantially as and for the purpose set forth.

2. In a folding coop, the combination, with the bottom and the folding ends, of the brace and hinge rods H H, as described, and the ridge-bar a^7, provided at each end with a notch for the engagement of said ends, substantially as and for the purpose set forth.

398,339. ROLLER-MILL. JONATHAN D. MAWHOOD, Richmond, Ind., assignor to the Richmond City Mill Works, same place. Filed Apr. 2, 1888. Serial No. 269,311. (No model.)



Claim.—1. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a housing for the fixed roll, a lever pivoted to the frame and carrying a trunnion-pin, an adjusting-screw for adjusting such lever upon its pivot and altering the position of said trunnion-pin, a lever carrying a box for the movable roll and pivoted upon said trunnion-pin, and a spring arranged to act upon said levers at a point intermediate between said trunnion-pin and the pivot of said first-mentioned lever.

2. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a housing for the fixed roll, a lever pivoted to the mill-frame and carrying at its upper end a trunnion-pin, means, substantially as described, for adjusting the distance between the pivot of said lever and its trunnion-pin, an adjusting-screw for adjusting such lever, a lever pivoted upon said trunnion-pin and carrying a box for the movable roll, and a spring acting upon both said levers.

3. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a housing for the fixed roll, a lever pivoted to the mill-frame and carrying a trunnion-pin, a lever pivoted upon said trunnion-pin and carrying a box for the movable roll, a spring acting upon both said levers, a nut, and an adjusting-screw engaging said first-mentioned lever and said nut to move said trunnion-pin toward said nut against the resistance of said spring.

4. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a housing for the fixed roll, lever K, pivoted to the mill-frame, trunnion-pin I, journaled in said lever, adjusting-screw M, engaging said lever and a nut, lever N, provided with box H and pivoted to said trunnion-pin, spring Q, and spring-screw P.

5. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a housing for the fixed roll, lever K, pivoted to the mill-frame and carrying a trunnion-pin, an adjusting-screw for adjusting said lever, hollow lever N, inclosing said first-mentioned lever and pivoted thereto and carrying a box for the movable roll, and a spring arranged to act upon both said levers.

6. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a housing for the fixed roll, a wrist, J, in the mill-frame, lever K, carrying a trunnion-pin and provided at its foot with nuts engaging said wrist, an adjusting-screw to serve in adjusting said lever and altering the position of said trunnion-pin, lever N, carrying box H and pivoted to said first-mentioned lever, and a spring acting on both said levers.

7. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a fixed-roll housing, C, secured to the mill-frame and carrying a box for the fixed roll, and an outwardly-open cup, a pivoted lever supported by the mill-frame and carrying a box for the movable roll, an adjusting-screw connecting said lever and a nut at the fixed-roll housing, spring Q, seating in said spring-cup, and spring-screw P, reaching from said spring to said lever.

8. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, boxes for said rolls provided with cap-receiving surfaces arranged in horizontal planes upon the non-wearing side of the journals and in angular planes upon the wearing side of the journals, caps secured to said boxes and engaging said surfaces, and tangential chambers 8, extending through the caps and past the non-wearing side of the journals into the boxes and below the level of the bottom of the journals.

9. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, boxes for said rolls provided with cap-receiving surfaces arranged in horizontal planes upon the non-wearing side of the journals and in angular planes upon the wearing side of the journals, caps secured to said boxes and engaging said surfaces, tangential chambers 8 in said caps and boxes at the non-wearing side of the bearing, and gaskets interposed in the horizontal joints between said boxes and caps and across said chambers.

10. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a feed-roll, a hopper, a spring-pressed feed-gate forming a wall of the hopper and arranged to have its edge act in conjunction with said feed-roll, a hopper-back, an agitator pivoted to such hopper-back, and having its lower edge contiguous to said feed-roll, and connecting-rods engaging said agitator and feed-gate.

11. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a hopper, a feed-roll, a hopper-back, a feed-gate with its lower free edge contiguous to said feed-roll and with its upper edge pivoted to the hopper, and a flexible packing at the ends of the hopper engaging the feed-gate and extending at the foot of the feed-gate from said feed-gate to said hopper-back.

12. In a roller-mill, the combination, substantially as set forth, of a mill-frame, a pair of mill-rolls, a hopper, a feed-roll, feed-gate W, hopper-back V, agitator Y, wire Z, engaging said agitator and feed-gate, and clip c, engaging such agitator and wire.

398,340. HAT-MEASURE. ALEXANDER B. MCDONALD, Brooklyn, N. Y. Filed July 23, 1888. Serial No. 280,965. (No model.)



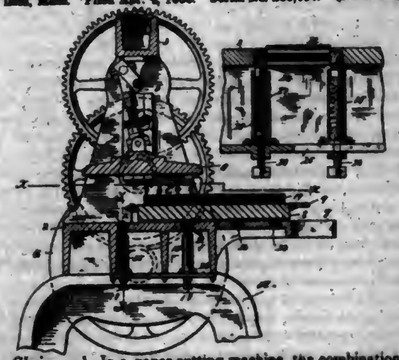
Claim.—1. A hoop-like hat-measure or measuring device with two inwardly-projecting thumb-pieces, *b* and *b'*, on one of its ends and a thumb-piece, *d*, on its other end, arranged between said thumb-pieces *b* and *b'*, whereby the said measure may be conveniently expanded and contracted.

2. A hat-measure consisting of a band, as A, of suitable resilient material, having overlapping ends and suitable keepers, an outwardly-projecting flange, as *g*, on the band, having on its upper face numbered graduations *x*, and a pointer, as *c*, carried by one end of said band and arranged to play over the margin of the flange *g* when the loop of the band is expanded and contracted, substantially as set forth.

3. A hat-measure consisting of a resilient band, as A, having overlapping ends, one of which is embraced by keepers on the other, and said band provided with outwardly-projecting flanges *g* and A, the former bearing numbered graduations, and with a pointer, *c*, and thumb-pieces *d b b'*, substantially as set forth.

4. A hat-measure consisting of a resilient band having overlapping ends, one of which is embraced by keepers on the other, said band being provided with inwardly-projecting thumb-pieces for contracting and expanding the band, one of said thumb-pieces being constructed of two telescoping parts and hinged at its end to the band, as set forth.

398,341. PAPER-CUTTING MACHINE. ELISHA MORGAN, Springfield, Mass. Filed Apr. 4, 1888. Serial No. 269,637. (No model.)



Claim.—1. In a paper-cutting machine, the combination, with the bed provided with vertically-movable journal-bearings, of rollers supported in said bearings, the cutter-board resting and movable on said rolls, the reciprocating platen, and a cutter, substantially as and for the purpose described.

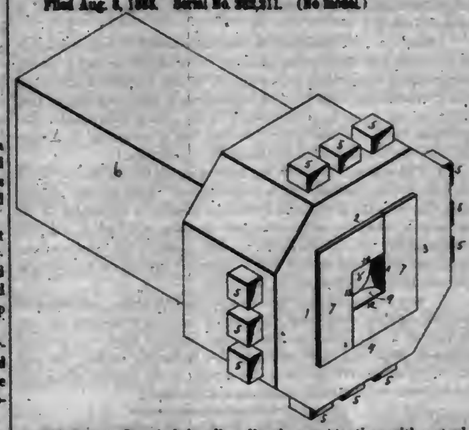
2. In a paper-cutting machine, the combination, with the bed provided with vertically-movable journal-bearings and sustaining-springs therefor, of rollers supported in said bearings, the cutter-board resting and movable on said rolls, the reciprocating platen, and a cutter, substantially as and for the purpose described.

3. In a paper-cutting machine, the combination, with the bed provided with vertically-movable journal-bearings, sustaining-springs therefor, and vertically-adjustable bearings for the lower ends of said springs, of rollers supported in said bearings, the cutter-board resting and movable on said rolls, the reciprocating platen, and a cutter, substantially as and for the purpose described.

4. In combination, the bed 2 of a paper-cutting machine, one or more cutter-board-sustaining rollers hung to rotate in said bed, whose peripheries project normally above the plane thereof, a cutter-board capable of a reciprocating horizontal movement on said rollers, and a brushing device, substantially as described, attached to one end of said board, having one end thereof in contact with the surface of said bed, substantially as set forth.

5. In combination with the bed of a paper-cutting machine, a cutter-board-sustaining roller, substantially as described, hung to rotate in said bed, the cylinders 15, supported vertically under said bed, the roller journal-bearings 14, having their lower ends entering said cylinders, the springs 17, constituting yielding supports for said bearings, and the screw-bolts 18, sustaining said springs, substantially as set forth.

398,342. BOLT-HEADING TOOL. FREDERICK MOTHNER, Rockford, Ill., assignor of one-half to the Rockford Bolt Works, same place. Filed Aug. 8, 1888. Serial No. 282,211. (No model.)

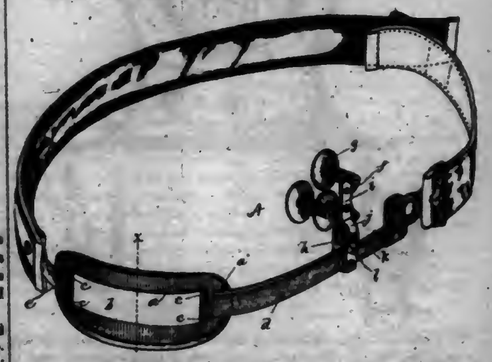


Claim.—1. In a bolt-heading die, the combination, with a stock, of sections held in place in said stock and made endwise reversible, substantially as set forth.

2. In a bolt-heading die, the combination, with the stock, of rectangular sections arranged in said stock and made endwise reversible, and set-screws for holding said sections in place, substantially as set forth.

3. In a bolt-heading die, the combination, with a stock and rectangular sections removably and reversibly secured therein, of a block placed between said sections and provided with a concave face and set-screws for holding said sections in position, substantially as set forth.

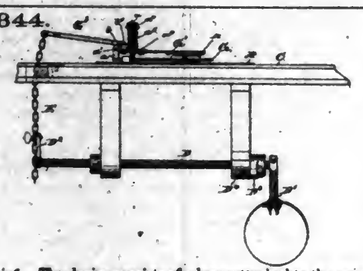
398,343. TRUSS. SHERMAN R. NYE, Chicopee Falls, Mass. Filed Dec. 24, 1887. Serial No. 258,899. (No model.)



Claim.—In a truss, the combination, with a short hip-pad, *a*, of a hernial-pad-supporting arm, *d*, hinged or pivoted thereto, substantially as and for the purposes set forth.

398,344. CLAMP-OPERATING MECHANISM FOR SUTTON-HOLE SEWING-MACHINES. FREELAND W. OSTRUM, Bridgeport, Conn., assignor to The Wheeler & Wilson Manufacturing Company, same place. Filed May 20, 1886. Serial No. 202,732. (No model.)

398,344.



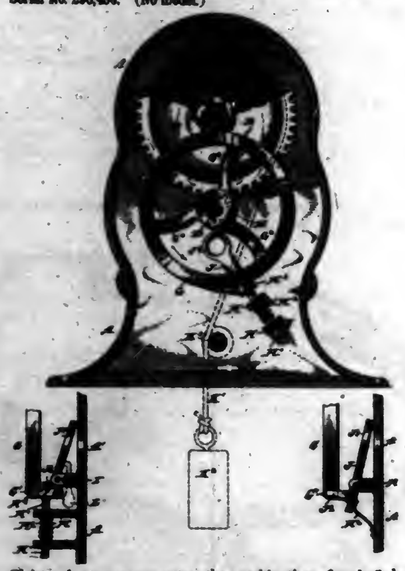
Brief.—The device consists of a lever attached to the upper member of the clamp and extending rearwardly therefrom. A chain or other flexible connecting device is attached to this lever and to a lever below the work-plate, which can be operated by the knee or foot to raise the clamp.

Claim.—1. The combination, with the stitch-forming mechanism, of a button-hole sewing-machine and a cloth-holding clamp having reciprocating movements in opposite directions parallel to the length of the button-hole while the said button-hole is being stitched, an arm G^2, projecting from the cloth-holding clamp, a lever constructed to be operated by an operator's knee or foot, and a connector interposed between the arm and lever, substantially as described.

2. The combination, with the stitch-forming mechanism, of a button-hole sewing-machine and a cloth-holding clamp having reciprocating movements in opposite directions parallel to the length of the button-hole while the said button-hole is being stitched, an arm, G^2, pivoted to the cloth-holding clamp, a lever constructed to be operated by an operator's knee or foot, and a connector interposed between the arm and lever, substantially as described.

3. In a button-hole sewing-machine, the bed-plate, combined with the cloth-holding clamp and a button for securing it thereto, the arm G^2, hinged to the upper member of the clamp, a knee or foot lever arranged below the table, and a flexible connector uniting the arm and lever, and at the same time permitting of the tipping of the sewing-machine, substantially as shown and described.

398,345. CIGAR-CUTTER. FRANK A. PHILLIPPI, Reading, Pa., assignor of one-half to Samuel Lutz, same place. Filed Nov. 10, 1888. Serial No. 290,436. (No model.)



Claim.—1. In a cigar-cutter, the combination of a shaft having a gear and spring mounted thereon with a shaft provided with a pinion adapted to mesh with said gear, and having a cutter-wheel mounted at one side, and with devices for releasing the cutter-wheel to permit the spring and intermediate mechanism to rotate the same, substantially as specified.

2. In a cigar-cutter, the combination of a shaft having a gear and a spring mounted thereon, or its described equivalent, with a shaft provided with a pinion adapted to mesh with said gear, and having a cutter-wheel mounted at one side and provided with stops, and devices, substantially as shown and described, for releasing the cutter-wheel, substantially as specified.

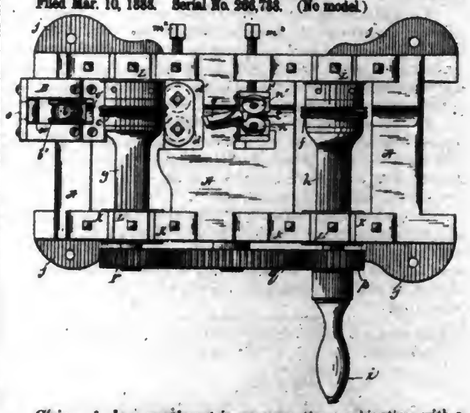
3. In a cigar-cutter, the combination of a shaft having a gear and spring mounted thereon with a shaft provided with a pinion meshing with said gear, and having a cutter-wheel mounted at one side thereof provided with stops, and with a cam-lever pivoted near the wheel and adapted to project into the path of the stops, substantially as specified.

4. In a cigar-cutter, the combination of a shaft having a spring and gear mounted thereon, a shaft provided with a pinion adapted to mesh with said gear, and with a cutter-wheel provided with stops and cutter-arms, and with a cam-lever provided with a cigar-receiving opening in one end, and with a spring-bolt arranged below the cam end thereof and projecting into the path of the stops, substantially as specified.

5. The combination, with the case A, having the opening A', of the shaft B, carrying the spring C and gear D, the shaft E, carrying the pinion F and the cutter-wheel G, having cutting-arms G^2 and peripheral stops G', the cam-lever J, and the spring-bolt H', substantially as specified.

6. The combination of the cutter-wheel G and devices for actuating the same with the lever J, having the cam at one end adapted to come into contact with the stops on the wheel, and a spring for retaining the same in said contact, and provided with an opening at its opposite end and adapted to be thrown into surface contact with the cutter-arms of the wheel, substantially as specified.

398,346. MACHINE FOR MAKING WEATHER-STRIPS. JOSIAH POTTON, New York, N. Y., assignor to Charles R. Vincent, same place. Filed Mar. 10, 1888. Serial No. 266,788. (No model.)



Claim.—1. In a weather-strip machine, the combination, with a set of rolls for beading the metallic strips, of a set of wrapping-rolls comprising a vertical double-grooved roll and two diagonal single-grooved rolls for inclosing an elastic cushion in one of the beads of the strips, and the clinching-rolls for finally securing the bead upon the said cushion, substantially as and for the purpose set forth.

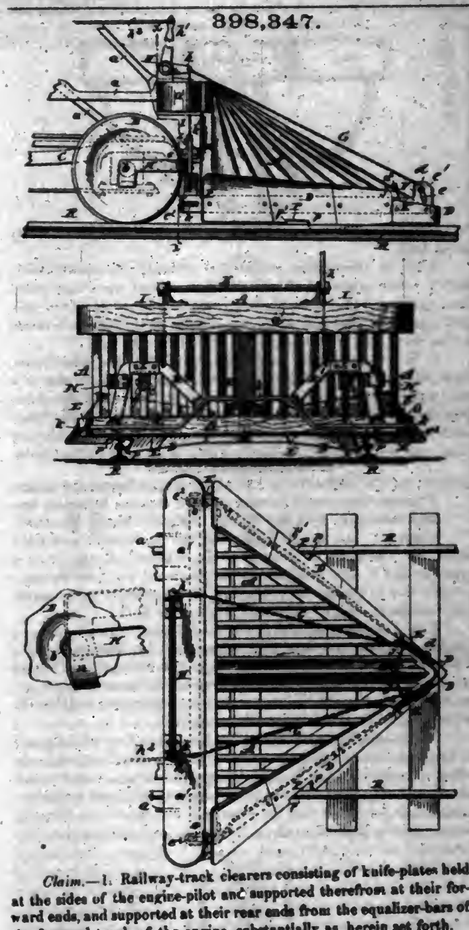
2. In a weather-strip machine, the combination, with a pair of feed-rolls for bending the metallic strips, of the revolving forming-rolls provided with double grooves, the horizontal forming-rolls for turning over the edges of the beads, the wrapping-rolls for inclosing an elastic cushion in one of the beads of the strips, and the revolving clinching-rolls for securing the cushion in said bead, substantially as and for the purpose set forth.

3. In a weather-strip machine, the combination, with a set of rolls for beading the metallic strips, of the vertical wrapping-roll *l* and diagonal wrapping-rolls *n n'*, the guide *c*, secured in front of the wrapping-rolls, whereby the elastic cushion is inserted in one of the beads of the strips, and the revolving clinching-rolls journaled behind said wrapping-rolls and securing the cushion in the bead, substantially as and for the purpose set forth.

4. In a weather-strip machine, the combination, with the supporting-frame, of the entering-roll *a* and feed-rolls *b b'*, journaled at the front end of the frame, the guide-plates *c* and *c'*, the forming-rolls *c* and *c'*, provided with toothed wheels for revolving them, the horizontal forming-rolls journaled behind the aforesaid forming-rolls, a set of wrapping-rolls for inclosing an elastic cushion in one of the beads of the strips, and the clinching-rolls journaled at the rear of the machine and provided with toothed wheels for rotating them, substantially as and for the purpose set forth.

398,347. TRACK-CLEANER. AUGUSTUS F. PRIEST, Fort William, Ontario, Canada. Filed July 3, 1888. Serial No. 278,094. (No model.)

398,347.



Claim.—1. Railway-track clearers consisting of knife-plates held at the sides of the engine-pilot and supported therefrom at their forward ends, and supported at their rear ends from the equalizer-bars of the forward truck of the engine, substantially as herein set forth.

2. Railway-track clearers consisting of knife-plates held at the sides of the engine-pilot and extending to the nose or front thereof clear across the track, and supported at their front ends from the pilot and at their rear ends from the equalizer-bars of the forward truck of the engine, substantially as herein set forth.

3. Railway-track clearers consisting of knife-plates hung at the sides of the engine-pilot and supported therefrom at their forward ends, and supported at their rear ends from the equalizer-bars of the forward truck of the engine, and said clearer-plates made vertically adjustable, substantially as herein set forth.

4. Railway-track clearers consisting of knife-plates hung at the sides of the engine-pilot and supported therefrom at their forward ends, and supported at their rear ends from the equalizer-bars of the forward truck of the engine, and said clearer-plates extending to the nose of the pilot or clear across the track and made vertically adjustable, substantially as herein set forth.

5. Railway-track clearers consisting of knife-plates held at the sides of the engine-pilot and guide bars or plates connected to the clearer-plate supports and overlapping the sides of the pilot truck-wheels or the ends of their axle, substantially as described, whereby the lateral position of the clearer-plates will be controlled by the forward truck of the engine, as set forth.

6. Railway-track clearers consisting of knife-plates held at the sides of the engine-pilot and supported therefrom at their forward ends and supported at their rear ends from the equalizer-bars of the forward truck of the engine, and guide bars or plates connected to the clearer-plate supports and overlapping the sides of the pilot truck-wheels or the ends of their axles, substantially as described, for the purposes set forth.

7. Railway-track-clearer knife-plates consisting of re-enforcing bars held to the sides of the engine-pilot and brittle or hard metal sectional plates secured to the re-enforcing bars, substantially as herein set forth.

8. The combination, in railway-track clearers and with the engine-pilot, of bars E E, having front slots, *c*, bolts *d*, passed through said slots into the pilot or a plate thereon, a shaft, H, on the engine, chains G, connecting the bars E to said shaft or arms thereon, a frame, K, supported on front extensions of the equalizer-bars of the forward truck of the engine and entering slots at the rear ends of the bars E, detents preventing lateral disengagement of the parts E K, chains I, connecting the frame K with the shaft H or its arms, and clearer-knives held to the bars E E and adapted when down to clear the track, substantially as herein set forth.

9. In railway-track clearers, the combination, with clearer-knife bars E E, hung at the front of the engine-pilot and provided with looped rear end parts, e^2, of a frame, as K, supported on front extensions of the equalizer-bars of the pilot-truck and entering slots in the ends e^2 of the bars E, and bolts or pins O, passed into the loops e^2 and into the frame K, substantially as herein set forth.

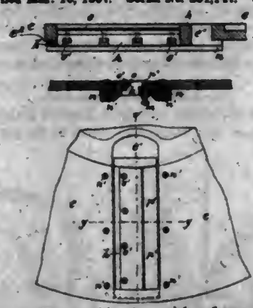
10. In railway-track clearers, the combination, with the clearer-knives or their re-enforcing bars and a frame suspending the rear ends of the clearers from front extensions of the equalizer-bars of the forward truck of the engine, of a wear plate or plates, as L M, held to the equalizer-bar or clearer-frame, one or both, and acting also to allow vertical adjustment of the back ends of the clearers relatively to the track to accommodate wear of the boxes of the pilot-wheel bearings of the engine, substantially as herein set forth.

11. In railway-track clearers, the combination, with the clearer-knife-supporting bars and a frame, as K, hung from the equalizer-bars of the front pilot of the engine, and on which the rear ends of the clearers are supported, of arms N N, held to the frame K and provided with depending lugs *n n*, substantially as described, for the purposes set forth.

12. In railway-track clearers, the combination, with the engine-pilot and vertically-adjustable clearer-knives or their supporting-bars hung therefrom, of safety chains or devices, as J, connected to the clearers and to the pilot, substantially as herein set forth.

13. In railway-track clearers, the combination, with the engine-pilot, of vertically-adjustable clearer-knives or their supports, having slots *c*, bolts or pins *d*, entering the slots into the pilot or a plate thereon, and said slots having beveled or inclined lower end walls, substantially as herein set forth.

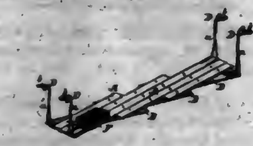
398,348. SUGAR-CANE-SLICING MACHINE. CARL RABE, Sangerhausen, Prussia, Germany, assignor to the Sangerhäuser Actien-Maschinen-Fabrik and Eisengiesserei, vorm. Hornung & Rabe, same place. Filed Mar. 16, 1887. Serial No. 231,147. (No model.)



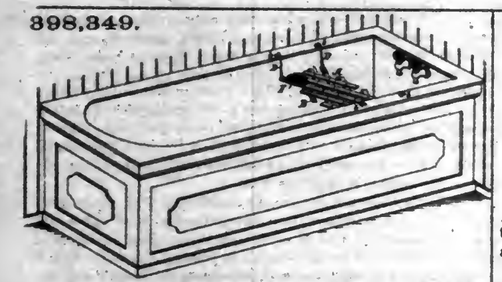
Claim.—1. The combination, with a frame having a chamber provided with a covering-plate and a feed-hopper delivering the cane through said plate, of the rotary disk *c*, having a radial slot, *c'*, and a recess, c^2, at the under side of the periphery of the disk communicating with the slot, the side bars, *n*, the boxes *k*, carrying a cutter, *o*, resting on the side bars and having an outer reduced end or tenon, *k'*, entering the said recess and engaging under the peripheral portion of the disk, substantially as described.

2. The combination of the cutting-disk *c*, having a radial slot, *c'*, and a recess, c^2, under the peripheral portion communicating with the slot, with the cutter-carrying box *k*, having a reduced outer end or tenon, *k'*, entering said recess and engaging under the peripheral portion of the disk, substantially as described.

398,349. BASIN-RACK FOR BATH-TUBS. LOUIS D. REYN, Philadelphia, Pa. Filed Nov. 22, 1887. Serial No. 256,867. (No model.)



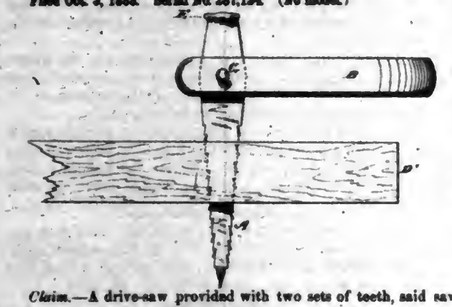
398,349.



Claim.—1. The within-described supporting-rack for bath-tubs, said rack comprising two sets of bars crossing each other and pivoted together at the crossing-points, in combination with hangers each secured to the end of a bar of the rack, but free from connection with any of the adjacent bars, all substantially as specified.

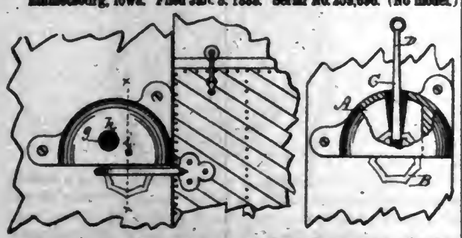
2. The combination of the rack comprising two sets of bars, crossing each other and pivoted together at the crossing-points, with hangers having projecting heads and flexible shanks, each hanger being secured to the end of a bar of the rack, but free from connection with any of the adjacent bars, all substantially as specified.

398,350. DRIVE-SAW. GRANVILLE T. SHEPLEY, Townsend, Mass. Filed Oct. 3, 1888. Serial No. 287,124. (No model.)



Claim.—A drive-saw provided with two sets of teeth, said saw coming to a point at its outer end and concaved upon both sides, the saw being movable upon a pivot within the handle thereof, substantially in the manner described and shown, and for the purposes set forth.

398,351. GATE-LATCH. ALEXANDER SIME and WILLIAM M. MOORE, Emmetsburg, Iowa. Filed Jan. 3, 1888. Serial No. 259,696. (No model.)



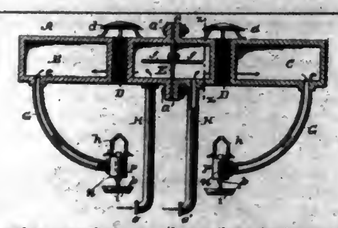
Claim.—1. A hollow metal case adapted to be fixed to a flat surface, having an open bottom, an opening in its top, and vertical grooves in the inside faces coinciding with the opening in the top, and a ring and a yoke combined therewith, to operate in the manner set forth for the purposes stated.

2. A hollow metal case, A, having perforated ears or flanges, an open bottom, an opening in its top, a ring, B, a yoke C, and a fixed stop, F, arranged and combined with a gate or door in the manner set forth, for the purposes stated.

3. In a gate-latch, the combination of an adjustable screw and a ring with a case having a screw-threaded key-hole, to operate in the manner set forth, for the purposes stated.

398,352. PETROLEUM-BURNER. FREDERICK H. SMITH and JOHN W. WRIGHT, Kansas City, Mo., assignors of one-third to Samuel R. Strathan, same place. Filed Nov. 21, 1888. Serial No. 291,455. (No model.)

Claim.—1. The combination, with a retort having two joined chambers and a diaphragm-wall provided with two deflector-plates, as shown, of two curved depending oil and vapor conveying pipes,



two aero-carbon-vapor burners, and two oil-supply pipes, substantially as set forth.

2. In an aero-carbon gaseous-fuel generator, the combination, with a retort composed of two chambers having open ends which abut against a joint-wall that is interposed between them, of two integral depending pipes and aero-carbon-vapor burners that are affixed to the lower ends of these pipes, substantially as set forth.

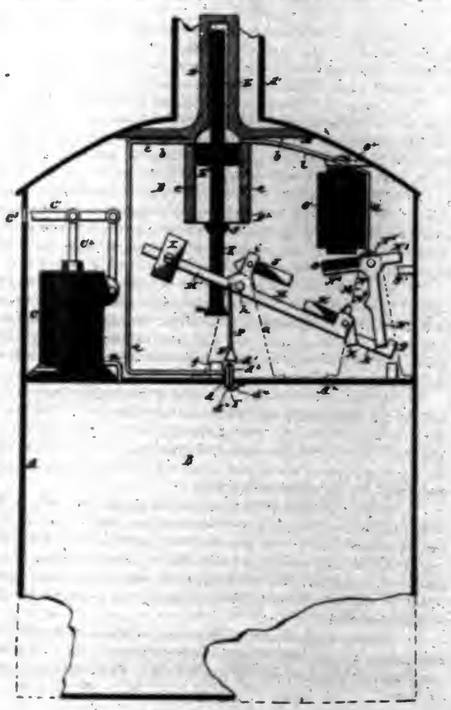
3. In an aero-carbon gaseous-fuel generator, the combination, with two chambers having open ends, a diaphragm-plate that is a joint-wall between these chambers, and bolts to connect the chambers detachably, of two oil-feed pipes that are formed on the lower walls of the chambers, two depending curved oil and vapor conveying pipes, and two aero-carbon-vapor burners, substantially as set forth.

398,353. SEMAPHORE-SIGNAL. FREDERICK STITZEL and CHARLES WEINEDEL, Louisville, Ky., assignors to the American Semaphore Company, same place. Filed Mar. 24, 1888. Serial No. 268,406. (No model.)

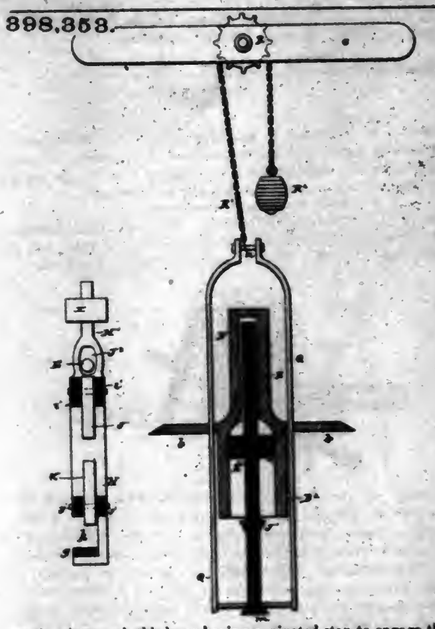
Claim.—1. In a signaling apparatus, the combination, with a cylinder and piston-rod, of a visual signal connected with the latter, a lever pivoted in close proximity to the piston-rod, this lever having a pivoted stop to engage the piston-rod, and mechanism to automatically release the pistop-rod, substantially as set forth.

2. In a signaling apparatus, the combination, with a cylinder, a piston, and piston-rod, of a signal-blade connected with the latter, a fluid-pressure supply-pipe communicating with the cylinder, a lever pivoted in close proximity to the piston-rod, this lever having a pivoted stop to engage the piston-rod, and mechanism to automatically release the piston-rod, substantially as set forth.

3. In a signaling apparatus, the combination, with a cylinder made in two parts, one of said parts being larger in circumference than the other, of a piston in the larger portion, a piston-rod secured to said piston and adapted to reciprocate in both sections of the cylinder, a signal-blade connected with the piston-rod, a fluid-pressure inlet-pipe communicating with the cylinder, a lever pivoted in close proximity



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to the piston-rod, this lever having a pivoted stop to engage the piston-rod, and mechanism to automatically move the stop to release the piston-rod, substantially as set forth.

4. In a signaling apparatus, the combination, with a cylinder having inlet and outlet ports, of a piston and piston-rod, enlargements on the rod, a lever pivoted in close proximity to the piston-rod, this lever having a pivoted stop to engage one of said enlargements, a signal-blade connected with the piston-rod, and mechanism to automatically release the piston-rod to display the signal, substantially as set forth.

5. In a signaling apparatus, the combination, with a cylinder and a piston and piston-rod, of a yoke or frame attached to the latter near its lower end and extending upwardly above the piston, a visual blade connected with the yoke, fluid-pressure inlet and outlet ports communicating with the cylinder, a pivoted stop to engage an enlargement on the piston-rod, and mechanism to automatically release said piston-rod and permit it and the yoke to rise and cause the signal-blade to be turned, substantially as set forth.

6. In a signaling apparatus, the combination, with a cylinder having perforated bosses on its exterior, and a piston and piston-rod, of a yoke or frame pivoted to the piston-rod near its lower end and passing through the perforated bosses on the cylinder, a visual-signal blade, a sprocket-wheel on the shaft of said blade, a chain carrying a weight at one end and connected at its opposite end to the yoke, and mechanism for actuating said piston to operate the signal-blade, substantially as set forth.

7. In a signaling apparatus, the combination, with a structure, a fluid-reservoir therein, and a pump for forcing fluid into said reservoir, of a cylinder, a pipe for connecting the reservoir with said cylinder, a valve in said pipe, a piston and piston-rod in the cylinder, a signal-blade connected with the piston-rod, and mechanism for operating the valve automatically just before the downward movement of the piston-rod to admit fluid to the cylinder, substantially as set forth.

8. In a signaling apparatus, the combination, with a fluid-reservoir, of a cylinder, a pipe connecting the reservoir and cylinder, a valve in said pipe, a piston and piston-rod in the cylinder, a visual signal connected with the piston-rod, a pivoted lever, a depending rod pivoted thereto, and mechanism for operating the lever to cause the depending rod to strike the valve and open the same, substantially as set forth.

9. In a signaling apparatus, the combination, with a fluid-reservoir, a cylinder, a piston and piston-rod, and a signal-blade connected with the latter, of a pipe connecting the reservoir and cylinder, a double valve communicating with the pipe, said valve being held open at one end by a spring, a pivoted lever carrying a depending rod, and mechanism to turn said lever and cause the depending rod to strike the valve to close one end and open the other, substantially as set forth.

10. In a signaling apparatus, the combination, with a cylinder, a piston and piston-rod therein, and a signal-blade connected with the latter, of a pivoted lever, a stop to engage an enlargement on the piston-rod, a T-lever to support one end of the first-mentioned lever and carrying an armature, and an electro-magnet to actuate said armature, substantially as set forth.

11. In a signaling apparatus, the combination, with a cylinder, a piston and piston-rod therein, and a signal-blade connected with the latter, of a lever carrying a counterbalance-weight, a stop pivoted to the lever to engage an enlargement on the piston-rod, a second pivoted stop near one end of the lever, a T-lever having an enlargement to engage this pivoted stop, an armature carried by the T-lever, and an electro-magnet to actuate the armature, substantially as set forth.

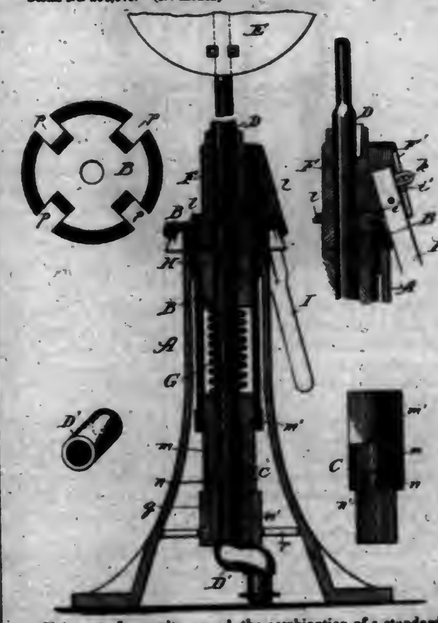
12. In a signaling apparatus, the combination, with a cylinder, a piston and piston-rod therein, and a signal-blade connected with the piston-rod, of a reservoir, a pipe connecting the cylinder and reservoir, a valve between the pipe and reservoir, a pivoted lever carrying a pivoted stop to engage an enlargement on the piston-rod, a pendulum-rod pivoted to the lever and adapted to strike the valve, an enlargement on the end of the piston-rod to strike the pendulum-rod to disengage the latter from the valve, a T-lever to support one end of the first-mentioned lever and carrying an armature, and an electro-magnet to attract said armature and retain the T-lever in place, substantially as set forth.

13. In a signaling apparatus, the combination, with a fluid-reservoir, a cylinder, a piston and piston-rod therein, and a signal-blade connected with the piston-rod, of a pipe connecting the reservoir and cylinder, a valve between the pipe and reservoir, a pivoted lever carrying an armature, an electro-magnet to attract said armature, a pipe connected with the cylinder and terminating above the lever, and a washer carried by said lever and adapted to close the end of the pipe, substantially as set forth.

14. In a semaphore-signaling apparatus, the combination, with the railroad-tracks, of a battery and an electro-magnet connected with said tracks at opposite ends of a block, a lever carrying an armature, a fluid-reservoir, a cylinder, a pipe connecting the reservoir and cylinder, a valve between the pipe and reservoir, a piston and piston-rod in the cylinder, a signal-blade connected with the piston-rod, and mechanism for operating the valve to admit fluid to the cylinder when the magnet is energized, substantially as set forth.

15. In a signaling apparatus, the combination, with a fluid-cylinder, a piston and piston-rod therein, and a visual signal connected with said rod, of a vibrating lever having an armature, an electro-magnet to attract the armature, a pipe connected with the cylinder and terminating near the armature, and mechanism carried by said lever and adapted to open and close the pipe, substantially as set forth.

398,354. SWITCH-STAND. AXEL A. STROM, Austin, assignor to the Strom Manufacturing Company, Chicago, Ill. Filed Nov. 26, 1888. Serial No. 291,575. (No model.)



Claim.—1. In a switch-stand, the combination of a standard, A supporting the lower stationary part, n, of a clutch, C, a recessed annular table, E, having a sleeve, E', extending into the standard, the

upper part, *m*, of the clutch extending into the lower end of the sleeve B' and longitudinally but not axially movable therein, a spindle, D, extending through the standard and clutch, a crank, D', at the end of the spindle, a spring, G, surrounding the spindle in the sleeve B' and pressing on the clutch, a yoke, F, secured to the spindle and confining the spring at its upper end, and an operating-lever, I, substantially as described.

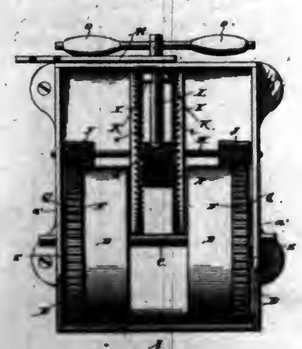
2. In a switch-stand, the combination of a standard, A, supporting a rectangular socket, *q*, a clutch, C, having a lower part, *n*, provided with a rectangular shank, *n'*, fitting into the socket *q*, a recessed annular table, B, having a sleeve, B', extending into the standard and rectangular on its interior near the lower end, the upper part, *m*, of the clutch having a rectangular shank, *m'*, fitting into the lower end of the sleeve B' and longitudinally movable therein, a spindle, D, extending through the standard and clutch, a crank, D', at the lower end of the spindle, a yoke, F, secured to the spindle, a spring, G, confined in the sleeve B' between the clutch and yoke, and an operating-lever I, substantially as described.

3. In a switch-stand having an annular peripherally-recessed revoluble table normally interlocked with the spindle and a clutch having a stationary part, and a rotary part actuated against the resistance of a confined spring, G, by turning the interlocked spindle, a yoke, F, secured to the spindle and provided with a flange, *l*, and extending below the flange into the opening in the table, and a lever, I, pivotally connected with the yoke and normally extending into a peripheral recess in the table, substantially as described.

4. A switch-stand comprising, in combination, a standard, A, having in its base a web, *r*, rigidly supporting a rectangular socket, *q*, a clutch, C, having a lower part, *n*, provided with a rectangular shank, *n'*, fitting into the socket *q*, a recessed annular table, B, having a sleeve, B', extending into the standard and rectangular on its interior near the lower end, the upper part, *m*, of the clutch having a rectangular shank, *m'*, fitting into the lower end of the sleeve B' and longitudinally movable therein, a spindle, D, extending through the standard and clutch and having a crank, D', at its lower end, a yoke, F, secured to the spindle and provided with a flange, *l*, and extending below the flange into the opening in the table, a spring, G, surrounding the spindle in the sleeve B', a sleeve, H, in the sleeve B' between the upper end of the spring and the yoke, and an operating-lever, I, substantially as described.

398,355. SPRING-MOTOR. HIRAM L. SUYDAM, Geneva, N. Y.

Filed Nov. 2, 1888. Serial No. 289,838. (No model.)



Claim.—1. The combination, in a spring-motor, of the frame, the main shaft journaled in the frame, the drive-wheels and springs arranged at the ends of the main shaft, the shaft H, carrying pinions meshing with the drive-wheels, and the scape-wheels mounted upon the said shaft H and provided upon their inner faces with teeth, substantially as described.

2. The combination, in a spring-motor, of the frame, the main shaft journaled in the frame, the drive-wheels and springs arranged at the ends of the said shaft, the shaft H, carrying pinions meshing with the drive-wheels, the scape-wheels mounted upon the shaft H, and the rock-shaft arranged between the scape-wheels and provided with the pallets adapted to be alternately engaged by the scape-wheels, substantially as described.

3. The combination, in a spring-motor, of the frame, the main shaft journaled in the frame, the drive-wheels and the spring arranged on said shaft, the shaft H, carrying the pinions meshing with the drive-wheels, the scape-wheels mounted upon the shaft H, the rock-shaft arranged between the scape-wheels and provided with pallets adapted to be alternately engaged by the scape-wheels, the lever, and the weighted arms, substantially as described.

398,356. CASH-CARRIER. MOSES C. SWEEZY, New Haven, Conn.

Filed Oct. 8, 1888. Serial No. 287,511. (No model.)



Claim.—In a store-service apparatus, a track-wire having near its termination a gradual enlargement formed by an overlay of wire wound thereon, said enlargement being adapted to gradually stop a car traveling on said track, all substantially as described.

398,357. SAW-SETTING DEVICE. WILLIAM TRAUDE, Louisville, Ky., assignor of two-thirds to W. W. Barnes and Guy C. Sibley, both of same place. Filed Nov. 12, 1888. Serial No. 290,601. (No model.)



Claim.—1. In a saw-set, the combination, with the crank, the cam on its shaft, and the pivoted notched thrower-plate for setting the teeth, of the intermittently-operating lever, the feed-pawl, and the adjustable devices regulating its stroke, substantially as specified.

2. The combination, with the side plate having the bearings, of the roller having the cam-groove, the pivoted plate N, having its end extended into said cam-groove, the pivoted set-disk, and the operating-crank, substantially as specified.

3. The combination of the side plate, A, having the bearings, the roller journaled in said bearings and having the annular cam-groove, the crank, the pivoted plate having the lug extended into the cam-groove, the pivoted set-disk secured to said plate, and the guide-plate D, having the bolt extended through an opening in the side plate, substantially as specified.

4. The combination, with the side plate, A, having the transverse bearing portion, the pivoted plate N, and the set-disk, of the roller having the cam-groove, the lugs on its extended journal, the pivoted lever M, having the eccentric within its ring end and the pin on its opposite end, and the graduated bar and the pawl pivoted thereon, substantially as specified.

5. In combination with the bearing-plate A, the cam-groove roller, the pivoted plate engaging the pivoted set-disk, and the pivoted lever M, the graduated bar seated in the grooved lateral bed-plate, the spring-controlled pawl pivoted to the bar, the yoke having the extension, the thumb-screw, and the returning spring, substantially as specified.

6. In a saw-set, the combination, with the slide-bar, the intermittingly-acting lever, and the operating mechanism, of the height-guide having the slot-opening and the inwardly-projecting portion, and the fastening-screw, substantially as specified.

7. In a saw-set, the combination, with a notched oscillating thrower-plate for setting the teeth, the adjustable height-guide, a slide-bar carrying a feeding-pawl, and an intermittently-acting stroke-lever, of a shaft having a turning-crank, and carrying devices to operate said thrower-plate and lever, substantially as specified.

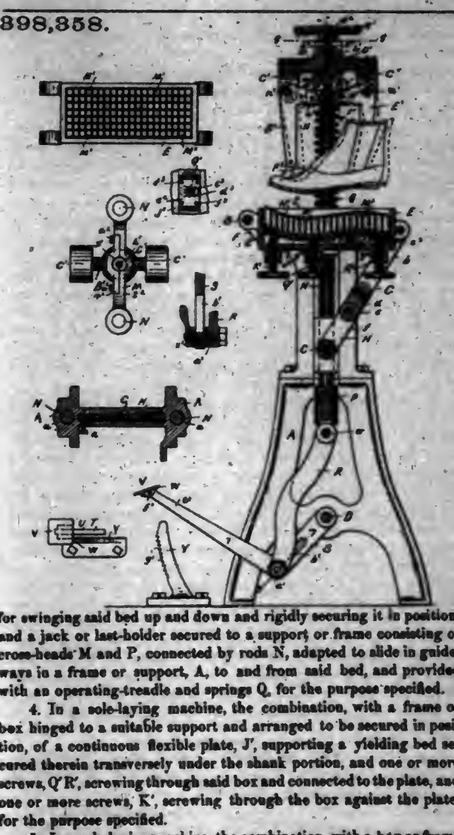
398,358. SOLE-LAYING MACHINE. ALFRED T. TREGURTHA Everett, assignor to Henry A. Clark, Boston, Mass. Filed Oct. 20, 1888. Serial No. 288,634. (No model.)

Claim.—1. In a sole-laying machine, a molding or pressure bed hinged at the toe end to a suitable support and having a toggle-lever pivoted to its opposite end, and suitable means for operating said toggle-lever for swinging said bed up and down and rigidly securing it in position, and a jack or last-holder secured to and adapted to move up and down in suitable guideways in a suitable frame or support to and from said bed in the operation of the machine.

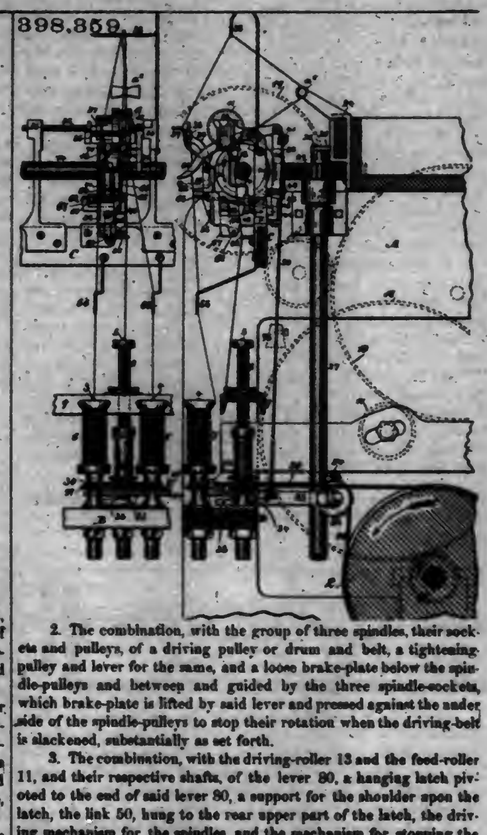
2. In a sole-laying machine, a molding or pressure bed hinged at the toe end to a suitable support and having a toggle-lever pivoted to its opposite end, and suitable means for operating said toggle-lever for swinging said bed up and down and rigidly securing it in position, and a jack or last-holder secured to a suitable frame or support by a ball-and-socket joint, and adapted to move up and down in suitable guideways in said frame or support to and from said bed in the operation of the machine.

3. In a sole-laying machine, a molding or pressure bed hinged at the toe end to a suitable support and having a toggle-lever pivoted to its opposite end, and suitable means for operating said toggle-lever

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for swinging said bed up and down and rigidly securing it in position, and a jack or last-holder secured to a support or frame consisting of cross-heads M and P, connected by rods N, adapted to slide in guideways in a frame or support, A, to and from said bed, and provided with an operating-treadle and springs Q, for the purpose specified.

4. In a sole-laying machine, the combination, with a frame or box hinged to a suitable support and arranged to be secured in position, of a continuous flexible plate, J', supporting a yielding bed secured therein transversely under the shank portion, and one or more screws, Q' R', screwing through said box and connected to the plate, and one or more screws, K', screwing through the box against the plate, for the purpose specified.

5. In a sole-laying machine, the combination, with a box or frame hinged at one end to a suitable support and having a toggle-lever pivoted to its opposite end, and suitable means for operating said toggle-lever for swinging said bed up and down and rigidly securing it in position, of a continuous plate, J', secured and arranged to be adjusted in said box, a sheet of india-rubber, and separate independent and removable blocks of india-rubber inclosed within said box, for the purpose specified.

6. In a sole-laying machine, a jack or last-holder having levers D' E', pivoted thereto, and each arranged by one of its arms to engage with a last and by its other arm to engage with a block or nut operated by a screw in a suitable support to swing said levers on their pivots, for the purpose specified.

7. In a sole-laying machine, a jack or last-holder having pivoted levers D' E', each arranged by one arm to engage with the last and by its other arm with a slot or slots, *t'*, in a block or nut operated by a screw, G', in a suitable support, for the purpose specified.

8. In a sole-laying machine, a jack or last-holder having pivoted levers D' E', the arm of one, E', of which is provided with a pivoted pin, v^3, to engage with the socket in the last, and having ratchet teeth z^3, for engagement therewith of a pawl, N', on the lever-arm for the purpose specified.

398,359. MACHINE FOR THROWING SILK. JOSEPH R. TYRAN Paterson, N. J. Filed Dec. 2, 1887. Serial No. 256,728. (No model.)

Brief.—The invention is a modification of and improvement upon the device described in Letters Patent No. 364,784, dated June 14, 1887.

Claim.—1. The combination, with the spindles, their sockets and pulleys, of a driving pulley or drum and belt, a tightening-pulley, and a lever for supporting and moving the tightening-pulley, a suspending link and latch for holding up the pulley-lever, the fallers, and mechanism for moving the latch off its support and allowing the pulley to descend and slacken the belt when one of the threads is broken, and a loose brake-plate below the spindle-pulleys and between and guided by the spindle-sockets, which brake-plate is lifted by the lever of the tightener-pulley and pressed against the under side of the spindle-pulleys to stop their rotation when said belt is slackened, substantially as set forth.

2. The combination, with the group of three spindles, their sockets and pulleys, of a driving pulley or drum and belt, a tightening-pulley and lever for the same, and a loose brake-plate below the spindle-pulleys and between and guided by the three spindle-sockets, which brake-plate is lifted by said lever and pressed against the under side of the spindle-pulleys to stop their rotation when the driving-belt is slackened, substantially as set forth.

3. The combination, with the driving-roller 13 and the feed-roller 11, and their respective shafts, of the lever 80, a hanging latch pivoted to the end of said lever 80, a support for the shoulder upon the latch, the link 50, hung to the rear upper part of the latch, the driving mechanism for the spindles, and the mechanism for stopping the same and the fallers, and intermediate mechanism, substantially as specified, for moving the shoulder of the latch off its support when the stop mechanism is to be brought into action, substantially as set forth.

4. The combination, with the feed-roller 11 and the driving-roller 13, of the faller-stand, the fallers pivoted upon the stand, the rocking lever 65, against which the fallers act, and the lever 80 and latch, and the claw for the roller to act upon in giving motion to the latch, substantially as set forth.

5. The combination, with the faller-stand and the feed and driving rollers, of the fallers pivoted to the faller-stand, the rocking lever and its claw, the detector having a finger that acts upon the rocking lever, the lever 80, and the latch 40, pivoted to said lever 80, substantially as and for the purposes set forth.

6. The combination, with the faller-stand, the feed and driving rollers, the rocking lever, lever 80, and latch, of pivoted fallers each having the hooked end projecting in one direction above the pivot and a nearly vertical counter-weight above and at the other side of the pivot, so that the hooked end bears with but little pressure on the thread and the power of the faller increases as it descends, substantially as specified.

7. The combination, with the starting-lever, of a latch pivoted at its upper end to the starting-lever, the link 50, pivoted to the latch at the rear portion thereof, so that the weight tends to move the latch toward its support, the fallers, feed and driving rollers, and intervening mechanism for acting upon the latch, substantially as set forth.

8. The combination, with the spindles, a driving drum and belt, a tightener-pulley, and its lever, of the lever 80, a link suspended from the starting-lever, a latch connected to the lever 80, a faller and a rocking lever with a claw and pushing-point acting against the latch, and a revolving roller acting against the claw to move the same endwise and disconnect the latch, substantially as specified.

9. The combination, with the spindles, a driving drum and belt, a tightener-pulley, and its lever, of the lever 80, a latch hanging from the end of the lever 80, and a link hung from its upper end and behind the latch, so as to limit the backward movement of the latch, and the mechanism, substantially as specified, for acting on the latch when a thread breaks, substantially as set forth.

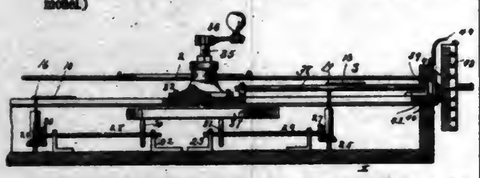
10. The combination, with the feed-roller, the driving-roller, and the fallers, rocking lever, latch, and lever to raise the feed-roller, of a detector pivoted below the shaft of the driving-roller and the upper end bearing against the thread above the shaft of the driving-roller and below the feed-roller, so as to be brought into action when the angle of the thread is changed by said thread becoming entangled on the feed-roller, substantially as set forth.

11. The combination, with the fallers and stop mechanism, of a starting-lever and a rocking lever and feed-roller, the starting-lever being above and adjacent to the rocking lever, as specified, so that the fallers can be controlled by one hand applied to the rocking lever and the starting-lever can be simultaneously actuated by the same hand, substantially as set forth.

12. The combination, with the feed-roll, of the thread-support 35 in front of the feed-roll and over which support the threads pass from behind, of the stop-motion fallers in front of such thread-support and adjacent to each other, said fallers having projecting ends, so that the threads as guided by one hand will pass in below the hooked ends of the fallers as the threads are drawn taut by the feed-roll.

13. The combination, with the rocking-lever and lever 80, of a latch pivoted to the said lever 80 and having the flange or projection 45 extending over the rocking lever, and mechanism, substantially as specified, to give motion to the rocking lever and unlatch the latch, the flange 45 returning the rocking lever to a normal position as the latch falls, substantially as set forth.

398,360. CALCULATING-MACHINE. JOHANNES VERMEHREN, Copenhagen, Denmark. Filed Jan. 30, 1888. Serial No. 262,318. (No model.)



Claim.—1. In a calculating-machine, the combination of a friction-disk having means for adjusting its axis and having means for revolving it, disks having their peripheries in frictional contact with the face of the former disk, and registering mechanisms having corresponding registering-indicators and operated by the revolutions of the friction-disks, as and for the purpose set forth.

2. In a calculating-machine, the combination of a friction-disk having means for revolving it and having means for adjusting its center in a line at right angles to its axis, disks journaled at right angles to the disk and with their peripheries in contact with the face of the disk, and registering mechanisms having corresponding indicators and operated from the revolutions of the friction-disks, as and for the purpose set forth.

3. In a calculating-machine, the combination of a carriage adjustable in one line, a disk journaled in this carriage and having a handle for turning it, friction-disks journaled at right angles to the shaft of the disk and having their peripheries in frictional contact with the face of the disk, and registering mechanisms having corresponding indicators and operated by the friction-disks, as and for the purpose set forth.

4. In a calculating-machine, the combination of a carriage sliding horizontally in a slot, a screw and nut for adjusting the carriage in the slot, a disk having its shaft journaled in the carriage and having a handle for revolving it, friction-disks having their peripheries in frictional contact with the face of the disk, and registering mechanisms operated by the disks and having corresponding indicators, as and for the purpose set forth.

5. In a calculating-machine, the combination of a casing having a longitudinal slot in its top provided with a scale at one end, a carriage sliding in the slot and having an index pointing to the scale, a screw-threaded rod secured to the carriage and extending through the side of the casing, a graduated nut upon the rod bearing against the side of the casing and having an index pointing to its graduations, a horizontal disk journaled with its shaft in the carriage and having a handle for revolving it, friction-disks journaled with horizontal shafts under the disk in frictional contact with its face with their peripheries, and registering mechanisms operated by the friction-disks and having corresponding indicators, as shown, and for the purpose set forth.

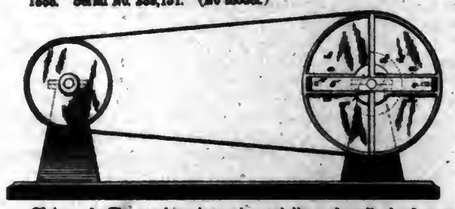
6. In a calculating-machine, the combination of a laterally-movable horizontal disk having a handle for revolving it and means for determining its lateral adjustment, two diametrically-opposite friction-disks journaled with their peripheries in frictional contact with the disk, and registering mechanisms operated by the friction-disks and having corresponding indicators, as and for the purpose set forth.

7. In a calculating-machine, the combination of a disk movable in a horizontal line and having means for determining its lateral adjustment, two diametrically-opposite friction-disks journaled with their peripheries in frictional contact with the disk and with their axes in line with the line of adjustment of the disk, and registering mechanisms operated by the friction-disks and having corresponding indicators, as and for the purpose set forth.

8. In a calculating-machine, the combination of a casing having a longitudinal slot in its top and a perforation in its side and having two sets of corresponding dials upon its top, a carriage sliding in the slot of the top and provided with an index pointing to a graduated scale at one edge of the slot, a screw-threaded rod extending from the carriage to the aperture in the side of the casing and through the same, a disk or nut turning with its threaded central bore upon the rod and with its hub in a bearing surrounding the aperture, a pointer projecting to the graduated periphery of the disk, a friction-disk journaled with its vertical shaft in a bearing in the carriage and having a handle for revolving it, two horizontal shafts journaled in a line with the slot in the top and having friction-disks upon their inner ends in contact with the horizontal disk, and registering mechanisms operated by the shafts and having hands pointing to the dials upon the top, as shown, and for the purpose set forth.

9. In a calculating-machine, the combination of a casing having a longitudinal slot in its top and a perforation in its side and having two sets of corresponding dials upon its top, a carriage sliding in the slot of the top and provided with an index pointing to a graduated scale at one edge of the slot, a screw-threaded rod extending from the carriage through the aperture in the side of the casing, a disk or nut with graduated periphery turning with its threaded central bore upon the rod and with its hub in a bearing surrounding the aperture, a pointer projecting to the graduated periphery of the disk, a friction-disk journaled with its vertical shaft in a bearing in the carriage and having a handle for turning it at its upper end, two diametrically-opposite horizontal shafts in a line with the slot having friction-disks upon their inner ends in contact with the horizontal disk and having conical pinions upon their outer ends, vertical shafts having hands upon their upper ends and revolving in the centers of the unit-dials and having conical pinions meshing with the pinions of the horizontal shafts, and suitable gearing and shafts having hands for the remaining dials of the top and operated by the former shafts, as and for the purpose set forth.

398,361. BELT-TIGHTENER. JOHN A. WIGAL, Tyler, W. Va., assignor of one-half to Thomas M. Wigal, same place. Filed Oct. 25, 1888. Serial No. 289,131. (No model.)



Claim.—1. The combination, substantially as described, of an automatically-expansible pulley, consisting of two semicircular sections having cam-slots centrally arranged in their meeting edges and united by sliding connecting-strips, and a shaft provided with a cam constructed to fit said cam-slots.

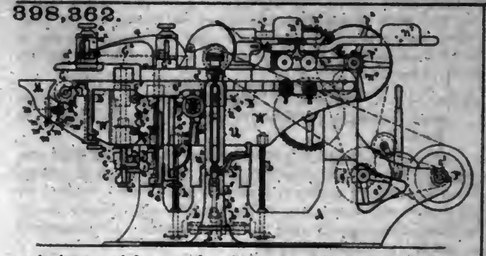
2. A pulley constructed in two sections having central ribs and cam recesses or slots, in combination with the connection-strips, the drive-shaft, and the cam engaging the cam recesses or slots for expanding said sections, substantially as described.

3. The combination, substantially as described, of a pulley composed of two equal independent sections having centrally-arranged cam-slots in their meeting edges, and on each side of said cam-slots ribs formed at right angles to said meeting edges, elongated slots arranged parallel with the ribs, connecting-strips seated between said ribs and united at their outer ends by pins passing through the elongated slots, a shaft, and a cam fixed on the shaft and shaped to fit the cam-slots in the meeting edges of the sections.

398,362. WOOD-PLANING MACHINE. SOLOMON A. WOODS, Boston, Mass. Filed Dec. 3, 1886. Serial No. 154,608. (No model.)

Claim.—1. In a wood-planing machine, the combination, with the rising-and-falling table B, having the upright U extending upward upon the front side of it, and formed of a lower section and an upper detachable section, and moving up and down upon guideways upon the frame on the rear side of it, of one or more screws, *b b*, provided with bevel pinion or pinions upon their lower end or ends, inclined shaft b^2, projecting upward and outward and downward and inward through the upright U, below its upper detachable section, in position to be within reach of the operator while observing the distance of adjustment of the table from above the latter frame, and carrying the crank b^4 on its outer and upper end, and the pinion b^3

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on its inner and lower end, and a gear mechanism connecting the gear or gears on the lower end or ends of said screw or screws, with the gear b^4, substantially as described.

2. In a wood-planing machine, the combination of the rising-and-falling table B, the inclined shaft b^2, having a bearing in the upright U and projecting outside of it, with the latter extending up and down outside of the path of the table and above the top thereof and having a joint, u^3, and its clamping mechanism above the shaft and below the table-top, whereby its upper part is adapted to be removed and replaced from in front of the table, substantially as described.

3. In a wood-planing machine, the combination of frame A, pulley P, rising-and-falling table B, provided with flanges W w' beneath the same, and the cutter-head C^2 and its shaft and pulley c^2, supported upon a yoke, adjustably attached by bolts to the opposite side of flange w' from the pulley P, said yoke being pivoted in substantially the same horizontal plane with pulley c^2 and upon one side thereof, substantially as described.

4. In a wood-planing machine, the combination of the pulley P, the rising-and-falling table B, provided with flanges W w' beneath the same, plate c^4, sliding inward and outward on flange w', plate c', sliding vertically upward and downward on plate c^4, and the cutter-head C^2 and its shaft and pulley c^2, supported upon a yoke pivoted to plate c' in substantially the same horizontal plane as pulley c^2 and upon one side thereof, the said plates and yoke being attached to flange w' and to each other, respectively, in the order named on their opposite sides from pulley P, substantially as described.

5. The combination of the table B, the lower horizontal cutter-head, C', mounted on bearings therein at one end and below the upper surface of the same, and the extension M m' of said table, in two parts adapted to be adjusted vertically one upon the other, pivoted thereto by the horizontal pivot m^4 below said cutter-head, and provided with clamping mechanism to secure said extension in position with its upper surface parallel to that of said table, substantially as described.

6. The combination of table B, having the slotted ear m^6 and swinging bolt m^7, and nut m^8, connected thereto, the lower horizontal cutter-head, C', mounted on bearings therein at one end below the upper surface of the same, and the extension M m' of said table in two parts adapted to be adjusted vertically one upon the other, pivoted thereto by the horizontal pivot m^4 below said cutter-head, and having part m', provided with the slotted ear m^5, substantially as described.

7. The combination of the table B, having the extension M m pivoted thereto, the horizontal cutter-head C', mounted in bearings below the table-surface and between its main part and extension M, and the supplemental bed m, adjacent to said cutter-head and mounted upon the vertically-sliding part M, having the adjusting-screw m^1, substantially as described.

8. The combination of the feed-roll shaft n', feed-roll shaft n^2, frame n^3, and frame n^5, pivoted to the main frame A, and provided with the projecting shoulder n^9, taking a bearing against frame n^5 outside the bearing of shaft n^2 therein, upon which the latter frame is pivoted, substantially as described.

9. The combination of the frame n^3, pivoted to main frame A shaft n^2, having pivotal bearings in frame n^3 and frame n^5, and the latter provided with slotted stud n^8, having friction-rollers n^{10} n^{10} in its slot, and the pivoted lever n^6, passing through between said rollers, substantially as described.

10. The combination of table B, arm *a*, provided at its outer end with vertical guideways, plate a^3, moving up and down on said guideways, and presser-foot a^5, connected to said vertically-moving plate by universal pivotal connections, substantially as described, adapted to incline its lower face at an angle to the table-surface either longitudinally or transversely thereof, and clamping mechanism to secure said plate in such inclined position, substantially as described.

11. The combination of table B, arm *a*, provided at its outer end with vertical guideways, plate a^3, moving up and down on said guideways, and presser-foot a^5, pivotally connected to said plate by one or more bolts, a^7, and provided with one or more adjusting set-screws, a^8, substantially as described.

12. The combination of the table B, carrying a throat or mouth-piece for the lower cutter-head, C', on its feed-in side, the said cutter-head and its spindle and the cutter-head frame supporting the bearings thereof mounted on vertical guideways on the table and adjustable vertically with relation to the throat or mouth-piece of the latter, and a bar or mouth-piece arranged parallel with the cutter-head on the feed-out or delivery side thereof, provided with downwardly-projecting arms or brackets supporting said bar or mouth-piece at the ends, and connected by horizontal pivots with the cutter-head frame below the cutter-head, whereby provision is afforded for swinging said bar or mouth-piece on its feed-out side downward from its normal or operative position and away from the cutter-head in a plane transverse to the length thereof, and whereby any rising or falling movement of the cutter-head frame with relation to table B and its attached throat or mouth-piece on the feed-in side will produce a corresponding movement of the said bar or mouth-piece on the feed-out side, substantially as described.

13. The combination of the table B, carrying a throat or mouth-piece for the lower cutter-head, C', on its feed-in side, the said cutter-head and its spindle and frame supporting the bearings thereof, mounted on vertical guideways on table B and provided with a screw and hand-wheel for adjusting the same vertically with relation thereto, and a bar or mouth-piece arranged parallel with the cutter-head on the feed-out or delivery side thereof, provided with downwardly-projecting arms or brackets supporting said bar or mouth-piece at the ends and connected by horizontal pivots with the cutter-head frame below the cutter-head, whereby provision is afforded for swinging said bar or mouth-piece on its feed-out side downward from its normal or operative position and away from the cutter-head in a plane transverse to the length thereof, and whereby any rising or falling movement of the cutter-head frame with relation to table B and its attached throat or mouth-piece on the feed-in side will produce a corresponding movement of the said bar or mouth-piece on the feed-out side, substantially as described.

398,363. TREADLE. LEONIDAS G. WOOLLEY, Grand Rapids, Mich. Filed July 18, 1888. Serial No. 280,280. (No model.)



Claim.—1. The combination of two parallel shafts provided with cranks at each of their ends, two treadles, each one connected to the two cranks at one end of the two shafts, gear-wheels secured to the two shafts, a driven shaft, and a wheel secured to the driven shaft, and which meshes with the two gear-wheels, substantially as shown.

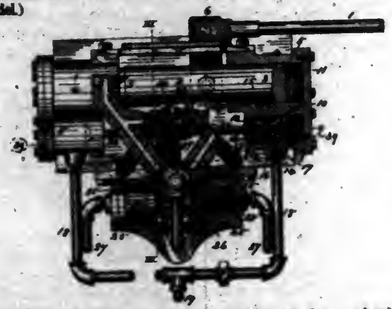
2. The combination of two driving-shafts provided with cranks set at different angles, two treadles mounted upon the four cranks, gear-wheels attached to the driving-shafts, and a driven shaft provided with a pinion which meshes with both of the gear-wheels, substantially as described.

3. The combination of a suitable frame-work provided with suitable bearings, the two driving-shafts C and the driven shaft D, the cranks secured to the ends of the two driving-shafts, the treadles which are mounted upon these cranks, the pinion secured to the driven shaft and meshing with the two gear-wheels, and a hand-wheel secured to the driven shaft, substantially as specified.

4. The combination of the driving-shafts, cranks secured thereto, and the treadles provided with bearings through which the cranks

pass, the bearings of the treadles being cut away, as shown at J, substantially as set forth.

398,864. PNEUMATIC SWITCH FOR RAILWAYS. MORRIS WUERPEL, St. Louis, Mo. Filed Apr. 30, 1888. Serial No. 272,356. (No model.)



Claim.—1. The combination, in a switch-actuating mechanism, of the piston 2, attached to the switch-rod, cylinders 8, in communication with cylinder 4, the piston-valves 12, actuating double-ended piston connected to the valve-stem 20, cylinders 25, and pipes 27 for the purpose set forth.

2. The combination, in a switch-actuating mechanism, of the double-ended piston 2, attached to the switch-rod and working in cylinders 4, valve-cylinders 8, in connection with the cylinders 4 by ports 10, piston-valves 12, working in the cylinders 8, the latter having exhaust-ports 39, double-ended piston 24, working in cylinders 25, and pipes 18, 19, and 27, supplying fluid under pressure to work the pistons 2 and 24, for the purpose set forth.

398,865. TAKE-UP MECHANISM FOR NARROW-WARE LOOMS. HORACE WYMAN, Worcester, Mass., assignor to the Crompton Loom Works, same place. Filed June 21, 1888. Serial No. 277,834. (No model.)

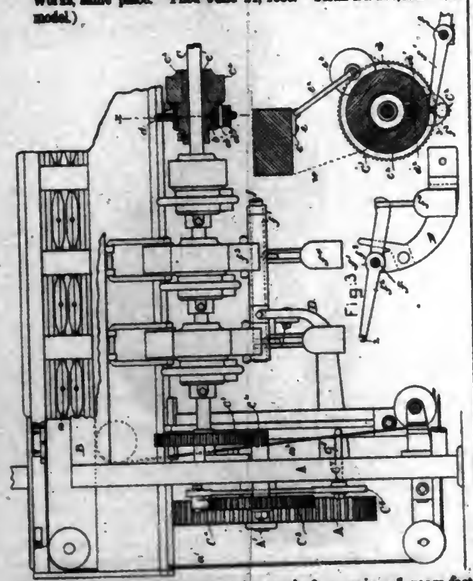


Fig. 3.

Claim.—1. In a loom, the take-up shaft, a series of gears fast thereon, a series of gears loosely mounted on the said shaft, and take-up or sand rolls attached to the said loose gears, combined with a series of hubs or hand-wheels loosely surrounding the said shaft, a pinion carried by each hub or hand-wheel and meshing with both the said gears, the teeth of the said gearing differing in number to constitute a differential gear, substantially as described, whereby or through the said loose hub or hand-wheel the said take-up or sand rolls may be freely rotated independently one of the other on the take-up shaft in either direction, substantially as described.

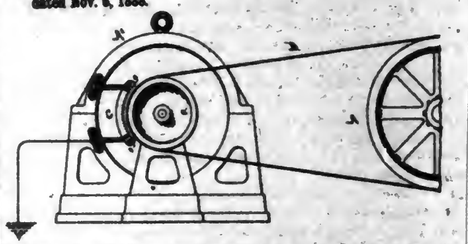
2. The take-up shaft C and a take-up roll loose thereon, a gear carried by the said take-up roll, a gear fast to the said take-up shaft next the end of the gear carried by the said roll, and having a different number of teeth, and means to engage and rotate the said shaft, combined with a hand-wheel having a pinion, d^3, to engage the teeth of the said gears carried, respectively, by the said take-up roll and by the said shaft, as described, whereby by the rotation of the hand-wheel and its pinion about the said gears the take-up roll may be rotated independently of the said shaft C in either direction, substantially as described.

398,866. METHOD OF PRESERVING WOOD. WILLIAM YOUNGLOOD, Jamaica, N. Y. Filed Feb. 7, 1888. Serial No. 263,226. (No model.)

Claim.—The herein-described method of preserving wood, consisting of first saturating the dried wood with a solution of saltpeter and water, and red-sanders or California red-wood bark, in about the proportions stated, and then drying the same, and, secondly, in subsequently saturating the wood in a bath of paraffine, all substantially as and for the purpose specified.

REISSUES.

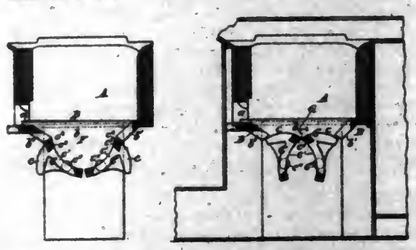
10,986. ELECTRIC DISCHARGE DEVICE. REGINALD BELFIELD, Pittsburg, Pa., assignor to the Westinghouse Electric Company, same place. Filed Jan. 21, 1888. Serial No. 267,094. Original No. 382,400, dated May 6, 1888.



Claim.—1. The combination, with a driving-engine, of an electric generator, a belt connecting the generator with the engine, and discharge-points directed toward the pulley or belt-wheel of the generator and in electrical connection with the engine.

2. The combination, with an alternate-current electric generator, of discharge-points insulated therefrom and directed toward the belt-wheel of the generator.

10,987. GRATE FOR STOVES, &c. DENNIS G. LITTLEFIELD, Albany, N. Y. Filed Oct. 20, 1888. Serial No. 288,713. Original No. 360,242, dated Oct. 2, 1888.



Claim.—1. The combination, with the stationary bottom plate, B, constructed substantially as described, and having the clear opening b^2 relatively between the oppositely-located series of downwardly-inclined fingers b, alternating with slots, of the two oscillatory concavo-convex grates, suitably connected, mounted on trunnions, and suspended within the opening of said bottom plate and relatively below said inclined fingers, substantially as and for the purposes set forth.

2. The combination, with the fire-box A, stationary bottom plate, B, at the lower end of said fire-box and having the clear opening b^2, and the inclined grated bars or fingers b, projecting relatively inwardly from the bottoms of the oppositely-located sides of said fire-box, of the concavo-convex grates C, suitably connected, mounted on trunnions, and suspended within the opening of said stationary bottom plate and relatively below the slotted fingers b, substantially as and for the purposes set forth.

3. The combination, with the fire-box A, stationary bottom plate, B, at the lower end of said fire-box, and having the clear opening b^2, and the grated bars or fingers b, projecting relatively inwardly from the bottom of said fire-box, of the concavo-convex grates C, suitably connected, mounted on trunnions, and suspended within the opening of said stationary bottom plate and relatively below the slotted fingers b, substantially as and for the purposes set forth.

R. PETERS, Photo-Lithographer, Washington, D. C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

MENENDEZ *et al. v.* HOLT *et al.*

Decided October Term, 1888.

1. TRADE-MARK—FLOUR.

Messrs. Holt & Co., New York, N. Y., adjudged to have acquired and to hold the exclusive right to the use of the words "La Favorita," registered by them February 28, 1882, as a trade-mark for flour.

2. INFRINGEMENT—DELAY IN BRINGING SUIT.

While there was such delay in bringing suit as to preclude recovery of damages for prior infringement, there was neither conduct nor negligence which could be held to destroy the right to prevention of further injury.

APPEAL from the Circuit Court of the United States for the Southern District of New York.

STATEMENT OF THE CASE.

Appellees, partners in business under the firm-name of Holt & Co., filed their bill of complaint July 17, 1882, against appellants, engaged in business under the firm-name of José Menendez & Brother, alleging that they were dealers in and bought and sold flour and grain; that Robert S. Holt had theretofore been for more than twenty-five years at the head of the firm of Holt & Co., which firm had from time to time been changed or dissolved by the retirement of various members, but in each such instance a new firm had been immediately formed and succeeded to the firm-name, good-will, brands, Trade-Marks and other assets of the preceding firm, so that there had been no interruption of the name and business identity of Holt & Co. for over twenty-five years, during which time said firm had had a high reputation in the trade; that complainants were now legally seized of the good-will and all the Trade-Marks ever at any time used by the firm; that they were the owners of a certain Trade-Mark for flour, which consisted of the fanciful words "La Favorita," which was originated by the firm and had been used by it for more than twenty years, to distinguish a certain flour of their selection and preparation; that said firm at all times exercised great care in the selection, packing and preparation of the flour packed and sold by them under the said brand, "La Favorita," and had carefully advertised the same, and by their care and efforts extensively introduced it to the trade, so that the said brand had come to be widely known and sought after by the trade, and the sale of flour so branded constituted an important part of the firm's business; that the brand was applied by stenciling it on the barrels; and that it had been duly registered by the firm in pursuance of law. Defendants were charged with having made use of the brand as a mark for flour of their own preparation or selection in violation of complainants' rights.

The answer admitted the existence of the Trade-Mark and that the defendants had used it, but denied that Holt & Co. were the owners, and averred that one Stephen O. Ryder was a member of Holt & Co. from 1861 to 1868, and had since used, and was entitled to use, said Trade-Mark as his own; that said Ryder put his own name on flour in connection with the name "La Favorita;" and that defendants had sold such flour as the special selection of said Ryder, and not as selected by complainants.

Evidence was adduced in relation to the connection of Ryder with the firm of Holt & Co., his retirement therefrom, and the ownership of the brand thereupon to establish the use of the Trade-Mark by Ryder and others without protest on complainants' part; also, subject to objection, to show a prior use of the same as a Trade-Mark for flour.

It appeared that Holt & Co. deposited *fac-similes* of the Trade-Mark October 17, 1881, in the Patent Office, and that it was duly registered February 28, 1882.

The circuit court refused an accounting, but held complainants entitled to the exclusive use of the words as a brand or Trade-Mark for flour, and that the defendants had infringed the rights of complainants in the use of the words on flour not prepared by complainants, and decreed a perpetual injunction. From that decree this appeal was prosecuted, and a reversal is asked on the grounds that the words "La Favorita" as used by the complainants cannot be protected as a Trade-Mark; that there has been no infringement; that the words had been used as a brand before being used by Holt & Co.; that the title of Holt & Co. was not superior to that of S. O. Ryder; and that whatever rights complainants may once have had had been forfeited by laches.

Mr. Rowland Cox for the appellees.

Mr. A. v. Briesen for the appellants.

Mr. Chief Justice FULLER delivered the opinion of the Court.

The fact that Holt & Co. were not the actual manufacturers of the flour upon which they had for years placed the brand in question does not deprive them of the right to be protected in the use of that brand as a Trade-Mark. They used the words "La Favorita" to designate flour selected by them, in the exercise of their best judgment, as equal to a certain standard. The brand did not indicate by whom the flour was manufactured, but it did indicate the origin of its selection and classification. It was equivalent to the signature of Holt & Co. to a certificate that the flour was the genuine article which had been determined by them to possess a certain degree of excellence. It did not, of course, in itself indicate quality, for it was merely a fancy name and in a foreign language, but it evidenced that the skill, knowledge and judgment of Holt & Co. had been exercised in ascertaining that the particular flour so marked was possessed of a merit

rendered definite by their examination and of a uniformity rendered certain by their selection. The case clearly does not fall within the rule announced in *Manufacturing Co.* v. *Trainer*, (101 U. S., 51, 55,) that "letters or figures which, by the custom of traders, or the declaration of the manufacturer of the goods to which they are attached, are only used to denote quality, are incapable of exclusive appropriation, but are open to use by any one, like the adjectives of the language;" or in *Raggett* v. *Findlater*, (L. R., 17 Eq., 29,) where an injunction to restrain the use upon a trade-label of the term "nourishing stout" was refused on the obvious ground that "nourishing" was a mere English word denoting quality. And the fact that flour so marked acquired an extensive sale, because the public had discovered that it might be relied on as of a uniformly meritorious quality demonstrates that the brand deserves protection rather than that it should be debarred therefrom, on the ground, as argued, of being indicative of quality only. (*Burton* v. *Stratton*, 12 Fed. Rep., 696; *Godillot* v. *Harris*, 81 N. Y., 263; *Ransome* v. *Graham*, 15 Law Jour., Ch. 897.)

Holt & Co. then, having acquired the exclusive right to the words "La Favorita" as applied to this particular vendible commodity, it is no answer to their action to say that there was no invasion of that right because the name of S. O. Ryder accompanied the brand upon flour sold by appellants, instead of the name of Holt & Co. That is an aggravation and not a justification, for it is openly trading in the name of another upon the reputation acquired in the device of the true proprietor. (*Gillott* v. *Esterbrook*, 47 Barb., 455; S. C., 48 N. Y., 374; *Coats* v. *Holbrook*, 2 Sandf. Ch., 586.)

These views dispose of two of the defenses specially urged on behalf of appellants, and we do not regard that of prior public use, even if it could be properly considered under the pleadings, as entitled to any greater weight. Evidence was given to the effect that from 1857 to 1860, the words "La Favorita" were occasionally used in St. Louis by Sears & Co., then manufacturing in that city, as designating a particular flour, but the witnesses were not able to testify that any had been on sale there under that brand (unless it were that of Holt & Co.) for upward of twenty years. The use thus proven was so casual and such little importance apparently attached to it, that it is doubtful whether Sears & Co. could at any time have successfully claimed the words as a Trade-Mark, and, at all events, such use was discontinued before Holt & Co. appropriated the words to identify their own flour, and there was no attempt to resume it. It is argued, however, that the title of Holt & Co. to the use of the mark was not superior to that of S. O. Ryder, because it is said that Ryder, upon leaving the firm, took with him his share of the good-will of the business, and consequently of the Trade-Marks, and hence that the defendants below rightfully sold flour under the brand "La Favorita" when selected by Ryder and so marked by him.

Good-will was defined by Lord Eldon, in *Cruttwell* v. *Lye*, (17 Vesey, 335, 346,) to be "nothing more than the probability that the old customers will resort to the old place," but Vice-Chancellor Wood, in *Churton* v. *Douglas*, (Johns. H. R. V., 174, 188,) says it would be taking too narrow a view of what is there laid down by Lord Eldon to confine it to that, but that it must mean every positive advantage that has been acquired by the old firm in the progress of its business, whether connected with the premises in which the business was previously carried on, or with the name of the late firm, or with any other matter carrying with it the benefit of the business.

It may be that where a firm is dissolved and ceases to exist under the old name, each of the former partners would be allowed to obtain "his share" in the good-will, so far as that might consist in the use of Trade-Marks, by continuing such use in the absence of stipulation to the contrary; but when a partner retires from a firm, assenting to or acquiescing in the retention by the other partners of possession of the old place of business and the future conduct of the business by them under the old name, the good-will remains with the latter as of course.

Holt & Co. commenced business in 1845, and had had an uninterrupted existence under that name since 1855; the Trade-Mark in question was adopted by the senior member of the firm in 1861, and had been thereafter in continuous use. Ryder became a partner in 1861, and retired February 1, 1869, when a circular was issued, in which he participated, announcing the dissolution by his retirement, the continuance of the business by the other partners under the same firm-name and the formation of another partnership by Ryder with one Rowland, to transact the flour and commission business at another place, under the name of Rowland & Ryder. In addition to these facts it is established by the preponderance of evidence that it was verbally agreed, at the time Ryder retired, that he surrendered all interest in the brands belonging to Holt & Co. Ryder attempts to deny this, but his denial is so qualified as to render it unreliable as against the direct and positive character of the evidence to the contrary. Indeed, when asked why the brands were not made the subject of appraisement when he went out, as it was conceded all the other property of the firm was, he says that it was because he "gave up all right, title and interest to those valuable brands to Robert S. Holt out of friendship, so there was no occasion for it." In our judgment, Ryder's claim to any interest in the good-will of the business of Holt & Co., including the firm's Trade-Marks, ended with his withdrawal from that firm.

Counsel in conclusion earnestly contends that whatever rights appellees may have had were lost by laches, and the desire is intimated that we should consider *McLean* v. *Fleming*, (96 U. S., 245,) so far as it was therein stated that even though a complainant were guilty of such delay in seeking relief upon infringement as to preclude him from obtaining an account of gains and profits, yet, if he were otherwise so entitled, injunction against future infringement might properly be awarded. We see no reason to modify this general proposition, and we do not find in the facts as disclosed by the record before us anything to justify us in treating this case as an exception.

The intentional use of another's Trade-Mark is a fraud. When the excuse is that the owner permitted such use, that excuse is disposed of by affirmative action to put a stop to it. Persistence, then, in the use is not innocent, and the wrong is a continuing one, demanding restraint by judicial interposition when properly invoked. Mere delay or acquiescence cannot defeat the remedy by injunction in support of the legal right, unless it had been continued so long and under such circumstances as to defeat the right itself. Hence, upon an application to stay waste, relief will not be refused on the ground that, as the defendant had been allowed to cut down half of the trees upon the complainant's land, he had acquired by that negligence the right to cut down the remainder, (*Att.-Gen.* v. *Eastlake*, 11 Hare, 205;) nor will the issue of an injunction against the infringement of a Trade-Mark be denied on the ground that mere procrastination in seeking redress for depredations had deprived the true proprietor of his legal right. (*Fullwood* v. *Fullwood*, 9 Ch. D., 176.) Acquiescence to avail must be such as to create a new right in the defendant. (*Rodgers* v. *Nowill*, 3 DeGex, M. & G., 614.) Where consent by the owner to the use of his Trade-Mark by another is to be inferred from his knowledge and silence merely, "it lasts no longer than the silence from which it springs; it is, in reality, no more than a revocable license." (Duer, J., *Amoskeag Mfg. Co.* v. *Spear*, 2 Sandf., 599; *Julian* v. *Hoosier Drill Co.*, 78 Ind., 498; *Taylor* v. *Carpenter*, 3 Story, 458; *Id.*, 2 Woodb. & M., 1.)

So far as the act complained of is completed, acquiescence may defeat the remedy on the principle applicable when action is taken on the strength of encouragement to do it; but so far as the act is in progress and lies in the future, the right to the intervention of equity is not generally lost by previous delay, in respect to which the elements of an estoppel could rarely arise. At the same time, as it is in the exercise of discretionary jurisdiction that the doctrine of reasonable diligence is applied, and those who seek equity must do it, a court might hesitate as to the measure of relief where the use by others for a long period under assumed permission of the owner had largely enhanced the reputation of a particular brand. But there is nothing here in the nature of an estoppel, nothing which renders it inequitable to arrest at this stage any further invasion of complainants' rights. There is no pretense of abandonment. That would require proof of non-user by the owner or general surrender of the use to the public. The evidence is positive that Holt & Co. continuously used the Trade-Mark, always asserted their exclusive right to it, and never admitted that of any other firm or person, and, in the instance of every party, including Ryder, who used this brand of flour not of Holt & Co.'s selection, that use, when it came to their knowledge, was objected to by the latter, and personal notice given, while publication was also made in the newspapers circulating where the flour was usually marketed, containing a statement of Holt & Co.'s rights and warning against imitations. It is idle to talk of acquiescence in view of these facts. Delay in bringing suit there was, and such delay as to preclude recovery of damages for prior infringement, but there was neither conduct nor negligence which could be held to destroy the right to prevention of further injury.

The decree of the circuit court will therefore be affirmed.

Supreme Court of the United States.

KENNEDY v. HAZELTON.

Decided December 17, 1888.

1. VALIDITY OF PATENT—APPLICATION—OATH.
   The patent law makes it essential to the validity of a patent that it shall be granted on the application, supported by the oath, of the original and first inventor.
2. SAME—SAME—WHEN VOID.
   A patent which is not supported by the oath of the inventor, but applied for by one who is not the inventor, is unauthorized by law, and void.
3. VOID PATENT NOT ASSIGNABLE.
   As a patent thus obtained confers no title or right upon the patentee, a court of equity will not order him to assign it.
4. ENFORCEMENT OF CONTRACT UNDER VOID PATENT.
   A court of chancery cannot decree specific performance of an agreement to convey property which has no existence, or to which defendant has no title.
5. SAME.
   A bill by vendee against vender for specific performance, which does not show any title in defendant, is bad on demurrer.
6. PATENT PRIMA FACIE EVIDENCE OF VALIDITY.
   A patent issued to an applicant is only *prima facie* evidence that he is the inventor.

APPEAL from the Circuit Court of the United States for the Northern District of Illinois.

STATEMENT OF THE CASE.

This was a bill in equity for specific performance, filed November 12, 1887, by a citizen of New York against a citizen of Illinois, and contained the following allegations:

On July 10, 1884, the defendant, in consideration of the sum of $10,000, paid by the plaintiff to him, made an assignment to the plaintiff of an interest of one-half in two patents previously obtained by the defendant for steam-boilers; and also made a written contract, acknowledged before a notary public and recorded in the Patent Office, by which the defendant agreed to assign to the plaintiff any and all patents which the defendant might thereafter obtain from the United States or the Dominion of Canada, for inventions in improvements in steam-boilers, and further agreed not to assign such inventions, or the patents obtained therefor, to any other person.

In 1885, the defendant publicly stated that he had invented such an improvement and explained its general plan and construction; and afterward combined and confederated with one Goulding to avoid and evade the effect of the contract of July 10, 1884; and for that purpose the defendant caused to be prepared at his expense, but in the name of Goulding, the necessary papers to procure Letters Patent for this invention; and Goulding, without any consideration received from the defendant therefor, assented to be used in that regard as the alleged inventor of the improvement, and, at the request and by the procurement of the defendant, filed an application under oath for a patent for it, which application was allowed; and Goulding, before the issue of the patent, assigned in writing to the defendant all his interest in the improvement and in the patent therefor; and on December 14, 1886, a patent was issued to the defendant accordingly as assignee of Goulding, a certified copy of which was made part of the bill.

The bill further alleged that the defendant was, and Goulding was not, the original and first inventor of the improvement so patented; that the defendant had engaged in the manufacture and sale of boilers under this patent, and had received and was receiving great benefits therefrom; that the patent was of value exceeding the sum of $5,000, exclusive of interest and costs.

The bill prayed for a decree that the defendant assign this patent to the plaintiff, for an adjudication that the title to it equitably vested in the plaintiff at

the date of its issue, for an account of profits received by the defendant from its use, for a preliminary injunction against transferring or incumbering the patent, or manufacturing or selling boilers containing the improvement described therein, and for further relief.

The defendant demurred to the bill, first, for want of equity; second, for multifariousness, in embracing two separate and distinct causes of action, one to enforce specific performance of a contract, the other for the infringement of a patent; third, because, as appeared by the allegations of the bill, the patent was absolutely void, and no suit could be maintained, either to compel its transfer, or for infringement thereof.

The circuit court sustained the demurrer, for the third reason, and dismissed the bill. (33 Fed. Rep., 293.) The plaintiff appealed to this Court.

Mr. C. A. Seward, *Mr. E. Banning*, and *Mr. T. A. Banning* for the appellant.

Mr. L. S. Bond and *Mr. E. A. West* for the appellee.

Mr. Justice GRAY, after stating the case as above reported, delivered the opinion of the Court.

The case, as stated in the bill and admitted by the demurrer, is shortly this: The defendant agreed in writing to assign to the plaintiff any patents that he might obtain for improvements in steam-boilers. He did invent such an improvement, and, with intent to evade his agreement and to defraud the plaintiff, procured a patent for this invention to be obtained upon the application under oath of a third person as the inventor, and to be issued to him as assignee of that person, and has made profits by manufacturing and selling boilers embodying the improvement so patented. The plaintiff seeks by bill in equity to compel the defendant to assign the patent to him, and to account for the profits received under it.

A court of chancery cannot decree specific performance of an agreement to convey property which has no existence, or to which the defendant has no title. A bill by vendee against vender for specific performance, which does not show any title in the defendant, is bad on demurrer. And if it appears, by the bill or otherwise, that the want of title (even if caused by the defendant's own act, as by his conveyance to a *bona fide* purchaser) was known to the plaintiff at the time of beginning the suit, the bill will not be retained for assessment of damages, but must be dismissed, and the plaintiff left to his remedy at law. (*Columbine* v. *Chichester*, 2 Phillips, 27; *S. C.*, 1 Coop. Temp. Cottenham, 295; *Ferguson* v. *Wilson*, L. R., 2 Ch. 77; *Kempshall* v. *Stone*, 5 Johns., Ch. 193; *Morse* v. *Elmendorf*, 11 Paige, 277; *Milkman* v. *Ordway*, 106 Mass., 232, 256.)

The patent law makes it essential to the validity of a patent that it shall be granted on the application, supported by the oath, of the original and first inventor, (or of his executor or administrator,) whether the patent is issued to him or to his assignee. A patent which is not supported by the oath of the inventor, but applied for by one who is not the inventor, is unauthorized by law, and void, and, whether taken out in the name of the applicant or of any assignee of his, confers no rights as against the public. (Rev. Stats., secs. 4886, 4888, 4892, 4895, 4896, 4920.)

The patent issued by the Commissioner to the defendant as assignee of Goulding is only *prima facie* evidence that Goulding was the inventor of the improvement patented; and the presumption of its validity in this respect is rebutted and overthrown by the distinct allegation in the bill, admitted by the demurrer, that the defendant, and not Goulding, was the inventor. This fact is not brought into the case by any answer or plea of the defendant, but it is asserted by the plaintiff himself as a ground for maintaining his bill.

As the patent, upon the plaintiff's own showing, conferred no title or right upon the defendant, a court of equity will not order him to assign it to the plaintiff—not only because that would be to decree a conveyance of property in which the defendant has, and can confer, no title; but also because its only possible value or use to the plaintiff would be to enable him to impose upon the public by asserting rights under a void patent. (*Post* v. *Marsh*, 16 Ch. D., 395; *Oldham* v. *James*, 14 Irish Ch., 81.)

The bill cannot be maintained for an account of profits received by the defendant from the use of this patent, because a decree for profits can only proceed upon the ground that the plaintiff is at least the equitable owner of the patent, and there can be neither legal nor equitable ownership of a void patent. The same reason is a sufficient answer to the suggestion of the plaintiff that the bill may be maintained as a bill to remove a cloud upon his title in this patent.

In *Ambler* v. *Whipple*, (20 Wall., 546,) cited by the plaintiff, the suit was based upon articles of partnership between Ambler and Whipple, by which it was agreed that all patents obtained by either partner should be owned by both in equal shares. The bill alleged that the two jointly had obtained a patent for a joint invention, and that another patent, afterward obtained by Whipple upon the application of a third person, embodied the same invention with only a colorable variation. Neither of the patents was in the record, and the questions now presented were not suggested by counsel or considered by the Court, but the decree for the plaintiff proceeded upon independent grounds. The result is that the present bill cannot be maintained, and that the plaintiff must be left to any remedy that he may have to recover damages in an action at law.

Decree affirmed.

The Chief Justice and Mr. Justice BRADLEY dissented.

U. S. Circuit Court—Eastern District of North Carolina.

FERNOLINE CHEMICAL COMPANY *v.* THE CAROLINA OIL AND CREOSOTE COMPANY.

Decided January 19, 1889.

1. STANLEY—APPARATUS FOR DISTILLING TURPENTINE, &c.
   Reissued Letters Patent No. 10,689, granted to James D. Stanley February 16, 1886, for an apparatus for distilling turpentine and for the purification of the crude products of the distillation thereof, *Held* to rest for its validity upon a very narrow margin of invention.
2. HANSEN AND SMITH—APPARATUS FOR DISTILLING WOOD.
   Letters Patent No. 333,750, granted to Hansen and Smith January 5, 1886, for sundry improvements, compared with said Stanley reissue patent and *Held* to cover substantial improvements.
3. EVIDENCE—TESTS.
   An *ex parte* test made by the defendant and a defective test made by the complainant *Held* to be entitled to no weight in evidence.

Mr. R. B. McMaster and *Messrs. Strong, Gray & Stamps* for the complainant.

Mr. Marcus S. Hopkins, *Mr. S. F. Phillips*, and *Messrs. Battle & Mordecai* for the defendant.

SEYMOUR, *J.*:

This is a bill in equity filed by the Fernoline Chemical Company to restrain the infringement of a patent and for an account.

The Letters Patent under which plaintiff claims are Reissued Letters Patent No. 10,689, granted to one James D. Stanly. The original patent bears date October 31, 1882, and is numbered 266,909. Reissue Patent No. 10,689 is for an apparatus for distilling turpentine and for the purification of the crude products of the distillation thereof. It relates to a process by which pine wood is placed in an oven or retort, subjected to heat, and the vapor thus caused to issue from the wood conveyed into receptacles, in which it is condensed and distilled. The apparatus consists of a heating structure, a retort for containing the wood, and the construction for condensation.

The controversy is with respect to the heating structure and the means adopted to convey the heat to and distribute it about the surface of the retort.

The defendant is engaged in the business of manufacturing oil from pine wood by distillation. Before the date of original Patent No. 266,909 Stanly had taken out two other patents for distilling turpentine and producing oil and other products from wood, numbered, respectively, 130,598 and 131,312, dated August 20 and September 10, 1872. On the 21st of February, 1882, and therefore earlier than the issuing of plaintiff's patent, he had sold to defendant's assignors, Hanson & Smith, the exclusive right to use said inventions (and all improvements that might be made thereon) in the State of North Carolina. The inventions so purchased not proving, as defendant alleges, practically satisfactory, by reason of the furnaces failing to heat the retort evenly, by too great a consumption of fuel, and by burning the bottom of the retort, Hanson & Smith devised sundry improvements, which were patented by Letters Patent No. 333,750, granted June 5, 1886. The apparatus used by defendant and alleged by plaintiff to be an infringement on its patent is constructed, as defendant claims, on the plan of the last-mentioned patent, which is itself an improvement on the patents which it holds under assignment from Stanly.

The claims made by Stanly in the specification forming part of Reissued Patent No. 10,689 are: a fire-box, an arch located over the fire-box and under the retort, a retort-chamber above the arch, in which is located the retort, and spaces above and below the retort separated for the greater length of the chamber but connected at one end.

The object of the arch over the fire-box and of the separation of the spaces above and below the retort containing the pine wood is to equalize as far as may be the heat applied to all parts of the retort. The products of combustion are kept from the retort by the arch, under which they pass to its rear beneath the arch, escaping from the latter at the rear end. Thence they pass horizontally along the under side of the retort, between the retort and the arch, to the front end, where they ascend through vertical passages at the sides of the retort into a space above the same. They then pass rearward along the top of the retort to the chimney, which is at the back end of the apparatus—that is to say, the heat passes backward under the arch before impinging upon the retort, thence forward over the arch and under the retort, and thence backward over the retort to the chimney. The original Stanly patent, No. 130,598, one of the two the right to use which was purchased by defendant's assignor, was, according to the specification, an improvement in the process and apparatus whereby spirits of turpentine are distilled from pine wood. It provides, as does plaintiff's patent, a process whereby pine wood is placed in a retort, subjected to heat, and its vapor conveyed in receptacles and condensed. The fire is placed directly under the retorts. The apparatus now used by defendant provides for an equalization of the heat applied to the retorts by means of forcing it to pass under an arch and through flues surrounding the retort.

Before considering what the court deems the substantial difference between the mode in which the heat is applied to the retort in the plaintiff's and defendant's inventions I will state the testimony shows that plaintiff's patent rests for its validity upon a very narrow margin of invention. Arranging spaces around vessels of various forms for the purpose of retarding and regulating the process of heating such vessels and the use of arches above fires to protect retorts from the action of flames were both old in the art at the time of the invention covered by plaintiff's patent. What it is entitled to protection in, if anything, is the manner in which the products of combustion are delayed in being carried around the retort—that is, its mode of equalizing the heat and its combination of contrivances for effecting its purpose. In defendant's apparatus the fire-box is, as in plaintiff's, covered by an arch. The retort is longer than that used by plaintiff, and is heated from opposite ends by two furnaces, each heating the retort from its end to the middle. In each furnace there is a space entirely around the retort between the outer surface and the surrounding masonry. In this space there are vertical partitions passing alternately over and under the retort. Each partition passes a little more than half-way around the retort and the ends terminate at the sides of the retort. These vertical partitions divide the space around the retort into an indirect flue or passage extending upward and downward repeatedly from the top to the bottom of the retort. At the rear end of each furnace—that is, under the middle of the retort—the arches are provided with openings extending outward into the chamber which contains the retort. The arch extends continuously to the rear wall. The openings through which the products of combustion escape into the chamber surrounding the retort are situated at the side and inner end of the arches and deflect them so that they do not directly impinge upon the retort, but are directed more immediately to the side walls of the furnace. The result of the mechanical arrangement described is that the products of combustion after passing along under the arch and through the flues into the chambers surrounding the retort and impinging upon the

side walls of the apparatus immediately ascend to the upper part of the chamber. On reaching it, being impelled forward by the draft, they meet a partition extending down from the roof of the chamber and are thrown down to the upper surface of the protecting-arch, where they come in contact with a surface heated by the direct action of the flames. Again impelled forward, they strike another partition, are thrown upward, and then, upon reaching the top of the chamber, are again directed downward and again upward until they escape through chimneys situated at the forward ends of the apparatus.

I do not place any stress upon the fact that two furnaces are used in defendant's and only one in plaintiff's apparatus; but, for other reasons, I cannot consider the former as substantially the same structure as the latter. The use of vertical instead of horizontal partitions has the effect of changing the method of heating the retort. The products of combustion in the case of the vertical partitions immediately surround the upper as well as the lower part of the retort, while under the Stanly patent they pass under the entire length of the retort before reaching its upper surface. Again, the heat in defendant's apparatus, after surrounding both the upper and lower part of the retort, is twice thrown down against the lower hot arch, where its temperature may be renewed. Again, the flames in defendant's furnace are diverted from the retort, where they first emerge from under the arch instead of directly impinging upon it—a fact which tends to increase its durability. These differences are, it would seem, sufficient to relieve defendant from the charge of infringing upon the plaintiff's method of producing the result aimed at, and are substantial improvements. The result itself I do not consider as covered by either patent.

I have laid no stress on the alleged tests to which so much testimony is directed. Defendant's trial was *ex parte*. In that of plaintiff the facts that no damper was placed in the smoke-stack of defendant's apparatus and that the wood used in it was 20 per cent. lighter than that used in plaintiff's retort deprive the tests of all title to confidence.

The bill is dismissed.

U. S. Circuit Court—Western District of Pennsylvania.

EMERSON, SMITH & CO., (LIMITED,) *v.* HUBBARD *et al.*

Decided March 2, 1888.

ASSIGNMENT OF A PATENT DOES NOT CARRY CLAIMS FOR PAST INFRINGEMENTS UNLESS SPECIFICALLY STATED THEREIN.

Mere intention, not signified in an assignment of Letters Patent, to include therein claims for infringements previously committed, will not suffice to invest the assignee with any equitable title to those claims, and such assignee, after bill filed, in a suit for infringement brought by him, having procured an assignment of said claims, will not be permitted in that suit to set up by a supplemental bill this post assignment.

SUR motion for leave to file a supplemental bill which is now shown to the court.

Mr. W. L. Pierce for the complainants.

Messrs. W. Bakewell & Sons for the respondents.

ACHESON, *J.*:

It seems to be quite plain that the assignments set up in the original bill transferred the title to the Letters Patent only and did not carry the claims for previous infringements. (*Moore* v. *Marsh*, 7 Wal., 515.) Now, giving to the allegations contained in the proposed supplemental bill the fullest effect, the plaintiffs' alleged equitable title to those claims rests upon the mere intention of the parties to those assignments thereby to transfer them; but no such intention appears on the face of the instruments. At best it is a case of naked intention verbally expressed but not carried out. No particulars are stated, or facts disclosed, from which the plaintiffs might deduce any equitable title. The assignment of the patents to the plaintiffs was for the nominal consideration of $5. In fine, it is not shown to the court that the plaintiffs had the shadow of right in or to the claims in question until nearly five months after this suit was brought, when assignments thereof were executed. These post assignments the plaintiff seeks, by means of a supplemental bill, to have "considered as included in the cause of action as set forth in the original bill, and more particularly as a part of complainant's title as set forth in paragraph 12 thereof." But a plaintiff cannot support a bad title by acquiring another after the filing of the original bill and bringing it in by supplemental bill. (Dan. Ch. Pr., 1594, note 2; *Tonkins* v. *Lethbridge*, Cooper's Ch. Cas., 43; *Pilkington* v. *Wignall*, 2 Mad., 240; Story's Eq. Pl., sec. 339.)

Being of opinion that this motion should be disallowed for the reasons above indicated, I do not think it necessary to consider the defendants' further objections to the motion.

The motion is denied.

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[BY AUTHORITY OF CONGRESS.]

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Fraudulent Practices by Attorneys.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., April 18, 1888.

The attention of this Office having frequently been called to circulars and communications of persons pretending to have access to the records of this Bureau, and claiming to possess information of the pendency of applications for patents, notice is hereby given the public that all such persons in so advertising themselves are acting under false representations and are guilty of unprofessional conduct, and should not be entitled to credit.

The Office has also received information that certain attorneys disbarred from practice under section 487 of the Revised Statutes are continuing to prosecute applications for patents under the names of other persons.

Hereafter a list will be published in the OFFICIAL GAZETTE containing the names and addresses of all such persons, and the public warned against employing them or intrusting applications or interests to their charge.

BENTON J. HALL, *Commissioner.*

The Office has information that *Isaac S. McGlehan, No. 155 Broadway, New York*, a disbarred attorney, has been practicing under the name of *Alexander Melhado.*

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of February 26, 1889.

Patents	445—No. 396,367 to No. 396,811,	inclusive.
Designs	7—No. 18,936 to No. 18,942,	inclusive.
Trade-Marks	32—No. 16,295 to No. 16,326,	inclusive.
Labels	3—No. 5,830 to No. 5,832,	inclusive.
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Total issue	488	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	....	Nebraska	3	....
Arizona Territory	1	....	Nevada	1	....
Arkansas	2	....	New Hampshire	2	....
California	10	....	New Jersey	20	1
Colorado	2	....	New Mexico Terri'y	1	....
Connecticut	14	1	New York	80	8
Dakota Territory	5	....	North Carolina	....	....
Delaware	1	....	Ohio	39	2
District of Columbia	5	....	Oregon	1	....
Florida	1	....	Pennsylvania	53	1
Georgia	1	....	Rhode Island	2	....
Illinois	32	1	South Carolina	4	....
Indian Territory	....	....	Tennessee	1	1
Indiana	10	2	Texas	5	....
Iowa	12	2	Utah Territory	....	....
Kansas	5	....	Vermont	4	1
Kentucky	2	....	Virginia	4	1
Louisiana	5	....	Washington Terri'y	2	....
Maine	5	....	West Virginia	1	....
Maryland	13	1	Wisconsin	10	....
Massachusetts	42	1	Wyoming Terri'y	....	....
Michigan	8	....	U. S. Army	....	....
Minnesota	2	....	U. S. Navy	....	....
Mississippi	....	....			
Missouri	9	1	Total to citizens of the United States	422	24
Montana Territory	....	....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Austria-Hungary	....	....	Germany	6	4
Barbadoes	....	....	India	....	....
Belgium	....	....	Ireland	....	....
Bermuda	....	....	Netherlands	....	1
Brazil	....	....	Queensland	....	....
Canada	3	1	Russia	....	....
Canary Islands	....	....	Scotland	....	....
Colombia, U. S. of	....	....	Sweden	....	....
Cuba	....	....	Switzerland	....	....
Denmark	1	....	Victoria	....	....
Ecuador	....	....			
England	20	4	Total to citizens of foreign countries	30	11
France	....	1			

DESIGNS.

18,936.—PAPER-WEIGHT.—*George H. Benton*, Boonton, N. J. Application filed January 10, 1889. Serial No. 295,969. Term of patent 7 years.

18,937.—BELL.—*Alexis Fatoux*, Meriden, Conn. Application filed January 21, 1889. Serial No. 297,079. Term of patent 7 years.

18,938.—PATTERN FOR SHOES.—*William B. Hamilton*, Toronto, Ontario, Canada. Application filed January 22, 1889. Serial No. 297,209. Term of patent 7 years.

18,939.—MAIL-BOX.—*Henry C. Hart*, Detroit, Mich. Application filed January 16, 1889. Serial No. 296,551. Term of patent 7 years.

18,940.—TYPE.—*William W. Jackson*, Philadelphia, Pa., assignor to *The MacKellar, Smiths & Jordan Company*, same place. Application filed November 30, 1888. Serial No. 292,334. Term of patent 14 years.

18,941.—DECORATIVE FABRIC.—*Charles H. Koster*, Brooklyn, N. Y., assignor to *The Unexcelled Fireworks Company*, same place. Application filed June 12, 1888. Serial No. 276,882. Term of patent 7 years.

18,942.—BOTTLE.—*Francis H. Leggett, Albert H. Jones*, and *Lewis Wallace*, New York, N. Y. Application filed December 12, 1888. Serial No. 293,389. Term of patent 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,295.—ALL GOODS MADE FROM THE COCOA-BEAN.—*Bensdorp & Co.*, Amsterdam, Netherlands. Application filed January 9, 1889. Used since November 16, 1861.

"The words 'ROYAL DUTCH.'"

16,296.—PLOWS.—*Cealy Billups*, Norfolk, Va. Application filed January 11, 1889. Used since December 1, 1888.

"The word 'ALLIANCE.'"

16,297.—WHISKY.—*William Boyle* and *John McGlinn*, Philadelphia, Pa. Application filed January 17, 1889. Used since March 3, 1888.

"The words 'CLOVER CLUB.'"

16,298.—FURNITURE-POLISH.—*The P. Hanson Hiss Manufacturing Company*, Baltimore, Md., and Washington, D. C. Application filed January 16, 1889. Used since December 1, 1888.

"The word 'REX.'"

16,299.—SODA-WATER AND SIMILAR CARBONATED BEVERAGES.—*George C. Henry*, Burlington, Iowa. Application filed January 25, 1886. Used since June 1, 1886.

"The words 'WHIPPED CREAM.'"

16,300.—CIGARS.—*Hesslein Bros.*, Chicago, Ill. Application filed January 19, 1889. Used since 1875.

"The representation of a bell and the words 'LIBERTY BELL.'"

16,301.—MEDICATED POWDER FOR ANIMALS AND POULTRY.—*Herrman & McLean*, Cleveland, Ohio. Application filed November 17, 1888. Used since October 15, 1888.

"The words 'THE STOCKMAN'S FRIEND.'"

16,302.—CORN-SALVE.—*Miller Brothers*, New York, N. Y. Application filed June 30, 1888. Used since April 1, 1888.

"The word 'STOP-CORNS.'"

16,303.—AROMATIC LIQUID DENTIFRICE.—*Angeline Armstrong*, New York, N. Y. Application filed December 31, 1888. Used since May, 1888.

"The words 'IMPERIAL ROSE.'"

16,304.—CRACKERS, BISCUITS, AND KINDRED ARTICLES.—*C. D. Boss & Son*, New London, Conn. Application filed March 22, 1888. Used since 1864.

"The word 'LUNCHEON.'"

16,305.—VERMIN-EXTERMINATORS.—*John C. Bowe*, Syracuse, N. Y. Application filed January 19, 1889. Used since January 1, 1887.

"The words 'LIGHTNING PULVERIZER.'"

16,306.—SPECIFICS FOR HOG-CHOLERA AND SWINE-PLAGUE.—*Charles E. Clarke*, New York, N. Y. Application filed January 31, 1889. Used since August 1, 1888.

"The word 'HOBOZONE.'"

16,307.—SHOES HAVING SOLID INSOLES AND HEEL-COUNTERS.—*Durrell Bros.*, Cincinnati, Ohio. Application filed November 24, 1888. Used since November 23, 1888.

"The word 'PHŒNIX.'"

16,308.—NEW HYPNOTIC.—*Farbenfabriken, vormals Fr. Bayer & Co.*, Elberfeld, Germany. Application filed December 28, 1888. Used since December, 1888.

"The word 'TRIONAL.'"

16,309.—NEW HYPNOTIC.—*Farbenfabriken, vormals Fr. Bayer & Co.*, Elberfeld, Germany. Application filed December 28, 1888. Used since December, 1888.

"The word 'TETRONAL-BAYER.'"

16,310.—NEW HYPNOTIC.—*Farbenfabriken, vormals Fr. Bayer & Co.*, Elberfeld, Germany. Application filed December 28, 1888. Used since December, 1888.

"The word 'TETRONAL.'"

16,311.—NEW HYPNOTIC.—*Farbenfabriken, vormals Fr. Bayer & Co.*, Elberfeld, Germany. Application filed December 28, 1888. Used since December, 1888.

"The word 'TRIONAL-BAYER.'"

16,312.—WHISKY.—*Fred. J. Kiesel & Company*, Ogden, Utah Ter. Application filed November 23, 1888. Used since July 15, 1881.

"The word 'PAROLE.'"

16,313.—SOAPS AND DETERGENTS.—*Lever Bros.*, Warrington, county of Lancaster, England. Application filed November 13, 1888. Used since March 28, 1884.

"The word 'SUNSHINE.'"

16,314.—SOAPS AND DETERGENTS.—*Lever Bros.*, Warrington, county of Lancaster, England. Application filed November 13, 1888. Used since April 20, 1885.

"The word 'SUNBEAM.'"

16,315.—FANCY SOAPS AND TOILET PERFUMERY.—*Lever Bros.*, Warrington, county of Lancaster, England. Application filed December 18, 1888. Used since March 28, 1884.

"The word 'SUNSHINE.'"

16,316.—FANCY SOAPS AND TOILET PERFUMERY.—*Lever Bros.*, Warrington, county of Lancaster, England. Application filed December 18, 1888. Used since April 20, 1885.

"The word 'SUNBEAM.'"

16,317.—CEREAL PRODUCTS.—*The Muscatine Oat Meal Company*, Muscatine, Iowa. Application filed November 30, 1888. Used since June 1, 1887.

"The word 'HAWKEYE.'"

16,318.—BOOTS, SHOES, AND SLIPPERS.—*Packard & Field*, Brockton, Mass. Application filed January 9, 1889. Used since January 1, 1889.

"The representation of a human foot visible through the upper of the boot or shoe within which it is inclosed."

16,319.—LINIMENTS.—*Peter P. Prando*, St. Xavier Mission, (Fort Custer,) Mont. Ter. Application filed January 23, 1889. Used since 1887.

"The word 'ISTEUMATE.'"

16,320.—PHOTOGRAPHIC PAPER.—*Antoine Schaeffner*, Paris, France. Application filed November 13, 1888. Used since January 1, 1888.

"The representation of an anchor and the letters 'A' and 'S.'"

16,321.—REMEDY FOR CHILLS AND FEVER AND LIVER-PILLS.—*Von Vleet & Co.*, Memphis, Tenn. Application filed January 22, 1889. Used since June 1, 1885.

"The word 'PLANTATION.'"

16,322.—ADDING-MACHINES.—*Charles Henry Webb*, New York, N. Y. Application filed November 21, 1888. Used since December, 1888.

"The words 'THE ADDER.'"

16,323.—PREPARATIONS FOR CURING HEADACHE.—*Samuel Whitehall*, South Bend, Ind. Application filed January 12, 1889. Used since June 1, 1888.

"The word 'MEGRIMINE.'"

16,324.—ZINC POWDER AND COMPOUNDS CONTAINING ZINC FOR EXTERNAL USE.—*Lucy N. White*, New York, N. Y. Application filed January 26, 1889. Used since September 17, 1888.

"The word 'SPELTERINE.'"

16,325.—INSECTICIDE.—*Samuel Woods*, Montreal, Quebec, Canada. Application filed January 18, 1889. Used since March 27, 1888.

"The word "MOTHINE.'"

16,326.—STOMACH-TONIC.—*Zobel & Faltmesger*, Brooklyn, N. Y. Application filed February 4, 1889. Used since November 1, 1887.

"The picture of 'PROFESSOR DOCTOR G. JAEGER.'"

LABELS.

5,830.—Title: "COTTINGHAM'S STOMACH AND KIDNEY RENOVATOR." *William H. Cottingham*, Noblesville, Ind. Application filed January 30, 1889.

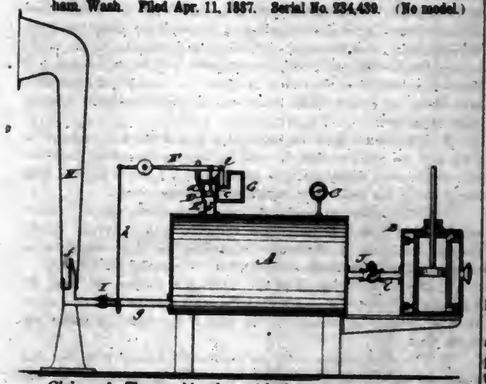
5,831.—Title: "RHEUMATISM AND GOUT" (FOR A MEDICINE.)—*Anthony Sieke*, New York, N. Y. Application filed January 4, 1889.

5,832.—Title: "COLLINGSWOOD" (FOR SPRING WATER.)—*David W. White*, Collingswood, N. J. Application filed January 29, 1889.

PATENTS

GRANTED FEB. 26, 1889.

398,367. AUTOMATIC FOG-HORN. AUGUST F. BAATZ, Bellingham, Wash. Filed Apr. 11, 1887. Serial No. 234,439. (No model.)

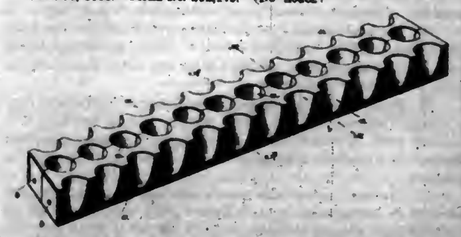


Claim.—1. The combination, with the reservoir A, the pump B, operating to charge said reservoir with compressed air, and the fog-horn H, of the valve-controlling piston D, the weighted lever F, attached to and operated by the piston D, and the way-cock I, connected with said lever and adapted to control the discharge of air from the reservoir to and through the horn, substantially as specified

2. In combination with the compressed-air reservoir A and fog-horn H, connected therewith, the valve-controlling piston D, with its box or casing and air-chamber G, said air-chamber being provided with a connecting-aperture, *c*, above the piston-head, leakage-aperture *d* about the piston-rod, the weighted valve-lever F, attached to the piston-rod, the connection *h* between said lever and the way-cock I, and the way-cock I, essentially as and for the purpose herein set forth.

3. The combination of the compressed-air reservoir A, the pump B, connected therewith, the check-valve J, located between the pump and reservoir, the valve-controlling piston D, with its casing E and air-chamber G, said air-chamber being provided with a connecting-aperture, *c*, above the piston-head, leakage-aperture *d* about the piston-rod, the weighted lever F, attached to and operated by the piston D, the fog-horn H, communicating with the air-reservoir through the pipe *g*, the way-cock I in said pipe, and the connection *h* between said way-cock and lever, substantially as shown and described.

398,368. CANDY-MOLD. SAMUEL E. BALL, Dayton, Ohio. Filed Nov. 30, 1888. Serial No. 292,179. (No model.)



Claim.—1. The candy-mold consisting of the series of independent rubber bars provided with complementary cells, and each provided with a stiffening rod or strip to prevent flexion.

2. A section for a candy mold consisting of a rubber bar provided with suitable mold cells or cavities, and with a stiffening strip or rod applied permanently thereto.

398,369. CABLE RAILWAY. PINKNEY F. BARR, St. Paul, Minn. Filed Dec. 18, 1888. Serial No. 293,063. (No model.)



Claim.—1. A yoke for cable railways, provided with a lug near the running-rail to receive the tie-rod for the slot-rail, in combination with the slot-rail and a tie-rod attached to said running-rail and said lug, substantially as described.

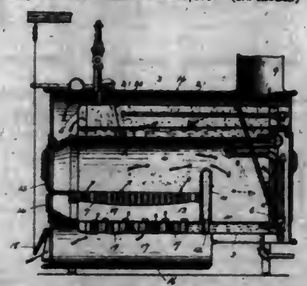
2. A yoke for cable railways, provided with recesses for the slot and running rails, and a lug substantially on the same horizontal plane with the running-rails, and having an aperture to receive the tie-rod holding the slot-rail, in combination with a tie-rod secured to the slot-rail and passing horizontally through the aperture in the lug, substantially as described.

3. The combination, with a yoke having seats for the slot and running rails and a lug projecting above the rail-seats therein, of said slot and running rails and two tie-rods, each running through one slot-rail, a running-rail, and said lug, substantially as described.

4. The combination of a yoke and a pulley-block, one of which is provided with a recess to receive the other and a key driven into the recess in the one and binding the two together, substantially as described.

5. The combination, with a yoke having a flange, *a'*, of a pulley-bracket having a recess embracing said flange and a key set between the wall of the recess and the flange, substantially as described.

398,370. STEAM-BOILER. ABDIAS I. BARRABOFF, Bangor, Me. Filed July 30, 1888. Serial No. 280,478. (No model.)



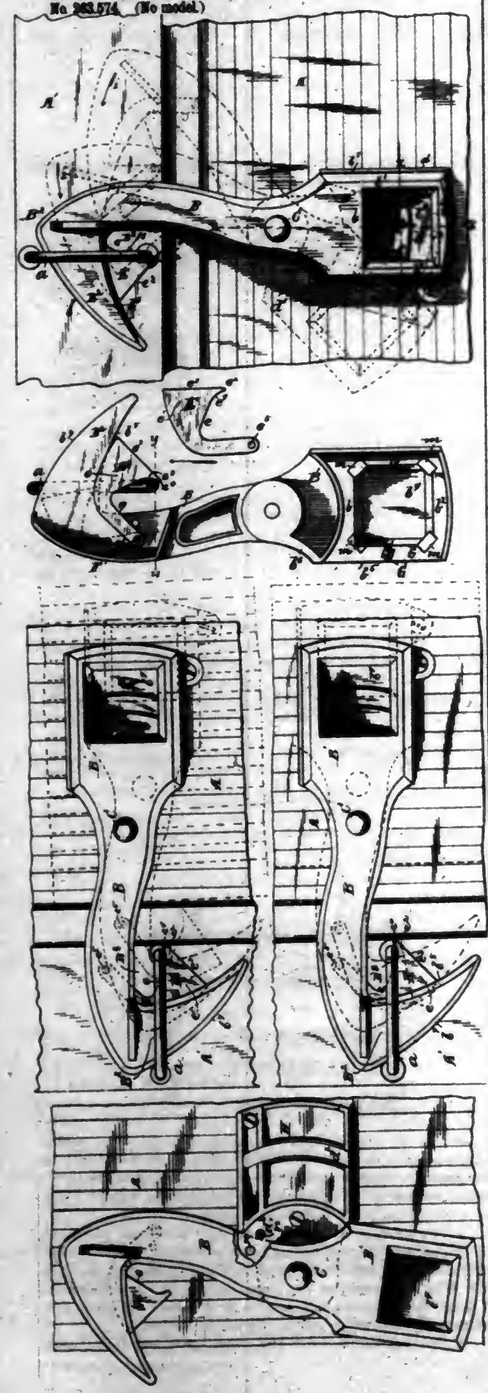
Claim.—1. The combination, in a steam-boiler having an annular water-space, of a hollow bridge-wall interiorly of said water-space, an ash-chamber exteriorly of said water-space, and air-passages 12, extending thereacross, which connect said ash-chamber with the chamber in the bridge-wall, substantially as specified.

2. In a steam-boiler having an annular water-space, with draft-flues 8 8 longitudinally therethrough, the combination, with said boiler, of the grate 7, the hollow bridge-wall 10, the air-passage 12, the draft-flues 19 19 transversely of the lower water-space, the ash-chamber 17 below the same, and the doors 14 18, the latter operating automatically, substantially as and for the purposes set forth.

3. The combination, with a boiler constructed with an inner shell,

4, an outer shell, 3, composing the water-space, and with the flues 8 8 therein, of the transverse draft-flues 19 19 exterior to and below the grate, the grate-bars 7-7, arranged above the lower water-space, and the plate 16, inclosing the outer shell, 3, and forming beneath the said shell the ash-chamber 17, and above and about said shell the flue 21, substantially as herein described.

398,371. SEAL-LOCK. EDWARD C. BARTLETT, Omaha, Nebr., assignor to John L. McCague, same place. Filed Feb. 10, 1888. Serial No. 263,574. (No model.)



Claim.—1. In a sealing device having a seal-cutting knife, a latch-bar provided with an automatically-operating catch, whereby the latch-bar engages with a fixed fastener when the door is being moved toward said fastener, substantially as set forth.

2. The latch-bar having a movable knife and an automatic catch adapted to engage with a fixed fastener and bear against the said fastener on lines transverse to the path of the knife, whereby said latch-bar automatically engages with said fixed fastener when moving toward it, and the knife must be moved automatically at the time when the latch-bar is being released from the fixed fastener, substantially as set forth.

3. In a sealing device, a latch-bar having a movable seal-cover connected with it, and an automatic catch whereby the bar engages with a fixed fastener when it is being moved toward the latter, substantially as described.

4. The latch-bar adapted to be engaged with a fixed fastener and having a seal-cover, in combination with a seal-holder, a stop for the latch-bar when the seal-cover is over the seal-holder, and a stop which prevents the latch-bar from carrying the seal-cover beyond a limited distance from the seal-holder, whereby the latch-bar always tends to hold the cover over the seal, substantially as described.

5. The pivoted seal-cover, the weighted arm for said cover, and the stops at the ends of the path of the seal-cover, whereby the weighted arm always tends to hold the cover over the seal-receptacle, substantially as set forth.

6. The pivoted latch-bar having the seal-cover at one side of its pivot and the catch or lock for said latch-bar arranged on the other side of the pivot, substantially as set forth, to act as a weight to hold the cover on the seal-holder, substantially as described.

7. The pivoted arm having the seal-cover on one side of its pivot and having the hook B^3, said hook and arm being of greater weight than the seal-cover, in combination with the stops for the arm and seal-cover situated in the path of their travel, substantially as set forth.

8. The combination, with the latch-arm having the hook B^3 formed with the cam b^7, and having the seal-cover secured thereto, of the fixed fastener a, arranged in the path of the cam b^7, substantially as set forth.

9. The combination, with the seal-holder formed with the stop d and the stop d', of the seal-cover and the weighted carrier for said cover, said cover and carrier engaging with the stop d when the cover is over the seal-holder and engaging with the stop d' before the center of gravity of the carrier reaches the vertical line passing through the axis about which the seal-cover and carrier move, substantially as set forth.

10. In a sealing device, the combination, with the seal-holder having the inclosing-walls d^3 d^4, and the retainer H, bearing against the outer surface of the seal, of the seal-passage at d^5, extended to or below the said retainer H, substantially as set forth.

11. In a sealing device, the combination, with the latch-bar, of the gravity-catch having a concave edge adjacent to the staple or fastener, substantially as set forth.

12. The combination, with the latch-bar, of the pivoted gravity-catch suspended from a pivot above the fastener, with which it engages, substantially as set forth.

13. In a sealing device comprising two parts, of which one rocks relatively to the other, the combination, with the rocking part and the fixed fastener a, of a gravity-catch suspended below a pivot other than the pivot about which moves the said rocking part of the sealing device, substantially as described.

14. The combination of the seal-receptacle and the cover, of which parts one rocks relatively to the other about a pivot, and a fixed fastener for said part, of a gravity-catch pivotally connected to the said rocking part on an axial line nearer to the fixed fastener than the axial line of the first aforesaid pivot, substantially as described.

15. The combination, with the sealing device and the hasp having a pivot, C, and a hook at its outer end, of the gravity-catch pivoted to the hasp between the hasp-pivot and the outer end of the hook, substantially as set forth.

16. The combination, with the pivoted hasp or latch arm having a catch, B^3, to bear against a fixed fastener in one direction, of a movable catch, E, secured to the hasp and bearing against the fixed fastener in a direction transverse to that aforesaid, substantially as set forth.

17. The combination, with the pivoted hasp having a catch, B^3, adapted to engage with a fixed fastener, of a catch, E, having an inclined edge adapted to strike the fixed fastener to move the catch while the hasp approaches said fastener, substantially as set forth.

18. The combination, with the hasp or latch arm, of a catch, E, having the inclined edge e^3 and the recessed edge e^4, arranged substantially as set forth.

19. The combination, with the fixed fastener and sealing devices, of the hasp or arm, adapted when closed to lie above and out of contact with the fixed fastener, substantially as set forth.

20. The combination, with the seal-holder, the glass cover, and the support for the glass, of the metal fasteners m m, secured to the glass-support and engaging with the edges of the glass, substantially as set forth.

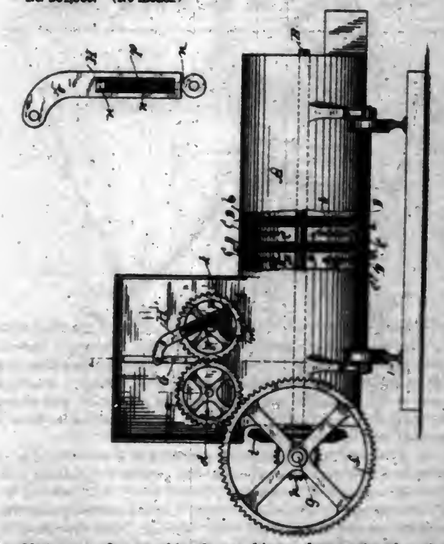
21. The combination, with the hasp and its pivot, of the re-enforcing dovetailed or wedge-shaped flanges, substantially as set forth.

398,372. HARNESS-BUCKLE. ISAAC E. BENNETT, Newton, Iowa. Filed Nov. 6, 1888. Serial No. 290,120. (No model.)



Claim.—The combination of the frame composed of side bars a and cross-bars b and c, said bar b provided with an aperture, and the frame composed of the side bars d, the end bar f, having a tongue on its under side, the bar and loop g, and a cross-bar, m, substantially as shown and described.

398,373. MACHINE FOR TEMPERING CLAY. MICHAEL BERLINE and JACOB BERLINE, Chaska, Minn. Filed Jan. 30, 1888. Serial No. 261,389. (No model.)



Claim.—1. In a machine for crushing and tempering clay, the combination of a horizontal tempering-cylinder, a horizontal blade-shaft in the said cylinder, and a pair of fluted clay-crushing and feed rolls mounted crosswise of the tempering-cylinder and over its forward end, substantially as and for the purpose herein set forth.

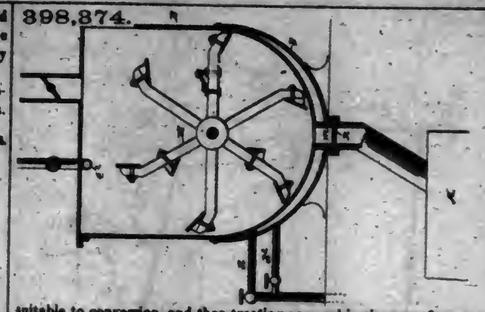
2. In a clay crushing and tempering machine, in combination with the upwardly and downwardly moving bar and crank-wheels for driving the same, the connecting rods or arms, made each in two parts, and a spring between the two parts adapted to act to draw the parts together and yield to a sufficient force tending to separate them, substantially as and for the purpose herein specified.

398,374. PROCESS OF MANUFACTURING BEER OR ALE. ANDREW W. BELLEMS, Brooklyn, N. Y. Filed Feb. 9, 1887. Serial No. 227,067. (No specimens.)

Claim.—1. The within-described improvement in the manufacture of beer, consisting in making a malt mash and also making a supplemental mash by mixing together malt and raw grain with water, raising the temperature not to exceed the coagulating point of diastase, and then mixing the supplemental mash with the main mash at a temperature varying between 140° and 170° Fahrenheit, and then conducting operations as in ordinary brewing, substantially as described.

2. In the manufacture of beer or ale, making a malt mash and making a supplemental mash by mixing together malt and corn with water, gradually raising the temperature by the injection of live steam to a point at which the diastase remains active, and then mixing the supplemental mash with the malt mash when at a temperature most

398,374.



suitable to conversion, and then treating as usual in the manufacture of ale or beer, substantially as described.

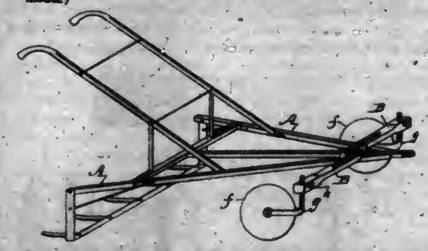
398,375. MANUFACTURE OF ULTRAMARINE. LIEUT. J. R. A. J. BOUILLET, London, County of Middlesex, England. Filed Mar. 25, 1887. Renewed Dec. 12, 1888. Serial No. 294,022. (No specimens.) Patented in England July 14, 1886, No. 9,176.



Claim.—1. The method of manufacturing ultramarine by first placing the powdered material in a fibrous bag or envelope containing calcareous or mineral matter while in constant motion, then placing a thin sheet of card-board over the material, and folding the paper bag or envelope over the card-board and sealing it with paste, the whole placed within a suitable retort and subjected to a proper degree of heat, substantially as described.

2. The combination, substantially as shown and described, of the fire-places A, flues B, fire-tiles C, hollow fire-bricks D, refractory bricks Z, blocks E, dampers E', arches F, flue-passages G, dampers G', flue H, fire-tiles I, iron bars K, brick piers L, layer of sand M, perforated incombustible pipe N, flue O, and apertures S, the whole adapted for the manufacture of ultramarine.

398,376. WEED-CUTTER AND HORSE-HOE. ANDREW CHENEY, Sergeant Bluffs, Iowa. Filed Sept. 28, 1888. Serial No. 286,636. (No model.)



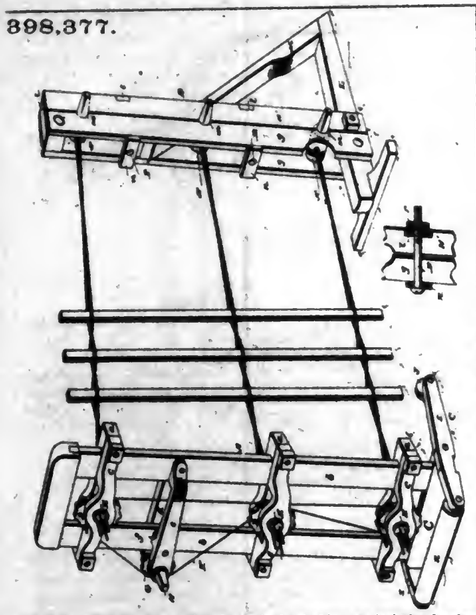
Claim.—The adjustable bars B, having longitudinal slots, and the bearers g, carrying rotary cutters f, in combination with the triangular frame A, to operate in the manner set forth, for the purposes stated.

398,377. FENCE-MACHINE. GEORGE J. CLINE, Goshen, Ind. Filed Nov. 3, 1888. Serial No. 290,272. (Model.)

Claim.—1. The combination, with a roller-frame, of the uprights b, secured thereto, the cross-bars c, having the central extended portion, the cross-bars c, having the central recess or depressed portion and secured together at their outer ends, the twisting-heads having sprocket-wheels and journaled between the two cross-bars on one side of the uprights, the sprocket-wheel G, journaled in the arms d e, and the arm e, having the lug f, so as to form a passage for the endless chain, substantially as specified.

2. In a tension device for use in fence-making, consisting of a base-piece, I., a strut, M, two parallel vertical bars, g, having matched notches in one edge and each rigidly secured to the base and strut, the block secured to the upper ends of said parallel bars, the two parallel bars H', having notches corresponding with those of the bars g, united by cross-bars and pivoted at their lower ends to the base-piece and passing alongside but not secured to the top block, the cross-bars n, secured to the bars g, the cross-bars l, secured to the bars H', the threaded rods passing through the respective cross-bars,

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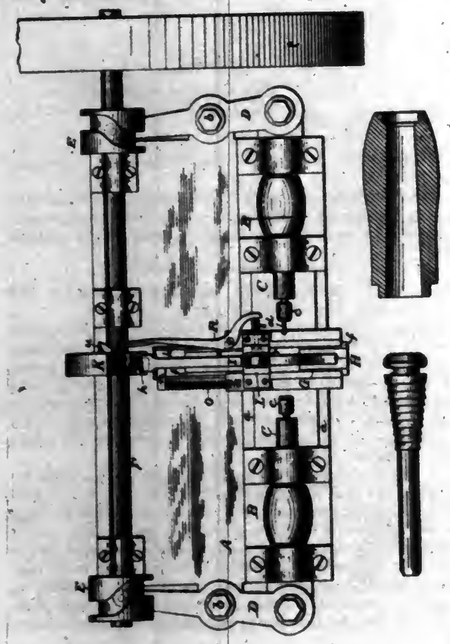


and tightening-nuts on said rods, and wire holders or bobbins having their spindles in the notched bearings, substantially as specified.

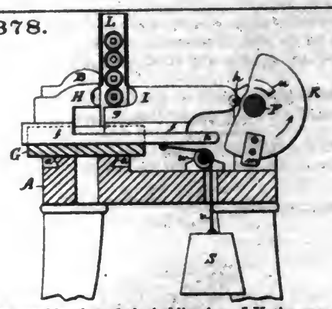
398,378. MACHINE FOR FINISHING CASTER-ROLLERS. ROBERT B. COOLING, Bristol, Conn. Filed June 20, 1888. Serial No. 277,623. (No model.)

Claim.—1. The combination of a pair of holding-jaws, the leveling-plunger and an opposing face for confining the work under lateral pressure when about to be grasped by the jaws, and mechanism for operating said plunger, substantially as described, and for the purpose specified.

2. The holding-jaws having holding-faces and arranged to move for bringing said faces to and from each other, and a weight or spring for holding the jaws together when gripping the work, and thereby determining the pressure of the jaws upon the work, substantially as described, and for the purpose specified.



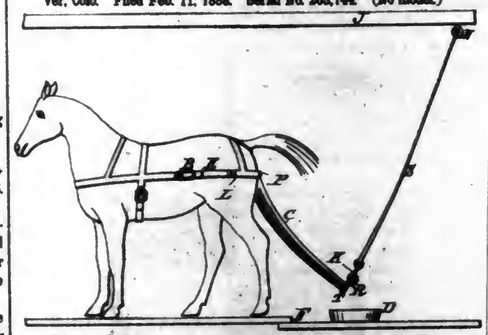
398,378.



3. The combination of the holding-jaws I H, the cams K and *m*, acting, respectively, upon the jaws I and H to force them forward, and a pressing device for throwing the jaw I toward the cam, and another pressing device for throwing the jaw H toward the jaw I and the cams, substantially as described, and for the purpose specified.

4. The combination of a lathe spindle or spindles, the holding-jaws I H, the cams K *m*, acting, respectively, first on the jaw I and then on the jaw H, and pressing devices for returning said jaws, substantially as described, and for the purpose specified.

398,379. MANURE AND URINE CONDUIT. HENRY COLE, Denver, Colo. Filed Feb. 11, 1888. Serial No. 263,744. (No model.)

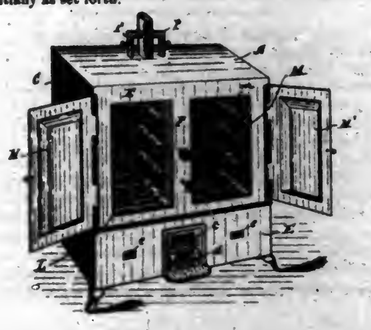


Claim.—1. In a manure and urine conduit, a chute, C, open at the top its entire length and provided with a spring, T, containing eyes R at its discharge-opening, in combination with a strap, S, attached at one extremity to said spring by means of a hook, K, and at the other extremity to the ceiling of the barn, substantially as shown and described, and for the purpose set forth.

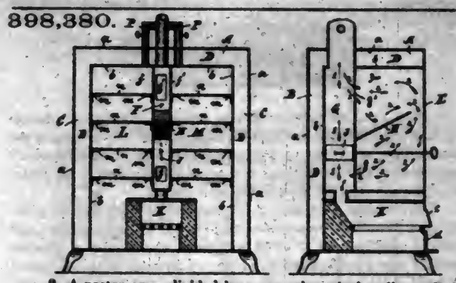
2. A manure and urine conduit consisting of a chute, C, open at the top its entire length and provided with a spring, T, containing eyes R, in combination with a strap, S, provided with a suitable hook, K, said strap being connected with a spring, T, at one extremity and with a suitable support above at the other extremity, and two straps, E, one on each side, forming part of a suitable means of attachment, substantially as shown and described, and for the purpose set forth.

398,380. PASTRY-OVEN. JOHN P. CONNOR, Boston, Mass. Filed June 16, 1888. Serial No. 277,316. (No model.)

Claim.—1. In combination with a pastry-oven, the central vertical radiator, F, provided with the pipe G, having openings *g g'* and fitted with a damper, J, and the partition H, whereby the heat entering the radiator through the opening *g* is caused to pass to the front of the oven and thence back and through the opening *g'* to the flue, substantially as set forth.

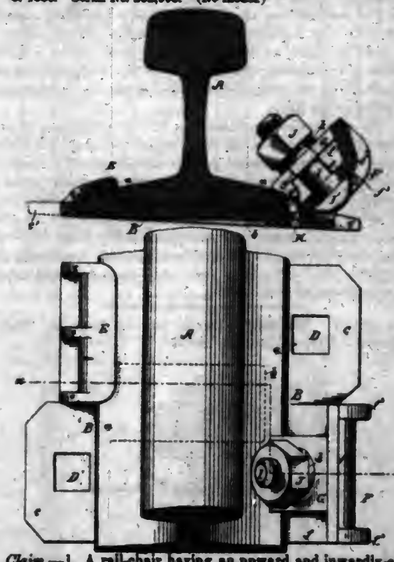


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2. A pastry-oven divided by a central vertical radiator, F, into two compartments, L M, closed by separate doors, N N', in combination with the smoke-pipe G, having openings *g g'* and damper J, and the fire-pot K, substantially as shown and described.

398,381. RAIL-CHAIR. HENRY F. COX, Altoona, Pa. Filed Dec. 8, 1888. Serial No. 292,908. (No model.)



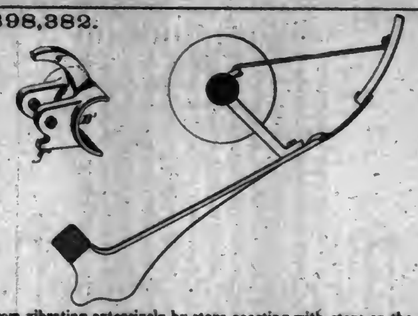
Claim.—1. A rail-chair having an upward and inwardly-extending lug at one corner, an upward and outwardly-extending lug with turned-up edge at the corner diagonal to the first, and plain outwardly-extending flanges pierced with spike-holes at the remaining two corners, in combination with a bolt passing through the outwardly-extending lug with its head beneath said lug, a clamping-piece adapted to rest against the turned-up end of the outwardly-extending lug and the edge of the base of a rail resting in the chair, said clamping-piece being perforated to permit the bolt to pass through it, and a nut screwing on said bolt, all substantially as and for the purpose specified.

2. A rail-chair having an upward and inwardly-extending lug at one corner, an upward and outwardly-extending lug with turned-up edge at the corner diagonal to the first, and plain outwardly-extending flanges pierced with spike-holes at the remaining two corners, in combination with a bolt passing through the outwardly-extending lug with its head beneath said lug, a clamping-piece adapted to rest against the turned-up end of the outwardly-extending lug and the edge of the base of a rail resting in the chair, said clamping-piece being perforated to permit the bolt to pass through it, a downwardly-extending lug at the lower edge of the clamping-piece extending beneath the rail-base, a perforation in the base of the chair to admit the said lug, and a nut screwing on the end of the bolt aforesaid and against the clamping-piece, all substantially as and for the purpose specified.

398,382. GRAIN-BINDER. HENRY F. CRANDALL, Milwaukee, Wis., assignor to the Milwaukee Harvester Company, same place. Filed Jan. 28, 1887. Serial No. 225,835. (No model.) Patented in England Dec. 6, 1887, No. 16,741.

Claim.—1. In a grain-binder, the combination, with the compressing-fingers and the bell-crank to which they are hung, of a spring-catch for engaging the inner end of the bell-crank, and a frame in which the shank of said spring-catch slides, said frame being prevented

398,382.

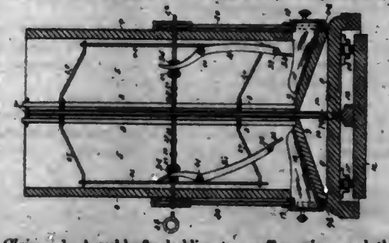


from vibrating extensively by stops coacting with stops on the main frame, having a bend which, acting on the lower end of the shank of the spring-catch, serves to tilt the catch and permits it to maintain its engagement with the bell-crank as it is drawn up by the action of the pressure of the gavel on the compressing-fingers, as set forth.

2. In a grain-binder, a spring-catch for the compressor-fingers mounted in a swinging frame, said frame being kept from extensive vibration by suitable stops, but having curved guides for the catch, so that the end of the latter may travel in the arc of a circle in spite of the restrictive action of the stops, substantially as and for the purpose set forth.

3. In a grain-binder, a bracket secured to a supporting-bar of the machine and provided with an upper and lower stop, a frame pivoted to the bracket, a spring-catch mounted in the frame to engage the compressor-fingers, and means, substantially as described, for actuating said frame at predetermined intervals, as set forth.

398,383. COMBINED SPICE-CADDY. ROBERT CROSMER, Philadelphia, Pa. Filed Jan. 5, 1888. Serial No. 259,857. (No model.)



Claim.—1. A caddy for holding tea, coffee, spices, and the like, comprising separable sections, the said sections resting on a movable base, in combination with means, substantially as shown and described, for rotating the said caddy, and scoops of different capacities in each of the said sections, the said scoops entering the said sections at an oblique angle.

2. The caddy herein shown and described, comprising separable sections, the said sections having false bottoms 9 and resting on a movable base, 11, in combination with the rollers 15 for rotating the said caddy, and the scoops 17 18, which enter the said sections at an oblique angle, as shown.

3. In combination, a caddy composed of separable compartments, the rods 3, running through the said compartments, and the supports 7, through which the rods 3 run.

4. A caddy composed of separable sections, the said sections resting on a movable base between flanges 16 and inclining toward the vertical axis of the caddy.

5. A caddy composed of compartments having the agitator 24 25 26 42 in the said compartments, all substantially as shown and described.

6. A caddy comprising compartments having the agitator 24 25 26 in the said compartments, all substantially as shown and described.

7. A caddy comprising compartments having the agitator 24 25 26 42 3 in the said compartments, all substantially as shown and described.

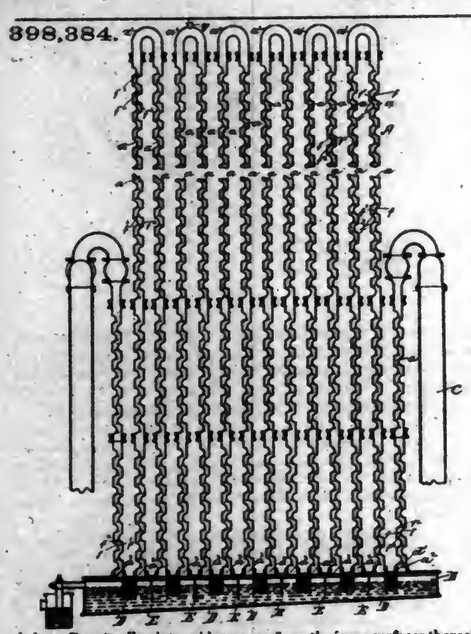
8. A caddy composed of compartments having the agitator 24 25 26 42 and the shovel-lever 37 and the shovels 38 in the said compartments, all substantially as shown and described.

9. The agitator 24 25 26 42 3, in combination with the shovel-lever 37 and the shovels 38, all substantially as shown and described.

398,384. COAL-GAS CONDENSER. FREDERICK J. DAVIS, Waltham, Mass. Filed July 1, 1887. Serial No. 243,108. (No model.)

Claim.—1. A gas-condenser consisting of a series of sections, the side walls of which are formed with concave portions *f*, diagonally opposite to each other, whereby a sinuous passage is formed, and the

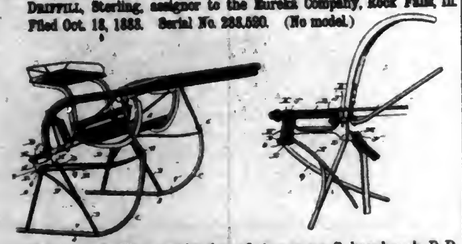
398,384.



ledges f^2, extending into said passages from the inner surfaces thereof, the sections being connected together alternately at top and bottom, substantially as described.

2. The condenser having the walls or cases A, having sinuous passages *a*, connected with each other, as specified, the tar-well B, the plates or partitions E, and the breakers D, placed alternately with said partitions, as and for the purposes specified.

398,385. RUNNER FOR WHEELED VEHICLES. FREDERICK DRIFFILL, Sterling, assignor to the Eureka Company, Rock Falls, Ill. Filed Oct. 18, 1888. Serial No. 288,520. (No model.)



Claim.—1. The combination of the runner C, bench-rods D D, rails E and G, brace-rod F, provided with pintle P, box N, the head H, provided with clips K K, journal M, and opening O, and the axle E, substantially as shown, and for the purpose described.

2. The combination of the runner C, provided with the tread S and central vertical flange, V, bench-rods D D, having their lower ends suitably supported on said tread and attached to said flange, the rail E, supported on said runner and bench-rods, the axle B, and means, substantially as shown, for removably seating said axle on said rail, for the purpose described.

398,386. CARTRIDGE. STEPHEN H. EMMENS, London, England. Filed Feb. 8, 1888. Serial No. 263,372. (No model.)



398,386.



Claim.—1. A cartridge containing a propelling charge or charges of a high explosive and having a yielding cushion which incloses the same, so that the elastic or compressible material of said cushion is interposed between said charge or charges and the walls of the chamber of the gun in which such cartridge is used.

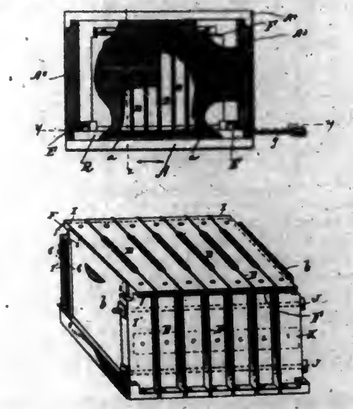
2. A cartridge containing a starting-charge, preferably of a low explosive, and one or more accelerating-charges of high explosive, and having a yielding cushion which incloses all the charges, so that its elastic or compressible material is interposed between said charges and the walls of the chamber of the gun in which such cartridge is used.

3. A cartridge containing a starting-charge, preferably of a low explosive, and two or more accelerating-charges of a high explosive inclosed within longitudinal chambers in an elastic or yielding cushion, and having a wad carrying plugs of different lengths, which close the front ends of said chambers and open them successively, substantially as hereinbefore specified.

4. The combination, in a cartridge, of a propelling charge or charges of a high explosive, a yielding cushion which incloses the same, a firing-primer at the initial firing-point, and at a distance therefrom a re-enforcing detonator in contact with each charge of high explosive to insure the full explosion of the latter, substantially as hereinbefore set forth.

5. The combination, in a cartridge for heavy ordnance, of an annular wooden cushion provided with longitudinal chambers charged with a high explosive, a central metallic tube closed at its breech end and provided with an external recess containing a firing-primer and with a bore connected with said recess by a flame-hole and charged with a low explosive, a wooden plug fitted to the front end of said bore, a superposed metallic wad carrying wooden plugs which close the front end of said high-explosive chambers, and re-enforcing detonators within the front ends of the chambers last named, substantially as hereinbefore specified.

398,387. BEE-HIVE. JOSEPH I. FOOT, San Diego, Cal. Filed Apr. 13, 1887. Serial No. 234,682. (Model.)

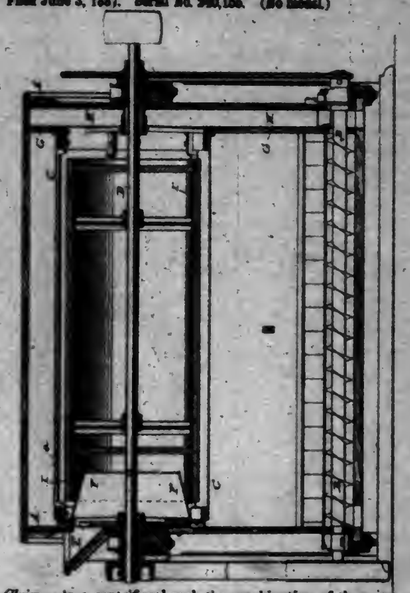


Claim.—1. The combination, with the bottom and the rim having bee-entrances, of the frames mounted upon the rim and having a space between them and the bottom, and having bee-entrances between their bottom bars, and the cut-off slide fitted against the bottom bars of the frames and located in said space and adapted to be moved therein to cut off any required number of the frames, substantially as and for the purpose described.

2. The combination, with the series of comb-frames the end ones of which have their sides extended and vertically grooved, of the slides *b* and glass *h*, fitted in the said grooves, and means, as described, for securing the said frames together, substantially as set forth.

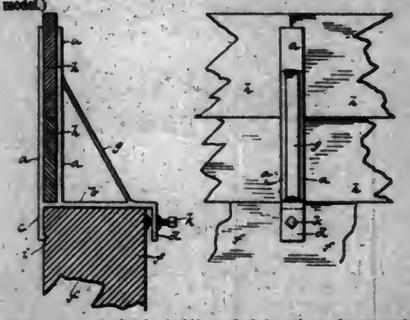
3. The herein shown and described bee-hive, composed of the bottom, the rim secured thereto, the brood-frames placed upon the rim, cleats fastened to the ends of the rim and embracing the lower edges of the frames, the wire holding the upper edges of the frames from spreading, the slides at each end of the series of brood-frames, and thin plates interposed between the brood-frames, the cut-off slide, the case rabbeted on its lower edge and fitted to the rim, and the supplemental top and the top proper, substantially as and for the purpose set forth.

398,388. ROTARY BOLT. JOHN M. FINCH and WILLIAM D. GRAY, Milwaukee, Wis., assignors to Edward P. Allis & Company, same place. Filed June 3, 1887. Serial No. 240,155. (No model.)



Claim.—In a centrifugal reel, the combination of the outer reel, the inner cylinder having a smooth surface and a recessed head, and the conical screen F, extended into the end of the cylinder, as described.

398,389. SPLASH-BOARD HOLDER FOR BOATS. ALBERT J. GOULD, Pittsburg, Pa. Filed Nov. 30, 1888. Serial No. 292,318. (No model.)



Claim.—1. A device for holding splash-boards on the gunwale of a vessel, consisting of a horizontal base, *b*, provided with two depending arms, one having a clamping-screw and the other a tooth or prong, and two vertical parallel arms, *a*, made integral with the base, said arms being separated laterally of each other to provide a space corresponding to the thickness of the splash-boards and of sufficient length to accommodate two or more boards, substantially as described.

2. In a device for holding splash-boards on the gunwale of a vessel, a bracket consisting of a flat horizontal base having means for attaching itself to a vessel, and two vertical parallel arms, *a*, spaced laterally of each other on said base to provide an intervening space substantially equal in width to the thickness of the splash-boards, said arms being of sufficient length to accommodate two or more boards, in combination with two or more splash-boards fitted between the arms of said bracket and resting on edge on the base thereof, substantially as described.

398,390. COMBINED FUNNEL AND CAN-TOP. HARVARD GREELY, Ellsworth, Me. Filed Dec. 12, 1888. Serial No. 292,376. (No model.)

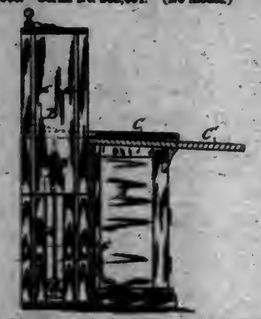
Claim.—1. A combined funnel and can-top consisting of the cone-shaped funnel-body D and the spout F, with the enlarged portion L, adapted to fit and be secured to the neck of a can, in combination with spout-cap *g*, substantially as shown, and for the purpose described.

2. As a new article of manufacture, an attachable funnel can-top consisting of the cone-shaped funnel-body D, provided with corrugations *f*, having the spout F, with an enlargement, and with fastening devices requiring a rotary movement of the funnel-body to the neck of a can, and a cap to fasten over the open end of the spout, substantially as shown and described.

398,390.

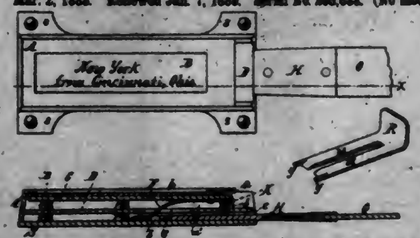


398,391. WRITING-DESK OR SECRETARY. FRANK HAMMOND, Homer, N. Y., assignor of one-half to Martha Faulkner, same place. Filed Aug. 6, 1888. Serial No. 282,091. (No model.)



Claim.—In combination with the desk provided with the usual open space at its under side and the secretary arranged to move vertically in said desk, a pivotal spring-catch arranged in the lower portion of the back of the aforesaid open space and provided with a foot-piece, whereby it is adapted to retain the secretary in its depressed position and be readily released by the foot, substantially as described and shown.

398,392. SPRING-LOCK. HENRY K. HARKER, Cincinnati, Ohio, assignor of fifty-one one-hundredths to L. A. Harris, same place. Filed Mar. 2, 1888. Renewed Jan. 7, 1889. Serial No. 295,952. (No model.)



Claim.—1. A lock of the class described, composed of the base-plate S and a casing or shell, A, the plate C, slotted plate D, secured in the case and forming compartments therein, and a locking-spring secured in one compartment, passing through the slot or slots in the plate D into the adjacent compartment, the said compartments being open at one end, substantially as described.

2. In a lock of the class described, the case composed of the base-plate S and casing or shell A, having an opening, A, at its upper side for exposing a tag or card, the plates C and D, located and secured in said casing or shell to form compartments open at one end for the insertion of a tag or card, a locking and unlocking device, and the locking-spring F, substantially as described, combined with the movable bolt K, extending across the openings at the end of the casing, substantially as shown, and for the purpose described.

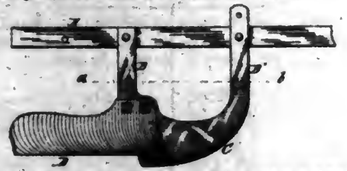
3. In a lock of the class described, the combination of a casing

or shell, A, the plate C, and the slotted plate D, secured in the case and forming compartments therein, the said compartments being open at one end, a locking-spring secured in one compartment and extending through the slot in the plate D into the adjacent compartment, and a locking-tongue, H, to be engaged by the locking-spring, as set forth.

4. In a lock of the class described, the combination of a casing or shell, A, the plate C, and the slotted plate D, secured in the casing or shell and forming chambers therein, the said chambers being open at one end, and a locking-spring secured in one chamber and projecting through the slotted plate D, adapted to engage the end of a locking-tongue, H, and to be disengaged by a key inserted at the end of the chamber in which it is secured, in the manner set forth.

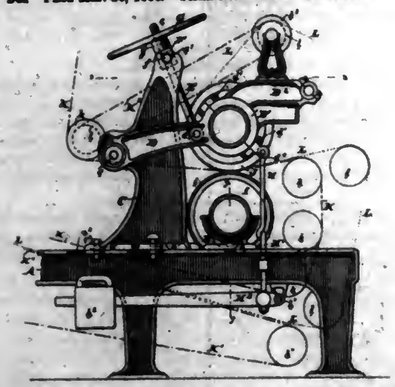
5. In a lock of the class described, composed of the casing having three compartments or chambers open at one end—to wit, one for the reception of a latching-tongue, H, a second in which the locking-spring is secured, but projecting into the tongue-receiving chamber, as described, and a third for containing a direction or address card—a movable bolt or pin extending across the openings to the chambers, adapted to be operated by the locking-tongue when the latter is inserted to close the opening through which the card is passed and to open the same when the locking-tongue is withdrawn, as set forth.

398,393. CULTIVATING-PLOW. GEORGE B. HART, Viola, Iowa. Filed Aug. 23, 1888. Serial No. 283,506. (No model.)



Claim.—The combination cutter and scraper consisting of the standard B B', having the downwardly and rearwardly extending cutter part C, sharpened on the under edge, and one or more shares, D, secured to the rear lower corner of the standard, substantially as shown and described.

398,394. PAPER-MACHINE. VINCENT G. HAZARD, Wilmington, Del. Filed Mar. 20, 1888. Serial No. 267,806. (No model.)



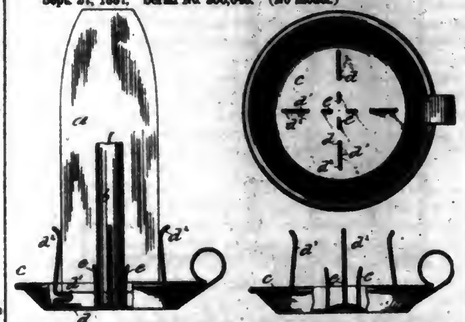
Claim.—1. In combination with the frame of a paper-machine having holes *a* formed in its upper face to receive the pedestals of the lower roll, removable pedestals B for the lower rolls, provided with projections *b*, formed to fit in the holes *a* of the frame, standards situated on the frame on one side and at each end of the press-rolls, arms D, pivoted at one end to said standards and having journal-bearings at their outer ends, and press-rolls journaled on the pedestals and in the journal-bearings of the arms D, all substantially as and for the purpose specified.

2. In combination with the press-rolls of a paper-machine, standards C, situated at each end and to one side of the rolls, arms pivoted at one end to said standards, journal-bearings for the upper roll secured at the other ends of said pivoted arms, lifting-rods E, secured to said pivoted arms at one end and threaded at their other ends, nuts *g*, with hand-wheels G, screwing into said threaded ends of the lifting-rods, and supporting-shoulders on the upper ends of the standards C to hold the nuts *g* stationary, all substantially as and for the purpose specified.

3. In a device for supporting and adjusting the upper press-roll of a paper-machine, substantially as shown and described, standards C, situated at each end and to one side of the rolls, in combination with crotches *d'*, formed in the top of said standards, double arms D, pivoted on both sides of the standards and having journal-bearings for the upper roll formed in their outer ends, lifting-rods E, pivoted at their lower ends to arms D and having a screw-thread formed on their upper ends, sleeves F, having trunnions *f f*, resting in the crotches *d'* of the standards, and nuts *g*, having hand-wheels G, screwing onto the threaded ends of rods E and resting on the sleeve F, all substantially as and for the purpose specified.

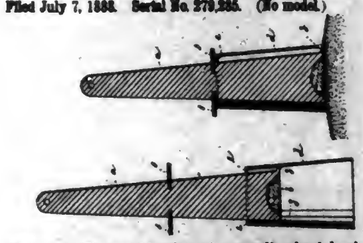
4. In a device for supporting and adjusting the upper press-roll of a paper-machine, substantially as shown and described, the combination of the standards C, arms D, pivoted to the standards at one end, journal-bearings for the upper roll at the outer end of said arms, the removable bearing-plate D', lugs *d*, and brackets D^2, attached to said bearing-plate, and the weight-rods and lever, said rods being secured to the lug *d*, all substantially as and for the purpose specified.

398,395. CANDLESTICK. JACOB W. HINEY, Albany, N. Y. Filed Sept. 27, 1887. Serial No. 250,843. (No model.)



Claim.—The candlestick herein described, consisting of the base *c*, provided with the spring candle-supports *c'*, and the chimney-supports composed of wires formed with a foot, *d*, a chimney-rest loop, *d'*, arranged below the top of the side of the base, and the uprights d^2, and the chimney *a*, all arranged as specified.

398,396. SOUNDING-LEAD. HORACE HOLDEN, East Orange, N. J. Filed July 7, 1888. Serial No. 279,285. (No model.)

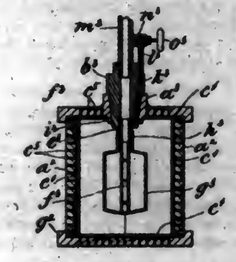


Claim.—1. The combination of a sounding-lead having a cavity in its base for the reception of the arming with a sliding sleeve surrounding the lead and adapted to be projected beyond its base, substantially as specified.

2. The combination of a conical sounding-lead with a sleeve embracing said lead and having flange *c*, and with the stop *f*, substantially as specified.

3. The combination of a sounding-lead, *a*, with a surrounding sleeve, *d*, having flange *c*, and with the stop *f* above sleeve *d*, and with the laterally-projecting flange *g* at the lower end of the lead *a*, substantially as specified.

398,397. APPARATUS FOR MANUFACTURING HOLLOW WARE FROM PULP. FRANK B. HOWARD, Montreal, Quebec, Canada. Filed July 21, 1887. Serial No. 244,862. (No model.)



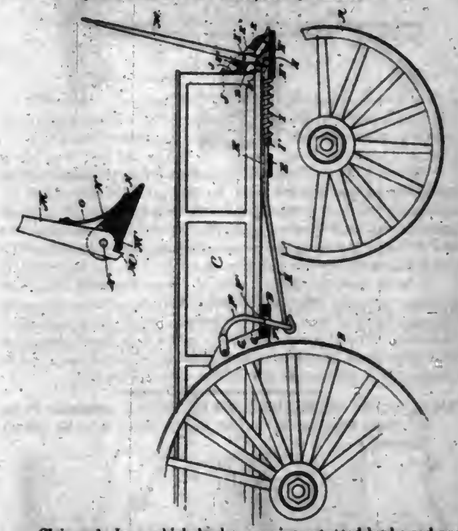
Claim.—In an apparatus for the manufacture of articles from pulp, the combination, with a perforated mold and filter-lining, of an elastic bag within said mold and a pipe for conveying air to the inside of said bag for expanding the same, said pipe being further provided with a passage forming a connection between the inside of the said pipe and the inside of the mold and provided with a stop-valve, by which the passage may be opened and closed, the whole substantially as described, for the purposes set forth.

398,398. TIRE-FASTENER. GEORGE W. HUNKABAY, Garfield, Ia. Filed Sept. 13, 1888. Serial No. 285,208. (No model.)



Claim.—As an improved article of manufacture, the tire-fastener described, comprising in a single element a shank, G, and two elongated plates, E F, both of said plates extending at substantially right angles to the axis of the shank, the plate E extending upon both sides of the shank and the plate F extending upon one side equal to the thickness of the tire, and the opposite side flush with the under side of the shank, and the downwardly-extended portion of the plate E formed with suitable holes, substantially as and for the purpose specified.

398,399. VEHICLE-BRAKE. GEORGE W. HUNKABAY, Garfield, Ia. Filed Sept. 12, 1888. Serial No. 285,208. (No model.)



Claim.—1. In a vehicle-brake, a spring-actuated brake-rod provided with notches, and a hand-lever provided with a dog and pawl for engaging said notches, substantially as specified.

2. In a vehicle-brake, a spring-actuated brake-rod provided with notches, and a hand-lever provided with a dog and pawl for engaging said notches, in combination with the lever F, notched brake-shoe G, and a block for engaging the notch in said shoe, substantially as specified.

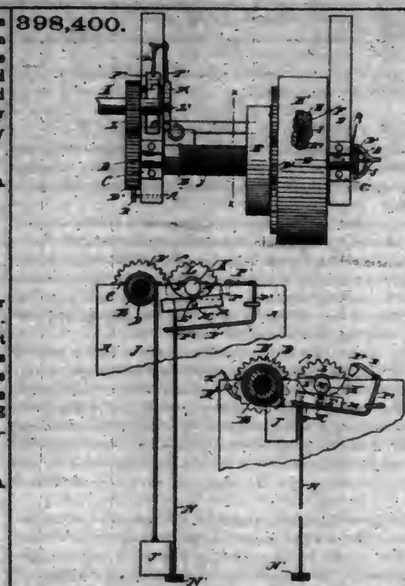
3. In a vehicle-brake, a spring-actuated brake-rod provided with notches, a bracket provided with a pawl, the pawl being provided with an opening, a lever in said opening, a pin fixed to the bracket and extending through the pawl and lever aforesaid, and a dog jointed to said lever, substantially as specified.

4. In a vehicle-brake, a spring-actuated brake-rod provided with notches, a bracket provided with a spring-actuated pawl, the pawl being provided with an opening, a lever in said opening, a pin fixed in the bracket and extending through the pawl and lever aforesaid, the said lever being provided with a projection, M^3, a recessed dog jointed to the lower end of said lever, and a spring for holding the dog in engagement with the notches aforesaid, substantially as specified.

398,400. MECHANICAL MOVEMENT. GEORGE W. HUNKABAY, Garfield, Ia. Filed Sept. 12, 1888. Serial No. 285,204. (No model.)

Claim.—1. In a mechanical movement, two shafts, D K, each provided with a gear, D' I, a sliding bearing for shaft K, an arm provided with a locking-plug for holding the two gears in engagement, a rocker-arm connected to the sliding block, a rod, N, provided

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with a block, N', said rod being connected to the rocker-arm aforesaid, in combination with the drum E and a cord connected to said drum, the outer end of said cord being provided with a weight, substantially as described.

2. In a mechanical movement, the shaft D, provided with gears D', D^2, and D^3, a drum, E, and flange E', loosely mounted on said shaft, a plate, F, fixed to the flange E' by cross pins or studs F', gears G G' G^2, journaled between said plate and flange, said gears G G' G^2 being in engagement with the gear D^2, a wheel, H, provided on its inner face with ratchet-teeth, and also provided with a rim, H, having teeth on its inner side, said teeth being in engagement with the gears G G' G^2 aforesaid, the face of the plate F being provided with a pawl, I, for engaging the ratchet on the wheel H, and an escapement, S, for regulating the speed of the parts, substantially as specified, and for the purpose set forth.

398,401. CANE-MILL. GEORGE W. HUNKABAY, Garfield, Ia. Filed Sept. 12, 1888. Serial No. 285,207. (No model.)



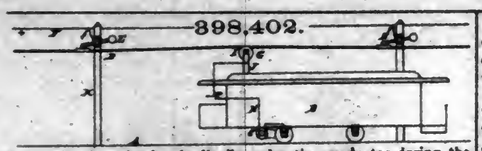
Claim.—1. The combination, with the grooved blocks A B, connected at one end by a block, *a*, and at the other end by an H-shaped block, *b*, of the rollers C D, one having its journal adjustably located in its bearings, the sliding blocks G H, the rabbeted block I, bearing against the outer ends thereof, the cam-levers J K, bearing against the block I and fulcrumed to the block *b*, and the weighted lever L, connected to the levers J K by means of links M N, substantially as and for the purpose specified.

2. The combination, with the sliding block I, the blocks G H, and shaft D', of the notched cam-levers J K and notched lever L, and the links M N, connecting said notched levers, substantially as specified.

398,402. CURRENT-COLLECTING DEVICE FOR ELECTRIC RAILWAYS. RUDOLPH M. HUNTER, Philadelphia, Pa. Filed June 7, 1888. Serial No. 276,262. (No model.)

Claim.—1. In an electric railway, the combination of the rails, a flexible and suspended bared working-conductor arranged above the rails, insulated supports therefor, a traveling electrically-propelled vehicle, an electric motor on said vehicle, and a current-collecting device carried by the vehicle, over which the working-conductor passes, consisting of a single upwardly-extending arm arranged above the car and carrying upon its end a loosely-journaled grooved contact-roller, the said collector-roller and its arm being substantially in the plane of

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its travel and passing longitudinally under the conductor during the travel of the vehicle, the distance from the road-bed to the collector-roller being greater than the normal distance from the road-bed to the conductor.

2. In an electric railway, the combination of a flexible and suspended bared working-conductor, insulated supports therefor, a traveling electric vehicle, an electric motor on said vehicle, and a current-collectiog device consisting of a grooved wheel carried by the vehicle over which the working-conductor passes and by which it is guided, the said collector-wheel raising the conductor and passing longitudinally under it during the travel of the vehicle.

3. In an electric railway, the combination of a flexible and suspended bared working-conductor, insulated supports therefor, a traveling electric vehicle, an electric motor on said vehicle, a current-collecting device carried by the vehicle over which the working-conductor passes, the said collector raising the conductor and passing longitudinally under it during the travel of the vehicle, a supply-conductor to supply electric current to said working-conductor, and branch conductors connecting the supply and working-conductors at intervals.

4. In an electric railway, a suspended and movable working-conductor, in combination with suitable counterbalancing devices to counterbalance the weight of the conductor, whereby it may be easily raised or lowered, a traveling vehicle, an electric motor on said vehicle, and a collecting device carried by said vehicle and making contact with said working-conductor and adapted to raise the working-conductor as it passes longitudinally beneath the same.

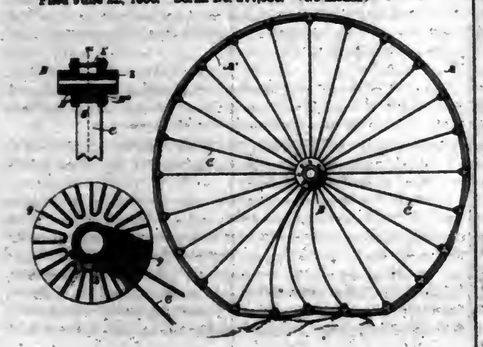
5. In an electric railway, a suspended working-conductor, in combination with suitable counterbalanciog devices to counterbalance the weight of the conductor, whereby it may be easily raised or lowered, a traveling vehicle, an electric motor on said vehicle, and a collecting-wheel carried by said vehicle and running in contact with the under side of the working-conductor.

6. In an electric railway, the combination of the rails, a suspended bared working-conductor formed of a continuous rod, wire, or cable, supported at intervals by auxiliary insulated supports, a traveling vehicle, an electric motor to propel said vehicle, and a current-collecting device between said vehicle and continuous conductor, consisting of a long upwardly-extending arm connected to the vehicle at its bottom, and supporting at its top a grooved collecting-wheel adapted to run in contact with the under side of the conductor.

7. The combination of a railway, a suspended cable or conducting-wire at a distance above the roadway, a traveling electrically-propelled vehicle, a grooved roller-contact pressing upon the under side of the cable or wire guiding said wire in its groove, and a support for said grooved roller carried by the car and extending upwardly, whereby the collector and car are located at a lower level than the conductor and the latter is guided by the collector and retained in position thereon by its weight.

8. The combination of a suspended conductor located above the railway-bed, an electrically-propelled vehicle, a grooved collector-wheel pressing upon the under side of the conductor, and an arm or support extending from the vehicle rearward and supporting a grooved collector-wheel or contact device in contact with the conductor

398,403. VEHICLE-WHEEL. CAMPBELL R. JAMES, Frankfort, Ky. Filed June 22, 1888. Serial No. 277,260. (No model.)



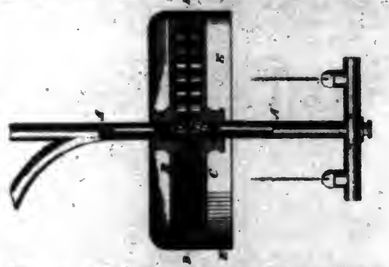
Claim.—1. In a vehicle-wheel, the combination, with the hub, of a sectional rim and elastic spokes, the rim-sections being pivotally connected at their ends and the spokes secured in the hub and to the rim, for the purpose set forth.

2. In a vehicle-wheel, the combination, with the hub, of a sectional rim and elastic spokes of a length greater than the radius from the hub to the rim, the rim-sections being pivotally connected at their ends and the spokes rigidly secured in the hub and pivotally connected to the rim, for the purposes set forth.

3. In a vehicle-wheel, the combination, with the hub, of a rim constructed of rigid sections pivotally connected at their ends, and curved spring-metal spokes rigidly secured in the hub and pivotally connected to the rim, for the purposes set forth.

4. In a vehicle-wheel, the combination, with the hub, grooved as described, of a rim constructed of rigid metal sections pivotally connected at their ends, and curved flat spring-metal return-spokes rigidly secured in the grooves in the hub and pivotally connected to the rim at the junction of the sections, substantially as described, and for the purposes set forth.

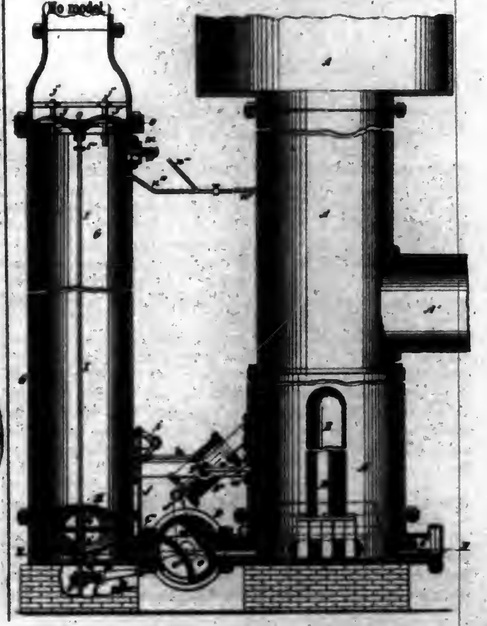
398,404. REGENERATIVE GAS-BURNER. FRANK G. JOHNSON, New York, N. Y. Filed Feb. 15, 1888. Serial No. 264,118. (No model.)



Claim.—1. In an illuminating-gas heater, the combination of the corresponding right and left parts, B and C, provided with a continuous tortuous rib from center to circumference, forming a corresponding continuous tortuous gas-passage from center to circumference, and the diaphragm D, having the communicating opening *d*, substantially in the manner and for the purposes set forth.

2. In an illuminating-gas heater, the combination of the corresponding right and left parts, B and C, provided with a continuous tortuous rib from center to circumference, forming a corresponding continuous tortuous gas-passage from center to circumference, and the diaphragm D, having the communicating opening *d* and cap E E, substantially in the manner and for the purpose described.

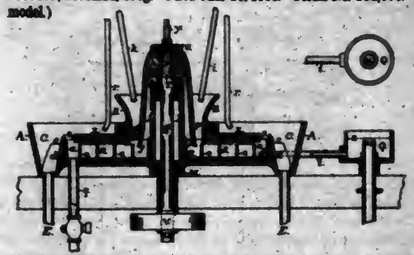
398,405. HYDRAULIC AIR-PUMP. FRANK R. JOHNSON and FRANK G. JOHNSON, New York, N. Y. Filed Mar. 12, 1888. Serial No. 266,990. (No model.)



Claim.—1. An air-condensing apparatus consisting of the water-pressure cylinder A, condensing-cylinder G, and rotary water-gate D, in combination with the water-engine F, connected by pipe with cylinder A, float H, and connections, as described, with engine F, whereby the said water-gate is actuated by the pressure of water within the cylinder A independently of the simultaneous flow of water through the gate D, and the said engine and gate are automatically operated by the rise and fall of the water, in the manner and for the purpose set forth.

2. An air-condensing apparatus consisting of the water-pressure cylinder A, condensing-cylinder G, and rotary water-gate D, in combination with the water-engine F, connected by pipe with cylinder A, float H, and connections, as described, with engine F and rod I, having the collars i' and i'', whereby the rise and fall of the water in the condenser automatically operates the valves of the engine F and water-gate D, substantially in the manner and for the purposes described.

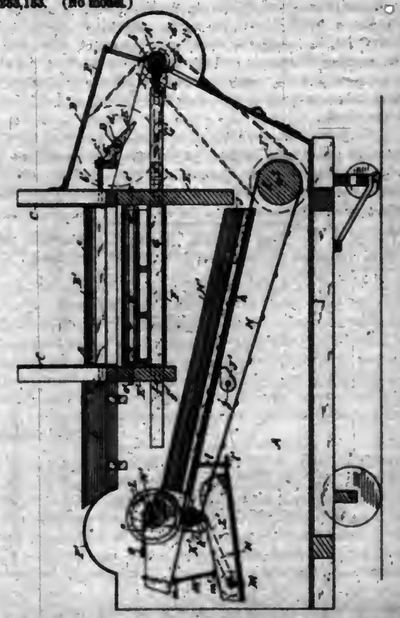
398,406. AMALGAMATOR. WILLIAM JOHNSON and GARRY W. JOHNSON, Portland, Oreg. Filed Jan. 23, 1888. Serial No. 261,671. (No model.)



Claim.—1. The combination, with the stationary rings R and the revolving turret-disk, of the outwardly-flaring ferrule *j* on the lower end of the shaft-holder *h* of said disk and extended below the bottom of the level face *l* of said disk into the space between two of said rings, substantially as shown and described.

2. The combination, with the bowl A and rotary turret-disk, of the rings R, secured within the inner chamber, *a*, of said bowl, and provided near their lower edge with apertures *e*, and the cross-bars S, dividing the space between said rings into separate compartments and arranged with the two adjacent bars out of line, substantially as shown and described.

398,407. BAND-CUTTER AND FEEDER. CHARLES C. KING and ALONZO D. TRIMBLE, Fort Worth, Tex. Filed Aug. 20, 1888. Serial No. 283,163. (No model.)



Claim.—1. In a band-cutter and feeder, the combination, with a reciprocating cutter-bar provided with blades, of a shaft journaled in the machine-framing and having a tappet-arm secured upon it, a receiving-table secured upon the shaft above the said bar, and tappet mechanism for actuating the said arm and tilting the table at intervals, substantially as and for the purpose set forth.

2. In a band-cutter and feeder, the combination, with a reciprocating cutter-bar provided with blades, of two receiving-tables supported above the said bar, and tappet mechanism for tilting the tables alternately at intervals, substantially as set forth.

3. In a band-cutter and feeder, the combination, with a reciprocating cutter-bar provided with blades, of the continuously-revolving rollers on each side of the blades, the guide-rollers journaled above the revolving rollers and placed wider apart than the said rollers, the receiving-tables above the guide-rollers, and tappet mechanism for tilting the tables alternately at intervals, substantially as set forth.

4. In a band-cutter and feeder, the combination, with the receiving-tables, of the vertical guide-boards at the sides of the tables, the shafts secured to the inner edges of the tables and having short arms secured on their ends, and the continuously-revolving shaft provided with tappets projecting upon opposite sides of it for depressing the said short arms and tilting the tables alternately, substantially as set forth.

5. In a band-cutter and feeder, the combination, with the transverse partitions, of the longitudinal reciprocating cutter-bar supported by said partitions and provided with vertical double-edged blades, and the cutter-blocks secured to the inner faces of said partitions and provided with slots open at their lower ends, into which the blades may enter at the extremities of the travel of the cutter-bar, substantially as set forth.

6. In a band-cutter and feeder, the combination, with the cutter-bar provided with vertical blades, of the feed and guide rollers mounted on shafts on each side of the blades, said guide-rollers being above the feed-rollers and wider apart, the beveled pinions secured to the feed-roller shafts, the revolving main shaft provided with a crank, the beveled pinions secured on the main shaft for revolving the feed-rollers, and the connecting-rod connecting the crank with the cutter-bar for reciprocating it and the blades, substantially as set forth.

7. In a band-cutter and feeder, the combination, with the tilting receiving-tables, of the guide and feed rollers below the table, said guide-rollers being above the feed-rollers and wider apart, the reciprocating cutter-bar provided with blades between the said rollers, a traveling conveyer-belt below the cutter-bar, and a barrel provided with disks and journaled at the head of the conveyer for evening the straw before delivering it, substantially as set forth.

8. In a band-cutter and feeder, the combination, with an inclosing-case, of a conveyer pivoted to the case at one end, a barrel provided with disks and journaled at the delivery end of the conveyer for evening the straw, the revoluble shaft provided with cams for raising the conveyer, a ratchet-wheel also secured upon said shaft, and a pawl pivoted to the casing and engaging with the ratchet-wheel for holding the conveyer and evening-barrel at any desired elevation, substantially as set forth.

9. In a band-cutter and feeder, the combination, with the conveyer pivoted at its receiving end and provided with an endless traveling belt, of a barrel provided with disks and journaled above the delivery end of the conveyer, and a shaking delivery-shoe supported from the side frames of the said conveyer below the evening-barrel, substantially as set forth.

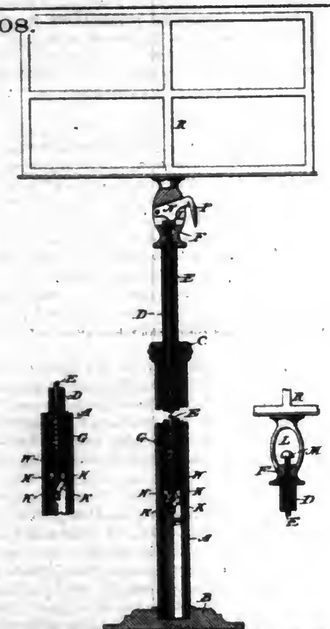
10. In a band-cutter and feeder, the combination, with the inclosing-case, of the conveyer driving-roller journaled in the said case, the conveyer sides provided with a solid bottom below the belt and guide-ledges above the belt, the roller journaled between said sides at the delivery end of the conveyer, the pivots at the receiving end of the conveyer, the conveyer-belt passing around said rollers, and the evening-barrel provided with disks and also journaled between the sides of the conveyer above the delivery-roller, substantially as and for the purpose set forth.

11. In a band-cutter and feeder, the combination, with the conveyer pivoted at its receiving end, of the barrel provided with disks and journaled above the delivery end of said conveyer, the shaking-shoe provided with a central rearwardly-projecting pin, the bent arms, and the straight links suspending the shoe from the conveyer sides, a crank operated by the motion of the conveyer, and a connecting-rod, and an arm connecting said crank with the shoe, substantially as and for the purpose set forth.

398,408. ADJUSTABLE STANDARD FOR MUSIC-RACKS. ALFRED KOEHN, New York, N. Y. Filed Sept. 21, 1888. Serial No. 286,008. (No model.)

Claim.—The combination, in an adjustable standard, as described, with a tubular upright secured to a supporting-base, an adjustable tube moving longitudinally within said standard, and a movable catch-rod extending through said tube, of the two catch-bars hinged to the lower end of the adjustable tube to swing outwardly into contact with the inner side of the inclosing-standard, and the links coupling the

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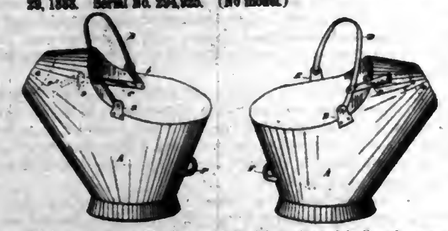


free end of each catch-bar with the lower end of the rod, substantially in the manner and for the purpose herein set forth.

398,409. ELECTRODE FOR SECONDARY BATTERIES. EDWARD M. LAMB, Falmouth, Me. Filed Oct. 29, 1888. Serial No. 289,479. (No model.)

Claim.—The electrode for accumulators or electric storage-batteries, consisting of fine threads of lead compressed into the desired form, substantially as described.

398,410. COAL-HOD. GODFRIED LAUBE, Huron, Dak. Filed Dec. 29, 1888. Serial No. 294,925. (No model.)



Claim.—1. A coal-hod provided with a pivoted bail and a movable poker within its spout having a connection with the bail, substantially as described.

2. The combination, with a coal-hod and its pivoted bail, of a movable poker having one end pivotally connected to the hod-bail and the other end supported free to move within the hod-spout, and a guide on the hod-spout for retaining the free end of the poker in its proper position, substantially as described.

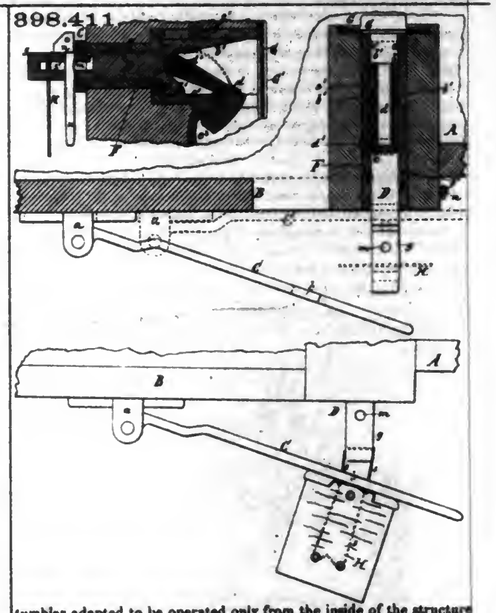
398,411. SEAL-LOCK. EDWIN H. LEA and WALTER B. MARSH, Richmond, Va. Filed Sept. 24, 1888. Serial No. 286,187. (No model.)

Claim.—1. In a seal-lock, in combination, the protection-casing having an access-opening at its rear end and formed with a fixed retaining-stop and adapted to be applied to the framing of a structure, the staple-bolt having an open loop, and a locking-tumbler adapted to be operated only from the inside of said structure, substantially as and for the purpose described.

2. In a seal-lock, in combination, the protection-casing having an access-opening at its rear end formed with internal and external shoulders and a fixed retaining-stop, the supporting-frame, the staple-bolt having an open loop, and a locking-tumbler adapted to be operated only from the inside of the structure to which it is applied, substantially as described.

3. In a seal-lock, in combination, the protection-casing provided with a retaining-stop, a vertical open guide-plate, and a vertical slide, the sliding staple-bolt having an open loop and provided with a locking-

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tumbler adapted to be operated only from the inside of the structure to which it is applied, substantially as and for the purpose described.

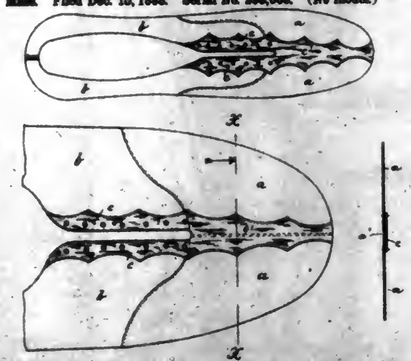
4. In a seal-lock, in combination, the protection-casing having a fixed retaining-stop, the sliding staple-bolt having an open and perforated loop for a sealing-tag and a retaining-pin, and a locking-tumbler adapted to be operated only from the inside of the structure to which it is applied, the frame, sliding door, the hasp, and the retaining-pin of such structure, substantially as described.

5. In a seal-lock, in combination, a sealing-tag having an opening through it, a sliding staple-bolt having an open loop and provided with a locking-tumbler adapted to be operated only from the inside of the structure to which it is applied, the protection-casing having a fixed retaining-stop, the frame, the sliding door, and the hasp of such structure, substantially as and for the purpose described.

6. For a seal-lock, the sealing-tag formed of paper or other equivalent fragile material on both its front and rear sides, and having an opening through it, and provided at one or more of its edges with a narrow metallic clasping re-enforce, which in the main leaves both the paper surfaces uncovered, substantially as and for the purpose described.

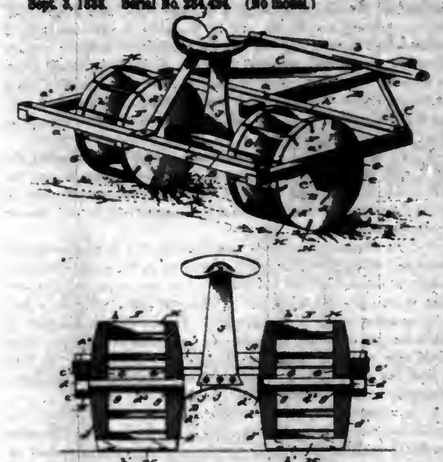
7. For a seal-lock, the sealing-tag formed of paper or other fragile material, and having an opening through it, and provided with a metallic clasping re-enforce at one or more of its edges, and with a wire-loop re-enforce inclosed and secured within the sealing-tag substantially as described.

398,412. BOOT OR SHOE. WOODBURY P. LEFAVOUR, Beverly, Mass. Filed Dec. 15, 1888. Serial No. 293,666. (No model.)



Claim.—The improved laced boot or shoe, as described, having the quarters *b b*, and the divided vamp *a a*, combined with the side stays, *c c*, having in one piece therewith the tip or stay *d*, extending centrally to the toe part of the boot or shoe, as set forth.

398,413. COTTON-STALK CRUSHER. JAMES LAUDS, Prosperity, S. C., assignor of one-half to Hardeen C. Mooney, same place. Filed Sept. 3, 1888. Serial No. 284,434. (No model.)



Claim.—1. The combination, with the frame comprising the transverse rear beam, and with the axle fixed or locked against rotary movement and provided with a dovetailed recess in the front face of its central portion, of the upright front standard formed by a plate having a dovetailed lower end corresponding to said recess, the rear standard secured upon the rear beam and projecting upwardly and forwardly, and the seat mounted upon and connecting said standards, substantially as and for the purpose set forth.

2. The combination, with the frame comprising the side beams, and the axle having an enlarged central portion forming shoulders and having its ends rigidly connected to the side beams, the portion of the axle between said shoulders and fixed ends being cylindrical, of the wheels mounted upon said cylindrical bearing portion and comprising transverse blades or knives connecting the end bearing-disks, the outer face of the latter being convexed, substantially as and for the purpose set forth.

3. A cotton-stalk crusher comprising the frame having the front and rear beams and side beams, the tongue or pole secured to the front beam, and rearwardly-divergent braces secured to the pole and side beams, the transverse stationary axle comprising a central portion forming shoulders d^3, the cylindrical portion d^2, and having its ends fixed in brackets upon the side beams, the wheels comprising disks mounted upon said cylindrical portions and connected by radially-disposed blades or knives having their cutting-edge about on the plane of the periphery of the wheel, and standards projecting from the central portion of the axle and rear beam of the frame and supporting the seat, substantially as and for the purpose set forth.

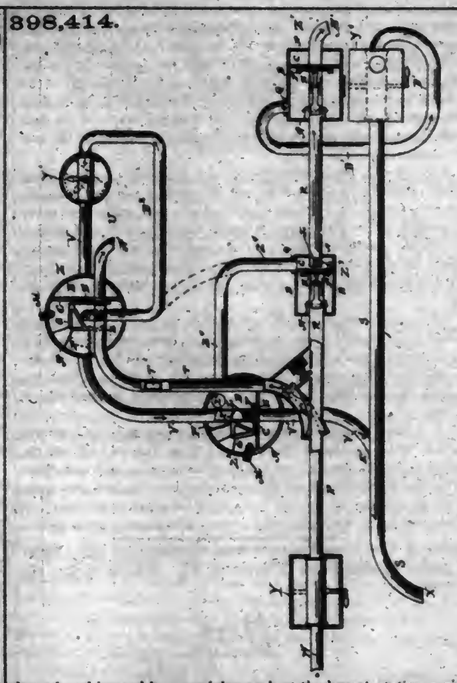
4. The herein-described cotton-stalk crusher, comprising a rectangular frame, a tongue projecting centrally from the center of the front beam thereof and braced by rods connecting it with the frame, an axle rigidly mounted upon the latter and provided with a central enlarged portion forming shoulders and with cylindrical end portions, wheels loosely mounted upon the cylindrical portions, consisting of two disks having convex outer faces connected by radially-disposed knives, the transverse cutting-edge of the latter being about on a plane with the periphery of the disks, and a seat mounted upon standards, the front one of which being provided with a dovetailed lower end adapted to be received by a corresponding recess in the central enlarged portion of the axle, while the latter one is connected with the rear beam of the frame, said standards being adapted to brace the axle, all arranged and adapted to operate substantially as and for the purpose set forth.

398,414. PNEUMATIC DISPATCH-TUBE. CHARLES A. LIEB, New York, N. Y. Filed Nov. 23, 1888. Serial No. 291,943. (No model.)

Claim.—1. In a pneumatic-tube system, the combination of an outgoing tube, an automatically-acting valve constructed and arranged to allow the passage of the carrier through and beyond it, a return-tube, a receiving-cock placed in the return-tube, and a connecting-pipe between the automatic valve and the receiving-cock, substantially as set forth.

2. In a pneumatic-tube system, the combination of an outgoing main-line tube and a return-tube, an outgoing branch tube, a switch adapted to shunt the carrier from the main-line outgoing tube into the branch tube, an automatically-acting valve in the outgoing branch tube, constructed and arranged to allow the passage of the carrier

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through and beyond it, a receiving-cock at the branch station, a pipe connecting the automatic valve at the branch station with the receiving-cock, and a return-tube which joins the main-line return-tube, provided with an automatic valve, substantially as shown, and an automatic valve in the main-line outgoing tube and a delivery-valve at the end thereof, and connecting-tubes between the valve in the branch return-tube and the valve in the main-line outgoing tube and between the valve at the end of the main-line outgoing tube and the receiving-cock in the main-line return-tube, substantially as set forth.

3. The combination, in a pneumatic-tube system, of outgoing and returning main-line tubes and outgoing and returning branch tubes with a switch and automatic valves, substantially as set forth, in the branch return and in the main-line tubes, and a connecting-tube between the valve in the branch return-tube and the main-line tube, whereby the circulation of the air is maintained, and receiving-cocks at the several stations, substantially as set forth.

4. The combination, in a pneumatic-tube system, of outgoing and returning main-line tubes and a branch tube provided with a switch, valves, substantially such as described, in the outgoing main-line tubes near the branch tube and in the outgoing branch tube, and a tube connecting the valve in the branch tube with the main-line outgoing tube beyond the valve therein, substantially as set forth.

5. In a pneumatic-tube system having outgoing and returning main-line tubes and outgoing and returning branch tubes, a valve, substantially as described, interposed in the return branch tube, whereby the current is deflected through a connecting-tube to the main-line tube beyond the junction of the outgoing branch tube with it, and another valve placed in the outgoing main-line tube adjacent to the junction of the branch tube with it, whereby the air is caused to circulate to the branch station before continuing down the main-line tube, substantially as set forth.

6. The combination, in a pneumatic-tube system, of outgoing and returning main-line tubes, outgoing and returning branch tubes, a switch placed at the junction of the outgoing branch and main tubes, constructed and arranged to be automatically shifted by the passage of the carrier over it, and automatic valves, substantially such as shown, in the main and branch tubes, whereby the circulation of the air is maintained, substantially as set forth.

7. A valve for pneumatic-tube systems, comprising a case having an opening in one side and divided crosswise by an apertured diaphragm, a gate adapted to cover the aperture in the diaphragm, inwardly-extending tube ends coincident with the aperture in the diaphragm and provided with necessary openings for the passage of the air, and a lever attached to the gate, one end whereof lies in the path of the carrier, whereby the carrier will automatically open the gate, substantially as set forth.

8. A valve for pneumatic-tube systems, comprising a case having

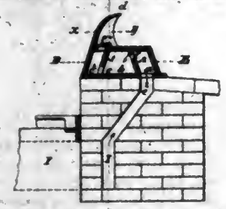
an opening in one side and divided crosswise by an apertured diaphragm, a gate adapted to cover the aperture in the diaphragm, inwardly-extending tube ends coincident with the aperture in the diaphragm and provided with necessary openings for the passage of the air, and a lever attached to the gate, one end whereof lies in the path of the carrier, and a retractile spring for the gate, whereby the gate will be automatically opened and closed upon the passage of the carrier, substantially as set forth.

9. A valve for pneumatic-tube systems, comprising a case having one side removable and provided with an opening, the case being divided crosswise by an apertured diaphragm, a gate adapted to cover the aperture in the diaphragm, inwardly-extending tube ends coincident with the aperture in the diaphragm and provided with necessary openings for the passage of the air, and a lever attached to the gate, one end whereof lies in the path of the carrier, substantially as set forth.

10. A gate constructed and arranged to be used in the closing of openings in pneumatic tubes, consisting of a piece of sheet metal having a depression made therein within the area of the hole which the gate closes, and lugs riveted to the reverse side of the gate from the gate-seat, the rivet-head lying within the depression, substantially as set forth.

11. A valve for pneumatic-tube systems, comprising a case divided crosswise by an apertured diaphragm, a gate adapted to cover the aperture in the diaphragm, inwardly-extending tube ends coincident with the aperture in the diaphragm and provided with necessary openings for the passage of the air, and a lever attached to the gate, one end whereof lies in the path of the carrier, substantially as set forth.

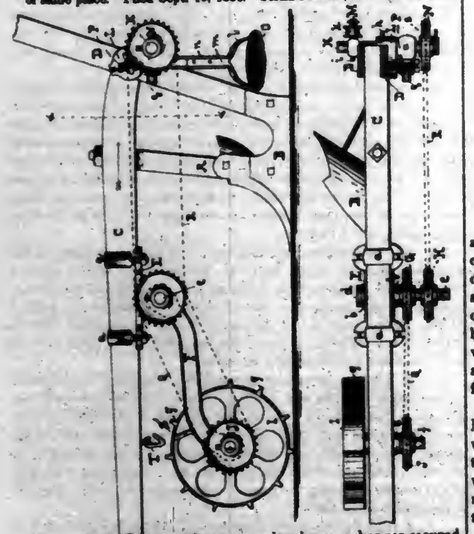
398,415. SMOKE-CONSUMING BRIDGE-WALL CAP. HENRY LIEBER, Des Moines, Iowa. Filed Oct. 29, 1888. Serial No. 289,453. (No model.)



Claim.—1. In a smoke-consuming furnace, the bridge-wall cap having circulating-chambers *a b c*, with partitions 1 and 2, connecting with each other by openings *f f* and *g g* through partitions 1 and 2, in combination with openings *h h h* and hollow tubes or teeth *d d d d*.

2. In a smoke-consuming furnace, the bridge-wall cap provided with hollow tubes or teeth for diffusing the heated air, the form of teeth as shown, with open back and curved cavity to deflect the outflowing current to a horizontal direction, all substantially as shown.

398,416. COTTON-CHOPPER. WILLIAM R. LINDSAY, Baltimore, Md., assignor to John M. McClintock and William H. Richardson, both of same place. Filed Sept. 10, 1888. Serial No. 284,990. (No model.)



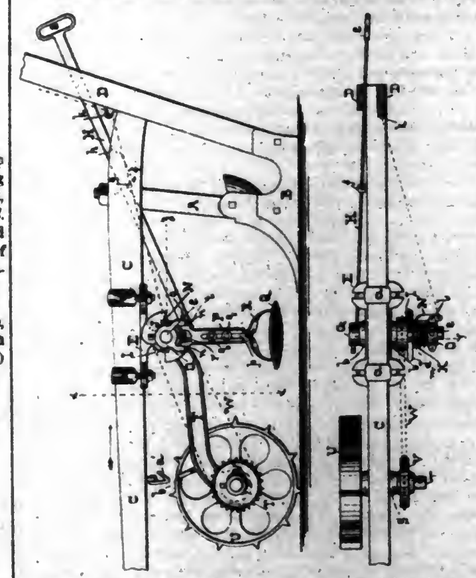
Claim.—1. In a cotton-chopper, a plow-beam, a hanger secured to the said beam, an arm connected to the said hanger by means of a shaft carrying sprocket-wheels, a shaft which passes through the lower end of the arm supporting a driving-wheel, and a sprocket-wheel, a vibratory hoe in the rear of the plow, a shaft carrying a sprocket-wheel having lugs on its face adapted to come in contact with a roller on the said vibratory hoe to move the same in one direction, a spring to move the said hoe in the other direction, and chain belts to connect the said sprocket-wheels together and effect the movement of the sprocket-wheel last named, all combined substantially as and for the purpose specified.

2. In a cotton-chopper, the combination of the beam having the hook T, with the hanger E, the pivoted arm F, having eye S', and the wheel I, whereby the said arm may be held in an elevated position and the driving-wheel made inoperative, substantially as and for the purpose specified.

3. In a cotton-chopper, the combination of a bracket attached to some part of the plow-frame, a shaft secured within the said bracket, to which is fastened a stud, a vibratory arm seated on the said stud having at its lower end a hoe and at its upper end a roller or projection, a sprocket-wheel with lugs on its face which are adapted to come in contact with the said roller or projection and thereby force the said arm in one direction, and a spring which connects the said arm with the bracket to move the said arm in a contrary direction, substantially as and for the purpose specified.

4. In a cotton-chopper, a vibratory hoe which is moved in one direction by means of a wheel carrying projections and in the other through the medium of a spring, combined with a chain attached to the said arm, whereby the same may be drawn from the said wheel and held thereat and inoperative, substantially as and for the purpose specified.

398,417. COTTON-CHOPPER. WILLIAM R. LINDSAY, Baltimore, Md., assignor to John M. McClintock and William H. Richardson, both of same place. Filed Sept. 10, 1888. Serial No. 284,991. (No model.)



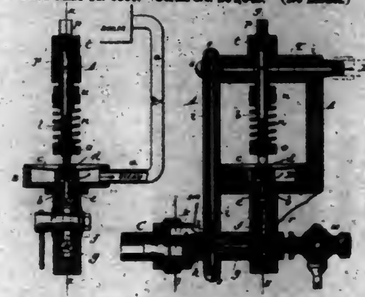
Claim.—1. In a cotton-chopper, a plow supported from a beam, a hanger fastened to the said beam, a shaft sustained by the hanger carrying a loose sprocket-wheel, a loose cam, a loose sliding clutch on the hub of the cam, and a tight collar, to which collar is attached a vibratory arm having at its end a hoe, and adapted to be moved in one direction by the action of the said cam and in the other direction by means of a spring, combined with a driving-wheel, a sprocket-wheel having a movement in common with the said driving-wheel, and a chain belt to connect the two sprocket-wheels, substantially as and for the purpose specified.

2. In a cotton-chopper, the shaft *c*, carrying the sprocket-wheel I, cam J, clutch K, situated on the hub of the said cam, and collar O, which supports the hoe-arm P, the said clutch having pins which pass through the cam and enter holes in the side of the sprocket-wheel, whereby in the movement of the said sprocket-wheel motion is communicated to the said cam, which in turn operates the arm, substantially as and for the purpose specified.

3. In combination with the shaft which carries a collar to which the hoe-arm is hung, a crank on the said shaft and a bar connected to the pin of the said crank, whereby the said hoe-arm may be elevated so as to be inoperative, substantially as and for the purpose specified.

4. In combination with the shaft *c*, sprocket-wheel I, cam J, clutch K, and a collar, O, which carries the hoe-arm, a spring situated between the said collar and the end of the said clutch, substantially as and for the purpose specified.

398,418. MEANS FOR AUTOMATICALLY REGULATING THE FLOW OF LIQUID FUEL TO INJECTOR-BURNERS FOR STEAM-BOILERS. ALLEN D. LEIN, Racine, Wis., assignor to THOMAS KANE, Chicago, Ill., and the Racine Hardware Manufacturing Company, Racine, Wis. Filed June 11, 1886. Serial No. 204,845. (No model.)



Claim.—1. The combination of the steam-boiler, the oil-supply pipe, its nozzle for delivering oil to the fire-box, the second nozzle arranged concentric with the first and connected by a pipe with the steam-space of the boiler, so that the steam is caused to effect the delivery of the oil to the fire-box, the valve in the steam-passage, the valve in the oil-passage, and the diaphragm connected with both valves and communicating with the steam-space of the boiler, whereby variations in the steam-pressure are caused to positively vary the flow of oil by the oil-controlling valve, and further vary the flow by regulating the steam-jet.

2. In an oil-burning boiler, and in combination with the steam oil-atomizing jet, two valves, one in the steam-passage and the other in the oil-passage, and the steam-actuated diaphragm connected with and operating both valves, whereby the oil-passage and the steam-passage are both diminished by increase in the steam-pressure, so that the delivery of oil is positively limited to correspond with the diminution of the steam-jet.

3. In combination with the frame or body having the distinct steam and oil passages therethrough, the intermediate steam-chamber B, with a flexible wall or diaphragm, the internal valve, *e*, attached to the diaphragm and controlling the flow of steam through the steam-passage, and the spindle *l*, seated at one end against the diaphragm and acting at its opposite end as a valve to control the flow through the oil-passage.

4. In an apparatus for automatically feeding liquid fuel to a boiler, and in combination with the boiler, an oil-supply pipe, and a delivery-nozzle attached thereto, a concentric nozzle, and a steam-conductor leading thence to the steam-space of the boiler, so that the steam-jet is applied to feed the oil, a steam-actuated diaphragm, two valves connected to and operated by the diaphragm and located one in the oil and the other in the steam-passage, and two independent valves, *q v*, for arbitrarily controlling the oil and steam delivery.

5. In combination with the oil pipe or passage *i*, the valve-spindle *l*, and the diaphragm connected therewith, the independently-adjustable spindle *p*, arranged in opposition to the first-named spindle, as described and shown.

6. In an oil-burning boiler, the combination of a steam oil-atomizing jet, a valve controlling the oil-delivery therethrough, a second valve controlling the steam-delivery therethrough, and valve-operating devices, substantially as shown, connecting with the boiler and subject to the steam-pressure therefrom, whereby an increase in pressure is caused to diminish the oil-supply and also to diminish the flow of the steam acting to propel the oil.

7. In combination with a frame or body having the passage *i* therethrough, the tubular body *t*, inserted through the body and provided with the two valve-spindles entering from opposite sides.

398,419. SHIFTING SEAT FOR VEHICLES. JOHN L. MASON, Davenport, Iowa. Filed Oct. 1, 1888. Serial No. 286,886. (No model.)

Claim.—1. In a vehicle-body provided with two or more seats for constant use, the combination of the permanent seat-frame with the hinged seat-carriers and seat hinged thereto, for the purpose of temporarily increasing the distance between adjacent seats by shifting such seat from one position of support upon said frame to another position of support thereon, substantially as described.



2. In a vehicle-body, a seat hinged upon its under side to two parallel cross-bars, the ends of said cross-bars bent downward, each terminating in elbows crosswise to said vehicle-body and hinged thereto, in connection with a permanent seat-frame attached to said body and arranged to support said seat when such horizontal bars are swung forward or backward, so the point of hinging with said seat is not in the same vertical line with the point of hinging said elbows to the body of said vehicle, substantially as described.

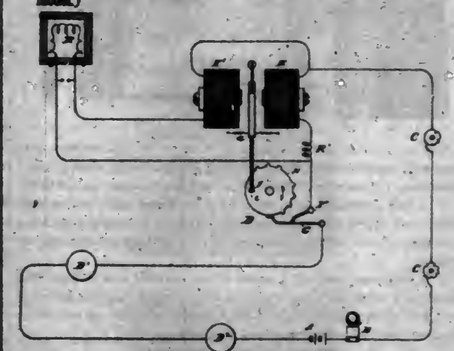
3. In a vehicle-body, the combination, with a permanent seat-frame attached thereto, of a seat hinged to seat-carriers, such carriers hinged in sill-sockets having threaded apertures to receive the threaded ends of the carriers for the purpose of swinging the seat from one position of support upon the frame to another position of support thereon, substantially as described.

4. The herein-described seat-carrier, consisting of two horizontal and parallel cross-bars, their ends bent downward, each end terminating in elbows of similar direction of extension as said horizontal cross-bars, hinged to the body of a vehicle, with a seat hinged upon the two horizontal and parallel cross-bars, substantially as described.

5. The herein-described seat-carrier, consisting of two horizontal and parallel cross-bars, their ends bent downward, each end terminating in screw-threaded elbows of similar direction of extension as said horizontal cross-bars, each hinged in the threaded aperture of a sill-socket, with a seat hinged upon the two horizontal and parallel cross-bars, substantially as described.

6. In a vehicle shifting seat, two L-shaped rods, their tops connected by a horizontal cross-rod, their bottoms hinged to opposite sides of the vehicle-body to permit the cross-rod to swing over forward and backward, arranged in pairs at suitable distances apart, and a seat hinged at a similar distance to each of said horizontal cross-rods, substantially as described.

398,420. ELECTRIC BURGLAR-ALARM. LAURENCE A. MCCARTHY, Brooklyn, N. Y. Filed Apr. 18, 1888. Serial No. 271,040. (No model.)



Claim.—1. In an electric signaling apparatus, the main circuit divided into two parts or paths, the current normally flowing through both of them and always flowing through one of them, a magnetic coil and an artificial resistance in each part or path, the total resistance in each part or path being equal, an automatic definite signaling apparatus, an armature normally balanced in a vertical position between the coils, and a clock-work for operating said signaling apparatus, a revolving portion of said clock-work having upon its face a projection opposite to and abutting against the end of the armature in its balanced position, and adapted to unlock said signaling apparatus by an excess of attraction of either of said coils and to lock said apparatus when the energization of the deflecting-magnet becomes normal.

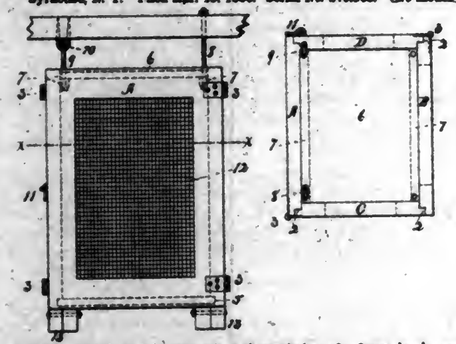
2. In an electric signaling apparatus, the main circuit divided into two parts or paths, the current normally flowing through both of them and always flowing through one of them, a magnetic coil and an artificial resistance in each part or path, the total resistance in each part or path being equal, an automatic definite signaling apparatus, an armature normally balanced in a vertical position between

the coils, and a clock-work for operating said signaling apparatus, a revolving portion of said clock-work having upon its face a projection opposite to and abutting against the end of the armature in its balanced position, and adapted to unlock said signaling apparatus by an excess of attraction of either of said coils and to lock said apparatus when the energization of the deflecting-magnet becomes normal, all in combination with one or more of the same elements in the same circuit and one or more manual circuit-breakers, as set forth.

398,421. PAVING COMPOSITION. ELIJAH S. MCCAUGHEY, Sioux City, Iowa. Filed Oct. 19, 1888. Serial No. 288,612. (No specimens.)

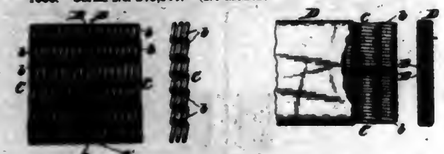
Claim.—The herein-described composition for brick, consisting of clay, sand, carbonate of lime, and silica, substantially as hereinbefore set forth.

398,422. KNOCKDOWN CUPBOARD. SEYMOUR V. MERRIMAN, Syracuse, N. Y. Filed Apr. 13, 1888. Serial No. 270,565. (No model.)



Claim.—A knockdown cupboard consisting of a front, back, and sides, all rabbeted upon their vertical edges and hinged together by hinges alternately inside of and external to the cupboard and one of the sides forming the door, and a top and bottom fitting with a rabbet-joint into the vertical walls, and means for suspending the whole cupboard, substantially as described.

398,423. WIRE BELTING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed May 31, 1888. Serial No. 275,579. (No model.)



Claim.—1. A belt composed of a series of intertwined wire helices with doubled-over edges, forming a substantially central longitudinal seam on one side of the belt, as and for the purpose set forth.

2. A belt composed of a series of intertwined wire helices with doubled-over edges, forming a substantially central longitudinal seam on one side of the belt, and secured in the manner substantially as described.

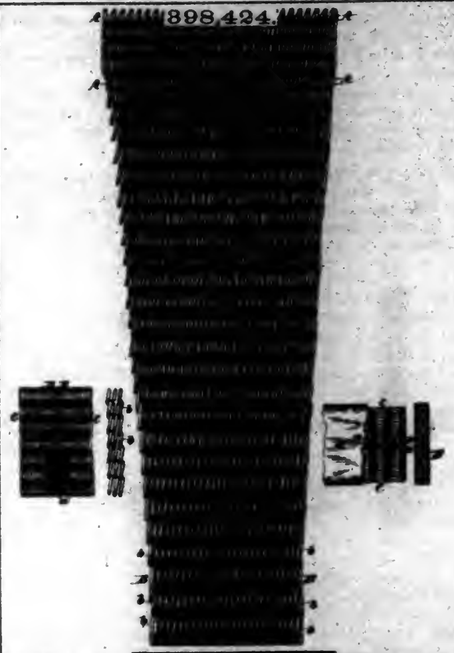
3. A belt composed of a series of intertwined wire helices with doubled over edges, forming a substantially central longitudinal seam on one side of the belt, and provided with a covering of rubber or equivalent material, substantially as described.

398,424. MANUFACTURE OF WIRE BELTING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed June 22, 1888. Serial No. 277,866. (No model.)

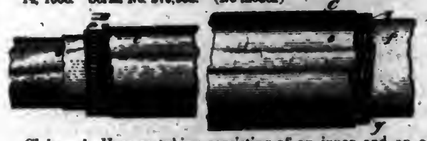
Claim.—1. The method herein described for making wire-belting, which consists in forming a metallic sheet or body by intertwining transverse sections of coiled wire, heating the sheet, stretching and flattening the helices into elongated links while heated, then folding the sheet transversely and bringing the ends of the sections together on one side of the belt, then tempering the belt, then securing the ends of the sections, and finally rolling the belt, substantially as described.

2. The method herein described for making wire belting, which consists in forming a metallic sheet or body by intertwining transverse sections of coiled wire, heating the sheet, stretching and flattening the helices into elongated links while heated, then folding the sheet transversely and bringing the ends of the sections together on one side of the belt, then tempering the belt, then securing the ends of the sections, and finally coating the belt with rubber or its equivalent and rolling the rubber into the interstices, substantially as described.

398,424.



398,425. HOSE OR TUBING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed July 14, 1888. Serial No. 279,932. (No model.)



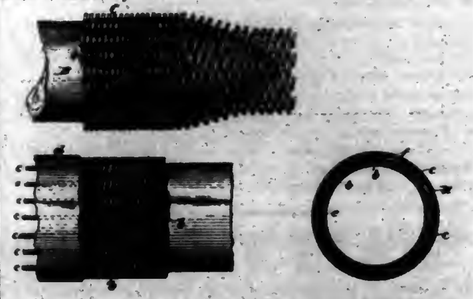
Claim.—1. Hose or tubing consisting of an inner and an outer tube in which the intertwined links or helices run at right angles to each other, and one of said tubes is coated or covered with rubber or equivalent material, substantially as described.

2. Hose or tubing composed of an inner tube, in which the intertwined links or helices run in the direction of the length of the hose and are covered with rubber, and an outer tube, in which the intertwined links or helices run in the direction of the circumference of the hose, substantially as described.

3. Hose or tubing composed of an inner tube of intertwined helices and a covering on both sides of rubber or equivalent material, and an outer tube of intertwined helices which run at a right angle to the helices of the inner tube and are covered with rubber or equivalent material, substantially as described.

398,426. HOSE OR TUBING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed July 18, 1888. Serial No. 280,283. (No model.)

Brief.—Improvements on Letters Patent Nos. 386,306 and 386,307, dated July 17, 1888.

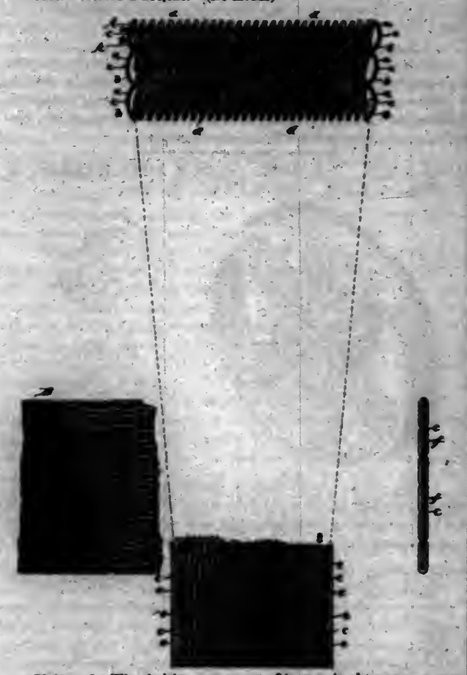


Claim.—1. Hose or tubing composed of a body formed of intertwined sections of coiled wire having the helices expanded into links

running in the direction of the circumference of the tube, and provided with a longitudinal re-enforcement, the links and the re-enforcement being embedded in and covered with rubber or equivalent material.

2. Hose or tubing composed of a body formed of intertwined sections of coiled wire having the helices expanded into links, and provided with a longitudinal re-enforcement within or between the links, the whole embedded in and covered with rubber or its equivalent material, substantially as described

398,427. WIRE BELTING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed Oct. 20, 1888. Serial No. 288,626. (No model.)



Claim.—1. Wire belting composed of intertwined transverse sections of coiled wire having the helices elongated, and the ends of the wires forming adjacent sections welded together to form an edge for the belt, substantially as described.

2. Wire being composed of intertwined transverse sections of coiled wire having the helices elongated, and the ends of the wires forming adjacent sections welded together, and a covering of rubber or equivalent material, substantially as described.

398,428. WIRE TUBING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed Oct. 20, 1888. Serial No. 288,627. (No model.)



Claim.—As an improved article of manufacture, a tubular wire body for hose, consisting of intertwined helices stretched to their full extent and running diagonally around the tube, substantially as described.

398,429. WIRE BELTING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed Oct. 20, 1888. Serial No. 288,628. (No model.)

Claim.—1. Wire belting consisting of a double thickness or layers of intertwined elongated helices crossing the belt diagonally and presenting folded edges and a continuous and unbroken surface, substantially as described.

398,429.



2. Wire belting composed of a double thickness or layers of intertwined elongated helices crossing the belt diagonally and presenting folded edges and a continuous and unbroken surface, and provided with a covering of rubber or equivalent material.

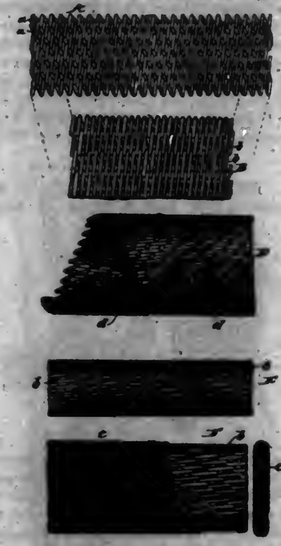
398,430. HOSE OR TUBING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed Oct. 20, 1888. Serial No. 288,629. (No model.)



Claim.—1. Hose or tubing composed of a body consisting of intertwined helices stretched to their full extent and running diagonally around the tube, and a lining of fluid-repellent material, substantially as described.

2. Hose or tubing composed of a body consisting of intertwined elongated helices running at an angle to the length, and also at an angle to a cross-section of the tube, a lining, and a covering of fluid-repellent material, substantially as described.

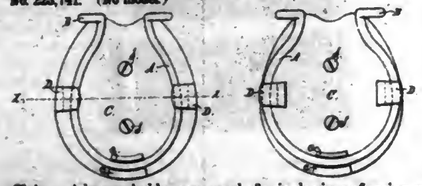
398,431. MANUFACTURE OF WIRE BELTING. THOMAS MIDGLEY, Beaver Falls, Pa., assignor of one-half to James R. Emerson, same place. Filed Oct. 20, 1888. Serial No. 288,630. (No model.)



Claim.—1. The method of manufacturing wire belting herein described, which consists in forming a sheet or body by intertwining sections of coiled wire, then heating the sheet or body so formed and elongating, flattening, and seating the helices by subjecting said body to longitudinal tension only while heated.

2. The method of manufacturing wire belting herein described, which consists in forming a sheet or body by intertwining sections of coiled wire, then wrapping the body diagonally around a mandrel and securing the adjacent edges by a separate section of coiled wire, then heating the tube so formed and elongating the helices by subjecting the tube to longitudinal tension while heated, then flattening the tube, and finally covering it with rubber.

398,432. BROOM-HOLDER. SIMON B. MIERLEY, Landisville, Pa., assignor to Jacob M. Grader, same place. Filed Jan. 8, 1887. Serial No. 223,741. (No model.)



Claim.—A broom-holder composed of a single piece of spring-wire having the center resting in a channel, each side secured above said channel by a cleat, and a plate to which the flanges forming the channel and the cleats are secured, the ends of the wire rising upward from said cleats and having their extremities bent outward therefrom to form arms, substantially as specified.

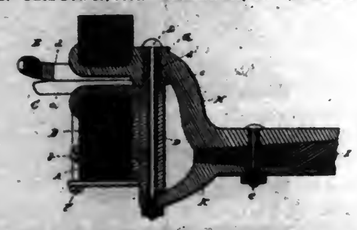
398,433. COMBINED THREAD TENSION AND LUBRICATING DEVICE FOR SEWING-MACHINES. DANIEL A. MOONEY and JAMES IRELAND, Troy, N. Y. Filed Aug. 13, 1887. Serial No. 246,917. (No model.)



Claim.—1. In a thread-lubricating device for sewing-machines, the combination, with a thread-tension wheel that is attached to the needle-arm thereof, of a tube that is also attached to said needle-arm adjacent to said tension-wheel, a lubricating-pencil within said tube, a spring within said tube above said pencil, and a set-screw at the top of said tube constructed to control the downward movement of said pencil to contact with the thread, substantially in the manner as and for the purposes set forth.

2. The combination, with the thread-tension wheel of a sewing-machine which is attached to the needle-arm of the latter and regulated by means of a spring and set-screw arranged on the same shaft as the tension-wheel, of a lubricating-pencil arranged within a tube that is attached to said needle-arm adjacent to said tension-wheel, said lubricating-pencil being constructed with a spring and set-screw that control the downward movement of said pencil to contact with the thread, substantially in the manner as and for the purposes set forth.

398,434. VEHICLE FIFTH-WHEEL. HOLLIS W. MOORE, Olean, N. Y. Filed Feb. 13, 1888. Serial No. 263,916. (No model.)

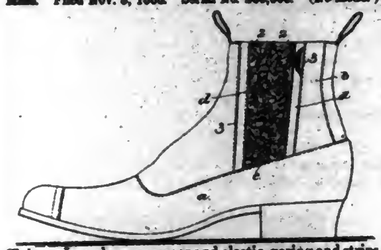


Claim.—The fifth-wheel consisting of the main branch C, having the segmental plates at its ends, the integral centrally-depending plate *c'*, the screwing-bolts *b*, passing through opening in the wooden portion of the axle near its junction with the iron portion, the integral vertically-bored sleeve, having the annular bearing-shoulder on a plane with the top of the branch C, the branch E, having the segmental plates at its ends, and the vertically-bored lug enlarged at its lower end, and the brace-arm, in combination with the reach, the axle, and the brace K, substantially as specified.

398,435. REMEDY FOR DIPHTHERIA. CONRAD H. A. HOCHSTWICK, Berlin, Germany. Filed Aug. 13, 1888. Serial No. 282,633. (No specimens.)

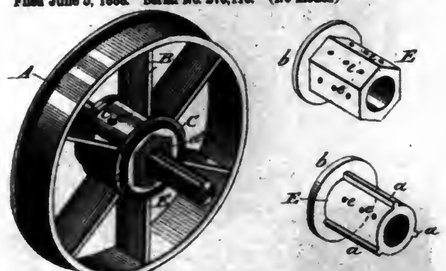
Claim.—The herein-described composition of matter to be used as a useful reliable remedy against diphtheria, consisting of sulphuret of potassium, anhydrous alcohol, tar from resinous fir wood, birch-tar, and Siberian castor, in the proportions specified.

398,436. BOOT OR SHOE. CHARLES H. NELSON, North Grafton, Mass. Filed Nov. 3, 1888. Serial No. 289,868. (No model.)



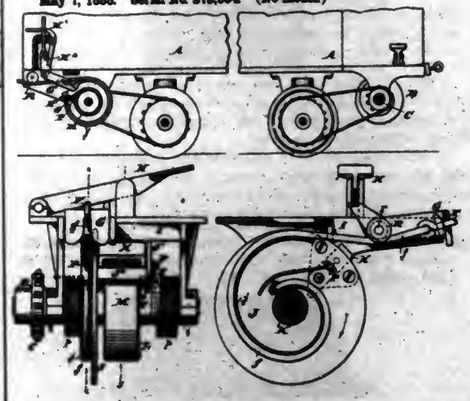
Claim.—In a shoe, an upper and elastic goring and strips or welts *d*, attached along one edge to the cut edge of the goring by one line of stitches, the opposite edges of the strips or welts being connected to the upper by another line of stitches not passing through the goring, substantially as and for the purpose described.

398,437. CAR-WHEEL. JAMES M. NORRIS, Wilkes-Barré, Pa. Filed June 5, 1888. Serial No. 276,110. (No model.)



Claim.—As an improvement in wheels for mine-cars, the combination of a wheel having a chambered hub, with a bushing inserted in said hub and forming the axle-bearing, said bushing being polygonal in cross-section to prevent rotation in the hub, substantially as specified.

398,488. CAR-STARTER. JOHN H. PALMER, Rockaway, N. J. Filed May 7, 1888. Serial No. 273,004. (No model.)



Claim.—1. In a car-starter, the combination of an extensible draw-bar, a wheel operated thereby, a friction-clutch wheel, and a friction-clutch band encircling said friction-clutch wheel, a band-tightening connection between the band and wheel operated by the draw-bar, and a power-connection for connecting the friction-clutch wheel and axle of the vehicle.

2. In a car-starter, the combination of an extensible draw-bar, a wheel operated thereby, a friction-clutch wheel, a friction-clutch band encircling said friction-clutch wheel, a band-tightening connection between the band and wheel operated by the draw-bar, a power-connection for connecting the friction-clutch wheel and axle of the vehicle, and a spring to return the draw-bar and its wheel to their normal position after the vehicle has started.

3. In a car-starter, the combination of an extensible draw-bar, a lock to prevent said draw-bar being drawn out except when desired, a wheel operated thereby, a friction-clutch wheel, and a friction-clutch band encircling said friction-clutch wheel, a band-tightening connection between the band and wheel operated by the draw-bar, and a power-connection between the friction-clutch wheel and axle of the vehicle.

4. In a car-starter, the combination of an extensible draw-bar, a lock to prevent said draw-bar being drawn out except when desired, a wheel operated thereby, a friction-clutch wheel, and a friction-clutch band encircling said friction-clutch wheel, a band-tightening connection between the band and wheel operated by the draw-bar, a power-connection for connecting the friction-clutch wheel and axle of the vehicle, and a spring acting upon the band-tightening connection to make it unclutch the band-wheel and return the draw-bar and its wheel to their original and normal position.

5. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft, a draw-bar, a connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, and a band-tightening device carried by the loose wheel.

6. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft and having a spirally-formed rope or chain surface, a draw-bar, a flexible connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, and a band-tightening device carried by the loose wheel.

7. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft, a draw-bar, a connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, a band-tightening device carried by the loose wheel, and a spring to return the draw-bar and loose wheel to their normal position after being put in motion.

8. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft and having a spirally-formed rope or chain surface, a draw-bar, a flexible connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, a band-tightening device carried by the loose wheel, and a spring to return the draw-bar and loose wheel to their normal position after being put in motion.

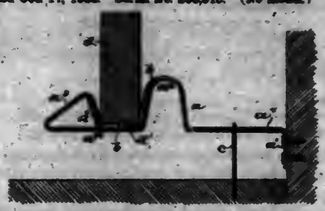
9. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft, a draw-bar, a connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, a band-tightening device carried by the loose wheel, consisting of a frame pivoted to the loose wheel at its inner end and having connections with the two ends of the friction-band and at different distances from the pivot-connection of the frame, and a spring connected to the inner of said band-connections to release the friction-band and return the loose wheel to its normal position.

10. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft, a draw-bar, a connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, a band-tightening device carried by the loose wheel, consisting of the pivoted frame N, having a hinge-connection at *n* with the loose wheel and having rods O P connecting with the ends of the friction-band, and a spring acting upon the rod P to release the friction-band and return the loose wheel to its original position.

11. The combination, in a car-starter, of a power-shaft having a friction-wheel secured thereto, a loose wheel supported concentric with said shaft, a draw-bar, a connection between said draw-bar and loose wheel, a lock to hold said draw-bar from being pulled out except when desired, a friction-band encircling the friction-wheel, a band-tightening device carried by the loose wheel, consisting of the pivoted frame N, having a hinge-connection at *n* with the loose wheel and having an extension, U, and having rods O P connecting with the ends of the friction-band, a spring acting upon the rod P to release the friction-band and return the loose wheel to its original position, and a stop, S, in the path of said extension U, to automatically release the friction-band when the loose wheel has made a given portion of a revolution.

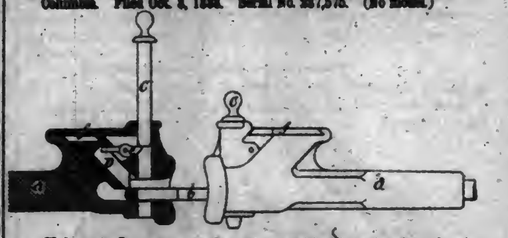
12. The combination of the axle of the car, a car-starter having a spirally-arranged groove or surface, a draw-bar and chain or rope therefor, a sprocket-wheel on the axle and the shaft of the car-starter and of different diameters, and a chain connecting said sprocket-wheels and in which the smallest radius of the spiral groove is substantially equal to the radius of the smallest sprocket-wheel which is secured to the car-starter shaft.

398,439. DOOR-CHECK. FRANK PARSONS, Russell Springs, Kans. Filed Oct. 17, 1888. Serial No. 288,315. (No model.)



Claim.—The herein-described door-check, composed of the elastic arm a^4, the check-loop a^3, and the latch a^2, having its inner arm, a^5, movable on the shank of the check, substantially as and for the purpose described.

398,440. CAR-COUPLING. THOMAS W. PATERSON, Victoria, British Columbia. Filed Oct. 3, 1888. Serial No. 287,575. (No model.)



Claim.—1. In a car-coupling, the combination of a draw-head having a vertically-inclined guide in rear of the vertical pin-aperture thereof, an endwise-movable block fitted in said guide to slide freely therein, a coupling-pin, and a pivoted dog or catch arranged between said block and coupling-pin and having one of its ends arranged in the path of the block to be tripped by the same, substantially as and for the purpose described.

2. In a car-coupling, the combination of a draw-head having a vertically-inclined guide in rear of the vertical pin-aperture thereof, an endwise-movable gravity-block fitted in said guide and having a longitudinal groove, a coupling-pin, and a pivoted dog or catch having its heel fitted in the groove of said gravity-block, substantially as described.

398,441. TELEGRAPH-CABLE. WILLIAM R. PATTERSON, Chicago, Ill., assignor to the Western Electric Company, same place. Filed May 24, 1886. Serial No. 203,117. (No model.)

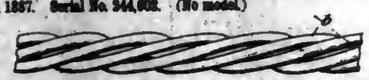


Claim.—1. The combination, with a core of insulated conductors, of an impervious serving wound thereon, the outside lead pipe, and the filling of coal-tar, or its equivalent, between the pipe and serving, substantially as described.

2. The combination, with the core *a* of separately-insulated elec-

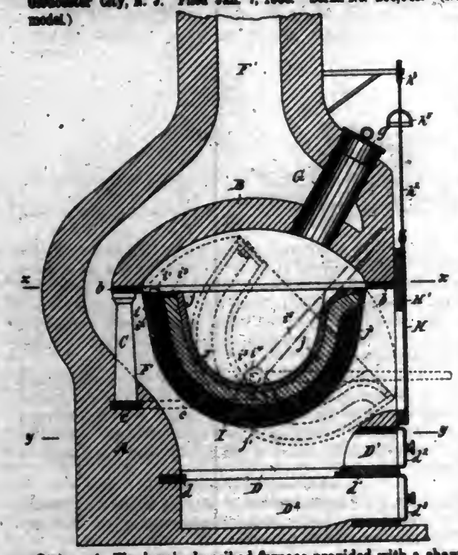
trical conductors, *of* a serving wound thereon and a winding of lead tape, *d*, a serving wound upon the lead tape, the filling *g* and the lead pipe A, substantially as described.

398,442. TELEGRAPH-CABLE. WILLIAM R. PATTERSON, Chicago, Ill., assignor to the Western Electric Company, same place. Filed July 18, 1887. Serial No. 244,003. (No model.)



Claim.—As a new article of manufacture, a cable consisting of an unserved core of separately-insulated conductors slightly and loosely twisted together, an exterior pipe inclosing said core, and a filling of insulating material forced into the pipe among and around the conductors of the core, said insulating filling being solidified when cold, like paraffine.

398,443. FURNACE FOR HEATING METALS. CLEMENT PAYNE, Philadelphia, Pa., assignor to the Electric Storage Battery Company, Gloucester City, N. J. Filed Jan. 7, 1888. Serial No. 260,041. (No model.)



Claim.—1. The herein-described furnace provided with a chamber having an arched roof, an incased crucible pivotally supported within said chamber, and said roof forming a cover for said crucible, and a lever operated from the outside of the furnace for tilting said crucible, substantially as and for the purposes set forth.

2. The herein-described furnace provided with a chamber having an arched roof, a chute extending downward into said chamber, a crucible pivoted to trunnions supported within said chamber, and a lever actuated from the outside of the furnace for tilting the same, substantially as and for the purposes set forth.

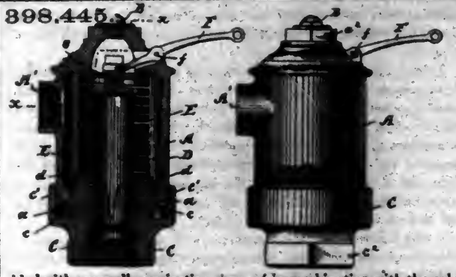
398,444. STEAM-ENGINE. ANDREW J. PIERCE, Racine, Wis. Filed July 20, 1888. Serial No. 280,503. (No model.)



Claim.—The upright tubular main frame having midway of its length the internal rigid cross-bar, *a'*, in combination with the cylinder fixed rigidly on the top of the frame, the piston, and the piston-rod extended through the guide a^3, the crank-shaft mounted in the base of the frame, and the longitudinally-divided pitman straddling the bar *a'* and connected at one end to the crank and at the opposite end to a cross-head, *e*, on the piston-rod.

398,445. POP SAFETY-VALVE. ROSWELL F. PRATT, Boston, Mass. Filed Apr. 16, 1888. Serial No. 270,913. (No model.)

Claim.—1. In a pop safety-valve, the body A, provided at its lower end with an inwardly-projecting flange, *a*, cap or cover C, pro-



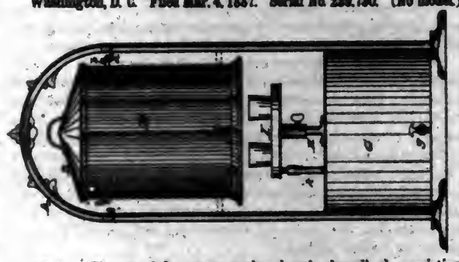
vided with upwardly-projecting rims *c c'*, in combination with the valve D and spring E, substantially as and for the purposes set forth.

2. In a pop safety-valve, a valve, D, consisting of a hollow cylinder closed at the top and provided with a flange, *d*, in combination with the spring E and body A, the spring being placed between the flange *d* and top of body A, whereby the valve is held to its seat in the cap C, substantially as and for the purposes set forth.

3. In a pop safety-valve, the body A, provided on its outside with a graduated scale, in combination with a cap or cover, C, provided with two upwardly-projecting rims, *c c'*, so that the body A is connected by a screw-thread to the rim *c*, while the rim *c'* acts as a pointer to indicate the pressure at which the valve will blow off, substantially as shown and described.

4. A pop safety-valve consisting of the following elements: an outer casing provided on its outer side with a graduated scale and at its lower end with an inwardly-projecting screw-threaded flange, a cap or cover provided with a steam-inlet and two upwardly-projecting rims, the inner one being screw-threaded to connect with the casing and the outer one serving as a pointer on the graduated scale, a hollow cylindrical valve provided on its outside with a flange near its lower end, and a spiral spring, all arranged and operating substantially as set forth.

398,446. STAND FOR WATER-COOLERS. CONSTANTINO P. RALLO, Washington, D. C. Filed Mar. 4, 1887. Serial No. 229,730. (No model.)



Claim.—The stand for water-coolers herein described, consisting of the arched frame A, provided with hooks *b* on its uprights for suspending a water-cooler, in combination with the receptacle G, secured to said frame, and said receptacle provided with the stand H, upon which the glass-holder I, having flange *i*, can be adjusted, and the flexible tube *k*, all arranged as shown, and for the purpose set forth.

398,447. CHUCK. CHARLES H. REID, Danbury, Conn. Filed Jan. 23, 1886. Serial No. 189,482. (Model.)



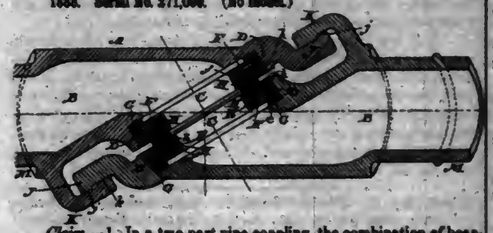
Claim.—1. In a chuck, the jaws arranged to slide freely within the chuck-body, in combination with an operating screw or bolt passed through said jaws independently of the body, substantially as shown and described.

2. In a drill-chuck, the combination, with two jaws and a screw for closing the same, of a new means for imparting a differential speed to the jaws for the purpose of centering the drill, consisting of a spring-actuated cone interposed between said jaws, as and for the purpose set forth.

3. In a drill-chuck, the male and female jaws adapted to slide in the body of the chuck, in combination with an actuating-screw passed through said jaws and a spring-actuated centering-pin having a conical end adapted to be forced between the jaws, and thereby deter-

mine the relative speed of the travel of said jaws, substantially as shown and described.

398,448. PIPE-COUPLING. WILLIAM G. RICHARDS, New York, N. Y., assignor of one-half to George H. Benjamin, same place. Filed Apr. 18, 1888. Serial No. 271,060. (No model.)



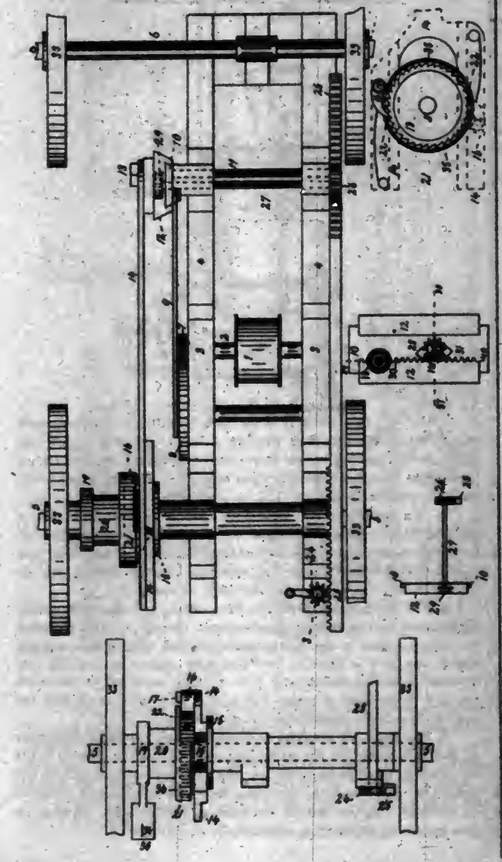
Claim.—1. In a two-part pipe-coupling, the combination of bearing-faces consisting of elastic packing material with an annular spring consisting substantially of two separated parallel annular leaves joined together at their inner edges to support the packing material, substantially as set forth.

2. In a two-part pipe-coupling, the combination of a chamber in each part of the coupling, packing material in the chamber, and an annular spring consisting of two separated parallel annular leaves joined together at their inner edge, substantially as set forth.

3. In a two-part pipe-coupling, the combination in each part of a ring of packing material, an annular spring for supporting the packing material, and an annular cylinder containing the same, all united and secured to the coupling, substantially as set forth.

4. In a two-part pipe-coupling, the combination at each part of a bearing-faced packing-ring and supporting-rings beneath the packing-ring with an annular cylinder containing and supporting the same, and a threaded ring adapted to screw into the body of the coupling for holding the parts together, substantially as set forth.

398,449. MOTOR FOR RAILWAY-CARS. IRA ROGERS, Camden, N. J. Filed Aug. 20, 1888. Serial No. 283,178. (Model.)



Claim.—1. In a car-motor, the combination of a pulley, 1, or other imparting mechanism, a shaft, 2, gears 7 8, a connecting-rod, 9, and a vibrating arm, 10, for the purpose shown and described.

2. In a car-motor, the combination of a vibrating arm, 10, an adjusting-head, 12, a forked rod, 14, an idle-wheel, 15, a shaft, 5, and a means for actuating the same, for the purpose shown and described.

3. In a car-motor, the combination of a shaft, 5, a forked rod, 14, an idle-wheel, 15, one or more pawls, 16, a ratchet-wheel, 18, and means for actuating the same, for the purpose shown and described.

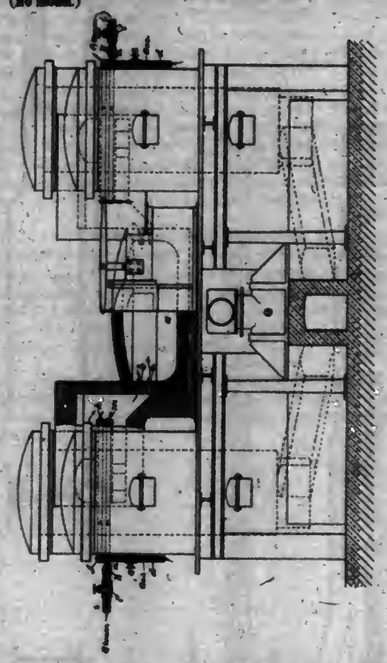
4. In a car-motor, the combination of a shaft, 5, an idle-wheel, 15, a forked rod, 14, one or more pawls, 16, a ratchet-wheel, 18, a weighted collar, 19, a shut-off wheel, 21, and means for actuating the same, for the purpose shown and described.

5. In a car-motor, the combination of a pinion, 24, a rack, 25, a pinion, 26, a shaft, 27, a pinion, 29, a rack, 30, and means for actuating the same, for the purpose shown and described.

6. In a car-motor an opening, 28, formed through a vibrating arm, 10, for the purpose shown and described.

7. In a car-motor, the combination of a gear-wheel, 29, with a rack, 30, in a head, 12, the gear and rack so arranged that the point of contact of the pitch-lines of their teeth is in a vertical plane passing through the center of shaft 11 of an arm, 10, for the purpose shown and described.

398,450. ART OF PROTECTING THE INTERIOR WALLS OF FURNACES. HENRY ROSSER, Pittsburg, Pa., assignor of one-half to George T. Oliver, same place. Filed Oct. 16, 1887. Serial No. 252,422. (No model.)



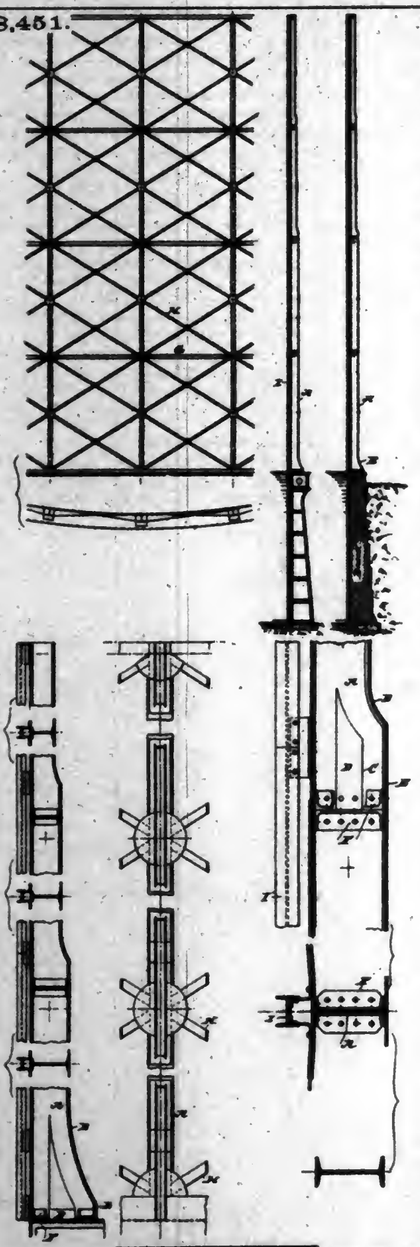
Claim.—The improvement in the art of protecting furnaces against the cutting action of flame, especially of fluid fuel, consisting in surrounding or enveloping the flame with steam, which acts as a cushion between the flame and the walls of the furnace, substantially as described.

398,451. IRON COLUMN. THOMAS F. ROWLAND, New York, N. Y. Filed June 26, 1888. Serial No. 278,204. (No model.)

Claim.—1. A column composed of angle-beams or bars which vary in width from the top to the bottom of the column, the ends of the narrower beams where two beams of different widths are united being spread out or expanded to substantially the width of the unexpanded ends of the larger beams, substantially as and for the purpose set forth.

2. A column composed of angle-beams A, which vary in width from the top to the bottom of the column, the webs of the ends of the smaller beams where two beams of different widths are united being split, and the flange E thereof spread out to substantially the width of the top of the beams below, and the pieces D inserted in the said expanded ends, substantially as and for the purpose set forth.

898,451.



head of said vertical spindle, a pair of governor-arms, O, pivoted to said pivots and crossing each other above the planes of said pivots, and provided with cams Q, engaging the top of said valve-stem, weights upon the governor-arms, stops to limit the movement of the governor-arms, angularly-disposed springs S, engaging spring abutments upon the head of the vertical spindle, and adjusting-screws upon the governor-arms between the pivot and weight of said arm.

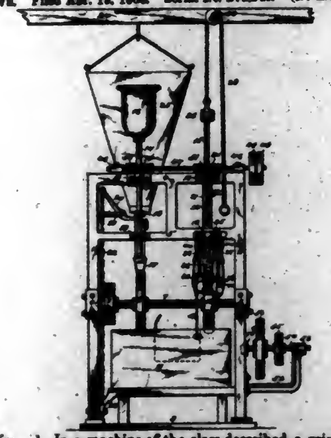
2. In a governor, the combination, substantially as set forth, with a governor-valve and stem and a spindle carrying the centrifugal mechanism, of the head K, carried by said spindle, pivots L, carried by said head, curved governor-arms O, carried by said pivots and carrying weights N, and lying close alongside each other at a point of crossing, and provided with cams Q, engaging the top of said valve-stem, and with lugs P, engaging each the opposite arm, and springs acting between said head and arms to furnish centripetal force.

898,453. SHANK-PROTECTOR. HENRY SCHRADER, New Springs, Iowa. Filed May 26, 1887. Serial No. 239,455. (No model.)



Claim.—As an improved article of manufacture, the herein-described shank-protector comprising the convex-concave plate B, adapted to be secured to the shank of a boot or shoe, and provided along the center with a series of parallel V-shaped ribs, said plate being solid throughout, and the corrugations being projected from the rest of the plate formed integral with the same and arranged in a continuous straight line transversely to the length of the plate, but not extending entirely across the same, the said plate having the front ears, *b*, as set forth.

898,454. PUNTING-MACHINE. HENRY C. SCHRADER, Wheeling, W. Va. Filed Apr. 19, 1888. Serial No. 271,346. (No model.)



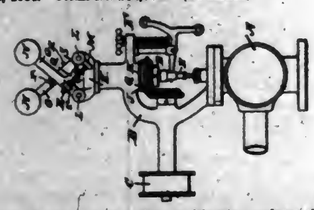
Claim.—1. In a machine of the class described, a grinding-wheel and a vertical rotating shaft bearing a chuck mounted above said wheel, in combination with a sleeve surrounding said shaft and arms attached to said sleeve and provided with glass-receiving chucks, substantially as described.

2. In a machine of the class described, the combination, with a grinding-wheel rotatably mounted upon a shaft, of a shaft mounted for reciprocation in a sleeve and adapted for rotation therewith and provided with oppositely-pivoted rotatable spindles having glass-receiving chucks at their ends, substantially as specified.

3. The combination, with the frame-work, of a sleeve longitudinally slotted and carrying a gear mounted thereon, a shaft mounted for reciprocation in the sleeve and provided with glass-receiving chucks mounted in spindles provided with pulleys, an endless belt mounted over the pulleys and over a pulley mounted on the shaft, and of a power-shaft provided with a gear adapted to mesh with the gear on the sleeve, substantially as specified.

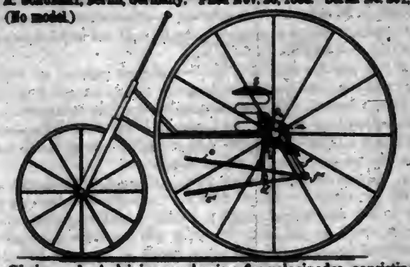
4. The shaft 15, mounted as described, and having pivoted arms 37 and twin pulley 35, the depending arms 38, having pivoted bends 39, carrying spindles 40, provided with pulleys 41 and chucks 42, the pulleys 44, mounted on the depending arms, and the chuck 36, mounted on the shaft, and the belt 43, mounted as described and adapted to give motion to the chucks, substantially as specified.

898,452. GOVERNOR. WILLIAM H. RUMELY, La Porte, Ind. Filed Sept. 10, 1888. Serial No. 284,972. (No model.)



Claim.—1. In a governor, the combination, substantially as set forth, with the governor-valve and stem and the spindle carrying the centrifugal mechanism, of a pair of horizontal pivots, L, carried by the

898,455. DRIVING MECHANISM FOR VELOCIPEDES. CONRAD A. SCHLUMPF, Berlin, Germany. Filed Nov. 26, 1886. Serial No. 291,636. (No model.)



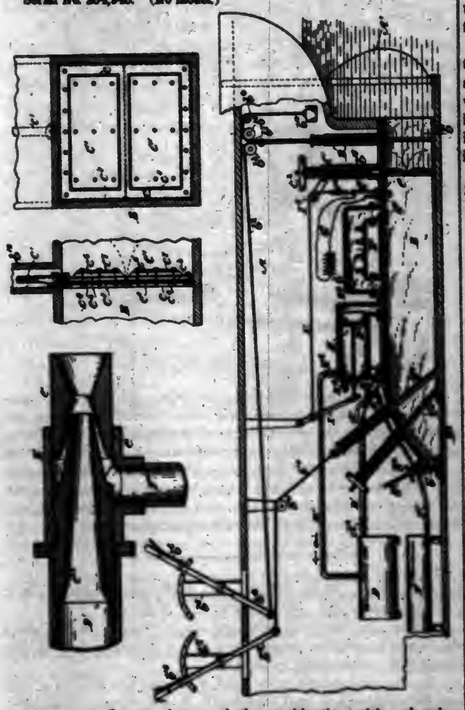
Claim.—1. A driving mechanism for velocipedes, consisting of treadle-levers *e e'*, disks or drums *c c'*, cord or chain *d*, pulleys *g*, levers *h i*, links *k l*, pawls *m*, and ratchet-toothed wheels *n*, combined, arranged, and operating substantially as herein described.

2. In a driving mechanism for velocipedes, the combination, with the sleeve or hub $a^{\times}$, carrying the riding-wheel F and the ratchet-toothed wheel *n*, of the toothed pawl *m*, links *k l*, levers *h i*, disk or drum *c* or *c'*, cord or chain *d*, and treadle-levers *e* or *e'*, arranged and operating substantially as herein described.

3. In a driving mechanism for velocipedes, the combination, with the riding-wheel and its sleeve or hub, the pawl-and-ratchet mechanism, and the lever-and-link mechanism, of a treadle-lever, a cord or chain, a disk or drum, and a spring, arranged and operating substantially as herein described.

4. In a driving mechanism for velocipedes, the combination, with the lever *h*, carried by the box or sleeve *b*, the lever *i*, working loosely on the axle *a*, and the ratchet-toothed wheel *n*, carried by the sleeve or hub $a^{\times}$, of the links *k l*, and the pawl *m*, carried by the link *l*, substantially as herein described.

898,456. ENGINE. JOHN A. SIBUR, Brooklyn, assignor to the Secor Marine Propeller Company, New York, N. Y. Filed Nov. 11, 1887. Serial No. 254,940. (No model.)



Claim.—1. In a marine vessel, the combination, with a chamber opening to the water, of a compressed-air reservoir communicating therewith, a receptacle for a hydrocarbon, also communicating with the chamber, a cylinder communicating at one end with the chamber and at the other end with the compressed-air reservoir, a piston in the cylinder, and an apparatus for igniting the contents of the chamber, substantially as specified.

2. In a marine vessel, the combination, with a chamber opening to the water, of a compressed-air reservoir communicating therewith, a receptacle for a hydrocarbon, also communicating with the chamber, a cylinder communicating at one end with the chamber and at the other end with the compressed-air reservoir, a piston in said cylinder, an electric apparatus for igniting the contents of the chamber and comprising two electrodes, one of which is movable, and a connection between the movable electrode and the said piston, substantially as specified.

3. The combination, with a chamber opening to the water, of an air-inlet therefor, a receptacle for hydrocarbon communicating with the chamber, an air-compressing engine communicating at one end with said chamber, an electric apparatus for igniting the contents of the chamber, and comprising two electrodes, one of which is movable, and a connection between the movable electrode and the air-compressing engine for moving said electrode, substantially as specified.

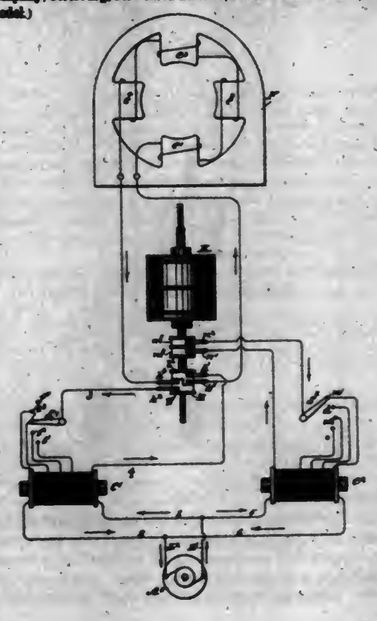
4. The combination, with a chamber, of a compressed-air reservoir, an injector communicating with the compressed-air reservoir and with the chamber, and a receptacle for hydrocarbon communicating with the injector, the said injector having an outlet having two reversely-arranged communicating tapering cavities, one receiving a nozzle which receives air from the compressed-air reservoir and the other opening into the said chamber, the diameter of the outlet of said nozzle being less than the smallest diameter of said outlet for the injector, substantially as specified.

5. In a marine vessel, the combination, with a chamber opening to the water, of an air-inlet, a hydrocarbon-inlet, igniting apparatus, an air-pump open at one end to the chamber, and a valve located at one end of the chamber and controlling communication with the water, said valve being capable of opening outwardly when subjected to excessive pressure within the chamber, and of closing inwardly under pressure of the water, substantially as specified.

6. In a marine vessel, the combination, with a chamber opening to the water, of a compressed-air reservoir, an inlet from the compressed-air reservoir to the chamber, a hydrocarbon-inlet, igniting apparatus, openings for establishing communication between the said chamber and the atmosphere, and valves which will open upon a reduction of pressure below atmospheric pressure inside the chamber to allow atmospheric air to enter the chamber, substantially as specified.

7. In a marine vessel, the combination, with a chamber opening to the water, of a valve located at one end of the chamber and operating to exclude water from the chamber, an air-inlet for the chamber, valves connected with said air-inlet and opening inwardly under the influence of atmospheric pressure when pressure within the chamber is reduced below atmospheric pressure, a hydrocarbon-inlet, and igniting apparatus, substantially as specified.

898,457. ALTERNATE-CURRENT ELECTRIC MOTOR. OLIVER B. SHALLENBERGER, Rochester, assignor to the Westinghouse Electric Company, Pittsburg, Pa. Filed Mar. 20, 1888. Serial No. 267,843. (No model.)



Claim.—1. In a marine vessel, the combination, with a chamber opening to the water, of a compressed-air reservoir communicating therewith, a receptacle for a hydrocarbon, also communicating with the chamber, a cylinder communicating at one end with the chamber and at the other end with the compressed-air reservoir, a piston in the cylinder, and an apparatus for igniting the contents of the chamber, substantially as specified.

Claim.—1. The combination, with the field-magnet and armature of an electric motor, of a converter having its primary coil supplied with alternating, intermittent, or pulsatory electric currents and its secondary coil connected with the armature-coils, and a second converter having its primary coil connected with a source of alternating, intermittent, or pulsatory electric currents and its secondary coil connected with the field-magnet coils of the motor.

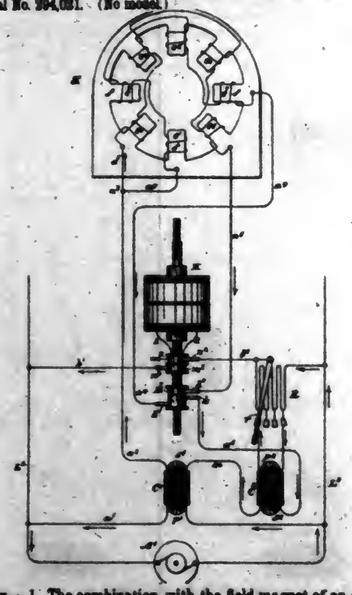
2. The combination, with the field-magnet and armature of an electric motor, of a converter having its primary coil supplied with alternating, intermittent, or pulsatory electric currents and its secondary coil connected with the armature-coils, a second converter having its primary coil connected with a source of alternating, intermittent, or pulsatory electric currents, a rectifying-commutator upon the armature-shaft of the motor, and circuit-connections from the secondary coil of the second converter through said rectifying-commutator with the field-magnet coils.

3. The combination, with the field-magnet and armature of an electric motor, of a converter having its primary coil supplied with alternating, intermittent, or pulsatory electric currents and its secondary coil connected with the armature-coil, a second converter having its primary coil connected with a source of alternating, intermittent, or pulsatory electric currents and its secondary coil connected with the field-magnet coils of the motor, and means for varying the ratio of conversion of one of said converters.

4. The combination, with the field-magnet and armature of an electric motor, of a converter having its primary coil supplied with alternating, intermittent, or pulsatory electric currents and its secondary coil connected with the armature-coils, a second converter having its primary coil connected with a source of alternating, intermittent, or pulsatory electric currents, a rectifying-commutator upon the armature-shaft of the motor, circuit-connections from the secondary coil of the second converter through said rectifying-commutator with the field-magnet coils, and means for varying the ratio of conversion of both of said converters.

5. The combination, with a source of alternating, intermittent, or pulsatory electric currents and a circuit therefor, of an electric converter having its primary connected in said circuit, a revolving armature having its coils connected in the circuit of the secondary coil of the converter, a second converter connected with said source of currents, a field-magnet applied to the armature included in the secondary circuit of the second converter, and a rectifying-commutator interposed in said secondary circuit between the field-magnet and the converter.

398,458. ALTERNATE-CURRENT ELECTRIC MOTOR. OLIVER B. SHALLENBERGER, Rochester, assignor to the Westinghouse Electric Company, Pittsburg, Pa. Filed Dec. 9, 1887. Renewed Dec. 13, 1888. Serial No. 294,031. (No model.)



Claim.—1. The combination, with the field-magnet of an electric motor and a source of current therefor, of a converter having its primary coil supplied with alternating electric currents and its secondary coil connected to assist the field-magnet current, and means for supplying more or less current to the primary coil of the converter.

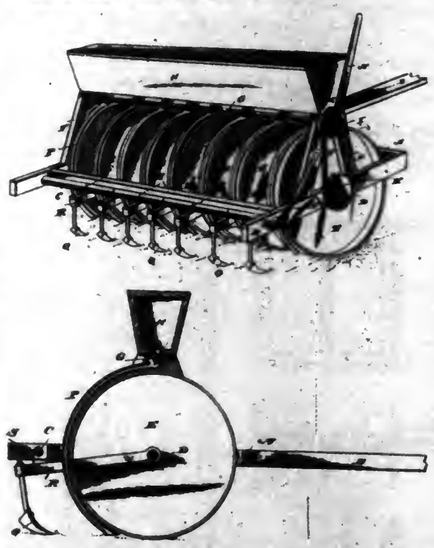
2. The combination, with the field-magnet coils of an electric motor, of a converter having its secondary circuit connected through said coils, a second converter assisting in effect the first-named converter, and connections through the armature of the motor independent of the field-magnet connections.

3. The combination, with the field-magnet coils of an electric motor, of a converter having its secondary circuit connected through said coils, a second converter assisting in effect the first-named converter, connections through the armature of the motor independent of the field-magnet connections, and means for cutting the primary coil of the second converter out of circuit.

4. The combination, with the field-magnet coils of an electric motor and the armature applied thereto, of a converter supplying currents to the field-magnet coils, a circuit-transferring commutator through which the secondary circuit of said converter is completed, an artificial resistance included in the circuit of the armature, means for including more or less of said resistance in circuit, and a second converter having its primary coil connected in shunt upon said resistance and its secondary coil in series with the secondary coil of the first-named converter, substantially as described.

5. The combination, with the field-magnet of an electric motor having multiple poles, of branch conductors including the coils applied to the alternate poles, a commutator upon the armature-shaft of the motor, means for completing the circuit-connections through said branch circuits alternately, and a source of alternating electric currents supplying said branch circuits.

398,459. SEED-DRILL. JOHN S. SHERIDAN, Columbia, Dak. Filed Sept. 26, 1888. Serial No. 286,436. (No model.)



Claim.—In a grain-drill, the combination, with the main frame, of the shaft D, journaled thereto, the rollers secured to the shaft, said rollers having broad peripheries as distinguishable from a tapering periphery and bound with tires, the hopper supported above the rollers, the seed-tubes having a sweeping curvature and leading from the base of the hopper to the earth in close relation to the respective rollers, and the covering-shovels journaled on the shaft and connected with a rock-shaft by chains, substantially as specified.

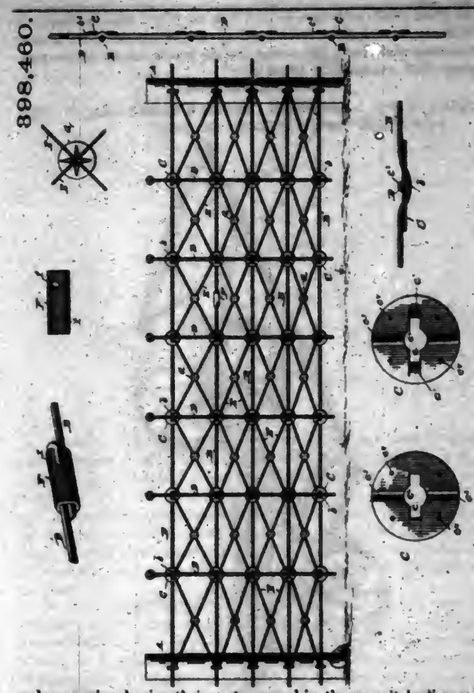
398,460. WIRE FENCE. JOHN G. SCHILLER, Washington, D. C. Filed June 5, 1888. Serial No. 276,115. (No model.)

Claim.—1. The herein-described disk for fences, provided with a slot having a central enlargement and with perforations near the edge of said disk, substantially as set forth.

2. The combination, with the line and upright wires of a fence and disks disposed at each intersection thereof provided with perforations, of cross-wires secured through the oppositely-disposed perforations, substantially as set forth.

3. The herein-described fence, consisting of the upright posts, line-wires secured thereto provided with bends, disks provided with slots adapted to receive said bends and having a central enlargement, perforations in said disks, upright wires disposed under the bends of the line-wires and adapted to be struck or forced in the enlargement.

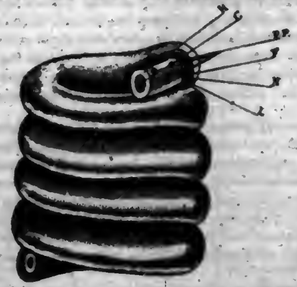
398,460.



and cross-wires having their ends secured in the oppositely-disposed perforations, substantially as set forth.

4. The combination, with the disks provided with perforations, of cross-wires secured at their ends through the oppositely-disposed perforations of two disks and at their point of intersection by staples, substantially as set forth.

398,461. STEAM OR WATER PACKING. JOHN T. SMITH, San Francisco, Cal. Filed Mar. 31, 1888. Serial No. 269,108. (No model.)



Claim.—A packing having a central core of suitable fibrous material saturated with a mixture of pulverized soapstone and flour, as above described, the core being wrapped with perforated rubber or cork to allow the lubricant to pass from the central core to the outer covering, which is composed of a fibrous material saturated as above described, and the whole plaited with a slack-twisted cord of suitable fibrous material, substantially the same as above described.

398,462. HORSE-POWER FOR HAY-STACKERS. ROBERT J. SMITH, Cascade, Iowa. Filed Aug. 20, 1887. Serial No. 247,994. (Model.)

Claim.—1. In a horse-power, the combination of the base-frame having the vertical standard, the drum or pulley journaled thereon and having the annular shoulder, the power-lever L, loose on the standard, the shaft K, journaled in said power-lever, the friction-band around the shoulder of the pulley and having one end connected to a fixed part of the power-lever and the other end connected to the shaft K, and the lever to rotate the said shaft, substantially as described.

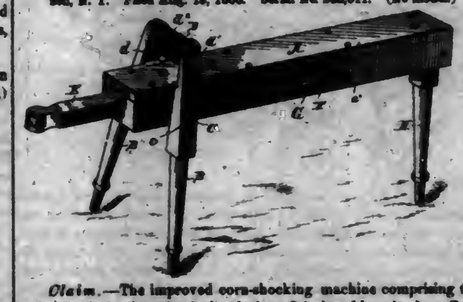
2. In a horse-power for hay-stackers, the base-frame having a vertical standard, the drum or pulley journaled thereon and having the annular shoulder, the power-lever also loose on said standard, the shaft K, journaled in said power-lever, the friction-band around the shoulder of the drum or pulley and having one end connected to a fixed part of the power-lever and the other end connected to the

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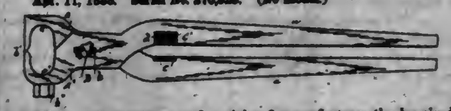
shaft K, the ratchet-wheel fast on said shaft, the pawl pivoted to the power-lever and engaging said ratchet-wheel, and the lever to rotate the shaft K, all combined and arranged to operate substantially as described.

398,463. CORN-SHOCKING MACHINE. ALBION W. SMITH, Addison, N. Y. Filed Aug. 13, 1888. Serial No. 282,611. (No model.)



Claim.—The improved corn-shocking machine comprising the hollow body having the inclined slots G in its sides, the legs B B, secured to the body at one end, the spool mounted between the upper ends of said legs, the bolt C, securing the legs to the body and passing transversely through the body, the handle sliding in the body and having a notch, I, in its lower side fitting over the bolt C, the said notch having a recess, J, in its top adapted to engage said bolt when the handle is pushed inward, and the arms F, fitting in the slots G, and having their inner ends pivoted to the end of the handle, as specified.

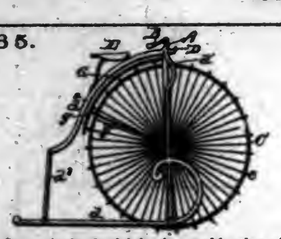
398,464. NIPPERS. JOHN SPRINGLER, Fort Apache, Ariz. Filed Apr. 11, 1888. Serial No. 270,326. (No model.)



Claim.—As an improved article of manufacture, the herein-described tool, comprising the two jaws or levers, the stud or post having a T-shaped end and formed integral with one of said jaws or levers and designed to be projected through a correspondingly-shaped slot of the other jaw or lever, the nippers formed at the outer ends of said jaws or levers, the hammer, and the oppositely-disposed grooved lugs, all constructed and arranged substantially as shown and described.

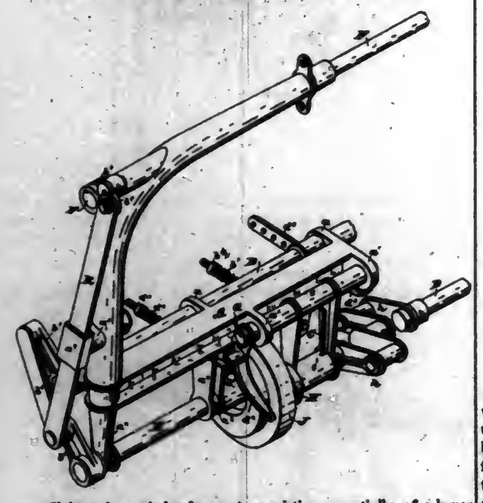
398,465. ICE-VELOCIPEDE. CHARLES STRAKE, Detroit, Mich. Filed Nov. 15, 1888. Serial No. 290,904. (No model.)

398,465.



Claim.—In a velocipede-sleigh, the combination of a standard, a drive-wheel journaled therein, a sleeve loosely embracing said standard above the wheel, suitable frame-work connecting said sleeve with the runners, a guard extending rearwardly from the standard, braces connecting the lower end of said guard with the lower ends of the two shanks *a'* of the standard, and a spring on the standard below the loose sleeve to keep the drive-wheel to its work and permit it to rise and ride over inequalities in the surface traversed, substantially as described.

398,466. GRAIN-BINDER. BENJAMIN F. STEWART, New Philadelphia, Ohio. Filed Aug. 6, 1887. Serial No. 246,236. (No model.)



Claim.—1. A binder-frame, A, consisting, essentially, of a lower horizontal portion and an upright portion projected therefrom, the lower horizontal portion being provided with shaft-supports projecting laterally therefrom in opposite directions, and with a hanger depending from said horizontal portion, and the upright portion being provided at a point above the horizontal portion with a journal projecting laterally therefrom, substantially as set forth.

2. The frame A, having the shaft-supports $a\ a\ a'\ a'$ extending laterally from its lower horizontal portion, the hangers $a^3\ a^3$, depending from said horizontal portion, and the journal a^5, projecting laterally from its upright portion, substantially as set forth.

3. In a grain-binder, the combination, with the yielding packer-shaft support and gear-wheels I and J, the former loosely mounted on the packer-shaft and the latter mounted on the shaft E, of the packer-shaft journaled in the yielding support and having a movement transverse to its axis to throw the said gear-wheels into and out of engagement, substantially as set forth.

4. The combination, with the binder-frame, of the yielding frame C, shaft D, driving-wheel I, loosely mounted on the shaft, spring-pawls $a^4\ b^4$, mounted in wheel I, and ratchet a^5, gear-wheel J, having groove a^7, provided with notch, and the stop b^5, substantially as set forth.

5. The combination of the wheel J, carrying a roller, d', shaft G, provided with a cam, d^3, and arm d^4, said roller d' being in position to engage the cam d^3 as the wheel J rotates, the bundle-supporting finger d^5, spring d^6, and bolt d^7, to hold the bundle-supporting finger in position to receive grain, the whole being constructed and arranged substantially as set forth.

6. The combination, with the binder-actuating shaft and the needle-shaft, of the knotter-head shaft, cranks secured to the binder-actuating shaft and knotter-head shaft, a differential link connected at one end with the crank on the knotter-head shaft, a link connecting the other end of the differential link with the crank on the binder-actuating shaft, a fulcrum for the link, on which the link bears at different distances from its ends during each revolution of the binder-actuating shaft, and a link connecting the needle and the binder-actuating shaft, substantially as set forth.

398,467. HARVESTER. CHARLES S. STICKLE, Pekin, Ill. Filed June 26, 1888. Serial No. 278,274. (No model.)



Claim.—1. The combination of the axle, a tongue extending rearward therefrom, an adjustable lever pivoted thereon, a bar disposed under the axle, a rectangular frame located in front of and below the bar, and connecting-bars secured to said frame and curved upwardly from the rear edge thereof in front of the axle and rigidly secured to the bar under the axle, the connecting-bars being extended in rear of the axle and connected with the adjusting-lever, substantially as set forth.

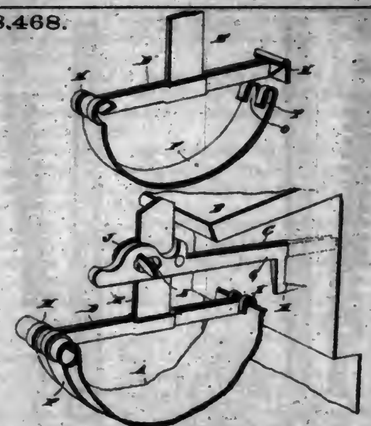
2. The combination, with an axle, a transverse vertically-adjustable bar disposed thereunder, a rearwardly-projecting tongue secured to the axle and carrying a lever, a rectangular frame located in front of and below the transverse bar, bars connecting the same with the bar under the axle, said connecting-bars being curved upwardly in front of the axle at the rear edge of said frame and being extended in rear of the axle, and a link provided with a series of perforations for adjustably connecting the latter with the lever, substantially as set forth.

3. The herein-described header, comprising the axle, a transverse bar, F, underlying the axle and having guides therefor at its ends, a rectangular frame, H, located in front of and below the transverse bar, the rearwardly-converging bars I I', the bar J, extending from the front beam of the rectangular frame to near the rear end of the bar I, the parallel bars J' and J³, respectively secured to the bars I and I' at one end and to the guides at the ends of the transverse bar, and a bar, K, secured at one end to the bar I and at the other to the outer end of a bar, L, projecting rearwardly from the rear end of the rectangular frame, said connecting-bars being curved upwardly from the rear edge of the rectangular frame in front of the axle, all arranged substantially as and for the purpose set forth.

4. The herein-described header, comprising the axle, a transverse bar underlying the axle and having guides therefor at its ends, a rectangular frame, and bars connecting the latter with the transverse bar, said connecting-bars being curved upwardly at the rear edge of the rectangular frame in front of the axle, substantially as and for the purpose set forth.

398,468. EAVES-TROUGH HANGER. WILLIAM STINE, Elmore, Ohio, assignor of one-half to Godfrey Jaeger, Jr., same place. Filed May 12, 1888. Serial No. 273,715. (No model.)

398,468.



Claim.—1. The eaves-trough hanger comprising a spike, a standard adjustably secured to the spike and depending therefrom, and a cross-bar secured to the standard and supporting the trough, as set forth.

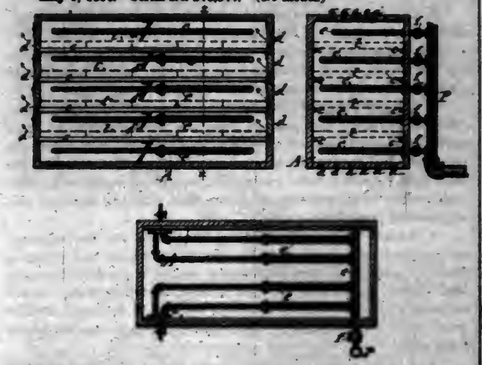
2. An eaves-trough hanger comprising a spike, a clamping-plate permanently secured to the side of the spike, a standard inserted vertically upward between said plate and the spike and adjustably secured between the same, and a suspending loop carried by the standard, as set forth.

3. An eaves-trough hanger comprising a spike having a vertical shoulder on its side and an opening beyond said shoulder, a clamping-plate secured to the spike and having an opening aligning with the opening in the spike, the standard inserted between the spike and the clamping-plate, a cross-bar secured to the standard and supporting the trough, and a wedge-shaped fastening device inserted through the aligned openings in the clamping-plate and the spike, as set forth.

4. An eaves-trough hanger comprising a spike, a standard adjustably secured thereto, a cross-bar at the lower end of the standard, having an open loop at one end to engage the bead of the trough, and a hook at the other end to engage the smooth edge of the trough, and a suspending loop depending from the open loop and adapted to engage the hook, as set forth.

5. An eaves-trough hanger comprising a spike, a standard adjustably secured to the spike, a cross-bar at the lower end of the standard, having a hook at its inner end, and a suspending loop secured to the outer end of the cross-bar and provided at its free end with tongues adapted to be bent over the hook and pass down on opposite sides of the cross-bar, as set forth.

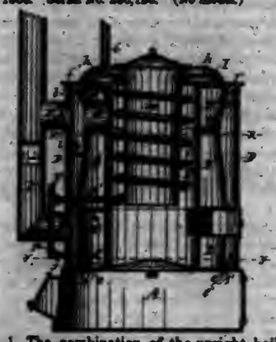
398,469. FRUIT-DRIER. GEORGE STRIEBER, Auburn, N.Y. Filed May 9, 1888. Serial No. 273,977. (No model.)



Claim.—1. The combination of the evaporating-chamber provided with tray-supports at various elevations, doors between the planes of the tray-supports and at opposite ends of the chamber, and steam-pipes between the tray-supports and distributed to present greater heat-radiating surfaces at the induction end of the case than at the eduction end thereof, substantially as described and shown.

2. The combination of the evaporating-chamber provided with a perforated bottom and perforated top, tray-supports at various elevations in the said chamber, inward-swinging doors between the tray-supports at one end of the case, outward-swinging doors diametrically opposite the inward-swinging doors, doors suspended across the central portion of the chamber, and steam-pipes between the planes of the tray-supports and distributed to present greater heat-radiating surfaces in the lower portion and the induction end of the chamber than at the upper portion and the eduction end of the chamber, substantially as described and shown.

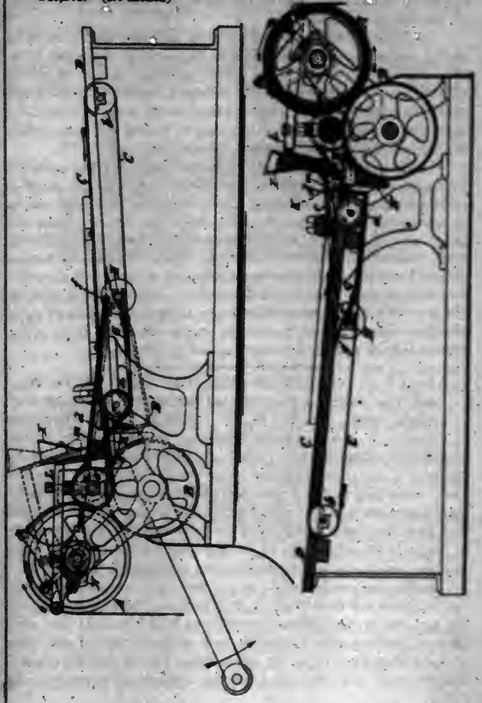
398,470. STEAM-BOILER. GEORGE STRIEBER, Auburn, N.Y. Filed July 16, 1888. Serial No. 280,126. (No model.)



Claim.—1. The combination of the upright boiler formed with the central combustion-chamber, C, and provided at its upper portion with the smoke-exit *a*, the smoke-jacket D, inclosing said boiler, the horizontal partition *b*, having the port *c*, the pipe P, having branches P' P", communicating with the smoke-jacket above and below the aforesaid partition and diametrically opposite the port *c*, and the dampers *d* in the direct branch P', substantially as described and shown.

2. The boiler proper, composed of the fire-pot section B, formed flaring externally from its base to its top, the central section, B', seated upon the section B and tapered externally from its base to its top, and the top section, B", seated upon the section B' and flared externally to its top and formed with the exit *a*, in combination with ash-pit A, formed with the projection A', the smoke-jacket D, seated upon said projection and provided with the exit P" at its base, and the horizontal partition *b* in the smoke-jacket between the exits *a* and P", and provided with the port *c*, substantially as described and shown.

398,471. APPARATUS FOR DUPLICATING MANUSCRIPT, &c. CHARLES A. THOMPSON, New York, N.Y. Filed Aug. 6, 1887. Serial No. 246,275. (No model.)



Claim.—1. The combination of the roller for containing the matter to be copied, the pressure-roller B, the feeding-table, and a vertically-movable water-retaining wetting device for moistening the paper arranged above the plane of the table and having a movement below such plane, substantially as described.

2. The combination of the roller A, for carrying the matter to be copied, the pressure-roller B, the secondary feeding and guiding roller E, table D, and a wetting device for moistening the paper, all substantially as and for the purpose herein set forth.

3. The combination of the roller A, for carrying the matter to be be copied, the pressure-roller B, a table, D, a wetting device, and movable stops *d*, for intermitting the movement of the paper from the table to the wetting device and the rollers A B, all substantially as and for the purpose herein set forth.

4. The combination of the roller A, for carrying the matter to be copied, the pressure roller B, the secondary feeding and guiding roller E, a table, D, a wetting device, and movable stops *d*, for intermitting the movement of the paper from the table to the wetting device and the rollers A B, all substantially as and for the purpose herein set forth.

5. The combination of the roller A, for carrying the matter to be copied, the pressure-roller B, table D, a movable wetting-trough and pad, and mechanical devices for giving an intermittent vertical movement thereto, all substantially as and for the purpose herein set forth.

6. The combination of the roller A, for carrying the matter to be copied, the pressure-roller B, table D, a movable wetting device, and bars L and cam N, for giving an intermittent vertical movement thereto, all substantially as and for the purpose herein set forth.

7. The combination of the roller A, for carrying the matter to be copied, the pressure-roller B, the trough B', for containing the moistening-liquid, and a movable device constructed and arranged to force downward the paper as it passes to the rolls A B into the said trough, all substantially as and for the purpose herein set forth.

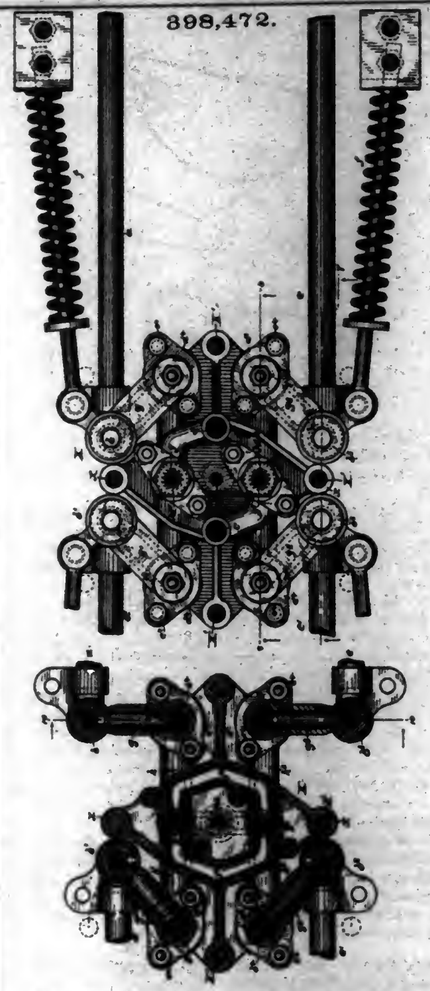
8. The combination of the roller for carrying the matter to be copied, the pressure-roller B, the trough B', for containing the moistening-liquid, and the movable upper moistening-trough, I, having a dampening-pad, K, and means for intermittently forcing said upper trough and its pad downward, carrying with it the paper to receive the copy into the said trough B', substantially as and for the purpose specified.

9. The combination of the roller for containing the matter to be copied, the pressure-roller, and a feeding-table for the paper to receive the copy, with a trough for containing water having a fixed relation to and arranged beneath the end of said table, a vertically-intermittently-movable trough, I, containing a moistening-pad arranged above the plane of said table, and vertically-intermittently-movable stops *d*, operating beneath the plane of said table, substantially as described, for the purpose specified.

10. The combination of the roller for carrying the matter to be copied, the pressure-roller B, and a feeding-table for the paper to receive the copy, with a wetting device consisting of a fixed and an intermittently-movable trough part arranged, respectively, below and above the plane of the table and the track of the paper to receive the copy, the movable part being operated to depress said paper below the plane of the table, substantially as described.

11. The combination of the roller for containing the matter to be copied, the pressure-roller B, and a feeding-table for the paper to receive the copy, with a wetting device consisting of a fixed and an intermittently-movable trough part arranged, respectively, below and above the plane of the table and the track of the paper to receive the copy, vertically-movable stops arranged below the table, mechanical devices for giving an intermittent downward movement to the movable wetting part upon the said paper, and mechanical devices for giving an intermittent upward movement to the stops upon said paper to raise it when the movable wetting part is raised free of the latter, substantially as described, for the purpose specified.

398,472. CAR-HEATING APPARATUS. HENRY R. TOWER, Stamford, Conn., assignor to The Safety Car Heating and Lighting Company, of New Jersey. Filed May 18, 1887. Serial No. 238,070. (No model.)



Claim.—1. In a car-heating apparatus, the combination of four longitudinally-movable pipes extending two from each end toward the center of a car, an intermediate center-fitting, four hollow arms pivotally connecting said four pipes and center-fitting, and local heating-pipes connected with the center-fitting and through it with the said four pipes, the center-fitting being provided with passages through it, so that a heating-fluid may be admitted into the local heating-pipes and also pass on for heating another car, substantially as set forth.

2. The combination, with a car, of four pipes connected with local heating-pipes and extending two from each end toward the center of the car, and an intermediate center-fitting with which the four pipes have a movable jointed connection, and springs acting on said pipes to move them lengthwise, the center-fitting having passages communicating with said pipes for a heating medium, substantially as set forth.

3. In a car-heating apparatus, a center-fitting containing two parallel longitudinal ports, $h\ h'$ and $h^2\ h^3$, and two transverse ports, $f^4\ f^5$, connected together, these ports being provided with valves for opening and closing them, in combination with the pivoted hollow arms $g\ g'\ g^2\ g^3$, substantially as set forth.

4. A center-fitting or distributing-chamber with two parallel longitudinal ports and two parallel transverse ports, each of the latter having a separate outlet or connection leading to the car, each transverse port being connected with one or the other of the longitudinal ports by a reversing-valve, whereby either of said outlets or connections leading to the car may be connected at will with either of said longitudinal ports.

5. A center-fitting or distributing-chamber having two longitudinal and two transverse ports and provided also with four vibrating arms, the passages or ports contained in each of said arms connecting, as described, with the longitudinal ports in the center-fitting, so that any fluid contained in any of said arms will tend to discharge itself by gravity into said longitudinal ports and thence to a common drip or drain cock.

6. A center-fitting or distributing-chamber having four vibrating arms, each of which is provided at one end with a plug or cock for opening and closing the passages into the center-fitting by the vibration of the arms, substantially as set forth.

7. A center-fitting or distributing-chamber with four vibrating hollow arms, each having at the highest point of its internal port or passage an automatic cut-off, substantially as set forth.

8. A center-fitting or distributing-chamber having one or more vibrating arms, and at each end of each of said arms a rotating plug, substantially as set forth.

9. A center-fitting or distributing-chamber having one or more vibrating arms, one end of each arm being pivoted to the center-fitting and the other connected pivotally to a longitudinal pipe, substantially as set forth.

10. A center-fitting or distributing-chamber fixed to the body of a car and having four vibrating arms and one or more reversing-valves for controlling the direction of flow through said center-fitting, substantially as described.

11. A center-fitting or distributing-chamber fixed to the body of a car, and having four vibrating arms, two longitudinal and two transverse ports, and provided also with a drip or drain cock located centrally, substantially as set forth.

12. A center-fitting or distributing-chamber fixed to the body of a car, and having four vibrating arms, two longitudinal and two transverse ports, one or more reversing-valves, and a drip-valve, substantially as set forth.

13. In a car-heating apparatus, the combination, with a center-fitting or distributing-chamber, of a hollow vibrating arm and a pipe connecting therewith and a spring acting on said pipe to vibrate said arm, substantially as set forth.

14. In a car-heating apparatus, the combination of a center-fitting, a pipe leading thereto, and a vibrating hollow arm pivotally connecting the center-fitting with the pipe, the pipe being supported so as to slide longitudinally with the vibrations of the arm, substantially as set forth.

15. In a car-heating apparatus, the combination of two parallel pipes, a center-fitting connected to the pipes by vibrating arms, and a coupling device for the pipes by which they are moved endwise, substantially as set forth.

16. In a car-heating apparatus, a series of longitudinal pipes extending throughout the train and rigidly connected together endwise, in combination with vibrating arms and center-fitting, substantially as set forth.

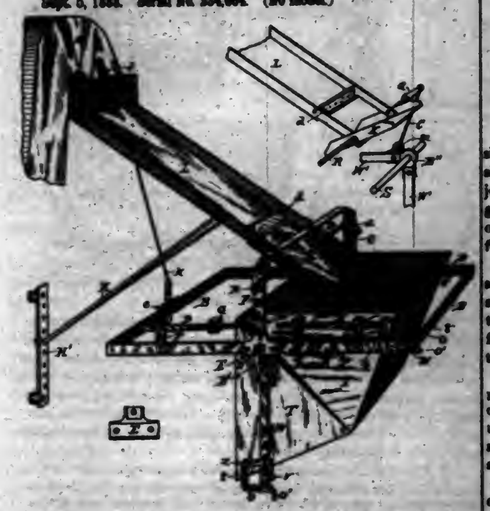
17. The combination, with a car, of a local heater, B, a local system of circulating-pipes, B', pipes *c* and *d*, connecting the local heater and the center-fitting, the center-fitting X, and the longitudinal pipes *a e*, the center-fitting having valve mechanism and passages for providing communication between said pipes, so that steam may be admitted to the local heater for local circulation, substantially as set forth.

18. A center-fitting, X, provided with the hollow pivoted arms g, g', g^2, and g^3, the valves $b\ b'\ b^2\ b^3$, passages $h\ h'\ h^2\ h^3$, valves *y* and *y'*, passages *i i'*, and cock *x*, substantially as set forth.

19. The combination, with the center-fitting X, provided with the valves and passages, as described, of the pipes *c* and *d*, draining to the center-fitting, and pipes *a*, *e*, *d'*, and *c'*, draining from the center-fitting to the opposite ends of a car, substantially as set forth.

20. The combination, with the pipes *a* and *c*, of the springs *f*, spring *o*, the rod *n*, and yoke *m*, with the hand-lever *t*, and the connecting bell-crank levers and rods between it and the rod *n*, substantially as set forth.

398,473. GRAIN-WEIGHING APPARATUS. LE ROY C. TRYON, Marseilles, assignor of one-half to Clarence R. Tryon, Ottawa, Ill. Filed Sept. 5, 1888. Serial No. 284,064. (No model.)

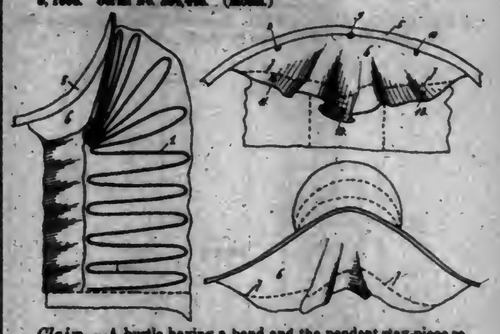


Claim.—1. The combination of the frame B, having the scale-beams D D, the oscillating buckets T T, having, respectively, the latches Z Z, and the oscillating chute K, connected with said buckets in such manner as to be oscillated thereby simultaneously in a reverse direction, substantially as and for the purpose set forth.

2. In a grain-measuring device, the combination of the oscillating chute, the similar and equal oscillating measuring-buckets, the scale-beams and the mechanism for detachably connecting said buckets therewith, and the mechanism, substantially as described, whereby the chute and buckets are oscillated simultaneously and in reverse directions from each other, substantially as and for the purpose set forth.

3. The combination of the frame B, having the bail F, the scale-beams D D, spring-latches Z Z, shaft S, having the crank-lug *n*, cranked shaft R, having the crank *a*, link *c*, connecting said crank and crank-ing, oscillating chute K, spout L, having its floor at its lower end shorter than its sides, brace H, and the mechanism, substantially as described, for adjustably connecting said spout with a separator, substantially as and for the purpose set forth.

398,474. BUSTLE. CHARLES B. TOWN, Utica, N. Y. Filed Sept. 3, 1888. Serial No. 284,462. (Model.)



Claim.—A bustle having a band and the pendent stay-piece secured thereto, in combination with three coiled springs, each spring incased in a separate pocket, the pockets being joined by web, the central pocket and spring being of larger diameter than the remaining springs and pockets, the upper and outer end of the central pocket and spring secured to the stay-piece at the band, the remaining springs and pockets secured at their upper and outer ends to the stay-piece on a lower horizontal plane than the central pocket and spring, and the lower portion of the pockets and two or more convolutions of the springs secured to the stay-piece at or near the bottom thereof, whereby the desired curvature may be secured in the bustle.

398,475. ORE-CONCENTRATOR. MILTON T. VAN DERVEER, Amsterdam, N. Y. Filed June 26, 1887. Serial No. 242,430. (No model.)



Claim.—1. The vanning-pan provided with a series of depressions extending across the pan, each depression having an inclined side, *v*, and a shelving bottom, *u*, which laps over the side of an adjoining depression, said depressions being deepest at the center and gradually decreasing in size therefrom and curving upward to ends of the depressions, substantially as described, for the purpose set forth.

2. The combination, in an ore-concentrator, of a pan having a series of pockets or depressions, with inclined bottoms and counter-sunk openings in said bottoms, valves of metal of less specific gravity than mercury fitted loosely in said openings, and suitable mechanism for imparting longitudinal and lateral vibration to said pan, substantially as described, for the purpose set forth.

3. In combination with a vanning-pan provided with vibrating mechanism and loosely supported at one end by hangers, a reciprocating rod, N, a cross-bar, *c*, with arms *h h'*, secured thereto at their upper ends, the lower ends of arms *h* being rigidly secured to the pan and arms *h'* being pivotally connected with the frame, substantially as described, for the purposes set forth.

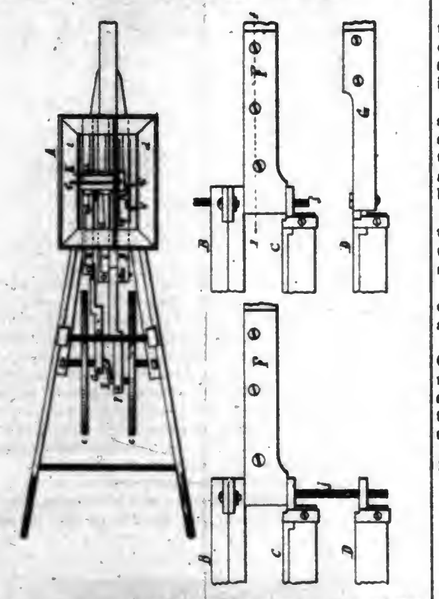
4. In an ore-concentrator, a vibrating vanning-pan having a series of depressions, each of which has an inclined side wall, and an inclined or shelving bottom provided with grooves or corrugations and a series of perforations, substantially as described.

5. The combination, with a vanning-pan having a series of depressions with inclined bottoms and sides, and mechanism for imparting a longitudinal and lateral vibration to said pan, of a horizontal rod and a series of stirrers conforming to said depressions secured to said rod, so as to follow the longitudinal movement of the pan, substantially as described.

6. In an ore-concentrator, a vanning-pan having a series of depressions, each of which has an inclined side wall and an inclined or shelving bottom which extends over and beyond the wall of the adjoining depression, and said depressions having each a varying depth, in combination with the mechanism for vibrating the pan longitudinally, laterally, and with a rising-and-falling movement, substantially as described.

7. A vanning-pan having a series of depressions, each depression having an inclined side and a shelving bottom that overlaps the side of the adjoining depression, said depressions being deepest at the center and decreasing in size therefrom toward their ends, in combination with a series of stirrers conforming in shape and arrangement to said depressions, substantially as described.

398,476. SEED-PLANTER. ELBRIDGE G. VAN PELT, Centre Hall, Pa. Filed May 1, 1888. Serial No. 98,563. (No model.)



Claim.—1. In a seed-slide, two similar parts, *m n*, arranged oppositely to each other and constructed as shown; so that two measuring-apertures, *i i*, are formed therein, each of said similar parts being formed with a laterally-extending projection, *r*, at one end, and with a longitudinally-extending slot, *o*, at the other end, the slot on one part being over the projection on the other, in combination with adjusting-screws and nuts *p q*, said adjusting-screws being adapted to pass through the projections *r r* and work in the slots *o o*, substantially as set forth.

2. In a seed-slide, the two similar parts *m n*, arranged oppositely to each other and constructed as shown, so that two measuring-apertures are formed therein, each part being formed with a projection, *r*, and a slot, *o*, located as shown and described, in combination with adjusting screws and nuts, and the guides *s s*, adapted to hold the parts *m n* in correct relative position, substantially as set forth.

3. In a fertilizer-slide, the combination of a fixed part extending the whole length of the slide, provided with upwardly-extending projections on each end and with a laterally-extending central projection, two adjustable parts formed with upwardly-extending slotted projections, said parts being located on the same side as the central projection, and means of adjustment whereby apertures of varying size may be formed between said adjustable parts and the laterally-extending central projection on the fixed part, substantially as set forth.

4. In a fertilizer-slide, the combination of the fixed part *w*, formed with upwardly-extending projections *y y* and projecting ways *d' d'*, the adjustable parts *x x*, formed with upwardly-extending projections *z z* and grooves *d' d'*, and means of adjustment, substantially as set forth.

5. The combination of a fertilizer-slide and a stirrer formed with two upwardly and outwardly projecting arms and one horizontally and inwardly extending arm mounted on said slide and traveling with it, substantially as set forth.

6. The combination of the fertilizer-slide B and the stirrer H, formed with two upwardly and outwardly projecting arms, *h' h'*, and one horizontally and inwardly projecting arm, *i'*, said stirrer being located on and traveling with said slide, substantially as set forth.

7. The combination of the crank E, the connecting-rod F, the fertilizer-slide B, provided with two adjustable measuring-apertures, *g g*, located at a distance apart less than the sweep of the crank E, the discharging-opening *k*, and the vertically-adjustable shoe-I, situated above said discharging-opening and constructed with a part, *j'*, overhanging the slide, of a length equal to or greater than the sum of the short distances which the apertures *g g* travel on opposite sides of the opening *k*, substantially as set forth.

8. In a seed-planter, a double-crank shaft the cranks of which are set at an angle of ninety degrees to each other, and the ends of which are eccentrically attached to the two driving-wheels of the planter at equal distances from the respective centers thereof, substantially as set forth.

9. The combination of a double-crank shaft, the cranks set at an angle of ninety degrees, fertilizer and seed slides, and connecting-rods, substantially as set forth.

10. The combination, with one fertilizer-slide, two seed-slides, and two connecting-rods, of a double-crank shaft, the cranks set at an angle of ninety degrees, one of said connecting-rods operating the fertilizer-slide and one of the seed-slides, and the other connecting-rod operating the remaining seed-slide, substantially as set forth.

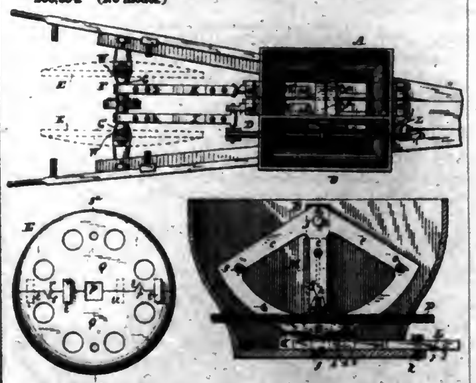
11. A double-crank operating-shaft, two seed-slides, a fertilizer-slide, a rod connecting one of the cranks of said shaft with one of said seed-slides, and a rod connecting the other crank with the fertilizer-slide and the remaining seed-slide, in combination with adjustable connections between said rods and slides, whereby the slides may be operated either from one or both cranks, substantially as set forth.

12. The combination of the two seed-slides, each constructed with two measuring-apertures, the fertilizer-slide constructed with two measuring-apertures, a double-crank shaft, the cranks set at an angle of ninety degrees, and the connecting-rods, substantially as set forth.

13. The combination of the connecting-rod F and the adjustable coupling-rod *j* with the clamp J and means of adjustment, substantially as set forth.

14. The double crank E, the connecting-rods F G, the seed-slides C D, each constructed with two measuring-apertures, *i i*, and connected, respectively, with the rods F and G, in combination with the fertilizer-slide B, provided with two measuring-apertures, *g g*, located at a distance apart less than the sweep of the crank E, said slide B being connected to the rod F, substantially as set forth.

898,477. SEED-PLANTER AND FERTILIZER-DISTRIBUTER. ELBRIDGE G. VAN PELT, Centre Hall, Pa. Filed May 1, 1888. Serial No. 200,854. (No model.)



Claim.—1. The fertilizer-compartment having a discharge-aperture in the bottom thereof, and a swinging fertilizer-distributer in said compartment swinging in a vertical plane, and having its lower edge curved in an arc coinciding with that in which it swings, and horizontally-projecting arms on said distributer, which swing over said discharge-aperture, in combination with a cut-off located in the compartment above the discharge-aperture, beneath which said projecting arms swing, substantially as set forth.

2. The fertilizer-compartment having an aperture in the bottom thereof and the swinging fertilizer distributer having three horizontally-extending arms which swing across said aperture, in combination with a vertically-adjustable cut-off above said aperture and above the path of said horizontal arms, substantially as set forth.

3. The fertilizer-compartment and the swinging fertilizer-distributer within the same, said distributer having a curved side which coincides with the arc in which it swings, in combination with a reciprocating operating-rod connected with said distributer, said rod passing through both ends of the fertilizer-compartment, substantially as set forth.

4. The fertilizer-compartment and the swinging fertilizer-distributer within the same, said distributer having a curved side coinciding with the arc in which it swings, and having two horizontally-extending arms, *h h*, in combination with a reciprocating operating-rod passing through both ends of the fertilizer-chamber, said rod having a pin, *g*, which is located between said arms *h h*, substantially as set forth.

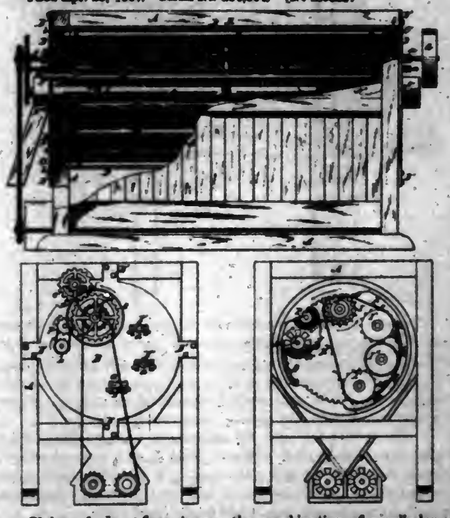
5. The divided axle, each division of which carries a crank, each of said cranks carrying a wheel concentric with the axle, said wheels being adjustable in relation to each other, substantially as set forth.

6. The double-cranked axle, the cranks of which are adjustable in reference to each other, in combination with two reciprocating seed-slides and one reciprocating fertilizer-rod, a connecting-rod connecting one of said seed-slides to one of said cranks, and a second connecting-rod connecting the remaining seed-slide and the fertilizer-rod to the remaining crank, substantially as set forth.

7. The divided wheel composed of two identical halves, each half having interlocking parts which interlock with the corresponding parts on the opposite wheel, substantially as set forth.

8. The axle having cross-bars N N, in combination with the divided wheels, the halves of which are bolted to said bars, substantially as set forth.

898,478. ROTARY BOLT. JOHN H. WALSH, Mason City, Iowa. Filed Apr. 25, 1887. Serial No. 236,004. (No model.)



Claim.—1. In a flour-dresser, the combination of a cylinder or reel, substantially as described, stationary heads upon which the reel revolves, shafts mounted in said heads and provided with sprocket-wheels, chain belts carried by said sprocket-wheels, elevators mounted on said chain belt within said reel, and mechanism, substantially as described, adapted to rotate the reel and carry said elevators in proximity to a portion of its interior, substantially as and for the purpose set forth.

2. In a flour-dresser, the combination of the closed heads B B, the open-ended reel, substantially as described, mounted thereon, sprocket-wheels I I' I', chain belts J J, and elevators K K, substantially as and for the purpose set forth.

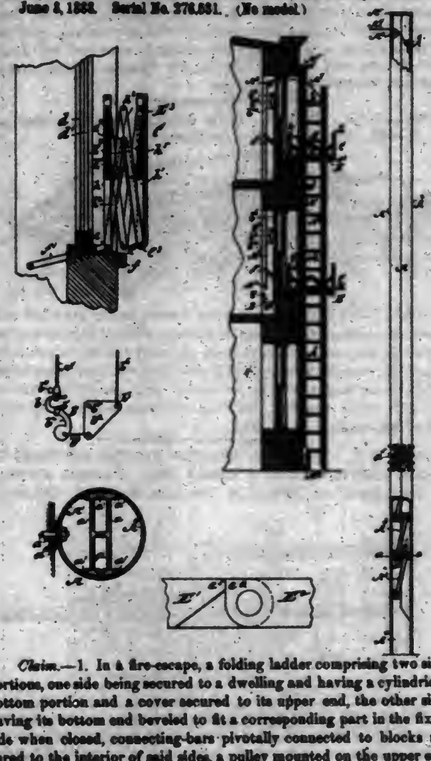
3. In combination with an open-ended flour-bolting reel, substantially as described, the sprocket-wheels I I' I', traveler I², guides *c c*, elevators K K, chain belts J J, and mechanism, substantially as specified, whereby simultaneous motion is imparted to the reel and the elevators, as set forth.

4. In combination with the reel of a flour-dresser and with suitable feed and discharge spouts, an internal conveyer adapted to discharge the stock at one side of the reel, and a trough for said conveyer, having its discharge side inclined, whereby the flow of the stock over the edge of the trough is made uniform, substantially as specified.

5. In combination with the reel of a flour-dresser and with suitable feed and outlet spouts, an internal conveyer adapted to discharge the stock at one side of the reel, and a trough for said conveyer, having the discharge side thereof vertically adjustable, whereby the flow of the stock is regulated, substantially as set forth.

6. In a flour-dresser, the combination of the open-ended reel, the feed-spout R, and discharge-spout S, the conveyer L, trough N, and apron O, substantially as described.

398,479. FIRE-ESCAPE. JOHN W. WEAVER, Brooklyn, N.Y. Filed June 4, 1888. Serial No. 276,331. (No model.)



Claim.—1. In a fire-escape, a folding ladder comprising two side portions, one side being secured to a dwelling and having a cylindrical bottom portion and a cover secured to its upper end, the other side having its bottom end beveled to fit a corresponding part in the fixed side when closed, connecting-bars pivotally connected to blocks secured to the interior of said sides, a pulley mounted on the upper end of the fixed side, and an eye-piece secured to the movable side, through which a cable is secured and passed over the said pulley and secured to a suitable retaining device, whereby the release of the cable will cause the ladder to automatically open by gravity, substantially as specified.

2. In a fire-escape, a folding ladder constructed substantially as described, having its side portions provided with projecting spikes on a part of their exterior surfaces, substantially as specified.

3. In a fire-escape, a ladder constructed substantially as described, having rungs consisting of I-shape bars pivotally connected at their extremities to independent blocks secured to the side portions of said ladder, substantially as described.

4. In a fire-escape, a folding balcony adapted to fold into a position above a window-sill, a support for said platform when open, and an inwardly-extending lever for opening the balcony, rigidly secured to the hinge-rod *c*, and having its free end attached to the cable A^7, whereby the weight of the movable side A^2 of the ladder serves on opening to operate and open the balcony, substantially as described.

5. In a fire-escape, a folding balcony comprising a platform in two or more sections adapted to fold within a window-opening and remain closed, the said platform having hinge-joints provided with the stop portions c^4 and c^5 to retain the same flatwise when open, chains for supporting the balcony when open, a lever rigidly connected to the rod *c* and pivotally connected to the hinge-rod c^3, an inwardly-extending lever for opening the balcony, rigidly secured to the rod *c*, and having its free end secured to a suitable retaining device, substantially as described.

6. In a fire-escape, a folding balcony comprising a platform in two or more sections hinged together and adapted to fold into a vertical position above a window-sill, chains for supporting said platform, a front railing hinged to said platform, the extension device H, comprising the upright slotted posts *h h'* and intermediate bars, h^3 h^4 h^5 h^6, a lever secured to the rod *d* and pivotally connected to the rod d^3, another lever secured to the rod *d*, and having its free end attached to the cable A^7, whereby the weight of the movable side of the lad-

der serves on opening to operate and open the balconies, substantially as specified.

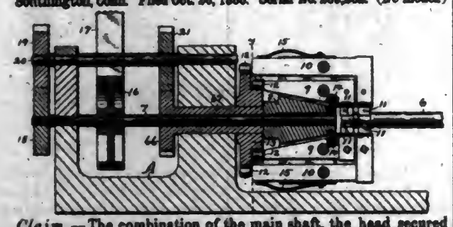
7. In a fire-escape, the combination of the folding ladder A, having a chain secured to the movable side and passing over a pulley mounted in the stationary side, and from thence extending downwardly through a series of floors, the retaining device B, operated by a wire extending vertically through a series of floors and provided with suitable actuating means, the folding balconies C, having their operating-levers attached to the cable A^1, whereby the release of the said cable will cause the ladder to automatically open, and in so doing exert the requisite force for opening the balconies simultaneously therewith, substantially as described.

398,480. HARROW. JAMES WHIPPS, Carlisle, Ind. Filed Oct. 17, 1888. Serial No. 288,235. (No model.)



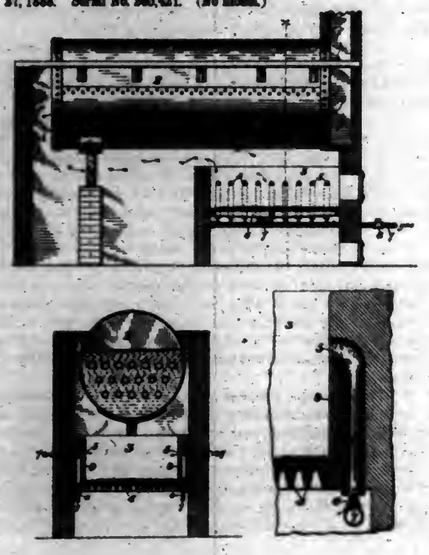
Claim.—The improved reversible harrow herein described and shown, comprising the side bars, B, having a series of angular notches in one side, the runners secured to the opposite sides of the side bars, the angular cross-bars secured to the side bars, with their edges fitting in the angular notches therein, the harrow-teeth secured to the lower front sides of the cross-bars, and the draft-chains secured to the front ends of the side bars, as specified.

398,481. MEANS FOR IMPARTING A RADIAL MOVEMENT TO THE CUTTING-TOOLS OF A ROTARY HEAD. PARDON A. WHITNEY, Southington, Conn. Filed Oct. 26, 1888. Serial No. 289,202. (No model.)



Claim.—The combination of the main shaft, the head secured thereon and carrying radially-moving milling-tools, the cam for moving said tools, mounted to revolve on a common axis with said shaft and head, and the differential gear-wheels for driving said cam at a different rate of speed from that of said shaft, substantially as described, and for the purpose specified.

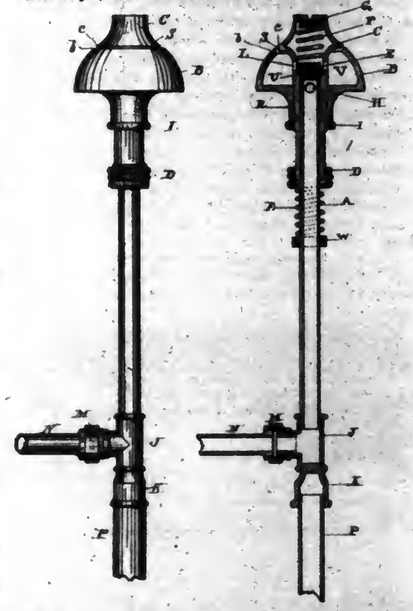
398,482. GAS-FURNACE FOR STEAM-BOILERS. GEORGE WEYMALL, Toledo, Ohio, and JOHN A. LAMBING, Wilkinsburg, Pa. Filed Feb. 27, 1888. Serial No. 265,421. (No model.)



Claim.—1. A combustion-chamber of a furnace having grate-bars and adapted to the combustion of solid fuel, and having a gas-supply pipe or port entering the combustion-chamber through the wall thereof, and having its opening at said wall above the normal level of the fuel on the grate-bars, substantially as and for the purposes described.

2. In a steam-boiler furnace, the combination, with the boiler and the combustion-chamber below the boiler, of gas-supply ports or pipes opening into the combustion-chamber on opposite sides thereof, and a flue extending from the combustion-chamber beneath the boiler, substantially as and for the purposes described.

398,483. FLUE-CLEANER. JOHN U. WILES, Mansfield, Ohio. Filed May 4, 1888. Serial No. 272,783. (No model.)



Claim.—1. In a steam flue-cleaner, the combination, with the steam-supply pipe, of a spring-controlled sleeve adapted to slide thereon and having an outwardly-projecting edge, and a tapered head B, shaped to co-operate with said projecting edge to produce a narrow steam-jet opening and longitudinally-adjustable upon said sleeve to regulate the size of said opening, substantially as set forth.

2. The combination, with the steam-supply pipe, of a sleeve fitted to slide thereon and having a tapered head, B, said sleeve having a chamber in its forward end, and a spring, F, situated in said chamber and bearing against the end of said pipe for forcing the sleeve forward relative to said pipe, substantially as set forth.

3. The combination, with a steam-supply pipe, of a sleeve fitted to slide longitudinally thereon and having a tapered head, and a steam-jet opening formed between relatively-adjustable parts, a spring for forcing said sleeve forward, and a valve and valve-seat independent of the jet-opening on said pipe and sleeve, which valve is closed by the action of the spring, and when closed prevents further movement of the sleeve relative to the pipe, substantially as set forth.

4. The combination, with a steam-supply pipe, of a sleeve fitted to slide thereon, a spring for forcing said sleeve forward upon the pipe, an outwardly-projecting flange or edge upon the sleeve, and a tapered head shaped to co-operate with said edge to form a narrow steam-jet opening and adjustably mounted upon a screw-thread upon said sleeve, substantially as set forth.

398,484. HANGER FOR VENETIAN BLINDS. JAMES G. WILSON, New York, N.Y. Filed July 27, 1888. Serial No. 281,236. (No model.)

Claim.—1. A hanger for Venetian blinds, consisting of a parallel series of hinged metallic sections, in combination with cross-pieces pivoted at their extremities to opposite alternate hinges of said series, substantially as set forth.

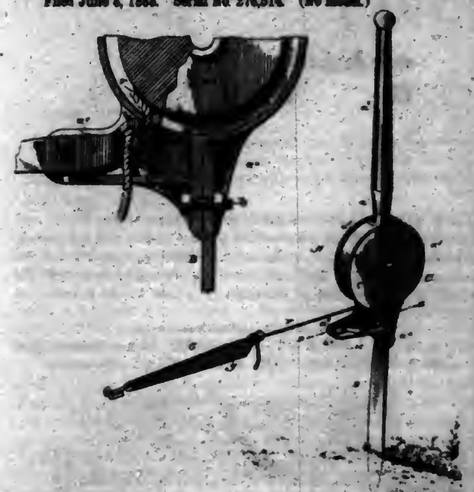
2. The herein-described hanger for Venetian blinds, comprising two strips each made up of a series of hinged metallic sections, a series of cross-pieces pivotally connected to alternate opposite hinges of said strips, and stop-lips adapted to limit the movement of the sections

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between said cross-pieces, whereby the outward folding of said sections is insured, substantially as and for the purposes set forth.

398,485. CHECK-ROW DEVICE FOR PLANTERS. JOHN W. BARTLETT, Moline, Ill., assignor to the Moline Plow Company, same place. Filed June 2, 1888. Serial No. 276,514. (No model.)



Claim.—1. In an anchor for a check-row wire or cord, the combination of a case or body having a blade to enter the ground, the winding-drum and its actuating-spring, the cord attached to and winding on the drum, and the arm or latch G, attached to said winding-cord and adapted to receive the check-row wire, and also adapted to engage directly and detachably with the body.

2. In an anchor for a check-row wire, the case or body having the flat or angular blade adapted to resist rotation in the ground, the stud a^2, and spring H, and the laterally-detachable arm G, adapted to engage the stud, said elements constructed and combined, as described, to permit the lateral disengagement of the arm G.

3. In anchor for a check-row wire, the combination of a body having the flattened or angular blade adapted to enter the ground and resist rotation therein and an arm or latch, G, to receive the check-row wire directly interlocked with the body and adapted to disengage therefrom by a lateral movement.

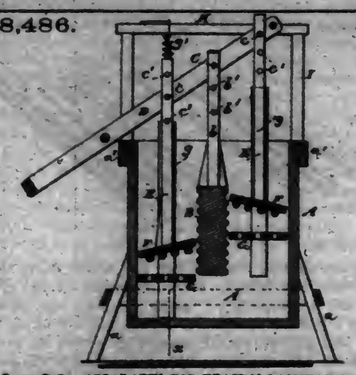
4. The case recessed in its two sides and provided with an anchoring blade and handle, in combination with the central shaft, the spring, the drum or pulley, the cord winding on the drum, and the arm or latch attached to said cord.

5. The case recessed in its two sides, the side plates applied thereto, and the central shaft provided with the plate-holding pins, in combination with the spring, pulley, and cord, as shown.

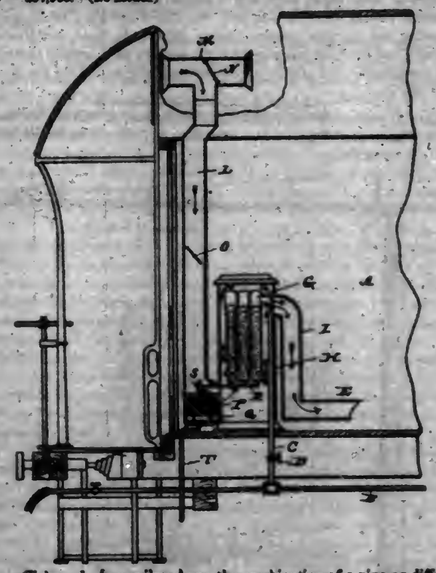
398,486. WASHING-MACHINE. GEORGE E. BEARE, White Stone Va. Filed July 14, 1888. Serial No. 279,910. (Model.)

Claim.—The wash-board B, fixed in the middle of the suds-box A, but not extending to the bottom thereof, and provided with vertical standards *b b*, perforated at *b'*, in combination with two inclined followers, F F, having standards E E, perforated at *e'*, and two clothes-rests, G G, arranged on the lower ends of arms *g*, suspended from springs *g'*, whereby said parts are adapted to be used in connection with an adjustable lever-frame, C D, in the manner described.

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398,487. APPARATUS FOR HEATING RAILWAY-CARS. GEORGE H. BENJAMIN, New York, N. Y., assignor to The Safety Car Heating and Lighting Company, of New Jersey. Filed Nov. 30, 1887. Serial No. 257,009. (No model.)



Claim.—1. In a railroad-car, the combination of a pipe or diffusing air-flue within the car provided with lateral flues, a steam-radiator, a pipe for connecting said radiator with the source of steam, a casing for said radiator, with which the diffusing air-flue is connected, an air-induction pipe communicating with the external air and said casing, an air-filter for said induction-pipe, a pipe arranged to moisten the filter by the water condensed in the radiator, and a waste-pipe leading from the filter, substantially as set forth.

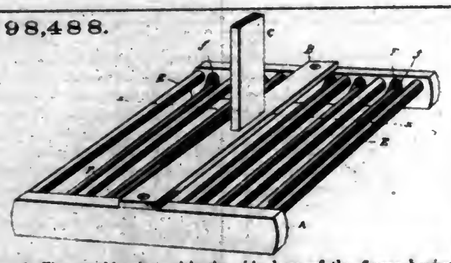
2. In a railroad-car, the combination of a pipe or diffusing air-flue within the car provided with lateral flues, a steam-radiator, a pipe for connecting said radiator with the source of steam, a casing for said radiator, with which the diffusing air-flue is connected, an air-induction pipe communicating with the external air and said casing, an air-filter for said induction-pipe, a pipe arranged to moisten the filter by the water condensed in the radiator, a waste-pipe leading from the filter, and an air-damper, U, in one end of the radiator for admitting air and for placing the filter-basket P, substantially as set forth.

398,488. CHURN-DASHER. CONRAD BERST, Kansas City, Mo. Filed Oct. 23, 1888. Serial No. 288,975. (No model.)

Claim.—1. In a dasher, the combination, with the frame and the fixed beaters arranged at intervals along the frame, of the vertically-movable beaters arranged between the fixed beaters, substantially as hereinbefore described.

2. In a dasher, the combination, with the frame and the fixed beaters arranged at intervals along the frame, of the vertically and laterally movable beaters placed between the fixed beaters to create a counter-current, substantially as and for the purpose described.

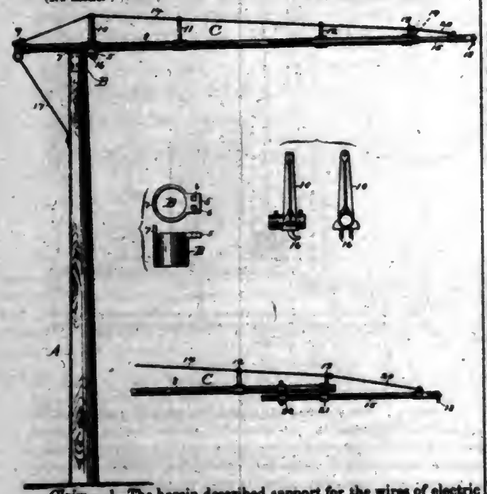
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3. The combination, with the side bars of the frame having recesses *f* in their opposing sides, which recesses are widened at their lower ends, and the beater-bars F, having their ends inserted in the said recesses and free to move vertically and laterally, of the fixed beater-bars arranged between the movable beater-bars and connecting the said side bars together, substantially as and for the purpose described.

4. The herein shown and described dasher, composed of the side bars having recesses in their opposing sides, said recesses being contracted at their upper ends and widened at their lower ends, the cross-bar uniting the said side bars, the dasher-rod fitted to the said cross-bar, the movable beaters having their ends fitted in the said recesses, and the fixed beaters arranged between the movable beaters and supported in the said side bars, substantially as and for the purpose specified.

398,489. SUPPORT FOR ELECTRIC-RAILWAY WIRES. THOMAS N. BRADY, New Britain, Conn. Filed Sept. 19, 1888. Serial No. 285,768. (No model.)



Claim.—1. The herein-described support for the wires of electric railways, consisting of the pole A, the bracket-arm C, and the adjustable extension 15 at the outer end of said bracket-arm, substantially as described, and for the purpose specified.

2. The bracket-arm C, consisting of a lower bar, truss-irons, truss-wire, and an extension at the outer end, and the extension-wire 20, for forming a continuation of the truss-wire to near the outer end of said bracket-arm, substantially as described, and for the purpose specified.

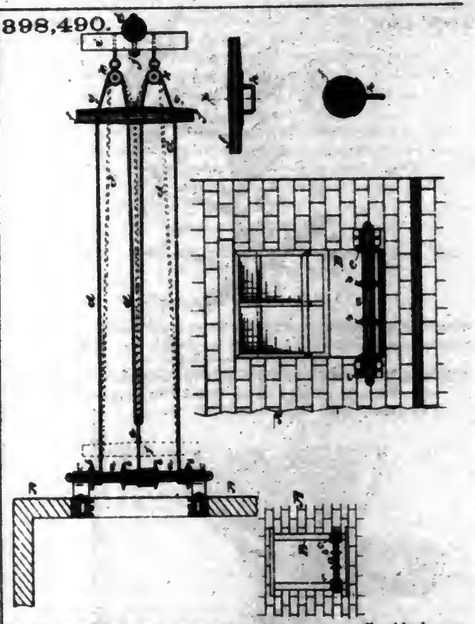
3. The combination of the pole A, cap-iron B, having legs 5 and 7, the truss C, fitted to said cap-iron, and the brace 17, substantially as described, and for the purpose specified.

398,490. HANGING DEVICE FOR CLOTHES-LINES. HENRY R. REED, Newark, N. J. Filed May 2, 1888. Serial No. 272,554. (No model.)

Claim.—1. In a clothes-line holder, the combination, with a reel adapted to be secured to a house and a clothes-line secured to said reel, of a separator secured at or near its ends to the clothes-line, pulley-blocks through which the clothes-line passes, eyebolts adapted to be secured in a post or wall of a house, and a drawing-rope secured at one end to the middle of the reel and at the other end at or near the middle of the clothes-line, substantially as and for the purposes set forth.

2. In a clothes-line holder, the combination, with a reel adapted to be secured to a house, of a cross-bar adapted to be secured to a

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post or wall of a house, eyebolts in said cross-bar, pulley-blocks connected to said eyebolts, a clothes-line secured to said reel and passing over and through the pulley-blocks, and a drawing-rope secured at one end to the middle of said reel and at the other end at or near the middle of said clothes-line, substantially as and for the purposes set forth.

398,491. STEAM-ACTUATED VALVE. JOHN C. BROMLEY, Rock Island, Ill. Filed May 4, 1888. Serial No. 272,804. (No model.)

Claim.—1. The combination of the cylinder and valve-chest, the ports D E, and channels F G, communicating with the opposite ends of said cylinder and centrally with the chest, and the ingress port C, communicating with the center of the valve-chest, and exhaust-ports O *o*, communicating with the ends of said chest, with the piston and the steam-actuated valve in said chest adapted to simultaneously establish communication between the port C and one port, E or D, and to establish communication between the remaining one of said ports and one exhaust-port, O or *o*, all constructed and arranged to operate substantially in the manner and for the purpose described.

2. The combination of the cylinder and valve-chest and the steam ingress and egress ports and channels therein, constructed and arranged substantially as described, with the piston-head H, having annular non-communicating grooves I and perforations *i i* in its opposite faces communicating with said grooves and the valve in said chest, all constructed and arranged to operate substantially as and for the purpose described.

3. The combination of cylinder A, its ports D and E, channels F and G, and piston-head H, grooved and perforated substantially as described, and the valve-chest B, its ingress and egress ports C and O *o*, with the valve J, having collars K *k*, heads L *l*, and intermediate reduced portions, *j*, P, and *p*, and the annular grooves and perforations in heads L *l*, and the rods Q, lever R, and arm S, all constructed and arranged substantially in the manner and for the purpose described.

398,492. CARPET-FASTENER. JOSEPH B. CALDWELL, Goodland, Kans. Filed Nov. 21, 1888. Serial No. 291,454. (No model.)

Claim.—The herein-described carpet-fastener, comprising the

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strip or bar A, adapted to be secured to the floor close to the wall and provided at intervals with tapped apertures C C, and the revoluble hooks having threaded lower ends engaging the said apertures and provided with shoulders E to bind on the upper side of the strip or bar when the free ends of the hooks extend toward the wall, substantially as specified.

398,493. MEAT-BROILER. ANNIS CALLEN, Albany, N. Y., assignor to herself and Alice J. Putnam, same place. Filed Aug. 6, 1888. Serial No. 282,088. (No model.)



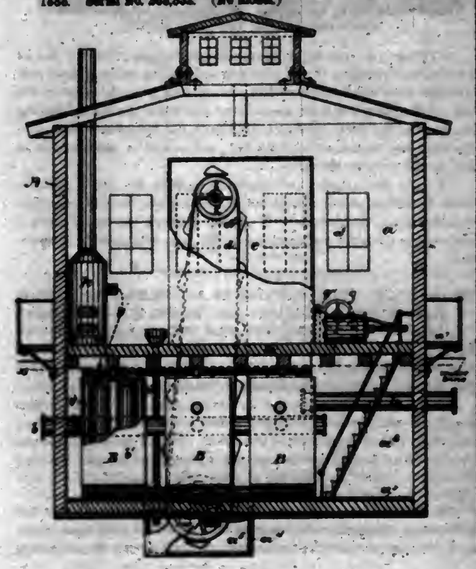
Claim.—1. A broiler comprising an open frame having parallel cross rods or wires and a reversible meat-holding frame having a sliding hinge-connection at one end with said cross-rods, substantially as set forth.

2. The combination, with the body or base of the broiler, provided with guide rods or wires, of the meat-holding frame and rings or eyes sliding on said guide rods or wires, and connected to one end of the meat-holding frame, substantially as set forth.

3. The combination, with the body or base of the broiler, provided with guide rods or wires, of the skeleton meat-holding frame, formed of two hinged members and hinged to the said guide-rods by rings, substantially as described.

4. A broiler consisting in an open frame having cross wires or rods, a meat-holding frame hinged to and sliding upon said cross-rods, a handle secured to the open frame and having an eye on one side, and a separate and independent suspending and operating rod having an eye at its outer end and a hook at its inner end, whereby the meat-holding frame may be slid by said rod, and said rod passed through the handle-eye to engage its hook with the swinging end of the meat-holding frame to hold it against the open frame when the broiler is to be suspended, substantially as set forth.

398,494. WATER-RENOVATOR. LEWIS S. CHAMBERLIN, Newark, N. J., assignor to Carrol Phillips Bassett, same place. Filed Mar. 24, 1888. Serial No. 268,332. (No model.)



Claim.—1. In a water-renovating device, the combination, with a filter-tank, *b'*, of a series of pure-water chambers formed by filtering materials within the unfiltered-water chamber of said tank, steam-pipes for conducting steam to said pure-water chambers, pipe *b*, for allowing an inflow of reservoir-water, pipes b^4 b^5, for leading the filtered water from said filter, and having cock b^{21}, for closing off exit therethrough, a waste-pipe, *u*, connecting with said pipe b^4, and having a cock, b^{20}, and a pipe, a^3, leading from the unfiltered-water chamber to said waste-pipe, and having a cock, a^3, therein, substantially as and for the purposes set forth.

2. The improved floating renovator herein described, combining therein a vessel or structure impervious to water at the bottom and partitioned to form a chamber, a^2, and an aerating-chamber, a^4, therein, filters disposed in chamber a^2 and divided or partitioned by filtering media into filtered-water chambers and unfiltered-water chambers, inlet-pipes connecting the unfiltered-water chamber of the filters with the exterior of the said vessel or structure, said pipes being open at said exterior to allow an inflow of reservoir-water by gravity, pipes connecting the filtered-water chamber with the aerating-chamber, and exit-pipes connecting the aerating-chamber with the outside of the said structure, whereby the filtered and aerated water may be conducted to the main supply-pipes, and an air-pump for forcing air into said aerating-chamber and bringing the air in said chamber under an abnormal pressure, substantially as and for the purposes set forth.

3. The improved water-renovator herein described, combining therein a vessel or structure partitioned to form chambers a' a^2, and partitioned to form an aerating-chamber, a series of filtering-tanks arranged in said chamber a^2, and having therein filtering media, and unfiltered-water chambers and filtered-water chambers, inlet-pipes open to receive reservoir-water and connecting with said tanks, pipes or ducts connecting the tanks and aerating-chamber, and exit-pipes connecting the aerating-chamber with the exterior of the vessel, and adapted to conduct the filtered and air-impregnated water to the main supply-pipe, substantially as and for the purposes set forth.

4. In combination, a vessel or structure having a chamber, a^2, therein and impervious to water at the bottom, and thus adapted to float or be partly immersed in a reservoir without leakage or an uncontrolled inflow thereto, a series of tanks arranged in the chamber a^2 and open to the outside of the said vessel or structure, and having a series of filtering-diaphragms therein, an aerating-chamber, and means, as described, for breaking the water into spray therein, and an air-pump for introducing an abnormal quantity of air into said aerating-chamber, ducts for conveying the water from the filtering-tanks to the aerating-chamber, and ducts or pipes for allowing the outflow of the filtered and air-impregnated water, substantially as and for the purposes set forth.

5. In combination, in a water-renovator, a vessel or structure having a chamber, a^2, for the reception of tanks and an aerating-chamber, pipes for leading reservoir-water through the chamber a^2 to said tanks, an elevator for raising the filtered water to the aerating-chamber, a pump connected with said aerating-chamber and adapted to force air therein and produce an abnormal air-pressure therein, and a pipe for conveying the filtered and air-impregnated water from the said vessel or structure, substantially as and for the purposes set forth.

398,495. BOTTLE-STOPPER. JOHN H. COREY, Pittsfield, Mass. Filed Nov. 16, 1888. Serial No. 290,960. (No model.)



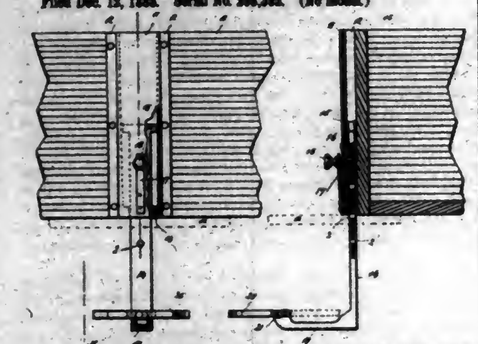
Claim.—1. In a bottle-stopper, the combination of the disk provided with a depending barrel, the washer encircling the barrel and provided near its upper end with a lateral flange bearing on the top of the bottle, and a vertical flange projecting above the lateral flange, and means to draw the disk downward, substantially as specified.

2. The combination, with a stopper provided with a central bore having diametrically-opposite tapering grooves in its sides, of the valve fitting the lower end of the bore and the handle or loop passing through the bore and tapered toward its lower end to fit in the said grooves to allow the valve to drop, substantially as specified.

3. In a bottle-stopper, the combination of the disk provided with a depending barrel and having a central vertical bore, the lateral flange *f* on the lower end of the barrel, the washer fitting around the barrel and provided with an internal groove, *g'*, fitting over the flange *f*, and an inward-extending lip, g^2, fitting over the lower end of the barrel and provided with a depression or valve-seat, and the valve fitting in the said depression or valve-seat and provided with a handle or loop extending upward through the bore, substantially as specified.

4. The combination of the disk D, bearing on top of the bottle and having a depending barrel extending into the neck of the bottle, and provided with grooves I I and notches *i i* in diametrically-opposite sides of its bore, the valve fitting against the lower end of the barrel, and the handle or loop K, connected to the valve and extending through the bore of the barrel and adapted to have its sides engaged in either the grooves I or the notches *i*, substantially as specified.

398,496. FOLDING STEP. HARMON T. CORE, Marshall, Ill. Filed Dec. 12, 1888. Serial No. 293,392. (No model.)



Claim.—1. The combination, with a case arranged for connection with a vehicle-body and provided with a spring-pressed plug or pin, of an apertured standard mounted within the case, and a step hinged to the standard, substantially as shown and described.

2. The combination, with a case arranged for connection with a vehicle-body and provided with a spring-supported plug or pin, of an apertured standard mounted within the case, an arm extending outward from the standard, and a step hinged to the arm, substantially as described.

3. The combination, with a case, 11, formed with shoulders 13, of a plug or pin, 16, a spring, 17, by which the plug is carried, a standard, 14, formed with apertures 2 and with shoulders 15, an arm, 19, connected to the standard and formed with a shoulder, 21, and a step, 20, hinged to the arm, substantially as described.

398,497. DEVICE FOR HOLDING CARD-CLOTHING ON GRINDING-MACHINES. GEORGE O. CURRIER, Leicester, Mass., assignor of one-half to J. & J. Murdock, same place. Filed Oct. 15, 1888. Serial No. 288,119. (No model.)

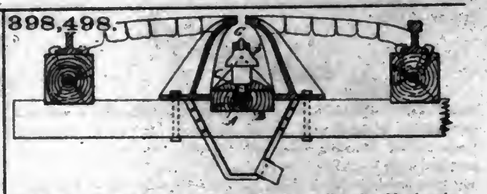


Claim.—1. A device for holding sheets of card-clothing on a grinding-cylinder, consisting of two bars extending parallel to the axis of the cylinder and provided with teeth or sharp points on their under surface, in combination with a stud secured on the cylinder, an adjustable collar on said stud, hinged arms extending from said collar to said bars, and means for drawing down said collar to spread the arms and bars for the purpose stated, substantially as shown and described.

2. In a device for holding sheets of card-clothing on a grinding-cylinder, the combination, with two parallel bars, 4, having teeth on their lower surface, and arms 12, having downwardly-projecting shoulders 12', for the purpose stated, and hinged at their outer ends to the ends of said bars 4, with their inner ends hinged to the adjustable collar 8, and said collar 8 supported on stud 5, and means for adjusting said collar, of said stud 5, extending up from the cylinder-face, a cam-lever, 6, secured upon the lower end of said stud for drawing down said stud and collar 8 to spread the bars 4 against the action of a spiral spring, 9, and said spring, all combined and operated substantially as shown and described.

398,498. CONDUCTOR FOR ELECTRIC RAILWAYS. OLOF DAHL, Brooklyn, N. Y. Filed Nov. 23, 1888. Serial No. 291,843. (No model.)

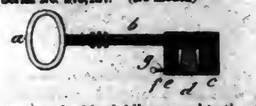
Claim.—1. In an electric-railway system, a main continuous insulated conductor provided at intervals with posts electrically and rigidly connected thereto, the heads of the posts being inclosed by air and water tight chambers having flexible walls, all in combination with a sectional conductor, the sections of which are movable and



rigidly and electrically connected with the walls of said chamber, whereby a weight upon the sectional conductor will establish electrical connection between the main and sectional conductor, as described.

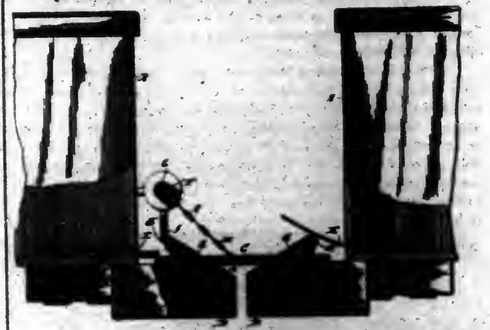
2. In an electric railway, a continuous electrical conductor, in combination with a sectional conductor whose sections are movable with respect to each other, the ends of the sections lapping each other and lying side by side, one of each adjacent pair of ends being beveled gradually toward its extremity, so that its contact side at the extreme end will normally be below the contact side of the adjacent lapping end, whereby when the current-collector passes from one section to another it will not be impeded and the flow of current to the collector will not be stopped.

398,499. KEY. JOSEPH P. DANDURAND, Virginia City, Nev. Filed May 26, 1888. Serial No. 275,127. (No model.)



Claim.—A key having the bit rigidly secured to the stem thereof, tumblers mounted on either side of the bit, and a pin passing through one of said tumblers and engaging the side of the bit, substantially as shown and described.

398,500. CAR-COUPLING. IRA C. DOYAL, Chumley, Ala. Filed Sept. 27, 1888. Serial No. 286,479. (No model.)



Claim.—1. In a car-coupler, the combination, with the link of the blocks secured to the draw-heads and having inclined faces and provided with shoulders standing inward and over the ends of the link, of the transverse shaft journaled on one end of the car and having crank-arms, the drum secured to said shaft, and the chains secured to the drum and to the sides of the link, and operating substantially as and for the purpose described.

2. In a car-coupler, the combination, with the link C and the block D, secured to the draw-head and having the inwardly-standing shoulder *d'*, of the detent-bar I, passing through the guide-staple *i'* and resting upon the adjacent end of the link, substantially as specified.

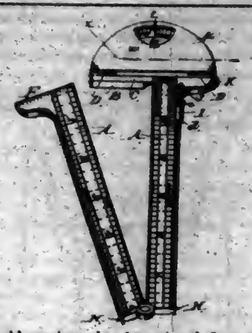
398,501. COMBINED PLOTTER AND PROTRACTOR. JOHN R. DUFFIN, Chester, Ill. Filed Oct. 3, 1887. Serial No. 251,905. (No model.)

Claim.—1. In a drafting-instrument, the combination of the rule A, having at one end the disk C, the protractor-flange secured to said disk, and the flanged and movable hood or cap E, fitted over said disk and protractor-flange, substantially as herein described.

2. In a drafting-instrument, the combination of the rule A, having at one end the disk C, the graduated protractor-flange seated on said disk, a hood or cap fitted over said disk and protractor-flange, and the block B, said hood or cap having a flanged portion inclosing the outer edges of the disk, the protractor-flange, and the block, substantially as described.

3. In a drafting-instrument, the rule A, having the disk at one end and the flange D, seated on said disk, and having the open center *n*, in combination with the flanged cap or hood having the projecting

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portion *m* fitting said opening, whereby a pivot is formed around which the disk moves, substantially as described.

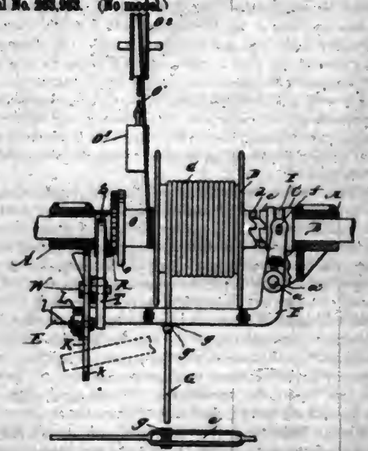
4. In a drafting-instrument, the combination of the rule A, having a disk at one end, the flanged hood or cap having a projection fitted in the open center of the disk, whereby said disk may be turned, and the stop-catch L, seated in a recess formed in the disk, said catch having its outer end adapted to project through an opening in the flange of the hood and its inner or free end bearing against one of the walls of the recess, substantially as described.

5. In a drafting-instrument, the combination of the rule A, the pivoted blade C, let into said rule, and the disk C, said disk having a groove within which the blade fits when swung outward to form the middle blade of a center-square, substantially as described.

6. In a drafting-instrument, the combination of the rule A, having the binding H, the sliding clasp I, having the barrel *c*, the pin K, fitted in said barrel, and the nut or socket J, for containing the marking-point, substantially as described.

7. In a drafting-instrument, the rule A, in combination with a clasp fitted to slide thereon, said clasp having a spring-actuated tongue provided with a barrel or socket, a pin adapted to fit said barrel or socket, and the nut or socket J, carried by the rule and adapted to receive a marking-point, substantially as and for the purpose specified.

398,502. CLUTCH MECHANISM FOR WINDING-DRUMS. JULIUS A. DYRLIE and BYVIND L. HEIDENREICH, Chicago, Ill. Filed Feb. 14, 1888. Serial No. 263,963. (No model.)



Claim.—1. The combination, with the winding-drum having teeth on its hub, a clutch-box for engagement with said hub, and a load-rope provided with a suitable stop, of a pivoted elbow-lever, E, one arm of which is connected directly with and is adapted to move in the same direction as the clutch-box, and the opposite arm of which extends across the winding-drum and is provided with an open space, *e*, adapted to engage with the stop on the load-rope, substantially as described.

2. The combination, with a winding-drum having teeth upon its hub, a clutch-box for said drum, and a winding-rope provided with a suitable stop, of an operating-lever adapted to engage said stop of the winding-rope, a suitable arm or bracket for engaging said operating-lever, a cam connected with and controlled by the movement of said winding-drum, and a throw-off lever having one arm extending into the path of said cam and having its opposite arm arranged to move the operating-lever for throwing the clutch-box into engagement with the winding-drum, substantially as described.

3. The combination, with a winding-drum having teeth on its hub and its clutch-box, of an operating-lever connected with said clutch-box, a suitable dependent arm or bracket for sustaining said operating-lever in elevated position, a throw-off lever for releasing said operating-lever, a cam for moving said throw-off lever, a ratchet-wheel for controlling the movement of said cam, and an engagement-rope and its winding-drum having a pawl for effecting the movement of said ratchet-wheel, substantially as described.

4. The combination, with a winding-drum having teeth on its hub and its clutch-box and a load-rope, of an operating-lever, E, a dependent arm or bracket, K, provided with a shoulder, k^2, a counterweighted throw-off lever, T, a cam, S, and ratchet-wheel R upon the main shaft, a pawl, P, engaging with said ratchet-wheel R, a drum, O, and engagement-rope O', and a counter-weight, O^2, substantially as described.

5. The combination, with a winding-drum having teeth on its hub and its clutch-box and a load-rope, of an operating-lever, E, for controlling said clutch-box, a dependent arm or bracket, K, having a shoulder, k^2, a dog, L, to temporarily prevent the entrance of said operating-lever into the space above said shoulder, and suitable mechanism for throwing said operating-lever out of engagement with the shoulder k^2, substantially as described.

398,503. LAMP-BURNER. STEPHEN ELLIS, Jacksonville, Ill. Filed Sept. 14, 1888. Serial No. 285,267. (No model.)



Claim.—1. A lamp-burner constructed with a perforated horizontal plate, with a wick-tube projecting through the same, an air-tube and gas-tube, a guard-casing resting on the perforated horizontal plate of burner and inclosing the wick-tube and open upper ends of air-tube and gas-tube, with a closed top surrounding the wick-tube, openings in its sides for the passage of air, and an air-space between its walls and the wick-tube and above the open upper ends of air-tube and gas-tube and the perforated horizontal plate of lamp-burner, substantially as shown and described.

2. A lamp-burner constructed with a perforated horizontal plate, with a wick-tube projecting through the same, an air-tube and a gas-tube, inlet air-passages in the burner beneath the horizontal perforated plate, a guard-casing resting on the perforated plate and inclosing the wick-tube and upper ends of air-tube and gas-tube, with a closed top surrounding the wick-tube, openings in its sides for the escape of air and gas, and an air-space between its walls and the wick-tube and above the open upper ends of air-tube and gas-tube and the perforated plate, substantially as shown and described.

3. A lamp-burner constructed with a perforated horizontal plate, with a wick-tube projecting through the same, an air-tube, and a guard-casing extending over the open upper end of air-tube inclosing the wick-tube and forming an intervening air-space, with a closed top surrounding the wick-tube, and openings in its sides for the passage of air, substantially as shown and described.

4. In a lamp-burner, the guard-casing 6, formed with the vertical portion 9, wick-tube slot 10 in its top, air-openings 11 in its sides, and a base portion, 7, extending laterally therefrom, with a depending flange, 8, substantially as described.

5. The combination, with a lamp-burner, 1, constructed with air-inlet openings 13, an air-tube, 2, and a gas-tube, 5, located adjacent to the wick-tube 3, with their upper open ends in the perforated plate 4, of a detachable guard-casing, 6, having a base portion, 7, with depending flange 8, resting on plate 4 and inclosing open ends of air-tube 2 and gas-tube 5, and the vertical portion 9, with a slot, 10, in its top, inclosing wick-tube 3, and openings 11 in its sides for passage of air from the space between the wick-tube 3 and casing 6, substantially as shown and described.

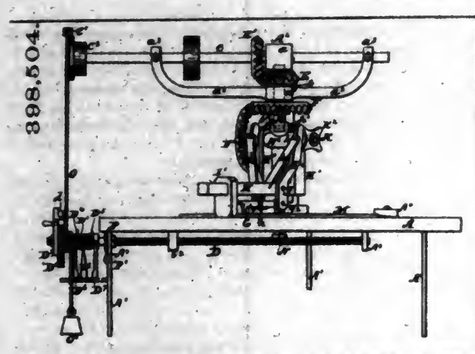
398,504. DIVIDING-ENGINE. JAMES A. FARQUHAR, Little Rock, Ark. Filed Jan. 28, 1888. Serial No. 262,231. (No model.)

Claim.—1. In a dividing-engine, the combination of the table or work-holder and a radially-moving tool-carrying arm, with a tangent-plate connected with said arm for marking tangent-graduations upon an arc or plate, substantially as described.

2. In a dividing-engine, the combination of the table or work-holder and a radially-moving arm for carrying a reciprocating marking-tool, a tangent-plate connected with said arm, and an operating-screw for moving the tangent-plate and carrying the outer end of the radially-moving arm, substantially as described.

3. In a dividing-engine, the combination of a table or work-holder

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and a radially-moving arm having its outer end carried by an adjustable tangent-plate, and a reciprocating tool-holder supported upon said arm, substantially as described.

4. In a dividing-engine, the combination of a table or work-holder and the radially-moving arm carried by an adjustable tangent-plate, a reciprocating tool-holder supported upon said arm, and cam for connecting and intermittently reciprocating said tool-holder, and gearing for moving said tangent-arm, substantially as described.

5. In a dividing-engine, the combination of a table or work-holder and the radially-moving arm pivoted above the center of the work-plate, the reciprocating tool-holder, a driving-shaft, K, above said center, and arms K^2 for reciprocating said tool-holder, substantially as described.

6. In a dividing-engine, the combination of a table or work-holder and the radially-moving carrier-arm pivoted above the center of the work-plate, the reciprocating tool-holder, a driving-shaft, K, and an arm, K', for lifting said tool-holder, substantially as described.

7. In a dividing-engine, the combination of a table or work-holder and the radially-moving carrier-arm having its pivot above the center of the work-plate, the reciprocating tool-holder, a driving-shaft, K, and levers $L' L^3$, operated by cams upon the said shaft to respectively reciprocate and raise or lower the said tool-holder, substantially as described.

8. In a dividing-engine, the combination of a table or work-holder and an overhanging bracket, a vertical shaft supported thereon, and a tool-carrying arm and tool-holder suspended from said shaft and to be rotated upon said shaft, and gearing for reciprocating the said tool-holder independently of the movement of the said arm, substantially as described.

9. In a dividing-engine, the combination of a table or work-holder and an overhanging bracket, a vertical shaft suspended therefrom for operating the tool-holder, a tool-holder arm and carrier suspended from said shaft, and a centering-bolt passing through the table and passing into a recess in the lower end of the said carrier, substantially as described.

10. In a dividing-engine, the combination of a table or work-holder and a driving-shaft supported above the table, a radially-moving tool-carrying arm and tangent-plate connected therewith, and a screw-shaft fitted under the tangent-plate and operated by the driving-shaft, substantially as described.

11. In a dividing-engine, the combination of a table, the driving-shaft connected with and reciprocating the tool-holder, the radial arm and tangentially-located screw-shaft, a sleeve fitted upon said shaft, and means, as described, for connecting the sleeve and shaft D to operate the same, substantially as described.

12. In a dividing-engine, the combination of a table, a driving-shaft connected with and operating the tool-holder, a radial tool-carrying arm and tangent-screw, a sleeve, a crank-arm upon the driving-shaft, a cord connecting said arm and sleeve, substantially as described, and a weight for returning the sleeve to its normal position upon the shaft, substantially as described.

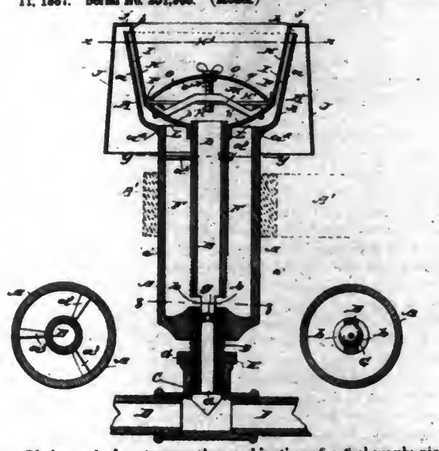
13. In a dividing-engine, the combination of a table, the driving-shaft, a radial tool-carrying arm and tangent-screw, a sleeve, a cord for rotating said sleeve, and an arm adjustably supported upon the shaft to operate the sleeve, substantially as described.

14. In a dividing-engine, the combination of a table, a radial tool-carrying arm, a tangent-screw, a sleeve upon said screw, an arm or arms secured to and projecting from said sleeve, and stops supported upon the frame for arresting the movement of said arms, substantially as described.

15. In a dividing-engine, the combination of a table, a radial tool-carrying arm, a tangent-screw, a sleeve supported upon said screw, stops supported upon the frame, and an arm or arms adjustably secured upon the sleeve to regulate and limit the movement of the sleeve, substantially as described.

16. In a dividing-engine, the combination of a table, a radial tool-carrying arm, a tangent-screw, a screw-threaded sleeve supported upon the screw-shaft, and a fixed blade engaging with the thread of the sleeve to guide it and cause it to move endwise upon the shaft, substantially as described.

398,505. BURNER. JAMES GIBSON, Jersey City, N. J. Filed Oct. 11, 1887. Serial No. 251,963. (Model.)



Claim.—1. In a burner, the combination of a fuel-supply pipe, forming also a gas and air mixing tube and apertured at its inner part for inlet of air, and a body or casing surrounding the pipe and forming a chamber supplying or conducting superheated air to the interior of the pipe and in advance of the point of ignition of the burner, the aperture of said fuel-supply pipe and mixing-tube forming the outlet from said superheating-chamber toward the point of ignition for the air superheated in said chamber, and said body or casing and the fuel-supply pipe and mixing-tube made relatively adjustable to control the supply of superheated air to said pipe and to the point of ignition of the burner, substantially as herein set forth.

2. In a burner, the combination of a fuel-supply pipe, forming also a gas and air mixing tube and apertured at its inner part for inlet of air, a flame-cup held at the outer part of said pipe, and a body or casing surrounding the pipe, and also the side walls of the flame-cup, and forming outside the pipe a main chamber supplying or conducting superheated air to the interior of the pipe, and forming at or next the flame-cup walls a passage for superheating air prior to its inlet to the air-superheating chamber around the pipe, said inner aperture of the fuel-supply pipe forming the outlet from said chamber toward the point of ignition for the air superheated in said chamber, substantially as herein set forth.

3. In a burner, the combination of a fuel-supply pipe, forming also a gas and air mixing tube and apertured at its inner part for inlet of air, a flame-cup held at the outer part of said pipe, and a body or casing surrounding the pipe and forming a chamber supplying or conducting superheated air to the interior of the pipe and through its inner aperture in advance of the point of ignition at the flame-cup, said body or casing and fuel-supply pipe made relatively adjustable to regulate the supply of air to the pipe at a passage next the flame-cup wall, and said inner aperture of the pipe forming the outlet from the air-superheating chamber toward the point of ignition for the air superheated in said chamber, substantially as herein set forth.

4. In a burner, the combination of a fuel-supply pipe, forming also a gas and air mixing tube and apertured at its inner part for inlet of air, a flame-cup held at the outer part of said pipe, a plate fitted in the flame-cup to deflect the flame to its side walls, and a body or casing surrounding the pipe, and also the side walls of the flame-cup, and forming outside the pipe a main chamber supplying or conducting superheated air to the interior of the pipe, and forming next the flame-cup walls a passage for superheating air prior to its inlet to the air-superheating chamber around the pipe, said inner aperture of the fuel-supply pipe forming the outlet from said chamber toward the point of ignition for the air superheated in the passage next the flame-cup walls and in the chamber outside the pipe, substantially as herein set forth.

5. The combination, in a burner, of a gas and air mixing tube, B B, apertured at *b* at its inner part, and a casing, A, having an open outer end admitting air and fitted at its closed inner end to the mixing-tube beyond or outside of its apertures *b*, substantially as shown and described, whereby an air superheating and conducting chamber, F, is formed between the mixing-tube and casing, and the superheated air from said chamber will find passage into the mixing-tube through its apertures *b*, as and for the purposes set forth.

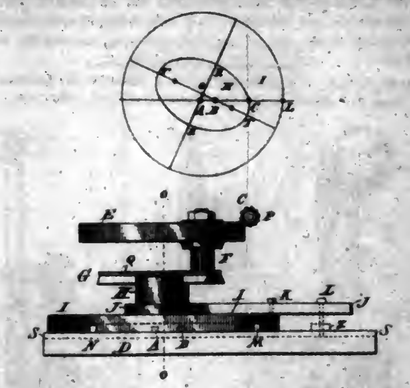
6. The combination, in a burner, of a gas and air mixing tube, B B, apertured at *b* at its inner part, and a surrounding casing, A, having an open outer end, admitting air and fitted adjustably at its closed inner end by a screw-joint to the mixing-tube beyond or outside of its apertures *b*, substantially as described, for the purpose set forth.

7. The combination, in a burner, of a gas and air mixing tube, B B, apertured at *b* at its inner part, a flame-cup, H, held to the outer end or part of the mixing-tube, a casing, A, fitted at its inner closed end to the mixing-tube beyond or outside of its apertures *b*, and extending outward around the tube to form an air superheating and conducting chamber, F, and extending, also, around the flame-cup to form an air-superheating passage, I, all arranged for operation substantially as herein set forth.

8. In a burner, the combination, with the tube B B, apertured at *b* and communicating with a fuel-feed pipe, of a body or casing, A, fitted to the tube back of its aperture, and having a part, *a'*, surrounding the tube, and an upper part, *a*, of a flame-cup, H, held to the tube and providing a passage, I, between the part *a* of the body and the side walls of the cup, and a pendent wall, J, forming an air-inlet and heating-chamber, K, outside the part *a* of the body which surrounds the flame-cup, substantially as herein set forth.

9. The combination, in a burner, and with a fuel-supply pipe, forming also a gas and air mixing tube having an air-inlet at its inner part, and a body or casing fitted to the pipe behind its air-inlet and surrounding the pipe to form an air-superheating chamber, of a fuel-feed-pipe coupling, to which the burner-pipe is threaded, and a lock-nut on the burner-supply pipe at the coupling, substantially as herein set forth

398,506. GEAR-CUTTING MACHINE. GEORGE B. GRANT, Maplewood, Mass. Filed Aug. 2, 1886. Serial No. 209,513. (No model.)



Claim.—1. The combination of the elliptic head H with the blank-holder G, adjustable in a direction parallel to the major axis of the ellipse, substantially as described.

2. The combination of the elliptic head H with the blank-holder G, adjustable in a direction parallel to the major axis of the ellipse, and the stud F, fixed on the center line of the holder, substantially as described.

3. The combination of the elliptic head H with the slide G, adjustable in straight guides on the head, substantially as described.

4. The combination of the elliptic head H with the slide G, adjustable in straight guides on the head, and the stud F, in the center line of the holder, substantially as described.

5. The combination of the fixed platen D, the fixed cutter P, with the rotatable elliptic head H, the index I, for spacing the rotary motion of the head, and the index-pin L, confined to move in a straight line with respect to the platen, substantially as described.

6. The combination of the fixed platen D, the fixed cutter P, the rotatable elliptic head H, and the index I on the head, with the two pins A and B on the platen and the two slots M and N on the head, substantially as described.

7. The combination of the fixed platen D, the rotatable elliptic head H, the index I, the pins A and B, and the slots M and N, with the index-pin L and the fixed slot SS in the line of the pins, substantially as described.

8. The combination of the platen D, the rotatable head H, the index I, the arm J, the stop-pin K, the index-pin L, and the slot SS, substantially as described.

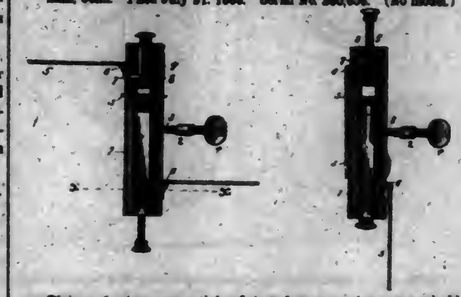
9. The combination of the platen D, the rotatable elliptic head H, the pins A and B, the slots M and N, the arm J, the index I, the stop-pin K, the index-pin L, and the slot SS, in the line of the pins A and B, substantially as described.

398,507. MECHANICAL TELEPHONE. ALEXANDER W. HALL, New York, N. Y. Filed May 8, 1883. Serial No. 273,230. (No model.)



Claim.—The combination, with the base A, the diaphragm-supporting ring *c*, and the diaphragm *b*, of the diaphragm-clamping rings *i i'*, and their clamping-screws *g*, and the tension-adjusting screws *e*, applied to said clamping-rings and base, substantially as and for the purpose herein described.

398,508. INSTRUMENT-HOLDER. GEORGE HATCH, South Windham, Conn. Filed July 31, 1883. Serial No. 260,654. (No model.)



Claim.—1. As a new article of manufacture, an instrument-holder consisting of a body, a clamp attached to the body, and the spring grasping-arms projecting from the body, substantially as described.

2. As a new article of manufacture, an instrument-holder consisting of the body, a clamp attached to the body, and the spring grasping-arms pivoted to the body, substantially as described.

3. As a new article of manufacture, an instrument-holder consisting of a body, a clamp attached to the body, spring-arms pivoted to the body, the inner ends of the said arms projecting into the body, a sliding bolt borne by the body, and locking-lugs attached to the bolt and adapted to strike the inner ends of the spring grasping-arms, substantially as described.

4. In combination, in the within-described instrument-holder, a body, 1, bearing a sliding bolt, 9, having lugs 8, spring-arms 2, pivoted to the body, with their inner end projecting into the path of the lugs 8, and the clamp 2, substantially as described.

398,509. BUTTON-HOLE SCISSORS. JOHANN A. HENKHAS, Solingen, Germany. Filed Sept. 3, 1888. Serial No. 284,967. (No model.)



Claim.—In a pair of button-hole scissors, the combination of the adjusting-pin *a*, the conical slotted nut *b*, having a small neck, the said nut being screwed into one of the arms of the scissors, substantially as described, and for the purpose set forth.

398,510. ELECTRIC SWITCH. WARREN S. HILL, Boston, Mass. Filed May 17, 1888. Serial No. 274,181. (No model.)



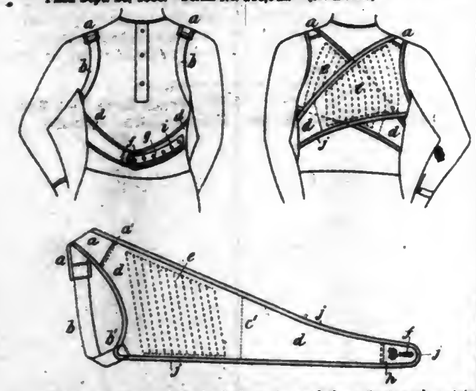
Claim.—1. In an electric switch, the combination, with the terminals having inclined faces, of an arm carrying insulated projections, connectors consisting of a series of thin plates having free ends secured to said projections, and arranged to bear upon the inclined faces of

the terminals, and a handle for operating said arm, substantially as described.

2. In an electric switch, the combination, with the two sets of terminals arranged in a line, each having an inclined face, of a lever carrying two insulating projections, a connector consisting of a series of plates having their centers secured to the insulating projections, a spring for operating the arm in one direction, a handle having an extension-bearing upon a projection of the lever for operating it in the other direction, and a locking-catch for securing it in position, substantially as described.

398,511. BODY-BRACE. ELEANOR R. HOWE, Bridgeport, Conn.

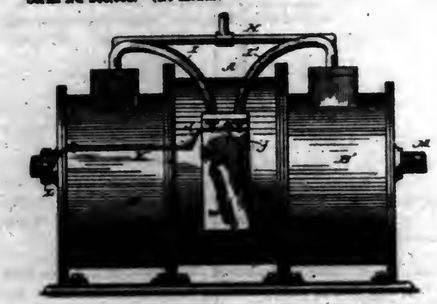
Filed Sept. 26, 1888. Serial No. 286,042. (No model.)



Claim.—1. A band for body-braces, consisting of a tapering strip of flexible fabric, at one end provided with an arm-hole partly encircled by an elastic band and at its other end having a fastening device and re-enforced along its body part by another strip of flexible fabric having its warp-threads at right angles to the warp-threads of the main piece, substantially as set forth.

2. A body-brace consisting of two bands, each composed of a shoulder-piece, *a*, a body-piece, *d*, a re-enforcing piece, *c*, and an elastic band, *b*, the direction of the warp-threads in the piece *d* being at right angles to the direction of the warp-threads in the pieces *a* and *c*, and each band provided with a part of a fastening device for securing the ends of the bands together, substantially as shown and described.

398,512. ROTARY ENGINE. LEWIS C. HUSON, Elmira, assignor to Romeyn B. Ayres, Hammondsport, N. Y., and John H. Heale, Scranton, Pa., and the Huson Motor Company, (Limited.) Filed Oct. 24, 1888. Serial No. 288,902. (No model.)

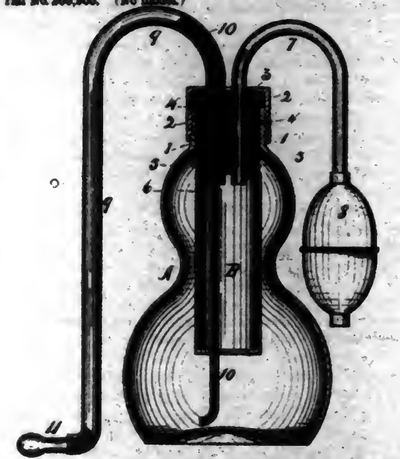


Claim.—1. A compound rotary engine consisting of a central chamber or section having a piston drum or head, the side sections arranged one on each side of the central section and having piston drums or heads, the shaft to which all three of said drums are secured and pipes or channels connecting the exhaust-ports of the side sections with the inlet-ports of the central section, substantially as set forth.

2. In a compound rotary engine, the combination, with a central chamber or section, of two side sections having their exhaust-ports connected with the inlet-port of the central section, each side section being arranged to discharge their exhaust alternately into the said central section, substantially as set forth.

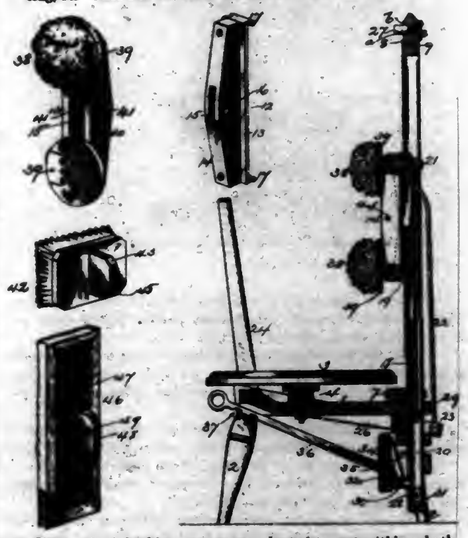
3. In a rotary engine, the combination of the central section, the side sections, the pipes or channels I I', connecting the exhaust-ports of the side sections with the inlet-port of the central section, the valves *i i'*, and connections between valves *i i'* and an eccentric on the shaft, all substantially as and for the purposes specified.

398,513. ATOMIZER. J. GILBERT JUSTIN, Syracuse, N. Y., assignor to Helen De Witt Justin, same place. Filed Apr. 7, 1888. Serial No. 269,908. (No model.)



Claim.—An atomizer consisting of a liquid-holder provided with a cork to close the same, a flexible air-chamber secured to the bottom of the cork, an air-supply tube connected to the air-chamber, a flexible discharge-pipe passing through the air-chamber into the liquid-chamber and inclosed within a discharge-pipe for air, and a spray-nozzle at the end of the discharge-pipe, substantially as described.

398,514. BATHING APPARATUS. EMANUEL W. KITCHEN, Furlong, Pa. Filed Feb. 25, 1888. Serial No. 265,270. (No model.)



Claim.—1. A bathing apparatus adapted to rest within a bath-tub or similar receptacle having water therein and comprising a seat for the bather, a vertical frame connected thereto, a vertical tube communicating at its lower portion with the water-supply, a pipe connected with said tube and extending to the top of the frame and adapted at its upper end to supply water to the bather and the rubbers, valve mechanism under the control of the bather, adapted to govern the supply of water to the bather, a rubber-frame having rubbers thereon and adapted to reciprocate upon the frame of the apparatus, a rubber-operating lever connected with said rubber-frame, and a piston attached to said rubber-frame and adapted to reciprocate within the tube in connection with the water-supply and force water up through the pipe, substantially as set forth.

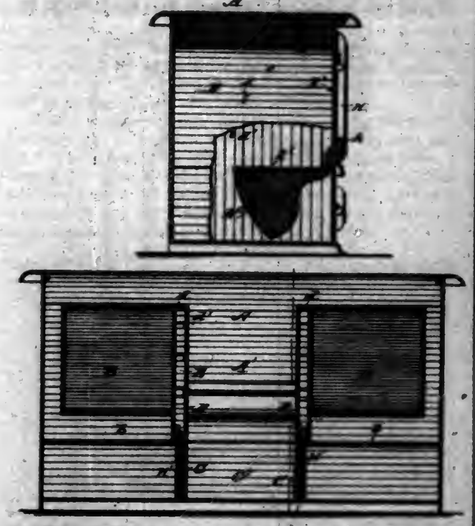
2. A bathing apparatus comprising a seat and seat-support, a framing composed of uprights connected together with an intervening vertical space or passage-way, guide-flanges secured to said uprights, a rubber-frame adapted to engage with and reciprocate along said guide-flanges, a guide-rod depending from said rubber-frame, a tube

secured between the lower portion of said uprights and having water-supply and waste openings and a self-closing valve in its lower end, a water-supply pipe connecting at its lower end with said main supply-tube and extending upwardly therefrom to and projecting inwardly beyond the uprights, an operating-rod connected at one end to the rubber-frame, a hand-lever connected to the lower end of said operating-rod, rubbing devices removably attached to said rubber-frame, a valve hinged to the frame and adapted to close the waste-opening in the main water-supply pipe, and a valve-rod adapted to operate said valve and hold the same either open or closed, substantially as set forth.

3. The combination, in a bathing apparatus, of a framing having a pair of uprights and distance-blocks secured thereto to secure said uprights in position a suitable distance apart, a main water-supply pipe having a waste-opening therein, a water-conveying pipe removably connected at its lower end with said supply-pipe and extending upward therefrom, and having a right-angled upper end, a slotted block attached to the top of the uprights to receive the upper end of said water-conveying pipe, a turn-button pivoted on said block to hold said pipe in position, a rubber-frame adapted to fit and reciprocate between said uprights, removable rubbing devices connected to said rubber-frame, and devices, substantially as described, for attaching said rubber-frame and rubbers and regulating the passage of water through the conveying-pipe, substantially as set forth.

4. In a bathing apparatus, the combination, with a rubber-frame substantially as described, of a sponge rubber comprising a pair of vertical strips adapted to fit over and embrace said rubber-frame, a sponge receptacle or support connected to either end of said strips, and sponges removably secured to said receptacles, substantially as set forth.

398,515. STOVE OR RANGE. GEORGE G. KNIFFIN, Brooklyn, assignor to Henry R. Jones and Herbert Jones, New York, N. Y. Filed Oct. 10, 1888. Serial No. 287,738. (No model.)

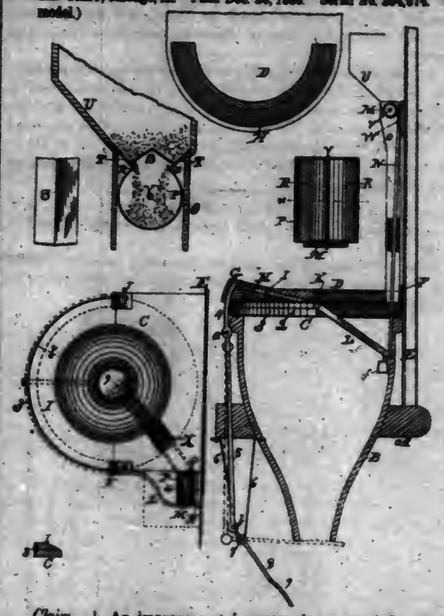


Claim.—1. The combination, with the stove or range having a vertical space at the side of the oven, of the vertically-swinging oven-door having a weight the upper face of which is at right angles to the inner face of the door to rest against the inner side of the front when the door is swung down to a horizontal position, substantially as set forth.

2. The combination, with the range having the two partitions C C, the side ovens, and the detachable partitions D D, resting on the upper edges of partitions C C, parallel with the ovens and having horizontal projections *d* along their upper edges engaging the upper ends of the ovens, of the downwardly-swinging doors hinged at their lower ends to the range-front and having integral weights working in the spaces between the ovens and partitions D, the upper faces of the weights being at right angles to the inner faces of the doors, substantially as set forth.

3. The combination, with the oven of a stove or range, a spaced detachable partition parallel with one side of the oven, and horizontal guide-lugs attached to said oven, arranged upon the arc of a circle, of a drop-door and a counterpoise-weight secured to the door capable of movement between the oven and partition, provided with a cylindrical outer edge and a straight upper surface, substantially as shown and described.

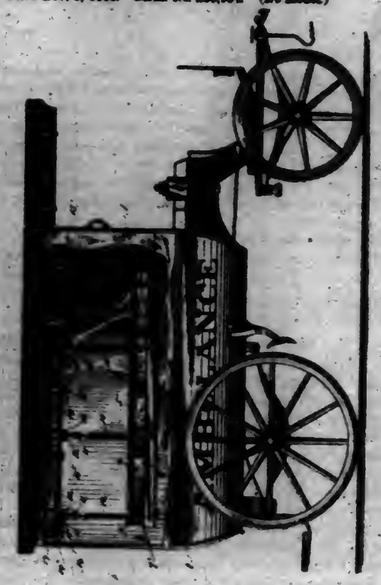
398,516. WATER-CLOSET FOR CARS. LOUIS LATTAN and HERMAN TREPT, Chicago, Ill. Filed Dec. 26, 1888. Serial No. 294,674. (No model.)



Claim.—1. An improvement in water-closets, consisting of the lever I L, which is pivoted to the rabbeted seat C, and the segment part I provided with the rod 4 at its middle portion, in combination with the connecting-rod 5, lever 8, valve 9, bowl B, and a lid, D, provided with a segmental recess, as and for the purpose specified.

2. The seat C, provided with a segmental rabbet in its top front portion, and a lever composed of the segmental part I and the back extending part, L, and the lever pivoted to said seat C, and the segmental part I provided with the rod 4 and lying over said rabbet, in combination with the rod 5, lever 8, and valve 9, the lid D, provided with the segmental recess H, the rod N, jointed to lever L and provided with the rack W, the sand-receptacle U, and the pipes O X, and bowl B, the bucket P, located in the top portion of pipe O, and provided with the shaft V and gear M, and the sand-receptacle U, as specified and shown.

398,517. AMBULANCE. WILLIAM LAWRENCE, Worcester, Mass. Filed Nov. 3, 1888. Serial No. 289,994. (No model.)

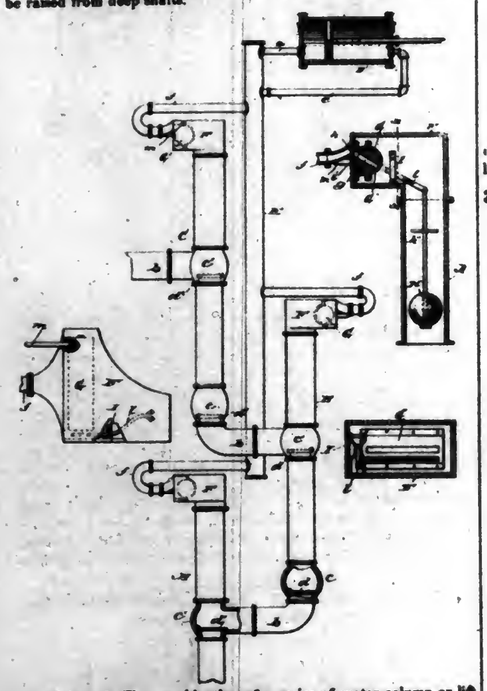


Claim.—1. In an ambulance, the combination, with the stretcher-frame supported by vertical spiral springs and attached to lateral horizontal spiral springs, of means for raising and lowering said frame and holding the same in place, substantially as shown and described.

2. In an ambulance, the combination, with the hanging stretcher-frame, consisting of the base 9, spiral springs 10, and cross-pieces 11, and the horizontal spiral springs 19, attached to said frame, of means for raising and lowering said frame, consisting of a shaft supported and turning in bearings within the ambulance-body, and straps or cords connecting the cross-pieces 11 with said shaft, substantially as shown and described.

398,518. APPARATUS FOR ELEVATING WATER. WILLIAM O. LEETE, Mauch Chunk, Pa. Filed Sept. 20, 1888. Serial No. 286,775. (No model.)

Brief.—By means of an exhaust-cylinder and valve mechanism the air is alternately withdrawn and admitted, thus enabling water to be raised from deep shafts.



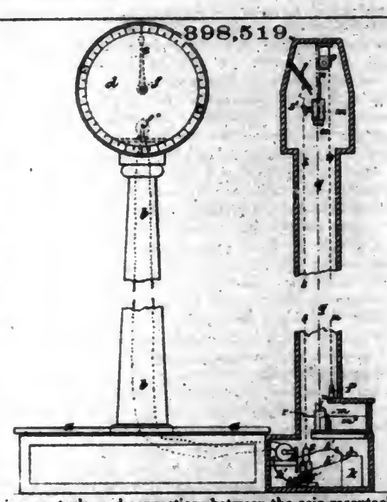
Claim.—1. The combination of a series of water columns or lift pipes, A B C, each connected intermediately of its height with the lower end of its adjacent column-pipe, the two check-valves *d d'* within each of said column-pipes, the exhaust air-pump D, arranged to connect with the upper ends of the column-pipes, valves controlling said connection and outside air-inlets at the upper ends of the column-pipes, and combined floats and weights within the upper portions of the column-pipes operating to reverse the actions of said valves, substantially as specified.

2. The combination, with the column-pipes and their upper boxes, F, each of which is provided with an exhaust-air aperture, *h*, and air-inlet *i*, of the valve G within each of said boxes, its cylinder G', its lever *l*, the spring-clamp I, the rod *k*, and the combined float and weight H, essentially as and for the purpose set forth.

398,519. COIN-CONTROLLED INDICATING APPARATUS. FREDERICK G. LYNDE, Manchester, County of Lancaster, England. Filed Jan. 27, 1888. Serial No. 262,162. (No model.) Patented in France Jan. 14, 1888, No. 188,140; in Belgium Jan. 20, 1888, No. 80,235; in Victoria Feb. 28, 1888, No. 5,682, and in New South Wales Mar. 1, 1888, No. 880.

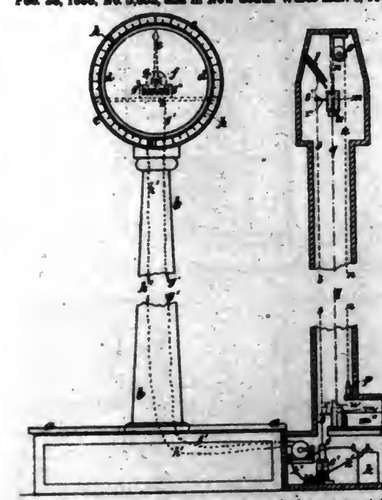
Claim.—1. In a weighing-machine, the combination of a scale and index, one movable and the other fixed, with a semi-opaque shield in front and normally hiding from view the moving part, and a source of light located behind the shield and adapted to illuminate the same when desired.

2. In a weighing-machine, the combination of a scale and index, one movable and other fixed, with a semi-opaque shield in front of and normally hiding from view one of said parts, with a source of artificial light placed behind and adapted to illuminate the shield, a



coin-receptacle, and connections between the coin-receptacle and the light, whereby the exposure of the latter is controlled by the former.

398,520. COIN-CONTROLLED INDICATING APPARATUS. FREDERICK G. LYNDE, Manchester, County of Lancaster, England. Filed Jan. 25, 1888. Serial No. 262,191. (No model.) Patented in France Jan. 14, 1888, No. 188,140; in Belgium Jan. 20, 1888, No. 80,235; in Victoria Feb. 28, 1888, No. 5,682, and in New South Wales Mar. 1, 1888, No. 880.



Claim.—1. The combination, with a coin-box open at the top and movable in a vertical plane, of a bottom for said box movable therein and a stop in its path of movement for engaging with the bottom and forcing the coin up out of the box.

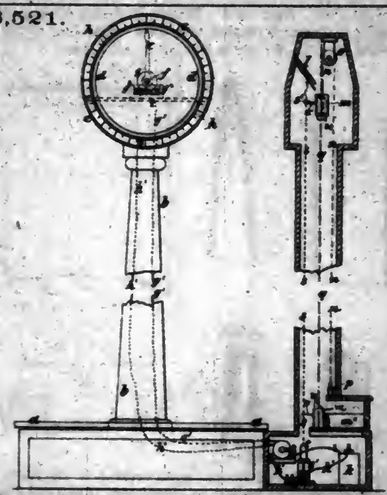
2. The combination of a masked indicator, a light for illuminating the said indicator, a movable controller which causes the light to be displayed or cut off, a movable coin-box attached to and actuating said controller, a movable bottom for said box, causing the removal of said coin when at the end of its path of movement, and means for restoring the box to its normal position.

3. In a weighing-machine, the combination of an indicator and a mask for the same, with an electric lamp located behind the mask and in an electric circuit, a circuit-breaker in the circuit with said lamp, a moving coin-box, and a connection between the latter and the circuit-breaker, whereby the light is controlled by the movement of the coin-box.

398,521. COIN-CONTROLLED INDICATING APPARATUS. FREDERICK G. LYNDE, Manchester, County of Lancaster, England. Filed Jan. 26, 1888. Serial No. 262,192. (No model.) Patented in England Mar. 3, 1887, No. 3,251; in France Jan. 14, 1888, No. 188,140; in Belgium Jan. 20, 1888, No. 80,235; in Victoria Feb. 28, 1888, No. 5,682, and in New South Wales Mar. 1, 1888, No. 880.

Claim.—1. The combination of a metallic visible scale or dial, an

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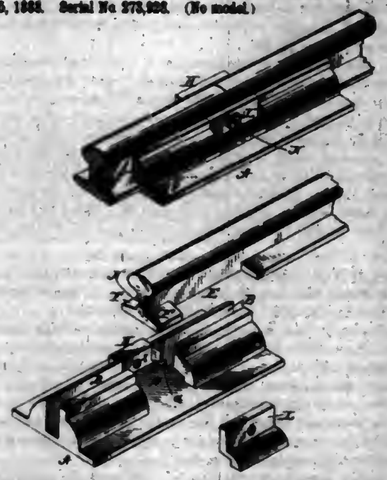


index-finger, and an opaque screen for the latter, with a suitable source of electricity, a circuit therefrom including the index and scale, and a circuit-interrupter, whereby when the circuit is complete a spark or sparks will pass from the index to the scale and indicate their relative positions.

2. In a weighing-machine, the combination of a metallic scale, an index-finger in close proximity thereto, a source of electricity, a circuit therefrom, including the index and scale, and a circuit maker and breaker, with a coin-receptacle, and connections between the receptacle and the circuit maker and breaker, whereby on the insertion of a coin the circuit will be completed and the position of the index denoted by an electric spark or sparks.

3. In a weighing-machine, the combination of the dial and the index or pointer in proximity thereto, one fixed and the other movable, with an opaque screen for the moving part, a suitable source of electricity, a circuit therefrom including both the dial and the index, and a circuit maker and breaker in said circuit, whereby the position of the moving part will be indicated by the passage of a spark from the one member to the other, substantially as described.

398,522. CHAIR AND LOCK-JOINT FOR RAILROAD-RAILS. JAMES H. MARTIN and WILLIAM H. HARRIS, Newberry, S. C. Filed May 15, 1888. Serial No. 273,926. (No model.)

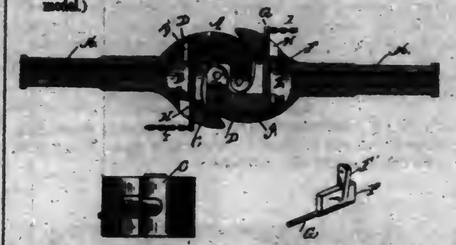


Claim.—1. A chair for railroad-rails having seats with an intermediate locking-space recessed at one end, in which the abutting ends of the rails are secured, substantially as shown and described.

2. The combination, with the chair having seats for the rails and intermediate locking-space and recesses G, of the rails provided with lugs at their ends adapted to fit in the said locking-space, and recesses to hold the rails in the chair, substantially as specified.

3. The combination, with the chair having seats for the rails and an intermediate locking-space, and the perforated web at one side of said space, of the detachable locking-plate, the screw bolt and nut, and the rails having out-away flange portions, whereby the rails are securely fastened, and at the same time the proper expansion and contraction of the rails are provided for, substantially as specified.

398,523. CAR-COUPLING. JAMES H. MARTIN and WILLIAM H. HARRIS, Newberry, S. C. Filed Dec. 10, 1888. Serial No. 293,079. (No model.)



Claim.—1. An automatic car-coupling having its draw-head provided with a recess, E, a latch, F, having an extension, F', on its upper surface pivoted in said recess, so that the latch will be pendulous in the draw-head, a recess, D', between the latch and inner wall of the draw-head, and the dog D, having a beveled end, *b*, adapted to elevate the latch and engage the said recess D', substantially as specified.

2. The combination, with the draw-head and its pivoted jaw and dog, of the pendulous latch having an arm extending through an opening in one side of the draw-head, and a recess between said latch and draw-head adapted to receive and hold the dog, and said arm adapted to release the dog, substantially as specified.

3. In a car-coupling, the combination, with a draw-head and its pivoted jaw, having a dog, D, with a beveled end, *b*, of the pendulous latch pivoted in the top portion of the draw-head, and having an arm extending through an opening in one side of the draw-head, and a chain connected to said arm, the opposite end of the chain adapted to be connected to a lever on the platform of a car, substantially as specified.

398,524. COVER-FASTENER FOR BUTTER-TUBS. ERWIN W. MAXSON, West Lenox, Pa. Filed Aug. 20, 1888. Serial No. 283,378. (No model.)



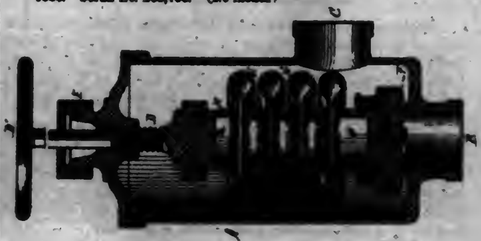
Claim.—1. The cans C, each having a slot, 1, and projection 3, combined with a hoop bent down into such slots, substantially as shown, and for the purposes described.

2. In combination with the slotted cans C and with the cover and its described cleats, the fastening-hooks E F, supported on pivots between the cleats and adapted to engage with said cans and also to be swung on their pivots to fasten or to release the cover.

3. In combination with a cover, the hook F, having a ring at its upper end, and the eccentric lever G, provided with the fulcrum-pin 10 and with the curved rib 11 and pin 12, all substantially as described.

4. In combination with the cleated cover, the hooks E F, eccentric lever G, slotted cans C C, applied to the tub, and the hoop applied to the cans, as set forth.

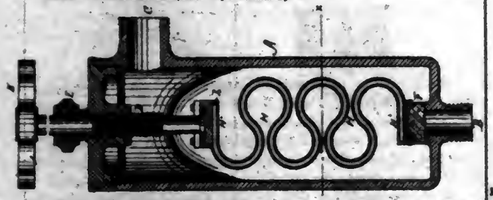
398,525. EXPANSION DEVICE. JOHN MCCLANKEY, Boston, Mass., assignor of one-half to Charles F. Parwell, same place. Filed Aug. 28, 1888. Serial No. 283,700. (No model.)



Claim.—1. The herein-described expansion device, consisting of a tube whose sides are formed externally and internally into one or more annular convolutions of the shape in section of reverse C curves or springs—*i. e.*, arcs comprehending more than semicircles—whereby longitudinal expansion or lengthening of the tube may be obtained, substantially as set forth.

2. The herein-described expansion device, consisting of a tube closed at its ends and whose sides are formed externally and internally into one or more annular convolutions of the shape in section of reverse C curves or springs—*i. e.*, arcs comprehending more than semicircles—said tube containing liquid, whereby by the application of heat longitudinal expansion or lengthening of the tube may be obtained, substantially as and for the purpose hereinbefore described.

398,526. EXPANSION DEVICE. John McCloskey, Boston, Mass., assignor of one-half to Charles F. Farwell, same place. Filed Aug. 25, 1888. Serial No. 283,701. (No model.)



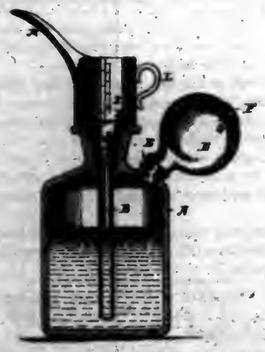
Claim.—1. The herein-described expansion device, consisting of a substantially flattened tube bent or formed into a series of reverse C curves or springs—*i. e.*, arcs comprehending more than semicircles—whereby longitudinal expansion or lengthening of said series forming the tube may be obtained, substantially as set forth.

2. The herein-described expansion device, consisting of a tube closed at its ends and bent or formed into a series of reverse C curves or springs—*i. e.*, arcs comprehending more than semicircles—said tube containing liquid, whereby by the application of heat longitudinal expansion or lengthening of said series forming the tube may be obtained, substantially as described.

398,527. METHOD OF PREPARING INSECTICIDES. James M. A. Miller, San Mateo, assignor to Eben Dean, Jacksonville, Fla. Filed May 22, 1888. Serial No. 274,689. (No specimens.)

Claim.—The within-described process of producing the within-specified insect-destroying compound or solution, especially applicable for the destruction of insects infesting, injuring, and destroying plant or tree and fruit life, and which consists in adding sulphur to lime while the latter is being slaked and afterward dissolving said ingredients in water, as set forth.

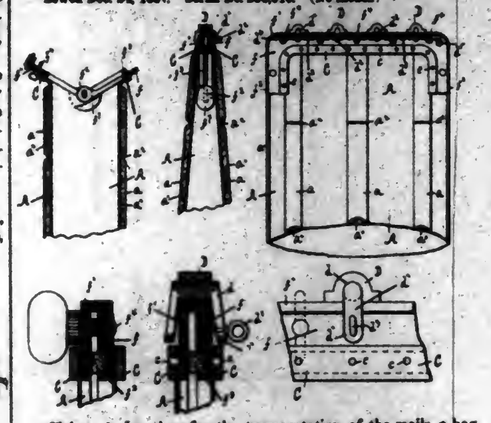
398,528. MEASURING APPARATUS FOR LIQUIDS. Charles G. Molin, Brooklyn, N. Y. Filed Oct. 24, 1888. Serial No. 289,087. (No model.)



Claim.—1. The combination, with the bottle A, having a tube, B, secured to the lower portion of its throat and extending into said bottle, and a bulb, D, also communicating with the interior of said bottle, of a detachable liquid-receptacle, I, having at its bottom a tubular projection, H, constructed to fit in said throat, and a valve, J, in said projection, substantially as described.

2. The combination, with the bottle A, having a tube, B, secured to the lower portion of its throat and extending into said bottle, and a bulb, D, having a valve, G, and communicating with the interior of said bottle, of a detachable liquid-receptacle, I, having at its bottom a conical tubular projection, H, constructed to fit in said throat, and a valve, J, in said projection, substantially as described.

398,529. MAIL-BAG. Everett D. Moore, Baltimore, Md., assignor to Thomas C. Chappell, same place. Filed June 3, 1886. Renewed Dec. 24, 1887. Serial No. 258,910. (No model.)



Claim.—1. In a bag for the transportation of the mails, a bag made of water-proof material, combined with independent pockets containing cork or other similar material, which are so located as to permit of the bag being folded, said bag combined with mechanism for hermetically sealing the mouth of the bag, substantially as described.

2. In a bag for transportation of mails, a bag made of water-proof material, combined with independent pockets containing cork or other similar material, which are so located as to permit of the bag being folded.

3. In a bag for the transportation of mails, the combination of a water-proof sack, the mouth of said sack formed by two frames hinged one to the other, the joint forming the hinges of said frames provided with a slot to admit of self-adjustment, a gasket placed between the said frames, wings extended from the said frames at the joints thereof for bearing-surfaces of said gasket, and screws for drawing the said frames together, for the purpose set forth.

4. In a bag for the transportation of mails, the combination of a water-proof sack, the mouth of said sack formed by two frames hinged one to the other, the joint forming the hinges of said frames provided with a slot for self-adjustment, a gasket placed between the said frames, wings extended from the said frames at the joints thereof for bearing-surfaces of said gasket, screws for drawing said frames together, binders pivoted to said frame for securing the said frames in the closed position, and means for locking the said binders in the closed position, for the purpose set forth.

5. In a bag for the transportation of mails, the combination of a water-proof sack provided with pockets around the sides thereof, in which is placed cork or some like buoyant substance, the mouth of said sack formed by two frames hinged one to the other, the joint forming the hinges of said frames provided with a slot for self-adjustment, a gasket placed between the said frames at the joints thereof for bearing-surfaces of said gasket, screws for drawing said frames together, binders pivoted to said frames for securing the said frames in the closed position, and a cord or chain for locking said binders in the closed position, substantially as shown, and for the purpose set forth.

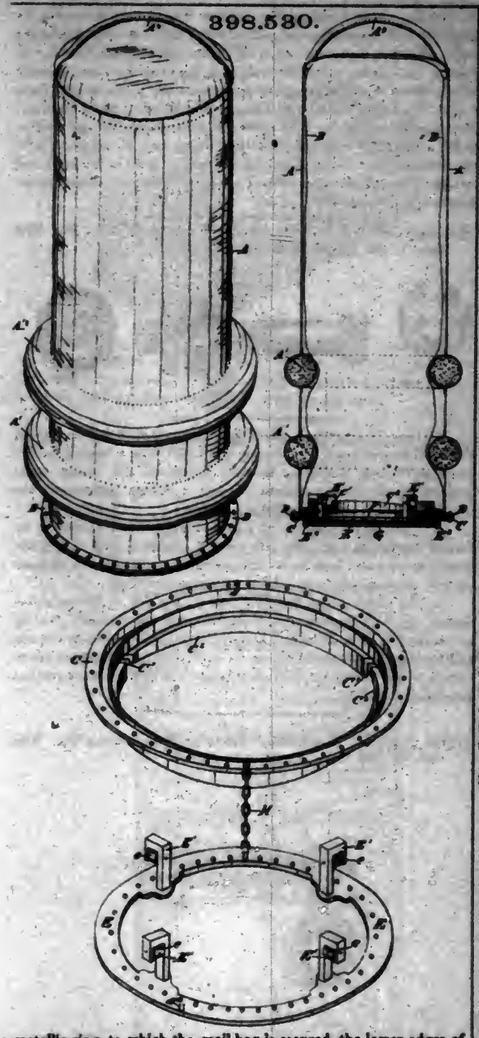
398,530. HERMETIC MOUTH-PIECE FOR MAIL-BAGS. Everett D. Moore, Baltimore, Md., assignor to Thomas C. Chappell, same place. Filed Apr. 10, 1888. Serial No. 270,184. (No model.)

Claim.—1. In a hermetic mouth-piece for mail-bags, the combination of a metallic ring, to which the bag is secured, the lower edge of which is cut into two or more inclined planes, and a cover of about the same size and shape as the ring and arranged to rest upon it, and provided on the side next the ring with two or more hooks set rigidly into the cover and adapted to engage the inclined planes of the ring, whereby the cover and the ring are pressed closely together when the cover is turned, substantially as described.

2. In a hermetic mouth-piece for mail-bags, the combination of a metallic ring, to which the bag is secured, the lower edge of which is cut into two or more inclined planes, and a cover of about the same size and shape as the ring and arranged to rest upon it, and provided on the side next the ring with two or more hooks or carriers set rigidly into the cover and provided with friction-rollers attached to them and engaging the inclined planes of the ring, whereby the cover and the ring are pressed closely together when the ring is turned, substantially as described.

3. In a hermetic mouth-piece for mail-bags, the combination of

398,530.



a metallic ring, to which the mail-bag is secured, the lower edges of which are provided with a downwardly-projecting flange cut into two or more inclined planes, a cover of about the same size and shape as the ring, and provided on the side next the ring with two or more hooks set rigidly into the cover and adapted to engage the inclined planes of the flange, and a gasket interposed between the ring and cover, as and for the purpose specified.

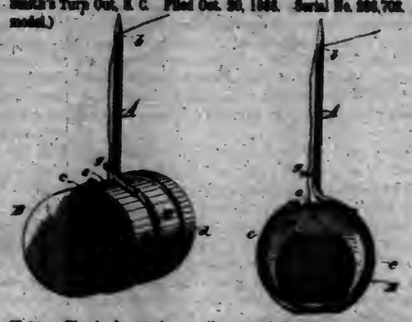
4. In a hermetic mouth-piece for mail-bags, the combination of a metallic ring, to which the bag is secured, cut with slots or ways to permit the hooks or carriers to pass through it, the lower edge of said ring being cut into two or more inclined planes, and a cover of about the same size and shape as the ring and arranged to rest upon it, and provided on the side next the ring with two or more hooks set rigidly into the cover and adapted to engage the inclined planes of the ring, whereby the cover and ring are pressed closely together when the cover is turned, substantially as described.

5. In a hermetic mouth-piece for mail-bags, the combination of a metallic ring, to which the bag is secured, the lower edge of which is cut into two or more inclined planes, and a cover of about the same size and shape as the ring and constructed of two rings of metal, between which is riveted a sheet of flexible water-proof material, and arranged to rest upon the bag-ring, and provided on the side next to the bag-ring with two or more hooks set rigidly into the rim of the cover and adapted to engage the inclined planes of the ring, whereby the cover and the ring are pressed closely together when the cover is turned, substantially as described.

6. In a hermetic mouth-piece for mail-bags, the combination of a metallic ring countersunk on the lower edge and provided with a gasket resting in said countersunk space, and having a downwardly-projecting flange the lower edge of which is cut into two or more inclined planes, and a cover of such a size and shape as to fit the countersunk space in the ring and rest upon the gasket, and having hooks provided with rollers secured to the sides of the cover next the ring and adapted to engage the inclined planes of the flange, whereby the cover and the gasket will be pressed closely together when the cover is turned, substantially as described.

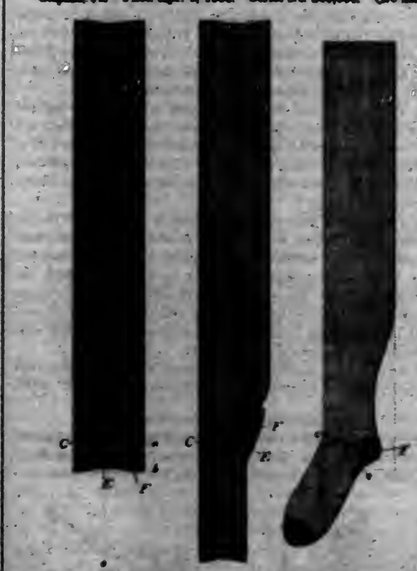
7. The combination of a hermetic mouth-piece consisting of a metallic ring provided on its lower side with inclined planes, a cover provided on the side next the ring with means adapted to engage the inclined planes and press the ring and cover together when the cover is turned, and a water-proof mail-bag secured to the ring, whereby the bag may be sealed so as to be water-tight.

398,531. NEEDLE FOR SEWING BAGS, &c. Samuel M. Neely, Smith's Turp Out, S. C. Filed Oct. 20, 1888. Serial No. 288,702. (No model.)



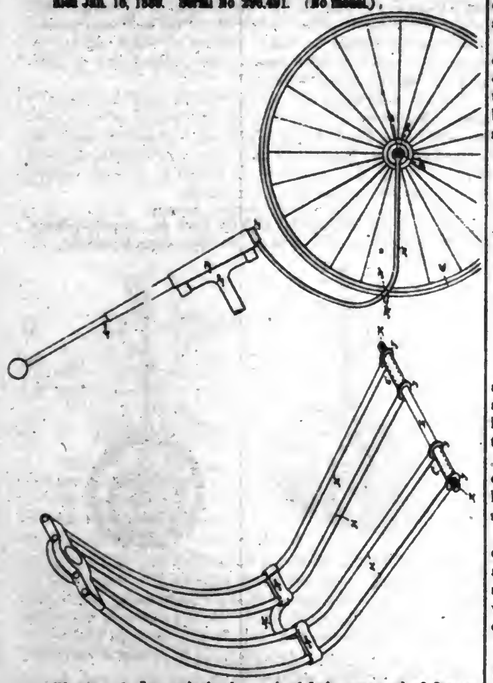
Claim.—The body of the needle provided with an eye near its point and having its rear end portion constructed to form a loop, in combination with a transversely-arranged and opening and closing thread-holding can having the looped rear end portion of the needle coiled around and secured to it, said can being provided with an eye near the base end of the body of the needle for passage of the thread to the needle, essentially as described.

398,532. ART OF MAKING STOCKINGS. Owen Gnogher, Philadelphia, Pa. Filed Apr. 6, 1888. Serial No. 269,809. (No model.)



Claim.—The hereinbefore-described improved art or method of making stockings, which consists of, first, knitting a tube which is to form the leg; second, cutting out a portion of the end of said tube to form an incision the length of whose edges corresponds to the periphery of the foot portion; third, running the loops along said edges onto the needles of a frame of the proper diameter to form the foot portion; fourth, knitting on said foot portion, and, fifth, cutting the tube first formed upon the proper lines to shape the heel, ankle, and lower portion of the leg and uniting the cut edges by sewing, substantially in the manner described.

398,533. VELOCIPEDE. ALBERT H. OVERMAN, Newton, assignor to the Overman Wheel Company, Boston, Mass. Original application filed Dec. 13, 1886, Serial No. 221,268. Divided and this application filed Jan. 16, 1888. Serial No. 296,491. (No model.)



Claim.—1. In a velocipede, a wheel-fork composed of four or more bowed springs placed side by side, with a space between the inner springs for the wheel to run in, substantially as set forth.

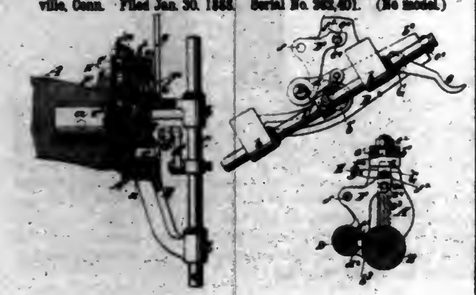
2. In a velocipede, the combination, with a wheel-fork composed of independent bowed springs, separated at each end, and each secured at one end to a cross-head common to them all, of a wheel having its axle extended at each end for the attachment of the other ends of the said springs, substantially as set forth.

3. In a velocipede, the combination, with a rearwardly-inclined steering-rod and a steering-wheel, of a bowed spring-fork composed of four or more independent springs connected with the lower end of the rod and with the wheel-axle, and curved, substantially as shown, so as to bring the rod virtually in line with the center of the wheel, substantially as set forth.

4. In a velocipede, the combination, with a steering-rod having a cross-head rigidly secured to its lower end, of a steering-wheel having the ends of its axle extended, and a spring wheel-fork composed of four or more bowed springs placed side by side with a space between the inner rods for the wheel to run in, and having their upper ends rigidly secured to the said cross-head, and their lower ends provided with eyes adapting them to be slipped over the extended ends of the wheel-axle, substantially as set forth.

5. In a velocipede, a wheel-fork composed of bowed spring-rods and a transverse brace tying such rods together, substantially as set forth.

398,534. LOCKING DEVICE FOR SEWING-MACHINE HEADS. WILLIAM H. PALMER, Jr., Norwich, assignor to Palmer Brothers, Montville, Conn. Filed Jan. 30, 1888. Serial No. 262,401. (No model.)



Claim.—1. The combination, with a sewing-machine arm and a head pivoted thereto, one of said parts having a lip overhanging the other, of a locking-bolt in one of said parts and a socket-piece for receiving the locking end of the bolt made separate from and laterally adjustable on the other of said parts, substantially as herein described.

2. The combination, with a sewing-machine arm and a head pivoted thereto and having a lip or portion overhanging the end portion of the arm, of the locking-bolt E, the locking-lever F, connected with the bolt, and the rocking unlocking-trigger journaled in the head, and having its end portion cam-shaped to act upon the said locking-lever, substantially as herein described.

398,535. NUT-LOCK. THOMAS W. PATTEN, Baltimore, Md. Filed Oct. 17, 1888. Serial No. 288,341. (No model.)



Claim.—1. A nut-lock consisting of a screw-threaded nut having an eccentric depression in one side, combined with a washer having an eccentric boss projecting laterally therefrom, and having on its inner periphery transverse teeth adapted to engage transversely the threads of a bolt, substantially as described.

2. A nut-lock consisting of a screw-threaded nut having an eccentric depression in its side with teeth *d*, combined with the washer having an eccentric boss on its side and transverse teeth *a* on its inner surface, substantially as and for the purpose described.

3. The combination, with the bolt, of the nut D, having an eccentric recess or depression, *c*, in its side, and the washer C, having an eccentric boss, *b*, on its side adapted to enter the recess of the nut, and having teeth or serrations on its inner periphery arranged transversely to the threads of the bolt, substantially as and for the purpose described.

398,536. OIL-BURNER. ANDREW J. PIERCE, Racine, Wis. Filed Feb. 28, 1888. Serial No. 265,618. (Model.)



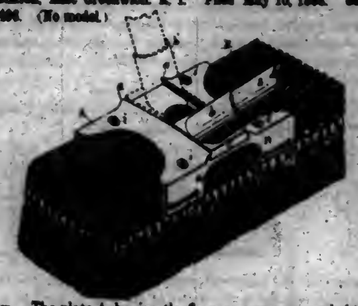
Claim.—1. In an atomizing oil-burner, the central steam-conducting pipe having the end cavity, *g*, and the central delivery-orifice, *k*, in combination with the inclosing-cap C, having the oil-inlet *n*, and the contracted front end with the central delivery-orifice, *k*, of less diameter than cavity *g*, said cap adjusted with its contracted end in close proximity to the end of the steam-pipe, whereby the oil is directed inward in a thin annular film to the central unexpanded steam-jet.

2. The external cap having an oil-inlet and the contracted end with the discharge-orifice *k* at its extremity, in combination with the internal steam-pipe terminating in close proximity to the end of the cap and provided with the central orifice, *k*, and with an end cavity, *g*.

3. The cock having the cylindrical pipe *a* and external thread, *c*, the cap C, provided with the inlet and outlet orifices and with the internal screw-threads, in combination with the intermediate pipe, B, fitted and threaded closely within the cap C, and also fitted and threaded closely upon the outside of the pipe *a*, whereby said pipe B is adapted to maintain the proper relation of the other parts and also to serve as a valve for regulating the oil-delivery.

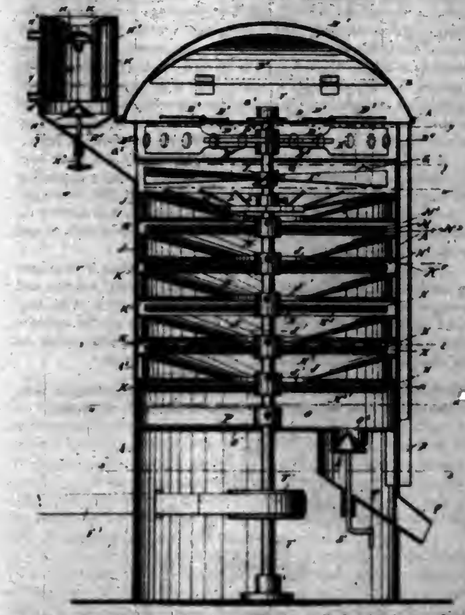
4. In an atomizing-burner, the central steam-pipe and the external cap having its delivery-orifice coincident with the bore of the steam-pipe, in combination with the cock comprising the body, with the lateral steam-inlet and the direct opening *b*², and the rotary plug having the angular steam-passage therethrough, and the opening *b'*, forming a continuation of said passage, whereby the steam may be directed through the burner or the steam shut off, and an opening established through the burner from end to end for the passage of a cleaning-instrument therethrough.

398,537. BRUSH-HOLDER. THOMAS A. PIERCE and ISAAC H. WARNER, East Greenwich, R. I. Filed May 10, 1888. Serial No. 273,496. (No model.)



Claim.—The plate A, having the flanges or ears *n n*, and ridges *a a*, forming dovetailed tapering recesses between them, substantially as described, in combination with the handle-socket *c b*, staples *g g*, and brush B, substantially as and for the purpose specified.

398,538. GRAIN-SCOURER. PETER PROVOST, Menominee, Mich. Filed Apr. 13, 1888. Serial No. 270,517. (No model.)



Claim.—1. The combination, with the cylinder having a dust-chamber and suction-fan therefor at its upper end, a grain-inlet leading into the upper end of the cylinder, and a discharge-chute at the lower end of the cylinder, of pipes leading from the upper end of the cylinder into the dust-chamber, a channel leading from said chute upwardly into the dust-chamber, and the shaft provided with cleaning-disks in said cylinder, substantially as set forth.

2. In a grain-cleaner, the combination, with a cylinder provided with a wire-screen lining and a suitable inlet, of an imperforate concave disk having a central opening and secured to the said cylinder, a shaft journaled centrally in the said cylinder, an agitator having inclined radial arms and secured to the said rotating shaft, said arms extending on the top surface of the said concave disk, said a flat disk secured to the shaft below the said central opening and of less diameter than the said cylinder, substantially as shown and described.

3. In a grain-cleaner, the combination, with a cylinder provided with wire-screen lining and a suitable inlet, of a concave disk having a central opening and secured to the said cylinder, a shaft mounted centrally in the said cylinder and having a rotary movement, an agitator having inclined radial arms and secured to the said rotating shaft, said arms extending on the top surface of the said concave disk, and a wheel secured to the said shaft directly above the said agitator and provided with inclined blades, so as to press the grain downward onto the said agitator and concave disk, substantially as shown and described.

4. In a grain-cleaner, the combination, with a cylinder provided with a wire-screen lining and a suitable grain-inlet, of a shaft mounted centrally in the said cylinder, a fan secured on the said shaft and located in a chamber formed in the top of the said cylinder, said chamber being provided in its top plate with openings, covers adapted to open and close said openings, a cap fitting over the top of the said cylinder and forming therewith a dust-chamber, and pipes leading from the interior of the cylinder into the said dust-chamber, so as to draw the moisture out of the said cylinder by the action of the said fan-wheel, substantially as shown and described.

5. In a grain-cleaner, a cylinder having a wire-screen lining, a shaft journaled centrally in the said cylinder, a series of concave disks having central openings and secured to the interior of the said cylinder, disks secured to the said shaft between the succeeding concave disks, and an arm secured to the said shaft for discharging the grain from the cylinder into a chamber, in combination with the said chamber, a channel leading from the said chamber upward, a cap held on the upper end of the said cylinder and forming therewith a dust-chamber, into which said channel discharges, a fan-wheel secured to the said shaft and located in a chamber connected with the said dust-chamber, pipes leading from the said dust-chamber to the upper part of the said cylinder, and a chamber formed on the said cap and connected with the interior of the same by a hinged part, substantially as shown and described.

6. In a grain-cleaner, the combination, with a lined cylinder, A and shaft F, journaled in the said cylinder, of the chute G³, discharging the steamed grain into the said cylinder, the concave disks J, having the central openings J', and fastened in the said cylinder, the flat disks N, provided with the arms N', the chamber O, formed in the said cylinder A and having the opening O² in its bottom, the arm P, secured to the said shaft F and forcing the grain into the said opening O², the valve S, adapted to open and close said opening O², the chamber Q, into which opens said valve, and provided with a chute, Q', leading to the outside of the cylinder A, the channel R, opening into the said chamber Q and extending upward, the cap B, held on the top of the said cylinder and forming a dust-chamber, the chamber D, formed in the top of the cylinder A and communicating with the said dust-chamber, the fan E, secured to the shaft F within the said chamber D, the hinged end B' of the said cap B, and the pipes G', leading from the dust-chamber to the interior of the cylinder A, substantially as shown and described.

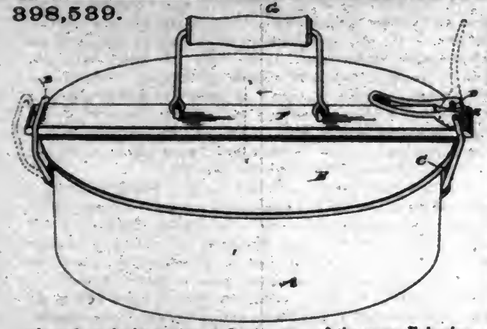
7. In a grain-cleaner, the combination, with the lined cylinder A, of the shaft F, journaled in the said cylinder, the chute G, leading into the said cylinder, the concave disks J, having central openings J', and fastened in the said cylinder, the flat disks N, provided with the arms N', the chamber O, formed in the said cylinder A and having the opening O² in its bottom, the arm P, secured to the said shaft F and forcing the grain into the said opening O², the valve S, adapted to open and close said opening O², the chamber Q, into which opens said valve S, and provided with a chute, Q', leading to the outside of the cylinder A, the channel R, opening into the said chamber Q and extending upward, the cap B, held on the top of the said cylinder and forming a dust-chamber, the chamber D, formed in the top of the cylinder A and communicating with said dust-chamber, the fan-wheel E, secured to the shaft F and within the said chamber D, the hinged end B² of the said cap B, the pipes G', leading from the dust-chamber to the interior of the cylinder A, and the chamber C, opening into the cap B and provided with the outlet-door C', substantially as shown and described.

8. In a grain-cleaner, the combination, with the lined cylinder A, of the shaft F, journaled in the said cylinder, the chute G, discharging the steamed grain into the said cylinder, the concave disks J, having central openings J', and fastened in the said cylinder, the flat disks N, provided with the arms N', the chamber O, formed in the said cylinder A and having the opening O² in its bottom, the arm P, secured to the said shaft F and forcing the grain into the said opening O², the valve S, adapted to open and close said opening O², the chamber Q, into which opens said valve S, and provided with a chute, Q', leading to the outside of the cylinder A, the channel R, opening into the said chamber Q and extending upward, the cap B, held on the top of the said cylinder and forming a dust-chamber, the chamber D, formed in the top of the cylinder A and having openings D' in its top to communicate with said dust-chamber, the fan E, secured to the shaft F and within the said chamber D, the hinged end B² of said cap B, the pipes G', leading from the dust-chamber to the interior of the cylinder A, the covers D², hinged on the top plate of the chamber D over the openings D', and the rods D³, extending through the cap B and serving to operate said covers D², substantially as shown and described.

398,539. SHIPPING-PACKAGE. ISAAC L. ROCK, Mooers, N. Y. Filed Sept. 14, 1888. Serial No. 285,376. (No model.)

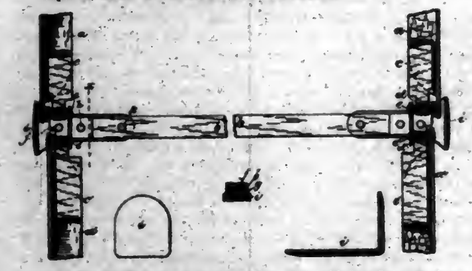
Claim.—The combination, with the pail A, having opposite vertically-swinging loops B C, and the lever D, pivoting on the upper end of loop C, between its sides, and having its pivoted end rounded and

398,539.



enlarged on its lower face to form a cam, of the cover E, having a cleat projecting beyond its sides to enter the loop B at one end and projecting at its opposite end through the loop C and under the lower or cam face of the said lever, substantially as set forth.

398,540. BAG-FRAME. WILLIAM ROEMER, Newark, N. J. Filed Sept. 18, 1888. Serial No. 285,850. (No model.)

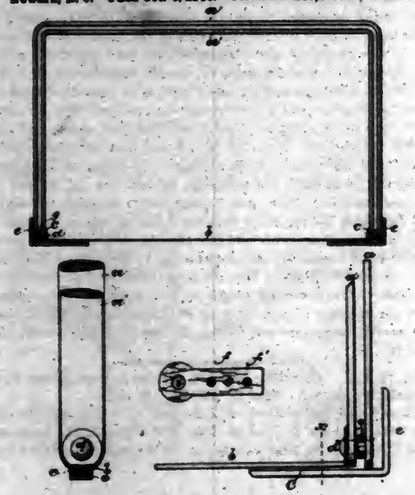


Claim.—1. The improved bag-frame, combining jaws or frame-sections *a a'*, a bottom bar or brace, *b*, and hinge-plates having eyes bent up to receive the pivots *c c'*, said plates being secured at the opposite ends to the bottom bar, all substantially as and for the purposes set forth.

2. The improved bag-frame, combining with jaws *a a'* and a bottom bar or brace, *b*, hinge-plates secured at the opposite ends of said bar or brace and having eyes *m m'* bent up, as described, pivots *c c'* for the jaws, arranged in said eyes, and inlays *e e'*, also arranged on said pivots, substantially as and for the purposes set forth.

3. In combination with the bag-frame, jaws *a a'*, one of which overlaps the other, as described, a bottom bar or brace, *b*, hinge-plates secured at the opposite ends of said bottom bar and having bent-up eyes to receive the pins upon which said jaws are hinged, and said pins made of different sizes, the inner jaw being hinged to the short pins and the outer jaw on the longer pin, substantially as and for the purposes set forth.

398,541. FRAME FOR TRAVELING-BAGS. WILLIAM ROEMER, Newark, N. J. Filed Oct. 6, 1888. Serial No. 287,459. (No model.)



Claim.—The improved frame for traveling-bags herein shown, combining therein jaws or sections *a a*, a brace or bar, *b*, hinge-plates *c c*, secured thereto and having a hinge-eye *c*, bent at or approximately at right angles to said brace or bar, and rivets *d d*, arranged above the line of the brace or bar, substantially as and for the purposes set forth.

398,542. BAG-FASTENER. WILLIAM ROEMER, Newark, N. J. Filed Sept. 7, 1888. Serial No. 284,787. (Model.)



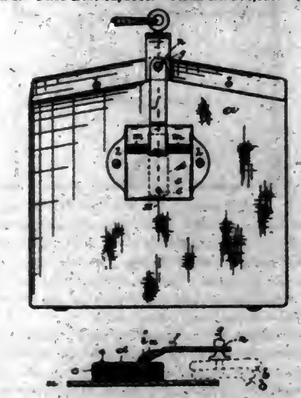
Claim.—1. The improved satchel-catch combining a face-plate adapted to be secured to the frame of the bag or satchel, a box secured on said face-plate and containing a spring, and a slide arranged between the face-plate and box and free to be thrown by the fingers from an uncatching to a catching position, and having a catching-tongue adapted to engage with a co-operating catch on the bag-frame, substantially as and for the purposes set forth.

2. In combination, a face-plate having a slot, *c'*, for the catching-tongue to work in and perforations *g* for fastening-lugs, a box, d^3, containing a spring and having said fastening-lugs arranged to pass through said perforations, and having on the under side a notch, d^5, adapted to receive and allow a slide to work therein, and said slide consisting of a cross-bar arranged in the said notch, a catching-tongue extending through the slot *c'* to engage with a co-operating catch, and finger-pieces arranged at the ends of the cross-bar on the outside of the box, the said spring bearing on said cross-bar and against the inner walls of the box, all substantially as and for the purposes set forth.

3. The combination, with the slotted face-plate *c* and a box having a notch, c^4, of a slide held in said notch and having a depending catching-tongue projecting through the slot of the face-plate to engage a co-operating catch, and a spring held in said box and bearing on said slide, said parts being arranged and combined substantially as and for the purposes set forth.

4. In combination, a box forming a spring-chamber, d^3, and having notches to receive a slide, a slide arranged in said notches and having a catching-tongue to engage a co-operating catch of the bag-frame, said slide having finger-pieces or parts lying on the opposite sides of said box, and a spring arranged in said box and bearing on said slide, substantially as and for the purposes set forth.

398,548. CATCH FOR BAG-FRAMES. WILLIAM ROEMER, Newark, N. J. Filed Nov. 12, 1888. Serial No. 290,535. (No model.)



Claim.—1. The combination, with the jaws *b b* of a bag or satchel frame, of a case secured to the body of the bag and containing a spring, a hasp pivoted to said case, and a stud secured to the outer jaw of said frame for receiving the slotted end of said hasp, all arranged and adapted to operate as and for the purposes set forth.

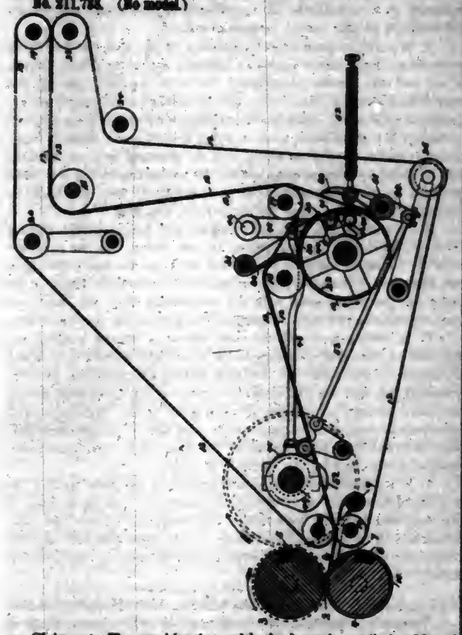
2. The combination, with the frame of a bag or satchel, of a spring-case provided with a spring, *d*, within said case and pivoted thereto, a locking-hasp pivotally connected with said case, and provided at its outer end with an opening, *n*, and a stud secured to said frame, over which one end of the lever passes, securing the parts of the bag-frame together, substantially as and for the purposes set forth.

3. The combination of a spring-case, a spring secured to said case, tubes or sockets *m m* on said case, a locking-hasp having one end resting on said spring, pins *i i* on the side of said hasp, adapted to reciprocate in said tubes, and stud *g*, secured to the bag and

adapted to enter an opening in the outer end of the locking-hasp, substantially as described, and for the purposes set forth.

4. In combination, a bag or satchel body, *a*, having jaws *b b*, one of which overlaps the other, studs *g*, secured on the outer of said jaws at the opposite depending ends thereof, and hasps *f*, pivotally secured on said body and adapted to enter into engagement with the pins or studs to hold both of said jaws down to said body, substantially as and for the purposes set forth.

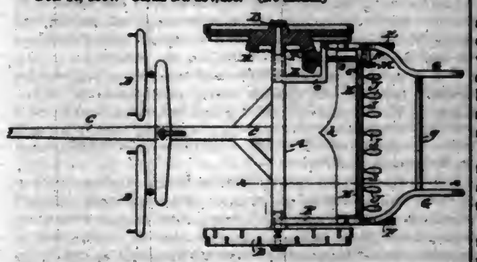
398,544. SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES. WALTER SCOTT, Plainfield, N. J. Filed Aug. 25, 1888. Serial No. 283,784. (No model.)



Claim.—1. The combination, with the imposing-cylinder 22 and the rollers 16 and 17, and tapes for bringing the sheets to such imposing-cylinder, of the guides 30, with curved faces adjacent to the cylinder 22 and roller 16, and the curved shields 50, cross-shaft 51 for supporting such shields outside the path of the tapes, and mechanism for moving the shields intermittently toward and from the imposing-cylinder, whereby alternate sheets are caused to pass beneath the guides 30, and the pairs of imposed sheets are delivered on the belts 12, substantially as set forth.

2. The combination, with the imposing-cylinder 22 and the rollers 16 and 17, and tapes for bringing the sheets to such imposing-cylinder, of the guides 30, with curved faces adjacent to the cylinder 22 and roller 16, and the curved shields 50, and cross-shaft 51 for supporting the same outside the path of the tapes 12 and the delivery-fingers 40, and mechanism, substantially as specified, for moving the delivery-fingers and segmental shields alternately for the latter to direct one sheet in beneath the segmental guides 30 and then for the delivery-fingers to cause the two sheets to follow the belts 12 to the rollers 17, substantially as specified.

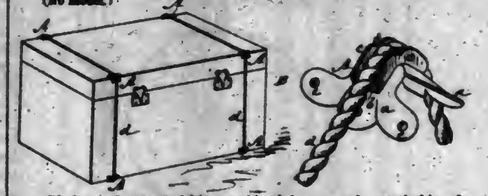
398,545. POTATO-DIGGER. HIRAM M. SHAW, Penn Yan, N. Y. Filed Dec. 10, 1887. Serial No. 257,489. (No model.)



Claim.—1. In a potato-digger, the combination, with the axle A, wheels B, and gear-wheel R on one of its wheels B, of beams E, pivoted on the axle, a blade, H, secured to and connecting the beams, a shaft, I, journaled in the beams in rear of the blade and provided with tines J and the arm K, the shaft O, journaled in the beams E and provided with the gear-wheel P, meshing with the gear-wheel on the drive-wheel, and with a wrist-pin, M, at its other end, and the pitman L, connected to the arm K and to the wrist-pin M, substantially as herein shown and described.

2. In a potato-digger, the combination, with the axle A, the wheels B, and gear-wheel R on one of the wheels, of the beams E F, pivoted to axle, the handles G, secured to the beams, the narrow blade H, secured to the beams and having the central forwardly-projecting point, *h*, the shaft I, journaled in the beams in rear of the blade and provided with the tines J and the arm K, the shaft O, journaled in the beam E and provided with the gear-wheel P and the crank-pin M, and the pitman L, substantially as herein shown and described.

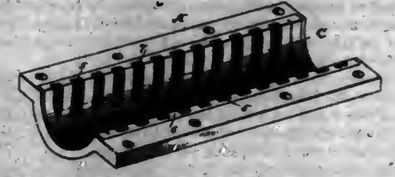
398,546. ROPING ATTACHEMENT FOR TRUNKS, &c. JOSEPH B. STOCKBAKER, Durango, Colo. Filed Aug. 14, 1888. Serial No. 282,731. (No model.)



Claim.—1. The within combined brace and rope-holder for trunks and other like articles, constructed of side flanges arranged at right angles with each other on their inner surfaces, and terminating where meeting in a projecting open or covered circular grooved portion, substantially as and for the purposes herein set forth.

2. As a new article of manufacture, a combined trunk-brace and rope-holder composed of perforated sides or flanges *a a*, arranged at right angles with each other on their inner surfaces and terminating at their meeting ends in a circular grooved portion, *b c c*, essentially as shown and described.

398,547. JOURNAL-BEARING. WILLIAM W. SMALLEY, Round Brook, N. J. Filed May 12, 1888. Serial No. 273,720. (No model.)



Claim.—A bearing for journals, consisting of a box, a soft-metal lining having flat-faced ridges substantially parallel with the surface of the journal, and with pockets or channels between the said ridges, and powdered graphite filling the said pockets, whereby it is adapted to fill inequalities in and coat or glaze the flat faces of the ridges, substantially as described.

398,548. STEAM-TRICYCLE. HERRMAN R. SMITH, Smithville, N. J. Filed May 16, 1887. Serial No. 238,249. (No model.)

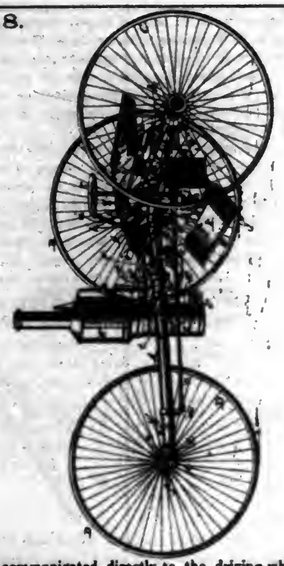
Claim.—1. In a power-driven tricycle, the axle and its two ground-wheels, the reach extending forward rigidly from the axle, the arm F, pivoted to and extending laterally from the forward end of the reach, the connections extending rearward from said arm to control the position of the wheel, an engine or motor mounted on and sustained wholly by the reach, and intermediate gearing connecting said motor with one of the rear wheels.

2. In a two-track tricycle provided with a steam-motor, the rear axle and its two ground-wheels, one of which is a driver, the reach extending forward rigidly from said axle at a point near the driving-wheel, the steering-wheel pivotally connected with the forward end of said reach in line with the rear driving-wheel, the engine and boiler located outside of the outer side of the reach between the driving and steering wheels and connected to and sustained wholly by said reach and the gearing connecting said engine with the driving-wheel.

3. In a steam-actuated vehicle, the axle, its two wheels, and a forwardly-extending reach, in combination with the boiler, engine, and driving-gear located on the outer side of the reach, and a driver's seat located inside of the reach, substantially as described.

4. In a steam-actuated riding-vehicle having the rear axle, its two wheels, the reach near one end of the axle and the front steering-wheel in line or substantially in line with the rear driving-wheel, the boiler and engine both carried by the reach, and intermediate gear connecting the engine with the rear wheel, as shown, whereby

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the motion is communicated directly to the driving-wheel and the weight of the boiler and engine applied mainly to the driving and steering wheels.

5. In a steam-tricycle, a frame provided with two independent rear wheels, one of which is the driver, and a front steering-wheel tracking with said driver, in combination with an engine or motor mounted on the reach and geared directly to the driving-wheel.

6. In combination with the non-rotating axle *a*, the driving-wheel revolving loosely thereon, a driving-gear also mounted directly on said axle and revolubly independently thereon, an elastic or yielding connection, substantially as described, between the gear and the driving-wheel, and an engine or motor connected with and driving said gear on the axle, as described, whereby the wheel and its immediate driving-gear are independently supported and allowed to independently turn upon the axle.

7. The axle, its two ground-wheels, the reach extending rigidly forward from the axle, the front steering-wheel located at one side of the reach and connected to the latter by the pivoted arm or axle *f*, in combination with the lever *m*, pivoted to the reach, link *n*, rod *o*, and the rack-and-pinion mechanism for controlling said rod.

8. In combination with the tubular reservoir-frame, the boiler, its burner, the pipe connecting the frame and burner, and the filter, applied as described.

9. In combination with the driving-wheel B, the two gears *o'* and *p'*, of different diameters, coupled thereto, the gears *l'* and *l'*, the shaft *i'*, and its clutch *m'*, and the engine geared to shaft *i'*, substantially as shown.

10. In a steam-tricycle or road-wagon, a tubular main frame, a boiler sustained therefrom, an oil-burner for the boiler, an oil-conductor communicating with the interior of the frame and with the burner, and a steam-conductor leading from the boiler to the burner, said elements combined for joint operation, as described.

398,549. SASH-FASTENER. THOMAS S. SMITH, Washington, D. C., assignor to Hobart B. Ives and Company, New Haven, Conn. Filed Feb. 3, 1888. Serial No. 262,830. (Model.)



Claim.—1. In a sash-fastener, in combination with the latch provided with the cam-engaging recess, the cam adapted to engage the outer side of the recess to force the latch outward and provided with an abutting portion to be swung around behind such side of the recess, so as to hold the latch positively outward, substantially as and for the purpose shown.

2. In a sash-fastener, in combination with the latch having the longitudinal slot and the cam-engaging recess, the pivot-pin engaging the slot, and the rotary cam adapted to engage the recess-side, so as to force the latch outward, and having an abutting face on its outer side adapted to be brought by the rotation of the cam around behind the recess-side, so as to lock the latch positively outward, substantially as and for the purpose set forth.

3. In a sash-fastener, in combination with the latch having the cam-engaging recess, the base, and engaging, guiding, and locking devices on the base and latch, respectively, to guide the latch in its swing and lock it from swinging as it is moved longitudinally at the ends of its swing, and the rotary cam having portions to engage the latch-recess sides to swing the latch and move it longitudinally, and with abutting faces on its outer side adapted to be moved around behind the engaged recess-sides when the latch has been moved longitudinally, so as to lock the latch positively against return movement, substantially as and for the purpose described.

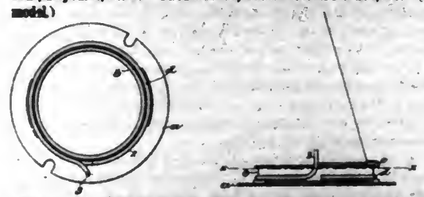
4. In a sash-fastener, in combination with the base provided with a curved guiding-surface having an inwardly-extending offset or notch at one end and a radial shoulder at the other, the latch having the longitudinal slot, the cam-recess, and the guide-lug, the pivot-pin engaging the slot in the latch, and the cam having the surfaces adapted to engage the recess-sides, so as to swing the latch and move it longitudinally at each end of its swing, and the abutting faces on its outer side adapted to swing around behind the recess-sides when the latch has been moved longitudinally, so as to positively lock the latch as moved, substantially as and for the purpose specified.

5. In combination with the swinging and longitudinally-moving latch provided with the cam-recess, the cam having the two eccentric sides for engaging opposite sides of the recess as the cam is swung in one direction or the other, and substantially concentric faces on its outer side for engagement with the recess-sides when the latch has been moved longitudinally, substantially as and for the purpose shown.

6. In combination with the base having a curved guiding-surface and an inwardly-extending notch at one end of such surface and a shoulder at the other end, the latch having the guide-lug, the longitudinal slot, and the cam-recess, the pivot-pin, and the cam having eccentric portions to engage opposite sides of the cam-recess and substantially concentric portions on its outer side to engage the recess-sides after the eccentric portions of the cam have acted upon them, substantially as and for the purpose set forth.

7. In a sash-fastener, in combination with the base having the two concentric slots with oppositely-extending locking-notches at their opposite ends, the latch having the two guide-lugs and the cam-recess, and the triangular cam having the two eccentric sides and the concentric outer end or side, substantially as and for the purpose shown.

398,550. TRAVELER-CLEARER FOR RING-SPINNING FRAMES. THOMAS H. SPEARMAN, Ware, assignor of one-half to George Draper & Sons, Hopedale, Mass. Filed Jan. 15, 1889. Serial No. 296,401. (No model.)



Claim.—1. The herein-described traveler-clearer consisting of wire-like material shaped to form a band to embrace the neck of the ring, and having a projection or finger, 3, substantially as described.

2. The combination, with the ring, of a clearer consisting of a spring-band having a finger, 3, substantially as described.

398,551. HAT-POUNCING MACHINE. CHARLES W. STEVENS, Yonkers, N. Y., assignor of one-half to James P. Ross, Newark, N. J. Filed May 7, 1888. Serial No. 273,093. (No model.)

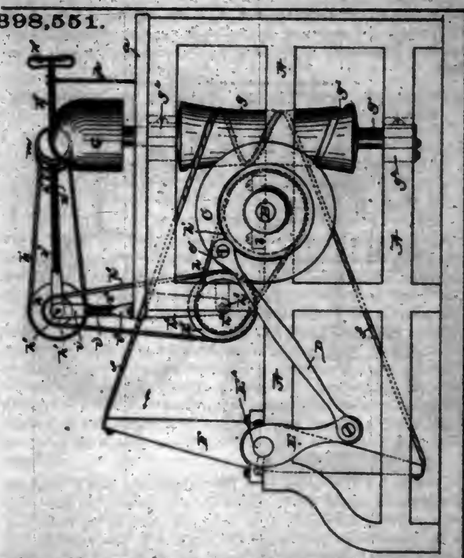
Claim.—1. A hat-block and its spindle or shaft, combined with a rocker having an alternate rotary movement, and a belt wound at or about its middle one or more times about said spindle or shaft, and having its ends attached to said rocker at opposite sides of its axis of movement, substantially as and for the purpose set forth.

2. A hat-block and its shaft, the latter having an enlarged portion or sleeve, combined with a rocker having an alternate rotary movement, and a belt wound at or about its middle one or more times about said enlarged portion or sleeve, and having its ends attached to said rocker at opposite sides of its axis of movement, substantially as and for the purpose set forth.

3. A hat-block and its shaft, the latter having an enlarged portion or sleeve with a concaved periphery or face, as set forth, combined with an oscillating rocker and a belt wound one or more times about said concaved sleeve, and having its ends attached to said rocker at opposite sides of its axis of movement, substantially as and for the purpose set forth.

4. A hat-block and its shaft, the latter having an enlarged portion

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or sleeve with a concaved periphery or face, as set forth, combined with a belt wound one or more times about said concaved face of the sleeve and mechanism for alternately pulling on one and then the other end of said belt to give reverse rotations to the hat-block, as and for the purpose set forth.

5. A hat-block and its shaft, the latter having an enlarged portion or sleeve provided with a concaved face, as set forth, a rocker mounted on a shaft, a belt wound one or more times about the concaved sleeve and having its ends attached to the rocker at opposite sides of the rocker-shaft, a main shaft and means to impart rotary motion thereto, and mechanism, substantially as described, connecting the main and rocker shafts for imparting an oscillatiog movement to the rocker from the rotary movement of said main shaft, in combination, substantially as and for the purpose set forth.

6. The combination, with a rotating hat-block, of a pouncing-tool consisting, essentially, of a disk having its face or flattened surface provided with suitable pouncing paper or cloth and adapted to be brought in contact with the crown and sides of the hat-body to be pounced, the diameter of said disk being considerably less than the diameter of the hat-block and capable of having imparted to it a rotary movement of considerably greater speed than said hat-block, as and for the purpose set forth.

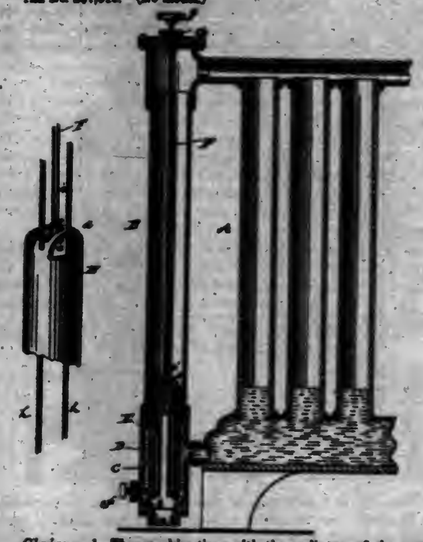
7. The combination, with a hat-block and means for imparting a reciprocatory rotary motion thereto, of a pouncing-tool consisting, essentially, of a disk having its face or flattened surface provided with suitable pouncing material or cloth and adapted to be brought in contact with the crown and sides of the hat-body to be pounced, and of a diameter considerably less than the diameter of the hat-block, and mechanism for rotating said disk at a speed considerably greater than the speed of the hat-block, as and for the purpose set forth.

8. The combination, with a rotating hat-block, of a pouncing-disk the face or flattened surface of which is adapted to be brought in contact with the crown and sides of the hat-body to be pounced and is of considerably less diameter than that of the hat-block, and provided with a pulley and shaft, a hand-rod having the said shaft journaled therein, a yoke-piece mounted on a shaft, as h^3, at one end, and having a swivel-connection with the hand-rod at its other end, the shaft, as h^3, mounted in a yoke-piece swiveled in a supporting-standard, said shaft having a pulley, a belt engaging said pulley and the pulley on the pouncing-disk shaft, and suitable well-known mechanism for imparting rotary motion to said shaft, as h^3, to cause rotation of the pouncing-disk, as and for the purpose described.

9. The combination, with a rotating hat-block, of a pouncing-disk the face or flattened surface of which is to be brought in contact with the crown and sides of the hat-body to be pounced and is of considerably less diameter than that of the hat-block, a swiveled holder for said disk, and mechanism, substantially as described, for imparting a rotary motion to said disk of considerably greater speed than that of the hat-block, as and for the purpose set forth.

10. The combination, with a hat-block having a reciprocatory rotary motion, of a swiveled disk-holder provided with a pair of pouncing-disks arranged with their backs opposite each other, said disks being of considerably less diameter than that of the hat-block, and the faces or flattened surfaces thereof being adapted to be brought in contact with the crown and sides of the hat-body to be pounced, and mechanism for imparting to said disks a speed of rotation in one direction considerably greater than the speed of the hat-block, substantially as and for the purpose set forth.

398,552. WATER-DISCHARGE REGULATOR FOR STEAM-RADIATORS. DANIEL H. SCHNEPER, Norristown, Pa. Filed Oct. 11, 1888. Serial No. 287,812. (No model.)



Claim.—1. The combination, with the radiator, of the vertical pipe B, having upper and lower lateral connections with the upper and lower ends of the radiator, and having an outlet, *a*, in its lower extremity, the longitudinally-extensible outlet-pipe within the pipe B, open at both ends and communicating at its lower end with the outlet *a*, and a rod extending down through the pipe B from its upper end to the extensible pipe, substantially as set forth.

2. The combination, with the radiator, of the vertical pipe B, having lateral connections near its upper and lower ends with upper and lower ends of the radiator, and provided with the outlet *a* below the lower connection, *c*, the longitudinally-extensible outlet-pipe open at both ends, with its lower end detachably connected with the outlet *a*, and a rod leading from said extensible pipe upwardly through the top of tube B, whereby said outlet-pipe may be extended and contracted in length and also be bodily moved away from the outlet *a*, substantially as set forth.

3. A water-discharge for steam-radiators, consisting in the tube B, having a cap at its upper end, a lateral opening adjacent thereto, a lateral water-inlet, *c*, near its lower end, and an outlet, *a*, in its bottom, the transverse set-screw *f*, extending into the tube B above the outlet *a*, the longitudinally-extensible and vertically-movable outlet-pipe within the pipe B and detachably held in register with the outlet *a* by said set-screw, the cross-piece *d*, the rod F, extending down through the cap to said cross-piece, and the guide-rods *h h*, extending down from the cap through said cross-piece, substantially as set forth.

398,553. WHIFFLETREE OR NECK-YOKE IRON. BENJAMIN J. SOMERS, Pittsburg, Pa. Filed June 19, 1888. Serial No. 277,534. (No model.)



Claim.—1. A vehicle-iron of the nature described consisting of a radially and longitudinally webbed or flanged steel bar, the flanges of which are reduced in height but not in thickness from at or near the middle of the bar toward its ends, substantially as and for the purpose described.

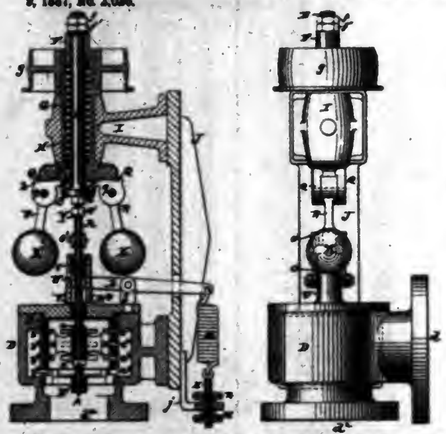
2. A vehicle-iron of the nature described consisting of a radially and longitudinally webbed or flanged steel bar, the flanges of which are gradually reduced in one only of the cross-sectional dimensions from at or near the middle toward the ends, substantially as and for the purpose described.

3. A vehicle-iron of the nature described consisting of a radially and longitudinally webbed or flanged steel bar, the flanges of which

are reduced, the core of the bar being of substantially the same dimension for a considerable portion of its length, substantially as and for the purposes described.

4. A vehicle-iron of the nature described consisting of a radially and longitudinally webbed or flanged steel bar having a clevis-band set thereon at the middle, substantially as and for the purposes described.

398,554. GOVERNOR FOR ENGINES. HENRY TATE, Jr., and JOHN KILLIP, Jr., Liverpool, County of Lancaster, England. Filed Nov. 5, 1887. Serial No. 254,412. (No model.) Patented in England Feb. 9, 1887, No. 2,086.



Claim.—1. In a governor, the combination of the non-rotating valve, its spindle, and the spring M, connected to said spindle to open the valve, the spindle E, bearing upon but disconnected from the valve-spindle, the rotary collar or head G, and its governor-arms R, acting on the spindle E, whereby the arms R are caused to close the valve and the spring M caused to open the same.

2. In a governor for engines, the upright sustaining-frame J, the rotating sleeve G, mounted therein, the driving-pulley *g*, keyed to the upper end of said sleeve, the flange *g'* on the lower end of the sleeve, and the governor-arms pivoted to said flange, in combination with the spindle E, located within said sleeve and adapted to be engaged by the governor-arms, the collar F on the upper end of the spindle, and the spring encircling said spindle, one end bearing on the collar F and the other end bearing on the flange *g'*.

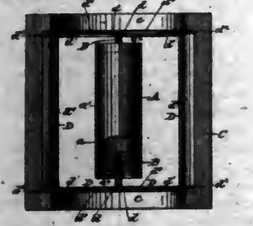
3. In a governor of the type herein described, the combination of the sleeve G, the governor-arms pivoted thereto, the spindle E, adapted to be engaged by the said arms, and the stops *k* on said arms, adapted to encounter the sleeve and limit the outward motion of the arms.

4. The combination of the sleeve G, governor-arms K, pivoted thereto, ball-crank arm R, projection *k*, and collar S, for the purposes described.

5. In a governor for engines, the valve, the valve-spindle connected thereto, the spindle E, disconnected from said valve-spindle, and the governor-arms adapted to operate the spindle E, in combination with the adjusting device V, having one end connected to one of said spindles and its other end free and adapted to bear against the opposing spindle, substantially as and for the purpose described.

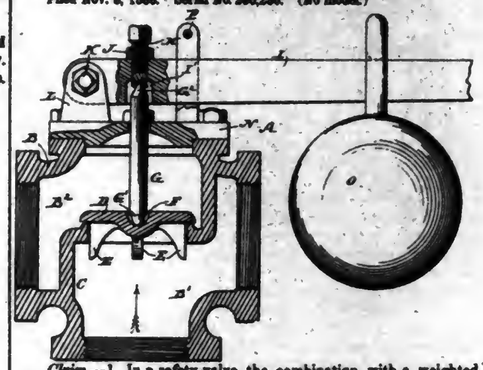
398,555. WITHDRAWN.

398,556. LUBRICATOR FOR JOURNALS OF RAILWAY-WHEEL AXLES. EMERY VAN DUCAR, East Albany, assignor of one-half to AARON FYLER, Bath-on-the-Hudson, N. Y. Filed Nov. 30, 1888. Serial No. 292,263. (No model.)



Claim.—The combination, with the lubricating-cylinder A, constructed of perforated metal *a*, and porous outer cushion, covering the former, and mounted on shaft B, and having open end heads, of the bearings *d d*, supported by the elastic holding devices D, constructed, substantially as described, for operation and purposes as set forth.

398,557. SAFETY-VALVE. FRANCIS X. VIEH, Brooklyn, N. Y. Filed Nov. 5, 1888. Serial No. 290,236. (No model.)



Claim.—1. In a safety-valve, the combination, with a weighted lever hung on pointed screws, of a set-screw screwing in the said lever, a pin provided with a point at its upper end engaging the under side of the said set-screw, and a valve-disk mounted to slide vertically and in the center of which rests the lower end of the said pin, substantially as shown and described.

2. In a safety-valve, the combination, with a valve-body provided with a valve-seat and a cover secured on the said valve-body, of a valve provided with downward projections for guiding it in its seat, a pin resting at its lower end in the center of the said valve and passing loosely through said cover, a set-screw engaging the upper pointed end of the said pin, a lever in which screws said set-screw, and screws having pointed ends forming the pivot for the said lever, said screws screwing in lugs on the said cover, substantially as shown and described.

398,558. LAWN-TENNIS BALL. HARRY H. WADDINGTON, Manchester, County of Lancaster, England. Filed Oct. 16, 1888. Serial No. 288,206. (No model.) Patented in England Oct. 21, 1887, No. 14,300.



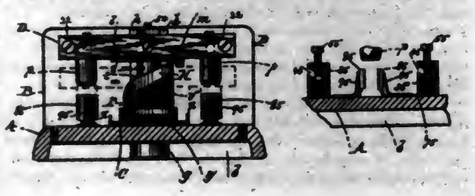
Claim.—The improvement in the manufacture of lawn-tennis balls, consisting in molding in the surface of the india-rubber ball a groove or grooves corresponding in form with the seam or seams, and after sewing on the cover, as usual, pressing the seam or seams into the said groove or grooves, so as to produce a ball in the form of a perfect sphere and with the stitches below the surface, substantially as hereinbefore described, and illustrated by the drawings annexed.

398,559. DYNAMITE. JOHN WAFFEN, Hancock, Mich., assignor to himself, Daniel Kloeckner, and Philip Schoenermann, both of same place. Filed June 16, 1888. Serial No. 277,267. (No specimens.)

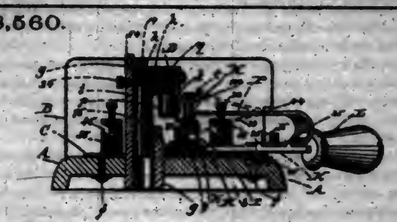
Claim.—The herein-described composition of matter to be used as an explosive, consisting of nitrate of soda, decayed wood, picric acid, sulphur, carbonate of soda, and nitro-glycerine having collodion mixed with it, substantially as and in or about the proportions specified.

398,560. ELECTRIC SWITCH. FRANKLIN A. WHELER and ADOLPH F. RIETZEL, Lynn, Mass. Filed Dec. 12, 1888. Serial No. 293,374. (No model.)

Claim.—1. In a switch of the character described, the combination of a table provided with poles, a rod bearing metallic plungers and fitted to slide in said table, metallic sockets for said plungers in



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contact with companion poles, a pivoted lever provided with a flat spring, a cam provided with two faces or tracks for distending said spring when the lever is moved, and arms on said rod for engaging the spring when it leaves said tracks, substantially as set forth.

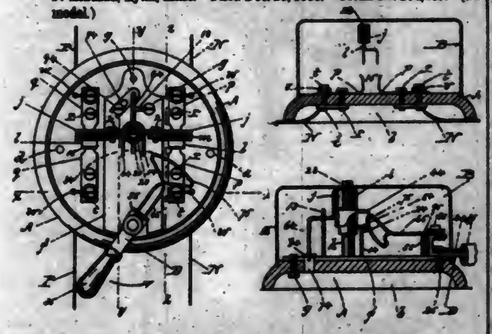
2. In a switch of the character described, the combination of a table provided with poles, a rod fitted to slide in said table and provided with a plate having arms, a bar on said plate provided with metallic plungers, metallic plates in contact with companion poles and forming sockets for said plungers, a pivoted lever provided with a flat spring, and a cam for distending said spring when the lever is moved, whereby it will strike one of said arms when returning to its normal position after leaving said cam, substantially as and for the purpose specified.

3. In a switch of the character described, the combination of a table provided with poles, a bed-plate provided with a tube, a rod fitted to slide therein, a plate on said rod provided with arms, a bar secured to said rod and bearing metallic plungers, metallic plates in contact with companion poles and forming sockets for said plungers, a pivoted lever provided with a flat spring, and a cam on said bed-plate for distending said spring, whereby it may be caused to strike said arms and actuate the plungers, substantially as set forth.

4. In a switch of the character described, the combination of the table A, provided with the poles 35 and 65, the rod *i*, fitted to slide in said table and provided with the plate *k*, having the arms *l m*, the bar D, provided with the plungers *p*, the plates 75 in contact with said poles and forming sockets for said plungers, and mechanism for engaging said arms and actuating said plungers, substantially as and for the purpose set forth.

5. In a switch of the character described, the combination of a table provided with poles, a bed-plate having a vertical tube, a rod fitted to slide in said tube, a plate on said rod having outwardly-projecting arms, a bar provided with metallic plungers and secured to said plate, a soft-copper plate in contact with each pole, companion plates forming sockets for the plungers, a pivoted lever provided with a flat spring, and a cam having two faces for distending said spring when said lever is moved, whereby it is caused to strike an arm of said plunger-plate as it leaves the cam, substantially as and for the purpose set forth.

398,561. ELECTRIC SWITCH. FRANKLIN A. WHELER and ADOLPH F. RIETZEL, Lynn, Mass. Filed Dec. 26, 1888. Serial No. 294,619. (No model.)



Claim.—1. In an electric switch, the lever D, pivoted on the bolt 25 and provided with the retaining-spring 45, in combination with the spring 65, provided with the diagonally-arranged head 75, substantially as and for the purpose set forth.

2. In an electric switch, the combination of a table provided with a standard, a tube fitted to slide on said standard and bearing sheet-metal plungers, connector-plates on said table forming sockets for said plungers, a pivoted lever provided with a spring having a diagonally-arranged head, a post for distending said spring, and arms on said tube for receiving said spring as it leaves said post, whereby said plungers are actuated, substantially as described.

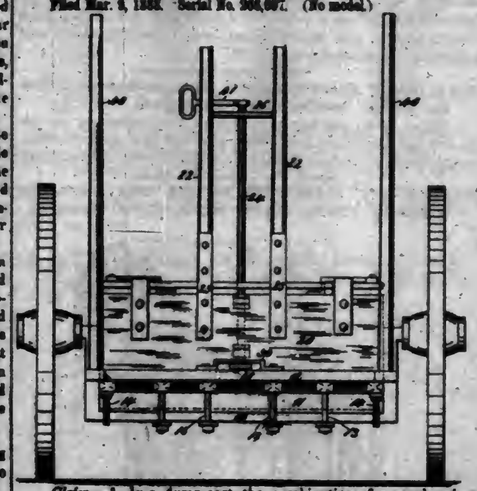
3. In a switch, the tube *i*, fitted to slide on the standard *h* and provided with the clamping-plate *j*, in combination with the guide-rod 64 and plate 84, whereby said clamping-plate may be adjusted horizontally, substantially as described.

4. In an electric switch, the combination of a table, provided with connector-plates bent to form plunger-sockets, a bed-plate provided with a standard, a tube fitted to slide on said standard and provided with sheet-metal plungers adapted to engage said sockets, a lever pivoted to said table, a spring secured to said lever and provided with a cam-shaped head, a post on said bed-plate for engaging said cam-head and distending the spring, and arms on said tube projecting into the path of said spring, whereby the plungers may be forced into contact with or disconnected from their sockets, substantially as described.

5. In an electric switch, the combination of the table A, provided with the connector-plates *p q*, bent to form sockets 15, the bed-plate *f*, provided with the standard *h* and post 14, the lever D, the spring 65, having the cam-head 75, the tube *i*, provided with the clamping-plate *j*, and arms 44 and 54, projecting into the path of said spring, the plungers *l*, adjustably secured in said clamping-plates, and the guide-rod 64 and plate 84, whereby said plungers may be adjusted horizontally, all being arranged to operate substantially as set forth.

6. In an electric switch, a pivoted lever provided with a spring having a cam-shaped head, in combination with a standard for engaging and distending said spring when the lever is moved, and a tension-spring secured to said lever and bearing upon the pivot thereof, substantially as and for the purpose specified.

398,562. DUMP-CART. HARTWELL A. WILKIN, New York, N. Y. Filed Mar. 3, 1888. Serial No. 266,097. (No model.)



Claim.—1. In a dump-cart, the combination of a crank-axle, a body mounted thereon at one side of the center of its length, angular draft-irons pivotally connected to the crank-axle, thills secured to the forward ends of the draft-irons, and a locking device for securing the body in its normal position, substantially as described.

2. In a dump-cart, the combination, with a crank-axle and a body secured thereto, of the thills provided with a foot-board, angular draft-irons pivoted to the axle and having their forward ends secured to the thills, and a locking-tongue adapted to engage the body to lock it in position, substantially as described.

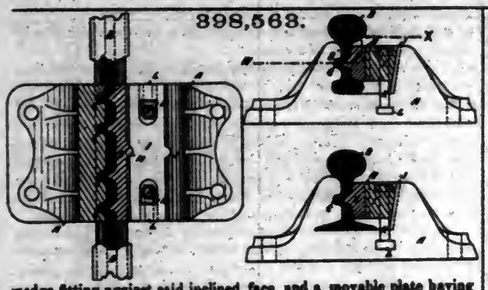
3. In a dump-cart, the combination, with a crank-axle and a body mounted thereon and provided with a keeper, of the thills 16, provided with the foot-board 17, the angular draft-irons 19, pivoted to the crank-axle and having their forward ends secured to the thills, and the shaft 24, provided with the locking-tongue 28 on its lower end for engaging the keeper of the body, substantially as described.

4. In a dump-cart, the combination, with a crank-axle and a body mounted thereon and provided with a keeper, of the thills 16, the foot-board 17, the apertured board 20, the angular draft-irons 19, pivoted to the axle and secured to the board 20 and to the thills, the thill-rungs 22, and the shaft 24, journaled between the thill-rungs and provided with the locking-tongue 28, substantially as herein shown and described.

398,563. RAILWAY-CHAIR AND THE METHOD OF SECURING RAILS THEREIN. GEORGE W. WILLFORD, Sheffield, County of York, England. Filed June 26, 1888. Serial No. 278,082. (No model.) Patented in England Mar. 16, 1885, No. 3,577.

Claim.—1. A rail having ribs on one side and corresponding recesses in the other, in combination with a chair which has recesses to receive said ribs and an inclined face on the other side of said rail, a

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wedge fitting against said inclined face, and a movable plate having ribs which fit the recesses of the rail, said plate being held in position against said rail by said wedge, substantially as set forth.

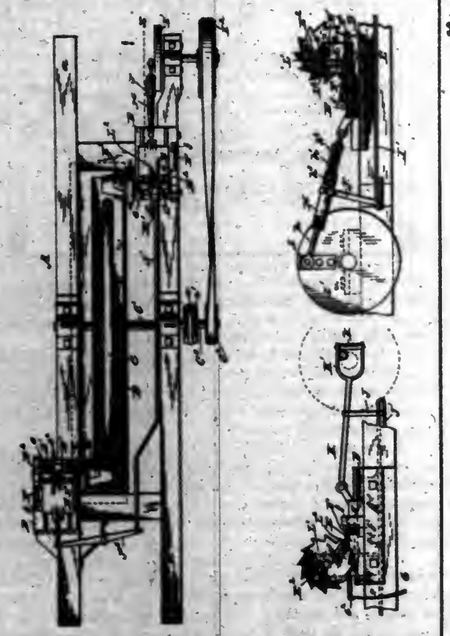
2. A rail having recesses in one side of it, in combination with a movable plate having ribs which fit into such recesses, and also a vertical rib or projection on its outer side, a wedge recessed to receive said rib, and a chair having an inclined face in contact with said wedge, substantially as set forth.

3. A rail having recesses on one side, in combination with a movable plate having ribs which fit into said recesses, and also a vertical rib or projection, H, on its outer face, a wedge recessed to receive said vertical rib or projection, and also provided on its outer face with a similar rib or projection, J, and a chair having an inclined face for contact with said wedge, and also recessed to receive said projection J, substantially as set forth.

398,564. MORDANT. WILLIAM J. WILLIAMS, Camden, N. J. Filed Aug. 13, 1888. Serial No. 282,612. (No specimens.)

Claim.—The mode herein described of fixing colors and preventing rust and crocking in textile fibers or fabrics, said mode consisting in subjecting the fabrics or fibers to the action of trisodium phosphate.

398,565. GLASS-CUTTING MACHINE. HARRY C. WOOD, New Brighton, Pa. Filed Apr. 20, 1888. Serial No. 272,243. (No model.)



Claim.—1. In a machine for cutting, grinding, or polishing glassware, the combination, with a grinding or polishing wheel, of a sliding carriage for supporting the glass and a yielding connection between the carriage and motive power, substantially as described.

2. In a glass-cutting machine, the combination, with the stone, of a reciprocating carriage for supporting the glass, a crank, and a yielding pitman connecting the crank with the carriage, substantially as described.

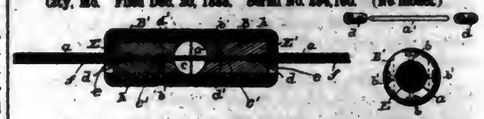
3. In a glass-cutting machine, the combination, with the stone and reciprocating work-support, of the sleeve-shaft, crank, rods connecting the sleeve-shaft with the crank and work-support, and a spring interposed between the end of the sleeve-shaft and an adjustable stop on one of the rods, substantially as described.

4. In a glass-cutting machine, the combination, with the stone, of a sliding work-support, a spring for moving the support toward the stone, a yielding connection between the support and the motive power, and an automatic stop for arresting motion of the support substantially as described.

5. In a glass-cutting machine, the combination, with the stone, of two sliding work-supports arranged on opposite sides of the stone, a lever and rod for connecting the two supports, and a yielding connection between one support and the motive power, substantially as described.

6. In a glass-cutting machine, a sliding carriage having a shaft provided with a chuck and a ratchet, said shaft being also provided with a hole in its circumference, a track having a hole and supporting a pawl, a spring-bolt adapted to engage both of said holes, and a lever connected to said bolt and adapted to hold it out of engagement with said holes, all combined substantially as and for the purpose set forth.

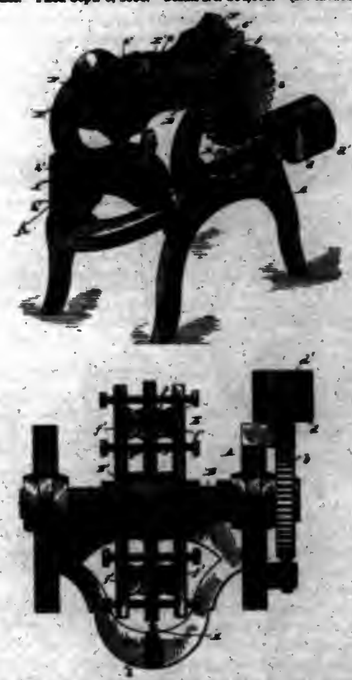
398,566. ELECTRIC CUT-OUT. WILLIAM H. S. WRIGHT, Kansas City, Mo. Filed Dec. 20, 1888. Serial No. 294,160. (No model.)



Claim.—1. An electric cut-out comprising two wires joined by a fusible connecting-rod and an inclosing insulated transversely-divided case, whereby when the fusible rod melts the wires are prevented from forming a ground-connection, substantially as set forth.

2. In an electrical insulated cut-out, the combination, with the adjacent terminals of an electrical conductor-wire and ferrules placed on these ends, of a fusible rod composed of metallic alloy, two cylinders having electrical conductivity, two enveloping-shells of insulating substance, two sleeves or ferrules placed on the ends of the fusible rod, and set-screws which engage these ferrules and have their heads embedded in the insulating-shells, substantially as set forth.

398,567. CRIMPING-MACHINE. ALPHEUS A. ABBOTT, Auburn, Me., assignor to Stephen Moore, Newton, and Frank T. Fuller, Boston, Mass. Filed Sept. 6, 1888. Serial No. 284,691. (No model.)



Claim.—1. In a machine for crimping boots and shoes, the combination, with the frame provided with an upright, and a spring-held form pivoted thereto, of a rotatable head carrying jaws adapted to pass over said form, substantially as and for the purpose set forth.

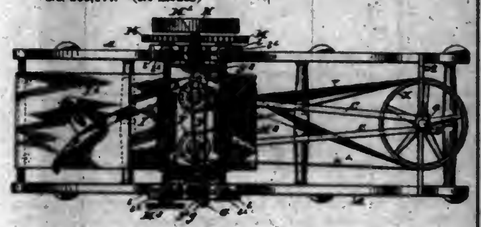
2. In a machine for crimping boots and shoes, the combination, with the frame provided with an upright, of a form pivotally secured to the latter, springs secured to the upright and bearing against the form to retain it in place, and a rotatable head carrying jaws adapted to pass over said form, substantially as set forth.

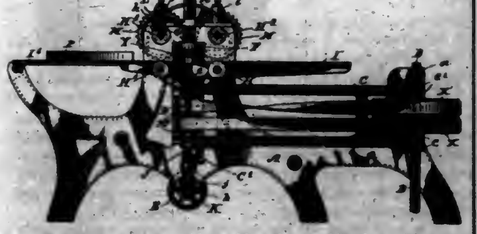
3. In a crimping-machine, the herein-described head, comprising a rotatable shaft, parallel arms mounted thereon and projecting in a straight diametrical plane at each side thereof, oppositely-disposed jaws pivoted at the ends of the arms upon their inner faces, and set-screws provided through the arms at each side the pivot, for adjusting the jaws, substantially as set forth.

4. In a crimping-machine, the herein-described head, comprising a standard, a form hinged vertically thereto, and springs secured to the standard at each side and having their free ends bearing against the form, substantially as set forth.

5. The herein-described crimping-machine, comprising a frame, a standard projecting therefrom carrying a spring-held form, a shaft journaled in the frame and carrying parallel arms projecting at each side thereof, jaws pivoted at both ends of the arms upon their inner faces, and set-screws for adjusting the same, and gearing connected with one end of the shaft for imparting motion thereto, all arranged and adapted to operate substantially as and for the purpose set forth.

398,568. MOLDING-MACHINE. JOSEPH BAKER, Andover, N. H., assignor to Baker, Carr & Co., same place. Filed Sept. 12, 1888. Serial No. 285,177. (No model.)





Claim.—1. In a two-side molder, the combination, with a vertical driving-shaft and pulleys thereon, of horizontal radial arms mounted upon said shaft, rotary cutter-heads and their driving-pulleys mounted upon an arbor running in the free ends of said horizontal arms, and means for maintaining an equal pressure of said arms automatically each toward the other and at varying distances apart.

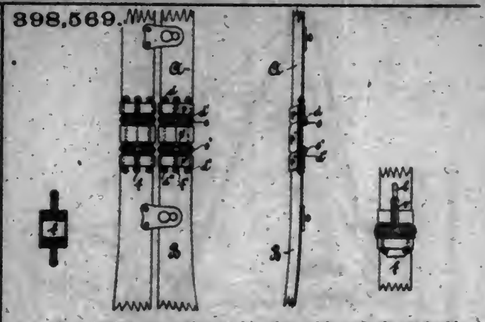
2. In a two-side molding-machine, the combination, with a suitable frame having horizontal feed and pressure rolls, of an adjustable table over which the work to be dressed is passed, a vertical driving-shaft and pulleys thereon, the horizontally-movable radial arms mounted upon said shaft, rotary cutter-heads and their driving-pulleys mounted upon an arbor running in the free ends of said radial arms, and means for maintaining an equal pressure of said arms automatically each toward the other and at varying distances apart, substantially for the purposes specified.

3. The combination of horizontally-movable radial arms provided at their free ends with an arbor and rotary cutter-heads and their drive-pulleys mounted thereon, and one or more trucks mounted on their under side and adapted to move upon a fixed support for partially sustaining their weight, as set forth.

398,569. CORSET-BUSK. OTTO RAHDER, Hamburg, Germany, assignor to Adolph Hartshorn & Co., same place. Filed June 11, 1888. Serial No. 166,908. (No model.) Patented in Belgium May 15, 1888, No. 86,895; in France May 23, 1888, No. 189,110; in Austria-Hungary Oct. 9, 1888, No. 39,109 and No. 51,512, and in England June 4, 1888, No. 6,907, and June 13, 1888, No. 8,128.

Claim.—1. A corset busk or stay composed of two halves united by hinge-joints and a helical spring placed transversely to the busk or stay, one end of the said spring being attached to one half and the other end to the other half of the busk or stay, substantially as described.

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2. In a busk or stay, the combination, with a single or double hinge, *d*, fitted with a single or double spring, *f*, across the staff coiled round pins *e*, of cover-plates *p*.

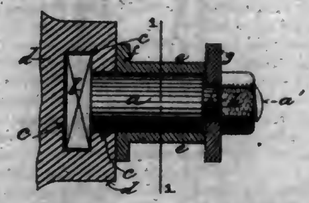
398,570. LOOM-PICKER. JOHN W. BARLOW, Lawrence, Mass. Filed Nov. 7, 1888. Serial No. 290,190. (No model.)



Claim.—1. A loom-picker having a foot or tenon composed of two parts, each folded upon itself and interlocked with the other.

2. A loom-picker having a foot or tenon composed of two parts, each folded upon itself and interlocked with the other, and having its greatest width in the direction of the movement of said picker when in operation.

398,571. TRUNNION FOR CYLINDERS. GODFAY A. BARTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Oct. 22, 1888. Serial No. 288,836. (No model.)



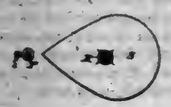
Claim.—1. The combination, with a cylinder having slotted projections, of detachable sleeve-trunnions, and T-headed bolts and nuts for securing the sleeve-trunnions to said cylinder, substantially as and for the purposes described.

2. The combination, with a cylinder having slotted projections, of detachable sleeve-trunnions provided with collars, and T-headed bolts and nuts for securing the sleeve-trunnions to said cylinder, substantially as and for the purposes described.

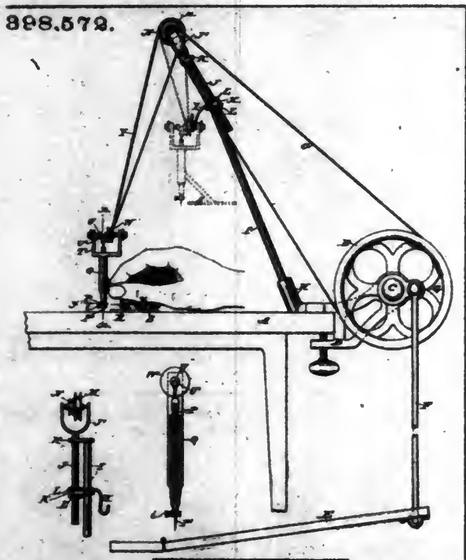
3. The combination, with a cylinder having slotted projections, of detachable sleeve-trunnions provided with collars and washers, and T-headed bolts and nuts for securing the sleeve-trunnions to said cylinder, substantially as and for the purposes described.

398,572. MACHINE FOR PERFORATING PAPER PATTERNS. MAX RENNER, New York, N. Y. Filed Mar. 5, 1888. Serial No. 266,307. (No model.)

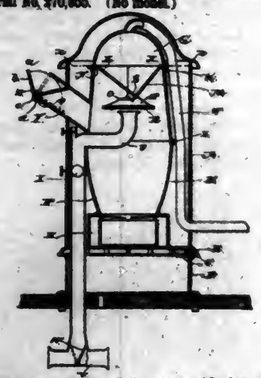
Claim.—The combination, with a reciprocating stencil-perforating needle and the case inclosing the same, of the flat extended base-plate and the interposed bracket-bar connecting the plate and case, whereby the needle is upheld in a vertical position by the base-plate independently of other support, substantially in the manner and for the purpose herein set forth.



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398,573. DOMESTIC OR RAILWAY-CAR HEATER. WILLIAM P. BRINER, Columbus, Ohio, assignor of nine-sixteenths to Van S. Baltzer, A. R. Robinson, and Wm. H. Slade, all of same place. Filed Apr. 14, 1888. Serial No. 270,655. (No model.)



Claim.—1. The inner shell and the removable dome G, the latter having the depending flange K, to fit around the upper end of the shell, in combination with the deflecting-plates L M, inclined in opposite directions and having the flanges N at their upper edges, said flanges bearing on the upper side of the shell, substantially as described.

2. The combination, with the shell or stove, of the deflecting-plates L M, suspended in the upper end thereof and inclined in opposite directions, and the horizontal deflecting-plate R, having the vertical ribs P on its upper side fast to the lower edge of the plate M, substantially as described.

3. The heater comprising the outer shell, the inner shell or stove, the eduction-pipe leading from the upper end of the latter and extending out through the outer shell, the oppositely-inclined deflecting-plates L M in the upper end of the inner shell, the horizontal deflecting-plate below plates L M, and the air-induction pipe having its upper end arranged under the horizontal deflecting-plate, substantially as described.

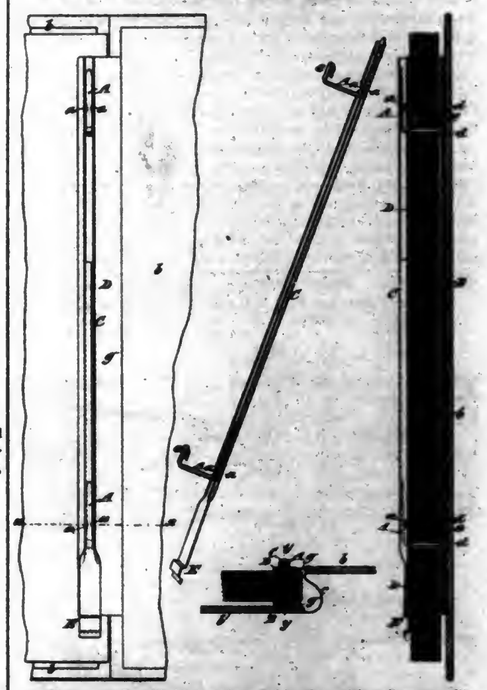
4. In a heater, the fire-pot, combined with the deflecting-plates L M, arranged in the upper end of the fire-pot, the lower edge of the plate M being extended below the plate L and having the ledge O, and the horizontal deflecting-disk R, suspended below the deflecting-plates at or about the ledge O, as set forth.

5. The heater provided with the oppositely-inclined plates L M, having their meeting inner ends separated by a space, and the horizontal deflecting-disk R, suspended below the meeting inner ends of the plates and secured to one of said plates, as set forth.

6. The inner shell and the removable dome G, combined with the removable deflectors L M, the latter being held in place within the shell by means of the dome, as set forth.

7. The heater having the inclined deflector-plates L M above the fire-box, the deflector-disk R, suspended below the plates, the eduction-pipe T, leading from the dome of the heater above the deflectors, and the induction-pipe U, having its upper end arranged below the deflectors, as set forth.

398,574. FILE-BINDER. MARCELLUS F. BERRY, Brooklyn, N. Y. Filed June 18, 1888. Serial No. 277,402. (Model.)



Claim.—1. In a file-binder, the combination, with a pliant metallic needle to pass through the file of papers and bend over thereon and bind the same, of a head-clamp bar, to which the needle is firmly attached, and a point-clamp bar grooved to receive the point and having a portion of the said groove closed or contracted to pass under and retain the needle, substantially as described and set forth.

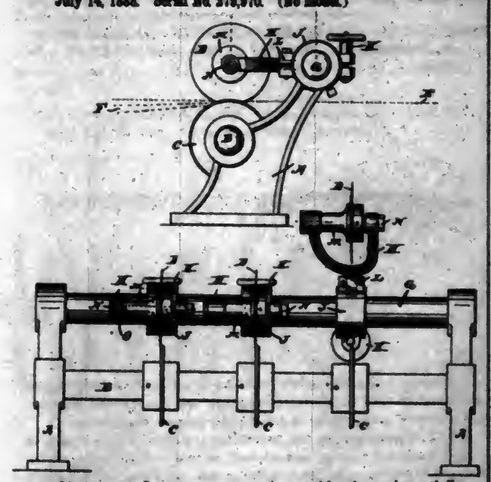
2. In a file-binder, the combination, with a pliant metallic needle to pass through the file of papers and bend over thereon and bind the same, of a head-clamp bar, to which the needle is firmly attached, a point-clamp bar grooved to receive the point and having a portion of the said groove closed or contracted to pass under and retain the needle, and an intermediate clamp-plate beneath the bent-over parts of the needle to stiffen the binding or attach to a cover, all substantially as described and set forth.

3. In a file-binder, the combination, with a pliant metallic needle to pass through the file of papers and bend over thereon and bind the same, and a head-clamp bar, to which the head of the needle is firmly attached by a loop or bend therein inclosing a portion of the bar, of a point-clamp bar grooved to receive the point of the needle and having a portion of the said groove closed or contracted to pass under and retain the needle, substantially as described and set forth.

4. In a file-binder, the combination, with a pliant metallic needle to pass through the file of papers, bend over thereon and bind the same, and a head-clamp bar, to which the head of the needle is firmly attached, of a point-clamp bar grooved to receive the point and having a portion of said groove closed or contracted to pass under and retain the needle, and an elastic catch or holder to retain the point-clamp bar on the needles, substantially as described and set forth.

5. In a file-binder, the combination, with a pliant metallic needle to pass through the file of papers, bend over thereon and bind the same, a head-clamp bar, to which the needle is firmly attached, a point-clamp bar grooved to receive the point and having a portion of said groove closed or contracted to pass under and retain the needle, an intermediate clamp-plate beneath the bent-over parts of the needle, of two covers and a flexible back, one of said covers being flexibly attached to the head-clamp bar and the other cover being flexibly attached to the intermediate clamp-plate, all substantially as herein described and set forth.

398,575. PAPER-CUTTER. ALBERT BEIS, Hamilton, Ohio. Filed July 14, 1888. Serial No. 279,970. (No model.)



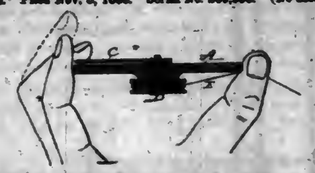
Claim.—1. In a paper-cutter, the combination, substantially as set forth, of a shaft carrying one or more slitter-disks, and a non-rotary shaft parallel therewith, a slitter-housing clamped to said non-rotary shaft and adapted for longitudinal and rotary adjustment thereon, a slitter carried in said housing and movable axially therein, and a spring engaging said slitter and housing.

2. In a paper-cutter, the combination, substantially as set forth, of a rotary shaft provided with one or more slitters, a non-rotary shaft disposed parallel thereto, a forked slitter-housing clamped to said non-rotary shaft and adjustable longitudinally and rotarily thereon, bolt N, slitter D, provided with hub M, engaging said bolt, and spring O.

3. In a paper-cutter, the combination, substantially as set forth, of shaft B, provided with one or more slitters, C, non-rotary shaft G, two-part collar J, provided with clamp-socket L, clamp-screw K, housing H, engaging said clamp-socket by a longitudinal shank, and slitter D, carried by said housing.

4. In a paper-cutter, the combination, substantially as set forth, of shaft B, one or more slitters, C, thereon, non-rotary shaft G, two-part collar J, clamp-screw K, clamp-socket L, housing H, slitter D, hub M, bolt N, and spring O.

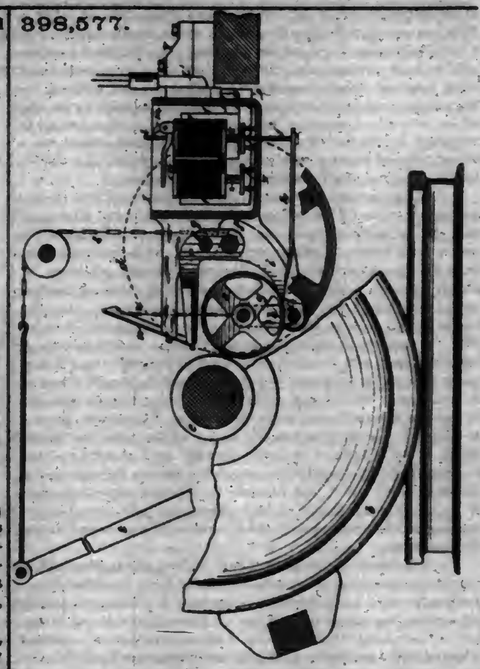
398,576. TOY FORTUNE-WHEEL. WILBERT C. BLAKEMAN, Shelton, Conn. Filed Nov. 5, 1888. Serial No. 289,963. (No model.)



Claim.—The herein-described toy fortune-wheel, consisting of a disk, A, having upon its face a concentric series of objects, a rotative shaft, B, centrally through the disk, combined with a pointer fixed to the said shaft on the face side of the disk, with a grooved pulley, D, fixed upon the shaft on the reverse side of the disk, and an elastic cord, one end of which is made fast to the pulley, and so that the said elastic cord may be wound upon said pulley under tension, and the free end of said cord held stationary upon said toy while the pointer is also held stationary, and whereby upon the release of the pointer the reactive force of the said elastic cord will impart rotation to the pointer around the dial, substantially as described.

398,577. ELECTRIC BRAKE FOR RAILWAY-TRAINS. ALEXANDER E. BOWMAN, Pemberton, Pa., and WARNER P. WINCHFIELD, Uxbridge, Ontario, Canada, assignors to said Winchfield, Anson Todd Button, Uxbridge, and Samuel Street Fuller, Stratford, Canada. Filed Oct. 20, 1888. Serial No. 288,469. (No model.)

Claim.—1. In a system of electric brakes for railway-trains, the combination of an electro-magnet, a second electro-magnet, two independent electric circuits respectively including said electro-magnets, a third electric circuit, T, including an electric-magnetic closing-switch normally closed as to the magnet of the circuit-closer, the circuit-closer itself being adapted to close the first electro-magnet's circuit, a suitable circuit-closer for the second electro-magnet's circuit, electric generators of equal electro-motive force, the one located on the locomotive of the train and the other on the last car of the train and connected in opposition with the said two independent electric circuits, and a third electric generator in circuit with the magnet of the said electro-magnetic circuit-closer.



2. In a system of electric brakes for railway-trains, the combination of two friction-pulleys, the one connected to the brake-lever and the other to the armature of an electro-magnet, and both being connected to each other and geared to a collar upon the car-axle, the said collar consisting of alternate rings of metal and fiber secured upon the car-axle.

3. In a system of electric brakes for railway-trains, the combination, with the friction-pulleys of the brake, of a collar upon which the said pulleys press, the said collar consisting of alternate rings of fibrous substance, as wood and metal.

4. In a system of electric brakes for railway-trains, the combination of a car-axle provided with a collar, a friction-pulley supported upon a lever, a friction-pulley of smaller diameter than the first-named pulley and whose shaft is connected to said lever, both pulleys being adjustable relatively to the said collar, a lever applied at one end to the smaller pulley and at the other end or arm to the core of a solenoid, the said arm being elastic, as and for the purpose described, a retaining device for the said core, consisting of a rack and pawl, and a second solenoid whose armature or core is in the path of the said pawl and so arranged as to be adapted to release the pawl from said rack, the said solenoids being located in suitable electric circuits.

5. In an electric-brake system for railway-trains, the combination of a normally-closed electric circuit, brakes on all the cars of the train normally out of action, a normally-open circuit, means for closing the latter to bring the brakes into action, electro-magnets in the said first circuit, and magnetic circuit-closers within attractive distance of said electro-magnets and included in circuit with the said normally-open circuit, electric generators located on both the locomotive of the train and on the rear car and included in circuit with said electric circuits.

6. In a system of electric brakes, the combination of a friction-pulley adapted to be brought in engagement with the axle of the car-wheels, a lever for applying the pulley to the axle, an elastic arm for the said lever, a solenoid, and a rod connecting the said elastic arm to the core of said solenoid.

7. In a system of electric brakes for railway-trains, the combination of a pulley in frictional contact with one of the axles of the wheels of the train, a shaft carrying said pulley and supported at one end to a suitable bearing and at the other end by one arm of a pivoted bent lever, a second pivoted lever hinged at one end to the remaining arm

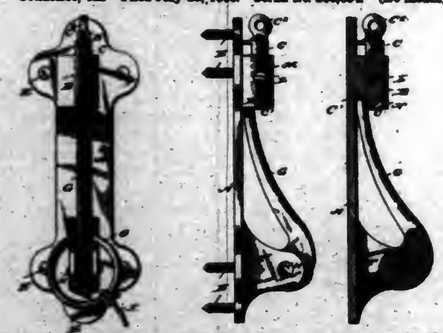
of the first lever and at the other end to a chain, a second pulley in frictional contact with the said axle and whose shaft is supported by a suitable bearing at one end and upon one arm of a third bent pivoted lever at another point, the said shaft being connected to said chain, a second chain connecting the shaft of the first pulley to the brake-lever, a solenoid whose core is connected elastically to the arm of the lever which supports the second pulley, a ratchet or toothed projection for the said core and a pawl engaging said ratchet, and a second solenoid whose core is adapted to trip said pawl, the said solenoids being included in independent electric circuits.

8. In an electric-brake system, the combination of two electric generators, the one A being located on the locomotive of the train of cars, and the other, A', being located upon the last car of said train, one or more electric couplings connecting the conductors which pass from the generators, of which there is one more generator, M, similarly located, a conductor, B, connecting similar poles of the first-named generators, two other conductors connecting the remaining similar or like poles of the same generators, a magnet, F, in circuit with the last-named conductors B and C, and a second magnet, *p*, being in circuit with the conductors B and D, a circuit-closer, E, normally open and in conductor D, a circuit-closer, P, normally open and in conductor C, both of said circuit-closers being located upon the locomotive and on the rear car, a circuit-closer, P', normally open and in conductor C, and located on the last car of the train, the circuit-closers P and P' being of magnetic material—such as soft iron—and magnets Q and Q', located within attracting distance beneath the said circuit-closers P and P', and normally in closed circuit with battery M by a conductor, T, and thereby maintaining said circuit-closers open against tension-springs R and R', respectively connected to said circuit-closers.

9. In a system of electric brakes for railway-trains, the combination of two generators of equal electro-motive force connected in opposition in such a manner that one conductor, B, connects two similar poles of the two generators, and two other conductors, C and D, connect the remaining two similar poles of the same generators, a solenoid in circuit with a conductor connecting the conductors B and C, a second solenoid in circuit with a conductor connecting the conductors B and D, the conductors D and C being normally open, a normally-closed circuit containing a magnet whose core is connected with a normally-open circuit-closer in conductor C, and a suitable generator for said normally-closed circuit.

10. In a system of electric brakes for railway-trains, the combination of two solenoids, movable cores for both solenoids, stops located under the cores at such a distance below the solenoids that the cores cannot fall away from the attractive influence of the solenoids, a rack or toothed rod secured to one of the said cores and gearing into a ratchet which is pivoted and whose one arm is located in the path of the core of the other solenoid, and a spool for the windings of the solenoids, the said spools having openings for the cores.

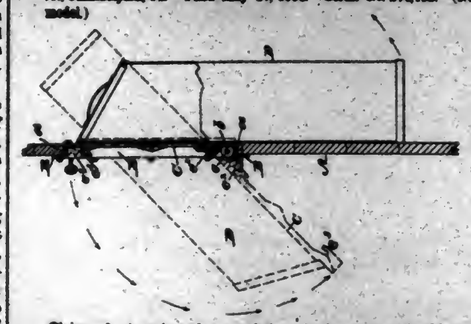
398,578. ANIMAL-RELEASING DEVICE. ALONZO R. BRANN, San Francisco, Cal. Filed July 23, 1888. Serial No. 280,854. (No model.)



Claim.—1. In a horse-releasing device, the combination, with the attaching-plate having a guide-catch box formed thereon and recessed at its lower end, of a catch-bolt arranged vertically in the said box and having its lower end beveled, and a tongue pivoted to the attaching-plate and having its free end beveled, so that it may engage the beveled end of the catch-bolt and lift the same, so as to be locked thereby, substantially as specified.

2. The combination, with the attaching-plate having the guide-catch box formed thereon near its upper end, and a hinge-bracket formed near its lower end, of the tongue to receive a halter-ring pivoted to the said bracket, and having its opposite end beveled, as shown, the said box having its lower end recessed for the entrance of the beveled end of the tongue, and also having a vertical slot in one of its side walls, and the catch-bolt having its lower end beveled, and also having a thumb-piece passing through the slot of the box, substantially as specified.

398,579. GARBAGE BOX OR RECEIVER. WILLIAM H. BUCKLEY, Jr., Philadelphia, Pa. Filed May 17, 1888. Serial No. 274,132. (No model.)



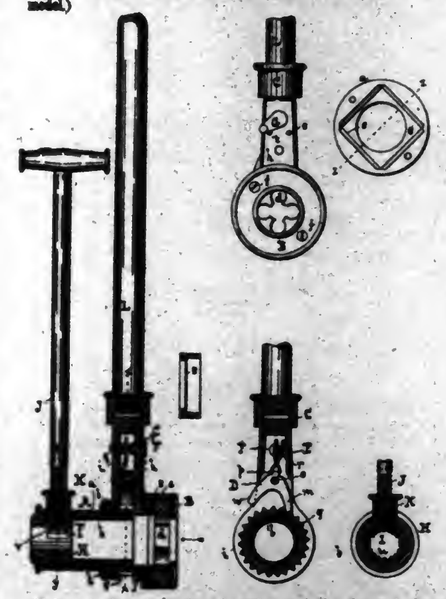
Claim.—1. A garbage-box consisting of a frame, a casting hinged or pivoted thereto, and a vessel secured to the casting, said parts being combined substantially as and for the purpose described.

2. In a garbage-box, the combination, with a metallic frame, of a casting pivoted thereto, and a vessel secured to said casting above the axis of the box, adapted to abut against the bottom of the frame when the vessel is overturned, substantially as described.

3. In a garbage-box, the combination, with a frame, of a casting pivoted thereto, carrying a vessel and provided with stops, a handle or pull, and a lock, substantially as described.

4. In a garbage-box, the metal frame B, the casting C, secured to the box and having lugs *e*, with rod B' passing through said lugs, and the stops *d'*, adapted to abut against the frame B, said parts being combined substantially as described.

398,580. MACHINE FOR THREADING PIPE. GEORGE W. BURGARNER, Baltimore, Md. Filed Nov. 19, 1888. Serial No. 291,354. (No model.)

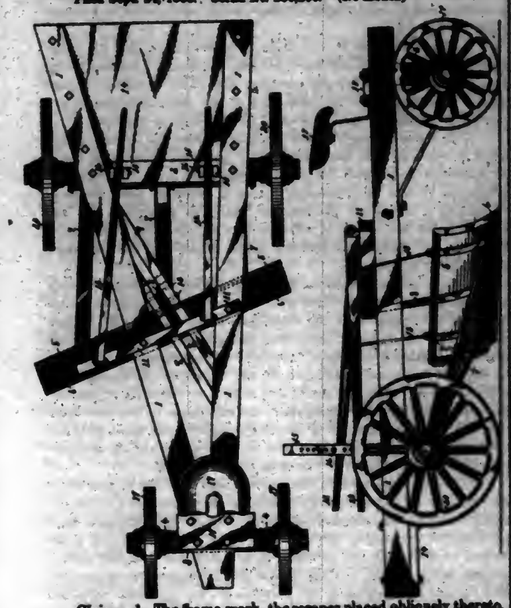


Claim.—1. In a screw-thread-cutting tool, the sleeve A, formed of the outer and inner threaded sections, *a* and *b*, the former having a polygonal chamber, *c*, at its end adapted to hold a die and ratchet-teeth on its circumference, and the latter provided with the centering-ring H, having inner teeth, and the movable toothed jaw I, with a threaded bar to adjust it within the said ring, combined with a handle, C, formed of the plates *h* and *i*, double pawl D, forked spring E, and shaft F, having the crank-pin *r* situated between the tines of the said forked spring, substantially as and for the purpose specified.

2. In combination with the sleeve-section *a*, having the circumferential teeth *g*, the handle C, having the double pawl D, forked spring E, shaft F, with the crank-pin *r* situated between the tines of the said forked spring, and handle C, whereby the said crank-pin is moved and the position of the pawl changed, substantially as and for the purpose specified.

3. As means for holding a pipe within the section *b* of the sleeve A, the interiorly-toothed ring H, movable toothed jaw I, and the threaded bar J, all combined substantially as and for the purpose specified.

398,581. ROAD-SCRAPER. ELIAS BURHANS, South Kent, Conn. Filed Sept. 24, 1888. Serial No. 286,260. (No model.)



Claim.—1. The frame-work, the scraper placed obliquely thereto, a front axle and wheels, and a rear axle and wheels, one rear wheel being in line with the corresponding front wheel and the other rear wheel in line with the forward end of the scraper, in combination with diagonal braces 9, an arm, 8, projecting from the scraper, whereby the angle may be adjusted, and levers 12 and rods 13, connecting said levers with the opposite ends of the scraper, whereby either end may be raised or lowered.

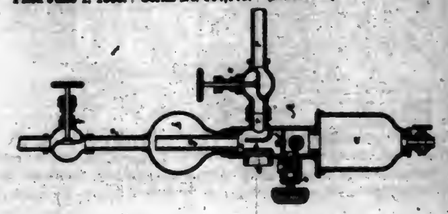
2. The scraper having an arm, 8, the rear axle, and braces pivoted to the axle and to the scraper, whereby the latter is supported, in combination with frame-work, diagonal braces 9, between which the arm lies, and pins passing through said braces, whereby the arm may be locked in position to hold the scraper at any desired angle.

398,582. DEVICE FOR SECURING HOSE TO COUPLINGS. ROBERT COWEN, Boston, Mass., assignor to the Boston Woven Hose Company, same place. Filed Jan. 23, 1888. Serial No. 261,628. (No model.)



Claim.—The combination, with a tail-piece and a compressible hose or pipe placed thereon, of a metal ring placed upon that portion of the hose which receives the tail-piece, and corrugated or indented at intervals on the hose to form a series of inwardly projecting or inverted hose-clamping arches and intermediate outwardly-projecting arches, as set forth.

398,583. LUBRICATOR. WARREN H. CRAM, Lawrence, Mass. Filed June 1, 1885. Serial No. 167,173. (No model.)



Claim.—1. The combination of a lubricator provided with a sight-feed or observation chamber in which oil rises through water in its passage to the discharging-conduit for leading such oil to the part or parts of the engine to be lubricated, with a conduit to lead steam from the boiler into the condenser of such lubricator, and with another conduit within and to lead steam from such condenser into the said oil-discharging conduit, as set forth.

2. A lubricator combining these elements: a condenser, a reservoir for oil, an observation-chamber in which oil rises through water, an oil-discharging conduit leading from the top of the observation-chamber, a conduit for conveying steam from the boiler into the condenser, and another conduit wholly within the lines of the lubricator and for conveying live steam from the induct-conduit of the condenser to the top of the observation-chamber, as set forth.

3. In a sight-feed lubricator through water in which the oil rises, the combination of the oil-reservoir, the sight-feed chamber, the oil-discharging conduit, the condenser having a pipe communicating with the boiler, and an internal tube leading from within the condenser and communicating with the sight-feed chamber and oil-discharging conduit, said latter conduit having in it a stop-cock, through which conduit the oil and steam may be discharged from said lubricator to the parts of the engine to be lubricated, as set forth.

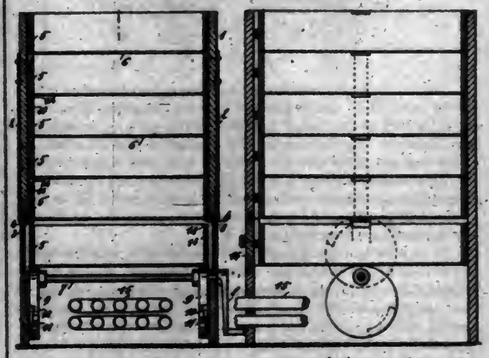
4. In a sight-feed lubricator through water in which oil rises, the combination of the oil-reservoir, a steam-chamber at the top thereof, the oil-discharge conduit and the condenser having a pipe to lead steam thereto, and also a pipe to lead steam into the said steam-chamber and oil-discharging conduit.

5. In a sight-feed lubricator of the character described, a steam-chamber located near the top of the oil-reservoir and communicating with the sight-feed chamber through which oil rises through water, and also having a pipe to lead steam into such chamber and also communicate with the steam-condenser of such lubricator, and another pipe to lead steam to the condenser and communicate with the steam-chamber or pipe leading thereto, whereby an equalizing pressure is obtained, as set forth.

6. A steam-chamber located at the top of the oil-reservoir and having a pipe to lead steam into such chamber and also to communicate with the condenser, and a pipe to lead steam to such condenser, such steam-chamber also communicating with a sight-feed chamber through which oil rises through water, and also having an oil-discharge passage to communicate with a pipe to convey the oil or oil and steam to the part or parts of the engine to be lubricated, all being substantially as set forth.

7. In a sight-feed lubricator in which oil rises through water and having a steam-chamber at the top part of the oil-reservoir of such a lubricator, the combination of the following: the steam-chamber referred to, a condenser, a pipe to lead steam thereto and another pipe to lead steam into the said steam-chamber, a conduit communicating with the sight-feed and steam chambers, a choked oil-discharge conduit communicating with the two last-named chambers, the oil-reservoir, and feed-regulating valve, all being combined to operate substantially as set forth.

398,584. FRUIT-DRIER. HENRY A. CRANDALL, Harrison, Ark. Filed Apr. 13, 1888. Serial No. 270,893. (No model.)



Claim.—1. In a fruit-drying apparatus, a drying-chamber, movable supports on which the trays rest projecting into the chamber, and a rotary shaft with eccentric-disks which engage and move back the supports and release and lower therefrom one tray at a time, substantially as described.

2. In a fruit-drying apparatus, a drying-chamber, a series of trays located therein, spring-actuated movable supports extending into the chamber and supporting the trays, and a rotary shaft having eccentric-disks which engage the spring-actuated supports, release

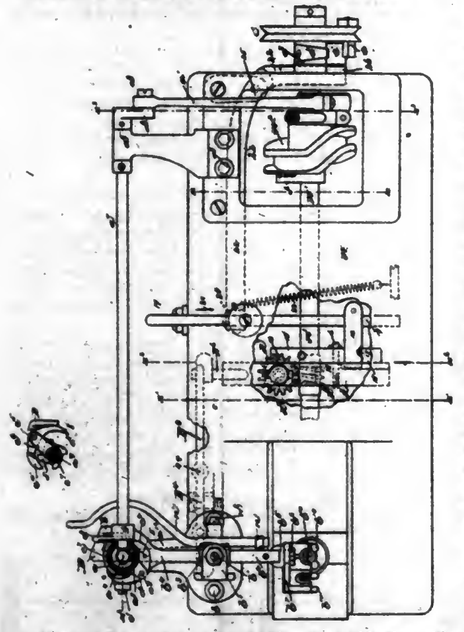
them from the trays, and lower a tray out of engagement with the supports, substantially as described.

3. A fruit-drying apparatus consisting of the drying-chamber 1, having spring-strips 2, with bent ends 3, having tapered edge 12 and projecting through openings 4 into chamber 1, the trays 5, with inclines 13 and slots 14 in line with bent ends 3, resting upon one another and supported by bent ends 3, and the eccentric-disks 9, mounted on shaft 7, with crank-handle 8, and having the recess 10, with tapered side 11, all constructed and arranged substantially as described.

4. In a fruit-drying apparatus, a drying-chamber, 1, having openings 4, spring-strips 2, with bent ends 3, having bevel-edge 12, and projecting through openings 4, and the shaft 7, with crank-handle 8, and eccentric-disks 9, with recess 10, having tapered sides 11, substantially as described.

5. In a fruit-drying apparatus, the combination, with the drying-chamber 1, having a feed-opening at its top and a tray-exit in its side, and tray-supports projecting into said chamber, of revoluble eccentrics mounted in the casing below the exit-opening and supports and having the inclined recesses 10, the side walls of which engage the said supports and force them outward, substantially as set forth.

398,585. BUTTON-SEWING MACHINE. HENRY H. CUMMINGS, Malden, assignor to the Union Button Sewing-Machine Company, Boston, Mass. Filed Dec. 21, 1886. Serial No. 222,165. (No model.)



Claim.—1. In a button-sewing machine, the combination, with a carrier bar or lever and its attached button-holding foot, of a pivoted guide for said carrier bar or lever between its ends, an eccentric or cam, a strap or collar surrounding said eccentric or cam and connected to the rear end of the said carrier bar or lever, and means for intermittingly rotating said cam or eccentric, whereby positive vibratory and longitudinal movements are imparted to the said carrier bar or lever to place different eyes of a button alternately under the needle of a sewing-machine, substantially as set forth.

2. In a button-sewing machine, the combination, with the carrier bar or lever b^4 and its attached button-holding foot, of a vertically-pivoted guide, b^5, having an opening through which the said bar or lever can slide and which is of sufficient size vertically to permit of a vertical movement of the said bar or lever therein, means for depressing and lifting the button-holding end of said bar or lever, and means for imparting positive vibratory and longitudinal movements to the latter to bring different eyes of the button alternately under the needle of the sewing-machine, substantially as set forth.

3. The carrier bar or lever and the foot or button-holder connected thereto loosely and provided with means for holding buttons of different sizes, combined with a latch or locking device to retain the said foot or holder in adjusted position, substantially as described.

4. The carrier-bar b^4, the collar upon which the said carrier-bar is pivoted, the eccentric within said collar, means for intermittingly rotating said eccentric, and a button foot or holder attached to said carrier-bar, combined with a pivoted block, b^5, through which said carrier-bar is free to slide, the said block being located between the ends of the carrier-bar, and operating substantially as described.

5. The carrier-bar, a button-holder attached to the carrier-bar at one end, a collar upon which the said carrier-bar is pivoted at its other end, an eccentric within the collar, an attached ratchet-pawl, a pawl-carrier, and means to rotate it intermittingly for a half-turn, combined with a pawl-releasing device to act upon the pawl to effect a quarter rather than a semi rotation of the said eccentric, substantially as described.

6. The carrier-bar b^4, its attached button-holding foot, the collar upon which the said carrier-bar is pivoted, the eccentric located within the said collar, the ratchet and pawl and pawl-carrier, and the beveled gear c^7, combined with the rock-shaft c^4, the toothed sector c^5, and means to operate the said rock-shaft, substantially as described.

7. In a sewing-machine for stitching buttons, the main rotating shaft A', worm thereon, the worm-gear d'', actuated thereby, the finger B^7, moved in unison with the said worm-gear, the lever B^8, having the projection B^9, and pawl-releasing device B, combined with the pawl C^3, having a tail, 8, the pawl-carrier, means to operate it, and the ratchet-wheel and eccentric, whereby change of position of the pawl-releasing device alters the effectual length of stroke of the said pawl, substantially as described.

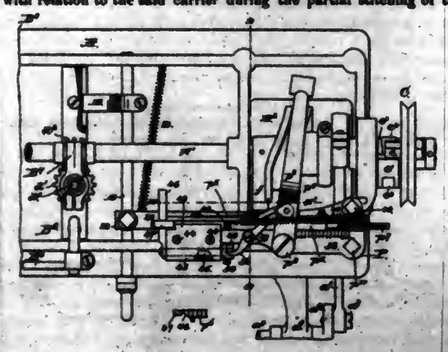
8. In a sewing-machine, the shaft A', the belt-pulley loosely mounted thereon and provided with a pin or projection, e, the worm attached to the said shaft, the worm-gear driven thereby, the projection or finger 13, moved in unison with the said worm-gear, the notched lever 15, actuated by said finger, the slide-rod 19, its projection engaged by the said lever, and a spring, as 23, and the shipper-lever, combined with the dog e', attached to the hub e^3, fast on the shaft A', and engaging the pin e of the band-pulley, the movement of the said lever effecting such a movement of the shipper-lever as to cause its outer end to disengage the dog e' from the pin or projection of the belt-pulley, permitting the latter to run loose on the shaft A'.

9. In a sewing-machine, the combination, with the shipper-lever 22, the shaft A', the belt-pulley loose thereon, and means for detachably connecting the said shaft and pulley and for operating said shipper-lever, of the locking device consisting of the notched arm f, attached to said shaft and provided at its outer end with the spring-pressed latch f', said locking device being arranged to engage the said shipper-lever and stop the rotation of the said shaft when the said pulley is disconnected therefrom, substantially as set forth.

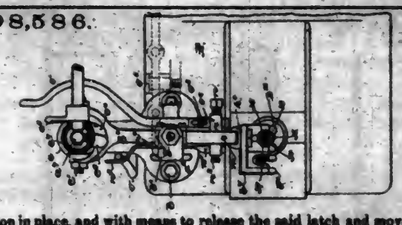
10. In a machine for stitching buttons upon fabric or other material, a carrier-bar having at one end a button-holding foot and pivoted at its other end to a collar, a guide for the said carrier-bar between its ends, an eccentric within the said collar and adapted by its rotation to vibrate the carrier-bar, a ratchet connected with the said eccentric, a pawl-carrier, and a pawl, combined with means, substantially as described, whereby the eccentric may be rotated, as desired, for a greater or less distance, whereby the carrier-bar may be moved far enough at each operation of the eccentric to enable the needle to descend first through one hole in the button and then through a hole diametrically across the center of the button, or whereby the carrier may be moved to cause the needle to descend through first one and then the next hole to it in the direction of the surface of the button and not across the center of the button, substantially as described.

398,586. BUTTON-SEWING MACHINE. HENRY H. CUMMINGS, Malden, assignor to the Union Button Sewing Machine Company, Boston, Mass. Filed Dec. 21, 1886. Serial No. 222,169. (No model.)

Claim.—1. The carrier-bar, means to vibrate it, the rod A, and the button-holder or foot connected therewith, combined with a latch and a projection to retain the button-holder or foot in locked position with relation to the said carrier during the partial stitching of the



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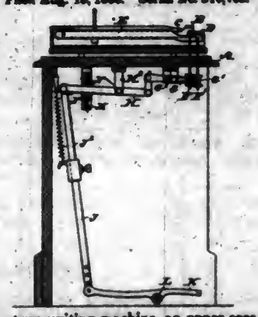
button in place, and with means to release the said latch and move the rod with its attached foot longitudinally with relation to the carrier-bar, substantially as described.

2. The carrier-bar, means to vibrate it intermittingly, the button-holder or foot, its attached rod free to be moved longitudinally with relation to the carrier-bar, and the head to act as a guide, combined with means to hold the rod in locked position with relation to the said carrier-bar to retain the button-holder or foot in proper position while part of the button is being stitched, and with means to release the said rod from its locked position and move it with its attached foot longitudinally with relation to the carrier-bar, substantially as described.

3. In a button-sewing machine, the combination, with the shaft A', the cam A^3 thereon, the pawl-carrier p^3, actuated by the said cam, the pawl p^4, pivoted to said carrier, the toothed slide-bar p^5, having the beveled end 42, a detent for said slide-bar, the rock-shaft 45, having the finger 49, said shaft having also an arm, 46, provided with the finger 47, the disengaging-lever 52, the shipper-lever 22, its actuating-spring, the loose pulley C, and detachable connections between said pulley and the shaft A', substantially as set forth.

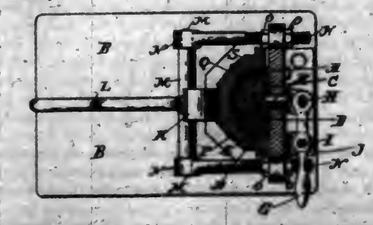
4. In a sewing-machine, the shaft A', the loose pulley C, detachable connections between said pulley and shaft, the shipper-lever 22, the notched and inclined arm 46, to hold the said shipper-lever, the rock-shaft 45, its attached finger 49, the pawl-disengaging lever 52, the pawl-carrier p^3, its attached pawl and the detent, and means to move the pawl-carrier, combined with the toothed slide p^5, moved intermittingly by the pawl of the pawl-carrier and adapted to operate the inclined and notched arm to release the shipper-lever, and means to move the shipper-lever to enable it to continue the movement of the said inclined arm, to operate substantially as described.

398,587. TYPE-WRITING MACHINE. JOHN S. DOVE, Jr., Philadelphia, Pa. Filed Aug. 13, 1886. Serial No. 210,782. (No model.)



Claim.—In a type-writing machine, an upper-case lever, in combination with a foot-treadle and intermediate depending rod, levers, and connecting-rod, one of said intermediate levers having a guide with buffers, all substantially as and for the purpose set forth.

398,588. MACHINE FOR LINING JOURNAL-BOXES. BENJAMIN J. DOWNS, Somerville, Mass. Filed Sept. 25, 1886. Serial No. 214,363. (No model.)



Claim.—1. The mandrel A, having in its working-face a deep vertical recess, C, and a laterally-movable tongue or block, D, of less depth than and located permanently in said recess, in combination with the lever G and stem E or equivalent means for giving lateral movement to said block, substantially as and for the purpose set forth.

2. The vertically-recessed mandrel A C, the tongue or block D, of less depth than the recess in the mandrel and permanently located therein, and means, substantially as described, for giving the block lateral movement in such recess, in combination with suitable clamping mechanism for holding the shell firmly, for the purpose set forth.

3. The mandrel A, fixed to the base B and standard F, and having the recess C in its front face and the smaller laterally-moving block, D, therein, in combination with the pivoted lever G, connected to the stem E for lateral adjustment of said block, and the cam K, pivotally connected to said standard, substantially as set forth.

398,589. HARNESS. FREDERICK DRIFFILL, Sterling, assignor to the Eureka Company, Rock Falls, Ill. Filed Oct. 13, 1888. Serial No. 288,512. (No model.)

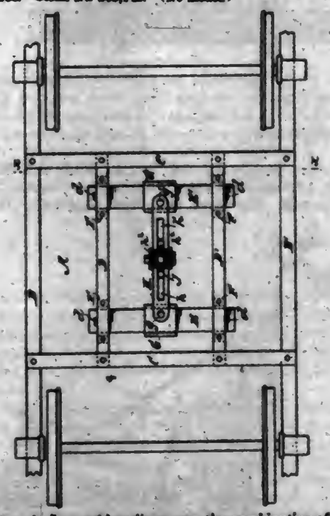


Claim.—1. In a harness, the combination of the pad C, provided with the forwardly-projected tongue 2, the bow A, provided with rearwardly-extending jaws 1 1, and the vertical bolt 4, substantially as shown, and for the purpose described.

2. In combination with the thills G, provided with box F, having opening H therein, the bow A, provided with pin J, and the pad C, centrally pivoted to said bow, substantially as shown, and for the purpose described.

3. The combination of the pad C, provided with tongue 3 and the recess 7, the bow A, supported at its front and rear ends, substantially as shown, and provided with jaws 1 1, bolt 4, and means, substantially as shown, for attaching the rear ends of said bow to the vehicle, for the purpose specified.

398,590. MEANS FOR MOUNTING THE GRIP ON CABLE-RAILWAY CARS. CARL E. REDDOCK, Long Island City, N. Y. Filed Sept. 11, 1888. Serial No. 285,142. (No model.)



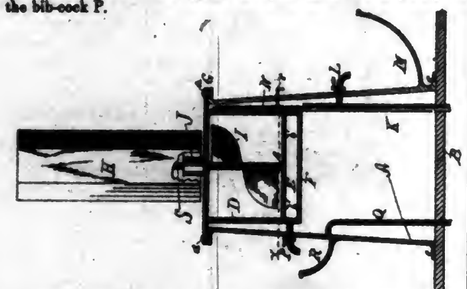
Claim.—1. In a cable-railway car, the combination of stationary bars extending crosswise of the truck-frame and detachably secured to the same, with sleeves loosely mounted to slide on said stationary bars, each sleeve consisting of a block having an opening extending

centrally through it adapted to receive one of the said stationary bars, and also having an end portion of the grip-carrying head-block pivotally connected thereto, substantially as described.

2. In a cable-railway car, the combination, with the car-truck, of stationary bars extending crosswise of the car and passing loosely through keepers secured to the truck-frame, and held in place by pins passing through their extremities, and sleeves loosely mounted to slide on said stationary bars and having pivotally connected thereto the head-block carrying the grip-gear, substantially as described.

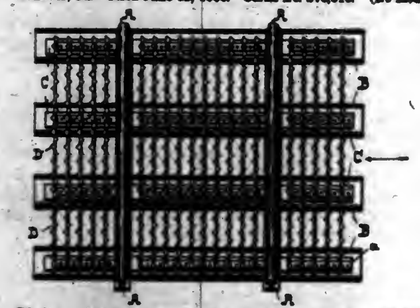
398,591. DRINKING-FOUNTAIN AND SHOW-STAND. CHARLES BERNHARDT, Chicago, Ill. Filed July 24, 1888. Serial No. 280,908. (No model.)

Brief.—The show-stand H is caused to revolve with the shaft S by the force of the water against the spiral blade I in its passage to the bib-cock P.



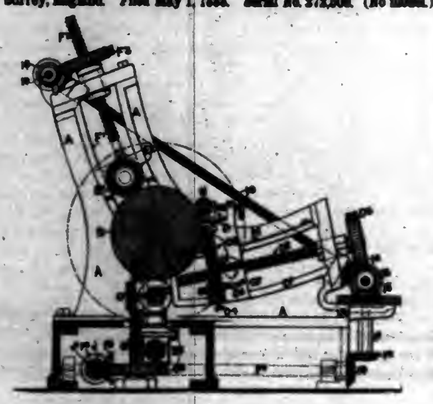
Claim.—The hollow post A, the cylinder D G F, partition E, the post S, extending into and above the cylinder, the screw I within the cylinder and on the post S, and the show-stand H on the post above the cylinder, in combination with the water-supply pipes K N and faucet P, substantially as specified.

398,592. RAILWAY CATTLE-GUARD. ABNER W. EICHELBERGER, Hanover, Pa. Filed June 12, 1888. Serial No. 276,816. (No model.)

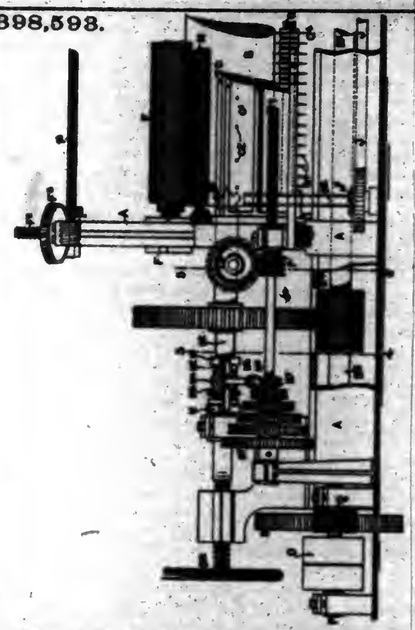


Claim.—In a cattle-guard, the guard-bars having a toothed or serrated upper edge, the said teeth being set or arranged with each alternate tooth bent to one side, and the intervening teeth bent to the other side, substantially as and for the purpose specified.

398,593. MACHINERY FOR CUTTING WOOD FOR MATCHES, SPLINTS, AND MATCH-BOXES. WILLIAM ELLIS, Peckham, County of Surrey, England. Filed May 1, 1888. Serial No. 272,508. (No model.)



398,593.

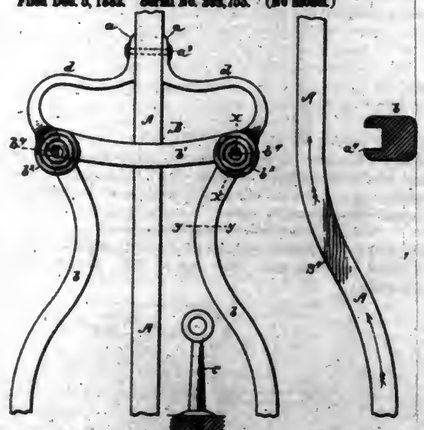


Claim.—1. In machinery for the purposes stated, the combination, with a long knife, a longitudinal incisor, and a circumferential incisor, of the curved guides D', screws D², slides D³, pivoted blocks D⁴, curved guides F', and screws F², hinged to slides F³, as and for the purposes set forth.

2. In machinery for the purposes stated, the combination, with longitudinal and circumferential incisors, of the long knife C, knife-carrier C', blocks D, curved guides D', straight screws D², suitably turned, slides D³, and pivoted blocks D⁴, as and for the purposes described.

3. In machinery for the purposes stated, the combination, with the shaft B², of the bracket H³, held by rings H and H', shaft H², bevel-wheels H⁴ H⁵, worm H⁶, change worm-wheels H⁷, sleeve H⁸, screw H⁹, sectoral bearing H¹⁰, frame H¹¹, screw H¹², and shaft I, all substantially as and for the purposes described.

398,594. STREET-CAR. WILLIAM G. ELLIS, Amesbury, Mass. Filed Dec. 5, 1882. Serial No. 260,763. (No model.)

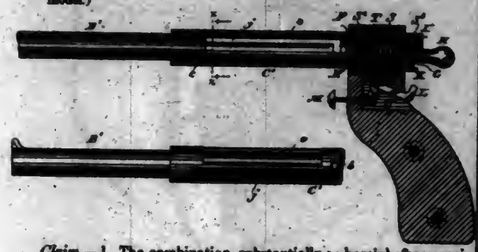


Claim.—1. As an improvement in street-cars, the within-described post A A, the uprights *b b*, and cross-piece *b'* of the panel-frame B, constructed and adapted as herein described, for the purposes set forth.

2. In the panel-frame B of a street-car, the metal guard *b²*, having the goose-neck *d*, with the flange *a*, rim-socket *d'*, hole *e*, and flange *a²*, constructed substantially as herein described, for the purposes set forth.

3. In a seat for street-cars, the panel-frame B, with the metal guard *b²*, having the goose-neck *d*, with the flange *a*, the hole *a*, rim-socket *d'*, and flange *a²*, in combination with the post A A, seat-bars *a³*, draw-bolts *b⁴* and *c'*, and foot-rail stanchion *c*, constructed and arranged as herein described, for the purposes set forth.

398,595. GUN AND PROJECTILE FOR THE SAME. STEPHEN H. EMMENS, London, England. Filed May 1, 1888. Serial No. 272,469. (No model.)



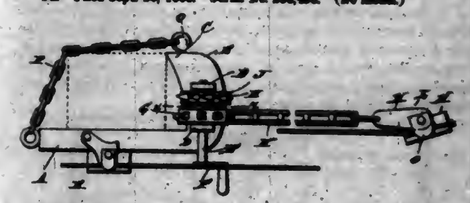
Claim.—1. The combination, substantially as hereinbefore specified, of a projectile composed of a head and a rearwardly-projecting open-ended tube, which latter contains the charge and is formed with an expanded rear end, and a fire-arm having the rear end of its barrel open and internally chamfered to receive said expanded end of the projectile and having an abutment behind the bore of the barrel, for the purposes set forth.

2. The within-described projectile, composed of a head and a rearwardly-projecting open-ended tube having a chambered and expanded rear end, which tube and its chamber contain the charge and a disk of fulminate, in combination with a fire-arm having the rear end of its barrel open and internally chamfered to receive said expanded end of the projectile, and having an abutment behind the bore, and a firing-pin projected through a hole in said abutment to explode the fulminate, substantially as hereinbefore specified.

3. The combination, substantially as hereinbefore specified, of a projectile composed of a head and a rearwardly-projecting tube, the latter having its rear end chambered and expanded, a sliding smooth-bore barrel having its rear end internally chamfered and provided externally with bayonet-joint studs, an outer tube having bayonet-joint slots and a projectile-admitting opening, and provided with an internal abutment behind the bore of the barrel, a piston behind said abutment provided on its respective sides with a firing-pin and a stem, and a pair of spiral springs on the respective sides of said piston, for the purposes set forth.

4. In combination with the spring-projected piston carrying the firing-pin and having on its back a flat stem which is slotted and provided with a terminal cocking-knob, a spring-projected stop-piston at right angles thereto, having a stem which passes through said slotted stem, and a disk which coacts directly with said knob, and a disengaging-lever acting on said stop-piston to fire the piece, substantially as hereinbefore specified.

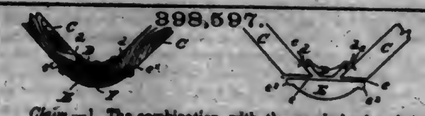
398,596. WIRE-STRETCHER. JOHN L. ESTRABE, Shirleysburg, Pa. Filed Sept. 26, 1888. Serial No. 286,453. (No model.)



Claim.—1. The combination of the casting A, the driving-shaft mounted thereon having a ratchet-wheel, the eye secured to the under side of the casting, and a pawl secured in said eye and extending around the casting and engaging the teeth of the ratchet-wheel, as set forth.

2. The improved wire-stretcher comprising the L-shaped casting A, having the lugs D D on the upper side of its shorter arm and the hook Q at the end of said arm, the chain permanently attached to the end of the longer arm of the casting and adapted to engage the end of the hook Q, the driving-shaft journaled in the ends of the lugs D D, the sprocket and ratchet wheels mounted on the said shaft between said lugs, the chain passing beneath and engaging the sprocket-wheel, the clamp at the end of the chain, and the pawl secured to the under side of the casting and engaging the teeth of the ratchet-wheel, substantially as specified.

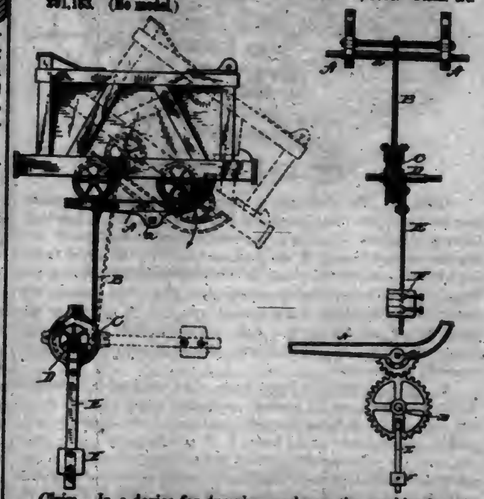
398,597. CARRIAGE SEAT AND BODY. HORACE S. FAIRBANKS, Racine, Wis. Filed Nov. 10, 1888. Serial No. 291,206. (No model.)



Claim.—1. The combination, with the panels having their ends beveled and sides grooved, substantially as shown, of the metallic plates D E, and means for securing said panels between said plates, in connection with bolts or rivets for clamping said plates firmly together.

2. The combination of the panels having their ends beveled and provided on their inner sides with vertical grooves, as shown, an angle-plate having vertical tongues fitting the vertical grooves in said panels, an outside vertical plate bearing against the beveled ends of said panels and the said angle-plate, and bolts or rivets clamping said plates and the panels securely together.

398,598. AUTOMATIC DEVICE FOR DUMPING COAL-CARS. CHARLES J. FARNER, Dunmore, Pa. Filed Nov. 19, 1888. Serial No. 291,183. (No model.)



Claim.—In a device for dumping coal-cars, the combination of the tip A, the rope B, having the upper end secured to the rear part of said tip and its lower end extending downward and around the sheave C, to which it is attached, the sheave C, the axle D, having suitable bearings, the lever E, secured to said sheave, and the weight bolted to said lever, substantially as described and shown.

398,599. SNAP-HOOK. WILLIAM H. FERGUSON, Castor, N. Y. Filed July 2, 1888. Serial No. 278,777. (No model.)



Claim.—1. The combination, with the hook and shank, of a sliding gate having a vertical back edge and adapted to move lengthwise through the shank up to and away from the entrance to the hook, and a lever pivoted to the shank and adapted by its movement to lock the the sliding gate and to automatically move the same down, substantially as set forth.

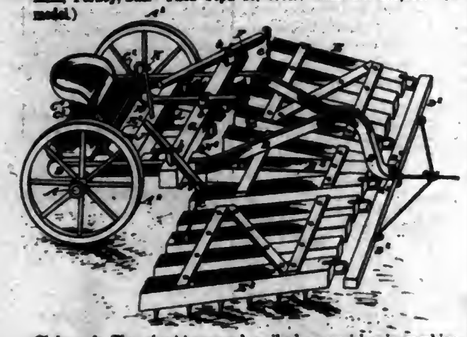
2. The combination, with the moving gate and a pivoted operating-lever, of the hook *a* and shank *b*, stamped up to shape of one piece of metal, and connected together as a double thickness, there being a bent edge to the shank at *b'*, said bent edge connecting the parts forming the shank and hook, and acting as a guide to the moving gate, substantially as set forth.

3. The combination, with the hook *a* and shank *b*, having a bent edge, *b'*, of a sliding gate, *c*, having a recess at 2, and curved portion 3, the lever *d*, pivoted at *d'* in the shank, and having an edge, 4, which is the arc of a circle from the pivot *d'*, and a stud, *e*, the loop end *f*,

and swivel *g*, the said gate moving automatically with the turning of the lever on its pivot, substantially as and for the purpose set forth.

4. The combination, in a snap-hook, with a moving gate and a swivel for attaching the chain or strap, of a hook and shank stamped up for a single piece of metal and bent to shape, a lever pivoted to the shank for operating the gate, said lever also being stamped up from a single piece of metal and bent to shape, and a loop end formed by the connecting portion of the metal of the lever, substantially as set forth.

398,600. WHEEL-HARROW. JAMES FISHMAN and WILLIAM MISS, Forney, Dak. Filed Sept. 19, 1888. Serial No. 285,808. (No model.)



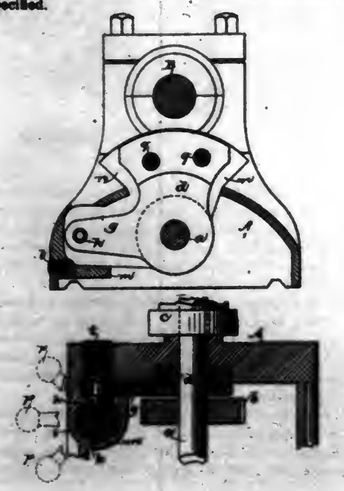
Claim.—1. The wheel-harrow described, comprising in combination the wheels, the frame composed of a bifurcated rod, as described, the seat supported upon the spring-arms C^3, and vertical rod C^2, surrounded by spiral spring C^4, the draft-bar pivoted at its center to the downwardly extended front end of the bifurcated rod, forming the frame, the foot-levers pivotally attached at their front ends to the under face of the timber G, the pivoted arms F F^2 F^3, pivoted to the upper face of said timber G, and the connecting-links between said foot-levers, pivoted arms and harrows, all arranged and operating substantially as described.

2. The combination, with the frame, the arched rod D, connected thereto, the draft-bar D^2, pivotally connected to the forward end of said rod, and the harrows pivotally connected to said draft-bar independent of each other, of the levers F, F^2, and F^3, pivoted near their centers to the cross-bar of the frame and pivotally connected at one end to said harrows, and the foot-levers pivoted at their forward ends to said cross-bar and pivotally connected to the levers F, F^2, and F^3, to the rear of their fulcrums, substantially as and for the purpose described.

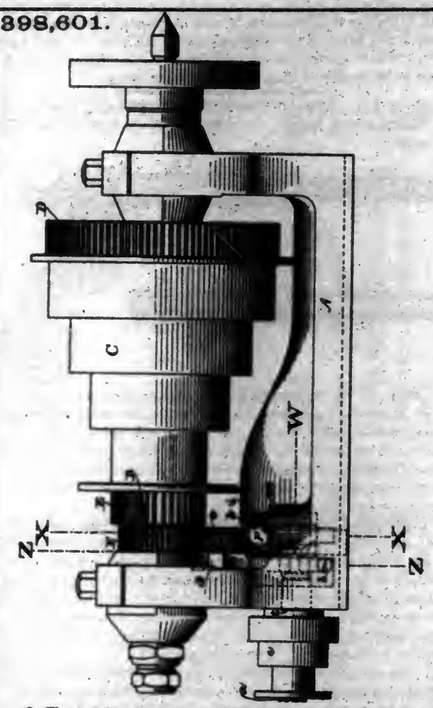
398,601. ENGINE-LATHE. JOSEPH FLATHER, Nashua, N. H. Filed June 21, 1888. Serial No. 277,757. (No model.)

Claim.—1. In an engine-lathe, the combination, with gear-carrier *d*, having arm *g*, provided with the side stud, *h*, of cam *i*, mounted on vertical axis *k* and formed with spiral groove *d*, interlocked with said stud and provided with lever *p*, all substantially as specified.

2. The combination of gear-carrier *d*, cam *i*, and the adjustable arm-supporting screw *t*, arranged at the side of said arm, substantially as specified.



398,601.

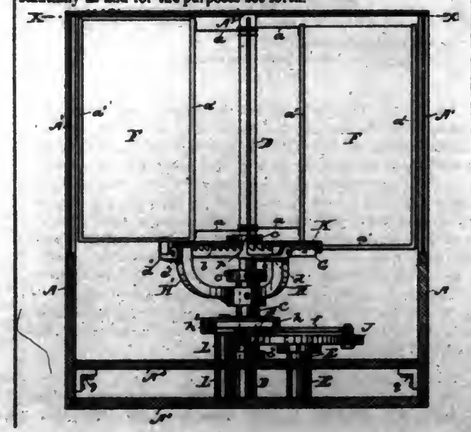


3. The combination of spindle B, feed-gear F, secured thereon, feed-spindle *a*, with its fixed gear *b*, gear-carrier *d*, having arm *g*, with its stud *h*, gears *e f*, mounted on said carrier, and cam *i*, mounted on its axis *k* and formed with groove *j*, interlocked with said stud *h* and arranged to actuate said carrier, all substantially as specified.

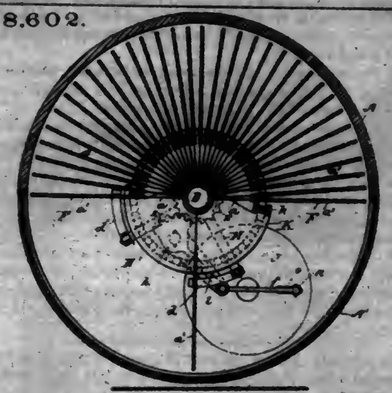
398,602. EXHIBITING OR ADVERTISING DEVICE. ELMER FLETCHER, Needham, assignor of one-half to Isaac M. Hall, Boston, Mass. Filed Apr. 4, 1888. Serial No. 269,550. (No model.)

Claim.—1. In an advertising or exhibiting device, the combination of the box A, vertical shaft D, connecting-rod *a*, frames *a'*, arms H H', fingers *d d'*, suitably supported by the springs *e* and *e'*, the collar G, provided with the notches *b*, the said collar being placed under the said frames, and the shield K, placed over the said collar to support the frame during a portion of each revolution, and the sleeve C, arranged to actuate the said arms, all adapted to be operated substantially as and for the purposes set forth.

2. In an advertising or exhibiting device, the sleeve C, provided with the gearing *x'*, the actuating-gear *x*, working in gear *x'*, and the lever *h*, connected with the gear *x*, the crank *f*, attached to the said lever, and the wheel J, arranged to form a pitman, all combined and adapted to impart an oscillating motion to the arms H and H', substantially as and for the purposes set forth.



398,602.



398,603. MACHINE FOR MITERING THE METAL OF SHOW-CASE MOLDINGS. FRANCIS X. GASTER, Baltimore, Md. Filed Jan. 26, 1888. Serial No. 262,214. (Model.)



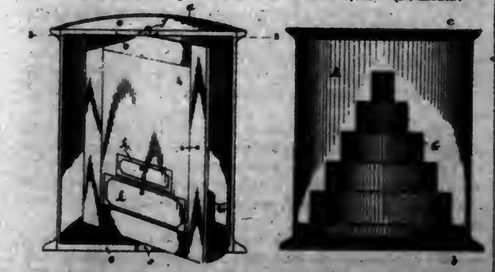
Claim.—1. A machine for mitering sheet-metal moldings, comprising the combination of a support, B, for the piece of molding, and a cutter or knife moving in a plane that is inclined one way with respect to said support and oblique in a crosswise direction with respect to said support.

2. A machine for mitering sheet-metal moldings, comprising the combination of a support, B, for the piece of molding, standards A', having grooves, and a cutter or knife having tongues which fit in said grooves and move in a plane that is inclined one way with respect to said support and oblique in a crosswise direction with respect to said support.

3. A machine for mitering sheet-metal moldings, comprising the combination of a support, B, for the piece of molding, two inclined standards at the front end of the support, one at each side of the machine and one having position in advance of the other, and each standard provided with a groove, and a cutter or knife having tongues which fit in said grooves.

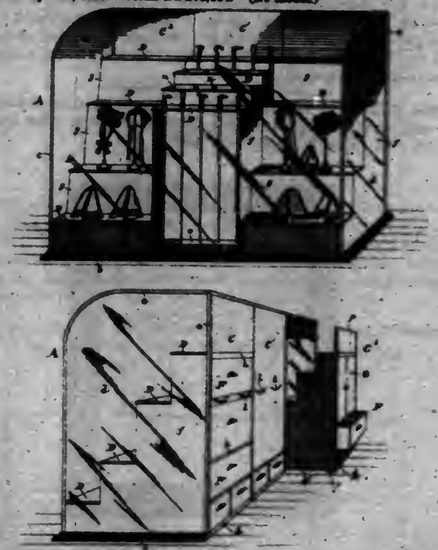
4. A machine for mitering sheet-metal moldings, comprising the combination of a support, B, for the piece of molding, two inclined standards at the front end of the support, one at each side of the machine and one having position in advance of the other, and each standard provided with a groove, a cutter or knife having tongues which fit in said grooves, a lever, L, and means, substantially as described connecting the lever and movable cutter.

398,604. REVOLVING SHOW-CASE. FRANCIS X. GASTER, Baltimore, Md. Filed Apr. 14, 1888. Serial No. 270,663. (No model.)



Claim.—The combination, in a show-case, of an inclosing-casing having a semi-cylindrical transparent front, and a display-stand provided with a series of semi-cylindrical step-like shelves in front, and a flat door or back, and recesses having drawers at the rear, the display-stand being pivoted within the casing, as described, whereby it may be turned to insert the articles to be displayed, substantially as shown and described.

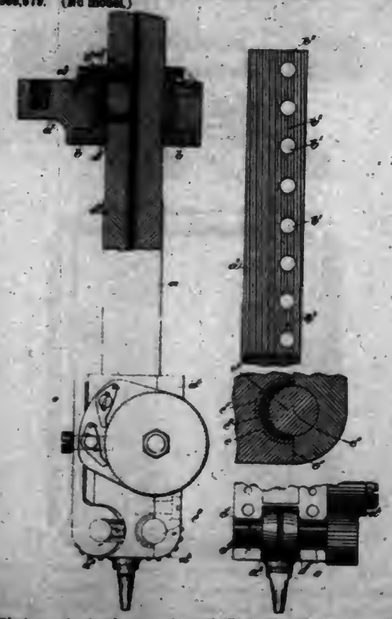
398,605. SHOW-CASE. FRANCIS X. GASTER, Baltimore, Md. Filed Apr. 14, 1888. Serial No. 270,664. (No model.)



Claim.—1. The combination, in a show-case, of an external case, A, having glass panels c, the removable sections C C^2 C^3, having step-like shelves in front for the display of goods, and the drawers F, located in said sections and adapted to be withdrawn from the same at the rear, substantially as shown and described.

2. The combination, with the casing A, of the removable sections having step-like shelves in front, internal recesses provided with drawers F, and doors G at the rear for closing said recesses, substantially as shown and described.

398,606. WIRE-NAILING MACHINE. LOUIS GOSON, Winchester, assignor to James W. Brooks, trustee, Cambridge, and Frank F. Stanley, associate trustee, Boston, Mass. Filed Apr. 5, 1888. Serial No. 269,679. (No model.)

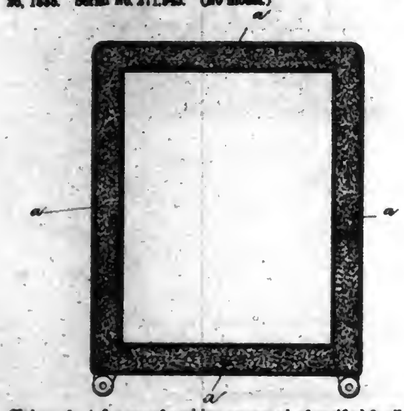


Claim.—1. A wire-carrying spindle having feed-rolls, a sliding segment, a^3, to operate them, and provided with screw-threads a^5, and a threaded sleeve to engage the screw-threads a^5, combined with a

threaded nut, as a^4, having a series of adjusting-holes, b', arranged in line with or so as to follow the pitch of a thread of the said nut, and with means to secure said nut in adjusted position, substantially as described.

2. The combination, with the sleeve a^4, provided with a bolt-receiving hole, of a nut, as a^4, having a series of adjusting-holes, b', arranged in line with or so as to follow the pitch of a thread of the said nut, and with a bolt or screw to secure the said nut and sleeve, substantially as described.

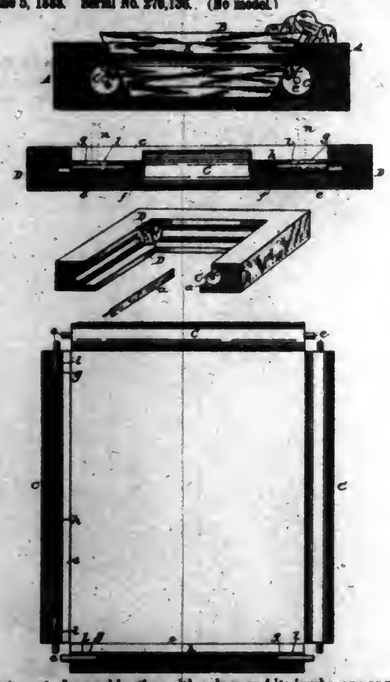
398,607. PACKING FOR SAFES, &c. ANTON GRAF, Georgetown, assignor of two-thirds to George H. Meader, Boston, Mass. Filed Apr. 26, 1888. Serial No. 271,943. (No model.)



Claim.—1. A fire-proof packing composed of purified fossil meal, as set forth.

2. A safe or receptacle having its walls packed with purified fossil meal, as set forth.

398,608. INTERLOCKING JOINT FOR THE DOORS AND FRAMES OF SAFES, &c. JOSEPH L. HALL, Cincinnati, Ohio. Filed June 5, 1888. Serial No. 276,136. (No model.)



Claim.—1. In combination with a door and its jambs, one or more movable bars or bolts, C, located in one of said parts, and a flange, *b*, on the other of said parts, arranged to engage therewith, substantially as and for the purpose set forth.

2. In a door and its frame, the combination of the movable bar or bolt C, located in one of said parts, the packing *m*, and the flange *b*, said parts being arranged for joint operation, substantially as and for the purpose set forth.

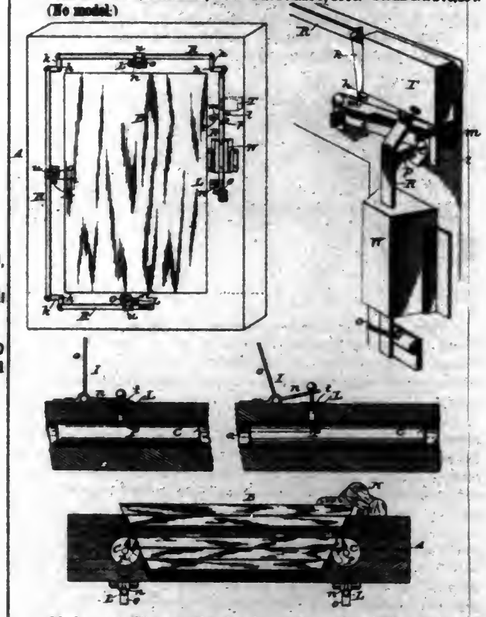
3. The combination of the movable bar or bolt C, provided with the slots *g*, the pintle or journals *e*, provided with the lugs *l*, and the springs *f*, all substantially as shown and described.

4. In combination with the movable bar or bolt C, set in the face of a door-jamb or in the edge of a door, as herein described, the removable strip *a*, substantially as and for the purpose set forth.

5. A door provided on one or more of its edges with a flange, *b*, projecting therefrom in the plane of the door and arranged thereon so as to engage with a movable bar or bolt set in the jamb of the door-frame, substantially as herein shown and described.

6. A movable bar or bolt set in the jamb of a door-frame or in the edge of a door, and provided with a longitudinal groove adapted to receive and interlock with a laterally-projecting flange on the opposing edge of the door or face of the jamb, substantially as herein set forth.

398,609. MEANS FOR FASTENING THE DOORS OF SAFES, &c. JOSEPH L. HALL, Cincinnati, Ohio. Filed June 5, 1888. Serial No. 276,137. (No model.)



Claim.—1. The combination, in a safe, vault, or other inclosure having a door and jambs, of the movable bars or bolts C, located in one of said parts, and a projection, *b*, on the other of said parts, a series of locking-bolts, L, and mechanism, substantially such as described, for connecting and operating said locking-bolts, whereby they can be simultaneously withdrawn to unlock the movable bars or bolts.

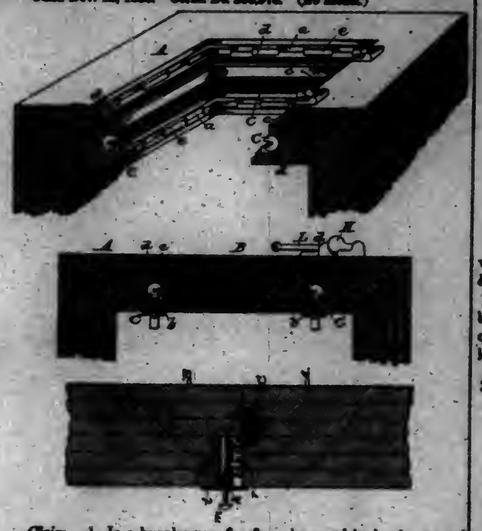
2. The combination, with a door and its jambs, of the movable bars or bolts C set therein, a series of locking-bolts, L, connected by mechanism for simultaneously withdrawing the locking-bolts, and a weight, W, arranged to operate the same when released, substantially as described.

3. In combination with the movable bars or bolts C, set in the jambs or door, a series of locking-bolts, L, with their connecting and operating mechanism, and a time-lock, T, adapted to be connected to the locking-bolt mechanism and to be disconnected therefrom by the action of the time-movement, substantially as and for the purpose set forth.

4. In combination with one or more movable bars or bolts, C, arranged and operating as described, a corresponding number of locking-bolts, L, connected to a sliding bar, R, having a weight, W, attached thereto, a time-lock, T, and the intermediate pivoted levers *m* and *i*, all arranged for joint operation substantially as shown and described.

5. In combination with the movable bars or bolts C, the bolts L, provided with springs to cause them to automatically engage with the movable bars or bolts C, a weight arranged to withdraw said locking-bolts when released, and a time-lock arranged to hold said weight and automatically release the same at the time set, substantially as and for the purpose set forth.

398,610. SAFE OR VAULT. JOSEPH L. HALL, Cincinnati, Ohio. Filed Nov. 12, 1888. Serial No. 290,573. (No model.)



Claim.—1. In a burglar-proof safe, a door and its jambs, one of said parts having the movable bolt C set therein, with a laterally-projecting flange, *b*, on the other part, and both the door and its jambs being provided with an interlocking tenon and groove, *c d*, all constructed and arranged to operate substantially as and for the purpose set forth.

2. In a burglar-proof safe, a door and its jambs, each provided with a series of interlocking dovetails, *c a*, with one or more movable bars or bolts, C, set in one of said parts, and a laterally-projecting flange, *b*, on the other of said parts, all constructed and arranged for joint action substantially as and for the purpose set forth.

3. In a burglar-proof safe, a door and its jambs, each provided with an interlocking tenon and groove, *c d*, and a series of interlocking dovetails, *c a*, with one or more movable bars or bolts, C, set in one of said parts, and a laterally-projecting flange, *b*, on the other of said parts, all constructed and arranged to operate substantially as described, for the purpose of fastening the door more securely in place when closed.

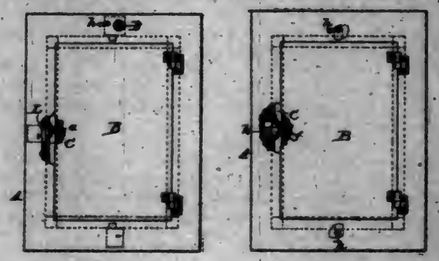
4. In combination with a movable bar or bolt, C, a spring-bolt, *m*, arranged to bear against the bolt C and hold it by friction from being accidentally moved while the door is open.

5. In combination with the movable bar or bolt C, the spring-bolt *m*, provided with a stud, *r*, arranged to engage with the former and lock it positively in position, said bolt *m* having its end arranged to project beyond the inner lip of bolt C, so as to be forced back by the flange *b* and disengage its stud *r* from the bolt C in the act of closing the door.

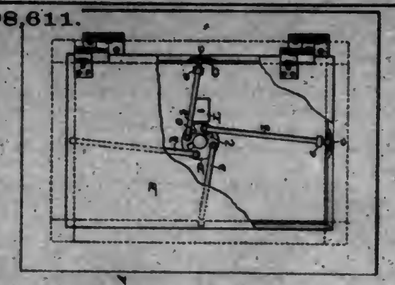
398,611. MEANS FOR FASTENING MOVABLE BARS OR BOLTS IN DOORS, &c. JOSEPH L. HALL, Cincinnati, Ohio. Filed Nov. 12, 1888. Serial No. 290,572. (No model.)

Claim.—1. In combination with a door and its frame, one or more movable bars or bolts, C, seated in one of said parts, with an interlocking projection or flange on the other of said parts, and a fastening device arranged to engage with said movable bar or bolt, substantially as and for the purpose set forth.

2. In combination with a door and its frame, having a movable bar or bolt, C, seated in one of said parts, with a projecting flange on the other of said parts, a series of bolts, *b*, arranged to engage



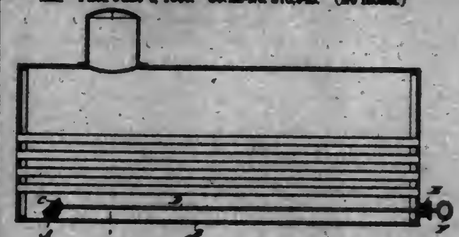
398,611.



with said movable bar or bolt, and a lock arranged to hold the bolts *b*, substantially as shown and described.

3. In combination with a door and its frame, having a movable bar or bolt, C, seated in one of said parts, with a projection or flange on the other of said parts, a lock, L, arranged to engage with and lock said movable bar or bolt, substantially as described.

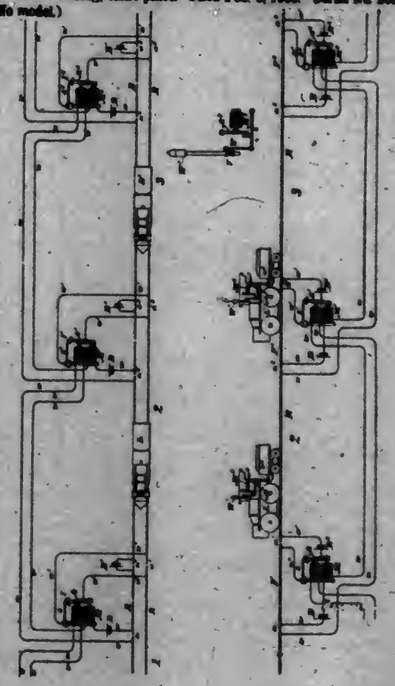
398,612. BOILER-CLEANER. WILLIAM T. HANEY, Chittenden, Ala. Filed June 4, 1888. Serial No. 275,945. (No model.)



Claim.—1. In a boiler-cleaner, a brush having on its upper side a beveled or inclined surface arranged to be acted on by the water as the brush is reciprocated, whereby to force said brush against the surface of the boiler, substantially as set forth.

2. A boiler-cleaner consisting of the brush having a block or body formed on its upper side with a beveled or inclined surface, and a handle connected with said brush, substantially as set forth.

398,613. ELECTRICAL RAILWAY-SIGNAL. HORACE HAYDEN, Jr., and WILLIAM F. X. DEBANY, New York, N. Y., assignors of one-third to Albert R. Gooding, same place. Filed Feb. 6, 1883. Serial No. 263,342. (No model.)



Claim.—1. In a system of block-signals for railways, the combination of a main battery located at one end of a block-section in a circuit including one coil of a switching-magnet at the home station and one coil of an additional switching-magnet at a distant station, with a local battery, also located at the home station, having circuit-connections, as described, with the armature-lever of the switching-magnet, and a local circuit extending into the cab of the engine, including a magnet the armature of which controls an alarm, substantially as described.

2. In a system of block-signals for railways, the combination of a series of batteries, one for each block-section, each of which includes in its circuit one coil of a switching-magnet at the home station and an additional coil of a switching-magnet at the next station in the rear, with a local battery at each station, and circuit-connections, as described, for closing a circuit through an alarm apparatus in the cab of the engine, substantially as described.

3. In a system of block-signals, the combination of the following elements: a main or switching battery and a magnet at each block having two independent coils, switching-circuits running to the adjoining advance and rear blocks and including the separate coils of said magnets, and a local battery at each block including in its circuit the armature of the switching-magnet, the insulated ends of two adjoining rails, and an alarm-circuit on the cab.

4. In a system of block-signals for railways, the combination of the following elements: one main or switching battery for each block included in a circuit running to one coil of each of two switching-magnets, one of said magnets being near the battery and the other at the next block to the rear, a local battery at each block including in its circuit the armature of the switching-magnet, a circuit running to the insulated ends of two adjoining rails, and a signaling-magnet located on the engine and included in a local circuit, substantially as described.

5. In a system of block-signals, the combination of two batteries located at each block, one of which includes circuits and switching-magnets located at the home and rear ends of the block for manipulating the circuit relations of an alarm located on the engine, while the second includes in its circuit the armature of the switching-magnet, the adjoining ends of two insulated rails of the track, and an alarm-magnet located on the engine and included in a local circuit, substantially as described.

6. In a system of block-signals for railways, the combination of two circuits for each block connected to a single line of insulated rails, one of said circuits including a battery and one portion of the coils of two switching-magnets located at each end of the block, while the other includes a second battery, the armature-lever of the first-named magnet, the adjoining ends of two insulated rails, and an alarm-magnet located on the engine and included in a local circuit, substantially as described.

7. In a system of block-signals for railways, the combination of the following elements: a single line of rails separated into block sections by insulation, a single battery for each section including in its circuit the insulated ends of the rails and one coil of a magnet at the battery end of the block and one coil of an additional magnet at the distant end of the block, a tilting armature-lever for each magnet adapted to tilt to the right or left, according to which half of the magnet is energized, a local circuit including each tilting armature-lever and a separate battery with circuit-connections, as described, running to the insulated ends of two adjoining rails, and a circuit on the engine including an alarm-magnet, whereby the engineer is warned in the event of danger in advance, substantially as described.

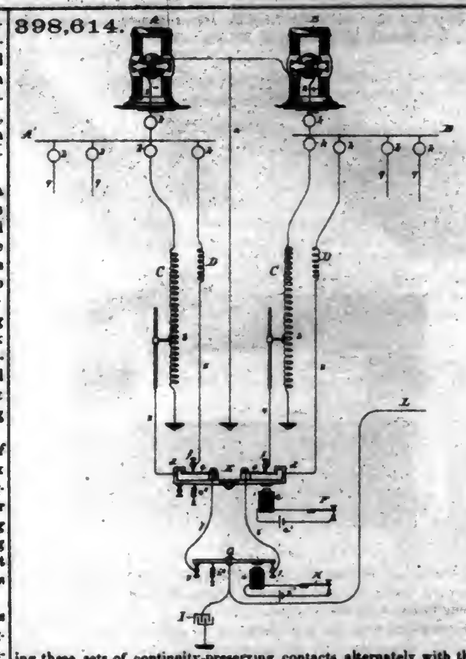
398,614. QUADRUPLEX TELEGRAPHY. CLARENCE L. HEALY, Brooklyn, N. Y. Filed Jan. 16, 1888. Serial No. 260,988. (No model.)

Claim.—1. In telegraphs, the combination, with a line, of a dynamo or other source of electrical energy grounded at one pole, a ground through resistance from the other pole of the dynamo, a direct-line connection from the latter pole of the dynamo through the balancing-resistance, a shunt-line connection from an intermediate point on the grounded resistance, and a key placing the direct and shunt connections alternately to line, substantially as set forth.

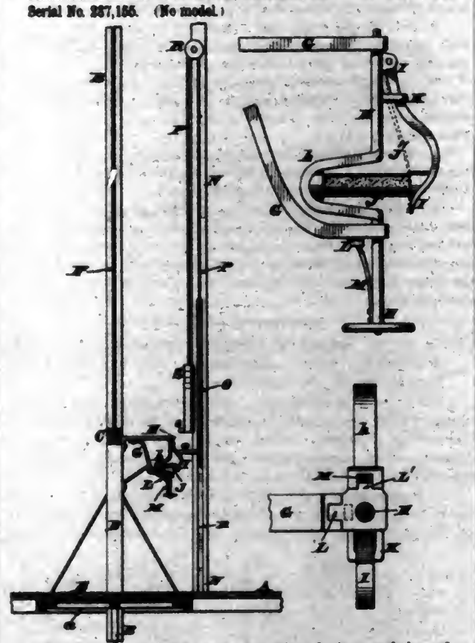
2. In telegraphs, the combination, with a line, of two dynamos or other sources of electrical energy grounded directly at opposite poles, a ground through resistance from the other pole of each dynamo, a direct-line connection from the latter pole of each dynamo through a balancing-resistance, a shunt-line connection from an intermediate point on each grounding-resistance, a key placing the shunt or direct connections alternately to line, and a key closing the line to the dynamos alternately, substantially as set forth.

3. In telegraphs, the combination, with a line, of two dynamos or other sources of electrical energy grounded at opposite poles, two line-connections from the other pole of each dynamo, giving different electro-motive forces, a lever having two sets of continuity-preserving contacts insulated from each other and connected with the line-connections of the two dynamos, respectively, a second lever connecting these sets of continuity-preserving contacts alternately with the line, and a grounded condenser connected with the line before it reaches said second lever, substantially as set forth.

398,614.



398,615. DEVICE FOR OPERATING HATCHWAY-GATES. FREDERICK HEISE and EDWARD BINGEL, Cincinnati, Ohio. Filed Oct. 4, 1888. Serial No. 287,185. (No model.)

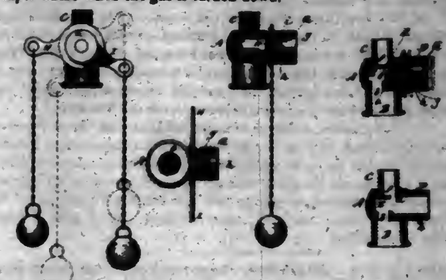


Claim.—1. An elevator-gate-operating device consisting of a frame attached to the platform or cab, a rock-shaft mounted in bearings of said frame, a lever pivoted to the rock-shaft to engage the gate, and a spring-lock adapted to hold said rock-shaft and lever in an operative or in an inoperative position, substantially as described.

2. The combination of rock-shaft H, pivoted lever I, spring J, locking-spring M, and a supporting-frame provided with bearings for the rock-shaft and sockets L L′ for said locking-spring, all substantially as described.

398,616. GAS-COCK. WILLIAM C. HOMAN, Hoosick, Conn., assignor to Edward Miller & Company, same place. Filed Nov. 5, 1888. Serial No. 289,959. (No model.)

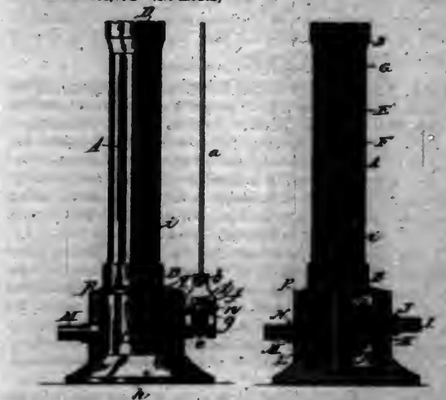
Brief.—The gas is never completely cut off, so that there will be a taper flame when the gas is turned down.



Claim.—1. The herein-described cock, consisting of a shell constructed with an inlet at one end and an outlet at the opposite end, with an intermediate chamber, E, between said outlet and inlet, the outlet opening into the said chamber E, the said shell constructed with a right-angular cylindrical projection, D, the interior of which is in line with and opens into the said chamber E, but the transverse area of the interior of the projection greater than the transverse area of the chamber E, and so as to form a seat, *a*, between the said chamber and interior of the projection, the interior of the said projection also opening into the outlet-passage of the cock, the said seat constructed with a slight escape, *e*, into the outlet-passage, combined with a cylindrical plug, F, adapted to rotate in said projection and to come to a bearing against the said seat *a*, and the said plug provided with a spiral or cam-shaped slot, and the said projection with a corresponding stud adapted to work in said cam-shaped slot, substantially as described, and whereby under rotation of the said plug the said cam-shaped slot operating in connection with said stud will impart to the said plug a longitudinal movement from or to its seat, according to the direction in which the plug is rotated.

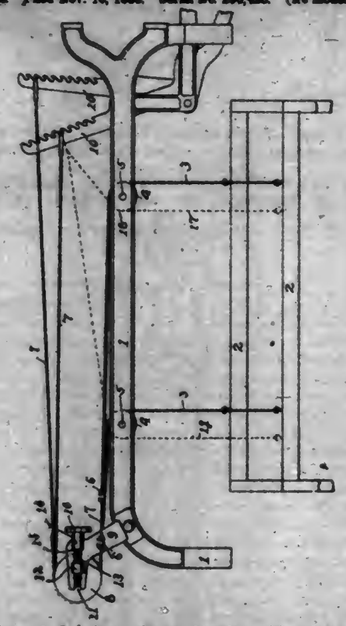
2. The herein-described gas-cock, consisting of a shell having an inlet at one end and outlet at the opposite end, with an intermediate chamber, E, into which the outlet opens, the shell constructed with a cylindrical tubular projection, D, the interior of said projection being in line with but of greater transverse area than the transverse area of the chamber E, and so as to form a seat, *a*, between the said chamber E and the interior of the projection D, the interior of the said projection opening into the outlet-passage from the cock, combined with a rotative plug, F, in said chamber, constructed with or formed as a part of a sleeve, G, concentric with and surrounding said cylindrical projection D, the sleeve constructed with a cam-shaped slot, *g*, and the projection provided with a corresponding stud, A, the seat between the chamber E and the interior of the projection D constructed with a slight escape, *e*, into the outlet-passage of the cock, substantially as and for the purpose described.

398,617. JACK-SCREW. CHARLES H. HOPKINS, Lyndonville, assignor to Sumner S. Thompson, Lyndon, Vt. Filed Aug. 1, 1888. Serial No. 281,704. (No model.)



Claim.—In a jack-screw, the combination, with the standard, cap, and base-rest A B C, of a cylindrical nut, E, working on a screw, F, therein, the bevel-gear K, rigidly attached thereto, the bevel-gears H and L on the stub-shafts I and M at right angles to said gear K and engaging therewith, a ratchet-wheel, *c*, that may be rigidly attached to said stub-shafts I and M, an operating-handle, *b*, that may be loosely mounted on said stub-shafts, and a double pawl, *g*, pivoted between the lugs of said handle and forced into engagement with the ratchet-wheel *c* by the action of the beveled edge on the lower end of the bar *a* in forcing the spring *f* to one side or the other, as and for the purpose set forth.

398,618. SHEDDING MECHANISM FOR LOOMS. GEORGE F. HOPKINS, Worcester, Mass., assignor to the Knowles Loom Works, same place. Filed Nov. 10, 1888. Serial No. 290,430. (No model.)



Claim.—1. In a loom, the combination, with a harness-lever, harness-frame, and two sheaves, as 4, located in the loom-frame, of a third supplemental sheave, as 8, located in a place above the sheaves 4 and at the opposite end of the frame from the harness-lever, and straps or cords connecting the harness-lever with the harness-frame, which passes over the sheave 8 to the sheaves 4, substantially as set forth.

2. In a loom, the combination, with a harness-lever, two sheaves located in the loom-frame, a harness-frame, and individual straps or cords passing from said frame over said sheaves, of a third supplemental sheave supported above the loom-frame, means for adjusting said sheave laterally, and a strap or cord passing over said sheave to connect the individual harness-frame straps or cords with the harness-lever, substantially as shown and described.

398,619. PRESERVING AND HARDENING WOOD. WARREN INGRAM, Warren, Ohio. Filed Dec. 20, 1888. Serial No. 294,211. (No specimens.)

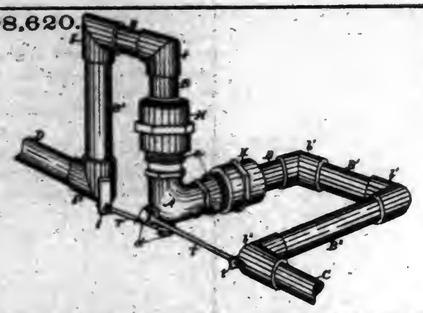
Claim.—The process or treatment of wood, as herein described, by which it is preserved, rendered hard and weather-proof, &c., consisting in subjecting it to a bath in a boiling solution composed of concentrated lye or potash, burnt lime, alum and salt, and pulverized iron ore mixed with water, and then subsequently immersing it with a hot solution composed of linseed-oil, petroleum-oil, rosin, red lead, or any suitable coloring-matter whereby the tint is given the wood, substantially as and for the purpose set forth.

398,620. STEAM-FITTING FOR RAILWAY-CARS. LEMUEL D. JONES, Erie, Pa. Filed Dec. 14, 1888. Serial No. 293,616. (No model.)

Claim.—1. The elbows A, having sockets with stuffing-boxes at the ends of its arms and pivot-lugs *a′* at its angle in axial line with said sockets, in combination with two goose-necks swiveled and packed in said sockets and the tie-rods T, journaled on said pivot-lugs *a′* and adjustably connected with lugs on the swinging ends of said goose-necks.

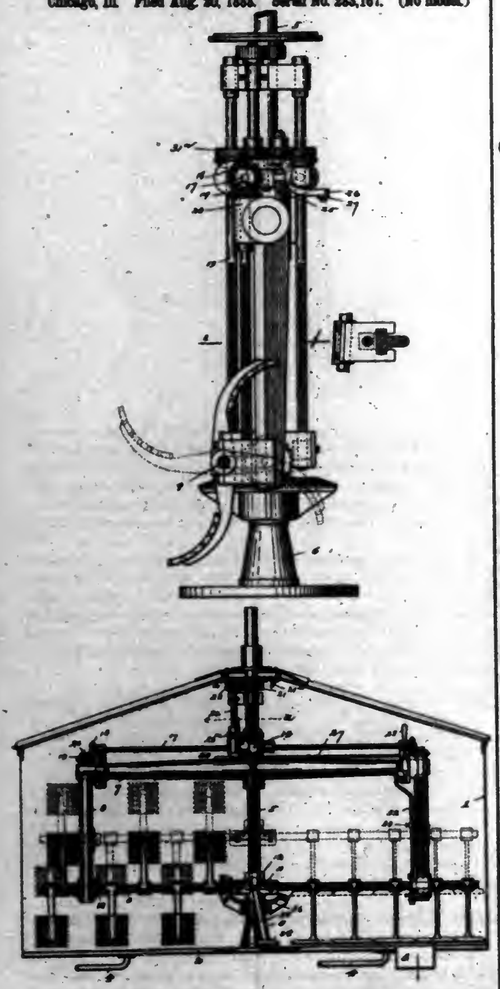
2. The elbow A, having externally-screw-threaded and internally-grooved sockets *a* at its ends and pivot-lugs *a′* on opposite sides of its angle in axial line with said sockets, goose-necks pivoted in each of said sockets, splined glands on said goose-necks fitting in said grooved sockets, nuts on said sockets acting on said glands, and tie-rods piv-

398,620.



oted on said pivot-lugs and adjustably connected with the swinging end of the goose-neck, which is pivoted concentrically therewith.

398,621. BREWER'S MASHING-MACHINE. CHARLES KARSTNER, Chicago, Ill. Filed Aug. 20, 1883. Serial No. 283,167. (No model.)



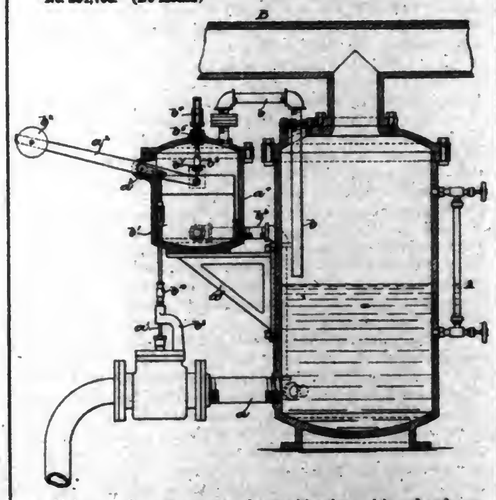
Claim.—1. In a mashing-machine, in combination with a non-adjustable central driving-shaft, a rigid arm extended longitudinally therefrom, vertical guides, one toward each end of said arm, a shaft carrying mash-working devices and having bearings movable along said vertical guides, operating-shafts having a threaded connection at one end with the movable bearings, and suitable gearing whereby to rotate the operating-shafts, substantially as described.

2. In a mashing-machine, the combination, with a longitudinal shaft carrying mash-working devices, of movable bearings for said shaft having threaded nuts, vertical operating-shafts, one for each bearing, said shafts adapted to turn in said nuts, whereby to move the bearings, and suitable gearing to rotate the operating-shafts, substantially as described.

3. In a mashing-machine, the combination, with the mixer-shaft and shovel-shaft having movable bearings provided with threaded nuts, of vertical operating-shafts threaded at one of their ends to adapt them to the threads of the bearings and suitable gearing whereby to rotate said operating-shafts and thereby simultaneously adjust the mixer-shaft and the shovel-shaft, substantially as described.

4. In a mashing-machine, the combination, with the mixer-shaft and shovel-shaft having movable bearings provided with threaded nuts, of vertical operating-shafts threaded toward one of their ends to adapt them to the threaded nuts of the bearings and a shifting rod having stops adapted to engage the movable bearing of one of the shafts, whereby to throw the operating-shafts out of gear, substantially as described.

398,622. STEAM-TRAP. CHRISTOPHER KANNEBERG, Boston, Mass., assignor to Joseph P. Stillman, same place. Filed Nov. 23, 1886. Serial No. 201,706. (No model.)



Claim.—1. In a steam-trap, the combination, with a chamber or vessel, A, provided with a steam-inlet and water-outlet and a valve to control said water-outlet, of an auxiliary chamber connected with the chamber or vessel A, a float in said auxiliary chamber operatively connected to the said valve, and a counter-balance for said float, substantially as described.

2. In a steam-trap, the combination, with a chamber or vessel, A, provided with a steam-inlet and water-outlet and a valve to control said water-outlet, of an auxiliary chamber connected with the chamber or vessel A, a float in said auxiliary chamber operatively connected to the said valve, an air-outlet in the auxiliary chamber, a valve for said outlet carried by the float, and a counter-balance for said float, substantially as described.

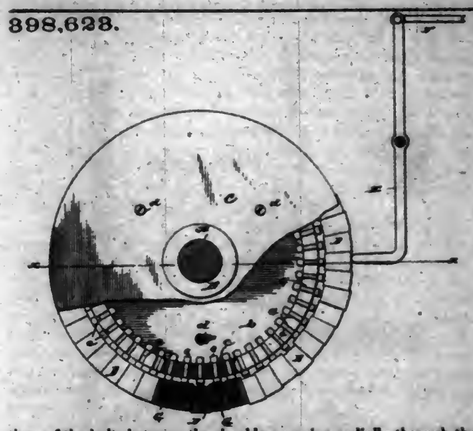
398,623. PATTERN-WHEEL FOR WARP-KNITTING MACHINES. JAMES KENYON, Brooklyn, N. Y., assignor of one-half to Job Welling, same place. Filed Mar. 22, 1888. Serial No. 268,125. (No model.)

Claim.—1. The combination, with the hub, the web, and the rim, of a series of radially-adjustable blocks forming the working-face of the wheel and having central longitudinal threaded apertures, and screw-bolts swiveled at their inner ends in the said rim and extending through the said apertures to the outer or working faces of the blocks to receive a screw-driver, substantially as set forth.

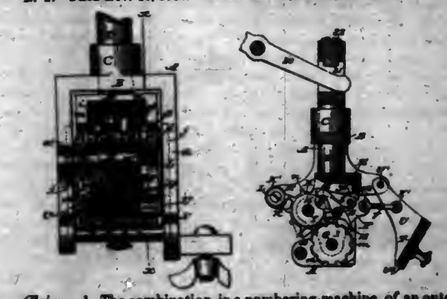
2. The combination, with the hub, web, and rim having slots *s* opening through the outer edge of the rim and the removable face-plate covering said slots, of the radially-extending screw-bolts swiveled at their inner ends in said slots and removable laterally out of the same, and the radially-adjustable segmental blocks having longitudinal threaded apertures, through which the said bolts pass to the working-faces thereof and there adapted to receive a screw-driver, substantially as set forth.

3. The combination, with the hub, the web, and the rim at opposite sides of the web near its periphery and having slots *c*, open at its edges, of the screw-bolts having nicks at their outer ends and two shoulders, *s s*, at their inner ends at opposite sides of the rim, the portions of the bolts between the shoulders passing radially through the slots, the radially-adjustable segmental blocks D at opposite sides of the web beyond the rim and having longitudinal threaded apertures, through which the threaded portions of the bolts pass to the working-faces of the blocks, the removable face-plate C at opposite sides of the web closing the slots in the rim and extending alongside of the blocks, and the screws *d*, securing said plates in position, substantially as set forth.

398,628.



398,624. NUMBERING-MACHINE. WILLIAM KOCH, New York, N. Y. Filed Nov. 10, 1887. Serial No. 254,773. (No model.)

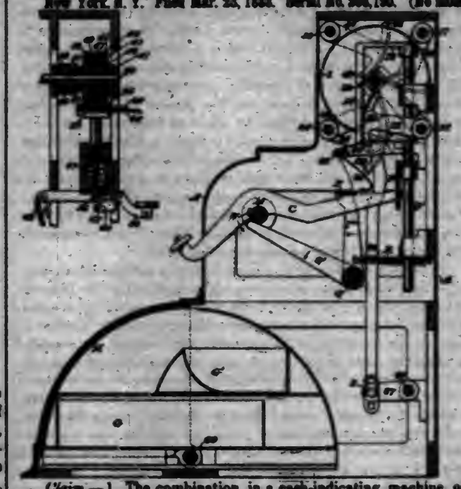


Claim.—1. The combination, in a numbering-machine, of an outer stationary frame, an inner movable frame reciprocating therein, parallel shafts mounted in said inner movable frame, a series of one or more peripherally-cogged numbering-wheels revolving upon one of said shafts and each bearing type upon their cogs, corresponding spur-wheels revolving upon the other shaft and gearing severally with said cogged numbering-wheels, a yielding finger projecting from the stationary frame in position to be engaged by a tooth of the first spur-wheel at each reciprocating movement of the inner frame, a stop preventing said finger from yielding under the pressure of the tooth as the frame moves inward, and a spring actuating said finger to carry it to its normal position, all substantially in the manner and for the purpose herein set forth.

2. The combination, in a numbering-machine, of an outer stationary frame, an inner movable frame reciprocating therein, parallel shafts mounted in said inner movable frame, a series of cog-wheels having type upon the cogs and revolving upon one of said shafts, a corresponding series of spur-wheels revolving upon the other shaft and gearing severally with said type wheels, a single tooth projecting laterally from each spur-wheel to engage the next adjacent type-wheel at each complete revolution, a disk upon the outer side of the first of said spur-wheels, said disk having a single notch in its periphery, a wide dog pivoted to the movable frame upon an axis parallel with the axial shafts of the spur and type wheels, and which engages simultaneously all the type-wheels excepting the first, and an arm projecting from the dog into contact with the periphery of the disk, all substantially in the manner and for the purpose herein set forth.

3. The combination, with the swinging ink-pad bracket U, pivoted to the fixed frame A, the reciprocating frame traversing in said fixed frame, and the numbering-wheels mounted in said reciprocating frame, of the link V, pivoted to the swinging bracket-frame and to the frame carrying the numbering-wheels, whereby the movements of the head operate to swing the bracket and its pad in and out of contact with the numbering-wheels, all substantially in the manner and for the purpose herein set forth.

398,625. CASH INDICATOR AND RECORDER. WILLIAM KOCH, New York, N. Y. Filed Mar. 23, 1888. Serial No. 268,195. (No model.)



Claim.—1. The combination, in a cash-indicating machine, of a group of keys all having the same length of stroke, a single reciprocating rod moved differentially by the engagement therewith of each separate key at a different interval in the length of its stroke, and a series of signal characters or numbers designating severally the several keys, all actuated by the movements of the one rod and each brought to view by a different length of movement of said rod, substantially in the manner and for the purpose herein set forth.

2. The combination, in a cash-indicating machine, of a group of oscillating keys pivoted intermediate their ends upon a common shaft, a vertically-reciprocating rod mounted at the rear of said keys to be actuated thereby, a plate fixed to the vertical rod, with its lower edge extending transversely over the ends of said keys and having differential notches or offsets formed in said edge, each adapted to be engaged by one of said keys, (whereby each key in making its stroke will produce a different extent of movement of the rod,) and one or more wheels geared to said rod, to be revolved thereby, and which bear characters or numbers designating the several keys in the group, substantially in the manner and for the purpose herein set forth.

3. The combination, in a cash-indicating machine, of two or more groups of keys, a series of two or more indicating-wheels, each bearing numbers or characters corresponding with the keys in one of said groups, and which are mounted to be read in their normal order from left to right at the front of the machine, and a second series of duplicate wheels mounted to be read in similar order from left to right at the rear of the machine, the corresponding wheels in the two series being geared to move in unison and be actuated simultaneously by the movement of the one key appropriate thereto, substantially in the manner and for the purpose herein set forth.

4. The combination, in a cash-indicating machine, of a series of indicating-wheels, each revolving about a common axis, a corresponding series of concentric tubular shafts revolving upon the same axis, a type-wheel upon each shaft, a series of rock-shafts mounted parallel with the axis of the indicating-wheels, and suitable gear coupling each rock-shaft with an indicating-wheel at one end and with one of said tubular shafts at the other, substantially in the manner and for the purpose herein set forth.

5. The combination, in a cash-indicating machine, of one or more type-wheels, keys C, to operate said wheels, two superimposed, slotted, or perforated guide-plates mounted adjacent thereto and below the same, a platen moving through the opening in the plates into contact with the type-wheels, a spring operating to carry the platen toward the type, a stop to limit the action of the spring before the movement of the platen is completed, a pivotal lever adapted to withdraw the platen and contract the spring, and a yielding contact-point adapted to engage the lever as it moves in the direction to withdraw the platen and allow its independent return, substantially in the manner and for the purpose herein set forth.

6. The combination, in a cash-machine, of a movable lid, a pivoted segmental frame, to which said lid is secured, an actuating-wheel revolving upon an axis parallel with the pivotal axis of the lid, a wrist-pin upon the wheel, and a connecting-rod coupling the wrist-pin with the pivoted frame, whereby the revolution of the wheel is made to alternately open and close the lid, substantially in the manner and for the purpose herein set forth.

7. The combination, in a cash-machine, of a movable lid, an acte-

ating-wheel revolving on an axis at a right angle to the line of movement of said lid, a wrist-pin upon the wheel, a connecting-rod coupling the wrist-pin and lid, a coiled spring actuating the wheel to produce an automatic revolution thereof, a controlling-disk secured to the axle of the wheel, to revolve with it, a movable stop-pin adapted to engage a notch or offset on said controlling-disk to arrest the movement of the wheel at each complete revolution thereof, a group of pivoted actuating-keys, a transverse bar pivoted above the ends of the keys, to be struck and lifted by either of them when the key is played, a rock-shaft mounted parallel with the axis of the actuating-wheel beneath the key-bar, a connecting-rod coupling said bar with a radial arm on the rock-shaft, and a radial arm projecting from the rock-shaft, to carry the stop-pin, whereby the play of a key will operate to disengage the stop-pin and allow the wheel to make its revolution, and thereby automatically open and close the lid, substantially in the manner and for the purpose herein set forth.

8. The combination, in a cash-machine, of a movable lid, an actuating-wheel revolving on an axis at a right angle to the line of movement of said lid, a wrist-pin upon the wheel, a coupling-rod connecting the wrist-pin and lid, a spring actuating the wheel to produce an automatic revolution thereof, a controlling-disk secured to the axle of the wheel, to revolve with it, a movable stop-pin adapted to engage a notch or offset on said controlling-disk, to arrest the movement of the wheel at each complete revolution thereof, a second movable stop-pin adapted to engage a second notch or offset formed at a diametrically-opposite point on the disk, to arrest the movement of the wheel at each half-revolution thereof after it is disengaged from the first stop-pin, a pivotal arm carrying said second stop-pin, a spring enforcing the engagement of the pin with the notch or offset, and an oscillating hand-lever adapted to move the arm and disengage the pin, substantially in the manner and for the purpose herein set forth.

9. The combination, substantially as set forth, of the actuating-wheel coupled, as herein described, to the reciprocating lid of a cash-machine, a controlling-disk secured to the axle of said wheel, to revolve with it, a movable stop-pin adapted to engage a stop or offset on said disk, to arrest its movement at a complete revolution thereof, a second movable stop-pin adapted to engage a second notch or offset on said disk, to arrest its movement at a half-revolution thereof after it has been disengaged from the first stop-pin, a pivoted arm carrying said second stop-pin, a spring enforcing the engagement of the pin with the notch or offset, a second winding-disk mounted parallel with the controlling-disk, to revolve independently about the same axis, a helical spring coiled between the two disks and secured at either end thereto, a pawl pivoted outside the winding-disk, to engage a notch in its periphery and prevent a reverse movement of the disk after the spring is wound, a toothed wheel revolving loosely upon the hub or axle of the winding-disk, a pawl pivoted to said disk, to engage the toothed wheel and prevent its independent rotation as the spring is wound, an oscillating hand-lever, a segmental rack carried by said lever and which gears with said toothed wheel, a spring-actuated yielding stop fitted upon the arm which carries the second stop-pin, to engage the controlling-disk, and a tooth upon the segmental rack adapted to slip by the yielding stop as the rack moves forward, to wind up the spring and to engage the stop and move the lever so as to release the controlling disk at the end of the return-stroke of the rack, substantially in the manner and for the purpose herein set forth.

398,626. CASH INDICATOR AND REGISTER. WILLIAM KOCH, New York, N. Y., and CHARLES R. HARLEY, Washington, D. C.; said Harley assignor to said Koch. Filed Mar. 30, 1888. Serial No. 269,452. (No model.)

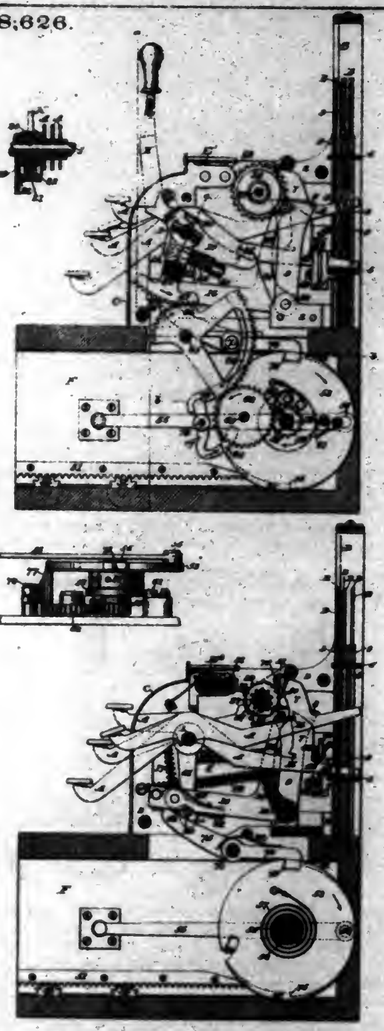
Claim.—1. In a cash-indicating machine, the combination of a tablet, a vertically-moving rod carrying said tablet, and a key-lever jointed immediately to said rod to prevent any independent movement of the two, whereby the position of the one shall indicate positively the position of the other, substantially in the manner and for the purpose herein set forth.

2. The combination of the series of parallel key-levers having a uniform length of stroke and a controlling-plate actuated differentially by the stroke of each key-lever, whereby the movement of a second key in the series is prevented until the first key has resumed its normal position, substantially as herein set forth.

3. The combination, with a series of parallel key-levers and a transverse controlling-plate mounted to reciprocate above said key-levers, of a series of differentially curved or inclined fingers severally carried by the key-levers to project therefrom into contact and engagement with said plate to move it, whereby the upward movement of any one key-lever will produce a transverse movement of the controlling-plate differing in its extent from that produced by the movement of any other key-lever in the same series, substantially in the manner and for the purpose herein set forth.

4. The combination of the series of parallel key-levers having a uniform length of stroke, a controlling-plate actuated differentially by the stroke of each key-lever, and an adding mechanism, substantially

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as described, actuated by the differential movements of the controlling-plate, substantially in the manner and for the purpose herein set forth.

5. The combination, in a cash indicating and adding machine, with a train of adding-wheels, a ratchet-wheel actuating the same, a segmental disk revolving at the side of the ratchet-wheel on the same axis and extending to the outer end of the ratchet-teeth, an oscillating pawl overlapping both the ratchet and proximate controlling-disk, and a toothed wheel or segment attached to said controlling-disk, of a group of oscillating key-levers, an actuating-finger projecting from the upper edge of each lever, a transverse reciprocating controlling-plate mounted immediately above the key-plates to be actuated by an upward movement thereof and moved differentially by each toward the controlling-disk, and a rack carried with the controlling-plate and adapted to gear with the toothed wheel or segment of the controlling-disk, whereby an upward movement of any one key operating to move the controlling-plate and its attached rack to a greater or less extent will thereby move the controlling-disk, so as to determine the point at which, in its movement, the swinging pawl shall engage the teeth of the ratchet-wheel of the adding-train, all substantially in the manner and for the purpose herein set forth.

6. The combination of a group of parallel key-levers, A A, actuating-fingers 7, projecting upwardly therefrom, a transverse strip, 12, mounted to oscillate over the key-levers into engagement with a notch, 15, in the proximate edge of each finger when elevated, upright arms 13, pivoted at their lower ends and carrying said locking-strip on their upper ends, a lever, 16, projecting from the lower pivoted end of one of said arms at about a right angle therewith, a spring, 17,

adapted to elevate the lever, a spring-actuated latch, 42, pivoted to the side of the lever near its outer free end, a stop, 43, to limit the down play of the latch, a rock-shaft, 1, mounted transversely to said lever above its outer end, a hand-lever, H, actuating said shaft, an arm, 41, depending from the rock-shaft in proximity to the latch, and a pin, 40, on said arm, adapted to ride under the latch to lift it from its stop in moving forward and over the latch to depress the latch and lever in moving back again, whereby the return movement of the hand-lever after being depressed will operate to depress the lever 16 and release the elevated key from the locking-strip, all substantially in the manner and for the purpose herein set forth.

7. The combination, with the rock-shaft 1, the hand-lever H, actuating the same, the arm 41, depending from the rock-shaft, the pivoted lever 16, whose outer free end extends at a right angle with the shaft 1 in proximity to the arm 41, the spring-actuated latch 42, pivoted upon the side of said lever, and a double-edged pin, 40, upon the proximate side of the arm 41, of a series of ratchet-teeth formed upon the upper and lower edges of said latch 42 and inclined in opposite directions to engage the pin in the movement of said arm and thereby prevent a reverse of the movement of the rock-shaft and hand-lever in either direction, substantially in the manner and for the purpose herein set forth.

8. The combination, substantially as above described, of the rock-shaft 1, the hand-lever H, actuating it, the arm 41, depending therefrom, the group of parallel keys A A, pivoted upon said shaft, a transverse longitudinal plate, 45, upon which the outer ends of the keys rest, pins projecting upward from said movable plate between the keys, lateral catches formed upon the ends of said pins and adapted when moved sidewise to overlap and lock the keys, and a rod, 50, pivoted to the arm 41 and terminating in a wedge-shaped end made to engage the end of the plate 45 at a right angle therewith.

9. The combination, substantially as above described, of the hand-lever H, the spring 24, the rod 21, encircled by said spring and pivoted to the hand-lever, the arm 19, having an offset, 23, through which said rod plays, and the rock-shaft 1, to which said arm is made fast.

10. The combination, in a cash-machine, of a cash-drawer, a crank-wheel, a pitman coupling the wrist of the crank-wheel to the drawer, a spring actuating said crank-wheel, and a hand-lever by whose movement the spring is compressed or energized, substantially in the manner and for the purpose herein set forth.

11. The combination, in a cash-machine, of a cash-drawer, a crank-wheel, a pitman coupling the wrist of the crank-wheel to the drawer, an idle-disk revolving loosely upon the axle of the crank-wheel adjacent thereto, a coiled spring interposed between the crank-wheel and disk and whose ends are secured to the one and the other, a toothed wheel revolving loosely upon the axle adjacent to the idle-disk, a rock-shaft geared to said wheel, a hand-lever by which the shaft is oscillated, and a pawl pivoted to the idle-disk to engage the toothed wheel, whereby the oscillation of the rock-shaft will operate to turn the idle-disk in the direction required to wind the attached spring, substantially in the manner and for the purpose herein set forth.

12. The combination, in a cash-machine, of a spring-actuated crank-wheel, a drawer coupled thereto to be reciprocated thereby at each revolution thereof, a detaining-pawl adapted to engage the crank-wheel at each semi-revolution thereof, and a hand-lever adapted by its movement to lift the pawl, substantially in the manner and for the purpose herein set forth.

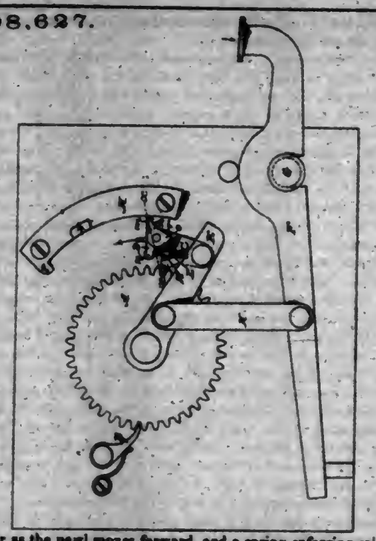
13. The combination, in a cash-machine, of a spring-actuated crank-wheel, a drawer coupled thereto to be reciprocated thereby at each revolution thereof, a detaining-pawl adapted to engage the crank-wheel at each semi-revolution thereof, a group of keys, a vibrating locking-strip adapted to be engaged automatically by each key when the key has been played, a lever oscillated by the movement of the locking-strip, and a second lever actuating the detaining-pawl and itself actuated by the movement of said locking-strip lever, whereby the crank-wheel will be released and the drawer be thereby automatically closed whenever any one key is played, all substantially in the manner and for the purpose herein set forth.

14. The combination, substantially as hereinbefore described, of a drawer, a casing inclosing it, a reciprocating arm coupled to one end of the drawer to actuate it, a rack upon the side of the drawer, and pinions mounted to rotate idly in the casing under the rack and to gear therewith to steady the movements of the drawer.

398,627. STOP DEVICE FOR ADDING AND REGISTERING WHEELS. WILLIAM KOCH, New York, N. Y. Filed Sept. 25, 1886. Serial No. 214,252. (No model.)

Claim.—1. The combination of the toothed wheel, the fixed friction-bar having a curved surface concentric with the wheel, the pawl-arm swinging upon the axis of the wheel as its pivotal center, the pawl pivoted to said arm to engage the wheel, the dog pivoted to said pawl to swing into frictional contact with the curved surface of

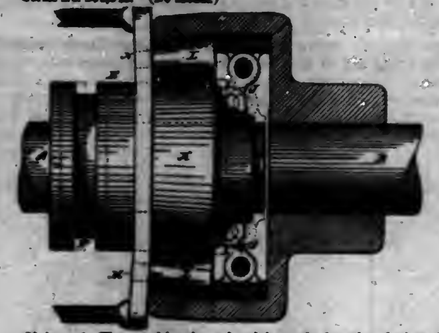
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the bar as the pawl moves forward, and a spring enforcing said contact, substantially in the manner and for the purpose herein set forth.

2. The combination of the toothed wheel, the fixed friction-bar having a curved surface concentric with the wheel, the pawl-arm swinging upon the axis of the wheel as its pivotal center, the pawl pivoted to said arm to engage the wheel, the dog pivoted to said pawl to swing into frictional contact with the curved surface of the bar as the pawl moves forward, a spring enforcing said contact, and fixed stops engaging the dog and the pawl-arm when the stroke of the latter is completed, substantially in the manner and for the purpose herein set forth.

398,628. FRICTION-CLUTCH. FREDERICK H. LAFOUNE, Waterbury, Conn., and HUGH J. BARKER, Philadelphia, Pa. Filed Nov. 19, 1888. Serial No. 291,948. (No model.)



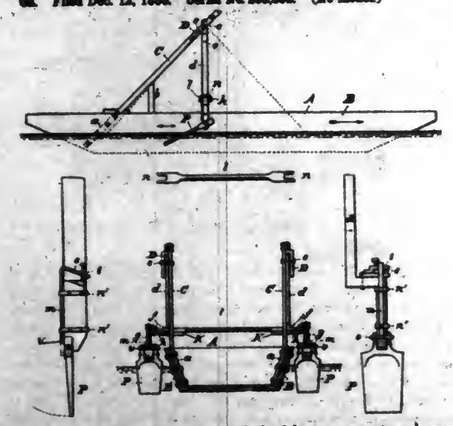
Claim.—1. The combination of a driven shaft and a shaft to be driven, the two shafts being in axial line with each other, a head made fast to one of said shafts, the said head constructed with a concentric chamber, into which the other shaft extends, a longitudinal slide on said other shaft secured to said other shaft and so as to revolve therewith, but free for longitudinal movement thereon, the said slide provided with a surface within said chamber corresponding to and adapted to frictionally engage or disengage said slide and head, according to the direction of movement of said slide, the said slide also constructed with a conical concentric surface within said chamber diminishing in diameter in the direction in which the slide moves to disengage its frictional surface from said head, said conical surface being of smaller diameter than the internal diameter of said chamber, that portion of the surface of said chamber which surrounds said conical portion of the slide being concentric with the said conical surface, with rollers arranged upon stationary axles between the conical surface of said slide and the corresponding surface of the said chamber, substantially as described, and whereby the movement of the said slide in one direction engages the said head, so as to impart rotation to the shaft with which the head is connected in the same direction as that of the other shaft, and when the slide is moved in the opposite direction the slide disengages the said connection with the said head, and the conical surface of the slide engages the said rollers, and thereby

imparts a rotation to the said head and its shaft in the direction opposite to that of the said other shaft.

2. The combination of a driven shaft and a shaft to be driven, the two shafts being in axial line with each other, a head made fast to one of said shafts, the said head constructed with a concentric chamber, into which the other shaft extends, a longitudinal slide on the said other shaft secured to said other shaft so as to revolve therewith, but free for longitudinal movement thereon, one or more shoes within said chamber and presenting a surface or surfaces corresponding to the surface of the wall of said chamber, the said shoes being in connection with the said slide, so that the longitudinal movement of the slide will impart corresponding radial movement to said shoes, the said slide constructed with a conical concentric surface diminishing in diameter in the direction in which the slide moves to retract the said shoes, said conical surface of smaller diameter than the internal diameter of said chamber, that portion of the surface of the said chamber which surrounds the said conical portion of the slide being concentric with the said conical surface, with rollers arranged upon stationary axles between the conical surface of said slide and the corresponding surface of the said chamber, substantially as described, and whereby the movement of the said slide in one direction applies the shoes to the said head to impart rotation to the shaft with which the head is connected in the same direction as that of the other shaft, and when the slide is moved in the opposite direction disconnects said shoes from the head, and the conical surface of the slide engages the said rollers, and thereby imparts a rotation to the said head and its shaft in the direction opposite to that of the said other shaft.

3. The herein-described friction-clutch, consisting of a head arranged upon a shaft and forming a concentric chamber around said shaft, combined with a longitudinal slide concentric with said chamber and arranged upon a shaft for longitudinal movement, but engaged with said shaft circumferentially, the said slide provided with a surface within said chamber corresponding to and adapted to frictionally engage or disengage said slide and head, according to the direction of movement of said slide, the said slide also constructed with a conical concentric surface within said chamber diminishing in diameter in the direction in which the slide moves to disengage its frictional surface from said head, said conical surface of smaller diameter than the internal diameter of the said chamber, that portion of the surface of said chamber which surrounds said conical portion of the slide being concentric with the said conical surface, with rollers arranged upon stationary axles between the conical surface of said slide and the corresponding surface of the said chamber, substantially as and for the purpose described.

398,629. VIBRATING PROPELLER. JAMES S. LAMAR, Valdosta, Ga. Filed Dec. 12, 1888. Serial No. 293,362. (No model.)

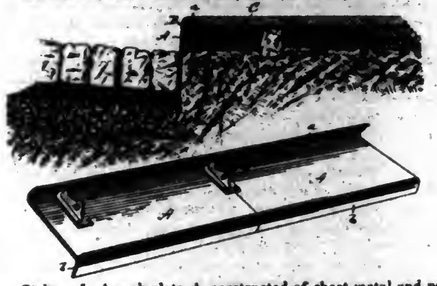


Claim.—1. The combination, with the fulcrum-supports and angular pendent paddle-shanks, of the paddles and the stop-joints, each consisting of a slide having at its lower end a cross-head engaging with the respective paddle, and which slide moves in bearings upon the paddle-shank, and has at its upper end an inclined arm engaging with an adjustable bearing connected to the horizontal portion of the paddle-shank, substantially as specified.

2. The combination, with the fulcrum-supports and angular pendent paddle-shanks, of the paddles, the stop-joints, each consisting of a slide having at its lower end a cross-head engaging with the respective paddle, and which slide moves in bearings upon the paddle-shank and has at its upper end an inclined arm engaging with an adjustable bearing connected to the horizontal portion of the paddle-shank, and the removable transverse bar, substantially as specified.

3. The combination, with fulcrum-bars attached to the boat, and pendent paddle-shanks, of the bifurcated transverse handle-bar, substantially as specified.

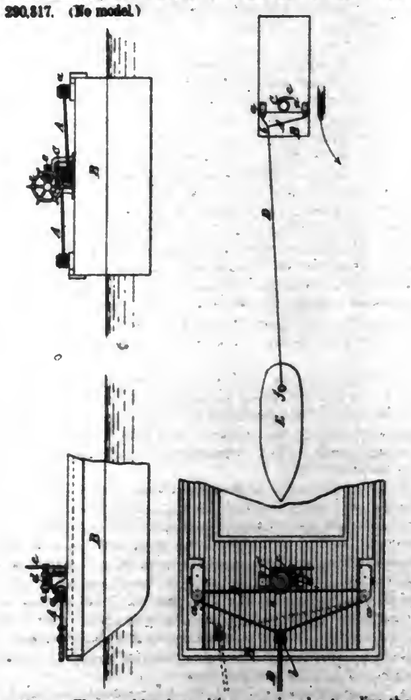
398,630. PAVEMENT-CURB. ISRAEL L. LANDIS, Lancaster, Pa. Filed Dec. 13, 1888. Serial No. 293,426. (No model.)



Claim.—1. A curb-plate, A, constructed of sheet metal and provided with a flange, *a*, at its upper edge and a stiffening-bracket secured in the angle formed by the said flange *a*, substantially as described.

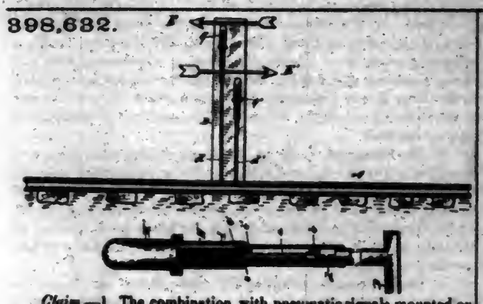
2. The combination of the curb-plates provided at their upper edges with inwardly-turned flanges, and cast brackets riveted in the angle formed by the said flanges, and securing-rods attached to the said brackets, substantially as described.

398,631. STEERING-GEAR FOR VESSELS AND FLOATING BODIES. VALDEMAR F. LEMOS, Brooklyn, assignor of one-half to Cornelius H. De Lamater, New York, N. Y. Filed Nov. 14, 1888. Serial No. 290,817. (No model.)



Claim.—The combination, with a vessel and a tow-line therefor, of a running steering-bridle, consisting of a rope or chain having its ends connected together and arranged athwart the vessel, supports for said bridle arranged on opposite sides of the center of the vessel, and a rotary barrel or capstan for moving said bridle athwart the vessel, the tow-line being connected with the bridle by a connection which is movable athwart the vessel by the movement of the bridle, substantially as and for the purpose herein set forth.

398,632. PNEUMATIC SIGNAL FOR RAILWAYS. JOHN K. LEIDY, Tom's Brook, assignor of two-thirds to Noah W. Solenberger and German Smith, Winchester, Va. Filed Dec. 3, 1887. Serial No. 257,237. (No model.)

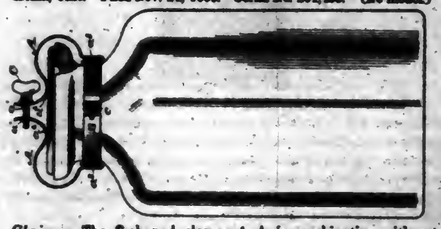


Claim.—1. The combination, with pneumatic signals mounted on posts and communicating with signals in remote stations, of signal-arrows fixed to said posts and pointing in opposite directions, substantially in the manner and for the purposes described.

2. A pneumatic signal composed of an opaque cylinder, a superimposed transparent cylinder, a guiding cylinder or barrel, and a colored vertically-movable signal provided with a valve-stem, and a valve adapted to close against a seat when the colored signal is raised and exposed to view, substantially as described.

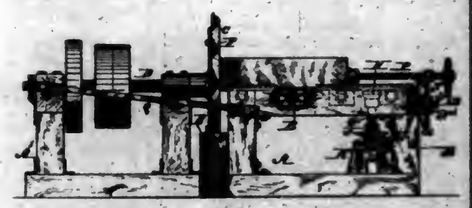
3. The combination of an opaque cylinder, a transparent cylinder, an inclosed vertically-movable visible signal, a pneumatic tube, and a valve, substantially in the manner and for the purposes described.

398,633. SEALING DEVICE FOR FRUIT-JARS. JOHN LOGAN, Xenia, Ohio. Filed Nov. 21, 1888. Serial No. 291,433. (No model.)



Claim.—The S-shaped clamps A A, in combination with set-screw C and adjustable band B, substantially as described, and for the purpose named.

398,634. MACHINE FOR RUBBING OR DRESSING STONE. DAVID MACKIE, Philadelphia, Pa. Filed Feb. 27, 1888. Serial No. 265,263. (No model.)



Claim.—1. The stone rubbing or dressing disk having cups or buckets connected with the periphery of the same and adapted to empty or discharge their contents over the rubbing side thereof, substantially as described.

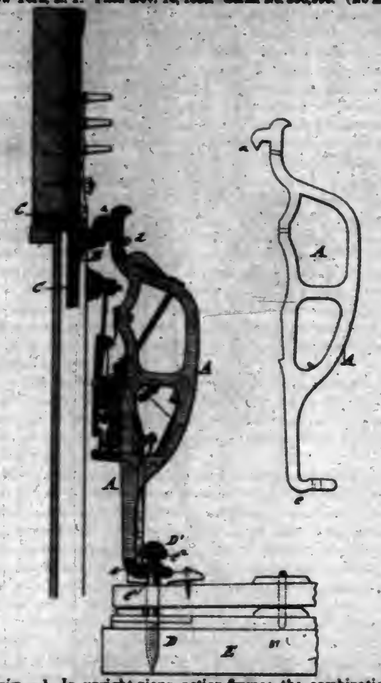
2. A stone rubbing or dressing disk having cups or buckets connected with the periphery thereof, in combination with a feeding-box into which said buckets dip and are filled as the disk rotates, substantially as described.

3. In a stone rubbing or dressing machine, a frame, a screw for holding the stone against a rubbing or dressing disk, and an arm supporting said screw adjustably connected with the frame, substantially as described.

4. A stone rubbing or dressing machine having a disk, a frame with rollers thereon, a box swiveled to said frame, an arm secured in said box, and a screw working in said arm, said parts being combined substantially as described.

5. A stone rubbing or dressing machine having a rubbing-disk, a frame with rollers journaled therein, an arm secured to said frame, a screw working in said arm, and a lifting-screw with mechanism, substantially as described, for operating the same, said parts being combined substantially as described.

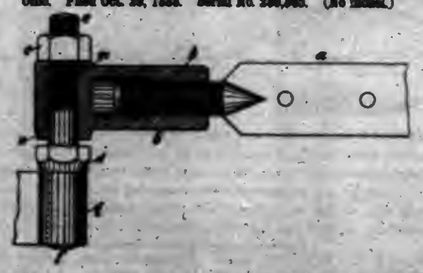
398,635. UPRIGHT-PIANO ACTION-FRAME. HENRY MALLMER, New York, N. Y. Filed Nov. 12, 1888. Serial No. 290,999. (No model.)



Claim.—1. In upright-piano action-frames, the combination of a string-frame having projecting brackets and recesses or sockets in said brackets, upright standards provided with beveled noses resting in said sockets, and screw-bolts connecting the lower ends of the standards with the key-bottom, substantially as set forth.

2. In upright-piano action-frames, the combination, with a string-frame having projecting brackets provided with recesses or sockets, upright standards for the actions, said standards having beveled noses at the upper ends resting in said sockets, set-screws passing through the upper ends of the standards and engaging the brackets, and screw-bolts connecting the lower ends of the standards with the key-bottom, said bolts having shoulders and threaded shanks for the fastening screw-nuts, substantially as set forth.

398,636. ADJUSTABLE HINGE. ELWYN A. MALLORY, Cincinnati, Ohio. Filed Oct. 20, 1888. Serial No. 288,265. (No model.)

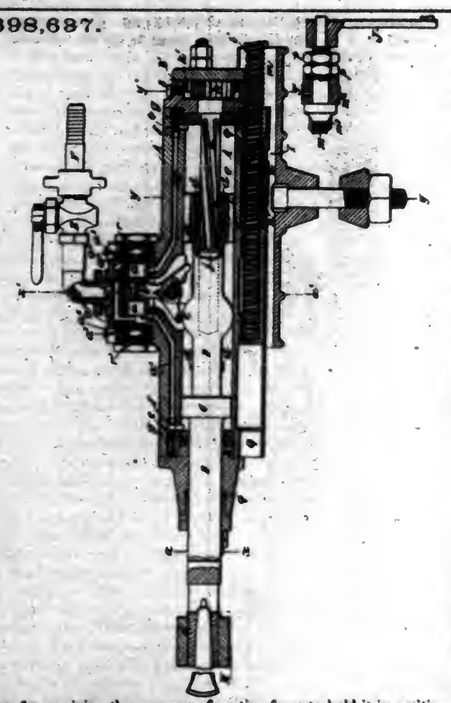


Claim.—In a hinge, the combination of the leaf *a*, having a cylindrical screw-threaded end, *b*, a cylindrical body, *b*, provided with a screw-threaded longitudinal bore to receive the screw-threaded end of the leaf, and provided also on its inner end with a head comprising the lugs *m n*, said head having a screw-threaded bore transversely thereof, a pivot-bolt, *f*, having a screw-threaded stem, *e*, designed to be screwed into the head of body *b*, a collar, *d*, integral with the pintle, a lock-nut, *c*, and a hinge-loop, *g*, all substantially as described.

398,637. ROCK-DRILL. JAMES MCCULLOCH, Manchester, England. Filed June 20, 1888. Serial No. 278,008. (No model.) Patented in England Aug. 16, 1887, No. 11,192.

Claim.—1. In a rock-drill or other machine, the combination, with a piston and a tappet operated by said piston, of the valve engaged with said tappet and having pockets in its ends forming cham-

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bers for receiving the pressure of motive force to hold it in position, substantially as shown and described.

2. In a rock-drill or other machine, the combination, with the cylinder and the double-ended piston, of the exhaust-ports *d*, placed at a distance from the ends of said cylinder, and check-valves in the supply-passages for preventing the escape of the air in the ends of the cylinder, substantially as described.

3. In a rock-drill or other machine, the combination, with the cylinder A, bracket I, and screw-threaded spindle *m*, mounted in said bracket, of screw-threaded nuts *n*, mounted on the cylinder and engaging with the spindle, and an auxiliary nut, *o*, placed around and screwed upon nuts *n*, for compensating for the wear upon said nuts, substantially as described.

398,638. BALL FOR TUBE-WELDING MANDRELS. WILLIAM S. MCMAHON, Chester, Pa. Filed Dec. 10, 1888. Serial No. 293,151. (No model.)



Claim.—1. A ball for the purpose set forth, formed of an integral hollow body having the continuity of its peripheral wall broken by a longitudinally-extending slot or slots, substantially as described.

2. A ball for the purpose set forth, consisting of an integral hollow body with an interior neck and slot or slots breaking the peripheral continuity of said integral body, substantially as described.

398,639. BARBER'S CHAIR. EDWARD MELCHIOR, Chicago, Ill. Filed Feb. 24, 1888. Serial No. 265,194. (No model.)

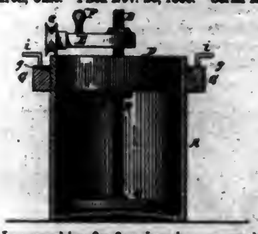


Claim.—1. The lifting-arm A, having the recess B, and a foot-piece, C, pivoted to said arm A at one end, said foot-piece having a projecting piece, D, for releasing purposes, in combination with the spring E, secured at one end to the arm A, a locking-block, F, pivoted in the recess B, and a locking-bar, G, which passes through the slot in the releasing end of the foot-lever C, substantially as and for the purpose specified.

2. The lifting-arm A, having the recess B, foot-piece C, pivoted to said arm A at one end, said foot-piece having a projecting piece, D, for releasing purposes, a locking-block, F, pivoted in the recess B, and the locking-bar G, which passes through the slot in the releasing end of the foot-lever C, in combination with the lifting-bar K, pivoted to the inner end of the arm A, and rock-shaft I, substantially as and for the purpose specified.

3. The lifting-arm A, having the recess B, and slot H, for the passage of the locking-bar G, and a foot-piece, C, provided with a releasing-piece, D, having a slot, I, near its acting end, in combination with the locking-block F, pivoted in the recess B, and locking-bar G, which passes through the slot in the releasing end of the foot-lever C, and engages with said locking-block F for adjusting the chair, substantially as specified.

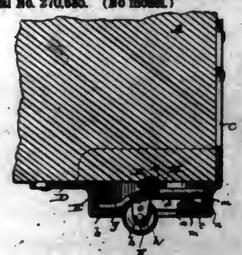
398,640. MACHINE FOR MAKING CROCK-RIMS. HENRY R. MERRILL, Akron, Ohio. Filed Nov. 20, 1888. Serial No. 291,362. (No model.)



Claim.—1. In a machine for forming rims on earthenware vessels while they are in a plastic state, the combination, with a shaft arranged to stand and be supported in the axis of the vessel and a radial arm carrying a rim-forming wheel arranged to revolve about said shaft, of an opening ring arranged to be clamped about said vessel and having a mold to form the lower part of the rim, substantially as shown and described.

2. The combination, with the cut ring G, having a mold for the lower part of the crock-rim, of the bent rods *i i*, arranged to be turned therein and support said ring, substantially as shown and described.

398,641. CASTER. SIGMUND M. MICHELSON, Milwaukee, Wis., assignor of one-half to George Sylvester, same place. Filed Apr. 14, 1888. Serial No. 270,685. (No model.)



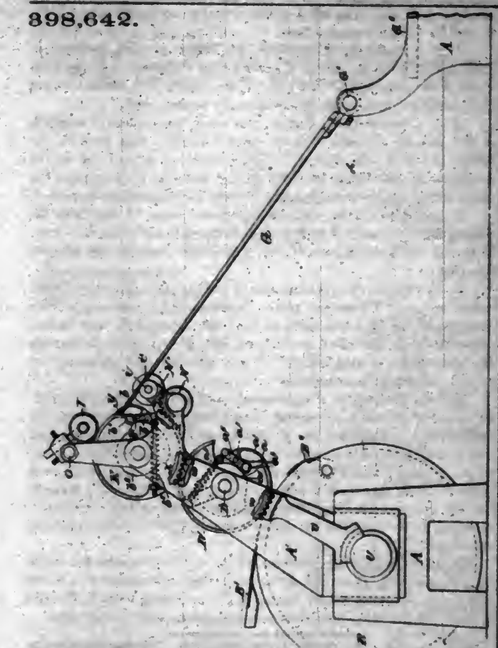
Claim.—In a caster, the combination, with a housing having an opening in its bottom plate, of a roller-carrying frame having an arm carrying an anti-friction roller at the end, and another arm or arms projecting above and beyond the edge of said opening, the said roller-frame having a pivotal bearing with the upper part of the housing, but free from attachment therewith, and the said housing having a suitable track or bearing-surface for engagement with the said anti-friction roller, substantially as set forth.

398,642. SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES. ROBERT MIEHLE, Chicago, Ill. Filed Mar. 21, 1887. Serial No. 231,786. (No model.)

Claim.—1. The combination, with the impression-cylinder, of a series of revolving sheet lifters or grippers, and a receiver-cylinder journaled at the front or top of the cylinder to seize the edge of the sheet and deliver it to a delivery-cylinder, said delivery-cylinder discharging the last (or freshly) printed side away from the receiving devices, substantially as described.

2. The combination, with the impression-cylinder, of a series of revolving sheet lifters or grippers, a revolving delivering-cylinder

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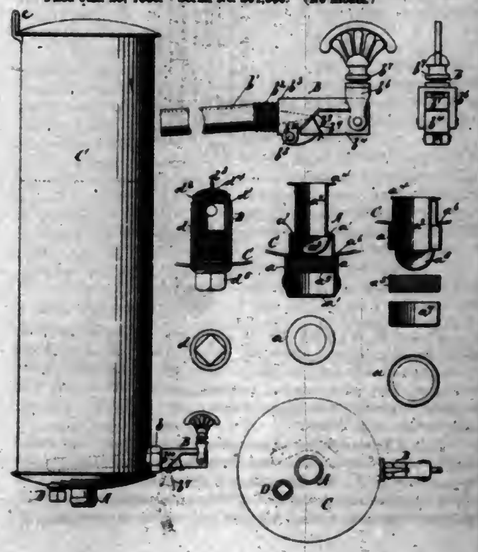
and receiving-fingers journaled at the front or top of the cylinder to seize the edge of the sheet and deliver it to a revolving delivery-cylinder, which in turn delivers it to a series of fingers with the last or freshly printed side away from the fingers, substantially as described.

3. The combination, with the impression-cylinder, of two sets or series of revolving sheet lifters or grippers journaled at the front or top of the cylinder, and a reel or reels revolving with said grippers to support the sheet as it is delivered to the second set of delivery-reels, the same delivering the sheet to the receiving devices with the last or freshly printed side away from the same, substantially as described.

4. The combination of the impression-cylinder, sheet-lifters *a'*, delivery-cylinder E, fly-fingers G, and pulleys *i*, substantially as and for the purpose set forth.

5. The combination of the impression-cylinder, revolving sheet-lifters *a'*, delivery-cylinder or reels E, stripping-fingers G, and pulleys *i*, said pulleys receiving motion by gearing from the cylinder E, substantially as described.

398,643. FIRE-EXTINGUISHER. JOSEPH M. MILLER, Chicago, Ill. Filed Jan. 23, 1888. Serial No. 261,639. (No model.)



Claim.—1. The combination, with a portable fire-extinguisher consisting, essentially, of an air-tight receptacle or can containing a fire-extinguishing liquid and air or gas maintained under pressure and provided with a discharge-valve adapted to be operated by hand, and a supplemental discharge-valve applied at or near the base of the can and adapted to be released by an increase in temperature, whereby said receptacle is adapted for use as a portable extinguisher or as a stationary extinguisher by suspending it over or near the place to be protected, the hand-operated valve serving a double purpose to discharge the contents and test the pressure, substantially as described.

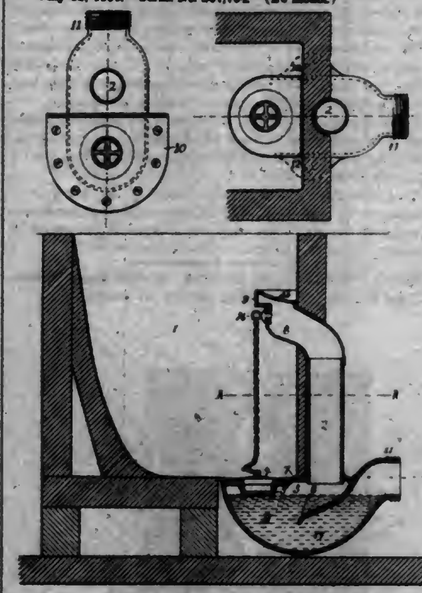
2. In a fire-extinguisher such as described, the combination of the tube *b'*, containing the discharge-orifice, the block b^4, carrying the packing or valves, and the link to which the fastening for engaging the cube is attached, said block b^4 being pivotally attached to the tube and swinging down to clear the discharge-orifice when the link is disengaged from the tube, substantially as described.

3. In a fire-extinguisher, the combination of the shouldered tube *a* with a sliding internal tube, a^3, provided with a spraying device at its outer end, and with a soft elastic block or disk, a^5, which closes the tube *a* and against which said spraying device normally rests, and the retaining cap or plug a^7, secured in the tube *a* by fusible solder, substantially as described.

4. In a fire-extinguisher, the combination of the discharge-tube *b'* with the rubber valve b^3, the pivoted block b^4, for forcing the valve to its seat, the freely-swinging link b^6, and the set-screw b^7, for tightening the pressure upon the valve while permitting of its rapid opening, substantially as described.

5. The combination, to form a portable fire-extinguisher such as described, of an air-tight can or receptacle provided with inlet and two outlet orifices, the one closed by a hand-operated valve and the other by an automatic valve released by an increase in temperature, all of said orifices being located at or near the base of the can or receptacle, which latter is charged with a fire-extinguishing liquid and a volume of air or gas under pressure, whereby all the orifices being below the liquid the escape of air or gas is prevented, and should the orifices be imperfectly closed the liquid in escaping will indicate the fact that the apparatus is not in perfect order and requires attention.

398,644. BATH-TUB. CHARLES H. MOORE, Yonkers, N. Y. Filed July 12, 1886. Serial No. 207,784. (No model.)

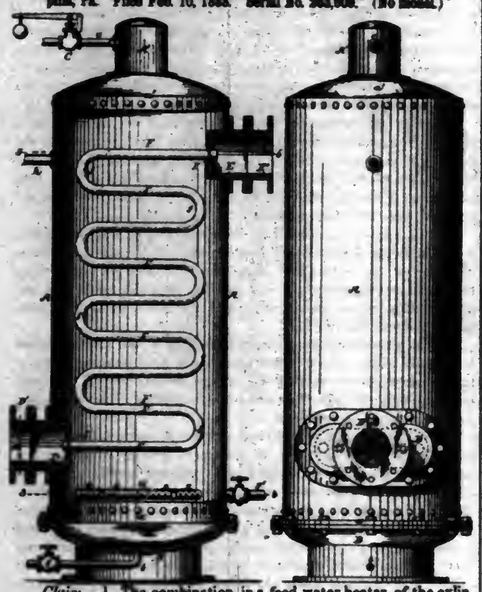


Claim.—1. The combination of a trap having a flat top with a bath-tub bottom having a U-shaped opening and a metal lining having a similar opening, the said trap being soldered to the said lining and so supported thereby that its flat top fills said U-shaped opening flush with the bottom of the tub and forms a section or portion of said bottom, as set forth.

2. The combination of a trap having a flat top provided with a threaded opening and a threaded plug-socket, with a bath-tub bottom having a U-shaped opening, and a metal lining having a similar opening, the said trap being soldered to and supported by said lining, so that its flat top fills said opening and forms a section or portion of the said tub bottom, and the said plug-socket being removable from the

inside of the tub (for the purpose of cleaning the interior of the trap) without interfering with or disconnecting the trap, as set forth.

398,645. FEED-WATER HEATER. EDWARD J. MOORE, Philadelphia, Pa. Filed Feb. 10, 1888. Serial No. 263,609. (No model.)



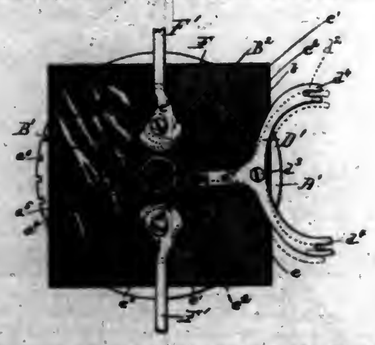
Claim.—1. The combination, in a feed-water heater, of the cylindrical casing, with oblong inlet and exhaust saddles inserted in the sides of said cylindrical casing and presenting internally plane faces parallel with each other, and a row of serpentine tubes in said casing, the lower ends of the tubes being secured to the saddle and the upper ends of the tubes to the other saddle, all substantially as described.

2. The combination, in a feed-water heater, of the cylindrical casing, with oblong saddles inserted therein, rows of tubes connecting said saddles, and caps for the saddles, each consisting of a plate having a central projecting flanged tube, substantially as described.

3. The combination, in a feed-water heater, of the casing with a spray-feed device cruciform in shape and having two or more of the tubes extending to the outside of the casing, substantially as and for the purpose described.

4. The combination, in a feed-water heater, of the casing with a spray-feeding device having four tubular arms, each arm extending to and supported by the casing and each arm adapted to be secured to the inlet-pipe, substantially as and for the purpose set forth.

398,646. TYPE-WRITING MACHINE. H. GRIER MOORE, Chicago, Ill. Filed Sept. 14, 1887. Serial No. 249,730. (No model.)



Claim.—1. In a type-writing machine, the combination of the type-disk A, movably secured to the non-rotating shaft B' by the hub a^2, the shaft B', the vertically-sliding collar B^3 thereon, with levers B^4 and B^5 and stops b^3 and b^4, substantially as described, to present the different tiers of type on the type disk or segment to the printing-point.

2. In a type-writing machine, the combination of the spacing-lever J, pawl J', the shaft *i*, the pinions I and I', mounted thereon, and the spring j^2 with a traveling paper-carrying carriage, substantially as and for the purpose specified.

3. In a type-writing machine, the paper-carrying carriage, in combination with the pinions I I' and spring j^2, mounted on the shaft *i*, the shaft *i*, the pawl J', the lever J^3, the bridges j^3 j^3, and the frames C C, arranged and operated substantially as described.

4. In a type-writing machine, the rotating type disk or segment A, the disk A', movably secured thereto by the collar a^2, with the levers J^3 and K, said disk A' having slots a^3, to engage one end of said lever K, and being provided also with a stop, a^7, to engage the other end of said lever, substantially as and for the purpose described.

5. In a type-writing machine, the combination of the pinion B^3, the segments or racks F F, the plate E, the yoke D', with the levers D D, and the key-frames C C, substantially as and for the purpose specified.

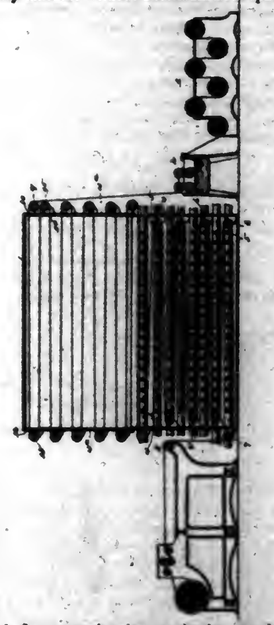
6. In a type-writer, the combination of the plate E, a pair of horizontal levers, F' F', secured thereto, each having a long and a short arm, the pinion B^3, connected to a type disk or segment, with means, substantially as described, for shifting said plate E so as to engage the short arms of said levers F' F' with the pinion B^3 alternately or at will, substantially as specified.

7. In a type-writer, the combination of the key-levers C C, vertical levers C^3 C^3, each connected, substantially as described, with its respective key-lever, and the pivoted levers F' F', each having a long and a short arm, said levers C^3 being so disposed along the long arms of the pivoted levers F' F' that the equal horizontal motion of each lever C^3 by its key-lever C will move the short arm of said lever F (to wit, the segment F) a distance greater or less as said key-lever C is nearer or farther from the fulcrum of said lever F', substantially as specified.

8. In a type-writing machine where the impressions are made by an oscillating paper roll or hammer, the combination of a series of key-levers, C C, with the frames C' C', the tilting lever G, the rod g^3, and a paper-carrying roll or hammer, substantially as specified.

398,647. WARP-DRESSING MACHINE. SIGMUND OBERDORFER, New Orleans, La. Filed Oct. 16, 1888. Serial No. 288,269. (No model.)

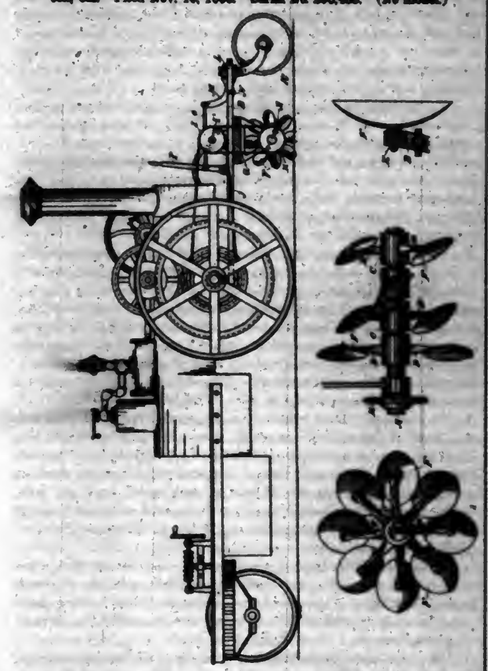
Brief.—The object of the invention is to increase the capacity of the ordinary machine without additional floor-space.



Claim.—1. In a warp-dressing mechanism or slasher, a hot-air or drying compartment consisting of the ordinary drying-chamber having steam-pipes and yarn-guiding rolls, and provided with a vertical extension having exterior guiding-rolls upon its ends and apertures for admitting the passage of the yarns to and from said rolls, substantially as described.

2. In a hot-air slasher or warp-dressing mechanism, the combination, with the sizing-rolls, of a hot-air chamber or drying-compartment consisting of a lower part having steam-pipes and interior guiding-rolls and an upper portion or extension communicating therewith, and provided with exterior rolls and with apertures permitting the passage of the yarns through the interior and to and from said rolls of the lower portion, substantially as described.

398,648. PLOW. JAMES PATTERSON and WILLIAM PATTERSON, Stockton, Cal. Filed Nov. 10, 1888. Serial No. 290,482. (No model.)



Claim.—1. A plowing device consisting of independent disks F, loosely journaled in the ends of arms which radiate from a central driving-shaft and are caused to revolve about said shaft by power applied thereto, substantially as herein described.

2. A series of disks loosely journaled in the ends of radial arms which are fixed to a central driving-shaft and are caused to rotate around it by power applied to said shaft, whereby the rotary disks are caused to travel through the ground with a motion independent of that which rotates the shaft, substantially as herein described.

3. A series of disks loosely journaled by means of central studs in the ends of arms which are fixed to a central shaft and extend spirally around said shaft, a mechanism whereby power may be applied to rotate said shaft, and mechanism whereby the apparatus to which the shaft is journaled is caused to travel along the surface of the ground at a rate of speed independent of that given to the rotary shaft, substantially as herein described.

4. The rotary driving-shaft having the radial arms spirally arranged around it, and a series of disks loosely journaled in the outer ends of said arms, so as to enter the soil successively and intermittently during its rotation, in combination with a mechanism whereby the shaft and disk may be raised or depressed to regulate the depth of cut, substantially as herein described.

5. A vertically-adjustable frame, B, having the disk-carrying driving-shaft A journaled to it, and means for raising and depressing the same, as shown, in combination with the extension-frames B', hinged at each side of the main frame and carrying similar shafts and plowing-disks, said extension-frames having caster-wheels supporting their outer ends, and a bell-crank lever and mechanism whereby they may be raised and depressed, substantially as herein described.

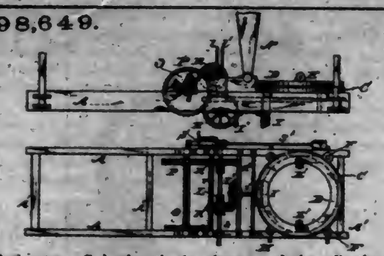
6. The center and jointed extension-frames, B B', having independent disk-carrying shafts journaled to them, each having a chain driving-pulley, H H', in combination with a driving-shaft carrying the pulleys I I', the driving-chains G G', and the main driving-chain J, by which power is transmitted to drive all the shafts and cutters, substantially as herein described.

398,649. WELL-BORING MACHINE. GUSTAVUS PROE, Storm Lake, Iowa. Filed May 24, 1888. Serial No. 274,899. (No model.)

Claim.—1. The combination, with the frame A A', of the circular curb C, the movable rim D, resting upon the curb, and the adjustable friction-rollers F, substantially as described.

2. The combination, with the frame A A', of the circular curb C, the movable rim D, having a flange, *d*, resting upon the curb, the roll-

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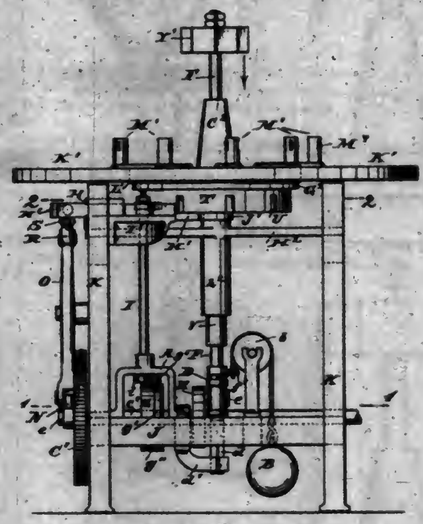


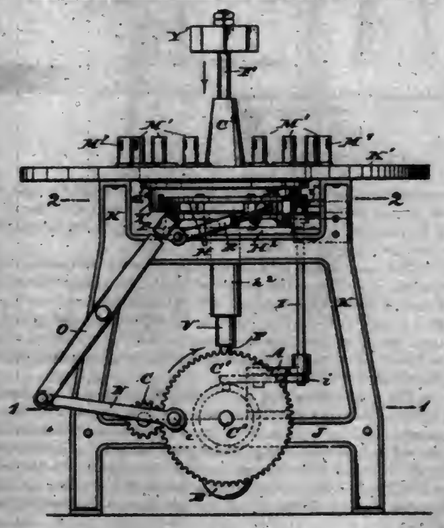
ers F, the straps G, having the bearings *g*, and the adjusting-screws H, pressing against the bearings, substantially as described.

398,650. CARTRIDGE-LOADING MACHINE. GIBSON M. PETERS, Cincinnati, Ohio. Filed Aug. 26, 1888. Serial No. 283,096. (No model.)

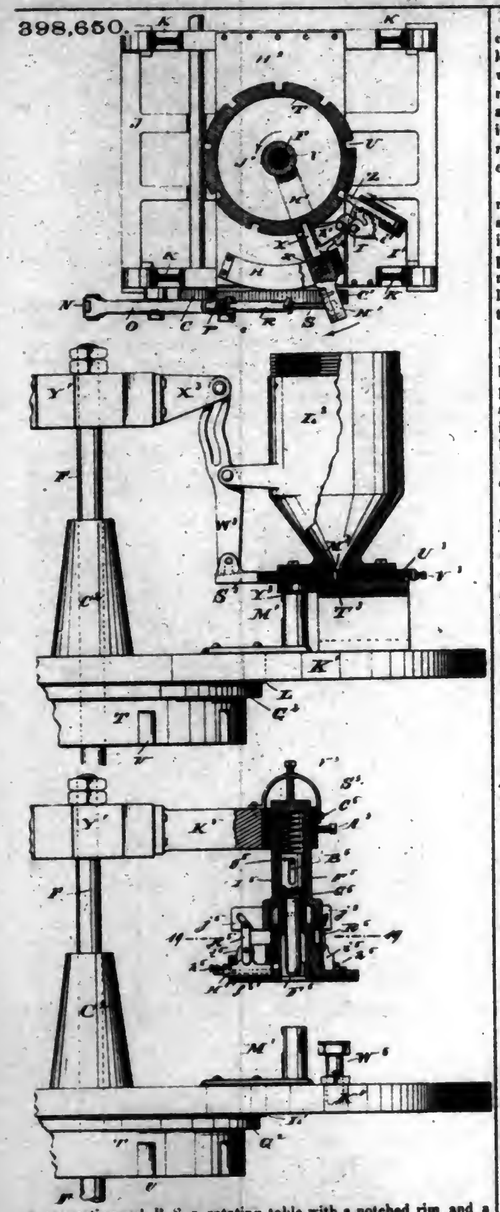
Claim.—1. In a cartridge-loading machine, the combination, with the primary actuating mechanism, of a cam-wheel having opposite cams, a vertical oscillating shaft, I, connected with the table locking and releasing mechanism, and a pivoted lever one end of which is in engagement with the said cam-wheel and the other in gear with the shaft I, substantially as described.

2. The combination, with the primary actuating mechanism, of a crank-wheel, C c, a pivoted lever one end of which is linked to the crank of said wheel and the other connected to an adjustable pitman





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or connecting-rod, R S, a rotating table with a notched rim, and a lever, H', movable in the plane of the table, connected with the pitman R S, and carrying a spring-pressed bolt to engage the notches of the table, substantially as described.

3. The combination, with the primary actuating mechanism, of a cam-wheel, G, a pivoted lever one end of which is in engagement with said cam and the other provided with a segmental gear, a vertical shaft, I, in gear with said lever and with a reciprocating locking-bolt, Z, and a revolving shell-carrying table provided with a notched rim, with which said locking-bolt engages to lock the table, substantially as described.

4. The combination, with the rotating crank-wheel G', of a cam-wheel, G, on the same shaft therewith, a vertical shaft, I, carrying a segmental gear, *z'*, a rotating shell-carrying table having a notched rim, a toothed locking-bolt in engagement with the gear *z'* to lock the table, and a pivoted lever one end of which is in engagement with the cam-wheel and the other with a gear on the shaft I, whereby the latter is intermittently oscillated and the table locked, substantially as described.

5. The combination, with the rotating cam-wheel G and with crank-wheel E of a vertical shaft, I, carrying a gear, *z'*, an interposed lever one end of which engages the cam-wheel G and the other gears with the gear *z*, a rotating shell-carrying table provided with a notched rim, a locking-bolt, Z, in gear with the shaft I and adapted to engage and lock the table, and a reciprocating vertical shaft, F, carrying at its lower end a yoke with which the crank-wheel E engages to reciprocate the same, and having its upper end connected with the shell-charging mechanism, substantially as described.

6. The combination, with the oscillating shaft I and the vertical reciprocating shaft F, connected with the shell-charging device, and suitable mechanism for actuating the same, of a rotating shell-carrying table having a notched rim, a vibrating lever, H', moving in the plane of the table and carrying a spring-pressed bolt to engage the notches of the table, and a toothed locking-bolt in gear with an oscillating shaft, E, to engage and lock the table after each movement of the latter, substantially as described.

7. The combination, with the cam-wheel G and the crank-wheel E, of a rotating shell-carrying table provided with a notched rim, a lever, H', movable in the plane of the table and carrying a spring-pressed bolt or pin, X, to engage said notched rim and rotate the table, a vertical shaft, I, in engagement with the cam-wheel G through an intermediate lever, *g*, and with a toothed locking-bolt to engage and lock the table, and a reciprocating vertical shaft the upper end of which carries the various shell-charging mechanism and the lower end connected with the crank-wheel E, substantially as described.

8. The combination, with the rotating table having a notched rim, of a lever, H', movable in the plane of the table and carrying a bolt, X, to engage and rotate the table, and a locking-bolt, Z, to lock the table, the said bolts X and Z being connected with the primary driving mechanism, such mechanism imparting reciprocations to said bolts, so that they will be alternately advanced into and retracted from the notched rim of the table to rotate, to lock, and to release the same, substantially as described.

9. In a cartridge-loading machine, the combination, with a stationary table supporting the shell-filling devices, of a rotating table having an integral upper and lower extension, which forms an elongated bearing for the shaft which operates the shell-filling devices, substantially as shown and described.

10. In a cartridge-loading machine, the combination, with the rotating table and filling devices, of a central shaft, a head-block adjustably secured thereto, said block having openings for the passage of wad-strips, and arms secured to said head and block, and the filling devices, whereby the filling devices are actuated directly by the central shaft, as set forth.

11. In a cartridge-loading machine, the combination, with the rotating table carrying the shell-cases and provided with a notched rim, of the arm H', movable in the plane of the table and carrying a bolt, X, a bolt, Z, geared with and actuated by an oscillating shaft, I, the shaft F, operating the various shell-charging mechanism, a cam-wheel, G, connected with the shaft I by an intermediate lever, *g*, and a crank-wheel, E, connected with the shaft F to reciprocate the latter, the parts being arranged and adjusted, as shown and described, to start the table when the shaft F is at the limit of its upward movement and to stop the same when said shaft begins its downward movement substantially as shown and described.

12. In a cartridge-loading machine, the combination, with the rotating table and the filling devices, of a central shaft actuating said filling devices and provided with a counterbalancing-weight which exerts a constant resistance to the downward throw of said shaft, substantially as shown and described.

13. In a cartridge-loading machine, the combination, with the stationary table having openings for the descent and insertion of shells, of a shell-carrier and actuating mechanism therefor, said carrier sliding horizontally beneath the table and having its inner end open and semicircular, as and for the purpose set forth.

14. The combination, with the rotating table carrying the shell-cases, the filling devices, and actuating mechanism therefor, of a shell-carrier having an open inner end, and a shell-placer consisting of a piston moving vertically through the inner end of the carrier-frame to the shell-cases, said carrier and piston being linked and pivotally connected with each other and the central shaft, whereby the piston and carrier are given a regular and continuous movement, the shell being carried forward with the downstroke of the piston, and the carrier moved back with the upstroke of the piston, as set forth.

15. In a cartridge-loading machine, the combination, with the powder and shot hopper, and with a vertical reciprocating shaft, of a charge-slide having a charge-opening, a graduating-slide lying on said charge-slide with its inner end bent down and projecting into the charge-opening, and a cam-lever between the said shaft and charge-slide, whereby the latter is reciprocated by the reciprocation of the shaft, substantially as shown and described.

16. In a cartridge-loading machine, the combination, with the rotating table having a notched rim and suitably actuated, and a wad cutter and rammer operated by the central shaft, as described, of a wad-strip feed operated by a slide, T', having a roller engaging the notched rim of the table, said slide being pivotally connected with the ratchet-feed for the wad-strip, whereby the rotating table and ratchet-feed are operated in unison, the ratchet being moved with each intermittent movement of said table, as set forth.

17. In a cartridge-loading machine, the combination of a reciprocating shaft having an arm, K', which carries a jam, *j'*, a reciprocating indenter, and a lever-connection between said indenter and cam, substantially as shown and described.

18. In a cartridge-loading machine, the combination, with the arm K', open at its outer end and actuated directly by the central shaft, F, of an indenting device consisting of a head-piece bored centrally and adjustably secured to said arm, and provided with extensions *j'*, having diagonal slots, a secondary head-piece, F', a rammer secured therein and having depressions at its lower end, and sliding indenters having links secured thereto and moving in the slots of the extension, as and for the purpose set forth.

19. The combination, with the stationary table having a stop, W', on the hollow head I', reciprocating toward and from said stop, a secondary head spring-seated within the first, a rammer connected with the secondary head and having depressions at its lower end, and indenting-points connected with and operated by cams on the primary heads, whereby as the indenting device descends and strikes the stop the secondary head will give back against the spring and cause the indenter-points to be thrust forward, as and for the purpose set forth.

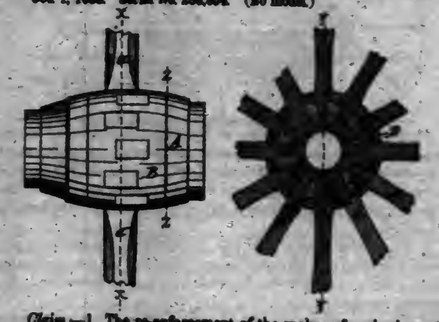
20. The combination, with the rammer G', having suitable depressions at its ends, of a shell-indenter movable toward and from said rammer and having indenting ends, consisting of a knife-edge extension, Y', to cut the shell, and a shouldered surface, X', to give form to the indentation after the cut is made, substantially as set forth.

21. In a cartridge-loading machine, the combination, with the rotating table and central shaft suitably actuated, of an extractor and inking device for the wad-marker, consisting of the extractor-rod secured to an arm of the central shaft, a triangular lever pivoted at its upper end to a collar on the extractor-rod, its outer end having a link pivoted thereto and to a lug on the stationary table, the inner lower end having an inking-roller, the vertical movement of the extractor giving a swinging movement to the triangular lever, and thus intermittently inking the die on the bottom of the extractor, as set forth.

upper end, and a carrying-belt running along said trough, of a cage divided into two separate parts, the delivery end of the upper part being vertically above the receiving end of the lower part, substantially as and for the purpose set forth.

5. The combination of an inclined trough having a downwardly-inclined upper end, J', a belt or chain having at regular intervals openings greater than the width and less than the length of a bullet, and having an obstacle in the path of the bullet for arresting and tilting same, as and for the purpose set forth.

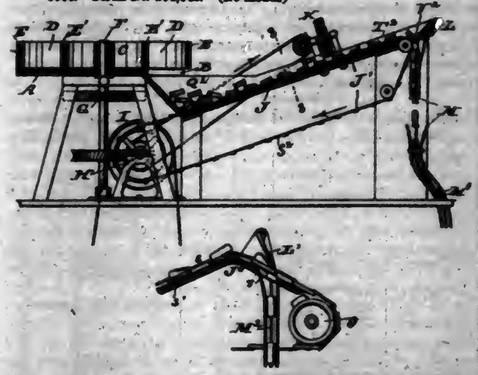
398,652. KUR. GEORGE J. RAPPEL, Middleville, N. Y. Filed Oct. 1, 1888. Serial No. 286,864. (No model.)



Claim.—1. The re-enforcement of the spokes of a wheel, consisting in forming an annular peripheral groove in the hub of greater width than the spoke-mortises, then driving the spokes into the hub, and then casting metal into the groove and over the shoulders of the spokes.

2. The gripping of the shoulders of the spokes of a wheel and the spokes themselves adjacent but exterior to the shoulders by casting a metallic band into an annular peripheral groove in the hub and around the spokes and their shoulders after the spokes have been driven into the hub.

398,651. FEEDING MECHANISM FOR CARTRIDGE-LOADING MACHINES. GUSTAVUS M. PETERS, Cincinnati, Ohio. Filed Nov. 26, 1888. Serial No. 291,842. (No model.)



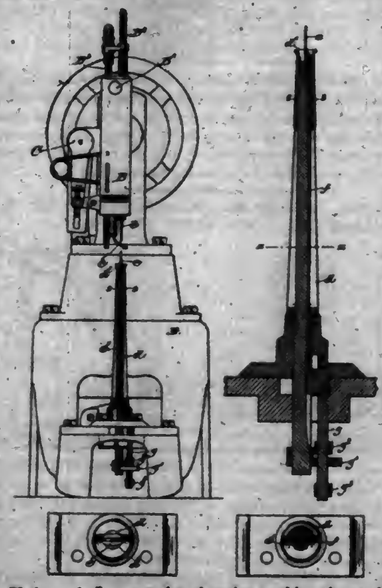
Claim.—1. In a device of the nature described, the combination, with a hopper, of an inclined trough, a belt passing along the bottom of same, and its actuating mechanism, and a revolving brush placed above the trough and moving across the path of the belt, substantially as and for the purpose set forth.

2. The combination, with the hopper, of an inclined trough tapering to about the width of a shell, a belt suitably actuated and moving along the bottom of said trough, a brush in the path of the belt and revolving at right angles thereto, and a side trough set at an angle to the hopper to receive shells or bullets thrown off by said brush, as set forth.

3. The combination, with a hopper and a belt to draw forward the cartridges, of a gradually-narrowing trough having an outlet-opening in its bottom, and a piece, I, at its upper end inclined at an angle to the bed of the trough to receive the open ends of the shells and lift the same as they are brought to the opening in the trough, substantially as set forth.

4. The combination, with the trough having an opening near its

398,653. WAX-THREAD SEWING-MACHINE. ARTHUR S. RAMSDELL, Reading, Mass. Filed Aug. 13, 1888. Serial No. 282,604. (No model.)



Claim.—1. In a wax-thread sewing-machine, the combination, with a work-support, of a needle-bar having an undercut groove and a cast-off bar fitting in said groove and retained therein by the inwardly extending or converging walls or flanges at the sides thereof, substantially as described.

2. The narrow post having its inner face grooved to guide the needle-bar at one side, and having the support or throat, combined with the needle-bar having an undercut groove, and the cast-off bar fitting in said groove and retained therein by the walls or flanges at the sides thereof, substantially as described.

3. The post having the narrow throat or support for the sole adjacent to the needle and the fenders 2 3, combined with the needle-bar having the undercut groove and the cast-off bar fitting in said groove and retained therein by the walls or flanges at the sides thereof, substantially as described.

398,654. CULTIVATOR. WILLIAM H. ROGERS, Indianapolis, Ind. Filed Apr. 23, 1888. Serial No. 272,154. (No model.)



Claim.—1. The combination of the axle, the supporting-wheels thereon, the clevises secured to the axle, the laterally-adjustable beams having their front ends pivotally connected to the clevises, and the harrow-beams having their front ends flexibly connected together, the said beams being also connected to the cultivator-beams, substantially as described.

2. The combination of the axle, the cultivator-beams pivotally connected thereto and arranged on each side, and the harrow-beams arranged within the cultivator-beams and connected thereto and also connected together.

3. In combination with the axle, the cultivator-beams having a hinged or pivotal connection therewith, the harrow-beams I', arranged between the cultivator-beams, said harrow-beams being hinged together at K, and having the links L', connecting the harrow-beams with the cultivator-beams, as set forth.

398,655. MACHINE FOR LOCKING SHEET-METAL JOINTS. LOUDLEY L. SAGENDORPH, Cincinnati, Ohio, assignor of one-half to Harlan P. Lloyd, same place. Filed Sept. 20, 1888. Serial No. 285,883. (No model.)



Claim.—In a machine for locking the joints of sheet metal, the lower stationary bar, B, having the ribs *b* and flat groove *b'* between them, and a semicircular groove, b^2, near the center of said groove *b'*, in combination with the movable bar A, having the flat groove *a'* in its under face and a rib projection, a^2, near the center of said groove *a'*, and suitable mechanism for operating said movable bar.

398,656. FOLDING BED. MARIUS SAMUEL, New York, N. Y. Filed June 20, 1888. Serial No. 278,506. (No model.)

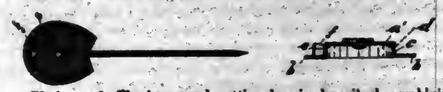


Claim.—1. The combination, in a folding bed, of a support, a swinging bed portion composed of an inner section pivoted to the support and an outer section sliding on the inner section, and a link pivoted at one end to the support and at its other end to the sliding section to slide the latter outward when the bed portion is swung to a horizontal position, substantially as described.

2. The combination, in a folding bed, of a support, a swinging bed portion comprising an inner section pivoted to the support and an outer section sliding on the inner section, a link pivoted at one end to the support and at the other end to the sliding section, a folding frame on the inner section, a mattress connected with the inner end of the inner section and with the folding frame, and a catch for holding the mattress and folding frame extended, substantially as described.

3. The combination, in a folding bed, of a support, A, a bed portion pivoted to the support and carrying at its outer end the sliding spring-impelled catches S, having finger-pieces T, and the sliding legs O, having upper and lower recesses Q, substantially as described.

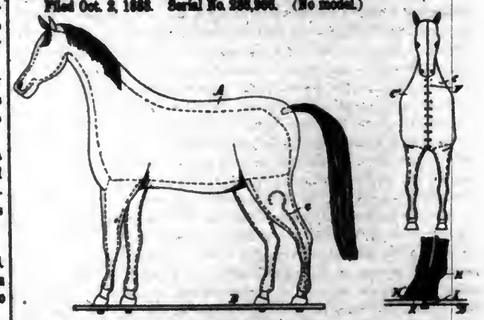
398,657. JEWELRY. EMIL SCHILL and ANDREAS BECKER, Newark, N. J. Filed Sept. 20, 1888. Serial No. 285,842. (No model.)



Claim.—1. The improved setting herein described, combining therein a raised blank or body portion of sheet metal, the outer rim of which is bent at right angles to said body portion to form a bearing, *c*, provided with a recess or groove, *d*, a flange, *b*, and a gallery secured to said flange provided with grasping-fingers and co-operating with said groove-bearing to hold the jewels firmly in place, as set forth.

2. The improved jewel-setting herein described, combining therein a body portion bent to form a recessed or grooved shoulder or bearing for the jewels and a flange or seat for a gallery, said bearing and flange being formed of one piece of metal, and said gallery fastened on said seat and adapted to hold the jewels against said grooved bearing, as set forth.

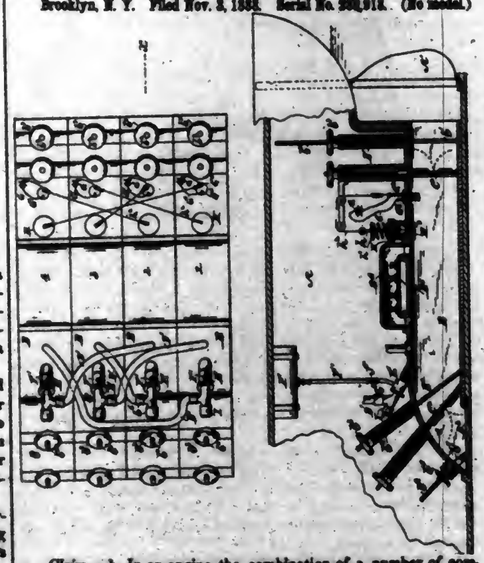
398,658. DISPLAY-MODEL. HENRY SCHWERDLE, Toledo, Ohio. Filed Oct. 2, 1888. Serial No. 286,966. (No model.)



Claim.—1. A display-model formed of two hollow side sections conforming to the contour of an animal, the legs being formed integral therewith, and an interior holding-strip also formed to correspond to the interior contour of the body of the model, said sections being united by nails driven through the adjoining edges into the holding-strips, substantially as described.

2. A display-model comprising two hollow side sections formed of plastic material, and having legs formed with a central core, the sections being united at their adjoining edges to a central holding-strip, said model being secured to a platform by rods and turn-buckles embedded within the central core of the leg-sections, and a bolt passed through the platform, substantially as described.

398,659. ENGINE FOR MARINE PROPULSION. JOHN A. SNOOK, Brooklyn, N. Y. Filed Nov. 3, 1888. Serial No. 289,918. (No model.)



Claim.—1. In an engine, the combination of a number of combustion-chambers, pipes or conduits conveying the product of combustion from one chamber to another, an apparatus for igniting the contents of the chambers, and motors for operating said igniting apparatus, substantially as specified.

2. In an engine, the combination of two or more combustion-chambers, said chambers having communication by means of conduits, feed-injectors for said chambers communicating with said pipes, a receptacle for hydrocarbon connecting with the chambers, and an apparatus for igniting the contents of the chambers in succession, substantially as specified.

3. In an engine, the combination, with a combustion-chamber and an igniting apparatus, of the piston-valve operating in a cylinder on the chamber and having connection with an igniting device, substantially as specified.

4. In an engine, the combination of a number of combustion-chambers, fuel-feeders therefor, and igniting apparatus, the fuel-feeder belonging to one combustion-chamber being in communication with a different combustion-chamber, substantially as specified.

398,660. PERMUTATION-PADLOCK. GEORGE F. SEIBER, CALVIN B. JOHNSON, and MORGAN B. PERRY, Port Royal, Ky. Filed June 12, 1888. Serial No. 276,907. (Model.)



Claim.—1. In a permutation-padlock, the case having a suitable longitudinal depression or groove, O, the arbor mounted in the case, the staple having suitable legs to enter the case, and the notched tumblers mounted on the arbor and adapted to engage notches in the legs of the staples, in combination with the springs having loops fitting in and held from movement by the depression or groove O, and the spring-arms embracing the tumblers, substantially as and for the purpose specified.

2. In a permutation-padlock, the case, the arbor, and the rigid tumbler on the arbor, in combination with the movable tumblers mounted on the arbor and having the annular flanges *k'*, and the springs having curved arms embracing the flanges and held from movement in the case, substantially as specified.

3. In a permutation-lock, the combination, with the arbor mounted in a suitable case and the shackle having its arms fitted in suitable openings in the case, of the tumblers mounted on the arbor to engage notches in the arms of the shackle and provided in their under sides with annular grooves, the pins *l'* in the said grooves, the pins *l* on the upper sides of the tumblers fitting and operating in the grooves of the superimposed tumblers, and the springs secured in the case and provided with arms embracing the tumblers, all substantially as specified.

4. In a permutation-padlock, the combination, with the arbor mounted in a suitable case, the shackle having its arms inserted in the case, and the rigid tumbler H and revoluble tumblers K, arranged on the said arbor and engaging the shackle, of the revoluble dial G, mounted on the arbor outside the case and bearing on the adjacent end of the latter, the head or knob on the outer end of the arbor provided with a pin engaging a perforation in the outer side of the said dial, and the spring I, coiled on the arbor between the rigid tumbler and the adjacent end of the case to normally hold the head or knob on the arbor pressed against the dial, substantially as specified.

5. In a permutation-padlock, the combination, with the arbor mounted in a suitable case and having tumblers mounted thereon, and the shackle having its arms inserted in the case and engaged by the said tumblers, of the annular bearing-plate F, secured on the opposite end of the case from the shackle, the revoluble dial G, mounted on the arbor without the case, and having a shoulder, *f*, fitting within the said plate and provided in its outer side with sockets *g'*, the head or knob on the outer end of the arbor bearing against the dial G, and provided with a pin, *c'*, engaging the sockets *g'*, and the spring I, arranged on the arbor and bearing at opposite ends against one of the tumblers and the adjacent end of the case to normally hold the head or knob in contact with the dial, substantially as specified.

6. In a permutation-padlock, the combination, with the longitudinally-movable arbor D, mounted in a suitable case and provided with a head or knob, E, provided with a pin, *c'*, the revoluble dial G, mounted on the arbor without the case, bearing against one end of the case and provided with sockets *g* to receive the pin *c'*, whereby the arbor and dial are locked together, the tumblers H and K, arranged on the arbor and provided with engaging-pins *l l'*, and the spring I, coiled on the arbor between the tumblers H and the adjacent end of the case, of the shackle having its arms fitting in openings in the case and provided with notches *d'*, in which the tumblers engage and fit snugly, whereby when the shackle is locked in place longitudinal movement of the arbor is prevented and the pin *c'* cannot be withdrawn from the socket *g'*, in which it is engaged, substantially as specified.

398,661. INSULATING-SUPPORT FOR ELECTRIC CONDUCTORS. ROBERT H. SHORT, Columbus, Ohio. Filed Nov. 6, 1888. Serial No. 290,117. (No model.)



Claim.—1. In combination with a supporting-wire, a tubular extension supported thereon through an adjustable insulating-block, and the insulator fixed in the tubular extension having a shank, *d*, provided with a clip supporting the conducting-wire, substantially as described.

2. In combination with the shank and its clip, the conducting-wire formed with an offset fitted to the clip, substantially as described.

3. The conducting-wire formed with an offset, and the clip fitted thereto and provided with a hole in its upper end for connection with the shank, substantially as described.

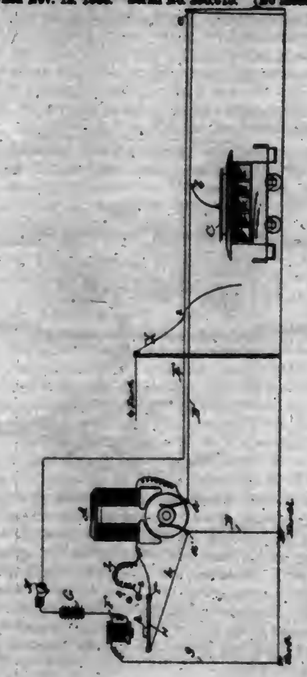
4. In combination, a supporting-wire, a tubular extension supported thereby, the conducting-wire and means for suspending it from the tubular extension, an arm, F, extending laterally, and a stay-wire, G, substantially as described.

5. In combination, the supporting-wire and the elongated curved clip, combined with the wire having an offset, and means of attachment between the said clip and the supporting-wire, substantially as described.

6. In combination with the conducting-wire, the guard-wire E, supported upon the insulating-block B, substantially as described.

7. The prongs on the sleeve C, combined with the button and wire and with the guard-wire E, all substantially as described.

398,662. ELECTRIC RAILWAY. ROBERT H. SHORT, Columbus, Ohio. Filed Nov. 12, 1888. Serial No. 290,615. (No model.)



Claim.—1. In combination with an electrical conductor and a generator, a guard-wire arranged in proximity to the main conductor, forming a normally-open circuit, a source of electrical energy included in the guard-wire circuit, and a controlling resistance-connection between said guard-wire and the generator, whereby in the closing of the guard-wire circuit the pressure on the main conductor is reduced, substantially as described.

2. In combination with an electrical conductor and a generator, a guard-wire arranged in proximity to the main conductor, forming a normally-open circuit, a source of electrical energy included in the guard-wire circuit, and a controlling resistance-connection automatically operated by the closing of the circuit between said guard-wire and the generator for reducing or controlling the pressure in the main conductor, substantially as described.

3. In combination with an electrical conductor and a generator, a guard-wire arranged in proximity to the main conductor, forming a normally-open circuit, a source of electrical energy, a controlling resistance-connection between said guard-wire and the generator for reducing or controlling the pressure in the main conductor, and a signaling device operated by the closing of the guard-wire circuit, substantially as described.

4. In combination with an electrical conductor and a generator, a guard-wire arranged above the main conductor, forming a normally-open circuit and including a source of electrical energy, a switch for controlling the electrical pressure on the main conductor, and an electro-magnet in the guard-wire circuit for automatically operating the switch, substantially as described.

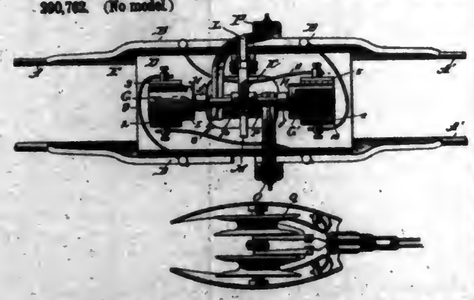
5. In combination with an electrical conductor and a generator, a guard-wire above the conductor, forming a normally-open circuit including a source of electrical energy, a switch for controlling the electrical pressure in the main conductor, an electro-magnet in the guard-wire circuit for automatically operating the switch, and a signaling device in the guard-wire circuit, substantially as described.

6. In combination with an electrical conductor and a generator, a guard-wire forming a normally-open circuit with a source of electrical energy included therein, a switch, an electro-magnet in the guard-wire circuit for automatically operating said switch, a connection from said switch to one brush of the armature, contact-points in the path of the switch, one directly connecting with a terminal of the field-magnet and the other connecting therewith through a resistance, substantially as described.

7. In the described combination, the switch-lever, the electro-magnet in the guard-wire circuit for automatically operating the same, a connection from the lever to one of the armature-brushes, contact-points in the path of the lever, a direct connection from one contact with one terminal of the field-magnets, a resistance-coil interposed between the second contact and the field-magnet, and the third contact having no connection, whereby the full pressure of the current may be maintained, reduced, or interrupted, substantially as described.

8. In combination with an electrical conductor and a generator, a guard-wire arranged in proximity to the main conductor, forming a normally-open circuit, a source of electrical energy included in the guard-wire circuit, and a signaling device operated by the closing of the guard-wire circuit, substantially as described.

398,668. SWITCH MECHANISM FOR ELECTRIC RAILWAYS. SIDNEY H. SHORT, Columbus, Ohio. Filed Nov. 13, 1888. Serial No. 290,762. (No model.)



Claim.—1. In combination with a sectional double line-conductor of an electric railway, a switch between the sections adapted to open one line and close the other upon the passage of the trolley, and a trolley having connection with both lines and arranged to operate the switch in its passage, and having also contact-surfaces in connection with the terminals of the motor, contact-surfaces in connection with the conductors and in line with the contact-surfaces of the trolley arranged to short-circuit the switch and establish an electrical connection between the conductors while the switch is shifting, substantially as described.

2. In combination with a double sectional line-conductor of an electric railway, a switch located between the sections, electrical connections between the sections of each line through a commutator, and a lever for operating the commutators, a trolley having contact-surfaces in line with the lever, whereby said lever is operated by the passing trolley and one line is closed and the other opened by the passage of the trolley.

3. In combination with a double sectional line-conductor of an electric railway, a supporting-frame, plates attached to the sides thereof, and interposed insulating-pieces, said plates having the ends of the sections attached thereto, two commutators mounted on the frame, each commutator being interposed between the sections of one of the lines, and levers arranged to turn the commutators upon the passage of the trolley, substantially as described.

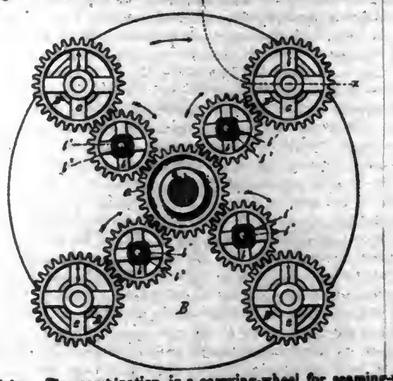
4. In combination with a trolley, a supporting-frame, the insulating-plates B B', to which the ends of the sections are attached, the shaft carrying two commutators supported in standards on the frame, each commutator having two conducting and two non-conducting sections arranged alternately in respect to each other, connections between the sections on each line through one of the commutators, and mechanism in the path of the trolley for turning the commutators one-fourth revolution by the passage of the trolley, substantially as described.

5. In connection with the commutator-shaft arranged upon the frame and in the described relation to the sections of the line, a star-wheel on the shaft, the operating and locking arms for the star-wheel, a lever arranged to operate these arms having its lower end in range with the trolley and adapted to be operated thereby, and means for returning the arms after the trolley has passed, substantially as described.

6. In combination with the star-wheel of the commutator-shaft, the short arm L and the long arm M, pivoted to move together, an insulating-bearing on the long arm for the operating-lever, the said operating-lever being pivoted upon the side plate, having its upper end arranged to bear upon the insulating-bearing of the long arm and its lower end extended into range with the trolley, and the spring for returning the arms L and M, substantially as described.

7. In combination with the arms operating with the commutator to ship the switch, said arms being in electrical connection with the line-sections on one side of the break, a trolley having contact-surfaces for the levers in electrical connection with the terminals of the motor, and arranged to short-circuit the switch and establish an electrical connection between the sections on the passage of the trolley and while the switch is shifting, all substantially as described.

398,664. CARRYING-WHEEL. CHARLES W. SLEEPER, Island Pond, Vt. Filed Apr. 17, 1888. Serial No. 270,996. (Model.)



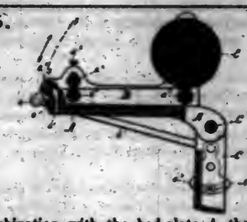
Claim.—The combination, in a carrying-wheel for seaming-machines, of the stationary gear *a*, the wheel or flange B, the intermediate gears *b b b b*, and the gears *c c c c*, substantially as described, and for the purpose set forth.

398,665. DEVICE FOR FEEDING AND CUTTING SOLDER. CHARLES W. SLEEPER, Island Pond, Vt. Filed Sept. 5, 1888. Serial No. 284,804. (No model.)

Claim.—1. The combination of the bed-plate A, the sides B B, the knife *a*, the rolls a^2 a^3 a^4, the cutting-roll a^5, and means for operating the movable parts, substantially as described, and for the purpose set forth.

2. The combination, with the bed-plate A, the sides B B, the knife *a*, the rolls a^2 a^3 a^4, the cutting-roll a^5, and means for operating the movable parts, of the ratchet-wheel *b*, the pawls *b'*, the lever b^2, and the adjustable stop b^3, substantially as described, and for the purpose set forth.

398,665.



3. The combination, with the bed-plate A, the sides B B, the knife *a*, the rolls a^2 a^3 a^4, the cutting-roll a^5, and means for operating the movable parts, of the crank *c*, the connecting-rod *d'*, and the quadrant d^2, substantially as described, and for the purpose set forth.

398,666. UMBRELLA. JAMES T. SMITH, New York, N. Y. Filed Aug. 26, 1888. Serial No. 283,776. (No model.)

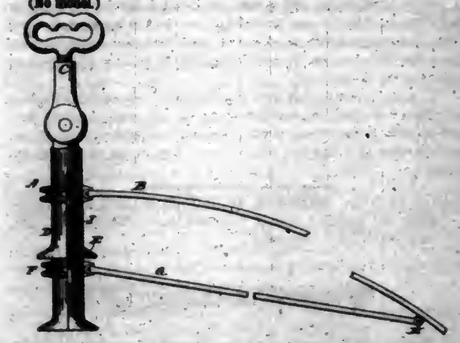


Claim.—1. In combination with a hollow handle of an umbrella, parasol, or cane, a folding stick composed of the parts A A', connected by a joint or bit and adapted to slide into the handle, so as to conceal from view the said joint, and a lock within the handle to connect the handle and stick, which lock is also concealed from view when the stick is in place within the handle, substantially as described.

2. In combination with the stick of an umbrella, parasol, or cane, a handle, a jointed rod connecting the stick and handle, and a tube within and concealed by the handle, into which the jointed rod is adapted to slide, substantially as described.

3. The combination of the stick, jointed rod, provided with a pin, the tube within which said rod is adapted to slide, and provided with a slot to receive said pin, and the hollow handle within which is secured said tube, substantially as described.

398,667. CANOPY FOR CHILDREN'S CARRIAGES. ADOLPHUS G. SELLI, New Haven, Conn. Filed Dec. 14, 1888. Serial No. 293,612. (No model.)



Claim.—In a carriage-canopy substantially such as described, the combination of the notch A, to which the ribs are hinged, and the runner F, to which the stretchers are hinged, the one constructed with a tubular projection, D, as an integral part thereof and terminating in a flaring mouth opening into it, the other constructed with a stud, I, as an integral part thereof, corresponding to the interior of the tubular projection D, substantially as described.

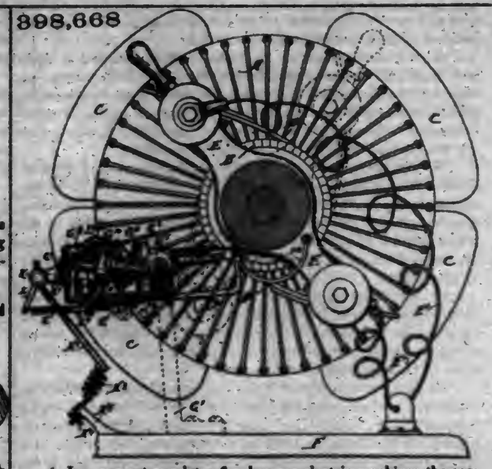
398,668. REGULATOR FOR DYNAMO-ELECTRIC MACHINES. ELMER A. SPERRY, Chicago, Ill., assignor to the Sperry Electric Company, same place. Filed Oct. 26, 1886. Serial No. 283,812. (No model.)

Claim.—1. In a current-regulator for dynamo-electric machines, the combination of a vibrating magnetic mass in proximity to the field-magnet with a movable current-collector and an elastic connection between the two.

2. In a current-regulator for dynamo-electric machines, the combination of a vibrating magnetic mass pivoted in proximity to the field-magnet with a movable current-collector and an elastic connection between the two.

3. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass responsive to the resultant of the magnetism of the field-magnet and the currents of the armature with a movable current-collector and a power-transmitting connection between the collector and the mass.

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4. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet with a movable current-collector, connections between the two, a compensating motor, and power-transmitting connections therefrom to the collector.

5. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet with a movable current-collector, connections between the two, a compensating motor, and power-transmitting connections therefrom to the mass and thence to the collector.

6. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet with a movable current-collector and an elastic connection between the two, and a compensating motor and connections therefrom to the mass.

7. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet, a movable current-collector, a shifter therefor connected therewith, and power-transmitting connections between such mass and shifter.

8. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet, a movable current-collector, a shifter therefor connected therewith by an elastic connection, and power-transmitting connections between such mass and shifter.

9. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet, a movable current-collector, a shifter therefor connected therewith, a compensating motor connected with such mass, and power-transmitting connections between the shifter and mass.

10. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass in proximity to the field-magnet, a movable current-collector, a shifter therefor connected therewith by an elastic connection, a compensating motor connected with such mass, and power-transmitting connections between the shifter and mass.

11. In a current-regulator for dynamo-electric machines, the combination of a magnetic mass responsive to the resultant of the magnetism in the field-magnet and the currents in the armature with a movable current-collector, connections between the two, a compensating motor connected with the mass, and a controller for such motor moving with the collector, so as at a certain point in the motion thereof to apply the said motor.

12. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, a driving-motor for such shifter, a magnetic mass in proximity to the field-magnet, and mechanical connections from the mass to the motor to control the application of the latter to the shifter.

13. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, an elastic connection from such shifter to such collector, a driving-motor for such shifter, a magnetic mass in proximity to the field-magnets, and connections from the mass to the motor to control the application of the latter to the shifter.

14. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, the two connected by an elastic connection, and a driving-motor for such shifter.

15. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, a driving-motor for such shifter, a magnetic mass in proximity to the field-magnet, a compensating motor, and connections for such magnetic

mass and re-enforcing motor to the driving-motor to control the application of the driving-motor to the shifter.

16. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor having oppositely-faced ratchets, a driving-motor carrying oppositely-acting dogs to engage such ratchets, a magnetic mass in proximity to the field-magnet, and connections therefrom to the driving-motor to control the application of the driving-motor to the shifter.

17. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor having oppositely-faced ratchets, a driving-motor carrying oppositely-acting dogs to engage such ratchets, a magnetic mass in proximity to the field-magnet, a compensating motor, and connections from such mass and re-enforcing motor to the driving-motor to control its application to the shifter.

18. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor having oppositely-faced ratchets, and a driving-motor for the shifter having oppositely-acting dogs to engage such ratchets, said dogs movable in a line at an angle to said ratchets.

19. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor having oppositely-faced ratchets, a driving-motor for the shifter having oppositely-acting dogs to engage such ratchets, said dogs movable in a line at an angle to said ratchets, a magnetic mass in proximity to the field-magnet, and connections therefrom to the driving-motor to control its application to the shifter.

20. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, a driving-motor for such shifter, a pivoted magnetic mass in proximity to the field-magnet, and an arm therefrom to the driving-motor to control its application to the shifter.

21. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, a driving-motor for such shifter, oppositely-faced ratchets on the shifter and oppositely-acting dogs on the motor, said dogs movable in a line at an angle to the line of the ratchets, a magnetic mass in proximity to the field-magnet, a compensating motor and connections from the mass, and the re-enforcing motor to the driving-motor to control its application to the shifter.

22. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor connected therewith by a spring-connection and having oppositely-faced ratchets, with a motor having oppositely-acting dogs to engage such ratchets, said dogs movable in a line at an angle to the line of the ratchets.

23. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, a constantly-moving motor to intermittently drive the same, severable connections between the motor and shifter, and a magnetic mass in proximity to the field-magnet, and connections therefrom to such severable connections to control the application of the driving-motor to the shifter.

24. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a driving-motor for such collector, a magnetic mass in proximity to the field-magnet, and mechanical connection from the mass to the motor to control the application of the latter to the collector.

25. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector, a driving-motor for such collector, a magnetic mass in proximity to the field-magnet, a compensating motor, and connections from such magnetic mass and compensating motor to the driving motor to control the application of the driving-motor to the collector.

26. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a driving-motor therefor having oppositely-faced ratchets and carrying oppositely-acting dogs to engage such ratchets, a magnetic mass in proximity to the field-magnet, and connections therefrom to the driving-motor to control the application of the driving-motor to the collector.

27. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a driving-motor therefor having oppositely-faced ratchets and carrying oppositely-acting dogs to engage such ratchets, a magnetic mass in proximity to the field-magnet, a compensating motor, and connections from such mass and compensating motor to the driving-motor to control its application to the collector.

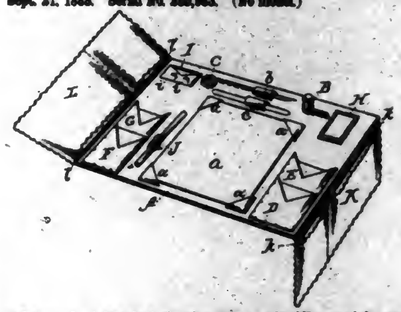
28. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a driving-motor therefor having oppositely-faced ratchets and oppositely-acting dogs to engage such ratchets, said dogs movable in a line at an angle to said ratchets.

29. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a driving-motor therefor, a pivoted magnetic mass in proximity to the field-magnet, and an arm therefrom to the driving-motor to control its application to the collector.

30. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector with a shifter therefor, a constantly-moving motor to intermittently drive the same and adapted to be connected therewith, a magnetic mass in proximity to the field-magnet, and connections therefrom to such motor to control the application thereof to the shifter.

31. In a current-regulator for dynamo-electric machines, the combination of a movable current-collector, a shifter therefor, a driving-motor for said shifter, connecting parts between the shifter and motor and attached to one and adapted to engage the other at varying intervals, a magnetic mass in proximity to the field-magnet, and connections therefrom to the motor to control its application to the shifter.

398,669. LAP-DESK. HELEN A. STARKEY, Sioux Falls, Dak. Filed Sept. 21, 1888. Serial No. 285,963. (No model.)



Claim.—1. A lap-desk having a base of stiff material, provided with a central space for writing and pockets at the sides thereof for holding paper and similar articles, in combination with flaps attached to the ends of said base and adapted to be folded over said pockets to protect them, leaving said central space uncovered, substantially as set forth.

2. In combination with a stiff base or lap board having a pocket on its face, and also a part for writing on which remains uncovered a flap, also provided with a pocket and attached to said board, in order that when folded on the face of the latter both of these pockets may be protected, as described.

3. A lap-board having flaps attached to its ends and provided on the inside with pockets, said lap-board having pockets on its face near its ends, and a central writing space or tablet, which is left uncovered when said flaps are folded over to protect the pockets, as set forth.

398,670. METHOD OF ENAMELING BOBBINS, &c. LORENZO STONE and ALONZO O. AUSTIN, Providence, R. I. Filed June 19, 1888. Serial No. 277,608. (No model.)



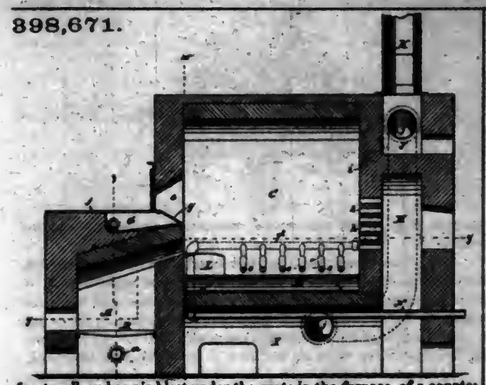
Claim.—The improvement in the method of enameling bobbins, spools, &c., which consists, first, in subjecting the bobbin to a high temperature before enameling; second, reaming the spindle hole or center; third, covering the exterior and interior surfaces of the bobbin with enameling material, as Japan varnish, and baking it thereon, and, fourth, in reaming the enameled surface of the spindle-hole to fit the driving-spindle, substantially as hereinbefore described and set forth.

398,671. REFUSE-BURNER. EDGAR G. TEED, Brooklyn, N. Y. Filed Apr. 19, 1888. Serial No. 271,236. (No model.)

Claim.—1. The combination of the furnace A, the combustion-chamber C, located at one side thereof and having the charging-opening *c* in its front wall, the hearth E in the bottom of the combustion-chamber, a flue, D, leading from the upper part of the furnace into the lower part of the combustion-chamber above the hearth, an air-blast delivering air into the combustion-chamber above the hearth and into the furnace below the grate, and an air-blower having its discharge-mouth extending through the front wall of the combustion-chamber beneath its charging-opening for directing an air-blast into the combustion-chamber to counteract the pressure therein and carry the charge therein, substantially as described.

2. The combination, with a furnace, A, a combustion-chamber, C, communicating therewith and having a charging-opening in its front wall, and an air-blast under the grate in the furnace, of a counter air-blower having its discharge-mouth extending through the front wall of the combustion-chamber directly beneath its charging opening to overcome the pressure in the combustion-chamber produced by the air-blast under the grate and the chimney and to carry the charge into the combustion-chamber, substantially as described.

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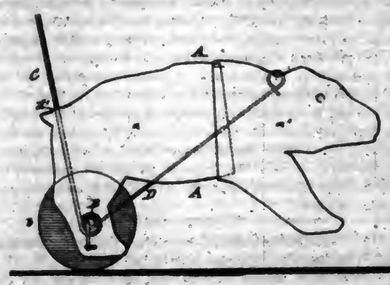


3. The combination of the furnace A, the combustion-chamber C at one side thereof, having the charging-opening *c* and bottom hearth, the flue D, leading from the upper part of the furnace-chamber into the combustion-chamber above the hearth, the flues F, located along the sides of the combustion-chamber and connecting at one end with the furnace-chamber above the grate, the blast-nozzles *e*, leading from the side flues into the combustion-chamber above the hearth, headers *d*, connected with the nozzles for supplying them with fresh air, and an air-blast pipe, N, connected with the headers, substantially as described.

4. The combination of the furnace A, the combustion-chamber C, located at one side thereof, having a bottom hearth, E, and provided in its wall with a charging-opening, *c*, a flue, D, leading from the upper part of the furnace into the lower part of the combustion-chamber, a cleaning-opening, L, located in the wall of the combustion-chamber on or about a level with the hearth and between the latter and the charging-opening, and an air-blowing mechanism having a discharge-mouth extending through the wall of the combustion-chamber beneath the cleaning-opening, to prevent the gases and flame escaping through the cleaning-opening when the hearth is being cleaned during the operation of the furnace, substantially as described.

5. The combination of the furnace A, a chimney, K, having a smoke-box, J, a combustion-chamber, C, located between the furnace and chimney, having transverse contracted flues *h* in its rear wall, and provided with a hearth, E, and a front charging-opening, *c*, the flue D, leading from the upper part of the furnace into the lower part of the combustion-chamber, an ash-pit, I, under the hearth of the combustion-chamber, a vertical flue, H, located in rear of the combustion-chamber and connecting the contracted flues with the ash-pit, and an external flue, *j*, leading from the ash-pit to the smoke-box in the chimney, substantially as described.

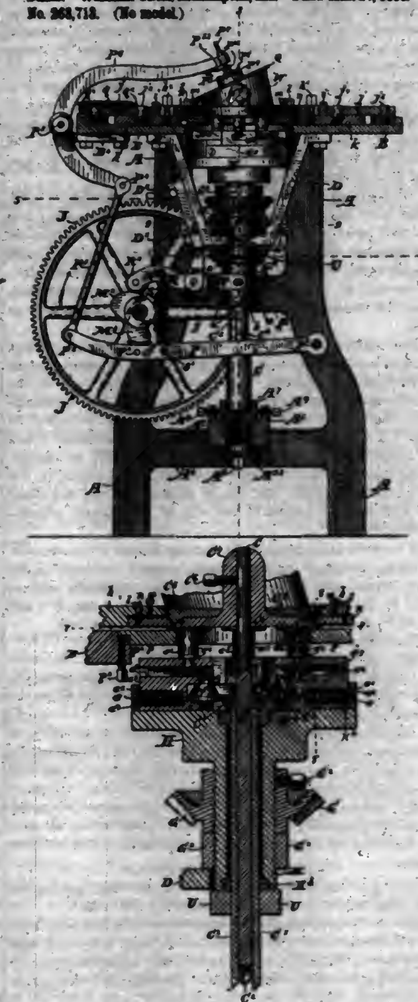
398,672. MOVABLE TOY. RICHARD TRUSHAM, Brooklyn, N. Y. Filed July 24, 1888. Serial No. 280,881. (No model.)



Claim.—1. The combination, with the body or shell of a toy figure, said body being provided with a guide opening or eye, of a crank-axle pivoted at the ends of said cranks to said body at one end of the same, wheels or rollers attached to said crank-axle, and an actuating handle-rod that is applied loosely by an eye or sleeve to the crank-axle and guided in the opening or eye of the body, substantially as set forth.

2. The combination, with the body or shell of a toy figure composed of a hind part having a guide opening or eye and a hinged front part, of a wheeled crank-axle pivoted to the hind part, an actuating handle-rod applied loosely to the crank-axle and passed through said guide-opening, and a connecting-rod pivoted to the crank-axle and the front part, whereby a falling and rising motion is imparted to the front part alternately with the rising and falling motion of the hind part, substantially as set forth.

398,673. MACHINE FOR FLANGING SHEET-METAL CYLINDERS. WILLIAM THUM, Indianapolis, Ind. Filed Mar. 27, 1888. Serial No. 268,713. (No model.)



Claim.—1. In an automatic machine for forming flanges on sheet-metal cylinders, the combination, with a rotating head carrying radially-sliding carriers in which are journaled the flanging-rollers, of a support for the sheet-metal section, an arm, P^4, carrying a hood, Q, a lever, P, connected to said arm, the rods C', carrying the cone-collar C^3 and collar T, a lever, R, connected to the collar T, and a shaft having cams actuating the levers P and R, substantially as described.

2. The combination, with a rotating head carrying radially-sliding carriers in which are journaled the flanging-rollers c^4, of a support for the pipe-section, a series of slides moving in ways toward and from said support, said slides having jaw-plates A, a ring, B^3, to which the slides are linked, a cam-slide, D^3, working in a slot in said ring, a lever, O, connected to said slide, a cam, N, on counter-shaft K, rods C', carrying the cone-collar C^3 and collar T, a lever connected to the latter collar, and a shaft having a cam, M^3, substantially as described.

3. The combination, with the revolving head H, carrying the sliding carriers c^4, having forming or flanging rolls c^4 and retracting-springs c^5, of the standard C, the rods C', moving in channels in said standard and carrying the cone-collar C^3, a lever, R, fulcrumed on a

bracket, D', and connected to a collar, T, on the rods C', a cam, M³, on a counter-shaft, a support, C³, for the pipe-section, slides having clamping-jaws k, surrounding said support, and means for moving said slides toward and from the latter, substantially as described.

4. The combination, with the revolving head H, having grooves H³, of the carriers c^3, the studs c^4, adjustable thereon, the flanging-rolls c^5, mounted on said studs, the rods C', carrying the cone-collar C³ and having the collar T, the lever R, cam M³ on counter-shaft K, a support for the pipe-section, and movable jaws for clamping the latter, substantially as described.

5. The combination, with the rotating head H, having grooves, of the carriers c^3, the adjustable flanging-rolls c^5, the rods C', arranged in channels in the standard C and carrying the cone-collar C³, acting upon friction-rolls f on the carriers, the slides k, linked to the ring B³ and having clamping-jaws k, said slides moving between ways B³, a support, C³, for the pipe, a lever, P³, carrying a hood, Q, a lever, F, connected to said lever, a lever, R, connected to a collar, T, pinned to the rods C', a cam-slide, O³, bearing on a friction-roll, B⁴, on the ring B³, a lever, O, connected to the cam-slide, and cams M', M³, and N on the counter-shaft K, substantially as described.

6. The combination, with the revolving head H, having ways H³, of the carriers c^3, having the adjustable rolls c^5 and friction-rolls f, and provided with openings e to receive springs c^6, of the rods C', moving in channels in the standard C and carrying the cone-collar C³, said rods provided with the collar T, the lever R, connected to said collar, the counter-shaft K, having a cam, M³, a support for the pipe-section, and means for clamping the latter upon said support, substantially as described.

7. The combination, with the revolving head H, having grooves, of carriers c^3, having grooves c^7, the flanging-rolls c^5, mounted on studs c^4, adjustable in said grooves, the support B, having ways B³, the slides k, moving therein and having steel jaws s mounted on the clamping-jaws k, the rods C', carrying the cone-collar C³ and connected to the collar T, a support, C³, for the pipe, a lever, R, connected to the collar T, a cam, M³, on counter-shaft K, a ring, B³, moving on the support B and connected to the slides k by links j, the cam-slide O³, the lever O, connected thereto, the cam N on shaft K, and the head-spring q, connected to support B and ring B³, respectively, substantially as described.

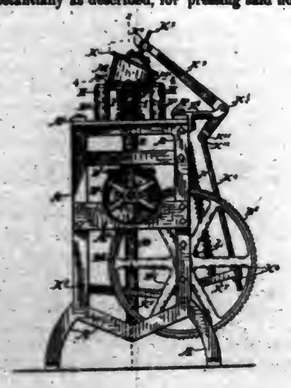
8. In an automatic machine for forming flanges on sheet-metal cylinders, the supports c^3 for the cylinder or pipe, the hood Q, the connected levers P and P³, the latter having an eye which receives the rod P⁷ on the hood and provided with a cushion-spring, P¹¹, and the cam M' on the counter-shaft K, substantially as described.

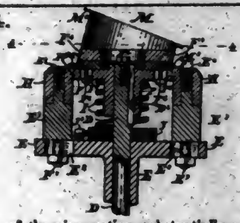
9. The combination, with the lever P, arm P³, and lever P⁹, having an eye receiving the threaded rod P⁷ on the hood Q, the latter having a socket receiving a ball on said rod, of the cushion-spring P¹¹, the nut P¹⁰, turning on the threaded rod P⁷, and the cam M' on the counter-shaft K, substantially as described.

10. The combination, with the top plate, B, having an orifice, of the gage-plate p, the set-screws p', the carriers c^3, having adjustable flanging-rolls c^5 and moving in ways in the revolving head H, the rods C', carrying the cone-collar C³, bearing upon friction-rolls f, a support for the pipe, movable clamping-jaws, a lever, R, connected to a collar on the rods C', a cam, M³, on a counter-shaft, K, and means, substantially as described, for operating the clamping-jaws, substantially as described.

398,674. FLANGING-MACHINE. WILLIAM TROM, Indianapolis, Ind. Filed Mar. 27, 1888. Serial No. 268,714. (No model.)

Claim.—1. In an automatic lock-seam elbow "hook-flanging" machine, the combination of the driving-shaft B, head E, gears B⁴ and B⁵, cone-rollers H, vertically-moving head F and adjustable hood K, and means, substantially as described, for pressing said hood against





the upper edge of the pipe-section, substantially as set forth and described.

2. In a machine for forming hook-flanges, the combination, with the standard D and the head E, running loosely on said standard, of gearing rotating said head, cone-collars H, mounted in said head and adjustable thereon, the head F, splined on the standard D, the spring I, adjustable collar J, and means, substantially as described, for pressing the pipe-section down on the head F, substantially as described.

3. In a machine for forming hook-flanges, the combination, with the shaft B and standard D and with the gears B⁴ B⁵, of the counter-shaft C, gears B⁶ and B⁵, the lever K³, connecting-rod K⁴, the lever K², the hook K, adjustably mounted thereon, the head F, splined on the standard D and having a seat for the pipe-section, the cone-rollers H, head E, and cam L, substantially as described.

4. In a machine for forming hook-flanges, the combination, with the standard D, of the head E, having slots E², the cone-rollers H, having their supports adjustable in said slots, gearing for rotating the head E, the head F, splined on the standard D, the spring I, collar J, and means, substantially as described, for clamping the pipe-section upon the head F, substantially as described.

5. In a machine for forming hook-flanges, the combination, with the standard D and with gears B⁴ B⁵, of the head E, the adjustable cone-rollers H, the head F, splined on standard D and having the ring F⁶, and cast ring F⁴, the spring I, collar J, set-screw J', and means, substantially as described, for clamping the pipe-section upon the head F, substantially as described.

398,675. PROCESS OF MAKING DUPLICATE COPIES OF WRITINGS, &c. CHARLES A. THOMPSON, New York, N. Y. Filed June 18, 1887. Renewed Feb. 4, 1889. Serial No. 299,562. (No model.)



Claim.—1. The improved method of preparing a transfer-sheet for manifold printing or copying, consisting in placing the absorbent sheet face down upon a surface impregnated and coated with the copying or printing medium or material, and producing by pressure the desired delineations or characters in obverse upon the back of the transfer-sheet, causing the said sheet to absorb the copying or printing medium at the points of impression and to have the delineations or characters to appear in reverse upon the face of the sheet absorbed into the same, as shown and described.

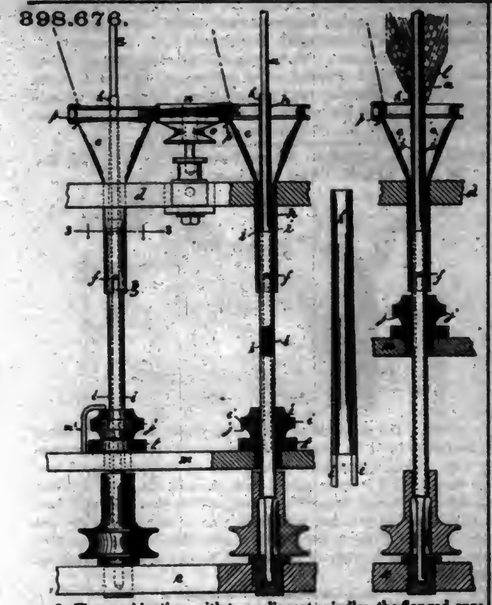
2. The improved method of preparing a transfer-sheet for manifold copying or printing, consisting in placing the absorbent transfer-sheet between two sheets having their facing sides coated or impregnated with the printing or copying medium, and thereupon producing the desired delineations or characters by pressure upon the back of one of the inclosing-sheets, causing the transfer-sheet to absorb the copying or printing medium at the points of pressure and to be thoroughly impregnated therewith from both sides, producing the impressed delineations or characters to appear in obverse upon the back of the transfer-sheet and in reverse upon the face of the same, and to be absorbed through the entire thickness of the sheet from both sides, as shown and described.

398,676. SPINNING-MACHINE, &c. PAUL WALLACE, Milnsbridge, County of York, England. Filed Oct. 15, 1888. Serial No. 288,173. (No model.) Patented in England June 28, 1884, No. 9,515, and July 20, 1887, No. 10,141.

Brief.—The object of the invention is to improve the parts directly concerned in the spinning, whereby bobbins or cops of various sizes may be produced by the same apparatus in either hard or soft yarn.

Claim.—1. The combination, with the spindle i, of the flanged cup thereon, the sleeve k thereon, inside of said cup, and means, substantially as described, for reciprocating said sleeve.

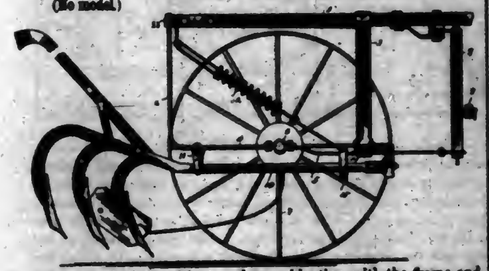
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2. The combination, with two adjacent spindles, the flanged cups thereon, and the travelers carried by said cups, of the revolving brush-wheel arranged to contact peripherally with both travelers, substantially as and for the purposes set forth.

3. The combination, with the grooved spindle, of two diameters, and the flanged cup, detachably mounted on the larger part of said spindle, of the longitudinally-sliding sleeve k, mounted on the smaller upper part of said spindle, and provided with the forks i, and means, substantially as described, for reciprocating said sleeve.

398,677. WHEEL-CULTIVATOR. WILLIAM WARING, Colora, and JOSEPH C. BERD, Rising Sun, Md. Filed Oct. 15, 1888. Serial No. 288,049. (No model.)



Claim.—1. In a cultivator, the combination, with the frame and drag-bars pivotally connected thereto, of a spring-connection between the drag-bars and the frame, the point of attachment to the frame being laterally adjustable from a vertical plane of the drag-bar, whereby side draft of the cultivator-beams inwardly or outwardly may be counteracted.

2. In a cultivator, the combination, with the frame thereof and drag-bars pivotally supported to said frame, of a spring-connection between each drag-bar and the frame of the machine, the point of connection on the drag-bar being longitudinally adjustable to vary the tension of the spring and counterbalancing effect and the point of connection on the frame being laterally adjustable to limit the side draft of the drag-bars, as and for the purpose set forth.

3. In a cultivator, the combination of the frame, a horizontal slotted arm for supporting the clevis, a clevis provided with a tongue extending into the slot in the arm, a clamping-plate, 20, and a U-shaped bar provided with nuts for locking the plate to the horizontal arm at any point in the slot, one limb of the bar 21 passing through the tongue of the clevis, as and for the purpose set forth.

398,678. CULTIVATOR. WILLIAM WARING, Colora, Md. Filed Nov. 13, 1888. Serial No. 290,665. (No model.)

Claim.—1. A plow-support comprising a frame, 1, channeled to embrace a standard, said frame being provided with concave extension, and a shovel-block provided with a convex stem co-operating

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with the extension, the shovel-block having rotary adjustment upon the frame through a slot and bolt.

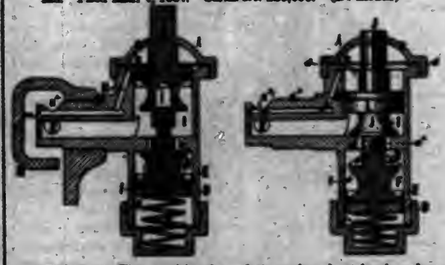
2. In a plow-support, the combination of a part, 1, adapted to be fixed to a plow-standard, a curved extension provided with a transverse slot, 4, a shovel-block provided with a stem, 6, having a curved face co-operating with the extension, and a bolt passing through the slot 4 for locking the parts together.

398,679. VACUUM-HOOK. FRANK WHITE, Philadelphia, Pa., assignor to Philip W. Pratt, Boston, Mass. Filed Oct. 3, 1887. Serial No. 251,570. (No model.)



Claim.—The combination of a metallic shank having a flange or enlargement at its inner end and suspensory device at its outer end, with a concavo-convex elastic holder having a thickened central portion in which the flange or enlargement of the said shank is embedded between the inner and outer surfaces of the holder, and an acute-angled marginal lip on its concave side, said lip having a beveled inner side which forms a flat bearing-surface when the holder is pressed inwardly, the thickness of the lip forming a depression in the outer surface of the holder when the latter is pressed against its seat, as set forth.

398,680. WATER-CLOSET VALVE. PETER WHITE, St. Louis, Mo. Filed Mar. 7, 1887. Serial No. 230,803. (No model.)



Claim.—1. The combination of the valve-chest having the tubular shank a', the passage N, and the cap a, with the cup-leather L and stem J, said cup-leather being turned toward the main valve and said passage N being wholly disconnected from all that portion of the construction through which the main pressure circulates and having an outlet independent of the main outlet K, substantially as described.

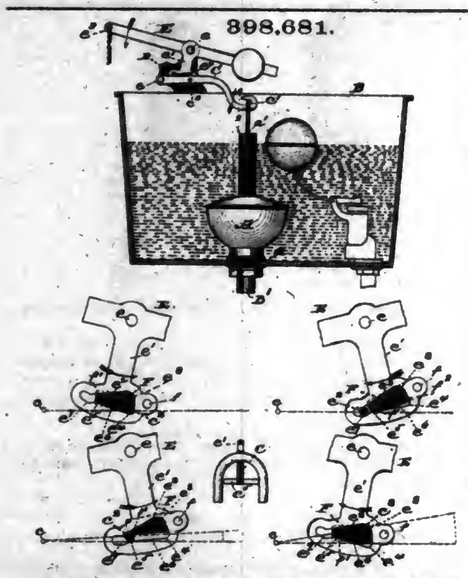
2. The combination of the valve-chest having the inlet, outlet, and valve-seat, as described, the grooved chamber, the stems H J, the spring, the cup-leathers E L, and the valve C, said cup-leather L being turned toward the valve-seat c, and said valve-chest having a passage, N, leading from the space beneath the chest-cap a, and being wholly disconnected from all that portion of the construction through which the main pressure circulates, and having an outlet independent of the outlet K, substantially as described.

398,681. TANK-VALVE. PETER WHITE, St. Louis, Mo. Filed Sept. 8, 1888. Serial No. 284,982. (No model.)

Claim.—1. The combination of the pivoted lever E, having the slotted arm, as described, the pivoted inclined plane, and the pivoted lever C, having the pin c^2, said pin c^2 traveling around said inclined plane and within the slot in said lever-arm, substantially as described.

2. The combination of the pivoted lever E, having the arm e', slotted at e^2, as described, with the pivoted lever C, having the pin c^2, and the hooked end c', and the float-valve and stem, said pin c^2 traveling around said inclined plane and within the slot in said lever-arm, substantially as described.

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3. The combination of the tank, the float valve and stem, the bracket, the pivoted lever E, having the arm slotted, as described, the pivoted inclined plane, and the pivoted lever C, having the pin c^3 and hooked end c', said pin c^3 traveling around said inclined plane and within the slot in said lever-arm, substantially as described.

398,682. HAY-LOADER. WILLIAM M. WHITE, Tacoma, Wash. Filed May 29, 1888. Serial No. 276,673. (No model.)



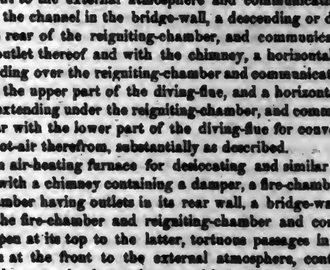
Claim.—1. The combination, with the wagon-body having the central transverse opening and the brackets, of the reel having its shaft supported by said brackets, the series of radial arms secured to said shaft and arranged in pairs, the casing attached to the outer ends of said arms and having slits formed therein, the rake-heads having curved teeth or tines and end plates, E', and the cams secured to said brackets, substantially as set forth.

2. The combination, with the wagon-body and the brackets secured thereto, of the reel, its shaft, the series of radial arms secured to said shaft, the rake-heads having end plates, E', the stationary cam G, secured to said brackets, the movable cams G' G^2, connected together at their upper ends, the pivoted stud K, upon which said cam G' is rigidly secured, and the lever for operating said stud and cams, substantially as set forth.

3. As an improvement in hay-loaders, the combination, with the wagon-body, of the rear tilting bottom hinged to the rear axle, and the rock-shaft extended across said wagon-body and provided with curved arms overlapping the forward end of said bottom and having a weighted handle, substantially as set forth.

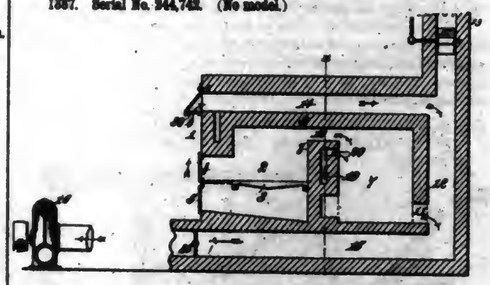
4. The combination, with the wagon-body, of the rear tilting bottom, the rock-shaft extended across said wagon-body and having curved arms overlapping the front end of said bottom, and the supporting-bar beneath the rear end of said bottom sliding in keepers on the wagon-body, substantially as set forth.

398,688. HOPPLE. WESTON WHITTEN, Unity, Me. Filed May 28, 1888. Serial No. 275,345. (No model.)



Claim.—The combination of the neck-strap 1, ring 2, breast-strap 3, the fetters 10 11 12, fitted to the hock of the mare, and connected by a short strap, 9, to prevent kicking sidewise, the belly-strap 7, having rings 6 and 8 at its respective ends, through the latter of which the fetter-connecting strap 9 runs freely, and the cord or strap 5, having one loose end attached by its other end to one of the rings, and rove through the rings 2 and 6 for instantly tightening the connection with both hind legs simultaneously and to any necessary extent, as explained.

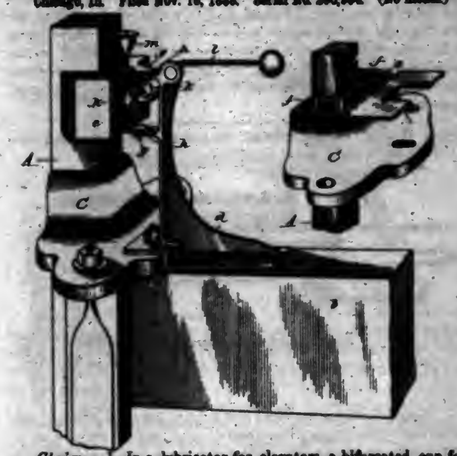
398,684. SMOKE-CONSUMING FURNACE AND AIR-HEATER. FREDERICK W. WIESENBOCK, Long Island City, N. Y. Filed July 19, 1887. Serial No. 244,742. (No model.)



Claim.—1. An air-heating furnace for desiccating and similar purposes, provided with a chimney, a fire-chamber, a reigniting-chamber having outlets in its rear wall, a bridge-wall located between the fire-chamber and the reigniting-chamber and containing a channel open at its top to the latter, tortuous passages in the side walls open at the front to the external atmosphere and communicating at the rear with the channel in the bridge-wall, a descending or diving flue located in rear of the reigniting-chamber, and communicating with the rear outlet thereof and with the chimney, a horizontal fresh-air flue extending over the reigniting-chamber and communicating at the rear with the upper part of the diving-flue, and a horizontal flue at the base extending under the reigniting-chamber, and communicating at the rear with the lower part of the diving-flue for conveying the purified hot-air therefrom, substantially as described.

2. An air-heating furnace for desiccating and similar purposes, provided with a chimney containing a damper, a fire-chamber, a reignition-chamber having outlets in its rear wall, a bridge-wall located between the fire-chamber and reigniting-chamber and containing a channel open at its top to the latter, tortuous passages in the side walls open at the front to the external atmosphere, controlled by valves, and communicating at the rear with the channel in the bridge-wall, an arch over the fire and reigniting chambers arranged to provide a passage above the bridge-wall, a descending or diving flue located at the rear of the reigniting-chamber, and communicating with the rear outlets thereof and with the chimney, a horizontal fresh-air flue extending above the arch, controlled at the front by a valve, and communicating at the rear with the upper part of the diving-flue at a point below the damper in the chimney, and a horizontal flue at the base containing a damper extending under the reigniting and fire chambers, and communicating at the rear with the lower part of the diving-flue for conveying the purified hot air therefrom, substantially as described.

398,685. LUBRICATOR FOR ELEVATORS. JAMES M. ARNOLD, Chicago, Ill. Filed Nov. 16, 1888. Serial No. 290,904. (No model.)



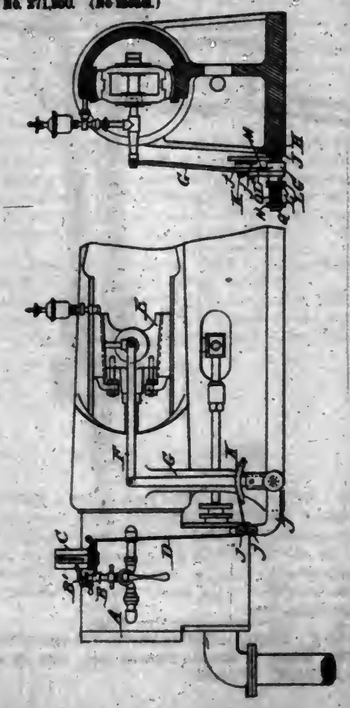
Claim.—1. In a lubricator for elevators, a bifurcated cup for containing a lubricant, in combination with the guides and carriage of an elevator, whereby the guides are automatically lubricated, substantially as shown and described, and for the purpose set forth.

2. In a lubricator for elevators, a bifurcated cup for containing a lubricant fixed on a bracket attached to the cross-beam of elevator-carriage, in combination with a weighted lever, and the elevator-guide, substantially as shown and described, and for the purpose set forth.

3. In a lubricator for elevators, the combination of the cup *c*, having the openings *f*, the guide A, a suitable bracket, *d*, whereon said cup is movably mounted, and a lever, *l*, for forcing the cup normally toward the guide, substantially as described.

4. In a lubricator for elevators, the combination, with the cup *c*, having the openings *f*, the adjustable plate *j*, and extensions *g*, of the guide A, a suitable bracket, *d*, having slotted supports *h*, and a lever, *l*, all constructed and arranged for operation substantially as described.

398,686. DEVICE FOR OPERATING STEAM-ENGINE INDICATORS. ROBERT M. BECK, Chambersburg, Pa. Filed Apr. 26, 1888. Serial No. 271,990. (No model.)



Claim.—1. In a device for operating steam-engine indicators, the combination of the oscillating cylinder, the moving cross-head, a leverage and cord connection between the cross-head and cylinder, and disengaging or clutch mechanism whereby the oscillating cylinder may be stopped when it is desired without stopping the engine, substantially as and for the purpose described.

2. In a recorder-indicator for steam-engines, the combination with the indicating mechanism and a moving part of the engine, of suitable connections between said indicating mechanism and said moving part, and a suitable disengaging or clutch mechanism whereby the indicator mechanism may be stopped without stopping the engine, substantially as and for the purpose described.

3. In a recorder-indicator for steam-engines, the combination of the operating-cord, the oscillating cylinder, the moving part of the engine, an armed sleeve supported on a stud on the engine-frame and carrying a quadrant to which the operating-cord is attached, the leverage-connections whereby the moving part communicates motion to the quadrant and operating-cord, and disengaging mechanism for throwing said leverage-connections out of operative connection with the quadrant and operating-cord, substantially as described.

4. In a device for operating steam-engine indicators, the combination of a vertical rock-lever actuated by a moving part of the engine, an armed sleeve supporting a device to which the operating-cord is attached, and the oscillating cylinder, said armed sleeve and rock-lever being mounted on a stud on the engine-frame, and disengaging mechanism for throwing the armed sleeve and its supporting-quadrant out of connection with the rock-lever, substantially as described.

5. In a device for operating steam-engine indicators, the combination of the moving cross-head, the vertical lever fulcrumed on a stud on the engine-frame, the link-connection between said lever and the cross-head, the armed sleeve carrying the device to which the operating-cord for the cylinder is attached, and adapted to be connected with the rock-lever, and the sleeved nut and its surrounding spring, said sleeved nut and armed sleeve being located on the same stud that operates the rock-lever, substantially as described.

6. In a recorder-indicator for steam-engines, the combination of a moving part of the engine, an oscillating vertical rock-lever fulcrumed at its lower end, a link-connection between it and the moving part, an armed sleeve located adjacent to the rock-lever, the oscillating cylinder, and the operating-cord for connecting it with said armed sleeve, and suitable devices whereby the armed sleeve is engaged with or disengaged from the rock-lever, substantially as described.

7. The combination, in a recorder-indicator, of the operating-cord D, rock-lever G, armed sleeve L, the arc K, carried by said sleeve and devices for engaging or disengaging the armed sleeve and rock-lever, substantially as described.

8. In a device for operating steam-engine indicators, the combination of the moving cross-head, the vertical lever G, fulcrumed on a stud, H, on the frame and connecting with said moving cross-head, the armed sleeve L, supported likewise on the stud and having projections M M and carrying the arc K, the cord D, attached thereto, and an oscillating cylinder which is actuated by said cord, substantially as described.

9. The combination of the lever G, the stud H, on which the lever is supported, a moving part of the engine by which said lever is actuated, the armed sleeve L on said stud H, having projections M M, which normally lie alongside lever G, and carrying the arc K, the indicator-cord attached thereto, said armed sleeve being also provided with a pin, *b*, the sleeved nut N, likewise on the stud, and having the slot *a*, and the surrounding spring O, all the parts being arranged for joint operation as specified.

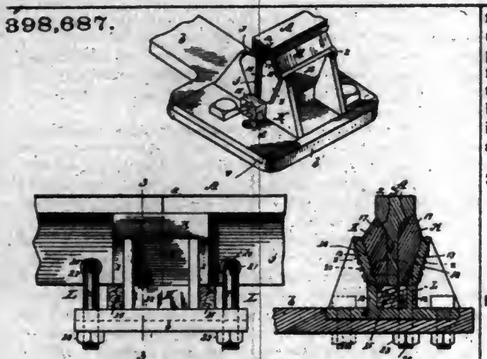
10. The combination of the oscillating lever G, having a sleeved portion, G', the stud H on the engine-frame surrounded by said sleeved portion, the armed sleeve L, having projections M M and carrying the pin *b*, the arc or quadrant K, secured to the armed sleeve, the sleeved nut N, fitted at *a*; the surrounding spring O, and the jam-nut Q, substantially as described.

11. The combination of an oscillating lever, a stud on the engine-frame on which it is fulcrumed, an armed sleeve supported on the stud alongside said lever, said armed sleeve being adapted for connection with the operating-cord and having the pin located as described, the sleeved nut, likewise on the stud and suitably slotted, as shown, and the coiled spring surrounding said nut, substantially as described.

398,687. RAILWAY. SUMNER A. BEMIS, Springfield, Mass., and LOUIS PFINDER, New York, N. Y. Filed June 30, 1888. Serial No. 278,671. (No model.)

Claim.—1. The combination, with the chairs, each comprising the base and the opposing inclined walls 13 13, of the track-rails having the enlarged upper tread and narrower mid-rib *j*, provided with the apertures 21, the wedge-blocks K, the confining-dogs L, each comprising the leg 20, entering one of said rail-apertures, and the screw-threaded shank 22, passing vertically through said base, and the nuts 23, substantially as and for the purpose described.

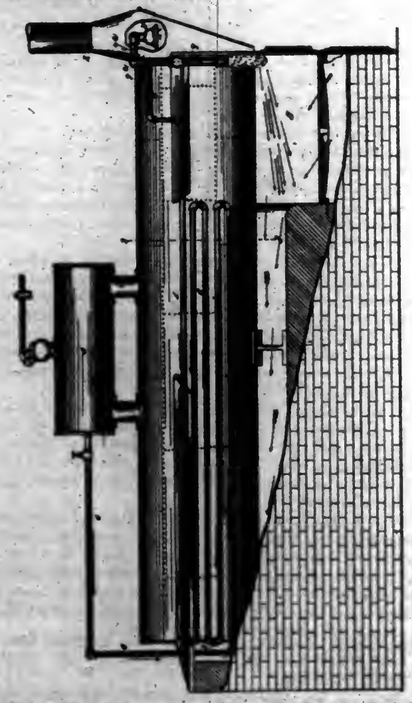
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2. The combination, with the chairs, each comprising the base and the opposing inclined walls 13 13, of the track-rails having the enlarged upper tread and narrower mid-rib *j*, provided with the apertures 21, the wedge-blocks K, provided at each end with the outwardly-extended flanges *z*, the confining-dogs L, each comprising the lug 20, entering one of said rail-apertures, and the screw-threaded shank 22, passing vertically through said base, and the nuts 23, all substantially as shown, and for the purpose described.

3. The combination, with the chairs, each comprising the base and the opposing inclined walls 13 13, and the blocks 15, resting on the said base, of the track-rails having the enlarged tread and narrower mid-rib *j*, resting on said blocks 15 and provided with the apertures 21, the wedge-blocks K, the confining-dogs L, each comprising the lug 20, entering one of said rail-apertures, and the screw-threaded shank 22, passing vertically through said base, and the nuts 23, substantially as described.

398,688. SMOKE-CONSUMER. HARRY BLAISDELL, St. Louis, Mo., assignor of one-third to Charles A. Stix, same place. Filed Sept. 17, 1883. Serial No. 225,608. (No model.)



Claim.—In a smoke-consumer, the combination, with the boiler, the setting in which said boiler is mounted having a fire-box and the smoke-stack, of the perforated pipe 7, extending under the boiler in juxtaposition thereto and to the forward end of the fire-box and curved to the contour of said boiler, a fire-proof crating around said pipe, having openings complementary to the perforations therein, an inverted funnel in said stack, a pipe, 7ª, connecting said funnel with pipe 7 at right angles thereto, the pipe 6, an injector-nozzle extending from said pipe 6 axially into pipe 7 beyond pipe 7ª, a cock for regulating the flow from said nozzle, and said pipe 6 extending from the steam-space to the boiler and connected to the lower one of a number of return-bends located between the boiler and the setting, forming a superheating-coil, and the pipe 7 being connected to the upper one of said bends, as set forth.

398,689. VAPOR-BURNER. GEORGE W. BILLINGS, Cleveland, Ohio. Filed Apr. 6, 1888. Serial No. 269,845. (No model.)

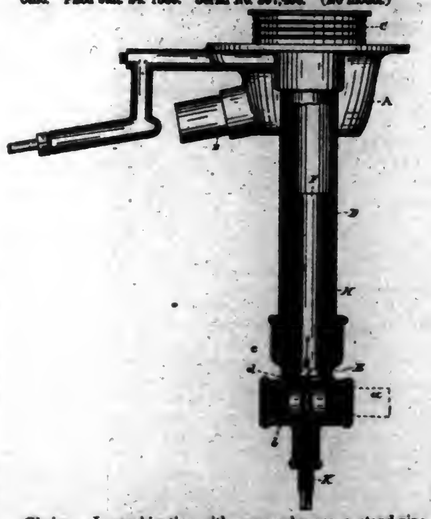


Claim.—1. In a vapor-stove, a generating-burner, a mixing-chamber, branch pipes leading therefrom to supplemental burners, an induction-tube leading to the mixing-chamber, a single valve for controlling the vapor in line with the induction-tube, and an eduction-tube from the mixing-chamber to the generating burner, whereby the generating and the supplemental burners are controlled by a single valve, substantially as described.

2. In a vapor-stove, a generating-burner, a mixing-chamber, an induction-tube leading to the mixing-chamber, a vapor-supply pipe with a valve for controlling the same, supplemental non-generating burners, and pipe-connections between said burners and the mixing-chamber, and a connection between said chamber and the generating-burner, substantially as described.

3. In a vapor-stove, a generating-burner, a mixing-chamber, an induction-tube, a pipe leading from the mixing-chamber to the generating-burner, a vapor-supply pipe, a valve controlling the same, supplemental burners with pipe-connections to the mixing-chamber, and independent valves for each burner, substantially as described.

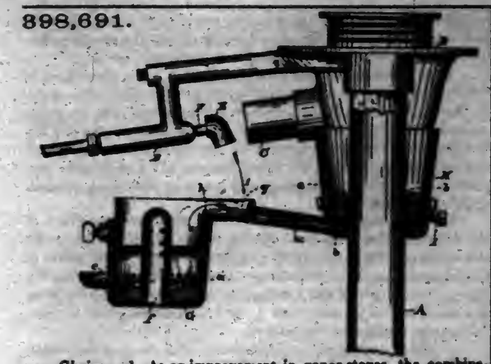
398,690. MECHANISM FOR PREVENTING THE PULSATION OF BURNING JETS IN VAPOR-STOVES. GEORGE W. BILLINGS, Cleveland, Ohio. Filed Jan. 24, 1888. Serial No. 297,466. (No model.)



Claim.—In combination with a vapor-burner, a stand-pipe, an auxiliary tube, F, within the stand-pipe and forming an annular chamber, H, between the said auxiliary tube and the stand-pipe, a coupling, *b*, for the attachment of the pipe connecting with the reservoir, and a branch coupling, E, having threaded bores of different diameters for the attachment of the stand-pipe and the annular tube F, substantially as described.

398,691. INITIAL LIGHTING DEVICE FOR GASOLINE-VAPOR STOVES. GEORGE W. BILLINGS, Cleveland, Ohio. Filed Jan. 24, 1888. Serial No. 297,467. (No model.)

398,691.



Claim.—1. As an improvement in vapor-stoves, the combination of the vapor-burner thereof with initial lighting devices having one or more cups provided with openings or perforations in their sides located above the surface of the gasoline, substantially as and for the purpose set forth.

2. In combination with a vapor-burner, the duplex cups G H, the receiver *g*, the dam *h*, separating said receiver from the cup G, and a passage, *a*, to the cup H, substantially as described.

3. In combination with a vapor-burner, initial lighting devices consisting of two cups, one of said cups being provided with a tube, *f*, in the center, said tube having an open bottom and a perforated upper portion, substantially as described.

4. In combination with a vapor-burner, the duplex cups H and G, secured to the stand-pipe of said burner, said cup G consisting of sections, the lower section having perforations *d'* in the sides and a tabular projection, *f*, and an adjustable connection between the upper and lower sections, substantially as and for the purpose set forth.

398,692. SHAKING-BOLT. HANS BUTTNER, Brunswick, Germany, assignor to C. Lüther, same place. Filed May 17, 1888. Serial No. 274,174. (No model.)

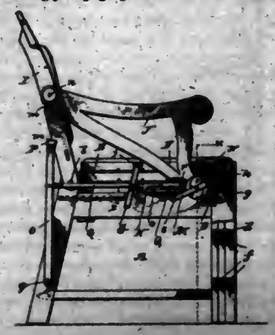


Claim.—1. The combination, with a horizontally-shaking sieve and its casing, of a bellows located at one end of said sieve and having its flexible leathering connected with the sieve and its casing, whereby the shaking of the sieve will actuate the bellows, substantially as described.

2. The combination, with a shaking sieve and its casing, of a bellows located at one end of said sieve and having its flexible leathering connected with the sieve and its casing, and a ceiling located close above and parallel to the sieve, whereby the shaking of the sieve will actuate the bellows and cause a current of air to flow along and between the sieve and ceiling, substantially as described.

398,693. FOLDING CHAIR. JAMES F. BUTLER, Lebanon, Pa. Filed Oct. 23, 1888. Serial No. 288,909. (No model.)

Claim.—1. The combination, with the pivoted back and the frame, of the arms pivoted at their rear ends to said back and at their front ends slidingly engaging the frame of the chair, and the



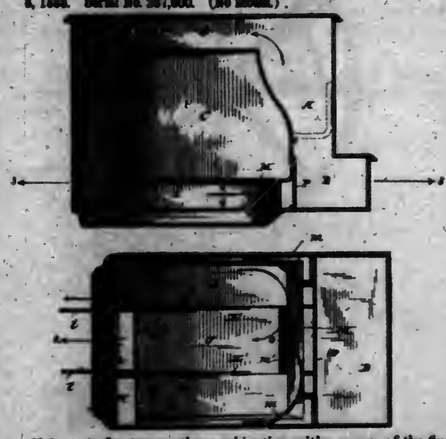
398,693.



brace pivoted at its lower end to the leg and pivotally connected between its ends to the arms and engaging said back to support the same, substantially as described.

2. The combination, with the frame and the back pivoted thereto, of the arms pivoted at their rear ends to said back and at their front ends slidingly engaging said frame, the uprights pivoted to the legs of the frame and connected at their upper ends by a cross-bar engaging said back, and the horizontal bars pivotally connected with said uprights and pivotally connected with and moving with said arms, substantially as shown and described.

398,694. STOVE. RICHARD BORNER, New Albany, Ind. Filed Oct. 6, 1888. Serial No. 287,003. (No model.)



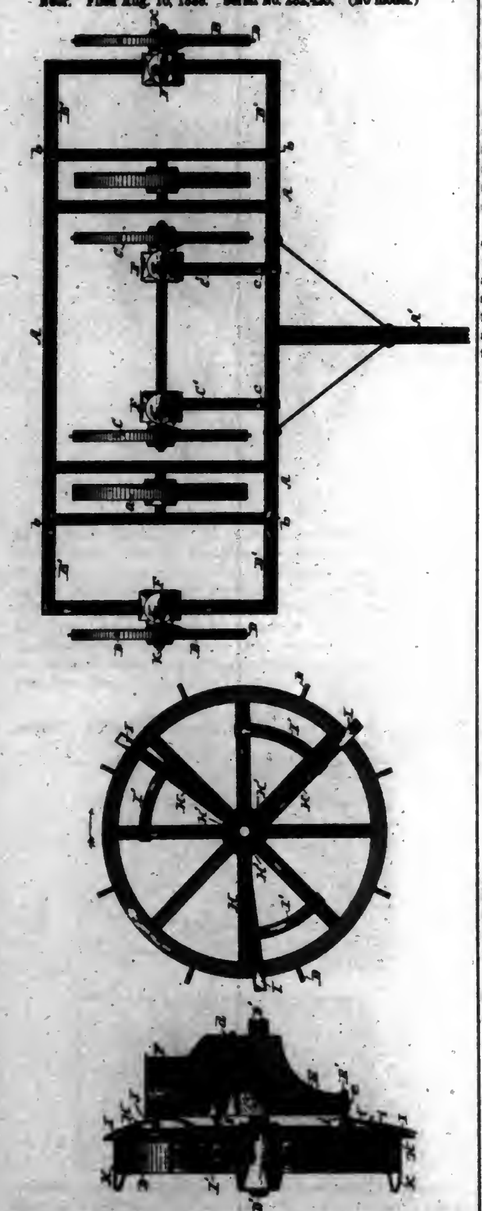
Claim.—1. In a stove, the combination, with an oven, of the flues I I and J below the oven, and separated by the partitions L, except at one end of the stove, where the said flues communicate, and the sliding plates L', substantially as described.

2. In a stove, the combination, with an oven, of flues I I and J below the oven, the partitions separating such flues constituted in part by the sliding plates L' at their ends, and the curved deflecting-plates M, substantially as described.

3. In a stove, the combination of the flues I I and J, an opening into the said flues closed by a door, and curved deflecting-plates M across the ends of the flues I, consisting of the parts *m* secured to the stove-plates, and the parts *m'* carried by the said door, substantially as described.

4. The combination, in a stove, of a hot-air flue, the walls whereof are arranged at angles to each other, the lugs *a* on the said walls, and the detachable curved plates secured behind the said lugs, substantially as described.

398,695. CORN-PLANTER. GEORGE M. DOLSON, Daly Branch, Nebr. Filed Aug. 10, 1888. Serial No. 282,426. (No model.)



Claim.—1. In a corn-planter, the combination, with the main frame provided with bearing-wheels, of the pivoted end and central subordinate frames, and the dropping-wheels carried by said subordinate frames, substantially as set forth.

2. In a corn-planter, the combination, with the dropping-wheel, of the dropping-tubes secured to the spokes thereof and provided with scoops at their inner ends, and a seed-holder provided with a valve operated by said tubes for delivering grain into said scoops, substantially as set forth.

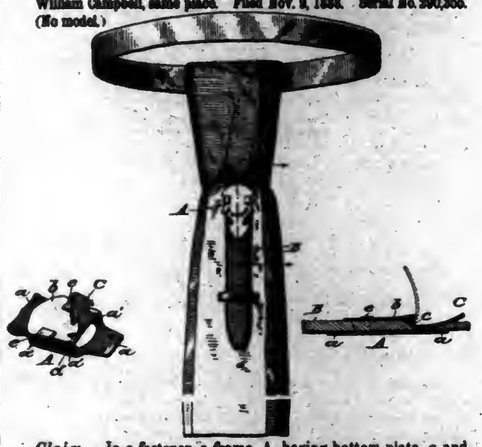
3. In a corn-planter, the combination, with a revolving seed-tube provided with the scoop H' at its inner end and a discharge-valve at its other end, of the seed-holder having a seed-valve operated by said tube, and a lower trip-roller for opening the said discharge-valve when the end of the tube is in the ground, substantially as set forth.

4. In a corn-planter, the combination, with a dropping-wheel, of the dropping-tubes secured to said wheel and provided with scoops at their inner ends and discharge-valves at their outer ends, the spring cam-plates secured to the spokes of the wheel and to the said discharge-valves, the lower trip-roller for bearing against the cam-plates and opening the valves as the wheel revolves, and a seed-holder provided with a valve for delivering seed into the said scoop, substantially as set forth.

5. In a corn-planter, the combination, with a dropping-wheel, of the dropping-tubes secured to the wheel and provided with scoops and discharge-valves, the spring cam-plates secured to the spokes of the wheel and to the said discharge-valves, the trip-roller for bearing against the cam-plates and opening the valves as the wheel revolves, and a seed-holder provided with a valve for delivering seed into the said scoops, substantially as set forth.

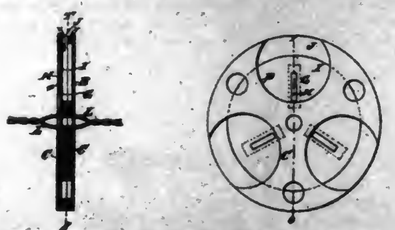
6. In a corn-planter, the combination, with the dropping-wheel, of the telescopic dropping-tubes secured to the wheel and provided with scoops H', the discharge-valves pivoted to the ends of the tubes and provided with springs for closing them, the spring cam-plate secured to the valves and to the spokes of the wheel, the trip-roller for opening the discharge-valves, and the seed-holders provided with a valve for delivering seed into the scoops, substantially as and for the purposes set forth.

398,696. NECKTIE-FASTENER. JACOB L. BRALLIER, Philadelphia, Pa., assignor, by direct and mesne assignments, to himself and William Campbell, same place. Filed Nov. 9, 1888. Serial No. 290,365. (No model.)



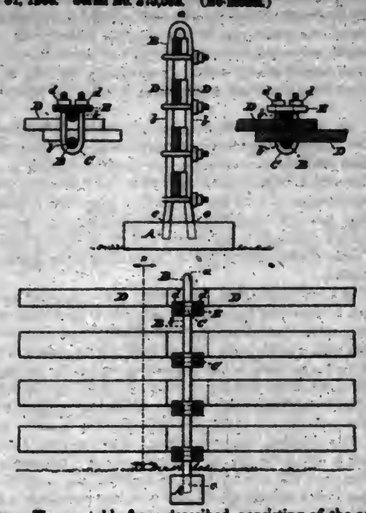
Claim.—In a fastener, a frame, A, having bottom plate, *a*, and sides *a' a'*, in combination with the spring-plate *b*, secured thereto by lugs *c*, and the clamp C, hinged to said side plates, *a' a'*, as described, and provided with a projection, *c*, adapted to engage with the under side of spring-plate *b*, substantially as hereinbefore set forth and described.

398,697. MUSICAL PNEUMATIC TOY. WILLIAM H. BROWN, Bolton, County of Lancaster, England. Filed Nov. 15, 1888. Serial No. 290,923. (No model.) Patented in England Sept. 5, 1888, No. 12,821.



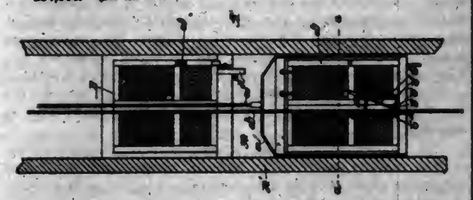
Claim.—A musical revolving toy consisting of the cords L, the plain disk B, having the circular center pieces, C, fixed thereto and provided with the circular chambers or openings D, extending to their periphery, the ring J, secured to the periphery of the center pieces, the outer disk, E, having radial air-passages G and secured on said ring, and the circular reed-carrying plate I, fitted inside said peripheral ring between the center pieces and the outer disk having the air-openings, substantially as described.

398,698. FENCE-POST. WIRT H. BROWN, Sycamore, Ohio. Filed May 31, 1888. Serial No. 275,532. (No model.)



Claim.—The portable fence described, consisting of the anchor-base, the elongated centrally-bent rod B, having its branches attached to said base and forming the post, the lapped rails D between the branches of said post, the elongated U-shaped clamp-bolt C, having its branches separated by a narrow interval and extending from the bend around one branch of the post parallel to the plane of the post under the lap of the rails, the perforated plate I, engaging the other branch of the post, and the nuts *d d*, engaging the threaded ends of the clamp-bolt, whereby said ends can be drawn up uniformly and the branches of the post-rod braced and caused to become pressed into the wood of the rails, holding them securely, substantially as specified.

398,699. ELEVATOR. WILLIAM R. CABOT, West Medford, and RICHARDS M. BRADLEY, Boston, Mass. Filed Dec. 8, 1887. Serial No. 257,209. (No model.)



Claim.—1. In an elevator, the combination, with a car having a door and a shipping mechanism within the car, of a clamp or holder to engage the shipping mechanism, and a bolt connected to the said clamp or holder to operate simultaneously therewith, and adapted to lock the car-door when the shipping mechanism is free to be operated to put the car in motion and to unlock said door when the shipping mechanism is clamped, substantially as described.

2. An elevator comprising a shaft-door, an elevator-car provided with a door, a shipping mechanism within the car, a clamp or holder to engage the shipping mechanism, a bolt connected to the said clamp or holder to operate simultaneously therewith and adapted to lock the car-door when the shipping mechanism is free to be operated to put the car in motion, and to unlock said door when the shipping mechanism is clamped, a door-connection, substantially as described, to lock the car-door and shaft-door together when the car-door is substantially opposite the shaft-door, a locking device to lock said shaft-door, and a projection carried by the car to operate said locking device to permit the shaft-door to be opened when the car-door is substantially opposite the shaft-door, substantially as described.

3. In an elevator, a car-door, a^3, having guides supported at its outer side combined with a door of the elevator shaft or well provided with a stud or projection to co-operate with said guides to open the said doors when the car-door is substantially opposite the shaft-door, substantially as described.

4. In an elevator, a car-door, a^3, and a shaft-door, B, combined with a locking device or door-connection, consisting of guides a^4 a^5, and a stud to engage said guides to unite the said doors together when substantially opposite each other, substantially as described.

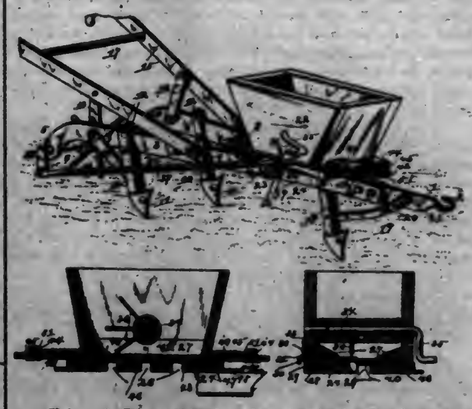
398,700. TOOL-BOX. ELI CALDWELL, East Las Vegas, N. Mex. Filed Dec. 20, 1888. Serial No. 294,216. (No model.)



Claim.—1. A combination tool-box for the purpose set forth, comprising a box proper having a hinged door at one end opening sidewise, a till with tool-receptacles, and a lower transversely-arranged hinged door opening upward and communicating with a lower compartment, substantially as described.

2. A combination tool-box for the purpose set forth, comprising a box proper having a metallic rest-plate on the top thereof, and hinged doors at one end opening sidewise and upwardly, with devices for locking the same closed, and a till adapted to be withdrawn from and projected into said box, having tool-receptacles formed at one end, and an open space or receptacle formed between the rear of said tool-receptacles and the rear end of the said till, substantially as described.

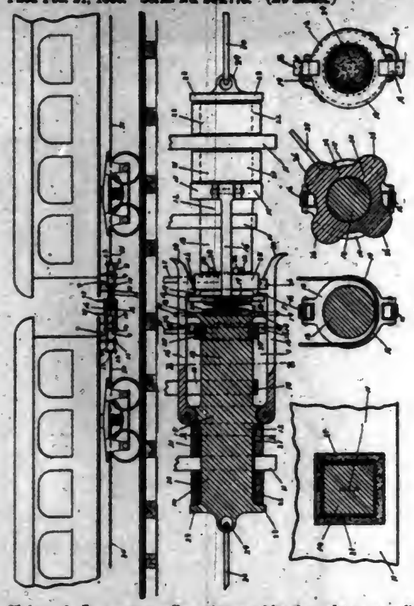
398,701. COMBINED CULTIVATOR AND PLANTER. EDWARD D. CARTER, Celesta, Tex. Filed May 5, 1888. Serial No. 272,955. (No model.)



Claim.—1. The combination of the box having the slot and the three apertures in the side of the slot, as shown and described, the reciprocating seed-slide, and the sliding and adjustable plate covering the slot, as shown, and for the purpose specified.

2. The combination of the staple having one leg rigidly secured to the upper side of the forward central beam, and the sliding plate having the slot near its end and engaging with the free leg of the staple, as and for the purpose specified.

398,702. CAR-COUPLING. THOMAS C. CHAPPELL, Baltimore, MA. Filed Feb. 21, 1888. Serial No. 264,773. (No model.)



Claim.—1. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, each of which is provided with a locking-arm hinged to it and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other coupling, and a buffer consisting of a laterally-projecting flange on the end of the coupling, which is adapted to engage the locking-arm of the other coupling, whereby the couplings are united, substantially as described.

2. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage one another when the cars are brought together, each of which is provided with a locking-arm hinged to the coupling-body, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the opposite coupling, and the ends of which are armed with elastic buffers adapted to engage one another and resist the shock of impact of the couplings, substantially as described.

3. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, each coupling-body being attached at its rear end to the draft-rod of the car, to each end of which a coupling is attached.

4. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, in combination with a releasing device which consists of a ring encircling the coupling and provided on its periphery with cams or lugs having inclined faces which bear upon the under side of one or all the locking-arms, and which is provided with means for turning said ring, whereby the arm or arms will be raised and the coupling unlocked when the cams are forced beneath them.

5. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with one or more locking-arms hinged to it, and a recess or recesses or a laterally-projecting flange upon its end adapted to engage the locking arm or arms of the other part of the coupling, whereby the couplings are united, each locking-arm being provided with a circular spring surrounding the locking-arms, whereby they are retained in contact with the flange or recess of the opposite coupling.

6. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, in combination with a rigid ring encircling the locking-arms, and provided with means for advancing the ring upon them when they are locked and withdrawing it when it is desired to open them.

7. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, the ends of said couplings being provided with projecting pins or lugs which enter corresponding holes or depressions in the opposite part of the coupling.

8. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, the ends of said couplings being provided with projecting jaws which engage the opposite part of the coupling and serve to center it.

9. In a coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, each coupling-body being suspended by a flexible suspending device, which consists of a rigid frame consisting of vertical rods connected together at their lower ends, and upon these rods slide blocks, above and below which are helical springs encircling the rods and maintaining the blocks midway of the rods, and the blocks are also perforated with horizontal holes, through which pass freely horizontal rods secured to the suspending-ring which encircles the coupling-body, and this horizontal rod is encircled by helical springs which bear between the sliding blocks and the suspending-ring, substantially as described.

10. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other part of the coupling, whereby the couplings are united, a suspending device for the couplings, which consists of a ring hung on the under side of the car, the interior of which is beveled, so as to bear upon the coupling-body only at its center, whereby the coupling-body is enabled to rock inside of the ring, substantially as described.

11. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, each of which is provided with a locking-arm hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking-arm of the other coupling, and buffers secured to the ends of said couplings and adapted to engage one another and resist the shock of impact, a pair of buffers encircling each coupling-body and bearing between flanges upon the coupling-body and a rigid part of the car placed intermediate between said buffers, with means whereby said locking-arms may be raised and the coupling unlocked, means for retaining the locking arm or arms in contact with the flange or recess in the opposite coupling, a device fixed to the end of a car supporting each coupling-body in position opposite to the other coupling-body attached to the end of another car in a similar manner, and the draft mechanism of the car secured to the coupling-body, substantially as described.

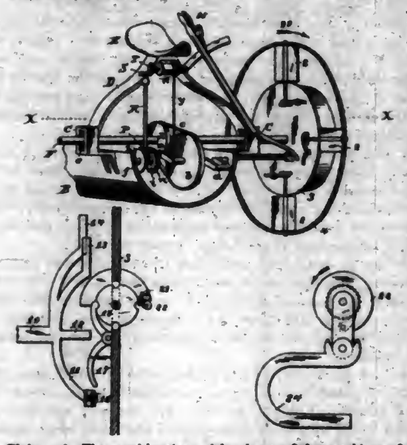
12. In a car-coupling, the combination of the two parts of the coupling, each of which is connected to the end of a railroad-car in position to engage the other when the cars are brought together, and a suspending device for said coupling, which consists of a rigid frame secured to the end of the car and a series of springs operating between the frame and the coupling, whereby the coupling is capable of radial motion and is self-centering.

13. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of the car in position to engage the other when the cars are brought together, and a suspending device fixed to the end of the car supporting each coupling-body, and mechanism operating between the coupling and suspending device, whereby the coupling is permitted partial spherically-radial motion, substantially as described.

14. In a car-coupling, the combination of two coupling-bodies, each of which is secured to the end of a railroad-car in position to engage the other when the cars are brought together, and each of which is provided with a locking arm or arms hinged to it, and a recess or a laterally-projecting flange upon its end adapted to engage the locking arm or arms of the other coupling, the arm or arms on the two parts of the coupling being placed on a line which is at an inclination of forty-five degrees with the perpendicular, and the arms on opposite couplings being on opposite sides of the perpendicular, substantially as described.

15. A car-coupling consisting of two coupling-pieces, each supported in a ring or strap, said ring or strap suspended by a series of springs, so that the ring may freely oscillate in any direction at right angles to the coupling-piece, while the coupling may freely reciprocate through the ring.

398,703. BOAT-PROPELLING MECHANISM. PAUL R. COLLINS, Lynn, Mass. Filed Apr. 26, 1884. Renewed Aug. 16, 1888. Serial No. 211,070. (No model.)



Claim.—1. The combination, with a boat, of the outriggers forming a bearing for the shaft F, the paddle-wheels consisting of air-tight chambers and outer rings, the paddles having bearings in the plate 3 and the said ring, and means, substantially as described, for operating said wheels to propel the boat, substantially as described.

2. The combination, with the boat, of the paddle-wheels consisting of air-tight chamber and ring, movable feathering-paddles between said chamber and ring, and means, substantially as described, under the control of the operator adapted to engage said paddles and hold the same during a part revolution of the wheel, and means, as described, to automatically release the same, substantially as set forth.

3. The combination of a wheel having movable feathering-paddles, substantially as described, the wheel 18, connected to the shaft of the paddle and notched as described, the pawl 17, pivoted to the plate 3, one end thereof engaging with the notches of the wheel 18, and means, substantially as described, adapted to engage the passage end of said pawl intermittingly and lift the same to release the wheel 18, substantially as described.

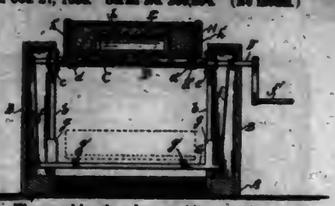
4. In a boat of the class described, the arm 10, connected to the boat and extending horizontally outward, having a branch, 11, and the lever 15, having the stud 16, combined with the wheel 18 and pawl 17, whereby in the revolution of the paddle-wheel the said pawl 17, holding the paddle-blade, comes in contact with the stud 16, thereby acting upon the wheel 18 to turn the paddle, substantially as described.

5. The combination, in a boat of the class described, of the shaft carrying the paddle-wheels, the air-tight chambers having face-plate 3, and the ring 4, of larger diameter than the plate 3 and in line therewith, the said plate and ring forming bearings for feathering paddle-blades having their movement between the plate 3 and ring 4, substantially as described.

6. In a boat of the class described, having the arm 10 connected thereto, with branch arms 12, 13, and 14, the combination of the wheel 18, pawl 17, and cam 21, carried by the plate 3, whereby when the said cam 21 strikes the arm 14 the said pawl 17 is lifted by the arm 13, thus allowing the cam to roll in passing the end of the arm 14 and effecting the half-turn of the paddle-blade.

7. The combination, in a boat of the class described, with the arm 10, having the branch 14, of the plate 3, carrying the wheel 18, pawl 17, and cam 21, with its spring-arm 24 and wheel 22, whereby the friction is avoided in the movement of the cam 21 over the arm 14 and straining prevented by the action of the spring-arm 24, substantially as described.

398,704. MOLDING-MACHINE. THOMAS A. CORRIGAN, Chicago, Ill. Filed Oct. 27, 1888. Serial No. 289,864. (No model.)



Claim.—The combination, in a molding-machine, of the mold-board D, bearings *d d*, set-screw *d'*, stationary hollow shaft C, shaft F, extending through the hollow shaft C, and having a wiedlam attached thereto, bar G, having cross-bars *g' g'*, flexible connections *f f*, for connecting said bar G with the shaft F, and parts *g g*, arranged in suitable slots in the frame of the machine for maintaining said bars *g' g'* in a horizontal position, substantially as shown and described.

398,705. WHIFFLETREE. HENRY COURTAD, Sandusky, Ohio. Filed Aug. 2, 1888. Serial No. 281,603. (No model.)



Claim.—1. A spring-whiffletree consisting of like halves A A, each integrally cast in one piece with the component part of a rule-joint connecting said halves together by means of a hollow bushing, and having the front and rear abutments, *c*, the spring D, centrally secured to said whiffletree, the shackles E, connecting the ends of the spring with the whiffletree, the wood filling *f*, secured in apertures of the whiffletree, and the shackle-bolts *g*, secured in said wood filling, substantially as described.

2. A new article of manufacture, a whiffletree consisting of like halves, each integrally cast in one piece with the component part of a rule-joint having front and rear abutments, *c*, a hollow bushing connecting them together, the spring D, the shackles E, the recess *h* in the rule-joint, and the bolt A, engaging with its head into said recess and centrally securing the spring to the whiffletree, substantially as described.

398,706. GATE. WILLIAM H. COX, Virden, Ill. Filed Nov. 8, 1888. Serial No. 290,276. (No model.)



Claim.—1. In combination, the sliding gate, the fastening on the gate-post, a latch pivoted on the gate and having a weight on its end to hold the latch normally out of engagement with the fastening, and a holder on the gate arranged to engage with the latch when the same engages with the fastening to counteract the force of the weight, substantially as described.

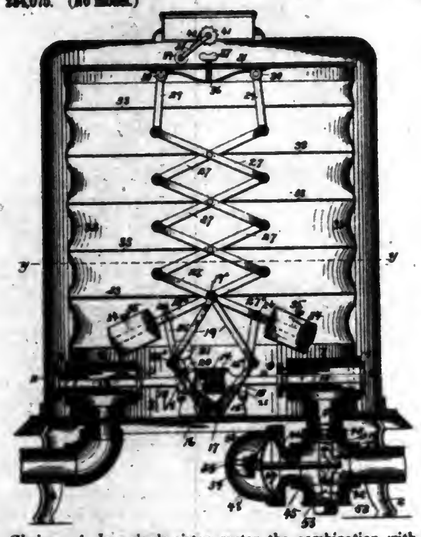
2. In combination with a sliding gate, a suitable fastening device on the gate-post, a gravity-latch on the gate, and a hooked lever for holding the same in locked position, substantially as described.

3. In combination with a sliding gate, a fastening device on the gate-post, a pivoted latch of angular form, having its front end hooked and its rear end weighted, and a hooked lever under spring-tension above the same, the latch and lever being adapted to co-operate and automatically lock the gate in place, substantially as described.

4. In combination with the sliding gate, an automatically-operating latch, a hooked lever for holding said latch in locked position, and operating-cords therefrom to supporting-posts on the side of the road, substantially as described.

5. In combination with a sliding gate, locking means consisting of a pivoted latch having hooked front ends rounded on the upper side and weighted rear end having projecting pins, a pivoted lever having hooked lower end and rounded faces adapted to co-operate with the pins on the weighted end of the latch, and operating-cords extending from the upper end of the hooked lever to supporting-posts on the side of the road, substantially as described.

398,707. GAS-METER. JOHN W. CULMER, New Brighton, Pa., assignor to John H. Logan, same place. Filed Aug. 29, 1888. Serial No. 284,076. (No model.)



Claim.—1. In a single-piston meter, the combination, with an outer case or shell and a piston and its bellows, of a meter-base ring having an annular flange for the attachment of the bellows, said flange provided with valve-ports and arranged to form a portion of the wall which divides the inner or bellows chamber from the outer or shell chamber, substantially as and for the purposes specified.

2. In a gas-meter, the combination, with a bellows and its piston and base, of parallel lazy-tongs mechanism, substantially as and for the purposes specified.

3. In a gas-meter, the combination, with a bellows and its piston, of a lazy-tongs and counter-weights, substantially as and for the purposes specified.

4. In a gas-meter, the combination of a bellows and its piston, with a lazy-tongs mechanism, and with interposed adjustable pivot-blocks which connect the lazy-tongs levers with the piston-head, substantially as and for the purposes specified.

5. In a gas-meter, the combination, with a bellows and its piston, of a lazy-tongs, plate 36, slides 30, and set-screw 37, substantially as and for the purposes specified.

6. In a gas-meter, the combination, with the bellows and its piston, of a lazy-tongs mechanism having adjustable connections with said piston, a spindle actuated thereby, a weighted drop-lever tripped or actuated by the spindle, and a valve arranged to be shifted by the fall of the drop-lever, substantially as and for the purposes specified.

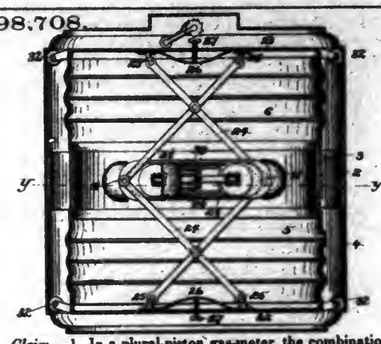
7. In a gas-meter, the combination, with a bellows, of a lazy-tongs, geared levers operated thereby, a spindle operated by the geared levers, a weighted lever loose on the spindle, a disk secured to the spindle and having pins which straddle the weighted lever, and a valve actuated by the weighted lever, substantially as and for the purposes specified.

8. In a gas-meter, the combination of a base, a piston, a bellows which connects the base and piston, a lazy-tongs movement and adjustable weights arranged on the lower members of the lazy-tongs, substantially as and for the purposes specified.

9. In a gas-meter, the combination of an inner and an outer meter or measuring-chamber, T-inlet and T-outlets which extend between the inner to the outer chambers, double puppet-valves therefor, a stem which connects the double puppet inlet-valve and the double puppet outlet-valves, and mechanism for actuating the valve-stem, substantially as and for the purposes specified.

10. In a gas-meter, the combination of an outer shell, an inclosed piston and bellows forming two chambers, inlet-ports and outlet-ports extending between the same, a double puppet inlet-valve, a double puppet outlet-valve, a slotted valve-stem which connects the two double puppet-valves, and is provided with strikes, a pivoted weighted drop or gravity lever, and lazy-tongs mechanism for actuating the drop or gravity lever from the bellows, substantially as and for the purposes specified.

398,708. PLURAL-PISTON GAS-METER. JOHN W. CULMER, New Brighton, Pa., assignor to John H. Logan, same place. Filed Aug. 29, 1888. Serial No. 284,076. (No model.)



Claim.—1. In a plural-piston gas-meter, the combination, with a shell-ring, a shell or case attached thereto, and a series of bellows and pistons, of a bellows-ring arranged concentrically with the shell-ring and provided with valved passages which connect the interior and exterior of said bellows-ring, said bellows-ring forming a common attachment for the series of bellows, substantially as and for the purposes specified.

2. In a plural-piston meter, the combination of concentric case-ring and bellows-ring, an inlet-passage which extends through the annular chamber between said rings, said passages terminating in valve-boxes having ports on both sides of the inner ring, and double puppet-valves arranged to control the ports of said inlet and outlet passages, substantially as and for the purposes specified.

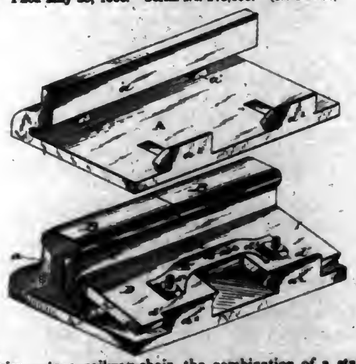
3. In a gas-meter, the combination of concentric shell-ring and bellows-ring, valve passages or boxes having ports on both sides of the inner ring, said boxes arranged parallel, double puppet-valves, a rock-lever for coupling said valves, and a gravity-lever for actuating the rock-lever from the bellows-pistons, substantially as and for the purposes specified.

4. In a gas-meter, the combination, with a central base, of a plurality of pistons, a single lazy-tongs mechanism which connects the several pistons, and inlet and outlet valves centrally arranged and actuated by the expansion and contraction of the lazy-tongs, substantially as and for the purposes specified.

5. In a gas-meter, the combination, with central concentrically-arranged shell-ring and bellows-ring, of plural piston-heads, a lazy-tongs mechanism which connects the piston-heads, and inlet and outlet valves arranged in the inner or bellows ring and actuated by the lazy-tongs, substantially as and for the purposes specified.

6. In a gas-meter, the combination, with a single case having centrally-arranged inlet and outlet valves, of a plurality of bellows, a lazy-tongs mechanism which connects the several pistons or bellows heads, and adjustable connections for uniting the ends of the lazy-tongs mechanism with each of the several heads or pistons, substantially as and for the purposes specified.

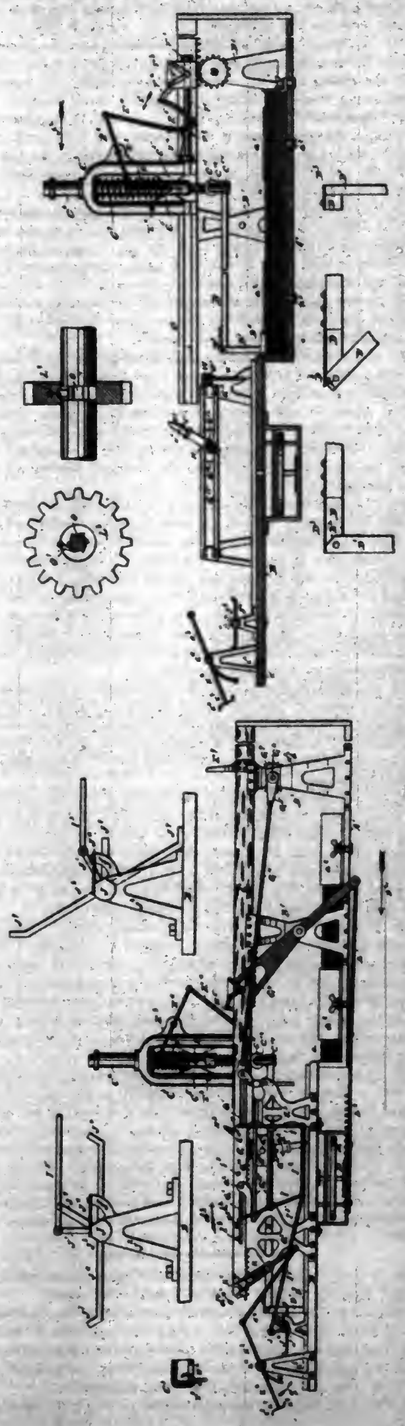
398,709. RAIL JOINT OR CHAIR. CHARLES M. CULP, South Bend, Ind. Filed May 25, 1888. Serial No. 275,055. (No model.)

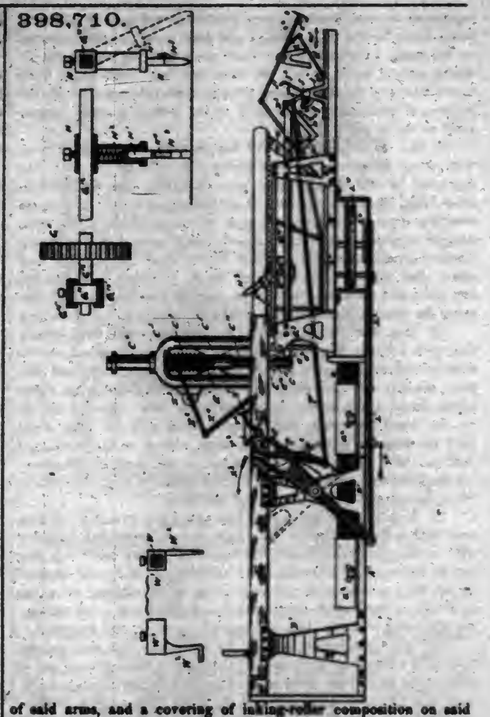


Claim.—In a railway-chair, the combination of a stationary cheek, a removable cheek for holding the rails against the stationary cheek, a clamp for holding the removable cheek in position against the rails, the edges of which are beveled or inclined, and projections or shoulders formed on the base-plate, the inner faces of which are inclined from their tops to their bottoms toward the stationary cheek, against which the clamp presses when the nuts are turned, thereby causing the removable cheek to press against the rails and hold the same in position, substantially as described.

398,710. SHEET-FEEDING MACHINE FOR PRINTING-PRESSES. JACOB C. DARNELL and SAMUEL DARNELL, Cincinnati, Ohio. Filed Feb. 20, 1888. Serial No. 264,552. (No model.)

Claim.—1. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a reciprocating carriage, bars supported by said carriage, arms hinged to said bars, blocks on swinging ends





of said arms, and a covering of inking-roller composition on said blocks, substantially as shown and described.

2. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage, bars on said carriage, arms pivoted to said bars, sheet-lifting blocks on the swinging ends of said arms, and springs on the bars resting on the upper ends of said pivoted arms, substantially as shown and described.

3. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage, bars on the same, arms pivoted to the ends of said bars, said arms having the inner corners at the upper ends beveled, sheet-lifting blocks on the swinging ends of said arms, and springs secured on the bars and resting on the upper ends of said arms, substantially as shown and described.

4. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage mounted to slide on said frame, a sheet-lifter carried by said carriage, sheet-shifters operated by parts of the carriage, and sheet-retainers operated by parts of the carriage, substantially as set forth.

5. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage mounted to slide on said frame, sheet-lifters carried by said carriage, a table on which the sheet can be placed, a rail mounted to slide laterally on said table to shift the sheets laterally, sheet-wipers operated by the carriage, and sheet-retainers operated by the carriage, substantially as shown and described.

6. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage mounted to slide on said frame, sheet-lifters carried by said carriage, a transverse beam sliding with the carriage on the frame and connected therewith, levers pivoted on the frame and operated by the ends of said beam, a laterally-movable sheet-shifting rail operated by intermediate power-transmitting members from said pivoted levers, paper-wipers operated by the carriage, and paper-retainers operated by the carriage, substantially as shown and described.

7. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage sliding on the same, a transverse beam moving with said carriage and connected therewith, a platform for receiving the sheets, sheet-lifters carried by the carriage, pivoted levers operated by the ends of said beam, a laterally-movable paper-shifting rail operated by suitable intermediate power-transmitting members from said pivoted levers, sheet-wipers operated by the carriage, sheet-stops operated from the carriage, sheet-retainers operated by the carriage, and a sheet-shifter at the end of the platform, also operated from the carriage, substantially as herein shown and described.

8. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage mounted to slide on the same, bars

supported by said carriage, arms pivoted to the ends of said bars, paper-lifting blocks on the ends of said arms, a rocking shaft mounted on the frame, bars fixed on said shaft and projecting toward the pivoted arms and serving to tilt the same, and fixed arms on the frame in the tracks of the said pivoted arms on their return-stroke for the purpose of swinging the arms back to the normal position, substantially as shown and described.

9. In a sheet-feeding machine for printing-presses, the combination, with a frame, of a carriage mounted to slide on the same, bars supported by said carriage, arms pivoted to the ends of said bars, sheet-lifting blocks on the ends of said arms, a rocking-shaft, sheet-retaining arms on said shaft, a rack on the carriage, a cog-wheel adapted to engage said rack, a slide on the frame, a connecting-rod connecting said slide with a crank on the shaft carrying the cog-wheel, pins on the slide, connected levers on which said pins can act, and a rod connecting said levers with an arm on the shaft carrying the sheet-retaining arms, substantially as shown and described.

10. In a sheet-feeding machine for printing-presses, the combination, with a frame, of guide-rails on the same, a carriage mounted to slide on said rails, a platform, a rock-shaft extending across said platform, arms on said rock-shaft, stops on the ends of said arms, a slide on the frame, a pin on the slide, a swinging lever on which the pin can act, a rod connecting said swinging lever with the arms of the shaft carrying the arms having the stops, a rack on the carriage, a shaft provided with a crank, a cog-wheel on said shaft, a rod connecting the slide with said crank, and sheet-retaining arms operated by the slide, substantially as shown and described.

11. In a sheet-feeding machine for printing-presses, the combination, with a frame, of guide-rails on the same, a carriage mounted to slide on the guide-rails, sheet-lifters supported by said carriage, a slide on the frame, paper-retaining arms, and arms having stops operated by the slide, a rack on the carriage, a cog-wheel adapted to engage said rack, a crank-shaft carrying said cog-wheel, and a rod connecting the crank with the slide, substantially as shown and described.

12. In a sheet-feeding machine for printing-presses, the combination, with a frame, of guide-rails on the same, a carriage mounted to slide on the guide-rails, sheet-lifters supported by the carriage, a platform, said platform being provided at its end with a recess forming the shoulder, a rock-shaft having arms, stop-lugs on said arms, which stop-lugs can swing against the shoulder formed by the recess, a slide on the frame, levers for operating the swinging stop-lug arms from the carriage, and mechanism, substantially as herein described, for operating the slide from the carriage, substantially as shown and described.

13. In a sheet-feeding machine for printing-presses, the combination, with a frame and a platform, of rails on the frame, a carriage mounted to slide on said rails, a rack on said carriage, a cog-wheel, a crank-shaft carrying the cog-wheel, the slide G on the frame, a connecting-rod connecting said slide with the crank-shaft, the pins I^3 and I^4 on the slide, the connected pivoted levers I and I', the shaft J, having the arms J^6, the crank J' on the shaft J, and the rod I^5, connecting the crank of the shaft J with the rods I I', substantially as shown and described.

14. In a sheet-feeding machine for printing-presses, the combination, with a frame and platform, of rails on the frame, a standard mounted to slide on the rails, a sheet-lifter supported by said standard, a transverse beam, F^6, connected with the sliding standard, the lever P, the slide G, mechanism, substantially as herein shown and described, for operating said slide from the standard, the levers I I', the rocking shaft J, the arms J^6 on the same, the rod I^5, connecting the crank-arm on said shaft J with the rods I I', and the connecting-rod P', connecting another crank on said shaft J with the lever P, substantially as shown and described.

15. In a sheet-feeding machine for printing-presses, the combination, with a frame and platform, of rails on the frame, a sliding standard on said rails, a rocking shaft above the platform, paper-retaining arms on said rocking shaft, and independent levers on opposite sides of the frame connected with said rock-shaft, substantially as shown and described.

16. In a sheet-feeding machine for printing-presses, the combination, with a frame and platform, of rails on the frame, a sliding standard on the rails, sheet-lifters supported by the standard, a rocking shaft at the end of the platform, arms having stop-lugs on said shaft, a slide connected with the rocking shaft, a hinged plate on said slide, beveled projections on the platform acting on said hinged plate, paper-retaining arms, and mechanism, substantially as herein shown and described, for operating the shaft carrying the arms having the stop-lugs and the shaft carrying the paper-retaining arms from the sliding standard, substantially as shown and described.

17. In a sheet-feeding machine for printing-presses, the combination, with a frame and platform, of a fixed rail on the platform, a longitudinal transversely-movable rail on the platform, guide-rails on the frame, a sliding standard supported by the guide-rails, a transverse beam supported by the guide-rails and connected with the sliding standard, levers pivoted to the side of the frame, on which levers the ends of the transverse beam can act, racks connected with the levers, cog-wheels engaging said racks, cams on the shafts of the cog-wheels, a pin on the movable rail on the platform, on which pin one of the cams acts, angle-levers at the fixed rail, a rod connecting the angle-levers, and a pin on said rod, on which pin the other cam acts, substantially as shown and described.

18. In a sheet-feeding machine for printing-presses, the combination, with a frame and platform, of the guide-rails C, the sliding standard C^3, the sliding beam F^6, connected therewith, the two levers L, pivoted on the frame and actuated by the ends of the beam F^6, the racks L^2, connected with the levers L, the cog-wheels L^3, engaged with the racks L^2, the cams L^4 and M, the movable rail L^{11}, the rod L^5, the spring N^7, the pin L^6, the fixed rail M^6, the angle-levers N, the rods N^4 and N^5, the rod M^3, the pin M', and the springs N^7, substantially as herein shown and described.

19. In a sheet-feeding machine for printing-presses, the combination, with a frame, of rails, a standard mounted to slide on said rails, bars supported by the standard, hinged arms on the ends of the bars, paper-lifters on said arms, a rock-shaft having cams that can abut against the sheet-lifting arms, a shaft, W, the arms W^2 on the same, pins W^3 on the paper-lifters, and mechanism, substantially as herein shown and described, for operating the rocking shaft from the sliding standard, substantially as shown and described.

20. In a sheet-feeding machine for printing-presses, the combination, with a frame, of rails on the same, a standard mounted to slide on the rails, a sheet-lifter supported by the sliding standard, a rocking shaft, wipers on said rocking shaft, a cog-wheel on the rocking shaft, a slide on the side of the frame provided with a rack engaged with said cog-wheel, and mechanism, substantially as shown and described, for operating the slide from the standard, substantially as shown and described.

21. In a sheet-feeding machine for printing-presses, the combination, with the frame, of rails on the same, a sliding standard on the rails, sheet-lifters suspended from the standard, the slide G on the frame, which slide is provided with a rack, G^{10}, the cog-wheel G^{11}, engaged with the rack G^{10}, the rails G^{12}, the adjustable bearings G^{14}, the shaft G^{13}, mounted in said bars G^{14} and carrying the wheel G^{11}, the sleeves H, having hollow arms, the pieces H' in said arms, the hinged pieces H^3 on the pieces H', and mechanism, substantially as shown and described, for operating the slide G from the sliding standard, substantially as shown and described.

22. In a sheet-feeding machine for printing-presses, the combination, with a frame, of rails, the sliding standard C^3 on the rails, the sliding tube C^3 in the standard, the spring C^7, pressing the tube downward, the rod C^9 in the tube C^3, the spring pressing the rod C^9 downward, and sheet-lifters supported from said rod C^9, substantially as shown and described.

23. In a sheet-feeding machine for printing-presses, the combination, with a frame, of rails, the sliding standard C^3 on the rails, the sliding tube C^3 in the standard, having the jaws C^8, of which one is provided with a notch, E^7, a spring for pressing the tube downward, sheet-lifters supported by said rod, a latch pivoted on the standard for locking the tube C^3 in the raised position, and the arm E^9 on one of the rails for tripping said latch, substantially as set forth.

24. In a sheet-feeding machine for printing-presses, the combination, with a frame, of rails, a sliding standard on the rails, a tube mounted to slide in the standard, sheet-lifters supported by said tube, angle-levers pivoted on parts of the standard and connected by intermediate levers with the sliding tube, a transverse beam mounted to slide on the rails, a rod projecting from the standard through the transverse beam, and arms on the transverse beam to act on the angle-levers, substantially as shown and described.

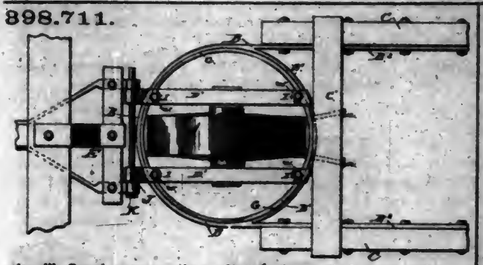
25. In a sheet-feeding machine for printing-presses, the combination, with a frame, of rails, a sliding standard on the rails, a tube mounted to slide in the standard, sheet-lifters supported by said tube, angle-levers pivoted on parts of the standard and connected by intermediate levers with the sliding tube, a transverse beam mounted to slide on the rails, a rod projecting from the standard through the transverse beam, and arms on the transverse beam to act on the angle-levers, a latch for locking the tube in raised position, and an arm on one of the rails for tripping said latch, substantially as shown and described.

398,711. HARVESTING-MACHINE. JAMES DRAPER, Stockton, Cal. Filed Oct. 18, 1888. Serial No. 287,507. (No model.)

Claim.—1. The combination, with the sills C and the transverse beam C', of the exterior ring, B B', having the extensions B^2 welded thereto and secured to said sills, the bolts *a*, passing through the rear of said ring and securing it to the transverse beam, and an inner ring within the outer ring, substantially as herein described.

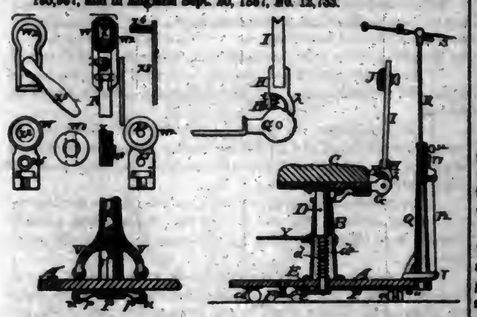
2. The combination of the outer stationary ring, B B', secured to

398,711.



the sills C and transverse beam C' of the frame, the inner ring, G, turning within the outer one, the plates D', secured to the top of the inner ring and extending beyond the edges of the outer one, and the angular plates D, secured to the bottom of the inner ring and extending under the outer ring and the eyes J, to which the tongue is connected, the journal-boxes H, and the axle of the bearing-wheel A, turning therein, substantially as described.

398,712. PHOTOGRAPHIC CHAIR. THEODORE BRUSAN, Cleveland, Ohio. Filed Jan. 9, 1888. Serial No. 260,202. (No model.) Patented in Canada Aug. 31, 1887, No. 27,531; in France Sept. 20, 1887, No. 183,967, and in England Sept. 20, 1887, No. 12,733.



Claim.—1. In a photographer's chair, the combination, with a platform supported on casters, of a hollow pedestal supporting a revolving seat, having a central spindle setting in said pedestal upon a spring, said spindle also connected with and operating a brake-lever and pad, substantially as described.

2. In a photographer's chair, the combination, with the seat C, of an adjustable back-rest consisting of a bracket, G, having a ratchet-toothed head, an arm-socket, H, having a pawl, A, and joined to the head G by links H^2, arm I, and adjustable pad J, all constructed to operate substantially as described.

3. In a photographer's chair, the combination, with the platform A, of the bar P, having crôss-arms *p p*, provided with rollers *n n*, the hollow post Q, having arms V, provided with rollers, and the lever T, connected by rod T^2 to hand-lever T^3, all constructed to operate substantially as described.

4. The combination, with rods R and S of the head-rest, of the adjustable swivel-clamp consisting of the two plates W W^2, each having a recess for embracing the head of rod R, and having the recesses X^3 and X^4, the disk W^2, having a recess in one side and in communication with hole X, through which rod S passes, and a journal projection, X^2, and a hand-lever screw, X^6 X^5, for screwing with threaded hole X^4 of plate W, for binding and clamping the disk W^2 and rod S and the head of rod R together, substantially as shown and described, and for the purpose specified.

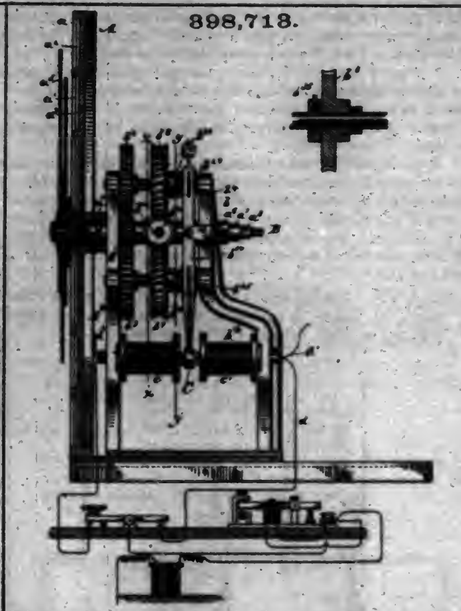
5. The rod Y, tubular rod Z, extension-rod Z^2, held by set-screw *x'*, and rod Z^3, attached to and held by swivel-clamp Z^4, and having adjustable curtain-canopy, in combination with chair-pedestal E, all constructed to operate substantially as described.

398,713. STOCK-INDICATOR. JOHN A. ROSS, Boston, Mass., assignor, by direct and mesne assignments, to Edwin Shepleigh, same place, and Howard Wilson Morton, Kemptville, Nova Scotia. Filed Mar. 2, 1888. Serial No. 265,915. (No model.)

Claim.—1. In a stock-indicator, the combination of a dial, a series of hands mounted on concentric sleeves, a main gear-wheel mounted on each sleeve, a gear-wheel meshing therewith and mounted on a second shaft, a worm-wheel also mounted on the shaft, a worm operating the worm-wheel, and a lever caused to vibrate by an electric current and operating said worm-wheel, substantially as described.

2. In an indicator, a dial, a hand mounted on a shaft carrying a gear-wheel, gear-wheels meshing therewith mounted on independent shafts, each caused to rotate in one direction with the shaft upon which

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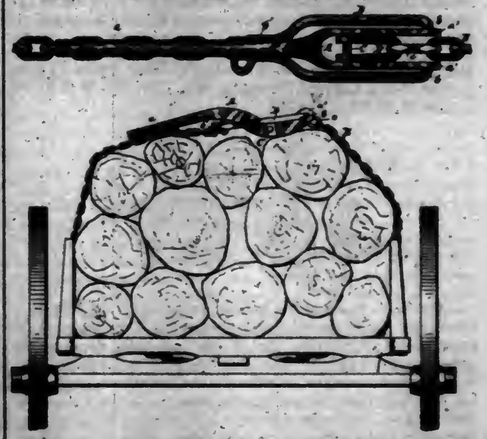


it is mounted, a worm-wheel mounted upon a shaft, a worm meshing with the worm-wheel, a lever mounted on the worm-shaft and carrying a pawl engaging to rotate upon said worm-shaft, and a magnet whose armature is carried by said lever, substantially as described.

3. In an indicator, a main shaft carrying a hand and a main gear-wheel, gear-wheels mounted on the independent shafts, worm-wheels also mounted on the independent shafts, a worm, and clutches engaging the worm-wheels to throw them into or out of engagement, said clutches being operated by movement of a lever actuated by a current of electricity, substantially as described.

4. In an indicator, the combination of a main shaft carrying the main gear-wheel, independent shafts carrying gear-wheels, worm-wheels also mounted on the independent shafts, the worm engaging the worm-wheels, clutches carried by a lever attached to said shafts, and a double magnet electrically connected, between which the lever extends, and means whereby a current of electricity may be caused to pass through either magnet for the purpose of operating the lever, substantially as described.

398,714. SELF-LOCKING LOAD-BINDER. WILLIAM M. FARR, Olean, N. Y. Filed Oct. 2, 1888. Serial No. 286,961. (No model.)



Claim.—1. The binder and locker herein described, consisting of a forked lever, a chain attached thereto at one end within said fork, and an open link movable on and over the end of said lever and provided at its outer end with a socket wherein said chain can be engaged, substantially as set forth.

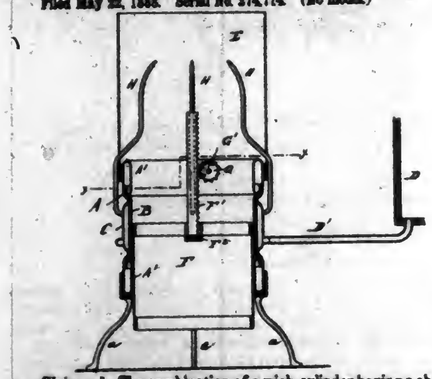
2. The lever A and chain E, attached at one end thereto, and the

link B, pivoted at one end to said lever and at its opposite end contracted, whereby there is provided a means for engaging the free end of the chain in and to the link, substantially as set forth.

3. The combination of the lever A, having the curved forked part, the chain E, attached at one end inside the said forks, the link B, pivoted at its bent ends in the ends of the lever-forks, its opposite end, *b'*, formed into a socket, *b''*, all substantially as and for the purposes set forth.

4. The binder and locker consisting of a forked lever, chain, and link, the several parts constructed and all combined as hereinbefore described, and the ends of the lever being curved, whereby when the lever-fork and the link are shut or folded together, the fulcrum-point of the lever being thrown outside of the line of draft, the draft upon the chain attached to the end of the link and to the clevis holds it fast or locks it.

398,715. AIR-HEATING APPARATUS. CHARLES P. FERY, Philadelphia, Pa., assignor of one-half to William G. Topin, same place. Filed May 22, 1888. Serial No. 274,714. (No model.)

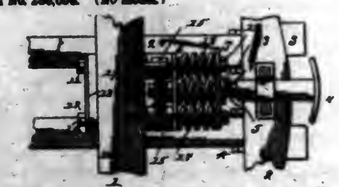


Claim.—1. The combination of a wick-cylinder having a channel, an asbestus or other wick supported by the wick-cylinder, a chimney applied to the upper end of the wick-cylinder, and a vertically-adjustable interior cylinder for regulating the size of the flame, substantially as set forth.

2. The combination of a wick-cylinder, a wick supported at the upper and lower ends by said cylinder, an annular channel formed in the wick-cylinder outside of the wick, a pipe for supplying liquid fuel to the same, upwardly-extending tubes for conducting the vapors from said channel, and a chimney at the upper end of the wick-cylinder, substantially as set forth.

3. The combination, with a wick-cylinder, a wick supported at the upper and lower ends by said cylinder, an annular channel in the wick-cylinder extending around the wick, a pipe for supplying liquid fuel to said channel, a chimney applied to the upper end of the wick-cylinder, a vertically-adjustable interior cylinder for regulating the size of the flame, and vapor-tubes connected to said channel and extended in upward direction into the chimney, substantially as set forth.

398,716. DRAW-BAR FOR RAILWAY-CARS. SAMUEL C. FISHER and CHARLES C. FISHER, Steubenville, Ohio. Filed Sept. 22, 1888. Serial No. 286,068. (No model.)



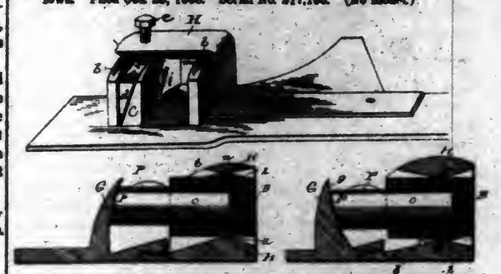
Claim.—1. In a draw-bar, the combination of the coupler-head, a coupler-bar loosely secured thereto, apertured follower-plates on the coupler-bar, rods extending through the said plates, springs on the rods between the plates, buffers behind the plates, and bolts for holding the buffers in position, substantially as described.

2. In a draw-bar, the combination of the coupler-head, a coupler-bar loosely secured thereto, apertured follower-plates on the coupler-bar, rods extending through the said plates, springs on the rods between the plates, buffers behind the plates, bolts for holding the buffers in position, and L-shaped braces beneath the rods, substantially as and for the purpose specified.

3. The combination of the buffers, bolts for holding the same in place, and L-shaped braces secured to the said bolts, substantially as and for the purpose specified.

4. The combination, with a coupler-head, of a movable bar carrying a spring, substantially as described.

398,717. PITMAN-CONNECTION. FRANK FORBES, St. Ansgar, Iowa. Filed Oct. 26, 1888. Serial No. 287,183. (No model.)



Claim.—1. In combination with the pitman, the knife-head having vertical bearing-sides adapted to confine the pitman snugly, and having its upper and lower portions cut away from a central bearing-point to allow free tilting movement of the knife-head and knife, substantially as described.

2. In combination with the pitman, the hollow knife-head having the bearing-sides and the bearing-edges *a a*, the upper and lower portions of the said head being cut away from the said edges to allow for the tilting of the knife-head and knife, substantially as described.

3. In combination, the pitman, the knife-head having the curved edges, and the bearing-box having bearing-lugs, substantially as described.

4. In combination, the pitman, the bearing-box B, having the curved surface *i*, and the knife-head having bearing-sides and the edges *a a*, the upper and lower portions being cut away from said edges, substantially as described.

5. In combination, the pitman, the knife-head, and the bearing-box having retaining-lugs, and an opening, *m*, extending partially through it to afford a bearing for the pitman, substantially as described.

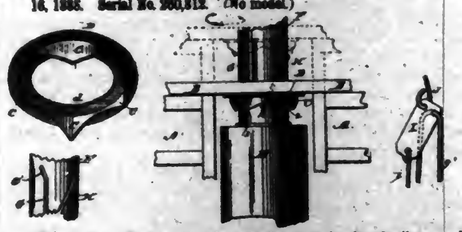
6. In combination with the pitman, the knife-head having vertical bearing-sides, and the bearing-box adapted to receive the end of the pitman and confined snugly by the bearing-walls of the head, portions of said head being cut away above and below to allow free tilting movement of the knife-head and knife, substantially as described.

7. In combination, the pitman, the knife-head, and the bearing-box removably held by the pitman and head, substantially as described.

8. In combination, the pitman, the knife-head constructed to permit tilting movement thereof up and down, and a guide or retaining plate having a curved face, *g*, adapted to allow said tilting movement, but to prevent displacement of the pitman during the same, substantially as described.

9. In combination, the pitman, the knife-head connected thereto in such a manner as to permit up-and-down tilting movement, a projection, *p*, on the pitman, and a guide-plate, G, having a face curved on the line of the tilting movement, substantially as described.

398,718. GATE. GEORGE FORD, New Harmony, Ind. Filed Jan. 16, 1888. Serial No. 260,812. (No model.)



Claim.—1. The combination of the gate having inclines, and bearings on which said inclines may rest and down which they may slide in the turning of the gate, said bearings being movable from their normal position in a direction reverse to that in which it is desired to open the gate, whereby as the gate is lifted the bearing may be moved from position to engage one incline to position for engagement by an incline in rear thereof, substantially as set forth.

2. In combination with a tube suitably supported and having an inclined or spiral slot inclined toward its upper end in a direction reverse to the direction of movement of the gate, the gate having inclines, a rod or bar movable in said inclined slot and extended to provide a bearing for the inclines of the gate, and a lifter for elevating the gate and the rod, all substantially as set forth.

3. The combination of the tube suitably supported and having

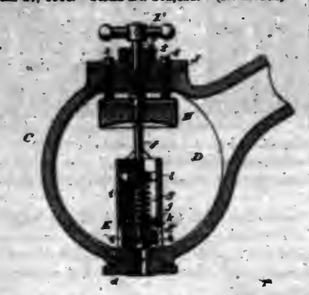
vertical slots and inclined slots, the gate having inclines, the lifting-shaft extended through the vertical slots and having its ends engaging the gate, the shaft extended through the inclined slots and having its ends arranged to be engaged by the inclines of the gate, and a lifter for the said two shafts, substantially as set forth.

4. The combination, with a gate having inclines, of bearings for such inclines down which the latter may slide, such bearings being movable, and inclined guides for said bearings, whereby when elevated such bearings will be also retracted and the gate when lowered will be partially turned by the movement of said bearings to their normal positions, and also by the sliding of its inclines down said bearings, all substantially as and for the purposes specified.

5. The combination of a gate, a lifter for said gate, bearings onto which said gate is lowered after being lifted by the elevator, such bearings being movable from their normal position rearwardly with reference to the direction of movement of the gate, and inclined guides for said bearings, down which such bearings move in the operation of the invention, substantially as set forth.

6. The combination of the gate having inclines, the tube having vertical slots and inclined slots, the shaft having its ends extended through the vertical slots and engaging the gate, the shaft extended at its ends through the inclined slot in position to be engaged by the inclines of the gate, connections between such shafts, and means for elevating the same, substantially as set forth.

398,719. STEAM-TRAP. EDWARD R. GOLD, New York, N. Y. Filed Jan. 27, 1888. Serial No. 262,122. (No model.)



Claim.—1. The combination, with a steam-heating system, of an automatic trap consisting of a drainage-valve connected with the steam-heating pipe or vessel and opening inwardly, and a tension device arranged to exert a pressure against said valve tending to open it, but insufficient to resist the normal steam-pressure in said pipe or vessel, whereby said valve is closed when steam is turned on and opens automatically when the steam-pressure ceases.

2. The combination, with a steam-pipe coupling for the steam-heating pipes of a railway-car, of an automatic trap applied to the coupling-head, consisting of a valve opening inwardly, with its seat arranged to drain the liquid from the normally-lowest portion thereof, and a tension device arranged to exert a pressure against said valve tending to open it, but insufficient to resist the normal steam-pressure within the pipes.

3. The combination, with a steam-pipe coupling for the steam-heating pipes of a railway-car, of an automatic trap applied to the coupling-head, consisting of a valve-seat at the normally-lowest part of the head, a valve opening inwardly from said seat, a retracting-spring tending to open the valve, but insufficient to resist the normal steam-pressure, a valve-stem, guides for said stem, and a stop for limiting the opening movement of the valve.

4. The combination, with a steam-heating system, of an automatic trap consisting of a drainage-valve connected with the steam-heating pipe or vessel and opening inwardly, and a tension device arranged to exert a pressure against said valve tending to open it, but insufficient to resist the normal steam-pressure in said pipe or vessel, and a screw arranged when turned to force said valve to its seat, whereby the automatic operation of the valve may be prevented at will.

5. The combination, with a steam pipe or vessel, of an automatic trap consisting of a valve-seat, a tubular standard borne by said seat, a valve opening inwardly, a valve-stem within said standard, a transverse partition in said standard forming a stop for limiting the opening movement of the valve, a spring tending to open the valve reënforced against said partition, and an adjusting-nut screwing on the valve-stem and receiving the tension of said spring, whereby the latter may be adjusted.

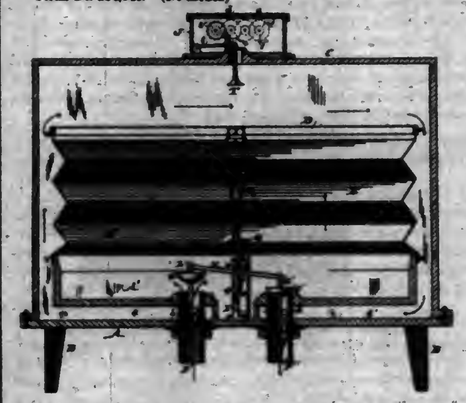
6. The combination, with a steam pipe or vessel, of an automatic trap consisting of a valve-seat, a tubular standard connected thereto and formed with an internal ledge or shoulder, a washer or disk placed within said standard against said shoulder, a valve opening inwardly, a valve-stem fixed to said valve and extending axially through said standard, a guiding-nut screwed on said valve-stem, and a spring tending to lift said valve reënforced against said washer and resting against said guiding-nut.

7. An automatic trap consisting of a valve opening inwardly and a tension device tending to open said valve, combined with a thermo-expansive device arranged relatively to said trap, so that upon its expansion by heat its movement shall be communicated to and shall close said valve, an adjustable stop to limit the movement of said expansion device away from said valve, and a screw connected to said thermo-expansive device and adapted to move the latter toward or from the valve, whereby by turning said screw the valve may be forced to its seat.

8. A hose-coupling head formed with a circular opening in its upper side, a cap closing said opening, a thermo-expansive vessel within the chamber of the coupling-head, a screw passing through said cap for vertically adjusting said vessel, and an automatic trap within the chamber of the coupling-head, consisting of a seat at the normally-lower side thereof, a valve opening inwardly and arranged relatively to said thermo-expansive vessel, so that the expansion of the latter will force it to its seat, and a tension device arranged to exert a pressure tending to open said valve.

398,720. WITHDRAWN.

398,721. GAS-METER. JOSEPH J. HARRELL, New Brighton, Pa., assignor to John H. Logan, trustee, same place. Filed Aug. 28, 1888. Serial No. 284,040. (No model.)



Claim.—1. In a meter, the combination, with an outer case, of a bellows which divides the meter into an inner or bellows chamber and an outer or case chamber, a bellows-bottom arranged within the outer case and having passages which lead into and from the case-chamber, as at *a a'*, inlet and outlet pipes which extend through the case and the bellows-bottom and are provided with ports which connect with the passages leading to the case-chamber, as at *b b'*, and valves for controlling said pipes and their ports, substantially as and for the purposes specified.

2. In a meter, the combination, with an outer case, of a bellows arranged therein, and which divides the meter into an inner or bellows chamber and an outer or case chamber, a bellows-bottom, inlet and outlet pipes which pass through the case and bellows-bottom, said pipes having ports which connect with the case-chamber, and sleeve-valves arranged in said pipes and connected with each other and with the bellows, so as to be simultaneously and reversely operated, substantially as and for the purposes specified.

3. In a meter, the combination, with an outer case, of a bellows arranged therein and which divides the meter into an inner or bellows chamber and an outer or case chamber, inlet and outlet pipes which pass through the outer case and into the bellows, said pipes provided with ports which connect with the outer or case chamber, puppet-valves which control the pipes, and sleeve-valves which control the ports in said pipes, said several valves connected with each other and with the bellows, substantially as and for the purposes specified.

4. In a meter, the combination of a bellows, a gas-inlet pipe to admit gas to said bellows, a pipe to allow gas to escape from said bellows, a valve for each of said pipes, a connection between said valves, whereby one closes when the other opens, and trip mechanism operated by the bellows to actuate said valves to alternately admit gas to the bellows and allow it to escape therefrom, said trip mechanism and valves being located wholly within the bellows.

5. The combination of a bellows, pipes to admit gas to and from

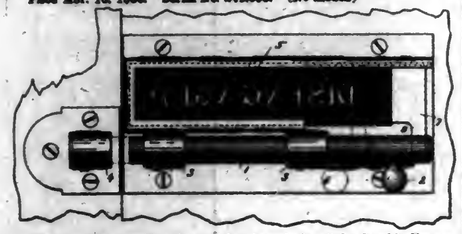
the bellows, a registering device operated by the bellows, valves for gas inlet and outlet, a pivoted valve-lever connecting said valves, so as to open one simultaneously with the closing of the other, and vice versa, a pivoted arm to press on the lever upon either side of its fulcrum, a spring acting upon said pivoted arm to hold it against the lever, a trip-lever adapted to shift said arm, and a flexible connection between the trip-lever and the bellows, whereby the movements of the bellows alternately operate the valves.

6. The combination of a bellows, pipes to admit gas to and from the bellows, a registering device operated by the bellows, valves for gas inlet and outlet, a pivoted valve-lever connecting said valves, so as to open one simultaneously with the closing of the other, and vice versa, a pivoted arm to press the lever upon either side of its fulcrum, a spring acting upon said pivoted arm to hold it against the lever, a trip-lever adapted to shift said arm, a flexible connection between the trip-lever and the bellows, whereby the movements of the bellows alternately operate the valves, and an adjustable striker to control the time of action of said trip-lever carried by the bellows.

7. The combination of a bellows, pipes to admit gas to and from the bellows, a registering device operated by the bellows, valves for gas inlet and outlet, a pivoted valve-lever connecting said valves, so as to open one simultaneously with the closing of the other, and vice versa, a pivoted arm to press on the lever upon either side of its fulcrum, a spring acting on the valve-lever to hold it in one of its extreme tilted positions, and a trip device actuated by the bellows for operating said valve-lever.

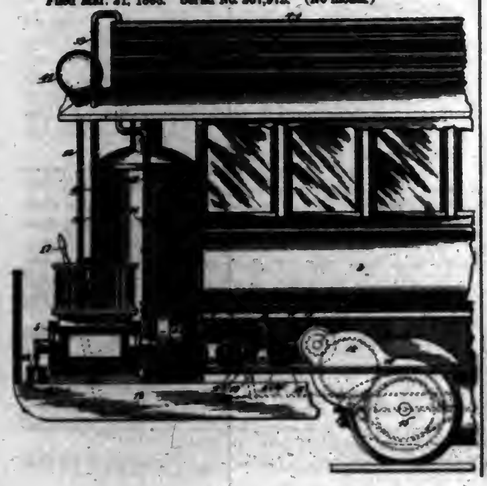
8. In a meter, the combination of the chamber A, having the interior bellows, E, inlet-pipe F, having ports *h*, outlet-pipe F', having ports *h'*, valves G and *g* for the inlet-pipe, connected together, valves G' *g'* for the outlet-pipe, connected together, a connecting valve-lever, K, for operating said valves, a trip mechanism, substantially as shown, for rocking said valve-lever, a chain-connection, R, carried by the bellows for actuating the trip mechanism, and a registering mechanism operated by movements of the bellows.

398,722. INDICATOR-BOLT. SAMUEL HARRIS, New York, N. Y. Filed Apr. 18, 1888. Serial No. 271,053. (No model.)



Claim.—The combination, with a door-bolt, of the fixed indicator-plate 5, bearing the word "Disengaged" or equivalent word, and a slide, 7, connected to the bolt and operated thereby, so as to cover the first syllable of the word when the bolt is advanced and uncover it when the bolt is retracted, thus giving positive and opposite indications with the respective positions of the bolt, as explained.

398,723. CAR-MOTOR. THADDEUS W. HERRMANN, Chicago, Ill. Filed Mar. 31, 1888. Serial No. 267,972. (No model.)



Claim.—1. The combination, in a car-motor, of a continuously-running engine, a shaft in axial line with the engine-shaft, a clutch connecting said shaft with the engine-shaft, driving mechanism connecting the first-named shaft to the car-axles, a brake, and a single lever connected to and operating said clutch and brake.

2. The combination of the continuously-running engine 5, the clutch 8, the shaft 42, and gearing connecting the same to the car-axle, the cross-shaft 44, having the clutch-fork 43 and arm 19 thereon, the brake-operating rod 20, the driver's lever 17, and connecting-rod 18.

3. The combination of the casings 16 and 12, pivotally connected to each other and inclosing the train of gearing and the slide 11, as and for the purpose set forth.

4. The combination, in a car-motor, of an engine upon the platform outside the car, a shaft at one side of the car extending longitudinally beneath the seats and driven through a clutch-connection by said engine, gearing connecting said shaft to the car-axles, a brake, and a single lever connected to and operating both the brake and the clutch, substantially as described.

398,724. NAIL-BOX. GAY HENDRICKS, Beardstown, Tex. Filed Nov. 15, 1888. Serial No. 290,896. (No model.)



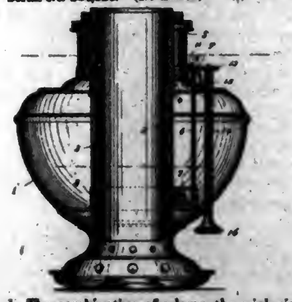
Claim.—1. The combination, with the counter and the support for the nail-box, composed of a fixed and a pivoted guide-rail, of the bin mounted on the said support and limited in its forward movement by engaging with a portion of the said pivoted guide-rail, substantially as described.

2. The combination, with the counter and the nail-box support composed of a fixed and a pivoted guide-rail, of the bin mounted on the said support and having its bottom inclined downwardly from each end and meeting on a line near its rear end, substantially as and for the purpose described.

3. The combination, with the counter and the nail-box support composed of a fixed guide-rail having a downwardly-beveled end, *f*, and a pivoted guide having an upwardly-projecting end, *f'*, of the bin adapted to rest on the fixed guide and on the end *f'* of the pivoted guide, said end *f'* forming a stop to limit the forward movement of the bin when the latter is tilted, substantially as described.

4. The combination, with the counter having the leg-sections A, the back D, and the cross-bar G, and the supports for the nail-box, composed of the fixed sections F^3, having the inclined ends *f*, and the pivoted sections having the inclined ends *f'*, which constitute guide-rails, of the bin having its bottom inclined downwardly from each end, substantially, as shown, and having side rollers, for the purpose described.

398,725. WICK-RAISER FOR LAMPS. LEONARD HENKLE, Rochester, assignor to Charles Stanford Upton, New York, N. Y. Filed Sept. 1, 1888. Serial No. 284,238. (No model.)

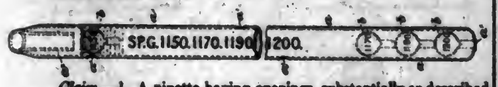


Claim.—1. The combination of a lamp, the wick-ring and draw bar, having screw-threaded connection, a shaft having bearing in the fount and geared to the upper end of the draw-bar by means of spur-wheels 13 14, and a shell or chimney-support having a lip or projection for holding the draw-bar in its bearing, substantially as set forth.

2. The combination of the fount having slot at top opening into the aperture 10 of the fount, the wick-raising draw-bar occupying said slot, and the shell or chimney-support having a lip or projection bearing against and holding the draw-bar laterally in its bearing, substantially as set forth.

3. The combination of the fount, draw-bar screwing into the wick-raiser, having bearing in the fount and provided with a collar for turning it, the shell or chimney-support, and a lip or projection on said shell or support bearing laterally against the draw-bar and downward on its collar, whereby it is held rigidly in place when turned for raising or lowering the wick, substantially as explained.

398,726. SPECIFIC-GRAVITY APPARATUS. JAMES J. HICKS, Hatton Gardens, County of Middlesex, England. Filed June 13, 1888. Serial No. 276,910. (No model.)



Claim.—1. A pipette having openings, substantially as described and shown, provided with bubbles of different specific gravity confined therein in such a manner as to permit them to rise in the order of their gravity, the lightest first.

2. The combination of bubbles of different specific gravity with a pipette chamber or container inclosing the same and provided with openings to permit of the free passage of the liquid to be tested into and out of said pipette chamber or container and with a hook, by which the said instrument can be suspended in the liquid to be tested, substantially as herein shown and described.

3. A pipette having openings, substantially as described and shown, provided with bubbles of different specific gravity and of various colors or patterns confined therein in such a manner as to permit them to rise in the order of their gravity, the lightest first.

4. A pipette chamber or container having openings, substantially as herein described and shown, provided with bubbles, one above another, with the heaviest bubble at the bottom, and gradually decreasing in specific gravity toward the top.

398,727. FOLDING OR KNOCKDOWN CRATE. ALONZO D. HOPPER, Bergen Point, N. J. Filed Aug. 2, 1888. Serial No. 281,735. (No model.)

Claim.—1. A folding crate comprising separate upper and lower frames held together by pivoted braces engaging slots in the frames, side and end pieces having indentations, and pins on the inner side of the top and bottom frames to engage the indentations in the side and end pieces, substantially as described.

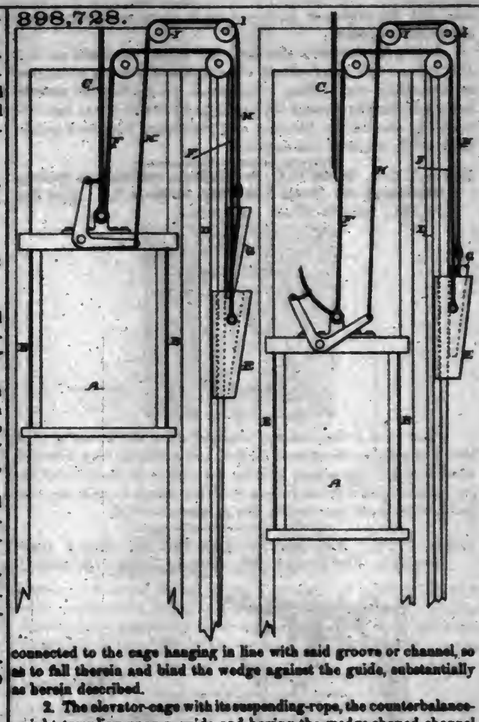
2. A folding crate comprising top and bottom frames, A and B, pivoted braces E, engaging slots in the top and bottom frames, folding side and end pieces, and spring-catch *o* on one frame and pin *o'* on the other frame, whereby when the crate is folded the frames will be kept together, substantially as described.

3. A folding crate or box comprising separate upper and lower frames having slots in their opposite ends, cross-braces centrally pivoted to each other and engaging at their ends the slots in the frames and serving, when in their extended or vertical position, to maintain the frames apart, corner-braces *m* on one frame, and folding side and end pieces provided with indentations adapted to engage with projections on the upper and lower frames, as set forth.

398,728. SAFETY ATTACHMENT FOR ELEVATORS. HENRY O. HOOPER, San Francisco, assignor of one-half to John Brannan, Eureka, Cal. Filed Nov. 1, 1883. Serial No. 289,722. (No model.)

Claim.—1. The combination, with an elevator-cage and its suspending-rope, of a counterbalance-weight connected with the cage and traveling upon a guide, and having a wedge-shaped groove or channel adjacent to the guide, and the independent suspended wedge

398,728.



connected to the cage hanging in line with said groove or channel, so as to fall therein and bind the wedge against the guide, substantially as herein described.

2. The elevator-cage with its suspending-rope, the counterbalance-weight traveling upon a guide and having the wedge-shaped channel adjacent to the face of said guide, in combination with a wedge, the rope by which the wedge is suspended above the wedge-shaped channel, and a lever one end of which is connected with the wedge-suspending rope and the other with the cage-rope, substantially as and for the purpose herein described.

3. The counterbalance-weight traveling upon a guide and having the wedge-shaped groove or channel adjacent to the guide, the wedge adapted to fit said groove and bind between the guide and the weight, the rope passing over pulleys at the top of the elevator-frame and connecting the channeled weight with the elevator-cage, and the second rope connecting the wedge-shaped weight with one arm of a lever, the opposite end of which is connected with the suspending-rope of the elevator-cage, so as to hold the wedge suspended above the groove or channel in the traveling weight and to allow the wedge to fall into the said groove or channel upon the breakage of the cage-suspending rope, substantially as herein described.

4. The elevator suspended and traveling between guides, and the counterbalance-weight connected with the elevator and traveling upon a guide, and having the wedge-shaped groove or channel formed between it and the guide, in combination with the two-part wedge having an elastic filling between the two parts, said wedge being suspended above the groove or channel in the weight, so as to be allowed to fall therein, substantially as herein described.

398,729. FUEL-BURNER. HUBERT H. HULL, Jersey City, N. J. Filed Apr. 21, 1888. Serial No. 271,440. (No model.)



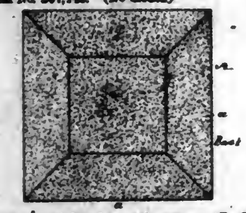
Claim.—1. In a fuel-burner, a wire-cloth case formed of a blank which is bent to a cylindrical or analogous shape, united on the longitudinal edges, and overlapped at the ends, the overlapped portions being fastened together, substantially as shown and described.

2. In a fuel-burner, the wire-cloth case formed of a blank the longitudinal edges of which are united by bending the transverse strands of one edge around a longitudinal strand of the other edge, and the ends of which are split longitudinally and overlapped inwardly to the

case, with the overlapped portions fastened together, substantially as shown and described.

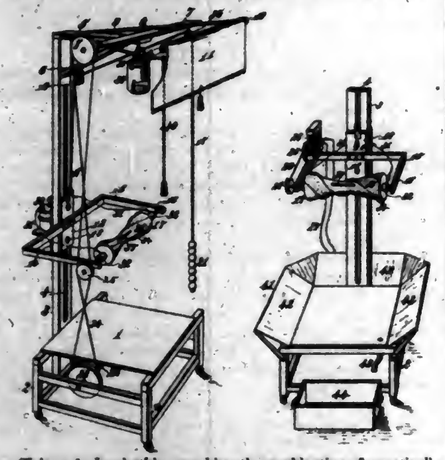
3. In a fuel-burner, a wire-cloth case formed of a blank the ends of which are split longitudinally and overlapped inwardly to the case, in combination with a filling of absorbent non-combustible material and staples passing through the overlapped portions of the case into the filling material for fastening said overlapped portions together, substantially as shown and described.

398,730. GLASS TILE. HOWARD ISHARD and FRANCIS A. STAPSER, Glassborough, and THOMAS C. DUFFIELD, Woodbury, N. J. Filed Mar. 14, 1888. Serial No. 267,148. (No model.)



Claim.—As a new article of manufacture, a tile formed of glass having a plain or ornamental surface and a ground back and side, whereby a dull appearance is given the surface of the tile, and the ground back and sides serve as a fastening means for said tile, substantially in the manner and for the purpose described.

398,731. ELECTRICAL BATHING-MACHINE. JACK W. JAMES, Cuba, Tenn. Filed June 14, 1888. Serial No. 277,091. (No model.)



Claim.—1. In a bathing-machine, the combination of a vertically-adjustable rotary brush provided with electrodes, an electric battery vertically adjustable with said brush and connected with the brush-electrodes by suitable conductors, and means for rotating said brush, substantially as described.

2. In a bathing-machine, the combination of a rotary brush, yielding electrodes carried by said brush, an electric battery, and conductors connecting said battery with the yielding electrodes on the brush, substantially as described.

3. In a bathing-machine, the combination of an upright having a vertical guideway, a counterbalanced frame supported in said guideway, and a rotary brush journaled in said frame, substantially as described.

4. In a bathing-machine, the combination of a vertically-adjustable frame, a rotary brush journaled in said frame and provided with electrodes, an electric battery supported by said frame, and conductors connecting said battery and electrodes, substantially as described.

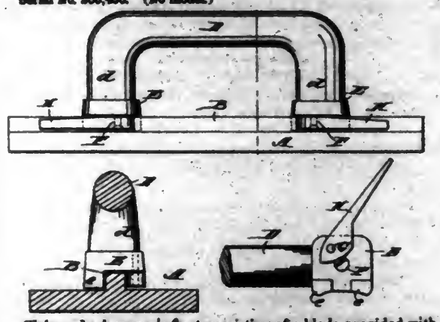
5. In a bathing-machine, the combination of a platform having folding sides, a perforated water-can or shower device suspended above said platform, a vertically-adjustable rotary brush provided with electrodes, an electric battery, and conductors between said battery and electrodes, substantially as described.

6. In a bathing-machine, a rotary brush provided with diagonal rows of bristles alternating with sponge or fiber, substantially as described.

7. In a bathing-machine, a rotary brush having a slot for the insertion of a towel, substantially as described.

8. In a bathing-machine, the combination, with a rotary brush, of a detachable rubber pad, 45, having teeth 46, substantially as described.

398,732. MASON'S FLOAT. GEORGE KAUTZ, Albany, N. Y., assignor to himself and Lewis A. Kautz, same place. Filed Aug. 22, 1888. Serial No. 283,460. (No model.)



Claim.—1. A mason's float consisting of a blade provided with a ridge, in combination with a handle and a pivoted clamp for binding the handle and ridge aforesaid, substantially as shown and described.

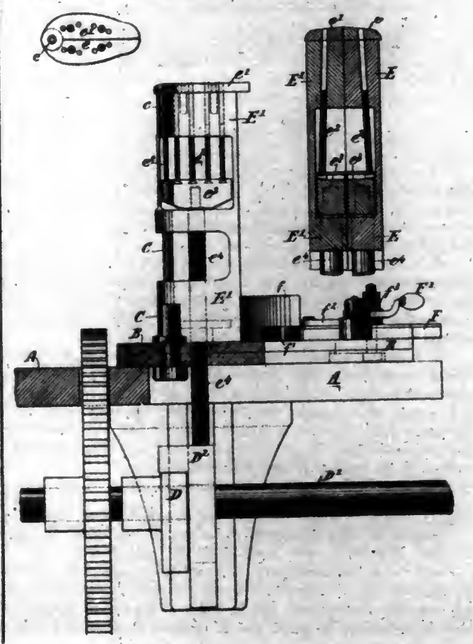
2. A mason's float consisting of a blade provided with a ridge, in combination with a handle, the respective ends of the handle being provided with a cam and lugs, *e e*, forming a recess for the reception of the ridge aforesaid, substantially as shown and described.

3. A mason's float consisting of a blade provided with a ridge, in combination with a handle, the respective ends of the handle being provided with a cam-lever and lugs, substantially as shown and described.

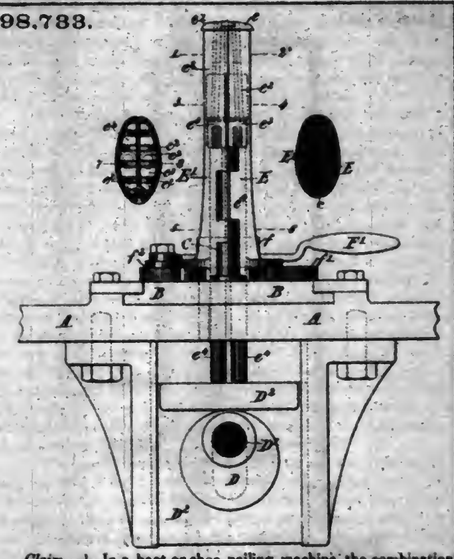
4. A handle for a mason's float, consisting of the bridge-body D *d d*, the caps E E, fixed to the ends *d d* aforesaid, each cap E being provided with one or more lugs, *e*, and a cam-lever, H, substantially as shown and described.

5. A mason's float consisting of the bridge-body D *d d*, the caps E E, fixed to the respective ends *d d* aforesaid, each cap E being provided with one or more lugs, *e*, and a cam-lever, H, in combination with a blade having a ridge, substantially as shown and described.

398,733. MACHINE FOR HEELING BOOTS OR SHOES. JOHN KRATZ, Bagnal, near Stoke-upon-Trent, County of Stafford, England. Filed Sept. 17, 1888. Serial No. 285,571. (No model.) Patented in England Dec. 11, 1883, No. 5,707; in France Jan. 12, 1884, No. 158,686; in Germany Jan. 22, 1884, No. 28,731; in Belgium Mar. 11, 1884, No. 64,474; in Italy Apr. 30, 1884, XXXIII, 190; in Spain June 20, 1884, No. 4,043, and in Austria-Hungary Oct. 27, 1884, No. 27,014.



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Claim.—1. In a boot or shoe nailing machine, the combination of a laterally-expanding post for supporting and centering the work, with receptacles at top for receiving the nails, and a set of drivers for supporting the nails in their receptacles, and means for thrusting up the nail-drivers to press the nails into the work, as and for the purpose above set forth.

2. In a boot or shoe nailing machine, the combination, with a laterally-expanding post, of a presser-plate, rods, as *e*, drivers for thrusting the nails into work carried by the post, and an eccentric for raising the drivers operating upon the presser-plate and said rods substantially as specified.

3. In a boot or shoe nailing machine, the combination, with an expanding post formed with nail-receptacles inclining inward, of nail-drivers loosely attached to cross-heads carried by rods that are actuated by a vertically-sliding support, as and for the purpose above described.

398,734. MANUFACTURE OF SOFT HATS. JOHN R. KNAGGS, Bethnal Green, County of Middlesex, assignor to William Henry Greenwood, London, England. Filed Dec. 19, 1888. Serial No. 294,104. (No specimens.) Patented in England Sept. 17, 1888, No. 13,620.

Claim.—1. In the manufacture of soft felt or similar hats, the process herein described of proofing the hat-body, which consists in applying thereto a compound or mixture composed of a solution of shellac, gum-mastic, collodion, rubber, bisulphide of carbon, oil, and turpentine, and subsequently blocking and applying plush or similar fabric to the proofed body, substantially as set forth.

2. The process herein described of manufacturing soft felt or similar hats, which consists in preparing and proofing the hat-body, then blocking the same, then applying thereto a lather mixture composed of a solution of shellac, ammonia, mastic, thus, turpentine, rubber, bisulphide of carbon, and collodion, and finally applying a covering of plush or other fabric, substantially as set forth.

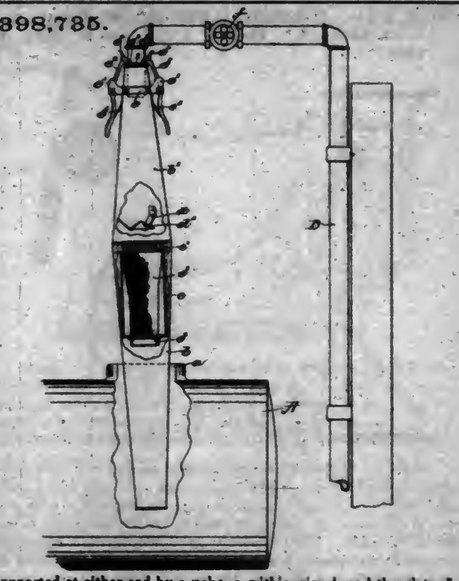
3. The process herein described of manufacturing soft felt or similar hats, which consists in preparing the hat-body and proofing it by applying thereto a compound or mixture composed of a solution of shellac, gum-mastic, collodion, rubber, bisulphide of carbon, oil, and turpentine, then blocking the body and applying thereto another mixture composed of a lather solution of shellac, ammonia, mastic, thus, turpentine, rubber, bisulphide of carbon, and collodion, and finally covering the same with plush or other fabric, substantially as set forth.

398,735. CONDUCTOR FOR STAND-PIPES. JOHN B. KENNEDY, Lynn, Mass. Filed Aug. 16, 1888. Serial No. 282,893. (No model.)

Claim.—1. The conductor or conveyer herein described, consisting of the tapering pipes *b b'*, joined at their larger ends by the collar *d'*, the tubular strainer *c*, distributer-plate *d'*, independent of and above said strainer, the yoke *c*, within one of the said pipes and attached to said collar to support said strainer at its ends, and the collar *c*, attached to the lower end of said yoke and containing a foraminous plate to form the bottom of the strainer, as and for the purpose set forth.

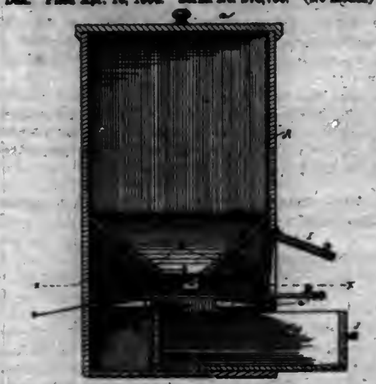
2. The conductor or conveyer herein described, consisting of the tapering pipes *b b'*, joined at their larger ends, the tubular strainer *c*,

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supported at either end by a yoke, *c*, within pipe *b*, and the plate *d'*, above said strainer, combined with the engaging device comprising the ears *d'*, rigidly attached to the end of said pipe, spring-controlled levers *c*, pivoted thereto, and the projections *c*, by which to partly inclose and engage the discharge end or nozzle of a stand-pipe, as and for the purpose set forth.

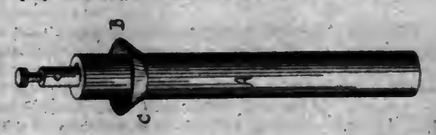
398,736. FLOUR-CHEST. GEORGE KIRCHGRABER, St. Lawrence, Dak. Filed Apr. 16, 1888. Serial No. 270,709. (No model.)



Claim.—1. A flour-chest sieve consisting of the side pieces, C C, covered at the ends by woven wire, and the cross-pieces F F, supporting a bottom of woven wire, pockets *c c'* being thus formed to extend above and below the sieve-bottom.

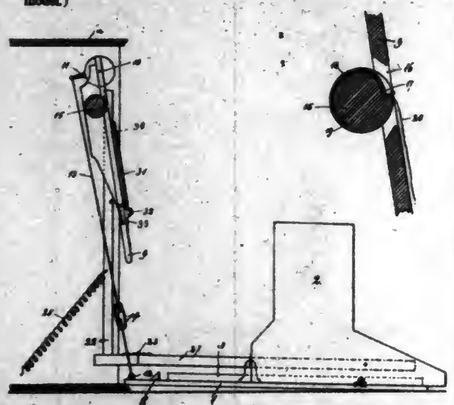
2. The combination of a flour-chest having side cleats, G G, and a sieve having cross-pieces F F, extended to rest on them, the cleats and cross-pieces on each side being separated by an intervening space, as shown, whereby the sieve may be put in or taken out, as described.

398,737. MERCURY-HOLDER FOR BATTERY-RINGS. WILLIAM P. KOOMBEY, Brooklyn, N. Y., assignor to the Koomgey Electric Company. Filed Aug. 13, 1888. Serial No. 282,626. (No model.)



Claim.—The combination of the zinc element of a galvanic battery and a cup partly or wholly of elastic material to hold a small quantity of mercury and attached to the zinc at or below the surface of the battery-liquid, substantially as described.

398,738. TYPE-WRITER CABINET AND COPY-HOLDER. CHAS. A. LEE, Herkimer, N. Y. Filed Sept. 10, 1887. Serial No. 249,305. (No model.)

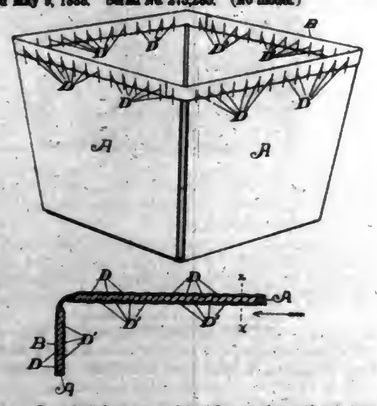


Claim.—1. A type-writer case having a swinging door and a type-writer mounted thereon, in combination with a swinging board journaled in the case having a bar mounted on the free ends of arms pivoted to the board and springs for holding the bar adjustably to the face of the board, a roller pivoted to the board having a clamping-bar held to the roller by a spring and adapted to receive the end of a copy-paper between the roller and bar, the crank-arm attached to the board, and a rod connecting the crank-arm and the door, substantially as set forth.

2. A type-writer case having a swinging door and a type-writer adjustably mounted thereon, in combination with a swinging board journaled in the top of the case having a bar mounted on the free ends of arms pivoted to the board and springs for holding the bar adjustably to the face of the board, a roller pivoted in the board having a clamping-bar held to the roller by springs for clamping the copy-paper and rolling it upon the roller, a ratchet-wheel on the roller, a movable rack engaging the ratchet-wheel, and a rule-jointed lever pivoted to the swinging door for operating the rack, substantially as set forth.

3. A type-writer case having a swinging door and a type-writer adjustably mounted thereon, in combination with a paper-holding device consisting of a swinging board journaled in the case, a device for holding the paper to the board, the crank-arm, and the connecting-rod connecting the crank-arm and the swinging door.

398,739. FRUIT-BOX. JOHN G. LETTELIER, Los Angeles, Cal. Filed May 9, 1888. Serial No. 273,285. (No model.)

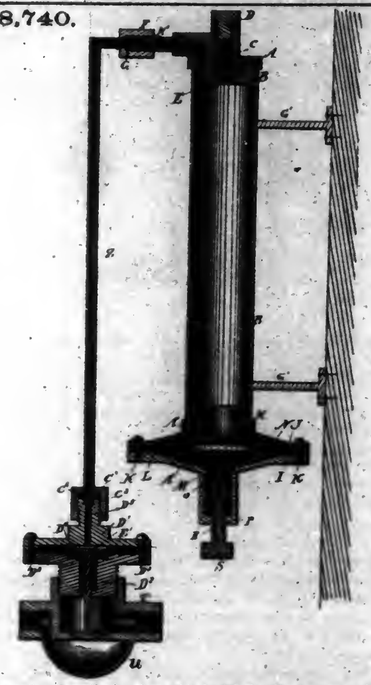


Claim.—In a fruit-box comprising the wooden strips A A and the trough B, fitted upon the ends of the strips, the creases D in the strips of wood, and the edges of the trough arranged alternately upon opposite sides thereof and extending from the edges of the trough toward, but not to, the end of the wooden strips within the trough and forming oppositely-alternating arches the bases and crowns of which fit upon and sustain each other.

398,740. THERMOSTAT. WILLIAM R. LEWIS, Corry, Pa. Filed Feb. 23, 1888. Serial No. 265,025. (No model.)

Claim.—1. In a thermostat, the combination, with a reservoir

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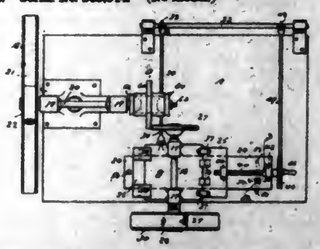


constructed as described and provided with the diaphragm at its lower end, of the threaded nut beneath the diaphragm and the right-and-left-threaded regulating-screw tapped in the bottom of the said reservoir and engaging the said nut, substantially as specified.

2. The combination, with a reservoir constructed as described, of the cap in the upper end of the said reservoir having a filling-aperture and the lateral branch provided with an outlet-aperture, the pipe Z, connected to the said branch, and the valve-regulating device secured to the lower end of the said pipe, substantially as specified.

3. In a thermostat, the combination, with the reservoir having the diaphragm at its lower end, threaded nut below the diaphragm, and the right-and-left-threaded regulating-screw, of the cap having the inlet and outlet aperture, the valve-regulating device, and the pipe Z, connecting the said valve-regulating device with the outlet-aperture of the reservoir, substantially as specified.

398,741. MACHINE FOR GRINDING ROTARY DISK CUTTERS. JOHN L. MORRISON and AMOS D. ROWE, Holyoke, Mass. Filed Sept. 18, 1888. Serial No. 285,314. (No model.)



Claim.—1. In a machine for grinding rotary cutter-disks, substantially as described, the combination, with a rotary holder-shaft on which to center the disk, of a carriage having mounted thereon a rotary grinding-wheel adjusted for a bearing by its edge against the face of said cutter-disk, and said carriage and grinding-wheel having a reciprocating traverse oblique to the plane of the disk-face, substantially as described.

2. In a machine for grinding rotary cutter-disks, substantially as described, the combination, with a rotary holder-shaft on which to center the disk, of a carriage having mounted thereon a rotary grinding-wheel adjusted for a bearing by its edge against the face of said cutter-disk, and said carriage and grinding-wheel having a reciprocating traverse oblique to the plane of the disk-face, and also mounted for a slide in the direction of the axis of said holder-shaft, substantially as described.

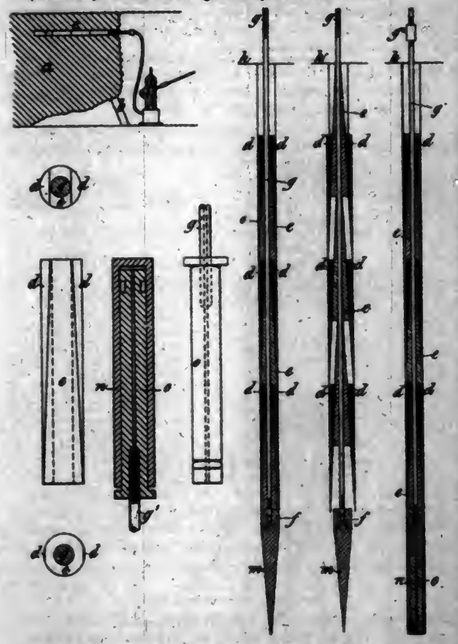
3. The combination, with the rotary holder-shaft on which to center a cutter-disk, of a longitudinally-sliding carriage, 25, having thereon the traverse grinding-carriage *g*, linked at one end to the said carriage 25, and carrying the rotary grinding-wheel, a tilting lever, 33, and a connecting-rod between said lever and said grinding-carriage, substantially as and for the purpose described.

4. The combination, with the rotary holder-shaft on which to center a cutter-disk, of a longitudinal slideway, 24, a carriage, 25, adapted to slide on said way, the grinding-carriage mounted for a transverse slide on said carriage 25, and by one end linked thereto, a tilting lever, 33, and a connecting-rod between said lever and said grinding-carriage, and a screw-shaft having a screw engagement with said carriage 25, and a fixed bearing for free rotation on the slideway 24, and provided with a crank-handle, substantially as described.

5. The combination, with the rotary holder-shaft on which to center a cutter-disk, of a longitudinal slideway, 24, a carriage, 25, adapted to slide on said way, a screw-shaft, 40, having a screw engagement with said carriage 25, and a fixed bearing for free rotation on the slideway 24, and provided with a ratchet-wheel, the grinding-carriage mounted for a transverse slide on the carriage 25, and by one end linked thereto, a rocker-shaft, 32, having thereon the swinging levers 33 and 48, the connecting-rod 34 between the lever 33 and the grinding-carriage, and the pallet-rod 47, connected by one end to the said lever 48 and engaging by its other end the said ratchet-wheel, substantially as and for the purpose described.

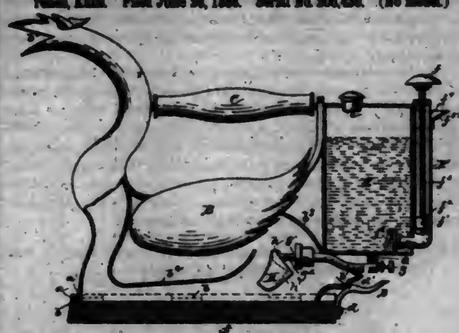
6. The combination, with the carriage 25 and the grinding-carriage constrained for a curvilinear traverse thereon, substantially as described, of the eccentric 36 and rocker-shaft 32, the lever 33, intermediately fixed on said rocker-shaft, the connecting-rod 34, connected to the said grinding-carriage and to the upper end of said lever 33, and the connecting-rod 35, by one end engaging said eccentric and by its other connected to the lower end of said lever 33, all substantially as and for the purpose described.

398,742. APPLIANCE FOR BREAKING LOOSE OR SPLITTING ALL KINDS OF MINERALS. ENOCH MOULD, White Barn, near Newcastle, County of Stafford, England. Filed Feb. 16, 1888. Serial No. 264,309. (No model.) Patented in England July 13, 1886, No. 9,123.



Claim.—In mechanism for breaking and splitting coal, the combination, with the screw-threaded rod *g*, of the inner series of separate centrally-bored and internally-threaded wedges, *e*, superimposed one upon another around said rod and having their points turned outward all in the same direction, and the outer series of expanding wedges, *d*, surrounding the wedges *e* and having their points turned inward in a direction opposite to that of the inner wedges, *e*, whereby all the outer wedges, *d*, are simultaneously expanded at distinct points by the outward longitudinal movement of said inner wedges, substantially as described.

398,748. SELF-HEATING SAD-IRON. WILLIAM H. MULL, Lawrence, Kans. Filed June 26, 1888. Serial No. 278,420. (No model.)



Claim.—In the herein-described sad-iron, the oil-reservoir E, provided with the safety-plug *e* and air-pump F, connected therewith, and provided with the drip-cup f^3, air-inlet f^4, and outlet-valve f^5, hinged to its lower extremity, in combination with oil-pipe G, having valve *g*, the burner *g'*, secured to the inner end of the pipe G and provided with perforations g^2, the wedge-shaped spreading device H, secured to the end of the burner, the shield b^3, secured within the iron and located in close proximity to said spreading device, the base-plate A, and the hollow body portion B, provided with inlet and outlet ports b^3 and b^4, all arranged and adapted to operate substantially as described.

398,744. MAGNETIC REGULATOR. SAMUEL R. NUTTING, Chicago, Ill., assignor to the Nutting Electric Manufacturing Company, same place. Filed Dec. 3, 1887. Serial No. 256,926. (No model.)



Claim.—1. In a dynamo-electric machine or motor, an automatic governor moving toward the pole-pieces by the attraction of their magnetism against a resistance which increases more rapidly than said attraction, and diminishing the action of the pole-pieces on the armature as it approaches them, the planes of the governor and the pole-pieces being parallel, and the distance between them being variable, according to the varying attraction of the magnetism, substantially as described.

2. In a dynamo-electric machine or motor, an automatic governor moving toward the pole-pieces by the attraction of their magnetism against a resistance which increases more rapidly than said attraction, and also against the resistance of a retractor, which as the magnetism of the pole-pieces diminishes withdraws the governor, the planes of the governor and the pole-pieces being parallel, and the distance between them being variable, according to the varying attraction of the magnetism, substantially as described.

3. In a dynamo-electric machine or motor, the combination of an automatic governor, a bearing on which it is mounted, and links connecting the governor to fixed points, whereby the governor approaches toward and recedes from the pole-pieces in a spiral rotation, substantially as described.

4. In a dynamo-electric machine or motor, the combination of an automatic governor, a bearing on which it is mounted, a retractor, and links connecting the governor to fixed points, said links tending to a position parallel to the bearing of the governor as it reaches the point of its nearest approach to the pole-pieces, whereby the governor approaches the pole-pieces in a spiral rotation of increasing resistance, substantially as described.

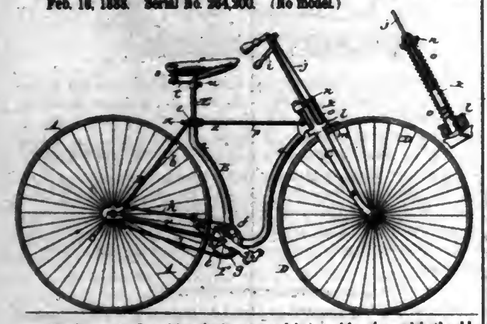
5. In a dynamo-electric machine or motor, the combination of an automatic governor, moving in spiral rotation toward the pole-pieces by the attraction of their magnetism, and brushes to effect the connection in the circuit, said brushes being connected with the governor and rotatable therewith, substantially as described.

6. In a dynamo-electric machine or motor, the combination of an automatic governor, moving in spiral rotation toward the pole-pieces by the attraction of their magnetism, and brushes to effect the connection in the circuit, said brushes being connected with the governor and rotatable therewith in a direction that will move their ends

away from a line central between the pole-pieces as the governor approaches them, and toward a line central between the pole-pieces as the governor recedes from them, whereby the brushes co-operate with the governor in regulating the strength of the current in the circuit, substantially as described.

7. In a dynamo-electric machine or motor, the combination of an automatic governor moving toward the pole-pieces by the attraction of their magnetism against a resistance which increases more rapidly than such attraction, a spring-retractor, and an arm connecting the governor with the spring-retractor, whereby as the magnetism diminishes the retractor withdraws the governor from the pole-pieces, the planes of the governor and the pole-pieces being parallel, and the distance between them being variable, according to the varying attraction of the magnetism, substantially as described.

398,745. BICYCLE. HERBERT S. OWEN, Washington, D. C. Filed Feb. 16, 1888. Serial No. 264,200. (No model.)



Claim.—1. In a bicycle-frame, and in combination with the U-shaped bar *a*, the two carrying-arms for the rear wheel, each arm consisting of a continuous rod bent to an angular form, its two extremities rigidly attached to the bar *a* and its central or angular portion adapted to receive the axle of the wheel.

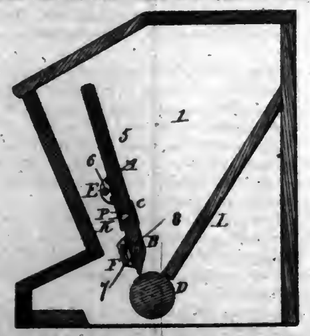
2. In a bicycle-frame, the wheel-carrying arms *b b'*, formed in a single piece and bent to form the axle-receiving slot *c*.

3. In combination with the brake-shoe, its tubular standard, the operating-rod *j*, and nut *n*.

4. In a brake for bicycles and the like, the brake-shoe having the tubular standard, in combination with the operating-rod adjustably secured thereto.

5. In a bicycle or tricycle, the seat consisting of the standard E, bent laterally at its upper end, the arm *t*, springs *s*, and flexible seat *r*.

398,746. FEED-REGULATOR. CARLISLE D. PATTERSON, Girard, Kans. Filed June 16, 1888. Serial No. 277,396. (No model.)

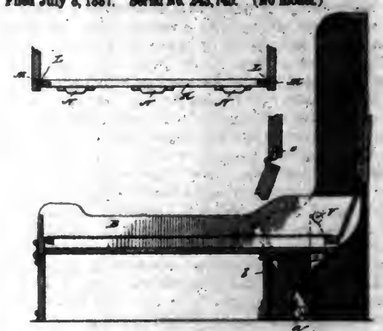


Claim.—1. In a feed-regulator, the combination of the hopper, the feed-roller arranged transversely therein, and the valve arranged above the roller and consisting of an upper section pivoted to and extending between the sides of the hopper and a lower section hinged to the upper section and also pivoted to and extending between the sides of the hopper, as set forth.

2. In a feed-regulator, the combination of the hopper and the valve arranged therein and consisting of an upper section pivoted to the sides of the hopper, the lower section hinged to the upper section and also pivoted to the sides of the hopper, and the guard secured to the upper section and projecting over the space between the adjacent edges of the two sections, as set forth.

3. The combination of the hopper, the valve pivoted in the hopper and composed of the upper valve-section having the brackets E on its front side, the said brackets being pivotally secured to the hopper, the lower valve-section hinged to the upper section, the brackets F on the front side of the said section and having the slots 7, and the retaining pins or screws passing through said slots into the casing of the hopper, as specified.

398,747. UPRIGHT OR FOLDING BED. DAVID J. POWERS, Chicago, Ill., assignor to the Union Wire Mattress Company, of Illinois. Filed July 8, 1887. Serial No. 243,745. (No model.)

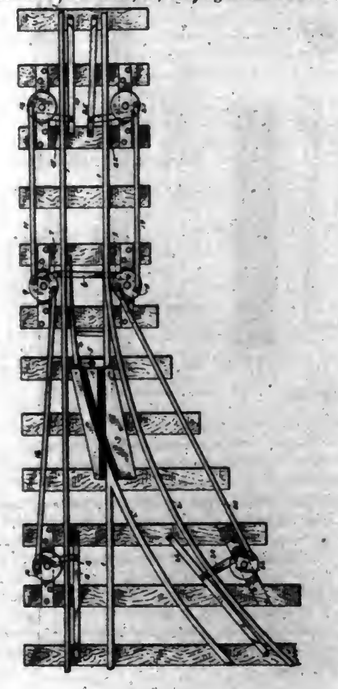


Claim.—1. In a folding bed, curved cams or plates vertically placed and facing to the rear on the stationary section of the bed, rollers attached to the sides of and near the inner end of the movable section adapted to engage with and travel against the rear faces of the cams, and arms that are pivoted to the folded section of the bed as a support for the latter, which are movably supported at or near the lower portion of the stationary section, so that when the bed is unfolded said arms incline outwardly and when the bed is folded their position is vertical, or approximately so.

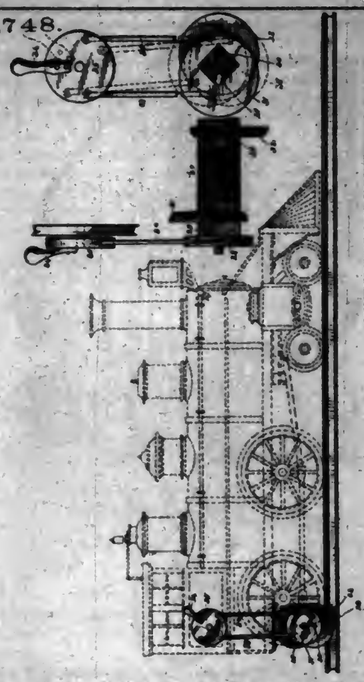
2. In a folding bed, a movable section and a stationary section in which the movable section is supported on pivotal arms near the head thereof, and is provided with rollers or wheels, in combination with cams fixed to the stationary section, said cams having, respectively, an upper and lower seat or ogee curve adapted for partial retention of said wheels in either the raised or lowered position of the movable section, substantially as set forth.

398,748. AUTOMATIC RAILWAY-SWITCH. JOSHUA RENNER, Hagerstown, Md., assignor of one-half to Thomas E. Mittag, same place. Filed Jan. 4, 1888. Serial No. 259,775. (No model.)

Claim.—A device for actuating an automatic switch of the kind described, consisting of a shaft, 27, carrying eccentrics 31 32, an end

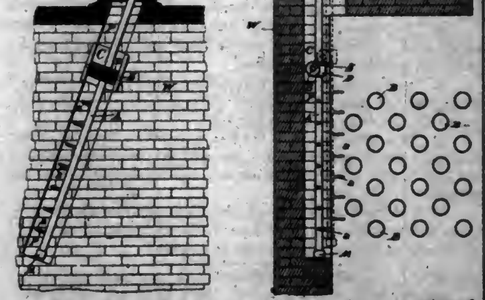


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disk, 28, attached to said shaft, a disk, 35, provided with a hand-lever, and rods connecting the two disks, substantially as described.

398,749. BOILER-TUBE CLEANER. HARVEY D. RICE, Brooklyn, and ERNST VOLKMANN, New York, assignors to The Abendroth & Root Manufacturing Company, of New York, N. Y. Filed Aug. 1, 1888. Serial No. 281,653. (No model.)



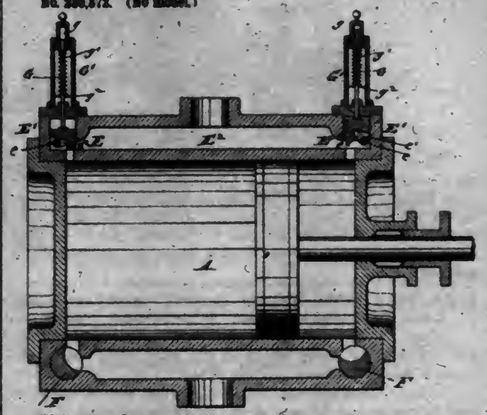
Claim.—The combination of a boiler-tube cleaner constructed, as described above, with a recess or pocket, P, in the side wall of the fire-chamber at right angles with the direction of the boiler-tubes, and a suitable mechanism, substantially as described, for revolving said cleaner and throwing it out of the recess P, as and for the purposes set forth.

398,750. ROLL-PAPER HOLDER AND CUTTER. ABBOTT G. ROSS, Cincinnati, Ohio. Filed July 23, 1888. Serial No. 280,758. (No model.)



Claim.—In a paper-roll holder of the character described, the combination, with the standards and their guides, of the friction-bar bearing directly on the roll of paper, and the tearing-knife supported on said friction-bar, but projecting in a plane above the same, so as to leave a clear space between the two and permit the web of paper to pass over the friction-bar and under the tearing-knife, whereby when the paper is drawn upward against the edge of the knife to sever it the remaining end will drop down by gravity away from the knife, in position to be grasped when the next sheet is desired to be removed, substantially as described.

398,751. VALVE-MOTION FOR CORLISS STEAM-ENGINES. GEORGE ROTHERMUNDER, New York, N. Y. Filed Nov. 3, 1888. Serial No. 289,572. (No model.)

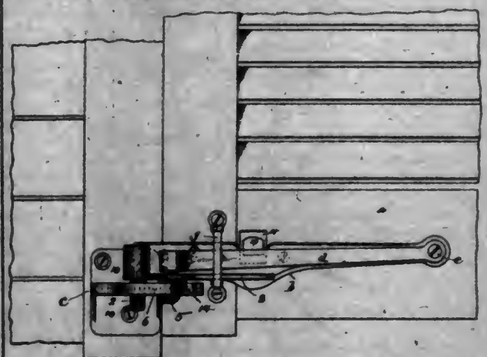


Claim.—1. The combination, with a steam-cylinder and steam-chest, said steam-chest being provided with transverse guide-boxes, of spring-pressed rectilinear reciprocating inlet-valves, oscillating spindles operated by a bell-crank connection with the wrist-plate, and toes in said spindles engaging recesses of the valves, substantially as set forth.

2. The combination, with a steam-cylinder and steam-chest, said steam-chest being provided with transverse guide-boxes, of rectilinear reciprocating inlet-valves, oscillating spindles operated by a bell-crank connection with the wrist-plate, toes on said spindles engaging recesses of said valves, and spring-actuated rods that press on the top of said valves, substantially as set forth.

3. The combination, with a steam-cylinder and steam-chest having transverse guide-boxes, of rectilinear reciprocating inlet-valves guided in said boxes, oscillating spindles operated by a bell-crank connection with the wrist-plate, toes on said spindles engaging recesses of said valves, spring-actuated rods that press on the top of said valves and pass through the top plates of the valve-boxes, and guide-casings for said presser-rods, substantially as set forth.

398,752. LOCK-HINGE. CHARLES J. SEYMOUR, Brookline, Mass. Filed May 14, 1888. Serial No. 273,822. (No model.)



Claim.—In a locking-hinge, the combination of the fixed member composed of the horizontal plate or web having the central pintle-receiving socket, 12, the concentrically-arranged latch-receiving sockets 7 8 9, and the vertical ears or flanges 10 10, the swinging member composed of a shank or arm secured to the outside of a blind and having a pintle, 2, at one end and bent or offset near said pintle, and provided with the rib 3, having an orifice, 4, and the latch *d*, pivoted at one end to one end of the swinging member, and having at its swinging end the downwardly-projecting stud or bolt 5, adapted to pass through the orifice of the rib 3 and enter one of the sockets of

the fixed member, and also provided near its swinging end with the handle 13, adapted to project through the blind, all arranged and operating substantially as set forth.

398,753. GRINDSTONE-FIXTURE. JOHN J. STUFFLE, Belleville, Tex. Filed Mar. 16, 1888. Serial No. 267,365. (No model.)



Claim.—In a fastening for grindstones, the combination of the shaft having the rounded collar and the screw-threaded portion, the stone fitting with its central perforation upon the shaft, the washer having the concave aperture fitting upon the collar, the washer having the set-screws, and the nut upon the threaded part of the shaft clamping the washers upon the stone, as shown, and for the purpose specified.

398,754. TREE-PLANTING MACHINE. THOMAS A. STRATTON, Lincoln, Nebr. Filed June 2, 1888. Serial No. 275,867. (No model.)

Claim.—1. The combination, with the walking-wheel provided with legs extended beyond the rim of said wheel, of the springs acting on said legs, substantially as described.

2. The combination, with the walking-wheel and its clamps, of stationary clamps in the path of the clamps on the wheel, substantially as and for the purpose described.

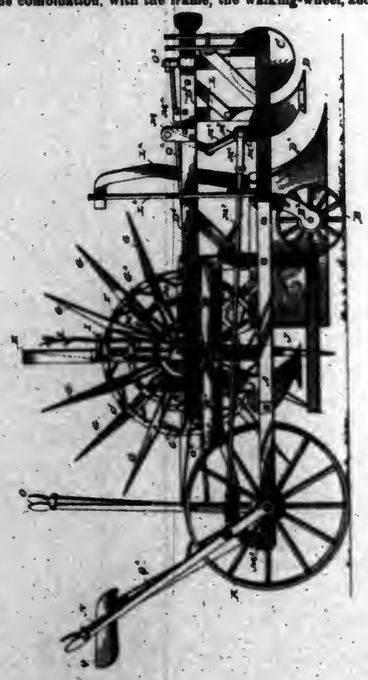
3. The combination, with the walking-wheel and the automatically-operating clamps carried thereby, of the stationary clamps in the path of the clamps on the wheel, substantially as described.

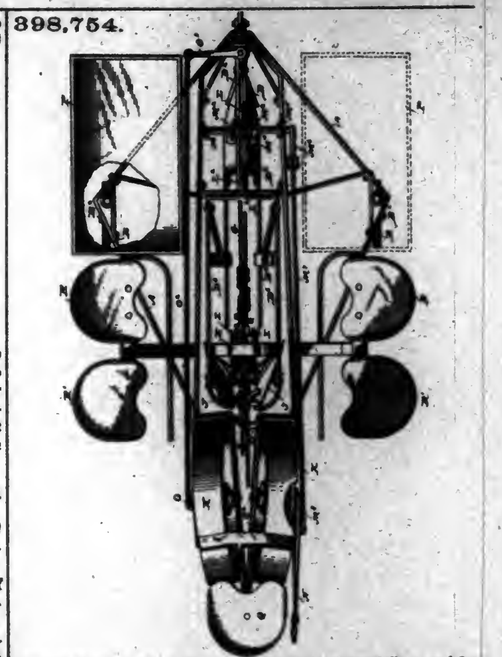
4. The combination, with the walking-wheel and its clamps, of the archway over said wheel, and a clamp on said archway, substantially as described.

5. The combination, with the walking-wheel, of clamps arranged alternately upon opposite sides of said wheel, the archway over said wheel, and the stationary clamps upon opposite sides of said archway, substantially as and for the purpose specified.

6. The combination, with the frame and the walking-wheel, of the plow, the subsoiler to the rear of the plow, and a coverer to the rear thereof, substantially as and for the purpose specified.

7. The combination, with the frame, the walking-wheel, and the





plow, of the subsoiler to the rear of the plow, substantially as and for the purpose specified.

8. The combination, with the frame and the walking-wheel, of the cutter, the plow to the rear of the cutter, and the subsoiler in the rear of the plow, substantially as described.

9. The combination, with the walking-wheel and the frame, of the cutter, the plow, the subsoiler to the rear of the plow, and the coverer to the rear of the subsoiler, substantially as described.

10. The combination, with the frame and the walking-wheel, of the plow and the subsoiler arranged in different horizontal planes, substantially as and for the purpose specified.

11. The combination, with the walking-wheel and the frame, of the rotary cutter, the plow, and the subsoiler, all upon different horizontal planes, substantially as shown and described.

12. The combination, with the frame and walking-wheel, of the cutter, plow, and subsoiler, and provisions for adjusting them simultaneously, substantially as described.

13. The combination, with the stationary frame, of the movable frame and the plow, subsoiler, and walking-wheel carried by said movable frame, substantially as described.

14. The combination, with the stationary frame, of the movable frame, the rotary cutter, the plow, the subsoiler, the walking-wheel, and the coverers, all carried by said movable frame, substantially as described.

15. The combination, with the stationary frame and the movable frame and its accessories, of the lever N, the crank-shaft M, the links M^2 M^3, and the rod M^1, substantially as described.

398,755. METALLIC THERMOMETER. JOHANN SUDMANN, Hamburg, Germany. Filed Dec. 12, 1887. Serial No. 257,656. (No model.)



Claim.—1. The combination, in a thermometer, of a supporting-frame having a bracket, a metallic strip secured at one end to the same, an indicator and its gearing mounted upon said support, a disk operating said gearing and having the fork-shaped drivers c c', pin l, and the pitman-connection between said drivers and metallic strip, substantially as set forth.

2. In a metallic thermometer, the combination of the pins l with the driving-disk d, having radial slots v, the movable plate d', provided with slots u, crossing those of the driving-disk, the pitmen c c', and

the thermometric strips, substantially as set forth, and for the purpose specified.

3. The combination, in a thermometer, of the movable frame A, thermometric strip connected at one end to the same, disk having the other end of said strip connected thereto, gearing and pointer operated by said disk, and the stationary bed-plate B, carrying the dial-work, substantially as set forth.

4. In a metallic thermometer having the driving mechanism secured to a movable frame, A, and the dial-work mounted on a stationary bed-plate, B, the combination of the eccentric c with the said stationary bed-plate and the said movable frame A, substantially as set forth, and for the purpose specified.

398,756. PACKING FOR PISTON-RODS. FRED P. SWAIN, Chicago, Ill. Filed Oct. 16, 1888. Serial No. 288,402. (No model.)



Claim.—1. The combination, substantially as set forth, of a metal wearing-ring composed of sections tongued together and an elastic backing-ring of greater breadth than the metal ring and connected thereto.

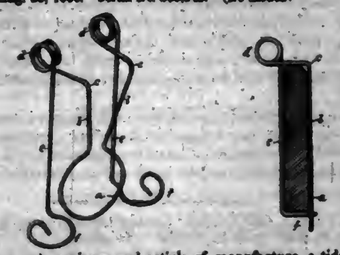
2. The combination, substantially as set forth, of a series of independent metallic wearing-rings having a bearing on the rod and an equal series of elastic backing-rings of greater breadth than the metal rings and each connected to its respective metal ring, whereby said metal rings are kept apart or spaced upon the rod.

3. The combination, substantially as set forth, of a series of independent metallic wearing-rings having a bearing on the rod, an equal series of elastic backing-rings of greater breadth than the metal rings and each connected to its respective metal ring to keep said metal rings apart, and one or more cork rings in the spaces between the metal rings.

4. The combination, substantially as set forth, of a metal wearing-ring, an elastic backing-ring, and a bridge-piece over the joint of the metal ring, between it and its backing, to protect the backing and keep the joint clear.

5. The combination, substantially as set forth, of a metal wearing-ring composed of segments tongued together, an elastic backing-ring, and a bridge-piece over each joint of the metal ring.

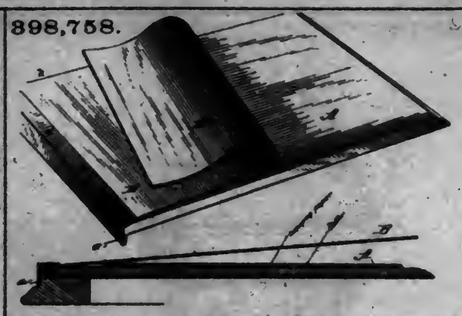
398,757. TIDY-HOLDER. JEROME B. SWEETLAND, Pontiac, Mich. Filed Aug. 23, 1888. Serial No. 283,545. (No model.)



Claim.—As an improved article of manufacture, a tidy-holder formed of a single piece of wire and consisting of a ring, a, the upwardly and outwardly extending portions b b, these two wires being bent abruptly backward at c, the horizontal spring-coil d d, formed on the ends of the said portions b b, the depending spring-actuated clamping-limbs e e, formed of continuations of the coils d d, these limbs leaving the coils at the front side thereof and projecting straight downward, thereby throwing the coils back out of the way, and the horizontal scrolls f f, formed on the lower ends of the limbs e e, substantially as herein shown and described.

398,758. PRESS-COPYING DEVICE. HUGO THUN, Grand Rapids, Mich. Filed Oct. 20, 1887. Serial No. 252,900. (No model.)

Claim.—1. In combination, the base-plate and a covering-flap connected thereto, said flap being flexible and arranged to cover the

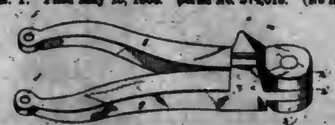


plate, and by reason of said flexibility to lie directly upon all parts of the paper underneath, whereby pressure may be applied to all parts uniformly, substantially as described.

2. A device for copying letters, consisting of a base-plate and a flexible sheet, said sheet being movable in its relation to the base-plate and adapted to be used in connection therewith, substantially as described.

3. In the described device for copying letters, consisting of a base-plate and flexible sheet connected therewith and covering the upper surface, a flange extending downwardly from one end thereof, all substantially as described.

398,759. WIRE-STRETCHER. FREDERICK J. TOWNSEND, Painted Post, N. Y. Filed May 15, 1888. Serial No. 274,013. (No model.)



Claim.—1. The hereinbefore-described wire-stretcher, consisting of the lever having the curved bottom slot formed in one end, the nose-iron having teeth on one end and its other end curved or rounded, the staple provided with the hook and eye, the chain provided with a swivel-link, the elongated links connected with said swivel-link, the tongs having its handles connected with said elongated links, and the corrugated jaws projecting laterally from said handles, one of said jaws extending beyond the other and tapering to a blunt point, as set forth.

2. The combination, in a wire-stretcher, of the lever, the tongs having laterally-projecting jaws, one of which extends beyond the other and tapers to a blunt point, and a chain for connecting said lever and tongs, substantially as described.

3. The combination, in a wire-stretcher, of the lever, the tongs having laterally-projecting jaws, one of which projects beyond the other, and each of which is recessed on its inner face, the corrugated plates having the countersunk perforations adapted to fit said recesses, screws for securing said plates in the recesses, and a chain connecting said lever and the handles of the tongs, substantially as described.

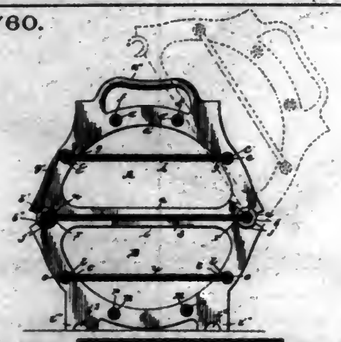
4. The combination, in a wire-stretcher, of the tongs having the corrugated jaws projecting laterally therefrom, the faces of said corrugated jaws curving diagonally from corner to corner, and the corrugations trending backward at an acute angle to the body of the tongs, substantially as described.

5. The hereinbefore-described tongs for a wire-stretcher, consisting of the handles pivotally secured together at one end, and having the laterally-projecting jaws, said jaws having recesses formed in their contiguous faces, the plates adapted to fit said recesses and curving diagonally from corner to corner on their upper surfaces and having corrugations formed on said curved faces, said corrugations trending at acute angles rearwardly from the handles of the tongs, substantially as described.

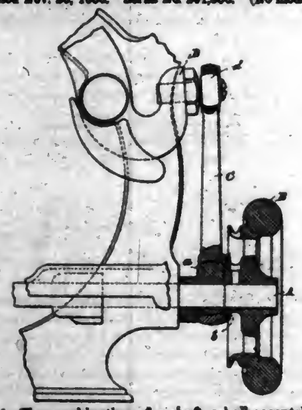
398,760. DISH-WASHER. STEPHEN WILES, Chicago, Ill. Filed July 16, 1888. Serial No. 280,130. (No model.)

Claim.—A dish-washer basket consisting of a top and bottom section hinged together on one side, having the top section formed of rigid end pieces, cushioned top rods, sectional cushioned side rods at the front and rear, and cushioned cross-wires from side rod to side rod, dividing the top lengthwise into regular spaces, and having the lower section formed of rigid end pieces, sectional cushioned front and rear side rods, sectional cushioned front and rear intermediate rods, cushioned bottom rods, and cushioned cross-wires for the front and rear top and intermediate side rods, dividing the bottom lengthwise into regular spaces coinciding with the spaces of the top section, substantially as and for the purpose specified.

398,760.



398,761. CONNECTING-ROD. CHARLES H. WILLOUX, New York, N. Y., assignor to the Willcox & Gibbs Sewing Machine Company, same place. Filed Nov. 20, 1888. Serial No. 291,336. (No model.)



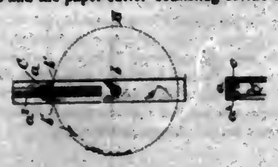
Claim.—1. The combination of a shaft, a ball-eccentric thereon, a connection-rod mounted on said eccentric and adapted to convey motion to a vibratory part, and a part—such as a flange—having a surface adjacent to said connection-rod, the latter being provided with a raised portion or edge on each side of the eccentric touching or nearly touching said adjacent part, and being cut away from the surface of said part on both sides of said raised portion or edge, so that said rod can oscillate on said eccentric on an axis parallel with said edge, but is prevented from oscillating in any other direction, substantially as described.

2. The combination of the shaft, ball-eccentric, vibrating lever, connection-rod for communicating motion from said eccentric to said lever and provided with an annular counterbored recess on one face, and a wheel on said shaft having a flange extending into said recess, the face of said recess adjacent to said flange being formed with a raised portion or edge touching or nearly touching said flange, and being cut away from the latter at an angle, so that the connection-rod can oscillate on an axis parallel to said raised portion or edge, but is prevented from oscillating on an axis perpendicular thereto, substantially as described.

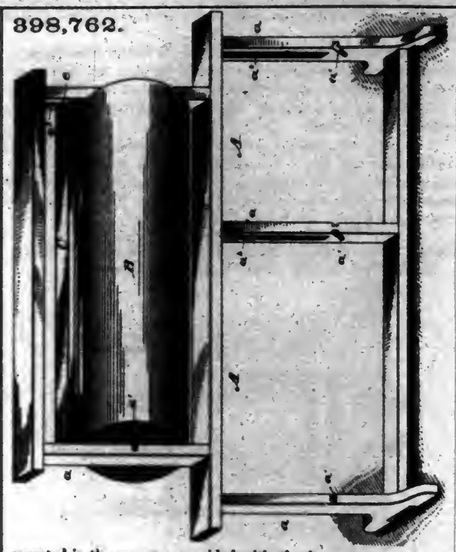
398,762. ROLL-PAPER HOLDER AND CUTTER. GUSTAV WIEHEIN, Carlyle, Ill., assignor to Abbott Q. Ross, Cincinnati, Ohio. Filed July 31, 1888. Serial No. 281,578. (No model.)

Claim.—1. In a paper holder and cutter, the combination, with the roll of paper, of a weighted bar having a cutting edge or edges pressed by gravity against the periphery of said roll, and guides for the cutter-bar arranged in planes substantially parallel to the plane in which the cutter-bar presses against the roll, whereby binding of the cutter-bar is prevented during its up and down movements, due to any irregularity in the contour of the roll, substantially as described.

2. In a paper holder and cutter, the frame having the vertical grooves or ways and the paper-cutter consisting of the bar of metal

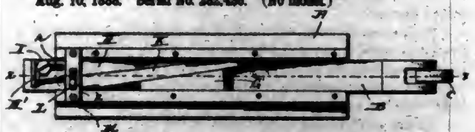


398,762.



mounted in the grooves, provided with the lower concave face, and bearing on the roll, substantially as described.

398,763. DOOR-CHECK. OWEN T. BOZER, Fort Worth, Tex. Filed Aug. 10, 1888. Serial No. 282,426. (No model.)



Claim.—1. In a door-stop, the combination, with a sliding bolt provided with a wedge-plate, of the longitudinally-movable catch or slide mounted on the bolt and the laterally-movably bar located between the adjacent sides of the wedge-plate and catch or slide, substantially as specified.

2. In a door-stop, the combination, with the sliding bolt provided with a wedge-plate, G, of the longitudinally-movable catch or slide having one of its edges adjacent to and parallel with the wedge-plate and the adjustable bar located between the adjacent edges of the wedge-plate and catch or slide and provided with a pin sliding in a suitable guide-slot, substantially as specified.

3. In a door-stop, the combination, with a sliding bolt provided with a wedge-plate, G, of the catch or slide H, mounted on the bolt and capable of a limited longitudinal movement, and the adjustable bar K, arranged between the adjacent edges of the wedge-plate and the catch or slide and tapered toward its lower end to fit the edges of the wedge-plate and catch or slide, the said adjustable bar being provided with a stud which operates in a suitable transverse guide-slot, whereby the bar is held from longitudinal movement, substantially as specified.

4. In a door-stop, the combination, with the spring-actuated sliding bolt provided with a wedge-plate, G, of the tapered catch or slide H, provided with a toe-hold, H', and the adjustable bar K, arranged between the wedge-plate and the catch or slide, substantially as specified.

398,764. CHECK-LOOP. EDWARD BARNARD, Rome, N. Y. Filed Nov. 16, 1888. Serial No. 291,052. (No model.)



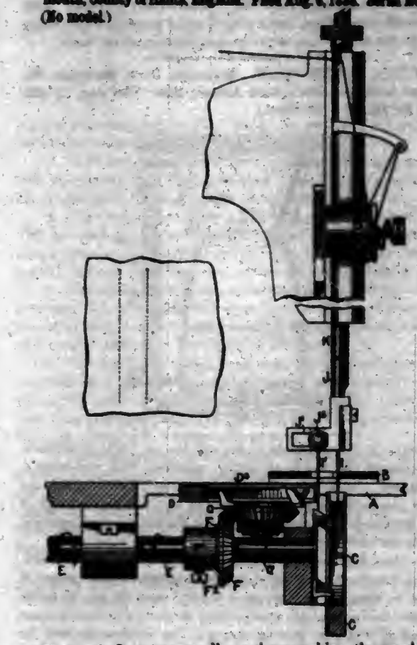
Claim.—1. In a checkrein-loop, the flat ear C, having a checkrein ring or bar attached thereto and provided with forwardly or inwardly turned hooks or tongues, and the flexible loop bearing at its ends against opposite sides of the said ear and provided with perforations engaging the hooks or tongues, substantially as and for the purpose specified.

2. The plate or ear C, having a checkrein ring or bar attached to its front end and provided with the hooks or tongues E E, and the loop D, bearing at its ends against opposite sides of the plate or ear

C and provided with the perforations *d d*, engaging the said hooks or tongues, and also with notches *d' d'*, engaging the rear side of the said checkrein ring or bar, substantially as and for the purpose specified.

3. As an improved article of manufacture, the herein-described checkrein hook or bar having a flat plate or ear provided on opposite sides with integral hook-shaped points or tongues E E, substantially as specified.

398,765. SEWING-MACHINE. EDWARD C. BEAR, Southland, Portsmouth, County of Hants, England. Filed Aug. 6, 1888. Serial No. 282,080. (No model.)

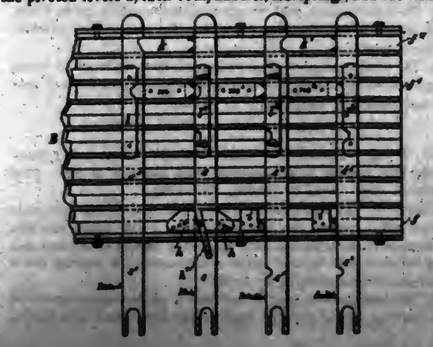


Claim.—1. In a two-needle sewing-machine, the combination, with the needle-operating mechanism of a two-needle sewing-machine and its two needles, of a shuttle-operating shaft carrying the usual shuttle for co-operating with one of the needles, a second shuttle arranged in a plane at right angles to the plane in which the first-named shuttle operates for co-operating with the second needle, and means for driving the second shuttle from the shuttle-shaft, all substantially as and for the purposes set forth.

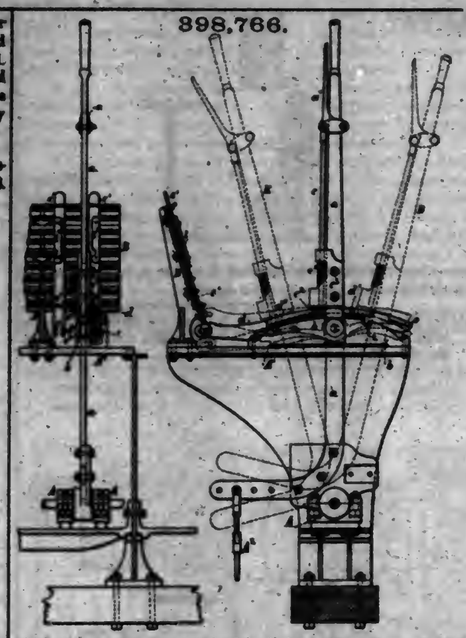
2. The combination, with the needle-operating mechanism of a two-needle sewing-machine and its two needles, of a shuttle-operating shaft carrying the usual shuttle for co-operating with one of the needles, a second shuttle arranged at right angles to the first-named shuttle for co-operating with the other needle, a spindle, G', on which said shuttle is mounted, a gear on said spindle, and a second gear on the shuttle-operating shaft and engaging with the first-named gear, all substantially as and for the purpose set forth.

398,766. INTERLOCKING APPARATUS FOR RAILROAD SIGNALS AND SWITCHES. THOMAS W. DUDLEY, Long Island City, N. Y. Filed May 20, 1882. Serial No. 276,266. (No model.)

Claim.—1. The combination, in an interlocking apparatus, with the pivoted levers *a*, their rods, handles, and springs, and the frame to



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which the same are connected, of the lock-box frame B, set at a slight inclination from the vertical line, the locking-bars *c c'*, moving up through the same, the horizontal sliding bars *f f' f²*, the beveled lugs *h* upon the upper face of the bars *f*, the ribs *h'* upon the bars *e*, and dogs *i* upon the bars *f* and adapted to engage notches in the bars *d'*, and mechanism, substantially as specified, for operating the bars *c d'*, substantially as set forth.

2. The combination, in an interlocking apparatus, with the pivoted levers *a* and the frame to which the same are connected, of the lock-box frame B, set at a slight inclination from the vertical line, the locking-bars *c d'*, moving up through the same, the horizontal sliding bars *f f' f²*, the beveled lugs *h*, ribs *h'*, and dogs *i*, the bolt-bars *k k'*, the interlocking bars *l l' P P*, and the interlocking bolts *m m' m²*, and mechanism, substantially as specified, for operating the bars *c d'*, substantially as set forth.

3. The combination, in an interlocking apparatus, with the pivoted levers *a* and the frame to which the same are connected, of the lock-box frame B, set at a slight inclination from the vertical line, the locking-bars *c d'*, moving up through the same, and the horizontal sliding bars *f f' f²*, moving through the grooves of the same, the interlocking bars *l l' P P*, connected upon the faces of the bars *c d'* and notched at convenient places, the interlocking bolts *m m' m²*, riveted upon one of the sliding bars *f'*, and having beveled elevated ends passing over the edges of the bars *c d'* and engaging with the notches or with the edges of the interlocking bars *l l' P P*, and mechanism, substantially as specified, for operating the parts, substantially as set forth.

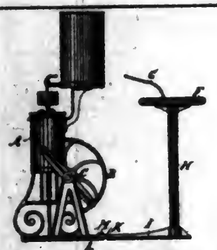
4. The combination, in an interlocking apparatus, with the lock-box frame, the sliding bars passing through the grooves thereof, and the locking-bars *c d'*, passing across through said frame, of beveled lugs *h* upon one or more of the sliding bars *f*, the ribs *h'* on one or more of the locking-bars, the pivoted swinging ribbed segments *d*, to the slotted ends of which the lower ends of the locking-bars are directly pivoted, and mechanism, substantially as specified, for moving one of the locking-bars, and by said rib *h'* shifting the sliding bars, substantially as set forth.

5. The combination, in an interlocking apparatus, with the pivoted levers *a* and the frame to which the same are connected, of the lock-box frame B, the locking-bars *c d'*, moving up through the same, the horizontal sliding bars *f f' f²*, the interlocking bars *l l' P P*, and the interlocking bolts *m m' m²*, and mechanism, substantially as specified, for operating the locking and sliding bars, substantially as set forth.

398,767. MOTOR. CARL C. BONNESEN, Copenhagen, Denmark. Filed Apr. 2, 1888. Serial No. 269,498. (No model.) Patented in Norway Mar. 5, 1888, No. 861; in Italy Mar. 6, 1888, No. 23,105; in France Mar. 8, 1888, No. 189,123; in Belgium Mar. 8, 1888, No. 80,871, and in Denmark May 28, 1888.

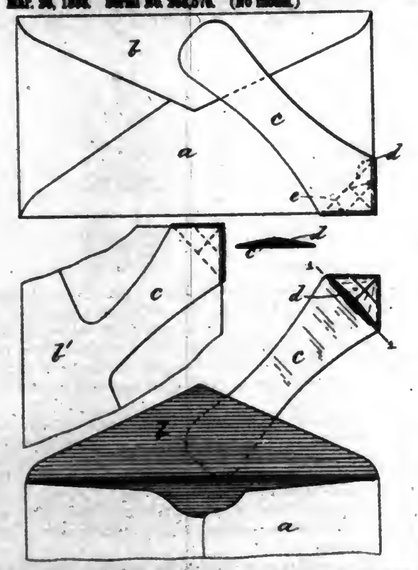
Claim.—In centrifugals, the combination of the adjustable seat F and bed-plate I, with the double cranks E E, gearing B N, shaft O,

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worm-wheel P, worm Q, upright shaft R, holder A, and bed-plate L, substantially as and for the purpose described.

398,768. ENVELOPE. JESSE J. OGAN and BENNY A. SAID, St. Louis, Mo., assignors of one-third to Frank H. Hite, same place. Filed Mar. 26, 1888. Serial No. 268,576. (No model.)



Claim.—The combination of a tongue or tag projecting from the flap of an envelope and having a pocket, with the body of the envelope, substantially as and for the purpose described.

398,769. ELECTRIC-CIRCUIT COUPLER. STANLEY G. G. CURRIE, Philadelphia, Pa., assignor to the United Electric Improvement Company, Gloucester City, N. J. Filed Sept. 20, 1888. Serial No. 286,715. (No model.)



Claim.—1. The combination of the circuit-terminals and the cases of different lengths and widths, inclosing the terminals and insulated therefrom, substantially as hereinbefore set forth.

2. The combination, substantially as hereinbefore set forth, of the handle, two dissimilar cases secured thereto, insulating material, and circuit-terminals of different polarities similarly arranged in each case, and projecting from the insulating material, but protected by the case.

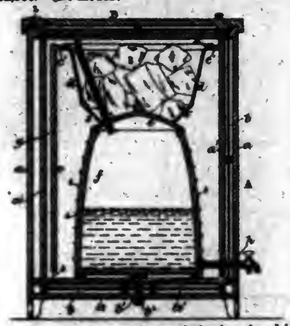
3. The combination, substantially as hereinbefore set forth, of two handles, two dissimilar cases secured to each handle, each case being adapted to interlock with the corresponding one of the opposite handle, insulating material in each handle, circuit-terminals of different polarities similarly arranged in each case, projecting from the insulating material and protected by the case.

4. An electric-circuit coupler, consisting of the combination, substantially as hereinbefore set forth, of the circuit-terminals and two dissimilar cases, arranged side by side, inclosing the circuit-terminals and extending beyond their outer ends.

5. The combination, substantially as hereinbefore set forth, of an electrical conductor projecting from a car, a handle connected therewith, two dissimilar cases connected with the handle, insulating material therein, circuit-terminals projecting from the insulating material, but protected by the case, and a corresponding handle carrying dissimilar cases, and circuit-connections on the adjacent car.

6. The combination, substantially as hereinbefore set forth, of the dissimilar overlapping cases, the symmetrically-arranged interlocking circuit-connections, and a stop, *d*, which prevents interlocking except with the connections in the proper relation, as set forth.

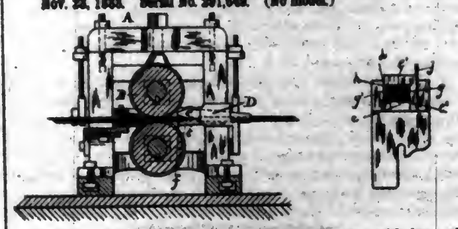
398,770. WATER-COOLER. NATHANIEL DAVIS, Montpelier, Vt., assignor to George L. Davis, North Andover, Mass. Filed Aug. 12, 1888. Serial No. 282,502. (No model.)



Claim.—1. The jacket or casing and the jar *f* and its outlet *h*, extended through the jacket or casing, combined with the cover *c*, for the jar, and the ice-chamber *d*, located immediately above the said cover, the cover forming the bottom of the ice-chamber, and an inlet-pipe for the said jar extended through the ice-chamber, substantially as shown and described.

2. The jacket or casing having the walls subdivided as described, and having the inner partition, *e*, terminating above the bottom of said jacket to form an air-passage, combined with the jar, its outlet *h*, the cover, the ice-chamber immediately above and in close contact with it, and an inlet-pipe passing through the ice-chamber into the jar, substantially as described.

398,771. GUIDE FOR ROLLING-MILLS. PATRICK L. DAY, Cleveland, Ohio, assignor to the American Wire Company, of Ohio. Filed Nov. 23, 1888. Serial No. 291,649. (No model.)



Claim.—1. The combination, with an open-top guide-box, of a guide seated therein, substantially as set forth.

2. The combination, with an open guide-box and a guide fitting therein, of a detachable fastening connecting the two together, substantially as set forth.

3. The combination, with an open guide-box and a guide fitting therein, of a frictional fastening connecting the two together, substantially as set forth.

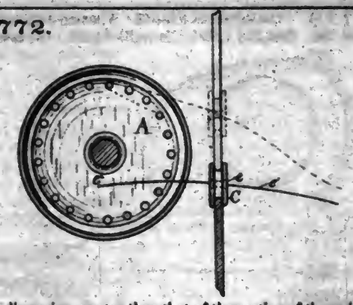
4. The combination, with an open guide-box and a guide fitting therein, of a wedge detachably fitted between adjacent walls of said guide and guide-box, substantially as set forth.

398,772. DEVICE FOR REELING WIRE. PATRICK L. DAY, Cleveland, Ohio, assignor to the American Wire Company, of Ohio. Filed Nov. 23, 1888. Serial No. 291,650. (No model.)

Claim.—1. The combination, with a reel and a reel face-plate provided with a vertical slot, of a guide fitted in the latter, said slot being located in the same line with the central portion of the reel, and having its lower end located below a horizontal line passing above the reel-axis, substantially as set forth.

2. The combination, with a reel and a guide-support provided with a vertical slot, of a guide fitted in the latter, said slot having

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vertical dimension greater than that of the portion of the guide which fits therein, substantially as set forth.

3. The combination, with a reel and a guide-support provided with an opening, of a guide having an annular bearing which loosely fits in said opening, substantially as set forth.

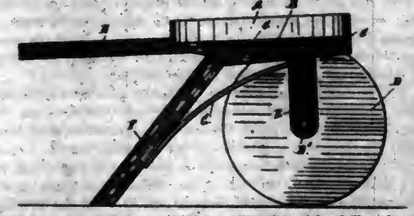
4. The combination, with a reel and a guide-support provided with an opening, of a guide having its central portion loosely fitted in said opening, and having front and rear flanges which respectively overlap the corresponding walls of the slot, substantially as set forth.

5. The combination, with a reel and a guide-support provided with a vertical slot, of a guide having an annular bearing loosely fitted in the latter, said slot having its vertical dimension greater than that of said annular bearing, substantially as set forth.

6. The combination, with a reel and a guide-support provided with a vertical slot, of a guide having its central portion fitted in said slot and of less vertical dimension than the latter, said guide provided with front and rear flanges respectively overlapping the corresponding walls of said slot, substantially as set forth.

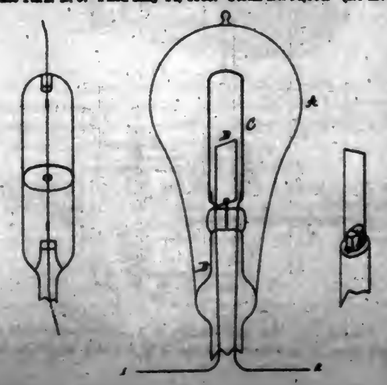
7. The combination, with a reel and a guide-support provided with a vertical slot formed in the same line with the central portion of the reel, of a guide having its central portion loosely fitted in said slot and of less vertical dimension than the latter, said guide formed with front and rear flanges respectively overlapping the corresponding faces of the slot-walls, substantially as set forth.

398,773. WHEELBARROW. JOHN DUPUY, San Francisco, Cal. Filed July 17, 1888. Serial No. 280,194. (No model.)



Claim.—In a wheelbarrow, the combination of the thills or handles B B, the hopper A, carried thereby, the vertically-depending hangers E E, secured to the outer ends thereof, the large wheel D, whose axle is journaled in said hangers, the inclined legs F F, secured to handles B B, and the stiffening-braces G G for the legs, substantially as described.

398,774. INCANDESCENT ELECTRIC LAMP. THOMAS A. EDISON, Menlo Park, N. J. Filed May 14, 1888. Serial No. 94,891. (No model.)



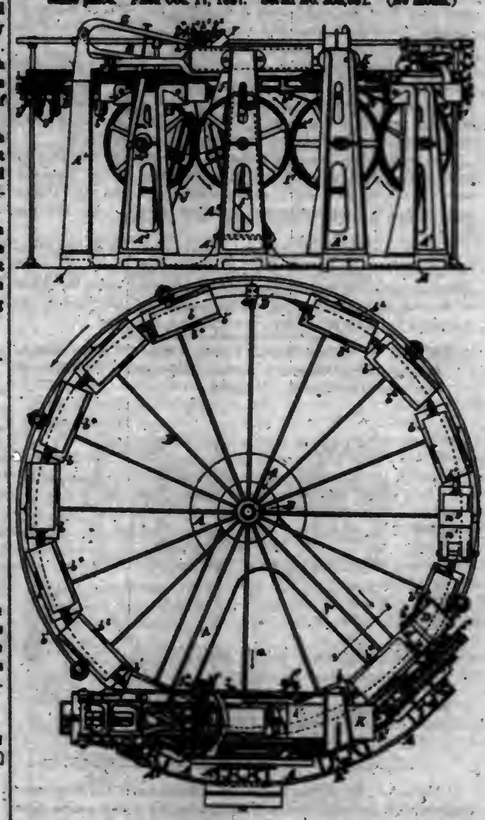
Claim.—1. In an incandescing electric lamp, the combination, with the incandescing conductor, of solid insulating material interposed between its terminals and adapted to prevent the formation of an arc between said terminals, substantially as set forth.

2. In an incandescing electric lamp, the combination, with the arched or looped conductor, of an insulating-plate interposed between the terminals of said conductor and adapted to prevent the formation of an arc between said terminals, substantially as set forth.

3. In an incandescing electric lamp, the combination, with the arched or looped conductor and the glass stem or wire support, of an insulating-plate interposed between the terminals of said conductor and supported from said wire support and adapted to prevent the formation of an arc between said terminals, substantially as set forth.

4. In an incandescing electric lamp, the combination, with the arched or looped conductor and the glass stem or wire support, of an insulating-plate having its edge inserted in the glass of said support and extending up between the terminals of said conductor and adapted to prevent the formation of an arc between the terminals, substantially as set forth.

398,775. MACHINE FOR LABELING CANS. MARTIN V. B. BRIDGE, Boston, Mass., assignor of nine-twentieths to Albert Leavitt, same place. Filed Oct. 17, 1887. Serial No. 252,681. (No model.)



Claim.—1. The can-carrier F, provided with one or more clamps, f^3, each mounted on a spindle provided with a pinion, f^5, which is connected to the spindle by a friction-brake, and one or more racks, f^4, the spindles of the clamps f^3 being movable endwise through the pinions f^5, all arranged and operating substantially as and for the purpose set forth.

2. The herein-described combination of a pack-carrier with pasting apparatus and the wiper n^2, mounted to engage the pasty surface of the pack on the carrier, all arranged and operating substantially as and for the purpose set forth.

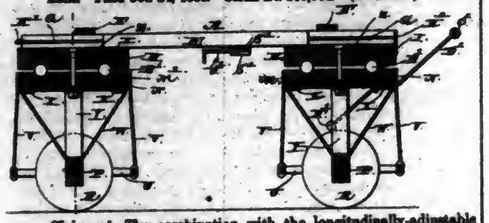
3. In combination, the endless pack-carrier, pasting apparatus, and can-carrier, all arranged and operating substantially as described.

4. The pack-holder *h*, in combination with the clamp-screw h^2 and a cord, 2, and spring 3, or its equivalent, for elevating the pack-holder, and means, substantially such as described, for tightening and releasing the clamp.

5. In a can-labeling-machine, a can-carrier moving in guides, in

combination with a pack-holder arranged to bring the surface of the pack when in the holder slightly inclined to the guides of the car-carrier, all substantially as and for the purpose specified.

398,776. BIER. JOHN W. FINCH and JOHN R. PARK, Clay Centre Kans. Filed Oct. 24, 1888. Serial No. 289,004. (No model.)



Claim.—1. The combination, with the longitudinally-adjustable members B C, of the tabular sleeves I', secured on the sides of one of the members, and the rods K', secured to the other member, and having their arms engaging the sleeves, substantially as described.

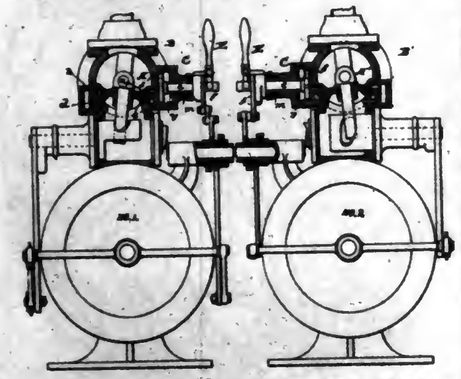
2. The combination, with the members B C, having the overlapping bars E, of the clamp-arms S', engaging the sides of the members, and the lever U', connected eccentrically to the inner ends of the said clamping-arms, substantially as described.

3. The bier having the body provided with the plates at its ends, the trucks having the circular disks or plates, the king-bolts centrally pivoting the trucks under the body-plates, and the anti-friction wheels engaging grooves in the opposing sides of the body and truck plates and concentric with the king-bolts, substantially as described.

4. In the truck, the combination of the plate, the standards depending therefrom, the axle secured to the lower ends of the standards, and the braces W and Y, arranged at right angles with relation to each other and connecting the plates with the axle, substantially as described.

5. The combination of the plate, the standards depending therefrom, the axle secured to the lower ends of the standards, and the W-shaped brace Y, having its central portion arranged under the center of the plate and its outer ends bearing against the outer sides of the standards and secured thereto, substantially as described.

398,777. STEAM-ENGINE VALVE. PERCY R. FOSTER, Brooklyn, N. Y., assignor to Marshall T. Davidson, same place. Filed June 26, 1888. Serial No. 278,313. (No model.)

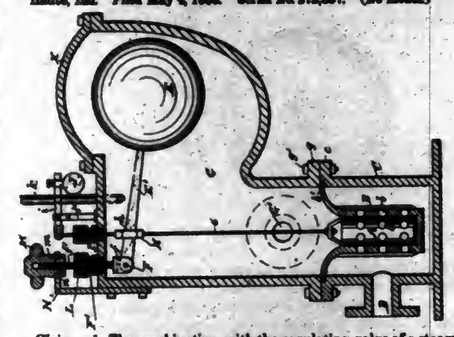


Claim.—1. In a duplex engine, the combination of auxiliary-valve chests having flat valve-faces and communicating with the main-valve chests through ports, flat-faced auxiliary valves fitted to the said valve-faces, to and from which they are adjustable, and provided with ports adapted to register with the aforesaid ports, and connections with the engines whereby the said auxiliary valves are rocked, substantially as set forth.

2. In a duplex engine, the combination of the auxiliary-valve chests having flat valve-faces and communicating with the main valves through steam-ports, the flat valves B^3, fitted to the said valve-faces and provided with steam-ports, and sliding and oscillating rods upon which the said valves are mounted, substantially as set forth.

3. In a duplex engine, the combination of the auxiliary-valve chests having flat valve-faces perforated to form the steam-ports *f*, *e*, and *e'*, the flat valves B^3, fitted to the said valve-faces below the ports *f* and covering the ports *e* and *e'*, and provided with the ports *n* and *n'*, adapted to be brought to register with the ports *e* and *e'*, and the sliding and oscillating rod upon which the valves are mounted, substantially as set forth.

398,778. STEAM-BOILER FEEDER. WINFIELD O. GORDON, Terre Haute, Ind. Filed May 4, 1888. Serial No. 273,237. (No model.)



Claim.—1. The combination, with the regulating-valve of a steam-boiler feeder, of a lever and a float for operating the valve, and a hand-actuated screw for altering the position of the fulcrum of the said lever, thereby permitting the water-level of the boiler to be changed, substantially as and for the purpose set forth.

2. The combination, with the regulating-valve of a steam-boiler feeder, of a lever and a float for operating the valve, an adjustable fulcrum for said float-lever, and a weight for counterbalancing the said valve and float when the float is supported at any desired water-level, substantially as and for the purpose set forth.

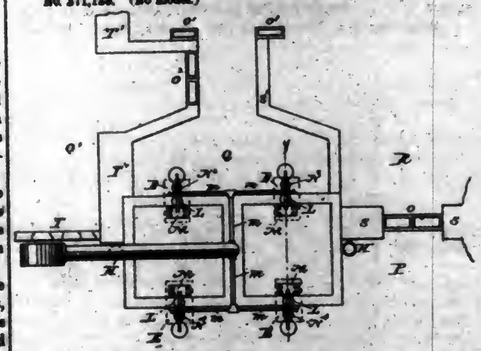
3. The combination, with the regulating-valve of a steam-boiler feeder, of a lever and a float for operating the valve, and an adjustable fulcrum for the said float-lever, substantially as and for the purpose set forth.

4. The combination, with the regulating-valve of a steam-boiler feeder, of the valve-stem connected to the valve, the float, the float-lever operatively connected to the said valve-stem, the vertical screwed spindle provided with a fulcrum-pin for the float-lever, and a revoluble screw-threaded sleeve for adjusting the position of the vertical spindle, substantially as and for the purpose set forth.

5. The combination, with the regulating-valve of a steam-boiler feeder, of the valve-stem connected to the valve and provided with a yoke, the float, the float-lever provided with an enlargement engaging with said yoke, the screwed spindle projecting through the float-casing and provided with a fulcrum-pin for the lever at its lower end, a standard secured outside the float-casing, and a revoluble screw-threaded sleeve journaled in the standard for operating the said spindle, substantially as and for the purpose set forth.

6. The combination, with the regulating-valve of a steam-boiler feeder, of the valve-stem connected to the valve, the float, the float-lever operatively connected to the said valve-stem, the vertical screwed spindle provided with a fulcrum-pin for the float-lever, a revoluble screw-threaded sleeve for adjusting the position of the vertical spindle, a lever pivoted to the end of the valve-stem, a stand pivotally supporting the said lever, and a weight upon the free end of the said lever for counterbalancing the regulating-valve and other moving parts when the float is supported at the water-level, substantially as and for the purpose set forth.

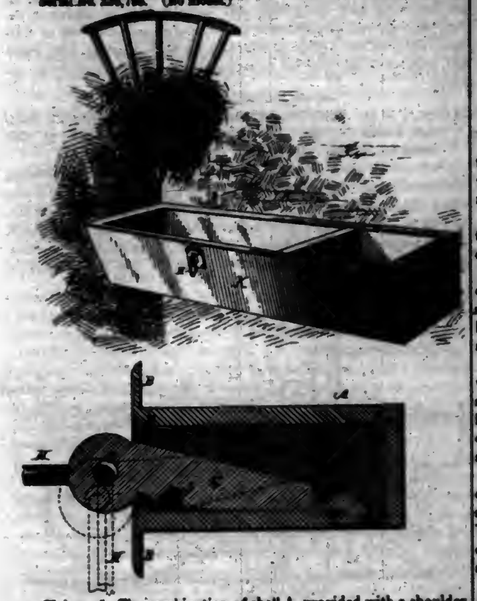
398,779. SUPPLY OF WATER TO WATER-MOTORS. JOHN H. HAGERTY, Lowell, Mass. Original application filed Jan. 16, 1888, Serial No. 260,850. Divided and this application filed Apr. 19, 1888. Serial No. 271,129. (No model.)



Claim.—1. The combination of a water-motor with a water-supply area, R, in which the water is of variable height by means of the supply-pond P, the waste-pond or drainage area Q', the intermediate discharge-pond, Q, the dams S S'-T T, and gates O O' O^2, substantially as described.

2. The combination of the supply-pond P and the drainage area Q' with a water area in which the water is of variable height by means of the dam S and gate O and dam T and the interposed water-motor and waste-pond Q, said waste-pond Q being separated from the water area R by the dam S' and from the drainage area Q' by the dam T, and connected at will with said water area R by the gates O' and with the drainage area Q' by the gate O^2, all in combination with each other, substantially as and for the purpose described.

398,780. HITCHING DEVICE. MATTHEW HIRST, Philadelphia, Pa., assignor to Louis De Geer, New York, N. Y. Filed Feb. 7, 1887. Serial No. 226,788. (No model.)



Claim.—1. The combination of shell A, provided with a shoulder to stay the bolt C, tilting bolt C, a catch, D, to engage with said shoulder, and depressor F, bearing upon said bolt to depress the inner end and elevate the outer end thereof, substantially as described.

2. The combination of shell A, having a recess, E, provided with a shoulder to stay the bolt C, tilting bolt C, provided with a friction-wheel and having a catch adapted to engage with said shoulder, and depressor F, bearing upon bolt C to depress the inner end and elevate the outer end thereof, substantially as described.

398,781. ADJUSTABLE ANGLE-TROWEL. FRANCIS T. HOVEY, Homer, N. Y. Filed Dec. 5, 1888. Serial No. 292,730. (No model.)

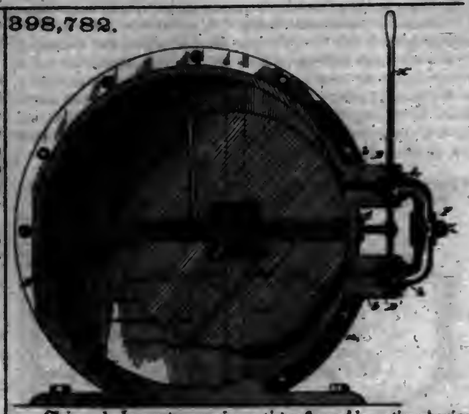


Claim.—A corner-trowel consisting of the hinged leaves, the overlapping short arms and their securing-bolts and nuts, the overlapping long arms, the handle E, and the securing and strengthening headed rod, and nut *f'*, substantially as set forth.

398,782. ROTARY ENGINE. LEWIS C. HINES, Hinsdale, assignor, by direct and mesne assignments, to Ramsey B. Ayres, Hammondsport, N. Y., John H. Hosie, Scranton, Pa., and the Hosie Motor Company, (Limited.) Filed Mar. 2, 1888. Serial No. 266,716. (No model.)



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Claim.—1. In a rotary engine, a piston formed in sections having their inner edges constructed to loosely interlock with each other, whereby such sections are connected together, and yet may move to a limited extent independently of each other, substantially as set forth.

2. In a rotary engine, the casing and the head having a way for the piston, combined with said piston fitted to the way and formed of sections loosely yoked together, substantially as set forth.

3. In a rotary engine, the combination of the casing, the head or drum having a way for the piston, and the sectional piston fitted to said way, and having its sections provided at their inner edges with interlapping portions, whereby they are yoked together, substantially as set forth.

4. The combination of the casing, the drum or head having a way for the piston and provided with steam ports or channels intersecting said way, and the piston formed in sections having bearings in advance of their inner ends, such bearings facing toward the outer ends of the piston, whereby steam acting on said bearings may operate to draw the pistons inward, substantially as set forth.

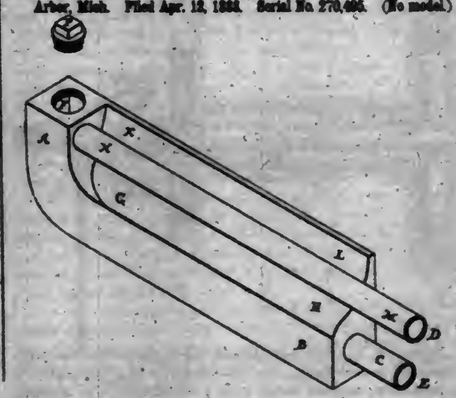
5. In a rotary engine, the combination of the casing, the head or drum having channels $n' n^2$ and a way for the piston, and the piston-sections O' O^2, the section O' being provided at its inner end with a T-like head, and the section O^2 having at the opposite sides of its inner end L-shaped portions engaging the T-head of the section O', substantially as set forth.

6. The combination, with the casing and the head or drum therein, of the independent valve-chambers communicating with the casing on opposite sides of the abutment, independent steam and exhaust valves in each of said chambers, a lever connecting the exhaust-valve of one chamber with that of the other, and a lever connecting the steam-supply valve of one chamber with that of the other, all substantially as and for the purposes specified.

7. In a rotary engine, the combination, with the head or drum, of the piston-section sliding therein and provided with a bearing arranged and adapted to receive steam-pressure in such manner as to draw the piston-section inward, substantially as and for the purposes specified.

8. The combination of the casing, the drum having way *n* and ports or channels $n' n^2$, and the sectional piston constructed to provide steam-chambers P P', substantially as set forth.

398,783. WATER-FRONT FOR STOVES. TITUS P. HUTZEL, Ann Arbor, Mich. Filed Apr. 12, 1888. Serial No. 270,495. (No model.)



Claim.—A water-back casting, A B, as shown, with a curved and sloping surface, H G K L, which is adapted to have the outlet-pipe N M of the water-back pass in front of it, with an offset at the end A, as represented, for receiving this outlet-pipe N M, a clean-out hole, F, to facilitate cleaning and molding said casting A B, with its closing device, as the plug P, and an inlet for the pipe C, in combination with the said outlet-pipe N M, detachably secured, for the purposes specified, as shown and described.

398,784. HYDRAULIC JACK. FRANK I. JOYCE, Dayton, Ohio. Filed Apr. 12, 1888. Serial No. 270,499. (No model.)



Claim.—1. In a hydraulic jack, the ram-head 11, having both inlet-valve 22 and outlet-valve 14 placed therein, as and for the purposes specified.

2. In a hydraulic jack, the combination, with the chambers 25 and 26, of the ram-head 11, having an inlet-valve chamber, 19, and a passage, 24, leading from the extreme side of the chamber 25 to the inlet-valve chamber 19, to permit the working of the jack in a horizontal or inclined as well as in a perpendicular position, substantially as described.

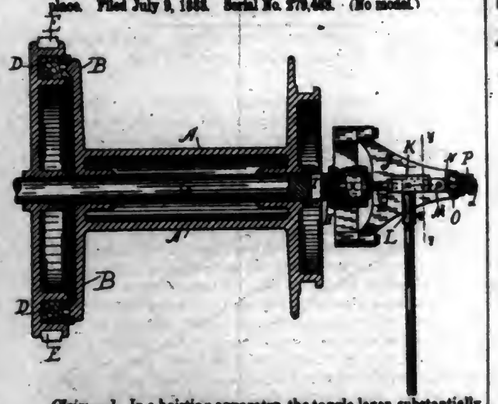
3. In the pump of a hydraulic jack, the combination, with the ram-head 11, having inlet and outlet valves located therein, and a side passage, 24, provided with valve 22, of a plunger, 1, having the inverted cup-packing 2', for the purpose of securing a perfect vacuum in the plunger-chamber, substantially as described.

4. In a hydraulic jack, the combination, with the chambers 25 and 26, of the ram-head 11, having valve-chambers 15 and 19, plunger-chamber 17, and passages 24 and 18, leading from the chamber 25 through said valve-chambers to the plunger-chamber, the valves 14 and 22, having stems 13 and 23, the valve-springs 12 and 21, and the plunger 1, having an inverted cup-packing, 2', and provided with a lug, 28, substantially as described.

5. In a hydraulic jack, the combination of the tubes C H, the chambers 25 and 26, the ram-head 11, having valve-chambers 15 and 19, plunger-chamber 17, and passages 24 and 18, leading from the side of the upper chamber, 25, through the valve-chambers 19 and 15, into the plunger-chamber, the valves 14 and 22, having stems 13 and 23, the nuts 10 and 20, and springs 12 and 21, for supporting said valves, the plunger 1, provided with lug 28 and packing 2 and 2', and the packing 30 and nut 31 at the lower end of the ram-head, substantially as described.

6. In a hydraulic jack, the combination, with the head J and plunger 1, of the bosses K L, the rock-shaft 4, having journals 5, supported in said bosses and provided with cranks 6 and 9, the packing-rings M N, and the jam-nuts P Q, substantially as described.

398,785. HOISTING APPARATUS. HUGH KENNEDY, San Francisco, Cal., assignor to Leon C. Marshutz and Thomas C. Cantrell, same place. Filed July 9, 1888. Serial No. 279,462. (No model.)



Claim.—1. In a hoisting apparatus, the toggle-lever, substantially as described, in combination with the follower or stem H and the bar I, a rope-drum mounted loosely upon a driving-shaft and provided with a frictional ring, and a corresponding frictional ring on the driving-gear, substantially as set forth.

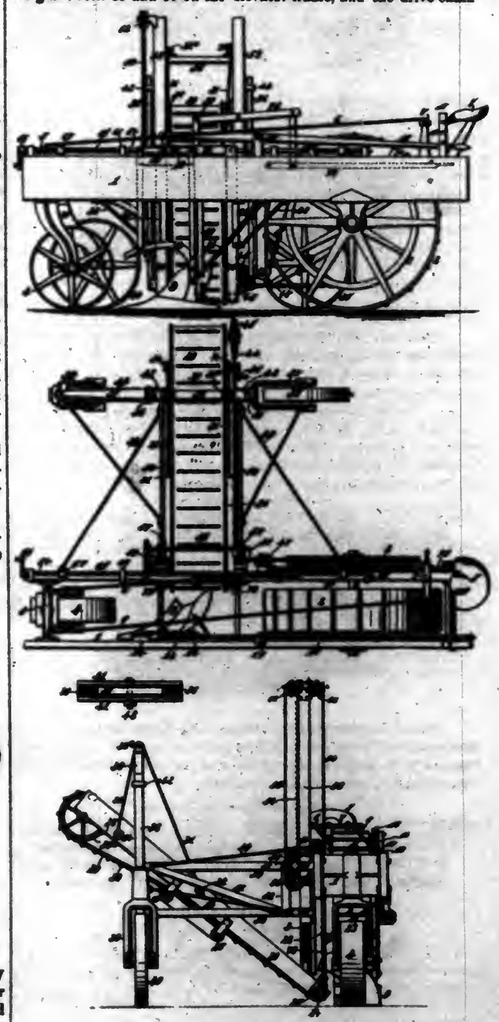
2. The combination of the driving-gear and loosely-mounted rope-drum provided with intermediate frictional surfaces, the hollow-ended shaft, the bar I, the follower, the toggle-lever, and the adjustable bolt N, substantially as described.

3. The combination of the plate J, provided with a guide, K, and a collar, O, the adjustable bolt, the toggle-lever, the follower, the bar I, the driving shaft, the loosely-mounted rope-drum, the frictional rings, and the driving-gear, substantially as described.

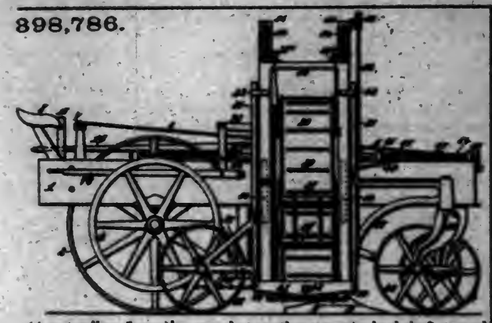
4. In a hoisting apparatus, the combination of the driving-gear and loosely-mounted rope-drum provided with intermediate frictional rings, a hollow-ended shaft, a follower adapted to have a longitudinal motion through said shaft and adapted to throw the drum into or out of contact with the driving-gear, a toggle-lever to depress or relieve the follower, an adjustable bolt to compensate for wear of frictional surfaces, and a plate attached to the shaft-bearings, with guide and collar and carrying an adjusting-sleeve, all substantially as set forth.

398,786. DITCHING AND GRADING MACHINE. DAVID D. KUHLMAN, Kansas City, Mo. Filed Apr. 9, 1888. Renewed Jan. 28, 1889. Serial No. 297,838. (No model.)

Claim.—1. In a ditching and grading machine, the combination of a main frame, 1, having a ground-wheel, 2, the shaft of which is provided with a sprocket-wheel, 3, a rising-and-falling elevator-frame pivoted at its lower end and provided at its upper end with a drum-shaft having a sprocket, 48, the endless web passing around the drum-shaft, the guide-rolls 45 and 46 on the elevator-frame, and the drive-chain



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44, extending from the sprocket on the ground-wheel shaft to and around the guide-rolls, and thence extending laterally along the elevator-frame to the sprocket on the said drum-shaft, substantially as described.

2. In a ditching and grading machine, the combination, with a machine-frame having a ground-wheel and a sprocket on the shaft of said wheel, of a laterally-inclined vertically-adjustable elevator-frame, an elevator-shaft on said frame geared to the sprocket, wheeled side bars or uprights pivotally connected to a pair of bolster-plates at their lower ends, and an upright frame connected by a central pivotal bearing to the bolster-plates and having loops in which the side bars may rise and fall, substantially as described.

3. In a ditching and grading machine, the combination, with a machine-frame supported by a ground-wheel, of an elevator-frame having its lower end pivotally connected to supports on said machine-frame, wheeled side bars supporting a frame within which the outer end of the elevator-frame lies, cords connected to the latter frame and passing over the friction-rolls on the inclosing-frame, and a windlass-shaft on the elevator-frame to which the other ends of said cord are connected, substantially as described.

4. The combination of the main frame having a ground-wheel journaled therein and a laterally-extending elevator connected at its lower end with the main frame, a plow located in advance of the ground-wheel and beside the lower end of the elevator, a vertically-adjustable frame comprising upright parallel arms connected, respectively, at their lower ends with the front and rear portions of the plow-beam, a bar connecting the upper ends of said arms, and a lever pivoted on the main frame and pivoted to the connecting-bar to simultaneously raise or lower the parallel arms, substantially as described.

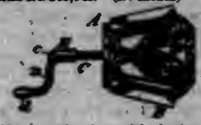
5. In a ditching and grading machine, the combination, with a machine-frame, of an elevator pivotally connected at its lower end to an adjustable frame on said machine-frame, a wheeled frame within which the outer end of the elevator is adjustable, bracing-frames connecting the wheeled frame to the machine and having slide-loops embracing racked uprights, and said braces having pinions meshing with racks on the uprights, and an actuating-shaft on the machine-frame, having a sprocket geared to a sprocket on the shaft carrying said pinions by a chain running over pulleys at the top of one of the uprights and over a pulley on the machine-frame, substantially as described.

6. In a ditching and grading machine, the combination, with a machine-frame, of an elevator mechanism having its supports pivotally connected at their lower ends to an adjustable frame on the machine-frame, a wheeled frame within which the outer ends of the elevator-supports are adjustable vertically, uprights on the machine-frame having racks, bracing-frames movable on said uprights and rigidly connected at their outer ends to the wheeled frame, a shaft on the bracing-frames having pinions meshing with the racks on the uprights and having a sprocket, a chain running on pulleys above and below said sprocket and gearing with the latter, an actuating-shaft on the machine-frame having reverse screw-threads and carrying a sprocket moving said chain, diagonal braces connected at their outer ends to the bracing-frames, and travelers moving on the reverse threads of the actuating-shaft to which the inner ends of said braces are connected, substantially as described.

7. In a ditching and grading machine, the combination, with a machine-frame, of an elevator mechanism having its supports pivotally connected at their lower ends to supports on said frame, a vertical frame inclosing the outer end of the elevator-frame, cords connected at one end to the elevator-frame and passing over friction-rolls on the vertical frame, a windlass-shaft on the elevator-frame, to which the other ends of said cords are connected, a bolster-frame centrally pivoted to the lower end of the vertical frame, side bars pivoted to the ends of the bolster-frame and held by loops on the vertical frame, and wheels bracketed to the side bars and supporting the latter, substantially as described.

8. In a ditching and grading machine, the combination, with a machine-frame, of an elevator-frame having its lower end pivotally connected to an adjustable frame on the machine-frame, vertically-adjustable bracing-frames intermediate between the machine-frame and the wheeled supports carrying the outer end of the elevator-frame, and a shaft on the machine-frame having reverse screw-threads and diagonal braces connected at one end to the outer ends of the bracing-frame and at the other ends to travelers moving on the reverse threads of the shaft, substantially as described.

398,787. BAR-RING OR OTHER JEWELRY. ADOLPH LUTEY, New York, N. Y., assignor to A. Lutey & Co., same place. Filed Feb. 24, 1888. Serial No. 265,145. (No model.)



Claim.—1. The combination, with the base, of a stem projecting therefrom and a laterally-projecting fastening crank-arm borne by said stem, and constructed to be adjustable toward and from the base.

2. The combination, with the base, of a stem projecting therefrom and a laterally-projecting fastening crank-arm borne by said stem, and constructed with a screw-thread, whereby it is adjustable toward and from the base.

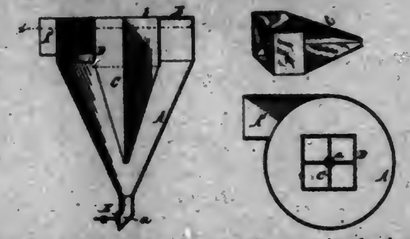
3. The combination, with the base, of a screw-threaded stem projecting rigidly therefrom and a laterally-projecting fastening crank-arm screwing on said stem, and thereby adjustable toward and from the base.

4. The combination, with the base, of a screw-threaded stem projecting rigidly therefrom and a laterally-projecting fastening-arm constructed with an internally-threaded sleeve screwing on said stem, whereby the arm is adjustable toward and from the base.

5. The combination, with the base, of a screw-threaded stem projecting rigidly therefrom and terminating in a head or enlargement and a laterally-projecting fastening-arm screwing on said stem, whereby it is adjustable toward and from the base and its separation from the stem is prevented.

6. The combination, with the base, of a stem projecting therefrom and a laterally-projecting fastening-arm borne by said stem and constructed to be adjustable toward and form the base, and the outer portion of said arm turned rearwardly to form a handle by which to turn or hold the arm.

398,788. DUST-COLLECTOR. JOHN G. MUNDY, Jackson, Mich., assignor to the Knickerbocker Company, same place. Filed Dec. 1, 1888. Serial No. 292,944. (No model.)



Claim.—1. The combination, with the separating-chamber provided with means whereby the dust-laden air is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a wind-break arranged across the path of the whirling air-current in the axial portion of the separating-chamber, whereby the whirling motion of the air is broken in the axial portion of the separating-chamber and the air is caused to move in a straight course toward and through the air-outlet, substantially as set forth.

2. The combination, with the separating-chamber provided with means whereby the dust-laden air-current is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a radial wind-break arranged in the axial portion of the separating-chamber, substantially as set forth.

3. The combination, with the tapering separating-chamber provided with means whereby the dust-laden air is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a tapering wind-break arranged across the path of the whirling air-current in the axial portion of the separating-chamber, substantially as set forth.

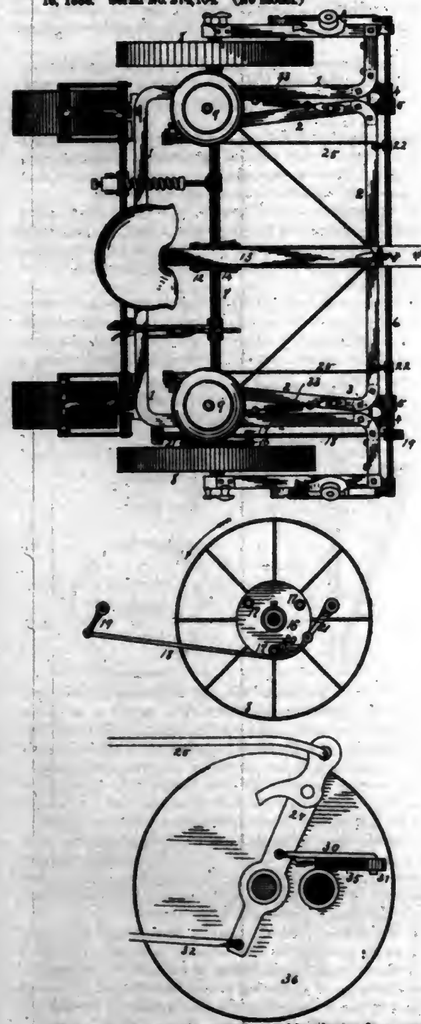
4. The combination, with the separating-chamber provided with means whereby the dust-laden air is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a tube arranged in the air-outlet, and a wind-break arranged in said tube, substantially as set forth.

5. The combination, with the separating-chamber provided with means whereby the dust-laden air is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a tube arranged in the air-outlet, and a wind-break extending from said tube into the separating-chamber, substantially as set forth.

6. The combination, with the separating-chamber provided with means whereby the dust-laden air is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a flat-sided tube arranged in the air-outlet, and a wind-break arranged in the axial portion of the separating-chamber, substantially as set forth.

7. The combination, with the separating-chamber provided with means whereby the dust-laden air is caused to assume a whirling motion in the same, and having an outlet for the purified air and a dust-discharge, of a flat-sided tube arranged in the air-oulet, and intersecting tapering wind-break plates having their large ends secured in said tube and having their tapering portions projecting from said tube into the separating-chamber, substantially as set forth.

398,789. CORN-PLANTER. FRANK P. MURPHEY, Decatur, Ill., assignor of one-half to William D. Chamberlain, same place. Filed May 16, 1888. Serial No. 274,104. (No model.)



Claim.—1. In corn-planters, in combination, a frame comprising an inner part and an outer part, composed each of a continuous bar, and brackets at the front angles of each part forming hinge-connections, as set forth.

2. In corn-planters, in combination, the frame comprising outer part, 1, and inner part, 2, the brace-bar 3 for the outer part, and brackets 4 5, adapted to form hinge-connections at the front of both parts, as set forth.

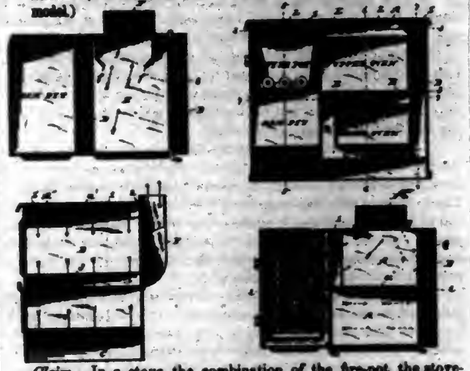
3. In corn-planters, in combination, the drill-disk attached to a wheel and provided with projections, the bar with the trip projection adapted to the projections of the disk, the arm pivoted to the bar and to the planter-frame, and means for imparting the motion of the bar to the seed-depositing mechanism of the planter, as set forth.

4. In corn-planters, in combination, the disk 16, having projections, the check-row shaft 6, the arm 19 on the check-row shaft, constructed as specified, the bar 18, having trip projection 20, and the arm 21, pivoted to the planter-frame and to the bar 18, as set forth.

5. In corn-planters, in combination, the seed-disk having ratchet-teeth, the lever having a pawl adapted to the teeth, and the oscillating second drop connected with the lever, as set forth.

6. In corn-planters, in combination, the oscillating second drop having the upper projection, 31, the curved lower termination, 37, and the face projection 38, ledge 40 in the shank, lever 27, adapted to operate the seed-disk, and the rod to connect the second drop with the lever, as set forth.

398,790. COOKING-STOVE. JOHN U. MOORE and WILLARD J. ANDREWS, St. Louis, Mo. Filed Feb. 9, 1888. Serial No. 263,545. (No model.)



Claim.—In a stove, the combination of the fire-pot, the stove-top, the upper flue, A, extending across beneath said top, the upper and lower ovens disposed beneath said upper flue, A, the vertical flue B, leading from flue A down the end of the stove, the lower flue, C, leading thence back beneath the lower oven, the short vertical flue D, leading thence upward past the end of the lower oven, the intermediate lateral flue, E, leading thence between the ovens and connecting with said vertical flue B, and the smoke-flue F, communicating with the rear of the upper and intermediate lateral flues, A and E, with the damper 2 between the smoke-flue and flue A, and the damper 3, for opening flue E into flue B at will, as and for the purpose set forth.

398,791. LOOM-TEMPLE. JAMES NUTTALL, Fall River, Mass. Filed Apr. 19, 1888. Serial No. 271,233. (No model.)



Claim.—1. In combination, the temple-roller, the spring-operated sliding bar, the holding-shell, and the bearing-spring for preventing looseness of the sliding bar, substantially as described.

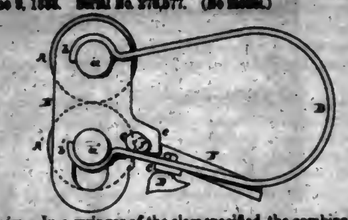
2. In combination, the temple-roller, the spring-operated sliding bar, the holding-shell, and the bearing-spring serving to prevent looseness of the sliding bar and adapted to form a spring-catch to hold the bar at its rearward position, substantially as described.

398,792. SAW. ALONZO OAKES, Taylor, Wis., assignor of one-half to Arthur B. Ellison, same place. Filed May 26, 1888. Serial No. 275,141. (No model.)



Claim.—The saw having the forwardly-inclined teeth B, bifurcated at the lower ends to form V-shaped cutting-points C, the latter being inclined laterally in opposite directions and beveled or sharpened on opposite sides, and the forwardly-inclined clearing-teeth D, arranged one between each pair of teeth B, said clearing-teeth being slightly shorter than the teeth B, and having their lower sides inclined upward and rearward, and provided at their lower front corners with the square chisel-edges F, substantially as described.

398,793. CLOTHES-WRINGER. LEWIS C. PARKER, Cincinnati, Ohio, assignor of one-half to Robert Simpson, Jr., same place. Filed June 9, 1888. Serial No. 276,577. (No model.)

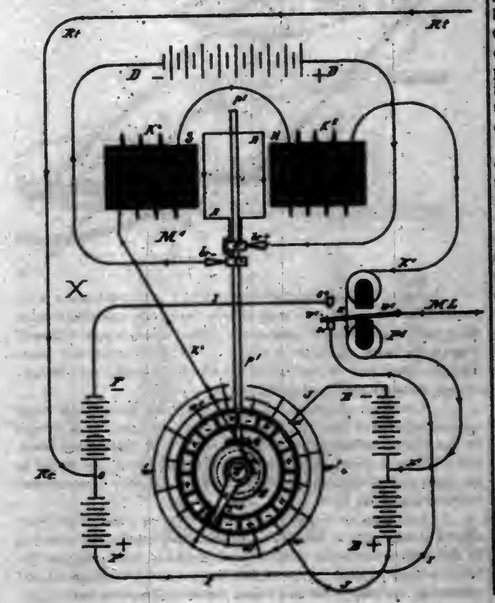


Claim.—In a wringer of the class specified, the combination, with cheek-pieces, each having a hole for the axle of one roll and a slot for the axle of the other, and a pivot-bearing adjacent to one arm of the spring, of an apron having end pivots resting in said bearings, each pivot bearing a cam arranged to engage one arm of the spring when the apron is swung upward for the purpose of separating the rolls, substantially as shown and described.

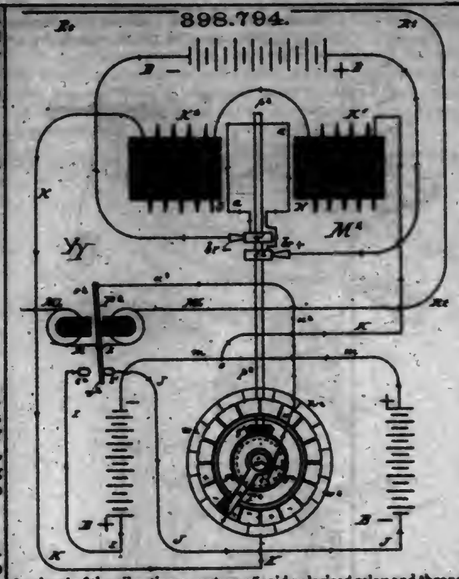
398,794. SYSTEM OF SYNCHRONIZING ELECTRIC MOTORS. FRANCIS J. PAYEN, New York, N. Y., assignor to J. M. Seymour, same place. Filed Aug. 1, 1888. Serial No. 281,701. (No model.)

Claim.—1. The system described for producing the synchronous movement of electric motors at distant points, comprising a main-line circuit connecting said points, electric motors at said points having their armatures and field-coils connected in separate independent circuits, one to a source of direct and the other to a source of alternating current, the supply of current in said alternating circuit being controlled by said main-line circuit and by polarized relays or vibrators included in said line-circuit.

2. A device for producing the synchronous rotation of electric motors at distant points, comprising an electric motor at one point having its field-coils connected through a polarized relay or vibrater and a revolving trailing brush driven by the armature of said motor to the parts of a fixed reversing-commutator, the alternate segments of which are connected to sources of current of opposite polarity, the armature-coils of said motor being connected in a continuous direct-current circuit, the reversals of current in said field-coils corresponding to the passage of the revolving trailing brush from one segment of the fixed commutator to the next and to the half-revolutions of the armature to which it is geared, the main-line circuit being connected to the



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fixed end of the vibrating armature of said polarized relay and through the latter and its contact-stops and the return-circuit to a separate source of alternate currents as the armature of said polarized relay vibrates.

3. A device for producing the synchronous rotation of electric motors, comprising an electric motor at one point having its field-coils connected through a polarized relay to a source of alternate currents, the armature of said polarized relay being connected to a main-line circuit extending to one or more distant points, the said main-line circuit connected in series to the coils of other polarized relays or vibrators, the armatures of which are connected through their contact-stops and sources of alternate currents connected thereto to the field-coils of the electric motors at said points, whereby the alternations of current in the said field-coils of the distant electric motors are made to correspond in period to the vibrations of the armatures of said polarized relays.

4. In an apparatus for producing synchronous movements at different distant points, electric motors at said points having their armature and field circuits separately connected, one to a source of continuous direct current and the other through the vibrating armature and contact-stops of a polarized relay or vibrator and a fixed contact-brush and revolving trailer to the parts of a fixed reversing-commutator, the segments of which are connected by the vibrating armature of said polarized relay or vibrator to sources of current of opposite polarity, whereby the current in the alternating circuit of said motors is reversed at each vibration of said armature and at each passage of the revolving trailing brush from one segment of the fixed reversing-commutator to the next.

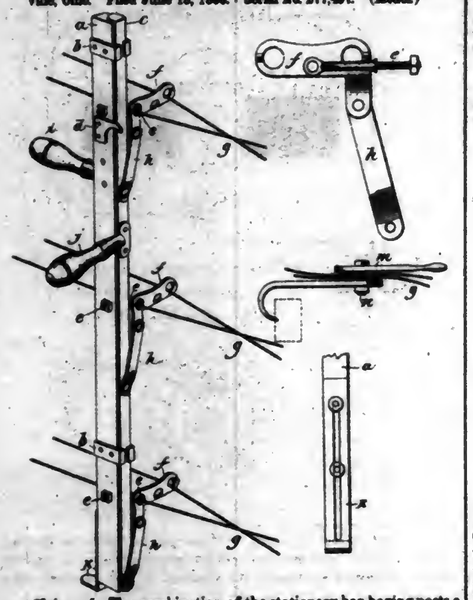
5. In a system for synchronizing electric motors, the combination of a governing-motor at one station, a current-reverser driven by the moving part of said motor, each reversal of current corresponding to a half-revolution of said moving part, a line-circuit traversed by reverse currents corresponding to the reversals produced by the current-reverser, a series of relays at distant stations operated by the line-currents, and a series of governed or driven motors at the distant stations, one magnetic element of each of which is excited by current of constant direction, and the other magnetic element of which is excited by reversed currents controlled by the relays.

398,795. NUT-LOCK. MORGAN PENETRACKER, Washington, D. C., assignor of one-half to Albert P. Kingsley, same place. Filed Nov. 20, 1888. Serial No. 291,327. (No model.)



Claim.—The combination, with the bolt having the longitudinal grooves and the nut, of the washer adapted to slip freely on the bolt, and having the wires to fit in the grooves, said wires being adapted to be bent outward over the face and sides of the nut to lock the latter, substantially as described.

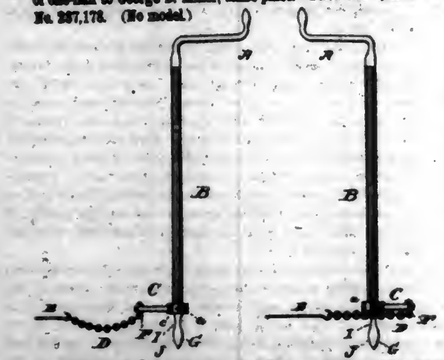
398,796. FENCE-MAKING MACHINE. LEWIS FISHER, Martinsville, Ohio. Filed June 18, 1888. Serial No. 277,407. (Model.)



Claim.—1. The combination of the stationary bar having posts *e*, rotary disks *f*, pivoted to the posts, having openings for the wires and having slots communicating with the openings, the slots being arranged at an angle to the direction of the openings, and sliding bar *c*, connected to the disks by links *h*, all substantially as and for the purpose set forth.

2. The combination of the hook *l* with the lever *m*, having lugs, the two connected by a bolt, as and for the purpose specified.

398,797. CAR-BRAKE. HOMER L. PHELPS, Athens, Pa., assignor of one-half to George D. Miller, same place. Filed Oct. 4, 1888. Serial No. 287,173. (No model.)



Claim.—1. The combination, with the crank-shaft having a narrowed spindle at its lower end, of the arm standing at right angles thereto above said spindle and removably secured by a bolt passing through said arm and shaft, substantially as specified.

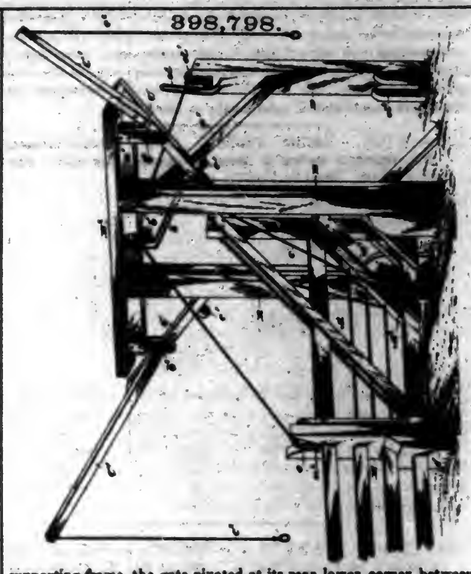
2. The combination, with the crank-shaft having a winding-spindle at its lower end, the chain, and the brake-rod, of the removable arm seated on said shaft above the spindle, and having the series of adjusting-openings, and having the enlarged portion provided with a perforation, and the transverse fastening-bolt, substantially as specified.

398,798. GATE. WILLIAM G. PIERCE, Sacramento, assignor of one-half to Max Mierson, Placerville, Cal. Filed Sept. 6, 1888. Serial No. 284,698. (No model.)

Claim.—1. In a gate of the character described, the combination of the supporting-frame, the gate pivoted therein, the operating-levers, a way or ways arranged diagonally across the rear lower corner of the gate, the automatic gravitating catch mounted thereon, and connections between the inner ends of the operating-levers and the catch, substantially as described.

2. In a gate of the character described, the combination of the

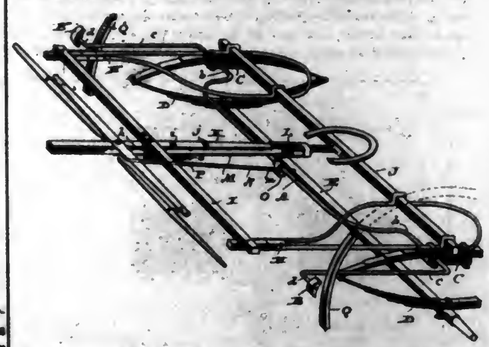
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supporting-frame, the gate pivoted at its rear lower corner between the lower ends of the side posts of said frame, the diagonally-arranged way, the automatic gravitating catch mounted thereon, the operating-levers pivoted on the frame, a spool or pulley journaled in the top of the frame between the side posts, connections between the inner ends of the operating-levers and the catch, and a weight, as *f*, connected to the upper free corner of the gate by a rope passing over the pulley on the frame, substantially as described.

3. In a gate of the character described, the combination of the supporting-frame, the gate connected thereto at its rear lower corner by a pivot, a way consisting of a metal rod strained diagonally between the hinge-post and bottom rail of the gate, and an automatic catch mounted on said way, consisting of a rectangular metal block having a central eye to receive said way, substantially as described.

398,799. WAGON-BRAKE. PAUL PUSCHEL, Milwaukee, Wis. Filed Nov. 22, 1888. Serial No. 291,822. (No model.)



Claim.—1. A carriage or wagon brake that comprises a horizontal beam shaped at both ends to form forwardly-extended cranks, shoes carried by the cranks, stationary guide-loops arranged to loosely support the beam, and a longitudinal rod or rods uniting said beam with the draft-gear of the vehicle to which the brake may be connected, substantially as set forth.

2. A carriage or wagon brake that comprises a horizontal beam terminated at both ends in forwardly-extended cranks, shoes carried by the cranks, stationary guide-loops arranged to support the beam, and a rod or rods adjustably connected to said beam and united to the draft-gear of the vehicle to which the brake may be connected, substantially as set forth.

3. A carriage or wagon brake that comprises a horizontal beam shaped at both ends to form forwardly-extended cranks, shoes carried by the cranks, stationary guide-loops arranged to loosely support the beam, a plate secured to the vehicle-tongue, and a longitudinal rod connecting the plate with said beam, substantially as set forth.

4. A carriage or wagon brake that comprises a horizontal beam terminated at both ends in forwardly-extended cranks, shoes carried by the cranks, stationary guide-loops arranged to support the beam, a rod or rods for uniting said beam with the draft-gear of the vehicle, to which the brake may be connected, and a spring or springs arranged to normally hold said draft-gear in such position that the shoes are away from the adjacent wheels, substantially as set forth.

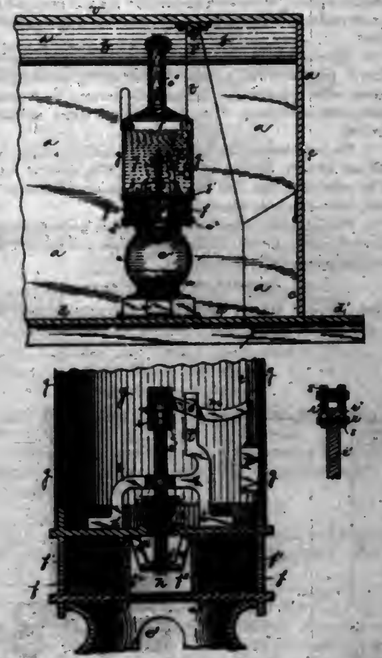
5. A carriage or wagon brake that comprises a horizontal beam shaped at both ends to form forwardly-extended cranks, shoes carried by the cranks, stationary guide-loops arranged to loosely support the beam, a plate secured to the vehicle-tongue, a supporting-loop for the tongue, a spiral spring connecting the plate and supporting-loop, and a longitudinal rod uniting said plate and beam, substantially as set forth.

6. A carriage or wagon brake that comprises a horizontal beam terminated at both ends in forwardly-extended cranks, shoes carried by the cranks, stationary guide-loops arranged to support the beam, and a rod uniting said beam with the tongue of the vehicle, to which the brake may be applied, in combination with a socket arranged to receive the butt of said tongue, substantially as set forth.

7. In a vehicle, the combination of vertical rods having their upper ends terminated in horizontal forwardly-extended guide-loops and their lower ends provided with horizontal forward extensions clipped to an axle of the vehicle, goose-necks forming continuations of said extensions and terminated in spring-shackles, a horizontal beam loosely supported in the guide-loops and shaped at both ends to form forwardly-extended cranks, shoes carried by the cranks, thills secured to the spring-shackles, and rods connecting said shackles and beam, substantially as set forth.

8. In a vehicle, the combination of vertical rods having their upper ends terminated in horizontal forwardly-extended guide-loops and their lower ends provided with horizontal forward extensions clipped to an axle of the vehicle, goose-necks forming continuations of said extensions and terminated at both ends in forwardly-extended cranks, straps connecting the shackles and lower horizontal extensions of the vertical rods, a horizontal beam loosely supported in the guide-loops and shaped at both ends to form forwardly-extended cranks, shoes carried by the cranks, thills connected to said spring-shackles, and rods uniting these shackles and the beam, substantially as set forth.

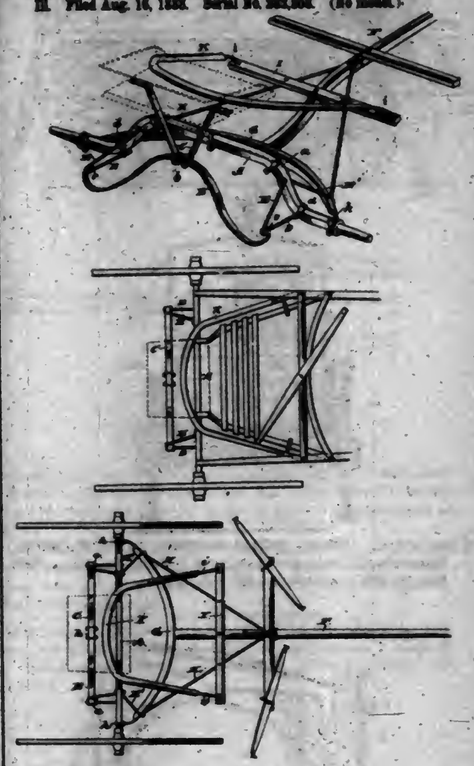
398,800. SAFETY CAR-STOVE. ABRAM REESE, Pittsburg, Pa., assignor to C. L. Magee, Robert Pitcairn, and C. McF. Reed, all of same place. Filed May 13, 1887. Serial No. 238,053. (No model.)

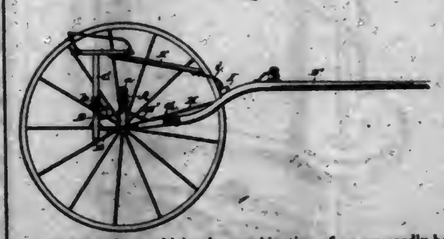


Claim.—1. In safety car-stoves, the combination of the stove, the water-reservoir located above the stove, the valve closing communication between said reservoir and stove, the operating-lever, and a sliding joint connecting the valve and lever, substantially as and for the purposes set forth.

2. In safety car-stoves, the combination of the stove, the reservoir located above the stove, the valve closing communication between them, the lever *m*, connected to the valve by a sliding joint, and the weight *n* for operating the lever, substantially as and for the purposes set forth.

398,801. TWO-WHEELED VEHICLE. FRANK RUDOLPH, Beaver, Ill. Filed Aug. 16, 1888. Serial No. 282,898. (No model.)



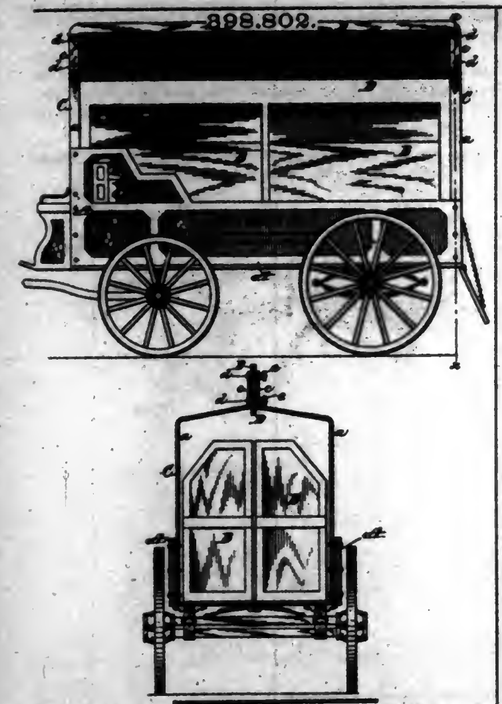


Claim.—In a vehicle, the combination of an upwardly-bowed axle, a semi-elliptical spring, B, connected to the axle by rearwardly-extending horizontal bars D, connected to clips on the axle, and brace-rods E, which extend from the outer ends of the rods D upwardly and inwardly and bolted to said axle, a bar, C, secured to the said spring B, and having outwardly-spreading bent ends adapted to be secured to and support the seat, the pole or thills having a cross-bar, I, secured thereto, the circle-bar K, secured to the seat, having spring-extensions *i*, attached to the cross-bar I, the curved bar G, and the brace-rods H and E, substantially as described.

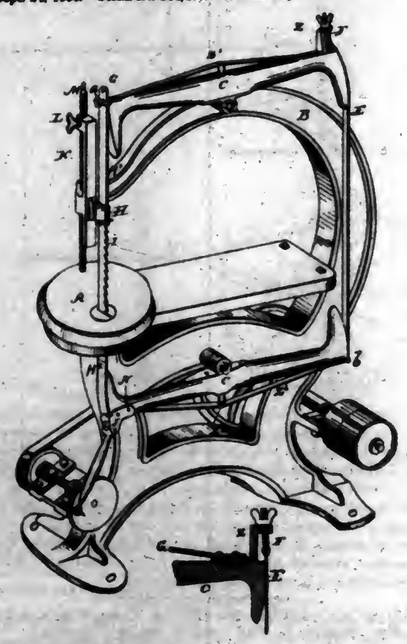
398,802. ADVERTISING-VEHICLE. THOMAS F. SCANLAN, Boston, Mass. Filed Dec. 26, 1888. Serial No. 294,660. (No model.)

Claim.—In an advertising-vehicle, the combination, with the body, of a series of supporting-frames, C, each composed of two portions, *a a*, having at their upper ends vertical offsets *c*, forming jaws, a detachable sign, D, supported by and fitting within said jaws, and extending centrally over the body of the vehicle in the direction of its length, and means for detachably securing said sign within the jaws of the supporting-frames, substantially as and for the purpose set forth.

398,802.

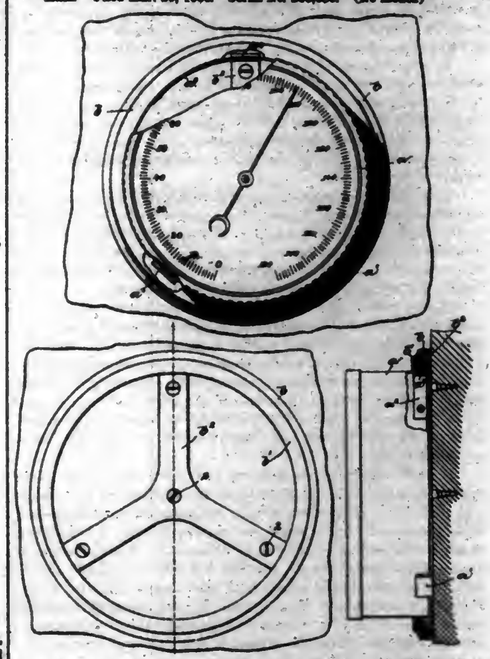


398,803. SCROLL-SAWING MACHINE. CALVIN W. SEDWICK, Callensburg, Pa., assignor of one-half to R. R. Elliott, same place. Filed Sept. 24, 1886. Serial No. 214,465. (No model.)



Claim.—The within-described scroll-sawing machine, consisting of the main supporting-frame having the overhanging arm B, the upper and lower oscillating beams, C C, each provided with bracing-straps and straining-posts, the straining-strap, its adjusting screw F, the bracket Z, the two straps H' H², the slide H, the adjustable guide, the saw I, the vertical back guide forming part of the arm B and provided with vertical apertures, the adjustable pressure-rod, and the set-screw for securing said rod, substantially as specified.

398,804. HOLDER FOR THERMOMETERS OR OTHER INDICATORS. THOMAS W. SHEFFIELD, Peabody, Mass., assignor to Edgar W. Upton and Henry G. Rice, same place, and Herbert Torrey, Hanover, Mass. Filed Mar. 29, 1888. Serial No. 269,089. (No model.)



Claim.—1. The case *a*, combined with the frame having a continuous flanged rim or frame adapted to receive the side wall of the case and locking devices concealed and protected by said flange, substantially as described, for permanently locking the case in position.

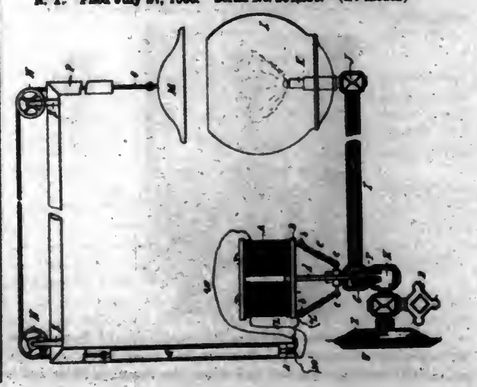
2. The case *a* and the flanged frame or rim *b*, combined with an automatic locking device concealed within the said case, and by which the said case is locked to the rim permanently, substantially as described.

3. The case having rigid and yielding locking devices concealed within it, combined with a frame or rim having a continuous flange adapted to be engaged and permanently secured by fastenings concealed by the said flange when placed in the frame, substantially as described.

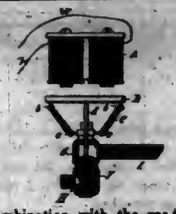
4. The case having the lugs *a'* and a yielding locking device, a^4, combined with the continuous flanged rim *b*, to which it is attached, and by which the lugs and yielding device are concealed and protected, substantially as described.

5. The case, the flanged rim *b*, having the spider b^5 within it, and concealed locking devices to connect the case and rim or holder permanently, substantially as described.

398,805. GAS-EXTINGUISHER. ADAM STRIEBLER, New York, N. Y. Filed July 27, 1888. Serial No. 281,238. (No model.)

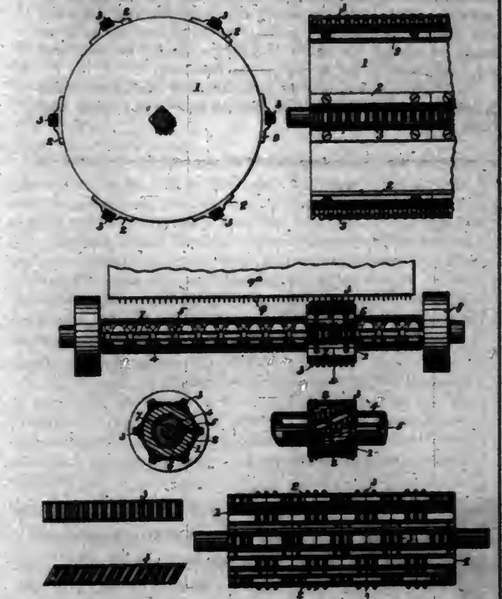


398,805.



Claim.—The combination, with the gas-fixture G H I J K L, hereinbefore described, of the key F, perforated as specified, and working in the joint G H of said fixture, the stem *d*, connecting the said key F and the armature B, the armature B, mounted on the end of the stem *d* and working on the poles of the electro-magnet A, the spring C, connecting the eyes *b* of the armature and the eyes *c* of the gas-fixture, the electro-magnet A, mounted so as to operate on the armature B, as specified, and connected with the circuit-closer R by the wires *w* and *x*, the circuit-closer R, connected with the magnet A and a battery, as specified, the weight Q, working upon said circuit-closer, the weight M, hanging over the globe of said gas-fixture and connected with the weight Q, the cord O, connecting the weight M and Q and passing over the pulleys N N, and the pulleys N N, mounted so as to accommodate the cord O, all substantially as and for the purpose set forth.

398,806. APPARATUS FOR GRINDING THE CARDS OF CARDING-ENGINES. JOHN STEAD, Lindley, near Huddersfield, County of York, England. Filed July 17, 1888. Serial No. 280,160. (No model.)



Claim.—In an apparatus for grinding card-teeth, a grinding-roller carrying readily-removable and suitably-spaced toothed grinding-strips, substantially as and for the purpose described.

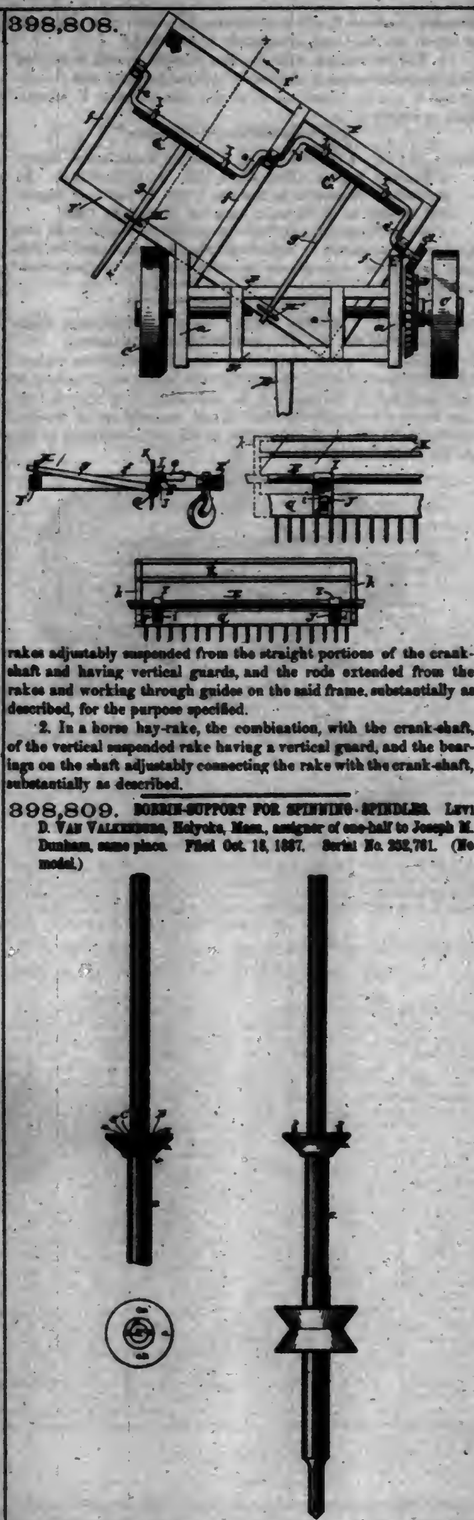
398,807. INSECTICIDE. JAMES TOBLINSON, near Morrison, Va. Filed Dec. 19, 1888. Serial No. 294,101. (No specimens.)

Claim.—The herein-described composition, consisting of kerosene, lard, lye, insect-powder, tobacco, and water, for the purpose and in or about the proportions described.

398,808. HORSE HAY-RAKE. ELWOOD TUBB and JACOB B. RUNSTROM, Manchester, Iowa; said Tubb assignor to said Runstrom. Filed Aug. 20, 1888. Serial No. 283,208. (No model.)

Claim.—1. The herein-described horse hay-rake, composed of the main frame, the wheels, the gear-wheel D, connected with one of the wheels, the rake-frame having middle cross-bar and set at an oblique angle to the draft of the machine and connected at one front corner with the main frame, the crank-shaft journaled at its ends and midway of its ends in the rake-frame and having one end extended and provided with a pinion which meshes with the said gear-wheel, the

398,808.



rakes adjustably suspended from the straight portions of the crank-shaft and having vertical guards, and the rods extended from the rakes and working through guides on the said frame, substantially as described, for the purpose specified.

2. In a horse hay-rake, the combination, with the crank-shaft, of the vertical suspended rake having a vertical guard, and the bearings on the shaft adjustably connecting the rake with the crank-shaft, substantially as described.

398,809. BOBBIN-SUPPORT FOR SPINNING-SPINDLES. LEVI D. VAN VALKENBURG, Holyoke, Mass., assignor of one-half to Joseph M. Dunham, same place. Filed Oct. 18, 1887. Serial No. 252,761. (No model.)

Claim.—1. The combination, with the screw-threaded spindle, of the interiorly-threaded button or bobbin-support A and the interiorly-

threaded check-nut B, said button being chambered on its upper side to receive the check-nut, substantially as described.

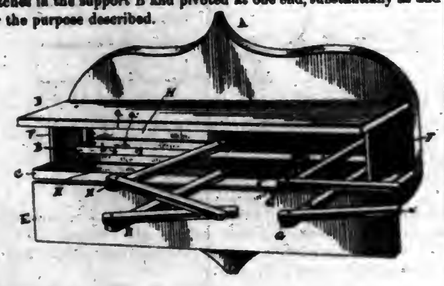
2. The combination, with the screw-threaded spindle, of the interiorly-threaded button A, chambered at G and provided with the pins or lugs D, and the check-nut B, formed with the slots H, substantially as described.

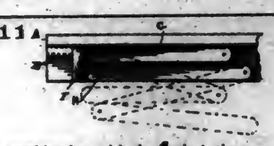
398,810. ARTIFICIAL FUEL. LEOPOLD WAGER, London, County of Middlesex, England. Filed May 1, 1888. Serial No. 272,618. (No specimens.) Patented in England Dec. 1, 1887, No. 16,901; in Belgium Feb. 23, 1888, No. 80,750, and in Spain Feb. 22, 1888, No. 7,959.

Claim.—The herein-described composition of matter to be used for fuel as a substitute for coal, consisting of coal-dust, sawdust, clay, sand, solution of saltpeter, and tar, substantially in the proportions specified.

398,811. CLOTHES-DRIER. DAVID L. WOOTHERSTON, Toledo, Ohio. Filed Mar. 21, 1888. Serial No. 268,057. (No model.)

Claim.—1. The herein-described rack, composed of the back A, the two supports B and C, the pairs of rack-bars G and H, pivoted at their inner ends to the supports, the end pieces, F, pivoted at their rear edges, the door E, the shelf D, and the supports *b b*, fitted in notches in the support B and pivoted at one end, substantially as and for the purpose described.





2. The combination, with the back A, the supports B and C, and the pairs of rack-bars G and H, adapted to fold between the supports, of the supports *b b*, fitted in notches in the support B, and adapted to be turned down and brace the support B when the rack-bars are opened, substantially as described.

3. The combination of the back A, the support B, and the pairs of rack-bars G and H, each rack-bar composed of a series of folding sections, the rack-bar G being pivoted near the inner edge of the support and folding against the back A, and the rack-bar H pivoted near the outer edge of the support and folding on the rack-bar G, the two rack-bars folding in opposite directions and in different vertical planes.

REISSUES.

10,988. PROCESS OF PURIFYING IRON. GEORGE G. MULLINS, Los Angeles, Cal., assignor to the Mullins Silicated Iron and Steel Company, East St. Louis, Ill. Filed Feb. 21, 1883. Serial No. 264,875. Original No. 370,401, dated Sept. 27, 1887.

Claim.—1. The process of purifying and improving iron by the introduction to the melted mass of iron, at the proper heat, of pulverized silica, which consists in adding silica when the iron is at a suitable white heat, subsequently puddling the charge until blue and green flames are emitted, then finally working the metal in the usual manner, substantially as and for the purpose described.

2. That improvement in the manufacture of iron which consists in adding silica to the molten iron when the latter is at a proper heat as set forth.

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DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

PATTEE PLOW COMPANY *v.* KINGMAN & COMPANY *et al.*

Decided February 4, 1889.

1. PATTEE—CULTIVATORS—REISSUE No. 6,080.

Reissue Letters Patent No. 6,080, granted to James H. Pattee October 6, 1874, for an improvement in cultivators, *Held* to have been illegally expanded. Even if valid, when limited to what alone could be claimed as new, is not infringed by the appellee.

2. REISSUES—ENLARGEMENT OF ORIGINAL PATENT.

It is well settled that a reissue can only be granted for the same invention intended to be embraced by the original patent, and the specification cannot be substantially changed, either by the addition of new matter or the omission of important particulars, so as to enlarge the invention as intended to be originally claimed.

3. KENDALL—CULTIVATORS.

The essential characteristics of Letters Patent No. 174,684, granted March 14, 1876, to Thomas W. Kendall, for an improvement in cultivators, are the rigidity of the runners and the resulting automatic action, and are not infringed by the appellee's machine, which does not contain runners constructed as the Kendall runners are, in the rigid form, and operated by the draft of the team to keep them off, or by the weight of the plows to keep them on, the ground, and so lacks the distinctive features of the Kendall patent, and which is not automatic, but requires manipulation every time the use is changed.

4. PATTEE—CULTIVATORS—No. 187,899.

Letters Patent No. 187,899, granted February 27, 1877, to Henry H. Pattee, for an improvement in cultivators covering the use of parallel bars and the attachment of the bars to the end-plates, embraces nothing that is not old and really nothing that is patentable, that is, which involves invention rather than mechanical skill.

APPEAL from the Circuit Court of the United States for the Eastern District of Missouri.

Mr. John R. Bennett for the appellant.

Mr. L. L. Bond and *Mr. E. A. West* for the appellees.

Mr. Chief Justice FULLER delivered the opinion of the Court.

This is an appeal from a decree of the Circuit Court of the United States for the Eastern District of Missouri, dismissing appellant's bill of complaint.

The bill charges appellees with infringement of the second claim of Reissue Letters Patent No. 6,080, dated October 6, 1874, which is a reissue of original Patent No. 124,218, to J. H. Pattee, dated March 5, 1872; of the first and second claims of original Patent No. 174,684, granted Thomas W. Kendall, March 14, 1876; and of original Patent No. 187,899, granted Henry H. Pattee, February 27, 1877; all for improvements in cultivators.

Appellee is an Illinois corporation, having a branch house in St. Louis, selling, among other things, cultivators manufactured by B. D. Buford & Co., at Rock Island, Ill., which are the alleged infringing machines.

The opinion of the circuit court was as follows:

Reissued patent 6,080, of 1874, second claim of which is under consideration, has, as to that claim, expanded the original beyond legal limits. Therefore, said reissued patent is void to the extent claimed, wherein the defendant is alleged to have infringed. Second, as to the Kendall patent No. 174,684, there is no infringement. Third, as to the Pattee patent of 1877, No. 187,899, said patent is void, there being no novelty of invention therein that is patentable.

The second specification of the original Pattee patent, No. 124,218, states that the invention consists—

in pivoting the wheels to the axle in such manner that the wheels may either one be advanced forward of the other, throwing the axle diagonal with the line of progression, while the wheels preserve the same relative position to the said line of progression.

The second specification of the reissue reads as follows:

It consists in *hinging the ends of the axle to plates, to which the draft animals are attached, and which are supported on wheels* in such manner that the wheels *are retained in the line of progression of the machine by the draft of the animals, and* may either one be advanced forward of the other, throwing the axle diagonal with the line of progression, while the wheels preserve the same relative position to the said line of progression.

The fourth specification of the original is:

It consists in the peculiar construction of the hitching device, allowing the draft animals to advance or recede, the one ahead or in the rear of the other, without influencing the plow-beams to the extent of the variation made by the said animals, all as hereinafter fully described.

The sixth specification of the reissue is:

It consists in the *arrangement* of a hitching device *with the draft-plates, which allow* the draft animals to advance or recede, the one ahead or in rear of the other, without influencing the plow-beams to the extent of the variation made by the said animals, all as hereinafter fully described.

The description of the accompanying drawings is given in the original and in the reissue, thus:

Original.	*Reissue.*
A is the axle, bowed or elevated at its central part. B B are plates secured to the ends of the axle A. The ends of the plates B B are *turned* outward, forming *snugs b b b b*. b^1 b^1 are snugs projecting inward from the plates B B. C C are *triangular-shaped draft-plates*, from which project snugs *c c c c*, corresponding with the snugs *b b b b*. D D are pins or bolts, passing through holes in the snugs *c c* and *b b*, and thereby pivoting the plates C C to the axle A. E E are the wheels. F F are the wheel-spindles, their inner ends shouldered, threaded, and secured in slots *e e* in the lower ends of the plates C C by nuts *f f*. G G are eveners, pivoted near their centers in the forward ends of the plates C C. H H are bars, their forward ends pivoted to the inner ends of the eveners G G, and their rearward ends pivoted to the snugs b^1 b^1. I I are hooks on the outer ends of the eveners G G, to which the draft animals are attached.	A represents the axle, formed as shown in the drawings, of an elevated central part, A, vertical side portions A^1 A^1, and *horizontal projections a a*, from each of the vertical side portions A^1. B B are draft-plates, with projecting forward ends *b*, to which the draft animals *may be attached direct* or by *any suitable* device, and with an enlarged rear end, from which project lugs b^1 b^1, corresponding with the *projections a a* of the axle A, to which they are hinged by vertical bolts C, as plainly shown in the drawings. D D are the supporting-wheels. E E are the wheel-spindles, their inner ends shouldered, threaded, and secured in slots *e* in the lower ends of the plates B by nuts e^1. G G are eveners, pivoted near their centers in the forward ends of the plates B. H H are bars, their forward ends pivoted to the inner ends of the eveners G G, and their rearward ends pivoted to lugs a^1 a^1, which project inwardly from the vertical parts A^1 of the axle. I I are hooks on the outer ends of the eveners G G, to which the draft animals are attached.

From this on the original and reissue specifications are substantially alike, the description of Fig. 1 of the reissue closing with the words—

It will be evident that the draft-plates B support and give direc-

tion to the course of the wheels, while the wheels in turn serve to support them.

The first claim of the original is for:

The axle A, having plates B hinged to the wheel-spindle plates C, so that the wheels are retained in the line of progression when one is in advance of the other, as set forth.

The second claim of the reissue is for:

The axle A, hinged to the wheel-spindle or draft-plates B B, so that the wheels are retained in the line of progression *by the draft of the animals*, when one is in advance of the other, substantially as described and for the purpose specified.

The third claim of the original is:

The evener-bars G G and bars H H, when combined and arranged to operate with the hinged axle A, plates C, and wheels E E, substantially as and for the purpose specified.

And the sixth claim of the reissue:

The evener-bars G and bars H, combined and arranged to operate with the hinged axle A, plates B, and wheels D, substantially as and for the purpose specified.

That purpose is stated in the second claim to be the retaining of the wheels "in the line of progression by the draft of the animals, when one is in advance of the other," and as this purpose can only be accomplished by the aid of the evener-bars G G and bars H H, that is, not by the combination of the second claim alone, but only by carrying into it the eveners and bars of the sixth claim, it follows that the latter must be brought into the former by intendment.

In the original patent the mode of attachment of the team to the cultivator is stated to be by the hooks I I—

on the *outer ends* of the *eveners* G G, to which the draft animals *are attached*—

while the reissue patent contains these words:

B B are draft-plates, with projecting forward ends *b*, to which the draft animals may be attached *direct*, or by any suitable device.

An examination of the machine discloses that the wheels are kept in the line of progression by the eveners G G and their connection, and when they are dispensed with, and the hitch made direct, the wheels follow the animals and may get out of the line of progression.

As it is admitted that if the eveners are elements of the second claim, the effect of their omission and of hitching directly to the draft-plates instead of to the eveners would be to enlarge the claim, and as in our judgment this is precisely what was done, the reissue must be held to have been illegally expanded.

It may also be observed that the connecting-bow in the original patent, called an axle, consists of a central curved portion with a plate attached to each end, and two spindle-plates, a combination of five parts. In the reissue the axle and side plates are treated as one part, making with the two spindle draft-plates three parts. There is, therefore, an omission in the latter combination which tends, by reducing the number of elements, to render its scope less narrow than that of the original.

As we have seen, the original first claim was for—

the axle A, *having plates B* hinged to the wheel spindle-plates C, so that the wheels are retained in the line of progression when one is in advance of the other, as set forth.

The second claim of the reissue is for—

the axle A, hinged to the wheel-spindle or draft-plates B B, so that the wheels are retained in the line of progression *by the draft of the animals*, when one is in advance of the other, substantially as described, and for the purpose specified.

The axle, having plates as described hinged to wheel spindle-plates, is not identical with an axle omitting the first-named plates, or having them so affixed as to become a constituent part thereof. The omission of the plates B and the addition of the direct draft are significant and material changes, and it is well settled that a reissue can only be granted for the same invention intended to be embraced by the original patent, and the specification cannot be substantially changed, either by the addition of new matter or the omission of important particulars, so as to enlarge the invention as intended to be originally claimed.

Passing to the question of infringement, it will be found that when the extent of the invention is determined, as it must be, by reference to the state of the art, the appellee's machine does not infringe in respect to those parts of the claim which can be held to have been unanticipated. It is alleged in the bill that in *Pattee* v. *Moline Plow Company*, in the United States Circuit Court for the Northern District of Illinois, the court sustained the validity of said Reissued Letters Patent No. 6,080. Upon referring to that case (10 Bissell, 377, and 9 Fed. Rep., 821, 22 O. G., 178) we find that Judge Blodgett held:

From the proof in this case it is quite clear to me that Pattee was not the first to conceive and embody in a working machine the idea of a tongueless straddle-row cultivator. The first machine shown in the proof which embodies this idea is that patented by Isaac Constant, in November, 1851. It is a tongueless straddle-row cultivator, with all the elements for a working machine of that description, and so arranged as to be what may be called in this art self-sustaining, that is, it will stand upon its own supports. This was also done by Arnton Smith in January, 1855; by Whitely in 1860 to 1865; by E. W. Vaugundy in February, 1864; by Pratt in October, 1864; and by Adam Young in November, 1866. All these show cultivators constructed without a tongue, with two plow-beams held together by a yoke, each plow drawn by its own draft animal and operating independently of the other.

The Constant patent here referred to is in this record and shows a tongueless cultivator, in which the inside beams move vertically and laterally, independent of each other, and each draft-animal is hitched to its own side, while the side supports are beams to which two cultivator-shovels are applied.

The Smith machine is a tongueless cultivator, in which two mold-board plows are connected together by a bar in front, not arched up in the center. A horse is to be attached to each plow, and the coupling so made as to allow an independent motion.

Of the Pratt patent Judge Blodgett says that Pattee's arched and jointed axle is fully anticipated by it in form of construction, function, and mode of operation. This Pratt patent shows a flexible, parallel, tongueless cultivator, in which each horse pulls his own side of the machine.

The patent to William Tasker of 1859 has an axle hinged to draft or spindle arms, having projecting bars so coupled that the wheels are retained in the line of progression by the draft of the animals. Tasker's fifth claim is:

The connecting of the wheel-stumps to a vertical spindle or spindles, capable of turning freely in vertical collar-bearings or sockets, as hereinbefore described.

The description as to this part of his machine is thus:

J J are adjustable stumps for carrying the running-wheels K K. These stumps pass through the overhanging lugs L L, formed at the top and bottom of each of the round spindles M M, which are contained in the vertical sockets N N (one of which is shown in section in Fig. 3) of the cast-iron frame C, and are free to turn therein, thereby enabling the stump of each wheel to swivel or lock round when turning the plow, as shown by the dotted lines in Fig. 2.

If Pattee's claim were merely for a combination of an axle, having an elevated central portion, with the wheel-spindles, so that the draft of the team controls the direction of the wheels, the Tasker patent anticipates it; but the combination differs from that in the arrangement by which the evener-bars are carried inwardly so as to connect with the arch or central part of the axle, making the axle a part of the evener so combined, and thus maintaining the parallelism of the wheels.

Appellee's machine does not have "the wheel-spindles or draft-plates" of the patent, nor the axle A with side-plates B, but it uses the Pratt axle of 1864. Nor in appellee's machine is the parallelism of the wheels maintained by the draft devices, nor are they retained in the line of progression by the draft of the animals, but turn as the animals may pull. The beam-frames of appellee's machine have nothing to do with the wheel-spindle. The snugs of Pattee's have nothing to do with the plow-beams. The differences are so great that interchangeability of the parts of the two machines would be utterly out of the question.

In our judgment the reissue if valid, when limited to what alone could be claimed as new, is not infringed by appellee.

The first and second claims of the Kendall patent, No. 174,684, are as follows:

1. The runners E, arranged to support the axle of a tongueless cultivator, with the plows D suspended therefrom, in manner substantially as described.

2. The combination of the runners E, plows D, hook-rods F, and axle A of a tongueless cultivator, substantially as and for the purpose specified.

As stated on behalf of appellant—

the second claim in said patent is a claim for substantially the same combination as recited in the first claim, but differently worded from the first claim—

and as the hang-up devices are necessary for the suspension of the plows, the two claims may be treated as one.

The invention is said in the specifications to consist of the use of runners attached to the truck frame or axle in such manner that they will not interfere with the operations of the machine when in use, and will act as supporting-runners for the axle when the rear ends of the plows are elevated and suspended thereon; and, second, in the combination of hooks or rods for suspending the plows on the axle, with said axle and plows.

The drawings show the axle, the wheels, the draft-plates, and the plows of an ordinary cultivator of the tongueless class. The runners, constituting as alleged the "main feature" of the improvement, are journaled on the outer ends of the spindles of the wheels, midway their lengths, and their forward ends curved inward, and secured to the draft-plates by a threaded end and nut, while their rear ends are extended backward and downward and curved in such position that when the plows are in operation in the field and the axle upright, the rear ends of the runners will be above and free from the surface of the ground, and when the rear ends of the plows are elevated and suspended by any means from the axle, the rear ends of the runners will rest upon the ground and support the axle from being pulled backward and downward. In short, as in the machines with a tongue, the plows are raised up and suspended from the tongue to keep them off the ground, so in the tongueless machine the plows are raised up and hooked on to the axle, and, to prevent their falling backward with the axle, runners are provided, connected with the axle and the hitching-arm of the machine, which sustain the axle when the plows are hooked on, but are themselves raised from contact with the ground by the draft when the plows are in use.

The runners are described as "journaled on the outer ends of the spindles," but it is also stated that they—

may be attached *rigidly* to any suitable part of the axle at one or more points of attachment, and extend backward in the same manner as described.

These runners, having the wheel spindle or axle for their fixed point of support, are necessarily rigid and unyielding, and work automatically, their rear ends being raised by the pulling of the team and lowered by the weight of the plow-beams when placed on the hooks.

The rigidity of the runners and the resulting automatic action are the essential characteristics of the patent, for tongueless wheel-cultivators with runners to keep the plows off the ground were common and well known in the art when it was issued.

It is contended by appellant that the true state of the art is contained in the prior patents of Poling of 1872 and Robertson of 1875, and while many others are exhibited, an examination of these will, we think, sufficiently establish the conclusion just expressed.

Poling's patent is for a tongueless cultivator, provided with runners, which are placed under the beams by hand, when the plows are being transported, and which are taken out and carried on the beams when the plows are in operation.

Robertson's patent is for a tongueless cultivator, with draft-plates, wheels, and beams, and runners pivoted to the beams near the axle, and arranged with set-screws to lock the plows up and let them down. It is immaterial to the operation of the runners whether they act directly on the plow-beams or through the axle.

In appellee's machine the runner is arranged upon the end of an arm which projects backward from the axle. When the plows are in use the runner is turned up out of the way. When the runners are used the plows are raised and the runners prevented from turning up by a catch on the arm. This machine does not contain runners constructed as the Kendall runners are, in the rigid form, and operated by the draft of the team to keep them off, or by the weight of the plows to keep them on, the ground, and so lacks the distinctive features of the Kendall patent. It is not automatic, but requires manipulation every time the use is changed. When the runner is put in use its rear extension is turned down by hand, and a locking-dog, hung within a slot in the arm, turned into position. When the runner is not to be used, it must be moved so as to release the dog and permit it to be thrown up, and the arm is then thrown upward and forward, the dog being allowed to drop so as to afford a support for the runner. This jointed runner with a lock cannot be held to be the Kendall rigid bar.

We agree with the circuit court that there is no infringement.

Patent No. 187,899 is described as being for a new and improved mode of constructing the arch or central and main part of straddle-row-cultivator beam yokes or axles, and of connecting the side parts thereto, and the invention as consisting—

in constructing said arch of curved adjacent bars of iron or steel, to the ends of which may be attached, by riveting, the cast-iron

parts for securing thereto the plows and wheels, and which may be strengthened by the use of stiffening-bolts.

The use of parallel bars is exceedingly common, and so far as the attachment of the bars to the end plates is concerned there is nothing new in that method.

The Burnham and Lathrop patent of 1866 shows a yoke connecting the plow-beams together, made with two parallel bars with end castings, put together with one bolt near the rear ends of the beams instead of with two bolts at the front ends, as in appellant's machine. The specification says:

The two frames G G are connected by an arched or semicircular yoke, H^2, the ends of which are pivoted to bars I I, which are secured on the tops of the plow-frames G G by pivots *e*, the bars being allowed to turn freely on the pivots *e*.

The Louden patent of 1876 has an arched axle of tubular wrought-iron, gas-pipe being stated to be very suitable, having end castings attached rigidly or cast thereon.

The Barr patent of 1872, and the Miller patent of the same year, show arched axles or beam-yokes of two or more parts. The Perkins patent of the same year shows the beams themselves made of parallel curved bars.

What is sought in all these patents is strength and lightness, together with cheapness and durability, but they are simply modes of construction. And that described in this patent embraces nothing that is not old and really nothing that is patentable, that is, which involves invention rather than mechanical skill.

Upon the whole case we are satisfied with the conclusions reached by the circuit court, and its decree is, therefore, affirmed.

U. S. Circuit Court—Western District of Pennsylvania.

TONDEUR *v.* CHAMBERS.

Decided January 10, 1889.

1. VALIDITY OF PATENT—OATH AS TO CITIZENSHIP.
   It is not a valid defense to a suit for the infringement of Letters Patent granted under the Revised Statutes that the patentee in his application therefor made oath that he was a citizen of the United States when he was not, such misstatement as to his citizenship having been made innocently through mistake, without any improper design whatever.

2. TONDEUR—GLASS-ANNEALING FURNACES.
   Letters Patent No. 258,156, dated May 16, 1882, for improvements in glass-annealing furnaces, granted to Cleon Tondeur, sustained, and the defendants adjudged to infringe the same. (Following *Tondeur* v. *Stewart*, 28 Fed. Rep., 561.)

Mr. J. Snowden Bell and *Messrs. W. Bakewell & Sons* for the complainant.

Mr. George J. Harding and *Mr. George Harding* for the defendants.

ACHESON, *J.*:

This is a suit for the alleged infringement by the defendants of Letters Patent No. 258,156, for improvements in glass-annealing furnaces, granted to Cleon Tondeur, the plaintiff, on May 16, 1882, a patent which this court already has had occasion to consider in the case of *Tondeur* v. *Stewart et al.*, (28 Fed. Rep., 561,) where there was a decree in favor of the patentee. The present defendants, however, were not parties to that suit, and, as some new proofs have been adduced by them, this case has been heard as if none of the questions involved had ever been passed on, and the conclusions I am about to announce have been reached after a re-examination of the grounds of the former decision and a careful consideration of the case in all its branches.

The patent discloses a device for transporting the sheets of glass from the flattening-wheel to the discharging end of the annealing-chamber, tunnel, or leer, consisting of two sets of parallel bars (designated *d* and *d'*) extending lengthwise through the leer and elevated above the bottom thereof, the bars of the respective sets being arranged side by side and alternately between each other, one set reciprocating longitudinally and conveying the glass, and the other set supporting the glass at certain times, whereby the sheets of glass are supported in and carried through the leer in substantially the same horizontal plane.

The specification shows and describes a series of transverse shafts to support the two sets of bars, each shaft being provided with two sets of arms, E' and E''', the arms E' carrying grooved wheels upon which the reciprocating or transmitting bars *d'* rest, and whereby they have a free rectilinear motion back and forth in the leer, while the supporting-bars *d* are made fast to the arms E''' by a hinge-joint. By means of a lever connected with one of the shafts one set of bars is raised and the other is lowered simultaneously to the extent altogether of about one inch, and thus the glass is shifted from one set of bars to the other; but, touching the motion of the bars *d*, the specification states, and the fact is, that it "is very small," (being limited to the short distance the lever moves the arm E''',) and "has no effect on the progress of the glass through the tunnel."

The described operation of the device is this: The ends of the reciprocating bars *d'* having been pushed into the flattening-furnace and a sheet of glass placed thereon, the operator at the outer end of the leer draws the bars *d'* outward the width of the sheet. Then by a motion of the lever he lowers the bars *d'* and raises the bars *d*, and thus the sheet is transferred from the bars *d'* to the bars *d*, upon which it rests while he pushes the bars *d'* back into the furnace. He then reverses the lever and the bars *d'* take up the sheet. A second sheet is then placed on the inner ends of the bars *d'*, and the two sheets are moved down the leer and deposited on the bars *d*, and the bars *d'* are again pushed back. This operation is repeated until a series of sheets extends throughout the leer, when they are discharged from the outer end one by one at each reciprocal movement of the bars *d'*.

The patent has 5 claims; but infringement of the first claim only is here asserted. That claim is as follows:

1. The combination of the bars *d d'*, arranged side by side and alternately between each other, the set *d* supporting the sheets of glass while the bars *d'* are pushed toward the leer or flattening-wheel *a*, and the set *d'* supporting the sheets of glass and moving them onward and through the tunnel, substantially as set forth.

The answer denies that the plaintiff was the first and original inventor of what was patented to him, and also denies infringement. To sustain the former defense the defendants rely not only upon the patents to Bievez and Bowen, which were mainly relied on to defeat the suit in *Tondeur* v. *Stewart et al.*, *supra*, but also upon Letters Patent dated November 25, 1873, granted to J. B. Boulicault, and several French patents, particularly the patent to A. M. Bouvy. Now, in respect to the first two mentioned

patents, I can discover no good reason for departing from the conclusion upon the question of anticipation expressed in the opinion of the court in the earlier case. Of the Boulicault patent it must be said that the drawings and specification in so far as they have any relation to the particular matter here in controversy are obscure. Moreover, there is some positive testimony tending to show that the construction thereby contemplated was a failure in practice; and so also there is evidence, especially the testimony of Henry L. Dixon, a furnace-builder and practical expert, which strongly impresses the conviction on my mind that the Bouvy device is impracticable for the proper annealing of sheets of glass. But, aside from these considerations, I think it can be confidently affirmed that not one of the several patents set up as anticipatory shows two sets of bars, one of them (the conveying set) having a reciprocating rectilinear motion, and the other set supporting the glass while the first set is pushed back into the furnace, which is an essential characteristic of the plaintiff's device. Notwithstanding, then, what prior inventors may have achieved, I am of the opinion that Tondeur's device possesses patentable novelty, and this conclusion is strongly sustained by the plaintiff's proofs—abounding and uncontradicted—showing the great utility of his patented invention and its immediate and very general adoption. The leers which had been commonly in use were the car-leer, in which the sheets of glass are transported through the annealing-tunnel on cars, and the hearth-leer, in which the sheets are moved along the floor of the leer, resting thereon except at the instant of transfer from place to place. But the plaintiff's improvement wrought a great change in the practice of the art to which it appertains. Glass-manufacturers generally have abandoned the old methods of transporting the glass through the annealing-tunnel, and have adopted the plaintiff's device, and a large number of them in various parts of the country have taken licenses from him. And, undoubtedly, the plaintiff's device secures more uniform and thorough annealing, resulting in a great saving of glass from breakage and also quicker work than any device or method previously employed for the like purpose. Now, while such facts as these may not be decisive of the question, they certainly go far to establish patentability. (*Smith* v. *Goodyear Dental Vul. Co.*, 93 U. S., 486; *Loom Co.* v. *Higgins*, 105 U. S., 580; *Consolidated Valve Co.* v. *Crosby Valve Co.*, 113 U. S., 158, 179.) Coming, then, to the question of infringement, we find that the defendants use two sets of elevated bars, and that the only difference (alleged to be material) in construction or mode of operation between their device and that described in the plaintiff's specification is that in the defendant's leers the bars which support the sheets of glass while the reciprocating bars are pushed toward the flattening-wheel are stationary, and the vertical movement for shifting the glass from one set of bars to the other is performed by the reciprocating bars alone. Is this difference sufficient to relieve the defendants from the charge of infringing the first claim of the patent? Certainly the variation is practically unimportant. As was said in *Tondeur* v. *Stewart et al.*, *supra*, most clearly the defendants' stationary bars perform the identical supporting function which the plaintiff's bars *d* perform, the only function, be it observed, assigned to those bars by the first claim. Then, again, it is evident that for the supporting of the sheets of glass by the bars *d* and the supporting and moving of them by the bars *d'* (the particular matters covered by the first claim) it is altogether immaterial whether the vertical movement is divided between the two sets of bars or is executed by the bars *d'* alone. The difference is not in principle, but in mere arrangement. In all essential particulars the plaintiff's described device and that employed by the defendants' are alike. They operate in substantially the same way and produce the same beneficial results. This, however, is not all, for not only do the defendants use and enjoy the substance of the plantiff's invention, but their bars come within the very terms of the first claim of the patent. Therefore, to escape the charge of infringement, the defendants are under the necessity of contending that the first claim of the patent shall be construed to mean two sets of movable elevating bars. To sustain this view, much stress is laid upon certain passages of the specification which treat of the shifting movement of the bars *d* and *d'*, and also upon the disclaimer to be found in the patent in the words following:

I am aware that movable bars and fixed temporary rests for the glass have long been in public use to move sheets of glass through an annealing-tunnel. Therefore I do not claim these.

Now, it may well be that the patentee considered the simultaneous change in the elevation of the two sets of bars as the most advantageous mode of shifting the glass from set to set, and this feature he has taken care to cover by the second claim of the patent. But the first claim calls for no such limitation as is insisted on, and its language is free from ambiguity. Why, then, should the court import into the claim a qualification not expressed—something wholly unnecessary to the therein-described operation—when the only practical effect would be to deprive a worthy inventor of the benefit of his patent?

The disclaimer was considered in the case of *Tondeur* v. *Stewart et al.*, *supra*, and the judgment of the court was against giving to it the effect here contended for. To that conclusion I must adhere. I will not repeat or much enlarge on what was said upon this subject in the former opinion. The disclaimer is to be read with reference to the prior state of the art, and it may and ought to be construed so that it may harmonize with the plainly-expressed terms of the first claim of the patent.

The claim follows directly upon the heels of the disclaimer—

But what I do claim is—
1. The combination of the bars *d d'*, &c.

The specification describes two sets of bars, one set having a temporary supporting function and the other set supporting and moving the sheets of glass through the leer. The first claim of the patent is for the combination of these two sets of bars arranged and cooperating in the manner and for the purpose defined. The claim should be interpreted with reference to the actual invention. The reasonable presumption is that, having a just right to cover and protect his whole invention, the patentee intended to do so. (*Winans* v. *Denmead*, 15 How., 341.)

The construction of patents should be liberal, so as to secure to inventors what they have created, if it can be done consistently with the language used. (*Turrill* v. *Railroad Co.*, 1 Wall., 491; *Klein* v. *Russell*, 19 Id., 433.)

Guided by these just principles, I must reject the construction the defendants would put on the first claim of the patent and hold them to be infringers thereof. But the defendants make the further defense (which was not set up in the prior suit) that the Letters Patent sued on are null and void, upon the ground that in the application for his patent the plaintiff made oath that he was a citizen of the United States, which he was not. The answer does not allege, nor is there any evidence to indicate, that the plaintiff was guilty of any fraud or that his oath was willfully false. On the contrary, it satisfactorily appears that he acted under an honest mistake and with no improper design whatever. The plaintiff left Belgium, his native land, in the year 1881, and came to the United States with the avowed intention of making this country thenceforth his permanent place of residence and citizenship, and he ignorantly supposed that by virtue of his residence and the residence of his family here he became a citizen. This mistake he did not discover until a long time after the grant of his patent. Now, the question raised, it will be perceived, is not whether the Letters Patent are voidable for the cause assigned at the suit of the Government. The position taken is that the patent is a nullity. In support of the proposition the defendants cite the case of *Child* v. *Adams*, (1 Fish., 189,) in which a similar defense was sustained by Judge Grier. But that case arose under and was governed by the patent act of 1836, which allowed the grant of Letters Patent to aliens only upon peculiar conditions, to which citizens were not subject. (5 Stats. at Large, 117.) By that act the patent-fee payable by a citizen was $30 only, whereas an alien was required to pay at least $300, and if a British subject $500; and by the stringent language of the act the fee was to be paid before the application for a patent could be considered by the Commissioner. (Section 9.) Then, again, an alien patentee was compelled "to put and continue on sale to the public, on reasonable terms, the invention or discovery for which the patent issued." (Section 15.) It was therefore, under that act of the highest importance that the applicant should truly disclose his citizenship, and section 6 required that before any inventor should receive a patent he should "make oath * * * of what country he is a citizen." The decision cited was expressly put upon the ground that an alien, whether through ignorance or intention, falsely swearing that he was a citizen in order to procure a patent not only failed to perform a condition upon which his right to a patent depended, but committed a fraud upon the Government. But the law governing the present case—*i. e.*, the patent act of 1870, as embodied in the Revised Statutes—abolished all such discriminations against aliens and placed them upon the same footing as citizens in respect to the grant of Letters Patent for inventions and the enjoyment of the privileges thereby secured. (R. S., secs. 4886, 4920, 4934.) Therefore, under the law as it stood when the plaintiff applied for and obtained his patent, the mistake in his statement as to his citizenship operated, and could operate, neither to his advantage nor to the detriment of the Government or the public. Furthermore, it is well worthy of notice that while section 4892 Revised Statutes requires the applicant for a patent to "make oath that he does verily believe himself to be the original and first inventor," &c., in respect to citizenship, the language is, "and shall state of what country he is a citizen." This change in phraseology seems to be intentional and to dispense with the necessity of an oath as to citizenship. At any rate, the citizenship of the applicant for a patent is no longer a matter of any real importance, and a mistake touching the same is harmless. I feel quite justified, then, in declining to apply to this case the rule which prevailed in *Child* v. *Adams*, *supra*. In the absence of express statutory provision avoiding a patent for a misstatement as to citizenship, it would be going to an extreme length, and, indeed, in the face of well-settled equitable principles, for the court to hold that a mere mistake in that regard, innocently made and working no sort of harm, should have such effect. In *Com. Mfg. Co.* v. *Fairbank Canning Co.*, (27 Fed. Rep., 78,) where it was urged that a patentee was estopped to deny that his American patent was for the same invention before patented by him in a foreign country by reason of his having made oath that such was the fact in his application for the former, it was held that if the inventor was laboring under a mistake as to this point his rights ought not thereby to be defeated or abridged. At an early day Judge Story held, in *Whittemore* v. *Cutter*, (1 Gall., 429,) that an error in the form of the oath of an applicant for a patent was immaterial; and in *Crompton* v. *Belknap Mills* (3 Fish., 536) the court said that even the entire failure to make the oath would not invalidate the patent. Upon the whole, then, I am of the opinion that the misstatement in the plaintiff's oath as to his citizenship is not an available defense to this suit.

Let a decree be drawn in favor of the plaintiff.

U. S. Circuit Court—District of Massachusetts.

THOMPSON *et al. v.* RAND-AVERY SUPPLY COMPANY.

Decided February 5, 1889.

SHOREY—MACHINE FOR FORMING STAPLE-SEAMS IN LEATHER—INFRINGEMENT.

The infringement of the third claim of Letters Patent No. 186,340, granted February 23, 1873, to Samuel W. Shorey, for an improvement in machines for forming staple-seams in leather by the use of defendant's rest or supporter, which has no incline or bevel, doubtful. Motion for injunction denied.

Mr. James E. Maynadier for the complainants.

Mr. H. D. Donnelly for the defendant.

COLT, *J.*:

In order to grant the motion for a preliminary injunction now prayed for I must be satisfied that the defendant uses the inclined or retreating anvil *n*, which is one of the elements of the third claim of the Shorey patent or its equivalent. Upon an examination of the papers before me I have considerable doubt whether defendant's rest or supporter, which has no incline or bevel, can be said to be the equivalent of the inclined anvil *n*, or whether the defendant can fairly be said to use the combination of devices or the equivalents contained in the third claim of the Shorey patent.

Judge Blodgett, in the case of these plaintiffs against the E. P. Donnell Manufacturing Company *et al.*, where the same question arose, refused an injunction, and after the opinion of Judge Wheeler in the case against the American Bank Note Co. (45 O. G., 347; 35 F. R., 203) he still refuses to modify his opinion. It further appears that Judge Shiras, of the district of Minnesota, denied similar motions in several cases brought by these complainants against different defendants. In view of the doubt in my mind on the question of infringement, I think I ought to follow the ruling of Judge Blodgett and Judge Shiras and deny the motion.

Motion denied.

The same order may be entered in the case of the complainants against L. P. Coffin.

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $3.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Indexes to Patents on Electricity.

Appendix No. 2 to the index to patents relating to electricity, covering the period of time from July 1, 1882, to June 30, 1883, has been issued, and is now for sale. These indexes, arranged alphabetically, numerically, and by classes, are completed to June 30, 1883, and comprise the following volumes:

Vol. 1. Index to patents relating to electricity granted by the United States prior to June 30, 1881, with an appendix, July 1, 1881, to June 30, 1882. One volume, 250 pages. In paper covers, $3; bound, $5.

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Indexes to Foreign Patents.

The following indexes to foreign patents have been translated, compiled, and published under the authority of the Commissioner of Patents, and may be obtained as a Patent Office publication at the prices given below:

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Reissues	1	—No. 10,989.
Total issue	489	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	1	...	Nebraska	1	...
Arizona Territory	...	...	Nevada	1	...
Arkansas	...	1	New Hampshire	1	...
California	5	1	New Jersey	13	1
Colorado	4	...	New Mexico Territory	...	...
Connecticut	17	...	New York	73	16
Dakota Territory	...	...	North Carolina	1	...
Delaware	...	...	Ohio	33	3
District of Columbia	2	...	Oregon	1	...
Florida	...	...	Pennsylvania	39	4
Georgia	...	...	Rhode Island	5	...
Idaho Territory	...	...	South Carolina	1	...
Illinois	45	3	Tennessee	1	...
Indian Territory	...	...	Texas	6	...
Indiana	9	2	Utah Territory	...	...
Iowa	8	...	Vermont	1	...
Kansas	8	1	Virginia	6	2
Kentucky	6	...	Washington Territory	...	...
Louisiana	2	1	West Virginia	1	...
Maine	...	1	Wisconsin	9	...
Maryland	2	...	Wyoming Territory	...	...
Massachusetts	44	2	United States Army	...	...
Michigan	16	...	United States Navy	...	...
Minnesota	3	...			
Mississippi	2	...	Total to citizens of the United States	384	33
Missouri	17	1			
Montana Territory	...	...			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries	Patents and Designs.	Trade-Marks and Labels.	Countries	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic	...	...	Germany	11	...
Australia	...	...	Ireland	...	1
Austria-Hungary	2	...	Mexico	...	...
Belgium	1	...	Netherlands	...	...
Bermuda	...	...	New Zealand	...	...
Brazil	...	...	Norway	...	...
Canada	8	...	Russia	...	...
Chili	...	...	Scotland	1	...
Colombia, U. S. of	...	...	Spain	...	...
Cuba	...	...	Switzerland	3	3
Denmark	...	...	Victoria	1	...
England	15	2			
Finland	...	...	Total to citizens of foreign countries	44	7
France	2	1			

DESIGNS.

18,943 and 18,944.—BRUSH OR MIRROR BACK.—*Henry Berry*, Shelton, Conn., assignor to *The Derby Silver Company*, same place. Applications filed January 14, 1889. Serial Nos. 296,296 and 296,297. Term of patents 7 years.

18,945.—GAS OR OIL STOVE.—*Theodore W. Burger*, Dunellen, N. J., assignor to *Burger & Lee*, New York, N. Y. Application filed July 5, 1888. Serial No. 279,122. Term of patent 14 years.

18,946.—FONT OF COMBINATION TYPE ORNAMENTS.—*John Graham*, Chicago, Ill. Application filed January 5, 1889. Serial No. 295,571. Term of patent 3½ years.

18,947 and 18,948.—RUG.—*Thomas E. Meagher*, Philadelphia, Pa., assignor to *Schofield, Mason & Co.*, same place. Applications filed February 8, 1889. Serial Nos. 299,161 and 299,162. Term of patents 3½ years.

18,949.—BATH-TUB.—*Francis J. Torrance*, Allegheny, Pa. Application filed February 9, 1889. Serial No. 299,299. Term of patent 14 years.

18,950.—STAIR-BUTTON.—*David Walker*, Newark, N. J. Application filed December 3, 1888. Serial No. 292,576. Term of patent 14 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,327.—PHOTOGRAPHIC PAPERS, INSTRUMENTS, SPECIALTIES, AND SUPPLIES.—*American Aristotype Co.*, Jamestown, N. Y. Application filed January 14, 1889. Used since December 22, 1888.
"The word 'ARISTO.'"

16,328.—WATCHES AND THEIR COMPONENT PARTS.—*Anc. Fque. Vacheron & Constantin, (Limited,)* Geneva, Switzerland. Application filed January 25, 1889. Used since January 1, 1869.
"The representation of two crosses of the Maltese type, the outer edge of the arms of one cross being straight and the equivalent edge of the arms of the other cross being essentially triangular."

16,329.—BEER OF A LIGHT COLOR AND SUPERIOR QUALITY.—*The Bergner & Engel Brewing Company*, Philadelphia, Pa. Application filed December 11, 1888. Used since June 1, 1882.
"The word 'TANNHÄEUSER.'"

16,330.—SHEETINGS AND SHIRTINGS.—*Boott Cotton Mills*, Lowell, Mass. Application filed January 22, 1889. Used since December 1, 1868.
"The word 'SIGNAL.'"

16,331.—COTTON-BATS.—*William J. Caldwell*, Reading, Pa. Application filed January 23, 1889. Used since November 1, 1888.
"The word 'GEM.'"

16,332.—COTTON-BATS.—*William J. Caldwell*, Reading, Pa. Application filed January 23, 1889. Used since May 1, 1888.
"The word 'MAMMOTH.'"

16,333.—METAL ROOFING.—*The Canton Steel Roofing Company*, Canton, Ohio. Application filed January 2, 1889. Used since October 1, 1886.
"A diamond or lozenge shaped figure having located therein a circle, rolls of roofing partly unwound, and within the circle a monogram consisting of the letters 'C S R Co.'"

16,334.—BITTERS.—*Elijah T. Cooper*, Allegheny, Pa. Application filed January 8, 1889. Used since October 2, 1888.
"A monogram of the initials 'E T C.'"

16,335.—SOAP.—*Joseph Crosfield & Sons*, Warrington, county of Lancaster, England. Application filed January 23, 1889. Used since January 1, 1881.
"The word 'UNIVERSAL.'"

16,336.—WASHING COMPOUND.—*Marie Perkins Evans*, New Orleans, La. Application filed January 24, 1889. Used since January, 1887.
"The word 'WATERLINE.'"

16,337.—COLLARS, CUFFS, NECK-WEAR, SHIRTS, AND UNDERWEAR.—*Simon Hayem, Aîné*, Paris, France. Application filed November 13, 1888. Used since 1830.
"The words 'MARQUE DE FABRIQUE' on the upper and 'MAISON FONDEE EN 1830' on the lower side of an oval band, the capital letters 'H' and 'A' on the left and right hand, respectively, of the representation of a phenix or bird with outspread wings arising out of a bed of flame, and the words 'MAISON DU PHENIX' above the oval."

16,338.—SHOE-ELASTIC.—*Herbert & Rapp Company*, Boston, Mass. Application filed January 19, 1889. Used since December 15, 1888.
"A heart-shaped device within which, in any style of lettering, are the words 'HUB' on one line, 'GORE' on a second line, and any single letter of the English alphabet on a third line in the apex of the figure."

16,339.—BISCUITS, CRACKERS, WAFERS, AND SIMILAR ARTICLES.—*Holmes & Coutts*, New York, N. Y. Application filed January 21, 1889. Used since December 5, 1888.
"A mottled border or frame surrounding the display-face of the packages of biscuits, crackers, and wafers."

16,340.—STOVE-POLISH.—*Gaylord M. Jackson*, Los Angeles, Cal. Application filed January 11, 1889. Used since 1886.
"A bust portrait of 'GAYLORD M. JACKSON' and the word 'JACKSON'S' and the word 'POLISH.'"

16,341.—CEMENT FOR MAKING BLACKBOARD-SURFACES.—*John K. Knox*, Skaneateles, N. Y. Application filed January 11, 1889. Used since October 8, 1886.
"The word 'HORNSTONE.'"

16,342.—LAUNDRY AND TOILET SOAP.—*B. A. Lynde & Son*, Buffalo, N. Y. Application filed February 6, 1889. Used since January 29, 1889.
"The word 'TRUTH.'"

16,343.—ILLUMINATING-OIL.—*Mather Brothers*, Albany, N. Y. Application filed January 14, 1889. Used since 1871.
"A star inclosed by a triangle which is partly surrounded by an incomplete ring."

16,344.—MEDICAL COMPOUNDS FOR THE CURE OF FEMALE DISEASES.—*John A. McGill*, South Bend, Ind. Application filed January 24, 1889. Used since December, 1888.
"The letters 'O B.'"

16,345.—MAPLE-SIRUP.—*George D. Powell*, Brooklyn, N. Y. Application filed September 28, 1888. Used since October 12, 1886.
"The word 'SAP' and the representation of a maple-leaf."

16,346.—WHISKY.—*John Power & Son*, Dublin, Ireland. Application filed July 31, 1888. Used since 1791.
"The letter 'P' within a diamond or lozenge shaped figure."

16,347.—FLAVORING EXTRACTS FOR FOOD.—*Price Baking Powder Company*, Chicago, Ill. Application filed January 11, 1889. Used since November 15, 1888.
"The representation of a bottle in outline, a label secured thereto, and a star and curved line on the label."

16,348.—CHEWING-GUM.—*H. D. Smith & Co.*, Cincinnati, Ohio. Application filed January 14, 1889. Used since March 1, 1888.
"The compound word 'YLANG-YLANG.'"

16,349.—EXPLOSIVES.—*The Smokeless Powder Company, (Limited,)* London, England. Application filed January 8, 1889. Used since March 24, 1888.
"A device which may be described as follows: On the right-hand side a figure representing a volunteer or soldier in uniform. In the center two concentric circles shown on a white rectangular space, between which circles are the words 'SMOKELESS POWDER COMPANY, LIMITED.' In the central circle are four blackened circles having the following white letters shown thereon—namely, 'S S,' 'S R,' 'S B,' 'S M.' Around the blackened circles are also the words 'SPORTING,' 'RIFLE,' 'MILITARY,' 'BLASTING.' On the left-hand side a figure representing a sportsman carrying a gun. The two figures are shown as standing on the banks of a piece of water."

16,350.—PLOWS.—*South Bend Iron Works*, South Bend, Ind. Application filed January 19, 1889. Used since 1870.
"The words 'THE OLIVER.'"

16,351.—CLOVER SEED.—*Chas. Stager & Co.*, Toledo, Ohio. Application filed January 21, 1889. Used since June 2, 1888.
"The word 'BUCKEYE.'"

16,352.—ROAD-WAGON THE BODY OF WHICH IS SUPPORTED BETWEEN SIDE BARS BY CROSS-SPRINGS.—*Rufus M. Stivers*, New York, N. Y. Application filed December 14, 1888. Used since June, 1882.
"The word 'RUNABOUT.'"

16,353.—MEDICINE FOR THE CURE OF INDIGESTION, DYSPEPSIA, AND LIVER COMPLAINT.—*E. M. Thomas Manufacturing Company*, Jersey City, N. J., and New York, N. Y. Application filed February 4, 1889. Used since January 9, 1889.
"The word 'VITALIA.'"

16,354.—SPIRAL OR VOLUTE SPRINGS FOR WATCHES.—*Usine Genevoise de Dégrossissage D'or*, Geneva, Switzerland. Application filed November 9, 1888. Used since September 15, 1888.
"The representation of a bowed arrow."

16,355.—BALANCE-WHEELS FOR WATCHES.—*Usine Genevoise de Dégrossissage D'or*, Geneva, Switzerland. Application filed November 9, 1888. Used since May 29, 1888.
"The representation of a straight arrow."

16,356.—LIQUID MEDICINE FOR EXTERNAL AND INTERNAL USE.—*Frank A. Wright*, Lewiston, Me. Application filed December 29, 1888. Used since 1861.
"The words 'MAGNETIC ELECTRIFIER.'"

LABELS.

5,832.—Title: "BOLLING'S CRYSTAL CREAM" (FOR CUTICLE OINTMENTS.)—*The Bolling Drug Company*, Little Rock, Ark. Application filed September 11, 1888. (Trade-Mark Registered.)

5,834.—Title: "BALDWIN'S PERFECTION SALVE."—*Joseph B. Brock*, Riverton, Va. Application filed February 7, 1889.

5,835.—Title: "BALDWIN'S PERFECTION SKIN-CURE."—*Joseph B. Brock*, Riverton, Va. Application filed February 7, 1889.

5,836.—Title: "CARTY'S AGUE CURE."—*William C. Carty*, Graniteville, Mo. Application filed November 30, 1888.

5,837.—Title: "THE COTTON OIL PRODUCT CO'S BATH SOAP."—*The Cotton Oil Product Company*, New York, N. Y. Application filed February 6, 1889.

5,838.—Title: "GUARANTEE" (FOR RUBBER AND OIL CLOTHING.)—*Dunlap, Lawton & Hall*, Chicago, Ill. Application filed February 11, 1889. (Trade-Mark Registered.)

5,839.—Title: "MELILOTUS CREAM" (FOR A COMPOUND FOR THE COMPLEXION.)—*Thomas H. Field*, Chicago, Ill. Application filed January 10, 1889.

5,840.—Title: "PROTECTION CHECK" (FOR BLANK BANK CHECKS.)—*George A. Libbey*, Kansas City, Kans. Application filed January 21, 1889.

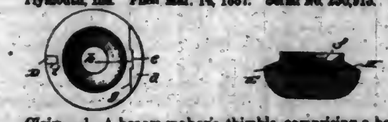
5,841.—Title: "SERRATED RIBBON" (FOR TYPEWRITER RIBBONS.)—*Adelbert P. Little*, Rochester, N. Y. Application filed February 5, 1889.

5,842.—Title: "YOUNG'S INDIAN SALVE."—*Frances E. Young*, New York, N. Y. Application filed February 6, 1889.

PATENTS

GRANTED MARCH 5, 1889.

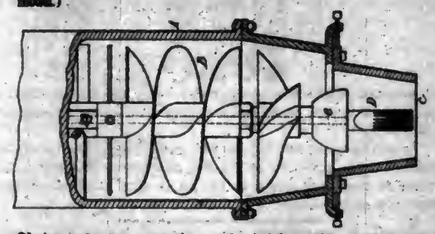
398,812. BROOM-MAKER'S THIMBLE. DANIEL W. ALBERT, Plymouth, Ind. Filed Mar. 14, 1887. Serial No. 230,913. (Model.)



Claim.—1. A broom-maker's thimble comprising a base-section and a top section of hard metal and a disk of a softer metal confined between the respective sections, substantially as specified.

2. The combination, with the plano-convex section, of the section connected therewith and having a flaring aperture and its inner side provided with an annular groove, and the disk arranged at the base of the aperture, substantially as specified.

398,813. ATTACHMENT FOR BRICK-MACHINES. PHILIP G. BENSON, Aurora, Ill. Filed Sept. 1, 1888. Serial No. 284,319. (No model.)



Claim.—1. As an attachment for brick-machines, the grooved blade D as made with continuous and gradually-deepening grooves and ribs on its opposite surfaces, all terminating in one thin zigzag or corrugated edge, as shown and described, and adapted to be held stationary at or near the exit-mouth of the machine, as set forth.

2. In combination with a brick-making machine, a stationary bar reduced at its outer end to a thinned blade, D, having unbroken longitudinal grooves extending to a thin terminal edge of the blade, all as set forth, such blade being located to project beyond the extremity of the clay-propelling mechanism, all substantially as set forth.

398,814. ELECTRICAL TRAMWAY. HENRY T. BLAKE, New Haven, Conn. Filed Nov. 30, 1888. Serial No. 292,292. (No model.)

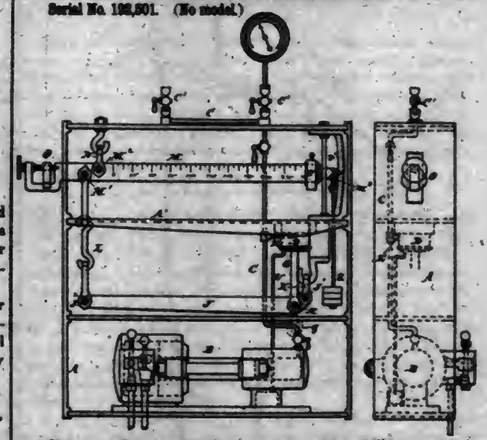


Claim.—1. An electrical conductor-conduit composed of a base, of wood or other non-conducting material, a metallic electrical conductor-strip laid in said base below its upper surface, a depression or channel in said base above said conductor, a strip or flap of flexible non-conducting material attached by one of its edges along the upper surface of said base and overlying said channel, and a strip of flexible non-conducting material attached to the under side of said flap and filling the mouth of said channel as a continuous plug and adapted to be lifted by a plow-shaped trolley, or by any other suitable device acting upon said plug or flap, all in the manner as described.

2. The devices described and shown as a covering for any slotted conduit, consisting of a flap of flexible material attached along one of its edges to the upper surface of said conduit, so as to cover such slot, a strip of flexible material attached to the under side of such flap and closing the slot of the conduit as a continuous plug and adapted to be lifted and replaced in the manner shown and described, and weighting-plates attached to the upper side of the flap, all as shown and described.

3. A conduit for an electrical railway and other uses, consisting, first, of a base, of wood or other suitable non-conducting material, having its upper surface rounded or roof-shaped, and having a channel cut in said upper surface, at the bottom of which the electric conductor is laid; second, a flexible flap overlying said upper surface and attached thereto along one of its edges, and, third, weighting-plates secured to said flap, which extend across said channel and whose under surface conforms to the curved or roof-shaped surface of said base, and thereby causes the said flap to conform, when in position, to such shape, so as to form a curved, roof-shaped, or sloping covering over said base, which is held in place by said weighting-plates, except when lifted by the passage of the trolley, all in the manner and for the purpose described.

398,815. APPARATUS FOR TESTING STEAM OR OTHER PRESSURE GAUGES. JOHN D. BOWMAN, Altoona, Pa. Filed Feb. 10, 1886. Serial No. 192,501. (No model.)



Claim.—1. In a gage-testing apparatus, substantially as specified, the combination of the chamber D, having piston F, supported on the scale-levers J M, with the fluid-conduit C extending above the piston and having at its top cocks C, to which the gages are attached.

2. In a gage-testing apparatus, substantially as specified, the combination of a force-pump, B, the fluid-conduit C, leading to the gages, a chamber, D, communicating with said conduit, the piston F, of known area, and the levers J M, arranged to support the piston and weigh the pressure on its surface.

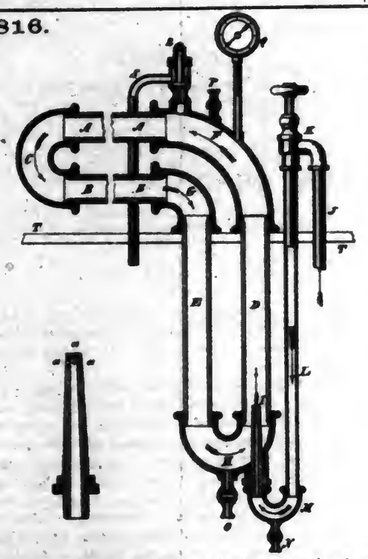
3. In a gage-testing apparatus, substantially as specified, the combination, with the chamber D and piston F, of the annular gutter S, having drip-pipe U, with the saucer-shaped ring T, secured upon the rod G and having its depressed rim over the gutter S.

398,816. RAILWAY-CAR HEATER. WILLIAM DEBERTY, New York, N. Y., assignor to John B. Gray, same place. Filed May 2, 1887. Serial No. 236,814. (No model.)

Claim.—1. The combination, with a radiator-pipe having a depending loop, the two forming a complete circuit of pipes for a heating medium, of a jet-pipe extending within the loop, and a suitably-governed valve on the circuit, substantially as described.

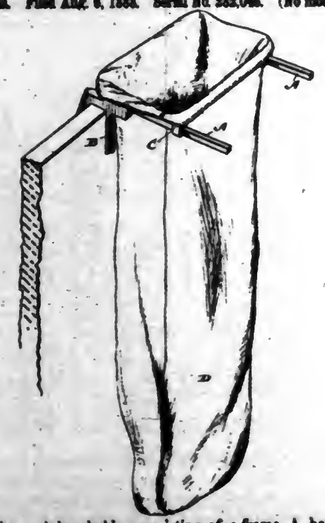
2. The combination, with a radiator-pipe having a depending loop, the two forming a complete circuit of pipes for a heating medium,

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of a jet-pipe extending within the loop, having a closed end and side perforations, and a suitably-governed valve on the circuit, substantially as described.

398,817. BAG-HOLDER. WILLIAM R. BURRAGE, Toronto, Ontario, Canada. Filed Aug. 6, 1888. Serial No. 282,046. (No model.)



Claim.—A bag-holder consisting of a frame, A, having downwardly-projecting jaws B, and an upwardly-bent side, *a*, extended above the top of said jaws, in combination with the studs or fingers C, adjustably fitted onto the frame A, and arranged in conjunction with the bent side *a*, to hold open the mouth of the bag D they are supporting, substantially as and for the purpose specified.

398,818. SPARK-CONDUCTOR. KENT H. CARPER, Salem, Va. Filed Dec. 7, 1888. Serial No. 292,899. (No model.)

Claim.—1. In a spark-conductor, the flue provided with the branch tubes extending out from the conductor and slightly inclined in the direction of the draft to re-enforce the same, and provided with flaring or bell-shaped mouths, substantially as described.

2. In a spark-conductor having a flue and discharge-pipes suitably connected thereto and placed at suitable distances along said flue, and provided at their lower ends with weighted valves controlled as described.

3. A spark-conductor having the flue provided with the wire-gauze bottom and the trough secured beneath said gauze bottom, substantially as described.

4. A spark-conductor having a reversible flue-section provided

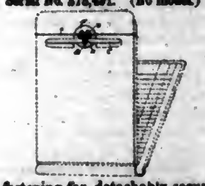
398,818.



with a central support having a swiveled clamp, and the end supports provided with curved clamping-arms hinged to the base, substantially as described.

5. In a spark-conductor, the wire-gauze receptacle detachably connected to the rear end of the flue and having its bottom constructed of gauze and hinged to one of its sides and held normally closed by a spring, substantially as described.

398,819. FASTENER. ARTHUR I. COLTON, Cleveland, Ohio. Filed June 28, 1888. Serial No. 278,491. (No model.)



Claim.—1. A fastening for detachably securing an elastic band to book, file-case, wrapper, or other article, such fastening consisting substantially of an elastic tongue fastened to and extending across a hole in the cover, flap, or casing of such article, the free end of the tongue overlapping the inside of such cover, flap, or casing, or an attachment thereof, to prevent the tongue from bending outward through such holes, substantially as set forth.

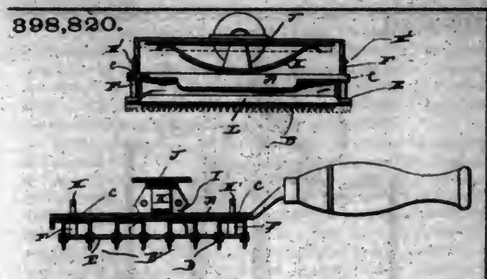
2. In a fastening for an elastic band, the combination, with a suitable hole in the cover, flap, or casing, for instance, of a book, wrapper, or other article, and a tongue fastened to and extending across a hole in and the free end of the tongue overlapping on the inside of such cover, flap, or casing, of a re-enforcing band secured around such hole, such tongue and re-enforcing band being preferably integral, substantially as set forth.

398,820. CURRY-COMB. WELLS R. DAVIS, Alberta, Mo. Filed Nov. 22, 1888. Serial No. 291,561. (No model.)

Claim.—1. The combination, with the curry-comb having the slots C at its corners, of the cleaning-frame having the guide-pins at its corners projecting through said slots and a spring secured to the comb and acting on the cleaning-frame to hold it normally withdrawn, as set forth.

2. The combination, with the curry-comb having stationary teeth and provided with the slots C at its corners, of the cleaning-frame having a series of longitudinally-slotted bars fitting snugly upon the teeth of the comb, and provided at its corners with guide-pins pro-

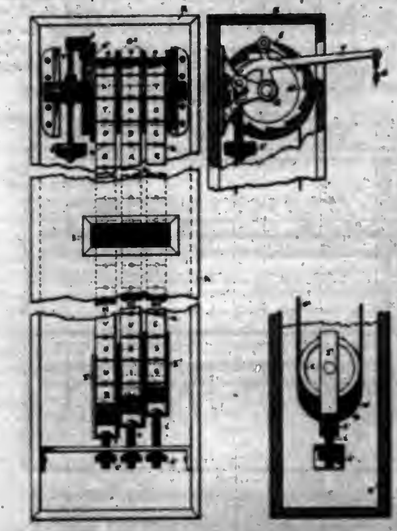
398,820.



jecting through the slots C, and a spring to hold the cleaning-frame normally withdrawn, as set forth.

3. The combination, with the curry-comb having slots C at its corners, of the side bars, E, the guide-pins erected on said side bars at the ends of the same and extending through the said slots C, and provided with shoulders H and the projections H', adapted to contact with the opposite sides of the curry-comb, the cross-bars secured to the side bars, E, and fitting upon the teeth-bars of the curry-comb, the standards erected on the side bars, the cross-bar extending between said standards, and the spring secured on the curry-comb and bearing against said cross-bar, as set forth.

398,821. TALLYING APPARATUS FOR GRAIN-HOPPERS. JOHN A. DENUYL, Toledo, Ohio. Filed May 31, 1888. Serial No. 275,009. (No model.)

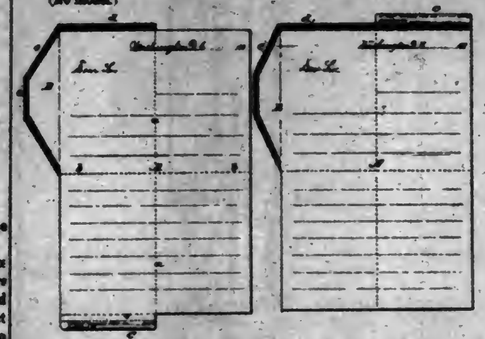


Claim.—1. In a registering apparatus for measuring grain, the combination, with a sprocket-drum and ratchet-wheel, pawl, and lever for intermittently rotating the drum, of endless belts of different lengths operating upon the sprocket-drum, these belts being lettered, and a casing inclosing the belts, such casing having a sight-hole through which one letter of each belt may be read at a time, substantially as set forth.

2. In a registering apparatus for measuring grain, the combination, with a motor consisting, essentially, of a casing located inside a hopper, such casing having a depressible false bottom and induction and eduction openings, of a sprocket-drum, ratchet-wheel, pawl, and lever for intermittently rotating the drum, endless belts of different lengths operating on the drum, and a flexible connection between the depressible false bottom of the casing and the lever, substantially as set forth.

3. In registering apparatus for weighing grain, the combination, with a sprocket-drum and ratchet-wheel, pawl, and lever for intermittingly rotating the drum, substantially as indicated, of belts, preferably of metal, and operating upon the sprocket-drum, the different belts having unequal numbers of equal spaces, the spaces of each belt being lettered without alphabetical order, the letters being placed in different relations on the different belts, and a casing inclosing the belts, such casing having a sight-hole through which one letter of each belt may be read, the relation of parts being such that the lettered spaces of the belt are successively brought before the sight-hole with each stroke of the ratchet, lever, and pawl, substantially as set forth.

398,822. COMBINED LETTER-SHEET AND ENVELOPE. HENRY A. DUTELL, Roanoke, N. Y. Filed Jan. 12, 1887. Serial No. 224,162. (No model.)



Claim.—The combined letter-sheet and envelope having the gummed flap B and edge *d* extending outside the outline of the body part of the sheet, and having a projecting tag, C, for the return address, adapted to overlap and extend beyond the edge *d* and expose on the front of the folded sheet or envelope a part of the inner face of the sheet, as described.

398,823. CARTRIDGE. STEPHEN H. REMER, London, England. Filed June 20, 1888. Serial No. 278,619. (No model.)



Claim.—In combination with a fire-arm cartridge and its primer, the shell of the cartridge having an external primer-recess and a flame-hole in its base, a combined ignition-tube and decapper consisting of a rearwardly-removable imperforate tube, fully open at both ends, fitted to said flame-hole, extending to the front of the main charge, with its rear end projecting as an anvil within said recess, and provided with a shoulder or shoulders to prevent its displacement forward, substantially as hereinbefore specified.

398,824. RAILROAD-SCALES. HARVEY L. FISHER and JAMES W. BALLARD, Toledo, Iowa, assignors of one-third to Leander Clark, same place. Filed Sept. 25, 1886. Serial No. 214,571. (No model.)

Claim.—1. In an attachment for platform-scales, the combination of the series of transverse rock-shafts F, the crank-arms on the outer ends of the said shafts, the links connecting said crank-arms, the rock-shaft I, the three-armed lever on said shaft, links connecting said lever with the crank-arms, the hinged levers on the rock-shafts F, adapted to support the platform of the scale, the operating-lever mounted on the platform, and the link connecting the same with the three-armed lever, as set forth.

2. The combination of the platform, the bearings R, secured to the under side thereof, the transverse rock-shafts arranged below the platform, the hinged levers comprising the lower members secured rigidly on the rock-shafts, and the upper members supported by the lower members and adapted to engage the bearings R when the two members are in alignment and be disengaged therefrom when the members are at an angle to each other, and mechanism for rotating the rock-shafts, as set forth.

3. In an attachment for platform-scales, the hinged lever comprising the lower member, S, having the transverse groove T in its upper end and provided with the arm U, and the upper member having its lower end journaled in the groove T, a pin projecting from said upper member through the arm U, and a spring coiled around said pin beyond the arm U and secured on said pin, as set forth.

4. The combination, with the platform, of the base-plate Y, secured thereto, the bearing-plate Z, secured to said base-plate and having the flanges *g* A, and the concave recess between said flanges, the wedge adjustably secured between the base-plate and the bearing-

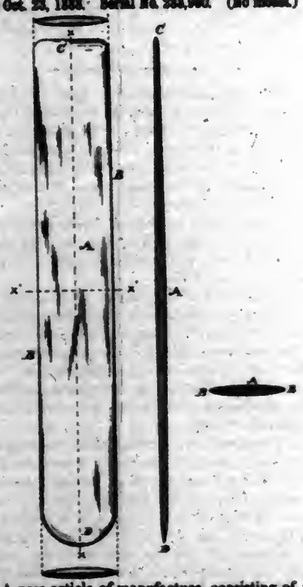


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plate, the hinged levers engaging the concave recess in the bearing-plate, and mechanism for operating said levers, as specified.

398,825. BLANK-BOOK TOOL. JONATHAN C. FORMAN, Cleveland Ohio. Filed Oct. 23, 1888. Serial No. 288,960. (No model.)

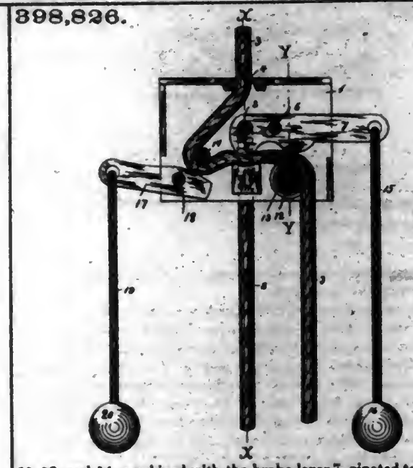


Claim.—A new article of manufacture, consisting of an aluminum-alloy tool, having the plate A, of an elliptical form in cross-section, with blunt edges B B, a curved terminal, D, and a straight end, C, having round corners and blunt edges, substantially as herein set forth, and for the purpose described.

398,826. FIRE-ESCAPE. CHARLES M. FOWLER, Salem, Mass. Filed Nov. 21, 1888. Serial No. 291,480. (No model.)

Claim.—1. The herein-described fire-escape, consisting of the frame 1 2, adapted to slide on the life-line 3, and having rope-guides

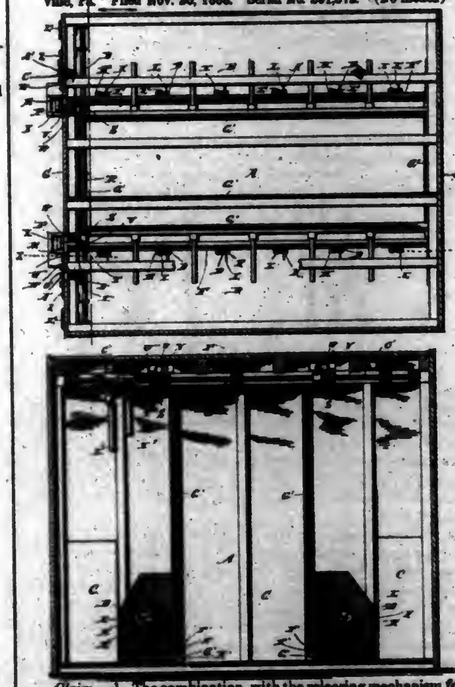
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11, 13, and 14, combined with the brake-lever 7, pivoted to the frame and having the brake projections 9 and 10, and the rope or chain 8, attached to said brake-lever, as and for the purpose set forth.

2. The herein described fire-escape, consisting of the frame 1 2, adapted to slide on the life-line 3, and having rope-guides 11, 13, and 14, combined with the pivoted main brake-lever 7, having the supporting rope or chain 8 attached to it and having the brake projections 9 10, as described, and the auxiliary brake-lever 17, substantially as and for the purpose set forth.

398,827. HORSE-RELEASING DEVICE. ELIAS L. FOX, Shannonville, Pa. Filed Nov. 20, 1888. Serial No. 291,372. (No model.)

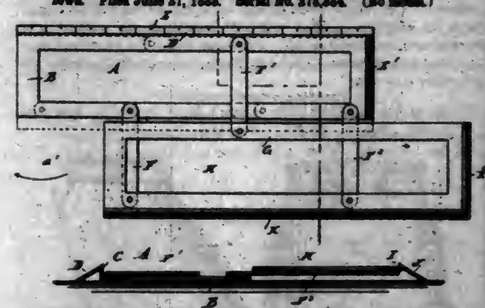


Claim.—1. The combination, with the releasing mechanism for detaching the horses in their stalls, of the shaft R, having the drums S and ratchet-wheel T, the cords or ropes attached to the said drums, the weights X, attached to said ropes and adapted to operate the releasing mechanism, the detent engaging the ratchet-wheels on the shaft, the combustible cords, the weights I', suspended thereby, and the slack cords connecting the said weights to the detent, whereby when one of the combustible cords is parted its weight I' will drop and trip the detent from the shaft R, for the purpose set forth, substantially as described.

2. The combination of the doors having the latches, the levers B', to trip the latches, the shaft R, having a ratchet-wheel, the detent to engage the same, the weights to rotate the shaft when released, the cords C', connecting the levers B' to the shaft, the combustible cords E', and the weights I', suspended thereby, the said weights being connected to the detents, substantially as described.

3. The combination, with the releasing mechanism having the movable rods F, of the cross-heads M, attached to the said rods, the shaft R, having the ratchet-wheel, the detent to engage the same, the combustible cords, the weights suspended thereby, the slack cords connecting the said weights to the detent, for the purpose set forth, the guide-boxes P, the cords V, wound on drums on shaft R, and the weights X, guided in the boxes P and attached to said cords V, the said weights having the wedge-shaped points Y at their lower ends adapted to engage the cross-heads when they descend, and thereby to operate the rods F, substantially as described.

398,828. PARALLEL-RULER. SHERMAN M. GEE, Council Bluffs, Iowa. Filed June 27, 1888. Serial No. 278,224. (No model.)



Claim.—1. A parallel-rule comprising a blade connected by links with a second blade extending parallel with the first blade, both blades being provided with inclined flanges having graduations, substantially as shown and described.

2. In a parallel-rule, the combination, with a blade provided with a rectangular frame having on one side an inclined flange provided on top with a graduation, of links pivotally connected with the said blade, and a second blade pivotally connected to the said links, and also provided with a rectangular frame having an inclined flange provided on top with a graduation, substantially as shown and described.

3. A parallel-rule comprising a blade connected by links with a second blade extending parallel with the first blade, said links being connected alternately with the opposite and corresponding edges of the two blades, substantially as and for the purpose specified.

398,829. PIPE-COUPLING FOR AIR-BRAKES. THEODORE H. HARRISON, Fort Wayne, Ind. Filed June 21, 1888. Serial No. 277,736. (Model.)



Claim.—1. In pipe-coupling for air-brakes, the combination, with interlocking lugs connected with the respective members of the coupling and located in pairs, respectively, on the lower and upper sides of the coupling, the lower lugs having longer and more inclined engaging faces than the upper lugs, of tubular sections of the coupling, such tubular sections trending upward from the axis of the coupling, substantially as set forth.

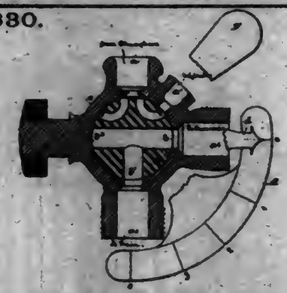
2. In a pipe-coupling, the combination of the two members, each provided with a guiding-lug, A^3, and with lugs A', having extended overlapping projections a' a', and with lugs A^2, having short overlapping faces a^2 a^2, substantially as set forth.

398,830. COMBINATION-VALVE FOR OPERATING AIR-BRAKE MECHANISMS. THEODORE H. HARRISON, Fort Wayne, Ind. Filed June 21, 1888. Serial No. 277,738. (No model.)

Claim.—1. In a valve for air-brake mechanism, the combination, with a valve-casing having ports connected, respectively, with the train-pipe, with the reservoir, and with the brake-cylinder, and a port leading to the outer air, of a valve located in said casing and provided with three main ports for connecting the reservoir and train-pipe and the train-pipe with the outer air, and two smaller ports for connecting the reservoir and engine-cylinder and the engine-cylinder and outer air, substantially as set forth.

2. The combination, with a casing having ports a, a', a^2, and a^3,

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of the valve having port j j, port i i', and port b, b', and b^2, and a handle for turning the valve, substantially as set forth.

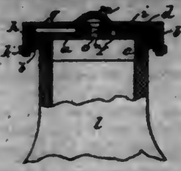
398,831. PLOW-STANDARD CAP. EDWARD S. HARTMAN, Allegheny Pa. Filed Dec. 14, 1888. Serial No. 293,540. (No model.)



Claim.—1. A plow-standard cap consisting of sheet metal having its long edges bent, the two ends of said bent edges folded upon the body thereof, and projecting cheeks between said two ends, the inner end of said cheeks being twisted, substantially as and for the purpose described.

2. The combination of a plow-beam and a plow-standard with a standard-cap consisting of a sheet-metal blank having its two longest edges provided with lugs and said lugs bent and twisted to embrace the plow-standard, substantially as and for the purpose described.

398,832. BOTTLE-STOPPER. RICHARD HERRMANN, Berlin, Germany. Filed Oct. 15, 1888. Serial No. 288,192. (No model.)

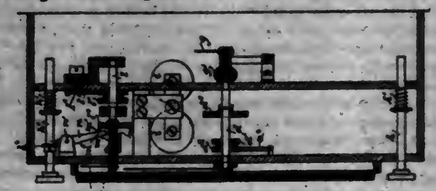


Claim.—A bottle-stopper consisting of a plate, a, having the opening c and pivoted eccentrically thereon, the plate d, having the opening n and the eccentric slot e, and the lid g, having the pin i and turning concentrically on plate a, as and for the purposes herein shown and set forth.

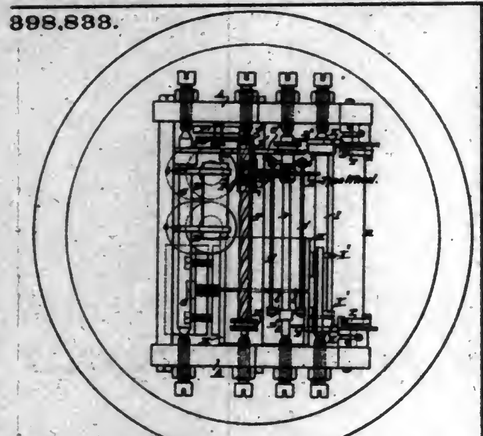
398,833. PRINTING-TELEGRAPH. FREDERICK H. W. HOUSE, London, England. Filed May 29, 1886. Serial No. 278,494. (No model.) Patented in England Feb. 19, 1887, No. 2,126.

Claim.—1. The combination, substantially as hereinbefore set forth, of the rotating finger g, the type-wheel, electro-magnetic devices for actuating the rotating finger and the type-wheel step by step and in unison, a single electric circuit including the electro-magnetic devices for actuating the rotating finger and the type-wheel, a circuit-breaker in said circuit, the finger-keys, the print-frame, its electro-magnetic actuating devices, and a second electric circuit including the finger-keys, the rotating finger g, and the print-frame-actuating devices.

2. The combination, substantially as hereinbefore set forth, of the rotating finger g, the shaft on which it is mounted, the notched wheel carried by said shaft, but insulated from the finger g, the circuit making and breaking lever engaging with said notched wheel, the propelment-lever, the ratchet on the shaft of the finger g, with which the propelment-lever engages, its electro-magnet, the type-wheel, its electro-magnetic actuating devices, and an electric circuit including the



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type-wheel-actuating devices, and the electro-magnet which actuates the propelment-lever.

3. The combination, substantially as hereinbefore set forth, of the type-wheel, the shaft on which it is mounted and on which it is free to slide, electro-magnetic devices for revolving the type-wheel, the screw-shaft, the print-frame, connections between the print-frame and the screw-shaft, whereby the screw-shaft is revolved to advance the type-wheel on its shaft, the coiled spring, gearing between the spring and screw-shaft, the shifting-pin D^2 on the type-wheel shaft, and connections between the pin and the screw-shaft, whereby the movement of the print-frame at a predetermined position of the pin D^2 is caused to automatically release the screw-shaft to allow its reverse movement by the spring with which it is geared.

4. The combination, substantially as hereinbefore set forth, of the type-wheel, the shaft on which it is mounted and with which it revolves, electro-magnetic devices for revolving the shaft, the screw-shaft connected with the type-wheel for moving it back and forth on its shaft, the print-frame, connections between the print-frame and the screw-shaft for revolving it, the rotating finger of the transmitter, the finger-keys engaging therewith, an electric circuit including the finger-keys, rotating finger, and the print-frame-actuating devices, one of said keys being arranged to actuate the print-frame to release the connections between the print-frame and the screw-shaft when the finger is depressed.

5. The combination, substantially as hereinbefore set forth, of the type-wheel, the type-wheel shaft on which the type-wheel is free to slide, the screw-shaft, the nut on the screw-shaft, connections between the nut and the type-wheel, the coiled spring, gearing between the coiled spring and the screw-shaft, the oscillating printing-frame, the toothed wheel on the end of the screw-shaft, the pawl engaging with the toothed wheel, a lever, on one end of which said pawl is mounted and having its opposite end connected to the printing-frame, the retaining-pawl M, the jointed levers connecting said pawl to the printing-frame, the pin D^2 on the type-wheel shaft, and the pivoted arm O^2, with which said pin engages to release the pawls from the type-wheel, for the purpose specified.

6. In an electric type-writer, the combination of parts constituting the indicator and by which the indicator is brought to zero, consisting in the combination of the magnet *i*, lever *k*, shaft *l*, and wheel *l'*, disk *F*, sleeve *m*, and disk *m'*, engaging with *F*, key k^x, finger *n*, cam m^x, and pointer m^4.

7. In an electric type-writer, the combination of parts for bringing back the type-wheel to the commencement of a line, consisting in the combination of the type-wheel, the shaft on which it is mounted, a pin, D^2, on the shaft, the piece O, moved thereby, the printing-frame K, the lever P, connected therewith, the retaining-pawls L^2 and N, also connected with the lever P, the screw F, the nut F', the spring F^1, and the connecting-gear.

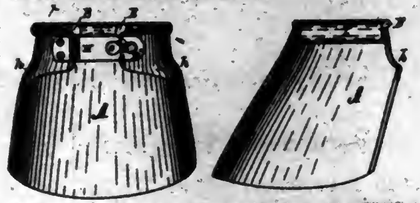
8. In an electric type-writer, the combination of parts for advancing the paper at the end of each line, consisting in the combination of the type-wheel, the driving-shaft on which it is mounted, the pin D^2 on the driving-shaft, the piece O, moved thereby, the filling-piece U, the piece O, connected with the filling-piece U, the pin K^2 on the printing-frame, the arm S^2, the paper-driving pawl, and the lever on which said pawl is carried and which carries the arm S^2.

9. In an electric type-writer, the combination, substantially as hereinbefore set forth, of the type-wheel, the print-frame, the magnet for operating the print-frame, the screw-shaft, connections between the screw-shaft and the type-wheel, the pawls engaging with the screw-shaft, the levers connecting the pawls with the print-frame, the pivoted arm O^2, the pin D^2 on the type-wheel shaft engaging at times with the arm O^2, and the springs for returning the type-wheel to zero.

10. In an electric type-writer, the combination, substantially as hereinbefore set forth, of the type-wheel, the print-frame, the magnet for operating the print-frame, the screw-shaft, connections between the screw-shaft and the type-wheel, the pawls engaging with the screw-shaft, the levers connecting the pawls with the print-frame, the pivoted armature O^2, the pin D^2 on the type-wheel shaft engaging at times with the arm O^2, the spring for returning the type-wheel to zero, the pusher U, the paper-roll, the pawl for operating the paper-roll connected with the pusher U, and connections between the pusher and the pivoted arm O^2, whereby the pusher is disconnected from the paper-roll-actuating pawl.

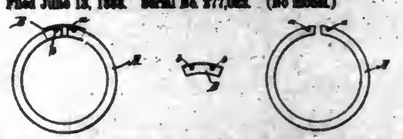
11. The combination, substantially as hereinbefore set forth, of the rotating finger, the type-wheel, electro-magnetic devices for rotating the finger and actuating the type-wheel, the printing-frame, the finger-keys, electro-magnetic devices for actuating the printing-frame, and an electric circuit including said actuating devices and the finger-keys, the indicator included in the printing-circuit and actuated step by step in correspondence with each actuation of the printing-frame, and connections between one of the finger-keys and the indicator for returning it to zero.

398,834. HORSE-BOOT. JAMES B. HOYT, Troy, N. Y. Filed June 7, 1888. Serial No. 276,297. (No model.)



Claim.—In a calking-boot, the combination, with the upper or body part, A, made of sheet metal and adapted to fit the exterior of the hoof at the front and sides, of the non-metallic ring L, made to line the interior of the upper or body part near its top and having the head B resting on the latter, and the hinged hasp H, made with the slot S, arranged on one of the rear side edges of the body part, and the pin P on the other side edge of the boot, substantially in the manner as and for the purposes set forth.

398,835. KEY-RING. ROBERT H. INGERSOLL, New York, N. Y. Filed June 13, 1888. Serial No. 277,062. (No model.)



Claim.—The combination, with a key-ring constructed of spring metal and provided with inclined notches *a*, placed in the upper edges of both ends, of a detachable clasp, B, constructed so as to fit over and cover the notches and ends of the ring and provided with cross-bars *b*, adapted to engage with the notches *a* and to be securely locked therein by the resiliency of the ring, substantially as described.

398,836. SWITCH FOR PNEUMATIC TUBES. CHARLES A. LIEB, New York, N. Y. Filed Nov. 23, 1888. Serial No. 291,644. (No model.)



Claim.—1. The combination, with a main tube and a branch tube, of a pivoted switch, a solenoid, substantially as set forth, and a latch which holds the switch in its position as set until the carrier passes the switch, one end of which latch enters the branch pipe in the path of the carrier, substantially as set forth.

2. The combination, with a main-line tube and a branch tube, of a switch operated by a solenoid provided with a spring for its retraction, and a latch constructed and arranged to hold the switch in its closed position, and which is released by the passage of the carrier past it, substantially as set forth.

3. The combination, with a main-line tube and a branch tube, of a pivoted switch, one end whereof is within the main-line tube and the other end whereof is connected to the core of a solenoid, and a spring-actuated latch constructed and arranged to hold the switch in its position, as set forth, one end whereof lies within the branch tube and in the path of the carrier, substantially as and for the purposes set forth.

398,837. RIBBON-SHIELD FOR TYPE-WRITING MACHINES. GEORGE H. LOEBE, Jr., St. Louis, Mo. Filed Mar. 1, 1888. Serial No. 265,854. (No model.)



Claim.—A type-writer ribbon-shield having a hammer-hole with elevated surfaces at the sides of the hammer-hole, so as to form a depression thereat, substantially as described, and for the purpose specified.

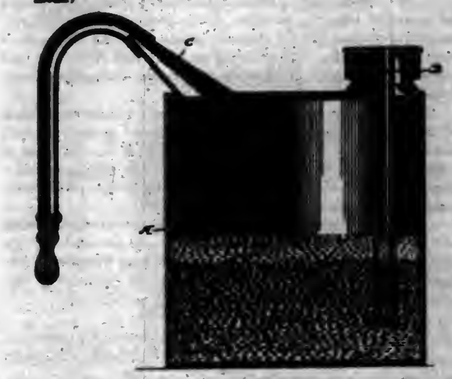
398,838. COUPLING FOR WATER-CLOSET BOWLS, &c. HERBERT MACHIN, Trenton, N. J., assignor to the Equitable Pottery Company, same place. Filed Nov. 15, 1888. Serial No. 290,872. (No model.)



Claim.—1. In a coupling for water-closet bowls, the crockery lip A', having the oval hole *d'* and undercut recesses d^3, the latter each formed with a square offset at one edge, and the coupling-pipe B, having wings B', each having a corresponding offset, in combination with each other and with a filling, *m*, adapted to tighten the joint, while the locking of the wings holds the parts together, as herein specified.

2. The bowl A, having a lip, A', with the oval aperture *d'* and recesses d^3, the latter having each a square offset, in combination with a screw-threaded coupling-pipe, B, having wings B', each with a square offset, and with the nut C and elastic washer D, all arranged to serve substantially as herein specified.

398,839. REMEDY FOR CATARRH, &c. SAMUEL MALIN, Wilton Place, Ohio. Filed Oct. 6, 1887. Serial No. 251,574. (No specimens.)

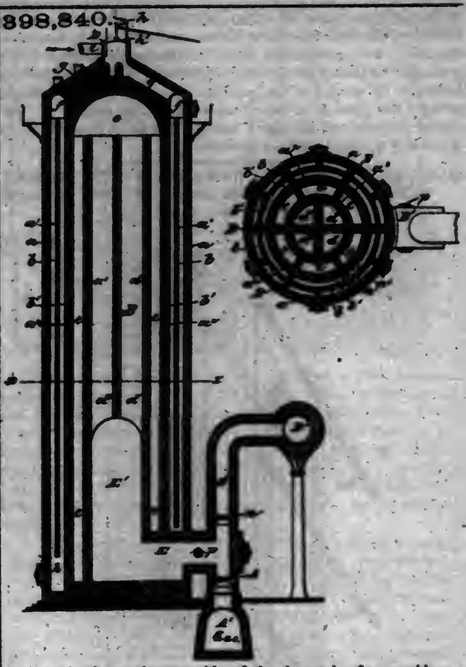


Claim.—A medical compound consisting of a mixture of tar, balsam of fir, and an oil, as oil of hemlock, substantially in the proportions named, together with an alkaline solution, substantially as described.

398,840. HOT-BLAST STOVE. HORACE MASSEDEN and WALTER CROOKE, Parish of Millom, County of Cumberland, England, assignors to George W. McClave and Louisa Schuler, executrix, both of Pittsburg, Pa. Filed Oct. 29, 1886. Serial No. 217,686. (No model.) Patented in England Mar. 24, 1881, No. 1,312.

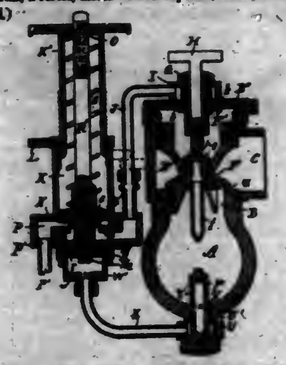
Claim.—1. A vertical hot-blast stove constructed with a gas-inlet leading to an uptake flue or flues arranged centrally of the stove, a suitable number of downtake flues outside of the central flue, and a final uptake flue or flues outside of the downtake flues, a chimney-flue leading therefrom at the top of the stove, and valves at the gas-inlet and at the chimney adapted to control the flow of air and gas to and from the stove, substantially as described.

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2. A vertical hot-blast stove having wall-work arranged to form an odd number of passes, a discharge-flue with which the upper passes are connected, a cold-blast inlet at the top of the stove, an uptake flue or flues arranged centrally of the stove and provided with a gas-inlet and constituting the first pass, a hot-blast outlet at the base of the stove, and valves arranged in conjunction with the air-blast, gas-inlet, and hot-blast outlet, substantially as described.

398,841. RELIEF-VALVE FOR STEAM FIRE-ENGINES. ALVARADO MAYNE, Detroit, Mich. Filed Sept. 27, 1888. Serial No. 286,348. (No model.)

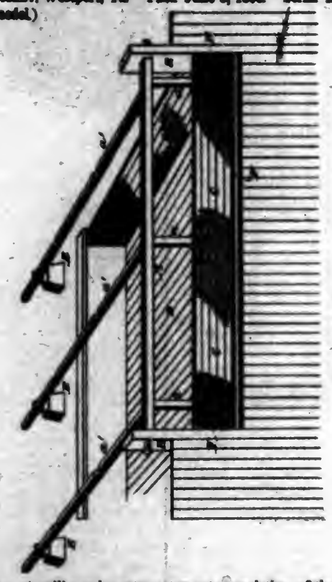


Claim.—1. The combination of the cylinder W', suitably connected with the water-way A, the pressure-piston R, working in the cylinder W' and secured on the piston-rod or valve-stem E', the piston or valve seat *r*, the piston-rod or valve-stem E', provided with the screw *m*, and carrying the piston R and valve N, and extending through the cylinder K and the cap K', the cylinder K, the cylinder-cap K', the valve-chamber P, with inlet and outlet pipes, the valve N, the valve-seat *n*, and the coiled spring S, substantially as shown and described.

2. The combination of the water-way, the cylinder B, containing the relief-valve F, the enlarged portion B' of the cylinder B, containing the piston F' on the relief-valve F, the relief-valve F and piston F', vertically perforated, the conduit from the relief-valve, the perforated cylinder-cap B'', the cap I over the perforations in the cylinder-cap B'', the gland G, holding in place the cap I, the screw-stem

M, governing the relief-valve, the pipe J, leading from the cap I to the valve-chamber P in cylinder K, the small cylinder K, the valve-chamber P and its outlet, the valve N in the small cylinder K, the graduated valve-stem R', the small cylinder-cap K', provided with an orifice for the passage of the graduated valve-stem R', the pressure-spring S, the piston R on foot of valve-stem R', the cylinder W', containing piston R, and the pipe k, leading from the cylinder W' to the water-way A, substantially as described.

398,842. MILL-POND WASTE-WATER GATE. WILLIAM T. MCCLOSKEY, Westport, Pa. Filed June 5, 1888. Serial No. 276,162. (No model.)



Claim.—A mill-pond waste-water gate consisting of the beam A, pivoted in posts B B, the breast C, connected by arms *a* with said beam, and the bars *a'*, attached to said beam, said bars being provided with movable weights on their free ends, as and for the purpose set forth.

398,843. DEVICE FOR SETTING TIRES ON WAGON OR OTHER WHEELS. NATHAN B. MCCREARY, Rockport, and ALFRED T. MCCREARY, St. Joseph, Mo. Filed Apr. 30, 1888. Serial No. 272,511. (No model.)



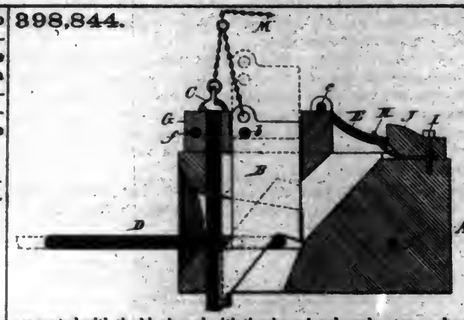
Claim.—In a tire-setting device, the combination, with the outer vessel, B, formed substantially V shape in cross-section, of a vessel, as A, within said other vessel, of substantially the same shape but smaller than the same, movable supports, as C, located within the vessel B, their ends resting on the edges of the same and their centers formed to conform to the shape of the under side of the vessel A, whereby the inner vessel is held in position in the center of the outer vessel, and legs supporting the outer vessel, substantially as described.

398,844. CAR-COUPLING. THOMAS O. MCMURTRAY, Yazoo, Miss. Filed May 26, 1888. Serial No. 275,246. (No model.)

Claim.—1. The combination, with the draw-head, of a block resting thereon, a coupling-pin passing vertically through said block and draw-head, and oblique arms having their ends pivoted, respectively, to said block and draw-head, whereby the coupling-pin may be withdrawn independently of the block or by raising the arms, substantially as described.

2. The combination, with the slotted draw-head, of a coupling-pin, a slotted movable block mounted on the draw-head, a weighted slide capable of independent bodily vertical movement in said block, and a series of arms connected with said block and with the draw-head, substantially as and for the purposes described.

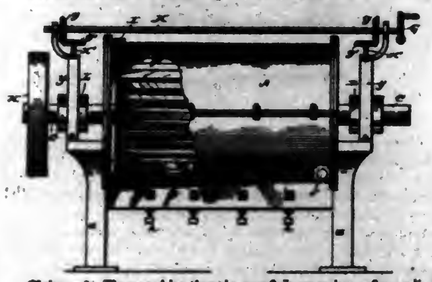
3. In combination with the draw-head, a movable block, G, a coupling-pin, and a weighted slide carried by said block, pivoted arms



connected with the block and with the draw-head, and a stop or check lug, J, provided with a spring, said lug being in position to stop the movement of the said block on said pivoted arms, substantially as set forth.

4. The combination of a movable block, G, mounted on the draw-head, and a coupling-pin carried by said block, a detent, L, pivotally connected with the coupling-pin, and adapted to connect with a catch, *l*, with which said block is provided, substantially as set forth and described.

398,845. REFINING PULP-ENGINE. JOSHUA HORTON, Jr., Portneuf, Quebec, Canada. Filed June 25, 1888. Serial No. 278,078. (No model.) Patented in Canada Apr. 4, 1888, No. 26,797.



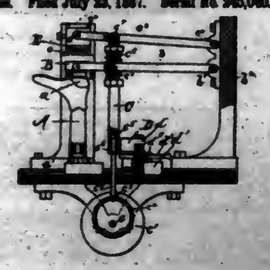
Claim.—1. The combination, in a refining-engine, of a cylinder-roll, a suitably-mounted shaft, fly-bars secured to said roll, with their edges uniformly distant from the roll's axis of rotation, a cylindrical case inclosing said roll with its fly-bars, and a series of knives set in the bottom of said case obliquely to the outer edges of the fly-bars, substantially as set forth.

2. In a refining-engine, the combination of a cylinder-roll, a shaft and means for adjusting the same, fly-bars secured to said roll, with their edges parallel to and uniformly distant from the roll's axis of rotation, a cylindrical case inclosing said roll with its fly-bars, and a series of knives set in the bottom of said case, substantially as described.

3. In a refining-engine, the combination of a cylinder-roll, a shaft and means for adjusting the same, fly-bars secured to said rolls, with their edges parallel to and uniformly distant from the roll's axis of rotation, a cylindrical case inclosing said roll with its fly-bars, and a series of adjustable knives set in the bottom of said case, substantially as and for the purpose set forth.

4. The combination, with the fly-bar cylinder, of the shaft C, sliding bearings L, the case A, inclosing said cylinder and provided with the bed-plates F, having knives *b* oblique to the fly-bars, the guides Y, the threaded rods K', engaging the bearings L, and the crank-rod K, connected by gearing to the rods K', substantially as described.

398,846. HEEL-NAILING MACHINE. FREDERICK F. RAYMOND, 2d, Newton, Mass. Filed July 23, 1887. Serial No. 245,049. (No model.)



Claim.—1. The combination of a last or work support, the vertically-movable templet B, the vertically-movable block *d'*, the gang of drivers *e*, carried thereby, and an actuating cam or crank, connected with said block or templet by means of a connecting-rod having a yielding connection with the templet-support and connected with the block *d'*, to communicate its full movement thereto, substantially as described.

2. The combination of the templet or work support, the lever *b*, carrying the templet B, the lever *b'*, carrying the head *d'* and drivers *e*, and devices for simultaneously moving the said levers in the same direction, substantially as described.

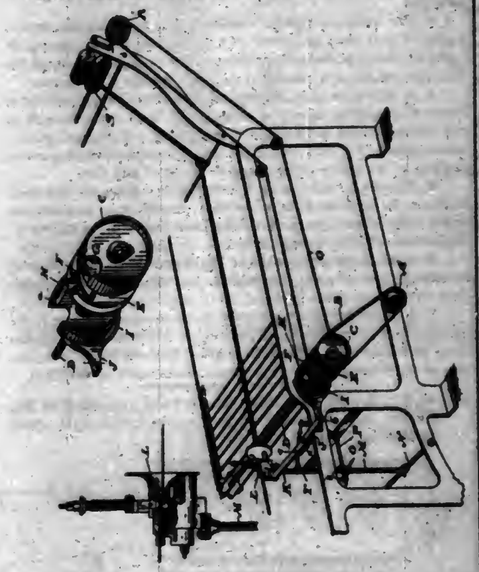
398,847. METHOD OF RESTORING FULLED WOOLEN FABRICS TO THEIR ORIGINAL DIMENSIONS. ROBERT C. ROTHERFORD, New York, N. Y. Filed Sept. 28, 1887. Serial No. 250,906. (No specimens.)

Claim.—1. The method of restoring felted woolen fabrics to their original dimensions, which consists in stretching the fabric while subjected to moist heat at a temperature of about 212° Fahrenheit, substantially as specified.

2. The herein-described method of restoring shrunken woolen fabric, which consists in first exposing the fabric to the action of steam to soften the fibers, then stretching the steamed fabric to the desired extent while it is in a moist and heated condition, and finally drying the steamed and stretched fabric, substantially as set forth.

3. The herein-described method of restoring shrunken woolen fabric, which consists in first forcing steam through the fabric, then stretching the steamed fabric to the desired extent while it is in a moist and heated condition, and then subjecting the stretched and steamed fabric to a hot ironing to dry it, substantially as set forth.

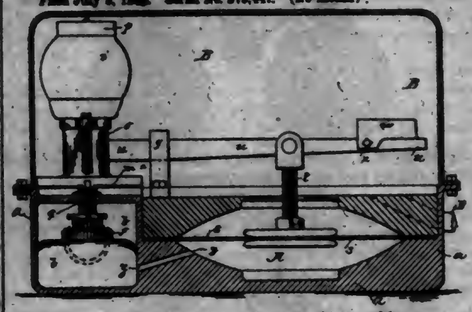
398,848. FEED-REGULATOR FOR MACHINES FOR SPINNING HEMP, &c. GEORGE RYAN, Brantford, Ontario, Canada. Filed July 7, 1888. Serial No. 279,305. (No model.)



Claim.—1. A nipper, L, a pivoted bar, M, carrying said nipper, and a spring, T, for holding the same in position, in combination with the pivoted lever K, having one end connected to the nipper, a bell-crank, J, connected to the opposite end of the lever K, the revolving shaft D, the inwardly-beveled flanged wheel I, movably mounted on said shaft and connected with the bell-crank, a pulley, E, a lever, H, and a pawl, F, carried by said pulley E, and a ratchet-wheel carried by said shaft D, and a pulley, as C, also mounted on said shaft, for receiving the motive power, substantially as described.

2. A nipper, L, a pivoted bar, M, carrying said nipper, and a spring, T, for holding the same in position, and the adjustable stops O, in combination with the pivoted lever K, having one end connected directly to the nipper, a bell-crank, J, connected to the opposite end of the lever K, the revolving shaft D, the inwardly-beveled flanged wheel I, movably mounted on said shaft and connected with the bell-crank, a pulley, E, mounted on shaft D, a lever, H, and pawl F, carried by the pulley E, a ratchet-wheel mounted on said shaft and engaged by the pawl, and a pulley, also mounted on said shaft, for receiving the motive power, substantially as described.

398,849. PRESSURE-REGULATOR. CHARLES ROGERS, Allegheny, assignor of one-half to Isaac Vance and T. I. Vandergrift, Pittsburg, Pa. Filed July 2, 1888. Serial No. 278,447. (No model.)



Claim.—1. In a pressure-regulator, the high and low pressure chambers *b c*, separated by a wall or bench, *d*, having a valve-seat, a valve, *f*, fitted on said valve-seat, a separate chamber, *i*, communicating with the high-pressure chamber, another separate chamber, A, communicating with the low-pressure chamber, a balancing plunger or plug, *k*, operating in the chamber *i* and connected with the valve *f*, and a diaphragm in the chamber A, and having intermediate connections with the valve-stem, substantially as and for the purpose described.

2. In a pressure-regulator, the high-pressure chambers *c i*, communicating with one another through an intermediate contracted passage, *o*, the low-pressure chambers *b* A, also communicating with one another through a separate passage, *z*, a valve, *f*, for establishing communication between the high and low pressure chambers *b c*, a balancing plug or plunger, *k*, in the high-pressure chamber *i*, connected with the valve, and a flexible diaphragm in the low-pressure chamber A, and connected by an adjustably-weighted lever with said valve, substantially as and for the purpose described.

3. In a pressure-regulator, the combination of the high and low-pressure chambers *b c*, another elevated chamber, *i*, communicating with the low-pressure chamber, a valve, *f*, for establishing communication between the high and low pressure chambers, a balancing plunger or plug operating in the chamber *i* and connected to the valve-stem, and a diaphragm located in the upper part of the low-pressure chamber and connected with the valve-stem, substantially as and for purpose described.

4. In an apparatus for the purpose set forth, the combination consisting of the valve *f*, having V-shaped openings *i* formed below the seat of the same, the balance plunger or plug *k* connected thereto and operating at the base of a spherical chamber, *i'*, the flexible disk *n*, secured to the top of the plunger or plug *k*, the passage *j*, connecting the high-pressure chamber *c* with the said spherical chamber *i'*, and the diaphragm *m*, properly attached to the valve-stem *l*, whereby a gas-tight connection is made and an atmospheric balance is formed, as and for the purpose described.

5. In a pressure-regulator, the combination of the high and low pressure chambers *b c*, a valve, *f*, for establishing communication between said chambers, another elevated chamber, *i*, communicating with the high-pressure chamber, a plunger or plug operating in the chamber *i* and connected to the valve-stem to move with the valve, and a flexible disk, *n*, secured to the plunger or plug and extending at its edges beyond the plunger or plug to bear against the wall of said chamber *i*, substantially as described.

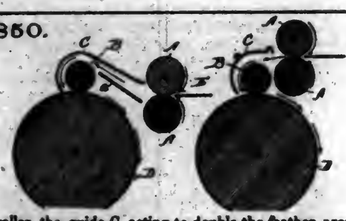
6. An apparatus for the purpose described, consisting of the valve *f*, provided with V-shaped openings *i* below the seat *h*, the balance plunger or plug *k*, connected thereto, the spherical chamber *i'* and disk *n*, secured to the top of the balance-valve *k*, the passage *j*, leading from the high-pressure chamber *c* to that above the balance plunger or plug *k*, the small diaphragm *m*, attached to the valve-stem *l*, the high and low pressure chambers *b c*, the relief-valve *q*, the large diaphragm *s*, having a passage, *z*, communicating with the low-pressure chamber *b* and the space beneath the same, and the weighted lever *w*, connected to the diaphragm *s* and to the valve-stem *l*, having an intermediate post or bearing, *y*, between the same, substantially as described.

398,850. MACHINE FOR PREPARING FEATHERS FOR DUSTERS. JONAS J. SAHR, Hartland, Wis. Filed Dec. 11, 1886. Serial No. 221,247. (No model.)

Claim.—1. The combination, with the feed-rolls, of the idle-roller, the guide C, acting to double the feather around said roller, and a sand-paper cylinder, substantially as set forth.

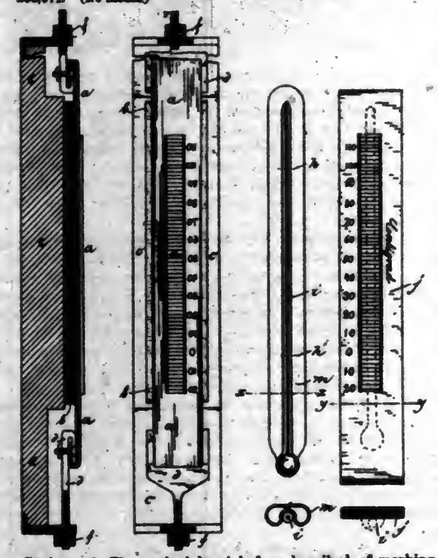
2. The combination of the feed-rolls and the inclined floor *a* with

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the idle-roller, the guide C, acting to double the feather around said roller, and the sand-paper cylinder, substantially as set forth.

398,851. METHOD OF GRADUATING THERMOMETERS. HERMANN SCHULER-RENER, Rochester, Pa. Filed Mar. 22, 1888. Serial No. 268,071. (No model.)

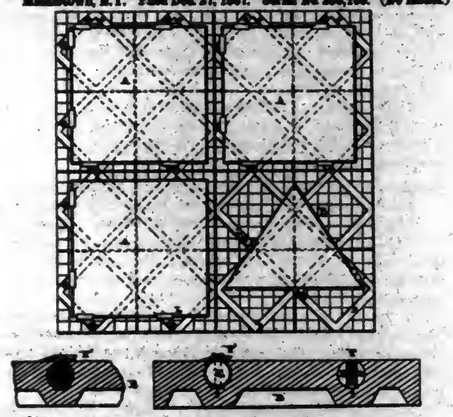


Claim.—1. The method hereinbefore described of marking a graduated scale for measuring-instruments, which consists in locating on the article or articles to be marked two or more determined points of the scale, then adjusting lengthwise a graduated elastic printing device until the corresponding points on it are the same in distance with the said determined points on the article to be marked, and then applying the printing device to the article in such position that the determined points on the article shall register with the corresponding points on the printing device and impressing said printing device to produce upon the article the intermediate graduated marks which form the scale, substantially as and for the purposes described.

2. The method hereinbefore described of marking a graduated scale for measuring-instruments, which consists in locating on a straight article which is to be marked two or more determined points of the scale, then adjusting lengthwise a graduated elastic printing device until the corresponding points on it are the same in distance with the said determined points on the article to be marked, and then applying the printing device, to the article in such position that the determined points on the article shall register with the corresponding points on the printing device, and rolling the said article on the axis of its length transversely to the line of marks on the printing device, whereby the marks at the said fixed points of the printing device and the intermediate graduated marks shall be imprinted on the article simultaneously, substantially as and for the purposes described.

3. The method hereinbefore described of marking a graduated scale for measuring-instruments whose scale-marks are of variable degrees of length and are arranged in a line, which consists in locating on the article to be marked two or more determined points on the scale, and then applying thereto a printing device of elastic and flexible material which is provided with graduated printing-marks corresponding in number and relative distance to those desired to be produced on the scale, the said printing device being applied in such position that the said determined points on the article shall register with the corresponding points on the printing device, and impressing said printing device to produce upon the article the intermediate graduated marks which form the scale, substantially as and for the purposes described.

398,852. STEREOTYPE-PLATE HOLDER. WILLIAM G. SLAWSON, Middletown, N.Y. Filed Dec. 27, 1887. Serial No. 258,160. (No model.)



Claim.—1. A stereotype-plate holder consisting of a number of rectangular grooved sections, the grooves extending continuously through the sections and so located in adjacent sections as to register at the edges of the sections.

2. The combination, with a grooved plate-holder, of adjustable and detachable filling-pieces entering said grooves, said filling-pieces resting on the bottom of the grooves and extending to the top of said grooves and being flush with the surface of the block, substantially as described.

3. The combination, with a holder having undercut grooves and a channel at the bottom thereof, of a filling-piece bearing against the upper shoulders of the groove, and a set-screw passing through the filler and bearing in a channel in the lower portion of the groove.

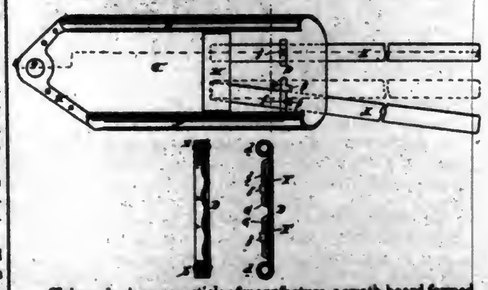
4. A stereotype-plate holder made in sections having a series of intersecting grooves, the unit of whose design is a rectangular unit of any adopted length and width, each unit having four diagonal grooves across its face, all of equal length, the opposite ones parallel, the grooves meeting at the middle of the respective sides of said unit.

5. The combination, with a holder of the character described having undercut grooves, of a swiveled clasping-piece on a follower in this groove, and a set-screw holding the follower in the groove independently of the clasping-piece.

6. A stereotype-plate holder of the character described, having an enlarged groove and a perpendicular slot extending a little deeper than said groove, as set forth.

7. A holder having a groove therein, a two-part follower in the groove, having a holding-catch thereon, the two parts of the follower being held apart by a spring, and a fastening device for the rear section of the follower, all in combination, substantially as described.

398,858. SWATH-BOARD FOR MOWING AND REAPING MACHINES. ANNA B. SMITH, Pittsburg, Pa. Filed Feb. 20, 1887. Serial No. 228,971. (No model.)



Claim.—1. As a new article of manufacture, a swath-board formed of sheet metal, having its upper and lower edges rolled over outwardly to strengthen and stiffen it laterally without obstructing the passage of the grass over the inner face of the swath-board.

2. As a new article of manufacture, a swath-board formed of a single thickness of sheet metal cut and bent to suitable form, and having a metal fork secured to its point, the fork being of the outline of the front end of the board, so as to stiffen that edge.

3. As a new article of manufacture, a swath-board formed of sheet metal, having its upper and lower edges rolled over outwardly to strengthen and stiffen it laterally without obstructing the passage of the grass over the inner face of the swath-board, and having a metal fork, E, secured to and shaped to fit and re-enforce its front end.

4. The combination, with a swath-board, of a socket, H, secured to the outside of said board, a dividing-stick having a lug, *f*, the forward end of said dividing-stick resting within said socket, and the swath-board being provided with a slot, G, or its equivalent, for engagement with the lug *f*, as and for the purpose specified.

5. The combination, with a swath-board, of a socket, H, secured to the outside of said board, a metal dividing-stick having a lug, *f*, the forward end of said stick resting within said socket, and the swath-board being provided with a slot, G, having detents *g*, or its equivalent, for engagement with the lug *f* and for regulating its inclination, as and for the purpose specified.

6. As a new article of manufacture, a swath-board formed of sheet metal cut and bent to suitable form and having a metal fork secured to its point, the fork being of the outline of the front end of the board, so as to stiffen that edge, and the upper and lower edges of the board being re-enforced, as described.

7. As a new article of manufacture, a swath-board formed of sheet metal longitudinally corrugated and cut and bent to suitable form and having a metal fork secured to its point, the fork being of the outline of the front end of the board, so as to stiffen that edge, and the upper and lower edges of the board being re-enforced, as described.

398,854. WALKING-STILT. GEORGE P. SMITH, Bridgeport, Conn. Filed June 2, 1888. Serial No. 276,542. (No model.)



Claim.—In a stilt, the combination of the standard, a step-bracket provided with a downwardly-beveled wedge-shaped plate bearing against the standard, and a ring encircling both the plate and the standard, whereby the weight of the user locks the bracket in any position on the standard by wedging the plate between the ring and the standard, substantially as set forth.

398,855. ROTARY ELEVATOR FOR RAISING LIQUIDS. RICHARD SMITH, Boston, Mass. Filed July 2, 1888. Serial No. 278,782. (No model.)



Claim.—1. An elevator for raising liquids, composed of a central rotary shaft, a band wound spirally thereabout, the width of said band being transversely of the shaft, a vertical strip, 7, on the edge of said band, a series of buckets attached consecutively along one of the faces of said band obliquely thereto, and an inclosing-tube, substantially as herein set forth.

2. An elevator for raising liquids, composed of a central shaft, a helical band transversely thereabout, and a series of consecutive buckets laterally secured to said band and to the shaft, the receiving end of each bucket being contiguous and tangent to the surface of the band, the discharge end being upraised from the latter and with the discharge and receiving ends radially disposed of the shaft, substantially as specified.

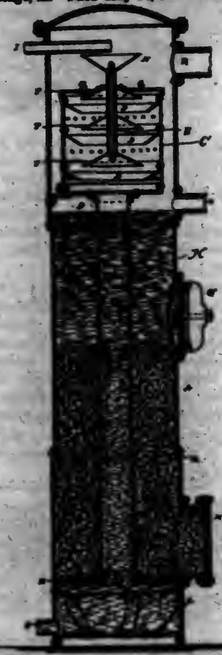
3. The combination, with a cylindrical tube, 3, open at both ends, of a rotary rod, 5, centrally therein, a continuous helical band, 6, affixed thereon, and a series of buckets, 8, the bottom of the latter being obliquely disposed of the band 6, to which they are affixed, and said buckets being provided with vertical strips 13, which connect the upper edge of each bucket with the lower edge of the next succeeding one, as and for purposes herein specified.

4. In combination with a stationary tube, 3, connected with a supply and discharge, a revoluble liquid-elevator, 4, composed of a shaft, 5, a helical band, 6, thereon, with its flange or strip 7 on its exterior edge, and the series of buckets 8, having bottom boat plates, 9, arranged consecutively along one side of the said band, as herein described.

5. The fixed hollow tube 3, open at both ends, a revoluble elevator, 4, inclosed within, having a central actuating-shaft, 5, and a helical band, 6, with its flange 7, combined with a series of consecutive buckets, 8, formed by the boat plates 9, the receiving end of said buckets being tangent with the band, the discharge end upraised from said band, and the pieces 13 radially of the shaft, which unite the discharge end of one bucket with the receiving end of the next adjacent bucket, all operating as herein set forth and stated.

6. An elevator for raising liquid matter, consisting of a central shaft, a helical band thereupon, a continuous lip secured to the outer edge of said band and disposed parallel with the longitudinal axis of the shaft, and a series of buckets attached consecutively along one of the faces of said band, obliquely thereto, substantially as herein explained.

398,856. FEED-WATER PURIFIER AND HEATER. WILLIAM H. SMITH, Chicago, Ill. Filed May 21, 1888. Serial No. 274,543. (No model.)



Claim.—1. In a feed-water purifier, the combination, with the outer cylinder having an inlet-pipe for admission of water, of an interior cylinder located below the inlet-pipe and provided interiorly with central and circumferential deflectors alternately arranged, whereby the water in its passage is thrown back and forth from and toward the center, substantially as and for the purpose described.

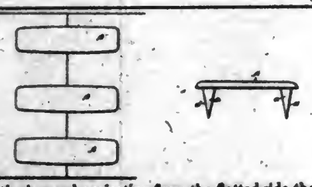
2. In a feed-water purifier and heater, the combination, with the outer shell provided at its upper part with steam and water inlet pipes, of an interior perforated cylinder, C, supported within the shell, with an annular space between the two, said cylinder C having interior deflectors for spreading and spraying the water in its passage, substantially as described.

3. In a feed-water purifier and heater, the combination, with the outer shell or case having at its upper part steam and water inlet pipes and in its lower part a perforated diaphragm, N, and above the latter filtering material and an outlet, of an interior perforated cylinder, C, supported within the shell or case, with an annular space between the two, said cylinder C having interior deflectors and communicating through a pipe, K, with the chamber below the diaphragm N, substantially as described.

398,857. BELT-FASTENER. JAMES SNOW, Cleveland, Ohio. Filed Oct. 18, 1888. Serial No. 288,442. (No model.)

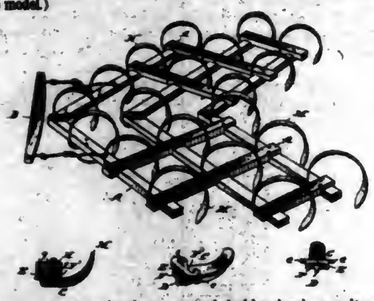
Claim.—A belt-fastener consisting of a narrow metal bar, the same having a flatted and convex side, with a conical tooth located

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near each end of the bar and projecting from the flatted side thereof, each tooth having a flatted side, substantially as shown, for reducing the point thereof to a thin edge suitable for clinching, substantially as set forth.

898,858. SPRING-TOOTH HARROW. PRATT A. SPIKER, Marshall, Mich. Filed Sept. 29, 1887. Renewed July 25, 1888. Serial No. 281,066. (No model.)

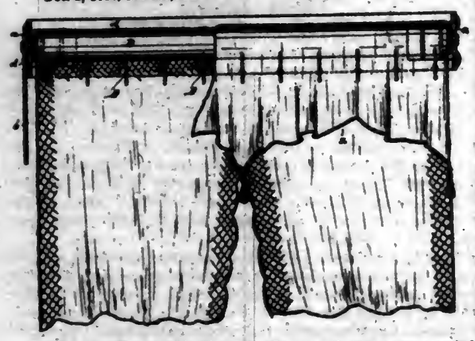


Claim.—1. A spring-harrow-tooth holder having on its under side a rib forming a runner, its upper side provided with a slotted bearing-lug, and the set-screw and plate, all combined and adapted for use in connection with a spring harrow-tooth and its beam, as shown and described.

2. A spring-harrow-tooth holder consisting of rib forming a runner on its under side, its upper portion provided with a slotted and recessed bearing-lug, a plate, and a set-screw, in combination with a harrow-beam and a spring harrow-tooth, as shown and described.

3. In a spring-harrow-tooth holder, the combination, with the harrow-beam, of a holder provided on its under surface with a rib forming a runner, the upper portion of said holder provided with a slotted and recessed bearing-lug, and the spring-tooth passing through the slotted portion of the lug and connected to the holder, and also adjustable thereon by means of a set-screw connecting the harrow-beam and holder, as shown and described.

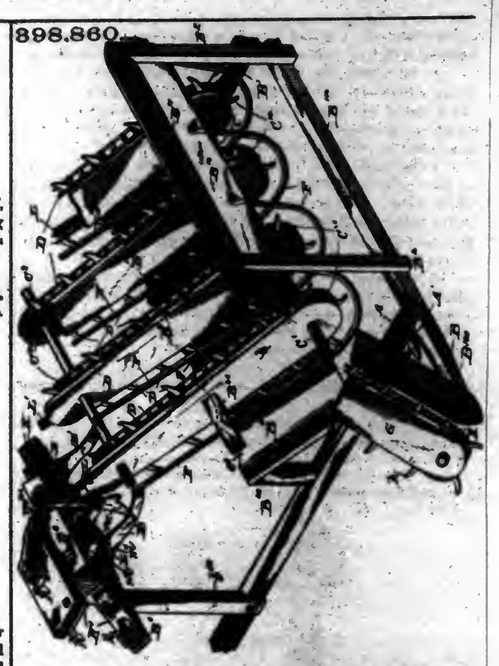
898,859. CURTAIN-FIXTURE. JULIE STEINHAGEN, Boitenhagen, Mecklenburg, Germany. Filed Nov. 24, 1886. Serial No. 219,773. (No model.) Patented in Germany July 30, 1886, No. 36,184; in England Nov. 12, 1886, No. 14,679; in Belgium Dec. 6, 1886, No. 75,488; in Austria-Hungary Mar. 26, 1887, No. 43,097 and No. 11,144; in Sweden Apr. 27, 1887, No. 1,029; in Denmark Oct. 29, 1887, No. 370, and in France Dec. 2, 1887, No. 180,044.



Claim.—The combination of a frame and bearings a carried thereby with the rod B, turning in said bearings, the projecting hooks D on the outer face of said rod, and the lever b, attached to said rod for turning it, substantially as set forth.

898,860. CORN-HARVESTER. JOHN F. STEWARD, Chicago, Ill. Filed Feb. 28, 1888. Serial No. 265,343. (No model.)

Claim.—1. In a corn-harvester, in combination with the sickle,



an open-topped cradle or stalk-receptacle located immediately in the rear of the sickle and having its bottom extended stubbleward to form a guide for the stalks, and a conveying mechanism overhanging the stalk-receptacle and the stubbleward extension thereof and traveling in vertical planes and moving stubbleward in its lower course, substantially as set forth.

2. In a corn-harvester, in combination with the sickle, an open-topped cradle or stalk-receptacle located immediately in the rear of the sickle and having its bottom extended stubbleward to guide the delivery of the stalks, and a conveying mechanism comprising endless chains overhanging said receptacle and traveling in vertical planes and moving stubbleward in their lower course, the grainward or receiving end of said chains being located in direct line rearward from the sickle substantially as set forth.

3. In a corn-harvester, in combination with the sickle and grainward divider, an open-topped stalk-receptacle located immediately in the rear of the sickle and having its grainward edge located as far grainward as the vertical plane of the stubbleward edge of said divider and considerably above the level of the sickle, the boundary of said receptacle extending thence downward and thence stubbleward, whereby said receptacle constitutes a cradle to receive the stalks from the sickle, and a conveying mechanism comprising endless toothed chains traveling in vertical planes and moving stubbleward in their lower course, their receiving or grainward end overhanging said stalk-receptacle, substantially as set forth.

4. In a corn-harvester, in combination with the sickle, a stalk-receptacle located immediately in the rear of the sickle, comprising a series of parallel bars located one behind the other in the rear of the vertical plane of the sickle and extending stubbleward across the path of the incoming stalks, and conveying-chains overhanging such receptacle and having teeth depending between said bars, such chains traveling stubbleward in their lower course, substantially as set forth.

5. In combination with the sickle, a stalk-receptacle located immediately in the rear thereof, comprising a series of parallel bars located one behind the other in rear of the vertical plane of the sickle, each commencing at a point grainward from the path of the incoming stalks and considerably above the level of the sickle and extending thence downward and stubbleward to form a cradle to receive and guide the stalks as they fall from the sickle, and a series of conveying-chains overhanging said series of parallel bars and having teeth depending between them and traveling stubbleward in their lower course, substantially as set forth.

6. In a corn-harvester, in combination with the sickle, the outside divider-frame, the parallel bars F, secured to the upper portion of said divider-frame in a series one behind another, the foremost bar being located a short distance rearward from the vertical plane of the sickle and without intervening mechanism, said bars extending from said divider-frame downward and stubbleward in the rear of the vertical plane of the sickle, and thence farther stubbleward beyond the vertical plane of the stubbleward end of the sickle, and suitably secured to the harvester frame-work, and the conveying-chains overhanging said series of bars throughout the last-mentioned portion of their extent, whereby the stalks severed by the sickle and falling upon the downward and stubbleward portion of said bars are by said portion guided within reach of said chains and thence farther conveyed by the latter, substantially as set forth.

7. In a corn-harvester, in combination with the stalk-receptacle in the rear of the sickle, having its bottom extended stubbleward to support and guide the stalks, conveying mechanism overhanging said extension, and the bars L', located and extending substantially parallel to said extension and overhanging the same, forming a rigid throat for the passage of the stalks, the conveying mechanism comprising chains which have teeth projecting into said throat, substantially as set forth.

8. In combination, substantially as set forth, the parallel bars F, forming a stalk-receptacle in the rear of the sickle and extending thence stubbleward and upward, the elevating mechanism comprising chains traveling in vertical planes parallel with said bars and overhanging the same, and the receptacle *c*, located beyond the delivery end of the elevating mechanism, substantially as set forth.

9. In combination, substantially as set forth, the harvester-frame comprising the grainward divider-frame and a fore-and-aft bar located at a distance stubbleward from said divider-frame, the parallel bars F, secured one end to the upper part of said divider-frame and connected at the other end to said fore-and-aft bar and depressed between said divider-frame and said fore-and-aft bar to form a stalk-receptacle, and the conveying-chains overhanging said series of bars F, the receiving end of said conveying-chains being located in said depression, substantially as set forth.

10. In combination, substantially as set forth, a harvester-frame comprising the grainward divider-frame and a fore-and-aft bar located at a distance stubbleward from said divider-frame, the parallel bars F, and the brackets E, the former secured at the grain end to the upper portion of said divider-frame and the latter secured at the stubble end to said fore-and-aft bars, the stubble end of the bars F being secured, respectively, to the brackets E, the bars F being depressed between said divider-frame and said fore-and-aft bar to form a stalk-receptacle behind the sickle, and said brackets being upwardly concave between their ends to form a secondary receptacle, and conveying mechanism overhanging the bars F and operating between said receptacles, substantially as set forth.

11. In a corn-harvester, in combination with the gatherer and the sickle, a stalk-receptacle or cradle located in the rear of the sickle and endless conveying-chains overhanging said receptacle and traveling stubbleward in their lower course, substantially as set forth.

12. In combination with the sickle, the gatherer operating from a point forward of the vertical plane of the sickle rearward past said vertical plane, a stalk-receptacle in the rear of the sickle, overhung at its forward end by the gatherer, and a conveying mechanism overhanging said receptacle and operating stubbleward therefrom, substantially as set forth.

13. In combination with the sickle, a stalk-receptacle in the rear thereof, and conveying-chains overhanging the receptacle and traveling stubbleward in their lower course, the receiving end of said chains being in the path of the incoming stalks, the gatherer having its delivery end overhanging the forward chain and the receptacle, substantially as set forth.

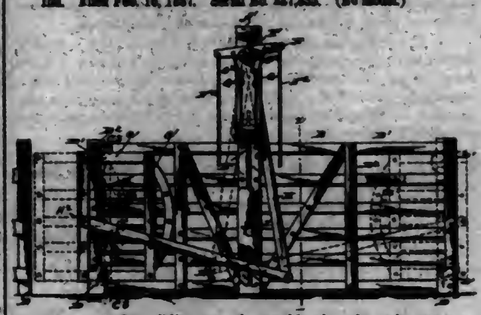
14. In combination with the sickle, a series of parallel bars extending from a line grainward of the path of the incoming stalks stubbleward across said path, a series of conveying-chains overhanging said series of bars and operating stubbleward in planes substantially parallel thereto, having their receiving ends in the path of the incoming stalks, and the gatherer operating from a point forward of the vertical plane of the sickle to a point in the rear of said plane and overhanging at its said rear end the foremost of said conveying-chains, substantially as set forth.

15. In combination with the sickle, the grainward divider-frame, and the stubbleward divider, the bars F, secured to the outside divider-frame considerably above the level of the sickle and sloping thence downward and extending across the path of the incoming stalks behind the sickle to form a receptacle for said stalks, and the conveying-chains overhanging such receptacle, and the gatherer supported upon the inside divider and at its rear end overhanging the foremost of said conveying-chains, substantially as set forth.

16. In combination with the stalk-receptacle behind the sickle and the conveying-chains overhanging the same and operating stubbleward therefrom in their lower course, packers operating near the vertical plane of the foremost of said chains at its delivery end, substantially as set forth.

17. In combination with a stalk-receptacle in the rear of the sickle, the overhanging elevating-chains operating stubbleward therefrom, and the receptacle *c* at the delivery end of said elevating-chains, the packers located and operating in the vertical plane of the foremost of said elevating-chains and overhanging said receptacle *c*, substantially as set forth.

898,861. SLIDING GATE. GEORGE W. STEWART, Rising Sun, Ind. Filed Feb. 16, 1887. Serial No. 227,833. (No model.)

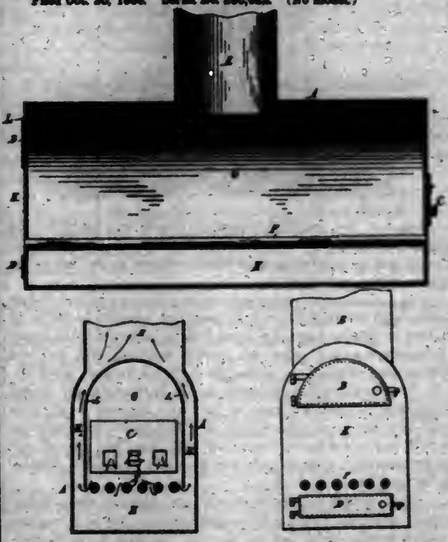


Claim.—1. In a sliding gate, the combination of a main gate provided with tracks, uprights having rollers adapted to receive said tracks, a smaller gate mounted and adapted to reciprocate within one end of the main gate, a rock-shaft journaled in the uprights and provided with rock-arms for operating the same, and a jointed arm connected to the rock-shaft and pivoted to the smaller gate, substantially as specified.

2. In a sliding gate, the combination of a main gate provided with tracks, uprights having rollers adapted to receive said tracks, smaller gates mounted at each end of the main gate, a rock-shaft journaled in the uprights and provided with rock-arms for operating the same, and a jointed arm connected to the rock-shaft and pivoted removably to one of the gates and adapted to be pivoted to the other, substantially as specified.

3. The combination, in a sliding gate, of a main gate having a notch and carrying a smaller gate at one of its ends, uprights for supporting the main gate, provided with a gravity-latch adapted to take into said notch and with a rock-shaft having rock-arms one of which is loosely connected with said latch, and a pivoted arm connecting the rock-shaft with the smaller gate, substantially as specified.

898,862. SMOKE-PREVENTING STOVE. JOHN STOTT, Aurora, Ill. Filed Oct. 30, 1888. Serial No. 289,982. (No model.)



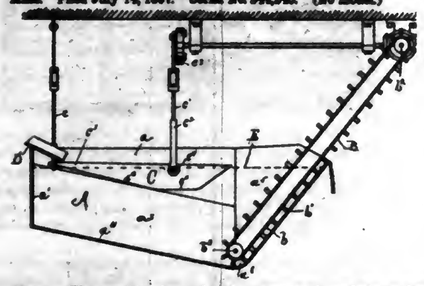
Claim.—1. A smoke-preventing stove adapted for burning bituminous coal, having within its outer case an inner arched plate, I, placed substantially parallel with such case and connected with both end plates of the stove, such plate having no opening therein, and provided with opposite vertical sides both extending down to the under side of the grate, leaving a free heating and flue passage from the under side of the grate up and between such sides and the entire inner side of the case, which is above the grate, the plate constituting,

with the grate, the combustion-chamber and serving to compel all the products of combustion to pass downward through the ignited fuel.

2. In combination with outer shell, A, having the top outlet, E, the arched plate L, applied relatively to the shell as set forth and leaving a continuous flue-passage around the whole surface of the plate, and a grate located between the two lower ends of said plate and extending through the stove and supported at both ends in and by the end plates of the stove, all substantially as described.

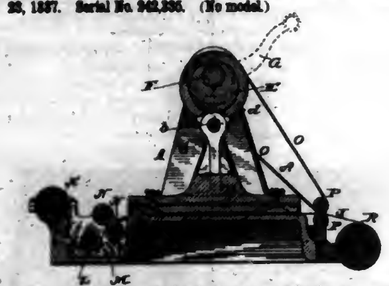
3. In combination, the shell A, having outlet E, plate L, applied thereto and to the grate, as shown and described, feed-door B, draft-door C at the opposite side or end of the stove and provided with a regulating-register, and a tight-fitting door for the ash-pit, the construction also compelling the air to pass downward through the fuel and grate, all substantially as set forth.

398,863. ORE-CONCENTRATOR. CHARLES H. TAYLOR, Boston, Mass. Filed July 14, 1887. Serial No. 244,240. (No model.)



Claim.—The combination, with the water-tank and the inclined bottomed pan C, shallow and narrow at its receiving end and wider and deeper at its discharging end, said pan being pivoted at its receiving end, of the yoke c^3, attached to said pan, the eccentric and pitman by which said pan is suspended and reciprocated vertically, and the eccentric and pitman for giving lateral movements to said pan, substantially as set forth.

398,864. APPARATUS FOR OBTAINING DUPLICATE COPIES OF WRITINGS. CHARLES A. THOMPSON, New York, N. Y. Filed June 28, 1887. Serial No. 242,335. (No model.)



Claim.—1. In a manifold printing or transferring apparatus, the combination of a platen reciprocating in suitable ways, an opposite bed-plate, and an imprinting stencil-sheet secured to the face of the platen, as shown and set forth.

2. The combination, with a body or plate having attached thereto a stencil-sheet, substantially such as described, adapted to move up and down in suitable ways, of a liquid-tank and base-plate, and means for conveying a strip of paper, &c., through said liquid-tank and over said base-plate, substantially as described, for the purpose specified.

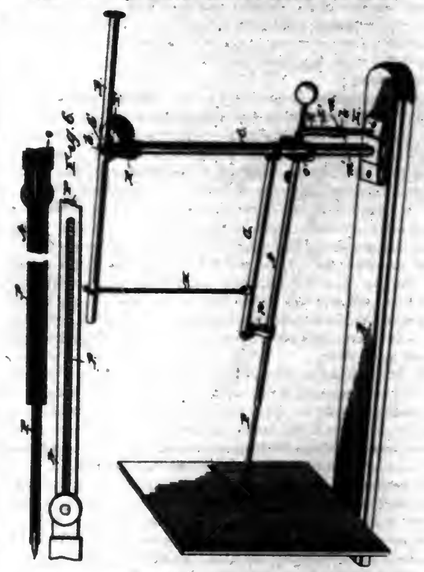
3. The combination, with a body or plate having attached thereto a stencil-sheet, substantially such as described, adapted to move up and down in relation to a base-plate, of a liquid-tank and squeezer-rolls N N, and means for conveying a strip of paper, &c., through said tank, between said squeezer-rolls and over said base-plate, substantially as described.

4. In a manifold printing or transferring apparatus, the combination of a platen reciprocating in suitable ways and having an imprinting stencil-sheet upon its face, an opposite bed-plate, a paper-roller, and a suitable dampening-tank and rollers for dampening and squeezing the strip or web of paper unwound from said roller at one side of the bed-plate, and feed-rollers at the other side of the bed-plate, as shown and set forth.

5. In a manifold printing or transferring apparatus, the combination, with a reciprocating platen having an imprinting-sheet upon its face and an opposite bed-plate, of a liquid-tank at one side of the bed, having a guide-roller within it, squeezing-rollers above the tank, and two feed-rollers at the opposite side of the bed-plate bearing against each other, as shown and set forth.

6. In a manifold printing or transferring apparatus, the combination of the bed-plate having the tank at one side, the platen reciprocating against the bed in suitable ways, the revolving drive-shaft having the eccentric-disk having its strap pivotally connected to the platen, the paper-roller and guide and squeezing rollers at the tank, and the feed-rollers at the opposite side of the bed having belt-connection to the drive-shaft, as shown and set forth.

398,865. DRAWING APPARATUS. DAVID K. WADE, McPherson, Kans. Filed Sept. 1, 1888. Serial No. 284,942. (No model.)



Claim.—1. The combination, with the revoluble standard, of the telescope swiveled at the upper end of the standard and provided with a segmental rack, F, the transverse shaft provided with a spur-wheel engaging the said rack, the tubular arm pivoted at its inner end and connected at its outer end to the telescope, and the pencil-bar mounted in the tubular arm, substantially as specified.

2. The combination, with the revoluble standard and the telescope mounted on the standard, of the pencil-bar mounted eccentrically with the telescope and connected thereto at its free end, substantially as specified.

3. The combination, with the revoluble standard and the telescope mounted thereon, of the vertical shaft arranged in rear of and adjacent to the standard, the tubular arm mounted on the shaft and connected to the telescope, and the pencil-bar mounted in the tubular arm, substantially as specified.

4. The combination, with the revoluble standard and the telescope swiveled at the upper end of the standard, of the vertical extensible shaft arranged adjacent to and in rear of the standard, the tubular arm pivoted to the upper end of the said shaft and provided with a hollow or slotted offset embracing the standard, and the pencil-bar mounted in the tubular arm, substantially as specified.

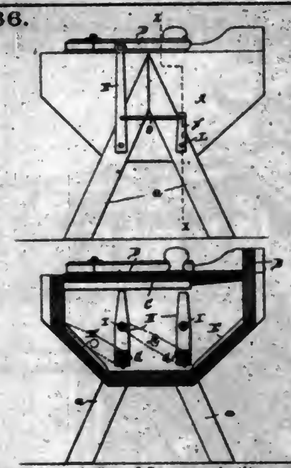
5. The combination, with the vertical revoluble standard C, of the telescope swiveled to the upper end of the standard and provided with suitable means, substantially as described, for operating the same, the swinging arm G, mounted on the standard and connected by a rod or wire, H, to the telescope, the tubular arm pivoted at one end to a vertical shaft arranged adjacent to the standard, and connected at the other end to the swinging arm by a suitable link, and the spring-actuated pencil-bar mounted in the tubular arm, substantially as specified.

398,866. WASHING-MACHINE. CHARLES R. WARNER, Meivern, Kans. Filed Mar. 22, 1888. Serial No. 268,113. (Model.)

Claim.—1. In a washing-machine, the combination of the suds-box and the beaters arranged within the tub, and consisting of main bars journaled between the sides of the suds-box near the lower edges of the same and fingers projecting upward from the shafts, as set forth.

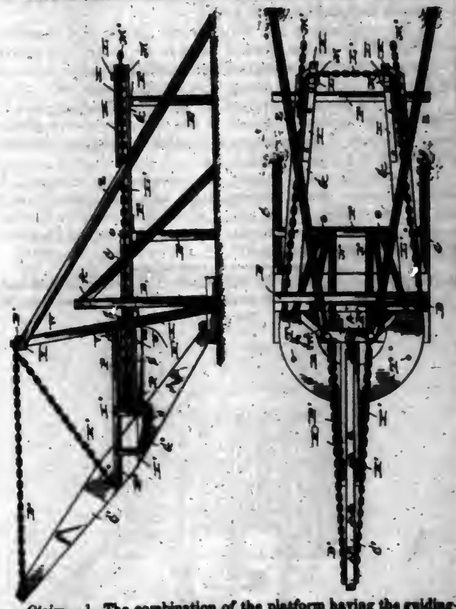
2. The combination of the suds-box having its lower corners cut away, the longitudinal V-shaped ribs secured to the upper faces of said cut-away portions, the beaters arranged within the suds-box and

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comprising transverse shafts and fingers projecting upward therefrom and adapted to rest upon the said cut-away portions and between the said ribs, and mechanism for oscillating said beaters, as set forth.

398,867. TURN-TABLE FOR CRANES. WILLIAM H. WHEELER, Scioto ville, Ohio. Filed Nov. 30, 1888. Serial No. 292,300. (No model.)

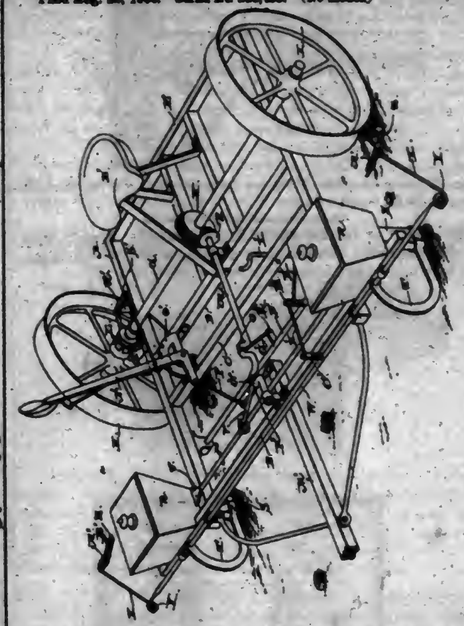


Claim.—1. The combination of the platform having the guiding-sheaves S, the boom, the pivoted arms on the platform on opposite sides of the boom, and the operating-chains attached to the said arms and engaging the guiding-sheaves, whereby the boom may be swung to any desired position, substantially as described.

2. The combination of the semicircular platform having the guiding-sheaves S arranged between its sides, the frame W, the yoke B', pivoted thereon, the pivoted boom, the guys connecting the upper end thereof to the ends of the yoke, the pivoted arms on the platform on opposite sides of the boom, the guys connecting the outer ends of said arms to the ends of the yoke, and the operating-chains engaging the guiding-sheaves and attached to the pivoted arms, whereby the latter may be swung to move the boom in either direction, substantially as described.

3. The combination of the frame having the semicircular platform at one end provided with the guiding-sheaves and the adjustable tightening-sheaves N at the opposite end, the pivoted arm on the platform, the endless chain engaging sheaves N, and the sheaves in the platform and attached to the pivoted arms, for the purpose set forth, and the boom arranged between the pivoted arms, substantially as described.

398,868. CORN-PLANTER. BERT H. WILLIAMS, Bonita, Kans. Filed Aug. 22, 1888. Serial No. 283,626. (No model.)



Claim.—1. The combination, in a check-row corn-planter, of the rock-shaft W, having the arms X, provided with the markers, and having the arm C, the rock-shaft D', having arm E' and arm F', the link H', connecting arms F' and C, the revolving crank-shaft M, and the pitman connecting the same to the arm F', substantially as described.

2. The combination, in a check-row corn-planter, of the rock-shaft W, having the arms X, provided with the markers, the rock-shaft D', having the arm F', connections, substantially as set forth, between the shafts D' and W, whereby the rocking motion of the former will be transmitted to the latter, the seed-slide, the revolving shaft M, having the cranks, and the pitmen connecting the cranks of said shaft to the seed-slide and to the arm F', substantially as described.

3. The rock-shaft having the spring-arms X, adapted for the attachment of the markers, substantially as described.

4. The rock-shaft W, having the spring-coils Y at its ends, and the arms X, extending from said coils and arranged at right angles to the said shaft, said arms being adapted for the attachment of the markers, substantially as described.

5. The combination, in a check-row corn-planter, of the rock-shaft W, having the arms X, provided with the markers, the rock-shaft D', having arm E', connected to a similar arm, C, on rock-shaft W, the foot-lever I', and the rod K', connecting the same to rod E', substantially as described.

6. The combination, in a check-row corn-planter, of the frame, the tongue pivoted thereto and adapted to turn in a vertical direction, the lever N', connections between the same and the tongue, whereby the latter may be operated to raise or lower the front end of the frame, the shaft G, the driving-wheel H loose thereon, the clutch on the shaft to lock said wheel thereto, the bell-crank lever R', engaging the clutch, and connections between said lever and the lever N', whereby when the hand-lever is operated to cause the tongue to raise the frame the clutch is simultaneously disengaged from the drive-wheel, substantially as described.

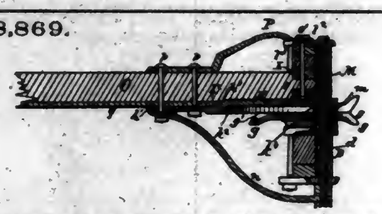
7. The combination, in a check-row corn-planter, of the frame, the rock-shaft W, journaled thereon and having the spring-arms X, the markers Z, having the openings B', and the bolts A', to secure said markers at any desired adjustment to the spring-arms, substantially as described.

398,869. FIFTH-WHEEL. JAMES M. WILLIAMS, Rocket, Mo. Filed Apr. 12, 1888. Serial No. 270,425. (No model.)

Claim.—1. The combination of the plate B, having the pairs of wings b^2 b^2, the enlargements E E, and the recesses b b, with the clips C C, the bolts F F, the axle A, and the tie-plate H, as set forth.

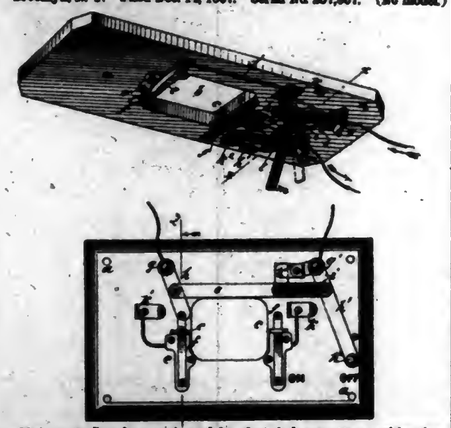
2. The combination of the perch G, the head-block I, the two portions of the fifth-wheel socketed together, the king-bolt M, the

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braces F and *n*, the plate N, having the prolongation *n'*, and the bolts *p* and *o'*, as set forth.

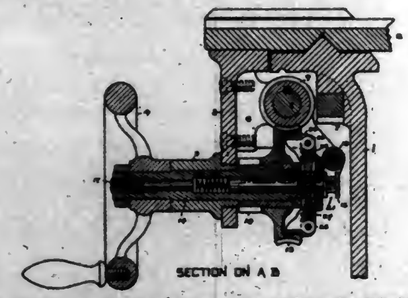
398,870. HANGER-BOARD FOR ARC LAMPS. JAMES J. WOOD, Brooklyn, N. Y. Filed Dec. 14, 1887. Serial No. 257,867. (No model.)



Claim.—1. In a hanger-board for electric lamps, the combination, with conducting suspension eyes or loops in connection with the terminals of the circuit, of conducting-springs, also in connection with the terminals of the circuit, adapted to press into the loops, with polar hooks or suspenders on the lamp adapted to engage between the loops and the springs, substantially as shown and described.

2. In a hanger-board, a suspension device formed of a base-plate, *c*, loop *e*, and spring *f*, both the loop and spring being in metallic contact with the base-plate, substantially as and for the purpose set forth.

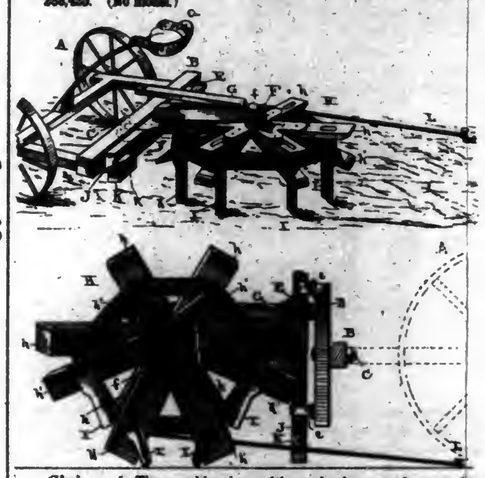
398,871. STOP-MOTION FOR LATHES. SAMUEL L. WORSLEY, Taunton, Mass., assignor to The Brown & Sharpe Manufacturing Company, Providence, R. I. Filed July 9, 1888. Serial No. 279,380. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of a worm driven by the power which drives the head-spindle of the lathe, a worm-wheel driven by said worm, a friction-clutch for connecting said worm-wheel with the train which communicates movement to the tool-carriage or for disconnecting it therefrom, a lever for working said friction-clutch, a holding-catch for locking the lever to close the clutch, a sliding tool-post carriage, and a stop for tripping the holding-catch, substantially as described.

2. The combination of a friction-clutch, connecting the train of gearing which gives movement to the tool-carriage with the prime mover, a lever for working said clutch to make or break such connection, a holding-catch for locking the lever to close the clutch, a sliding tool-post carriage, and a stop for tripping the holding-catch, substantially as described.

398,872. SELF-WINDING REEL FOR CHECK-ROW PLANTERS. WILLIAM H. ALDRICH, Red Oak, Iowa. Filed Oct. 12, 1888. Serial No. 288,425. (No model.)



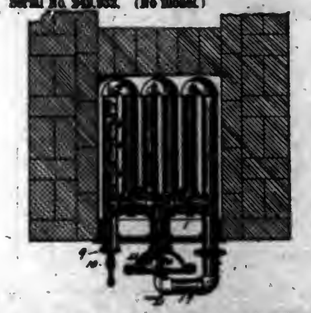
Claim.—1. The combination, with a check-row planter, of a check-line reel united thereto by a swivel-joint the axis of which lies horizontally, substantially as set forth.

2. The combination, with the check-row planter, of a check-line reel hinged to a cross-bar which is united to the planter by a swivel-joint, so as to be capable of vibration in a vertical plane transverse to the longitudinal axis of the planter, substantially as set forth.

3. A check-line reel composed of a cross-bar, D, a base-piece, E, hinged thereto, an arm, F, fastened to the base-piece and carrying a bolt, *f*, and a reel, H, mounted to revolve on the bolt and provided with projecting fingers I, as set forth.

4. A check-line reel composed of a cross-bar, D, a base-piece, E, hinged thereto, an arm, F, fastened to the base-piece and carrying a bolt, *f*, a bar, G, hinged to the arm F, a reel, H, mounted on the bolt *f*, and a block, K, attached to the base-piece and provided with an eye, *k*, substantially as described.

398,873. APPARATUS FOR GENERATING AND BURNING GASEOUS FUEL. RICHARD B. AVERY, New York, N. Y. Filed Sept. 17, 1887. Serial No. 249,932. (No model.)



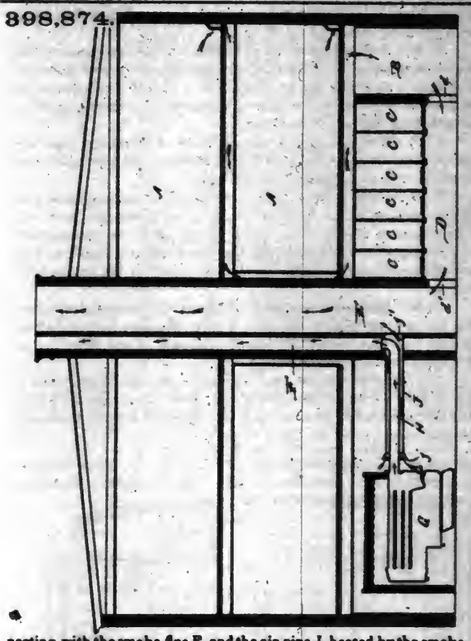
Claim.—1. In devices for generating and burning gaseous fuel, the combination of a closed combustion-chamber, a generating pipe or retort arranged therein, an air or mixing chamber into which the generating-chamber delivers, said mixing-chamber arranged to deliver into the burner located in the closed fire-chamber, and a steam jet or exhaust arranged in the delivery end of the generator, substantially as and for the purposes specified.

2. In a device for generating and burning gaseous fuel, the combination of a closed fire-chamber, the series of generating-pipes 3 arranged therein, the nozzle 20 at the delivery end of the pipes 3, the central steam-jet exhaust, 21, the funnel-shaped air and mixing chamber provided with the register 26 26', and a perforated burner, 25, substantially as and for the purposes specified.

398,874. VENTILATION OF BUILDINGS. STERLING L. BAILEY, Hyde Park, Ill. Filed Jan. 7, 1888. Serial No. 295,603. (No model.)

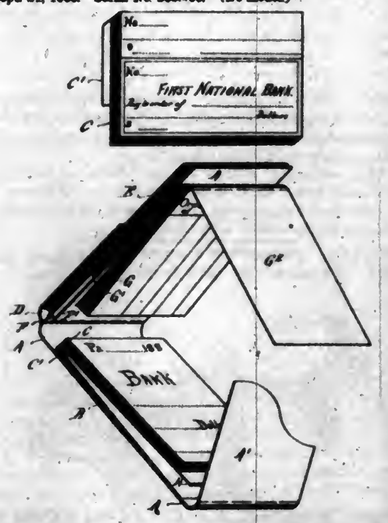
Claim.—1. In a ventilating apparatus for buildings, the combination, with the dry-closets and their horizontal shaft D, of the ventilating-shaft E, the smoke-flue F, the furnace G, and the smoke-pipe H, connecting with the smoke-flue F, and the air-pipe J, heated by the smoke-pipe and communicating with the ventilating-shaft E, substantially as specified.

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2. In a building to be ventilated, the combination of the heating apparatus G, flues E and F, smoke-pipe H, connected to the flue F, and air-pipe J, heated by the smoke-pipe and connected to the ventilating-flue E, substantially as specified.

398,875. COMBINATION BANK-BOOK. WILLIAM H. BENSON, Reading, Pa., assignor of one-half to Charles F. Heller, same place. Filed Sept. 21, 1888. Serial No. 285,966. (No model.)



Claim.—1. A bank-book consisting of a case having a flap, A', and an inside pocket, B, on one side, and an outside pocket, D, on the other, in combination with a check-book having a back, C, removably held in said pocket B, and a bank-book placed in said pocket D, the flaps A' being adapted to cover the bank-book and be inserted in the pocket D, substantially as set forth.

2. A bank-book consisting of a case having a flap, A', and an inside pocket, B, on one side, and an outside pocket, D, and the inside pocket F on the other, in combination with a check-book having a back, C, removably held in said pocket B, a record-book similarly held in the pocket F and a bank-book placed in said pocket D, the flaps A' being adapted to cover the bank-book and be inserted in the pocket D, substantially as set forth.

3. A bank-book consisting of a case having a flap, A', and inside pockets, B and H, on one side, and an outside pocket, D, and inside pocket F on the other, in combination with a check-book, a bank-book, and a record-book, removably secured in said pockets B, D, and F, all arranged substantially as set forth.

4. A bank-book consisting of a case having inside pockets, B and H, on one side, and an inside pocket F on the other, in combination with a check-book and a record-book having backs C and G', removably held in said pockets B and F, substantially as set forth.

398,876. METHOD OF PREPARING FILLER MATERIAL FOR THE MANUFACTURE OF CIGARS. RICHARD A. BRIGHT, Providence, R. I., assignor to Walter A. Peck, trustee, same place. Filed June 2, 1888. Serial No. 275,947. (No specimens.)



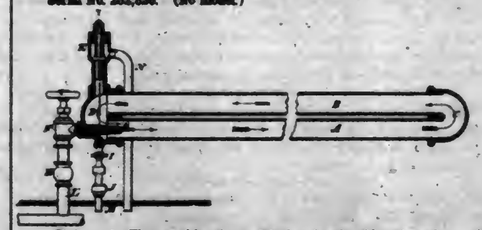
Claim.—The method of preparing a mass of cigar-fillers, which consists in first arranging a quantity of fillers in a substantially parallel position and then cutting out or removing a portion of the tobacco, so that the prepared mass will have the tobacco cut out or removed at its edge, and thus contain the proper proportion of tobacco in its different parts to form cigars of the required shape or taper.

398,877. FILLER MATERIAL FOR CIGARS. RICHARD A. BRIGHT, Providence, R. I., assignor to Walter A. Peck, trustee, same place. Filed Aug. 18, 1888. Serial No. 283,134. (No model.)



Claim.—A prepared mass of cigar-fillers having a portion of the tobacco cut out or removed at the edge of the mass, so that a quantity taken from any portion of said mass will contain the proper proportion of tobacco in its different parts to form cigars of the required shape or taper.

398,878. RAILWAY-CAR HEATER. WILLIAM BURNETT, New York, N. Y., assignor to John B. Gray, same place. Filed Mar. 20, 1887. Serial No. 232,236. (No model.)



Claim.—1. The combination, with the circuit of heating-pipes, of a steam-jet pipe extending within the said pipes and an automatic relief-valve on the circuit-pipes, substantially as described.

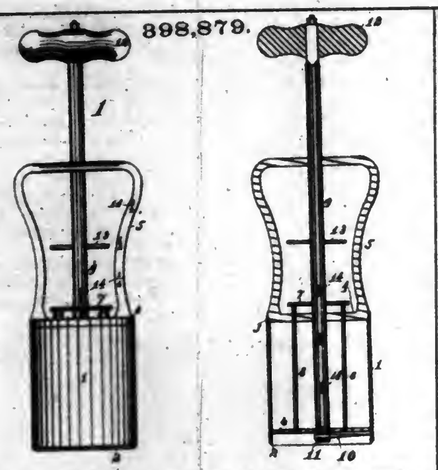
2. A heater consisting of a continuous and unbroken circuit of pipes through which the circulating medium, consisting of air mingled with steam, is to be impelled, and a steam-jet pipe extending within the pipes of the circuit, the said circuit of pipes having an automatic steam-trap, substantially as described.

3. A heater consisting of a continuous and unbroken circuit of pipes through which the circulating medium is to be impelled, a steam-jet pipe extending within the pipes of the circuit and having a controlling-valve, the said circuit of pipes having a steam-trap and an automatic relief-valve, so as to be employed at will either for heating with the combined medium of air and steam or with the medium of water, substantially as and for the purpose described.

398,879. BUTTER-CUTTER. HARRY M. CAIN, Denver, Colo. Filed July 3, 1888. Serial No. 278,970. (No model.)

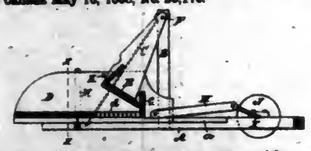
Claim.—The combination of the cylinder 1, cap 4, with attached handle 5, follower 6, ring 7, rods 8, connecting the follower and ring, knife-rod 9, having handle 12, and knife 10, pivoted by pivot 11 in the rod and at right angles thereto to automatically turn and present

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its edge in the direction of movement of the knife, substantially as set forth.

398,880. CURD-MILL. RICHARD H. CASWELL, Ingersoll, Ontario, Canada. Filed May 23, 1888. Serial No. 274,852. (No model.) Patented in Canada May 18, 1888, No. 29,176.

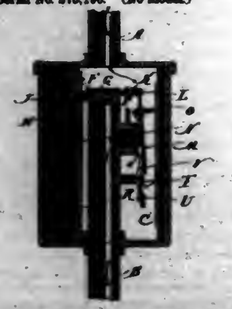


Claim.—1. In a curd-mill, the combination, with a supporting-frame, A, having posts B B', of a swinging presser, E, hung from said posts, and a trough, D, under the presser, said trough having an aperture in the bottom provided with intersecting knives *d*, and an end, *c*, and cross-bar K, to swing the presser when the trough is reciprocated to alternately expose and cover the knives, for the purpose set forth.

2. In a curd-mill, the combination, with a supporting-frame, A, of the reciprocating trough D, having an aperture in the bottom, provided with diagonally-intersecting knives *d*, a swinging presser, E hung from posts B B' of said frame and between an end, *c*, and cross-bar K of the trough, and a pitman, I, and crank-shaft H to reciprocate the trough, whereby the knives are exposed when the presser swings from the perpendicular, and the presser closes upon the knives when at the perpendicular, for the purpose set forth.

3. In combination with the reciprocating trough D and the supporting-frame A, the gate M, secured at top to a bent bar, L, straddling the trough and standing in holes in the frame, whereby the gate will remain stationary crosswise of the trough when the trough is reciprocated, for the purpose set forth.

398,881. GAS-REGULATOR. EDWARD J. COLBY, Chicago, Ill. Filed May 26, 1888. Serial No. 275,196. (No model.)



Claim.—1. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a flap-valve and adjustable plate to which such flap-valve is pivoted, so as to vary the normal distance of the valve from the aperture.

2. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a flap-valve pivoted above and supported below by a swinging stop.

3. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a discharge-valve pivoted above and supported below by a swinging stop provided with a curved bearing-edge, so that as the flap-valve moves toward the aperture its bearing-point approaches the fulcrum of such stop.

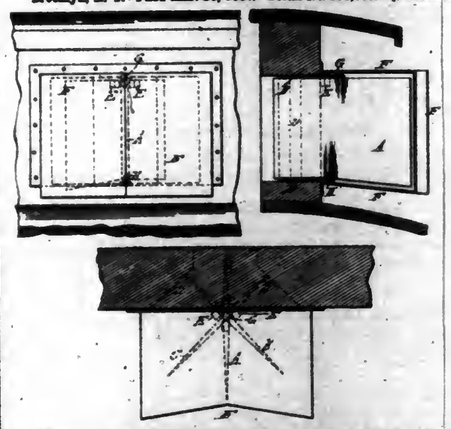
4. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a flap-valve pivoted above and a swinging stop provided with an adjustable counter-weight.

5. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a flap-valve and a swinging stop provided with a bearing-edge of such shape that as the flap-valve nears the aperture the bearing-place approaches the fulcrum of the stop, and also with an adjustable counter-weight, so that the power of the stop may be varied.

6. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a flap-valve, a fixed stop, and a screw-bolt to engage such stop, so that the limit of approach of the flap-valve to the aperture may be fixed at will.

7. In a fluid-regulator, the combination of a discharge-pipe having an aperture with a flap-valve pivoted above to an adjustable slide and supported below by a swinging stop provided with an adjustable counter-weight to fix the power of the stop at will.

398,882. AUTOMATIC CAR-VENTILATOR. WILLIAM G. CREAMER, Brooklyn, N. Y. Filed Mar. 26, 1887. Serial No. 232,605. (No model.)



Claim.—1. In a car-ventilator, a deflector pivoted in the air-exit opening and having the upper pivot nearer than the lower to the outer edge of the deflector, whereby the deflector tends normally to assume a position at right angles to the side of the car.

2. The combination, with the pivoted deflector, of elastic strips located on each side of the pivot, and as close as possible thereto, and elastic strips located as described, so as to form a tight joint with the inner edge of the deflector in either position.

398,883. EDGE-SETTING MACHINE. JOHN E. DRAKE, Quincy, Mass. Filed June 23, 1888. Serial No. 278,061. (No model.)



Claim.—The edge-setting machine, as described, consisting of the stationary head or frame *a*, the reciprocating block *d*, mounted therein, and the tool-carrier *c*, secured to or forming a part of said block and projecting to one side of said head or frame, combined with the stationary guide a^4, and the arm or extension E, forming a part of or secured to the tool-carrier *c* or the block *d*, and suitable tools arranged on the said carrier *c*, substantially as and for the purpose set forth.

398,884. SASH-FASTENER. JACOB EBERHARDT, Chicago, Ill. Filed Jan. 7, 1889. Serial No. 295,658. (No model.)

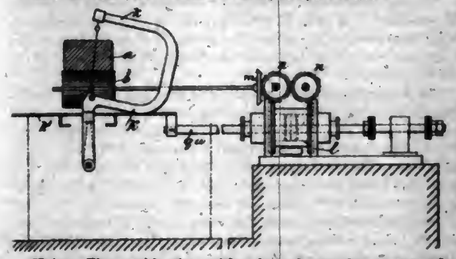
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Claim.—1. A cam A, provided with a handle, *a*, in combination with the plate B, having a curved groove, *c*, and the spring-actuated pin *d*, substantially as and for the purpose specified.

2. The cam A, having a serrated edge, and plate B, having a curved groove, *c*, having its bottom oppositely inclined toward its ends, and a central depression, *f*, in combination with the spring-actuated pin *d*, substantially as and for the purpose specified.

398,885. TILE-CUTTING MACHINE. CARL A. RIEMER, Lugau, Saxony, Germany. Filed Feb. 20, 1888. Serial No. 264,610. (No model.) Patented in Germany Sept. 26, 1887, No. 44,518; in Belgium Jan. 31, 1888, No. 80,941, and in France Mar. 26, 1888, No. 183,107.



Claim.—The combination, with a bow, *k*, carrying cutters, of a cylinder, *l*, having inlet-valves *p p'* and outlet-valves *f f'*, a piston in said cylinder having rod *q u*, adapted to move said bow *k* back and forth, friction-drum *b*, and tumblers *o* o' o^2 o^3, revolved by gear from said drum, for the purpose set forth.

398,886. REST FOR DISPLAY-FRAMES. ROBERT PARISH, Decatur, Ill. Filed June 19, 1888. Serial No. 277,601. (No model.)



Claim.—1. A rest comprising the saddle recessed in its upper surface and the bars, the bars held centrally in the saddle and extended divergently on opposite sides thereof, as set forth.

2. A rest comprising the saddle *h*, recessed in its upper surface, the bars *i i*, held centrally in the saddle and extended divergently on opposite sides thereof, and the supporting-surfaces *k'*, formed of the terminations of the bars, as set forth.

3. A rest comprising the saddle having the concave under surface, the bars in the saddle, and the attaching-screw adapted to retain the bars in the saddle and secure the saddle to a frame, as and for the purpose set forth.

4. A rest comprising the saddle *h*, recessed in its upper surface, the bars *i i*, held centrally in the saddle and extended divergently on opposite sides thereof, the supports *k'*, and the clamps *k*, both formed of terminations of the bars, as set forth.

5. A rest comprising the saddle and the wires, the saddle recessed in its upper surface and notched to receive the wires, as set forth.

398,887. SHOVEL. EDWARD I. PRESCOTT, Halifax, Nova Scotia, Canada. Filed Sept. 18, 1888. Serial No. 285,690. (No model.) Patented in Canada Sept. 24, 1888, No. 26,002.

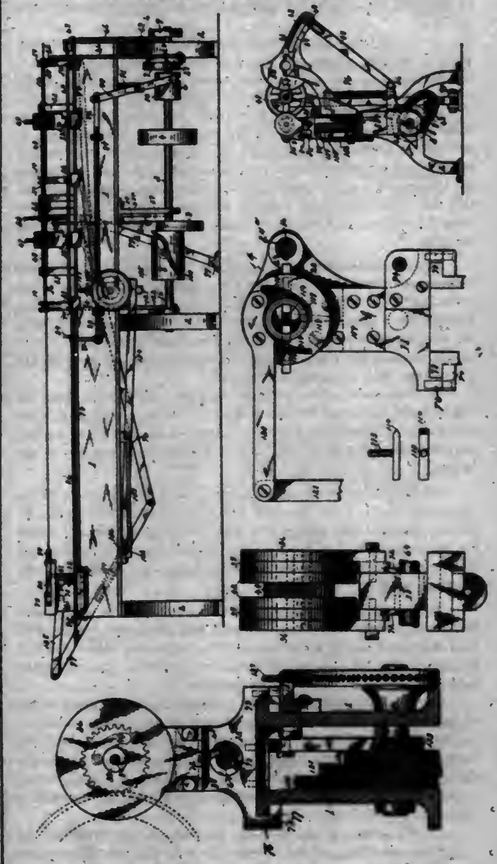


Claim.—1. In a shovel, the combination of a body or pan, a curved socket riveted to said pan and having the inner edge of its mouth beveled, a handle, and a covering-plate riveted to said pan and the inner side of said socket, substantially as set forth.

2. In a shovel, a covering-plate, as D, secured to the pan and inner side of the socket of said shovel, substantially as and for the purpose set forth.

3. In a shovel, the combination of the pan A, the socket C, provided with the beveled mouth *t* and tang *f*, and secured to said pan by rivets *z*, the covering-plate D, secured to said pan and the inner side of said socket by rivets *v z*, and the handle B, all being arranged substantially as described.

398,888. WIRE-TWISTING MACHINE. FREDERICK D. FRY, Danbury, Conn., assignor of one-half to Theodore H. Benedict, same place. Filed Apr. 28, 1888. Serial No. 272,114. (No model.)



Claim.—1. The combination, with the frame-work, of stationary and movable standards, each of which is provided with a stationary and a movable jaw adapted to hold the wire, a rock-shaft, 16, and stationary and movable cams on said shaft adapted to force the movable jaws into operating position when it is desired to grasp the wire.

2. The combination, with standard 11 and adjustable standards 12, each carrying holding-jaws, of rock-shaft 16, having cams 24, for

operating the holding-jaws, the cams which operate the jaws carried by the movable standards being adapted to slide on said shaft.

3. The combination, with standards 12, the twisting-heads and operating mechanism therefor, stationary standard 11, and movable standards 12, of side plates 14, attached to the standards, stationary holding-jaws, movable holding-jaws pivoted between the side plates, and cams engaging the movable jaws to throw them to the closed position.

4. The combination, with rock-shaft 16, having cams 24, of standards 11 and 12, side plates secured thereto, in which the rock-shaft is journaled, stationary jaws having inclines 23, and movable jaws actuated by the cams and having inclines corresponding with inclines 23, so that the jaws register in the closed position.

5. The combination, with the standards and side plates, of stationary holding-jaws 17, jaws 19, carried by oscillating plates 20, and cams for oscillating said plates, said jaws having notches at their forward ends to engage the wire and inclines, whereby they are caused to register in the closed position.

6. The combination, with rock-shaft 16, having a groove, and cams 24, secured to said rock-shaft by splines engaging the groove, of stationary and movable standards each carrying a stationary and movable holding-jaw, and side plates on opposite sides of the cams, all arranged so that the movable standards may be adjusted without affecting the operation of the cams and jaws.

7. The combination, with stationary and movable standards 11 and 12 and holding-jaws carried thereby which grasp the wire, of movable standards 13, carrying twisting-heads midway between the holding-jaws, jaws in the twisting-heads, mechanism, substantially as described, for closing the jaws upon the wire, and mechanism, substantially as described, for rotating the twisting-heads while the jaws are holding the wire.

8. The twisting-heads consisting of side plates, 36, sleeve 33, journaled in the side plates, said sleeve having a longitudinal opening to receive the wire and a transverse opening, 35, pinion 44, disks 42, said pinion and disks having a transverse slot registering with the slot in the sleeve, a stationary and a movable jaw lying in said slots, the latter having rollers 41, disks 39, having eccentric slots engaged by said rollers, brakes acting on disks 39, and mechanism, substantially as described, to operate the brakes and to oscillate the pinion, whereby the brakes are caused to engage disks 39, the jaws to engage the wire, and the brakes to release disks 39, and the continued movement to twist the wire until the brakes act again and cause the jaws to release the wire.

9. The combination, with standards 13, side plates, 36, secured thereto, and a sleeve, 33, journaled in the side plates and having transverse slot 35, of pinion 44 and disks 42, having slots corresponding with slot 35, a stationary and a movable jaw lying in said slots, disks 39, also journaled on said sleeve, eccentric slots in said disks, rollers on the movable jaw engaging said slot, brakes engaging disks 39, and a segmental gear engaging the pinion.

10. The combination, with the standard, side plates, sleeve 33, disks 39 and 42, pinion 44, and the jaws, of brakes 38, recessed in the side plates, rock-shaft 64, having a groove, sleeve 69, having a spline engaging said groove, and links 72, connecting said sleeve with the brakes.

11. In a machine for twisting wire, the combination, with the stationary jaw and the movable jaw having rollers 41, of disks 39, having eccentric slots engaged by said rollers, pinion 44 and means for operating it, brakes 38, engaging said disks, and a rock-shaft and links whereby said brakes are caused to engage with disks at predetermined times.

12. In a machine for twisting wire, the combination, with sleeve 33, having a transverse slot, of disks 42 and pinion 44, turning with said sleeve and having transverse slots corresponding with the slot in the sleeve, jaws lying in said slots, and an oscillating gear engaging said pinion, whereby the jaws are operated.

13. The combination, with the holding-jaws and twisting-heads of an oscillating shaft having gears by which the twisting-heads are oscillated and a pinion, 49, a segmental gear having a slotted arm with a gage, a slide in the frame-work, and a rod, 55, pivoted to said slide and adjustably secured in said slot, whereby the oscillation of the twisting-heads may be regulated to impart more or less twist to the wire.

14. The combination, with the holding-jaw and twisting-head standards and racks pivoted thereto, of shaft 129, carrying gears of diminishing size engaged by said racks, whereby movement of said shaft and gears in either direction will adjust said standards to different sizes of hat-wires, the gears being so laid out that the twisting-heads are kept midway between the pairs of holding-jaws.

15. The combination, with the standards carrying the holding-jaws and twisting-heads and racks pivoted to said standards, of shaft 129, carrying diminishing gears engaged by said racks, and a disk, 136, having openings in its periphery, bracket 138, and a pin engaging said bracket and the openings in the disk, whereby the standards are locked at any desired adjustment.

16. The combination, with standard 11 and plates 109 and 116, of the cutters having pins 113 and an oscillating disk having curved slots engaged by said pins, whereby the oscillation of said disk operates the cutters to sever the wire at predetermined times.

17. Standard 11, plate 109, having slots 112, and plate 116, having grooves 115, in combination with the cutters lying in said grooves, and pins 113, which pass through slots 112 and engage curved slots in oscillating disk 117, as and for the purpose set forth.

18. The combination, with standard 11 and plate 109, having a threaded opening, of sleeve 111, engaging said opening, the cutters having pins 113, and oscillating disk 117, journaled on said sleeve and having slots engaged by said pins.

19. The combination, with standard 11, plate 116, having grooves 115, and the cutters having pins engaging said grooves, of disk 117, having slots engaged by said pins, arm 120, secured to said disk, lever 122, engaging cam 10, and a rod connecting said lever and arm.

20. The sliding feeding device consisting of upper and lower plates, a shaft journaled in said plates and carrying an operating-cam, and jaws pivoted to one of said plates, whose shanks are engaged, respectively, by springs 80 to open the jaws and by the cam to close them.

21. The combination, with the sliding feeding device having jaws 79, of shaft 81, carrying cam 82 to close the jaws, and a pin, 83, and a finger, 85, carried by a sliding shaft, 86, said fingers engaging pin 83 to open the jaws again at the proper time.

22. Sliding shaft 86, having fingers 84 and 85, in combination with the sliding feeding device carrying jaws 79, a shaft carrying a cam and having a pin, 83, which is engaged by finger 84 to close the jaws upon the wire when the feeding device is at its forward position and by finger 85 to open the jaws when the feeding device is at the opposite extreme of its movement.

23. The combination, with upper and lower plates, 73 and 74, and standard 75, of jaws 79, pivoted to the upper plate, springs 80, acting to throw said jaws to the open position, and shaft 81, journaled in said plates and carrying a cam which engages the shanks of the jaws to close them.

24. The jaws and shaft 81, having cam 82 and pin 83, in combination with sliding shaft 86, having fingers 84 and 85, which are engaged by pin 83 at predetermined times to open and close the jaws.

25. The combination, with jaws 79 and shaft 81, having cam 82 and pin 83, of sliding shaft 86, having fingers 84 and 85, sliding shaft 88, to which shaft 86 is connected, lever 90, carrying a roller engaging cam 6, and link 92, connecting said lever to shaft 88.

26. The combination, with the sliding feeding device, cam 5, and lever 98, having a roller engaging said cam, of rod 96, link 108, and lever 97, connected to said link and said rod.

27. The combination, with the sliding feeding device, cam 5, and lever 98, having a roller engaging said cam, of rod 96, link 108, and lever 97, pivoted to adjustable block 102 and connected to said link and said rod.

28. The combination, with the sliding feeding device, levers 97 and 98, rod 96, and link 108, of block 102, to which lever 97 is pivoted, and a rack pivoted to said block and engaging gear 130, whereby the throw of the sliding feeding device may be adjusted.

29. The combination, with block 102, rack 134, and gear 130, of the sliding feeding device, oscillating lever 98, rod 96, pivoted to said lever, link 108, pivoted to the sliding feeding device, and lever 97, pivoted to block 102 and to said rod and link, and provided with a gage, 105, whereby the parts may be set to feed the desired length of wire.

30. The combination, with block 102, rack 134, and gear 130, of the sliding feeding device, oscillating lever 98, rod 96, pivoted to said lever, link 108, pivoted to the sliding feeding device, lever 97, having slot 104 and gage 105, bolt 106, passing through said block and said slot, and a lock-nut engaging said bolt to lock the parts when adjusted.

31. In a wire-twisting machine, the combination, with sets of holding-jaws and intermediate twisting-heads, of a sliding feeding device carrying jaws 79 and operating mechanism arranged and timed, substantially as set forth, whereby each forward movement of the feeding device draws forward the wire last twisted and places new wire in the holding-jaws and twisting-heads ready to be acted upon.

32. The combination, with the holding-jaws, the twisting-heads, the sliding feeding device having jaws 79, cutters 114, and operating mechanism arranged and timed substantially as set forth, whereby a completed hat-wire is severed while the second is being formed.

33. The combination, with the cutters, the sliding feeding device, and operating and connecting mechanism, substantially as described and shown, of oscillating lever 98, rod 96, lever 97, having an adjustable fulcrum, and link 108, connecting said lever with the sliding feeding device.

34. The combination, with the cutters having pins 113, and oscillating disk 117, having slots 118 engaged by said pins, of arm 120, attached to said disk, lever 122, engaging cam 10, and rod 121, connecting said lever and said arm.

35. The combination, with standards 11 and 12 and a stationary and a movable holding-jaw in each standard, of rock-shaft 16, having a groove, cams 24, which actuate the movable jaws and are provided with splines engaging said groove, crank-arm 25 on said shaft, lever 27, having a roller engaging cam 7, and a rod connecting said lever and said crank-arm.

36. The combination, with stationary and movable twisting-jaws, the latter having rollers 41, and disks 39, having slots engaged by said rollers, of brakes 38, engaging said disks, rock-shaft 64, having a groove, sleeve 68, having a spline engaging said groove, links connecting said sleeve with the brakes, a crank-arm on said rock-shaft, a slide having a roller engaging a groove in cam 9, and a rod connecting the crank-arm with the slide.

37. The combination, with sleeve 33, having a transverse slot, disk 42, and pinion 44, having transverse slots registering with the slot in the sleeve, and a stationary and a movable jaw lying in said slots, the latter carrying rollers, of disks 39, having grooves engaged by said rollers, segmental gear 50, having arm 53, a slide having a roller engaging cam 8, and a rod connecting said arm and said slide.

38. The combination, with standards 12 and 13, the holding-jaws and twisting-heads carried by said standards, the feeding mechanism, and block 102, by which it is adjusted, of racks pivoted to said standards and said block, and a shaft carrying gears engaged by said racks, whereby the sliding feeding device and the holding-jaws and the twisting-heads may be so adjusted as to feed the desired length of wire and hold it at both ends and the center and to twist it midway between the points at which it is held.

39. The standards 12 and 13, having lugs 124, racks pivoted to said lugs so as to lie side by side, and block 102, also having a rack pivoted thereto, in combination with a shaft carrying diminishing gears engaged by said racks, the sliding feeding device, and holding-jaws and twisting-heads carried by the standards.

40. The combination, with standard 11, the cutters having pins, sleeve 111, and a disk journaled thereon and having slots engaged by said pins, of the sliding feeding device carrying jaws and operating mechanism arranged and timed substantially as set forth, whereby when the forward movement of the sliding feeding device takes place the jaws enter said sleeve and grasp the end of the wire after the cutters have severed the completed hat-wire.

41. The combination, with standard 11, the cutters having pins, sleeve 111, and a disk journaled thereon and having slots engaged by said pins, of the sliding feeding device, jaws 79, carried thereby, and mechanism, substantially as described, which causes the jaws to grasp the wire at one extreme of its movement and to release it at the other extreme.

42. The combination, with the sliding feeding device having jaws which grasp the wire at one extreme of its movement and release it at the other, of cutters which sever the completed hat-wire, holding-jaws which grasp the second wire at both ends and at the center, and oscillating heads which twist the wire midway between the points at which it is grasped, substantially as described.

43. The combination, with the twisting-heads having pinions 44, and oscillating shaft 48, having gears engaging said pinions, and a pinion, 49, of a segmental gear engaging pinion 49 and having a slotted arm, a slide, and a rod pivoted to said slide and adjustably secured in said slot, as and for the purpose set forth.

44. The combination, with the twisting-heads, oscillating shaft 48, and segmental gear 50, having an arm, 53, of a slide, 57, having a roller engaging a groove in cam 8, and a rod connecting said slide with said arm to cause the oscillation of the twisting-heads.

45. The combination, with the twisting-heads, shaft 48, segmental gear 50, having slotted arm 53, and gage 61, of slide 56 and arm 55, pivoted to said slide and adjustably secured to said arm, whereby the amount of rotation imparted to the twisting-heads may be accurately regulated.

46. The combination, with stationary standard 11 and movable standards 12 and 13, carrying the holding-jaws and twisting-heads, of the sliding feeding device carrying jaws, mechanism, substantially as described and shown, to cause said jaws to grasp and release the wire at proper times, and cutters whereby the wires are severed.

47. The holding-jaws, and twisting-heads located midway between the holding-jaws and the cutters, in combination with the sliding feeding device and mechanism, substantially as described, for adjusting the holding-jaws and the twisting-heads in proper relation to each other and adjusting the throw of the feeding device to correspond therewith.

48. The combination, with stationary and movable standards, the holding-jaws, mechanism, substantially as described and shown, for operating said jaws, and the twisting-heads, of a segmental gear having a slotted arm by which the twisting-heads are operated, and means, substantially as described, for regulating the oscillation of the segmental gear, whereby more or less twist may be imparted to the wire, as may be required.

49. The combination, with the holding-jaws, the twisting-heads, and the cutters, of the sliding feeding device carrying jaws 79, mechanism, substantially as described, for adjusting the throw of the feeding device, and adjustable fingers 84 and 85, carried by sliding shaft 86, whereby the opening and closing of the jaws may be regulated.

398,889. FASTENER FOR THE MEETING-RAILS OF SASHES.

GOTTLIEB GERBERS, Jamaica Plain, Mass. Filed Dec. 28, 1888. Serial No. 294,405. (No model.)



Claim.—1. The improved sash-fastener, as described, consisting of the shell or frame *c* and its pivoted spring-pressed pawl *d*, and the spring *f*, having projection *f'*, adapted to fit in a recess, *d''*, in said pawl, combined with the block *g*, having locking-surface *g'* and lip or projection *g''*, substantially as and for the purpose set forth.

2. The improved sash-fastener, as described, consisting of the frame or shell *c* and its pivoted spring-pressed pawl *d* and side projections, *c' c'*, in combination with the block *g*, having locking-surface *g'* and hooks *g³ g³*, substantially as and for the purpose set forth.

398,890. HAIR-TONIC.

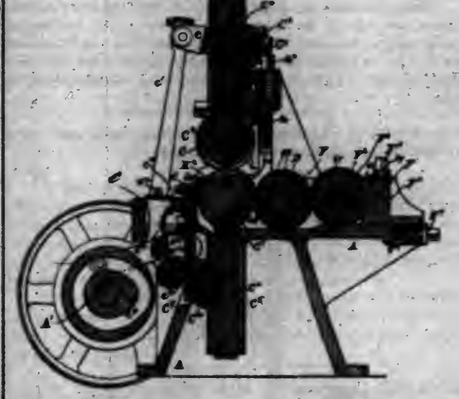
HANS H. GARDE, Notting-Hill, County of Middlesex, England. Filed Jan. 2, 1889. Serial No. 295,156. (No specimens.) Patented in England Oct. 20, 1888, No. 15,889.

Claim.—1. The process of preparing a lotion for the hair and scalp by mixing apple-juice and alcohol, using juice expressed from rotten apples and alcohol, as above set forth.

2. The process of preparing a lotion for the hair and scalp by mixing apple-juice and alcohol, using juice expressed from rotten apples and grape-alcohol, as above set forth.

398,891. NAIL-MAKING MACHINE.

LOUIS GOSSE, Winchester, Mass., assignor to the Golden Improvement Company, Portland, Me. Filed July 12, 1888. Serial No. 279,766. (No model.)



Claim.—1. In a machine for forming nails from wire-like material, the combination of the following-described instrumentalities, viz: the feed mechanism to feed the wire, the combined cutting and forming mechanism to sever the wire to form a double blank and offset the same where the blank is to be separated to constitute the points for two nails, the carrying-wheels for the blank, and the cutting mechanism to separate the double blank at its offset portion and form points for the nails, substantially as described.

2. In a machine for forming nails from wire-like material, the combination of the following-described instrumentalities, viz: the feed mechanism to feed the wire, the combined cutting and forming mechanism to sever the wire to form a double blank and offset the same where the blank is to be separated to constitute the points for two nails, the carrying-wheels for the blank, the cutting mechanism to separate the double blank at its offset portion and form points for the nails, and the transferrer, to operate substantially as described.

3. In a machine for forming nails from wire-like material, the combination of the following-described instrumentalities, viz: the feed mechanism to feed the wire, the combined cutting and forming mech-

anism to sever the wire to form a double blank and to offset the same, the carrying-wheels for the double blank, the cutting mechanism to separate the double blank at its offset portion and form points for the nails, and the die-rolls having die-grooves, substantially as described.

4. The combination, in a nail-making machine, of a former-bar to bend the stock to form a double blank, and blank-carrying wheels having grooves out of line with each other, as described, and a transferrer to transfer the offset blanks into the said grooves, substantially as described.

5. In a machine for making nails, the former-bar, carrying-wheels having grooves out of line, as described, and a transferrer to transfer the offset double blank into the said grooves, combined with cutting mechanism to sever the offset blank and form points for the nails, substantially as described, without waste of stock.

6. In a nail-making machine, blank-carrying wheels having grooves out of line, as described, and the cutters to sever the offset blanks, combined with die-rolls having die-grooves, and with headers to head the nails held in the said die-grooves, substantially as described.

7. The former and anvil to offset the double blank, the transferrer, the carrier-wheels for the blank, and the cutting mechanism to sever the offset blank, combined with a shield having flanges to permit the escape from the grooves of the separate blanks, substantially as described.

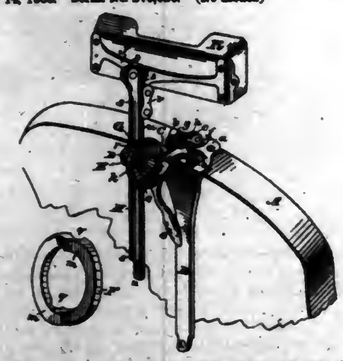
8. In a nail-making machine, the carrier-wheel and the compound shaft 40 42, to which it is attached, substantially as shown and described.

398,892. ANKLE-SUPPORTER. RICHARD H. GOLDEN, South Norwalk, Conn. Filed July 26, 1888. Serial No. 281,064. (No model.)



Claim.—An ankle-supporter the body of which consists of a single piece of material and the bottom of which has two full overlapping plies integral with the said body, and independent plies 4 and 5, secured to the inner and outer of the said overlapping plies, the said body being provided at its front side with lacing-holes, substantially as set forth.

398,893. HEAD-REST. AARON P. GOULD, Canton, Ohio. Filed Apr. 14, 1888. Serial No. 270,630. (No model.)



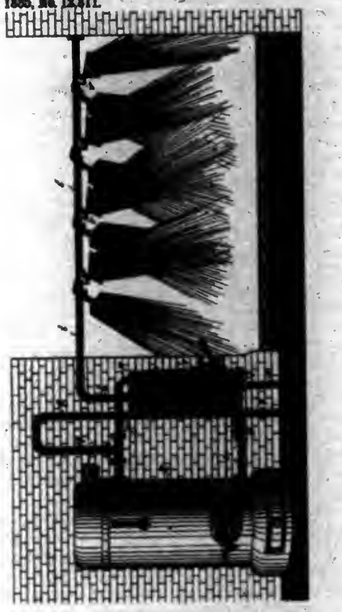
Claim.—1. The combination, in a head-rest, with a body portion, B, secured to the chair, of a supporting-stem formed of two parts, link A, cushion-support J, supporting-stem H, formed of two parts pivotally secured thereto, link *v*, pin D, having perforations *k p*, clamping-disks E F G, having inclined planes *m n* placed on said pin between the stems C and H, and a handle for turning said disk G, whereby the adjustable parts may be secured in desired adjustment, substantially as described, and for the purpose set forth.

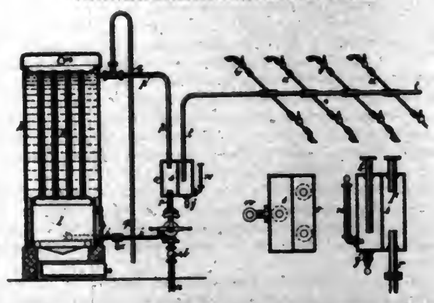
2. In a head-rest, the combination, with a suitable support and a head-rest cushion, of a two-part stem connecting the head-rest cushion with the support, one of the parts of the two-part stem being pivoted directly to the cushion-frame and the other connected therewith by a link, and a clamping device to lock the parts of the stem together and to the support, the said link forming a brace when the stem is locked, substantially as set forth.

3. In a head-rest, the combination, with a suitable support and a head-rest cushion, of a two-part stem pivoted to the support, one part of the two-part stem being pivoted directly to the support and the other connected with the support by a link, means for connecting the cushion with said two-part stem, and a clamping device to lock the parts of the stem together, substantially as set forth.

4. In a head-rest, the combination, with a suitable support, and a head-rest cushion, of two two-part stems, each element of one of the two-part stems being pivotally connected to the support, and each element of the other two-part stem being pivoted to the head-rest cushion, and an intermediate clamping device connecting said stems at points opposite their pivotal connection, substantially as set forth.

398,894. SHOWER-BATH. DAVID GROVE, Berlin, Germany. Filed Nov. 16, 1885. Serial No. 182,970. (No model.) Patented in England Oct. 26, 1885, No. 12,811.





Claim.—1. The combination of the heater *k* with the circulation-pipe or tube *p*, the exhaust pipe or tube *g*, the three-way cock *c*, pipes *i* and *r*, and the mixing vessel or chamber *o*, into which hot water will flow as soon as cold water is fed into the lower part of the heater, substantially as described and shown.

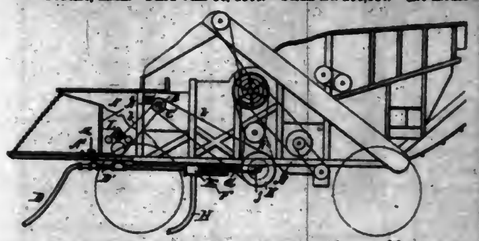
2. The combination of the mixing-vessel *o* with the delivery-pipe *t*, the roses, mouth-pieces, or nozzles *u*, the pipes *i*, *r*, and *p*, the heater *k*, and the cock *y*, substantially as described and shown.

3. The combination of the partition *s* and mixing-vessel *o* with the three-way cock *c*, pipe or tube *r*, *p*, and *t*, the thermometer *w*, roses, mouth-pieces, or nozzles *u*, and the regulating valves or cocks *v*, substantially as described and shown.

4. The combination of the three-way cock *c* with the water-supply pipe *a*, the pipe or tube *r*, the pipe or tube *i*, heater *k*, pipe *p*, mixing vessel or chamber *o*, pipe or tube *t*, and the roses, mouth-

pieces, or nozzles *u v*, so that the simultaneous supply of cold water to the heater *k* and mixing vessel or chamber *o* and hot water from the heater *k* to the mixing vessel or chamber *o* and the delivery-pipe *t*, and roses, mouth-pieces, or nozzles *u* can be regulated at will, substantially as described, and shown in the accompanying drawings.

398,895. STEAM-THRASHER REGULATOR. EPHRAIM HOWLAND, Pontiac, Mich. Filed Jan. 10, 1888. Serial No. 260,017. (No model.)



Claim.—1. The combination, with a thrashing-machine or separator, of a steam-engine located thereon and a governor adapted to regulate the steam-supply, said governor engaged directly with a moving part of the separator, whereby the motions are imparted immediately thereto, substantially as described.

2. The combination, with a thrashing-machine or separator, of a steam-engine located thereon and a governor adapted to regulate the steam-supply, said governor engaged directly with the cylinder of the thrasher or separator, whereby variations in the motion of the cylinder are imparted immediately to the governor, substantially as described.

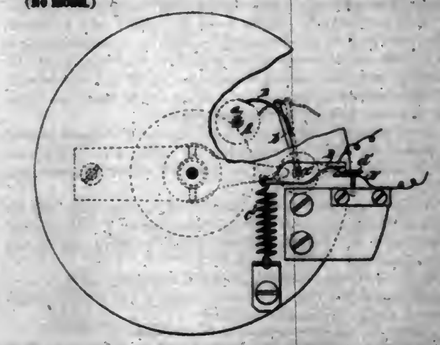
3. The combination, with a thrashing-machine or separator, of a steam-engine located thereon beneath the body of the machine and between the sides, a steam-pipe leading thereto, and a governor adapted to regulate the supply of steam to the engine, said governor engaged directly with the cylinder of the thrasher or separator, substantially as described.

4. The combination, with a thrashing-machine or separator, of a steam-engine located thereon and engaged with a drive-shaft, and a steam-supply pipe with a governor to regulate the supply of steam to the engine, both said drive-shaft and said governor connected directly with the shaft of the thrashing or separating cylinder, substantially as described.

5. The combination, with a thrashing-machine or separator, of an operating steam-engine located thereon, an operating steam-supply pipe leading thereto beneath the platform, and a governor located in an apartment above the steam-pipe and between the feeder's position and the body of the machine, substantially as described.

6. The combination, with a thrashing-machine or separator, of a steam-engine located thereon, a steam-supply pipe whereby it may be connected with a separate boiler, a governor on the machine, whereby is regulated the supply of steam to the engine, and a throttle-valve, also on the machine and adjacent to the feeder, whereby steam may be admitted to or cut off from the engine.

398,896. ELECTRIC ALARM-CLOCK. SAMUEL KAHAN and ALBERT W. GRAVES, Melbourne, Victoria. Filed Oct. 13, 1888. Serial No. 287,969. (No model.)



Claim.—1. In an alarm-clock, the combination, with a make-and-break device interposed in an alarm-circuit and one of the quick-going arbors of the going train, of a shifting mechanism controlled by a slow-going arbor of the going train and connecting devices controlled by the shifting mechanism for connecting the make-and-break device with the quick-going arbor, substantially as and for the purpose specified.

2. In an alarm-clock, the combination, with a make-and-break device interposed in an alarm-circuit, one of the quick-going arbors of the going train, and a connection between one element of the make-and-break device and the quick-going arbor of the going train, consisting of a longitudinally-movable rock-shaft on which such element is mounted, a pawl secured to said rock-shaft, and a ratchet-wheel on the quick-moving arbor, of a shifting mechanism controlled by a slow-going arbor of the going train and adapted to operate on the rock-shaft to move the pawl into and out of engagement with the ratchet, substantially as and for the purpose specified.

3. In an alarm-clock, the combination, with one of the quick-going arbors of the going train, a make-and-break device, and a ratchet-and-pawl connection between the two, of shifting mechanism adapted to move the pawl into and out of engagement with the ratchet and a controlling device operated by a slow-going arbor of the going train, consisting of a cam, and a connection between the cam and pawl-shifting mechanism, substantially as and for the purposes specified.

4. In an alarm-clock, the combination, with a quick-going arbor of a clock-going train, a ratchet-wheel, A, secured thereto, the hour-hand arbor of said train, and the cam E mounted thereon, of the contact D, a longitudinally-movable rock-shaft for said contact, a pawl carried on the rock-shaft and adapted to engage the ratchet on the quick-going arbor, and a shifting device connected with the rock-shaft and controlled by the cam on the hour-hand arbor to move the pawl into and out of engagement with the ratchet, substantially as and for the purpose specified.

5. In an alarm-clock, the combination, with a quick-going arbor of a clock-going train, a ratchet-wheel, A, secured thereto, a longitudinally-movable rock-shaft, C, the pawl B, and spring *c* mounted thereon, of the hour-hand arbor, the cam E loose thereon and provided with a head, *e*, the sliding pin *d*, and the spring F, said parts being arranged and operating substantially as and for the purpose specified.

398,897. SHEAVE. WILLIAM S. KNEBOUR, Bellevue, Ky., assignor of two-thirds to A. G. Stiebel, St. Louis, Mo., and Henry G. Stiebel, Jr., Cincinnati, Ohio. Filed Dec. 6, 1886. Serial No. 202,812. (No model.)



Claim.—1. A composite sheave or carrying-pulley for cable railways and other uses, composed of two parts, to wit, a supporting frame or hub portion and a separable annulus containing the belt-groove or wearing portion entire, the parts being formed with corresponding interlocking lugs and recesses, whereby the same fit and are held together without bolts or other separate fastenings, substantially as set forth.

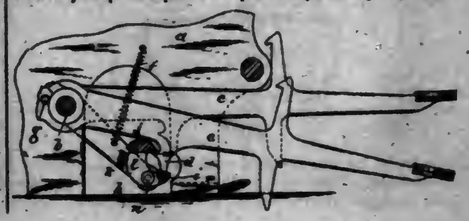
2. In a composite pulley having the wearing portion of its rim detachable, a permanent or hub portion provided with concentric lugs projecting at one side, and a detachable annulus containing the wearing portion of the face and completing the rim, provided interiorly with corresponding recesses, by which it may be slipped over and interlocked with the lugs, substantially as set forth.

3. In a composite pulley, the combination of the part *a'*, provided with the hub *b*, spoke *c*, and beveled lugs *d*, with the annulus *a²*, provided with recesses *e*, and beveled interlocking surfaces *e'*, substantially as set forth.

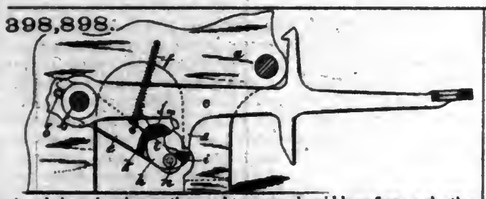
398,898. CASH INDICATOR AND REGISTER. CHARLES R. LOGE, Boston, Mass. Filed Oct. 11, 1888. Serial No. 287,802. (No model.)

Claim.—1. In a cash-register, the combination, with the registering-keys, of the key-coupler adapted to couple the displaced keys together during their registering motion, substantially as described, and for the purpose specified.

2. In a cash-register, the combination, with the registering-keys, of the key-coupler adapted to couple the displaced keys together dur-



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ing their registering motion, and to uncouple said keys from each other after the registration has been completed, substantially as described, and for the purposes specified.

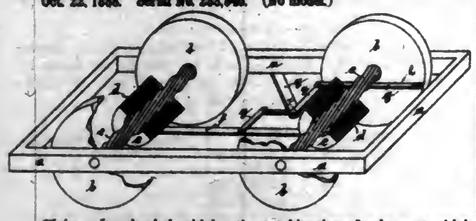
3. In a cash-register, the combination, with the registering-keys, each adapted to engage with a key-coupler, of the movable key-coupler support and the key-coupler mounted thereon and adapted to engage with displaced registering-keys during their registering motion, substantially as described, and for the purposes specified.

4. In a cash-register, the combination, with a set of registering-keys, of a key-coupler support pivoted to a suitable support, and the key-coupler pivoted upon said key-coupler support and engaging with displaced registering-keys during their registering motion, substantially as described, and for the purposes specified.

5. In a cash-register, the combination, with the pivoted registering-keys, each provided with the projection *d*, of the key-coupler support pivoted to a suitable support and held toward said keys by suitable means, and the key-coupler pivoted on said key-coupler support and engaging with the projections *d* on the displaced registering-keys during their registering motion, substantially as described, and for the purposes specified.

398,899. MECHANISM FOR DRIVING WHEELED VEHICLES.

JOHANNES MARTIENSSEN, Frankfort-on-the-Main, Prussia, Germany. Filed Oct. 22, 1888. Serial No. 288,946. (No model.)

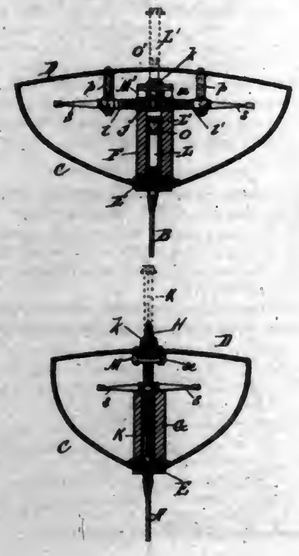


Claim.—In wheeled vehicles, the combination of axles *c*, on which the wheels are fixed, nuts *d*, and frames *e*, with lever-connections *f g h*, for the purpose specified, substantially as described and shown.

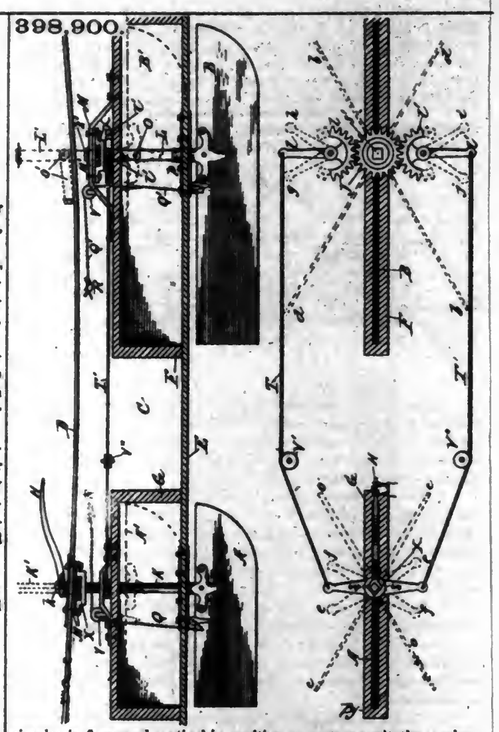
398,900. STEERING APPARATUS FOR VESSELS.

FREDERICK W. MARTIN, Waukegan, Ill. Filed Apr. 23, 1887. Serial No. 235,930. (No model.)

Claim.—1. In machinery for steering boats, the box M, fastened to the under side of the deck of the boat, its interior surface being



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circular in form and vertical in position, so as to permit the washer X to revolve therein, and being also of such diameter as to afford the said washer the least practicable lateral motion, said washer being pierced with a hole of such size and shape that it fits loosely upon the rudder-stock K, which bears the rudder-blade A and revolves with said rudder-stock, steadying its motion, and allows it to pass upward and downward in the trunk G, substantially as shown, and for the purposes specified.

2. In machinery for steering boats, the yoke S, fastened tightly on the rudder-stock K and connected by means of the yoke-lines T and T' with the lever-gears I and I', which engage with the cogs of the gear-wheel J on its opposite sides, substantially as shown, and for the purpose specified.

3. The lever-gears I and I', fastened beneath the deck of the boat, in combination with the yoke S, by means of the connecting yoke-lines T and T', and engaging by their cogs with the cogs of the gear-wheel J, said gear-wheel being provided with an angular hole through its hub, of such diameter as to permit the rudder-stock L to easily pass through and also to cause it to revolve when the said gear-wheel J revolves, substantially as described, and for the purposes specified.

4. In machinery for steering boats, the rudder-stock L, angular in form except at its lower extremity, P, and of such diameter as to pass through and fit loosely in the hub of the gear-wheel J, and the washer X', said stock passing through the box M' and the trunk F, and being fastened at its lower end to the rudder-blade B, substantially as shown, and for the purposes specified.

5. In machinery for steering boats, the box M', fastened beneath the deck of the boat and containing the washer X', in combination with the rudder-stock L, passing through them, substantially as shown, and for the purposes specified.

6. The drop-joint O in the rudder-stock L, constructed near the middle of the same, and the cylinder-shaped section P of the rudder-stock L, made at its lower end, substantially as shown, and for the purposes specified.

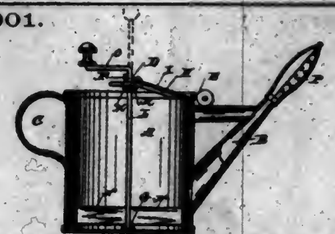
7. In machinery for steering boats, the chains Q and Q', in combination, respectively, with the rudder-blades A and B, substantially as shown, and for the purpose specified.

398,901. SPRINKLER.

JOSEPH HARER, Jr., Collins, N. Y. Filed Mar. 20, 1888. Serial No. 267,813. (No model.)

Claim.—1. In a sprinkler, the combination, with the can having a spout, of the socket in the bottom of the can, the spring-catch having a bearing, K, aligned with the socket, and the vertical shaft carrying a paddle and a crank and mounted in the socket and bearing, substantially as specified.

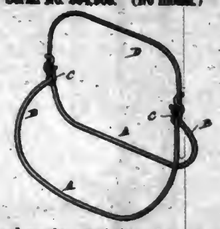
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2. In a sprinkler, the combination, with a can provided with a spout, and a hood, I, overhanging the front side of the can, of the spring-catch H, secured to the hood and extending beyond the rear edge thereof, and provided at its free end with the open-sided bearing K, which aligns with a socket, G, in the bottom of the can, and has its open side closed by the edge of the hood, and the vertical shaft provided with a paddle and a crank and mounted in the socket and bearing, as set forth.

398,902. WOOD-CARRIER.

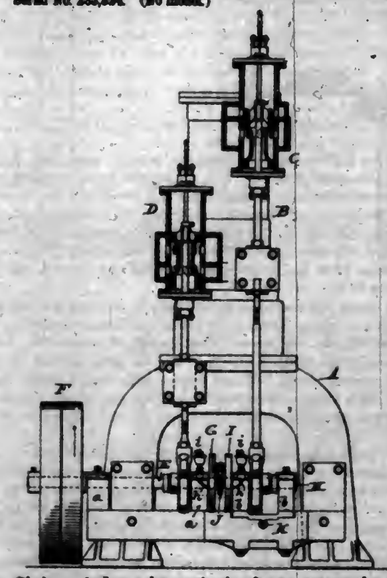
EDWIN W. PAYNE, Morrison, Ill. Filed Feb. 23, 1888. Serial No. 264,908. (No model.)



Claim.—A wood-carrier consisting of two base-wires and a bail said base-wires having upwardly-extending and converging ends united to each other and to the ends of the bail in the manner described, whereby said base-wires are placed at a considerable distance apart at the base, and are thereby adapted to hold and support the wood laid crosswise thereon, and the bail is centrally and conveniently arranged for lifting and carrying.

398,903. VALVE MECHANISM FOR ORE-STAMPS.

EDWIN REYNOLDS and BRUNO V. NORDBERG, Milwaukee, Wis. Filed Aug. 21, 1888. Serial No. 283,234. (No model.)



Claim.—1. In a valve mechanism for ore-stamps, the combination, with the cylinder and its valves B C, of two revolving shafts each provided with a crank, a link connecting the cranks, and connections between the shafts and the valves.

2. In valve mechanism for ore-stamps, the combination, with a steam-cylinder and its valve, of a driving-shaft provided with a crank, a second shaft out of line with the driving-shaft and provided with a crank, a link connecting the cranks, and a connection between the driven shaft and the valve.

3. In a valve mechanism for ore-stamps, the combination, with a steam-cylinder and its valves, of a driving-shaft provided with a crank and connected with one of the valves, a second shaft out of line with the driving-shaft and provided with a crank, a link connecting the cranks, and a connection between the driven shaft and one of the valves.

4. In a valve mechanism for ore-stamps, the combination, with two revolving shafts, each provided with a crank, of a link connecting the cranks and means for changing or adjusting the relative positions of the shafts.

5. In combination with frame-work A, provided with cylinder B and bearings *a a*, shaft E, provided with band-wheel F, crank G, and crank-pin *d*, and mounted in the bearings *a a*, a second shaft, H, provided with crank I and crank-pin *e* and mounted in the bearings *b b*, a link, J, connecting the crank-pins *e* and *d*, a screw, K, adapted to adjust the bearings *b b* to bring the shaft H into or out of alignment with the shaft E, and a connection between the driven shaft H and the valve or valves of the cylinder.

398,904. URETHRAL POWDER-APPLIER.

CARLTON SAGE, Elkhart, Ind. Filed June 20, 1888. Serial No. 278,540. (No model.)



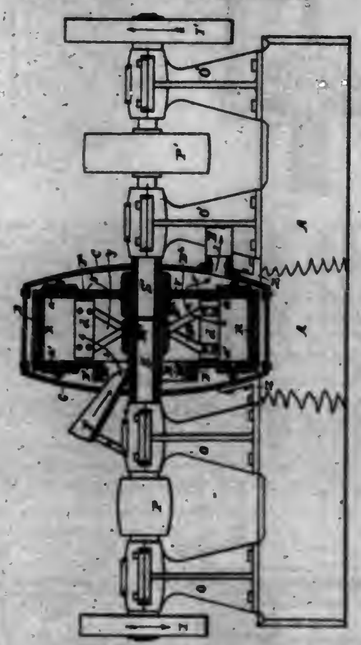
Claim.—1. In a urethral powder-applier, the combination, with shell A, having hollow head B, of the interchangeable devices D and E, and a retaining device for the latter.

2. In a urethral powder-applier, the combination, with shell A and head B, of a rod, D, provided with notch *a*, and a retaining device for the rod.

3. In a urethral powder-applier, the combination, with the shell A and head B, of a conveyer, E, provided with groove *b*, and a retaining device permitting rotary but not longitudinal motion of the conveyer.

398,905. PULVERIZING-MACHINE.

AUSTIN D. SEABIA, Sr., Seward, AUSTIN D. SEABIA, Jr., Channahon, and DEWITT C. SEABIA, Troy, Ill. Filed May 28, 1888. Serial No. 275,358. (No model.)

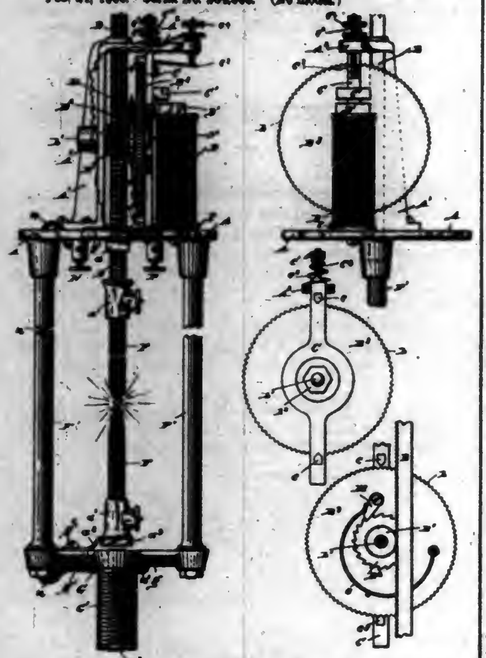


Claim.—1. In the pulverizing-machine shown and described, the combination of the drum D, having its inner head, D^2, provided with the perforations V, surrounding its hub and the removable lining-

plates *a*, the notched beater-plates R, arranged on its inner peripheral surface, the head D', having a central feed-opening and the removable lining-plates *a'*, the beater-head D^2, consisting of the hub H, radial arms *y*, and beaters *d*, secured to the outer ends of said arms, and the case C, the said beater-head D^2 arranged within said drum and adapted to rotate in an opposite direction therefrom, substantially as and for the purpose set forth.

2. The combination, with the case C, consisting of two parts hinged together and having the feed-pipe F, and the exit-pipe E, arranged on the side of said case opposite to said feed-pipe, shaft S, beater-head D^2, consisting of the hub H, secured on the inner end of said shaft and having radial arms *y*, and beater-plates *d*, secured on the outer ends of said arms, shaft S', rotatable drum D, consisting of hub D^3, secured on said shaft, head D^4, having the central perforations, V, and the removable lining-plates *a*, and head D', having the central feed-opening surrounded by the outwardly-projecting flange D^5, and having the removable lining-plates *a'*, all arranged to operate substantially as and for the purpose set forth.

398,906. ARC LAMP. WILLIAM L. SILVEY, Lima, Ohio. Filed Feb. 21, 1888. Serial No. 264,962. (No model.)

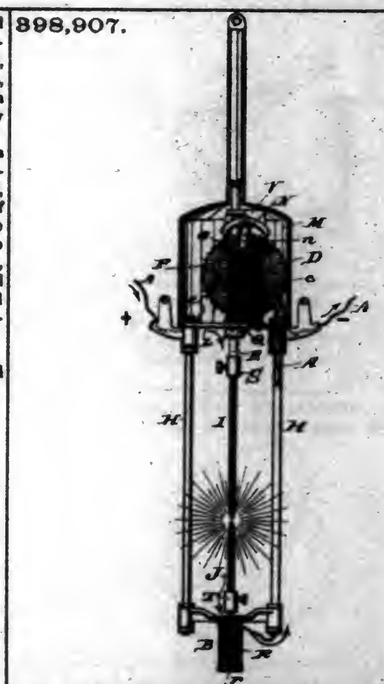


Claim.—In an arc lamp, the combination of the base-plate A, bracket A', and overhanging arm A^1, square rod B, having a rack cut in one side of it, pinion B', ratchet-wheel B^2, and escapement B^3, all mounted on the common center, *b'*, their motions being controlled by vertical escapement-bar C, having on one side two escapement-points, *c c'*, engaging at diametrically-opposite points of the escapement-wheel, all being operated by electro-magnet D, armature B^4, spring c^3, contact-screw c^4, and vibrating circuit-breaker c^5, as set forth and described.

398,907. ELECTRIC-ARC LAMP. WILLIAM L. SILVEY, Lima, Ohio. Filed July 23, 1888. Serial No. 280,744. (No model.)



Claim.—In a monophotal arc lamp, the combination of base-plate L, stationary standard V, secured thereto, escapement-wheel D, ratchet-wheel G, and small pinion F, operating in one direction by racked



carbon-rod E, with pendulum and detent N O, solenoid-magnet C, of high resistance, whose coils are in derived circuit around the arc, the movable iron core P, actuated thereby, allowing the carbon-rod to descend, and the negative carbon drawn downward by solenoid-magnet B and iron core R in the main or arc circuit, as specified.

398,908. PAPER BAG. GEORGE J. STEVENS, Boston, Mass. Filed June 5, 1888. Serial No. 276,078. (No model.)



Claim.—1. The improved blank for forming paper bags herein described, the same consisting of a rectangular sheet provided with two transverse creases or folding-lines which set off side pieces and a longitudinal crease or folding-line which sets off bottom pieces, said blank being slit from the intersections of said crease-lines diagonally across the center bottom piece, thus leaving a triangular flap on each outer bottom piece, and adapted to be folded and secured, substantially as set forth.

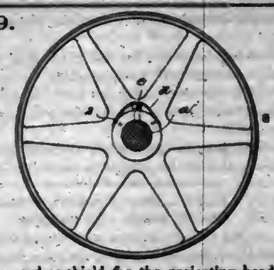
2. A paper bag consisting of the blank A, provided with the parallel creases or folding-lines *v x*, the longitudinal crease or folding-line *m*, and the diagonal slits *p*, cut from the points of intersection of said lines, whereby the blank is divided into the body portion B, side pieces, D, bottom pieces, G H, and flaps *f*, said bottom pieces, flaps, and side pieces being secured together, so that the bottom portion of the bag is of equal double thickness throughout, substantially as set forth.

3. A paper bag consisting of a blank comprising the body portion B, provided with the bottom piece H and side pieces, D, having the bottom pieces G, provided with triangular flaps *f*, the bottom piece H being pasted to the inner faces of said side pieces, the piece G pasted to the outer face of the body portion B, and the flaps *f* to the outer face of said side pieces, whereby the bag is provided with a bottom portion of equal double thickness throughout, substantially as described.

398,909. GUARD OR SHIELD FOR PROJECTING SURFACES. RANDOLPH L. STICKNEY, Peabody, assignor of one-half to King Upton, Salem, Mass. Filed Nov. 10, 1888. Serial No. 290,490. (No model.)

Claim.—1. The combination of a shaft, a hub or collar thereon, and a set-screw securing the same to the shaft and projecting from

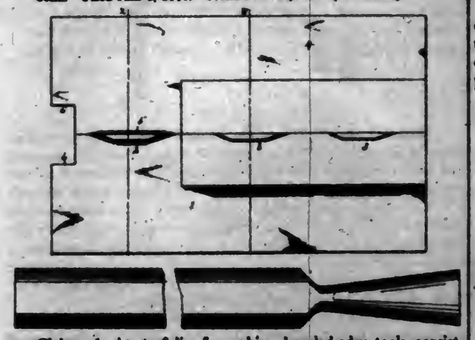
398,909.



its face, with a guard or shield for the projecting head or end, said guard consisting of a metallic strip bent over upon said head or end and attached at its ends to the said hub or collar, substantially as and for the purpose described.

2. The combination of a shaft, a hub or collar thereon, and a set-screw securing the same to the shaft and projecting from its face, with a guard or shield for the projecting head or end, said guard consisting of a curved strip having an opening therein to receive the screw-head and attached at its ends to the said hub or collar, substantially as and for the purpose described.

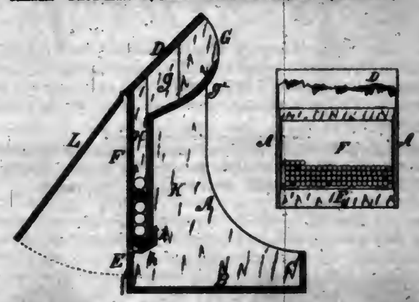
398,910. DIE FOR MAKING CHISELS. JAMES SWAN, Seymour, Conn. Filed Jan. 3, 1889. Serial No. 295,794. (No model.)



Claim.—1. A set of dies for making beveled-edge tools, consisting of a relatively short breaking-down die of the required shape whose ends flare outward, substantially as shown and described, and a relatively long drawing and finishing die corresponding substantially therewith in cross-section, as shown and described.

2. The combination, with a pair of short breaking-down dies grooved, as set forth, said groove flaring outward at both ends, and the corresponding upper member being slightly rounded from front to back, of a pair of relatively long drawing and finishing dies, the lower member of which is grooved to correspond with the breaking-down dies, the upper member being flat upon its under side.

398,911. BALLOT-BOX. CHARLES M. TAYLOR, Toronto, Ontario, Canada. Filed Mar. 24, 1888. Serial No. 268,632. (No model.)



Claim.—1. In a ballot-box, the combination, with a suitable case having an inlet for the balls, of a ball-chamber in communication with said inlet and having a transparent face, a removable covering for said face, and a hinged or removable bottom for said ball-chamber, substantially as and for the purpose specified.

2. In a ballot-box, the combination, with the case, of the glass front F, flap L, mouth or funnel G, ball-chamber H, hinged bottom A, and catch *k*, substantially as and for the purpose set forth.

398,912. METHOD OF MANUFACTURING SCREWS AND BOLTS BY ELECTRICITY. ELIHU THOMSON, Lynn, Mass. Filed May 17, 1888. Serial No. 274,195. (No model.)



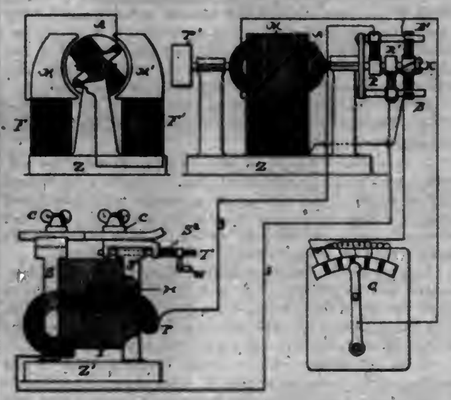
Claim.—1. The herein-described method of manufacturing screws, screw bolts and taps, consisting in forming the screw and plain or shank portions separately, bringing the same into contact, passing a current of large heating effect across the joint, and then uniting the pieces by end-pressure applied while they are heated by the electric current.

2. The herein-described method of manufacturing screws and screw bolts or taps, consisting in forming threaded stock in any desired lengths, subdividing the same as desired, and attaching the parts to shanks or plain portions by end-pressure applied while the joint is heated by an electric current passed across the joint, as and for the purpose described.

3. The herein-described improvement in manufacturing screws or screw-bolts, which consists in forming the head or nut separately, abutting the head and bolt proper, passing a heavy heating electric current across the joint to heat the head and bolt to welding temperature, and subjecting the two to endwise pressure in the direction of the end of the bolt, as and for the purpose described.

4. The herein-described method of manufacturing bolts and screws, consisting in forming the screw and shank portions separately, uniting the same by the electric welding process described, and then forming or adding the head or nut at any desired point, as and for the purpose described.

398,918. ELECTRICAL WELDING-MACHINE. ELIHU THOMSON, Lynn, Mass. Filed June 2, 1888. Serial No. 275,795. (No model.)



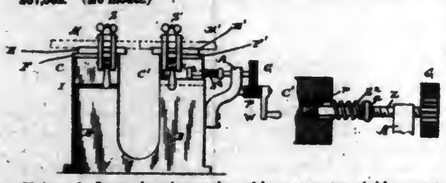
Claim.—1. In an apparatus for the electric working of metals, the combination of a transformer, a dynamo-machine having an armature-coil supplying the primary of said transformer, uncommuted currents, a field-coil connected with a commutator, by which the primary alternating currents are locally rectified in said coil, and a means for varying the current flowing to said coil, as and for the purpose described.

2. An apparatus for developing currents of large volume, comprising in combination a dynamo-machine, the armature of which develops alternating currents, a converter having a low-resistance secondary and a primary included in an alternating portion of the armature-circuit, a field-sustaining coil for the dynamo placed in series with the armature and primary of the transformer, and a commutator between the field and the alternating portion of the circuit for locally straightening the alternating currents which pass through the armature and primary of the converter and develop the large-volume currents in the secondary of the latter.

3. The combination, with a dynamo-machine delivering alternating currents direct to a working-circuit, of a commutator for locally commuting the working-currents, a field-magnet sustained by such locally-commuted currents, and a variable resistance around said commutator.

4. In an alternating-current dynamo, continuous-current field-coils traversed by the main or working current commuted, in combination with a variable resistance around the commuting device, as and for the purpose described.

398,914. ELECTRIC METAL WORKING AND WELDING MACHINE. ELIHU THOMSON, Lynn, Mass. Filed Oct. 8, 1888. Serial No. 287,562. (No model.)



Claim.—1. In an electric metal-working apparatus, rigid supports upon which the clamps or holders for the work are directly supported, in combination with independent conducting-pieces for supplying current to the work through a path independent of the rigid supports, as and for the purpose described.

2. In an electric metal-working apparatus, a supporting and guiding base carrying clamping devices by which the work is held, made of steel, iron, or such like rigid but comparatively poor conducting material, in combination with electric conductors of copper or other good conducting material in connection with the work and supplied with current through a path independent of the supporting and guiding base.

3. In an electric metal-working apparatus, mechanical holding and moving devices for the work, in combination with current-supplying devices electrically independent thereof, as and for the purpose described.

4. In an electric metal-working apparatus, the combination, with mechanical holding devices for the work, of plates or pieces of good conducting material interposed between the same and the metal to be operated upon and electrically connected with the source of heating-current by a direct conductor independently of the material of the holding devices.

5. In an electric metal-working apparatus, clamping or holding devices for the work, made of steel, iron, or such like material that is a comparatively poor conductor, in combination with electric conducting-pieces of good conducting material applied to the work near the part to be heated and connected with the source through a conductor independent of the body or material of the holding devices.

6. The combination, with the movable clamp body or support sliding in a suitable guide, of a current conveying-sliding connection independent of said guide.

7. In an electric welding or metal-working apparatus, the combination, with the movable clamp or holder carrying the work, through which an electric current passes, of an operating-screw and interposed spring for giving a forward movement to the clamp, and a connection between the screw and clamp for moving the latter in the opposite direction when the screw is reversed and the spring relieved.

8. In an electric welding or metal-working apparatus, the combination, with the movable clamp carrying the metal, heated by an electric current, of the operating-screw provided with a flange, a pin in the clamp for engaging with the flange, and a spring compressed between the clamp and screw, as and for the purpose described.

9. The combination, with an electric welding or metal-working apparatus, of the clamp bar or plate D', a link at one side pivoted to the clamp-body, and a locking-cam hung from a link connected with the opposite side.

10. The combination, with an electric metal-working apparatus, of a clamp bar or plate, D', a rod pivoted to the clamp-body and provided at its upper end with an adjustable nut, and a locking-cam hung from a link connected to said bar at the side of and opposite said rod.

11. The combination, with an electric metal-working apparatus, of the clamp bar or plate D', a pivoted locking-cam supported thereby, and an adjustable lug with which the locking-cam engages, said lug being supported by the clamp-body.

12. The combination, with an electric metal-working apparatus, of the clamping devices, the locking-cam, and an adjustable lug for engagement by said cam, said lug being provided with serrations, as described, and a fastening-screw for holding it in position against the clamp-body.

398,915. ACID GELATINE. CLEMENT B. TOWER, Hyde Park, Mass. Filed June 14, 1888. Serial No. 277,097. (No specimens.)

Claim.—1. Acidulated gelatine in a dry and frangible or brittle form, consisting of ordinary gelatine and an edible vegetable acid, as set forth.

2. Acidulated gelatine in a dry and frangible or brittle form, consisting of ordinary gelatine and citric acid, as set forth.

398,916. ACID GELATINE. CLEMENT B. TOWER, Hyde Park, Mass. Filed July 14, 1888. Serial No. 279,905. (No specimens.)

Claim.—1. Acidulated gelatine in a dry and frangible or brittle form, consisting of ordinary gelatine combined with an innocuous acid, as set forth.

2. Acidulated gelatine in a dry and brittle form, consisting of ordinary gelatine combined with free phosphoric acid, as set forth.

3. Acidulated gelatine in a dry and brittle form, consisting of ordinary gelatine containing a mixture of phosphoric and other innocuous acids, as set forth.

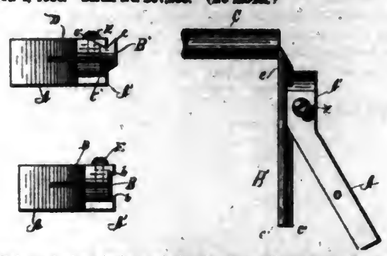
4. Acidulated gelatine in a dry and brittle form, consisting of ordinary gelatine combined with phosphoric and citric acids, as set forth.

398,917. PAINT. ISRAEL TOWNSEND, Portsmouth, Va. Filed June 4, 1888. Serial No. 276,088. (No specimens.)

Claim.—1. The vehicle for paint, consisting of milk of lime, alum, linseed-oil, and litharge, substantially in the proportions specified.

2. The paint composed of the milk of lime, alum, linseed-oil, and litharge mixed with metallic brown, dry cement, and sand, substantially in the proportions described.

398,918. LATHE-TOOL. JOHN WHATLEY, Syracuse, N. Y. Filed Oct. 4, 1888. Serial No. 287,235. (No model.)



Claim.—1. In a lathe-tool, the shank A, offset A', slot D, binding-screw E, dovetail channel *b*, and blade B', provided with the shoulders *c' c'*, held in said channel *b b* by means of the binding-screw E, all constructed and operating substantially as and for the purpose set forth.

2. In a lathe-tool, the shank A, provided with the offset A', blade-holding channel *b b*, slot D, and binding-screw E, in combination with the blade B', held in said channel *b b* by means of the shoulders *c' c'* thereon and having the beveled cutting-edge *e* projecting laterally from the main portion thereof, all constructed and operating substantially as and for the purpose set forth and shown.

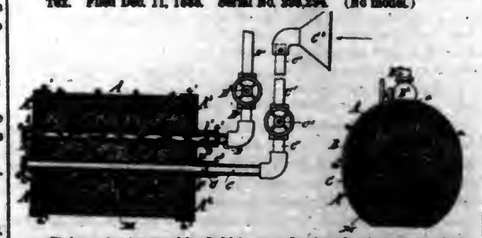
3. In a lathe-tool, a bent holding-shank provided, respectively, with a shank, A, and offset A', slot D, dovetail blade-holding channel *b b*, binding-screw E, and beveled edge G, in combination with a cutting-blade provided with dovetail shoulders corresponding to the channel *b b* and adapted to be adjustably held therein, all constructed and combined substantially as specified and shown.

398,919. FIRE-CLAY HEATER. GEORGE W. WHITE, Waco, assignor to the Texas Fire-Clay Manufacturing Company, Fort Worth, Tex. Filed June 26, 1888. Serial No. 278,295. (No model.)



Claim.—The fluid-burner fire-log formed of fire-clay in cylindrical or tubular form, and provided with an oil-supply passage, jet-burner passages in its periphery, a filling opening, and cap at one end, said tubular log filled with asbestus, substantially as and for the purpose described.

398,920. FLUID-BURNER FIRE-LOG. GEORGE W. WHITE, Waco, assignor to the Texas Fire-Clay Manufacturing Company, Fort Worth, Tex. Filed Dec. 11, 1888. Serial No. 293,294. (No model.)



Claim.—1. A portable fluid-burner fire-log having, in combination, a perforated tubular body, metallic removable heads, a fluid-supplying tube, a perforated air-induction distributing tie-tube provided with screw threads and nuts on its ends outside the heads, and a comminuted or disintegrated fire-proof filling surrounding the perforated portion of the air-tube and occupying the chamber of the body, substantially as and for the purpose described.

2. A portable fluid-burner fire-log having, in combination, a perforated tubular body, metallic removable heads, an air-supply tube, a perforated fluid conducting and distributing tube provided with screw threads and nuts at its ends outside of the heads, and a comminuted fire-proof filling surrounding the perforated portion of the oil-tube and occupying the chamber of the body, substantially as and for the purpose described.

3. In a portable fluid-burner fire-log, the combination of the perforated tubular body, metallic removable heads, a perforated air induction and distributing tie-tube, a perforated air induction and distributing tie-tube, both of said tubes provided with screw threads and nuts on their ends outside of the heads, and comminuted or disintegrated fire-proof filling surrounding the perforated portions of the tubes and occupying the chamber of the body, substantially as and for the purpose described.

4. In a portable fluid-burner fire-log, the combination of the perforated body, the removable heads, the perforated tie and oil induction and distributing tube, air supply and distributing tube provided with an inner perforated portion and an imperforated outer portion with funnel-shaped mouth, and a fire-proof filling, substantially as and for the purpose described.

398,921. GRAIN-BINDING HARVESTER. WILLIAM H. WHITELEY, WILLIAM BAYLEY, and OSCAR E. PERRIGO, Springfield, Ohio, assignors to said William H. Whiteley. Filed Apr. 1, 1886. Serial No. 197,436. (No model.)



Claim.—1. In a self-binding harvester, the combination of a continuously-moving grain-carrier, a bundle-forming mechanism, a needle-arm operated from beneath, and a knotter mechanism situated over said grain-carrier and binding the grain while resting thereon.

2. In a grain-binding harvester wherein the binding mechanism is situated between the grain-platform and the drive-wheel, the combination of the inclined continuously-moving elevating-belt, which carries the grain over the drive-wheel, and a knotter mechanism situated over said belt, which binds the grain while resting on said moving belt.

3. In a grain-binding harvester, the combination of a continuously-moving elevating-belt divided substantially centrally and a binding mechanism situated over said belt and adapted to bind the grain in bundles while resting on said belt, parts of said binding mechanism operating through the space between the parts of said divided belt.

4. In a grain-binding harvester, the combination of a continuously-moving lower elevating-belt divided substantially centrally, an upper elevating-belt moving in proximity to said lower belt, and also divided substantially centrally, and a binding mechanism which binds the grain into bundles while resting on said lower belt, parts of said binding mechanism operating in the space between the parts of said divided belts.

5. In a grain-binding harvester, the combination of a divided lower elevating-belt, a binding mechanism situated between the edges of the adjacent parts of the belt, and having parts thereof operating in the space between the parts of said divided belt, and an upper elevator-belt traveling in proximity to the lower belt and terminating near the knotting mechanism of the binder.

6. In a grain-binding harvester, the combination of a divided elevator-belt, rollers at the opposite ends of such belt, over which the belt travels, the axes of rollers of the parts of the divided belt being in the same line, and a binding mechanism situated between the adjacent edges of the parts of said belt, and having parts thereof operating in the space between the parts of the belt, substantially as set forth.

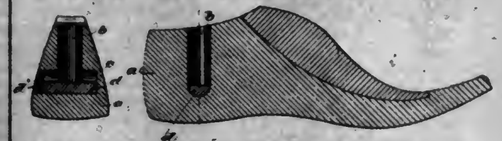
7. In a self-binding harvester, the combination of the needle-operating mechanism, a trip-arm, N, adapted to be depressed by the gavel, the dog L^2, a clutch-tripping lever, M, held normally in contact with said dog L^2, and a connecting-rod between the trip-arm and said clutch-tripping lever, said connecting-rod being also directly connected with and operated by the needle-operating mechanism, whereby when the needle is in operation the tripping-lever is free from dog L^2, regardless of the position of the trip-arm, as set forth.

398,922. THILL-COUPLING. GEORGE T. WILSON, Lowville, N. Y.; assignor of two-thirds to John D. Hough and Miles H. Bronson, both of same place. Filed Nov. 6, 1888. Serial No. 290,085. (No model.)



Claim.—The combination, with the axle and the clip B, of the plate H, having ears J J, the concave plate N, provided with vertical extension N^2, bearing against said clip, the set-screw M, the pivot pivotally connecting said plate N to said screw, the thill-iron pivotally secured between said ears, and the bearing-block in said plate N, extending behind the pivot of the thill-iron between the same and said extension, substantially as and for the purpose specified

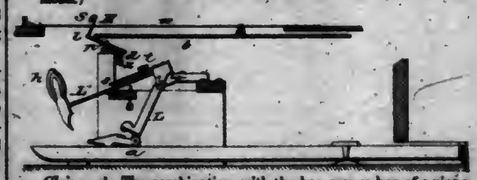
398,923. LAST. EDWARD C. WOODWARD, Brockton, Mass., assignor of two-thirds to Ellery C. Wright and Horace F. Woodward, both of same place. Filed Nov. 23, 1888. Serial No. 291,699. (No model.)



Claim.—1. The last having the pin or tool receiving hole, and having a block-receiving hole in its body intersecting the said tool-receiving hole, combined with a metallic bar-like support inserted in the said block-receiving hole at the end of the tool-receiving hole, the said block constituting a rigid bottom within the body of the last for the tool to abut against, substantially as described.

2. The last having the pin or tool receiving hole, and having a block-receiving hole in its body intersecting the said tool-receiving hole, and a metallic tube placed in the said tool-receiving hole, combined with a metallic bar-like support inserted in the said block-receiving hole at the end of the tool-receiving hole, the said block constituting a rigid bottom within the body of the last for the tool to abut against, substantially as described.

398,924. HARMONIC DAMPER FOR PIANOS. HARVEY WORRALL, Topeka, Kans. Filed June 14, 1886. Serial No. 205,130. (No model.)



Claim.—1. The combination, with the hammer or key of a piano, of a node-producing stop acting in connection with the key or hammer

and so arranged that by the action of the key or hammer the stop will press upon the piano-string when the string receives the blow from the hammer, thus causing the string to give out one of its harmonic tones, and be removed from contact with the string shortly after the blow from the hammer has been delivered, substantially as and for the purpose hereinbefore described.

2. The combination of the lever *l*, with its fingers *d* and *e*, node-producing stop S, buffer *x*, springs *c* and *s*, thumb-screw *t*, and buffer-button, with the piano-string *w* and its hammer A, key *a*, and complementary levers L L′, substantially as and for the purpose hereinbefore described.

398,925. MUSTACHE-TRAINER. LOUIS A. ALLARD, St. Louis, Mo. Filed Sept. 7, 1888. Serial No. 284,842. (No model.)

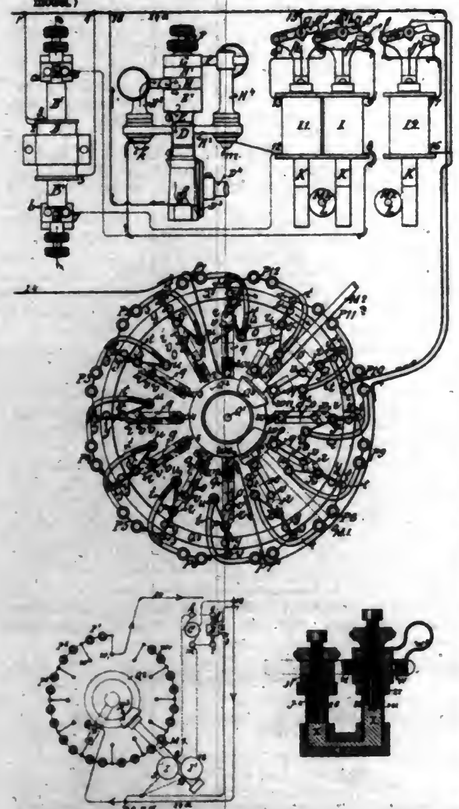


Claim.—1. A mustache trainer or cultivator consisting of a yielding strip adapted to be applied over a mustache upon the face, hooks pivoted to the said strip and adapted to straddle the upper edge thereof, depending plates or flanges, and pivoted hooks adapted to straddle the lower edges of the said plates, substantially as specified.

2. A mustache trainer or cultivator consisting of a yielding bowed strip, and hooks pivoted thereto and adapted to straddle the upper edge of the said strip, substantially as specified.

3. In a mustache trainer or cultivator, the combination, with the main flexible or yielding strip having pivoted hooks, of the loops, such as B, on the end of the said strip, substantially as specified.

398,926. ELECTRIC-CURRENT REGULATOR. JOSEPH W. RALEY, New York, N. Y., assignor of one-half to Robert Dunlap and Lake F. Cozans, same place. Filed Jan. 27, 1888. Serial No. 262,178. (No model.)



Claim.—1. In a regulator for dynamos and electric motors, the combination of the following elements, viz: a controller actuated by a current derived from the main circuit and adapted to complete another circuit when the main current is too weak or too strong, mechanism governed by the controller for operating the switches, and a series of storage-batteries arranged to receive the current of the main circuit through the switch-operating mechanism when the main current is too strong and to deliver a current from the storage-batteries to the main circuit when the main current is too weak, substantially as specified.

2. In a regulator for dynamos and electric motors, the combination of the following elements, viz: a centrifugal regulator connected with the motor driven by a current derived from the main circuit and adapted to complete another circuit when the main current is too weak or too strong, mechanism governed by the regulator for operating the switches, and a series of storage-batteries arranged to receive the current of the main circuit through the switch-operating mechanism when the main current is too strong and to deliver a current from the storage-batteries to the main circuit when the main current is too weak, substantially as specified.

3. In a regulator for dynamos and electric motors, the combination of the following elements, viz: a controller actuated by a current derived from the main circuit and a centrifugal governor connected with the motor driven by the main current, and both adapted to complete another circuit when the main current is too weak or too strong, mechanism governed by the controller for operating the switches, a second set of switches, mechanism governed by the centrifugal regulator for operating the second set of switches, and a series of storage-batteries arranged to receive the current of the main circuit through the switching mechanism when the main current is too strong and to deliver a current from the storage-batteries to the main circuit when the main current is too weak, substantially as specified.

4. In a regulator for dynamos and electric motors, the combination of the following elements, viz: a controller actuated by a current derived from the main circuit and adapted to complete another circuit when the main current is too weak or too strong, switch-actuating mechanism governed by the controller, switches operated by the switch-actuating mechanism, switches operated by gas, a sounder adapted to indicate that the storage-batteries are charged, and a series of storage-batteries arranged to receive the current of the main circuit through the switching mechanism when the main current is too strong and to deliver a current from the storage-batteries to the main circuit when the main current is too weak, substantially as specified.

5. In a regulator for dynamos and electric motors, the combination of the following elements, viz: a centrifugal regulator actuated by a motor driven by the main current and adapted to complete another circuit when the main current is too weak or too strong, switch-actuating mechanism governed by the regulator, switches operated by the switch-actuating mechanism, switches operated by gas, and a series of storage-batteries arranged to receive the current of the main circuit through the switching mechanism when the main current is too strong and to deliver a current from the storage-batteries to the main circuit when the main current is too weak, substantially as described.

6. In a regulator for dynamos and electric motors, the combination of a controller actuated by a current derived from the main circuit, a centrifugal regulator driven by a motor operated by the main current, the controller and regulator both being adapted to complete other circuits when the main current is too weak or too strong, switch-actuating mechanism governed by the controller and switch-actuating mechanism governed by the regulator, switches operated by the switch-actuating mechanism, switches operated by gas, a sounder arranged to be operated when the storage-batteries are charged, and a series of storage-batteries arranged to receive the current of the main circuit through the switching mechanism when the main current is too strong and to deliver a current from the storage-batteries to the main circuit when the main current is too weak, substantially as described.

7. In a current-regulator, the combination of the following elements, viz: a controller actuated by a current derived from the main circuit and adapted to complete another circuit when the main current is too weak or too strong, switch-actuating mechanism governed by the controller, switches operated by the switch-actuating mechanism, a series of storage-batteries arranged to receive the current of the main circuit through the switching mechanism, so as to make equilibrium between the main or charging current and the current of the storage-batteries, gas-actuated switches arranged to cut out of the main circuit the storage-batteries which have received their maximum charge, and a sounder for indicating that a storage-battery or set of storage-batteries has received its maximum charge, substantially as described.

8. In a current-regulating system, the combination of the following elements, viz: a series of storage-batteries arranged to receive a charging-current, a gas-actuated switch operated by the batteries, and a sounder operated from the said switch and indicating when the batteries have received their maximum charge, substantially as described.

9. In a current-regulator, the combination of a controller actuated by a current derived from the main circuit and adapted to complete another circuit when the main current is too weak or too strong, switch-actuating mechanism governed by the controller, a switch operated by the switch-actuating mechanism, and a series of cells arranged to send their current into the main circuit, the whole being constructed to switch into the main circuit the number of cells corresponding to the work to be done, substantially as described.

10. In a current-regulating system, the combination of a centrifugal regulator operated by a motor driven by the main circuit and adapted to complete another circuit when the main current is too weak or too strong, switch-actuating mechanism governed by the centrifugal regulator, a switch operated by the switch-actuating mechanism, and a series of cells arranged to send their current into the main circuit, the device being constructed to switch into the main circuit a number of cells corresponding to the work to be done, substantially as described.

11. In a current-regulating system, a controller formed of the solenoid B, provided with the tubular core B′, the armature A, placed in the tubular core and provided with contact-points *a b*, the spring B^2, arranged to oppose the action of the solenoid on the armature, and the contact-points *c d*, substantially as described.

12. In a current-regulating system, the combination, with circuit-controlling and switching mechanism, of one or more solenoids, I, each provided with a switching mechanism, a core, K, a roller, L, of magnetic material, adapted to be magnetized by induction from the core K and to be turned by the longitudinal movement of the said core, and means, substantially as herein described, for shifting the current passing through the solenoids, so as to cause the core K to vibrate longitudinally and turn the roller L, substantially as described.

13. In a current-regulating system, the combination of a series of contacts, *w*, arranged in a circle, and an automatically-operated switch-arm, Q, moving periodically in one direction over the said contacts, substantially as described.

14. In a current-regulating system, the combination of a series of contacts, *w*, arranged in a circle, and the switch-arms N Q, moving independently of each other over the contacts, the arm Q moving periodically in one direction and the arm N in both directions, substantially as described.

15. In a current-regulating system, the combination of a series of contacts, *w*, contact-springs engaging said contacts, and the sector R′, sliding over the said contact-springs to break the contact between the said springs and contacts *w*, substantially as described.

16. In a current-regulating system, the combination of a series of contacts, *w*, arranged in a circle, the contact-springs O^3, the automatically-operated switch-arm N, moving over said contacts, and the sector R′, carried by the said switch-arm and sliding over the springs to break the contact between the said springs and the contacts *w*, substantially as described.

17. In a current-regulating system, the combination, with a storage-battery and conductors carrying the charging-current, of a switch formed of the communicating tubes 25 26, of insulating material, the mercury, X, contained by the tubes, the contact-screws *u x*, entering the tubes, and the pipe *t*, communicating with the storage-battery and adapted to convey gas to the tube 25, the tube 26 being filled with air under pressure, substantially as and for the purpose specified.

18. The combination, with the communicating tubes 25 26, the contact-points *u x*, inserted therein, and the pipe *t*, communicating with the tube 25, of the valve W, supported on a spring-arm and adapted to shut the gas in the tube 25, and the arm Q, provided with the curved end U, adapted the hold the valve W closed, substantially as described.

19. The combination, with the communicating tubes 25 26, the contact-points *u x*, inserted therein, and the pipe *t*, communicating with the tube 25, of the valve W, closed by a spring-arm, W′, the said spring-arm being adapted to operate the valve W as a safety-valve for the relief of pressure within the tube 25, substantially as described.

20. The combination, in a current-regulating system, of a series of storage-batteries and mechanism, substantially as specified, for switching the storage-batteries into the main circuit for charging and switching the storage-batteries out of the main circuit after charging, and a sounder to indicate when and which set of storage-batteries are charged, substantially as described

21. In a current-regulating system for dynamos and electric motors, the combination of the distributing mechanism provided with the contacts *w*, the arms N Q, adapted to convey the current to different contacts, the sector R′, springs O^3, the storage-batteries P′ P^3, &c., the valves 30, the bevel-wheels Q^2 N^3, the bevel-pinions Q^2 N^3, engaging the said bevel-wheels, the shafts M′ M^3, provided with rollers L L′, the centrifugal regulator connected with the motor driven by the main current, and the electrical connections, substantially as described.

22. In a current-regulating system for dynamos and electric motors, the combination of the distributing mechanism provided with the contacts *w*, the arms N Q, adapted to convey the current to different contacts, the sector R′, springs O^3, the storage-batteries P′ P^3, &c., the valves 30, the bevel-wheels Q^2 N^3, the bevel-pinions Q^2 N^3, engaging the said bevel-wheels, the shafts M′ M^3, provided with the rollers L L′, the controller operated by a current derived from the main circuit, and the electrical connections, substantially as specified.

23. In a current-regulating system, the combination of a series of storage-batteries, switches actuated by a current derived from the main circuit, switches actuated by gas developed in the storage-batteries which have reached their maximum charge, and a sounder for indicating that the storage-batteries have received their maximum charging, substantially as described.

24. In a current-regulating system for dynamos and electric motors, the combination of the distributing mechanism provided with the contacts *w*, the arms N Q, adapted to convey the current to different contacts, the sector R′ and contact-springs O^3, the storage-batteries P′ P^3, &c., the valves 30, the bevel-wheels Q^2 N^3, the bevel-pinions Q^2 N^3, engaging the said bevel-wheels, the shafts M′ M^3, provided with the rollers L L′, the solenoid I^3, with switching mechanism and armature K, connected with the roller L, the solenoids I I′, with switching mechanism and armatures K, connected with the rollers L L′, the controller actuated by a current derived from the main circuit, the sounder, and the electrical connections, substantially as described.

25. In a current-regulating system for dynamos and electric motors, the combination of the distributing mechanism provided with the contacts *w*, the arms N Q, adapted to convey the current to different contacts, the sector R′ and contact-springs O^3, the storage-batteries P′ P^3, &c., the valve 30, the bevel-wheels Q^2 N^3, the bevel-pinion Q^2 N^3, engaging the said bevel-wheels, the shafts M′ M^3, provided with the rollers L L′, the solenoid I^3, with switching mechanism and armature K, connected with the roller L, the solenoids I I′, with switching mechanisms and armatures K, connected with the rollers L L′, the centrifugal regulator connected with the motor driven by the main current, and the electrical connections, substantially as described.

26. In a current-regulating system for dynamos and electric motors, the combination of distributing mechanism provided with the contacts *w*, the arms N Q, adapted to convey the current to different contacts, the sector R′ and contact-springs O^3, the storage-batteries P′ P^3, &c., the valve 30, the bevel-wheels Q^2 N^3, the bevel-pinions Q^2 N^3, engaging the said bevel-wheels, the shafts M′ M^3, provided with the rollers L L′, the solenoids I^3, with switching mechanisms and armatures K, connected with the rollers L, the solenoids I I′, with switching mechanisms and armatures K, connected with the rollers L L′, the centrifugal regulator connected with the motor driven by the main current, the controller actuated by a current derived from the main circuit, the sounder, and the electrical connections, substantially as described.

27. In a current-regulating system, the combination of the distributing mechanism provided with the contacts *w*, the arm Q, adapted to convey the current to different contacts, the cells P′ P^3, &c., the bevel-wheel Q^2, the bevel-pinion N^3, engaging the said bevel-wheel, the shaft M′, provided with the rollers L L′, the solenoids I I′, with switching mechanisms and armatures K, connected with the rollers L L′, the controller actuated by a current derived from the circuit of the cells, and the electrical connections, substantially as described.

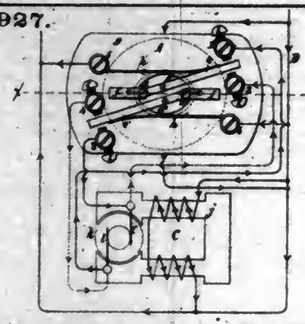
28. In a current-regulating system, the combination of the distributing mechanism provided with the contacts *w*, the arm Q, adapted to convey the current to different contacts, the cells P′ P^3, &c., the bevel-wheel Q^2, the bevel-pinion N^3, engaging the said bevel-wheel, the shaft M′, provided with the rollers L L′, the solenoids I I′, with switching mechanisms and armatures K, connected with the rollers L L′, the centrifugal regulator connected with the motor driven by the current of the said storage-batteries, and the electrical connections, substantially as described.

29. In a current-regulating system, a centrifugal regulator formed of the spindle D′, the head E, the ring E′, of insulating material, attached to the head, the ring H, of conducting material, carried by the ring E′, the ring H′, of insulating material, carried by the ring H, the cap G, of conducting material, the contact-screw F, inserted in the cap G, the body F′, of mercury, contained by the receptacle, and the contact-brushes *i l*, touching the ring H and cap G, substantially as specified.

30. In a current-regulator, the combination, with the contact-screw F and the body, F′, of mercury inclosed in the receptacle C, of a filling of mercurial vapor contained by the chamber C above the mercury for the prevention of sparking between the contact-screw F and the mercury, F′, substantially as specified.

398,927. ELECTRIC-CURRENT REGULATOR. JOSEPH W. RALEY, New York, N. Y., assignor of one-half to Robert Dunlap and Lake F. Cozans, same place. Filed May 14, 1888. Serial No. 273,841. (No model.)

398,927.



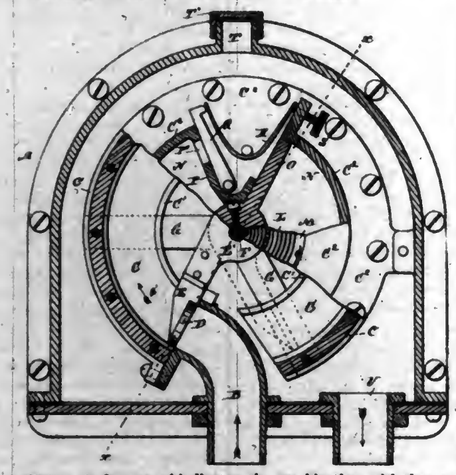
Claim.—1. In an electric-current regulator, the combination, with a helix, of two switch-operating bars of magnetic material, each movably supported within the helix, substantially as described.

2. In an electric-current regulator, the combination of a helix, two bars of magnetic material arranged within the helix parallel to its axis, two arms attached to and movable by the bars, springs pressing the movable arms in opposition to the magnetic action of the bars, and contact-points arranged to be touched by the movable arms, substantially as specified.

3. In an electric-current regulator, the combination of a helix, two bars of magnetic material arranged on pivotal supports and arranged to move independently of each other, two spring-pressed arms carried by the magnetic bars, contact-points arranged in the paths of the arms, an electric motor, and circuit-connections, the whole being arranged to cause the current to pass in one direction or in the other through the amature of the electric motor, according as the current is strong or weak, substantially as specified.

4. In a current-regulator, the combination of the helix B, magnetic bars a' a^2, arms c c', connected with the bars, two pairs of contact-points, one pair for each arm c c', the springs h h', the electric motor C, having its field-magnet permanently connected in a shunt to the main circuit, and the double connections of the commutator-brushes l l', substantially as specified.

398,928. SPEED-INDICATOR. ERNEST H. BARBER, Kent, Ohio. Filed Aug. 24, 1886. Serial No. 211,747. (No model.)



Claim.—1. In a speed-indicator, the combination, with the casing having a fluid inlet and discharge, as specified, and a curved compartment, C, one of whose sides or walls is slotted lengthwise, of an arm pivoted on a central spring-actuated shaft and working in the aforesaid slot, and a piston attached to the outer end of said arm and working in the compartment, substantially as specified, whereby the piston vibrates and opens or closes the slot more or less, according to the pressure of the fluid and the consequent increase or decrease of the volume passing through the slot.

2. In a speed-indicator, the combination, with an oscillating shaft, of two pistons, each connected to the said shaft and working in separate chambers, one of the said pistons automatically increasing or decreasing the available portion of the discharge-opening of its chamber as the volume of the actuating-fluid passing increases or decreases, and the other piston serving to prevent quick or vibratory motions of the said shaft, a pointer carried by the shaft, and a graduated scale over which the pointer works, substantially as herein shown and described.

3. In a speed-indicator, the combination, with a casing having two chambers, one of which communicates directly with the supply-pipe and is provided with a discharge-opening, of two pistons, one in each chamber, a shaft to which the said pistons are connected, a spring for actuating the shaft backward, a pointer, and graduated scale, substantially as and for the purpose set forth.

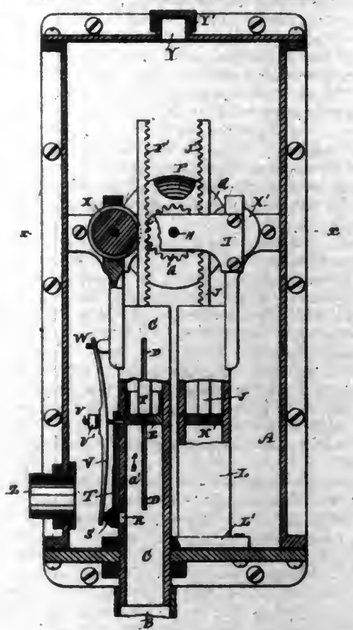
4. In a speed-indicator, the combination, with an outer casing and an inner casing having two chambers, one of which communicates with the supply-pipe and is provided with a discharge-opening, of a shaft provided with a pointer on its end, a spring secured to the shaft and casing, pistons secured to the said shaft and working in the said chambers, one of the pistons having its rod projecting through the discharge-opening of its chamber, and a graduated scale, substantially as described.

5. In a speed-indicator, the combination, with a casing provided with two chambers, of a piston in one chamber for automatically increasing or decreasing the available portion of its discharge-opening as the volume of the fluid passing increases or decreases, and a piston in the other chamber for overcoming the vibratory motion of the first-named piston, substantially as described.

6. In a speed-indicator, a casing having a chamber or compartment, a piston operating in the same, a shaft connected with the piston, a coil-spring on the said shaft, a pointer, and a dial, in combination with a chamber, a piston operating in the same, substantially as shown and described.

7. In a speed-indicator, a casing having a chamber or compartment, a piston operating in the same, a shaft connected with the piston, a coil-spring on the said shaft, a pointer, a dial, the chamber N, and the piston O, in combination with a valve covering an aperture in the wall of said chamber regulated by a spring and screw, substantially as shown and described.

398,929. SPEED-INDICATOR. ERNEST H. BARBER, Kent, Ohio. Filed Aug. 24, 1886. Serial No. 211,748. (No model.)



Claim.—1. In a speed-indicator, the combination, with a casing and a slotted tube connected to the supply-pipe, of a piston in said tube provided with a toothed piston-rod, a gear-wheel meshing with the said toothed piston-rod, and a spring to actuate the shaft of said gear-wheel backward, substantially as described.

2. In a speed-indicator, the combination, with a casing and a tube connected to the supply-pipe and provided with one or more longitudinal slots, of the piston in the said tube, the piston-rod F, having teeth F', the shaft H, the gear-wheel G on the shaft H, the spring P on said shaft, the pointer M, and the dial N, substantially as described.

3. The combination, with a chamber with which the supply-pipe communicates, provided with one or more discharge-openings, of an adjustable relief or safety valve covering another separate and distinct opening from the said chamber, substantially as described.

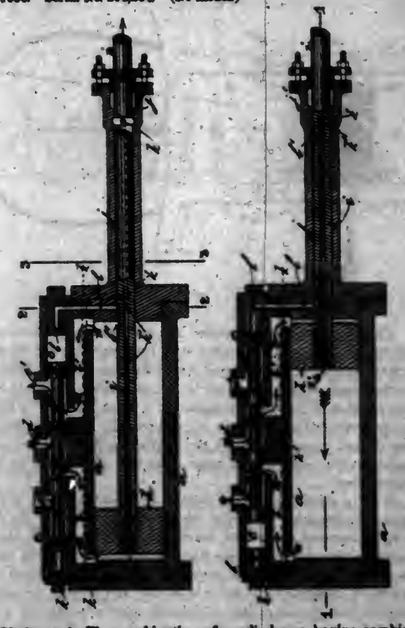
4. In a speed-indicator, the combination of a casing, a tube or pipe connected to the supply-pipe, projecting into the said casing and provided with an aperture within the said casing, and an adjustable valve for closing the said aperture, substantially as described.

5. In a speed-indicator, the tube C, having one or more slots, D, the piston E, the piston-rod F, having rack-teeth F', the gear-wheel G, and the shaft H and the spring P, in combination with the piston-rod J, having rack-teeth J', the piston K, and the cylinder L, substantially as shown and described.

6. In a speed-indicator, the tube C, having one or more slots, D, the piston E, the piston-rod F, having rack-teeth F', the guide-wheel the gear-wheel G, the shaft H, and the spring P, in combination with the piston-rod J, having rack-teeth J', the guide-wheel X', the piston K, and the cylinder L, substantially as shown and described.

7. In a speed-indicator, the tube C, having one or more slots, D, and the aperture, in combination with the adjustable valves S, substantially as shown and described.

398,930. STEAM-ACTUATED VALVE. GUSTAV A. BARTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Nov. 19, 1888. Serial No. 291,264. (No model.)



Claim.—1. The combination of a cylinder, *a*, having combined inlet and exhaust ports and passages *b b'*, a steam-chest, *c*, having inlet-port *d* and exhaust-ports *e e'*, a slide or distribution valve, *f*, located in steam-chest *c*, and formed with circumferential depressions or passages *g g' g²*, a piston, *h*, fitted within the cylinder *a*, and provided with a rod, *i*, passing through a tube, *j*, relief-passages *k* and *l*, opening from the tube *j* into the steam-chest *c* behind the respective ends of the distribution-valve *f*, with corresponding passage *k'* and groove *l'* formed in piston-rod *i*, substantially as shown, and for the purpose described.

2. In a direct-acting steam or other motive power engine, the combination of a cylinder, *a*, having combined inlet and exhaust ports and passages *b b'*, a steam-chest, *c*, having inlet-port *d* and exhaust-ports *e e'*, a slide or distribution valve, *f*, located within steam-chest *c*, and formed with circumferential depressions or passages *g g' g²*, a piston, *h*, fitted within the cylinder *a*, and provided with a rod, *i'*, passing through a tube, *j*, relief-passages *k* and *l*, opening from the tube *j* into the steam-chest *c* behind the respective ends of the distribution-valve *f*, said passages *l* having a cock or valve, *m*, with a corresponding passage, *k'*, and grooves *l' l²* formed in the piston-rod *i'*, substantially as shown, and for the purpose described.

398,931. PISTON-ROD-GUIDE PACKING. GUSTAV A. BARTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Dec. 27, 1888. Serial No. 294,764. (No model.)

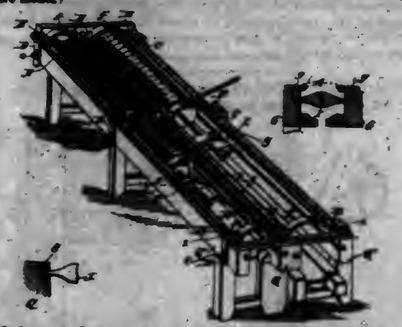
Claim.—1. In a piston-rod packing, the combination of a key or tongue inserted within a slotway formed through the wall of the casing containing the packing, with bolts passing through the said wall and tongue, and means for tightening said bolts, substantially as shown, and for the purpose described.



2. In a piston-rod packing, the combination of a key or tongue inserted within a slotway formed through the wall of the casing containing the packing and entering the circumference of the said packing, with bolts passing through the said wall and tongue, and means for tightening the bolts, substantially as shown, and for the purpose described.

3. The combination of packing-strips *b*, inserted within the cylindrical tube or casing *a a²* and fitted around the piston-rod *c* of a direct-acting engine, slotway *d*, formed longitudinally through the wall *a²* of the casing, key or tongue *e*, inserted flatwise within the slotway *d* and engaging between adjacent edges of the packing-strips *b*, lugs *f*, projecting from the wall *a²* of the casing, with bolts *g*, passing through the lugs *f* and interposed tongue *e* and provided with nuts *e'*, substantially as shown, and for the purpose described.

398,932. ATTACHMENT FOR GANG CHEESE-PRESSES. WILLIAM L. ERATON, Hallock, Minn. Filed Aug. 31, 1888. Serial No. 284,294. (No model.)



Claim.—1. In a gang-press of the herein-described type, the combination, with the frame having guides, of the guide attachment composed of longitudinal strips and cross-bars, the said strips being arranged to come over the said guides, substantially as described, for the purposes specified.

2. The combination, with the frame having guides, of the attachment composed of longitudinal strips and cross-bars, the strips being arranged in pairs and having the opposing edges of each pair of strips beveled, substantially as described, for the purposes specified.

3. The combination, with the frame having a guide, of the cross-bars, and the pair of longitudinal strips adjustably connected with the cross-bars, substantially as described, for the purposes specified.

4. The combination, with the frame having a guide, of the cross-bars arched opposite the said guide and having elongated openings, the longitudinal strips, and the bolts and the set-screws adjustably connecting the strips with the cross-bars, substantially as described, for the purposes specified.

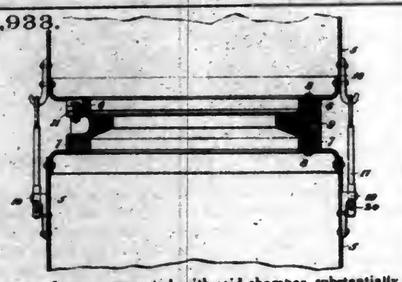
5. The combination, with the frame having a series of parallel guides, of the cross-bars arched opposite the guides and having elongated openings each side of the said guides, the short vertical bars hinged to the cross-bars at one end, the hasps hinged to the other ends of the cross-bars, the longitudinal strips arranged in pairs, and the bolts and thumb-screws for adjustably securing the strips to the said cross-bars, substantially as described.

398,933. VALVE-SEAT FOR HOT-BLAST STOVES. PER TORSTEN BUHS, Braddock, Pa. Filed Sept. 1, 1888. Serial No. 284,266. (No model.)

Claim.—1. The combination of the valve-chamber made in transversely-divided sections, a valve-seat ring interposed between the sections, fixed to one of them and bearing loosely on the other, so as to permit of independent transverse motion thereof, a valve connected with that section of the valve-chamber to which the valve-seat is fixed, and a pipe for the passage of gases connected with said chamber, substantially as and for the purposes described.

2. The combination of the upright valve-chamber composed of transversely-divided sections, a valve-seat secured to the upper section only, a vertically-moving valve arranged within the valve-chamber and having its stem connected with the upper section, and a pipe for

898,933.

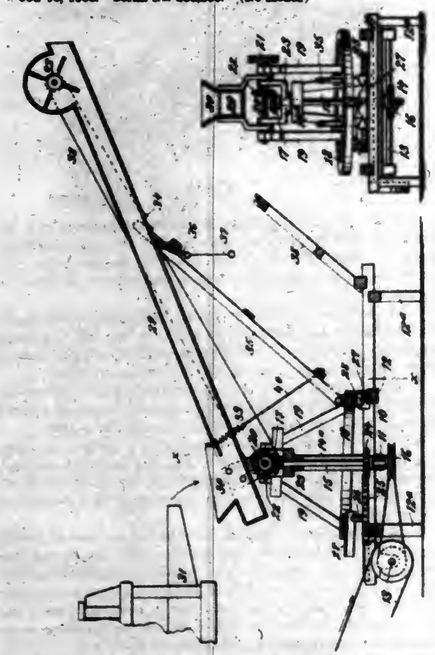


the passage of gases connected with said chamber, substantially as and for the purposes described.

3. The combination of the valve-chamber made in transversely-divided sections, a valve-seat ring interposed between the sections, fixed to one of them and bearing loosely on the other, a valve which is connected with that section of the valve-chamber to which the valve-seat is fixed, links connecting the sections of the valve-chamber, and a pipe for the passage of gases connected with said chamber, substantially as and for the purposes described.

4. The combination of the valve-chamber made in transversely-divided sections, metal rings or facings fixed to the opposing faces thereof, a valve-seat ring interposed between the facings, fixed to one and bearing loosely on the other, a valve which is connected with that section of the valve-chamber to which the valve-seat is fixed, and a pipe for the passage of gases connected with said chamber, substantially as and for the purposes described.

898,934. STACKER. THOMAS BERRY, North Fort, Ky. Filed Oct. 16, 1888. Serial No. 288,208. (No model.)



Claim.—1. In a stacker, the combination, with a base-frame, of a vibratory and vertically-rocking table mounted on the base and a trunk mounted upon the said table, substantially as described.

2. In a straw-stacker, the combination, with a base-frame and a table mounted thereon capable of a simultaneous horizontal vibratory and a vertical movement, of a vertically-adjustable trunk mounted upon said table, and means, substantially as shown and described, for adjusting the trunk, as and for the purpose specified.

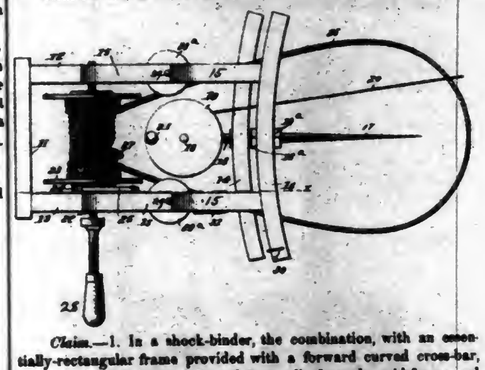
3. In a straw-stacker, the combination, with a base-frame and a table capable of a horizontal vibratory and a vertical movement, of a trunk pivoted upon the table, provided with teeth integral with the under side, a spring-actuated supporting-frame hinged to the table, and a spring-actuated latch located upon the supporting-frame engaging with the teeth of the trunk, substantially as shown and described.

4. The combination, with a base-frame, a vertical drive-shaft, a table mounted upon said base, and provided with a friction-roller at one side and a guide-plate upon the opposite side, of a spur-wheel rotated from the drive-shaft, a roller eccentrically located upon the said wheel, an undulating block secured to the base-frame adapted for contact with said roller, a trunk pivoted upon the table, and a spring-actuated supporting-frame hinged to the table and engaging with the trunk, substantially as shown and described.

5. In a straw-stacker, the combination of a vibratory and vertically-rocking trunk having an open outer end and provided with a hopper at its inner end, and an exhaust-fan arranged in said trunk, substantially as herein shown and described.

6. The combination, with a base-frame, a vertical shaft journaled in said base-frame, a wheel journaled upon the frame provided with an eccentric-pin, and a block having an undulating surface fixed on the frame, of a table suspended upon said shaft, a guide-plate and a friction-roller on said table, a horizontal shaft journaled in the frame of the table, a straw-elevator carried on the frame of the table, and operating-gearing, substantially as shown and described.

898,935. SHOCK-BINDER. CHRISTIAN RIE, Moline, Kans., assignor of one-half to John D. Dunlap, same place. Filed Aug. 3, 1888. Serial No. 281,846. (No model.)



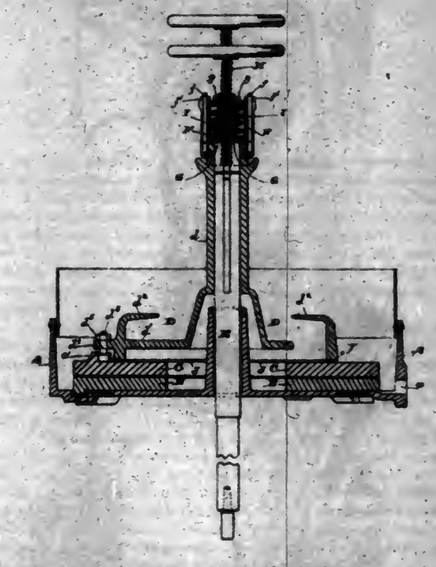
Claim.—1. In a shock-binder, the combination, with an essentially-rectangular frame provided with a forward curved cross-bar, brackets projected upwardly and forwardly from the said frame, and a curved upper cross-bar secured to the extremities of the said brackets in advance of the lower cross-bar, of a drum carrying a tightening-rope journaled in the frame, a reel vertically supported from the lower curved cross-bar to carry the binding cord or wire, and a spear attached to the center of the upper cross-bar, substantially as shown and described.

2. In a shock-binder, the combination, with a frame provided with a front cross-bar of greater length than the width of the frame, having a concaved outer face, brackets projected upward and outward from the side bars of the frame in vertical plane with the side bars, an upper cross-bar, also having a concaved face, secured to the brackets in advance of the lower cross-bar, and a spear horizontally projected from the outer face of the said upper cross-bar, of a drum journaled transversely in the frame adapted to carry a compressing-rope, a ratchet-wheel secured to the said drum, a pawl pivoted to the frame engaging the ratchet-wheel, an angled spindle rearwardly projecting attached to the inner side of the lower cross-bar, and a reel journaled upon the said spindle to carry the binding rope or wire, all combined to operate substantially in the manner and for the purpose specified.

3. In a shock-binder, the combination, with a frame, a cross-bar secured to the forward end of the said frame having a curved outer face, brackets projected upwardly and outwardly from the side bars of the frame, a second cross-bar secured to the extremities of the said brackets in advance of and concentric with the lower cross-bar, and a spear horizontally attached to the center of the outer face of the upper cross-bar, of a drum transversely journaled in the frame, a compressing-rope secured to the said drum, a ratchet-wheel attached to the drum, and a pawl engaging the said ratchet, guide-pulleys journaled between the frame and brackets, an angled spindle projected centrally and rearwardly from the inner face of the lower cross-bar, a reel journaled on said spindle, a tying or binding rope secured to said reel, a clamp-hook attached to the upper cross-bar, and a knife secured to the outer face of one bracket adjacent to the said hook, all combined to operate substantially as shown and described.

4. In a shock-binder, the combination, with a frame, a cross-bar secured to the forward end of the frame provided with a concaved outer face, brackets projected upwardly and forwardly from the said side bars of the frame, an upper curved cross-bar attached to the extremities of the said brackets in advance of and concentric with the lower cross-bar, a clamp-hook secured to the upper cross-bar near one extremity, and a knife projecting upward from the bracket contiguous to the said clamp-hook, of a drum journaled in the frame adapted to carry a compressing-rope, an angled spindle projected rearwardly from the lower cross-bar, a reel journaled upon the said spindle carrying a binding-rope, a spear attached to the outer face of the upper cross-bar, and means, substantially as shown and described for locking the drum, as set forth.

898,936. GRINDING-PAN. MARTIN P. BOSE, San Francisco, Cal. Filed May 4, 1888. Serial No. 272,882. (No model.)



Claim.—1. In a grinding-pan, a muller having the stem *d*, and the drive-shaft E, passing into said stem and adjustably connected therewith, whereby the muller is rotated and is adapted to move vertically, in combination with the driver-cap F, secured to the top of the muller-stem and having a flanged top, the adjusting-screw H, passing into the driver-cap and having its lower end bearing on the top of the drive-shaft, the nut G within the driver-cap and seated on the adjusting-screw, said nut having a flanged base, and the spring I within the driver-cap, around the nut, and bearing between the flanged base of said nut and the flanged top of said driver-cap, substantially as herein described.

2. In a grinding-pan, the combination of a pan, a drive-shaft and operative mechanism therefor, a die, a centrally-apertured shoe, and a muller having an apertured annular body and inwardly-curved flange d^3, for confining and directing the pulp between the shoe and die, substantially as herein described.

3. In a grinding-pan, and in combination with the pan having a die in its bottom and a discharge-opening in the base of its rim, the annular muller for confining the pulp, and having a centrally-apertured shoe on its foot operating over the die for directing the pulp outwardly between the shoe and die to the discharge-opening, said muller having an inwardly-curved flange, d^3, substantially as described.

898,937. ROTARY HARROW. ASA G. BROWN, Eugene City, Oreg. Filed Oct. 20, 1888. Serial No. 289,198. (No model.)

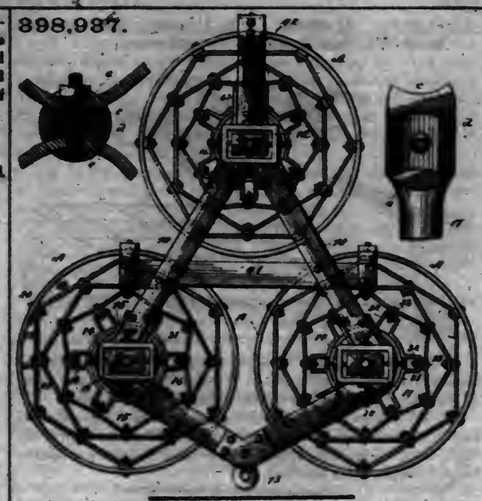
Claim.—1. In a rotary harrow, the combination, with a supporting-frame, of tilting blocks carried by the frame, and wheels carrying harrow-teeth and formed with gudgeons adapted to enter apertures in the tilting blocks, substantially as described.

2. The combination, with a main supporting-frame carrying anti-friction rollers, of trussed harrow-teeth carrying wheels A, gudgeons extending from the wheels A, blocks through which the gudgeons pass, and a pivotal connection between the blocks and the main supporting-frame, substantially as described.

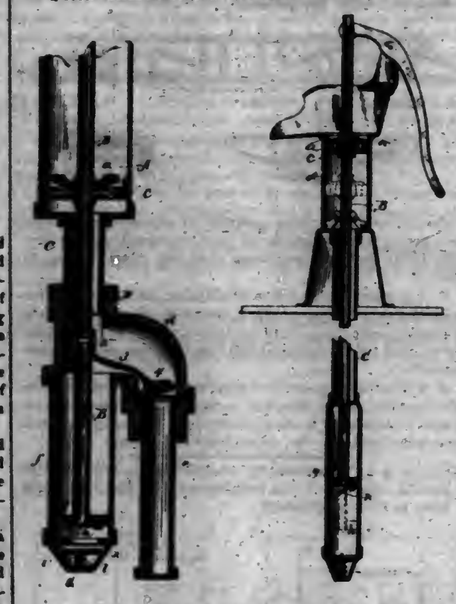
3. In a rotary harrow, the combination, with a box, 11, of a block formed with a central aperture, set-screws by which said block is supported within the box, limit-screws arranged in connection with the block, and a tooth-carrying wheel formed with a gudgeon which enters the aperture in the block, substantially as described.

4. A harrow-tooth formed with a head having concave faces, as *c* and *d*, and shoulders, as *e*, substantially as described.

898,987.



898,938. PUMP. WILLIAM L. BUTTS, Nashville, Tenn. Filed Sept. 4, 1888. Serial No. 284,564. (No model.)

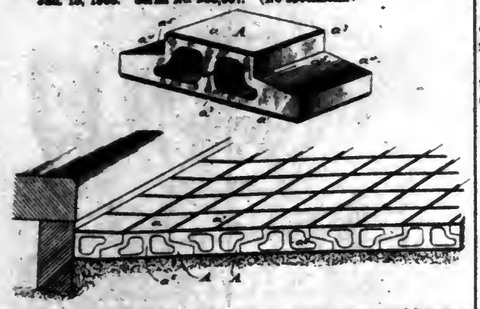


Claim.—1. In a pump, the combination, with the pump-barrel, of a piston and hollow piston-rod, valves carried by said rod for lifting the water, an inlet-valve, an air-chamber connected to the pump-barrel with its lower end below the water-line, and provided with an opening covered by a suitable valve between the chamber and outside water, and an opening also covered by a valve from the piston-rod to the air-chamber, substantially as described.

2. In combination with the pump-barrel, the hollow piston-rod carrying the lifting-valves, an inlet-valve, an air-chamber connected to the pump-barrel openings from said chamber to the surrounding water, a valve normally closing said openings, a disk carried on the lower end of the piston-rod, forming the piston of the air-chamber, and a valve covering the lower open end of the rod, substantially as described.

3. In combination with the piston-rod of a pump, carrying the lifting-valves, an inlet-valve, and an air-cylinder connected to the pump-barrel, arranged below the water-line opening to the outside air through the hollow piston-rod, protected from the water above by a closely-fitting disk carried on the end of the piston-rod, and protected from the water below by a spring-supported valve, substantially as described.

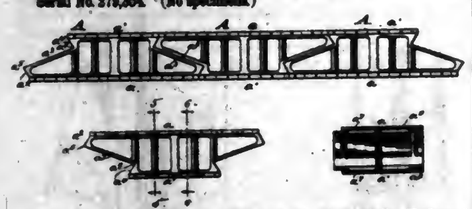
398,939. PAVEMENT. LYDIA J. CADWELL, Chicago, Ill. Filed Jan. 12, 1888. Serial No. 260,607. (No specimens.)



Claim.—1. A hollow T-shaped paving-block recessed between upper and lower bearing-walls and provided with one or more vertical studs through the hollow interior, substantially as described.

2. A T-shaped paving-block of metal or other hard material made hollow, having recesses between upper and lower bearing-walls of the block, and provided with a filling of other material suitable to deaden sound, substantially as described.

398,940. PAVEMENT. LYDIA J. CADWELL, Chicago, Ill., assignor to the Metal Block Pavement Company, of Illinois. Filed July 9, 1888. Serial No. 279,304. (No specimens.)

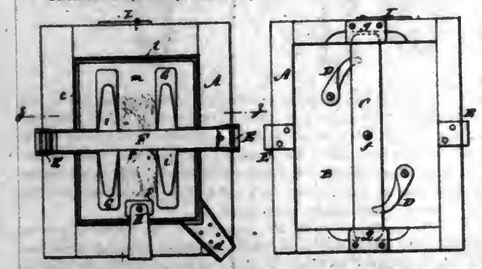


Claim.—1. A pavement composed of substantially T-shaped blocks having their contiguous end faces overlapped and also interlocked against vertical displacement when laid, substantially as described.

2. A pavement composed of overlapping blocks severally provided with a long face on one side, a short centrally-opposite parallel face on the opposite side, and end faces provided with mutually-engaging projections and recesses, substantially as described, and for the purposes set forth.

3. A pavement composed of overlapping blocks severally provided on their opposite parallel faces with transverse ribs terminating at one end short of the edge of the block and having a longitudinal rib which intersects the transverse ribs, substantially as described.

398,941. PHOTOGRAPH TRANSFERRING AND PRINTING FRAME. CORNELIUS T. CAIN, Owensborough, Ky. Filed June 15, 1888. Serial No. 277,231. (No model.)



Claim.—1. The frame A, having a groove or recess, *b*, in its rear on its inner side and provided with a lining-like strip or ledge, *c*, having its facial sides in direction of the thickness of the frame from front to back and arranged to project below the top wall of the recess in the frame, substantially as specified.

2. The frame A, grooved or recessed in its rear, and provided with a lining-like marginally-projecting ledge, *c*, and spout *d*, essentially as shown and described.

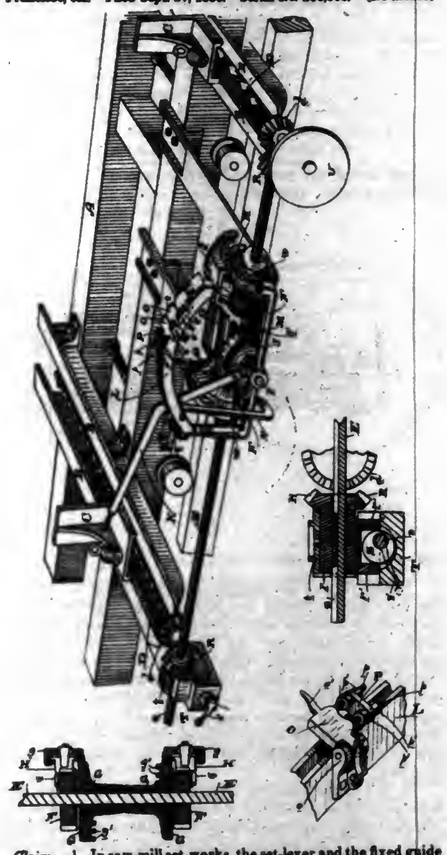
3. The frame A, grooved or recessed in its rear, and provided with a lining-like marginally-projecting ledge, *c*, and pivoted leg I at its one end or side, substantially as specified.

4. The combination, with the frame A, having a recess, *b*, in its rear, of the clamping-board B, the swiveling spring-bar C, clips *g*, and the pivoted wedge-like cams D D, essentially as described.

5. The combination, with the frame A, of the spring-pressure device H *k*, applied to the one or lower end portion of the frame in front, substantially as specified.

6. The combination, with the frame A, of the spring-racks E E, the cross-bar F, constructed to engage with said racks, and the springs G G, carried by said bar, essentially as described.

398,942. SAW-MILL SET-WORKS. FREDERICK W. COOK, San Francisco, Cal. Filed Sept. 27, 1888. Serial No. 286,563. (No model.)



Claim.—1. In saw-mill set-works, the set-lever and the fixed guide by which it is directed, in combination with the independent hinged limiting-plates O, secured to the guide, and the adjustable cross-stop on the foremost of said plates, substantially as herein described.

2. In saw-mill set-works, the set-lever and the fixed guide by which it is directed, in combination with a series of independent hinged limiting-plates, O, secured to the guide, the adjustable cross-stop P on the foremost of said plates, and the adjustable cross-stop Q at the other end of the guide behind the lever, substantially as herein described.

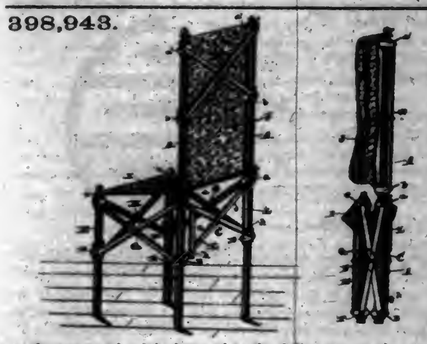
3. In a saw-mill set-works, the set-shaft and the set-screw having a gear, in combination with the adjustable gear R on the set-shaft, the sliding sleeve carrying said gear, the eccentric S, seated in the base of the sleeve, and the lever *a*, for operating the eccentric to slide the sleeve and throw its gear into or out of engagement with the gear of the set-screw, substantially as herein described.

4. In saw-mill set-works, the set-shaft and the set-screw having a gear, in combination with the sliding sleeve on the set-shaft, the gear on the sliding sleeve meshing with the gear on the set-screw, the eccentric and lever for moving the sleeve, and the box T, having the sliding top *t*, fitted over the sleeve, substantially as herein described.

398,948. FOLDING CHAIR. JESSE A. CRANDALL, Brooklyn, N.Y., assignor of one-half to George A. Hurd, same place. Filed Oct. 3, 1888. Serial No. 287,072. (No model.)

Claim.—1. The combination of the front and rear pair of legs, the sliding pieces thereon, and the X-braces thereof connected to said pieces at their lower ends, with the pair of side X-braces connected to the upper ends of the legs and to the sliding pieces, whereby all the braces are opened or closed simultaneously, substantially as set forth.

398,943.



2. The combination of the rear legs extended to form the back-support, and the upper and lower X-braces connecting the same, having sliding connections with the legs at their lower ends, with the front pair of legs, the X-brace connecting the same, and the side pairs of X-braces connecting the front and rear legs, the lower ends of the braces being connected to sliding pieces on the legs, substantially as specified.

3. The combination of the front and rear pairs of legs and the sliding pieces thereon, the X-braces connecting the same, attached to said sliding pieces at their lower ends, with the side X-braces connecting the front and rear pairs of legs, and connected at their lower ends to said sliding pieces, and the locking device for the braces, substantially as described.

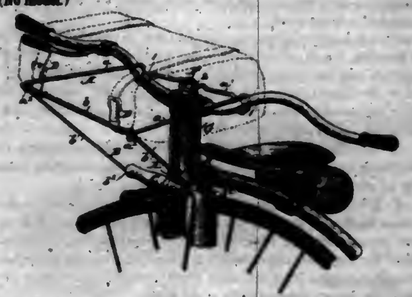
4. The combination, in a folding chair, of the pieces forming the rear legs and back-supports, and having knobs at center and top, and sliding pieces below each knob, and the X-braces connected to said knobs and sliding pieces, with the front pair of legs having knobs at top and sliding pieces below the knobs, the X-brace connected to said knob and sliding pieces, and the side pair of X-braces connected to the fixed knobs and sliding pieces of one front and one rear leg, and the flexible seat and back, all substantially as set forth.

398,944. BOTTLE-STOPPER. WILLIAM P. CRARY, New York, N.Y. Filed Aug. 20, 1888. Serial No. 284,092. (No model.)



Claim.—As an improved article of manufacture, a stopper comprising a cork, A, and a covering, B, of fabric, animal or rubber tissue, secured by cord C above the cork and extended to form the handle or grasp D for withdrawing the cork, substantially as described.

398,945. LUGGAGE-CARRIER FOR BICYCLES. HENRY S. CRUMBAUGH, New Carlisle, Ohio. Filed Sept. 1, 1888. Serial No. 284,377. (No model.)



Claim.—1. A luggage-carrier for bicycles, consisting of a body portion, A, formed of spring-wire having one end constructed to fit upon and clamp the head or the handle-bars of the bicycle, and its opposite end provided with a depending portion adapted to be supported at its lower end upon the bicycle-head, substantially as and for the purposes specified.

2. A luggage-carrier for bicycles, consisting of a body portion, A, one end thereof constructed to fit upon and clamp the head or the handle-bars of the bicycle, and a depending portion or bracket, B, hinged at one end to the body portion, its opposite end adapted to be supported upon the bicycle-head when in place, said portion B forming a handle portion when the carrier is detached from the bicycle, substantially as shown and described.

3. In a luggage-carrier, the combination, with the body portion A, formed of spring-wire, having one end, *a'*, constructed to fit upon and clamp the head and handle-bars of the bicycle, of the bracket portion B, formed of spring-wire, its upper portion, *b*, hinged in the outer ends of the arms *a a*, its arms *b' b'* extended inward, forming supports for a handle-block, C, said block provided with a notch, *c*, substantially as and for the purposes described.

4. A luggage-carrier formed of spring-wire, consisting of the body portion A, said body portion formed of side arms, *a*, and cross-bar *a'*, said cross-bar bent to form downwardly-depending legs 1 and an inwardly-bent portion, 2, whereby said cross-bar may be clamped upon the head and handle-bars of the machine, and a swinging bracket portion, B, hinged in the outer end of the arms, said portion provided with extended arms *b b'*, and a handle-block, C, supported between said arms, substantially as and for the purpose described.

5. As a new article of manufacture, a luggage-carrier for bicycles, formed of spring-wire, consisting of a body portion, A, having side arms, *a*, and a cross-bar, *a'*, said cross-bar provided with clamping-legs 1 1 and 2, whereby said cross-bar may be clamped to the head and handle-bars of a bicycle, the forward ends of the arms *a* being provided with eyes a^4, a swinging portion, B, consisting of the cross-bar *b*, hinged in said eyes, said bar *b* bent to form arms *b' b'*, said arms bent toward each other, as at b^3, said bent portions b^3 supporting a handle-block, C, said handle-block having a transverse notch, substantially as and for the purpose described.

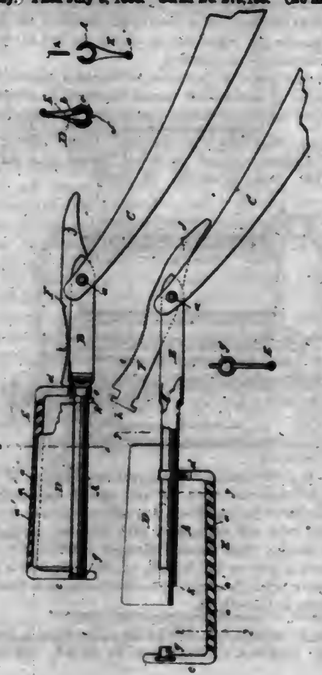
398,946. COMPOSITE PAVEMENT. MURRY CUNNINGHAM, Belle Vista, Pa. Filed Sept. 3, 1888. Serial No. 284,442. (No specimens.)

Claim.—1. In compositions for pavements, a binding mixture consisting of coal-tar, sulphur, tallow, and a coloring material, combined substantially in the proportions set forth.

2. A composition for pavements, consisting of broken stone screenings, coal-tar, sulphur, tallow, and a coloring material, combined substantially in the proportions set forth.

3. A composition for pavements, consisting of broken stone, coke-screenings, coal-tar, sulphur, tallow, and Prussian blue, substantially as described.

398,947. SAFETY-GUARD FOR RAZORS. THERON F. CURLEY and ALBERT S. GRANGER, Brooklyn, N.Y.; said Granger assignor to said Curley. Filed July 6, 1888. Serial No. 279,188. (No model.)

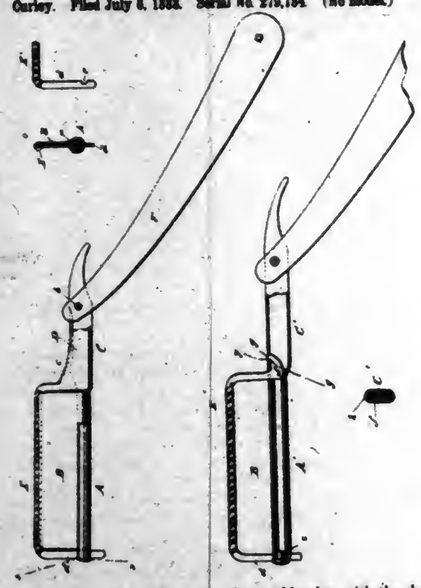


Claim.—1. The combination, with the slotted tubular back A, provided with the hollow shank B, of the razor-blade D, held by the tubular back, the swinging guard E, provided with the slotted eye *e*, and having the stud *g* and the swinging arm F, provided with the T-shaped head *h*, substantially as specified.

2. In a safety-razor, a reversible guard, E, provided with transverse ribs *a'* upon opposite sides, substantially as specified.

3. In a safety-razor, the combination, with the slotted tubular back A, and the razor-blade D, held by the said tubular back, of a swinging guard, E, provided with transverse ribs *a'*, and a fastener for holding the guard in the position of use, substantially as specified.

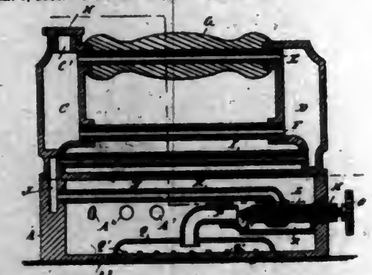
398,948. SAFETY-GUARD FOR RAZORS. TERENCE F. CURLEY and ALBERT S. GRANGER, Brooklyn, N. Y.; said Granger assignor to said Curley. Filed July 6, 1888. Serial No. 279,184. (No model.)



Claim.—1. In a safety-razor, the combination, with the slotted tubular back, and the blade loosely fitted to the said back, of a guard having one of its ends inserted in the tubular shank of the back and having the opposite end removably secured to the end of the tubular razor-back, substantially as specified.

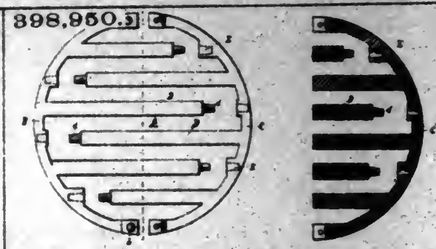
2. The combination, with the slotted tubular back A, provided with the tubular shank C, of the blade B, and the guard E, provided with the shank D, pivoted in the tubular shank C, substantially as specified.

398,949. SELF-HEATING SAD-IRON. JULIUS J. CHEPELL, Charleston, S. C., assignor to himself and Bernard Doscher, same place. Filed Mar. 9, 1888. Serial No. 266,673. (No model.)



Claim.—In a self-heating sad-iron, the combination of a hollow body, reservoirs supported upon the body at each end thereof, pipes connecting the reservoirs together, a chamber at one end of the body, a pipe leading from one reservoir to said chamber, a burner in the body, a pipe leading from the said chamber to the burner, an apertured distributing-pan on the bottom of the body, and a pipe into which the burner opens leading to the distributing-pan, substantially as herein shown and described.

398,950. GRATE FOR FURNACES. ARMELAND C. BAKER, Clinton, Mass. Filed Sept. 11, 1886. Serial No. 268,108. (No model.)

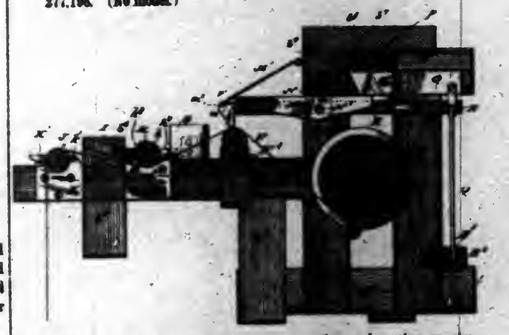


Claim.—1. A grate composed of two frame-sections connected substantially as described, and a series of grate-bars, each one of which is rigidly connected to or formed with one of the frame-sections at one end and has its free end loosely engaged in a corresponding socket in the opposite frame-section, whereby each bar can expand and contract independently of the other bars, substantially as described.

2. The herein-described grate, composed of the frame-sections B and C, connected at their ends, and each provided with alternate grate-bars and sockets, the ends of the bars of one section being arranged to enter loosely the sockets of the opposite section when the sections are united, substantially as set forth.

3. The combination, in a grate, of the section B, formed with alternate grate-bars and sockets, and a central grate-bar, F, with the section C, also formed with alternate grate-bars and sockets and connected at its ends to the ends of section B and centrally to the end of bar F, all constructed and arranged substantially as and for the purpose described.

398,951. HARMONIGRAPH OR MUSIC-RECORDING DEVICE. JOSEPH A. DROUIN, New Orleans, La. Filed June 15, 1888. Serial No. 277,196. (No model.)



Claim.—1. In a harmonigraph, a connecting-rod section consisting of the frame having guideways for the rods and formed in sections, whereby it may be folded, and the rods supported and movable in the guideways of such frame, substantially as set forth.

2. A harmonigraph, substantially as described, comprising a marker-section and a connecting-rod section, whereby to transmit the motion of the keys to the marker-section, such connecting-rod section having its rods arranged to converge upwardly, and being made in sections foldable, substantially as set forth.

3. In a harmonigraph, a connecting-rod section having its rods arranged to converge, as described, and formed in sections foldable, substantially as set forth.

4. In a harmonigraph, the combination, in the marker-section, of the framing, the paper-carrying roller journaled in said framing, the hammers, and the levers arranged to engage the hammers and pivoted in the framing above the paper-carrying roller, the bed roller or rollers journaled in said framing in rear of the paper-roller, and the feed-roller, substantially as set forth.

5. In a harmonigraph, the combination, with a marker by which to indicate tones or notes, of measure-indicating markers, substantially as set forth.

6. In a harmonigraph, the combination of the hammers pivoted between their ends and provided at one end with the markers, the levers pivoted between their ends and engaged at one end with the ends of the hammers opposite the markers, and connections whereby to transmit motion from the keys of the musical instrument to the ends of the levers, substantially as set forth.

7. In an apparatus substantially as described, the combination of the paper-support, the feeder, the mover for operating said feeder, the marker for indicating tones or notes, and the measure-indicating marker, substantially as set forth.

8. A harmonigraph having a bed along which the paper to be marked is passed, and provided with a marker bearing normally on the said bed or the paper thereon, whereby to normally mark the paper, and connections between the said marker and the keys of the musical instrument, whereby by the operation of said keys the marker may be lifted clear of the marked paper sheet, leaving a blank in the line drawn on such paper, substantially as set forth.

9. In a harmonigraph, the combination, with a supporting-frame and a series of bars, of hangers having top or end plates secured to the supporting-frame and depending plates fitting between the adjacent bars, the bars and plates being provided with coincident openings, and the pivot-shaft passed through said openings, substantially as set forth.

10. In a harmonigraph, the combination, with the bed over which the paper is directed, of the pivoted markers and springs engaging said markers, whereby to operate the same, substantially as set forth.

11. In a harmonigraph, a marker consisting of lever bar or support pivoted between its ends, a cup-like holder supported at one end of the bar, and an absorbent body in said holder, substantially as set forth.

12. In a harmonigraph, the combination, in the marker-section, of the framing provided with guideways for the depending rods Q, the markers or hammers, the levers pivoted between their ends, arranged at one end to engage the markers, and the rods Q, connected at their opposite end with the levers and extended through the guideways in the framing, substantially as set forth.

13. In a harmonigraph, the combination, with the supporting-frame and the markers, of the paper-supporting roller, a bearing for one end of said roller, and a bearing for the opposite end of said roller, the latter bearing consisting of a plate having a slot cut from its lower edge, and provided at its inner end with a seat-notch and a pivoted latch-plate, whereby to hold the trunnion of the roller in said seat-notch, substantially as set forth.

14. A harmonigraph comprising the supporting-frame, the markers adapted to mark with ink, the bed over which the paper is drawn below said markers, and fastenings for detachably securing said bed, whereby it may be replaced by the ink-well support, substantially as set forth.

15. In a harmonigraph, the combination of the markers for indicating tones or notes, connections by which said markers may be operated from the keys of the piano or similar instrument, the measure-marker, and a treadle, whereby said marker may be operated by the foot of the performer, substantially as set forth.

16. In a harmonigraph, a marker proper consisting of a funnel-shaped cup open at its large and small ends and the carrier or absorbent body fitted in said cup and drawn through the small end thereof, substantially as set forth.

17. The combination, with the marker-section frame, of the measure-marker consisting of the lever arms or bars pivoted between their ends, having crayon-holders at their rear ends, a cross-bar extended between said arms and connected rigidly to both of same, and the spring engaging said bar, substantially as set forth.

18. In a harmonigraph, the combination of the paper-support, the markers, the bed-roller, the feed-roller, and the side guides arranged between the feed-roller and the bed-roller, substantially as set forth.

19. In a harmonigraph, the combination, with the markers and the paper-support, of the feeding-roller and the guide-strip which prevents the paper from being drawn or carried upward by the feed-roller, substantially as set forth.

20. A harmonigraph having markers by which to indicate tones or notes and provided with a measure-marker, and a treadle by which the same may be operated by the foot, substantially as set forth.

21. In a harmonigraph, the combination of a measure-marker having a bar pivoted between its ends and provided at its forward end with a depending rod, a connecting-rod arranged at its upper end to engage the lower end of said depending rod, the treadle, and the treadle-rod arranged to engage the lower end of the said connecting-rod, substantially as set forth.

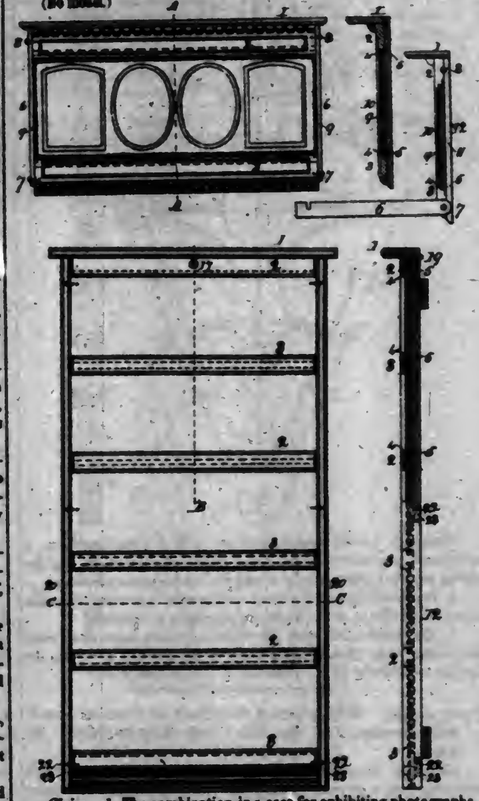
398,952. RIBBED CONOIDAL WASHER. DAVID DODD, Orange, assignor to the National Lock Washer Company, Newark, N. J. Filed May 25, 1888. Serial No. 275,041. (No model.)



Claim.—1. The new article of manufacture herein shown and described, the same consisting of a conoidal or dished washer provided with a circular V-shaped rib adjacent to the concave edge of that one of the sides of the washer which is intended for impact against the face of the nut.

2. The combination, as herein set forth, of a bolt and nut of ordinary construction with a conoidal or dished washer provided upon that one of its sides which bears against the nut with a circular V-shaped rib, all parts of the apex of which after it has acquired contact with the nut are made by the screwing home of the nut to simultaneously embed themselves in the face of the nut, and to thereby effect the progressive movement of a portion of the nut toward the bolt while the central portion of the washer is being forced toward and against the surface of the object upon which the outer portion of the washer bears.

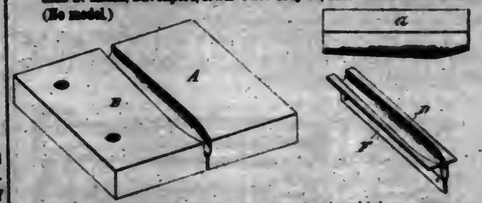
398,953. WALL-CASE FOR EXHIBITING PHOTOGRAPHS. FRANCIS KIRT, Dundee, Scotland. Filed Sept. 24, 1883. Serial No. 288,190. (No model.)



Claim.—1. The combination, in a case for exhibiting photographs, pictures, and similar articles having a glazed front slide, of moldings 2 and 3, each having a double groove, 4 and 5, for holding the glass and photograph-slide, respectively, and permitting their removal and replacement without displacing the wood-work containing said glazed slide, and the pivoted strips 6 6, for closing said double grooves, for the purpose set forth.

2. The combination, in a show-case having a glazed front slide and moldings formed with a double groove for holding the glass and photographic slide, of the hinged top 1 and side pieces, 20, having metal plates 23, provided with screw-pins 22, in the manner and for the purpose set forth.

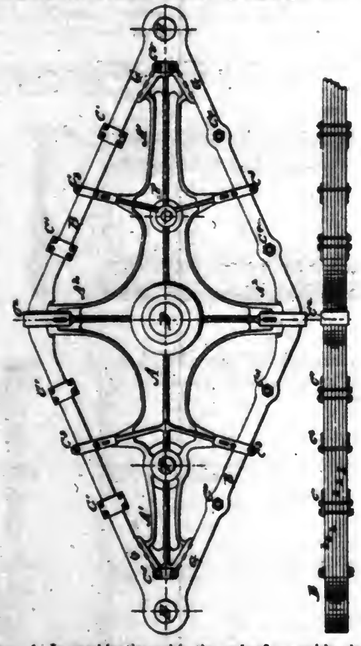
398,954. DIE FOR STAMPING METALLIC CIGAR-MOLDS. GOTTLIEB D. HAHN, Davenport, Iowa. Filed May 17, 1888. Serial No. 274,311. (No model.)



Claim.—A female die having a depression in which to stamp metallic cigar-molds, composed of two halves, between which the lower

portion of the metallic blank is held and its form retained, notwithstanding the operation of stamping the upper part of said blank into the depression of the die and forming it into a mold, substantially as described.

398,955. WORKING-BEAM. CHARLES B. EMERY, Brooklyn, N. Y. Filed June 6, 1888. Serial No. 276,276. (No model.)



Claim.—1. In combination with the web of a working-beam, a beam-strap composed of a number of thicknesses connected and operating together, substantially as and for the purposes specified.

2. In a working-beam, a strap composed of a number of laminæ clamped together to act as a unit, substantially as described.

3. The combination, with the web of a working-beam and a compound beam-strap formed of a number of thicknesses, of clamps for insuring the stability of the strap under compressive strains.

398,956. WORKING-BEAM FOR STEAM-ENGINES. CHARLES B. EMERY, Brooklyn, N. Y. Filed June 7, 1888. Serial No. 276,387. (No model.)

Claim.—1. In combination, to form a working-beam, eye-bars, connecting-pins, a web, and devices for straining the eye-bars over the web.

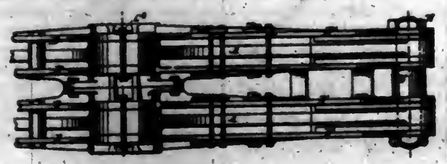
2. In combination with a beam-strap composed of eye-bars and a web over which the eye-bars are strained, pins connecting the eye-bars provided with journals for the main connections.

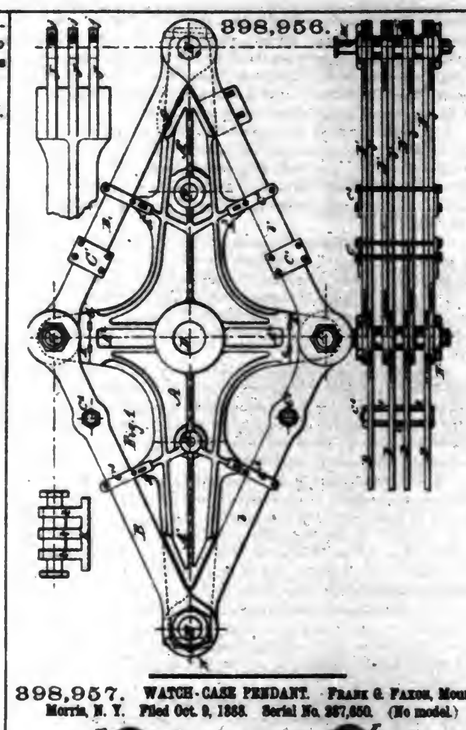
3. A working-beam provided with a strap composed of eye-bars, a web over which the eye-bars are strained, and clamps and necessary distance-pieces applied at various intermediate points along the eye-bars to hold the same rigidly together, so that they will act as a unit in compression, substantially as described.

4. In a working-beam provided with a strap composed of eye-bars and a suitable web, adjustable saddles transmitting the thrust of the eye-bars to the arms of the web.

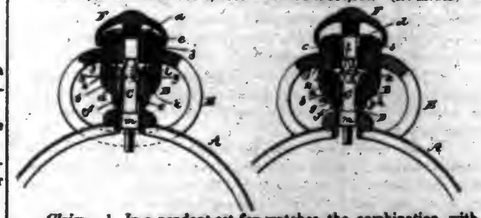
5. In a working-beam, an eye-bar forming part of the strap and provided with a lateral lug, P, near the eye, adapted to transmit the strains arising from the tension of the bar when connected with other parts to an arm on the web, substantially as described.

6. The web of a working-beam and a strap for the same provided with a lateral projection at one of the angles, combined with a pin, R, substantially as described.





398,957. WATCH-CASE PENDANT. FRANK G. FAXON, Mount Morris, N. Y. Filed Oct. 9, 1888. Serial No. 287,650. (No model.)



Claim.—1. In a pendant-set for watches, the combination, with the winding and setting stem, of one or more springs arranged to hold the stem in position for setting or winding the watch and a lock for holding the said spring or springs in engagement with the winding and setting stem, substantially as specified.

2. In a pendant-set, the combination of the winding and setting stem C, provided with the collar *l*, the spring D, having the arms *g*, provided with heads *h*, and the bow E, having recesses *k* in the ends thereof, substantially as specified.

3. In a watch-pendant, the combination of the main part *a*, provided with the shoulder *e*, the ring *c*, the sleeve *b*, nut *d*, and the bow E, substantially as specified.

4. In a pendant-set, the combination of the part *a*, provided with the shoulder *e*, the slotted sleeve *b*, the ring *c*, nut *d*, the spring D, the bow E, having conical ends journaled in the part *a* and ring *c* and provided with recesses *k*, and the stem C, having the collar *l*, substantially as specified.

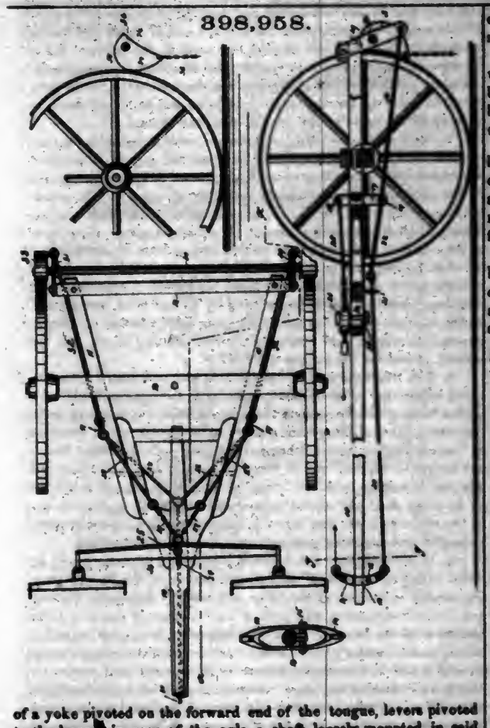
398,958. VEHICLE-BRAKE. JOHN FRASER, Simcoe, Ontario, Canada, assignor to himself and C. A. Upper, same place. Filed Oct. 30, 1888. Serial No. 289,494. (No model.) Patented in Canada Oct. 13, 1888, No. 29,964.

Claim.—1. The combination, with a vehicle having a yoke pivoted on the forward end of its tongue, of pivoted levers, reversible brake-shoes pivoted in said levers, and a connection between the said yoke and the lower ends of the levers, substantially as described.

2. The combination, with a vehicle having a yoke pivoted on the forward end of its tongue, of pivoted levers, a shaft loosely mounted in the arched said levers, brake-shoes having opposing concave and convex bearing-faces and secured to the ends of the said shaft, and a connection between the lower ends of the levers and yoke, substantially as herein shown and described.

3. In a vehicle-brake, the combination, with the forward hounds, the tongue, and a doubletree having a sliding movement on the tongue,

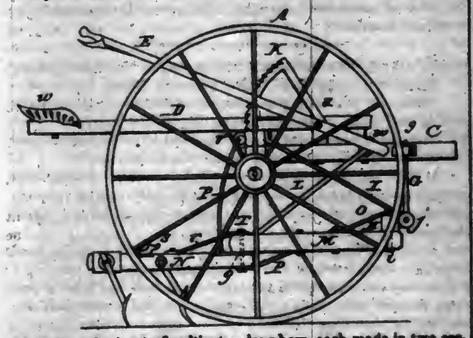
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of a yoke pivoted on the forward end of the tongue, levers pivoted to the hounds in rear of the axle, a shaft loosely mounted in said levers, brake-shoes having opposing concave and convex bearing-faces, levers pivoted to the hounds in front of the axle and having their upper ends connected to the doubletree and their lower ends to the yoke and to the levers in rear of the axle, substantially as herein shown and described.

4. In a vehicle-brake, the combination, with the tongue, of the clevis 13, secured to the forward end of the tongue, and the yoke 14, through which the tongue projects, provided with eyes at its ends and pivoted to the clevis by the bolt 15 passing through the yoke and clevis below the tongue, substantially as herein shown and described.

398,959. CULTIVATOR. CHARLES H. GAGE, Richmond, Wis. Filed Sept. 1, 1888. Serial No. 284,351. (No model.)



Claim.—1. A set of cultivator drag-bars, each made in two sections jointed end to end for lateral vibration, in combination with couplings which connect the parallel sections in pairs, braces extending from each forward section to the rear section of the same drag-bar, a cultivator-frame, and a hanger which suspends said drag-bars from said frame, but allows vertical vibration, substantially as set forth.

2. The combination, with the main frame of the cultivator, of the arched bail or hanger G, the braces I, the coupling H, the jointed or sectional drag-bars, the perforated cross-plate *g*, and the arched brace *f*, sliding in guides upon the axle, substantially as set forth.

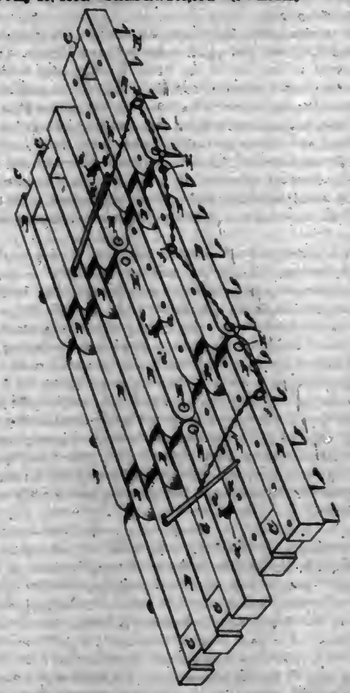
3. The combination, with the main frame and the arched hanger G, of the jointed drag-bar frames, the couplings H, the sliding brace or arch F in rear of the joint, the plate *g*, to adjustably connect the drag-bars and the lifting-lever, and the cross-bar *x* with foot-rests S, substantially as shown and described.

4. The cultivator-frame and the arched hanger, in combination with the jointed frames or drag-bars M N, the couplings H, the cross-bars *g* and *x* upon the rear section of the drag-bars, the sliding arched brace *f*, adjustable in plates *g*, and the lifting-lever, substantially as shown and described.

5. The combination, with the frame and the arched hanger G, having horizontal spindles, of the cross-barrel couplings H, the jointed drag-bars, the rear section, N, having the cross-bars *g x*, the adjustable connecting-bar F, and the foot-rests S, whereby said rear section may be swayed laterally, turning upon the pivot-bolts T of the jointed frame, as shown and described.

6. The frictional standard-holder consisting of flanged plate A', having the tapered opening *a*, the tapering pin B', having the recess *d* and a central perforation, and a bolt and nut, whereby all the parts are secured to the drag-bar and the shovel-standard held by friction so as to yield to obstructions.

398,960. DRAG AND HARROW. JOHN R. GOODMAN, Calumet, Mo. Filed July 13, 1888. Serial No. 279,534. (No model.)



Claim.—1. A drag or harrow consisting of two or more sections hinged together by loose spacing-blocks between the respective beams of the sections at the adjoining ends thereof, and bolts passing through the ends of the beams of the respective sections and through opposite ends of the said spacing-blocks, substantially as described.

2. A drag or harrow consisting of two or more sections hinged together by means of loose spacing-blocks between the respective beams of the sections at the adjoining ends thereof, and bolts passing through the ends of the respective sections and through the opposite ends of the said spacing-blocks, as set forth, the outer ends of the outer sections being spaced by fixed spacing-blocks, substantially as described.

3. A combined drag and harrow consisting of a drag composed of jointed sections and a harrow composed of jointed sections, the two being hinged together, substantially as described.

4. The combination, with a drag and harrow hinged together and each composed of jointed sections, of chains F, connecting the several sections of the harrow, the levers G, pivoted to the end sections of the drag, and the chains F', secured to the end sections of the harrow and to the said levers, substantially as described.

398,961. WHEEL-PLOW. ANDREW GOODYEAR, South Bend, Ind., assignor to the South Bend Chilled Plow Company, same place. Filed Aug. 20, 1888. Serial No. 283,223. (No model.)

Claim.—1. In a wheel-plow, the combination, with a frame and a plow supported thereon, of a guiding-wheel secured to the furrow

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side of the forward portion of said frame, a spring-latch holding said wheel substantially parallel with the landside of the plow, a lever pivotally secured to the frame, and means for connecting said lever with the guiding-wheel, whereby the spring-latch may be released and said wheel turned at any desired angle to guide the plow, substantially as shown and described.

2. In a wheel-plow, the combination, with a frame, a landside-wheel secured thereto, and a plow supported on said frame, of a caster-wheel secured to the rear of the frame, a spring-latch holding said caster-wheel parallel with the landside of the plow, a guiding caster-wheel secured to the furrow side of the forward portion of the frame, a spring-latch holding said forward caster-wheel parallel with the rear caster-wheel, and a lever pivotally secured to the frame, and means, substantially as described, for connecting said lever with the forward guiding caster-wheel, whereby the spring-latch may be released and said caster-wheel turned by said lever at any desired angle to guide the plow, all constructed, arranged, and operating substantially as set forth.

3. In a wheel-plow, the combination, with a frame and a plow supported thereon, of a guiding caster-wheel secured to the furrow side of the forward portion of the frame, a spring-latch holding said guiding-wheel substantially parallel with the landside of the plow, a segment-gear formed on the yoke of the guiding caster-wheel, a shaft mounted in a bearing on the frame, an upwardly-projecting toothed sector rigidly secured to said shaft and provided with a downwardly-projecting arm having a notched end, a spring-latch secured to the frame and engaging said notched end, and a lever pivotally secured to the shaft and provided with a spring-actuated dog adapted to engage with the toothed sector and having a segment-gear on its lower end adapted to be thrown in or out of gear with the gear on the yoke of the caster-wheel and to be held as adjusted by the spring-latch, all constructed, arranged, and operating substantially as shown and described.

4. In a wheel-plow, the combination, with a frame and a plow supported thereon, of a guiding caster-wheel, R', secured to the forward end of the furrow side of the frame, a spring-latch, *p*, adapted to hold said caster-wheel substantially parallel with the landside of the plow, a beveled segment-gear, R^4, secured to and projecting from the yoke of the caster-wheel, a bearing, S, formed on the frame, a shaft, S', mounted in said bearing and having rigidly secured to its rear end an upwardly-projecting toothed sector and a downwardly-projecting arm, T', having a hook end, *t*, provided with notches t' t^2, a spring-latch, T^3, secured to the frame and adapted to engage with said notches, and a lever, V, pivotally secured to the shaft S' and provided with a spring-actuated dog adapted to engage the toothed sector, and a beveled segment-gear, V', on its lower end, adapted to be thrown in or out of engagement with the gear R^4 and to be held as adjusted by the spring-latch T^3, all constructed, arranged, and operating substantially as shown and described.

5. In a wheel-plow, the combination, with a substantially U-shaped frame, a plow supported on said frame, a landside-wheel secured thereto, a casting, G, secured to the rear of the frame and laterally adjustable thereon and having a rearwardly-projecting arm, G', a vertical bearing, G^2, in said arm, a caster-wheel, H', having the pintle *h* of its yoke H mounted in the bearing G', and the segmental cross-bar H^2, having a notch, h^2, and a spring-latch adapted to engage with said notch, of a forward cross-bar, B, secured to the forward portion of the frame and projecting beyond its furrow side, a casting, P, secured to the extension of the cross-bar, a rearwardly-projecting arm, P', formed on said casting, a vertical bearing, P^2, formed in said arm, a caster-wheel, R', having the yoke R and pintle *r* mounted in said bearing P^2, and the segmental cross-bar R^2, provided with the notch r^2, and a spring-latch, *p*, adapted to engage with said notch, all constructed, arranged, and operating substantially as shown and described.

6. In a wheel-plow, the combination, with a frame supported upon suitable carrying-wheels, a crank-shaft mounted upon said frame, a lifting-lever secured to the crank-shaft, and a plow-beam pivotally secured to said crank-shaft and carrying on its rear end a plow, of a lever pivotally secured to the forward end of frame and having substantially S-shaped slot therein, and a pin on the forward end of the plow-beam engaging with said slot, all constructed, arranged, and operating substantially as shown and described, whereby, as the lever is moved back, the forward end of the beam will be forced down, so as to cause the point of the plow to enter the ground.

7. In a wheel-plow, the combination, with a frame having the vertical slot C' in its forward end and supported upon suitable carrying-wheels, a crank-shaft mounted on said frame, a lifting-lever secured to the shaft, and a plow-beam, L, pivotally secured to said crank-shaft, carrying on its rear end a plow and having its forward end projecting through the vertical slot C', of a toothed sector, O', secured to the frame at one side of the vertical slot, a lever, O, pivotally secured to the frame and provided with a spring-actuated dog, *o*, adapted to engage with the toothed sector and a hand-lever, *o'*, connected with said dog, a substantially S-shaped slot, O', in said lever, and a pin, *l*, on the forward part of the beam, engaging with said slot O', all constructed, arranged, and operating substantially as shown and described, as and for the purpose set forth.

8. In a wheel-plow, the combination, with a frame, a wheel secured to the rear of the frame, a crank-shaft mounted on said frame, a plow-beam pivotally secured to the crank-shaft and carrying on its rear end a plow, a lifting-lever secured to said crank, and a cross-bar or brace extending across the rear of the plow, of a depending brake-bar hinged to the rear of the frame in front of the rear wheel and adapted to engage with the cross-bar or brace as the plow is lifted by its crank-shaft and moved back so as to be forced against the tire of the rear wheel, and thus form a brake for the plow, all constructed, arranged, and operating substantially as shown and described.

9. In a wheel-plow, the combination, with a frame, a wheel secured to the furrow side of the forward portion of the frame, a casting secured to the rear of the frame and laterally adjustable thereon, and a wheel secured to said casting and adapted to travel in a line parallel with the forward wheel, of a depending brake-bar hinged to the adjustable casting in front of the rear wheel, a plow-beam mounted on said frame and carrying a plow on its rear end, and means for raising and lowering the beam, whereby as said beam is raised the plow will engage the brake-bar and force it against the rear wheel, substantially as shown and described, as and for the purpose set forth.

10. In a wheel-plow, the combination, with the frame, a landside-wheel secured thereto, a caster-wheel secured to the furrow side of the forward portion of the frame, a casting, G, secured to the rear of the frame and laterally adjustable thereon, a caster-wheel, H, secured to said casting, a crank-shaft mounted on the frame, a plow-beam, L, pivotally secured to the crank-shaft and carrying on its rear end a plow, L', a lifting-lever secured to said crank-shaft, and a cross-bar or brace, *w*, extending across the rear of the plow, of a depending brake-bar hinged to the casting G in front of the caster-wheel H and adapted to be engaged by the cross-bar or brace on the plow and be forced against the tire of the rear caster-wheel when said plow is lifted by its crank-shaft and moved back, thus forming a brake for the same, all constructed, arranged, and operated substantially as shown and described.

398,962. MULTIPLE DRILLING-MACHINE. RICHARD HAMMOND, Buffalo, N. Y. Filed May 29, 1888. Serial No. 275,423. (No model.)

Claim.—1. In a drilling-machine, the combination, with a central drilling-tool, of two outer drilling-tools held parallel with the said central drilling-tool and mounted in bearings held to swing from the said central drilling-tool, substantially as shown and described.

2. In a drilling-machine, the combination, with a central shaft carrying a drilling-tool, of two outer parallel shafts rotated from the said central shaft and mounted in bearings pivoted on the said central shaft, substantially as shown and described.

3. In a drilling-machine, the combination, with a central shaft carrying a drilling-tool, of two outer parallel shafts, each carrying a drilling-tool and rotated from the said central shaft, and bearings carrying the said outer shafts and pivoted on the said central shaft, substantially as shown and described.

4. In a drilling-machine, the combination, with a face-plate, of a central shaft held to rotate in the said face-plate and carrying a drilling-tool, two outer parallel shafts, each carrying a drilling-tool and rotated from the said central shaft, and bearings carrying the said outer shafts pivoted on the said central shaft, said bearings being adapted to be secured to the said face-plate, substantially as shown and described.

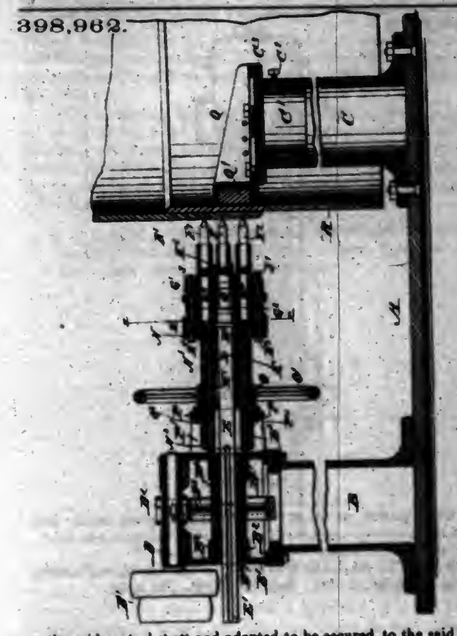
5. In a drilling-machine, the combination, with a face-plate mounted to slide forward and backward, of a central shaft passing through the said face-plate and carrying a drilling-tool, two outer parallel shafts, each carrying a drilling-tool and rotated from the said central shaft, and bearings carrying the said outer shafts and pivoted on the said central shaft and adapted to be secured to the said face-plate, substantially as shown and described.

6. In a drilling-machine, the combination, with a face-plate and means, substantially as described, for imparting a forward and backward sliding motion to the said face-plate, of a central shaft passing through the said face-plate and carrying a drilling-tool, two outer parallel shafts, each carrying a drilling-tool and rotated from the said central shaft, and bearings carrying the said outer shafts and pivoted on the said central shaft and adapted to be secured to the said face-plate, substantially as shown and described.

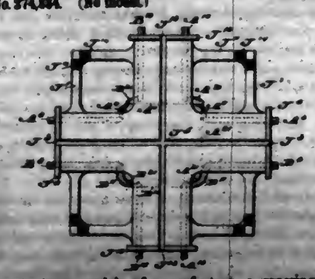
7. In a drilling-machine, a face-plate mounted to slide forward and backward and provided with an annular slot, in combination with a central shaft mounted to rotate in the said face-plate and sliding forward and backward with the same, two outer parallel shafts rotated from the said central shaft, bearings carrying the said outer shafts and pivoted on the said central shaft, and bolts passing into the said annular slots and through the said bearings to secure the latter to the face-plate, substantially as shown and described.

8. In a drilling-machine, a face-plate mounted to slide longitudinally, a central shaft mounted to rotate in and sliding with the said face-plate, two outer parallel shafts rotated from the said central shaft, and bearings carrying the said outer shafts and pivoted on the said central shaft and connected with the said face-plate, and drilling-tools secured to the said central and outer shafts, in combination with a wooden block held in front of the said drilling-tools, a frame carrying the said block and mounted to slide horizontally, a table in which the said frame is held to slide, a sleeve carrying the said table, and a column in which the said sleeve is held vertically adjustable and mounted to turn, substantially as shown and described.

398,962.



398,963. CROSSING-CONDUIT FOR ELECTRIC RAILWAYS. ISAAC W. HEYBERGER, Philadelphia, Pa. Original application filed Apr. 21, 1887, Serial No. 236,034. Divided and application filed Nov. 29, 1887, Serial No. 256,260. Again divided and this application filed May 24, 1888. Serial No. 274,634. (No model.)



Claim.—1. As an article of manufacture, a crossing-conduit for electric railways for use at intersections thereof, formed in a single construction, practically complete before being put into place, said conduit having two transverse passages crossing at an angle and opening into each other, provided with longitudinal slots along their upper surfaces, intersecting and opening into each other, said passages having secured to their inner and opposite sides parallel conducting leads for each intersecting line A^4 B^5 A^{16} B^{16}, interrupted by the distance between the internal corners of said transverse passages, and having the free ends of the conductors of said leads joined to their continuations beyond said interrupted space by deflected and insulated metallic conductors carried across said intersection out of the line of travel of the current-gathering devices of a motor-car upon either line of railway, said leads attached to the inner sides of said conduit by insulated supports, the free ends of said leads at the extremities of the passages and the outer ends of said passages adapted to be attached to the free ends of the leads and the free ends of the passages of the conduits of said railways, so as to complete the said intersecting railways and the electric connections thereof when the said conduit is in place, substantially as described.

2. The railway-crossing conduit having transverse passages open through the same and intersecting each other, longitudinal open slots along its upper surfaces intersecting each other, and a supporting frame-work, J^9 J^{11}, for the rails of an intersecting railway, the whole formed in one construction before being put into place for use, substantially as described.

3. In a crossing-conduit for electric railways, the transverse intersecting passages L L', having walls J J^{10}, said passages crossing each other at an angle, in combination with supporting-arms J^7 J^{11} J^7 J^{11} springing from the outer walls of said passages and having their free ends united at J^{20} J^{20}, the whole forming a rigid square frame-work adapted to support the trackway of two intersecting railways and prevent displacement of the said conduit by the thrust of said railways in either direction, together with a line of electric leads extended along said passages, insulated from said walls, and interrupted at said intersection, and laterally-deflected conductors bridging said interrupted spaces out of line of travel of the current-gathering devices of a motor-car upon said railways, substantially as described.

4. In combination with a crossing-conduit for electric railways, the intersecting passages L L', having intersection L^3, the leads A^4 B^5 along the sides of the passage L, and the leads A^{16} B^{16} along the sides of the transverse passage L', said leads insulated from the conduit-walls J J^{10} and interrupted at said intersection L^3, each of said leads substantially continuous and carried out laterally through the wall of said conduit and across said intersection beneath the same, and thence back through said wall into said passage beyond said intersection and continuously onward along the line, together with flexible insulating tubes or ducts K K^6, surrounding said leads and preserving the insulation thereof in their passage from the deflected end of each of said leads to the continuation of the same beyond said intersection, substantially as described.

5. In an electric-railway-crossing conduit, the transverse passages L L', intersecting each other, in combination with the leads A^4 B^5 A^{16} B^{16}, extended along said passages and interrupted at the intersection L^3 thereof, said leads deflected, so as to cross the said intersection out of the line of passage of the current-gathering devices of a motor-car, and the insulating-tubes K K^4 K^6 K^8, surrounding said deflected leads, substantially as and for the purposes described.

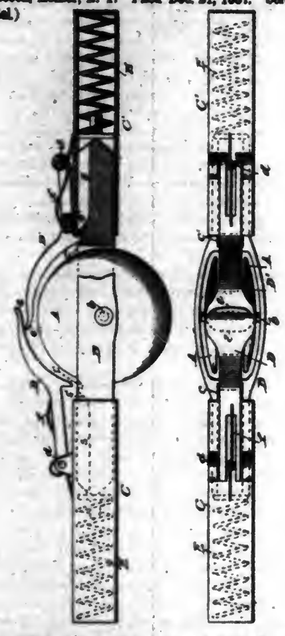
6. In combination with the cross-shaped conduit having walls J J J^{10} J^{10} and intersecting passages L L', the electric leads A^4 B^5 A^{16} B^{16}, adapted to be connected with the corresponding leads of one or more electric railways, and the flanged expansions J^9 J^9 J^{10} J^{10} upon the free ends of the walls of said cross-shaped conduit, and bolt-holes J^7 J^{17} in said flanged expansions, the said flanges adapted to face against corresponding flanges of the conduits of transverse lines of electric railway, and, bolted thereto through said bolt-holes, maintain the said leads and said cross-shaped conduit in place against thrust from either direction, substantially as described.

7. In an electric-railway crossing, in combination with the leads A^4 B^5 A^{16} B^{16}, insulated from their supports and adapted to supply electricity to the current-gathering devices of a motor-car traveling in contact therewith, the deflected wires A^{11} A^{16} B^{11} B^{16}, covered with an insulating substance and contained within ducts K K' K^6 K^8, carried across the intersection L^3 out of line of travel of said current-gathering devices, the space between said wires and said ducts filled with melted paraffine or the like after the said wires are in place in said ducts, substantially as described.

8. In an electric-railway-crossing conduit, conducting-leads extended along within the same, insulated from said conduit by insulators I^5, and interrupted at the intersection L^3, said leads deflected at said interruption to bridge the said intersection, or the free ends thereof connected by laterally-deflected wires, in combination with leaden tubes K^6, or the like, surrounding and insulating said deflected wires, said tubes extended through perforations in said insulating-blocks I^6 I^5,

opposite the free ends of said leads, and secured in said insulators I^5 by joints or expansions K^5 K^5, substantially as described.

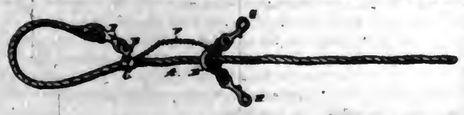
398,964. POSITIVE SHUTTLE-MOTION FOR LOOMS. WILLIAM F. HITCHCOCK, Homer, N. Y. Filed Dec. 21, 1887. Serial No. 258,567. (No model.)



Claim.—1. The combination, with a shuttle, B, consisting of a yoke having vertically-aligned bobbin-bearings, diametrically-opposite projecting ends, and notches *c c'* on one side of the shuttle and where the said projecting ends join the yoke, of the tubular shuttle-carriers having arch-shaped hooks D D' pivoted at their outer ends to the same side of the carriers, with their axes parallel with the said bobbin-bearings and constructed to travel along the projecting shuttle ends and engage the notches therein, and the springs throwing the hooks toward the open side of the yoke, substantially as set forth.

2. The combination of the shuttle B, having a central yoke, side notches, *c c'*, at opposite ends of the yoke, and opposite end side grooves, *s s*, terminating in inclined inner ends, *s' s'*, the tubular shuttle-carriers C C', and the horizontally-operating arch-shaped hooks D D', pivoted to said carriers and constructed to travel within the grooves *s s* up the inclines *s' s'* and to engage with the notches in the shuttle also having inclined outer ends adapted to lift or release the one hook by the other, and springs operating to latch or close the hooks into engagement with the shuttle, essentially as set forth.

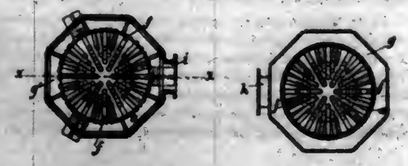
398,965. DEVICE FOR HITCHING ANIMALS. CHARLES A. HUNT Fall River, Mass. Filed Nov. 30, 1888. Serial No. 292,212. (No model.)

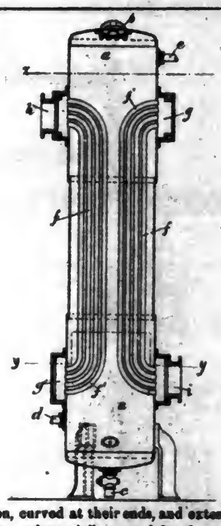


Claim.—A hitching-strap comprising the neck-loop, a loose ring connected by a chain to said loop, and snap-hooks attached to said ring, substantially as described.

398,966. FEED-WATER HEATER. JOSEPH L. HUNTER, Pittsburg Pa. Filed Sept. 11, 1888. Serial No. 285,145. (No model.)

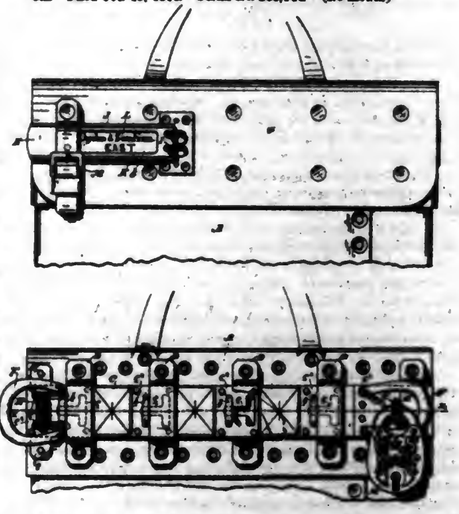
Claim.—As an improvement in feed-water heaters, a water-tank, *a*, annular steam-chambers *g g'*, arranged outside of and encircling the water-tank, and steam-heating pipes straight and vertical through





their major portion, curved at their ends, and extending radially into the steam-chambers, substantially as and for the purpose described.

398,967. MAIL-BAG FASTENING. JOSEPH JACOBS, San Francisco, Cal. Filed Oct. 15, 1888. Serial No. 288,144. (No model.)



Claim.—1. In a mail-bag fastening, the combination of T-shaped tongues on the flap of the bag adapted to pass through openings or slits in its sides or folds, the sliding strap on the back of the bag having the T-shaped grooves or slots for receiving and holding the T-shaped tongues of the flap, and the limiting-stop for defining the movement of the sliding strap, consisting of a loop or band, E, secured to the bag and passing through elongated slots *e'* in the strap, substantially as described.

2. In a mail-bag fastening, tongues upon the flap of the bag adapted to pass through its sides or folds, a sliding strap upon the back of the bag and having grooves or slots for receiving and holding the tongues, and a locking-staple passing through the bag and the sliding strap and receiving a lock at the back of the bag, whereby the sliding strap is held, in combination with the frame for receiving the tag or destination-card, consisting of the open-faced plate K, hinged to the flap of the bag and carrying the locking-staple, and the flanged plate J, secured to the flap and receiving the plate K and its staple, substantially as herein described.

3. In a mail-bag fastening, tongues upon the flap of the bag adapted to pass through its sides or folds, a sliding strap upon the back of the bag and having grooves or slots for receiving and holding the tongues, and a locking-staple passing through the bag and sliding strap and receiving a lock on the back of the bag, whereby the sliding strap is held, in combination with the frame for receiving the tag or destination-card, consisting of the open-faced plate K, hinged to the flap of the bag and carrying the locking-staple, and the flanged plate J, secured to the flap and receiving the plate K and its staple, and the cross-strap and buckle for holding the plates together when the staple is released from the back of the bag, substantially as herein described.

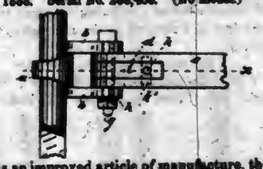
4. In a mail-bag fastening, and in combination with the staple by which the bag is locked, the frame for the tag or destination-card, consisting of the outer open-faced plate, K, hinged to the flap of the bag and carrying the staple, and the flanged base-plate J, hinged to the flap and having a slotted end through which the staple passes, substantially as herein described.

398,968. VENTILATING ATTACHMENT FOR STOVE-PIPES. GEORGE L. JONES and BENJAMIN M. MILES, Chippewa Falls, Wis. Filed Mar. 7, 1888. Serial No. 266,366. (No model.)



Claim.—The combination, with a vertical draft-pipe having a series of lateral openings at different heights, of a sleeve, as E, surrounding said pipe, having an opening, as J', registering with said openings when the sleeve is adjusted, a projection, as C, and pin, as D, rigidly secured on said pipe below and above the sleeve, respectively, a shoulder, as F, produced on the upper edge of said sleeve, and a hood, as G, secured to said sleeve; having a brace, as P, substantially as described.

398,969. THILL-COUPLING. DANIEL KAVANAGH, Orange, N. J. Filed Sept. 26, 1888. Serial No. 286,408. (No model.)



Claim.—1. As an improved article of manufacture, the thill-coupling herein described and shown, consisting of a clip with ears and bolt, a thill-iron having a slotted hooked end, and a locking-key pivotally secured at one end to the clip-bolt and the other end fitting in said slot, said thill-iron and key turning freely on said bolt, said key being held in position thereon by a set-screw with elongated head, for the purpose set forth.

2. The combination, in a thill-coupling, of a clip, *a*, with ears *b b* thereon, a thill-iron, *c*, having hooked ends *c*, and a locking-key pivotally connected to the clip-bolt at one end and securing the thill-iron to the said clip, substantially as and for the purposes set forth.

3. The combination, in a thill-coupling, with a clip, *a*, with ears *b b* thereon, and a bolt secured in said ears, of a loose ring, *i*, on said bolt and having a tangential portion, i^3, with beveled end i^3, a thill-iron, *c*, slot *d*, hooked end *e*, thumb-screw *k*, and oblong head *k'*, substantially as and for the purposes set forth.

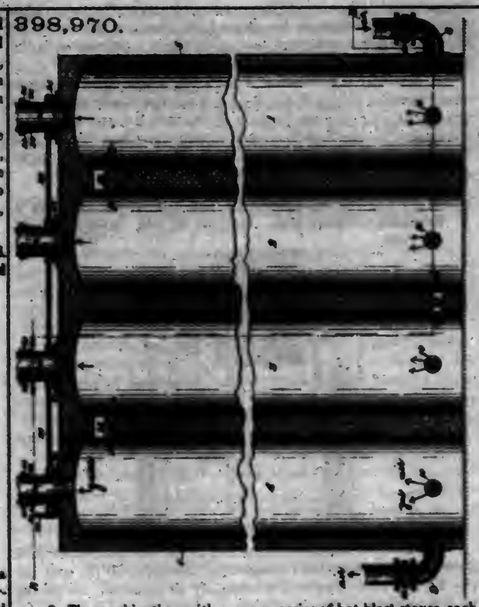
4. A locking-key for a thill-coupling, pivotally secured to the clip-bolt at one end and at the other end adapted to fit in a slot in a thill-iron, as and for the purposes set forth.

398,970. HOT-BLAST STOVE. HUGH KENNEDY, Sharpsburg, Pa. Filed Aug. 15, 1887. Serial No. 246,263. (No model.)

Claim.—1. The combination of a series of hot-blast stoves, connected by alternate high and low openings, forming a continuous air-passage therethrough, with separate gas-inlets at the base and separate gas-outlets at the top of each stove, substantially as and for the purposes described.

2. The combination, in a hot-blast stove, of a gas-outlet at the top, with a sliding valve for closing the same, and a pipe pivotally connected by rods to the sliding valve, and also pivotally connected by rods to a stationary point on the opposite side from the valve, so that when the valve is opened the pipe shall occupy a vertical position over the gas-outlet, and when the valve is being advanced to close the outlet the pipe shall be raised out of the path of the valve, substantially as and for the purposes described.

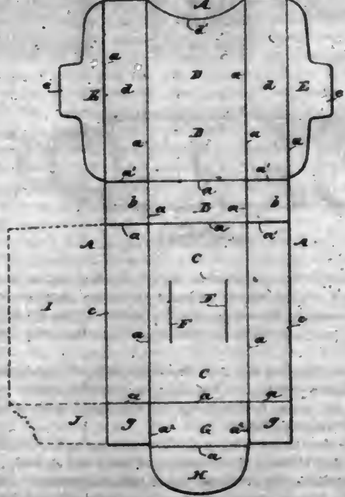
398,970.



3. The combination, with a row or series of hot-blast stoves, each having a gas-outlet at the top controlled by a sliding valve provided with a rack, of a power-shaft extending transversely to the valves and provided with pinions engaging the racks, a pulley on said shaft, and a chain or belt extending to near the ground for actuating the shaft, substantially as and for the purposes described.

4. A series of hot-blast stoves having air-ports opening from one to the other, each stove of the series being provided with a gas inlet and outlet port, so that the gas shall pass through each stove independently of the other, and the air shall pass from one stove to the other, substantially as and for the purpose specified.

398,971. PAPER BOX. EMIL L. MEYER, Brooklyn, N. Y. Filed Sept. 19, 1888. Serial No. 285,782. (No model.)



Claim.—1. A folding box-blank made with transverse slits *a' a' a' a'* and longitudinal slits a^5 a^5 and locking slits F F, providing parts B *b b*, C *c c*, D *d d*, E *e* E *e*, G *g g*, and H, all substantially as herein set forth.

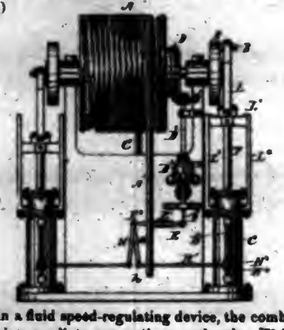
2. A folding box-blank made with transverse slits *a' a' a' a'* and longitudinal slits a^5 a^5 and locking-slits F F, providing parts B *b b*, C *c c*, D *d d*, E *e* E *e*, G *g g*, and H, and scored at *a* between said parts, substantially as herein set forth.

3. A folding box formed of a blank made with slits *a'* a^5 F, providing parts B *b b*, C *c c*, D *d d*, E *e* E *e*, G *g g*, and H, said parts folded

with the flaps *b b* between the pairs of side flaps, *c d*, and the parts E overlapping the part C and having their tabs *e* interlocked in the slits F of said part C, substantially as herein set forth.

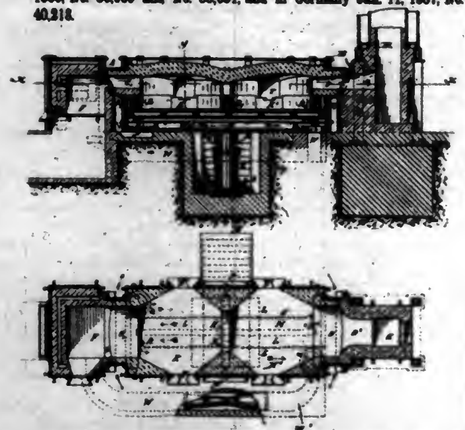
4. A folding box formed of a blank made with slits d' d^2 F, providing parts B *b b*, C *c c*, D *d d*, E *e* E *e*, G *g g*, and H, said parts folded with the flaps *b b* between the pairs of side flaps, *c d*, and the parts E overlapping the part C and having their tabs *e* interlocked in the slits F of said part C, and said parts E C, across the slits F, secured by an adhesive stamp, strip, or label, substantially as herein set forth.

398,972. SPEED-REGULATOR FOR ELEVATORS. WILLIAM E HENDERSON, Cambridge, Mass. Filed Nov. 30, 1888. Serial No. 292,234. (No model.)



Claim.—In a fluid speed-regulating device, the combination of a governor, D^3, intermediate connections, and valve H^3 H^4, with the pipe H^2, and fluid-cylinder C, substantially as described, and for the purpose set forth.

398,973. ROTARY DOUBLE-FLAME FURNACE. GOTTFRIED PIETZKA, Witkowitz, Moravia, Austria-Hungary. Filed Mar. 16, 1888. Serial No. 267,411. (No model.) Patented in Austria-Hungary Nov. 1, 1886, No. 30,909 and No. 55,631, and in Germany Jan. 11, 1887, No. 40,218.



Claim.—1. The combination, with a fire-box and a stack or chimney, of a double hearth or heating-chamber constructed and arranged to connect alternately with the exit-flue of the fire-box and with the chimney, and means for rotating said hearth, substantially as described.

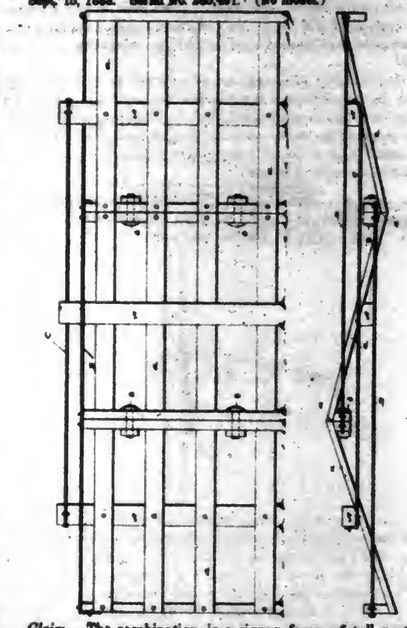
2. The combination, with a fire-box and a stack, of a double hearth arranged between the fire-box and stack, a turn-table supporting the said hearth, and means for operating said turn-table, substantially as herein shown and described.

3. The combination, with a fire-box and a stack, of a double hearth arranged between the fire-box and stack and provided with opposite channels leading therefrom, a turn-table supporting the hearth, and means for raising, lowering, and turning the said turn-table, substantially as herein shown and described.

4. In a furnace, the combination, with a fire-box and a chimney opposite the fire-box, of a double hearth between the fire-box and chimney and provided with an air-channel below the bottom thereof, and a blast-engine connected with the said air-chamber and with the fire-box, substantially as herein shown and described.

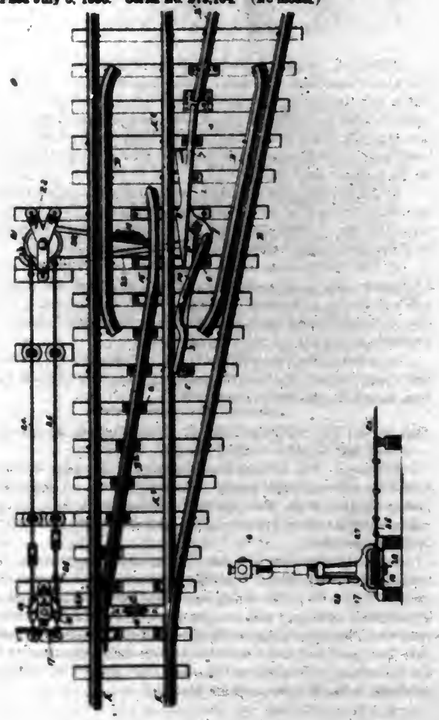
5. In a furnace, the combination, with a hearth, of a partitioned channel, l, below the bottom of the hearth, and connected at one end with the open air and at the other end with the suction-pipe of a blast-engine, substantially as described.

398,974. FENCE. EPHRAIM POTTER, Bowling Green, Ky. Filed Sept. 15, 1888. Serial No. 285,491. (No model.)

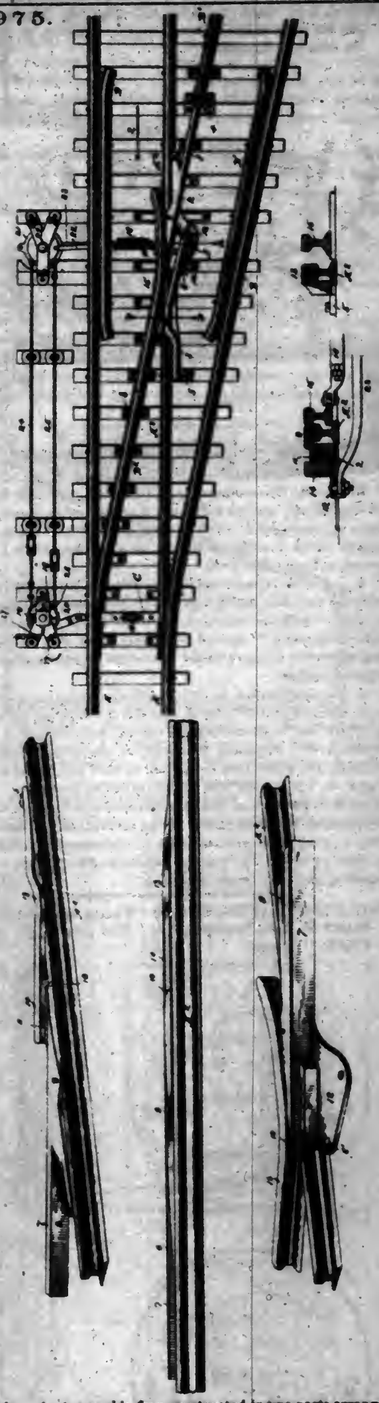


Claim.—The combination, in a zigzag fence, of tall posts alternating with the main fence-posts and arranged in line with each other, outer wires arranged, as shown, parallel to each other and to the middle wire and secured to the main fence-posts, so as to cross the bends or zigzags, the intermediate wire being arranged at a greater altitude than the outer ones and secured to the alternating tall posts, substantially as specified.

398,975. RAILROAD-FROG. CHARLES B. PRICE, Pittsburg, Pa. Filed July 5, 1888. Serial No. 279,104. (No model.)



398,975.



Claim.—1. A movable frog constructed in two parts arranged to be thrown on and off the main rail at one side thereof, substantially as described.

2. A movable frog constructed in two parts hinged together and arranged at one side of the main rail to be operated by a single connection to throw them upon the said main rail, substantially as described.

3. A movable frog constructed in two parts connected to move together at their inner ends and arranged to be moved simultaneously to and from the main rail, the outer ends of the two parts being pivotally attached to the track and arranged at one side of the main rail, substantially as described.

4. A movable frog constructed in two sections pivoted at their outer ends at one side of the main rail, in combination with an actuating device connected to the sections at their inner ends, substantially as described.

5. A movable frog constructed in two parts hinged together and arranged to be operated simultaneously, one part acting to form a continuation of the side-track rail and the other operating as a guide-rail therefor, substantially as described.

6. A movable frog constructed in two parts and connected to move together, one part forming a continuation of the side-track rail and an inclined way for the main track, and the other part forming a guard for the side-track rail and an inclined way for the main track, substantially as described.

7. A movable frog consisting of two sections connected together, one section being pivoted at one end adjacent to the side-track rail and arranged to form a continuation of said rail, and having a flange arranged to overlap the main rail and furnishing a bearing for the wheels, and the other section being pivotally mounted adjacent to the main rail, substantially as described.

8. A movable frog consisting of two sections connected together, one section being pivoted at one end adjacent to the side-track rail and arranged to form a continuation of said rail, and having a flange arranged to overlap the main rail and furnishing a bearing for the wheels, and having a recess, as 11, for the passage of the wheel-flanges, substantially as described.

9. A movable frog consisting of two sections connected together, one section being pivoted at one end adjacent to the main track and having an inclined flange, as 13, adapted to overlap the main rail, the free end being bent to act as a guard-rail, substantially as described.

10. A movable frog consisting of two sections, one having an extended base to which the other is pivoted, and a connecting-rod secured to said base for operating the sections simultaneously, substantially as described.

11. The combination, with a main rail, of a movable frog on one side of said main rail, and a spring-rail on the opposite side of the main rail movable independently of the frog, substantially as described.

12. The combination, with the main rail, of a movable frog consisting of two sections pivotally connected together and arranged to form a continuation of the side-track rail, and a spring-rail movable independently of the frog and arranged to form a continuation of the leading-in rail, substantially as described.

13. The combination, with the main rail, of a movable frog consisting of two sections pivoted together and arranged at one side of the main rail, and a spring-rail movable independently of the frog arranged at the other side of the main rail, and connecting-rods for the frog and spring-rail, the said rods being secured to the opposite sides of the operating-wheel, substantially as described.

14. The combination, with the movable frog consisting of two sections, one forming a continuation of the side-track rail and having a flange overlapping the main rail, the other section forming a guard-rail for the frog and having a flange overlapping the main rail, of a spring-rail forming a continuation of the leading-in rail, and connections with the frog-rail and spring-rail for moving them simultaneously, substantially as described.

15. The combination, with a continuous main-line rail, of a movable frog forming a continuation of the side-track rail and having a portion overlapping the main rail, and a spring-rail movable independently of the frog constructed to meet the overlapping portion of the frog and constituting therewith a practically continuous side-track rail over the main rail, substantially as described.

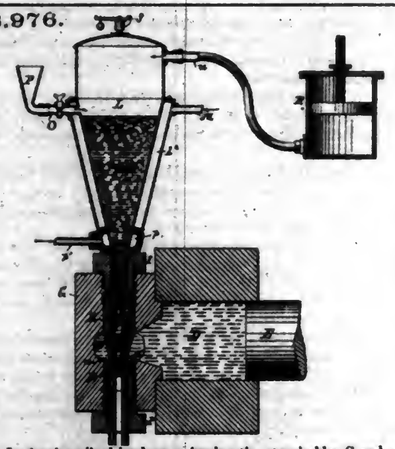
16. The combination, with the movable frog-section having a pointed flange overlapping the main-track rail, of a spring-rail arranged to complete the leading-in rail and protect said flange-point, substantially as described.

17. The combination, with a switch-stand connected to operate the switch-points upon a quarter-turn, of a movable frog and guard-rail pivoted at two points upon the same side of the main rail, and operating-wheel connected to operate both upon a quarter-turn, and connecting-rods between the operating-wheel and switch-stand, whereby the wheel is operated by a direct pull in either direction, substantially as described.

398,976. APPARATUS FOR MANUFACTURING SOLDER-RODS. JOHN ROSENBERG, Brooklyn, N. Y., assignor of one-half to James Hartle, same place. Filed Sept. 26, 1888. Renewed Oct. 8, 1888. Serial No. 287,556. (No model.)

Claim.—1. The combination, with the combined lead-press and flux containing and heating vessel, of the described separate heating devices located at and so as to heat the lower end of the said vessel, as and for the purpose specified.

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2. In the described lead-press, having the core-holder G and contained core H, the combination, with said holder and core, of highly-heated blocks of iron, V V, one or more, constructed and applied as and for the purpose described.

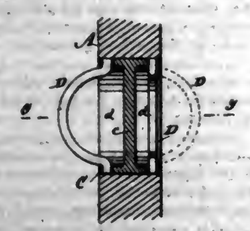
398,977. HORSE-DETACHER. STEPHEN H. ROBLIN, Bay City, Mich., assignor to the American Whiffletree Company, same place. Filed Sept. 4, 1888. Serial No. 284,523. (No model.)



Claim.—1. The combination, in a horse-detaching device, of the whiffletree having end ferrules, *d*, provided with the horizontal slots *e*, the tag-holders *h*, pivoted in said slots *e* and provided with the arms *j*, extending inwardly over the rear side of the whiffletree and having the depressions *k* and cap-pieces *l*, secured to the whiffletree and provided with the central slots, *n*, and the end slots, *o*, with the lock-pieces *r* beneath the said cap-pieces, and with their outer ends passed over the free ends of the arms *j*, the screws *s*, passed through the slots *n* and into the lock-pieces, and the operating-cords *v*, secured to the inner ends of the lock-pieces, substantially as and for the purpose set forth.

2. In a horse-detaching device, the combination, with the thills and whiffletree provided with devices, as described, for securing the tugs thereto and for releasing the same, with holdback securing devices consisting of a base-plate secured to each thill and provided with hooks *b'*, projecting inwardly from their rear ends and extending forward, the rings *c'*, engaging with the hooks, and retaining-bolts *h'* between the hooks and base-plates, and with one end bearing against the rings, and the springs *g'*, for holding the said retaining-bolts in position against the rings, substantially as and for the purpose set forth.

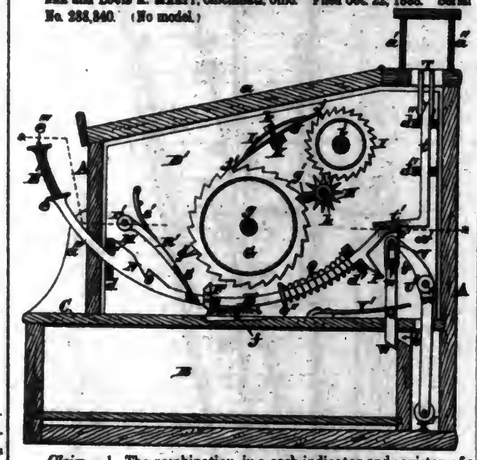
398,978. HANDLE FOR SLIDING DOORS. PETER SCHEER and JOHN G. STATES, Minn., Nebr. Filed July 27, 1888. Serial No. 281,183. (No model.)



Claim.—1. A handle attachment for sliding doors and for other analogous uses, consisting of a circular band open at its opposite ends and handles pivoted to said band and arranged to close into the opposite end portions thereof, substantially as specified.

2. The within-described handle attachment for sliding doors and for other analogous uses, consisting of the circular band C, open at its opposite ends, but closed by a partition, *c*, in its center, and the handles D, pivoted to said band on opposite sides of said partition and adapted to close within the band, as set forth.

398,979. CASH INDICATOR AND REGISTER. WILLIAM G. SCHENKER and LOUIS K. MARTY, Cincinnati, Ohio. Filed Oct. 22, 1888. Serial No. 288,340. (No model.)



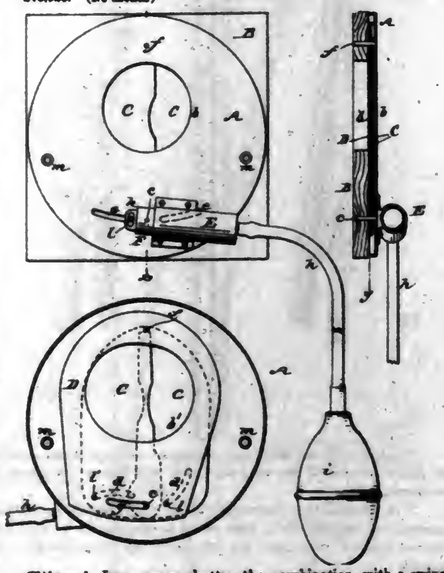
Claim.—1. The combination, in a cash indicator and register, of a bent key suitably guided within the case and having means for operating a registering-disk, said key being provided with a trip and rigid shoulder, which shoulder is caught by a rest-bar when a tablet is exposed, as herein described.

2. In a cash indicator and register, the bent key E, suitably guided within the case and having a pawl, F, trip N, and rigid shoulder O, in combination with the rest-bar S and tablet T, said rest-bar being provided with levers R R', pivoted to the side plates, *r r'*, and the pawl F being adapted to engage with the teeth of the registering-disk G, for the purpose described.

3. The combination, in a cash indicator and register, of the bent key E, having a pawl, F, trip N, shoulder O, retracting-spring Q, and spur P, the bar V, connecting the pivoted bell-cranks U *u* U' *u'*, the drop-catch W *w*, suspended from said bar, the spring V', that retracts said catch, the tablet-stem *t*, operated by said key E, and a registering-disk, G, actuated by said pawl F, as herein described.

4. The combination, in a cash indicator and register, of primary and secondary registering-disks having ratchet-teeth, a double-ended spring, J *j j'*, engaged with said teeth, a supplementary spring, L, bearing upon the spring J *j j'*, and an adjusting-screw, *k*, tapped into the supporting-bar K, as herein described.

398,980. CAMERA-SHUTTER. WILLIAM SHAKESPEARE, Jr., and GARRET W. LOW, Kalamazoo, Mich. Filed July 3, 1888. Serial No. 278,925. (No model.)



Claim.—1. In a camera-shutter, the combination, with a swinging or rocking slotted shutter, of a pivoted arm, lever, or plate provided with a pin arranged to engage with the slot in the shutter for operating the latter, substantially as specified.

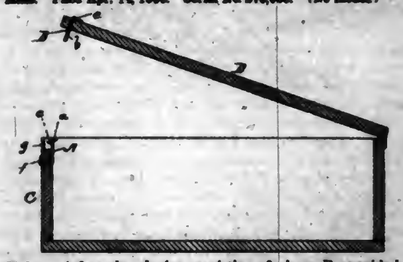
2. The combination, with the apertured shutter case or frame and its pivoted shutter-slides C C, having reverse slots *d d*, of the pivoted lever-like operating-plate D, having studs or pins *l l*, arranged to engage with said slots, essentially as and for the purpose herein set forth.

3. The combination, with the apertured shutter case or frame having slots *e*, of the swinging or rocking shutter-slides C C, having a common pivot, *c*, and reverse slots *d d*, and the pivoted arm, lever, or operating-plate D, having a slot, *g*, and pins *l l*, substantially as specified.

4. The combination of the piston F of the air-cylinder E with the pivoted lever-like shutter-operating plate D, having attached pins *l l*, and the pivoted swinging or rocking shutter-slides C C, having reverse slots *d d*, essentially as described.

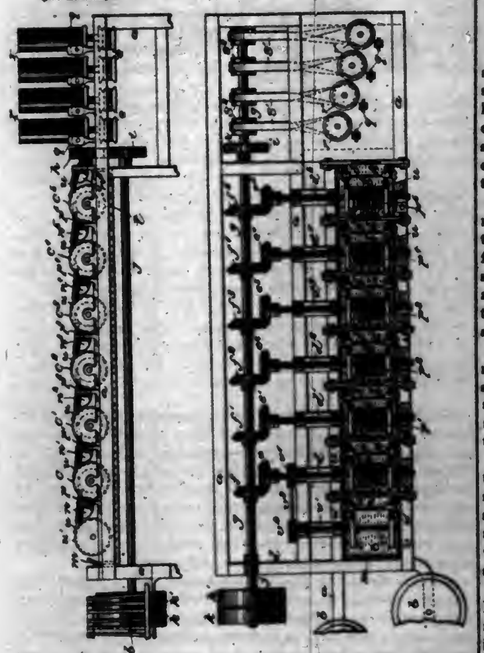
5. The combination, with a shutter case or frame having duplicate exposing-apertures *b b*^{3} out of line with each other, of a pivoted swinging or rocking slotted shutter or shutter-slides having extension-wings *s*, and the pivoted arm, lever, or shutter-operating plate with attached pin or pins for operating the shutter, substantially as specified.

398,981. BOX-FASTENER. JOSEPH W. SHAW, Shelburne Falls, Mass. Filed Apr. 14, 1888. Serial No. 270,605. (No model.)



Claim.—A fastening device consisting of a hasp, B, provided with the slot *b*, and the catch A, formed with a projecting hook, *c*, and the guard *a*, all combined substantially as and for the purposes set forth.

398,982. WIRE-DRAWING MACHINE. FREDERIC SMITH, Halifax, County of York, England. Filed July 18, 1888. Serial No. 280,310. (No model.)

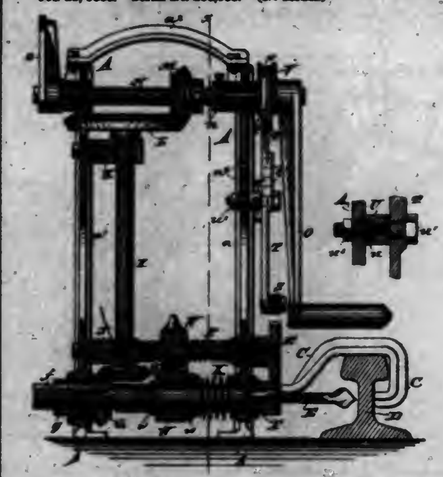


Claim.—1. In a machine for drawing two or more wires and reducing them simultaneously any required number of sizes, the combination of the swifts *b*, the series of revolving drawing-through pulleys *c*, each pulley being broad enough to accommodate on its periphery all the wires to be drawn, all the pulleys being driven by bevel-gearing at gradually-increasing surface speeds from the swifts to the winding-on drums *b*, which are driven at a still quicker speed by pulleys and belts, the several series of dies or draw-holes *o*, each series of holes being smaller than the preceding one, the lubrication of the wires being effected by immersing the revolving drawing-through pulleys in lubricant contained in a reservoir, and also by immersing the series of dies *o* in lubricant supplied to a series of troughs, *n*, all substantially as herein set forth, for the purposes specified.

2. The combination, with the series of flanged drawing-through pulleys *c*, driven at varying surface speeds by bevel-gearing, as described, and immersing in a reservoir containing lubricant, of the tubes or channels *u*, and the series of troughs *n*, substantially as and for the purposes herein described, and as shown.

3. The combination, with the series of lubricating-troughs *n* and the series of dies *o*, of the series of guides or forks *p*, and the drawing-through pulleys *c*, substantially as herein set forth, for the purposes specified.

398,983. RAIL-DRILL. MERITT W. SMITH, Waverly, N.Y. Filed Oct. 22, 1888. Serial No. 288,363. (No model.)



Claim.—1. In a drilling-machine, the combination, with a frame, a rotating and endwise-movable spindle thereon, and gearing, substantially as specified, for rotating the spindle, of an open-sided or half nut hung to the spindle, a feed-screw held parallel with the spindle and which the nut is adapted to engage, a ratchet on the feed-screw, a cam on the driving-shaft, a lever fulcrumed to the frame and engaged by the cam to oscillate it, and a pawl on the lever engaging the feed-screw ratchet, substantially as herein set forth.

2. In a drilling-machine, the combination, with the frame, a rotatable and endwise-movable drill-spindle thereon, gearing, substantially as specified, for rotating the spindle, of a feed-screw, P, on the frame, an open-sided nut, W, on the spindle adapted to engage the feed-screw, a ratchet, R, on the feed-screw, a cam, V, on the driving-shaft, a lever, T, fulcrumed on the frame and having a forked end engaging the cam, and a pawl on the lever engaging the ratchet, substantially as herein set forth.

3. In a drilling-machine, the combination, with the frame, a rotating and endwise-movable spindle, and gearing, substantially as specified, for rotating the spindle, of an open-sided nut hung to the spindle, and a feed-screw held parallel with the spindle, and which the nut is adapted to engage for feeding the spindle and drill, substantially as herein set forth.

4. In a drilling-machine, the combination, with the frame, a rotating and endwise-movable spindle, and gearing, substantially as described, for rotating the spindle, of an open-sided nut hung to the spindle, a feed-screw held parallel with the spindle and with which the nut is adapted to engage, and a spring forcing the spindle backward when its nut is disengaged from the feed-screw, substantially as herein set forth.

5. In a drilling-machine, the combination, with the frame, of shafts I N, gearing H L M thereon, a pinion, G, journaled to the frame and meshing with the pinion H, a spindle, F, splined at one end to the pinion G and journaled at its other end in the frame, a half-nut, W, hung to the spindle, but immovable endwise of it, a feed-screw, P, on the frame, adapted to be engaged by the nut, and a spring, X, normally

withdrawing the spindle or drill when the nut is disengaged from the feed-screw, substantially as herein set forth.

6. In a rail-drill, the combination, with the frame provided with a rotatable and endwise-movable drill-spindle, of hooks adapted to clamp the rail to be drilled and having a quickly-detachable hook-and-eye connection with the frame, substantially as herein set forth.

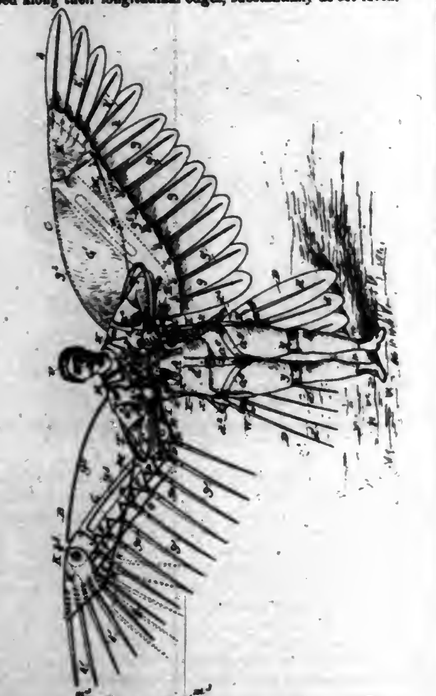
7. In a rail-drill, the combination, with the frame provided with a rotatable and endwise-movable drill-spindle, of clamp-hooks having a quickly-detachable hook-and-eye connection with the frame and provided with bent outer ends bearing on the farther side of the web of the rail, substantially as herein set forth.

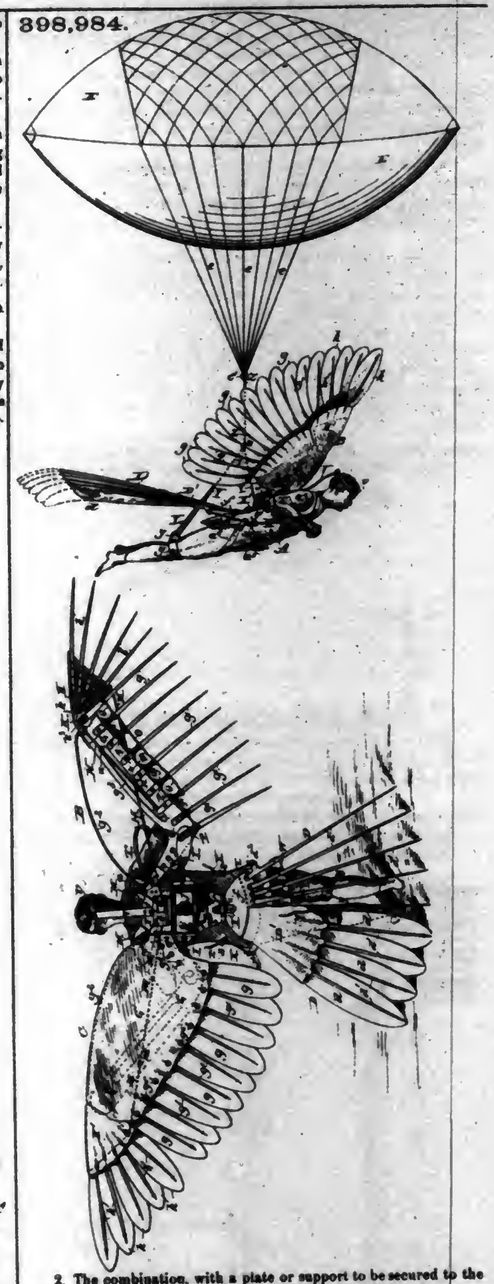
8. The combination, with the drill-frame and the feed-lever actuated from the driving-shaft and operating the feed-screw, substantially as specified, of a detachable fulcrum, U, made of two bolt-studs, *u u'*, held to the frame and to each other, substantially as herein set forth.

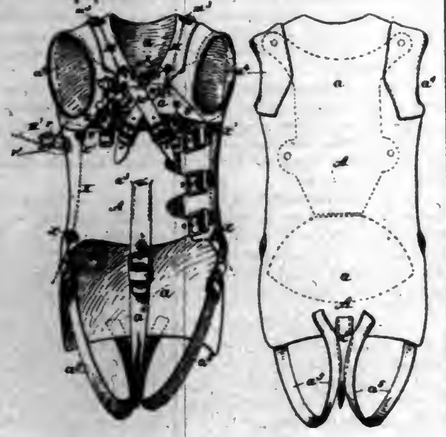
398,984. FLYING-MACHINE. REUBEN J. SPALDING, Rosita, Colo. Filed Sept. 1, 1888. Serial No. 284,340. (Model.)

Claim.—1. The combination, with a plate or support to be secured to the back of an aeronaut, of spring-elevated wing-levers hinged to said plate to swing vertically and inclined outwardly and forwardly therefrom, and separate flexible feathers secured at their front ends to and projecting rearwardly from said levers and alternately overlapped along their longitudinal edges, substantially as set forth.

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2. The combination, with a plate or support to be secured to the back of an aeronaut, of vertically-swinging elbow-levers hinged at their angles to the said plate or support behind the shoulder portions thereof, with their short arms inclined inwardly and provided with bearings on the shoulder portions of the plate or support, the long arms of said levers projecting forwardly and outwardly, and separate and independent feathers secured at their front ends to said long arms extending rearwardly therefrom and overlapping alternately along their longitudinal edges, substantially as set forth.

3. In a flying-machine, the combination, with a support to be secured to the back of an aeronaut, of vertically-swinging wings having bearings on said support, springs acting on the wings at their pivots or axes to raise them, and operating-connections, substantially as described, leading from the wings to points within reach of the aeronaut, substantially as set forth.

4. In a flying-machine, the combination, with a jacket or support for the aeronaut, of a pair of wings fulcrumed on the jacket, a spring, J, held to the jacket and having opposite end coils, *j j*, and arms I I, connected to the wings and fulcrumed to the spring-bearings, and connected to the spring-coils which raise the wing, and operating-connections, substantially as described, connected to the wings and in reach of the aeronaut for lowering the wings, substantially as herein set forth.

5. In a flying-machine, the combination, with a jacket or support for the aeronaut, of a pair of wings fulcrumed on the jacket, a spring connected to the jacket, and also to the wings, and operating normally to raise the wings, and auxiliary springs connected to the wings and operating to assist the aeronaut in lowering the wings, substantially as herein set forth.

6. In a flying-machine, the combination, with a jacket or support for the aeronaut, of a pair of wings fulcrumed thereto, a spring connected to the jacket, and also to the wings, and operating normally to raise the wings, operating-connections, substantially as described, connected to the wings and to hand-grasps for the aeronaut, and plate-springs T, connected to the jacket and to the hand-grasps, and assisting the aeronaut to lower the wings, substantially as herein set forth.

7. In a flying-machine, the combination, with a jacket or support for the aeronaut, of wings fulcrumed thereto and made in inner and outer sections hinged together, and cords leading from the outer wing-sections in reach of the aeronaut, who by pulling the cords will contract or fold the wings edgewise to reduce their area, substantially as herein set forth.

8. In a flying-machine, the combination, with a jacket or support for the aeronaut, of wings fulcrumed thereto and each made with a hinged sectional frame and a spring which normally expands the wing edgewise, and cords leading from the outer wing-section in reach of the aeronaut for contracting or folding the wing-sections to reduce the area of the wings, substantially as herein set forth.

9. In a flying-machine, the combination, with a jacket or support for the aeronaut, of wings fulcrumed to the jacket and made with sectional frames having spring-actuated joints which normally expand the wings, cords leading from the outer wing-sections in reach of the aeronaut and provided with knots for holding the cords, and detents on the jacket with which the cords may be interlocked to hold the wings in contracted condition, substantially as herein set forth.

10. In a flying-machine, the combination, with a jacket or support for the aeronaut, of wings fulcrumed thereto and made in two hinged sections adapted to fold or contract edgewise to reduce the area of the wings, and the feathers of the inner or main wing-section pivoted to their frame, and pull-rod and cord connections from the outer wing-sections to the feathers of the inner wing-sections, substantially as described, whereby as the outer wing-sections are folded edgewise the feathers of the inner wing-sections will also be contracted or folded edgewise, and as the outer wing-section is expanded the feathers of the inner wing-sections will also be expanded, as herein set forth.

11. In a flying-machine, the combination of a jacket or support for the aeronaut and a pair of wings fulcrumed thereto, said wings made with a main lever, G, and feathers or aerial planes *g*, pivoted thereto, and cords P, interlaced between the lever and feathers, substantially as herein set forth.

12. In a flying-machine, the combination of a jacket or support for the aeronaut and a pair of wings fulcrumed thereto, said wings made with a main lever, G, provided with feathers or aerial planes, as *g*, an upper rod, g^2, on the lever, and webbing G', stretched on said rod and on the frame, substantially as herein set forth.

13. In a flying-machine, the combination of a jacket or support for the aeronaut and a pair of wings fulcrumed thereto, said wings each made with a main lever, G, having feathers *g*, and an outer plate, H, hinged to the lever G by a spring-joint normally expanding the wing, and having feathers *h*, a rod, g^2, on the lever G, and webbing G' H' on the wing-frame sections G H, substantially as herein set forth.

14. In a flying-machine, the combination, with a jacket or support for the aeronaut, of a tail or aerial plane hinged thereto and comprising a plate, a series of feathers pivoted thereto, an elastic connection between the feathers holding them normally in contracted condition, and pull-cords connected to the outer feathers and leading to the aeronaut, substantially as described, whereby on pulling the cords the tail or aerial plane may be expanded laterally, substantially as and for the purposes set forth.

15. In a flying-machine, the combination, with a jacket or support for the aeronaut, of a tail or rudder hinged thereto and comprising a plate and a series of feathers held thereto, pull-cords X, connected to the tail, and guides *x x'* and detents, as x^2, on the jacket for the pull-cords, substantially as herein set forth.

16. In a flying-machine, the combination, with a jacket or support for the aeronaut and wings connected therewith and operative by the aeronaut, of a tail or rudder hinged to the jacket and comprising a plate, as *f*, a series of feathers, as *d*, held thereto, and a webbing, D', held to the plate and feathers, substantially as herein set forth.

17. In a flying-machine, the combination, with a jacket or support for the aeronaut and wings connected therewith and operative by the aeronaut, of a head-rest for the aeronaut connected to the jacket, substantially as herein set forth.

18. In a flying-machine, the combination, with a jacket or support for the aeronaut and wings connected therewith and operative by the aeronaut, of an elastic plate, V, connected to the jacket, and a band, *v*, attached to the plate and adapted to receive the aeronaut's head, substantially as herein set forth.

19. In a flying-machine, the combination, with a jacket or support for the aeronaut, of a tail or rudder hinged thereto, and a stay-plate, X', held at the tail-joint and limiting vertical movement of the tail, substantially as herein set forth.

20. In a flying-machine, the combination, with a jacket for the aeronaut, of a metal plate, F, held thereto, a pair of wings, B C, fulcrumed to the plate at *f f'* and connected by arms I I to a spring, J, held to a bearing-plate, I', also fixed to the plate F, springs T, fulcrumed at *t'* to the plate F and connected to the aeronaut's hand-grasps, pull-rods R, connected to the hand-grasps and wings, a head-rest, V *v*, also held to the plate F, and an auxiliary plate, *f*, hinged to the main plate F and carrying the tail D, all arranged for operation substantially as herein set forth.

398,985. BRICK-TRUCK. JAMES C. STEELE, Statesville, N. C. Filed Oct. 22, 1888. Serial No. 288,979. (No model.)



Claim.—1. The combination, with a wheeled truck, of a pair of rests or lifting-arms, G G, arranged between the wheels and near the ground, and lifting mechanism for both the front and rear ends of said arms to raise and lower the same in level position, as described.

2. The combination, with a wheeled truck, of a pair of rests or lifting-arms, G G, arranged between the wheels and near the ground, link-bars H, connecting with the front ends of the arms, elbow-levers I, jointed to the links, rods J J, connected to the elbow-levers, and bail-shaped handle K, connected to the rods J, substantially as and for the purpose described.

3. The combination, with the wheeled truck, of the rests or arms G G, formed at the front end of a bent bar, lift-rod L, connected to the middle portion of the bent arms, and the links H, elbow-levers I, rods J, and bail K, connected to and operating the front ends of the rests or arms, as described.

4. The combination, in a truck, with the longitudinal side bars and the cross-bar connecting the same, of the axle-arms extended inside the longitudinal bars and across the angle to the cross-bar to form a brace, as described.

398,986. SCREW-DRIVER. CARL A. STRASSER, Baltimore, Md., assignor, by mesne assignments, of one-half to Christian Schroeder, same place. Filed Aug. 30, 1888. Serial No. 284,214. (No model.)

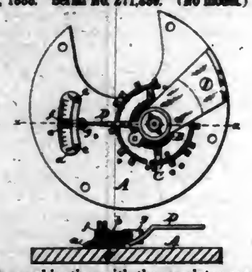


Claim.—1. The improvement in screw-drivers, consisting of the ratchet-head having a slot formed in the direction of its axis, the screw-driving blade fitted in said slot, the handle having bearings for the ratchet-head, the pawl engaged at one end with the ratchet-ring and having on its outer side, near such end, a rearwardly-facing shoulder, and the spring bearing at one end against the pawl back of such shoulder and having its opposite end held in the handle, substantially as and for the purposes set forth.

2. An improved screw-driver consisting of the handle having a portion, A', recessed at I and having the rear wall of such recess provided with a nick or slot, S, the pawl fitted in said recess and having at its rear end a projecting portion, *d*, fitting a corresponding recess in the portion A', whereby to prevent longitudinal movement of the

pawl, such pawl having a rearwardly-facing shoulder, *d'*, on its outer side near its rear end, the spring held at one end in slot 3 and bearing at its opposite end against the pawl in rear of the shoulder *d'*, the ratchet-head, and the plate A', all substantially as and for the purposes specified.

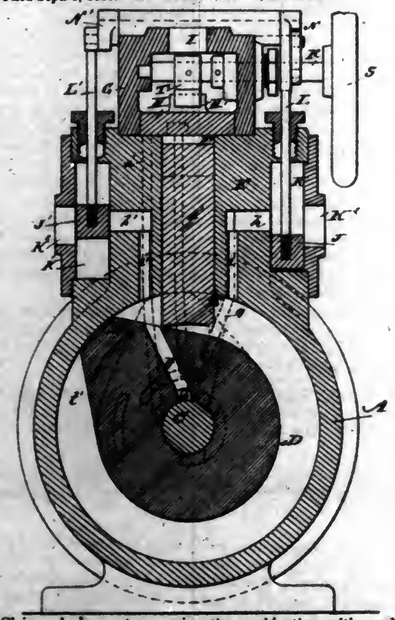
398,987. WATCH-REGULATOR. CHARLES TIMES, Hartford, Conn. Filed Apr. 26, 1888. Serial No. 271,889. (No model.)



Claim.—1. In combination with the regulator-arm of a watch, a fixed bar having on its body portion a downwardly-projecting longitudinal rib, the traveler-block, the body portion of which is slotted transversely and fitted to slide on the ribbed portion of said fixed bar, the inner end of said block being fitted to receive the end of the regulator-arm, and the outer end being perforated, and a disk journaled in the perforation at the outer end of said block and with its perimeter in engagement with the outer edge of said fixed bar, substantially as described, and for the purpose specified.

2. In combination with the regulator-arm of a watch, a fixed bar adjacent thereto, a traveler-block fitted to slide longitudinally on said bar, having its inner end connected to said regulator-arm and its outer end pointed to form an index, a disk journaled in the index end of said traveler-block with its perimeter in engagement with said bar, and the graduated scale on the outer side of said bar, over which scale the pointed outer end of the traveler-block traverses, substantially as described, and for the purpose specified.

398,988. ROTARY ENGINE. ARTHUR TICKLE, Brooklyn, N. Y. Filed Sept. 5, 1888. Serial No. 284,615. (No model.)



Claim.—1. In a rotary engine, the combination, with a cylinder and a piston mounted to rotate therein, of a gate held to slide in the said cylinder and forced against the said piston by live steam, a steam-chest held on top of the said cylinder, a slide-valve held in the said steam-chest to reverse the motion of the engine, and exhaust-valves moving simultaneously with the said slide-valve to open and close the exhaust-ports, substantially as shown and described.

2. In a rotary steam-engine, a cylinder provided with inlet and outlet ports and also with gate-ports, a steam-chest held on top of the said cylinder, and a valve held to slide in the said steam-chest to open and close alternately said inlet-ports and said gate-ports, in combination with a piston mounted to rotate in the said cylinder and provided on its face with recesses which connect said inlet-ports with the interior of the cylinder, and also connect said inlet-ports with the said gate-ports, substantially as shown and described.

3. In a rotary steam-engine, a cylinder provided with inlet and outlet ports and also with gate-ports, a steam-chest held on top of the said cylinder, and a valve held to slide in the said steam-chest to open and close alternately said inlet-ports and said gate-ports, in combination with a piston mounted to rotate in the said cylinder and provided on its face with recesses which connect said inlet-ports with the interior of the cylinder, and also connect the said inlet-ports with the said gate-ports, and a gate held to slide in the said cylinder against the said piston, being pressed against the latter by the live steam passing through the said gate-ports on top of the said gate, substantially as shown and described.

4. In a rotary steam-engine, a cylinder provided with inlet and outlet ports and also with gate-ports, a steam-chest held on top of the said cylinder, and a valve held to slide in the said steam-chest to open alternately said inlet-ports and said gate-ports, in combination with a piston mounted to rotate in the said cylinder and provided on its faces with recesses to connect the live-steam ports with the interior of the cylinder, and also provided with recesses for connecting the live-steam ports with the gate-ports and for connecting the latter with the exhaust-ports, substantially as shown and described.

5. In a rotary steam-engine, a cylinder provided with inlet and outlet ports and also with gate-ports, a steam-chest held on top of the said cylinder, and a valve held to slide in the said steam-chest to open alternately said inlet-ports and said gate-ports, in combination with a piston mounted to rotate in the said cylinder and provided on its faces with recesses to connect the live-steam ports with the interior of the cylinder, and also provided with recesses for connecting the live-steam ports with the gate-ports and for connecting the latter with the exhaust-ports, and a gate held to slide in the said cylinder and forced against the said piston by live steam entering through the said ports, substantially as shown and described.

6. In a rotary steam-engine, a cylinder provided with inlet and outlet ports and also with gate-ports, a steam-chest held on top of the said cylinder, and a valve held to slide in the said steam-chest to open and close alternately said inlet-ports and said gate-ports, in combination with a piston mounted to rotate in the said cylinder and provided on its faces with recesses which connect the live-steam ports with the interior of the cylinder, and also provided with recesses for connecting the live-steam ports with gate-ports and for connecting the latter with exhaust-ports, a gate held to slide in the said cylinder and forced against the said piston by live steam entering through the said gate-ports, and exhaust-valves operating simultaneously with the said slide-valve to open and close the said exhaust-openings alternately, substantially as shown and described.

7. In a steam-engine, the combination, with a cylinder having an inlet-port and a gate-port, of a piston mounted to rotate in the said cylinder and provided on its face with recesses for connecting the said inlet-port with the said gate-port, substantially as shown and described.

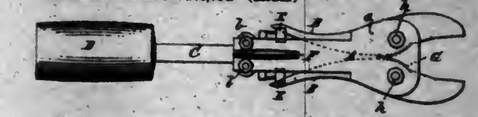
8. In a steam-engine, the combination, with a cylinder having an inlet-port, a gate-port, and an exhaust-port, of a piston mounted to rotate in the said cylinder and provided on its face with recesses for connecting said inlet-port with the said gate-port and the said gate-port with the exhaust-port, substantially as shown and described.

9. In a steam-engine, the combination, with a cylinder having an inlet-port, a gate-port, and an exhaust-port, of a piston mounted to rotate in the said cylinder and provided on its face with recesses for connecting said inlet-port with the said gate-port and the said gate-port with the exhaust-port, and a gate held to slide in the said cylinder and forced against the said piston by steam entering through the gate-port, substantially as shown and described.

10. In a steam-engine, the combination, with a cylinder having an inlet-port, a gate-port, and an exhaust-port, of a piston mounted to rotate in the said cylinder and provided on its face with recesses for connecting said inlet-port with the said gate-port and the said gate-port with the exhaust-port, a gate held to slide in the said cylinder and forced against the said piston by steam entering through the gate-port, a steam-chest held on top of the said cylinder, and a slide-valve held in the said steam-chest above the said gate and provided with a recess for taking the steam from the gate-port into the said gate, substantially as shown and described.

11. In a steam-engine, the combination, with a cylinder having an inlet-port, a gate-port, and an exhaust-port, of a piston mounted to rotate in the said cylinder and provided on its face with recesses for connecting said inlet-port with the said gate-port and the said gate-port with the exhaust-port, a gate held to slide in the said cylinder and forced against the said piston by steam entering through the gate-port, a steam-chest held on top of the said cylinder, a slide-valve held in the said steam-chest above the said gate and provided with a recess for conducting the steam from the gate-port on top of the said gate, and an exhaust-valve operating simultaneously with the said slide-valve to open and close the said exhaust-opening, substantially as shown and described.

398,989. WRENCH. JOSEPH TOBLINSON, Folsom, Cal. Filed June 30, 1888. Serial No. 278,704. (Model.)

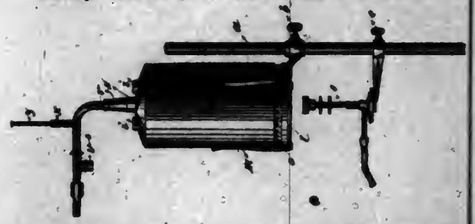


Claim.—In a wrench, the combination, with the body portion A, of the lever-jaws B, pivoted in and at the forward end of the body and having outwardly-curved rear ends, the spring C, interposed between the lever-jaws for holding them open, the bar C, sliding within the body and provided with the head *c*, and the blocks E, secured to the head *c* and recessed to receive the rear ends of the lever-jaws, substantially as described.

398,990. PROCESS OF MAKING A YELLOW DYE. JOHANNES WALTER, Basle, Switzerland, assignor to John R. Geigy & Co., same place. Filed Dec. 13, 1888. Serial No. 293,995. (Specimens.)

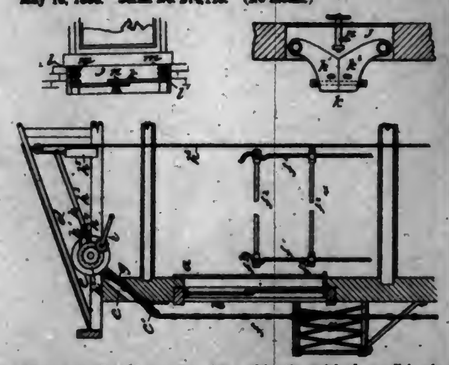
Claim.—The herein-described process for producing a new yellow coloring-matter by first dissolving sodium salt of thioparatoluidine sulphonic acid in water, mixing it with sulphuric acid, and to the precipitate of the acid compound thus obtained and cooled with ice adding gradually nitrite of sodium dissolved in water, the solution of the diazo compound poured into an alkaline solution of salicylic acid containing enough caustic soda to saturate the acids employed, the mixture being then boiled, and after that the color precipitated with salt, substantially as described.

398,991. INHALER FOR WARM AIR. LOUIS WEISSER, Berlin, Germany. Filed Dec. 7, 1888. Serial No. 292,907. (No model.)



Claim.—An apparatus for producing warm air for inhalation, comprising a chamber, *f*, heated by a burner, *c*, or equivalent heating device, fitted with outlets *i i* for the escape of the products of combustion and surrounded by a casing, *n*, the space *u*, intervening between the chamber and the casing, serving as a passage for air which enters through openings below, becomes heated through contact with the central chamber, *f*, and ultimately escapes from the upper part of the space *u* by way of a conduit furnished with valves *z z'* for inhalation and exhalation, respectively, substantially as described.

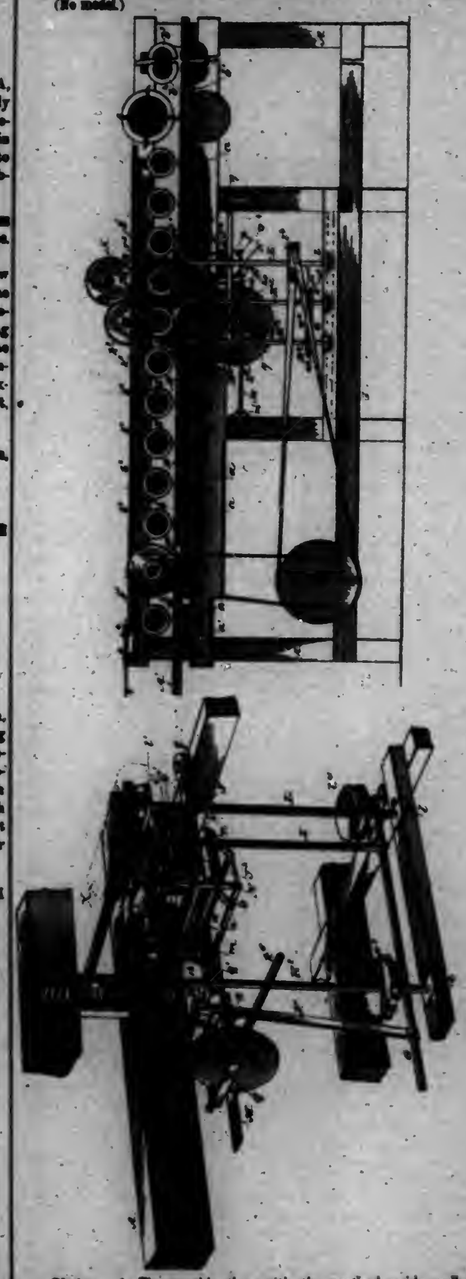
398,992. FIRE-ESCAPE. JOHN WHITE, Hartford, Conn. Filed May 16, 1888. Serial No. 274,113. (No model.)



Claim.—1. In a fire-escape, in combination with the wall having the ladder-slot, the ladder-reel provided with a brake normally holding the reel against rotation, the sectional bracket located in a socket below the window and through the wall and adapted to be swung outward on a horizontal plane and engage the ladder, and the pull-rope connected to the roll-brake, all substantially as described.

2. In a fire-escape, in combination with a flexible ladder secured at its upper end to a wall, a folding bracket formed in two sections, each swinging on a pivot and pressed outward by a spring, and the bolt whereby the folding parts of the bracket are temporarily held within the bracket-socket, all substantially as described.

398,993. STAVE JOINTING AND PLANING MACHINE. WILLIAM J. WERNET, Cooperstown, Pa. Filed Sept. 26, 1888. Serial No. 286,269. (No model.)



Claim.—1. The combination, with the vertical guide-rollers mounted upon shafts having a pivotal bearing at their lower ends, and rock-shafts connected with said guide-rollers, of the head-blocks J, con-

nected to said shafts and the cutter-heads, the shafts of said heads having a pivotal bearing at their lower ends in the frame, and their upper ends journaled to the head-blocks, whereby the movement of the guide-rollers will automatically set the cutters to the point of the beginning of the cut of the stave-bevel, substantially as and for the purpose specified.

2. In a stave-jointing machine, the combination, with the guide-rollers E E, mounted upon rotatable shafts having a pivotal bearing at their lower ends, rock-shafts G, mounted in the frame, arms F, connecting said shafts to the roller-shafts, and an arm, I, connected to the rock-shaft, of the head-blocks J, adapted to lateral movement in the frame, said head-blocks connected to the arm I, and the cutter-heads L, journaled at their upper ends in the head-blocks, their lower ends having a pivotal bearing in the frame, all arranged substantially as and for the purpose set forth.

3. In a stave-jointing machine, the combination of the vertical guide-rollers mounted on a shaft having a rotatable and swinging movement, rock-shafts journaled in the frame and operated by the movement of the guide-roller shafts, the divided head-blocks, the upper sections, J', connected with the rock-shafts, the cutter-heads mounted in said sections, the yielding shaft and roller X, journaled in the frame above the bed, said shaft connected to the lower section, J², said shaft X adapted to raise said lower section in operative contact with the upper section when raised, and the automatic devices, substantially as shown and described, for vibrating said head-blocks, the movement of said vibrating devices, the yielding shafts, and the head-blocks being timed and regulated by the moving billet, substantially as described.

4. In a stave-jointing machine, the combination, with the yielding guide-roller shafts, said shafts journaled at their lower ends in pivotal bearings, lateral arms E², connected to said shafts, said arms projected at their inner ends in the frame, and rebounding springs mounted on said arms between the frame and the roller-shafts, of the rock-shafts G, mounted in the frame-shaft, provided with arms F F, connected at their upper ends to the arms E², and an arm, I, connected to the upper head-block, said head-block supporting the upper end of the cutter-disk shaft, the lower end of said shaft having a pivotal bearing at its lower end, all arranged substantially as and for the purpose specified.

5. In a stave-jointing machine, essentially as described, the combination, with the automatic feed devices, substantially as shown and described, and pivotal bearings *l*, mounted thereon, of the cutter-shafts L, journaled at their upper ends in said pivotal bearings *l*, and their lower ends provided with pivotal bearings *e*, journaled in the main frame, whereby the upper ends of said cutter-shafts will be moved differentially to determine the cut of the bevel and the bilge, substantially as shown and described.

6. In a stave-jointing machine, the combination, with the yielding roller-shafts, the rock-shafts G, operated thereby, the head-blocks J, and the cutting devices, substantially as shown, connected to and operated by the head-blocks, of the adjustable connections between said head-blocks and rock-shafts, said connections consisting of arms I, secured at their lower ends to the said shafts, vertically-adjustable centrally-apertured plates guided at their ends on vertical screw-posts secured at the inner ends of the head-blocks, and adjusting-nuts engaging said posts, the upper ends of said arms I passed through the apertured plates, substantially as set forth.

7. In a stave-jointing machine, the combination, with the upper head-block sections, said sections connected with the cutter-disks, and the yielding guide-rollers, whereby said head-blocks and cutter-disks are forced outward when the staves enter between said roller, of the yielding roller-shaft X, supported above the bed of the machine, the lower section, J², supported on the frame O, connected with and operated by the vertical movement of said shaft X, and the vibrating levers arranged to be automatically operated by said shaft X and the upper head-block, whereby said head-blocks are moved to and from each other to determine the curvature of the edges of the staves, as set forth.

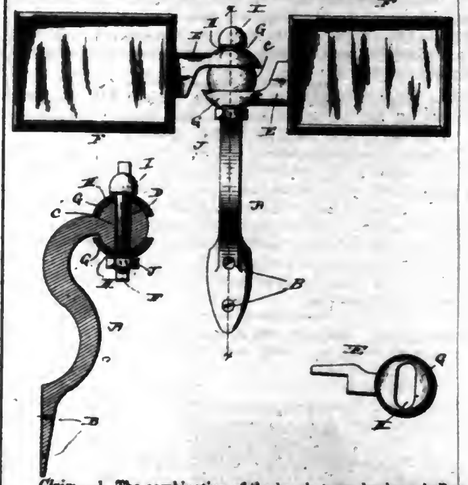
8. In a stave-jointing machine, the combination, with the table B, having an opening, *d*, and the trimmer-saws C C, adjustably mounted on the shaft *c*, supported above said bed and opening *d*, of the stop-plate D, pivoted in said opening, said stop adapted to automatically close the feed-passage between said saws by pressure of the billet being treated, substantially as shown and described.

9. In a stave-jointing machine, the combination, with the head-blocks J, the rock-shafts G, connected therewith, spring-arms F, connected with the rock-shaft, and the yielding roller-shafts connected with the arms F, and the swinging frame M, of the bell-crank levers 13, provided with diagonally-slotted arms 12, adapted to receive pintles 10 on the upper sections, J', of the head-blocks, said levers pivoted at 14 to the frame of the machine and having arms 16, and arms *m m*, secured at their lower ends to the swinging frame M and pivotally connected with the arms 16 at their upper ends, all arranged substantially as and for the purpose described.

10. The combination of the swinging frame M, connected at its free end to the upper section, J', of the head-block, the shaft L², journaled in said frame and provided with diagonally-arranged cam-disks P P, said shaft provided with a drive-gear, L², the vibrating arms Q' Q', having yokes Q at their forward ends, their rear ends pivoted to the frame at *g*, said yokes formed with contact-points against which the disks P operate, the yielding shaft and roller X, journaled above the bed of the machine, said shaft provided with a gear, K', which is automatically geared with the gear L² on shaft L², all arranged substantially as and for the purpose described.

11. In a stave-jointing machine, the combination, with the shaft L², having a ratchet-wheel, 19, and the shaft X, of the retaining-pawl 20, engaging the wheel 19, and a connection between said pawl and the shaft X, whereby the pawl is automatically lifted from engagement with the wheel 19, substantially as and for the purpose specified.

398,994. WINDOW-MIRROR. NIELS ANDERSEN, Decorah, Iowa. Filed Nov. 16, 1888. Serial No. 291,040. (No model.)

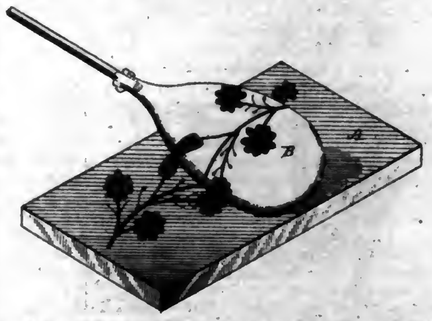


Claim.—1. The combination of the bracket-arm having a ball at its upper end, the mirror-supporting arm having a cup resting on said ball and having a diametrical slot, and the pivotal securing-bolt inserted vertically through said ball and the slot in the cup, as set forth.

2. The combination of the bracket-arm having a ball at its upper end, the mirror-supporting arm having a cup resting on said ball and provided with diametrical slot, and the pivotal securing-bolt inserted through the ball and the slot in the cup, as set forth.

3. As an improvement in window-mirrors, the combination of the bracket-arm having a ball at its upper end provided with the vertical opening, the mirror-supporting arm having its inner end provided with the cup resting on the ball and having the diametrical slot, and the pivotal bolt inserted vertically through the slot in the cup and the opening in the ball and provided with a securing-nut on its lower end, as specified.

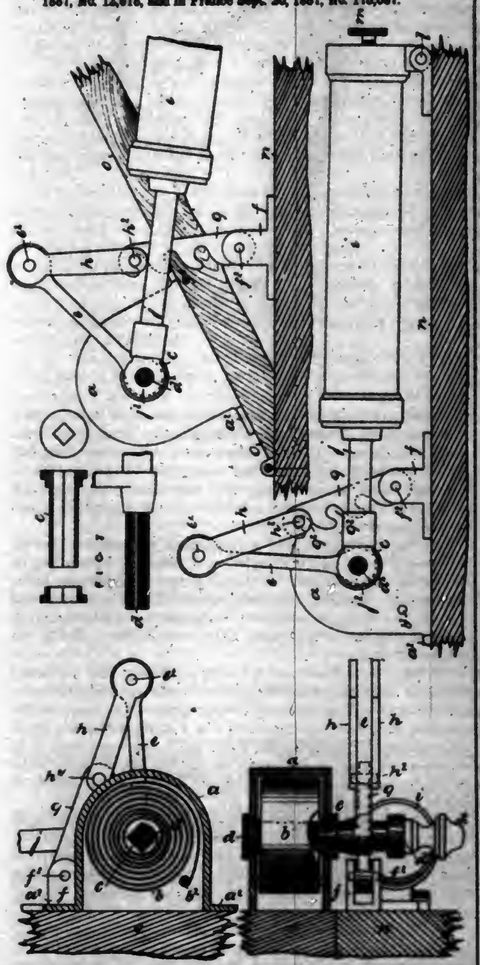
398,995. METHOD OF MANUFACTURING ORNAMENTAL GLASS. THOMAS R. ATTERBURY, Pittsburg, Pa. Filed Sept. 20, 1888. Serial No. 285,906. (No model.)



Claim.—1. The herein-described improvement in the art of manufacturing ornamental glass, which consists in rolling the glass bulb or ball, while in a hot condition, on a plate or marver having the design formed thereon, on which is placed a vitrifiable coloring material, and finally shaping the bulb into the article desired.

2. The herein-described improvement in the art of manufacturing ornamental glassware, which consists in rolling the hot bulb or ball of glass over a marver having a design formed thereon of vitrifiable coloring material such as described, thus depositing the colors on the bulb, reheating the bulb to fuse the colors, and finally blowing or pressing the bulb in a mold to form the article, as set forth.

398,996. DOOR SPRING AND CHECK. PERSIFER R. AYTON and SAMUEL HILL, Birmingham, England; said Hill assignor to Thomas Pemberton & Sons, same place. Filed Dec. 21, 1887. Serial No. 258,609. (No model.) Patented in England Mar. 8, 1887, No. 3,493, and Sept. 17, 1887, No. 12,618, and in France Sept. 20, 1887, No. 178,087.



Claim.—1. In a door spring and check, the combination, with the reversible drum *a*, the spring *b*, and the angular hollow bush *c*, open at both ends and turning in said drum, of the angular spindle *d*, adapted to fit into said bush from either end and connected by suitable levers to a bracket, *f*, on the door-jamb, substantially as described.

2. In a door spring and check the combination of air-cylinder *i* and piston *j*, drum *a*, spring *b*, bush *c*, secured to the end of said spring, spindle *d*, fitting in said bush, lever *e*, rigidly secured to said spindle, link *h*, jointed to said lever and having pin h^3, with link *g*, formed with open-ended slots or notches g^3, and pivoted to bracket *f*, said bracket being located between the air-cylinder and the spring, substantially as described.

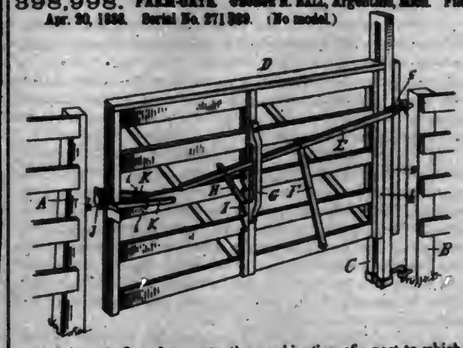
398,997. DUST-PAN. ROYAL F. BAILEY, Galva, Ill. Filed Dec. 23, 1887. Serial No. 258,332. (No model.)

Claim.—1. As an article of manufacture, the dust-pan herein described, having the rearwardly-inclined bottom C, provided at its front and with the inclined flange D, the sides having their upper edges tapering or inclining downwardly both to the rear and to the front, the flattened top E extending from the rear lower edge of the sides to the point where said sides incline forwardly, and having the forwardly and downwardly inclined lip G projecting from along the front edge of the top E, substantially as and for the purposes set forth.



2. As an article of manufacture, the dust-pan herein described, having the bottom inclined from front to rear and provided at its front with the forwardly-inclined flange D, the upright sides A, having their upper edges tapering or inclining downwardly both to the front and the rear, the incline of the front edge being shorter and at a greater angle than the incline of the rear edge, as shown, and the flattened top E, extending from the rear edge of the pan to the top of the rear incline, substantially as and for the purposes set forth.

398,998. FARM-GATE. GEORGE H. BALL, Argentine, Mich. Filed Apr. 20, 1888. Serial No. 271,339. (No model.)



Claim.—1. In a farm-gate, the combination of a post to which is hinged a slotted standard, a gate sliding vertically in said slotted standard, and a lever pivotally connected to the gate and standard, said lever being provided with a pivoted dog engaging a racked bar on the gate, substantially as and for the purposes described.

2. In a farm-gate, the combination, with the posts A B, of slotted standard C, hinged to the post B, gate D, sliding vertically in said slotted standard, lever E, pivoted at one end to the standard, bar F, connecting said lever with the gate, dog H, pivoted to said lever and arranged to engage with a notched bar, I, secured to the gate, latch J, pivoted to the free end of the gate, and latch-bars K, the parts being constructed, arranged, and operating substantially in the manner and for the purposes specified.

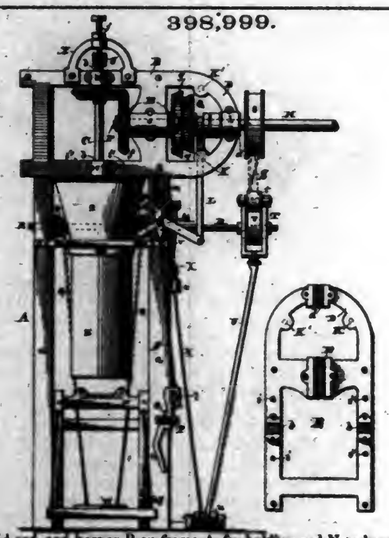
398,999. FLOUR-PACKER. HERMAN A. BARNARD, Moline, Ill., assignor to the Barnard & Leas Manufacturing Company, same place. Filed Mar. 3, 1888. Serial No. 266,018. (No model.)

Claim.—1. In a packer, a metal frame having bearings cast integral with it for the support of the auger and driving shafts, and a detachable arch, constructed substantially as described, attached to said frame and adapted to keep the auger-shaft from rising out of place, said frame being provided with bolt-holes at the upper and lower side and made reversible, whereby the driving-shaft may be made to extend to either side and the arch attached in proper position when reversed, substantially as described.

2. The combination of the sectional counter-shaft with the shaft R, carrying cone-drums, a friction-wheel, and a pulley, with the belt S, tightener T, friction-band *v*, lever X, rods U and Y, and treadle *u*, whereby the belt S can be tightened simultaneously with the loosening of the friction-band, and vice versa, substantially as described.

3. The combination of frame A, the metal frame B thereon, the auger-shaft and sectional counter-shaft supported thereon, and the friction-clutch G on said counter-shaft, with the bifurcated lever for operating said clutch pivoted on a leg projecting from frame B, the toggle-lever M and rod N, for actuating said clutch, and the dog O

398,999.



on said rod, and keeper P on frame A, for holding rod N to keep the clutch engaged, substantially as described.

4. The combination of the auger-shaft, the sectional counter-shaft provided with a friction-clutch, and a vertically-reciprocating platform, with the shaft R and chains for lifting said platform, the belt S and pulleys for transmitting motion from the counter-shaft to shaft R, and mechanism, substantially as described, for simultaneously tightening belt S, to cause the raising of the platform and to operate the friction-clutch to start the shaft, substantially as described.

5. The combination of the auger-shaft, the sectional counter-shaft for driving the same, the friction-clutch on said counter-shaft for connecting its parts, and the vertically-reciprocating platform, substantially as described, with the lever for operating said friction-clutch, the toggle-lever, and spring-controlled rod for operating said lever, and the dog O on said rod engaging a keeper, P, on the main frame when the rod is depressed, to keep the clutch engaged and adapted to be struck by a lug on the movable platform as the latter descends, and to be released, thereby permitting the disengagement of said clutch, substantially as set forth.

6. The combination of the auger-shaft, the sectional counter-shaft connected by a friction-clutch, and a vertically-reciprocating platform to carry the receptacle to be filled, with the bifurcated lever engaging said clutch, toggle-lever M, and spring-controlled rod N, for operating said clutch, the dog O on said rod for engaging a keeper on the main frame, and the devices, substantially as described, for depressing said rod to keep the clutch engaged, substantially as set forth.

7. The combination of the sectional counter-shaft and its clutch G, the shaft R, receiving motion from said counter-shaft by a belt, S, and operating the movable platform, with the lever L, toggle M, and rod N, for actuating the clutch, the tightener T for belt S, and the connections of rod N and tightener with a treadle, whereby the platform can be elevated and the packer started simultaneously, substantially as specified.

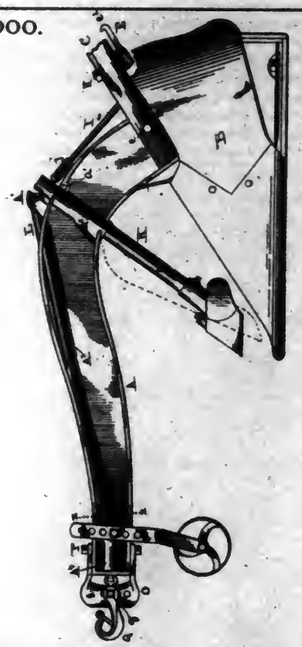
8. The combination of the sectional counter-shaft having a friction-clutch, G, for connecting its parts and driving the auger-shaft, the movable platform W, shaft R, having friction-wheel V and receiving motion from the counter-shaft by a slack belt, S, when the latter is tightened, with the mechanism for simultaneously closing clutch G, tightening belt S, and loosening the friction-band around pulley V, substantially as specified.

9. The herein-described frame B, having an offset arch, D, and cast with bearings *b b* for the auger-shaft and bearings E and *d* for the counter-shaft, and having lugs K K′ on arch D, and openings *i i′ i′*, and the arch I, bolted to said frame, substantially as set forth.

10. The combination of frame A and reversible frame B thereon, having bearings formed in it for the auger-shaft and counter-shaft, and having opposite lugs, K K′, with the auger-shaft C, shaft F, supported in frame B and imparting motion to shaft C, and the shaft H, having one journal in frame B, and engaging shaft F by a friction-clutch, G, and the lever pivoted on one of the legs of frame B, for operating said clutch, substantially as and for the purpose specified.

399,000. HILLSIDE-PLOW. MILO D. BEACH, Litchfield, Conn. Filed Nov. 16, 1888. Serial No. 291,085. (No model.)

399,000.



Claim.—1. The combination, with a reversible plow provided with a duplex hook and having a shifting jointer or colter and a laterally-movable clevis, of suitable crank-like devices for operating said jointer or colter and the clevis and connections between said cranks and duplex hook, substantially as described, whereby when the hook is turned the jointer or colter and the clevis will be shifted, as and for the purpose set forth.

2. The combination, with a reversible plow provided with a duplex hook and having a shifting jointer or colter and a laterally-movable clevis, of an eccentric for operating the jointer or colter and a crank-pin for operating the clevis, connected shafts carrying said eccentric and crank-pin, and means, substantially as described, for imparting the motion of the duplex hook to the shafts, as and for the purpose set forth.

3. The combination, with a reversible plow provided with a duplex hook and having a shifting jointer or colter and a laterally-movable clevis, of a shaft carrying a sector-gear and an eccentric for operating the jointer, and connected with a shaft carrying an adjustable crank-pin for operating the clevis, and a sector-gear secured to the duplex hook and meshing with the aforesaid gear, whereby when the duplex hook is reversed the shafts will be rotated, substantially as and for the purpose set forth.

4. The combination, with a reversible plow, of a duplex hook loosely pivoted on an axially-yielding bolt and having its hooks turned upwardly on its upper side, so that when locking with the lugs on the mold-board its arms move downward in a plane at right angles to their plane of revolution without any backward movement, substantially as described.

5. The combination, with a reversible plow, of a cross-bar, D, attached thereto and provided with the lugs *d′*, and a duplex hook, E, having upwardly-turned hooks e^3, pivotally supported on the bar between the lugs by means of an axially-yielding bolt, and having ribs e^2 for engaging the lugs *d′*, substantially as described.

6. The combination, with a reversible plow having catches *b* made with inclined edges, of a duplex hook, E, having upwardly-turned hooks e^3 provided with similarly-inclined edges, substantially as described.

7. The combination, with a reversible plow having a shifting jointer or colter, of the cross-bar D, the sleeve F, mounted thereon and carrying the sector-gear G, the duplex hook attached to the sleeve, and the shaft I, carrying the sector-gear F, meshing with the gear G, and provided with a crank-like device for operating the jointer or colter, substantially as described.

8. The combination, with a rotatable jointer or colter stem having a diametrical slot, of an eccentric shaft passing through the slot and means for rotating the shaft, substantially as described.

9. The combination, with a jointer or colter stem capable of rotation and lateral vibration and having a diametrical slot, of an eccentric shaft passing through the slot and means for rotating the shaft, substantially as described.

10. The combination, with a reversible plow, of a colter having a stem capable of rotation and lateral vibration and a blade having its point lying in the axial line of the stem and its cutting-edge diverging from said line in front or rear of the same, and means for simultaneously rotating and vibrating the colter-stem, substantially as described.

11. The combination, with the shaft I, of the eccentric provided with a semi-cylindrical socket, *j*, and a hub, *j′*, substantially as described.

12. The combination, with the shaft I, of the rotatable jointer or colter stem and the eccentric shown and described, consisting of a socket, *j*, a hub, *j′*, and a short straight cylindrical shaft uniting the socket and hub and having its axial line at an angle to the axial line of the socket and hub, substantially as described.

13. The combination, with a clevis, O, having a groove, *o*, of a crank-pin engaging with said groove and means, substantially as described, for actuating the crank-pin, as and for the purpose set forth.

14. The combination, with a plow-beam, of the shaft M, carrying the curved head M′, the dog N, adjustable on the head, the clevis O, engaged by the dog, and means for rotating the shaft, substantially as described.

15. The combination, with the shaft M, carrying the curved head M′, having the grooves *m′*, of the dog N, adjustable along the grooves *m′* and having a nose, N′, the clevis O, having a groove, *o*, and means for rotating the shaft M, substantially as described.

16. The combination, with the laterally-adjustable clevis O, having chamfered sides, and vertical teeth o^3, extending the entire length of its front edge, of the clevis-hook Q, having the vertical teeth *q′*, intermeshing with the teeth o^3 when the hook is attached to the clevis, substantially as described.

17. The combination, with the laterally-adjustable clevis O, of the clevis-hook Q, pivoted thereto by a horizontally-arranged bolt, the front edge of the clevis and the rear end of the clevis-hook having vertical teeth which intermesh when the hook is bolted to the clevis, whereby the hook is capable of lateral adjustment with reference to the clevis, substantially as set forth.

18. An iron plow-beam provided with the tubular bearing A^2 for a jointer or colter stem and tubular bearings A^2 A^5 for shafting, said bearings being cored out in the beam, substantially as described.

19. The combination, with a reversible plow having a shifting jointer or colter, of a crank-like device for operating the same, adapted to make a half-revolution when shifting the jointer or colter and to stand on a dead-center when the jointer or colter is in either of its working positions, whereby the crank-shaft is relieved of all torsional strain, substantially as described.

20. The combination, with a reversible plow having a laterally-adjustable clevis, of a crank-like device for shifting said clevis, adapted to make a half-revolution in so doing and to stand on a dead-center when the clevis is in either of its working positions, whereby the crank-like device is best enabled to resist the strain upon the clevis, substantially as described.

399,001. HILLSIDE-PLOW. MILO D. BEACH, Litchfield, Conn. Filed Nov. 16, 1888. Serial No. 291,086. (No model.)

Claim.—1. The combination, with a plow-standard, A′, having a rounded flange, A^3, of the vertically-adjustable handles E, secured to the bar D′, which has a groove, *d*, fitting the flange A^3, substantially as described

2. The combination, with a plow-standard having the slot *a* and the journals a^3, of the handles E, the blocks G, having the slots *g*, and bearings for the journals a^3, and the bolt *e*, passing through the slots *a* and *g* and adjustably securing the handles to the blocks, substantially as described.

3. The combination, with a plow having a reversible jointer or colter, of a shaft provided with crank-like devices for actuating the jointer or colter, a gear-wheel on said shaft, a pair of laterally-shifting handles, and a rack fastened to the handles and meshing with the gear-wheel, substantially as described.

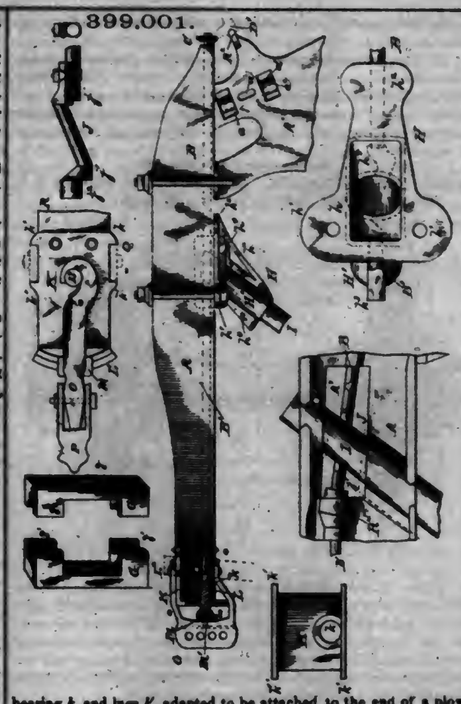
4. The combination, with a plow having a laterally-swinging clevis, of a shaft provided with a crank-pin for actuating the clevis, a gear-wheel on said shaft, a pair of laterally-shifting handles, and a rack fastened to the handles and meshing with the wear-wheel, substantially as described.

5. The casting H, having a tubular bearing, H′, a base-plate, *h*, ears *h′*, rear extension, h^2, hollow rib h^3, and brace h^4, adapted to be attached to a plow-beam and receive the stem of a jointer or colter, substantially as described.

6. The casting K, having a top, bottom, and end, and a tubular bearing, *k*, adapted to be attached to the end of a plow-beam and afford a bearing for the shaft, substantially as described.

7. The casting K, having a top, bottom, and front end, tubular bearing *k*, and lugs *k′*, adapted to be attached to the end of a plow-beam and receive the wheel-standards, substantially as described.

399,001.



399,002. PERMUTATION-LOCK. LOUIS A. BAUER, Paris, France, assignor to Edouard Vieillot, same place. Filed Aug. 24, 1888. Serial No. 283,043. (No model.) Patented in France Aug. 16, 1882, No. 150,054, and in Belgium Aug. 19, 1882, No. 58,806.



Claim.—1. In a lock, the combination, with the bolt-controller, of the carriages and the blocks, one set movable with said bolt-controller, the other being stationary, and the screws which adjust said carriages, so that motion of said controller is or is not dogged by contact between them and the said blocks, substantially as described.

2. The combination, with the bolt-controller, of the carriages and the blocks, one set movable with said bolt-controller, the other stationary, the screws which adjust said carriages, so that the said controller is or is not dogged, and the adjustable mounting for the said blocks, so that their position can be altered to change the secret combination, substantially as described.

3. The combination, with the bolt-controller, of the carriages and blocks, one set movable with said bolt-controller, the other stationary, the screws which adjust said carriages, and the adjustable mounting for said blocks, composed of a friction-clamp and a slotted support, said blocks interlocking with said carriages when in registering position, and said friction-clamps permitting them when interlocked to be moved with said carriages by said screws, substantially as described.

4. The combination, with the bolt-controller, the carriages, and the blocks, of the screws which adjust the carriages, provided with flat places, and the springs which press upon said flat places, substantially as described.

5. The combination, with the bolt-controller, the carriages, and the blocks, of the screws which adjust the carriages, provided with flanges, and the washer held with yielding pressure against said flanges, substantially as described.

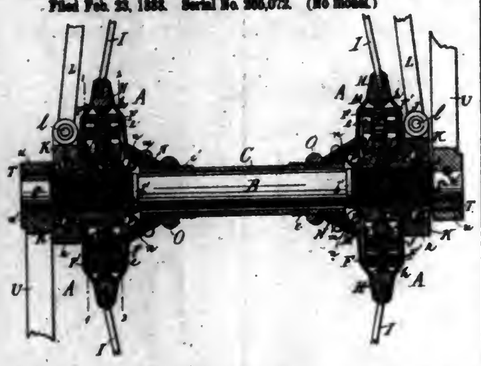
6. The combination, with the bolt-controller, the carriages, and blocks, one set movable with the bolt-controller, the other set stationary, the carrier for said movable set and the screws which adjust said carriages, of the spindle having a friction-connection with said carrier, substantially as described.

7. The combination, with the bolt-controller, having an operating handle or device on each side of the lock, the carriages, and the blocks, of the screws which adjust said carriages, having both ends

accessible for operation on each side of the lock, substantially as described.

8. The combination, with the bolt-controller, of the carriages and blocks, the one set stationary and the other movable with said bolt-controller, the cylinder or its specified equivalent for carrying said movable set, the case which supports the stationary set, and the screws journaled in bearings and adjusting the said carriages, substantially as described.

399,008. VELOCIPEDE. CHARLES E. BENTLEY, New York, N. Y. Filed Feb. 23, 1888. Serial No. 265,072. (No model.)



Claim.—1. The combination, in a velocipede, and with its drive-wheel axle, of a spur-gear rotating with the axle, an internal gear fast to the drive-wheel, a frame or support placed between said spur-gear and internal gear and carrying planet-gears meshing with said spur-gear and said internal gear, and a clutch device acting between the planet-gear frame and a relatively-stationary surface or support, substantially as described, for the purposes set forth.

2. The combination, in a velocipede, and with its drive-wheel axle, of a spur-gear rotating with the axle, an internal gear fast on the drive-wheel, a frame or support placed between said spur-gear and internal gear and carrying planet-gears meshing with said spur and internal gears, and two clutch devices or series of clutch devices, one clutch or series of clutches operating between the planet-gear frame and the spur-gear or a collar on the axle, and the other clutch or series of clutches acting between the planet-gear frame and a relatively-stationary surface or support, substantially as described, for the purposes set forth.

3. The combination, in a velocipede, and with its drive-wheel axle, of a spur-gear fixed to each end of the axle, two internal gears forming opposite side hubs or supports to the drive-wheel spokes, a planet-gear frame, and gears placed between the spur-gear and internal gear of each side hub, and two clutch devices at each side, one clutch device operating between the planet-gear frame and the spur-gear or a collar on the axle, and the other clutch device acting between the planet-gear frame and a relatively-stationary surface or support, substantially as described, for the purposes set forth.

4. The combination, in a velocipede, and with its drive-wheel axle, of a spur-gear, D, rotating with the axle, a collar or shoulder, d^3, also rotating with the axle, an internal gear, H, held to the driving-wheel spokes or body, a ring-frame, F F', carrying planet-gears E, meshing with the gears D H, a relatively-fixed collar or flange, as k, connected to the machine-frame, a clutch device operating between the frame-ring F and the shoulder d^3, and a clutch device operating between the frame-ring F' and the collar or flange k, substantially as described, for the purposes set forth.

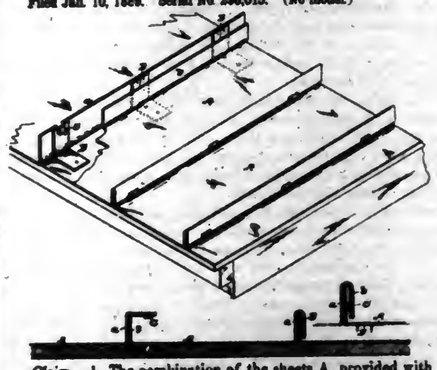
5. The combination, in a velocipede, and with its drive-axle, of a spur-gear, D, rotating with the axle, a collar or shoulder, d^3, also rotating with the axle, an internal gear, H, held to the drive-wheel spokes or to the body of the wheel, a ring-frame, F F', carrying planet-gears E, meshing with the gears D H, a collar, K, connected to the fork-frame and supported on a ball-bearing from the axle, and provided with a flange, k, a clutch device operating between the ring F and shoulder d^3, and a clutch device acting between the ring F' and the flange k, substantially as described, for the purposes set forth.

6. The combination, in a velocipede, and with its drive-wheel axle, of a spur-gear, D, rotating with the axle, a collar or shoulder, d^3, also rotating with the axle, an internal gear, H, held to the drive-wheel spokes or to the body of the wheel, a ring-frame, F F', carrying planet-gears E, meshing with the gears D H, a relatively-fixed collar or flange, as k, connected with the machine-frame, a clutch device operating between the ring F and the shoulder d^3, a clutch device operating between the ring F' and the collar k, and dust-guard plates fitted to the drive-wheel at opposite faces of the planet-gear frame and covering the gearing and clutches, substantially as herein set forth.

7. The combination, in a velocipede, and with its drive-wheel axle, of a tube or sleeve, C, next the axle, and mechanism fitted at each end of the axle, as follows: a spur-gear, D, rotating with the axle, a collar or shoulder, d^3, also rotating with the axle, an internal gear, H, forming a hub or half-hub to the drive-wheel spokes, a ring-frame, F F', carrying planet-gears E, meshing with the gears D H, a collar, K, supported on a ball-bearing from the axle and connected to the fork-frame, and provided with a flange, k, a clutch device operating between the ring F and the shoulder d^3, and a clutch device operating between the ring F' and the flange k, an outer dust-guard plate, J, held to the gear H and surrounding the flange k, an inner dust-guard, M, held to the gear H, a hardened metal collar fixed to and with the plate M, and a circle of balls placed between said collar and an opposing surface on the axle for an inner ball-bearing, all arranged for operation substantially as described, for the purposes set forth.

8. The combination, in a velocipede, of an axle having near its ends hardened metal collars fast to said axle, a tube loosely surrounding said axle and having at its ends hardened metal collars fitted to said tube at one end by a right-handed and at the other by a left-handed thread, and the collars on the tube forming the inner and the collars on the axle the outer surfaces of ball-bearings, the adjustment of which is made by the revolution of said tube.

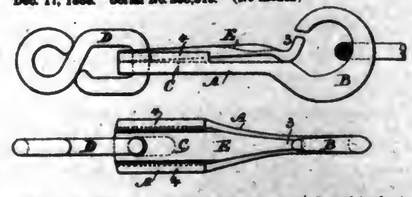
399,004. METAL ROOFING. WILSON C. BERGER, Canton, Ohio. Filed Jan. 10, 1889. Serial No. 296,015. (No model.)



Claim.—1. The combination of the sheets A, provided with the tongued-up portions a and b, the lips C, formed in the tongued-up portion a and the anchors B and said lips folded over each other, and the tongued-up portion a extending above the tongued-up portion b, bent or folded over the tongued-up portion b, together with the anchors B and lips C, substantially as and for the purpose set forth.

2. The sheets A, provided with the tongued-up portions a and b, the anchor B, and the lips C, formed in the anchors B and the tongued-up portion a, said lips cut opposite to each other and both of said lips bent down, substantially as and for the purpose set forth.

399,005. SNAP-HOOK. OSCAR V. BLAKER, Gillette, N. J. Filed Dec. 17, 1888. Serial No. 293,819. (No model.)



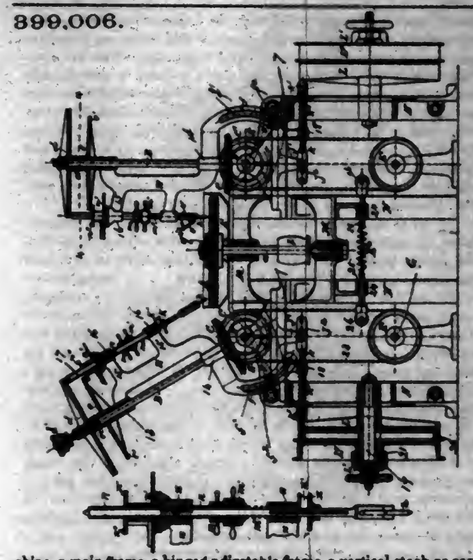
Claim.—1. The combination, with the hook B and body A, having a longitudinal slot, C, of the sliding hook-closer E, having a head, 3, to close the mouth of the hook, and a hole through which the connection D to the trace or chain passes, substantially as set forth.

2. The combination, with the hook B and slotted body A, of the sliding hook-closer E, having a head, 3, and a connection to the chain or trace, whereby the tension upon the chain or trace draws the head 3 into the mouth of the hook, substantially as set forth.

399,006. MACHINE FOR CUTTING AND POLISHING PRECIOUS STONES, &c. THEODOR BLAUSCHILL, Schaffhausen, Switzerland. Filed Dec. 20, 1886. Serial No. 222,031. (No model.) Patented in France July 1, 1886, No. 177,126, and in Germany July 4, 1886, No. 39,311.

Claim.—1. The combination, in a gem polishing and grinding machine, a main frame, a hinged adjustable frame, a vertical stock or carrier in said hinged frame, connections, substantially as described, for intermittently depressing said stock and carrier, and a polishing-disk and its shaft mounted in the main frame, substantially as set forth.

399,006.



2. In a gem polishing or grinding machine, the combination of a horizontal grinding-disk, devices for rotating it, a block, J, a spring-pressed shank connected to said block J and having a roller, a cam-wheel, L, and a frame, H, mounted on said block J and carrying a tool-stock, substantially as described.

3. In a tool grinding or polishing machine, the combination, with a horizontal rotating grinding or polishing disk, of the frames H, having the stocks and tools and cam-disks for intermittently depressing said stocks, pulleys E E', and chain belts 23, for driving said depressing-disks and tension devices connecting said chain belts, substantially as set forth.

4. In a tool grinding or polishing machine, the combination, with the horizontal rotating grinding or polishing disk, of the frame H, carrying the tool-stock and the tool and shaft B, having disks d e, the disk d being provided with shoulders d'' and the disk e with projections e', and a disk, n', provided with shoulders n'', substantially as described.

5. In a machine for grinding or polishing gems, the combination, with a horizontal rotating grinding or polishing disk, of a frame or carrier, a stock and tool mounted therein, and devices for actuating said stock and tool, a disk, K, mounted on said stock, and a fixed index or needle, k', substantially as set forth.

6. The combination, in a gem grinding or polishing machine, of a tool-stock having an independent tool and a spring-pressed cam-lever, i', substantially as set forth.

399,007. SWITCH FOR OVERHEAD TRACKS. JOHN BOUCHARD, Chicago, Ill., assignor of one-half to George H. Webster, same place. Filed Oct. 21, 1887. Serial No. 253,094. (No model.)

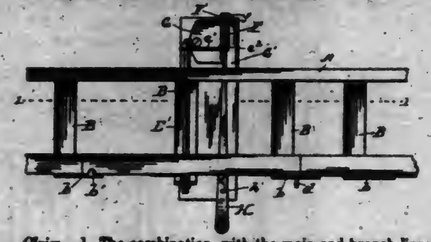


Claim.—1. The combination, with the main and branch rails, of the switch-rail arranged between the same and having one of its ends flexibly connected to the end of the main rail, the rock-shaft provided with a crank-arm attached to the switch-rail by a sliding connection, the operating-lever, and a second crank-arm on the rock-shaft connected to said operating-lever, substantially as and for the purposes specified.

2. The combination, with the main and branch rails, of the switch-rail arranged between the same and having one of its ends flexibly connected to the end of the main rail, the slide mounted on said switch-rail, the rock-shaft provided with a crank-arm pivoted to said slide, the depending operating-lever, and a second arm on the rock-shaft engaging said operating-lever, substantially as and for the purposes specified.

3. The combination, with the main and branch rails, of the switch-rail arranged between the same and having one of its ends flexibly connected to the end of the main rail, said switch-rail being slotted as described, the slide connected to said switch-rail by bolts passing through the said slots, the rock-shaft provided with a crank-arm pivoted to the slide, the depending operating-lever provided with a slot, a notched rack for said lever, and a second arm on the rock-shaft extending through the slot in the said lever, substantially as and for the purposes specified.

399,008. SWITCH FOR OVERHEAD TRACKS. JOHN BOUCHARD, Chicago, Ill., assignor of one-half to Michael Cudady, same place. Filed Mar. 31, 1888. Serial No. 269,186. (No model.)



Claim.—1. The combination, with the main and branch lines, of the horizontally-swinging switch-rail, a vertical rock-shaft having one arm connected to said switch-rail, and a second arm by which it is operated, a pair of toggle-levers connected to said second arm and to a fixed support, and an operating-lever connected to said toggle-levers, substantially as and for the purposes specified.

2. The combination, with the main and branch lines, of the horizontally-swinging pivoted switch-rail, the rock-shaft E, having arm E connected thereto, and arm e', the toggle-levers F and F', the former connected to the arm e' by means of links e^2, and the latter pivoted to a fixed support, the operating-lever H, pivoted to the toggle-levers, and means for locking said operating-lever, substantially as and for the purposes specified.

3. The combination, with the swinging switch-rail and the rock-shaft E, for operating the same, of the toggle-levers F and F', the former connected to said rock-shaft and the latter pivoted to a suitable fixed support and provided with a toe, f'', to limit its downward motion, substantially as and for the purposes specified.

4. The combination, with the swinging switch-rail, its rock-shaft, and the toggle-levers for operating the same, of the support G, having keeper g and pin g', and the operating-lever H, pivoted to the toggle-levers, passing through the keeper, and apertured at h to receive the pin g', substantially as and for the purposes specified.

399,009. PROCESS OF PRODUCING COBALT MATTE FROM COBALT ORES. WILLIAM BRADENBURG, Sing Sing, assignor to the Mineral Reduction Company, New York, N. Y. Filed Feb. 2, 1887. Serial No. 226,327. (No specimens.)

Claim.—1. The process of producing cobalt matte from cobalt ores, consisting of breaking up the ore, then mixing it with graphitic carbon and adding a suitable flux, then melting the mass and drawing off the metal, substantially as described.

2. The process of producing cobalt matte from cobalt ores, consisting of breaking up the ore, breaking up a quantity of graphitic carbon equal to about twenty-five per cent., by weight, of the ore, mixing the ore and graphitic carbon, adding a suitable flux, then melting the mass, and then drawing off the metal, substantially as described.

3. The process of producing cobalt matte from cobalt ores, consisting of breaking up the ore, breaking up a quantity of graphitic carbon equal to about twenty-five per cent., by weight, of the ore, mixing the ore and graphitic carbon, adding a suitable flux, melting the mass in a furnace having a hearth made of graphitic carbon, and then drawing off the metal, substantially as described.

399,010. PRODUCING NICKEL MATTE FROM NICKEL ORES. WILLIAM BRADENBURG, Sing Sing, assignor to the Mineral Reduction Company, New York, N. Y. Filed Feb. 2, 1887. Serial No. 226,329. (No specimens.)

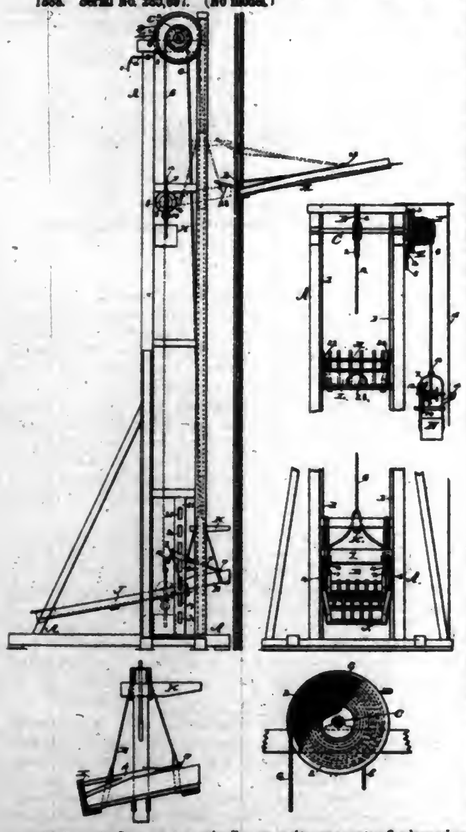
Claim.—1. The process of producing nickel matte from nickel ores, consisting of breaking up the ore, then mixing it with graphitic carbon and adding a suitable flux, then melting the mass and drawing off the metal, substantially as described.

2. The process of producing nickel matte from nickel ores, consisting of breaking up the ore, breaking up a quantity of graphitic

carbon equal to about twenty-five per cent., by weight, of the ore, mixing the ore and graphitic carbon, adding a suitable flux, then melting the mass, and then drawing off the metal, substantially as described.

3. The process of producing nickel matte from nickel ores, consisting of breaking up the ore, breaking up a quantity of graphitic carbon equal to about twenty-five per cent., by weight, of the ore, mixing the ore and graphitic carbon, adding a suitable flux, melting the mass in a furnace having a hearth made of graphitic carbon, and then drawing off the metal, substantially as described.

399,011. AUTOMATIC APPARATUS FOR LOWERING ICE FROM STORE-HOUSES. JOHN H. BRIGGS, Coeymans, N. Y. Filed Sept. 18, 1888. Serial No. 285,607. (No model.)



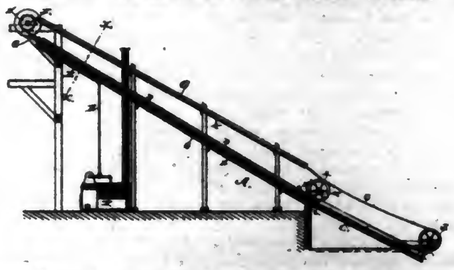
Claim.—1. In an automatically-operating apparatus for lowering ice, the combination of a rope-drum having only sufficient space between its heads or flanges to receive a single diameter of the rope used thereon, and upon which the rope is wound so that each successive convolution of said rope will be wound upon and be of greater diameter than the precedent convolution, and a spirally-grooved cylindrical rope-drum having a gradual decrease in its diameter near the end where the terminal turns of said rope are wound thereon, the rope of one of said rope-drums being wound thereon in a contrary direction to that of the other drum, a gig for carrying the ice being secured to the lower end of the rope attached to the first drum, and a weight, which overbalances said gig when the latter is empty, being attached to the lower end of the rope of the other drum, as and for the purpose herein specified.

2. The combination of a vertically-reciprocating gig, a rope-drum to which said gig is connected and whose heads are spaced at such distance apart as to admit between them only a single diameter of the rope which connects said drum with the gig, a spirally-grooved rope-drum having a gradual decrease of diameter toward the end where the terminal turns of the rope are wound, and a counteracting-weight connected by a rope to said spirally-grooved drum, said weight having a preponderance over said gig when the latter is in an unloaded condition, and being adapted to move always in a reciprocally-different direction to that in which said gig moves in, as and for the purpose herein specified.

3. In an apparatus for automatically lowering ice, the combination of upper feeding-chute, whereon the cakes of ice slide by their own gravity toward the discharge end of said chute, an automatic gate located at the discharge end of said chute, a gig which has a vertically-reciprocating movement, and which is fitted to automatically raise said gate when said gig is near the upper termination of its movement, a drum-shaft provided with rope-drums, as herein described, one of said drums having said gig connected thereto by a rope, and the other drum having a weight connected thereto by a rope which winds in a contrary direction to the gig-rope, said weight being adapted to normally retain said gig when unloaded at the highest point of its movement, as and for the purpose herein specified.

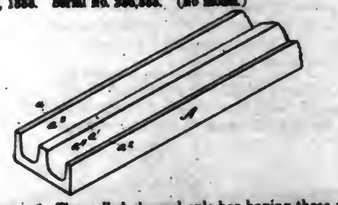
4. In an apparatus for automatically lowering ice, the combination of an upper feeding-chute, whereon the cakes of ice slide by their own gravity toward the discharge end of said chute, an automatic gate located at the discharge end of said chute, a gig having an outwardly and downwardly inclined bottom, said gig having a vertically-reciprocating movement and provided with means for automatically raising said gate of the feeding-chute, and a drum-shaft provided with rope-drums, as herein described, one of said drums having said gig connected thereto by means of a rope, and the other drum having a weight connected thereto by means of a rope which winds in a contrary direction to the gig-rope, and said weight being adapted to retain said gig when the latter is unloaded at the highest point of its movement, and said gig being provided at its discharging side with an automatic gate, which is fitted to engage with a fixture by which said gate will be opened near the termination of its lowest point of movement, said apparatus being so arranged that its operation will be entirely automatic so long as cakes of ice remain on the feeding-chute, as and for the purpose herein specified.

399,012. HEATER FOR ICE-ELEVATORS. JOHN H. BRIGGS, Coeymans, N. Y. Filed Oct. 19, 1888. Serial No. 288,532. (No model.)



Claim.—In an ice-elevator, the combination of the endless chains of the elevator, guideways for said endless chains provided with longitudinal channels in proximity to the path of said endless chains, and steam-pipes arranged in said channels, whereby ice is prevented from forming on said chains and guideways, as and for the purpose herein specified.

399,013. VEHICLE-AXLE. CHARLES B. BROWN, Chicago, Ill. Filed Oct. 1, 1888. Serial No. 286,883. (No model.)



Claim.—1. The rolled channel axle-bar having three webs extending from one end of the axle to the other, said webs being squeezed together at the ends of the bar to form tapering ends, said tapering ends uniting with the middle part of the axle on gradual curves without forming abrupt bends or shoulders, substantially as specified.

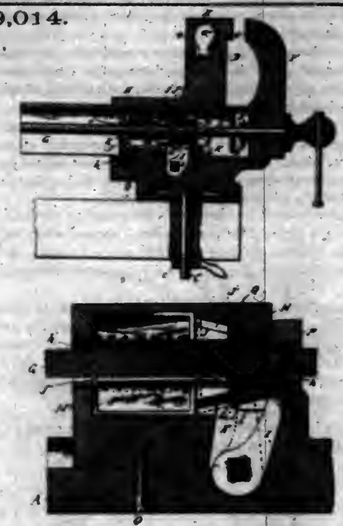
2. The combination, with an axle-bar having three parallel vertical webs squeezed together at the ends of the axle, of axle-skeins fitting upon the tapering ends of said axle-bar, said tapering ends uniting with the middle part of the axle on gradual curves without forming abrupt bends or shoulders, substantially as specified.

399,014. VISE. PERRY BROWN, Louisville, Ky., assignor to Daniel R. Doherty, same place. Filed June 12, 1888. Serial No. 276,736. (No model.)

Claim.—1. In a vise, and in combination with the screw thereof, a divided nut constructed, as described, so as to move in the direction of the length of the screw as the nut opens, substantially as described.

2. In a vise, and in combination with the screw thereof, a divided nut and means, as the thumb-lever i', rocking shaft i, finger I, and the inclined guides j', for opening said nut, substantially as described.

399,014.



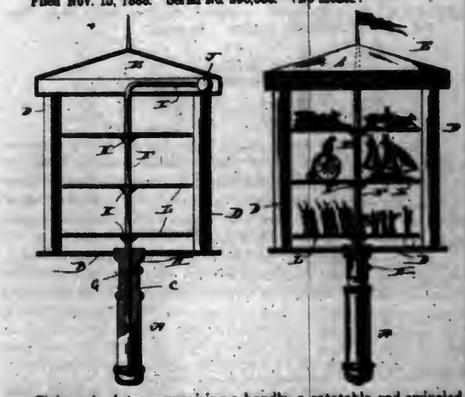
3. In a vise, and in combination with the screw thereof, the box J, having guides j', a tube working in the box, a spring operating on said tube, a divided nut working on said guides, a yoke embracing said nut, and vibrating finger operating said nut, substantially as described.

4. In a vise, and in combination with the screw and the movable and fixed sections of the vise, a box, H, secured in said fixed section, a second box inclosed in said box H and having guides j'', a divided nut whose sections travel on said guides, a yoke embracing said nut-sections, a tube acting on said yoke and nut-sections, a spring acting on said tube, and a vibrating finger operating on said yoke in opposition to the spring and tube, substantially as described.

5. The combination, with one of the sections of a vise having a ball-stud, of a movable jaw with a ball-socket formed therein and having its bottom curved, and a washer surrounding said ball-stud and provided with a curved face, substantially as described.

6. In a vise, and in combination with the screw thereof, a divided nut constructed, as described, so as to move on inclined guides set between the ends of the sections of the nut and a pair of inclines above and below the nut to hold them firmly against the action of the screw, substantially as described.

399,015. MECHANICAL TOY. JOSEPH P. BURFOOT, Mobile, Ala. Filed Nov. 15, 1888. Serial No. 290,888. (No model.)



Claim.—1. A toy comprising a handle, a rotatable rod swiveled in the handle, a series of disks secured to said rod and rotated thereby and having images secured upon their upper sides, and a weight secured to the rod independently of the disks, whereby when the handle is tilted the weight will fall and the rod be rotated, as set forth.

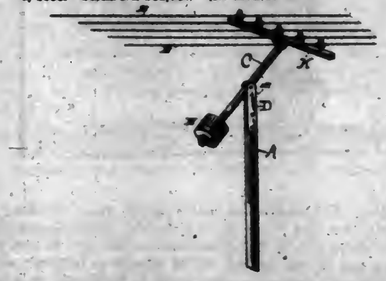
2. A toy comprising a handle, a rotatable rod swiveled in said handle, an arm extending laterally from the said rod, a weight secured to the end of said arm, and a series of disks secured to and rotated by the rod and having images secured on their upper sides, as set forth.

3. A toy comprising a handle, a roof supported by the handle, a rod mounted in the handle and having a ball connected to its upper end and adapted to move over the bottom plate of the roof, and the disks secured to the said rod and carrying figures, as set forth.

4. A toy comprising a handle, a rod mounted in said handle and having laterally-projecting tongues or offsets, disks secured to the handle and carrying figures, and a ball connected to the said rod to rotate the same, as set forth.

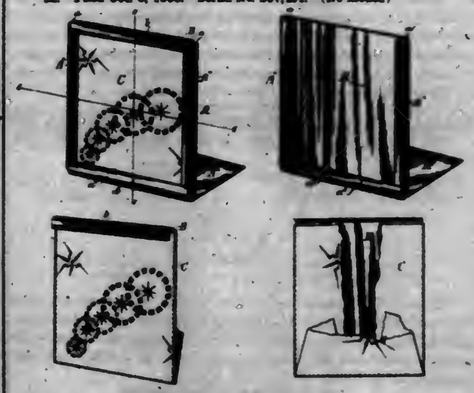
5. The improved toy herein described and shown, comprising the handle having a socket in its upper portion, the platform secured to the upper end of the handle, the columns erected on the platform, the roof supported by the columns, the rod having its lower end journaled in the socket in the handle and provided with an annular groove, and having its upper end bent to one side, the pin inserted transversely through the handle and engaging the annular groove of the said rod, the ball secured to the upper end of the said rod, and the disks secured to the said rod and carrying figures, as set forth.

399,016. STRETCHER FOR MECHANICAL-TELEPHONE-LINE WIRES. ALEXANDER W. BUTTERWORTH, New York, N. Y. Filed Aug 6, 1888. Serial No. 282,047. (No model.)



Claim.—A tension device for overhead wires, consisting of a main support, as a pole, a lever pivoted upon the pole, a bridge-piece for carrying the wire attached to one end of the lever, and an adjustable counter-weight on the opposite end of the lever, substantially as set forth.

399,017. SAMPLE-HOLDER. WILLIAM A. CAMPBELL, Hyde Park, Ill. Filed Oct. 6, 1888. Serial No. 287,431. (No model.)



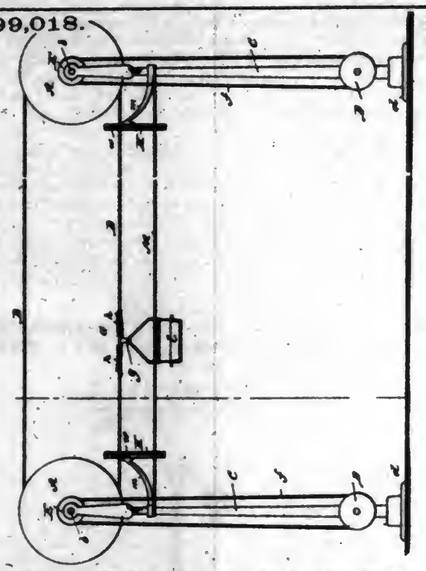
Claim.—1. A holder for samples, comprising a frame provided with a horizontal plate or wing for supporting the frame in the vertical position and with guide-grooves, and a sample-holding plate adapted for insertion in said guide-grooves, substantially as described.

2. A holder for samples, comprising a frame provided with a horizontal plate or wing for supporting the same in a vertical position and with guide-grooves upon three of its sides, and a sample-holding plate adapted for insertion in said grooves and provided with a flange on one of its margins, substantially as described.

3. A holder for samples, consisting of a vertical frame provided with a horizontal part or wing, said frame consisting of a piece of sheet metal bent inwardly at its opposite edges to form two guide-grooves, and the wing consisting of a second piece of metal bent upwardly at its front edge and secured to the piece of sheet metal forming the frame, and a metal plate adapted for insertion into the guide-grooves of the frame, substantially as described.

399,018. CASH AND PARCEL CARRIER. EDSON P. CLARK and ADDO T. CROMLEY, Northampton, Mass. Filed June 6, 1888. Serial No. 276,341. (No model.)

399,018.



Claim.—1. The combination, with a pair of wheels or rollers, A A, and the endless cord B thereon, of a frictional saddle consisting of a length of spring-wire by its intermediate portion bent to form an eye or loop and its end portions wound spirally to form the coils A A, said coils being disposed at slight angles to each other, whereby four points of yielding contact upon the cord are insured, and a carrying device suspended from the said eye-loop, substantially as and for the purpose described.

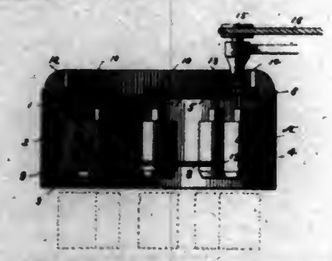
2. In combination, the standards C C, provided with the wheels and sheaves A E at one end and the sheaves D at the other, the hand-belts *f f* around said sheaves, the endless cord B on said wheels A, the brackets *m m*, supported on said standards, and the abutment-guards H H on said brackets, standing in planes across the travel of said endless cord and provided with apertures to permit the travel of said cord therethrough, and a frictional saddle mounted on said endless cord, and an article-carrying appliance supported from said saddle, all substantially as and for the purpose described.

399,019. PROCESS OF ELECTRIC WELDING. CHARLES L. COFFIN, Detroit, Mich. Filed Sept. 18, 1888. Serial No. 285,740. (No specimens.)



Claim.—The process herein described of welding two articles together, which consists in placing the two articles against each other and welding the joint by simultaneously traversing such joint by an electric current and subjecting it to the action of a voltaic arc, substantially as set forth.

399,020. CAN-SOLDERING MACHINE. JOHN M. COLBERT, Manton assignor to James H. Ferguson and Frank Ferguson, Bridgeton, N. J. Filed Jan. 22, 1889. Serial No. 297,191. (No model.)



Claim.—1. A head for a can-soldering machine, consisting of a case or frame, a series of spindles supported therein and provided with soldering-irons and pinions, and a driving-wheel gearing with all the said pinions, substantially as set forth.

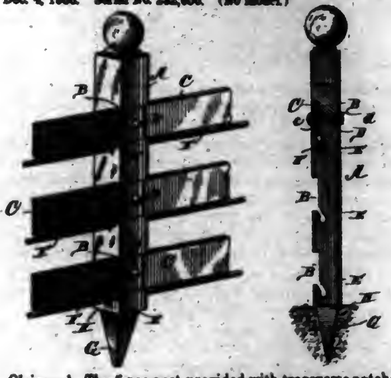
2. The combination, in a head of a can-soldering machine, of a support for a series of vertical spindles arranged in a circle and each provided with a pinion and a soldering-iron, and a driving-wheel gearing with all of said pinions, substantially as set forth.

3. The combination of a frame or case having bearings for a series of spindles arranged in a circle and each capable of moving vertically in its bearings, a pinion, and a soldering-iron carried by each spindle, and a driving-wheel gearing with all of the pinions and greater in depth than the latter, substantially as set forth.

4. The combination, in a head of a can-soldering machine, of a case supporting a series of vertical spindles, a series of soldering-irons carried by the spindles, the case extending below the irons, and pinions upon the spindles gearing with the driving-wheel, substantially as set forth.

5. The combination of a case provided with a perforated top and bottom, a series of vertical spindles extending through the perforations in the top and each provided with a pinion at its upper end gearing with a driving-wheel, and a series of soldering-irons carried by the spindles and each extending through one of the perforations in the bottom of the case, substantially as set forth.

399,021. FENCE-POST. THOMAS DAILEY, Jackson, Mich. Filed Dec. 4, 1888. Serial No. 292,656. (No model.)



Claim.—1. The fence-post provided with transverse notches B B, and grooves E E at the lower inner angles of the said notches, in combination with the wires fitting in the said grooves, and the rails or boards fitting in the notches and held in place by bolts passing through the posts, substantially as specified.

2. A fence-post provided in one side with shallow rail-notches B B, and having grooves *g g* inclining downwardly and inwardly from the inner lower angles of the said notches, substantially as specified.

399,022. GAS-STOVE. ALFRED S. DUNMORE, Boston, Mass. Filed Feb. 16, 1888. Serial No. 264,265. (No model.)



Claim.—1. The combination of a heating-drum of a gas-stove with a two-part top, one part of which is seated upon and closes the end of the drum, and is provided with an opening and movable cover therefor, the other part of which top is supported a short distance above the first-mentioned part, with a space between said parts open to the outside air, substantially as and for the purpose described.

2. The combination of the heating-drum of the gas-stove with a two-part top, one part being fastened upon and closing the end of the drum and being provided with a central opening, and the other part being provided with feet that rest upon the first-mentioned part, a bolt fastening the said parts together, with a space open to the outside air between them, and a cover for the opening of the under part movable on and guided by the said bolt, substantially as described.

399,023. PROCESS OF MAKING ALLOYS OF CHROME, IRON, AND MANGANESE. HENRICH EICKARDT, Dortmund, Prussia, Germany. Filed Jan. 8, 1889. Serial No. 296,756. (No specimens.) Patented in Germany Jan. 31, 1888, No. 44,896; in England Sept. 24, 1888, No. 13,742, and in Belgium Sept. 29, 1888, No. 82,166.

Claim.—1. The herein-described process of producing alloys of chrome, iron, and manganese, which consists in mixing chrome ore with the slag of the acid Bessemer process and subjecting the mixture to the reduction process, substantially as set forth.

2. The process herein described of producing alloys of chrome, iron, and manganese, which consists in mixing ores of chrome and manganese with the slag of the acid Bessemer process, and subjecting the mixture to a reduction process, substantially as set forth.

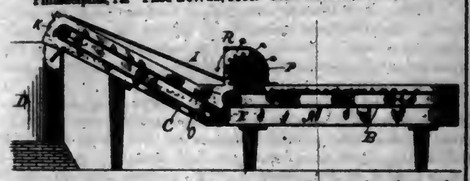
3. The herein-described process of producing alloys of chrome, iron, and manganese, which consists in mixing the chromium ore, manganese ore, and the slag of the acid Bessemer process in finely-ground state with tar freed of water, and reducing the pasty mass in the form of briquettes in a blast or reverberatory furnace, substantially as set forth.

399,024. PLATE-HOLDER. WILLIAM C. RUSH, Ashland, Pa. Filed Mar. 15, 1888. Serial No. 267,280. (No model.)



Claim.—In a plate-holder, the combination of the vertical post A, stationarily secured to a base, a block, *b*, adjustably mounted on the post A, having an integral stationary jaw formed with an upward and downward bend, a movable jaw pivoted to the elbow of the said stationary jaw, and a clamping-screw passing through the ends of the two jaws, substantially as described.

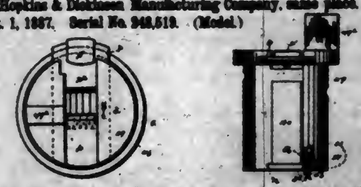
399,025. CLAY PULVERIZER AND CONVEYER. JAMES EVANS, Philadelphia, Pa. Filed Nov. 22, 1888. Serial No. 291,583. (No model.)



Claim.—1. A device for disintegrating and conveying clay to the machine, an endless belt or carrier, and a spiked drum located over said carrier to disintegrate the clay on said carrier as it passes to the machine.

2. A device for disintegrating and conveying clay from the pit to the machine, a horizontal traveling belt or carrier, a disintegrating device located over and adapted to pulverize the clay on said carrier, and an inclined carrier for conveying the clay upward into the machine, as set forth.

399,026. LOCK. WILLIAM S. PIKE, Brooklyn, N. Y., assignor to the Hopkins & Dickinson Manufacturing Company, same place. Filed Sept. 1, 1887. Serial No. 248,513. (Model.)



Claim.—1. In a cylinder-lock, the combination, with the cylinder-case, having the opening 47, and the revolving plug, of the slotted sliding plate, the lug thereon, and the tumblers engaging a slot in said plate, the said plate adapted to operate against the eccentric flange of a mortise-lock, substantially as specified.

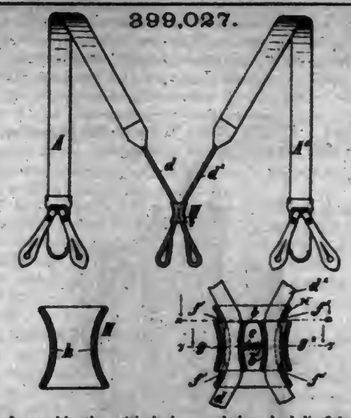
2. In a cylinder-lock, the combination, with the case and the revolving plug, of the slotted plate seated in bevel grooves in the plug and having the key-slot, and the tumblers having the actuating-springs, substantially as specified.

3. The combination, with the cylinder-case having the central opening provided with a radially-disposed slot, of the revolving plug provided with the shouldered spring-pressed locking-pin supported in a seat therein and normally engaging said slot, the shouldered tumblers K, K', K², K³, and K⁴ and their actuating-springs, the removable piece 150, the slotted plate having its slot registering with the radially-disposed slot in the cylinder-case, the projecting slotted sliding plate, and the projecting arm 49², substantially as specified.

399,027. BRACES OR SUSPENDERS. SIGISMUND FRANK, Hamburg, Germany. Filed Nov. 10, 1888. Serial No. 290,408. (No model.)

Claim.—1. As an improvement in suspenders having end cords, the collar or slide and the laterally-movable dies for clamping said end cords, substantially as set forth.

399,027.



2. In combination with the loop-ended cords *d d'* of the shoulder-straps A A', a collar or slide, H, provided with a pair of laterally-movable dies, *b g* and *b' g'*, and spring *c*, substantially as and for the purpose set forth.

399,028. PROCESS OF RECOVERING GLYCERINE FROM SPENT SOAP-LYES. ARTHUR W. TRENOR, Brooklyn, N. Y., assignor to Joseph Bates, same place. Filed Dec. 12, 1888. Serial No. 293,373. (No specimens.)

Claim.—1. In the process of extracting glycerine from spent soap-lye, the improvement which consists in adding to the lye rennet solution for coagulating and precipitating albuminous matter and fatty acids contained in said lye, substantially as described.

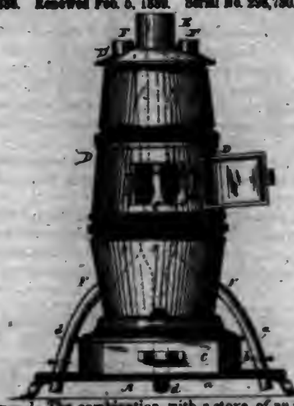
2. In the process of extracting glycerine from spent soap-lye, the improvement which consists in adding to the lye a rennet solution in acid, and afterward adding an acid to complete the precipitation of the albuminous matter and of the fatty and resinous acids contained in the lye, as specified.

399,029. ART OF DECORATING POTTERY-WARE. LAURA A. FRY, Camp Dennison, Ohio. Filed Mar. 16, 1888. Serial No. 186,404. (Specimens.)

Claim.—1. The improvement in the art of decorating articles of clay-ware, which consists in blowing an atomized spray or cloud of coloring-matter upon the surface thereof, and thereafter fixing the same by firing, substantially in manner as described.

2. The improvement in the art of decorating clay-ware, which consists in heating the surface and blowing upon the heated surface an atomized spray or cloud of coloring-matter, and thereafter fixing the same by firing, substantially in manner as described.

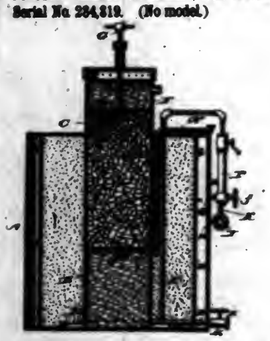
399,030. STOVE. NANCY J. GRAHAM, Jackson, Ohio. Filed Feb. 26, 1888. Renewed Feb. 5, 1889. Serial No. 298,730. (No model.)



Claim.—1. The combination, with a stove, of an annular series of air-heating tubes having contracted upper and lower ends, and bulging intermediate portions arranged in the combustion-chamber to form a centrally contracted space for the ascent of the products of combustion, the pipes *d*, leading through the stove-hearth and through the wall of the stove and communicating with the lower ends of said tubes, and a series of upwardly-flaring pipes connected to the upper ends of said tubes and leading out of the stove through its top, substantially as described.

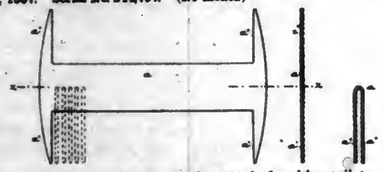
2. The combination of a stove, a concentric series of air-heating tubes having bulging portions in the combustion-chamber thereof, each tube having an air-supply pipe provided with a damper, and a concentric series of upwardly-flaring pipes leading out of the top of the stove around the outlet E, substantially as described.

399,031. FILTER. HENRY W. GRELLE, New Orleans, La. Filed Sept. 7, 1888. Serial No. 284,819. (No model.)



Claim.—The combination, with the outer casing, A, of the sand-chamber B, arranged therein and having perforations near its upper end, as shown, to communicate with the chamber *a*, the gravel-chamber C, arranged centrally in the sand-chamber and having at its lower end the water-chamber E and at its opposite or upper end a pure-water chamber, F, the said gravel-chamber having a perforated bottom, D, and a removable perforated top carrying a pressure-screw, F, which has a bearing in the top of the pure-water chamber, the perforated pipe L, arranged in the sand-chamber and concentric to the water-chamber E, valved pipes leading from said chamber, the pipe N, leading from the upper portion of the water-chamber E and provided with cocks, the pipe H, provided with the valve and communicating with the chamber *a*, the pipe K, leading from the pipe H and communicating with the perforated pipe in the said chamber, the pipe Q, provided with valves and connecting a pipe, K, with the chamber *a*, and the air-pipe P, also connected with the chamber *a*, substantially as specified.

399,032. COMB. HENRY G. GUILD, New York, N. Y. Filed July 20, 1887. Serial No. 244,797. (No model.)

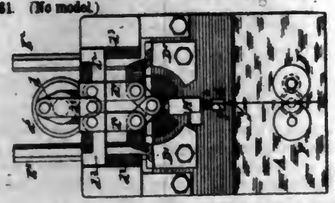


Claim.—1. The herein-described method of making toilet-combs, which consists in first forming the blank for the head of the comb of sheet metal with integral prongs $a^{\times}$ $a^{\times}$, then applying a film of solder to the one face of each of said prongs, then placing the metal teeth of the comb between the plies of the head and subjecting the whole to pressure, as described, then heating the comb until the solder melts, and then cooling it, substantially as set forth.

2. A comb having its head and guard-teeth formed of two thicknesses or plies of sheet metal of like form, placed face to face and soldered together, substantially as set forth.

3. A comb having its head and guard-teeth formed of a sheet-metal blank comprising the body *a* and four prongs, $a^{\times}$ $a^{\times}$, said blank being folded along the line *x*, and the prongs $a^{\times}$ $a^{\times}$ thus brought face to face in pairs united by solder to form the guard-teeth $b^{\times}$, substantially as set forth.

399,033. MACHINE FOR MAKING SHEET-METAL HINGES. WILLIAM HAAS, Brooklyn, N. Y. Filed Aug. 23, 1888. Serial No. 283,561. (No model.)



Claim.—1. The combination of upright feed-boxes, horizontally-reciprocating pushers at the lower end of said feed-boxes, oscillating jaws, feed-rollers for the pintle-wire, a reciprocating pintle-cutter, an eye for guiding the pintle from the cutter into the partly-closed pintle-sleeves, and a reciprocating sleeve-closing jaw, substantially as set forth.

2. The combination of upright feed-boxes, reciprocating pushers guided in ways below the feed-boxes, fixed stops in front of said feed-boxes, and oscillating bending-jaws moving at right angles to the pushers and jaws, substantially as set forth.

3. The combination, with oscillating jaws, of arc-shaped guide-cheeks for said jaws, wire-feeding rollers, a reciprocating pintle-cutter, a fixed eye above the same for guiding the cut-off pintle, and a reciprocating sleeve-closing jaw, substantially as set forth.

4. The combination of oscillating bending-jaws, arc-shaped guide-cheeks for said jaws, a shoulder intermediately between said cheeks, intermittently-rotating wire-feed rollers, a reciprocating pintle-cutter having an opening for the wire, a guide-eye above the cutter, and a reciprocating sleeve-closing jaw, substantially as set forth.

5. The combination of a rotary crank-shaft, a connecting pivot-link, a vertically-guided cross-piece, angular oscillating sleeve-bending jaws applied to a fixed pivot, and parallel pivot-links connecting said cross-piece and jaws, so as to impart oscillating motion to the jaw, substantially as set forth.

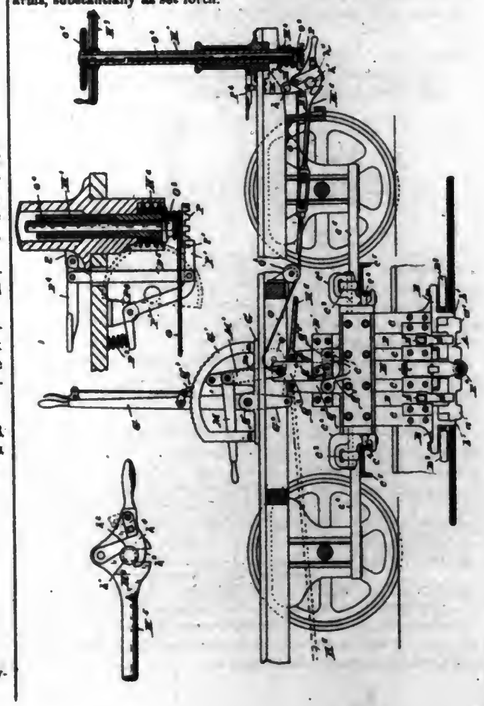
6. The combination of intermittently-rotating grooved wire-feed rolls, a fixed cheek for guiding the wire, a horizontally-reciprocating cutter having an opening for the wire, a fixed eye above the cutter, and a horizontally-reciprocating sleeve-closing jaw, substantially as set forth.

399,034. CABLE-GRIP. WORCESTER HADDOCK, Cincinnati, Ohio. Filed June 9, 1888. Serial No. 276,599. (No model.)

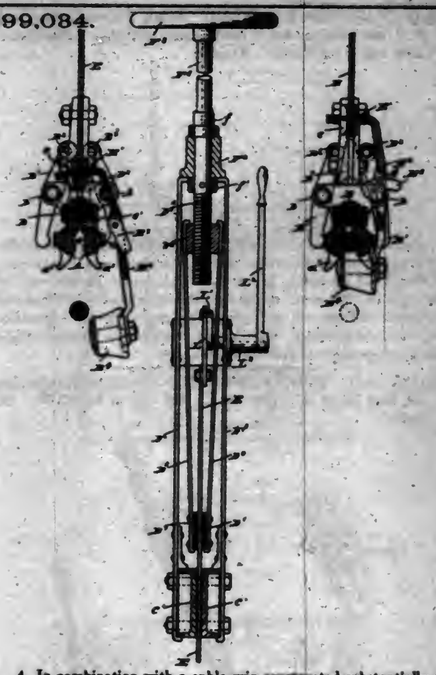
Claim.—1. A cable-grip consisting of two hinged or pivoted jaws having outwardly-flared extensions for guiding the cable into said jaws, in combination with the pawl-arm mechanism for closing the jaws and suitable mechanism for operating said pawl-arms, for the purposes set forth.

2. In combination with a cable-grip, a cable-lifting device consisting of a suitable arm having a sheave pivoted at its lower end portion, said arm being provided with a suitable cam for throwing the lifting-sheave from beneath the cable, and mechanism, substantially as set forth, for raising and lowering said arm independent of the grip.

3. A cable-grip consisting of two hinged or pivoted jaws attached to a suitable hanger-bar, as B, said bar being attached to and suspended from the cross-bars C by means of bars C, in combination with the grip-bars D, having wedge-shaped lugs D^3, pawl-arms B', pivoted to said hanger-bar B, the jaws of the grip being closed by raising said bars D through the medium of said wedge-shaped lugs and pawl-arms, substantially as set forth.



399,034.



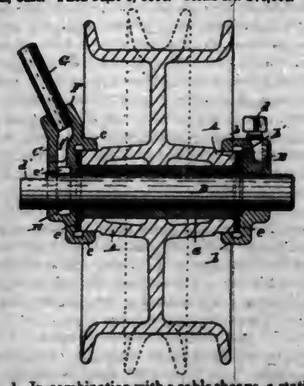
4. In combination with a cable-grip constructed substantially as set forth, a cable-lifting device consisting of a suitable sheave, E^4, attached to an arm, as E^3, said arm being attached to the bar E in an opening, E', therein, and having a suitable cam, E^5, pivoted near the center thereof, and suitable mechanism for raising and lowering said bar.

5. In combination with a cable-grip constructed substantially as set forth, the connection between the car and grip, consisting of the yokes C^2, attached to cross-bars C', and having the rollers C^3 and C^4 pivoted therein in a vertical and horizontal position, respectively, said rollers bearing upon and against the top and sides of the channel-bars C^5, made fast to the frame of the car, substantially as set forth.

6. The jaws A, having projections *a'*, said jaws being pivoted or hinged to the hanger-bar B, bars C, cross-bars C', grip-bars D D, having the wedge-shaped lugs D^3, and pawl-arms B', having the rollers B^2 pivoted in one end thereof, in combination with lifting-bar E, arm E^3, having the cam pivoted therein, and the sheave E^4 and suitable mechanism for raising and lowering the grip-bars D D and lifting-bar E, substantially as set forth.

7. In combination with a cable-lifting device constructed substantially as set forth, the bar E, pivoted to link L, said link being pivoted at its other end to the crank-arm L', the latter having a suitable lever attached thereto, substantially as set forth.

399,035. CABLE-RAILROAD SHEAVE. WORCESTER HADDOCK, Cincinnati, Ohio. Filed June 9, 1888. Serial No. 276,600. (No model.)



Claim.—1. In combination with a cable sheave, a stationary shaft having a longitudinal oil-reservoir in its under or lower face, the collars B and C, attached to said shaft, the collar B, having an air-vent therein, and the collar C, constructed, substantially as described, for admitting oil to said reservoir in the shaft, and suitable means for supporting said shaft to the conduit.

2. In combination with a cable sheave, the shaft D, having the oil-reservoir E therein, collars B and C, set-screws *d d*, for attaching said collars to the shaft, washers *c c*, interposed between said collars and the ends of the hub, and suitable means for attaching said shaft to the conduit, substantially as set forth.

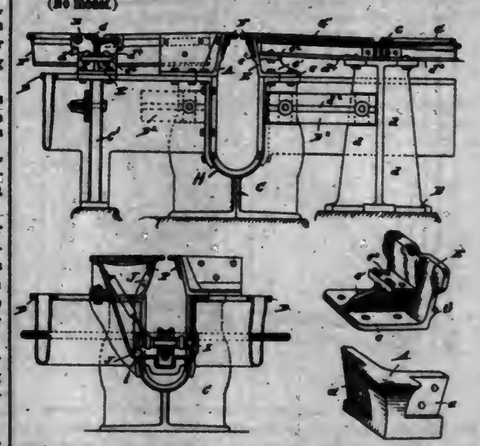
3. In combination with a cable sheave, the shaft D, having a longitudinal oil-reservoir therein, collars B and C, having overlapping flanges *b* and *c*, respectively encircling the end portions of the hub A, the collar B, having an air-vent therein, and the collar C, having an annular recess, *c'*, on its inner portion, and lug F, cast with said collar C, and having an opening, *f'*, leading to said recess *c'*, substantially as set forth.

4. In combination with a cable sheave, the shaft D, having a longitudinal recess therein, collar B, having an air-vent, *b'*, and suitable means for connecting said collar to the shaft, collar C, having the annular recess *c'* therein, lug F, having opening *f'*, said lug being cast with said collar C, pipe G, inserted or attached to said lug, and having a suitable cover, *g*, and suitable means for connecting the shaft to the conduit, as and for the purposes set forth.

5. In combination with a cable sheave, shaft D, having an oil-reservoir, E, collar B, having an air-vent, *b'*, collar C, having annular recess *c'*, and lug F, cast thereto, set-screws *d*, washers *c c*, pipe G, and suitable means for securing said shaft in the conduit in a non-rotatable position, substantially as set forth.

6. In combination with a cable sheave, a shaft, and oiling attachments constructed, substantially as set forth, the journal-boxes H and I, formed with the walls of the conduit, and key *i*, inserted into the journal-box I over the flat portion *d'* of the shaft, substantially as set forth.

399,036. CROSSING FOR CABLE RAILWAYS. WORCESTER HADDOCK, Cincinnati, Ohio. Filed July 2, 1888. Serial No. 278,050. (No model.)



Claim.—1. In a crossing for cable railways, the corner pieces or castings, A, bolted or suitably secured to the top intersecting flanges of the conduits, said castings having the rabbeted portions *a* in their inner faces corresponding in configuration to the slot-rails to be secured therein, substantially as set forth.

2. In a crossing for cable railways, the corner castings, A, secured to the top intersecting flanges of the conduits, said castings having their inner faces rabbeted to receive varying configurations of slot-rails, in combination with said slot-rails, and suitable brackets, as E, secured to the top flanges, B, of the conduits, said brackets being adapted to retain the slot and tram-rails in their relative positions on the conduits, substantially as set forth.

3. In a crossing for cable railways, suitable pedestals constructed, substantially as described, for supporting the intersection of the tram-rails, said pedestals being located at right angles to the two lines of cables, substantially as set forth.

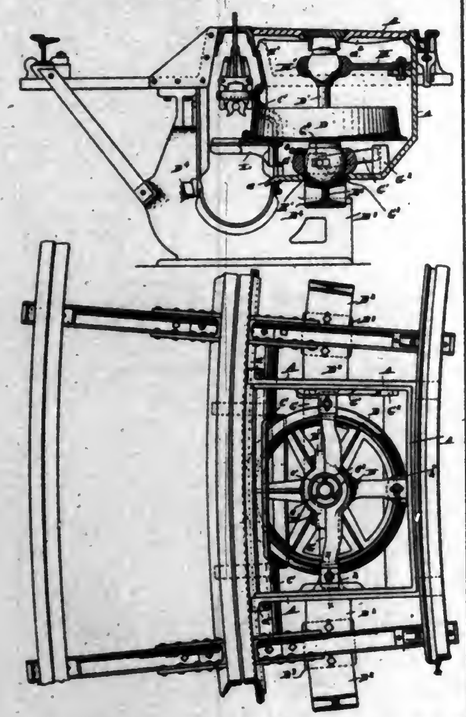
4. In combination with a cable-crossing constructed substantially as set forth, the pedestals having an octagonal base, D, supporting-ribs *d*, top extensions, D', and lugs d^3, the intersecting tram-rails resting on said extensions between said lugs, said pedestals being connected to the yokes of the conduits by suitable stay-bars, D^2, substantially as set forth.

5. In a cable-railway crossing, the brackets E, having a base, *e*, supporting-rib *e'*, platform *e²*, and hooked lug *e³*, the ends of the tram-rails resting upon said platform, and the slot-rails resting in said lug, substantially as set forth.

6. In combination with a crossing for cable railways constructed substantially as set forth, the two depression-sheaves P P, for lowering one cable below the cable traveling at an angle thereto, substantially as set forth.

7. In combination with a cable-crossing, the two depression-sheaves P P, adapted to rotate upon suitable shafts, one end of said shafts resting in a journal, I, in one side of the conduit-wall, the other end of said shafts being pivoted in a lever-arm, J, said arm resting in a shoulder, *i*, at bottom and detachably connected at top to the slot-rail or other suitable portion of the conduit, substantially as set forth.

399,037. CABLE-CONDUIT CURVE. WORCESTER HADDOCK, Cincinnati, Ohio. Filed July 23, 1888. Serial No. 280,837. (No model.)



Claim.—1. In a cable-railway-curve construction, a series of sheave-boxes detachly connected to the slot-rails on the inner side of the curve, a space intervening between said boxes, said boxes being supported by a suitable connecting-bar resting upon extensions of the conduit-yokes, and a sheave suitably supported in said boxes in a horizontal position, the periphery of said sheaves projecting into the conduit through an opening in the side plate thereof, substantially as set forth.

2. In the construction of a cable-conduit curve, the sheave-box A, sheave D, shaft D', and ball journal-bearings E and E', in which the shaft rotates, the lower journal-bearing resting in a circular recess in the bar G, the top journal-bearing being secured to place in the box by means of the brace H and clamp H', substantially as set forth.

3. The construction herein shown and described for supporting and adjusting the sheave, consisting of the ball journal-bearings E and E', the journal-bearing E being secured in place on the shaft by a spider-shaped brace, H, and cap H', the journal-bearing E' resting in the circular recess G^3 in lever-bar G, said bar being pivoted at one end to suitable lugs in the box, the other end of said bar having the hand-lever G' pivoted thereto, substantially as set forth.

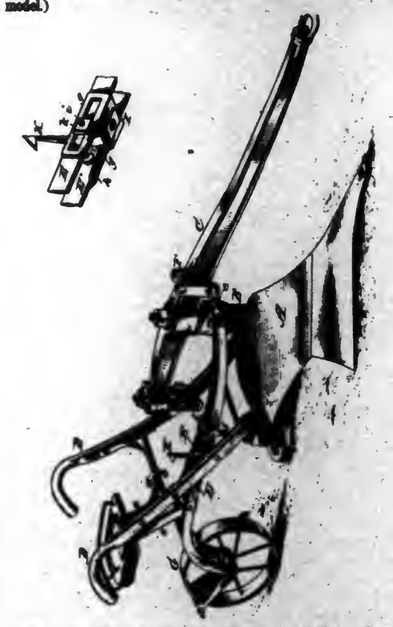
4. In combination with one or more sheaves mounted in boxes secured at one side of a cable-curve, the side plate, C, having the sheave-opening C^2 and drain-opening C^4, said plate being suitably connected to the yokes of the conduit, substantially as set forth.

399,038. CARPET-FASTENER. THOMAS D. HAMMOND, Syracuse, N. Y., assignor of one-half to Ellen J. Keller, same place. Filed June 7, 1888. Serial No. 276,342. (No model.)



Claim.—The within-described carpet-fastener, composed of the base *a*, post *b* at one end of said base and terminating in the rearward and downward projecting jaw *c*, the spring-plate *d*, placed over the base *a*, parallel therewith, and having its heel secured to said base and its opposite and free end under the jaw *c*, and the lever *f*, pivoted to the post *b*, and provided with the cam *e* under the free end of the plate *d*, substantially as described and shown.

399,039. RIDING ATTACHMENT FOR PLOWS. CHARLES HARSON, Rock Island, Ill. Filed Aug. 15, 1888. Serial No. 282,796. (No model.)



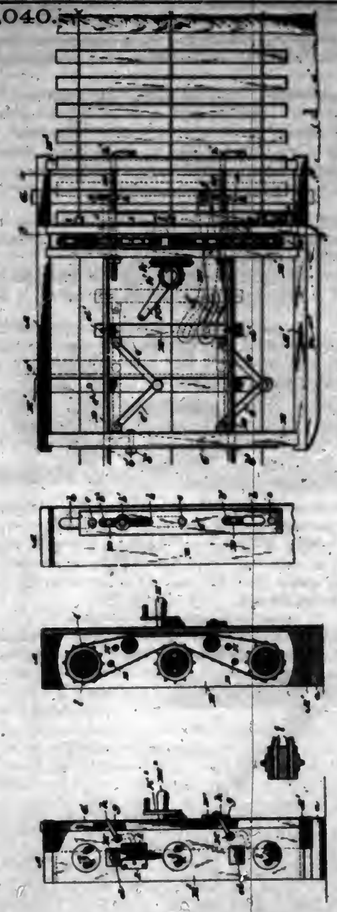
Claim.—1. The combination, with the hand-plow, of an adjustable clip on the beam of said plow, a lateral jointed bolt projecting from said clip, and the riding attachment consisting of the beams E, secured together at their forward ends and having a hole to receive one portion of said bolt, substantially as shown and described.

2. The combination, with the plow, of the riding attachment consisting of two beams, E, secured together at their forward ends and connected to the plow-beam by a pivotal connection and gradually separated toward their rear ends, the wheel G between the rear ends of the beams, and the guard *d*, connected to the beams and extending over the rim of said wheel, substantially as shown and described.

3. The combination, with the plow, of the beams E, secured together at their forward ends and to the plow-beam, the bracket I secured to the beams and having slotted sides *g* and tongues *h*, the bolt *i*, passed through holes in the beams and through the slots in said sides *g*, and the nut *k* on the threaded end of said bolt, substantially as described.

4. The combination, with the plow, of the beams E, secured together at their forward ends and to the plow-beam, the bracket I, secured to the beams and having slotted sides *g* and tongues *h*, the bolt *i*, passed through holes in the beams and through slots in said sides *g*, the nut *k* on the end of said bolt, and the spring-catch K, attached to said bracket and extending between the beams, substantially as and for the purpose specified.

399,040. FENCE-MAKING MACHINE. WALLACE A. HAWLEY, Napoleon, Mich. Filed Jan. 2, 1889. Serial No. 295,163. (No model.)



Claim.—1. In a fence-machine, the combination of the horizontally-supported rods D D, connected to each other to move in unison by a connecting-bar, a lever engaging with said connecting-bar so as to operate a vertically-moving bar to which rock-shafts are connected, the outer ends of said rock-shafts being provided with hooks, substantially as shown, and for the purpose set forth.

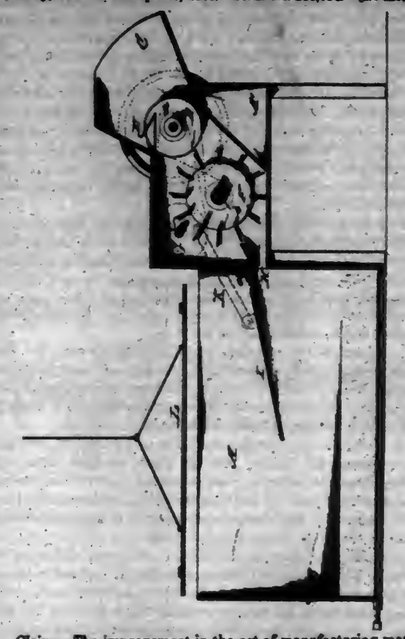
2. The combination, in a fence-machine constructed substantially as shown, of the parallel rods D D, connected to each other by a bar, E, which is adjustable thereon, a vertically-moving bar, E', provided with links *c* and *d*, and a pivoted lever having one end slotted for engagement with the bar E, said lever being secured to a vertically-moving bar, G, with which projecting members of the rock-shafts H H engage, the ends of said rock-shafts being bent to form hooks or locks, substantially as shown, and for the purpose set forth.

3. The combination, substantially as described, of the supporting-frame, the horizontal bars D D, the coupling-bar rigidly secured thereto, the toggle-arms connected at their ends to the frame and coupling-bar, and centrally to a bar, E', adapted to slide in vertical guides on the frame, and an adjustable stop, e^4, secured to said bar E' to limit the forward movement of bars D D.

4. The combination, substantially as described, of the twister-frame, the hooked rock-shafts journaled in said frame and threaded at their inner ends, arms secured to said rock-shafts, a vertically-moving bar provided with openings to engage said arms, and nuts engaging the threaded ends of the rock-shafts to regulate the distance of the hooks from the face of the frame.

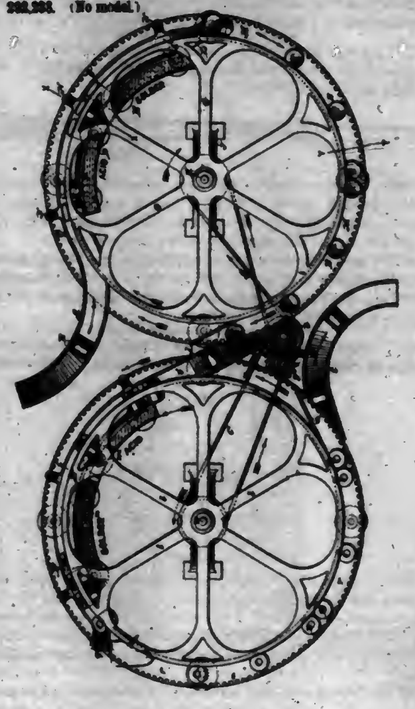
5. In a fence-machine constructed substantially as shown, the combination, with the horizontally-moving bars D D, having heads, of a connecting-bar adjustably secured to said rods and provided with an outwardly-projecting pin which passes through a curved slot in a pivoted lever, F, the opposite end of said lever engaging with a vertically-moving bar for operating the rock-shafts H, so as to throw, when the bars D D are projected, the bent ends of the rock-shafts beyond the frame to engage with a picket, substantially as set forth.

399,041. METHOD OF MAKING MATTRESSES. DANIEL HAYES, Sealy, Tex. Filed Sept. 20, 1888. Serial No. 286,784. (No model.)



Claim.—The improvement in the art of manufacturing mattresses, which consists in first disintegrating the material and simultaneously forcing the same into a suitable receptacle, fanning said material as it passes into the receptacle, and finally compressing the same, substantially as described, thereby dispensing with tacking of the bat, as set forth.

399,042. CAN-SOLDERING MACHINE. WILLIAM HIPPERLING, New York, N. Y., assignor to Stephen A. Glass, Plainfield, N. J., and Richard A. Donaldson, Brooklyn, N. Y. Filed Nov. 30, 1888. Serial No. 292,262. (No model.)



Claim.—1. In a machine for soldering the heads upon tin cans, the inclined table upon which the cans are moved through the acid and solder baths and the rotating frame or wheel for moving said cans, combined with the acid and solder receptacles and the rotating frame for receiving the cans from said receptacles and conveying them to a point of delivery, substantially as and for the purposes set forth.

2. In a machine for soldering the heads upon tin cans, the inclined table upon which the cans are moved through the acid and solder baths and the rotating frame or wheel for moving said cans, combined with the acid and solder receptacles mounted upon vertically-adjustable standards and the rotating frame for receiving the cans from said receptacles, also mounted upon vertically-adjustable standards, substantially as set forth.

3. In a machine for soldering the heads upon tin cans, the acid and solder receptacles arranged in the arc of a circle, the inclined table on which the cans move, and the rotating frame or wheel for moving said cans, combined with the rotating frame for receiving the cans from said receptacles and having a toothed periphery, gearing for engaging said periphery, and a stationary frame for supporting said toothed frame, substantially as set forth.

4. In a machine for soldering the heads upon tin cans, the acid and solder receptacles, the inclined table on which said cans move, and the rotating frame or wheel for moving the cans, combined with the rotating toothed frame M, having groove *d*, the stationary frame *f*, having groove *e*, and the rollers *g*, substantially as set forth.

5. In a machine for soldering the heads on tin cans, the acid and solder receptacles, the inclined table on which the cans move, and the rotating frame or wheel G, having pivoted fingers F for moving the cans, combined with the rotating frame for receiving the cans from said receptacles and transmitting them to a point of delivery, substantially as and for the purposes set forth.

6. A machine for soldering the heads on tin cans, embracing in duplicate the acid and solder bath receptacles, the inclined table on which the cans move, the rotating frame or wheel for moving the cans along said receptacles, and the rotating frame for receiving the cans after leaving said receptacles, combined with means, substantially as described, for reversing the position of the cans between the times of their treatment by the duplicate parts of the machine, so as to present one head of the can to one part and the other head to the other part, substantially as set forth.

7. A machine for soldering the heads on tin cans, having duplicate parts, each embracing the following elements: the acid and solder receptacles, the rotating frame for carrying the cans through said receptacles, and the rotating frame for receiving the cans from said receptacles, combined with feed and delivery chutes for the cans and a table for receiving the cans from one of said duplicate parts and delivering them to the other of said parts, substantially as set forth.

399,043. PEN-HOLDER. LOUIS HOLSWORTH, New York, N. Y., assignor to the Eagle Pencil Company, same place. Filed Dec. 3, 1888. Serial No. 292,467. (No model.)



Claim.—1. A pen-holder consisting, essentially, of the external or main barrel, B, and a plurality of curved sheet-metal strips or tongues, C, nested and secured within said barrel concentrically with one another, as and for the purpose shown and described.

2. The pen holder and handle consisting of the external barrel, B, and the tongues C, provided with tubular inner ends, C', nested within the barrel and around the tenon of the handle A, as and for the purpose set forth.

399,044. DEVICE FOR CLEANING WELLS. JAMES F. HUDSON, Cheyenne Wells, Colo. Filed Sept. 10, 1888. Serial No. 285,089. (Model.)



Claim.—1. In a well-cleaner, the combination of a central bottom piece with the folding sides, which are loosely connected thereto, rods connected to these sides, a rod connected to the central bottom piece, and a sliding sleeve placed upon the central rod, and to which the connecting-rods are attached at their inner ends, substantially as shown.

2. The combination, in a well-cleaner, of a central bottom piece having an elevating-rod connected thereto, with the side and corner pieces, rods for closing or raising the side and end pieces, and a sliding sleeve which is placed upon the elevating-rod, substantially as described.

3. In a well-cleaner, the combination of the bottom piece, A, having an elevating-rod connected thereto, the folding side pieces connected to the edges of the pieces A, the folding corner-pieces, which unite the ends of the sides together, the sliding sleeve placed upon the elevating-rod, and the rods which connect the folding sides to the lower end of the sleeve, substantially as set forth.

399,045. PAVEMENT. BEN W. HUNTER, Washington, D. C., assignor of four-fifths to Clement W. Howard, same place. Filed Mar. 23, 1888. Serial No. 268,281. (No specimens.)

Claim.—A paving composition consisting of sand and grits, fibrous rock, a fixed oil, rosin, coal-tar, and asphalt, substantially in the proportions specified.

399,046. SPINDLE FOR SPINNING-MACHINES. DAVID JACKSON, Pawtucket, R. I. Filed Apr. 2, 1888. Serial No. 269,373. (No model.)



Claim.—The combination, with the bolster of a roving-machine, of a spindle therefor provided with annular packed grooves for absorbing and holding the lubricant, said grooves having no communication with each other and being formed within the limits of that portion of the spindle which traverses the bolster, as and for the purposes hereinbefore set forth.

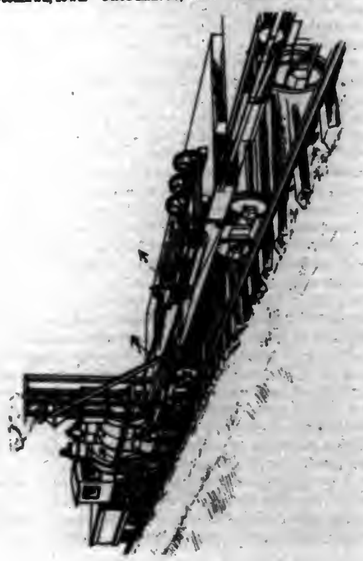
399,047. POCKET-KNIFE. EDMUND JAMES, Solingen, Prussia, Germany. Filed Sept. 12, 1888. Serial No. 285,780. (No model.)



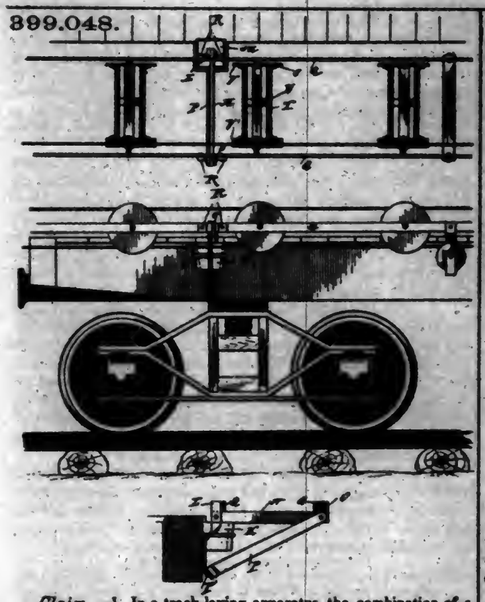
Claim.—1. In pocket-knives, the combination of a hasp, *d*, blade *a*, and sliding clasp *b*, the said clasp *b* being loosely fastened to the blade *a* and sliding over the end of the clasp *d*, so as to keep the blade from accidentally opening or shutting, substantially as described.

2. In pocket-knives, the combination of a hasp, *d*, blade *a*, having a hook, *v*, and sliding clasp *b*, the said clasp *b* being loosely fastened to the back of the blade *a* by the guide-piece *f*, so as to slide over the end of the clasp *d*, substantially as and for the purpose described.

399,048. TRACK-LAYING APPARATUS. DELBERT E. JOHNSON, Ottumwa, Iowa. Filed Mar. 16, 1887. Serial No. 231,183. (No model.)



399,048.



Claim.—1. In a track-laying apparatus, the combination of a locomotive-engine, a conveyer, an engine for propelling the conveyer supported by one of the cars of the train, and a pipe-connection between the locomotive-boiler and the engine aforesaid for propelling the conveyer, substantially as set forth.

2. In a track-laying apparatus, the combination of a locomotive, a conveyer, a separate engine for propelling the same, and a pipe-connection between said separate engine and the locomotive-boiler, said pipe-connection being provided with a yielding coupling for permitting the pipe to accommodate itself to relative movements of the locomotive and the car, substantially as set forth.

3. In a track-laying apparatus, the combination of a locomotive-engine, a conveyer, a separate engine for propelling the same, a pipe-connection between said separate engine and the boiler of the locomotive, and a flexible hose-connection between the parts of said pipe attached, respectively, to the locomotive and the separate engine, substantially as set forth.

4. In a supporting-bracket for conveyers in a track-laying apparatus, the combination of an upright to pass through and extend below the stake-socket and approximately fitting the opening of said socket, a cross-piece pivoted at one end to the top of said upright above the socket, and a diagonal brace pivoted at one end to the outer end of said cross-piece, and its lower end having a bearing in the lower end of the upright, substantially as described.

5. In a track-laying conveyor, the combination of a frame-work for supporting rollers, a bracket, and lugs attached to said frame-work for preventing lengthwise motion thereof in the brackets, substantially as set forth.

399,049. FOLDING CHAIR. LEWIS KELLER, Five Creek, W. Va. Filed Aug. 15, 1888. Serial No. 282,776. (No model.)



Claim.—1. In a folding chair, the combination, with the seat provided near its rear edge with horizontal slots L L, of the back having side bars, K, which extend below its lower edge and are provided with pins which slide in the said slots, whereby when the back is in a horizontal position its edge fits close to the rear edge of the seat, and the swinging arms attached to the back and engaged by suitable clutches, substantially as specified.

2. In a chair, the combination, with the seat provided with the side bars, B B, having slots L L near their rear ends and slots Q Q near their front ends, of the back having side bars provided with pins mounted in the slots L L, the swinging arms on the back engaged by clutches on the seat, the side arms pivoted at their rear ends to the back, and the links connected to the front ends of the arms and having pins on their lower ends operating in the slots Q Q, substantially as specified.

399,050. TOBACCO-BOX. ARDEN D. KENDALL, Miles, Iowa. Filed Dec. 3, 1888. Serial No. 292,464. (No model.)

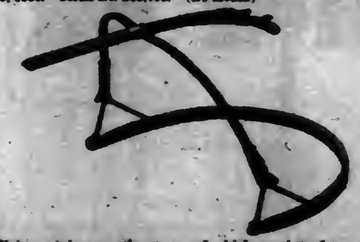


Claim.—1. The combination, with the box, the cover pivoted at one end to one end of the box and having a notch at its other end, which is engaged by a pin on the other end of the box, the opening through which the pivot passes being extended and curved in its length, of the gravity locking-bolt adapted to enter the said longitudinally-curved opening, substantially as and for the purpose described.

2. The combination, with the box and the horizontally-moving cover, of the lever pivoted midway of its ends, the weight at one end of the lever and the locking-bolt at the other end of the lever, substantially as and for the purpose described.

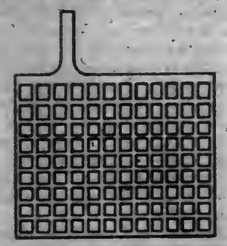
3. The combination of the box and the covers B and J, the cover B having a notch, *b*, in its front end and an opening or slot, *b'*, near its rear end, curved in its length, of the pin E for limiting the movement of the covers, the pivot D, connecting the covers with the box and passing through the said longitudinally-curved opening *b'*, and the gravity locking-bolt normally projecting into the said curved opening, substantially as described.

399,051. HARNESS. PAUL KIRK, Washington, D. C. Filed Aug. 25, 1888. Serial No. 283,708. (No model.)



Claim.—A harness the straps of which consist of two layers of animal hide tanned with the hair on, said layers stitched together at their edges with their flesh sides in contact, substantially as specified.

399,052. SECONDARY BATTERY. EDWARD P. KNOWLES, Brooklyn, assignor, by mesne assignments, to the Mutual Electric Manufacturing Company, New York, N. Y. Filed Dec. 1, 1888. Serial No. 292,419. (No model.)



Claim.—1. The method herein described of making secondary-battery plates, which consists in first sulphating the oxides, then pasting the same onto the grids, then pickling the grids in different solutions of acidulated water, the solutions being of gradually-increasing strength, and finally forming and mounting them for use.

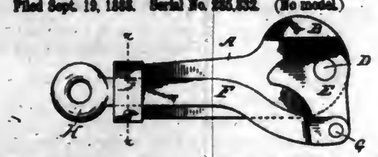
2. The method herein described of making secondary-battery

plates, which consists in first sulphating the oxides, then pasting the same onto the grids, allowing them to dry, then pickling the grids in different solutions of acid and water, the solutions being of gradually-increasing strength, and finally forming and mounting them for use.

3. The method herein described of making secondary-battery plates, which consists in first sulphating the oxides, then pasting the same onto the grids, then pickling the grids first in pure water and then in different solutions of acid and water, the solutions being of gradually-increasing strength, and finally forming and mounting them for use.

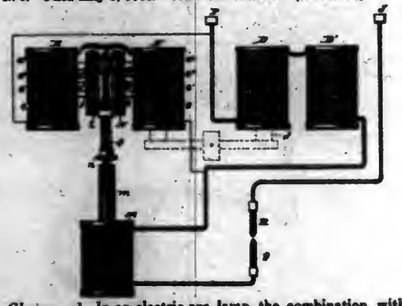
4. The method herein described of making secondary-battery plates, which consists in first treating the finely-divided oxides with sulphuric acid or a solution of the same until all of the oxides which it is possible to be acted upon by the acid are sulphated, then pasting the same on the grids, then pickling the grids thus prepared in different solutions of acid and water successively, the solutions being of gradually-increasing strength, and finally forming and mounting them for use.

399,053. WIRE-STRETCHER. FRANK A. LANDER, Moline, Ill. Filed Sept. 19, 1888. Serial No. 285,532. (No model.)



Claim.—A wire-stretcher composed of the straight frame or body A, arranged longitudinally in the line of draft and provided at one end with the guiding-loop C and at the other end with the lateral projection D, the cam E, pivoted on said frame or body opposite said projection, and the bar F, having one end curved or deflected laterally and pivoted to the cam, and its remaining portion arranged in the line of draft and passing through and embraced by the loop which serves to support and guide said bar, substantially as and for the purposes specified.

399,054. ELECTRIC-ARC LAMP. GEORGE M. LANE, Asbury Park, N. J. Filed May 3, 1888. Serial No. 272,633. (No model.)



Claim.—1. In an electric-arc lamp, the combination, with the feed-controlling magnets, the one in the main circuit and the other of high resistance in a derived circuit and composed of a series of sections, of a circuit-closer and an auxiliary magnet in the main circuit to control the circuit-closer to bring more or less of the resistance-magnet in the derived circuit, substantially as and for the purpose specified.

2. In an electric-arc lamp, the combination, with the magnet of high resistance placed in a derived circuit and composed of a series of sections, of the circuit-closer and an auxiliary magnet in direct circuit and controlling the circuit-closer to bring more or less of the resistance-magnet in the derived circuit, substantially as set forth.

3. In an electric-arc lamp, the combination, with the feed-controlling magnets, the magnet of high resistance being in the derived circuit and composed of a series of sections, and the series of contacts having the top and bottom terminals of each two sections connected with each contact, respectively, of the circuit-closer and the auxiliary magnet in the direct circuit to control the position of the circuit-closer to bring more or less of the resistance-magnet in the derived circuit, substantially as described.

4. In an electric-arc lamp, the combination, with the resistance-magnet composed of a series of sections and a series of contacts having each contact in electrical connection with the top and bottom terminals of each two of the said sections, respectively, of the circuit-closer and the auxiliary magnet in the main circuit and controlling the circuit-closer to bring more or less of the resistance-magnet in circuit, substantially as and for the purposes specified.

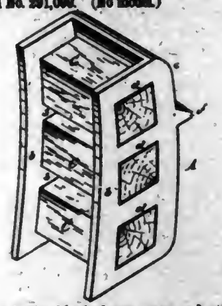
5. In an electric-arc lamp, the combination, with the magnet of high resistance, arranged in a derived circuit and composed of a series of sections, and the series of contact-points having the top and bottom terminals of each two of the said sections connected therewith, of the circuit-closer, the rod supporting the circuit-closer and threaded, the spring arranged on the rod and adjustable by a nut mounted on the rod, the core, and the solenoid placed in direct circuit, substantially as specified.

6. In an electric-arc lamp, the combination, with a twin magnet having each branch thereof composed of a series of sections, and the two series of contacts having the top and the bottom terminals of each two sections connected therewith, substantially as shown, and arranged opposite each other, of the circuit-closer and the magnet in the main circuit for controlling the circuit-closer for bringing a greater or less number of the sections of the said resistance-magnet in circuit, substantially as described.

7. In an electric-arc lamp, the combination, with the two magnets D and E, the magnet E, of high resistance, being in a derived circuit and composed of a number of sections, and means, substantially as described, controlled by the variation of the current in the main line, to bring more or less of the resistance-magnet in the derived circuit, of the rocking lever controlled by the variation in strength between the two magnets D and E, the movable frame I, connected with the rocking lever and carrying the feed-controlling devices, and the brake, substantially as and for the purpose described.

8. In an electric-arc lamp, the combination, with the magnets D and E, the rocking lever controlled by the magnets D and E, the frame I, and the adjustable connection between the rocking lever and the said frame, of the feed-controlling devices supported by the frame I and the brake, substantially as and for the purpose described.

399,055. BRAKE-BLOCK. ROBERT H. LANYON, Carterville, Mo., assignor of one-half to William R. Poundstone, same place. Filed Nov. 17, 1888. Serial No. 291,060. (No model.)

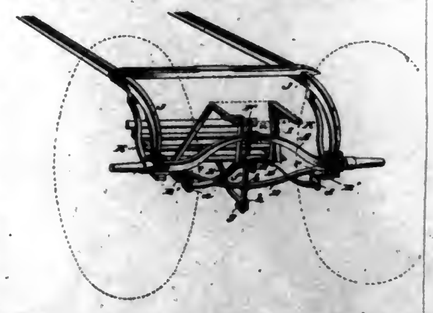


Claim.—1. In a brake-block for wagons and other vehicles, the metal frame A, having a back, *c*, and constructed with sides *b b*, adapted to receive the tire of the vehicle-wheel within them, and provided with openings *d d*, essentially as and for the purpose herein set forth.

2. In a brake-block for wagons and other vehicles, the metal frame A, having apertured sides *b b* and a back, *c*, provided with a bolt-hole and an exterior lug, *f*, essentially as described.

3. In a brake-block for wagons and other vehicles, the combination of the frame A, having a back, *c*, and constructed with sides *b b*, having a series of openings, *d*, in them, and the separated wooden blocks C C, arranged to enter within said openings and leaving spaces *e* in between them, substantially as shown and described.

399,056. ROAD-CART. BOSWIE B. LAWRENCE, Napoleon, Mich. Filed Dec. 20, 1888. Serial No. 294,318. (No model.)



Claim.—1. The combination, in a sulky or road-cart, of an upwardly-curved axle, a brace-bar located beneath the same, said axle and brace-bar having guides or perforations, and springs secured rear of the axle and provided with a seat-support, the rod F, passing through the guides in the axle and brace-bar and provided with a rearwardly-extending member connected to the spring, substantially as shown, and for the purpose set forth.

2. The combination, in a road-cart or sulky, of an axle and brace beneath the same having perforations through which passes a rod, F, having a rearwardly-extending member, a spring located rear of the axle, to which said rearwardly-extending member is secured, means for connecting the seat to the spring, and a forwardly-extending bar connected to the lower part of the bar F and to the foot-rest or front portion of the body, substantially as shown, and for the purpose set forth.

3. The combination, in a road cart or vehicle, of an upwardly-curved axle having a central perforation, a brace-bar having a corresponding perforation located beneath the axle and provided with rearwardly-extending lugs, a semi-elliptical spring connected to said lugs by links or swinging connections, a rod, F, passing through the perforations in the axle and brace-bar, said rod having a rearwardly-projecting member connected to the under side of the semi-elliptical spring, means for connecting the seat to the spring, and a forwardly-extending bar having a perforated rear end, through which the rod F passes, the front end of said bar being connected to the foot-rest of the body of the vehicle, substantially as shown, and for the purpose set forth.

4. The combination, in a road-cart or sulky, of a seat supported upon semi-elliptical springs, a movable guide having a rearwardly-extending member connected to the center of said spring, the spring being connected to the axle by links, and a forwardly-extending brace connected to the foot portion of the body and to the lower end of the brace-rod, the parts being organized so that the body of the vehicle can have a vertical and a lateral swinging movement, for the purpose set forth.

5. The combination, in a road-cart, of a seat supported upon a spring, said spring being connected to a vertical bar, F, which passes through the axle and brace-bar, so as to insure a vertical movement thereof, and the thills secured to the axle and provided with springs K K, the parts being constructed and combined substantially as shown, and for the purpose set forth.

399,057. INTERRUPTER FOR ELECTRIC CIRCUITS. ISAAC R. LECOULTRE, Lausanne, Switzerland. Filed Sept. 21, 1887. Serial No. 250,387. (No model.) Patented in Belgium Mar. 15, 1887, No. 78,612.



Claim.—1. The combination, with the base and cover of insulating material, the metallic segments upon the base, and a movable piston, of a flat, bent, or loop-shaped friction-spring secured at its central portion to the cover, and having its free opposing ends curved to frictionally grasp and hold the piston, substantially as specified.

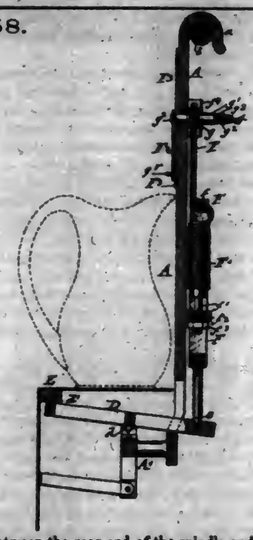
2. The combination, with the base and cover of insulating material, of the metallic segments D E upon the base, and the electric connections to the said segments, a movable piston for making and breaking the electric circuit, and a stem to the same passing through the insulated cover, and a button-head, c^2, a bent or loop friction-spring connected to the cover and having curved or concave opposing free ends engaging the piston widthwise at opposite sides and acting to maintain the same in its various positions, and a ring, *c'*, connected to and acting to prevent the displacement of the piston, substantially as set forth.

399,058. SPRING-SCALE FOR WEIGHING LIQUIDS. THEODORE LEE, New York, N. Y. Filed Aug. 31, 1888. Serial No. 284,205. (No model.)

Claim.—1. The combination, with a supporting-frame, of a fulcrumed scale-beam, a platform on said scale-beam, a rack-bar guided on the frame and resting on the scale-beam, a spiral spring connected to the rack-bar and frame, a hollow arbor provided with a pinion meshing with said rack-bar, a headed and spring-actuated spindle passing through the hollow arbor, a hand or index placed loosely on said spindle, a graduated scale in the supporting-frame, and a lever connected to the spindle and adapted to release the hand from the pressure of the spindle, so that it can drop back to the starting-point, substantially as set forth.

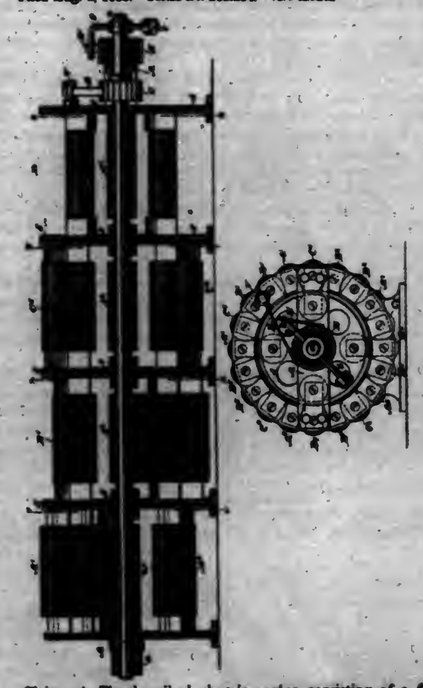
2. In a spring-scale, the combination, with a guided and spring-actuated rack-bar, of a hollow arbor having a pinion meshing with said rack-bar, a headed spindle passing through said hollow arbor, a loose hand at the front end of the spindle, a graduated scale, a spiral spring

399,058.



interposed between the rear end of the spindle and the hollow arbor, and a pivoted lever for pressing the spindle forward and releasing the hand, so that it drops back to the starting-point on the scale after having indicated the weight of the vessel and the contents of the same, substantially as set forth.

399,059. ELECTRIC MOTOR. ORAMEL LAGO, New York, N. Y. Filed Aug. 8, 1888. Serial No. 282,234. (No model.)



Claim.—1. The described electric motor, consisting of a field-magnet composed of a number of concentrically-arranged bobbins or electro-magnets, two or more of which are connected in series, in combination with an armature composed of similar bobbins or electro-magnets, two or more of which are also connected in series, and commutator-connections for throwing said field and armature bobbins into and out of action as the armature rotates, substantially as described.

2. In an electric motor, a series of stationary field magnets or bobbins surrounding a series of armature magnets or bobbins having in-

termediate and commutator connections, as described, for connecting the armature and the field bobbins in multiplex-series circuits successively, substantially as described.

3. In an electric motor, the combination of field-magnet bobbins arranged in sets in two or more branches from the same electric source, with corresponding sets of armature-bobbins and commutator and intermediate connections for throwing two or more of said field-magnet bobbins and two or more of said armature-bobbins into independent series connection, substantially as described.

4. In an electric motor, the combination of two or more sets of field-magnet bobbins having a common multiple-arc connection at one end of one set, corresponding sets of armature-bobbins located on a single shaft, with a single multiple-arc connection at the end of one set and independent and intermediate connections from the free ends of the other sets of both the field-magnet and armature bobbins for throwing two or more bobbins in the armature and the field-magnet in series with a fixed and a rotating brush for successively commutating the circuit through the field-magnet and armature bobbins, substantially as described.

5. In an electric motor, the combination of a series of field-magnet bobbins arranged in sets with a series of armature-bobbins, arranged also in sets on a common shaft, two commutators, one stationary and the other rotary, two brushes, one stationary and the other rotary, multiple-arc connections from one set of field-magnet bobbins to the propelling-battery and stationary brush resting on the rotating commutator, independent connections from the free ends of one set of the field-magnet bobbins to the stationary commutator, intermediate connections between the several sets of field-magnet bobbins, multiple-arc connections from one set of the armature-bobbins to the rotary brush resting on the stationary commutator, independent connections from the free ends of one set of armature-bobbins to the commutator-strips of the rotary commutator, and intermediate connections between the several sets of armature-bobbins, whereby two or more field-magnet bobbins and two or more armature-bobbins are caused to act simultaneously at different tangential points of the armature's circumference, substantially as described.

6. An electric motor or dynamo-electric machine having a fixed and a rotary commutator, in combination with a fixed and a rotary brush, all of said parts being located at one end or side of the machine, substantially as described.

7. An electric motor or dynamo-electric machine having a fixed or stationary commutator attached to the frame of the machine and a rotary commutator attached to the armature-shaft, in combination with a fixed or stationary brush bearing on the rotary commutator and a rotary brush attached also to the armature-shaft and bearing on the fixed commutator, said parts being all located at one end or side of the machine, substantially as described.

8. An armature for an electric motor or dynamo-electric machine, consisting of two or more sets or groups of electro-magnets bolted together end to end and fixed upon a common shaft, substantially as described.

9. An electric motor or dynamo-electric machine having a field-magnet composed of two or more sets or groups of electro-magnets or bobbins joined together end to end, electro-magnets or bobbins of the different sets lying in different radial planes, substantially as described.

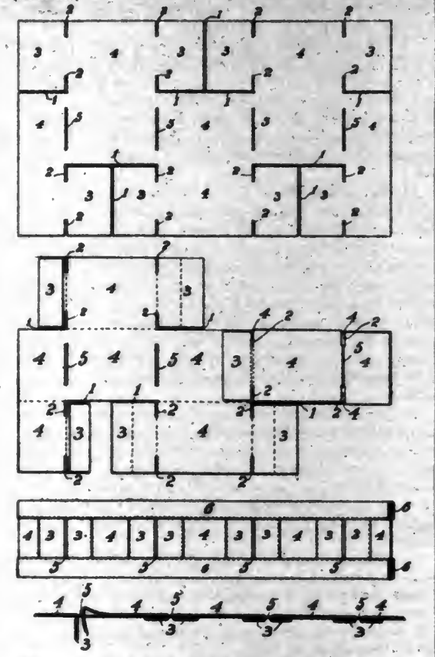
10. An electric motor or dynamo-electric machine having a field-magnet composed of two or more sets or groups of electro-magnets or bobbins joined together end to end, the individual bobbins of the different sets or groups lying in different radial planes, in combination with an armature composed of similar sets or groups of electro-magnets or bobbins, the individual electro-magnets or bobbins of the respective sets being located in the same plane, substantially as described.

399,060. RECEIPT AND RECORD BOOK. HUGO LOEWENBACH, Milwaukee, Wis. Filed July 16, 1886. Serial No. 208,170. (No model.)



Claim.—A record and receipt book consisting of stiff covers and alternate permanent and detachable leaves bound together between said covers, the detachable leaves being of greater width than the permanent leaves, and each of the former being provided with a vertical line of perforations in close proximity to the back of the book and another vertical line of perforations between the just-named line and the outer edge of said leaf, substantially as set forth.

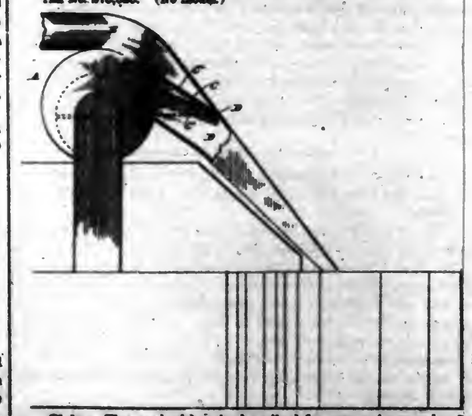
399,061. METHOD OF MAKING BUTTON-HOLE STRIPS. HENRY W. LYON, Bridgeport, Conn. Filed Dec. 3, 1888. Serial No. 292,446. (No model.)



Claim.—1. The method of making button-holes in a strip, the same consisting in cutting button-hole slits at suitable distances throughout the central section of the strip, forming T-headed flaps at the sides of the strip, folding said flaps upon themselves, folding the sides of the strip inward, inserting said flaps in pairs through the slits, and folding the flaps backward in opposite directions against the strip, substantially as set forth.

2. The method of making button-holes, which consists in forming a single blank having button-hole slits at proper intervals within the central section of said blank and T-headed flaps within the opposite sides of said blank, doubling said flaps upon themselves and folding the sides of the blank inward, inserting the flaps through said slits and folding said flaps backward in opposite directions against the blank, stitching the flaps to the blank, and finally barring the opposite ends of the button-holes, substantially as shown and set forth.

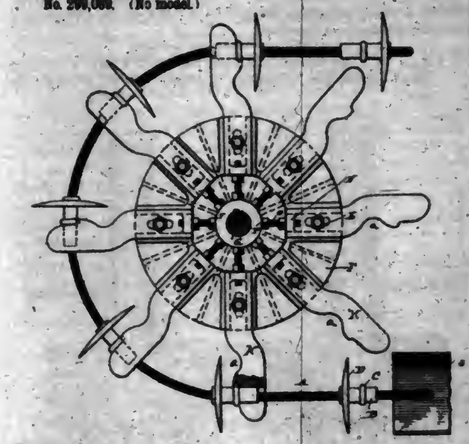
399,062. METHOD OF CONSUMING SMOKE. RICHARD H. MICHELL, Redruth, County of Cornwall, England. Filed May 25, 1888. Serial No. 275,023. (No model.)



Claim.—The method herein described for consuming smoke for its utilization as fuel, which consists in mechanically separating the combustible from the incombustible gases, and varying the feeding of the lighter combustible gases to the fire, such separation being effected

by the centrifugal force developed by a rotary fan or exhauster, and such variation of the feeding of the combustible gases being effected by the adjustment or manipulation of the damper, substantially as set forth.

399,063. DEVICE FOR CONVEYING GRAIN, ICE, COAL, &c. THOMAS MCBRIDE, Philadelphia, Pa., and REUBEN FISHER, Kincardine, Ontario, Canada. Filed Mar. 5, 1888. Renewed Feb. 7, 1889. Serial No. 299,669. (No model.)



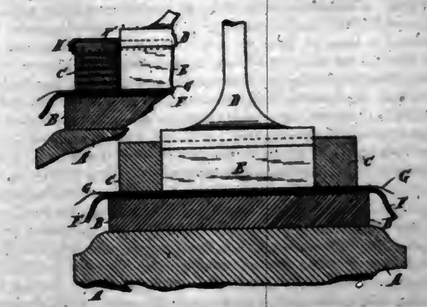
Claim.—1. In a device for conveying coal, ice, grain, &c., an endless wire cable having carrying disks or plates, the sleeves of which disks are provided with projections or ribs near the middle at a distance from the disks, said ribs adapted to be engaged by bifurcated arms on the driving-wheel, as set forth.

2. A conveyer for coal, ice, grain, &c., comprising a conveying trough or tube, an endless cable provided at intervals with disks or plates the sleeves of which have circumferential ribs or projections near the middle at a distance from the disks, and an expansible driving-wheel with bifurcated arms, around which said cable passes, said arms engaging said ribs or projections, substantially as shown and described.

3. In a device for conveying coal, grain, &c., a sleeve to engage a wire cable, having near one end a flange or annular projection to which a carrying disk or plate is attached, and an enlarged annular portion or rib adjacent the point of connection of the disk, the latter adapted to be engaged by the bifurcated arms of the driving-wheel, as set forth.

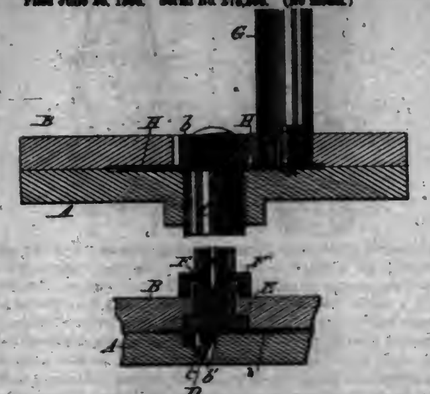
4. The conveying-trough provided with a discharge-aperture and a spring-hook arranged at the aperture, in combination with the conveyer having mounted thereon carrying-disks to be engaged by the spring-hook to tip the disks and discharge the load, as set forth.

399,064. BRICK-MOLD. ALEXANDER MCLEAN, Reservoir Road, Brockley, County of Surrey, assignee of one-half to Robert Cunyns Ames, London, England. Filed Feb. 17, 1887. Serial No. 227,960. (No model.) Patented in England June 2, 1886, Nos. 8,747 and 8,748.



Claim.—In a mold for bricks and similarly-shaped articles, the combination of a base-plate forming the bottom of the mold, a receptacle forming the sides of the mold and supported by said base-plate, a layer of felt or similar absorbent material placed on the said base-plate between it and the said receptacle, and a layer of coarse fabric upon the top of the said absorbent material, both said absorbent material and the layer of coarse fabric extending beyond the side edges of the receptacle, and a plunger, substantially as specified.

399,065. COIN-ADJUSTER. SAMUEL MCLOUGHLIN, Corunna, Mich. Filed June 20, 1888. Serial No. 278,008. (No model.)

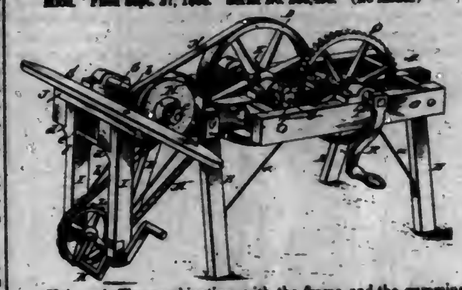


Claim.—1. In a machine for adjusting planchets, the combination of the plates A and B, relatively adjustable, the feed-tube G, and the knife D, attached to said plates, and the plate provided with fingers revolving between said plates A and B to carry forward the planchets, substantially as specified.

2. In a planchet-adjusting mechanism, the combination, with the recessed plates, of fingers revolving in the recess between said plates, an adjustable shaving-knife, the feeding-tube, and an opening through the lower plate for the escape of the planchets, as and for the purpose specified.

3. In adjusting mechanism for coining, the combination of the supporting-frame, recessed plates A B, knife D, and plate E, with the revolving shaft C, carrying the plate H, said plate being provided with curved fingers adapted to carry the planchet between the knife and plate E, substantially as and for the purpose set forth.

399,066. SAW-GUMMER. CALVIN S. MCMILLAN, East Saginaw, Mich. Filed Sept. 27, 1888. Serial No. 286,496. (No model.)



Claim.—1. The combination, with the frame and the gumming-wheel, of the shaft C, journaled in said frame, the wheel D on said shaft, the pulley *b* on the shaft of the gumming-wheel, the belt connecting said pulley and wheel D, the crank-shaft K, a sprocket chain and wheel connection between said shafts K and C, and the pinion Q, provided with a crank-handle and constructed to impart motion to said shaft C, substantially as described.

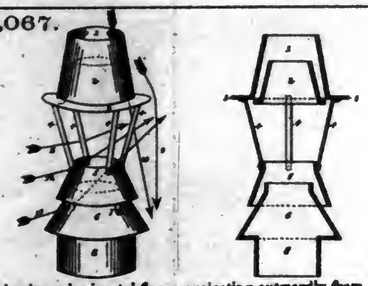
2. The combination, with the frame, the shafts C and G, journaled therein, parallel with each other, the pinion F on the shaft C, the pulley *b* and the emery-wheel H on the shaft G, the pulley D and sprocket-wheel E on the shaft C, and the endless belt N, of the arms I, the crank-shaft K, journaled in the lower ends thereof, the sprocket-wheel L on said shaft K, and the endless sprocket-chain M, connecting said sprocket-wheels, the shaft P, and the pinion Q thereon, meshing with the pinion F, substantially as and for the purpose specified.

399,067. VENTILATING TOP FOR CHIMNEYS. THOMAS J. WHEELOCK, Louisville, Ky. Filed Nov. 26, 1887. Serial No. 256,302. (No model.)

Claim.—1. In a ventilator-top for chimneys, a caplike top part consisting of a hollow conical frustum with a horizontal flange projecting outward from the rim of its lower base, surrounding a small similar frustum rising to about two-thirds of its height and projecting below it, having a horizontal flange, the walls of the two frustums being inclined obliquely toward each other, the diameter of the lower base of the smaller being greater than the diameter of the flue-pipe below, and both being open at the top.

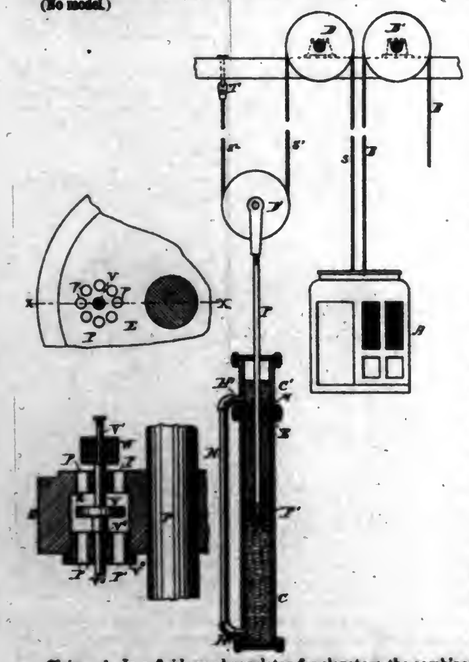
2. In a ventilator-top for chimneys, the combination, with a flue-

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pipe, 8, having a horizontal flange projecting outwardly from the rim of its orifice, of a hollow conical frustum, 6, having a vertical cylindrical flange around its upper base, which is less in diameter than the pipe 8, a similar frustum, 5, similarly flanged, having the diameter of its upper base the same as that of 8 and its walls inclined obliquely to those of 6, so as to have a wind-channel narrowing downward between them, and a capless top part raised over 5, so as to leave an open interval consisting of a hollow conical frustum, 1, having a horizontal flange, 3, surrounding a smaller flanged frustum, 2, having the diameter of its lower base greater than that of 8, all the frustums being open at the ends and braced together and arranged substantially as set forth, and for the purpose specified.

399,068. SPEED-REGULATOR FOR ELEVATORS. WILLIAM R. NICKERSON, Cambridge, Mass. Filed Nov. 30, 1888. Serial No. 292,236. (No model.)



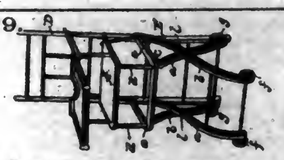
Claim.—1. In a fluid speed-regulator for elevators, the combination of the safety-rope S S' S^2, the piston-rod P, and piston P', with the cylinder C, cap-plate E, valves V, auxiliary cylinder C', and pipe H' H H^2, leading from the auxiliary cylinder C to the lower part of the cylinder C, all operating together substantially as described, and for the purpose set forth.

2. In a safety-fluid speed-regulator for elevators, the combination of the piston-rod P, piston P', main cylinder C, cap-plate E, and valve V, having adjusting-weights W, with the auxiliary cylinder C' and pipe H' H H^2, substantially as described, and for the purpose set forth.

399,069. CONVERTIBLE CHAIR. BENJAMIN C. ODELL, Kingston, N. Y., assignor to Thompson, Perley & Wells, Baldwinsville, Mass. Filed Jan. 11, 1888. Serial No. 260,690. (No model.)

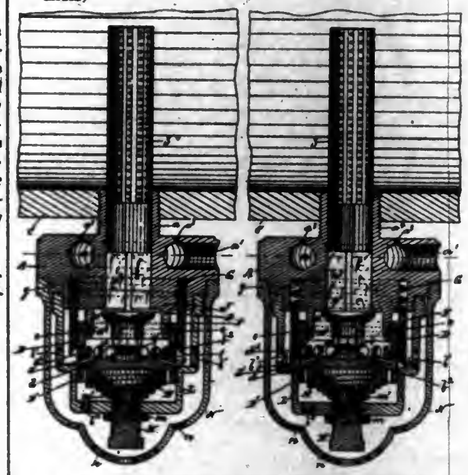
Claim.—A convertible chair consisting of the seat, a supplemental frame beneath the same, serving to support the seat and form a base therefor, pivoted crossed legs connected with the lower sills of the frame to support the same, the wheels connected to the legs, and the

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pivoted arms E, and the locking-links connecting the arms to the chair, substantially as described.

399,070. WATER-DRAINER AND POP SAFETY-VALVE. CHARLES PARENT, Boston, Mass. Filed Oct. 17, 1888. Serial No. 288,400. (No model.)



Claim.—1. An automatic water-drainer and pop safety-valve, consisting of a head, A, adapted to be attached to a reservoir or boiler, an orifice through the head opening on one side into the reservoir, a valve, B, controlling the outlet, a spring-seated thimble shutting over the outlet and forming a seat for the valve-stem, the thimble being provided with ports which are closed by a sliding sleeve outside the thimble, the sleeve being seated upon a spring, a cap, L, enveloping the thimble and sleeve and secured to the head and provided with ports, the thimble being also provided with a small vent leading into a passage between the sleeve and the thimble, a small vent leading from this passage into cap L, the small vents being so proportioned to the pressure of the spring on which the thimble is seated that when the pressure reaches a certain degree beyond the capacity of the vent the valve will open further, forcing the thimble back on its spring-seat and partially opening the larger ports, d^3, when the increased pressure thereby brought against the beveled rim of the sleeve will force the sleeve back upon its spring-seat, opening wide the ports, substantially as described.

2. An automatic water-drainer and pop safety-valve, consisting of a head, A, adapted to be attached to a reservoir or boiler, a chamber, a, within the head, and a port, a', through which steam may be admitted to heat the head, an orifice through the head opening on one side into the reservoir, a valve, B, controlling the outlet, a spring-seated thimble shutting over the outlet and forming a seat for the valve-stem, the thimble being provided with ports which are closed by a sliding sleeve outside the thimble, the sleeve being seated upon a spring, a cap, L, covering the thimble and sleeve and secured to the head and provided with ports, the thimble being also provided with a small vent, d', leading into a grooved passage formed by the thimble, the beveled edge of the sleeve and the shoulder on which the edge of the sleeve is seated, the beveled edge of the sleeve having a small vent leading from the grooved passage into the cap L, the small vents being so proportioned to the pressure of the spring on which the thimble is seated that when the pressure reaches a certain degree beyond the capacity of the small vent the valve will open further, forcing the thimble back on its spring-seat and partially opening the larger ports, d^3, when the increased pressure thereby brought against the beveled edge of the sleeve will force the sleeve back upon its spring-seat, opening wide the ports d^3, substantially as described.

3. An automatic water-drainer and safety-valve, consisting of a head, A, adapted to be attached to a reservoir or boiler, an orifice through the head opening on one side into the reservoir, a valve, B, controlling the outlet, a spring-seated thimble, D, shutting over the outlet and forming a seat for the valve-stem, the thimble being provided with ports which are closed by a sliding sleeve, F, outside the thimble, the sleeve being seated upon a spring, G, a cap covering the thimble and sleeve and secured to the head and provided with ports, the cap L, having in its end a set-screw, M, to regulate the tension of the spring H and to hold the thimble on its seat in case the spring is broken, the thimble being also provided with a small vent, d', leading into a grooved passage formed by the thimble, the beveled edge of the sleeve, and the shoulder on which the sleeve is seated, the beveled edge of the sleeve having a small vent leading from the grooved passage into the cap L, the small vents being so proportioned to the pressure of the spring on which the thimble is seated that when the pressure exceeds the capacity of the small vent the valve will open further, forcing the thimble back on its spring-seat and partially opening the larger ports, d^3, when the increased pressure thereby brought against the beveled rim of the sleeve will force the sleeve back upon its spring-seat, opening wide the ports, substantially as described.

4. A water-drainer having within its head a chamber, a, independent of the valve-chamber, with ingress-port a', connected with a pipe, a^2, through which steam may be admitted to heat the head, and egress-ports a^3, through which the steam may escape, substantially as described.

399,071. COMBINATION DENTAL TOOL. JOHN J. B. PATRICK, Belleville, Ill. Filed Aug. 31, 1888. Serial No. 284,375. (No model.)



Claim.—1. In a dental tool, the pliers having tapered screw-dies D between the jaws, and the regulating set-screw C, substantially as specified.

2. In a dental tool, the combination of the pliers, the screw-dies, and the taper-cutter on one of the jaws, substantially as specified.

3. In a combination dental tool, the adjustable barb-cutter, substantially as specified.

4. In a combination dental tool, the pliers, the barb-cutter having a chisel point, and the set-screw, substantially as specified.

5. In a combination dental tool, the combination of the pliers, the set-screw, the cutter-blades, the screw-threaded dies, the taper-cutter, and the barb-cutter, substantially as specified.

399,072. COMB OR FORMER FOR FELT-HARDENING MACHINES. JOHN PENDERGAST, Boston, and DANIEL PENDERGAST, Merrimac, Mass. Filed Nov. 17, 1888. Serial No. 291,094. (No model.)



Claim.—1. As an improved article of manufacture, a former for felt goods, comprising a foraminous body provided with ribs or corrugations on one or both of its faces, substantially as set forth.

2. The former A, provided with perforations x and corrugations z, substantially as and for the purpose described.

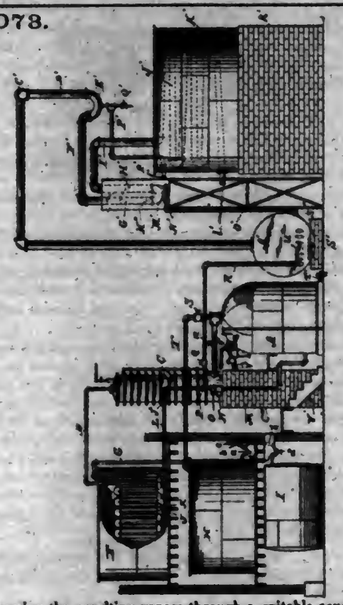
399,073. PROCESS OF DISTILLING PETROLEUM. GEORGE H. PERKINS, Philadelphia, Pa. Filed May 14, 1886. Serial No. 202,143. (No model.)

Claim.—1. The process of distilling a petroleum product and separating its distillates, which consists in treating said product with heat in a still, in passing the resulting vapors through a suitable condenser, in conveying, by suitable conduits, the lighter distillates to a proper receiving-vessel, and in conveying the heavier distillates, which have not been trapped back into the original still, to a supplementary vessel or still, in which they may, without other heat than that originally derived from the original still, further separate into heavier and lighter products, as specified.

2. The process of distilling a petroleum product and separating its distillates, which consists in treating said product with heat in a still, in passing the resulting vapors through a suitable condenser, in conveying, by suitable conduits, the lighter distillates to a proper receiving-vessel, in conveying the heavier distillates, which have not been trapped back into the original still, to a supplementary vessel or still, in which they may, without other heat than that originally derived from the original still, further separate into heavier and lighter distillates, and, finally, in distilling and separating the residual products remaining in said supplementary still by the application of heat thereto, as specified.

3. The process of distilling a petroleum product and separating its distillates, which consists in treating said product with heat in a

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still, in passing the resulting vapors through a suitable condenser, in conveying, by suitable conduits, the lighter distillates to a proper receiving-vessel, in conveying the heavier distillates, which have not been trapped back into the original still, to a supplementary vessel or still, in which they may, without other heat than that originally derived from the original still, further separate into heavier and lighter distillates, and, finally, in distilling and separating the residual products remaining in said supplementary still by the application of heat thereto, in conveying the resulting vapors from said supplementary still to and through a proper condenser, in conveying, by suitable conduits, the resulting lighter distillates to a proper receiving-vessel, and in conveying the resulting heavier distillates back to the supplementary still, as specified.

399,074. HARNESS-PAD. ERNEST F. PFLUEGER, Akron, Ohio. Filed Oct. 31, 1888. Serial No. 289,600. (No model.)



Claim.—The medicated sack-pad for harness, consisting of the medicated cloth sides and an intermediate flattened layer of ground cork and astringent chemicals with starch and carbolic acid, said sides being held together by edge stitches and by quilting-seams through said intermediate layer, substantially as specified.

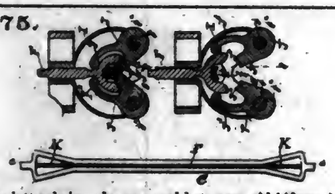
399,075. GRIP FOR CABLE RAILWAYS. ELWOOD C. PHILLIPS, St. Louis, Mo., assignor to the Phillips Economical Cable Grip Construction Company, Chicago, Ill. Filed Sept. 24, 1888. Serial No. 286,260. (No model.)

Claim.—1. In a cable-gripping device, the combination of a pair of pivoted jaws with a vertically-reciprocating plunger, the said jaws being actuated by said plunger, and these three devices combining to grip the cable, substantially as set forth.

2. In combination with a pair of pivoted jaws, a reciprocating plunger bifurcated at its lower end and operating between them, each jaw being provided with a shoulder arranged to be struck by one of said bifurcations as the plunger descends, and with a curved plate or raised part arranged to be struck on the reverse motion for opening said jaws, substantially as set forth.

3. In combination with a pair of pivoted jaws, each provided with an inwardly-inclined shoulder and raised plate, as described, a plunger having rounded bifurcations arranged to strike against said plates or said shoulders, according to the upward or downward motion of said

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plunger, the latter being also recessed between said bifurcations to fit said cable, substantially as set forth.

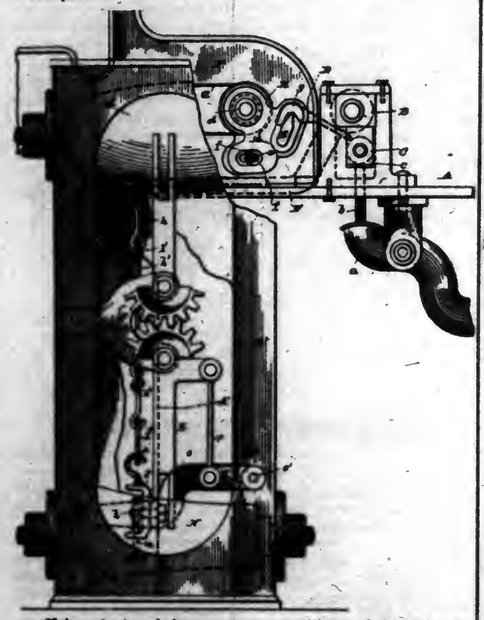
4. A vertically-movable plunger and jaws operated thereby for gripping a cable, in combination with a lever, pawl, and rack for moving said plunger into either the gripping or releasing position and locking it there, a frame to which said lever is pivoted, and plates in contact with the outer edges of said frame and movable angularly to brace the latter, substantially as set forth.

5. In combination with a fixed guide-frame and a lever pivoted thereto, angularly-movable bracing-wings fitted against the edges of said frame, metallic straps which inclose said frame and wings, and are provided with flaring recesses having end walls arranged to fit said wings in any position of the latter, substantially as set forth.

6. In combination with a fixed guide-frame and a lever pivoted thereto, a plunger working up and down in said frame, a connection between said lever and said plunger, pivoted gripping-jaws opened and closed by said plunger, and a casing which provides bearings for the jaws and incloses them and the lower end of said plunger, substantially as set forth.

399,076. EVENING MECHANISM FOR COTTON-OPENERS, &c. JAMES C. POTTER, Pawtucket, R. I. Filed July 9, 1888. Serial No. 279,266. (No model.)

Brief.—The invention consists in improvements in the scale-lever system and in the means for supporting the knife-edge bar for the evener-plates.



Claim.—1. A scale-lever system comprising scale-levers having connecting-links, whereby the levers below are suspended from those next above, in combination with evener-arms and links whereby the topmost scale-levers are connected to and suspended from said arms, substantially as and for the purposes hereinbefore set forth.

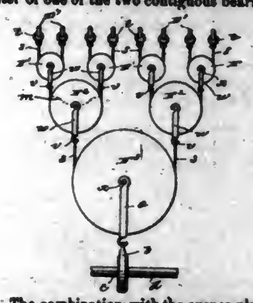
2. In combination with the evener-arms, the scale-lever system comprising scale-levers and connecting-links, whereby the levers below are suspended from those next above and the topmost scale-levers are connected to and suspended from said arms, said scale-lever system being located outside of the front wall of the machine and under the feed-trough, substantially as set forth.

3. The combination of the evener-plates, the knife-edge bar, its swiveled adjustable supporting-brackets, and means for securing said brackets in adjusted position, substantially as and for the purposes hereinbefore set forth.

4. The combination of the evener plates and arms, the suspended scale-lever system connected to said arms and having the scale-levers below suspended from those next above, the cone-drums, cone-drum belt, and belt-shipper, and belt-shipper-actuating mechanism connected to and operated by the main-scale lever, all substantially as and for the purposes hereinbefore set forth.

399,077. EVENING MECHANISM FOR COTTON-OPENERS, &c. JAMES C. POTTER, Pawtucket, R. I. Filed Jan. 23, 1889. Serial No. 297,907. (No model.)

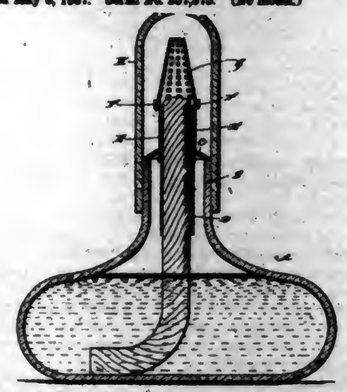
Brief.—The scale-lever system of the evening mechanism is replaced by a system of curved bearing-pieces, in combination with supporting-straps, each of which passes peripherally around the under face of its curved bearing-piece below and has its two ends connected each to the center of one of the two contiguous bearing-pieces above.



Claim.—1. The combination, with the evener plates and arms, of the described system of curved bearing-pieces and supporting-straps, each strap passing peripherally below and around its appropriate bearing-piece, the topmost series of straps being suspended by their ends from the evener-arms, and the straps of the other series being suspended from the centers of the curved bearing-pieces next above, substantially as and for the purposes hereinbefore set forth.

2. The combination, with the evener plates and arms, the cone-drums, cone-drum belt and shipper therefor, and shipper-actuating mechanism, of the described system of curved bearing-plates and supporting-straps therefor, each strap passing peripherally below and around its appropriate bearing-piece, the topmost series of straps being suspended by their ends from the evener-arms, the straps of the other series being suspended from the centers of the bearing-pieces next above, and the lowermost or main bearing-piece being connected to the shipper-actuating mechanism, substantially as and for the purposes hereinbefore set forth.

399,078. ALCOHOL DISINFECTING-LAMP. MARKWELL S. PURDY and HERMANN ALBER, Corning, N. Y.; said Purdy assignor to said Alber. Filed May 6, 1887. Serial No. 237,373. (No model.)

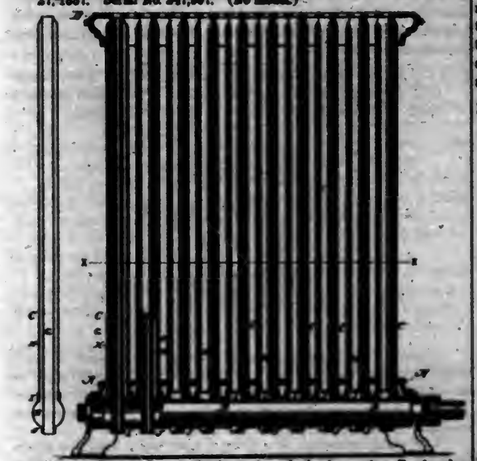


Claim.—1. The herein-described alcohol disinfecting-lamp, comprising the bowl A, having its central portion extended up and reduced to form the integral neck B, the disk C, resting on the upper edge of the neck, the wick-tube D, extending down through an opening of the disk and secured at an intermediate point of its length thereto, and the vertical supports E, secured to the disk C and extended upward beyond the wick-tube, so as to hold the cap out of contact with the wick, and having hooks at their upper ends, the perforated platinum cap G, supported detachably by the hooks above the wick-tube, and the extinguisher H, as set forth.

2. The bowl A, the cap G, of perforated sheet metal or platinum, and the extinguisher H, to extinguish the flame, whereby when the extinguisher is removed after the flame is extinguished the vapor from the alcohol, rising up, comes in contact with the cap and becomes decomposed, and the heat generated by the decomposition of the alcohol-vapor keeps the platinum cap in an incandescent condition, as set forth.

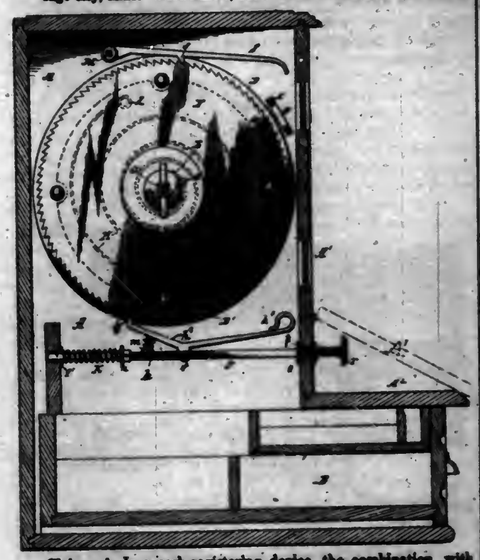
3. The bowl A, disk C, and wick-tube D, combined with the supports E, extending up from the disk above the wick-tube and having the hooks F, and the removable platinum or sheet-metal cap G, having its base or open end resting on the top of the supports within the hooks, whereby the cap will be held above the wick, so that the latter cannot come in contact with the cap, as set forth.

399,079. RADIATOR. JAMES REILLY, Brooklyn, N.Y. Filed Aug. 27, 1887. Serial No. 247,997. (No model.)



Claim.—In a radiator, the base A and the base-pipe B, circular in cross-section and having the flanges I J, combined with the pipes G H, brazed to the flanges I J, respectively, the upper edge of the outer pipe, H, being closed against and brazed to the upper edge of the inner pipe, G, and all of said pipes being constructed from thin sheet-copper, substantially as and for the purposes set forth.

399,080. CASH-REGISTERING DEVICE. OTTO C. REMLOFF, Winnebago City, Minn. Filed June 6, 1888. Serial No. 276,199. (No model.)

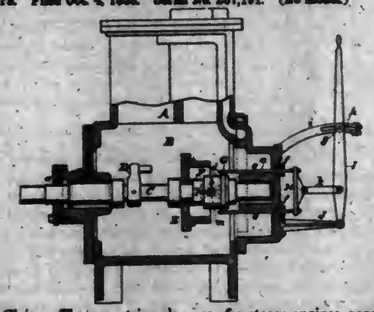


Claim.—1. In a cash-registering device, the combination, with the disk and ratchet-wheel, of a push-bar provided with a retractile spring, a pawl pivoted to the push-bar and provided with a rearwardly-projecting arm, and a spring, substantially as set forth.

2. In a cash-register, the combination, with suitable frame-work and a shaft journaled therein, of two distinct sets of disks mounted on said shaft, each disk being adapted to rotate independently of the others, a ratchet-wheel secured to each disk, a spring to rotate it in one direction, a dog to prevent said ratchet-wheel from rotating in one direction, a push-bar provided with a retractile spring, a pawl pivoted to the push-bar and provided with a projecting arm, and a spring interposed between the push-bar and pawl, substantially as set forth.

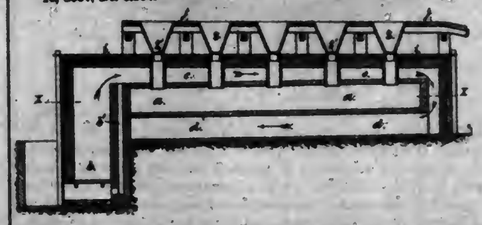
3. In a cash-registering device, the combination, with suitable frame-work and a shaft journaled therein, of two distinct sets of disks mounted on said shaft, each disk being adapted to rotate independently of the others, figures or characters denoting different denominations of money on the disks, a bar in front of the disks having sight-holes, pins on said bar to engage pins projecting from the disks, a ratchet-wheel on each disk, springs to rotate the disks in one direction, a push-bar for each disk having a retractile spring, spring-sustained pawls pivoted to said push-bars to rotate the disks positively, and dogs for locking the disks against return movement, substantially as set forth.

399,081. ECCENTRIC VALVE-GEAR. JOHN V. REES, Jr., Chester, Pa. Filed Oct. 4, 1888. Serial No. 287,191. (No model.)



Claim.—The eccentric valve-gear for steam-engines, consisting of the eccentric having the sleeve fitting loosely on the main shaft and having diametrically-opposite longitudinal slots, the outer sleeve having applied thereto means for the movement of the valve, said main shaft having oblique crossing recesses therein, and the pins or pivots connected to the outer sleeve and passed through the slots in the inner sleeve, and having spiral form of blocks engaging with the oblique crossing slots of the main shaft, substantially as and for the purpose set forth.

399,082. PROCESS OF PURIFYING FERRIC CARBIDE. HAROLD BIRNIE, Ramside, Ulverston, County of Lancaster, England. Filed Nov. 1, 1888. Serial No. 288,751. (No model.) Patented in England June 10, 1887, No. 8,357.



Claim.—1. In the manufacture of magnetic carbide-of-iron filtering material by reducing iron ore through the medium of heat to a lower oxide and combining carbon therewith, the process herein described of purifying the magnetic carbide of iron, which consists in cooling the same and subjecting it to the action of an acid conveyed by water to remove the lime, magnesia, phosphorus, or other impurities, substantially as described.

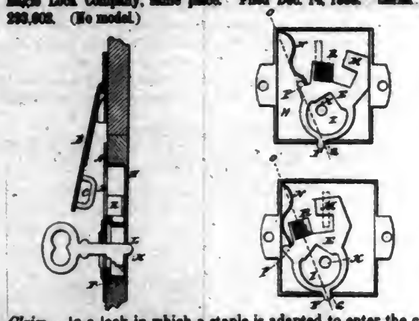
2. In the manufacture of magnetic carbide-of-iron filtering material by reducing iron ore through the medium of heat to a lower oxide and combining carbon therewith, the process herein described of purifying the magnetic carbide of iron and removing the lime, magnesia, phosphorus, or other impurities therefrom, which consists in cooling the magnetic carbide of iron in water and then subjecting it to the action of hydrochloric acid conveyed by water, substantially as set forth.

3. The process herein described of manufacturing magnetic carbide-of-iron filtering material, which consists in reducing iron ore by heat in a closed chamber to a lower oxide and combining carbon therewith to convert the ore into magnetic carbide of iron, cooling the latter with water, and while cool purifying the same and removing the lime, magnesia, phosphorus, or other impurity by subjecting

the carbide of iron to the action of an acid conveyed by water, substantially as set forth.

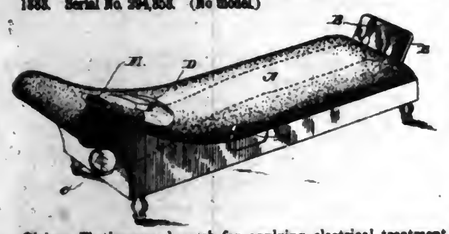
4. The process herein described of manufacturing magnetic carbide-of-iron filtering material, which consists in reducing the iron ore by heat to a lower oxide and combining carbon therewith to convert the ore into magnetic carbide of iron, cooling the latter, and then purifying it and removing the lime, magnesia, phosphorus, or sulphur by subjecting the carbide of iron to the action of hydrochloric acid conveyed by water, substantially as set forth.

399,083. LOCK. JAMES ROCHE, Perryville, Conn., assignor to the Eagle Lock Company, same place. Filed Dec. 14, 1888. Serial No. 293,602. (No model.)



Claim.—In a lock in which a staple is adapted to enter the case to be engaged with the bolt, the bolt hung upon a pivot within the case, and adapted to rock on said pivot in the plane of the case, the bolt constructed with a nose arranged to engage or disengage the staple entering the case, a spring arranged between a stationary bearing in the case and a corresponding seat on the bolt, the said seat on the bolt being adapted to cross the central line of action of the spring as the bolt moves from one extreme to the other, the said bolt constructed with a cam projection in the path of the staple as it enters the case when the bolt is in the unlocked position, the said cam projection inclined to the path of the staple as it enters the case, substantially as described.

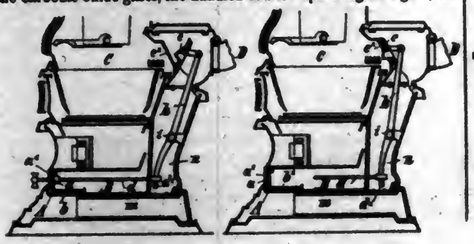
399,084. COUCH FOR APPLYING ELECTRICAL TREATMENT. JOHN R. SCHMALS and JOHN B. FAULKNER, Norfolk, Va. Filed Dec. 26, 1888. Serial No. 294,853. (No model.)



Claim.—The improved couch for applying electrical treatment, having the battery C supported in its lower portion near one end, the sponge E, arranged near the head of the couch and connected with the battery and adapted to be placed on the neck of the patient, the plate F, arranged near the sponge and connected with the battery and adapted to bear against the shoulders of the patient, the foot-plates at the end of the couch connected with the battery, and the hand-plates secured on the upper edges of the sides of the couch and connected with the battery, as specified.

399,085. DRAFT-REGULATING DEVICE FOR STOVES OR FURNACES. MAX SCHWENDER, Doos, near Nuremberg, Germany. Filed Nov. 5, 1888. Serial No. 289,960. (No model.)

Claim.—1. As an improvement in draft-regulators for stoves, the combination of the gate having apertures for the passage of air and the carbonic-oxide gases, the handled rod for operating said gate, the



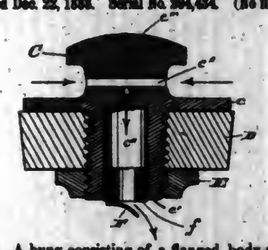
399,085.



hinged damper, and the lever connected to said damper and to said rod, substantially as set forth.

2. As an improvement in draft-regulators, the combination, with a magazine stove or furnace having a lower base-flue, of the gate having a front aperture for the passage of air and a lower aperture for the passage of the carbonic-oxide gases, the handled rod loosely connected to said gate, the upper hinged damper, and the lever connected to said damper at its upper end and to said rod at its lower end, substantially as set forth.

399,086. BUNG. MATTHIAS SCHWEINSBERG and ANTON GROSSCHEL, Cincinnati, Ohio, assignors of one-third to L. H. Buhrmann, same place. Filed Dec. 22, 1888. Serial No. 294,434. (No model.)

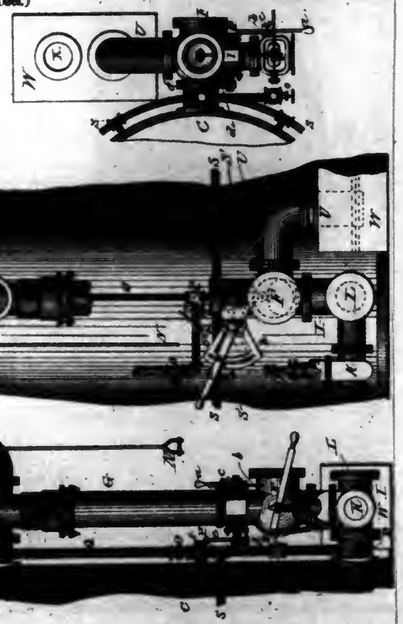


Claim.—1. A bung consisting of a flanged body-piece having a screw-threaded projection taking through a disk, which forms the bearing-surface of the bung, a clamping-piece adjustable on such projection, a vent-passage through the bung, and a valve therein, substantially as and for the purpose specified.

2. A bung consisting of a flanged body-piece having a screw-threaded projection taking through a disk, which forms the bearing-surface of the bung, a clamping-piece adjustable on said projection, a vent-passage through the bung, and a valve therein carried by a removable projection taking into said vent-passage, substantially as and for the purpose described.

3. A bung consisting of a body-piece, C, disk D, projection *d* taking through said disk, vent-passage *c'*, automatic downwardly-opening valve F, and removable projection *f*, substantially as and for the purposes specified.

399,087. APPARATUS FOR THE MANUFACTURE OF GAS. HENRY C. SHIELDS, Troy, N. Y. Filed Dec. 16, 1887. Serial No. 258,060. (No model.)



Claim.—1. In combination with a gas-generator provided with upper and lower gas-outlets and upper and lower steam-supply pipes leading to and connecting with reversing-valves, a valve-reversing lever common to and connected with each of said valves, whereby a single movement of the lever will reverse the direction of steam entering the generator and the direction of gas escaping therefrom, substantially as described, and for the purposes set forth.

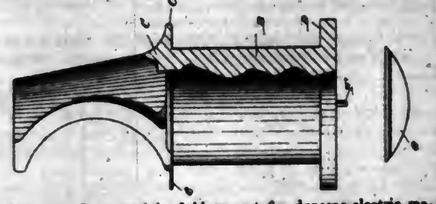
2. The combination, with a gas-generator having valved upper and lower gas-outlet pipes and upper and lower valved steam-supply pipes, of a valved runaround steam-supply pipe having connections leading to the interior of the generator through its sides at a plurality of points intermediately of the upper and lower steam-supply-pipe inlets to the generator, substantially as described.

3. A valve case having interiorly two circular valve-seats, each forming the mouth of one of two inlets to the case, and intermediately of said seats a third opening, which forms the outlet from said case, and a lever-chamber formed by lateral extension of the valve-case, in combination with a valve suspended between and movable from one to the other of said seats, and a valve supporting and actuating lever-arm vertically vibratory in said chamber and fixed upon an actuating-shaft passing through said chamber and projecting exteriorly from the valve-case, substantially as and for the purposes set forth.

4. The combination, with a gas-generator, of upper and lower gas-outlets, valved upper and lower steam-supply pipes, and a single valve-operating lever operative to conversely open and close the valvular openings in said supply-pipes, substantially as described, and for the purposes set forth.

5. The combination, with a gas-generator, of an upper and lower steam-supply pipe, valved upper and lower gas-outlet pipes, and a single valve-operating lever operative to conversely open and close the valvular openings in said outlet-pipes, substantially as described, and for the purposes set forth.

399,088. DYNAMO-ELECTRIC MACHINE. WILLIAM L. SILVEY, Lima, Ohio. Filed Oct. 1, 1888. Serial No. 286,823. (No model.)



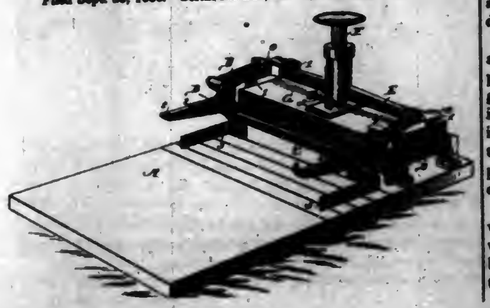
Claim.—1. In an upright field-magnet for dynamo-electric machines, the field-magnet core B, cast solid, the pole-piece C, and flanges C' D, in combination with the supplementary flange-plate *e*, for holding the wire in place and collecting and distributing the magnetism of the coils, as set forth.

2. The field-magnet for a dynamo-electric machine, the pole-piece C, and the expanded flange C', cast solid, the front part, *e*, of a non-magnetic material, secured thereto by screws, as set forth.

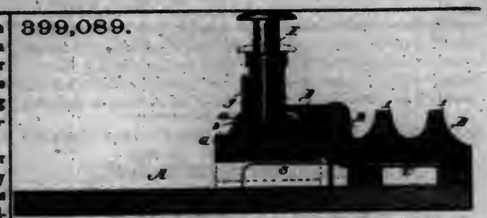
3. In a dynamo-machine having salient poles, the combined base and heel plate A, upright field-magnets B B, their lower ends expanded into flanges D D, their upper ends forming pole-pieces C C, and flanges C' C' and *e e*, for holding the coils of wire in place, as set forth.

4. The combination, in the field-magnet core of a dynamo-electric machine, of the field-magnet core B, and the flange-piece D, cast thereon, and forming a connecting-block for joining the magnet to the base and heel-plate A, the upper end of the core D expanded into the pole-piece C, having a flange, C', as a part thereof, the flanges, pole-pieces, and core cast in one piece, to which a supplementary flange, *e*, is secured, as set forth.

399,089. PRINTING-STAMP. JOHN SCHWALM, Jr., Chicago, Ill. Filed Sept. 26, 1886. Serial No. 214,514. (No model.)



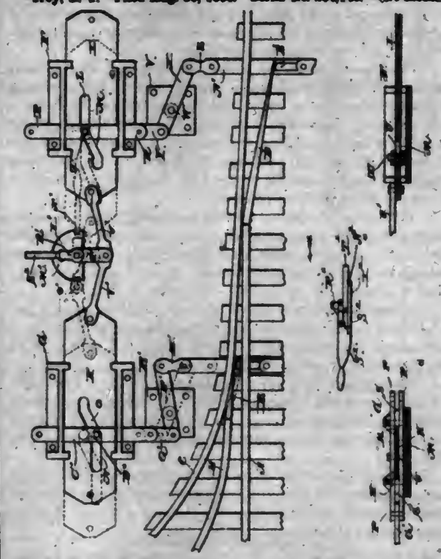
399,089.



Claim.—1. In a printing-stamp, the combination, with the die-plate, the vertical plunger carrying said die-plate, and the die-plate frame wherein said plunger is held in a manner free to move, of vertically-swinging arms whereby said die-plate frame is carried, standards in pivotal connection with the vertically-swinging arms, and stops or rests for sustaining the die-plate frame during the vertical downward movement of the plunger, substantially as described.

2. In a printing-stamp, the combination, with the die-plate and the vertical plunger, of the pivoted die-plate frame E, having rests or seats *c* at each side of its pivotal points, the standards provided with stops whereon said seats will bear, and vertically-swinging arms pivotally connected to the die-plate frame and the standards, whereby during the vertical movement of the plunger the pivoted die-plate frame will be guarded against movement about its pivot-bearings and in downward direction, substantially as described.

399,090. THREE-THROW SPLIT SWITCH. ARON D. SIMPSON, Troy, N. Y. Filed Aug. 30, 1888. Serial No. 284,140. (No model.)



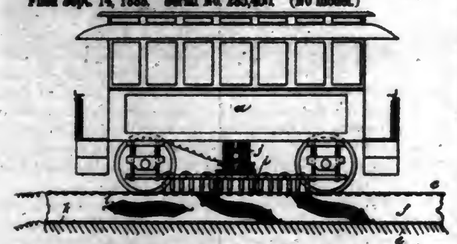
Claim.—1. The combination, in a three-throw switch, of the frames, the longitudinally-movable plates therein having the oblique angled slots, the longitudinally-movable bars guided in the frames and having the bolts, sleeves, or rollers engaging the said slots, whereby said bars are adapted to be operated, the levers X F and links connecting them to the respective bars and switch-rails, the shaft K', mounted between the frames and having the arm T, the links connecting the said arm to the plates, whereby the latter may be operated in unison, and the lever attached to the shaft K', substantially as described.

2. The combination, with the main track and side track, B C, and the switch-rails D E, of the frames, the longitudinally-movable plates guided therein and having the oblique-angled slots, the bars guided in the frames and having the bolts, sleeves, or rollers engaging the slots, for the purpose set forth, the levers and links connecting the bars to the switch-rails, and the operating-lever and connections, substantially as set forth, between the same and the slotted plates, whereby the latter will be moved in unison, substantially as described.

3. In a railway-switch-operating mechanism, the combination, with the frame having the end and side flanges, the former being provided with the openings H, of the plate guided in said openings and between the side flanges, and provided with the oblique-angled slot, the bar guided in transverse openings in the said flanges, and con-

prising the upper and lower portions arranged on the upper and lower side of the plate, and the blocks connecting the ends thereof, the bolt roller, or sleeve secured to the bar and engaging the slot, the lever having one end connected to one end of the bar, and the link connecting the opposite end of the switch-rail, substantially as described.

399,091. ELECTRIC RAILWAY. HARRY W. SMITH, Newark, N. J. Filed Sept. 14, 1888. Serial No. 285,400. (No model.)



Claim.—1. The improved electrical railway having a sealed conduit provided with a conductor, an air-impelling device, *d*, contact-plates, and armatures for connecting said conductor and contact-plates, combined substantially as and for the purposes set forth.

2. The improved electrical railway herein described, combining therein a series of grooved stringers arranged to form a continuous conduit, a series of contact-plates arranged on the top of said stringers and insulated from one another, a series of armatures, a conducting-wire arranged in the groove of said stringers, and a packing or filling for insulating said contact-plates and sealing the conduit, substantially as and for the purposes set forth.

3. The improved electrical railway herein described, combining a longitudinally-grooved stringer, a series of insulated plates covering said groove and packed or sealed, and forming, with said stringer, a closed conduit, a conducting-wire arranged at the bottom of said groove, levers having armatures thereon arranged in said groove over said conducting-wire, and a packing or filling for sealing or closing the openings between said plates to provide an impervious passage in said stringer, substantially as set forth.

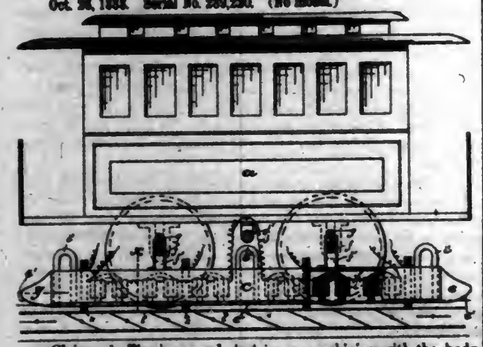
4. The improved electric railway combining therein stringers having a continuous passage therein open to allow air to be forced therethrough, plates *h h*, secured on said stringer, covering the groove or passage therein and insulated from one another, armatures, and a conductor, substantially as and for the purposes set forth.

5. In combination, in an electric railway, stringers having a passage, *f*, plates *h h*, a conductor, *k*, levers *m*, having an armature, *c*, and springs or brackets *s*, electrically connected, and stops *r*, all arranged and operating substantially as set forth.

6. The improved electric railway having a conduit, with a conductor and a series of armatures therein, and a series of non-magnetizable plates, *h h*, adapted to be engaged by said armatures and transmit the electric current to the car, substantially as and for the purposes set forth.

7. The improved electric railway having a conductor and a series of non-magnetic plates, and armatures interposed therebetween and adapted to connect the same when influenced by a magnet of a car, substantially as and for the purposes set forth.

399,092. ELECTRIC CAR. HARRY W. SMITH, Newark, N. J. Filed Oct. 26, 1888. Serial No. 289,230. (No model.)



Claim.—1. The improved electric car combining with the body of a car a magnet-holder, magnets, and a plate of non-magnetic metal arranged between the magnet and railway when the car is in operation, substantially as and for the purposes set forth.

2. The improved electric car combining with the car-body a magnet-holder consisting of boards or plates *d d*, provided with feeders at the ends and covered top and bottom with non-magnetic material and magnets arranged in said holders, substantially as and for the purposes set forth.

3. The improved electric car or vehicle combining with the car-body a magnet-holder arranged beneath the body of the car, and a series of magnets, including both electro-magnets and permanent magnets, substantially as and for the purposes set forth.

4. The improved electric car combining with the car-body axles *b b*, a magnet-holder movably arranged on said axles, and magnets, substantially as and for the purposes set forth.

5. The improved electric car combining with the car-body an adjustable magnet-holder suspended from the axles thereof, and magnets, substantially as and for the purposes set forth.

6. The improved electric car combining with the car-body an electric motor and magnets, a magnet-holder inclosing said magnets, and a brush or brushes extending through said holder to engage the track or way, substantially as and for the purposes set forth.

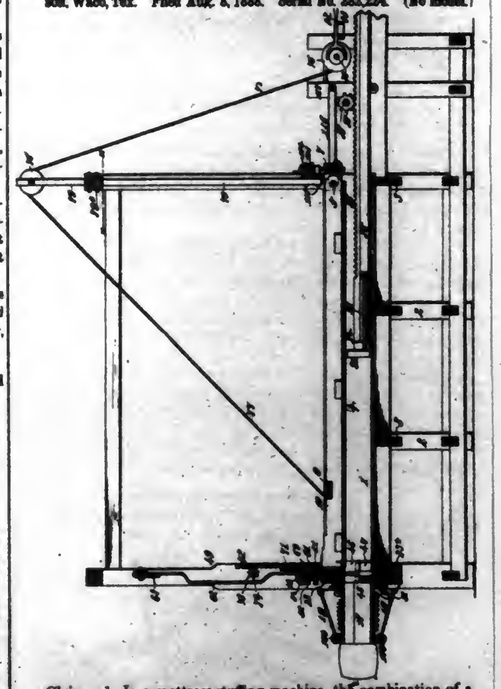
7. The improved electric car combining with the car-body a series of inclosed magnets arranged beneath the body of the car to attract armatures in the railway, substantially as and for the purposes set forth.

8. In combination, in a car having an electromotor, plates *d d*, cover *h*, and partitions *m' m'*, forming brush-passages, brushes arranged in said passages and adapted to engage a conductor in the railway and transmit the current therefrom and connected with said motor, substantially as and for the purposes set forth.

9. The improved electric car combining with the car-body a magnet-holder, brushes adjustably arranged with relation to said holder, and springs secured on said holder and to said brushes, substantially as set forth.

10. The improved electric car combining therein a magnet-holder and magnets, and brushes arranged on said holder to engage the conducting agents on the road or way, said brushes being carried by springs to allow an automatic adjustment relative to said way, substantially as and for the purposes set forth.

399,093. MATTRESS-STUFFING MACHINE. EDWIN H. STEPHENSON, Waco, Tex. Filed Aug. 8, 1888. Serial No. 282,224. (No model.)



Claim.—1. In a mattress-stuffing machine, the combination of a laterally-expansible press-box, a vertically-adjustable and laterally-expansible box-cover, a spout connected with the discharge-mouth of the press-box, composed of two upper sections movable vertically and laterally adjustable, and two lower sections laterally adjustable and loosely connected with the upper sections, substantially as described.

2. In a mattress-stuffing machine, the combination, with a laterally-expansible press-box, of a cover composed in part of separable sections, said cover hinged upon a vertically-adjustable end bar, means for raising and lowering the same, a spout formed in four overlapping sections adjustable one upon the other in a horizontal and vertical direction, and means, substantially as described, for closing the spaces between the press-box and the mouth of the spout, substantially as described.

3. In a mattress-stuffing machine, the combination, with a press-box expansible laterally, and a vertically-adjustable box-cover, of a four-part spout located at the end of said press-box and composed of two upper and two lower sections lapped upon each other, the two upper sections being movable vertically, and one upper and one lower section being movable laterally in unison with the laterally-adjustable side of the press-box, and means for so adjusting the spout-sections, substantially as described.

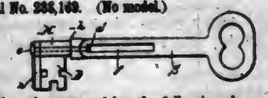
4. In a mattress-stuffing machine, the combination, with a press-box having a laterally-movable side, of a hinged cover composed in part of separable sections, one or more of which may be united with the integral portion of said cover, the movable side being provided with rack-bars meshing with pinions giving lateral movement, and a rest-bar being connected to said movable side near one end, extended outward and supported by the end of one or more of said rack-bars to support the ends of the separable sections above the teeth of the racks, substantially as described.

5. In a mattress-stuffing machine, the combination, with a press-box having a laterally-movable side, of a cover hinged upon a vertically-adjustable end bar, said cover composed in part of separable sections, and the screws mounted in fixed supports and engaging said end bar, said screws being rotated by a horizontal shaft carrying miter-gears which mesh with similar miters on the screws, substantially as described.

6. In a mattress-stuffing machine, the combination, with a press-box capable of lateral expansion and a vertically-adjustable box-cover, of a spout composed of four sections overlapping and sliding upon each other, the two lower sections having at their outer ends upwardly-turned double plates between which the downwardly-bent ends of the upper sections lie, and removable pins passing through an opening in the double plates and through one of a series of openings in the downwardly-turned ends of the upper sections, substantially as described.

7. In a mattress-stuffing machine, the combination, with a press-box having one side wall adjustable laterally, and a vertically-movable box-cover comprising removable and replaceable sections to vary its width, of a spout located at the discharge-mouth of the press-box and comprising two upper sections movable vertically and laterally adjustable, and two lower sections laterally adjustable and loosely connected with the upper sections, substantially as described.

399,094. KEY. OSCAR STODDARD, Detroit, Mich. Filed Oct. 15, 1888. Serial No. 288,169. (No model.)



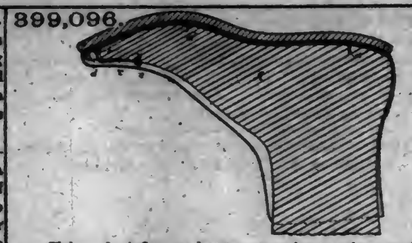
Claim.—A door-key comprising the following elements: the shank having the opening therein, the head having the annular shoulder and and wing, said parts formed integral, the hole passing through the head and communicating with the opening in the shank, the auxiliary wing, its form in cross-section coinciding with the head and wing of the key and having the hole therein, and the rivet passing through the head and the auxiliary wing, its outer end being upset, as and for the purposes specified.

399,095. SPOOL-HOLDER FOR SEWING-MACHINES. CHARLES L. THOMAS, York, Pa. Filed June 14, 1888. Serial No. 277,066. (No model.)



Claim.—As a new article of manufacture, the herein-described spool-holder, comprising the base-plate provided with the apertures *a a*, the face-plate having a concavely-curved upper edge, and provided with the curved slot D, parallel with its upper edge, and the ends F, substantially as specified.

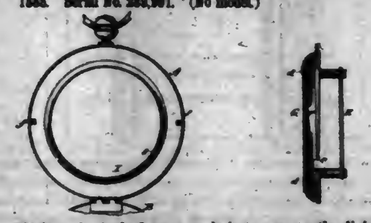
399,096. ATTACHMENT FOR LASTS. AUGUSTUS S. TROWBRIDGE, Milford, Mass., assignor of two-thirds to Charles W. Shippee, same place, and William H. Dunbar, Boston, Mass. Filed Sept. 15, 1888. Serial No. 285,473. (No model.)



Claim.—1. A form or last to enter a boot or shoe provided at its toe with a spring-catch and in its heel and ball portions with catches, holders, or points to support the sock-lining or cover for the inner sole while a boot or shoe is being applied to the form or last, and is pressed or forced into contact with the adhesive surface of the said lining or cover and onto the form to give shape to the sole thereof, the toe-catch having its point inclined forward, all as set forth and represented.

2. In combination with a form or last to enter a boot or shoe, the spring toe catch or holder *b*, having its point inclined forward, and the heel and ball holders or points *a a'*, for supporting a sock-lining or inner-sole cover while being applied and secured to the inner sole of a boot or shoe, substantially as shown and set forth.

399,097. CLOCK-CASE. ALFRED D. TERRELL, New Haven, Conn., assignor to the New Haven Clock Company, same place. Filed Nov. 5, 1888. Serial No. 289,991. (No model.)



Claim.—1. A clock-case made in two parts, the division being in a plane at right angles to the axis of the case, one of the parts of the case constructed with radially-projecting studs *f* upon its inside, combined with a movement having its front plate provided with a flange corresponding to the shape of the interior of the case, the edge of the flange adapted to rest against the inner surface of the case, the said flange constructed with notches *e*, corresponding in position to the studs *f* of the case, and the edge of the flange from the recesses inclined to the plane of movement, substantially as described, and whereby the said notches permit the flange of the movement to pass into the case beyond the studs, and then by a partial rotation of the movement to bring the inclined edges of the flange under said studs.

2. A circular clock-case made from sheet metal in two parts, the division being in a plane at right angles to the axis of the case, the one part, A, being the front and the other part, B, the rear part, the front part provided with a glass, I, and a border, H, resting upon the inside of the glass, combined with a movement constructed with a circular flange, F, corresponding in shape to and so as to rest against the interior of the front portion of the case, the said flange constructed with two or more notches, *e*, through its edge, and the edge of the case from the notches inclined to the plane of movement, the said front portion of the case provided with studs *f*, corresponding to the notches *e* in the flange of the movement, and whereby the said movement and its flange are removably secured in the case, and also serve to secure the glass and its holding in place, substantially as and for the purpose described.

399,098. ATTACHMENT FOR GRATES. JOHN H. WAIT, Portsmouth, Ohio. Filed Sept. 8, 1888. Serial No. 284,905. (No model.)

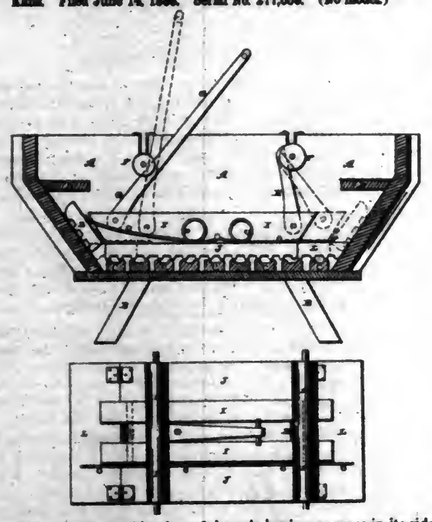


Claim.—1. An attachment for grates, comprising a flat plate having a series of grooves in its upper surface and a number of openings, G, the front central opening being of proper size to be engaged by a

lifter, and feet or prongs depending from the under side of the plate at the rear end of the same, as specified.

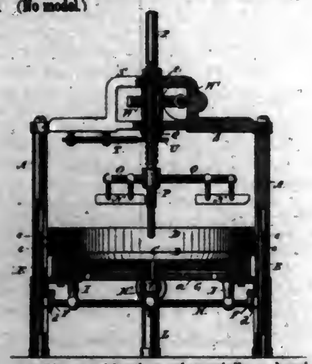
2. An attachment for grates, consisting of a flat plate having on its under side at its rear end the lugs K and notches M, and the depending feet N, provided with the prongs O O at their lower ends, substantially as and for the purpose specified.

399,099. WASHING-MACHINE. JOSEPH A. WALKER, Meivern, Kans. Filed June 14, 1888. Serial No. 277,058. (No model.)



Claim.—The combination of the tub, having recesses in its sides and the ribs C upon its bottom, with the cross-pieces F, the hanger H, secured to one of the cross-pieces, the lever G, secured to the other, the wash-board J, the cleats I, secured to the top of the board and between which the lower ends of the lever and hanger are secured, the hinged end pieces, L, attached to opposite ends of the wash-board, and the springs O, for keeping the end pieces pressed downward, substantially as shown and described.

399,100. SUGAR CREAMING AND MIXING MACHINE. WILLIAM WALTHER, New York, N. Y. Filed Aug. 27, 1888. Serial No. 283,854. (No model.)



Claim.—1. The combination, substantially as herein set forth, in a machine for cooling and creaming sugar, of a double-bottomed pan inclosing a hollow space to contain a cooling medium and having inlet and outlet apertures to promote a circulation therein, a rotating and longitudinally-moving spindle mounted axially above the pan and having a screw formed thereon, a nut engaging said screw, having a ratchet upon its periphery and revolving loosely in a stationary bearing, a pawl engaging said ratchet-scrapers carried by the spindle, a low stationary wall encircling the pan, an outer movable concentric rim encircling said wall, whereby the depth of the pan may be increased or diminished, and mechanism, substantially as described, for actuating said rim.

2. The combination, with the vertical rotating spindle in a sugar-creaming machine, the scraping-blades carried thereby, and means, substantially as described, for rotating the spindle, of a screw formed upon said spindle, a nut encircling and engaging said screw and revolving loosely in a stationary bearing, a ratchet encircling the periphery of said nut, and a spring-actuated pawl engaging said ratchet, substantially in the manner and for the purpose herein set forth.

3. The combination, substantially as set forth, with the rotating spindle in a sugar-creaming machine, scraping-blades carried thereby, and the pan in which said blades revolve, of a fixed low encircling rim, a concentric movable extension-rim telescoping with said fixed rim, and means, substantially as described, for raising and lowering said extension-rim, substantially in the manner and for the purpose herein set forth.

4. The combination, with the movable rim encircling the pan in a sugar-creaming machine, of the vertical standards, the guide-rods playing in said standards and attached to the rim, the horizontal rock-shaft mounted in bearings under the pan, the lifting-arms projecting from said rock-shaft and linked to the guide-rods, the main arm projecting from the rock-shaft at an angle with said lifting-arms, the nut pivoted to said main arm, and the horizontal screw-shaft rotating in bearings under the pan and engaging said nut, all substantially in the manner and for the purpose herein set forth.

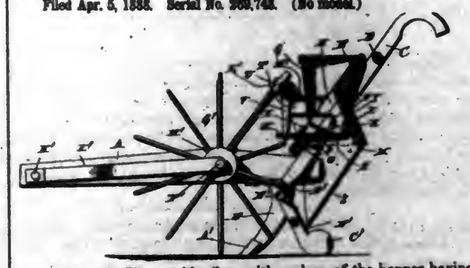
399,101. STEAM-ENGINE. JACOB WEST, Bolivar, Pa. Filed Nov. 17, 1888. Serial No. 291,110. (No model.)



Claim.—1. The combination, substantially as described, of the cylinder or casing having a conical chamber, lateral ingress and egress ports communicating, respectively, with the larger and smaller ends of said chamber, a head to close the larger end of said chamber, and a conical piston provided with spiral grooves terminating near the larger end of the piston.

2. The combination, substantially as described, of a cylinder or casing provided with a conical chamber, an eduction-port opening laterally from the smaller end of the chamber, a circular steam-passage surrounding the larger end of the chamber and communicating therewith through one or more radial openings, an ingress-port opening into said circular chamber, a removable head to close the larger end of the chamber, and a conical spirally-grooved piston mounted in the chamber with its shaft journaled in the heads of the cylinder and provided at its larger end beyond the ingress-ports with a peripheral plain surface.

399,102. CORN-PLANTER. MOSES A. WESTBROOK, Carthage, Miss. Filed Apr. 5, 1888. Serial No. 269,743. (No model.)



Claim.—1. The combination, with a plow, of the hopper having the inclined rear side board, E, detachably secured to the plow-handles, the seed-slide arranged in the bottom of the hopper, the rock-shaft journaled in supports projecting from the hopper and having the arm V engaging the seed-slide, the operating-arm L', and the driving-wheel journaled on one side of the plow-beam and having the tappet-arms H' engaging the arm L', substantially as described.

2. The combination, with a plow, of the hopper having the inclined rear side board, E, detachably secured to the plow-handles, and having the opening H, the spout I, depending from said board and fitted between the handles, the reciprocating seed-slide in the lower portion of the hopper and projecting forward through an opening in the board E, the rock-shaft journaled in supports on the hopper and having the arm engaging the seed-slide, and means, substantially as set forth, to oscillate said rock-shaft.

399,103. BRAKE-SHOE. GEORGE WESTINGHOUSE, Jr., Pittsburg, Pa. Filed Nov. 15, 1888. Serial No. 290,914. (No model.)



Claim.—1. A brake-shoe having those parts of its face which operate on the portions of the wheel-tread normally in contact with the rail recessed at one or more points and the other portions thereof solid with reference to securing by different areas of wearing-surfaces in different parts of the brake-shoe a uniform or practically uniform wear of the wheel against which it operates, substantially as set forth

2. A brake-shoe having in combination the continuous bearing portions 6 and 7 and the sectional bearing-faces 5, arranged to operate on that portion of a car-wheel normally bearing upon the rail, substantially as set forth.

399,104. GAS-BURNER. FERNANDO WHITE, Pittsburg, Pa., assignor of one-half to William Yagle & Co., (Limited,) same place. Filed Mar. 15, 1883. Serial No. 267,949. (No model.)



Claim.—1. In a gas-burner, the combination of the body *a*, the gas-supply pipe *d*, extending into the same, said pipe having outlets *e* therein and having its upper end threaded, the cover-plate *g*, screwing onto the end of said pipe and resting against the top of the body *a*, and a cap or plug, *h*, closing the end of the pipe *d*, substantially as and for the purposes set forth.

2. In a gas-burner, the combination of the body *a*, having the outlets *f*, the pipe *d*, extending up through the body and having outlets *e* therein, the cover-plate *g*, screwing onto said pipe and resting on said body, and the regulating-sleeve *j*, screwing onto said pipe and having an enlarged portion inclosing said outlet *e* and extending up toward said cover-plate, substantially as and for the purpose set forth.

399,105. TRUSSED SUSPENSION-BRIDGE. GEORGE M. WILSON, Melvern, Kans. Filed Nov. 22, 1888. Serial No. 291,560. (No model.)



Claim.—1. The combination, in a suspension-bridge, of the cables, the chords or stringers, the plates or castings on the cables and under the stringers, the vertical tie-rods connecting the plates or castings, and the truss-rods, also secured to and connecting the said plates, the said truss-rods being crossed in the spaces between the tie-rods, substantially as described.

2. The plates or castings L, having the concaved grooves on their lower sides to adapt them to fit on the cables and having the ears M and the ears S, in combination with the tie-rods secured to the ears M, and the truss-rods secured to the ears S, substantially as described.

3. The combination, with the stringers or chords arranged in pairs and apart from each other, the plates or castings O, arranged under the stringers and having the transverse arms N and the longitudinal arms R, the tie-rods secured to the arms N, and the truss-rods secured to the arms R, substantially as described.

4. The combination, in a suspension-bridge, of the cables, the chords or stringers, the tie-rods depending from the cables and supporting the chords, the truss-rods also connecting the cable and chords, the deck-beams arranged on the chords or stringers, the floor-boards supported on the deck-beams, and the hub-boards X, secured to the tie-rods, substantially as described.

5. In a bridge, the piers B, the chords or stringers A, slightly arched and supported by the piers, the ends of the chords or stringers projecting beyond the piers for a suitable distance and resting on the banks or approaches, the posts C, arranged in pairs on opposite sides of the bridge, and having their lower ends passed between the stringers or chords and supported by the piers, the saddles or caps D at the upper ends of the posts C, and the cables H, supported by the posts C by bearing on the saddles D, and having their ends secured at a suitable distance beyond the piers of the stream by suitable anchoring devices, as set forth.

6. The posts C, arranged in pairs on opposite sides of the bridge, and having the caps or saddles D provided with ears or flanges E, the said caps or saddles being connected by the cross-bar F, combined with the cables H, supported by the posts C, bearing upon the saddle-plates D between the flanges thereof, and having their ends secured at a suitable distance beyond the piers by suitable anchoring devices, I, as set forth.

7. In a suspension-bridge, the cables, the plates or castings L on the cables, the V-shaped truss-rods V, having their upper ends connected to the plates or castings L, the chords or stringers A, and the plates or castings O below the chords or stringers and connected to the truss-rods V, as set forth.

8. In a suspension-bridge, the chords or stringers A, the cables H, the V-shaped truss-rods V, depending from the cables and passing under the chords or stringers, and the tie-rods K, also depending from the cables, having the shape of an inverted U, and passing down and connected to the chords or stringers, and the truss-rods V, crossing each other midway between the tie-rods K, as set forth.

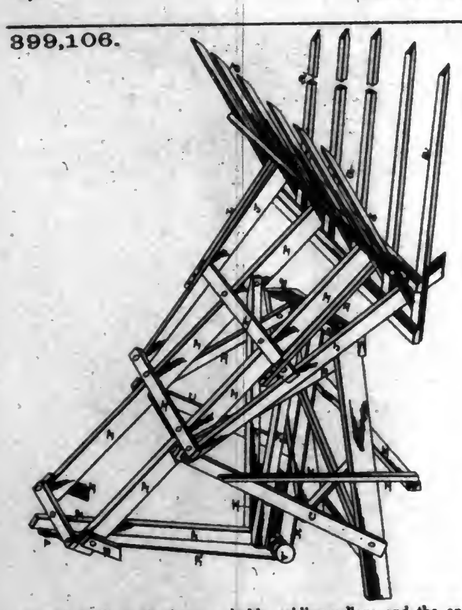
9. In a suspension-bridge, the cables H, the chords or stringers A, and the truss-rods V, having the shape of the letter V, the central portion of the truss-rods passing under the chords or stringers, and the upper ends being secured to the cables, the said truss-rods crossing each other, as set forth.

10. In a suspension-bridge, the cables H, the chords or stringers A, the plates L on the cables, the plates O below the chords or stringers, and the V-shaped truss-rods V, having their central portions passed through the plates O, to hold the same against the chords or stringers, and their upper ends connected to alternate plates L, the said truss-rods crossing each other, as set forth.

399,106. HAY-STACKER. JULIUS E. WILL and HENRY WILL, Bethel, Mo., assignors of one-third to Philip Steinbach, Sr., same place. Filed Oct. 2, 1888. Serial No. 287,092. (No model.)

Claim.—1. The combination of a suitable supporting-frame, the lovers F, the fork composed of two sets of teeth placed at a suitable angle to each other, the braces N P, secured to the levers, a weight

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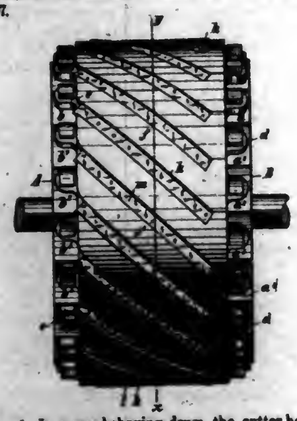


secured rigidly to the brace, suitable guiding-pulleys, and the operating-rope, substantially as described.

2. In a hay-stacker, the combination of the levers F, pivoted upon a suitable supporting-frame, the braces J, cross-pieces K, and the adjustable braces L, with the hay-fork consisting of a stationary set of teeth and a pivoted shorter set of teeth, which are adapted to be held at different angles to the stationary set by means of said braces L, substantially as set forth.

3. The combination of the frame A, the braces B C, secured together at their upper ends by the cross-bolt D, the levers F, having the fork G secured to their front ends, the stops E, secured to the rear ends of the levers, the braces N P, the weight secured to the braces, the guiding-pulleys, and the operating-rope, substantially as specified.

399,107. MACHINE FOR CUTTING WOOD INTO CHIPS. OTTO A. WEITZE, Barzehnde, Prussia, Germany. Filed May 28, 1888. Serial No. 275,271. (No model.) Patented in Germany Mar. 24, 1887, No. 42,187.



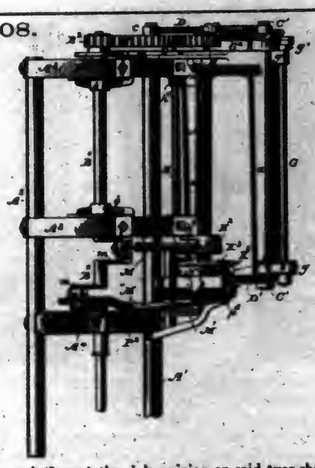
Claim.—1. In a wood-shaving drum, the cutter head or drum having a series of diagonal slots in its periphery, the helicoidal staves, and the series of knives, substantially as set forth.

2. In a wood-shaving drum, the combination, with the cutter head or drum and the polygonal bottom pieces, A and B, of the helicoidal staves *f* and the knives *h*, substantially as set forth.

399,108. GRAIN-BINDER. CHARLES B. WITHERSTON, Janesville, Wis. Filed Apr. 26, 1887. Serial No. 236,977. (No model.)

Claim.—1. The combination, substantially as hereinbefore set forth, of the trip-pinion on the packer-shaft, the trip-latch, the main gear, with which said pinion directly meshes, the delay-flange on its

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side, the tyer-shaft, and the delay-pinion on said tyer-shaft directly meshing with the main gear.

2. The combination, substantially as hereinbefore set forth, of the trip-pinion on the packer-shaft, the main gear meshing directly therewith, the binder-arm mounted on an overhead shaft, the pitman connecting the main gear with an arm on said shaft, the parallel compressor-shaft, the delay-pinion on the tyer-shaft directly meshing with the main gear, and the link connecting said delay-pinion with an arm from the compressor-shaft.

3. The combination, substantially as hereinbefore set forth, of the trip-pinion on the packer-shaft, the trip-latch, the main gear, with which said trip-pinion directly meshes, the tyer-shaft, the delay-pinion on said tyer-shaft, having a shoe engaging a delay-flange on the main gear and itself meshing directly with the teeth of said main gear, the binder-arm shaft, and a pitman connecting the wrist-pin on the main gear with an arm from said shaft.

4. The combination, substantially as hereinbefore set forth, with the delay-pinion and its shoe having lateral channels in its toes, of a driving-gear having a delay-flange provided with supporting-pins at the center of the cut-away spaces therein, projecting to about half the thickness of the shoe to support it after it has passed through said cut-away spaces.

5. The combination, substantially as hereinbefore set forth, with the trip-pinion, trip-clutch, and pivoted trip-latch, and with a wheel in the train driven by said pinion and between said pinion and the band applying and uniting devices, of the locking-dog independently pivoted to the frame and taking into a notch in said wheel, and an arm from said locking-dog projecting into the path of the independent trip-latch, whereby it will be lifted when the trip-latch is moved to release the driving-dog.

6. The combination, substantially as hereinbefore set forth, with the trip-clutch and trip-latch, of the rock-shaft upon which said trip-latch is secured, the spring pressing the trip-latch normally away from the path of the trip-dog, the arm from the inner end of the trip-shaft resting adjacent to the periphery of the shaft, which is carried in the subtending arm of the binder-frame, and a finger normally resting under said arm to hold the latch into engagement and partaking of the motions of said subtending shaft, whereby after disengagement it is brought up again beneath the heel of said arm and again resets the trip-latch.

7. The combination, substantially as hereinbefore set forth, with the trip-latch, the trip-shaft, and the spring which urges said trip-latch out of the path of the trip-dog, of the arm at the inner end of the trip-shaft, the trip-lever mounted upon a support sleeved about the shaft carried in the subtending arm of the binder-frame, the finger projecting laterally from said support under the arm from the trip-shaft, means whereby said sleeve is permitted a limited play about its supporting-shaft, and a spring holding it resistingly against such play, that as the grain is packed against the trip-finger it may yield and overcome the spring, carrying the lateral arm or finger out from beneath the arm from the trip-shaft, and then be taken around to come up on the other side of said arm in the ensuing revolution of its supporting-shaft.

8. The combination, substantially as hereinbefore set forth, with the trip-finger carried upon the inner end of the shaft in the subtending arm of the binder-frame, the trip-shaft extending alongside and parallel with said subtending frame-arm to the inner end of the shaft which the latter carries, the arm from the inner end of said trip-shaft, and the sleeve encircling the inner end of the subtending shaft where

it projects from the frame-arm and carrying the trip-finger, of the discharge-arm projecting rigidly from the other side of said sleeve, whereby as the trip-lever is carried around after starting the binder the discharge-arm is brought up into its place to eject the bound sheaf, and then returns beneath the binder as the trip-lever comes up to its initial position.

9. The combination, substantially as hereinbefore set forth, with the driving-dog, trip-latch, trip-shaft, and its arm, and with the subtending shaft of the binder, of the sleeve K, tangential supporting-bar K^3, the trip-lever K^2, supported upon and adjustable along said tangential supporting-bar, the spring L, and a device for adjusting the stress of said spring.

10. The combination, substantially as hereinbefore set forth, with the tyer-shaft, of a knotter-stock fixed thereto to revolve therewith, a tying-bill carried by said stock, and means whereby said bill is rotated upon its own axis during a portion of the revolution of the stock.

11. The combination, substantially as hereinbefore set forth, with the tyer-shaft and with the revolving knotter-stock carried thereby, of the tyer-spindle set obliquely in said stock, the pinion and delay-shoe on one end of said spindle, a segment-gear and delay-flange so cared to the binder-frame, with which said pinion and shoe engage, the tying-bill at the head of said spindle, and a cam carried by the revolving stock, with which the heel of the pivoted jaw engages as the bill is rotated to open said jaw.

12. The combination, substantially as hereinbefore set forth, with the tyer-shaft and the revolving stock mounted thereon, of the tyer-spindle, the tying-bill at the head thereof, the stationary holder, and means whereby the tyer-spindle is rotated to form the knot as it is approaching the holder, and stopped in its individual rotation with the jaws trending toward the holder immediately after it passes thereby to strip and tighten the knot as the stock continues to revolve.

13. The combination, substantially as hereinbefore set forth, with the tyer shaft and the revolving stock mounted thereon, of the obliquely-set tyer-spindle, the tying-bill at the head thereof, the stationary holder, and means whereby the tyer-spindle is rotated to form the knot as it is approaching the holder, and stopped in its individual rotation with the jaws trending toward the holder immediately after it passes thereby to strip and tighten the knot as the stock continues to revolve.

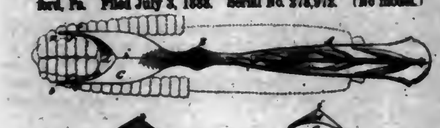
14. The combination, substantially as hereinbefore set forth, of the tyer-shaft, the revolving tyer-stock carried thereby, the tying-bill mounted in said stock, the stationary holder comprising a notched disk and shoe, the Geneva stop-pinion upon the holder-spindle, and the delay-flange and tooth upon the revolving knotter-stock engaging with said pinion to actuate the holder.

15. The combination, substantially as hereinbefore set forth, with the revolving knotter-stock and the tying-bill carried thereby, of the stationary holder and the cord-stop between said holder and the knotter, whereby the cord-strands are retained in position to pass between the open jaws of the tying-bill as it approaches the holder.

16. The combination, substantially as hereinbefore set forth, with the revolving knotter-stock and tying-bill carried thereby, of the knife mounted upon said stock above the crown of the tying-bill, projecting across the plane in which the cord is laid by the binder-arm, and serving to retain the cord-strands prior to the knotting movement.

17. The combination, substantially as hereinbefore set forth, with the tying-bill, the revolving stock in which it is mounted, and the stationary holder, of the knife carried by said stock above the crown of the tying-bill and projecting across the plane in which the cord is laid by the binder-arm, and having a notch in its shank to receive the spool-strand as it passes the holder and deflect it into position to spring beneath the chin of the knotter.

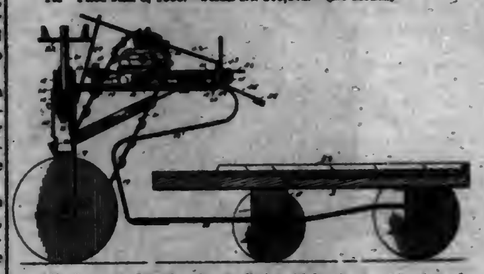
399,109. TABLE-KNIFE FOR GREEN CORN. JESSE F. WYNKOOP, Brooklyn, N. Y., assignor of one-half to Alonzo I. Wilcox, Bradford, Pa. Filed July 3, 1888. Serial No. 278,972. (No model.)



Claim.—1. The table-knife for green corn, consisting of the handle A and the body C, the body being concave on its under side and having at its end the forwardly-extending tines *a b* and the continuous cutting-edges *d f*, substantially as shown and described.

2. The table-knife for green corn, consisting of the handle A and body C, the latter having the concave under surface and oppositely-beveled upper surface, and having also at its end the forwardly-extending tines *a b* and cutting-edges *d e f*, substantially as shown and described.

399,110. HAND-PROPELLED VEHICLE. CYRUS YINGST, Annville, Pa. Filed Jan. 2, 1889. Serial No. 295,172. (No model.)



Claim.—1. In a hand-propelled vehicle, the combination of a vertical fork carrying a steering-wheel, a supplemental frame secured rigidly to the fork, a hanger pivotally connected to the fork and rigidly connected to a pivoted front axle, a bed, devices for detachably locking the supplemental frame to the hanger, and a driving-shaft journaled in the supplemental frame and connected to the axle of the steering-wheel, substantially as and for the purpose described.

2. In a hand-propelled vehicle, the combination of a bed having a pivoted front axle, a vertical fork having a rigid cross-head at its upper end and a steering-wheel journaled in its lower end, a supplemental frame rigidly secured to the cross-head, a hanger secured at one end to the front axle of the bed and having a horizontal arm arranged beneath the supplemental frame and pivoted to the cross-head, a device for adjustably and detachably locking the supplemental frame to the arm of the hanger, and a power-shaft journaled in the supplemental frame and gearing to the axle of the steering-wheel, substantially as and for the purpose described.

3. In a hand-propelled vehicle, the combination of a bed having a pivoted front axle, a vertical fork carrying a steering-wheel, a cross-head rigidly secured to the upper end of the fork, a hanger rigidly secured to the front axle of the bed and having a horizontal perforated arm pivoted to the cross-head, a supplemental frame rigidly secured to the cross-head and provided with a notched rear bar, which rests on the horizontal arm of the hanger, a latch pivoted to the arm of the hanger and having a prong adapted to enter one of the notches and the aperture of the supplemental frame and hanger-arm, respectively, and a power-shaft journaled in the supplemental frame and geared to the shaft of the steering-wheel, substantially as and for the purpose described.

4. In a hand-propelled vehicle, the combination of a bed having a front axle, a vertical fork carrying a steering-wheel and a cross-head, a hanger pivoted to the cross-head and rigidly secured to the front axle, a supplemental frame secured to the cross-head, a horizontal plate secured to the rear end of the supplemental frame and having the sockets for the reception of the knees of the occupant of the vehicle, and a locking device for detachably connecting said supplemental frame to the hanger, substantially as and for the purpose described.

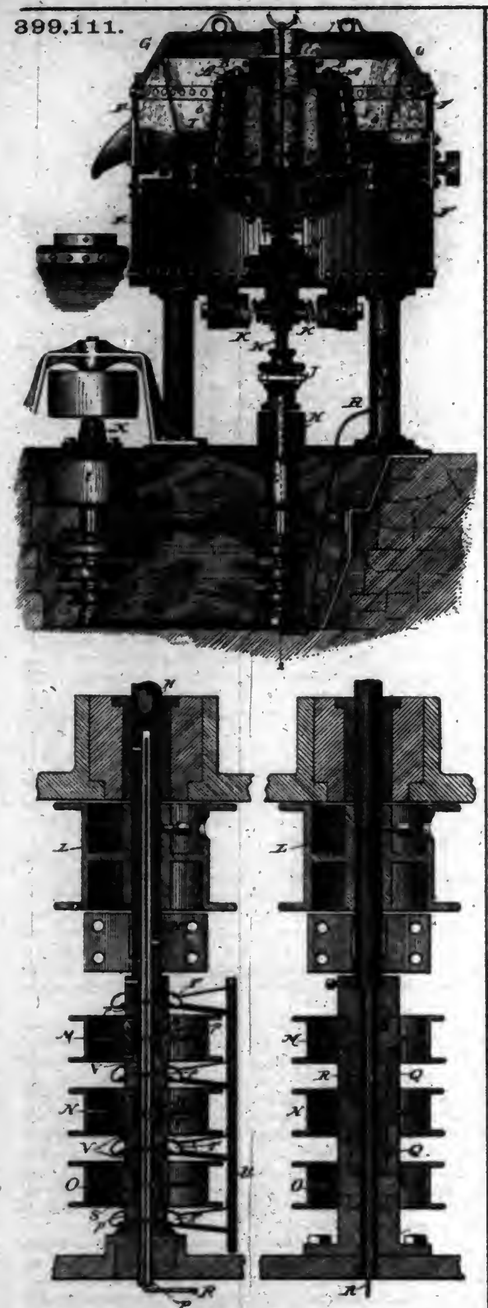
5. In a hand-propelled vehicle, the combination of a bed having a pivoted front axle, a vertical fork carrying a cross-head, a steering-wheel rotatively mounted in the lower end of the fork and having gear-wheels provided on its extended ends, a supplemental frame rigidly secured to the cross-head, a transverse bar secured to the fork above the axle of the steering-wheel, inclined braces secured to the ends of said transverse bar and the rear end of the frame, a power-shaft journaled in the supplemental frame and having gear-wheels at its ends, which are connected with the similar wheels on the shaft of the steering-wheel by intermediate chains, and a hanger rigidly secured to the front axle and pivoted to the cross-head, substantially as and for the purpose described.

6. In a hand-propelled vehicle, the combination, with an adjustable swinging frame carrying the driving mechanism, of a table arranged above said frame and the devices supported thereon, and vertical standards secured to the swinging frame and the front end of the table for supporting the latter in an inclined position.

399,111. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMUS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Nov. 24, 1886. Serial No. 201,594. (No model.)

Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revolubie receiving-vessel adapted to receive molten material to be treated, comprising a surrounding shell or case and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and provided with a neck or mouth separable from the main portion of the lining and removable from the surrounding

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shell or case, and means for revolving said vessel, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination, of a revoluble receiving-vessel adapted to receive molten material to be treated, comprising a surrounding shell or case and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and provided with channels, grooves, or indentations to diminish the surface-contact between the lining and the shell or case, and provided with a neck or mouth separable from the main portion of the lining and removable from the surrounding shell or case, and means for revolving said vessel, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, an incasing cover or envelope of wire wrapped or coiled around said vessel, and means for revolving said vessel, substantially as described.

4. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated and separable in the plane of its largest diameter, an incasing cover or envelope of wire wrapped or coiled around said vessel, and means for rotating said vessel, substantially as described.

5. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, comprising a surrounding shell or case provided with an incasing cover or envelope of wire wrapped or coiled around said shell or case, and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and means for revolving said vessel, substantially as described.

6. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated and separable in the plane of its largest diameter, comprising a surrounding shell or case provided with an incasing cover or envelope of wire wrapped or coiled around said shell or case, and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and means for revolving said vessel, substantially as described.

7. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, comprising a surrounding shell or case provided with an incasing cover or envelope of wire wrapped or coiled around said shell or case, and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and provided with channels, grooves, or indentations to diminish the surface-contact between the lining and the shell or case, substantially as described.

8. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated and separable in the plane of its largest diameter, comprising a surrounding shell or case provided with an incasing cover or envelope of wire wrapped or coiled around said shell or case, and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and provided with channels, grooves, or indentations to diminish the surface-contact between the lining and the shell or case, and means for revolving said vessel, substantially as described.

9. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive the molten material to be treated, comprising a surrounding shell or case having an incasing cover or envelope of wire wrapped or coiled around said shell or case, and a lining of an exterior size and shape to fit the interior of the surrounding shell or case, and provided with a neck or mouth separable from the main portion of the lining and removable from the shell or case, and means for revolving said vessel, substantially as described.

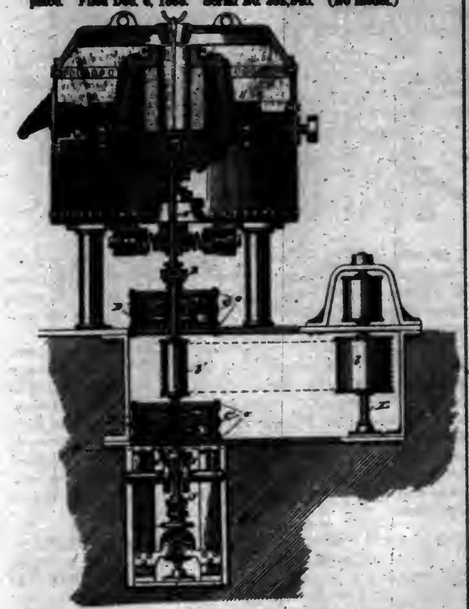
10. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive the molten material to be treated, a bottom in said vessel composed of refractory material or material capable of withstanding great heat in that spot where the molten material falls, a removable ring or collar forming the outer rim of the bottom and extending from the central portion of refractory material to the sides of the receiving-vessel and separable therefrom, and means for revolving said vessel, substantially as described.

11. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive the molten material to be treated and a surrounding curb having an incasing cover or envelope of wire wrapped or coiled around said curb, substantially as described.

12. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive the molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a divided bearing for the lower end or portion of the actuating-shaft, comprising a stationary section and a number of sections respectively rotatable in the direction of the rotation of the actuating-shaft, such sections being provided with sockets and hubs, the hubs fitting and rotating in the sockets, whereby the various sections are maintained in their vertical position, and means for rotating the actuating-shaft, substantially as described.

13. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive the molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves and having a hollow perforated lower extension diminished in diameter, a divided bearing for the lower end or portion of the actuating-shaft, comprising a number of sections with a hole through them receiving the hollow lower diminished extension of the actuating-shaft and being respectively rotatable in the direction of the rotation of the actuating-shaft, a pipe entering said hollow diminished extension and introducing oil therein, and means for rotating the actuating-shaft, substantially as described.

399,112. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMUS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Dec. 6, 1883. Serial No. 302,840. (No model.)



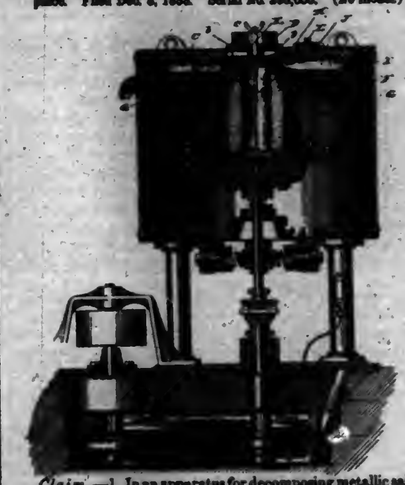
Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a divided bearing for supporting the actuating-shaft and its superimposed load, comprising two sets of vertical wheels arranged in suitable bearings, and two horizontal disks arranged on the actuating-shaft and rotating as it revolves, and resting upon the upper peripheries of the vertical wheels and rotating them, and means for rotating the actuating-shaft, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a divided bearing for supporting the actuating-shaft and its superimposed load, comprising two sets of vertical wheels arranged in suitable bearings, and two horizontal disks arranged on the actuating-shaft and rotating as it revolves, and resting upon the upper peripheries of the vertical wheels and rotating them, a spring arranged on the actuating-shaft above the second disk, with its upper end against a collar or stop, and the second disk movable vertically, and means for rotating the actuating-shaft, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, one or more journal-boxes maintaining the actuating-shaft in a vertical position, containing wheels or rollers which bear against the surface of the actuating-shaft and rotate with it, a divided bearing for supporting the actuating-shaft and its superimposed load, comprising two sets of vertical wheels arranged in suitable bearings and two horizontal disks arranged on the actuating-shaft and rotating as it revolves, and resting upon the upper peripheries of the vertical wheels and rotating them, a spring arranged on the actuating-shaft above the second disk, with its upper end against a collar or stop, and the second disk movable vertically, and means for rotating the actuating-shaft, substantially as described.

4. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, and comprising a flexible or laterally-vibratable upper portion and a rigidly-journaled lower portion, a laterally-yieldable journal for maintaining a flexible or laterally-vibratable upper portion of the actuating-shaft in a vertical position, one or more journal-boxes for maintaining the rigidly-journaled lower portion of the actuating-shaft in a vertical position, containing wheels or rollers which bear against the surface of the actuating-shaft and rotate with it, a divided bearing for supporting the actuating-shaft and its superimposed load, comprising two sets of vertical wheels arranged in suitable bearings, and two horizontal disks arranged on the actuating-shaft and rotating as it revolves, and resting upon the upper peripheries of the vertical wheels and rotating them, a spring arranged on the actuating-shaft above the second disk, with its upper end against a collar or stop, and the second disk movable vertically, and means for rotating the actuating-shaft, substantially as described.

399,113. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMUS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Dec. 8, 1883. Serial No. 303,055. (No model.)



Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, having its contracted neck or mouth lined with refractory material capable of withstanding great heat, a cover for the neck or mouth of the receiving-vessel, with space between the cover and the neck or mouth to permit the discharging material to escape therefrom, and means for rotating the receiving-vessel, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, having its contracted neck or mouth lined with refractory material capable of withstanding great heat, a cover over the neck or mouth of the receiving-vessel, adjustable up or down to increase or diminish the space between the cover and the neck or mouth, through which the material is discharged, and means for rotating the receiving-vessel, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a cover over the neck or mouth of the receiving-vessel, with space between the cover and the neck or mouth to permit the discharging material to escape therefrom, a removable spout directing the molten material, preferably, into the center of the neck or mouth of the receiving-vessel, and means for rotating the receiving-vessel, substantially as described.

4. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be

treated, a cover over the neck or mouth of the receiving-vessel, with space between the cover and the neck or mouth to permit the discharging material to escape therefrom, a removable spout directing the molten material, preferably, into the center of the neck or mouth of the receiving-vessel, a bowl surrounding the removable spout, and means for rotating the receiving-vessel, substantially as described.

5. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a removable annular tub surrounding the same and adapted to receive molten material discharged from the mouth of the receiving-vessel, and means for rotating the receiving-vessel, substantially as described.

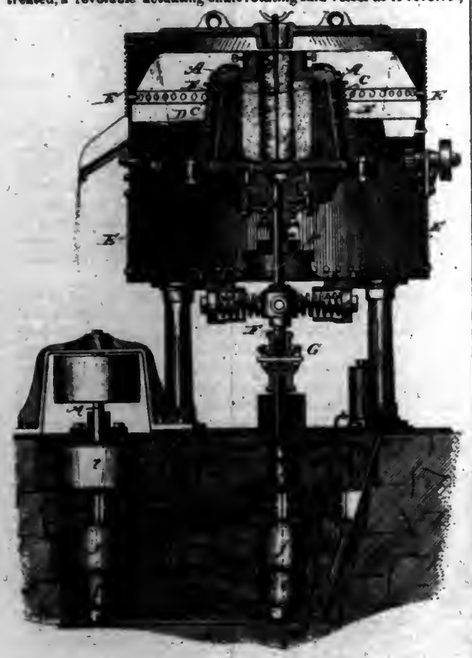
6. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a removable annular tub surrounding the same and adapted to receive the molten material discharged from the mouth of the receiving-vessel, and provided with a space in its walling, into and through which a blast or current of air may be passed and heated by the molten material discharged into the tub, and means for rotating the receiving-vessel, substantially as described.

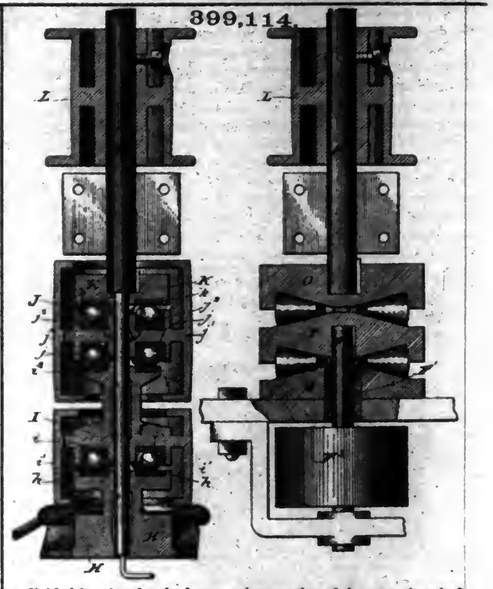
7. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a series of pipes arranged over the same and in proximity to the molten material discharged from the mouth of the receiving-vessel, and means for rotating the receiving-vessel, substantially as described.

399,114. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Nov. 26, 1888. Serial No. 293,191. (No model.)

Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, comprising a surrounding shell or case provided with an incasing cover or envelope of wire wrapped or coiled around the same, and a lining having an exterior of a size and shape to admit it to the interior of the surrounding shell or case, and a non-heat-conducting packing interposed between the lining and the surrounding shell or case, and means for rotating the receiving-vessel, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves,

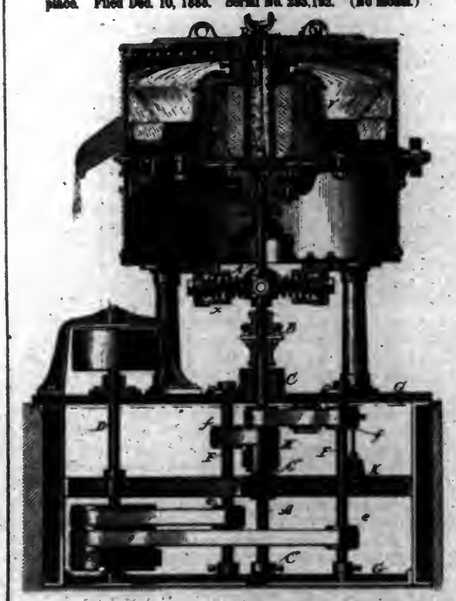




a divided bearing for the lower end or portion of the actuating-shaft, comprising a number of sections respectively rotatable in the direction of the rotation of the actuating-shaft, with balls or rollers interposed between the sections of the bearing, and means for rotating the actuating-shaft, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a divided bearing for the lower end or portion of the actuating-shaft, comprising a number of sections respectively rotatable in the direction of the rotation of the actuating-shaft, with balls or rollers interposed between the sections of the bearing, and means for rotating the actuating-shaft and the rotatable sections of the bearing, substantially as described.

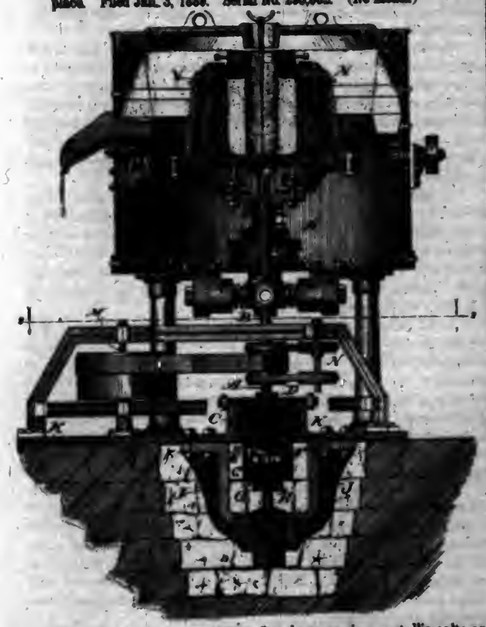
399,115. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Dec. 10, 1888. Serial No. 293,192. (No model.)



Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft carrying said vessel and its superimposed load and rotating them as it revolves, one or more counter-shafts with belts drawing against the actuating-shaft from different lateral directions and maintaining it in a vertical position while carrying and rotating the receiving-vessel and its superimposed load, and means for rotating one or more of said shafts, whereby all are rotated, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft carrying said vessel and its superimposed load and rotating them as it revolves, one or more counter-shafts, with belts drawing against the actuating-shaft from different lateral directions and maintaining it in a vertical position while carrying and rotating the receiving-vessel and its superimposed load, means for severally tightening and maintaining the tension of the connecting-belts, and means for rotating one or more of said shafts, whereby all are rotated, substantially as described.

399,116. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,962. (No model.)



Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the shaft, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load, balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, and means for rotating the actuating-shaft, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the shaft, a box or frame depending from the flexible journal and vibrating in unison therewith, a vibratable bed in the lower end of such box or frame supporting the weight of the actuating-shaft and its superimposed load, balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, and means for rotating the actuating-shaft, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the shaft, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load and vibrating in unison with the vibrations of the flexible journal, balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, a center or stud arranged beneath the vibratable bed, wholly or partially sustaining it, a stationary bed supporting the center or stud, and means for rotating the actuating-shaft, substantially as described.

4. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the shaft, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load and vibrating in unison with the vibrations of the flexible journal, balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, a center or stud arranged beneath the vibratable bed, wholly or partially sustaining it, a stationary vertically-adjustable bed supporting the center or stud, and means for rotating the actuating-shaft, substantially as described.

5. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the shaft, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load and vibrating in unison with the vibrations of the flexible journal, balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, a center or stud arranged beneath the vibratable bed, wholly or partially sustaining it, a stationary vertically-adjustable bed supporting the center or stud, and means for rotating the actuating-shaft, substantially as described.

6. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the shaft, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load and vibrating in unison with the vibrations of the flexible journal, balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, a center or stud arranged beneath the vibratable bed, wholly or partially sustaining it, a stationary vertically-adjustable bed supporting the center or stud, and means for rotating the actuating-shaft, substantially as described.

7. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a flexible journal for the lower portion of the actuating-shaft conforming to the lateral vibrations of the actuating-shaft, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load, sets of balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating vibratable bed, with a rotatable block interposed between the sets of balls or rollers, and means for rotating the actuating-shaft, substantially as described.

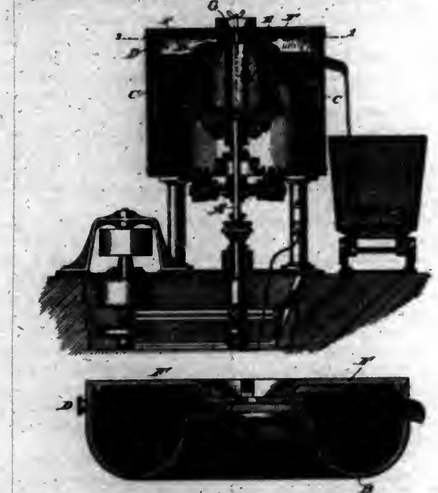
8. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a divided bearing for the lower end of the actuating-shaft comprising sets of balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating bed, with a loose rotatable block interposed between the sets of balls or rollers, and means for rotating the actuating-shaft, substantially as described.

9. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a vibratable bed supporting the weight of the actuating-shaft and its superimposed load, a divided bearing for the lower end of the actuating-shaft comprising sets of balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating bed, with a rotatable block interposed between the sets of balls or rollers, and means for rotating the actuating-shaft, substantially as described.

10. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revolable receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a divided bearing for the lower end of the actuating-shaft comprising sets of balls or rollers interposed between the rotating head of the actuating-shaft and their non-rotating bed, with a rotatable block

interposed between the sets of balls or rollers, a power-shaft and one or more counter-shafts whose belts connect with the actuating-shaft and draw against it from different lateral directions, and means for rotating the actuating-shaft, substantially as described.

399,117. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,363. (No model.)

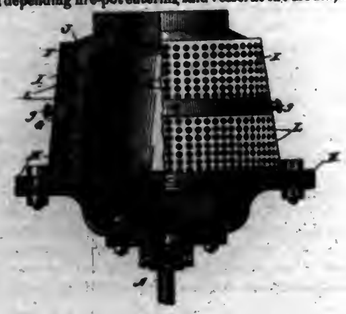


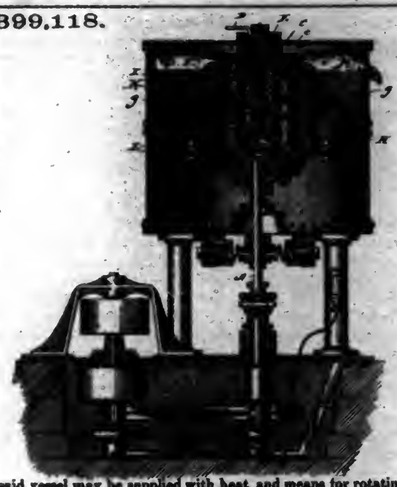
Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, an annular tub surrounding the same and adapted to receive the molten material discharged from the mouth of the receiving-vessel, a removable cover for such tub to retain the heat of the molten material therein, a revoluble actuating-shaft rotating the receiving-vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revolable receiving-vessel adapted to receive molten material to be treated, an annular tub surrounding the same and adapted to receive the molten material discharged from the mouth of the receiving-vessel, a removable cover for such tub to retain the heat of the molten material therein having a depressed central portion forming a cover over the neck or mouth of the receiving-vessel, with space between the cover and the neck or mouth to permit the discharging material to escape therefrom, whereby the heat in the receiving-vessel is largely retained, a revoluble actuating-shaft rotating the receiving-vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

399,118. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,364. (No model.)

Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a depending fire-pot entering said vessel at the mouth, whereby





said vessel may be supplied with heat, and means for rotating the actuating-shaft, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a depending fire-pot entering said vessel at the mouth and provided with a hole or opening through it for the admission of molten material to said vessel, and means for rotating the actuating-shaft, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a cover or envelope of wire wrapped or coiled around said vessel, a covering or jacket protecting the wire, a revoluble actuating-shaft rotating said vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

4. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a cover or envelope of wire wrapped or coiled around said vessel, a covering or jacket protecting the wire and provided with holes or perforations to admit air to the wire and permit the cooling of the exterior of the receiving-vessel, a revoluble actuating-shaft rotating said vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

5. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a ring or shoulder around the receiving-vessel affording a stop for the upper coils of wire, a cover or envelope of wire wrapped or coiled around said vessel, a revoluble actuating-shaft rotating said vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

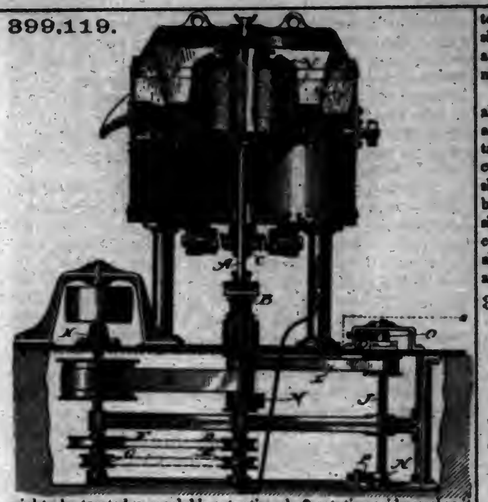
6. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a band or hoop around the receiving-vessel enabling it to be removed or handled, a cover or envelope of wire wrapped or coiled around said vessel, a revoluble actuating-shaft rotating said vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

7. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, said vessel being specially re-enforced or strengthened at the base or angle of its shell or case, a cover or envelope of wire wrapped or coiled around said vessel, a revoluble actuating-shaft rotating said vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

399,119. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,365. (No model.)

Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten mate-

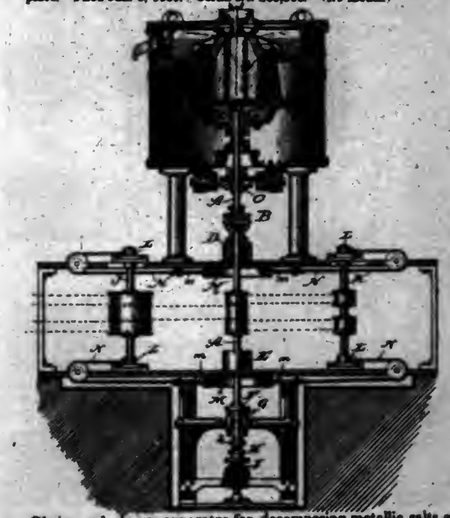
399,119.



rial to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a bearing for the lower end or portion of the actuating-shaft, a counter-shaft adjustable toward or from the actuating-shaft to regulate the tension of its belt, and with its belt drawing against the actuating-shaft in opposition to the power-shaft to counteract or counterbalance lateral strain, and means for rotating the actuating-shaft and the sections of its bearing, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a bearing for the lower end or portion of the actuating-shaft, comprising a number of sections respectively rotatable in the direction of the rotation of the actuating-shaft, a counter-shaft adjustable toward or from the actuating-shaft to regulate the tension of its belt, with yieldable means for adjusting and sustaining it in proper position, and with its belt drawing against the actuating-shaft in opposition to the power-shaft to counteract or counterbalance lateral strain, and means for rotating the actuating-shaft and the sections of its bearing, substantially as described.

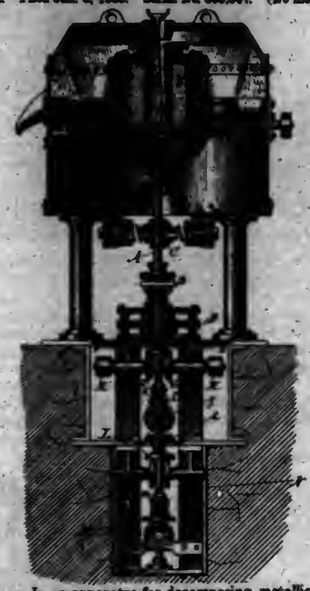
399,120. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,366. (No model.)



Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating in a loose journal-box and rotating said vessel as it revolves, one or more counter-shafts with their belts drawing against the actuating-shaft in opposition to the power-shaft to counteract or counterbalance lateral strain and to maintain the actuating-shaft vertical in its loose journal, and means for rotating the actuating-shaft, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, counter and power shafts adjustable toward and from the actuating-shaft to regulate and equalize the tension of their belts, and with the belt of the counter-shaft drawing against the actuating-shaft in opposition to the power-shaft, means for effecting the adjustment of the counter and power shafts, consisting of a connection holding them apart against the strain of their belts, and means for rotating the actuating-shaft, substantially as described.

399,121. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,367. (No model.)



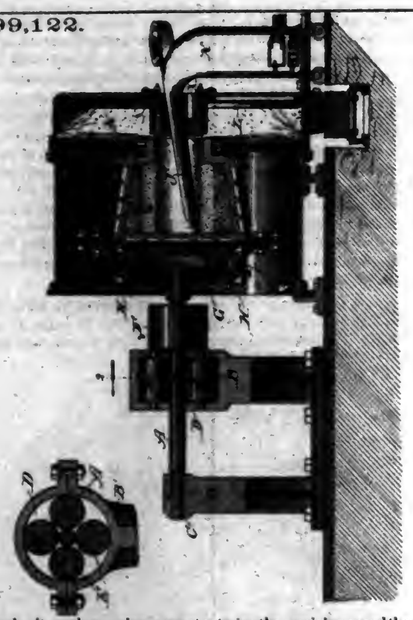
Claim.—In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a revoluble receiving-vessel adapted to receive molten material to be treated, a revoluble actuating-shaft rotating said vessel as it revolves, a bearing for supporting the actuating-shaft and its superimposed load, comprising vertical wheels arranged in suitable bearings and a horizontal disk arranged on the actuating-shaft and rotating as it revolves and resting upon the upper peripheries of the vertical wheels, a spring arranged on the actuating-shaft above the disk, with its upper end against a vertically-adjustable collar or stop, whereby the tension of the spring may be increased or diminished, and means for rotating the actuating-shaft, comprising a rotating frictional surface bearing against the frictional surface on the actuating-shaft and rotating it, substantially as described.

399,122. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,368. (No model.)

Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a horizontal revoluble receiving-vessel adapted to receive molten material to be treated, a horizontal revoluble actuating-shaft rotating said vessel as it revolves, a pipe or spout entering the receiving-vessel through its mouth and discharging the molten material to be treated into the receiving-vessel at or near its farther end, means for supplying heat to the interior of the receiving-vessel, and means for rotating the actuating shaft, substantially as described.

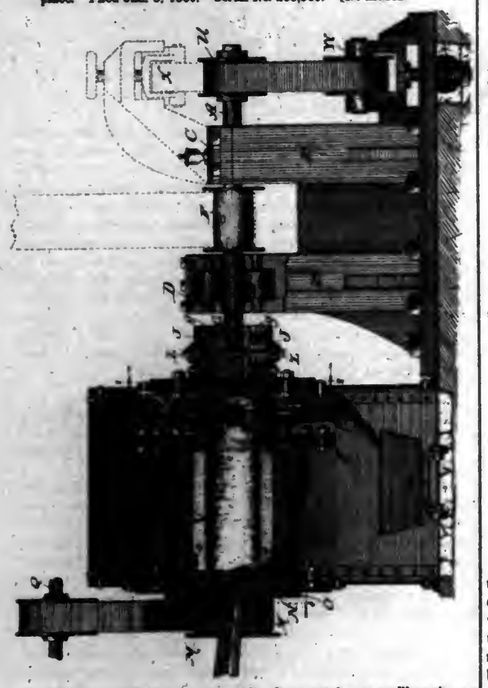
2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a horizontal revoluble receiving-vessel adapted to receive molten material to be treated, a horizontal revoluble actuating-shaft rotating said

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vessel as it revolves, a pipe or spout entering the receiving-vessel through its mouth and discharging the molten material to be treated into the receiving-vessel at or near its farther end, a plate or cover before the mouth of the receiving-vessel, with space between the plate or cover and the mouth of the receiving-vessel for the discharge of the molten material thrown off by the action of centrifugal force, and means for rotating the actuating-shaft, substantially as described.

399,123. APPARATUS FOR USE IN DECOMPOSING METALLIC SALTS AND DESULPHURIZING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,369. (No model.)



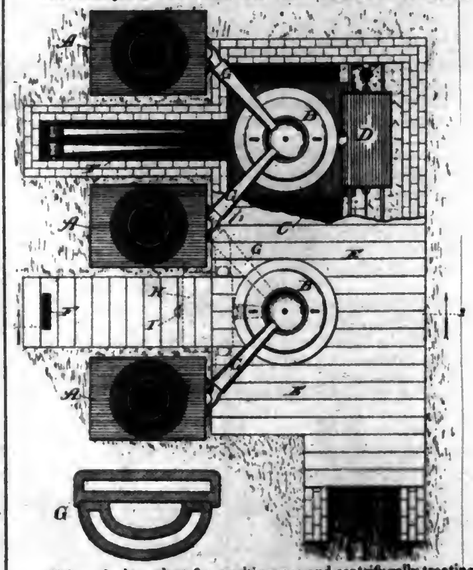
Claim.—1. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a horizontal revoluble receiving-vessel adapted to receive molten material to be treated, and having a mouth at one end through which the molten material is introduced and an annular extension at the other, having its interior of less diameter than the interior of the receiving-vessel, containing one or more openings in its walls through which the material thrown off by the action of centrifugal force is discharged, a horizontal revoluble actuating-shaft rotating said vessel as it revolves, and means for rotating the actuating-shaft, substantially as described.

2. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a horizontal revoluble receiving-vessel adapted to receive molten material to be treated, and having a mouth at one end through which the molten material is introduced and an annular extension at the other, having its interior of less diameter than the interior of the receiving-vessel, closed at its outer end, and containing one or more openings in its walls through which the material thrown off by the action of centrifugal force is discharged, a horizontal revoluble actuating-shaft rotating said vessel as it revolves, a yieldable connection between the actuating-shaft and the receiving-vessel to accommodate the vibrations of the latter, and means for rotating the actuating-shaft, substantially as described.

3. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a horizontal revoluble receiving-vessel adapted to receive molten material to be treated and having a mouth at one end through which the molten material is introduced, a horizontal revoluble actuating-shaft rotating said vessel as it revolves, a counter-balance device to counterbalance the weight of the receiving-vessel and its load, and means for rotating the actuating-shaft, substantially as described.

4. In an apparatus for decomposing metallic salts or salts of metals and desulphurizing ores when in a molten state, the combination of a horizontal revoluble receiving-vessel adapted to receive molten material to be treated and having a mouth at one end through which the molten material is introduced, a horizontal revoluble actuating-shaft rotating said vessel as it revolves, a bearing for the actuating-shaft, comprising a number of wheels or rollers bearing against the actuating-shaft and rotating as it rotates, a counter-balance device to counterbalance the weight of the receiving-vessel and its load, and means for rotating the actuating-shaft, substantially as described.

399,124. PLANT FOR USE IN SMELTING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,370. (No model.)



Claim.—1. In a plant for smelting ores and centrifugally treating the resulting materials, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, pipes, spouts, or conduits connecting the smelting-furnace with the receiving-vessel, through which the molten material to be treated may be flowed into the same, and means for rotating such receiving-vessel, substantially as described.

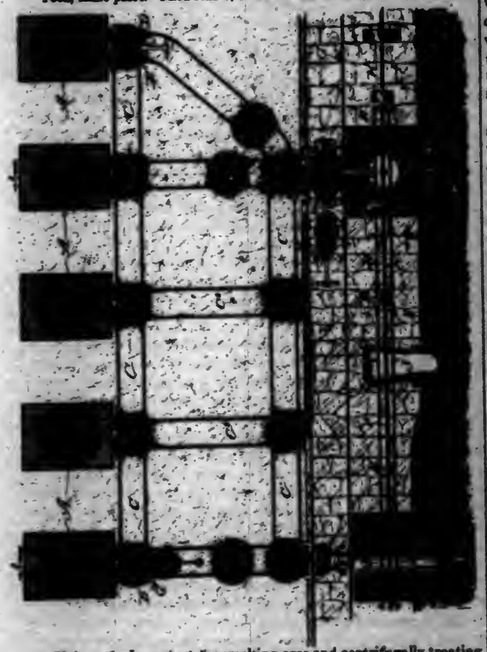
2. In a plant for smelting ores and centrifugally treating the resulting materials, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, pipes, spouts, or conduits connecting the smelting-furnace with the receiving-vessel, through which the molten material to be treated may be flowed into the same, a precipitating-receiver intermediate the smelting-furnace and the receiving-vessel, into which the heaviest particles of the molten material may settle, and means for rotating the receiving-vessel, substantially as described.

3. In a plant for smelting ores and centrifugally treating the resulting materials, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and arranged in an excavation bringing the mouth of the receiving-vessel below the tapping-point of the smelting-furnace, pipes, spouts, or conduits connecting the smelting-furnace with the receiving-vessel, through which the molten material to be treated may be flowed into the same, and means for rotating such receiving-vessel, substantially as described.

4. In a plant for smelting ores and centrifugally treating the resulting materials, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and arranged in an excavation, bringing the mouth of the receiving-vessel below the tapping-point of the smelting-furnace, a passage to the excavation containing the centrifugal apparatus, a floor or covering over such passage, pipes, spouts, or conduits connecting the smelting-furnace with the receiving-vessel, through which the molten material to be treated may be flowed into the same, and means for rotating such receiving-vessel, substantially as described.

5. In a plant for smelting ores and centrifugally treating the resulting materials, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and arranged in an excavation, bringing the mouth of the receiving-vessel below the tapping-point of the smelting-furnace, branch excavations or conduits affording facilities for the introduction of the means for rotating vessel, pipes, spouts, or conduits connecting the smelting-furnace with the receiving-vessel, through which the molten material to be treated may be flowed into the same, and means for rotating such receiving-vessel, substantially as described.

399,125. PLANT FOR USE IN SMELTING ORES. PHINEAS H. ADAMS, Jr., and ORSEMAS T. X. ADAMS, Chicago, Ill., assignors to Melinda Peck, same place. Filed Jan. 3, 1889. Serial No. 295,371. (No model.)



Claim.—1. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, a car or conveyer for carrying the molten material to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

2. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, a car or conveyer for carrying the molten material to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

3. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, an intermediate precipitating-vessel to catch and retain the heaviest particles of the material treated, a car or conveyer for carrying the molten material to the centrifugal apparatus, and means for rotating the receiving-vessels, substantially as described.

4. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, an intermediate precipitating-vessel to catch and retain the heaviest particles of the material treated, a car or conveyer for carrying the molten material to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

5. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, an intermediate storage-vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

6. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, an intermediate storage-vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

7. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, an intermediate vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, said vessel being arranged on a plane intermediate that of the smelting-furnace and the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

8. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, an intermediate vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, said vessel being arranged on a plane intermediate that of the smelting-furnace and the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

9. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, a track or way leading from the smelting-furnace to the centrifugal apparatus, a car or conveyer for conveying the molten material along the track or way to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

10. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated,

the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, a track or way leading from the smelting-furnace to the centrifugal apparatus, a car or conveyer for conveying the molten material along the track or way to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

11. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, a track or way leading from the smelting-furnace to the centrifugal apparatus, a turn-table arranged in the track or way to facilitate the turning of a car or conveyer or transferring it from the track, a car or conveyer for carrying the molten material along the track or way to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

12. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, a track or way leading from the smelting-furnace to the centrifugal apparatus, a turn-table arranged in the track or way to facilitate the turning of a car or conveyer or transferring it from the track, a car or conveyer for carrying the molten material along the track or way to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

13. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, an intermediate storage-vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, a car for receiving and carrying away the material discharged from the receiving-vessel by the action of centrifugal force, and means for rotating the receiving-vessel, substantially as described.

14. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, an intermediate storage-vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, a car for receiving and carrying away the material discharged from the receiving-vessel by the action of centrifugal force, and means for rotating the receiving-vessel, substantially as described.

15. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated, tracks or ways communicating with the smelting-furnaces and the centrifugal apparatuses permitting cars or conveyers carrying molten material to be run from the smelting-furnaces to the centrifugal apparatuses, cars or conveyers carrying the molten material along the tracks or ways to the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

16. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the material treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated and located on a lower plane than the smelting-furnaces, tracks or ways communicating with the smelting-furnaces and the centrifugal apparatuses permitting cars or conveyers carrying molten material to be run from the smelting-furnaces to the centrifugal apparatuses, cars or conveyers carrying the molten material along the tracks or ways to the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

17. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated the combination of a number of smelting-furnaces for reducing ore to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated, tracks or ways communicating with the smelting-furnaces and the centrifugal apparatuses, permitting cars or conveyers carrying molten material to be run from the smelting-furnaces to the centrifugal apparatuses, cars or conveyers carrying the molten material along the tracks or ways to the centrifugal apparatuses, a track or way arranged between the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, and means for rotating the receiving-vessels, substantially as described.

18. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated and located on a lower plane than the smelting-furnaces tracks or ways communicating with the smelting-furnaces and the centrifugal apparatuses, permitting cars or conveyers carrying molten material to be run from the smelting-furnaces to the centrifugal apparatus, cars or conveyers carrying the molten material along the tracks or ways to the centrifugal apparatuses, a track or way arranged between the centrifugal apparatuses on a plane intermediate that of the smelting-furnaces and the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, and means for rotating the receiving-vessels, substantially as described.

19. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated, tracks or ways communicating with the smelting-furnaces and the centrifugal apparatuses, permitting cars or conveyers carrying molten material to be run from the smelting-furnaces to the centrifugal apparatuses, cars or conveyers carrying the molten material along the tracks or ways to the centrifugal apparatuses, a track or way arranged between the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, a car for receiving, carrying away, and disposing of the material treated by the action of centrifugal force, a track or way along which such car can move and communicate with the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

20. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated and located on a lower plane than the smelting-furnaces, tracks or ways communicating with the smelting-furnaces and the centrifugal apparatuses, permitting cars or conveyers carrying molten material to be run from the smelting-furnaces to the centrifugal apparatuses, cars or conveyers carrying the molten material along the tracks or ways to the centrifugal apparatuses, a track or way arranged between the centrifugal apparatuses on a plane intermediate that of the smelting-furnaces and the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, a car for receiving, carrying away, and disposing of the material treated by the action of centrifugal force, a track or way along which such car can move and communicate with the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

21. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated, cars or conveyers for carrying the molten material to the centrifugal apparatuses, a track or way communicating with each of the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, and means for rotating the receiving-vessels, substantially as described.

22. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated and located on a lower plane than the smelting-furnaces, cars or conveyers for carrying the molten material to the centrifugal apparatuses, a track or way communicating with each of the centrifugal apparatuses on a plane intermediate that of the smelting-furnaces and the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, and means for rotating the receiving-vessels, substantially as described.

23. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated, cars or conveyers for carrying the molten material to the centrifugal apparatuses, a track or way communicating with each of the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatus to operate in connection therewith, a car for receiving, carrying away, and disposing of the material treated by the action of centrifugal force, a track or way along which such car can move and communicate with the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

24. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnaces, cars or conveyers for carrying the molten material to the centrifugal apparatuses, a track or way communicating with each of the centrifugal apparatuses on a plane intermediate that of the smelting-furnaces and the centrifugal apparatuses, a storage or precipitating vessel arranged on such track or way and movable thereon to any desired centrifugal apparatuses to operate in connection therewith, a car for receiving, carrying away, and disposing of the material treated by the action of centrifugal force, a track or way along which such car can move and communicate with the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

25. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, a car or conveyer for carrying the molten material to the centrifugal apparatus, a tramway overhanging the centrifugal apparatus, a derrick or tackle car movable along such tramway and adapted to raise and carrying the receiving-vessel to the place for emptying its contents, and means for rotating the receiving-vessel, substantially as described.

26. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated and located on a lower plane than the smelting-furnace, a car or conveyer for carrying the molten material to the centrifugal apparatus, a tramway overhanging the centrifugal apparatus, a derrick or tackle car movable along such tramway and adapted to raise and carry the receiving-vessel to the place for emptying its contents, and means for rotating the receiving-vessel, substantially as described.

27. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated, cars or conveyers for carrying the molten material to the centrifugal apparatuses, a tramway overhanging the centrifugal apparatus, a derrick or tackle car movable along such tramway and adapted to raise and carry the receiving-vessel to the place for emptying its contents, a car for receiving, carrying away, and disposing of the material treated by the action of centrifugal force, a track or way along which such car can move and communicate with the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

28. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a number of smelting-furnaces for reducing ores to a molten condition, a number of centrifugal apparatuses provided with revoluble receiving-vessels adapted to receive molten material to be treated and located on a lower plane than the smelting-furnaces, cars or conveyers for carrying the molten material to the centrifugal apparatuses, a tramway overhanging the centrifugal apparatus, a derrick or tackle car movable along such tramway and adapted to raise and carry the receiving-vessel to the place for emptying its contents, a car for receiving, carrying away, and disposing of the materials treated by the action of centrifugal force, a track or way along which such car can move and communicate with the centrifugal apparatuses, and means for rotating the receiving-vessels, substantially as described.

29. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and located in a trench, excavation, or depression, which wholly or partially receives it and which is provided with sufficient covering to afford a surface to permit operations over or about the top of the apparatus, a car or conveyer for carrying the molten material to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

30. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and located in a trench, excavation, or depression, which wholly or partially receives it and which is provided with sufficient covering to afford a surface to permit operations over or about the top of the apparatus, an intermediate precipitating-vessel to catch and retain the heaviest particles of the material treated, a car or conveyer for carrying the molten material to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

31. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and located in a trench, excavation, or depression, which wholly or partially receives it and which is provided with sufficient covering to afford a surface to permit operations over or about the top of the apparatus, an intermediate storage-vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

32. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and located in a trench, excavation, or depression, which wholly or partially receives it and which is provided with sufficient covering to afford a surface to permit operations over or about the top of the apparatus, an intermediate vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, said vessel being arranged on a plane intermediate that of the smelting-furnace and the centrifugal apparatus, and means for rotating the receiving-vessel, substantially as described.

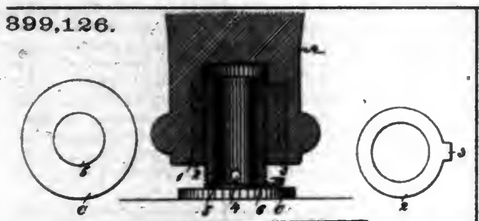
33. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and located in a trench, excavation, or depression, which wholly or partially receives it and which is provided with sufficient covering to afford a surface to permit operations over or about the top of the apparatus, an intermediate storage-vessel in which the molten material may be emptied or dumped in quantity and from which it may flow in a desired stream to the centrifugal apparatus, a car for receiving and carrying away the material discharged from the receiving-vessel by the action of centrifugal force, and means for rotating the receiving-vessel, substantially as described.

34. In a plant for smelting ores and centrifugally treating the resulting materials and handling and disposing of the materials treated, the combination of a smelting-furnace for reducing ores to a molten condition, a centrifugal apparatus provided with a revoluble receiving-vessel adapted to receive molten material to be treated, and located in a trench or excavation, which wholly or partially receives it and which is provided with sufficient covering to afford a surface to permit operations over or about the top of the apparatus, a car or conveyer for carrying the molten material to the centrifugal apparatus, a tramway overhanging the centrifugal apparatus, a derrick or tackle car movable along such tramway and adapted to raise and carry the receiving-vessel to the place for emptying its contents, and means for rotating the receiving-vessel, substantially as described.

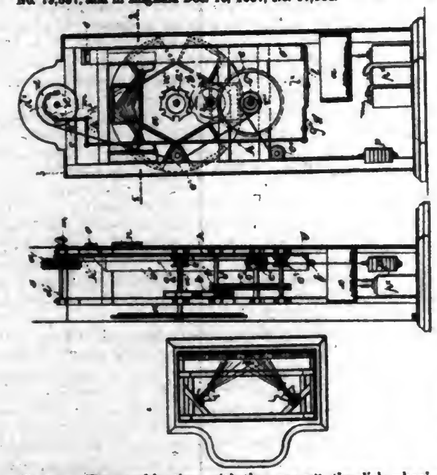
399,126. DEVICE FOR LEVELING BILLIARD-TABLES. HENRY C. HENRY, Philadelphia, Pa. Filed Aug. 7, 1888. Serial No. 282,194. (No model.)

Claim.—A table-leveling device consisting of an interiorly-threaded bushing with vertical shoulder on the side thereof, a base-plate with shoulder on its upper face, and a screw-threaded stem having a recess on its lower edge and side openings, the latter for insertion of handles, said parts being combined substantially as described.

399,126.

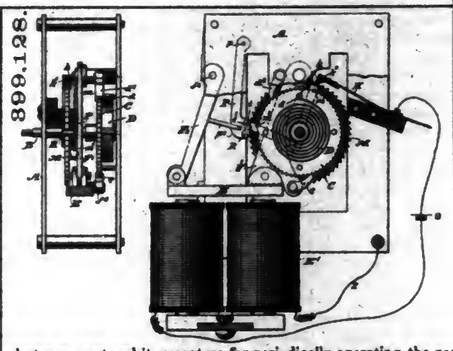


399,127. **DEVICE FOR EXHIBITING PICTURES.** VICTOR BONNET, HIPPOLYTE LEMAGARAY, ARMAND RICHARD, and ALFRED RICHARD, Paris, France. Filed May 1, 1888. Serial No. 272,468. (No model.) Patented in France Dec. 10, 1887, No. 18,752; in Belgium Dec. 13, 1887, No. 79,897, and in England Dec. 16, 1887, No. 17,611.



Claim.—The combination, with the case $a^{\times}$, the disk-wheel a, mounted upon a shaft, a'', journaled within said case, the slotted wheel a', mounted upon the same shaft, the one-toothed wheel b, mounted on a shaft, b'', journaled within said case and engaging the slotted wheel a', the wheel b', mounted upon the same shaft with the wheel b and meshing into the wheel c, the wheel c, mounted upon a shaft, c'', journaled within said case and meshing into the wheel b', the wheel c', mounted upon the same shaft with the wheel c, the shaft d'', journaled within said case, the wheel d, mounted upon the shaft d'', the cord e, wrapped upon said wheel d, extending over the guide-wheel e', journaled in bearings in said case, the pulley e' and the guide-wheel e', journaled on bearings in said case and finally attached to the weight p, and the weight p, attached to the cord e within said case, of the conduit c' within said case, the lever i, pivoted at $i^{\times}$ within said case extending with one end under the conduit c' to receive coins falling therefrom and engaging the lever g' with its other end, the lever g, pivoted at $g^{\times}$ within said case, engaging said lever l, and pivotally attached to the rod h, the rod h, attached to said lever g and the bell-crank h', the bell-crank h', pivoted to $h^{\times}$ within said case and attached to the rod h and the said wheel d, and the knob m, attached to the wheel d and moving in a slot, $d^{\times}$, in said frame $a^{\times}$, all substantially as and for the purpose set forth.

399,128. **SELF-WINDING ELECTRIC CLOCK.** FRANK W. BRAINERD, Chicago, Ill. Filed May 25, 1888. Serial No. 275,043. (No model.)



399,128.

Claim.—1. The combination, with a clock-movement, of an electro-magnet and its armature for winding the same, a pawl carried by the armature giving a step-by-step movement to the winding mechanism, a toothed wheel operated by the clock-train, a circuit-closing device operated by the toothed wheel, and a circuit-interrupting device operated by the armature-lever at the limit of its forward movement.

2. The combination of a clock-movement, an electro-magnet, its armature for winding the driving-spring of the clock step by step, a contact-arm loosely mounted upon the minute-hand arbor of the movement, a circuit-closing spring operated by a wheel moving with the minute-hand arbor to make contact with the contact-arm, and thus periodically complete the connections through the winding-magnet, and an arm movable with the armature for moving said contact-arm out of contact with the circuit-closing spring.

3. The combination of a clock-movement, a spring having one end attached to the central arbor, a wheel surrounding said arbor, to which the other end is attached, a pawl for driving the wheel, an electro-magnet and its armature for periodically operating the pawl, a wheel or cam moving with the clock-train, and mechanical connections therewith for forcing the armature away from its electro-magnet after each forward movement as the clock unwinds, substantially as described.

4. In a self-winding clock-movement, the combination of an electro-magnet and its armature, the pivoted contact-arm m, the circuit-closing spring K, a wheel moving with the clock-train for operating the circuit-closing spring, and a system of levers engaging the contact-arm and moving it out of contact with said spring by the forward movement of the armature, substantially as described.

5. In a self-winding electric clock, an electro-magnet and its armature for giving a step-by-step movement to the winding mechanism, a toothed wheel advanced by the forward movement of the clock-train, a pawl engaging the teeth of the wheel, and a lever operated by the pawl and engaging the support of said armature and gradually forcing the latter away from the poles of its magnet as a tooth of the wheel passes under said pawl.

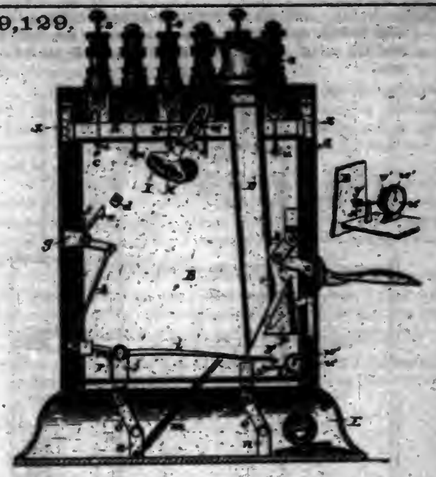
6. In a self-winding electric clock, the combination, with the electro-magnet E' and its armature E, and a pawl carried by the armature, of the loosely-mounted lever P, the links supporting the armature, one of which is engaged by said lever P, the wheel M, moving with the clock-movement, and the pawl carried by the lever P and engaged by the teeth of said wheel.

7. In a self-winding electric clock, the combination of the electro-magnet E' and its armature E, a pawl, e, moving with the armature, the loosely-mounted lever P, the links supporting the armature, one of which is engaged by said lever P, the wheel M, moving with the clock-movement, the pawl carried by the lever P and engaged by the teeth of said wheel, the loosely-mounted contact-arm m, the circuit-closing spring applied to the contact-arm and controlled by said wheel, and a link-connection between said contact-arm and the lever P for removing the arm from the contact with the spring.

399,129. **COIN-OPERATED CALCULATING-MACHINE.** FRANKLIN W. BROOKS, New York, N. Y. Filed Nov. 17, 1888. Serial No. 291,079. (No model.)



399,129.



Claim.—1. The combination, with the casing having the vertically-elongated openings a, of the movable plate located in said casing, and having columns of figures thereon adapted to align with said openings, and also having the lug d, and a pivoted bell-crank lever engaging said lug when the plate is in its downward position, substantially as described.

2. The combination, with the box or casing having the vertically-elongated openings, a, the movable plate located in said casing and having columns of figures thereon adapted to align with said openings, and the spring m, connecting the lower edge of said plate with the bottom of the casing and tending to draw the plate diagonally downward, substantially as described.

3. The combination, with the box or casing having the vertically-elongated openings a, of the movable plate B, having columns of figures thereon adapted to align with said openings, a hand-lever having its fulcrum in one side of the casing, and a link connecting said lever and plate, whereby when the lever is depressed the plate will be caused to move slightly to one side and then upwardly, substantially as shown, and for the purpose set forth.

4. The combination, with the box or casing having the vertically-elongated openings a, of the movable plate B, having thereon columns of figures adapted to align with said openings, and also provided with the lug d, the pivoted bell-crank lever engaging said lug when the plate is down, and the spring m, connecting the lower edge of said plate with the bottom of the casing at diagonally-opposite points, substantially as described.

5. The combination, with the box or casing having the vertically-elongated openings a, of the movable plate located in said casing, and having thereon columns of figures adapted to align with said openings, and also provided with lug d, the pivoted bell-crank lever engaging said lug when the plate is down, the spring m, connecting the lower edge of the plate with the bottom of the casing, the hand-lever having its fulcrum in one side of the casing, and a link connecting said lever and plate, substantially as shown, and for the purpose described.

6. The combination, with the box or casing having the vertical openings a, of a movable plate located in said casing, and having thereon columns of figures adapted to align with said openings, a spring tending to draw said plate diagonally downward, a lock for maintaining the plate in such downward position, and a hand-lever and link-connection for operating said plate, substantially as described.

7. The combination, with the box or casing having the vertically-elongated openings a, of the movable plate B, having the lug d, and provided with columns of figures adapted to align with said openings, a pivoted bell-crank lever for engaging said lug when the plate is drawn downwardly, a rod connected to said lever, and a weighted rocking lever connected to said rod, substantially as described.

8. The combination, with the weighted rocking lever i, mounted in V-shaped bearings, of the metal strip r, formed to overlap the lever and retain it in its bearing, and having a portion turned under said lever to act as a stop therefor, substantially as shown and described.

9. The combination, with the casing having in its bottom the posts s s, of the movable plate B and the links o o, connecting said plate to said posts, substantially as described.

10. The coin chute or conduit D, constructed in two parts, the line of separation beginning a suitable distance from the bottom at one of the sides, and extending diagonally downward to or near to the lower edge at the opposite side, substantially as described.

11. The combination, with the box or casing A and the movable plate B, of the coin-chute D, constructed of two parts, the lower part, p, of which is connected to said plate, by which to be carried therewith when the same is moved, substantially as described.

12. The combination, with the casing A and movable plate B, having the stud or projection y', and spring m, drawing the plate downward diagonally, of pawl x', operated by said stud, and the indicator and ratchet-wheel, substantially as described.

13. The combination, with the casing A, having the upper openings, b, and the movable plate provided with the series of lugs or teats c, of the spring-bolts e, provided with spring-catches for engaging said lugs or teats when the plate is up and said bolts are depressed, the same being also provided with the plates t, having numbers thereon for registering with said openings b, substantially as described.

14. The combination, with the box or casing A, having the vertical openings a and the upper openings, b, of the movable plate B, provided with columns of figures adapted to align with said vertical openings having the series of teats c, the spring-bolts e, having the spring-catches u and numbered plates t, and a hand-lever and link for moving said plate upwardly, substantially as described.

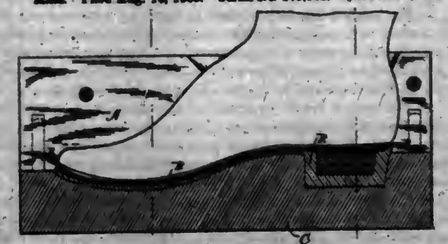
15. The combination, with the box or casing having the vertical openings a and upper openings, b, of the movable plate B, having the lug d, and the series of teats c, and also provided with columns of figures adapted to align with said vertical openings, the spring-bolts having the spring-catches and numbered plate, a hand-lever and link for moving the plate upwardly, and a lever for engaging lug d, to maintain the plate locked in its downward position, substantially as described.

16. The combination, with the movable plate B, having lug d, of the lever f, engaging said lug, the rod h, and the weighted rocking lever i, connected to the rod and adapted to release said lever f from lug d when depressed, substantially as shown and described.

17. The combination, with the spring-bolts e, having the plates t, of the movable locking-strip v, having the projections w, which rest beneath the lower ends of said plates when the parts are in their normal positions, substantially as shown, and for the purpose described.

18. The combination, with the casing having strip z, provided with slot y, and the spring-bolts having the plates t, of the movable plate B, the strip v, having projections w, and provided with pin x, and the sector G, formed with slot a', working on pin x, and secured to the movable plate, substantially as shown and described.

399,130. **BOOT OR SHOE.** GEORGE F. BUTTERFIELD, Stoneham, Mass. Filed Aug. 10, 1885. Serial No. 173,972. (No model.)



Claim.—1. The described process of forming rubber-soled boots or shoes, consisting in first making the boot or shoe and securing its leather sole to it in any usual way, then applying to the bottom of such leather sole a coating of rubber cement and an outsole of raw-rubber compound, and subsequently curing the rubber sole and permanently affixing it to the leather-sole bottom by vulcanization, substantially as set forth.

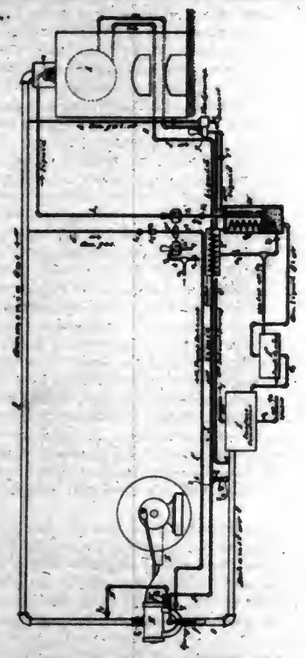
2. A boot or shoe having a leather sole sewed, pegged, or nailed to the upper thereof, and provided with a rubber outer sole secured by cement and vulcanization directly upon the bottom of the leather sole, so as to conceal said sole and its fastenings, substantially as set forth.

399,131. **METHOD OF UTILIZING AQUA-AMMONIA AS A MOTIVE POWER IN ENGINES.** JOSEPH H. CAMPBELL, New York, N. Y. Filed Sept. 18, 1887. Renewed July 24, 1888. Serial No. 280,917. (No model.)

Claim.—1. The method herein described of relieving the boiler of an aqua-ammonia engine from an excess of pressure, which consists in drawing off a portion of the solution or liquid from the boiler through an aperture additional to the exhaust-absorbing jet, cooling said solution, and returning it to the boiler, as set forth.

2. The method herein described of relieving the boiler of an aqua-ammonia engine from an excess of pressure, which consists in drawing off a portion of the solution or liquid from the boiler through an aperture additional to the exhaust-absorbing jet, cooling said solution,

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and returning it to the vapor-space of the boiler, where it is brought in contact with the vapor in the boiler, as set forth.

3. The method herein described of relieving the boiler of an aqua-ammonia engine from an excess of pressure, which consists in causing the pressure of vapor in the boiler to automatically start and operate a pump to transfer cool solution to the boiler, whereby the pressure is reduced by the introduction of the cooled solution or fluid into the boiler, as set forth.

4. The method herein described of operating a vapor-pump, in combination with an aqua-ammonia engine, which consists in driving a pump directly by vapor of aqua-ammonia and absorbing the exhaust-vapor of said pump by a continuous stream of absorbing-liquid designed to absorb the exhaust of the engine, substantially as set forth.

5. The method herein described of operating a vapor-pump, in combination with an aqua-ammonia engine, the same consisting in driving a pump directly by vapor of aqua-ammonia and absorbing the exhaust-vapor of said pump by the absorbing-liquid designed to absorb the exhaust of the engine, substantially as set forth.

6. The method herein described of utilizing a single-spray jet for absorbing the exhaust-vapor from an engine and a pump, the same consisting in bringing the exhaust-pipes of said engine and pump into one common exhaust-pipe which is provided with an absorbing-jet, substantially as set forth.

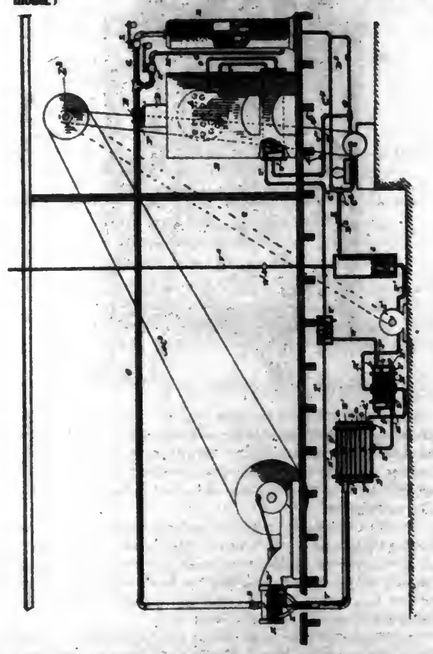
7. The method herein described of relieving the boiler of an aqua-ammonia engine from an excess of pressure, which consists in transferring the vapor from the boiler directly to the absorbers and well without passing it through the engine and bringing said vapor in contact with a continuous stream under boiler-pressure of cooled weak solution or fluid while in transit to the absorbers, as set forth.

8. The method herein described of relieving the boiler of an aqua-ammonia engine from an excess of pressure, which consists in transferring the vapor from the boiler directly to the exhaust-pipe of the cylinder of the engine without passing it through the engine and bringing such vapor in contact with a continuous stream of the cooled weak solution, as set forth.

9. The method herein described of reducing the pressure in the boiler of an aqua-ammonia engine, which consists in conveying the vapor from the pipe leading from the boiler to the cylinder of the engine directly to the exhaust-pipe of the cylinder and absorbing said vapor, together with exhaust-vapor from the cylinder, by a continuous stream of the cooled solution, as set forth.

10. The method herein described of relieving the boiler of an aqua-ammonia engine of excessive pressure, which consists in withdrawing liquid from the boiler, cooling it by cooling-water, and returning the liquid to the boiler, part of said cooling-water being supplied by a pump started and operated by such excessive pressure, substantially as set forth.

899,182. METHOD OF UTILIZING AQUA-AMMONIA AS A MOTIVE POWER IN ENGINES. JOSEPH H. CAMPBELL, New York, N. Y. Filed Aug. 6, 1887. Renewed July 24, 1888. Serial No. 280,918. (No model.)



Claim.—1. The method herein described of absorbing vapor of ammonia, which consists in bringing said vapor in contact with cooled liquid from the boiler and then subjecting such solution and the unabsorbed vapor to successive simultaneous coolings and absorptions, alternating with the evolutions of heat produced by the successive absorptions, substantially as set forth.

2. The method herein described of absorbing vapor of ammonia, which consists in bringing said vapor in contact with a continuous stream of cooled liquid from the boiler, then subjecting such solution and the unabsorbed vapor to successive simultaneous coolings and absorptions, alternating with the evolutions of heat produced by the successive absorptions, and discharging the solution into a well below its liquid-line, substantially as set forth.

3. The method herein described of absorbing vapor of ammonia, which consists in passing such vapor with cooled liquid from the boiler into the upper end of a surface condenser or absorber provided with lateral tubes and vertical pockets, so as to drain the liquid contents from such surface condenser by gravity, substantially as set forth.

4. The method herein described of operating an aqua-ammonia engine, which consists in propelling the engine with vapor of ammonia, bringing the exhaust-vapor in contact with cooled liquid from the boiler, subjecting the solution and the unabsorbed vapor to successive simultaneous coolings and absorptions, alternating with the evolutions of heat produced by the successive absorptions, and returning the combined liquid and exhaust-vapor to the boiler, substantially as set forth.

5. The method herein described of operating an aqua-ammonia engine, which consists in propelling the engine with vapor of ammonia, bringing the exhaust-vapor in contact with a continuous stream of liquid from the boiler under boiler-pressure, subjecting the solution and the unabsorbed vapor to successive simultaneous coolings and absorptions, alternating with the evolutions of heat produced by the successive absorptions, and returning the combined exhaust-vapor and liquid to the boiler, substantially as set forth.

6. The method herein described of operating an aqua-ammonia engine, which consists in propelling the engine with vapor of ammonia, passing such vapor with cooled liquid from the boiler into the upper end of a surface condenser or absorber provided with lateral tubes and vertical pockets, so as to drain the liquid contents from such surface condenser by gravity into a suitable well, entering it below the liquid-line, and returning the contents of said well to the boiler, substantially as set forth.

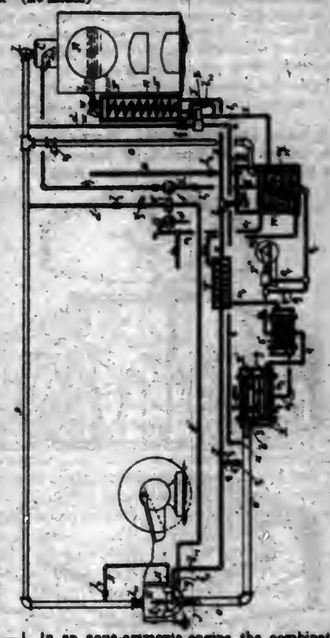
7. In a vapor-engine, the method herein described of indicating a deficiency of liquid in the boiler, which consists in placing the spray-pipe at the low-water point and extending it into the exhaust-pipe of the cylinder, whereby when the solution in the boiler falls too low the vapor will rush over to the exhaust-pipe and cause a back-pressure on the piston to check the engine.

8. In ammonia-engines, the method herein described of drawing off from the cylinder the unabsorbed exhaust-vapor by producing a vacuum on the piston and creating a pressure in the well to aid absorption by means of a pump operating between the absorbers and well, as set forth.

9. The method herein described of purging the apparatus of air, which consists in carrying the air into a well, together with absorbing liquid and ammonia-vapor, absorbing the vapor under pressure produced by a pump, and forcing the air out of the well through an escape-pipe, substantially as set forth.

10. The method herein described of relieving the boiler of excessive pressure, which consists in discharging the excess of vapor into a reservoir containing absorbing-liquid below its liquid-line, said excessive pressure operating a safety-valve, substantially as set forth.

899,183. AMMONIA-VAPOR ENGINE. JOSEPH H. CAMPBELL, New York, N. Y. Filed Dec. 30, 1887. Renewed July 24, 1888. Serial No. 280,919. (No model.)



Claim.—1. In an aqua-ammonia engine, the combination, with the cylinder thereof, of a pipe carrying spraying or absorbing liquid from the boiler to the exhaust-pipe, and a horizontal surface-condenser, substantially as set forth.

2. In an aqua-ammonia engine, the combination, with the cylinder thereof, of a pipe carrying spraying or absorbing liquid from the boiler to the exhaust-pipe, a horizontal surface-condenser, and a secondary absorber into which the fluid enters below the liquid-line, substantially as set forth.

3. In an aqua-ammonia engine, the combination, with the cylinder thereof, of a pipe carrying spraying-fluid from the boiler to the exhaust-pipe and an absorber provided with vertical chambers and horizontal tubes, substantially as set forth.

4. In an aqua-ammonia engine, the combination, with the cylinder thereof, of a pipe carrying spraying-fluid from the boiler to the exhaust-pipe, and an absorber provided with vertical chambers and horizontal tubes and partitions, and a secondary absorber into which the fluid passes underneath the liquid-line for the purpose of entrapping gas carried along by adhesion, substantially as set forth.

5. In an aqua-ammonia engine, the combination, with the boiler of a reservoir containing liquid of greater absorptive power than that contained in the boiler, and a pipe provided with a valve constructed to admit automatically, in case of excessive pressure in the boiler, vapor from the boiler into the liquid contained in the well, substantially as set forth.

6. In an aqua-ammonia engine, the combination, with the boiler, of a reservoir containing solution of greater absorptive power than that contained in the boiler, a pipe with suitable valve leading from the vapor-space of the boiler into the liquid-space of the reservoir, and a pump for forcing the solution from the reservoir back into the boiler, substantially as set forth.

7. In an aqua-ammonia engine, the combination, with the boiler, of a reservoir containing solution of greater absorptive power than that contained in the boiler, and a pipe provided with a valve for admitting vapor from the boiler to the well, that part of said pipe within the fluid in the well being provided with a series of perforations, substantially as set forth.

8. In an engine of the character described, the spray-pipe J, leading from the boiler to the exhaust-pipe of the cylinder, provided with the branch pipe J', leading into the cylinder, and having the cock P, whereby a jet of the solution may be injected into the cylinder to lubricate the same prior to starting the engine, substantially as set forth.

9. In an engine of the character described, the combination of an apparatus for reabsorbing the exhaust-vapor, and the pump P', for increasing the vacuum on the piston and creating a pressure in the well, substantially as set forth.

10. In an engine of the character described, the combination of an apparatus for reabsorbing the exhaust-vapor, the pump P', placed between the absorbers and the well W, and a by-pass around said pump with suitable valve, substantially as set forth.

11. In an engine of the character described, the combination, with the well W, partly filled with aqua-ammonia for receiving the combined spraying-liquid and exhaust-vapor, of the pump P', for discharging absorbing-liquid into said well, and the pipe M, with cock P, for purging the apparatus of air, substantially as specified.

12. In an engine of the character described, the combination, with the well W, of a pipe for filling said well with solution, the cock P, for closing the outlet of said well, and the pipe M, with cock l, for purging the apparatus of air, substantially as set forth.

13. In an engine of the character described, in combination with the boiler and the spray-pipe J, the strainer w, substantially as set forth.

14. In an engine of the character described, the combination, with the boiler and the spray-pipe J, of the casing U, with detachable bottom and containing the strainer w, substantially as set forth.

15. In an engine of the character described, the combination, with the boiler and the spray-pipe, of the strainer w and cock P^{11}, substantially as specified.

16. In an engine of the character described, the combination, with the boiler and the spray-pipe, of the cock P^{10} in said spray-pipe, substantially as set forth.

17. In an aqua-ammonia engine, the combination, with a spray-pipe for conveying the fluid or solution from the boiler to the exhaust-pipe of the engine, of an additional pipe provided with a suitable valve or cock connecting the spray-pipe with the exhaust-pipe, whereby the amount of solution or fluid admitted from the boiler to the exhaust-pipe can be increased, as set forth.

18. In an aqua-ammonia engine, the combination of a pipe for conveying spraying-fluid from the boiler to the exhaust-pipe of the engine, an additional pipe provided with a suitable valve or cock connecting the spray-pipe with a cooling apparatus, and a pump for forcing the cooled fluid or solution into the vapor-space of the boiler, as set forth.

19. In an aqua-ammonia engine, the combination of a pipe for conveying spraying-fluid from the boiler to the exhaust-pipe of the engine, an additional pipe provided with a self-acting or automatic valve connecting the spray-pipe with the exhaust-pipe and cooling apparatus, and a pump for forcing the cooled fluid or solution into the vapor-space of the boiler, as set forth.

20. In an aqua-ammonia engine, the combination of a pipe for conveying spraying-fluid from the boiler to the exhaust-pipe of the engine, an additional pipe provided with a self-acting or automatic valve connecting the spray-pipe with the exhaust-pipe and cooling apparatus, and a pump for forcing the cooled solution or fluid into the vapor-space of the boiler, said pump being arranged and adjusted to operate automatically under an increased pressure in the boiler, as set forth.

21. In an aqua-ammonia engine, the combination, with the boiler and engine-cylinder, of the pipe N N, provided with a cock or valve, for conveying vapor directly (and without passing it through the cylinder) to the absorbing-jet j, discharging liquid under boiler-pressure for the purpose of relieving the boiler, substantially as specified.

22. In an aqua-ammonia engine, the combination of a boiler and pipe leading from the vapor-space of the boiler to the cylinder of the engine, with a pump adapted to be operated by the vapor from the boiler, and a pipe leading from the exhaust of the pump to the exhaust-pipe of the engine, as set forth.

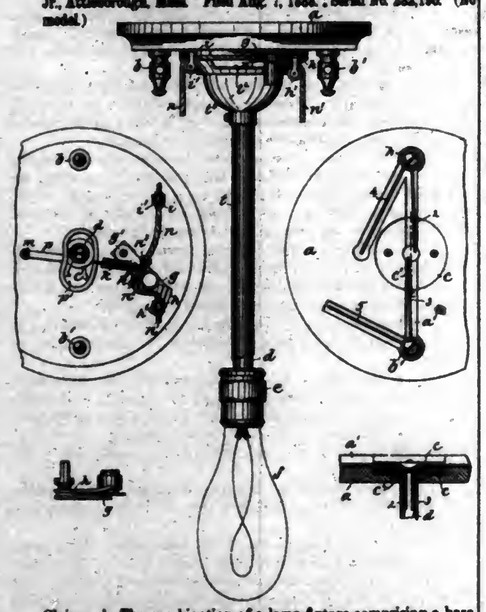
23. In an aqua-ammonia engine, a boiler for generating the vapor, and a pipe leading from the vapor-space of the boiler to the cylinder of the engine, a pump adapted to be operated by the vapor from the boiler, and a pipe leading from the exhaust of the pump to the exhaust-

pipe of the engine, in combination with a spray of the cooled solution or fluid, whereby the exhaust from the cylinders of the pump and engine are absorbed, as set forth.

24. In an aqua-ammonia engine, the combination of the boiler, a system of circulating-pipes for conveying cooling-water to the absorbers, and a pump adjusted to automatically increase the amount of such cooling-water in case of excessive pressure in the boiler, substantially as set forth.

25. In an aqua-ammonia engine, the combination, with the boiler and absorbers for absorbing the exhaust-vapor, of an air-pump, a receiving-well, and a feed-pump, said well being placed between said pumps, substantially as set forth.

399,184. ELECTRIC-LAMP FIXTURE AND SWITCH. LOUIS W. DILLON, North Attleborough, assignor of one-half to Homer M. Daggett, Jr., Attleborough, Mass. Filed Aug. 7, 1888. Serial No. 282,190. (No model.)

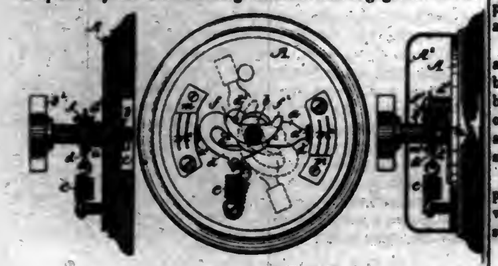


Claim.—1. The combination of a lamp-fixture comprising a base and lamp-supporting shank fastened thereon, with a switch pivoted on said base and provided with stops, limiting its movement in either direction, a spring connected at one end with said switch in advance of its pivot, and the arm connected with the other end of said spring and pivoted on said base at the other side of the shank from the switch-pivot, and provided with an opening through which said shank passes, and operating-cords connected with said switch, and pulleys therefor on the base of the lamp-fixture, substantially as described.

2. The combination of the base and lamp-supporting shank extending therefrom, with a switch pivoted on said base at one side of said shank, a spring connected with said switch in advance of its pivot, and the arm connected with said spring pivoted on said base at the other side of the shank from the switch-pivot, and provided with an opening through which the said shank passes, substantially as and for the purpose described.

399,185. ELECTRIC SWITCH. LOUIS W. DILLON, North Attleborough, assignor of one-half to Homer M. Daggett, Jr., Attleborough, Mass. Filed Oct. 3, 1888. Serial No. 287,045. (No model.)

Claim.—1. The combination of the pivoted switch-arm with an independently-movable actuating cam-lever that engages the switch-



399,185.

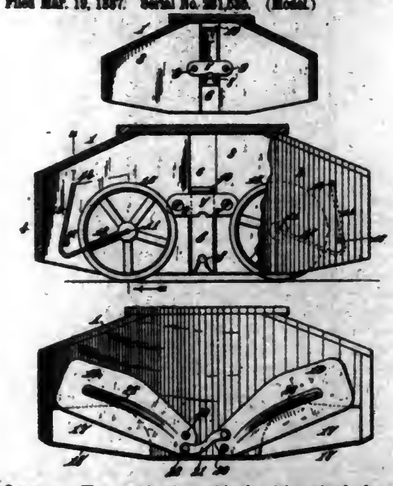


arm at each side of its pivot and a projection or abutment co-operating with the cam-surface and constituting the fulcrum of said cam-lever, by which cam-surface and abutment the said cam-lever is retained wholly disengaged from the said switch-arm during its movement from one to the other side of the pivot thereof, substantially as described.

2. The combination of the switch-arm and arbor constituting the pivot or fulcrum therefor with an independently-movable actuating shifting cam-lever and spring, said lever having a cam-surface co-operating with said arbor, which constitutes the fulcrum for said lever in both positions of the latter, and arms connected with said arbor for shifting the cam-lever relative thereto, substantially as described.

3. The combination of the pivoted switch-arm having contact-surfaces at each end insulated from said switch-arm with a pair of stationary contacts co-operating with the contacts at each end of said switch-arm, and a movable cam-lever that engages the said switch-arm at each side of its pivot, the cam-surface of said lever constituting the guide that determines its path of movement when shifted with relation to the pivot of said switch-arm, substantially as described.

399,186. CARPET-SWEEPER. WALTER J. DREW, Grand Rapids, Mich., assignor to The Bissell Carpet Sweeper Company, same place. Filed Mar. 19, 1887. Serial No. 231,536. (Model.)



Claim.—1. The combination, with the drive-wheel of a carpet-sweeper, of a wheel-holder composed of a single continuous piece of spring-wire bent to form an axle, on which the wheel revolves, and continued at both ends of the axle into two side supports extending along opposite sides of the wheel to free the latter from side draft, both side supports having their extremities secured to parts of the sweeper-casing, substantially as described.

2. The combination, with the drive-wheel of a carpet-sweeper, of a wheel-holder composed of a single continuous piece of spring-wire bent to form an axle, on which the wheel revolves, and continued at both ends of the axle into two side supports extending along the opposite sides of the wheel to free the latter from side draft, both of said side supports having their extremities turned laterally into pivots which are pivoted to parts of the sweeper-casing, substantially as described.

3. The combination, with the drive-wheel of a carpet sweeper, of a wheel-holder composed of a single continuous piece of spring-wire bent to form an axle, on which the wheel revolves, and continued at both ends of the axle into two supporting-arms extending along the opposite sides of the wheel beyond the periphery thereof, and bent at an angle to the said side supporting-arms and pivotally supported substantially as described.

4. The combination, with a carpet-sweeper casing, of a sliding plate having a seat for the journal of a brush-shaft and free to slide vertically at all times for the insertion and removal of the brush-shaft substantially as described.

5. The combination, with a carpet-sweeper casing, of a vertically

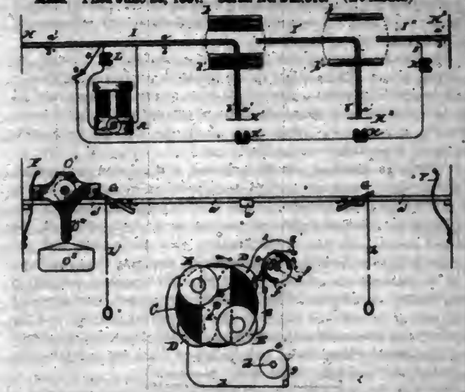
sliding plate having a seat at its lower end for the journal of a brush shaft, a cross-bar behind which the plate slides, and screws for connecting the cross-bar with the casing and causing friction on the sliding plate, substantially as described.

6. The combination, with a carpet-sweeper casing having its end wall provided with a channel, of a vertically-sliding plate in said channel, having at its upper end a lug and at its lower end a seat for the journal of a brush-shaft, and a cross-bar extending over the plate, secured to the casing, and confining the plate in the channel, substantially as described.

7. The combination, with a carpet-sweeper casing having discharge-openings, of movable gates and a link-connection between the gates, substantially as described.

8. The combination, with a carpet-sweeper casing having dust-pans and discharge-openings therefor, of pivoted gates and a link pivotally connected with the gates, said link having its pivots alternating with the pivots of the gates, substantially as described.

399,187. ELECTRICAL STORE-SERVICE APPARATUS. RICHARD M. DYER, East Orange, N. J., assignor to William S. Lamson, Lowell, Mass. Filed June 20, 1887. Serial No. 242,218. (No model.)



Claim.—1. In electrical store-service apparatus, the combination, with the way formed of two parallel tracks placed close together in the same horizontal plane and connected with opposite sides of the circuit, of a carrier having wheels in the same horizontal plane riding upon both of said tracks, an electric motor mounted upon said carrier and receiving current through said wheels, and a receptacle-supporting bail depending from the carrier on one side of the way, substantially as set forth.

2. In electrical store-service apparatus, the combination, with a way formed of two parallel tracks connected with opposite sides of the circuit and arranged close together, and insulating-supports at intervals connecting the tracks to form a single structure and projecting laterally in one direction, of a carrier having wheels riding upon both of said tracks, an electric motor mounted upon said carrier and receiving current through said wheels, and a receptacle-supporting bail depending from the carrier and hanging down on one side of the way, substantially as set forth.

3. In electrical store-service apparatus, the combination, with a carrier having two driving-wheels riding on the way, of two revolving soft-iron armatures with their central longitudinal lines in the same plane, two electro-magnets located at right angles to each other and arranged so that the armatures revolve across their poles, and a commutator for directing the current to the magnets alternately, substantially as set forth.

4. In electrical store-service apparatus, the combination, with a way forming the circuit, of a carrier having an electric motor riding on said way, a section at the end of the way disconnected from the circuit and forming a continuation of the main body of the way and in line therewith and in the same horizontal plane, a latch for holding the car, and a starting device for starting the car on its return-trip, substantially as set forth.

5. In electrical store-service apparatus, the combination of a carrier, an electric motor thereon, and a shifting commutator which is shifted by the friction of the spring or springs thereon in starting the carrier, substantially as set forth.

6. In electrical store-service apparatus, the combination of a carrier, an electric motor thereon, a commutator mounted loosely on a shaft of the carrier and connected therewith by a slot and pin, and one or more springs bearing on said commutator and causing it to shift by friction thereon, substantially as set forth.

7. In electrical store-service apparatus, the combination, with the way formed of two tracks connected with opposite sides of the electric circuit, of breaks in said way and parallel switching-plates bridging such breaks and also connected with the circuit, substantially as set forth.

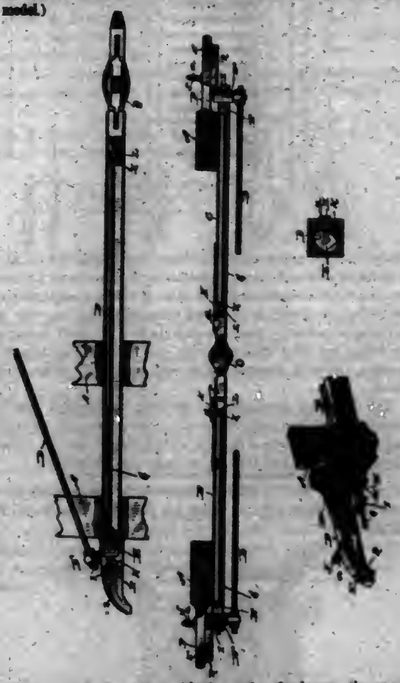
8. In electrical store-service apparatus, the combination, with the way formed of two tracks connected with opposite sides of the electric circuit, of switching-plates, also connected with said circuit, and carriers having switching-wheels on the driving-shafts of the carriers, substantially as set forth.

9. In electrical store-service apparatus, the combination, with the way formed of two tracks connected with opposite sides of the electric circuit, of switching-plates, also connected with said circuit and carriers having switching-wheels on the driving-shafts of the carriers, said switching-wheels being smaller than the main wheels of the carriers, substantially as set forth.

10. In store-service apparatus, the combination, with a way and carriers traveling thereon, of latches holding the carriers at their stations and electro-magnets locking such latches, substantially as set forth.

11. In store-service apparatus, the combination, with a way and carriers traveling thereon, of latches holding the carriers at their stations, electro-magnets locking such latches, and a switch at one end of the way controlling the circuit to such electro-magnets, substantially as set forth.

399,188. POSITIVE SHUTTLE-MOTION FOR LOOMS. JOHN W. EISENHART, York, Pa. Filed July 20, 1888. Serial No. 280,542. (No model.)



Claim.—1. In a positive shuttle-motion for looms, the combination, with a reciprocating shuttle-operating arm, of a latch for engaging the shuttle and carried by the arm, a rock-shaft also carried by the arm and provided with a cam or equivalent device for moving the latch, and means, substantially as described, for operating the shaft.

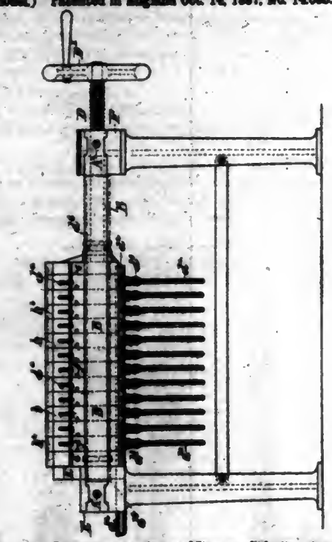
2. In a positive shuttle-motion for looms, the combination, with a reciprocating arm, of a latch on the arm for engaging the shuttle, a rock-shaft carried by the arm and provided at one end with a cam or equivalent device and at the other end with a finger, and a dog arranged in the path of the said finger to operate the said shaft, substantially as described.

3. The combination of a frame, the reciprocating tubular carrier-arms mounted in this frame, spring-latches upon the inner ends of these arms for engaging the shuttle, rock-shafts journaled inside of these tubular arms and provided with cams on their inner ends for operating the shuttle-latches, adjustable fingers on the outer ends of the said rock-shafts, means for adjusting these fingers, and pivoted dogs for operating the said rock-shafts and fingers, substantially as described.

4. The combination of a frame, reciprocating carrier-arms, spring-latches carried by these arms, rock-shafts carried by these carrier-

arms and provided on their inner ends with cams for operating the said spring-latches, fingers on the outer ends of these rock-shafts curved dogs R, pivoted to the said frame in line with the said fingers and springs for keeping these dogs normally pressed downward, substantially as described.

399,139. APPARATUS FOR THE MANUFACTURE OF NAPHTHALINE. HENRY J. PHIPSON, Brookehelme, St. John's Park, Blackheath, County of Kent, and GEORGE H. PERKIN, 33 Hillsboro Road, Dulwich, County of Surrey, England. Filed Aug. 21, 1888. Serial No. 283,343. (No model.) Patented in England Oct. 14, 1887, No. 14,085.



Claim.—1. In apparatus for molding naphthaline for use as set forth, a series of separable mold-plates having in their faces a number of recesses or cavities registering with those of the next adjacent plate, these plates being ranged on edge and clamped tightly together, the recesses communicating by small channels made in the mold, the structure also being provided with receiving and guiding channels, with cooling-pipes, and with chambers *d* in each part mold, substantially as set forth.

2. The described apparatus for forming naphthaline into ball forms, consisting of the combination of a receiving-trough, the molds *b*, having cooling-chambers *d* therein, distributing-channel *b'*, channel *c*, and mold-recesses *c'*, substantially as shown and described.

399,140. HAY-CARRIER. HENRY L. PERKIN, Harvard, Ill., assignor to Hunt, Heim & Ferris. Filed Oct. 10, 1888. Serial No. 287,756. (No model.)



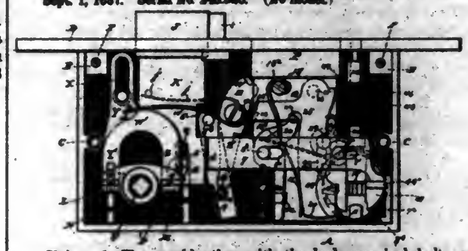
Claim.—1. In a hay-carrier, a carrier-frame provided with wheels adapted to engage or rest upon opposite sides of the supporting-track, the wheels of one side being mounted upon arms pivoted to said frame, substantially as set forth.

2. The combination, with the two-part carrier-frame A A', having integrally-formed arms on part A', said arms bearing supporting-wheels C" C", of the integrally-formed arms B, pivoted on the part A of said frame and bearing the wheels C C, substantially as set forth.

3. The combination, with the two-part carrier-frame A A', one part of which is provided with integrally-formed wheel-bearing arms B', of the integrally-formed arms B, pivoted to the other part of said frame, said arms B having the flange H and said frame part A having the hook G, adapted to engage said flange, substantially as and for the purpose set forth.

4. The combination, with the frame A A', provided with wheel-bearing arms B', formed integrally with the part A', of arms B, formed integrally with each other and pivoted to the part A, and wheels C C, mounted upon the arms B, respectively, said arms B having the flange H and the lip I, and said frame part A having the hook G, adapted to engage said flange, substantially as and for the purpose set forth.

399,141. LOCK. WILLIAM S. PIERCE, Brooklyn, N. Y., assignor to the Hopkins & Dickinson Manufacturing Company, same place. Filed Sept. 1, 1887. Serial No. 248,590. (No model.)

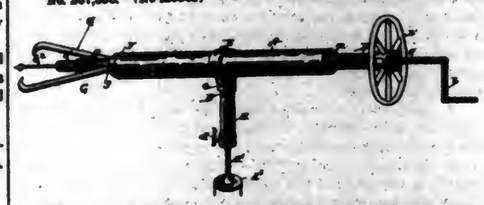


Claim.—1. The combination, with the lock-case, lock-bolt and latch-bolt, and operating-cylinder, of the slotted sliding fence connecting said lock-bolt and latch-bolt and governing the movements thereof, whereby said bolts are operated simultaneously as well as independently, substantially as specified.

2. The combination, with the lock-case provided with a stud, 30, engaging a lock-bolt having a spring-actuated notched angle-lever, a latch-bolt provided with a slot or guideway, and a shouldered stud, R, on the lock-case, of a slotted sliding fence adapted to engage a recess of the latch-bolt, and a cylinder-lock mechanism for rotating the sliding fence, substantially as specified.

3. The combination, with the lock-case, of the slotted and notched lock-bolt, the pivoted and notched angle-lever resting against the stem of the lock-bolt, the spring-actuated lever having the rounded dog engaging the notched angle-lever on the stem of the lock-bolt, the pivoted slotted lever having the flange or stop at its inner end, the latch-bolt having the slotted branched stem engaging the shouldered stud on the inner one of the parallel ribs, the branched and slotted slide resting on the stem of the latch-bolt, the pivoted lever provided with pins at its ends and engaging the notched angle-lever, and the pivoted lever connected with flanged and slotted stop-lever, the slotted and shouldered sliding fence, and the armed hubs for operating the latch-bolt and lock-bolt, substantially as specified.

399,142. DRILL. ROBERT L. PRATT, Sweet Valley, Pa., assignor of one-half to F. M. Raggio, same place. Filed Mar. 20, 1888. Serial No. 267,890. (No model.)



Claim.—1. As an improvement in drills, the combination, with the drill-shaft and the barrel or cylinder, of the telescoping rods, one of which has a lower forked end and the other a set-screw bearing against said rod, the hoop or band encircling said barrel or cylinder, and the bolt passed through lower parallel ends of said hoop or band, substantially as shown and described.

2. In a drill, the combination, with the barrel or cylinder having the apertured cheeks at its forward end, of the grappling-forks pivotally secured to said cheeks, substantially as shown and described.

399,143. HAND PLOW AND WEEDER. GERSHAM GIDDEN, Buchanan, Mich., assignor to Elliott Eugene Gidden, same place. Filed Sept. 10, 1888. Serial No. 285,068. (No model.)



Claim.—In a hand-plow, the combination of the inclined standard, a shovel secured at its lower end, an adjustable curved frame secured to the said standard, a traction-wheel journaled therein, sleeves secured to the said curved frame, and a curved standard working in the said sleeves and carrying a cutting implement, and means for securing the same in position, substantially as described.

399,144. LUMINOUS SIGHT FOR FIRE-ARMS. HERBERT H. GRESHILL, Newcastle-upon-Tyne, County of Northumberland, England, assignor to W. G. Armstrong, Mitchell & Co., (Limited,) same place. Filed Oct. 22, 1888. Serial No. 288,842. (No model.) Patented in England Apr. 2, 1886, No. 4,653.



Claim.—1. The combination, substantially as hereinbefore set forth, of the sight-piece, the luminous body below the sight-piece, and the case hiding the luminous body from view, but having an opening at the top through which light is transmitted to the sight-piece.

2. The combination, substantially as hereinbefore set forth, of the transparent sight-piece, the luminous body, and the case hiding the luminous body from view, but having an opening through which light is transmitted to the sight-piece.

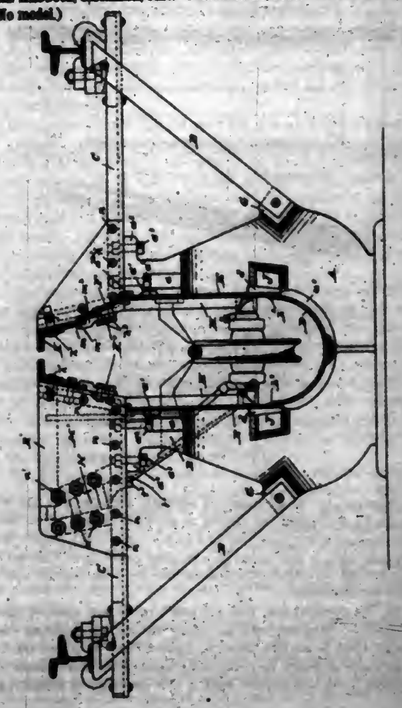
3. The combination, substantially as hereinbefore set forth, of the transparent sight-piece, the socket-piece in which it is mounted, the electric lamp and the case hiding the electric lamp from view, but having an opening through which light is transmitted to the sight-piece, and the circuit-connections of the electric lamp supported in the socket-piece.

4. The combination, substantially as hereinbefore set forth, of the transparent sight-piece, the socket-piece or support in which it is mounted, the electric lamp contained within the socket-piece incased thereby and hidden from view, but having an opening through which light is transmitted to the sight-piece, and the clamp for removably securing the socket piece to a gun.

5. The combination, substantially as hereinbefore set forth, of the transparent sight-piece, the socket-piece or support on which it is mounted, and the electric lamp and its circuit-connections removably secured to the socket-piece.

6. The combination, substantially as hereinbefore set forth, of the front and rear sight-sights for guns, each consisting of a transparent sight-piece, a luminous body, and a case hiding the luminous body from view, but having an opening through which light is transmitted to the transparent sight-piece.

399,145. CABLE-RAILWAY-CONDUIT CONSTRUCTION. WILLIAM THE HADDOCK, Cincinnati, Ohio. Filed June 22, 1888. Serial No. 277,914. (No model.)



Claim.—1. In a cable-railway-conduit construction, bottom plate, D, recessed at each end, in combination with lug *b'* on the yoke, substantially as set forth.

2. In a cable-railway-conduit construction, side plates, as D, having feet b^3, said plates suitably wedged into position, substantially as set forth.

3. In a cable-railway-conduit construction, side plates, F, in combination with a rib, as L, substantially as set forth.

4. In a cable-railway-conduit construction, yokes and bottom, side, and top plates, as set forth, in combination with lugs, as J, and suitable wedges, substantially as set forth.

5. In a cable-railway-conduit construction, the combination, with suitable frame-work, substantially as set forth, of the man-hole pocket R, having a flange, r^3, to rest on a ledge on the bar N, substantially as set forth.

6. In a cable-railway-conduit construction, T-headed bar N, bolted to the gusset-plates M', and the cross-bars P, said bars having the rabbeted edge *t*, substantially as set forth.

7. In a cable-railway-conduit construction, a side plate, as E, having cast with it a man-hole pocket, substantially as set forth.

8. In a cable-railway-conduit construction, a short pipe, R^2, cast with the bottom plate of the conduit, in combination with lugs *w*, forming T-slots *w'*, bolts w^4, collar w^5, and sewer-pipe S, substantially as set forth.

9. In a cable-railway-conduit construction, the combination, with yoke and bottom, side, and top plates, of lugs, as J, and suitable wedges, and wedges, as *d'*, substantially as set forth.

10. In a cable-railway-conduit construction, a yoke having flanges, as J, substantially as set forth.

11. In a cable-railway-conduit construction, side plates, substantially as set forth, suitably wedged into position, substantially as set forth.

399,146. PUZZLE. MAURICE JACOBS, New York, N. Y. Filed Dec. 12, 1888. Serial No. 293,407. (Model.)



Claim.—1. In a puzzle of the class described, an open link consisting of a rod bent at its middle to form a plane U, and having both its branches bent back into a plane parallel to the body of the U, the two branches being at their ends only at a distance from each other less than the diameter of the rod itself.

2. The combination, with the U-shaped link having both its branches bent back into a plane parallel to the body of the U and converged toward their free ends, of a second link similar to and engaging the first, and having its body or rod of a diameter greater than the distance between the converged ends of the first, substantially as set forth.

399,147. REGULATOR FOR DYNAMO-ELECTRIC MACHINES. JAMES F. KIRTLEY, Terre Haute, Ind., assignor of three-fourths to Joseph H. Briggs, same place. Filed Oct. 20, 1888. Serial No. 289,412. (No model.)



Claim.—1. A dynamo-regulator comprising adjustable commutator-brushes, an electro-magnetic device to shift the same, a normally-

open regulating-circuit including the electro-magnetic device, a circuit-controller, and a speed-governor carried by a rotating part of the machine and connected with the circuit-controller, as set forth.

2. In a regulator for an electric motor or generator, the combination of a movable brush-holder for the commutator-brushes, an electro-magnet to shift the brush-holder and change the line of commutation, a regulating-circuit including the electro-magnet, a circuit-controller in the circuit, and a speed-governor attached to a rotating part of the machine for operating the circuit-controller when the machine reaches a certain speed, as described.

3. In a regulator for an electric motor or generator, the combination of a movable brush-holder, an electro-magnet to shift said brush-holder, a regulating-circuit including the magnet and part of the field-magnet coil, a circuit-controller in the circuit, and a centrifugal governor attached to a rotating part of the machine for operating the circuit-controller when the machine reaches a certain speed, substantially as described.

4. A dynamo-regulator comprising adjustable commutator-brushes, an electro-magnetic device to adjust the same, a regulating-circuit including a source of electricity and the electro-magnetic device, and a speed-governor carried by a rotating part of the machine to close the regulating-circuit when a predetermined speed is reached and actuate the electro-magnetic device to adjust the commutator-brushes.

5. A dynamo-regulator comprising shifting commutator-brushes, an electro-magnetic device to adjust the same, a normally-open regulating-circuit including a source of current and the electro-magnetic device, and a centrifugal circuit-controller to close the circuit and actuate the electro-magnetic device to adjust the brushes.

6. A dynamo-current regulator comprising shifting commutator-brushes, an electro-magnetic device to adjust the same, a regulating-circuit including a portion of the field-magnet and the electro-magnetic device, a circuit-controller in the circuit, and a speed-regulator carried by the armature-shaft and connected with the controller to close the circuit and thereby shift the commutators when a predetermined speed is attained.

7. A dynamo-regulator comprising a movable brush-holder provided with stops to limit its movements, a spring secured to one end of the same to yieldingly hold that end depressed, an extension upon the opposite end of the holder, an electro-magnet located below the extension which forms the armature of the magnet, a normally-open regulating-circuit including the magnet, and a centrifugal circuit-controller to close the circuit and actuate the magnet to move the brush-holder.

8. In a regulator, the combination of an armature-shaft extension, a circuit-closer carried by the same, a centrifugal governor to operate the circuit-closer, collars on the extension connected with the closer, brushes bearing upon the collars, and a regulating-circuit including the closer, collars, and brushes, substantially as described.

399,148. GRAIN-SEPARATOR. JOHN A. KRAKE, Buffalo, N. Y., assignor of one-half to Joseph Burk, same place. Filed July 20, 1888. Serial No. 280,491. (No model.)

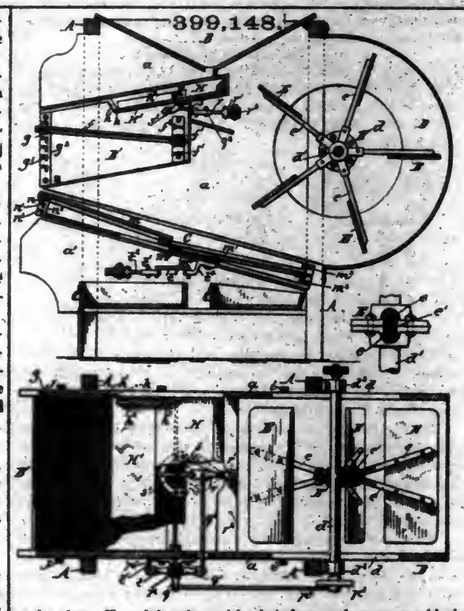
Claim.—1. The combination, with the fan-shaft d' and fan-blades E, of the hub E', mounted on said shaft and provided with sockets e', and the outwardly-diverging arms e, secured with their inner ends in said sockets and with their outer ends to the fan-blades, substantially as set forth.

2. The combination, with the upper shaking-shoe, provided in its sides with notches h', of the feed-board H, secured to said shaking-shoe, and a removable extension, H', having pins h engaging in the notches h', and provided with a supporting-bar, h^3, overlapping the end of the feed-board H, substantially as set forth.

3. The combination, with the shaking-shoe B', provided in its sides with inclined notches h', and the feed-board H, provided with a deflector, h^3, of the removable extension H', having pins h engaging in the notches h', and provided with a supporting-bar, h^3, overlapping the outer end of the feed-board and forming a continuation of the deflector h^3, substantially as set forth.

4. The combination, with the lower shoe, C, provided at its upper end with a plate having a series of undercut notches, n', and at its lower end with a series of notches, m^2, of the lower screen, m', provided at its lower end with supporting-pins engaging in the notches m^2, and having an upper cross-bar engaging with a cross-piece, m^4, secured to the frame of the shoe, and an upper screen, m, abutting with its lower end against the lower screen, m', and provided at its upper end with supporting-pins engaging in the undercut notches n', substantially as set forth.

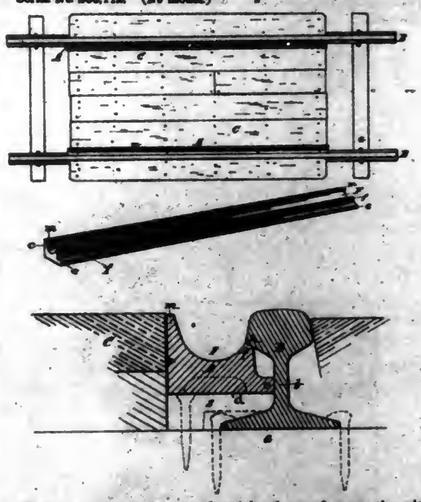
5. The combination, with the stationary frame and shaking-shoe, of adjustable hangers J, pivoted at one end to the shoe and provided at their opposite ends with pins j, plates K, having an opening or slot in which the upper portions of the hangers are arranged, and with a series of notches, k k' k^3, for receiving said pins, and plates L, hinged



to the plates K and bearing with their lower edges upon said pins, substantially as set forth.

6. The combination, with the stationary frame and a longitudinally-vibrating shoe, of longitudinal toggle-links connecting the shoe with the stationary frame, a transverse driving-shaft having a crank-disk, an upright rock-shaft having two actuating-arms arranged about at right angles to each other, a rod connecting one of said arms with said crank-disk, and a rod connecting the other arm of the upright shaft with said toggle-links at or near the joint thereof, substantially as set forth.

399,149. FLANGEWAY-RAIL FOR RAILROAD CROSSINGS AND BRIDGES. WILLIAM LAWRENCE, Worcester, Mass. Filed Oct. 15, 1888. Serial No. 288,112. (No model.)

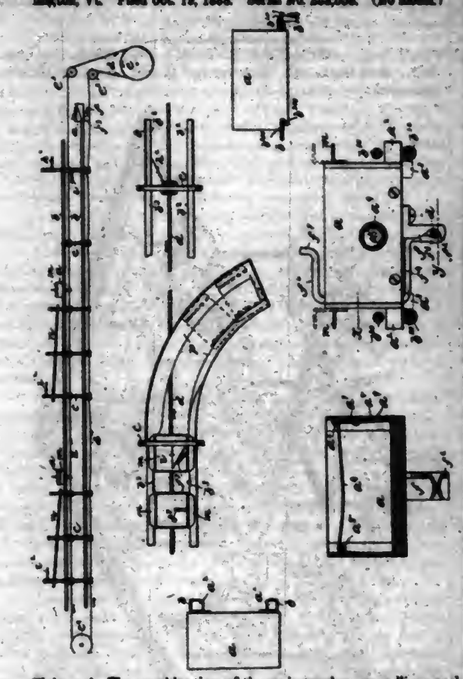


Claim.—1. As an improved article of manufacture, the within-described rolled metal rail shaped as shown, with the lateral flange c at its forward lower part, the lip f at the upper front corner, the upright rear edge, c, and upwardly-extended guard-lip m, and the channel F, having the hollow rounded contour between the said lips, all as shown and described.

2. The combination, with the track-rail B and crossing-plank C, of the rolled flangeway-rail A, having the lateral projecting flange c at its forward lower part abutting against the web of the track-rail, the upwardly-directed lip f, matching against the lower corner of the track-rail head, the upright back c, and guard-lip m, sustaining the

crossing-plank, and the rounded channel F between said lips f and m, all as shown and described.

399,150. CONVEYING APPARATUS. JOSEPH C. MARTIN, Burlington, Vt. Filed Oct. 19, 1888. Serial No. 288,568. (No model.)



Claim.—1. The combination of the main track, a propelling-cord moved parallel thereto, an auxiliary or delivering track inclined to the line of the main track, the carrier supported and guided on the main track and provided with flanges distinct and separate from those of its parts which engage the main track, and which are adapted to engage said auxiliary track and to support and guide it thereon, a cord-engaging clutch attached to the carrier, and a clutch-tripper arranged and operating to release the clutch from the cord after the carrier has left the main track and has traveled a predetermined distance on the auxiliary track, substantially as and for the purposes hereinbefore set forth.

2. The combination of the carrier with a main track composed of two opposite rails, each having upper and under guide-surfaces that engage corresponding guide-surfaces on the carrier above and below, portions of one of said rail-guide surfaces being removed at stations or points on the track where the carrier is to be applied thereto and removed therefrom to permit the carrier to be lowered onto and raised up from the said track, the remaining portion of said rail-guide surfaces at such points serving to support and guide the carrier, substantially as described.

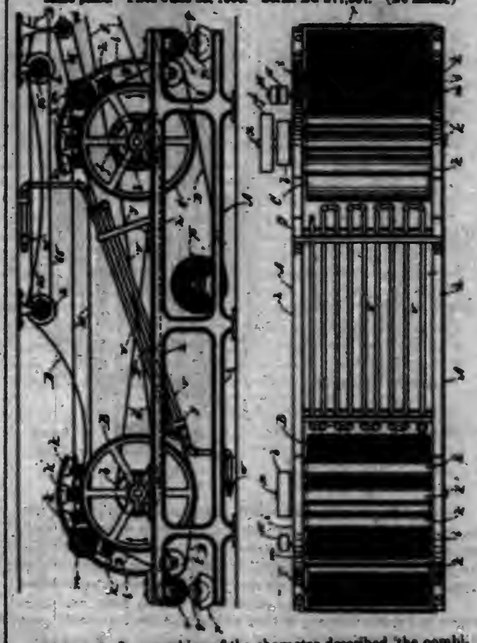
3. The combination of the carrier, a main track composed of two opposite rails, each having upper and under guide-surfaces that engage corresponding guide-surfaces on the carrier above and below, portions of one of said rail-guide surfaces being removed at the station or point on the track where the carrier is to be removed therefrom, and an auxiliary or delivering track at said station, inclined to the line of the main track, composed of two opposite rails adapted to engage lateral longitudinal flanges on the said carrier distinct from those parts of the carrier which engage the main track, substantially as and for the purposes hereinbefore set forth.

4. The combination of a track and propelling-cord moved parallel thereto, with carriers movable on said track, provided with a cord-engaging clutch composed of a cord-receiving member consisting of an arm attached to the carrier, and a movable member consisting of a finger supported on an arm connected with the rock-shaft, and a cam on said rock-shaft and spring co-operating therewith to retain the said clutch in its open and closed positions, substantially as described.

5. The combination of the main track and the propelling-cord moving substantially parallel therewith, with the carrier moving on said track, provided with a cord-engaging clutch having a cord-receiving member consisting of an arm attached to the body of the carrier and provided at its extremity with a laterally-projecting finger, and a member movable toward and from said cord-receiving member in an arc substantially tangential to the line of movement of said cord, substantially as set forth.

6. The combination of the main track and propelling-cord moving substantially parallel therewith, with a carrier movable on said track, provided with a cord-engaging clutch having a cord-receiving member consisting of an arm attached to the body of the carrier and provided near its extremity with an inclined cord-engaging recess, and a member movable toward and from said cord-receiving member in an arc substantially tangential to the movement of said cord, substantially as set forth.

399,151. MACHINE FOR COATING PAPER. JAMES M. MCCAMLAND, Pepperell, Mass., assignor of one-fourth to Albert McCausland, same place. Filed June 22, 1888. Serial No. 277,867. (No model.)



Claim.—1. In a machine of the character described, the combination of a frame, two cylinders journaled in said frame, two coils of steam-pipe disposed between said cylinders in an inclined plane, impinging the top surface of one cylinder and the bottom surface of the other cylinder, said coils forming a straight passage between them through which the paper passes to be dried, troughs for containing the coating material, provided with a feed-roll and secured, respectively, at each end of said frame, a coating-brush journaled in said frame in contact with said feed-roll, and a guide-roll for the paper journaled near each of said coating-brushes in such a manner that the paper will receive a coating from said brushes on opposite surfaces as it passes over said rolls and cylinders, substantially as set forth.

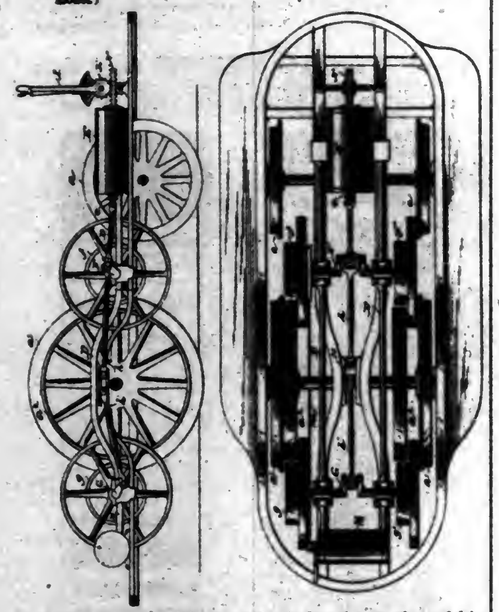
2. In a machine of the character described, the combination of a frame, two cylinders journaled in said frame and revolving in opposite directions, a trough for containing the coating material, provided with a feed-roll and secured at each end of said frame, a revolving coating-brush journaled in each end of said frame in contact with said feed-rolls, guide-rolls for the paper journaled, respectively, in said frame nearly in contact with said coating-brushes, a series of laterally-arranged straight brushes and a revolving brush for distributing the coating as the paper passes over said cylinders, and diagonally-arranged coils of steam-pipe for drying the coated surface of the paper as it leaves one cylinder, whereby it is adapted to be brought in contact with the second cylinder to permit the opposite surface to be coated, substantially as specified.

3. In a machine of the character described, the combination of the frame A, the revolving cylinders B C, journaled in said frame, brushes for depositing the coating material upon opposite surfaces of the paper as it respectively passes over said cylinders, and the steam-coils v, secured between said cylinders for drying the paper as it leaves the cylinder C, and thereby preventing it from adhering to the cylinder B, substantially as set forth.

4. In a machine of the character described, the combination of the frame A, the cylinders B C, journaled in said frame, the troughs p, secured to said frame and provided with feed-rolls q, the revolving

coating-brushes *r*, journaled in said frame, the guide-rolls *t*, the finishing-brushes *k m*, supported above said cylinders, and the steam-pipes *v*, adapted to dry the paper as it passes between the cylinders, substantially as specified.

399,152. DRIVING MECHANISM FOR STREET-CARS. JAMES MCLEAN, Pueblo, Colo., assignor to the McLean Rapid Transit Machine Company, of Colorado. Filed Apr. 25, 1888. Serial No. 271,796. (No model.)

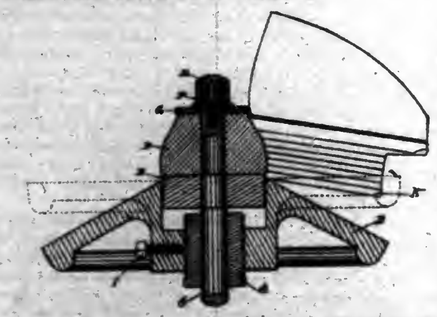


Claim.—1. In combination with a body and supporting and driving wheels, a sliding frame carrying friction-wheels, with crank-shafts and piston-connections to an engine, all mounted on the said frame, the friction-wheels being arranged to shift their contact with friction-wheels on the axle to reverse the movement, substantially as described.

2. In combination with a car-body, a moving frame carrying a motor, two shafts carrying friction-wheels, said friction-wheels being in line with friction-wheels on the driving-axle, but on opposite sides thereof at a distance asunder greater than the diameter of the friction-wheels on the driving-axle, and connections between the two shafts on the moving frame and the motor, all substantially as described.

3. In combination with the sliding frame carrying the engine, crank-shafts journaled thereon and their friction-wheels arranged on both sides of friction-wheels on the axle of the driving-wheels, the connection between one crank-shaft and the piston-rod of the engine, and connection between the two crank-shafts through the sliding head moving on ways in the frame.

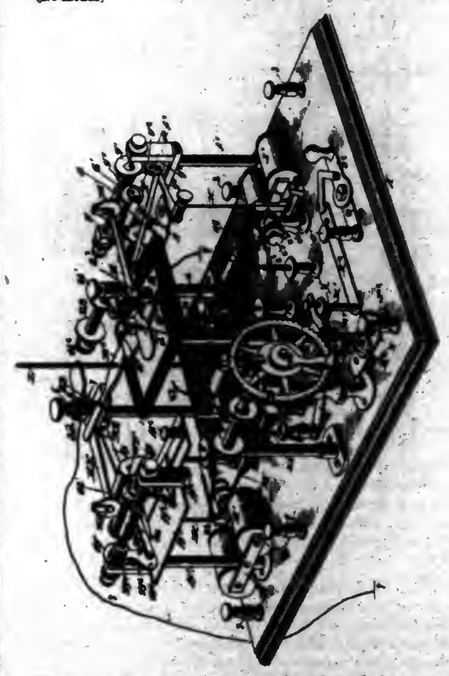
399,153. HEEL-TRIMMER. OSCAR L. HOGLE, Boston, Mass. Filed Mar. 12, 1888. Serial No. 266,163. (No model.)



Claim.—1. The improved heel-trimming machine above described, consisting of table B, cutter D, top-lift guide E, and collar G, the surface of the table being inclined to the axis of the cutter-arbor C, the table being recessed to receive the top-lift guide E, and the collar G being held by means substantially such as are shown, substantially as described, and for the purpose set forth.

2. In a heel-trimming machine, the table B, with its surface inclined to the axis of the cutter, in combination with the cutter D and the top-lift guide E, the table B being recessed to receive the top-lift guide, substantially as and for the purpose set forth.

399,154. AUTOMATIC TELEGRAPHY. JOHN O'NEIL, New York, N. Y. Filed July 6, 1886. Renewed July 23, 1888. Serial No. 280,836. (No model.)



Claim.—1. In an automatic multiplex-telegraph instrument, a continuously-energized electro-magnet interposed in the main-line circuit and independent intermittently-energized electro-magnets in alternate circuit with said main line, in combination with styluses vibrated by said continuously-energized magnet and independent electrodes in intermittent circuit with said main-line circuit, substantially as described.

2. In an automatic multiplex-telegraph system, a combined transmitting and receiving instrument, each having supports to receive material on which the message is written or is to be recorded, a single electro-magnet interposed in the main-line circuit, continuously-vibrating separate styluses or electrodes connected to a vibrating armature pivoted in the field of said electro-magnet, and mechanism, substantially as described, to intermittently throw said electrodes into and out of said main-line circuit, as and for the purpose set forth.

3. A continuously-energized electro-magnet interposed in the main-line circuit, a vibrating armature therefor, and independent electro-magnets in intermittent circuit with said main line and provided with armatures positively connected together, in combination with styluses, connections between said styluses and the armature of the continuously-energized magnet, electrodes carried by said styluses, message-fillets in normal contact with said electrodes, feed mechanism for said fillets, and connections between the armatures of said independent magnets and said feed mechanism, substantially as described.

4. In an automatic multiplex-telegraph instrument, a message-fillet, a support therefor, and feed mechanism to move said fillet in forward direction, a stylus having an electrode in normal contact with said fillet, an armature to vibrate said stylus, a continuously-energized electro-magnet included in the main-line circuit to actuate said armature, and independent intermittently-energized electro-magnets, substantially as described, armatures therefor, and connections between said armatures and said electrode to automatically throw said electrode into and out of the main-line circuit and into and out of contact with the message-fillet, as and for the purpose specified.

5. In an automatic multiplex-telegraph system, a combined transmitting and receiving instrument having supports to receive material on which the message is written or is to be recorded, means, substantially as described, to move said material in forward direction, separate styluses or electrodes connected together and to an armature pivoted in the field of an electro-magnet, which is continuously closed to the main-line circuit, and mechanism, substantially as described, to intermittently throw said electrodes into and out of circuit with the main line, as and for the purpose specified.

6. In an automatic multiplex-telegraph system, a transmitter and a receiver placed in juxtaposition and provided with supports to receive strips on which messages are written and are to be recorded, means to move said strips consecutively in forward direction, separate styluses connected together and to a vibrating armature pivoted in the field of a single electro-magnet, which is interposed in the main-line circuit, whereby the said styluses are vibrated over the surface of said material, and means, substantially as described, for throwing said styluses alternately out of contact with said material and out of circuit with the main line, as and for the purpose set forth.

7. A transmitting-instrument and a receiving-instrument in juxtaposition, each having a message-fillet, a support and feed mechanism for the same, and a stylus or electrode in normal contact with said fillet, a connection between said styluses or electrodes, an armature to vibrate said electrodes simultaneously, a continuously-energized electro-magnet to actuate said armature, and intermittently-actuated electro-magnets independent of said continuously-energized magnet, to actuate said feed mechanism and to intermittently throw said electrodes into and out of circuit with the main line, substantially as described.

8. A multiplex-telegraph instrument provided with a transmitting-instrument and a receiving-instrument in juxtaposition, each having a message-fillet, a support and feed mechanism for said fillet, and a stylus or electrode in normal contact with said fillet, connections between said styluses or electrodes, a continuously-energized magnet interposed in the main-line circuit to simultaneously vibrate said electrodes, in combination with devices to positively move said electrodes out of contact with said fillets, intermittently-energized electro-magnets interposed in the circuits of said transmitting and receiving instruments, and connections between said magnets, feed mechanism, and contact-breaking devices, substantially as described.

9. An automatic multiplex-telegraph instrument having a transmitting and a receiving device provided with styluses intermittently in circuit with the main line, connected together and to the vibrating armature of an electro-magnet interposed in the main-line circuit, electro-magnets interposed in the circuits of said transmitter and said receiver and alternately energized by message-impulses over said main line, and means, substantially as described, connected to said magnets to feed the message sending and receiving material in forward direction, and to automatically and intermittently throw the transmitting and receiving instruments into and out of the main-line circuit, as and for the purpose set forth.

10. In a combined transmitting and receiving instrument, styluses, which are intermittently thrown into and out of the main-line circuit are connected together and to a vibrating armature pivoted in the field of and operated by the intermittently-reversed polarity of a single electro-magnet interposed in the main-line circuit, supports to receive material on which the message is written or is to be recorded, feed mechanism to move said material in forward direction, mechanism to move said styluses out of contact with said material, and intermittently-operating electro-magnets interposed in the circuit of each of said instruments and connected to said feed mechanism and to the mechanism by which the styluses are thrown out of contact with said message sending and receiving material, as and for the purpose specified.

11. A transmitting-instrument and a receiving-instrument placed in juxtaposition and provided with message-fillets, feed mechanism therefor, and with connected styluses having electrodes in normal contact with said fillets, a continuously-energized electro-magnet to vibrate said styluses, an intermittently-energized electro-magnet included in the circuit of each of said magnets and provided with armatures, positive connections between said armatures, and stops to limit the movement thereof, connections between said armatures and feed mechanism, devices to move said electrodes out of contact with said fillets, and connections between said devices and the armatures of said intermittently-energized magnets, substantially as described.

12. In an automatic multiplex-telegraph system, a transmitting and a receiving instrument having metallic rollers F FF to receive strips of material on which messages are written or are to be recorded, styluses or electrodes E EE in contact with said material and attached to vibrating arms E EE, which are connected together and operated by a vibrating armature pivoted in the field of an electro-magnet which is interposed in the main-line circuit and adapted to be intermittently energized by oppositely-moving message-impulses over said main-line circuit, intermittently-operating electro-magnets interposed in the circuits of said instruments and connected to feed mechanism to move said material in forward direction, and mechanism to throw said arms E EE and electrodes E' EE' out of contact with said material, as and for the purpose set forth.

13. A transmitting and a receiving instrument placed in juxtaposition and provided with electro-magnets I' and II' interposed in the circuits of said instruments, respectively, and having armatures I and II, positively connected together and provided with binding-posts *k* and *kk*, which are insulated from said armatures, rods or bars H HH, and connecting-rods from said bars to operate feed mechanism arranged to move message sending and receiving material in forward direction and to move electrodes which are normally in contact with said material out of contact therewith, substantially as described.

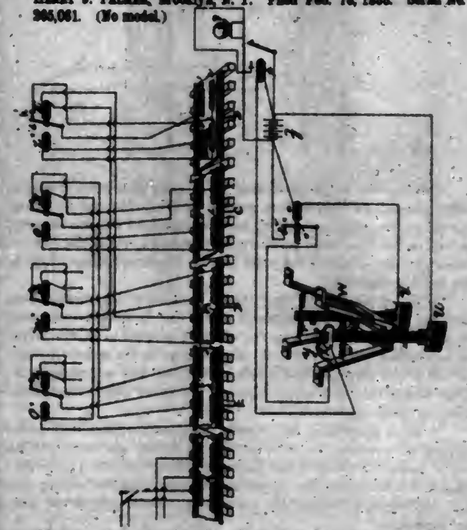
14. In an automatic multiplex-telegraph system, the combination of a transmitting and a receiving instrument provided with vibrating stylus-carrying arms E EE, metallic rollers F FF, to receive strips or fillets of proper material on which messages are written or are to be recorded, and means, substantially as described, to operate said arms and rollers, with pivoted props R RR and arms S SS, connecting said props with feed mechanism, as and for the purpose specified.

15. The combination of the vibrating stylus-carrying arms E EE, metallic rollers F FF, feed-rollers G GG, having feed ratchet-wheels and pendent arms provided with spring-pressed pawls, and means, substantially as described, to operate said feed-rollers, with material on which messages are written or to be recorded, and pivoted props R RR and connecting-rods S SS, substantially as described.

16. The combination, in a multiplex-telegraph instrument and with the message receiving and transmitting fillet thereof, of a fluid-receptacle, 13, having rollers 14 and 15 arranged therein and upon opposite sides of said fillet, contact-rollers F and FF, and feed-rollers having intermittent rotary motion, substantially as described.

17. The combination, with the message receiving and transmitting fillet of a receiving or transmitting instrument, of intermittently-rotating feed-rollers and a fillet-dampening device comprising a fluid-receptacle, a vulcanite roller, 14, and a metallic roller, 15, operating therein, and a spring, 16, connected to hold said rollers in contact with the opposite sides, respectively, of said fillet, substantially as described.

399,155. ELECTRICAL RAILWAY SIGNALING APPARATUS. HENRY J. PALMER, Brooklyn, N. Y. Filed Feb. 18, 1888. Serial No. 265,081. (No model.)

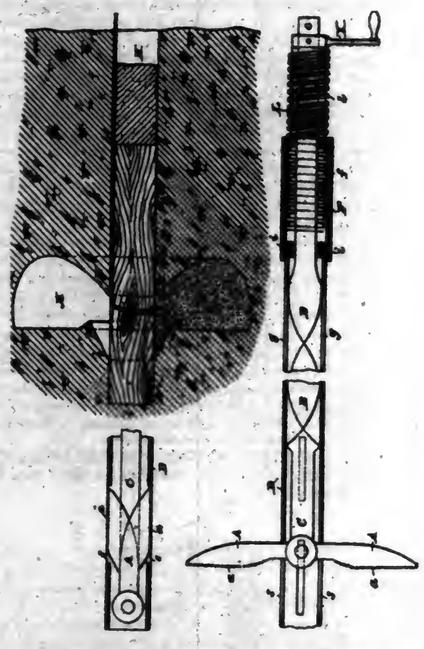


Claim.—1. In an electric railway signaling system, track-terminals and a partial electric circuit connected therewith, corresponding train-terminals and a partial circuit connected therewith and passing to a battery on the train through an electro-magnet, in combination with a separate circuit controlling a signaling apparatus through the armature and back stop of the said magnet, the said separate circuit being normally open between two points, but closed at those points when the contact devices on the train are upon the road-terminals, whereby, if the external circuit be found closed, a signal upon the locomotive will be prevented, and if found open a signal will be sounded, as and for the purpose set forth.

2. The combination, with conducting-rails along a railway-track, of corresponding contact devices upon a train, the said devices being attached to one or more movable or tilting supports, and a circuit-controller operated directly by the movement of said tilting supports to close a circuit upon the train, as and for the purpose set forth.

3. The combination, with the contact-brushes and the supporting-frame in which they are pivoted, of the battery Z, the partial circuit containing the magnet *e*, and the secondary circuit controlled by the said-magnet and having as its terminals the head X and the spring Y, as and for the purpose set forth.

399,156. REAMER FOR FORMING BLAST-HOLES. LEOPOLD PLOM, Retinne, and JULIEN D'ANDRIMONT, Liege, Belgium. Filed Oct. 31, 1888. Serial No. 289,563. (No model.) Patented in Belgium Dec. 23, 1886, No. 5,616; in France Jan. 3, 1887, No. 167,287; in Luxemburg Jan. 3, 1887, No. 783, and in England Jan. 4, 1887, No. 139.



Claim.—1. In an instrument for forming blast-holes in coal or other mineral, the combination, with an inclosing-tube and a drill-rod having an extensible and folding within said rod, of a sleeve screwing on one end of the above members and secured to the other, so as to rotate thereon, whereby the latter may be withdrawn substantially in the manner explained.

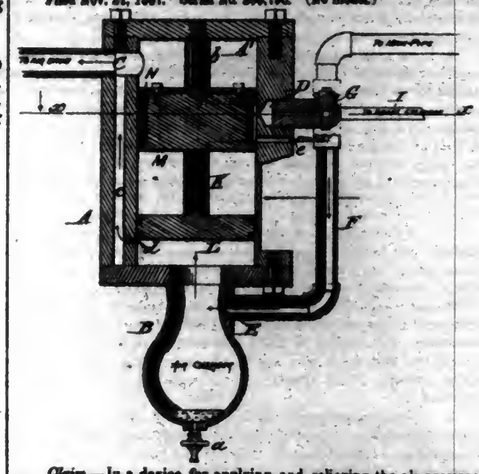
2. In an instrument for forming blast-holes, the combination, with the tube D, having apertures *s*, of a rod, C, located within said open-ended tube and having the wings A pivoted to it, said wings being inclined outward, whereby they engage in the apertures when moved in one direction and fold upon the rod, and are brought entirely within the tube when moved in the other direction, substantially as herein explained.

3. In an instrument for forming blast-holes, substantially as described, the combination, with the tube D, having apertures *g*, of the rod C, carried by the tube and having a cutting end, and a spiral portion, B, for conveying the pulverized material from the cutting end and discharging it through the apertures *g*, substantially in the manner explained.

4. In an instrument for forming blast-holes, substantially as described, the combination, with the tube D, having sleeve F, keyed by a lug and annular slot thereon, of a rod, C, having wings A bent outward in opposite directions, whereby they engage an edge on the tube and a head, L, said sleeve and head having corresponding screw-threads, whereby upon rotation of the sleeve the rod is moved relatively to the tube D and the wings A extended, as fully explained.

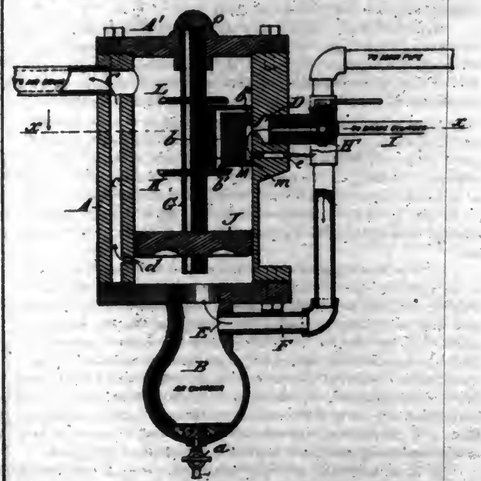
5. In an instrument for forming blast-holes, substantially as described, the combination, with the tube D, stem C, and wings A, mounted on the stem, said tube having the apertures *s g*, and the sleeve F, keyed thereon so as to be rotatable, of a rod having the conveyer B and head L and crank X, said head and sleeve F being correspondingly screw-threaded, whereby they engage, and upon rotation of the sleeve the rod is moved relatively to the tube to extend the wings and convey the fine material to discharge it through the apertures *g*, the whole instrument being rotated substantially in the manner herein set forth.

399,157. AUTOMATIC PISTON FOR AIR-BRAKES. NATHANIEL J. PRITCHARD and JAMES S. TREPLOW, Milton, assignors, by direct and mesne assignments, to the Pritchard Brake Company, Roanoke, Va. Filed Nov. 21, 1887. Serial No. 256,790. (No model.)



Claim.—In a device for applying and relieving the air-pressure on railway-brakes, the combination of the inclosing-case A, whose top plate, A', has a downward projection, *b*, said case having port C, leading to the air-drum, port D, leading to the brake-cylinder, port E, where the main pipe enters, the exhaust-port *c* in the side wall of the cylinder near port D, the vertical passage *e* and port *d* between it and the interior chamber of the case, the T-shaped pipe connected to the casing at port D, and having a plug-valve, G, located at the intersection of its members, the piston K within said interior chamber of the casing, having heads L and M, the loosely-placed ring N, surrounding head M, and having a recessed face adapted to connect port D and exhaust-port *c*, all of said parts being arranged to operate substantially in the manner and for the purpose described.

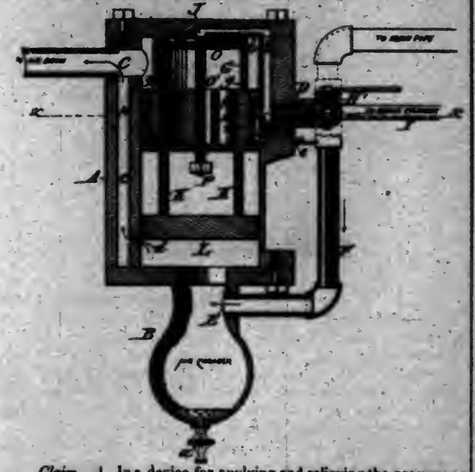
399,158. AIR-BRAKE. NATHANIEL J. PRITCHARD and JAMES S. TREPLOW, Milton, assignors, by direct and mesne assignments, to the Pritchard Brake Company, Roanoke, Va. Filed Apr. 13, 1888. Serial No. 270,568. (No model.)



Claim.—1. In a device for applying and relieving the pressure on pneumatic railway-brakes, the combination of the inclosing-case having ports leading to the air-drum, main pipe, and brake-cylinder, an exhaust-port, and a vertical passage extending upward through the wall of the cylinder to the port that leads to the air-drum, said passage having communication near the bottom of the cylinder by a port with the interior of the cylinder, the cap-plate for the cylinder provided with a downwardly-extending tubular box, the piston and its piston-rod, the upper end of which is received into said tubular box, the two flat circular plates or disks secured upon said piston-rod, the valve located between said plates, and consisting of a semi-cylindrical piece of metal having a port in the bottom and a port in the side, which ports are connected by an air-passage, the opening to the lower or bottom port being controlled by the flat plate beneath it, all the parts being arranged to operate substantially as and for the purpose herein described.

2. In a device for applying and relieving pneumatic pressure on railway-brakes, the combination of the main cylindrical case A, having the port C, leading to the air-drum, port D, leading to the brake-cylinder, port E, leading to the main air-supply pipe, an exhaust-port, *c*, and a vertical passage, *e*, extending upward through the wall of the cylinder to the port C, said passage *e* communicating by port *d* with the interior of cylinder A, the cap-plate A' for the main body A, provided with a downwardly-projecting tubular box, *o*, the piston J and its piston-rod G, whose upper end enters the tubular box *o*, the two flat circular plates K and L, secured upon the piston-rod, the valve M, located between said plates or disks, and having a bottom port, *b'*, a lateral port, *b³*, and a connecting-passage, *b*, between said ports, the port *b'* being adapted to be closed or opened by the disk or plate K, all the parts being arranged for joint operation, substantially as described, and for the purpose specified.

399,159. DEVICE FOR APPLYING PRESSURE TO RAILWAY-BRAKES. NATHANIEL J. PRITCHARD and JAMES S. TREPLOW, Milton, assignors, by direct and mesne assignments, to the Pritchard Brake Company, Roanoke, Va. Filed Mar. 5, 1888. Renewed Jan. 18, 1889. Serial No. 296,794. (No model.)



Claim.—1. In a device for applying and relieving the pressure on railway-brakes, the combination of the inclosing-case having ports leading to the air-drum, main pipe, and brake-cylinder, the double-ended piston located within said case, the valve surrounding the upper end of the piston, in the manner specified, and the graduating-piston, all the parts being combined and arranged for joint operation, substantially as described.

2. In a device for applying and relieving the air-pressure to pneumatic railway-brakes, the combination of the cylindrical inclosing-case having ports leading to the air-drum, main pipe, and brake-cylinder, suitable air-passages, as specified, and also an exhaust-port, the cap-plate for said inclosing-case having a downwardly-projecting cylindrical extension provided with a port and apertures, the main double-ended piston operating within the inclosing-case, and the graduating-piston working within the cylindrical extension on the cap-plate, all substantially as described, and for the purpose set forth.

3. In a device for applying and relieving the air-pressure to air-brakes, the inclosing-case provided with properly-arranged ports, as specified, in combination with the main double-ended piston, its surrounding valve, and the graduating-piston having its piston-rod connected to and actuated by the main piston, substantially in the manner and for the purpose set forth.

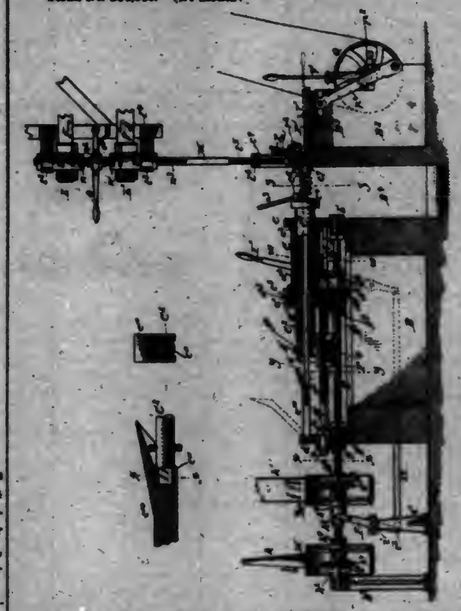
4. The combination of the inclosing-case having ports leading to the air-drum, main pipe, and brake-cylinder, together with connecting-passages and exhaust-ports, the cap-plate for said case having a downwardly-projecting cylindrical extension furnished with a small port and other apertures, the main double-ended piston carrying a valve arranged relatively thereto, as described, the graduating-piston working in the cylindrical extension on the cap-plate and having its piston-rod connected to and adapted to be actuated by the main piston, all substantially in the manner and for the purposes hereinbefore described.

5. The combination, with the inclosing-case having ports C D E and exhaust *c*, the cap-plate A', having the cylindrical extension G, provided with port *b*, and an aperture or apertures, *g*, said case and cap-plate having also suitable air-passages, of a main piston operating within the central chamber, and a graduating-piston operating within the cylindrical extension on the cap-plate to accomplish the result specified, substantially as set forth.

6. The combination of the cylindrical case A, having ports C D E and exhaust *c*, the cap-plate A', having the extension G, provided with small port *b*, and an aperture or apertures, *g*, the main piston having suitably-connected heads L and M, said head M being peripherally flanged at top and bottom to form an annular recess, the valve N, located within said annular recess, and the piston O, working within the extension G and having a piston-rod, O', projected through the head M and furnished with a nut, P, all the parts being arranged substantially as and for the purpose described.

7. In combination with an inclosing-case constructed substantially as described, a main piston having heads L and M, said head M being annularly recessed, the valve N, recessed at *n* and located within the said annular recess of head M, but being shorter in vertical length than the recess, for the purpose indicated, and the piston O, having rod O', extending through head M and furnished with nut P, all substantially as described.

399,160. SPRING-BENDING MACHINE. JAMES M. RICE, Pittston, Pa., assignor to William T. Haydock, St. Louis, Mo. Filed Sept. 25, 1888. Serial No. 286,213. (No model.)



Claim.—1. The combination, with the clamping-dies, whereby one end of the spring-bar is held, of a winding-cylinder, a removable mandrel arranged within the winding-cylinder, a rotating drum surrounding the winding-cylinder and connected therewith by a groove and feather to rotate the same, and feed mechanism whereby the winding-cylinder is moved longitudinally in the drum, substantially as set forth.

2. The combination, with the clamping-dies, whereby a portion of the spring-bar is held, of the winding mechanism whereby the spring-bar is coiled, and a ram whereby the end of the spring-bar is bent, substantially as set forth.

3. The combination, with the clamping-dies, of the winding-cylinder, a mandrel arranged in the bore of the winding-cylinder, and a locking-arm whereby the mandrel is held against longitudinal movement, substantially as set forth.

4. The combination with the clamping-dies, the winding-cylinder, and the mandrel provided with a flat-sided end, of a locking-lever provided with a flat-sided recess engaging with the flat-sided end, of the mandrel, whereby the mandrel is held against rotary movement, substantially as set forth.

5. The combination, with the hollow drum provided with driving-gear whereby it is rotated, of a winding-cylinder arranged in said drum and connected therewith by a groove and feather, a cross-head provided with a screw-nut and connected with said winding-cylinder, and a feed-screw engaging with said screw-nut, substantially as set forth.

6. The combination, with the hollow drum provided with a gear-rim, of a winding-cylinder arranged in said drum and connected therewith by a groove and feather, a feed-screw connecting said winding-cylinder, a driving-shaft provided with mechanism whereby it can be rotated in either direction, gears connecting said driving-shaft with the feed-screw, and a gear-pinion and clutch whereby the drum can be rotated from said driving-shaft, substantially as set forth.

7. The combination, with the lower die provided in its face with a recess, of a mandrel having an inclined end seated in said recess and a winding-cylinder surrounding said mandrel, substantially as set forth.

8. The combination, with the clamping-dies, of a winding-cylinder and a feed-screw whereby the cylinder is moved toward the clamping-dies, thereby bending the body of the bar preparatory to winding the same, substantially as set forth.

9. The combination, with the winding mechanism, of an upper movable die and a lower stationary die provided in its upper face with a depression, and having on its front side a slotted flange opening upwardly and projecting upwardly beyond the face of the die, and having inclined deflecting-faces to form in connection with the winding mechanism the initial bend of the spiral, substantially as set forth.

10. The combination, with the winding mechanism, of a lower stationary die, an upper movable die provided on its rear side with a former-plate, a pivoted ram, and mechanism whereby an oscillating motion is imparted to the ram, substantially as set forth.

11. The combination, with the winding mechanism, the clamping-dies, and the ram whereby the end of the spring-bar is bent, of a locking-lever which is engaged with the spring-bar and whereby the latter is held in position during the operation of winding, substantially as set forth.

899,161. GLOVE-FASTENER. WILLIAM S. RICHARDSON, Boston, Mass., assignor to the Ball and Socket Fastener Company, Nashua, N. H. Filed May 26, 1888. Serial No. 275,228. (No model.)



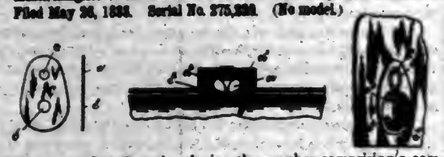
Claim.—1. The ball member of a fastening, comprising the ball a, applied to one surface of the material upon which it is used, the cap a', applied upon the opposite surface of said material and having a cavity to receive the material and ball, and a washer or flange between the ball and material, the said ball being secured to the cap with the material to bring the principal part of its body within the edge of the material determined by the edge of the cap, substantially as described.

2. A socket member of a fastening, comprising a flat plate having at one end an ear, b^2, affording means by which the member of the fastening is secured to the material, and at the other end the continuous flange b^3, and the yielding or spring jaws b^5, rising from the inner edge thereof and having an opening to receive the ball member of the fastening, substantially as described.

3. The combination, in a fastening for gloves and other articles, of the flat plate b^2, the jaws b^5, extending upward therefrom, and the slit or slits b^4, and an extension, b^3, of the plate b^2, for receiving a fastening for securing the member to the material with the ball, post, or stud member, substantially as described.

4. The combination, in a fastening for gloves and other articles, of a ball member comprising a ball, a, secured within a cavity formed in one surface of the material, and a cap located upon the other surface of the material, and a washer, the ball and washer being secured to the cap, and the washer and cap determining said cavity in the material, with a socket member having upwardly-extending yielding jaws b^5, provided with an opening to receive the ball, substantially as described.

899,162. GLOVE-FASTENING. WILLIAM S. RICHARDSON, Boston, Mass., assignor to the Ball and Socket Fastener Company, Nashua, N. H. Filed May 26, 1888. Serial No. 275,229. (No model.)



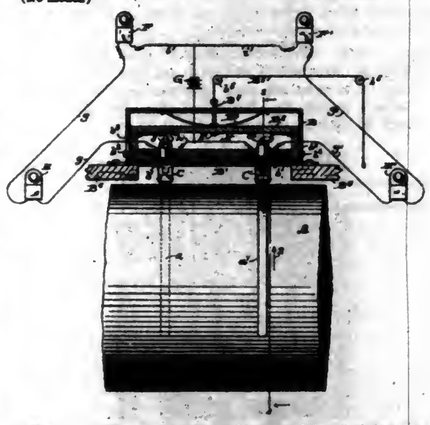
Claim.—1. In a fastening device, the member comprising a compressible ball adapted to be placed upon one surface of the material of the glove or other article to which it is attached, and a cap upon the opposite surface of said material, the ball being secured to the cap and held in its cavity by a fastening extending from the ball through the material to the cap, substantially as described.

2. The combination of the member of a fastening, consisting of a compressible ball, a, a cap, a', held or secured to the material, as described, with the ball-receiving device comprising a plate, C, having a sleeve, c^2, provided with the opening c^3, of less size than the size of the ball when expanded, substantially as described.

3. The member of a fastening device for receiving and holding an expansible ball, comprising the plate C, the sleeve c^2, extending therefrom and having the opening c^3, of less size than the expanded ball which it receives, and the ear c^4, by which it is secured to the material, substantially as described.

4. The combination of the compressible ball a, the cap a', the crowned washer a^2, and a stud or eyelet connecting the ball and washer with the cap, substantially as described.

899,168. ELECTRIC SIGNAL FOR ENGINE-SHAFTS. JAMES G. RICKETSON, Milwaukee, Wis. Filed Oct. 4, 1882. Serial No. 267,161. (No model.)



Claim.—1. The combination, with a revolving shaft having cams attached thereto, as described, each cam having one inclined and one blunt end, of a pair of push-rods suspended in housings above said shaft, hangers hinged to said push-rods and capable of turning on their hinge-joints in one direction only and normally located in the paths of motion of said cams, contact-strips attached to the housings of the push-rods in the path of motion of the latter, and a pair of distant signals electrically connected to said contact-strips, whereby the inclined edge of one cam will pass under the hanger of one of the push-rods and raise it, closing a circuit and actuating the distant signal in said circuit, while the blunt edge of the other cam will strike the hanger of the other push-rod and swing it out of the way on its hinge-joint, substantially as set forth.

2. The combination, with a revolving shaft having cams attached thereto, as described, of a frame supported above said shaft, a movable block sliding vertically in said frame and carrying push-rods having hangers hinged thereto in the paths of motion of said cams, a spring within the said frame bearing against said block, a rod connected to the latter, and a cord connected to said rod, whereby the hangers may be withdrawn from possibility of contact with the said cams by drawing upon said cord and on releasing the cord automatically restored to place, substantially as set forth.

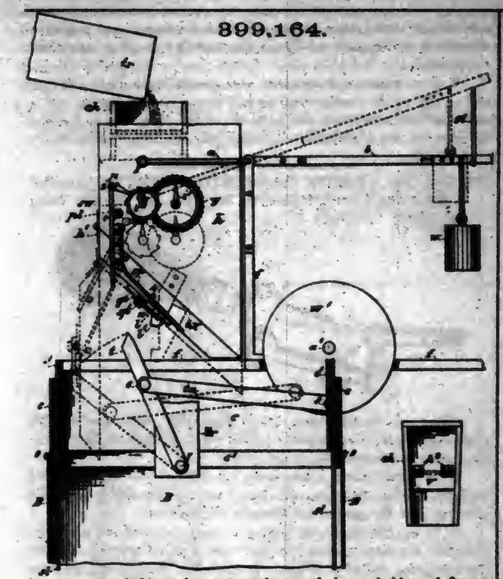
899,164. AUTOMATIC GRAIN WEIGHER AND MEASURER. WILLIAM S. SCOTT, Rentsonce, Ind. Filed Feb. 13, 1888. Serial No. 263,930. (No model.)

Claim.—1. In an automatic grain weighing and measuring machine, a frame-work, a hopper suspended therefrom, a scale-beam connected to the hopper and carrying a weight, a bottom hinged to such hopper, a spring connected thereto for closing and a latch for securing the same, and a trip for unlatching connected to a wheel driven by suitable power, such trip operating to release the latch when the loaded hopper falls, all combined substantially as shown and described.

2. A grain-weighing machine comprising a hopper having a hinged bottom suspended by a bail from a frame, a scale-beam connected to the hopper-bail, and a chute connected above the hopper, having a valve in its bottom adapted to be lifted when the chute falls by contact with a projection, whereby the grain is held in the chute and prevented from falling into the hopper until the latter rises, substantially as described.

3. A grain-weighing machine comprising, in combination, a frame-work, a hopper having a hinged bottom, a bail connected to such

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hopper suspended in such frame-work, an axle journaled in such frame a driving-wheel mounted thereon, a tripping mechanism connected to such driving-wheel at one end and at the other, and a trip which engages with a latch secured to the hinged bottom of such hopper, whereby the latch is freed by the descent of the load, substantially as shown and described.

4. A grain-weighing machine comprising a hopper suspended by its bail from the frame and carrying above it a chute provided with a valve located in line and in combination with a projection from the frame, whereby the descent of the loaded hopper closes the valve and retains the grain in the chute until the hopper again rises, substantially as described.

5. In a grain-weighing machine, the chute ch, the projection pr, connected to the frame-work below, and valve v, hinged to the bottom of such chute and opening upward in the line of such projection, all combined substantially as described.

6. In an automatic grain weighing and measuring machine, a frame-work, a hopper having a hinged bottom suspended by a bail therefrom, a pressure-spring connected to such hopper for closing the hinged bottom when the load is discharged, an axle journaled in the frame-work, a driving-wheel mounted thereon, a tripping mechanism connected to such driving-wheel at one end and at the other with a trip which engages with a latch secured to the hinged bottom of such hopper, and a registering mechanism which is actuated by the opening of the hopper-bottom, all combined substantially as shown and described.

7. In an automatic grain-weighing machine, a frame-work, f, hopper h, having a hinged bottom, hx, bail a; the latter having bearings in such frame-work, driving-wheel w', revolving in bearings upon such frame, and the trip-arm tx, connected to such driving-wheel at one end and at the other end to the trip t, pivoted at 7 to the crombar of the frame and adapted to engage with a latch, l, which secures the hinged bottom in place, substantially as shown and described.

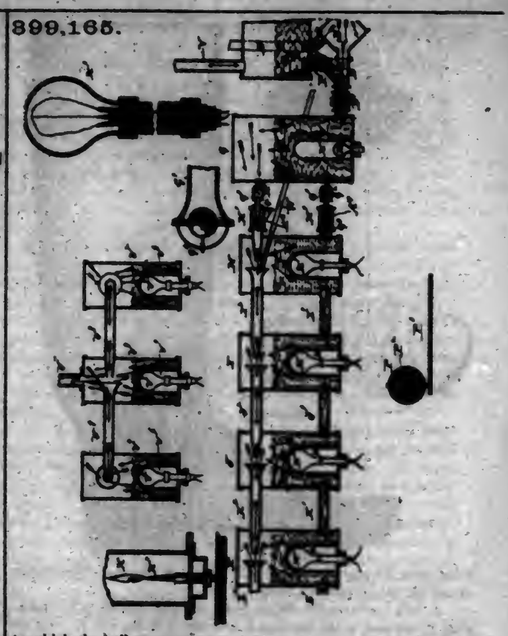
8. In an automatic grain weighing and measuring machine, the frame-work f, hopper h, suspended by a bail therefrom and provided with a hinged bottom, hx, closable by a pressure-spring, sp, registering mechanism comprising a pawl-lever, pl, pivoted to the hopper, pawl p, ratchet-wheel sw, gear-wheel gw, and indexes ii upon such wheels, all secured to the side of the hopper, such registering mechanism actuated by the back-pressure of the hinged bottom of the hopper through the pin 3 upon the pawl-lever, all combined as shown and described.

9. In an automatic grain weighing and registering mechanism, a hopper h, suspended by a bail, a, in frame-work f, a chute, ch, having a valve, v, connected to such hopper, a scale-beam, b, carrying a weight, w, and projection pr, connected to the frame for closing the valve in the chute, all combined and operating substantially as shown and described.

899,165. STEAM-GENERATOR. DANIEL W. SMITH, St. Louis, Mo., assignor of one-half to Joseph C. Addington, same place. Filed Nov. 26, 1887. Serial No. 256,265. (No model.)

Claim.—1. In combination with a number of boilers and a receiver

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to which the boilers are connected, pipes connecting the boilers and having flared ends and injector-nozzles adapted to inject therein arranged above the water-level, and burners for heating the water in the boilers, substantially as set forth.

2. The combination, with a number of boilers and a receiver to which said boilers are connected, of pipes connecting said boilers, each having a flared mouth and an injector-nozzle, and said mouths and nozzles being arranged opposite each other and above the water-level within said boilers, water-pipes connecting the boilers at their lower parts, and burners for heating the water in said boilers, substantially as set forth.

3. In combination with a number of boilers provided with burners and a receiver to which the boilers are connected, injector-pipes connecting the boilers near their upper parts, pipes connecting the boilers near their lower parts, one of which is provided with automatic valves, and the steam-exhaust pipes for discharging steam into the boilers, substantially as and for the purpose set forth.

4. In combination with a number of boilers provided with burners and a receiver to which the boilers are connected, injector-pipes connecting the boilers together near their upper parts, pipes connecting the boilers near their lower parts, exhaust-pipe provided with an automatic valve discharging steam into the tanks, and a water-tank provided with automatic valve and connected with the exhaust-steam pipe, substantially as shown and described.

5. In combination with a number of boilers provided with burners and a receiver to which the boilers are connected, injector-pipes connecting the boilers near their upper parts, pipes connecting the boilers near their lower parts, and exhaust-steam pipe discharging steam into the boilers and pipes, substantially as and for the purpose set forth.

6. In combination with a lower series of boilers provided with burners and a receiver to which said boilers are connected, an upper series of boilers connected to the receiver and provided with injector-pipes, substantially as and for the purpose set forth.

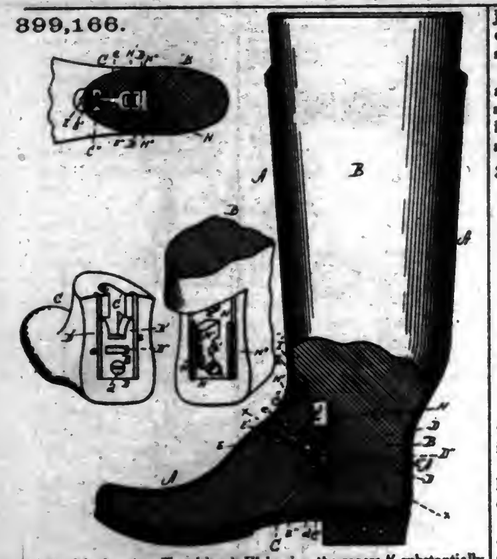
7. In combination with an upper and lower series of boilers provided with heaters and a receiver to which said boilers are connected, a kettle arranged in the receiver, substantially as shown and described, for the purpose set forth.

8. In combination with a series of boilers provided with heaters and a receiver to which the boilers are connected, an exhaust-steam pipe discharging steam into the boilers through a pipe, B, and pipe E, connecting the exhaust-steam pipe to the respective boilers, substantially as and for the purpose set forth.

899,166. BOOT-TREE. JOSEPH D. BULLER, Malden, Mass. Filed Jan. 7, 1888. Serial No. 260,676. (No model.)

Claim.—1. In a boot-tree for rubber boots, the combination of the foot C, recessed at C', provided with the plate D, slotted at D', the spring-rod E, adapted to play in the passage C', and the leg B, pro-

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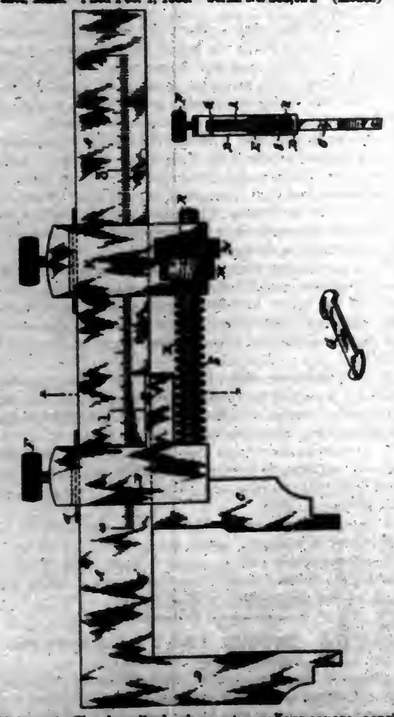


vided with the plate H and hook H', having the recess *h'*, substantially as and for the purpose set forth.

2. In a boot-tree for rubber boots, the combination of the hook-plate H, secured to the leg B and provided with the ribs H", with the plate D and foot C, the latter provided with the grooves *c c* next the sides of said plate, substantially as and for the purpose above set forth.

3. In a boot-tree for rubber boots, the combination of the foot portion C, provided with a locking-bolt, the leg portion B, provided with a catch for engaging said bolt, and a spring, as I, set into said leg portion and bearing against the foot portion, substantially as and for the purpose set forth.

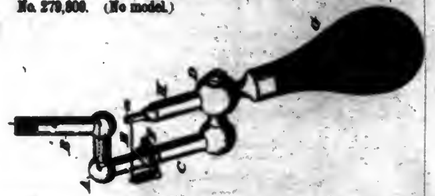
399,167. MICROMETER CALIPER-SQUARE. LAROY S. STARRETT, Athol, Mass. Filed Feb. 1, 1888. Serial No. 262,634. (Model.)



Claim.—1. The described micrometer caliper-square, consisting of a graduated blade or beam, A, with a fixed jaw, B, and movable jaw C D E, in combination with an adjustable binding-clasp, K, micrometer-nut M N, threaded rod R, and surrounding spring S, substantially as set forth.

2. In a measuring-instrument, a graduated blade, a movable jaw, and an adjustable binding-clasp on said blade, in combination with a screw-rod extending from the jaw to the clasp, a spiral spring embracing such rod, and a micrometer-nut engaging such screw, substantially as set forth.

399,168. ELECTRIC CIGAR-LIGHTING DEVICE. WILLIAM TAG and SANFORD C. SMITH, Philadelphia, Pa. Filed July 13, 1888. Serial No. 279,809. (No model.)

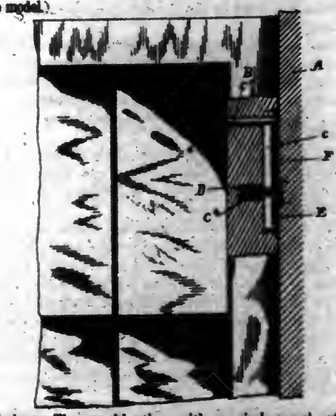


Claim.—1. In an electric lighter, a gas-pipe carrying a movable wiping-electrode, in combination with a cock and a tip, the latter having a groove, substantially as described.

2. In a gas-lighter, a burner-tip constituting one electrode and having a guiding lip or groove adapted to guide the sliding electrode or wiper over the gas-jet, substantially as described.

3. A gas-lighter device having a fixed electrode and a wiping-electrode, the former being provided with a guide adapted to guide the contacting end of the wiping-electrode over the gas-exit, substantially as described.

399,169. SASH-FASTENER. THOMAS H. TEAL and ROBERT A. CAMPBELL, Jonesborough, Tex. Filed Dec. 27, 1888. Serial No. 294,737. (No model.)



Claim.—The combination, with a window-sash, of the spiral spring D, its inner end resting in the socket *d*, its other in the thimble *d'*, locking-plate E, having the hinge-nib *d*, working in the perforation *f*, and thimble *d'*, receiving and covering the outer end of said spring, and handle *e*, said lock-plate and handle fitting and working in groove *c*, and perforation *d'*, covering-plate F, countersunk in the face of said sash, covering said lock-plate, and provided with the perforation *f* and opening *f'*, substantially as shown and described, and for the purposes set forth.

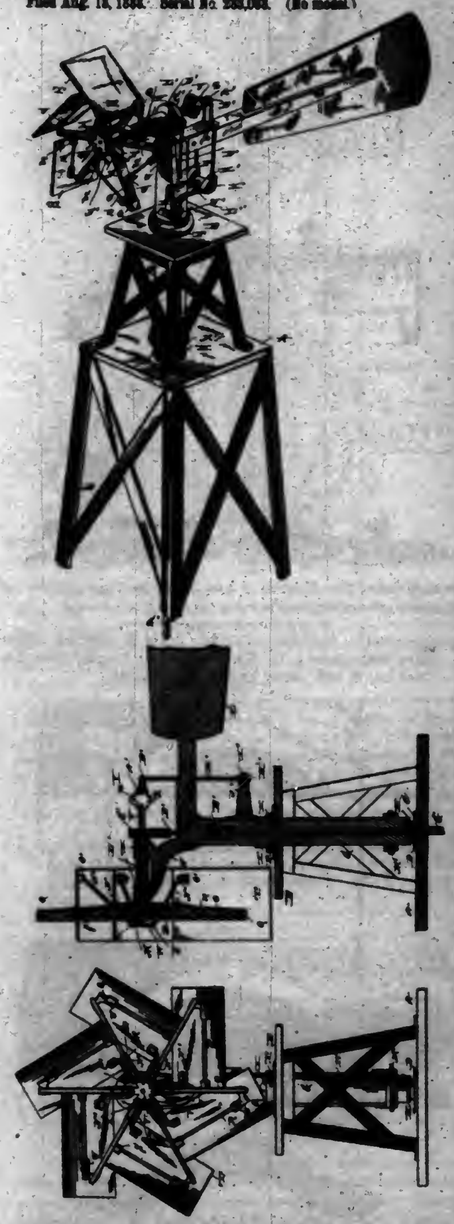
399,170. HANDLE. JOHN TOMS, Newark, N. J. Filed Jan. 12, 1888. Serial No. 260,537. (No model.)



Claim.—A handle for coffee-pots and other articles, consisting of a body, A, having a solid closed head, a longitudinal bore extending into the body to the closed head thereof, a counter-bore, *b*, extending laterally through the body at right angles to the main bore below the head, and the handle-sections B and C, extending, respectively, into

the said bores, one having formed directly in its extremity a transverse screw-socket, into which directly screws the screw-threaded end of the other, the outer ends of said sections being bent and adapted to be attached to the article, substantially as shown and described.

399,171. WINDMILL. ZACHARIAH P. TOWNSEND, Sunquoit, N. Y. Filed Aug. 18, 1888. Serial No. 283,063. (No model.)



Claim.—The windmill consisting of a hollow shaft carrying a hub provided with a series of radial arms, the blades connected to said arms by means of rods, upon which they are pivoted, the rod of each blade connecting with the outer end of one arm and to the intermediate portion of the adjacent arm, a second shaft passing through the aforesaid hollow shaft and provided upon one end with a disk connected by cranked rods to said blades near the rear edges of the latter, and the double bell-crank connected with the opposite end of the said second shaft and to a weight, substantially as and for the purpose set forth.

399,172. PROCESS OF RECOVERING GLYCERINE FROM SPENT SOAP-LYES. ARTHUR W. TERRY, Brooklyn, N. Y., assignor to Josef Glatz, same place. Filed Dec. 1, 1888. Serial No. 292,414. (No specimens.)

Claim.—1. In the process of extracting glycerine and salt from spent soap-lye, the improvement herein described, consisting in first treating said spent lye with lime, in then settling the lime, drawing off the clear liquor and evaporating the same to salting-point, in then mixing said lye with tallow or fat, in then boiling the mixture of lye and tallow or fat, and in then adding to the lye alum or muriate of tin to precipitate and carry down fatty and resinous acids in solution in the lye, substantially as specified.

2. In the process of extracting glycerine and salt from spent soap-lye, the improvement herein described, consisting in first treating said spent lye with lime, in then settling the lime, drawing off the clear liquor and evaporating the same to salting-point, in then mixing said lye with tallow or fat, in then boiling the mixture of lye and tallow or fat, in then adding to the lye alum or muriate of tin, in then filtering the liquor, and in then adding to the clear liquor caustic soda or carbonate of soda to precipitate the albuminous matter contained in the lye and any remaining alum or muriate of tin, substantially as specified.

3. The process of extracting glycerine and salt from spent soap-lye herein described, consisting in first treating said spent lye with lime, in then settling the lime, drawing off the clear liquor and evaporating the same to salting-point, in then mixing said lye with tallow or fat, in then boiling the mixture of lye and tallow or fat, in then adding to the lye alum or muriate of tin, in then filtering the liquor, in then adding to the clear liquor caustic soda or carbonate of soda to precipitate the albuminous matter contained in the lye and any remaining alum or muriate of tin, in then filtering the liquor again, and in then evaporating the liquor to proper density to deposit glycerine and salt, substantially as specified.

399,173. TAPPING-BUNG. JACOB VAN LANDT, Syracuse, N. Y., assignor of one-half to Duncan W. Peak, same place. Filed May 3, 1888. Serial No. 272,633. (No model.)



Claim.—The combination, with a barrel, of a tubular bung inserted into its head, consisting of a threaded tubular body, 3, having a flange, 4; a spider, 5, integral with the body and transverse thereto, a tubular extension, 7, integral with the body, a perforated cap, 8, closed at its inner end and fitting over the extension, a shaft, 11, integral with the head and passing through the spider 5, and provided with a spider, 12, upon its outer end, and a spring, 13, upon the shaft and between the spiders 5 and 12, substantially as described.

399,174. INCANDESCENT DEVICE. CARL A. VON WELSBACH, Vienna, Austria-Hungary, assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Mar. 8, 1887. Serial No. 230,146. (No model.) Patented in France Nov. 4, 1886, No. 172,064; in Belgium Nov. 4, 1886, No. 70,730; in England Nov. 4, 1886, No. 13,548, Dec. 12, 1886, No. 15,906, and Mar. 15, 1886, No. 3,892; in Italy Feb. 28, 1886, XXXVIII, 310; in Cape of Good Hope Mar. 4, 1886, No. 6/205; in Victoria Mar. 17, 1886, No. 4,473; in Tasmania Mar. 24, 1886, No. 306/9; in South Australia May 3, 1886, No. 676; in New South Wales May 11, 1886, No. 1,330/3; in New Zealand June 11, 1886, No. 1,303; in Queensland June 26, 1886, No. 106; in Finland July 10, 1886, No. 361; in Spain Aug. 10, 1886, No. 3,091/5,858; in Norway Aug. 26, 1886, No. 36, and in India Sept. 2, 1886, No. 40/1,145.



Claim.—1. An incandescent composed of the oxide of thorium, substantially as described.

2. A filament, fabric, or textile frame of combustible material impregnated with a salt of thorium in aqueous solution, substantially as set forth.

399,175. SALT OF SODIUM. JOHN I. WATTS and WILLIAM A. REMMERS, Sandbach, County of Chester, England. Filed July 5, 1887. Serial No. 243,488. (No specimens.) Patented in England Oct. 12, 1886, No. 13,891.

Claim.—The new product, the salt containing one equivalent of bicarbonate of soda, one equivalent of monocarbonate of soda, and two equivalents of water in chemical combination, (Na_2HCO_3,Na_2CO_3, $2H_2O$.)

399,176. PROCESS OF MAKING A SODIUM SALT. JOHN I. WATTS and WILLIAM A. RICHARDS, Sandbach, County of Chester, England. Original application filed July 5, 1887, Serial No. 243,349. Divided and this application filed Nov. 26, 1888. Serial No. 291,890. (No specimens.) Patented in England Oct. 13, 1886, No. 13,001; in France June 30, 1887, No. 184,551; in Belgium June 30, 1887, No. 78,082, and in Germany July 12, 1887, No. 43,888.

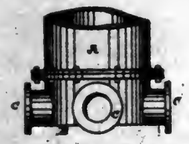
Claim.—The process of manufacturing the said salt by preparing an aqueous solution containing not less than three equivalents of soda (Na_2O) to four equivalents of carbonic acid (CO_2) and causing the salt ($Na_2H_2CO_3+2H_2O$) to crystallize from it at a temperature above 35° centigrade, substantially as herein described.

399,177. DENTAL TOOTH-REGULATING SCREW. EDWARD H. ANGLE, Minneapolis, Minn. Filed Feb. 18, 1888. Serial No. 264,531. (No model.)



Claim.—The combination, with the resistance-tube and its band adapted to be cemented to the anchor-teeth, of the delivery-tube and its band adapted to be cemented to the tooth to be moved at right angles to the resistance-tube, a screw-threaded shaft having a body adapted to closely fit said resistance-tube and a right-angled extremity adapted to closely fit said delivery-tube, and a screw-threaded nut adapted to fit said screw-threaded shaft and bear against said resistance tube, substantially as described.

399,178. CROCK-PRESS. FRANKLIN BENNETT, Canal Fulton, Ohio, assignor of two-thirds to Billings Brothers, same place, and to the Ohio Stoneware Company, Akron, Ohio. Filed Dec. 24, 1887. Serial No. 258,909. (No model.)



Claim.—1. In a crock-press of the class designated, the combination, with a pipe projecting from the exit-port of a clay-forcing cylinder and a crock-mold consisting of an outer case and an inner core opposite and in the axial line with said pipe, of a sleeve which envelops the end of said pipe, provided with devices, such substantially as shown, by which it is carried against and withdrawn from said outer case, substantially as and for the purpose hereinbefore set forth.

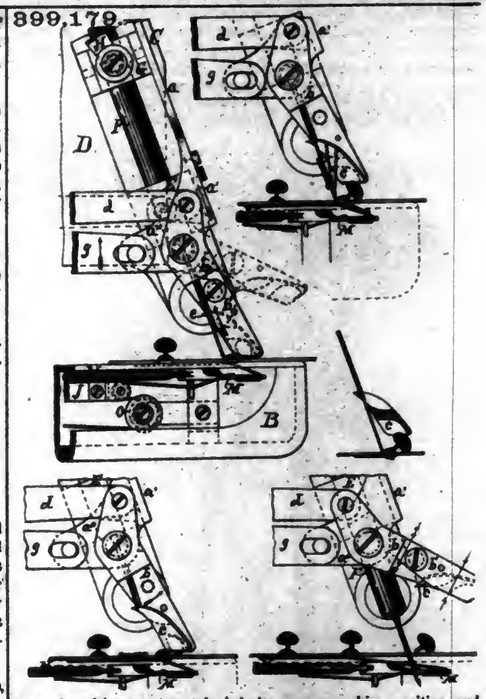
2. In a crock-press of the kind described, the combination, with a clay-forcing cylinder and an outer mold composed of segmental sections hinged and arranged to be locked together and connected at one end with an exit or discharge port of said cylinder, of a movable closed forming-cylinder mounted adjacent to and in alignment with the axis of the mold and a carriage for supporting said cylinder and for effecting the required movements thereof toward and away from the said mold, substantially as and for the purpose specified.

3. The combination, in a crock-mold having an outer case, an inner core, and rim closing the space between them at one end, and in which the outer case consists of segmental sections hinged and arranged to be locked together, of a segmental removable lining which fits in recesses in said case, substantially as shown, and for the purpose specified.

399,179. LOOP REMOVING AND SPREADING MECHANISM FOR BUTTON-SEWING MACHINES. WALTER R. BENNETT, Boston, Mass., assignor to the Morley Button Sewing Machine Company, same place. Filed June 14, 1888. Serial No. 277,108. (No model.)

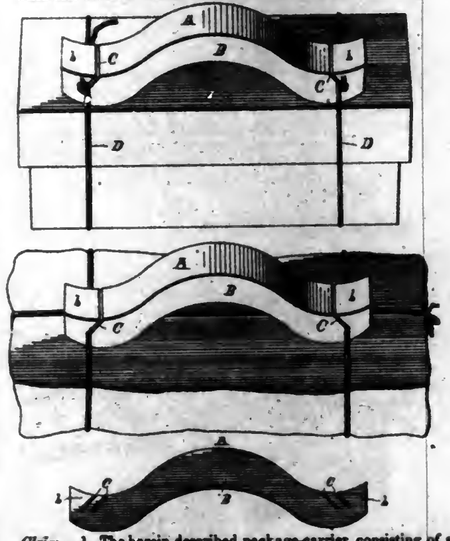
Claim.—In a shank-button-sewing machine, the combination, with the work-table, open-eyed double-barb needle, stitch-forming tension, and take-up devices and their operating mechanisms, of the loop-taker *c* and its swinging, rising, and falling carrier *b* and operating mechanisms, said loop-taker having the point at the top to receive a loop of thread from the eye of the needle, a slot to receive the point of the needle, and an opening at the bottom to receive a button-head and fitted loosely in its carrier, the latter being partially curved around

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its back and bottom to retain it in its proper working position, and operating substantially as described, for the object set forth.

399,180. PACKAGE-CARRIER. JAMES W. BRIDWELL, Hillsborough, Ohio, assignor to the Star Manufacturing Company, same place. Filed Jan. 10, 1888. Serial No. 295,967. (No model.)

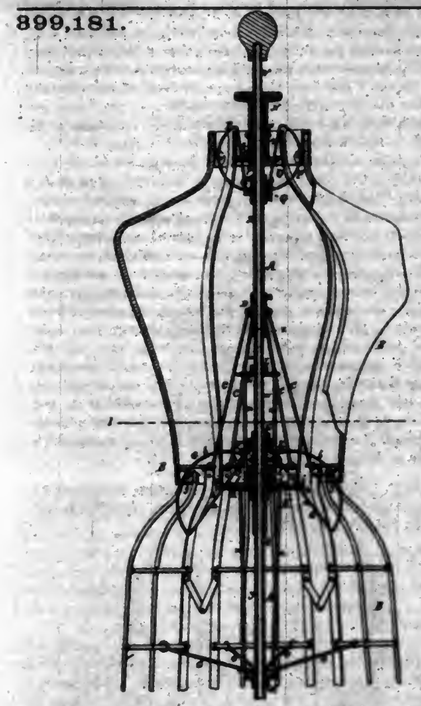


Claim.—1. The herein-described package-carrier, consisting of a bow-shaped handle having upturned ends and narrow inclined slots in the upper faces of said upturned ends, and the knotted cords secured in said slots, substantially in the manner and for the purpose specified.

2. A package-carrier consisting of a bowed handle having narrow inclined slots C formed in the upper faces and transversely of said ends, and the knotted cords engaged in said slots, all substantially as specified.

399,181. DRESS-FORM. FREDERICK W. BROWN, Cambridgeport, assignor to Oliver Whyte & Co., Boston, Mass. Filed Aug. 10, 1888. Serial No. 282,445. (No model.)

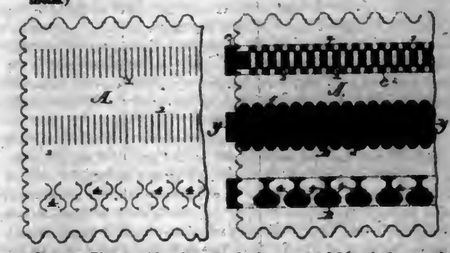
399,181.



Claim.—1. The flanged slide K, provided with openings *k*, combined with the nut L, connected to the standard, as shown, the rods *m*, connecting said nut and slide, the head F, supported on the standard, the adjusters G, pivoted to the head and connected to the flanged slide and to the form-sections, arranged, connected to each other, and supported essentially as shown and set forth.

2. The combination of the dress-form made in sections, the standard A, the nut L, and slides K and M on the standard, the head F, also on the standard and between the nut L and slide K, the rods *m*, connecting the nut L and the slide K, the rods *n*, connecting the slides M and K, the rods *o*, connecting the slide M with the dress-form sections, the adjusters G, pivoted to the head F and loosely connected to the slide K, and the dress-form sections, as set forth.

399,182. ORNAMENTAL FABRIC FOR TABLE-SPREADS. DANIEL W. CAMPBELL, West Troy, assignor of one-half to Frederick H. Stowe, Albany, N. Y. Filed Apr. 26, 1888. Serial No. 272,126. (No specimens.)

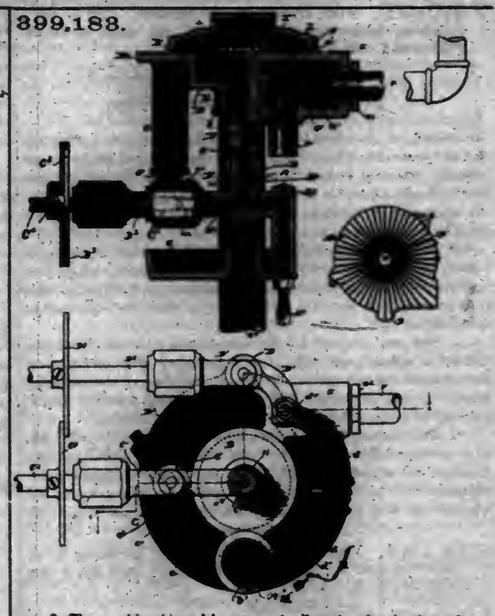


Claim.—The combination of a body-piece, of felt, cloth, or other felted or woven fabric, provided with a row of incisions, an applique-piece provided with incisions which correspond to the incisions in said body-piece, and a separable ribbon woven or drawn through said incisions, whereby said applique-piece is secured to said body-piece, as herein specified.

399,183. VAPOR-BURNER. CHARLES H. CHILDS, Cleveland, Ohio. Filed Oct. 24, 1887. Serial No. 253,265. (No model.)

Claim.—1. The combination, with the commingling-chamber having a laterally-projecting flange and a series of radial grooves in the top surface of the flange, of a burner-cap having a series of notches or serrations in its under side, said burner-cap being adapted to rest on the flange of the said commingling-chamber, substantially as set forth.

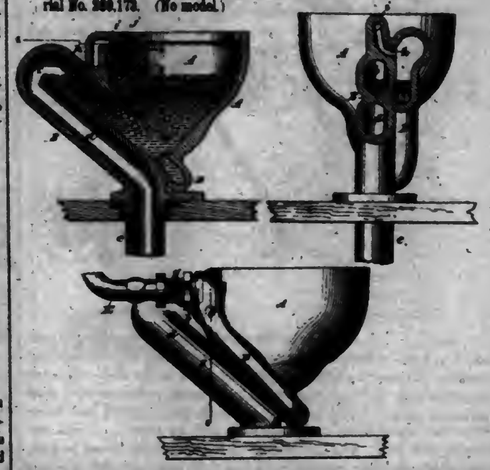
399,183.



2. The combination, with a commingling-chamber having a laterally-projecting flange with a series of grooves on the surface of the flange, substantially as indicated, of a burner-cap having a depending rim with a serrated lower edge, said serrations being made to mismatch the grooves of the generator-flange, and wings connected with the burner-cap for engaging the inner wall of the primary commingling-chamber to hold the cap centrally, substantially as set forth.

3. The combination, with primary and secondary induction-tubes, of valve-arms having ducts and jet-orifices, hand-valves for opening and closing the ducts, and stops mounted on the respective valve-stems, said stops overlapping and abutting each other, with the valves in open or closed position, substantially as set forth.

399,184. SIPHON WATER-CLOSET. HUGH H. CRAIGIE, Stamford, Conn., assignor to Julia Craigie, same place. Filed Oct. 26, 1888. Serial No. 289,173. (No model.)



Claim.—1. The bowl A, having flushing-aperture *i* and water-supply pipes D A, the pipe A being wholly above the normal level of the water in the bowl and leading upward to said aperture *i*, and the pipe D extending higher than its connection with the pipe A, substantially as described.

2. The bowl A, having flushing-aperture *i* and water-supply pipes D A, the pipe A being wholly above the normal level of the water in the bowl and leading upward to said aperture *i*, and the pipe D extending higher than its connection with the pipe A, in combination with the lower jet-nozzle, *f*, and siphon B, substantially as described.

399,185. WIRE STRETCHER AND HOLDER. JOHN W. DAVY, Kingston, Ontario, Canada. Filed May 23, 1888. Serial No. 274,670. (No model.)



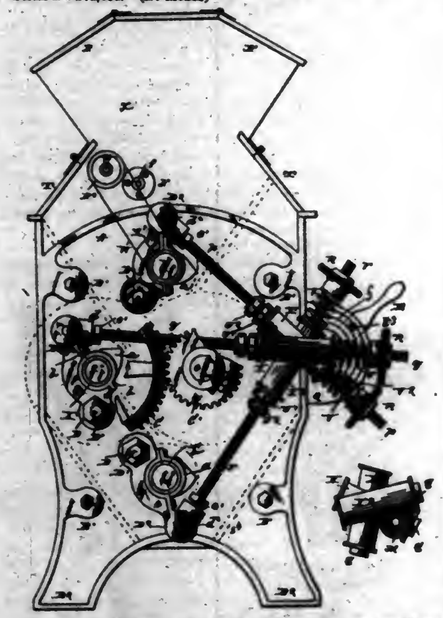
Claim.—1. As a new article of manufacture, a wire holding clip and tightener adapted to form a part of the fence and consisting, essentially, of a body portion to be secured to a post, and one or more longitudinally-adjustable rods carried by the body to which the wires are secured, and by which they are fastened to the post and are stretched, substantially as set forth.

2. The herein-described wire holder and stretcher, consisting of a body portion provided with a central slot or opening adapted to receive or slip over a post, and one or more longitudinally-adjustable rods or bolts, each provided with an eye to which the wires are secured, as set forth.

3. The combination, with the body portion provided with a central slot or aperture and with laterally-extending arms or flanges on each side, of the rods extending through said flanges, one rod being located on each side of the body portion, and each provided with an eye and screw-threaded portion, substantially as described.

4. The combination, with a post, of the herein-described wire fastener and stretcher, consisting of a clip or body portion provided with a central slot to embrace or slip upon a post, a pair of longitudinally-adjustable rods to which the wires are secured, and a wedge or pin, whereby the body portion is clamped to the post, as set forth.

399,186. ROLLER-MILL. JAMES DAWSON, Harrisburg, Pa., assignor of one-half to John H. Dawson, same place. Filed May 3, 1888. Serial No. 273,788. (No model.)

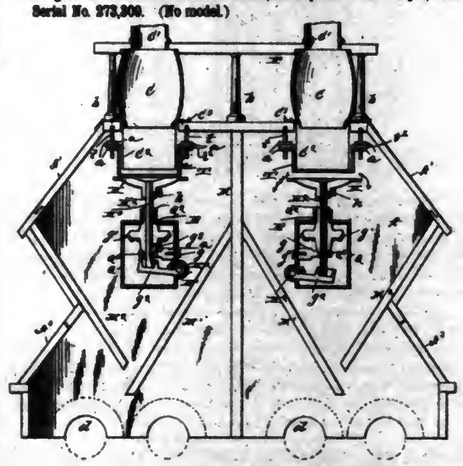


Claim.—1. In a roller-mill, the combination of the main roll journaled in fixed bearings in the center of the frame, three smaller adjustable rolls rotating in the opposite direction to the main roll, levers provided with bearings supporting said lesser rolls, eccentric studs mounted on the frame and each supporting one end of said levers, three-way union-joints, each provided with an abutment, rods connecting said joints with one end of each of the said levers, respectively, said rods being screw-threaded at their ends and each provided with a spiral spring and a hand-nut, and an eccentric-bar journaled in bearings in the frame, and having its ends swiveled in the abutments of the three-way joints, substantially as described.

2. In a roller-mill, the combination of the main roll journaled centrally in the frame in fixed bearing, and having upon its shaft the opposite similar pulleys, G, and gear-wheels C, three smaller rolls having bearings on levers S, supporting said bearings, said rolls having their shafts provided with gear-wheels C, intergeared constantly with said gear-wheels on main-roll shaft, eccentric studs D^3, adjustably bolted on the machine-frame and supporting said levers as pivots at their inner ends, three-way joints Y Y' Y^2, provided with abutments M, rods *p q r*, pivoted to the levers, respectively, on the inner ends, and passing through the three-way union-joints at their outer ends, so as to bring the lesser rolls into grinding contact with the main roll, the spiral springs V and hand-nuts R, one on each of said rods, and the eccentric bar E', journaled in fixed bearings on the frame, and swiveled at its ends in the abutments M on both said three-way joints, substantially as and for the purposes described.

3. In a roller-mill, the combination of the main roll fixedly journaled centrally in the frame, and having on both ends of its shaft a driving-pulley, G, and a gear-wheel, C', three smaller rolls having bearings on movable levers supporting said bearings, said rolls having their extended shafts provided oppositely with gear-wheels C, intergeared with the corresponding gear-wheels on the main-roll shaft, the eccentric studs D^3, supporting one end of said levers, respectively, and adapted to be adjusted to compensate for wear of the rolls, the three-way joints Y Y' Y^2, having abutments M, rods *p q r*, pivoted to the movable levers S, respectively, at their inner ends, and passing through the tubular branches of the three-way union-joints at their outer ends, said rods being provided with jam-nuts J' J^2 to limit their outward movement, spiral springs V and hand-nuts R, one on each of the ends of said rods exterior to said joints, and the eccentric bar E', swiveled at its ends to the abutments M on the three-way joints, and provided with the operating-handle E and means for holding it in its adjusted position, substantially as described.

399,187. FEED-REGULATOR. JAMES DAWSON, Harrisburg, Pa., assignor of one-half to John H. Dawson, same place. Filed May 9, 1888. Serial No. 273,909. (No model.)



Claim.—1. In a feed-regulator for roller-mills, the combination of feed-hopper having sides inclined equally to the line of deposit of the feed parallel to and along the whole length of the rolls, the main sleeve C^2, added sleeve T, attached adjustably by hangers exterior to said sleeve and both depending from the hopper-top, and the rotating disk H directly under said sleeves, an axle journaled in the casing and provided with a swinging arm supporting said disk, and means for yieldingly securing said axle, rendering the disk vertically self-adjusting, substantially as set forth.

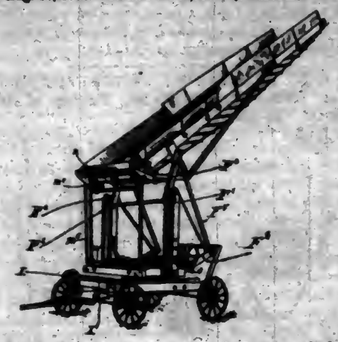
2. In combination with the inclosing-casing Q Q', provided with the arms D^4 and secured equidistantly to the hopper-walls, the intergearing bevel-wheels *g'* and R, journaled in said casing, the tubular shaft Q^2 Q^4, secured to said wheel *g'*, the driver-shaft W', which is extended through the hopper-wall, having the bearing W^2 thereon and carrying the wheel R, the vertically-sustained shaft H^2, keyed loosely in the tubular shaft of wheel *g'*, with the disk H, secured rigidly on the shaft, substantially as and for the purposes set forth.

3. In combination with the inclosing-casing Q Q', the intergeared wheels *g'* R, the vertically-guided rotary shaft H^2, the distributer H on said shaft, and the shaft K^2, provided with the arm g^5, and means for sustaining said shaft thereon, said wheels and arm being inclosed in the casing, in whose walls they have their bearings, substantially as and for the purposes set forth.

4. In combination, the casing Q Q', provided with the arms D^4, for attaching it in mid-hopper, the bracket *g*, secured in said casing, the hollow gear *g'*, journaled in the casing and in said bracket *g*, the distributer-disk H on the shaft H^2, one end of which is guided in said hollow gear, and having an internal grooved connection to permit vertical adjustment therein, the driving-shaft W', with its bevel-wheel R, intergeared with said hollow gear, the arm g^5, on which the shaft H^2

rests, and the rock-shaft K^2, oppositely poised, with the weight W hung thereon and limited in its throw, substantially as and for the purposes shown and described.

399,188. STRAW-STACKER. LOUIS F. DEWEY, Springfield, Ohio. Filed Aug. 20, 1888. Serial No. 282,966. (No model.)



Claim.—1. The combination of a platform, vertical guides on each side thereof, sliding bearings in said guides, pivoted raising-arms connected to said sliding bearings and to the carrier-frame, supporting-arms and connecting-arms of different length, each pivoted at one end to the platform and at the other end to the carrier-frame, and means, substantially as described, for raising and lowering said sliding bearings, substantially as and for the purpose set forth.

2. The combination, with a platform having vertical guides thereon and sliding bearings in said guides, of raising-ropes passing under said sliding bearings, raising-arms connected at one end to the sliding bearings and at the other to the carrier-frame, supporting and connecting arms of different lengths, each pivoted at one end to the platform and at the other to the carrier, and operating mechanism for winding said ropes to raise the sliding bearings, substantially as and for the purpose set forth.

3. The combination, with the main frame and movable platform, of a turn-table consisting of a stationary hub or bearing-support secured in said main frame, an encircling frame secured to the platform, and the alternating guiding and supporting wheels in said encircling frame, adapted to travel on the bearing-support, substantially as set forth.

4. The combination, with the main frame and the movable platform, of a turn-table having the inner bearing-support, with a plane peripheral bearing and beveled flanges, as described, and an encircling frame secured to the platform and provided with alternating beveled supporting-rollers and plain horizontal guiding-rollers, substantially as set forth.

5. In a straw-stacker, a turn-table, substantially as described, consisting of an inner bearing-support provided with a plane peripheral bearing having flanges at each end thereof, and an encircling frame provided with beveled supporting-rollers adapted to travel on said beveled flanges, and alternating horizontal guiding-rollers adapted to travel on said plane peripheral bearing, substantially as described.

6. The combination, with the main frame and the movable platform, of a flanged ring, B^2, attached to said platform, the tripping-wheel connected to said ring by a cable, as described, and means for operating said tripping-wheel, substantially as and for the purpose set forth.

7. The combination, with the tripping-wheel D and the shaft c^2 and the intermediate moving mechanism, of a tripping-lever, f^2, the pivoted arms connected thereto, and a spring-connection connecting said arms, substantially as and for the purpose set forth.

8. The combination, with the driving-shaft and the loosely-revolving pinions thereon adapted to engage on opposite sides of a gear-wheel and drive the same in opposite directions, of a moving clutch adapted to engage either of said pinions to said driving-shaft, a trip-lever connected to said clutch, and a segmental arm geared to said trip-lever carrying at one end a spring-connection, which is connected at the other end to said trip-lever, whereby the trip-lever is forced into position to cause the clutch to change its engagements with the respective pinions when the said trip-lever is moved across a line passing through the pivoted bearings of said trip-lever and segmental arm, substantially as specified.

9. The combination, with the clutching mechanism, as described, of a trip-lever, a segmental arm geared thereto, and a spring-connection between said trip-lever and arm, said spring-connection being attached to the trip-lever and arm, respectively, on opposite sides of their respective centers of oscillation, substantially as specified.

10. The combination, with the movable platform and the flanged ring secured thereto, of a tripping-wheel connected to said flanged ring by cables, as described, suitable driving mechanism attached to said tripping-wheel, and means, substantially as described, for reversing said driving mechanism when the tripping-wheel D has reached a given point, substantially as specified.

11. The combination, with the movable platform and the flanged driving ring or wheel secured thereto, of a tripping-wheel connected to said driving-wheel by cables passing in opposite directions around said wheel, and means for adjusting the tension of said cable, substantially as specified.

12. The combination, with the movable platform, the tripping-wheel, and means, as described, for connecting the same, of a driving-gear secured rigidly on the same shaft on which the tripping-wheel is adapted to turn, and means, substantially as described, for connecting said tripping-wheel with or disengaging it from said driving-gear, substantially as specified.

13. The combination, with the driving-shaft c^2, the beveled pinions turning loosely thereon, adapted to be engaged by a clutch turning with said shaft, and a driving-gear meshing with said pinions, of a tripping-wheel connected by suitable intermediate mechanism to said driving-gear, a pivoted tripping-lever connected to said clutch, a tripping-finger on said tripping-wheel, and means, substantially as described, for connecting and disconnecting said tripping-wheel to or from the driving mechanism, substantially as set forth.

14. In a straw-stacker, a turn-table having an inner bearing-support and an outer inclosing-frame, the alternating supporting and guiding rollers in said frame adapted to travel on said bearing-support, and a removable plate on the top of said bearing-support, substantially as set forth.

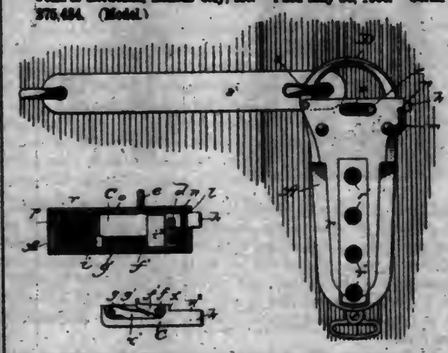
15. In a straw-stacker, the combination, with the stationary base-frame, of a turn-table and a wheel-rim secured to the movable portion of said turn-table and connected by cables to the moving tripping-wheel on the stationary base-frame, substantially as specified.

16. In a straw-stacker, the combination, with the base-frame and tripping-wheel and mechanism to drive the same supported on said base-frame, of a wheel-rim on the movable portion of said turn-table, said tripping-wheel and wheel-rim being connected together by cables, substantially as and for the purpose set forth.

17. The combination, in a straw-stacker, of the raising mechanism having sliding bearings and raising-ropes passing at each side under said bearings, said ropes being each secured at one end to a stationary post and at the other to a windlass on the moving shaft, and means, substantially as described, for adjusting the windlass to which one of said ropes is attached in relation to said shaft, substantially as specified.

18. The combination, with the sliding bearings and the raising-ropes, of a revolving shaft having a rope-receiving windlass thereon, operating-gear on said shaft having clutching-faces adapted to engage with similar faces on one of said windlasses mounted loosely on said shaft, and means for holding said windlass in engagement with said clutching-face, substantially as specified.

399,189. LOCK. JOSEPH M. ROSAR, Argentine, Kans., assignor to John X. Reinhart, Kansas City, Mo. Filed May 26, 1888. Serial No. 275,494. (Model.)

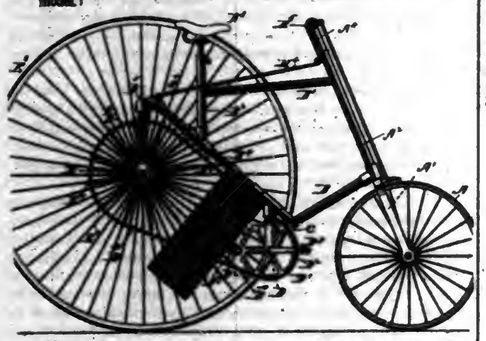


Claim.—1. In a safety lock or guard for freight-car doors and the like, having a case provided with registering mechanism, substantially as described, the combination, with the case and registering mechanism, of a pivotal bolt, D, a sliding locking-bolt, C, engaging with the bolt D and registering mechanism, and an opening extending through the case and sliding bolt, with the latter in its locking position to admit a car-seal, substantially as set forth.

2. In a safety lock or guard for freight-car doors and the like, having a case provided with registering mechanism, substantially as described, the combination, with the case and registering mechanism, of a pivotal bolt, D, a sliding locking-bolt, C, engaging with the registering mechanism and bolt D, a slot, *a*, in the cover of the case, and

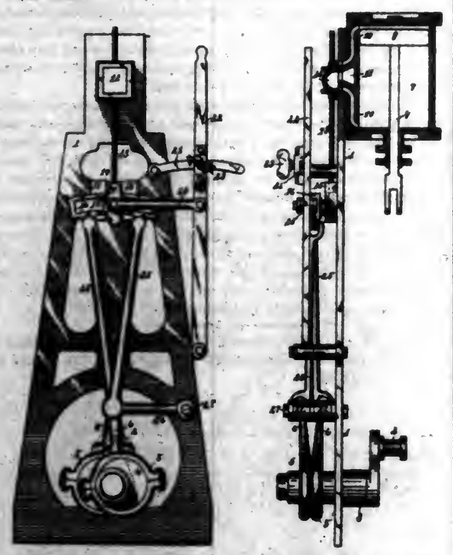
a stud, *e*, on the bolt C extending through the slot *o*, substantially as set forth.

399,190. TRICYCLE. WILLIAM C. FOSTER and HENRY W. MERRITT, Somerville, Mass. Filed Aug. 29, 1888. Serial No. 284,071. (No model.)



Claim.—In a velocipede, the combination of the sprocket-wheel device on the shaft E, adapted to be increased or diminished in diameter, with the operating mechanism consisting of the sleeves F F', collar F², forked lever H³ H³ H, and cord or chain H², all operating together, substantially as described, and for the purpose set forth.

399,191. CUT-OFF AND REVERSING-GEAR FOR ENGINES. CHARLES FOX, Stamford, Conn. Filed May 22, 1888. Serial No. 274,647. (No model.)



Claim.—1. In a cut-off and reversing mechanism, the combination, with the valve, valve-stem, eccentrics, and eccentric-rods, of an arc-shaped link, a block connected to the valve-stem, upon which said link slides, a reach-rod connected to the link, rods 25, pivoted to the opposite ends of the link and each pivoted to one of the eccentric-rods, and rocker-arms pivoted to a fixed point and to the eccentric-rods and rods 25 at their pivotal points to each other, substantially as set forth.

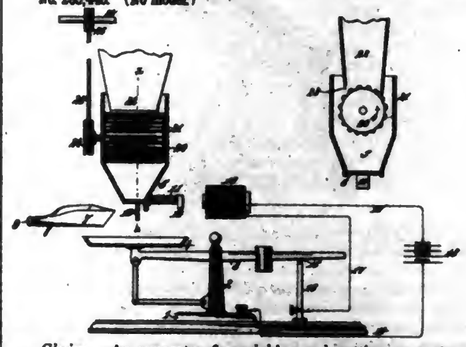
2. The combination, with the eccentric-rods, an arc-shaped link, and link-block 17, of rods 25, pivoted to opposite ends of the link and to the eccentric-rods, and rocker-arms pivoted to a fixed point and to the eccentric-rods and rods 25 at their pivotal points to each other.

3. The combination, with the eccentric-rods, rods 25, and rocker-arms pivoted to a fixed point and to the eccentric-rods and rods 25 at their pivotal points to each other, of a link to the opposite ends of which rods 25 are pivoted, and which is an arc of a circle of which the pivotal points of the rocker-arms, eccentric-rods, and rods 25 are the center.

4. The combination, with the eccentric-rods, an arc-shaped link having saddle 19, and link-block 17, of rods 25, pivoted to opposite ends of the link and to the eccentric-rods, rocker-arms pivoted to a fixed point and to the eccentric-rods and rods 25 at their pivotal points to each other, and a reach-rod pivoted to the saddle.

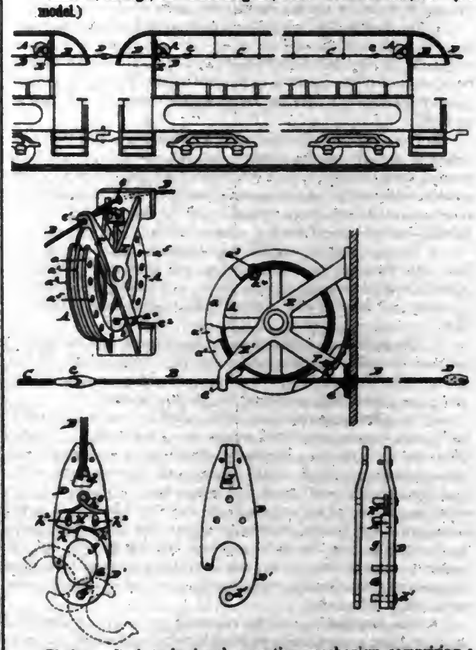
5. The combination, with the eccentric-rods, an arc-shaped link, and link-block 17, of rods 25, pivoted to the opposite ends of the link and to the eccentric-rods, rocker-arms pivoted to a fixed point and to the eccentric-rods and rods 25 at their pivotal points to each other, a reach-rod pivoted to the link, a valve, and a valve-stem connected to link-block 17, whereby movement of the link acts to change the point of cut-off, but without changing the lead of the valve.

399,192. MECHANISM FOR WEIGHING PACKAGE TEA, COFFEE, &c. OWEN A. GILL, Baltimore, Md. Filed Sept. 15, 1888. Serial No. 285,440. (No model.)



Claim.—An apparatus for weighing and putting up package teas and other materials, consisting of a weighing-scale having a scale-pan, a throatway located above the scale-pan, a rotating force-feed, a supply-tube having its lower end arranged relatively to the force-feed to provide a narrow transverse channel at one side between a lower edge of the tube and the force-feed, a driven shaft, and devices, substantially as described, outside the throatway, which drive the force-feed to force the material laterally from the supply-tube through the channel and downward, and a valve for the throatway automatically closed when the scale-beam is overbalanced.

399,193. SIGNAL-OPERATING DEVICE FOR TRAINS. WILLIAM GLASGOW, Chicago, Ill. Filed Aug. 26, 1887. Serial No. 247,966. (No model.)



Claim.—1. A train-signal-operating mechanism comprising a local permanent cord-section in each car, a coupling for uniting such sections together between the cars, and a carrying-sheave at each end of the car, around which the cord-section loops or winds and is fixedly attached, in manner substantially as herein described.

2. A train-signal-operating mechanism comprising a local permanent cord-section in each car, an automatic pull-apart coupling, essentially as herein described, for uniting such sections together between the cars, and a carrying-sheave at each end of the car, around which the cord-section loops or winds and is fixedly attached, in manner substantially as herein described.

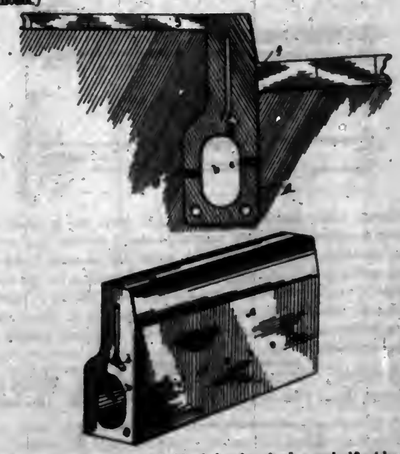
3. The combination, with the sectional pull-cord of a train-signal-operating mechanism, of a carrying-sheave, A, at each end of the car, having grooves formed by flanges *a a' a²*, the cord-section B, fitted in said grooves and passing from one groove to another through orifice *a³*, the clamping-bolt *a⁴*, and supporting frame or bracket E for said sheave, essentially as herein described.

4. The combination, with a sectional pull-cord of a train-signal-operating mechanism, of a carrying-sheave, A, at each end of the car, having grooves formed by flanges *a a' a²*, the cord-section B, fitted in said grooves and secured to the sheave by a clamping-bolt, *a⁴*, the supporting frame or bracket E, having orifice *e³*, and pin F, adapted to pass through said frame-orifice and one of a series of orifices, *a⁵*, in the rim of the sheave to lock said sheave at any desired adjustment, essentially as herein described.

5. A train-signal-operating mechanism comprising a local permanent cord-section in each car, consisting of a central connecting-section, C, and end metallic sections, B, the outer ends of which are provided with couplings D, a carrying-sheave, A, at each end of the car, having receiving-grooves in its periphery, cord-section B, fitted in said grooves, and the clamping-bolt *a⁴*, for permanently connecting the cord-section B at its middle to the sheave, essentially as herein described.

6. A train-signal-operating mechanism comprising a local independent cord-section permanently arranged in each car and an automatical pull-apart coupling for the adjacent ends of each pair of the same, consisting of a head, D, having a recess, *d*, for attachment to the ends of the cord-section B and forked ends *D'*, the C-shaped latch-bar G, pivoted at *d'* to one of the forks, and the spring dog or catch H, having a notched engaging-face to engage and hold in a yielding manner the longer arm, *g*, of the latch-bar, essentially as herein described.

399,194. STREET-CURB AND SUBSOIL DRAIN. HENRY S. HALLWOOD, Columbus, Ohio. Filed Nov. 12, 1888. Serial No. 290,633. (No model.)



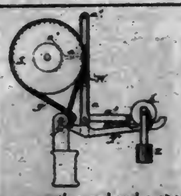
Claim.—1. A street-curb block having its lower half wider than its upper half and said upper half beveled on one side, and the lower half provided with a longitudinal passage, *b*, and lateral openings leading into the passage *b*, substantially as and for the purpose specified.

2. A street-curb block having its lower half wider than its upper half, said upper half having a longitudinal passage, *d*, and the lower half having a longitudinal passage, *b*, said passages *d* and *b* being made to communicate by means of openings, substantially as described.

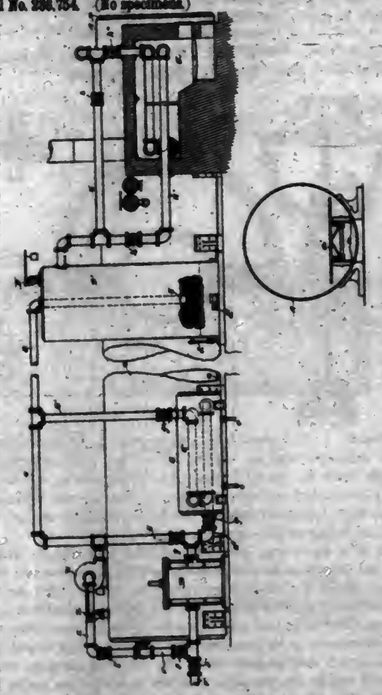
399,195. LET-OFF MOTION FOR LOOMS. SYLVANUS HAMBLIN and STEPHEN M. HAMBLIN, Plymouth, Mass. Filed Feb. 25, 1888. Serial No. 265,284. (No model.)

Claim.—The combination, with the warp-beam having a disk, as described, and the cord or strap embracing said disk, of the lever T, pivoted to the frame of the loom and having the cord or strap connected thereto, the weight and wheel carrying the same supported by the said lever T, the upright W, extending from said lever T, and the lever *e*, pivoted thereon, having an arm provided with a yoke to bear upon the warp, and a connecting-rod and a shoe bearing upon the said lever T, and controlling the positions of the wheel and weight upon the lever, all arranged substantially as and for the purpose set forth.

399,195.



399,196. METHOD OF VULCANIZING WOOD. SAMUEL E. HASKIN, Avoca, N. Y. Filed Dec. 5, 1887. Renewed Sept. 29, 1888. Serial No. 286,754. (No specimens.)



Claim.—1. The method herein described of vulcanizing wood, consisting, essentially, in introducing heated air into the vulcanizing-chamber and under such pressure as will prevent the evaporation of the sap of the wood being treated, substantially as set forth.

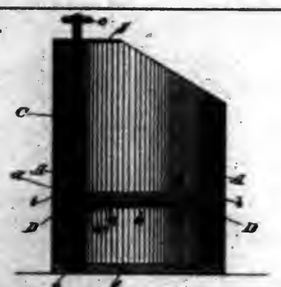
2. The method herein described of vulcanizing wood, consisting, essentially, of introducing heated air into the vulcanizing-chamber under such pressure as will prevent the evaporation of the sap of the wood being treated, more or less of the moisture of such compressed air having been precipitated before the air is discharged into the wood-cylinder, substantially as set forth.

3. The method herein described of vulcanizing wood, consisting, first, in compressing air and heating the same; second, precipitating the moisture of the air; third, superheating the air and introducing such dry superheated air into the vulcanizing-chamber under such pressure as will prevent the evaporation of the sap of the wood being treated, substantially as set forth.

399,197. GROCER'S MIX. LORAN B. HAWKINS, Danville, Ind., assignor of one-half to Joseph Schwartz, same place. Filed May 31, 1888. Serial No. 274,573. (No model.)

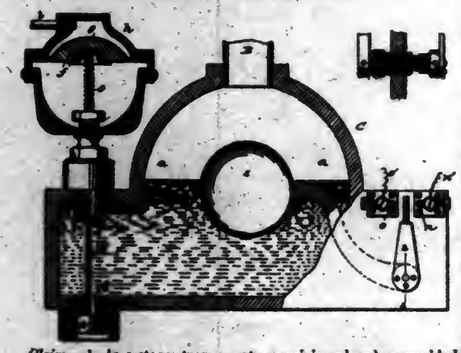
Claim.—In combination, the sheet-metal open-top tubular body A, having the cross-piece E, secured at the lower end, the socket *e*, secured to said cross-piece, the vertical screw C, loosely seated at its lower end in said socket, having a square or angular head to receive a similarly-shaped socket of a key, the metal bracket D, having a screw-threaded boss, outwardly-extended arms mounted upon the screw and adapted to be raised or lowered thereby as the screw is turned, the bottom B, secured to the arms of said bracket, and the flexible annular packing-ring *b*, secured to the periphery of said bot-

399,197.



tom B and projecting above the upper face of said bottom, all substantially as shown, and for the purpose set forth.

399,198. STEAM-TRAP. WARREN S. JOHNSON, Milwaukee, Wis. Filed Apr. 8, 1888. Serial No. 269,490. (No model.)



Claim.—1. In a steam-trap, a water-receiving chamber provided with a drainage-valve, an electric circuit, and intermediate devices through which the circuit controls the drainage-valve, a circuit-controlling switch, and a switch-operating device, such as a thermostat or its described equivalent, located within the chamber subject to the rising and falling of the water therein.

2. In a steam-trap, the water-receiving chamber, its drainage-valve, the expansion-chamber connected with said valve and with an external source of fluid-pressure supply, an electric valve controlling the delivery of the fluid to and from the expansion-chamber, an electric circuit including said valve, a switch or circuit controlling device, and a thermostat or its described equivalent connected to and operating the switch and located within the receiving-chamber, whereby the water within the chamber is caused to bring into action power from an external source to operate the drainage-valve.

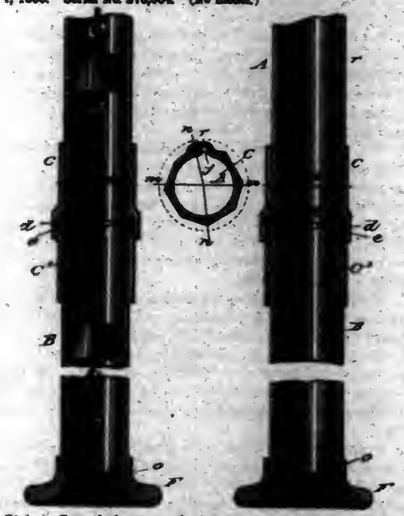
3. In a steam-trap, a water-receiving chamber and a drainage-valve therefor, a spring to close said valve, the expansion-chamber to open the valve, a pipe extending from the chamber to an external source of fluid-pressure supply, and a three-way valve located on said pipe.

4. In a steam-trap, the combination of a water-chamber provided with a discharge-valve for the water, an expansion-chamber, by which said valve is operated, a source of fluid-pressure supply, as a compressed-air reservoir, connected with the expansion-chamber, an electric valve controlling the delivery of the pressure-fluid to the expansion-chamber, an electric circuit embracing said electric valve, and a switch-controlling device, substantially as described, actuated by the rising water within the trap, whereby the water causes the electric current to actuate the electric valve and the latter causes the compressed air or other fluid to operate the outer valve of the trap.

5. A steam-trap provided with a self-opening drainage-valve having an expansion-chamber to open the same and a self-closing drainage-valve with an expansion-chamber to close the same, in combination with a source of constant fluid-pressure supply connected to the two expansion-chambers and a valve controlling the delivery of the fluid to the chamber of the self-closing valve, whereby the last-named valve may be caused to open and close at will, while the other is caused to open automatically only when the fluid-pressure fails, to the end that ice may not be formed within the apparatus.

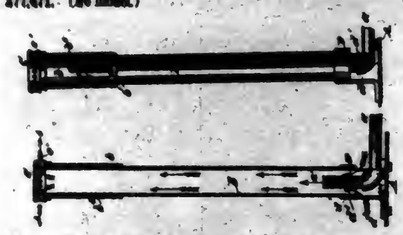
6. In a steam-trap, a drainage-valve, an expansion-chamber, the electric three-way valve, through which said chamber is connected with a source of constant fluid-pressure supply, said valve provided with the switch for opening and closing its two operating-circuits *a' a''* alternately, the switch *l*, adjacent to the trap, for completing said circuits, and the thermostat or its described equivalent within the trap to actuate the switch.

399,199. PUMP. WILLIAM KOEHLER, Bellevue, Iowa. Filed Apr. 7, 1888. Serial No. 270,004. (No model.)



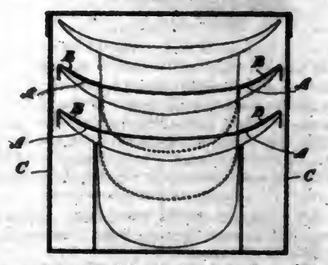
Claim.—In a chain-pump, the combination of the metallic flanged tubes A and B, having the backwater-groove *j*, seam-rib *r*, entering recesses in the coupling-thimbles C and C', and the inverted-funnel ring F, all constructed substantially as and for the purposes set forth.

399,200. APPARATUS FOR THE PASTEURIZATION OF BEER. CHARLES F. KOEHLER, St. Louis, Mo. Filed June 18, 1888. Serial No. 277,471. (No model.)



Claim.—The combination, with an open vat or tub in which bottled beer is pasteurized, of the centrally-located upright pipe or tube having openings between its legs by which it is secured to the vat-bottom, and a deflecting-cap supported over openings at the top of said pipe in conjunction with a steam-supply pipe having its opening or discharge immediately below the lower openings in the center of said stand-pipe, all substantially as shown and described, and for the purpose specified.

399,201. HAT-SUPPORT AND PACKING-RING. GEORGE LAKE, Bethel, Conn. Filed July 27, 1888. Serial No. 281,222. (No model.)

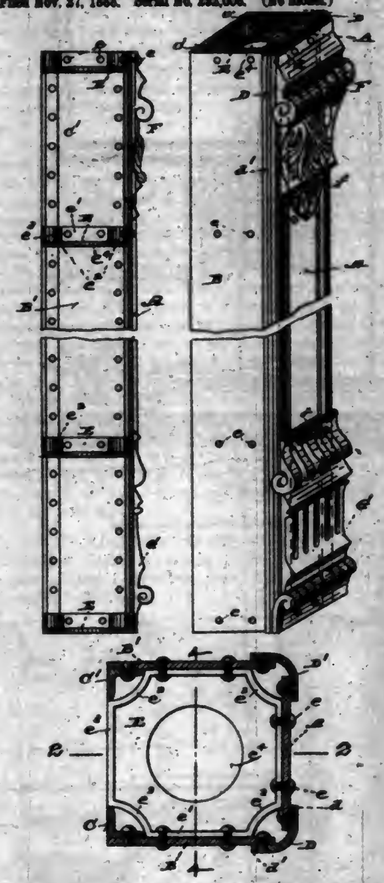


Claim.—1. A combined ring and support for packing hats, consisting of a flat ring and a flexible strip bridging said ring and secured to opposite sides of the latter, substantially as set forth.

2. The combination, with the flat ring approximately corresponding in diameter to the diameter of the hat-packing box, of the flexible strip depending through the opening of said ring and secured to opposite sides of the latter, substantially as and for the purposes set forth.

3. The combination, with the flat ring resting against the under face of the hat-brim and admitting the crown-tip of a succeeding hat, of a flexible strip secured to opposite sides of said ring and depending through the ring, whereby a support is afforded for said crown, substantially as shown and described.

399,202. PLATE-METAL COLUMN. FRANK MUNKER and HENRY F. EDWARDS, St. Louis, Mo., assignors to Munker & Brother, same place. Filed Nov. 27, 1888. Serial No. 292,008. (No model.)



Claim.—1. The combination of the front plate, the side plates, the angle-irons at the rear of the column, and the curved angle-irons at the front corners of the column, the front plate being spaced apart from the side plates, substantially as described.

2. The combination of the front plate, the side plates, the angle-irons at the back and the curved angle-irons at the front of the column, and the horizontal stiffening-plates, substantially as described.

3. The combination of the front plate, the side plates, the flanged stiffening-plates, the curved angle-irons, the angle-irons at the back of the column, and the attachments upon the front of the columns, substantially as described.

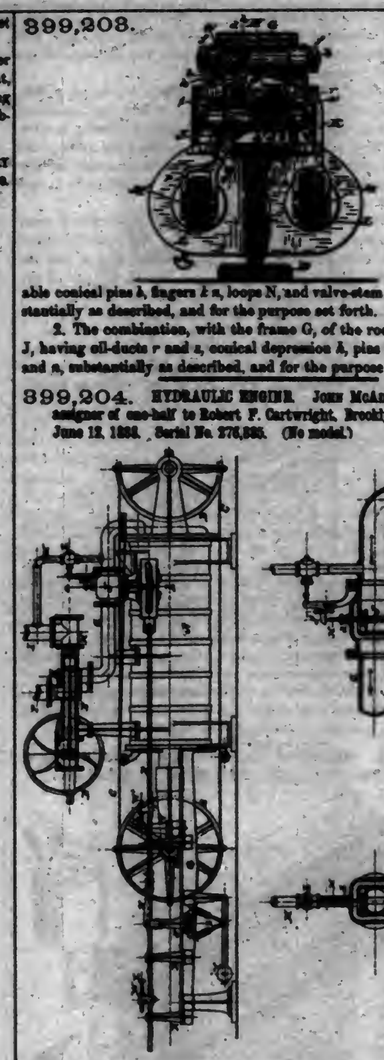
399,203. VALVE-GEAR FOR DUPLEX STEAM-PUMPS. GEORGE M. BUTLER, Canton, Ohio. Filed Apr. 4, 1888. Serial No. 269,857. (No model.)

Claim.—1. The combination, with the piston-rods M M' and frame G, of the actuating-arms O K, rock-shafts H J, supported on adjustable conical pins *h*, fingers *k n*, loops N, and valve-stem support E, substantially as described, and for the purpose set forth.



2. The combination, with the frame G, of the rock-shafts H and J, having oil-ducts *r* and *s*, conical depression *h*, pins *d*, and fingers *k* and *n*, substantially as described, and for the purpose set forth.

399,204. HYDRAULIC ENGINE. JOHN MCADAMS, New York, assignor of one-half to Robert F. Cartwright, Brooklyn, N. Y. Filed June 12, 1888. Serial No. 276,980. (No model.)



Claim.—1. In a hydraulic engine, the cylinder, the supply-pipe G, leading to one end thereof, the valve J in said pipe, and the arm *h*, connected with and extending downward from the stem of said valve and carrying the wheel *i*, combined with the reciprocating block *n*, mounted in horizontal guides below said valve, the longitudinal slot *m* in said block inclosing said wheel and having the connected cam-surfaces *t*, *w*, *x*, *w'*, and *x'*, and mechanism, substantially as described, for reciprocating the block *n* in its horizontal guides to partially close the valve J during a portion of each end of the travel of the piston, substantially as shown and described.

2. In a hydraulic engine, the cylinder, supply-pipe G, leading into one end of said cylinder, the vertically-acting valve J in said pipe, and the arm *h*, connected with the stem of said valve and carrying the wheel *i*, combined with the reciprocating cam-block *n*, mounted in horizontal guides below said valve, the longitudinal slot *m* in said block inclosing said wheel and having the connected cam-surfaces *t*, *w*, *x*, *w'*, and *x'*, the reciprocating rod P, rigidly connected with the cam-block, the arms W W' on said rod, the traveling arm V, carried by the main piston, and mechanism, substantially as described, for returning the cam-block to its normal position after it has been acted on by the arm V, substantially as and for the purposes described.

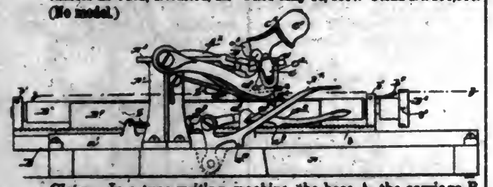
3. The valve J in the supply-pipe G, and having a stem extending through the box inclosing said valve, combined with the sliding cam *n*, having surfaces *t*, *w'*, *x'*, and *z*, mechanism, substantially as described, for moving said cam against the stem of valve J during the operation of the engine, the bell-crank lever *f*, adapted to be acted

ated by the upper end of valve J, and the relief-valve L in a supplemental pipe, M, extending from the pipe G to the discharge-pipe, said valve L being arranged to open and close under the influence of the bell-crank lever *f*, substantially as set forth.

4. In a hydraulic engine, the main cylinder A, the supply-pipe G, leading into one end thereof, and the valve J in said pipe, combined with the discharge-pipe I, the supplemental pipe M, having a valve, L, and passing from a point in the pipe G between the valve J and the end of the cylinder to the discharge-pipe, and mechanism, substantially as described, for actuating said valve, substantially as and for the purposes described.

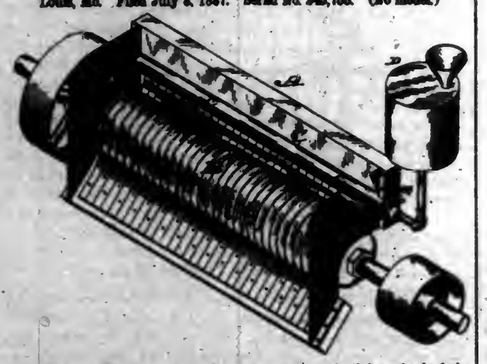
5. In a hydraulic engine, the supply-pipe, having the valve J, combined with the cam *n*, for operating said valve, the rod P, coupled with the cam *n*, arms W W' on said rod, traveling arm V, and the weight Y, equalizing-rods Z, rocker A', and link B', one end of the latter being connected with the said rocker and the other end with the rod P, substantially as and for the purposes set forth.

399,205. TYPE-WRITING MACHINE. LEVI J. ODELL, Beloit, assignor of three-fourths to John R. Burton, Lake Geneva, Wis., and Charles H. Odell, Rockford, Ill. Filed May 16, 1887. Serial No. 238,263. (No model.)



Claim.—In a type-writing machine, the base A, the carriage B, having the rack-bar, and the vibrating type-bar frame C, having the depending rigid arm C^1, combined with the spring-actuated lever A^4, carrying a pawl to engage the rack-bar of the carriage, said lever being pivoted to the base and arranged below and on a line with the arm C^1, so that upon depression of the type-bar frame the arm C^1 comes in contact with the lever A^4, the latter being extended upward and outward, whereby it is within convenient reach to be struck by the hand of the operator in spacing, as set forth.

399,206. METHOD OF GINNING COTTON. JAMES C. OSBORN, St. Louis, Mo. Filed July 8, 1887. Serial No. 243,763. (No model.)



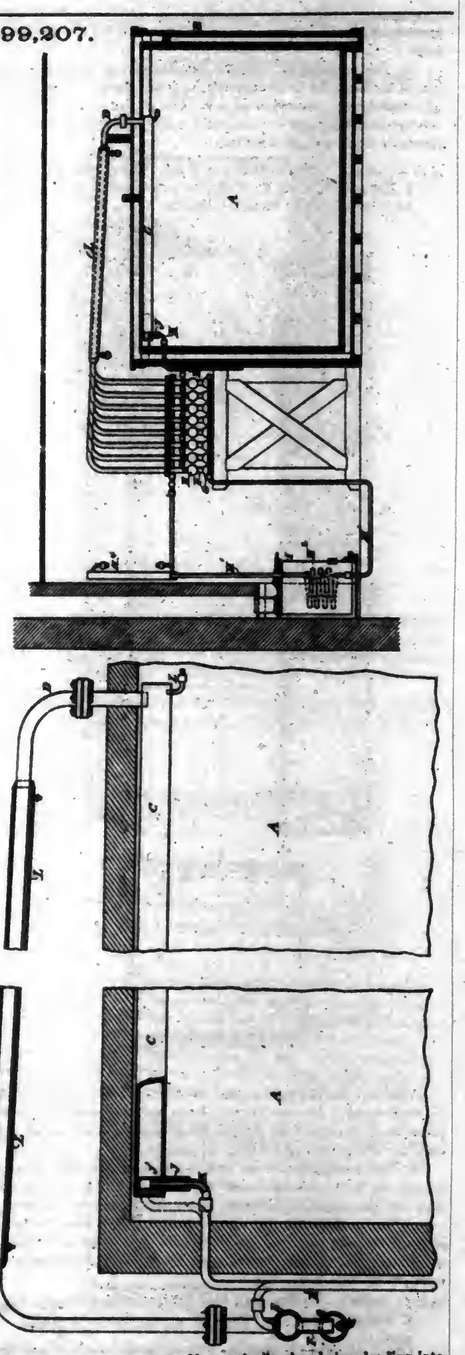
Claim.—The herein-described improvement in the method of ginning cotton, the same consisting in applying oil to the cotton as it is being ginned.

399,207. REFRIGERATING AND FREEZING APPARATUS. LOUIS PERKINS, Gray's Inn Road, County of Middlesex, England. Filed May 26, 1888. Serial No. 275,190. (No model.) Patented in England Feb. 18, 1888, No. 2,471; in India May 4, 1888, No. 121; in France May 15, 1888, No. 190,607; in Belgium May 15, 1888, No. 81,905; in Victoria June 13, 1888, No. 5,866; in New South Wales June 14, 1888, No. 726; in Queensland June 16, 1888, No. 494; in Italy June 30, 1888, No. 23,516, and in Brazil Oct. 20, 1888, No. 698.

Claim.—1. The combination, substantially as hereinbefore set forth, of the cooling-chamber A, a system of hermetically-closed pipes extending into the chamber and outside thereof, the heaters for the pipe system outside of the chamber A and at a level lower than that of the pipes within the cooling-chamber, the overflow-pipes leading from that part of the pipe system to which heat is applied to the pipes within the cooling-chamber A, and opening therein above their bottoms, whereby the ammonia solution is automatically separated from the liquefied ammonia and carried back to the heating part of the pipe system.

2. The combination, substantially as hereinbefore set forth, of a

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cooling-chamber, A, a system of hermetically-closed pipes leading into said chamber, and also arranged outside thereof, the heaters for the pipe system outside of the cooling-chamber and below the level of the pipes therein, the overflow-pipes extending from the pipes outside the cooling-chamber to the pipes within said chamber and opening therein above their bottoms, and a trap-pipe, J, surrounding the end of the overflow-pipe, through which the ammonia solution separated from the ammonia is carried.

3. The combination, substantially as hereinbefore set forth, of the horizontal liquor-pipe G, (filled with a solution of ammonia or like solution,) the short connecting-pipe F, rising from about the mid-level of

the liquor-pipe G, the upper liquor-pipe, E, into which the pipe F extends, the chamber A, the cooling-pipe D, extending from the liquor-pipe E into the chamber A, the liquefied-gas pipe C within the chamber A, at a higher level than the liquor-pipe G, and the overflow-pipe K, connecting the liquefied-gas pipe C to the liquor-pipe G, whereby liquid is conveyed from the liquefied-gas pipe C to the former when the liquefied-gas pipe C becomes nearly filled with liquefied gas.

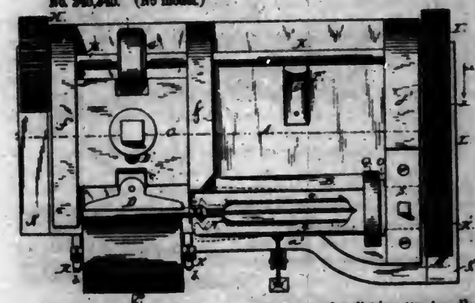
4. The combination, substantially as hereinbefore set forth, of the horizontal liquor-pipe G, (filled with a solution of ammonia or like solution,) a second horizontal liquor-pipe, E, the short connecting-pipe F, rising from about mid-level of the pipe G into the liquor-pipe E, the liquefied-gas pipe C at a higher level than the liquor-pipe G, the cooling-pipe D, passing from the liquor-pipe E to the liquefied-gas pipe C, a trap-pipe, J, rising up into the liquefied-gas pipe C, and provided with an opening at the top and with an opening, J', near the bottom, and the overflow-pipe K, passing from the interior of the pipe J back to the pipe E.

5. The combination, substantially as hereinbefore set forth, of the horizontal liquor-pipe G, the liquefied-gas pipe C at a higher level than the pipe G, the pipe D, connecting the former with the latter and an overflow-pipe extending into the liquefied-gas pipe C above the lower level thereof and connecting it with the pipe G, whereby the ammonia solution in the pipe C is separated from the liquid ammonia and automatically carried to the pipe G.

6. The combination, substantially as hereinbefore set forth, of the horizontal liquor-pipes G, (filled with a solution of ammonia or like solution,) the liquor-pipes E, the pipes F, rising from about mid-level of the pipes G and extending into the pipes E, the liquefied-gas pipes C at a higher level than the liquor-pipes G, the cooling-pipes D, connecting the former with the latter, and a water-jacket, L, surrounding each pipe D.

7. The combination, substantially as hereinbefore set forth, of two horizontal liquor-pipes, G, (filled with a solution of ammonia or like solution,) liquor-pipes E, arranged over the liquor-pipes G, the pipes F, connecting the liquor-pipes E and G, the liquefied-gas pipes C, and the cooling-pipes D, connecting the pipes C with the pipes E, said pipes D having part of the length of one pipe passing through part of the length of the other pipe.

399,208. MACHINERY FOR GRINDING AND POLISHING THE HANDLES OF CUTLERY. MICHAEL L. POWERS, Miller's Falls, Mass., assignor to Patrick O. Keefe, same place. Filed July 26, 1887. Serial No. 245,345. (No model.)



Claim.—1. In a machine for grinding and polishing the handles of case or table knives, the revolving mandrel or knife-holder composed of a shank journaled in the supporting-frame and provided with a gear-wheel, and extending from said shank two spring-fingers formed, substantially as described, and adapted to hold the blade of the knife between them while the handle projecting outside of said mandrel is being acted upon by the grinding-cylinder, as and for the purpose set forth.

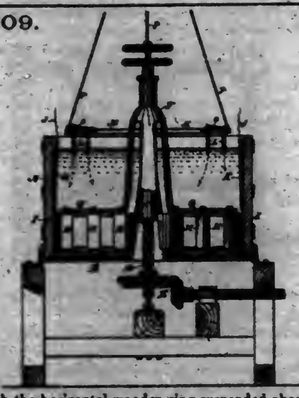
2. In a machine for grinding and polishing case or other table-knife handles, the combination, with the sliding carriage B, held to place by means of a cord and weight, substantially as described, of the bar C, inclosed in plate C, the presser-foot pivoted to said bar and the cam fixed to the driving-shaft, as and for the purpose specified.

3. The combination, with the base or bed plate provided with guide-cleats and having a grinding-cylinder fixed thereon, of the carriage movable upon the said base, the knife-holder or mandrel, substantially as described, the gear-wheels for rotating said knife-holder, and the elliptical cam fixed upon the driving-shaft to operate the presser-foot during the revolution of the knife, substantially as and for the purpose set forth.

399,209. ELECTRIC AMALGAMATOR. JULIO H. RAE, San Francisco, Cal. Filed Feb. 10, 1888. Serial No. 264,294. (No model.)

Claim.—1. In an apparatus for working ores, the pan or tub with the internal copper ring and the rotating arms or stirrers, in combi-

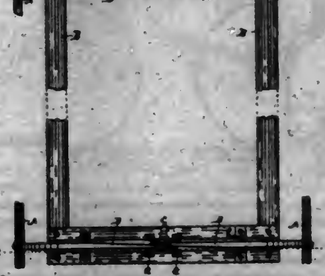
399,209.



nation with the horizontal wooden ring suspended above the tub, the copper plate forming the upper surface of said ring and perforated to admit the carbons L, which pass loosely through the plates, said carbons having heads or transverse pins at the upper ends, and the movable elastic plates or springs O, pressing upon the heads of the carbons to hold them in contact with the copper plate, substantially as herein described.

2. The tube having the internal copper rings and the stirrers or arms with the outwardly and inwardly pointed shoes, in combination with the horizontal two-part rings consisting of wooden bases and copper disks suspended above the tub and having depending carbons, spring-plates pressing upon the heads of the carbons, the suspending rods or wires, and the screw-connections through which the disks are suspended and connection made between them and the positive wires of the dynamo, substantially as herein described.

399,210. VEHICLE-SPRING. SILAS H. RAYMOND, Grand Rapids, Mich., assignor to George R. Raymond & Co., same place. Filed Nov. 10, 1888. Serial No. 290,457. (No model.)



Claim.—1. In a vehicle, the levers pivoted to the body and having the non-slotted lapping ends resting upon a spring attached to the body, the other ends of said levers being attached to supports disconnected from the body, substantially as set forth.

2. In combination, a vehicle-body, the levers having the non-slotted lapping ends, and spiral springs having the connecting hair-pin arm contacting the under side of said lapping ends, substantially as set forth.

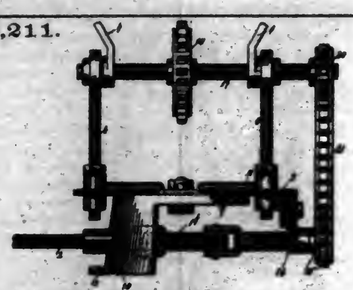
3. The combination of a vehicle-body, the levers at each end pivoted thereto and having the lapping ends, the spiral springs having the hair-pin lever portions supporting said lapped ends of the levers, and the side bars to which the outer ends of the levers are attached, substantially as set forth.

399,211. SHIFTABLE STACKER. WILLIAM S. REMEN, St. Louis, Mo. Filed Apr. 27, 1888. Serial No. 272,097. (No model.)

Claim.—1. The combination, with a shiftable stacker, of a driving mechanism for the carrier of said stacker rigidly secured to said stacker and revolving therewith, a stationary power-shaft, and a flexible slotted shafting between said stationary power-shaft and said driving mechanism, consisting of links 22, having pins projecting therefrom at right angles to each other, and a two-part link made of slotted links 23 and 24, joined rigidly together at right angles to each other and engaging the pins aforesaid.

2. A stacker having adjustable pillars, as 6 6, between the carrier-

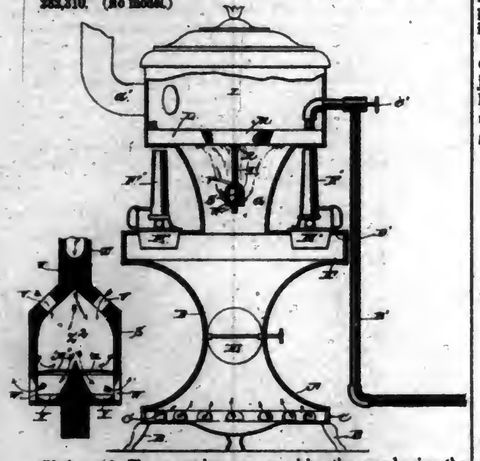
899,211.



driving shaft and the platform which carries the mechanism for actuating said shaft, for the purpose set forth.

3. The combination, with a shiftable stacker, of offsets, as 4 4, supporting said stacker and terminating in journal-boxes, pillars, as 6 6, in which said boxes have bearings, whereby the stacker can be swung up or down, a carrier for said stacker, a shaft, as 17, journaled in said boxes and carrying gearing for said carrier, a turn-table to which said pillars are adjustably secured, a gear-wheel, as 15, carried by said turn-table, a stationary power-shaft, as 1, and a flexible connection between the latter two.

899,212. VAPOR STOVE AND BURNER. HENRY P. ROSECRS, Jamestown, N. Y., assignor of three-fourths to A. F. Allen Brown, George S. Gifford, and Martha B. Marshall. Filed Aug. 9, 1888. Serial No. 282,310. (No model.)



Claim.—1. The vapor-burner comprising the case having the mixing-chamber Z' formed in its interior, the feed-channel U and air-inlet openings communicating with the upper end of said mixing-chamber, the escape-openings W at the lower end of said mixing-chamber and communicating directly with the outer air, and the cone X, rising from the bottom of the case, substantially as described.

2. The burner having the opening U in its upper end for the admission of vapor, the air-inlet openings at its upper end, the cone X, projecting from the base of the burner, the annular groove Y, surrounding the base of the cone, the escape-openings W in the sides of the burner near its base, and the diaphragm or plate Z, arranged in the case and having central opening, A', through which the apex of the cone projects, substantially as described.

3. The vapor-burner comprising the casing S, having the vapor-supply channel U and the air-inlet openings V in its upper end, the escape-openings W near its base, the cone X, projecting from its base and the plate or diaphragm Z, arranged in the case and having the central opening, A', in combination with the combustion-chamber, in which the burner is arranged, and means, substantially as specified, to supply the combustion-chamber with an ascending current of air, substantially as described.

4. The vapor-stove having the combustion-chamber G and the drum I, in combination with the retort arranged in the drum, the burner depending from the retort and arranged in the chamber G, and the lamps E' on the outer side of the chamber G and arranged under the retort, substantially as described.

5. The vapor-stove comprising the hollow standard A, communicating at its lower end with the outer air, the table F at the upper end of said standard, the contracted combustion-chamber G, rising from the table, and the drum or oven I above said combustion-chamber, in combination with the retort and the burner depending therefrom, the said burner being located in the chamber G, substantially as described.

6. The combination of the vapor-stove having the hollow standard A, with the openings C at its base, and the contracted neck B, the combustion-chamber rising from and communicating with the hollow standard, the drum or oven above and communicating with the combustion-chamber, the retort, the burner depending therefrom and arranged in the combustion-chamber, and the damper E in the neck of the standard, substantially as described.

899,213. DYNAMO-ELECTRIC MACHINE. JAMES H. ROBERTSON, Rutherford, N. J. Filed Jan. 20, 1887. Serial No. 225,087. (No model.)



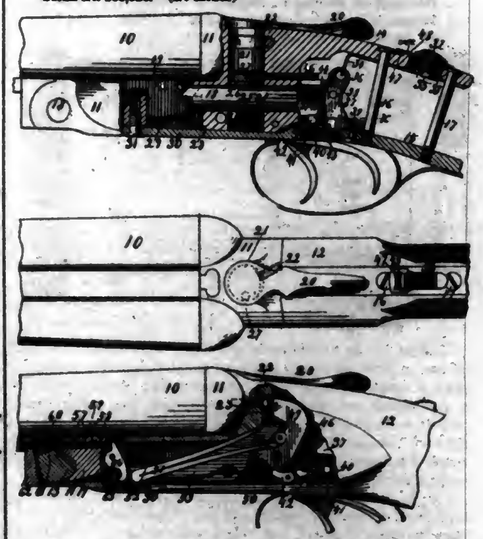
Claim.—1. In a dynamo-electric machine, an armature formed of a set of disks provided with projections of magnetic material, combined with a less number of plain disks arranged at intervals, substantially as described.

2. In a dynamo-electric machine, an armature formed of a set of disks provided with projections of magnetic material alternating with a less number of plain disks, the disks being magnetically separated from each other, substantially as described.

3. In a dynamo-electric machine, an armature constructed of plain disks placed at intervals among a larger number of disks with projections of magnetic material, the same forming an armature having longitudinal and circumferential grooves, substantially as described.

4. In dynamo-electric machines, an armature composed of plain disks placed at intervals among a larger number of disks having projections of magnetic material, the same forming an armature having longitudinal and circumferential grooves, and wire wound longitudinally and secured by binding-wires wound in said circumferential grooves, substantially as described.

899,214. BREECH-LOADING FIRE-ARM. LEROY H. SMITH, Utica, assignor to the Rhines Gun Company, Rhines, N. Y. Filed Nov. 3, 1888. Serial No. 289,980. (No model.)



Claim.—1. The combination of a gun-frame having a narrow tang forming side angles therewith, a stock fitted to the said frame and tang to fill the said angles, a bolt-retracting lever having a shaft vertically journaled in the frame and circumferentially grooved, and a screw threaded through the said frame in one of the said angles and adapted to engage one end with the said groove in the shaft when its other end is flush in the said corner, substantially as shown and described, whereby the stock will both conceal the screw and prevent its being worked out of place.

2. The combination of a gun-frame, a locking-bolt fitted to slide therein, a collar transversely grooved in its upper side and adjustably secured upon the said bolt, a lever having a shaft vertically journaled in the frame above the said collar and provided with a crank-pin projecting down from the shaft, and a shoe fitted to slide in the said groove in the collar and perforated to receive the said crank-pin, substantially as shown and described.

3. The combination of a gun-frame, a barrel pivoted to the forward end thereof and provided with a hook-lug projecting downward, a locking-bolt fitted to slide in the frame to engage the said hook and provided with a forward-impelling spring, a pin fitted to slide in the frame and into the path of the said bolt in front of the bolt when retracted, a spring adapted to impel the pin into the path of the bolt, and means, substantially as described, for connecting the said pin with the said hook-lug, whereby the descent of the lug retracts the pin, as and for the purpose specified.

4. The combination of a gun-frame, a barrel pivoted thereto and provided with a downwardly-projecting lug, a locking-bolt fitted to slide in the frame to engage the said hook, a pin fitted to slide in the frame forward of the retracted bolt and notched in one side, and a spring adapted to engage the said notch and secured at its shank to the frame and curved upward to be engaged by the said hook-lug when the barrels are closed down, substantially as shown and described.

5. The combination of the gun-frame 11, the barrels provided with the hook-lug 19, the locking-bolt 18, the pin 28, fitted to slide across in front of the bolt and notched in one side, the spring 29, fitted at one end to engage the notch in pin 28 and perforated for a screw at the other end and curved upward midway to be engaged by lug 19 when closed down, the plate 30, fitted to the frame, and the screw 31, binding the plate, the spring, and the frame together, substantially as shown and described.

6. The combination of a gun-locking-bolt, a pin fitted to move transversely thereto in the frame and adapted to spring in front of the locking-bolt in its retracted position, and connections comprising a lug, 19, projecting down from the barrel, and an arm, 29, between the pin and barrel, substantially as described, whereby, first, the bolt is retained when retracted, and, second, the retaining-pin is withdrawn and the bolt is set free by closing the gun, as described.

7. The combination of a gun-frame, 11, a knob, 32, fitted to slide upon the upper tang thereof, the reach 34 beneath the said tang and secured to the said knob to slide therewith and having a downward-bent forward end, a stop-lever, 36, pivoted in a fixture of the frame and provided with horns at its upper end to engage the reach 34 and with studs 40, projecting from its sides at its lower end, and the triggers 41, provided each with a knob, 43, having a cavity in front of it and adapted to pass up either before or behind the said studs 40, substantially as shown and described, whereby the positions may be given to the safety device, as set forth.

8. The combination of gun-triggers provided each with a knob, 43, a stop-lever, 36, having studs 40 in the path of the triggers and provided with teeth or stop-notches 44, and a spring-catch, 45, arranged to engage the said notches, substantially as shown and described.

9. The combination of the removable lower tang, 15, the block 37, secured thereon by means of a screw, 39, the stop-lever 36, pivoted in the block and having notches 44, and the spring-catch 45, fitted in the removable block 37 and adapted to engage the said notches, substantially as shown and described.

10. The combination of the gun-frame 11, the barrel-locking bolt 18, fitted to slide longitudinally therein, the collar 24, adjustably secured upon the said bolt, the stop-lever 36, pivoted in a fixture of the frame, the push-pin 46, fitted to slide in the frame between the said collar and stop-lever, and trigger mechanism connected with the stop-lever, substantially as shown and described.

11. The combination of a gun-locking bolt fitted to slide longitudinally in the gun-frame, an adjustable collar on the bolt, a safety device, substantially as described, and a push-pin, 46, or similar connection between the said device and collar, whereby a certain amount of rearward motion of the bolt communicates to the safety device a certain amount of motion whether the bolt be set forward or backward in the collar.

12. The combination of a gun-tang, the knob of a safety device, substantially as described, fitted to slide thereon, and having a window through it, and a piece of metal, of different color from the said knob and about the size and form of the said window, secured in the said tang to register with the window when the latter is in one of its fixed positions, substantially as shown and described.

13. The combination of a gun-frame, 11, a pair of cocking-levers, 53, pivoted therein, mainsprings 51, located in the frame beside the said levers and in the same slots therewith, hammers connected with both the levers and springs, and screws 52, passing through the side of the frame and across the path of the mainsprings, but not crossing the path of the cocking-levers, as shown and described.

14. The combination of the mainspring 51, the sear 42, the screw 55, and the sear-spring 54, curved upward midway forming a notch to engage the said screw and resting its ends respectively on the mainspring and on the sear, as shown and described.

15. The combination of the levers 53, the lug 19, the hook 56 removably connecting the said levers and lug, the sectional pin 57, and the spring 58, fitted to slide in the lug in line of the hook 56, the removable fore-end 62, and the stud 60, projecting therefrom in line of the pin 57, substantially as shown and described.

16. The combination of gun-cocking levers 53, a removable hook, 56, engaging the same with the gun-barrels, a stud projecting from the fore-end of the gun, and a push-pin or other means, substantially as described, for connecting the stud with the said hook, whereby the hook is held engaged when the fore-end is in position and is liberated when the fore-end is removed.

899,215. EGG-CRATE. HILLARD F. SMITH and THOMAS L. FIRESTONE, Fredericksburg, Ohio. Filed Dec. 20, 1888. Serial No. 294,302. (No model.)



Claim.—A wooden tray or cell-frame for a cell-case, consisting of two parts secured together, each of said parts being composed of two end or supporting pieces, two side pieces, and two series of crossing division-strips halved together and to the said end and side pieces, said division-strips and side pieces being of less width vertically than said end or supporting pieces, so that the two parts of the tray or frame and superposed trays or frames will be separated from each other, substantially as set forth.

899,216. SASH-BALANCE. JOSEPH SPENCER, Chicago, Ill. Filed June 27, 1888. Serial No. 278,377. (No model.)



Claim.—1. In a sash-balance, the combination of the bed-plate *c* with the sash *a*, and cord-holding sleeve *h*, having a curved shank, *k*, and tongue *l*, engaging with the bed-plate *c*, substantially as shown and described, and for the purpose set forth.

2. In a sash-balance, the combination of the bed-plate *c*, formed with a depressed flange or shoulder, *f*, and having a T-formed eye, *g*, a cord-holding sleeve, *h*, having a curved shank, *k*, and tongue *l*, adapted to engage said eye *g*, and the sash *a*, formed with a depression, *e*, for the reception of the plate and cord-sleeve and tongue, substantially as shown and described, and for the purpose set forth.

899,217. PLOW. JOHN A. STEWART, Houston, Tex., assignor to Deere, Mansur & Co., St. Louis, Mo. Filed Apr. 4, 1887. Serial No. 233,582. (No model.)

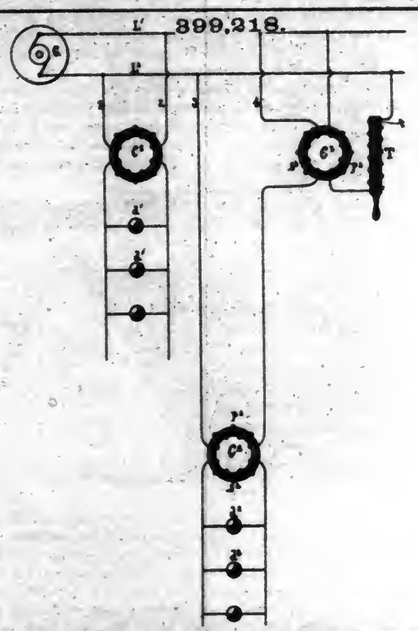


Claim.—1. In a plow, a longitudinal center bar extending below the base of the sweep and having the pointed nose and the fan-shaped lip, substantially as described.

2. In a plow, the combination of the center bar, the adjustable sweep, and the saddle, substantially as described.

899,218. REGULATOR FOR SYSTEMS OF ELECTRICAL DISTRIBUTION. LEWIS B. STILLWELL, Pittsburg, Pa., assignor to the Westinghouse Electric Company, same place. Filed Oct. 26, 1888. Serial No. 289,292. (No model.)

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Claim.—1. The combination of a source of alternating intermittent or pulsatory electric currents, independent electric circuits derived therefrom, an electric converter having one coil connected in one of the derived circuits, and an independent circuit connected directly across the poles of said source and including only the second coil of the converter, whereby currents will be caused to traverse said second coil in value directly dependent upon the current traversing derived circuit, said coils being wound and connected so that the currents induced in the first-named coil are superposed upon those traversing said derived circuit, substantially as described.

2. The combination, with a source of alternating, intermittent, or pulsatory electric currents, of circuits derived therefrom, and an adjustable converter having one coil connected in one of the said derived circuits, and a special independent circuit including the other coil connected in the circuit of said source in parallel with said derived circuit, the coils of said converter being so wound and connected as to superpose induced currents upon the current traversing said derived circuit.

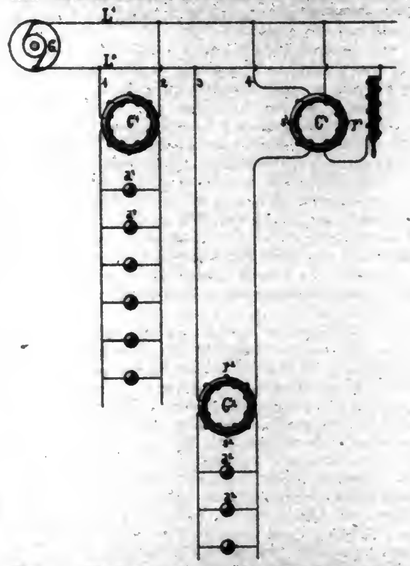
3. The combination, with a source of alternating, intermittent, or pulsatory currents, of two or more groups of translating devices respectively supplied with currents therefrom, and an electric converter having its secondary coil connected in the circuit supplying one of said groups and its primary coil connected in the circuit of the source of current independently of any other translating or transforming device, whereby an additional electro-motive force is applied to said circuit, and means for varying the amount of additional electro-motive force thus applied.

4. The combination, with a source of alternating, intermittent, or pulsatory electric currents, of two or more converters having their primary coils connected with said source in multiple arc, and a variable number of translating devices connected in their respective secondary circuits, and a device for superposing electric currents upon the primary circuit of one of said converters, consisting of an electric converter having one of its coils connected in said primary circuit in series with the converter included therein and its other coil connected in multiple arc with said converter.

5. The combination, with a source of alternating, intermittent, or pulsatory electric currents, of two or more circuits receiving currents therefrom, a regulator for one or more of said circuits, consisting of an electric converter having one coil independently connected in circuit with said source between points of approximately constant difference of potential and its other coil delivering currents to the circuit to be regulated, the first-named coil receiving currents opposite in direction from those traversing the last-named coil.

6. The combination, with a source of alternating, intermittent, or pulsatory electric currents, of two or more circuits receiving currents therefrom, a regulator for one or more of said circuits, consisting of an electric converter having its primary coil independently connected in circuit with said source between points of approximately constant difference of potential and its secondary coil delivering currents to the circuit to be regulated, the said primary coil receiving currents opposite in direction from those traversing the secondary circuit, and an adjustable reactive coil in series with the primary coil of said converter.

399,219. METHOD OF REGULATION FOR SYSTEMS OF ELECTRICAL DISTRIBUTION. LEWIS B. STILLWELL, Pittsburg, Pa., assignor to the Westinghouse Electric Company, same place. Filed Oct. 26, 1888. Serial No. 289,239. (No model.)



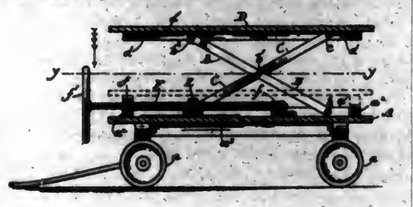
Claim.—1. The hereinbefore-described method of regulating the difference of potential upon an electric circuit, which consists in supplying to such circuit a difference of potential of a given value, deriving from the same source an induced electro-motive force approximately equivalent in value to the loss of potential upon said circuit, and in superposing such induced electro-motive force upon said circuit.

2. The hereinbefore-described method of maintaining a required difference of potential at the terminals of a variable number of translating devices connected in an electric circuit, which consists in applying a predetermined difference of potential to said circuit, deriving from the same source a variable difference of potential equivalent to or compensating for the variable loss of potential upon such circuit, and superposing the same upon said circuit.

3. The hereinbefore-described method of maintaining a normal difference of potential at the terminals of translating devices in two or more different circuits, which consists in applying to said circuits a given difference of potential, deriving independent electro-motive forces from the same source and applying the same to the respective circuits, and causing the effective value of the electro-motive force so applied to the respective circuits to approximately compensate for the loss upon that circuit due to the resistance thereof and to the amount of current traversing the same.

4. The hereinbefore-described method of maintaining a normal difference of potential at the terminals of the translating devices in two or more different circuits, which consists in applying to the terminals of all the circuits a given difference of potential, deriving a supplemental electro-motive force for one or more of said circuits, the value of which is dependent upon and variable with the loss of potential upon said circuit, and in applying such supplemental electro-motive force to such circuit or circuits.

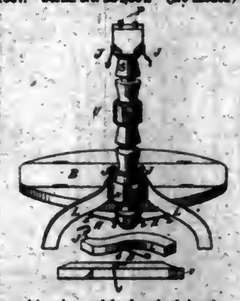
399,220. ADJUSTABLE FLY-TABLE FOR PRINTING-PRESSES. RUDOLPH TIEBOUT, Chicago, Ill., assignor to Rand, McNally & Co., same place. Filed July 23, 1888. Serial No. 280,709. (No model.)



Claim.—1. An adjustable portable fly-table for printing-presses, consisting of a hand-truck, a lazy-tongs mounted and pivoted thereon, a screw for actuating said lazy-tongs, and a table mounted upon the latter, whereby the table may be lowered in proportion as the paper is placed thereon by the fly, substantially as shown and described.

2. The combination, with a printing-press, of a table mounted upon lazy-tongs, a truck for supporting said lazy-tongs, and a screw and hand-wheel for actuating the same, whereby the top of the paper pile may be made to conform to the position of the fly, substantially as shown and described.

399,221. FOLDING TABLE. JAMES TURNER, Coudersport, Pa. Filed Jan. 19, 1887. Serial No. 224,804. (No model.)



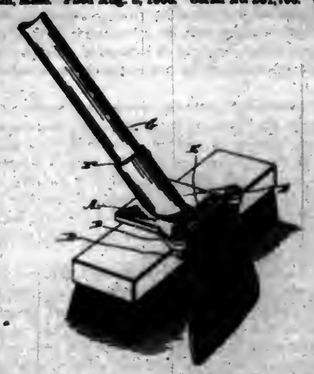
Claim.—The combination, with the shaft having a central slotted or recessed collar, U, a lower recessed collar, K, and pins P, of the table top and leaves, the braces A, hinged to the collar U and provided with hook-and-eye connections, and the legs L, fitting the recesses of the collar K and having hook-and-eye connections, substantially as set forth.

399,222. MITTEN. JOHN TYRRAL, Leo, assignor to Louis Berkheimer, Chicago, Ill. Filed Oct. 30, 1888. Serial No. 289,502. (Model.)



Claim.—A reversible mitten comprising the following construction: four rectangular blanks, each having a thumb-blank extending from one end, the rectangular blanks being united in pairs along the edges provided with the thumb-blanks which are united around their edges, thereby forming the thumbs B and B', and the said united pairs of blanks being secured together near their lateral edges and folded into ears q and q' at the sides and closed toward one end, substantially as and for the purpose set forth.

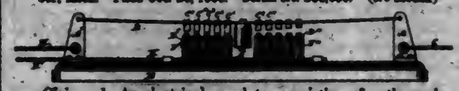
399,223. MOP AND SCRUBBING-BRUSH HOLDER. JOSEPH T. VARNEY, South Wareham, assignor of one-fourth to Edgar Robinson, Wareham, Mass. Filed Aug. 2, 1888. Serial No. 281,766. (No model.)



Claim.—1. A combined mop and brush holder, comprising a plate having depending flanges at its edges, binding-screws mounted in said flanges to secure the brush, and a clamping-bar mounted on the upper side of the plate to secure the mop, as set forth.

2. A combined mop and brush holder, comprising a plate having depending flanges at its edges, binding-screws mounted in said flanges to secure the brush, vertical screws on the upper side of the plate, and a clamping-bar on the said screws to secure the mop, as set forth.

399,224. ELECTRIC REGULATOR. FRANK C. WARNER, Ann Arbor, Mich. Filed Oct. 20, 1888. Serial No. 288,060. (No model.)



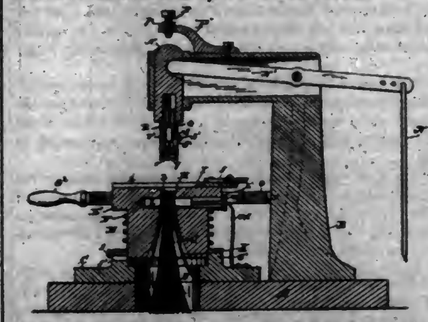
Claim.—1. An electrical regulator consisting of a thermal conductor located in circuit with a translating device requiring current regulation, in combination with a multiple-arc shunt around the translating device, and two sets of contacts, one of which sets is borne by the thermal conductor and the other connected to the multiple-arc branches of the shunt and adapted to contact successively, substantially as described.

2. A thermal electric regulator consisting of the following elements: a thermal conductor carrying multiple contacts and a shunt having multiple contacts located near the first set of contacts, substantially as described.

3. In a regulator, the combination of a thermal conductor located in the main circuit with the device requiring current regulation, a shunt around said device, and circuit-varying connections between the shunt and the thermal conductor, whereby the current is shunted around the device requiring regulation in proportion to its flow, substantially as described.

399,225. MACHINE FOR MAKING CARRIAGE-TUFTS. LOUIS P. WARNER, Rochester, N. Y. Filed July 30, 1888. Serial No. 280,456. (No model.)

Brief.—The invention has for its object to provide a machine for making the tufts used in upholstering carriage or other cushions, in which tufts the shank is clamped around the material.



Claim.—1. The combination, with a movable plunger and a device for positively securing a tuft-back thereto, of a perforated anvil through which the material passes, and with which the back co-operates to clamp it to the material, whereby upon the retraction of the plunger the material will be pulled through the anvil by the back, substantially as described.

2. The combination, with the movable plunger and device for positively securing a tuft-back thereto, of a perforated co-operating anvil through which the material passes, the edge of the perforation being arranged to compress the edges of the back toward the material, whereby upon the retraction of the plunger the material will be pulled through the anvil by the back.

3. The combination, with the movable plunger, a back-securing device mounted thereon, and an adjustable stop for limiting the movement of the plunger, of a perforated co-operating anvil through which the material passes, the edge of the perforation being arranged to compress the edges of the back toward the material, substantially as described.

4. The combination, with the movable plunger and a device for positively securing a tuft-back thereto, of a perforated co-operating anvil through which the material passes, the edges of the perforation being arranged to compress the edges of the back toward the material, and a cutting-blade adapted to be moved between the plunger and die to sever the material, substantially as described.

5. The combination, with the movable plunger and a back-securing device mounted thereon, and a stop limiting the movement of the plunger, of a perforated co-operating anvil through which the material passes, the edges of the perforation being arranged to compress the edges of the back toward the material, and a cutting-blade adapted to be moved over the top of the anvil to sever the material close to the same, substantially as described.

6. The combination with the movable plunger, of a perforated co-operating anvil through which the material passes, the edges of the perforation being arranged to compress the socket-edges toward the material, a spring for supporting said anvil, and a stationary material-guide inside the anvil, substantially as described.

7. The combination, with the movable plunger, of a perforated co-operating anvil through which the material passes, the edges of the perforation being arranged to compress the back edges toward the material, a spring supporting the anvil, feeding-rollers for the material within the die, and means, substantially as described, for rotating said rollers when the anvil is moved against the spring, as set forth.

8. The combination, with the movable plunger, of a co-operating anvil having a perforation through which the material passes, the edges of the perforation being arranged to compress the socket edges toward the material, a spring supporting the anvil, and feeding-rollers for the material within the anvil, having ratchet-wheels and a pawl to rotate them when the anvil is moved against its spring, substantially as described.

9. The combination, with the movable plunger, of a co-operating anvil having a perforation through which the material passes, the edges of the perforation being arranged to compress the edges of the back toward the material, a spring supporting said anvil, a stationary guide within the anvil, feeding-rollers, also within the anvil, and means, substantially as described, for rotating said rollers and feeding the material when the same is moved against the spring, as set forth.

10. The combination, with the movable plunger, of a co-operating anvil having a perforation through which the material passes, the edges of the perforation tapering toward the material, a spring normally projecting it, and a stop for limiting its movement, substantially as described.

11. The combination, with the movable hollow plunger, the spring thereon, and a back-supporting device secured to the spring, of an anvil having an opening therein, the edge of the opening tapering toward the center, substantially as described.

12. The combination, with the hollow slotted plunger, the spring therein, a back-holding device secured to the spring, and a pin projecting through the slot, of a co-operating anvil having an opening within, with rolls tapering toward the center, substantially as described.

13. The combination, with the plunger, of the co-operating anvil having the perforation for the material, a spring for normally projecting the anvil, and a stop for limiting its motion, of the guides on the anvil and a sliding knife arranged to operate thereon, substantially as described.

14. The combination, with the plunger having the cavity in the end, the hook, and the spring for operating it, of the co-operating anvil having the perforation through which the material passes, the edges of which are tapered toward the center, and the sliding knife operating on the top of the anvil, substantially as described.

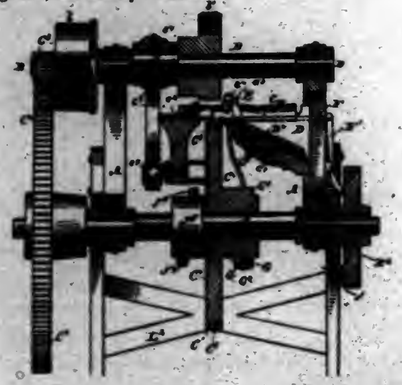
15. The combination, with the plunger, the co-operating perforated anvil, a spring for normally projecting the anvil, a stop for limiting its motion, and a handle for moving it against the spring, of a knife arranged to slide over the anvil-face, substantially as described.

16. The combination, with the plunger having the device for the positive attachment of the tuft-back shank thereon, of the perforated anvil through which the material passes, and with which the back co-operates to clamp it to the material, whereby upon the retraction of the plunger the material will be pulled through the anvil, substantially as described.

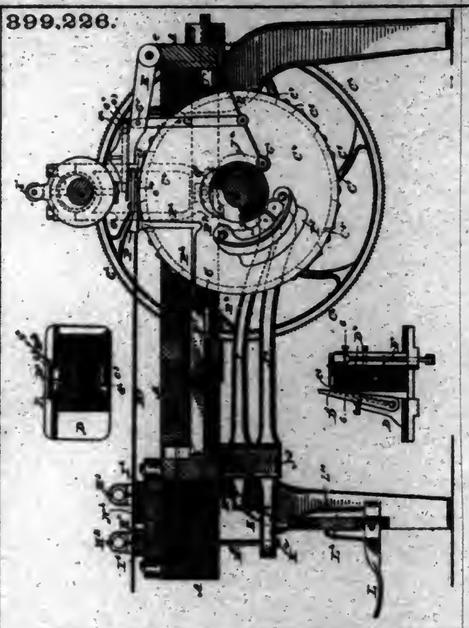
399,226. MACHINE FOR FORGING HORSESHOE-NAILS. DAVID F. WILLIAMS, Plattsburg, assignor of one-third to Timothy J. Sullivan Albany, N. Y. Filed Mar. 26, 1888. Serial No. 268,514. (No model.)

Claim.—1. The combination, with the roller-hammer, of the anvil-carrier and interchangeable anvils on the periphery of said carrier, substantially as described.

2. The combination, with the roller-hammer, of the rotary anvil-carrier having a peripheral groove, and anvils removably secured in said groove, substantially as described.



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3. In a machine for the purpose described, a rotary anvil-carrier provided with a peripheral groove, combined with removable and interchangeable anvils seated in said groove, and beveled clamping-pieces for securing said anvils in place, substantially as described.

4. In a machine for the purpose described, an anvil formed with a projection on the rear portion of its face, as and for the purpose described.

5. The combination, with the dies for forming the point of the nail, of guards for protecting the sides of said dies, substantially as described.

6. In a machine for the purpose described, a cutter-stock centered upon suitable bearings upon the rear end of the frame, substantially as described.

7. The combination, with the cutter-stock centered within suitable bearings upon the rear end of the frame, of the cutter secured in the upper face of the free end of the stock, substantially as described.

8. The combination, with the cutter-stock centered within suitable bearings upon the frame, of the cutter adjustably secured within a slot in the upper face of the free end of the stock, substantially as described.

9. The combination, with the cutter-stock centered within suitable bearings on the frame, of the cutter and the gage-block secured in the upper face of the free end of the stock, substantially as described

10. The combination, with the cutter-stock centered within suitable bearings upon the frame, of an adjustable cutter and gage-block secured in the upper face of the free end of the stock, substantially as described.

11. The combination, with the cutter-stock centered within suitable bearings on the frame, of the spring G, the link connecting said spring with the cutter-stock, and the anvil-carrier constructed to actuate said spring, substantially as and for the purpose described.

12. The combination, with the cutter-stock centered within suitable bearings upon the frame, of the spring G, the link connecting said spring with the cutter-stock, the anvil-carrier, and the cam on the hub of said anvil-carrier, constructed to actuate said spring, substantially as and for the purpose described.

13. The combination, with the cutter-stock, centered as described and carrying the upper cutter, of the spring G, connected at one end to the frame and having its other end bifurcated, the anti-friction roller carried by said bifurcated end, the link connecting said spring with the cutter-stock, the anvil-carrier, and the cam on the hub of said carrier arranged to contact with said roller, substantially as and for the purpose described.

14. The combination, with the former, of the anvil-carrier, the nail-pusher, and the disk on the shaft of said carrier, constructed to actuate said pusher, substantially as and for the purpose described.

15. The combination, with the dies and the nose-guide, of the spring-bar carrying said nose-guide, the anvil-carrier, and the cam on the said carrier, constructed to actuate said spring-bar, substantially as and for the purpose described.

16. The combination, with the nose-guide and the spring-bar carrying the same, of the striking-hammer carrier, enlarged on its inner side, the anvil-carrier, and the cam P[2] on the side of said carrier, substantially as and for the purpose described.

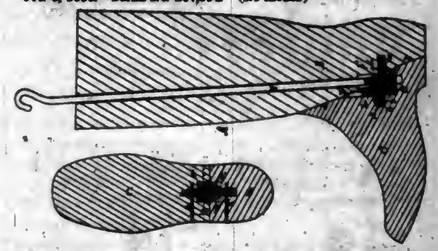
17. The combination, with the striking-hammer and the die secured thereto, of the stationary die arranged at an angle, as shown and described.

18. The combination, with the striking-hammer and the die carried thereby, of the stationary die arranged at an angle, as shown and having its free face formed substantially vertical, as and for the purpose described.

19. The combination, with the block D, of the lower cutter secured in said block with its end beveled to form a cutting-edge at an angle to the direction of its length, and inclined in the manner and for the purpose specified.

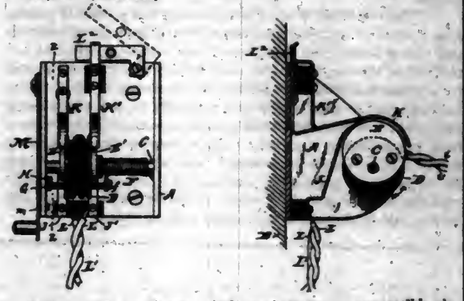
20. In a machine for the purpose described, a feeding device consisting, essentially, of a movable grip and a stationary grip having alternate periods of action, as set forth.

399,227. LAST. GEORGE H. HEALEY, Stoneham, Mass. Filed Oct. 6, 1888. Serial No. 287,354. (No model.)



Claim.—In a last or form for boots, the part B, provided with the dovetail secured thereto, the rod F, screw-threaded at its lower end and provided with a nut or shoulder to bear on the shank of the dovetail through which the rod passes, the part C of the last provided with the dovetail-grooved piece G, secured thereto, in which is a female screw to receive the screw of the rod F to connect the parts of the last together, the abutting surfaces of said parts each being formed as represented, and all being substantially as shown and set forth.

399,228. CIRCUIT-CLOSER FOR RAILWAY-CAR TELEGRAPHS. GEORGE I. HOPKINS, Manchester, N. H. Filed Dec. 21, 1887. Serial No. 258,618. (No model.)



Claim.—1. In a railway-car-telegraph system, a convertible circuit-controller consisting of two pairs of contact-springs and corresponding movable contact-pieces normally in contact with one pair only of the springs, the said contact-pieces when operated breaking contact therewith and making contact with the second pair, and an adjustable conducting-arm in electrical connection with one of the springs of the second pair and capable of being thrown into or out of contact with the other, the springs of the first pair being normally insulated from each other, as set forth.

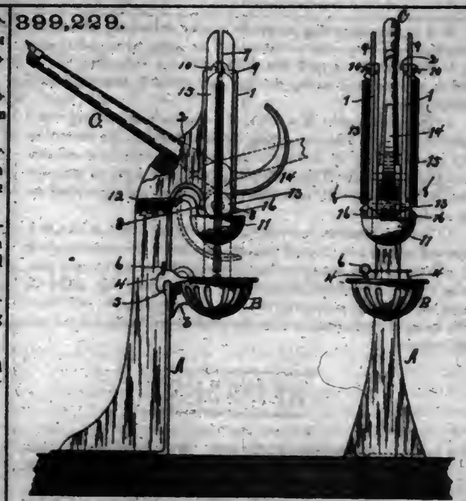
2. The combination, with the conductors *i i'*, the insulated springs J J' and K K', and the disks E E', of the pivoted arm L, one of the springs K K' being normally insulated, and the arm L being in electrical connection with the other spring and capable of being moved into contact with the insulated spring, as and for the purpose set forth.

399,229. LEMON-SQUEEZER. ERWIN M. SCOTT, Auburn, N. Y. Filed Sept. 3, 1888. Serial No. 284,464. (No model.)

Claim.—1. The cup B, provided with a bracket, 3, and hooks 4, in combination with the standard A, provided with the lugs 5 upon the inner edges thereof, and the locking-pin 6, inserted through the standard above the hooks, substantially as described.

2. A fruit-squeezer consisting of a standard provided with lugs

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and bifurcated at the top, forming uprights or vertical bars 1, which are provided with flanges 8 and ears 10, the plates 11, provided with parallel stems 9, guided by the flanges and ears of the uprights, a friction-roller journaled in the plates-stems, and a cam-lever pivoted between the uprights 1 and bearing upon the friction-roller, and the springs 15, connected to the plates-stems at one end and to the ears 10 at the other, in combination with the cup B, provided with a bracket, 3, and hooks 4, hooking over the lugs 5 upon the standard, and a pin, 6, inserted through the standard above the cup-hooks, substantially as described.

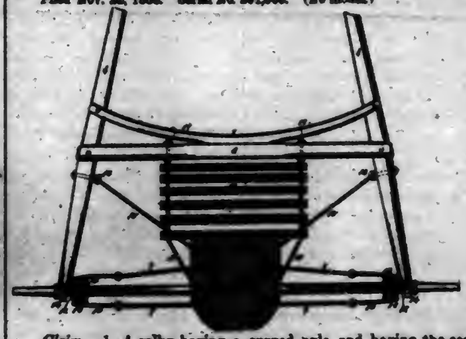
399,230. COMBUSTIBLE VAPORIZING-CASE. JOHN MORRIS, Shirley Cottage, South View, Basingstoke, England, assignor to the Chemical Carbon Company, (Limited,) same place. Filed June 20, 1888. Serial No. 277,649. (No model.) Patented in England Mar. 3, 1885, No. 2,786.



Claim.—1. The within-described cone or case for dissipating active materials in a state of vapor, said cone or case being composed, essentially, of carbon combined or mixed with nitrate of potash, substantially as set forth.

2. A combustible cone or case for the purpose specified, composed of carbon and levigated fused nitrate of potash, and provided with an incombustible support or base, substantially as described.

399,231. SULKY. HENRY HEIDEMANN, St. Louis County, Mo. Filed Nov. 22, 1888. Serial No. 291,563. (No model.)



Claim.—1. A sulky having a curved axle, and having the seat thereof supported from said axle by means of coil-springs and connecting-rods arranged at each side of said seat and axle.

2. As a means for supporting the seat of a sulky, coil-springs secured to the axle of said sulky at each side of said seat, having the ends thereof arranged on each side of the axle and connected to said seat.

3. A spring-supporting means for a sulky embodying, essentially, connecting-rods 9, secured to the seat of the sulky, arranged at each side of said seat and at each side of the axle, and coil-springs 10, secured to said axle and having the free ends pivotally fastened to said connecting-rods.

4. The combination, in a sulky, of a seat, as 8, connecting-rods 9 at each side of said seat, supporting the same through the instrumentality of coil-springs 10, secured to the axle of the sulky, the said connecting-rods and ends of the coil-springs being arranged on each side of said axle, and cars 13, extending from said axle and supporting the coils of the springs 10.

5. The combination, in a sulky, of the curved axle 5, a seat, as 8, supported by said axle through the instrumentality of connecting-rods 9 at each side of said seat and axle, coil-springs 10, secured to said axle having their ends pivotally secured to said connecting-rods, plates 12 having ears 13 13 for supporting the coils of the springs 10, and braces 15 15, secured to said seat and to the shafts of said axle, for the purpose described.

REISSUES.

10,989. TELEPHONE-EXCHANGE. WILLIAM B. VARNEY, Plainfield, N. J. Filed Jan. 23, 1888. Serial No. 267,221. Original No. 368,529, dated Nov. 27, 1888.

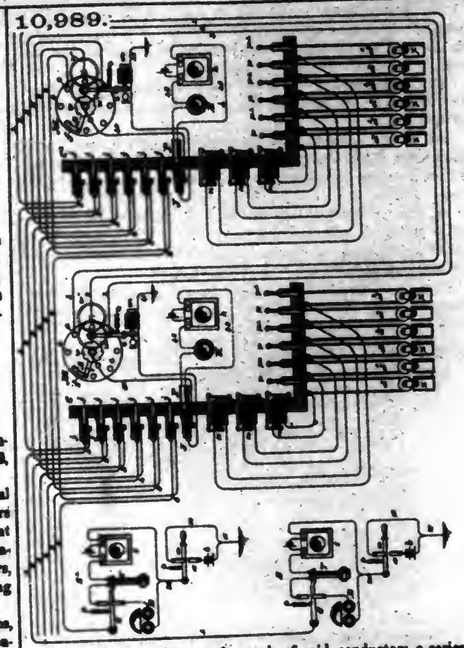
Claim.—1. The combination, in a telephone-exchange, of a central station and a series of sub-stations, a series of electrical conductors uniting said central station and sub-stations, telephonic instruments at each station for the purpose of intercommunication, switching apparatus at the central station for connecting said conductors in pairs, and an automatic switch at the central station making and breaking connection with each of said conductors periodically.

2. The combination of a central station and a series of sub-stations, a series of electrical conductors uniting the sub-stations with the central station, a switch-board at the central station containing a series of spring-jacks, one for each of said conductors, a series of flexible conducting cords and plugs for electrically uniting the spring-jacks in pairs, a series of circumferentially-arranged fixed contact-points, each forming the terminal of one of said conductors, and a rotating radial arm forming the terminal of a fragment of conductor containing a receiving-telephone, said arm forming contact with each of said fixed contacts successively.

3. The combination of a central station and a series of sub-stations, a series of electrical conductors uniting said sub-stations with said central station, a switch-board at the central station containing a series of spring-jacks, one for each of said conductors, a series of flexible conducting cords and plugs for electrically uniting the spring-jacks in pairs, a series of fixed contact-points, each forming the terminal of one of said conductors, a movable contact-point forming the terminal of a fragment of conductor, a receiving-telephone located in said conductor fragment, and means for imparting a progressive movement to said contact-point, whereby the said movable contact-point is carried into connection with each of said fixed contact-points periodically and successively.

4. The combination of a central station and a series of sub-stations, a series of electrical conductors uniting said sub-stations with said central station, a switch-board at the central station containing

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a series of spring-jacks, one for each of said conductors, a series of flexible conducting chords and plugs for electrically uniting the spring-jacks in pairs, a series of circumferentially-arranged fixed contact-points, each forming the terminal of one of said conductors, a rotating radial arm located upon a suitable bearing, a toothed wheel fixed to said arm and rotating therewith, a fragment of conductor connected to said arm, an electro-magnet having its coils included in said fragment of conductor, a hooked armature-bar therefor to catch and hold the arm and wheel, and a receiving-telephone located in said fragment of conductor, all arranged and operating substantially as described.

5. The combination of a central station and a series of sub-station, a series of electrical conductors uniting said sub-stations with said central station, two or more duplicate switch-boards at the central station, upon each of which each of said conductors has an electrical connection, suitable switching devices at each board for uniting the conductors in pairs, and in close proximity to each board a separate subdivision or group of said conductors connected to a series of fixed contact-points, a movable contact forming the terminal of a fragment of conductor containing a receiving-telephone, and means for imparting a progressive movement to said movable contact, whereby the said movable contact is carried into connection with each of said fixed contacts periodically and successively.

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DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

COMMISSIONER'S DECISIONS.

McDONOUGH *v.* GRAY *v.* BELL *v.* EDISON.

Decided February 23, 1889.

STATEMENT.

Statement of the litigation growing out of the several interferences declared between the patents granted to A. G. Bell and the applications of later applicants; the inventions distinguished and compared with the previous state of the art, and the decisions rendered by the various tribunals in the Office considered and discussed.

1. GRAY'S PETITION TO REOPEN.

Held that the petition "is of no avail for any purpose whatever;" that Gray proposes no new evidence as to dates, nature, or the character of his own invention; that it was conclusively shown in the evidence that Gray, at the time of filing his caveat, while having a conception of the telephone, did not understand the invention, and was unable to explain the mode of its operation; that he adhered to the idea that articulate speech must be transmitted upon the multiple-telegraph principle; that he positively conceded that he did not reduce his invention to practice for a long time after the issuance of patent to Bell; that he regarded the invention patented to Bell as trivial, and called it a "scientific toy," and turned his attention to other and, in his opinion, more important inventions; that he negligently omitted to file his application for a patent until two years after the grant of Bell's patent, and was then stimulated to do so only by other parties, who had acquired an interest in his inventions; and that his present petition, filed without notice to the adverse parties, was delayed for 3 years and 5 months after the decision of the Examiner of Interferences awarding priority to Bell, and was then accompanied by a request that it should not be acted upon until further motion was made.

2. CHARGES OF FRAUD.

For reasons stated, the charges in Gray's petition that Bell had fraudulently secured access to his caveat, purloined his invention, and interpolated a description thereof in his application *Held* not sustained.

3. PRIORITY OF INVENTION AND VALIDITY OF BELL'S PATENT.

Held that the decision of Commissioner Butterworth, of March 3, 1885, was elaborately considered and deliberately rendered, and that a rehearing could only be justified upon clear and satisfactory evidence showing in such decision error in the conclusions of fact or in the application of the law, and that evidence could be produced establishing that Gray could antedate Bell's invention, that he could prove a prior conception and reduction to practice, or that, having made an earlier conception, he had diligently prosecuted it to a reduction to practice. In the absence of showing the existence of such evidence, upon the testimony filed before and considered by the various tribunals in the Office, *Held* that "the award of priority of invention was justly given to Bell," and, in view of the construction given by the Office and the courts to the patent, the grant was properly issued, and the protection afforded the inventor was authorized.

4. EXTENDING THE MONOPOLY.

The public has a direct and immediate interest in the further prosecution of Gray's application for a patent. If the award of priority given to Bell can be vacated and set aside, it should only be done upon a showing of merits that would entitle Gray to a patent. Such patent would run for a period of 17 years from its date, and would dominate and control all devices relating to the telephone for another period of 17 years. The effect would be to subject the public to a renewed monopoly in all nearly, if not quite, thirty-four years. Such result would be in contravention of the spirit of the statute, and, in view of the liberal provisions of the patent system, cannot be tolerated except when the inflexible rules of law and justice compel it, especially in the present case, wherein it is clearly shown that the Bell Company is the "equitable if not the legal owner of Gray's telephone inventions."

5. TITLES AND RIGHTS UNDER ASSIGNMENTS.

The Commissioner has no equitable jurisdiction over the rights of parties claiming under assignments and grants of inventions and patents. He cannot set aside or vacate such instruments, nor can he recognize equitable rights growing out of transactions between inventors and applicants and other parties. While the Commissioner is authorized to recognize formal legal assignments, and when they have been filed in the Patent Office before patent issues may give the assignee control of the management and prosecution of an application and direct the patent to issue in the name of the assignee, yet he cannot recognize equitable rights under executory or other equitable contracts; but where the relief asked, as in a petition for rehearing, is founded upon an alleged state of the title to the invention, the Commissioner possesses the power to determine the allegation as to title in order to exercise his discretion in granting or refusing the relief.

6. MCDONOUGH'S PETITIONS.

As to the petition of McDonough that he be allowed to demonstrate the operativeness of the make-and-break principle, the Commissioner holds the decisions of his predecessors are conclusive on that question; that McDonough never claimed to be the original inventor of the telephone, but a mere improver upon Reis's instruments; that he accepted and still accepts the make-and-break system of Reis as the foundation of his invention; and, in view of the settled judgment of the Patent Office that speech cannot be transmitted by an instrument which operates solely by the making and breaking of the circuit, and also in view of the fact that the Supreme Court of the United States has also definitely settled this question with reference to Reis, he must regard the matter *res adjudicata*.

7. NO INTERFERENCE BETWEEN MCDONOUGH AND BELL.

As to the petition to reopen on the merits, the Commissioner holds that McDonough's original claim for the receiver having been rejected on reference to Bell's patent, and he submitting thereto and canceling the claim, and McDonough having been brought into the interference in consequence of the later applicants, so as to compel them to establish an earlier date of invention than himself, it follows, inasmuch as there could have been no interference between McDonough and Bell alone, that when Gray and the other later applicants were defeated and taken out of the interference there could be left no contest between McDonough and Bell.

8. CLAIMS VOLUNTARILY CANCELED.

Whether an applicant who has voluntarily eliminated his claims and apparently abandoned them should be permitted, after the invention has been publicly introduced and made commercially valuable, to return after 11 years and amend and claim an interference with a patent so long outstanding is a serious question, and the right to the relief should be most convincing.

9. PETITIONS DENIED—INSUFFICIENT SHOWING.

Petitions denied because the showing is deemed insufficient to justify the Commissioner in setting aside former decisions and decrees, since he is fully convinced that another trial on the question of priority would result in another award in favor of Bell.

PETITIONS of Elisha Gray and James W. McDonough to amend and to reopen.

TELEPHONES.

A. G. Bell, Patent No. 174,465, granted March 7, 1876,

on application filed February 14, 1876. A. G. Bell, Patent No. 186,787, granted January 30, 1877, on application filed January 15, 1877. Elisha Gray, applications Nos. 1, 2, and 3, filed October 29, 1877. James W. McDonough, application filed April 10, 1876.

Mr. James J. Storrow and *Mr. Roscoe Conkling* for Bell.

Mr. Robert G. Ingersoll and *Mr. Frank H. Hurd* for McDonough.

Mr. M. B. Philipp and *Mr. Casey Young* for Gray.

HALL, *Commissioner:*

On the 26th of March, 1878, a series of interferences, lettered from A to M, were declared, and by an order of the Commissioner, dated March 6, 1879, case H was consolidated with case F and case K was merged in case I. By a stipulation between the parties thereto it was agreed that case No. 1 of a series of six interferences, declared August 14, 1879, should be proceeded with and presented in connection with the lettered series. In September, 1880, case M was suspended by consent. Owing to the complex nature of the inventions and the variety of detail of events involved in the controversy the issues were tried together upon the evidence taken by the respective parties, so far as it was relevant to the several issues.

The parties originally involved in one or more of the issues were A. G. Bell, James W. McDonough, T. A. Edison, E. Berliner, G. B. Richmond, E. Gray, A. E. Dolbear, A. G. Holcombe, C. E. Chinnock, C. A. Randall, F. Blake, J. H. Irwin, and G. M. Phelps. W. L. Voelker was made a party to case No. 1 November 3, 1879, and cases A and B December 29, 1879.

Prior to the date on which the cases were submitted to the Examiner of Interferences decisions had been rendered against Richmond, (except as to case C,) Holcombe, Randall, Phelps, Chinnock, and Berliner, so that they were no longer parties to the controversy.

The evidence presented to the Examiner of Interferences was contained in 5 volumes: I. Testimony on behalf of Edison. II. Exhibits of Edison. III. Testimony on behalf of Voelker, Irwin, Gray, Dolbear, McDonough, Blake, and Bell. IV. Vol. 1 of the record in the case of the *Bell Telephone Company* v. *Dowd*, comprising Bell's answers and proofs introduced by stipulation. V. Vol. 2 of the record in the Dowd case, comprising exhibits, &c.

The taking of evidence was practically concluded in May, 1881. The case was argued before the Examiner of Interferences, and fully submitted to him in October and November, 1881. He held the case under advisement until July 21, 1883, when he filed his decision, which covers 348 pages of closely-printed matter. In cases A, B, C, E, F, I, J, and L he awarded priority of invention to Bell; in cases D and No. 1 to Edison, and in case G to McDonough. From this decision of the Examiner of Interferences Edison appealed to the Examiners-in-Chief in cases A, B, C, G, J, and L. Voelker appealed in cases A and B and No. 1. Bell and Gray appealed in case G, and Irwin in case No. 1. This relieved the controversy of cases D, F, and I, which remained finally disposed of by the decision of the Examiner of Interferences.

After having held the cases under advisement nearly a year the Examiners-in-Chief, on October 23, 1884, rendered a decision affirming the decision of the Examiner of Interferences as to all of the issues except issue G, as to which they reversed him and awarded priority to Bell. From this decision Voelker appealed to the Commissioner as to issues A and B, but Gray aquiesced therein and took no appeal. McDonough and Gray appealed as to issue G.

Pending the appeal before the Commissioner, McDonough, on December 19, 1884, presented a motion—

to have the above-mentioned interference (G) reopened in order that I may be permitted to introduce proof before the proper tribunal as to the operative character of the telephone-transmitter shown in my application of April 10, 1876, involved herein, and for such other and further action in the premises as may be rendered necessary.

The grounds of the motion were that the Examiners-in-Chief had held that a make-and-break apparatus such as McDonough described was incapable of transmitting articulate speech; that this was at variance with the action of the Primary Examiner in declaring the interference, who must have found the apparatus to have been an operative one, and because, under the rules, the only method of raising the question of operativeness was by reference to the Primary Examiner. After full argument this motion was denied by the Commissioner on January 16, 1885.

On March 3, 1885, the Commissioner filed his decision affirming the action of the Examiners-in-Chief as to all issues. This was a final award of priority in favor of Bell upon all the issues involved.

Nothing further appears to have been done by any of the parties in the interferences until December 30, 1886, when there was received by the Office the following petition of Gray:

To Hon. M. V. Montgomery, Commissioner of Patents:

Elisha Gray, one of the parties to the above-stated proceedings, brings this, his petition, to set aside the various orders, decisions, and judgments heretofore made and rendered therein, and to reopen the same upon the following grounds, viz:

I.

Upon the ground of newly-discovered evidence, important and material in its character, and which would, as petitioner believes, have changed the various orders and judgments made and rendered in the progress of, and upon the final hearing of, said interference proceedings, if the same had been presented at the proper time to the officers of the Patent Office having them in charge and passing upon the matters and things pertaining thereto, and which evidence was not known to petitioner to exist, nor did he have any reason to suspect that it did, until long after the final decision in said interference proceedings was rendered against him, and in favor of A. G. Bell, upon nearly all the material issues therein involved; and therefore no laches can be imputed to him in not having earlier discovered and presented the same.

II.

The said newly-discovered evidence will, as petitioner is informed and believes, establish the following facts, viz: That on or about the 1st day of March, 1876, A. G. Bell, the successful party in said interference proceedings, went to the Patent Office, and by undue and unlawful means and influences procured full knowledge of the contents of, and drawings attached to, a certain caveat, accurately describing a speaking-telephone, then recently (viz., on the 14th day of February, 1876) filed by petitioner, and upon which caveat, and the invention therein set forth, and the apparatus therein described, were based the three (3) several applications for patent for a speaking-telephone afterward filed by petitioner and involved in said above-mentioned interferences.

III.

By the knowledge thus obtained, in violation of law and the rights of petitioner, the said Bell was enabled to construct an apparatus, a few days afterward, by which he succeeded in transmitting articulate speech, and which apparatus, so constructed in exact accordance with the drawings attached to and the description and specification set out and contained in petitioner's said caveat, he, the said Bell, subsequently claimed was the apparatus set out, described in, and covered by an application which he had filed in the Patent Office on the said 14th day of February, 1876, purporting on its face to be an application for patent for "an improvement in telegraphy," but was never in any way claimed by the said A. G. Bell to be for a speaking-telephone, nor recognized as such by any one else, until long after a patent had been issued thereon, on the 7th day of March, 1876, numbered 174,465, and which was involved in the aforesaid interference, while in fact no one of the devices or apparatuses set out and described in the said application never had previous thereto and never since, as petitioner is informed and believes, been made to transmit articulate speech.

IV.

It was not until after the time and the occurrences above narrated that the said Bell claimed he had invented the speaking-telephone, or that he had mentioned, described, or claimed any such invention, or any device or apparatus constituting a part thereof, in said application filed on the aforesaid 14th day of February, styled an "improvement in telegraphy;" and the fact is that the said Bell did not, in his said application, describe or claim any apparatus or device that could or can be made to operate as a variable-resistance telephone for the transmission of articulate speech; but by reason of having wrongfully and illegally obtained information as to the nature and contents of petitioner's aforesaid caveat, and of being thereby enabled to construct an apparatus theretofore unknown to and never previously conceived of by him that would transmit speech, and which apparatus he forthwith claimed as his own, the officers of the Patent Office were induced to adjudge him to be the first and original inventor of the speaking-telephone, as against petitioner and others, because, as it was then believed, by reason of the above-recited fraudulent acts upon the part of the said Bell, he had first reduced the same to practice, though it was found and so reported by the Examiner of Interferences that he was not otherwise entitled to claim, or have awarded to him, priority over petitioner as to the said invention; and it was further found and so reported by said Examiner of Interferences that petitioner lost whatever right he might have had and secured under his said caveat to be adjudged the first and original inventor of said art of telephony as against said Bell, because of his own laches in not completing and reducing it to practice before the same was done by him, the said Bell.

V.

Petitioner further shows that by reason and in consequence of the aforesaid wrongful and fraudulent acts and doings upon the part of the said Bell, together with certain other irregular and illegal proceedings, hereafter to be set out, had and taken in the Patent Office concerning and in respect to his aforesaid caveat and the application of the said Bell, he, petitioner, was deceived and misled as to his real legal status in the Patent Office in respect to the speaking-telephone and as to his rights in relation thereto acquired by virtue of having filed his said caveat, and which rights were subsequently involved in the interferences aforesaid; and by being so deceived and misled he failed and neglected to take such action and to obtain and present such proof in the beginning and during the progress of said interferences as he would otherwise have done, and which would, as he believes, have secured a judgment in his favor upon all the material issues involved therein, instead of being given in favor of said Bell; and among the said irregular, wrongful, and illegal acts and doings petitioner submits the following, to wit:

VI.

The aforesaid caveat of petitioner and application of said Bell being filed in the Patent Office on the same day, to wit, the 14th day of February, 1876, without any noting of the hour at which the respective filing occurred, the same was entitled to and should have been considered as a simultaneous act; and when said caveat and said application came for action before Z. F. Wilber, the Primary Examiner to whom they were referred, he held and decided in accordance with the law and practice in that behalf, which had always theretofore prevailed in and governed the action of the Patent Office, that they were filed simultaneously, and that therefore said application should be suspended for ninety days, and that petitioner was entitled to notice of the pendency of said application, and to be also notified to complete the invention set out in his said caveat within the time prescribed by law; and the said examiner did, pursuant to law, give such notice to petitioner. But, contrary to and without authority of law, he also notified said Bell of the pendency of petitioner's caveat, informing him, at the same time, that it appeared to interfere with certain designated parts of his application. Upon the *ex parte* application, however, of the said Bell, through his attorneys, Messrs. Pollok and Bailey, the aforesaid decision of the said Wilber was reversed, and it was then decided, without the taking of any competent and sufficient proof and without notice to the petitioner, that his caveat was filed some hours later in the day than was the application of the said Bell. Whereupon the notice given petitioner to complete his said invention was withdrawn; and soon thereafter, to wit, on the 7th day of March, 1876, a patent was issued, on the aforesaid application, to the said Bell, without models having been filed by him, as required by law, of the different devices or apparatuses claimed to be set out and described therein, and without his ever having shown and demonstrated to the officers of the Patent Office, or to any one else, that the same were in any way fitted for or capable of performing the functions of a speaking-telephone. By all of which petitioner says the rules of the Patent Office were disregarded, the law violated, and great injustice done to him.

VII.

And petitioner further shows that said interferences should be reopened and set aside for further proceedings therein, because the same were wrongfully instituted, as aforesaid, and were not conducted in good faith, with a view to reach the real merits thereof, but were collusive and simulated in this: That before any proof had been taken in said interferences, or any substantial progress had been made in the same, those to whom the said Bell had previously transferred the ownership of the two patents involved, namely, patents numbered 174,465, and 186,787, acquired, or supposed they had acquired, by assignment, all the other patents and applications for patents (which were thought to possess any value) that had been put in interference with those of petitioner and of others; and among the patents and applications so acquired, it was supposed, by the aforesaid owners of the two abovementioned patents of the said Bell, that the alleged interfering applications of petitioner were included; and petitioner being under a misapprehension in that regard, brought about by no act of his, supposed this to be true until long after the proceedings in said interferences were ended in the Patent Office.

VIII.

From the time these patents and applications were acquired, or supposed to have been acquired, as aforesaid, the interference proceedings in respect thereto, as between those representing the interest and claims of the said Bell and petitioner and certain other of the defendants, were mainly under the management and control of those who had acquired the aforesaid interest therein, and with the view of reaching such results as they desired, they paying, as petitioner is informed and believes, the counsel on both sides, as well as other necessary expenses.

IX.

And as a further and additional ground upon which petitioner submits that the various decisions made in the progress of said interferences should be set aside and the same reopened is the following: That the patent of the said Bell, numbered 174,465, was adjudged by the officers of the Patent Office to be for a speaking-telephone, and that it described an apparatus therefor, not upon any evidence presented to establish that fact, but because it had been so held and adjudicated in a consent decree taken and entered in a certain collusive suit known as the "Dowd" case, in which the same party, to wit, the American Bell Telephone Company, who had represented the interest of the said Bell in the aforesaid interferences, was the complainant, and one Peter A. Dowd was the nominal defendant; and in the progress of the same the parties thereto consolidated their interests, and a consent decree was entered in favor of the complainant, the American Bell Telephone Company, it paying the counsel fees on both sides of the case, together with all other costs and expenses of the same, as petitioner is informed and believes. Under authority of this collusive adjudication the officers of the Patent Office held that the aforesaid patent of the said Bell, numbered 174,465, should be put in interference with the applications of petitioner, though it was also held that said patent did not describe a speaking-telephone, and that but for said adjudication it could not and would not have been put in interference as aforesaid.

X.

Petitioner asks that said interferences be reopened, upon the further ground that the officers of the Patent Office erred in putting the aforesaid patent of the said Bell in interference with the applications of petitioner as to the broad art of telephony, in this, that the said patent contains no description, specification, drawings, or claim that would inform any one that it in any way relates to the art of transmitting articulate speech by any means pointed out or suggested therein; but it plainly appears upon the face thereof that it was intended alone for an improvement in telegraphy. And in this, that the apparatus which is described in said patent, and shown in the drawings attached thereto, is in no way like that set out in petitioner's application, and shown in the drawings thereof, but is of entirely different construction, and operates, if it will operate at all for any purpose, upon a wholly different principle.

XI.

And petitioner further says that the officers of the Patent Office especially erred in awarding priority to said Bell in issue G of said interferences, as against him, petitioner.

XII.

And, finally, petitioner moves the honorable Commissioner to set aside said interferences, upon the further ground that the various orders, decisions, and final judgment had and rendered therein are not supported by the evidence, nor warranted by the law applicable thereto.

XIII.

Therefore, petitioner brings this his petition, with accompanying affidavits, proofs, and exhibits, in support of the allegations therein set out and contained, and prays that the various orders, decisions, and final judgment made and rendered in said interferences be set aside, and that the same be reopened, to the end that such other and further proceedings may be held in respect thereto as shall seem to the honorable Commissioner to be just and lawful in that behalf.

ELISHA GRAY.

M. B. Philipp, attorney for petitioner.

District of Columbia, United States of America:

Before me, A. S. Taylor, a notary public in and for said District, this day personally appeared Elisha Gray, who made oath that the statements contained in the foregoing petition are true, to the best of his knowledge, information, and belief.

Sworn to and subscribed before me this twenty-fourth day of December, A. D. 1886.

[SEAL.] A. S. TAYLOR,
Notary Public.

[Endorsement.]

Office of Commissioner of Patents. Received Dec. 30, 1886, Petition of Elisha Gray to reopen the telephone interferences between himself, A. G. Bell, and others.

The petition is presented by Hon. Casey Young, with the statement that Mr. Philipp, counsel in the case, does not desire to have it acted upon until he shall hereafter present a formal motion asking therefor.

M. V. MONTGOMERY,
Commissioner.
Dec. 30, 1886.

No formal motion was subsequently presented by Gray asking for any action on the above petition, nor was any motion served by Gray upon Bell or other party of the filing thereof or that action would be asked. It was not until a general order of the Commissioner was made applicable to all old cases pending in the Office, to prevent delays and the prolongation of monopolies, that this petition was brought to the knowledge of the present Commissioner, and under his direction it was set down for disposition on February 1, 1888, and Bell and other parties notified.

February 18, 1887, an order was made by Commissioner Montgomery suspending action in Gray's case No. 3. Why this order was made, or upon what reason, does not appear. It was made in case No. 3 as *ex parte*.

February 23, 1887, Gray presented a proposed amendment in case No. 3, which was not entered in the case.

On April 4, 1887, Gray presented another amendment in case No. 3, which was not entered, but which is now before the Commissioner as an *ex parte* case. The amendment covers the metallic diaphragm.

March 2, 1887, McDonough filed in the interference case two petitions, as follows:

I hereby move for an order for reopening the above-entitled interference, with leave to furnish proofs in regard to the operativeness of my teleloge as a speaking-telephone; and respectfully present the following as the grounds for this motion:

I.

That the Commissioner of Patents, when the said interference was under argument on its merits, erred in receiving, at the instance of the assignee of the contestant Bell, and in considering, certain depositions, or what purported to be copies of certain depositions, of Professors Brackett and Young, taken as a part of the evidence in the suit of the American Bell Telephone Company against the Overland Telephone Company, but forming no part of the interference record.

II.

The Commissioner of Patents erred in that he heard and decided the interference with the avowed determination, as expressed in his opinion, not to determine the issue adversely to the owners of the Bell patent, it being explicitly stated by him in such opinion that if he had become convinced that the Board of Examiners-in-Chief were wrong in their judgment in awarding priority to Bell he would have declined to reverse such judgment. His exact language was as follows: "If, on examination of the evidence in consideration of the arguments, I had become convinced that the finding and decision of the Examiners-in-Chief were erroneous, or if a serious doubt in that behalf had been raised in my mind, I would have felt constrained to leave the case undecided, to be reheard by my successor."

III.

The Commissioner of Patents erred in that, instead of deciding the question of priority involved in the interference he did not either dissolve the interference (so far, at any rate, as Bell and myself were concerned) or else suspend it, and institute a special investigation as to the operative character of my "teleloge" as a speaking-telephone.

In deciding the motion to reopen the interference, in order to permit me to adduce proof as to the operative character of my telephone, heard by the Commissioner of Patents January 15, 1885, and refused by him in an opinion rendered on the following day, he said as follows: "If, on the hearing of this cause, I should ascertain that there is doubt about the operativeness of this device, and the question of priority should turn wholly on that point, and through inadvertence, mistake, or surprise the evidence was not full and satisfactory, so as to enable me to reach a right conclusion without further evidence, such proceedings could be taken in that behalf as might be fit and proper to ascertain the truth. My opinion is that the case should proceed. If it occurs that further investigation shall become necessary, it is not only within the power, but it would be the duty of the Commissioner, to make such inquiry by means best calculated to ascertain the exact fact."

In view of this ground of denying the then motion to reopen, it was error for the Commissioner, subsequently, in considering the interference on its merits, to find (as it fully appears, from an inspection of his opinion in the premises, he did find) that the operativeness of my apparatus was a controlling factor in determining the question of priority, and at the same time not to take proper and effectual steps for the full investigation of that question, particularly in view of the fact that at the time of taking the testimony in the interference no issue was made between the parties as to the operativeness of my teleloge, neither Bell nor any other of the contestants having offered evidence to rebut the proved facts in regard to the actual transmission of speech by means of the instrument, or even theoretically in regard to its capability to transmit speech.

The Commissioner erred specially, in that, finding that the operativeness of my teleloge was vital to the determination of the question of priority, he allowed his mind to be influenced, in the settlement of this fundamental question, by the introduction into the case of matter taken from depositions that formed no part of the record, and as to which no opportunity was, or under the circumstances could be, afforded me to cross-examine the witnesses.

That the depositions thus wrongfully introduced and considered had a controlling influence upon the Commissioner's decision appears from his opinion, in which he says: "I have considered the affidavits of Professors Young and Brackett, *in connection with the evidence given by them in the case of the American Bell Telephone Company v. The Overland Telephone Company of New Jersey*," (being the depositions of which it is alleged that they wrongfully introduced.) "Taking the evidence of these two scientists as a whole, I cannot find that they have demonstrated, or that they unqualifiedly affirm, the fact to be that a telephone using the make-and-break system as contemplated by McDonough will transmit articulate speech within the terms of the issue. It transpires in the cross-examination of those learned gentlemen" (in the depositions that form no part of the interference record, and in which I had no opportunity to cross-examine them) "that they assume," &c.

IV.

The Commissioner of Patents erred in that, in considering McDonough's invention of the teleloge, as described in his application of 1876, he failed to distinguish between the *actual invention* therein described and the *theory* therein presented, in regard to the operation of the apparatus that constitutes the real invention.

V.

The Commissioner erred in holding that the underlying principle of my teleloge was that it should operate by a "palpable" make-and-break system.

VI.

The Commissioner erred in not making award of priority as between me and Gray, it being upon the claim of the said Gray that the interference was based.

VII.

The Commissioner erred in holding that my teleloge was inoperative to transmit speech.

VIII.

The Commissioner erred in holding (as in substance he did hold) that a telephone constructed on the make-and-break system will not talk, as is abundantly shown by the subsequent practice of the Patent Office in granting patents, special reference being made in this connection to the patent of Bonta, No. 333,810, January 5, 1886.

IX.

The Commissioner erred in awarding priority of invention to Bell, such decision being contrary to the law and the facts of the case, and contrary to sound practice.

Wherefore, I respectfully petition the honorable the Commissioner of Patents for an order reopening the aforesaid interference, or for such other or such further relief in the premises as to your honor may seem meet and proper, and may be just and equitable.

JAMES W. MCDONOUGH.

State of New York, City and County of New York, ss:

I, James W. McDonough, being duly sworn, depose and say that I am the person whose application for a patent for a teleloge (filed April 10, 1876) was involved in the interference above named; that I am advised and verily believe that an injustice has been done me by the decision in the said interference awarding priority to Mr. Bell; and that the above are good and sufficient reasons for reopening the interference.

Subscribed and sworn to before me, this second day of March, 1887.

[SEAL.] ROBT. F. GAYLORD,
Notary Public, (168,) *N. Y. Co.*

[PETITION OF ASSIGNEES.]

Your petitioner, J. W. McDonough, a resident of the city and State of New York, and one of the parties to the above-stated interference proceedings, brings this petition, and respectfully asks that the aforesaid interference proceedings be set aside, and the various orders, decrees, and judgments rendered therein be vacated and annulled upon the following grounds, viz:

I.

Because the same were not conducted in good faith, as petitioner believes, and charges were fraudulent and collusive, and carried on with the purpose and intention of securing an award in favor of Alexander G. Bell upon all material issues therein involved.

II.

Because all of the orders, judgments, and decrees taken and held in said proceedings, in so far as priority of invention as to the speaking-telephone was awarded to Alexander G. Bell, were erroneous, and not supported by either the law or the facts applicable to the same.

III.

Because the proof does not show that Alexander G. Bell was the first and original inventor of the speaking-telephone, or any material or necessary part thereof, but, on the contrary, the evidence shows that petitioner was himself first and original inventor as against the said Bell and the other parties to the proceedings.

For the reasons above stated and others to be hereafter presented, petitioner prays that said interference proceedings may be reopened, and the different orders, judgments, and decrees made and entered therein be vacated and annulled, and that all the issues therein involved be heard *de novo*.

FRANK H. HURD,
Attorney for E. S. Stokes and the North American Telephone Company, Assignees of J. W. McDonough.

District of Columbia, ss:

Personally appeared before me, this second day of March, A. D. 1887, Frank H. Hurd, who, being duly sworn, says that the aforegoing petition is true, to the best of his knowledge and belief.

FRANK H. HURD.

Sworn and subscribed to before me,

[SEAL.] CHAS. S. BUNDY,
Notary Public, D. C.

It will be seen that the first of these motions seeks two kinds of relief: *first*, to have reopened the interferences and permit McDonough to take additional evidence as to operativeness; *second*, to have set aside the decision of Commissioner Butterworth of March 3, 1885, on the merits, and to have a new trial granted. On March 17, 1887, this motion was submitted to Commissioner Montgomery, who, on March 29, 1887, filed a decision holding that as to the first branch of the motion he was concluded by Commissioner Butterworth's decision of January 16, 1885, which rendered the matter *res adjudicata;* but as to the second branch of the motion, the right to move to set aside the decision of Commissioner Butterworth of March 3, 1885, on the merits of the interference, remained, unless it had been lost by laches. The decision concludes as follows:

First. That McDonough has a right to be heard on the subject of vacating the award of priority made by Commissioner Butterworth, and such hearing is hereby fixed for the nineteenth day of April next, at twelve o'clock noon, at which time the petition filed on the 2nd instant by the assignee of McDonough, and which petition is not under consideration at present, will be called up for hearing.

Second. I must decline to entertain that part of the present motion which is but a repetition of the one which was passed upon by my predecessor.

This proceeding was conducted wholly independent of Gray's petition and proposed amendment, the former lying dormant, as before explained.

This motion of McDonough for a rehearing was not heard on April 19, but was continued from time to time until February 1, 1888. In the meantime Gray's amendment was a second time referred to the Primary Examiner for report. Bell was allowed to be heard, and on July 14, 1887, the examiner reported adversely to admitting the amendment. Subsequently Bell moved that the further hearing of Gray's motion to amend be postponed until after the Supreme Court should dispose of the telephone cases then pending before that tribunal. This motion was denied on November 23, 1887, and this decision advised Bell for the first time that Gray had filed a petition to reopen and set aside the interferences.

Gray's motion to amend was submitted before the Commissioner on December 1, 1887, and the argument of this motion resulted in causing the McDonough petitions and the Gray petition to be set down for disposition February 1, 1888. Gray made no request to have his petition so set down, nor did he do anything to have his petition called up for action. As previously stated, when the Commissioner ascertained that such a petition was on file it was deemed that the public interest required that it should be disposed of without further delay. It was accordingly directed that notices issue fixing February 1, 1888, as the date of hearing. At that date parties appeared, the presentation of the McDonough petition began, and that of Gray's petition followed the conclusion of the former.

It has been deemed important to recall and set out this history of these proceedings, not only for the better understanding of the merits of questions involved, but because they characterize the conduct of the parties, to some extent, as to laches or diligence, which may affect to greater or less extent the merits.

The proposed amendment of Gray in case No. 3 has been disposed of separately as an *ex parte* case. Reference to it here is due to its intimate relations with the matters now under consideration.

The McDonough and Gray petitions must be considered separately; but there are matters common to both which may be presented before entering upon them.

THE ISSUES.

The issues in these interferences are as follows:

A.

The hereinbefore-described art of transmitting and reproducing at a distance sonorous waves or vibrations of any description, which consists in increasing and decreasing the strength of an electric current, traversing a circuit in such a manner as to produce in said circuit a series of electrical waves or vibrations precisely corresponding in their intervals of succession and relative amplitudes to the sonorous waves which are to be reproduced at the receiving station or stations, so that oral conversations or sounds of any description may be telegraphically transmitted.

In this interference was Gray's case No. 1, the subject-matter being that of his first claim, the Bell patent of March 7, 1876, and, among other applications, those of Edison, filed April 27, 1877, No. 130, Emile Berliner, filed June 4, 1877, and A. E. Dolbear, filed October 31, 1877.

B.

The hereinbefore-described improvement in the art of transmitting vocal sounds or spoken words telegraphically, which consists in throwing upon the line through the medium of a varying resistance electric impulses corresponding to the vibrations of a diaphragm operated by the movements of the air produced by a spoken word.

In this interference was also Gray's case No. 1, the subject-matter being that of his second claim, the Bell patent of March 7, 1876, and, among other applications, those of Edison, filed April 27, 1877, No. 130, and Berliner, filed January 4, 1877.

C.

First. The transmitter consisting of the combination, in an electric circuit, of a diaphragm and a liquid or equivalent substance of high resistance, whereby the vibrations of the diaphragm cause variations in the resistance of the electric circuit, and consequently of the strength of current traversing said circuit.

Second. In a telegraph-instrument operated by sound, the combination, with the diaphragm, of two or more electrodes placed in electrolytic liquid and operating to increase and decrease the resistance of the electric circuit by the movement derived from the diaphragm.

In this interference was Gray's case No. 2, the first part of the subjects-matter being that of his first claim, the Bell patent of March 7, 1876, and, among other applications, that of Edison, filed September 5, 1877, No. 144, the second part of this subject-matter being that of his first claim.

E.

In an acoustic telegraph, an armature-plate, the electro-magnet for the same, and a closed circuit passing from the helix of such electro-magnet to the source of undulatory electric energy.

In this interference was Gray's case No. 3, the Bell patent of March 7, 1876, and, among other applications, one of Edison, filed December 13, 1877, No. 145, and that of Dolbear, filed October 31, 1877.

F.

A telephonic transmitter consisting of a coil of wire, one or more magnets, and a disk or diaphragm so arranged relative to each other that a motion of the diaphragm shall induce in the coil of wire an electro-motive force in virtue of the pressure of the magnet or magnets.

In this interference was Gray's case No. 1, the Bell patent of March 7, 1876, and, among other applications, that of Dolbear, filed October 31, 1877.

G.

A telephonic receiver consisting of the combination, in an electric circuit, of a magnet, and a diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced accurately as to pitch and quality.

In this interference was Gray's case No. 3, the Bell patent of March 7, 1876, and, among other applications, that of Dolbear, filed October 31, 1877, one of Edison, filed December 24, 1877, No. 148, and one of James W. McDonough, filed April 10, 1876.

H.

The combination in one circuit of two or more coils of wire, two or more magnets and two or more disks or diaphragms so arranged relatively to each other that if one of the disks or diaphragms be put in motion by the voice, by a current of air, or otherwise, it shall induce a transient current of electricity in its associated coil, which current shall actuate the other disks or diaphragms in virtue of the coil and magnets associated with them.

In this interference was Gray's case No. 1, the Bell patent of March 7, 1876, and, among other applications, that of Dolbear, filed October 31, 1877.

J.

The combination, with an electro-magnet, of an iron or steel diaphragm secured to a resonant case for rendering audible acoustic vibrations.

In this interference was Gray's case No. 3, Bell's patent No. 186,787, of January 30, 1877, on application filed January 15, 1877, also applications of Edison and Dolbear.

The other issues are of no importance.

After the declaration of these interferences a motion was made by Bell to consolidate them, which motion was denied by the Commissioner, because the motion was made *ex parte*, the other parties not being notified. (See *Bell* v. *Gray*, 15 O. G., 385.)

A second motion was made by Bell to re-form the issues or consolidate them. This motion was resisted by both Gray and McDonough, and was denied by the Commissioner on March 6, 1879. (See *Bell* v. *Gray*, 15 O. G., 776.) In this decision Commissioner Paine very clearly defined and construed the issues, and that construction has been recognized in all subsequent decisions both of the Office and the courts.

The Examiner of Interferences rendered a most elaborate and exhaustive decision, in which he set forth the state of the art, settled what efforts had been made by the respective parties in the direction of the invention of the subjects-matter of the several issues, and the dates thereof, determined the facts relative to each, gave his construction to the issues, and awarded priority, as hereinbefore stated. This decision, with the single exception of the construction of issue G and consequent award to McDonough, has stood the test of all subsequent investigations, and as a determination of the facts of the case is, in my judgment, unassailable. No tribunal proceeding upon the evidence before the Examiner of Interferences would ever reach any other determination of facts.

THE STATE OF THE ART.

The decision of the Examiner of Interferences has not been officially published. I might, perhaps, be justified in setting forth his statement of the state of the art at the time the several parties to these interferences came into the Office, but it would doubtless take more space than would be best, and I shall therefore content myself with a brief statement.

Morse's patent for a method of telegraphy was issued in 1846, and reissued in 1848. Prior to that various modes of telegraphing and making signs and signals by means of electricity had existed from as early a date as 1787. This had been accomplished by means of the movements of pith-balls, electric sparks, &c., but the results of these methods were evanescent. The state of the art in this respect is concisely set forth in Morse's specifications. (See statement of the case in *Morse* v. *O'Reilly*, 15 How., 86.) But Morse invented a method by which stable or permanent signals or characters could be telegraphed. His method involved an electric circuit that could be closed and opened (make-and-break) and a piece of iron that could be magnetized and demagnetized. The ordinary Morse telegraph is well understood.



The elements required were a battery and circuits; a key to be manipulated with the hand; a piece of soft iron in the shape of a horseshoe-magnet, around which passed the line-wire of the circuit, and an armature within the field of the magnet suspended on a spring. When the hand pressed upon the key and closed the circuit, the iron was magnetized and the armature was attracted to it, causing the pin to impress a dot or dash upon a scroll of paper, depending upon the length of time the circuit was closed. The click of the armature as it came in contact with the magnet also indicated the signals—the dots and dashes—and soon experienced operators became able to read the sounds of the instrument.

Here we have all the rudimentary parts from which have been evolved and developed the telephone. There are the transmitter, (the key,) the electric circuit, and the receiver—the magnet and armature or plate, (or disk.) The transmitter operated upon the make-and-break principle, and yet it contained all the potential qualities of the modern microphone-transmitter. When actually open no electric current or impulse traversed the circuit; but during the brief periods when the hand pressed the metallic electrodes constituting the keys together with greater or less force the variable resistance of the microphone was actually executed, although without the knowledge of any one, for the secret possibility was unknown and unthought of. On the other hand, the armature suspended on the delicate spring unquestionably responded to and was capable of responding to not only the make-and-break variations, but also to the more delicate and imperceptible variations resulting from the variations of force by which the metallic electrodes of the keys were held together. If, instead of employing the hand to open and close the circuit, a toothed wheel had been adjusted so that the movement of each tooth should close and open the circuit, the armature would have faithfully responded. If the revolutions of the wheel were increased so that the circuit was opened and closed with a sufficient degree of speed, a tone would be produced at the transmitter and also at the receiver; but the tones would be those resulting from the mechanical clicking of the keys and the armature upon the magnet. Still it would also be true that the armature vibrating back and forth under the influence of the magnet would produce air-waves reproducing the tone, although they might be drowned or lost in those of the mechanical clicking of the armature.

Here we see the elements of modern discovery and invention. The transmitter was that of Reis—the make-and-break. The receiver was the magnet and the metallic diaphragm. In the Morse telegraph the armature responded to the mechanical opening and closing of the circuit; but it was potential of all that has succeeded. Was it only a new use of that armature when Reis, or Edison, or Bell, or Gray, or McDonough caused it to respond to the vibrations of tone? Was it a second new use when Bell, or Gray, or McDonough caused it to respond not only to pitch but to quality—articulate speech?

The invention of the Morse telegraph stimulated investigation and invention in electricity. The idea of transmitting articulate speech took possession of inventive genius in Europe and America. Instead of making and breaking the circuit with the hand or a toothed wheel, it was proposed to introduce a mechanism so delicate that the makes and breaks could be effected by the sound-waves of the human voice. The delicate mechanism which in ancient times in the temple of Delphos was set into musical motion by the mere force of the rays of the morning sun was to be

surpassed not only in the delicacy and infinite variety of movement, but the results were to be transmitted in infinite directions and to infinite distances, and to constitute the invisible bridge between mind and mind. So that Morse had given to the world a receiver of the character described and which possessed the capabilities that have since been discovered.

The Reis telephone had been given to the world. He introduced a transmitter constructed of electrodes which were opened and closed by the tone-waves of the voice or of a musical instrument operating on a delicate membrane, called the "diaphragm." His receiver consisted of an iron rod attached to a sounding-box, the rod being elongated and shortened under the influence of the rapidly-interrupted electric current, as an iron rod is more slowly elongated or shortened by the effect of heat.

As early as 1854 Bourseul had given to the world in publications suggestions as to the transmission of articulate speech, which contained descriptions of a receiver and transmitter. He said:

> The electric telegraph is based upon the following principle: An electric current passing through a metallic wire circulates through a coil around a soft piece of iron, which it converts into a magnet. The moment the current stops the piece of iron ceases to be a magnet. This magnet, which takes the name of "electro-magnet," can thus in turn attract and then release a movable plate, which by its to-and-fro movement produces the conventional signals employed in telegraphy.

Then, after adding the mode in which speech is transmitted by the vibrations of the air, he continues:

> Suppose that a man speaks near a movable disk sufficiently flexible to lose none of the vibrations of the voice, that this disk alternately makes and breaks the connection with a battery, you may have at a distance another disk which will simultaneously execute the same vibrations.

In *The Wonders of Electricity*, a publication translated from the French of J. Baile, published in 1872, there is found a further description of a receiver and transmitter. After adverting to the marvels accomplished in the transmission of thought, handwritings, and drawings, and referring to the acoustic telegraph as disclosing a new principle or discovery, he says: "Already experiments have been made for this purpose," and he proceeds to describe an apparatus resembling that of Bourseul, with the addition of an electro-magnet for giving motion to the plate in the receiver. The transmitter contains a plate, which, at each vibration, touches a small point placed in front of it, and so throws an impulse of electricity on the line, which shall cause the attraction of the second plate, whose size and quality are identical with the former, causing it to perform the same number of vibrations per second and give forth a sound "which will have the same musical value as the first. If this be perfected, a series of sounds, a tune, a spoken sentence, and conversation" may be transmitted, but as yet it has not been accomplished.

Here is a complete description of a make-and-break telephone having a receiver consisting of an electro-magnet operating upon a metallic disk placed before it. There is no occasion here to consider or dwell upon the multiple or harmonic telegraphs invented by the various parties to these interferences. They all proceeded upon the make-and-break principle, to be hereinafter considered. But the important fact to be noted is that at the date these several inventors entered upon the field of invention in respect of the transmission of speech the electric circuit was old; the Reis transmitter was old; the metallic disk or armature attracted by a magnet was old. As to the receiver, unless there were invention in applying it to harmonic telegraphy over the Morse use of it in his telegraph, or in applying it to the reception of quality over and above both, then neither Bell, Gray, McDonough, nor any one else could secure a patent for it, broadly. It was as old as, if not older than, the Morse telegraph.

At the time these parties to the interference came into the Office it was old to produce variation in the strength or volume of the electric current by means of the variable resistance, whether effected upon the principle of the microphone or the liquid of high resistance. It is also proper to say that the telephone does not depend upon a diaphragm-receiver, and that with a proper transmitter speech can be transmitted wholly without a diaphragm as an element in the receiver.

Thus when properly understood it will be seen that the telephone when invented consisted of elements which were all old, and that the invention consists in an adjustment and arrangement between these old parts by means of which a result never before reached was attained. It must also follow that not any of these old elements could be broadly claimed, but must necessarily be limited to their proper place and situation in that new arrangement and combination, and to their specific construction.

As the present petitions seek to have all the orders and decisions set aside, new evidence taken, and a rehearing upon the merits, it is necessary to a proper understanding that so much of the material portions of the decisions as relates to the claims of Bell, Gray, and McDonough be set out.

As to Bell, the Examiner of Interferences gave him as the date of his invention the date of the filing of his application. It was urged before him that Bell's application and patent, No. 174,465, did not show the invention, and that he in fact had never conceived the invention of the telephone nor reduced it to practice until after his patent issued; but the Examiner of Interferences, while evidently inclining to this view, felt concluded by the decisions of Commissioner Paine and of the courts. He says:

> Upon the evidence presented it must be held that the subject-matter of this interference * * * had not been invented—that is, demonstrated—by any of the parties to this interference prior to the filing of Bell's application, February 14, 1876; nor is it entirely clear that he had at that time any knowledge of a practical mode or mechanism for producing the results contemplated by the invention. But as the Office as well as the courts have determined that the patent contains a sufficient disclosure of the subject-matter in dispute, it must be held that the invention was made at least as early as the date on which he filed his application. Bell's claim does not, however, depend upon the application alone, for he was in fact and in law the first to disclose and publicly explain the principle, as well as the first to construct and use instruments not only designed and adapted to carry into effect that principle, but actually and successfully used for that purpose.

As to issue C, which covers the liquid transmitter, he says:

> While no such instruments are found described in Bell's patent, his proof as to "Exhibit 41," its description, use, and exhibition, are considered as amply sufficient to defeat the claims of Gray and Edison founded upon the facts appearing in the record, at the same time anticipating Richmond's record date of August 24, 1877.

As to Gray, the examiner finds:

> * * * He claims, however, that at this time (1867) he conceived the idea of constructing an instrument for transmitting tones "similar in its general aspects to the instruments made at a later date." As the character of these mental speculations cannot at this day be determined, and as they took no material form or expression until seven years later, they can no more be considered as affecting inventions subsequently developed than can Bourseul's prophecy regarding the transmission of speech by electricity. He does not appear to have considered the matter further until the latter part of January or first part of February, 1874, when his attention was again accidentally called to the subject by what is known as the "bath-tub experiment." His nephew was engaged in taking shocks from an induction-coil by connecting one end of the secondary coil to the zinc lining of a bath-tub and holding the other end in one hand. Upon rubbing the zinc

lining with the free hand to complete the circuit Gray noticed that a sound proceeded from under the hand at the point of contact apparently of the same pitch and quality as that of the electrotome of the induction-coil. His curiosity was aroused and he at once tried the experiment himself, and was astonished to find that by rubbing hard and rapidly he could amplify the sound, and that by changing the rate of vibration of the electrotome a corresponding change was effected in the pitch of the sound under his hand. (Int. III, 387; Dowd 1, 123.)

He says of this experiment that his attention was particularly attracted to the fact that "the quality as well as pitch and loudness could be transmitted electrically through a telegraphic circuit and received upon a common or universal receiver." (Dowd 1, 123.) Experiments were continued during February and March, using the same induction-coil and various receivers, among which was the exhibit "Animal Tissue Violin Receiver," wherein a plate of metal is substituted for the strings, and by rubbing the hand across this plate the sounds of the electrotome were produced. It was during this period, according to Gray, that he "conceived the idea of transmitting musical compositions and sounds of all kinds, including articulate speech." (Int. III, 388.) But, as would appear from the record, his energies were directed exclusively to the transmission of musical tones and their utilization for telegraphic and other purposes, no attention being given to instruments for the *reception*, transmission, and *reproduction* of articulate speech until along in February, 1876, and, although he claims to have had some conception of the *possibilities* late in the fall of 1875, (Int. III, 391; Dowd 1, 125,) he neither disclosed them to others nor clothed them in any fixed and positive form until he made the sketch for his caveat, February 11, 1876. Whatever may have been the inherent capacities of the instruments constructed in the interim, they were not designed for, nor known to be capable of, the transmission and reproduction of articulate speech, (Dowd 1, 389, 98-99; Int. III, 375-389,) nor were his transmitters either intended or adapted for the reception of sounds, but were designed to create and originate the particular sounds to be conveyed. Both Gray and Goodridge were led to *believe* that the receivers used in the winter of 1874-5 were adapted to reproduce the sounds of the human voice, (Dowd 1, 99-107-108-124,) if they could be impressed upon and transmitted by the electric current, but they were totally unaware of any transmitter capable of performing this highly important and essential task, and it was not until Gray had witnessed the successful operation of Bell's telephone at the Centennial that the possibility of using his receiver as a transmitter was suggested to his mind, as Gra frankly admits. (Dowd 1, 399.) His idea of a transmitter—and it was merely an abstract idea, such as cannot under the law be regarded as a conception—is thus stated by him, (Int. III, p. 388:) "During these experiments I observed that the quality of the sound made by the transmitter was faithfully reproduced in the receiver. This led me to the conclusion that it was only a question how to convert the aerial vibrations made by the production of any sound whatever into electrical vibrations of a similar character with respect to rate, amplitude, etc., to solve the problem of transmitting articulate speech. I was *convinced* that the receiver would reproduce articulate words inasmuch as it *seemed* to be capable of reproducing any form of vibration that I was *able* to transmit. I remember speaking of this to different ones about this time. I may have mentioned this before the first of April, (1874,) or it may have been a little while after. My impression is that I first mentioned it before. My conception then of an instrument for transmitting articulate speech was one of a complicated character, having a series of transmitting-points adapted to respond to all the tones of the human voice, somewhat similar to the apparatus referred to in my caveat of February 14th, 1876." The description contained in said caveat is as follows:

"I contemplate, however, the use of a series of diaphragms in a common vocalizing-chamber, each diaphragm carrying an independent rod and responding to a vibration of different rapidity and intensity, in which case contact-points mounted on other diaphragms may be employed."

When called upon to explain the construction of the apparatus thus ambiguously outlined, Gray confesses that it was but a general idea not clearly defined in all its details, and was based upon a theory which has since proved to be false. (Dowd 1, 135.) The instrument was never constructed by him.

Thus, by tracing this original idea of a transmitter from its conception, in 1874, to its mere mention in the caveat of 1876, we find that it amounts to nothing but an abstract speculation. Passing now to the form of transmitter described and illustrated in said caveat and the applications of October 29, 1877, we will endeavor to trace back its origin, premising, however, that Gray alone testifies as to these mental operations, for Goodridge, his assistant in all experiments during this period, when asked if Gray had ever described any instrument which he had devised for transmitting speech electrically by talking to the transmitter prior to the caveat, says, (Int. III, 371:) "I heard no description from Mr. Gray of any instrument which he had devised fully, but merely some idea or plan by which it could or might be done;" and his first definite knowledge of the transmitter illustrated in the said caveat was February 11, 1876, when the exhibit "Speaking Telephone Caveat, original sketch," was handed him for the purpose of having drawings made for a caveat. (Int. III, 396, 394.)

* * * Gray seems to have been indebted to the so-called lovers' telegraph for suggestions as to the construction of an instrument for transmitting speech electrically. "The observation in respect to the lovers' telegraph proved to my mind that the movements of a single point on the diaphragm corresponded accurately with the movements of the air produced by any spoken word or sound," (Int. III, 397,) and it was after this observation in November or December, 1875, (Dowd 1, 122,) that he seems to have abandoned his preconceived ideas of multiple diaphragms, (undoubted y intended as analyzers, each diaphragm being tuned to and adapted for the transmission of a given note corresponding to its fundamental or normal rate of vibration,) and to have fixed upon a single diaphragm as theoretically adapted for the reception of sound-waves and their conversion into corresponding electrical impulses. Gray thus describes the results of his observations on the lovers' telegraph, (Dowd 1, 125:) "I saw that if I could reproduce electrically the same motions that were made mechanically at the center of the diaphragm by speaking upon it such electrical vibrations would be reproduced upon a common receiver in the same manner that musical tones were; and from the fact that the electrical vibrations were the same in respect to rate, amplitude, and form or complexity as the motions made in the air by uttering words or sounds, it followed that the receiving-diaphragm would be thrown into mechanical vibration or motion of a corresponding character, and consequently reproduce the same word or sound. The fact that the longitudinal movement (in water or other fluid of poor conducting quality) of a wire or some good conductor of electricity, with reference to another wire or metal conductor, produced variations in the resistance of an electric circuit proportional to the amplitude of movement, was old in the art of that time; so that the last link of knowledge necessary to solve the problem in my mind was furnished in the capabilities at the longitudinal vibrations of the string in the before-mentioned so-called lovers' telegraph." But this knowledge does not seem to have been disclosed to others, nor to have been reduced to form until February 11, 1876, when the sketch for the caveat was made.

The answer above quoted most satisfactorily confirms the conclusions reached regarding the incompleteness of his preconceived multiple diaphragm idea, for in it he acknowledges there was a defect or missing link, even in his theoretical transmitter, which was remedied or supplied by the "lovers' telegraph" and the knowledge derived from observations made as to its operation. February 11, 1876, is therefore the earliest date that can be accorded Gray for the conception of his first instrument organized designedly for the transmission of articulate speech. * * *

* * * He had already made and patented instruments capable of responding to varying impulses of electricity, but, instead of relying upon these for receivers, he contrived a new form of receiver, retaining only that part which was well known, long before his discovery, to be capable of responding to fluctuations in the current—*i. e.*, an electro-magnet and armature, and to this applied the membrane diaphragm and vocalizing chamber of the lovers' telegraph.

These circumstances lead to the conclusion, as before stated, that the invention of the art of transmitting and *reproducing* articulate speech, and the means therefor, was not contemporaneous with nor the natural outgrowth of the transmission and production of musical tones, as previously practiced by him; but it is to be regarded, under the law and upon the evidence adduced, as anterior to and derived from the "lovers' telegraph," so called. * * *

* * * It was during these experiments that he claims to have observed that the *quality* of the sound made by the transmitter was faithfully reproduced in the receiver, from which he drew the conclusion "that it was only a question how to convert the aerial vibrations made by the production of any sound whatever into electrical vibrations of a similar character, with respect to rate, amplitude, &c., to solve the problem of transmitting speech," (Int. III, 388.) He says, moreover, that he was "convinced that the receiver would reproduce articulate words, inasmuch as it *seemed* to be capable of reproducing any *form* of vibration that I *was able to transmit*."

In the early history of the art the *possibility* of transmitting and reproducing speech by *imaginary* devices did not lack advocates, several of whom, prior to these alleged mental speculations of Gray, had approached much nearer in their prophecies and predictions than he ever claims to. The various descriptions of the Reis telephone evince a recognized capacity in the receiver to respond to such tones as were thrown upon the line by the transmitter; and various scientists have said it were possible *if* the means could be devised. Gray was therefore no nearer the solution of the problem when he recognized that the question was *how* to convert sound into electrical vibrations of a similar character than many who had preceded him. * * *

* * * The history of his experiments, from the bath-tub experiment in January or February, 1874, to the caveat sketch in February, 1876, as narrated above, establishes, beyond peradventure, the character of the inventions upon which he was engaged—viz., the electrical production of music and the multiple transmission of telegraphic messages. He neither sought nor contemplated the *transmission* and *reproduction of sound* as such; not a single transmitter was designed or adapted for converting sound-waves into corresponding electrical impulses; on the contrary, every tone or sound heard at the receiver, instead of being a reproduction, was a new creation, the product of a certain series of undulations induced in the current by the transmitter and made manifest for the first time at the receiver. Tones accompanied the action of the transmitter while establishing these series of electrical vibrations or undulations; but they were merely incidental. He was aware of Reis's experiments, but evinced no disposition to follow in the same direction. He proceeded to develop a system of telegraphy wherein two or more transmitters were employed, each capable of setting up an arbitrary series of electrical impulses or vibrations in the line. The receivers at first were designed to respond to the tones resulting from these vibrations. (Dowd 1, 100-1.) The knowledge possessed by him at that time led to the use of an electro-magnet for this purpose, for the researches of Page, Henry, and others, and his experiment in 1867, demonstrated the capacity of such an instrument to respond to electrical vibrations or impulses, and he himself acknowledges having observed this property in 1874, and that the armature or diaphragm, so called, was unnecessary, (Int. III, 390,) the duration of the vibrations of each transmitter was to be divided into longer and shorter periods representing the dot and dash of the Morse alphabet, and the sound of each, as produced by the receiver, was to be noted separately, (Dowd 1, 99-100;) the resonant box, the wash-basin, and the tin cup were in all probability designed and used for the sole purpose of simplifying the sounds. At least there is no evidence to the contrary. In his first patent embodying the resonant-box magnet-receiver—No. 166,095—he says, speaking of the secondary circuit: "As the receiving electro-magnet is connected with the circuit it will be caused to vibrate, thus producing a tone of corresponding pitch, *the sound of which may be intensified* by the use of a hollow cylinder S, of metal placed on the poles of the magnet." The "diaphragm-box magnet-receiver" was regarded as a modification of the "resonant-box magnet-receiver," and was not made as a new form of receiver, but for use in testing the feasibility of transmitting tones over a long line. It was necessary that a receiver of some kind should be employed, and inasmuch as at the time of said trial, 9th of February, 1875, one of the two resonant-box magnet-receivers had been filed as a model in the Office, and the other sent to New York, where it remained, (Dowd 1, 84-95,) he had this diaphragm-box magnet-receiver made as substantially the same thing. The "concave metallic-diaphragm magnet-receiver" may therefore be regarded as the last of its type. Passing from this style of receiver, wherein two or more tones were produced, and, when employed telegraphically, required that the operator should disregard all but the one which he was to answer for, (Dowd 4, 329,) he devised a means for deadening all tones except the particular one corresponding to a given transmitter, and to this end he employed separate receivers, with sounding-boxes as analyzers, and this he also adopted for his musical receivers. The next step forward was to provide the analyzing receivers with means for operating a local circuit, in which was included a Morse or other telegraphic receiver, when, and only when, the corresponding transmitter was in use.

That this line of invention would ever have eventuated in the modern articulating-telephone no one can predict. The capacity of his receivers to respond to electrical undulations induced by a proper transmitter under the influence of sound-waves of any description, whether articulate, as in the modern telephone, or musical, as in the Reis telephone, was not capable of demonstration under the conditions in which they were used. It was a purely latent property, and would never have been discovered had the articulating-transmitter not been invented. He does not appear to have even contemplated their use with a Reis transmitter or any other of its kind; hence his inventions were not engrafted upon the former as improvements.

His mental speculations or anticipations of future possibilities for his instruments cannot be classed as inventions, nor even as conceptions of inventions, for they were neither reduced to definite form and proportions nor experimented upon with a view to their development.

The several receivers described were not designed or used for the *reproduction* of articulate speech or other sounds, but it is claimed that some of them, at least, possessed the inherent capacity of rendering audible sound impressed currents; that this function was inseparable from the structure and was sufficiently demonstrated by the use made of the instruments. The devices mainly relied upon are the "resonant box, concave metallic diaphragm, and diaphragm box magnet receiver." These were used in 1874 and 1875 for rendering simple and complex tones, as produced by the musical transmitters heretofore described, and when so used included in a closed circuit.

While it is satisfactorily established that they did perform the functions of musical receivers and operated satisfactorily to render audible certain electrical waves or undulations created by the transmitting-instruments, it is equally certain that such use was occasionally and experimentally only, and their use was ultimately abandoned and their place supplied by instruments of a different design.

Aside from the fact that after a few trials they were laid aside and never utilized or applied in the same or modified form, it is extremely doubtful if the so-called diaphragms were intended to be responsive to the varying attractive force of the magnets, as from the testimony inferences alone can be drawn as to their actual operation. As one of the later applicants, all doubts on this score must be resolved against Gray.

The blacking-box, wash-basin, and tin cup were none of them employed primarily for producing the sound; that function was performed by the electro-magnet itself, as appears from the testimony and patent number 166,095. Their purpose seems to have been the same as the resonant case and cover of the Reis receiver—*i. e.*, to increase the volume of the sound proceeding from the magnet. It is nowhere stated in evidence that any other purpose was had in view; hence it is fair to presume that if the diaphragms did, in fact, respond to the electrical variations it was an unforeseen and unnoticed circumstance. And again, the magnet being under the conditions of use the source of sound, there was no necessity or opportunity for discriminating between the sounds which might have emanated from the diaphragm and those known to proceed from the core; hence the capacity of a diaphragm to respond to sound-waves electrically transmitted could not and was not ascertained or taken advantage of.

None of the witnesses refer to any observations made as to the capacity of the diaphragm to vibrate and thereby produce sound, irrespective of the audible effects produced by the magnets. There is every reason to believe that the cases were intended to act as reflectors or resonators, and that in so far as the other functions of a vibrating diaphragm sensitive to sound-impressed currents was concerned it was unknown, unappreciated, and would not have been mentioned as pertaining to the structure or use of these instruments were it not for the invention of the articulating-telephone, the introduction of which was the signal for the presentation of claims based upon devices which, so far at least as the sensitiveness of the diaphragm was concerned, had never been tested, the use of which in the system proposed had been discontinued, and the instruments virtually abandoned. * * *

* * * The system favored by Gray, and to which his attention seemed the most devoted, did not require or demand the sensitive diaphragm. Aside from what are termed the animal tissue receivers, we find him experimenting with universal receivers for a time and ultimately putting them aside for individual responsive receivers. The first and third he embodied in a variety of forms in patents, but the second found no place in these patents, except the resonant box receiver, which, as has been shown, was not alleged or claimed as containing a diaphragm.

When he came to file his caveat, instead of nominating one of his old instruments for receiver he devised a new one, including a diaphragm stretched across a chamber and carrying a piece of soft iron to act as an armature. This diaphragm becomes, in his application, a thin sheet of steel or iron rigidly supported at its edges. Clearly the use of these old instruments in the manner and for the purpose described in the application was an afterthought, incident upon the introduction of the articulating telephone.

Until then there was no suggestion as to their action, nor was the use to which they were put such as to develop or prove their capacity. As matters of evidence they furnished no fund of information from which the public or their projectors could derive any benefit. The so-called diaphragms were not regarded as the sound-producing medium; that was the accredited function of the magnet; but the devices of which they formed material portions were added to re-enforce or deflect the tones like a sounding-board and a sound-board, respectively.

As to McDonough, the examiner finds:

* * * This brings us down to the period when he claims to have first disclosed the invention to others. It will be well to consider the nature of the testimony we have been discussing and its bearing upon the invention.

In the first place, there is not the slightest proof as to the nature, structure, or mode of operation of any instrument devised by him for the purpose of transmitting and reproducing articulate speech, nor does he even seem to have had a definite idea of such an instrument. There are but three circumstances that can be adduced in his favor: the experiment of 1867; the sketch of 1871, with its legend, "to send speech through wires by means of electricity," and his conversation with Eastman, in the spring of 1874, wherein he expressed his opinion that it might be possible to send speech over a wire, at the same time referring to the sketch of 1871 as being designed for that purpose. The question at once arises, does this constitute satisfactory proof of the conception of an instrument adapted for the transmission and reproduction of speech, or for any other purpose? The experiment of 1867 must be disregarded not only as uncorroborated and unwitnessed but as clearly abandoned. The sketch of 1871, as previously remarked, was made solely as a memorandum for recalling to mind fugitive ideas. Except for its legend, there is nothing to indicate in the slightest the purpose of the device represented, and the manner in which that object was to be attained is neither expressed in the illustration described to others nor, so far as the evidence shows, was it understood or even devised by McDonough himself. * * *

Apparently spurred on by the discussion with Eastman, (1875,) he entered upon what may be regarded as the first stage in the process of invention. He does not appear to have had such a knowledge of and familiarity with the art as it then existed as would enable him to judge of the correctness of his theory with any degree of certainty. He speculated upon possibilities, and was groping in the dark for the means of realizing his expectations.

Let us assume that he had in contemplation an instrument for transmitting and reproducing articulate speech, wherein was to be embodied a diaphragm to receive the sound-waves and another to reproduce them with *some means* unknown and unexplained, whereby the vibrations of one diaphragm were to set up corresponding vibrations in the other through the medium of electricity. If this constituted an invention, it was clearly anticipated by Du Moncel's description of a combination in every way as complete as any disclosed by McDonough up to this time. "Imagine that you speak against a sensitive plate, so flexible as to lose none of the vibrations produced by the voice, and that this plate makes and breaks successively the communication with the electric pile. You may have at any distance another plate, which will undergo in the same time the same vibration." (Prescott, 147.)

But, it is argued, McDonough had made and tested his receiver in 1867, and made drawings of a transmitter and receiver in 1871, and subsequently, in 1875, made an instrument, whereas Bourseul never did. To this it is answered that the 1867 experiment, whatever it was, amounts to nothing, having been entirely and completely abandoned, while the 1871 sketch, standing, as it does, alone and unexplained, proves nothing whatever. A speaking-telephone made according to Du Moncel's description has never, so far as we are advised, been successfully operated, and there are defects and omissions which, in the present advanced state of the art, make it apparent that it could not be made to work. But what can be said of McDonough's devices? He has made no record of his ideas; hence we cannot say they were either good or bad, for the simple reason that we do not know what they were. As to the receiver alleged to have been made in 1867, there is nothing to indicate its capacity even to receive and reproduce the impression made upon the current by a proper transmitter, had one existed; but inasmuch as the transmission of articulate sounds by means of electricity had not been, to his knowledge, accomplished, the capacity of the receiver to respond thereto could not have been determined by him had the said receiver been in his possession and in daily use with the mechanical transmitter. This, then, was the status of McDonough's inventions when, in the latter part of May, 1875, he began the construction of his first instruments designed for the transmission and reproduction of articulate speech by means of electricity. (488.)

* * * As to the results produced, McDonough says: "We could hear with this instrument perfect tunes and could distinguish the tones of the voice; but I do not remember of hearing any distinct words," (492.) Whereas Eastman, who assisted, says: "The results from these experiments, as heard at the other end, or in the receiver, was a variation of rattling sound and musical tones," (510;) and again: "We made many experiments with this machine, and at times we could distinguish the tune that was sung." (Ibid.)

Without apparently understanding the cause of his failure or, at least, without any express purpose to depart from the general principles embodied in these first instruments, he constructed a new transmitter and receiver, (493-4-5,) which he tested at a date not later than the 30th of June, 1875, (496.) Although McDonough fails to state the purpose of any changes effected in those new instruments, Eastman says he thought the diaphragms were too small, (510,) and that the needle was abandoned because he could find no way to keep it from jumping, (511;) whereas, it would appear from his previous answers (q. 15, p. 510) that McDonough sought to facilitate the movement of the needle by putting in the glass tube; and the new transmitter, as at first constructed, did not provide a means for maintaining contact, but the necessity for some device for preventing the displacement of the contact-piece was suggested by the use of the instrument. (495.) The instrument made at this time is illustrated in "McDonough Drawing No. 4," "Transmitter Exhibit No. 3," and "Receiver Exhibit No. 4," and is substantially identical in principle and mode of operation with that upon which the present application was based. (502.) He took the iron hoop, twelve inches in diameter, (499,) used in his 1867 experiment, and had a duplicate made. Upon each of these hoops he fastened parchment diaphragms, by first winding cotton cloth around the hoops and then pasting the parchment to it. Near the center of one of the diaphragms is pasted a piece of tinned iron, and mounted the hoop upon a base in front of the electro-magnet used in his previous experiment. This constituted the receiver.

The other hoop he used in the transmitter. Near the center of the diaphragm two pieces of thin German silver were pasted, about an

inch and a half apart, (499,) with a wire attached to each. A bridge or arch-shaped piece of thin German silver rested loosely upon the pieces of German silver on the diaphragm. The circuit was from one of the pieces, through the bridge to the other piece, thence through the coil of the receiver back to the battery.

When these devices were first tested it was found that the bridge-piece was shaken off from the contact-pieces by the vibrations of the diaphragm; and to remedy this he sought to maintain the bridge-piece in place by passing a thread through it and the diaphragm, tying a knot above the former and one below the latter. He mentioned incidentally that they "twisted the thread to tighten it," (495,) referring to the bridge-piece. With these instruments, McDonough says, "we could distinguish tunes and some words distinctly." (496.) He then substituted for the thread a screw-threaded pin, fastening it to the diaphragm by two nuts—one above and the other below—and placed another nut above the bridge-piece.

This constitutes the perfection of his invention, and it only remains to consider the nature of the results obtained therewith. * * *

* * * The results obtained are testified to as follows by McDonough: "We obtained results as follows, viz., clearly-recognizable tunes and entire sentences of clearly-understood words were transmitted through the instruments and heard at the receiver," (496;) and when asked to specify the tunes or spoken words, he says: "To my knowledge, the tunes were 'Swanee River,' 'Muffin Man,' 'Shoo-fly,' and some others. The words which impressed themselves upon me more particularly were 'Way down upon the Swanee Ribber, far, far away,' which I heard consecutively and clearly, noticing the elision at the beginning of the word 'way' and the change of 'v' to 'b' in the word 'river.' The words of other tunes were distinct when the instruments were properly regulated. I myself could distinguish peculiarities of voice in those speaking or singing." (497.)

Eastman: "I assisted Mr. McDonough in operating the machine whenever I had time and we were home together—generally every evening—and I guess we exhausted all the songs we ever heard. I can give you the names of a few of them; others I do not remember. They were 'Swanee River,' 'Down in a Coal Mine,' 'Old Zip Coon,' and others that I have forgotten. I heard many of the words of these songs; exactly which words I can't remember. I also heard Mr. McDonough say 'Halloo, Frank,' and other words that I can't remember now." (512.)

Wilsey, McDonough's step-father: "It was in the latter part of June—the exact date I can't recollect—1875, at 72 Warren avenue, Chicago, I asked Mr. McDonough what results he was getting. He told me he was pretty well satisfied. I requested him to let me listen, in order to hear whether I could hear anything or not. I listened at it. At first I heard nothing. I concluded that I was a little too far from the machine. By getting very close to it I could hear singing; I was able to determine what tune he was singing. I also was enabled to catch now and then a word; that is all." (522.)

J. E. McDonough, applicant's brother: "It was at 72 Warren avenue, in the latter part of June or near the first of July, 1875. I was called to listen by my brother one evening while my mother was singing in the parlor of the house, and I heard the singing; and, slapping my brother on the back and saying, 'By George, Jimmie, you've got it after all,' (524,) I heard 'Down Come Uncle and Aunt, Down Come Sister Caturah.' That's about all I can recollect at the time of hearing. (525.) The words referred to above were the words of a song he had often heard his mother sing." (526.)

The above are the only parties who testify of their own knowledge as to the working of the device. In addition to this, however, there is the evidence of three parties—Jeffery, (527), Cobb, (529,) and Wilkins, (532)—to the effect that in 1875 McDonough incidentally stated to them he had an instrument with which he could send speech through wires by means of electricity. * * *

With respect to the construction and mode of operation of the several devices before referred to evidence of two kinds is presented, and from this and the surrounding circumstances we are called upon to determine, as best we may, the nature and extent of McDonough's invention, for with the filing of his application his work as an inventor in this line came to a standstill.

The two kinds of evidence referred to are the testimony of witnesses as to transactions occurring a number of years previous, and the description of the apparatus as contained in the application. With respect to the first of these it would seem, upon a careful examination thereof, to be insufficient to establish beyond doubt or question the successful reduction to practice of an articulating-telephone, whatever else it may prove. Not a single witness describes, nor does it appear that he was conversant with, the conditions necessary to render the instruments capable of transmitting and reproducing articulate speech. It is not pretended that, prior to the last of June, 1875, any instrument had reproduced a single articulate sound, and this was due, it would seem, to the fact that the transmitter broke the circuit instead of maintaining a constant control over it. Without designing, so far as the record shows, to depart from the principles underlying previous constructions, he made an instrument such as is embodied in his application, obviously capable of operating in the same manner as those that preceded it, and with it obtained the results stated. Conversation was not carried on with it, but tunes were recognized, together with some words of the tune. A sound approximating to a familiar tune naturally suggests to the mind the words. It is frequently a mental deception, as observation teaches. That his experiments amounted to more than this has not been satisfactorily proved. He may have advanced a little beyond Reis, but it is not certain.

Not having fully realized his expectations, he attempted to improve not alone the loudness, as he would have us understand, but the distinctness also, (513;) in this he failed. Fearful lest others should outstrip him in the accomplishment of that for which he was seeking, but had not found, he concluded to file an application for a patent.

This application, then, must be presumed to contain the best explanation of his invention that he could furnish to the public. It forms the standard with which his invention must be compared and measured. Further progress was abandoned, the instruments neglected or destroyed, and, except as described in said application, not a single person, including himself, knew how to construct and operate the devices for the accomplishment of the end in view. Even if, accidentally, and without knowing how to repeat the operation, he had used the devices in such a manner as to produce the result aimed at, he had not made the invention, for he could not repeat the effects. He is not entitled to a patent for possible combinations, but for such only as he has devised and can, and does, instruct the public in the use of. The mere allegation that a described combination will produce a certain result, when in fact it will not, does not render him entitled to exclude others from using the same elements, in a different relation, for producing that result. Such changes amount to independent inventions. What others may succeed in doing with the instrumentalities he had constructed, by establishing a relation of the parts unknown to him, does not inure to his benefit, nor entitle him to claim such invention as his own.

The application, which we will now consider, was filed by an attorney who undoubtedly received information for the preparation of the drawings and specifications, directly or indirectly, from McDonough himself. He is not produced, however; hence the application stands alone as representing what he had accomplished, and it cannot be departed from; and, if it could, there is certainly nothing in the testimony to warrant the conclusion that, without apparent reason or purpose, he, either ignorantly or designedly, described his invention other than as he knew it. The instrument is denominated a "telelogue," and, as we find no evidence of its having been so termed before, it is fair to presume that the word was coined at the time and for the purpose of the application.

* * * Then follows a description of the apparatus made the last of June, 1875, the bridge-piece being referred to as the *circuit-breaker*, and is thus described: "D is the circuit-breaker, which consists of an arch-shaped piece of metal *loosely* secured at its center upon the bolt D, and is bent upward at each end, and from the membrane A, as shown in Figure 3, so as to form independent V-shaped points adapted to rest upon the respective plates C C. The circuit-breaker D is so fitted upon the bolt D as to admit of a free and easy ascending and descending movement, *the limit of its ascending movement being determined by its contact with the nut E on the bolt, and the descending movement being limited by its contact with the plate C C.*" * * *

* * * There cannot be the shadow of a doubt but that he claimed to have invented an instrument which should operate to transmit articulate speech by opening and closing, or, as he says, "breaking and closing," an electric circuit. It is the judgment of all the experts examined in this case, as well as of the Office, that articulate speech cannot be transmitted by such an instrument. Had a patent been granted upon this application as it stands it would undoubtedly be void as for an inoperative device.

As opposed to this proposition, what do we find tending to establish the contrary? Only the testimony of three or four witnesses that they recognized the words of some familiar tunes, and the allegation contained in the application that a device constructed as described will transmit and reproduce articulate speech. This, it is submitted, is not sufficient proof of the fact; the only inference that can be drawn from the record is that the witnesses are either mistaken or he operated the device in a manner different from that set forth in his application, and unknown to him.

But these are not the only circumstances from which such a conclusion can be drawn. He describes in his application an alternative form of transmitter, which must be presumed to operate upon the same principle and with the same results as the one illustrated. *It is the instrument made in May, 1875*, with which they could "recognize tunes *but no words*," and is thus described: "I do not limit myself to the construction and arrangement of the circuit-breaker D, as shown and described, as other means may be employed, as for example, only one of the plates C may be attached to the membrane and the other made either in the form of a plate or *needle* and attached directly to the connecting-wire, and adjusted to rest upon the plate *so as to break the connection by the vibration of the membrane, which will accomplish the same result.*" * * *

* * * There is but one more circumstance to be noted, and the history of McDonough's invention will be completed. Interferences A to L were declared March 26, 1878, at which time the applications were open to inspection by the several contestants. McDonough was included in G alone, but from the complex nature of the several cases they were treated substantially as one case, and he undoubtedly knew of the other issues involved, and knowledge is brought home to him in the matter of the decision of the Commissioner, published in the OFFICIAL GAZETTE of May 13, 1879, he being a party thereto. In a communication addressed to the Office and filed August 23, 1879, he makes the following inquiry: "Having fully described in my application filed April 10, 1876, a *speaking* telephone, am I not properly concerned in the case of Interference A?" To which the Examiner of Interferences replied, under date of August 28, "that the judgment of the Office was that he could not be a party to case A. If he thinks that judgment wrong, his proper remedy is to move (by regular motion) to be made a party thereto."

Had the Office regarded McDonough's mode of operation as the same as that of the contestants in Case A, his application would have been included therein; but as it purported upon its face to be for a different method, and the Office not being in a position at that time, for want of sufficient information on the subject, as yet in its infancy, it was not rejected as inoperative for the transmission of articulate speech, but the interference was declared as to the receiver alone.

As to issue G, the Examiner of Interferences finds:

For the reasons heretofore stated in construing the issues this interference is held to embrace a receiver containing an electro-magnet and a diaphram supported and arranged in close proximity thereto, *and adapted to respond to variations in the electric current passing through the coils of the magnet, when used in connection or combination with a transmitter adapted to create sound-producing fluctuations in the electric current, whether said electrical variations, waves, pulsations, or undulations represent or are derived from sound-waves or mechanical vibrations.* * * *

* * * McDonough's application was filed April 10, 1876, shortly after the grant of Bell's patent, and before his lecture of May 10, 1876, or the introduction and use of the articulating-telephone, so that his efforts in this direction may be regarded as entirely independent of and uninfluenced by Bell's disclosures and inventions.

It is evident that McDonough represented and claimed for his transmitter more than it had been proved competent to perform, but it is equally clear that as to his receiver it was shown to be capable of carrying into execution this invention and of responding to such electrical

waves or pulsations as he was able to transmit. The Office held his instruments to be modifications or variations of the Reis-Legat telephone, and with that understanding included him as a party to this interference, thereby admitting that his receiver as described and shown embodied the invention, and that it differed from or was an improvement upon the Reis-Legat receiver.

Now, it is satisfactorily proved that McDonough made and used substantially the receiver shown in his application, and in connection or combination with substantially the same form or character of transmitter there shown, as early, at least, as May, 1875, for transmitting and reproducing musical tones, and that he was reasonably diligent in the prosecution of his experiments, which eventuated, not in a successful articulating-telephone, but in the instrument contained in his application.

There is some evidence tending to show an earlier conception of this invention, but he cannot derive any benefit therefrom because of his unreasonable delay and want of diligence prior to May, 1875, in carrying into practice his designs.

It is perfectly evident that, under the law, McDonough cannot be deprived of his right to a patent for such matters as he is shown to have actually invented, diligently prosecuted, and for which he has filed an application, (and it matters not that the advance or improvement was but slight, and restricted in its application,) unless it shall appear that, prior to the date of completion of his invention, another had perfected or had conceived and was diligently prosecuting to completion the same invention.

Taking, therefore, May, 1875, as the date of McDonough's invention of the receiver in issue, it only remains to be considered whether Bell has proved prior conception, for he does not pretend to have constructed such a receiver prior to July, 1875.

Upon the evidence submitted it is impossible to find that he had conceived, much less disclosed, the invention in issue in this case. In his disclosures to Blake, in October, 1874, no suggestion is made of any change in his system, as illustrated in the "harp instrument," except as to the means for transmitting sound-vibrations, and from that time until June, 1875, no further disclosures or experiments were made, and when the matter was taken up in June, 1875, and the first tangible expression given to his ideas, he used a reed receiver.

Upon this count, as defined and explained, J. W. McDonough is awarded priority of invention.

Upon all the other issues now involved priority was awarded to Bell, as already stated.

THE DECISION OF THE EXAMINERS-IN-CHIEF.

Gray did not appeal from the decision of the Examiner of Interferences as to any of the issues, except issue G, but acquiesced. Voelker and Edison did appeal. Bell, Gray, and Edison appealed as to issue G. It is unnecessary to set out the decision of the Examiners-in-Chief, excepting in so far as it relates to issue G. As to the other issues, it is in accord both as to the construction of the issues and the conclusions of fact with the decision of the Examiner of Interferences, whose decision was affirmed except as to issue G.

As to Bell, the Examiners-in-Chief said:

Bell is the only one of the contestants having patents. Of these his first, granted March 7, 1876, has been vigorously attacked upon the ground that it does not disclose the invention in controversy; but this question has already been determined, by the Office when the patent was granted, when the interference was declared, and when, in *Bell* v. *Gray*, (C. D., 1879, 42,) the Commissioner defined the various issues, and by the courts, in *American Bell Telephone Company* v. *Spencer*, (8 Fed. Rep., 509,) and *Same* v. *Dolbear*, (15, Ib., 448.) It is not now therefore to be considered by this tribunal as open. Neither will it be necessary for Bell to prove reduction to practice. Having a patent, the law presumes that his invention was complete when he filed his application describing it.

They cite in support of the last proposition the following authorities: *Wheeler* v. *Chenowith*, (C. D., 1869, 43;) *Hammond* v. *Laird*, (C. D., 1875, 23;) *Potter* v. *Holland*, (1 Fish., 382;) *Cahoon* v. *Ring*, (Ib., 397;) *Busha* v. *Phelps*, (C. D., 1876, 119;) *Huntly* v. *Smith*, (C. D., 1880, 182;) *Starr* v. *Farmer*, (C. D., 1883, 34;) *S. C., Secretary of Interior's Decisions*, (C. D., 1883, 116.)

The Examiners-in-Chief then cite numerous authorities to show that in an issue between an applicant and a patentee the burden of proof is upon the former, and the evidence to sustain priority over the patentee must show an earlier conception, followed by diligence toward reduction to practice, or an actual reduction to practice, and such evidence must be of the clearest and most satisfactory character. In their decision the Examiners-in-Chief say:

The issue is in substantially the language of Gray's claim and its exact scope and meaning have been made the subject of much controversy. The controversy has arisen from the fact that the issue states the combination as a telephone-receiver, and its object the reproduction of both the pitch and quality of the transmitted sound.

On this account it is contended on the part of Bell that there must be read into the claim a device for transmitting quality—that is, an articulating-transmitter, and on the part of Gray that it is sufficient if the transmitter transmit "rythmical vibrations of any and every description, including the tones of the human voice and articulate speech." McDonough, it seems, agrees with Bell.

The examiner, reasoning from the premise that while the other parties show articulating-transmitters, neither McDonough nor Edison does, and Gray contemplates the transmission of sounds produced either by mechanism or the human voice, reaches the conclusion that the issue embraces any receiver consisting of the elements named, whether used in connection with an articulating or other transmitter, and whether it reproduces quality or not.

The construction given the claim, [he says,] the combination of the electro-magnet, the diaphragm, and an electric circuit over which sound-producing currents are transmitted, is in harmony not only with the express declaration of the applicant upon whose demand for a patent these proceedings were instituted, but also with the action of the office in including the applications of Edison (No. 148) and McDonough.

If an articulating-transmitter forms an essential element of Gray's claim, these applications could not properly have been joined in the interference, for neither shows or describes such an invention.

It is, however, necessary for the determination of the issue that some kind of transmitting-instrument be used to throw sounds upon the line. The terms of the issue require this, and also that the quality of such sounds shall be reproduced. Hence if it be possible some means must be adopted to bring all the parties within these terms; but to do this the manifest requirements of the issue should not be disregarded.

It is held by the examiner, as above quoted, that a limitation of the issue to an articulating-transmitter would do violence to the direct statement of the applicant whose claim forms the basis of this issue, but this does not necessarily follow. Upon examination of Gray's specification it appears that he states the object of his invention to be "to provide an apparatus capable of accurately reproducing in an electric circuit not only the different tones but the pitch and quality of sounds, whether produced by mechanism or the vocal organs." In Fig. 2 he shows his receiver in connection with a series of vibrating reeds, each transmitting a tone of different pitch, which may be operated simultaneously or successively. It is not intended to transmit quality with this apparatus, but the statement is simply that the *tones* are transmitted and reproduced. When, however, the arrangement shown in Fig. 3 is described, in which receiver and transmitter are alike, it is expressly stated that "articulate words spoken in one instrument will be accurately reproduced in the other both as to pitch and quality as well as *tone*." It is upon this latter description that the claim is based, for after stating the elements of the combination he uses substantially the language employed in describing Fig. 3, whereby sound thrown upon the line may be reproduced accurately as to tone, pitch, and quality.

It thus appears that not only is no violence done to Gray's statement by such a limitation of his claim, but that a fair inference to be drawn from considering it in connection with his specification is that he himself so intended to limit it, else why insert so carefully the word "quality?" The fact that his receiver is also capable of reproducing other sounds should not be decisive in construing the issue. The greater includes the less. If a given apparatus transmit and reproduce quality, it will likewise pitch and tone, and the issue is not who first constructed a device to reproduce these, but these in conjunction with quality.

As to Edison, it is true that his application No. 148 does not show or describe an articulating-transmitter, and that he therefore does not transmit quality; neither does McDonough. It is, however, none the less true that Edison's application No. 145 does not disclose such a transmitter; but the Commissioner, when these issues came before him for construction and re-formation, held that issue E, which includes and is, in fact, based upon Edison's claim in No. 145, embraces a device which was a necessary part of the means for carrying out the method involved in issue A—*i. e.*, the transmission of articulate speech. Following his lead, this tribunal made an articulating-transmitter an element of that issue, and such a course is equally proper here, for this issue was similarly construed by the Commissioner in that same decision.

In considering it he says:

It is true that this receiving device is but the transmitting device of "Interference F" reversed, but the fact that the device as used in "Interference G" would enable an undulatory current of electricity to reproduce at the point of delivery the same sound-vibrations which had been caused *by articulate speech* at the starting-point was not enough to suggest to the skilled workman or electrician that the same device would, if reversed, enable the sound-vibrations, caused *by the spoken word*, to cause such variations of the electric current as to reproduce at a remote point of the circuit the same sound-vibrations.

Language could not more plainly indicate than this the guiding principle of this entire proceeding, and it was not only the intent of the Office that the invention of the speaking-telephone should be tried here, but it was also the intent of the parties. Their testimony has all been directed to this end, and with the exception of Gray they are all still insisting that they invented not only the art but the apparatus. At the beginning of this controversy Gray made the same contention, and filed simultaneously three applications, one for the method, one for the transmitter, and one for the receiver. That he has withdrawn from the contest, except as to this issue, does not entitle him to have one of these applications used as a basis for an interpretation which neither he nor the other parties originally intended. Bearing this intent in mind, then, and the further fact that no other one of the issues will permit it, where else shall the question of priority as to the receiver be determined if not under this issue?

It was pertinently remarked by counsel for McDonough that without an articulating-transmitter the receiver of this issue could not be practically tested, and its capability of reproducing indiscriminately the quality of any and all sounds could not therefore be known. It may as pertinently be asked how then can the question of priority be decided upon an issue whose terms require the transmission of quality unless the only instrument which has this capacity be included—*i. e.*, an articulating-transmitter?

To sum up briefly, it appears that this interference was sought by the parties to determine who invented the speaking-telephone, the art, and apparatus for carrying it out; and the declaration was made by the Primary Examiner for the same purpose. The Commissioner, upon a proceeding to reform the issues, recognized and confirmed this, the parties accepted it, and the testimony was taken with it in view. Gray formerly insisted, and Edison and McDonough still insist, that not only the art is of their invention, but the apparatus also, and it is only by including an articulating-transmitter in this issue that the question of priority as to the receiver can properly be determined.

If the construction of the issue given by the Examiner of Interferences is to prevail, and priority be awarded to a party who had no articulating-transmitter, it would result that an experimentor who had tried to transmit speech and failed, or one who had never tried, should so dominate the art that an inventor who had worked out the idea, patented his process of carrying it out, introduced it to the public, and put it into extensive use could not practice the art which he had created without being tributary to his unsuccessful rival. * * *

* * * Stated more specifically, his (Gray's) proposition is:

"That as certain devices he mentions are not only capable of acting as receivers of articulate speech, but when properly organized as to their circuit-connections will operate both as receivers and transmitters of articulate speech, * * it makes no difference whether Gray knew or not that his instruments possessed this quality, so long as they did possess it. Gray knew that his receivers would reproduce the quality of sounds transmitted through the line, and he believed that if he could transmit articulate speech it would probably be reproduced, but he at that time did not have the conception of such a transmitter."

That is, indeed, a shadowy theory upon which to rest his case, and the most conclusive answer to it is that of counsel for McDonough, before quoted, that he could not know his receiver would reproduce speech unless he was able to test it, and this could only be done by a speech-transmitter. If he did not know this, how could he impart the knowledge to the public, and how obtain a patent?

It is a prerequisite to the grant of a patent that it shall convey to the public the knowledge necessary to enable it to practice the invention, and it is just here that Bell and Gray differ. If Gray had obtained a patent for his instruments which he now says can transmit and reproduce speech, the public would not have been in any manner enlightened as to this art. He stands in an entirely different light from Bell, and the decision of Mr. Justice Lowell in *American Bell Telephone Company* v. *Spencer, infra*, does not help him. It was not held in that case that it was enough for a person to have constructed an apparatus capable of doing a certain thing, although he did not know it. Another and a controlling element entered into the decision, that a mode of doing this thing had been pointed out and that the apparatus operated after this mode.

"There is some evidence," say the court, "that Bell's experiments with the instrument described in Fig. 7 before he took out his patent were not entirely successful; but this is now immaterial, for it is proved that the instrument will do the work, whether the inventor knew it or not, *and in the mode pointed out by the specifications.*"

Gray had not only not pointed out how his receiver could reproduce speech, but he did not know himself until taught by Bell's patent.

In this view of the case it will not be necessary to look into Gray's evidence, for it is admitted that he had never transmitted speech before the date of Bell's patent or application, and in the view we take of this issue it is immaterial when the devices upon which he now relies were constructed.

The case of McDonough is somewhat similar to Gray's, though with this important difference, that he still insists that he is the inventor of the speaking-telephone. His case, as stated by his counsel, is as follows:

"We submit, therefore, that Mr. McDonough was the original and first inventor, because he had in 1867 practically used the magnet and diaphragm in combination for a receiver; had in 1871 conceived of the use of said combination for articulate speech; had reduced the same to a drawing, and in April, 1874, attempted to embody the same; being prevented by sickness he went to Europe; returning in the fall of 1874, he began in April, 1875, again to put his receiving apparatus together, and combined and used it with a transmitter in May, 1875, and applied for his patent April 10, 1876."

All these acts of McDonough may be admitted, and yet priority cannot be awarded to him unless he can be shown to have had an articulating-transmitter. Upon this depends his entire case, and it becomes important to determine what he really had.

The history of McDonough's efforts and devices is then set out, following a line similar to that of the Examiner of Interferences. In conclusion the Examiners-in-Chief add:

Upon the whole, McDonough's proofs cannot be held to be sufficient to overcome Bell's record dates. We have seen that a party contesting the right of a patentee must show completed and perfected apparatus. That McDonough did not have this is clear. Had a patent been granted to him for it as described in his application or as experimented with in June, 1875, the public would have been no wiser than before. It still would have been ignorant of the method and apparatus for speech-transmission, for no instrument working upon its principle of making and breaking contact can accomplish that result. In this respect McDonough gave no more to the world than Reis. As was said of Reis by Mr. Justice Lowell, in *American Bell Telephone Company* v. *Spencer*, above, a century of McDonough would never have produced a speaking-telephone.

GRAY'S CASE.

As noticed several times, Gray acquiesced in the decision of the Examiner of Interferences as to all the issues except G. It is important to understand why he pursued this course. This decision was rendered July 21, 1883. His present petition was not filed until December 30, 1886, three years and five months after the decision. Even then the petition was filed with a request that it should not be acted upon until further motion was made, and no notice of its filing was served upon the adverse parties. It is well settled that a petition filed and presented under such circumstances is of no avail for any purpose whatever. It performs no function. In the meantime rights of other parties are accruing or vesting from lapse of time, statutes of limitation run, &c. It is only from December 1, 1887, that this petition can be justly said to have been filed—the date at which the Commissioner directed all matters relating to these interference cases to be set down for disposition.

Why, therefore, did Gray acquiesce in the decision and wait so long before action?

It appears from the record, and about this there is no dispute, that for a long time after Bell's patent issued Gray conceded and acknowledged that Bell was the first original inventor. He also regarded the invention as a trivial and unimportant one, a scientific toy. As early as November 1, 1877, he had written his attorney, Baldwin:

Bell's talking-telegraph—it only creates interest in scientific circles, and as a scientific toy; it is beautiful, but we can already do more with a wire in a given time than by talking, so its commercial value will be limited.

This was after Gray had seen Bell's telephone at the Centennial, in 1876, at Philadelphia, and had heard it talk. In letters to Mr. Bell and others, in lectures at Chicago and elsewhere, in 1876 and 1877, Gray publicly and privately conceded priority of the invention of the telephone by which articulate speech could be transmitted, to Bell, and awarded him the honor of being the inventor. That he did these things is fully conceded by Gray.

Gray was a prolific inventor, and had prior to 1876 taken out a number of patents. These related to multiple and harmonic telegraphy, among other things. Some of these inventions subsequently became the foundation of his claim to have invented the telephone—for instance, his patent No. 166,095. At an early date he had interested a Dr. Samuel S. White in his inventions. At the time Dr. White became interested Gray had never succeeded in transmitting speech, but undoubtedly was speculating upon the subject. Recognizing Bell as the inventor, Gray filed no application for a speaking-telephone until October 29, 1877, although, as he says in a statement prepared and published in April, 1878—

As early as March, 1874, Dr. Samuel S. White, of Philadelphia, had purchased an interest in all of my telephonic inventions which I had made or might thereafter make.

That this would include and was subsequently made to include Gray's caveat cannot be doubted, as subsequent important transactions and Gray's evidence abundantly show.

Being thus jointly interested, Gray and White concluded to conduct their business under a corporate organization, and by articles, dated May 26, 1876, they organized "The Harmonic Telegraph Company," with

a capital of 5,000 shares, $100 each, of which Gray had 2,475, White 2,475, Andrews about 50, and some others a few shares.

Evidently this organization looked to the exploiting of Gray's patents, and did not contemplate the subject of telephones so much as the introduction of telegraphic inventions, for at this date Gray regarded the telephone as a toy and Bell as the inventor.

There existed at this time the Gold and Stock Telegraph Company, which controlled the inventions of Edison, Dolbear, and others. In the fall of 1877 Gray and White, representing the Harmonic Telegraph Company, opened up negotiations with the Gold and Stock Telegraph Company for the sale to them of all inventions Gray had made or might make thereafter relating to speaking-telephones. By this time it had been demonstrated that the telephone was not a toy; its commercial importance was beginning to be understood, and it was being introduced.

In this condition of things, being under the belief that Bell was the first inventor, having organized the Harmonic Telegraph Company, and negotiating for the sale of his telephonic inventions to the Gold and Stock and the American Speaking Telephone Company, about to be organized, Gray filed his applications Nos. 1, 2, and 3, October 29, 1877. He says in his affidavit of November 9, 1885—

Being in this belief, I did not take steps to file my application upon my caveat promptly, but the matter rested without any application until November, 1877. This long delay will be understood in view of what I have already stated. Some time prior, however, to the filing of said application it was suggested by the American Speaking Telephone Company, under the idea that it was the owner of said [my] caveat, *that some advantage or benefit might be derived from it.* [That is, Gray filing his applications.] I accordingly filed my applications. This was my act thus done, and done by my counsel at the request of said company.

He is mistaken about the suggestion coming from The American Speaking Telephone Company, for that was not organized at the date he filed his applications. It came either from his own company, the Harmonic, or else from the Gold and Stock, or the Western Union. It was probably the latter companies, which had become owners of Edison's, Dolbear's, and other inventions, and who knew that sooner or later a bitter controversy must rise between themselves and The Bell Telephone Company as to the validity of Bell's patents. It was probably these latter companies which were then negotiating with Gray and White, as the owners of these inventions, who advised Gray to file his applications, expecting "that some advantage or benefit might be derived from it." These companies expected to become interested in Gray's inventions as the result of the pending negotiations, and thus having control of Gray's inventions, as well as Edison's, Dolbear's, and others, they would be better equipped to enter the legal lists with the Bell Company. There is no other possible explanation of Gray's course in filing his three applications and making the oath to them, when he, as he now testifies, still believed that Bell was the first inventor. It was long after this that Gray changed his belief, though he has not seen proper to state the precise time when the change occurred. As will presently be seen, up to and long after the decision of the Examiner of Interferences he conceded priority to Bell, except as to issue G.

The American Speaking Telephone Company was organized pursuant to an agreement of date November 17, 1877, between the Harmonic and the Gold and Stock Companies and the Western Union Telegraph Company. The Harmonic Company was to transfer to the former—

all existing and future patents and inventions owned and controlled by it, or which may thereafter be owned and controlled by it, so far as the same *relate to speaking-telephones*, more particularly the *patents and inventions and right to future patents and inventions of Elisha Gray.*

The Gold and Stock Company were in like manner to transfer to the American Speaking Telephone Company the patents and inventions, present and future, of Amos E. Dolbear.

These agreements were subsequently carried out. The American Speaking Telephone Company organized under articles dated December 1, 1877, and, the transfer made, Gray received large blocks of stock in the new company, was a director thereof, and also held important and responsible positions for the company. It is somewhat difficult to understand just what position Gray assumes with reference to these transactions. He now declares that for some years he *believed* that he had transferred his telephonic inventions, including those now in controversy, and virtually that all the parties with whom he dealt *believed* that they had acquired them. He does not assert that he did not *intend* to assign them and transfer them to the Harmonic Company, of which he was an officer and stockholder, or that they were not intended to pass to the American Speaking Telephone Company. But he appears to simply assert that the formal conveyances from himself to the former company were not in law sufficient, because the inventions were not specifically named or described, or because the contract was of an executory character. Precisely what he relies on is not definitely known; but that he believed he had assigned and transferred them, and that he received large and valuable consideration for the supposed transfer, is as clearly shown as that the parties receiving the transfers believed they were thereby acquiring the right and title and paying for them. This is shown by Gray's own statements and testimony and by the subsequent litigation between Gray's supposed assignees and the Bell Company both in the Patent Office and in the courts, in all of which Gray took part both as party and as witness, *believing* that he had invested the American Speaking Telephone Company and the Western Union Telegraph Company with the title to his telephone inventions. What were these contests about? The telephone. To suppose that this contest, extending until recently decided in the United States Supreme Court, was one that did not include Gray's telephone, and that those great companies, as well as Gray, were resisting the Bell Company in any other belief than that they owned Gray's inventions, is incredible.

Thus organized, and controlling the several inventions and patents of Gray, Edison, and Dolbear, the American Speaking Telephone Company began to put out telephones in the winter of 1877–'78, and before the close of 1879 had put more than twenty thousand into commercial use. This company paid the expense of preparing and presenting Gray's applications, the erection of necessary telephone-lines, material, bells, batteries, &c.

Peter A. Dowd was an agent of the American Speaking Telephone Company and was engaged in their telephone business. In September, 1878, the Bell Company at Boston sued him and the American Speaking Telephone Company and the Western Union Tele-

graph Company as infringers of the Bell patents, and thus the expected contest was begun. The defense of the suit was assumed by the Western Union and associated Companies. It was determined to set up Elisha Gray as a prior inventor of the speaking-telephone and of various important features of telephones then in use. Gray prepared a printed statement of all he had done toward the invention. It occupied nearly 100 pages. While it does not appear that he had changed his opinion as to the original inventorship, the importance of the pendency of his three applications in the Patent Office and of the interference between them and Bell's patents, which had been declared in the meantime, is apparent. The answer to the Bell Company suit justified under Gray. Every exertion appears to have been made to present Gray's inventions in the strongest light. Besides furnishing the statement alluded to, Gray went to New York and spent most of the winter and spring of 1878-'79 in assisting in the preparation of the defense. He also gave his testimony, and in the present procedure it is not pretended that he can add anything or throw any new light upon the subject or history of his invention. He has disclosed everything and has no more to tell. There were thus pending contemporaneously two contests or proceedings, the interferences in the Patent Office and the Dowd suit in the United States Circuit Court for the District of Massachusetts. The taking of evidence progressed, but that in the Dowd case was completed first. It was practically closed on the 19th of September, 1879, including the complainant's evidence-in-chief, the defendant's evidence-in-chief, and the complainant's evidence in rebuttal. No question is made but that up to this date the contest was most vigorously and bitterly conducted, the Bell Company claiming under the Bell patents and the Western Union having control of Edison's, Dolbear's, and Gray's inventions, as was supposed and believed. Eminent counsel represented the respective parties and the litigation became a matter of public notoriety and its determination one of public interest.

At this stage of the litigation, when the evidence had been concluded and counsel were in condition to take a definite survey of the facts, counsel, including Mr. Gifford, advised the Western Union and the associate companies that the Bell patents were valid, and that the defense must fail. But valuable improvements had been made upon the speaking-telephone which were deemed important to the commercial success of the original invention, and the Western Union and associate companies controlled these—such as Edison's carbon telephone, the Page patent covering the induction-coil, &c. With impending defeat before them, the Western Union Company, proceeding upon the basis of these valuable improvements, opened negotiations with the Bell Company to compromise the litigation and unite all patents relating to the speaking-telephone upon terms to be agreed upon. Such an agreement could not well have been proposed or made unless it had been believed that Gray was not the first inventor, and also that the Western Union had acquired his inventions, for his inventions had been those under which they had justified, and to settle that litigation leaving his inventions out would have been absurd. This settlement was effected and a preliminary memorandum was executed on September 27, 1879. This preliminary agreement was a voluminous instrument settling and determining the rights of the various parties in and to these various inventions, and determining in what manner the telephone business should be conducted, &c. It is not necessary to set the agreement out with any great particularity. It appears that when this preliminary memorandum was made it contemplated that it should subsequently be reduced to a more complete and perfect form, which was afterward done, of date November 10, 1879. There is no claim that there is any essential difference between the memorandum and the subsequently executed formal instrument, except in Article 16, which provides—

> The existing suits and interferences shall be disposed of as counsel of the parties of the first and second parts may advise to recognize and protect the rights of the respective inventors to their several inventions, subject to the orders of the courts and the decisions of the Patent Office.

This paragraph in the memorandum read as follows:

> The suits and the interferences shall be disposed of as counsel for the respective parties may advise to carry out the purpose of this agreement, so long as it shall continue in force.

Article 17 provided that the contract should go into effect as of November 1, 1879, and remain in force for 17 years thereafter. Pursuant to this contract a decree was entered in the Dowd case on the 4th of April, 1881, adjudging Bell's patent to be valid and perpetually enjoining the infringement of the same. This decree recites the fact that it is by consent of parties.

The evidence in the Dowd case was by stipulation of all parties to the interference proceedings transferred and introduced in the interferences as evidence to be used and considered in those cases.

The effect of the contract of November 10, 1879, by which the Dowd suit was settled, was to invest the Bell Telephone Company with the ownership of all the telephone inventions, which at that time were supposed and believed to include Gray's inventions, and obligated it to pay to the Western Union Telegraph Company 20 *per centum* of all rentals or royalties received or rated as paid by licenses or lessees for speaking-telephones, and also 20 *per centum* of the net profits of the manufacture of telephones made in the United States for export.

As further explaining Gray's course in failing to file his applications sooner than he did, and also in making the subsequent concessions hereinbefore referred to in favor of Bell as the prior inventor, it is proper to call attention to some additional circumstances which appear in the history of the matter.

Bell's application was prepared and executed January 20, 1876. Gray's caveat was prepared and executed February 14, 1876, and both were filed in the Patent Office on the same day—viz., February 14, 1876. The examiner at that time in charge of the division to which they were referred, following what appears to have been the practice theretofore, treated Gray's caveat as having been filed first, within the meaning of the statute, and issued notices to the parties advising them of the fact of an apparent interference between the application and the caveat, and required Gray to proceed and file his application within the 90 days if he desired to avail himself of the caveat. Bell's attorneys at once made an inquiry of the Office to know the precise date on which the caveat was filed. This was a matter which of course they were entitled to know, and finding that the date of filing

the caveat was the same as that of Bell's application they insisted that it was proper to determine which was in fact filed first, regardless of the date or day. This matter was then referred to the Commissioner, who instituted an investigation, and ascertained to his satisfaction at that time that Bell's application was filed first, and as matter of law he held that the caveat was not filed within the time or before the application within the meaning of the patent law, and directed that the notices which had been theretofore issued to the parties should be withdrawn and that Bell's application should not be suspended to await action on Gray's part. This investigation made by the Commissioner at that time appears to have been conducted as any other investigation would be in the Patent Office under similar circumstances—*ex parte*. It was instigated, of course, by Bell's attorneys. Gray, however, had he manifested the same diligence, could have set on foot a similar investigation and been heard. Indeed, the record discloses the fact that Gray's attorney, on March 3, 1876, advised his partner, S. S. White, of the situation, and added:

> We could still have an interference by Gray's coming down to-morrow and promptly filing an application for a patent. If you want this done, telegraph me in the morning on receipt of this and I will have the papers ready in time to stop the issue of Bell's patent; but my judgment is against it, as Gray made the invention, as I understand it, while here, after Bell's application was sworn to. He may, however, have invented the resistance part of the application at an earlier date, and Bell's claim is for the system of graduated interruptions by a varying resistance instead of the abrupt interruptions, as I have mentioned.
>
> (Signed) WM. D. BALDWIN.

Neither Gray nor his partner White responded to the suggestion of this letter. No application was filed, and Bell's patent issued.

Quoting now from Gray's affidavit of November 16, 1885, this explanation of his inaction is given:

> At the Centennial Mr. Bell exhibited a telephone which transmitted articulate speech. I witnessed the exhibition. He did not use a liquid transmitter on this occasion, but used an instrument very nearly resembling the receiver of my invention. I communicated this fact to my counsel and requested his opinion as to how my case stood in view of said fact, *and he informed me that practically my claim was defeated*, that Bell's application was filed on the same day as my caveat, and that Bell having made an instrument that successfully transmitted articulate speech he occupied a better position and would undoubtedly succeed.
>
> Upon this advice of my counsel and my friend I acted. I had the fullest confidence in him. I believed that he was not only faithful in all respects, but that he had the necessary learning, ability, and experience to advise me rightly. In the latter it seems I was mistaken; but I did not for a long time find out the mistake, and did not know that the advice thus given was wrong and not in accordance with the law, as I am now advised.
>
> All my subsequent correspondence, admissions, statements, and interviews must be construed with this in mind and in view of the fact that I supposed I had parted with all my pecuniary interests in this and other inventions and was therefore only interested as to my reputation as an inventor, and it seems my counsel, so called, had the same idea in view, as stated in his letters of October 24 and 29, 1881, as set forth in his last affidavit, in which he wrote as follows:
>
> "I am devoting my argument more to a vindication of your position than to attacking your adversary, though I am stating some facts in regard to Bell and Edison very plainly."
>
> In the letter of October 29, 1881, he says: "Inclosed find an advanced copy of my argument in your behalf in the speaking-telephone interference case. My object has been mainly to place you right before the public on the scientific side of the question. I hope I have succeeded, but I am not proud of the performance."

This state of mind on the part of Gray appears to have continued down to a point of time which was later than the decision of the Examiners in-Chief in the interference proceedings.

Mr. Baldwin was Gray's attorney in preparing his caveat and his applications, and also in conducting the interference. Baldwin says that upon the settlement of the Dowd case, in November, 1879, it was understood and agreed that the questions of priority pending in the interferences involving a personal pride and feeling to the parties should be settled by adjudication in the Office.

That particular plan was in accordance with a correspondence between Mr. Gray and myself. The plan set forth in that correspondence was faithfully followed by me throughout to the best of my ability. Moreover, Mr. Gray was kept advised from time to time of the plan on which the argument and appeal were made.

The record is very satisfactory that Mr. Baldwin kept his client, Mr. Gray, constantly advised of what was being done in the cases. The correspondence is produced and not controverted. The relations of the Bell Telephone Company to the applications of Gray, Dolbear, and Edison, which were the result of that settlement, were thoroughly understood by Gray at the time. In a printed brief, prepared by Gray's counsel in the interferences, it was stated that articulate speech had not been transmitted by either of the inventors or others prior to the Bell patent; that Bell's first reduction to practice was after his patent issued and by means of a liquid transmitter. It was also stated in the brief:

> When, however, in the course of subsequent litigation, the fact was developed that as between Gray and Bell the latter really was the first to conceive the invention of transmitting articulate speech and to reduce the invention to practice, Gray voluntarily came forward, like the straightforward, fair-minded man that he is, and conceded that fact to his rival. We shall therefore retire from the contest over the issues in cases A and B so far as relates to the question of electrical transmission of articulate speech. * * * The ground was so thoroughly cultivated then (in the Dowd case) that it was not seen where it could be improved by harrowing it again, and the entire record was accordingly stipulated into this case (the interference) that we might have the benefit of the numerous and valuable facts developed. * * * The fifth claim of this patent has since been interpreted and sustained by the courts as broadly as Bell himself could desire in the recent case of *American Bell Telephone Company* v. *Spencer*, (20 O. G., 229.)

It also appears that copies of this brief were furnished Gray by his counsel, Baldwin, of which he acknowledged the receipt in a note, dated New York, November 14, 1881, as follows:

> DEAR BALDWIN:
>
> I received the patents and also a copy of your brief. The latter was a very able document and you did yourself "proud." I would like a few copies for distribution.

In response to this 50 copies were sent to Gray and it does not appear that he ever expressed any disapproval of its contents. After the decision by the Examiner of Interferences Mr. Baldwin advised him in a note—

> My opinion is to appeal on the receiver cases and let the rest go.

This course was either approved or acquiesced in by Gray, and the appeal was subsequently taken, as explained, from the decision so far as it related to the receiver, issue G, with the results heretofore set forth, so that it must be recognized as one of the established facts in the present matter that Gray's recognition of Bell as the first original inventor, as explained above, was made deliberately and publicly.

In order more fully to understand the question of collusion, as urged in these proceedings, it is necessary to state in this connection that prior to November 2, 1880, negotiations had been entered into between the American Bell Telephone Company and McDonough with reference to the purchase by the company of McDonough's inventions in telephony, and on the 2d day of November, 1880, a written contract was executed between those parties, of which the following is a copy:

> This agreement, made the second day of November, A. D. 1880, by and between James W. McDonough, of the first part, and the American Bell Telephone Company, a corporation, of the second part, witnesseth:
>
> In consideration of *five thousand dollars*, paid by said corporation to said McDonough, the receipt of which is hereby acknowledged, it is agreed as follows:
>
> If said McDonough on his inventions shall obtain a *valid* patent, covering broadly the art of transmitting articulate speech by electricity, he shall assign the same to said corporation, and said corporation shall thereupon pay him the sum of *two hundred thousand dollars* therefor. If said McDonough, on his own inventions, obtains a *valid* patent, covering broadly variable resistance contact transmitters for electric speaking-telephones, he shall assign the same to said corporation, and said corporation shall thereupon pay him the sum of *fifty thousand dollars*.
>
> If said McDonough, on his own invention, shall obtain a patent covering broadly magnetic receivers for electric speaking-telephones, he

shall assign the same to said corporation, and said corporation shall thereupon pay him the sum of *fifty thousand dollars*.

It is understood that Mr. McDonough is not to take out foreign patents in such a way as to shorten the life of the United States patents, which if granted, will be subject to this agreement.

Signed and sealed at Boston on the first day above written.

This agreement is not to be taken as any manner of admission by either party as to the validity or invalidity of claims made by the respective parties.

(Signed) THE AMERICAN BELL TELEPHONE COMPANY,
By W. H. FORBES, *President*.

In presence of C. Emerson as to W. H. F.

(Signed) JAMES W. McDONOUGH. (Seal.)

Received $5,000, as within, November 2, 1880.

(Signed) JAMES W. McDONOUGH.

Attention is called to the closing paragraph, which clearly indicates that neither party contemplated assisting the other in procuring their respective patents, but that each party evidently undertook to look after his own interests in the prosecution of his claims.

With this statement of the facts relating to Gray's case I now proceed to consider the merits of his petition. In advance it must be understood that the case is before me upon a petition for rehearing, in which I am asked to set aside all of the orders heretofore made and to reinstate the cases for reconsideration upon new and additional evidence and upon the merits broadly. The decision which is sought thus to be set aside was rendered by Mr. Commissioner Butterworth in March, 1885. The subject was allowed to pass over the entire administration of Mr. Commissioner Montgomery for presentation or consideration other than to file the petition with an indication that it should not be acted upon until further motion should be made, and it now comes before me, the second successor of the officer who decided the case.

Rule 144 of the Office, which has been in force during all this period, provides as follows:

Cases which have been deliberately decided by one Commissioner will not be reconsidered by his successor except in accordance with the principles which govern the granting of new trials.

An attempt is made in argument to show that this case was not deliberately decided by Commissioner Butterworth, for the reason that in his decision he made use of the following expression:

If on examination of the evidence and consideration of the arguments I had become convinced that the findings and decisions of the Examiners-in-Chief were erroneous, or if a serious doubt in that behalf had been raised in my mind, I would have felt constrained to leave the case undecided, to be reheard by my successor. Had I reached a different conclusion it would have been desirable that the reasons for overruling the decision of the Board should be stated at length.

I am not able to see the force of the argument that this expression indicates that Mr. Butterworth's decision was not one deliberately made. On the contrary, if any inference can be drawn from it, it is that the case was elaborately considered and deliberately determined, and that he had no doubt about the result which should be reached, and accordingly announced his decision. The record shows that the case was argued at length and was given great consideration, and it is this which, in my judgment, determines whether a case has been deliberately decided or not. It follows, therefore, that the case is not before me upon its merits, and I am not in a situation to be called upon to grant a rehearing upon a mere preponderance of evidence, as if the case were before me originally, where the preponderance of evidence would prevail; but I am to bear in mind that this controversy has extended through a period of years in the Office, that it has passed through all of the tribunals, and with a single exception—viz., as to issue G—the decisions have all been uniformly in the same direction, and a case must now be presented which justifies the exercise of a judicial discretion before a rehearing can be granted, and this must be done by evidence either of an error in the conclusions of fact or in the application of the law of a very clear and satisfactory character.

At every stage of the contest in this Office one of the serious and important questions has been the effect and legal construction to be given to the Bell patent of March 7, 1876. The Examiner of Interferences felt concluded by the construction which had been put upon that instrument by the Commissioner and the courts, evidently referring to the Spencer case. The same is true of the Examiners-in-Chief, who cite the Spencer case and the Dolbear case. Before me it has been urged with great force of argument that those cases were not authoritative; that Bell's patent was not a patent for a telephone, but for a multiple telegraph, and that Bell in fact had never invented the telephone. But I am relieved of any further consideration of these questions by the recent decision of the Supreme Court in the *Telephone Cases*, (126 U. S.,) where that tribunal has finally and definitely settled such questions. That Court says:

In the present case the claim is not for the use of a current of electricity in its natural state as it comes from the battery, but for putting a continuous current in a closed circuit into a certain specified condition, suited to the transmission of vocal and other sounds, and using it in that condition for that purpose. So far as at present known, without this peculiar change in its condition it will not serve as a medium for the transmission of speech, but with the change it will. * * * We see nothing in Morse's case to defeat Bell's claim; on the contrary, it is in all respects sustained by that authority. It may be that electricity cannot be used at all for the transmission of speech, except in the way Bell has discovered, and that, therefore, practically, his patent gives him its exclusive use for that purpose; but that does not make his claim one for the use of electricity distinct from the particular process with which it is connected in his patent. It will, if true, show more clearly the great importance of his discovery; but it will not invalidate his patent. But it is insisted that the claim cannot be sustained because when the patent was issued Bell had not in fact completed his discovery. While it is conceded that he was acting on the right principle and had adopted the true theory, it is claimed that the discovery lacked that practical development which was necessary to make it patentable. In the language of counsel, "there was still work to be done and work calling for the exercise of the utmost ingenuity and calling for the very highest degree of practical invention."

It is quite true that when Bell applied for his patent he had never actually transmitted telegraphically spoken words so that they could be distinctly heard and understood at the receiving end of his line; but in his specification he did describe accurately and with admirable clearness his process—that is to say, the exact electrical condition that must be created to accomplish his purpose—and he also described with sufficient precision to enable one of ordinary skill in such matters to make it a form of apparatus which, if used in the way pointed out, would produce the required effect, receive the words, and carry them to and deliver them at the appointed place. The particular instrument which he had and which he used in his experiments did not, under the circumstances in which it was tried, reproduce the words spoken so that they could be clearly understood; but the proof is abundant and of the most convincing character that other instruments, carefully constructed and made exactly in accordance with the specification, without any additions whatever, have operated and will operate successfully. A good mechanic with proper skill in matters of the kind can take the patent and by following the specification strictly can without more construct an apparatus which, when used in the way pointed out, will do all that it is claimed the method and process will do. * * *

The law does not require that a discoverer or inventor in order to get a patent for a process must have succeeded in bringing his art to the highest degree of perfection. It is enough if he describes his method with sufficient clearness and precision to enable those skilled in the matter to understand what the process is, and if he points out some practicable way of putting it into operation. This Bell did. He described clearly and distinctly his process of transmitting speech telegraphically by creating changes in the intensity of a continuous current or flow of electricity in a closed circuit, exactly analogous to the changes of density in air occasioned by the undulatory motion given to it by the human voice in speaking. * * *

The apparatus, "as herein described," which is included in the claim, is undoubtedly one in which an electro-magnet is employed and constructed "substantially as set forth" in the specification. One acting on the variable-resistance mode is not described further than to say that the vibration of the conducting-wire in mercury or other liquid included in the circuit occasions undulations in the current; and no other special directions are given as to the manner in which it must be constructed. The patent is both for the magneto and variable-resistance *methods*, and for the particular magneto *apparatus* which is described, or its equivalent. There is no patent for any variable-resistance apparatus. It is undoubtedly true that when Bell got his patent he thought the magneto method was the best. Indeed, he said in express terms he preferred it; but that does not exclude the use of the other if it turns out to be the most desirable way of using the process, under any circumstances. Both forms of apparatus operate on a closed circuit by gradual changes of intensity and not by alternately making and breaking the circuit or by sudden and instantaneous changes, and they each require to be so adjusted as to prevent interruptions. If they break, it is a fault, and the process stops until the connection is restored.

It is to be observed that in so far as the Supreme Court gave a construction to the Bell patent and held that it disclosed the invention, they were united and there was no dissenting opinion.

It has thus been established, in my judgment, definitely and finally that Bell's patent discloses the invention of the telephone, covering both the method and the apparatus, one composed of a transmitter, a closed circuit, and a receiver; that this patent relates back to the date of the application, and also to the date of its execution, viz: January 20, 1876, as the first original date of conception. It does not follow, of course, unless established by other evidence, that Bell was the first inventor, or that he was an original inventor. But whoever attempts, either in these interference proceedings or in an infringement suit or suits, such as those decided in the Supreme Court of the United States, to antedate Bell's invention and establish an earlier invention, must prove by clear and satisfactory evidence a prior conception and prior reduction to practice to the date of Bell's application, or that having made an earlier conception than he did such inventor diligently prosecuted it to a reduction to practice. These propositions may be supported by innumerable decisions of the Commissioner and of the courts, but I see no occasion to cite them.

INTERFERENCES A, B, C, E, AND F.

First comes the inquiry whether there is anything submitted to me in the record which justifies me in reaching a conclusion that there was any error in the action of the Examiners-in-Chief with reference to the date of Gray's invention, or whether in fact he ever did invent the telephone. In this consideration I exclude for the present issue G, which relates to the receiver.

A most careful and laborious examination of the evidence and arguments submitted failed to impress me with any want of satisfaction in the facts as found by the Examiner of Interferences. It is conceded by all parties that Gray's caveat, prepared and filed February 14, 1876, was the first description he ever made of the invention covered by the issues under consideration. Prior to that date the subject was evidently one of speculation and experiment. As is said by the Examiner of Interferences—

His energies were directed exclusively to the transmission of musical tones and their utilization for telegraphic and other purposes, no attention being given to instruments for the *reception*, transmission, and *reproduction* of articulate speech until along in February, 1876, and although he claims to have had some conception of the *possibilities* late in the fall of 1875, he neither disclosed them to others nor clothed them in any fixed and positive form until he made the sketch for his caveat, February 14, 1876.

Gray says:

I was *convinced* that the receiver would produce articulate words, inasmuch as it *seemed* to be capable of reproducing any form of vibration that I was *able* to transmit. I remember speaking of this to different ones about this time; I may have mentioned this before the first of April, 1874, or it may have been a little while after. My impression is that I first mentioned it before. My conception then of an instrument for transmitting articulate speech was one of a complicated character, having a series of transmitting-points adapted to respond to all the tones of the human voice, somewhat similar to the apparatus referred to in my caveat of February 14, 1876.

The description contained in his caveat is as follows:

I contemplate, however, the use of a series of diaphragms in a common vocalizing-chamber, each diaphragm carrying an independent rod and corresponding to a vibration of different rapidity and intensity, in which case contact-points mounted on other diaphragms may be employed.

When called upon to explain the construction of the apparatus thus ambiguously outlined in his caveat, Gray confesses that it was a general idea, not clearly defined in all its details and based upon a theory which has since proved to be false. The instrument was never constructed by him.

It is evident that while Gray's caveat may be accepted as a conception of the invention of the telephone, a method, and also an apparatus, Gray himself did not fully understand it and, as stated, was unable to explain the mode of its operation. In other words, even after filing the caveat and before the true secret of the telephone had been made known by the publication of Bell's patent and his lectures and experiments at the Centennial, Gray still adhered to the old idea that articulate speech must be transmitted upon the multiple-telegraph principle by the use of a series of diaphragms in a common vocalizing-chamber, each diaphragm carrying an independent rod and responding to a vibration of different rapidity and intensity, so that the earliest possible date of conception which can be given to Gray is February 11, 1876. But of course this cannot affect Bell's patent, for the reason that the evidence is satisfactory and it is absolutely conceded by Gray that he did not reduce his invention to practice for a long time after the issuance of Bell's patent; that in the meantime, regarding the invention as of trivial importance, he neglected it altogether and turned his attention to other inventions, to the exclusion of this, so that the Examiners-in-Chief were justified in finding that Gray was neither diligent in filing an application in the Office nor was he diligent in reducing to practice, and consequently, under well-settled principles of law, cannot be given the benefit of his date of conception as against another independent inventor. But Bell is shown to have conceived the invention on the 20th of January, 1876, when he prepared his specification and showed it to others, and subsequently filed it in the Office, on the 14th of February, as heretofore stated. There is no doubt that Bell prosecuted his discovery with great diligence, at once filing his application and obtaining the patent at the earliest moment possible.

These facts are not only conclusive and convincing, but the conduct of Gray afterward is equally satisfactory as to the same. His concessions were made at a time when he was vastly interested in making the most thorough examination of the facts before he should concede anything. His omission to file his applications until nearly two years after the date of his caveat, his concessions made in the Patent Office as matter of record in a controversy, and the further fact that when he filed his applications it does not appear that he had changed his belief as to who was the first inventor, but was acting in the interest and under the direction of parties who had in view a litigation with Bell as to the validity of his patent, all serve to confirm the correctness of the decisions of the Office giving priority to Bell.

So far therefore as the present petition of Gray may be said to be a motion for a rehearing of these issues upon the alleged ground of error in law or in fact, or both, in the decisions to be reviewed, it might well be regarded as disposed of here; for Gray proposes no new or additional evidence as to the dates, nature, or character of his own invention. What he did as an inventor, the experiments he made, the date of conception, his caveat, applications, &c., remain fully stated,

described, and disclosed in the evidence already submitted by him. He does not propose to add anything to the evidence upon which the several decisions before the Office have heretofore proceeded; nor does he pretend that the collusion and misapprehension on his part or the supposed mis advice of his counsel, or other matters to be hereinafter considered, prevented him in any manner from given his testimony, from giving all the facts—the whole truth—with reference to the history of his own efforts and transactions as an inventor. Upon the evidence introduced and considered the decisions were correctly made and the award of priority of invention was justly given to Bell. With his patent construed and sustained, as it has been in the courts, Bell must upon the record before the Office be held to have been the first to conceive; the first to disclose and by his patent give the invention to the world; the first to reduce the invention to practice, first, constructively by his patent, and actually, later, by the transmission of speech in the early part of 1876, as explained. But in his petition to reopen the interferences Gray seeks to go farther and affect these decisions in the Office upon the evidence adduced by a direct attack upon the procedure in the Office, and by the introduction of new and additional evidence to establish the alleged fact that Bell was not an independent inventor, but pirated the invention from him, Gray.

Without presenting all the points *seriatim*, or following the petition and argument in their exact order, the several propositions may be stated as follows:

First: As to these issues before any substantial progress had been made in taking the proof in these interferences: The Bell Telephone Company, owning Bell's two patents, had acquired or supposed they had acquired, by assignment, all the other patents and inventions supposed to possess any value involved in the interferences, including Gray's; that from thence on the proceedings in the interferences were mainly under the management and control of said company and its associates, with the view of reaching such results as they desired—viz., priority to Bell—said company paying counsel on both sides and all other necessary expenses, and the proceedings were therefore collusive and should be disregarded and set aside.

Second: That the concessions of priority made by Gray in favor of Bell were made under incorrect and improper advice of his (Gray's) counsel, who later on in the interference was paid for his services by the Bell Telephone Company combination, acting under the Dowd settlement of November 10, 1879, and was under their influence; and that it was in consequence of this improper advice under these conditions that he declined to appeal from the decision of the Examiner of Interferences as to these issues. Also, that these concessions were made and his subsequent course governed by the belief that Bell was in fact an original inventor—had actually filed his application in point of time earlier than Gray's caveat had been filed; whereas he now believes that neither of said conditions existed, but, on the contrary, Bell had fraudulently secured access to his caveat, purloined his invention, and carried the description therefrom into his application.

Third: Upon the ground of newly-discovered evidence, important and material, which petitioner did not know to have existed in time to produce it before the Office, which new evidence will show that those portions of the Bell specification containing the description of the variable-resistance appliances were not contained in it when originally filed and were not in any of Bell's previous specifications or writings, that he obtained the knowledge and description of them from his fraudulent inspection of Gray's caveat and then fraudulently caused them to be written into his application after it had been filed, and so he, Bell, was not in respect to them an original inventor.

Fourth: That the decisions of the Office were erroneous in law and in fact, because as matter of fact Gray's caveat was filed before and not after the filing of Bell's application, and consequently it was error to give Bell the status of a patentee, the rule being in such cases that Bell was to have been regarded as a mere applicant for a patent on an equal footing with Gray.

1. *The alleged collusion.*

Gray alleges that the proceedings in these interferences in the Patent Office were collusive because the Bell Telephone Company, as was supposed, had acquired all the interests involved, and was therefore able to mold and control the decisions in such form as it saw proper. This proposition of course depends upon whether this company had then acquired Gray's inventions. He now claims that it had not, that the inventions then belonged and still belong to him, and that it was merely a matter of supposition at the time that it had acquired his inventions. He does not pretend that in consequence of that belief he was in any manner deterred from presenting all his evidence and receiving all the consideration to which he was entitled, or that he can now add anything to the evidence or present any new consideration as to the origin or date of his invention.

It is rather a peculiar situation in which he finds himself. He is forced to assert that the company had acquired his inventions in order to establish the collusion, and is required then to deny that it had so acquired them in order to find a standing for his petition to vacate the decisions upon the ground of collusion. His counsel cite in support of the proposition the following authorities: *Cox* v. *Hardwick*, (Cases Temp, Hardwick, 237;) *Earl of Bandon* v. *Betcher*, (3 Clark & Finnelly's Reports;) *Lord* v. *Veazie*, (8 How., 351;) *Cleveland* v. *Chamberlain*, (1 Black, 419;) *Wood Paper Company* v. *Heft*, (8 Wall., 333;) *Gardner* v. *Goodyear Dental Vulcanite Company*, (6 Fish., 329;) *Fletcher* v. *Peck*, (6 Cranch, 147.) These decisions settle the proposition, as stated by the counsel, that courts will not try and adjudge cases in which there is no controversy or where the controversy has been settled by the parties themselves; nor will they try moot questions for the purpose of obtaining decisions affecting injuriously the rights of third parties; but none of them establishes that the courts will vacate or set aside their action where in the proceeding before the court the court has been fully advised of the situation and relation of the parties, and with full knowledge has proceeded and rendered judgment. Nor will the court vacate or set aside such judgment where the interests of third parties are not affected at the instance of the parties to the controversy, unless they have acted promptly and called the attention of the court to the settlement, or the fact that there is no controversy as soon as that condition arises.

When these interferences were declared and up to November 10, 1879, there could have been no collusion, for the reason that during this period the Bell Telephone Company had not acquired Gray's interest, and the contest between that company and the American Speaking Telephone Company and others was being hotly conducted. It is clearly established that the Patent Office was well advised, and all parties understood that the Bell Telephone Company had come to be the owner of most of the inventions involved, and had acquired an interest in that of McDonough, (involved in issue G,) and that the proceeding before the Office after the settlement of November 10, 1879, was conducted in accordance with the practice which has existed from time immemorial. It is a matter of common occurrence that interference proceedings are conducted after the inventions involved have been assigned to the same person or corporation. Counsel are employed to represent the respective inventors, take evidence, and conduct the proceedings, and the decision of the Office is given for the purpose of ascertaining which of the inventors was the original and true inventor, within the meaning of the statute, in order that the assignee may obtain a valid patent. This practice has been assailed in argument as being irregular and improper and coming within the condemnation of the courts, as found in the decisions just cited; but I do not think the decisions are applicable.

In these interference proceedings the public is interested in seeing that a valid patent issues, and the rules of practice are such as to require the procedure to be conducted to a conclusion. The Office is not always willing to award priority upon a stipulation between the parties, but requires that the award of priority shall be determined either by the record date of the parties or by a satisfactory showing.

Under the English system a patent may be issued to the assignee of a number of applicants for the same invention and his patent will be valid, provided either of the assignors was the real inventor. In such a case it cannot be presumed that the public will be injured by a patent issued to the assignee under such circumstances, for the reason that he represents the true inventor, although it may not be known at the time which of the several applicants was the true inventor. But under our system a judicial investigation is required by the statute to enable the Office to ascertain who was the true inventor. This requirement is on behalf of the public, or the third party, as it is sometimes called, for in an interference between a patentee and a later applicant the public is distinctly interested in not having the monopoly prolonged by the issuance of a second and later patent, unless it be made to appear clearly that the applicant was in fact the original inventor, justly entitled to a patent which he could obtain in no other way than by an award of priority. For this reason, as just suggested, the Office will not always receive the concessions of the parties themselves as to priority, but insists upon the evidence being produced; and this is just as essential in cases where both inventions belong to the same assignee as in other cases, for otherwise it would be placed in the power of the assignee to obtain a second patent and thus prolong his monopoly. Besides, the patent, if issued for the invention of the wrong assignor, would be void if the fact should be developed.

It is urged by Gray's counsel that instead of having what he terms an apparent contest after the Bell Telephone Company had become practically the owner of the inventions, it could have been settled upon the record, and Bell's application having antedated all others he would have received an award of priority, and that the course pursued in this case was due to a purpose on the part of what is called the combination of the Bell Company and its associates to secure a decision of the Office which could be used in courts and elsewhere and was so used in several suits to support the *primas facies* of the patent and to obtain preliminary injunctions *pendente lite*.

It must be apparent that if the course suggested here had been pursued and an award of priority entered upon the record without the production of evidence, most of which, as already explained, was taken in a hotly-contested controversy, a still stronger objection could have been urged to the award of priority than is now brought against the course which was pursued. The question would have been asked then—why did they take an award upon the record and not pursue the ordinary course of taking testimony and establishing the fact upon an investigation? I can see no force in this objection. It may be true that the parties to these interferences at that time desired to secure a proper decision of the Office in order that they might derive such benefit from it as the law and the practice in the courts entitle them to; but it must be understood that at that time Gray was interested in the combination and was not only assenting to this course, but was promoting it, and it is difficult to see how he now can challenge the course of procedure in the Office upon these grounds, when his relation to it was such as stated. Even if it were true that it is bad practice to award priority, as was done in this case, after several interests have become vested in a single assignee, and that the practice should be abolished, it should be for future cases and not for the purpose of vacating and setting aside a case already disposed of, and especially not for the purpose of reinstating it for a retrial.

It is evident that in the present petition Gray does not ask to have the decisions of this Office set aside so as simply to avoid them and leave the matter standing on Bell's patent alone, but for the secondary and more important purpose of having the contest reinstated and a retrial and readjudication. In other words, he asserts that at the time the interferences were heard before the Office his mental condition was such that he believed the Bell Telephone Company with its associates to be the owner of his inventions; that his mental condition in this particular has since changed and he desires the rehearing in order that it may be retried under the new mental condition. He may still, however, be in error as to the ownership, for the record presents strong evidence that his first belief or opinion was correct and that the Bell Company is in fact the true and equitable owner of the inventions; and if this be true the supposed "collusion" would exist in the new trial as much as in the original.

As already stated, Gray promoted this interference procedure with full knowledge on his part of the set-

tlement and of the facts which he now asserts constitute the collusion. He was also aware that it was conducted before the Office with full knowledge and consent on its part, and in accordance with its recognized practice with reference to such interferences. If this collusion exists, it existed then, and then was the time for Gray to have promptly moved, after November 10, 1879, to arrest proceedings in the Office, on the ground that to proceed further would be in violation of public policy and contrary to the rules recognized by the courts; but having failed to do this, and not only allowed without objection, but promoted the controversy to a final decision, in order that he might succeed if he could and obtain an award of priority on behalf of his assignee, he has seen proper to wait until defeated before raising this question of collusion. To permit this to be done would enable a party to trifle and experiment with the Office, accept its results if favorable, and repudiate them if unfavorable. But there is no judgment in these interferences which the rule of the courts in cases cited would require to be set aside. Priority was awarded to Bell and patents denied to the other interfering parties, much as a bill is dismissed for want of equity. No execution can issue nor other order be made affecting the rights of third parties, injuriously or otherwise. The condition of parties remains precisely as it was before the interferences were declared, and as if nothing whatever had been done. In my judgment no court would interfere with an award of this character, and certainly not for the mere purpose of reinstating the contest.

It must follow that if the rehearing is to be granted at all it must be upon other grounds than the collusion referred to.

2. *Gray's concessions.*

In his present petition Gray seeks to avoid the effect of his admissions and concessions in favor of Bell's priority, upon the ground that they were the result of misapprehension, improper advice of his counsel, and of fraud practiced by Bell in pirating his invention and deceiving him about the facts. He insists that his admissions have been introduced as part of the evidence submitted, and have had more or less influence in affecting the judgment of the Examiner of Interferences; that his concessions of priority and withdrawal from the contest before the Examiners-in-Chief and his failure to appeal from their decision to the Commissioner were the results of the same continuing influences operating upon his mind and misleading him; that in consequence the decision should be set aside, he should be restored to his original status as a suitor, and should be allowed to retry the issues upon the original evidence and such new evidence as he can produce.

It is undoubtedly true that Gray's admissions were introduced in the evidence submitted, and that they were adverted to by the Examiner of Interferences in his decision. The Examiner of Interferences says:

> In addition to the testimony we have the direct admissions of Gray, in lectures, publications, and letters to Bell, acknowledging that the latter was the first inventor of the apparatus for transmitting vocal sounds. In a letter to Bell, dated March 5, 1877, Gray says, referring to the matter of transmitting vocal sounds: "I do not, however, claim even the credit of inventing it, as I do not believe a mere description of an idea that has never been *reduced to practice*—in the *strict sense* of that phrase—should be dignified with the name of invention." It is clear, therefore, that Gray cannot be regarded as the inventor of the articulating-telephone *per se*, and, recognizing that fact, he seeks to maintain such of his claims as are involved in these interferences upon other experiments and inventions made by him with respect to the transmission of sounds generally; and these will next be considered.

It is also true that the Examiners-in-Chief recognized Gray as having withdrawn from the contest as to all of the issues except issue G. They say:

> Gray, as before stated, has withdrawn from the contest as to all but this issue. His case does not rest upon the fact that he is the inventor of the art or even of an articulate transmitter, but upon the proposition, as stated by his counsel, that "having invented, discovered, and reduced to practice prior to the other contestants in this case an apparatus involving the combination" of the issue, he "is entitled to a patent for that apparatus with all its functions, incidents, and capabilities, whether known at the time or not."

Even if the law will permit Gray, in consequence of the alleged misapprehension, the improper advice of his counsel, and the alleged fraud of Bell, to be restored to his original status and to have a retrial, it will do so only when he shall have clearly established these allegations as to the mistake, advice, and fraud.

An examination of the decision of the Examiner of Interferences shows clearly that while he adverted to Gray's admissions he was by no means controlled by them. His decision proceeds upon the evidence of Gray and the other parties to the interference as to their several acts and proceedings in inventing, and upon this evidence he finds that Bell was the first inventor. As stated, he gives Gray as the date of his conception February 11, 1876, the date of the sketch on which his caveat was based, and in my opinion no retrial of the case will ever change that conclusion. His decision also shows that Bell's application, prepared January 20 and filed February 14, 1876, was regarded as his (Bell's) first conception, antedating Gray, and that Bell diligently prosecuted his application and secured his patent. This settled and still must settle beyond serious question Bell's priority, provided Bell's application and patent disclose the invention. Throughout the entire history of these interferences this has been one of the important questions contested. It was determined by the Examiner of Interferences, not upon any concession by Gray, but upon the decisions of the Commissioner and the courts, who had placed a construction upon the patent, holding that it did disclose the invention. The same decision in this particular was made by the Examiners-in-Chief. These tribunals did not cite the decisions of the courts for the purpose of ascertaining any date or priority as to Bell's patent, because whatever it disclosed it was certainly prepared on January 20, and filed on February 14, 1876, and was proof of a conception of whatever invention was disclosed by it. The courts held, and all the tribunals of the Patent Office have held, that it disclosed the inventions involved, and consequently priority of invention was awarded to Bell upon these facts. As heretofore stated, this question has since been finally settled by the Supreme Court of the United States in the telephone cases, so that it is palpable and clear that if Gray's admissions, which are found in the evidence, and his concessions, which were made as a matter of record in the interferences, be wholly withdrawn from the case, the conclusion as to the priority remains unaffected thereby.

As to the allegation that his counsel, Mr. Baldwin, gave Gray improper advice or was actuated by any improper influences, it is necessary to notice what the advice was and the circumstances under which Mr. Baldwin was placed with reference to his client. It is to be remembered that the advice to which Gray refers was given long before the interferences were declared and before the relations came into existence which grew up between the Bell Company and Gray

and others, arising from the contract of November 10, 1879. It was at a time when no influence is claimed to have been operating upon Mr. Baldwin as an attorney except a proper regard for the interest of his client. Gray says:

> At the Centennial Mr. Bell exhibited a telephone which transmitted articulate speech. I witnessed the exhibition. He did not use a liquid transmitter on this occasion, but used an instrument very nearly resembling the receiver of my invention. I communicated this fact to my counsel and requested his opinion as to how my case stood in view of said fact, and he informed me that practically my claim was defeated; that Bell's application was filed on the same day as my caveat, and that Bell having made an instrument that successfully transmitted articulate speech he occupied a better position and would undoubtedly succeed.

Now, as to this advice which is made the foundation of the charge of Gray, it is proper to say that the position assumed by Mr. Baldwin has been shown to have been correct by every decision in relation to the subject since it was given in the Patent Office and in the courts. As to Mr. Baldwin's subsequent course in the conduct of the case, it appears clearly that he acted diligently; that he kept his client, Gray, constantly advised of everything which was done, and in his subsequent relations with other parties and with the Bell Telephone Company Gray was fully advised and made no objection whatever to them. Under such circumstances a court would hesitate long before granting a relief upon the allegations now presented by Gray or condoning either the advice or the conduct of his attorney.

The allegation that Bell had fraudulently obtained access to Gray's caveat and had pirated the invention and was not himself the original inventor is a material one, and will be considered further on in connection with the subject of the newly-discovered evidence presented by Gray. But even conceding that Gray could establish these several allegations, there is a grave question whether he could be restored to his original position and be allowed to retry and recontrovert these issues. If the matter involved were of such a character as to be purely personal between Bell and Gray and the controversy related to private matters alone, there is no doubt that a rehearing might be granted; but in this case there are in fact three parties. The public is a party interested and whose rights are to be protected as well as those of Bell and Gray.

Bell's patent has now been running since March 7, 1876. Gray has seen proper, as already explained, to concede priority to him; has come into the tribunal where the question of priority was being determined judicially, and has entered a plea awarding priority to Bell and withdrawing from the controversy. For a valuable consideration he has allowed other parties, supposing themselves to have become the owners of whatever inventions he had made, to invest largely in the property. He became himself personally interested as a stockholder, an officer, and in other particulars in a corporation or a combination of corporations dealing with both the Bell property and his own, and inducing the public to become interested in them upon the strength of the decisions in this case and his recognition of Bell's priority. As he himself says in one of his affidavits as to these issues, he has acted and conducted himself upon the belief that Bell was the first inventor and that the Bell Telephone Company was the owner of his (Gray's) inventions, which they were regarding and inducing the public to regard as invalid and subservient to the Bell inventions. While receiving consideration for his supposed transfer of his inventions he has for several years regarded the matter as settled and disposed of, and until the filing of his present petition, which proceeds upon the assertion that he has obtained new and additional information, he has acted like one who has completely abandoned the invention. It is not necessary to a disposition of this petition to hold that Gray has actually abandoned these inventions to the public if they do not belong to Bell, but I have little doubt that his conduct establishes such an abandonment.

The course pursued by Gray in disclaiming the invention, asserting and publicly indorsing Bell as the inventor, and for these reasons entering before the Examiner of Interferences in October, 1881, his formal withdrawal from the contest was with full knowledge that the invention then had been in public use for over three years, and that private enterprise throughout the country was investing vast sums of money in the promotion and introduction of the invention. While it is true he still asserted, both in the Patent Office and in the courts, his claim for invention of the receiver, (issue G,) yet as to the art or method and the transmitter as involved in these issues he made no move to avoid his disclaimer or reassert his inchoate right as inventor until he filed this petition, December 30, 1886, more than five years after his disclaimer, during all which period the public use continued and increased. Now, whether the invention belongs to the Bell Company as assignee of Bell or of Gray, regardless as to which of the two was the real inventor, the invention had gone into public use and innumerable persons had invested in it. Gray was a party to and had encouraged its public use with a disclaimer on his part. It is difficult to conceive much stronger evidence of abandonment on his part. (*Pennock* v. *Dialogue*, 4 Wash., 538; *Kendall* v. *Winsor*, 2 How., 322; *Am. H. & L. S. Co.* v. *Tool Co.*, 1 Holmes, 503.) It is settled that abandonment may be after application is filed or patent issued, (*Bell* v. *Daniels*, 1 Bond, 212,) and after abandonment the inventor's right is as much beyond recall as when two years' public use intervene before application is filed. He cannot regain his inchoate rights or be restored thereto upon the ground that he was misled or deceived by fraud, &c. (*Mellus* v. *Silsbee*, 4 Mason, 108; *Bowles* v. *Mason*, 2 Am. L. T. R., (U. S.,) 106; *Jones* v. *Sewell*, 3 Cliff., 563; *Bell* v. *Daniels*, 1 Bond, 212.)

Without absolutely holding that Gray has abandoned the invention there are considerations which are quite as fatal to his petition. It is evident that the public has a direct and immediate interest in the further prosecution of Gray's application for a patent. If the award of priority heretofore given to Bell can be vacated and set aside, it should only be done upon a showing of merits that would entitle Gray to an award of priority and to a patent. Such a patent would run for a period of seventeen years from the date of its issuance, and would dominate and control the method and all the devices relating to the telephone for another period of 17 years. Its effect would be to subject the public to a renewed monopoly—in all nearly, if not quite, 34 years. Such result is in such contravention of the spirit of the statute and so unnatural a consequence, in view of the liberal provisions of the

patent system, that it cannot be tolerated, except where the inflexible rules of law and justice compel it. Before an inventor can demand such a result or a patent that would bring about such consequences he must show himself not only absolutely entitled, but that he has been diligent and persistent in the prosecution of his rights, and that the failure to sooner secure them has been unavoidable and not due to his own mistakes, laches, or failure. It scarcely needs comment or requires suggestion to show that Gray does not bring himself within the requisite conditions for such relief.

If, in addition to the foregoing considerations, there shall be added the further fact that the Bell Telephone Company acquired the equitable ownership of Gray's invention under the settlement of November 10, 1879, and the transactions prior thereto, and that a patent to Gray would at once inure to that company and enable it or a new combination in this manner to prolong for another full statutory period its monopoly of the invention, there would appear conclusive reasons for refusing the present petition. There is not the slightest evidence before me of the existence of collusion between the Bell Company and Gray and his present associates by which such a result is sought after; but unless the rights of the public shall be strictly guarded and the principles of law properly enforced such combinations could easily be made and could successfully and unduly extend their monopolies. It is to prevent such consequences that, in many cases, the Office is unwilling to award priority in interference proceedings upon stipulation of parties.

The state of the title as to Gray's invention will be considered further on.

(3.) *The newly-discovered evidence: Bell's piracy of Gray's invention.*

The proposition to be established is that on the 14th day of February, 1876, when Gray's caveat and Bell's application were filed, the latter contained no reference to the variable-resistance method (issues B and C,) and claim 4 was not in it; that through improper and fraudulent influences of Bell's attorneys at Washington with the examiner in charge of the subject the former were permitted to see the caveat, and thereupon surreptitiously and fraudulently withdrew Bell's specification, rewrote it, incorporating the portion now found relating to the variable resistance and the new claim 4, and substituted the amended and unverified specification for the old. This, if done at all, must have been done before the 19th day of February, for the official letter of that date, addressed to both Gray and Bell, advising them of the interfering matter, shows conclusively that the suspected matter of the specification was in it at that date.

There is no claim or pretense that Bell received his ideas from Gray in any other way or by any other means than by this alleged fraud of stealing them from the caveat. Indeed, the charge does not connect Bell personally with the matter, for it is conclusively shown that Bell was not at Washington during the period between February 14th and 19th, 1876, nor was he in any manner cognizant of the alleged alteration at the time. The theory presented makes it necessary that the fraudulent alteration should have been made by Bell's attorneys at Washington upon their own responsibility and without the authority or consent of their client. The evidence of this alleged fraud is the "newly-discovered" evidence relied upon by Gray as one of the grounds for setting aside the award of priority in these interferences. It consists of certain evidence—the testimony of Bell himself, taken in "The People's Case," so called.

In March, 1876, Bell had written Gray:

> My specification had been prepared months before it was filed, and a copy had been taken to England by a friend.

This was George Brown, of Toronto, whom Bell had interested in his inventions in the fall of 1875. In his testimony in the Dowd case Bell had produced the original rough draft of the specification in 7 sheets. He testified that he began to work upon the specification in September, 1875, in Canada. He had searched for other drafts of his specification made in the course of preparing his application, but was unable to find them. This was in July, 1879, when he was giving his deposition. He says the 7 sheets of the original draft then produced do not read successively, and were—

> the mere remains of my first attempt to put into correct language the ideas embodied in my specification. Some passages are written in pencil, others in ink, and many of them are so disfigured by the corrections, &c., that it is difficult in some cases now to read them.

He further says these original drafts are by no means all he made in preparing the specification for his application. He also states that he had concluded arrangements with Mr. George Brown to have the specification filed simultaneously in England and the United States, and the application was not filed here until February 14, 1876, because he was waiting for a cablegram from England. While he does not specifically state that he gave Brown a copy of his specification, his testimony inferentially makes it clear that he did, for he produces a sketch which he placed in Brown's hands before the latter went to England, which was handed back to Bell in 1878. But in the cross-examination Bell was not asked to produce that copy which he gave Mr. George Brown, nor to state its contents, or whether it contained anything relating to the variable resistance. The original first draft then produced did not contain any reference to it, and as this was one of the important facts involved the most natural inquiry would have been to ask Bell about it.

When the newly-discovered evidence now relied upon comes to be considered, there can be no doubt that, had he been asked by Gray or any one in the Dowd suit, Bell would have replied that the George Brown copy of the specification did not contain claim 4, or any reference to the variable resistance, and would have given substantially the same statement now relied upon, though he might not at that time have been able to produce the copy.

The evidence in the Dowd case was closed in September, 1879.

In the case of *The People's Telephone Company* v. *The American Bell Telephone Company*, Mr. Bell again testified at great length. His deposition was taken in March, 1883, pending the decision of the Examiner of Interferences, whose decision was announced in July following. While Gray was not a party to this suit, he must have been interested in it and cognizant of the progress made therein. At this time Bell was able to produce some additional memoranda, letters, &c., and, among other things, he produced the George Brown copy of Bell's specification, which the latter had taken to England, with the view of taking out

the English patent, and which he had returned to Bell in 1878. It is this evidence of Bell relating to the George Brown copy which is relied upon as being new, important, and relevant. It is stated substantially as follows: In his decision (page 320) the Examiner of Interferences calls attention to—

> certain suspicious circumstances attending the production and development by Bell of the liquid resistance or water telephone that demand attention. There is an entire and absolute absence of evidence tending to prove that at the time or prior to the filing of his application of February 14, 1876, he had conceived, disclosed, experimented upon or tested, or even contemplated so doing, any form or system of articulating-telephones other than magneto, as disclosed in Fig. 7 of his patent, with the single possible exception of the abandoned and discarded idea of the vibrating wire.

In September, 1875, while in Canada, Bell began the preparation of the specification for his patent and continued it in Boston during the early part of October following. In the Dowd case he produced some rough drafts of his earliest efforts, which were mere fragmentary remains of his first attempt. His specification was prepared subsequently for Mr. Hubbard to take to Washington and have examined by their attorney, Pollok. In January, 1876, Hubbard wrote to Bell:

> I have been over your specification with Mr. Pollok. He is very much pleased with it and says he does not think it will require any alteration.

A fair copy of the specification was received from Mr. Pollok on the 19th or 20th day of January, 1876, as shown by a letter addressed to Mr. Bell, under date of January 18, 1876.

In his preliminary statement Bell says:

> I completed the specification for my American patent early in January and sent it to Mr. Hubbard in Washington to be examined by Mr. Pollok. I am not able to fix the date when I sent it; but on the 18th of January I received a letter from Mr. Hubbard expressing his satisfaction with it, and it must have been returned to me then or immediately after, as I made oath to it in Boston on the 20th of January, 1876, and sent it back to Mr. Hubbard. The reason why it was not filed immediately was that it was deemed important that I should meet Mr. Pollok and go over it with care. We met in New York shortly after and spent a day, January 25, 1876, in considering the specification. No change whatever was made in it, and Mr. Pollok took it back with him and filed it in the Patent Office.

Hubbard testifies:

> I saw the specification of the speaking-telephone in October, 1875 I believe it was substantially like the one for which the Letters Patent were issued, though several changes were made in it subsequent to my first seeing it. I believe I took it with me to Washington on the first of December, 1875. I showed it to Mr. Pollok, brought it back with me on leaving Washington, December 14th or 15th; then took it with me on my return to Washington, which was, I think, on the 10th of January, 1876; showed it again to Mr. Pollo ; then I returned it to Mr. Bell for his signature and oath.

On the 28th of September, 1875, Bell wrote from Toronto to Hubbard that he was about arranging with his friend, Hon. George Brown, ex-Premier of Canada, to become interested in the subject of the invention. On the 29th of December, 1875, a contract was made between Bell, George Brown, and J. Gordon Brown, in Toronto, by which Bell agreed to assign them a fourth interest in all his "patents and inventions that are now or may be hereafter taken out in any other parts of the world, except in the United States of America," and on the same day received a memorandum from the Browns agreeing to pay him, Bell, $25 apiece per month while perfecting his inventions in telegraphy and preparing the necessary specifications for taking out patents under their agreement of that date.

Hubbard also testifies:

> I met Mr. Bell in New York about January 25th, at his request, to meet Mr. George Brown, of Toronto. We met Mr. Brown, and he agreed to take out Letters Patent in Great Britain. Mr. Bell gave me his copy of the specification, which I was to take under a promise which he exacted from me that it should not be filed at Washington until Mr. Brown should have filed it in England. He did not hear from Mr. Brown, as he expected, and finally wrote to me that if he did not hear by a certain day that I might file it. I strenuously objected to the least delay; but it was of no avail, as he wished to have it taken out in his native country, that he might there have the benefit of what he believed to be a great invention.

All the foregoing testimony was given in the Dowd case. Now follows the "new testimony," which is found in the People's Record:

> 567. Q.—About when did Mr George Brown go to England? A.—About the last week in January, 1876.
>
> 568. Q.—Did he take with him a specification furnished by you corresponding to the specification of your patent of March 7, 1876? A.—He did.
>
> 569. Q.—Please look at the paper now shown you, and state whether it is the specification which you furnished to Mr. George Brown? A.—It is.
>
> (Complainant's counsel puts a copy of the paper in evidence to be marked "Complainant's Exhibit George Brown Specification.")
>
> 570. Q.—How long before Mr. George Brown sailed for England did you deliver this paper to him? A.—I only know that it was handed to him between the date of the agreement, December 29, 1875, and the time he sailed, the latter part of January, 1876.
>
> 571. Q.—When was this paper written? A.—In October, 1875.
>
> 572. Q.—I observe that it is headed "United States Patent Office," from which I infer that this particular paper was originally prepared for your American specification and not for the purpose of being handed to Mr. George Brown; what is the fact about that? A.—Certainly that is the fact.
>
> 573. Q.—Did you at or about the time when you handed this paper to Mr. George Brown also give to him descriptions of your other electrical inventions patented and unpatented? A.—Yes.
>
> 576. Q.—In the Exhibit George Brown specification there are some alterations made by drawing a pen through words or phrases, and interlining others in place of them; what is your recollection as to when these changes were made? A.—I have not any clear recollection of the time when these changes were made excepting that they were made before the specification was given to Mr. Brown, March 12, 1883.
>
> 585. Q.—You have told me this morning that you wanted to make some addition to your answer to Interrogatory 571. Please do so. A.—Yes; I desire to state that, though from the language used in this paper I know that it is a copy of the specification as I wrote it in October, 1875, I cannot be perfectly certain that the copy was itself made in October, 1875, although it is my belief that it was. It was made as a fair copy, not in my handwriting. The interlineations and corrections are in my handwriting.
>
> 586. Q.—I observe that the fifteen sheets of which it is composed are numbered consecutively, and each of them bears at the top the initials 'G. B.;' are those initials Mr. George Brown's handwriting? A.—They are; I saw him write them.
>
> 587. Q.—The last sheet, which happens to be the sheet of drawings, contains on the back this indorsement: "These papers were received by me from Prof. Alex. G. Bell in the winter of 1875-76, shortly before I left for England. I can fix the exact date by reference to my books and papers, but have not them at hand now. George Brown, Toronto, 12th November, 1878." In whose handwriting is that? A.—In the handwriting of Mr. George Brown. I saw him write it.
>
> 621. Cross-Q.—On the papers which you gave to George Brown preparatory to his going to England, I find indorsed the words "November 12, 1878;" how happened that? A.—I had just returned from Europe at that time, and understanding from Mr. Watson, who met me at Quebec, that interferences were arising in the Patent Office, I thought it might be important to obtain from Mr. Brown whatever papers he might have. We therefore called on Mr. Brown in Toronto, on the 12th of November, and at my request Mr. Brown indorsed the papers and gave them to Mr. Watson.

The argument which is founded upon this new evidence naturally connects itself with the history of Gray's caveat, and insists that the procedure in the Patent Office, in changing its practice with reference to the dates on which caveats are filed, and holding that Gray's caveat had not been filed prior to Bell's application, the failure to declare an interference and hold Bell's application until Gray could file one, the speed with which Bell obtained his patent, and the circumstances disclosed by this evidence in connection with the evidence in the Dowd suit, establish the fact that when Bell's application was filed it did not contain claim 4 or any reference to the variable-resistance matter.

It is insisted by Gray's counsel that in pursuance of the contract made by Bell with Brown, December 29, 1875, in order to obtain patents in England, Bell handed him, after December 29, 1875, a copy of the specification which had been prepared to take to England to be used there; that Brown met Bell, Pollok, and Hubbard on the 25th of January, 1876, in New York, when he agreed to take out a patent in England. This was done to have the applications filed simultaneously in England and in the United States, the intention being that Bell should arrange to have both filed simultaneously; and that as George Brown sailed for

England the last week in January he must have left after January 25 and before February 1, 1876. It is further urged that Brown filed no application for a patent in England upon the specification he took there, and it was not until the 9th of December, 1876, that the application was made for a patent in England by Bell, in the provisional specification of which appears the description of a liquid transmitting device.

It is concluded by counsel:

> There can be no doubt, in view of this evidence, that the specification which George Brown took to England in January, after the 25th, 1876, was a copy of the specification sworn to by Bell five days before on the 29th of January of the same year; but this copy taken by Brown *does not contain the portion of the description regarding the variable-resistance appliances found in the present Bell specification in the Patent Office.* It is impossible to believe that if Bell had thought of these variable-resistance devices prior to Brown's going to Europe he would have omitted to describe them in the specification which Brown took there to file simultaneously with the application in this country.

I think the argument has been fairly stated and as strongly as made by the counsel, and it will be seen that the entire force of the argument resides in the proposition that the Brown specification, which had been given to him by Bell, was the exact copy of the specification sworn to by Bell on January 20, and filed in the Patent Office February 14, 1876.

The George Brown specification is headed "United States Patent Office," and Bell says it was prepared for the American specification, which shows quite conclusively it was prepared before he had made any definite arrangement with Brown. Bell testifies that the paper was written in October, 1875—that is, that it is a copy of a specification written by him in October, 1875, and while not certain that it was made (as a copy) in October, it is his belief that it was. Bell further testifies that the original drafts produced in the Dowd suit were by no means all the specifications he prepared between September, 1875, and January 20, 1876, so that it is reasonably established that Bell was industriously at work preparing, amending, rewriting, and improving his specifications between those dates. It is clear, of course, that the American specification was completed about January 10, 1876, and remained unchanged until filed February 14.

Now the argument for Gray concedes that Bell had invented the magneto-undulatory telephone and described it both in the original drafts and in the George Brown specification; for it clearly appears in both. In the latter Bell distinctly asserts that he does not limit himself to any particular mode of producing the electrical undulations, and attempts to broaden his description so as to include others. He says in the George Brown specification:

> There are many other ways of producing undulatory currents of electricity, but all of them depend for effect upon the vibration or motion of bodies capable of inductive action. A few of the methods that may be employed I shall here specify.

He then adds four illustrations of known methods, but does not include the variable resistance. In the statement that all of them depend upon inductive action he was mistaken, for the liquid resistance mode was then known.

Whether Mr. Bell was sufficiently skilled in patent law to know the importance of embracing in his specification all known methods of producing variations or undulations in the electric current is not shown, but the above quotation indicates that he was, and that he was attempting to specify them. Certainly any one possessing such knowledge would have embraced all *known* methods. The situation was this: Bell had made the discovery which depended upon the vibratory or undulatory current. This called to its aid and dominated all known methods of producing those undulations. Any one would properly desire to introduce into his specification and cover all the methods. In preparing his specification in October, 1875, Bell evidently tried to do this and incorporated four methods, but omitted the fifth—the liquid resistance method. But this was a well known method, just as well known as the others. Bell invented no methods of producing variations in the current. He only applied what were already known. The liquid resistance mode was then as well known as the other methods which Bell described in his George Brown specification. It required no invention to apply it, for the use of a diaphragm was then so well known that the attachment of a diaphragm to the wire which was to be vibrated in the liquid could have been made by any ordinary mechanic. It was fully suggested in the *lover's telegraph*, where the vibrations of the diaphragm operated longitudinally on the string. Why then did not Bell introduce this liquid resistance method into his October specification. Possibly because at that date he may not have known of the liquid resistance method, or, if he did, it did not occur to him at the time. Where then could Bell learn this? Is there no source from which he could have derived this knowledge prior to filing his application, unless he acquired it through Gray's caveat? Must he have thus acquired it from Gray's caveat and then have fraudulently incorporated it in his application? Assuredly not. The information existed in books and was matter of common knowledge. It could be obtained from associates, those with whom he conversed. It is probable that Bell possessed the knowledge previously, but it did not occur to him when preparing the first drafts of his specification, the magneto undulatory mode, depending upon induction, through which the invention had been made, being at that time uppermost in his mind.

A comparison of the original draft, the George Brown draft, with the final specification shows that they present internal evidence of progression toward completeness, and that they were not written at the same time, nor can either be a copy of the other.

A complete *alibi* is shown for Bell. If the fraudulent interpolation was made it must have been made between the 15th and 19th of February by his attorneys without his knowledge or consent. There is not a scintilla of evidence that they had any possible knowledge of the existence of the caveat until after the 19th of February. The Bell specification is word for word the same as his patent. I have personally examined the specification and find that it is written upon both sides of the paper, in a clear, fair hand, so continuously from page to page that if any such change or alteration was made the entire specification must have been abstracted and a new one restored in place of it.

It is incredible that attorneys of intelligence and standing would, without their client's knowledge, change a specification which had been prepared with such unusual care, and thus imperil his rights in such a novel and valuable invention. They could not know that the additional matter could be properly added, and consequently the act might be condemned by their client, not only as prejudicial but as an infamous

fraud. If the alteration was made by the attorneys who had stolen the idea from the caveat, it would have introduced the identical invention found there, for they were neither electricians nor experts; but the invention introduced was a different one and shows that whoever wrote the passage understood thoroughly the secret of the telephone, which Gray did not. Gray used a liquid of *high* resistance. This suspected passage in Bell's specification called for a liquid of *low* resistance. Bell had been in pursuit of the delicate sound-waves that constitute *quality*. This Gray did not understand when he prepared his caveat, for, as shown heretofore, Gray was unable to explain the operation and still adhered to the multiple tone idea. In other words, the suspected passage shows a full appreciation of the invention which is not found in the caveat and which neither Gray nor the attorneys of Bell possessed sufficiently to have prepared it.

The change in the practice as to caveats which held a day *punctum temporis*, was made by the Commissioner upon consideration and not by the suspected examiner, whose action in the matter had been adverse to Bell. There can be no question that Commissioner Spear's action was correct. (*Louisville* v. *The Bank*, 104 U. S., 469.) The fact that the Bell application was filed in the Office earlier in the day than the Gray caveat was determined by an investigation instituted by the Commissioner at the time, when it was susceptible of investigation. Both Bell's and Gray's attorneys knew just when the respective papers came into the Office. Attention has already been called to the fact that when the Commissioner withdrew his notices as to the caveat Gray could have had an investigation, but did not, nor did he arrest the issuance of Bell's patent, when he might have done so by filing his own application. But he did neither, and no doubt it was because his attorneys were entirely satisfied that the Bell application preceded the caveat "a couple of hours." Notwithstanding that this subject was urged upon the attention of the Supreme Court in the telephone cases that Court appears to have disposed of it in a single sentence: "Bell's application was filed February 14, 1876, and afterward, during the *same day*, Elisha Gray filed a caveat," &c. The order of filing was thus judicially declared, and there is no intimation that, having been filed on the "same day," one was not filed earlier than the later, or that the caveat had not been given its proper status in the Patent Office.

The Bell patent issued very promptly. It met with neither anticipating reference nor with interference. It was a new art for the transmission telegraphically of articulate speech, and so went speedily to patent because it went unchallenged.

In concluding this subject of the alleged fraudulent alteration of Bell's specification it is proper to observe that this very question, based upon this identical new evidence, was presented to the Supreme Court in the telephone cases and was fully considered and passed upon. I might have contented myself merely with citing the portions of the opinion relating to it, but I felt it necessary to dwell upon some considerations not mentioned there. One extract from the opinion will be sufficient:

> On the 27th of January, 1876, Bell met Brown, who was then on his way to England, in New York. It is now assumed that the paper which Brown took to England was handed to him then, and because the variable-resistance method and the fourth claim were not in that it is argued that they could not have been in the American specification at that time. But no one has said when the paper was actually handed to Brown. Bell says he cannot tell, but that it must have been after he made his contract with Brown, on the 29th of December. As the American specification was signed and sworn to five days before the interview with Brown on the 25th of January, and the paper of Brown differs from it in so many particulars besides that now in question, it would seem to be clear that the paper was a copy of some former draft which Bell had made—possibly one taken to Canada in December—and not of that which was perfected afterward. As the specification which had been prepared and sworn to was a fair copy, without erasures or interlineations, the fact that the paper handed Brown was not a fair copy would imply that it was not intended to be an exact transcript of the other. At any rate, the bare fact that the difference exists under such circumstances is not sufficient to brand Bell and his attorneys and the officers of the Patent Office with that infamy which the charges made against them imply. We therefore have no hesitation in rejecting the argument. The variable-resistance method is introduced only as showing another mode of creating electrical undulations. That Bell had had his mind upon the effect of such a method is conclusively established by a letter which he addressed to Mr. Hubbard on the 4th of May, 1875, and which is found in the Dowd record, introduced into the Overland case by stipulation. Its insertion in his final draft of his specification is another proof of the care with which his work had been done.

I am of opinion that this so-called new evidence is really not such. It does not appear but that all the facts sought to be established by it—viz, that the George Brown specification did not contain the variable-resistance clause—could have been ascertained by asking for it in the Dowd deposition. Neither is it shown that by the use of ordinary diligence Gray could not have discovered this evidence in the People's case years before he did. The difficulty is that he has been acting under the belief that he did not own the inventions and that Bell was the prior inventor, and has allowed years of inaction to follow. Under these circumstances he cannot allege diligence or be excused negligence. Especially will not a court excuse his negligence and delay when the causes assigned are not established and it accepts his former opinion as to ownership and priority to have been correct. But even if satisfied that the evidence was newly discovered and that Gray could not have earlier discovered it by the exercise of diligence, it would still be unavailing, for the reason that, giving it all the force and effect asked for it, it could not change the result or throw any doubt upon the correctness of the former decision.

As to issue C, it is insisted by Gray that the decision in the interferences was erroneous because Bell does not show or describe a liquid transmitter in his patent, and that consequently there should not have been an interference nor an award of priority to Bell. Some justification for the suggestion may be found in the decision of the Examiner of Interferences, who says:

> While no such instruments are found described in Bell's patent, his proof as to "Exhibit 41," its description, use, and exhibition are considered as amply sufficient to defeat the claims of Gray and Edison, founded upon the facts appearing in the record, at the same time anticipating Richmond's record date of August 24, 1877.

But evidently this view is a misapprehension of what the Examiner of Interferences means. He does not mean that a liquid transmitter is not shown, but that its specific construction was not shown in Bell's patent. As heretofore stated by me, the liquid-resistance method and means of applying it by moving the wire by hand or otherwise were well known, as was also the use of a membrane or diaphragm, so that any one skilled in the art would know from Bell's patent how to construct such a transmitter. It was therefore deemed to be shown in that patent. The examiner declaring the interference must have so held, otherwise he would not have made Bell a party to issue C. Not only this, but Gray made no motion to dissolve the interference, and I have no doubt as to the correctness of the action of the Office in either declaring or deciding the issue. What has been said about issues A and B is conclusive as to this.

GRAY'S TITLE.

The Commissioner of Patents has no equitable jurisdiction over the rights of parties claiming under assignments and grants of inventions and patents. He cannot set aside or vacate such instruments, nor can he recognize equitable rights growing out of transactions between inventors and applicants and other parties. While he is authorized to recognize formal legal assignments, and when they have been filed in the Patent Office before patent issues may give the assignee control of the management and prosecution of an application and direct the patent to issue in the name of the assignee, yet he cannot recognize equitable rights under executory or other equitable contracts. (*Ex parte Edison*, C. D., 1875, 42.) But when a party to an interference which has been determined adversely to him asks a rehearing and bases such request upon the allegation that during the trial he was laboring under the supposition that he had parted with the ownership of his inventions, and that in consequence, although he remained a party, was active in securing and giving testimony, the parties to whom he supposed he had transferred were the actual managers of the case; that in consequence—"I had no counsel, I was not a litigant. The whole apparent controversy was, as I now believe, collusive, carried on with an appearance of an array of opposing counsel"—the question of ownership is made material and it is competent for the Commissioner to examine it in order to know how to exercise his discretion intelligently. A party cannot make the question of ownership or non-ownership a material ground of the relief sought and at the same time deny the power of the tribunal to consider and pass upon it.

It is unnecessary to again refer at length to the transactions between Gray and White and the American Speaking Telephone Company and its associates, resulting in the settlement of November 10, 1879. It is evident that that agreement and the transfer of telephone inventions were made under the belief that it included Gray's inventions, and but for such belief it would not have been made. Gray so understood the agreement and was a beneficiary under it. The American Speaking Telephone Company had previously put out large numbers of Gray's telephones as its own property. In the settlement of November 10, 1879, it was expressly stipulated that the inventions of Gray became the property of the Bell company. That all this was done with the full knowledge of Gray is not controverted. With this knowledge and acting under this belief Gray has allowed seven years to pass, knowing that third parties were also acting in the same belief and making investments upon the strength of the transactions and that the interests of the general public were directly involved. If Gray can now repudiate these transactions and assert his ownership, it would constitute *pro tanto* a rescission of the agreement of November 10, 1879, though it would be totally impossible to restore any of the parties to their original situation. Under these circumstances the authorities relied upon as to the estoppel seem conclusive. The Bell Company is certainly the equitable if not the legal owner of Gray's telephone inventions. *Bronson's Exr.* v. *Chappell*, 12 Wall., 681; *Morgan* v. *R. R. Co.*, 96 U. S., 716; *Bank of U. S.* v. *Lee*, 13 Pet., 107; *Dickerson* v. *Colgrove*, 100 U. S., 578; *Baker* v. *Humphrey*, 101 U. S., 494; *Close* v. *Glenwood Cemetery*, 107 U. S., 466. It follows therefore that Gray was not mistaken in his original opinion that the Bell Company had become the owner of his inventions, also that his original belief that Bell was the first original independent inventor and had not pirated any invention from his caveat was also correct, and that all the alleged grounds for reopening these interferences and granting a new trial must fail.

ISSUE G.

A telephonic receiver consisting of the combination, in an electric circuit, of a magnet and a diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced accurately as to pitch and quality.

This issue relates to the receiver. All that has been said about the title of Gray's inventions involved in the other issues is equally pertinent here; but the conclusion is much strengthened by transactions not yet referred to.

Gray took out a patent, No. 166,095, on July 27, 1874. This covered what is commonly called the "blacking-box receiver." It has been formally transferred, with other of Gray's inventions, by mesne assignments, until it came to belong to the Harmonic Company. It was reissued to the latter company. In 1880 the Harmonic Company assigned it to the American Speaking Telephone Company, so far as it related to speaking-telephones, but not including its use for harmonic telegraphic purposes. This patent, subject to this limitation, subsequently went to the Bell Company, under the contract of November 10, 1879. Gray obtained reissues of the patent with claims of which this is one:

The diaphragm or disk of metal capable of responding to all kinds of tones vibrating in unison with the electro-magnet included in the electric circuit, substantially as set forth.

In his testimony in the Dowd case and in his preliminary statement in the interferences Gray repeatedly stated that he had made the inventions embraced in issues G, I, C, and E in the year 1874, and that they were covered in his patent, No. 166,095, which, as already explained, has been assigned, then reissued to the Harmonic Company, and then, as to the use of said inventions as telephones, transferred to the Bell Company. Thus, according to Gray's description of the inventions and his claim for the same, there is a technical formal transfer of them, and he is not the owner of them. His Patent No. 166,095 and the reissue would bar his present claim, and even though he could take out a patent it would at once become the property of the Bell Company.

While it is true that Patent No. 166,095 and the reissue of the same cover a receiver, "the diaphragm or disk capable of responding to all kinds of tones vibrating in unison with the 'electro-magnet,'" &c., yet the present contention of Gray, in issue G, is that he had invented a receiver that would thus respond to *tones*, and he believed and also expressed the opinion that such a receiver was capable of responding to quality and of reproducing articulate speech, if a transmitter could be found; and that therefore his *tone*-receiver was a *quality*-receiver, the latter capacity of responding to quality arising only from a new or additional use of which the receiver was originally and at all times capable. It is clear that if this be true still the invention, whatever it was and however capable, has been assigned, and as a telephone-receiver is now the property of the Bell Telephone Company.

The argument urged with so much force by Gray, that after one of the parties has acquired all the interests in the controversy there should be no further contest, is certainly applicable here, where the objection is presented and urged. Especially is it true that under such circumstances a defeated party, who has parted with all his interest, cannot be allowed to reopen an adjudication in order to retry a matter in which he can have no interest. The discretion of the Commissioner cannot properly be called in aid of a request to reopen and retry these interferences simply to gratify the personal pride or reputation of one of the parties. If the title to Gray's invention is vested in the Bell Company and that company is content with the adjudication, no one else can properly complain.

Referring now to the merits of this issue G, its proper construction must be determined. As heretofore shown in the statement of the facts and extracts from the decisions, the Examiner of Interferences held the issue to mean—

A receiver containing an electro-magnet and a diaphragm supported and arranged in close proximity thereto, and adapted to respond to variations in the electric current passing through the coils of the magnet, when used in connection or combination with a transmitter adapted to create sound-producing fluctuations in the electric current, *whether said electrical variations, waves, pulsations, or undulations represent or are derived from sound-waves or mechanical vibrations.*

In other words, he held in effect that the issue covered a receiver which was capable of responding to and reproducing the tones in pitch of sounds, possessing the capability, when operated on by a proper transmitter, of responding to and reproducing the more delicate variations that constitute quality; that it was merely a new use when a receiver which had responded to a transmitter of tone or pitch was placed in connection or combination with a transmitter capable of transmitting quality or articulate speech. I have already called attention to the fact that the potential possibility of a disk held in close proximity to an electro-magnet was old. It existed in a rudimentary state in the Morse telegraph, and has not only been described in such publications as those of Bourseul and others, but it was long known that the armature or diaphragm would respond to the increased or decreased energy of the electro-magnet in connection with the electric circuit. Not only this, but it was believed and so expressed by scientific men and published in publications that if the circuit could be controlled by some proper device or transmitter articulate speech could be transmitted and reproduced by the receiving-disk. But between these speculations and the discoveries which realized them there lay long regions of invention. When it is recalled to mind how near Reis came to discovering the telephone, what a slight apparent line lies between his transmitter and the microphone-transmitter of Berliner—so near, indeed, that the former sometimes, without the knowledge of its inventor, may have operated on the principle of the microphone and sent across the circuit a stray word or syllable, and, in the light of more recent knowledge, can be adjusted to act as a microphone—we can appreciate how near men may approach to great discoveries without finding them, and what distances in invention sometimes separate necessities or speculations that are almost contiguous.

If it can be said that there is no invention or patentable difference between a receiver which, by reason of want of skill and knowledge, can only reproduce tones, and one which, by the invention of a proper transmitter, can reproduce quality, and that the new relation or adjustment of the latter is only a new use of the former, then we may go back and say of the former that there is no patentable difference between it and the Morse receiver, or that described by Bourseul and others, and that its use as a tone-receiver is only a new use; for the old diaphragm placed in close proximity to the electro-magnet possessed all the qualities and potentialities of the Bell or Gray diaphragm; but between these stages of development there was invention. As well might it be said that the reversing of the magneto-receiver and using it as a transmitter was merely a new use of it and disclosed no invention. In my judgment no broad claim for a magneto-receiver can be maintained. It must be limited to its relation to the transmitter with which it is combined, for between such a combination that will transmit and reproduce pitch alone and one that will do this and also transmit quality or articulate speech there is great invention. The history of the subject, the vain and failing efforts of scientific and learned men of genius for years, demonstrate this, no less than the philosophical and scientific principles involved. If, however, issue G could properly bear the construction given it by the Examiner of Interferences, it will not avail Gray; for if he were allowed to take dates of invention for a receiver of tone or pitch, so should also the other parties to the interference. Edison and McDonough had made inventions of receivers which would reproduce pitch, and of course their tone-receivers possessed the same capabilities as to new uses, quality, &c. It is unnecessary to dwell at any length upon the evidence relating to the efforts of these various parties, as the construction of the issue cannot be maintained and was reversed by the Examiners-in-Chief. It is sufficient to say that it is doubtful if Gray ever conceived the invention prior to his caveat; but admitting that he did, even earlier than Bell or McDonough, he never reduced it to practice or gave the public the benefit of it, nor did he prosecute it diligently by efforts to reduce it to practice, or by filing an application. Consequently it is impossible for him, upon his own statement of facts, to overcome Bell's record date.

The Examiner of Interferences awarded priority to McDonough, holding that he had first conceived the invention in May, 1875, and had been diligent in prosecuting it up to the filing of his application, April 10, 1876. This decision was subsequently reversed by the Examiners-in-Chief, who awarded priority to Bell and whose decision was affirmed by Commissioner Butterworth; but this need not be considered further here, as it relates to McDonough's case, between whom and Bell the controversy remains. In any event Gray cannot succeed in this issue.

The proper construction given the issue by the Examiners-in-Chief and the Commissioner does not affect Gray's status with reference to it. If priority could not be awarded to him under the former construction, it could not be under the latter, for under the latter, as already shown, his earliest date is that of his caveat, which fails to overcome Bell's record date.

Upon these considerations, Gray's petition to set aside the orders, &c., in the interferences and open up the case anew must be denied.

MCDONOUGH'S CASE.

McDonough's application was filed April 10, 1876, for

a teleloge, or far-speaker. He did not claim to have invented a method of transmitting articulate speech:

The object of my invention is to provide a *means* for transmitting articulate sounds from one place to another through the medium of electricity; and it consists in the combination, with an electrical battery, circuit-wires, armature, magnet, and circuit-breaker, of a transmitting and a receiving membrane or sounding apparatus. * * *

My invention also consists in the novel construction of the circuit-breaker, as hereinafter more fully described.

His original claims were as follows:

1. The combination, with the battery, circuit-wires, magnet, armature, and circuit-breaker, of the transmitting-membrane A and receiving-membrane F, substantially as and for the purpose specified.
2. The combination, with the plates C C, of the circuit-breaker D', whereby the circuit is alternately opened and closed by the vibrations of the membrane A, substantially as specified.
3. The combination of the bolt D and adjusting-nut E of the circuit-breaker D', substantially as and for the purpose specified.

April 28, 1876, his claims were rejected upon reference to the "old Reis telephone." His claim to the receiver was rejected upon reference to Bell's patent, No. 174,465. March 4, 1878, McDonough amended his specification, adding, among other things—

The breaking of contact may be rendered more abrupt and the contact rendered more perfect by a drop of water or oil.

He also struck out all the claims and inserted the following:

The combination, with the membrane A, plates C C, the circuit-breaker D', of the bolt D and adjusting-nut E, *for confining the vibrations* of the membrane against the circuit-breaker, substantially as specified.

At the date this application was filed the principle of the microphone had not been discovered or applied; but at the time this amendment was filed it had been and was known. The change by the amendment whereby the nut E was given what se. med a new function, not originally contemplated, "for *confining* the vibrations of the membrane against the circuit-breaker," was regarded by the Office as a departure from the original invention and as an attempt to adopt or incorporate the new feature of the microphone. Accordingly, on March 8, 1878, the Office replied as follows:

The amended claim, filed March 4th, it is thought may be allowed. The matter introduced at the end of the specification by this amendment is, however, held to be new matter, as it describes modifications nowhere adverted to or shown in the application as originally filed. This matter should consequently be erased.

This claim involved nothing but the peculiar construction of the *circuit-breaker*, and thus left the application without any claim to a receiver or other element in the telelogue or telephone. From that date until the present time no other claim has been presented.

On March 26, 1878, the interferences were declared and notices issued to the parties. Under the practice then and ever since existing McDonough could not have been put into interference with Bell and no issue could have been formulated between their inventions, for the reason that McDonough claimed nothing shown or claimed in Bell's patent. He was brought into the interference in consequence of the fact that applicants whose cases were filed later than his, (Edison, Gray, and others,) made claims to elements in the telephone which he showed, but did not claim. In other words, when rejected upon reference to Reis, and to Bell's patent, McDonough submitted to the rejection and voluntarily eliminated the claims, much as a suitor in court dismisses certain counts in his declaration; but inasmuch as his application still showed a so-called "telephone" he was put into interference with Gray and others, so as to compel them to establish that they made their inventions earlier than that shown by McDonough. His position was therefore one of obstruction to Gray and other later applicants, but not to Bell, whose application was earliest in the Office. It would, seem therefore, a natural and necessary consequence, inasmuch as there could be no interference between McDonough and Bell alone, that when Gray and the later applicants were defeated and taken out of the interferences there could be left no interference or contest between the former two. Especially would this seem to be true in view of the fact that McDonough had expressly avoided an interference with Bell by dismissing his claims. Not only did he do this, but afterward, August 20, 1879, he wrote the Office, among other things—

I should like to ask a question, if not improper. Having fully *described* in my application, filed April 10, 1870, a *speaking*-telephone, am I not fully concerned in the case of interference A? By answering you will oblige, &c.

He was informed that he could not properly be a party in case A, and that if he thought otherwise he should make proper motion, &c.; but he took no action whatever.

McDonough's preliminary statement, filed May 1, 1879, is as follows:

James W. McDonough, being duly sworn, deposes and says that he is one of the parties to the above-entitled interference; that he conceived the idea of a *telephonic receiver* consisting of the combination in an electric circuit of a magnet, a diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced as to pitch and quality, and also constructed a practical instrument as early as 31st of December, 1867; that subsequently, on the 20th of August, 1871, this deponent made drawings of a speaking-telephone embodying his said ideas, and that thereafter, on the 30th day of June, 1875, this deponent reduced the same to practice by constructing and operating a speaking-telephone, substantially as shown and described in his said application.

It is insisted by McDonough's counsel that this in itself constitutes a claim to a receiver and relieves his case of the difficulty referred to. It will be observed that by the award of priority Gray and all the later applicants for whom the interferences were declared have been fully disposed of. They are no longer parties, and McDonough is now seeking to reopen the contest as between himself and Bell, when upon his application no such contest could have been originally declared. Nor, under the rules of practice, so long as his present petition stands, can McDonough amend so as to justify such a contest.

I am not prepared to hold that McDonough is barred of this right to petition, in view of the condition of his case. Had he not originally dismissed his claims voluntarily and acquiesced in the rejection at a time when he knew the telephone was going into public use there probably would have been no question as to his right to amend within a reasonable time so as to claim the receiver; but having voluntarily eliminated his claims at a time when his alleged receiver was going into public use, and allowed eleven years to elapse without any other effort to amend or file a divisional application including the claim, a very different case is presented. At the date of his preliminary statement the invention had been in public use for over two years, and this, as just stated, with a voluntary cancellation of his claims.

I am not willing to dispose of the petition upon this ground, or hold that, even if McDonough could reopen the interference as to Bell and secure an award of priority, he could not amend; but the situation is suggestive. A patent to McDonough under these circumstances would dominate the entire telephone inventions as far as now of any commercial value, and it is certainly a serious question whether an applicant who has canceled his claims and apparently abandoned them, under the circumstances stated, ought to be

permitted, after the invention has been introduced and made valuable, to reinstate his claims and receive the benefit of others' enterprise, energy, and capital. While it may be said that all through the interferences he has been contending for his receiver, and this was public notice that he had not abandoned it, yet, as already stated, this was done in a controversy with the later applicants.

It is from his application alone that there can be ascertained what an applicant's claims are, and this showed, at least as to Bell and those claiming through him, that McDonough had acquiesced in the references cited in the rejection, Bell being one of them, had canceled the claims, and allowed them to remain so canceled, and in 1879 had his attention called specifically to the subject of the general interference A, with a statement that he could not be made a party to it.

While it may be that this condition of McDonough's case is not such as to constitute a bar to the relief sought in his petitions, it certainly suggests that his right to the relief should be most convincing before it should be granted.

THE PETITIONS.

The petition signed by counsel as attorneys for the North American Telephone Company *et al.* is so vague and general that it could not be considered in the civil courts either as a motion for rehearing or an assignment of errors. It assigns the following:

First. The interferences were fraudulent and collusive and carried on in the interest of Bell, &c.

This has been fully disposed of in Gray's case, where it more appropriately belongs. McDonough is not in a situation to raise the objection. In interference G there was a contest between himself and the Bell Company, as assignee of all the important inventions. It is true that he also had given the Bell Company an executory agreement to transfer his invention to that company, but it was conditional upon securing his patents, so that he still retained the title so as to support his demand for the consideration whenever the condition thereto should be performed. He was a proper and active party. Although much was said in argument about a conspiracy and combination between Bell and others to conduct the interferences in the interest of Bell, the evidence does not support the charges. Indeed, it is impossible to see how McDonough can avail himself of such a charge. It is asserted, by implication at least, that the Bell Company undertook or were in some manner under obligation to aid him (McDonough) in the contest to secure his patents; but clearly there is nothing to justify such an idea. In the agreement of November 2, 1880, on which $5,000 was paid McDonough, it is expressly provided: "This agreement is not to be taken as any manner of admission by either party as to the validity or invalidity of claims made by the respective parties." This was executed long after the declaration of interferences, after the settlement of the Dowd case, and when McDonough knew well that the respective parties were preparing to establish, if possible, their claims to priority. At that date the Bell Company had become the owner of the important inventions of Edison and others, and had secured a hold upon McDonough by virtue of this contract. However much that company might prefer to secure an award to Bell, it is clear that its status could not be injured by securing, as assignee, a patent to the person whom the Patent Office should adjudge the prior inventor, for it would then hold both patents. In any event, there is nothing in the statute, the practice, or in reason why the Bell Company, as assignee of Edison and other inventors, should not contend for such priority as they deemed right and proper; nor is there anything in the relation between McDonough and that company upon which he can found complaint that such course has been pursued by it. He was simply a party to the interference, interested in establishing his own priority. In contested litigations each party necessarily looks after his own case, and cannot complain that the adverse parties do not assist him, or do not forego their own interests. Such proceedings are open and public, and before they can be attacked some actual fraud or wrong on the part of the successful party must be shown whereby the right of the losing party has been prejudiced or by which he was prevented from fairly presenting his case.

It is in view of these propositions that McDonough insists that the Dowd record, to which he was not a party, and in which the testimony of witnesses whom he never had opportunity to cross-examine was taken, was stipulated into the interference without his knowledge and consent; but the record shows that this stipulation was made by his own attorney, and that long before the trial of the interferences and at a time when he could have interposed objection he was made aware of the fact and was furnished with a copy of the record. At no time did he interpose objection or make any movement to strike the Dowd record out of the case or seek to examine the witnesses. A client is bound by what is done by his attorney in the course of conducting and managing his cause in court. He is presumed to know what is done by his attorney and to authorize it; but here it is shown that McDonough was advised in time to have recovered from the position if there had been anything objectionable or improper in it. It may be, as suggested, that, not being a lawyer, and relying upon his attorney, he did not personally read and inspect the voluminous record, nor understand what it contained; but this will not avail here. If he is unwilling to be bound by the acts of his attorney, then he must act for himself, and cannot plead his own failure as a justification. Especially cannot he do so after trial in support of a motion for a new trial.

As to the difference between the paragraph found in the memorandum of settlement and the formal contract of November 10, 1879, I am not able to perceive that any importance can attach to it. It is immaterial whether in preparing the original draft there was present the idea of submitting the question of interference to the Patent Office or not. If it occurred to the parties afterward, when they came to put the memorandum in formal shape, it was proper to insert it. The interferences had been declared a year before and were pending. It was necessary to dispose of them. Issue G was a seriously contested matter. The Dowd case was still pending in court. To add to the paragraph the words—"Subject to the orders of the courts and the decisions of the Patent Office," was certainly appropriate in view of the situation in which the contracting parties were placed.

The second and third assignments of error relate to the question of priority of invention and the effect of

Bell's patent, and will be disposed of hereafter, with the consideration of the merits.

The other petition, signed by McDonough, assigns the following causes for the relief asked, viz: Reopening interference G and granting leave to furnish proofs in regard to operativeness, &c.

First. Error on the part of Commissioner Butterworth in considering certain affidavits of Professors Brackett and Young, taken and used in the suit of *The Bell Telephone Company* v. *The Overland Telephone Company*, but which were not part of the record in the interferences. It appears, however, that these affidavits were read, or parts of them were read, by the respective counsel of McDonough and the Bell Company without objection from either, so that, although not taken regularly or formally in the interference proceeding, they were used therein. Of course, this being so, it cannot be complained of by either party as error.

Second. That the Commissioner decided the interferences with a determination not to decide the issue adversely to Bell. This has been disposed of in the Gray case, where the objection was made that the Commissioner's decision was not a "deliberate" decision. There is nothing to justify the idea or suggestion that the decision was made with any predetermination in either direction.

Third. That, having denied, in his decision of January 16, 1885, the motion to reopen the case and remand McDonough's application to the Primary Examiner on the question of operativeness, there was error in his final decision in not taking further steps to investigate the operativeness of McDonough's invention; also, in considering the affidavits of Young and Brackett in the Overland case. The decision of Commissioner Montgomery, of March 29, 1887, disposes of this so far as it relates to operativeness, although I hold that this question inheres in Commissioner Butterworth's final decision and can now be properly urged in McDonough's motion for a rehearing as to that. It will be considered hereinafter in connection with the merits of the petitions. As to the affidavits of Young and Brackett, that question is disposed of above.

The remaining assignments of error relate to the operativeness of the invention and the merits of McDonough's case, and will be considered under the general subject of—

MERITS.

From what has been shown it is clear that McDonough has never claimed to have been the original inventor of the telephone, either the method or the apparatus. This appears clearly from his specification in his application and his preliminary statement. In the former he limited his claim to a little device for making and breaking the circuit—according to Reis. In the latter he claimed the magneto-receiver. He calls himself a mere improver upon Reis's instruments, accepting him as the original inventor. In presenting the petitions under consideration his counsel, Mr. Hurd, says:

In 1874-'5 "there were two classes of applicants before the Office—those who recognized Professor Reis as the inventor and whose efforts and attention were directed exclusively to the development of his instruments and the operation of the methods which he described by which speech might be transmitted." Of these McDonough was probably the most prominent.

So, also, Mr. Ingersoll, after stating that the first point in the investigation is whether the evidence absolutely shows that Reis's telephone, as invented by him, will speak, adds:

The importance of that is perfectly manifest from the further fact that McDonough claims an improvement on that system, so that the first question is, Will the Reis telephone talk? Was it intended to be and is it a speaking-telephone?

It will be remembered that Reis's receiver is what is known as the "knitting-needle" receiver—a bar of iron within the coil of the circuit-wire and affected by the make and break in the circuit. The only improvement presented by McDonough is to substitute his diaphragm and magnet for this knitting-needle receiver. He had never conceived of the undulatory current or the variable resistance, but accepted and still accepts the make-and-break system of Reis as the foundation of his invention. The Examiner of Interferences, the Examiners-in-Chief, and the Commissioner have held that articulate speech cannot be transmitted by means of the Reis instruments as made and described by him and as made and described by McDonough. In other words, it has been and is the settled judgment of the Patent Office that speech cannot be transmitted by any instrument which operates solely by the making and breaking of the circuit according to Reis. This also has been definitely settled with reference to Reis by the Supreme Court of the United States in the telephone cases:

But it is needless to quote further from the evidence on this branch of the case. It is not contended that Reis had ever succeeded in actually transmitting speech, but only that his instrument was capable of it if he had known how. He did not know how, and all his experiments in that direction were failures. With the help of Bell's later discoveries in 1875 we now know why he failed. * * *

We have not had our attention called to a single item of evidence which tends in any way to show that Reis or any one who wrote about him had it in his mind that anything else than the intermittent current caused by the opening and closing of the circuit could be used to do what was wanted. No one seems to have thought that there could be another way. All recognized the fact that the "minor differences in the original vibrations" had not been satisfactorily reproduced, but they attributed it to the imperfect mechanism of the apparatus used rather than to any fault in the principle on which the operation was made to depend.

It was left for Bell to discover that the failure was due not to workmanship but to the principle which was adopted as the basis of what had to be done. He found that what he called the intermittent current—one caused by alternately opening and closing the circuit—could not be made under any circumstances to reproduce the delicate forms of the air vibrations caused by the human voice in articulate speech, but that the true way was to operate on an unbroken current by increasing and diminishing its intensity. This he called a vibratory or undulatory current, not because the current was supposed to actually take that form, but because it expressed with sufficient accuracy his idea of a current which was subjected to gradual changes of intensity exactly analogous to the changes of density in the air occasioned by its vibrations. Such was his discovery, and it was new. Reis never thought of it, and he failed to transmit speech telegraphically. Bell did, and he succeeded. Under such circumstances it is impossible to hold that what Reis did was an anticipation of the discovery of Bell. To follow Reis is to fail, but to follow Bell is to succeed. The difference between the two is just the difference between failure and success. If Reis had kept on he might have found out the way to succeed, but he stopped and failed. * * *

So as to James W. McDonough. We presume that it will not be claimed that he is entitled to more than he asked for in his application for a patent, filed April 10, 1876, and there a "circuit-breaker," so adjusted as to "break the connection by the vibrations of the membrane," is made one of the elements of the invention. The Patent Office was clearly right in holding that he had been anticipated by Reis.

The question must now be regarded as finally settled in the Patent Office. The fact that certain patents have been issued to persons *ex parte* by the Patent Office, whether erroneously or inadvertently, which appear to recognize a different opinion cannot change a deliberate conclusion thus reached in a contested matter after full consideration.

It must also be recognized as settled that if an occasional word was ever transmitted by the Reis instrument the result was due to the fact that the instrument, at the moment it happened, failed to operate in accordance with the principle of its construction; the make and break did not occur; the contact of the electrodes remained, and the instrument

secretly and without Reis knowing the fact operated upon the principle of the microphone, which was not yet discovered.

It must also be recognized as settled that if an instrument constructed according to Reis and as described by McDonough in his application can now be made to transmit speech it must be by means of adjustment of the electrodes so that it operates, not upon the make-and-break principle, as described, but upon that of the microphone, which has been discovered since Reis made his invention.

Now this distinction is not one of mere theory or speculation, but of principle or knowledge and specific construction of the invention. Under the patent law, invention is not recognized in the mere doing of something new or the accomplishing of some new result. A new and valuable product may be accidentally discovered and produced and the discoverer not be able to recall the steps of his process or reproduce the product. There is the first specimen. It is new, concrete, tangible, and useful; but there is no invention within the meaning of the patent law. Though the operator has made the product, he does not know how it was made and cannot explain the process to others.

The accidental effects produced in Daniell's water-barometer and in Walther's process for purifying fats and oils preparatory to soap-making are of the same character. They revealed no process for the manufacture of fat acids. If the acids were accidentally and unwittingly produced while the operators were in pursuit of other and different results, without exciting attention, and without its even being known what was done or *how it had been done*, it would be absurd to say that this was an anticipation of Tilghman's discovery. (*Tilghman* v. *Proctor*, 102 U. S., 711.)

To constitute invention it is required by the statute that the inventor shall possess knowledge of the very construction of the instrument or means and of its mode of operation, so that he can communicate the same to the world and enable others, pursuing the very directions pointed out, to construct the same instrument or means, operate it in the manner pointed out, and accomplish the same result. This Reis could not do as to this instrument, for his description of construction and operation was that the electric current must be broken and closed, whereas, to make it transmit speech, the very opposite was required, viz: That the electrodes should remain in contact, so that the microphonic principle of variable resistance could operate. His knowledge was such as would lead the world in directly the opposite direction from that required to produce the desired result, and would show others how not to do it. The true construction and necessary mode of operation remained in the secret arcana of nature until discovered later on. They were not discovered when McDonough filed his application in which, in compliance with the statute, section 4888, he attempted—

A written description of the same (his invention) and of the manner of making, constructing, (compounding,) and using the same, in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains or with which it is most nearly connected to make, construct, (compound,) and use the same; and in case of a machine he shall explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions, &c.

What has been said of Reis is equally true of McDonough. He built upon the palpable make-and-break system. The fatal vice of giving the wrong description and directions is in his application, and he can never depart from what was and is now in it. If his teleloge has ever talked or can now be made to transmit speech, it must be changed in its construction and mode of operation, so as to become a microphone; or if by the light of later knowledge and experience the makes and breaks, instead of being palpable and of full amplitude, are rendered inappreciable, so that its mode of operation is different, the original invention becomes lost in a newer and later one, which must be presented in a new and later application.

McDonough presents a number of affidavits and statements of scientific persons who testify to having been able to make the Reis telephone transmit articulate speech. He has also presented evidence that tends to show that his original instruments did so; but did they do so *in the mode pointed out* by Reis or, by McDonough in his application? These witnesses do not so testify. Most of them simply undertook to make a telephone, constructed like Reis's, talk without regard to the principle, the mode, or the description given by Reis. It may be conceded that anyone skilled in the art can, in the light of present knowledge, accomplish this; but it proves nothing, except that those who know how can so adjust and arrange the Reis transmitter that it ceases to be a make-and-break device which will not transmit quality, and becomes a microphone, which will. The only witnesses produced by McDonough who claim to have been able to transmit speech by means of a Reis instrument, when called upon to explain the conditions, practically concede this. If, therefore, Reis never invented a telephone or transmitter capable of transmitting articulate speech, if the art of transmitting speech by a transmitter was unknown, and McDonough makes no claim to have invented more than a receiver to co-operate with a Reis transmitter, what reason is there to open up the interference to enable McDonough to introduce evidence of operativeness, that the Reis transmitter does transmit quality? He could without doubt produce witnesses to testify that they to-day could make the Reis transmitter transmit quality; but is it not clear that that is not the question at all? The question is: Did Reis possess, and does McDonough's application show, the knowledge of the principle of construction and mode of operation which explains the transmission of speech, (if they ever did transmit it,) and which, without later knowledge and discoveries of others, could have communicated that knowledge to the world? This question has already been sufficiently answered in the negative.

What has been said in Gray's case in regard to the claim that a receiver of multiple tones is also a receiver of quality, because of its potential qualities of responding to every variation in the magnetic and electrical force, is equally pertinent in its application to McDonough's receiver. This appears to have been the view of the Examiner of Interferences, at least this result would seem to follow the adoption of his views; but the Examiners-in-Chief and the Commissioner disposed of the matter as stated.

Say the Examiners-in-Chief:

Gray formerly insisted, and Edison and McDonough still insist, that not only the art is of their invention, but the apparatus also, and it is only by including an articulating-transmitter in this issue that the question of priority as to the receiver can properly be determined.

If the construction of the issue given by the Examiner of Interferences is to prevail, and priority be awarded to a party who had no articulating-transmitter, it would result that an experimenter who had tried to transmit speech and failed, or one who had never tried, should so dominate the art that an inventor who had worked out the idea, patented his process of carrying it out, introduced it to the public, and put it into extensive use, could not practice the art which he had created without being tributary to his unsuccessful rival.

This construction of the issue was insisted upon by McDonough throughout the interference, not only

when Bell moved to reform the issue before Commissioner Paine, but ever since, up to the present petitions. Not only is it the correct construction, but McDonough cannot, at this late hour, ask to have a different one given to it as a ground for rehearing.

As frequently stated by me, in view of the state of the art when McDonough's application was filed, no one could secure a broad claim for a receiver, *per se*. A receiver of tone or pitch would not have been patentable in the absence of the invention of a transmitter which would transmit tone; and while it is true that a receiver of quality will necessarily respond to tone, yet the reverse is not necessarily true. As to such a receiver, it is dependent upon a transmitter through the umbilicus of patentable combination and necessary union, and cannot be said to have been discovered or invented until a transmitter of articulate speech had been invented or discovered. It is insisted, however, by counsel for McDonough that speech was occasionally transmitted by the transmitter constructed after Reis; and whether it occurred accidentally and was attributed to the wrong cause or mode of operation, it was articulate speech, reproduced and delivered by the magneto-diaphragm receiver; and that while McDonough might have been ignorant of the mode of operation of the transmitter he was not of that of the receiver, whose functions had long been known. This, however, is, in effect, a complete reversal of all that McDonough had insisted upon heretofore, and eliminates the articulating-telephone from the issue and leaves remaining only a receiver. Why McDonough insisted upon the former construction of the issue—unless he thought it the correct one—does not appear, except he may have feared that as to a mere receiver Edison, Gray, or Voelker might antedate him. Evidently he cannot be permitted to secure an award upon a limited issue which puts all his adversaries out of the case and then insist upon another and broader construction for himself. Not only this, but the relation between the receiver and transmitter is such that the invention is not complete as to the receiver until it is as to the transmitter also. They are one, in the conception and completion of invention, and cannot be divided or separated. It could not be known that such a receiver would reproduce quality until a transmitter could be found to transmit it. If quality were transmitted accidentally and only occasionally, it could not be certainly and absolutely known but that the failure to transmit regularly and when desired was due to a defect in the receiver. In other words, it required a result which could be controlled and relied upon, which could be repeated at will, and that the construction and mode of operation should be known and understood, as required by the patent law. This involved the transmitter as well as the receiver, and until a transmitter had been made which would successfully transmit speech, whose construction and mode of operation were understood, there could be no invention of a receiver, within the meaning of that law. It is urged most strenuously, however, that this question of operativeness is one belonging to McDonough's case *ex parte;* that in the interference the Office is bound by the action of the Primary Examiner who declared the interference, and that the only mode of considering or reviewing that question is to remand the case to the examiner and give McDonough an opportunity to be heard and present proofs before him. Further, it is insisted that when the right to a patent is denied for want of operativeness or utility, it must be by rejection by the Primary Examiner, giving the applicant his right of appeal; but this view cannot be maintained. The Commissioner, as the ultimate head of the Patent Office, has the power to withhold a patent which in his judgment ought not to issue; but the present question does not depend upon the power. There are two modes of rejecting an application: one upon references, want of utility, &c., as an *ex parte* case; the other through the procedure of interference. The former may be appealed from the Commissioner to the Supreme Court of the District of Columbia; in the latter, the decision can be reviewed only by a bill in equity.

The statute requires an interference to be instituted whenever in the opinion of the Commissioner there is pending an application which interferes with another or with an unexpired patent. This interference was declared at a time when the nature of the telephone was not so well known and understood as now. I am not prepared to say but that a motion to dissolve should have been sustained if urged upon the ground that McDonough and some others of the parties did not disclose an operative invention. A motion to reform was made, which, had it been sustained, might have remanded McDonough's case to the Primary Examiner; but he opposed the motion and insisted upon the interference and elected that mode of trial. The trial has progressed through several years, and a final decision has been reached. There is not the slighest doubt that in determining the question of priority, in such interference proceeding, it is right and proper for the Commissioner to determine and pass upon the entire merits of each invention involved, including utility, operativeness, &c. The very question involved is: When did the respective parties first make the inventions set forth in the issues? If the evidence shows that one of the parties never made any invention, as defined in the statute, and consequently is not entitled to an award of priority, while another party did and is so entitled, the Commissioner is unquestionably authorized to so decide and award priority of invention accordingly. He possesses the power in such case to dissolve the interference if he thinks best to do so; but he is not required to do it. In cases of doubt, when he is not certain as to the want of operativeness, he may very properly suspend or dissolve the interference, remand and make the case *ex parte*, giving the right of appeal, so that the question could come back to him illuminated by the action of the Primary Examiner and the Examiners-in-Chief. If the doubt as to operativeness should be resolved in favor of the applicant, the interference would be reinstated and decision made accordingly; but where there is no doubt, when the question is one settled in the Office, settled in a number of circuit courts, and by the Supreme Court of the United States, such a course cannot be seriously considered.

This is all that is asked by McDonough. His petition is, in effect, a motion to dissolve and be permitted to establish to the satisfaction of the Patent Office the operativeness of the invention. He claims that, in consequence of the collusion and the manner in which the interference has been conducted, he has been deprived of an opportunity to do this. It is expressly stated by his counsel that—

> It is not supposed to be possible in another hearing that any addition to the testimony could be made.

He was offered on the hearing before me an opportunity to present any experiments or tests proving his case; but none were submitted.

The question of collusion has been disposed of. The record shows that Bell in taking his testimony directly attacked the operativeness of McDonough's invention, and he had knowledge of the fact personally, as well as by counsel. He had ample time allowed him to rebut this evidence and establish all he could; but he took no such evidence. Neither did he ask the Office to enlarge the time, nor did he make any motion in that direction. Having had all these opportunities and neglected them, he cannot now complain if he is denied any further time; but it would not avail him if it were given. The alleged fact is incapable of being established. It thus appears that McDonough's application has received the consideration provided for it under the statute. The interference has been pending since 1878. Final decision was rendered by the Commissioner on March 3, 1885, in which it was held that McDonough had never invented a speaking-telephone, and consequently was not entitled to an award of priority as against Bell, who had. The present petitions ask me to vacate this decision, remand the case, &c. It is to be disposed of upon the principles applicable to new trials.

I am not convinced that there has been any error or mistake in the former decision; but, on the contrary, I am satisfied that another trial would necessarily result in the same conclusion. McDonough's petitions are therefore denied.

EX PARTE GRAY.

(Case No. 3.)

Decided February 23, 1889.

1. AMENDMENT REFUSED.

   Applicant proposes to amend his claim so as to limit his invention to a metallic diaphragm, and such amendment has been refused admission.

2. RIGHT TO AMEND LOST.

   When the Office has called the attention of an applicant to his right to cover in his claim certain specific matter and advised him to amend accordingly, and the applicant, declining to do so, enters into an interference contest upon the broad issue, in which he is finally defeated, he cannot, after acquiescing for a long period in such award of priority and waiting nearly ten years after filing his application, return to the Office for the purpose of proposing the amendment suggested by the Office and declined by him, and which, if admitted, would result in a new interference.

3. DECISIONS ON ISSUE IN INTERFERENCE CONCLUSIVE.

   The tribunals adjudicating the interference discussed and considered the specific invention and intimated that a motion to dissolve and re-form the issue would be entertained; but applicant declined to avail himself of the suggested remedy. *Held* that the decisions, involving the very question presented in the amendment now insisted upon, are final and conclusive upon Gray's right to claim the subject-matter presented in the proposed amendment.

4. DEFECTS CURED BY VERDICT.

   It is a fundamental principle in the common law of pleading that when there is any defect, imperfection, or omission, whether in substance or form, which would have been a fatal objection upon demurrer, (motion to dissolve or re-form,) if the issue joined be such as necessarily required on the trial proof of the facts so defectively or imperfectly stated or omitted, or without which it is not to be presumed either that the judge would have directed the jury to give or the jury would have given the verdict, such defect, imperfection, or omission is cured by the verdict.

5. SAME.

   In the matter of issues in interferences there is no rule applicable except that which provides the motion to dissolve. Clearly, however, when an issue has received a construction as to its meaning by the court and has been tried under that construction and the parties have acquiesced in it the case becomes one in which the issue must be held to be complete and to read according to the construction thus given it.

6. ADJUDICATION OF PETITIONS TO REOPEN CONCLUSIVE AS TO PROPOSED AMENDMENT.

   The adjudication of the petitions to reopen the interference is conclusive as to the subject-matter of the proposed amendment.

PETITION to amend.

TELEPHONES.

Application of Elisha Gray filed October 29, 1877.

Mr. M. B. Philipp and *Mr. Casey Young* for the applicant.

HALL, *Commissioner:*

This application was filed October 29, 1877, and on the 26th of March, 1878, was put into interference with Bell's patent of March 7, 1876, and applications of Dolbear, Edison, McDonough, and others. Two of the issues were as follows:

ISSUE G.

A telephonic receiver consisting of the combination, in an electric circuit, of a magnet and a diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced accurately as to pitch and quality.

ISSUE J.

The combination, with an electro-magnet, of an iron or steel diaphragm secured to a resonant case for rendering audible acoustic vibrations.

Issue G is a broad claim for a telephonic receiver consisting of *any* diaphragm supported and arranged in close proximity to the magnet in an electric circuit. Issue J embraces as an element specifically an iron or steel diaphragm.

Such proceedings were had in the interferences that the Examiner of Interferences gave an award of priority in issue J to Bell on July 26, 1879. Gray acquiesced in this decision, and has never appealed from it, though on December 30, 1886, 7 years afterward, he presented a petition to the Commissioner of Patents asking to have all the orders and decisions in the interferences set aside and a new trial granted. This will be more clearly seen by a reference to the decision of this date in the interferences.

In issue G priority of invention was awarded to McDonough by the Examiner of Interferences. Gray and Bell appealed to the Examiners-in-Chief, where the decision was reversed and priority was awarded to Bell October 23, 1884. Upon appeal by Gray and McDonough this decision was affirmed by Commissioner Butterworth March 3, 1885. Subsequent proceedings in reference to this issue are set out in the decision in the interferences above referred to.

Pending the petition for rehearing in the interferences Gray presented an amended claim February 23, 1887, which was not admitted or entered, probably because the effect of his petition was to preserve the pendency of the interference, during which amend-

ment affecting the issue cannot be made. April 4, 1887, Gray presented a second amendment waiving inferentially the first. It is as follows:

The combination, substantially as hereinbefore set forth, in an electric circuit, of a magnet and metallic diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced accurately as to tone, pitch, and quality.

Issue G was framed upon Gray's original claim—

The combination, substantially as hereinbefore set forth, in an electric circuit, of a magnet and a diaphragm supported and arranged in close proximity thereto, whereby sounds thrown upon the line may be reproduced accurately as to tone, pitch, and quality.

It will thus be seen that the only difference between the two claims is that the latter covers *a* (*any*) diaphragm, while the former is limited to a metallic diaphragm.

Prior to the filing of Gray's application Bell had taken out his two patents, Nos. 174,465 and 186,787, the former containing a broad claim for a diaphragm generically and the latter a specific claim for the metallic diaphragm. January 30, 1878, Gray's claim was rejected upon Bell's patent, No. 186,787. Subsequently this was withdrawn and the rejection made upon Bell's patent, No. 174,465. This was because the latter contained the broad claim. In the letter of rejection the Office called Gray's attention specifically to the metallic diaphragm, and advised him that if he desired to make a specific claim to the metallic diaphragm he should do so. He declined to do this, although his application showed the metallic diaphragm, and in his specification he states that he prefers to use such a diaphragm. In his letter to the Office, March 20, 1878, he stated that he intended "to contest the matter in its broadest scope."

The declaration of interferences followed, in which, among other issues, were formulated G and J. From this statement it will appear that it became necessary for the examiner, in preparing the interferences, to frame two issues, one covering the broad or generic claims and one covering the specific claims, for while Bell claimed each in his patents, and Gray, claiming the invention broadly, only showed the specific construction, yet there were other parties behind or later than Gray who showed and claimed the specific construction—the metallic diaphragm. It was to meet this necessity that issues G and J were framed, Gray and Bell being parties to each.

The decision of issue G disposed of the broad or generic claim in favor of Bell. It so happens that without a metallic diaphragm the telephone cannot be made commercially valuable; and while Bell's broad claim would dominate the specific metallic-diaphragm-claim, yet the latter would really be the controlling one, without which the other would be of little use.

Now, in this condition of the case, nearly ten years after the filing of his application, nearly four years after the decision of issue J, and not quite two years after the final decision of the Commissioner in issue G, Gray tendered this amendment and asked to be allowed to claim the metallic diaphragm. Notwithstanding Gray's petition to reopen the interferences was on file, this amendment was referred by my predecessor to the examiner for report, who made a favorable report April 6, 1887. Upon my succeeding to the position of Commissioner I resubmitted it to the examiner. It appeared that possibly the amendment might affect the interests of parties under the adjudications in the interferences. Accordingly, notice was given to Bell to appear and be heard, if he desired, upon the question as to how far Gray was concluded by the adjudications and whether they precluded him from filing this amendment and setting on foot a new interference. Objection was made by Gray that at this time his case was *ex parte*, and the Office had no right or power to bring Bell in or give him notice of the claim; but this view did not prevail. It was known that if the amendment were admitted it would result in a new interference, which would at once disclose Gray's claim to Bell, and in view of the long and expensive proceedings in the interferences which had been closed, it was deemed best to have a full hearing before opening them up again on an *ex parte* motion. The result was that the case was fully argued before the Primary Examiner, who advised against admitting the amendment. It was fully argued before the Commissioner and is now to be disposed of.

Gray claims the right to amend because his application is still pending, undisposed of. He insists that the right to amend is given by statute; that the amendment was not admissible pending the interferences, which were only disposed of March 3, 1885; that he tendered an amendment February 18, 1887, which was within two years succeeding the last action of the Office; that from this date he was entitled to two years longer to appeal from the action of the Office refusing to admit the amendment, or to take such other appropriate action as he saw proper; that he filed another and different amendment, and in consequence his application is not abandoned, and that he is entitled to action upon it.

Bell introduces the record and adjudications in the interferences and in effect pleads them in bar of this amendment. The entire record is before me in support of the plea. Bell also insists that the inventions of Gray belong to the Bell Telephone Company; that Gray's case is abandoned, and that in the exercise of a proper discretion the Commissioner ought to deny Gray's motion to amend.

The case was argued orally at great length, and elaborate briefs, showing great research, have been presented to aid me in disposing of the questions involved. The record discloses the fact that in the interferences Gray has introduced all the evidence attainable, so far as concerns his invention, whether we consider a membranous diaphragm with an armature or a metallic diaphragm, "the blacking-box receiver," "the wash-basin receiver," or "the tin-cup receiver," and whether the issue be a generic claim to *any* diaphragm-receiver or a specific claim to a metallic diaphragm-receiver. It also appears clearly that in declaring the several interferences the examiner endeavored to formulate them in such a way as to cover the whole subject of the telephone and all its elements as shown and claimed by the various parties. The situation was such that it was the duty of the examiner in formulating the issues to frame one covering a receiver, consisting of a magnet, a metallic diaphragm, &c., for it was shown in all the applications later than Gray and claimed by one of them, as well as by Bell in his second patent. That issue J was intended to meet this requirement there is little doubt. If it does not, then an issue that would meet it ought to have been framed. While it is true that primarily the examiner prepares and formulates the issues, yet a duty also rests upon the parties with respect to the matter. The rules provide that they may move to dissolve the interference or to remodel or reform the issues. They bear much the same relation to the issues that suitors do to feigned issues in equity.

In the interferences the evidence was taken and introduced, as if every possible question were presented. It was argued, apparently, upon the same general presumption. That this is true is clearly shown by the elaborate decision of the Examiner of Interferences:

Now, it is true all of the parties to this count describe receivers containing an electro-magnet and an iron or steel diaphragm secured *to a resonant case*, but not to *a resonator*, such as Edison's, nor are they adapted to respond only to a given series of electrical impulses. Gray shows the diaphragm attached to a flaring, bell, or trumpet-shaped case. Dolbear fastens his diaphragm to a rigid frame or support, K, and says: "A bonnet or tube, t, may be attached to the frame K, as shown, or in any other convenient manner; *but, although it facilitates speaking and hearing, it is not essential to the successful operation of the instrument.*" Holcombe, speaking of his instrument, says: "I find it *convenient* for but *not absolutely necessary* to the satisfactory performance of the instrument to have a box to partially inclose the disk, and also to have a tube or mouth-piece which shall direct the voice more effectually upon the vibrating or transmitting disk. * * * When the instrument is used as a receiver, this mouth-piece or tube can be applied to the ear, and serves to concentrate upon the ear the sounds evolved from the receptive and vibrating disk."

Richmond's transmitter is provided with a strained metallic diaphragm, above which extends "a removable speaking tube or channel, through which the sound it is desired to transmit is conveyed to the diaphragm," and he mentions placing an electro-magnet under this diaphragm to convert it into a receiver, and Bell employs a metallic diaphragm fixed to a rigid support with a cover, and what he terms a "speaking-tube."

From the circumstance that all of the parties mention the use of a resonant case or tube, though totally unlike Edison's in purpose and function, it might be inferred that the term "resonant case," as employed in the declaration, comprehended any and all such devices, whether used to confine and direct sound-waves or as an analyzer to respond to a given series. This would be the logical conclusion deduced from the facts as they appear, were it not for the alleged interfering claims of Bell and Dolbear, which are said to comprehend the same subject-matter as Edison's claim, and hence should contribute in an equal degree to its definition.

Bell's third claim relates to the combination of an electro-magnet with a plate of iron or steel or other material capable of inductive action, so arranged as to be thrown into vibration by sound-waves or the attraction of a magnet. No reference whatever is made to the resonant case or tube, nor does the specification warrant its inclusion as a necessary element. It was properly included in cases I and J, because of the reference to its action as transmitter and receiver.

Turning next to Dolbear's third claim and the absence of a resonant case is equally apparent. He mentions it in his specification as a useful but non-essential element, and claims: (3.) "One or more helices or coils, included in the circuit of the main line, and surrounding a core or cores, in combination with an elastic inductive plate or armature facing the poles of said core or cores, and a rigid support or frame to which the opposite edges of said plate or armature are secured."

Were it not for the specific reference to Edison's "resonant case for rendering audible acoustic vibrations," a middle ground common to all of the parties might be found in the combination, with the electro-magnet, of an iron or steel diaphragm secured at its edges to a rigid support or frame, and adapted to render audible electric waves or undulations traversing the electro-magnet; but such a construction, while supported by Dolbear's claim 3, is at variance and totally irreconcilable with Edison's *invention* as expressed in his claim and the declaration. No proper and legitimate interference is believed to exist between the parties hereto on Edison's claim. It refers and pertains to a different system, device, combination, and purpose from anything disclosed by the other parties. It is not coextensive with, nor does it include, the invention claimed by Bell and Dolbear.

Inasmuch as Edison's claim, when restricted to the invention described by him, is insufficient to support the declaration, but two alternatives are present, either to report the case for dissolution or give to the claim a fictitious value. As the parties are at liberty to move for a dissolution, it is thought best to proceed with the case, and, if possible, so construe the terms of the count as to include matter common to the patent and the several applications.

To satisfy all the conditions the instrument may be either a producer or reproducer of sound, for Edison develops the former capacity only, while the remaining parties employ the latter. The diaphragm must be of iron or steel, because Bell's first patent describes a membrane diaphragm; and the diaphragm must be secured at its edges to a resonant case, which latter may be, *first*, a resonator adapted to pick out and respond to a given series of electrical waves as described by Edison; or, *second*, a conveyer for confining and directing all series and characters of sound-waves as described by the remaining parties.

Such is believed to be the only rational and consistent interpretation that can be given to the declaration and at the same time create an interference. * * *

It results from this condition of affairs that the inventor of a device consisting of an electro-magnet and a diaphragm fastened to the end of a resonator, and used in connection with a reed or harmonic transmitter, with whose rate of vibration the column of air is in accord, the whole being so arranged, adjusted, and used that the tones produced by the vibrations of the transmitter shall alone be rendered audible; that the inventor of such a device, adapted and used only as an acoustic or harmonic telegraph receiving-instrument, may claim and thereby subordinate an instrument, which, although it includes the diaphragm and electro-magnet, is so constructed and used that, instead of responding to one tone only, as produced by a vibrating reed with which its resonator is made to accord, responds to any and all tones not produced but transmitted by an instrument under the influence of sound-waves.

Yet such would be the legitimate outcome of this interference were it proved that Edison's invention of the devices shown and described in his application antedated the inventions of the other parties.

It appears, however, from the evidence adduced that Edison's Exhibits A and A', relied upon in support of his claim, were no more than abandoned experiments, abandoned for no other reason than because they were found to be incapable of satisfactorily performing their alloted duty, and were regarded as of no value.

None of Gray's instruments made in 1874, 1875, or 1876 are proved to have possessed the features in issue. Dolbear's suggestions of October, 1876, as to the substitution of a sheet-iron diaphragm for the rubber and iron, as applied to the tube, were not carried out in the instruments commenced in December, 1876, and finished in February, 1877.

Irrespective of the construction of the instrument, which seems to have been about the time the application for the second patent was filed, it is evident that Bell had practically made the invention when he suggested and applied the first iron diaphragm. He had invented and applied all the other elements, and the iron diaphragm was to take the place of the membrane diaphragm previously employed.

Priority of invention is accordingly awarded A. G. Bell on this count.

Although Gray did not appeal from the decision of the Examiner of Interferences in issue J, he did in issue G, and must have known at once what the decision was in issue J, as between Bell and Edison.

The Examiners-in-Chief adopted the construction placed upon the issue by the Examiner of Interferences. They say:

The problem presented by this state of facts is how to construe the issue so that Bell's patent, the applications of the other parties, and the three claims of Bell, Edison, and Dolbear may be held to cover the same subject-matter, for it is evident that if Edison's application and claim alone be the guides there would be no interference. It is true the dissolution of the interference might be recommended, but, remembering the present advanced stage of the case, the failure of any of the parties to whom all of these matters have long been known to seek dissolution in the manner described, and, above all, the controlling fact that this proceeding was instituted, and by common consent has been conceded to have been instituted, to try the question of the inventorship of the speaking-telephone, it is thought best to pursue the course adopted by the Examiner of Interferences, and award priority upon a meaning given to the issue which will best accomplish this end. If either party feels aggrieved by this course, his remedy is ample. The effect of the adoption of a contrary course is so clearly set out by the examiner that we quote his language entire:

"It results from this condition of affairs that the inventor of a device consisting of an electro-magnet and a diaphragm fastened to the end of a resonator, and used in connection with a reed or harmonic transmitter with whose rate of vibration the column of air is in accord, the whole being so arranged, adjusted, and used that the tones produced by the vibrations of the transmitter shall alone be rendered audible, that the inventor of such a device, adapted and used only as an acoustic or harmonic telegraph receiving-instrument, may claim and thereby subordinate an instrument which, although it includes the diaphragm and electro-magnet, is so constructed and used that, instead of responding to one tone only, as produced by a vibrating reed with which its resonator is made to accord, responds to any and all tones not produced but transmitted by an instrument acting under the influence of sound-waves.

"Yet such would be the legitimate outcome of this interference were it proved that Edison's invention of the devices shown and described in his application antedated the inventions of the other parties."

To obviate this difficulty two constructions of the issue are presented—one by the decision of the Examiner of Interferences and the other by the argument for Bell. Both of them may be here stated: The former is, in effect, an instrument for rendering audible acoustic vibrations, consisting of an electro-magnet and an iron or steel diaphragm secured at its edges to a resonant case consisting either of a resonator which picks out and responds to a given series of electrical waves, or a conveyer which confines and directs all sound-waves, the latter a speaking-telephone receiver consisting of an electro-magnet and an iron or steel diaphragm mounted on a suitable support.

Though this latter construction appears to be more in accordance with the spirit of this interference and the recognized purpose for which it was declared, it in fact makes little difference which is adopted. In either case the establishment of Edison's contentions would give him an award of priority. * * *

It thus appears that in either view which may be taken of the meanings of this issue Edison has neither overcome Bell's record dates nor gone beyond his ascertained date of invention.

It thus clearly appears that issue J was construed and decided as covering a speaking-telephone receiver consisting of an electro-magnet and an iron or steel diaphragm mounted on a suitable support. Not only this, but it also appears that in determining the issue the Examiner of Interferences gave consideration to the whole of Gray's evidence. He discussed and considered the claims of Gray as they were predicated upon each of his specified receivers containing his alleged metallic diaphragms, and he awarded priority to Bell over Gray and the other parties. Gray acquiesced in this decision until he presented his petitions to reopen the interferences. These petitions having been disposed of, the adjudication is conclusive as to the subject-matter of the present amendment. If there was error on the part of the Examiner of Interferences in giving to the issue the construction he did and in not taking steps to have the issue re-formed, it could have been corrected by appeal to the Commissioner or by moving to have the issue re-formed. It was as much the duty of Gray to move in these directions as of the Office or the other parties. Unquestionably it would have been better and more satisfactory to have had the issue put in better shape; but it was allowed to stand, and must be allowed to stand as a final adjudication. Not only this, but the construction given to the issue was favorable to Gray according to the claims he then made and the claims to invention he now urges. So far as is known, he may himself have been largely instrumental in convincing the examiner and inducing him to accept this very construction of the issue. Some of the other parties to the issue possibly might have had just grounds for complaint at the construction. For instance, Edison might have insisted upon a patent for his resonant case receiver, notwithstanding priority was given to Bell under this construction upon the ground that as to his receiver he was not a proper party to the interference; but he made no motion to re-form the issue, nor has he made any complaint. The same is true as to Gray. Although the Examiner of Interferences suggested the difficulty, as did also the Examiners-in-Chief, and intimated that it might be a case for a motion to dissolve and re-form the issue, yet both Gray and the other parties acquiesced, and Gray declined to appeal from the decision of the Examiner of Interferences, so that as to him the decision is final and conclusive. It was a decision upon a well-understood issue, involving the very question presented in the amendment now insisted upon, and to which issue the whole evidence in the case was directed. If the amendment shall be admitted, it would result in a new interference with the same patent of Bell. Without doubt a new and better issue would be framed; but it would be precisely the same in meaning, scope, and effect as issue J, as construed, tried, and determined.

It is a fundamental principle in the common law of pleading and is recognized in all code pleading that where there is any defect, imperfection, or omission in any pleading, whether in substance or form, which would have been a fatal objection upon demurrer, (motion to dissolve or re-form,) yet, if the issue joined be such as necessarily required on the trial proof of the facts so defectively or imperfectly stated or omitted, or without which it is not to be presumed either that the judge would have directed the jury to give or the jury would have given the verdict, such defect, imperfection, or omission *is cured by the verdict*. (Chitty on Pleading, 16 Am. Ed., and notes.)

In the matter of issues in interferences there is no rule applicable except that which provides the motion to dissolve. Clearly, however, where an issue has received a construction as to its meaning by the court and has been tried under that construction and the parties have acquiesced in it the case ceases to be one of defective pleading, and becomes one in which the issue must be held to be complete and to read according to the construction thus given it.

The decision of the Examiner of Interferences upon issue J, thus construed, read, and understood, is conclusive upon Gray's right to claim the subject-matter presented in the proposed amendment. (*Harlow* v. *Guernsey*, C. D., 1875, 47; *Whiteley* v. *McCormick*, C. D., 1870, 229; *Beloit* v. *Morgan*, 7 Wall., 619; *Cromwell* v. *Sac County*, 94 U. S., 352; *Wilson's Executors* v. *Deen*, 121 U. S., 525.)

The subject-matter of this amendment was not only involved in issue J and claimed there, but it was adjudicated as a matter of *fact* in issue G, and, under well-settled principles recognized in the decisions just cited, such an adjudication is conclusive.

In issue G Bell's broad claim to a receiver was involved. The examiner gave him as the date of his invention the date of the filing of his application—February 14, 1876. Gray attempted to establish priority by introducing evidence of his metallic diaphragms in 1874 and 1875 or at any time earlier than February 14, 1876. If he had established by his proof that he had invented the metallic-diaphragm receiver at an earlier date, this would have entitled him to a broad claim to any receiver, for whoever invents a species at the same time invents the genus; but it was expressly found and decided by the Examiner of Interferences, the Examiners-in-Chief, and the Commissioner that Gray did not make such invention and complete it so as to take priority over Bell's date of February 14, 1876. They also expressly found that Gray did nothing toward completing any invention involved until long after Bell's second patent was applied for and issued. These findings are based upon Gray's testimony, which (as he states) is all that he can produce relating to the metallic-diaphragm receivers—the "blacking-box receiver," the "wash-basin receiver," and the "tin-cup receiver."

These adjudications and findings cannot be reviewed by me here. I must accept them as correct, just, and conclusive, for the reason that in the interference proceedings I have been called upon to make such review and re-examination, and have not been able to see my way clear to disturb them.

It follows that Gray's motion to amend is denied and the amendment refused.

THE

OFFICIAL GAZETTE

OF THE

United States Patent Office.

[BY AUTHORITY OF CONGRESS.]

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Sub-Classes Established.

(ORDER No. 533.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., February 28, 1889.

The following sub-classes are hereby established under Class 75, Metallurgy, Division III:

Blast-furnaces, charging devices.
Blast-furnaces, charging devices, bell-and-hopper.
Blast-furnaces, protecting walls.
Blast-furnaces, tymps and slag-spouts.
Charcoal, kilns.
Charcoal, processes.
Charcoal, retorts.
Coke, ovens.
Coke, ovens, charges and dischargers.
Coke, ovens, doors.
Coke, ovens, dumping-bottoms.
Coke, processes.
Coke, retort-ovens.
Cupolas, drop-bottoms.
Cupolas, fore-hearths.
Cupolas, water-jackets.
Cupolas, wind-chests and tuyeres.
Finery fires.
Gas-furnaces, steam-boiler.
Leers, grids.
Mechanical puddlers, rotary hearths.
Mechanical puddlers, tools.
Melting-furnaces, open-hearth.
Puddling-hearths, chills and bottoms.
Puddling-hearths, doors and bits.
Roasters, blasting.
Roasters, hearths.
Roasters, hearths, rotary.
Roasters, revolving retorts.
Roasters, muffles.
Roasters, stirrers, endless-chain.
Roasters, stirrers, reciprocating.
Roasters, stirrers, rotary.
Roasters, stirrers, screw.
Reverberatory furnaces, fire-boxes.
Reverberatory furnaces, heating air.
Reverberatory furnaces, necks and chimneys.
Reverberatory furnaces, water walls and roofs.
Slag.
Slag, disintegrating.
Slag, heaters.
Slag, separators, centrifugal.
Hot-blast valves.

The titles of the following sub-classes in the same class are changed to read:

Blast furnaces, accessories, to *blast furnaces*.
Calcining kilns to *roasters, kilns*.
Furnaces, annealing, to *leers*.
Furnaces, cupola, to *cupolas*.
Furnaces for heating blanks to *furnaces, blank*.
Furnaces, melting, pot-furnaces, to *furnaces, melting, pot-hearths*.
Furnaces, melting, tank-furnaces, to *furnaces, melting-tank*.
Furnace-protecting, fire-brick, to *fire-brick*.
Furnaces, puddling, to *puddling-hearths*.
Furnaces, shaft and shelf, to *roasters, shaft and shelf*.
Furnaces, slag, to *slag-heaters*.
Iron and steel, direct, furnaces, to *iron and steel, direct, apparatus*.
Iron and steel, direct, retort-furnaces, to *iron and steel, direct, retorts and hearths*.
Mechanical puddlers and tools, to *mechanical puddlers*.
Regenerators, continuous or double surface, to *regenerators, double surface*.
Regenerators, discontinuous or single surface, to *regenerators, single surface*.

The following sub-classes are abolished:

96. Blast-furnaces, bells.
8. Coke and charcoal.
10. Furnace-protecting.
11. Gas-furnaces.
88. Gas-furnaces, heating air.

It is also directed that a sub-class of *Wipers* be established in Class 96, Coating with Metal.

BENTON J. HALL,
Commissioner.

Issue of March 12, 1889.

Patents	412—No. 399,232 to No. 399,643,	inclusive.
Designs	12—No. 18,991 to No. 18,962,	inclusive.
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Alabama	2	.....	Nebraska	5	.....
Arizona Territory	.....	.....	Nevada	.....	.....
Arkansas	.....	.....	New Hampshire	1	.....
California	6	.....	New Jersey	13	4
Colorado	5	.....	New Mexico Terri'y	.....	.....
Connecticut	17	.....	New York	86	7
Dakota Territory	.....	.....	North Carolina	.....	.....
Delaware	1	.....	Ohio	17	1
District of Columbia	2	.....	Oregon	4	.....
Florida	1	.....	Pennsylvania	61	2
Georgia	.....	1	Rhode Island	6	1
Illinois	33	1	South Carolina	.....	.....
Indian Territory	.....	.....	Tennessee	3	.....
Indiana	15	.....	Texas	4	1
Iowa	8	.....	Utah Territory	1	.....
Kansas	6	.....	Vermont	3	1
Kentucky	4	.....	Virginia	2	.....
Louisiana	2	.....	Washington Terri'y	2	.....
Maine	8	.....	West Virginia	.....	.....
Maryland	6	1	Wisconsin	10	1
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Michigan	15	.....	U. S. Army	1	.....
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TO CITIZENS OF FOREIGN COUNTRIES.

To citizens of foreign countries: Patents and Designs—29, Trade-Marks and Labels—4.

DESIGNS.

18,951.—RECEIVING-CARD.—*David Lawrence Clinton*, Clintonville, Conn. Application filed December 22, 1888. Serial No. 294,429. Term of patent 3½ years.

18,952 and 18,953.—TRIMMING.—*Johann C. F. Edelmann* and *Alphonse H. Kursheedt*, New York, N. Y., assignors to *The Kursheedt Manufacturing Company*, same place. Applications filed January 21, 1880. Serial Nos. 297,102 and 297,103. Term of patents 7 years.

18,954.—WIRE SCREEN.—*Alonzo J. Griffin*, Wilkes-Barré, Pa. Application filed January 22, 1889. Serial No. 297,201. Term of patent 3½ years.

18,955.—ADVERTISING-FRAME.—*William H. Hardin*, New York, N. Y. Application filed January 29, 1889. Serial No. 298,033. Term of patent 7 years.

18,956.—HINGE.—*William H. Hart* and *Thomas Corscaden*, New Britain, Conn, assignors to *The Stanley Works*, same place. Application filed January 26, 1889. Serial No. 297,687. Term of patent 14 years.

18,957.—DRESS-TRIMMING.—*Joachim Maidhof*, New York, N. Y. Application filed February 13, 1889. Serial No. 299,741. Term of patent 3½ years.

18,958.—BED-PAN.—*Irene H. Ovington*, Brooklyn, N. Y. Application filed October 12, 1888. Serial No. 287,965. Term of patent 7 years.

18,959.—ORNAMENTATION OF GLASSWARE.—*Frederick S. Shirley*, New Bedford, Mass. Application filed November 24, 1888. Serial No. 291,817. Term of patent 7 years.

18,960.—PICTURE SUPPORT.—*Seymour A. Curtis*, Stratford, Conn. Application filed February 13, 1889. Serial No. 299,743. Term of patent 3½ years.

18,961.—FOOT WARMER OR SUPPORT.—*John B. Doyle*, Lansingburg, assignor of one-half to *Jerome F. Young*, New York, N. Y. Application filed February 8, 1889. Serial No. 299,198. Term of patent 7 years.

18,962.—ARTIFICIAL FEATHER.—*Hugo H. Plaut*, New York, N. Y. Application filed January 19, 1889. Serial No. 296,948. Term of patent 3½ years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,357.—SPROAT-HOOKS AND OTHER FISH-HOOKS.—*Samuel Allcock & Co.*, Redditch, county of Worcester, England. Application filed January 24, 1889. Used since October, 1873.
"The representation of a stag or deer in an erect position."

16,358.—CARPENTERS' PENCILS.—*American Lead Pencil Company*, Hoboken, N. J. Application filed January 29, 1889. Used since 1884.
"The words 'MECHANICS' FAVORITE.'"

16,359.—CARPENTERS' PENCILS.—*American Lead Pencil Company*, Hoboken, N. J. Application filed January 29, 1889. Used since 1884.
"The words 'CARPENTERS' PET.'"

16,360.—CARPENTERS' PENCILS.—*American Lead Pencil Company*, Hoboken, N. J. Application filed January 29, 1889. Used since 1884.
"The words 'CARPENTERS' FRIEND.'"

16,361.—CARPENTERS' PENCILS.—*American Lead Pencil Company*, Hoboken, N. J. Application filed January 29, 1889. Used since 1884.
"The words 'AUNTY HUB.'"

16,362.—CHEWING AND SMOKING TOBACCO.—*Arnold, Carlton & McCord*, Atlanta, Ga. Application filed February 4, 1889. Used since April, 1866.
"The bust-picture of JEFFERSON DAVIS."

16,363.—OINTMENT.—*Hutchins C. Cady*, Columbus, Ohio. Application filed February 6, 1889. Used since December 1, 1888.
"The word 'MONONA.'"

16,364.—SIZING FOR FABRICS.—*The Gloy Manufacturing Co.*, London, county of Middlesex, England. Application filed August 10, 1887. Used since 1881.
"The word 'GLOY.'"

16,365.—BLANK ACCOUNT-BOOKS.—*Samuel W. Goldberg*, Dallas, Tex. Application filed January 18, 1889. Used since August 1, 1888.
"The word 'MATURITY.'"

16,366.—STEAM-EXHAUST HEADS.—*Wilfred C. Lyman*, Chicago, Ill. Application filed February 4, 1889. Used since 1869.
"The word 'LYMAN.'"

16,367.—PREPARED WHALEBONE.—*Francis E. Merriman*, Boston, Mass. Application filed January 21, 1889. Used since 1876.
"The representation of a right whale swimming on the surface of the water and in the act of spouting, and in connection therewith the word 'ARCTIC' and representation of a row-boat one of whose occupants is standing and preparing to throw a harpoon."

16,368.—REMEDIES FOR FEMALE COMPLAINTS.—*Charles O. Prosser*, Westerly, R. I. Application filed January 12, 1889. Used since January 1, 1864.
"The words 'BARKO UTERINE.'"

16,369.—METAL-POLISHING PASTE.—*Walter J. Ramsay*, New Bedford, Mass. Application filed January 25, 1889. Used since June, 1888.
"A three-quarter front view of a pair of horses at speed drawing a steam fire-engine and the following-named letters of the alphabet disposed about it—viz., the letter 'M' at the left of the picture, the letter 'S' at the top, and the letter 'P' at the right of the same."

16,370.—HOSE OF RUBBER, COTTON, OR LINEN.—*Revere Rubber Company*, Boston, Mass. Application filed February 2, 1889. Used since December 1, 1888.
"The word 'TRIDENT.'"

16,371.—HOSE OF RUBBER, COTTON, OR LINEN.—*Revere Rubber Company*, Boston, Mass. Application filed February 2, 1889. Used since December 1, 1888.
"The word 'CRESCENT.'"

16,372.—HOSE OF RUBBER, COTTON, OR LINEN.—*Revere Rubber Company*, Boston, Mass. Application filed February 2, 1889. Used since December 1, 1888.
"The word 'NAVY.'"

16,373.—WOOD-PRESERVING OIL.—*Adolf Wingenroth*, Mannheim, Baden, Germany. Application filed November 14, 1888. Used since December 15, 1887.
"The representation of an eagle."

16,374.—TOILET WATERS AND LOTIONS.—*Zobel & Failmezger*, Brooklyn, N. Y. Application filed February 4, 1889. Used since November 1, 1887.
"A bust-picture of PROFESSOR DR. G. JAEGER."

16,375.—KEROSENE-OIL.—*William Briscoe & Son*, London, county of Middlesex, England. Application filed October 24, 1887. Used since September 2, 1878.
"The representation of a trident with the word 'DOMESTIC' above and the letters 'B B B' below."

16,376.—COTTON LININGS.—*Burton Bros. & Co.*, New York, N. Y. Application filed February 9, 1889. Used since January 2, 1889.
"The word 'ETRUSCAN.'"

16,377.—SIRUP FOR THE CURE OF ASTHMA.—*Mary A. Cunningham*, St. Albans, Vt. Application filed February 9, 1889. Used since October 21, 1888.
"A monogram of the letters 'C A S.'"

16,378.—NEWSPAPER OR WEEKLY PAMPHLET.—*Manufacturers' Record Company*, Baltimore, Md. Application filed February 6, 1889. Used since November 23, 1882.
"The words 'MANUFACTURERS' RECORD.'"

16,379.—MEDICINE FOR EXTERNAL USE.—*Fanny G. Mass*, Brooklyn, N. Y. Application filed February 7, 1889. Used since January 1, 1880.
"The fac-simile signature 'MRS. G. MASS.'"

16,380.—FIRE-BRICK, STOVE-LININGS, AND ARTICLES MADE WHOLLY OR PARTLY OF FIRE-CLAY.—*Francis A. Ostrander*, Troy, N. Y. Application filed February 8, 1889. Used since June 14, 1888.
"The letters 'OB' in monogram form."

16,381.—BEER.—*The Phillip Best Brewing Company*, Milwaukee, Wis. Application filed April 10, 1888. Used since April or May, 1882.
"A band of red crossing a label or similar field obliquely from one corner to the other."

16,382.—GAS-BURNER TIPS.—*Draper Manufacturing Company*, North Attleborough, Mass. Application filed January 24, 1889. Used since November 15, 1888.
"The representation of a gas-burner tip with jet of flame, and sole of a human foot and plain capital letters 'D. M. C.' appearing in the flame."

16,383.—FRESH AND PICKLED EGGS.—*Mackenzie, Chase & Co.*, New York, N. Y. Application filed January 10, 1889. Used since 1869.
"The initials 'R. P. B.'"

16,384.—CIGARS.—*Clifton G. Sauerhammer*, Littlestown, Pa. Application filed February 9, 1889. Used since December 1, 1888.
"The words 'MA' DIX' and the monogram 'C G S'"

16,385.—CONFECTIONERY.—*Philip Wunderle*, Philadelphia, Pa. Application filed March 3, 1868. Used since September, 1867.
"The representation of an open scroll with a seal thereon."

LABELS.

5,843.—Title: "M. BEHREND & SON'S DESCRIPTIVE SCHOOL BOOK LABELS."—*M. Behrend & Sons*, New York, N. Y. Application filed February 6, 1889.

5,844.—Title: "WARRANTED GENUINE WHALEBONE."—*Francis E. Merriman*, Boston, Mass. Application filed January 21, 1889. (Trade-Mark Registered.)

5,845.—Title: "THE STANDARD METAL POLISH."—*Walter J. Ramsay*, New Bedford, Mass. Application filed January 25, 1889. (Trade-Mark Registered.)

5,846.—Title: "SIEKE'S RECIPE FOR RHEUMATISM AND GOUT."—*Anthony Sieke*, New York, N. Y. Application filed February 15, 1889.

DISCLAIMERS.

219,464.—*Philip Hake*, Hoboken, N. J. IMPROVEMENT IN VISITING-CARDS. Patent dated September 9, 1879. Disclaimer filed March 6, 1889, by the patentee.

Enters his disclaimer to the second claim of said patent, which is in the following words, to wit:

"2. A stationer's card having all the edges beveled from one face and the cut surface sized, metal-coated, burnished, and embossed, as herein specified."

PATENTS

GRANTED MARCH 12, 1889.

399,232. FASTENING FOR RAILWAY-STRINGERS. DUNCAN ATWOOD, Milwaukee, Wis. Filed Dec. 11, 1888. Serial No. 293,250. (No model.)



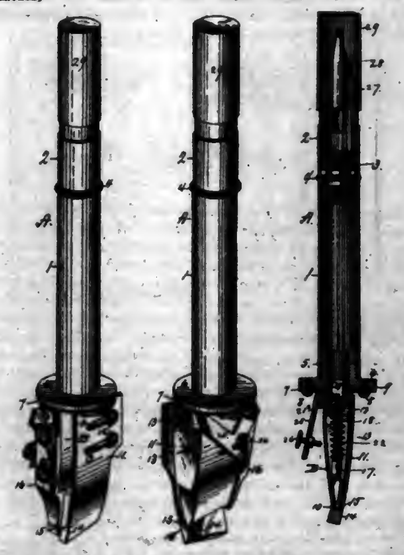
Claim.—1. The combination, with the ties of a railway and stringers resting thereon, of metallic straps placed over said stringers and fastened at the ends to the ties on which they are seated, substantially as and for the purposes set forth.

2. The combination, with the stringers of a railway and cross-ties on the tops of which the stringers are supported, of inverted-U-shaped metallic straps perforated at the ends and center, and spiked or bolted through said perforations to said ties and stringers, substantially as and for the purposes set forth.

3. The combination, with the ties of a railway, of rail-supporting stringers spiked or bolted to the tops of said ties, and inverted-U-shaped straps turned outwardly at right angles at the ends, and seated upon and secured to the ties on opposite sides of said stringers, substantially as and for the purposes set forth.

4. The combination, with the ties of a railway, of rail-supporting stringers supported upon said ties, and inverted-U-shaped straps turned outwardly at the ends, seated upon and fastened on opposite sides of the stringers to the ties and sunk into the upper sides of the stringers, substantially as and for the purposes set forth.

399,233. PANELING AND STRIPING IMPLEMENT. ANDREW J. AVERY, Norway, Me. Filed Oct. 24, 1888. Serial No. 289,090. (No model.)



Claim.—1. In a paneling implement, the combination, with a hollow handle, of a shell formed with an ink-slot in its end, a spring-actuated plunger in the shell adapted to set with its end in the slot of the shell, and a lever connected to the plunger to lift it from the slot in the end of the plunger, substantially as described.

2. In a paneling implement, the combination, with a hollow handle, of a shell formed with an ink-slot in its end, a spring-actuated plunger in the shell arranged to set with its end in the slot of the shell, a lever connected to the plunger to lift it from the slot in the shell, and an adjustable gage or guard fitted on the shell with its gage-piece adapted to close the slot in the end of the shell, substantially as described.

3. The paneling-instrument composed of the hollow handle, a shell formed with an ink-slot in its end, a spring-actuated plunger in the shell arranged to set with its end in the slot thereof, a lever connected to the plunger to lift from the slot in the shell, an adjustable guard or gage fitted on the shell, and a scoring-knife to score the sole of the shoe, substantially as described, and for the purpose stated.

4. In a paneling implement, the combination of an ink-holding tube, a shell on the tube having an ink-slot in its end, and a gage adjustably fixed on the shell, with the gage part formed to project below the end of the shell and having a channel to set over and close the slot in the shell, substantially as described, and for the purpose stated.

5. The paneling and striping implement consisting of a separable ink-tube having a partition at the point of separation, a paneling-tool fixed to one end of the tube, and a striping-tool fixed to the other end, substantially as described.

6. The combined paneling and striping implement, composed of a separable ink-tube having a partition at the point of separation, a paneling-tool fixed to one end of the tube, and a striping-tool fixed to the other end, said striping-tool consisting of a plug fixed in the tube, and a striping-tube projected through the plug, substantially as described.

7. The combined paneling and striping implement, composed of a paneling-tool, a striping-tool separably attached to the paneling-tool, and a handle having a gage-piece detachably connected to the striping-tool, substantially as described, and for the purpose specified.

399,234. VETERINARY MEDICAL APPARATUS. CYRUS H. BARR, Dwight, Ill. Filed Nov. 17, 1888. Serial No. 291,120. (No model.)



Claim.—The combination of the closed vessel B, having the perforations *a*, with the vessel A, substantially as and for the purpose set forth.

399,235. TALLY-SHEET. FREDERICK W. BARRETT, Springfield, Ohio. Filed Aug. 24, 1888. Serial No. 283,622. (No model.)



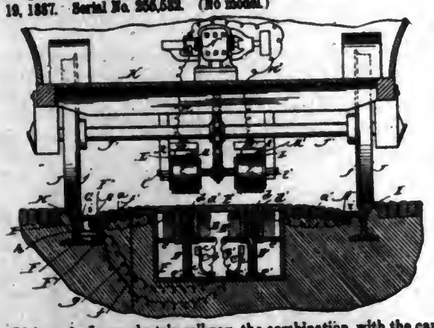
Claim.—1. An improved article of manufacture consisting of a principal tally-sheet having columns a' a^2, main body a^3, and total-column a^4, and having a crease between the column a^2 and the main page a^3, and another crease between the column a^4 and the main body a^3, and one or more other creases in said body, whereby the sheet may be folded over to bring the crease 4 in proximity to the crease 2, so that the total-column will follow at the right, the column a^2 bearing the phrase "Names of Persons Voted for."

2. In a combined poll-book and tally-sheet, the principal tally-sheet A, consisting of the columns a' a^2, main body a^3, total-column a^4, and having the creases 2, 3, and 4, the one 2 being directly on a line with the outside border-line of column a^2, the one 4 being on a direct line with the inner border-line of total-column a^4, and the one 3 being directly central between the creases or folding-lines 2 and 4, whereby the sheet A may be folded over to bring the inner boundary-line of the total-column on a direct line with the outer boundary-line of column a^2 or column headed "Names of Persons Voted for," substantially as set forth.

3. The principal tally-sheet A, having the columns a', a^2, a^3, and a^4 and creases or folding-lines 2, 3, and 4, located as described, the column a^4 terminating at a point considerably remote from the outer edge of the sheet A to form a margin or holding-strip, D, in combination with certificate pages or sheets c, to overlap the margin or holding-strip D when the tally-sheet is folded over to bring the total-column a^4 in close proximity to the column a^3 and hold the same pressed down, all substantially as shown and described.

4. The combination, in a poll-book and tally-sheet, of the principal tally-sheet A, having the columns a', a^2, a^3, and a^4, the creases or folding-lines 2, 3, and 4, the ones 2 and 4 being located on a line with the outer and inner edges of the columns a^2 and a^4, respectively, and the one 3 being central between the ones 2 and 4, as and for the purpose described, and having the projecting margin or holding-strip D, the supplemental tally-sheet B, having the crease or folding-line 5 directly central between the outer boundary-line of column a^4 of the sheet A when the same is folded over in close proximity to column a^3 and the outer edge of said sheet B, and the certificate-page C, creased and adapted to be folded over upon the margin or holding-strip D, with their inner edges directly aligned with the total-column a^4 when it is desired to certify to the number of votes taken, all substantially as and for the purpose described.

399,236. ELECTRIC RAILWAY. JOHN R. BLAIR, Chicago, Ill., assignor to himself and Ulric Bickenderfer, same place. Filed Nov 19, 1887. Serial No. 256,582. (No model.)



Claim.—1. In an electric railway, the combination, with the car, of a motor carried by it for propelling its wheels, an electrical connection between said motor and conductors along the car, contact bolts or cores adapted to be projected above the road-bed or track, the main conductor-connections between said conductors and the contact-bolts, and means for projecting said bolts or cores above the bed or track to complete the circuit through the motor, substantially as described.

2. The combination, with an electric motor carried by a car and having electrical connections with conductors along the car, of bolts or cores adapted to be projected above the road-bed or track, helices or coils around such bolts or cores, and means for completing a circuit to project the bolts or cores above the road-bed or track and form an electric circuit from a main conductor through the car-motor, substantially as described.

3. In an electric-railway system, the combination, with the road-bed or track, of helices or coils, bolts or cores having an axial motion through said helices or coils and above the road-bed or track, the main conductors and connections between the same and said contact-bolts, a circuit-closer, a car carrying a motor having electrical connections with conductors along the car, and a trip or arm on the car for operating said circuit-closer, substantially as and for the purpose described.

4. In an electric-railway system, the combination, with the road-bed or track, of a main conductor, helices or coils having electrical connection, bolts or cores through the coils and having an axial movement above the road-bed or track, and a circuit-closer, substantially as and for the purpose set forth.

5. In an electric-railway system, the combination, with the road-bed or track and a car carrying a conductor and a motor having electrical connections with the conductors, of a bolt or core adapted to be projected above the road-bed or track, electrical connections for influencing said bolt, and a circuit-closer, the said electrical connections and circuit-closer projecting said bolt and establishing a current through it while the car is passing over it and permitting it to drop and cutting off the current therefrom in its normal position after the car has passed, substantially as described.

6. In an electric-railway system, the combination, with the road-bed or track and a car carrying a conductor and a motor having electrical connections with said conductor, of a bolt or core adapted to be projected above the road-bed or track, a main conductor, a circuit-closer acted on by a part of the car, and electrical connections between the bolt and the circuit-closer and main conductor, substantially as described, for projecting the bolt and holding it projected and passing a current through it while the car is passing, and cutting off the current and permitting the bolt to drop to its normal position after the car has passed, substantially as described.

7. The combination, with the main conductor A, helix or coil B, spring C, and axially-moving bolt or core D, and wires a b, of contact-springs F and G, sliding pin H, and connecting-wire to the spring C, completing a circuit to project the bolt and complete a circuit from the main conductor through the coil and bolt, substantially as and for the purpose specified.

8. The combination of a main conductor, A, helices or coils B B', springs C C', sliding bolts or cores D D', and connecting-wires a b b', with the contact-springs F G, sliding pin H, and connecting-wires f g, for closing a circuit and projecting the bolts or cores to form a circuit from the main wire or conductor, substantially as and for the purpose specified.

9. The combination of the wire or conductor A, helix or coil B, spring C, axially-moving bolt or core D, contact-springs F and G, sliding pin H, conductors L, plate M, wire s, motor N, wire s', plate M', conductors L', axial moving bolt or core D', spring C', helix or coil B', and electrical connection between the main conductors, the helices, and the contact-spring, substantially as and for the purpose described.

10. The combination, with a main conductor and a helix or coil connected therewith, of a bolt or core adapted to project above the road-bed or track, and a connection between the bolt or core and its helix or coil for completing the circuit from the main conductor through the bolts or core when the helix is energized, substantially as specified.

399,237. SHOE-CLASP. MELLEN N. BRAY, Boston, Mass. Filed Nov. 23, 1888. Serial No. 291,623. (No model.)



Claim.—In a buckle for securing together two sides or portions of a shoe or other article, the combination of a tongue-engaging plate having a plurality of transverse bars separating rectangular slots formed in said plate, said plate being constructed and adapted to be secured to one side or portion of the shoe or other article, a spring-plate secured by each end to the inner side of said tongue-plate and extending across the slots in said tongue-plate, and having formed in its surface next the tongue-plate a plurality of depressions or indentations corresponding in number and position to the bars in the tongue-plate, a hinge-plate constructed and adapted to be secured to the other side or portion of the shoe or other article, and a tongue in the form of a lever of the first order pivoted to said hinge-plate, the short arm of which lever is constructed to enter a slot in and engage with a bar of said tongue-plate, and provided upon its under side between its end and fulcrum with a projecting lug or detent constructed and arranged to snap into an indentation in said spring-plate when the long arm of the tongue is pressed down upon the slotted plate, and thus lock said tongue in closed position.

399,238. COMBINED SHIRT OR VEST AND SUSPENDERS. JOHN T. BROSNAN, New Orleans, La. Filed Aug. 27, 1888. Serial No. 282,998. (No model.)

Claim.—1. The combination of an under-garment having a re-enforce at each side of its front and another re-enforce at or about the center of its back, each re-enforce provided with a vertical slit,

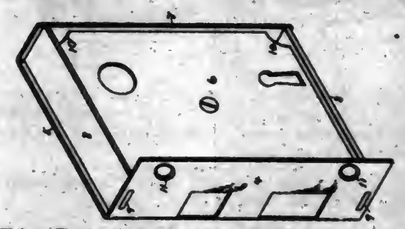
399,238.



or with a series of vertically-arranged slits, as described, with the button-strap provided with devices for connecting it to the pants, and for connecting it adjustably directly with the slits in the re-enforce, substantially as described.

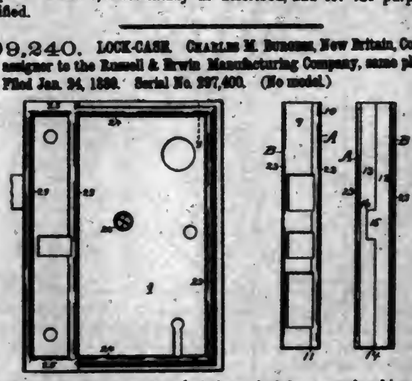
2. The combination of a shoulder-supported garment having a re-enforce at each side of its front and at or about the center of its back, the said re-enforces being each provided with a vertical slit, or with a series of vertically-arranged slits, as described, with the independent straps, each provided with an adjustable fastening device adapted to engage directly with the material of the re-enforce at each side of the slit and at any desired point thereof, substantially as described.

399,239. SHEET-METAL LOCK-CASE. CHARLES M. BURDSAL, New Britain, Conn., assignor to the Russell & Erwin Manufacturing Company, same place. Filed Jan. 24, 1888. Serial No. 267,392. (No model.)



Claim.—The herein-described sheet-metal lock-case, consisting, essentially, of the face-plate 4, lock-plate 5, rear edge plate, 7, all formed from a single piece of sheet metal, a cap-plate, and the top and bottom end pieces, 8 8, provided with tenons at each end, by means of which said top and bottom end plates are firmly secured to the parts 4 and 7, substantially as described, and for the purpose specified.

399,240. LOCK-CASE. CHARLES M. BURDSAL, New Britain, Conn., assignor to the Russell & Erwin Manufacturing Company, same place. Filed Jan. 24, 1888. Serial No. 267,400. (No model.)



Claim.—1. The Janus-face lock formed of sheet metal and having its lock-plate and cap-plate ribbed or corrugated, substantially as described, and for the purpose specified.

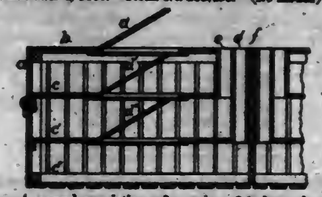
2. A Janus-face sheet-metal lock having its lock-plate and cap-plate bent toward each other at their front vertical edges to form the face-plate, substantially as described, and for the purpose specified.

3. A Janus-face sheet-metal lock having its lock-plate and cap-plate bent toward each other at their vertical edges to form the face-plate and rear edge of the lock-case, substantially as described, and for the purpose specified.

4. In a Janus-face lock formed of sheet metal, the lock-plate and cap-plate provided with horizontal beads or corrugations at their upper and lower ends, in combination with the upper and lower end plates, whose edges are received within said corrugations, substantially as described, and for the purpose specified.

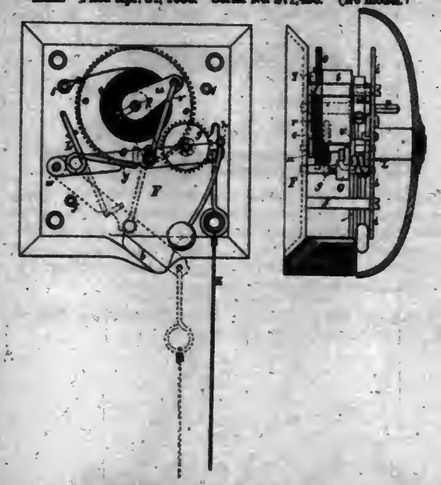
5. In a Janus-face lock, the hollow sheet-metal post 20 within the body of the lock-case and provided with the integrally-formed nut 21, for receiving the cap-screw, substantially as described, and for the purpose specified.

399,241. POUND FOR LOBSTERS. JAMES R. BURNS, Friendship, Me. Filed Jan. 4, 1888. Serial No. 295,430. (No model.)



Claim.—A pound consisting of a series of independent compartments arranged one above the other, each compartment having a door through which the fish can be removed, and chutes extending down from the top of the pound into each separate compartment, substantially as and for the purposes specified.

399,242. ALARM FOR DOORS, &c. HARVEY J. BURT, Maplewood, Mass. Filed Apr. 21, 1883. Serial No. 271,430. (No model.)



Claim.—1. The combination of the frame constructed as described and provided with the inclined stop, as shown, and having the bell-hammer-operative mechanism arranged therein, as represented, said mechanism consisting of the arbor p, mainspring t, and ratchet r, fixed thereto, gear o, revolubie thereon, pawl q, and spring t, connected to said gear o, the lantern pinion, escape-wheel, and shaft, the pallets and their shaft, with the arm O, pivoted in the frame connected with the arbor p of the mainspring by the arm u and link v, as shown, and having the actuating-wire E applied to it near its free end, all substantially as described and represented.

2. The combination of the frame constructed as described and provided with the inclined stop, and having the bell-hammer-operative mechanism arranged therein, essentially as set forth and represented, with the arm O, pivoted in the frame, connected, as shown, with the mainspring-arbor p, by the arm u and link v, and the take-up spring L, secured to the frame and applied to the notch j' of the arm O, as represented, the actuating-wire being attached to the said arm near its free end, all as shown, and for the purpose set forth.

3. The back plate, F, constructed as shown, and provided with the inclined stop, in combination with a door-bell-alarm apparatus secured to said plate F and having the pivoted arm O, and the stop limiting the movement of the arm, as and for the purpose set forth.

399,243. MANUFACTURE OF PLUMBERS' TRAPS. ROBERT CLARKE, Gravesend, N.Y. Filed Oct. 12, 1888. Serial No. 287,909. (No model.)



Claim.—1. As a new article of manufacture, a plumber's trap having a body contracted at one end to form a neck provided with a cap, B, and at the other end to form the bottom in one piece with the body, with a central closing-plug at the bottom and with inlet and outlet pipes, substantially as set forth.

2. The within-described improvement in the manufacture of plumbers' traps, the same consisting in spinning down one end of a soft-metal tube to form the contracted neck of a trap-body, in spinning down the other end and forming a bottom in one piece with the body to close such end, with the exception of a central opening, and then plugging said opening, substantially as set forth.

399,244. TUBING. EDMUND C. CONVERSE, New York, N.Y. Filed Oct. 22, 1888. Serial No. 288,761. (No model.)



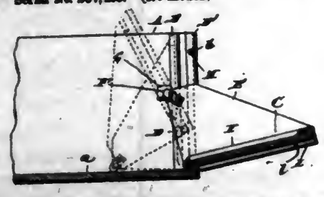
Claim.—A new article of manufacture, consisting in a drawn-iron or soft-steel tube having a soft metal or alloy compressed into and forming a composite alloy with the molecules of the metal of the tube, on the interior and exterior surfaces thereof, substantially as and for the purposes set forth.

399,245. MANUFACTURE OF TUBING. EDMUND C. CONVERSE, New York, N.Y. Filed Oct. 22, 1888. Serial No. 288,762. (No model.)



Claim.—The herein-described improvement in the art of forming tubing, consisting in coating the interior and exterior surfaces of the tube with a molten soft metal or alloy which will alloy with the metal of the tube, and then forcing the soft metal or alloy into the body of the tube and elongating it by cold-drawing the tube interiorly and exteriorly, substantially as and for the purposes set forth.

399,246. END-GATE. ISAAC CRIBAR, Waggoner, Ill. Filed Oct. 6, 1888. Serial No. 287,423. (No model.)

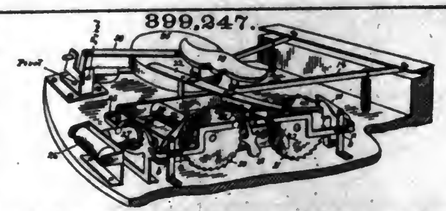


Claim.—1. The combination, with a wagon-body having guide-strips upon its inner sides, of the end-gate having trunnions D fitting between the said guide-strips and provided with ears *d d*, which pass on opposite sides of the end-gate, the wings E E on the ends of the said gate, provided at their front ends with hooks, and the catches or keepers G G, secured to the sides of the wagon-body and provided with slots adapted to be engaged by the said hooks, substantially as specified.

2. The wagon-body having the guide-strips B', combined with the end-gate provided at its ends with wings E, substantially triangular in form, with their bases or lower edges perpendicular to the plane of the end-gate, the latter being provided further at its ends with trunnions D, which fit and slide between the strips B', whereby the end-gate may be inclined forward on the front angles of the wings and elevated to separate it at its lower edge from the bottom of the wagon-body, the hooks F at the front ends of the wings, and the keepers G, engaged by the hooks F when the end-gate is tilted outward, as set forth.

3. The combination, with a wagon-body, of the end-gate pivoted between the sides thereof, the wings at the ends of the said gate provided with inturned flanges lying on the inner side thereof, the cleats I, bearing against the said flanges and provided with beveled inner edges, and the horizontal cleat extending between the upper ends of the cleats I I, and provided with beveled ends which overlap the beveled edges thereof, substantially as specified.

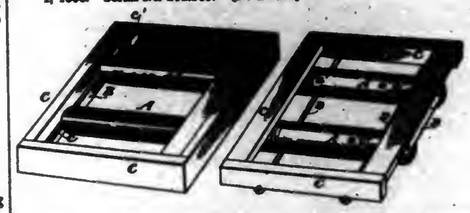
399,247. STENOGRAPHIC MACHINE. CHARLES A. DAMON, Fenton, Mich. Filed Apr. 23, 1888. Serial No. 109,773. (No model.)



Claim.—1. In a stenographic machine, substantially as described, the combination, with a bed-plate, of the operating keys and levers arranged in a plane above the bed-plate and slightly inclined to the rear, an ink-ribbon feed and a paper-feed arranged in the space between the bed-plate and the forward ends of the key-levers, and the paper-carriage having a swiveled standard to permit folding underneath the keys, all substantially as described.

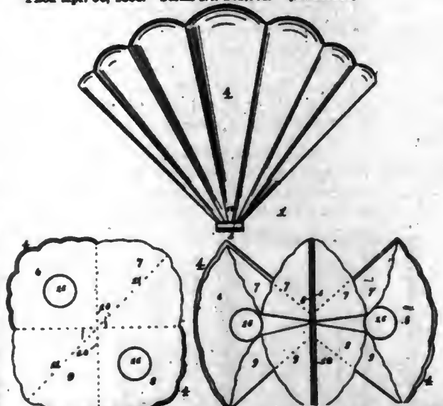
2. In a stenographic machine, substantially as described, the combination, with the spacing-key, its lever and cross-bar, of a reversible ink-feed actuated thereby, and consisting of the feed-rollers 24 25, loose roller 26, ratchet-wheels 30 31, reversible gravity-pawl 28, reversing-lever 29, and spring-clicks 32 33, connected to and operated by the reversing-lever, all substantially as described.

399,248. TRUCK. CHARLES G. DEMING, Leeds, N. Y. Filed Dec. 1, 1888. Serial No. 292,363. (No model.)



Claim.—In trucks, the combination of the rolls A A, carrying journals *a a*, the connecting-frame B, attached to said journals, and the weight-supporting frame C, having the opposite grooves *c c*, substantially as shown and described.

399,249. BOOK OR ALBUM. NANCY J. DOBBINS, Denver, Colo. Filed Apr. 30, 1888. Serial No. 272,391. (No model.)



Claim.—1. A book or album having its leaves creased or folded diagonally into segmental quarters, two of the quarters being creased or folded into half-segments of such quarters, the leaves being united together at the angle or union of the creased or folding lines, substantially as set forth.

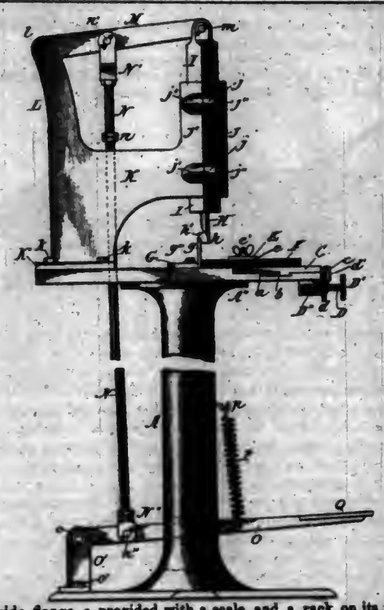
2. An album or book having its leaves creased or folded segmentally into quarters, two of the quarters being creased or folded into half-segments of such two quarters, and a cover of shape corresponding to the shape of the quarters, cover and leaves being united at the angle or union of the creased or folding lines, substantially as described.

3. A book or album comprising the leaves having folding or creased lines dividing each sheet into quarters, two of which quarters are again creased or folded each into halves of quarters, the contiguous quarters of two adjoining leaves being secured together at their edges to form a pocket, 12, one of the walls of the pocket being perforated, and a cover of shape corresponding to the quarters, leaves, and cover being secured together at the angle or intersection of the creased or folding lines, substantially as set forth.

399,250. MACHINE FOR CUTTING INDEXES. EDWARD P. DONNELL, Chicago, Ill. Filed Mar. 8, 1886. Serial No. 194,653. (No model.)

Claim.—In an index-cutting machine, the bed B, having recess *a*, sliding plate C, having dovetail *b* on its under side to enter the recess

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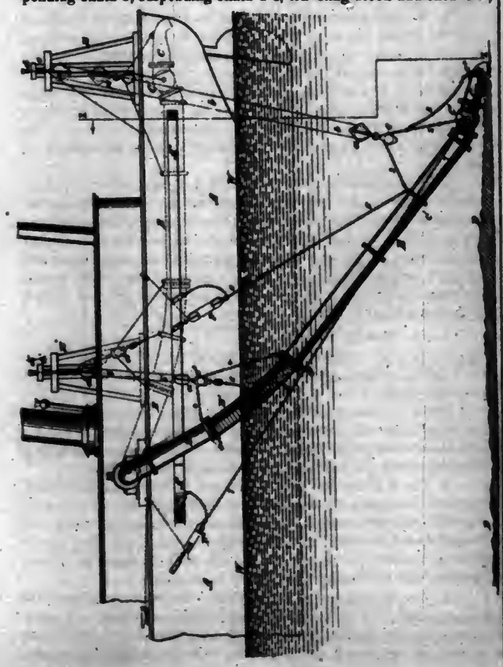


a, and side flange, *c*, provided with a scale, and a rack on its upper and under faces, respectively, in combination with the rod D, gear-wheel *d*, and pointer *d'*, substantially as and for the purpose specified.

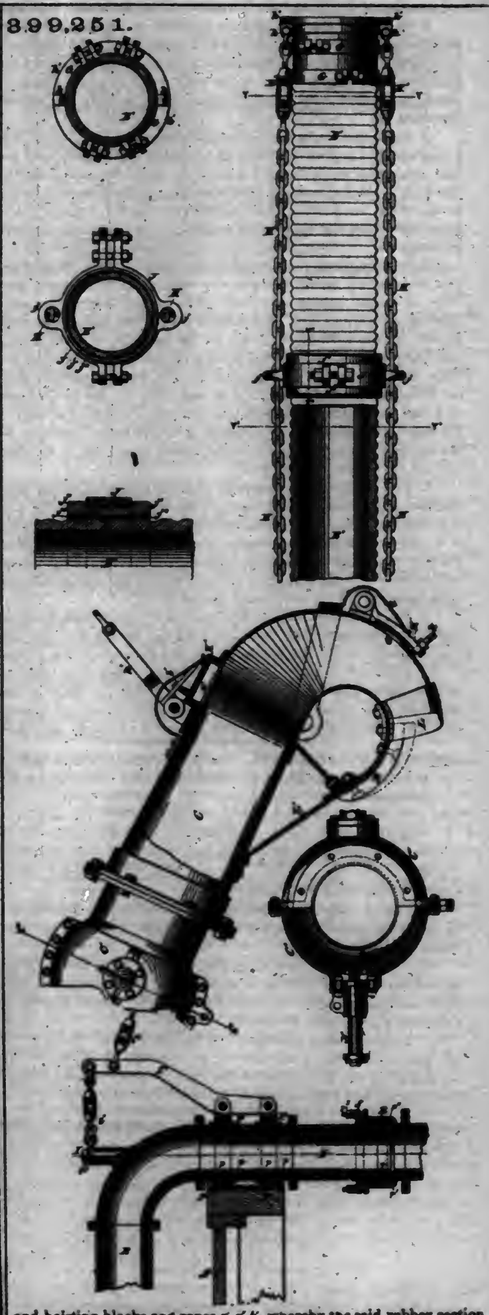
399,251. DREDGING-MACHINE. JOSEPH EDWARDS, Brooklyn, N. Y. Filed Dec. 21, 1888. Serial No. 294,333. (No model.)

Claim.—1. In a pump dredging-machine mounted on shipboard, the combination of the flexible section B' B' of the suction-pipe B B, the supporting-chains H H, the iron portions of the suction-pipe B B, the clamp-band J, having the perforated ears *j j*, and suspending-chain 5, whereby the said chains H H and rubber section are kept in line with each other and from unduly sagging in the middle, as and for the purposes described.

2. In a pump dredging-machine mounted on shipboard, the combination of the rubber section B' B' of the suction-pipe B B, the suspending-chain 5, suspending-chain 4 4, traveling block and sheave *c*,



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and hoisting blocks and ropes *a a' b'*, whereby the said rubber section of the suction-pipe is kept nearly in a straight line and prevented from deviating from a gentle curve irrespective of whatever angle the said suction-pipe takes with the horizontal plane, substantially as and for the purposes set forth.

3. In a pump dredging-machine mounted on shipboard, the combination of the suspending-chain 2 2, traveling block and sheave *c*, drag-holding chain 3, suction-pipe B B, drag C, and hoisting blocks and ropes *a a b*, whereby the strain of the suspending-chain 2 2 is equally applied to two distant points of the said suction-pipe and the drag is held from falling below the line of the said pipe when lifted from its work, whatever be the angle formed by the suction-pipe with the horizontal plane, as and for the purposes set forth.

4. In a pump dredging-machine mounted on shipboard, the combination of the suction-pipe B B, drag C, and the universal ball-and-socket joint C', having the circular socket *m* and stem *n*, whereby the said drag can adjust its mouth to its work in all directions, vertical, lateral, and rotary, substantially in the manner and for the purpose described.

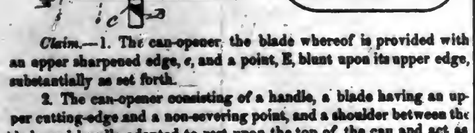
5. In a pump dredging suction-pipe, drag C, the set-nut and bolt *k*, and spring *l*, in combination with the water-door K, whereby the said water-door can be set and held at any open position that may be required to admit as much or little water as may be, according to the nature of the materials dredged, necessary to cause a free flow of the same through the said drag and its suction-pipe, as and for the purposes set forth.

6. In a pump dredging-machine mounted on shipboard, the suction-pipe box, Fig. 12, having two separate bearings, P P, in a single base, O O, and double separate caps O' O', said separate bearings and caps working in corresponding sunken seats around the suction-pipe B B, formed by raised shoulders *p p p p* on the said pipe, whereby a long stiff rotating bearing is provided for holding the said pipe without liability of being cramped by rolling of the ship, and whereby the caps can be repaired without detention by removing but one of the same at a time, and whereby the said pipe has a double lateral support in the longitudinal direction by means of a double set of shoulders on the said pipe striding the double bearings and double caps, in the manner and for the purposes set forth.

7. In a pump dredging-machine mounted on shipboard, the combination of the supporting elbow-lug I, having its center on the central horizontal line of the suction-pipe B, the goose-neck arm I', caps O' O', and connecting holding-chain *i*, whereby the weight and strain of the said suction-pipe are greatly supported and corresponding vertical relief afforded to the bearing of the said pipe in the side of the ship, in the manner and for the purpose described.

8. In a pump dredging-machine mounted on shipboard, the combination of the supporting elbow-lug I, having its center on the central horizontal line of the suction-pipe B, the goose-neck arm I', caps O' O', connecting holding-chain *i*, vertical arm-supporting chain i^3, and horizontal elbow-supporting chain i^4, whereby the elbow of the said suction-pipe is supported in a lateral forward and vertical upward direction, substantially in the manner and for the purposes described.

399,252. CAN-OPENER. JOSEPH H. FISHER, Deerfield, assignor to Arthur J. Sands, Chicago, Ill. Filed Dec. 3, 1888. Serial No. 292,452. (No model.)



Claim.—1. The can-opener, the blade whereof is provided with an upper sharpened edge, *c*, and a point, E, blunt upon its upper edge, substantially as set forth.

2. The can-opener consisting of a handle, a blade having an upper cutting-edge and a non-severing point, and a shoulder between the blade and handle adapted to rest upon the top of the can and act as a fulcrum, substantially as specified.

3. The can-opener consisting of a handle, a blade having an upper cutting-edge and a non-severing point, and a shoulder between the blade and handle adapted to rest upon the top of the can and act as a fulcrum, and a side guide, B, substantially as specified.

399,253. TOE-WEIGHT. FRANK W. FLOYD, Detroit, Mich. Filed Aug. 21, 1888. Serial No. 283,209. (No model.)

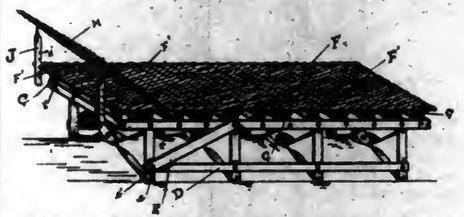


Claim.—1. In a toe-weight for horses, the combination of a dovetailed tenon-spur concaved to fit the convexed surface of the hoof and provided with screw-holes, screws passed through the lower end of said spur into the hoof, a mortised weight fitted onto the spur, and a screw passed through said weight and spur into the hoof, substantially as described.

2. In a toe-weight for horses, the combination, with the spur B, having its inner surface concave to fit the convex surface of the hoof and provided with screw-holes *b*, an elongated opening, b^2, and beveled edges b^3, of the weight C, provided with a recess, *c*, having its edges beveled to fit the edges of the spur B, an orifice, c^2, and the screw c^3, which passes into the hoof, substantially as described.

3. In a toe-weight for horses, a dovetail tenon-spur with screw-holes at its lower end and an elongated opening, b^2, in combination with a weight having a dovetail mortise to fit the tenon and a screw-hole, c^2, substantially as described.

399,254. COT-BED. EDWIN J. FOSTER, Cleveland, Ohio. Filed June 18, 1888. Serial No. 277,410. (No model.)



Claim.—1. In a cot-bed, the combination of a frame with pairs of legs for supporting the same, each leg consisting of a single piece bent at its point of contact with the floor, so as to form a vertical depending part, which is pivoted to said frame, and an oblique brace portion which extends upward across the frame and is pivoted to the opposite side thereof, the oblique brace portions of each pair of legs being also pivotally secured together at their points of crossing and free to move at their upper ends, substantially as set forth.

2. In a cot-bed, the combination of a frame with a pair of legs pivoted thereto on opposite sides and locking mechanism engaging one of said legs to prevent folding, each leg consisting of a single piece bent at the point of contact with the floor, so as to form an oblique brace portion, which is attached to the opposite side of said frame, but free to move thereon to allow folding, the brace portions of said legs being pivoted together at their points of crossing, substantially as shown.

3. In combination with the frame of a cot-bed having transverse bars which are provided with protruding ends, supporting-legs arranged in a series of pairs and pivoted on said ends, each leg consisting of a single piece bent at the point of contact with the floor to form an oblique brace portion, which is slotted at its upper end and fits movably on the end of the transverse bar to which said leg is pivoted, the legs of each pair being pivoted on opposite sides of the frame, substantially as set forth.

4. In combination with a cot-bed frame, a series of connected pairs of folding legs, each leg being pivoted thereto at one end, bent at the point of contact with the floor to form an oblique brace portion, pivoted to the companion leg of the pair at the point of crossing and having a slotted pivotal attachment to the opposite side of the frame, allowing motion thereon for folding and unfolding, substantially as set forth.

5. In combination with a cot-bed frame, a series of connected pairs of folding legs and a locking device engaging one of said legs to hold the series against folding, each leg being pivoted to one side of the frame at one end and pivoted at the other end to the other side of said frame, free to move, as described, and consisting of a single piece bent at the point of contact with the floor to form an oblique brace portion, which is pivoted to the corresponding portion of the companion leg of the pair at their point of crossing, substantially as set forth.

6. In combination with a frame having transverse bars which are provided with journals extending beyond the frame on each side, a series of pairs of legs, connected by bars D and provided with locking mechanism to prevent accidental folding, the legs of each pair being pivoted to opposite pivots or journals of the same transverse bar, and each leg being bent to form an oblique brace portion having a slotted attachment to the journal of said transverse bar remote from that journal to which it is pivoted, substantially as shown.

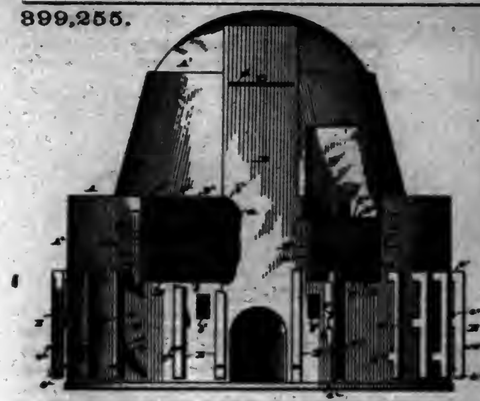
399,255. CONDENSER FOR CHARCOAL-KILNS. JOHN FRIEDRICH, Iron Mountain, Mich. Filed June 27, 1887. Serial No. 242,575. (No model.)

Claim.—1. The combination, with a kiln, of an outer casing surrounding its lower portion, a condensing apparatus located within the chamber between the kiln-wall and outer casing, and connections from the kiln-chamber to said condensing-chamber, as set forth.

2. The combination, with a kiln and an outer casing surrounding its lower portion, of division-plates dividing the chamber between the kiln-wall and casing into several communicating compartments, water-pipes traversing said compartments, and connections, as described, between the interior of the kiln and the chamber between the kiln-wall and casing, substantially as set forth.

3. The combination, with the kiln and the inclosing-casing, of the division-plates *a a' a²*, having openings at alternating ends and water-pipes placed in the chambers or apartments formed by said division-plates, and the flues E, communicating with the condensing-chamber at the top and with the combustion-chamber of the kiln at the lower end, as set forth.

399,255.

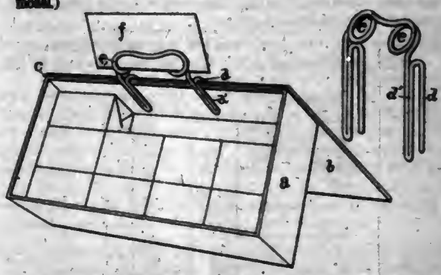


4. The combination, with the kiln and the inclosing-casing forming a condensing-chamber, of the flues connecting with the condensing-chamber at their upper ends, with the atmosphere at their lower ends, and the kiln at intermediate points, whereby communication is established between the kiln-inclosing casing at one end and the combustion-chamber and outside air at the other, substantially as specified.

5. The combination, with the kiln and the casing forming the condensing-chamber, of the connecting-flues communicating with the condensing-chamber at their upper ends and having branch pipes *e'*, communicating with the combustion-chamber of the kiln, and the projection e^3, opening into the outside air, the branch pipes and projections being provided with dampers for controlling the area of the opening of the same, substantially as specified.

6. The combination, with the kiln and the casing forming the condensing-chamber formed by the walls of the kiln and the surrounding casing, and having separate apartments or chambers arranged horizontally around the kiln, and having communication at alternate ends to make a circuitous path through them, of connecting-flues provided with dampers and gates, substantially as and for the purpose specified.

399,256. SHOW-CASE SUPPORTER AND CARD-HOLDER. GEORGE C. FETE, Portland, Me. Filed Nov. 21, 1888. Serial No. 291,501. (No model.)

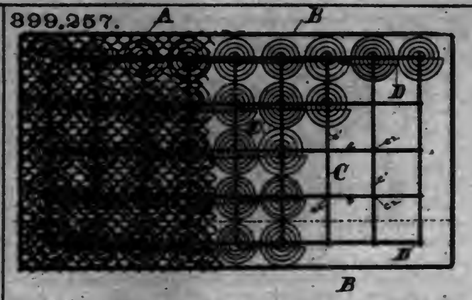


Claim.—1. The combination, with a box having a cover wider than the depth of the box, of a combined case-supporter and card-holder composed of a single piece of metal having its ends bent to form clamping-jaws to hold the cover against the side of the box and its middle bent into a coil to hold a card, substantially as and for the purpose set forth.

2. The combination, with a box or case having a hinged cover wider than the depth of the case, of the herein-described case supporter and card-holder, composed of a single piece of metal having its ends bent to form the sides of a clamp to hold the hinged cover against the side of the case and its middle bent into a coil to hold a price or advertising card, substantially as and for the purpose hereinbefore set forth.

3. The combination, with a case having a cover wider than the depth of the case, of a combined case-supporter and card-holder made of a single piece of metal, its middle bent into a coil and its ends bent to form jaws to engage the edges of the box or case, one extremity of each jaw being pointed, substantially as and for the purpose set forth.

399,257. SPRING-BED. DANIEL H. GAIL, Cleveland, Ohio, assignor to Edwin J. Foster, same place. Filed Mar. 10, 1888. Serial No. 266,900. (No model.)



Claim.—1. The combination of a woven-wire mattress and a series of spiral supporting-springs, the upper extremity of said springs being woven into the mattress in a right line, the extremity of one spring engaging with the extremity of an adjacent spring of the series, whereby said extremities form a substantially continuous wire interwoven in the mattress, substantially as set forth.

2. The combination, with a woven-wire mattress, of a series of spiral supporting-springs, the upper extremities of said springs being woven into said mattress in a right line parallel to one of the boundaries of the mattress, the extremity of one spring overlapping the extremity of the adjacent spring of the series, whereby said extremities form a substantially continuous wire interwoven in the mattress, substantially as set forth.

3. The combination, with a frame-work composed of intersecting rods circular in cross-section and crimped at their intersecting points, of a series of springs secured at the points of intersection, one or more of said springs having a double engagement with both the longitudinal and the transverse rods of said frame-work, the double engagement with the transverse rod being on opposite sides of the longitudinal rod, the double engagement with the longitudinal rod being on opposite sides of the transverse rod, substantially as set forth.

4. The combination, with a frame-work composed of intersecting rods crimped at their point of intersection, of a series of springs secured at said intersecting points, one spring passing over the longitudinal rod, thence under the intersecting rod, thence again over the longitudinal rod, and again engaging with the intersecting rod, the adjacent spring of the series having an alternate engagement first around the intersecting rod, thence under the longitudinal rod, over intersecting rod, and again engaging with longitudinal rod, the engagements of the springs with the intersections thus forming a brace one to the other, substantially as set forth.

5. The combination of a woven-wire mattress, a metallic supporting-frame composed of rods circular in cross-section and crimped at their points of intersection, a series of spiral supporting-springs intermediate of the mattress and supporting-frame, said springs respectively located at said intersecting points, the upper extremity of said springs respectively being woven into said mattress in a right line, the upper extremity of one spring engaging with the upper extremity of an adjacent spring, the lower extremities of said springs having a double engagement with each of the two rods forming the point of intersection to which said spring is attached, substantially as set forth.

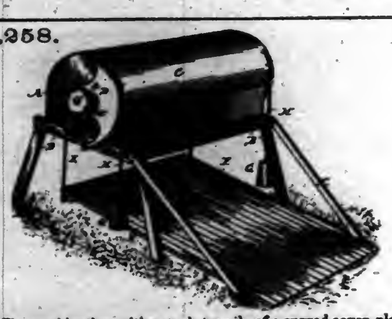
6. The combination of a woven-wire mattress, the strands of which extend transversely of the bed, a metallic supporting-frame composed of a series of rods circular in cross-section and extending transversely and longitudinally of the bed, the rods being crimped at their points of intersection, and a series of spiral springs, each of said springs located at one of said intersecting points, the upper extremity of each of said springs being interwoven in the meshes of said mattress longitudinally of the bed, the lower extremity of each of said springs having an encircling and a secondary bearing on each of the two rods, forming an intersection of said supporting-frame, substantially as set forth.

399,258. FEED-TROUGH. ALBERT C. GETTER, Chicago, Ill. Filed July 28, 1888. Serial No. 281,278. (No model.)

Claim.—1. The combination, with a stock-trough, of a cover, pivoted plates or arms for controlling the movement of said cover, suitable connections attached to said plates or arms near the points at which they are pivoted to said cover, said connections extending downwardly at one side of the vertical plane through said pivot-points, and a treadle or platform attached to said connections, whereby a comparatively slight movement of the treadle or platform will cause the full movement of said cover, substantially as described.

2. The combination, with a stock-trough, of a cover, pivoted plates or arms for controlling the movement of said cover, power-blocks connected with said arms or plates, a treadle or platform, and cables connecting said power-blocks and said treadle or platform, substantially as described.

899,258.

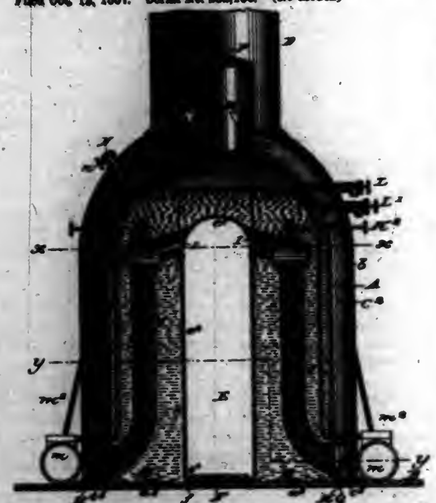


3. The combination, with a stock-trough, of a curved cover, plates or arms for pivotally connecting said lid to the ends of the trough, power-blocks connected with said plates or arms near their pivot-points, a cable passing over said blocks, and a platform connected to said cable, substantially as described.

4. The combination, with a stock-trough, of a cover, pivoted plates or arms connected to said cover, power-blocks connected to said plates or arms near their pivot-points, a treadle or platform connected to said power-blocks, and retracting-cables connected to said cover at a distance from the pivot-points, substantially as described.

5. The combination, with a stock-trough, of a cover, pivoted arms or plates connected to said cover, a treadle or platform, a connection attached to said treadle or platform and attached also to the pivot arms or plates at a distance from their pivot-points, and retracting-cables connected with the cover at a greater distance from the pivot-points of the plates or arms than connections that extend to the treadle, substantially as described.

899,259. STEAM-GENERATOR. ABNER L. GILSTRAP, Macon, Mo. Filed Oct. 13, 1887. Serial No. 252,182. (No model.)



Claim.—1. In a steam-generator, the covering C, flue c^3, walls A, furnace E, annular flue H, and connecting-flues I J, water-feeders Q, braces G, plates K, and base-plate B, all arranged and constructed to operate in the manner described, and for the purposes set forth.

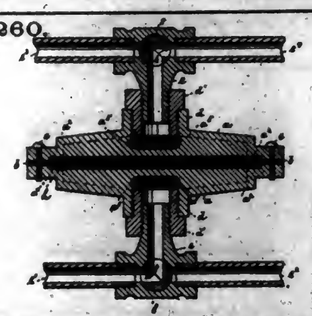
2. In a steam-generator, the combination of the furnace E with the annular flue H and its connecting-flues I J, the flues c^3, and covering C with the walls A, substantially in the manner and for the purposes set forth.

3. In a steam-generator, the combination of the furnace E with the annular flue H and its connecting-flues I J, the walls A, covering C, flue c^3, smoke-stack D, the braces G, the steam connecting-pipes M, the steam-engines m, the escape-pipes m^3, the base-plate B, water-feeders Q, reception-pipe N, the grate F, and the plates K, substantially for the purposes and in the manner set forth and described.

899,260. FILTER. HUGO HARTUNG, Linden, assignor to Ohl & Heather, Newark, N. J. Filed Jan. 2, 1889. Serial No. 295,207. (No model.)

Claim.—1. The combination of disks a, having ribs a' and cavities a^4 on their inner face, with an interposed percolator, h, and with inlet and discharge pipes connected to the disks, substantially as specified.

899,260.



2. The combination of disks a, having radial ribs a' and cavities a^4 on their inner face, with the disks a^3, placed back of the inlet and discharge openings of the disks a, and with perforations a^5, connecting such openings with the cavities a^4 and with percolator h, and with inlet and discharge pipes, substantially as specified.

3. The combination of disks a, having disks a^3, ribs a', perforations a^5, and sockets d, with cocks e, received by said sockets and having plugs f, and with the pivoted frame $g\,g$, engaging said plugs, and with the percolator h, washer b, and binding-screws c, substantially as specified.

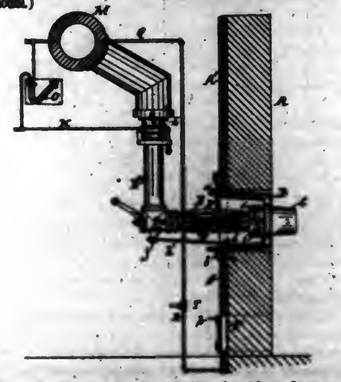
899,261. PANEL-FASTENER. EDWARD HARROUN, Princeton, Wis. Filed Sept. 30, 1887. Serial No. 251,151. (No model.)



Claim.—1. A panel-fastener consisting of a tube having a cap, B, and an opening therethrough, a rod passing through said opening into said tube, a holder on the end of said rod, a spring within the tube encircling the rod having one end bearing against the inside of the cap B, and the other end in positive connection with the other end of the rod, and thus arranged to press the rod inwardly to keep the holder close to the tube and to place a yielding resistance on the same against outward movement, substantially as described.

2. A panel-fastener consisting of a tube, A, a cap, B, brazed thereto, a rod, C, passing into said tube and having an upset head, and a securing-button on said rod, a spring encircling said rod and bearing upon the head a, whereby said rod is kept normally pressed within the tube, and a cap, D, removably secured to the other end of the tube, all substantially as described.

899,262. BLAST APPARATUS FOR BLAST-FURNACES. JOHN M. HARTMAN, Philadelphia, Pa. Filed Mar. 20, 1885. Serial No. 159,548. (No model.)



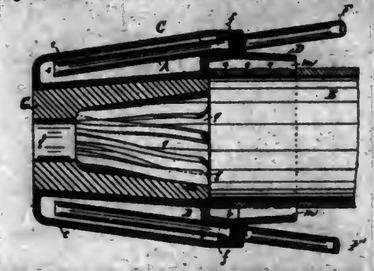
Claim.—1. The combination, with the blast-furnace and the tuyere, of the belly-pipe E, having a series of radially-projecting ribs along its exterior, substantially as and for the purposes set forth.

2. The combination, with the tuyere and the blast-pipes connected therewith, of a reducer and a gage operated by the pressure of the air-blast within said pipe, situated at a point between the reduced portion of the pipe and the tuyere, substantially as set forth.

3. The combination, with the tuyere and the blast-pipes connected therewith, of a reducer placed in a portion of the pipe, a small pipe communicating with the blast-pipes on opposite sides of the reducer, and a differential pressure-gage arranged in the said small pipe, substantially as set forth.

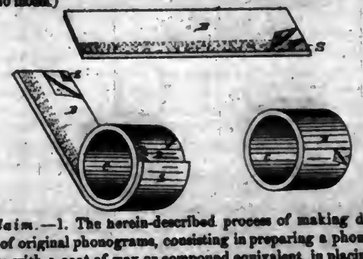
4. The combination of the circulating-coil for the crucible-jacket with branch pipes leading from the blast apparatus and suitable cocks whereby the water can be shut off from and the hot blast turned on the said coil, for the purposes set forth.

899,263. TUYERE. JOHN M. HARTMAN, Philadelphia, Pa. Filed Aug. 13, 1885. Serial No. 174,346. (No model.)



Claim.—The tuyere having a hollow interior for water-circulation in direct contact with the metal thereof, and having a rear portion of brass and a nose of bronze, said nose being integral with said rear portion, substantially as set forth.

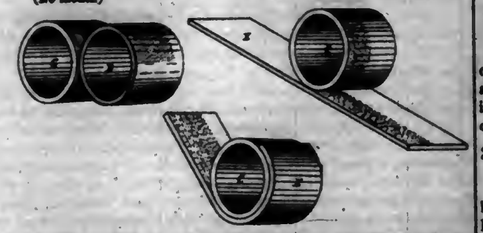
899,264. PROCESS OF DUPLICATING PHONOGRAMS. GEORGE H. HERRINGTON, Wichita, Kans. Filed Sept. 21, 1888. Serial No. 285,977. (No model.)



Claim.—1. The herein-described process of making duplicate copies of original phonograms, consisting in preparing a phonograph-cylinder with a coat of wax or compound equivalent, in placing about said cylinder one or more layers of tin-foil, or an equivalent, thus forming a surface upon which to register the original phonogram, in covering said tin-foil having the original register thereon with a coat or covering of either wax, resin, pitch, celluloid, glue, rubber, or their compound or equivalent to form a shield to protect their impressed characters and form, and in removing said shield and tin-foil, and in placing or impressing said shield and tin-foil about a duplicate cylinder, in the manner substantially as and for the purpose specified.

2. The herein-described process of duplicating copies of phonograms, consisting in preparing a phonograph-cylinder with a coating of wax or composition which is adapted to be softened by the influence of heat, in placing layers of tin-foil or an equivalent about said prepared cylinder, thus forming a surface upon which to register the original phonogram, and in removing said layers of foil after the record has been made from the original cylinder and placing them about duplicate cylinders, thus forming duplicate copies of the original phonogram, substantially as and for the purpose specified.

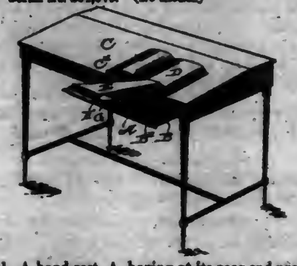
899,265. PROCESS OF DUPLICATING PHONOGRAMS. GEORGE H. HERRINGTON, Wichita, Kans. Filed Sept. 21, 1888. Serial No. 285,978. (No model.)



Claim.—1. The herein-described process of making duplicate copies of original phonograms, consisting in preparing a phonograph-cylinder with a coating of wax or composition which will soften under the influence of heat, thus forming a surface upon which to register the phonogram when said surface is in a soft state, then permitting said recorded surface to harden, in applying a sheet or strip prepared from said wax or composition, while in a soft state from the influence of heat, in contact with said hardened recorded surface of the original phonogram, impressing said sheet or strip with said record, and while in such contact permitting the wax or composition to set, in removing said impressed sheet or strip from contact with the record, thus producing a negative duplicate copy, and in applying duplicate cylinders having a coating of said wax or composition in contact with said negative copy while the coatings of said cylinders are softened from the influence of heat, impressing in their surface a positive duplicate copy of the original phonogram from said negative, substantially as and for the purpose specified.

2. The herein-described process of making duplicate copies of original phonograms, consisting in pressing sheets of wax or composition which is adapted to soften from the influence of heat in contact with the original phonogram while in a soft state, then permitting it to set, thus impressing said sheet with the original record, in removing said sheet or strip from contact with the original record, thus forming a negative duplicate copy, and in applying duplicate cylinders having a coating of said wax or composition in contact with said negative copy while the coatings of said cylinders are softened from the influence of heat, thus impressing in their surface a positive duplicate copy of the original phonogram from the negative record, substantially as and for the purpose specified.

899,266. HAND-REST. ELLE S. HULL, Chicago, Ill. Filed Nov. 27, 1888. Serial No. 291,979. (No model.)



Claim.—1. A hand-rest, A, having at its rear end projections A^2 A^3, to extend beneath the front edge of the table-top, and having notches A^3 on its lower side to receive the front of the drawer of the table, substantially as described.

2. A hand-rest, A, having at its rear end projections to extend beneath the front edge of the table-top, and having notches on its lower side to receive the front of the drawer of the table, and a top, E, hinged by its front end upon the bottom A, and a shifting support for said top E, located between the latter and the bottom A, substantially as shown and described.

3. A hand-rest, A, having at its rear end projections to extend beneath the front edge of the table-top, and having notches on its lower side to receive the front of the drawer of the table, and a top, E, hinged by its front end upon the bottom A, substantially as shown and described.

899,267. METHOD OF CONSTRUCTING WIRE FENCE. WILLEY M. HYDE, Youngstown, Ohio, assignor of one-half to John Bryan Johnston, Meade Center, Kans. Filed Sept. 27, 1888. Serial No. 286,510. (No model.)



Claim.—The method herein described of constructing wire fence, consisting in first crimping the locking-plates and assembling the parts, and, secondly, in simultaneously straightening or flattening the locking-plates and kinking the wires in opposite directions at their point of crossing, substantially as set forth.

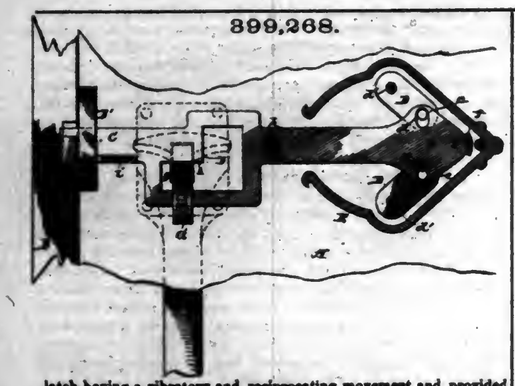
899,268. LATCH. ORIEN A. JEMISON, Lansing, Mich. Filed June 30, 1888. Serial No. 278,095. (No model.)

Claim.—1. The combination, with longitudinally-adjustable latch-bar having a shoulder thereon, of a lifting-lever, the latter being so located that when the bar is adjusted longitudinally to one position the shoulder thereon is in a position to be engaged by the lifting-lever, so as to be lifted thereby, and when in another position the shoulder thereof is beyond the limit of movement of the lifting-lever, substantially as set forth.

2. The combination, with a door and door-frame, of a latch-bar pivoted thereto by means of links, said bar being provided with a slot, a lifting-lever pivoted in the door and adapted to work in said slot, and a keeper secured to the door-frame, substantially as set forth.

3. The combination, with a keeper having a notch therein, of a

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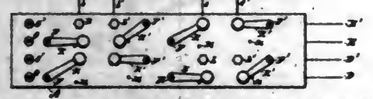


latch having a vibratory and reciprocating movement and provided with a flange adapted, when the bolt is moved in one direction endwise, to enter the notch in the keeper, substantially as set forth.

4. The combination, with a door and door-frame, of a latch having a vibratory and reciprocating movement, a keeper secured to the door-frame, a housing-box to cover the pivoted portion of the latch-bar, and a flange on said housing-box to limit the rearward movement of the latch-bar, substantially as set forth.

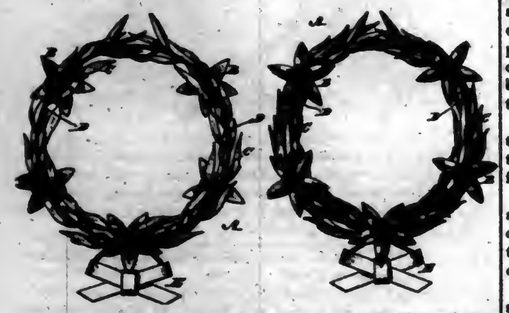
399,269. SWITCH-BOARD. JOHN W. KELLY, Minneapolis, Minn.

Filed Mar. 13, 1888. Serial No. 267,129. (No model.)



Claim.—In a switch-board, the combination, with two or more sets of source conductors, as *b b'* and *c c'*, of two or more sets of distributing-conductors, as D D' and E E', crossing said source conductors on the switch-board, sets of binding posts or contacts, as L L', projecting from said source conductors through the face of the board corresponding in number on each set of source conductors to the sets of distributing-conductors, sets of binding posts or contacts, as F F', projecting from said distributing-conductors through the face of the board in proximity to the sets of said source contacts corresponding in number on each set of distributing-conductors to the sets of source conductors, pivoted contacts, as K K', adapted to connect L L' and F F', or each of them as desired, an independent series of binding posts or contacts, as G G', attached to and corresponding in number to the distributing-conductors, and a removable cable, H, adapted to connect any set of the same together, substantially as described.

399,270. ARTIFICIAL WREATH. ADOLPH KUMPF and HENRY KUMPF, Philadelphia, Pa. Filed Jan. 5, 1889. Serial No. 295,533. (No model.)

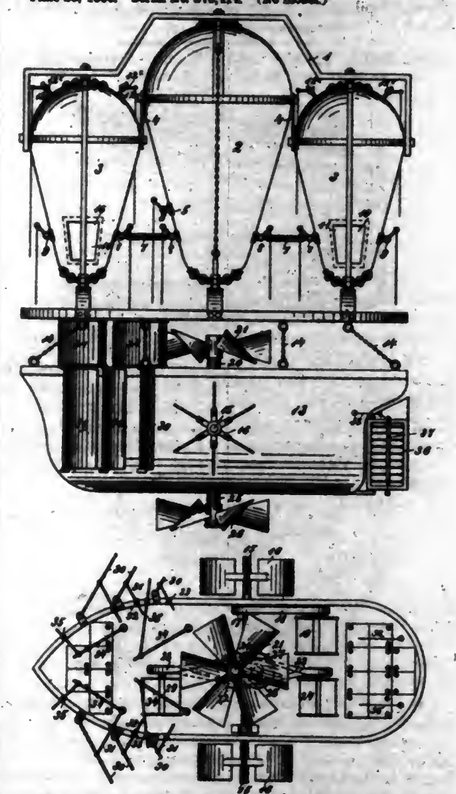


Claim.—1. As an article of manufacture, an artificial wreath consisting of flowers and leaves formed of metal coated with paint and a backing of the form of the stem of a vine, substantially as described.

2. An artificial wreath formed of metal with the backing for the flowers having connected with its ends a bow of metal, substantially as described.

3. An artificial wreath formed of painted metallic flowers and leaves and a wire backing of the form of the vine, crossed near its ends and having said ends connected by a metallic ornament, substantially as described.

399,271. BALLOON. CHARLES A. KIDDLE, Philadelphia, Pa. Filed June 28, 1888. Serial No. 278,414. (No model.)



Claim.—1. The combination of a ship, sails pivoted to the sides and top thereof at the bow, rods connected to said sails, eyes through which said rods pass, and set-screws in said eyes for engaging the rods, operating in the manner and for the purpose described.

2. In a balloon, the combination of the gas-envelope, a ship connected therewith, a propeller-wheel above the ship and another below the same, propeller-wheels on the sides of the ship, and adjustable wings at the bow of the ship, substantially in the manner and for the purpose described.

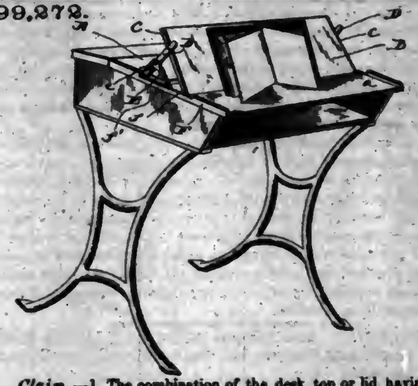
3. In a balloon, a frame, a gas-envelope suspended therefrom, charging-vessels on each side of the balloon suspended from the frame and connected with the balloon, a car or ship connected to the balloon and charging-vessels, a rudder carried by the car formed of a series of slats, a propeller-wheel above the ship and another below the same, propeller-wheels at the sides of the car, and adjustable wings in front of the side propeller-wheels and above the car, said parts being combined, arranged, and operating substantially in the manner and for the purpose described.

4. In a balloon, the ship or car, the wings attached to the top of the ship, the said wings being of different lengths, and the wings attached to the bow of the ship, also of different lengths, substantially as and for the purpose described.

5. In a balloon, the combination, with the gas-envelope, the ship, and the propelling devices, of the adjustable wings secured to the top of the car of different lengths, and the adjustable wings secured to the front or bow of the ship, also of different lengths, arranged and operating substantially in the manner and for the purpose described.

6. A balloon or aerial ship consisting of a balloon, charging-vessels, a ship connected with and depending from said balloon and charging-vessels, propelling devices, substantially as described, carried by the ship, and mechanism, substantially as described, in said ship for operating the propelling devices, a rudder carried by the ship consisting of a series of slats, and adjustable wings arranged at the bow of the ship and of different lengths or sizes, said parts being combined, arranged, and operating in the manner and for the purpose described.

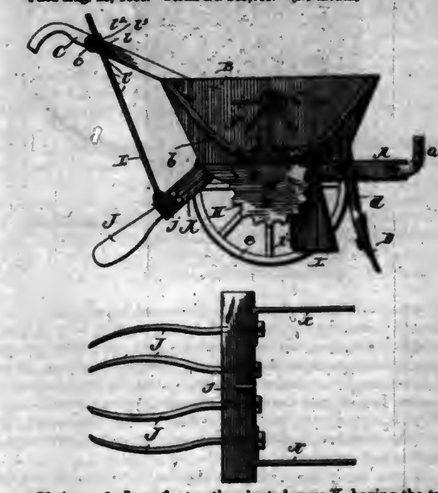
399,272. SCHOOL-DESK. WILLIS LEFFINGOTT, Smith Centre, Kans. Filed Aug. 22, 1888. Serial No. 283,430. (No model.)



Claim.—1. The combination of the desk top or lid having its front portion reduced in thickness, and provided with recessed side strips having racks, the supporting-slab sliding between said strips, the movable bars pivotally connected to the top or lid, and the arms secured to the movable bars and adapted to engage the said racks, said bars and arms adapted to fold in the recessed portions of said strips and to align with the tops thereof, substantially as and for the purpose described.

2. The combination of the desk top or lid having the reduced portion, and provided with the recessed side strips having the racks, the supporting-slab having the re-enforced strips and sliding between said side strips, the movable bars pivotally connected to the top or lid and the supporting-slab, and the arms secured to the movable bars and engaging the said racks to hold the supporting-slab in an elevated position, said bars and arms being adapted to fold in the recessed portion of said side strips and to align with the tops thereof, substantially as described.

399,273. COTTON-PLANTER. JOHN J. LONG, Cooksville, Miss. Filed Aug. 25, 1888. Serial No. 283,705. (No model.)



Claim.—1. In a planter, the pivoted arms K, having the transverse bar *j*, provided with the blades J, combined with the adjusting-bar L, loosely connected to the bar *j* and adjustably connected to the cross-bar of the handles, as set forth.

2. In a planter, the combination, with the angularly-adjustable frame composed of a transverse bar, and arms having their rear ends secured to the ends of said bar and their front ends pivoted on the rear portion of the hopper, of the bent coverer-blades standing rearward from said transverse bar and arranged in equal numbers on each side of the center thereof, with their edges downward, their convexities outward, and the rear ends standing inward, substantially as specified.

3. In a planter, the combination of the frame composed of the transverse bar *j*, and the arms K, pivoted to the rear part of the hopper, the coverer-blades standing rearward from the bar *j*, with their edges downward, their convexities outward, and their points standing inward, the adjusting-rod L, pivoted at its lower end to the bar *j*, passing through a staple, *l*, on the cross-bar C, and provided with the adjusting-openings *l'*, the pin P, standing from the said bar and engaging said openings, and the spring P, forcing the rod L into engagement, substantially as specified.

399,274. SECONDARY-BATTERY ELECTRODE. ABRAHAM V. MIDDLEKAUFF, New York, N. Y. Filed Dec. 26, 1888. Serial No. 294,644. (No model.)



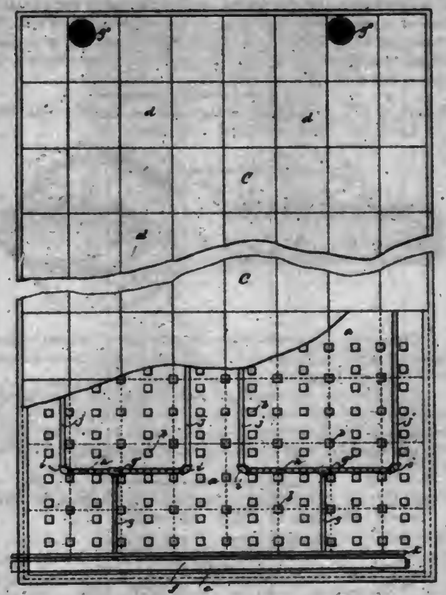
Claim.—1. The herein-described composite electrode, consisting of a plate, A, perforated to provide chambers *a*, and plates B, located upon the opposite sides of said plate A, and having openings *b*, communicating with the chambers *a* and of less size than said chambers, substantially as described.

2. The herein-described electrode, consisting of the plate A, perforated to provide chambers *a* and having studs 2, and the plate or plates B, secured to said plate A by said studs 2 and having openings *b*, which communicate with the chambers *a*, but are of less size than said chambers, substantially as described.

3. The herein-described composite electrode, consisting of a plate, A, perforated to provide chambers *a*, and plates B, located upon the opposite sides of said plates A, and having openings *b*, communicating with the chambers *a*, surrounded by inwardly-projecting flanges 5 and of less size than said chambers, substantially as described.

4. The herein-described composite electrode, consisting of a plate, A, perforated to provide chambers *a*, which are separated by walls of different thicknesses in different parts of the plate, and plates B, located upon the opposite sides of said plate A, and having openings *b*, communicating with the chambers *a* and of less size than said chambers, substantially as described.

399,275. BRICK-DRYING APPARATUS. GEORGE B. MERRILL, Lock Haven, Pa. Filed Sept. 15, 1887. Serial No. 249,788. (No model.)



Claim.—1. In a brick-drying apparatus, the combination of a metallic drying-floor made in sections and laid on piles or piers, with clear open air-tight space beneath each floor, and between the piles or piers a system of conducting-pipes beneath said floor, discharging steam into said open space, and a vent or vents, *f'*, extending up through the drying-floor, substantially as described.

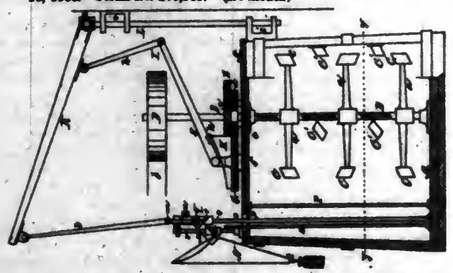
2. In a brick-drying apparatus, the combination, with the metallic drying-floor made in sections and laid on piles or piers, having an open space beneath it, and provided with the vent or vents *f'* at the rear end, connecting the space under the drying-floor with the outside atmosphere, of the pipes *f*, for exhaust-steam, and the pipes *k*, for live steam, both connected with pipes arranged beneath said floor, said live and exhaust steam conducting pipes extending above the floor, and there provided with controlling-valves *l*, substantially as and for the purpose set forth.

3. In a drying apparatus, the combination, with an inclined con-

crete or cement floor and an iron drying-floor supported above the same on piles or piers, of a system of steam-conducting pipes arranged between the two, substantially as described.

4. A drying apparatus consisting of an inclined concrete or cement floor made in concave inclined sections laid on grouting, an iron drying-floor supported above the same on piles or piers and made in sections fastened securely together and provided with outlet-vents at its extreme end, and a system of steam-conducting pipes leading into the chamber formed between the inclined floor proper and the drying-floor, and provided at a convenient point or points with regulating-valves, substantially as described.

399,276. APPARATUS FOR MIXING LIQUID AND POWDERED SUBSTANCES. BENJAMIN D. MILLIKEN, Somerville, Mass. Filed July 10, 1888. Serial No. 279,586. (No model.)



Claim.—The tank A, with a slot, *p*, in its top, a strainer, P, located in the tank, one or more filling-cups, M, pivoted to a reciprocating cross-head, T, a series of levers connected with the cross-head, and one or more spouts, N, in combination with a revolving mixer, a series of toothed gear actuated by the shaft of the same, and a cam, H, secured to one of said gear, one, *g*, of the levers connected with the cross-head being located in the path of said cam and being periodically raised thereby, all constructed to operate substantially in the manner and for the purpose specified.

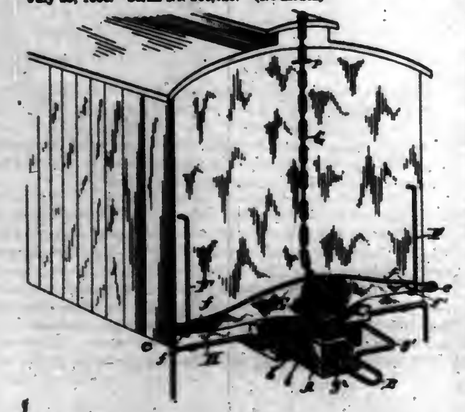
399,277. LAMP-WICK. AUGUST MUELLER, Kansas City, Mo. Filed Apr. 7, 1888. Serial No. 269,906. (No model.)



Claim.—1. A lamp-wick composed of a pair of tubular sections connected together by separated longitudinal strips, in the manner and for the purpose described.

2. In a tubular lamp-wick, the combination of an upper tubular section adapted to slide upon the center tube of a lamp, a lower tubular section adapted to remain stationary at the base of said center tube, and separated longitudinal strips connecting said upper and lower tubular sections, in the manner and for the purpose set forth.

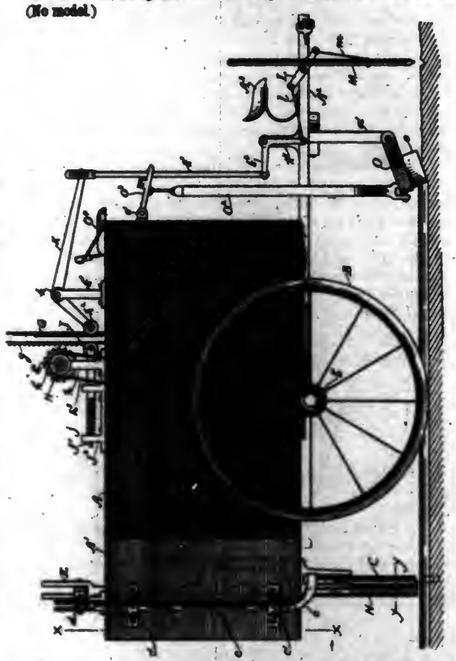
399,278. CAR-COUPLING. DEWITT C. MCCOY, Bushnell, Fla. Filed July 23, 1888. Serial No. 280,729. (No model.)



Claim.—1. In combination, a draw-bar, a coupling-pin, a vertically-movable cross head or bar curved or arched outwardly at its center and extending across the end of a car, an arm projecting forwardly from said cross-bar and carrying the coupling-pin, and vertical yokes secured to the car and embracing the ends of said cross-bar, by which the same is loosely confined to the car and rendered vertically movable, substantially as described.

2. In a car-coupler, the combination of a draw-bar provided with a spring-actuated block, a coupling-pin, a vertically-movable cross-head extending across the end of a car and provided with handles at its ends and with a forwardly-projecting arm carrying the coupling-pin, and vertical yokes secured to the end of the car near the opposite ends of and loosely confining the cross-head to the car to allow the head a suitable vertical movement within the yokes, said cross-head being provided with notches in which the ends of the yokes rest and with pins or projections to prevent longitudinal movement of the same, substantially as described.

399,279. MACHINE FOR IRRIGATING HILLS FOR PLANTS. HANS F. OLSEN, Stoughton, Wis. Filed Sept. 21, 1888. Serial No. 285,902. (No model.)



Claim.—1. The combination, with the tank A, as specified, of the spouts N, valves *f f*, bar F, spring *d'*, bar E, attached to laterally-extended levers connected with drills in operative connection with said spouts, a lever connected with a normally-disengaged rack and pinion, the latter being in operative connection with one of the wheels of the machine, stake M, and a series of levers in operative connection with said rack, whereby the latter may be thrown into engagement with said gear whenever the stake is thrust into the ground, substantially as shown and described.

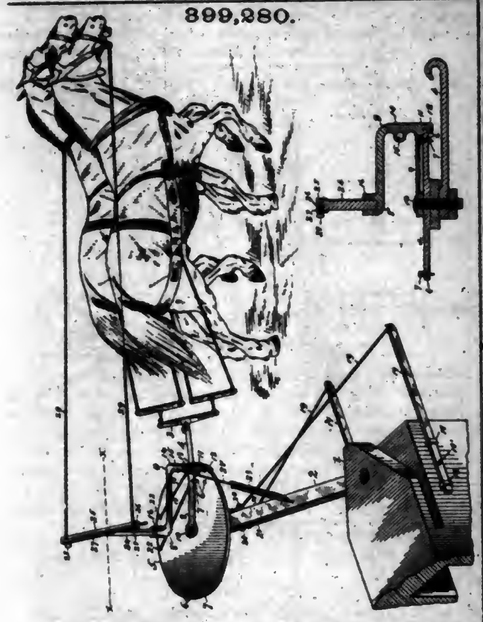
2. The combination, with the treadles O^2, of the links O^3 and suspended shoes O, flaring outwardly in front and open at the rear whereby the soil may be deposited in hills at each cross-mark, substantially as shown and described.

399,280. DRIVING DEVICE FOR HORSE-POWERS. WILLIAM H. OSBURN, Burrton, Kans. Filed May 24, 1888. Serial No. 274,907. (No model.)

Claim.—1. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, the combination of a reversible driver or rein-holder and a sweep provided with means for limiting the throw of said driver, with ropes for reversing said driver at the end of each stroke of said sweep, substantially as described.

2. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, a sweep, in combination with a reversible driver or rein-holder mounted thereon, a spring attached to said driver, adjustable stops for limiting its throw, and means for starting its reversing-throw at the end of each stroke of said sweep, substantially as described.

399,280.



3. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, a sweep, in combination with a reversible driver having the lines or reins attached thereto, stops for limiting its throw, a spring for drawing it against said stops, and means for reversing it at the end of each stroke of the sweep, substantially as described.

4. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, a sweep, in combination with a pivoted driver having a rein-holder attached thereto, stops arranged at diametrically-opposite points of said sweep, a spring for drawing said driver against said stops, and ropes for throwing said driver around at the end of each stroke of said sweep, substantially as described.

5. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, a sweep, in combination with a driver pivoted at the outer end of said sweep and having a rein-holder attached thereto, a crank-arm arranged at right angles to said rein-holder, stops upon the sweep for limiting the throw of said crank-arm to substantially a semicircle, a spring for drawing said crank-arm against said stops, and ropes arranged to alternately throw said crank-arm around at the end of each stroke of the sweep, substantially as described.

6. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, a sweep, in combination with a platform mounted thereon and provided with adjustable stops at diametrically-opposite points of its side edges, a driver consisting of a rein-holder, and also of a crank arranged at right angles to said rein-holder, a spring for drawing said crank against said stops, and ropes attached to the end of said crank and passed through perforations formed in the platform at its outer edge and arranged to throw said crank around at the end of each stroke of the sweep, substantially as described.

7. In an automatic driving device for horse-powers for rebounding-plunger presses and similar machines, a sweep, in combination with a platform mounted thereon and formed with perforations in its side edges and with two perforations in its outer edge, a crank pivoted in the center of said platform, an upright rod, a rein-holder arranged at right angles to said crank, stops inserted in the perforations in the side edges of said platform, a spring secured to the end of the crank and also to the sweep, and ropes secured to the end of said crank and passed through the perforations in the outer edge of said platform and adapted to be alternately tightened at the ends of the stroke of the sweep, substantially as described.

8. The combination of the sweep, the spring, the ropes, the circular platform, the driver, the crank pivoted at the center of said platform and provided with the cross-head having eyes or rings for the attachment of said spring and ropes, and formed with the downwardly and inwardly bent flanges or catches fitting around the edge of said platform, substantially as and for the purpose specified.

9. The combination of the sweep, the circular platform mounted upon the end thereof and formed with two series of perforations in its side edges and with two perforations in its outer edge, the crank pivoted at the center of said platform and provided with the flanged cross-head having the eyes or rings, the upright rod, the rein-holder, the stops in the perforations of said platform, the spring secured to the eye or ring on the wrist-pin of said crank, and the ropes secured to the eyes on said cross-head and passed through the perforations in the outer edge of said platform and arranged to be alternately tightened at the ends of the stroke of the sweep, substantially as and for the purpose described.

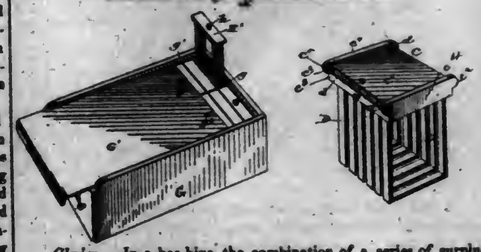
10. The combination of the sweep, the platform having the perforations 6 and 22, the stops in the said perforations, the crank provided with the flanged cross-head having the eyes or rings, the upright rod, the rein-holder, the spring secured to the eye or ring on the wrist-pin of said crank and to the sweep, the guide-pulleys upon said sweep, the removable bars or beams, the bails upon the sides of the press, and the ropes secured to said bars or beams and to the eyes or rings on said crank and passed over said pulleys and up through the perforations 22 in said platform, substantially as described.

11. The rein-holder consisting of the cross-head having a rabbeted outer face, a clamping-bar, and screw-bolts for securing said clamping-bar to said cross-head, in combination with the sweep and means for automatically reversing said rein-holder at the ends of the stroke of said sweep, substantially as described.

12. The rein-holder consisting of the cross-head having a rabbeted outer face, a clamping-bar, and screw-bolts for securing said clamping-bar to said cross-head, in combination with the sweep and means for automatically reversing said rein-holder at the ends of the stroke of said sweep, said means consisting of the platform provided with stops and perforations, the crank, the spring, and the ropes, substantially as described.

399,281. BEE-HIVE. HIRAM PERDYEE, Western Saratoga, Ill. Filed May 29, 1888. Serial No. 275,486. (No model.)





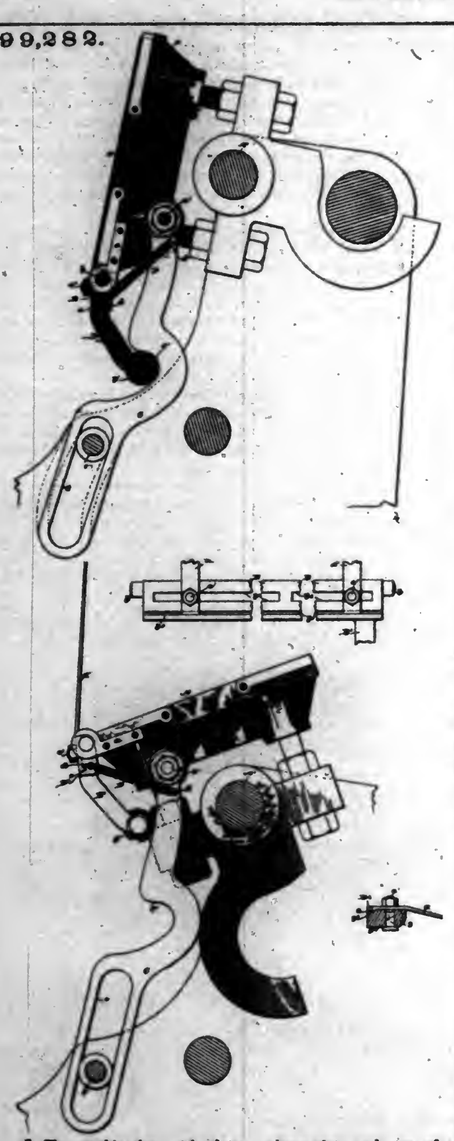
Claim.—In a bee-hive, the combination of a series of surplus comb-frames, D, each having end projections, *d*, with a surplus comb-frame section composed of two end pieces, c^2, and two side pieces, c^3, the latter provided with projecting ends c^5, inner grooves, c^3, and a cover, c^4, adapted to operate in said grooves and hold the frames in position, as specified.

399,282. GRIPPER MECHANISM FOR PLATEN PRINTING-PRESSES. WILLIAM H. PRICE, Jr., Cleveland, Ohio, assignor to Chandler Price, same place. Filed Apr. 21, 1888. Serial No. 271,380. (No model.)

Claim.—1. The combination, with platen, gripper-plate, and arm, of a traveling cam for engaging such gripper-plate arm, the said cam being pivotally connected with and operated by the platen, substantially as set forth.

2. The combination, with platen, grippers, gripper-plate, and arm, of link pivoted to the platen, the lower portion of the link traveling on a stationary support, said link having a cam-face for engaging the gripper-plate arm, whereby the grippers are actuated, substantially as set forth.

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3. The combination, with platen, gripper-plate, and arm, of a reciprocating vibratory cam for engaging and operating such arm, said cam being pivotally connected with the platen, substantially as set forth.

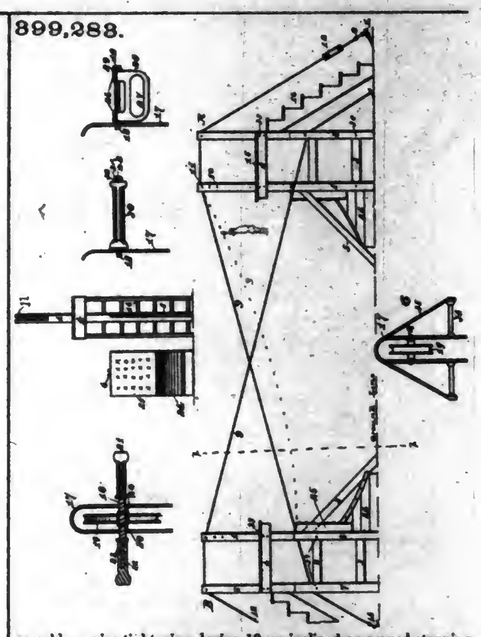
4. The combination, with a platen, gripper-plate, and arm, of a traveling link pivotally connected with and operated by the platen and having a cam-surface for engaging such gripper-plate arm, and a spring connected with the gripper-plate and link for holding the arm in contact with the cam-surface of the link, substantially as set forth.

5. The combination, with grippers and gripper-plate, the former having toes and the latter having a longitudinal groove for receiving such toes, of rib projecting from the face of the gripper-plate in position to engage the end of the grippers, said rib being flush with the rear side of said groove, substantially as set forth.

899,283. AERIAL RAILROAD OR WIRE TRAMWAY AND APPLIANCES THEREFOR. JAMES PRITTER, Denver, Colo. Filed Nov. 6, 1883. Serial No. 290,164. (No model.)

Claim.—1. A tramway for physical exercise, consisting of higher posts at one end, a platform thereat, lower supporting-posts at the other end, an inclined wire or cable stretched over such posts and between the two sets thereof, means for securing the ends of the wire

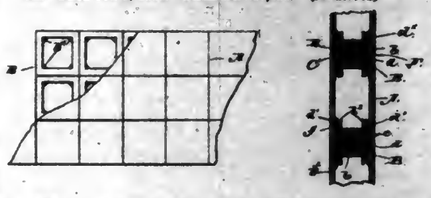
899,288.



or cable, a wire-tightening device, 12, an inclined or curved stopping-platform, 24, and a padded surface, 25, substantially as set forth.

2. A tramway for physical exercise, consisting of the higher cable-supporting posts at one end, having their upper ends slotted for varying the height of the upper end of the cable, a platform at such end, lower cable-supporting posts at the other end, an inclined wire or cable stretched over such posts, means for securing the ends of the wire or cable, and a wire-tightening device applied to such cable, substantially as set forth.

899,284. WALL FOR HOUSES. WILLIAM R. RAY, Los Angeles, Cal. Filed Oct. 3, 1888. Serial No. 287,096. (No model.)



Claim.—1. A supporting-frame for the interior of a wall, molded of any suitable material—such as concrete—into any proper shape to be laid in regular courses, with similar frames and provided with a surrounding peripheral groove to register with the similar grooves in adjoining frames, and receive a suitable binding material—such as cement or mortar—substantially as specified.

2. In the wall of a house or other structure, the interior framing, composed of similar supporting-frames laid in regular courses and provided with registering peripheral acute-angled grooves, a suitable cement within said grooves, and lengths of strap or hoop iron laid at suitable intervals in said registering grooves to bind the courses together, substantially as specified.

3. In a wall, the combination of the hollow supporting-frames, molded of suitable material and in proper shape, provided with surrounding peripheral grooves and laid in regular courses with their grooves registering and filled in with a suitable cement, and incasing-slabs corresponding in area and contour to the supporting-frames and secured thereto with their edges meeting and registering with the joints between said frames, substantially as specified.

4. In a wall, the combination, with the hollow supporting-frames B, provided with the peripheral grooves *b* and the webs *b'* in their interior angles, of the incasing-slabs D, provided with the grooves *d* and the flanges *d'*, the grooves and spaces between the flanges *d'* and supporting-frame being filled with cement or mortar, substantially as specified.

5. The hollow supporting-frames *b*, adapted to be laid in regular courses, with similar frames, and the incasing-slabs A, to close both sides of the frames, as set forth.

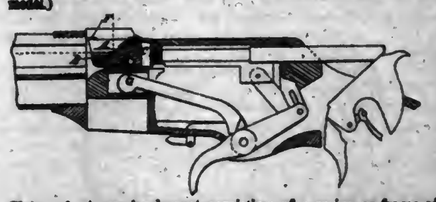
6. In a wall, the hollow supporting-frames B, provided with the webs *b'* on their interior angles, combined with the incasing-slabs A, having the flanges *d'* to bear against the webs *b'*, as set forth.

899,285. BICYCLE. AARON G. ROSE, Greencastle, Ind. Filed Dec. 1, 1888. Serial No. 292,494. (No model.)



Claim.—The combination, with the fork provided with a vertical slot, D, and the main axle provided with a removable pinion outside the fork, of the stub-axle E, fitting in the slot D and vertically adjustable therein, the stub-axle M, arranged in the said slot and vertically adjustable therein, the power gear-wheel mounted on the stub-axle E and carrying the pedal, and the intermediate spur-wheel mounted on the stub-axle M and meshing with the power-wheel and the pinion, all substantially as and for the purpose specified.

899,286. REFLECTOR FOR INSPECTING GUNS. ANDREW H. RUSSELL, U. S. Army. Filed Aug. 10, 1888. Serial No. 282,469. (No model.)

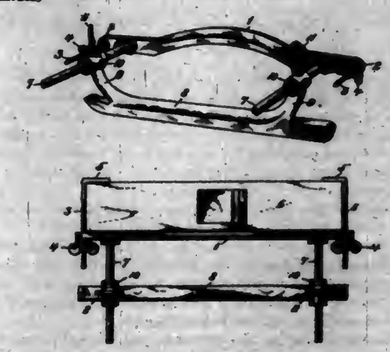


Claim.—1. A gun implement consisting of a casing or frame of such shape as to fit the receiver of a gun, and a mirror held by said casing at the proper angle to throw light into the bore when the casing is adjusted in the receiver, substantially as described.

2. A gun implement consisting of a bent casing of such form as to fit the receiver of a gun and inclosing the sides of an inclined mirror, a mirror, inclined as described, and clasps to retain the mirror in position, substantially as set forth.

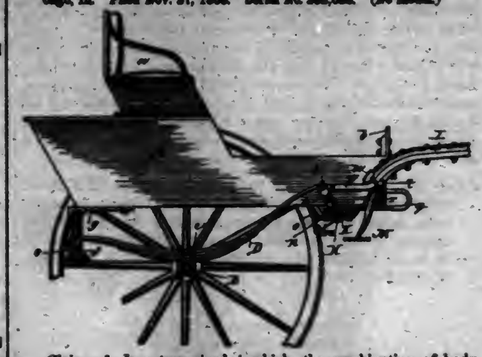
3. The combination, in a gun implement, of a metallic casing shaped to fit the receiver of a gun, an inclosed mirror in said casing, retaining-catches for the mirror, and a finger-piece or catch for removing the implement from the receiver, all substantially as described.

899,287. GAGE ATTACHMENT FOR PLANES. GEORGE H. RUSSELL, Pittsfield, Mass. Filed Oct. 27, 1883. Serial No. 289,304. (No model.)



Claim.—The herein-described adjustable gage attachment for planes, consisting of the bar 1, having end perforations, 2, provided with the L-shaped clamping-bolts 3, bent, as at *b*, adapted to embrace a plane at its ends, and having set-nuts 4, and opposite bars, 7, projecting from the bar 1, and the gage-bar 8, having upwardly-disposed arms 9, terminating in perforated bosses 10, for the reception of the bars 7, and having set-screws 11, substantially as specified.

899,288. TWO-WHEELED VEHICLE. LOUIS SCHNEIDER, Chicago, Ill. Filed Nov. 27, 1888. Serial No. 292,082. (No model.)

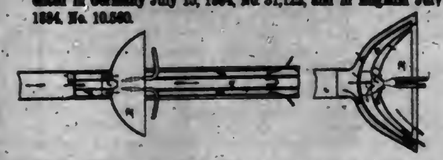


Claim.—1. In a two-wheeled vehicle, the combination of body A, side springs, D, secured upon axle B, transverse spring E, secured under the rear end of body A and coupled with its ends to the rear ends of springs D, rocker-shaft H, pivoted under the forward end of body A and having end cranks, *h*, coupled with the forward ends of springs D, and crank *m*, having swivel-nut *n*, engaging screw *o*, projected through the body A of the vehicle, to be adjusted from above by means of a swiveled lever, *p*, or by an equivalent device, all substantially as described, for the purpose specified.

2. In a two-wheeled vehicle, the combination, with the above-claimed elements, of loops *q*, secured to or under the forward end of body A and forming guides for a bar, *r*, and spring-bars *s* and *s'*, secured to the top and bottom of such bar *r*, the ends of which being coupled to the thills to hold them yieldingly in line with the body A, all substantially as set forth.

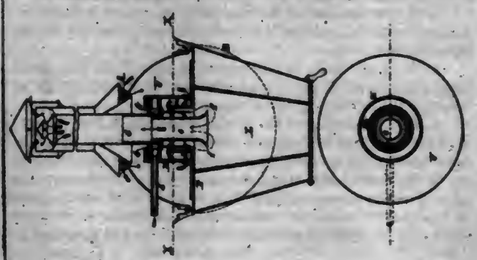
3. In a two-wheeled vehicle, the ends of thills I, pivotally coupled to any part of the vehicle-body, in combination with loops *q*, holding a bar, *r*, with springs *s s'*, secured against the top and bottom of the same for yieldingly holding it centrally therein, and with the eyed ends of said bar *r* being adjustably coupled to the thills by vertical screws *v*, secured by nuts *y y*, all substantially as set forth, for the purpose specified.

899,289. GAS-LAMP. FREDERICK SIEMENS, Dresden, Saxony, Germany. Filed July 12, 1886. Serial No. 207,810. (No model.) Patented in Germany July 15, 1884, No. 31,122, and in England July 24, 1884, No. 10,560.



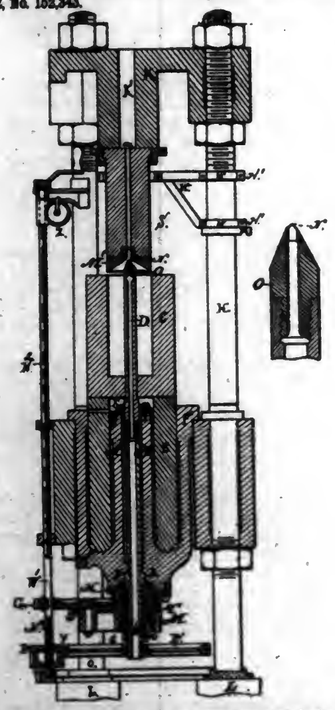
Claim.—The combination of the burner set inclosed by a glass or globe, the bell-reflector R, within which the burner is placed, the mouth *r*, through which the products of combustion pass, and which deflects the air upon the flame, the channels *a a'*, through which the products of combustion pass to the chimney, the channel *b*, in which the ascending air is heated and caused to issue into the upper part of the reflector to supply the flame, and a small aperture, a^3, for the passage of a portion of the hot products of combustion to start the chimney-draft, as and for the purpose described.

899,290. REGENERATIVE GAS-BURNER. FREDERICK SIEMENS, Dresden, Saxony, Germany. Filed Oct. 20, 1886. Serial No. 217,505. (No model.) Patented in France Oct. 23, 1886, No. 178,187; in England Oct. 26, 1886, No. 13,701; in Belgium Oct. 26, 1886, No. 74,901; in Italy Nov. 26, 1886, XLI, 81; in Spain Jan. 10, 1887, No. 6,891, and in Austria-Hungary Apr. 4, 1887, No. 42,048 and No. 9,415.



Claim.—In a gas-lamp, the combination of a horizontal partition constructed of material having a reflecting-surface, a lower compartment closed on all sides by glass, an upper compartment to which air is admitted through shielded perforations, a metal cylinder open at its bottom and having formed upon its top an annular gas-chamber, a metal ring projecting upward from the partition-plate, a central trumpet-mouthed flue made of refractory material, a series of small tubes projecting downward from the gas-chamber between the said ring and the said flue, and a chimney from which the products of combustion escape through shielded perforations at the top of the upper compartment, as and for the purposes described.

399,291. HYDRAULIC PRESS FOR COVERING ELECTRICAL CONDUCTORS WITH SOFT METAL. WERNER SIEMENS, Berlin, Germany, assignor to Siemens & Halske, same place. Filed Aug. 20, 1884. Serial No. 141,880. (No model.) Patented in Germany Nov. 23, 1882, No. 23,176; in Belgium Nov. 23, 1882, No. 59,636, and in France Nov. 23, 1882, No. 152,343.



Claim.—1. In a hydraulic press for covering electrical conductors with soft metal, an annular cylinder having a central space for the reception of the mandrel, and the mandrel having an upper part, D, which screws into the lower part, D', as and for the purpose described.

2. In a hydraulic press for covering electrical conductors with soft metal, the combination of a plunger, rotated in a plane perpendicular to the direction of the mandrel, with a mandrel capable of being raised and lowered, as and for the purpose described.

3. The combination of the nipple movable in relation to the mandrel, the mandrel, and the perforated plunger, as and for the purpose described.

4. In an apparatus for making insulated telegraph cables and wires, the combination of the hinged plunger S, capable of horizontal movement, and the chamber C, as and for the purpose described.

5. The combination of the mandrel D, the chamber C, and the hinged plunger S, capable of horizontal rotation, as and for the purpose described.

6. The combination of the annular cylinder F, the chamber C, the annular piston E, and the mandrel passing axially through the chamber, as and for the purpose described.

7. The combination of the annular cylinder F and the tube for the reception of the cable or wire passing axially through the cylindrical space in the center of cylinder, as and for the purpose described.

8. The combination of the plunger, having a central passage or opening therein corresponding in form to the desired exterior form of the cable or conductor, with a vertically-adjustable mandrel provided with an adjustable point, as and for the purpose described.

9. The combination of the plunger S, capable of being rotated about the column H, the cross-head K, provided with a perforation, K', and the lead-chamber C, as and for the purpose described.

10. The combination of the mandrel, the perforated plunger, and the nipple N, as and for the purpose described.

11. The combination of the chamber C, provided with a hole for the passage of the mandrel, the piston E, supporting the cylindrical chamber, and the cylinder F, as and for the purpose described.

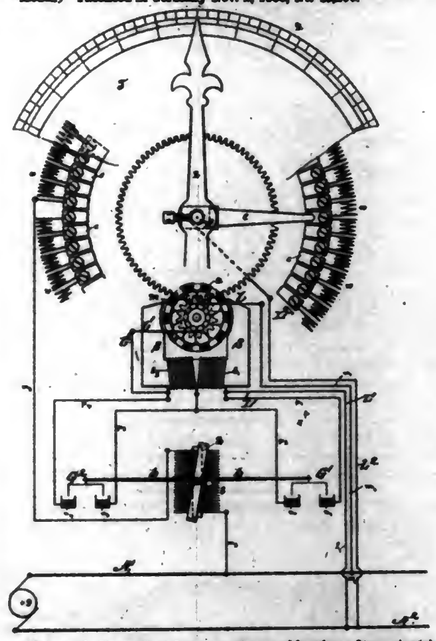
12. In a hydraulic press for covering electrical conductors with soft metal, the combination of the upright column H, the rotatable plunger S, the bearings H' H', and the braces H^3, as and for the purpose described.

13. In a hydraulic press for covering electrical conductors with soft metal, the combination of the shaft W', provided with a gear, G, the wheel G', and the toothed nut M, the tube T, and the lower part of the mandrel having a shoulder, B, as and for the purpose described.

14. In a hydraulic press for covering electrical conductors with soft metal, the combination of the shaft W^3, provided with a gear, P, the wheel P', the lower section of the mandrel D', and the upper section of the mandrel D, which is received into the lower section, as and for the purpose described.

15. The combination of the six-edged guide-piece F and the mandrel constructed in two sections, one of which screws into the other, as and for the purpose described.

399,292. ELECTRICAL MEASURING AND CONTROLLING APPARATUS. WILHELM SIEMENS, Berlin, Germany, assignor to Siemens & Halske, same place. Filed Dec. 2, 1887. Serial No. 256,208. (No model.) Patented in Germany Nov. 2, 1886, No. 40,290.



Claim.—1. In an electric meter, the combination of two electrical circuits, an electromotor, the field and armature coils thereof forming a part of one of the said circuits, means actuated by the other or second circuit for controlling the said motor, and resistances adapted to be included in or excluded from the second, thereby changing the amount of current passing through the second circuit, while the current in the first circuit remains unchanged by the insertion or exclusion of the said resistances, as and for the purpose described.

2. In an electric meter, the combination of a measuring and regulating circuit, an electromotor, the field and armature coils thereof forming a part of the measuring-circuit, means included in the regulating-circuit for controlling the movements of the armature of the motor, and resistances adapted to be included in or excluded from the regulating-circuit, varying the current thereof, while the current in the measuring-circuit remains unaffected thereby, as and for the purpose described.

3. In an electric meter, the combination of a measuring and regulating circuit, a motor the field and armature coils of which are included in the measuring-circuit, a contact-arm rotated thereby, resistances traversed by the said arm, and means included in the regulating-circuit for changing the polarity of the magnetic field of the said motor, whereby the contact-arm is caused to include or exclude the said resistances from the said regulating-circuit, varying the current thereof, while the current in the measuring-circuit remains unaffected thereby, as and for the purpose described.

4. In electrical measuring and controlling apparatus, the combination of two electrical circuits, an electromotor included in one of the said circuits, a magnet, E, excited by the current of the other circuit and adapted to regulate the said motor, and resistances adapted to be included in and excluded from the same circuit as excites the magnet E by means of the said motor, as and for the purpose described.

5. In electrical measuring and controlling apparatus, the combination of two electrical circuits, an electromotor included in one of the said circuits, resistances adapted to be included in the other circuit thereby, a magnet, E, excited by the current of the same circuit and a lever provided with contact-points and adapted to be moved by the said magnet E, whereby the motor may be regulated, as and for the purpose described.

6. In electrical measuring and controlling apparatus, the combination of two electrical circuits, an electromotor, coils surrounding the legs of the magnet thereof and included in one of the said circuits, resistances adapted to be included in the other of the said circuits by the said motor, and means included in the same circuit with the resistances, whereby the supply of electricity to the said leg-coils may be evenly or unevenly distributed, as and for the purpose described.

7. In electrical measuring and controlling apparatus, the combination of two circuits, an electromotor, coils surrounding the legs of the magnet thereof and included in one of the said circuits, resistances adapted to be included in or excluded from the other circuit, a magnet, E, included in the same circuit with the resistances, and a lever of insulating material having conductive stirrups attached to the ends thereof, whereby the electricity may be supplied to either or both of said leg-coils of motor, as and for the purpose described.

8. In electrical measuring and controlling apparatus, the combination of two electrical circuits, an electro-magnet actuated by one of the said circuits, means actuated by the other of the said circuits for regulating the electricity supplied to the said motor, resistances, and a conductive arm adapted to be moved by the said motor, whereby the resistances are included in or excluded from the same circuit that actuates the means for regulating the motor, as and for the purpose described.

9. In an apparatus for regulating the flow of electricity, the combination of a magnet, E, having an oblique position, a core therein provided with eccentric heads, a ring mounted upon an axis of rotation, and an insulating-arm having conductive stirrups upon the ends thereof mounted upon the said axis of rotation, as and for the purpose described.

10. In an apparatus for regulating the flow of electricity, the combination of a magnet, E, having an oblique position, a core therein having an eccentric head upon each end thereof, a ring mounted upon an axis of rotation and provided with an adjustable weight, and insulating-arm having conductive stirrups upon the ends thereof mounted upon the said axis of rotation, as and for the purpose described.

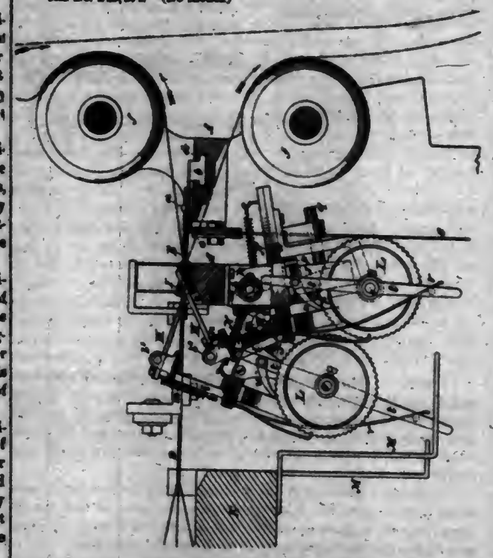
11. In an electrical indicating and controlling apparatus, the combination of two circuits, an electromotor included in one of the said circuits, the shaft of the armature of the said motor gearing with another shaft, a contact-lever and pointer attached thereto, a dial, and resistances which are included in the other of the said circuits by the rotation of the motor, as and for the purpose described.

12. In an apparatus for the measurement of height, the combination of two electrical circuits, a wheel, R, adapted to be rotated as the said height to be measured varies, a contact-lever, C, mounted upon the said wheel, resistances c' c', adapted to be included in one of the said circuits, means included in the said circuit adapted to control an electro-magnet, a contact-lever, C, and resistances adapted to be included in the said circuit by the movement of the arm, a pointer, and a dial traversed thereby, and an electric motor actuated by the other of the said circuits and controlled by the said means provided therefor, and adapted to move the said contact-lever, as and for the purpose described.

13. In apparatus for the measurement of physical magnitude, the combination, with a measuring and a regulating circuit of electricity, of a set of resistances adapted to be included in or excluded from the said regulating-circuit, whereby the amount of current passing therethrough varies as the magnitude to be measured, a second set of resistances, a motor included in the said measuring-circuit, and of means included in the said regulating-circuit for controlling the motor, whereby it is caused to include or exclude the said second set of resistances in or from the said regulating-circuit, as and for the purpose described.

14. In an apparatus for the measurement of physical magnitude, the combination, with a measuring and a regulating circuit of electricity, of a set of resistances, a slide-contact moving thereon as the magnitude to be measured varies, whereby the resistances are included in or excluded from the said regulating-circuit, thereby changing the quantity of electricity passing therethrough, a second set of resistances, a motor included in the said measuring-circuit, and a magnet included in the regulating-circuit for controlling the motor, whereby it is caused to include or exclude from the said regulating-circuit a sufficient number of the second set of resistances to keep the current passing therethrough constant, as and for the purpose described.

399,293. KNIFE-SHARPENER FOR DOUBLE-PILE FABRIC LOOMS. ROBERT SIMON, Weehawken, N. J. Filed July 27, 1887. Serial No. 245,604. (No model.)



Claim.—1. The combination of the reciprocating cutter B with the sharpener I and means, substantially as herein described, for moving said sharpener by degrees into the path of the knife, so that said knife will pass over a different part of the stone after each cut in the fabric, as set forth.

2. The stationary frame G, combined with the slide F, means for intermittently moving the same, the lever H, and with the sharpener I, carried by said lever, substantially as described.

3. The slide F, carrying the lever H, combined with said lever and with means for intermittently moving the said slide, and with the sharpener I, substantially as described.

4. The pivoted lever H and sharpener I, combined with means, substantially as described, for supporting said lever and for moving said lever intermittently, as set forth.

5. The slide F and a spring for moving the same, the frame G, lever H, the sharpener I, and pin p, in combination with the cam J, and with means, substantially as described, for moving said cam, as set forth.

6. The combination of the slide F, lever H, the sharpener I, spring N, pin p, cam J, worm s and worm-gear r, ratchet-wheel L, lever t, and pawl u, for moving the same, the lever t being adapted to be actuated from the batten E, substantially as described, and for the purposes set forth.

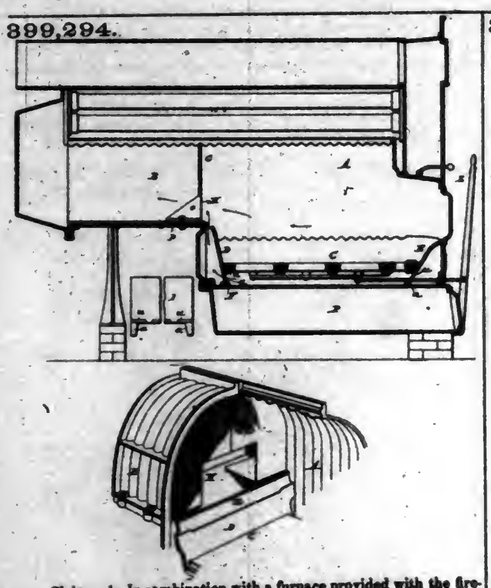
7. The combination of the batten having a lever-actuator, the slide F, and the movable hose-carrier H, carried by said slide, with the reciprocating knife B, and with a cam, worm r and s, ratchet-wheel L, pawl u, and lever t, intermediate between said batten and said hose-carrier, for moving the same by the batten, as specified.

8. The combination, in a loom, of the reciprocating knife B with two movable hose-carriers, H H, and mechanism, substantially as described, for moving both hose-carriers from time to time, so that the knife will pass over a different part of the hose after each cut in the fabric, substantially as described.

9. The slide F and movable hose-carrier H, carried thereby, combined with the knife B and the rest or support a^4 for said hose-carrier, and with a cam connected with the slide F, and a lever, and intermediate mechanism connecting the lever with the cam to shift the position of said hose-carrier, so that the knife will pass over a different part of the hose after each cut in the fabric, and with the batten for actuating the lever, as specified.

399,294. FURNACE AND GRATE THEREFOR. ISAAC D. SMEAD, Toledo, Ohio. Filed Nov. 12, 1887. Serial No. 254,967. (No model.)

399,294.

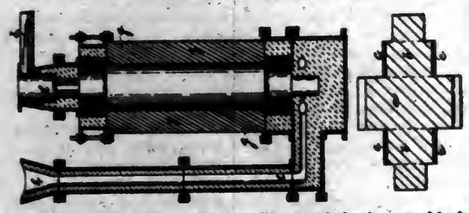


Claim.—1. In combination with a furnace provided with the fire-box A and the combustion-chamber B, and provided with suitable grate-supports and a grate, the removable diaphragm G, provided with an opening, H, all arranged substantially as shown and described, whereby the furnace can be adapted to burn either hard or soft coal at will.

2. In combination with the furnace having the fire-box A, provided with supports for a low-down grate to burn soft coal, the removable grate supports or plates E D, adapted to support the grate at a higher elevation, substantially as shown and described.

3. In combination with a furnace, substantially such as described, constructed to burn soft coal, the removable perforated diaphragm G, the removable grate-supports E D, and a grate adapted to be supported thereby, all constructed for joint operation, substantially as shown and described.

399,295. ROLL AND PINION. ROBERT C. TOTTEN, Allegheny, Pa. Filed Jan. 11, 1888. Serial No. 296,096. (No model.)

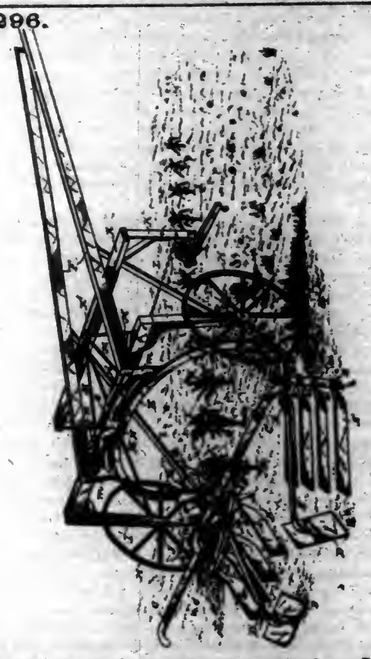


Claim.—1. A roll or pinion for rolling metals, having a steel body and a thin shell or facing of chilled cast-iron upon the necks or journals of the roll, substantially as and for the purposes set forth.

2. A roll for rolling metals, having a steel body and a thin shell or facing of chilled cast-iron upon the necks or journals, and upon the working-surface of the roll, substantially as and for the purposes set forth.

399,296. CULTIVATOR. AUGUSTUS C. TOWER and JUSTUS D. TOWER, Mendota, Ill. Filed July 23, 1887. Serial No. 245,613. (No model.)

399,296.



Claim.—1. A cultivator provided with two independently-movable gangs of knives pivoted in the ends of an arch rigidly connected to the tongue and a pair of traction-wheels pivoted at a point in advance of the wheels, whereby the direction of the wheels and knives may be changed by pressure upon either gang of knives independently of the direction of movement of the team, substantially as described.

2. In a cultivator, the combination, with the plow-beams B, of a pair of spring-metal arms, D', connected at their forward ends to said beams, and a clod-crushing plate, D, suspended from the rear end of each arm, substantially as described.

3. In a cultivator, the combination, with the plow-beams B, of a pair of arms, D', adjustably connected at their forward ends to the beams by bolts *f*, passing through slots *f'* in said beams, and a clod-crushing plate suspended from the rear end of each arm, substantially as described.

4. In a cultivator, the combination, with the plow-beams B, of a pair of backward-extending arms, D', connected at their forward ends to said beams, and a clod-crushing plate, D, suspended from the rear end of each arm by a hanger, D^2, attached to the arm by a bolt and nut, *i*, substantially as and for the purpose set forth.

5. In a cultivator, the combination of a pair of plow-beams, a gang of knives secured to each plow-beam, and means for changing the inclination of the gang to fit the surface of ground, consisting of the slotted and corrugated convex plate *d*, the corrugated concave plate *e*, fitting over the same, and the bolt *c* and its nut *d'*, all arranged substantially as described and shown.

6. In a cultivator, the combination of a pair of plow-beams, a gang of knives secured to each plow-beam, and means for adjusting each gang horizontally in the path of a circle, consisting of the plate *d*, with a slotted extension, *d'*, and a bolt, *d''*, passing down through the slot into the knife-head, substantially as described.

7. In a cultivator, the combination of an arch or bow, E, provided with yokes F on its ends, and a pair of plow-beams, B, pivoted at their front ends in said yokes by means of a pin, F', passing through a socket on the end of the beam, substantially as and for the purpose set forth.

8. In a cultivator, the combination of an arch or bow, E, provided with yokes F on its ends, and a pair of plow-beams, B, pivoted at their forward ends in said yokes by means of a pin, F', passing through a socket on the end of the beam, and each laterally adjustable upon its pin F' by means of a set-screw, *k*, passing through its end socket, substantially as described and shown.

9. In a cultivator, the combination of an arch or bow, E, with yokes F on its ends, a pair of plow-beams, B, pivotally and adjustably connected to said yokes, a forked tongue, F, rigidly connected at its rear ends to said arch or bow, and a pair of stay-rods, *l l*, extending from the tongue F down into the yokes F, substantially as described and shown.

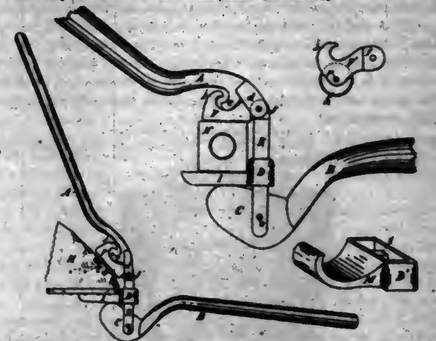
10. In a cultivator, the combination, with the tongue F and the rigidly-connected arch or bow E, provided at its center on top with the notch *n'*, of the independently-working axle I, provided with the drop-latch N, substantially as and for the purpose set forth.

11. In a cultivator, the combination of a pivoted axle, I, provided with curved tracks *n' n'*, and a rigid forked tongue, F, provided with friction-rollers at the points where it crosses the axle, substantially as described and shown.

12. A cultivator-knife having its rear lower point in line with the center line of the shank, substantially as and for the purpose set forth.

13. A cultivator-knife with its blade made separate from the shank and adjustably connected thereto for the purpose of retaining or adjusting its rear lower point in line with the center line of the shank, while said shank may be rotated in its holder, substantially as and for the purpose set forth.

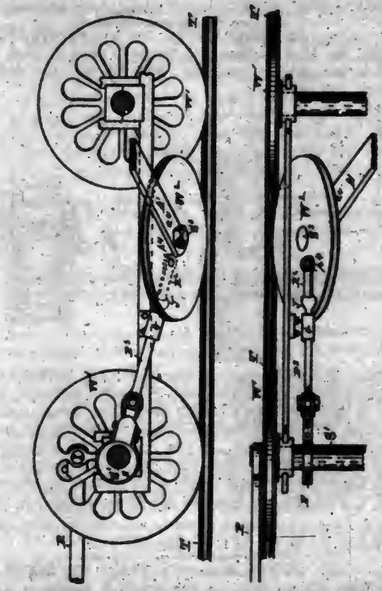
399,297. COMBINED TOOL. GEORGE H. TUCKER, Brownville, Me. Filed May 7, 1888. Serial No. 273,082. (No model.)



Claim.—1. A tool consisting of the combination of the upper handle, A, with projecting cam *c* and hinge *d*, the guide-bars B B, and serrated upper jaw, F, pivotally connected with said upper handle, the casing D, with laterally-projecting shelf or jaw I, and the lower handle, B, with cam C, operating the casing D and jaw I, substantially as shown, and for the purpose described.

2. As a new article of manufacture, a tool consisting of two handles or levers pivotally connected to the opposite ends of guide or connecting bars, each handle having a respective cam at or near its pivotal connection, a sliding jaw operated by the lower handle and moving on the connecting guide-bars, and an upper jaw pivoted at the upper end of the guide-bars and containing a curved or horn-like projection extending over the end of the cam on the upper handle, substantially as shown and described.

399,298. TRACTION MECHANISM FOR SELF-PROPELLING VEHICLES. HARRY L. VAN ELS, Albany, assignor of two-thirds to Oscar B. Van Els, Troy, and John MacCormack, Albany, N. Y. Filed Feb. 27, 1888. Serial No. 265,453. (No model.)



Claim.—1. The combination, with a car or locomotive truck provided with wheels to support the weight of the car or locomotive upon a rail-track, of arms pivotally connected to said truck and extended rearwardly therefrom, and traction or driving wheels arranged on the outward end of said arms constructed to receive power and to make a tractional engagement with the sides of the rail-track, substantially in the manner as and for the purposes set forth.

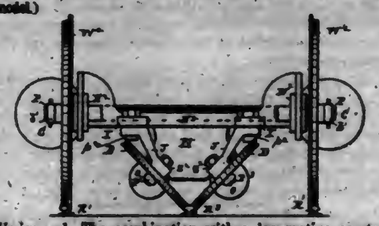
2. The combination, with the truck of a car or locomotive that is provided with wheels to support the latter upon the rail-track and to receive power for the propulsion of the truck, of supplemental drivers or traction-wheels constructed to receive power and arranged to engage with the sides of the rail-track and mounted upon the rear end of arms that are pivotally connected to the truck, substantially in the manner as and for the purposes set forth.

3. In a traction mechanism for moving locomotives or street-cars upon a rail-track, the combination of traction-wheels arranged to support the weight of the locomotive or street-car and to have propelling-power applied thereto from their frictional engagement with the tops of the rails, arms pivotally connected to the car or locomotive truck and extended therefrom on an angle, and supplemental traction wheels or drivers arranged upon the rearwardly-extended ends of said arms so as to make a tangent engagement with the sides of the rails, substantially in the manner as and for the purposes set forth.

4. In a mechanism for moving cars or locomotives along and over a rail-track, the combination of traction-wheels arranged to support the weight of the car or locomotive upon the tops of the rails, arms pivoted to the car or locomotive truck-frame, which arms at their front ends where extending their pivotal connection with the truck are connected by an intermediate spring and extended rearwardly from where pivoted upon an angle, and traction or driving wheels constructed to engage with the sides of the track and arranged on the rearward extension of said arms, substantially as and for the purposes set forth.

5. In a traction mechanism for moving locomotives or street-cars upon a rail-track, the combination of traction-wheels arranged to support the weight of the locomotive or street-car upon the tops of the rails and to have propelling-power applied thereto, arms that are pivotally connected on their ends with the car-truck and therefrom oppositely extended on an angle toward the track, and supplemental traction-wheels or drivers arranged on the rearward angular extension of said arms, said supplemental traction-wheels or drivers being constructed to receive power and to engage with the sides of the rail, substantially as shown and described.

399,299. TRACTION MECHANISM. HARRY L. VAN ELS, Albany, assignor of two-thirds to Oscar B. Van Els, Troy, and John MacCormack, Albany, N. Y. Filed Oct. 30, 1888. Serial No. 289,542. (No model.)



Claim.—1. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or car upon a two-rail track, of a center rail and traction-wheels or drivers operated to make a tractional engagement with the opposite sides of said center rail by the same mechanism that operates said traction-wheels or drivers for propulsion, substantially in the manner as and for the purposes set forth.

2. The combination, with a locomotive or street-car truck having wheels for supporting the weight of the locomotive upon a two-rail track and operated to engage with said two-rail track for propulsion, of a center rail and supplemental traction-wheels or drivers operated to make a tractional engagement with the opposite sides of said center rail by the mechanism operating them for propulsion, substantially in the manner as and for the purposes set forth.

3. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon the rail of a two-rail track, of a center rail, and traction-wheels or drivers arranged upon each side of said center rail that are operated to make a tractional engagement with the opposite sides thereof by the power operating them for propulsion, with each of said traction-wheels or drivers mounted upon an arm that at its front end is pivoted to the truck and therefrom extended rearwardly to receive the traction-wheel axles, substantially as and for the purposes set forth.

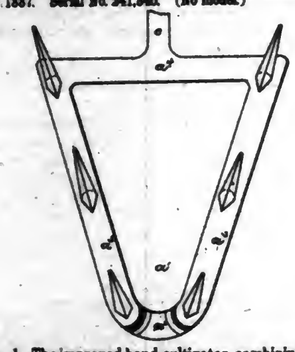
4. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon a two-rail track and operated to make a tractional engagement therewith for propulsion, of a center rail, supplemental traction-wheels or drivers operated to engage with the opposite sides of said center rail, and arms each of which at their front ends are pivoted to the truck and therefrom extended rearwardly to support the axles of the said supplemental drivers or traction-wheels, substantially as and for the purposes set forth.

5. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon the rails of a two-rail track, of a center rail and traction-wheels or drivers making a tangent contact with the opposite sides of said center rail, and each of said drivers or traction-wheels mounted upon the

rear end of an arm which at its front end is pivoted to the truck and therefrom extended on an angle to receive the axles of the said drivers or traction-wheels, substantially in the manner as and for the purposes set forth.

6. The combination, with a locomotive or street-car truck having wheels to support the weight of the locomotive or street-car upon the rails of a two-rail track, of a center rail, arms that are each separately pivoted to the truck at their front ends and therefrom rearwardly projected on an angle, and a traction-wheel or driver mounted upon the rear end of each of said arms, with each of said traction-wheels or drivers making a tangent engagement with the opposite side of said central rail, substantially in the manner as and for the purposes set forth.

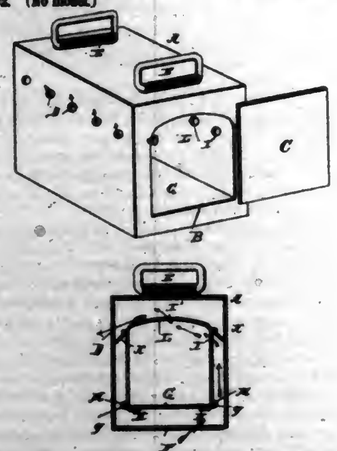
899,800. HAND-CULTIVATOR. KARL VOIGT, Newark, N. J. Filed June 20, 1887. Serial No. 241,840. (No model.)



Claim.—1. The improved hand-cultivator, combining a triangular frame, its two opposite sides provided with rearwardly-curved teeth, and their meeting ends curved or arched to form recess a^3, and the cross-bar or third side provided with a handle-connection and a handle, substantially as set forth.

2. The combination, with a single handle, of a three-sided frame, a^3 a^4 a^4, at the center of one side of which is formed a handle-connection to receive the handle, the other two sides of which are provided with backwardly-turned teeth and are united at the angle opposite said handle-connection, the said teeth being disposed away from said angle to form a plant-passage beneath the frame at the said angle in line with the said single handle, substantially as set forth.

899,801. OVEN FOR VAPOR-STOVES. GEORGE M. VOLTZ and CHARLES H. SHULTS, St. Joseph, Mo. Filed Apr. 20, 1888. Serial No. 271,292. (No model.)



Claim.—1. An oven for vapor-stoves having the outer shell provided with openings D, the lining L, arranged within the outer shell and forming an intermediate space between it and the outer shell, and having openings I in its side and openings I' in its top, and deflectors adapted to open and close the intermediate space upon each side of the said lining L and cause the heat to pass into the oven through the side or around and over the top of the oven, substantially as described.

2. A portable oven having the shell A, provided with openings D, the lining arranged within the shell and having the openings I in its sides and the openings I' in its top, and the deflectors hinged to the lining and adapted to open or close the intermediate space, and also the openings I, to cause the heat either to pass through said openings I or to pass around the top of the oven, substantially as described.

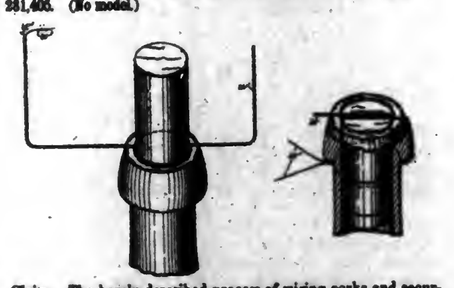
3. A portable oven having the shell A, provided with the openings D, the lining L, arranged within the oven and having the openings I in its sides and the openings I' in its top, and inclined deflectors arranged in the spaces between the walls of the shell and the sides of the lining, having their upper edges above the openings I, substantially as described.

899,802. VALVE. ELIJAH WARE, Omaha, Nebr. Filed Nov. 1, 1888. Serial No. 289,737. (No model.)



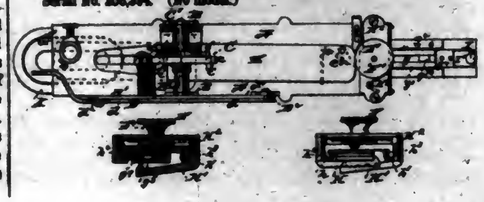
Claim.—In a valve, the combination of a casing having two distinct inclosed ports or passages of segmental configuration whose central integral walls have an opening therein for the entrance of the key, and forming stops, a flat valve-plate with two segmental openings therein adapted to be mounted in a suitable seat above the inclosed ports or passages, and provided with an integral stem which depends downward into the central opening between the central integral walls of the said inclosed ports or passages, a key adapted to enter said central opening and engage with the lower end of the stem, having reduced sides adapted to bear against one of the side walls of each of the inclosed ports when the valve-plate is opened or shut, thereby to cause an exact registration, and a coiled spring inserted between the key and the valve-casing around the stem to cause the valve-plate to be retained in its seat, substantially as described.

899,803. PROCESS OF CORKING AND WIRING CORKS TO BOTTLES. SOL WILE, Rochester, and HENRY LA CAMME, Syracuse, N. Y.; said La Camme assignor to said Wile. Filed July 30, 1888. Serial No. 281,405. (No model.)



Claim.—The herein-described process of wiring corks and securing the same to the bottle in the operation of corking the bottle, for the purpose of providing a draw or pull with which to withdraw the cork to open the bottle, the same consisting in first compressing the cork, then driving the compressed cork for a part of its length into the neck of the bottle, then applying the wire to the cork and forcing the cork home into the bottle, then bending the wire over the top of the cork and bottle and around the neck of the bottle, and, finally, twisting the free end of the wire onto the standing end secured to the cork, substantially as and for the purpose set forth.

899,804. BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES. HENRY J. WILLIAMS, New York, N. Y., assignor to the Harris Button Hole Attachment Company, same place. Filed Nov. 30, 1887. Serial No. 256,204. (No model.)

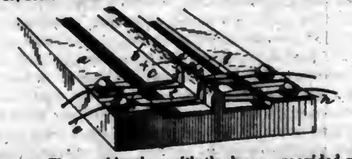


Claim.—1. In a button-hole attachment for sewing-machines, the combination, substantially as hereinbefore set forth, of the bed-plate, the feed-plate having a longitudinal slot, g, at its rear end, the toothed rack above the slot and around its edge, the driving-pinion engaging with the rack, the guide-blocks at each end of the slot, and the hooks hinged to the bed-plate and engaging with opposite sides of the feed-plate, for the purpose specified.

2. In a button-hole attachment for sewing-machines, the combination, substantially as hereinbefore set forth, of the bed-plate, the feed-plate, the toothed rack on the feed-plate, the driving-pinion engaging therewith, means for driving the pinion, and the hooks hinged to the bed-plate and engaging with opposite sides of the feed-plate for holding the pinion in engagement with the rack.

3. In a button-hole attachment for sewing-machines, the combination, substantially as hereinbefore set forth, of the bed-plate, the feed-plate, the toothed rack on the feed-plate, the driving-pinion engaging with the rack, the hooks hinged to the bed-plate and engaging with opposite sides of the feed-plate, the block having an inclined lower face, g^6, secured to the feed-plate for disengaging the hooks at one extremity of the longitudinal movement of the feed-plate, said feed-plate being provided with a curved or rounded end to allow the hooks to disengage themselves at the other extremity of its longitudinal movement.

899,805. LIGHTNING-ARRESTER. CHARLES H. WILSON, Columbus, Ohio, assignor to the Western Electric Company, Chicago, Ill. Filed Nov. 19, 1887. Serial No. 255,593. (No model.)



Claim.—1. The combination, with the base a, provided with the bead b, of lightning-arrester springs arranged in rows on opposite sides of said bead and suspended by fusible wires passing over the bead, and common ground connections or stripe c d, substantially as described.

2. In a lightning-arrester, the springs f h, connected together and suspended by a fusible wire passing over a screw-head, g, in combination with the underlying contact-pieces c d, the tension of spring h being greater than the tension of spring f, to insure the closing of spring h upon its underlying connecting-piece d when the connecting-wire is fused or elongated, substantially as described.

3. In a lightning-arrester, the combination, with springs adjusted to press toward underlying contact-strips, in combination with said contact-strips, an insulating-piece separating said strips, and a fusible wire connecting said springs and passing over said insulating-piece to hold said springs normally suspended, substantially as described.

899,806. FOUNTAIN-PEN. PAUL E. WIRT, Bloomsburg, Pa. Filed Mar. 16, 1888. Serial No. 267,423. (No model.)



Claim.—1. In a fountain-pen, the pen-body formed with one or more longitudinal capillary grooves or ducts, which extend back to the heel thereof, as set forth.

2. In a fountain-pen, the pen-body formed with one or more longitudinal capillary grooves or ducts, which extend back to the heel thereof, and the tongue-piece or lip at the front terminal of said ducts or grooves, as set forth.

3. In a fountain-pen, the pen-body formed substantially W-shaped in cross-section, so as to provide longitudinal capillary grooves or ducts, which extend throughout the length of the pen back to the heel thereof, as set forth.

4. In a fountain-pen, the pen-body formed with longitudinal capillary grooves or ducts d for the passage of ink, and the central duct or channel, e, forming the air-passage, as set forth.

5. A fountain-pen in which capillary attraction is produced solely by the use of a pen the body of which is formed with one or more capillary grooves or channels or ducts, which extend back to the heel thereof, and a tongue-piece communicating with the ducts to draw the ink therefrom to the nibs of the pen, as set forth.

6. A fountain-pen having its pen-body provided with one or more capillary ducts or channels, which extend back to the heel of the pen and which of themselves attract the ink from the reservoir, as set forth.

7. A fountain-pen having its pen-body provided with one or more capillary ducts or channels, which extend back to the heel of the pen, and a tongue-piece formed integral with the pen-body and communicating with the ducts or channels, as set forth.

8. In a fountain-pen, the pen-body provided with one or more longitudinal capillary ducts or channels, which extend back to the heel of the pen, so that the channels communicate with the interior of the pen reservoir or holder, so as to draw the ink therefrom, and a tongue-piece communicating with the front termini of the ducts or channels and lying over the back of the pen above the nibs, as set forth.

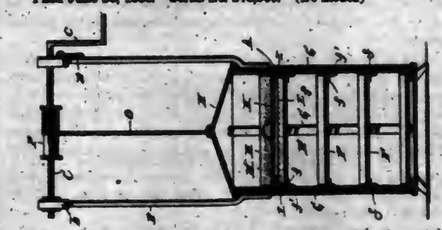
9. A fountain-pen body provided with longitudinal capillary ducts or channels, which communicate with the ink-reservoir, so as to attract the ink from the reservoir, and the tongue-piece to draw the ink from the ducts or channels down to the nibs of the pen, as set forth.

10. In a fountain-pen, the body provided with longitudinal capillary grooves or ducts, which communicate with the ink-reservoir, so as to attract the ink from the reservoir, and the tongue-piece formed integral with the pen-body and lying over the nibs of the pen and communicating with the front termini of the grooves or ducts, as set forth.

11. In a fountain-pen, the pen-body formed with one or more longitudinal capillary ink-conducting grooves or ducts and one or more longitudinal ducts or channels for the passage of air.

12. A fountain-pen in which capillary attraction is produced solely by the use of a pen the body of which is provided with one or more capillary ink-conducting grooves or ducts or channels extending longitudinally back to the heel of the pen and adapted to attract the ink from the reservoir to the nibs of the pen, as set forth.

899,807. REFRIGERATOR. JOHN H. WITHROW, Oak Harbor, Ohio. Filed June 20, 1888. Serial No. 278,069. (No model.)



Claim.—In a refrigerator, the combination, with the receiver adapted to be arranged below the surface of the ground, of the elevator comprising the parallel shelves F F, held in position by the side straps, G G, the cap N, affixed to the upper ends of the straps and adapted to fit over the upper end of the receiver when the elevator is lowered, and the reservoir H, arranged between the straps G, below the cap N, and provided with a removable shelf or partition, K, arranged on suitable brackets, I I, whereby separated chambers L and M are formed, substantially as and for the purpose specified.

899,808. WHISK-BROOM. JOHN WRIGHT, Hoosick Falls, N. Y. Filed Nov. 28, 1888. Serial No. 291,667. (No model.)

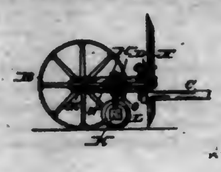


Claim.—1. The combination, with a broom, of a shield and handle-cover, and of a suspension device connected with the handle-core, and serving to maintain the shield and handle-cover in position, substantially as specified.

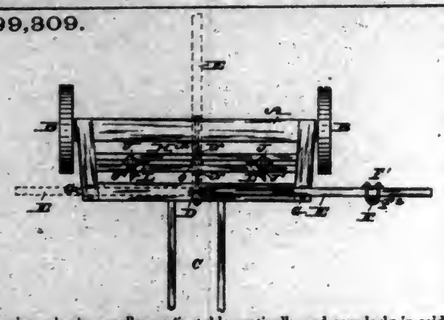
2. The combination of the broom A, having the core A', the shield B, having the swell B^2, cover C, cap D, and suspension device E, seated in the core, substantially as specified.

899,809. MARKER, FURROWER, AND COVERER. EDWIN WYCOFF, Camden, N. J. Filed Sept. 7, 1888. Serial No. 284,797. (No model.)

Claim.—1. In a marker, furrower, and coverer, a frame having lugs or uprights, a marker pivoted to the frame and retained in place by said uprights, a slotted cross-bar in the frame, threaded shanks



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carrying wheels or rollers adjustable vertically and angularly in said slotted bar, and a clamping-rod passing through said frame and slotted bar, substantially as and for the purpose described.

2. In a marker, furrower, and coverer, a frame, a slotted bar arranged transversely in the frame, threaded shanks in said slotted bar, studs on the shanks forming axles for the covering and furrowing wheels, clamping-nuts on the threaded shanks for binding against the slotted bar for retaining said shanks in their adjusted positions, a block arranged in the slotted bar, a rod passing through the frame, bar, and block, and nuts on said rod for binding against the slotted bar, all arranged and adapted to serve substantially as and for the purpose described.

3. In a marker, furrower, and coverer, a frame, a transverse slotted bar carried thereby, shanks carrying wheels adjustable vertically and angularly in said slotted bar, nuts on said shanks for retaining the same in the adjusted positions, and a rod passing through the frame, and slotted bars having clamping-nuts thereon, all arranged and adapted to serve substantially as and for the purpose set forth.

399,310. METHOD OF SEWING. GEORGE A. XANDER, Hamburg, and JOHN G. XANDER, Reading, Pa. Filed May 28, 1888. Serial No. 276,207. (No model.)



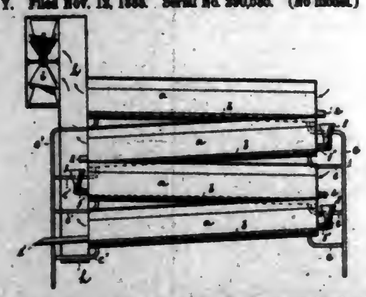
Claim.—1. The method of forming separate lock-stitches, consisting in passing a thread through the material at three points, so as to form a central loop and pulling both ends of the thread through said loop, substantially as set forth.

2. The method of forming separate lock-stitches, consisting in passing a thread through the material from one side thereof in a series of three loops and pulling both ends of thread through the central loop, substantially as set forth.

3. The method of stitching herein set forth, which consists in forming two loops, reversing their position, pulling the end of the thread which forms the first loop through the second, forming a third loop, passing it through the second, and tightening the knot.

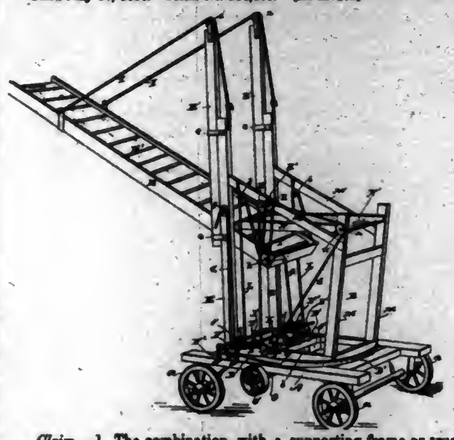
4. The method herein set forth of forming a series of lock-stitches, which consists in forming two loops, reversing their position, pulling the end of the thread which forms the first loop through the second, forming a third loop, passing it through the second, tightening the knot, cutting the thread, and moving the material into position for the next stitch.

399,311. EVAPORATING APPARATUS. MAX ARB, New York, N. Y. Filed Nov. 12, 1888. Serial No. 290,595. (No model.)



Claim.—The combination of a series of communicating inclined troughs having double bottoms, covers, and steam inlet and discharge pipes, with open walls at one end and with a vapor-collecting chamber at the other end, into which the several troughs open, and with a fan-wheel within said vapor-collecting chamber, substantially as specified.

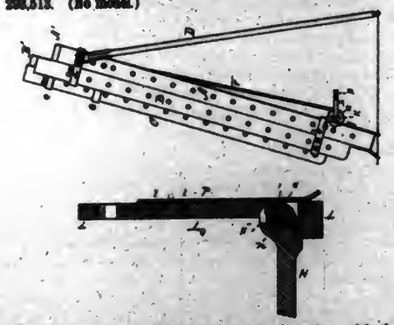
399,312. STRAW-STACKER. ROBERT S. ARBOGAST, Selma, Ind. Filed July 17, 1888. Serial No. 280,173. (No model.)



Claim.—1. The combination, with a supporting frame or truck and a turn-table mounted thereon, of suitable supports secured to one end of said turn-table and having adjustable extensions mounted thereon, a shaft mounted on the turn-table and provided with a crank-handle and a pawl and ratchet, ropes secured at one end to said shaft and their other ends to the lower ends of the extensions, pulleys mounted on the upper ends of the supports, over which said ropes pass, a main conveyer-trough provided with an endless conveyer, mechanism for operating said conveyer, ropes secured at one end to the upper outer end of the conveyer-trough and at their other ends to the supports, pulleys mounted on the upper ends of the extensions, over which said ropes pass, a second shaft mounted on the turn-table and provided with a crank-handle and a pawl and ratchet, ropes secured at one end to said shaft and at their other ends to the lower inner end of the main conveyer, and suitably-supported pulleys, over which said ropes pass, all constructed, arranged, and operating substantially as shown and described.

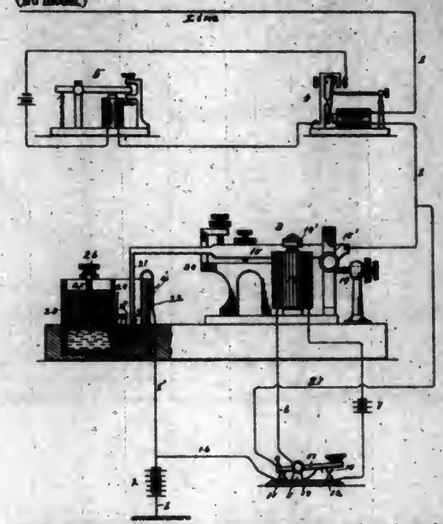
2. The combination of the supporting frame or truck A, the turn-table B, mounted thereon, the supports E E, having the adjustable extensions F' F', the shaft F, mounted on the turn-table and provided with the windlasses F' F', the ropes G G, secured to the windlasses at one end and at their other ends to the lower ends of the extensions F' F', and passing over the pulleys *g g*, the main conveyer-trough H, having the endless conveyer H', the ropes I I, secured at one end to the outer end of the trough H and at their inner ends to the supports E E, and passing over the pulleys *i i* on the top of the extensions F' F', the shaft K, mounted on the turn-table and provided with the windlasses K' K', the ropes L L, secured at one end to the inner end of the main conveyer-trough and at their other ends to the windlasses K' K', and the supports M M, and stationary receiving-table N, secured to said supports and projecting over the lower inner end of the conveyer-trough H, and having the endless conveyer N', all constructed, arranged, and operating substantially as shown and described.

399,313. FOLDING CRANK FOR EXTENSIBLE LADDERS. PHILIP S. BRADFORD, Bridgewater, Mass. Filed Dec. 13, 1888. Serial No. 293,513. (No model.)



Claim.—In an extensible ladder, the combination, with the hoisting mechanism thereof, of a crank mechanism consisting, essentially, of the main arm L, handle N, pivoted to said main arm and provided with the notches or depressions N' N'', and the spring P, secured at one end to said main arm L, and provided near its free end with a projection, P', adapted to drop into said notches, substantially as and for the purpose described.

399,314. TELEGRAPH SYSTEM. WILLIAM DORSHEIMER, North East, assignor of two-thirds to Samuel A. Davenport, Erie, and Charles A. Hitchcock, North East, Pa. Filed July 9, 1888. Serial No. 279,448. (No model.)



Claim.—1. The combination, in a system of telegraphy, of a main-line circuit and ordinary relays and sounders with continuous-current telegraphic-transmitting mechanism consisting of a circuit making and breaking device, an oscillating lever in the main-line circuit supporting and operating a movable metallic electrode tipped with non-conducting material and operating in a conductive fluid in the main-line circuit in unison with the circuit making and breaking device, so that when the electrode is down the metallic portion thereof is immersed in said fluid, and when up the metallic portion of the electrode is withdrawn from the fluid, leaving only its non-conductive tip therein, substantially as and for the purpose set forth.

2. In a system of telegraphy, the combination, with a main-line circuit and ordinary relays and sounders, of a transmitter for sending contiuous currents to line, consisting of a finger-key, local battery-circuit, electro-magnet armature having a pendent metallic electrode with a tip of non-conducting material, and a cup containing a conductive fluid forming part of the main-line circuit, substantially as herein set forth.

3. The combination, in telegraphic-transmitting mechanism, of a circuit making and breaking device with a movable metallic electrode tipped with non-conducting material and a cup of conductive fluid in a main-line circuit in which said electrode operates so as to immerse the metallic portion thereof in the fluid and withdraw the same therefrom (leaving only the non-conducting tip thereof in said fluid) in unison with the circuit making and breaking key, substantially as and for the purpose set forth.

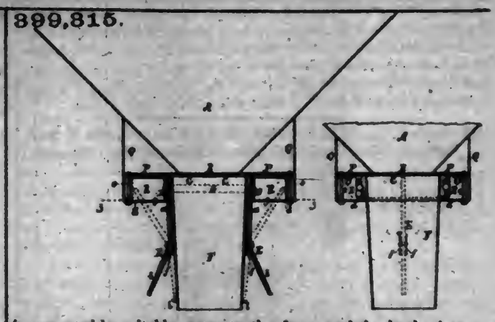
4. The combination of the cup containing a conductive fluid, the reservoir or feed-cup communicating therewith, and the plunger with the armature-lever, the metallic electrode having a non-conductive tip, and the electro-magnet co-operating with the armature-lever, substantially as and for the purpose set forth.

399,315. SCALE-PAN. FRANK H. BURRILL and GEORGE G. BURRILL, Concord, Mass. Filed Nov. 23, 1888. Serial No. 291,635. (No model.)

Claim.—1. The scale-pan substantially as described, it comprising the pan A, provided with the educt B, the frame Q, and perforated plate P, secured to each other and to the pan and provided with the guides O, the slides C, arranged to move in the guides and provided with the turned-down portions D, the springs G, to close the slides, the tube F, provided with the flange, slotted as described and held in contact with the frame by screws, and the levers E, pivoted to the said tube, to move the slides so as to open the educt B, all essentially as set forth and represented.

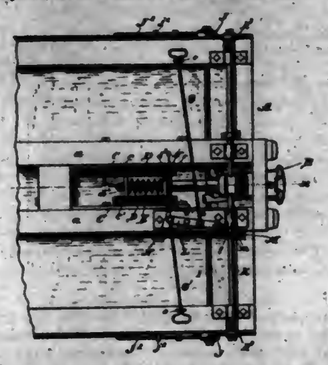
2. The scale-pan comprising the pan A, provided with an educt, B, of the frame Q and perforated plate P, secured to each other and to the pan and provided with guides O, the slides C, adapted to be moved in said guides, the springs G, the levers E, fulcrumed to the tube F, the said tube F having a slotted flange, *d*, by which said tube

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is connected by suitable means to the frame, and the hooks *i*, connected to the tube, all essentially as set forth and represented.

399,316. CAR-COUPLING. GEORGE W. DECKER, Willowmoc, N. Y. Filed Sept. 18, 1888. Serial No. 285,722. (No model.)



Claim.—1. In a car-coupling, the combination of the fixed castings, an oscillating carrier mounted in the castings to turn a limited distance therein, a draw-head mounted in said carrier to rock therewith and capable of a limited endwise movement in said carrier independent of the rocking movement of the latter, and a cushion-spring for retarding the endwise movement of the draw-head, substantially as and for the purpose described.

2. In a car-coupling, the combination of the fixed castings having the segmental flanges, the oscillating carrier having the parallel connected sides provided with the carred ends, which fit snugly in the segmental flanges, and the sliding bridge-piece fitted between said parallel sides, a draw-head fitted in the fixed and sliding bridge-pieces of said carrier, and a cushion-spring interposed between the fixed and sliding bridge-pieces, substantially as described.

3. In a car-coupling, the combination of an oscillating carrier, a draw-head carried thereby, fixed castings in which said carrier is mounted to be capable of a limited vertical play, and manually-operated devices for raising or depressing the free end of the draw-head, substantially as described.

4. In a car-coupling, the combination, with a draw-head capable of a limited vertical play, of a rock-shaft having a cam or spiral arm and a notched disk, a spring-controlled latch adapted to engage the disk, and an operating-rod connected to the latch, substantially as and for the purpose described.

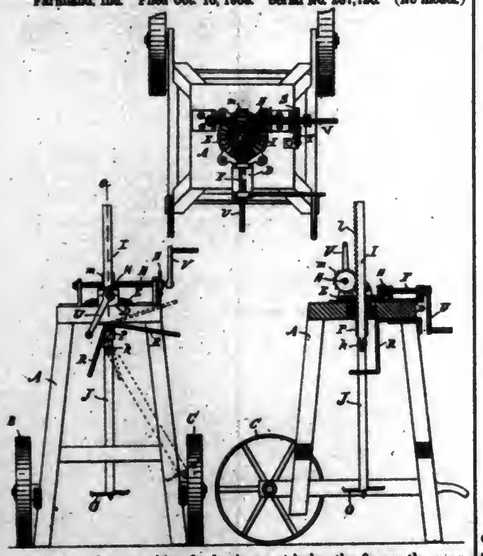
5. In a car-coupling, the combination of an oscillating carrier mounted between fixed castings, an endwise-movable draw-head carried by said carrier and retarded by a cushion spring, a rock-shaft having means for moving the draw-head vertically, and manually-operated devices for locking said rock-shaft and to hold the draw-head in its adjusted position, substantially as described.

6. In a car-coupling, the combination of a draw-head, a rock-shaft having a spiral arm and notched disk, the detachable levers adapted to be fitted in recesses in the car-beams and concealed from view by a plate, a pivoted toothed latch, a spring connected thereto, and operating-rods pivoted to the latch on opposite sides of its fulcrum, substantially as described.

7. In a car-coupling, the combination of a draw-head having a spring-controlled slide operating therein, a coupling-pin, a pivoted spring-pressed lever connected to the pin, a rock-shaft having a tappet-arm for raising said lever and pin, and the operating-levers each coupled to the shaft to be capable of a limited movement thereon without rocking the same, substantially as described.

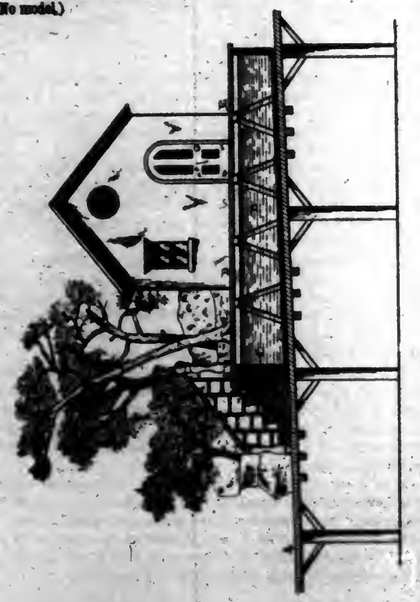
8. In a car-coupling, the combination of a draw-head, a slide operating therein, a coupling-pin, a lever connected to the pin, a rock-shaft having a tappet-arm for lifting the lever and pin, and provided at its ends with fixed slotted disks, and the levers each pivoted to a disk which is loosely fitted on the shaft and has a pin adapted to ride in the slot of one of the fixed disks, substantially as described.

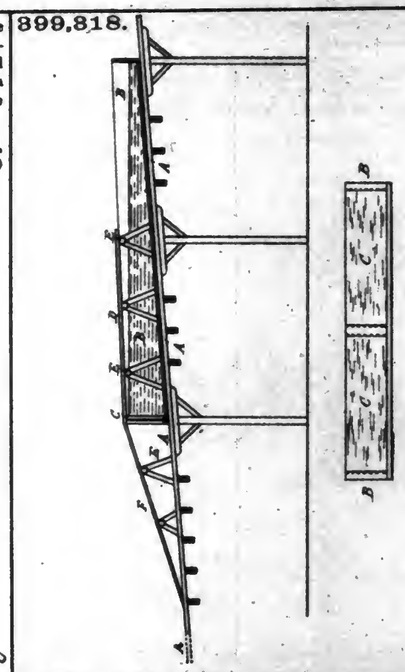
399,317. POST-HOLE-BORING MACHINE. HARVEY H. DIGGS, Farmland, Ind. Filed Oct. 10, 1888. Serial No. 287,720. (No model.)



Claim.—In a machine for boring post-holes, the frame, the gear-wheel mounted on said frame and having an angular central opening, the auger, the auger-shaft formed of two sections hinged together, one of which sections fits said opening in the gear-wheel, so as to slide longitudinally therein and rotate therewith, the cog-teeth in one side of said section, the pinion arranged to intermesh with said cog-teeth, the shaft arranged to rotate and to form a sliding support for said pinion, and the bent lever mounted on the frame and arranged to engage the lower section of the auger-shaft, all combined and arranged to co-operate substantially as specified.

399,318. THEATRICAL STAGE. JOHN DOUGLASS, London, County of Middlesex, England, assignor to Hal. S. Taylor, Brooklyn, and James R. Nugent, New York, N. Y. Filed July 23, 1887. Serial No. 245,477. (No model.)





Claim.—1. In a theater in which the auditorium is wholly on one side of the stage, the combination of the main stage of the theater with a water tight tank provided with a temporary removable flooring adapted to form a secondary stage, substantially as described, and for the purposes set forth.

2. The combination, with the main stage of a theater, of a navigable body of water extending into one or both of the wings, suitable means floating upon the water for conveying to and fro before the audience one or more of the persons assuming the characters in the play, and a temporary removable flooring covering part or all of the tank, substantially as described.

3. The combination, with the main stage of a theater, of a water-tight tank, which latter occupies a portion of said stage and is adapted to be floored over, as described, and when so floored over forms with the unoccupied portion of said stage the acting-stage of the theater, substantially as described, and for the purposes set forth.

4. The combination of the main stage of a theater with a portable tank capable of holding water and means whereby it may be temporarily floored over to form a second stage, substantially as described, and for the purposes set forth.

5. The combination, with a main theatrical stage, of a water-tight tank provided with a glass front and adapted to be placed upon the said main stage, and provided with a removable flooring adapted to form a second stage, substantially as described, and for the purposes set forth.

6. The combination of a main theatrical stage, a water-tight tank adapted to be placed upon said main stage and temporarily floored over, so as to form a second stage, and a supplemental stage connecting the said second stage with the main stage, substantially as described, and for the purposes set forth.

7. In combination with the main stage of a theater, a portable water-tight tank adapted to be placed upon the said main stage and provided with a removable flooring adapted to form a second stage, substantially as described, and for the purposes set forth.

8. The combination of the main stage A, tank B, flooring D, and supports E E, arranged substantially as described, and for the purposes set forth.

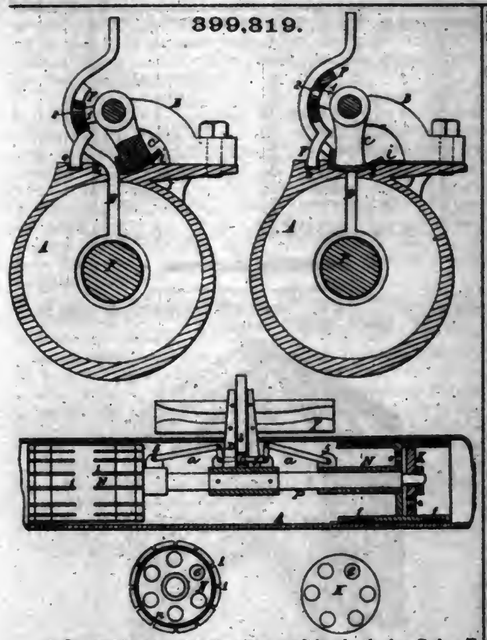
399,319. PNEUMATIC RAILWAY. GEORGE L. DU LANEY, Philadelphia, Pa. Filed Aug. 8, 1887. Serial No. 246,448. (No model.)

Claim.—1. The air-chamber A, when constructed with a curved valve-seat, *z*, flange I, and longitudinal groove *o*, as shown, and for the purpose specified.

2. The vibratory valve C, provided with the pad *i*, and having the series of spiral springs, as set forth, and having a radial arm, 1, provided with a frictional roller, all substantially as shown and described.

3. In combination, the tube A, bracket B, and valve C, as shown and described, and for the purpose specified.

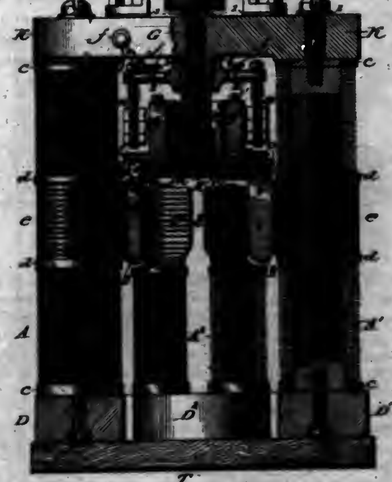
399,319.



4. In combination with the piston and heads, the bar D, bar F, frictional roller 2, radial arm 1, and valve C, as and for the purpose specified.

5. In combination, the rod P, the adjustable head N, and disk K, the head and disk having perforations *e* therein not in line or non-registering with each other, as and for the purposes set forth.

399,320. DYNAMO-MACHINE. GEORGE L. DU LANEY, New York, N. Y. Filed Aug. 22, 1888. Serial No. 283,479. (No model.)



Claim.—1. In a dynamo-machine, the combination, with the base-ring and the bridge-piece K, of the cores secured between said base-ring and bridge-piece and provided with the collars *d d* and *e e*, the coils wound upon the ends of the cores between the collars, and the pole-pieces *c c*, built up of sections, substantially as and for the purpose set forth.

2. In a dynamo-machine, the revolvable vulcanite disk R, for carrying the armature, provided with wedge-shaped vertical slots V in its periphery and with the channels for the wires, substantially as and for the purpose set forth.

3. In a dynamo-machine, the combination, with the revolvable disk R, provided with vertical wedge-shaped slots V in its periphery, of the armature-ring built up of sections provided with projections fitting into the slots in the said disk and a band for holding said segments in position, substantially as set forth.

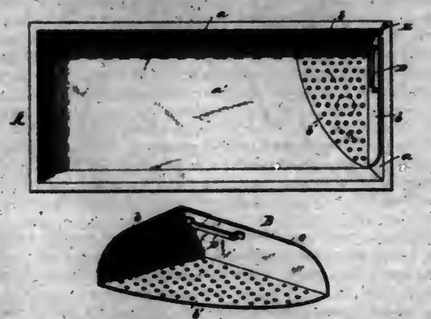
4. In a dynamo-machine, the combination, with the revolvable disk R, provided with vertical wedge-shaped slots V in its periphery, of the armature-ring built up of sections provided with flanges on one side having projections at one end of them fitting into the said slots, the coils wound upon the said sections, and an insulated metallic band shrunk upon the periphery of the disk for holding the said sections in position, substantially as set forth.

5. In a dynamo-machine, the combination, with the revolvable disk R, provided with wire-channels *n* and *h*, of the armature-ring depending from the disk, the commutator-bars *g*, secured to the upper surface of the disk and provided with binding-screws *l* and *l'*, and the armature-coils having their opposite ends passed through the said channels in the disk and secured to the commutator-bars by the binding-screws, substantially as and for the purpose set forth.

6. In a dynamo-machine, the combination, with the outer field-magnets, A A', provided with the pole-pieces *c c*, built up of thin sections, the end coils, and the collars at each end of the coils, substantially as set forth, of the revolvable armature-ring between the said pole-pieces and the inner electro-magnets, A^2, provided with pole-pieces inside the said armature-ring and built up of thin sections and secured to the cores, substantially as and for the purpose set forth.

7. In a dynamo-machine, the combination, with the field-magnets A A', provided with pole-pieces *c c* and coils, as set forth, of the bridge-piece K, secured to the upper end of the field-magnet cores and provided with a long hub projecting centrally between them, the armature-disk R, secured to a shaft journaled in said hub, the armature-ring depending from said disk between the pole-pieces, the commutator-bars secured to the upper side of said disk, and the cross-head secured on the outside of said hub and provided with depending bars and with brushes bearing against the said commutator-bars, substantially as and for the purpose set forth.

399,321. SINK-CLEANER. WILLIAM V. RENOUD, Chicago, Ill. Filed Sept. 21, 1888. Serial No. 286,263. (No model.)



Claim.—1. A combined strainer and cleaning-scoop for sinks, consisting of a single piece of sheet metal with sides conforming in shape to one corner of a sink, and having a perforated bottom to cover the outlet-pipe, substantially as and for the purposes described.

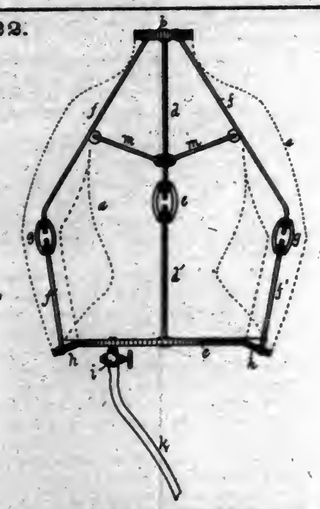
2. A combined strainer and cleaning-scoop for sinks, consisting of a single piece of sheet metal with sides conforming in shape to one corner of a sink, and having a perforated bottom to cover the outlet-pipe, and a suitable handle attached to the inner surface of one of its sides, substantially as shown and described.

3. A combined strainer and cleaning-scoop for sinks, consisting of a single piece of sheet metal with sides conforming in shape to one corner of a sink, and having a perforated bottom to cover the outlet-pipe, and a suitable handle attached to the inner surface of one of its sides, in combination with a sink, substantially as set forth.

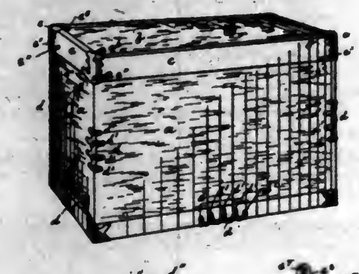
399,322. INFLATABLE DRESS-FORM. ANNA M. SELWYNN, Decatur, Ill. Filed Jan. 19, 1888. Serial No. 296,897. (No model.)

Claim.—The inflatable form *a* of uniformly-elastic material, the closures *b c h h*, the rods *d d'*, secured to the closures *b* and *c*, respectively, and reversely threaded at their ends, the reversely-threaded turn-buckle *e*, rods *f f'*, connected with closures *b* and *h h*, respectively, and reversely threaded at their ends, the reversely-threaded turn-buckles *g g*, braces *m m*, air-admitting tube *k*, and valve *i*, all in combination, as set forth.

899,322.



899,323. TRUNK-TRIMMING. HENRY E. GILSON, Somerville, Mass. Filed Apr. 6, 1888. Serial No. 269,877. (No model.)







Claim.—1. In a trunk or similar receptacle, the metallic angle-clamp herein shown and described, the same consisting of a body bent to conform to the angular edge of the trunk, and having at varied distances from the vertex of said angle a series of openings or apertures adapted to receive rivets which pass through the wall of said trunk at different distances from the angle and in separate lines of strain, substantially as described.

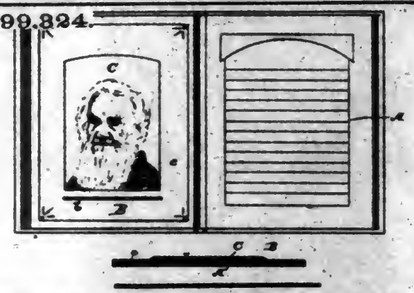
2. In a trunk or other similar receptacle, the combination, with the body or top thereof, of angle-clamps each consisting of a body portion bent to embrace the angle of the part to which it is applied, said body portion having arms or prongs varying in length, said arms being provided at their ends with apertures to receive rivets entering the adjacent walls at varying distances from the angle formed by said walls, whereby said rivets act upon the parts to which they are attached in different lines of strain, substantially as described.

3. In a trunk or other receptacle, a metallic corner-piece and valance-clamp combined and formed in one piece of metal, the same consisting of an angular body shaped to embrace the corner and overlie the top, and having a downwardly-projecting portion, *d*, provided with arms *d'*, their lower edges curved below the edge of the top, said arms having terminal openings *d²*, the whole being formed in one integral piece of metal, substantially as described.

899,324. ALBUM. OWEN J. GRIFFITHS, Chicago, Ill. Filed Mar. 23, 1888. Serial No. 268,280. (No model.)

Claim.—A picture-album having leaves, each of which has a sight-opening at one side or face of a size adapted to a picture corresponding in size to the capacity of the album and having its opposite side closed and formed of a hard-finished paper, substantially as set forth.

899,324.



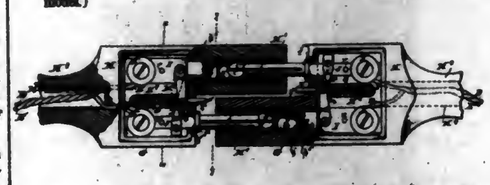
899,325. ALBUM. OWEN J. GRIFFITHS, Chicago, Ill. Filed Nov. 2, 1888. Serial No. 289,801. (No model.)



Claim.—1. A book constituting a family-record photograph-album, having photograph-receiving leaves, blank leaves of prepared calendered paper thinner than the photograph-receiving leaves, arranged opposite thereto and especially adapted to receive descriptive matter relating to the photographs, and leaves for a family-record arranged at the end of the book, the whole being bound together, substantially as described.

2. A book constituting a family-record photograph-album, having photograph-receiving leaves, blank leaves of prepared calendered paper thinner than the photograph-receiving leaves, arranged opposite thereto and especially adapted to receive descriptive matter relating to the photographs and leaves for a family-record, and an ancestral or genealogical chart arranged together at the end of the book, substantially as described.

899,326. COUPLING FOR ELECTRIC CIRCUITS. ALBERT C. GRIGGS, Wilmington, Del. Filed Jan. 3, 1888. Serial No. 260,208. (No model.)



Claim.—1. As an electric-circuit-coupling device, the L-shaped box H H', in combination with a conductor, I, secured in it and having an open tubular end, *i*, extending through the arm H', a conductor, J, with projecting split end and enlarged head *j'*, and clamps secured to said conductor, whereby electric wires may be secured in contact with them, all substantially as specified, and for the purpose of making a coupling with a similar coupling device.

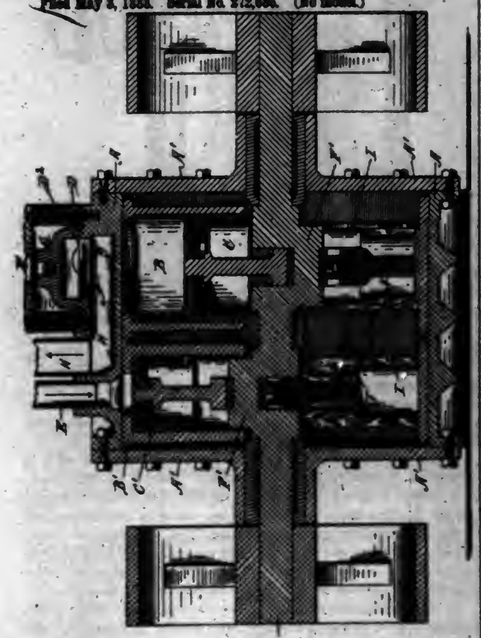
2. As an electric-circuit-coupling device, the L-shaped box H H', in combination with a conductor, I, secured in it and having an open tubular end, *i'*, extending through the arm H', a conductor, J, with projecting split end, enlarged head *j'*, and collar *j³*, adapted to make a neat fit in tube *i*, and clamps secured to said conductor, whereby electric wires may be secured in contact with them, all substantially as specified, and for the purpose of making a coupling with a similar coupling device.

3. As an electric-circuit-coupling device, the L-shaped box H-H', in combination with a conductor, I, secured in it and having an open tubular end, *i*, extending through the arm H', a conductor, J, with projecting split end and enlarged head *j'*, a rod, N, projecting through the front end of the part H, a spring, O, connected with said rod, as specified, a tongue, M, electrically connected with one of the conductors in the box, and mechanism connecting said tongue with the rod N, whereby as said rod moves in or out said tongue is moved to make temporary contact with the second conductor, substantially as and for the purpose specified.

4. As an electric-circuit-coupling device, the L-shaped box H H', in combination with a conductor, I, secured in it and having an open tubular end, *i*, extending through the arm H', a conductor, J, with projecting split end and enlarged head *j'*, a rod, N, projecting through the front end of the part H, a spring, O, connected with said rod, as specified, and a tongue, M, in electric contact with one of the conductors in the box, said tongue being pivoted at one end to the box or conduit, pivoted also on the rod N, and having a projecting end arranged to make temporary contact with the second conductor as the rod N moves in or out, all substantially as and for the purpose specified.

5. As an electric-circuit-coupling device, the L-shaped box H H', in combination with a conductor, I, secured in it and having an open tubular end, *i*, extending through the arm H', a conductor, J, with projecting split end and enlarged head *j'*, a rod, N, projecting through the front end of the part H, a spring, O, connected with said rod, as specified, a tongue, M, in electric contact with one of the conductors in the box, said tongue being pivoted at one end to the box or conduit, pivoted also on the rod N, and having a projecting end, and a tongue, L, secured in electric contact with the second conductor and arranged so as to make temporary contact with the projecting end of pivoted tongue M as the rod N is moved in or out, all substantially as and for the purpose specified.

899,327. VIBRATING ENGINE. DEXTER D. HARDY, Chicago, Ill. Filed May 3, 1888. Serial No. 272,606. (No model.)



Claim.—1. In a vibrating engine, the combination of two cylinders having different calibers, one of said cylinders having steam therein constantly, the other receiving and exhausting steam by its own movement, whereby the steam-ports are opened and closed, substantially as stated.

2. In a vibrating engine, the combination of the cylinder B', opening directly into the pipe E, leading from the steam chest or boiler, the cylinder B, having a caliber greater than that of the cylinder B', the exhaust-port *g*, the exhaust-passage H, and the steam-ports *d* and *d'*, whereby steam is received and exhausted intermittently by the movement of said cylinder B, and the pistons C' and C, moving in said cylinders, respectively, and connected with the main shaft by cranks placed thereon diametrically opposite to each other, substantially as and for the purposes stated.

3. In a vibrating engine, the combination of the steam-chest D, the valve-seat D², the system of steam-ports *d* and *d'*, passing through said valve-seat and opening into the end of the cylinder B opposite to the main shaft, at a distance from each other greater than the caliber of said cylinder, and the slide-valve G, having a cavity in its base shorter than the distance between said steam-ports, said slide-valve being designed to produce by its movement, either by hand or automatically, a reversal of the action of the engine, substantially as stated.

4. A vibrating engine consisting of two or more vibrating cylinders, said cylinders being of different calibers, with steam constantly in the cylinder of less caliber, and having single-acting pistons journaled directly to the cranks F' F, at equal angular distances apart on the main shaft F, the casing A, inclosing said cylinders, pistons, and cranks, and the slides I and cross-heads J, substantially as set forth.

899,328. DYNAMO-ARMATURE. JOHN A. HAYES, San Francisco, Cal. Filed May 2, 1888. Serial No. 272,608. (No model.)



Claim.—1. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of armature-coils wound upon rectilinear iron plates, and arc-shaped plates laminated and connecting the first-named plates.

2. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of separable laminated sections, and coils wound upon alternate sections.

3. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of radial supports provided with holes, insulated arc-curved iron plates arranged in sets which are respectively located at each of said supports, pairs of non-magnetic disks located between the said sets of iron-plates, separated rectilinear iron plates connecting the members of each pair and extending between the arc-curved plates, and bolts or similar retaining devices passing through the arc-curved iron plates and through the extensions of the iron plates which connect the members of the pairs of non-magnetic plates and into the holes in said radial supports.

4. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of coils provided with cores of laminated insulated rectilinear iron plates, arc-curved extensions upon the plates and containing holes, laminated insulated arc-curved iron plates whose ends fit among the said extensions and whose ends contain holes, and bolts or similar retaining devices passing through the arc-curved iron plates, and other bolts passing through said holes, and all the bolts being secured to radial supports around a suitable hub, the bolts being surrounded by insulating-tubes.

5. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of alternate arc-curved and rectilinear insulated iron plates and arc-curved extensions upon the said rectilinear plates, fitting among the said arc-curved plates, the said combination being attached to a central hub, and the said rectilinear plates being provided with coils of conducting-wire, such as copper.

6. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of alternate arc-curved and rectilinear insulated iron plates, arc-shaped extensions upon some of the said rectilinear plates fitting among the ends of the said arc-curved plates, one set of bolts, insulated, passing through the arc-curved plates, a second set of bolts passing through the ends of the arc-curved plates and through the said extensions, and a suitable central support receiving the ends of all the screws.

7. In a dynamo-electric machine or motor, a ring-armature consisting of the combination of separable sections of laminated iron plates, and coils wound upon alternate sections, which are provided with polar extensions projecting among the plates of the immediately adjacent sections.

8. In a dynamo-electric machine or motor, an armature-coil whose core consists of a set of separated iron plates connecting non-magnetic plates, and projecting through them to form polar extensions.

899,329. COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES AND ELECTRIC MOTORS. BENJAMIN HOTCHKISS, New York, N. Y. Filed May 11, 1888. Serial No. 273,854. (No model.)

399,329.

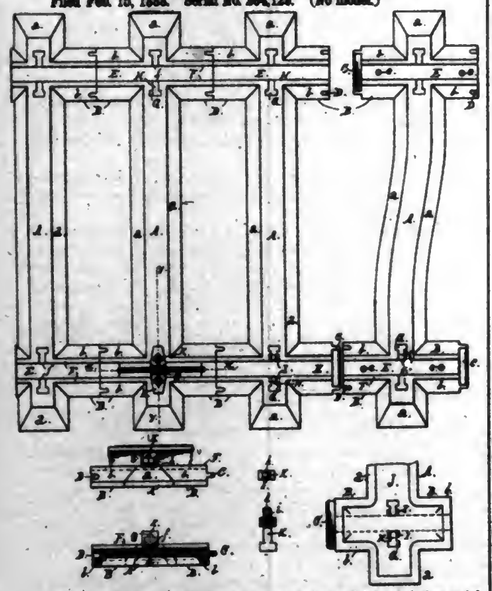


Claim.—1. The combination, in a dynamo or electric motor, of a rotary commutator and a rotary brush having the plane of the bars of the commutator and a plane taken through the axis of the brush at its point of contact with the commutator oblique or diagonal to each other, substantially as and for the purpose herein described.

2. In a dynamo or electric motor, the combination, with the rotary commutator, a rotary brush, and a rocker-arm for carrying said brush, of a spring for pressing the rotary brush in the direction of the line of the axis of the commutator for and into continuous contact with the commutator, substantially as and for the purpose herein set forth.

3. In a dynamo or electric motor, the combination, with the main shaft and the rotary commutator thereon, of a rocker-arm, a rotary brush carried by the rocker-arm, and a spring for pressing the said brush in the direction of its own axis into contact with the commutator, substantially as and for the purpose set forth.

399,330. RAILROAD-TIE. AMOS K. HOFFNEIER, Lancaster, Pa. Filed Feb. 16, 1888. Serial No. 264,129. (No model.)



Claim.—1. A cross-tie having an arm formed integral therewith and projecting from the sides to form additional bearings for the rails, the ends of the cross-ties projecting beyond the arms, substantially as and for the purpose shown.

2. The combination, with the tie having the perforations G and slots H, of the angle-plates and the bolts provided with the grooves *k*, connected by the eyes *i*, substantially as and for the purpose described.

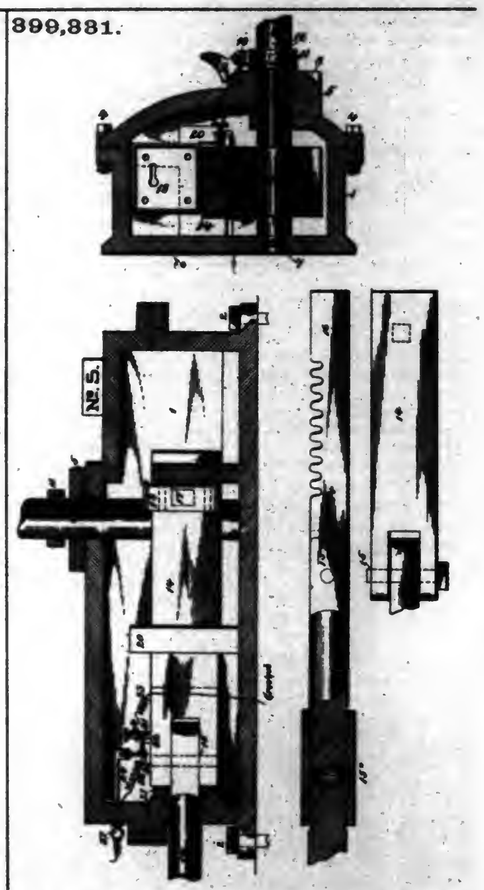
3. The combination, with a tie having perforations to receive the head of the bolt and clamps for securing the rails in position, of bolts provided with grooves *k*, connected by eyes *i*, substantially as set forth.

399,331. ELECTRIC RAILWAY SWITCH AND ALARM. WILLIAM S. HULL, Sheffield, Ala., and JAMES C. ANDERSON, Charleston, S. C. Filed May 21, 1888. Serial No. 274,886. (No model.)

Claim.—1. In a railway-switch, a lock for securing the operating parts in a desired position, having a bolt, 17, bearing a contact-point, and a second contact-point so placed as to touch the first when the bolt is in the locking position, in combination with an electric alarm and a circuit connected therewith and with the two contact-points, substantially as described.

2. The combination, with the switch-bar of a railway-switch, of a case inclosing said bar, and having therein a lock for securing said bar in a desired position, contact-points on the bolt and case of said lock, and an electric circuit terminating in said points, substantially as described.

399,331.



3. The combination, with the switch-bar of a railway-switch, of a case inclosing the same and its operating mechanism and carrying an electrical contact-point arranged in a circuit and a companion contact-point mounted on the switch-bar and electrically connected with the ground, substantially as specified.

4. In a railway-switch, a lock for securing the operative parts in a desired position, having a casing, a bolt, 17, bearing a contact-point, and a second contact-point so placed on the inside of said casing as to touch the first contact-point when the bolt is in locking position, in combination with a slot in said casing for the reception of a key, said slot so directed as only to admit of the removal of the key when the bolt is shot, and an electric alarm and circuit connected therewith and with the two contact-points, substantially as described.

5. In combination with a railway-switch, circuit making and breaking devices arranged in circuit with an electrical magnet, a signal-plate carrying a pivoted armature, and an audible alarm connected with said armature and with a contact-point thereon, and a spring for completing the circuit of the audible signal when the armature is otherwise uninfluenced, substantially as specified.

6. The combination, with the railway-switch, of the case 1, having the cover 2, provided with the boss 5, perforated for a bearing for the switch-mast 6, and having notches 8, the collar 11, the dog 9, the pinion 13, switch-bar 14, and the lock 18, substantially as specified.

7. The combination, with a railway-switch operating-bar and mast, of a case inclosing the bar and having guides for the same, and a lock for securing the bar in a desired position within the case, substantially as specified.

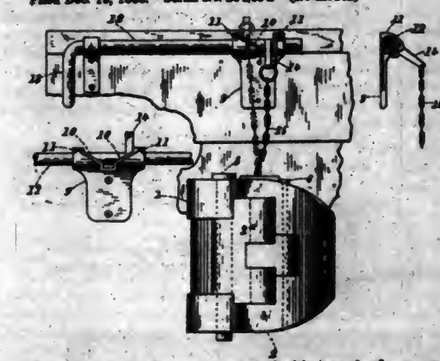
8. The combination, with a railway-switch and its operating-bar, of a case provided with a lock, a detent secured to the case of the lock and adapted to take into a recess formed on the edge of the bolt when the latter is thrown from the case, and a key adapted to throw the detent out of connection with the bolt, and the latter being slotted to retain the key from withdrawal from the lock when the bolt is in an unlocked position, substantially as specified.

399,332. FRINGE FABRIC. WALDEMAR W. JAENKE, Chicago, Ill. Filed Aug. 13, 1888. Serial No. 283,067. (No specimens.)



Claim.—The improved fringe fabric which consists, substantially as described, of the heading or gimp A, the hanger-loops secured thereto, and the tassels consisting of the combined yarn-strands passing through and looped around the hanger-loops and bound just below said loops by warp-threads passing around the tassels and fastened at each side thereof by weft-threads in the ordinary manner.

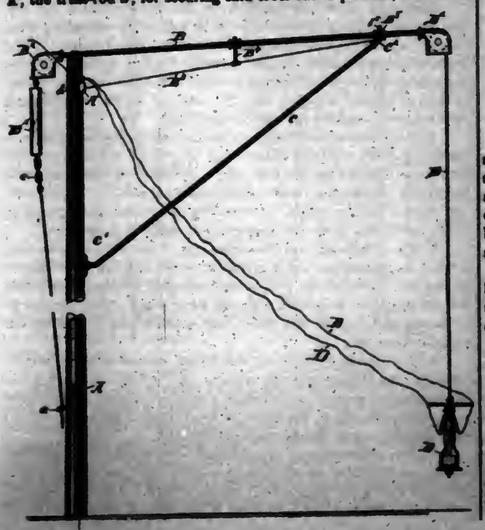
399,333. CAR-COUPLING. FREDERICK JOHNSON, Buffalo, N. Y. Filed Dec. 19, 1888. Serial No. 294,054. (No model.)



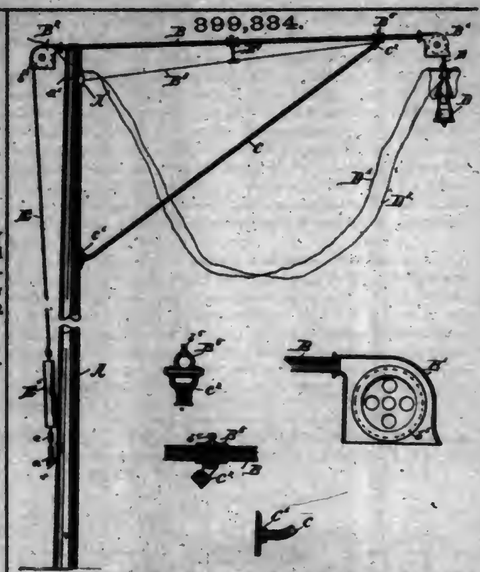
Claim.—A device for operating the locking-catch of a car-coupling, consisting of a stationary cam-plate, 9, having an inclined camway opening between the bearings, in combination with an uncoupling-bar mounted in said bearings so as to permit both a turning and a longitudinal movement, and provided with an arm for operating it, and an arm, 14, rigidly connected to and projecting out from the uncoupling-bar and connected by a chain to the locking-catch of a car-coupling, whereby a simultaneous longitudinal and turning movement of the uncoupling-bar will lift the arm 14 as it moves up the inclined camway and hold it and the locking-catch in their upward position until it is necessary to release them, substantially as described.

399,334. MAST-ARM. C. MARTIN KELLER, Columbus, Ind. Filed Mar. 10, 1888. Serial No. 266,899. (No model.)

Claim.—1. The combination of the mast A, having a cross-bar, A', the truss-rod *a'*, for securing said cross-bar in position, the arm B,



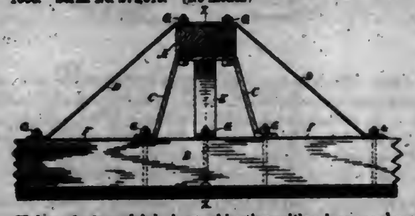
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mounted near one end on the top of said mast, as shown, and provided with housings B^2 and B^3 on its ends, in which are journaled the sheaves b' and b^3, the brace C, secured at one end to the mast and at the other end connected to the adjustable sleeve B^4 on the arm B, the stay-wires B^5, running from near the forward end of said arm to the ends of the cross-bar A' on the mast A, the truss-arms B^6, interposed between said stay-wires and said arm midway of its length, the lamp D, the rope E, running from said lamp over the sheaves b' and b^3 to alongside the mast, and means for attaching it in position, substantially as set forth.

2. The combination of the mast A, having a cross-bar, A', a truss-rod, *a'*, securing said cross-bar in position, an arm, B, stay-wires B^5, running from a point on said arm to the ends of the cross-bar A', the brace C, connected at one end to the mast and at the other to the arm, the latter connection of which is adjustable, the lamp D, suspended upon the end of the arm, and a rope, E, running from said lamp over sheaves and through said arm to a point alongside the mast, said rope being of just sufficient length that it will reach to the point where it is to be fastened when said lamp is in elevated position, substantially as set forth.

399,335. SLEIGH. LEWIS KELLEY, Bowne, Mich. Filed May 21, 1888. Serial No. 274,619. (No model.)



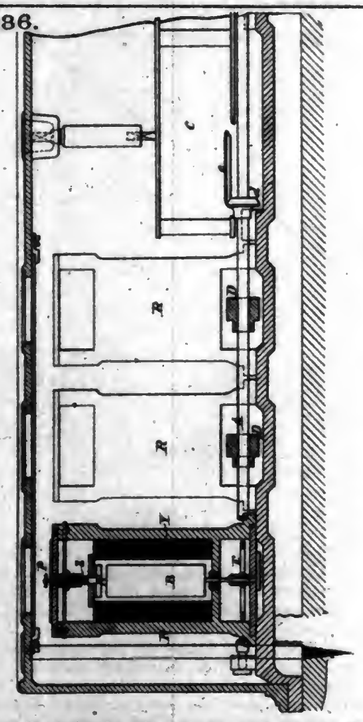
Claim.—1. In a sleigh, in combination with a beam and runner, strips of bar-iron, each bent at an obtuse angle at four points, substantially as described, each having horizontal middle portions rigidly attached to the upper and under sides, respectively, of the beam, extending downward and outward and attached to the runner, and a brace attached to the runner and extending upward and inward and attached to the beam, substantially as described.

2. In a sleigh, in combination with a beam and runner, strips of bar-iron C, D, and E, substantially as described, connecting and attached to said beam and runner, and a strip of band-iron, F, substantially as described.

399,336. ELECTRIC MOTOR. EDWARD P. H. H. LAUCKERT, Charlton, County of Kent, assignor to Siemens Brothers & Company, (Limited,) Westminster, England. Filed Oct. 5, 1888. Serial No. 287,344. (No model.) Patented in England Dec. 21, 1887, No. 17,502, and in France Sept. 25, 1888, No. 196,196.

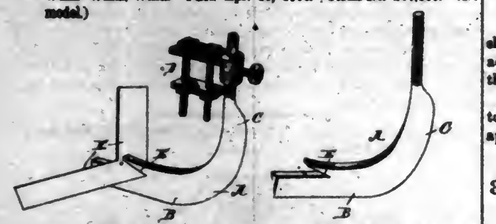
Claim.—In apparatus for indicating the time during which electricity is used, the combination of clock-work, electro-magnetic clutches driven thereby, indices, and coils, through which a current of electricity passes during the time to be measured, exciting the elec-

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tro-magnetic clutches, and causing them to engage and move the said indices, as and for the purposes described.

399,337. SELF-CLEANING WEED-CUTTER. FREDERICK B. LUX, Walla Walla, Wash. Filed Apr. 16, 1888. Serial No. 270,880. (No model.)



Claim.—The improved weed-cutter consisting of the curved cutter A, having the vertical portion C and the horizontal portion B, the front edge of the vertical portion and the lower edge of the horizontal portion being both cutting-edges, and the flat V-shaped horizontal knife rigidly secured at its apex to the upper edge of the horizontal portion of the cutter at the rear end of the same, as specified.

399,338. BUTTON-STRIP FOR GARMENTS. HENRY W. LYON, Bridgeport, Conn. Filed Jan. 17, 1888. Serial No. 296,669. (No model.)

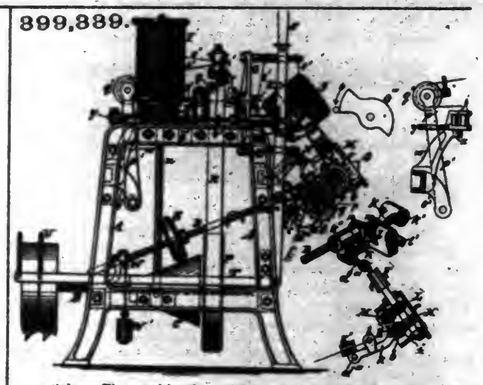


Claim.—The combination, with a fabric strip having at the rear edge a hollow bead and provided with interior cross-pockets which intersect said bead, of a continuous cord threaded through said bead and extended through said pockets in the form of loops which project beyond the front edge of the strip, said loops being threaded with the eyes of the buttons, substantially as shown, and for the purpose set forth.

399,339. TWINE-BALLING MACHINE. ISAAC P. MEEKS, Brooklyn, N. Y., assignor to John Loyd, same place. Filed June 1, 1886. Serial No. 303,966. (No model.)

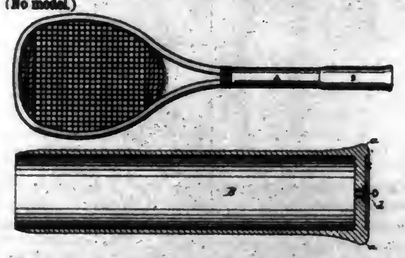
Brief.—The invention consists in improvements upon the machine shown in Letters Patent No. 262,412, dated August 8, 1882, the special object being to adapt the machine for use for a considerable number of sizes of balls and twines.

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Claim.—The combination, with the inclined shaft D, of the spindle F, head *e*, the yoke *f*, fly G, brackets *h* and *k*, cam O, stop N, worm-gear K, worm *i*, shaft *b*, worm or endless screw L, the cam-shaft M, bracket *a*, shaft *l*, gears *m n*, and interchangeable gears *o*, *p*, and *r*, for changing the speed of the spindle F on its longitudinal axis in balling twines of different sizes or diameters, substantially as and for the purpose set forth.

399,340. RUBBER SLEEVE FOR TENNIS-RACKETS. ROBERT W. MORGAN, New York, N. Y. Filed May 4, 1888. Serial No. 272,831. (No model.)



Claim.—1. The sleeve B for the handle of tennis-rackets, the said sleeve consisting of the cylindrical portion having the thickened end adapted to fit against the end of the handle and forming a body for the cushion-shoulder *a*, substantially as shown and described.

2. The sleeve B, of rubber or other soft material, having an apertured end, combined with the backing-plate C, also provided with an aperture, substantially as and for the purposes set forth.

399,341. ELECTRICAL APPLIANCE FOR STOPPING AND STARTING ELEVATORS. RONALD P. MCPEELY and HENRY V. POTTER, Pittsburg, Pa. Filed Dec. 12, 1887. Serial No. 257,711. (No model.)

Claim.—1. In an electric elevator, the combination of the continuous contact-strips connected in circuit with valve-controlling magnets, the spaced broken contact-strips, a switch-board carried by the elevator-car and having brushes normally bearing against said continuous strips, a series of brushes adapted to contact with the spaced broken strips, and a switch movably mounted on the switch-board, substantially as and for the purpose described.

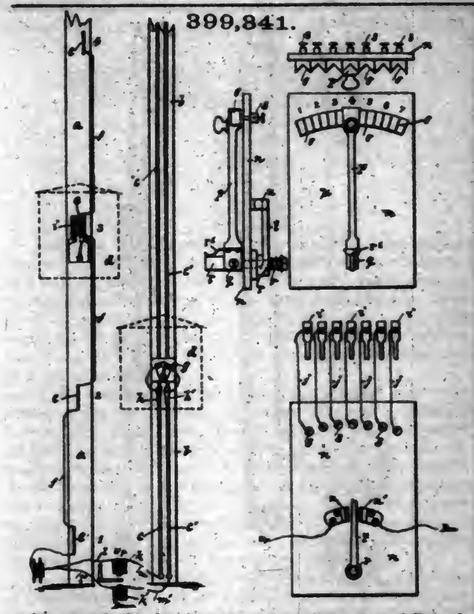
2. The combination of the continuous metallic contact-strips connected in circuit with valve-controlling magnets, a switch-board carried by an elevator-car and normally in contact with said continuous strips, the interrupted contact-strips also connected in circuit with said magnets, and a switch for reversing the current through either of the continuous strips and magnets, substantially as described.

3. The combination of the continuous contact-strips, valve-controlling magnets connected in circuit with said strips, a switch-board having two contact-posts, *u u'*, brushes normally bearing on said continuous strips and connected with said posts, and a switch adapted to be moved into contact with either post, substantially as and for the purpose described.

4. The combination of the continuous contact-strips, a switch-board having brushes normally pressing against the continuous strips, the interrupted spaced contact-strips, a series of brushes each adapted to contact with one of the series of interrupted strips, and a switch, substantially as and for the purposes described.

5. The combination of the series of interrupted spaced contact-strips *c*, connected in circuit with one another and having the breaks therein, a switch-board having a series of contacts, *o*, a series of brushes, *i*, each adapted to contact with one of the series of interrupted strips

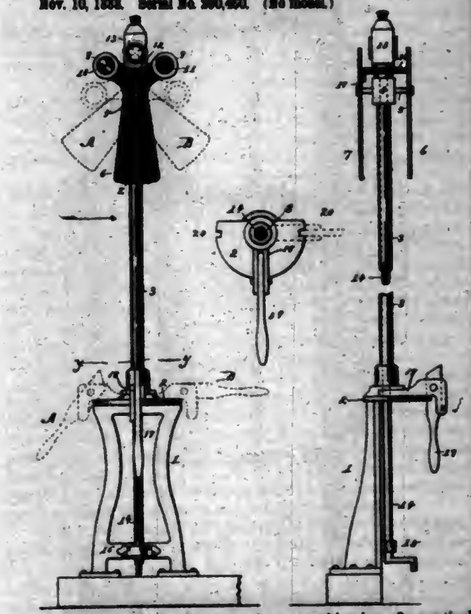
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and connected with the contacts *o*, and a switch, substantially as described.

6. The combination of a switch-board having a series of contacts, *o*, and the contact-posts *u u'*, a switch pivotally mounted on said board and capable of lateral movement thereon to adjust its free end against either of the contacts *o* and the posts *u* or *u'*, a series of brushes, *i*, connected with the posts, the continuous and interrupted strips *c c'*, and *e*, and the valve-controlling magnets, substantially as described.

399,342. RAILWAY-SWITCH SIGNAL. HENRY M. NORTON, Louisville, Ky., assignor of one-half to Edward R. Morris, same place. Filed Nov. 10, 1888. Serial No. 290,402. (No model.)

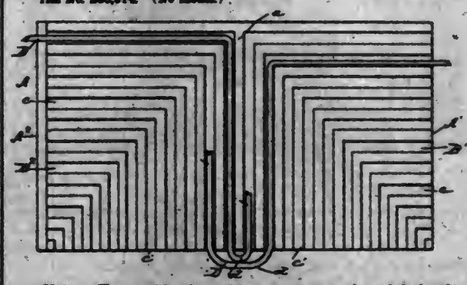


Claim.—1. In a railway-signal, the combination of a vertical post, a signal-blade, 6, having the diagonal arms 8 9, provided with lenses arranged on opposite sides thereof and pivoted on the post at a point between said diagonal arms, a fixed lantern arranged at one side of the signal-blade and in the vertical plane of the pivot thereof, and mechanism for moving said signal-blade to an inclined position on either side of the post, and thereby adjusting one or the other of the lenses of said blade in line with the lens of the lantern, substantially as described, for the purpose set forth.

2. In a railway-signal, the combination of a vertical tubular post, the two signal arms or blades 6 7, carried by a common horizontal shaft which passes centrally therethrough, and each signal-blade having two reversely-inclined arms, 8 9, each provided with a colored lens, a stationary lantern on the post arranged between the two signal-arms in the vertical plane of the pivot thereof, and a vertical shaft geared directly with the signal-blades for positively moving the latter to an inclined position at either side of the post and adjusting one or the other of the two lenses carried by each blade in line with the lenses of the lantern, substantially as and for the purpose set forth.

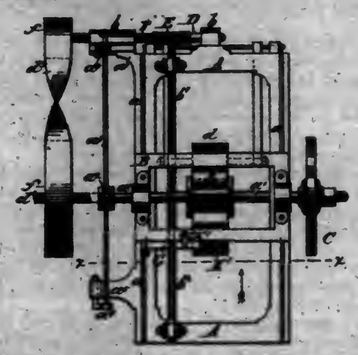
3. In a railway-signal, the combination of a fixed stand, 1, having the vertical tubular post 3 fixed thereto, a horizontal transverse shaft journaled on the post at the upper end thereof, the signal-blades each having the diverging lens-holding arms 8 and 9, fixed on said shaft at a point between the arms thereof, a lantern fixed between said arms in the vertical plane of the horizontal shaft, a vertical shaft, 14, passing through the tubular post and geared at its upper end directly to one of the signal-blades, and a lever, 18 19, fixed to the vertical shaft, substantially as described.

399,343. UNDERGROUND ELECTRIC-WIRE CONDUIT. WILLIAM L. PERRETT and THOMAS LITTLE, Pittsburg, Pa. Filed Jan. 16, 1888. Serial No. 260,914. (No model.)



Claim.—The combination, with an underground conduit for electric wires, of a plate of sufficient size to fit wholly within said conduit, said plate being provided on its face at opposite sides of its center with right-angle grooves, one branch of each groove being in line with the interior of the conduit and the other branch of each groove extending at right angles thereto to the longitudinal edge of the plate, whereby a conductor extending through the conduit may pass through a right-angle groove at each side of the center of the plate, and thus expose a portion of said conductor beyond the edge of said grooved plate, substantially as set forth.

399,344. MACHINE FOR FITTING THE ENDS OF BAND-SAWS. JAMES M. PETERSEN, Clinton, Iowa. Filed June 16, 1888. Serial No. 277,202. (No model.)

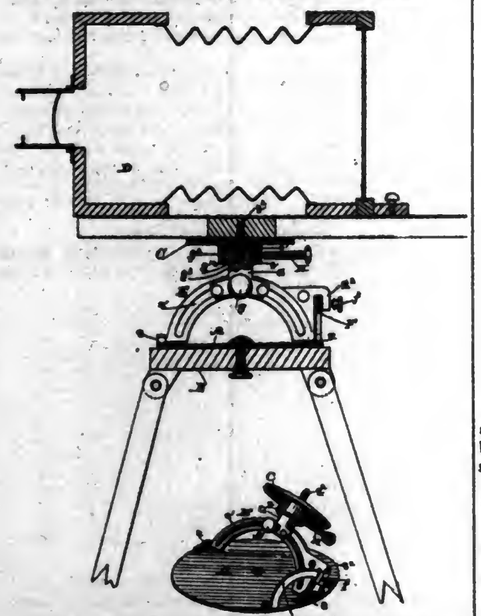


Claim.—1. In a machine for fitting the ends of a band-saw preparatory to brazing them together, the combination of the wheel C, mounted on the reciprocating shaft *a'*, having the annular groove a^6, the bar a^5, placed in the annular groove and supported in the oscillating bearings a^4, the worm-shaft D, the worm-gear E, mounted in position to engage the worm-shaft, and the bar F, pivoted to the gear-wheel and connected with the bar a^5, substantially as and for the purposes described.

2. In a machine for fitting the ends of a band-saw, the combination of the reciprocating carriage B, the reducing-wheel C, mounted

on a shaft, a', having its bearings on the carriage, the oscillating bar a^3, connected with the shaft a', the worm-shaft D, the gear-wheel E, mounted on the threaded shaft b', the bar F, pivoted to the gear-wheel and connected with the bar a^3, and the bar G, pivoted to the frame, and having a threaded notch, c, placed over the threaded shaft, substantially as and for the purposes described.

399,845. CAMERA-ADJUSTER. HENRY R. FOEHLMAN, San Francisco, Cal. Filed Nov. 7, 1888. Serial No. 290,348. (No model.)



Claim.—1. In a camera-adjuster, a slotted curved bracket hinged to the tripod and adapted to be turned from a vertical to a horizontal position, in combination with a plate secured to the camera, said plate being adjustable longitudinally in the slotted curved bracket, substantially as herein described.

2. A camera-adjuster for connecting the camera with the tripod, comprising a hinged slotted curved bracket to be secured to the tripod and adapted to be turned from a vertical to a horizontal position, a standard fitted to and adjustable longitudinally in the slotted bracket, and a plate to be secured to the camera and journaled on the standard, whereby it may have an axial movement, substantially as herein described.

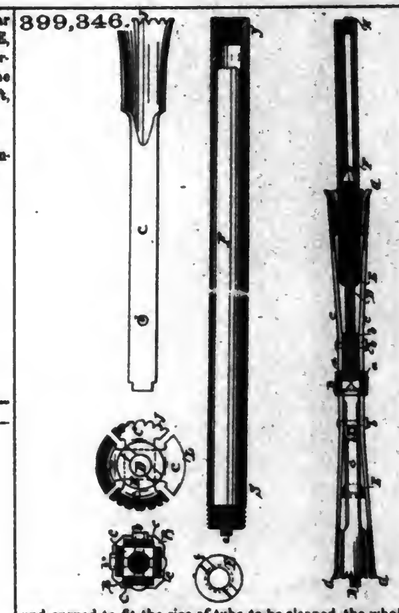
3. A camera-adjuster for connecting the camera with the tripod, consisting of a plate to be secured to the tripod, a plate to be secured to the camera, and intermediate adjustable connections, comprising a slotted curved bracket hinged to the tripod-plate, a standard carried by and movable longitudinally on the slotted bracket, and an axial-pivot-connection between the standard and the plate to be secured to the camera, substantially as herein described.

4. A camera-adjuster consisting of the plate to be secured to the tripod, the curved slotted bracket hinged to the plate, the set-screw and fixed guide-rack for holding the bracket in position where adjusted, the standard fitted to and movable longitudinally on the slotted bracket, and set-screw for holding the standard where adjusted, the plate secured to the camera and axially pivoted to the top of the standard, and the set-screw for holding the plate where adjusted, substantially as herein described.

5. In a camera-adjuster, the combination of the plate to be secured to the tripod, the curved slotted bracket, the standard mounted and adjustable on the bracket, said standard having a cylindrical head with a central socket, the plate C, having in its upper surface a screw for securing it to the camera, and on its lower surface an annular flange fitting over the head of the standard, and a central pin fitting in the socket of said head, substantially as herein described.

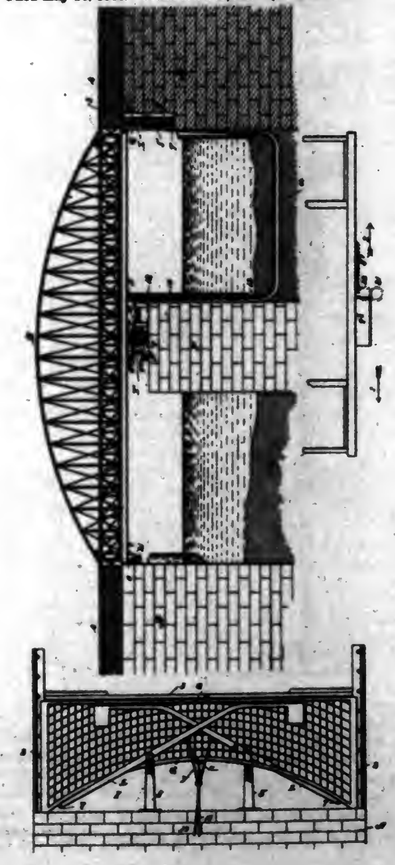
399,846. TUBE SCRAPER AND CLEANER. JARED POOLMAN, Passaic, N. J. Filed Oct. 17, 1888. Serial No. 288,267. (No model.)

Claim.—A tube-cleaner composed of several full longitudinal sections of steel, each full section being composed of two half-sections, one end of each half-section being drawn or tapered down, broadened,

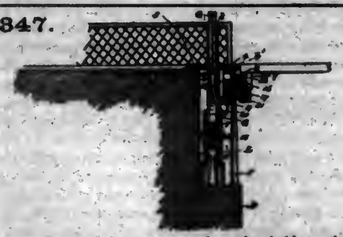


and curved to fit the size of tube to be cleaned, the whole being combined together and with the central stock, A, and screw-stem D, substantially as described.

399,847. SWING-BRIDGE. MARIUS A. REDDING, New York, N.Y. Filed May 26, 1888. Serial No. 275,250. (No model.)



399,847.



Claim.—1. As an improvement in swing-bridges, the combination, with the bridge and its abutments, of gates held in suitable vertical ways or guides connected with the abutments, counterbalancing-levers placed on each side of the gate, and suitable mechanism interposed between the gates and the bridge, so that by the motion of the bridge the said gates are raised to close the street when the bridge is opened and lowered to open the street when the bridge is closed, substantially as specified.

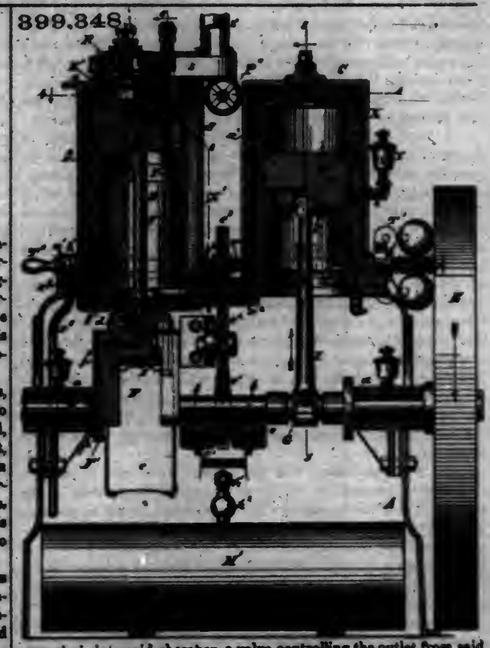
2. The combination of the swing-bridge provided with racks, suitable pinions fixed to shafts, said pinions being held in position to be engaged by the said racks when the bridge is opened and closed, vertically-movable gates held in suitable guideways in the abutment, counterbalancing-levers connected with suitable stanchions placed in the abutment and supporting the gates, and suitable connections interposed between the shaft of the pinions and the gates and its levers, whereby when the bridge is opened and closed the motion thereof is utilized and applied through the racks, pinions, and connections to open and close the gates, substantially as specified.

3. The combination of the vertically-movable gate, the two sets of double levers L L', said levers being fulcrumed in suitable stanchions and having their upper ends weighted and their lower end connected by a bar, 7, on which the bottom rail of the gate rests, and by which the gate is supported, the swing-bridge provided with racks that engage and operate the mechanism by which the gate is raised and lowered, and chains and ropes that connect the said mechanism with the levers and with the gate, substantially as specified.

4. The combination of the vertically-movable gates supported by counterbalancing-levers, the swing-bridge provided with a turn-table having suitable racks formed upon it, a pinion provided with a shaft and supported in position to engage the racks of the turn-table when the bridge is opened and closed, a sprocket-wheel on the shaft of the pinion, a chain placed on said sprocket-wheel, and wire ropes extending down through the pier, under the river-bed, through a suitable pipe, and up in the abutment to the gate, one of said ropes being connected with the levers and the other with the gate, substantially as specified.

5. The combination, with the vertically-movable gate, of the grooved columns 2 2, provided with rollers, the plate 3, placed transversely of the abutment, over the recess I, and inside the columns 2 2, and the plate 4, placed outside of the side columns and over the recess and supported by brackets and stanchions b', substantially as specified.

399,848. HYDROCARBON-ENGINE. GEORGE M. RICHARDS, New Brunswick, N. J. Filed Mar. 31, 1888. Serial No. 269,190. (No model.)



Claim.—1. In a motor-engine, the combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air, and a compressed-air passage leading thence to the power-cylinder and controlled by the inlet-valve, of an oil-commingling chamber communicating with said passage, having its bottom or floor formed with a slight upward incline toward the outlet to the cylinder and arranged to be traversed by the air flowing toward said outlet, a source of oil, and an oil-duct leading to said commingling-chamber.

2. In a motor-engine, the combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air, and an air-passage leading thence to the power-cylinder and controlled by the inlet-valve, of an oil-commingling chamber arranged to be traversed by the compressed air in its passage, having its bottom or floor formed with an upward incline toward the outlet of the cylinder and provided with a deflector for causing the air to circulate in said chamber; a source of oil, and an oil-duct leading to said chamber.

3. In a motor-engine, the combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air, and an air-passage leading thence to the power-cylinder and controlled by the inlet-valve, of an oil-commingling chamber covered by said air-passage at its top and having an outlet through its bottom to the cylinder, a valve for closing said outlet, adapted when lifted to act as a deflector for causing the air to circulate outwardly and inwardly in said chamber, a source of oil, and an oil-duct leading to said chamber.

4. In a motor-engine, the combination, with the power-cylinder and its piston, a source of compressed air, and an air-passage leading thence to the power-cylinder, of a commingling-chamber communicating with said passage, a valve controlling the admission of compressed air into said chamber, a valve controlling the outlet from said chamber to the cylinder, a source of oil, and an oil-duct leading to said commingling-chamber, whereby the oil in said chamber is vaporized by the circulation of air therethrough and controlled by said valves.

5. In a motor-engine, the combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air and an air-passage leading thence to the power-cylinder and controlled by the inlet-valve, a source of oil communicating with said air-passage, whereby the air may absorb oil on its way to the cylinder, and an oil chamber or groove having an absorbent filling and communicating with said source of oil, of a restricted air-inlet duct extending from said air-passage through said oil-chamber to the power-cylinder, adapted to admit a reduced flow of air through said absorbent filling while the inlet-valve is closed, whereby the injection of combustible vapor into the cylinder during the exhaust-stroke is insured for the maintenance of ignition therein.

6. In a motor-engine, the combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air and an air-passage leading thence to the power-cylinder and controlled by the inlet-valve, and a source of oil communicating with said air-passage, whereby the air may absorb oil on its way to the cylinder, of an oil chamber or groove having an absorbent filling, an air-passage through said oil-chamber to the cylinder, and a valve and valve-gear constructed to admit a momentary charge of compressed air into said oil-chamber at intervals in order to drive the oil into and through the absorbent filling therein.

7. The combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air and an air-passage leading thence to the cylinder, and a source of oil communicating with said air-passage, whereby the air may absorb oil on its way to the cylinder, of an oil chamber or groove having an absorbent filling, an air and oil chamber communicating with said oil-chamber through perforations, and into which the oil is injected, a valve for admitting air from said air-passage into said oil and air chamber, an air-passage through said oil-chamber to the cylinder, and a valve-gear constructed to open said valve momentarily at intervals in order to admit a charge of compressed air into said oil and air chamber and cause the same to drive the oil through said perforations into said oil-chamber and into and through the absorbent filling therein.

8. The combination, with the power-cylinder and its piston, its inlet and exhaust valves, a source of compressed air and an air-passage leading thence to the power-cylinder, and a source of oil communicating with said air-passage, whereby the air may absorb oil on its way to the cylinder, of an oil chamber or groove having an absorbent filling and communicating with the cylinder, an air and oil chamber into which oil is injected and which communicates with said oil-chamber through perforations, a restricted air-inlet extending from said air-passage into said air and oil chamber, adapted to admit a reduced flow of air through said absorbent filling and into the cylinder

to maintain ignition therein during the exhaust-stroke, a valve for admitting air from said air-passage into said air and oil chamber, and a valve-gear constructed to open said valve momentarily at intervals in order to admit a charge of compressed air into said air and oil chamber and cause the same to drive the oil through said perforations into said oil-chamber and into and through the absorbent filling therein.

9. The combination, with the power-cylinder and its piston, a source of compressed air and an air-passage leading thence to the power-cylinder, a commingling-chamber traversed by said air-passage, an oil chamber or groove having an absorbent filling communicating with the power-cylinder and communicating through perforations with said commingling-chamber, a source of oil discharging into said commingling-chamber, and a restricted air-inlet from said air-passage into said commingling-chamber, adapted to admit a reduced flow of air through said absorbent filling and into the cylinder to maintain ignition during the exhaust-stroke, of a main and supplemental air-inlet valve, the one adapted to control the flow of compressed air into said commingling-chamber and the other to control its flow from said commingling-chamber to the cylinder, and a valve-gear constructed to open said main inlet-valve at each stroke in advance of said auxiliary valve and thereby to admit a momentary charge of compressed air into said commingling-chamber to drive the oil through said perforations into said oil-chamber and into and through the absorbent filling therein.

10. The combination, with the power-cylinder and its piston, a source of compressed air and an air-passage leading thence to the power-cylinder, a commingling-chamber traversed by said air-passage, an oil chamber or groove having an absorbent filling and communicating with said commingling-chamber and the cylinder, a source of oil discharging into said commingling-chamber, and a restricted air-inlet from said air-passage into said commingling-chamber, of a main air-inlet valve adapted to control the flow of compressed air into said commingling-chamber and having a valve-stem, a valve-gear constructed to move said stem to open and close said valve, and a supplemental valve adapted to control the flow of air from said commingling-chamber to the cylinder and connected to said main valve by a mechanical connection providing some lost motion, whereby the main valve opens before and closes after the supplemental valve.

11. The combination, with the power-cylinder and its piston, its inlet and exhaust valves, a passage for compressed air controlled by the inlet-valve, and an ignition-chamber between the inlet-valve and said cylinder and communicating with the latter through a contracted opening, of a plate or diaphragm in said ignition-chamber adjacent to the outlet therefrom adapted to be heated by the flame therein and to aid in maintaining ignition.

12. In a motor-engine operating by the combustion of hydrocarbon vapor in its power-cylinder, the combination, with the power-cylinder, its inlet and exhaust valves, a valve-gear for operating them, a device connected with said valve-gear for rendering the latter impotent to open said inlet-valve, a lighting-port communicating with the power-cylinder and opening to the exterior thereof, and a gate or valve for closing said port, of a handle connected with and adapted to close said gate, and a connection between said handle and said device for rendering impotent the valve-gear, operating substantially as described, to render the valve-gear operative and open the inlet-valve by the act of closing said lighting-port gate, whereby the starting of the engine is rendered automatic.

13. In a motor-engine operating by the combustion of hydrocarbon vapor in its power-cylinder, the combination, with the power-cylinder, its inlet and exhaust valves, a valve-gear for operating them a valve-closing device connected with said valve-gear for holding the inlet-valve temporarily closed during the igniting of the vapor to start the engine, a lighting-port communicating with the power-cylinder and opening to the exterior thereof, and a gate or valve for closing said port, of a handle connected with and adapted to open and close said gate, and a mechanical connection between said handle and said valve-closing device adapted when moved to close said gate to simultaneously throw said valve-closing device out of operation and thereby open the inlet-valve by the act of closing the lighting-port.

14. In a motor-engine operating by the combustion of hydrocarbon vapor in its power-cylinder, the combination, with the power-cylinder, its inlet and exhaust valves, a source of compressed air and an air-passage leading thence to the power-cylinder, a lighting-port communicating with the power-cylinder and opening to the exterior thereof, a gate or valve for closing said port, and a valve-closing device adapted to close temporarily a valve controlling the passage of compressed air or vapor into the power-cylinder, of a handle for closing said lighting-port gate, and a connection between said handle and said valve-closing device adapted to transmit to the latter the movement of the handle when closing said gate, and thereby to throw said device out of action and consequently to effect the admission of compressed air or vapor to the cylinder, whereby such admission is effected automatically by the act of closing the lighting-port.

15. In a motor-engine, the combination, with the power-cylinder, its inlet and exhaust valves, a valve-gear for operating them, a valve-closing device connected with said valve-gear for holding the inlet-valve temporarily closed during the igniting of the vapor to start the engine, a lighting-port communicating with the power-cylinder and opening to the exterior thereof, and a gate or valve for closing said port, of a handle connected with and adapted to open and close said gate, and also connected with and adapted to operate said valve-closing device, the said connections being arranged, on the movement of said handle in one direction, to first throw said valve-closing device into action to close the valve and subsequently open the lighting-port gate, and on the movement of the handle in the opposite direction to first close the lighting-port and subsequently open the inlet-valve.

16. In a motor-engine, the combination, with the power-cylinder, its inlet and exhaust valves, and a valve-gear for operating them, comprising a lever through which movement is communicated to the inlet-valve, a valve-closing device engaging the fulcrum of said lever and constructed, when actuated, to move said fulcrum and thereby close the valve, whereby the valve-gear is rendered impotent to open said valve, a lighting-port communicating with the power-cylinder and opening to the exterior, and a gate for closing said port, of a handle connected with and adapted to operate said gate, and also connected with and adapted to operate said valve-closing device, whereby the opening or closing of the lighting-port and the closing or opening of the inlet-valve are effected by a single stroke of said handle.

17. The combination, with the power-cylinder, its lighting-port, its inlet-valve, and a valve-gear for operating said valve, comprising a rock-lever, a movable standard to which said rock-lever is fulcrumed, a sliding wedge or cam engaging said standard and adapted by its movement to raise or lower the latter and thereby to open or close the inlet-valve, and a gate for closing said lighting-port, of a hand-lever for operating said gate arranged to encounter said wedge in its movement of closing said gate and thereby drive in said wedge and throw open the inlet-valve.

18. The combination, with the power-cylinder, its lighting-port, a gate for closing said port, the inlet-valve, and a valve-gear for operating said valve, comprising a rock-lever, f', of an adjustable standard, A', for moving the fulcrum of said lever, a wedge, B', acting on said standard, a hand-lever, K", for opening and closing said gate, and means for engaging said lever with and disengaging it from said wedge, consisting of a hooked arm, w, on the one part, a shoulder, w^3, and a spring-mounted hook, w', on the other part, operating substantially as described.

19. In a motor-engine operating by the combustion of hydrocarbon vapor, the combination, with a cylinder constructed with a water space or jacket in its walls and water inlet and outlet passages communicating with said jacket at one end of the cylinder, of a tube within said jacket leading from one of said passages and extending through the jacket and opening at or near the opposite end thereof, whereby a circulation of water from end to end of the jacket is assured.

399,849. CAST CHILLED REAMER. JAMES A. SHERMAN, Buffalo, N. Y. Filed Jan. 2, 1889. Serial No. 295,130. (No model.)



Claim.—1. As an improved article of manufacture, a cast-iron chilled reamer for iron working having a body provided with longitudinally-projecting cutting-teeth the edges of which are ground sharp along the advance edges and the bottom thereof, an interior bore, and recesses in its face, as and for the purpose set forth.

2. The cast-iron chilled reamer hereinbefore described, consisting of the body A, having the taper bore B, the oppositely-located recesses C in the face of said body, and the laterally-projecting cutting-lips D, the latter being provided with the rounded cutting-edges E, relieved in the manner as and for the purpose set forth.

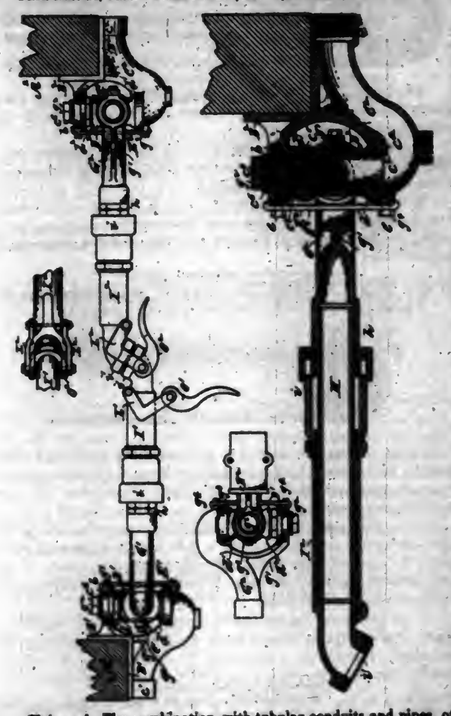
399,850. DENTAL DISK-HOLDER. HENRY H. SIMON, New York, N. Y. Filed Dec. 17, 1888. Serial No. 293,809. (No model.)



Claim.—1. The disk-holder for dental engines, consisting of the shank A, having upon its outer end the disk E and flange G, a portion of the disk being removed, forming an opening, F, at which the operating-disk is exposed, combined with the shank C, adapted to enter the tool-holder of the engine, and means for holding the disk in position, substantially as and for the purposes set forth.

2. The holder for disks of dental engines, consisting of the shank A and disk E, having the flange G and being cut away at F, combined with the central shank, C, and screw H, the operating-disk being held between the head of the screw and the end of the shank C, substantially as set forth.

399,851. PIPE-COUPLING. WILLIAM H. H. SMITH, Brooklyn, N.Y. Filed Nov. 21, 1888. Serial No. 291,447. (No model.)

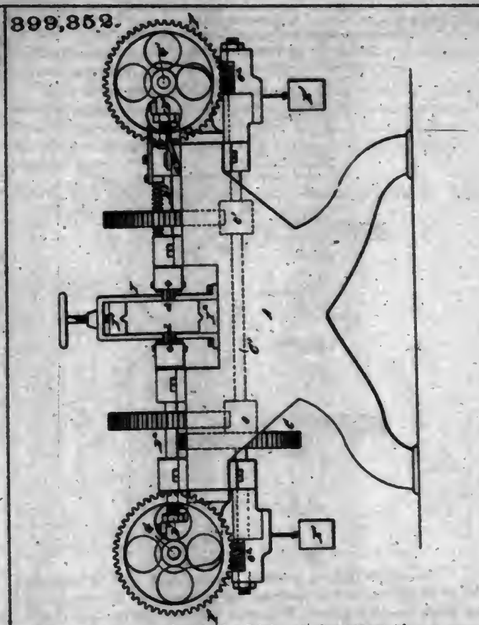


Claim.—1. The combination, with tubular conduits and pipes, of approximately T-shaped pipe-sections having portions extending at right angles to each other, two of said portions communicating with the tubular conduits and with the pipes in different planes, and two of said portions being recessed at the ends, and retaining-screws engaging in said recesses, substantially as specified.

2. The combination, with an oscillating pipe-section, of a seat in which it is fitted at one end, a screw entering a cavity at its other end, a bearing-piece fitting the screw and cavity, and a spring between the bearing-piece and the screw, substantially as specified.

3. The combination, with the oblique-ended pipes I' I², of L-shaped links pivotally connected to one of said pipes and a bifurcated lever pivotally connected to said L-shaped links and having eccentric ends, substantially as specified.

399,852. REAMING-MACHINE. HARRISON H. TAYLOR, Detroit, Mich., assignor to the Michigan Radiator and Iron Manufacturing Company, same place. Filed Aug. 8, 1888. Serial No. 282,274. (No model.)



Claim.—1. The combination, with a supporting-bed, of a rotatable and reciprocatory reamer-spindle provided with a reamer-tool, a driving-shaft geared with said spindle, a cam to force the spindle to the work, and a worm-gear to operate the cam, substantially as set forth.

2. In a reaming-machine, the combination, with a supporting-bed, of a driving-shaft geared with a shaft, C', and a reamer-spindle geared with shaft C', said spindle having a reciprocatory movement upon said bed, substantially as described.

3. In a reaming-machine, the combination of the supporting-bed and driving-shaft, a shaft, C', geared with the driving-shaft, a reamer-spindle provided with a reaming-tool geared with the shaft C', said latter shaft provided with a worm, a worm-gear meshing with said worm, and a cam driven by said worm-gear to reciprocate the reamer-spindle, substantially as described.

4. The combination, with a supporting-bed, of a pair of reamer-spindles having a reciprocatory movement thereupon toward and from each other, and a driving-shaft geared with a shaft, C', said shaft C' geared with the reamer-spindles, substantially as set forth.

5. The combination, with a supporting-bed, of a pair of rotatable reciprocatory reamer-spindles, a driving-shaft geared with said spindles and a cam-shaft geared with the driving-shaft to force the reamer-spindles respectively to the work, substantially as set forth.

6. The combination, with a supporting-bed, of a pair of retracting reamer-spindles having a rotating and reciprocating engagement upon said bed, of a driving-shaft geared with said spindles, and a cam to feed the spindles forward to their work, substantially as set forth.

7. The combination, with a supporting-bed, of a pair of rotatable and reciprocatory reamer-spindles located end to end to admit the work between them, a driving-shaft geared with said spindles, cam-shafts geared with the driving-shaft to feed the spindles to the work, and an automatic retracting device, substantially as set forth.

8. The combination, with beds A A, of a pair of rotatable and reciprocatory reamer-spindles located upon each bed, said beds having an adjustable connection the one with the other, substantially as described.

9. The combination, with supporting-beds A A, of a pair of reamer-spindles engaged upon each bed, a driving-shaft geared with each pair of spindles, and cam-shafts G G' to feed the spindles to the work, said shafts respectively geared with the driving-shaft, substantially as set forth.

10. The combination, with a supporting-bed, of a rotary and reciprocatory reamer-spindle, a driving-shaft geared with a shaft, C', feeding mechanism to feed the spindle to the work, said feeding mechanism and spindle geared with said shaft C', and a retracting device to restore the spindle to its normal position, substantially as described.

399,853. SCREW-TAPPING MACHINE. HARRISON H. TAYLOR, Detroit, Mich., assignor to the Michigan Radiator and Iron Manufacturing Company, same place. Filed Aug. 8, 1888. Serial No. 282,275. (No model.)

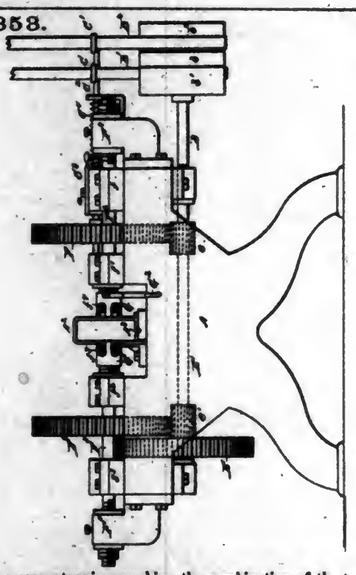
Claim.—1. In a screw-tapping machine, the combination, with a supporting-bed, of rotatable reciprocatory shafts or spindles, said spindles provided with taps and tightening-heads upon their adjacent ends, substantially as described.

2. In a screw-tapping machine the combination, with a supporting-bed, of rotatable and reciprocatory spindles provided with taps and tightening-heads, one of said heads made reciprocatory, substantially as described.

3. In a screw-tapping machine, the combination, with a supporting-bed, of rotatable reciprocatory spindles journaled thereupon and provided with taps and tightening-heads to embrace the work, one of said heads having a screw-threaded engagement upon the bed, whereby it may be moved to and from the work, substantially as described.

4. In a screw-tapping machine, the combination, with rotatable reciprocatory tap-spindles, of a driving-shaft geared with said spindles, a clutch-rod, C², a latch to engage one end of said clutch-bar, and a sliding block to raise said latch and release said clutch-bar, the said sliding block being operated by one of the gears upon the tap-spindles, substantially as set forth.

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5. In a screw-tapping machine, the combination of the tap-spindles F^1 F^2, having a screw-threaded engagement upon the supporting-bed of the machine, a shaft, E', geared with said spindles, and a driving-shaft geared with the shaft E', substantially as described.

6. In a screw-tapping machine, the combination, with suitably-journaled taps, of tightening-heads for clamping the work between said taps, substantially as set forth.

7. In a screw-tapping machine, the combination, with suitably-journaled taps, of tightening-heads for holding the work in position, said taps working through said heads, substantially as set forth.

8. In a screw-tapping machine, the combination, with the tightening-heads having a screw-threaded engagement with their supports, of suitably-journaled taps working through said heads, substantially as set forth.

9. In a screw-tapping machine, the combination, with rotatable reciprocatory tap-spindles, of a driving-shaft geared with said spindles, a clutch-rod, C^2, a spring-actuated latch to engage one end of said clutch-rod, a sliding block to raise said latch and release it from said clutch-rod, and a pin or arm having an adjustable engagement with said sliding block, the said sliding block operated by a gear upon the tap-spindles, substantially as set forth.

399,354. VEHICLE-WHEEL TIRE. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,639. (No model.)



Claim.—1. A tire having the tread portion made thicker than the felly-facing portion, in combination with a felly and means, substantially as described, for permitting of the inflation of the tire, substantially as and for the purposes set forth.

2. A hollow tire having a re-enforce applied to the tread portion, in combination with a felly and a cock secured into said felly and tire, substantially as and for the purposes set forth.

399,355. WHEEL-TIRE. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,640. (No model.)

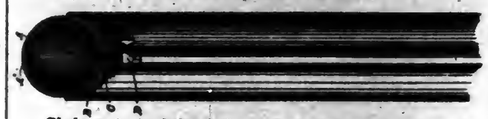


Claim.—1. A hollow tire of rubber or other material of uniform thickness, but with the tread portion thereof made tougher than the felly-facing portion, substantially as and for the purposes set forth.

2. An inflatable tire of rubber or other material of uniform thickness, but with the tread portion thereof tougher than the felly-facing portion, and provided with projections, substantially as and for the purposes set forth.

3. An inflatable tire having the tread portion thereof made tougher than the felly-facing portion, in combination with a felly having said tire secured thereto, substantially as described.

399,356. WHEEL-TIRE. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,641. (No model.)



Claim.—1. An inflated tire composed of two or more tubes closely fitted or nested within each other, substantially as and for the purposes set forth.

2. An inflated tire composed of two or more tubes closely fitted into or nested within each other and free to creep the one with respect to the other, substantially as described.

3. An inflated tire composed of two or more tubes closely fitted into or nested within each other, and the outer tube made wholly or in part of tougher material than the inner tube or tubes, substantially as described.

399,357. WHEEL-TIRE. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,642. (No model.)



Claim.—1. An inflatable tire composed of a sheet of flexible material, having the sides thereof enlarged and firmly held in grooves or countersunk channels formed in the sides or edges of a felly, substantially as described.

2. An inflatable tire composed of flexible material, having the sides enlarged, in combination with a felly having grooves or channels in the sides or edges thereof to receive the enlargements of the tire, and a tube with a cock secured into said felly, substantially as and for the purposes set forth.

3. An inflatable tire composed of flexible material, having enlarged sides or edges which engage in the grooves of a duplex felly, and means, substantially as described, for firmly holding said tire in position therein, substantially as and for the purposes set forth.

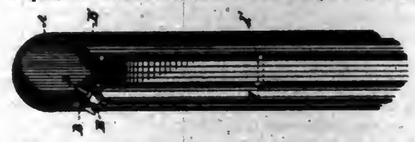
399,358. WHEEL-TIRE. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,643. (No model.)



Claim.—1. An inflatable tire sprung onto or into the felly and held by a band or bands of pliable material cemented or vulcanized to said tire or felly, or both, substantially as shown and described.

2. An inflatable tire sprung into a grooved felly and held therein by means of a pliable or elastic band or bands cemented or vulcanized to the tire and caused to circumscribe the surface of said felly, substantially as shown and described.

399,359. RIM AND TIRE FOR WHEELS. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,644. (No model.)



Claim.—1. A hollow flexible tire, in combination with a two-part felly, means, substantially as described, for clamping the tire to said felly, and a device for inflating said tire, substantially as and for the purposes set forth.

2. An inflatable tire, in combination with a two-part felly, a rim, and means for clamping said rim, tire, and felly together, substantially as shown and described.

3. A hollow flexible tire having the edges thereof firmly held together, in combination with a two-part felly and means for clamping said tire firmly between said felly, substantially as and for the purposes set forth.

399,360. WHEEL TIRE AND FELLY. AMOS W. THOMAS, Philadelphia, Pa. Filed June 30, 1888. Serial No. 278,645. (No model.)



Claim.—The combination of the non-inflatable flexible tire A, a rim interposed between the sides of said tire, rings B and B', and means, as described, for clamping said rim and rings to the sides of said tire, substantially as shown and described.

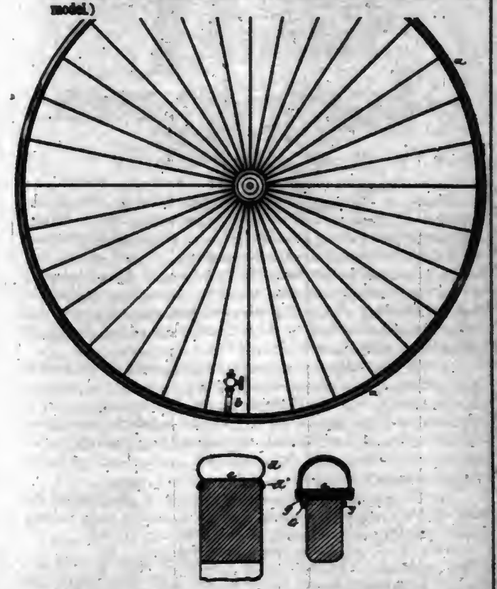
399,361. WHEEL TIRE AND FELLY. AMOS W. THOMAS, Philadelphia, Pa. Filed July 14, 1888. Serial No. 279,967. (No model.)



Claim.—1. A flexible or elastic hollow tire provided with ribs formed integral therewith and firmly secured in a felly adapted to receive said tire, and a tube with a cock extending through the body of said felly and tire, substantially as and for the purposes set forth.

2. An inflatable tire provided with ribs and a web, in combination with a two-part felly adapted to receive said tire, and means, as described, for securing the ribs of said tire in said felly and clamping the web thereof between the parts of said felly, substantially as and for the purposes set forth.

399,362. VEHICLE-WHEEL. AMOS W. THOMAS, Philadelphia, Pa. Filed Dec. 14, 1887. Renewed Feb. 1, 1889. Serial No. 298,419. (No model.)



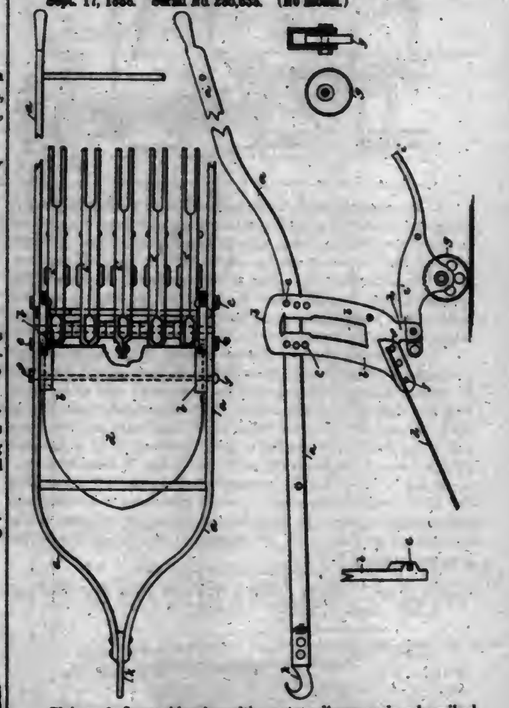
Claim.—1. A wheel provided with an inflatable tire having the sides or edges thereof secured between the double walls of the flanges of a rim or felly, substantially as and for the purposes set forth.

2. A wheel provided with an inflatable flexible tire having the sides thereof pinched and secured between the walls of flanges formed with a rim or felly and the flanges projecting inwardly from the periphery of said rim or felly, substantially as and for the purposes set forth.

3. A wheel provided with an inflatable flexible tire having the sides or edges secured between the walls of flanges mounted on a filling consisting of segments of wood or other material arranged between the rim and hoop of the wheel and said segments flanged so as to abut against one side of the rim, and means, as described, for securing the same to the wheel, substantially as described, and for the purposes set forth.

4. A wheel provided with a tire composed of a web of flexible material having the sides or edges secured between the walls of flanges formed with a rim and a tube provided with a cock for permitting of the inflation of said tire, substantially as described, and for the purposes set forth.

399,363. POTATO-DIGGER. ISLAS VANCE, Washington, Pa. Filed Sept. 17, 1888. Serial No. 285,632. (No model.)



Claim.—1. In combination with a potato-digger such as described, the separator consisting of a series of bars or sections, *i*, hinged at their forward end and each supported by a small wheel, *g*, arranged eccentrically in a manner that when the machine is in motion each section *i* is given a rapid vertical motion, as and for the purpose described.

2. In a potato-digger, the combination, with a shovel, of a separator consisting, essentially, of a series of horizontal bars hung at their forward ends beneath the rear end of the shovel, and each having a ground-wheel eccentrically hung thereon, substantially as and for the purpose described.

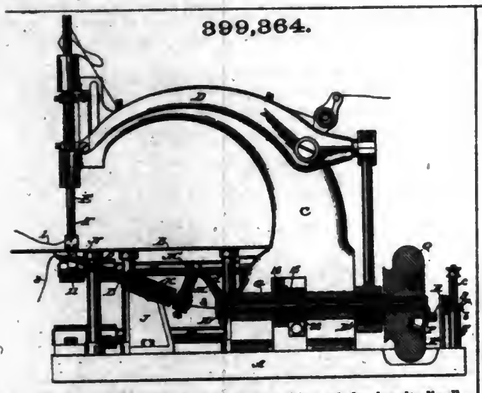
3. In a potato-digger, the combination of the depending hangers, an inclined shovel fixed thereto, and a series of horizontal bars arranged side by side and pivoted at their forward ends in the hangers beneath the rear end of the shovel, each of said bars having a ground-wheel eccentrically hung thereto for reciprocating said bars at irregular intervals in vertical planes, substantially as and for the purpose described.

399,364. SEWING-MACHINE. CHARLES W. WEBB, Brooklyn, assignor of one-half to Charles Kruse, New York, N. Y. Filed Dec. 8, 1887. Serial No. 257,310. (No model.)

Claim.—1. The combination, with the reciprocating needle in a sewing-machine, of a looper which has a rotary movement about its longitudinal axis and a simultaneous reciprocating movement in the direction of said axis, and which is formed with a longitudinal perforation extending through it, substantially in the manner and for the purpose herein set forth.

2. The combination, with the reciprocating needle in a sewing-machine, the main rotating shaft actuating the same, and a looper-shaft and looper mounted to rotate and reciprocate upon its longitudinal axis in front of the end of said main shaft and to traverse the path of the needle, of an arm projecting radially from the end of the main shaft outwardly at an angle therewith, and a crank-arm upon the proximate end of the looper-shaft coupled to said radial arm by a universal joint, substantially in the manner and for the purpose herein set forth.

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3. The combination, in a sewing-machine, of the longitudinally-perforated rotating shaft G, the longitudinally-perforated looper-shaft L, rotating and reciprocating upon its longitudinal axis at an angle with said shaft G, the mechanism, substantially as described, for actuating the looper-shaft by means of the rotation of the shaft G, the longitudinally-perforated looper N, carried by the shaft L, and the reciprocating needle T, traversing the line of movement of the looper, substantially in the manner and for the purpose herein set forth.

4. The combination, in a sewing-machine, of the longitudinally-perforated rotating shaft G, the longitudinally-perforated looper-shaft L, rotating and reciprocating upon its longitudinal axis at an angle with said shaft G, the crank-arm M upon the inner end of said looper-shaft, the outwardly-inclined radial arm I, fitted upon the proximate end of the shaft G and coupled to said crank-arm M by a universal joint, the curved longitudinally-perforated looper N, fitted to the opposite end of looper-shaft L, a reciprocating needle, T, traversing the line of movement of the looper to intersect the same, and mechanism, substantially as described, for actuating the needle by means of the rotation of the shaft G, all substantially in the manner and for the purpose herein set forth.

399,865. SKATE. JAMES A. WHELPLEY, Keene, N. H. Filed Apr. 2, 1888. Serial No. 269,270. (No model.)



Claim.—1. The toe-plate B, formed of a single piece of metal and provided with a hole, *g*, channel *k*, depression *i*, and holes *j j*, in combination with the piece H, runner A, and key I, substantially as shown and described.

2. A toe or heel plate provided with a depression, *i*, and holes *j j*, in combination with a runner having upwardly-projecting pieces provided with recesses *e* and notches *d*, and the nut I, substantially as and for the purpose set forth.

3. The lever D, provided with a straight slot, *p*, and two slots, *q q*, set at an angle to each other, the regulating screw-threaded bar F, bolt K, and adjustable heel-clamp G, in combination with the toe-clamps E E, provided with studs *n*, toe-plate B, provided with curved channel *k*, bolt J, upon which the lever D is free to turn, and also to travel longitudinally, and heel-plate C, provided with a slot, *m*, substantially as and for the purposes set forth.

4. The regulating-bar F, provided with a thumb-piece, *w*, in combination with the lever D, whereby the bar F is prevented from turning when the lever is locked, substantially as set forth.

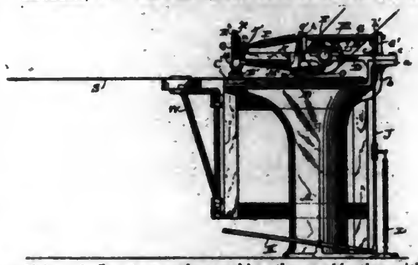
5. The piece H, in combination with the runner A, provided with the hooked recess *b*, and toe-plate B, provided with the hole *g*, substantially as and for the purpose set forth.

6. Toe or heel clamps provided at their upper edges with spurs that are upset in the process of stamping out the blank, substantially as set forth.

7. The toe-plate B, provided with the channel *k*, said channel being bent on a slight curve transversely of the skate, in combination with the toe-clamps D, bent to correspond thereto, substantially as and for the purpose set forth.

8. The actuating-lever D, provided at its forward end with a straight slot, through which is passed a bolt to secure it to the toe-plate, so that it is free to turn, and also to travel longitudinally, and also provided with two slots set at an angle to each other for operating the toe-clamps, the rear end of the lever being formed saddle-shaped to lock it onto the runner, substantially as shown and described.

399,866. SAW-HAMMERING MACHINE. ROBERT WHITEHILL, Milwaukee, Wis. Filed Mar. 6, 1888. Serial No. 266,310. (No model.)



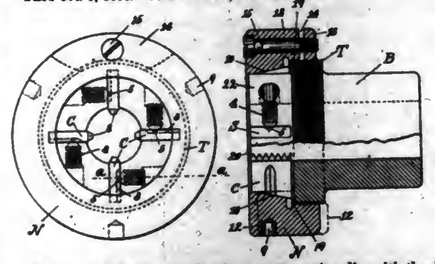
Claim.—1. In a hammering-machine, the combination, with the hammer-shank, of a cam for lifting the hammer, a supporting-collar connected thereto, and means for shifting the cam and supporting-collar, substantially as described.

2. In a hammering-machine, the combination, with the hammer of a tapering cam for lifting and releasing it, a collar for supporting the hammer when at rest, and means for shifting the cam and collar simultaneously, substantially as and for the purpose set forth.

3. The combination, with the hammer, of the tapering cam, a spanner suitably connected therewith, a rock-shaft from which the spanner depends, and a treadle and spring for operating the rock-shaft, substantially as and for the purpose set forth.

4. The combination, with the hammer, of the tapering cam and connected collar, a driving-shaft to which the cam is splined, and a spanner, rock-shaft, treadle, and spring for shifting the cam and collar, substantially as described.

399,867. SCREW-CUTTING DIE. JAMES R. WOODBRIDGE, Hartford, Conn., assignor to the Pratt & Whitney Company, same place. Filed Oct. 5, 1888. Serial No. 287,343. (No model.)



Claim.—1. The combination, in a screw-cutting die, with the die-body formed cylindrical at its forward end and having therein radially-disposed chaser-receiving slots and having a screw-thread rearward of said slots, of chasers contained in said slots, and an annular ring having an internal thread fitting the thread on said die-body, having a cylindrical bearing fitting the cylindrical forward end of said die-body, and having a conical portion between said cylindrical and threaded portions for taking the outward thrust of the chasers, all substantially as described.

2. The combination, in a screw-cutting die, with the die-body B, having the cylindrical forward part, 22, the thread T, and carrying the chasers C in the radial slots S, of the chaser-adjusting ring N, threaded to engage with the thread T, and having the inclined surface 10, for receiving the thrust of the chasers, and the cylindrical surface 20, bearing on said surface 22, substantially as described, and for the purpose specified.

3. The combination, in a screw-cutting die, of the threaded die-body and the chaser-adjusting ring having the slot 14, and a binding-screw extending across said slot, as set forth.

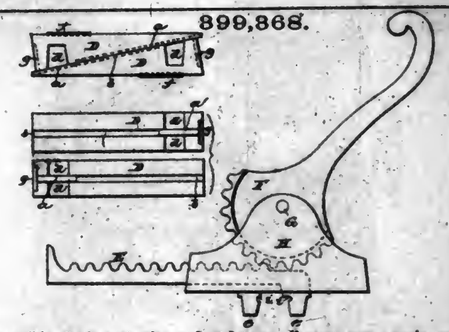
399,868. PRINTER'S QUOIN. MATHEW W. BERRYMAN, New York, N. Y., assignor to M. Nichols Johnson, same place. Filed June 11, 1883. Serial No. 97,633. (No model.)

Claim.—1. Printers' duplicate quoins whose inclined meeting faces present wide bearings and are provided with longitudinal guiding-ribs adjacent to their heads, and with corresponding guiding and retaining grooves extending longitudinally from such rib toward the thinner extremities of such duplicates.

2. Printers' duplicate wide-bearing quoins whose inclined meeting faces are each provided with a narrow longitudinal guide-rib adjacent to their heads, and a corresponding longitudinal guiding and retaining groove extending from such rib toward the other extremity, each head being provided with a recessed hold for a lever-key.

3. A printer's quoin provided with a base-grip consisting of a compressible elastic projecting pad set into or adherent upon a quoin and partially covering its base, substantially as described.

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4. In a printer's key for locking up recessed duplicate quoins, a lever carrying a segmental cogged periphery at one end articulating with a correspondingly-cogged longitudinal rack-bar, carrying on its under side a lug working in a slotted guide-frame, also provided with a corresponding lug on its under side, and all substantially constructed in the manner and for the purposes described.

5. In a locking-up device for securing printers' forms, the combination of mutually guided and guiding quoin parts acting by means of short head-ribs and long longitudinal mutually-guiding grooves extending toward their other extremity upon their meeting faces, together with a lever-key adapted to locking and unlocking the same by means of articulating lugs upon such key and receiving-recesses upon such quoins, all substantially as described.

399,869. CAR-AXLE LUBRICATOR. THOMAS B. BISHOP, Clifton, N. J. Filed Oct. 22, 1888. Serial No. 288,702. (No model.)



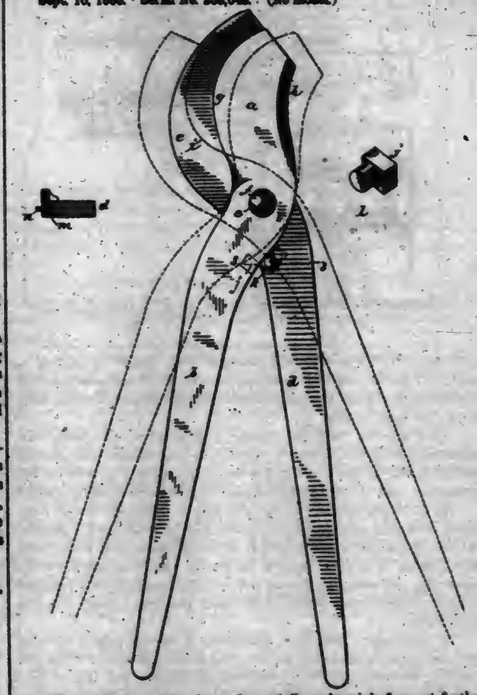
Claim.—1. In a car-axe lubricator, the combination, with the axle-box and the axle therein, of a stretching-plate having a concavity in its top and a flat surface on each side of said concavity, a continuous web passing over the top of said plate and the bottom of the box, the axle bearing on that portion of the web within the concavity in the plate, and a spring bearing at the bottom on the web and at the top against the plate, whereby the web is kept smooth under the axle.

2. In a car-axle lubricator, the combination, with the axle-box and the axle therein, of a stretching-plate slotted, as described, and having a concavity in its top and a flat surface on each side of said concavity, a continuous web passed through said slots and over the top of the plate, and also over the bottom of the box, the axle bearing on that portion of the web within the concavity in the plate, and a spring bearing at the bottom on the web and at the top against the plate, for the purpose stated.

3. In a car-axle lubricator, the combination, with the axle-box and the axle therein, of a stretching-plate of the full width of the interior of the box, slotted, as described, and having a concavity in its top and a flat surface on each side of said concavity, a continuous web, of the width of the part to be lubricated, passed through said slots and over the top of the plate, and also over the bottom of the box, the axle bearing on that portion of the web within the concavity in the plate, and a spring bearing at the bottom on the web and at the top against the plate, whereby the web is kept straight and smooth under the axle.

4. In a car-axle lubricator, the combination, with the box and axle, of a stretching-plate for the web, a continuous web passing over the top of said plate and over the bottom of the box, and a coil-spring provided with a hook for hooking up a number of the coils, the said spring pressing at the bottom on the web and at the top against the plate, as set forth.

399,870. PRUNING IMPLEMENT. ADAM BURR, Mercer, Pa. Filed Sept. 10, 1888. Serial No. 285,042. (No model.)



Claim.—The combination, substantially as hereinbefore set forth, of the cutting-jaw, its handle, the opposite jaw formed with a concave seat and a handle, the pivot-pin connecting the two jaws, the gage-blocks, their eccentric shanks seated in sockets in the handles and adjustable therein, and the set-screws engaging with the shanks for firmly securing the shanks in their sockets.

399,871. ASH-SIFTER. GEORGE W. BOWN, Philadelphia, Pa. Filed June 27, 1888. Serial No. 278,262. (No model.)



Claim.—1. The improved sifter herein described and shown, consisting of the casing A, having the bearings *a* and provided with the latch D, pivoted at *d* and provided with a slot, *d'*, the ring C, having trunnions journaled in bearings *a*, the spring-catches secured between their ends to the ring C and extended at such ends, whereby to engage the pan and sieve, and the pan and sieve, all substantially as set forth.

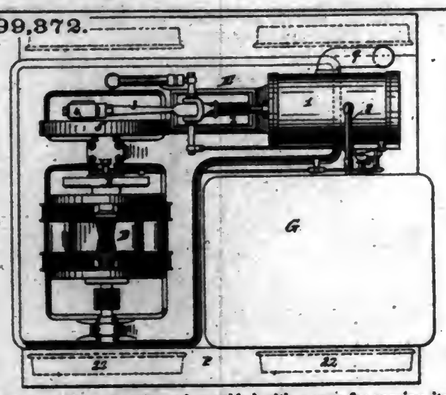
2. The sifter herein described, comprising the sieve having a shoulder or catch, *g*, the pan having handles F', the ring C, formed to fit over the pan below the handles F', and having the clamps E, engaging the shoulder or catch *g*, the trunnions on ring C, and the casing having bearings for said trunnions, substantially as set forth.

399,872. ELECTRIC-RAILWAY SYSTEM. CHARLES S. BRADLEY, Yonkers, N. Y. Filed Aug. 9, 1888. Serial No. 282,286. (No model.)

Claim.—1. The combination of a prime mover provided with means for automatically regulating its consumption of energy proportionally to the load and dependent thereon and a dynamo-electric generator driven thereby and provided with means for varying its potential, both located on a moving vehicle, and an electric motor energized by said generator and constituting the propelling device for said vehicle.

2. The combination of a prime mover provided with means for automatically regulating its consumption of energy proportionally to the load and dependent thereon and a shunt-wound dynamo-electric

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generator driven thereby and provided with means for varying its potential, both located on a moving vehicle, and a series-wound electric motor energized by said generator and constituting the propelling device for said vehicle.

3. A wheeled vehicle or car carrying a prime mover and a dynamo-electric generator driven thereby, in combination with another vehicle having as its motive power an electric motor energized by said generator, said vehicles being coupled together in a suitable manner.

4. A wheeled vehicle or car carrying a prime mover and a dynamo-electric generator driven thereby, said generator being adapted for the regulation of its potential, in combination with another vehicle having as its motive power an electric motor energized by said generator, and means on the latter vehicle for regulating the potential of the said generator, both vehicles being coupled together in a suitable manner.

5. An electric locomotive comprising a wheeled vehicle carrying two independent prime movers, two independent dynamo-electric generators, respectively driven by said prime movers, and two or more electric motors constituting the immediate motive power of said vehicle, in combination with switching mechanism adapted to connect any motor with either of said dynamo-electric generators.

6. A wheeled vehicle or car carrying, first, a gas-engine provided with means for automatically regulating its consumption of energy proportionally to the load; secondly, means of supplying the same with gas or vapor, and, thirdly, a dynamo-electric generator having means of varying the strength of its field magnetism and driven by said gas-engine, in combination with an electric motor energized by said generator and constituting the propelling-power of said vehicle.

7. A wheeled vehicle or car carrying, first, a gas-engine; secondly, means of supplying the same with gas or vapor, and, thirdly, a dynamo-electric generator driven by said gas-engine, in combination with a second vehicle or car carrying an electric motor energized by said generator and constituting the motive power, both vehicles being coupled together.

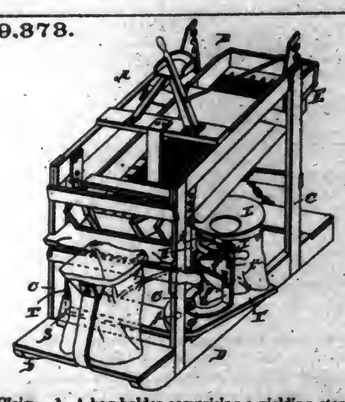
8. A wheeled vehicle or car carrying a gas-engine, provided with means for automatically regulating its consumption of energy proportionally to the load and dependent thereon, means for supplying the same with gas or vapor, and a dynamo-electric generator driven by said gas-engine, and having means of varying the strength of its field magnetism, both engine and generator being maintained in continuous rotation while in transit, in combination with an electric motor energized by said generator and constituting the propelling-power of said vehicle, and suitable connections for closing the circuit of the dynamo through the motor at will.

9. An electric locomotive comprising a wheeled vehicle carrying two or more independent gas-engines, a gas-supply therefor, and two or more independent dynamo-electric generators, respectively driven by said gas-engine, and two or more electric motors constituting the immediate motive power of the locomotive, and arranged in combination with switching devices adapted to connect any motor with either generator and transfer one generator as motor into the circuit of the other generator for the purpose of starting its engine.

10. In a plant for the generation and utilization of electrical energy, the combination of a prime mover, a dynamo-electric generator, and an electric motor energized thereby, both said dynamo-electric generator and motor having each a dynamic capacity in excess of that of the prime mover, whereby the maximum effort of the prime mover may be exerted either in tractive force or speed on the part of the electric motor.

399,373. BAG-HOLDER. JAMES M. BRADSHAW and WILLIAM R. MIER, Bastonville, Cala. Filed Aug. 16, 1888. Serial No. 282,895. (No model.)

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Claim.—1. A bag-holder comprising a yielding standard having a longitudinal slot at its upper end, an angular head, a bolt passed through the head and the slot in the standard to adjustably secure the head to the standard, and a lever supported at a slight distance from the said standard and carrying bag-retaining prongs, as set forth.

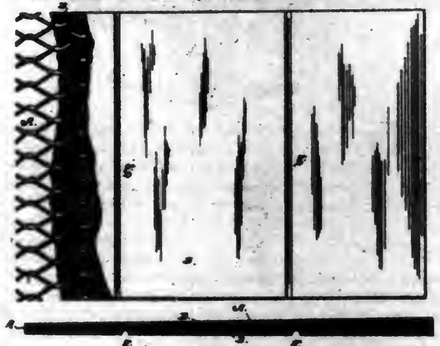
2. A bag-holder comprising a support, a yielding standard arranged a slight distance from said support, a lever mounted on said support, and bag-retaining prongs carried by said lever, as set forth.

3. A bag-holder comprising a yielding standard, a vertically-adjustable support arranged a slight distance from the yielding standard, a lever mounted on said support, bag-retaining prongs carried by said lever, and a spring having one end secured to said support and its other end bearing against the under side of the lever, as set forth.

4. The combination of the horizontally-swinging base, the standards erected thereon, the plate H, adjustably secured to said standards, the lever pivoted to said plate, and the bag-retaining prongs carried by said lever, as set forth.

5. The combination of the standards G G, the plate H, secured to said standards and adjustable vertically thereon, the guides i' i^2 on said plate, the lever pivoted on the plate and projecting through the guide i^2, and the bag-retaining prongs carried by the lever and extending through the guide i', as set forth.

399,374. ARTIFICIAL SLATE. CALVIN BROWN, San Francisco, Cal., assignor of one-half to John H. Miller, same place. Filed Jan. 7, 1888. Serial No. 260,052. (No model.)



Claim.—1. As a new article of manufacture, an artificial slate consisting of an interstitial metallic web and a covering of set plastic material, as set forth.

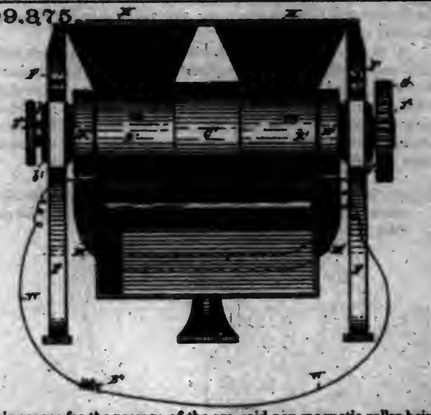
2. As a new article of manufacture, an artificial slate consisting of an interstitial metallic web and coverings of set plastic material on both sides tapered from one end to the other, as set forth.

3. As a new article of manufacture, an artificial slate consisting of an interstitial metallic web and a covering of set plastic material on both sides, one side having transverse grooves therein, as set forth.

399,375. MAGNETIC SEPARATOR. JAMES A. BURDEN, Troy, N. Y. Filed Jan. 18, 1888. Serial No. 260,726. (No model.)

Claim.—1. In an apparatus for separating magnetite from a non-magnetic gangue, the combination, with an iron roller that is made in two parts and having an intermediate coupler of non-magnetic material, said iron roller at its outer ends being within the excited field of an electro-magnet and provided with journals and insulated journal-bearings, and having an insulated pulley at one end, of a non-magnetic roller arranged by the side of the metal roller, with an intervening space for the passage of the ore, said non-magnetic roller being provided with journaled ends having bearings and constructed to receive motion, and with a pulley and belt to transmit the same to the insulated pulley of the metal roller, substantially in the manner as and for the purposes set forth.

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2. In an apparatus for separating magnetite from a non-magnetic gangue, the combination, with an iron roller that is made in two parts having an intermediate non-magnetic coupler, said iron roller at its outer ends being within the excited field of an electro-magnet and provided with journals having insulated bearings, with an insulated pulley at one end, of a non-magnetic roller arranged by the side of the iron roller with an intermediate passage for the ore, said non-magnetic roller being provided with journaled ends and bearings and constructed to receive motion, and with a pulley and belt to transmit power to the iron roller-pulley, a chute arranged beneath the metal roller, and a chute arranged beneath the non-magnetic roller, substantially in the manner as and for the purposes set forth.

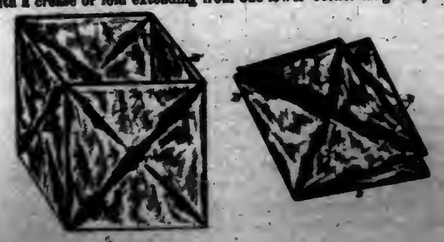
3. In an apparatus for separating magnetite from a non-magnetic gangue, the combination, with an iron roller made in two parts connected by a non-magnetic coupler, said iron roller at its outer ends being within the excited field of an electro-magnet and provided with journals having insulated bearings with an insulated pulley at one end, of a non-magnetic roller arranged by the side of the iron roller with an intermediate space for the passage of the ore, and being provided with journaled ends having bearings, an actuating-gear at one end and a pulley and belt connecting with the pulley of the iron roller at the other end, a chute leading from the iron roller, and a chute leading from the non-magnetic roller, which latter chute is provided with an interiorly-placed exhaust-fan, substantially as and for the purposes set forth.

4. The combination, with the iron roller R', made in two parts, connected by a non-magnetic coupler, C', and having the end journal, J', of the electro-magnet M', having its pole ends adjacent to the outer ends of the roller, and slotted at its pole ends for the side insertion of the roller-journals, insulated bearings for said journals outside of where passing through the electro-magnet, and stoppers S', made to close said slots where not occupied by the journals, as and for the purposes set forth.

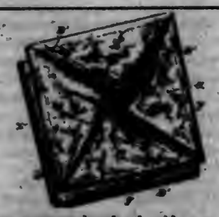
399,376. POCKET-BOOK. RALDY A. GAPENARY, Washington, D. C., assignor of one-half to J. Reed Littell, same place. Filed Nov. 26, 1888. Serial No. 291,894. (No model.)

Claim.—1. A pocket-book of the class described comprising the bottom portion and connected sides projecting from the same, each side being relatively creased or folded diagonally from one lower corner to the opposite top corner, substantially as and for the purpose set forth.

2. A pocket-book of the class described comprising the bottom portion and sides projecting from the same, each side being provided with a crease or fold extending from one lower corner diagonally to



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the opposite upper corner, whereby the sides are adapted to fold and overlap one another above the bottom, and with a crease extending diagonally at right angles to the main crease and adapted to enhance the flexibility of the sides in opening or closing, substantially as set forth.

3. A pocket-book having the bottom and relatively creased sides adapted to fold and form double overlaps, substantially as set forth, whereby outward pressure of the coin locks the overlaps more securely in position.

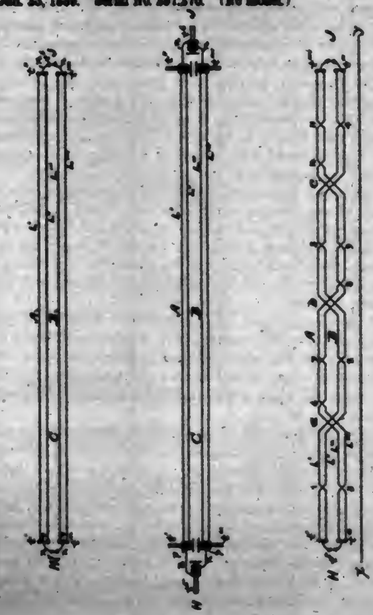
4. An angular pocket-book of the class described having the bottom and sides, each side being diagonally creased and adapted to fold downwardly and inwardly over the bottom, so that each side diagonally covers one-half the bottom portion, with the lower half of the side forming the under lap and the upper half of the side forming the upper lap, and one half of each side projecting over the adjoining half of the next side, whereby double overlaps for retaining the coin are formed, substantially as and for the purpose set forth.

5. In a pocket-book of the class described, the combination of a bottom piece and the side portion forming the sides and provided with the projecting edge extending around and projecting inwardly at the bottom, to which edge the bottom piece is secured, substantially as set forth.

6. In a pocket-book of the class described, the combination of the side portion forming the sides and provided with a projecting edge extending around and projecting inwardly at the bottom, the outer bottom piece secured to said edge forming the outer surface of the bottom, and the corresponding inner bottom piece secured inside the pocket-book and forming the inner surface of the bottom, substantially as set forth.

7. In a pocket-book of the class described, the combination of the outer bottom piece, *a*, secured inside the pocket-book, the inner bottom piece, *a'*, and the side portion forming the sides and constructed of a double strip of leather or other flexible material and having a projecting edge at the bottom received between the outer and inner bottom pieces, *a* and *a'*, the sides being diagonally creased, substantially as and for the purpose set forth.

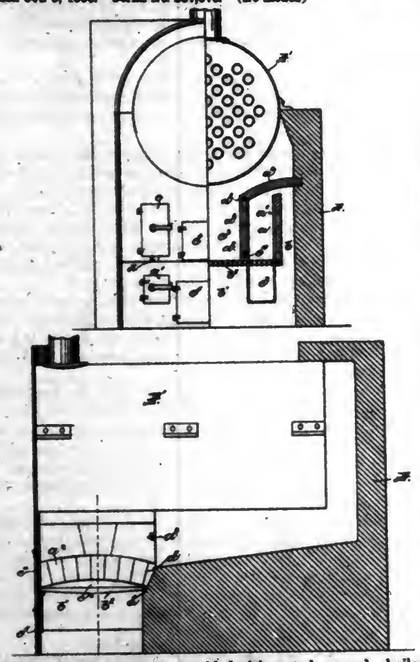
399,377. ELECTRIC CIRCUIT. JOHN J. CARTY, New York, N. Y., assignor to the American Bell Telephone Company, Boston, Mass. Filed Jan. 23, 1889. Serial No. 297,370. (No model.)



Claim.—1. In a telephone system, an electrical circuit consisting of two pairs of main lines, the lines composing each pair being transposed at intervals, and said pairs being transposed at intervals.

2. An electrical circuit or system of circuits consisting of two pairs of main lines, the outgoing and return conductors of each pair being transposed at intervals, and said pairs being transposed at intervals, in combination with electrical instruments for producing currents in each pair and an electrical instrument for producing currents in all of the lines, substantially as described.

399,378. COKING-FURNACE. GATES A. CLARK, Rochester, N. Y., assignor to Clark's Coking and Smokeless Furnace Company, same place. Filed Oct. 3, 1888. Serial No. 287,078. (No model.)



Claim.—1. The furnace A, provided with grate-bars, and a boiler supported by said furnace, combined with coking-ovens *a*, composed of the inner wall, a^7, forming with the wall of the furnace the passage *a*, and the outer wall forming with the grate-bars a passage, c^{10}, and with a door or opening in the furnace-wall substantially in line with the said passage, substantially as and for the purpose specified.

2. The furnace A, provided with grate-bars, and a boiler supported by said furnace, combined with coking-ovens *a*, composed of the inner wall, a^7, forming with the wall of the furnace the passage *b*, the outer wall formed by the slabs a^8 and arch a^9, of refractory material, and the top a^4, and the arch a^5, forming with the grate-bars a passage, c^{10}, substantially as and for the purpose specified.

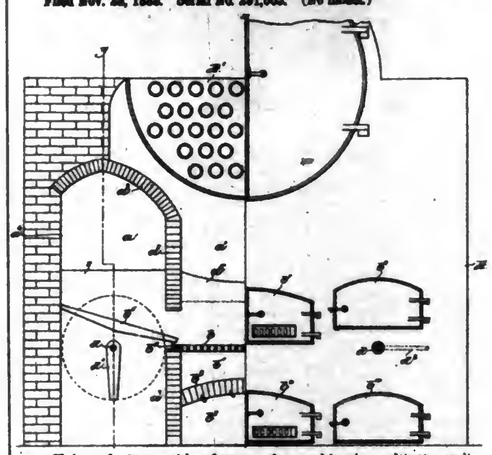
3. The furnace A, provided with stationary grate-bars, and a boiler supported by said furnace, combined with a coking-oven having its wall adjacent to the combustion-chamber of the said furnace made to form with the stationary grate-bars a passage, c^{10}, and a flue or passage located within said furnace and connecting the said coking-oven with the ash-pit of the furnace below the said grate-bars, as and for the purpose specified.

4. A furnace provided with a combustion-chamber, a coking-chamber, a partition-wall separating said chambers and having a normally-open passage-way connecting said chambers, and a flue or passage-way located within the said furnace and leading from the coking-chamber below the grate of the combustion-chamber, substantially as described.

5. In a coking-furnace, a combustion-chamber and its grate-bars, combined with a communicating coking-chamber having one wall constructed to leave a passage near the top or arch of the coking-chamber and constitute between the said wall and the wall of the furnace a flue through which to lead the volatile products generated from the coal in the coking-furnace to a point below the grate-bars of the combustion-chamber, the wall separating the coking-chamber from the combustion-chamber being provided at its lower end with an open passage, c^{10}, through which the coke may be discharged from the coking-chamber into the combustion-chamber, and a door or opening in the furnace-wall substantially in line with the said open passage, substantially as and for the purposes set forth.

6. The furnace A, provided with stationary grate-bars, and a boiler supported by said furnace, combined with a coking-oven having its wall adjacent to the combustion-chamber of the said furnace provided with a passage, c^{10}, and with stationary grate-bars in said coking-oven, and a flue or passage located within the said furnace and connecting the said coking-oven with the ash-pit of the furnace below the said grate-bars, as and for the purpose specified.

399,379. COKING-FURNACE. GATES A. CLARK, Rochester, N. Y., assignor to Clark's Coking and Smokeless Furnace Company, same place. Filed Nov. 22, 1888. Serial No. 291,603. (No model.)



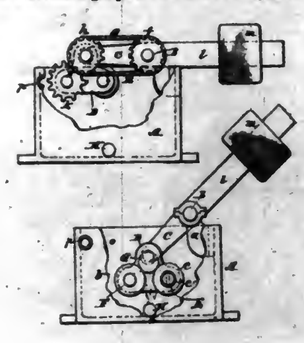
Claim.—1. In a coking-furnace, the combination, with the walls of the furnace and the walls a^6 a^7, forming the side walls of a coking-oven within said furnace, of a bridge-wall, a^3, provided with a passage communicating with the fire-box below the grate, the said bridge-wall forming with a wall of the furnace an exit-flue for the coking-oven communicating with the passage in the bridge-wall, substantially as described.

2. In a coking-furnace, the combination, with the walls of the furnace and the walls a^6 a^7, forming the side walls of a coking-oven within said furnace, of a bridge-wall, a^3, provided with a passage communicating with the fire-box below the grate, and a roof for said passage extended into the ash-pit, the said bridge-wall forming with a wall of the furnace an exit-flue for the coking-oven communicating with the passage in the bridge-wall, substantially as described.

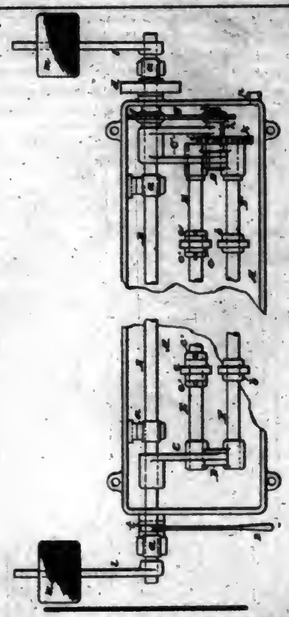
399,380. PROCESS OF TOUGHENING STEEL AXLES. JOHN COFFIN, Johnstown, Pa., assignor to The Cambria Iron Company, of Pennsylvania. Filed Mar. 10, 1888. Serial No. 266,827. (No model.)

Claim.—1. The within-described process of toughening steel axles, consisting of cooling off a forged axle, then reheating it, then placing it on rotating devices that revolve it, and simultaneously with its revolution spraying jets of cold water or other cooling-liquid on the axle through its entire length, and finally removing the axle while it has sufficient contained heat to render it uniformly of a low red color in the dark.

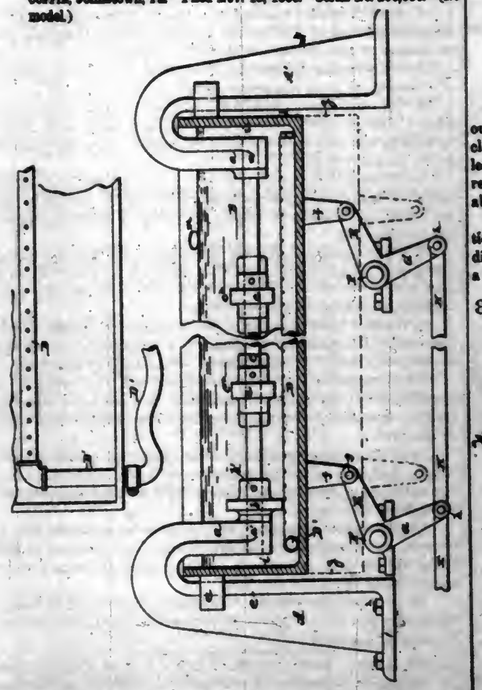
2. The within-described process of toughening steel axles, consisting in cooling off a forged axle, then reheating it, then rapidly rotating the axle, and simultaneously with its revolution spraying jets of cold water or other cooling-liquid on the axle through its entire length.



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399,381. APPARATUS FOR TOUGHENING STEEL BARS. JOHN COFFIN, Johnstown, Pa. Filed Nov. 13, 1888. Serial No. 290,690. (No model.)



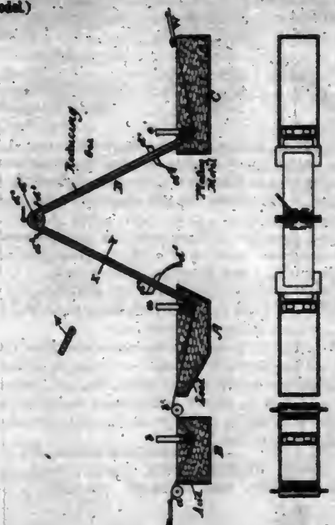
Claim.—1. The combination, with a frame and a cradle carried thereby for supporting the article to be toughened, and mechanism for rotating the article, of a water-container located below the cradle, and devices for elevating the container.

2. The combination, with a frame, a stationary cradle supported thereby, and devices for rotating the article carried by the cradle, of a water-container located under the cradle, and mechanism for raising the container up to the cradle, substantially as set forth.

3. The combination, with a frame and a stationary cradle carrying a rotating mechanism, of a vertically-movable bosh of water beneath the rotating mechanism, and means for raising this bosh until the rotating mechanism is submerged by the water therein, substantially as set forth.

4. The combination, with a supporting-frame and a stationary cradle carrying an axle-rotating mechanism, of a vertically-movable bosh, means for raising the latter until its contained water submerges the axle on the revolving mechanism, and a spray-pipe to cause jets to impinge upon the axle, substantially as set forth.

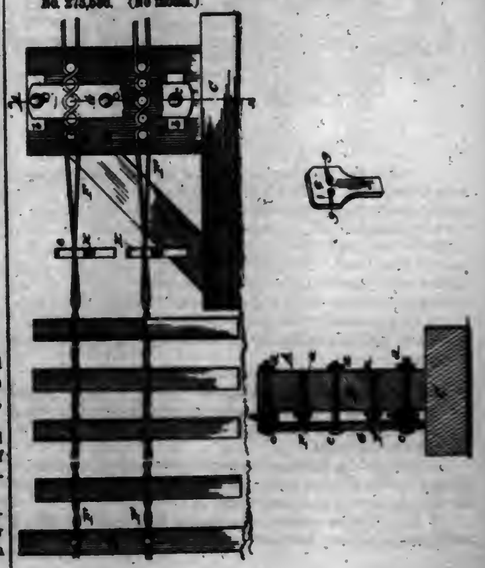
399,382. PROCESS OF CONTINUOUSLY ANNEALING AND PLATING WIRE. JOHN COFFIN, Johnstown, Pa., assignor to The Cambria Iron Company, of Pennsylvania. Filed July 26, 1888. Serial No. 281,304. (No model.)



Claim.—1. The process of annealing and plating wire by continuous operation, consisting in passing the wire, first, through a suitable cleaning-bath of acid; second, through an annealing-bath of red-hot lead or other medium; third, through a sealed conduit filled with reducing-gas, and, fourth, through a bath of molten zinc or other suitable plating-metal, substantially as and for the purpose set forth.

2. The process of annealing and plating wire by continuous operation, consisting in passing the wire through an annealing-bath, thence directly through a conduit filled with reducing-gas, and thence through a bath of plating-metal, substantially as and for the purpose set forth.

399,383. TENSION DEVICE FOR USE IN MAKING FENCES. GARRIE D. COMER, Keiter's Store, Va. Filed May 11, 1888. Serial No. 273,586. (No model.)



Claim.—The improved wire-tension device, consisting of the vertical standard B, having a broad base, C, to which it is rigidly secured, the removable guard-plate G, rigidly secured to said standard in vertical and parallel position, spacing-blocks *b*, interposed between the plate and standard, and the pins *a*, inserted through the standard and projecting from its face in two horizontal rows arranged between the upper and lower ends of the guard-plate, as shown and described.

399,384. FEED-GAGE FOR PRINTING-PRESSES. LUTHER COLBURT, Oak Park, Ill. Filed Jan. 6, 1888. Serial No. 260,019. (No model.)



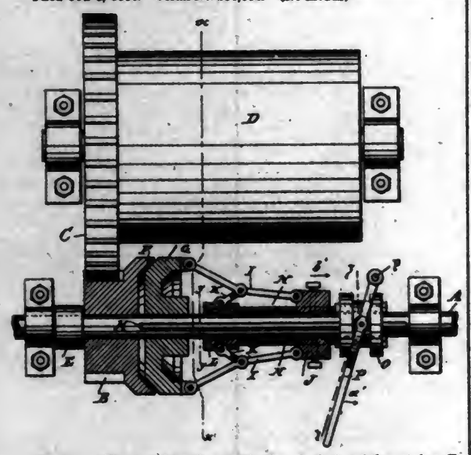
Claim.—1. A gage for printing-presses, comprising a head or gage and integral elastic portions provided integrally with engaging-points adapted to be inserted in the tympan-sheet to fix the position of the gage by the reaction of said elastic portions, substantially as described.

2. In a gage for printing-presses, the combination of the head or gage portion *a*, flexible bars *b* and *b'*, and laterally-extending points connected with said bars, substantially as set forth.

3. In a gage for printing-presses, the combination of the head or stop *a*, side bars, *b* and *b'*, laterally-extending points *d* and *d'*, and central guide-bar, *c*, substantially as set forth.

4. In a gage for printing-presses, the combination, with the gage-body having flexible side bars armed with engaging-points, of a guide-bar, *c*, adapted to puncture the tympan-sheet, and so serve as a guide, that the gage may be secured with relation to the tympan-sheet at any desired point within the length of said guide-bar, substantially as described.

399,385. FRICTION-CLUTCH. DANIEL T. DENTON, Soudan, Minn. Filed Oct. 1, 1888. Serial No. 286,532. (No model.)



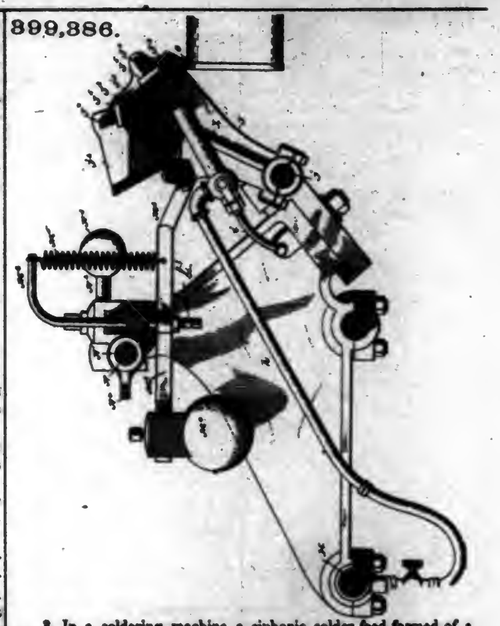
Claim.—The combination, with the shaft A, of the pinion B, loose thereon and provided with the friction-flange F, the friction clutch-wheel G, mounted to slide on the shaft, the fixed collar J on the shaft, provided with apertures parallel with the shaft, the sliding collar L on the shaft between wheel G and collar J, the toggle-links K, connecting the toggle-links at their joints with the collar L, the sliding collar O, the rods extending therefrom through the apertures in collar J to the collar L, a tongue-and-groove connection between said shaft, the wheel G and collars, and the shifting-lever for operating collar O, substantially as set forth.

399,386. SOLDERING-MACHINE. EDWARD J. DOLAN, Philadelphia, Pa., assignor, by mesne assignments, to the Bureau Can and Manufacturing Company, of Delaware. Filed Sept. 18, 1888. Serial No. 285,730. (No model.)

Claim.—1. A soldering-instrument consisting of a number of separate bodies affording capillary interstices for the passage of molten solder, substantially as described.

2. In a soldering-machine, a solder-feed formed of a plurality of wires, substantially as described.

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3. In a soldering-machine, a siphonic solder-feed formed of a plurality of wires, substantially as described.

4. A solder-feeder consisting of a number of separate bodies arranged in the form of a siphon and affording capillary interstices for the passage of molten solder, substantially as described.

5. In a soldering-machine, a capillary siphonic solder-feed formed of a plurality of wires compressed, substantially as described.

6. The combination, with the solder-holder, of a plurality of wires, a plate for holding said wires against said holder, and means for holding said plate upon the wires and holder, substantially as and for the purpose specified.

7. The combination, with the solder-holder and the longitudinal bars above the same, of the plate, the wires between said plate and the holder, and keepers for holding said plate in position, substantially as described.

8. The combination, with the solder-holder and the longitudinal bars above the same, of the plate, the plurality of wires between said plate and holder, and the wedges between the bars and plate, substantially as and for the purpose specified.

9. A solder-feeder formed of a plurality of separate bodies, affording capillary interstices for the passage of molten solder, with one end forming the point of the soldering-iron, substantially as described.

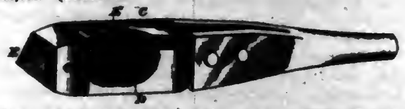
10. A combined siphonic solder-feeder and iron formed of a plurality of separate bodies arranged near each other and affording capillary interstices for the passage of the molten solder, substantially as described.

11. In a soldering-machine, a solder-holder and a solder-feeder composed of a plurality of wires arranged in the form of a siphon, one end of the said wires forming the point of the soldering-iron, substantially as described.

12. In a soldering-machine, the solder-holder, combined with a soldering-iron consisting of a plurality of wires having one end in said holder and the other end extending to the position of the parts to be soldered, substantially as described.

13. In a soldering-machine, a combined capillary solder-feeder and iron formed of a plurality of tinned wires, substantially as and for the purpose described.

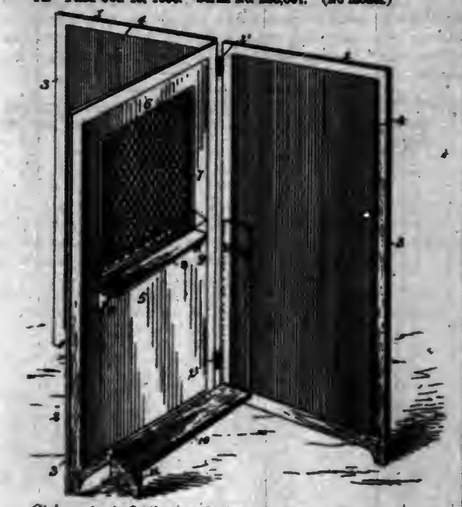
399,387. HAND SOLDERING-IRON. EDWARD J. DOLAN, Philadelphia, Pa., assignor, by mesne assignments, to the Bureau Can and Manufacturing Company, of Delaware. Filed Oct. 13, 1888. Serial No. 288,001. (No model.)



Claim.—1. A hand soldering-iron composed of a head, a handle, and a plurality of separate metallic bodies forming an absorbent core and projecting beyond said head, substantially as described.

2. As a new article of manufacture, the herein-described hand soldering-iron, comprising, in combination, a handle, a head provided with a central chamber open at the end of the iron, and a series of parallel wires held within the chamber, the ends of the wires being extended beyond the open end of the chamber and formed into a soldering-point, substantially as and for the purpose described.

399,388. FOLDING CONFESSIONAL. JAMES J. DUNN, Meadville, Pa. Filed Oct. 15, 1888. Serial No. 288,067. (No model.)

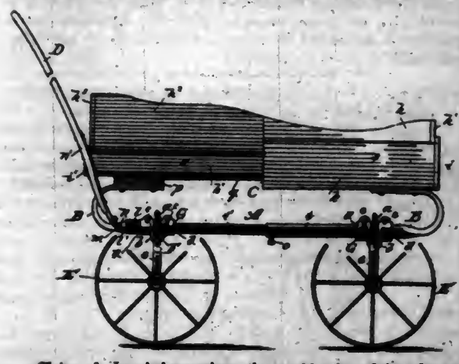


Claim.—1. A folding confessional consisting in a middle screen having a window or opening in its upper part and the outer screens hinged to the same vertical edge of the middle screen, substantially as set forth.

2. A religious confessional consisting of a series of screens hinged together to be folded up and set up on end in unfolded position, one of the screens forming an intervening screen having a confessional window or opening, a foldable hand-rest attached to the screen beneath the window, and on the opposite side beneath the window a folding hand-rest for the confessor, and a foldable kneeling-stool beneath the hand-rest attached to the confessional, substantially as shown and described.

3. A religious confessional consisting of screens 1 1 and 2, connected together by hinges 2', the screens 1 1 being formed of frames 3, having a light material stretched over them, and the screen 2 being formed of a frame, 3, having a rigid panel, 5, an opening, 6, covered by a grating, 7, foldable hand-rests 8, hinged to screen 2 beneath opening 6, and having depending foldable bracket-supports 9 hinged to their ends, and a kneeling-stool consisting of board 10, hinged at one end to screen 1 to fold up against the latter, and having a foldable hinged leg or support, 11, the screens, hand-rest, and kneeling-stool being foldable together, substantially as shown and described.

399,389. BABY-CARRIAGE. WILLIAM H. DUHN and HARRIETT H. DUHN, Chicago, Ill., assignors of one-half to Charles S. Harmon, same place. Filed Nov. 27, 1888. Serial No. 292,057. (No model.)



Claim.—1. In a baby-carriage, the combination of the telescoping side bars, A, telescoping body C, mounted thereon, and crank-shaped axles F, adjustable to raise and lower the wheels with respect to the body, substantially as described.

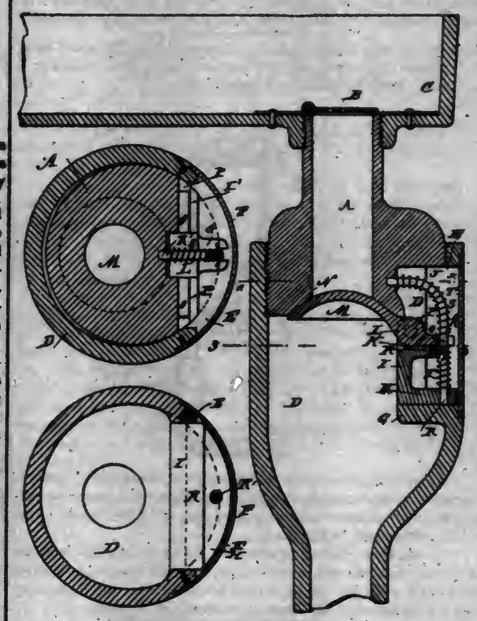
2. In a baby-carriage, the combination, with the telescoping side bars and body, of the jointed handle D, attached to the vehicle outside the lateral confines of the side bars, whereby it may fold over outside the confines of the body, substantially as described.

3. In a baby-carriage, the combination of the telescoping side bars, A, having curved extensions B, telescoping body C, mounted on the extensions B, and crank-shaped axles F, adjustably connected to the side bars, substantially as described.

4. In a baby-carriage, the combination, with the telescoping side bars of the telescoping and folding body C, mounted thereon, and comprising the forward box, *c*, having the guides *r*, sides *k*, and end *i*, extensions *k' k'*, hinged to the sides *k*, and foot-piece *g*, hinged to a part, *k'*, and the rear box, *c'*, having the tongues *q*, sides *k'*, and end *i*, extensions k^2 k^2, hinged to the sides *k'*, and rear piece, *g'*, hinged to a part, k^2, substantially as described.

5. In a baby-carriage, the combination, with the carriage-body, of an axle, F, mounted revolubly in bearings transversely of the vehicle and provided toward opposite ends with crank-shaped extensions *e*, whereby the hubs of the wheels when mounted thereon are out of line with the main part of the axle and may be raised and lowered with reference to the body of the vehicle by turning the axle in its bearings, and a fastening device for securing the axle against turning when desired, substantially as described.

399,390. GAS-CHECK FOR WATER-PIPES. HENRY R. HARRISON, New York, N. Y. Filed June 15, 1888. Serial No. 277,203. (No model.)



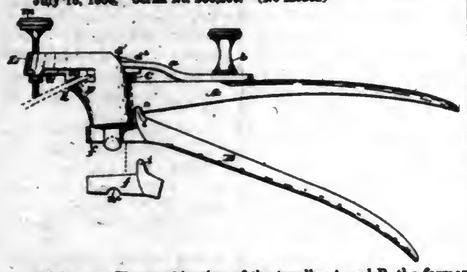
Claim.—1. A trap of the character described constructed with a closed side chamber, J, having a transverse slot, K, in its inner wall, and provided with a flap-valve, M, having a pivot-hub, L, adapted to turn in while closing the slot K, substantially as shown and described.

2. A trap of the character described formed of an upper pipe-section, A, having a downward extension, I', provided with open bearings P, a lower pipe-section, D, having a side opening, E, and rest G, an internal flap-valve pivoted in the bearings P, and removable filling-block I, interposed between the rest G and extension I', substantially as shown and described.

3. A trap of the character described provided with a closed side chamber, J, having a transverse slot, K, in its inner wall, and a lip, R, at the bottom of the slot K, and a flap-valve, M, having a pivot-hub, L, mounted in said slot, and a bearing-arm, Q, adapted to the lip R, substantially as described.

4. The combination, with a trap-body provided with a side chamber, J, separate from the interior, and having a slot, K, in its inner wall, of an internal flap-valve, M, pivoted to turn in while closing the slot K, and having an outward-projecting arm, Q, a fixed guide, E', on which the arm Q works, and a valve-operating spring on the guide E', substantially as described.

399,391. SAW-SETTING DEVICE. ADOLPH EPPINGER, LEVI L. DEWEESE, CHARLES W. KOONS, and WILLIAM H. METZGER, Canton, Ohio, said Koons and Metzger assignors to said Ellinger and Deweese. Filed July 16, 1888. Serial No. 280,299. (No model.)

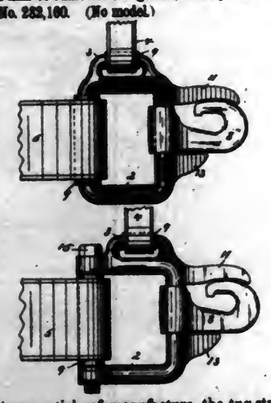


Claim.—1. The combination of the handles A and B, the former having the groove *c*, adapted to receive the rib *i* upon the latter, the die *d'*, provided with the extension d^2 and the link *g*, the anvil provided with the beveled portion *k*, the gage *a*, and the spring C, substantially as and for the purpose set forth.

2. The combination of the handles A and B, the anvil D, formed integral with the handle A and provided with the aperture *h*, the die *d'*, the link *g*, and the sliding gage K, provided with the beveled heads *a*, substantially as and for the purpose specified.

3. The combination of the handles A and B, the anvil D, provided with the beveled portion *k*, the die *d'*, the link *g*, the gage-screw *m*, and the lock-lever O, substantially as and for the purpose specified.

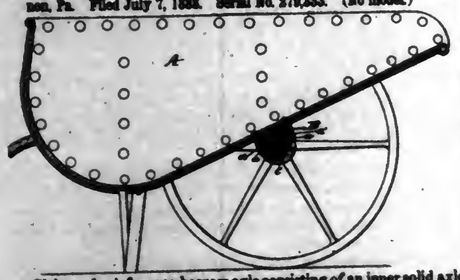
399,392. HARNESS-HOOK. EDWARD ELLIOTT, Stillwater, Minn., assignor of one-half to James P. Fitzgerald, same place. Filed Aug. 7, 1888. Serial No. 282,160. (No model.)



Claim.—1. As an article of manufacture, the tug-strap hook, as described, consisting of the frame, the hook 8, swiveling on said frame, and the horn 11 upon said frame projecting over the opening in the hook, substantially as described.

2. In a device of the class described, the combination of the frame 2, the hook 8, swiveled on said frame, the horn 11 upon said frame projecting over the opening in said hook, and the bolt 15, forming the front member of said frame, substantially as set forth.

399,393. FURNACE-FILLING BARROW. THOMAS FAILER, Lebanon, Pa. Filed July 7, 1888. Serial No. 279,333. (No model.)



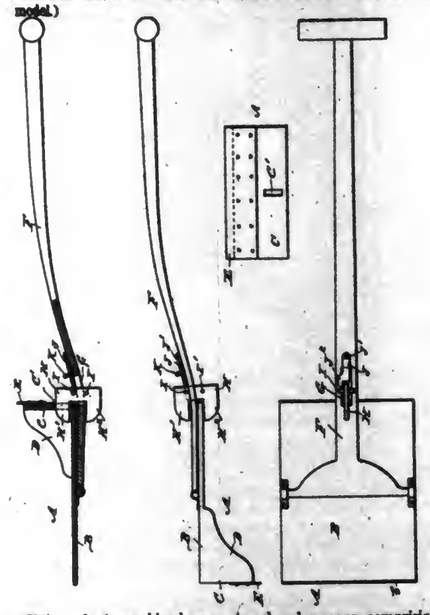
Claim.—1. A furnace-barrow axle consisting of an inner solid axle secured to one hub and a tubular axle secured to the opposite hub, in combination with a surrounding sleeve having axle-boxes secured thereto, substantially as described.

2. A furnace-barrow axle consisting of an inner solid axle secured to one hub, a tubular axle secured to the opposite hub, and a surrounding sleeve, all of which extend across the barrow, in combination with axle-boxes secured to the barrow and provided with detachable covers, substantially as described.

3. A furnace-barrow axle consisting of an inner solid axle secured to one hub, a tubular axle secured to the opposite hub, and a surrounding sleeve having collars on each end, in combination with hubs having recesses in their inner ends, substantially as described.

4. A furnace-barrow axle consisting of an inner and an outer axle secured, respectively, to opposite hubs, and a sleeve, all of which have bearings in the hubs of the wheels of the barrow, in combination with axle-boxes for securing the axle to the barrow, substantially as described.

399,394. SNOW SHOVEL AND SCRAPER. LYDIA FAIRWEATHER, Richmond Hill, N. Y. Filed Jan. 12, 1888. Serial No. 296,122. (No model.)



Claim.—1. A combined snow shovel and scraper, comprising a scoop provided on its end with a scraper, and a handle on which said scoop is pivoted and locked in place, substantially as shown and described.

2. A combined snow shovel and scraper, comprising a scoop, a scraper held on one end thereof, a handle on which the said scoop is pivoted, and means, substantially as shown and described, for locking the scoop in place on the handle, as set forth.

3. A combined snow shovel and scraper, comprising a scoop, a scraper held on one end thereof, a handle on which the said scoop is pivoted, and a key for locking the said scoop on the said handle, substantially as shown and described.

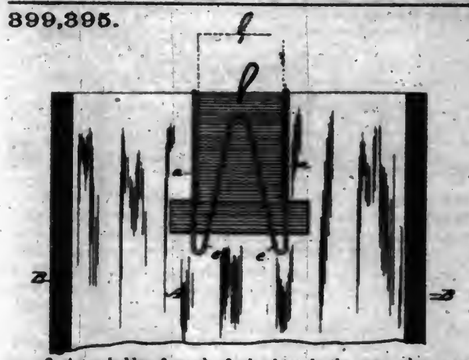
4. A combined snow shovel and scraper, comprising a scoop, a scraper held on one end thereof, a handle on which the said scoop is pivoted, a key for locking the said scoop on the said handle, and a latch for locking the said key in place on the said handle and scoop, substantially as shown and described.

399,395. TAG-HOLDER AND TAG. MARTIN L. FOSSE, Superior, Nebr. Filed Oct. 29, 1888. Serial No. 289,338. (No model.)

Claim.—1. The combination, with a tag provided with wings, of a tag-holder of substantially a W shape, the wings of said tag entering between the inner and outer arms of the W-shaped tag-holder, and the outer arms being provided with penetrating-points, substantially as specified.



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2. A tag-holder formed of wire bent in the same plane, comprising the outer arms, *a a*, and the inner arms, *c c*, said inner arms approaching each other, and said outer arms having formed therewith the penetrating-points *f f*, substantially as specified.

399,396. SHARE-STRAINER FOR DRUMS. ELWOOD R. FRY, Brooklyn, N. Y. Filed Aug. 13, 1888. Serial No. 282,561. (No model.)



Claim.—1. The combination of the snares of a drum with a hinged lever carrying an adjustable clamp for the snares, and a catch to retain the lever in the closed position, substantially as described.

2. The combination of the snares of a drum with a hinged bridge-lever, over which the snares can be stretched, an adjustable clamp carried by the lever, and a catch to retain the lever in the closed position, substantially as set forth.

3. The combination of the snares of a drum with a hinged bridge-lever having a grooved edge for the snares, an adjustable clamp carried by the lever, and a catch to retain the lever, substantially as described.

4. The combination of the snares of a drum and a hinged bridge-lever, with a clamp carried by the lever, an adjusting-screw for the clamp, and a catch for the lever, substantially as specified.

5. The combination of the snares of a drum and a bridge-lever, with an adjustable clamp consisting of plates carried by the lever, the securing-screws of the said plates being on the inner side, as and for the purpose set forth.

399,397. VALVE-GEAR. EDWIN GARDT, Dayton, Ohio, assignor to himself and Wilber Heathman, same place. Filed June 26, 1888. Serial No. 278,407. (No model.)

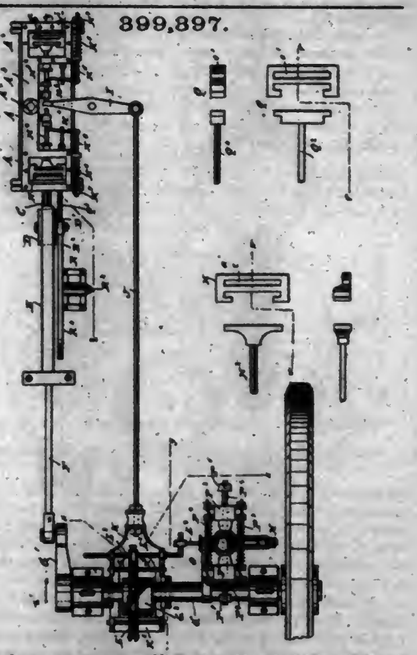
Claim.—1. The combination, with the rotary cam, of a longitudinally-sliding valve-operating frame and a transversely-sliding frame thereon embracing a cam, substantially as set forth.

2. The combination, with a shaft having a fixed cam provided with a spiral ridge, of a longitudinally-sliding valve-operating frame under the cam at right angles to the shaft, and provided with a curved frame extending over the cam and having front and rear friction-wheels for the cam to engage, substantially as set forth.

3. In a valve-gear, the combination, with a spiral cam secured to the main driving-shaft, of a frame mounted to slide transversely and carrying friction-wheels acted on by the said spiral cam, a second frame carrying the said first-named frame and connected with the steam-inlet valves, and a governor operated from the main driving-shaft and controlling the transverse motion of the said first-named frame, substantially as shown and described.

4. In a valve-gear, the combination, with a main driving-shaft and a spiral cam secured to the said main driving-shaft, of a frame mounted to slide transversely and carrying friction-rollers acted on by the said cam, a second frame, mounted to slide longitudinally, carrying the said first-named frame and connected with the steam-inlet

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valves, and a governor operated from the said main driving-shaft and controlling the transverse movement of the said first-named frame, substantially as shown and described.

5. In a valve-gear, the combination, with steam-inlet valves and a lever for controlling the said inlet-valves, of a frame held to slide and connected with the said lever, a second frame held to slide transversely on the said first-named frame, and a governor for controlling the transverse movement of the said second frame, substantially as shown and described.

6. The combination, with the crank-shaft, the cylinder, its piston, steam-chests, inlet slide-valves having stems extending toward each other, and exhaust-valves connected by a rod, of the cross-head connected to the piston-rod of said cylinder and operated by said crank, a cam on the crank-shaft, a lever extending between the two stems of said inlet-valves and oscillated by said cam, a rocking lever actuated by said cross-head, a rod connected to said lever and to the rod connecting the exhaust-valves, and a governor for changing the relation of the inlet-valve-operating frame with respect to the cam, substantially as set forth.

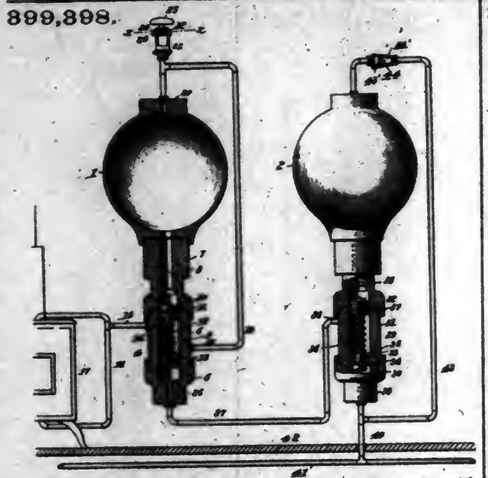
7. In a valve-gear, the combination, with a main driving-shaft, of a spiral cam secured on the said main driving-shaft, friction-wheels acted on by the said spiral cam, a frame mounted to slide transversely and carrying the said friction-wheels, a second frame carrying the said first-named frame and mounted to slide longitudinally, being also connected with the steam-inlet valves, a rod secured to the transversely-sliding frame, a link pivotally connected with the said rod, and a bell-crank lever pivotally connected by one arm with the said link, its other arm being acted on by the governor, substantially as shown and described.

8. In a valve-gear, a main driving-shaft, a governor operated from the said main driving-shaft, and a spiral cam secured on the said main driving-shaft, in combination with friction-wheels operated on by the said cam, a frame mounted to slide transversely and carrying the said friction-wheels, a second frame mounted to slide longitudinally and carrying the said first-named frame, being also connected with the steam-inlet valves, a rod secured on the said transversely-sliding frame, a link pivotally connected with the said rod, and a bell-crank lever pivotally connected by one arm to the said link, its other arm being acted on by the said governor, substantially as shown and described.

399,398. APPARATUS FOR EXTINGUISHING THE FIRES IN RAILWAY-CAR STOVES. ROBERT H. GILMOUR and FORTUNATUS G. KELLOGG, Huntington, Ind. Filed Feb. 23, 1888. Serial No. 264,891. (No model.)

Claim.—1. An apparatus for extinguishing fire in car-stoves, consisting of a main pipe through which air is supplied under pressure, an air chamber and cylinder with reacting piston and valve, pipe-con-

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sections leading from the main pipe to cylinder, an air-chamber with an outwardly-closing self-acting valve located in air-chamber pipe-connection, a chamber to contain water or chemicals, and a cylinder having a reacting piston and valve, and pipe-connections leading from said cylinder to the first-named cylinder, to the water-chamber, and to a car-stove, substantially as described.

2. In an apparatus for extinguishing fire in car-stoves, an air-chamber, a cylinder communicating with the air-chamber and having a piston with reacting spring and valve normally closing one end of said cylinder, a main air-pipe through which air is admitted under pressure connecting with the closed end of the cylinder and with the air-chamber, the air-chamber connection having a reacting-valve, a chamber for containing water or chemicals communicating with the cylinder having a piston with a reacting spring and valve normally closing one end of the cylinder, and pipe-connections leading from said cylinder to air-chamber cylinder, to water-chamber, and to a car-stove, substantially as described.

3. In an apparatus for extinguishing fire in a car-stove, the combination of a water-chamber, a cylinder communicating therewith and adapted to be connected to a stove, a valve in said cylinder, an air-chamber, a cylinder communicating with said air-chamber, a valve in said cylinder, a pipe connecting the two cylinders, an air-supply pipe connected to the cylinder of the air-chamber, a pipe leading from the air-supply pipe to the top of the air-chamber, and an automatic reacting valve in the pipe leading from the air-supply pipe to the air-chamber, substantially as described, whereby when the compressed-air supply is cut off the air in the air-chamber will enter the water-chamber and force its contents into the stove, as set forth.

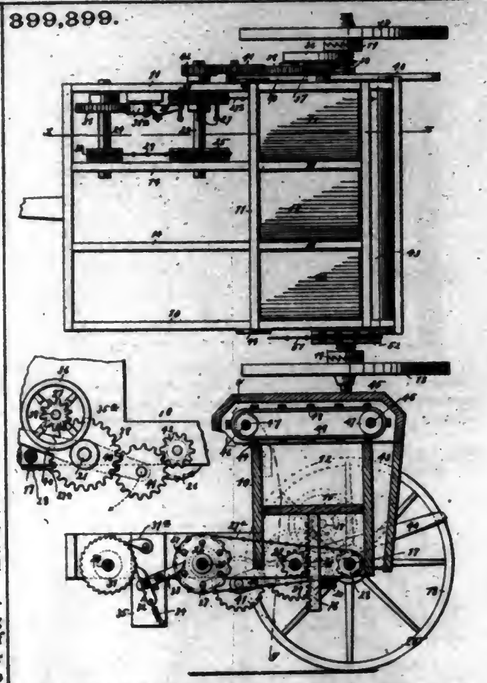
4. In an apparatus for extinguishing fire in car-stoves, a chamber for containing water or chemicals, having a cylinder communicating with its lower end provided with an upwardly-moving piston and valve with reacting spring, and having pipe-connections with the car-stove and with the top of the water-chamber above the piston-head, an air-chamber having a cylinder communicating with its lower end provided with a downwardly-moving piston and valve with reacting spring, a pipe-connection beneath the piston-head leading to the lower end of the water-chamber cylinder, a main pipe for the supply of compressed air, and a branch pipe connecting the said main pipe leading to the lower end of the air-chamber cylinder and to the upper end of the water-chamber, and an outwardly-closing reacting valve closing the connection between the top of the air-chamber and the main air-pipe, substantially as described.

5. In an apparatus for extinguishing fire in car-stoves, the combination of the following elements, viz: the water-chamber 1, having the cylinder 4, with reacting piston 9 and valve 10, the pipe-connections 15 and 16, leading to the stove 17, pipe-connections 19, leading to the upper end of air-chamber 2, and pipe-connection 27, leading to cylinder 29, air-chamber 2, having cylinder 29, with reacting piston 35 and valve 34, pipe 40, connecting with lower end of cylinder 29, branch pipe 43, connecting pipe 40 with the upper end of air-chamber 2, and having reacting valve 44, and the main compressed-air-supply pipe 41, connecting with pipe 40, substantially as described.

899,899. FERTILIZER-DISTRIBUTER. CHARLES GERAVIS, Mount Lebanon, N. Y. Filed Aug. 21, 1888. Serial No. 283,363. (No model.)

Claim.—1. In a machine for distributing fertilizer, the combination, with a hopper provided with a series of transverse compartments, followers held to vertically reciprocate in said compartments, and

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racks attached to the under surface of the said followers, of a shaft, pinions secured to the said shaft engaging said racks, a cover hinged to the said hopper, endless belts connected by slats rotating in said cover above and in connection with the upper surface of the hopper, and means, substantially as shown and described, for rotating the said belt and the said pinion-shaft, as and for the purpose specified.

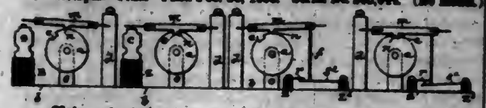
2. In a fertilizer-distributer, the combination, with a hopper divided into a series of transverse compartments, followers vertically reciprocating in said compartments, racks secured to the under surface of the said followers, and a shaft provided with pinions engaging the said racks, of a chute secured to the rear of the hopper, open at the top and bottom, and of a height equal to that of the hopper, a cover closing the upper ends of the hopper and chute, shafts journaled in said cover, endless belts carried by said shafts, connected by spaced strips, and means, substantially as shown and described, for rotating the shafts in the cover and the pinion-shaft, whereby the fertilizer is brought into engagement with the endless belts and conveyed thereby to the chute, as set forth.

3. The combination, with a frame, an axle journaled in said frame, provided with a clutch-section, and drive-wheels journaled upon the axle provided with an engaging clutch-section, a hopper supported upon said frame, divided into a series of compartments, followers reciprocating in said compartments, racks attached to the under surface of the said followers, a shaft journaled in the frame, carrying pinions engaging with the said racks, and means, substantially as shown and described, for rotating the said pinion-shaft, of a chute formed at the rear of the hopper of equal height and width, a cover hinged to the hopper, parallel spaced shafts journaled in said cover, endless belts carried by the said shafts, provided with connected slats, a sprocket-pinion secured to the outer end of one of the said shafts, a sprocket-wheel attached to the axle, and a sprocket-belt connecting the said sprocket wheel and pinion, substantially as shown and described.

4. The combination, with a frame, an axle journaled in said frame at the rear, drive-wheels attached to the said axle by a clutch, a hopper secured to the frame, divided into compartments, followers reciprocating in said compartments, racks attached to the under side of the said followers, and a notched bar guiding the said racks, of a shaft journaled in the frame in advance of the axle, carrying pinions meshing with the said racks, a short drive-shaft journaled in advance of the pinion-shaft, provided with a pinion upon the outer end, a pin-carrying sprocket-wheel secured to the said shaft, connected by a chain belt with a sprocket-pinion upon the axle, a second short shaft belted to the said short drive-shaft, a ratchet-wheel attached to the forward short shaft, a lever pivoted to the side of the frame, engaging the pins of the said sprocket-wheel, a dog pivoted to the said lever, bearing against the ratchet-wheel, and means, substantially as shown

and described, for throwing the pinion-shaft in and out of connection with the short drive-shaft, as and for the purpose specified.

899,400. ELECTRIC-CIRCUIT PROTECTOR. WIRT R. HARVEY, Memphis, Tenn. Filed Feb. 28, 1888. Serial No. 265,644. (No model.)



Claim.—1. A circuit-protector for telegraphic and analogous electrical circuits, consisting of a clock mechanism, in combination with an electro-magnet controlling its operation and a normally-open shunt around the key, including in its circuit a switch controlled by said clock mechanism, as described, whereby the key will be automatically shunted when the main line is left open at any point, substantially as described.

2. A circuit-protector for telegraphic or analogous circuits, consisting of a normally-open shunt connected to the front and back contacts of the operator's key, in combination with a clock mechanism having a switch mechanism for closing said shunt when set in motion, said clock mechanism being held out of action by an electro-magnet so long as the line remains closed, substantially as described.

3. A circuit-protector for telegraphic and analogous circuits, consisting of a normally-open shunt around the point to be protected, with switch mechanism for closing the shunt, and a clock mechanism held out of action with the switch for controlling the operation of the switch mechanism, substantially as described.

4. A circuit-protector for keeping a circuit closed at a given point, consisting of a normally-open shunt around the point to be protected, in combination with a switch connected to a mechanical motor for operating it, and an electro-magnet for connecting said motor with the switch and permitting the switch to automatically close the shunt, said electro-magnet being under the control of the operator at both the home and distant stations, substantially as described.

5. A circuit-protector for keeping a telegraphic or analogous circuit closed at a given point, consisting of a normally-open shunt around the point to be protected, in combination with a switch for closing the shunt and an electro-magnet under the control of the main-line current for regulating the operation of the switch, substantially as described.

6. A circuit-protector for breaking an earth-circuit in a telegraphic or analogous circuit, consisting of an earth-wire having a circuit-breaker normally closed between the switch-board and the earth, in combination with a mechanical motor for breaking said earth-wire at said point and an electro-magnet for connecting said motor with the switch when de-energized, whereby when the line is grounded by an operator at a station said ground will after a predetermined time be automatically broken, substantially as described.

7. A circuit-protector for telegraphic or analogous circuits, consisting of a normally-open shunt around the point to be protected, in combination with a switch for closing said shunt, a motor for operating said switch, and an electro-magnet for holding said motor normally out of operative connection with the switch, whereby, when the circuit is left open at the point to be protected for a predetermined time, said shunt will be automatically closed and the main circuit maintained intact, substantially as described.

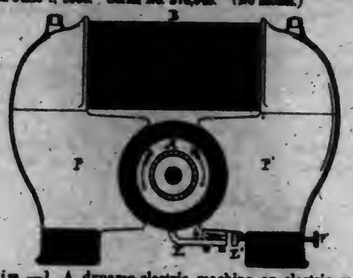
8. A circuit-protector for telegraphic or analogous circuits, consisting of the following combination of parts: a normally-open shunt around the point to be protected, a switch for closing said shunt, a spring-impelled motor for actuating said switch, an electro-magnet for holding said motor out of operative connection with the switch, and a second normally-open shunt about the same point, said second shunt being open at a point between a fixed contact-point and the spring which impels the motor, substantially as described.

9. A circuit-protector for telegraphic or analogous circuits, consisting of a normally-open shunt about the point to be protected, in combination with a spring-impelled motor and an electro-magnet holding said motor out of operative connection with the switch, said shunt, when closed, including in its circuit a fixed point and the spring of the motor, the parts being arranged as shown, so that when the motor is wound up the shunt is open, and when run down it is closed, substantially as described.

10. A protector for telegraphic or analogous circuits, consisting of a shunt about the point to be protected, said shunt being open when the circuit is closed through said point, in combination with a switch for closing said shunt, a mechanical motor for actuating said switch, and an electro-magnet located in a derived circuit from the sounder or local battery for holding said motor out of action with the switch, whereby, after the main circuit has remained open a predetermined time, the shunt is automatically closed about said point, substantially as described

11. A circuit-protector for telegraphic or analogous circuits, consisting of a normally-open shunt around the point to be protected, in combination with a switch and spring-impelled motor for closing said shunt, and a second shunt normally open between the spring of the motor and a fixed point, with an electro-magnet for holding said motor out of operative connection with the switch, whereby the point to be protected is shunted by the first shunt after the circuit has been left open a predetermined time and again permanently shunted by the second shunt until the motor is wound up, substantially as described.

899,401. PREVENTION OF SPARKING IN DYNAMO-ELECTRIC MACHINES AND ELECTRIC MOTORS. DANIEL HIMMAN, Philadelphia, Pa., assignor to the Higham Electric Light Company, Rockland, Me. Filed June 7, 1888. Serial No. 276,243. (No model.)



Claim.—1. A dynamo-electric machine or electric motor in which the armature and field-magnet currents are constant or vary simultaneously and having a magnetic conducting-bar not an electro-magnet adjacent to a pole-piece of the field-magnet and acting on the short-circuited armature-coils.

2. A dynamo-electric machine or electric motor having a magnetic conducting-bar acting on the armature-coils, which are being short-circuited by the commutator-brushes during the rotation of the armature, and means for adjusting the resistance of the magnetic circuit passing through the said bar.

3. A dynamo-electric machine or electric motor having a magnetic conducting-bar acting on the short-circuited armature-coils, and an adjustable piece adjacent to the field-pole and movable toward and from the said conducting-bar, as and for the purpose set forth.

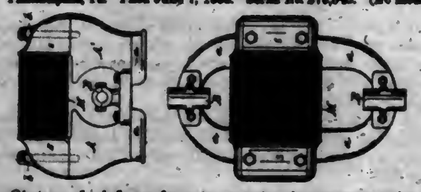
899,402. PREVENTION OF SPARKING IN ELECTRIC GENERATORS AND MOTORS. DANIEL HIMMAN, Philadelphia, Pa., assignor to the Higham Electric Light Company, Rockland, Me. Filed June 7, 1888. Serial No. 276,244. (No model.)



Claim.—1. A dynamo-electric machine or electric motor having a magnetic conducting-bar acting upon the short-circuited armature-coils, a helix upon the said bar, and coils upon the field-magnet connected to the said helix, but not connected with the field-magnet coils or working-circuit.

2. A dynamo-electric machine or electric motor having a magnetic conducting-bar acting upon the short-circuited armature-coils, a helix upon the said bar, and coils C' upon the field-magnet connected to the helix C, which is wound contrary to the coils C'

899,408. DYNAMO-ELECTRIC MACHINE. DANIEL HIMMAN, Philadelphia, Pa. Filed June 7, 1888. Serial No. 276,245. (No model.)

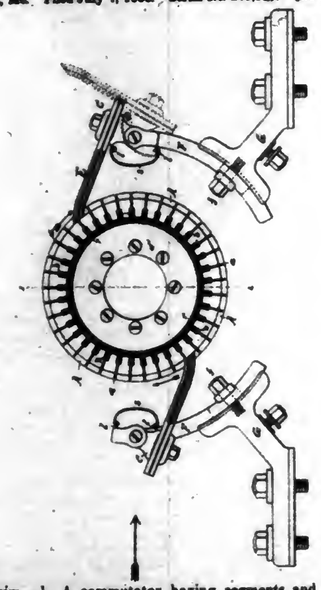


Claim.—1. A frame for a dynamo-electric machine or electric motor having a horizontal field-magnet core resting upon and secured to the pole-pieces between which the armature revolves.

2. A dynamo-electric machine or electric motor having a horizontal field-magnet core resting upon and secured to pole-pieces, the line of separation between the core and pole-pieces being below the coils of the field-magnet winding.

3. A dynamo-electric machine or electric motor having pole-pieces, with extended bases curved at their outer adjacent ends toward each other, and supporting non-magnetic bearings for the armature-shaft.

399,404. DYNAMO-ELECTRIC MACHINE. DANIEL HIGHAM, Philadelphia, Pa., assignor to the Higham Electric Light Company, Rockland, Me. Filed July 7, 1888. Serial No. 279,315. (No model.)



Claim.—1. A commutator having segments and intermediate insulating-blocks with air spaces or slits extending down into the intermediate insulating-blocks, and clamping-rings not covering the ends of the slits, as and for the purpose set forth.

2. A commutator having segments with insulating-blocks and air-spaces, and clamping-rings not covering the ends of the air-spaces, as and for the purpose described.

3. A commutator-brush composed of two strips having the bearing ends of the individual members or points of different widths, as and for the purpose set forth.

4. The combination of a commutator, with a pair of commutator-brushes set out of line for bearing upon independent portions of the commutator, substantially as set forth.

399,405. SLED-BRAKE. CLARENCE E. HOLLEY, Fort Fairfield, Me., assignor, by direct and mesne assignments, of two-thirds to Harlan Jerome Palmer and L. K. Cary & Co., same place. Filed June 21, 1888. Serial No. 277,854. (No model.)



Claim.—1. The combination of the endwise or longitudinally movable plate or bar having connection with the longitudinally-movable tongue, with the brakes having a whiffletree-like or cross-bar connection with the longitudinally-movable bar or plate, substantially as and for the purpose set forth.

2. The sled-brake comprising the central or longitudinal endwise movable plate or bar and the proximate whiffletree-like connection or cross-bar between said plate and the brakes, substantially as set forth.

3. The sled-brake comprising the longitudinal plate or bar actuating the brakes and having a stepped slotted forward end, and the sliding tongue or pole having a pendent stud or projection engaging said stepped slotted end of the longitudinal bar or plate, substantially as specified.

4. The sled-brake comprising the longitudinal endwise-movable plate or bar actuated by the tongue or pole and having connection about at its mid-length with a cross-bar about at its center, which cross-bar is provided at its ends with apertured plates, and the elbow-lever brakes having their upper ends entering the apertures of the end plates of said cross-bar, substantially as set forth.

5. In a sled-brake, the combination, with the endwise-movable plate or bar having a slotted stepped forward end and carrying about at its middle a cross-bar having apertured end plates which receive the upper ends of the brake-levers, of the sliding tongue having applied to its reduced rear end or extension a casting or plate provided with a stud or projection entering the slotted stepped forward end of the endwise-movable plate, and the whiffletree provided with the hook-clips, substantially as specified.

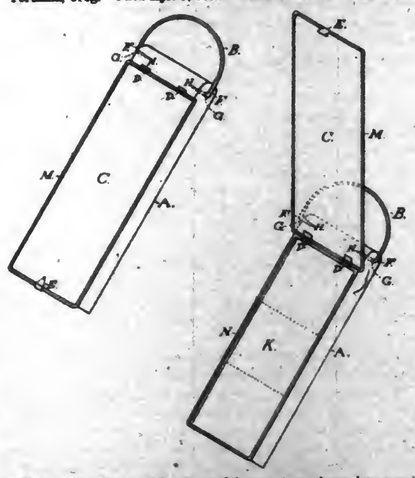
399,406. DENTIST'S LATHE. NEWTON W. HOLT, Bennington, Vt. Filed Aug. 22, 1888. Serial No. 283,503. (No model.)



Claim.—1. The horizontal circular lathe-head A, provided with radial spindle seated in radial bearings in the edge of the rim of the head, each carrying on its inner end one member of a clutch, in combination with a driving-pulley, and the other member of said clutch pivoted on the column upon which the head revolves, the spindles being arranged so that by revolving the head their axes may successively be brought into line with the axis of the driving-pulley, substantially as specified.

2. The combination of standard A, carrying clutch-pulley P, pivoted, as shown, with the revolving head A, carrying a series of radial spindles, each of which carries a clutch member to co-operate with the pulley-clutch, and the latch-bolt L, for locking the head in any desired position, substantially as shown, and for the purposes set forth.

399,407. COVER FOR SHIPPING-RECEIPTS. DANIEL K. HOWE, Portland, Oreg. Filed Apr. 5, 1888. Serial No. 269,704. (No model.)

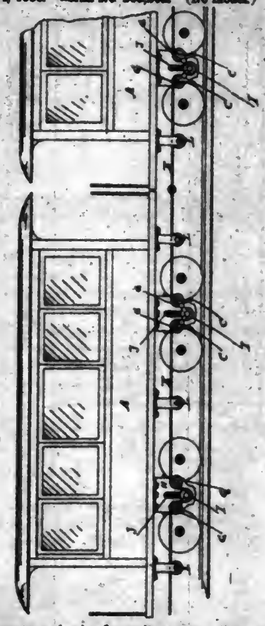


Claim.—1. The combination, with a casing adapted to receive a pad, provided with aligning apertures, of a spring-bail provided with inwardly-projecting spurs entering the apertures of the casing and engaging the pad to retain the same in the casing, as and for the purpose set forth.

2. The combination, with a covering for receiving a pad provided with a hinged lid and aligning apertures, of a spring-bail having inwardly-projecting spurs entering the said apertures and engaging the pad, substantially as herein shown and described.

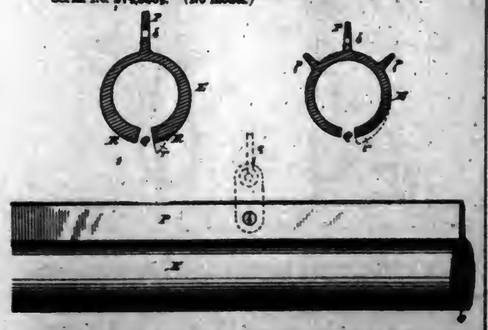
3. The combination, with a casing, A, having a hinged lid, C, and aligning apertures G, of the pad K, provided with the bail L, and the spring-bail B, having the inwardly-projecting spurs H, substantially as herein shown and described.

399,408. CAR-BRAKE. HENRY W. HOWELL, Jr., Elizabeth, N. J. Filed Feb. 24, 1888. Serial No. 265,302. (No model.)



Claim.—In a steam-brake for railway-cars, in combination with the friction-clutch, drum S, and cable W, extending from car to car, the steam-cylinder P, and shifting-lever R, to operate the friction-clutch to apply the brakes, and spring T, to disengage the friction-clutch to release the brakes, the stationary friction-pulleys G and movable pulley I, to operate the shoes C, and slotted bracket to support and guide the roller I in its up and down movements, substantially as herein set forth.

399,409. CONDUCTOR FOR ELECTRIC RAILWAYS. RUDOLPH M. HUNTER, Philadelphia, Pa. Original application filed Mar. 16, 1888, Serial No. 267,267. Divided and this application filed May 18, 1888. Serial No. 274,230½. (No model.)



Claim.—1. An electric-railway working-conductor consisting of a tube having a longitudinal slot, and also having the thickness of its metal greater as the slot is approached from either side.

2. A working-conductor for an electric railway, consisting of a slotted tube having one or more longitudinal ribs upon its outer surface, and in which the metal of the tube becomes thicker as the slot is approached.

3. A working-conductor for an electric railway, consisting of a slotted tube having one or more longitudinal ribs upon its outer surface, and in which the metal of the tube becomes thicker as the slot is approached.

4. A working-conductor for an electric railway, consisting of a slotted tube having one or more longitudinal ribs upon its outer surface and diametrically opposite to the slot, and in which the metal of the tube becomes thicker as the slot is approached.

5. A working-conductor for an electric railway, consisting of a slotted tube in which the thickness of the metal on one side of the slot is greater than that on the other side.

6. A working-conductor for an electric railway, consisting of a slotted tube having a long central and two short lateral longitudinal ribs upon its outer surface on the side away from the slot.

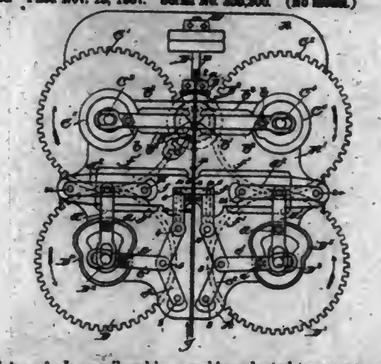
7. A working-conductor for an electric railway, consisting of slotted tube rolled in one piece having a smooth interior surface of continuous metal in cross-section and a longitudinal rib projecting from its outer surface away from the slot.

8. A working-conductor for an electric railway, consisting of a slotted tube of metal forming a band of continuous metal from slot to slot and a rib exterior to said band of continuous metal and formed integral therewith.

9. A working-conductor for an electric railway, consisting of a slotted tube having one of its outer edges of the slot projecting beyond the other.

10. A working-conductor for an electric railway, consisting of a slotted tube having one of its outer edges of the slot projecting beyond the other and having one or more longitudinal ribs upon its outer surface.

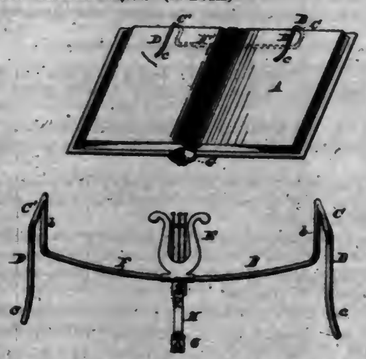
399,410. NAIL-MACHINE. EDWARD P. HYER, Boston, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Nov. 15, 1887. Serial No. 255,200. (No model.)



Claim.—1. In a nail-making machine adapted to operate upon a wire, the clamping-jaws, and the upsetting-jaws to grasp the wire near the clamping-jaws, and means to move one set of the said jaws toward the other to upset the wire grasped between them to form the head of a nail, combined with the independent pointing-dies to act on the upset wire after it has been released by the clamping-jaws and fed forward, and with means to actuate the said pointing-dies, whereby the headed blanks yet connected together are pointed, substantially as described.

2. In a nail-making machine, the clamping-jaws *f*, having the guiding portions 6, combined with the upsetting-jaws *c*, adapted to slide thereon, substantially as described.

399,411. LEAF-HOLDER FOR BOOKS. JOSEPH HYLAND, Buffalo, assignor of one-half to R. P. Sullivan, Eagle Village, N. Y. Filed Dec. 6, 1888. Serial No. 292,967. (No model.)



Claim.—1. A leaf-holder for books, substantially as described, consisting, essentially, of a single piece of spring-wire having the curved back-piece F, upwardly-bent members *b b*, cross-pieces C C, and downwardly-projecting tangs D D, the latter having the curved ends *c c*, as described, for the object stated.

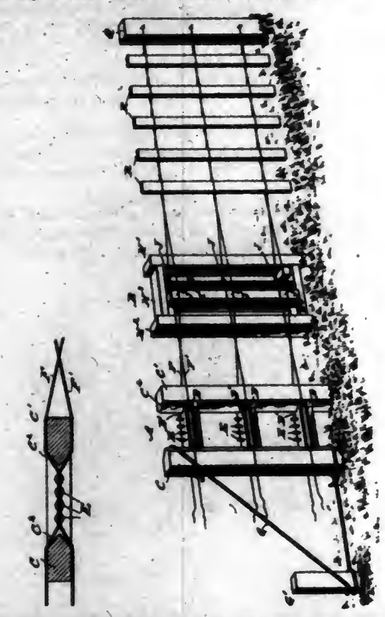
2. As a new and improved article of manufacture, a leaf-holder for books, consisting, essentially, of a holder having a curved back-piece, F, provided with the bearing-piece E, upwardly-pointing mem-

bers *b b*, cross-pieces C C', and downwardly-projecting tangs D D, as and for the purpose stated.

3. In book-holders, the combination, with the back-piece B, having the bearing-piece E, provided with the lug *e*, of the elastic strap H and the hook G, as described, for the purpose set forth.

399,412. FENCE-MACHINE. GEORGE W. JOHNSON, Dallas, Oreg.

Filed May 16, 1888. Serial No. 274,089. (No model.)



Claim.—1. In a fence-machine, a tension device comprising two upright posts connected with each other by bars, each having a row of pins, and an apertured bar held to slide on the said posts and fitting over the said pins, substantially as shown and described.

2. In a fence-machine, the combination, with a frame, of rods held to slide transversely, pins having ears secured to the said rods, links pivotally connected with the said rods, shafts mounted to turn on the said frame and connected with the said link, crank-arms formed on the said shafts, a rod connecting the said crank-arms, and a lever pivoted on the said frame and connected with the said rod, substantially as shown and described.

3. In a fence-machine, the combination, with a frame having grooved cross-bars, the rods I I', held to slide in said grooved cross-bars and provided with the pins J J', having eyes J^2 J^3, the shafts N N', links L L' L^2 L^3, connecting the rods I I' to the shafts N N', and means for operating the said shafts, substantially as herein shown and described.

399,413. WEATHER-STRIP. JOHN E. JOHNS, New York, N. Y.

Filed June 7, 1887. Renewed Sept. 1, 1888. Serial No. 284,367. (No model.)

Claim.—1. As a new article of manufacture, a weather-strip having a compressible and anti-friction surface of cork, substantially as described.

2. The combination, with a door or window, of a weather-strip composed of blocks of cork applied to the edge of the window or door, substantially as described.

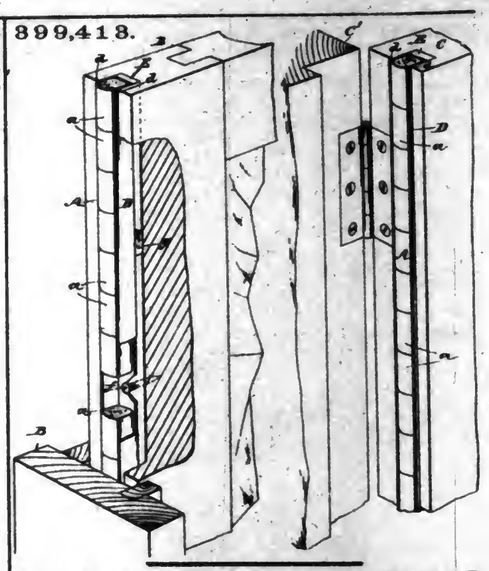
3. The combination, with a door or window, of a weather-strip composed of short blocks of cork applied to the door or window, with the ends of the grain at right angles to the edge of the window or door, substantially as described.

4. As a new article of manufacture, a weather-strip composed of a casing, D, and blocks of cork *a*, held therein, substantially as described.

5. The window-sash B, formed with a groove, E, and provided with the cushions *g*, in combination with the casing D, provided with the packing *a* and held in the groove E, substantially as described.

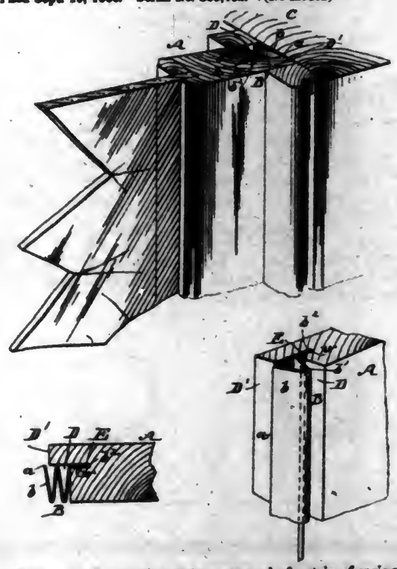


399,418.



399,414. WEATHER-STRIP. JOHN E. JOHNS, New York, N. Y.

Filed Sept. 19, 1888. Serial No. 285,782. (No model.)



Claim.—1. The weather-strip composed of a strip of spring metal bent to form the diverging members *b b'*, substantially as described.

2. A weather-strip composed of a narrow strip of spring metal bent to form the diverging members *b b'*, and the flange b^2, substantially as described.

3. The sash A, rabbeted to form the flange D' and space D, in combination with the weather-strip B, formed of a strip of metal folded to form diverging members *b b'*, substantially as described.

4. The sash A, rabbeted to form the flange D' and space D, and slotted at E, in combination with the weather-strip B, formed of a strip of metal bent to form diverging members, and the flange b^2, substantially as described.

399,415. FOLDING BOOK-CASE. PHILIP KAUFFMANN, Springfield, Mo. Filed Nov. 19, 1888. Serial No. 291,196. (No model.)

Claim.—1. In a folding case, the combination of a permanent shelf with permanent end pieces and folding end pieces mounted upon the permanent end pieces to move toward each other and the shelf, said folding pieces being provided with means for removably connecting one or more shelves thereto, substantially as specified.

2. In a folding case, the combination of a shelf, A, permanent end

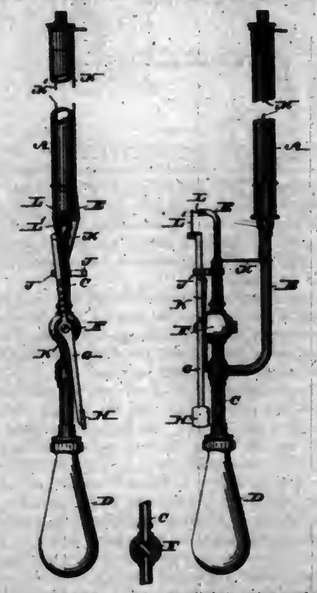
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pieces B B, folding end pieces F F, removable shelves H, and tie-rod I, substantially as specified.

3. In a folding case, the combination of a permanent shelf and end pieces with a strip, E, connecting the front and rear ends of said end pieces, and folding end pieces mounted upon the permanent end pieces to move toward each other and the permanent shelf, said folding pieces being provided with means for removably connecting one or more shelves thereto, substantially as specified.

399,416. ELECTRIC GAS-LIGHTER. EDWARD KNOBLOCH, Philadelphia, Pa. Filed Oct. 17, 1888. Serial No. 288,333. (No model.)



Claim.—1. An igniting device for lighting cigars, cigarettes, &c., consisting of a pendant, in combination with a gas-cock having an operating-lever carrying a movable electrode, and a burner-tip carrying a fixed electrode, the lever having a retractile spring for holding said cock closed and the electrodes out of contact.

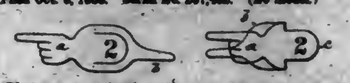
2. An igniting device for lighting cigars, cigarettes, &c., consisting of a non-conducting pipe attached to a pendant and carrying a fixed and a wiping electrode, in combination with two insulated wires running one inside and the other outside of the pipe, said wires being attached, respectively, to the fixed and wiping electrodes, substantially as described.

3. A pendent igniting device having a burner and two electrodes, one fixed and the other movable, the former attached to the burner of the pendant and the latter attached to a lever carried by the gas-cock and lying in the plane of the body of the pendant, and having a retractile spring for holding the gas-cock normally closed and the electrodes out of contact, substantially as described.

4. In a pendent device for lighting cigars, &c., a cock-actuating lever lying substantially in the plane of the pendant, and having a spring under stress for holding the cock normally closed, and carrying a wiping-electrode at its free end, with a fixed electrode carried by the burner-tip, but insulated therefrom, and electrical connections, as described, the whole being so arranged that when the lever is actuated gas is allowed to flow and a spark is created, whereby ignition ensues, substantially as described.

399,417. INDEXING BOOK-MARK. JOHN LANE, Brooklyn, N. Y.

Filed Oct. 8, 1888. Serial No. 287,402. (No model.)

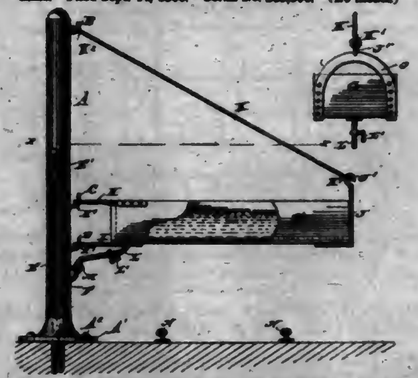


Claim.—1. A book-mark or indicator formed of one piece of metal folded over between its extremities upon itself so as to form a pair of spring-lips, one of said lips having a backward extension or flap, for the purpose described.

2. A book-mark or indicator formed of a single piece of metal folded over between its extremities upon itself, thus forming two lips which spring toward each other, one of said lips being made up of two extensions, said extensions being located on opposite sides of the fold, substantially as described.

3. A book-mark or indicator formed of one piece of metal folded over between its extremities so as to form a pair of spring-lips, one of said lips having a backward extension or flap provided with a letter, figure, or other indicating character.

399,418. WATERING-TROUGH. GEORGE W. LAWDEN, Clinton, Mass. Filed Sept. 14, 1888. Serial No. 285,208. (No model.)



Claim.—1. In a watering-trough, the combination, with a standard adapted to be arranged adjacent to a railroad-track, of a water-supply pipe projecting from the standard, and a trough hinged at one end to the said standard, substantially as described, whereby provision is made for swinging the trough under the supply-pipe for filling it, and then swinging it across the track, as set forth.

2. In a watering-trough, the combination of a hollow standard, a water-supply pipe projecting through the standard, a trough hinged to the standard, and a discharge-pipe leading from the trough to the standard and provided with a swivel-joint, substantially as described.

3. In a watering-trough, the combination, with a standard provided with pivot-pins, of a trough provided at its inner end with arms having eyes to receive the two lowermost pivot-pins, a yoke secured to the outer end of the trough, and a brace-rod engaging the yoke and the uppermost pivot-pin, substantially as herein shown and described.

4. A watering-trough comprising a hollow standard, a water-supply pipe projecting through the standard and provided with a cock, a trough having its inner end hinged to the standard, a brace-rod hinged to the outer end of the trough and to the standard, and a discharge-pipe leading from the trough through the standard and provided with a swivel-joint and a cock, substantially as herein shown and described.

5. In a watering-trough, a standard provided with a trough hinged thereto, a hinged brace-rod connecting said standard and trough, a supply-pipe for filling the trough, and a discharge-pipe provided with a swivel-joint, substantially as shown and described.

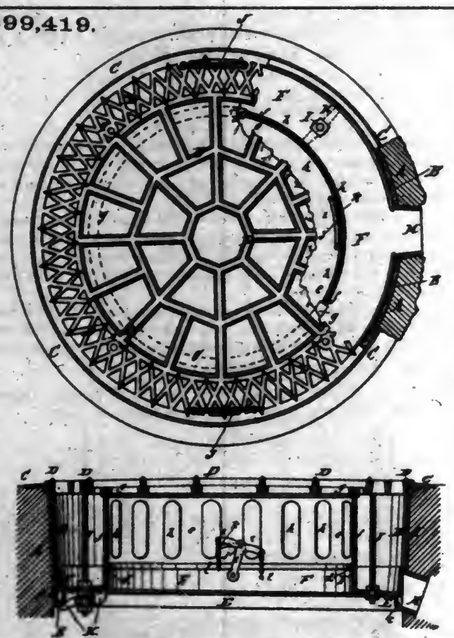
6. The combination, with a standard, of a watering-trough hinged thereto, a hinged brace-rod for said trough, and a discharge-pipe provided with a swivel-joint, the hinge-points of said trough and brace-rod and the swivel-joint of said discharge-pipe being all in a vertical line, substantially as shown and described.

399,419. VAULT LIGHT AND VENTILATOR. THEOPHILUS W. LAPELL, New York, N. Y. Filed Feb. 14, 1885. Renewed Mar. 8, 1887. Again renewed Oct. 24, 1888. Serial No. 289,021. (No model.)

Claim.—1. In a vault light and ventilator, the combination, with the grating D and the inner flange of the channel-plate F, of the stationary apertured plate *e*, having curved slot *h*, the correspondingly-apertured movable plate *f*, the three-armed lever *i*, and its chains *l*, substantially as herein shown and described.

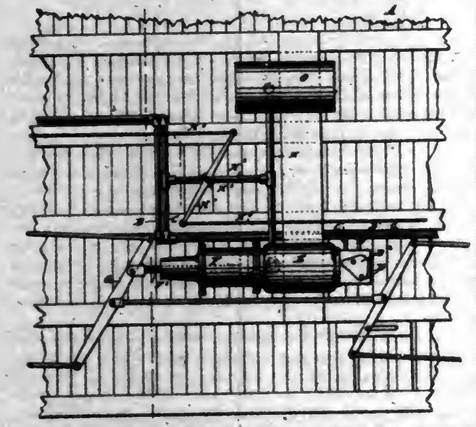
2. In a vault cover and ventilator, the grating D, made, substan-

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tially as herein shown and described, with open-work near the outer edge of the cover in the parts over the water-receiving channel-plate and with the other parts adapted to receive glass plates, as set forth.

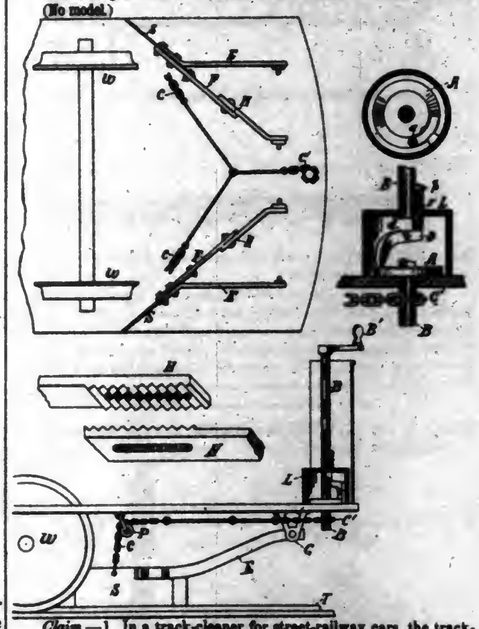
399,420. AIR-BRAKE. JOSEPH S. LAPISH, American Fork, Utah. Filed Aug. 4, 1888. Serial No. 282,007. (No model.)



Claim.—1. In an air-brake, an operating-pipe and an air-supply pipe, both connected with the main reservoir and under the control of the engineer, in combination with a valve-chest connected by branch pipes with the said air-supply pipe and the said operating-pipe, an auxiliary air-supply connected with the said air-chest, and a brake-cylinder connected with the brake mechanism, and also with the said valve-chest, a second auxiliary reservoir connected with the first-named reservoir, a pipe connecting said auxiliary reservoir with the said operating-pipe, a valve held in the said pipe to connect the operating-pipe with or disconnect it from the said auxiliary reservoir, and a coupling held at each end of the car and adapted to operate the said valve, substantially as shown and described.

2. In a car-brake, the combination, with two auxiliary reservoirs located on each car and connected by a pipe, of an operating-pipe connected with the said auxiliary reservoirs, a valve located in the connection between the said operating-pipe and the said auxiliary reservoirs, and a coupling located between two adjoining cars and provided with two parts, of which one is connected by a rod with the said valve to actuate the same in case of the breaking apart of the two cars, substantially as shown and described.

399,421. STREET-RAILWAY-TRACK CLEANER. JAMES A LEWIS, Binghamton, N. Y. Filed Feb. 15, 1888. Serial No. 264,154. (No model.)



Claim.—1. In a track-cleaner for street-railway cars, the track-scrapers S, suspended by chains running over pulleys and which are connected together near the shaft upon which they wind up, in combination with brace-bars E and F, for holding the scrapers in position, the inner brace-bar, F, having a toothed and slotted splice by which the sweep of the cleaner may be extended or contracted, substantially as shown and described.

2. In a track-cleaner for street-railways, the combination, with track-scrapers, of bars or braces, between the forward ends of which the track-scrapers are clamped, and hangers depending from the bottom of the car and having the rear ends of the bars or braces pivoted thereto, substantially as shown and described.

3. In a track-cleaner for street-railways, the combination, with track-scrapers, bars, or braces, between the forward ends of which the track-scrapers are clamped, and hangers depending from the bottom of the car and having the rear ends of the bars or braces pivoted thereto, of a suspending-chain, as C, for each of the scrapers, running over a pulley secured to the car-bottom and extending diagonally toward each other, a chain, such as C', connecting the rear extremities of the chains C, and a vertical shaft upon which chain C winds, all substantially as and for the purposes herein set forth.

4. In a track-cleaner for street-railways, the combination, with track-scrapers, of bars or braces situated in pairs, between the forward ends of which the track-scrapers are clamped, and the inner bar of each of which pairs has a toothed and slotted splice, substantially as and for the purposes herein set forth.

5. In a track-cleaner for street-railways, track-scrapers and means for suspending the same, in combination with bars or braces for holding the scrapers in position, situated in pairs, the inner bar of each of which is formed in two parts and with intermeshing teeth at the point of junction, and also with an elongated slot, and a pin or bolt extending through the said slot and adapted to clamp the two portions of the inner bar together.

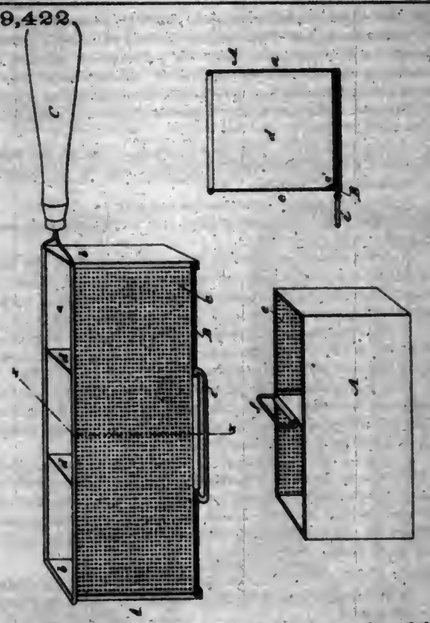
399,422. EGG-POACHER. WILLIAM H. LITTLETON, Clayton, Mich. Filed Mar. 23, 1888. Serial No. 268,231. (No model.)

Claim.—1. In an egg-poacher, the combination, with the body A, formed of the imperforate back *a*, imperforate ends *b*, the perforated side *c*, and the inwardly-projecting clearing-lip *c'*, of the removable bottom B, having its upper face adjacent to the clearing-lip *c'* substantially as specified.

2. An egg-poacher having a sliding bottom and a transverse scraping-lip extending inwardly from the lower edge of that side of the poacher under which the bottom slides to the upper face of said bottom, whereby the egg will be loosened from the bottom as it is withdrawn, substantially as set forth.

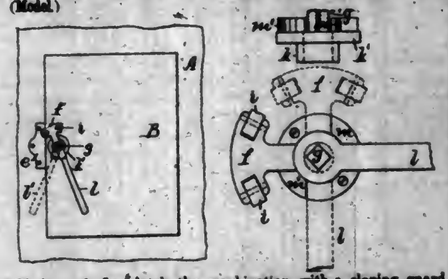
3. An egg-poacher consisting of an oblong frame having a sliding bottom completely closing its lower end, and imperforate parti-

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tions extending transversely across said body and upper face of the sliding bottom, one side of the body being foraminated, substantially as set forth.

399,423. LATCH. PAUL L. MALTBIE, Newark, N. J., assignor to Lewis D. Maltbie, same place. Filed Aug. 20, 1888. Serial No. 283,180. (Model.)



Claim.—1. In a latch, the combination, with a sloping guard affixed upon the inner side of the door-frame, of a head pivoted upon a spindle extended through the door and provided with handles upon the inner and outer sides of the door, set at an angle with each other and projecting downwardly to operate by their weight to hold the latch in its normal position, substantially as shown and described.

2. In a latch, the combination, with a sloping guard affixed upon the inner face of the door-frame, of a head pivoted upon a spindle extended through the door and provided with rollers in its opposite corners and with a curved seat intermediate to the rollers to bear upon the guard, and a handle upon the spindle at each side of the door to turn the head, as and for the purpose set forth.

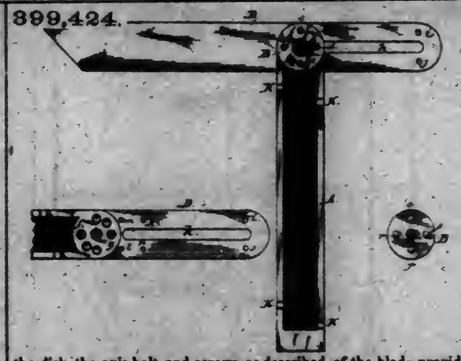
3. In a latch, the combination, with a sloping guard affixed upon the inner face of the door-frame and having a beveled lip extending inside the door-opening, of a head pivoted upon a spindle and provided with rollers in its opposite corners, and with a curved seat intermediate to the rollers to bear upon the guard and having its outer corners beveled, as described, and a handle upon the spindle at each side of the door to turn the head, as and for the purpose set forth.

4. In a latch, the combination of a symmetrical guard, *c*, having inclined lip *c'*, the head pivoted upon a spindle and provided with rollers in its opposite corners, and a square spindle fitted to the head, with a handle adjustable upon one end of the spindle to opposite angles with the head, as and for the purpose set forth.

399,424. TRY-SQUARE AND BEVEL. CHARLES F. MERRIFIELD, Bernardstown, Mass. Filed Nov. 6, 1888. Serial No. 290,123. (No model.)

Claim.—1. The combination, with the stock of the square, having an open slot for the blade, radially-opposite holes, and an axis-hole,

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the disk, the axis-bolt, and screws, as described, of the blade provided with a long slot and conical indentations and the clamping-nut for the bolt, as and for the purpose specified.

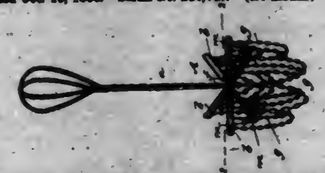
2. In a try-square and bevel, the slotted stock provided with bolt-openings, in combination with a disk provided with fixed screws and a bolt and the indented blade provided with a slot, as and for the purpose set forth.

399,425. WASHING-MACHINE. GERSHOM A. MILLER, Butler, Pa. Filed Oct. 22, 1888. Serial No. 288,733. (Model.)



Claim.—As an improvement in washing-machines, the combination of the tub B, the steam-chest C secured thereon, the sliding lid in the upper portion of the steam-chest, and the rotary beater consisting of a metallic bar having its ends journaled in the sides of the tub and its intermediate portion bent reflexly to form a series of arms, which extend on opposite sides of the axis of the beater, as specified.

399,426. DISH-WASHER. WILLIAM D. MILLER, Florence, Mass. Filed Oct. 10, 1888. Serial No. 287,749. (No model.)



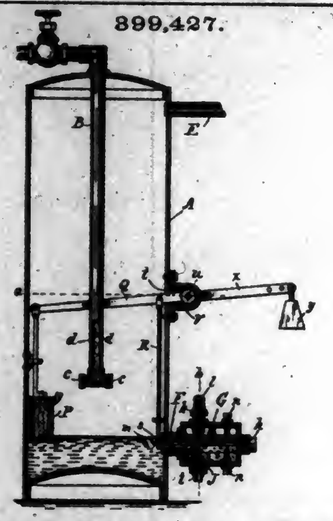
Claim.—A metallic dish-washer consisting of a series of wires having their intermediate portions bent and twisted upon themselves to form a handle and having their end portions extending radially to form legs, each leg having the return-bend and fastening *f* to form the closed eye *m*, and the series of chains directly connected with said eye-legs and pending therefrom, substantially as and for the purpose described.

399,427. APPARATUS FOR SEPARATING LIQUIDS FROM NATURAL GAS. WILLIAM MOORE, Kokomo, Ind. Filed May 21, 1888. Serial No. 274,499. (No model.)

Claim.—In an apparatus for separating liquids from natural gas, the combination, with the reservoir, the tubular casing detachably secured thereto so as to connect with the interior thereof, and having a discharge-opening, the valve arranged to close said opening, and

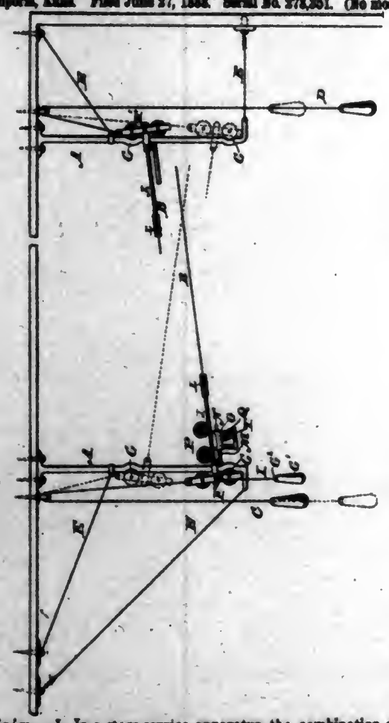


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the lever arranged to operate said valve, of a vertically-adjustable fulcrum consisting of a pair of set-screws mounted in opposite sides of the tubular casing and arranged to embrace the lever between them.

399,428. CASH-CARRIER APPARATUS. CHARLES W. MCCORMICK, Emporia, Kans. Filed June 27, 1888. Serial No. 278,261. (No model.)



Claim.—1. In a store-service apparatus, the combination of a track movable vertically at each end, so as alternately to incline in opposite directions, a vertically-movable trolley to which each end of the track is secured, a vertical track for each trolley, provided with stops and holders for the trolleys, and pull-cords and pulleys to independently raise each end of the movable track, the length of the track being so regulated that the act of raising one end of it reduces its tension and releases the other end, which drops to place, substantially as set forth.

2. In a store-service apparatus, a track movable vertically at both ends, so as to incline it in opposite directions, in combination with an independent pull-cord for elevating each end of the track, a trolley at each end of the track, to which the pull-cords for elevating are attached, a vertical track for each trolley, provided with stops for automatically fastening both trolleys, one above and the other below, by lifting one trolley and shifting the incline of the track, substantially as set forth.

3. The combination, with the wire track, of the car, the endless pull-cord I, doubled upon itself, as described, and the sliding holder L', substantially as set forth.

4. In a store-service apparatus, the combination of a bumper, M, and the adjustable curved spring-plates N N with the adjusting screw N², substantially as set forth.

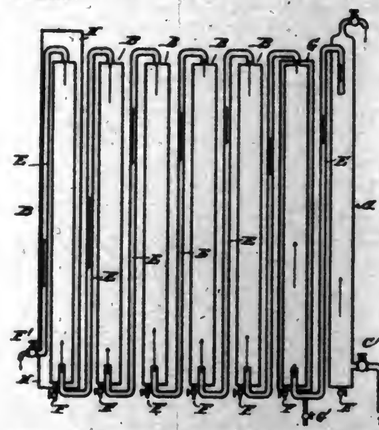
5. In a store-service apparatus, the combination, with a wire track and its car, of a lifting-trolley, an endless propelling-cord, I, and a car stopping and retaining mechanism, all adapted to be raised and lowered simultaneously with the wire track, substantially as set forth.

6. The combination of a bumper and curved plates with the car having the bar O, cut away on each side, at P, to form curved recesses for the reception of the curved plates, substantially as set forth.

7. In a propelling device of a store-service apparatus, the combination of the hollow arms J J, the pulleys L L K K, the wire track B, the propelling-cord I, and the sliding holder L', with the bumper M and the plates N N, substantially as described.

8. In a car of a cash-carrier, the combination of the tapered cup T, cut away, as shown, to form recesses, with a reversely-tapered cap, Q, having side openings, R, and springs S, curved, as described, and arranged to bear inwardly against the upper wall of the recesses, whereby the cup is tightly held and prevented from rattling, substantially as set forth.

399,429. PURIFIER FOR WATER OR OTHER LIQUIDS. THOMAS H. MCCULLOCH, Omaha, Nebr. Filed May 28, 1888. Serial No. 275,230. (No model.)



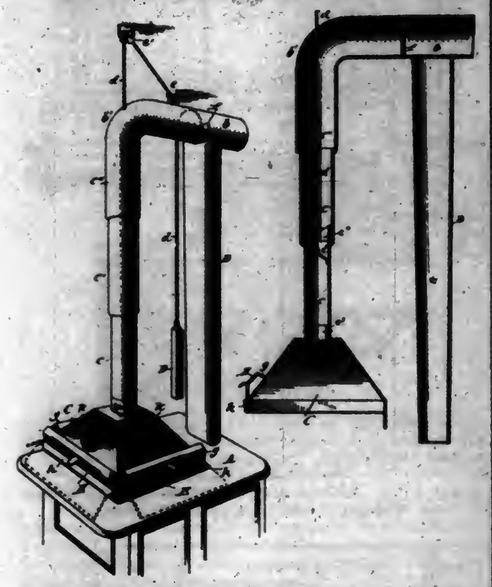
Claim.—1. The combination, with a series of settling-tubes, A B, the first tube, A, having an inlet-pipe, C, at its lower end and an outlet at its upper end, of the pipes E, connecting said tubes, the upper end of each said pipes communicating with the interior of a tube at its upper end and the lower side of the adjacent tube, the last pipe extending out of the top of last tube and having a discharge-cock, substantially as set forth.

2. In a purifier for water and other liquids, the combination of a series of settling-tubes, the first tube of said series extending above the top of the adjacent tube, the upper end of said first tube being provided with a pipe for discharging the floating substance, a series of connecting-pipes having open ends connecting said settling-tubes, the upper end of each of said pipes communicating with the interior of a tube, so as to receive the water that may rise to the upper end of said tube, the lower end of each pipe communicating with the lower side of the adjacent tube, substantially as specified.

3. In a purifier for water and other liquids, the combination of a series of settling-tubes, and a series of connecting-pipes having open ends connecting said settling-tubes, the upper ends of each of said pipes communicating with the interior of a tube, so as to receive the water that may rise to the upper end of said tube, the lower end of each pipe communicating with the lower side of the adjacent tube, one or more of the tubes being provided with a casing, so as to leave a space between said tube and casing, substantially as specified.

4. In a purifier for water and other liquids, the combination of a series of settling-tubes and a series of connecting-pipes having open ends connecting said settling-tubes, the upper end of each of said pipes communicating with the interior of a tube, so as to receive the water that may rise to the upper end of said tube, the lower end of each pipe communicating with the lower side of the adjacent tube, one of the settling-tubes being provided with an opening or pipe for the induction of water, and an opening or pipe in one of the said tubes for the discharge of purified water, substantially as specified.

399,430. STOVE-HOOD. HERMANN NEW, Jefferson City, Mo. Filed Apr. 14, 1888. Serial No. 270,627. (No model.)



Claim.—The hood constructed with edge grooves, A, in combination with the independent wings E, constructed in hook form at their upper edges, as described, whereby the lower edges of said wings may be supported in the grooves when in open position, and the hooked edges of the wings may hang in the grooves when in closed position, as set forth.

399,431. COFFEE-POT. EDWARD T. NEWLIN, Brooklyn, N. Y. Filed Dec. 30, 1887. Serial No. 259,400. (No model.)

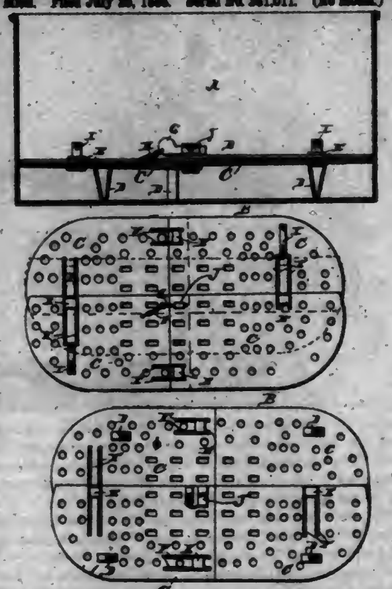


Claim.—1. In a pot, the combination, with a spring-tripod and a strainer, of an elastic split ring having a segmental piece of smaller diameter rigidly secured in one of its ends, and a tubular opening in its opposite end, in which said piece is placed and is adapted to work, substantially as described.

2. In a coffee-pot, a strainer-support consisting in a tripod formed of a series of elastic arms converging and united at their lower ends, free at their upper ends, and bowed outwardly between their ends, substantially as set forth.

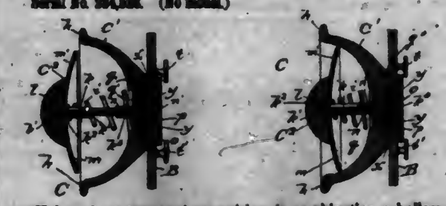
3. The combination, with a coffee-pot provided with a socket on its bottom, of a spring-tripod adapted to fit into said socket, and a strainer sustained on said tripod, substantially as set forth.

399,432. WASH-BOILER. MALINDA K. OSBORN, Maple Rapids, Mich. Filed July 25, 1888. Serial No. 281,011. (No model.)



Claim.—The combination of the perforated sections or members provided with slots, the bails secured to the adjacent members and engaging said slots, the staple inserted through the registering perforations of all the sections, and the key engaging said staple, as set forth.

399,433. TRUSS. ALVA OWEN, Chicago, Ill. Filed Sept. 4, 1888. Serial No. 284,522. (No model.)



Claim.—1. A truss-pad comprising, in combination, a hollow retainer, C, having an expanded rim, A, and a plate, B, upon which the retainer C is secured and movable, and a yielding retainer, C', having a projection, l, extending from near the center of the hollow retainer, and a stop, w', surrounding the base of the projection, whereby, in case of displacement of the said projection, the viscera, wherever they shall protrude, may enter the hollow retainer, substantially as described.

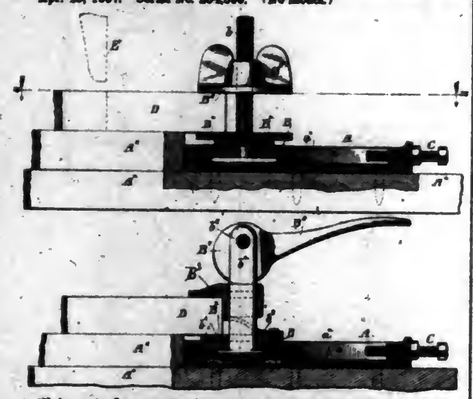
2. A truss-pad comprising, in combination, a concave retainer, C, provided with a sleeve, n, and a retainer, C', comprising a plate, m, and projection l, secured together upon a rod, k, confined toward one end within the sleeve n and having limited longitudinal play therein, and a spring, i, surrounding the rod k and confined between the retainers C and C', substantially as described.

399,434. HORSE-DETACHER. GEORGE T. PARKER, Glasgow, Ky. Filed June 26, 1888. Serial No. 278,498. (No model.)



Claim.—The improvement in holdbacks, substantially as herein described, consisting of the body having hook a and mortise G, and provided in the side walls of each mortise with grooves g, the dog D, provided with the lateral pivot-lugs f entering the grooves g, and the presser engaging dog D, substantially as set forth.

399,435. MORTISING-MACHINE. FRANCIS V. PHILLIPS, Chicago, Ill., assignor to the Chicago Sash Pulley Company, same place. Filed Apr. 15, 1887. Serial No. 234,899. (No model.)

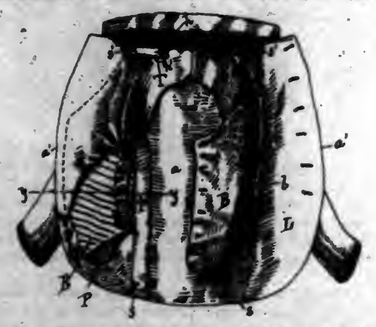


Claim.—1. In combination, the horizontal table for supporting the work, the slotted plate having guideways, a movable part fitted to said slotted plate and adapted to engage with the material, and a stop supported by the plate in direct line with the movable part, for limiting its movement, substantially as described.

2. The combination, in a mortising-machine, of a stationary work-supporting table, a slotted guide-plate secured thereto, a slides, as B, engaging said guide-plate and movable thereon, a clamp carried by the slide B for engaging the material to be operated upon, and an adjustable stop passing through the end of the slotted guide-plate in the path of the slide B, whereby the movement of the work is limited, all substantially as described.

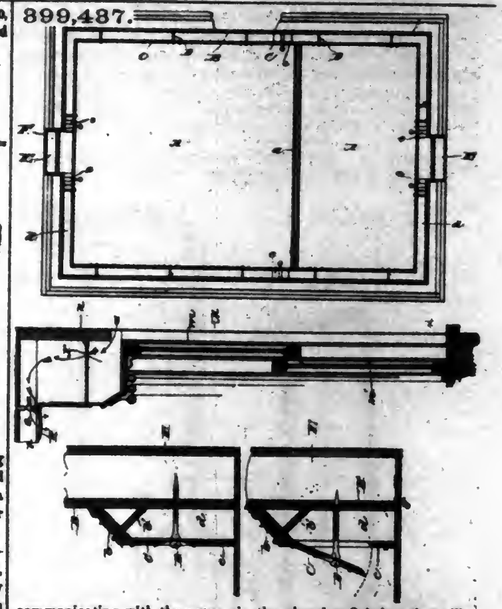
3. In combination, a table for supporting the work, a cutting-tool, guideways on said table, a movable plate adapted to said guideways, a clamp carried by said movable plate for engaging the top of the work, and a spar, b^4, on said plate adapted to engage with the work, all substantially as described.

399,486. COMBINED COAT AND VEST. SAMUEL R. REINHARD Baltimore, Md. Filed Nov. 13, 1888. Serial No. 290,794. (No model.)



Claim.—The within-described combination-garment, having a back, *a*, front pieces, *a' a'*, each provided with a lining, L, at the inner edge of which is an opening to form plackets of pockets P, and vest-sections B, provided with extending button-holed tabs T, all in combination with slots *t'* of the lining L above the armhole of the garment, substantially as described and illustrated, as and for the purpose indicated.

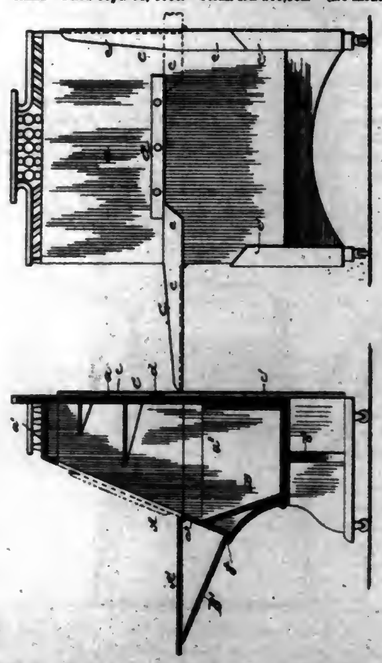
399,487. VENTILATING MECHANISM. RICHARD A. REW, Manitou, Minn. Filed Mar. 29, 1888. Serial No. 268,730. (No model.)



Claim.—1. The combination, in a house-ventilator, of the wall having the vertical escape-flue E, the mop-board arranged at a slight distance from the inner side of the wall on the floor, the molding *b*, connecting the upper side of the mop-board with the wall, and thereby forming a chamber, *d*, communicating with the lower end of flue E, the door or valve C, hinged at its upper edge to the mop-board and fitting snugly in an opening in the same, and the adjusting screw or bolt D, having its inner end engaging an opening in the side of flue E, and having its outer end swiveled in the door or valve, substantially as described.

2. The combination, with the window-frame having the upper and lower sashes, of the chamber N in the upper part of the frame communicating with the outer air, the chamber Q below the ceiling and having the air-perforations *q* in its lower side, said chamber Q communicating with chamber N, substantially as described.

399,488. KITCHEN-CABINET. CHARLES R. ROGERS, St. Peter, Minn. Filed Sept. 11, 1888. Serial No. 285,162. (No model.)

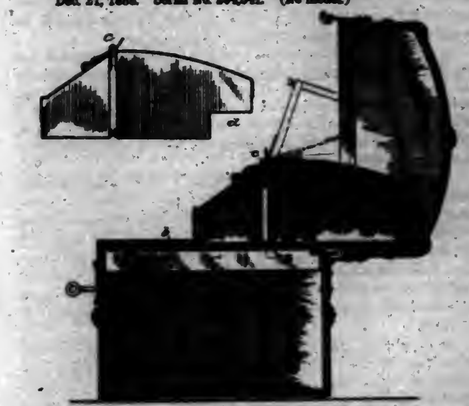


Claim.—1. The case or closure having at its sides hinged shelves or leaves provided at their rear edges with strips extended beyond the sides, along the back of the case or closure, said case or closure having a stop or cleat upon its back, which engages with the extensions of said strips, substantially as and for the purpose set forth.

2. In a kitchen-cabinet, the combination, with a case provided with a cleat across its back and with a molding along the lower part of its rear edges, of shelves hinged to the sides of the case and provided on their rear edges with rearwardly-projecting strips adapted to engage alternately the cleat and the molding, substantially as herein shown and described.

3. The herein-described kitchen-cabinet, consisting of a case provided with the cleat *d* and the molding *d'*, the hinged front portion, A', the board B', hinged to the front A' and serving both as a prop and a pawl, and the shelves C, hinged to the sides of the case and provided with rearwardly-projecting strips for engaging alternately the cleat and molding, as specified.

399,489. TRUNK. HENRY W. ROMPTREE, Richmond, Va. Filed Dec. 21, 1888. Serial No. 294,341. (No model.)

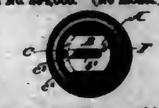


Claim.—1. The combination, with a trunk, its hinged lid or cover, and supporting-strips for the tray fixed to the ends of the trunk, of a tray sustained upon these strips and adapted to slide horizontally back on said supports so as to protrude into the hinged cover, substantially as described.

2. The combination, with a trunk, its hinged lid or cover, and supporting-strips for the tray fixed to the ends of the trunk, of a tray sustained upon these strips and made in two hinged sections and adapted to slide horizontally back on said supports so as to protrude into the hinged cover, substantially as described.

3. The combination of the trunk having its rear edge, *a*, cut down or reduced in height, the supporting end strips, C, having their upper edge higher than the rear edges of the trunk, and provided with anti-friction rollers, and the tray made in two hinged sections and arranged upon the rollers on the strips to slide horizontally back into the lid of the trunk when raised.

399,440. BOTTLE-STOPPER. JONAS J. SANDS, Merton, Wis. Filed Dec. 18, 1888. Serial No. 294,005. (No model.)



Claim.—1. The combination, with a vessel having an orifice to be stopped, provided with opposite interior shoulders, of a stopper-holder composed of two interlocked parts which slide upon each other, whereby the holder may be expanded to engage the shoulders of the orifice and retracted to disengage them, substantially as described.

2. A stopper-holder composed of the connected sliding parts B and C and provided with centrally coincident slots which overlap each other at their ends, whereby the parts may be expanded by outward pressure on the ends of the slots to engage the shoulders of the orifice to which the holder is to be applied, substantially as described.

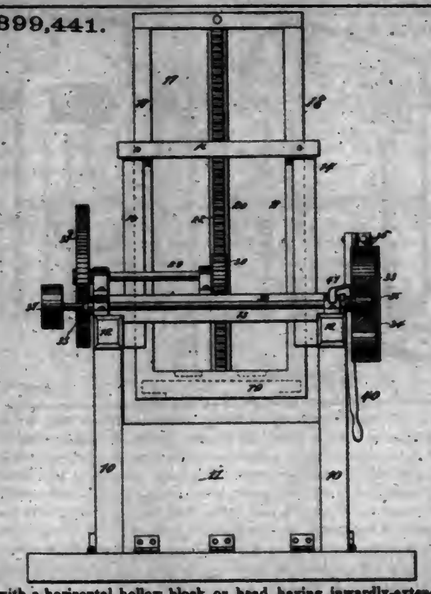
3. The connected and relatively sliding parts B and C, adapted to engage the shoulders of a bottle-neck or other vessel-orifice, one of said parts being provided with the hole or slot c^2 for the admission of a point for the contraction of the holder, substantially as described.

399,441. TRAMPER ATTACHMENT FOR COTTON-PRESSES. AUGUST SCHRADE, Giddings, Tex. Filed July 13, 1888. Serial No. 279,767. (No model.)

Claim.—1. The combination, with a press, a plunger box or slide secured to said press, and a plunger reciprocating in said box or slide and provided with an attached block or head and central uprights having a racked outer surface, of a horizontal shaft at each side of the plunger box or slide provided with a pinion adapted to engage the said racked surface of the uprights, and means, substantially as shown and described, for rotating the said shafts, as and for the purpose specified.

2. The combination, with a press, a plunger box or slide secured to said press, a plunger reciprocating in said box or slide, provided

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with a horizontal hollow block or head, having inwardly-extending lower marginal flanges, uprights secured to said plunger-block at the center, and a rack secured to the outer face of the said uprights, of a horizontal shaft journaled at each side of the plunger box or slide, and pinions keyed to said shafts adapted to engage the said racks, substantially as and for the purpose specified.

3. The combination, with a press, a plunger box or slide secured to said press, a plunger reciprocating in said box or slide, a horizontal hollow block or head secured to said plunger, provided upon its under face with an inwardly-extending marginal flange, an upright centrally secured at each side of the plunger-block, and a rack secured to the outer faces of the said uprights, of a horizontal shaft journaled at the front and rear of the plunger slide or box, a pinion secured to said shafts engaging said racks, gear-wheels secured to the outer ends of the said shafts, an adjustable drive-shaft provided with a friction-pulley at one end, a second parallel shaft provided with a pinion engaging the said gear-wheels, and a grooved balance-wheel secured to the latter shaft, adapted to receive the friction-pulley upon the drive-shaft, substantially as and for the purpose specified.

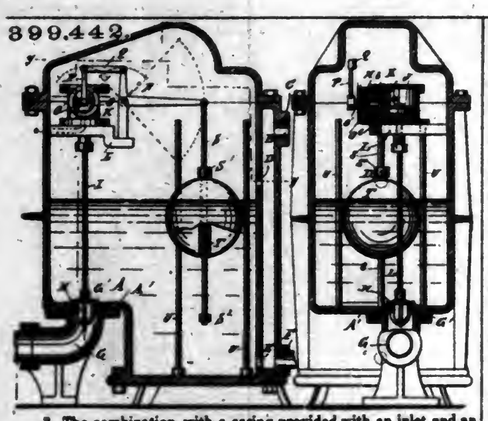
4. The combination, with a press, a plunger box or slide secured to said press, a plunger reciprocating in said box or slide, a horizontal hollow block or head secured to said plunger, provided upon its under face with an inwardly-extending marginal flange, an upright centrally secured at each side of the plunger-block, and a rack secured to the outer faces of the said uprights, of a horizontal shaft journaled at the front and rear of the plunger slide or box, a pinion secured to said shafts engaging said racks, gear-wheels secured to the outer end of the said shafts, an adjustable drive-shaft provided with a friction-pulley at one end, a second parallel shaft provided with a pinion engaging the said gear-wheels, a balance-wheel provided with an inwardly-projecting peripheral flange and an inwardly-projecting hub adapted for engagement with the friction-pulley of the drive-shaft, a brake-lever adapted for engagement with the periphery of the balance-wheel, and means, substantially as shown and described, for adjusting the drive-shaft, as and for the purpose specified.

399,442. DRAINAGE-TRAP. JOHN SHAW, Sr., Bayonne, N. J. Filed Sept. 24, 1888. Serial No. 286,194. (No model.)

Claim.—1. In a drainage-trap, the combination, with a cylinder provided with a valve-chest and inlet and outlet ports, of a piston held to travel in the said cylinder, an outlet-valve supported on the said piston, a valve held to swing in the said valve-chest and operating over the said ports, and a float operating the said valve, substantially as shown and described.

2. In a drainage-trap, the combination, with a casing provided with an inlet and an outlet, of a valve seated in the said outlet, a piston supporting the said valve, a cylinder containing said piston and provided with a valve-chest and inlet and outlet ports, a valve held in the said valve-chest and operating over the said ports, a rod connected with the said valve and provided with collars, and a float traveling on the said rod between the said collars, substantially as shown and described.

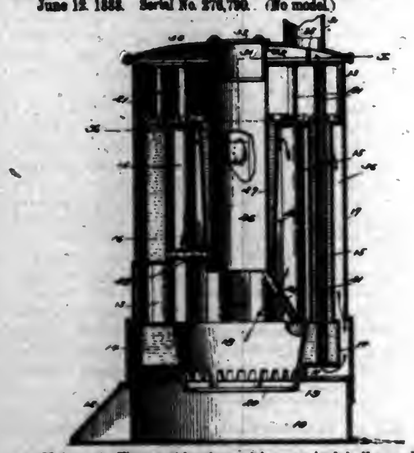
399,442.



3. The combination, with a casing provided with an inlet and an outlet pipe, of a valve seated in the said outlet-pipe and opening inward in the said casing, a piston-rod supporting said valve, a piston connected with the said piston-rod, a cylinder containing said piston and provided with inlet and outlet ports, and also with a valve-chest, a valve held to turn in the said valve-chest and operating over the said ports, a bell-crank lever connected with the said valve, a rod pivotally connected with the said bell-crank lever and provided with collars, and a float held to travel on the said rod between the said collars, substantially as shown and described.

4. The combination, with a casing provided with an inlet and an outlet pipe, of a valve seated in the said outlet-pipe and opening inward in the casing, a piston-rod supporting said valve, a piston connected with the said piston-rod, a cylinder containing said piston and provided with inlet and outlet ports and also with a valve-chest, a valve held to turn in the said valve-chest and operating over the said ports, a bell-crank lever connected with the said valve, a rod pivotally connected with the said bell-crank lever and provided with collars, and a float held to travel on the said rod between the said collars, and guide-rods held in the said casing for guiding said float, substantially as shown and described.

399,443. BOILER. GEORGE F. SPENCER, Thompson, Pa. Filed June 12, 1888. Serial No. 276,790. (No model.)



Claim.—1. The combination, with a vertical boiler and its fire-pot and a smoke-box above the boiler, of a jacketed fuel-magazine extending down through smoke-box and the top of the boiler into the combustion-chamber and having a movable or sliding direct-draft section within the smoke-box, the space within the jacket communicating with the interior of the boiler, substantially as set forth.

2. The combination, with the vertical casing having a smoke-box in its top, a fire-pot, and flues leading from the space above the fire-pot downward and then upward into the smoke-box, of a fuel-magazine leading down through the smoke-box into the combustion-chamber and provided with a removable section within the smoke-box, whereby by removing said section a direct draft through the magazine from the fire-pot to the smoke-box will be formed, substantially as set forth.

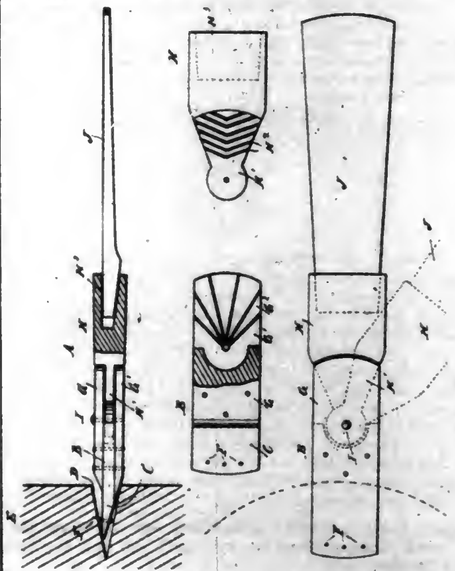
3. The combination, with the vertical casing having a smoke-box in its upper end, the boiler in said casing consisting of upper and lower water-chambers, tubes connecting them, concentric fire-tubes passing through the water-tubes and both water-chambers, the lower ends of the fire-tubes leading from a space within the casing below the lower water-chamber and their upper ends discharging into the smoke-box, and baffle-plates for causing the draft to pass from the upper part of the combustion-chamber downward to the lower ends of the fire-tubes, of a jacketed magazine extending down through the smoke-box and upper water-chamber, with its jacketed space communicating with the interior of the boiler and having a removable section within the smoke-box, by removing which a direct draft through the magazine will be formed, substantially as set forth.

4. In a boiler, the combination, with a lower water-chamber surrounding the fire-pot, an upper water-chamber, water-tubes connecting the upper and lower chambers, and fire-tubes passed through the water-tubes and water-chambers, of a fuel-magazine surrounded by a water-jacket connected with the lower water-chamber and baffle-plates partially closing the space intervening the several water-tubes, substantially as shown and described.

5. In a boiler, the combination, with a lower water-chamber surrounding the fire-pot, a base supporting said chamber, an upper water-chamber, water-tubes connecting the upper and lower chambers, fire-tubes passing through the water-tubes and said chambers, and baffle-plates partially closing the space intervening the water-tubes, of a fuel-magazine surrounded by a water-jacket connected with the lower water-chamber and a casing surrounding the chamber and water-tubes supported upon the base, substantially as shown and described.

6. In a boiler, the combination, with a lower water-chamber surrounding the fire-pot, an upper water-chamber, water-tubes connecting the upper and lower chambers, fire-tubes passing through said chambers and water-tubes, and baffle-plates partially closing the space intervening the water-tubes, of a fuel-magazine surrounded by a water-jacket connected with the upper and lower water-chambers, a casing surrounding the water-receptacle provided with an offtake-flue, and a segmental deflecting-plate attached to the upper water-chamber beneath said flue, all combined to operate substantially as shown and described.

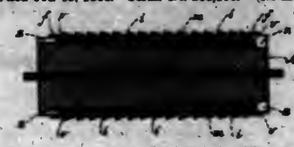
399,444. FOOT-BOARD FOR WOOD-CHOPPERS. AARON L. STEVENS, Little Falls, Wash. Filed Mar. 8, 1888. Serial No. 266,611. (No model.)



Claim.—1. In a wood-chopper's foot-board, the combination, with the broad flat arm adapted at its forward end to enter a transverse notch in a tree and having a horizontally-forked inner end, of the head H, having a forwardly-projecting tenon pivoted within said forked end to swing horizontally in the plane of the arm, and the flat board J in the plane of the arm and head, whereby the operator may step from the board to the arm when it is necessary for him to change the relative position of the board, substantially as set forth.

2. In a foot-board for wood-choppers, the combination, with an arm adapted to be secured in a notch of the tree and provided near its outer end with a roughened surface, of a head pivotally secured to the outer end of the said arm, and also provided with a roughened surface in contact with the roughened surface of the said arm, and a board secured to the said head, substantially as shown and described.

399,445. ROLL FOR LOOM-TEMPLES. BENJAMIN D. STEVENS, Burlington, Vt., assignor to himself and Benjamin H. Cheever, Lowell, Mass. Filed Oct. 15, 1888. Serial No. 288,106. (No model.)



Claim.—1. A loom-temple roll provided with a series of longitudinal grooves having inclined bottoms and serrated plates disposed therein, an edge of each of said plates being inclined to conform to the bottom of said grooves, substantially as set forth.

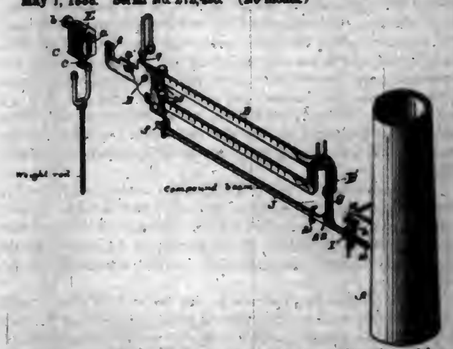
2. The combination of a roll having a series of grooves in its body provided with inclined bottoms, serrated plates disposed therein and having correspondingly-inclined edges, whereby they may be adjusted vertically when moved longitudinally, and rings for securing said plates in position in said grooves, substantially as described.

3. A roll provided with a series of longitudinal grooves having inclined bottoms, plates fitted to slide in said grooves, the outer edges of said plates being provided with teeth or points and the inner edges inclined to conform to the bottoms of said grooves, and adjunctive mechanism for detachably securing the plates in position, whereby the teeth or points may be adjusted vertically in relation to the surface of the roll as the plates are moved longitudinally, substantially as set forth.

4. The combination of a roll having reduced ends and provided with a series of longitudinal grooves having inclined bottoms, plates provided with beveled ends and fitted to slide in said grooves, the outer edges of said plates being serrated and the inner edges inclined to conform to the bottoms of the grooves, and rings adjustably disposed on the reduced ends of the roll in engagement with the beveled ends of the plates, substantially as and for the purpose set forth.

5. In combination, the body A, having reduced ends and provided with grooves *z*, having longitudinally-inclined bottoms, in combination with the serrated plates *m*, provided with beveled ends *v*, and having their inner edges inclined to conform to the bottoms of said grooves, and the rings *f*, disposed on the reduced ends of said body and adapted to engage the ends *v* of said plates and secure the same in position in said grooves, substantially as described.

399,446. WEIGHING-SCALE. WILLIAM H. STEWART, Kansas City, Mo., assignor of one-half to William S. Whittaker, same place. Filed May 1, 1888. Serial No. 272,490. (No model.)



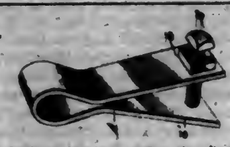
Claim.—1. The main beam of a scale, in combination with an additional beam hung below and fulcrumed to the main beam, said additional beam being provided with a shank at its outer end, and a movable block which is located on said shank and carries a pivot.

2. In a weighing-scale, the main beam B, in combination with additional beam J, hung below it, link *g*, which fulcrums the lower beam to the upper movable block, I, carrying pivot *h*, located on outer end of beam J, and a stationary bracket or surface which is engaged by pivot *h*.

399,447. ANTI-RATTLER FOR THILL-COUPLINGS. FRED P. STILES, Sparta, Wis. Filed Nov. 2, 1888. Serial No. 289,301. (No model.)

Claim.—1. The herein-described anti-rattler, composed of the strip bent in an inverted-U shape and having a set-screw passed through

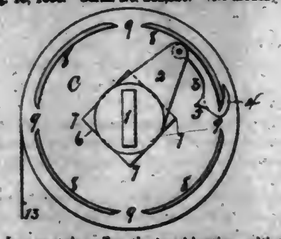
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one of its limbs and adapted to bear on its other limb to force the two limbs apart to take up wear, substantially as described.

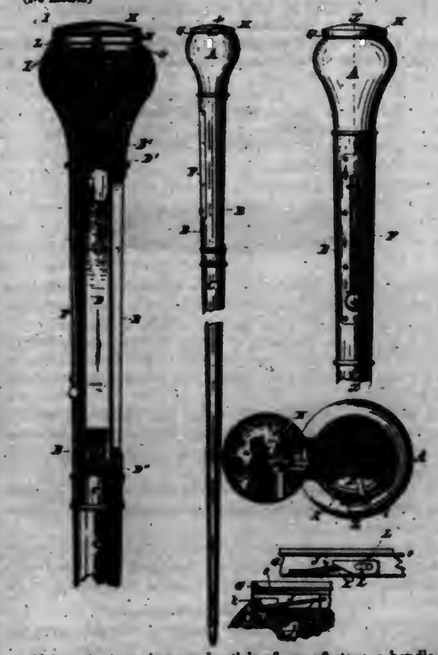
2. The hereinbefore shown and described anti-rattler, composed of an untempered strip of metal bent to an inverted-U shape, and the set-screw arranged at the separated ends of the limbs passing through one of the said limbs and adapted to bear on the other limb, to force the two limbs apart to take up wear, substantially as described.

399,448. CURTAIN-ROLLER. ALVAH SWEETLAND, Syracuse, N.Y. Filed Aug. 13, 1888. Serial No. 282,630. (No model.)



Claim.—In a curtain-roller, the combination, with the roll proper, a plate provided with a rectangular central hub the corners of which constitute shoulders, and multiple-curved flanges opposite the straight sides of the hub with spaces or openings between them opposite and equal in number to the corners or shoulders of said rectangular hub, of a stationary spindle, a stationary arm upon the spindle, a pawl, 3, having a hooked end, 4, providing a deep notch for the effectual engagement with the ends of said flanges, said pawl being pivoted to the arm, and an inclined-face lug, 5, at the back of the pawl opposite the hook 4, whereby with the rotation of the roll said lug is engaged by any one of said shoulders and the hook of the pawl thrown into engagement with one of said flanges, substantially as shown and described.

399,449. HANDLE FOR UMBRELLAS, WALKING-CANES, &c. WILLIAM TAYLOR, Buffalo, N.Y. Filed Aug. 4, 1888. Serial No. 282,017. (No model.)



Claim.—1. As an improved article of manufacture, a handle for a walking-cane, umbrella, parasol, fishing-pole, and the like, consisting

of a head, A, having the compass with its cover H, the hollow body portion B, provided in its bore with the storm-glass D, and the slotted aperture E, and the thermometer F, the whole being combined and arranged in a manner as and for the purpose stated.

2. The combination, with the head A, of the shell G, having the cover H, the central pin, M, magnetic needle I, and the lifter J, provided with a suitable handle, L, as and for the object set forth.

3. In handles for canes, umbrellas, and the like, the combination, with the central portion, B, having a core, C', of a storm-glass, D, retained in position by the elastic cushions D' D'', said portion B having a longitudinal slot, E, as and for the object stated.

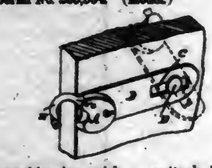
399,450. EYEGLASS-POLISHER. EDWARD R. THORPE, New York N. Y., assignor to himself and Harry Robinson, same place. Filed Nov. 2, 1888. Serial No. 290,362. (No model.)



Claim.—1. A polisher consisting, essentially, of an outer backing or body of flexible material and an inner sheet of polishing material, the sheet of polishing material being connected to the backing or body, substantially as described

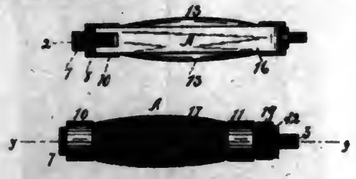
2. A polisher consisting, essentially, of an outer backing or body, a sheet of polishing material, as chamois, and an interposed layer of viscid material, substantially as described.

399,451. HASP-LOCK. WILLIAM TIFFANY, Creswell, Oreg. Filed Apr. 30, 1887. Serial No. 235,534. (Model.)



Claim.—The combination, with a padlock having a pivoted shackle, of the sheet-metal plate B, having a longitudinal slot, C, at one end adapted to engage over a stud or similar device on the door, and secured at its other end to the body of the lock and forming a back for the same, the said lock being so arranged that its shackle projects beyond the end of the plate, substantially as specified.

399,452. GUN-CLEANER. CHARLES TOMLINSON, Syracuse, N. Y., assignor to Harvey McMurchey, same place. Filed Dec. 20, 1888. Serial No. 294,162. (No model.)



Claim.—1. In a gun-cleaner, a wire-cloth tube, in combination with expansible springs mounted in a frame-work, and means for expanding or contracting the springs, substantially as described.

2. A gun-cleaner consisting of spring side pieces mounted in a frame, the frame mounted upon the body of the cleaner, a take-up spring within the frame, and a tension-nut, in combination, substantially as described.

3. A gun-cleaner consisting of spring side pieces mounted in a frame, the frame mounted upon the body of the cleaner, and a tension-nut, in combination with a wire-cloth tube drawn longitudinally over the spring side pieces.

4. In a gun-cleaner, a wire-cloth tube fitting over and in combination with an elastically compressible and expansible body, substantially as described.

5. In a gun-cleaner, a wire-cloth tube fitting over and in combination with an elastically compressible and expansible body, and means for regulating the expansion and compression, substantially as described.

399,453. VEHICLE-WHEEL. GEORGE T. WARWICK, Springfield, Mass. Filed Sept. 3, 1888. Serial No. 284,437. (No model.)

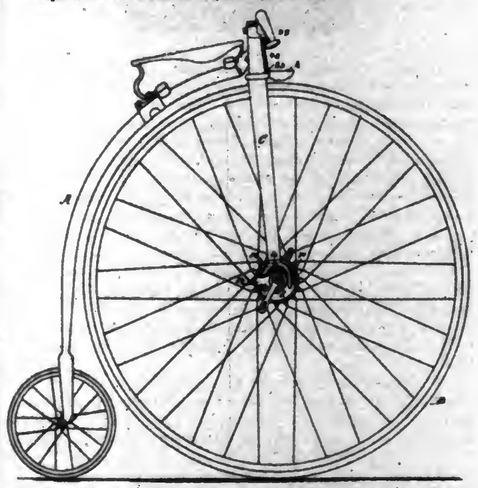
Claim.—The wheel-rim 5, having the tubular spoke-holding nut 6, and the spoke 4, having thereon the tubular nut 8 within said nut

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6, combined with a rubber thimble interposed between said nuts, on which said inner nut bears, substantially as set forth.

399,454. BICYCLE. GEORGE T. WARWICK, Springfield, Mass. Filed Sept. 3, 1888. Serial No. 284,438. (No model.)



Claim.—1. In a velocipede, the combination, with a fork-leg provided with a yoke having an extension provided with a pivotal bearing-socket, 54, of the wheel-spindle and the bearing-box embracing same, having an extension by its outer end pivotally hung in said socket, and a spring interposed between the top of said bearing-box and the said yoke above said box, the said pivotal connection between the yoke and the bearing-box extension being in a line at about right angles to the line of compression of said spring, substantially as described.

2. In a velocipede, the combination, with a fork-leg provided with a rigidly-attached yoke having an extension provided with a pivotal bearing-socket, 54, and terminating in the extension-bearing 55, substantially as described, of the wheel-spindle and the bearing-box embracing same, having an extension by its outer end pivotally hung in said socket, and a spring interposed between the top of said bearing-box and the said yoke above said box, the said pivotal connection between the yoke and the bearing-box extension being in a line at about right angles to the line of compression of said spring, and the adjusting-screw 56, passing through said bearing 55 against the side of the said bearing-box, substantially as and for the purpose described.

3. The combination, with the bearing-box and the fork-leg having the yoke connected with and spring-supported from said box, substantially as described, and provided with the extension 52 in front of the said box, having the slot 63, of the guiding-pin 64, secured on the edge of said box and passing through said slot, substantially as described.

4. The combination, with the bearing-box and the wheel-spindle *f*, provided with the annularly-grooved journal-collar 65, of the ring-shaped ball-case fitting in said bearing-box and about said journal-collar, having the internal annular groove formed in segments having their matching ends in planes inclining to the sides of the case, whereby the lines of juncture at the grooved walls cross same obliquely, and the hardened balls *m*, substantially as and for the purpose described.

5. The combination, with the wheel-spindle having the hub fixed thereon, and the journal-collar 65, and the bearing-box suitably supported at its inner end embracing and bearing on the periphery of said journal-collar, of the dust-cap 73 between the end of the hub and the ends of the journal-collar and bearing-box, and covering the circular line of contact between said collar and box, substantially as and for the purpose described.

6. The combination, with the wheel-spindle having the externally-grooved journal-collar or enlargement thereon, the bearing-box, and the annular internally-grooved ball-case peripherally surrounding the

said journal-collar, of the inclosing-cap 74, screwing into the bearing-box, with its inner face in a plane at right angles to the axis of the said spindle and ball-case, and lying against and covering the circular line of contact between the inner periphery of the ball-case and the outer periphery of the journal-collar at the outer end thereof, substantially as described.

7. The combination, with the wheel-spindle having the journal-collar thereon and the bearing-box and ball-case therein surrounding the journal-collar, of the inclosing-cap 74, screwing into the bearing-box, having a rabbet, 75, and the supplemental dust-plate 76 therein, covering the circular line of contact between the journal-collar and the ball-case at the outer end thereof, substantially as shown and described.

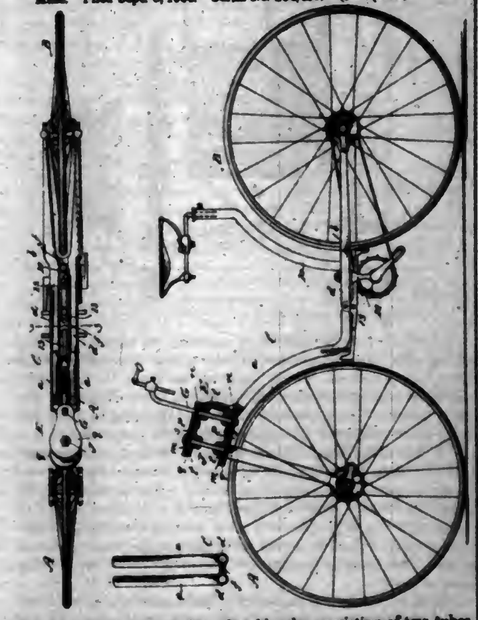
8. The combination, with the fork-head having the vertical socket 90 therein and the brake-shoe and pivoted carrying-arm therefor, of the pivoted brake-lever 85 and the connecting-rod by its lower end pivoted to an intermediate portion of the brake-carrying arm, having an offset bracket, to which the brake-lever is connected by its end, and a spring to lift said connecting-rod, substantially as described.

9. Improved pivotal connections between levers and the parts to which they are connected, consisting of a rabbet formed in the stock of one of the adjacent surfaces around the pivotal pin, and a bushing of compressible material inserted in said rabbet to exert a transverse pressure between the parts, whereby the swinging part may be held against its pivot-head, and a washer interposed between the outer end of the bushing and the surface of the adjacent part and surrounding the pivot, substantially as and for the purpose described.

10. The combination, with the slotted fork-head and the backbone connected to and capable of swinging thereon, of a dust-guard having rigid ear-pieces secured to the neck of the backbone, said dust-guard entirely surrounding the fork-head and covering the slot therein

11. The combination, with the slotted fork-head and the backbone swinging thereon, of the semicircular dust-guards 106, encircling said fork-head, having at their rear edges the ear-pieces 107, and the bolt 108, passing through the said ear-pieces and said backbone, as shown.

399,455. SAFETY-BICYCLE. GEORGE T. WARWICK, Springfield, Mass. Filed Sept. 3, 1888. Serial No. 284,439. (No model.)



Claim.—1. A frame for safety-bicycles, consisting of two tubes ranging in parallelism and joined together, curved at their forward end portion to form the backbone for the forward wheel, and to the rear of which they extend horizontally and form suitable carrying-supports for other parts of the machine, as described, and the rear-wheel fork, substantially as and for the purpose described.

2. In a bicycle, the combination, with the forward and rear wheels, which are of substantially the same diameters, and a fork carrying the front wheel provided with a vertically-extending spindle-bearing for rotation in the stationary head of the bicycle, and a separate vertically-extending handle-bar spindle, also bearing for rotation in said head, of a motion-reducing connection on and between the said handle-bar and fork spindles, whereby on the rotation of the former a rotation of less extent is imparted to the latter spindle, substantially as and for the purpose described.

3. In a bicycle, the combination, with a suitable head-frame and the front fork having a spindle-bearing for rotation in said head, provided with a spur-gear, of the handle-spindle bearing for rotation in said head-frame provided with a spur-gear of less diameter than the one on the fork-spindle, and an intermediate pinion between and engaging said spindle-gears, substantially as and for the purpose described.

4. In a bicycle, the combination, with a suitable head-frame and the front fork having a spindle-bearing for rotation in said head, provided with a spur-gear, of the handle-spindle bearing for rotation in said head-frame, provided with a spur-gear of less diameter than the one on the fork-spindle, and an intermediate pinion between and engaging said spindle-gears, the said frame being provided with a rabbeted chamber, into which said gear-wheels are disposed, and a cap for inclosing the same, substantially as described.

399,456. BALL-BEARING FOR VELOCIPEDES. GEORGE T. WARWICK, Springfield, Mass. Filed Sept. 3, 1888. Serial No. 284,440. (No model.)



Claim.—1. In an improved ball-bearing, the combination, with the legs of the fork and the axle non-rotatable thereon, of two normally-separated and movable bearing-collars on the axle having a ball-groove in and between their adjacent separated ends, a rotatable adjusting-sleeve interposed between said collars and axle having a screw engagement with said collars, a wheel-hub receiving therein said bearing-collars, having an annular ball-groove therein, and bearing-balls between said hub and collars, substantially as described.

2. An improved ball-bearing consisting of the combination, with an axle, substantially as described, of two normally-separated but movable bearing-collars carried on the axle having a ball-groove in and between their adjacent separated ends, one of said collars having an engagement with said axle, a rotatable adjusting-sleeve interposed between said collars and axle having a screw-connection with said collars, whereby they are approached and separated, a wheel-hub receiving therein said bearing-collars having an annular ball-groove therein, and bearing-balls between said hub and collars, substantially as set forth.

3. An improved ball-bearing consisting of the combination, with an axle, of two normally-separated but movable bearing-collars carried on the axle having a ball-groove in and between their separated ends, one of said collars having an engagement with said axle, a rotatable adjusting-sleeve interposed between said collars and axle having a screw-connection with said collars, whereby they are approached and separated, a turning washer applied to the outer end of said sleeve, a wheel-hub receiving therein, said bearing-collars having an annular ball-groove therein, and bearing-balls between said hub and collars, substantially as set forth.

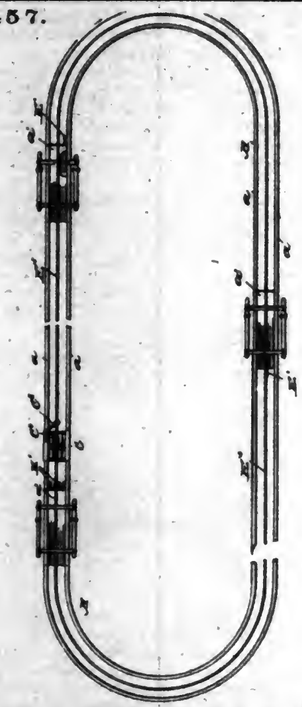
4. In combination, the wheel-hub 3, having therein an annular ball-groove, the axle 2, having a projecting pin or pins, 5, the exteriorly-screw-threaded sleeve 6, rotatable on said axle, the normally-separated bearing-collars 7 and 8 on said sleeve having a screw engagement therewith and a ball-groove in their separated ends, said collars 7 having a slotted engagement with said pins 5 in the axle, a turning washer, 12, engaging with the end of said sleeve, bearing-balls between said hub and collars, and a locking-nut, 4, screwed on the end of said axle, substantially as set forth.

399,457. CASH-CARRIER APPARATUS. NELSON WEBER, Jr., Long Island City, N. Y. Filed Sept. 5, 1888. Serial No. 284,605. (No model.)

Claim.—1. In a carrier apparatus, the combination, with a compartied carriage having a series of latches or retainers each normally effecting a closure of a single compartment, of separate trips at each station in the path of the carriage, the trip of each station being out of line with those of the remaining stations and in the line of a single compartment of the carriage, substantially as described.

2. In a carrier apparatus, a carriage divided longitudinally into sections corresponding to the different stations and a series of latches each of which normally effects a closure of a single section of the carriage, in combination with a trip-block at each station in the path of

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one of said latches, a trip-standard in alignment with said trip-block and acting to eject a pocket or holder as the said block trips the latch, and an arm for temporarily holding the pockets to be taken up by the carriage, the trips and take-ups of each station being wholly out of line with the corresponding devices of the remaining stations and in line with a section of the carriage, substantially as described.

3. A carrier apparatus comprising a carriage and a cash pocket or holder therefor, the carriage being divided into longitudinal compartments and longitudinally slotted at the bottom wall, and the pocket formed with a head and adapted to said compartment to lie wholly within the plane thereof, and thus not project into the plane of the remaining compartments of the carriage, substantially as described.

4. In a carrier apparatus in which the carriage automatically takes up and discharges the cash pockets or holders, a take-up and carrier mechanism, comprising a carriage divided longitudinally into compartments, cash pockets or holders formed with a socket and having a head fitting the said compartments, to lie wholly within the plane thereof, and an arm at each station adapted to be received in the socket of the cash-pocket, substantially as described.

5. The combination, with the carriage formed with compartments, of latches or retainers pivotally mounted thereon and normally effecting a closure of one end of said compartments, substantially as described.

6. The combination, with the comparted carriage, of latches or retainers pivoted thereon and normally effecting a closure of one end of each compartment, and automatically closing gates at the opposite ends of each compartment, substantially as described.

7. In a carrier apparatus, a carriage divided longitudinally into compartments, the bottom wall of which is slotted longitudinally, and guide-plates or flanges extending therefrom between the said pockets, in combination with cash holders or pockets provided with heads fitting in said compartments and whose bodies fit between said flanges, substantially as described.

8. As a new article of manufacture, a cash-pocket for cash-carriers, formed with a head by which it is held in the carriage and with a socket by which it is held on the take-up arm, substantially as described.

9. A carrier apparatus comprising an endless track, a cash-station, and a series of sales-stations, baskets held below each of said stations, a comparted carriage on said track provided with latches normally effecting a closure of the one end of said compartments, a trip-block at each station in the path of one of said latches and a trip-standard for the cash-pockets adapted to eject the same from the carriages simultaneously with the tripping of the latches, a take-up standard at each station provided with an arm for temporarily holding the cash-pockets, and a full complement of trips and take-ups at the cashier's desk representing each of the sales-stations, substantially as described.

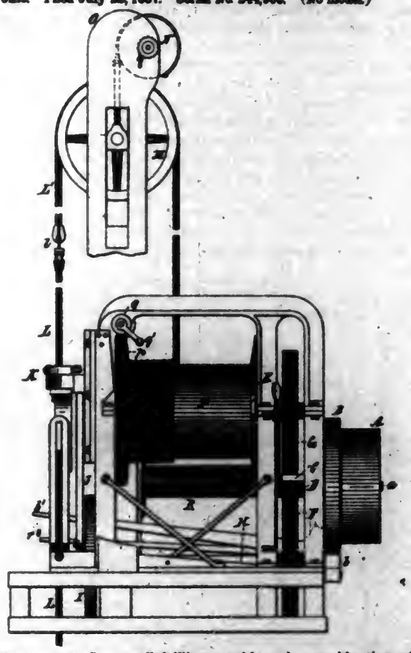
399,458. HAME-TUG. JOHN E. WHEELER, Cincinnati, Ohio. Filed Dec. 15, 1888. Serial No. 293,745. (No model.)



Claim.—1. The hame-tug A, having a series of T-shaped slots, J J', and stops K K', in combination with the trace-hook L, having pins M M', for the purpose described.

2. As an improved article of manufacture, the hame-tug A, having a raised loop, D, side bars, F F', center bar, G, stamp H, slots J J', and stops K K', all as herein described.

399,459. WELL-DRILLING MACHINE. WILLET C. WELLS, Tiffin, Ohio. Filed July 22, 1887. Serial No. 244,968. (No model.)



Claim.—1. In a well-drilling machine, the combination of a driving-shaft, a pinion secured thereto, a spur-wheel transmitting power to a cross-head, thereby imparting motion to the drill, and a spur-wheel adapted to actuate the rope-spool for the purpose of raising or lowering the drill, with mechanism for throwing the pinion into engagement with either spur-wheel, substantially as specified.

2. In a well-drilling machine, the combination of a driving-shaft, a pinion mounted thereon, a spur-wheel, a crank-wheel connected therewith and adapted to be driven thereby, a pitman connecting the crank-wheel with a cross-head provided with mechanism adapted to engage with the drill-stock or a cable connected therewith, a rope-spool and a spur-wheel connected therewith, with an eccentric adapted to throw the pinion into engagement with either spur-wheel, substantially as specified.

3. In a well-drilling machine, the combination of a driving-shaft, a balance-wheel thereon, a drum carrying the sand-bucket rope, and a friction-wheel connected with the drum with a sliding box carrying the drum-shaft, and a lever connected with and adapted to actuate the sliding box for the purpose of bringing the friction-wheel into engagement with the balance-wheel, substantially as and for the purpose specified.

4. In a well-drilling machine, the combination of the driving-shaft a, balance-wheel B, brake r^3, drum R, carrying the sand-bucket rope, and friction-wheel r', with a sliding box, r^2, and a lever, r^3, connected with and adapted to actuate the sliding box for the purpose of bringing the friction-wheel into engagement with the balance-wheel, substantially as and for the purpose specified.

5. In a well-drilling machine, the combination of the driving-shaft a, pinion C, spur-wheel F, connected with and adapted to actuate the cross-head K, spur-wheel G, connected with and adapted to actuate the rope-spool, balance-wheel B, and friction-wheel r', connected with the sand-bucket spool, with the eccentric D, substantially as and for the purpose specified.

6. In a well-drilling machine, the combination, with a reciprocating cross-head provided with mechanism adapted to engage with a cable carrying the drill-stock, of a rope supporting the cable carrying the drill-stock and connected to the cable by a swivel, and a clamp for rotating the cable, substantially as specified.

7. In a well-drilling machine, the combination, with a reciprocating cross-head provided with mechanism adapted to engage with a cable carrying the drill-stock, of a spring-pulley adapted to take up the slack in the cable, substantially as specified.

8. In a well-drilling machine, the combination, with a reciprocating cross-head provided with mechanism adapted to engage with a cable connected with the drill-stock, of a drum carrying a rope which supports the cable and mechanism for paying out the rope, substantially as specified.

9. In a well-drilling machine, the combination, with a reciprocating cross-head provided with mechanism adapted to engage with a cable connected with the drill-stock, of a drum carrying a rope which supports the cable, a swivel connecting the rope with the cable, and mechanism for rotating the cable, substantially as specified.

10. In a well-drilling machine, the combination of a reciprocating cross-head provided with mechanism adapted to engage with a cable carrying the drill-stock, and a drum carrying a rope which supports the cable, with mechanism for paying out the rope, and mechanism for actuating the drum for the purpose of raising or lowering the drill, substantially as specified.

11. In a well-drilling machine, the combination of a reciprocating cross-head adapted to engage with a cable carrying the drill-stock, with a rope supporting the cable, a drum to which the rope is connected, and a spring-pulley adapted to take up the slack in the cable substantially as specified.

12. In a well-drilling machine, the combination of a reciprocating cross-head provided with mechanism adapted to engage with a cable carrying the drill-stock, with a spring-pulley, a yoke suspended from the spring-pulley and supporting a sheave, and a rope supporting the cable and taking over said sheave, substantially as specified.

13. In a well-drilling machine, the combination of a reciprocating cross-head provided with mechanism adapted to engage with a cable carrying the drill-stock, with a spring-pulley, a yoke suspended from the spring-pulley and supporting a sheave, elastic bumpers beneath said yoke, and a rope supporting the cable and taking over said sheave, substantially as specified.

14. In a well-drilling machine, the combination of a reciprocating cross-head provided with mechanism adapted to engage with a cable connected with the drill-stock, a rope supporting the cable, a spring-pulley adapted to take up the slack in the cable, and a cord whereby the tension of said spring-pulley may be increased or decreased, substantially as specified.

15. The combination, in a well-drilling machine, of a reciprocating cross-head, an externally-threaded temper-screw, a clamp adapted to lock the temper-screw to a cable supporting the drill-stock, and a nut journaled in the cross-head and supporting the temper-screw, with mechanism for locking the nut to the temper-screw, substantially as specified.

16. The combination, in a well-drilling machine, of a reciprocating cross-head, an externally-threaded temper-screw, a clamp adapted to lock the temper-screw to a cable supporting the drill-stock, and a nut journaled in the cross-head and supporting the temper-screw, with mechanism for locking the nut to the cross-head, substantially as specified.

17. The combination, in a well-drilling machine, of a reciprocating cross-head, an externally-threaded temper-screw, and a clamp adapted to lock the drill-stock to a cable supporting the drill-stock, with mechanism for locking the nut to the temper-screw or to the cross-head, substantially as specified.

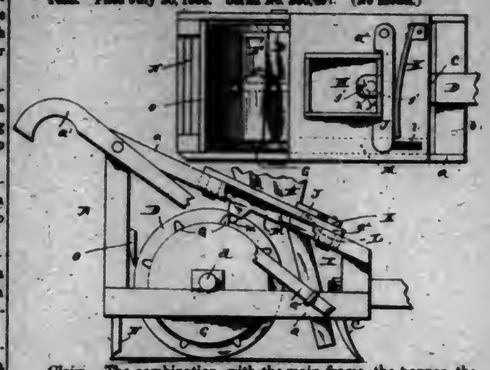
18. The combination, in a well-drilling machine, of a reciprocating cross-head, a temper-screw journaled therein, a clamp adapted to lock the temper-screw to a cable supporting the drill-stock, and mechanism for rotating the temper-screw, substantially as specified.

19. In a well-drilling machine, the temper-screw T, clamp t, nut k', and means for rotating the temper-screw, in combination with the eccentric c^6, substantially as and for the purpose specified.

20. The grip U, consisting of pivoted jaws u, having recesses u', the arm u^3, and the link u^2, connecting the outer jaw with the arm, substantially as and for the purpose specified.

21. The grip U, consisting of pivoted jaws u, having recesses u', the link u^2, arm u^3, and catch u^4, substantially as and for the purpose specified.

399,460. SEED-DRILL. MILLARD F. WHITE, Gleason Station, Tenn. Filed July 20, 1888. Serial No. 280,497. (No model.)



Claim.—The combination, with the main frame, the hopper, the dropping-tube communicating with the hopper through its bottom, the furrow-opener in front of said tube, the pivoted lever J, having the perforated extension passing into a slot in the front of the hopper and provided with the pin L, passing through the slot l, and the slide-bar M, pivoted to the pin L, and having the depending pin m, of the cylinder D, journaled upon the main frame, provided with the door F and discharge-openings d^3, and having the tappets G in a circumferential rabbet at one of its ends, as specified.

399,461. WASH-STAND. EDWARD W. WOODRUFF, Washington, D. C. Filed Sept. 13, 1887. Serial No. 249,562. (No model.)



Claim.—1. As a new article of furniture, the stand A, provided with the wash hand-basin below the top b, a receptacle for a slop-water jar or pail, and two reservoir-tanks, f and g, one at each side of said basin and elevated above and overhanging the slab b, as set forth, said tanks having their inner forward corners removed to permit free access to the basin.

2. In a portable wash-stand, the combination, with the stand A, of a sliding draw-out commode arranged as a drawer in said stand, having a seat, and the sliding imperforate cover above the latter fitted with a foot-rest and adapted to hold implements for blacking shoes, substantially as set forth.

3. In a portable wash-stand, the combination, with the stand A, of a sliding draw-out commode having a chamber-receptacle, a seat, the sliding imperforate cover above the latter fitted with a foot-rest and adapted to hold a blacking box and brushes, and the hinged front piece adapted to be turned up to form a closed drawer, or to be turned down to permit access to the foot-rest and the removal of the sliding cover and access to the commode, substantially as set forth.

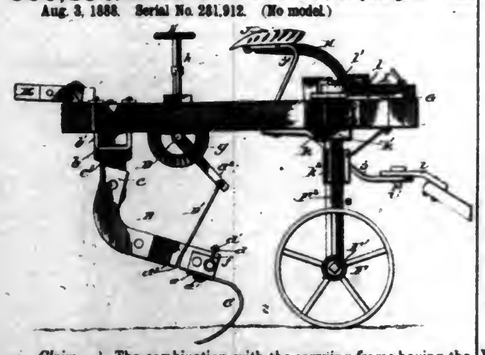
4. In a portable wash-stand, the basin *d*, attached to the slab *b*, combined with an open trough, *m*, supported below the basin, to catch the waste water and conduct it to the slop-pail, the waste-valve for the basin, and the actuating-lever Q below and connected with said valve and above the trough.

5. In a wash-stand, the soap-cup *h*, indented, provided with a drip-hole perforated through the slab, and a surrounding groove, *a*, in the under side of said slab, to prevent drippings from running away on the under surface, as set forth.

6. In a portable wash-stand, the combination of the reservoir tank or tanks carried by the stand, the slab *b*, the basin below the latter, the plug or valve *p*, provided with a pendent stud, a pivoted lever engaging said stud and provided with a hand-lift, the open trough *m* below said plug and lever, and a compartment for the waste-water receiver below the basin, substantially as set forth.

7. In a portable wash-stand, the basin *d*, attached to the slab *b*, combined with a waste-pipe for said basin having its lower end open and accessible, the waste-valve for the basin, the valve-stem situated in said drain-pipe, and the transverse actuating-lever Q, situated below the open end of the drain-pipe and connected with said valve-stem through said open end, and an operating-handle for said lever.

399,462. SULKY-PLOW. JOHN H. ZEIN, Gettysburg, Pa. Filed Aug. 3, 1888. Serial No. 281,912. (No model.)



Claim.—1. The combination, with the carrying-frame having the longitudinally-slotted bar applied thereto, of the pendants or posts having tenon-like projections fitting in the slot of said bar and provided with screws fitted with nuts, and the plow-beams provided at their inner ends with socket-forming plates articulated or pivoted to said pendants or posts, substantially as set forth.

2. The combination, with the plow-beams and the plows, of the clips secured to said beams at their outer or rear ends, the slotted cross-bars connecting said beams, and adjusting-screws to effect the holding of both the shanks of the plows and the cross-bars, substantially as specified.

3. The combination, with the carrying-frame, of the plow-beams applied thereto, the slotted bar or yoke *d*, adjustably securing said beams, the sockets or clips *e*, holding the plow-shanks, and eyebolts *f*, receiving bolts from said beams and connecting with said slotted bars or yokes *d*, substantially as and for the purpose described.

4. The combination, with the carrying-frame provided with plows, of the roller having its tongue or pole provided with a deflected or angled plate having a pin or stud engaging with an apertured step-like plate applied to the carrying-frame, substantially as set forth.

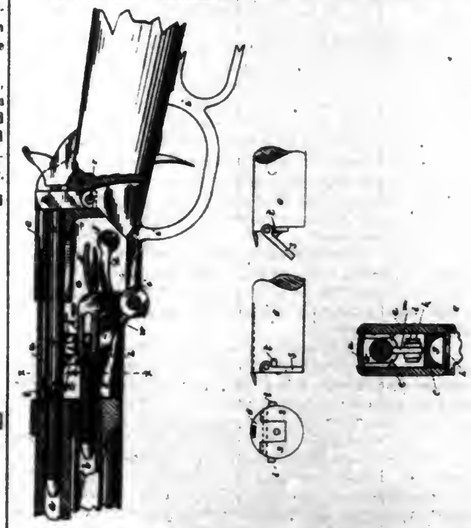
5. The combination, with the carrying-frame, of the wheels borne by axles having spindles applied to said frame and provided with levers connected or linked together, a hand-lever for actuating the link or connecting medium between the aforesaid levers, the pawl or detent engaging with a ratchet positioned upon the carrying-frame, which pawl or detent is disposed to move edgewise in a guide or clip secured upon parallel bars or pieces of the frame, and which pawl or detent is actuated by a crank-lever linked thereto, substantially as set forth.

399,463. FIRE-KINDLER. EDWARD ZOEKER, Corunna, Ind. Filed Sept. 26, 1888. Serial No. 286,405. (No model.)



Claim.—In a fire-kindler, the conical receptacle B, having its ends open and composed of a series of integral coils of wire arranged in contact and increasing regularly in diameter from the apex to the base, the stem or handle connected directly to the base of the receptacle and consisting of the strands E E', arranged in contact, and the strand F, coiled around the wires E E', and the strengthening-wire H, extending axially through the receptacle and connecting the base thereof to the apex, substantially as specified.

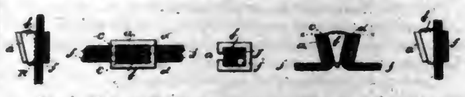
399,464. MAGAZINE FIRE-ARM. ROBERT M. AUSHENBAUGH, Beaver, and GEORGE R. RUFFLEY, Glenfield, Pa. Filed May 29, 1888. Serial No. 275,527. (No model.)



Claim.—1. In a magazine fire-arm, the combination of an endwise-movable breech-bolt having the parallel slotted arms *m* depending therefrom near its front end, a pivoted lever, *i*, the carrying-block *c*, having the rearward-extending arms *d* pivoted at a point in rear of the fulcrum of the lever, the horizontal slotted levers *k*, arranged above the carrying-block when the latter is in position to receive a cartridge from the magazine, and having the depending vertical arms at their rear ends, which are secured to the lever *i*, a vertically movable block, *l*, fitted in the parallel vertical slots of the arms *m*, and having pins fitted in the horizontal slots of the levers *k*, and an arm, *w*, carried by the lever, for the purpose of raising the carrying-block *c*, substantially as and for the purpose described.

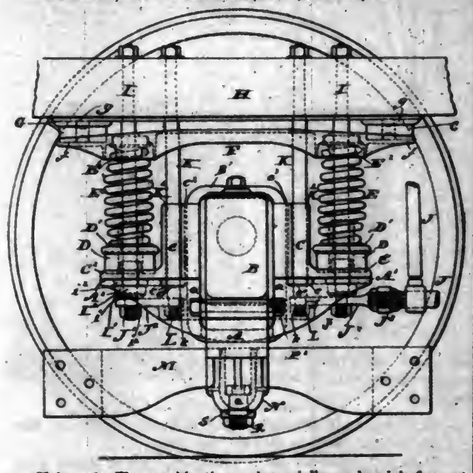
2. The combination of an endwise-movable breech-bolt, an ejector plate, *s*, pivoted at its upper edge to the front end of said breech-bolt, and having laterally-extending lugs *t* projecting from opposite sides of said ejector-plate, near the pivot thereof, and fixed lugs on the frame of the gun and arranged on opposite sides of the breech-bolt, in the path of the lugs *t* on the ejector-plate, whereby when the breech-bolt is suddenly drawn rearward the lugs *t* will be suddenly struck by the fixed lugs to raise the ejector-plate forcibly and expel the shell, substantially as described.

399,465. WIRE-COUPLING. WILLIAM BAINBRIDGE, Omaha, Nebr. Filed Aug. 26, 1888. Serial No. 283,715. (No model.)



Claim.—The combination, in a wire-coupling, of a sleeve provided with a central chamber larger at one end than at its opposite end, and having straight inner walls inclined toward each other throughout the length of the sleeve, a wedge having an inclined exterior surface corresponding with the inner walls of the sleeve, and wires interposed between the wedge and sleeve, in the manner and for the purpose described.

399,466. CAR-TRUCK. WILLIAM S. G. BAKER, Baltimore, Md. Filed June 7, 1888. Serial No. 276,368. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the supporting-springs, the spring-carriage supporting the springs, means for supporting the spring-carriage from the axle-box, and supports for holding the springs when the spring-carriage is removed.

2. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the spring-carriage, means for supporting the spring-carriage from the axle-box, the springs connected with the car-body and resting on the spring-carriage, the post extending through the springs and connected to the carriage, and the supports for holding the springs when the spring-carriage is removed.

3. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the spring-carriage supported by the axle-box, the springs connected to the car-body and resting on the spring-carriage, the posts extending through the springs, the guide-blocks, the guide-posts extending through the guide-blocks, and means for holding the springs in position on the posts independent of the carriage.

4. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the spring-carriage supported by the axle-box, the springs connected with the car-body and resting on the spring-carriage, the guide-blocks, and the guide-posts connected with the car body and extending through the guide-blocks.

5. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the spring-carriage supported thereon, the supporting-springs resting on the carriage, the spring-posts connected to the car-body extending through the springs and through the spring-carriage, the brace-rods having a short section connected to the lower ends of the spring-posts, and devices for securing the section of the brace-rods to the remaining portions of the braces near their junction with the spring-posts and for removing the short section without removing other parts of the braces.

6. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the spring-carriage supported thereon, the supporting-springs resting on the carriage, the spring-posts connected to the car-body extending through the springs and through the spring-carriage, the guide-blocks, the guide-posts, the brace-rods having a short section connected to the lower ends of the spring-posts and to the guide-posts, and devices for securing the section of the brace-rods to the remaining portions of the braces near their junction with the spring-posts and the guide-posts.

7. The combination, substantially as hereinbefore set forth, of the axle or axle-box, the hanger supported thereby, the grip-bar seated in the hanger, the spring-carriage, and means independent of the grip-bar hanger for supporting the spring-carriage.

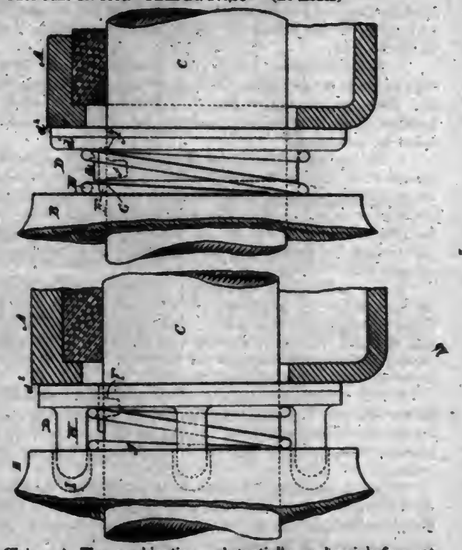
8. The combination, substantially as hereinbefore set forth, of the axle or axle-box, the hanger supported thereby, and the grip-bar flexibly supported in the hanger.

9. The combination, substantially as hereinbefore set forth, of the axle-box, the saddle supported thereby, the hanger secured to the saddle, and the grip-bar seated in the hanger.

10. The combination, substantially as hereinbefore set forth, of the axle-box, the hanger supported thereby, the grip-bar seated in the hanger, and means for limiting the movement of the grip-bar in the hanger.

11. The combination, substantially as hereinbefore set forth, of the car-body, the axle-box, the springs, the spring-carriage, the braces, the guide-blocks, and the guide-posts extending through the guide-blocks.

399,467. CAR-AXLE BOX. WILLIAM S. G. BAKER, Baltimore, Md. Filed June 19, 1888. Serial No. 277,510. (No model.)

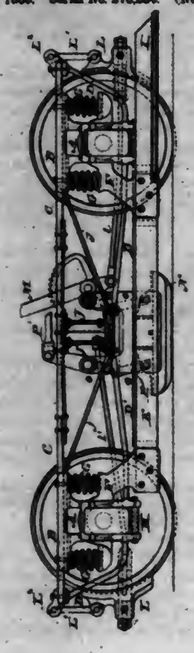


Claim.—1. The combination, substantially as hereinbefore set forth, of the axle-box, the axle, the dust-guard that bears against the axle-box, and the tongue or key on the axle which fits in a groove or keyway in the dust-guard.

2. The combination, substantially as hereinbefore set forth, of the axle-box, the axle, the spring-actuated dust-guard that bears against the axle-box, and the T-shaped tongue or key resting in a socket in the axle, and which fits in a groove or keyway in the dust-guard.

3. The combination, substantially as hereinbefore set forth, of the axle-box, the car-wheel, the axle, the dust-guard that bears against the end of the axle-box, devices for directly connecting the dust-guard to the wheel, and the tongue-and-groove connection between the guard and axle.

399,468. CAR-TRUCK. WILLIAM S. G. BAKER, Baltimore, Md. Filed June 26, 1888. Serial No. 278,235. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the car-axle boxes, the grip-frame, and the brackets secured to the grip-frame and resting on the axle-boxes.

2. The combination, substantially as hereinbefore set forth, of the axle-boxes, the grip-frame, the brackets secured to the grip-frame and resting on the axle-boxes, and the car-springs resting in seats on the brackets.

3. The combination, substantially as hereinbefore set forth, of the axle-boxes, the grip-frame, the brackets secured to the grip-frame and resting on the axle-boxes, the pedestals through which the brackets extend, and the bolts connecting the arms of the pedestals below the axle-boxes.

4. The combination, substantially as hereinbefore set forth, of the axle-boxes, the grip-frame, the brackets secured thereto and resting on the axle-boxes, the pedestals having side openings through which the brackets extend and having seats in which the brackets rest when the axle-boxes are removed, the car-supporting springs mounted on the brackets, and devices for connecting the lower ends of the pedestal-arms below the axle-boxes.

5. The combination, substantially as hereinbefore set forth, of the car-axle box, the grip-frame, and a bracket secured to the grip-frame, extending over the axle-box and resting in a transversely-curved seat formed in the top of the box over the center of the journal-bearing, said bracket at its upper end being free to rock transversely across the box in the curved seat thereof.

6. The combination, substantially as hereinbefore set forth, of the axle-box, the bracket resting thereon, the grip-frame secured to the lower bifurcated end of the bracket, the pedestal in which the axle-box is mounted, and the rods for bracing the lower end of the pedestal.

7. The combination, substantially as hereinbefore set forth, of the brackets, the axle-boxes on which the brackets rest, the grip-frame secured to the brackets, and the life-guards secured to the grip-frame at the lower ends of the brackets.

8. The combination, substantially as hereinbefore set forth, of the car-wheels, the wheel-brakes, the jointed levers connecting opposite wheel-brakes on the same side of the car-truck, the rock-shaft *s'*, the operating-lever, connections between the operating-lever and the rock-shaft, and connections between the rock-shaft and the jointed levers between the brakes.

9. The combination, substantially as hereinbefore set forth, of the car-wheels, the grip-frame, the wheel-brakes, the brake-beams connecting similar brakes on opposite sides of the truck, the jointed levers connecting the brake-beams, hinged link-supports for the upper ends of the brake-shoes, a rock-shaft, an operating-lever, jointed hinged connections between the operating-lever and the rock-shaft, and connections between the rock-shaft and the levers connecting the brake-beams.

10. The combination, substantially as hereinbefore set forth, of the grip-frame, the track-brake, and yielding connections between the grip-frame and the track-brake, whereby the brake is normally withdrawn from the track.

11. The combination, substantially as hereinbefore set forth, of the frame, the track-brake, the vertical posts secured to the brake and extending through the frame, the adjusting-nuts, and springs interposed between the adjusting-nuts and the frame.

12. The combination, substantially as hereinbefore set forth, of the frame, the track-brake, yielding connections between the track-brake and frame, whereby the brake is normally withdrawn from the track, the rock-shaft, the jointed levers connecting the track-brake to the rock-shaft, and a lever secured to the rock-shaft for operating the brake.

13. The combination, substantially as hereinbefore set forth, of the grip-frame, the track-brakes, the grip-housing, the shafts mounted in bearings in the grip-frame and in the grip-housing, the jointed lever, connections between the brakes and the shafts, the operating-lever connected to the shafts, the rock-shaft, and connections between the operating-lever and the rock-shaft.

14. The combination, substantially as hereinbefore set forth, of the grip-frame, the track-brakes yieldingly connected to the grip-frame, the grip-housing, the shafts mounted in bearings in the grip-frame and in the grip-housing, the jointed lever-connections between the brakes and the shafts, the operating-lever connected to the shafts, the rock-shaft, and connections between the operating-lever and the rock-shaft.

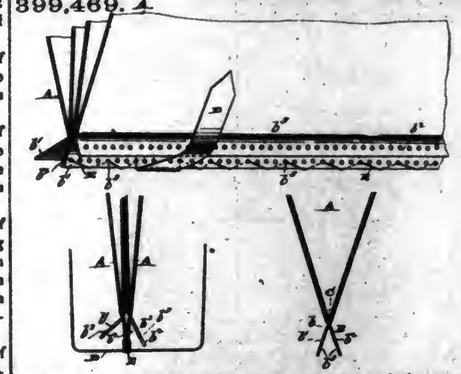
399,469. BOOK. GEORGE D. BARNARD, St. Louis, Mo. Filed Mar. 2, 1888. Serial No. 265,973. (No model.)

Claim.—1. The herein-described book-guards, the same consisting of a strip folded, stiffened, and perforated, as set forth.

2. The combination of the straps, the guards, and the signatures, said guards being perforated and the guards connected with each other and with the straps, substantially as described.

3. The combination of the straps, the guards, and the signatures,

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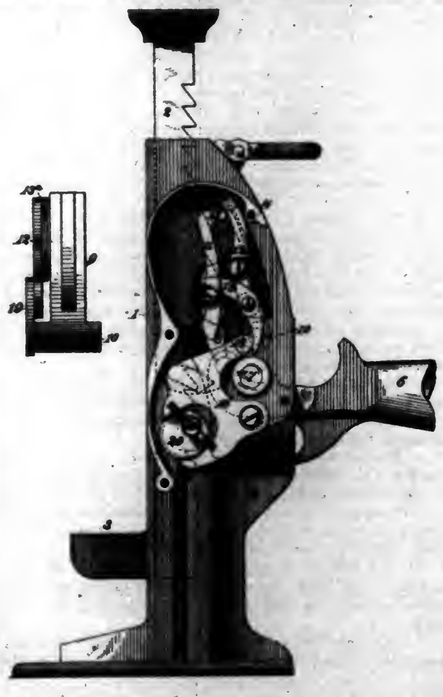
said guards being folded, stiffened, and perforated, and the guards being connected with each other and with the straps, substantially as described.

399,470. LIFTING-JACK. JOHAN BARRETT, Allegheny, Pa. Filed Oct. 26, 1888. Serial No. 289,196. (No model.)

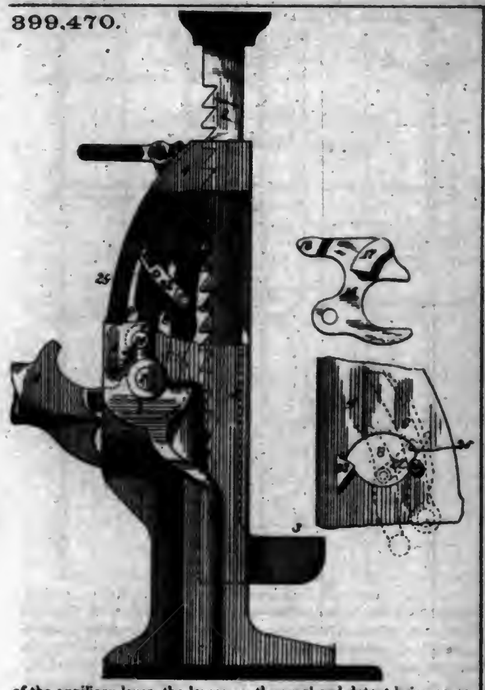
Claim.—1. A toothed bar, in combination with a pivotal lever, a pawl pivoted to said lever, a detent pivoted to the frame, and spring-actuated levers pivoted to said pawl and detent, and having their upper ends rigidly supported as against the action of their actuating-springs, substantially as set forth.

2. A toothed bar, in combination with a pivoted operating-lever, a pawl pivoted to said lever, a detent pivoted to the frame, spring-actuated levers pivoted to said pawl and detent, an auxiliary lever pivoted to the lower end of the spring-actuated lever on the detent, a stud or projection on the pawl adapted to engage one end of the auxiliary lever, a movable tripping-plate having a cam-lug, and a stop or shoulder respectively adapted in certain positions of the plate to engage and shift the lower end of the pawl and to hold one end of the auxiliary lever as against inward movement, substantially as set forth.

3. A toothed bar, in combination with a pivoted operating-lever, a pawl pivoted to said lever, a detent pivoted to the frame, spring-actuated levers pivoted to said pawl and detent, an auxiliary lever pivoted to the spring-actuated lever of the detent below its pivotal point, and a stud or projection on the pawl adapted to engage one end



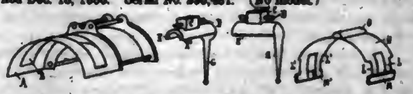
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of the auxiliary lever, the levers on the pawl and detent being so arranged, as described, that when rigidly at their upper ends, as against the action of their springs, they will operate to hold the pawl and detent against the toothed bar, and when the lower end of the pawl and the ends of the auxiliary lever are similarly supported they will cause the pawl and detent to move away from the toothed bar, substantially as set forth.

4. A toothed bar, in combination with a pivoted operating-lever, a spring-actuated pawl pivoted to said lever, a spring-actuated detent pivoted to the stationary frame, said detent being arranged outside of the pawl, a tripping-dog pivoted to the pawl, and a stop or shoulder on the frame with which said dog can in certain positions engage and operate to force the pawl and detent away from the toothed bar, substantially as set forth.

399,471. WAGON-BRAKE. AUGUSTE C. T. BAUTAIN, Paris, France. Filed Dec. 13, 1888. Serial No. 293,431. (No model.)



Claim.—1. The combination, in a friction-brake for vehicles, of the retaining-plate A, the curved plate H, the block C, having a lever, G, and adapted to rock on the curved plate, the friction-bands P P', having cramps Q Q', the draft-band R, connected at its ends with the rocking block, and means for operating the lever, substantially as described.

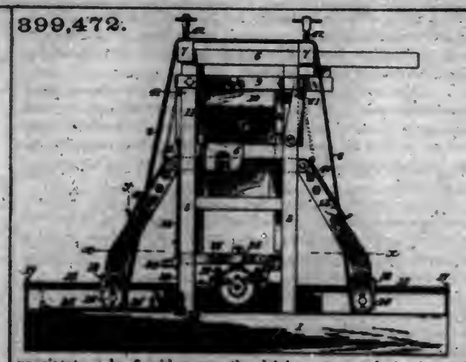
2. The combination, in a friction-brake for vehicles, of a stationary retaining-plate, A, having a slot, B, a curved plate, H, having separated fingers connected by end plates M M', rocking block C, supported by the curved plate and having a pin, D, and a projecting lever, G, the separated friction-bands P P', connected by end plates N N', provided with cramps Q Q', the draft-band R, located between the friction-bands provided with stops T T', and having end links, S S', connected with the pin of the rocking block, and means for operating the lever of the rocking block, substantially as described.

3. The combination, in a friction-brake, of a retaining-plate, A, a curved plate, H, having end plates M M', a rocking block, C, the friction-bands P P', having end plates N N', the draft-band R, between the friction-bands, connected at its ends with the rocking block, and means for operating the block, substantially as described.

399,472. BALING-PRESS. ELWOOD BEARDS, Centre Star, Ala. Filed Aug. 4, 1888. Serial No. 281,971. (No model.)

Claim.—1. The combination of the compressing-arms, the cross-bar connecting their upper ends, the follower on said cross-bar, the endless screws actuating said arms, the bevel-wheels upon the inner

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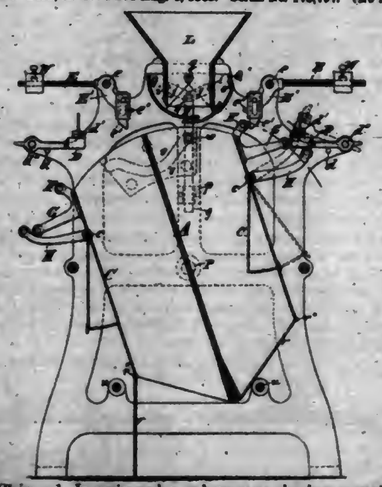


proximate ends of said screws, the driving counter-shaft at a right angle therewith, the interposed adjustable bevel-gear, the reversing-lever controlling said gear, the lateral springs actuating said lever, and the plate having notches engaging the free end of the lever, substantially in the manner and for the purpose herein set forth.

2. The combination of the compressing-arms, the cross-bar connecting their upper ends, the follower on said cross-bar, the endless screws actuating said arms, the bevel-wheels upon the inner proximate ends of said screws, the driving counter-shaft at a right angle therewith, the interposed adjustable bevel-gear, the reversing-lever controlling said gear, the lateral springs actuating said lever, the plate having notches engaging the free end of the lever, the vertical reciprocating rod having a bent end underlying the notch in said plate which engages the end of the lever when the counter-shaft is geared to the screws to move the follower upward, and the arm from said rod intersecting the path of the cross-arm carrying the follower, all substantially in the manner and for the purpose herein set forth.

3. The combination, in a cotton or hay press, of the compressing-arms, the horizontal cross-bar connecting their upper ends, the follower carried by said cross-bar, the endless screws actuating said compressing-arms, the bevel-wheels upon the inner proximate ends of said screws, the driving counter-shaft at a right angle therewith, the interposed adjustable bevel-gear, the reversing-lever controlling said gear, the lateral springs actuating said lever, the plate having notches engaging the free end of the lever, an angular lever pivoted to swing vertically and having one arm underlying the notch in said plate that engages the end of the lever when the counter-shaft is geared to the screws to move the follower downward, a second angular lever pivoted on the bed-plate to swing horizontally, a link coupling the two, and a rod extending from the free arm of said horizontal lever outward parallel with the proximate endless screw and terminating in an arm in position to be engaged by the lower end of the compressing-arms traversing said screw, all substantially in the manner and for the purpose herein set forth.

399,473. GRAIN SCALE AND MEASURE. R. JOHN M. BECKER, New York, N. Y. Filed Aug. 6, 1888. Serial No. 173,797. (No model.)



Claim.—1. In grain scales and measures having an oscillating box, a lever-detent connected with the box and adapted to be actuated

by the quantity of grain received into the compartment above a determined level and arranged to engage with a catch on the frame of the box to hold the box in an inclined position, in the manner described, and for the purpose set forth.

2. In grain scales and measures having an oscillating box, a measuring-detent consisting of the lever C H, connected with the box and adapted to be actuated by the quantity of grain received into the compartment above a determined level, and the catch D, arranged to engage with and hold the box, in the manner described, and for the purpose set forth.

3. In grain scales and measures, an oscillating prismatic box having straight sides divided into compartments, and having at the bottom thereof doors constructed in the arc of a circle whose center is the fulcrum on which the box oscillates, and operating in the manner and for the purpose set forth.

4. In grain scales and measures, the combination of the oscillating receiver A, having the groove V, with the spout L, provided with the doors Q, operated by the rod *g*, adapted to engage with the groove V and with the doors Q, substantially in the manner described, and for the purpose set forth.

5. In grain scales and measures, the combination, with the oscillating box A, supported on a fixed frame so as to turn, substantially as described, and having the projection F, of the scale-beam E, having the weight W, and arranged to hold and release the box, substantially as and for the purposes set forth.

6. In grain scales and measures, the combination, with the box A, hung on the pivots P on a fixed frame, so as to oscillate, substantially as described, and having the projection F, of the weighing-detent consisting of the scale-beam E, having the weight W, and the detent E', provided with the nib *e'*, adapted and arranged to hold and release the box, substantially as described, and for the purpose set forth.

7. In grain scales and measures, the combination, with the oscillating box A, provided with the projection F, and having doors on its lower end constructed in the arc of a circle whose center is the point of support of the box, of the spout L, provided with the doors Q, operated by the rod *g*, arranged to engage with the doors and with the groove V on the side of the box, and of the detent consisting of the beam E, having the weight W, and detent E', provided with the nib *e'*, substantially as and for the purpose set forth.

8. In grain scales and measures, the combination, with the box A, hung on pivots on a fixed frame, so as to oscillate in the manner described, and having the projection G, swinging section C, and arm H, of the detent D, pivoted to the frame supporting the box, and arranged to engage with the projection G to hold the box, and adapted to be released from engagement by the arm H, substantially as and for the purposes set forth.

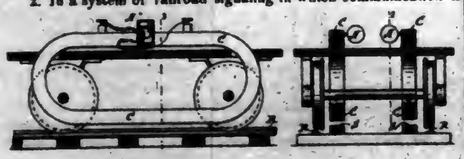
9. In grain scales and measures, the combination, with the box A, hung on pivots on a fixed frame, so as to oscillate in the manner described, and having the projections F and G, the swinging section C, and arm H, of the detent E E', adapted to engage with the projection F, and the detent D, adapted to engage with the projection G and be released by the arm H, substantially as described, and for the purpose set forth.

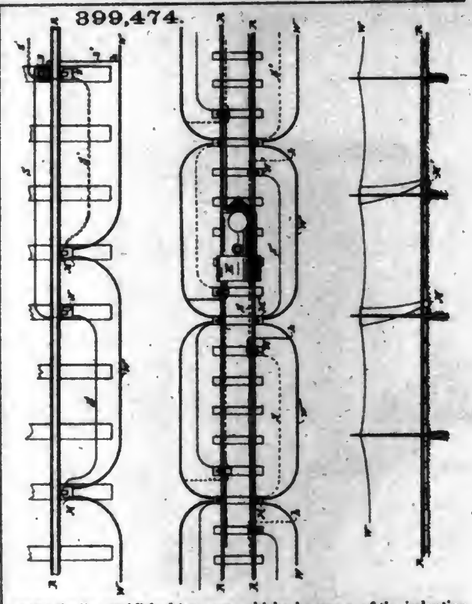
10. In grain scales and measures, the combination of the oscillating box A, provided with the projections F and G and having the lever C H, and doors at its lower end constructed in the arc of a circle whose center is the point of support of the box, of the detent E E', adapted to engage with the projection F, and of the detent D, adapted to engage with the projection G and be released by the detent-lever C H, and of the spout L, provided with the doors Q, operated as described, substantially as and for the purpose set forth.

399,474. RAILROAD SIGNALING DEVICE. FRANK P. BENJAMIN, New York, N. Y. Filed Feb. 11, 1888. Serial No. 263,717. (No model.)

Claim.—1. In a system of railroad-signals in which communication between vehicles is automatically established by means of the inductive effects of a current of electricity, the combination of a plurality of separate and independent local circuits arranged on both sides of the track, a vehicle carrying a plurality of conductors respectively parallel to and in inductive relation to different portions of said local circuits, said local circuits carrying make and break devices in the path of a moving vehicle for the purpose of signaling both ahead and behind it, and an electrical generator the current from which is automatically cut into and out of said local circuits by said make and break devices, substantially as described.

2. In a system of railroad signaling in which communication is





automatically established between vehicles by means of the inductive effects of a current of electricity, the combination of a vehicle having a plurality of conductors, each including instruments for receiving signals, and a plurality of local circuits arranged on both sides of the track parallel to and in inductive relation to said vehicle-conductors, respectively, substantially as described.

3. In a system of railroad-signals in which communication between trains is automatically established by means of the inductive effects of a current of electricity, the combination of a vehicle carrying a conductor with instruments for receiving signals, a local circuit arranged along the line, one part of which is parallel to and in inductive relation to said vehicle-conductor, and another part of which, carrying make and break devices in the path of a moving vehicle, is out of inductive relation to said vehicle-conductor, and an electrical generator, the current from which is cut into and out of said local circuits by said make and break devices, substantially as described.

4. In a system of railroad signaling in which communication is established between vehicles by means of the inductive effects of a current of electricity, the combination of a vehicle carrying a conductor with signaling-instruments, and a plurality of separate and independent local circuits arranged along the line in inductive relation thereto, said local circuits being overlapped, substantially as and for the purpose set forth.

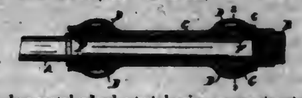
5. In a system of railroad signaling in which communication between vehicles is established by means of the inductive effects of a current of electricity, the combination of a vehicle carrying a conductor with signaling-instruments, and a plurality of separate and independent local circuits arranged along the line in inductive relation thereto having make and break devices in the path of a moving vehicle, said local circuits being overlapped, substantially as described.

6. In a system of railroad-signals in which communication between trains is automatically established by means of the inductive effects of a current of electricity, the combination of a vehicle having a conductor with instruments for receiving signals, a plurality of local circuits arranged along the line, parts of which are parallel to and in inductive relation to said vehicle-conductor and other parts of which, carrying make and break devices, are out of inductive relation to said vehicle-conductor, said local circuits being overlapped, and an electrical generator the current from which is cut into and out of said local circuits by said make and break devices, substantially as described.

7. In a system of railroad signaling in which communication between vehicles is automatically established by means of the inductive effects of a current of electricity, the combination of a vehicle having a plurality of conductors, each including instruments for receiving signals, and a plurality of local circuits overlapped and arranged on both sides of the track in inductive relation to said vehicle-conductors, respectively, substantially as described.

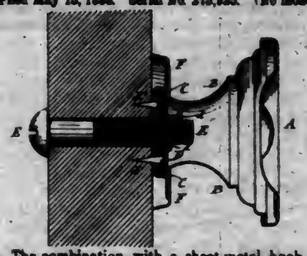
8. In a system of railroad signaling, the combination of a plurality of local circuits, each circuit including make and break devices, and a make-and-break device common to a plurality of said circuits, whereby when the circuit is completed in one of said local circuits it is automatically broken in the other, substantially as described.

399,475. WHEEL. ERNST M. BENNETT, Toledo, Ohio. Filed Sept. 10, 1888. Serial No. 285,043. (No model.)



Claim.—In a metal wheel, a hub having an annular chamber upon each end thereof, formed of an integral concentric portion having recesses upon the outer edge, and correspondingly formed caps having coincident recesses, in combination with return-spokes partially embracing the body portion of the hub and passed through the recesses, as and for the purpose set forth.

399,476. SHEET-METAL KNOB. JULIUS BERDUCHER, New York, N. Y. Filed May 15, 1888. Serial No. 273,925. (No model.)

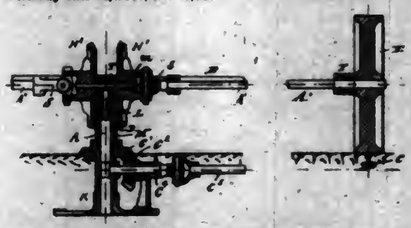


Claim.—The combination, with a sheet-metal knob the base of which is provided with a re-enforcing plate having a central screw-tap and one or more bent-up prongs made integral with said plate, of a washer extending around the base of the knob, having holes registering with said prongs, and a fastening-screw passing through said washer and engaging the screw-tap of the re-enforcing plate, substantially as set forth.

399,477. BOTTLE-CLEANING MACHINE. BARTHOLOMEW BENNINGTON, Hull, County of York, England. Filed Oct. 9, 1888. Serial No. 287,610. (No model.) Patented in England Oct. 22, 1887, No. 14,305.

Claim.—In a bottle-cleaning machine, the combination of the soaking-vessel A, the horizontal shaft journaled therein and having radial arms, and the containing-boxes pivotally suspended from the outer ends of the said radial arms and divided into compartments adapted to receive the bottles with their mouths upward, whereby the bottles constantly remain in an upright position, and are submerged, filled, and raised from the liquid in the tank by the rotation of the shaft, all substantially as shown and set forth.

399,478. HORSE-POWER. CARL V. BIRK, Borup, Denmark. Filed Nov. 1, 1888. Serial No. 289,717. (No model.) Patented in England Sept. 24, 1888, No. 13,777; in France Dec. 3, 1888, No. 190,680, and in Germany Jan. 14, 1889, No. 46,642.



Claim.—1. In a horse-power, the combination, with a spindle, of a sleeve on the same, a cross-bar on said sleeve, beams secured to the ends of said cross-bar and inclined toward each other, bearings secured to the outer meeting ends of said beam, shafts journaled in said bearings, and wheels secured on the outer ends of the shaft and running on a suitable support, cog-wheels connected with the inner ends of the shafts, and a cog-wheel mounted loosely on the spindle and engaged with the cog-wheels on the inner ends of the shafts, substantially as set forth.

2. In a horse-power, the combination, with an upright spindle, A, of the sleeve L on the same, the cross-piece T on the sleeve L, beams B, secured to the cross-piece C and to bearings F, the shafts A', journaled in the bearings F, wheels E, fixed on the outer ends of the shafts A, the beveled cog-wheels H' H², connected with the inner ends of the shafts A', the transverse bolt *m* in the cross-bar T, on which bolt *m* the wheels H' H² are mounted, and the cog-wheel D, loosely mounted on the spindle A, substantially as set forth.

399,479. ALIZARINE-GREEN. RENÉ BOHN, Ludwigshafen-on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik, Mannheim, Germany. Filed Oct. 13, 1888. Serial No. 288,429. (Specimens.)

Claim.—As a new product, the coloring-matter or dye-stuff (alizarine-green) hereinbefore described, and having the following characteristics: In its free or uncombined state it appears under the form of fine bluish-gray needle-shaped crystals which are insoluble in cold water and possess only a slight degree of solubility in boiling water and in alkaline solutions; it forms blue saline compounds with alkaline carbonates and green compounds upon being mixed with caustic potash or soda liquor in excess, the compounds thus formed being quite insoluble in excess of caustic-alkaline solutions, and it produces soluble compounds with the bisulphites of potash, soda, or ammonia, which, with the aid of chrome mordants, produce shades more or less approaching a green.

399,480. ALIZARINE-BLUE SULPHO-ACID. RENÉ BOHN, Ludwigshafen-on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik, Mannheim, Germany. Filed Oct. 13, 1888. Serial No. 288,431. (Specimens.)

Claim.—As a new product, the coloring-matter or dye-stuff (alizarine-blue sulpho-acid) hereinbefore described, and having the following characteristics: In its free state it is nearly insoluble in cold water, but it dissolves in much boiling water with a characteristic bluish-green color; its alkaline salts are readily soluble in water with a blue color, which, upon the addition of caustic potash or soda liquor in excess, changes into a bright green; said alkaline salts are precipitated by the addition of common salt in sufficient excess; by the addition of hydrochloric acid to an alkaline solution of alizarine-blue sulpho-acid a purple crystalline precipitate of the free acid is produced which dissolves in adequate excess of hydrochloric acid with a red color, and alizarine-blue sulpho-acid or its bisulphite compounds produce upon chrome-mordanted wool blue shades with a greenish hue.

399,481. ALIZARINE-BLUE SULPHURIC ACID. RENÉ BOHN, Ludwigshafen-on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik, Mannheim, Germany. Filed Oct. 13, 1888. Serial No. 288,432. (Specimens.)

Claim.—As a new product, the coloring-matter or dye-stuff (alizarine-blue sulphuric acid) hereinbefore described, and having the following characteristics: It is capable of forming two series of alkaline salts, those containing the minimum of alkali exhibiting a yellow or brown appearance, while a larger proportion of alkali effects a change of the said color into purple or blue; by adding to the purple solution a small amount of mineral or organic acid it assumes gradually the before-named yellow or brown tint; by the further addition of a mineral or organic acid the alizarine-blue sulphuric acid becomes precipitated in alizarine-like yellow flocks, and it dyes wool or other animal fiber with the aid of mordants blue.

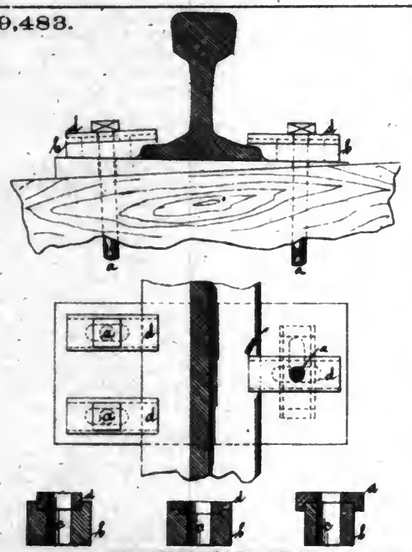
399,482. ALIZARINE INDIGO-BLUE. RENÉ BOHN, Ludwigshafen-on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik, Mannheim, Germany. Filed Oct. 31, 1888. Serial No. 289,673. (Specimens.)

Claim.—As a new product, the coloring-matter or dye-stuff (alizarine indigo-blue) hereinbefore described, and having the following characteristics: It is insoluble in water even at the boiling-heat; it forms blue saline compounds upon treatment with caustic or carbonated alkalies, which compounds are quite insoluble in caustic-alkaline solutions; it dissolves with a bright indigo-blue color in concentrated sulphuric acid; it combines with the bisulphides of potash, soda, or ammonia, thus producing compounds soluble in water and capable of being employed in dyeing and printing; upon chrome-mordanted wool it produces shades similar to those produced by indigo-blue.

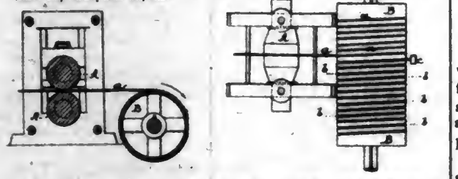
399,483. METHOD OF FIXING RAIL-CHAIRS ON TIMBER-SLEEPERS. ARPAD BOZZANO, Augsburg, Bavaria, Germany. Filed Aug. 16, 1888. Serial No. 282,904. (No model.) Patented in Germany June 16, 1888, No. 45,741; in France July 27, 1888, No. 192,010; in Belgium Aug. 14, 1888, No. 82,910; in England Aug. 16, 1888, No. 11,887; in Sweden Sept. 10, 1888, No. 1,692, and in Italy Sept. 30, 1888, XXII, 34,058, XLVIII, 34.

Claim.—The combination, with the pressing-plate *d* and the binding-plate *b*, of the screw *a*, made to pass through the perforation in the pressing-plate and through the slot in the binding-plate, said pressing and binding plates being provided with the engaging depressions and ridges running longitudinally along the connecting-faces of said plates, substantially as herein shown and described.

399,483.



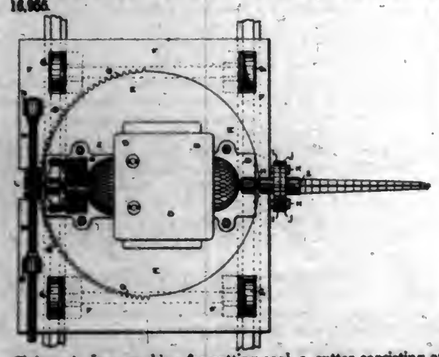
399,484. MECHANISM FOR MAKING COILS FOR METAL SKELETONS FOR COMPOSITE STRUCTURES. JEAN BORDENAVE, Paris, France. Filed Sept. 28, 1887. Serial No. 250,773. (No model.) Patented in France Mar. 10, 1887, No. 182,086; in Italy Mar. 22, 1887, XXI, 31,408, XLII, 357; in England Mar. 23, 1887, No. 4,366, and in Spain Mar. 30, 1887, No. 10,743.



Claim.—1. As a means of forming the metallic coil destined to form the skeleton of a cement pipe, the combination, with the rolls for rolling the metal bar, of a drum having the proper sectional contour rotatively mounted adjacent to said rolls, said drum having a spiral peripheral groove to receive the bar and being capable of endwise movement, substantially as set forth.

2. The combination, with the rolls A for rolling the flanged bar, of the drum B, rotatively mounted adjacent to the rolls and having a peripheral spiral groove, *b*, to receive the bar from the rolls, said drum being free to move longitudinally, and a fixed stud, as *c*, engaging the spiral groove in the drum and serving to feed the latter endwise, substantially as set forth.

399,485. MACHINE FOR CUTTING COAL. THOMAS BOWER, Hull, ROBERT W. BOWER, Leeds, and JAMES BLACKBURN, Woodlesford, County of York, England. Filed July 5, 1888. Serial No. 279,145. (No model.) Patented in England May 26, 1887, No. 7,662, and Dec. 9, 1887, No. 16,955.



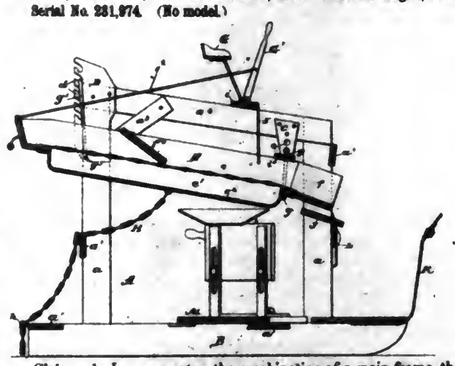
Claim.—1. In a machine for cutting coal, a cutter consisting of a tapering bar, A, provided with cutters or pieces B, of polygonal form, having diamond-shaped or pyramidal steel bits C secured thereto, substantially as and for the purpose herein described.

2. In a machine for cutting coal, the combination, with the tapering cutter bar or shaft A, provided with the coupling-plate J, of the motor D, having its shaft H provided with the coupling-plate I, whereby motion is transmitted direct from the motor-shaft, substantially as herein described.

3. In a mining-machine, the combination, with a laterally-moving carriage, of an electric motor mounted thereon, and a cutter-bar in line with, carried by, and forming a continuation of the armature-shaft, substantially as set forth.

4. In a mining-machine, a taper cutter-bar polygonal in cross-section, in combination with a series of removable cutters, B, correspondingly tapered and adapted to fit over and be rotated by said taper bar, and provided with diamond-shaped pointed steel projections, substantially as set forth.

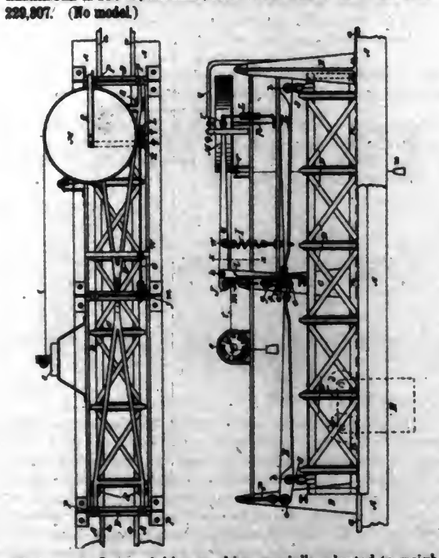
399,486. SEPARATOR. JAMES M. BRADSHAW and WILLIAM R. MEEK, Table Rock, Colo. Filed Feb. 8, 1886. Renewed Aug. 4, 1888. Serial No. 281,974. (No model.)



Claim.—1. In a separator, the combination of a main frame, the vibrating shoe suspended within the same, the chain connected to the frame and shoe at opposite ends and limiting the movement of the shoe in one direction, and a stop for limiting the movement of the shoe in the opposite direction, substantially as described, for the purpose set forth.

2. In a separator, the combination of a main frame, a vibrating shoe suspended within the main frame, the chain connected at opposite ends to the frame and shoe, and the spring-metal stop I, fixed to the main frame and depending therefrom into the path of the vibrating shoe, substantially as described, for the purpose set forth.

399,487. MACHINE FOR WEIGHING TRAVELING LOADS. ALEXANDER R. BROWN, Cleveland, Ohio. Filed Mar. 5, 1887. Serial No. 229,807. (No model.)

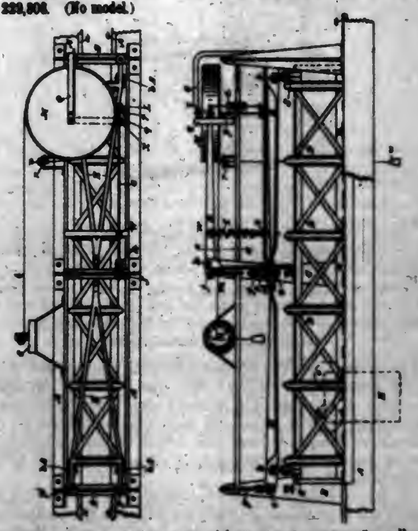


Claim.—1. In a weighing-machine specially adapted to weigh and record the weights of loads passing over a railway, the combination of the following instrumentalities, arranged and operating in substantially the manner hereinbefore set forth—viz., first, a suitable depressible platform provided with tracks which form continuations of those of the railway upon which the load to be weighed is supposed to travel and suitably supported in the proper relationship to said railway; second, the system of supporting-levers forming the connecting means between said depressible platform and its means of support, the final one of the series of said levers constituting the weight-indicating beam, and being arranged to move (by the depression of the depressible platform) in opposition to the resistance of a suitable spring; third, the marking device arranged at the end of the longer arm of said final one of the series of levers and operating to make marks of lengths corresponding with those of the movements of the end of said lever, and, fourth, a suitable surface for the registration thereon of the marks so made by the device at the end of said lever.

2. The combination of the following instrumentalities, all arranged and operating together in substantially the manner and for the purposes hereinbefore set forth: first, the railway over which the traveling-loads to be weighed are supposed to travel; second, the depressible platform provided with rails which form continuations of the rails of said railway, and which is suspended from suitable supports in the proper relationship to said railway; third, the marking-beam G and an intermediate system of levers connected therewith and with each other, and operating to connect the said depressible platform with its means of support, and, fourth, a dash-pot applied to one of the levers, (preferably to the end of the longer arm of the final lever G,) and connected with some stationary part of the apparatus, and operating, as specified to prevent the marking device of the lever G making any movement beyond the point up to which it should move, in order to make a mark that will correctly indicate the weight exerted upon the depressible platform by the load being weighed, and to thus prevent any inaccuracy in the registration of the lines or marks employed for estimating the aggregate weight of the loads passed over the depressible platform.

3. In a weighing apparatus or contrivance adapted specially to the weighing of traveling loads, the combination of, first, the depressible platform D, suspended from suitable supports, and having its track arranged substantially in line with that of the railway over which the loads to be weighed are supposed to travel; second, a suitable supporting-frame operating to sustain the suspended and depressible platform; third, a resistant spring connected at one end to the final one of the system of levers and at the other end to some stationary portion of the apparatus, and, fourth, a system of levers, each one of which has its pivotal or fulcral points (or knife-edge bearings) arranged in a right line, in order that each and every one of said levers may work at all times with the same degree of leverage, and the final one of which system of levers operates to produce a record of marks, the various lengths of which correspond substantially with the variable movements of its longer arm, the said combination as a whole being and operating in the manner and for the purposes hereinbefore set forth.

399,488. MACHINE FOR WEIGHING TRAVELING LOADS. ALEXANDER R. BROWN, Cleveland, Ohio. Filed Mar. 5, 1887. Serial No. 229,808. (No model.)



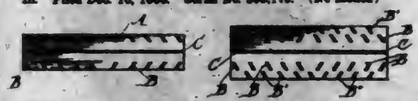
Claim.—1. The combination, with the track-beams of a railway, of the slightly-depressible platform suspended within a suitable frame-work supported by said track-beams, and provided with rails which form continuations of those secured to said track-beams, a system of levers from which said depressible platform is suspended, and which is sustained by said frame-work, and means for registering the extent of movement of the longer arm of the final lever of said system, all substantially as and for the purpose set forth.

2. In combination with the depressible platform D, a system of levers from which it is suspended, and a scale-beam provided with a suitable resistant for indicating the extent of movement of said platform, a uniformly-rotated drum or wheel, M, (moved by any suitable mechanism within or without said drum,) and a marking device on the scale-beam to register the movements of the latter on the face of said drum, whereby I am enabled to not only register the measurement-marks of all weights passed over the platform D, but am also enabled to ascertain the exact times at which said loads or any of them may have made their passage over the weighing apparatus.

3. In combination with the tramway and the depressible platform suspended within a frame-work supported on said tramway, the system of levers, including the scale-beam G, supported by said frame-work, and from which said platform is suspended, and the adjustable resistant spring I, adapted to have its tension regulated so that the machine will not begin to operate under any less load than the minimum weight of the loads to be carried over the tramway, all substantially as hereinbefore explained.

4. In combination with the scale-beam G, the registering-drum M, and a suitable marker device applied to the scale-beam, a guide or keeper bar, *g*, and a suitable anti-friction roller mounted on the scale-beam and traveling against the face of said keeper-bar, in substantially the manner and for the purpose hereinbefore explained.

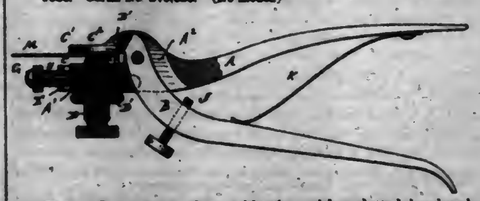
399,489. BELT-FASTENER. EDWARD L. BUDLONG, Bowmanville, Ill. Filed Dec. 10, 1888. Serial No. 293,179. (No model.)



Claim.—1. The plate A, provided on each of its side edges with series of chisel-formed teeth B, the teeth standing at an inclination to the sides of the plate, the teeth on the two ends having an opposite inclination to each other adapted when the two ends of the belt are driven down upon them to draw the abutting ends of the same together and prevent lateral spreading thereof, substantially as described.

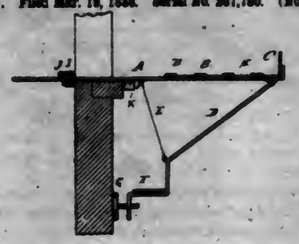
2. In combination with the plate A, having series of chisel-formed teeth on each outer edge thereof, and having the diagonal inclination to said side edges specified, the teeth B, adapted to be bent into the form of hooks in the act of forcing the ends of the belt down upon the same, substantially as described.

399,490. SAW-SET. ANDREW L. BUELL and EDGAR BUELL, Clinton, Conn., assignors to Francis T. L. Ihne, New York, N. Y. Filed July 13, 1888. Serial No. 279,866. (No model.)



Claim.—In a saw-set, the combination, with a slotted head and its handle, of a handle pivoted in said head and having a diamond-shaped setting-jaw, a sliding gage on said head, a pin fixed in the end of the head, a tubular screw surrounding said pin and screwed through a threaded aperture in the closed end of the sliding gage, and an abutment on the above-mentioned head, substantially as herein shown and described.

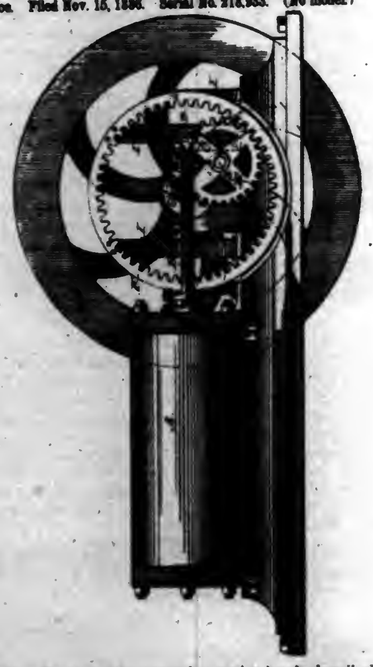
399,491. WINDOW-STAND. KASMIERAS BUKAWIETH, New York, assignor of one-half to Mandel Pianka, Brooklyn, and Adam Moras, New York, N. Y. Filed Mar. 19, 1888. Serial No. 267,789. (No model.)



Claim.—1. In a window-stand, the combination, with two bars united by slats forming a seat, of braces hinged to the ends of said bars and united at their swinging ends by a foot-rail, rods connecting the swinging ends of the braces with the above-mentioned bars, a retaining-bar through which the above-mentioned bars are passed, and keys or pins in said bars and resting against the retaining-bars, substantially as herein shown and described.

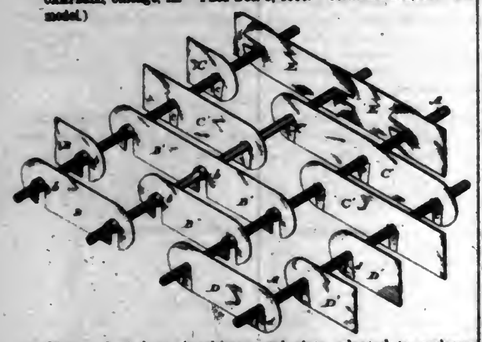
2. The combination, with two bars united by slats forming a seat, of braces hinged to the ends of said bars, a foot-rail uniting the swinging ends of said braces, rests on the swinging ends of the braces, rods connecting the swinging ends of the braces with the ends of said bars, a retaining-bar through which the above-mentioned bars are passed, and keys or pins passed through apertures in said bars and resting against the retaining-bars, substantially as herein shown and described.

399,492. MEANS FOR CONVERTING MOTION. EDWARD BURKE, Lemars, Iowa, assignor to the Gateway Manufacturing Company, same place. Filed Nov. 15, 1886. Serial No. 218,933. (No model.)



Claim.—The means for converting motion herein described, consisting of a rectilinearly-reciprocating rod, B, a shaft, G, with rigid crank D, a small traveling gear-wheel mounted upon the outer end of said crank and having a crank connecting with the rectilinearly-moving rod, and a stationary concentric gear connected with the traveling gear-wheel, substantially as and for the purpose described.

399,493. HEAT-ABSORBING PLATE FOR COOLING-COILS. ALLAN CAMPBELL, Chicago, Ill. Filed Dec. 3, 1888. Serial No. 292,562. (No model.)

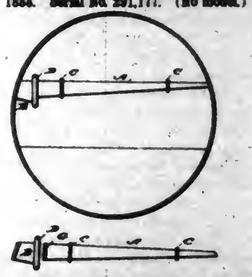


Claim.—1. A heat-absorbing metal plate adapted to embrace and rest upon two or more of the pipes of a cooling-coil, substantially as and for the purpose hereinbefore set forth.

2. A heat-absorbing metal plate notched or slotted to fit upon two or more of the pipes of a cooling-coil and having flanged saddles which embrace the pipes, substantially as hereinbefore set forth.

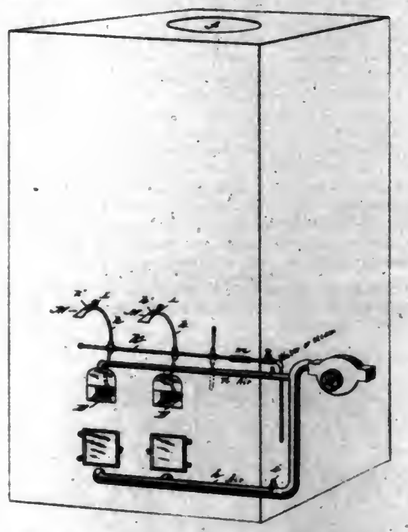
3. A heat-absorbing metal plate notched or slotted to fit upon two or more of the pipes of a cooling-coil, with blocks or plugs which fill the notches and closely embrace the pipes, substantially as herein-before set forth

399,494. BARREL-HEAD. JAMES A. CAMPBELL, New Orleans, La. Filed Nov. 17, 1888. Serial No. 291,177. (No model.)



Claim.—The combination, with the sections of a barrel-head such as described, of the large wedge having one end adapted to enter the chine-groove of a barrel and its opposite end beveled, and a small wedge having one end adapted to enter the chine-groove, its opposite end beveled to engage the bevel of the large wedge, and provided with a flange overhanging the said beveled end, substantially as specified.

399,495. KILN FOR CALCINING STONE, &c. GRANVILLE R. CARLETON, Rockport, Me. Filed July 7, 1888. Serial No. 279,309. (No model.)



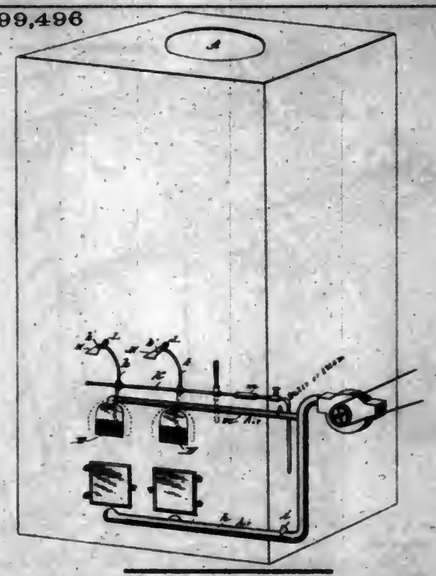
Claim.—In combination with the barrel of the kiln and with the arch or fire-box thereof, having a grate, and with the ash-pit thereof, an air-pipe communicating with the ash-pit beneath the grate, with air-forcing mechanism therefor, and a steam or water pipe arranged to discharge steam or water within the arch or fire-box and over the surface of the fuel, substantially as and for the purpose set forth.

399,496. METHOD OF CALCINING ROCK. GRANVILLE R. CARLETON, Rockport, Me. Filed July 7, 1888. Serial No. 279,310. (No model.)

Claim.—1. The method of calcining rock in the manufacture of lime, consisting of, first, introducing an air-blast underneath the fuel in the kiln to increase the draft, and, second, introducing a spray of steam or water above the bed of coals, substantially as and for the purpose described.

2. The hereinbefore-described mode of calcining rock in a kiln having a barrel to contain the rock and arches leading thereto, consisting in applying an air-blast below the grate to create a draft, and in applying steam or a spray of water within the arch above the fuel to regulate the heat, as and for the purpose set forth.

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399,497. COMBINED GAS AND ELECTRIC LIGHT FIXTURE. JOHN C. CASSIDY, East Orange, N. J. Filed Jan. 3, 1889. Serial No. 295,246. (No model.)



Claim.—In a coupling for combined gas and electric light arms, the combination of the section A, connected with the gas-conducting tube, with the section B, connected with an electric-light-wire connecting-tube, said section B being provided in its inner surface with a recess forming a passage for the electric-light wires between the two sections, substantially as set forth.

399,498. TRACE-CARRIER. ALEXANDER R. CLARK, Rockhills, Tex. Filed Nov. 22, 1888. Serial No. 291,541. (No model.)



Claim.—The combination of the frame A, having the hook B formed upon its lower edge and provided with a slot or opening, C, the sides of which are inclined toward each other, with the triangular-shaped rod or rods which are pivoted upon the frame and around which the band is passed, and which, when closed, clamp the back-band against the inclined sides of the slot or opening, and at the same time close the upper end of the hook, substantially as shown and described.

399,499. PHOTOGRAPHIC LENS. ALVAN G. CLARK, Cambridgeport, Mass. Filed Oct. 4, 1888. Serial No. 287,302. (No model.)

Claim.—1. In a photographic tube, the combination of a concavo-convex crown-glass lens, D, ground on spherical lines, and a concavo-convex flint-glass lens, C, ground on spherical lines, with a front combination consisting of two similar lenses separated from each other by a ring of blackened metal or substitute therefor, substantially as described and set forth.

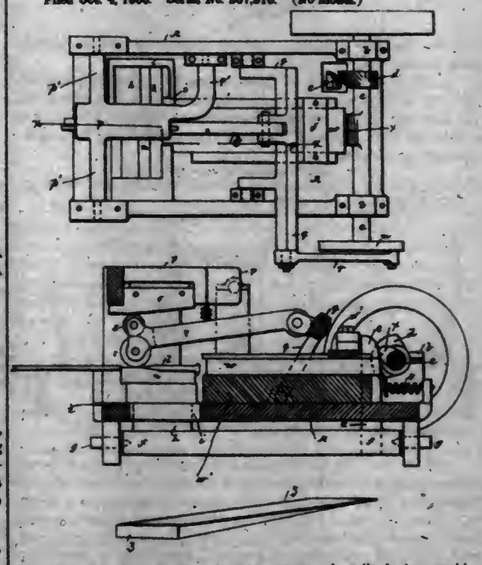
2. In a photographic tube, a front combination, X, composed of two lenses having their respective surfaces both ground to spherical curves, or curves practically spherical, substantially as described.

3. In a photographic tube, a front combination, X, composed of two lenses having their respective surfaces both ground to curves which are practically spherical and separated from each other, substantially as described.

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399,500. SPIKE-MACHINE. JAMES P. COLLINS, Allegheny, Pa. Filed Oct. 4, 1888. Serial No. 287,318. (No model.)



Claim.—1. In a machine for the purpose described, the combination consisting of the shaft *c* and a means for rotating the same, the gripping-dies *m k*, one of which having a limited movement toward the other, the inclined plates *n o*, the rollers *r s*, operating between the same, mounted in an arm, *t*, connected to a rocker, *q*, actuated by means of a disk, *u*, and pitman *v*, connected to the driving-shaft *c*, and the heading device *w*, capable of moving forward toward the gripping-dies *m k* by means of a cam, *x*, secured to the shaft *c*, the said heading device being capable of being elevated and made to operate on a tapering or inclined surface, substantially as and for the purpose set forth.

2. In a spike-machine, the combination of a stationary inclined plate, *n*, the fixed and movable gripping-dies for holding the blank in fixed position on said plate, an inclined fixed block arranged in the vertical plane of said plate *n* and above the latter, and an endwise-movable arm carrying two rollers, one adapted to ride against the inclined block to depress the other roller upon the blank held on the plate *n* by the gripping-dies, substantially as and for the purpose described.

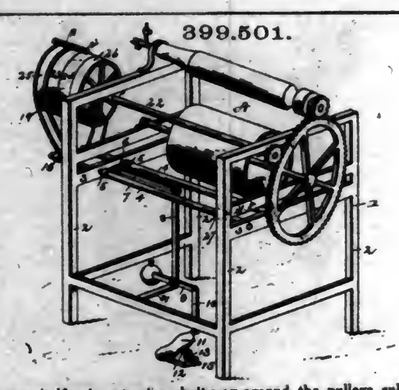
3. In a spike-machine, the combination, with the gripping-dies, of an endwise horizontally-movable header and a tapered block or plate removably fitted between the rear end of said header and the support thereof, substantially as and for the purpose described.

399,501. BELT-SHIFTING MECHANISM. JOHN J. DALEY, Brooklyn, N. Y. Filed Nov. 5, 1888. Serial No. 290,011. (No model.)

Claim.—1. The combination, in a belt-shifting device, of two movable rods mounted in cross-pieces of the supporting-frame, the outer portions of said rods carrying the belt-rods and the inner portions united by collars 5, connected with a lever for operating the rods, whereby the same may be moved in the direction necessary either to start, reverse, or stop the machine, substantially as specified.

2. The combination, with the movable rods mounted in cross-pieces upon the end of the frame, of brackets 16, secured thereto and carrying the belt-rods consisting of a center-rod encircling the pulley

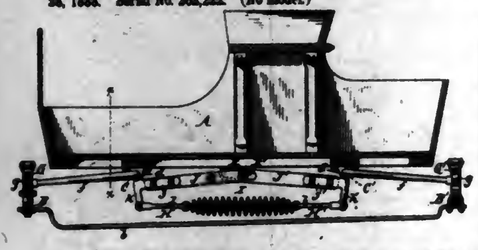
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and two half-rods extending half-way around the pulleys, substantially as described.

3. The combination, with the cross-piece having collars 5 mounted upon the shifting-rods, of an arm, 7, connected with said cross-piece, the outer end of the arm being pivoted to a vertical rod, 8, secured to a weighted lever, 9, upon a standard, 31, secured to the frame, substantially as specified.

399,502. WAGON. ELMER G. DAVIS, Friendship, N. Y. Filed Jan. 26, 1888. Serial No. 262,222. (No model.)



Claim.—1. The combination, with the running-gear and the vehicle-body, of rock-shafts journaled to the under side of the body and having arms attached to the running-gear, depending arms or levers secured to said rock-shafts, a spiral spring connected at opposite ends to said depending arms and tending to draw said arms inwardly toward each other, and connecting-links secured, respectively, at their inner ends to said rock-shafts and pivotally connected together at their outer free ends, whereby the movement of either rock-shaft is imparted to the other rock-shaft, substantially as set forth.

2. The combination, with the running-gear and the body provided with rock-shafts having arms attached to the running-gear, of depending arms or levers also mounted on said rock-shafts, yokes or frames pivoted to said depending arms, spiral springs connecting said yokes, and connecting-links secured at their inner ends to said rock-shafts and united at their outer ends by a movable connection, substantially as set forth.

3. The combination, with the running-gear and the body provided with rock-shafts having arms attached to the running-gear, of depending arms or levers also mounted on said rock-shafts, yokes or frames pivoted to said depending arms and provided with a series of notches or hooks, spiral springs connecting said yokes, and pivoted links connecting said rock-shafts, substantially as set forth.

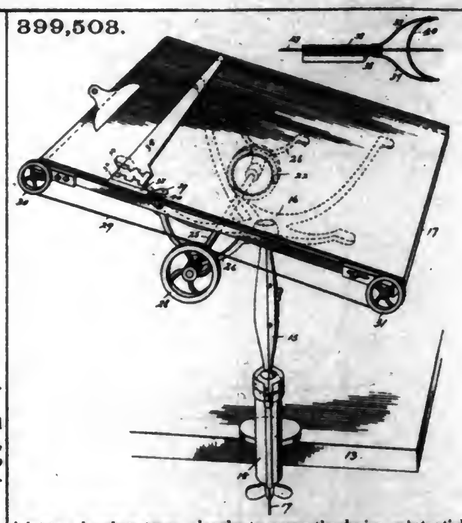
4. The combination, with the body and the front and rear axles, B B', having elliptical springs G G', of rock-shafts C C', pivoted to the under side of the body, and having arms *f*, attached with their outer ends to said elliptical springs, depending arms or levers *h h'*, mounted on said rock-shafts, yokes or frames H H', pivoted to the arms *h h'*, spiral springs I, connecting said yokes, and links J J', secured with their inner ends to said rock-shafts and united at their outer ends by a connection consisting of a pin secured to one of said links and engaging in a slot formed in the other link, substantially as set forth.

399,503. COPY HOLDER AND REGISTER. JAMES C. A. DEAN, Chicago, Ill. Filed Oct. 13, 1888. Serial No. 288,016. (No model.)

Claim.—1. A copy-holder comprising, in combination, a table for the copy and a standard having a universal ball-and-socket joint therein, and suitable means whereby to secure the copy-holder, substantially as described.

2. A copy-holder comprising, in combination, a table secured to a spider, and a standard connected at one end by a ball-and-socket joint to a bracket-clamp, whereby to secure the device, substantially as described.

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3. The combination, with a copy-holder, comprising a table and a suitable standard or support, of a marking-finger secured to an endless traveling belt or cord, and a foot-pedal and connections between said traveling belt and the foot-pedal, whereby the marker may be moved by depressing the pedal, substantially as described.

4. The combination, with a copy-holder, of a marking-finger secured at one end to an endless cord or belt, a rotatable shaft bearing a sheave, over which said belt is passed, a ratchet-and-pawl mechanism adapted to rotate said shaft, a foot-pedal, and a cord connecting the foot-pedal and the ratchet mechanism, substantially as described.

5. The combination, with a foot-pedal and disk, of a cord secured to the pedal at one end and at the other to the periphery of the disk, a ratchet-wheel concentric to the disk, pawls pivoted upon the rim of the disk and adapted to engage the ratchet-teeth, a shaft bearing both disk and ratchet and a belt-pulley, a belt passed over said pulley, and a marking-finger connected to said belt, substantially as described.

6. The combination, with a copy-holder, of a marking-finger connected to an endless traveling belt, a shaft and pulley for moving said belt, a ratchet device for rotating the shaft, a cord or rod connecting the ratchet with the foot-pedal, and stops whereby to limit the movement of the marking-finger, substantially as described.

7. In combination with a copy-holder, a movable marking-finger and a traveling belt, said finger having spring-clamping jaws, whereby to secure it to the belt, substantially as described.

399,504. STRAW-STACKER. WILLIAM W. DINGEE, Racine, Wis., assignor to the J. I. Case Threshing Machine Company, same place. Filed July 14, 1888. Serial No. 279,923. (No model.)

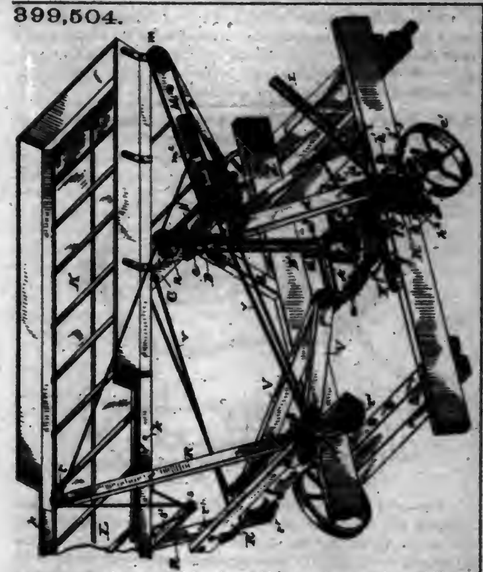
Claim.—1. In a stacker, the combination, with a carrier and its main supporting-frame, of a pivoted cross-head, a sector-frame interposed between the cross-head and the carrier, a shaft mounted on the cross-head and provided with pinions engaging the sectors, and a brace, the ends of which are at all times the same distance apart, connected with the cross-head and adapted to move with the same, said brace supporting the carrier in rear of its connection with the sector-frame, substantially as described.

2. In a stacker, the combination, with the main supporting-frame, of a shaft mounted vertically therein, a cross-head mounted on said shaft, a rigid brace-frame connected with the lower end of said shaft, and a carrier having its forward end supported by the said cross-head and its rear end supported by the brace-frame, substantially as described.

3. In a stacker, the combination, with the main supporting-frame, of a shaft vertically mounted therein, a cross-head and gear-segment mounted on said shaft, a sector-frame pivoted on said cross-head, a rigid brace-frame rigidly connected with the gear-segment on the shaft, and a carrier having its forward end supported on the sector-frame



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and its rear end supported by the rigid brace-frame, substantially as described.

4. In a stacker, the combination, with the main frame, of a pivoted sector-frame, a shaft provided with pinions engaging the sectors, a rigid brace-frame having cord-guides, a shaft on said brace-frame, a carrier having its forward end pivoted to said sector-frame, and a cord or cords connected with the carrier passing through the guides of the brace-frame engaging the sector-frame forward of its pivots and connected to the shaft on the brace-frame, substantially as described.

5. In a stacker, the combination, with the main supporting-frame, of a shaft vertically mounted therein, a cross-head on the upper end of said shaft, a rigid brace-frame rigidly connected with the lower end of said shaft and provided with cord-guides, a shaft mounted on said rigid brace-frame, a carrier having its forward end connected with said cross-head, and a cord or cords connected with the carrier passing through the cord-guides and connected to the shaft on said rigid brace-frame, substantially as described.

6. In a stacker, the combination, with a swinging carrier and a gear-segment connected with the same, of a power-shaft provided with a pinion, a counter-shaft provided at one end with a pinion, gearing connecting the other end of the shaft with the said segment, and a support provided with two engaging-gears, one of which is always in gear with the power-shaft, the said support being adapted to be moved to bring either of its gears into engagement with the gear on the counter-shaft, substantially as described.

7. In a stacker, the combination, with a swinging carrier and a gear-segment connected therewith, of a shaft adapted to slide in its bearings and provided with a worm engaging said segment, a main shaft, and reversing-gearing connecting the same with the worm-shaft, substantially as described.

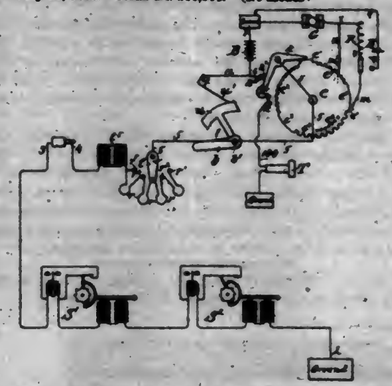
8. In a stacker, the combination, with a swinging carrier and a gear-segment connected therewith, of a shaft adapted to slide in its bearings and provided with a worm engaging said segment, an adjustable stop on said shaft, a main shaft, and reversible gearing connecting the said main shaft with said worm-shaft, substantially as described.

9. In a stacker, the combination, with a swinging carrier and a gear-segment connected therewith, of a main or power shaft provided with a pinion, a counter-shaft provided with a pinion at one end, and gearing connecting its opposite end with the said segment, and a pivoted plate having two engaging-gears mounted thereon, one of which is always in engagement with the pinion on the main shaft, said plate being adapted to be moved so as to bring first one and then the other of its gears into engagement with the pinion on the counter-shaft, substantially as described.

10. In a stacker, the combination, with a swinging carrier, of a gear-segment provided with pins or stops, reversible gearing for actuating said segment, a weighted lever for reversing said gearing, a link attached to said lever and having a projection lying in the path of the said pins or stops on said segment, a slotted link connected with the reversing-gearing, and a pin on said lever engaging the slot of said link, substantially as described.

11. A folding straw-carrier having a rear portion slightly narrower than the forward portion and pivoted to the latter forward of the rear end of the same, substantially as described.

399,505. TRANSMITTING-INSTRUMENT FOR ELECTRIC SIGNALING APPARATUS. WALKER J. DUDLEY, Everett, Mass., assignor to the Dudley Electric Manufacturing Company, Concord, N. H. Filed July 19, 1888. Serial No. 280,261. (No model.)



Claim.—1. The controlling-shaft movable to and held in different positions, combined with a current-interrupter controlled by the said shaft, and a lock for said current-interrupter and a releasing-projection therefor connected with the said shaft, whereby the said interrupter is released and produces a number of electric impulses dependent on the point at which the said shaft has been stopped, substantially as described.

2. The main-line and two branch circuits containing sources of different kinds of electric currents—as, for instance, a battery and magneto-generator—combined with a transmitting-instrument comprising a movable signaling-surface having a definite cycle of movement, the same at each operation, and an actuator therefor, and circuit-controlling contacts operated thereby during said continuous movement, controlling the connection of said branches with the main line, substantially as and for the purpose described.

3. The main-line and three branch circuits, one containing a battery, one a magneto-generator, and the third containing a source of currents of opposite polarity to that of the said battery, combined with a transmitting-instrument comprising a movable signaling-surface having a definite cycle of movement, the same at each operation, and actuator therefor and circuit-controlling contacts operated thereby, by which the said branches are all connected to line each at different times during a single operation of said signaling-surface, substantially as and for the purpose described.

4. The actuating-shaft and wheel having a signaling-surface loose thereon and actuating-spring connecting said shaft and wheel, combined with a stop for said wheel released by said actuating-shaft and a second stop connected with said wheel-stop and operated thereby, the second stop being arranged to arrest the actuating-shaft, except when the first is engaged with the said wheel, substantially as described.

5. The actuating-shaft and transmitting-wheel loose thereon, combined with an actuating-spring connecting the said shaft and wheel, an arm loose on said shaft, and stops co-operating with said arm on said wheel, and a projection co-operating with said arm connected with said actuating-shaft, substantially as and for the purpose described.

6. The actuating-shaft and disk fixed thereon, having a portion of its periphery provided with ratchet-teeth, combined with a pawl to engage said teeth, a circuit-controlling wheel loose on said shaft, and an actuating-spring connecting said shaft and wheel, and a stop for said wheel operated to release the wheel by the movement of the shaft, substantially as described.

7. The actuating-shaft movable to and held in different positions, combined with a circuit-controlling wheel having a signaling-surface and electric contacts controlled thereby, a segment connected with said wheel, and a projection co-operating with the said segment connected with the actuating-shaft, whereby the said segment is moved to prevent a portion of the signaling-surface from operating the contacts, substantially as described.

8. The combination of the main circuit and generator of electricity therein, with resistance in said circuit and contact-points between different portions of said resistance, a switch movable over the said contact-points, and an electro-magnet included in said circuit, and an armature therefor which engages and arrests the said switch when

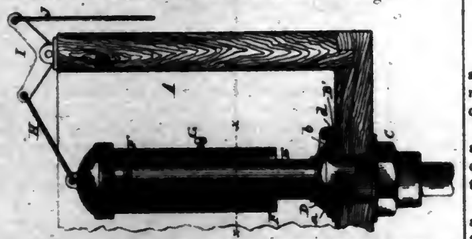
the attraction of the magnet overcomes the retractor of the armature, substantially as described.

9. The combination of the actuating-shaft, with a movable switch engaged by said shaft, and an electro-magnet and its armature that arrests the said switch, a lock that retains the said switch in the position to which it has been moved, and a releasing device for said lock operated by said shaft before the latter engages the said switch, substantially as and for the purpose described.

10. The combination of the actuating-shaft with a movable switch engaged by said shaft, and an electro-magnet and its armature that arrests the said switch, a lock that holds the said armature up to its magnet, and an actuator for said lock on said shaft by which the armature is released while the switch is engaged by the shaft, substantially as and for the purpose described.

11. The main circuit and transmitting instrument provided with a circuit-controlling wheel and electric contacts operated thereby, combined with a branch circuit containing a source of electricity which is connected to said main circuit during the movement of said wheel, and another branch containing a telephone which is connected to said main circuit by the wheel-controlled contacts when said wheel is arrested in its normal position, substantially as described.

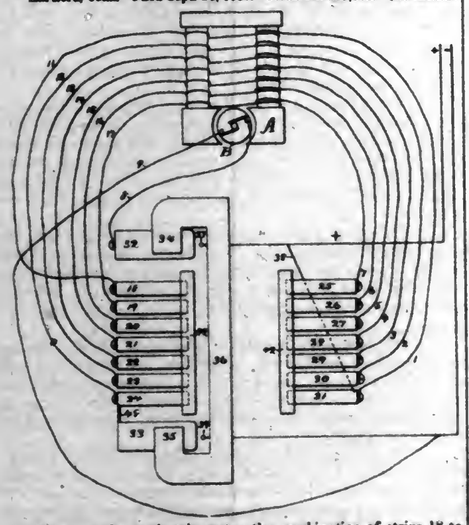
399,506. FLUSH-TANK VALVE. PATRICK V. DWYER, St. Paul, Minn. Filed Sept. 1, 1888. Serial No. 284,335. (No model.)



Claim.—1. In combination with a flushing-tank, A, having an outlet, a hinged valve, D, provided with an upright tube, E, a shorter tube, F, closed at its upper end and surrounding and separated from tube E, and means for tipping the valve and its tubes positively.

2. In combination with a tank having an outlet, a valve, D, provided with a tube, E, and adapted to close the outlet, and an adjustable pipe, F, closed at its upper end and secured to the pipe E, substantially as and for the purpose set forth.

399,507. SWITCH FOR ELECTRIC MOTORS. ARTHUR H. EDDY, Hartford, Conn. Filed Sept. 28, 1887. Serial No. 250,952. (No model.)

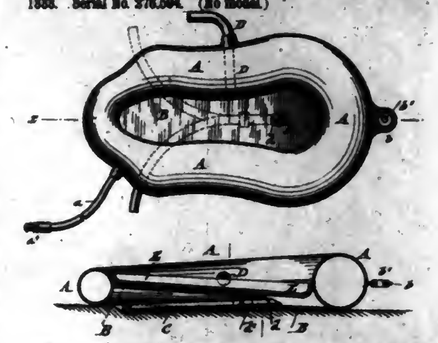


Claim.—1. In an electric motor, the combination of strips 18 to 31, inclusive, series springs 40, and the slide D, having the pair of blank strips 42, substantially as described, and for the purpose specified.

2. In an electric motor, the combination of the strips 18 to 31, inclusive, series springs 40, the slide D, having the pair of blank strips 42, contact-strips 32 and 33, the latter connected with the strip 24, connected blanks 34 35, and the armature and field circuits, substantially as described, and for the purpose specified.

3. In an electric motor having a switch for changing the machine into a shunt or series machine, the combination of the switch, with a catch for holding it in its position for starting, and a spring for throwing it into its second position upon releasing the catch, substantially as described, and for the purpose specified.

399,508. RUBBER BED-PAN. ANTON C. ROGERS, Bath Beach, assignor to the Ideal Rubber Company, Brooklyn, N. Y. Filed June 9 1888. Serial No. 276,594. (No model.)



Claim.—1. A rubber bed-pan provided with an inflatable rim and a bottom web secured at one end to the under side of the inflatable rim, and at the opposite end inclined upward and secured to the sides of the rim, so as to form a discharge-spout, substantially as set forth.

2. The combination, with a bed-pan having an inflatable rim and a bottom web, of a fixed discharge-tube connected to said web, and of a rigid discharge-tube swiveled to the fixed tube, so as to extend to either side of the pan, substantially as set forth.

3. The combination, with a bed-pan having an inflatable rim and a bottom web, of a detachable concave bowl corresponding in shape to the interior cavity of the pan, substantially as set forth.

399,509. FRUIT-ASSORTER. FRANK H. ELLETHORPE, Port Clinton, Ohio. Filed Oct. 11, 1888. Serial No. 287,785. (No model.)



Claim.—1. In a fruit-assorter, the combination of a frame, an inclined loose flexible perforated separating diaphragm connected at its upper end to the said frame, and an agitating device arranged beneath the said loose diaphragm.

2. In a fruit-assorter, the combination of a supporting-frame, a loose flexible perforated diaphragm connected to the frame, an agitating-frame arranged below and adapted to support this diaphragm, and means for giving this agitating-frame a longitudinal movement under the diaphragm, substantially as described.

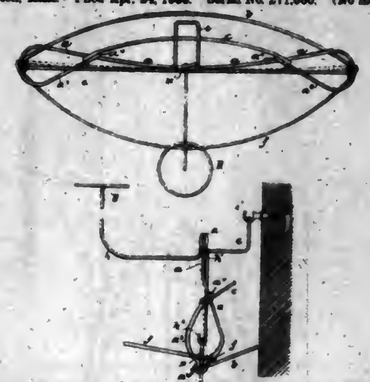
3. In a fruit-assorter, the combination of a frame, a flexible inclined perforated diaphragm, and a transverse depending retarder, F, this retarder being constructed of flexible material, and having its lower edge resting upon the said flexible diaphragm, substantially as and for the purpose set forth.

4. The combination, with the inclined flexible diaphragm provided with different-sized holes, of a reciprocating agitating-frame arranged beneath and adapted to support the said diaphragm and provided with transverse rollers.

5. The combination of a frame, a perforated diaphragm, a support above this diaphragm, a vertically-guided stop-bar, G, a pivoted weighted angle-lever upon the said support, and a chain connecting the angle-lever and stop-bar, substantially as and for the purpose set forth.

6. The combination of a trough, a spout attached thereto and provided with the notches *m*, a vertically-movable gate, the transverse bars connected together by means of the hand-lever and to the gate by suitable connecting-rods, and the confining staples or loops secured over the notches *m*, substantially as described.

399,510. HANGER FOR WEARING-APPAREL. WILLIAM BYRNE, Boston, Mass. Filed Apr. 24, 1888. Serial No. 271,660. (No model.)



Claim.—1. The shoulder portion *a* of the hanger, bent to form end loops, and the brace-bar *c*, extended rearwardly from the shoulder portion, combined with the transverse pantaloons-supporting bar *p*, engaging the said end loop, substantially as described.

2. The shoulder portion *a* of the hanger, bent to form end loops, a^3, combined with the curved back brace, *b*, having its ends bent into the said loops, substantially as described.

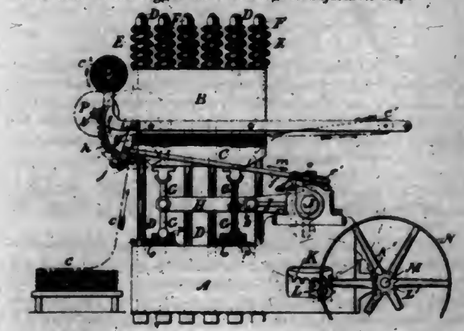
3. The shoulder portion *a* and transverse pantaloons-bar *p*, connected to the ends thereof, combined with the loop-like hat-holder H, having hooks to engage the shoulder portion, and the bar *p*, to form a central support for the latter, substantially as described.

4. The shoulder portion *a*, combined with the curved back and front braces for a coat, connected to the said shoulder portion at or near its ends to operate substantially as described.

5. The shoulder portion *a*, bent substantially as shown and described, and its attached hook *c*, combined with the back and front braces, substantially as described.

399,511. MACHINE FOR PRESSING FABRICS. THOMAS C. FAWCETT, Leeds, County of York, England. Filed Aug. 10, 1888. Serial No. 282,442. (No model.) Patented in England Feb. 16, 1888, No. 2,339.

Brief.—The toggles are all connected to one crank, which is constructed to throw the knuckles of the toggles past the center, thus imparting two pressures at each revolution of the crank. Mechanism is provided for drawing through the cloth in installments, and the lower arms of the toggles have bearings in adjustable steps.

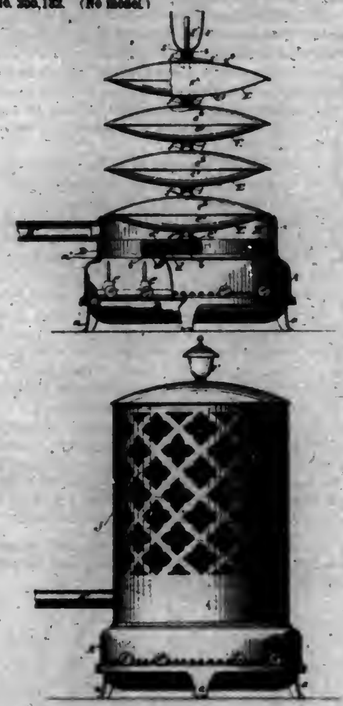


Claim.—1. The combination, with the upper pressure-plate and its springs and the lower pressure-plate, of toggles arranged under said lower plate, a crank-shaft, and rods connecting the knuckles of said toggles with the crank in said shaft, said crank being constructed to move said knuckles past the center, whereby two pressure impulses are imparted to the press at each revolution of the crank-shaft.

2. The combination of the upper and lower pressure-plates, the toggles arranged under the lower pressure-plate, the rods connecting said toggles with the crank in the shaft J, the said shaft, the crank *d* thereon, the arm *g*, its pawl *j*, the slotted rod *f*, connecting the arm *g* with crank *d*, the toothed wheel A, engaged by pawl *j*, the cloth-feeding roller P, and the pinion *l*, on the journal of roller P, gearing with the wheel A, substantially as set forth.

3. The combination of the upper and lower pressure-plates, the crank-shaft, the toggles coupled together and connected to the crank in the crank-shaft, the steps *p* under said toggles, and the adjusting-wedges *o* under said steps, whereby the lower pressure-plate may be set to the proper elevation.

399,512. PORTABLE STEAM GENERATOR AND RADIATOR COMBINED. ROBERT G. FERGUSON, Saratoga Springs, N. Y., assignor of one-half to Oscar A. Day, same place. Filed Nov. 15, 1887. Serial No. 255,182. (No model.)



Claim.—1. In a portable combined steam generator and radiator, the combination, with the steam-generator D, having its water-chamber of small vertical extension and provided with a series of vertical walled perforations, *c c*, all as described, of the burners C, situated directly beneath the said steam-generator, and the horizontal radiator E, having its lower side wall, *e'*, directly over the series of vertical perforations in said steam-generator and its chamber communicating directly with the chamber of the latter, substantially as and for the purposes set forth.

2. In a portable combined steam generator and radiator, the combination, with the steam-generator D, having its water-chamber of small vertical extension and provided with a series of vertical walled perforations, *c c*, all as described, and a series of two or more horizontal radiators, E E, having free communication with each other and with the steam-generator, of burners C C, situated beneath the said steam-generator, and the inclosed chamber H, situated between the latter and the horizontal wall *e'* of the said radiator, substantially as and for the purposes set forth.

3. In a portable combined steam generator and radiator, the combination, with the steam-generator D, having its water-chamber *d* of small vertical extension and provided with a series of vertical walled perforations, *c c*, all as described, and the burners C C, operating below the said steam-generator, of a series of connected horizontal radiators, E E, composed each of concave-convex walls e' e^2, as

described, and situated one above the other and having free communication with each other, the lowermost radiator of the series being connected with the said steam-generator and having its lower side wall, *d'*, heated by the products of combustion passing upwardly through the walled perforations in the said steam-generator, all substantially as and for the purposes set forth.

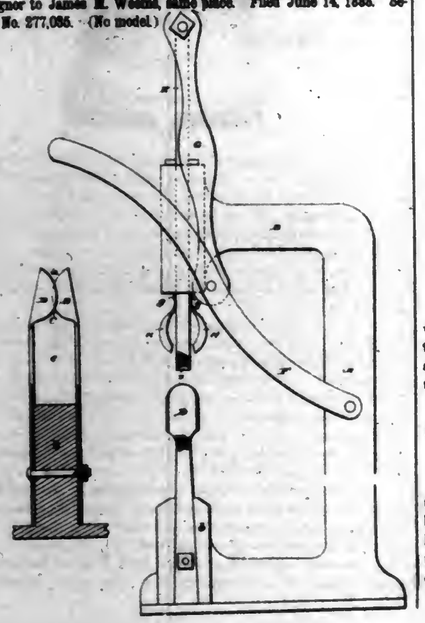
4. In a portable combined steam generator and radiator, the combination, with the steam-generator D, having its water-chamber of small vertical extension and provided with a series of vertical walled perforations, a combustion-chamber below the said steam-chamber and containing burners C, and the radiator E above said generator and communicating with it, of the chamber H between said radiator and generator, with the lower side wall, *d'*, of the former forming the upper wall of said chamber H, and the pipe G', leading from the said chamber to an exit, substantially as and for the purposes set forth.

5. In a portable combined steam generator and radiator, the combination, with the series of horizontal radiators E E, having each the horizontal concavo-convex walls d' d^2, and the chambers of which communicate each with the other, and the steam-generator D, having its water-chamber of small vertical extension and provided with a series of vertical walled perforations, e e, of a series of burners contained within an inclosed chamber situated underneath the said steam-generator, and heating through the walled perforations of the latter the lower side wall of the lowermost radiator of the series, and a liquid fuel tank supplying the said burners with fuel, and the chamber H between the said steam-generator and the lower radiator and provided with an exit for escape of the products of combustion, substantially as and for the purposes set forth.

6. In a portable combined steam generator and radiator, the combination, with the uppermost one of the series of radiators E, of the measuring-vessel F and the tubular plug F', having its lower end screw-threaded and working in a screw-threaded opening in the bottom of the said vessel and communicating with the chamber of the radiator and having one or more openings, *a*, communicating with the chamber of said measuring-vessel, substantially as and for the purposes set forth.

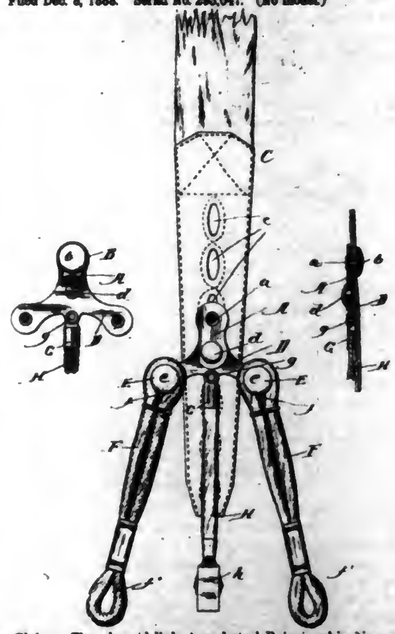
7. The combination, with the portable combined steam generator and radiator above described, and consisting of a series of horizontal radiators, E E, formed each by concavo-convex walls d' d^2, and having their chambers communicating with each other, and a steam-generator, D, having its water-chamber *d* of small vertical extension and communicating with the lowermost one of the series of radiators, and having through it a series of vertical walled perforations, e e, which communicate above with the chamber H between this generator and the lower radiator and below with the combustion-chamber provided with a series of burners, of the open-work or perforated jackets K, inclosing the steam-generator and the several radiators of the series and supported from the base which supports the burners and steam-generators, all substantially as and for the purposes set forth.

399,513. PEACH-STONER. CHARLES I. FERRIOTT, Dawson, Tex., assignor to James M. Weems, same place. Filed June 14, 1888. Serial No. 277,055. (No model.)



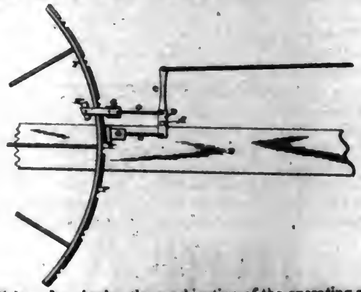
Claim.—The improved peach stoning and halving machine herein described, consisting, essentially, of the main frame having the part *b* rising from its base, the yielding holding-blades D, having their upper edges beveled and formed as cutters and overlapping at their side edges, as shown, the plunger having its lower end recessed and provided with an annular cutting-edge, the crescent-shaped cutting-blades H, secured to said plunger above its cutting-point, with their convex edges forming cutters, the operating-lever, and pitman connecting the same with the upper end of the plunger, substantially as specified.

399,514. SUSPENDERS. BENJAMIN O. FOSTER, Humboldt Park, Ill. Filed Dec. 8, 1888. Serial No. 293,047. (No model.)



Claim.—The pivoted link A and stud B, in combination with the bar D, a suspender-end, and a suspender for attaching the suspender-end to the suspender, the latter provided with means for attaching the stud thereto, substantially as specified.

399,515. BRAKE. JOHN FULTON, Biggs, Oreg. Filed Nov. 22, 1888. Serial No. 291,548. (No model.)



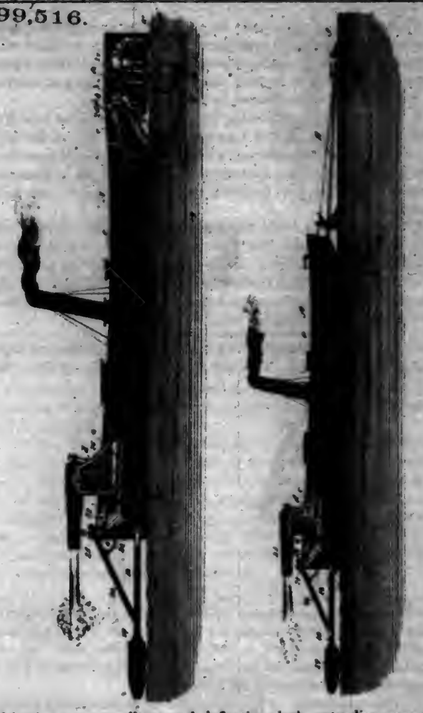
Claim.—In a brake, the combination of the operating-shaft provided with a crank, the arms projecting at right angles from the shaft, the brake-bars, the connecting-rods between the brake-bars and the arms, and the brakes which are applied to opposite sides of the periphery of the wheel upon its same side, substantially as shown.

399,516. COMBINED TORPEDO AND GUN BOAT. RICHARD J. GATLING, Hartford, Conn. Filed Oct. 29, 1888. Serial No. 289,450. (No model.)

Claim.—1. A torpedo-boat having a spar-torpedo projecting from the stem, an upwardly-curved deflecting-deck extending from the bow back of the engines, and a compartment at the rear of the boat having sighting-apertures through the curved deck, said compartment having operative connections to the torpedo, substantially as described.

2. A torpedo-boat provided with offensive weapons at its bow,

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and having an upwardly-curved deflective deck extending over and to the rear of the engines, and a rear compartment open at top, but shielded in front by said deck, from which compartment the offensive weapons and steering-gear may be operated, substantially as described.

3. A torpedo-carrying boat, substantially as described, having a forwardly-projecting spar pivoted by one end to the stem thereof, an explosive shell attached to said spar, a stay-rod pivoted by one end to said spar and having by its opposite end a detachable engagement with the boat, whereby said spar is supported in a horizontal position, a tripping-lever pivoted near the engaged end of said rod, an operator's compartment annexed to the stern of said boat, extending rearwardly therefrom, and communicating by a passage-way with the hold thereof, and a chain attached to one arm of said tripping-lever and extending to said compartment, substantially as set forth.

4. A gun-boat provided with a deflective deck extending rearwardly from the bow and over the engines, an open-top compartment for the crew in rear of said deck and having sighting-apertures through the curved deck, said compartment having side ports protected by shields, substantially as described.

5. A torpedo-carrying boat, substantially as described, having a forwardly-projecting spar attached to the stem thereof, an explosive shell attached to said spar, a gun mounted on said boat capable of throwing shells containing high-power explosives, substantially as described, an operator's compartment annexed to the stern of said boat, extending rearwardly therefrom, and electric conductors extending between said gun and compartment, substantially as set forth.

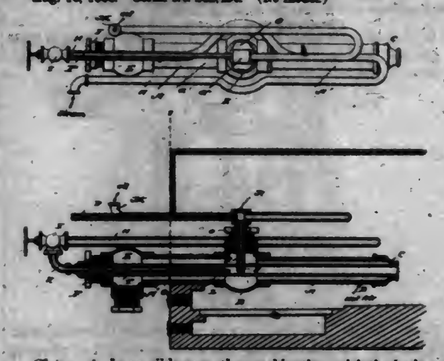
6. A torpedo-carrying boat, substantially as described, having an operator's compartment annexed to the stern thereof, whereby said boat is caused to become a shield against projectiles fired toward the bow of said boat, a longitudinal extension of the keel under said compartment, a post rigidly secured to the floor thereof and the extremity of said extension, and a rudder having its post-bearings in said floor and extension, substantially as set forth.

7. A torpedo-carrying boat, substantially as described, having an operator's compartment annexed to the stern thereof, whereby said boat is caused to become a shield against projectiles fired toward the bow of said boat, a rudder having its post extending through the floor of said compartment, a tiller-holder fixed to said floor having notches in its upper end, and a tiller pivotally connected to said rudder-post and engaging in said notches, substantially as set forth.

8. A torpedo-carrying boat, substantially as described, having an operator's compartment annexed to the stern thereof, whereby said boat is caused to become a shield against projectiles fired toward the bow of said boat, and curved shields within said compartment extending from the stern of the boat rearwardly, substantially as set forth.

9. A torpedo-carrying boat, substantially as described, having an operator's compartment annexed to the stern thereof, whereby said boat is caused to become a shield against projectiles fired toward the bow of said boat, the deck of said boat at its junction with said compartment being upwardly inclined, and having one or more longitudinal sight-holes therein communicating with said compartment, substantially as set forth.

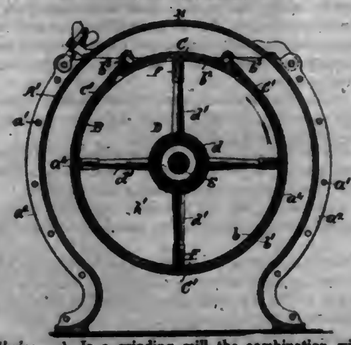
399,517. OIL-BURNER. CHARLES GILBERT, Omaha, Nebr. Filed Aug. 10, 1888. Serial No. 282,430. (No model.)



Claim.—1. In an oil-burner, the combination, with the body composed of two tubular sections, of a coupling therefor, a nut arranged in the upper branch of the coupling, the T-coupling arranged in said nut, the oil-pipe extending nearly the entire length of the burner and communicating with the T-coupling, the pipe G, arranged in the main body, a pipe leading from the T-coupling to said pipe in the main body, and the small pipe K, leading from the valve and passing into the main body, substantially as specified.

2. In an oil-burner, the combination, with the main body composed of two tubular sections united by a T-coupling, one section having a hot-air inlet and a reducer and the other section a coupling for the main supply, a tube arranged within the body and provided with an opening, T, a reducing-nut at the T-coupling, a T-coupling arranged within said nut, an oil-supply pipe extending from the T-coupling in the main body, a steam-pipe extending the entire length of the main body in a loop form and having a valve at one end, a small pipe leading from said valve and passing into the pipe arranged within the main body, and an air-pipe communicating with the T-coupling N, substantially as specified.

399,518. GRINDING-MILL. JOHN GOSS, Chicago, Ill. Filed May 24, 1888. Serial No. 274,934. (No model.)



Claim.—1. In a grinding-mill, the combination, with the inclosing-casing constructed in two parts and provided on the interior with the annular shoulders, as described, of the wire-gauze cylinder, the edges of which overlap and have a close bearing on said shoulders, the corrugated plate, the clamping-bands for securing said cylinder in proper position relative to the inclosing-casing and said corrugated plate, and the beater-arms, as described, substantially as and for the purpose set forth.

2. In a grinding-mill, the combination, with the inclosing-casing provided on the inner side with the annular shoulders a^3 a^4, of a wire-gauze cylinder arranged on the interior of the inclosing-casing, and having the edges overlap said shoulders, the clamping-bands C C^2, having screw-threaded ends, the curved corrugated plate C, provided with lugs b^2, the screw-threaded nuts engaging with the correspondingly-threaded ends of the clamping-bands, and the beater arms and

bars, as described, all arranged and operating in the manner and for the purpose set forth.

3. In a grinding-mill of the character described, the combination, with the inclosing-casing provided on the inner sides with annular shoulders a^3 a^4, of the wire-gauze cylinder B, the curved corrugated plate C, provided with the perforated lugs b^3, the clamping-bands encircling said gauze cylinder and having the ends adjustably secured in said lugs, the reducing-wheel D, rotating inside of the gauze cylinder, and the driving-shaft upon which said wheel is rigidly mounted, substantially as and for the purpose set forth.

899,519. AUTOMATIC FIRE-EXTINGUISHER. FREDERICK GRINNELL and RICHARD W. GRINNELL, Providence, R. I. Filed Mar. 20, 1887. Serial No. 232,874. (No model.)



Claim.—1. The combination, with an automatic fire-extinguisher having metallic parts for holding the water in check and releasing the same upon the occurrence of a fire, of a globe made of non-corrodible material secured hermetically to the extinguisher and inclosing the said parts, so as to protect the same from the action of corrosive gases, substantially as described.

2. The combination, with an automatic fire-extinguisher having metallic parts for holding the water in check and releasing the same upon the occurrence of a fire, and having also a base adapted to fit a covering-globe, of a non-corrodible globe fitted air-tight to such base and inclosing the said parts, so as to protect them from the action of corrosive gases, substantially as described.

3. The combination, with an automatic fire-extinguisher having metallic parts for holding the water in check and releasing the same upon the occurrence of a fire, of a non-corrodible cap or globe inclosing such parts and hermitically sealed with non-corrodible sealing material.

4. The combination of an automatic fire-extinguisher, having metallic parts for holding the water in check and releasing the same upon the occurrence of a fire, with a protecting cap or globe inclosing the said parts and a non-corrodible sealing material closing the joint between the cap and the extinguisher, as and for the purpose set forth.

5. The combination, with an automatic fire-extinguisher having metallic parts for holding the water in check and releasing the same upon the occurrence of a fire, of a non-corrodible cap or globe inclosing such parts and hermetically sealed with a non-corrodible sealing material that will melt or soften at or below the operative temperature of the extinguisher.

6. The combination of an automatic fire-extinguisher with a protecting cap or globe therefor made in parts and sealed together with a fusible and non-corrodible sealing material.

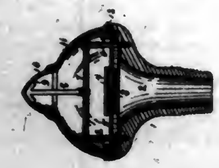
7. The combination of an automatic fire-extinguisher with a corrodible cap adapted to cover the same, made in parts and sealed together with a fusible non-corrodible sealing material.

8. The combination, with an automatic fire-extinguisher, of a fibrous composition cap surrounding the same, substantially as set forth.

9. The combination of an automatic fire-extinguisher with a paper cap therefor, a metallic attachment secured to the cap where it will abut on part of the extinguisher, and a soldered connection between the attachment and the extinguisher.

10. The combination of the automatic fire-extinguisher with the paper cap, the metallic attachment secured to the cap, the soldered connection between the said attachment and the extinguisher, and a covering of non-corrodible material over the soldered connection.

899,520. AUTOMATIC FIRE-EXTINGUISHER. FREDERICK GRINNELL, Providence, R. I. Filed Feb. 3, 1888. Serial No. 262,958. (No model.)



Claim.—1. In an automatic fire-extinguisher, the combination of the valve closing the water-passage with a protecting-cap fitted with an air-tight joint to the extinguisher-base, and a heat-actuated device independent of said joint located entirely within the cap and holding said cap to its seat until released by heat.

2. In an automatic fire-extinguisher, the combination of the valve closing the water-passage with a protecting-cap fitted with an air-tight joint to the extinguisher-base, and a heat-actuated device independent of said joint located in the space between the valve and cap, and secured to both valve and cap, so as to hold them to their respective seats until released by heat.

3. In an automatic fire-extinguisher, the combination of the valve closing the water-passage with a protecting-cap covering the valve, and inclosing a heat-actuated device adapted to hold the cap to its seat until released by heat, the said cap made partly of heat-conducting material and partly of heat-insulating material, and the said device secured to the heat-conducting part.

899,521. AUTOMATIC FIRE-EXTINGUISHER. FREDERICK GRINNELL, Providence, R. I. Filed Feb. 3, 1888. Serial No. 262,959. (No model.)



Claim.—1. In an automatic fire-extinguisher, the combination of a valve closing the water-passage, a cap seated on the extinguisher and covering the valve, and a heat-actuated device inside the cap connecting the valve and the cap through a lever the fulcrum of which is supported from the base of the extinguisher.

2. The combination of the base 1, having water-passage 2, valve 4, closing said passage, yoke 8, supported on the base 1, lever 7, fulcrumed on the said yoke, strut 6, between lever 7 and valve 4, cap 10, fitted to base 1 and inclosing the parts, as shown, and a device, as 9, connecting lever 7 to the cap and releasing both cap and valve when subjected to a temperature above the normal.

3. The combination of the extinguisher-base, having a water-passage, as shown, with an imperforate cap fitted air-tight to the base and inclosing between it and the base a valve covering the water-passage, and also inclosing a reacting thermal device, the latter having a bearing on a fixture to the base and holding both the valve and the cap to their respective seats.

4. In an automatic fire-extinguisher, the combination of the base with a non-corrodible cap seated thereon, a valve closing a passage through the base, and a heat-actuated device secured to the inside of the cap, said device bearing against a support from the base, and a valve whereby the said device holds the valve and the cap to their seats.

5. The combination of the extinguisher-body, having a water-passage closed by a valve, a flexible valve-seat for the valve, a cap seated on said body, and a heat-actuated device located entirely within the cap and holding the valve closed against its flexible seat, and also holding the cap to the body.

6. The combination of the extinguisher-body, having a water-passage and a valve for closing the same, with a cap inclosing a heat-actuated device and the valve, the former having a support from the base and holding both the valve and the cap to their seats, and the said body having an adjustable seat for the cap.

7. In an automatic fire-extinguisher, the combination, with the extinguisher-body, having a water-passage, as shown, and a valve closing such passage, of a heat-actuated device supported from the base controlling the valve, and an imperforate non-corrodible cap seated on the body and inclosing said valve and heat-actuated device, the said cap having secured to its interior surface a metallic anchorage to which the said device is attached.

8. The combination of the extinguisher-body, having the water-passage, as shown, and a valve closing the same, a heat-actuated device supported from the base holding the valve closed, and a glass cap seated on the base and inclosing the valve and heat-actuated device, the said cap having a metallic anchorage secured to its interior surface, to which the heat-actuated device is attached.

899,522. AUTOMATIC FIRE-EXTINGUISHER. FREDERICK GRINNELL, Providence, R. I. Filed Feb. 3, 1888. Serial No. 262,960. (No model.)

Claim.—1. The combination, in an automatic fire-extinguisher, of an air-chamber, a supply-pipe, a valve closing an inlet-port from the

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supply-pipe to the air-chamber, a second valve closing a discharge-port from said air-chamber, and a heat-actuated device holding both of said valves closed and located entirely within the air-chamber independently of either valve-seat, substantially as and for the purpose set forth.

2. The combination, in an automatic fire-extinguisher, of an air-chamber, a supply-pipe, a valve closing an inlet-port from the supply-pipe to the air-chamber, a second valve closing a discharge-port from said air-chamber, a heat-actuated device located entirely within said air-chamber, and a lever connected at one end to said heat-actuated device and bearing upon one of said valves at its other end, substantially as set forth.

3. The combination, in an automatic fire-extinguisher, of an air-chamber, a supply-pipe, a valve closing an inlet-port from the supply-pipe to the air-chamber, a second valve closing a discharge-port from said air-chamber, a heat-actuated device located entirely within said air-chamber, a lever, a rod connecting one end of said lever with said heat-actuated device, the rod 11, supporting the other end of said lever and resting upon one of said valves, and an elastic medium against which said lever bears, substantially as set forth.

899,523. AUTOMATIC FIRE-EXTINGUISHER. FREDERICK GRINNELL, Providence, R. I. Filed Mar. 9, 1888. Serial No. 266,737. (No model.)



Claim.—1. An automatic fire-extinguisher having a chamber communicating with the supply-pipe, a valve closing a discharge-outlet, and a heat-actuated device located entirely within the chamber and adapted to cause the opening of the valve when the temperature rises above the normal.

2. The combination, in an automatic fire-extinguishing apparatus, of a water-pipe, a valve closing an outlet from said pipe, an air-chamber communicating with the water-pipe, the said air-chamber being located so as to have air trapped within it by the water, and a heat-actuated device located in the said air-chamber and connected with the said outlet-valve, so that the said valve will be released by the heat-actuated device when the temperature rises above a predetermined point, as set forth.

3. An automatic fire-extinguisher having a chamber communicating with the supply-pipe, a valve closing an outlet and held closed against the pressure from within by a heat-actuated device located entirely within the chamber, the said device being attached to a yielding or movable part of the said chamber, so as to cause the internal pressure to hold the valve closed.

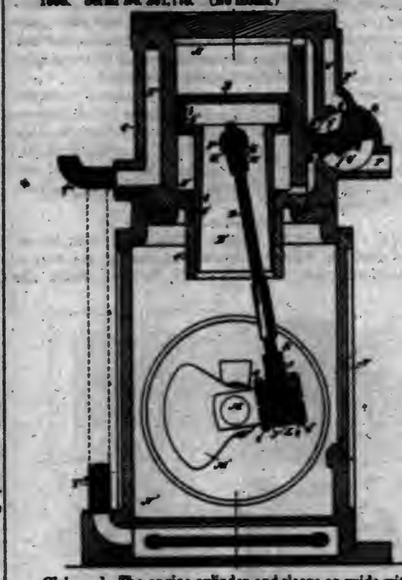
4. An automatic fire-extinguisher having a chamber communicating with the supply-pipe, a valve closing an outlet, a flexible diaphragm in the wall of said chamber, and the heat-actuated device in the chamber connecting the diaphragm and the valve, for the purpose set forth.

5. The combination, in an automatic fire-extinguisher, of an extinguisher-chamber communicating with the supply-pipe, an air-chamber leading into the extinguisher-chamber, a valve closing an outlet, and a heat-actuated device located in said air-chamber and controlling the valve.

6. The combination, in an automatic fire-extinguisher, of an extinguisher-chamber communicating with the supply-pipe, an air-chamber located within the extinguisher-chamber, the said air-chamber having an inlet from the extinguisher-chamber, a valve closing an outlet, and a heat-actuated device in said air-chamber controlling the valve.

7. The combination, in an automatic fire-extinguisher, of an extinguisher-chamber communicating with the supply-pipe, an air-chamber leading into the extinguisher-chamber through a contracted inlet, a valve closing an outlet for the water, and a heat-actuated device located in said air-chamber and controlling the valve.

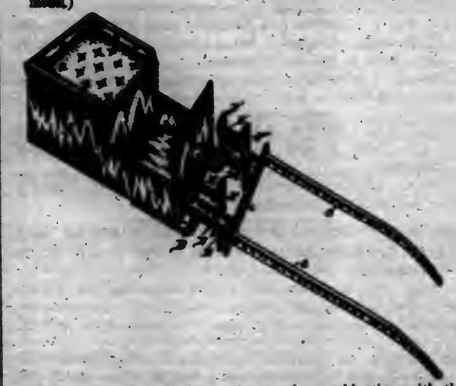
899,524. COMPOUND GARRETT-ENGINE. EARL W. HAMLIN, San Francisco, Cal., assignor to O. S. Wilson, same place. Filed Jan. 24, 1888. Serial No. 261,775. (No model.)



Claim.—1. The engine-cylinder and sleeve or guide with a piston fitted therein and having a hollow cylindrical trunk projecting outwardly through the sleeve, the yoke E, fitting a pin within the trunk and inclosing the anti-fractional ring F, yoke J J', fitted to the crank-pin at the opposite end, and the intermediate connecting-rod, D, having screw-threads of the same direction and pitch cut upon its opposite ends, so that one end may be screwed into the yoke E and set against the block H to close the ring F and take up wear at that end, and be equally screwed out of the strap or yoke upon the crank end, so that the distance between the two centers will remain the same, substantially as herein described.

2. The engine-cylinder having the piston of the cylindrical hollow-trunk pattern extending outward through a guide-sleeve at one end, the pin fixed inside the trunk, and the connecting-rod extending from said pin to the crank with screw-threads cut at opposite ends, so that adjustment for wear upon the pin G may be made by turning the connecting-rod without lengthening the distance between the two points, in combination with the two-part yoke J J', the cap-screws d d', and the set-screw e, substantially as herein described.

899,525. SHAFT ATTACHMENT FOR VEHICLES. DUNCAN D. HARR, Allegheny, Pa. Filed July 18, 1888. Serial No. 280,209. (No model.)



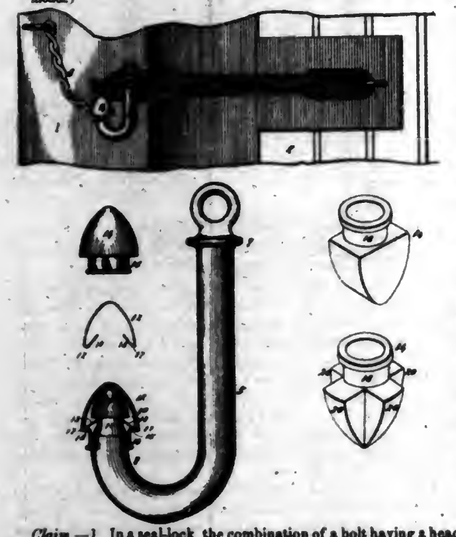
Claim.—1. In a shaft attachment, the combination, with the vehicle and shafts, of spiral springs placed longitudinally one above and the other below the shafts, substantially as described, and for the purpose set forth.

2. The combination, in a shaft attachment for two-wheeled vehicles, of a main spring and a supplementary spring set longitudinally one above and the other below the shafts, substantially as shown and described.

3. In a two-wheeled vehicle having pivotally-attached shafts and cross-bar, said bar being wider than the vehicle-body, the combination of the braces G G', with blocks F F', located above and below said braces and giving bearing to the bolts E E', said bolts passing through the standards B B' and supporting the main springs D D', and supplementary spring *d*, all arranged substantially as described.

4. In a two-wheeled vehicle having pivotally-attached shafts, the combination, with the standards B B', having recesses *b b'* for the eye-lugs *A A'*, of the braces G G', bolts E E', passing longitudinally through the standards B B' and bearing against blocks F F', springs D D', surrounding the bolts or rods E E', of the supplementary springs *d d'*, and nuts *e e'*, impinging against said springs, substantially as described and for the purpose set forth.

399,526. SEAL-LOCK. MICHAEL C. HARNEY, St. Louis, Mo., assignor of one-half to William H. Brennan, Ann Brennan, and Mary A. Grace, all of same place. Filed Sept. 1, 1888. Serial No. 284,342. (No model.)



Claim.—1. In a seal-lock, the combination of a bolt having a head forming a shoulder, a spring having ends fitting beneath the head of the bolt, and a seal having a shoulder engaging against the extremities of the spring, substantially as and for the purpose set forth.

2. In a seal-lock, the combination of the bolt formed with a hook or upturned end, a head on the end of the bolt, a spring having ends engaging beneath the head of the bolt, and a seal fitting over the head of the bolt and having a shoulder engaging the extremities of the spring, substantially as set forth.

399,527. SPONGE FOR REDUCING GOLD AND SILVER AND OTHER ORES. ABRAHAM T. HAY, Burlington, Iowa. Filed Sept. 25, 1888. Serial No. 286,265. (Specimens.)

Claim.—A ferruginous sponge containing iron and an alkali or alkalies, substantially as and for the purposes set forth.

399,528. PROCESS OF MANUFACTURING STEEL. ABRAHAM T. HAY, Burlington, Iowa. Filed Sept. 26, 1888. Serial No. 286,450. (Specimens.)

Claim.—A ferruginous sponge containing iron, calcium, aluminum, sodium, and chromium, substantially as set forth.

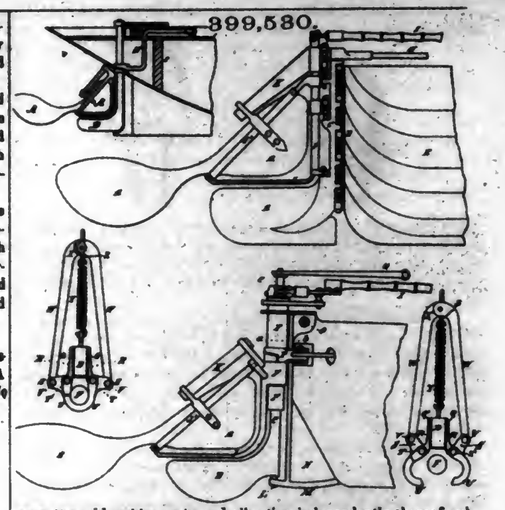
399,529. PROCESS OF REDUCING GOLD, SILVER, &c. ABRAHAM T. HAY, Burlington, Iowa. Filed Oct. 4, 1888. Serial No. 287,198. (No specimens.)

Claim.—The herein-described method of smelting ores—such as those of gold, silver, copper, and lead—consisting in reducing the ore, together with a ferruginous alkaline sponge, substantially as set forth.

399,530. APPARATUS FOR PROPELLING AND STEERING VESSELS. THOMAS R. HEATHORN, London, England. Filed Oct. 23, 1888. Serial No. 288,968. (No model.) Patented in England Feb. 26, 1887, No. 3,066.

Claim.—1. In a vessel, the combination, with the rudder having its post fastened to the stern-post, of the vibrating propellers hinged

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upon the said rudder-posts and vibrating independently thereof, substantially as described.

2. In a vessel, the combination, with the rudder-post, of two independent propellers hinged to said rudder-post and adapted to be spread apart for retarding the motion of the vessel, substantially as described.

3. In a vessel, the combination, with rudder and vibrating propeller-posts, the one adapted to pass through the other, of a bracket fastened to said propeller-post and hinged to the stern-post of the vessel, and a guide at the bottom of the rudder-post, substantially as described.

4. In a vessel, the combination, with the rudder-post and the propeller-post hinged thereupon, but vibrating independently thereof, of a fastening device engaging said posts and normally holding them in their vertical positions, substantially as described.

5. In a vessel, the combination, with the rudder and propeller posts, connected together but moving independently one of the other, of a fastening device for engaging said posts, said device consisting of the clips or jaws U, pivoted to the stern-post and having their outer ends pivotally engaged at V with the spring-impelled bars W, substantially as described.

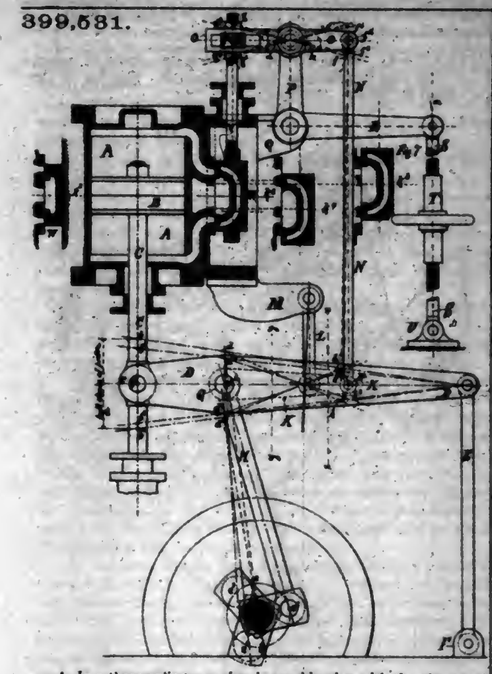
399,531. STEAM-ENGINE VALVE-GEAR. JOSEPH J. HEINDL, Brooklyn, N. Y. Filed Dec. 26, 1888. Serial No. 294,502. (No model.)

Claim.—1. In a three-cylinder engine, in combination with the piston-rod of any one of the said cylinders, a main-valve-operating lever connected to and operated by said piston-rod and swinging upon a vibrating fulcrum, a pitman or connecting-rod joining said main-valve-operating lever with one of the crank-pins of a triple-crank shaft, a secondary lever connected to and operated by said main operating-lever, a vibrating fulcrum supporting said secondary lever, a pitman or connection between said secondary lever and a valve-operating lever, and a connecting valve-stem and valve of a second cylinder of the set of three, substantially as set forth.

2. In a three-cylinder engine, in combination with the piston-rod of any of the said cylinders, a main-valve-operating lever connected to and operated by said piston-rod and swinging upon a vibrating fulcrum, a pitman or connecting-rod joining said main-valve-operating lever with one of the crank-pins of a triple-crank shaft, a secondary lever connected to and operated by said main-valve-operating lever, a vibrating fulcrum supporting said secondary lever, a pitman or connecting-rod joining said secondary lever to a slotted-valve-operating lever, a vibrating fulcrum or support for said slotted-valve-operating lever, and means for adjusting the position of said fulcrum-support, and a valve-stem and valve of a second cylinder of the set of three connected to and operated by said slotted-valve-operating lever, substantially as and for the purposes set forth.

3. A valve-adjusting mechanism for steam-cylinder steam-chests, consisting of a slotted lever attached directly to the valve-stem, a vibrating fulcrum-support for said slotted lever made adjustable to or from the valve-stem to lengthen or shorten the throw of valve, an adjusting arm or lever operating through a rock-shaft, to which both the vibrating fulcrum-support and the adjusting-arm are attached, a fixed bearing for the support of said rock-shaft, and a turn-buckle rod adapted to be lengthened or shortened, one end of said turn-buckle rod being attached to said adjusting-arm and the other to a fixed center or swing support, substantially as set forth.

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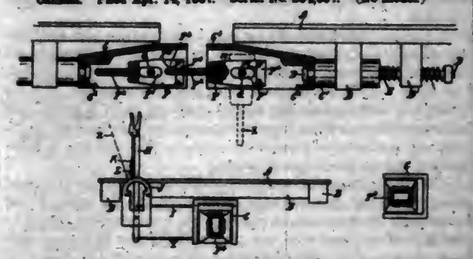


4. In a three-cylinder engine, in combination with the piston-rod of any one of said cylinders, a main-valve-operating lever connected to and operated by said piston-rod and swinging upon a vibrating fulcrum, a pitman or connecting-rod joining said main operating-lever with one of the crank-pins of a triple-crank shaft, a rod connecting said main-valve-operating lever directly with the valve-lever, the valve-lever operating upon a vibrating support, and the connected valve and valve-stem of a second cylinder of the set of three, substantially as set forth.

5. In a three-cylinder engine, in combination with the piston-rod of any one of said cylinders, a main-valve-operating lever attached to and operated by said piston-rod and swinging upon a vibrating fulcrum, a pitman or connecting-rod joining said main-valve-operating lever with one of the crank-pins of a triple-crank shaft, a connecting-rod directly attached to and operated by said main operating-lever and communicating motion to and operating a slotted-valve lever, a vibrating fulcrum-support for said slotted-valve lever, and means or mechanism for adjusting the position of said fulcrum or support to effect a longer or shorter throw of valve, and a valve-stem and valve of a second cylinder of the set of three connected to and operated by said slotted lever, substantially as and for the purposes set forth.

6. In a three-cylinder-engine, the combination of the piston-rods of said engine, main-valve-operating levers connected directly to said piston-rods and swinging upon a vibrating fulcrum, connecting-rods joining said levers to the cranks of a triple-crank shaft, said crank-shaft being placed in such position that the center line of motion of said connecting-rods shall not be parallel with the center line of motion of the said piston-rods, whereby the movements of the cranks valves, and piston-rods are never in exact unison with each other, substantially as set forth.

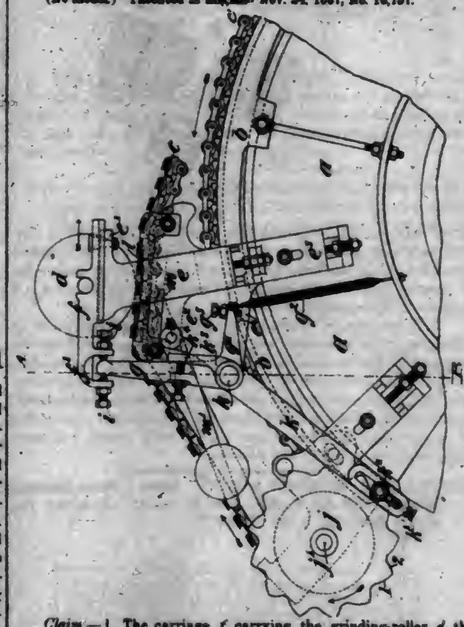
399,532. CAR-COUPLING. ALEXANDER HENRY, Delaware, Ontario, Canada. Filed Apr. 14, 1887. Serial No. 234,837. (No model.)



Claim.—1. In a car-coupling, the draw-bars C, formed round in cross-section at C' and revolving laterally in their bearings, in combination with reversible coupling links or pins F, which are secured in and revolve laterally with the draw-bars, and formed with longitudinal oblong slots F^4, vertical slots F^5, shoulders F^6, and entering end F^7, formed with flanges *n'*, as and for the purpose set forth.

2. In a car-coupling, the draw-bars C, formed round in cross-section at C' and revolving laterally in their bearings, and reversible coupling links or pins F, which are secured in and revolve laterally with the draw-bars, and formed with longitudinal oblong slots F^4, vertical slots F^5, shoulders F^6, and entering end F^7, formed with flanges *n'*, in combination with the lever H, cog-segment J, dog K, spring L, and connecting-rods I I, as and for the purpose set forth.

399,533. APPARATUS FOR CONTROLLING THE GRINDING OF CARDING-ENGINE FLATS. JOHN M. HETHERINGTON, Manchester, County of Lancaster, England. Filed Aug. 10, 1888. Serial No. 282,449. (No model.) Patented in England Nov. 24, 1887, No. 16,157.



Claim.—1. The carriage *f*, carrying the grinding-roller *d*, the shaft *h*, and arms *g*, for sliding the said carriages to and fro, the lever $k\ k^2$, for operating upon the shaft *h* through the arm *g*, and the cam *j*, for operating upon the lever $k\ k^2$, substantially as and for the purpose set forth.

2. The roller *d*, mounted on the sliding carriage *f*, the slide at *d'* on the bracket *c*, having the described inclination with respect to the rail *l* upon each side of the carding-engine, in combination with means, substantially as described, for traversing the carriages *f* to and fro during the grinding action of the roller *d* upon each flat in the traveling chain *c*, substantially as set forth.

3. The cam-wheel *j*, the lever $k\ k^2$, the shaft *h*, and the lever-arms *g*, one formed with an arm, *g'*, attached to the spring g^6, in combination with the sliding carriages *f f'*, carrying the guiding-roller *d*, substantially as set forth.

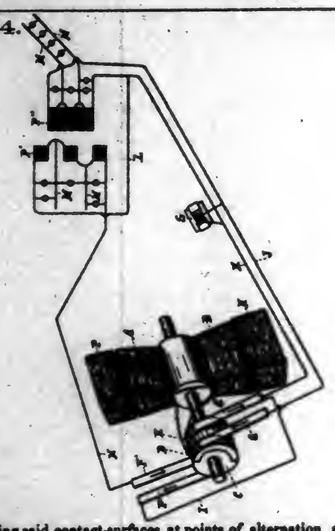
4. The grinding-roller *d* and movable bearings therefor, in combination with the shaft *h*, arms mounted on said shaft and operating said bearings, the lever *k* on said shaft and adapted to actuate said arms, and the cam *j*, engaging and adapted to oscillate said lever, substantially as set forth.

399,534. SYSTEM OF ELECTRICAL DISTRIBUTION AND CONVERSION. THOMAS H. HINES, Detroit, Mich., assignor to the Hines Induction-Light and Motor Company, of Michigan. Filed Apr. 30, 1888. Serial No. 271,987. (No model.)

Claim.—1. In a system of electrical distribution, the combination of an alternating-current machine provided with two sets of brushes, a line-wire electrically connected with one set of brushes of like sign, and independent return branches from said line-wire electrically connected, respectively, with the two brushes of the other sign, whereby electrical waves of one polarity may be maintained throughout the line-circuit and its branches.

2. In a system of electrical distribution, the combination of an alternating-current generator, contact-surfaces connected with the terminals of its generating-coils, two pairs of distributing-brushes alter-

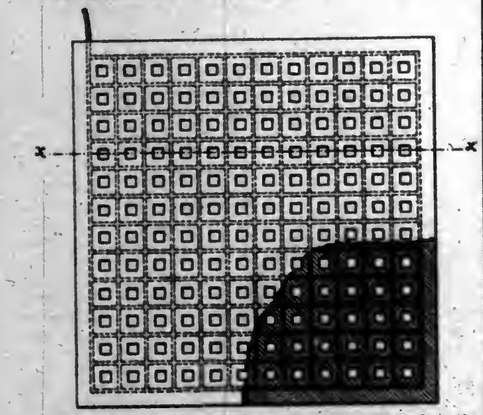
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nately engaging said contact-surfaces at points of alternation, a line-wire electrically connected to two brushes of like sign, and independent return branches of said line-wire connected, respectively, to the brushes of opposite sign, whereby intermittent impulses of one direction will circulate in the respective circuits.

3. In a system of electrical distribution, the combination of an alternating-current generator, contact-surfaces connected with the terminals of its generating-coils, two pairs of distributing-brushes alternately engaging said contact-surfaces at points of alternation, a line-wire electrically connected to a pair of brushes of like sign, independent return branches of said line wire connected, respectively, to the brushes of opposite sign, an induction-generator in each branch, and translating devices supplied by said generator.

399,535. SECONDARY BATTERY. JOSEPH L. HUBER, Hamburg, Germany. Filed Jan. 12, 1888. Serial No. 296,191. (No model.) Patented in France Oct. 3, 1888, No. 193,357.



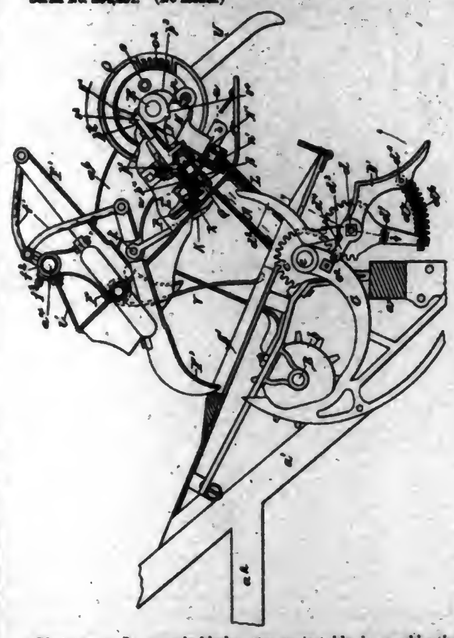
Claim.—1. In a secondary electric battery, an electrode having the conductor or conductors of electricity in the form of net-work, grating, or screen embedded in the active mass for the storage of electricity, which mass is provided with perforations or impressions corresponding with the meshes or holes of the conductor, substantially as and for the purpose specified.

2. As an improvement in secondary batteries, an electrode consisting of a conductor or conductors in the form of net-work, grating or screen covered with the active mass, which has formed therein perforations or impressions, substantially as and for the purpose described.

3. An electrode for secondary batteries, comprising a conductor within the active mass, which mass is provided with perforations or impressions, substantially as and for the purpose set forth.

4. As a new article of manufacture, an electrode for secondary batteries, consisting of a conductor or conductors in the form of net-work, grating, or perforated plate, serving as a support for the active mass, which is provided with perforations or impressions for the passage of the battery-fluid, substantially as specified.

399,536. GRAIN-BINDER. GEORGE G. HUNT, Bristol, Ill., assignor to the Plano Manufacturing Company, Plano, Ill. Filed Jan. 15, 1887. Serial No. 224,451. (No model.)



Claim.—1. In a grain-binder, the grain-table, in combination with a binding-arm mounted below the table, a packer-shaft mounted above the table over the binding-arm shaft and provided with cranks, vibrating packer-arms mounted on said cranks and extending inward over the table, and shipping mechanism for the packer-shaft constructed to operate at certain predetermined points, whereby the packer-shaft is always stopped with one of the packers projected inward and downward, substantially as and for the purpose specified.

2. In a grain-binder, the grain-table, in combination with a binding-arm mounted below the table, a packer-shaft mounted above the table and provided with cranks, vibrating packer-arms mounted on said cranks and extending inward over the table, and shipping mechanism for stopping and starting the packer-shaft, constructed and arranged to stop the latter at a point which will leave one of the packer-arms projected inward and lying alongside the closed binding-arms, substantially as and for the purpose specified.

3. In a grain-binder, the packer-shaft, in combination with its drive wheel mounted loosely thereon, the friction-clutch provided with diametrically-opposite radial lugs g^9 g^{10}, the spring-lever H, arranged to engage with one of said lugs at a certain fixed point for unclutching the wheel from the packer-shaft, the bell-crank lever H', having one of its arms arranged to engage the spring-lever H, and the rocking binding-arm shaft *c* and its operating crank-arm c^4, said crank-arm being arranged to engage the other arm of the bell-crank lever H', substantially as and for the purpose specified.

4. In a grain-binder, the packers, in combination with a yielding grain-stop independent of both the compressor and trip-arm, against which the gavel is formed, substantially as and for the purpose specified.

5. In a grain-binder, the packers, in combination with the yielding grain-stop d^3, independent of the trip-arm and compressor, and the bundle-discharger U, substantially as and for the purpose specified.

6. In a grain-binder, the binding-arm, in combination with the packers, a yielding grain-stop against which the gavel is formed, and an independent yielding trip-arm separated entirely from the grain-stop and graduated to present less resistance than said stop, substantially as and for the purpose specified.

7. The bracket D, in combination with the shaft *d* secured thereto, the grain-stop d^3, provided with an elongated hub, the spring d^{13}, the compressor D', composed of two separate arms mounted loosely on the hub of the grain-stop and connected together near their outer ends, the arm d^7, to which the compressor is connected by sliding rod and spring, and the gear-sectors whereby said arm is vibrated, substantially as and for the purpose specified.

8. In a grain-binder, the binding mechanism and its main or cam shaft arranged above the grain, in combination with a clutch-pawl attached to and carried by said shaft, a driving-wheel mounted loosely on said shaft and connected thereto by the said pawl, a stop-arm, also arranged above the grain and in the path of the pawl, a trip-arm arranged above the grain and fixed on a rock-shaft, and a link-rod connecting a crank-arm on said rock-shaft with the stop-arm, substantially as and for the purposes specified.

9. The main or cam shaft E, in combination with the wheel *c*, mounted loosely thereon and provided with a flange-rim having projections *c'*, as described, the spring clutch-pawl F', carried by the shaft and adapted to engage the said projections, its toe being widened to project laterally beyond the rim of the wheel and turned forward to form a projection, c^8, radially beyond the rim of said wheel, and the stop-arm arranged to engage with the said projection c^8, substantially as and for the purposes specified.

10. The main or cam shaft, in combination with a bracket, E', fastened thereto, a spring-pawl, c^6, pivoted to the bracket, a locking projection, c^5, on the bracket, and the stop-arm arranged to engage both pawl and lock, substantially as and for the purposes specified.

11. The bracket E', fastened to the main shaft and provided at its outer edge with a cam-surface, c^7, and notch c^6, in combination with a spring-pawl pivoted to the bracket, the stop-arm, the drive-wheel loose on the shaft, the yielding locking-bolt M, arranged to be engaged and depressed by the cam on the bracket and to just enter the notch therein at the moment the pawl is disconnected from the wheel, and the lock-bolt spring of greater strength than the pawl-spring, whereby the thrust upon the bolt will throw the bracket forward slightly to seat the bolt in the notch after the pawl is disengaged from the wheel, substantially as and for the purposes specified.

12. The main or cam shaft, in combination with the bracket E', fastened thereto and provided with the cam c^7, and notch c^6, the lock-arm c^5 on the bracket, the spring-pawl c^6, pivoted to the bracket, the drive-wheel loose on the shaft and provided with projections *c'*, the stop-arm I, the lock-bolt M, and its actuating-spring *m'*, stronger than the pawl-spring, all constructed and operating substantially as and for the purposes specified.

13. In a grain-binder, the breast-plate L, provided with the bent slot *l* and the pivoted cord-placer P, arranged at one side of said slot and shaped to guide the cord into the knotting-hook, said cord-placer being provided with mechanism whereby it is vibrated at the proper time downward and across the slot to bring the cord into proper position, in combination with a cord-support pivoted close to the breast-plate and arranged to stand normally direct across the slot therein, and mechanism whereby the said support is turned away from the slot just as the bundle is bound and returns to its place just before the binding-arm opens, substantially as and for the purposes specified.

14. The pivoted cutter S, in combination with the shaft s^6, provided with the fork *s'* and bent crank-arm s^4, and the cam s^5 on the main or cam shaft, substantially as and for the purpose specified.

15. The packers F', in combination with the links f^7 and the studs f^9, sleeved to the rod c^4 and adjustable lengthwise of said rod, substantially as and for the purposes specified.

16. The packers F', in combination with the links f^7, the studs f^9, to which said links are pivoted, and sleeves carrying the said studs and mounted on the rod c^4, said sleeves being independently adjustable around said rod as a center, substantially as and for the purposes specified.

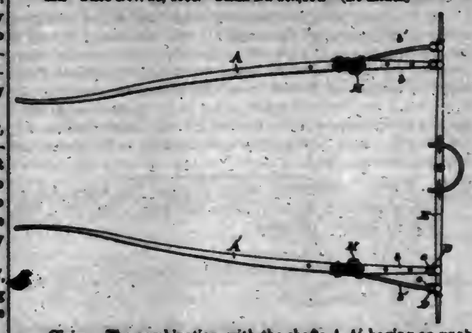
17. In a grain-binder, the main or cam shaft, in combination with the packer-shaft, chain-wheels mounted on each, and a single drive-chain arranged and operating to drive both shafts, substantially as and for the purposes specified.

18. In a grain-binder, the binding mechanism, in combination with the packing mechanism, chain-wheels constructed and arranged for driving each respectively, a single chain for driving said wheels, and a chain-driving wheel mounted on the frame of the binder, whereby the entire chain-driving mechanism is attached to and removable with the binder, substantially as and for the purposes specified.

19. The main or cam shaft E, in combination with the chain-wheel *e*, mounted loosely thereon, the packer-shaft F, the chain-wheel *f*, mounted loosely thereon, clutch mechanism for connecting and disconnecting the said wheels and their respective shafts, a single chain, B', arranged to drive the wheels *e* and *f*, and the chain-wheel b^3, mounted on the binder-frame, substantially as and for the purposes specified.

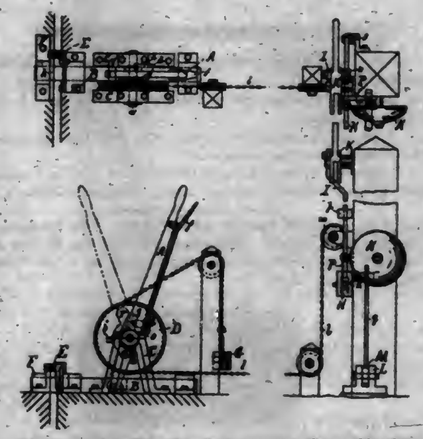
20. The main or cam shaft E, in combination with the chain-wheel *e*, mounted loosely thereon, the packer-shaft F, the chain-wheel *f*, mounted loosely thereon, clutch mechanism for connecting and disconnecting the said wheels and their respective shafts, a single chain, B', arranged to drive the wheels *e* and *f*, the chain-wheel b^3, mounted on the binder-frame, the gear-wheel b^5, attached to said wheel b^3, and the driving-shaft B, provided with a pinion engaging with said wheel b^5, substantially as and for the purposes specified.

399,537. THILL FOR VEHICLES. GEORGE H. HUTTON, Baltimore, Md. Filed Nov. 26, 1888. Serial No. 292,104. (No model.)



Claim.—The combination, with the shafts A A', having an unobstructed space between them, of the branches *b' b'*, secured to the outside of shafts, and a spring-yielding trace-hook attached to each of said shafts, the whole arranged to operate substantially as shown and described, and for the purposes set forth.

399,538. SWITCH-SIGNAL. FRANK H. KELSEY, New Haven, assignor of part interest to Joseph C. Peck, same place, and James Graham, Orange, Conn. Filed Mar. 17, 1888. Serial No. 267,464. (No model.)



Claim.—1. In railway signaling apparatus, the combination, with the operating-lever and the bolt operated thereby, of a bolt-lock pivoted beside the bolt and adapted to drop across the end of the bolt at right angles to its line of motion when the bolt is fully retracted and prevent forward motion of the bolt, substantially as shown and described.

2. The combination of an operating-lever with the bolt B, operated thereby, to lock the draw-bridge or switch, the bolt-lock E, pivoted beside the bolt and adapted to drop across the end of the bolt, the dog *d*, pivoted to the lever on the side of the lever-fulcrum, opposite to the pawl *h*, and adapted to be caught and held by the projection *e* on the frame, a sprocket or chain wheel provided with a ratchet, *g*, formed on its side, the pawl *h*, pivoted on the lever adapted to engage at one end with the ratchet, and having its opposite end weighted and so shaped as to come in contact with a stop, and thereby be thrown out of engagement with the ratchet when the operating-lever is at one end of its travel, and a chain passing around the chain-wheel, connected at one end to a weight and at the other end to the mechanism for operating the semaphore, substantially as described.

3. In combination, the weighted lever H, pivoted at one end and adapted to be lifted and held up by a chain, *l*, the rod I, having at its lower end a fork which engages and rests upon the lever, and provided at its upper end with a slot, and a semaphore-arm connected to the rod I by a bolt passing through the slot in the rod and into the arm near its fulcrum, substantially as and for the purpose specified.

4. In railway signaling apparatus, the combination, with a bell or gong and suitable mechanism for operating it fixed beside the rails of the track, of the lever H, the rod I, provided with a forked end, *n*, and a slot, *o*, in the other end, the semaphore-arm K, the chain or wire *l*, the chain-wheel D, with a ratchet, *g*, formed on the side of it, the

pawl *h*, the lever A, the dog *d*, pivoted on the lever, and the stops *i* and *e*, all combined as and for the purpose specified.

5. In combination, the operating-lever A, the dog *d*, pivoted on the lever, the sprocket or chain wheel D, with a ratchet, *g*, formed on the side of it, the pawl *h*, pivoted on the lever A and provided with a weighted end, the stop *i* on the frame, the bolt B, the bolt-lock E, the socket F, carrying the rib *k*, the weight G, the chain or wire *l*, the lever H, the rod I, provided with a forked end, *n*, and a slot, *o*, in the other end, the semaphore-arm K, the lever M, the rod *q*, the bell-hammer P, and the bell or gong N, all combined substantially in the manner and for the purpose specified.

399,539. ATOMIZER. ROBERT S. KNODE, Fort Wayne, Ind., assignor of one-half to Emmett L. Siver, same place. Filed Oct. 4, 1888. Serial No. 287,339. (No model.)



Claim.—1. In an atomizing apparatus, the combination of the air-tube A with the liquid-tube B, with the sleeve *c*, the connecting-tube D, and the cup C, for the purpose and substantially as described.

2. In an atomizing apparatus, the combination of the separable connecting-tube D, constructed with two curves, with a liquid-tube adapted to be rotated thereon, and with a vessel for containing the liquid to be sprayed.

399,540. SURGICAL DRAINAGE-TUBE. JOHN E. LEE, Conshohocken, Pa., assignor to the J. Ellwood Lee Company, same place. Filed Aug. 2, 1888. Serial No. 281,732. (No model.)



Claim.—1. A surgical drainage-tube of coiled wire, substantially as described.

2. A surgical drainage-tube of coiled wire, having the top coil bent up to form a loop.

3. A surgical drainage-tube of coiled wire, with the coils at one end soldered together into a solid tube.

4. A surgical drainage-tube of closely-coiled wire, but having some of the coils stretched apart, as and for the purpose set forth.

399,541. SUPERHEATER AND BURNER. JOHN LIVINGSTONE, Toronto, Ontario, Canada. Original application filed Apr. 25, 1888, Serial No. 271,797. Divided and this application filed Dec. 1, 1888. Serial No. 292,396. (No model.)



Claim.—1. The superheater and burner consisting of an outer casing, a perforated tube within the outer casing, forming a space between it and the casing, iron or steel filings or pieces filling said space, and nozzles connecting the inner tube and outer casing, substantially as described.

2. The superheater and burner consisting of an outer casing, a perforated tube within the outer casing and forming a space between it and the casing, wire-cloth surrounding the perforated tube, iron or steel filings or pieces filling said space, and nozzles connecting the tube and outer casing, substantially as described.

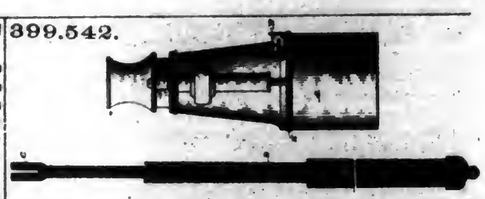
399,542. OPERA OR MARINE GLASS. WILLIAM MACK, Terre Haute, Ind. Filed July 17, 1888. Serial No. 280,168. (No model.)

Claim.—1. An opera or marine glass provided with a tube, socket, or clamp secured to or formed with a cross or yoke piece of the glass in a plane at right angles to the length of the glass and adapted to removably receive and tightly hold a detachable holder or handle, substantially as described.

2. In an opera-glass or the like, the combination of a cross or yoke piece with a vertical socket, sleeve, or clamp having a lower open

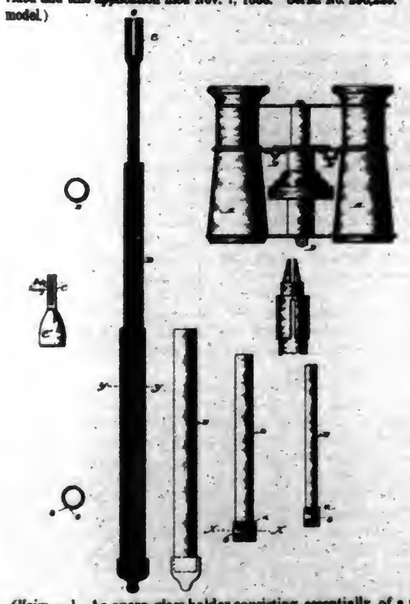


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end and transversely located upon and secured to or formed with the cross-piece and adapted to receive and hold the end of a detachable handle for the glass, substantially as described.

399,543. OPERA-GLASS HOLDER. WILLIAM MACK, Terre Haute, Ind. Original application filed July 17, 1888, Serial No. 280,168. Divided and this application filed Nov. 7, 1888. Serial No. 290,289. (No model.)



Claim.—1. An opera-glass holder consisting, essentially, of a rigid body portion having its upper outer end longitudinally bifurcated, forming spring legs or arms tending to spring apart and adapted to snugly and removably fit in the herein-described tube or socket of an opera-glass, and thereby rigidly hold the same in position, as set forth.

2. An opera-glass holder comprising telescopic sections having exterior and interior intermeshing corrugations, the section at one end having its outer end longitudinally bifurcated to engage the yoke-piece of an opera-glass, said bifurcated end having a soft lining, and the section at the opposite end serving as a handle, substantially as described.

3. An opera-glass holder comprising telescopic sections, one or more of which are provided with exterior corrugated collars having outwardly-springing ends and sliding in adjoining sections, the section at one end being longitudinally bifurcated to hold the yoke-piece of the opera-glass and the opposite end section serving as a handle, substantially as described.

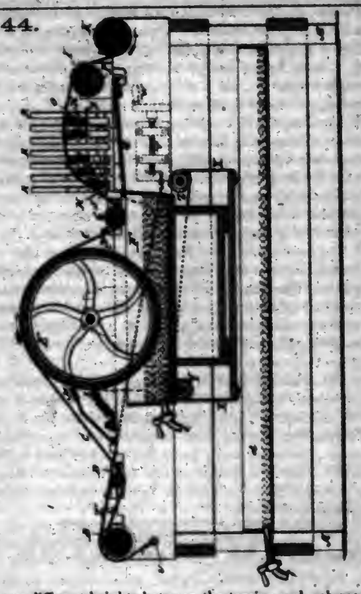
4. An opera-glass holder comprising telescopic sections, one end section serving as a handle and the opposite end section adapted to removably hold the glass, for the purpose set forth, the inner ends of said sections being provided with serrations or corrugations sliding in similar corrugations in the interiors of the adjoining sections.

5. An opera-glass holder comprising telescopic sections, the section at one end serving as a handle and the opposite end section adapted to be removably secured to a cross-piece of a glass, the inner ends of said sections being provided with exterior and interior intermeshing corrugations and outwardly-springing ends, as described.

399,544. APPARATUS FOR COATING PAPER AND OTHER MATERIAL. THOMAS MAHARAN, New York, N. Y. Filed Sept. 12, 1888. Serial No. 285,234. (No model.)

Claim.—1. The combination, with a trough, F, and a delivery-roller, E, rotating therein, and over which the web passes, of a tension-roller, G, above the trough, and under which the web passes, a web-receiving roller, K, and the softened scrapers H, adjustable in a vertical plane to different heights between the tension and web-receiving rollers and constituting a support for the web, over and against which the latter travels, substantially as described.

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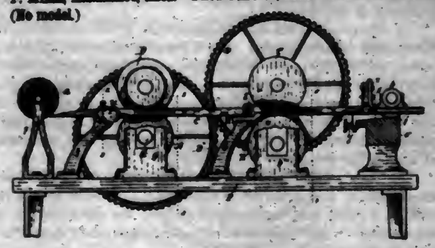
2. The combination, with a trough, F, a delivery-roller, E, and rollers for feeding a web over the delivery-roller, of arms R, arranged to form guideways, a series of scrapers, H, adjustable vertically independent of each other in said guideways, and pins S, for supporting the scrapers at different heights, substantially as described.

3. The combination, with a delivery-roller, E, and rollers for feeding a web over the same, of the trough F, the straps X, suspending the trough, the strap-supporting guide-roller Y, and the rotary shaft Z, connected with the straps for winding and unwinding the same to raise and lower the trough, substantially as described.

4. The combination, with a web-carrying roller, B, a trough, F, a delivery-roller, E, over which the web travels, a web-receiving roller, K, and tension-rollers, of a brake-band, T, passing around a part of the web-carrying roller, and a longitudinally-adjustable screw, V, connected with one end of the brake-band, and having a handle, W, for rotating it, substantially as described.

5. The combination, with a trough, F, a delivery-roller, E, over which the web passes, and a web-receiving roller, K, of softened scrapers H, located between the delivery and web-receiving rollers, and constituting a supporting-rest over which the web passes, and a distributing-roller, I, having an absorbent covering, P, and rotating in bearings between the guides and web-receiving roller, substantially as described.

399,545. MACHINE FOR MAKING METAL SASH. WILLARD F. MILLS, Kalamazoo, Mich. Filed June 12, 1888. Serial No. 276,841. (No model.)

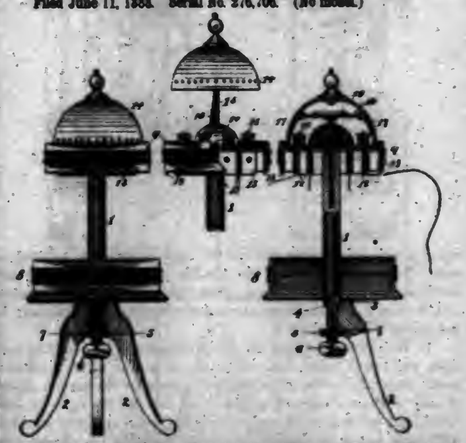


Claim.—1. The combination of a suitable support, a bracket thereon having a V-shaped recess for the strip of metal to pass through, a roller having an angular peripheral groove and a wheel above in said groove, between which groove and wheel the metal passes, a bracket having a ⊥-shaped recess, through which the metal next passes, and a roller having a peripheral groove and a roller below, between which rollers the ⊥-shaped metal strip passes, substantially as set forth.

2. The combination of a suitable support, a bracket thereon having a V-shaped recess for the strip of metal to pass through, a roller having an angular peripheral groove and a wheel above in said groove, between which wheel and groove the metal strip passes, a ⊥-shaped recess, through which the metal strip next passes, two rollers, between which the ⊥-shaped metal passes, one having the peripheral groove to receive the stem of the metal strip, the tool having the prong and shoulders for separating the parts of the double stem and turning them over, and the bracket and roller having the T-shaped recess between them, through which the metal finally passes, substantially as set forth.

3. The combination of a suitable table or support, a reel on which the metal strip is wound, a V-shaped recess for the metal to pass through, the grooved roller, and wheel in said groove, the ⊥-shaped recess, through which the U-shaped metal passes, the rollers, one of which is grooved and between which the ⊥-shaped metal passes, and the tool having the prong and shoulders, and the end bracket having the block and roller with T-shaped recess, through which the sash is drawn in its completed condition, substantially as set forth.

399,546. WORK-STAND. DANIEL H. MURPHY, Hartford, Conn. Filed June 11, 1888. Serial No. 276,706. (No model.)



Claim.—1. In combination, in the within-described work-stand, the spindle 1, having a socket in its upper end, a rod having a vertical movement in the socket, a spring, 16, attached to the rod, a diaphragm attached to the upper end of the rod, the springs 17, and the cover 14, all substantially as described.

2. In combination, in the within-described work-stand, the spindle bearing a socket in its upper end, a rod having a vertical movement in the socket, a spring attached to the rod, a diaphragm attached to the upper end of the rod, and a cover removably attached to the diaphragm, substantially as described.

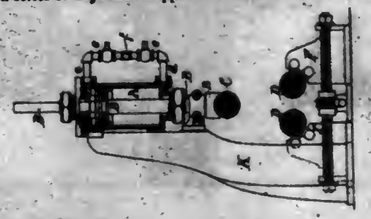
3. In combination, in the within-described work-stand, the spindle 1, having a reduced upper end, a rotary tray borne on the upper end of the spindle, said tray bearing the posts 11, and having the tubes 12 projecting through the floor, and the knives, substantially as described.

4. In combination, in the within-described work-stand, the spindle 1, having a reduced upper end, a rotary tray borne on the reduced portion of the spindle, the sides of the tray extending below the floor, said tray bearing the posts 11, and having the tubes 12 extending through the floor of the tray to act as a finger-guide to the thread, and the knives, substantially as described.

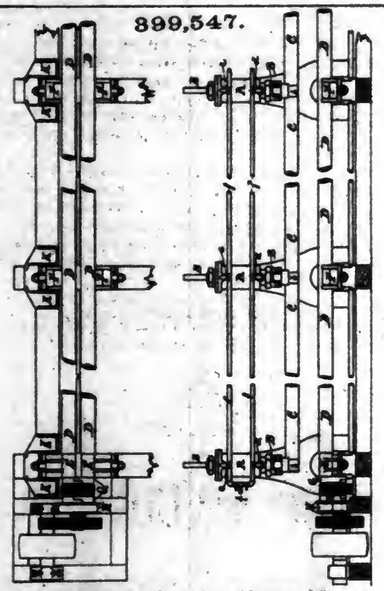
399,547. HOSE-MACHINE. JOHN MURPHY, Brooklyn, N. Y. Filed Nov. 21, 1888. Serial No. 291,498. (No model.)

Claim.—1. In combination with the lower rollers of a hose-making machine, a direct-acting steam or air cylinder provided with upper and lower ports and communicating pipes and valves for the admission or discharge of the operating medium, and an upper roller supported and operated by means of a piston moved in said cylinder substantially as and for purposes specified.

2. In combination with the lower rollers of a hose-making machine, a series of adjustable supports for said lower rollers, an upper



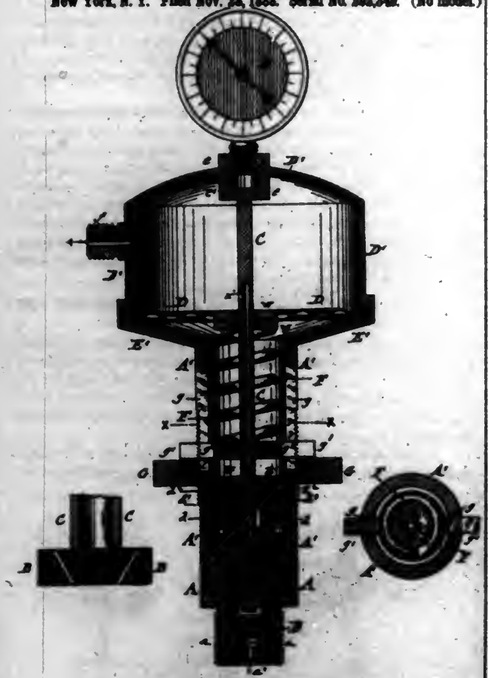
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roller, a supporting piston and rod for said upper roller, and one or more direct-acting steam or air cylinders provided with upper and lower ports, and communicating pipes and valves for the admission and discharge of the medium operating said pistons, substantially as and for purposes set forth.

3. In combination with the three rollers of a hose-making machine, any one of which is covered with an annular layer of soft and elastic material, a series of adjustable supports for the bottom rollers of said machine, a supporting piston and rod for the upper of said rollers, and one or more direct-acting steam or air cylinders provided with ports, and communicating pipes and valves for the admission of the medium operating said supporting piston and rod, substantially as and for purposes set forth.

899,548. PRESSURE-REGULATING VALVE. JOHN HAGELDINGER, New York, N. Y. Filed Nov. 29, 1888. Serial No. 292,349. (No model.)



Claim.—1. The combination, in a testing-machine, of the specimen-carriers, the tension of compression mechanism, the specimen cylinder and piston, the card-carrier cylinder and piston, and a communication between the two cylinders, whereby displacement in one cylinder causes corresponding displacement in the other cylinder, substantially as described.

2. The combination, in a testing-machine, of the specimen-carriers, the tension or compression mechanism, the specimen cylinder and piston, the card-carrier cylinder and piston, and a communication between the two cylinders, with a valve-chest, communicating-tubes between the chest and the specimen-cylinder and between the chest and the card-carrier cylinder, and valves in said chest, so that the passages between the two cylinders may be regulated, substantially as and for the purpose set forth.

3. The combination of the specimen cylinder and piston and the drum cylinder and piston with a valve-chest, G, valves therein, a reservoir, H, a pump, and communications from the valve-chest to both the specimen-cylinder and piston-cylinder, substantially as and for the purpose described.

4. The combination, in a testing-machine, of the collars E E', cylinders F, and their pistons and rods confined between said collars, a cylinder, J, and its piston, and a recording-drum connected to said piston in such a manner as to be revolved as the piston in the cylinder J is moved, substantially as described.

5. The combination of the collar E, the pointed blocks W, adapted to engage with the specimen, and a spring in the rear of the blocks to keep said blocks always in contact with said specimen, substantially as and for the purpose set forth.

6. The combination of the collar E, the pointed blocks W W, and springs at the rear of said blocks, with blocks V V, carrying friction-rollers, and springs in the rear of these blocks, so that the rollers will at all times bear against the specimen to be tested, substantially as described.

7. The combination of the collar E and the pointed blocks W with a spindle, W', having a threaded portion adapted to a threaded opening in the block W, and a spring adapted to force the spindle and the block against the specimen to be tested, substantially as set forth.

8. The combination, in a testing-machine, of the scale-beam and its balancing-pivot with a poise and operating mechanism therefor and a driving-pulley for said mechanism, said pulley being mounted on the pivot-line of the beam, so that the power exerted on the driving-belt will not affect the balancing of the beam, substantially as set forth.

9. The combination, in a testing-machine, of the scale-beam and its balancing-pivot with a poise-operating screw, a driving-pulley, and mechanism connecting the pulley to the screw, said pulley being mounted on the pivot-line of the beam, so that the power exerted on the driving-belt will not affect the balancing of the beam, substantially as described.

10. The combination, in a scale-beam, of the screw, the wheel P, magnets, an armature situated between said magnets, and the lever S, having at one end the said armature and at the opposite end carrying the shaft Q, and mechanism for driving said shaft, substantially as and for the purpose set forth.

11. The combination, in a scale-beam, of the screw-shaft, a wheel, P, an annular recess, *p*, therein, having two bearing-faces, *p' p²*, a driving-roller, *q*, and a lever carrying the same, and devices by which said roller is thrown against either the faces *p' p²* or suspended between the two, substantially as and for the purpose described.

12. The combination, in a scale-beam, of its screw-shaft, the wheel P, having an annular recess therein, driving-roller *q*, its shaft Q, mounted on the lever S, an armature at one end of said lever, magnets I I', and a shaft, Q', connected to said shaft Q with a belt-wheel *q'*, substantially as described.

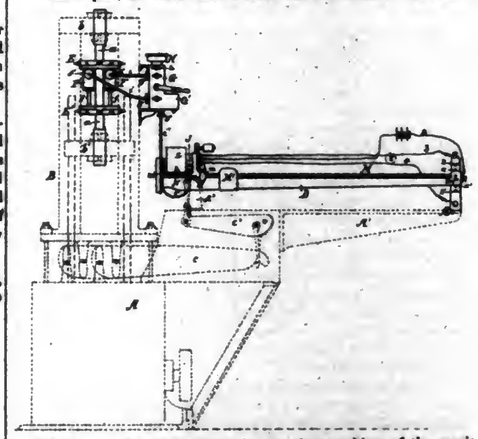
13. The combination, in a scale-beam, of the screw, its driving-wheel, the pivoted lever S, carrying at one end the driving-shaft Q, an armature at its opposite end, magnets on each side of said armature, with springs *v v*, tending to keep said armature in a central position, and a driving-roller on said shaft Q, central between the two surfaces of the recess in the wheel P, substantially as described.

14. The combination, in a testing-machine, of the specimen cylinder and piston, the recording-drum L and its cylinder and piston, and connections between said cylinders with a scale-beam, and lever mechanism connected thereto and to the specimen, a screw-shaft carrying a pencil-holder, and reversible driving mechanism for actuating said pencil-holder, magnets controlling said driving mechanism, and contacts on said scale-beam and on the frame, so that as the scale-beam swings it will make and break the circuit through said magnets, the whole acting in conjunction with the drum and its cylinders to form a chart giving the tensile or compression strength and the amount of expansion or contraction, substantially as set forth.

15. The combination, in a recording-drum, of the screw M, and a pencil-carrier mounted in bearings and having teeth engaging with said screw, with a lever mounted on said pencil-carrier and having a finger, n^3, on the movement of which the pencil-carrier is thrown out of gear with the screw, substantially as specified.

16. The combination of the drum-shaft K, a driving pinion or pulley, K', with a drum, L, carrying the record-paper, and a nut, P, adapted to bind the drum to or release it from the driving mechanism, substantially as and for the purpose described.

899,549. TESTING AND RECORDING MACHINE. TITUS OLSEN, Philadelphia, Pa. Filed June 28, 1888. Serial No. 278,443. (No model.)



Claim.—1. The combination, in a testing-machine, of the specimen-carriers, the tension of compression mechanism, the specimen cylinder and piston, the card-carrier cylinder and piston, and a communication between the two cylinders, whereby displacement in one cylinder causes corresponding displacement in the other cylinder, substantially as described.

2. The combination, in a testing-machine, of the specimen-carriers, the tension or compression mechanism, the specimen cylinder and piston, the card-carrier cylinder and piston, and a communication between the two cylinders, with a valve-chest, communicating-tubes between the chest and the specimen-cylinder and between the chest and the card-carrier cylinder, and valves in said chest, so that the passages between the two cylinders may be regulated, substantially as and for the purpose set forth.

3. The combination of the specimen cylinder and piston and the drum cylinder and piston with a valve-chest, G, valves therein, a reservoir, H, a pump, and communications from the valve-chest to both the specimen-cylinder and piston-cylinder, substantially as and for the purpose described.

4. The combination, in a testing-machine, of the collars E E', cylinders F, and their pistons and rods confined between said collars, a cylinder, J, and its piston, and a recording-drum connected to said piston in such a manner as to be revolved as the piston in the cylinder J is moved, substantially as described.

5. The combination of the collar E, the pointed blocks W, adapted to engage with the specimen, and a spring in the rear of the blocks to keep said blocks always in contact with said specimen, substantially as and for the purpose set forth.

6. The combination of the collar E, the pointed blocks W W, and

springs at the rear of said blocks, with blocks V V, carrying friction-rollers, and springs in the rear of these blocks, so that the rollers will at all times bear against the specimen to be tested, substantially as described.

7. The combination of the collar E and the pointed blocks W with a spindle, W', having a threaded portion adapted to a threaded opening in the block W, and a spring adapted to force the spindle and the block against the specimen to be tested, substantially as set forth.

8. The combination, in a testing-machine, of the scale-beam and its balancing-pivot with a poise and operating mechanism therefor and a driving-pulley for said mechanism, said pulley being mounted on the pivot-line of the beam, so that the power exerted on the driving-belt will not affect the balancing of the beam, substantially as set forth.

9. The combination, in a testing-machine, of the scale-beam and its balancing-pivot with a poise-operating screw, a driving-pulley, and mechanism connecting the pulley to the screw, said pulley being mounted on the pivot-line of the beam, so that the power exerted on the driving-belt will not affect the balancing of the beam, substantially as described.

10. The combination, in a scale-beam, of the screw, the wheel P, magnets, an armature situated between said magnets, and the lever S, having at one end the said armature and at the opposite end carrying the shaft Q, and mechanism for driving said shaft, substantially as and for the purpose set forth.

11. The combination, in a scale-beam, of the screw-shaft, a wheel, P, an annular recess, *p*, therein, having two bearing-faces, *p' p²*, a driving-roller, *q*, and a lever carrying the same, and devices by which said roller is thrown against either the faces *p' p²* or suspended between the two, substantially as and for the purpose described.

12. The combination, in a scale-beam, of its screw-shaft, the wheel P, having an annular recess therein, driving-roller *q*, its shaft Q, mounted on the lever S, an armature at one end of said lever, magnets I I', and a shaft, Q', connected to said shaft Q with a belt-wheel *q'*, substantially as described.

13. The combination, in a scale-beam, of the screw, its driving-wheel, the pivoted lever S, carrying at one end the driving-shaft Q, an armature at its opposite end, magnets on each side of said armature, with springs *v v*, tending to keep said armature in a central position, and a driving-roller on said shaft Q, central between the two surfaces of the recess in the wheel P, substantially as described.

14. The combination, in a testing-machine, of the specimen cylinder and piston, the recording-drum L and its cylinder and piston, and connections between said cylinders with a scale-beam, and lever mechanism connected thereto and to the specimen, a screw-shaft carrying a pencil-holder, and reversible driving mechanism for actuating said pencil-holder, magnets controlling said driving mechanism, and contacts on said scale-beam and on the frame, so that as the scale-beam swings it will make and break the circuit through said magnets, the whole acting in conjunction with the drum and its cylinders to form a chart giving the tensile or compression strength and the amount of expansion or contraction, substantially as set forth.

15. The combination, in a recording-drum, of the screw M, and a pencil-carrier mounted in bearings and having teeth engaging with said screw, with a lever mounted on said pencil-carrier and having a finger, n^3, on the movement of which the pencil-carrier is thrown out of gear with the screw, substantially as specified.

16. The combination of the drum-shaft K, a driving pinion or pulley, K', with a drum, L, carrying the record-paper, and a nut, P, adapted to bind the drum to or release it from the driving mechanism, substantially as and for the purpose described.

899,550. ELECTRIC SWITCH. HARRY T. PARRY, West Chester, Pa. Filed Apr. 28, 1888. Serial No. 272,112. (No model.)



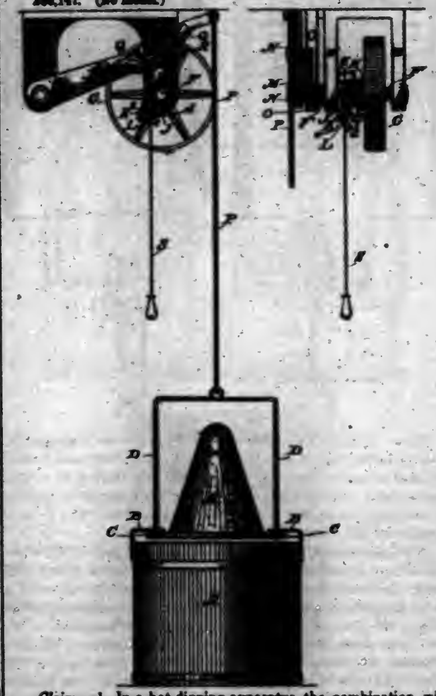
Claim.—1. The combination of a switch-shaft, an arm thereon, a spring-lever carried thereby, and a terminal having a portion tangential to the pivot of the lever, whereby the free arm of said lever has a sliding contact with the tangential portion of the terminal during that portion of its movement which is due to the action of the spring, all substantially as specified.

2. The combination of the U-shaped terminal D and the flat terminal C, placed across the open end of the U-shaped terminal, with a switch-shaft having an arm, a contact-lever pivoted to said arm, and a spring acting on said lever and serving to move the same independently of the arm, all substantially as specified.

3. The combination of the U-shaped terminal and the straight terminal, a shaft having a cross-head, and two levers, I I', pivoted thereto and connected together by a spring, each lever having contact-faces for bearing upon the terminals, substantially as described.

4. The combination of the U-shaped terminal having a lug, *p*, with a straight terminal, C, and the shaft and spring-lever for completing the circuit between the terminals C D, substantially as described.

899,551. HAT-FORMING MACHINE. SETH G. PALMER, South Norwalk, Conn., assignor, by direct and mesne assignments, to Elias M. Palmer and Alden Selmans, same place. Filed Sept. 24, 1888. Serial 286,147. (No model.)

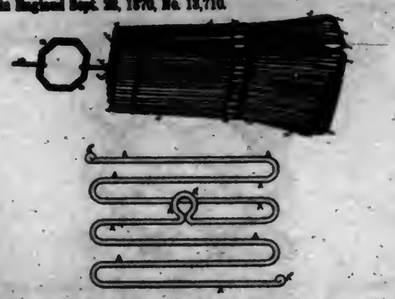


Claim.—1. In a hat-dipping apparatus, the combination, with a crank, of a pivoted lever having a slot within which the pin of said crank extends, and the cone-supporting platform suspended from the forward end of said lever, substantially as set forth.

2. The combination, with a revolving crank and a pivoted lever having a slot within which the crank-pin travels during its circuit, of a rod pivotally hung from the end of said lever, and the cone-supporting platform suspended from the rod, substantially as set forth.

3. In combination with the reciprocatory lever and the bail of the cone-supporting platform, the rigid rod connecting said bail and lever, whereby a positive and synchronous movement is imparted from the latter to the former, substantially as set forth.

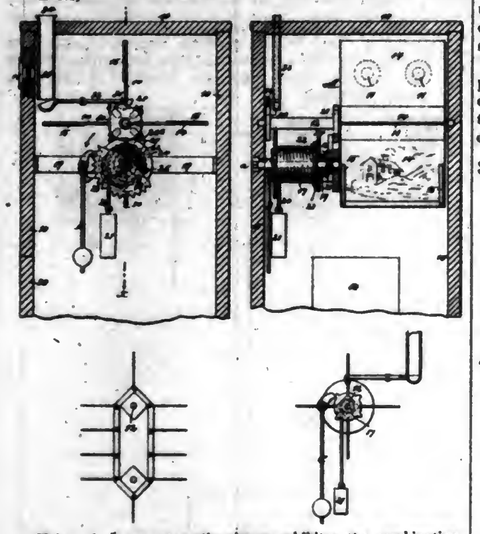
899,552. APPLIANCE FOR HANGING AND EXHIBITING BOOT OR SHOE LASTS. JAMES PATON, Johnstone, County of Renfrew, Scotland. Filed Nov. 24, 1888. Serial No. 291,590. (No model.) Patented in England Sept. 28, 1870, No. 13,710.



Claim.—The herein-described appliance for hanging and exhibit-

ing boot or shoe laces and such like goods, comprising a central suspending loop with wires or rods branching out from such central loop in a horizontal plane and having their unconfined outer ends raised or rounded, as and for the purpose set forth.

399,553. AUTOMATIC PICTURE-EXHIBITOR. CLARA E. PATTERSON, New York, N. Y. Filed May 19, 1888. Serial No. 274,418. (No model.)



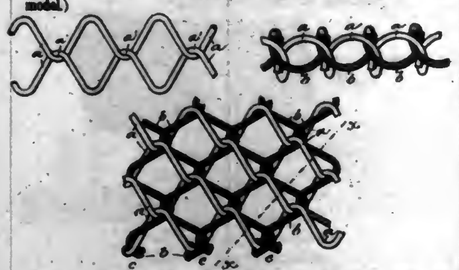
Claim.—1. In an automatic picture-exhibitor, the combination, with a picture-holder, of an actuating-shaft upon which said holder is mounted, a motor connected to said shaft and tending to revolve the same, and a lever normally blocking said shaft against revolution, said lever being interposed in the path of entrance of a coin, so as to be tripped by said coin, substantially as described.

2. In an automatic picture-exhibitor, the combination, with a picture-holder, of an actuating-shaft upon which said holder is mounted, a motor connected to said shaft and tending to revolve the same, a lever normally blocking said shaft against revolution, and a coin-chute leading to the free end of the lever, substantially as described.

3. In an automatic picture-exhibitor, the combination, with a picture-holder, of an actuating-shaft upon which said holder is mounted, a motor connected to said shaft and tending to revolve the same, a lever normally blocking said shaft against revolution, said lever being interposed in the path of entrance of a coin, whereby it may be tripped by said coin, and a Geneva stop-movement located between the motor and the picture-holder shaft, substantially as described.

4. In an automatic picture-exhibitor, the combination, with a picture-holder, of an actuating-shaft upon which said picture-holder is mounted, a motor connected to said shaft and tending to revolve the same, said motor consisting of a shaft, a drum carried thereby, a cord and a weight attached to said cord, a lever normally blocking said picture-holder shaft against revolution, said lever being interposed in the path of entrance of a coin, whereby it may be tripped by said coin, and a Geneva stop-movement located between the motor and the picture-holder shaft, substantially as described.

399,554. WOVEN-WIRE MAT AND SCRAPER. ROBERT B. PRAHL, Hartford, Conn. Filed July 27, 1887. Serial No. 245,397. (No model.)

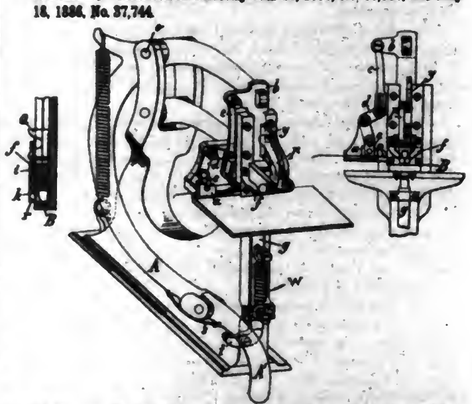


Claim.—1. As an improved article of manufacture, a wire mat and scraper composed of a system of primary coils interwoven with each other, and a transverse system of locking-coils interwoven with each other and with the primary coils, the turns of the locking-coils lying outside of the successive primary coils, whereby the several coils are held against depthwise movement on each other, all substantially as described.

2. In combination, in an interwoven-wire fabric, a series of interlocking primary coils, *a*, and a series of transverse and interlocking bracing-coils, *b*, the latter having a greater number of turns to the unit of length than the former, the successive turns of each bracing-coil lying alternately over and under the successive primary coils, all substantially as described.

3. In combination, in an interwoven fabric of spirals of wire, the primary fabric and the secondary fabric, the coils of the two sets crossing each other and interwoven, so that the planes common to the points of intersection in the two sets are approximately coincident, all substantially as described.

399,555. BOOK-STAPLING MACHINE. CARL R. PREUSER, Roudnitz, Leipsic, Saxony, Germany. Filed May 5, 1887. Serial No. 237,393. (No model.) Patented in Germany Jan. 26, 1886, No. 36,510, and May 18, 1886, No. 37,744.



Claim.—1. In a book-stapling machine, the combination, with a driver-slide, of a wire-feeding slide, a cam-piece on said feeder-slide, and mechanism, substantially as herein shown and described, connecting said cam on the feeder-slide with the driver-slide, substantially as set forth.

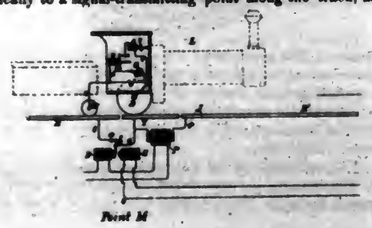
2. In a book-stapling machine, the combination, with a driver-slide, of a slide having blades, a mandrel provided with bevels, a fork on the slide having the blades, which fork has beveled ends that act on the bevels of the mandrel, springs for holding said mandrel, and mechanism for operating the slide having the blades from the driver-slide, substantially as herein shown and described.

3. In a book-stapling machine, the combination, with a driver-slide, of a wire-feeder slide, a cam-piece on said feeder-slide, a slide having blades, a mandrel, a slide having blades and fork with beveled ends acting on the mandrel, springs for holding the mandrel, mechanism for operating the feeder-slide from the driver-slide, and mechanism for operating the slide having the blades from the driver-slide, substantially as herein shown and described.

4. In a book-stapling machine, the combination, with mechanism for driving staples, of a lever for operating the said mechanism, a handle part pivoted on said lever, a spring held on the lever and handle section, a pivoted lever having one end below said handle part, and a sliding anvil resting on the other end of said lever, substantially as herein shown and described.

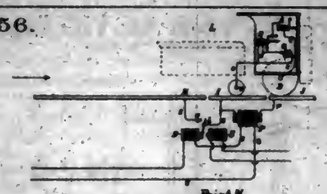
399,556. ELECTRIC RAILWAY-SIGNAL. THEODORE A. B. PUTNAM, New York, N. Y., assignor to the Railway Cab Electric Signal Company, same place. Filed Oct. 3, 1885. Serial No. 178,868. (No model.)

Claim.—1. In an electric railway-signal, the combination of an induction-coil with the opposite terminals of its primary connected electrically to a signal-transmitting point along the track, and a remote signal-receiving point, to which the terminals of the secondary coil are electrically connected, substantially as set forth.



Point M

399,556.



Point N

2. The combination, with a railway-track having insulated spaces or breaks, of an induction-coil with the opposite terminals of its primary connected, respectively, to two rails insulated from each other, and a signaling-point to which the terminals of the secondary coil are connected, substantially as set forth.

3. The combination, with two successive rails of a railway-track insulated from each other, of an induction-coil having the opposite terminals of its primary wire connected to said rails, respectively, and a signaling-point to which the terminals of the secondary coil are connected, substantially as set forth.

4. The combination of two rails of a railway-track insulated from each other, an induction-coil having the opposite terminals of its primary connected to said rails, respectively, a locomotive running on said track, a partial electric circuit on said locomotive with its terminals in connection with the rails, and normally closed and completed therethrough, and a generator and alarm in said circuit, substantially as set forth, whereby at the instant of crossing the insulation between said rails the partial circuit will be completed through the primary of said coil.

5. The combination, with a locomotive, of a partial circuit terminating in connections with the rails, a generator in said circuit, and a closed shunt-circuit of relatively higher resistance connecting the poles of said generator, substantially as set forth.

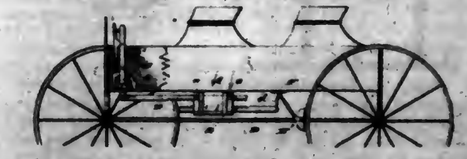
6. The combination, with a locomotive, of a partial circuit terminating in connections with the rails and normally closed or completed through the rails, a generator in said circuit, a closed shunt-circuit extending from one pole of the generator to the other, and an electro-magnet in said shunt-circuit, substantially as set forth, whereby the diversion of an excessive current into said shunt-circuit actuates said magnet.

7. The combination, with a locomotive, of a partial circuit terminating in connections with the rails and normally closed or completed through the rails, a generator in said circuit, a shunt-circuit extending from one pole of the generator to the other, whereby the current from said generator is normally divided between said two circuits, an electro-magnet in said shunt-circuit, and the armature of said magnet provided with a retractive resistance sufficient to prevent its attraction by the normal current in said shunt-circuit, but insufficient to prevent its attraction when the current therein is greatly increased by the introduction of an extraordinary resistance in said partial circuit, substantially as set forth.

8. The combination, with a locomotive, of a partial electric circuit terminating in connections with the rails and normally closed or completed through the rails, a generator in said circuit, an alarm electro-magnet in said circuit, a shunt-circuit extending from one pole of the generator to the other, an electro-magnet in said shunt-circuit, and circuit-breaking contacts in connection with the armature of said magnet and with said partial circuit, substantially as set forth, whereby upon a sufficient increase of the current in said shunt-circuit said armature is attracted and the said partial circuit is thereby broken.

9. A locomotive, a partial circuit thereon terminating in connection with the rails, and normally closed or completed through the rails, a generator in said circuit, a shunt-circuit extending from one pole of the generator to the other, and an electro-magnet in said shunt-circuit, combined together and with the track-rails, with insulations between the rails and with an induction-coil, the primary of which is connected at its opposite terminals to two rails on opposite sides of the insulation, whereby on crossing such insulation the partial circuit on the locomotive is completed through the primary of of said coil, substantially as set forth.

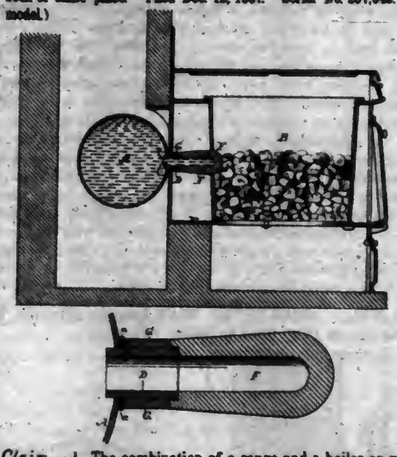
399,557. VEHICLE-BRAKE. CHRISTOPHER T. QUICK, Temple Hill, Ky. Filed Dec. 27, 1888. Serial No. 294,612. (No model.)



Claim.—1. In a vehicle-brake, the combination of a supporting-box adapted to be secured to the under part of a vehicle, pinions or gears mounted therein, and the rack bars or lever engaging with the upper and lower parts of said pinions or gears and connected to an operating-lever, and the brake-bar carrying brake-shoes, substantially as described.

2. In a vehicle-brake, the combination of the box adapted to be opened and closed, secured to the bottom of the vehicle by metallic straps surrounding the same, pinions mounted in said box, and the rack-bars passing through said box and engaging with the upper and lower parts of said pinions, one of which is connected to an operating-lever in the forward part of the vehicle and the other to the brake-bar carrying the brake-shoes at the rear part of the vehicle, substantially as described.

399,558. RANGE-BOILER. THOMAS W. REES, Philadelphia, Pa., assignor of one-half to Thomas W. Snowden and Richard T. Stockman, both of same place. Filed Dec. 12, 1887. Serial No. 257,649. (No model.)



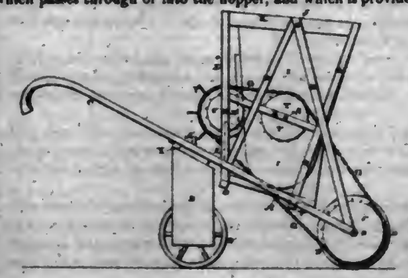
Claim.—1. The combination of a range and a boiler or water-heater located within the structure of the range and fixedly set in respect to the fire-pot of the same, with a plug having a screw-connection with the shell of the boiler, and having a closed outer end which projects to or into the fire-pot of the range, all substantially as specified.

2. The combination of a range and a boiler or water-heater located within the structure of the range and fixedly set in respect to the fire-pot of the same, with a nipple screwed directly into the shell of the boiler and projecting therefrom, a hollow plug screwed onto said nipple and projecting into the fire-pot of the range, and a packing-ring for preventing leakage at the shell of the boiler, all substantially as specified.

3. The combination of a range and a boiler or water-heater located within the structure of the range and fixedly set in respect to the fire-pot of the same, with a nipple screwed into and projecting from the shell of the boiler, a hollow plug screwed onto the outer end of the nipple and projecting into the fire-pot of the range, and a collar and packing interposed between the said plug and the shell of the boiler, all substantially as specified.

399,559. SEED-PLANTER AND FERTILIZER-DISTRIBUTER. CHARLES R. REID, Heidelberg, Miss. Filed Oct. 27, 1888. Serial No. 289,313. (No model.)

Claim.—1. The combination of a suitable frame, supporting-braces which extend therefrom, a hopper pivoted in these supporting-braces so as to have a swinging movement at its lower end, the shaft which passes through or into the hopper, and which is provided with



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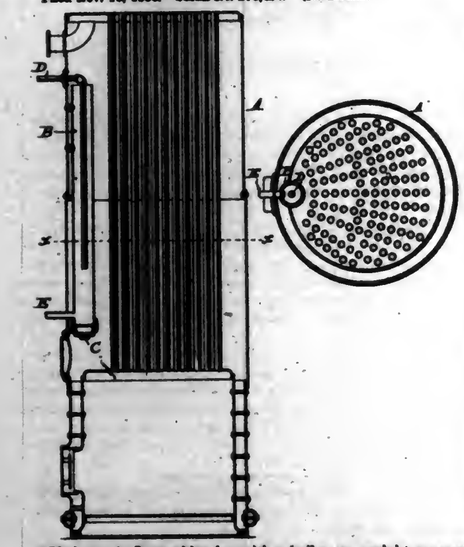
operating-wheels, an operating-chain for passing around these wheels, an operating-axle provided with a supporting-wheel, and a wheel for operating the chain, and hooks or other devices for holding the hopper in an operative position, substantially as shown.

2. The combination of the main frame, a supporting-wheel, the axle to which the wheel is secured, and which is provided with an operating-wheel for the chain, a hopper which is pivoted at its upper end, so that its lower end will have a swinging movement, a shaft provided with an operating-wheel for engaging with the chain, a stirring device located inside of the hopper, a second shaft, also provided with an operating-wheel and a device for distributing the seed or fertilizer, and hooks or other devices for holding the lower portion of the hopper in an operative position, substantially as described.

3. The combination of the main frame provided with handles, the axle provided with a supporting-wheel at one end, the supporting-legs at the opposite end of the frame, and a vertically-adjustable frame provided with a fulcrum or bearing by means of which the entire planter can be swung around within its own length, substantially as set forth.

4. The combination of the main frame provided with handles, the front axle provided with a supporting and operating wheel, the legs Z, a vertically-adjustable frame, Y, the axle C, journaled in the said frame, and the wheel D, substantially as specified.

899,560. STEAM-BOILER. EDWIN REYNOLDS, Milwaukee, Wis. Filed Nov. 10, 1888. Serial No. 290,457. (No model.)



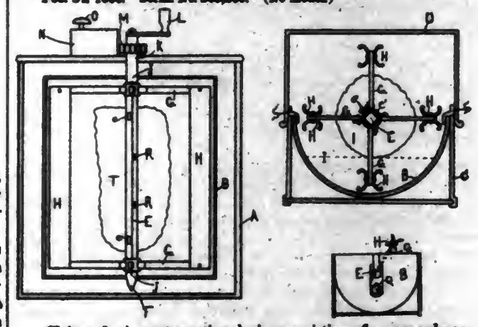
Claim.—1. In combination with a boiler, an upright reservoir secured within the water-space thereof and open at its upper end, a feed-water pipe extending into the upper end of the reservoir, and a blow-off pipe at the lower end of the reservoir, all substantially as shown, whereby the latter is adapted for use as a heater and separator, and also as a surface blow-off.

2. In combination with a boiler, an upright feed-water reservoir provided with a bottom plate or cap, and a feed-pipe, all substantially as shown, whereby the sediment and deposit may be thoroughly removed.

3. In combination with a boiler, an upright reservoir open at its upper end, a removable cap applied to the lower end of the reservoir, a feed-water pipe at the upper end, and a blow-off pipe at the lower end.

4. In combination with a boiler, an upright reservoir open at its upper end and having said upper end located at or about the water-line, a feed-water pipe entering the top of the reservoir and extending nearly to the bottom of the latter, and a blow-off pipe at the lower end of the reservoir.

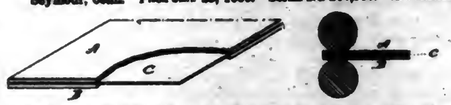
899,561. MEAT-ROASTER. ELISHA R. KENT, Chicago, Ill. Filed Feb. 24, 1888. Serial No. 265,209. (No model.)



Claim.—1. A meat-roasting device consisting of a covered pan, a spit suitably journaled therein, radial arms on such spit, and transverse curved pouring devices upon such arms, the arms being of such length as to permit the pouring devices to dip into the liquid in the bottom of the pan.

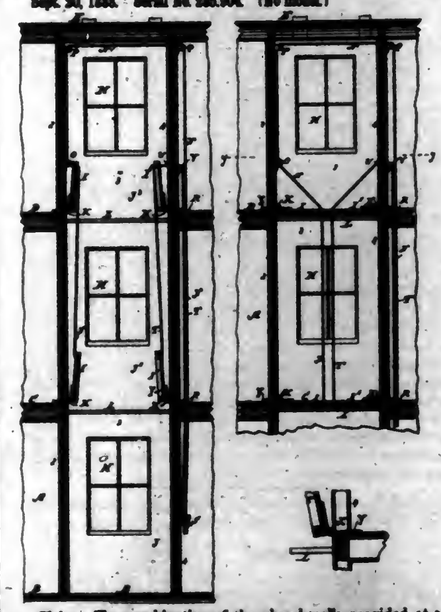
2. In a meat-roasting device, the combination of a covered pan with a spit journaled therein, a crank attached thereto, arms upon said spit, and transverse curved pouring devices across said arms outside of the meat and in such position as to pass through the liquid in the bottom of the pan to carry it up and pour it on the meat as the rotation progresses.

899,562. COLD-ROLLING SHEET METAL. PHILIP RICHARDS, Seymour, Conn. Filed Jan. 25, 1889. Serial No. 297,580. (No model.)



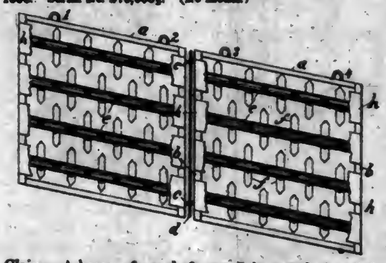
Claim.—The herein-described improvement in cold-rolling sheet metal, which consists in placing the sheet to be operated upon between two planished copper plates, and then passing the said two plates with the sheet between them between the rolls under pressure, substantially as described.

899,563. HATCHWAY. JOHN ROACH, New York, N. Y. Filed Sept. 20, 1888. Serial No. 285,904. (No model.)



Claim.—The combination of the closed walls provided at each floor-landing with a pair of covers, each pair secured, respectively, to opposite sides of the walls by hinges, the spring-plates respectively connected at one end with the hinges to the covers and loose and sliding at the other end for automatically closing the covers down toward each other, and two independent cords passing over pulleys respectively connected with all the covers at one side of the shaft and both descending together at one side thereof and adapted to be simultaneously drawn down together, or to be independently drawn down, substantially as described.

899,564. HARROW. OSMUND ROREM, Elliott, Ill. Filed June 9, 1888. Serial No. 276,600½. (No model.)



Claim.—A harrow formed of a parallelogram frame of plank, *a d*, set edgewise in a vertical plane, to the lower edge of which are secured boxes, in which revolve cylinders *c*, parallel to the front side, *a*, which are provided with flat teeth having short pyramidal points, the teeth passing through said cylinder at right angle each to the preceding, and the plane of their flat sides parallel with the axis of the cylinder, with draft-hooks 1 2 3 4 placed in the front side and pitched as shown, and fixed covering-planks, in combination with a hinged cover, substantially as specified.

899,565. PRESSURE-REGULATING STOP-COCK. EMIL REUTT, New York, N. Y. Filed May 24, 1888. Serial No. 274,908. (No model.)



Claim.—The combination of the casing having the vertical receiving-channel *c* and the lateral delivery-channel, *d*, the valve-seat E, located between said receiving and delivery channels, the valve D, arranged in the casing and closing upwardly upon the valve-seat with the pressure of the fluid, and having a valve-stem, F, rising through the valve-seat and extending to the outside of the casing at the upper end thereof, a low-pressure chamber, L, in the casing above the lateral delivery-channel, a flexible diaphragm, G, closing the casing at the low-pressure chamber secured to the valve-stem, and by its rising movement under the fluid-pressure lifting and closing the valve upon its seat, a spring, H, located in the valve-stem and pressing upon the diaphragm to force it downward and thereby lower and open the valve, and against the pressure of which spring the valve closes on its seat, a wheel, J, outside the casing for lifting and closing the valve-stem against the pressure of the spring, the internally-screw-threaded cover F, and the tubular screw-nut I, adjustable in the cover, pressing on the upper end of the spring and through which nut and spring the valve-stem passes to the hand-wheel, substantially as described.

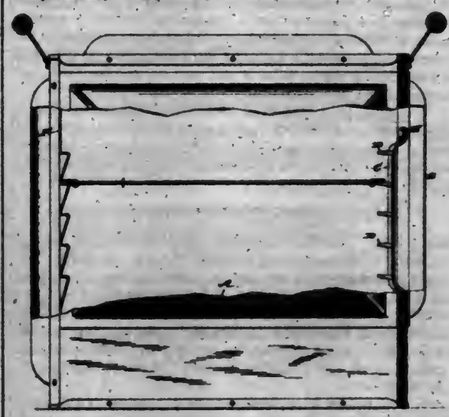
899,566. CHIMNEY CAP OR VENTILATOR. ERWIN P. RYDER, Port Jefferson, N. Y. Filed Oct. 17, 1888. Serial No. 288,269. (No model.)



Claim.—1. In a chimney cap or ventilator, the flue-pipe section A, having the radial wings or flanges C, and the cap D, supported thereon, the said wings or flanges extending from below to above the pipe-top on its outer side, gradually increasing in width to their upper ends, and the said cap forming a clear way and through side opening all round between the wings at the top of the pipe, as shown and described.

2. In a chimney cap or ventilator, the flue-pipe section A, having the collar B, the radial wings or flanges C, and the cap D, the said wings or flanges starting from a point on the pipe at the collar and extending above the top of said pipe, gradually increasing in width from said collar to their upper ends, and supporting the cap-plate to form a clear way and through side opening all round between the wings at the top of the pipe, as shown and described.

899,567. DOMESTIC OR PORTABLE OVEN. MARION S. SAGER, Washington Court-House, Ohio. Filed May 5, 1888. Serial No. 272,992. (No model.)



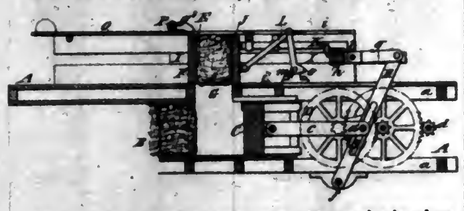
Claim.—1. The combination, with an oven having side and end doorways, of the tray-supports C, rigidly secured to the corners of the oven, substantially as shown, and for the purpose set forth.

2. The combination, with a domestic or portable oven having side and end doorways of sufficient size to permit the insertion of the trays through either doorway, of the tray-supports C, secured to the corners of the oven and provided with projections D, formed integrally therewith, substantially as shown, and for the purpose set forth.

3. The combination, with an oven having side and end doors, A and B, of an inner side wall, F, having transverse corrugations, and casting C or tray-supports, constructed substantially as shown, secured to the opposite corners from the lining F; said tray-supports C having

projections D, with which the trays engage, substantially as shown and for the purpose set forth.

399,568. POWER BALING-PRESS. WILLIAM W. SEELEY, Albany, N. Y. Filed Aug. 30, 1888. Serial No. 284,162. (No model.)



Claim.—1. In a press, the combination, with a condensing-chamber, of a compression-chamber, a feeding passage or chamber intermediate the same, a plunger or follower operating in the condensing-chamber, a movable abutment for the condensing-chamber, a pusher or ram operating in the compression-chamber, driving mechanism, a connection between said driving mechanism and the movable abutment and between the driving mechanism and the follower, and a connection between the driving mechanism and the pusher or ram, said plunger or follower and abutment being moved forwardly in unison to convey compressed material above the feeding passage or chamber, through which it may be forced downwardly in front of the pusher or ram, substantially as specified.

2. In a press, the combination, with a condensing-chamber, of a plunger or follower within the condensing-chamber, a movable abutment operating to close one end of said chamber during the compression, toggles maintaining said abutment in such position, a cross-head for operating the toggles, a lever for operating the cross-head, a connection between the lever and the cross-head, and a connection between the cross-head and the plunger or follower, substantially as specified.

3. In a press, the combination, with a condensing-chamber, of a movable abutment closing one end of said chamber during the compression, a plunger within said chamber, slider-bars connected to said plunger or follower, toggles acting on said abutment, a cross-head operating both the follower or plunger and the abutment, and a lever for operating the cross-head, substantially as specified.

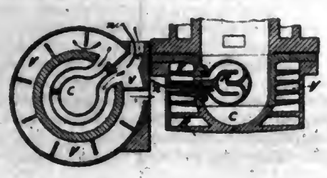
4. In a press, the combination, with a pusher or ram, of a crank for operating the pusher or ram, a plunger or follower, a movable abutment, a lever operated from said crank, and a connection between said lever and the plunger or follower and between the lever and the abutment, whereby motion is transmitted to both the plunger or follower and said abutment, substantially as specified.

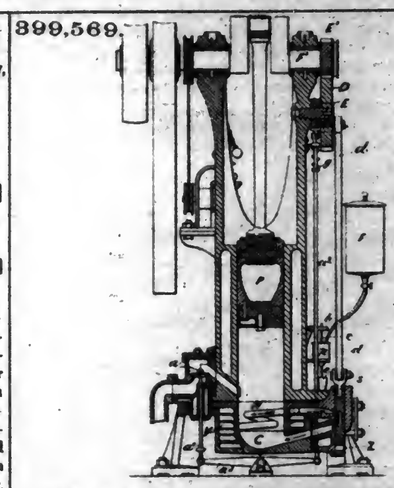
5. In a press, the combination, with a pusher or ram, of a crank for operating said pusher or ram, a plunger or follower, a movable abutment, a slotted lever operating to transmit motion both to the follower or plunger and the abutment, and a connection between said lever and the plunger or follower and between the lever and the abutment, substantially as specified.

6. In a press, the combination, with a condensing-chamber, of a rocking or tilting cover therefor and a movable roller carried by the follower or plunger above said cover and occupying such a position as to be approximately above the point of compression, substantially as specified.

399,569. PETROLEUM-ENGINE. MATHIAS V. SCHILTS, Cologne Germany. Filed June 25, 1887. Serial No. 242,474. (No model.) Patented in Germany June 16, 1885, No. 36,044, and Apr. 10, 1886, No. 38,121; in France Aug. 12, 1885, No. 170,620, and July 3, 1886, No. 177,161; in Belgium Aug. 12, 1885, No. 69,892, and June 30, 1886, No. 73,679; in England Oct. 27, 1885, No. 12,896, and Aug. 16, 1886, No. 10,490; in Austria-Hungary Nov. 10, 1885, No. 30,369, and Oct. 23, 1886, No. 19,835, and in Italy Feb. 4, 1886, No. 19,209, and May 10, 1887, No. 20,715.

Claim.—1. In a hydrocarbon-engine, a metallic evaporating jacket surrounding the explosion-chamber of the engine and subdivided by transverse partitions, so as to increase the inner surface, substantially as described, and for the purpose specified.





2. In a hydrocarbon-engine, the combination of the explosion-chamber with a metallic evaporating-jacket separated from the explosion-chamber by a single wall, and therefore directly heated by the explosions, the said jacket being subdivided by transverse partitions, so as to increase the inner evaporating-surface of the jacket and to lengthen in this way the evaporating-canal, the said evaporating-canal being furnished with a valve adapted to produce and interrupt communication with the explosion-chamber at every cycle of the engine, substantially as described.

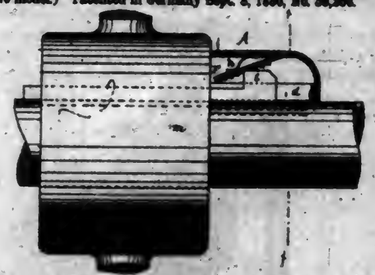
3. In a hydrocarbon-engine, the combination of the explosion-chamber with (*a*) a metallic evaporating-jacket separated from the explosion-chamber by a single wall, and therefore directly heated by the explosions, the said jacket being subdivided by transverse partitions, so as to increase the inner evaporating-surface and to lengthen in this way the evaporating-canal, the said jacket being furnished with a valve adapted to produce and interrupt communication with the explosion-chamber at every cycle of the engine, (*b*) an oil feeder or pump adapted to introduce into the said evaporating-canal small exactly-measured quantities of liquid fuel at every cycle of the engine, and (*c*) a pump, preferably the working-cylinder, adapted to produce in the said canal at every cycle of the engine a sharp air-current into or toward the explosion-chamber of the engine, substantially as described.

4. In a hydrocarbon-engine, the combination of the explosion-chamber with (*a*) an evaporating-jacket separated from the explosion-chamber by a metallic wall only, and subdivided by transverse partitions, so as to form a helical or zigzag canal surrounding the explosion-chamber, said canal being provided with a valve adapted to produce and interrupt communication with the explosion-chamber at every cycle of the engine, (*b*) an oil feeder or pump adapted to introduce into the said evaporating-canal small exactly-measured quantities of liquid fuel at every cycle of the engine, and (*c*) a pump, preferably the working-cylinder, for producing in the said canal at every cycle of the engine an air-blast into or toward the explosion-chamber, substantially as described.

5. In a hydrocarbon-engine, the combination of the explosion-chamber with (*a*) a helical or zigzag-shaped evaporating-canal surrounding the explosion-chamber and cast in one piece with the same, said canal being furnished with a valve adapted to establish and interrupt communication with the explosion-chamber at every cycle of the engine, (*b*) an oil feeder or pump adapted to introduce into the said evaporating-canal small exactly-measured quantities of liquid fuel at every cycle of the engine, and (*c*) a pump, preferably the working-cylinder, for producing in the said canal at every cycle of the engine an air-blast into or toward the explosion-chamber, substantially as described.

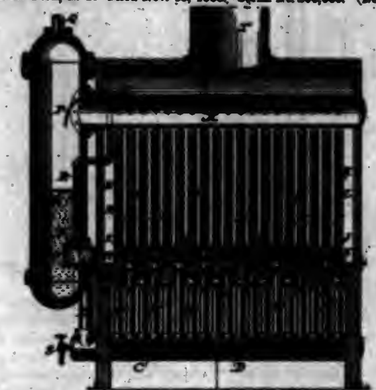
6. In a hydrocarbon-engine, the combination of the explosion-chamber with (*a*) a metallic evaporating-canal separated from the explosion-space by a single wall, the said canal being partly formed by a helical or zigzag passage surrounding the explosion-chamber and partly situated in the interior of the latter, and furnished with a valve adapted to produce and interrupt communication with the explosion-chamber at every cycle of the engine, (*b*) an oil feeder or pump adapted to introduce into the said evaporating-canal small exactly-measured quantities of liquid fuel at every cycle of the engine, and (*c*) a pump, preferably the working-cylinder, for producing in the said canal at every cycle of the engine an air-blast into or toward the explosion-chamber, substantially as described.

399,570. SAFETY-COVER FOR KEY-NOSES. GOTTLIEB P. SUHRIDT, Schmiedeberg, Saxony, Germany. Filed Dec. 2, 1887. Serial No. 256,746. (No model.) Patented in Germany Sept. 8, 1886, No. 36,986.



Claim.—A safety-cover for the key-noses of shafts, composed of a covering-box provided with an interior U-shaped spring pressing against the sides of the key, and with a pivoted and spring-actuated rack that engages the nose of the key, substantially as set forth.

399,571. SECTIONAL STEAM-BOILER. CHARLES L. SEABURY, New York, N. Y. Filed Nov. 13, 1888. Serial No. 290,669. (No model.)



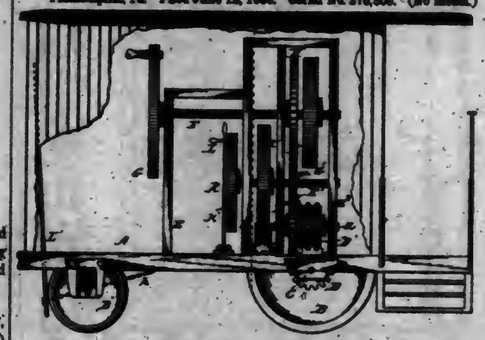
Claim.—1. The combination, in a sectional steam-boiler, with its fire-box and furnace, and with lateral circulating-manifolds placed one on each side of the fire-box and connected with a water-supply pipe, of a series of detachable steam-generating manifolds or sections mounted in the furnace over the fire-box, each consisting of a transverse pipe spanning the fire-box and connected at each end to corresponding vertical tubes in the two lateral manifolds, an inner tube inclosed within the transverse pipe and whose open ends project beyond the closed end of said pipe, a series of upright tubes closed at their upper end and whose lower ends are fitted to the transverse pipe to communicate freely therewith, open-ended upright tubes fitted to said inner tube to communicate therewith and extend therefrom up into the upright closed tubes nearly to the top thereof, and discharge-tubes connecting the two ends of the transverse pipe with a suitable delivery-pipe, substantially in the manner and for the purpose herein set forth.

2. The combination, in a sectional steam-boiler, of the lateral manifolds D D, the interposed detachable manifolds H H, the standing pipes L L, fitted to said detachable manifolds, the inclosed tubes J K, the steam-delivery pipes N, connected with said inclosed tubes, and a steam-drum, M, to which all of said delivery-pipes are connected, substantially in the manner and for the purpose herein set forth.

3. The combination, in a sectional steam-boiler, of the lateral manifolds D D, the interposed detachable manifolds H H, the standing pipes L L, fitted to said detachable manifolds, the inclosed tubes, the steam-delivery pipes N, connected with said inclosed tubes, a vertical drum, E, connected mediately at its upper end with said steam-delivery pipes and at its lower end with the two lateral manifolds, and a water-supply pipe communicating therewith, substantially in the manner and for the purpose herein set forth.

4. The combination, in a sectional steam-boiler, of the lateral circulating-manifolds, the interposed detachable steam-generating manifolds, the standing pipes fitted to said detachable manifolds, the connected tubes inclosed in the standing pipes and detachable manifolds, the steam-delivery pipes connected with said inclosed inner tubes, a vertical drum connected mediately at its upper end with said steam-delivery pipes, a valve-chamber communicating with the lower end of said drum and with the two lateral circulating-manifolds, a valve controlling the communication with the drum and opening inwardly into the chamber, and a water-supply pipe connected with said chamber, substantially in the manner and for the purpose herein set forth.

399,572. MOTOR FOR RAILWAY-CARS. EDWIN R. SHUMAN, Philadelphia, Pa. Filed June 12, 1883. Serial No. 276,808. (No model.)



Claim.—1. In motors for cars, the combination, with the driving-axle C of the car and the worm-wheel D, mounted thereon, of a train of motor-gearing for communicating motion to said axle, the same comprising the main and supplementary shafts F F', arranged at right angles to the axle and geared together and to the worm-shaft, each shaft being provided with an independent motor-crank, substantially as described.

2. In motors for cars, the combination, with the driving-axle C, of the worm-wheel D, mounted thereon, the worm D', engaging with said worm, the toothed wheel I upon the worm-shaft, the pinion or idler G^3, the main and supplementary motor-shafts F F', the former carrying the gear-wheel H, the fly-wheel G, and pulley G', and the latter carrying the idler G^3 and fly-wheels K K', substantially as described.

3. In a motor for cars, the combination, with a shaft, F', of said motor, and a fly-wheel, K, mounted thereon, of a pair of horizontally-movable brake-shoes, operating-chains connected therewith and passing over pulleys, a brake-lever to which said chains are connected, and suitable retracting-springs attached to said shoes, substantially as set forth.

4. In a motor for cars, the combination, with the motor-gearing train comprising the supplementary power-shaft F', carrying the crank-pulley K', of the slotted starting-lever R, substantially as set forth.

399,573. BOOK-BINDER'S PRESS-BOARD. JOHN H. SHAW, Chicago, Ill. Filed Dec. 11, 1888. Serial No. 293,143. (No model.)



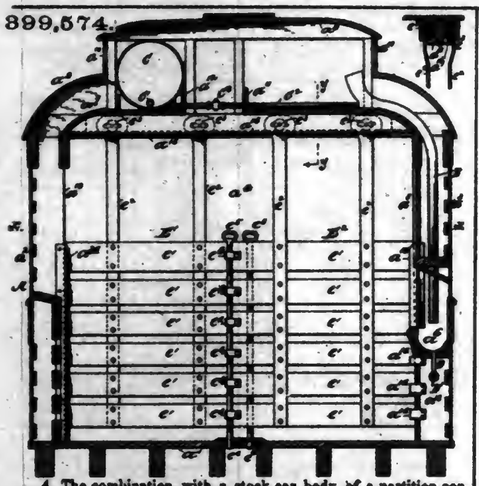
Claim.—As a new article of manufacture, a book-binder's press-board, A, provided with the steel spring-rods B, adapting said board to yield in a limited degree to unequal pressures without breaking, and to resume its proper and original form when relieved, substantially as described.

399,574. STOCK-CAR. WILLIAM H. H. SMITH, Brooklyn, N. Y. Filed Sept. 19, 1888. Serial No. 285,800. (No model.)

Claim.—1. The combination, with a stock-car body, of a partition consisting of two sections arranged out of line and sliding widthwise of the car, jaws on the car-body sustaining one end of each section, and vertical bolts sustaining the opposite ends, substantially as specified.

3. The combination, with a stock-car body, of a partition consisting of two suspended sliding sections arranged out of line, removable bolts sustaining one end of each section, and fixed jaws sustaining the opposite ends, substantially as specified.

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4. The combination, with a stock-car body, of a partition consisting of two sections arranged out of line and jointly extending across the car-body and removable bolts for securing said partitions in position when extended across the car, substantially as specified.

5. The combination, with a stock-car body, of a partition consisting of two slatted sections arranged out of line and jointly extending across the car-body, removable bolts, and fixed jaws for sustaining the partitions, substantially as specified.

6. In a stock-car, the combination, with the carlings having tracks on each side, of partitions comprising two sections, hangers extending from said sections, and grooved wheels journaled in the upper ends of said hangers engaging the tracks, substantially as specified.

7. In a stock-car, the combination, with carlings arranged transversely, of tracks on each side of said carlings, partitions comprising overlapping sections, hangers extending from said sections, grooved wheels on said hangers, fixed jaws for sustaining one end of each section, eyes at the opposite ends of said sections, and bolts passing through said eyes and engaging with the floor, substantially as specified.

399,575. WHISK-BROOM. CHARLES SKEELS, Brooklyn, N. Y. Filed Oct. 20, 1887. Serial No. 252,890. (No model.)



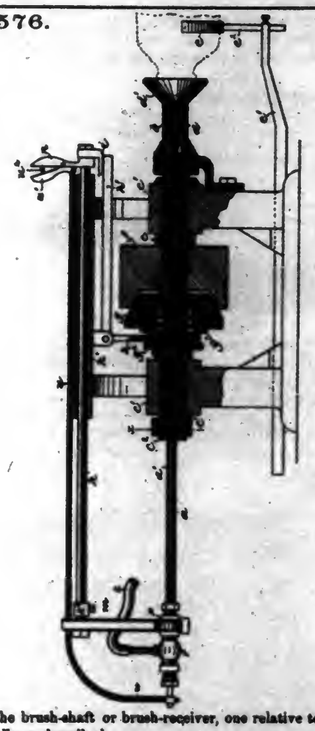
Claim.—The hereinbefore-described broom, consisting of the handle, a cross-piece rigidly secured across one end of said handle, the inner course of fiber forming the under work having its ends rigidly bound to said handle above the cross-piece, the outer course of fiber forming the outer work having its ends bound to said handle above the ends of the inner course, and the whole stitched together below the cross-piece, substantially as described.

399,576. BOTTLE-WASHER. GEORGE S. BLOOM, Newport, R. I., assignor to Joseph M. Hoyt, William G. Hoyt, and Charles Healey, all of Lynn, Mass. Filed July 19, 1886. Serial No. 208,445. (No model.)

Claim.—1. The combination, with the brush-receiver and rotary brush-shaft, one movable with relation to the other, and driving mechanism for rotating said brush-shaft, of a spring-closed clutch for transmitting motion from said driving mechanism to said brush-shaft, the members of which engage at the beginning of the movement by which the brush enters the bottle, and disengage at the end of the movement by which the brush is withdrawn from the bottle, substantially as and for the purposes hereinbefore set forth.

2. The combination of the brush-shaft and brush-receiver, one movable with relation to the other, with a pulley free to rotate loosely with relation to the brush-shaft and provided with one member of a clutch, and a co-operating clutch member connected to rotate with the brush-shaft and longitudinally movable with relation to the brush-shaft and to the said pulley, a shipper-lever engaged with said longitudinally-movable clutch member, and an actuating projection that operates said shipper and is itself operated by the longitudinal movement of the brush-shaft or brush-receiver, one relative to the other, substantially as described.

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3. The combination of the brush-shaft with a sleeve inclosing the same and connected to rotate therewith and bearings for said sleeve, a pulley loose on said sleeve and provided with one member of a clutch and a co-operating clutch member keyed upon said sleeve and longitudinally movable thereon to engage and disengage said pulley, as described, and a clutch-shipper engaged with said longitudinally-movable clutch member, substantially as described.

399,577. VEHICLE-HUB. MILTON B. SOUTHERLAND, East Perryville, Tenn., assignor of one-half to James R. Hount, same place. Filed July 11, 1888. Serial No. 279,634. (No model.)

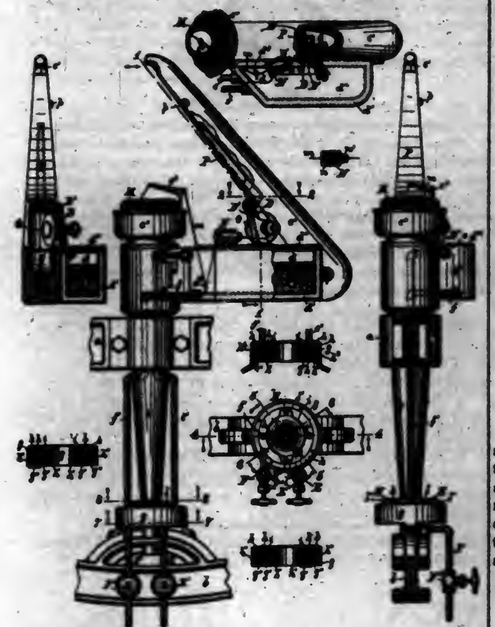


Claim.—1. In a vehicle-wheel, the combination, with the spokes and felloes, of the metallic hub consisting of the flange *a*, the collar *b*, forming between itself and said flange an annular groove or channel for the spokes, a sleeve integrally formed with said flange and collar, and a second flange adapted to be screwed upon said sleeve, substantially as described.

2. In a vehicle-wheel, a metallic hub comprising a flange, a contiguous collar, and an externally-threaded sleeve, said flange, collar, and sleeve formed in one piece, in combination with a removable flange, *c*, adapted to be screwed upon said sleeve, and a packing-ring between said flange and the sides of the spokes, substantially as herein described.

3. An improved vehicle-wheel, comprising spokes and felloes, a metallic hub formed in two sections, one section consisting of an integral exterior flange, interior collar, and threaded sleeve, and the other section consisting of an external removable flange adapted to be screwed upon said sleeve, a packing-ring over said collar and between the inner face of the removable flange and the spokes, and a boxing in said sleeve screwed within the core of the fixed flange, substantially as described.

399,578. WAXING DEVICE FOR WAX-THREAD SEWING-MACHINES. EDWARD A. STRONG, Brockton, Mass., assignor of one-half to Henry G. Phipps, same place. Filed Oct. 26, 1887. Serial No. 253,208. (No model.)



Claim.—1. The combination, with the post and horn of a wax-thread sewing-machine, of a jacketed wax-tank, the stationary cup *g*, having inner and outer annular grooves, the rotating ring *h*, having inner and outer annular grooves and vertical pins or projections H, the pipes *d* and *f*, leading, respectively, from the grooves to the jacketed tank, the pipe E, leading from a source of steam-pressure to the inner grooves, the drip leading from the outer grooves, and the collar *l*, secured to the post and engaging the pins or projections on the ring, substantially as described.

2. The combination of a jacketed wax-tank, a bracket, D, having the channel D' communicating with the jacketed tank, the horn *d*, the chambered arm P, pivoted to the bracket and communicating with the channel therein, and a steam-supply for the tank, substantially as described.

399,579. SEMAPHORE-SIGNAL. FREDERICK STIEBEL and CHARLES WERNERS, Louisville, Ky., assignors to the American Semaphore Company, same place. Filed Mar. 21, 1888. Serial No. 267,969. (No model.)

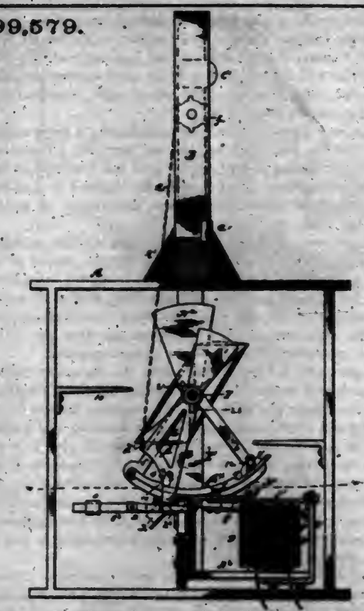
Claim.—1. The combination, with a railroad-track, of a semaphore signaling apparatus having electro-magnets located at each end of a block of said railroad, a closed circuit through the track and semaphore at one end of the block, and a second closed circuit through the semaphore at the opposite end of the block, said second circuit being adapted to be automatically broken by the operation of the first-mentioned semaphore, substantially as set forth.

2. The combination, with a railroad-track, of a semaphore signaling device having electro-magnets, a closed circuit through the track and semaphore-magnets located at one end of a block, a second circuit through a semaphore at the opposite end of the block, and contact-pieces attached to the first-mentioned semaphore to normally close said second circuit, substantially as set forth.

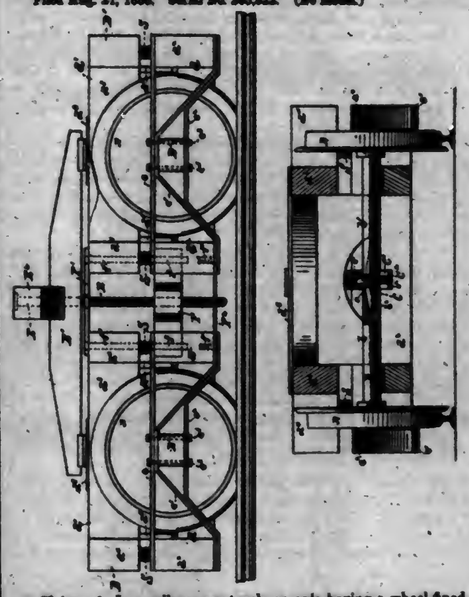
3. The combination, with a railroad-track, of two semaphores having electro-magnets, a closed circuit through the railroad-tracks and semaphore located at one end of a block, a second closed circuit through the track, a conducting-wire and a semaphore at the opposite end of the block, and contact-pieces attached to the first-mentioned semaphore to normally close said second circuit, substantially as set forth.

4. The combination, with a railroad-track, of two semaphores having electro-magnets, a closed circuit through the railroad-tracks and a semaphore located at one end of a block, a second closed circuit through a semaphore at the opposite end of the block, the track, and a conducting-wire, contact-pieces attached to a rigid part of the first-mentioned semaphore and included in said second circuit, and an arm carried by a moving part of the first-mentioned semaphore to connect the contact-pieces and normally close said second circuit, substantially as set forth.

399,579.



399,580. CAR-TRUCK. SOLOMON P. STODDARD, Brookville, Ind. Filed Aug. 21, 1888. Serial No. 283,322. (No model.)



Claim.—1. In a railway-car truck, an axle having a wheel fixed on each end thereof and bisected midway its length, with a conical recess in each of the opposed inner ends of the thus constituted sections thereof, a mandrel having conical ends fitted into said recesses in the axle-sections and giving bearings therefor, and a collar or disk loosely journaled on said mandrel between said opposed inner ends of said axle-sections, substantially as and for the purpose specified.

2. In a railway-car truck, an axle having a wheel fixed on each end thereof and bisected midway its length, with a conical recess in each of the opposed inner ends of the thus constituted sections thereof,

a mandrel having conical ends fitted into said recesses in the axle-sections and giving bearings therefor, and a collar or disk loosely journaled on said mandrel between said opposed inner ends of said axle-sections, together with a frame carried by the truck-timbers and fitted loosely upon and giving bearing to said collar or disk, substantially as and for the purpose set forth.

3. A car-truck composed of a frame constituting a lower section thereof, in which the wheel axle or axles are journaled, a frame constituting an upper section thereof upon which the drafting-bars rest and have play, and springs seated between the opposed faces or timbers of said upper and lower section-frames, substantially as and for the purpose specified.

4. In a car-truck, the combination of a frame in which the wheel axle or axles are journaled and constituting a lower section of the truck, with a frame which is imposed upon the lower section and upon which the drafting-bars rest and have play, springs seated between the timbers of the said upper and lower truck-sections, and flanges on the upper section which reach into and have play in the lower section, substantially as and for the purpose specified.

5. In a car-truck, the combination, with the transverse timbers thereof, of arch-bars composed of a brace-bar extending longitudinally of the truck from the forward to the rearward timbers on the upper side thereof, a truss extending similarly between said timbers from the under side thereof and bent intermediate its ends to reach upwardly to said brace-bar, and a truss extending similarly of the truck and below and in contact with said first truss and bent to reach upwardly to a less height than said first truss, together with axle-boxes seated between the crowns of said trusses and bolts passing through and uniting said brace-bar, trusses, and boxes, substantially as and for the purpose specified.

6. A car-truck composed of separate and independent sections, in each of which is journaled a bisected axle having a wheel fixed on the outer end of each section of said axle, and a conical-ended mandrel-bearing for the correspondingly-recessed opposed inner ends of said axle-sections, together with a collar journaled loosely upon said mandrel between said opposed ends of said axle-sections, a coupling between and pivotally uniting said truck-sections, a king-bolt seated in said coupling, and drafting-bars pivoted on said king-bolt, with its ends reaching to and resting upon each truck-section, substantially as and for the purpose set forth.

399,581. PROCESS OF MAKING A BROWN DIE. JOSEF STRASBURGER, Moscow, Russia, assignor to the Actien-Gesellschaft für Anilin Fabrikation, Berlin, Germany. Filed Nov. 7, 1888. Serial No. 290,244. (No specimens.) Patented in Germany June 22, 1888, No. 1,989, and July 14, 1888, No. 1,950; in England July 23, 1888, No. 10,653; in Russia July 30, 1888, No. 7,908; in France Aug. 10, 1888, No. 179,376; in Austria-Hungary Aug. 10, 1888, No. 7,840, and in Italy Sept. 30, 1888, XXII, 23,899, XLVII, 306.

Claim.—1. The process herein described of producing coloring-matter for dyeing, the same consisting, first, in combining tetrazo-diphenyl with one molecule of salicylic acid, then combining with the product one molecule of resorcin, and finally combining with the product a diazobenzole-sulphonic acid and precipitating the dye or color, substantially as specified.

2. The process herein described of producing coloring-matter for dyeing, the same consisting in treating resorcin with paradiazo-benzole-sulphonic acid, then dissolving the product in water, then adding to the solution the product obtained by the reaction of tetrazo-diphenyl with salicylic acid, then allowing the mixture to stand a suitable period of time, and then heating it and adding common salt, by which the coloring-matter is precipitated, which is finally filtered, pressed, and dried, substantially as specified.

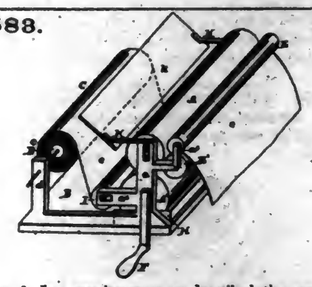
399,582. HINGE. CORNELIUS F. SULLIVAN, Boston, Mass., assignor, by mesne assignments, to Charles C. Richmond, same place. Filed May 7, 1888. Serial No. 273,021. (Model.)



Claim.—A box-hinge composed of the plates A B, to be placed respectively on the inside of the box and of the cover, and provided with ears *a b* at right angles to the main plates and united by a link, C, having a straight portion, 2, at one end and a straight side to form stops, the cover-plate being provided with a slot to allow it to pass over the link C, substantially as shown and described.

399,583. LETTER-COPYING PRESS. CHARLES A. THOMPSON, Galveston, Tex. Filed Dec. 20, 1888. Serial No. 187,157. (No model.) Patented in England Mar. 9, 1888, No. 3,077; in Canada May 12, 1888, No. 21,667, and in France June 16, 1888, No. 189,382.

399,588.



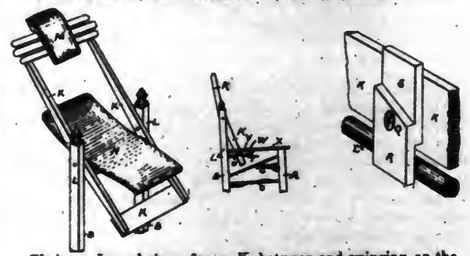
Claim.—1. In a copying-press, as described, the combination of the dampening-roller A', moistened in the manner described, with the smoothing-roller I at one side of and in close proximity to it and situated between said dampening-roller and the roll of paper, and the roller A, journaled in the standard *a*, and the smoothing-rollers E E, placed at one side and beyond the rollers A and A' and journaled in brackets a^2, the several parts made and all arranged and combined in the manner and for the purposes described, whereby the paper is evenly and smoothly moistened before the copy-paper is applied and both are kept smooth during the process of copying.

2. The combination, with the frame B, having roller I, journaled in brackets a^2 in close proximity to roller A', and rollers A A', journaled in standards *a*, and roller E', journaled in bracket a^2 and the trough H, and the inclined copy-table K, the edges of which are contiguous to the roller A, substantially as and for the purposes set forth.

3. The combination of the water-vessel, the squeezer-roll at the side of the dampening-roll, and the copy-press roll directly over the dampening-roll, substantially as described.

4. In a copying-press, the combination of the press-copy roll with the dampening and the squeezer rolls, whereby the copying is done between the dampening-roll and the press-copy roll after the surplus moisture has been removed from it.

399,584. ROCKING-CHAIR. ORRIN S. TURNER, New Vineyard, Me. Filed Oct. 11, 1887. Serial No. 251,987. (No model.)



Claim.—In a chair, a frame, K, between and swinging on the back uprights, B, of the chair, and at its upper portion having a head-rest, M, in combination with a back-frame, N, located below the head-rest M and adapted to swing on frame K independently of the swing of frame K on uprights B, and with means consisting of a swinging block, V, and pins T, relatively applied to chair and back frames and adapted to be engaged and disengaged, substantially as and for the purposes described.

399,585. FAN ATTACHMENT FOR BABY-CARRIAGES. EDWIN C. VAN NOUHUYS, Albany, and KYRAN C. DOWNER, Greenbush, N. Y. Filed Mar. 5, 1887. Renewed Jan. 16, 1889. Serial No. 296,570. (No model.)



Claim.—1. The combination, with a baby-carriage and its supporting-wheels, of a bracket secured to said carriage and forming the bearings for the fan-actuating shafts, a vertical shaft provided with a friction-wheel which bears against a wheel of said carriage and is held in frictional contact with said wheel by means of a spring-bearing, and a horizontal shaft which is connected by gearing to the vertical shaft and has a series of fan-blades attached thereto, as and for the purpose specified.

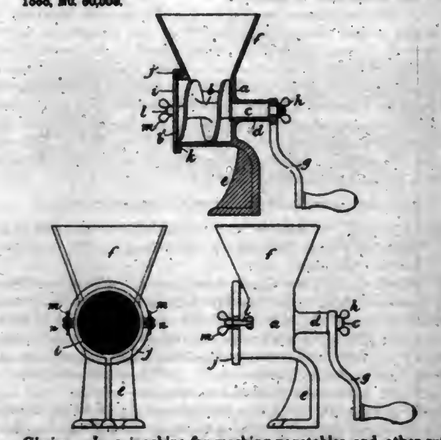
2. A fan attachment for baby-carriages, consisting of a bracket having journal-bearings for a horizontal and a vertical shaft formed therein, the lower bearing for the latter being forced outwardly by a spring, and said vertical shaft having a friction-wheel that is arranged to bear against one wheel of the carriage, the said horizontal shaft being geared to the vertical shaft and having blades for a rotary fan attached thereto to extend over the body of the carriage, as and for the purpose herein specified.

399,586. BOILER-FEEDER. FRANCIS H. VAUGHN and MARION H. VAUGHN, Richmond, Ind., assignors of one-third to Alonzo H. Rigg, same place. Filed Oct. 8, 1888. Serial No. 287,560. (No model.)



Claim.—A fixed valve-stem consisting of a tube which communicates only with a source of water-supply, in combination with a valve-seat which turns on said valve-stem, a pair of water-pipes extending from opposite sides of said seat, a pair of reservoirs connected by said pipes, another pair of pipes and a valve-seat, also connecting said reservoirs, another fixed tubular valve-stem which is connected to a source of steam-supply only and on which the latter seat turns, a tilting-frame for said reservoirs, and outlet-pipes which extend from said reservoirs to the boiler, substantially as set forth.

399,587. MACHINE FOR MASHING POTATOES, &c. CHARLES WARREN, Ipswich, County of Suffolk, England. Filed Dec. 22, 1887. Serial No. 258,702. (No model.) Patented in England Oct. 20, 1887, No. 14,723; in France Feb. 7, 1888, No. 183,806, and in Belgium Feb. 7, 1888, No. 80,559.



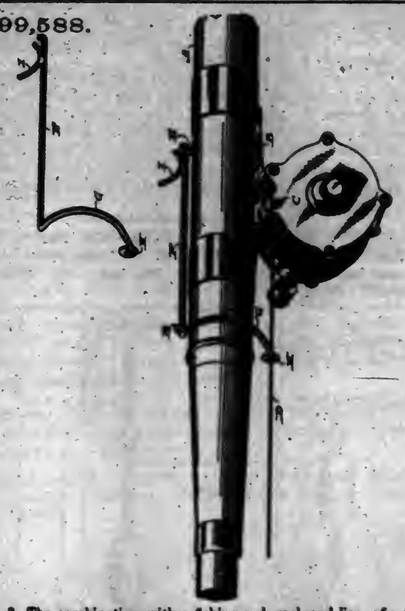
Claim.—In a machine for mashing vegetables and other substances, the combination, with the barrel or cylinder *e*, of the wire-gauze provided with a ring, *k*, extending around the cylinder, of the ring *j*, also extending around the cylinder, having a flange, J', extending over the end of the cylinder and being provided with slotted ears and the swivel-bolts secured to the cylinder and adapted to engage the slotted ears, whereby the wire-gauze is stretched tightly across the end of the cylinder and clamped, substantially as described.

399,588. LINE-GUIDE FOR FISHING-RODS. CHARLES H. WARREN, Racine, Wis. Filed June 8, 1888. Serial No. 276,426. (No model.)

Claim.—1. As a new article of manufacture, an attachment for a fishing-rod that comprises a rocking lever having its forward end bent at an angle to pass around under the rod and terminate in an eye, substantially as set forth.

2. As an improved article of manufacture, a reel-seat provided with bearings, a lever arranged to rock in the bearings and having its forward end terminating in an eye and bent at an angle to pass around under a rod to which said reel-seat may be attached, substantially as set forth.

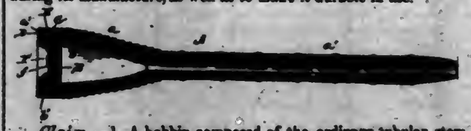
399,588.



3. The combination, with a fishing rod, reel, and line, of a rocking lever having its bearings on the rod and provided with an angular forward extension bent to pass around under the rod and terminate in an eye for engagement with the line, and a thumb-piece arranged on said lever, substantially as set forth.

399,589. BOBBIN. J. HENRY WELLS, Fall River, Mass. Filed Feb. 15, 1888. Serial No. 264,156. (No model.)

Brief.—The object of the invention is to strengthen the bobbin during its manufacture, as well as to make it durable in use.

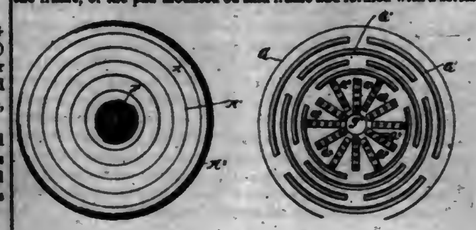


Claim.—1. A bobbin composed of the ordinary tubular stem, having a circumferential inner groove near the lower end of its bore, and a cap of sheet metal having a central portion lying against the lower or base edge of said stem or spindle, provided with an inner flange extending within said stem against the surface of the bore, and with its edge spun into said groove and bearing on the lower side thereof, and having an outer flange extending upward on the outer surface of the stem or spindle, and overlying the groove to re-enforce the stem on the outside of the groove, substantially as specified.

2. The herein-described bobbin composed of the ordinary tubular stem, A, having the enlarged cylindrical base portion *a'* and the conical portion *a*, adjoining said cylindrical portion, and provided with the circumferential groove B, having the rectangular shoulder *b'* in the cylindrical end portion of its bore, and the sheet-metal base-cap C, having the central part, D, the outer flange, E, extending over the groove to re-enforce the bobbin thereat, and the inner flange, F, lying against the surface of the bore, and having its edge turned outward upon the circumferential shoulder *b'* of the groove B, substantially as specified.

399,590. CENTRIFUGAL AMALGAMATOR. WILLIAM WHITE, Mount Vernon, assignor to James B. Brewster and Richard Kelley, New York, N. Y. Filed Nov. 22, 1888. Serial No. 291,546. (No model.)

Claim.—1. In a centrifugal amalgamator, the combination, with the frame, of the pan mounted on said frame and formed with a series

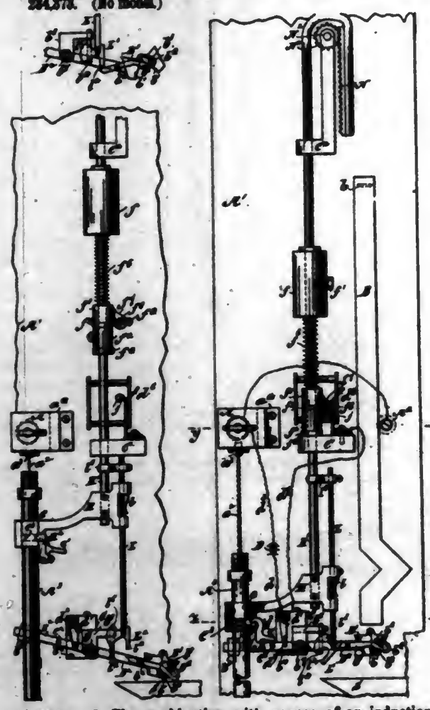


of concentric steps the outer part of which beyond the last step is inclined upwardly and terminates in a downwardly-curved peripheral edge, substantially as shown and described.

2. The combination, with the frame, the rotary pan, the disk above the pan, and the plate secured at its outer edges to the said disk, with a space between the pan and disk, of the vent-tube K, extended through the plate and disk and communicating at its lower end with the space between the pan and disk, and through the plate and provided at its upper end with an enlargement, and the conical hood in said enlarged part with an air-space around the same, substantially as and for the purpose specified.

399,591. COIN-OPERATED INDUCTION-COIL.

PERCY G. WILLIAMS and ALFRED W. ROOVERS, Brooklyn, N. Y., assignors to the Automatic Battery Company, same place. Filed Sept. 1, 1888. Serial No. 284,373. (No model.)



Claim.—1. The combination, with a case, of an induction-coil, primary and secondary circuits therefor, a longitudinally-movable part in electrical contact with the induction-coil, electrodes outside the case, one of which is connected with the said movable part, a weight for moving said movable part in one direction, an arm adapted to be locked with said weight, a rod rigidly secured to said arm, time mechanism having a portion in one of said circuits, and a pin or projection on said rod adapted to contact with said portion of the time mechanism to close such circuit, substantially as specified.

2. The combination, with a case, of an induction-coil, primary and secondary circuits therefor, a longitudinally-movable part in electrical contact with the induction-coil, electrodes outside the case, one of which is connected with the said movable part, a weight for moving said movable part in one direction, an arm adapted to be locked with said weight, a rod rigidly secured to said arm, time mechanism having a portion in one of said circuits, and a yielding pin or projection on said rod adapted to contact with said portion of the time mechanism to close such circuit, substantially as specified.

3. The combination, with a case, of an induction-coil, primary and secondary circuits therefor, a movable part in electrical contact with the induction-coil, electrodes outside the case, one of which is secured to said movable part, a weight for moving said movable part in one direction, an arm adapted to be locked to said weight, a rod rigidly secured to said arm, a lever, a receptacle for a coin mounted on said lever, a pin or projection on said rod, and time mechanism, whereby when a coin has been deposited in the receptacle the lever will rock to close circuit, and when the said movable part for the induction-coil is moved outwardly and the weight is raised said rod will be elevated to permit the operation of the time mechanism and to cause the breaking of the circuit, substantially as specified.

4. In a coin-operated induction-coil, the combination of an indicator, two electrodes extending outside the case, one constructed to be longitudinally movable, a coin-chute, a coin-receptacle moved on receiving a proper coin from the chute, an electric circuit, circuit-changers operated upon the movement of the coin-receptacle, gearing imparting movement to the indicator, and mechanism operated upon the movement of the coin-receptacle to connect said gearing with the movable electrode, substantially as specified.

5. In a coin-operated induction-coil, the combination of an indicator, two electrodes extending outside the case, one constructed to be longitudinally movable, a coin-chute, a coin-receptacle moved on receiving a proper coin from the chute, an electric circuit, circuit-changers operated upon the movement of the coin-receptacle, time mechanism, gearing imparting movement to the indicator, and mechanism operated upon the movement of the coin-receptacle to connect said gearing with the movable electrode, substantially as specified.

6. The combination of an indicator, a rod connected therewith for operating the same, a movable electrode, a lever having at one end a coin-receptacle, and a catch operated by said lever to lock the movable electrode to the said rod, substantially as specified.

7. The combination of an indicator, a rod connected therewith for operating the same, a movable electrode, a catch for securing the movable electrode to the rod, a lever, and a sliding trip, substantially as specified.

8. The combination of a coin-chute, a lever carrying a receptacle for coin, a movable electrode, and a catch operated to be rocked and locked to the said movable electrode by means of a working-lever, substantially as specified.

9. In a coin-operated induction-coil, the combination, with an electrode, of a weight secured thereto and elevated when said electrode is drawn outwardly, an arm adapted to be locked to said weight, a rod frictionally secured to said arm, a trip on said rod, a lever, a receptacle for coin composed of sections and mounted on said lever, and an opening and closing device operated by said trip upon the lowering of said weight to open said receptacle, substantially as specified.

10. The combination, with a movable electrode, of a weight connected to said electrode, an arm connected to said weight, a rod having a sliding connection with said arm, an abutment for said rod, a receptacle for coin, and an opening and closing device operated by said rod, substantially as specified.

11. The combination, with a longitudinally-movable electrode, of a weight secured thereto and elevated when the electrode is drawn outwardly, an arm adapted to be locked to said weight, a rod adapted to be locked to said arm and moved upwardly therewith, time mechanism, and a pin or projection on said rod adapted upon the descent of said rod to rewind said time mechanism, substantially as specified.

12. In a coin-operated induction-coil, the combination, with the weight A^3, provided with a groove, c^3, of the arm H, provided with a dog, H^3, adapted to engage said groove, and the lever B^3, provided with a pin, c^3, substantially as specified.

399,592. SYSTEM OF AND APPARATUS FOR HEATING CARS.

ROBERT J. WILSON, Pittsburg, Pa. Filed Apr. 26, 1887. Serial No. 236,207. (No model.)

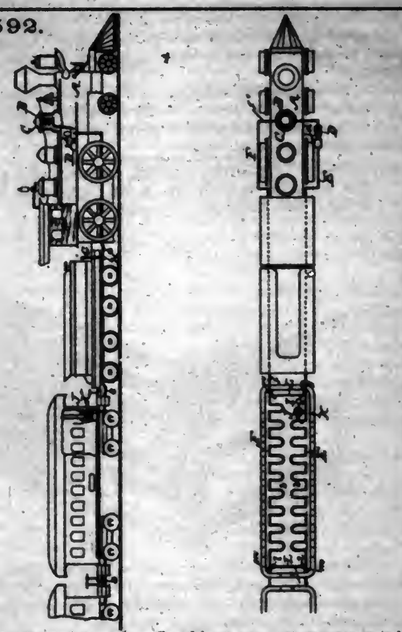
Claim.—1. In a car-heating apparatus, the combination, with a main water-heating device mounted on the locomotive-boiler and within the same, of a water-circulating system, consisting of direct and return pipes mounted on a car and arranged and adapted to heat the car by direct radiation, and connected directly to said heating device, and a local or supplementary heating circuit comprising a water-tank, stove, and coil mounted on the car, said coil being connected to the main system by pipes having cocks, whereby the car may be heated independently from the heat derived from the locomotive-boiler, substantially as described.

2. In a car-heating apparatus, the combination, with a main water heating and circulating system comprising a water-heating device mounted on a locomotive and the boiler thereof, and delivery and return pipes connected directly thereto and passing through a car, of a supplementary or local heating and supply circuit mounted on the car and connected to said main system, substantially as described.

3. In a system of heating cars, the combination, with a water heating and supplying device consisting of a steam-pump and coil, said coil being located within the steam-space of the locomotive-boiler and connected to said pump, of delivery and return pipes connected with said coil and passing through the car to be heated, and a stove and supplemental coil carried on the car, said coil being connected to the service-pipes by branch pipes having suitable cocks, whereby said car may be heated independent of the locomotive.

4. In a car-heating apparatus, the combination of a steam-boiler carried upon one of the vehicles of the train, a main water-heater contained in a vessel communicating with said boiler and carried on the same vehicle direct, return-pipes connected to said main heater and traversing the other vehicles of the train, and a supplementary heating-circuit consisting of a coil and heater on each car, connected to said direct and return pipes by branch pipes having cocks, substantially as described.

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399,593. STEAM-ENGINE.

WILLIAM O. WORTH and JOHN D. WORTH, Cedar Rapids, Iowa. Filed Feb. 10, 1888. Serial No. 263,657. (No model.)



Claim.—1. In an engine of the class described, a shell having cylinders in opposite ends thereof, lateral heads adapted to close the central portion of the shell and having boxes for the crank-shaft, steam-passages along the upper portion of said shell, a central chamber within which the crank and its connections operate and adapted to hold oil, and chambers near the ends of said shell communicating with the exhaust-steam passages, substantially as specified.

2. In an engine, substantially as described, a shell having a central chamber isolated from the steam-passages and adapted to hold oil, and chambers near the ends communicating with the exhaust-steam passages and by a suitable valve with the central chamber, whereby the oil from the exhaust-steam deposited in said end chambers may be conveyed to the central chamber, substantially as set forth.

3. In an engine of the class described, the combination of a shell having a central chamber adapted to hold oil, end chambers communicating with the exhaust-steam passages and also adapted to hold oil, and valves, substantially as described, adapted to be automatically operated by a float, whereby the surplus oil from the end chambers is conveyed to the central chamber, as specified.

4. In an engine, substantially as described, the combination of a shell having a central chamber adapted to hold oil, terminal chambers adapted to catch oil from the exhaust-steam, an automatic valve adapted to allow the surplus oil from the terminal chambers to flow into the central one, and an overflow-pipe communicating with the central chamber and adapted to keep the oil at a uniform level, substantially as set forth.

5. In an engine, the combination, with a shell, substantially as described, having terminal heads with steam-valves therein, of a cylinder having an exhaust-port in one side and adjacent to said head, a valve having a convex face fitting the bore of said cylinder and adapted to slide reciprocally in the same direction as the piston, a reciprocating valve-rod connecting with said valve by an arm extending through said port, and mechanism adapted to actuate said valve-rod, substantially as described, and for the purpose set forth.

6. In an engine, the combination of a crank-shaft having two or more travelers mounted on the crank-pin and a piston having a yoke to receive said travelers and allow for the revolution of the crank, said yoke being adapted to bear on opposite sides of the respective travelers, but on only one side of any one traveler, substantially as and for the purpose set forth.

7. The combination, in an engine, of the crank-shaft having two or more travelers mounted on its crank-pin, and a yoke bearing against said travelers from opposite sides, but upon only one side of any traveler, and having for one of its bearing-faces an adjustable wedge, whereby the lost motion due to wear may be taken up, substantially as specified.

8. In an engine of the class specified, the combination, with a cam or eccentric oscillating arms and valves, substantially as described, of a reciprocating rod adapted to actuate the steam or exhaust valves, said rod being placed below the surface of the oil or water within the shell of the engine, whereby the sound caused by actuating said rod is muffled, substantially as set forth.

9. In an engine of the class described, the combination of the valve-rods Q Q, the pivoted arms J J, having travelers *b b*, the spring *p*, and the cam or eccentric mounted on the crank-shaft, substantially as and for the purpose set forth.

399,594. CHIMNEY CAP AND PROTECTOR.

WILLIAM W. WEIGEL, Willink, N. Y. Filed May 18, 1888. Serial No. 274,312. (No model.)



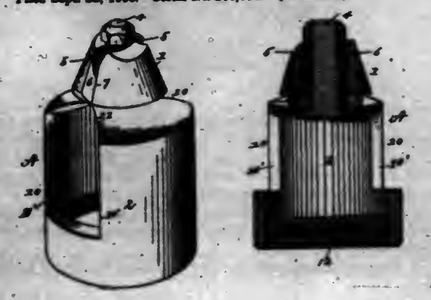
Claim.—1. In a chimney-cap consisting of the main plate having a central opening and provided with circumferential flanges depending from its outer edges and from the edges of its central opening, and the hood arranged over the main plate and provided with a depending surrounding flange resting at its lower edge on the main plate around the central opening therein and removed some distance from the same, the top of the said hood being solid at its center over the opening in the main plate, and provided with apertures *i*, which are over the inclosed portion of the main plate, substantially as specified.

2. A chimney-cap comprising the main plate having a central opening and provided with a circumferential flange, *c*, the hood arranged over the plate and provided with a depending flange resting on the main plate around its opening and removed some distance therefrom, and the deflecting-flange I, larger than the opening in the main plate and depending from the top of the hood, the portion of the top of the hood inclosed by this flange being solid, while the portion around the flange is provided with openings *i*, substantially as specified.

3. In a chimney-cap, the main plate C, having a central opening, c^4, and provided with the depending flanges *c* and *c'*, and the vertical protecting-flange D, standing up around the central opening in the plate, in combination with the hood G, fitting over the main plate and provided with the depending flange *g*, bearing on the plate between the central opening and the outer edge and provided with notches or outlet openings *g' g'*, and the deflecting-flange I, depending from the top of the hood, with its lower edge arranged over the portion of the main plate between the flanges D and *g*, the top of the hood being solid within the deflecting-flange I, and provided with openings *i i* around the same, substantially as specified.

399,595. AUGER-BIT.

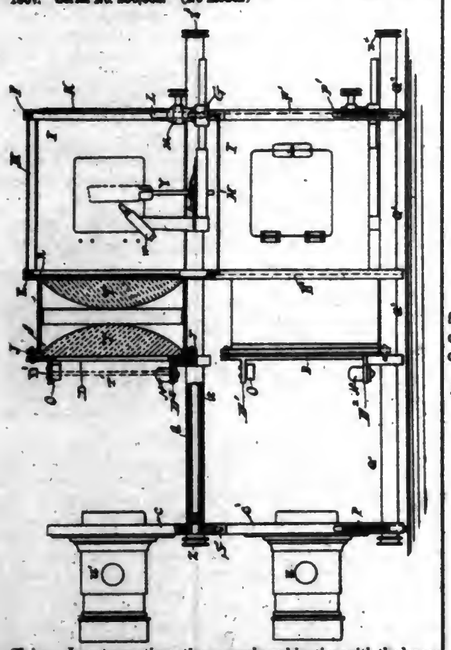
FRANK T. WYCKOFF, Williamsport, Pa. Filed Sept. 22, 1888. Serial No. 286,063. (No model.)



Claim.—1. An auger consisting of a cutter having cutting-edges and a cutting-shoulder and an opening through the shoulder, a leader on the shoulder having cutting-edges in its sides aligning with the cutting-edges of the cutter and a threaded opening through its center, and a bolt extending through the opening in the cutter and engaging the threaded opening in the leader, substantially as described.

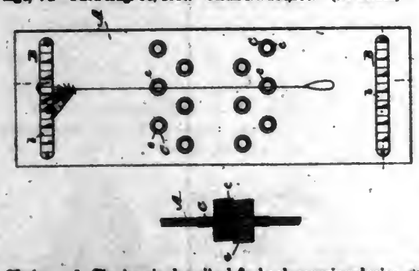
2. An auger having a cutter provided with openings in its sides, the metal surrounding the openings forming cutting-edges, a leader having cutting-edges aligning with and forming a continuation of the cutting-edge of the cutter, and a bolt for holding the leader and cutter together, substantially as described.

399,596. MAGIC LANTERN. HENRY J. BROWER, Brooklyn, assignor to Thomas H. McAllister, New York, N. Y. Filed Sept. 27, 1887. Serial No. 250,908. (No model.)



Claim.—In a stereopticon, the general combination, with the lenses and burners, of metallic plates *c*, D, E, and F, having openings and grooves, substantially as shown, tubes A and B, on which the different plates are mounted, slip-tubes Q, Q', Q², Q³, and Q⁴, fitting on over tubes A and B and separating plates *c*, D, E, and F from each other, milled-head screws Z Z', fitting into tubes A and B, for holding the plates and tubes firmly together, post L, and sleeve M, for holding burner W in position, all substantially as and for the purpose set forth.

399,597. FISHING-FLY BOOK. THOMAS H. CHUBB, Post Mill Village, Vt. Filed Aug. 31, 1888. Serial No. 284,266. (No model.)



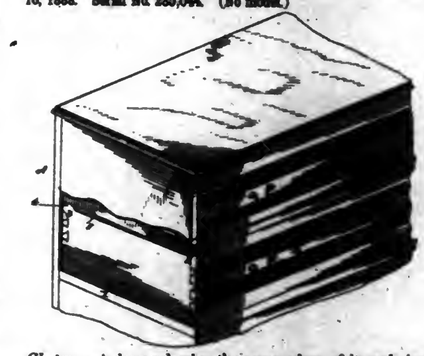
Claim.—1. The herein-described fly-hook-securing device, consisting of the combination, with the card or leaf having means for retaining the hooks, of the coiled-spring retaining-fingers having the end of the coil standing out at substantially right angles to the surface of said card, and the base of the coil secured to the card.

2. The combination, with the card or leaf, of the two coiled-spring fingers passing through the card secured thereto and projecting from opposite sides of the same.

3. The combination, with the card or leaf, of the strip B, having the raised sockets *b*, for holding the points of the fly-hooks, and the eyelets having the corresponding coiled-spring fingers, *c*, operating toward the face of the card for retaining the snells, substantially as set forth.

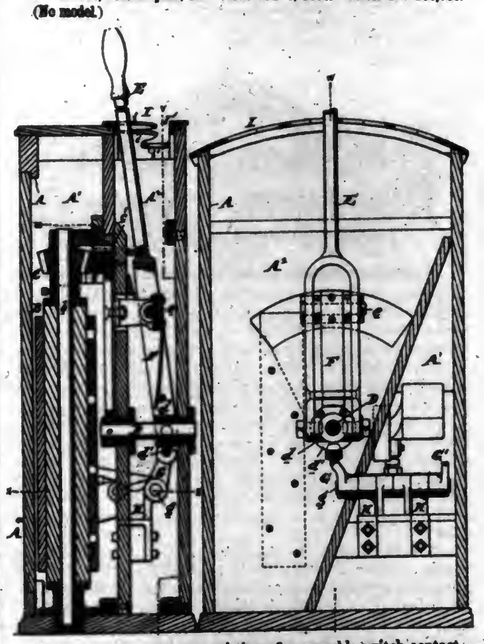
4. The combination, with the card or leaf having suitable means for holding the free ends of the snells, of the strip B, having raised sockets *b*, for holding the points of the hooks, and spaces or recesses intermediate between said sockets.

399,598. FURNITURE-DRAWER. DWIGHT C. CLAFF, Owosso, Mich., assignor of one-half to David M. Estey, same place. Filed Sept. 10, 1888. Serial No. 285,044. (No model.)



Claim.—A drawer having the upper edges of its ends inclined from the front to the back, and having upwardly-projecting shoulders on the inclined edges, the height of which is equal to the highest point of the inclined edge, substantially as described.

399,599. REGULATOR FOR ELECTRICAL MACHINERY. GEORGE H. CONDICT, Philadelphia, Pa. Filed Oct. 1, 1888. Serial No. 286,906. (No model.)



Claim.—1. A regulator consisting of a movable switch contact-surface for varying the current supplied, in combination with a hand-lever movable in one direction to move said contact-surface and movable transversely thereto to make and break the electric circuit, and a circuit maker and breaker controlled thereby.

2. A regulator consisting of a movable switch contact-surface for varying the current supplied, in combination with a hand-lever movable in one direction to move said contact-surface and movable transversely thereto to make and break the electric circuit, a circuit maker and breaker controlled thereby, and a notched plate for said lever to hold it in position when moved to shift the contact-surface a given distance.

3. A regulator consisting of a movable switch contact-surface for varying the current supplied, in combination with a hand-lever movable in one direction to move said contact-surface and movable transversely thereto to make and break the electric circuit, a circuit maker and breaker controlled thereby, a notched plate for said lever to hold it in position when moved to shift the contact-surface a given distance, and a spring to press said lever normally into the notches.

4. In a regulator, the combination of a moving contact-surface for coupling up circuits in different orders and varying the current, a hand-lever movable on a horizontal axis to shift the contact-surface and movable on a second axis transverse thereto to make or break the circuit, a spring-actuated circuit maker and breaker in the regulator-circuit, and connecting devices, substantially as set out, for operating said circuit maker and breaker by the movement of the hand-lever on the transverse axis.

5. In a regulator, the combination of a source of electrical energy, electric-motor coils, a moving contact-surface for coupling up motor-coil circuits in different order and varying the current, a hand-lever movable on a horizontal axis to shift the contact-surface and movable on a second axis transverse thereto to make or break the circuit, a spring-actuated circuit maker and breaker in the regulator-circuit, and connecting devices, substantially as set out, for operating said circuit maker and breaker by the movement of the hand-lever on the transverse axis.

6. In a regulator, the combination of a rotary contact-surface for coupling up circuits in different orders and varying the current, a hand-lever movable on a horizontal axis to shift the contact-surface and movable on a second axis transverse thereto to make or break the circuit, gearing between said hand-lever and rotary contact-surface to rotate the latter by a reciprocation of the former, a spring-actuated circuit maker and breaker in the regulator-circuit, and connecting devices, substantially as set out, for operating said circuit maker and breaker by the movement of the hand-lever on the transverse axis.

7. In a regulator, an operating handle or lever movable in two lateral directions with reference to its length, and in which said movements are transverse with respect to each other, a current-regulator operated by said handle or lever when moved in one direction, and a circuit-interrupter operated by the handle or lever when moved in the other direction.

8. In a regulator, an operating handle or lever movable in two lateral directions with reference to its length, and in which said movements are transverse with respect to each other, and a guide having a continuous slot with lateral notches therefrom, in which said handle or lever moves, a current-regulator operated by said handle or lever when moved in one direction, and a circuit-interrupter operated by the handle or lever when moved in the other direction.

9. In a regulator, an operating handle or lever movable in two lateral directions with reference to its length, in which said movements are transverse with respect to each other, a guide having a continuous slot with lateral notches therefrom, in which said handle or lever moves, and a spring to force said handle or lever into the notches, a current-regulator operated by said handle or lever when moved in one direction, and a circuit-interrupter operated by the handle or lever when moved in the other direction.

10. In a regulator the combination of the handle or lever movable laterally in two directions, with the guide I, having continuous slot I', and notches *i i'*, opening laterally therefrom, a current-regulator operated by said handle or lever when moved in one direction, and a circuit-interrupter operated by the handle or lever when moved in the other direction.

11. In a regulator, a switch for varying the resistance offered to the line-current, a line-circuit, a circuit-breaker in said line-circuit, and a spring to assist the circuit-breaker in opening and make it move quickly.

12. In a regulator, a switch for varying the resistance offered to the line-current, a line-circuit, a pivoted circuit-breaker in said line-circuit, a spring to assist the circuit-breaker in opening or closing and make it move quickly, a lever for moving one end of the spring up or down above the pivot-point of the circuit-breaker, a hand-lever for moving the resistance-varying switch, and also the lever for moving the spring.

13. In a regulator, the combination of a switch for varying the current flowing through the line, a line-circuit, a circuit-breaker in the line-circuit, a switch-operating lever movable in two directions, a mechanical connection between the lever and current-varying switch, whereby said switch is operated by a movement of said lever in one direction, and a mechanical connection between the lever and circuit-breaker, whereby the circuit-breaker is operated by the other movement of the switch.

14. In a regulator, the combination of a switch for varying the current flowing through the line, a line-circuit, a circuit-breaker for the line-circuit, a single lever movable in two directions, a power-transmitting connection between the lever and current-varying switch, whereby the latter is operated for one movement of the lever, a second power-transmitting connection between the lever and circuit-breaker, whereby the latter is operated for the other movement of the lever, and a guide to prevent two successive movements of the regulator-switch without first moving the lever to operate the circuit-breaker.

15. In a regulator, the combination of a switch for varying the current flowing through the line, a line-circuit, a spring-actuated circuit-breaker for the line-circuit, a single lever movable in two directions, a power-transmitting connection between the lever and current-varying switch, whereby the latter is operated for one movement of the lever, a second power-transmitting connection between the lever and spring of the circuit-breaker, whereby the latter is operated for the other movement of the lever, and a guide to prevent two successive movements of the regulator-switch without first moving the lever to operate the circuit-breaker.

16. In a regulator, a line-circuit, in combination with a switch for varying the current flowing through the line, and a circuit-breaker in the line consisting of a cup holding mercury, a vertically-reciprocating frame, and a removable contact-rod.

17. In a regulator, a line-circuit, in combination with a switch for varying the current flowing through the line, a circuit-breaker in the line consisting of a cup holding mercury, a vertically-reciprocating frame, a removable contact-rod, and a counter-weight to counterbalance the weight of the contact rod and frame.

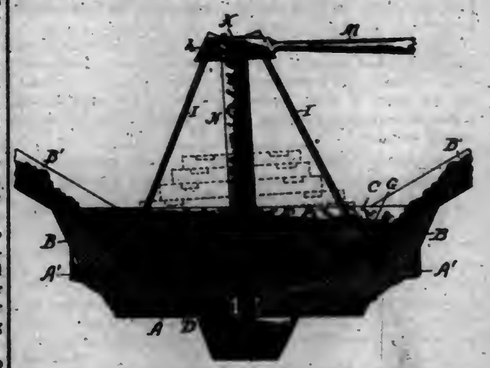
18. The combination of a source of electric supply, a line-circuit, an electric motor in said line-circuit, a current-regulator, and a circuit-breaker in series in said line-circuit and exterior to said motor, and a resistance-shunt connecting the line-circuit on each side of the circuit-breaker.

19. The combination of a source of electric supply, a line-circuit an electric motor in said line-circuit, a current-regulator, and a circuit-breaker in series in said line-circuit and exterior to said motor, a resistance-shunt connecting the line-circuit on each side of the circuit breaker, and a lever to operate the current-regulator or circuit-breaker alternately, but not both at the same time.

20. In a regulator, the combination of a rotary barrel-switch for varying the flow of current in the line, a small pinion on said switch, a segmental rack of great radius meshing with said pinion, and a hand-lever for operating said rack pivoted on an axis at right angles to the barrel of the switch.

21. In a regulator, an operating handle or lever movable in two lateral directions with reference to its length, and in which said movements are transverse with respect to each other, and a series of guide-notches made V-shaped, in which the handle or lever moves and whereby it cannot catch in approaching them, and a spring to force said lever or handle into the notches, a current-regulator operated by said handle or lever when moved in one direction, and a circuit-interrupter operated by the handle or lever when moved in the other direction.

399,600. ORE-CRUSHER. JOHN D. COPLAN, Denver, Colo. Filed Aug. 1, 1887. Serial No. 245,704. (No model.)



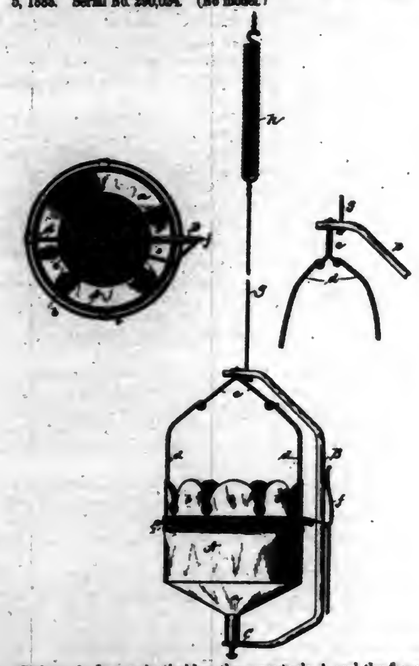
Claim.—1. The combination of a concave bed having sides formed with vertical slots directly over the lowest point of said bed, a heavy or weighted muller having a convex face and guide or stay pins located on its sides at points near the convex face opposite the middle of the curve, and a rocking frame for connection with a prime motor, substantially as described.

2. The combination of a concave bed having pulp-discharge holes through the bottom, and having sides formed with vertical slots over the lowest point of such bed, a heavy or weighted muller having a convex face and provided with guide or stay pins located at the sides opposite the middle of its curve and near its convex face, and a rock-

ing frame for connection with a prime motor, substantially as described.

3. The combination of a concave bed having sides provided with vertical slots over the lowest point of said bed, a heavy or weighted muller having a convex face and vertically-adjustable guide or stay pins located at the sides at points near the convex face and the middle of the curve, and a frame for rocking the muller, substantially as described.

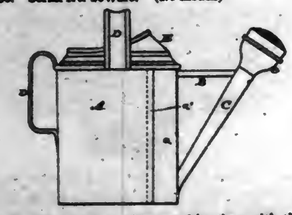
399,601. TWINE-HOLDER. ISAAC DAVIS, Oil City, Pa. Filed Nov. 5, 1888. Serial No. 290,024. (No model.)



Claim.—1. In a twine holder, the receptacle A and the frame B, in which the same is pivoted, in combination with the spring-rods *d*, connected to the receptacle, and the cord *e*, connected to spring-rods and to the frame, substantially as described, whereby the turning of the receptacle in paying out the twine will twist the holding-cord to produce a tension therein, to revolve the receptacle in a reverse direction to wind the twine upon the periphery of the holder, as set forth.

2. In a twine-holder, the combination of the receptacle A, the frame B, in which the same is pivoted, the spring-rods *d*, connected to the receptacle, and the cord connected to the rods and to the frame, and the railing or guide *i*, consisting of a rim projecting out and around the receptacle, and hook *f*, substantially as shown, and for the purpose set forth.

399,602. WATERING-POT. WILLIAM DIXON, Newark, N. J., assignor to the Iron Clad Manufacturing Company, New York, N. Y. Filed Jan. 24, 1889. Serial No. 297,418. (No model.)



Claim.—1. In a watering-pot, the combination, with the cylinder or body, of a spout, web, and supporting-base formed separately from and adapted to be applied and secured as one integral structure to said body, substantially as and for the purposes hereinbefore set forth.

2. In a watering-pot, the combination, with the cylinder or body, of a spout, web, and supporting-base formed from one continuous piece of sheet metal, separately from and adapted to be applied and secured as one integral structure to said body, substantially as and for the purposes hereinbefore set forth.

3. In a watering-pot, the combination, with the cylinder or body, of a spout, web, and supporting-base, constituting one integral structure, formed separately from and adapted to be applied to said body, said elements being formed or provided with guides, whereby the base, when applied to the body, is guided to and assured in place, substantially as and for the purposes hereinbefore set forth.

4. In a watering-pot, a spout, web, and supporting-base, separately formed and constituting a single integral structure, substantially as and for the purposes hereinbefore set forth.

399,603. JEWELRY-CASE. CHARLES F. DOMANN, Lake View, assignor to William Roetz, Chicago, Ill. Filed Aug. 21, 1888. Serial No. 283,384. (No model.)

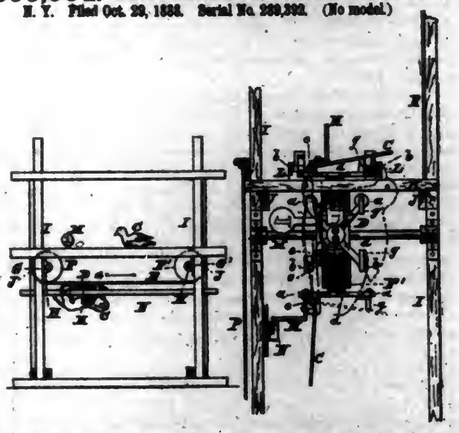


Claim.—1. A jewelry-case composed of base A and lids B and B', hinged thereto, and link-bars C and C', pivotally connected with each other and with the lids B B', substantially as set forth.

2. A jewelry-case composed of base A and lids B and B', hinged thereto, link-bars C C', pivotally connected with each other and with the lids B B', and cross-bar E, carrying frame F, all substantially as set forth.

3. A jewelry-case composed of base A and lids B and B', hinged thereto, link-bars C C', pivotally connected with each other and with the lids B B', cross-bar E, carrying frame F, and rods G, rigid with base A, for guiding frame F, all substantially as set forth.

399,604. TARGET. BERNHARD DUPPER and EMIL PREISNER, Buffalo, N. Y. Filed Oct. 22, 1888. Serial No. 289,292. (No model.)



Claim.—1. In shooting-galleries, a target-figure pivoted to a suitable carrier, in combination with an auxiliary target affixed to the main target at approximately a right angle to the face of the main target, whereby the latter, when hit by a bullet, will be knocked down and thereby exhibit the auxiliary target automatically, as and for the object set forth.

2. A compound target consisting of a main target pivoted to a suitable carrier, with the axis of the target in a horizontal line across the line of firing, and an auxiliary target affixed to the main target at approximately a right angle, whereby the latter in disappearing automatically exhibits the auxiliary target, as and for the purpose stated.

3. In compound targets, a main target pivoted to a suitable carrier, with the axis of the target in a horizontal line across the line of firing, in combination with an auxiliary target affixed to the main target at approximately a right angle, the carrier being moved by suitable mechanism for moving-target practice, as and for the purpose set forth.

4. In shooting-galleries, the combination, with an endless belt revolving around two pulleys with shafts the axes of which are in horizontal planes, of a series of carriages, each having a pivoted target adapted to be knocked down when struck by a bullet, said targets being provided with laterally-projecting portions supporting the targets upon a suitable rail while traveling with the lower horizontal line of said belt, in a manner as and for the object set forth.

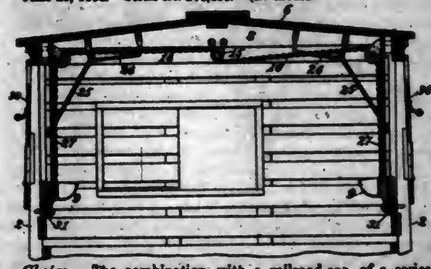
5. In shooting-galleries, the combination, with the belt, of a carriage consisting of an X-shaped frame, D, the four extremities of which engage guides L L, as described, said frame D having upon its upper face lugs *c*, engaging a bar, *f*, affixed to the target proper, and further lugs *g*, carrying said target free of the rear rail, L, after being knocked down, the whole being moved by suitable mechanism, as and for the purpose set forth.

6. In shooting-galleries, the combination, with the movable-target figures C, having auxiliary targets M affixed at approximately a right angle to the face of the said movable-target figures, as described, of the supporting-bar N, arranged parallel with the lower line of the belt, the driving-pulleys with their shafts, and suitable operating mechanism, substantially as and for the purpose set forth.

7. The combination, with a suitable frame, of the two horizontally-revolving shafts G G', carrying the pulleys F F', and the belt E, stretched over said pulleys and carrying upon its flat side a series of carriages, D, provided with targets C, the carriages being arranged to move in guides L L when upon the upper plane of the belt, and supported upon the rail N by the auxiliary targets M when upon the lower plane, said auxiliary targets being placed at approximately a right angle to the face of the target proper and sliding upon said supporting-bar N, as and for the object stated.

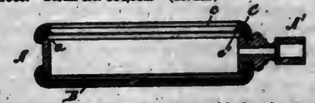
8. The carriage D, consisting of an X-shaped body having its forward members provided with guide-wheels *a* and upwardly-projecting lug *g*, and its rear members provided with laterally-projecting slides *b*, one of which is also fitted with an upwardly-pointing lug, *g*, the lugs *c*, bar *f*, and bolt *e*, the whole being arranged upon an endless belt driven by suitable mechanism for target practice, as and for the object stated.

399,605. STOCK-CAR. JAMES P. ELDER, Philadelphia, Pa. Filed June 25, 1888. Serial No. 278,158. (No model.)



Claim.—The combination, with a railroad-car, of a series of transverse guide-rods secured to the roof-framing, a series of vertical guide-rods secured to the side framing, a lower hay-rack-frame rod or bar fitting freely and without connection thereto and adapted to traverse vertically between the vertical guide-rods and side framing, an upper hay-rack-frame rod or bar fitting freely upon the transverse guide-bars, and rods or bars connecting the upper and lower hay-rack-frame bars, substantially as set forth.

399,606. WATCH-CASE. CHARLES E. GILBY, Chicago, Ill. Filed Dec. 3, 1888. Serial No. 294,532. (Model.)



Claim.—In a watch-case, the plain wide band or case-body A, externally threaded at each edge and provided with a pendant, A', and an internal seat, *a*, at its front edge, in combination with a back cap, B, provided with an internally-threaded flange projecting beyond the periphery of said body, and a bezel, C, provided with a like internally-threaded projecting flange and an inwardly-projecting flange extending inward over the seat *a* of the body, substantially as specified.

399,607. METHOD OF MANUFACTURING HEELS. CHARLES W. GILDOM, Lynn, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed June 26, 1888. Serial No. 278,143. (No model.)



Claim.—1. In the art or method of manufacturing heels, piling the lifts in a pile and forming in the same a U-shaped wedge-like opening, thereby stretching or expanding the heel to pitch or incline the same, substantially as described.

2. In the art or method of manufacturing heels, piling the lifts in a pile and forming in the same a U-shaped wedge-like opening, thereby stretching or expanding the heel to pitch or incline the same, and then filling the said cut with a filling to prevent the contraction of the heel, substantially as described.

399,608. HEEL-CUTTING DIE. CHARLES W. GILDOM, Lynn, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed June 29, 1888. Serial No. 278,560. (No model.)

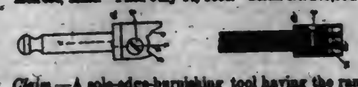


Claim.—1. The mold F, combined with the die having a cutter-blade beveled at its outer side and acting, when forced into the heel, to force outwardly, as described, the substance of the heel outside the blade to give to the heel at its rear the desired bevel or pitch, substantially as described.

2. The die having a cutter-blade beveled at its outer side and acting, when forced into the heel, to force outwardly, as described, the substance of the heel outside the blade to give to the heel at its rear the desired bevel or pitch, and the convex-faced follower, substantially as described.

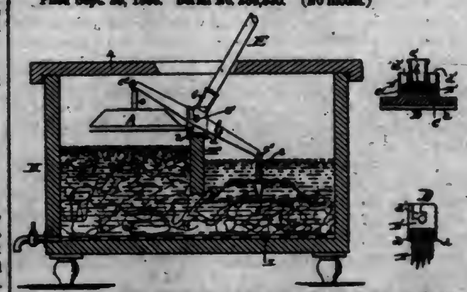
3. The die having a cutter-blade beveled at its outer side and acting, when forced into the heel, to force outwardly, as described, the substance of the heel outside the blade to give to the heel at its rear the desired bevel or pitch, and the center block and presser-pin to operate substantially as described.

399,609. SOLE-EDGE-BURNISHING TOOL. WILLIAM GORDON, Melrose, Mass. Filed July 14, 1888. Serial No. 279,984. (No model.)



Claim.—A sole-edge-burnishing tool having the rand-lip 3, sole-edge-burnishing face 2, and lip or rest 4, and divided across said lips and face into two or more sections, which are rigidly but detachably connected, and are rounded along their meeting edges to form a groove, *a*, extending across the burnishing face and lips of the tool, as set forth.

399,610. WASHING-MACHINE. WILLIAM H. GOSS, Yonkers, N. Y. Filed Sept. 25, 1886. Serial No. 296,235. (No model.)



Claim.—The combination of the tank, the transverse partition therein, and the casting D, having slotted upstanding lugs D', mounted on said partition, with the lever C, having trunnions engaging the slots in lugs D', and the compressors mounted on the ends of said lever at opposite sides of the partition, substantially as and for the purpose specified.

399,611. MANUFACTURE OF IRON. ABRAHAM T. HAY, Burlington, Iowa. Filed Sept. 27, 1888. Serial No. 286,032. (No specimens.)

Claim.—A ferruginous sponge containing iron, an alkali, and a metal isomorphous with iron and thermo-electric relative thereto, substantially as set forth.

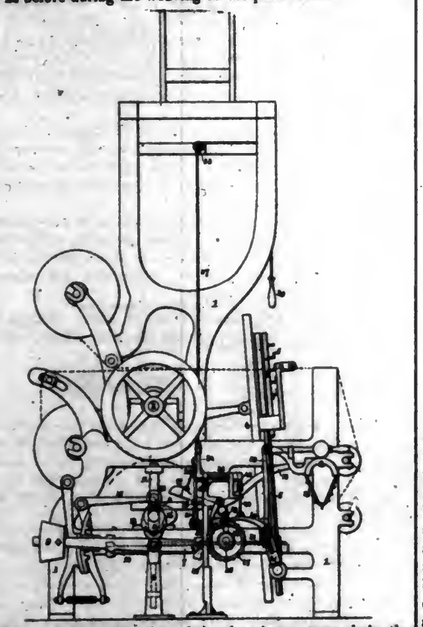
399,612. MANUFACTURE OF STEEL. ABRAHAM T. HAY, Burlington, Iowa. Filed Oct. 3, 1888. Serial No. 287,076. (No specimens.)

Claim.—The herein-described method of manufacturing steel,

consisting in desiliconizing and wholly or partially decarburizing the metal, as in a Bessemer converter or open-hearth furnace, and fining and alloying the molten steel by adding thereto a ferruginous alkaline sponge, substantially as set forth.

399,613. SHUTTLE-BOX PATTERN MECHANISM FOR LOOMS FOR WEAVING FABRICS HAVING END BORDERS. FRANK HERDIS, Philadelphia, Pa. Filed Jan. 23, 1888. Serial No. 261,500. (No model.)

Brief.—At the time of completion of the weaving of the plain fabric the retainer, which holds the movable part of the pattern mechanism out of operative position, is tripped by the tripping-toe, and thereby the pattern mechanism proper is allowed to operate, and the boxes are shifted to permit of the weaving of the fancy border. At the same time the pawl, which actuates the tripping-toe mechanism, is placed in inoperative position. When the border is completed, the loom is stopped, as by the picking in of an empty shuttle, and the retainer is then placed in its former position by hand, thus throwing out of action the shuttle-box mechanism and once more throwing into action the tripping-toe mechanism, which proceeds to operate as before during the weaving of the plain fabric.



Claim.—1. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripper for said retainer, and mechanism for actuating said tripper, all substantially as specified.

2. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, and a tripping device for said retainer, comprising a shaft having a tripping-toe and worm-wheel, another shaft having a worm and ratchet wheel, and means for operating said ratchet-wheel, all substantially as specified.

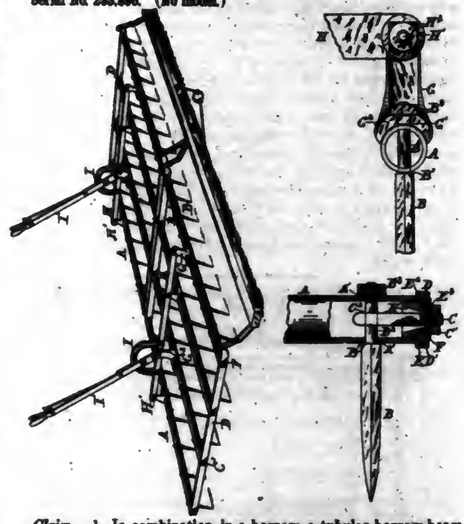
3. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe for said retainer, operating-gearing for said toe having a ratchet-wheel, a pawl for operating said ratchet-wheel, means for actuating the pawl, and a connection between said pawl and the retainer, whereby the pawl is thrown out of action on the release of the retainer, all substantially as specified.

4. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, a bar, 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe for said retainer, the pawl and ratchet and intervening gearing for operating said toe, and a rock-shaft having two arms, one connected to the pawl and the other to the retainer and to the movable arm of the bar 18, all substantially as specified.

5. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe, an operating-shaft therefor having a driving-pin adapted to a slot of greater width than the pin, and means for driving said shaft, all substantially as specified.

6. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe, an operating-shaft therefor having a worm-wheel, a driving-shaft having a worm and ratchet wheel, means for operating said ratchet-wheel, a bracket carrying said driving-shaft, and means for adjusting said bracket, whereby worm-wheels of different diameters may be used, all substantially as specified.

399,614. HARROW. SIMON P. HENDRICKS, Rockford, Ill., assignor to the Skandia Plow Company, same place. Filed Dec. 17, 1888. Serial No. 293,896. (No model.)



Claim.—1. In combination, in a harrow, a tubular harrow-beam provided with transverse holes A', extending therethrough, for admitting harrow-teeth, an end cross-beam having transverse openings D' therein, the combined double bushing and washer E, the bushing E' thereof being inserted into the end of the tubular harrow-beam, the bushing E' extending through the opening D' in the end cross-beam, and the washer E² embraced between the end of the harrow-beam and an end cross-beam, an eyebolt threaded to receive a nut, having an eye, C², and being inserted through the end cross-beam and combined double bushing and washer E, a harrow-tooth threaded to receive a nut inserted through one of the holes A' in the harrow-beam and the eye C² in the eyebolt, and nuts for securing all of said parts operatively together, substantially as described, and for the purpose specified.

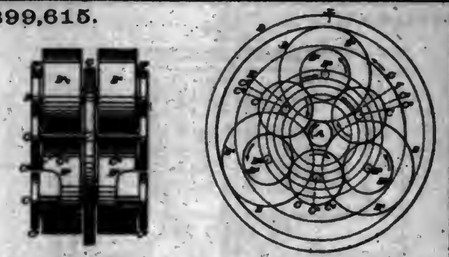
2. In combination, a harrow-beam provided with transverse holes A', extending therethrough, for admitting harrow-teeth, a harrow-tooth having a horizontal shoulder thereon and cylindrical portion B², adapted to be inserted through the holes A' in said beam and threaded to receive a nut, an adjusting-standard having a vertical hole, G', extending through the foot G² thereof to admit said tooth therethrough, and a nut, B³, for securing said tooth into and said standard upon said harrow-beam, substantially as set forth.

3. In combination, the harrow-beams A, provided with transverse holes A', extending therethrough, the end cross-beams, D, having transverse openings D' therein, the combined double bushings E, inserted into the ends of the harrow-beams A and through the end cross-beams, D, the washers F, the eyebolts C, the teeth B, inserted through the harrow-beams A and eyes C² in the eyebolts C, the standards G, the adjusting-beams H, the bolts H', and nuts B³, C', and H², for securing said parts operatively together, substantially as described, and for the purpose set forth.

399,615. ROLLER-BEARING. REUBEN W. HUNT, San Francisco, Cal. Filed Apr. 13, 1888. Serial No. 270,567. (No model.)

Claim.—1. In a roller-bearing, the combination of a series of bearing-rollers bearing directly on the central journal and the bearing-casing, a series of separating-rollers to keep the bearing-rollers separate from each other, bearing neither on the shaft nor casing, but on the bearing-rollers, and a ring bearing at its periphery on journals of the bearing-rollers, and at its inner side on journals of the separating-rollers, the bearing-rollers having journals of smaller diameter than the bearing-rollers and adapted to bear only on journals of the separating-rollers, and the latter journals being adapted to bear only on the last-mentioned journals of the bearing-rollers, all substantially as and for the purposes set forth.

399,615.



rollers, and the latter journals being adapted to bear only on the last-mentioned journals of the bearing-rollers, all substantially as and for the purposes set forth.

2. In a roller-bearing, the combination, with a ring, E, of a series of rollers, B, consisting of journals B', bearing directly on the shaft A, and the casing D, of journals B², rotating in contact with the periphery of the ring E, and of journals B', of smaller diameter than the journals B', and a series of rollers, C, consisting of journals C', adapted to bear only on the journals B², adapted to bear only on the journals C², and of journals C', rotating in contact with the inner side of the ring E, all substantially as shown and described, and for the purposes set forth.

3. A roller-bearing comprising the central journal, the bearing-casing, a ring, E, coaxial with the central journal, a series of bearing-rollers bearing directly on the central journal and the bearing-casing and having journals rotating in contact with the periphery of the ring E, and journals smaller than the bearing-rollers and bearing only on a series of separating-rollers keeping the bearing-rollers separate from each other, and said series of separating-rollers bearing on said smaller journals, but on no other parts of the bearing-rollers, nor on the shaft nor casing, and having journals rotating in contact with the inner side of the ring E, all constructed, arranged, combined, and adapted to operate substantially as and for the purposes set forth.

4. A roller-bearing comprising the shaft A, the casing D, the ring E, the series of rollers B, consisting each of two journals, B', bearing directly on the shaft A and casing D, of a journal, B², located between the journals B' and rotating in contact with the periphery of the ring E, and of two journals, B', of smaller diameter than the journals B' and located one at the outer end of each journal B' and bearing only on the journals C', each journal B² on and between two journals C', and the series of rollers C, consisting each of two journals C², bearing only on the journals B', each journal C² on and between two journals B', and of a journal, C', located between the journals C² and rotating in contact with the inner side of the ring E, all constructed, arranged, combined, and adapted to operate substantially as shown and described, and for the purposes set forth.

5. In a roller-bearing, the combination of a series of bearing-rollers bearing directly on the central journal and the bearing-casing, a series of separating-rollers to keep the bearing-rollers separate from each other, bearing neither on the shaft nor casing, but on the bearing-rollers, a ring bearing at its periphery on journals of the bearing-rollers, and at its inner side on journals of the separating-rollers, and a ring bearing at its periphery on journals of the separating-rollers, the bearing-rollers having journals of smaller diameter than the bearing-rollers and adapted to bear only on journals of the separating-rollers, and the latter journals being adapted to bear only on the last-mentioned journals of the bearing-rollers, all substantially as and for the purposes set forth.

6. In a roller-bearing, the combination, with rings E and F, of a series of rollers, B, consisting of journals B', bearing directly on the shaft A and the casing D, of journals B², rotating in contact with the periphery of the ring E, and of journals B', of smaller diameter than the journals B', and a series of rollers, C, consisting of journals C', adapted to bear only on the journals B², adapted to bear only on the journals C', and of journals C², rotating in contact with the inner side of the ring E, and the periphery of the ring F, all substantially as shown and described, and for the purposes set forth.

7. A roller-bearing comprising the central journal, the bearing-casing, two rings, E and F, coaxial with the central journal and of different diameters, a series of bearing-rollers bearing directly on the central journal and the bearing-casing, and having journals rotating in contact with the periphery of the larger ring, E, and journals smaller than the bearing-rollers and bearing only on a series of separating-rollers, keeping the bearing-rollers separate from each other, and said series of separating-rollers bearing on said smaller journals, but on no other parts of the bearing-rollers, nor on the shaft nor casing, and having journals rotating in contact with the inner side of said larger ring, E, and in contact with the periphery of the smaller ring, F, all constructed, arranged, combined, and adapted to operate substantially as and for the purposes set forth.

8. A roller-bearing comprising the shaft A, the casing D, the rings E and F, the series of rollers B, consisting each of two journals, B', bearing directly on the shaft A and casing D, of a journal, B², located between the journals B' and rotating in contact with the periphery of the ring E, and of two journals, B', of smaller diameter than the journals B' and located one at the outer end of each journal B' and bearing only on the journals C', each journal B² on and between two journals C', and the series of rollers C, consisting each of two journals C², bearing only on the journals B', each journal C² on and between two journals B', and of a journal, C', located between the journals C² and rotating in contact with the inner side of the ring E and the periphery of the ring F, all constructed, arranged, combined, and adapted to operate substantially as shown and described, and for the purposes set forth.

9. In a roller-bearing, the combination of a series of bearing-rollers bearing directly on the central journal and the bearing-casing, a series of separating-rollers to keep the bearing-rollers separate from each other, bearing neither on the shaft nor casing, but on the bearing-rollers, a ring bearing at its periphery on journals of the bearing-rollers, and at its inner side on journals of the separating-rollers, and a ring bearing at its inner side on journals of the bearing-rollers, the bearing-rollers having journals of smaller diameter than the bearing-rollers and adapted to bear only on journals of the separating-rollers, and the latter journals being adapted to bear only on the last-mentioned journals of the bearing-rollers, all substantially as and for the purposes set forth.

10. In a roller-bearing, the combination, with rings E and G, of a series of rollers, B, consisting of journals B', bearing directly on the shaft A and the casing D, of journals B², rotating in contact with the periphery of the ring E, and the inner side of the ring G and of journals B', of smaller diameter than the journals B', and a series of rollers, C, consisting of journals C', adapted to bear only on the journals B², adapted to bear only on the journals C², and of journals C', rotating in contact with the inner side of the ring E, all substantially as shown and described, and for the purposes set forth.

11. A roller-bearing comprising the central journal, the bearing-casing, two rings, E and G, coaxial with the central journal and of different diameters, a series of bearing-rollers bearing directly on the central journal and the bearing-casing, and having journals rotating in contact with the periphery of the smaller ring, E, and in contact with the inner side of the larger ring, G, and journals smaller than the bearing-rollers, and bearing only on a series of separating-rollers keeping the bearing-rollers separate from each other, and said series of separating-rollers bearing on said smaller journals, but on no other parts of the bearing-rollers, nor on the shaft nor casing, and having journals rotating in contact with the inner side of said smaller ring, E, all constructed, arranged, combined, and adapted to operate substantially as and for the purposes set forth.

12. A roller-bearing comprising the shaft A, the casing D, the rings E and G, the series of rollers B, consisting each of two journals, B', bearing directly on the shaft A and casing D, of a journal, B², located between the journals B' and rotating in contact with the periphery of the ring E and the inner side of the ring G, and of two journals, B', of smaller diameter than the journals B', and located one at the outer end of each journal B', and bearing only on the journals C', each journal B² on and between two journals C', and the series of rollers C, consisting each of two journals C², bearing only on the journals B², each journal C² on and between two journals B², and of a journal, C', located between the journals C² and rotating in contact with the inner side of the ring E, all constructed, arranged, combined, and adapted to operate substantially as shown and described, and for the purposes set forth.

13. In a roller-bearing, the combination of a series of bearing-rollers bearing directly on the central journal and the bearing-casing, a series of separating-rollers to keep the bearing-rollers separate from each other, bearing neither on the shaft nor casing, but on the bearing-rollers, a ring bearing at its periphery on journals of the bearing-rollers and at its inner side on journals of the separating-rollers, a ring bearing at its periphery on journals of the separating-rollers, and a ring bearing at its inner side on journals of the bearing-rollers, the bearing-rollers having journals of smaller diameter than the bearing-rollers and adapted to bear only on journals of the separating-rollers, and the latter journals being adapted to bear only on the last-mentioned journals of the bearing-rollers, all substantially as and for the purposes set forth.

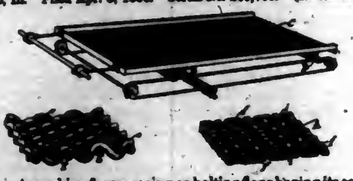
14. In a roller-bearing, the combination, with rings E, F, and G, of a series of rollers, B, consisting of journals B', bearing directly on the shaft A and the casing D, of journals B², rotating in contact with the periphery of the ring E and the inner side of the ring G, and of journals B', of smaller diameter than the journals B', and a series of rollers, C, consisting of journals C², adapted to bear only on the journals B², and of journals C', rotating in contact with the inner side of the ring E and the periphery

of the ring F, all substantially as shown and described, and for the purposes set forth.

15. A roller-bearing comprising the central journal, the bearing-casing, three rings coaxial with the central journal and of different diameters, a series of bearing-rollers bearing directly on the central journal and the bearing-casing, and having journals rotating in contact with the periphery of the intermediate ring and with the inner side of the larger ring, and journals smaller than the bearing-rollers and bearing only on a series of separating-rollers keeping the bearing-rollers separate from each other, and said series of separating-rollers bearing on said smaller journals, but on no other parts of the bearing-rollers, nor on the shaft nor casing, and having journals rotating in contact with the inner side of said intermediate ring and with the periphery of the smaller ring, all constructed, arranged, combined, and adapted to operate substantially as and for the purposes set forth.

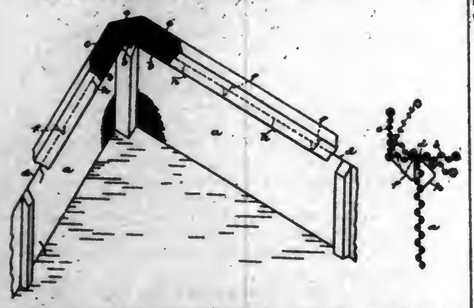
16. A roller-bearing comprising the shaft A, the casing D, the rings E, F, and G, the series of rollers B, consisting each of two journals, D', bearing directly on the shaft A and casing D, of a journal, B^2, located between the journals B' and rotating in contact with the periphery of the ring E and the inner side of the ring G, and of two journals, B^3, of smaller diameter than the journals B' and located one at the outer end of each journal B' and bearing only on the journals C^2, each journal B^2 on and between two journals C^2, and the series of rollers C, consisting each of two journals C^2, bearing only on the journals B^2, each journal C^2 on and between two journals B^2, and of a journal, C^3, located between the journals C^2 and rotating in contact with the inner side of the ring E and the periphery of the ring F, all constructed, arranged, combined, and adapted to operate substantially as shown and described, and for the purposes set forth.

399,616. SCREEN FOR BOLTING FLOUR. OLIVER P. HUMFORD, Chicago, Ill. Filed Apr. 5, 1888. Serial No. 269,700. (No model.)



Claim.—A machine for screening or bolting flour having its screening-surface composed of a flattened woven-wire fabric, substantially as and for the purposes set forth.

399,617. FENCE. HARRO IHSEN, Jersey City, N. J. Filed Apr. 16, 1888. Serial No. 270,786. (No model.)



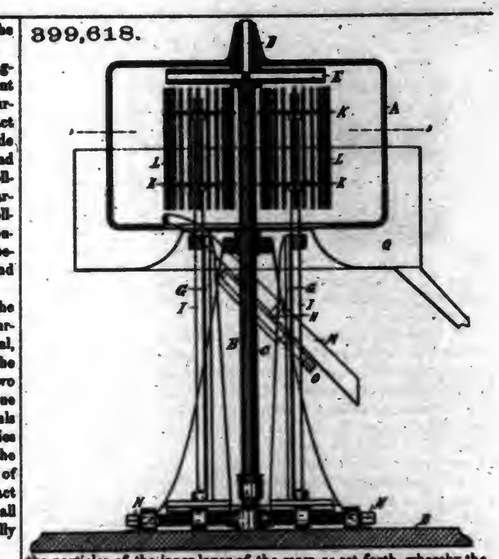
Claim.—1. The combination, with a fence, of a horizontally-arranged tilting cap or top plate and supports to maintain it normally in said position, said cap being hinged or pivoted thereto, so as to tilt downward one side and upward the other side of the fence, and slightly overbalanced for automatically returning to the normal position, substantially as described.

2. The combination, with a fence, of a tilting cap or top hinged or pivoted thereto and stops to maintain it normally in the horizontal position, said cap being slightly overbalanced and also having stops to limit the tilting action for automatically returning to the horizontal position, and said cap or top being constructed with an upwardly-projecting flange or angle-plate on the upwardly-tilting side, substantially as described.

399,618. METHOD OF EXTRACTING BUTTER-FAT FROM MILK. CARL A. JOHANSSON, Stockholm, Sweden. Filed Mar. 22, 1887. Serial No. 231,946. (No model.) Patented in England Mar. 15, 1888, No. 3,994.

Claim.—1. The improvement in the art of obtaining butter-fat from milk, which consists in subjecting the milk to centrifugal action in a rapidly-revolving drum and simultaneously therewith separating

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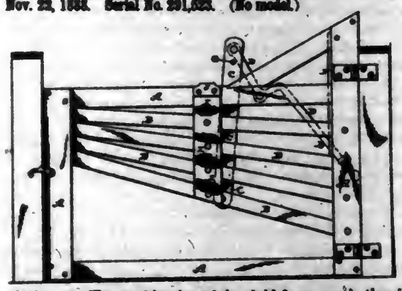


the particles of the inner layer of the mass, as set forth, whereby the blue milk within said layer is set free and is driven off by centrifugal force and the butter globules are allowed to coalesce.

2. The improvement in the art of obtaining butter-fat from milk, which consists in subjecting the milk to centrifugal action in a rapidly-revolving drum and simultaneously therewith separating the particles of the inner layer of the mass, as set forth, whereby the blue milk within such layer is set free and is driven off by centrifugal force and the butter globules are allowed to coalesce, continuously removing the blue milk and also continuously removing the butter as it sinks by gravity, substantially as specified.

3. The improvement in the art of obtaining butter-fat from milk, which consists in continuously feeding the milk into a rapidly-revolving drum in which it is submitted to centrifugal action, separating the particles of the inner layer of the mass within such drum, whereby the blue milk in such layer is set free and is driven off by centrifugal force and the butter globules are allowed to coalesce and sink by gravity, and continuously removing the blue milk and also continuously removing the butter from the drum, substantially as specified.

399,619. GATE. SAMUEL W. KEASLING, Rockwell, Ind. Filed Nov. 22, 1888. Serial No. 291,523. (No model.)



Claim.—1. The combination of the rigid frame-work, the pivoted bars, and the flexible connection fastened to the bars, whereby the bars are supported in a horizontal position, but are left free to move upward, substantially as described.

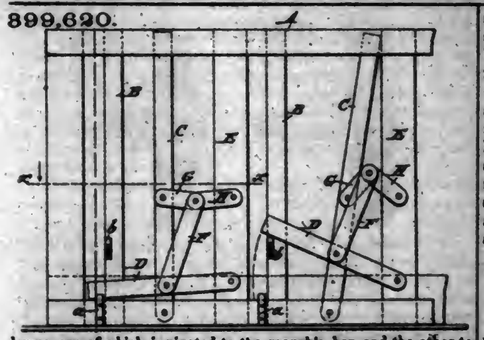
2. The combination of the rigid frame, the bars pivoted therein at one end, the lifting-rod connected to the lower bar, the operating-lever, and a device for locking the lever in position, substantially as set forth.

3. The combination of the rigid frame, the bars pivoted thereon at one end, the lifting-rod, the operating-lever, and the flexible connection for supporting the bars in a horizontal position, substantially as specified.

399,620. CATTLE-STANCHION. DAVID LANE, Hayt's Corners, N. Y. Filed Oct. 8, 1888. Serial No. 287,405. (No model.)

Claim.—1. In a self-fastening cattle-stanchion, the combination of the fixed stanchion-bar, the movable stanchion-bar pivoted at its lower end, the horizontal lever located transversely to said bars and in a position to be acted upon by the animal, the interpivoted short

399,620.

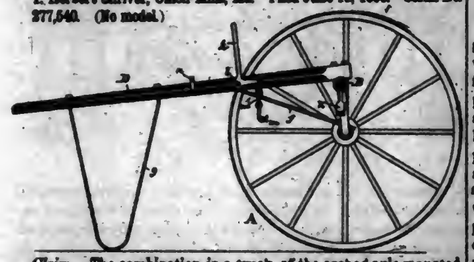


levers, one of which is pivoted to the movable bar and the other to the stationary frame, and the connecting-rod between the interpivoted levers and the horizontal lever, all arranged substantially as described.

2. In a self-fastening cattle-stanchion, the combination of the stationary post B, pivoted bar C, the lever D, located transversely to bars B and C, the interpivoted short levers G H, one of which is pivoted to the bar C and the other to the stationary frame, and the connecting-rod F between the interpivoted levers and the lever D, all arranged substantially as described.

3. The combination of the stationary bar B, having a lug *b*, the pivoted bar C, the pivoted lever D, located across the two bars B and C, the short levers G and H, lever F, pivoted at the junction of said levers and to the lever D, and the frame-work A, having the projecting pin *a*, all arranged substantially as described.

399,621. CANNING-HOUSE TRUCK. MARTIN J. LEARY, Westminster, Md., assignor of two-thirds to James Shriver, same place, and T. Herbert Shriver, Union Mills, Md. Filed June 19, 1888. Serial No. 277,540. (No model.)



Claim.—The combination, in a truck, of the arched axle mounted upon wheels, the tongue secured thereto, the hooks dependent from and longitudinally adjustable on said axle, the lever having a hook secured at one end, and the catch on the axle, whereby said lever is held when the crate is elevated, substantially as specified.

399,622. HOTEL-REGISTER. ARTHUR D. MACKEY, Lawrence, Kans., assignor to I. R. Mackey. Filed Mar. 26, 1888. Serial No. 268,558. (No model.)

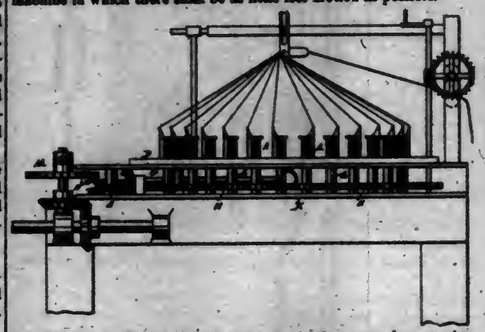


Claim.—1. A hotel-register comprising signature-sheets and blotter-sheets alternately arranged, the pages of the signature-sheets having horizontal printed signature-lines of words, and the spaces between said lines being serially numbered, the pages of the blotter-sheets having spaces formed by horizontal and vertical lines and the spaces serially numbered in duplicate to correspond with the numbered spaces of the signature-pages, all combined substantially as set forth.

2. A hotel-register comprising signature-sheets and blotter-sheets alternately arranged, the pages of the signature-sheets having horizontal printed signature-lines of words, and the spaces between the said lines being serially numbered, the pages of the blotter-sheets having spaces formed by horizontal and vertical lines, and the spaces serially numbered in duplicate to correspond with the numbered spaces of the signature-pages, the said signature-sheets and blotter-sheets being arranged in reverse order to each other, and combined as set forth, and for the purpose specified.

399,623. BRAIDING-MACHINE. WILHELM MUNDT, Brooklyn, assignor of two-thirds to Jacob Habermann and Rinka Ochs, both of New York, N. Y. Filed Aug. 27, 1888. Serial No. 283,260. (No model.)

Brief.—The object of the invention is to provide a braiding-machine in which there shall be as little lost motion as possible.



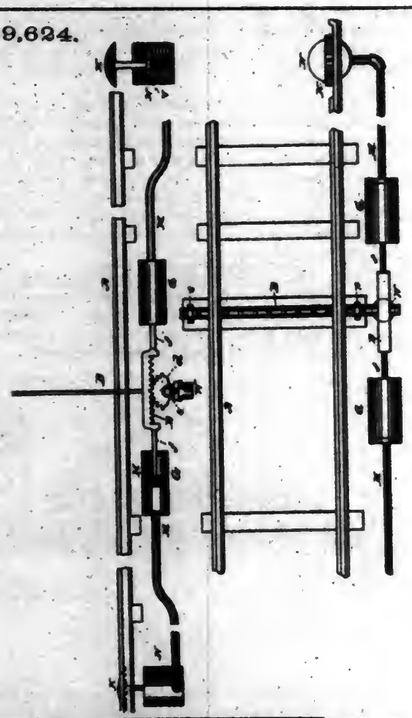
Claim.—1. The combination of plates having crossed serpentine guide-slots, spool-spindles movable in said guide-slots, wheels for conveying the spindles, a series of engaged cog-wheels disposed in a circle for operating the wheels that convey the spindles, vertical shafts disposed at different points within the circuit of engaged cog-wheels, actuating-gears on said shafts engaging certain of said cog-wheels, beveled gears on said shafts, a diametrical shaft provided with beveled pinions at its opposite ends for engaging two of said beveled wheels and with a beveled pinion near its center, a main actuating radial shaft, as O', provided with a pinion, O, at its outer end, which meshes with the transmitting mechanism of the driving-shaft, and with a pinion, as O^2, at its inner end, which meshes with the central pinion of said diametrical shaft, and an auxiliary actuating radial shaft, as T', provided with a beveled pinion, T, at its inner end, which also meshes with said central pinion of the diametrical shaft, and with a beveled pinion, as T^2, at its outer end, which meshes with one of the beveled gears on one of said vertical shafts, substantially as described.

2. The combination of plates having crossed serpentine guide-slots, spool-spindles movable in said guide-slots, wheels for conveying the spindles, a series of engaged cog-wheels disposed in a circle for operating the wheels that convey the spindles, vertical shafts disposed at different points within the circuit of engaged cog-wheels, actuating-gears on said shafts engaging certain of said cog-wheels, beveled gears on said shafts, a diametrical shaft provided with beveled pinions at its opposite ends for engaging two of said beveled wheels and with beveled pinions near its center, a main actuating radial shaft, as O', provided with a pinion, O, at its outer end, which meshes with the transmitting mechanism of the driving-shaft, and with a pinion, as O^2, at its inner end, which meshes with one of the central pinions of said diametrical shaft, an auxiliary actuating radial shaft, as T', provided with a beveled pinion, T, at its inner end, which also meshes with said central pinion of the diametrical shaft, and with a beveled pinion, as T^2, at its outer end, which meshes with one of the beveled gears on one of said vertical shafts, and a short shaft, as E', provided at its inner end with a second pinion, E, which meshes with the other central beveled pinion, and at its outer end with a beveled pinion, E^2, which meshes with the beveled gear on another of said vertical shafts, substantially as described.

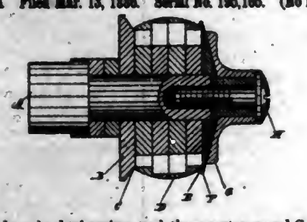
399,624. RAILROAD-GATE. JAMES W. HERRINGALL, Prairie Creek, Ind., assignor of one-half to Curtis G. Thomas, same place. Filed Dec. 3, 1888. Serial No. 292,496. (No model.)

Claim.—The pivoted railroad-gate having a segment-gear and weight secured to its pivotal portion, in combination with a reciprocating rack, a piston-rod and piston attached to the rack, a horizontal air-cylinder, an upright air-cylinder, pistons, and pressure-head rising above the track, and an air-pipe connecting the horizontal and upright cylinders, substantially as specified.

399,624.



399,625. TOOL FOR TRIMMING HEELS. OSCAR L. NOBLE, Boston, Mass. Filed Mar. 13, 1886. Serial No. 195,165. (No model.)



Claim.—In a heel-trimming tool, the counter-guard G and rand-guide F, in combination with the cutter D, the counter-guard and the rand-guide being in separate pieces and the counter-guard being loosely mounted on its journal, substantially as and for the purpose set forth.

399,626. WASHING-FLUID. SAMUEL L. PARAMORE, St. Louis, Mo., assignor to the Tower Manufacturing Company, same place. Filed Sept. 17, 1888. Serial No. 285,595. (Specimens.)

Claim.—1. A washing-liquid composed of an extract of black snakeroot, gentian root, bloodroot, Virginia snakeroot, ginseng, slippery-elm bark, Indian corn and oats, and a solution of common salt substantially in accordance with the formula as described.

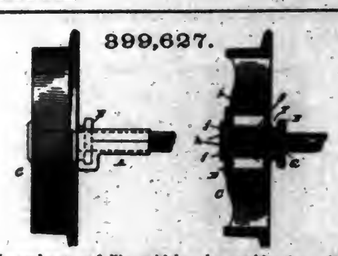
2. A washing-liquid composed of an extract of the following ingredients in about the following proportions: one pound of black snakeroot, one pound of gentian root, one pound of bloodroot, one pound of Virginia snakeroot, half a pound of ginseng, half a pound of slippery-elm bark, six pounds of Indian corn, three and a half pounds of oats, and half a pound of common salt in solution, substantially in accordance with the formula as described.

399,627. AXLE-LUBRICATOR FOR CARS. GEORGE W. PARKER, Terre Haute, Ind. Filed May 8, 1888. Serial No. 273,305. (No model.)

Claim.—1. In coal-cars and like vehicles, an axle-clamp or journal-bearing having at one end a raised collar and a groove, and provided with a central longitudinal opening and a lubricating-chamber, substantially as described.

2. In coal-cars or like vehicles, a wheel constructed with a central opening surrounded by a continuous oil chamber or reservoir communicating with such opening through outwardly-inclined apertures, the said wheel having the inner end of its hub constructed with a raised collar and continuous groove, substantially as described.

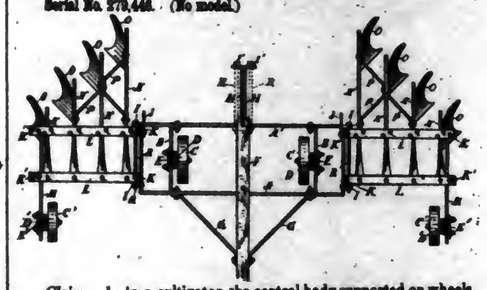
399,627.



3. In coal-cars and like vehicles, the combination, with an axle-clamp or journal-bearing constructed at one end with a raised collar and a groove and secured to the under side of the vehicle, of a wheel having the inner end of its hub constructed with a corresponding collar and groove, the collars and grooves of the two being adapted to fit each other, substantially in the manner shown and described.

4. In coal-cars and like vehicles, the combination, with an axle-clamp or journal-bearing constructed at one end with a collar and groove, of an axle having spiral grooves on opposite sides of its journal tending in an opposite direction to each other, and a wheel having a central opening for the journal surrounded by a continuous oil chamber or reservoir communicating with such opening through suitable apertures, the said wheel having the inner end of its hub constructed with a collar and groove corresponding to the clamp, substantially as described.

399,628. CULTIVATOR. JOSEPH A. PEARCE, Grand Rapids, Mich., assignor of one-half to Milo B. Stewart, same place. Filed July 9, 1888. Serial No. 279,442. (No model.)



Claim.—1. In a cultivator, the central body supported on wheels, in combination with wings hinged to either side of said body, and supporting-wheels for said wings placed in front of the cultivator-teeth and within the space covered by the cultivator, substantially as described.

2. In a cultivator, the central body, in combination with detachable wings, one on each side, said body provided with lugs and bolts for attaching the wings to said body, said wings adapted to be attached to the extreme outside of the body when cultivating at a distance from the center line of the body, and to be attached to the rear of the body in order to cultivate the space passed over by said central body, substantially as described.

3. The combination, with the body provided with the extremes H H and lugs I I and I' I', of the wings bearing the teeth O O O, &c., and provided with bolt-holes K K and K' K' and the bolts R R, said wings adapted to be attached to either side of the body at points most distant from the tongue and to the projections H H, substantially as described.

399,629. POLISHING-CYLINDER. JAMES L. PERRY, Watertown, assignor to the Berlin Machine Works, Beloit, Wis. Filed Oct. 25, 1887. Serial No. 253,304. (No model.)



Claim.—1. A polishing-cylinder having longitudinal concavities in its circumference, a series of radial arms that have their outer ends passed through the periphery of the cylinder to extend beyond said concavities, clamping-rods connected to said outer ends of the arms, and suitable means for actuating said arms to bring the clamping-rods in and out of contact with the polishing material on said cylinder, substantially as set forth.

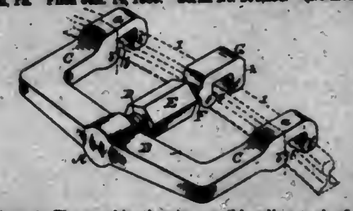
2. A polishing-cylinder having longitudinal concavities in its circumference, a shaft for the cylinder, radial arms eccentrically connected to the shaft, and having their outer ends passed through said cylinder to extend beyond the concavities therein, clamping-rods arranged on said ends of the arms, and suitable means for holding the cylinder stationary and actuating the shaft to bring the clamping-rods in or out of contact with the polishing material on said cylinder, substantially as set forth.

3. A polishing-cylinder having longitudinal concavities in its circumference, a shaft for the cylinder provided with a series of lugs, a series of radial arms having slotted inner ends arranged on the shaft and provided with grooves or sockets to engage the lugs thereon, the outer ends of said arms passed through the cylinder to extend beyond the concavities therein, clamping-rods arranged on said outer ends of the arms, and suitable means for holding the cylinder stationary and actuating the shaft to bring the clamping-rods in or out of contact with the polishing material on said cylinder, substantially as set forth.

4. A polishing-cylinder, a shaft for the cylinder, ratchet-wheels fast on the shaft, pawls pivoted to the adjacent heads of the cylinder to normally engage the ratchet-wheels, and a pivotal rod passed through said cylinder, and provided with lugs or buttons that come under against the pawls, substantially as set forth.

5. A polishing-cylinder having longitudinal concavities in its circumference, a shaft for the cylinder, ratchet-wheels fast on the shaft, pawls pivoted to the adjacent heads of the cylinder to normally engage the ratchet-wheels, a pivotal rod passed through the cylinder and provided with lugs or buttons that come under against the pawls, a series of radial arms eccentrically connected to the shaft, and having their outer ends passed through the cylinder to extend beyond the concavities therein, clamping-rods arranged on these outer ends of the arms, and suitable means for holding said cylinder stationary and actuating the shaft, substantially as set forth.

399,630. RAIL-BENDING TOOL. WILLIAM H. PHILLIPS, Jonkintown, Pa. Filed Jan. 14, 1889. Serial No. 296,256. (No model.)



Claim.—1. The combination, in a rail-bending tool, of a beam having arms for engaging the rail, a bending-head also engaging the rail, and a nut interposed between the beam and bending-head, and engaging with portions of both, substantially as described.

2. The combination, in a rail-bending tool, of the beam B, arms C C, having recesses *b* for the rails, and a screw-threaded stud, D, on said beam, with a head, G, recessed for the reception of the rail, and having a screw-threaded stem, F, and a nut adapted to the threads on stud D and stem F, substantially as described.

3. The combination, in a rail-bending tool, of the beam B, arms C C, and head G, with a stem, F, a stud, D, on said beam, a screw-threaded nut adapted to said stud D and stem F, a flattened portion, *c*, on the beam, and a flattened portion, *h*, on the head, so that the tool can be formed into a jack, substantially as described.

399,631. HEEL-NAILING MACHINE. JOSEPH H. POPE, Brockton, Mass., assignor to the American Heeling Machine Company, same place. Filed Nov. 7, 1888. Serial No. 290,179. (No model.)

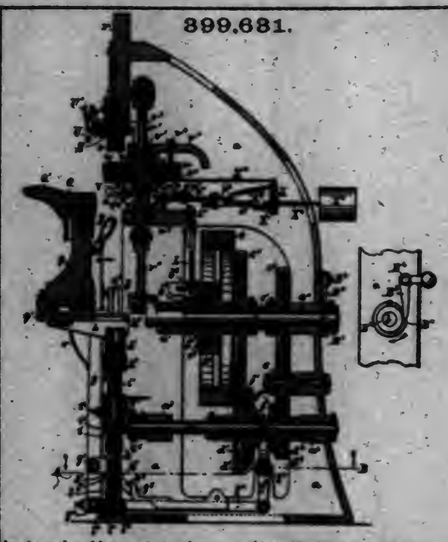
Claim.—1. In a heeling-machine, the cam or eccentric *k' k''*, arranged between the pressure-screw-supporting block *k* and the step *l*, and having the lever or projection k^3, in combination with the lever *g* and the link *g''*, connected to the friction-clutch lever g^5, and provided with the tooth or projection g^6, substantially as and for the purpose set forth.

2. In a heeling-machine, the vertically-movable jack-support *h* and the spring-pressed pawl *n*, pivoted on said jack-support or an extension thereon, in combination with the jack-operating lever *g* and the adjustable latch *m*, secured to said lever, substantially as and for the purpose set forth.

3. In a heeling-machine, the nail-die holder *v*, having the horizontal grooves v^6 v^6, and the detachable nail-die *w*, inserted in said holder, in combination with the spring-pressed fastening-pins w^6 w^6, arranged in the die-holder and adapted to lock the nail-die to said holder, as specified.

4. In a heeling-machine, the expansive spring-actuated boot or shoe centering jaws *x x*, pivoted and geared together as described, combined with a yoke, X, to which the supporting-bar of said jaws is pivoted, said yoke being hung on fulcra X' X', as described, for the purpose of longitudinally adjusting said jaws relative to the nail-die when the top lift is being spanked, substantially in a manner as set forth and described.

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5. In a heeling-machine, a pair of spring-pressed expansive boot or shoe centering jaws, *x x*, pivoted in their rear ends to the supporting-bar, said bar being hung on fulcra x^{10} x^{10} in the pivoted yoke X, in combination with the balance-weight X^2, substantially as and for the purpose set forth.

6. In a heeling-machine, the expansive spring-pressed boot or shoe centering jaws *x x*, pivoted in their rear ends to the support x', in combination with the pivoted bar x^2, and the adjusting-screw x^3 and thumb-nut x^4, arranged on the parts x' x^4, as described, for the purpose of adjusting the said jaws *x x* in a longitudinal direction relative to the nail-die, substantially as set forth and described.

7. In a heeling-machine, the starting-lever R, connected to a clutch mechanism for actuating the plunger *r*, combined with a pivoted safety-lever, R^2, connected to the starting-lever R, as described, and having a tooth or projection, R^7, adapted to enter recesses in the awl or driver block shipper-bar U, for the purpose of preventing the plunger being actuated until the awls or drivers are placed in their proper positions relative to the nail-die, as set forth.

8. In a heeling-machine, the loose driving-pulley *c*, having recessed hub c^4 and one or more stop projections, c^5, and a hub, b', secured to the plunger-actuating shaft *b*, and having the spring-pressed pawl b^3, mounted on the pin b^4, combined with the rocking plate L, connected to the starting-lever R, and having in its lower end the inclined projection L^4 and stop screw or projection L^5, substantially as and for the purpose set forth.

9. In a heeling-machine, the nail-die holder *v*, mounted on the sleeve *v'*, combined with the regulating-screw v^4 and adjustable rest-screws v^5 v^5, and the lateral regulating and fastening screws v^6 v^6, substantially as and for the purpose set forth.

10. In a heeling-machine, the driving-shaft *b* and the pulley *c*, loosely journaled and having clutch mechanism for connecting said parts together, combined with a weighted pawl, B^2, and a toothed hub, B', secured to the driving-shaft *b*, substantially as and for the purpose set forth.

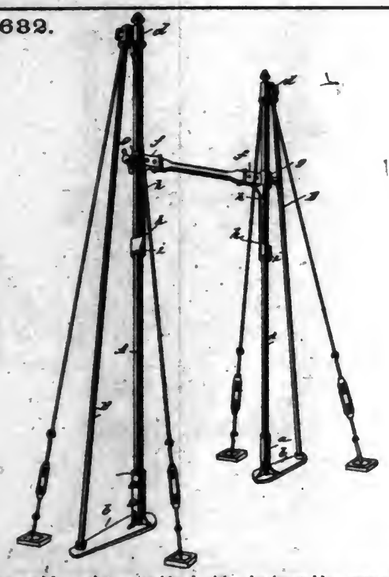
11. In a heeling-machine, the vertically-adjustable jack-support *h* and screw-shaft *i i'* and gear i^4, connected to a friction-clutch reversing mechanism, as described, combined with an adjustable post or bar, H', secured to said jack-support and adapted to be brought in contact with said gear i^4 when the jack reaches its lowest position, substantially as and for the purpose set forth.

399,632. EXERCISING APPARATUS. ROBERT REACH, Philadelphia, Pa. Filed June 27, 1888. Serial No. 278,248. (No model.)

Claim.—1. An exercising apparatus consisting of vertical posts A A, a horizontal bar, sockets for receiving the ends of said bars, said sockets having bearings encircling the posts in line with the bar and provided with a second bearing-point at a distance from the first, substantially as described.

2. An exercising apparatus consisting of vertical posts A A, set in sockets in base-plates, cap-pieces for said vertical posts, and supporting-rods extending directly to the rear, fitting in sockets in the

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cap-pieces and base-plates, combined with a horizontal bar supported on the vertical posts, substantially as described.

399,683. CAR-HEATER. FRANK RUPRECHT, Syracuse, N. Y., and FRANCIS G. BATH, Philadelphia, Pa. Filed May 31, 1888. Serial No. 275,563. (No model.)



Claim.—1. In combination with two sections of a car steam-heater pipe, a valve-case interposed and connected at opposite ends to said sections and valves arranged conversely in relation to each other in the case and held mechanically in closed positions under different degrees of resistance, as set forth.

2. In combination with two sections of a car steam-heater pipe, a valve case interposed and connected at opposite ends to said sections, valves arranged conversely in relation to each other in the case, and springs opposed to the movements of the valves from their seats, as set forth.

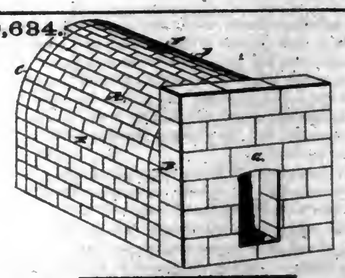
3. In combination with the pipe-sections A A', the case C, provided with the pipe attachments *a a'* at the centers of its ends, and having thereat the compartments C C, intervening longitudinal channels *c c*, connecting said compartments at opposite sides of the longitudinal central line of the case, and each provided with a valve-seat reverse from that of the other, valves *v v'*, movable in said channels and closing against the aforesaid seats, and springs *d d*, adjustable in tension and pressing the valves onto their seats, substantially as described and shown.

4. In combination with the pipe-sections A A', the case C, interposed and connected to said pipe-sections, compartments C C in opposite ends of the case, longitudinal channels *c c*, connecting the compartments, reversely-disposed valves *v v'* in said channels, springs *d d*, holding the valves in their closed position, the stop-cock *e*, connected to the pipe-section A', and the telescopic coupling *h* on said pipe-section, substantially as described and shown.

399,684. COKE-OVEN. MICAJAH SANDFORD, Gallitzin, Pa. Filed Dec. 27, 1887. Serial No. 259,115. (No model.)

Claim.—The coke-oven A, constructed of equal-sized large blocks, having a laterally-arched top and a common feed and discharge opening in the middle of said top, and a door, I, in its front, in combination with the heavy stone wall C, rectangular in shape, provided with a door registering with the door I, not leaning on the front of the oven, and with its sides rising flush with the sides of said oven, so that when a number of said ovens are arranged side by side the side edges of said walls will be in contact all the way to the tops, and will support the earth packed between the arched tops of adjacent ovens, for the purpose of laying a railway-track thereon, substantially as specified.

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399,685. TELEPHONE-LINE CABLE. GEORGE F. SHAVER, New York, N. Y., assignor to the Shaver Corporation, same place. Filed July 5, 1888. Serial No. 278,053. (No model.)



Claim.—1. The combination of a diaphragm of a telephonic instrument with one or more metallic wires connected thereto, which wire or wires are wound around, inclosed, or are impacted upon a fibrous core, as above described.

2. The combination of a diaphragm of a telephonic instrument with one or more metallic wires connected thereto, which wire or wires are wound around, inclosed, or are impacted upon a fibrous core saturated with a water-repellent viscid material, as above described.

399,686. BELT-PULLEY. JOHN A. J. SHULTZ, St. Louis, Mo., assignor to Bruce C. Alvord, same place. Filed Oct. 13, 1888. Serial No. 288,022. (No model.)



Claim.—1. A pulley provided with a facing, said facing being wider than the pulley-rim and having its side edges confined in the sides, respectively, of the rim, substantially as described.

2. A pulley provided with a facing, said facing being wider than the pulley-rim and having its side edges confined in grooves, respectively, in the sides of the pulley-rim, substantially as described.

3. A pulley provided with a facing, said facing being wider than the pulley-rim and having its side edges folded and confined in grooves in the sides, respectively, of the sides of the pulley-rim, substantially as described.

4. A pulley provided with a facing, said facing being wider than the pulley-rim and having its side edges folded and wedged in grooves in the sides, respectively, of the pulley-rim, substantially as described.

5. A pulley provided with a facing, said facing being wider than the pulley-rim and having its side edges confined in the sides, respectively, of the rim, and its ends united by means of the fastenings and plates, substantially as described.

6. A pulley or wheel provided with a facing, said facing being wider than the face of the pulley or wheel, and having its side edges secured to the sides, respectively, of said face, substantially as described.

399,687. APPARATUS FOR MANUFACTURING SEAMLESS DRESS-SHIELDS. FRIEND W. SMITH, Jr., Bridgeport, Conn. Filed Oct 15, 1888. Serial No. 288,074. (No model.)

Claim.—1. The combination, with the former having slots which extead in the direction of the line of stretching and provided with stretching-pins within said slots, of the bed-plate upon which said former is supported, a pair of leaves provided with gouge-slots and hinged to said plate on opposite sides of said former, and means for folding said leaves closely to said former, substantially as set forth.

2. The combination of the form to which the shield is stretched, having stretching devices adapted to be operated through guide-slots in said form, a bed-plate having a central transverse rib, a pair of hollow leaves having slots corresponding with the aforesaid slots, said leaves hinged to said rib at the ends thereof and provided with steam inlet and outlet pipes, and means for folding said leaves closely to said form, substantially as set forth.

3. The combination of the bed-plate E, having transverse rib G and mounted upon any suitable table, F, the post K, projecting upward from said table and having stop-pin 13, the plates A C, having ears 11 12 extending laterally therefrom and pivoted to the post K, and the lug 14, extending from the plate A, substantially as set forth.

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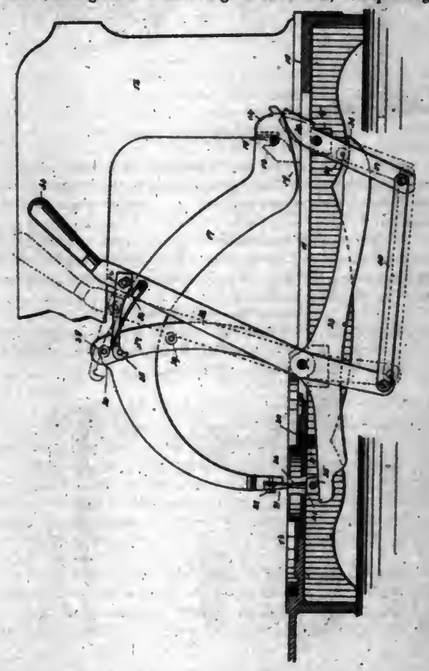
4. The combination, with the plates A C, having slots 2 extending in the direction of the line of stretching, and the plate B, having cam-slots 4 extending athwart the slots 2, said plates having a common pivotal point, stretching devices projecting through said slots 2 4, the bed-plate which supports said former and to which the latter is pivoted, and the leaves H, hinged to said plate and having slots 10, which register with the slots 2 when said leaves are folded against the plates A C, whereby the fabric is automatically attached to the stretching devices and the movements of the latter rendered perfectly free within said leaves, substantially as shown, and for the purpose set forth.

399,688. BUTTON-HOLE-CUTTING ATTACHMENT FOR SEWING-MACHINES. RUDOLPH SPAHN, Brooklyn, N. Y. Filed Oct. 22, 1888. Serial No. 288,747. (No model.)

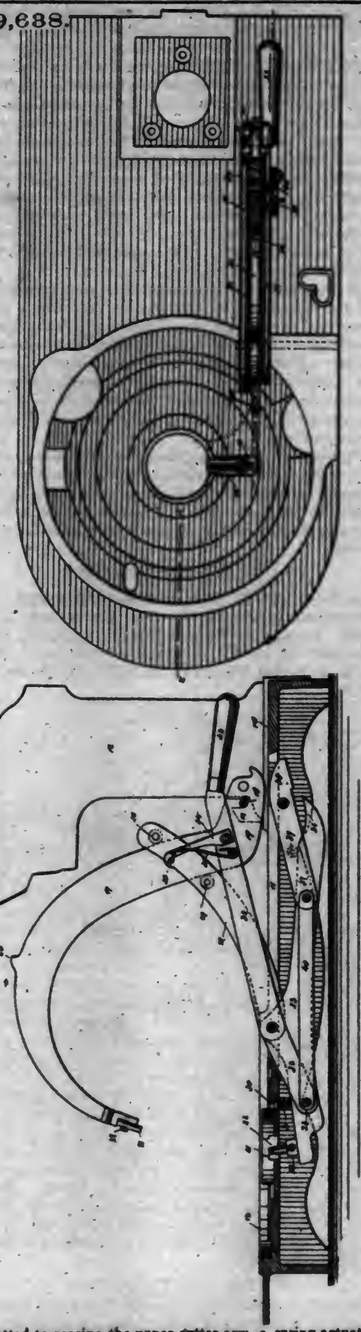
Claim.—1. The combination, with the bed of a sewing-machine and a curved cutter-arm fulcrumed at one end upon the upper face of the bed, of an essentially straight cutter-arm pivoted beneath the bed, said cutter-arms being provided with an anvil and cutter, respectively, a pivotal slotted guide-arm embracing the upper cutter-arm, a compressing-arm, a trip-lever engaging the upper and lower cutting-arms, and a link connecting the compressing-arm and trip-lever, substantially as shown and described.

2. The combination, with the bed of a sewing-machine and a curved cutter-arm fulcrumed at one end upon the upper face of the bed, of an essentially straight cutter-arm pivoted beneath the bed, said cutter-arms being provided with an anvil and cutter, respectively, a pivoted slotted guide-arm embracing the cutter-arm, a compressing-arm slotted to receive the upper cutter-arm, a spring-actuated latch connecting the compressing-arm with the guide-arm, a trip-lever engaging the upper and lower cutter-arms, and links connecting the compressing-arm and trip-lever, substantially as and for the purpose specified.

3. The combination, with the bed of a sewing-machine, a curved cutter-arm fulcrumed upon the upper face of the bed, provided with an essentially straight heel, and a pivoted slotted arm embracing the upper cutter-arm, of an essentially straight spring-actuated cutter-arm pivoted beneath the bed, said cutter-arms being provided with an anvil and cutter, respectively, parallel therewith, a compressing-arm slotted to receive the guide-arm and upper cutting-arm, a trip-lever provided



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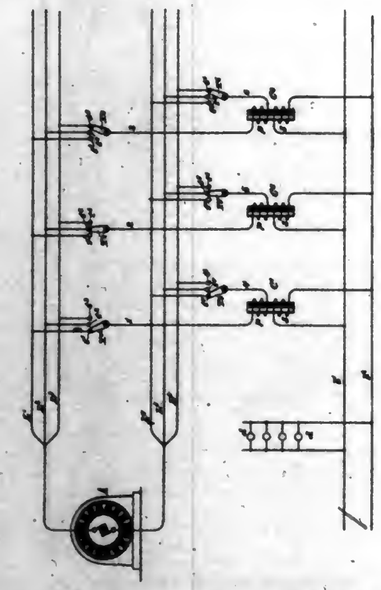
with a finger and friction-roller engaging, respectively, with the upper and lower cutting-arms, and a link-connection between the compressing-arm and trip-lever, substantially as shown and described.

4. The combination, with the bed of a sewing-machine, a curved cutter-arm fulcrumed upon the upper face of the bed, provided with an essentially straight heel and a stop upon the upper edge, and a guide-arm embracing the cutter-arm, provided with spaced friction-rollers, of an essentially straight cutting-arm pivoted beneath the bed, said cutter-arms being provided with an anvil and cutter, respectively, a reciprocating compressing-arm slotted to receive the guide-arm and upper cutter-arm, a spring-actuated latch pivoted to the compressing-arm, engaging with the guide-arm, a trip-lever provided with a finger and friction-roller engaging, respectively, with the upper and lower cutter-arms, and links connecting the compressing-arm and trip-lever, substantially as shown and described.

5. The combination, with the bed-plate of a sewing-machine and a curved arm fulcrumed at one end upon the upper face of the bed, of an essentially straight arm pivoted below the bed, a detachable anvil-block attached to the upper arm, a detachable cutter secured to the lower arm, a pivoted slotted guide-arm embracing the upper curved arm, and a reciprocating arm embracing the guide-arm and upper arm, a trip-lever, and a link-connection between the trip-lever and the compressing-arm, all combined to operate substantially as and for the purpose specified.

6. The combination, with an upper cutter-arm and a lower cutter-arm provided, respectively, with an anvil and cutter, of a guide-arm engaging the upper cutter-arm, a compression-arm having a latch at its upper end detachably engaging the guide-arm, and a time trip-lever engaging the said cutter-arms, substantially as and in the manner set forth.

399,639. SYSTEM OF ELECTRICAL DISTRIBUTION. GEORGE WESTINGHOUSE, Jr., Pittsburg, Pa. Filed Nov. 23, 1886. Serial No. 219,639. (No model.) Patented in England July 12, 1887, No. 9,739; in Germany July 12, 1887, No. 43,129; in France July 12, 1887, No. 184,742; in Belgium July 12, 1887, No. 78,173, and in Canada Nov. 10, 1887, No. 27,975.



Claim.—1. The combination, with a source of electricity, of multiple conductors extending from the respective poles, a series of converters having their primary coils respectively connected with different pairs of said conductors, and a single pair of distributing-conductors with which the secondary coils are connected in multiple arc.

2. The combination, with a source of electricity, of two or more conductors leading from the respective poles thereof, two or more converters having their primary coils respectively connected with different pairs of conductors thus formed, and translating devices connected in multiple arc with the several secondary coils of said converters.

3. The combination, with an alternate-current electric generator, of two or more main lines extending from each pole, translating devices, distributing-conductors with which said devices are connected, and means for supplying currents to said distributing-conductors from the different pairs of main lines.

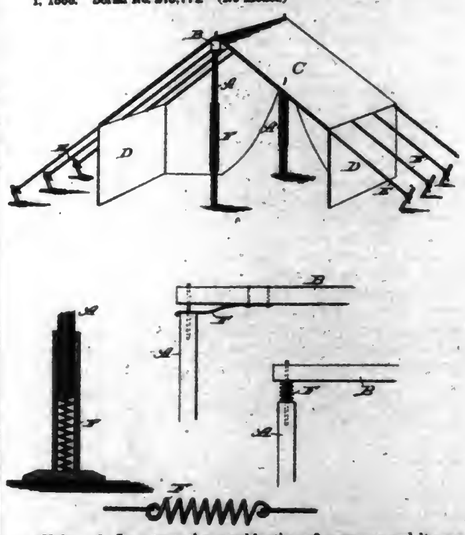
4. The combination of a source of alternating electric currents, a series of main lines extending from each pole thereof, a series of converters, conductors including the respective primary coils of the same, switches applied to one terminal of each of said conductors, and contact-points applied to each switch connected with the respective main lines leading from one pole of the source.

5. The combination of a source of alternating electric currents, a series of main lines extending from one pole thereof, a series of converters, conductors leading from said main lines and including the respective primary coils of the same, switches applied to one terminal of each of said conductors, and contact-points applied to each switch connected with the respective main lines and connections from the remaining terminals of said conductors with the remaining pole of said source.

6. The combination, with the primary coil of an electric converter, of pairs of supply-conductors, means for supplying currents of electricity thereto, and a circuit-controller through which connections with the different pairs of conductors are secured.

7. The combination, with the primary circuit of an electric converter, of multiple mains and circuit-controlling devices for connecting any pair of said mains to said primary circuit.

399,640. TENT. ALVINUS B. WOOD, Ann Arbor, Mich. Filed June 1, 1888. Serial No. 275,774. (No model.)



Claim.—1. In a tent, the combination of a canvas and its supporting-post provided with a spring which permits the post to lengthen or shorten as the canvas contracts or expands, substantially as described.

2. In a tent, the combination of a ridge-pole, upright posts supporting the same, and springs placed in or upon such posts, whereby the ridge-pole is raised or lowered as the tent-canvas expands or contracts, substantially as described.

399,641. TOOL-HANDLE. JOHN H. WUNDER, Lancaster, Pa., assignor to E. F. Bowman and W. B. Musser, same place. Filed Oct. 22, 1888. Serial No. 288,811. (No model.)

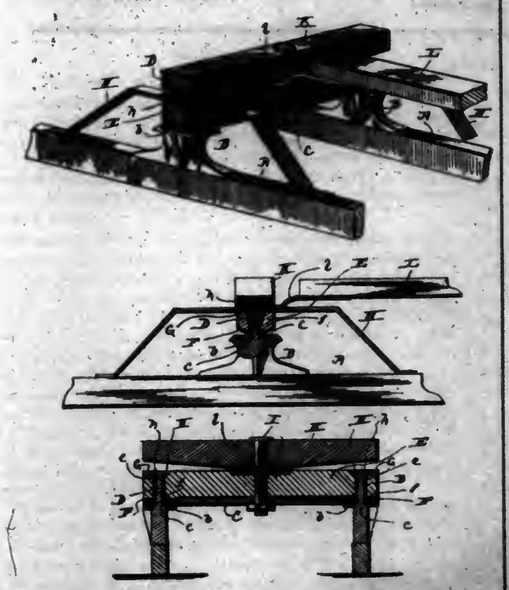


Claim.—1. A tapering tool-handle which is provided with a longitudinal groove in one of its sides, in combination with a tool-shank bent inward at its rear end but extending laterally out from said groove, and a movable sleeve fitting on said handle in contact with said shank to hold the latter in place, substantially as set forth.

2. A tool-handle having a longitudinal groove which ends before reaching the upper end of said handle, in combination with a tool-shank bent inward at its upper end and set into said groove, and a removable sleeve which fits on said handle in contact with said stem to bind the latter in place, substantially as set forth.

3. A tapering longitudinally-slotted sleeve, in combination with a tool-shank and a tool-handle having a tapering stem which is provided with a longitudinal groove to receive said tool-shank, the groove and slot corresponding in position, and the side of the tool-shank extending into said slot, substantially as set forth.

399,642. SLEIGH-KNEE. EDWIN J. YOUNGS, Flint, Mich., assignor to the Castres Mallory Company, same place. Filed Oct. 16, 1888. Serial No. 288,208. (No model.)



Claim.—1. In a bob-sleigh, the combination, with the standards secured to the runners at opposite points, of the torsion-plate connected at its ends to the standards, and the bolster swiveled at its center to the torsion-plate, whereby the runners are allowed free oscillating movement independent of each other and of the bolster, substantially as and for the purpose specified.

2. In a bob-sleigh, the combination, with the standards attached to the runners, of the torsion-plate connecting the upper ends of the said standards, and the beam provided on its under side with convex plates bearing on the torsion-plate and secured in position by vertical pins, substantially as specified.

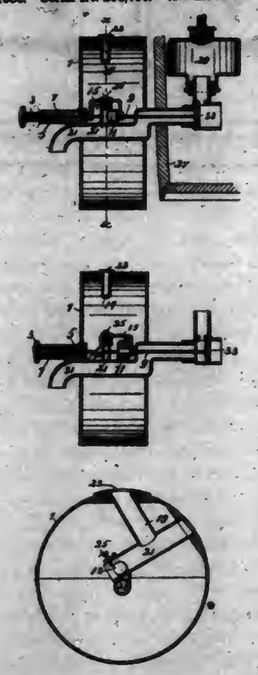
3. In a bob-sleigh, the combination, with the standards affixed to the runners and provided at their upper ends with vertical pins D, of the torsion-plate connecting the upper ends of the standards and provided with apertures fitting over the said pins, the beam provided with tapered openings or slots fitting the pins, and the convex plates on the under side of the beam bearing on the torsion-plate, substantially as specified.

4. In a bob-sleigh, the combination of the runners, the standards secured to the runners and provided with the transverse channels *b* in their upper ends, the torsion-plate affixed at its ends in the said channels, the pins D rigid with the standards and passing vertically through the said torsion-plate, the beam provided with openings fitting over the pins and having convex plates bearing on the torsion-plate, and the braces secured at their ends to the runners and passing at intermediate points through transverse grooves in the upper side of the beam, substantially as specified.

5. In a bob-sleigh, the runners having the standards, the pins D, extending upward from and rigid with the standards, the torsion-plate T, extending across and connecting the standards, the beam E, rounded on the under side and bearing at said rounded side on the torsion-plate, the tapered openings in the beam through which openings the pins D pass, and the braces H, connected with the runners and passing over the top of the beam and receiving the upper end of the pins D, as set forth.

6. In a bob-sleigh, the runners having the standards, the torsion-plate T, extending across and connecting the standards, and the beam E, rounded on the under side and bearing at said rounded side on the torsion-plate, substantially as set forth.

399,643. AUTOMATIC COIN-OPERATED DEVICE. BARTON S. MOLYNEUX, Minneapolis, Minn., assignor, by direct and mesne assignments, to the National Water Supply Company, of Minnesota. Filed Nov. 24, 1888. Serial No. 291,700. (No model.)



Claim.—1. In a device of the class described, the combination, with the plunger 3, having the spring 5 and the stop 17, of the rod 9, having the yoke 15, and the seat 11, adapted to receive and support a suitable coin interposed between it and the plunger, by means of which motion is transmitted from said plunger to said rod 9, substantially as described.

2. In a device of the class described, the combination, with a suitable support or case, 1, having a suitable coin-conduit fitted with a suitable stop, 25, of the plunger 3, the yoke 15, and the seat 11, adapted to receive and support a suitable coin interposed between it and the plunger, substantially as described.

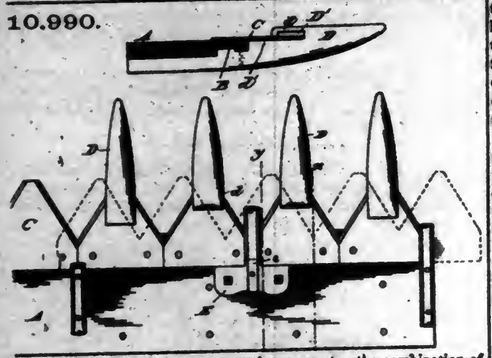
3. The combination, with the reservoir and the receiving-chamber, of the valve arranged to control the flow of liquid from said receiving-chamber, the valve-rod provided with a seat having a cavity therein, a plunger provided with a stem adapted to enter the cavity in said seat, a coin-conduit arranged to conduct a coin to a position between said plunger and said seat; and a stop arranged to arrest said coin in such position, substantially as described.

REISSUES.

10,990. ATTACHMENT FOR MOWING-MACHINES. WILLIAM S. FOX, Short Creek, Ohio. Filed Mar. 15, 1883. Serial No. 267,266. Original No. 350,351, dated Mar. 15, 1887.



10,990.



Claim.—1. In a harvester cutting apparatus, the combination of the cutters, the guard-fingers D, having the rear ends of their overhanging portions *d* turned down and bearing upon the cutters near their front ends, and the keepers E intermediate the guard-fingers fixed to the finger-bar and having their front ends extended, turned down, overhanging, and bearing upon the cutters near their front ends, and a portion bearing upon their rear edges, substantially as and for the purposes set forth.

2. In a harvester cutting apparatus having the usual form of finger-bar A, cutter-bar B, and cutters C, the keepers E intermediate the guard-fingers attached to the finger-bar and having their front ends extended, turned down, and bearing upon the cutters near their front ends, and a portion, *e*, bearing upon said cutters on their rear edges, as and for the purposes set forth.

3. In a harvester cutting apparatus, the combination of the cutters, the guard-fingers D, having their overhanging portions *d* turned down and bearing upon the cutters near their front ends, and the keepers E intermediate the guard-fingers, attached to the finger-bar and bearing upon the cutters near their front ends, to prevent vertical vibration of the front ends of the cutters, substantially as shown and specified.

PHOTO LITH NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

COMMISSIONER'S DECISIONS.

EX PARTE CARTER.

Decided March 1, 1889.

STATEMENT.

One of the claims in this application has been rejected because it covers an illegitimate combination or an aggregation of elements. Applicant appealed from such rejection to the Examiners-in-Chief. The Board refused to take jurisdiction of the appeal and remanded the case to the Primary Examiner for reconsideration and such action as would dispose of the merits of all the claims. The examiner has referred the case to the Commissioner for instructions.

1. Whenever a claim for an illegitimate combination is presented in an application which also contains claims for different elements constituting distinct and separate inventions which ought not to be claimed in the same application, a vital objection as to form is presented, and the claim may be rejected for the purpose of enabling the Office to require division. Such a rejection, though relating to form, involves merits, and an appeal therefrom should lie to the Examiners-in-Chief.
2. Division must be required for two reasons: *first*, because the distinct subjects of invention ought not to be embraced in one application; *second*, because the applicant has not the right by aggregating claims to any number of distinct inventions under a false claim to a combination to force the Office to examine and act upon his several inventions.
3. There is no rule or requirement that an appeal which, though made because relating to form, involves the absolute merits of a claim shall be taken to the Commissioner merely to save applicant the appeal fee. If applicant be put to the trouble and expense of a second appeal after the requirement of division has been complied with and the application has reached the stage for full consideration upon its entire merits, the fault is with applicant who has presented his application under such conditions rather than due to the Office or its practice.

REFERENCE.

BRICK-MOLDS.

Application of Edward B. Carter filed April 19, 1888, No. 271,127.

Messrs. C. A. Snow & Co. for the applicant.

HALL, *Commissioner:*

In this case the examiner advises the Commissioner that the claims were objected to on the ground that they embraced aggregations and not legitimate combinations. Relying upon *ex parte Gillette*, (44 O. G., 819,) he refused to enter upon a consideration of the merits of the claims until the question of form was settled. The examiner evidently held that the alleged illegal combination as presented in the claims raised a question of form. In due time applicant appealed to the Examiners-in-Chief. Such tribunal refused to assume jurisdiction and give consideration to the appeal, and remanded the application to the Primary Examiner for further action, which would dispose of the merits of the whole case. The examiner thereupon referred the matter to the Commissioner for instructions.

I shall not look into the case to determine whether the status involved is one in which the illegitimacy of combination can be said to raise a preliminary question as to form, but will content myself with pointing out the conditions under which that question arises.

The question of legitimacy of combination is necessarily one involving merits. It may, however, present itself in such a way as to constitute one of form also. Thus in an application where appears a claim for a combination between three elements, A, B, and C, and no other claim is made to either of the elements, no question can arise as to form. A decision on the merits of the combination claim can be made at once, thus disposing of the entire application. As contradistinguished from such a case, take one wherein the elements A, B, and C are distinct and separate subjects of invention—one for a governor of an engine, another for a hoisting apparatus, and a third for a lifting jack. The application contains a claim for a combination between the three elements, and also broad and specific claims for the three distinct subjects or elements, respectively. It is apparent at a glance that the claim is for an illegitimate combination, and that the remaining claims are for such subjects which prevent their being prosecuted in the same application. Division must be required for two reasons: *first*, because the three distinct subjects of invention ought not to be embraced in one application or secured in one set of Letters Patent; *second*, because the applicant has not the right, by aggregating claims to any number of distinct inventions under a false claim to a combination, to force the Office to examine and act upon his several inventions. The practice and the rules recognize and provide for the requirement of division, and this supposititious case is one in which such requirement should be made. Here is presented a case where one of two things must occur—either the illegitimate claim must be disposed of preliminarily, so that a division may be required between the remaining claims, or else the whole application must be examined upon its merits. The Office must be put to the trouble of examining as many inventions as may be presented under an illegitimate combination claim for one fee, when separate applications covering them should be filed and separate fees paid, and the question of division must await the whole procedure, to be determined after final action on the merits and appeals, or be waived altogether.

It has always been and is the settled practice that these preliminary questions, such as division, must be disposed of before the merits are considered. No one

proposes to change such practice; but how can escape be had if in such case the examiner, finding himself confronted with the illegitimate claim, is compelled to give it consideration with the others and finally reject it? In my judgment, such a claim has a double aspect; it involves merits, because it covers a combination which must be considered and disposed of; there is also presented a question vital to the consideration of the whole application, and in this respect the question must be disposed of before the *proper* claims can be considered and acted upon. Whenever, therefore, a claim for an illegitimate combination is presented in an application, which also contains claims for different elements constituting distinct and separate inventions, which ought not to be claimed in one and the same application, a vital objection as to form is presented, and the claim may be rejected for the very purpose of enabling the Office to require division. In various decisions the Commissioner has held that such a rejection, though relating to form, involves merits, and an appeal therefrom should lie to the Examiners-in-Chief. (*Ex parte Gillette*, 44 O. G., 819; *ex parte Carpenter*, MS. Dec., February 2, 1889; *ex parte Willcox and Borton*, 45 O. G., 455.) It is not to be understood that this rule applies to any other case than the one mentioned. An application might contain claims for an illegal combination without any claims for the elements thereof, but still include other claims for matter in no wise related to the supposed combination. This would be embracing two separate and distinct inventions in a single application. Division would be required. Applicant would elect which invention he would prosecute in the pending application, and if he retained the claim for the improper combination consideration would be given on its merits and the claim rejected. The only distinction between a rejection under such conditions and one in the supposed case is that in the former the action is made for the single purpose of disposing of the whole application on its merits, while in the latter the rejection is for the twofold purpose of removing a vital objection as to form which stands in the way of a requirement of division, and at the same time disposing of the merits of this obstructing claim. In other words, the latter is an instance in which it is impossible to enter at once upon the merits of the whole application and consider all the claims without waiving and foregoing the requirement of division. The obstructing claim stands in a position somewhat analogous to a plea which possesses its own merits in bar or abatement, but which must be disposed of by the court before the actual merits of the contention can be taken up. What shall be done under these circumstances? There can be but two answers: either to require division upon the theory that the claim to the combination is no claim—to ignore it as such—deny the applicant's right to a rejection and appeal to the Examiners-in-Chief and so on to the Supreme Court of the District of Columbia, or else to reject the claim on its merits and thus enable the Office to make the requirement of division. Evidently, to pursue either of these courses is the same in effect and differs only as to the direction an appeal shall take. In either case the claim to the combination is rejected and refused recognition. If the action is *called* a "rejection," the appeal may go to the Examiners-in-Chief; but if it be termed a "requirement for division" the appeal comes direct to the Commissioner. The term applied to the action is immaterial; the merits of the claim are involved, and so long as the distinction is maintained between appeals which go to the Examiners-in-Chief and those which go to the Commissioner it is not only appropriate but proper that the appeal taken from such an action should go to the former tribunal. Formerly all appeals went to the Board, and certainly such a one as this should.

In the present case applicant appealed from the action of the Primary Examiner rejecting the claim. The Board declined to take jurisdiction and remanded the application to the examiner, holding that an appeal did not lie until the examiner had disposed of the entire case—all the claims upon all questions of merits—citing *ex parte Mewes*, (C. D., 1872, 163;) *ex parte Smoot*, (C. D., 1877, 51;) *ex parte Smith*, (MS. Dec., Examiners-in-Chief, 517.) The correctness of the practice announced in such decisions and the pertinency of the authorities are undoubted when applied to a case which has reached such a stage that the consideration of all the merits involved can be entered upon; but until all preliminary vital questions are disposed of such stage cannot be reached. (Rule 64.) Rules 65 and 134 must be construed *in pari materia* with Rule 64, and it must also be remembered that the rules were made for the cases which arise and not the cases for the rules. The spirit and prime purpose of a system of practice must always be kept in mind, and mere details and incidentals subordinated thereto. The case now before me appears to be one not specifically provided for in the rules, and the claim under consideration is one involving a vital question of form and also one of merits, and hence falls partly under the effect of two rules of practice, but wholly within the scope of neither. Under such circumstances the claim must be disposed of in accordance with the general spirit and equity of the practice. The rights of the applicant must also be considered and protected. He should not be required to go to extra expense or pay unnecessary appeal fees; but if he sees proper to present an application with a claim to a combination when he has only an aggregation of inventions which have no place in a single application, and also at the same time makes claims for several separate inventions, he should submit to a proper division. This can only be accomplished by elimination of the claim to the illegal combination, and this in turn can be effected only through a rejection of such claim. If upon such rejection applicant still persists in the claim, his remedy lies in an appeal which must go either to the Examiners-in-Chief or to the Commissioner. Now, is there any rule or requirement that an appeal which, though made because relating to form, involves the absolute merits of the claim shall be taken to the Commissioner rather than to the Board merely to save applicant the appeal fee? I am not aware of any. It is true, undoubtedly, that after the requirement of division has been complied with and the application has reached the stage for full consideration upon its entire merits a rejection of one or all the claims may follow, and the applicant, if he still persists, be put to the trouble and expense of a second appeal. This, however, is due not to the Office or its practice, but to the applicant himself, who has presented his application under such conditions.

The present application is remanded to the examiner, with instructions to determine whether the case is one within the principle herein announced. Is it a case where, in his opinion, the combination claim is illegitimate and stands as an obstruction to the requirement of division between separate inventions which are embraced as elements in the claimed combination? If it be such, he will then reject it upon its merits as constituting a vital objection to the consideration of any proper claims and in order to enable the Office to make the requirement of division between the independent inventions. In making this preliminary rejection the examiner may assign all causes of rejection. It is not probable that any valid references can be found for an illegitimate combination. If it be not such a case, the examiner will proceed in accordance with the suggestions of the Examiners-in-Chief and act upon the whole application.

DECISIONS OF THE U. S. COURTS.

U. S. Circuit Court—Southern District of New York.

ROOT *v.* THIRD AVENUE RAILROAD COMPANY.

Decided February 5, 1889.

1. PUBLIC USE.
   Use of an invention for business purposes or profit and in which the test of its success and value was only incidental will defeat a patent if it occurred more than two years before application.
2. FORMER DECISIONS CONSTRUED.
   Smith & Griggs Manufacturing Co. v. *Sprague* and *City of Elizabeth* v. *Pavement Co.* applied and explained.
3. ROOT—CABLE RAILWAYS.
   Letters Patent No. 262,162, granted August 1, 1882, to Henry Root, for an improvement in the construction of cable railways, declared invalid by reason of public use more than two years prior to application.

Mr. George Harding and *Mr. George J. Harding* for the complainant.

Messrs. Lauterbach & Spingarn, Messrs. Frost & Coe, and *Mr. Harry E. Knight* for the defendant.

WALLACE, *J.*:

The complainant sues for infringement of Letters Patent granted to him August 1, 1882, (No. 262,162,) for an improvement in the construction of cable railroads. His application for the patent was filed September 3, 1881.

The California Street Railroad, a cable railway in the city of San Francisco, was built by the patentee, completed, and went into regular operation prior to April 11, 1878, and as constructed embodied the invention described in the patent in suit. The defendants insist that this is a public use of the patented invention more than two years prior to the patentee's application for his patent, and consequently invalidates the patent. The complainant contends that this was an experimental use of the invention, and that the application was filed within two years after the patentee became satisfied that the invention was a practical success.

It is conceded that the road as built embodied the invention of the patent; that Mr. Root had complete charge of the construction of the road and built it for the projectors, and that it has been operated ever since April, 1878, as built, without any changes or modifications in plan or details. The evidence is, that in the early part of 1876 the projectors obtained a franchise to lay and operate a cable railway in California street, one of the public thoroughfares of the city of San Francisco. In the expectation of being employed as the consulting engineer to build the road, the complainant investigated the subject of cable roads and matured the invention in controversy between May and September, 1876. In September, 1876, he disclosed the invention to the projectors; between that time and January, 1877, made a model of it; and in February, 1877, laid down an experimental section of the cable railway embodying the invention in the yard of the Central Pacific Railway Company in San Francisco. His invention was adopted by the projectors, and work was commenced upon the structure in July, 1877. The road cost, with the equipment, $418,000. It was about two miles in length, and the road-bed and tunnel construction cost about two hundred and twenty-five thousand dollars. From April 9, 1878, the structure has been in regular successful use as a street-railway, carrying passengers for pay. Up to the time when the complainant made application for the patent in suit and until 1883 the complainant was superintendent of the road for the owners.

In explanation of his delay in making the application for patent, the complainant testifies that he did not wish to patent the invention if the structure proved weak or undesirable and he did not feel sufficiently certain of the durability and general practicability until the year 1881; that there was no way but by trial in a public street, through a long period of time, to determine to what extent the moving of cars and the street traffic over a rail connected to iron work without the intervention of any wood would affect the durability of the structure, or to what extent changes of temperature and the effect of water and rust would tend to separate the iron work from the concrete in which it was embedded; and that while he believed there was more than an even chance of its proving a durable and desirable structure he had some doubts in his own mind, and was influenced also by the doubts expressed by others in whose judgment he had confidence. He admits that he never expressed these doubts to the projectors, either while discussing with them the features of his invention, or while the road was being built, or while he remained its superintendent and after it was completed. In answer to a question whether he had any doubts of the durability of the structure after the road was completed, he states that in the spring of 1879, while making an extension of the railway, some parts of the structure were exposed, and he then saw some indications of the loosening of the yokes in the concrete, and "had some little fear at that time" that trouble might arise in that respect.

Manifestly the complainant received a consideration for devising and consenting to the use of an invention which was designed to be a complete, permanent structure, which was to cost a large sum of money,

and which he knew would not meet the expectation of those who had employed him unless it should prove to be in all respects a practically operative and reasonably durable one. If he had entertained any serious doubts of its adequacy for the purpose for which it was intended it would seem that he would not have recommended it in view of the considerable sum it was to cost. At all events, he did not treat it as an experimental thing, but allowed it to be appropriated as a complete and perfect invention, fit to be used practically, and just as it was, until it should wear out or until it should demonstrate it own unsuitableness. He turned it over to the owners without reserving any future control over it, and knowing that except as a subordinate he would not be permitted to make any changes in it by way of experiment, and at the time he had no present expectation of making any material changes in it. He never made or suggested a change in it after it went into use, and never made an examination with a view of seeing whether it was defective or could be improved in any particular.

In *Smith & Griggs Manufacturing Co.* v. *Sprague* (41 O. G., 1037, 123 U. S., 249) it was held that when it is clearly established that there was a public use of the invention by the inventor for more than two years prior to his application for a patent for it the burden is on him to show by convincing proof that the use was not a public use in the sense of the statute, but that it was for the purpose of perfecting an incomplete invention by tests and experiments. And in defining the distinction between a public and an experimental use the Court in that case used the following language:

A use by the inventor for the purpose of testing the machine, in order by experiment to devise additional means for perfecting the success of its operation, is admissible; and where, as an incident to such use, the product of its operation is disposed of by sale, such profit from its use does not change its character, but where its use is mainly for the purpose of trade and profit, and the experiment is merely incidental to that, the principle and not the incident must give character to the use. The thing implied as excepted out of the prohibition of the statute is a use which may be properly characterized as substantially for the purposes of experiment. Where the substantial use is not for that purpose, but is otherwise public, and for more than two years prior to the application, it comes within the prohibition.

Tested by the rule thus stated, the proofs do not show a use substantially for experiment, but show such a public use of the invention as must defeat the patent. The facts are in marked contrast with those in the case of *Elizabeth* v. *Pavement Co.*, (97 U. S., 126.) There the use was solely for experiment. In the language of the opinion in that case—

Nicholson wished to experiment on his pavement. He believed it to be a good thing, but he was not sure, and the only mode in which he could test it was to place a specimen of it in a public roadway. He did this at his own expense, and with the consent of the owners of the road. He wanted to know whether his pavement would stand and whether it would resist decay. Its character for durability could not be ascertained without its being subjected to use for a considerable time. He subjected it to such use in good faith for the simple purpose of ascertaining whether it was what he claimed it to be.

A decree is ordered dismissing the bill, with costs.

U. S. Circuit Court—Northern District of Illinois.

SCHLICHT & FIELD COMPANY *v.* CHICAGO SEWING MACHINE COMPANY *et al.*

Decided November 5, 1888.

1. SMITH AND SHANNON—PAPER-HOLDERS.

The first, second, third, fourth, fifth, and seventh claims of Patent No. 217,909, issued July 29, 1879, to Frederick W. Smith and James S. Shannon, for an improvement in paper-holders, sustained, (citing *Shannon* v. *Printing Company*, 9 Fed. Rep., 205,) and *Held* to be infringed by a letter-file having its receiving-wires arranged to rock forward instead of backward out of contact with its arched wires.

2. INFRINGEMENT—CHANGE OF LOCATION OF PARTS.

A change in the position of a part of a machine will not avoid infringement where the part transposed continues to perform the same function as before. (Citing *Adams* v. *Manufacturing Company*, 3 Banning & A, 1.)

3. JOINT INVENTOR CANNOT IMPEACH HIS OATH TO DESTROY ANOTHER'S INTEREST IN THE PATENT.

A party applying for a patent as a joint invention of himself and another should be estopped as against a *bona fide* owner of the patent from defeating it by proof tending to show that he took a false oath or otherwise imposed upon the Patent Office. Having given life to the patent by one oath, he cannot be heard to destroy it by another.

4. JOINT INVENTORS.

Where two parties work together in the making of an invention, each making suggestions to the other, the invention covered by a joint patent will generally be considered as the result of their joint efforts or contributions.

Messrs. Banning & Banning & Payson for the complainant.

Mr. M. W. Robinson and *Mr. C. M. Hardy* for the defendants.

BLODGETT, *J.*:

The bill in this case asks for an injunction and an accounting by reason of the alleged infringement of Patent No. 217,909, granted July 29, 1879, to Frederick W. Smith and James S. Shannon, for an improvement in paper-holders. The invention covered by this patent is described by the patentees in their specification as follows:

Our invention relates to that class of paper-files or temporary binders adapted, by having separable uniting-wires, to allow of the withdrawal of any one of many papers thereon held, or the insertion of papers between those already on the file, without disturbing the order in which the others are placed.

The object of our invention is to provide a file more prompt and positive in its action, less calculated to tear the papers filed thereon, more convenient of manipulation, and adapted, in its double form especially, to serve as a writing-tablet for the lap or desk.

It consists, first, in a paper-holder with duplex parallel hinged transfer-wires made from one piece; second, in a paper-holder having the fixed wires and movable wires secured to the same connecting-plate, whereby those parts may be separately packed and attached to any desired base-board; third, in the structure of the puncturing-wire; fourth, in a felt or plush covering for the bottom of the base-board; fifth, in the stop to limit the movement of the hinged wires.

This patent was before this court in the case of *Shannon* v. *Printing Co.*, reported in 9 Fed. Rep., 205, in which the validity of the patent was sustained, and nothing shown in the record in the present case induces me to in any degree modify or change the conclusions there arrived at.

Infringement is charged in this case of the first, second, third, fourth, fifth, and seventh claims of the patent, which are:

1. The combination, in a paper-holder, of a base-board, two parallel fixed puncturing-wires, and two parallel hinged transfer-wires, made in a single piece, arranged thereon, as shown, to form two parallel rings, adapted to be opened and closed at pleasure, substantially as and for the purposes set forth.

2. In combination with the duplex file or paper-holder, substantially as shown, a rigid connecting part, joining the hinged wires, so that both may be rotated or held by applying force for the purpose to either, substantially as set forth.

3. In combination with the fixed wires T and the movable wires H, the plate P, constructed to give hinged support to H at *h h*, and to have the central bearing-spring, S, all arranged and adapted to operate substantially as described.

4. The combination, with the fixed wires T and hinged wires H, of the plate P, having the hinge-arms R, and the spring-tongue S, and supporting said wires T and H in working position, whereby the working parts of the file or paper-holder are adapted to be applied to any tablet by screws *a a*, substantially as and for the purposes specified.

5. In a paper-holder having a tubular puncturing-wire, sharpened by having its end beveled from one side to the other, and a second wire entering the tube to serve as a transfer-wire, the inwardly bent or curved form of the beveled point of the tube, whereby the said point may lie close to the transfer-wire, substantially as described, and for the purpose set forth.

7. In combination with the hinged wires H and a spring operating them, as described, a stop, *s*, or stops *s* and *s'*, arranged to arrest the throw of the wires H, substantially as and for the purpose set forth.

Defendants deny infringement of the patent, and also attack the validity of the patent upon the ground that Smith, one of the patentees, has testified in this case that he was the only inventor of the devices covered by the patent, and that Shannon, the other patentee and alleged inventor, had nothing to do with the invention.

In regard to the second matter of defense, which was not considered in the former case, I will merely say that Smith, having applied for a patent as the joint invention of himself and Shannon, should be estopped, as against any *bona fide* owner of the patent, from now defeating it by proof tending to show that he took a false oath or imposed upon the Patent Office for the purpose of obtaining the patent. Proof that Smith was the sole inventor is undoubtedly admissible to defeat the patent; but it must come from some one else than himself, because he has given the patent life by one oath and cannot now be heard to destroy it by another oath. Certainly as much faith must be placed in the affidavit which the law required him to make at the time he applied for the patent, showing that the device covered by the application was the joint invention of himself and Shannon, as should now be given to his deposition in this case, wherein he claims to be the sole inventor. So that it may be said, for the purposes of this question of fact, that the testimony of Smith is neutralized by his conduct in applying for and obtaining a patent, and this leaves the question as to whether or not Smith was the sole inventor to the testimony of Blades, the other witness called by the defense upon this point, and Blades's testimony goes to show that Shannon and Smith were consulting together and acting together in perfecting and completing the invention. Smith was a mechanic, and it would seem both from his own testimony and that of Blades that he was attempting to invent a letter-file, and that what he was doing was done under the constant supervision and criticism of Shannon, and from the testimony it would seem that suggestions were made from time to time by Shannon; and the court at this time, and in the light of the testimony before it, cannot see but what the ideas embodied in the machine were as essentially those of Shannon as of Smith. Hence the defense that the patent is void because of Smith being the sole inventor is not sustained.

The defendants manufacture and sell a letter-file consisting of receiving-wires, upon which the papers to be filed are strung, and arched wires adapted to come in contact with the receiving-wires, so as to form with the receiving-wires a continuous ring or arch, upon which the papers may be turned for the purpose of inspection or examination, the same as is provided for in the complainant's patent; but in the defendants' device the receiving-wires are so arranged that they rock forward from out of contact with the arched wires. This seems to me to be merely a colorable change in the construction of the device. The transfer of the function of movement from the vibrating wires to the receiving-wires is merely such a change as, with the complainant's patent before him, any mechanic might readily make, and is but an attempt at an evasion of the idea covered by the complainants' patent. The case seems to me to come closely within the principle announced in *Adams* v. *Manufacturing Co.*, (3 Ban. & A, 1,) where it was said:

Changing the position of a part of a machine does not avert infringement where the part transposed performs the same function as before.

I therefore find that the complainant's patent is valid, and that the defendants infringe, and a decree may be prepared accordingly.

AMENDMENTS

TO THE

ENGLISH PATENT LAW.

CHAPTER 50.

An Act to Amend the Patents, Designs, and Trade Marks Act, 1883. [24th December, 1888.]

ARRANGEMENT OF SECTIONS.

1. Register of patent agents.
Amendments of 46 & 47 Vict. c. 57.
2. s. 7, as to applications.
3. s. 9, as to disclosure of reports of examiners.
4. s. 11, as to opposition to grant of patent.
5. s. 18, as to amended specification.
6. s. 52, as to inspection of designs.
7. s. 58, as to piracy of registered designs.
8. s. 62, as to application for registration.
9. s. 63, as to limit of time for proceeding with application.
10. s. 64, as to fancy words.
11. s. 67, as to colours of trade marks.
12. s. 68, as to advertisement of applications.
13. s. 69, as to opposition to registration.
14. s. 72, as to restrictions on registration.
15. s. 73, as to restriction on registration.
16. s. 74, as to additions to trade marks.
17. s. 75, as to effect of registration.
18. Certificate as to exclusive use and costs thereon.
Amendments of 46 & 47 Vict. c. 57.
19. s. 79, as to removal of trade mark from the register.
20. s. 81, as to Sheffield marks.
21. s. 87, as to entry of assignments, &c.
22. s. 88, as to inspection.
23. s. 90, as to rectification of register.
24. s. 91, as to correction of errors.
25. Proceedings of Board of Trade.
26. Jurisdiction of Lancashire Palatine Court.
27. Construction of principal Act.
28. Commencement of Act.
29. Short title.

Whereas it is expedient to amend the Patents, Designs, and Trade Marks Act, 1883, hereinafter referred to as the principal Act:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1.—(1.) After the first day of July one thousand eight hundred and eighty-nine a person shall not be entitled to describe himself as a patent agent, whether by advertisement, by description on his place of business, by any document issued by him, or otherwise, unless he is registered as a patent agent in pursuance of this Act.

(2.) The Board of Trade shall, as soon as may be after the passing of this Act, and may from time to time, make such general rules as are in the opinion of the Board required for giving effect to this section, and the provisions of section one hundred and one of the principal Act shall apply to all rules so made as if they were made in pursuance of that section.

(3.) Provided that every person who proves to the satisfaction of the Board of Trade that prior to the passing of this Act he had been bona fide practicing as a patent agent shall be entitled to be registered as a patent agent in pursuance of this Act.

(4.) If any person knowingly describes himself as a patent agent in contravention of this section he shall be liable on summary conviction to a fine not exceeding twenty pounds.

(5.) In this section "patent agent" means exclusively an agent for obtaining patents in the United Kingdom.

2. For section seven of the principal Act the following section shall be substituted, namely:—

"**7.** (1.) If the examiner reports that the nature of the invention is not fairly described, or that the application, specification, or drawings has not, or have not, been prepared in the prescribed manner, or that the title does not sufficiently indicate the subject-matter of the invention, the comptroller may refuse to accept the application, or require that the application, specification, or drawings be amended before he proceeds with the application; and in the latter case the application shall, if the comptroller so directs, bear date as from the time when the requirement is complied with.

"(2.) Where the comptroller refuses to accept an application or requires an amendment, the applicant may appeal from his decision to the law officer.

"(3.) The law officer shall, if required, hear the applicant and the comptroller, and may make an order determining whether, and subject to what conditions, (if any,) the application shall be accepted.

"(4.) The comptroller shall, when an application has been accepted, give notice thereof to the applicant.

"(5.) If, after an application for a patent has been made, but before the patent thereon has been sealed, another application for a patent is made, accompanied by a specification bearing the same or a similar title, the comptroller, if he thinks fit, on the request of the second applicant, or of his legal representative, may, within two months of the grant of a patent on the first application, either decline to proceed with the second application or allow the surrender of the patent, if any, granted thereon."

3. In sub-section five of section nine of the principal Act the words "other than an appeal to the law officer under this Act" shall be omitted.

4. In sub-section one of section eleven of the principal Act the words from "or on the ground of an examiner" to "a previous application," both inclusive, shall be omitted, and there shall be added in lieu thereof the following words, namely, "or on the ground that the complete specification describes or claims an invention other than that described in the provisional specification, and that such other invention forms the subject of an application made by the opponent in the interval between the leaving of the provisional specification and the leaving of the complete specification."

5. For sub-section ten of section eighteen of the principal Act the following sub-section shall be substituted, namely:—

"(10.) The foregoing provisions of this section do not apply when, and so long as any action for infringement or proceeding for revocation of a patent is pending."

6. After sub-section one of section fifty-two of the principal Act the following words shall be added; namely,

"Provided that where registration of a design is refused on the ground of identity with a design already registered, the applicant for registration shall be entitled to inspect the design so registered."

7.—(1.) In section fifty-eight of the principal act the words "or cause to be applied" shall be added after the word "apply."

(2.) To the same section the following words shall be added: "Provided that the total sum forfeited in respect of any one design shall not exceed one hundred pounds."

8.—(1.) In sub-section two of section sixty-two of the principal Act for the words "the patent office in the prescribed manner" shall be substituted the words "such place and in such manner as may be prescribed."

(2.) To the same section of the principal Act the following sub-section shall be added:—

"(6.) Where an applicant for the registration of a trade mark otherwise than under an international convention is out of the United Kingdom at the time of making the application he shall give the comptroller an address for service in the United Kingdom, and if he fails to do so the application shall not be proceeded with until the address has been given."

9. In section sixty-three of the principal Act for the words "the application shall be deemed to be abandoned" shall be substituted the words "the comptroller shall give notice of the non-completion to the agent employed on behalf the applicant, and, if at the expiration of fourteen days from that notice the registration is not completed, shall give the like notice to the applicant, and if at the expiration of the latter fourteen days, or such further time as the comptroller may in special cases permit, the registration is not completed, the application shall be deemed to be abandoned."

10.—(1.) For section sixty-four of the principal Act the following section shall be substituted, namely—

"**64.**—(1.) For the purposes of this Act, a trade mark must consist of or contain at least one of the following essential particulars:

"(a.) A name of an individual or firm printed, impressed, or woven in some particular and distinctive manner; or

"(b.) A written signature or copy of a written signature of the individual or firm applying for registration thereof as a trade, mark; or

"(c.) A distinctive device, mark, brand, heading, label, or ticket; or

"(d.) An invented word or invented words; or

"(e.) A word or words having no reference to the character or quality of the goods, and not being a geographical name.

"(2.) There may be added to any one or more of the essential particulars mentioned in this section any letters, words, or figures, or combination of letters, words, or figures, or of any of them, but the applicant for registration of any such additional matter must state in his application the essential particulars of the trade mark, and must disclaim in his application any right to the exclusive use of the added matter, and a copy of the statement and disclaimer shall be entered on the register.

"(3.) Provided as follows:

"(i.) A person need not under this section disclaim his own name or the foreign equivalent thereof, or his place of business, but no entry of any such name shall affect the right of any owner of the same name to use that name or the foreign equivalent thereof:

"(ii.) Any special and distinctive word or words, letter, figure, or combination of letters or figures, or of letters and figures used as a trade mark before the thirteenth day of August, one thousand eight hundred and seventy-five, may be registered as a trade mark under this part of this Act."

11. In section sixty-seven of the principal Act the words "or colours" shall be added after the word "colour" in each place where that word occurs.

12. In section sixty-eight of the principal Act after the word comptroller shall be added the words "unless the comptroller refuse to entertain the application."

13.—(1.) In sub-section one of section sixty-nine of the principal Act for the words "two months" shall be substituted the words "one month or such further time, not exceeding three months, as the comptroller may allow."

(2.) In the same sub-section the word "first" shall be omitted.

(3.) In sub-section two of the same section for the words "two months" shall be substituted the words "one month."

(4.) For sub-sections three and four of the same section the following sub-sections shall be substituted; namely,

"(3.) If the applicant sends such counter-statement the comptroller shall furnish a copy thereof to the person who gave notice of opposition, and shall, after hearing the applicant and the opponent, if so required, decide whether the trade mark is to be registered, but his decision shall be subject to appeal to the Board of Trade, who shall, if required, hear the applicant and the opponent and the comptroller, and may make an order determining whether, and subject to what conditions (if any), registration is to be permitted.

"(4.) The Board of Trade may, however, if it appears expedient, refer the appeal to the court, and in that event the court shall have jurisdiction to hear and determine the appeal, and may make such order as aforesaid.

"(5.) If the applicant abandons his application after notice of opposition in pursuance of this section he shall be liable to pay to the opponent such costs in respect of the opposition as the comptroller may determine to be reasonable.

"(6.) Where the opponent is out of the United Kingdom he shall give the comptroller an address for service in the United Kingdom."

14. In sub-section two of section seventy-two of the principal Act, the following words shall be added at the beginning of the sub-section, namely, "except as aforesaid," and for the words "so nearly resembling" shall be substituted the words "having such resemblance to."

15. In section seventy-three of the principal Act the word "exclusive" shall be omitted.

16. For sub-section two of section seventy-four of the principal Act the following sub-section shall be substituted; namely,

"(2.) The applicant for registration of any such addition must, however, state in his application the essential particulars of the trade mark, and must disclaim in his application any right to the exclusive use of the added matter, and a copy of the statement and disclaimer shall be entered on the register.

"Provided that a person need not under this section disclaim his own name or the foreign equivalent thereof, or his place of business, but no entry of any such name shall affect the right of any owner of the same name to use that name or the foreign equivalent thereof."

17. For section seventy-five of the principal Act the following section shall be substituted; namely,

"Application for registration of a trade mark shall be deemed to be equivalent to public use of the trade mark, and the date of the application shall for the purposes of this Act be deemed to be, and as from the first day of January one thousand eight hundred and seventy-six to have been, the date of the registration."

18. After section seventy-seven of the principal Act the following section shall be added and numbered 77A; namely,

"In an action for infringement of a registered trade mark the court or a judge may certify that the right to the exclusive use of the trade mark came in question, and if the court or a judge so certifies, then in any subsequent action for infringement the plaintiff in that action, on obtaining a final order or judgment in his favour, shall have his full costs, charges, and expenses as between solicitor and client, unless the court or judge trying the subsequent action certifies that he ought not to have the same."

19.—(1.) In sub section five of section seventy-nine of the principal Act, for the words "the five years" shall be substituted the words "one year."

(2.) To the same sub-section the following words shall be added; namely, "unless it is shown to the satisfaction of the comptroller that the non-payment of the fee arises from the death or bankruptcy of the registered proprietor, or from his having ceased to carry on business, and that no person claiming under that proprietor or under his bankruptcy is using the trade mark."

20.—(1.) For sub-section two of section eighty-one of the principal Act the following sub-section shall be substituted:

"(2.) The Cutlers' Company shall enter in the Sheffield register, in respect of metal goods as defined in this section, all the trade marks entered before the first day of January one thousand eight hundred and eighty-nine in respect of metal goods either in the register established under the Trade Marks Registration Act, 1875, or in the register of trade marks under this Act, belonging to persons carrying on business in Hallamshire or within six miles thereof. The Cutlers' Company shall also, on request made in the prescribed manner, enter in the Sheffield register, in respect of metal goods, all the trade marks which shall have been assigned by the Cutlers' Company and actually used before the first day of January one thousand eight hundred and eighty-four, but which have not been entered in either of the said other registers."

(2.) In sub-sections three and eight of the same section, for the words "on cutlery, edge tools, or on raw steel, or on goods made of steel, or of steel and iron combined, whether with or without a cutting edge," shall be substituted the words "on metal goods."

(3.) For sub-section seven of the same section the following sub-section shall be substituted:

(7.) The provisions of this Act and of any general rules made under this Act with respect to the registration of trade marks, and all matters relating thereto, shall, subject to the provisions of this section, apply to the registration of trade marks on metal goods by the Cutlers' Company, and to all matters relating thereto; and this Act and any such general rules shall, so far as applicable, be construed accordingly with the substitution of the Cutlers' Company, the office of the Cutlers' Company, and the Sheffield Register, for the Comptroller, the Patent Office, and the Register of Trade Marks, respectively; and notice of every entry, cancellation, or correction made in the Sheffield Register shall be given to the Comptroller by the Cutlers' Company: Provided that this section shall not affect any life estate and interest of a widow of the holder of any Sheffield mark which may be in force in respect of such mark at the time when it shall be placed upon the Sheffield Register.

(4.) To the same section the following sub-sections shall be added; namely,—

(14.) For the purposes of this section the expression "metal goods" means all metals, whether wrought, unwrought, or partly wrought, and all goods composed wholly or partly of any metal.

(15.) For the purpose of legal proceedings in relation to trade marks entered in the Sheffield register a certificate under the hand of the master of the Cutlers' Company shall have the same effect as the certificate of the comptroller.

21. In section eighty-seven of the principal Act, after the words "subject to," shall be added the words "the provisions of this Act and to."

22. In section eighty-eight of the principal Act, after the words "subject to," shall be added the words "the provisions of this Act and to."

23. In section ninety of the principal Act, after the words "of the name of any person," shall be added the words "or of any other particulars."

24. To section ninety-one of the principal Act the following sub-section shall be added; namely,

"(d.) Permit an applicant for registration of a design or trade mark to amend his application by omitting any particular goods or classes of goods in connexion with which he has desired the design or trade mark to be registered."

25. After section one hundred and two of the principal Act the following section shall be added and numbered 102A; namely,

"(1.) All things required or authorised under this Act to be done by, to, or before the Board of Trade, may be done by, to, or before the President or a secretary or an assistant secretary of the Board.

"(2.) All documents purporting to be orders made by the Board of Trade and to be sealed with the seal of the Board, or to be signed by a secretary or assistant secretary of the Board, or by any person authorised in that behalf by the President of the Board, shall be received in evidence, and shall be deemed to be such orders without further proof, unless the contrary is shown.

"(3.) A certificate, signed by the President of the Board of Trade, that any order made or act done is the order or act of the Board, shall be conclusive evidence of the fact so certified."

26. After section one hundred and twelve of the principal Act the following section shall be added and numbered 112A; namely,

"The Court of Chancery of the County Palatine of Lancaster shall, with respect to any action or other proceeding in relation to trade marks the registration whereof is applied for in the Manchester Office, have the like jurisdiction under this Act as Her Majesty's High Court of Justice in England, and the expression 'the court' in this Act shall be construed and have effect accordingly.

"Provided that every decision of the Court of Chancery of the County Palatine of Lancaster in pursuance of this section shall be subject to the like appeal as decisions of that court in other cases."

27. The principal Act shall, as from the commencement of this Act, take effect subject to the additions, omissions, and substitutions required by this Act, but nothing in this Act shall affect the validity of any act done, right acquired, or liability incurred before the commencement of this Act.

28. This Act shall, except so far as is by this Act otherwise specially provided, commence and come into operation on the first day of January one thousand eight hundred and eighty-nine.

29. This Act may be cited as the Patents, Designs, and Trade Marks Act, 1888, and this Act and the Patents, Designs, and Trade Marks Acts, 1883 to 1886, may be cited collectively as the Patents, Designs, and Trade Marks Acts, 1883 to 1888.

PATENT LAW OF ECUADOR.

The following translation of the Patent Law of 1880 *has been made by Messrs. W. P. Thompson & Co., of Liverpool, Manchester, and London.*

Law of November 3, 1880.

The Congress of the Republic of Ecuador consider that it is important to regulate the mode and form of grant of patents of invention in order to avoid their being transformed into a species of monopoly and to facilitate the acquisition of them if useful to science, art and industry. It is decreed—

Article 1. The law assures to every inventor the full and entire enjoyment of his own invention, provided that it be not contrary to the laws or good morals.

Art. 2. The following shall be considered as inventions,—the means or methods which may be discovered for the improvement of any manufacture or industry.

Art. 3. The following shall not be considered as inventions,—those which consist in theoretical modifications or objects of pure ornament.

Art. 4. The State shall have power to buy for public use the secret of any invention useful to industry.

Art. 5. To assure the author of an invention or of an improvement, the enjoyment of his exclusive property, a patent is to be conceded to him of which the duration shall not be less than ten (10) years or more than fifteen (15.)

Art. 6. It is unlawful to grant patents to inventors of secret remedies; they ought to publish the composition of these under the reserve of a just indemnity.

Art. 7. The introducers of machines or of new methods of manufacture, or industry unknown heretofore in the Republic, will have the right of obtaining exclusive patents which will be conceded upon the following scale:

Art. 8. If the establishment of the machine or industry imported requires a capital or an advance of 25,000 pesos the patent will be granted for three years; if this capital be raised to 50,000 pesos it will be granted for six years; and if the same capital amounts to 100,000 pesos or more, it will be granted for ten years.

Art. 9. The patent conceded to introducers of machines or of novel methods of manufacture or of industry already known and employed abroad will only effect for the locality where the machine will be worked or the territory necessary for its exploitation.

MANNER OF OBTAINING PATENTS OF INVENTION, IMPROVEMENT OR IMPORTATION.

Art. 10. The applicant for a patent in any one of these classes must present to the Executive an application in which he will explain what the invention or improvement consists in, reserving to himself the secret of the method of the substances or of the ingredients which he makes use, or of the instrument which he employs. This application must be accompanied by a specimen of the article, of the metal worked, or of the improved invention.

Art. 11. When an application is made for a patent of importation the interested party will add to his application drawings or models of the machine which he proposes to establish or a detailed specification describing the principles, methods, and processes of the industry which he desires to establish in the territory of the Republic as well as the product which he proposes to manufacture.

Art. 12. The government will then name a commission of three competent persons to judge of the matter and examine the process or secret constituting the invention, improvement, or importation.

Art. 13. This commission will be always presided over by the political chief of the canton where the patent is to be worked; and if the patent be taken for the entire Republic, by the chief of the canton where the application shall be presented and by two members of the municipal council who will proceed to the examination of the matter set forth in the preceding article.

Art. 14. The two members of the municipal council and the three members of the commission named by the government will take before the same political chief an oath not to reveal the secret of the invention or improvement and to conscientiously perform their mission.

Art. 15. The commission and the two members of the municipal council will then discuss (the interested party not being present) the advice which they ought to present, taking care to set forth all the divergences of opinion which may occur between themselves.

Art. 16. The advice or report mentioned in the preceding article will be remitted under sealed cover with "communication réservée" to the Minister of the Interior. In the same envelope will

be inclosed the description of the manufacture, machine or other details which constitute the invention, the improvement, or importation.

Art. 17. Within a maximum period of three months after the receipt of the report of the commission charged to examine the invention, improvement, or importation of the new industry, the Executive Power will remit to Congress the papers furnished by the applicant as well as the report cited above.

The Congress after examination will concede or refuse the patent. In the first case it will return the papers presented by the Executive Power, and the latter will send the patent upon stamped paper of the 10th class, and cause to be registered at the Ministry of the Interior the application or specification spoken of in Art. 11.

Art. 18. In order to avoid the abuse which owners of patents can make of their patents the Government will declare upon the same that it does not guarantee either the reality, the merit, or the utility of the invention, improvement or importation, and that the interested party will work the same at his own risk and peril.

Art. 19. The owner of a patent who shall desire to make changes in his invention or in his original application before obtaining his patent or before the expiration of the term of his patent must make a declaration in writing accompanied by the description of his new methods in the form and fashion prescribed in Art. 10 in order to obtain a corresponding alteration in his patent of which the duration shall not in the meantime be prorogued.

THE RIGHTS OF OWNERS OF PATENTS.

Art. 20. The owner of a patent shall enjoy exclusively the benefit of an invention, improvement, or importation made the object of his patent.

Art. 21. He shall have the right of forming establishments in all parts of the Republic, if his invention is taken for the whole extent of it, or all of the localities to which he shall be limited or to authorize parties to employ his methods as well as to dispose of his right as personal property.

Art. 22. The owner of a patent shall not be able to assign it in whole or in part except by a notarial act under pain of losing all rights to his patent.

Art. 23. In case of an interference or doubt between the authors of two applications, the priority of application for a patent shall be decided by the certificate of the Under Secretary of State for the Interior, who shall inscribe the date and hour of the presentation of the respective applications.

ON THE DURATION OF PATENTS.

Art. 24. The duration of patents of invention, improvement, or importation shall commence to run from the date of the decree of their grant.

Art. 25. The Letters Patent once accorded by the Government shall be registered in a special book at the Ministry of the Interior. At the same Ministry shall remain also filed until the expiration of the term of the patent the original application, the specification and other papers spoken of in Art. 10.

Art. 26. The grant of patents shall be communicated officially by the Minister of the Interior to the governors of the cantons and published in the Official Journal, it shall also be transcribed in the collections of laws and decrees.

CONCERNING THE RIGHTS OF THE NATION AT THE EXPIRATION OF THE TERM OF THE PATENT.

Art. 27. When the term of duration of a patent has expired the invention, the improvement or the importation of the new industrial process for which such patent has been granted will become public property.

Art. 28. At the expiration of a patent the specification and other documents mentioned in Art. 10 will be published and deposited in the public library of the Capitol of the Republic.

Art. 29. When a patent shall be declared void from any of the causes mentioned in the law it shall likewise be published and deposited in the Public Library with the object mentioned in Art. 27.

Art. 30. The Government will print the specifications and drawings required for the understanding of the process when it shall become public property and will forward a sufficient number of copies to the governors of Provinces.

CONCERNING GUARANTEES FOR THE PATENT AGAINST FRAUD.

Art. 31. The patentee, if he can show sufficient cause, may, by provisional mandate, require the sequestration of machinery, instruments or products, used or manufactured in infringement of his rights; observing with regard thereto the provisions of the laws as in force.

Art. 32. The proprietor of such goods shall, if proved guilty of fraud, be condemned to the confiscation of the goods seized, for the benefit of the patentee, and also to the payment, to the latter, of damages and interest in proportion to the importance of the fraud.

Art. 33. If the offense be not proved the (patentee) plaintiff shall pay the defendant for the damages caused by the seizure, and further a fine equal to that which would have been imposed on the defendant if he had been convicted of fraud.

Art. 34. If the patentee be disturbed in the exercise of his exclusive rights he may bring any persons so disturbing him before the ordinary tribunals by which the penalties provided by the preceding articles may be imposed. But if he shall raise any discussion as to the validity of the patent judgment must be given by the administration in the person of the Minister of the Interior.

Art. 35. In case of dispute between two patentees, with regard to two exactly similar inventions, the patent first granted shall be considered valid.

Art. 36. The second patentee shall in this case be considered as improver of the invention.

CONCERNING GUARANTEES FOR THE NATION AGAINST ABUSES BY THE PATENTEES.

Art. 37. Shall be declared void, all patents granted for an invention, improvement or importation which the tribunals shall condemn as contrary to the laws of the State, to public safety or to police regulations. The patentee will in this case forfeit all claim to an indemnity.

Art. 38. The patents shall also be declared to have lapsed in the following cases: 1st. If the inventor be proved to have concealed in his specification the true method of working his invention. 2nd. If the inventor be proved to have used secret processes which have not been detailed in his specification nor in the declaration which, by Art. 19, he is allowed to make to modify the same. 3rd. If the inventor or one pretending to be such be proved to have obtained a patent for an invention which has already been described and published through the press in the Republic or elsewhere. 4th. If the patentee has allowed a year and a day to pass from the date of granting the patent without having worked his invention and without having justified himself in view of the circumstances as allowed by the laws. 5th. If the inventor or the licensee of his rights, on any grounds, shall violate the obligations attached to the use of his patent.

Art. 39. In all cases where the patent shall go void or lapse, from any cause, the provision of Art. 27 will be applied.

Art. 40. Every patentee must undertake to submit to the laws of the country on all occasions with regard to his patent and must expressly reject all complaint or diplomatic intervention.

Art. 41. All patentees who have patents already in the Republic are subject, as regards the conditions involving the lapse of such patent, to the provisions of this present law.

THE OFFICIAL GAZETTE

OF THE

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[BY AUTHORITY OF CONGRESS.]

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Errata.

In OFFICIAL GAZETTE, March 5, 1889, Commissioner's Decision, *McDonough* v. *Gray* v. *Bell* v. *Edison*, page 1251, second column, lines 10, 11, 12, and 13, the clause—

"by means of the variable resistance, whether effected upon the principle of the microphone or the liquid of high resistance,"—

should read—

whether effected by means of an armature in the presence of a magnet in the circuit, or other inductive means, or by the introduction as part of the circuit of a liquid of high resistance, whereby the resistance could be varied.

Page 1252, second column, line 14 from the bottom, the word "simplifying" should read *amplifying*.

Page 1265, first column, line 30, the word "condoning" should read *condemning*.

Page 1266, second column, lines 11 and 12 from the bottom, the case cited, "*The People's Telephone Company* v. *The American Bell Telephone Company*" should read *The American Bell Telephone Company* v. *The People's Telephone Company*.

Page 1267, second column, the answer to question 576 should terminate with the words "Mr. Brown" and the date "March 12, 1883," following, should head the testimony which follows.

The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified and subclassified in the Scientific Library for convenient and ready reference.

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Issue of March 19, 1889.

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Designs	11	No. 18,963 to No. 18,973, inclusive.
Trade-Marks	27	No. 16,386 to No. 16,412, inclusive.
Labels	7	No. 5,847 to No. 5,854, inclusive.
Reissues	None.	
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TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	1	....	Nebraska	5	....
Arizona Territory	....	....	Nevada	....	....
Arkansas	2	....	New Hampshire	4	....
California	14	1	New Jersey	15	....
Colorado	2	....	New Mexico Terri'ty	1	....
Connecticut	13	....	New York	58	4
Dakota Territory	....	....	North Carolina	2	....
Delaware	2	....	Ohio	22	4
District of Columbia	11	1	Oregon	....	....
Florida	....	....	Pennsylvania	25	2
Georgia	2	....	Rhode Island	2	....
Idaho Territory	....	....	South Carolina	2	....
Illinois	29	3	Tennessee	6	....
Indian Territory	....	....	Texas	6	....
Indiana	12	....	Utah Territory	....	....
Iowa	9	1	Vermont	2	....
Kansas	13	....	Virginia	1	....
Kentucky	9	....	Washington Terri'y	2	....
Louisiana	2	....	West Virginia	2	....
Maine	1	....	Wisconsin	5	....
Maryland	5	1	Wyoming Territory	....	....
Massachusetts	36	7	United States Army	2	....
Michigan	12	3	United States Navy	....	....
Minnesota	4	....			
Mississippi	1	....	Total to citizens of the United States	352	29
Missouri	8	2			
Montana Territory	....	....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic	....	....	Germany	16	1
Australia	....	....	Ireland	....	....
Austria-Hungary	1	....	Mexico	1	....
Belgium	1	....	Newfoundland	1	....
Bermuda	....	....	New Zealand	1	....
Brazil	1	....	Norway	....	....
Canada	6	....	Russia	....	....
Chili	....	....	Scotland	1	....
Colombia, U. S. of	....	....	Spain	1	....
Cuba	....	1	Switzerland	1	....
Denmark	....	....	Victoria	....	....
England	14	3			
Finland	....	....	Total to citizens of foreign countries	45	5
France	8	....			

DESIGNS.

18,963.—MIRROR-FRAME.—*Henry Berry*, Shelton, Conn., assignor to *The Derby Silver Company*, same place. Application filed February 16, 1889. Serial No. 300,172. Term of patent 7 years.

18,964.—DESK.—*Francis A. Coffin*, Indianapolis, Ind. Application filed January 24, 1889. Serial No. 297,441. Term of patent 7 years.

18,965.—COLLAR.—*Charles W. Dater*, Brunswick, N. Y. Application filed December 22, 1888. Serial No. 294,428. Term of patent 7 years.

18,966.—REVOLVER-HANDLE.—*Charles A. Davis*, Washington, D. C. Application filed February 7, 1889. Serial No. 299,061. Term of patent 14 years.

18,967 and 18,968.—TYPE.—*Charles E. Heyer*, Chicago, Ill., assignor to *Barnhart Bros. & Spindler*, same place. Applications filed January 26, 1889. Serial Nos. 297,728 and 297,729. Term of patents 14 years.

18,969 to 18,971, inclusive.—TYPE.—*Ernst Lauschke*, Chicago, Ill., assignor to *Barnhart Bros. & Spindler*, same place. Applications filed January 26, 1889. Serial Nos. 297,725 to 297,727, inclusive. Term of patents 14 years.

18,972.—HANGING STAND.—*John L. Leavitt*, Grant, N. Mex. Application filed February 19, 1889. Serial No. 300,492. Term of patent 7 years.

18,973.—SCREW-HEAD.—*Edward G. Soltmann*, New York, N. Y. Application filed January 29, 1889. Serial No. 298,023. Term of patent 14 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,386.—TONIC EMMENAGOGUE.—*William Thos. Batterson, Millard F. Welsh*, and *John F. Funk*, Springfield, Ohio. Application filed February 21, 1889. Used since December 25, 1888.

"The letters and figures 'LUNAR—28.'"

16,387.—METAL-WORKING TOOLS, BRASS AND COPPER SUPPLIES, AND PLATERS' AND POLISHERS' SUPPLIES.—*Charles H. Besly & Co.*, Chicago, Ill. Application filed December 24, 1888. Used since February 3, 1888.

"The representation of a cube or the word 'CUBE.'"

16,388.—COTTON LININGS.—*Burton Bros. & Co.*, New York, N. Y. Application filed February 9, 1889. Used since January 2, 1889.

"The word 'NUBIAN.'"

16,389.—COTTON LININGS.—*Burton Bros. & Co.*, New York, N. Y. Application filed February 9, 1889. Used since January 2, 1889.

"The representation of two bees."

16,390.—SHOTGUN-CARTRIDGES.—*The Chamberlin Cartridge Company*, Cleveland, Ohio. Application filed February 2, 1889. Used since October 1, 1888.

"The word 'RABBIT' and the representation of a rabbit."

16,391.—SHOTGUN-CARTRIDGES.—*The Chamberlin Cartridge Company*, Cleveland, Ohio. Application filed February 2, 1889. Used since October 1, 1888.

"The word 'KANGAROO' and the representation of a kangaroo."

16,392.—FEBRIFUGES OR FEVER CURATIVES.—*Farbenfabriken, vormals Fr. Bayer & Co.*, Elberfeld, Prussia, Germany. Application filed January 30, 1889. Used since January, 1888.

"The word 'PHENACETIN-BAYER.'"

16,393.—CIGARS.—*Antonio Fernandez Garcia*, Havana, Cuba. Application filed December 18, 1888. Used since November 8, 1878.

"The words 'LA FLOR DE A. FERNANDEZ GCIA.'"

16,394.—WASH-BOARDS.—*Charles D. Fuller* and *Frank D. Fuller*, Kalamazoo, Mich. Application filed February 11, 1889. Used since December, 1888.

"The words 'THE CELERY CITY PROTECTOR.'"

16,395.—WASH-BOARDS.—*Charles D. Fuller* and *Frank D. Fuller*, Kalamazoo, Mich. Application filed February 11, 1889. Used since December, 1888.

"The words 'THE UNIVERSAL PROTECTOR.'"

16,396.—MEATS, VEGETABLES, FRUITS, OYSTERS, AND FISH.—*L. P. Haviland & Co.*, Camden, N. Y. Application filed January 17, 1889. Used since August, 1888.

"The word 'ARGOSY.'"

16,397.—REFINED PETROLEUM.—*Alfred Hopps & Sons* and *Samuel Banner & Co.*, Liverpool, England. Application filed February 14, 1889. Used since October, 1885.

"The word 'JESSAMINE.'"

16,398.—NEWSPAPER OR WEEKLY PAMPHLET.—*Kansas City Times Newspaper Company*, Kansas City, Mo. Application filed February 11, 1889. Used since September 21, 1868.

"The words 'KANSAS CITY TIMES.'"

16,399.—MEDICINAL PREPARATION FOR THE TREATMENT OF GENERAL DEBILITY AND BRAIN AND NERVE DISEASES.—*Robert David Lalor*, London, England. Application filed February 11, 1889. Used since 1862.

"The word 'PHOSPHODYNE.'"

16,400.—EXTERNAL REMEDIES.—*James H. McGuinness*, New York, N. Y. Application filed February 19, 1889. Used since January 1, 1889.

"The word-symbol 'UN-X-L-ED,' or the word 'UNEXCELLED.'"

16,401.—BOOTS AND SHOES.—*Parker, Holmes & Co.*, Boston, Mass. Application filed January 25, 1889. Used since January 1, 1889.

"The letters and character 'P. H. & Co.'"

16,402.—STITCHING-HORSES.—*Randall & Co.*, Cincinnati, Ohio. Application filed February 4, 1889. Used since January 1, 1889.

"The words 'RANDALL & Co.' surrounded by an inverted equilateral triangle."

16,403.—RUBBER AND COTTON HOSE METAL-COVERED.—*Revere Rubber Company*, Boston, Mass. Application filed February 13, 1889. Used since January 1, 1889.

"The words 'STEEL ARMOR PROTECTED.'"

16,404.—RUBBER, LINEN, OR COTTON HOSE.—*Revere Rubber Company*, Boston, Mass. Application filed February 13, 1889. Used since December 1, 1888.

"The word 'PROTECTIVE.'"

16,405.—NERVINE.—*Samuel A. Richmond*, Tuscola, Ill. Application filed February 18, 1889. Used since 1884.

"The bust portrait of DR. S. A. RICHMOND associated with the representation of four globes."

16,406.—MEDICAL COMPOUNDS TO CURE DISEASES OF THE NERVES, LIVER, AND STOMACH.—*Henry R. Rogers*, Boston, Mass. Application filed February 18, 1889. Used since November 1, 1888.

"The word 'ROYAL.'"

16,407.—CIGARS.—*William Schliep*, Mount Pleasant, Iowa. Application filed February 2, 1889. Used since January 10, 1872.

"The word-symbol 'LA FLOR DE MAYO" and the initials 'W. H. S.'"

16,408.—HEEL-SHAVES.—*Varanus Snell*, Brockton, Mass. Application filed January 26, 1889. Used since February, 1881.

"The letters 'O. E. D.'"

16,409.—LININGS AND SUMMER COATINGS.—*C. E. Parkinson & Co.*, Bradford, county of York, England. Application filed January 31, 1889. Used since December 1, 1888.

"The word 'ETHEL.'"

16,410.—MEDICINAL PETROLEUM PRODUCTS.—*Terraline Company*, Washington, D. C. Application filed February 20, 1889. Used since September 1, 1886.

"The word 'TERRALINE.'"

16,411.—DIE-PLATES FOR THREADING STEAM, GAS, AND OTHER PIPES.—*Walworth Manufacturing Company*, Boston, Mass. Application filed January 5, 1889. Used since 1860.

"The word 'WALWORTH'S.'"

16,412.—HORSESHOE-NAILS.—*Samuel G. Wintermitz & Bro.*, Baltimore, Md. Application filed September 20, 1888. Used since January 1, 1880.

"The letter 'P,' formed of a horseshoe as its bow and a horseshoe-nail as its stem, inclosed within a frame formed of crossed horseshoe-nails."

LABELS.

5,847.—Title "DR. BALL'S CREAM." (FOR THE TOILET.)—*Joseph G. Ball*, Boston, Mass. Application filed February 1, 1889.

5,848.—Title: "NON-POROUS" (FOR PAINT.)—*Charles W. Bruce*, Philadelphia, Pa. Application filed February 27, 1889.

5,849.—Title: "M. F. CONINE'S GERMAN SCROFULAR SALVE."—*Martin F. Conine*, Plainwell, Mich. Application filed February 23, 1889.

5,850.—Title: "TAPEWORM SPECIFIC."—*Jennie G. Egersdorff*, Kansas City, Mo. Application filed February 18, 1889.

5,851.—Title: "DR JAMES' SURE CURE" (FOR REMEDY FOR CATARRH, COUGH AND CONSUMPTION.)—*Charles A. James*, San Francisco, Cal. Application filed February 25, 1889.

5,852.—Title: "CONDENSED COFFEE."—*John Lorentzen*, Chicago, Ill. Application filed February 20, 1889.

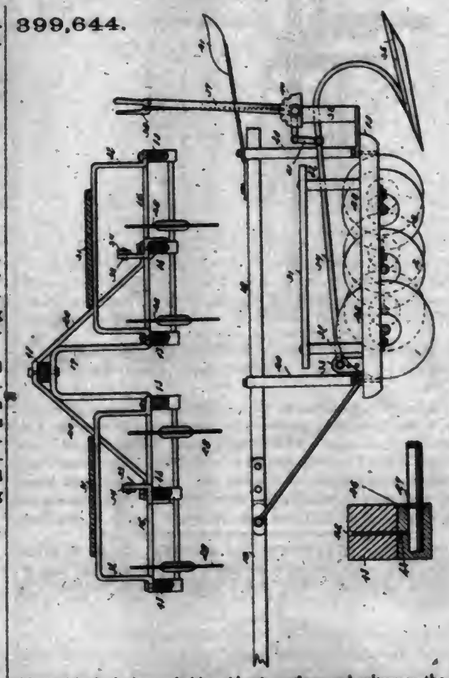
5,853.—Title: "OVAL HEADS AND FORGED NUTS," (FOR CARRIAGE BOLTS.)—*Oliver Iron and Steel Company*, Pittsburg, Pa. Application filed February 13, 1889.

PATENTS

GRANTED MARCH 19, 1889.

399,644. ROLLING HARROW AND CULTIVATOR. ANDREW J. ADAMSON, Sabetha, Kans. Filed May 22, 1888. Serial No. 274,633. (No model.)

399,644.



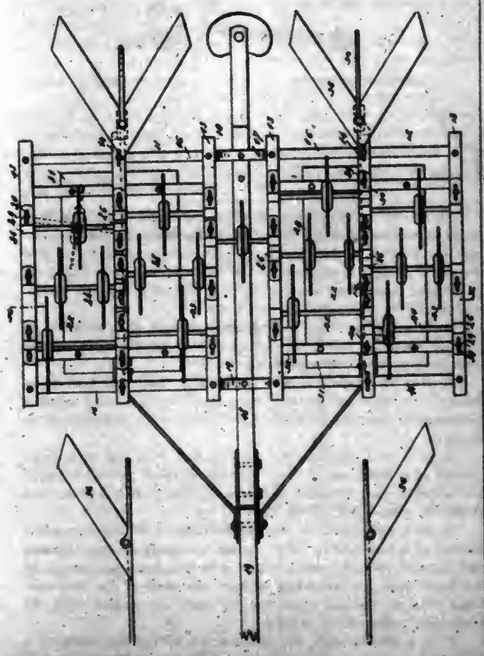
Claim.—1. A harrow-section divided into longitudinal sub-sections provided with non-aligning shafts journaled in said sub-sections and colters on the said shafts, the colters of one shaft being intermediate of those on the adjacent shafts, substantially as and for the purpose specified.

2. In a harrow, a harrow-section provided with longitudinal sub-sections, non-aligning shafts adjustably journaled in the said sub-sections, and colters on the said shafts, the colters on one shaft being intermediate of those on the adjacent shafts, substantially as and for the purpose specified.

3. A harrow-section divided into longitudinal sub-sections, non-aligning shafts adjustably journaled in said sub-sections, colters rigidly attached to the said shafts, the colters on one shaft being intermediate of those upon the adjacent shafts, and the forward colters being of a greater diameter than the remaining colters, as and for the purpose specified.

4. The combination, with harrow-sections united by a yoke and divided into longitudinal sub-sections, and non-aligning shafts adjustably journaled in said sub-sections, of colters fixed upon said shafts, the colters on one shaft being intermediate of those on the adjacent shafts and the forward colters of greater diameter than the remaining colters, a shovel-carrying bar adjustably pivoted to each section extending rearwardly from the same, shovels attached to the said bar, and means, substantially as shown and described, for raising and lowering said shovel-carrying bar, as and for the purpose specified.

5. A harrow-section divided into longitudinal sub-sections provided with shafts journaled in said sub-sections and colters on the said shafts, the colters of one shaft being intermediate of those on the adjacent shaft, substantially as and for the purpose specified.



6. In a harrow, a harrow-section provided with longitudinal sub-sections, shafts adjustably journaled in the said sub-sections, and colters on the said shafts, the colters on one shaft being intermediate of those on the adjacent shafts, substantially as and for the purpose specified.

7. A harrow-section divided into longitudinal sub-sections, shafts adjustably journaled in said sub-sections, colters rigidly attached to the said shafts, the colters on one shaft being intermediate of those upon the adjacent shafts, and the forward colters being of a greater diameter than the remaining colters, as and for the purpose specified.

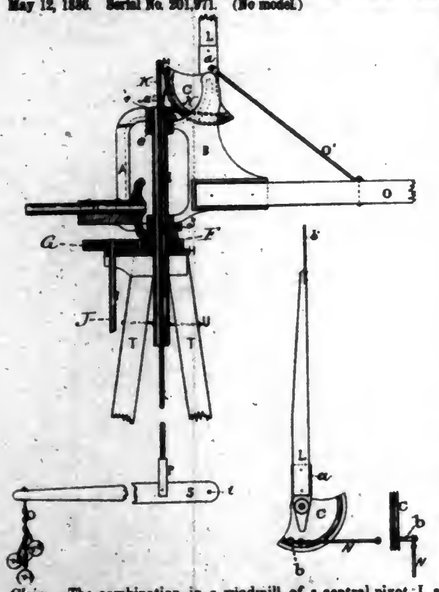
8. The combination, with harrow-sections united by a yoke and divided into longitudinal sub-sections, and shafts adjustably journaled in said sub-sections, of colters fixed upon said shafts, the colters on one shaft being intermediate of those on the adjacent shafts and the forward colters of greater diameter than the remaining colters, a shovel-carrying bar adjustably pivoted to each section extending rearwardly from the same, shovels attached to the said bar, and means, substantially as shown and described, for raising and lowering said shovel-carrying bar, as and for the purpose specified.

9. In a harrow, a harrow-section provided with longitudinal sub-sections, shafts adjustably journaled in the said sub-sections to shift them from a transverse to a diagonal position, and colters on said shafts, substantially as and for the purpose specified.

10. The combination, with harrow-sections united by a yoke extended above the harrow and divided into longitudinal sub-sections, shafts adjustably journaled in said sub-sections, colters fixed upon

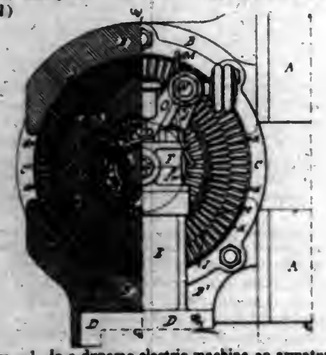
said shafts, a shovel-carrying bar adjustably pivoted to each section extending rearwardly from the same, shovels attached to the said bar, and means, substantially as shown and described, for raising and lowering said shovel-carrying bar, as and for the purpose specified.

399,645. WINDMILL. WILLIAM H. ALDRICH, Keokuk, Iowa. Filed May 12, 1886. Serial No. 201,971. (No model.)



Claim.—The combination, in a windmill, of a central pivot, I, a collar, *c*, rigidly secured thereto, wind-wheel and tail castings A B, wheel-shaft D, provided with bevel gear-wheel E, meshing with bevel-gear upon wheel F, loosely secured to said central pivot, a side shaft, J, provided with a pinion, G, meshing with gearing upon said wheel F, and mechanism, substantially as described, for regulating the speed of the wind-wheel, all arranged and adapted to operate as described.

399,646. DYNAMO-ELECTRIC MACHINE. JOSEPH W. RALEY, New York, N. Y., assignor of one-half to Robert Dunlap and Lutke F. Comans, same place. Filed Feb. 1, 1888. Serial No. 262,634. (No model.)

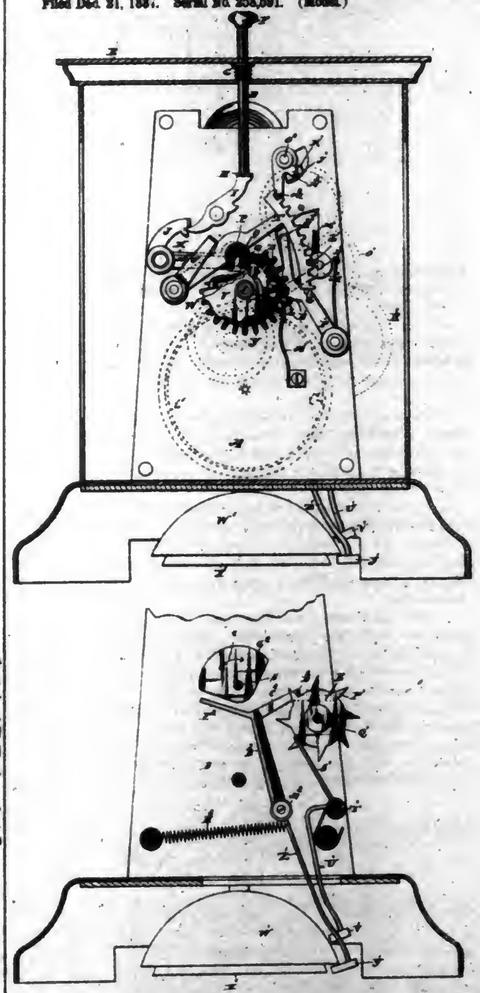


Claim.—1. In a dynamo-electric machine, an armature-core provided with longitudinal grooves extending inward from the periphery thereof to a depth much greater than the diameter of the conductor, and a conductor arranged at the bottom of the grooves and in close proximity to the walls of the grooves, substantially as specified.

2. In a dynamo-electric machine, the combination, with the hollow armature-core, of collars arranged to partly support the armature-core and provided with apertures and inclined wings *h* for introducing air into the interior of the armature, substantially as specified.

3. In a dynamo-electric machine, the combination, with the field-magnets A, provided with polar extremities B, adapted to inclose the sides of the armature, of the armature having the laminated longitudinally-grooved core K, the grooves extending inward from the periphery of the core to a depth much greater than the diameter of the conductor, the conductor in the bottom of the said grooves, and the commutator and electrical connections, substantially as described.

399,647. REPEATING-CLOCK. ARCHIBALD RAMSAYTHE, Waterbury, Conn., assignor to the Waterbury Clock Company, same place. Filed Dec. 21, 1887. Serial No. 258,691. (Model.)



Claim.—1. In a repeating-clock, the combination, with a spring-actuated push-rod mounted in the top of the clock-case, of a repeating-lever pivoted to the front frame-plate and engaged by the said rod and a lifting-arm engaged by the said repeating-lever and made in the same piece with the operating-lever of a rack, and snail repeating mechanism, substantially as set forth.

2. In a striking-clock, the combination, with an hour-wheel, of an hour star-wheel and a snail rigidly secured together and coupled with the hour-wheel, substantially as set forth.

3. In a striking-clock, the combination, with the hour-wheel thereof, of a snail and an hour star-wheel rigidly secured together and mounted upon the same arbor as the hour-wheel, substantially as set forth.

4. In a striking-clock, the combination, with the hour-wheel thereof, of a snail and an hour star-wheel rigidly secured together and mounted upon the same center as the hour-wheel and coupled therewith, substantially as set forth.

5. In a striking-clock, the combination, with the hour-wheel thereof, of a snail and an hour star-wheel rigidly secured together and mounted upon the same center therewith, and a pin carried by the hour-wheel and extending between the teeth of the hour star-wheel, whereby the said wheel and the snail are coupled with the hour-wheel, substantially as set forth.

6. In a striking-clock, the combination, with a time-train, of a strike-train, a single spring operating both trains, and rack and snail striking mechanism, the snail and the hour star-wheel being mounted on the same center as and coupled with the hour-wheel of the time-train, substantially as set forth.

7. In a striking-clock, the combination, with the hour-wheel thereof, of an hour star-wheel and a snail rigidly secured together and coupled with the hour-wheel and hourly-actuated thereby, and a spring applied to the hour star-wheel and completing its hourly movement and that of the snail, substantially as set forth.

8. In a striking-clock, the combination, with a snail and an hour star-wheel rigidly secured together, of a spring entering between the teeth of the hour star-wheel and provided with a lip for engaging with the face of the same and holding the snail and wheel in place upon their center, substantially as set forth.

9. In a chiming-clock, the combination, with a time-train, of a strike-train, a striking-hammer actuated by the strike-train, a chiming-hammer also actuated by the strike-train, and an independent chiming-cam driven by the time-train and operating to cut in and cut out the chiming-hammer, substantially as set forth.

10. In a clock, the combination, with a strike-train, of a time-train, a striking-cam actuated by the time-train and releasing the strike-train, a striking-hammer, a chiming-hammer, a hammer-wheel driven by the strike-train and operating first one hammer and then the other, and a chiming-cam actuated by the time-train and cutting out the chiming-hammer from the hammer-wheel and releasing it for operation thereby, substantially as set forth.

11. In a chiming-clock, the combination, with a strike-train, of a time-train which releases the striking-train, a striking-hammer, and a chiming-hammer actuated by the strike-train, and an independent chiming-cam located upon the center arbor of the clock and rotating therewith and operating to release the chiming-hammer for operation by the strike-train and to cut it out, so that it will not be operated thereby, substantially as set forth.

12. In a chiming-clock, the combination, with a time-train, of repeating mechanism, a striking-hammer and a chiming-hammer actuated by the strike-train, and a chiming-cam driven by the time-train and constructed to periodically release the chiming-hammer, so that for a part of the time it will follow the striking-hammer in repeating the hour, substantially as set forth.

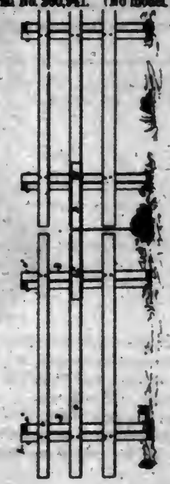
13. In a clock, the combination, with a repeating mechanism, of a chiming mechanism including a chiming-cam automatically operated by the time-train and arranged to bring the chime into play in signaling the half-hour and thereafter in repeating until the conclusion of the hour, substantially as set forth.

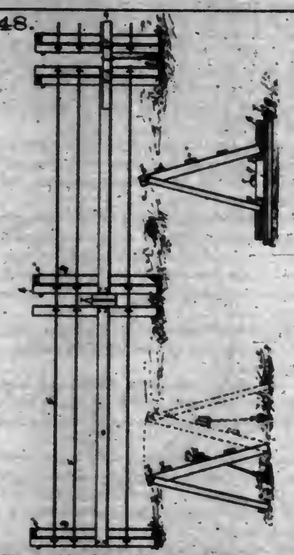
14. In a clock, the combination, with a time-train and a strike-train, of a chiming-cam driven by the time-train, a hammer-wheel operated by the strike-train, and a spring-actuated two-armed chiming-lever engaged by the said cam and wheel and carrying a bell-hammer, substantially as set forth.

15. In a clock, a friction-pinion mounted upon the center arbor and having an extended sleeve, which is split and grips the arbor, substantially as set forth.

16. In a striking-clock, the combination, with a strike-train, of a striking mechanism having a rack, a pin carried by one of the wheels of such train, a rotatable staff, and two detents carried by such staff and respectively arranged to be engaged with the toothed edge of the rack and the pin, whereby the said rack and pin are each directly held, substantially as set forth.

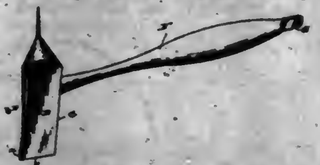
399,648. FENCE. HENRY W. BARBER, Rock Creek, Ohio. Filed Jan. 16, 1888. Serial No. 260,941. (No model.)





Claim.—The combination, with a fence panel, posts, and braces pivoted to the upper ends of the posts, of a cross-piece pivoted at its center to a blocking, said cross-piece having mortises therein adapted to receive the ends of the posts and braces, substantially as set forth.

399,649. COMBINED TOOL. GEORGE H. BACON, Morganfield, Ky. Filed Oct. 17, 1888. Serial No. 288,282. (No model.)

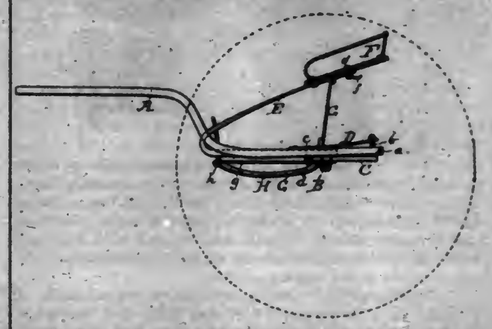


Claim.—1. In the within-described tool, the hammer-head A, formed with sides inclined inwardly from its rear toward its front, and at the end opposite the driving end with the awl-point E, substantially as described.

2. In the within-described tool, the hammer-head A, formed with sides inclined inwardly from its rear toward its front, and having the front *a* of said head extended forward of the upper portion of the head, substantially as and for the purpose set forth.

3. The within-described tool having the hammer-head A formed with sides inclined inwardly from its rear toward its front, with the portion *a* extended forward of the upper portion of the head, and with the awl-point E at the end opposite to the driving end, substantially as and for the purpose set forth.

399,650. TWO-WHEELED VEHICLE. IRA BROWN, Milford, Ill. Filed Jan. 16, 1888. Serial No. 260,907. (No model.)



Claim.—1. A two-wheeled vehicle provided with a suitable seat, springs for supporting said seat above the axle, and said axle, in combination with the shafts, the rear ends of which extend back of the axle and have vertical apertures therein, and arms C C, having

studs *b* rising from their rear ends, and having their forward ends bent at right angles to its length, as set forth.

2. A two-wheeled vehicle provided with a longitudinally-adjustable seat, springs for supporting said seat above the axle, and said axle, in combination with shafts A, having their rear ends extended back of the axle and provided with holes *a'* therein, arms C C, and studs *b*, arising from their rear ends, as set forth.

3. A two-wheeled vehicle provided with a suitable seat, springs for supporting said seat, and axle upon which said springs rest, in combination with arms C C, having studs projecting from their rear ends, and springs D, as set forth.

4. A two-wheeled vehicle having a suitable seat, springs supporting said seat, and axle to which said springs are clipped, in combination with arms C C, as described, having studs *b* rising from their rear ends, shafts A, the rear ends of which extend back of the said axle and through which said studs pass vertically, and springs D, substantially as described.

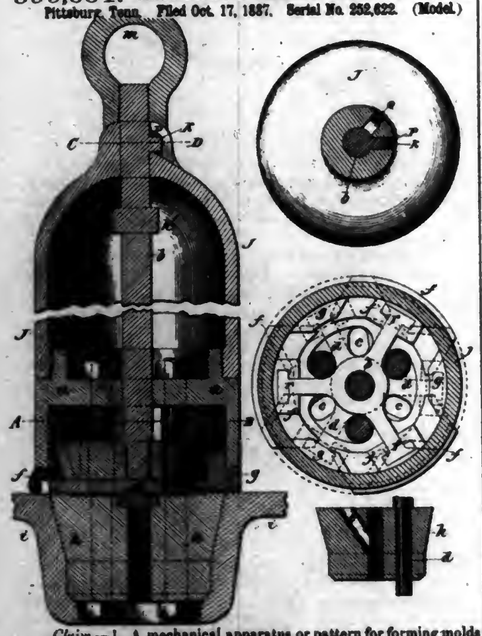
5. In a two-wheeled vehicle, the combination, with the seat, of the <-shaped supporting-springs, the axle, the springs *g g*, and the basket H, as set forth.

6. In a two-wheeled vehicle, the combination, with the shafts, arms C, having studs *b* and fulcrumal projections *d*, and springs D, of the axle, flat springs *g*, springs E, the seat F, and the basket H, as set forth.

7. The combination, in a two-wheeled vehicle, with the shafts, arms C, having studs *b* and fulcrumal projections *d*, and springs D, of the axle, springs E, and seat F, said seat being provided with longitudinal slots in its side frames and secured to springs E by bolts and thumb-nuts, as set forth.

8. In a two-wheeled vehicle, the combination, with the shafts and axle, of <-shaped springs and the seat secured thereto, said springs having their lower ends clipped to the axle, pursuing a forward course a suitable distance, and then bent back toward the rear, extending obliquely in toward each other and upward at a suitable angle, as set forth.

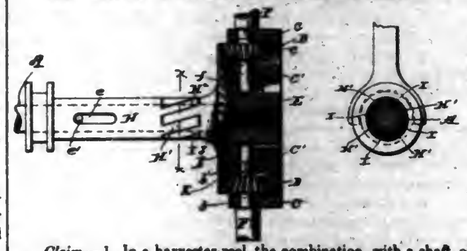
399,651. PIPE-MOLDING APPARATUS. AVERY C. BROCK, South Pittsburg, Tenn. Filed Oct. 17, 1887. Serial No. 252,622. (Model.)



Claim.—1. A mechanical apparatus or pattern for forming molds for casting pipe, consisting of the casing *a* and J, an operating-rod, *b*, having inclined T-shaped heads passing through said casing, sliding female bead-formers *f f f*, having inclined slots, rotary shouldered plate *g*, capable of being revolved about one-sixth of a revolution within casing *a*, shouldered bolts *d d d*, print *h*, and chill-plate *i*, to operate as and for the purposes specified.

2. The combination, in an apparatus for forming pipe-molds, of cylinder *a* and J, having slots P Q, vertical sliding rod *b*, having eye *m*, collar *b'*, lug K, and T-shaped inclined heads with sliding bead-formers *f f f*, having inclined slots, rotary plate *g*, shouldered bolts *d d d*, print *h*, and chill-plate *i*, to operate as and for the purposes specified.

399,652. HARVESTER-REEL. ALVIN O. CARMAN, Potterville, Mich. Filed Oct. 15, 1887. Serial No. 252,452. (No model.)



Claim.—1. In a harvester-reel, the combination, with a shaft, of a flanged plate secured to the end of the latter, reel-arms journaled in the flanges, pinions fixed on the arms, and means for actuating said pinions, substantially as set forth.

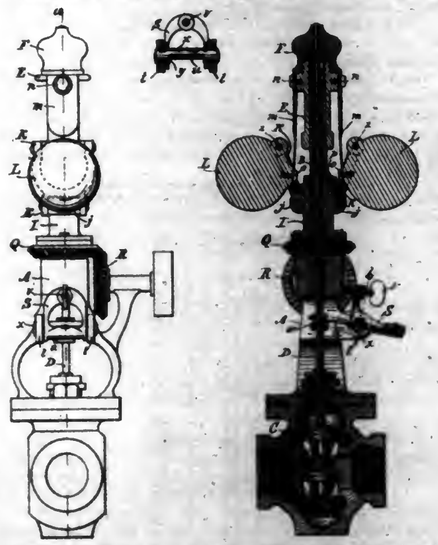
2. In a harvester-reel, the combination, with a shaft and a flanged plate secured to the end thereof, of a series of reel-arms journaled in the flanges of the plate, pinions fixed on said arms, a toothed wheel or disk loosely mounted on the shaft to engage said pinions, and means for actuating said wheel, substantially as set forth.

3. In a harvester-reel, the combination, with a shaft and a plate secured to one end thereof and provided with two annular flanges, one within the other, of a series of arms journaled in said flanges, these arms having blades thereon, pinions on the arms between the flanges, and means, substantially such as described, for actuating said pinions to incline the blades, substantially as set forth.

4. In a harvester-reel, the combination, with a shaft having a head secured thereon, and arms journaled in the head and provided with pinions, of a gear-wheel loosely mounted on the shaft with its teeth meshed with the teeth of the pinions, and a sliding sleeve mounted on the shaft and interlocked with the gear-wheel, and adapted by its sliding movement to turn the gear-wheel, substantially as set forth.

5. In a harvester-reel, the combination, with a shaft and a flanged plate secured at one end thereof, of a series of arms journaled in the flanges of the plate, pinions on these arms, a gear-wheel loosely mounted on the shaft adapted to mesh with said pinions, said toothed wheel having inclining fingers thereon, and a sleeve adapted to slide on the shaft, said sliding sleeve also having inclining fingers adapted to interlock with the fingers on the toothed wheel, and mechanism for sliding the sleeve, substantially as set forth.

399,653. STEAM-ENGINE GOVERNOR. OLIVER H. CASTLE, Indianapolis, Ind. Filed July 13, 1888. Serial No. 279,727. (No model.)



Claim.—1. In a governor, the combination of the following elements, namely: a main frame terminating in a hollow shaft, a reciprocating valve-stem mounted in said frame and passing through said shaft, a valve attached to said valve-stem, a sleeve attached to the valve-stem and arranged to turn and to slide longitudinally on the shaft, a pair of flat springs secured to opposite sides of said sliding sleeve, balls secured to the free ends of the springs, a sleeve mounted

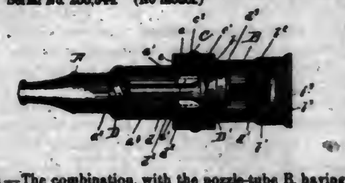
on the shaft so as to turn thereon, but fixed as to longitudinal movement, a driving-wheel secured to said fixed sleeve, and a pair of links, each pivoted at one end to the fixed sleeve and pivoted at the other end to a ball at a point beyond the point of attachment of the ball to the flat spring, all arranged to co-operate substantially as set forth.

2. In a governor, the combination, with the main frame, the valve, the stem for operating the valve arranged to slide longitudinally in said frame, and means for reciprocating the stem in the frame, and thereby opening and closing the valve, of a two-armed bracket pivoted to the frame, a set-screw mounted in one arm of the bracket and arranged to engage the frame, and a flat spring secured at one end to the other arm of the bracket, and having its free end connected to the reciprocating valve-stem, whereby the sliding of the valve-stem in one direction is adjustably resisted, substantially as and for the purpose specified.

3. In a governor, the combination of the main frame having lugs *t t*, bracket S, set-screw *v*, spring *u*, and pivot *x*, having notch *y*, all substantially as specified.

4. In a governor, the combination of a pair of revolable sleeves, one of which is free to move longitudinally and the other of which is fixed as to longitudinal movement, a pair of links, each of which is pivoted at one end to said fixed sleeve, so as to swing thereon in a path at right angles to its path of rotation, a pair of weights pivoted to the free ends of said links, so as to swing thereon in the same plane therewith, and a pair of flat springs rigidly secured at opposite ends, respectively, to said weights and the sliding sleeve, whereby the sliding sleeve is moved longitudinally by the combined swinging movement of the links and weights, substantially as and for the purpose specified.

399,654. HOSE-NOZZLE. JOHN CLIFFORD, Chicago, Ill., assignor to the L. Wolff Manufacturing Company, same place. Filed Nov. 22, 1887. Serial No. 255,844. (No model.)



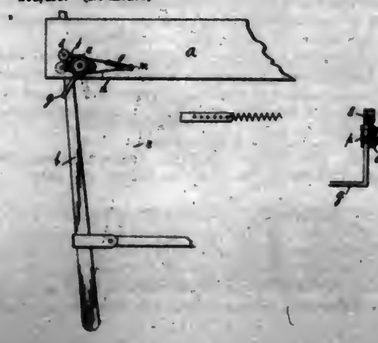
Claim.—The combination, with the nozzle-tube B, having screw-threaded end *b* and axial nut *b'*, of revolvable barrel A, having collar *a* and internal grooves, *a'*, valve-seat *a*^{3}, screw-threaded coupling-sleeve C, having flange *c*, packing-ring *c*^{2}, spirally-grooved spraying-piston D, valve D', and stem *d*, connecting said spraying-piston and valve, and having screw-threads *d'*, fitting in said axial nut *b'*, and provided with guide arms or wings *d*^{2}, fitting in said grooves *a'*, substantially as specified.

399,655. WATCH-MAKER'S AND JEWELER'S PLIERS. JOSEPH DANIELS, Cleveland, Ohio. Filed Oct. 31, 1887. Serial No. 253,839. (No model.)



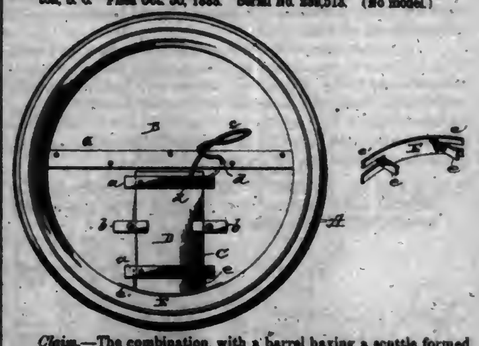
Claim.—In pliers, a lower jaw having a sharp-edged end diagonal to the sides of the body part and longitudinally corrugated, an upper jaw constructed to touch the lower one only at its extremity, and both jaws curved laterally and downwardly, substantially as set forth.

399,656. PICKER-CHECK FOR LOOMS. JAMES DAVIDSON and JESSE BANISTER, New Bedford, Mass. Filed Dec. 1, 1888. Serial No. 292,453. (No model.)



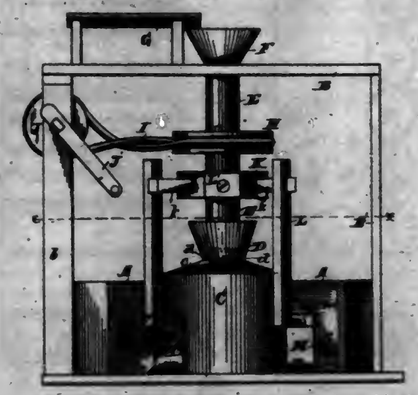
Claim.—A buffer for looms, consisting of a lever carrying a pawl to engage a ratchet and an arm to project under the lathe to receive the blow of the picker-stick in its backward motion, a ratchet and pulley pivoted to the lathe, with said pawl engaging the ratchet, a strap or band attached to the lathe and wrapped around said pulley, and a spiral spring attached to the lathe and to the end of the strap, substantially as and for the purpose shown and described.

399,657. SCUTTLE FOR BARRELS. JOSEPH B. NATHAN, Charleston, S. C. Filed Oct. 30, 1888. Serial No. 289,513. (No model.)



Claim.—The combination, with a barrel having a scuttle formed in one head of the barrel and extending to one edge thereof and a stay-plate, E, secured to the inner wall of the barrel near the chine, said stay-plate having stops *c c*, formed integral therewith, which engage the walls of the scuttle adjacent to its outer edge, of a lid constructed to be removably secured to the head of the barrel and cover the scuttle, substantially as set forth.

399,658. ORE-SEPARATOR. ALMA RUDOLPH, Galena, Kans. Filed Apr. 9, 1888. Serial No. 270,013. (No model.)



Claim.—1. In an ore-separator, the combination, with the vertically-arranged revolving water-pipe, of the ore-receptacle at the lower end of and concentrically arranged around said pipe, the latter having escape-orifices, through which the water passes first directly to the ore-receptacle, and said ore-receptacle having escape-passages for the mingled materials, the stationary distributer, the tank, and the agitators in the tank and remote from the stationary distributer, substantially as set forth.

2. In an ore-separator, the combination, with the vertically-arranged revolving water-pipe and the ore-receptacle arranged concentrically around the lower end of said pipe, the latter having escape-orifices, through which the water passes first directly to the ore-receptacle, and said ore-receptacle having escape-orifices for the mingled materials, of the stationary downward-flaring distributer having its operative surface immediately under the last said orifices from which it receives simultaneously the water and ore, the cylindrical distributer below the flaring part, the tank, and the agitators revolving in the tank and remote from the flaring distributer, substantially as set forth.

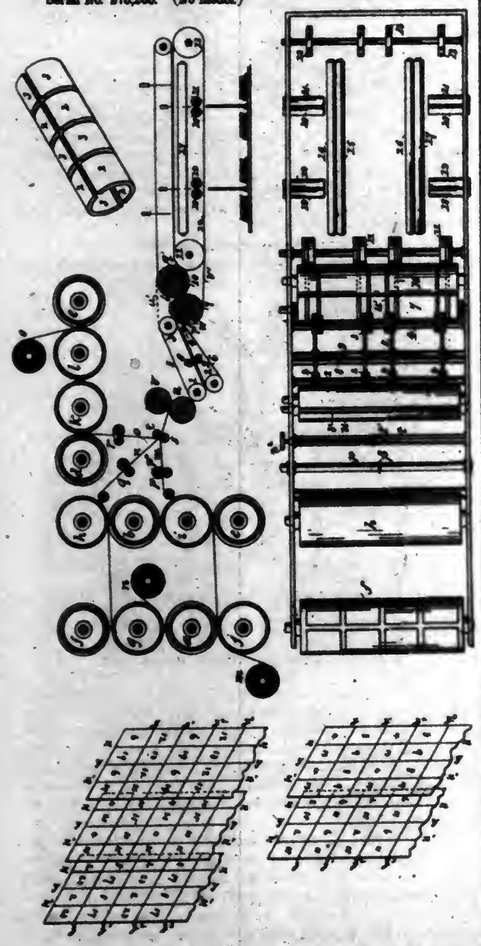
3. In an ore-separator, the combination, with the tank, the cylindrical distributer rising above the bottom of the tank, the downward-flaring distributer at the top of the cylindrical part, the agitators arranged substantially as set forth, to affect the material only in the tank, the receptacle above the flaring distributer for the mingled ore,

earth, and water, and having escape-passages through which the material passes over the said flaring distributer in an undisturbed state, and the central vertical water-pipe having escape-passages, through which the water passes first directly to the ore-receptacle, substantially as set forth.

4. The combination of the tank A, the distributer with vertical walls above the bottom of the tank, the flaring distributer above said vertical walls, the receptacle for the ore and water above the flaring distributer, the central vertical water-pipe which discharges directly into the said receptacle, and the agitators arranged within the tank below the flaring distributer and formed with the flexible sweeps M, substantially as set forth.

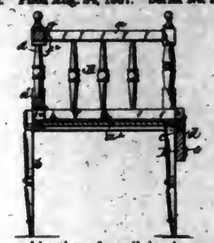
5. The combination of the tank, the distributer above the bottom of the tank and having a downward-flaring surface, the ore-receptacle above the said flaring surface, the water-pipe arranged concentrically within the said receptacle, the means for revolving the said water-pipe, the adjustable hub K, secured to the revolving pipe, and the agitators situated in the tank below the flaring distributing-surface and supported from the said hub, substantially as described.

399,659. METHOD OF PRINTING NEWSPAPERS OR PAMPHLETS. JOSEPH I. FIRR, Jersey City, N. J. Filed May 28, 1888. Serial No. 275,265. (No model.)



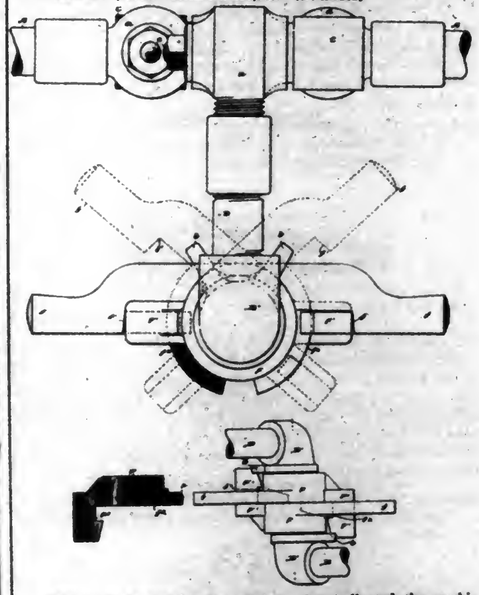
Claim.—The improvement in the art of printing newspapers or pamphlets, which consists in printing on a plurality of webs, so that certain pages belonging to the same pamphlet succeed each other longitudinally on the same web—*i. e.*, follow each other lengthwise of the web—and bringing the said webs one over another, then severing said webs transversely between the succeeding pages, then superposing the successive cuts on said webs over one another, substantially as described, whereby the various pages may be assembled in proper order without turning or reversing.

399,660. CRIB ATTACHMENT FOR BEDSTEADS. VIOLA FIFE, Richmond, Ind. Filed Aug. 24, 1887. Serial No. 247,734. (No model.)



Claim.—The combination of a crib having a complete set of supporting-legs pivoted thereto, leaves hinged to the side rail of said crib, and a bedstead provided with keepers on the inner side of the side rail thereof, whereby the crib may be attached to and detached from the bedstead and used either in connection with or independently of the same, substantially as described.

399,661. PIPE-COUPLING. THOMAS FLEMMER, Dunkirk, N. Y. Filed Nov. 7, 1887. Serial No. 254,545. (No model.)



Claim.—1. In pipe-coupling of the variety indicated, the combination, with locking-levers, of lugs or stops connected with the respective members of the coupling for engaging and automatically unlocking the levers when the coupling shall have reached a predetermined degree of extension, substantially as set forth.

2. In pipe-coupling, the combination, with locking-lever, substantially as indicated, of spring for engaging and pressing the levers apart and thereby drawing the members of the coupling toward each other, substantially as set forth.

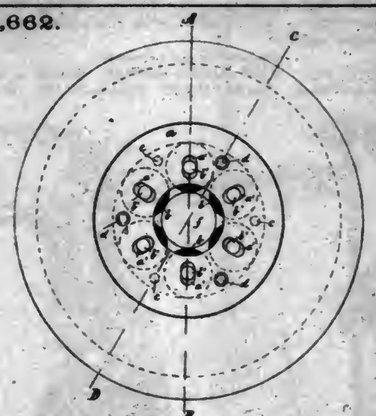
3. In pipe-coupling, the combination, with locking-levers and springs, substantially as indicated, of wedge-shaped flanges for engaging the hook of opposing locking-levers, whereby in locking the levers the springs are compressed, substantially as set forth.

4. The combination, with pipe-coupling, substantially as indicated, of segmental flanges projecting from the face of the respective members of the coupling, said flanges being adapted to interlock, and one flange having a journal bearing in the supporting member of the coupling, substantially as set forth.

399,662. ANTI-FRICTION BEARING. THOMAS R. PERRALL, Boston, Mass. Filed Sept. 5, 1888. Serial No. 284,693. (No model.)



399,662.

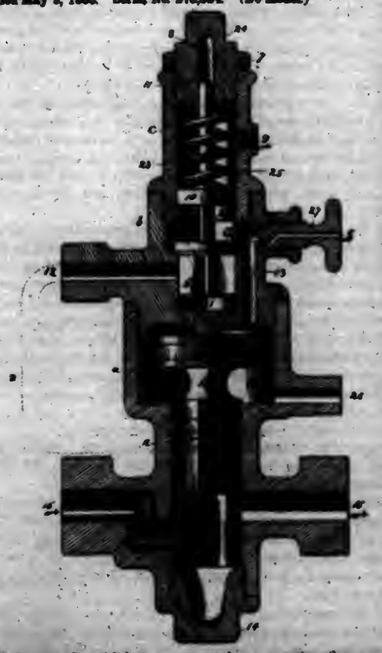


Claim.—1. In an anti-friction bearing, a pair of perforated washers, *a a*, and a series of anti-friction rollers journaled in perforations in said washers, combined with a series of stay bolts or wires, *c c c*, having their ends resting in recesses *a'' a''* on the inside of the washers *a a*, and a series of rivets, *d d d*, riveted to the said washers, substantially as and for the purpose set forth.

2. In an anti-friction bearing, the metal washers *a a*, having the radial perforations *a' a' a'*, as described, and having the anti-friction rollers *b b b* loosely journaled in said perforations, combined with the alternate stay bolts or wires *c c* and rivets *d d*, substantially as and for the purpose set forth.

3. The radially-perforated annular metal washers *a a* and the anti-friction rollers *b b*, having their end trunnions, *b' b'*, loosely journaled in said perforated washers, combined with the centrally-perforated part *c*, and the washer-holding device consisting of alternate stay bolts or wires *c c c*, having their ends resting in recesses on the interior of the washers *a a*, and the rivets *d d d*, substantially in a manner and for the purpose as specified.

399,663. PRESSURE-REGULATOR. JOHN C. CLARK, Verona, Pa. Filed May 9, 1888. Serial No. 273,234. (No model.)

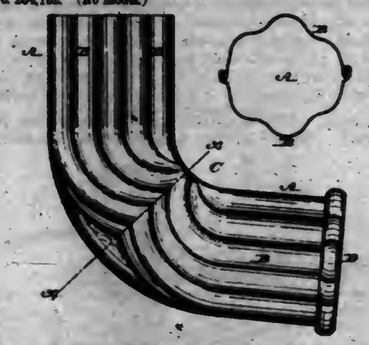


Claim.—1. In a high-pressure regulator, a main valve constantly exposed to the high-pressure fluid, a piston the area of which is larger than the main valve, low-pressure-fluid connections with one side of the piston, and an auxiliary valve controlling the flow of low-pressure fluid to the main valve and operated thereby, substantially as described.

2. In a high-pressure regulator, a main valve and its cylinder, a valve-piston of larger area than the valve and its cylinder, low-pressure-fluid connections with one side of the piston-cylinder, and an auxiliary valve controlling the flow of low-pressure fluid to the main valve and operated thereby, whereby a rise of pressure of the low-pressure fluid will open the auxiliary valve and operate the piston and main valve, substantially as described.

3. In a high-pressure regulator, a main valve constantly exposed to the high-pressure fluid, a piston the area of which is larger than the main valve, low-pressure-fluid connections with one side of the piston, an auxiliary valve controlling the flow of low-pressure fluid to the main valve and operated thereby, and a relief-valve between the auxiliary valve and piston, substantially as described.

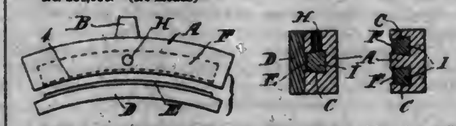
399,664. SHEET-METAL PIPE-ELBOW. WILLIAM J. GORDON and EDMUND D. GILBERT, Philadelphia, Pa. Filed Aug. 30, 1888. Serial No. 284,182. (No model.)



Claim.—1. A corrugated sheet-metal pipe-elbow, the corrugations whereof are converged at the center of the bend of the elbow, in the manner and for the purpose described.

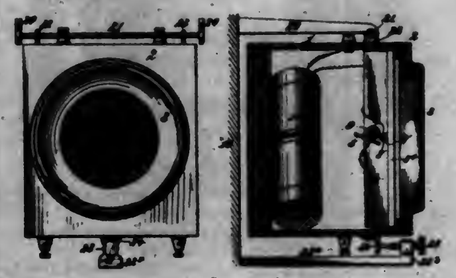
2. A sheet-metal pipe-elbow having converging corrugations at the central portion of the bend thereof, substantially as and for the purpose described.

399,665. BRAKE-SHOE. SAMUEL HATT, Montreal, Quebec, Canada, assignor to George Sanderson, same place. Filed July 26, 1888. Serial No. 281,106. (No model.)



Claim.—The combination of the body A, cast with a dovetailed groove, F, with a core of chilled metal, I, cast within said groove F, the whole substantially as described.

399,666. TELEPHONE-TRANSMITTER. CHARLES A. HITCHCOCK, North East, Pa., assignor of two-thirds to Samuel A. Davenport and William Barnley, same place. Filed Feb. 12, 1887. Serial No. 227,404. (No model.)



Claim.—In a telephone-transmitter, the combination of the supporting-arms, the transverse wire or rod, the transmitter-box having eyes turning on said wire or rod, the stationary inclined platform, the loose electrode, the diaphragm and its electrode, the bottom projection on the transmitter-box, and a horizontal bar having a set-screw for adjusting the transmitter-box and holding it at different angles relatively to the plane of the horizon, as and for the purpose herein set forth.

399,667. SAFETY-PIN. WILLIAM F. HYATT, Brooklyn, N. Y. Filed Sept. 1, 1888. Serial No. 284,320. (No model.)

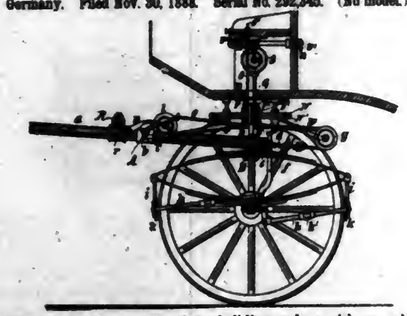


Claim.—1. A safety-pin having a shield provided with a narrow opening and made wider at that side which receives the pointed limb of the pin than that at the opposite side, which is rigidly secured to the unpointed limb, the inner edge of the wide side of the shield being curved downwardly, inwardly, and upwardly, substantially as specified.

2. A safety-pin having a shield rigidly secured to a limb of the pin, and having a wide retaining portion for the pointed limb of the pin, the edge of said wide portion adjacent to the narrow opening curved downwardly, inwardly, and upwardly, forming the curved extension, and the said edge extended laterally, substantially as specified.

3. A safety-pin having a shield provided with a narrow opening having its edges substantially parallel and standing at an angle to the length of the pin, the said shield being wider at that side which receives the pointed limb of the pin than at the opposite side, which is secured to the unpointed limb of the pin, substantially as specified.

399,668. VEHICLE-BRAKE. ADOLF JERNEL, Breslau, Prussia, Germany. Filed Nov. 30, 1888. Serial No. 292,345. (No model.)

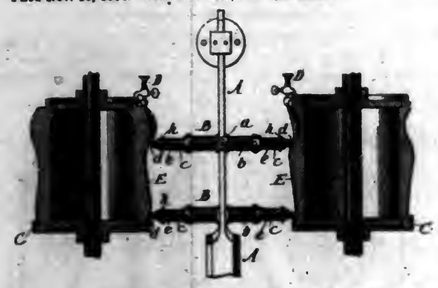


Claim.—1. The combination of sliding pole *a* with cross-bar *e*, levers *f*, rods *h*, and brake-shoes *k*, substantially as specified.

2. The combination of shaft *a* and stop *r* with sheaves *l*, secured to the carriage-body, and with cords *o*, wound on sheaves *l* in opposite directions, and with click *n* on shaft *l'* of sheaves *l*, substantially as specified.

3. The combination of bar *e*, rods *h*, and brake-shoes *k* with straps *w*, sheave *t*, worm-wheel *s*, worm *v*, and handles *v'*, substantially as specified.

399,669. BURNISHING-MACHINE. GEORGE R. KELLEY, Rockford, Ill., assignor to the Rockford Silver Plate Company, same place. Filed Nov. 19, 1888. Serial No. 291,194. (No model.)



Claim.—1. The combination of the tool-holders *c c* and spring *g* with the tube *b*, substantially as specified.

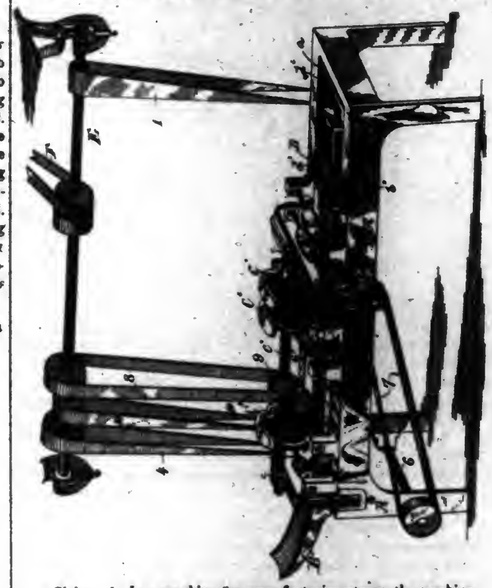
2. The combination of the tool-holders *c c*, having the slots *e* with the tube *b*, pins *f*, and spring *g*, substantially as specified.

3. The combination of the rod A, one or more tubes, *b*, having a boss, *a*, the tool-holder, *c c*, and spring *g*, substantially as and for the purpose specified.

4. In a burnishing-machine, a cylinder or drum, C, in combination with a clamp, D, consisting of a bracket, *i*, stem *j*, head *k*, spring *l*, set-screw *q*, and head *m*, adapted to receive the article to be burnished, substantially as and for the purpose specified.

5. In a burnishing-machine, a cylinder or drum, C, in combination with a clamp, D, consisting of a bracket, *i*, stem *j*, set-screw *q*, head *m*, adapted to receive the article to be burnished, and provided with a projection, *o*, and the plane portion *p*, substantially as and for the purpose specified.

399,670. STAVE-MAKING MACHINE. WILLIAM L. KELLOGG, Mound City, Ill. Filed Sept. 29, 1888. Serial No. 286,769. (No model.)



Claim.—1. In a machine for manufacturing staves, the combination of the frame-work, a longitudinal shaft arranged above said frame-work and carrying a cutter-head, a bed-plate formed with a notch beneath said cutter-head, into which the rear end of the stave may fall as it leaves said cutter-head, and an inclined end for guiding said stave out of the machine, substantially as set forth.

2. The combination, in a machine for dressing staves, of the frame, the cutter-head arranged to operate transversely of said bed-plate, and said bed-plate formed with a short abrupt incline in front of said cutter-head, and a longer incline terminating in another abrupt incline beyond said short inclines, substantially as set forth.

3. In a stave-dressing machine, the combination of the frame-work, a bed-plate mounted thereon formed with a notch, into which the rear end of the stave may drop as it leaves the cutter-head, an upwardly-inclined end beyond said notch, and a cutter mounted above and arranged to operate transversely of said bed-plate and above said notch, substantially as described, and for the purposes specified.

4. In a machine for dressing staves, the combination of the frame, a shaft journaled above said frame and extending longitudinally thereof, a series of cutter-heads thereon arranged to cut to different depths, and suitable feeding and driving mechanism, substantially as set forth.

5. In a machine for dressing staves, the combination of the frame, the bed-plate for guiding the staves, a cutter-head formed to dress one side of said stave, mounted beneath said bed-plate, a series of cutter-heads arranged to cut into the block different depths for dressing the other side of said stave mounted above said bed-plate, and an adjustable table for receiving the stave-blocks and suitable mechanism for carrying them forward, substantially as set forth.

399,671. PAPER-BAG AND TWINE HOLDER. CHAMBERS E. KEMLE, Wilmington, Del. Filed July 7, 1888. Serial No. 279,286. (No model.)

Claim.—1. A combined paper-bag and twine holder consisting of a suspending-rod, a twine-holder secured to the lower end thereof, and a paper-bag holder surrounding said twine-holder and depending below the same, said bag-holder being swiveled upon the lower end of said rod above the point of attachment of the twine-holder, substantially as set forth.

2. In a combined paper-bag and twine holder having a suspending-rod, and the twine-holder and paper-bag holder suspended therefrom, the suspending-rod formed in two parts, *g h*, one part attached at the upper end to the support above and the other attached to the twine-holder at the lower end, and one sliding adjustably on the other.

3. In a combined paper-bag and twine holder having a suspending-rod, and the paper-bag holder and twine-holder suspended therefrom, the twine-holder fixedly attached to the lower end of the sus-

399,671.

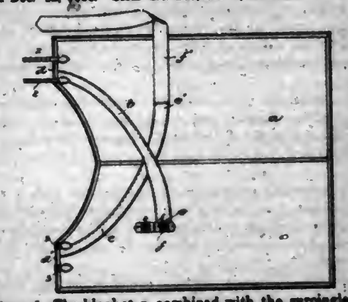


pending-rod, and the paper-bag holder being adapted to swivel around and slide on the suspending-rod above the twine-holder, as set forth.

4. The paper-bag holder having a body, C, of polygonal form, and bag-hooks pivoted in pairs on the respective sides of the same, and having their points swung against the said sides and held in catch-notches thereof, substantially as herein specified.

5. The paper-bag holder having a body, C, in combination with the bag-hooks, each having a vertical axis or pivot part by which it is pivoted to said body, and each having a hook part projecting from the axis at a sharp angle and a steep inclination, substantially as set forth.

399,672. HORSE-BLANKET. ARTHUR H. KINDER, Boston, Mass. Filed Dec. 12, 1888. Serial No. 293,355. (No model.)



Claim.—1. The blanket *a*, combined with the surcingle permanently attached to it, and composed of stays or stripe crossing the shoulder portions and extended to the front edges of the blanket, substantially as shown and described.

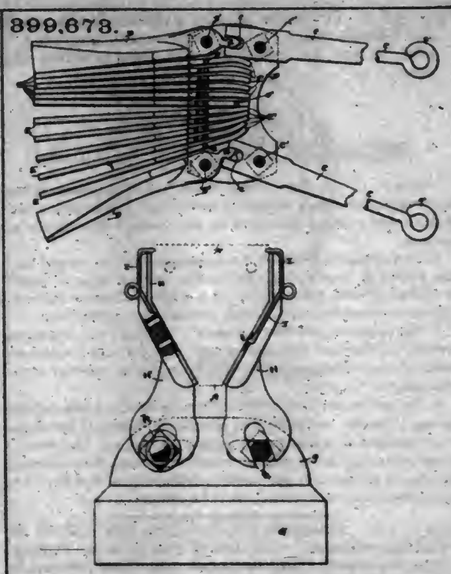
2. The blanket *a*, combined with the stripe *b c*, attached to it, extending from the front edges, *d d'*, across the shoulder portions and crossing each other at the median line of the back portion, and the clasp for engaging the free end *f'* of the strip *c*, substantially as described.

3. The blanket *a*, and stripe or stays *b c*, secured thereto, as shown and described, one of said stripe or stays, as *c*, having the free end *f* combined with the clasp, comprising the corrugated hinged plates and the fastening therefor, substantially as described.

4. The blanket *a*, and stripe or stays *b c*, secured thereto, as shown and described, one of said stripe or stays, as *c*, having the free end *f'* combined with the clasp, comprising the corrugated hinged plates and the fastening therefor, one of said corrugated plates having teats and the other having sockets or recesses to receive said teats, substantially as described.

399,673. APPARATUS FOR TEMPERING MOWING-MACHINE SECTIONS. LEVI L. LANE, Akron, Ohio, assignor to the Whitman & Barnes Manufacturing Company, same place. Filed Sept. 27, 1888. Serial No. 286,506. (No model.)

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Claim.—1. In so-called multiple tongs for holding a series of mowing-machine sections, the combination, with hand-levers and arms adapted to co-operate with such levers at the sides of the tongs, substantially as indicated, of a series of fingers pivoted to the head of the tongs between the pair of hand-levers and pair of arms aforesaid, the arrangement of parts being substantially as shown, whereby the fingers are opened and closed by corresponding movements of the hand-levers, substantially as set forth.

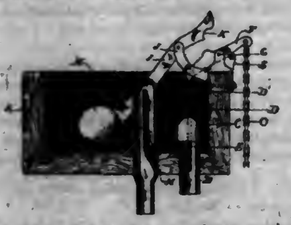
2. The combination, with hand-levers and arms adapted to co-operate with such levers, substantially as indicated, of a series of fingers pivoted to the head of the tongs and provided with projecting shanks, the hand-levers actuating the shanks of the fingers in distending the tongs, and the arms actuating the fingers proper inclosing the tongs, substantially as set forth.

3. The combination, with a pair of angle-plates located in reverse position and held separate, forming the head of the tongs, substantially as indicated, of hand-levers, arms adapted to co-operate with such levers, and a series of fingers pivotally connected with the angle-plates to form so-called multiple tongs, substantially as set forth.

4. The combination, with tongs adapted to grasp a series of mowing-machine sections, substantially as indicated, of holder for assembling such sections for supplying the tongs, such holder having fixed jaws for receiving the sections, and yielding jaws for holding the sections separated, the one from the other to correspond with the distended fingers of the tongs, substantially as set forth.

5. The combination, with base having stationary jaws adjustably secured thereto, of movable spring-actuated jaws mounted on such stationary jaws, such movable jaws having teeth for holding the sections separated, such teeth in the normal or closed position of the movable jaws overhanging the inner faces of the stationary jaws, substantially as set forth.

399,674. FLUSH-TANK. JAMES LAWSON, Denver, Colo. Filed Aug. 13, 1888. Serial No. 282,572. (No model.)



Claim.—In a flush-tank for water-closets, a valve, C, provided with a suitable stem, a lever, F, connected with the stem of valve C and provided with a lug, L, float H, provided with a lever, I, having a support, J, for its fulcrum, the short arm of lever I being provided with a notch, K, and a discharge-siphon, M, substantially as described, and for the purpose set forth.

399,675. DEVICE FOR SHAPING MATERIAL TO THE ARC OF ANY DESIRED CIRCLE. PULASKI LEWIS, Louisville, assignor to R. T. Miller, Covington, Ky. Filed Nov. 22, 1888. Serial No. 291,612. (No model.)



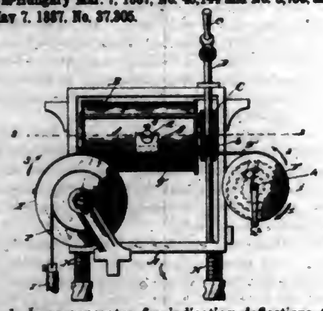
Claim.—1. In a slot-cutting device, the combination of the hinged bed-plates, carriers adapted to slide in said slots formed in said bed-plates, and a husk-box secured to said carriers, substantially as described.

2. In a slot-cutting device, the combination of the hinged bed-plates, slotted as described, with the carriers adapted to move in said slots of the bed-plates and carrying the husk-box, and means for regulating the movement of said carriers, substantially as described.

3. The combination of the bed-plates *a a'*, hinged and slotted, as described, the carriers *c c'*, furnished with studs *d d'*, and a husk-box pivoted upon said studs and carrying the blank to be operated upon, substantially as described.

4. The herein-described device for cutting slots, consisting of the following elements: bed-plates *a a'*, hinged and slotted, as described, having perforations *p* near the hinge-joint, carrier *c c'*, husk-box *f*, secured to the carriers by means of studs *d d'*, means for producing movement to carriers *c c'*, and means, substantially as described, for securing the blank to be slotted into the husk-box.

399,676. APPARATUS FOR INDICATING THE FLEXION OF BRIDGES, RAILS, &c. OSCAR LEUNER, Dresden, Saxony, Germany. Filed Jan. 26, 1887. Serial No. 225,559. (No model.) Patented in England Oct. 28, 1886, No. 13,544; in Belgium Nov. 15, 1886, No. 74,936, in Austria-Hungary Mar. 7, 1887, No. 43,144 and No. 3,739, and in Germany May 7, 1887, No. 37,305.



Claim.—1. In an apparatus for indicating deflections, the combination, with an indicator-drum on a rotative shaft, of a rotative spring-drum, a pulley provided with a pendent weight, a band connected with said spring-drum and pulley, and a head provided with a marking-pencil and secured to the said band, substantially as and for the purposes described.

2. The combination, with an indicator-drum on a rotative shaft, of a spring-drum on a shaft provided with ratchet-wheels, pawls engaging with said ratchet-wheels, a stepped pulley and a weight connected therewith, a band which is connected with said pulley and with said spring-drum, a sliding head secured to said band, and a rod, *f*, on which said head moves, said band rotating the indicator-drum, substantially as and for the purposes described.

3. The combination, with the rotative indicator-drum, of two rotative cylindrical devices, a band connected with said devices and carried near said drum, a fixed rod, and a movable head provided with a pencil, the said movable head being mounted on said rod and secured to the said band, substantially as and for the purposes described.

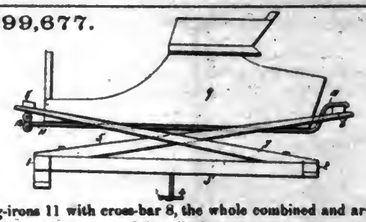
4. The combination, with the shaft *a*, an indicator-drum on said shaft, the shaft *D*, and the worm *b* on said shaft, of a fixed rod, *f*, a movable head provided with a pencil and mounted on said rod, a band, *g'*, which is secured to said movable head, and mechanism, substantially as described, for drawing said band in either of two opposite directions, substantially as and for the purposes described.

399,677. VEHICLE-SPRING. JOHN R. LINTON, New Bedford, Mass. Filed Aug. 3, 1888. Serial No. 281,885. (No model.)

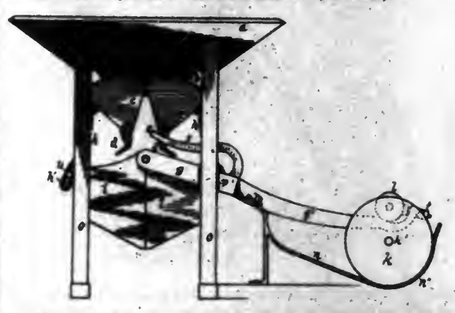
Claim.—1. The combination, with the side bars, 3, of the wooden springs supported thereon near the ends of the said bars 3, extending thereabove at an angle, and passing each other near their centers, substantially as shown and described.

2. In a device of the character herein specified, head-block 1, rear axle, 2, curved side bars, 3, wooden springs 5 and 7, connecting cross-bars 6 and 8, hanging-irons 10 and 11, and links 12, connecting hanging-irons 11 with cross-bar 8, the whole combined and arranged substantially as shown and described.

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399,678. AUTOMATIC GRAIN-SCALE. JAMES LOCHER, Decatur, Ill. Filed May 1, 1888. Serial No. 272,480. (No model.)



Claim.—1. In automatic grain-scales, in combination, a bivalvular cut-off on a permanent pivot, a bivalvular weighing-receptacle pivoted in a scale-beam below the cut-off, and arms connecting the receptacle with the cut-off, as and for the purpose set forth.

2. In automatic grain-scales, in combination, a bivalvular cut-off on a permanent pivot, a scale-beam having two pivotal points, a bivalvular weighing-receptacle pivoted in the scale-beam, arms connecting the receptacle with the cut-off, and a stop partaking of the motion of the scale-beam and adapted to temporarily prevent complete closing of the cut-off, as and for the purpose set forth.

3. In automatic grain-scales, in combination, a bivalvular cut-off on a permanent pivot, a scale-beam having two pivotal points and a shifting weight, a bivalvular weighing-receptacle pivoted in the scale-beam, arms connecting the receptacle with the cut-off, and a stop partaking of the motion of the scale-beam and adapted to temporarily prevent complete closing of the cut-off, as and for the purpose set forth.

4. In automatic grain-scales, in combination, cut-off *c c*, scale-beam *g g'*, having pivots *q* and *r*, weighing-receptacle *i i*, pivoted in the scale-beam, arms *h h*, slotted at *N' N'*, weight *k k' l* on beam *g g'*, legs *d d* on the cut-off, and roller *e* on arm *f*, as and for the purpose set forth.

5. In automatic grain-scales, in combination with a weighing-receptacle, beam *g*, curved at *g'*, and provided with upward projection *g''*, the weight comprising the opposed disks internally recessed and the interposed sheave, and the adjusting device *s t*, as and for the purpose set forth.

6. In automatic grain-scales, in combination with a weighing-receptacle, beam *g g g'*, weight *k k l*, and incline *m*, as and for the purpose set forth.

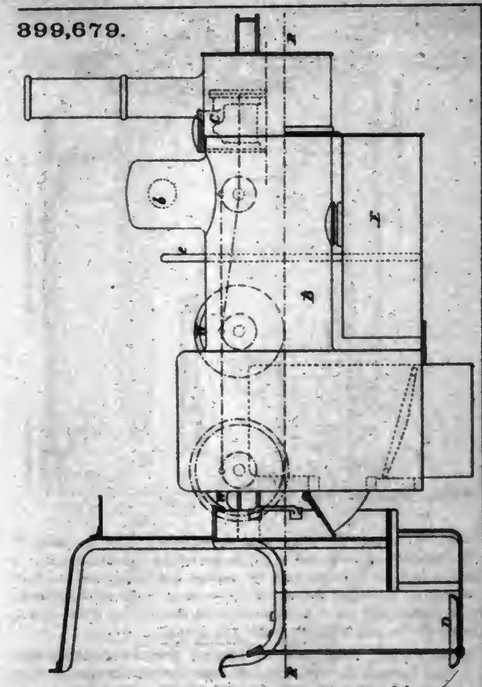
7. In automatic grain-scales, in combination with a weighing-receptacle, beam *g g g'*, weight *k k l*, inclines *m* and *n*, and stop *n'*, as and for the purpose set forth.

399,679. LOCOMOTIVE FOR SINGLE-RAIL RAILWAYS. ANATOLE MALLET, Paris, France. Filed July 27, 1886. Serial No. 209,245. (No model.) Patented in England June 10, 1886, No. 7,810.

Claim.—1. The combination, with the single supporting-rail R of a single-rail elevated railway, of a locomotive having a pair of supporting-wheels in line upon the upper side of said rail, and provided with a boiler, B, and water-tank E at each side, all of which depend below the wheel-supporting rail at opposite sides thereof and serve to keep the center of gravity low, a pair of cylinders, C, at opposite sides of the rail working one of the supporting-wheels, and connections between the latter and the other supporting-wheel, substantially as described.

2. The combination, with the single supporting-rail R and side rails, G, below the same of a single-rail elevated railway, of a locomotive having a pair of supporting-wheels in line upon the upper side of said rail, and provided at each side with a boiler, B, and water-tank E, all of which depend below the wheel-supporting rail at opposite sides of the side rails to keep the center of gravity low, a pair of

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cylinders, C, at opposite sides of the rails working one of the supporting-wheels, connections between the latter and the other supporting-wheel, and the side wheels, *g g*, bearing against the opposite rails G below the supporting-rail R, substantially as described.

3. The combination, with the single supporting-rail R, of a single-rail elevated railway, of a locomotive having at each side a depending boiler, B, and water-tank E, all of which hang below said rail, two wheels, W W', arranged in line on the rail, the axles A A', carrying the wheels, the cylinders C at opposite sides of the rail driving one of the axles, and connections between the latter and the other axle, said axle A' having a spherical boss, N, rotating but sliding with it, and the wheel W' having a hollow hub provided with internal spherical surfaces fitting the boss and rotating and sliding with the latter, substantially as described.

4. A locomotive for a single-rail elevated railway, consisting of a depending boiler, B, and water-tank E at each side, a pair of side cylinders, C, an axle, A, having a supporting-wheel, W, and driven by the cylinder-pistons, an axle, A', connected with and driven by the other axle, and having the boss N rotating but sliding with it and provided with studs *n*, and the supporting-wheel W', having a hollow hub provided with internal spherical surfaces fitting the boss, substantially as described.

5. A locomotive for a single-track elevated railway, comprising a depending boiler, B, and water-tank E at each side, a pair of side cylinders, C, a shaft, A, carrying a supporting-wheel, W, and driven by the cylinder-pistons, a shaft, A', driven by the other shaft and having a spherical boss, N, sliding on it, and provided with studs *n*, the supporting-wheel W', having a hollow hub and rotating and sliding with the boss, and the swinging fork F, having eyes in which journals on the wheel revolve, substantially as described.

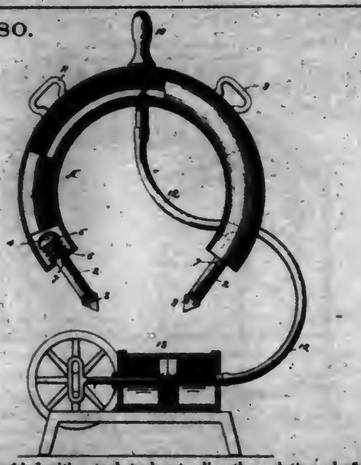
399,680. IMPLEMENT FOR CUTTING STONE, &c. JAMES W. MALOY, Marietta, Ga. Filed July 12, 1888. Serial No. 279,760. (No model.)

Claim.—1. An implement for cutting stone, consisting of a hollow frame having converging arms, each provided with a sliding piston or hammer, and with a tool-stock arranged to be struck by said hammer, and projecting beyond the end of the arm with a retracting-spring, and with a port for the admission and discharge of air for actuating the hammer, substantially as set forth.

2. The combination, in a stone-reducing implement, of a frame having two converging hollow arms, a tool-stock extending through the ends of the arms, a sliding hammer within each arm, and a pump connected with the chambers in the arms through a flexible pipe, substantially as set forth.

3. A stone-cutting implement consisting of a frame provided with hollow arms hinged together, each containing a reciprocating hammer and provided with a tool-stock extending through the end of the arm in position to be struck by the hammer, and a spring for retracting the stock, and a port for the admission and discharge of air into and from the hollow arms, substantially as set forth.

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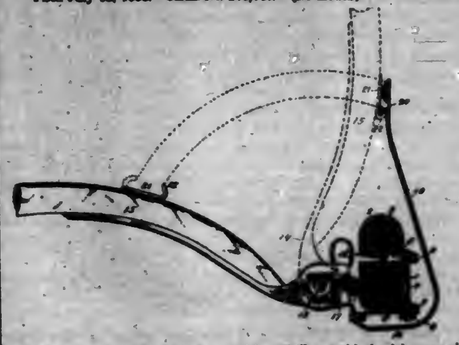


399,681. CLOSURE FOR CHURNS. JOHN MCDERMAID, Rockford, Ill. Filed Jan. 23, 1888. Serial No. 297,322. (No model.)



Claim.—In combination, a churn having cover-retaining lugs secured to the outside of and projecting above the chine of the same, a ring-head set into the chine thereof and having cover-guide lugs extending from the top of the latter along said chine, a cover fitted to the chine-ring, and suitable fastenings for retaining said cover thereon, substantially as described, and for the purpose specified.

399,682. THILL-COUPLING. FRANCIS J. MILLER, Carrollton, Ky. Filed July 12, 1888. Serial No. 279,747. (No model.)



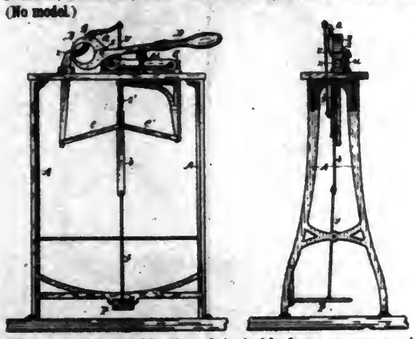
Claim.—1. The combination, with a thill provided with a catch and its shackle, of a spring anti-rattler consisting of an open loop or bow portion inserted between the thill-iron and the shackle, one member of the loop resting against the inner face of the shackle passing under the same to the rear and above and terminating in a catch, and the other member of the loop resting against and partly embracing the thill-iron, substantially as specified.

2. The combination of the axles 1 and 2, having the shackle herein described, consisting of the upper and lower plates, 3 and 4, and embracing the metal portion 1 of the axle, and formed with the perforated projections 10, connected to the axle by the clip 9, and perforated projections 6, bound together by the bolt 7, having the nut 8 at the opposite side, and having the forwardly-projecting lugs or ears 12, substantially as specified.

3. The combination of the axles 1 and 2, having the shackle herein described and consisting of the plates 3 and 4, binding-bolt 7, and binding-clip 9, arranged as specified, and having the opposite lugs 12, thill-iron 14, bolt 13, and thill 15, having the catch 21, with the interposed spring 16, bent, as at 17, to embrace the thill-iron bent

upon itself, as at 18, to the rear and upwardly, as at 19, and terminating in the catch 20, substantially as specified.

399,683. MACHINE FOR BENDING METAL SASH. WILLARD F. MILLS, Kalamazoo, Mich. Filed June 12, 1888. Serial No. 276,840. (No model.)

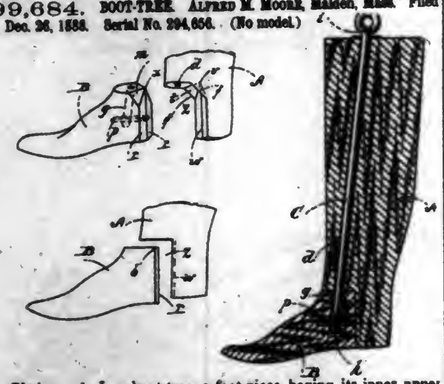


Claim.—1. The combination of a suitable frame or support, jaws pivoted to open and close and having their gripping ends curved, a clamp for clamping the sash on each flanged side, and means for operating said clamp, substantially as set forth.

2. The combination of a suitable support, the jaws having their gripping ends curved, said jaws mounted upon said supports, one of the jaws being pivoted to the other, the latter being stationary, a clamp on each side of the jaws for clamping the flanged sides of the sash, and an adjustable stop to limit the play of the movable jaw, substantially as set forth.

3. The combination of a suitable support, the jaws having the curved ends, the pivoted clamp-levers arranged to clamp the sash in the jaws between them, the vertically-playing rod attached to the end of one of the clamp-levers, a treadle to which the other end is attached, a spring forming a resistance to the downward movement of said rod, a toggle-bar pivoted to the end of the other clamp-lever and to the vertically-playing rod, and a toggle-bar pivoted to said rod at one end and to a suitable support at the other end, substantially as set forth.

399,684. BOOT-TREE. ALFRED M. MOORE, Malden, Mass. Filed Dec. 26, 1888. Serial No. 294,656. (No model.)



Claim.—1. In a boot-tree, a foot-piece having its inner upper corners beveled, substantially as and for the purpose described.

2. In a boot-tree, the combination of a foot-piece having beveled upper corners, a leg portion provided with a chamber having converging walls for receiving the beveled portion of said foot-piece, and means for detachably locking said foot-piece to the leg, substantially as described.

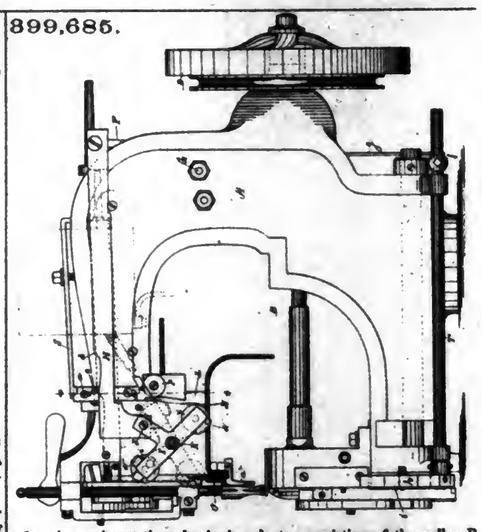
399,685. TAKE-UP DEVICE FOR SEWING-MACHINES. LEE E. MOORE and WILLARD A. DAVIS, Boston, Mass., (Charles P. Gaither executor of Lee E. Moore, deceased,) assignors to the Davis-Moore Sewing Machine Company, Saco, Me. Filed Nov. 5, 1886. Serial No. 218,108

Claim.—1. In a sewing-machine, the combination, with an intermittent thread-gripping device, of a take-up lever having two oppositely-extending thread-carrying arms.

2. In a sewing-machine, the combination, with the sliding bar H and its operating mechanism, of the three-armed take-up lever pivotally connected with said bar to be operated thereby, the sheaves or rollers *i*, carried by the two opposite arms of said lever, and the guards N, overlapping said sheaves or rollers.

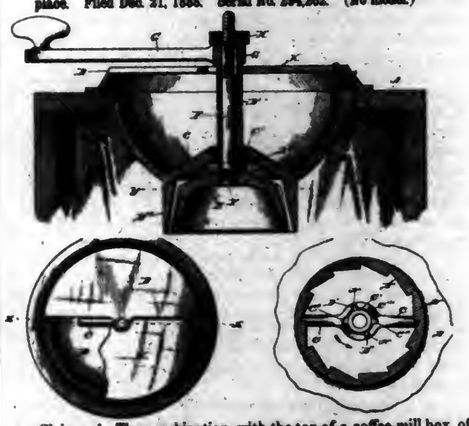
3. In a sewing-machine, the combination, with a take-up lever,

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of an intermittent thread-gripping device consisting of the pulley P, the vertically-movable sliding bar R, having a projection, as pin *c*, a spring, as S, for pressing said bar against said pulley, and the horizontally-reciprocating sliding bar H, having an incline or shoulder, as *d*, to engage said pin or projection and lift the said bar R out of contact with the said pulley to release the thread.

399,686. COFFEE-MILL. EDGAR H. MORGAN and CHARLES MORGAN, Freeport, Ill. assignors of one-third to Albert Baumgarten, same place. Filed Dec. 21, 1888. Serial No. 294,262. (No model.)



Claim.—1. The combination, with the top of a coffee-mill box, of a grinding-shell lying below the top and a cover lying above the top, said shell being provided with a diametrical bridge having a central opening and said cover with a central tube adapted to pass through said opening and to lock the parts together when they are rotated with reference to each other.

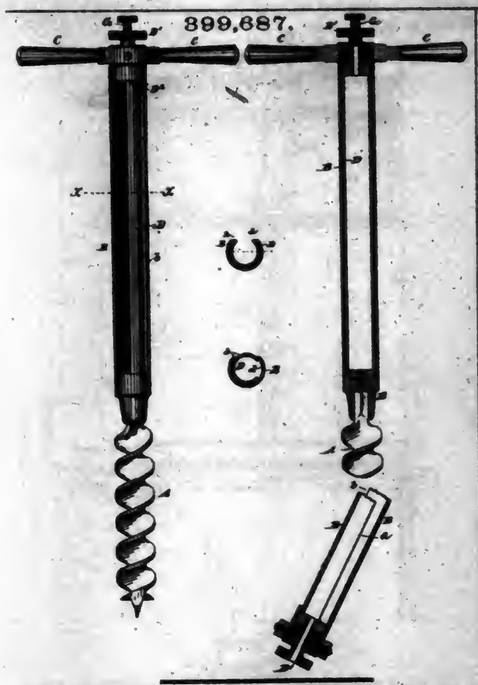
2. The combination, with the top A, and the hopper B, lying below the top and having the grinding-shell B″, and the bridge C, formed with the central opening, C′, and notches C″, of the cover D, resting upon the top and provided with a central tube, D′, formed with lugs D″, adapted to pass through the opening in the bridge and to lock the bridge and cover together upon the rotation of the cover with reference to the bridge, substantially as set forth.

399,687. GRAIN-SAMPLER. BENJAMIN F MORNINGSTAR, Brooklyn, N. Y. Filed Mar. 1, 1888. Serial No. 265,879. (No model.)

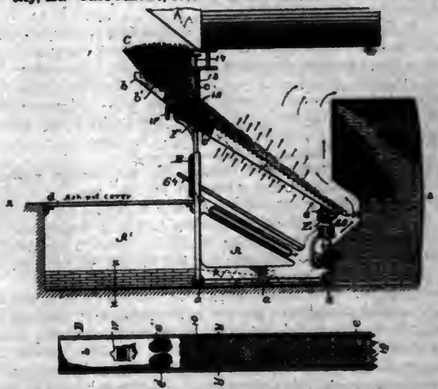
Claim.—1. The sample-trier described, having, in combination with the boring-bit A and hollow tubular shank B, with its open side *b*, the internal close-fitting tube, D, having an open side, *d*, and means, as the button D′, for turning it, all arranged for joint operation as herein specified.

2. In a sample-trier, the plug G, in combination with the boring-bit A, shank B *b*, handle C, internal tube, D *d*, and turning means D′, for the latter, all arranged to serve substantially as herein specified.

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399,688. FURNACE-GRATE. MAXIMILIAN H. MOSKOVITS, Kansas City, Mo. Filed June 21, 1888. Serial No. 277,733. (No model.)



Claim.—1. The improved grate-bar constructed solid for a considerable portion of its length and with the remaining portion of its length in the form of a fire-surface composed of short zigzag webs which are disposed transversely, the upper surface of said bar being stepped or corrugated, substantially as described.

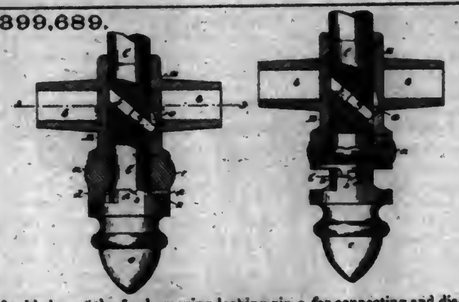
2. The combination of inclined grate-bars provided with suitable bearing-sockets near each end, friction-balls located in these sockets, a transverse bearing-bar, E, provided with depending shanks 60 and upon which the lower ends of said grate-bars rest, cams 62, which engage the lower ends of said shanks to raise and lower same, and a hand-lever for rotating said cams, substantially as described.

399,689. POWER-FAN. PETER MURRAY, Jr., Newark, N. J. Filed Nov. 22, 1887. Serial No. 255,846. (No model.)

Claim.—1. In a power-fan, the combination, with the driven shaft C and the loosely-mounted vertically-moving hub B, for carrying the



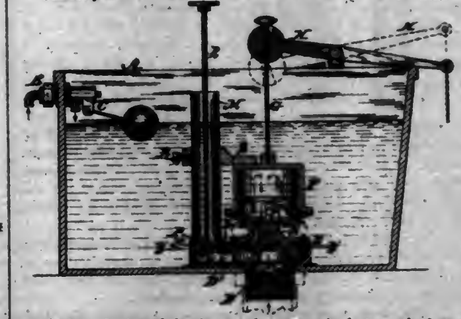
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fan-blades, of the freely-moving locking-pin *g*, for connecting and disconnecting the shaft and hub, substantially as described.

2. In a power-fan, the combination, with the shaft C and the loosely-mounted hub B, said shaft and hub being provided, one with the recess *e* and the other with the freely-moving locking-pin *g*, of the head *c* and loose collar *a*, having the coacting inclines *d*, for raising and lowering the hub, substantially as described.

399,690. TANK OR WATER-VALVE. WILLIAM H. NEWELL, Philadelphia, Pa. Filed Dec. 3, 1887. Serial No. 256,864. (No model.)



Claim.—1. A tank having a valve-seat raised above the bottom thereof, an outlet, D, within said valve-seat, a guiding chambered plunger connected to said seat by the neck K and having an opening in the top, openings in the bottom, and an inner passage leading from the chamber thereof, the hollow valve F, closed at the top and adapted to cover said plunger when seated, the tube L, and chamber D′, connecting said inner passage of plunger and said outlet D, said parts being combined substantially as described.

2. The combination of a tank having a valve-seat, with the outlet D leading from within said seat, with the stationary plunger J, connected to said valve-seat and having the chamber *b* in its upper part, with openings at top and bottom, the passage *a*, leading from said chamber and communicating with said outlet D, and a cup-shaped valve closed at top and open below, and adapted to closely encircle said plunger J and rest on said valve-seat, substantially as and for the purpose set forth.

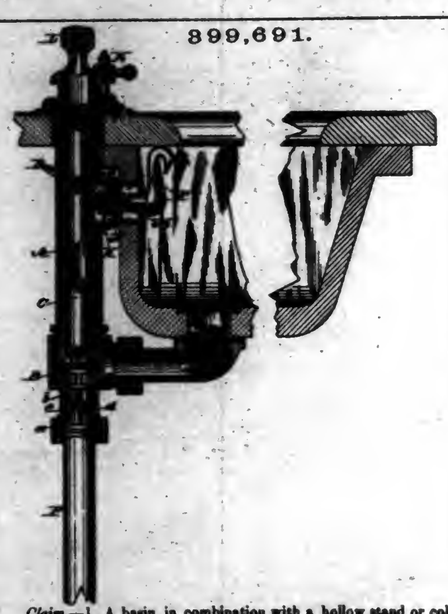
3. The valve-seat with outlet-pipe D leading from within the same, the chambered guiding-plunger J, connected by the neck K to said seat and having openings at top and bottom, the passage *a*, leading from the plunger-chamber, the chambered valve F, closed at the top and inclosing the plunger, the tube L, and chamber D′, said parts being combined substantially as and for the purpose set forth.

4. A tank with valve-seat and outlet, the said valve-seat having connected therewith a guiding-plunger having an open top and bottom, and the chamber *b* and passage *a*, the valve F, the tube L, with valve-seat N, the valve P, connected to rod R, the overflow-tube M, with rod R therein, and the chamber D′, leading from tube L to outlet D, said parts being combined substantially as and for the purpose set forth.

5. A tank with a raised valve-seat and an outlet leading from within said seat, a chambered plunger secured by a neck to said seat and having a passage leading from said chamber, a valve covering said plunger, mechanism, substantially as described, for raising and lowering said valve, a tube connected with said passage in said plunger and provided with an adjustable valve, and a chamber directly connecting said tube with the tank-outlet, said parts being combined substantially as described.

399,691. SECRET SUPPLY, WASTE, AND OVERFLOW FOR BASINS AND BATHS. WILLIAM H. NEWELL, Philadelphia, Pa. Filed May 22, 1888. Serial No. 274,063. (No model.)

899,691.



Claim.—1. A basin, in combination with a hollow stand or column having overflow openings, a tube within said column, having openings corresponding to the overflow-openings of the stand, a nozzle leading from said overflow-openings, supply-pipes leading into said nozzle, and a pipe leading from said basin to said column, substantially as and for the purpose set forth.

2. A stand having an overflow-collar, a valve and a supply-pipe, and a nozzle which passes through the covering cap or strainer of said collar and is connected with said supply-pipe, said parts being combined and operating substantially as described.

3. The confluent supply-pipes united at the overflow-collar of the stand and connected with a discharge-nozzle which passes through the strainer of said collar, substantially as described.

4. The combination of a basin with a stand-pipe having a valve-seat in the lower part thereof, an outlet-pipe and overflow-openings in the top, a tube within said stand-pipe having overflow-openings, a valve seated on said seat in the lower part of the stand-pipe, confluent pipes leading from said overflow-openings to a nozzle discharging within the basin, and a pipe connecting said basin and stand-pipe, substantially as described.

899,692. TANK AND WATER-VALVE. WILLIAM H. NEWELL, Philadelphia, Pa. Filed May 22, 1888. Serial No. 274,695. (No model.)

Claim.—1. A tank with an inlet and an overflow pipe, a lever pivoted to bearings secured to a cross-bar on the upper part of the tank, and having a chain secured to one end and provided at its other end with a slot and an upright, a second lever pivoted in said upright of first lever and having a weighted end, a slotted guide secured to said cross-bar, and a discharge-pipe with controlling-valve, having a rod with slotted or bifurcated upper end, said parts being combined substantially as described.

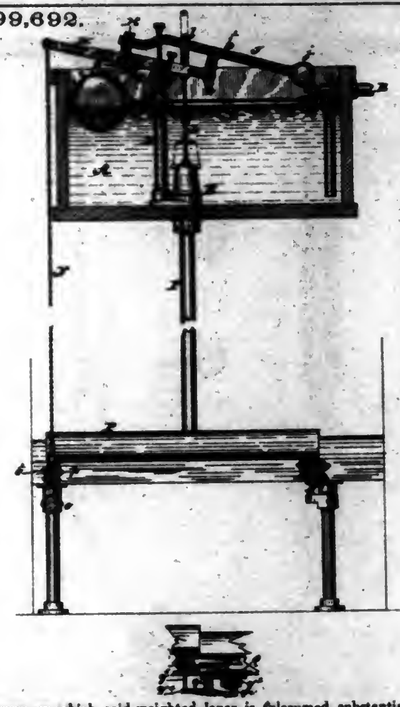
2. A tank with the lever H pivotally secured to the upper part thereof, and having the slot A and upright A', the weighted lever J, fulcrumed to the upright A', a discharge-pipe for said tank, a valve controlling said discharge-pipe and having a rod with slotted upper end, and a slotted guide, in which the light end of said lever J operates, said parts being combined substantially as described.

3. A basin with a discharge-pipe, a pivoted lever with chain at one end and a slot and upright at the other end, a weighted lever pivoted to said upright, a valve with stem having bifurcated upper end, a guide in which the light end of said weighted lever operates, a pivoted lever connected to the lower end of the chain, and a seat-lid bearing on one end of said lever, said parts being combined substantially as and for the purpose set forth.

4. In a device of the character named, the plate Q, having lug q and socket q', the lever q^4, pivoted to the lug q, the receding tube q^5 and spring q^6, and the arm q^4, adapted to bear against the seat, said parts being combined substantially as described.

5. The combination, with the rod carrying the valve, having a bifurcated end, of the weighted lever passing through said bifurcated end forming a loose connection between the said rod and lever, and

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a lever on which said weighted lever is fulcrumed, substantially as and for the purpose described.

6. The combination, with the lever carried by the closet, of the lever fulcrumed to the tank connected therewith, said lever having an arm, a weighted lever fulcrumed to said arm, the rod carrying the valve loosely connected with the weighted lever, the slotted guide for guiding and limiting the movement of the end of the weighted lever, and the screw for regulating the throw of said weighted lever, all arranged and adapted to serve substantially as described.

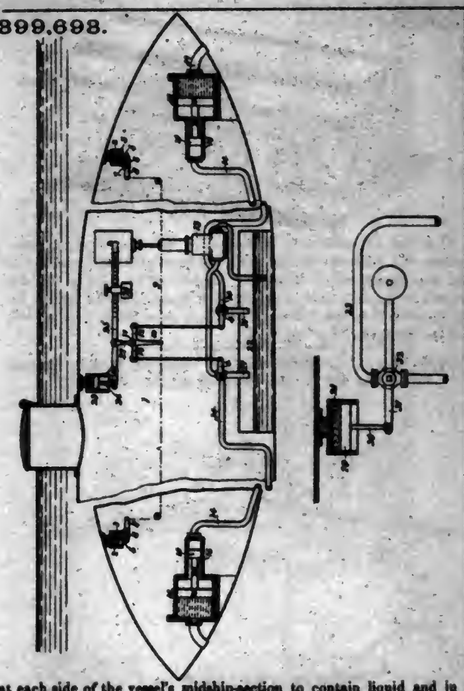
899,693. SUBMARINE VESSEL. GRATTON POOLE and WILLIAM C. STOREY, London, County of Middlesex, England. Filed Feb. 6, 1888. Serial No. 263,113. (No model.) Patented in England Mar. 21, 1887, No. 4,227; in France Jan. 23, 1888, No. 183,279; in Belgium Jan. 24, 1888, No. 80,364; in Germany Jan. 28, 1888, No. 44,063; in Italy Mar. 31, 1888, XLV, 218; in Austria-Hungary May 27, 1888, No. 4,533, and in Spain June 7, 1888, No. 7,905.

Claim.—1. In a submarine vessel, the combination of pistons or their equivalent, subject on one side to the pressure of the water in which the vessel is placed and arranged to be capable of moving under the differential action of the water-pressure thereon, chambers arranged at each side of the vessel's midship-section to contain liquid, a fluid-pressure generator adapted to supply fluid under pressure, pipes connecting said generator with said chambers, and a valve or valves to control the passage of fluid under pressure from said generator to one of said chambers and the escape of fluid from the other of said chambers, said valve or valves being arranged to be operated by movement of said pistons or equivalent due to difference of pressure thereon, for the purpose specified.

2. In a submarine vessel, the combination of pistons or their equivalent, subject on one side to the pressure of water in which the vessel is placed, and so connected and arranged as to be operated by the difference in water-pressure upon them, a fluid-pressure generator adapted to supply fluid under pressure, chambers arranged at each side of the vessel's midship-section, and each in communication at one end with a liquid-supply and at the other end with said fluid-pressure generator, pistons arranged to travel in said chambers, and a valve or valves adapted to control the passage of fluid from said generator to each of said chambers, and also the escape of such fluid therefrom, said valve or valves being in connection with said pistons or their equivalent, and arranged to be operated thereby, substantially as described.

3. In a submarine vessel, the combination of a piston or equivalent, subject on one side to pressure of the external water, a loaded lever connected at one end to said piston or equivalent, a fluid-pressure generator adapted to supply fluid under pressure, chambers arranged

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at each side of the vessel's midship-section to contain liquid and in communication with said generator, and a valve or valves to control the passage of fluid under pressure from said generator to said chambers, and the escape of fluid therefrom, said valve or valves being connected to said loaded lever, substantially as described, for the purpose specified.

4. In a submarine vessel, the combination, with pistons or their equivalent, connected to move together and arranged at opposite sides of the vessel's midship-section and subject on one side to the pressure of the water in which the vessel is placed, a loaded lever, a piston or equivalent, also subject on one side to the pressure of the external water and connected to one arm of said lever, a fluid-pressure generator, chambers arranged at opposite sides of the vessel's midship-section to contain liquid, and each in communication at one end with said fluid-pressure generator, and at the opposite end with a liquid-supply, and a valve or valves adapted to control the passage of fluid under pressure from said generator to one of said chambers and the escape of fluid from the other of said chambers, said valve or valves being connected with said loaded lever and with the connected pistons, substantially as described, for the purpose specified.

5. In a submarine vessel, the combination of chambers 2, arranged at opposite sides of the vessel's midship-section and in free communication at one end with the external water, pistons 3, or their equivalent, adapted to move in said chambers, a pump, 13, adapted to supply fluid under pressure, pipes 14, in communication with said pump and adapted to conduct said fluid from one part of the vessel to another, valves 4, adapted to control the passage of said fluid through said pipes 14, and means for connecting said pistons 3 with said valves 4, substantially as herein described, for the purpose set forth.

6. In a submarine vessel, the combination of chambers 2, each in communication at one end with the external water, pistons 3, or equivalent, arranged to move in said chambers, levers 6 8, and chain 9, or equivalent, connecting said pistons, a double bell-crank lever, 10 12, pivoted at 11 and connected with said chain 9, a pump, 13, adapted to supply fluid under pressure, pipes 14, in communication with the delivery side of said pump and capable of conducting said fluid from one part of said vessel to another, a tank, 22, containing fluid and placed in communication with the suction side of said pump, and valves 4, connected with said double bell-crank lever 10 12 and adapted to control the passage of fluid through said pipes 14, all substantially as herein described.

7. In a submarine vessel, the combination of chambers 2, each in free communication at one end with the external water, pistons 3, or equivalent, arranged to move in said chambers, a pump, 13, adapted to supply fluid under pressure, pipes 14, in communication at one end with said pump, valves 4, adapted to control the passage of said fluid through said pipes 14, means for connecting said pistons with said valves 4, cylinders 15 16, located at each side of the vessel's midship-section, and each in communication at one end with one of said pipes 14, and at the other end with the external water, connected pistons 18 19, adapted to move in said cylinders 15 and 16, respectively, a tank, 22, in communication with the exhaust side of said pump, and pipes 21, adapted to place said pipes 14 in communication with said tank, substantially as herein described, for the purposes set forth.

8. In a submarine vessel, the combination of chambers 2, each in free communication at one end with the external water, pistons 3, or equivalent, arranged to move in said chambers, a pump, 13, adapted to supply fluid under pressure, pipes 14, in communication at one end with said pump, valves 4, adapted to control the passage of said fluid through said pipes, a double bell-crank lever, 10 12, pivoted at 11 and connected with said pistons 3 and with said valves 4, a piston, 23, acted upon by pressure of external water, a lever, 25, connected to said piston 23, and provided with an adjustable balance-weight, 26, or a spring, a link, 27, whereby said double bell-crank lever 10 12 is suspended to said lever 25, cylinders 15 and 16, located at each side of the vessel's midship-section, and each in communication at one end with one of said pipes 14, and at the other end with the external water, connected pistons 18 19, adapted to move in said cylinders 15 and 16, respectively, a tank, 22, in communication with the suction side of said pump, and pipes 21, adapted to place said pipes 14 in communication with said tanks, substantially as herein described, for the purpose set forth.

9. In a submarine vessel, a cylinder, 28, in free communication at one end with the water in which said vessel is placed, a piston, 29, or equivalent, arranged to move in said cylinder, a loaded lever, one arm, 31, of which is in connection with said piston, or equivalent, a vessel containing liquid under pressure, a pipe, 33, in communication with said vessel containing liquid under pressure and with the water external to said submarine vessel, and a valve, 32, connected to said lever and arranged to control the passage of liquid under pressure through said pipe 33, substantially as herein described, for the purpose set forth.

10. In a submarine vessel, the combination of chambers 2, each in free communication at one end with the external water, pistons 3, or equivalent, arranged to move in said chambers, a pump, 13, adapted to supply fluid under pressure, pipes 14, each in communication at one end with said pump, a double bell-crank lever, 10 12, pivoted at 11, means for connecting said pistons 3 with said bell-crank lever, valves 4, connected with said double bell-crank lever and arranged to control the passage of fluid through said pipes 14, a piston, 23, acted upon by pressure of external water, a lever, 25, connected to said piston 23, and provided with an adjustable weight, 26, or a spring, a link, 27, whereby said double bell-crank lever 10 12 is suspended to said lever 25, cylinders 15 and 16, located at each side of the vessel's midship-section, and each in communication at one end with one of said pipes 14, and at the other end with the external water, connected pistons 18 19, adapted to move in said cylinders 15 and 16, respectively, a tank, 22, in communication with the suction side of said pump, and pipes 21, adapted to place said pipes 14 in communication with said tanks, a cylinder, 28, in free communication at one end with the water in which said vessel is placed, a piston, 29, or equivalent, arranged to move in said cylinder, a loaded lever, one arm, 31, of which is in connection with said piston, or equivalent, a vessel containing liquid under pressure, a pipe, 33, in communication with said vessel containing liquid under pressure and with the water external to said submarine vessel, and a valve, 32, connected to said lever and arranged to control the passage of liquid under pressure through said pipe 33, substantially as herein described, for the purpose set forth.

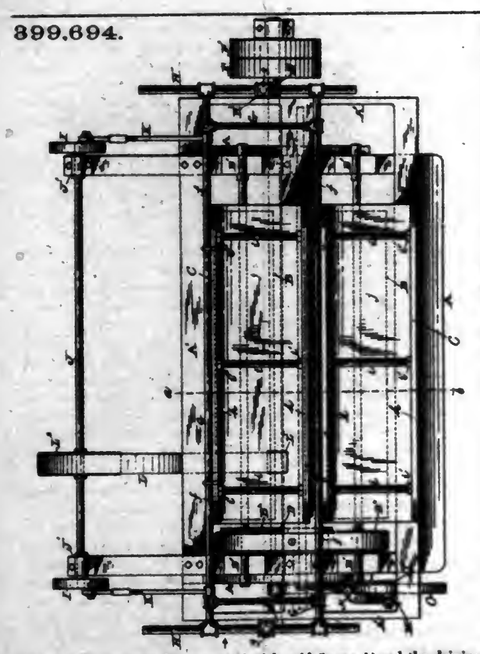
899,694. CARD-GRINDING MACHINE. SAMUEL A. PRESCOTT, Wilkinsonville, Mass. Filed July 19, 1888. Serial No. 280,352. (No model.)

Claim.—1. In a card-grinding machine, the grinders C C, frame G, fitted to slide longitudinally on suitable supports and upon which said grinders are mounted, and eccentrics I I, operatively connected with said frame G and the driving mechanism for imparting longitudinal reciprocating movements to the grinders, in combination with frame A', fitted to slide laterally in suitable supports and operated by a cam, M, operatively connected with said frame A' and the driving mechanism for imparting lateral reciprocating movements to the grinders, substantially as shown and specified.

2. In a card-grinding machine, the grinders C C, in combination with frame G, fitted to slide longitudinally on suitable supports, and upon which said grinders are mounted, said frame-supports, and the eccentrics I I, operatively connected with said frame G and the driving mechanism, whereby longitudinal reciprocating movements may be imparted to the grinders, substantially as shown and specified.

3. In a card-grinding machine, the combination of the supports upon which the grinder-frame G slides longitudinally, with the frame A', fitted to slide laterally in suitable supports, said frame-supports

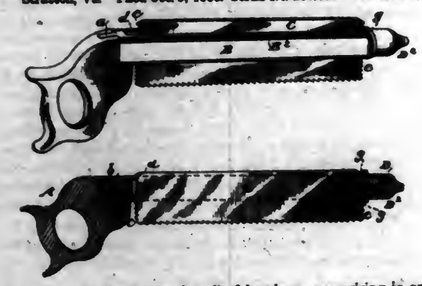
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and cam M, operatively connected with said frame A' and the driving mechanism, whereby lateral reciprocating movements may be imparted to said grinder-frame supports, and from thence through the other connections described to the grinders, substantially as shown and specified.

4. In a card-grinding machine, the grinders C C, in combination with frame G, fitted to slide upon suitable supporting rods or bars, H H, arranged longitudinally at an angle to the machine, and upon which frame the grinders are mounted, said rods or bars and their supports, and the eccentrics I I, operatively connected with said frame G and the operating mechanism, whereby both longitudinal and lateral reciprocating movements are imparted to the grinders, substantially as shown and specified.

399,695. ATTACHMENT FOR HANDSAWS. NOAH W. RASSICK, Stratton, Va. Filed Oct. 3, 1888. Serial No. 287,061. (No model.)

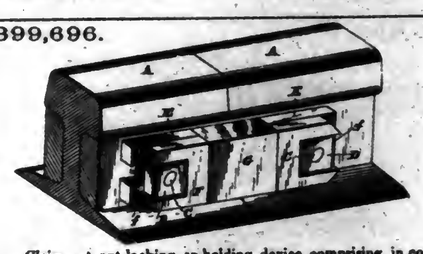


Claim.—1. The herein-described handsaw, comprising in combination a handle, a vertically-slotted bar secured at one of its ends to the handle and provided at its opposite end with a screw-threaded neck, a screw-threaded cap to engage said neck, and a saw-blade fitted within the vertical slot and adapted to be retained therein by the cap, substantially as described.

2. In a device for the purpose described, a handle, a vertically-slotted bar having one of its ends secured to the handle and its opposite end provided with an adjustable cap or nut, the inner end of which is provided with an annular extension or collar, as described, a saw-blade having its inner end provided with a series of notches to engage lugs provided within the end of the vertical slot adjacent to the handle, and its opposite end furnished with similar notches to engage the collar upon the cap, substantially as and for the purpose described.

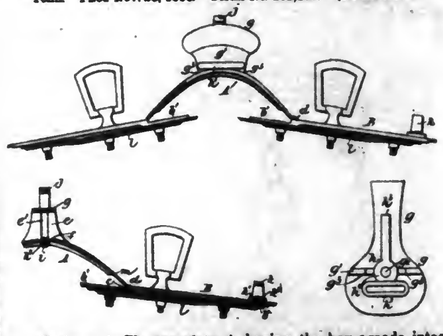
399,696. NUT-LOCK. ADOLPH RASSMUSS, Louisville, Ky., assignor to himself, Pierre Marvonnot, and Louis Nicolas, same place. Filed Nov. 3, 1888. Serial No. 289,966. (No model.)

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Claim.—A nut locking or holding device comprising, in combination, the following elements: a plate having notches or apertures for the passage of the bolts and adapted to be held by the nuts screwed upon said bolts, a second plate having angular notches for locking the nuts, and a U-shaped holding-clamp fitting over the two plates, substantially as described.

399,697. HARNESS-SADDLE. FREDERICK RENKOFF, Memphis, Tenn. Filed Nov. 28, 1888. Serial No. 292,119. (No model.)



Claim.—1. The top plate, A, having the box *e* made integral therewith, and having the slot *f*, in combination with the piece *g*, having the rib *g'* and pin *g²*, and the tail-piece A, having the loop or ring h^3, and the projection h^2, serving as the journal of a friction-roller, substantially as described.

2. In combination, the top plate, A, having the slot *f*, the side plates, B, each having a slot, h^3, and the loops *k*, adapted to be fastened to said plates, and provided with the integral rods *k'*, for forming the journals of friction-rollers, substantially as described.

3. In combination, the piece A, having the tongues *d* and friction-roller *i*, the side pieces, B, having the journals *c* and slots, as described, and also having the loops *k*, friction-rollers k^2, and the extension *b'*, and the perforated plates *l*, adapted to be secured to a pad and to the side pieces, B, all substantially as set forth.

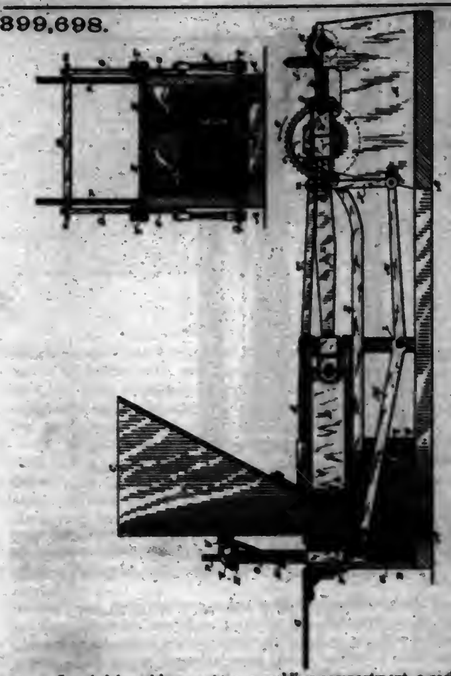
399,698. BRICK-MACHINE. ROBERT F. ROBISON, Kansas City, Kans. Filed Oct. 2, 1888. Serial No. 286,905. (No model.)

Claim.—1. In a brick-making machine, a molding-compartment having an open top and a feed-hopper above said compartment communicating therewith, in combination with a horizontally-reciprocating presser moving in said compartment and beneath said hopper, said presser constituting one end of said compartment and controlling the communication between said compartment and hopper, a vertically-reciprocating cover which opens and closes the open top of said compartment, a vertically-reciprocating follower which reciprocates crosswise of the compartment beneath said cover, and which lifts the finished bricks out from said compartment, and a swinging finger which swings between said cover and said follower when the same are elevated, and which removes the bricks from said follower, substantially as set forth.

2. In a brick-making machine, the brick-forming mechanism thereof, in combination with a crank-shaft which actuates said mechanism, a large pinion, *e*, on said shaft, a rotating drive-shaft, a small pinion, *d*, thereon, and a large pinion, *f*, and a small pinion, *g*, connected so as to rotate together, said large pinion *f* meshing with the small pinion *d* in the drive-shaft, and said small pinion *g* meshing with said large pinion *e* on the crank-shaft, substantially as set forth.

3. In a brick-making machine, the brick-forming mechanism thereof, a crank-shaft which actuates said mechanism, a large pinion, *e*, on said shaft, a rotating drive-shaft, and a small pinion, *d*, thereon, in combination with a rotatable shaft, *h*, having eccentric bearing-studs *i i*, a shifting-lever for rotating said shaft, and a large pinion, *f*, and a small pinion, *g*, connected together and rotating on said shaft *h*, said pinions *f* and *g* co-operating with said pinions *d* and *e*, respectively, substantially as set forth.

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4. In a brick-making machine, a molding-compartment, a reciprocating presser moving in said compartment, and a vertically-reciprocating follower moving crosswise of said compartment, in combination with a rotating crank-shaft, a connecting-rod connecting the crank of said shaft with said presser, an oscillating lever connected at one end with said follower, and a connecting-bar connected at one end with said oscillating lever and at the other end with said connecting-rod near the crank-shaft, substantially as set forth.

5. In a brick-making machine, a molding-compartment, a horizontally-reciprocating presser moving therein, and a vertically-reciprocating follower moving crosswise of said compartment, in combination with a rotating crank-shaft, a connecting-rod connecting the crank of said shaft with said presser, a stud, *s*, on said rod near said crank, an oscillating lever connected at one end with said follower and extending beneath said connecting-rod, and a vertically-extending bar pivotally connected at its lower end with the end of said oscillating lever, and having a longitudinally-extending slot in its upper end embracing said stud on said connecting-rod, substantially as set forth.

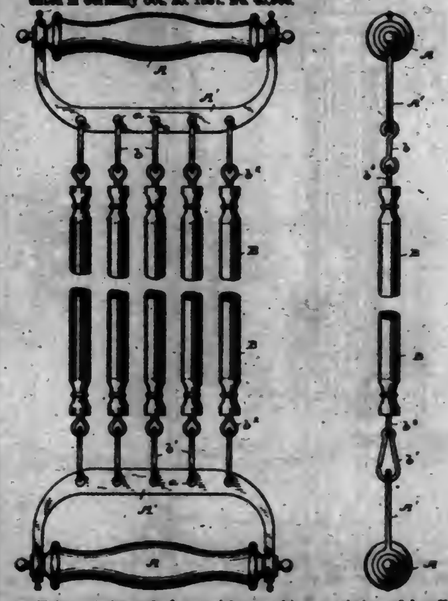
6. In a brick-making machine, a molding-compartment having an open top, a reciprocating presser moving in said compartment, and a vertically-reciprocating cover which opens and closes the open top of said compartment, in combination with a rotating crank-shaft, a connecting-rod connecting the crank of said shaft with said presser, a rock-shaft beneath said compartment, said rock-shaft having a central crank-arm, *q*, and crank-arms P P on its ends, a connecting-bar, R, connecting said crank-arm *q* and said connecting-rod, and levers O O, connecting said crank-arms P P and said cover, substantially as set forth.

7. In a brick-making machine, a molding-compartment having an open top, a reciprocating presser moving in said compartment, and a vertically-reciprocating cover which opens and closes the open top of said compartment, in combination with a rotating crank-shaft, a connecting-rod connecting the crank of said shaft with said presser, a stud, *s*, on said connecting-rod, a rock-shaft beneath said compartment, said rock-shaft having central crank-arm, *q*, and end crank-arms, P P, levers O O, connecting said crank-arms P P and said cover, and a connecting-bar, R, connected at one end to said crank-arm *q*, and having at its other end a cam-slot, *r*, embracing said stud *s*, substantially as set forth.

8. In a brick-making machine, a molding-compartment having an open top and a vertically-reciprocating cover which opens and closes said open top, said cover having projecting studs *u* on opposite ends, in combination with locking-slides having projecting locking-tongues *t t*, adapted to said studs *u*, a rotating shaft, eccentric studs on said shaft, and bars T T, connecting said eccentric studs and said locking-slides, substantially as set forth.

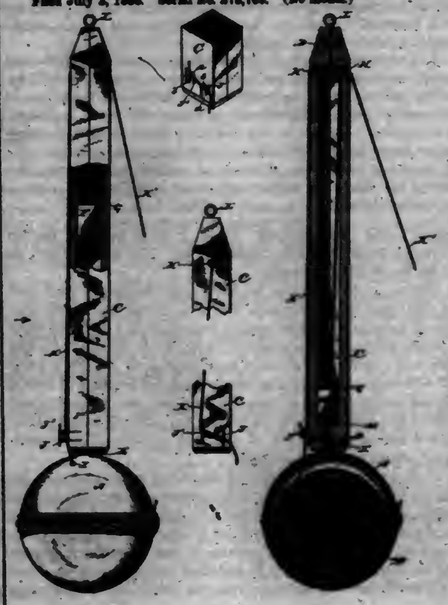
9. In a brick-making machine, a molding-compartment having an open top, a vertically-reciprocating cover which opens and closes said open top, and a vertically-reciprocating follower moving crosswise of said compartment beneath said cover, in combination with a rock-shaft, U, a downwardly-depending finger, H, thereupon, said finger being adapted to swing between said cover and said follower when the same are elevated, and an arm, V, on said rock-shaft projecting outwardly above said cover and in the path thereof, substantially as set forth, whereby said shaft is rocked by the contact of said cover with said projecting arm.

399,699. EXERCISING APPARATUS. WILLIAM SAMM, Berlin, Germany. Filed June 28, 1888. Serial No. 278,195. (No model.) Patented in Germany Oct. 25, 1887. No. 43,300.



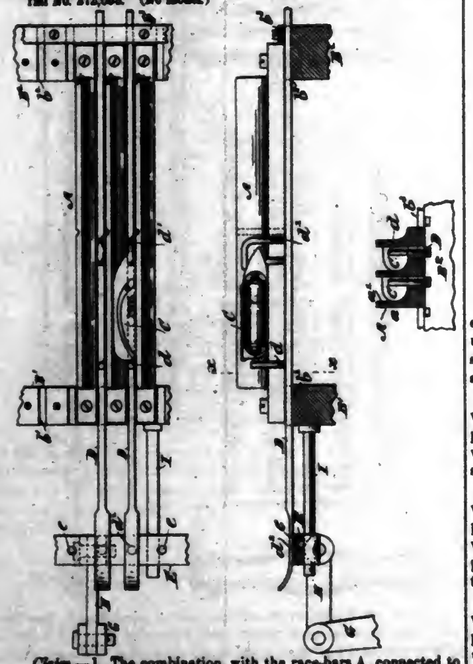
Claim.—A dynamical exercising-machine consisting of handles A A, hoops A' A', secured thereto, said hoops being provided with suitable holes, and a series of elastic cords or their equivalents provided with fastening devices on each end adapted to be detachably connected with the holes in the hoops, all substantially as described.

399,700. TWINE-HOLDER. PETER F. RAW, Humboldt, Iowa. Filed July 2, 1888. Serial No. 278,788. (No model.)



Claim.—The combination, with the ball-receptacle A, of the two-part tube C, closed at each end and transversely perforated near its top, the weight F, sliding but not revolubly in the tube C, the revolubly-adjustable doubly-bent tension-screw hooks J J', each having its two heads at different distances from its axis of rotation, the eye L, and the non-resonant plate M, fixed in the bottom of said tube, substantially as set forth.

399,701. SHUTTLE-DRIVING MECHANISM FOR SEWING-MACHINES. LOUIS SCHULTZ, New York, N. Y. Filed Apr. 27, 1888. Serial No. 272,093. (No model.)



Claim.—1. The combination, with the race-bars A, connected to the stationary bearer-bars B' B², and having sides *a'*, provided with concavities, and opposite plane or flat sides, *a*, of the shuttle carrier or driver-rods D, provided with hooks and working in grooves provided in the stationary bearer-bars B' B², a cap-plate on the bearer-bar B² holding the shuttle carrier or driver rods D, and the reciprocating bar E, to which said shuttle carrier or driver rods are detachably connected, substantially as specified.

2. The combination, with the race-bars A, connected to the stationary bearer-bars B' B², and having sides *a'*, provided with concavities, and opposite plane or flat sides, *a*, of the shuttle carrier or driver rods D, having resilient ends provided with hooks and working in grooves provided in the stationary bearer-bars B' B², a cap-plate on the bearer-bar B² holding the shuttle carrier or driver rods, and the reciprocating bar E, furnished with holes or cavities for receiving the pins in the resilient ends of said shuttle carrier or driver rods, substantially as and for the purpose set forth.

399,702. PEA-HULLER. ROBERT P. SCOTT, Baltimore, Md., and JOHN A. CRESSLER, Oakville, Ontario, Canada. Filed Oct. 10, 1888. Serial No. 287,743. (No model.)

Claim.—1. In a machine for hulling and separating green peas upon the vines, the combination, with a revolving perforated separating-cylinder having a feed-opening at one end and a discharge-opening at the other end, of a revolving hulling-drum which is arranged within said cylinder and provided with brackets at one end, a transverse adjustable bar arranged at its other end and formed with slotted ends, and impact openers or beaters having their ends secured in said brackets and said adjustable slotted bar and adapted to be variably adjusted obliquely to the axis of said drum and upon the periphery thereof, substantially as described.

2. In a machine for hulling and separating green peas upon the vines, the combination, with a revolving perforated separating-cylinder having a feed-opening at one end and a discharge-opening at the other end, of a revolving hulling-drum which is arranged within said cylinder and provided with slotted brackets at one end thereof, a transverse bar formed with slots in its ends and provided with set-screws for adjustably securing the same upon the drum-shaft at the other



end of said hulling-drum, and flat impact openers or beaters arranged upon the periphery of said drum and having their ends secured in said slotted brackets and said adjustable slotted bar, substantially as described.

3. In a machine for hulling and separating green peas upon the vines, the combination of a revolving perforated separating-cylinder provided with one or more interiorly-arranged knives for cutting the vines, and a revolving hulling-drum arranged within said cylinder, substantially as described.

4. In a machine for hulling and separating green peas upon the vines, the combination of a revolving perforated separating-cylinder provided with one or more interiorly-arranged knives for cutting the vines, and a revolving hulling-drum arranged within said cylinder and provided with impact openers or beaters extending from end to end thereof, substantially as described.

5. In a machine for hulling and separating green peas upon the vines, the combination of a revolving perforated separating-cylinder provided with one or more interiorly-arranged knives for cutting the vines, and a revolving hulling-drum arranged within said cylinder and provided with adjustable impact openers or beaters upon its periphery, which are arranged slightly oblique to its axis, substantially as described.

6. In a machine for hulling and separating green peas upon the vines, the combination of a revolving perforated separating-cylinder provided with curved knives arranged upon opposite sides thereof, and a revolving hulling-drum arranged within said cylinder and provided with impact openers or beaters which are secured upon its periphery, arranged slightly oblique to its axis, and formed with notches which register with said curved knives, substantially as described.

7. In a machine for hulling and separating green peas upon the vines, the combination of a revolving perforated separating-cylinder provided with curved knives arranged upon opposite sides thereof near its feed end, one of said knives being arranged in advance of the other, and a revolving hulling-drum arranged within said cylinder and provided with impact openers or beaters which are secured upon its periphery, arranged slightly oblique to its axis, and formed with notches which register with said knives, substantially as described.

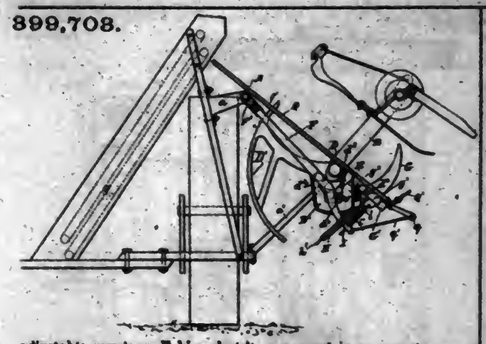
8. In a machine for hulling and separating green peas upon the vines, the combination of the revolving perforated prismatic cylinder having feed and discharge openings and the longitudinal bars or ribs 11, the curved knives 21, secured near the feed end to pairs of said longitudinal bars or ribs, and the revolving hulling-drum 13, provided with the impact openers or beaters 16, which are secured upon its periphery, arranged slightly oblique to its axis, and formed with the notches 22 for the passage of said knives 21, substantially as described.

399,703. GRAIN-BINDER. JOHN F. SEIBERLING, Akron, Ohio. Filed May 23, 1888. Serial No. 274,654. (No model.)

Claim.—1. The combination, with the needle and its shaft, of the cam rigidly secured thereto, the cam-lever pivoted on the frame, the yoke pivoted thereto, and the compressor connected to and supported by said yoke and also pivoted to the needle, substantially as described.

2. The combination of the needle-shaft, the needle secured to said shaft, the cam secured to the heel end of the needle, the pivoted and

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adjustable cam-lever F, hinged at its upper end at or near the upper side of the binder-frame and supported at its lower end and actuated by a cam-roller on said lever engaging the cam on the needle, the compressor, and the pivoted and yielding connection between the cam-lever and compressor, substantially as described.

3. The combination of the needle-shaft, the needle secured to said shaft, the cam on the needle, the compressor-arm hinged to the needle below the shaft, the spur on the needle supporting the compressor in position to receive the grain, the compressor connected to said compressor-arm, the cam-lever, the hinged connection between the cam-lever and compressor-arm, permitting said arm to yield, the supporting-spring *f*, and the spring-rod I, hinged to the compressor-arm and connected with the cam-lever F, in the manner substantially as described.

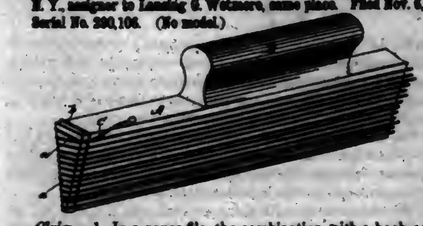
4. The combination of the yoke H, the spring h^2 in said yoke, the rod K, provided with the hook or pin engaging the compressor-arm, the cam-lever F, hinged to the yoke, the compressor-arm G', and the compressor G, substantially as described.

5. The combination, with the needle and the cam formed on the heel end thereof, and the compressor-arm connected to the heel of the needle, of the compressor-actuating lever F and yoke H, connecting said lever and compressor-arm and having the trunnions h h, journaled in said lever, the rod K, spring h^2, and the adjustable nuts k^2 and k^3 on the rod K, one to preserve the proper distance between the cam-lever and compressor-arm and the other to adjust the spring to its proper tension, substantially as described.

6. The combination, with the needle, the cam rigidly secured thereto, and the compressor, of the cam-lever carrying the cam-roller and made adjustable in length to preserve the cam-roller in proper relation to the cam, substantially as described.

7. The combination, with the needle, the adjustable compressor, and the compressor-arm connected with said needle, of the pivoted cam-lever F, the double switch E, and its spring *e'*, the yoke H, and connections interposed between said lever F and the compressor, and the cam-roller *f* on the cam-lever F, substantially as described.

399,704. NEWSPAPER-FILE. HERBERT A. SHEARER, Rochester, N. Y., assignor to Lansing G. Watmore, same place. Filed Nov. 6, 1888. Serial No. 290,108. (No model.)



Claim.—1. In a paper-file, the combination, with a back or strip having two faces arranged at an angle to each other, of a cord or wire extending longitudinally around the strip one or more times, passing over said faces, substantially as described.

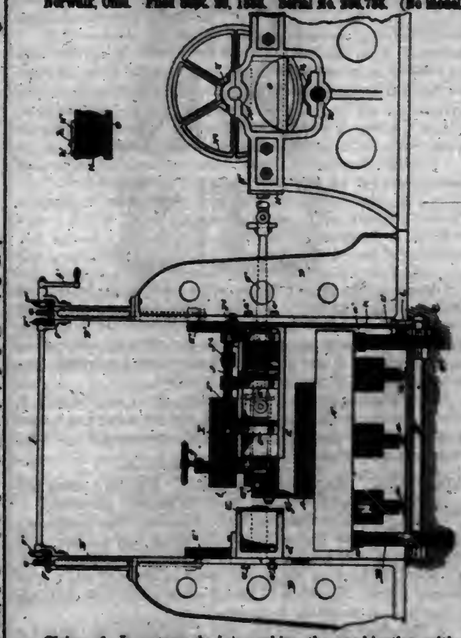
2. In a paper-file, the combination, with a back or strip having two faces arranged at an angle to each other, of wires or cords on which the papers are mounted, extending longitudinally over said faces, being rigidly spaced at the ends of the strip, substantially as described.

3. In a paper-file, the combination, with a back or strip having two faces at an angle to each other, of a continuous cord or wire wound around the strip and passing longitudinally across said faces, substantially as described.

4. In a paper-file, the combination, with the triangular back or strip, of a cord or wire wound around it longitudinally one or more times, passing lengthwise of two of its faces, substantially as described.

5. In a paper-file, the combination, with the back or strip having two faces at an angle to each other, of the continuous cord or wire wound around the strip and passing longitudinally across said faces, and the loops *b b*, substantially as described.

399,705. STONE-PLANING MACHINE. WILLIAM R. SIDDELL, Norwalk, Ohio. Filed Sept. 20, 1888. Serial No. 286,736. (No model.)



Claim.—1. In a stone-planing machine, the combination, with a car and feed mechanism substantially as indicated, and ways located above and crosswise of the car and having vertical adjustment, of a cross-head bearing cutting-tools, said cross-head being mounted on the ways, a plunger operating horizontally and at right angles to the movement of the car, and a pitman connecting the plunger and cross-head for operating the latter at different elevations, substantially as set forth.

2. The combination, with horizontally-reciprocating plunger, the latter being cylindrical and having a flatted upper side, said plunger being connected by pitman with the cross-head of the machine, substantially as indicated, of corresponding cylindrical ways for supporting said plunger, whereby the plunger is self-adjusted on its axis, substantially as set forth.

3. The combination, with cylindrical plunger having a flatted upper side, a corresponding way for supporting such plunger, of rack and dog mounted on the upper side of the plunger, the latter having a longitudinal groove for securing the dog, the latter being adjustable lengthwise of the groove to give the different length of stroke, substantially as set forth.

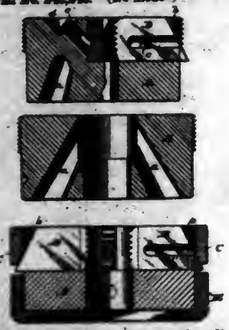
4. In a stone-planing machine, the combination, with a rock-shaft and attached rock-arm and connecting mechanism, substantially as indicated, for feeding the car by the action of such rock-arm, of reciprocating cross-head and inclined way connected with the cross-head for actuating such feed mechanism, substantially as set forth.

5. In a stone-planing machine, the combination, with a cross-head bearing an inclined way and rock-shaft arranged parallel with the line of the cross-head, such rock-shaft having attached two or more rock-arms that present toward the line of the cross-head, said arms being adjustable lengthwise of the rock-shaft, of removable plug adapted to engage and interchangeable with such rock-arms, said plug having a head adapted to operate in the inclined way of the cross-head, substantially as set forth.

399,706. PROCESS OF EXTRACTING ZINC FROM ORES CONTAINING PRECIOUS METALS. HENRY B. SLATER, Detroit, Mich. Filed Mar. 30, 1886. Serial No. 263,886. (No specimens.)

Claim.—The herein-described process of separating zinc from ores containing precious metals, consisting in, first, crushing the ore; second, roasting the ore; third, moistening the mass to convert it to the woolly condition; fourth, subjecting the mass to the action of free chlorine in a pure condition and continuing the operation of chlorination only until all of the oxide of zinc is converted into chloride of zinc, and, fifth, leaching the ore with cold water, substantially as specified.

399,707. SCREW-CUTTING DIE. THOMAS L. SMITH, Roxbury, Wis., assignor to the Pratt & Whitney Company, Hartford, Conn. Filed Aug. 30, 1887. Serial No. 248,240. (No model.)



Claim.—1. The combination, in a screw-cutting die of the class specified, of the collet having radially-disposed chaser-receiving slots, chasers in said slots, each having a groove longitudinally on one side thereof, and set-screws set obliquely in said die-body and bearing against the chasers in said grooves, said screws being accessible from the face of the die, all substantially as described.

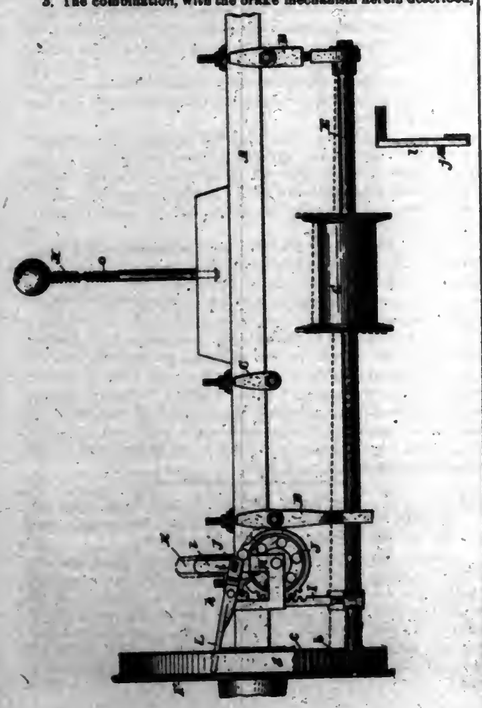
2. The combination, in a screw-cutting die, of the die-body A, chasers B, having the V-shaped groove *d'*, and the set-screws *c*, bearing against the rear face of said groove, all arranged and operating substantially as shown and described.

399,708. HORSE-CHECKING DEVICE. WILLIAM P. SMITH, Renton, Wash. Filed Nov. 8, 1888. Serial No. 290,259. (No model.)

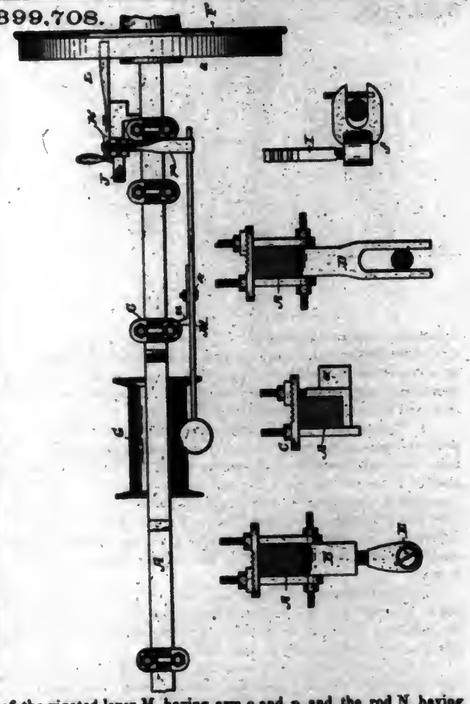
Claim.—1. The combination, with a wagon or other vehicle, of a ring surrounding the hub of one of the wheels and toothed on its inner surface, a shaft supported in hangers from the vehicle, and having a pinion adapted to engage the teeth of the ring and a drum arranged thereon, the wheel J, having notch *g*, the lock-plate, and the foot-lever, substantially as described.

2. The combination, with the shaft E, of the rack-bar shaped or constructed at its lower end to embrace said shaft, and having its upper end free, the case H, the wheel for engaging the rack-bar having the notch *g*, the locking-plate, the sliding plate *l*, having stud *j*, and the pivoted foot-lever having a slot working on said stud, substantially as described.

3. The combination, with the brake mechanism herein described,

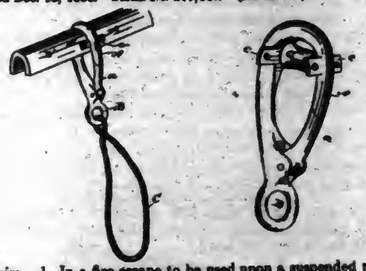


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of the pivoted lever M, having arm *o* and *p*, and the rod N, having retracting-spring O, substantially as described.

399,709. FIRE-ESCAPE. WILFRED J. SMITH, Rochester, N. Y. Filed Dec. 13, 1888. Serial No. 293,447. (No model.)



Claim.—1. In a fire-escape to be used upon a suspended rope or cable, the combination, with a loop or belt arranged to be applied to the person of the operator, of an open-sided suspending-hook attached thereto for engaging the rope and an open-sided brake for operating on the rope when in the hook, substantially as described.

2. The combination, with the hook adapted to be applied to a rope or cable from the side, and a loop or belt arranged to be applied to the person of the operator secured thereto, of an open-sided collapsible brake secured to the hook, substantially as described.

3. The combination, with the snap-hook and the loop or belt arranged to be applied to the person of the operator, of the open-sided collapsible brake secured to the hook, substantially as described.

4. The combination, with the hook and the loop or belt arranged to be applied to the person of the operator, of the open-sided pieces of collapsible material secured on opposite sides of the hook, substantially as described.

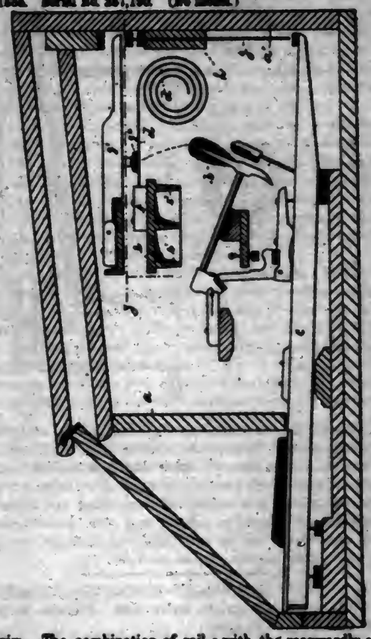
5. The combination, with an open-sided hook and the roller journaled in the upper portion thereof, adapted to operate on the top of the suspending-rope, of a loop or belt arranged to be applied to the person of the operator, substantially as described.

6. The combination, with an open-sided hook and a roller journaled in the upper portion thereof, adapted to operate on the top of the suspending-rope, and an open-sided brake secured to the hook, of a loop or belt arranged to be applied to the person of the operator, substantially as described.

7. The combination of the hook having lugs on the side thereof, the pieces of collapsible material secured thereto, and the loop or belt

arranged to be applied to the person of the operator, substantially as described.

399,710. PIANO. GEORGE SENK, New York, N. Y. Filed Oct. 4, 1888. Serial No. 287,189. (No model.)



Claim.—The combination of rail *c* with the rearwardly-extending coiled springs *d*, secured thereto, and with hammers *b* and damper lifters *g* at opposite sides of the spring-heads, the spring, damper lifter, and hammer of each note being in line with each other, substantially as specified.

399,711. PLANING-MACHINE. MARTINUS STEENBD, Seattle, Wash. Filed Mar. 20, 1888. Serial No. 267,857. (No model.)



Claim.—1. In a planer, the planing apparatus consisting of the block A, flanged pocket C, having blade-opening *o*, and carrying wedge projections over the blades, and the sockets *p p* in the casting, the blade B, provided with slots *x x* and slots S' S', counter-blade B', provided with slots *x x*, screws S' S', wedges W W, bed-plate K, carrying two sets of supports, H H, and journals J J, the screws D D, carrying collars L L, and nuts N N, provided with nuts *n n*, the rollers R R, axle *q*, levers V V, stationary axle *z*, horizontal rod T, handle M, spring Q, flanges F F, provided with slots *y y* and clamping-bolts I I, and the guide-pieces P P, substantially as herein described.

2. In a planer, the block A, in combination with the flanged cast-iron pocket C, provided with wedge projections *y y* over the blades and formed with blade-opening O and sockets *p p* in the casting, the blade B, provided with the slots *x x* and slots S' S', the counter-blade B', provided with slots *x x*, the wedges W W, screws S' S', the bed-plate K, carrying two sets of supports, H H, and journals J J, the screws D D, carrying collars L L, and nuts N N, provided with nuts *n n*, acting upon the blade B through the slots S' S', substantially as herein set forth.

3. In a planer, the combination, with block A, formed with opening O, of the flanged cast-iron pocket C, fitted into said opening, said pocket C provided with wedge projections *y y* over the blades B B' for the wedges W W, blade-opening *o* for the blade B, and sockets *p p* for the adjusting-screws D D in the casting, substantially as herein set forth.

4. In a planer, the combination, with pocket C of block A, said pocket formed with wedge projections *y y*, and the blades B and B', of the wedges W W, which operate in said wedge projections *y y* of said pocket over the blades, substantially as herein shown.

5. In a planer, the block-pocket C, provided with sockets *p p* in the casting, and the planing-blade B, provided with slots S' S' above the counter-blade, in combination with adjusting-screws D D, screw-nuts N N, projected through said blade-slots, and the nuts *n n*, substantially as herein shown.

6. In a planer, the combination, with the cutting-blade B, slotted above the counter-blade B', of an independent bed-plate, K, attached to the top of the block A, and provided with two upright sets of supports, H H, having journals J J, and the collared screws D D and their parts, and the nuts *n n*, adjustable in the slots of the cutting-blade, constituting the adjusting mechanism or means for properly supporting and co-ordinating the said screws in the adjustment of the cutting-blade above the counter-blade, substantially as herein shown.

7. In a planer, the adjusting mechanism for the planing-blade, consisting of the combination, with block A and blade B, provided with slots S' S' above the counter-blade, of the pocket C, provided with sockets *p p* in the casting, bed-plate K, attached to the block, double supports H H upon the bed-plate, the screws D D, provided with collars L L, and projected nuts N N, provided with other nuts, *n n*, which said projected nuts operate through the blade-slots S' S' above the counter-blade, all substantially as herein set forth and explained.

8. In a planer, the combination, with the block A and its adjustable planing apparatus, of the rollers R R, axle *q*, levers V V, stationary axle *z*, horizontal rod T, double-shouldered handle M, and spring Q, coacting to move the planing-machine backward after a progression or propulsion, substantially as herein set forth.

9. In a planer, the uplifting and depressing mechanism for the rollers R R, consisting of the combination, with the block A, of the levers V V, stationary axle *z*, horizontal rod T, handle M, and spring Q, acting upon the rollers, substantially as herein set forth.

10. In a planer, the combination, with the block-rollers R R, movable around the axle *q* under the block A, of the uplifting and depressing roller mechanism, consisting of the levers V V, axle *z*, and rod T, and the handle M, double-shouldered for retaining the rod T in each of its positions, and the spring Q, all substantially as herein described.

11. In a planer having rollers and roller-operating handles, the mechanism for connecting the operating-handle with the rollers, consisting of levers attached to the axle of the rollers and movable around a stationary axle, in co-operation with the rod T, uniting the levers substantially as herein shown.

12. In a planer constructed with the roller-operating handle M, and having levers attached to the roller-axle, as shown, the rod T, uniting such levers and connecting them united with the operating-handle, substantially as herein set forth.

13. In a planer having rollers, the double-shouldered handle M for operating the roller mechanism, substantially as herein described.

14. In a planer of the character described, the combination, with the double-shouldered handle M and the roller mechanism set forth, of the spring Q for rendering the roller mechanism undetachable from the operating-handle, substantially as herein shown.

15. In a planer, the flanges F F, provided with slots *y y*, said flanges so constructed as to run on both sides of the block A the length of the block, and the clamping-bolts I I, which pass through the block and the flange-slots, said flanges bent inward under the block A and forming angle-irons and adjustable under the block A, and the guide-pieces P P, attached to the flanges F F and flush with their lower surfaces, substantially as herein described.

16. In planers, the combination, with block A and cutting-blade B, of the adjustable flanges F F, provided with slots *y y* and clamping-bolts I I, passing through the slots, said flanges bent inward under the block, forming angle-irons and carrying the guide-pieces P P, made as long as the flanges and flush with their lower surfaces, all substantially as herein shown.

17. The combination, with planers having adjustable flanges of the character described, of the attached flanged guide-pieces P P, made as long as the flanges and flush with their lower surfaces, constituting an arrangement which gives large adjustable guiding-surfaces on both sides of the planer, substantially as herein set forth.

399,712. TUNING-PIN FOR MUSICAL INSTRUMENTS. VICTOR VON FRANKENBERG, Fine Knuf, Ark. Filed June 11, 1888. Serial No. 276,880. (No model.)



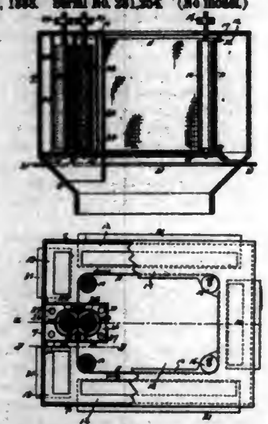
Claim.—1. A tuning-pin provided with the square foot C, middle part, B, and head part A, the parts A and B being of different sizes

and having their threads cut in opposite directions, for the purpose set forth.

2. The combination, with a tuning-pin, of a head-screw, having wings W, threaded part A', and nose N, for the purpose set forth.

3. The combination, with a tuning-pin having foot C, middle part, B, and head part A, the last two parts being of different sizes and having their threads cut in different directions, of a tube having a polygonal head, D, top table, T, threaded part B', and knob K, and a head-screw consisting of threaded part A', wings W, and nose N, as and for the purpose specified.

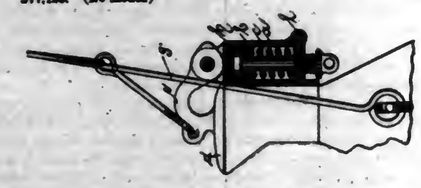
899,713. DUST-COLLECTOR. TALBOT WATSON, Baltimore, Md. Filed July 27, 1888. Serial No. 281,254. (No model.)



Claim.—1. In a dust-collector, the combination, with an upright dust-arresting cloth, means for directing the dust-laden air against one side thereof, a rotating brush for dislodging the dust therefrom, and a roller for dislodging the dust from the said rotating brush, for the purpose set forth.

2. In a dust-collector, the combination, with an upright dust-arresting cloth, means for directing the dust against one side thereof, a rotating brush for dislodging the dust therefrom, a shield, 24, provided with the opening 25 therein, placed around the said brush, and a still-air compartment formed by the walls 30, which completely incases the said brush and shield 24, for the purpose set forth.

899,714. MECHANICAL LID-SHUTTER FOR CANS. BRUNO WHEELMANN, Hamburg, Germany. Filed June 14, 1888. Serial No. 277,122. (No model.)



Claim.—The combination of a vessel having chamber *b*, a lid having a bow, *c*, with an eccentric end, a cap, A, spring *c*, a bolt, *a*, movable lengthwise in the chamber, and means for fixing the bolt in an advanced position, all for the purpose set forth.

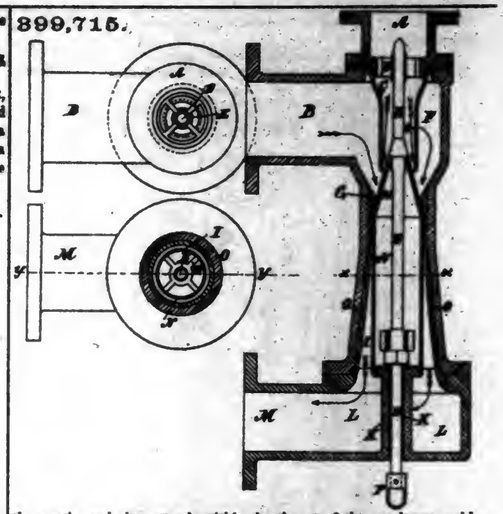
899,715. EJECTOR-CONDENSER. NORMAN W. WHEELER, New York, N. Y. Filed May 8, 1888. Serial No. 273,282. (No model.)

Claim.—1. In an ejector-condenser, the combination of a nozzle for admitting the condensing-water and a cone or conoid which projects within the nozzle, and also extends within the throat of the condenser, said throat being formed so as to contract about said cone, and also to extend parallel or approximately parallel to the axis of the same, whereby the stream of water is deflected and the throat sealed, substantially as described.

2. In an ejector-condenser, the combination of a nozzle for admitting the condensing-water, a cone or conoid which projects within the nozzle, and also extends within the throat of the condenser, said throat being formed so as to contract about said cone, and also to extend parallel or approximately parallel to the axis of the same, and an adjustable rod adapted to support said cone, whereby said cone is raised and lowered and the nozzle or throat contracted or enlarged simultaneously, substantially as described.

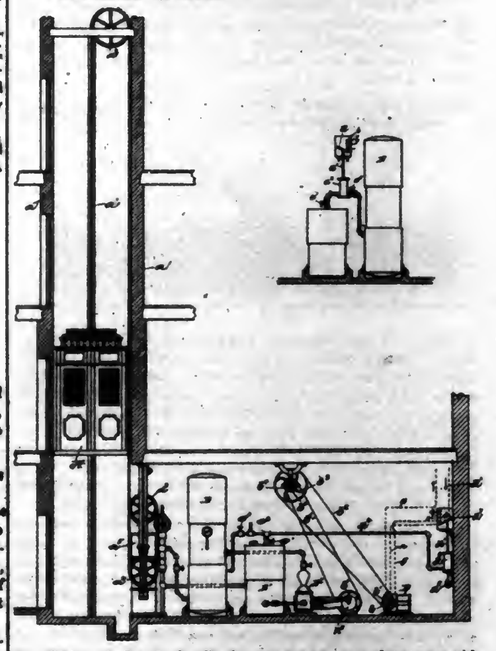
3. In an ejector-condenser, the combination of a nozzle for admitting the condensing-water, a cone or conoid which projects within

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the nozzle, and also extends within the throat of the condenser, said cone being provided with a cylindrical projection and said throat being formed so as to contract about said cone, and also to extend parallel or approximately parallel to the axis of the same, a retarding-pipe extending from said throat and surrounding said cylinder, and an adjustable rod adapted to support said cone, whereby said cone is raised and lowered and the nozzle or throat contracted or enlarged, substantially as and for the purpose set forth.

899,716. ELECTRICALLY-CONTROLLED HYDRAULIC ELEVATOR. CHARLES WHITTIER, Boston, Mass. Filed Jan. 26, 1887. Serial No. 225,433. (No model.)



Claim.—1. In a hydraulic-elevator system, a regulator operated by changes in pressure of the fluid used to actuate the elevator, a pump, and an electric motor, combined with a switch controlled by the regulator to affect the circuit of the electric motor to start or stop the pump according to the pressure of the fluid employed, substantially as described.

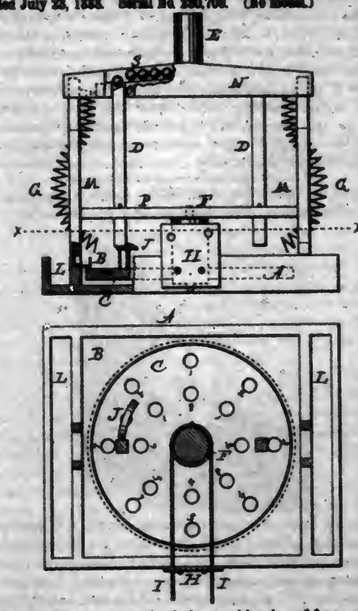
2. In a system for actuating hydraulic elevators, the following instrumentalities, viz: a closed tank to contain a fluid under pressure, a pump to force the fluid into the said tank, and an electrically-actuated motor to operate the said pump at intervals, combined with a regulator under the control of the fluid under pressure in the tank, and with a switch to control the circuit of the electric motor, the said instrumentalities operating substantially as described.

3. In a system for actuating hydraulic elevators, a closed tank to contain a fluid under pressure, a pump to force the fluid into the said tank, and an electrically-actuated motor to operate the said pump at intervals, combined with a regulator under the control of the fluid under pressure in the tank, and with a resistance and a lever co-operating therewith and controlled by the said regulator to affect the circuit of the electric motor, as and for the purpose specified.

4. In a system for actuating hydraulic elevators, a tank to contain a fluid under pressure, a pump, and an electric motor, a resistance and a lever co-operating therewith, and a piston connected to the said lever and actuated by fluid from the pressure-tank to move the said lever, combined with a relief-valve to control the fluid actuating the said piston, and with means, substantially as described, to move the piston in a direction opposite to that in which it is moved by the actuating-fluid, as and for the purpose specified.

5. In a system for actuating hydraulic elevators, a tank to contain a fluid under pressure, a pump, and an electric motor, a resistance and a lever co-operating therewith, a regulator in operative connection with the said lever, a pipe connecting said regulator with the pressure-tank, and a branch pipe forming a discharge-pipe for the said regulator, combined with a relief-valve to control the admission of fluid to the said regulator, and with a valve in the branch pipe to control the passage of fluid from the said regulator, as and for the purpose specified.

899,717. GAME-WHEEL. GOTTLIEB WILKENING, Dayton, Ohio. Filed July 23, 1888. Serial No. 280,708. (No model.)



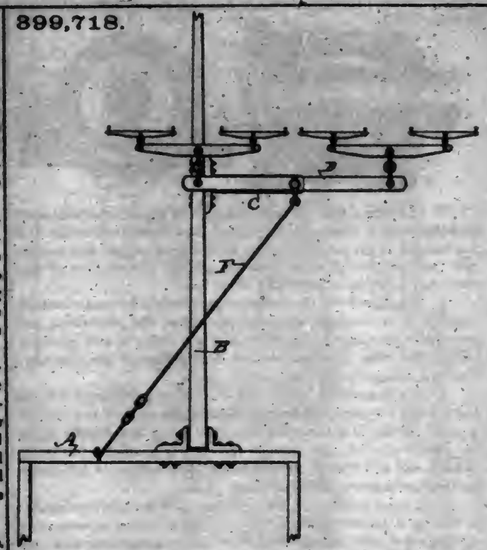
Claim.—1. In a game-wheel, the combination of frame A, having a channeled top for the conveyance of marbles, wire conduits G G to convey said marbles from said channels to the wheel, discharging-bars D D, operated by projection J of the wheel, and the revolving wheel C, provided with numbered cavities to receive said marbles, substantially as shown and described.

2. In a game-wheel, the combination of frame A, having a channeled top for the conveyance of marbles, wire conduits G G to convey said marbles from said channels to the wheel, discharging-bars D D, operated by projection J of the wheel, the revolving wheel C, provided with numbered cavities to receive said marbles, and cords I I, attached to the shaft of said wheel to produce alternating rotary motions thereof, substantially as shown and described.

899,718. FOUR-HORSE EQUALIZER. ANDREW C. WILSON, Victor, Iowa. Filed Nov. 5, 1888. Serial No. 290,044. (No model.)

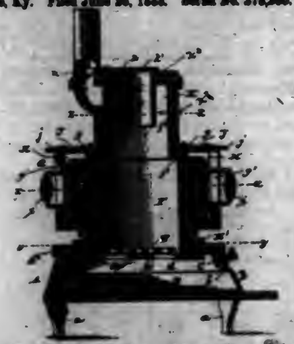
Claim.—The four-horse draft-equalizer composed of a pole, B, hinged to a reaper-frame, A, a branch, C, fixed to the pole and provided with a large perforation or slot in its free end, an evener, D, pivoted to the end of the said branch by means of a clevis, doubletrees and singletrees connected with the ends of the evener, and a

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rod, F, connected with the clevis at the end of the branch C and with the frame A, substantially as shown and described, to operate in the manner set forth.

899,719. STOVE FOR HEATING SAD-IRONS. JOHN S. WHITE, Louisville, Ky. Filed June 26, 1888. Serial No. 278,206. (No model.)



Claim.—In a stove for heating sad-irons, the combination, with a cylindrical drum forming the fire-chamber and provided with a circumferential shoulder, of a rotatable drum encompassing the said fire-chamber, provided with a flange at its upper edge adapted to rest upon said shoulder, and with a series of individual vertically-disposed chambers, each of which has a top door with a projecting lug and a side slot, and having open backs, whereby the irons are brought in contact with the heating-surface of the stove, substantially as described.

899,720. THIMBLE FOR COUPLING LEAD AND CAST-IRON PIPES. LEWIS WOLFF, Chicago, Ill., assignor to the L. Wolff Manufacturing Company, same place. Filed Feb. 13, 1888. Serial No. 263,769. (No model.)



Claim.—A cast-iron thimble having a soft-iron or steel band fusibly united therewith, said band being coated on the outside with tin or an alloy thereof, substantially as specified.

899,721. JOURNAL-BOX. WILLIAM W. WORSWICK, Cleveland, Ohio. Filed Feb. 3, 1888. Serial No. 262,921. (No model.)

Claim.—1. In a journal-box, the combination, with a stationary bearing located within the box and a rotary bearing, the working-faces of said stationary and rotary bearings being located in the same horizontal plane, of a plain-faced journal portion having direct engagement with both said bearings, substantially as set forth.

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2. In a journal-box, the combination of an axle-journal, stationary bearings located within said journal-box, and against which said axle has bearing at the inner and outer ends, respectively, of said journal-box, and anti-friction roller-bearings located intermediate of said stationary bearings, substantially as set forth.

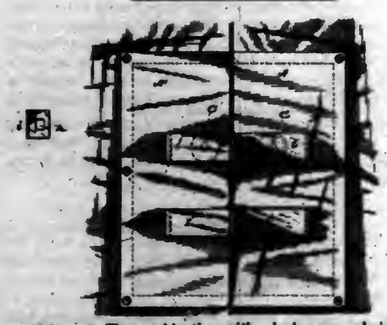
3. In a journal-box, the combination of flange and washer located, respectively, at the inner and outer portions of the journal-box and provided with openings, stationary bearings fitting in said openings, and friction-roller bearings located intermediate of said stationary bearings, substantially as set forth.

4. In a journal-box, the combination of an axle-journal, a flange and a washer located, respectively, on opposite sides of the journal-box, the horizontal distance between them being least slightly below the center of said axle-journal, and thence gradually increasing upward, and anti-friction rollers located intermediate of said flange and washer, substantially as set forth.

5. In a car journal-box, the combination of the bearing-chamber F, the cap N, secured to the outer face of said bearing-chamber, said cap provided with the chamber N', which communicates with said bearing-chamber, the diameter of said two chambers being substantially equal, the axle-journal D, journaled in said bearing-chamber, and the washer *n*, rigidly secured to the axle of said journal within said chamber N', midway between the outer and inner walls of said chamber and free from engagement with said walls, a clear space being left on either side of said washer intermediate of the said respective walls and washer, the diameter of said washer being slightly less than that of said chamber, substantially as set forth.

899,722. SEAL-LOCK. CARL SWINKARZ, Sahrwedel, Prussia, Germany. Filed June 9, 1886. Serial No. 204,663. (Model.) Patented in Germany Apr. 17, 1886, No. 39,052, and in France Apr. 21, 1886, No. 176,664.





Claim.—1. The combination, with a lock-case made in two parts and provided with a securing-bolt, of two heads placed in sockets and provided with arms *d*, two slits, and two pivoted levers provided with tongues which are in position to engage the seals *i*, said two levers being adapted to be engaged by the arms of said heads, substantially as and for the purposes described.

2. In combination with a lock-case provided with a slit, E, and a lock-bolt, a head placed in a socket and provided with an arm, *d*, and a projection adapted to retract the lock-bolt, and a pivoted lever, *f*, provided with a spring and a tongue, *g*, which is in position to engage seal *i*, substantially as set forth and described.

3. The combination, with the lock-casing divided into two parts, each having a slit, E, of a seal provided with perforated extremities adapted to be inserted in the slits, and devices, substantially as described, adapted to engage said extremities, substantially as and for the purposes described.

899,723. WHEELBARROW. JOSEPH ABEL, Brooklyn, N. Y. Filed May 20, 1868. Serial No. 275,472. (No model.)



Claim.—1. In a wheelbarrow or truck of substantially the described kind, the combination, with a sheet-metal tray, A, mounted on handle-bars B and adapted to dump sidewise, of the longitudinal brace-bars *m m*, fixed to the bottom of the tray on the dumping sides between the handle-bars and its dumping-edge, substantially as shown and described.

2. A metallic wheelbarrow-tray, A, formed with the central longitudinal bar, *k*, and longitudinal side bars, *m m*, substantially as and for the purpose set forth.

3. The metallic wheelbarrow-tray A, formed with the marginal binding *i*, central longitudinal brace-bar, *k*, and side longitudinal brace-bars, *m m*, arranged on the under side of the tray and operating substantially as and for the purpose set forth.

4. The combination, with the tray of a wheelbarrow, of the central longitudinal bar, *k*, and the transverse clip-bars *c c*, the one bent to overlap the other, substantially as shown and described.

5. In a metallic wheelbarrow, the combination, with the sheet-metal tray A, of the handle-bars B B, secured to and underlying the same, the marginal binding *i*, the central bar, *k*, secured longitudinally to the tray between the handle-bars and the side bars, *m m*, secured to the dumping sides of the tray between the marginal band and the handle-bars, substantially as herein shown and described.

899,724. SHUTTER-FASTENER. JOSEPH A. RAGSDALE, Austin, Tex. Filed Aug. 17, 1888. Serial No. 283,021. (No model.)



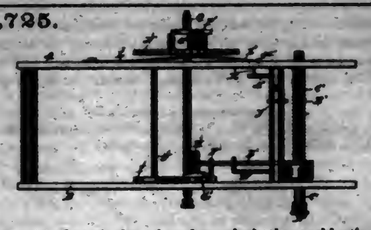
Claim.—1. The combination, with the plate A B C, secured to a sill, provided with suitable cavities or recesses and through-cut openings and ways, of the latches, movable horizontally in said ways by suitable springs toward a common point, of the plate D, secured to a shutter provided with suitable cavities or recesses and through-cut openings, and the vertically-movable bolt influenced by a suitable spring toward the center of approach for the three latches, as and for the purpose set forth.

2. The combination, with the vertically-movable bolt, suitably housed, having an inwardly-projecting pointed foot opposite recesses and a notch in its rear, substantially as described, of the horizontally-movable latches, suitably housed, two of which have their ends cut away to form a dovetail space, as set forth, and the three being provided with undercut notches, as and for the purpose specified.

899,725. ALARM-CLOCK. ARCHIBALD RAMSAYER, Waterbury, Conn., assignor to the Waterbury Clock Company, same place. Filed July 16, 1887. Serial No. 244,500. (Model.)



899,725.



Claim.—1. In a single-spring alarm-clock, the combination, with a spring, of a time-train and an alarm-train driven thereby, and alarm stop-work for holding the alarm-train, such stop-work being entirely independent of the time-train of the clock and adapted for direct manual operation in unlocking the alarm-train, substantially as set forth.

2. In a single-spring alarm-clock, the combination, with a spring, of a time-train and an alarm-train driven thereby, and alarm stop-work having a rotatable and a longitudinally-movable push-staff carrying a lever, through which the alarm-train is automatically locked, the said train being unlocked by manually moving the staff endwise and thus shifting the lever, substantially as set forth.

3. In a single-spring alarm-clock, the combination, with a manual push-staff carrying a stop-lever, of a rotary stop actuated from the mainspring and engaging with the said stop-lever, which is disengaged from the stop when the said staff is manually moved endwise, and an arm carried by the verge-staff and engaged by the stop-lever when the same is lifted by the rotary stop, substantially as set forth.

4. In a single-spring alarm-clock, the combination, with a spring-actuated manual push-staff carrying a stop-lever, of male and female rotary stop-pieces driven by the mainspring, a stop-pin carried by the female stop-piece and rotated in range of the said stop-lever, a stop-arm carried by the verge-staff in position to be operated by the stop-lever, and a locking-arm also carried by such staff and controlled by the alarm-train, substantially as set forth.

5. In a single-spring alarm-clock, the combination, with a spring, of a time-train and an alarm-train driven thereby, and alarm stop-work made entirely independent of the time-train and having two rotary stop-pieces always rotated in the same direction by the alarm-train, which is stopped through them, one of such rotary pieces carrying a pin operating a stop-lever, substantially as set forth.

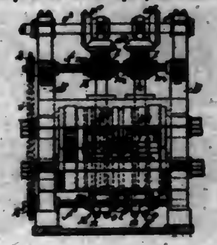
6. In a single-spring alarm-clock, the combination, with a spring, of a time-train, an alarm-train provided with a verge-staff having a stop-arm and a locking-arm, and alarm stop-work having a push-staff adapted for direct manual operation, and carrying a stop-lever which co-operates with the stop-arm to stop the alarm-train, the said locking-arm being connected with the time-train, which automatically holds and releases it, substantially as set forth.

7. In a clock, the combination, with a spring, of a time-train driven by said spring, an alarm or escape train geared to the said spring and normally cut out of action, and manual let-off or stop mechanism entirely independent of the time-train and manually operated to release the escape-train, whereby the spring may be run down without disturbing the time-train, substantially as set forth.

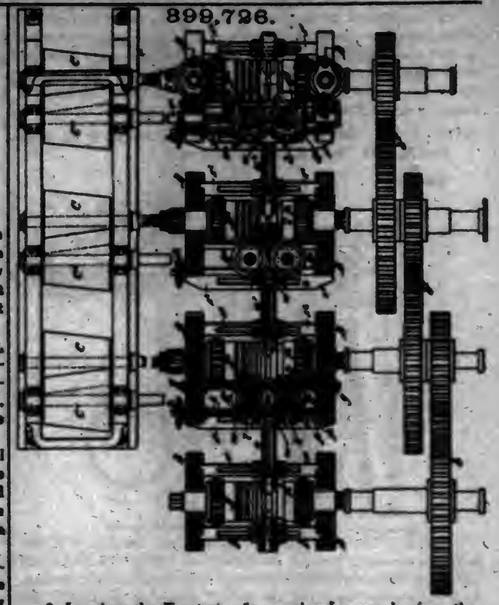
8. In an alarm-clock, the combination, with the time-train thereof, of a sleeve-cam carried by a wheel driven by such train, an independent rotatable set-staff extending through such cam which rotates around the staff, and a flat collar having a finger projecting from its edge in the same plane therewith, such collar and finger being made from one piece of sheet metal and the finger bearing flatwise on the edge of the cam, substantially as set forth.

899,726. UNIVERSAL ROLLING-TRAIN. WILHELM BARNER, Kattowitz, Prussia, Germany. Filed Jan. 7, 1888. Serial No. 260,000. (No model.)

Claim.—1. In universal rolling-trains for round and square bar-iron, the combination of the horizontal grooved rolls A A A' A' A² A² A³ A³, placed one behind the other, with the vertical plain rolls B' B' B² B² B², driving-cones C C, shafts *c d d*, and bevel-wheels *d d' d² d² d³ d³*, substantially as and for the purpose described.



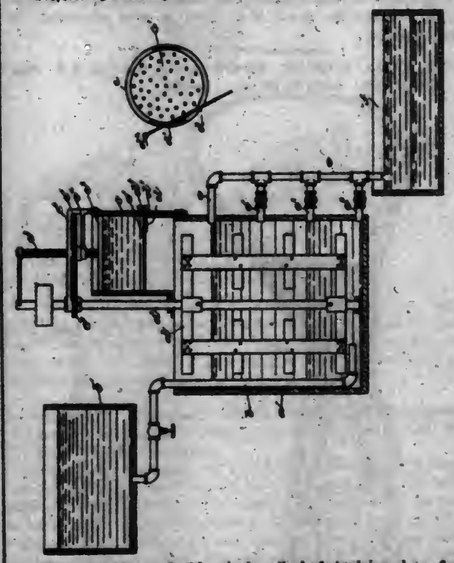
899,726.



2. In universal rolling-trains for round and square bar-iron, the combination of the horizontal grooved rolls A A A' A' A² A² A³ A³, placed one behind the other, with the vertical plain rolls B' B' B² B², driving-cones C C, shafts *c d d*, and bevel-wheels *d d' d² d² d³ d³*, substantially as and for the purpose described.

3. In universal rolling-trains for round and square bar-iron, the combination of the horizontal grooved rolls A A A' A' A² A² A³ A³, placed one behind the other, with the vertical plain rolls B' B' B² B², driving-cones C C, shafts *c d d*, and bevel-wheels *d d' d² d² d³ d³*, screws *f' f'*, nuts *l l*, and bearings *k k'*, having the slit *n* and lock-nuts *m m*, substantially as and for the purpose described.

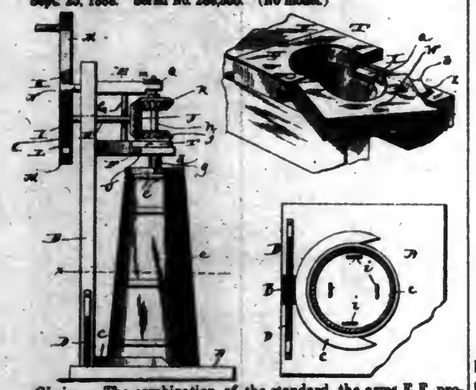
899,727. METHOD OF OBTAINING GLUTEN AND STARCH. HERMAN BARKER, Somerville, Mass. Filed June 25, 1888. Serial No. 278,163. (No model.)



Claim.—1. The method herein described of obtaining gluten from cereals, which consists in adding water to the granulated or pulverized cereal to form a semi-fluid or pasty mass, dividing the said pasty mass into small independent pieces or particles, disintegrating the said independent pieces in liquid to set free the gluten, and thereafter collecting the gluten by subsidence.

2. The method herein described of obtaining starch from cereals, which consists in adding water to the granulated or pulverized cereal to form a semi-fluid or pasty mass, dividing the said pasty mass into small independent pieces or particles, disintegrating the said independent pieces in liquid to set free the starch, and thereafter collecting the starch by subsidence.

399,728. CHURN. PELEG C. BARLOW, Buckhannon, W. Va. Filed Sept. 25, 1888. Serial No. 286,355. (No model.)



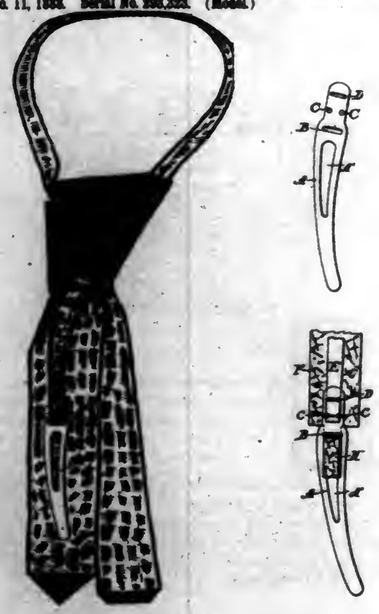
Claim.—The combination of the standard, the arms E F, projecting horizontally forward therefrom and having their front ends bifurcated, the dashers inserted through said bifurcated ends, the plate U, secured to the lower arm, the plate W, hinged to the plate U, and the spring secured to said arm and engaging the plate W, the said plates U W encircling the outer dasher, as set forth.

399,729. SWEAT-BAND FOR HATS. WILLIAM F. BEARDSLEE, Boston, Mass., assignor to the Hat Sweat Manufacturing Company, New York, N. Y. Filed Mar. 12, 1887. Serial No. 230,863. (No model.)



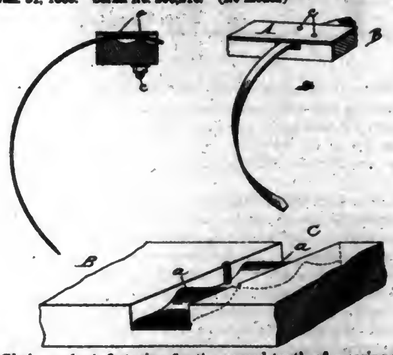
Claim.—The combination, with a hat sweat-leather, D, of a spring, A, soft covering B, spirally-laid thread C, and a line of stitches formed by a separate thread, E, arranged to serve substantially as herein specified.

399,730. SCARF-TIP. EDWIN S. BELLOWS, New York, N. Y. Filed Dec. 11, 1888. Serial No. 293,323. (Model.)



Claim.—The tip or leader for the end of a neck band, constructed, substantially as described, of a thin flat plate having converging sides and a parallel-sided head transversely slotted with dual slots B and D and having intermediate perforations, C, therein, for the purpose set forth.

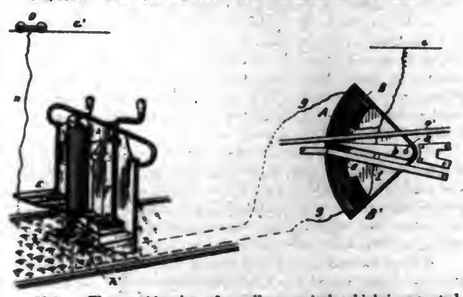
399,731. HARROW. CLARENCE E. BENEDICT, Lansing, Mich. Filed Jan. 31, 1889. Serial No. 298,210. (No model.)



Claim.—1. A fastening for the curved tooth of a spring-tooth harrow, consisting of a supporting frame-piece provided with a gain to receive the shank of the tooth, which gain has a transversely corrugated or grooved bottom, so as to provide transverse knife-edge supports or ridges *a*, and a clip arranged to bear upon the outer face of the tooth at a point between the points where the inner face of the tooth meets the said supports *a*, substantially as described.

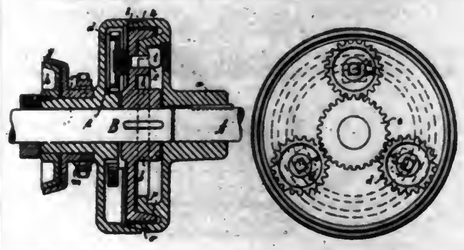
2. The combination of the frame-piece, formed with a tooth-receiving gain having a bottom transversely corrugated or grooved, so as to provide the knife-edge supports or ridges *a*, and a clip formed of the iron plate A, held to the frame-piece and against the tooth by conically-headed bolts fitting in conical counter-seats in said plate, substantially as hereinbefore set forth.

399,732. ELECTRIC-RAILWAY SWITCH. EDWARD BLAKE, Boston, Mass. Filed Oct. 22, 1888. Serial No. 288,576. (No model.)



Claim.—The combination of a railway-switch which is actuated in both directions by an electro-motive agency with electric conductors extending from such electro-motive agency to contact-makers set near the railway-track, a railway track and car, and means attached to the car for making connections through such contact-makers with said conductors, respectively, so as to complete an electric circuit through either of them at will, and thereby to move the switch in either direction.

399,733. FRICTION-CLUTCH. EMIL BOEHME, Breslau, Prussia, Germany, assignor to Stanislaus Leutner & Co., same place. Filed Aug. 21, 1888. Serial No. 283,208. (No model.) Patented in Germany Nov. 4, 1887, No. 44,460.



Claim.—1. A friction-clutch consisting of two parts, one carried by the driving-shaft and the other by the shaft to be driven, said L-shaped screws connecting said parts and serving to draw them together.

2. In a friction-clutch, the combination of two parts, one a driver and the other to be driven, screws extending from one of said parts and adapted to engage the other, nuts applied to said screws, and a wheel connected with the driving-shaft and serving to rotate the nuts, whereby the screws are caused to draw the parts together or to release them, as required.

3. In a friction-clutch, the combination of a main clutch consisting of a driver and a driven part, screws extending from one of said parts to the other, toothed nuts applied to said screws, a toothed wheel meshing with said toothed nuts, and a secondary friction-driver carried by the driving-shaft, and serving to rotate the toothed wheel and through it the nuts.

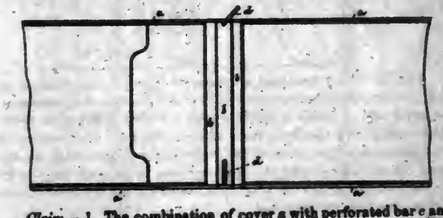
4. In a friction-clutch, the combination of a driver, a driven part adapted to be locked thereto, screws extending from one of said parts to the other, toothed nuts applied to said screws, a toothed wheel meshing with said toothed nuts, and a brake arranged to act upon the toothed wheel and to hold it against rotation while the toothed nuts rotate about it.

5. In a friction-clutch, the combination of a driver and a driven part, screws extending from one of said parts to the other, nuts applied to said screws, a wheel engaging with and serving to rotate said nuts, a secondary clutch or connection serving to connect said wheel with the driver, and a brake arranged to act upon said wheel and prevent its rotation with the driver when not coupled thereto by the secondary clutch.

6. In a friction-clutch, the combination, with a driving-shaft, A, and a driven shaft, B, of two parts, as *a* and *b*, secured, respectively, to the shafts A B, and one of said parts having an undercut flange, screws *c*, carried by one of said parts and having undercut heads to engage the flange on the other part to draw the parts together, and means for actuating the screws.

7. In a friction-clutch, the combination, with a driving-shaft carrying one part of the clutch, of a shaft to be driven carrying the other part of the clutch, and screws carried by one of said parts and adapted to directly engage the other part to connect the said parts.

399,734. BOOK-COVER. FRANCIS F. BRAILLARD, Brooklyn, N. Y. Filed Dec. 4, 1888. Serial No. 292,568. (No model.)



Claim.—1. The combination of cover *a* with perforated bar *c* and with the hooks *d*, the shanks of which pass through said perforated bar, substantially as specified.

2. The combination of cover *a* with perforated bar *c* and with hooks *d*, having reduced shanks *d'*, and washers *e*, substantially as specified.

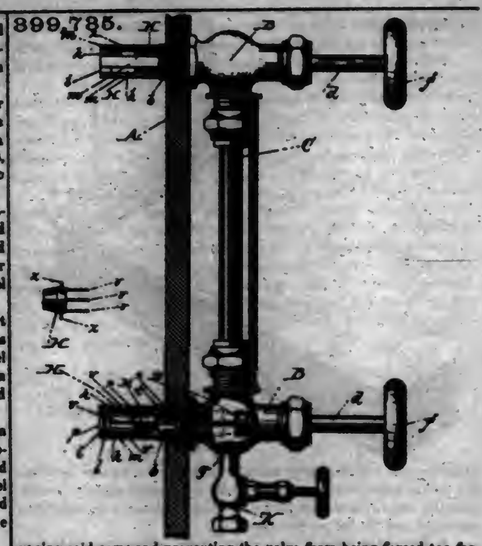
3. The combination of cover *a* and lining *b*, forming a pocket between them, with the perforated bar *c* within said pocket, and with the hooks *d*, the shanks of which pass through said perforated bar, substantially as specified.

399,735. AUTOMATIC SAFETY-VALVE FOR WATER-GAGES. WILLIAM H. BRAY, Boston, and CORNELIUS ECKERSON, Chelsea, Mass. Filed Jan. 10, 1888. Serial No. 295,990. (No model.)

Claim.—1. In a valve for water-gages, the combination of a body provided with an exteriorly-threaded tube for securing it to the boiler, said tube projecting within the boiler and provided with longitudinal slots, a stop in the outer end of said tube, an automatic valve fitted to slide in said tube and provided with rearwardly-projecting arms for engaging said stop, a seat for said valve, a main valve and seat in said body, and a spindle on said main valve for engaging the automatic valve, substantially as described.

2. In a valve for water-gages, the combination of a body provided with an exteriorly-screw-threaded pipe projecting into the boiler, a main valve and seat in said body, a spindle on said valve projecting into said tube, longitudinal slots in said tube within the boiler, an automatic valve fitted to slide in said tube and provided with pins projecting through said slots, a seat for said valve, horizontal arms on the automatic valve, and a stop in the inner end of the tube for engaging said arms and preventing the valve from being forced too far from its seat, substantially as described.

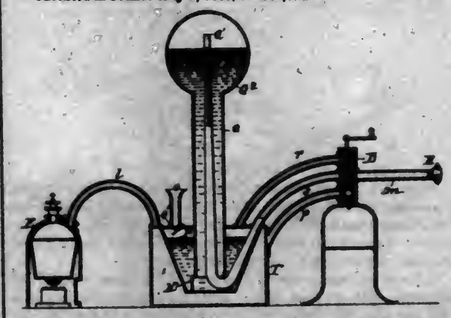
399,785.



3. In a valve for water-gages, the combination of a conical automatic valve fitted to slide in the main valve-tube, a seat for said valve, longitudinal slots in said tube, pins on said valve projecting through said slots, and rearwardly-projecting arms on said valve for engaging a stop in said tube, substantially as and for the purpose specified.

4. In a valve for water-gages, the combination of the body B, provided with the threaded tube *b*, having the slotted extension *m*, the main valve D, having the stem *d* and spindle *s* projecting into said tube, the conical valve H, fitted to slide in said tube and provided with pins *x*, projecting through the slots therein, the stops *i*, the arms *v* on said conical valve, engaging said stop, and the seat *t*, all being arranged to operate substantially as described.

399,736. INHALER AND RESPIRATOR. CHARLES BRAILLARD, Paris, France. Filed Aug. 20, 1887. Serial No. 248,200. (No model.) Patented in France May 2, 1885, No. 168,654.



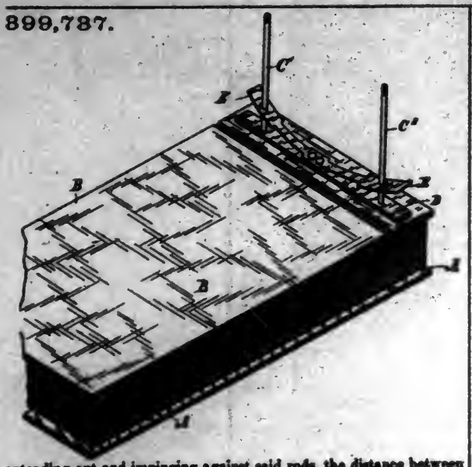
Claim.—The combination of the vessel P, arranged in the chamber T and provided with an inlet, *o*, having a valve, *o'*, globular pipe Q, and vacuum-source E by means of the pipe *l*, and a mouth-piece, R, by means of the pipes *r*, *s*, *p*, and *m*, and valve B, substantially as and for the purpose specified.

399,737. TEMPORARY BINDER. JOHN F. BROWN, Indianapolis, Ind., assignor to Albert R. Baker, same place. Filed Feb. 15, 1888. Serial No. 264,060. (No model.)

Claim.—1. In a temporary binder, the combination of a base, rods extending upwardly from said base, a clamp-bar provided with holes and mounted to slide on said rods, and a spring-clamp secured to said clamp-bar and also provided with holes which do not quite register with the holes in the bar, whereby, when the clamp-bar is slid to any position on said rods, said spring-clamp serves as a friction-brake and automatically secures it from any upward movement, substantially as set forth.

2. In a temporary binder, the combination of a base, rods extending upwardly from said base, a clamp-bar mounted to slide on said rods, and a spring-clamp secured to said clamp-bar at its center and

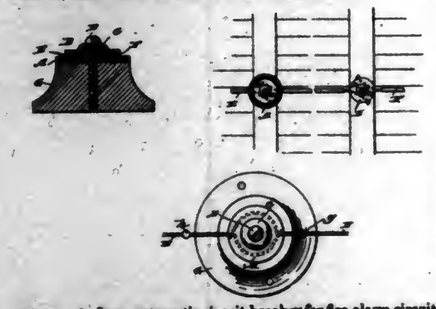
899,737.



extending out and impinging against said rods, the distance between the points which impinge against said rods being slightly greater than the space between the perforations in clamp-bar, substantially as described, and for the purposes specified.

3. The combination, in a temporary binder, of the upper and lower file-boards, a lower clamp-bar having upwardly-projecting rods, an upper clamp-bar having holes and adapted to be placed over said rods, and a spring-clamp, E, secured to the upper clamp-bar and also having holes, which, however, are slightly farther from the center than the holes in the clamp-bar, substantially as shown and described.

899,738. COUPLING AND AUTOMATIC CIRCUIT-BREAKER FOR FIRE-ALARM CIRCUITS. JOHN J. CARNAR, Rochester, N. Y. Filed Jan. 26, 1888. Serial No. 297,676. (No model.)



Claim.—1. In an automatic circuit-breaker for fire-alarm circuits, the combination, with the base, of the plate for clamping the terminals of the line-wire, the fusible button resting on the plate, and the fastening device engaging the button to clamp the plate and base together to hold the said terminals, substantially as described.

2. In an automatic circuit-breaker for fire-alarm circuits, the combination, with the base, of the washer for clamping the terminals of the line-wire, the fusible button resting on the washer, and the screw passing through the button and washer and engaging the base and button for clamping the washer and base together to hold said terminals, substantially as and for the purpose set forth.

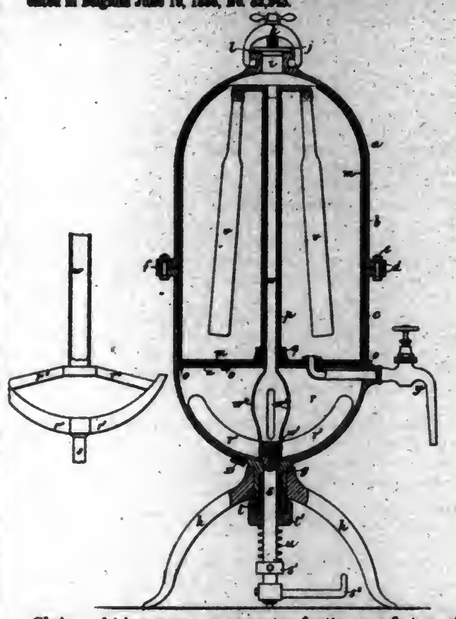
3. In an automatic circuit-breaker for fire-alarm circuits, the combination, with the base, of the washer having the relatively large apertures therein, the fusible button resting on the washer, and the screw passing through the button and washer and engaging the base for clamping the parts together and having the head of less diameter than the aperture in the washer, whereby the washer will drop off when the button is melted, substantially as described.

4. In a coupling and automatic circuit-breaker, the combination, with the base, of the washer resting thereon having the grooves in its under surface for the terminals of the line-wire, the fusible button resting on the washer, and the screw engaging the button and base for clamping the parts together, substantially as described.

5. In a coupling and automatic circuit-breaker, the combination, with the base, of the insulating-washer resting thereon and the metallic washer, between which the terminals of the line-wire are clamped, the superimposed fusible button, and the screw engaging the button and base to clamp the parts together, substantially as described.

6. In a coupling and automatic circuit-breaker, the combination, with the base, of the insulating-washer resting thereon, and the metallic washer having the relatively large central aperture, the superimposed fusible button, and the screw passing through the button and washer and engaging the base for clamping the parts together, and having the head of relatively smaller diameter than the aperture in the metallic washer, whereby said washer will drop off when the button is melted, substantially as and for the purpose specified.

899,739. GASOGENE OR APPARATUS FOR MAKING AERATED BEVERAGES. LUTHER S. CHESBRO and SWARES M. CHESBRO, London, England. Filed Oct. 17, 1888. Serial No. 288,242. (No model.) Patented in Belgium June 19, 1888, No. 82,943.



Claim.—1. A gasogene or apparatus for the manufacture of aerated beverages, comprising a vessel divided into two compartments, the upper one of which is provided with a loosely-fitting glass chamber for containing the liquid to be aerated, while the lower serves for the generation of gas, each of the said chambers containing an agitator, the spindle carrying the upper agitator being made tubular for the introduction of the gas-producing materials into the lower chamber, substantially as described.

2. A gasogene having, in combination, a vessel, *a*, mounted on a stand and provided in its upper part with an interior upper glass chamber, *m*, for the liquid, and open at its top, and with a clear space between said vessel and chamber, said glass chamber having a central tube, *p*, extending nearly to its top, said vessel *a* having a gas-chamber, *r*, located beneath the chamber *m*, and a vertical tube, *w*, extending nearly through the tube *p* and surmounted by agitators, as set forth.

3. In combination, the stand A, vessel *a*, open-top glass chamber *m* for liquid and serving to equalize the gas-pressure, vertical tubes *p w*, vertical spindle *s* and its stuffing-box, gas-chamber *r* beneath chamber *m*, handle s^2 on the spindle *s* and beneath the stand, and agitators within each chamber, all substantially as and for the purposes set forth.

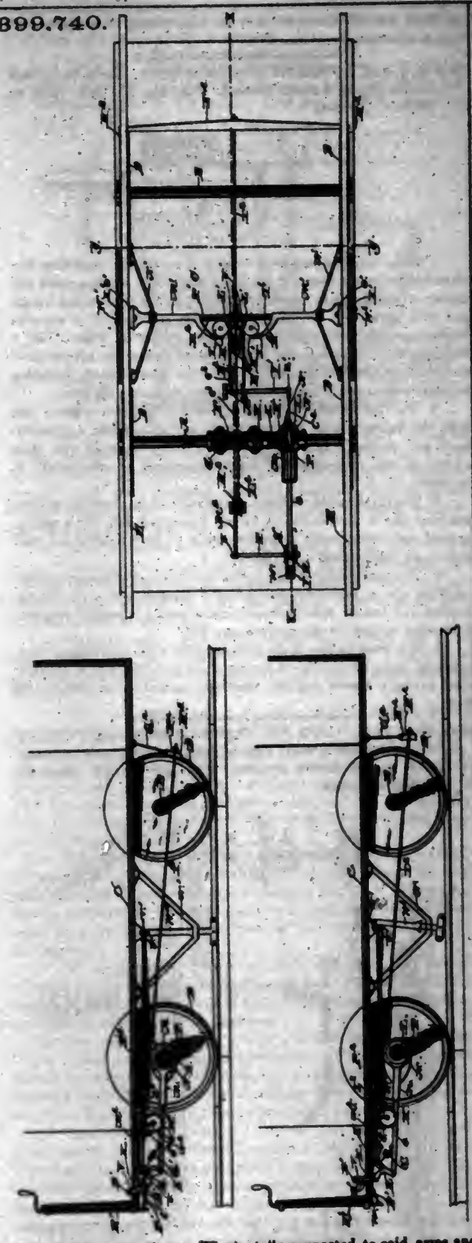
899,740. BRAKE FOR STREET-RAILWAY CARS. WALTER B. CLARK, Covington, Ky. Filed July 18, 1888. Serial No. 280,254. (No model.)

Claim.—1. In a car-brake, the combination of the cam-levers, means, substantially as set forth, to operate the same, and the rods M', attached to the cam-levers, and having the shoes or blocks adapted to engage the inner upper sides of the track-rails, substantially as described.

2. In a car-brake, the combination of the cam-levers, the brake-levers M', connected thereto and extending outward therefrom, and adapted to engage the inner sides of the track-rails, the suspended brake-levers W', adapted to engage the outer sides of the track-rails, and the rods D^2, connecting said brake-levers to the cam-levers, substantially as described.

3. In a car-brake, the combination of the rock-shafts T', having

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the arms, the brake-levers W', pivotally connected to said arms and suspended therefrom, means, substantially as set forth, to apply said brake-levers to the track-rails and release them therefrom, and means, substantially as described, to turn the rock-shafts and thereby raise or lower the brake-levers.

4. In a car-brake, the combination of the cam-levers, the brake-levers M', pivotally connected thereto and adapted to engage the inner sides of the track-rails, the arms R', extending from said brake-levers, and the springs bearing on said arms, substantially as described.

5. In a car-brake, the combination, with the cam-levers, of the spring-depressed brake-levers M', connected thereto and adapted to engage the track-rails, substantially as described.

6. The combination of the car, the hinged yokes N', suspended from the same, the brake-levers M', guided and supported by said yokes and adapted to engage the track-rails, and means, substantially as specified, to operate the said brake-levers.

7. In a car-brake, the combination of axle, the drum loose thereon, the cam-lever, connections between the same and the drum, the brake-levers, connected to and operated by the cam-lever, and the clutch devices to secure the drum to the axle, substantially as described.

8. The combination, in a car-brake, of the rock-shafts T', the brake-levers W', connected thereto, adapted to be raised and lowered thereby, and having the shoes X' to engage the track-rails, the cam-levers, the rods connecting the same to the brake-levers W' to operate the latter, the crank-shaft Y', and connections, substantially as set forth, between the same and the rock-shafts, substantially as described.

9. The combination, in a car-brake, of the brake-levers, the cam-lever connected thereto and adapted to operate the same, the ratchet-wheel K^2, the chain connecting said ratchet-wheel to the cam-lever to operate the latter, the rocking levers R, having the arms U, the dog M^2, connected to said arms and engaging the ratchet-wheel, the link connecting the free end of the dog to the axis of the ratchet-wheel, the spring-pressed pawl pivoted to the dog and adapted to engage the wheels, and means, substantially as set forth, to operate the rocking lever, substantially as described.

899,741. CUP FOR FOOD-WARMERS. SAMUEL CLARKE, Childs Hill, County of Middlesex, England. Filed May 21, 1888. Serial No. 274,350. (No model.)



Claim.—A cup for food-warmers, having its lower portion circular in cross-section and of less diameter than the upper portion, and having also a projecting lip at the top and a cover extending over the top of the cup toward the front edge of the lip to reduce or regulate the size of the delivery-opening at the lip, and also extending in an opposite direction over a portion of the main body of the cup, said cup being formed with a tube or passage on its front side passing downwardly from the lip under the cover to near the bottom of the cup, substantially as described.

899,742. BEE-HIVE. FRANCIS M. CLEMENT, Marion, Ky. Filed Nov. 14, 1888. Serial No. 290,806. (No model.)

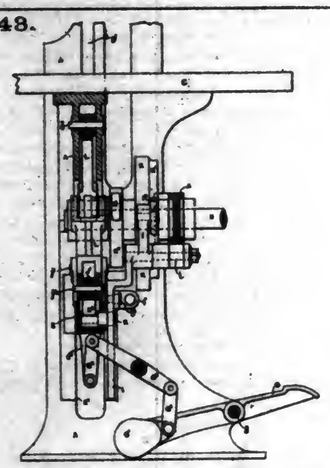


Claim.—An earthenware bee-hive comprising a conical brood-chamber closed at its bottom and open at its top, a vertical standard within said chamber, an apertured plate on top of said chamber, a conical surplus-honey chamber open at its bottom and having an aperture in its top, resting on said plate, and a honey-comb support inside the surplus-honey chamber, removably secured in the aperture in the top, the brood-chamber being surrounded by an embankment of earth having a perforated face-plate and provided with an entrance-tube leading through the embankment and said face-plate, substantially as described.

899,748. CLAMPING APPARATUS FOR PAPER-CUTTING MACHINES. GEORGE DARLING, Reddish, County of Lancaster, England. Filed Sept. 2, 1887. Serial No. 248,612. (Model.) Patented in England Dec. 9, 1884, No. 15,160.

Claim.—1. In combination, the supporting-frame, the press D, the wedge-frame E, and connecting-rods between them, the main shaft H, a series of cams on said shaft, a sliding wedge on the frame E, operating-connections between one of said cams on the main shaft and the sliding wedge for giving one part of the movement to the clamping apparatus, and an independent set of operating-connections between another of said cams on the main shaft and the sliding wedge

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for giving the final movement to the clamping parts, substantially as described.

2. In combination with the sliding press D, wedge-frame E, with connecting-bars between them, a stationary frame, A, the main shaft H in said frame, the sliding wedge on the wedge-frame, movable shoes J, engaging with said sliding wedge, operating-connections from the sliding wedge to the main shaft, and independent operating-connections between the movable shoes and the main shaft, whereby the wedge-frame and press D in operation move at varying rates of speed.

3. In combination, the supporting-frame, the press D, the wedge-frame E, and connecting-rods between them, the main shaft H, a series of cams on said shaft, a sliding wedge on the frame E, operating-connections between one of said cams on the main shaft and the sliding wedge for giving one part of the movement to the clamping apparatus, and an independent set of operating-connections between another of said cams on the main shaft and the sliding wedge for giving the final movement to the clamping parts, and a pawl engaging with the sliding wedge, and connections between said pawl and a third cam on the shaft H, whereby the parts are automatically locked in position, substantially as described.

4. In a clamping device, the combination of the frame E, the wedge E^2, adjustable thereon, the links J' J', the shoes J J, pivoted thereto, the jointed levers L L, the connecting-link L', having bowl L^2, and the cam K^5, substantially as described.

5. In combination with the sliding wedges E^2, the pin *e*, the rocking levers I I^2, and the spring-connection I' i^2, interposed between said levers, substantially as described.

6. In combination with the press D and wedge-frame E, with connections between them, the frame A, the main shaft, a sliding wedge moving in and supported directly by said wedge-frame, and operating-connections between the wedge and main shaft, substantially as described.

7. In combination with the press D and wedge-frame E, with connections between them, the frame A, the main shaft, a sliding wedge moving in and supported directly by said wedge-frame, said wedge-frame having a slot, *d'*, a pin, *e*, on the wedge projecting through said slot, an operating-lever, I, pivoted on the frame and provided with a slot, *i'*, through which the pin *e* projects, and suitable connections between the lever I and shaft H, substantially as described.

8. In combination, the wedge E^2, having the serrations e^2, the pawl M, slotted link M', oscillating lever M^2, bowl M^3, and cam-plate K^5, substantially as described.

9. In combination, the press D, the wedge-frame E, with connections between them, the supporting-frame A, the sliding wedge E^2 on said wedge-frame, the main shaft H, cams K K' on said shaft, the rocking lever I^2, pivoted to said supporting-frame, the rocking lever I, also pivoted to the main frame, the rod connecting the same, bowls on one end of said rocking levers engaging with the cams, respectively, and a spring, i^2, for keeping said bowls normally in engagement with the cams.

10. In combination, the supporting-frame, the press D, the slotted wedge-frame E, connecting-rods between them, a wedge, E^2, sliding on said frame and provided with a pin projecting through the slot thereof, a lever, I, pivoted on the frame and provided with a slot through which the pin *e* projects, an operating-shaft, H, a series of cams on said shaft, connections between said lever I and the cams on the shaft for moving the sliding wedge, movable shoes J in engagement with said sliding wedge, and connections between the cams on the shaft and the movable shoes for compressing them against the wedge, substantially as described.

399,744. OVEREDGE SEWING-MACHINE. DAVID R. DAWSON, Dundee, County of Forfar, Scotland. Filed Aug. 21, 1888. Serial No. 283,247. (No model.)



Claim.—1. The improved combination of parts, consisting of a thread-barrel made with a stepped end and with a spring-pressed end button, a pressing-plate shaped centrally to fit the front of the button and with a step-like depression round the middle part, a movable bracket carrying the pressing-plate and guided on a fixed bar, a weighted cord actuating the pressing-plate, and a ratchet-and-pawl device connected to the pressing-plate, the several parts operating together, substantially as and for the purposes herein set forth.

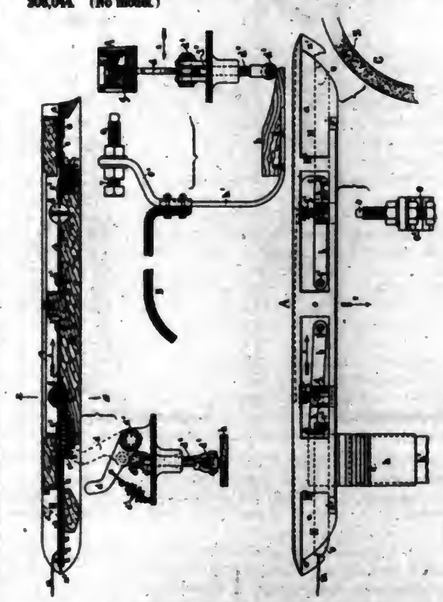
2. The combination of the thread-barrel, having a stepped end, with the helical needle of an overedge sewing-machine, a pressing-plate, and devices, substantially as described, to press the said plate up toward the stepped end of the thread-barrel, all substantially as set forth.

3. The combination of the helical needle of an overedge sewing-machine and a thread-barrel having a stepped end, and a spring-pressed end button, with a pressing-plate to bear against the said button, all substantially as set forth.

4. The combination of the helical needle of an overedge sewing-machine and a thread-barrel having a stepped end, and a spring-pressed end button, with a pressing-plate having a central step-like depression, as and for the purpose specified.

5. The combination of the helical needle of an overedge sewing-machine and a thread-barrel having a stepped end, with a pressing-plate having a central step-like depression, as and for the purpose set forth.

399,745. LOOM FOR WEAVING UNSPUN PLANT-STALKS. PAUL DE HEMPTINNE, Ghent, Belgium, assignor to the Flachsbau Gesellschaft, Cologne, Prussia, Germany. Filed July 14, 1888. Serial No. 208,044. (No model.)



Claim.—1. In combination with the shuttle-body, the fixed plate *a'*, and movable jaw-plate *c*, formed with projections *c'* and c^2, spring *f*, catch *b*, and the spring *g'*, substantially as described.

2. In combination with a shuttle-body, the fixed plate *a'*, movable jaw-plate *c*, catch *b*, pin *g*, and spring *g'*, and fixed bolt *e*, rod *d'*, breast-beam B, spring *f*, and the lathe, substantially as set forth.

3. In combination with a shuttle-body and movable jaw-plate, *c*, having projection *c'*, the elbow-lever *d*, situated in the shuttle-race, rod d^3, roller d^3, and inclined surface A, bar *h'*, breast-beam B, spring *f*, and the lathe, substantially as set forth.

399,746. MECHANICAL MOVEMENT. DARIUS W. DODSON, Wilkes-Barré, Pa., and FRANCIS H. RICHARDS, Springfield, Mass.; said Richards assignor to said Dodson. Filed Nov. 16, 1888. Serial No. 310,327. (No model.)



Claim.—1. The combination, with a revoluble shaft having an orbital movement, and having thereon a starting-arm and a segmental gear, of a latch interposable in the path of said arm for starting said shaft, and a repeating mechanism actuating a tooth or arc of gear interposable in the circuit of said gear, all substantially as and for the purpose described.

2. The combination of the revoluble shaft having thereon the gear 10, the stationary gear having teeth 11, tooth or teeth 20, constructed to have a reciprocating movement, a cam driven slower than shaft 5, and connections actuating said tooth or teeth from the cam, all substantially as described.

3. The combination, with shaft 5, having the segmental gear 10, of sleeve 23, carrying one or more teeth, 20, and cam 27, driven from said shaft and operatively connected with said sleeve, substantially as described.

4. The combination, with a revoluble shaft having an orbital movement and having thereon the stop-arm; of a segmental rim intercepting the movement of said arm, all substantially as described.

5. The combination, with a revoluble shaft having an orbital movement and having thereon a starting-arm and a stop-arm, of a latch interposable in the path of said starting-arm for starting said shaft, and a segmental rim intercepting the movement of said stop-arm, all substantially as described.

6. The combination, with a revoluble shaft having an orbital movement and having thereon a starting-arm and a stop-arm, of a latch operating on said starting-arm to start said shaft, a segmental rim for intercepting said stop-arm to stop said shaft, and a detent operating to restrain the axial rotation of said shaft, all substantially as described.

7. The combination, with a revoluble shaft having an orbital movement and having thereon a segmental gear, of a repeating mechanism actuating a tooth or arc of gear interposable in the circuit of said gear, all substantially as described.

8. The combination, with a revoluble shaft having an orbital movement and having thereon a starting-arm, of means (as a shaft-starter) for starting said shaft revolving, and gearing, substantially as described, for continuing the said movement through two revolutions each time the shaft is started, all substantially as described.

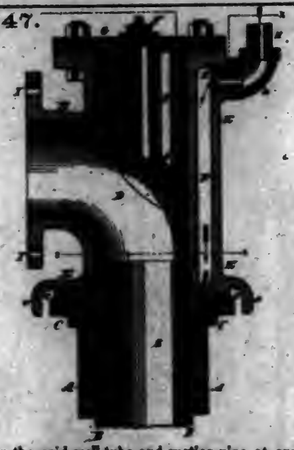
9. The combination, with a revoluble shaft having an orbital movement, of a stationary gear concentric to said shaft's orbit, a segmental gear fixed and arranged on said shaft to run in mesh with said stationary gear, and having a tooth normally out of the plane of the stationary gear, and a cam moving simultaneously with said shaft and actuating said tooth to throw the same into mesh with said stationary gear, whereby said shaft is revolved twice each time it is started, substantially as described.

10. The combination, with a revoluble shaft having an orbital movement and having thereon a starting-arm, of a latch interposable in the path of said arm for starting said shaft, a stationary gear concentric to said shaft's orbit, a segmental gear fixed and arranged on said shaft to run in mesh with said stationary gear, and having a tooth normally out of the plane of the stationary gear, and a cam moving simultaneously with said shaft and actuating said tooth to throw the same into mesh with said stationary gear, whereby said shaft is revolved twice each time it is started, substantially as described.

399,747. DRIVEN-WELL HEAD. JOSEPH EDWARDS, Brooklyn, N. Y. Filed Dec. 31, 1888. Serial No. 294,960. (No model.)

Claim.—In pipe-wells, the combination of the well-tube A A, suction-pipe B B, and well-head E E E E, having the elbow D and the air-passage F, and the pipe H, whereby outer air is admitted to flow

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in between the said well-tube and suction-pipe at any necessary elevation above the top of the said well-tube to keep out therefrom all surface-water and other impurities, substantially in the manner and for the purpose set forth.

399,748. INCANDESCENT-ELECTRIC-LAMP SOCKET. CHARLES H. EBAN, Columbus, Ohio, assignor of one-tenth to E. W. Halley, Tipton, Ind. Filed July 11, 1888. Serial No. 279,612. (No model.)



Claim.—1. In an incandescent electric lamp, the combination of a socket adapted to fit over the stem of the lamp, spring-jaws provided with gripping-faces within the socket in permanent electrical connection with the opposite sides of the supply-circuit, and metallic projections on its stem in electrical connection with the filament adapted to be engaged by the jaws and hold the lamp firmly in the socket, whereby the lamp may be lighted or extinguished by rotating the globe.

2. In an incandescent electric lamp, the combination of a socket adapted to fit over the stem of the lamp, two or more pairs of diametrically-opposite spring-jaws within the socket, metallic projections on the stem in electrical connection with the filament adapted to be engaged by either pair of jaws, and conductors leading from one pair of jaws to the outside of the socket, whereby when the lamp is in a supply-circuit it may be lighted or extinguished by partially rotating the bulb.

3. In an incandescent electric lamp, the combination, with the socket, of two or more pairs of spring-jaws within the same, projections on the lamp-stem electrically connected with the filament adapted to be engaged by either pair of jaws, contacts in operative relation to one pair of jaws and engaged by the same when the filament is out of circuit, and a resistance equal to the lamp-filament between the contacts, whereby the lamp may be extinguished by partially rotating its bulb and the resistance thrown into circuit.

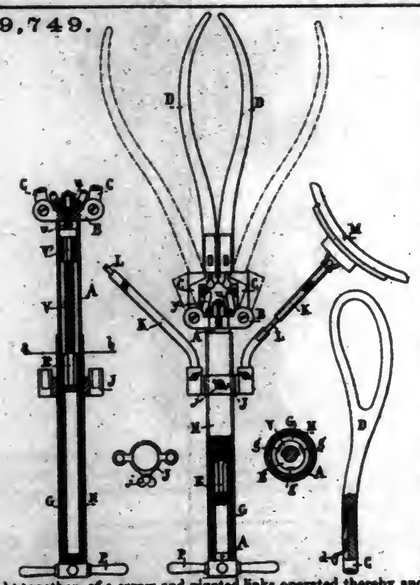
4. In an incandescent electric lamp, the combination of a socket adapted to fit over the stem of the lamp, spring-jaws within the socket, and metallic projections on the stem electrically connected with the filament, said jaws being provided with gripping-faces adapted to engage the projections when the lamp-globe is turned in either direction, whereby the lamp may be secured firmly in its socket, lighted or extinguished, and the current through the filament reversed by simply turning the globe, as and for the purpose set forth.

399,749. OPHTHALMIC FORCEPS. ARMANDO C. GALIANO, Madrid, Spain. Filed Oct. 10, 1888. Serial No. 287,770. (No model.) Patented in Spain Mar. 12, 1888, No. 4,090, and in England Sept. 21, 1888, No. 12,969.

Claim.—1. In mechanical forceps, the combination, with the arms or branches mounted on supports which can be extended and brought together, of a screw connected to said supports for moving the same and the head or nut on said screw and the movable tube or key engaging the same, substantially as described and illustrated.

2. In mechanical forceps, the combination, with the removable arms or branches mounted on supports which can be extended and

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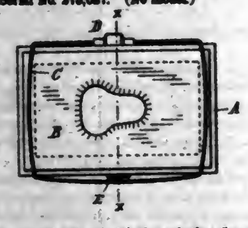
brought together, of a screw and pivoted links operated thereby and connected to the movable supports for moving the same and the head or nut on said screw and the movable tube or key engaging the same, substantially as described.

3. In mechanical forceps, the combination, with the inner longitudinally-movable tube provided with the internal spurs or teeth and the intermediate head having teeth for engagement therewith, of the screw V and nut E, substantially as and for the purpose herein described.

4. In mechanical forceps, the combination, with the supporting-tube, of the adjustable brackets thereon, bearing the extensible arms and pads which bear against the inguinal regions of the mother and serve as supports during the extraction of the child, substantially as described.

5. In an extracting mechanism, the combination, with the tube G, provided with spurs or teeth, of the nut E, engaging said spurs or teeth, the handles P, secured to tube G, and screw V, engaging said nut and carrying the arms or branches, whereby when the handle is turned the screw and the arms or branches are withdrawn, substantially as described.

899,750. VIGNETTE-HOLDER. ADELBERT L. GEER, Midland, Mich., assignor of one-half to Edwin C. Berryman, same place. Filed May 7, 1888. Serial No. 273,027. (No model.)



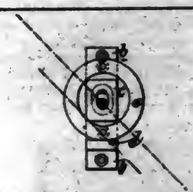
Claim.—1. The combination, with the printing-frame and a catch upon one side thereof, of a holder for vignettes, attached at its ends only to the opposite side of said frame, leaving all four sides of said holder free and providing greater elasticity from the hinge to the adjacent corners, substantially as and for the purpose specified.

2. In a vignette-holder, the combination, with the printing-frame, of the hinge-box D, adapted to be fastened to the sides of the frame, and provided with the recess *c*, of the four-sided spring-wire frame C, made of one piece of wire, with the upturned ends *a* and the catch E secured to the opposite side of the printing-frame, the parts being arranged to operate substantially as described.

899,751. FRICTION-HINGE. EDWIN HAINES, Paddock Wood, County of Kent, England. Filed Nov. 5, 1888. Serial No. 290,012. (No model.)

Claim.—1. The stationary fitting *b*, with lugs *c* and *d*, in combination with the ring *a*, which is applied to a rotatable part working

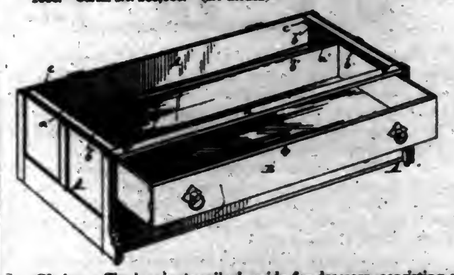
899,751.



in connection therewith and works between the lugs *c* and *d*, substantially as and for the purpose set forth.

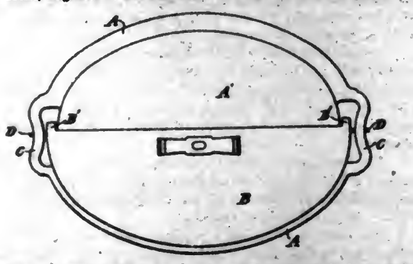
2. The fitting *b*, adapted to be fixed to a swing looking-glass stand and provided with lugs *d* and *c*, the latter having an oval hole for a pivot, *e*, that is secured to the looking-glass, in combination with a ring, *a*, that is adapted to be secured to the looking-glass and works between the lugs *c* and *d*, substantially as and for the purpose set forth.

899,752. DRAWER-GUIDE. WILLIAM HORNOCK, Herkimer, N. Y., assignor of one-half to Frank F. Lathrop, same place. Filed Sept. 10, 1888. Serial No. 285,060. (No model.)



Claim.—The herein-described guide for drawers, consisting of the two cords *b b'*, having their ends rigidly secured to the body A at front and rear and passed around the pulleys *a* and *a'* at opposite ends of the drawer B in reverse directions, substantially as shown and described.

899,753. COVERED DISH. GEORGE JONES, FRANCIS R. JONES, GEORGE H. JONES, HORACE O. JONES, and CHARLES S. JONES, Stoke-upon-Trent, England. Filed Oct. 22, 1888. Serial No. 288,949. (No model.)



Claim.—The combination, substantially as hereinbefore set forth, of the dish having a portion of its cover formed integrally with its lower portion, the movable section of the cover, the downwardly projecting lugs thereof slotted, as described, the slotted handles of the dish, into which the lugs project, and the pivots for the downwardly-projecting lugs between the dish and the handles.

899,754. TESTING-MACHINE. WILLIAM J. KEEP, Detroit, Mich. Filed July 30, 1883. Serial No. 280,461. (No model.)

Claim.—1. In a testing-machine, the combination of a post to act on the article to be tested, a beam arranged over the post and bearing thereon, a weight running on the beam, and means, as the drum F and cords E E', for moving said weight along the beam, substantially as described.

2. In a testing-machine, the combination of a post to rest on the article being tested, a beam arranged over the post and bearing thereon, a diagram-paper holder, a pencil-holder, and means, as the drums F F and cords E E' I I', for giving simultaneous motion to the weight and diagram-paper holder, substantially as described.

3. In a testing-machine the combination of a traveling device, as the weight D, a cord attached to and moving the same, an endwise-moving drum which winds the cord, a shaft carrying said drum, provided with a screw-thread, and a fixed bearing for said shaft having a female thread corresponding to the thread on the shaft, and arranged to move said shaft and drum endwise as it revolves the drum and winds the cord thereon, substantially as described.

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4. In a testing-machine, the combination, with the beam resting on a fulcrum and constructed to bear on the article being tested, of a weight moved on the beam by a cord, and a drum having an endwise motion for coiling said cord, located below the beam and in the rear of the fulcrum, substantially as described.

5. In a testing-machine, the combination, with a beam and a diagram-paper holder moving parallel with the same, of a fulcrum-support provided with an aperture to receive said paper-holder and the test-bar, substantially as described.

6. In a testing-machine, and in combination with the beam thereof, a support for the test-bar, and a diagram-holder constructed to slide parallel with the beam, a pencil-holder, and means, as the beams C, moving in unison with the test-bar to communicate motion to said pencil-holder, substantially as described.

7. In a testing-machine, and in combination with the beam thereof and a support for the test-bar, a pencil-holder attached to and carried by the beam and a diagram-paper holder constructed to slide parallel with the beam, substantially as described.

8. In a testing-machine, and in combination with the beam thereof and a pencil-holder attached thereto, a paper-holder, as M, ways for guiding the same, and means, as the revolving drum F and cords E E', for giving it motion, substantially as described.

9. In a testing-machine, and in combination with the beam and weight thereof, a retarding device, as the dog V, pivoted to the beam, and slotted arc U U', for stopping the motion of the beam, substantially as described.

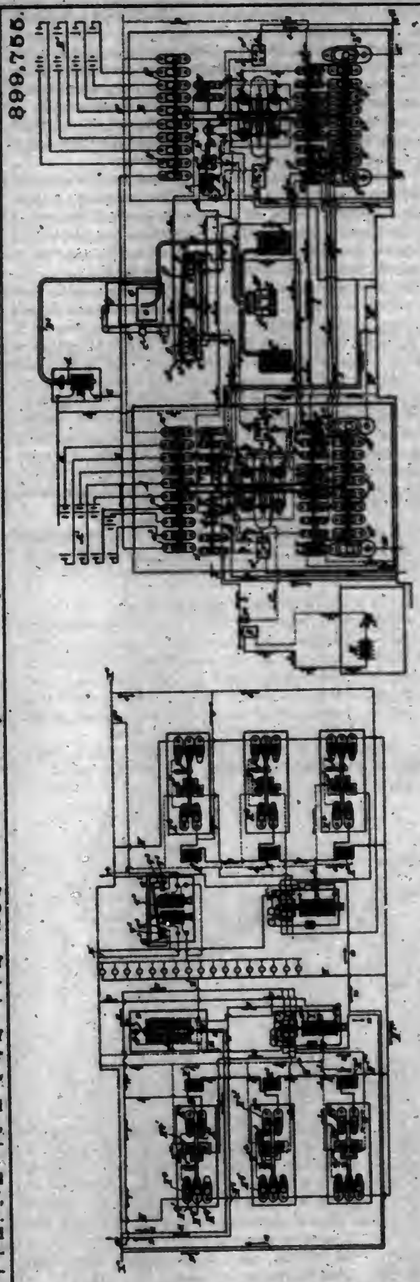
10. In a testing-machine, and in combination with the beam and weight thereof, a dog, V, pivoted to the beam, and a slotted arc, U U', having chutes and steps, substantially as and for the purpose specified.

11. In a testing-machine, and in combination with the beam and weight thereof, a dog, V, pivoted to the beam, and a slotted arc consisting of the stationary section U and the pivoted section U', substantially as and for the purpose specified.

899,755. ELECTRICAL DISTRIBUTION BY SECONDARY BATTERIES. FRANK KIRK, Fulham, County of Middlesex, England. Filed Oct. 22, 1888. Serial No. 288,775. (No model.) Patented in England Dec. 7, 1887, No. 16,863.

Claim.—1. In apparatus for automatic electrical distribution and change of secondary batteries, the combination of a set or pair of switching apparatus for transferring the connection of a battery or set of batteries from series to parallel, and vice versa, and a resistance in a branch circuit having contacts controlled by said switching apparatus, whereby the continuity of the charging-circuit is maintained through said resistance while the batteries are being transferred, substantially as described.

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2. The combination of switching apparatus A and B, batteries A' and B', gas-pipe-sealing apparatus E, gasometer C, and switch F, with their connecting-circuits, substantially as and for the purpose hereinbefore described.

3. The combination, with the switching apparatus A and B, batteries A' B', gas-collecting chambers, pipe-sealing apparatus E, and gasometer C, of the switch F and valve apparatus K^3 and their connecting-circuits, substantially as and for the purpose hereinbefore described.

4. In a system of electrical distribution, the combination, with the secondary batteries and distributing-main supplied thereby, of the electro-magnetic regulating apparatus Z, contacts actuated thereby, and counter-electro-motive-force cells and controlling apparatus for

effecting the regulation of the electro-motive force in the said distributing-main, substantially as described.

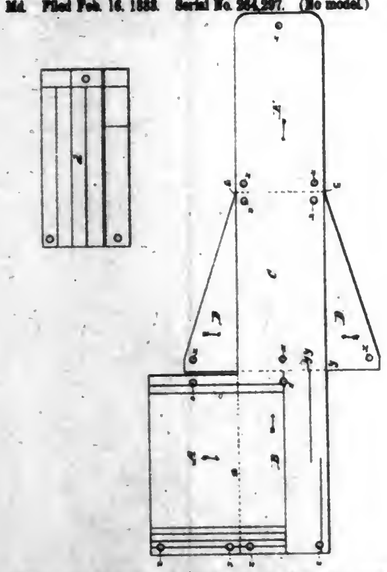
5. The combination, with the switching apparatus A B for transposing the connections of a battery from parallel to series, and vice versa, of connections and circuits controlled directly by the movement of the said switches, an electro-magnetic device connected with the distributing-main, and circuits and contacts controlled by said device for regulating the electro-motive force in the discharging-circuit of said batteries, substantially as hereinbefore described.

6. In a system of electrical distribution, means for insuring equality of discharge-current from two sources of electricity by the insertion in the respective circuits of a sufficient counter-electro-motive force, the said means consisting of the current-balance apparatus Q, in combination with the switching apparatus R^5 and R^6, and cells attached thereto, substantially as hereinbefore described.

7. The combination, with one or more pairs of batteries and one or more pairs of switches for transposing the connections of the said batteries from series to parallel, and vice versa, of a gasometer, C, gas-seal E, switch F, electro-magnetic valvular device K^3, regulating apparatus Z, counter-electro-motive-force cells R' R^2 R^3 R^4 R^5 R^6, and current-balance Q, with their connecting-circuits, substantially as and for the purpose hereinbefore described.

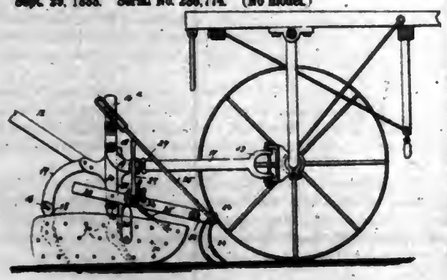
8. In a system of electrical distribution, the combination, with a set or sets of batteries provided with apparatus for automatically charging and discharging the said batteries, of cells used as counter-electro-motive force for the regulation of the electro-motive force in the discharge-circuit of the said batteries, substantially as hereinbefore described.

399,756. COMBINATION-TAG. WILLIAM H. LARSON, Baltimore, Md. Filed Feb. 16, 1888. Serial No. 264,297. (No model.)

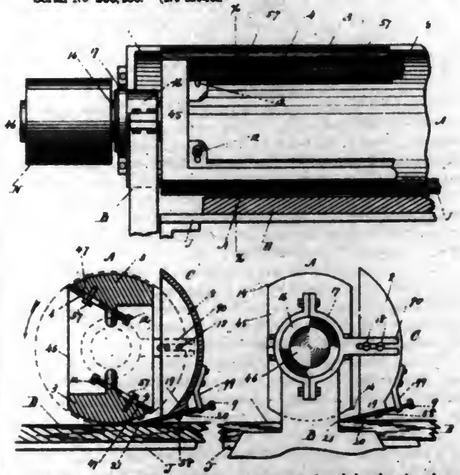


Claim.—As an improved article of manufacture, a combination shipping-tag comprising the parts A and B, the part A, adapted to fold over the part B, the body C, attached to the part B, the oblong end flap, E, at the end of the body C, opposite to the part B, and the side flaps, D, on the body C, having their acute-angled points nearest the end flap, E, and holes or perforations, substantially as described.

399,757. CULTIVATOR. ENOS LANDIS, Reserve, Kans. Filed Sept. 29, 1888. Serial No. 286,774. (No model.)



399,758. CUTTER-HEAD FOR PLANING-MACHINES. VICTOR V. LAWRENCE, Waterford, Vt., assignor of one-half to Isaac F. Paul, Boston, Mass., and Amos H. Carpenter, Waterford, Vt. Filed Mar. 26, 1888. Serial No. 268,433. (No model.)



Claim.—1. The improved rotary cutter-head having heads or end pieces, 45, provided with short integral journals or gudgeons 46, projecting from their outer sides, and the parallel portions 3, which connect said end pieces, the same being separated by a clear space extending their whole length, and having flat inclined knife-beds 47, which are tangential to the axis of the cutter-head, as shown and described.

2. The cutter-head A, having the knife-carrying bar 3, said bar being constructed higher at its rear than at its front side to form the burnisher 48, substantially as described.

3. The end pieces, 45, provided with the gudgeons 46 and connected by the bars 3, the knives 4, secured to the front inner sides of said bars by the screws 58, the brackets 5, attached to said end pieces, and the adjusting-screws 12, mounted in said brackets and connected with said knives by the annular flanges 95, and slots 13, all being constructed, combined, and arranged to operate substantially as described.

399,759. BOOK CARRIAGE AND PROTECTOR. LAWRENCE C. LEITE, Galveston, Tex. Filed July 25, 1888. Serial No. 280,979. (No model.)

Claim.—1. A roller platform-carriage for books, composed of a base-piece having a longitudinally-central raised table-piece adapted to support the leaves of the book, and a depressed-ledge portion outside thereof adapted to support the cover of the book, substantially as specified.

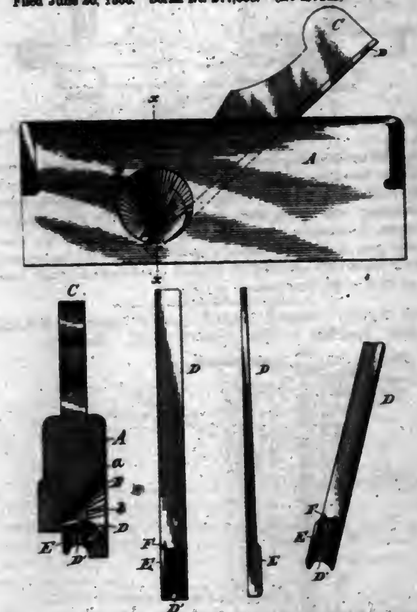
2. The within-described book carriage and protector, consisting

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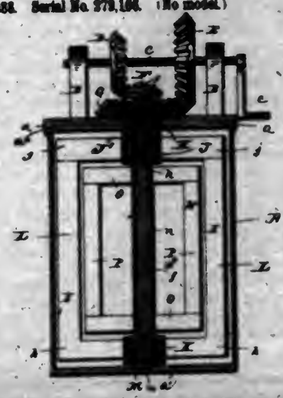
of the base-piece A, having a raised table-piece, *b*, constructed to form or leave a depressed ledge, *h*, the rollers *c c*, and the front pull-piece, *d*, as and for the purposes herein set forth.

399,760. HEAD-PLANE. JAMES F. LEWALLEN, Wilmore, Ky. Filed June 20, 1888. Serial No. 277,006. (No model.)



Claim.—In a molding-plane, the combination of the stock having the oblique cone-shaped throat through one cheek thereof, and the bit-key C, having its lower end concavely beveled to conform to the bevel in the throat to form therewith a continuous deflecting discharge-orifice, of a bit having its cutting-edge of substantially ogee form, one side thereof being provided with an upturned cutting-flange, and a groove or depression adjacent thereto, said groove gradually merging in the bit-shank, substantially as described, and for the purpose set forth.

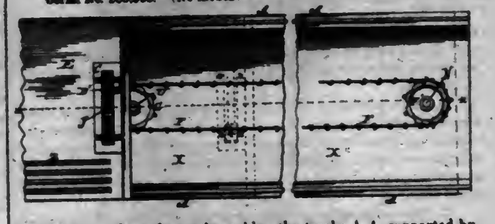
399,761. CHURN. WILLIAM D. MAKEMSON, Prescott, Kans. Filed July 6, 1888. Serial No. 278,166. (No model.)



Claim.—1. In a churn, the combination of the rectangular dasher-rod provided with a conical lower end, the inner dasher provided with a rectangular axial sleeve fitting on the dasher-rod, the loose circular sleeve H, mounted on an upper rounded portion of the dasher-rod, and the outer dasher provided at its upper end with a rectangular sleeve, J, embracing the lower squared extension of the sleeve H, and at its lower end with the sleeve K, having the inverted conical step mounted in a suitable socket in the churn-body and forming a bearing for the conical lower end of the dasher-rod, substantially as specified.

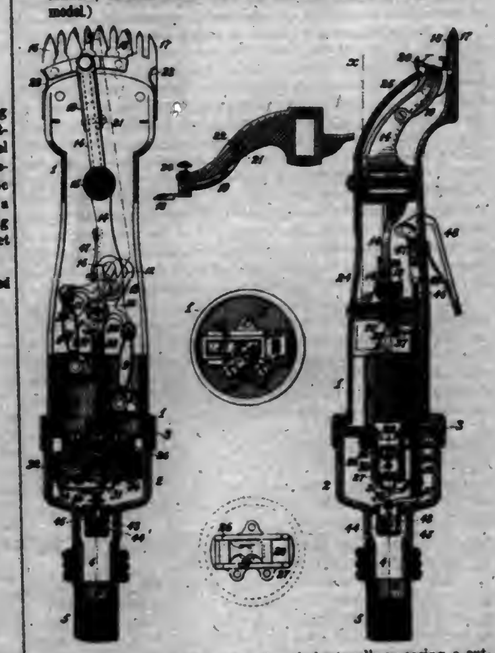
2. In a churn, the combination, with the churn-tub provided with a suitable cover having a central bearing, *c'*, of the vertical squared dasher-rod *f*, provided with a rounded portion, A, and a squared upper extremity, the removable gear-wheel F, fitting on the squared extremity of the dasher-rod, the gear-wheel G, above the churn-cover and provided with a circular sleeve, H, mounted in the bearing *c'*, and having a squared extension, J', on its lower end, the outer dasher provided with a rectangular sleeve, J, fitting on the squared extension J', the inner dasher provided with a square axial sleeve fitting on the dasher-rod below the sleeve J, and the horizontal shaft C, provided with the gear-wheels E and D, which mesh, respectively, with the gear-wheels G and F, substantially as specified.

399,762. RECIPROCATING TABLE FOR HOLDING MOLDINGS TO BE POLISHED. LOUIS MALMROW, Chicago, Ill. Filed Sept. 17, 1888. Serial No. 285,593. (No model.)



Claim.—In reciprocating tables, the tracks A-A, supported by suitable frame-work, and the table E thereon, in combination with the slotted guide portion C D', placed transversely on one end of the table, and the slide D in the guide, the reversing-link H K L I, with the pivot J, projecting into the slide, and the portion I, jointed to the chain F, the sprocket-wheels G F', with the endless chain thereon, and suitable gearing, N M O P', as and for the purpose specified.

399,763. SHEARING AND CLIPPING MACHINE. THOMAS A. MARTIN, Brainerd, Minn. Filed Oct. 1, 1888. Serial No. 286,634. (No model.)



Claim.—1. The combination of a tubular handle or casing, a cutter-lever pivoted thereto, a removable end plate connected to and closing one end of the handle, and a fluid-pressure motor secured to said end plate and having a piston or pistons coupled to the cutter-lever, substantially as set forth.

2. The combination of a tubular handle or casing which is open

at one of its ends, an end plate connected to and closing the opposite end of the handle, a cutter fitted to vibrate adjacent to the open end of the handle, and a fluid-pressure motor fixed to the end plate within the handle and having one or more pistons coupled to and actuating the cutter, and an exhaust-port for the discharge of motive-fluid into and through an open end of the handle, substantially as set forth.

3. The combination of a tubular handle or casing, a fluid-supply chamber connected thereto, an end plate interposed and fixed in position between the handle and supply-chamber, a cylinder fixed to said end plate within the handle and having its piston connected to a cutter-lever pivoted thereto, a valve-chest secured to the end plate within the supply-chamber, and a main or distribution valve working in said chest and governing the supply and exhaust of motive-fluid to and from the piston, substantially as set forth.

4. The combination of a handle or casing, a cylinder fixed thereto, a vibrating lever pivoted thereto and provided with a longitudinal slot, a piston fitting the cylinder and coupled to said vibrating lever, a cutter-lever pivoted to the handle and having a longitudinal slot in its arm adjacent to the vibrating lever, and a coupling-pin passing through the slot of the cutter-lever and secured adjustably in the slot of the vibrating lever, substantially as set forth.

5. The combination of a handle or casing, a fixed cutter or comb secured thereto, a cutter-lever pivoted thereto, a cutter-carrier pivoted to said lever by a pin passing through a slotted hole therein, and a vibrating cutter secured to the free end of said carrier, substantially as set forth.

6. The combination of a handle or casing, a fixed cutter or comb secured thereto, a cutter-lever pivoted thereto, a cutter-carrier pivoted to the cutter-lever, a vibrating cutter secured to the free end of said carrier, and an adjusting-screw engaging a female thread in the cutter-lever and adapted to bear on the cutter-carrier, substantially as set forth.

7. The combination of a handle or casing, a cutter-lever pivoted thereto, a fluid-pressure motor secured thereto and having a piston or pistons coupled to the cutter-lever, and cushion-springs connected to the handle in position to bear against the cutter-lever at the opposite terminals of its traverse, substantially as set forth.

8. The combination of a handle or casing, a cylinder fixed thereto, a vibrating lever pivoted thereto, a piston fitting the cylinder and coupled to said vibrating lever, a main valve governing the supply and exhaust of motive-fluid to and from the cylinder, a valve-piston coupled to and actuating said main valve, and a supplemental valve actuated by the vibrating lever and effecting the supply and exhaust of motive-fluid to and from the valve-piston, substantially as set forth.

9. The combination of a handle or casing, a fluid-supply chamber connected thereto, an end plate interposed and fixed in position between the handle and supply-chamber, and having an exhaust-port leading from the chamber to the handle, a cylinder fixed to the end plate within the handle, a vibrating lever pivoted to the handle, a piston fitting the cylinder and coupled to said vibrating lever, a main or distribution valve working in the supply-chamber and controlling a supply-port in the cylinder and the exhaust-port of the end plate, a valve-piston working in a closed chamber within the supply-chamber and coupled to the main valve, a supplemental valve controlling the supply of motive-fluid to the valve-piston and its exhaust therefrom through the exhaust-port of the end plate, and a valve-stem coupled to the supplemental valve, said stem passing freely through the end plate and being adapted to be rocked in its bearing by the movements of the vibrating lever, substantially as set forth.

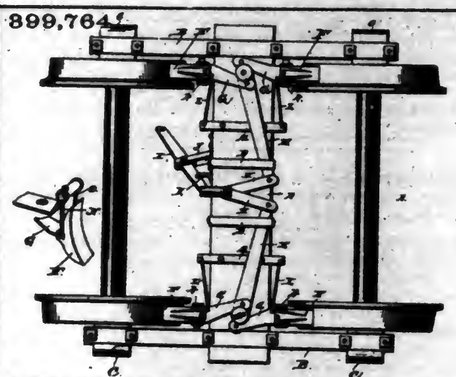
10. The combination of a handle or casing, a fixed cutter or comb secured thereto at one of its ends, a cutter-lever pivoted thereto and carrying a movable cutter, a pair of motor-cylinders fixed to the handle, a vibrating lever pivoted to the handle and having opposite arms coupled to pistons working in the motor-cylinders, and a pin coupling the cutter-lever to the vibrating lever between the piston-connections of said vibrating lever, substantially as set forth.

11. The combination of the handle, the end plate, the supply-chamber provided with induction-ports, the tubular valve-stem passing through the end plate, the regulating-valve controlling the induction-ports, and having a stem passing through the tubular valve-stem, and the valve-lever coupled to the handle and to the regulating valve-stem, substantially as set forth.

399,764. CAR-BRAKE. CHARLES MAYER, El Paso, Tex. Filed Dec. 31, 1888. Serial No. 293,094. (No model.)

Claim.—1. The combination, with the transverse truck-beam, of the levers pivoted on the under side thereof, the brake-shoes connected to said levers, the operating-lever mounted on the beam, the links connecting the lower end of the same with the inner ends of the pivoted levers, and the spring secured to the operating-lever and the beam, as set forth.

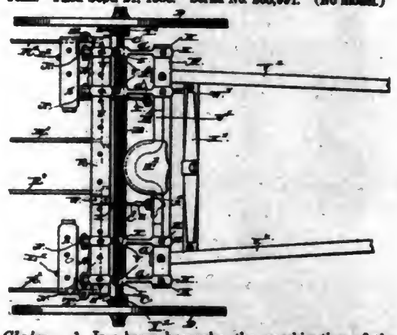
2. The combination, with the transverse beam of the truck, of the levers pivoted to the under side of the same, the brake-shoes, the pitmen connecting the brake-shoes with the levers, the straps M, secured to the beam, the retaining-rods having their ends pivoted to



the pitmen and the straps, and devices for operating the levers, as set forth.

3. The combination, with the beam, of the levers pivoted thereto, devices for operating the levers, the brake-shoes, the pitmen connecting the brake-shoes with the levers, the straps M, secured to the beam, the retaining-rods having their ends pivoted to the pitmen and the said straps, the metallic straps secured to the upper side of the beam, the pivot-pins secured in the ends of said straps, and the hangers having their upper ends mounted on the said pivot-pins and their lower ends pivoted to the brake-shoes, as set forth.

399,765. HORSE HAY-RAKE. JAMES M. MCCLINTOCK, McKenzie, Tenn. Filed Sept. 21, 1888. Serial No. 285,991. (No model.)



Claim.—1. In a horse hay-rake, the combination of the telescoping axle comprising the central tubular section and the sliding extension C therein, the horizontally-pivoted rake-head having the vertically-hinged extensions S, the bars G, through which the central section of the rake-head is pivoted to the central section of the axle, and the bars M', attached to and adjustable on the connecting-bars and having the discharge or clearing teeth, substantially as described.

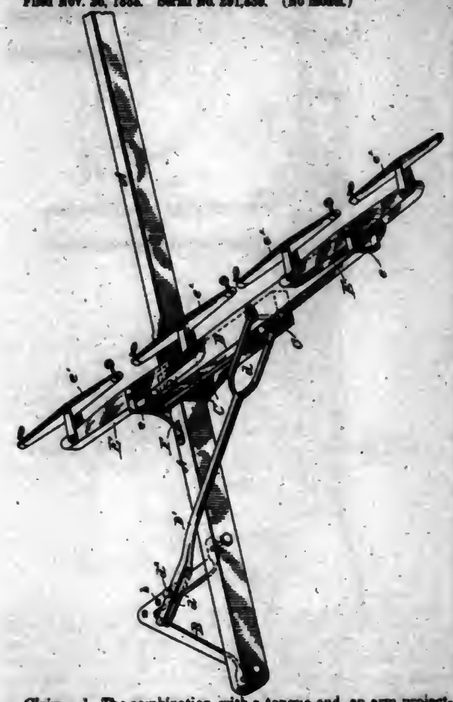
2. In a horse hay-rake adapted to be widened or contracted, the combination of the rake-head and axle, the bars G, the bars M', having slots N', the bolts attached to the bars G and extending through the said slots, and the clamping-nuts on said bolts, whereby the bars M' may be secured at any adjustment, the said bars having the clearing or discharge teeth R', substantially as described.

3. The combination, in a horse hay-rake, of the draft-bar F, the telescoping axle comprising the tubular section B and the end extensions, C, therein, the rake-head comprising the central section, R, and the extensions S vertically hinged to the ends thereof, the connecting-bars G, having their front ends provided with boxes H, in which the draft-bar is secured, provided further with the boxes I for the central tubular axle-section, and the extensions N, horizontally hinged to the rear end of bars G and having the boxes O, in which the central section of the rake-head is secured, substantially as described.

4. The combination, in a hay-rake, of the lever Z, fulcrumed to the frame, the rake-head hinged or pivoted to the frame, and thereby adapted to be raised or lowered, the casting W, secured to the rake-head and having the arms X and Y, and the rod C', attached to the lever and adapted to be connected to either of said arms, substantially as described.

5. In a horse hay-rake, the combination of the wheels having the ring swiveled to their hubs, the extensible axle on which the wheels are mounted, the rake-head having the hinged extensions, and the stay chains or rods attached to said extensions and having the hooks to engage the rings, substantially as described.

399,766. DRAFT-EQUALIZER. JONAS P. MCDOWELL, Foote, Iowa. Filed Nov. 26, 1888. Serial No. 291,830. (No model.)



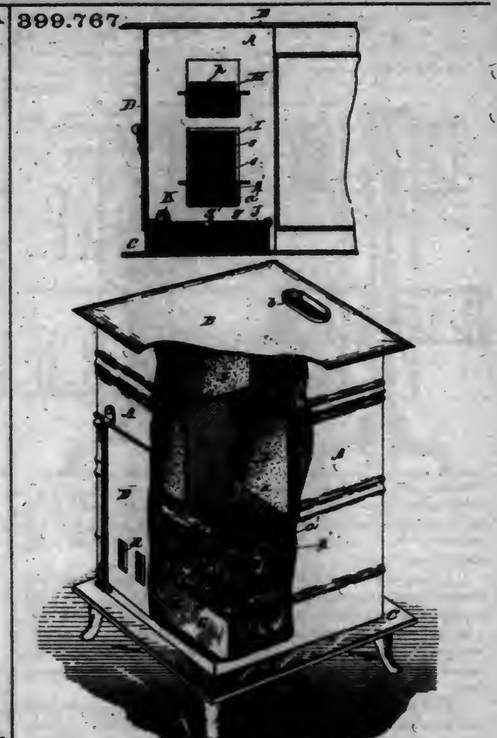
Claim.—1. The combination, with a tongue and an arm projecting horizontally at a right angle to the same, of an evener centrally pivoted upon the outer end of the arm, a doubletree pivoted to said evener at the extremities, and a stop secured to the tongue limiting the inward movement of one extremity of the evener, substantially as shown and described.

2. The combination, with a tongue, an arm projecting horizontally outward at a right angle from the right side of the tongue, and an evener centrally pivoted upon the free end of the arm, of a doubletree pivoted upon said evener at each extremity, clips embracing the evener and doubletrees, and a stop attached to the tongue limiting the rearward movement of the left-hand extremity of the evener, all combined for operation substantially as shown and described.

3. The combination, with a tongue, a horizontal apertured bracket secured at one side near the inner end, and a horizontal arm pivoted upon the tongue extending outward from the opposite side in advance of the bracket, of an evener pivoted upon the outer end of the arm, a doubletree pivoted upon the extremities of the evener, a stop secured to the tongue at the rear of the arm, and an adjustable connecting-rod uniting the evener, the arm, and the bracket, all combined for operation substantially as shown and described.

4. The combination, with a tongue, a horizontal apertured bracket secured to the left side of the tongue near the rear end, a pivoted arm extending at a right angle from the right-hand side of the tongue in advance of the bracket, and a strap limiting the movement of said arm, of an evener centrally pivoted upon the free end of the arm, a double-tree pivoted upon each extremity of the evener, a stop secured upon the tongue limiting the rearward movement of the left extremity of the evener, a connecting-bar having forked extremities uniting the arm and evener with the bracket, and a detachable pin passing through one forked end of the connecting-rod and one aperture in the bracket, all combined for operation substantially as shown and described.

399,767. STOVE. WILLIAM B. MCELHENY, Nevada, Mo. Filed Jan. 12, 1888. Serial No. 260,504. (No model.)



Claim.—1. In combination with a stove, a series of cartridges arranged one above another, one of the cartridges being removable, substantially as set forth.

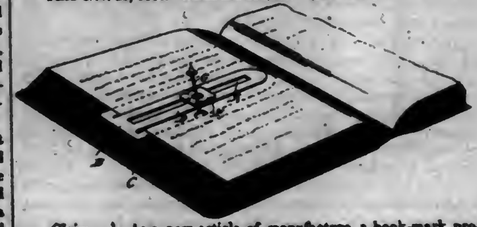
2. In combination with a stove, a series of cartridges arranged one above another, and of which the upper one is removable, and the lower one is adapted to receive and retain material falling from the upper one, substantially as set forth.

3. The combination, with a stove, of the perforated trough, the cartridge supported in the trough, and the cartridge below the trough adapted to receive material flowing from the upper cartridge through the trough, substantially as set forth.

4. In combination with a stove, a series of cartridges, one above the other, the upper cartridge having perforations in its upper surface and one side of its casing, the second cartridge having perforations in only one of its sides, substantially as set forth.

5. In combination with a stove, a series of cartridges, of which the upper one has perforations in the upper surface or wall of its casing, and also in two or more of the sides of its casing, substantially as set forth.

399,768. BOOK-MARK. HENRIETTA L. MERRER, New York, N. Y. Filed Nov. 23, 1888. Serial No. 291,612. (No model.)



Claim.—1. As a new article of manufacture, a book-mark provided with a slide, and a pointer pivoted on the said slide, substantially as shown and described.

2. A book-mark comprising two arms connected with each other at one end, a slide held to slide on one of the said arms, and a pointer pivoted on the said slide, substantially as shown and described.

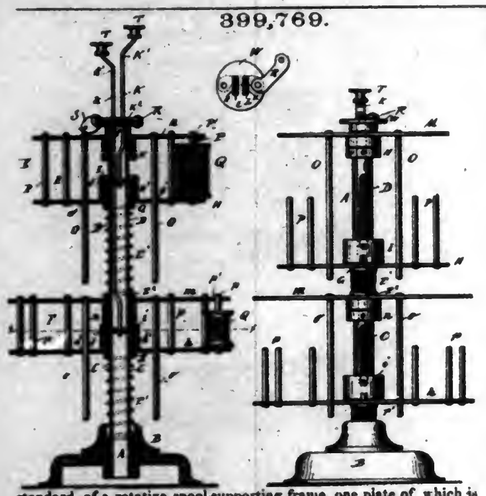
3. In a book-mark, the combination, with an arm, of a slide fitted to slide on the said arm, and a pointer pivoted on the said slide, substantially as shown and described.

4. In a book-mark, the combination, with a slotted arm and a second slotted arm secured at one end on the said first-named arm and fitting in its slot, of a slide held to slide in the said second slotted arm and a pointer adapted to turn on the said slide, substantially as shown and described.

399,769. SPOOL-STAND. VINCENZ MEHAS, Brooklyn, N. Y. Filed Feb. 6, 1888. Serial No. 263,861. (No model.)

Claim.—1. In a spool-stand, the combination, with a tubular

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standard, of a rotative spool-supporting frame, one plate of which is mounted to slide on the standard in the direction of the length of the standard, spool-supporting pins on one of said plates, and a push-rod connected with the sliding plate and passed through the standard, substantially as set forth.

2. In a spool-stand, the combination, with a tubular standard, of a rotative spool-supporting frame, one of the plates of which is mounted to slide on the standard in the direction of the length of the standard, a spring pressing said sliding plate toward the other plate, and a push-rod for said sliding plate, which push-rod passes through the tubular standard and is connected with the sliding plate, substantially as set forth.

3. In a spool-stand, the combination, with a tubular standard, of a rotative spool-supporting frame composed of top and bottom plates and spool-holding pins on said bottom plate, the top plate being mounted to rotate on a fixed collar on the standard and the bottom plate being mounted to turn on a sliding sleeve on the standard, a spring pressing said sliding bottom plate toward the top plate, and a push-rod connected with the sliding sleeve supporting the bottom plate and passed up through the tubular standard, substantially as set forth.

4. In a spool-stand, the combination, with a tubular standard having longitudinal slots, of a rotative spool-supporting frame composed of top and bottom plates and spools supporting pins, the top plate being mounted to turn on a fixed collar of the standard and the bottom plate being mounted to turn on a sliding sleeve on the standard, a pin passing through the sliding sleeve and through slots in the standard, and a push-rod connected with said pin and passing up through the tubular standard, and a spring for pressing the bottom plate upward, substantially as set forth.

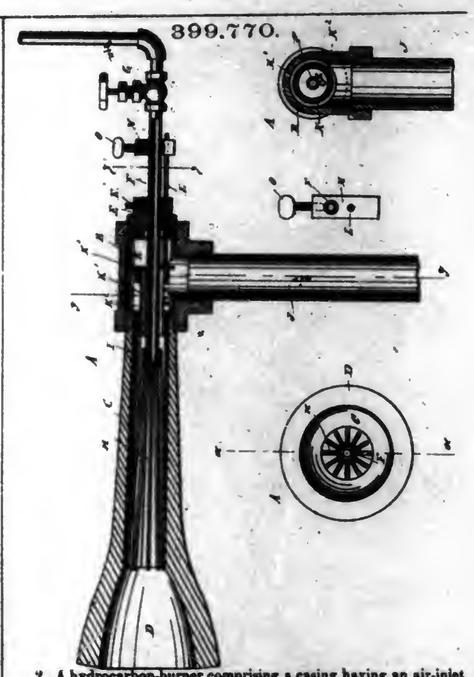
5. In a spool-stand, the combination, with a tubular standard, of a rotative spool-frame composed of top and bottom plates, the bottom plate being mounted to slide on the standard in the direction of the length of the standard, spool-supporting pins on the bottom plate, and a push-rod extending from the bottom sliding plate up through the standard and through a slot in the top plate of the same, said push-rod being provided with a notch for engagement with one end of the slot in the top plate, substantially as set forth.

6. In a spool-stand, the combination, with a tubular standard, of a rotative spool-frame composed of top and bottom plates, the bottom plate being mounted to slide on the standard in the direction of the length of the same, spool-supporting pins on the bottom plate, a push-rod extending from the bottom sliding plate up through the standard and through a slot in the top plate of the same, said push-rod being provided with a notch for engagement with one end of the slot in the top plate, and a locking-lever on said top plate for keeping the notch in the push-rod engaged with the end of the slot in the top plate, substantially as set forth.

399,770. HYDROCARBON-BURNER. FRANK B. MEYERS, Fort Plain, N. Y., assignor of one-half to Charles S. Tanner, same place. Filed Nov. 30, 1888. Serial No. 292,271. (No model.)

Claim.—1. A hydrocarbon-burner comprising a casing having an air-inlet pipe, a burner proper comprising a tube connected at its inner end with said casing and having a bell-shaped mouth, and an oil-pipe passing through the inner end of said casing into the said tube, and carrying at its forward end a tubular series of rods extending to the juncture of the bell-shaped mouth with outer end of the tube, substantially as shown and described.

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2. A hydrocarbon-burner comprising a casing having an air-inlet pipe, a burner proper comprising a tube connected at its inner end with said casing and having a bell-shaped mouth, an oil-pipe passing through the said casing into the rear end of said tube, and carrying a tubular series of rods extending to the outer end of the tube at its juncture with the flaring mouth, and an air-supply regulator held in the said casing, substantially as shown and described.

3. In a hydrocarbon-burner, the combination, with a burner proper comprising a tube having a bell-shaped mouth, of an oil-pipe extending into the inner end of said tube, and provided with a tubular flaring series of rods extending along the inside of the tube to its outer end at the juncture of said bell-shaped mouth and serving to carry the oil to be atomized, substantially as shown and described.

4. In a hydrocarbon-burner, the combination, with the burner-tube connected with an air-supply, of an oil-pipe extending into the inner end of said burner-tube, and rods secured around the inner end of the said oil-pipe, and extending forwardly at an incline along the said tube to the inner end of the bell-shaped mouth, substantially as shown and described.

5. In a hydrocarbon-burner, the combination, with an oil-pipe closed at its discharge end, and provided near the same, on the top, with an opening, of rods secured on the discharge end of the said oil-pipe and projecting from the same, and serving to carry the oil discharged through the said pipe-opening, substantially as shown and described.

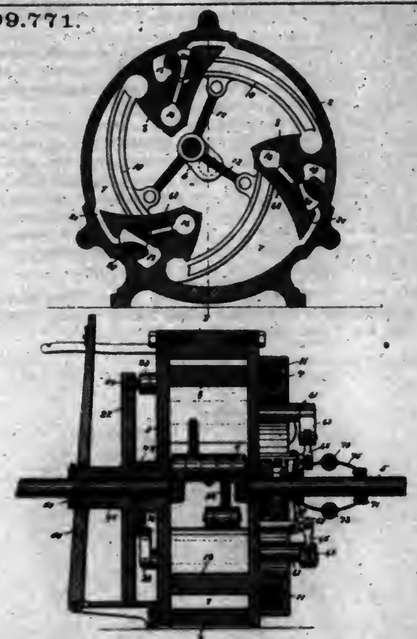
6. In a hydrocarbon-burner, the combination, with a casing having an air-inlet pipe, of a burner proper comprising a tube secured at one end to the said casing and carrying at its other end a bell-shaped mouth, an oil-pipe passing through the inner end of said casing into the said burner-tube, and rods secured in a tubular series to the said oil-pipe, and extending along the said burner-tube to the inner end of the bell-shaped mouth and receiving the oil from the said oil-pipe, substantially as shown and described.

7. In a hydrocarbon-burner, the combination, with a casing having an air-inlet pipe, of a burner proper comprising a tube secured at one end to the said casing and carrying at its other end a bell-shaped mouth, an oil-pipe passing through the said casing into the inner end of said burner-tube, rods secured in a tubular flaring series to the said oil-pipe, and extending along the said burner-tube to the inner end of the flaring mouth and receiving the oil from the said oil-pipe, and an air-regulator, K, held adjustably in the said casing, and provided with a rod extending through the end of the casing and having an adjusting-collar on the oil-pipe, substantially as shown and described.

399,771. STEAM-ENGINE. NILS NILSON, Minneapolis, Minn. Filed Mar. 26, 1888. Serial No. 268,497. (No model.)

Claim.—1. A steam-engine comprising a suitable casing provided with a series of curved abutments, as 8, a crank-shaft mounted in said casing, a series of three or more pistons pivoted in said casing opposite said abutments, arms connecting said pistons with said crank-shaft, and suitable ports admitting and exhausting the steam and operating to admit the steam to each piston before it ceases to act upon the next preceding piston, substantially as described.

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2. The combination, in a steam-engine, with the casing 2, provided with the abutments 8, of the series of oscillating pistons 10, mounted at equidistant points around said casing, the crank-shaft journaled in said casing, arms connecting said pistons with said crank-shaft, the induction and exhaust ports 16 and 18, and the valves 20, controlling said ports, substantially as described.

3. The combination, in a steam-engine, with the casing 2, provided with the abutments 8, having the ports 16 and 18 arranged therein, of the crank-shaft 5, journaled in said casing, and the series of oscillating pistons 10, pivoted within said casing and connected with said crank-shaft, substantially as described.

4. The combination, in a steam-engine, with the cylindrical casing 2, provided with the inlet and exhaust ports 16 and 18, of the pivoted piston 10, adapted to fit against the inner curved surface of the casing 2, the crank-shaft 5, and the arms 12, connecting said pistons with said crank-shaft, substantially as described.

5. The combination, in a steam-engine, with the casing 2, the crank-shaft journaled therein, and the oscillating pistons 10, connected with said crank-shaft, of the rotary valves 20, arranged to control the valve-ports and provided with the crank-arms 23, and the cam 22, secured upon the shaft 5 and controlling said valves 20, substantially as described.

6. The combination, in a steam-engine, with the casing 2 and the oscillating pistons 10, of the valves 20, arranged to control the supply of steam to said casing and provided with the crank-arms 23, the grooved cam 22, with which said crank-arms engage, provided with the projection 46, and the collar 44, secured upon said crank-shaft and provided with the projection 45, adapted to engage the projection 46, substantially as described.

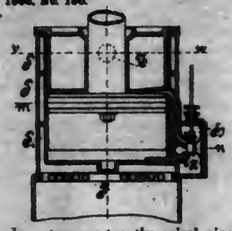
7. The combination, in steam-engine, with a series of valves, 20, and the main shaft 5, of the reversible grooved cam 22, mounted upon said shaft and engaging all of said valves, substantially as described.

8. The combination, in a steam-engine, with the crank-shaft 5, of the series of valves 20, the grooved cam 22, engaging said valve and having a hub, 47, provided with V-shaped recesses 48, the sliding clutch 51, having the V-shaped projections 49, adapted to engage the recesses of the collar 47, and the pivoted lever 50, engaging said collar, substantially as described.

9. The combination, in a steam-engine, with the casing 2, the crank-shaft, and the oscillating pistons, of the rotary valve 60, arranged to control the induction-ports in said casing, and the centrifugal governor mounted on said crank-shaft 5 and connected with said valve 60, substantially as described.

10. The combination, in a steam-engine, with the casing and the crank-shaft mounted therein, of the oscillating pistons connected with said crank-shaft, the induction-ports 16, the exhaust-ports 18, and the oscillating valves 20, adapted to connect either of said ports with the steam-chambers formed behind said pistons, substantially as described.

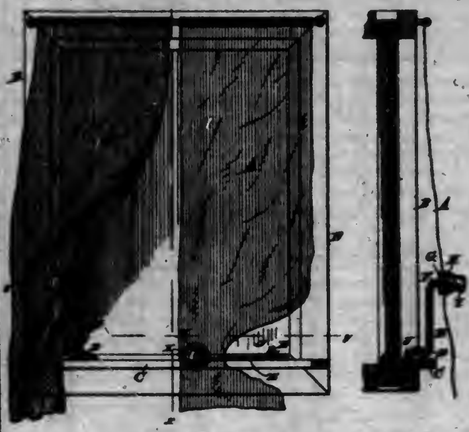
399,772. STEAM-MOTOR. OTTO HILL, Berlin, Germany, assignor to Theodor Schiller and Paul Brunstein, same place. Filed Jan. 3, 1887. Serial No. 223,903. (No model.) Patented in Belgium June 26, 1886, No. 72,623; in France June 26, 1886, No. 177,080; in Italy June 30, 1886, No. 20,157, and Oct. 20, 1887, No. 22,462/376; in Germany July 3, 1886, No. 41,817; in England July 13, 1886, No. 9,117; in Denmark Nov. 16, 1886, No. 857; in Spain July 14, 1886, No. 9,295, and in Norway July 21, 1886, No. 190.



Claim.—1. In a steam-motor, the spiral pipe F and the pump for supplying water thereto, in combination with a furnace below said coil, and a cylinder above said coil, into which the steam from the latter is discharged to work the engine or motor, substantially as set forth.

2. In a steam-motor, the spiral pipe F and the pump for supplying water thereto, in combination with a furnace below said spiral pipe, a cylinder supplied with steam by said coil, and a jacket surrounding said cylinder and communicating with said furnace, the said jacket being provided with a spiral passage through which the products of combustion pass in contact with said cylinder, for the purpose set forth.

399,773. CURTAIN-HOLDER. DAVID D. HELLEY and ROBERT L. WYATT, Wilson, N. C. Filed June 2, 1888. Serial No. 276,202. (No model.)



Claim.—1. In a curtain-holder, the combination, with an arm pivoted on the window-frame, of a pin formed on the free end of the said arm and engaging the curtain, and a handle held on the said pin for conveniently operating the arm, substantially as shown and described.

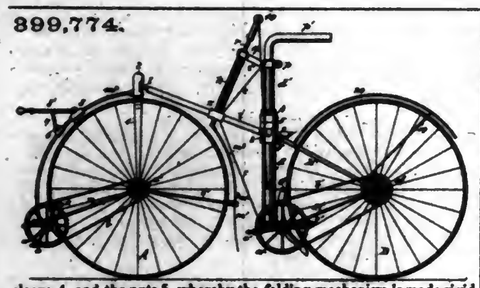
2. In a curtain-holder, the combination, with an arm pivoted on the window-frame and provided at its pivoted end with a lug and on its free end with a threaded pin, of washers held on the said pin to clamp the curtain, and a handle screwing on the said pin to press the washers onto the curtain, substantially as shown and described.

399,774. BICYCLE. THOMAS O'REILLY, New York, N. Y. Filed Aug. 2, 1883. Serial No. 261,817. (No model.)

Claim.—1. The combination, in a bicycle, with the wheels A B, of a frame composed of the tube *d*, the forks H H', tube *d'*, the arm *f'*, the tube K, the spring-bars *i i*, and the bracing-rods *c c*, the whole forming a bridge free from vibration, substantially as specified.

2. The combination, in a bicycle, with the wheels A B and the connecting-frame, of the tube *d*, which receives the tube *d'*, the threaded

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sleeve 4, and the nuts 5, whereby the folding mechanism is made rigid or loose, substantially as specified.

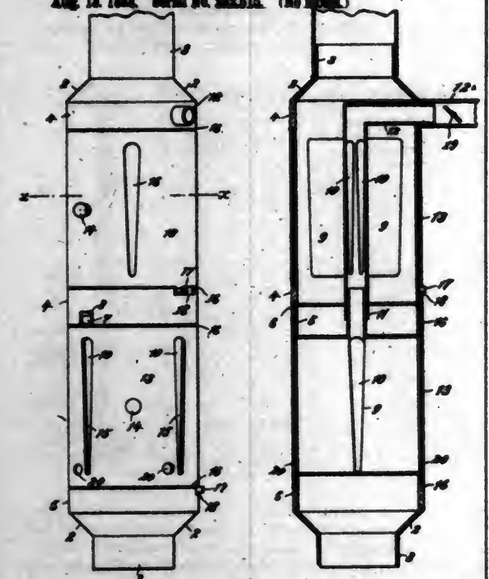
3. The combination, in a bicycle, with the wheels A B and the connecting-frame, of two spring-bars, *i i*, between which passes the steering-rod *r*, the mud-guard m^3, and the rods *d'*, which are free on the axle of the steering-wheel, substantially as specified.

399,775. SUSPENDER-HOOK. EDWARD F. PARADISE, Oconto, Wis. Filed Sept. 13, 1888. Serial No. 285,256. (No model.)



Claim.—A detachable fastening for suspenders, consisting of hook 1, constructed of a single piece of wire and formed with the rearwardly-projecting hooks 3, having pointed ends 4, and the laterally-swinging fastening-plate 2, pivoted to the back of hook 1, and having recesses 5, with which the points 4 are adapted to engage, substantially as shown and described.

399,776. HEAT-RADIATOR. ADAM PEARY, Corning, N. Y. Filed Aug. 13, 1888. Serial No. 282,515. (No model.)



Claim.—1. A heat-radiator consisting of a drum formed in sections having intersecting air-chambers in each section transverse thereto and connected together with openings in the sides of the drum-sections, and dampers movable over the air-chamber openings, substantially as described.

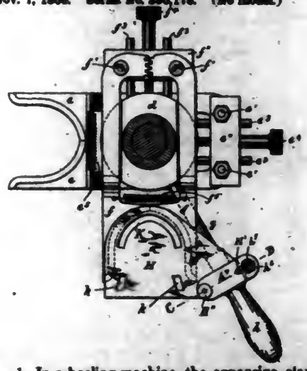
2. A heat-radiator consisting of a drum formed in sections having intersecting air-chambers in each section transverse thereto, connected together, and having an escape-pipe extending out of the drum, with openings in the sides of the drum-sections, and dampers movable over the air-chamber openings, substantially as described.

3. In a heat-radiator, a drum-section, 4, with narrow intersecting air-chambers 9, transverse to the drum-section and located at angles to each other, with openings 10 in the side of the drum-section, a rotary damper, 13, having a handle, 14, and openings 15, registering with openings 10, and an escape-pipe, 12, with damper 19, substantially as described.

4. In a heat-radiator, a drum having a series of narrow intersecting air-chambers transverse thereto and located at angles to each other, with openings in the side of the drum, and dampers for closing the openings, substantially as shown and described.

5. A heat-radiator consisting of drum 1, formed in sections 4 5, attached together and having narrow intersecting air-chambers 9 transverse thereto and located at angles to each other, with openings 10 in the side of the drum, and circular rotary dampers 13, with handle 14 and openings 15, movable over the openings 10, and openings 20 in lower section, 5, and in lower damper, 13, which register with openings 20 in lower section, 5, when the damper 13 is closed, the chambers 9 being connected by pipe 11 and having an escape-pipe, 12, with damper 19, substantially as shown and described.

399,777. HEEL-NAILING MACHINE. JOSEPH H. POPE, Brockton, Mass., assignor to the American Heeling Machine Company, of Maine. Filed Nov. 7, 1888. Serial No. 290,173. (No model.)

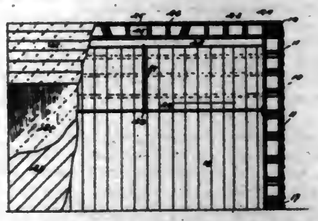


Claim.—1. In a heeling-machine, the expansive clamps *f f*, and the hub *d*, with its handle *h*, combined with the plate H, having the front and rear perforations, *K k k*, as and for the purpose set forth.

2. In a heeling-machine, the perforated spanker and slugger plate H and the holder h^1, secured together, as described, in combination with the handle *h*, the carrier h^2, laterally adjustable in guides in said handle and pivoted to the holder, and having means, substantially as described, for securing the said carrier and holder in an adjustable manner to the said handle, as and for the purpose set forth.

3. In a heeling-machine, the hub *d*, having the expansive clamps *f f*, and the rod *g*, secured to said hub, combined with the detachable handle *h* and the perforated spanker-plate H, secured to said handle in an adjustable manner, as and for the purpose set forth.

399,778. CONSTRUCTION OF BUILDINGS. JAMES R. RANKIN, Elk Rapids, Mich. Filed July 12, 1888. Serial No. 279,771. (No model.)



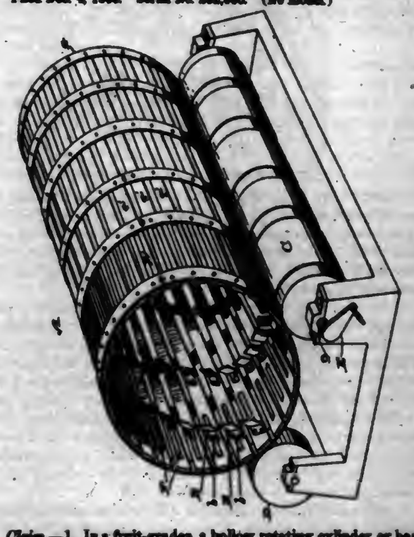
Claim.—1. A building adapted for use as a silo, constructed of a series of horizontally arranged and spaced rectangular frames, vertical linings secured to the inner faces of said frames, diagonally-arranged sheathing attached to the outer face of the said frame, a water-proof material secured to said sheathing, and clapboarding covering said water-proof material, all combined to operate substantially in the manner and for the purpose specified.

2. In a building adapted for use as a silo, the combination, with a series of horizontally arranged and spaced rectangular frames, vertical linings secured to the inner faces of said frames, diagonally-arranged sheathing attached to the outer face of the said frame, a water-proof material secured to said sheathing, and clapboarding covering said water-proof material, of a roof provided with a removable section, a perpendicular brace-rod projected from said roof, and horizontal brace-rods attached to the perpendicular rod and to the respective inner sides of the structure, substantially as and for the purpose specified.

3. In a building adapted for use as a silo, the combination, with a series of rectangular-spaced frames, the sides of which frames are secured at their extremities through the medium of an angle-bar consisting of a body located between the contiguous faces of the sides, having the extremities bent in opposite directions to embrace the edges of the approaching sides, which clamping extremities are secured to the respective sides of the frame, of a vertical lining secured to the inner face of the frame, diagonally-arranged sheathing attached to the outer edges of the frames, water-proof material covering said sheathing, clapboarding covering said water-proof material, a roof provided with a detachable section, and perpendicular and horizontal brace-rods attached, respectively, to the inner sides of the structure and to said roof, as and for the purpose specified.

4. In a building adapted for use as a silo, the combination, with horizontally-arranged boards having their ends lapped at right angles, of a brace located between said lapped ends and having its extremities bent in opposite directions to embrace the outer edges of said boards, substantially as shown and described.

399,779. FRUIT-GRADER. VOLNEY RAYNAL, San Francisco, Cal. Filed Dec. 4, 1888. Serial No. 292,892. (No model.)



Claim.—1. In a fruit-grader, a hollow rotating cylinder or barrel having its periphery composed of longitudinal separated slats or bars of tapering form throughout, whereby the spaces between said slats or bars gradually increase in width from one end to the other, in combination with the independent guide-flanges secured separately to the inner surface of each slat or bar and arranged in a spiral course throughout the length of the cylinder or barrel, substantially as described.

2. In a fruit-grader, a hollow rotating cylinder or barrel having its periphery composed of longitudinal separated slats or bars the spaces between which gradually increase in width from one end to the other, in combination with an exterior rotating clearing drum or roll of uniform diameter throughout extending along the hollow cylinder or barrel and in contact with its periphery for pushing back the fruit which sticks between the slats, substantially as herein described.

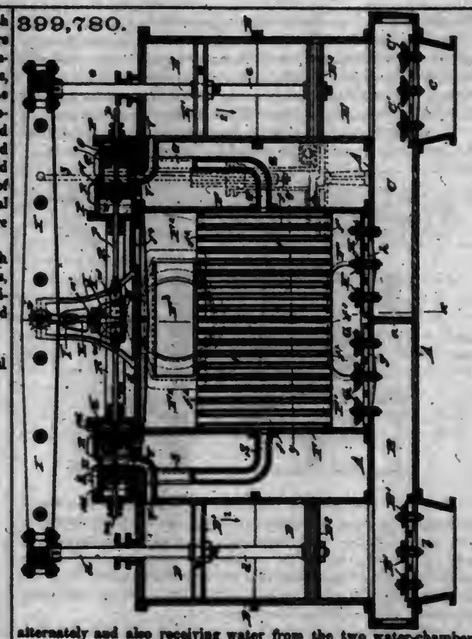
3. In a fruit-grader, a hollow cylinder or barrel having its periphery composed of longitudinal separated slats or bars leaving interspaces which gradually increase in width from one end to the other, and the spirally-arranged flanges upon the inner surface of said slats or bars, in combination with the supporting rollers or wheels on one side and the frictional driving and clearing drum or roll on the other side, substantially as herein described.

399,780. DUPLEX PUMP AND CONDENSER. JOHN REID, Rio de Janeiro, Brazil. Filed May 2, 1888. Serial No. 272,540. (No model.)

Claim.—1. A duplex pump and condenser constructed with two main valved steam and water cylinders, pistons operated therein, two valved water-chambers, one communicating with each cylinder, and an adjacent condenser receiving exhaust-steam from the two cylinders alternately and also receiving water from the two water-chambers alternately, substantially as herein set forth.

2. A duplex pump and condenser constructed with two main valved steam and water cylinders, pistons operated therein, two valved water-chambers, one communicating with each cylinder, an adjacent condenser receiving exhaust-steam from the two cylinders alternately and also receiving water from the two water-chambers alternately, and a pump discharging the water of condensation from the condenser, substantially as herein set forth.

399,780.



3. A duplex pump and condenser constructed with two main valved steam and water cylinders, pistons operated therein by rods connected to opposite ends of a walking-beam, two valved water-chambers, one communicating with each cylinder, an adjacent condenser receiving exhaust-steam from the two cylinders alternately and also receiving water from the two water-chambers alternately, and a pump operated by the walking-beam and discharging the water of condensation from the condenser, substantially as herein set forth.

4. A duplex pump and condenser constructed with two main valved steam and water cylinders, two spaced pistons working together in each main cylinder, two valved water-chambers, one communicating with each cylinder, and an adjacent condenser receiving exhaust-steam from the two cylinders alternately and also receiving water from the two water-chambers alternately, substantially as herein set forth.

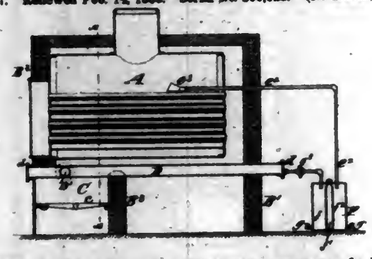
5. The combination, in a duplex pump, of a bed, A, having water-chambers B C, provided with openings *b c* and inlet-valves B' C', and having outlets *g h*, two main steam and water cylinders, D E, on the bed A, and provided with ports U V, respectively, and communicating with the chambers B C, pistons, as D' E', working in the cylinders D E, and connected by rods *d e* with a walking-beam, I, fulcrumed on the pump-frame, valve-cylinders M P, having inlet-ports *k n*, communicating with a steam-supply pipe, R, and exhaust-ports *l o*, communicating with steam-outlets, piston-valves K L, working in the cylinder M, and piston-valves N O, working in the cylinder P, and said valves having connected stems *m p*, and devices, substantially as described, connecting the valve-stems with the walking-beam for actuating the valves therefrom, substantially as herein set forth.

6. In a duplex pump, the combination, with two main steam and water cylinders, D E, and pistons, as D' E', fitted therein and having rods *d e*, a walking-beam, I, fulcrumed on the pump-frame and connected to said piston-rods, two valve-cylinders, M P, valves K L in cylinder M, and valves N O in cylinder P, and said cylinders M P having inlet and exhaust ports *k l n o*, and rods *m p*, connected to the valves K L N O, of a yoke, W, connecting the rods *m p*, a lever, X, engaging the yoke or cross-bars thereof, and an arm, Y, on the beam I, engaging the lever X, all arranged for operation substantially as herein set forth.

7. The combination, in a duplex pump and condenser, of a bed, A, having water-chambers B C, provided with openings *b c*, and inlet-valves B' C', and having outlets *g h*, valved at G H, two main steam and water cylinders, D E, on the bed A, and provided with main ports U V, respectively, and communicating with the chambers B C, pistons D' D^2 in the cylinder D and E' E^2 in the cylider E, a walking-beam, I, journaled on the frame, rods *d e*, connecting the pistons in the cylinders D E, respectively, to opposite ends of the beam I, valve-cylinders M P, having inlet-ports *k n*, communicating with a steam-supply pipe, R, and also having exhaust-ports *l o*, communicating with steam-out-

lets, piston-valves K L, fitted in the cylinder M, and piston-valves N O, fitted in the cylinder P, and said valves having connected stems *m p*, devices, substantially as described, connecting the valve-stems with the walking-beam for actuating the valves therefrom, a condenser, F, valves G H, controlling communication between the water-chambers B C and the condenser, and pipes S T, connecting the exhaust-ports *l o* of the valve-cylinders M P with the steam-chamber of the condenser, all arranged for operation substantially as described, for the purposes set forth.

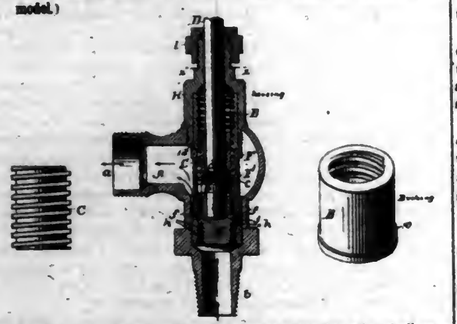
399,781. STEAM-GENERATOR. THOMAS J. REYNOLDS, Brooklyn, N. Y., assignor of one-half to Francis Nolan, same place. Filed Oct. 17, 1887. Renewed Feb. 14, 1889. Serial No. 299,925. (No model.)



Claim.—1. The combination, with a steam-generator, of a heater consisting of longitudinal tubes and a cross-tube connecting them near their end, said tubes being exposed to the heat of the furnace and having their ends exposed for cleaning, a feed-pipe connected with one end of the one longitudinal tube and a pipe leading from the corresponding end of the other longitudinal tube for delivering water from the heater, substantially as herein described.

2. The combination, with a steam-generator, of a filter, F, a feed-water heater outside the generator, exposed to the heat of the generator-furnace and comprising a straight tube, as D, having its ends exposed beyond the brick setting of the generator to afford facility for cleaning, pipes leading from one end of said tube to the receiving-chamber of the filter and from the delivery-chamber of the filter to the generator at about the water-line therein, and outlet-cocks in the receiving and delivery chambers of the filter, whereby provision for cleaning the filter or blowing off the generator from the surface is afforded, substantially as herein described.

399,782. STOP OR THROTTLE VALVE. FRANK W. RICHEY, Armourdale, Kans. Filed Jan. 31, 1888. Serial No. 262,497. (No model.)

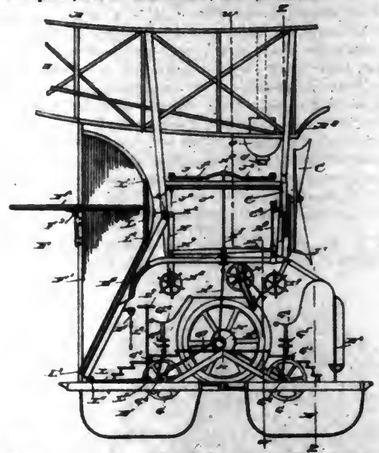


Claim.—1. In a throttle-valve, the combination of a shell containing a removable cylinder provided with ports, a valve provided with packing-rings fitting within the bore of the cylinder, a stem in engagement with the valve and provided with external threads, a sleeve surrounding the stem and engaged by the threads, a bushing seated upon the upper extremity of the cylinder and the housing bored to receive and hold down the bushing, and hence the cylinder, substantially as described.

2. In a throttle-valve, a shell having a housing attached thereto, a bushing with a plain exterior located within the housing, a cylinder fitting loosely within the shell and held in place on a shoulder in the shell by the longitudinal pressure of the bushing which is seated upon it, said cylinder being provided with ports, a valve provided with packing-rings, and a threaded stem in engagement with the valve, whereby it is operated, all arranged to operate in the manner and for the purpose set forth.

3. In a throttle-valve, the combination of a shell, a removable cylinder provided with ports and fitting loosely within the bore of the shell, a sliding valve and stem operating within the cylinder, a housing secured to the shell, a bushing fitting loosely within the bore of the housing and seated upon the upper extremity of the cylinder, whereby the latter and the bushing are held together in operative adjustment, substantially as described.

399,783. AIR-SHIP. HERMAN A. J. RIECKERT, New York, N. Y. Filed Apr. 10, 1888. Serial No. 270,205. (No model.)



Claim.—1. In an air-ship, a balloon consisting of three compartments, of which the lowermost is stiffened by a frame-work and supports at its top the second compartment, the third compartment being formed on top of the second compartment and secured with its edges to the said frame-work, and being exposed to the action of the wind, substantially as shown and described.

2. In an air-ship, the combination, with a balloon, as described, of a closed basket supported on the under side of the said balloon, a suction-wheel mounted to rotate above the said basket at its rear, the said suction-wheel being provided with a central rim and a hub and operated from the motive power located within the said basket, a friction-wheel secured on a shaft mounted to rotate in a swinging bearing under the control of the operator in the basket, said friction-wheel being adapted to be thrown alternately into and out of contact with the said central rim and hub of the suction-wheel, and a propeller-wheel secured on the said shaft of the friction-wheel and rotating with the same, substantially as shown and described.

3. In an air-ship, the combination, with a closed basket supported on the under side of a balloon, of a steering device located in front of the said basket, and consisting of a vertical wing mounted to swing, and a disk-wing pivoted on the said vertical wing and mounted to swing, substantially as shown and described.

4. In an air-ship, the combination, with a closed basket supported on the under side of a balloon, of a steering device located in front of the said basket, and consisting of a vertical wing mounted to swing, and a disk-wing pivoted on the said vertical wing and mounted to swing, and ropes extending into the said basket for operating the said wings of the steering device, substantially as shown and described.

5. In an air-ship, the combination, with a balloon having three compartments located one above the other, of a filling-receptacle provided with an inlet-pipe and three outlet-pipes formed on the said filling-receptacle, and leading to the said three compartments of the balloon, substantially as shown and described.

6. In an air-ship, the combination, with a balloon having three compartments located one above the other, of a filling-receptacle secured in the bottom of the lowermost compartment, an inlet-pipe held on the said receptacle and adapted to be connected with the source of gas-supply, and outlet-pipes extending from the top of the said receptacle, and leading, respectively, to the said three compartments, substantially as shown and described.

7. In an air-ship, the combination, with a balloon having three compartments located one above the other of a filling-receptacle secured in the bottom of the lowermost compartment, an inlet-pipe held on the said receptacle and adapted to be connected with the source of gas-supply, outlet-pipes extending from the top of the said receptacle, and leading, respectively, to the said three compartments, and apertured slides held in the said receptacle to control the inlet of the gas to the said outlet-pipes and the outlet of the air from the said three compartments, substantially as shown and described.

8. In an air-ship, the combination, with a closed basket, of wheels mounted to rotate in the said basket, crank-arms connected with the said wheels, treadles connected with the said crank-arms, a central fly-wheel located between the said wheels and connected with the said crank-arms, so that a rotary motion is imparted to the said main fly-wheel when the treadles are operated, an eccentric secured on the shaft of the said main fly-wheel, an eccentric-rod extending upward from the said eccentric, a lever connected with the said rod, a suction-wheel operated from the said lever, and flapping wings operated from the said rod, substantially as shown and described.

9. In an air-ship, the combination, with the main fly-wheel, of a starting device operating on the said main fly-wheel, and consisting of a friction-wheel adapted to engage the periphery of the said fly-wheel, a swinging arm in which the said friction-wheel is mounted, a crank-arm operated by a rod, and a shaft carrying the said crank-arm and provided with a pulley connected by a belt with a pulley on the said friction-wheel, substantially as shown and described.

10. In an air-ship, the combination, with the main fly-wheel, of a starting device operating on the said main fly-wheel and consisting of a friction-wheel adapted to engage the periphery of the said fly-wheel, a swinging arm in which said friction-wheel is mounted, a crank-arm operated by a rod, a shaft carrying the said crank-arm and provided with a pulley connected by a belt with a pulley on the said friction-wheel, and a handle for pressing the said swinging arm toward or from the said fly-wheel, so as to connect the said fly-wheel with the friction-wheel or disconnect it from the same, substantially as shown and described.

11. In an air-ship, the combination, with a suction-wheel mounted to rotate and provided with a central hub and a middle rim, of a friction-wheel held between the said central hub and the middle rim, a shaft on which the said friction-wheel is secured and carrying a propeller-wheel, a pivoted bearing carrying the said shaft, and a lever pivotally connected with the free end of the said pivoted bearing, so as to throw the latter up or down to alternately engage the said friction-wheel with the said central hub and the said middle rim or disengage it from the same, substantially as shown and described.

12. In an air-ship, the combination, with a suction-wheel mounted to rotate and provided with a central hub and a middle rim, of a friction-wheel held between the said central hub and the middle rim, a shaft on which the said friction-wheel is secured and carrying a propeller-wheel, a pivoted bearing carrying the said shaft, a lever pivotally connected with the free end of the said pivoted bearing, so as to throw the latter up and down to alternately engage the said friction-wheel with the said central hub and the said middle rim or disengage it from the same, and a rope mounted on pulleys and passing over a drum operated by a hand-wheel, said rope being connected with the lower end of the said lever, substantially as shown and described.

13. In an air-ship, the combination, with a suction-wheel mounted to rotate and provided with a central hub and a middle rim, of a friction-wheel held between the said central hub and the middle rim, a shaft on which the said friction-wheel is secured and carrying a propeller-wheel, a pivoted bearing carrying the said shaft, a lever pivotally connected with the free end of the said pivoted bearing, so as to throw the latter up and down to alternately engage the said friction-wheel with the said central hub and the said middle rim and disengage it from the same, a link pivotally connected with the said bearing, and a pivoted brake-shoe pivotally connected with the said link and adapted to engage the periphery of the said friction-wheel, substantially as shown and described.

14. In an air-ship, the combination, with sets of double wings, of beams carrying the said sets of wings and mounted to swing, levers each provided on one end with a pocket, said pockets engaging the inner ends of the said beams, and a rod having an up-and-down movement and connected with the inner ends of the said levers, substantially as shown and described.

15. In an air-ship, the combination, with sets of double wings, of beams carrying the said wings and mounted to swing, levers each provided on one end with a pocket, said pockets engaging the inner ends of the said beams, a rod having an up-and-down movement and connected with the inner ends of the said levers, blocks adapted to slide longitudinally and forming pivots for the said levers, and a fixed frame carrying the said blocks and the said beams, substantially as shown and described.

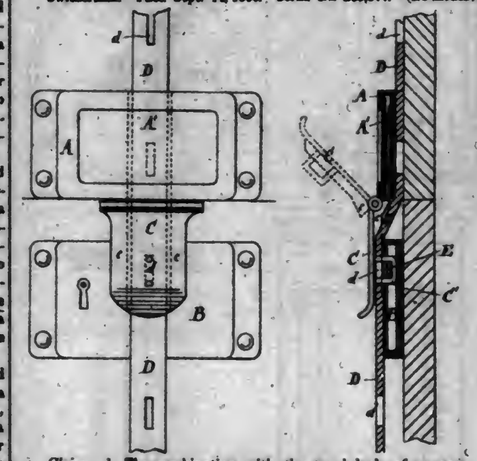
16. In an air-ship, the combination, with wings, of beams carrying the said wings and mounted to swing, levers each provided on one end with a pocket, said pockets engaging the inner ends of the said beams, a rod having an up-and-down movement and connected with the inner ends of the said levers, blocks adapted to slide longitudinally and forming the pivots for the said levers, a screw-rod adapted to be turned and screwing in the said blocks, said screw-rod being provided with right and left hand threads, so that it moves the said blocks simultaneously toward or from each other, and a fixed frame carrying the said blocks, substantially as shown and described.

17. In an air-ship, the combination, with wings, of beams carrying the said wings and mounted to swing, levers each provided on one end with a pocket, said pockets engaging the inner ends of the said beams, a rod having an up-and-down movement and connected with the inner ends of the said levers, blocks adapted to slide longitudinally and forming the pivots for the said levers, a screw-rod adapted to be turned and screwing into the said blocks, said screw-rod being provided with right and left hand threads, so that it moves the said blocks simultaneously toward or from each other, a pulley secured on the said screw-rod, a rope passing over the said pulley, a drum provided with a hand-wheel on which the said rope winds, and a fixed frame carrying the said blocks, substantially as shown and described.

18. In an air-ship, a wing having an up-and-down movement and comprising a frame having a central partition, slats secured to the said frame and central partition, and a canvas strip secured by one end to one of the said slats and by its sides to the said frame-work and the said central partition, the other end of the said canvas strip being bagged directly under the next following slat, substantially as shown and described.

19. In an air-ship, a wing provided with transverse slats and a canvas strip secured by one end to one of the said slats and by its sides to the frame-work of the wing, the other end of the said canvas strip being bagged directly under the next following slat, so that when the wing moves upward the bag is opened, but when the wing moves downward the bag closes onto the next following slat, substantially as shown and described.

399,784. LOCK FOR TRUNKS, &c. JOHANN J. SAGER, Berne, Switzerland. Filed Sept. 14, 1888. Serial No. 285,277. (No model.)

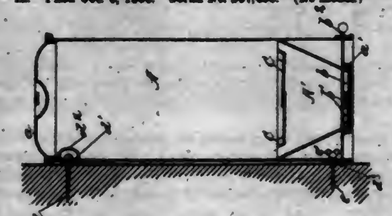


Claim.—1. The combination, with the trunk-lock, of an open-faced frame, A, and a hasp, C, pivoted thereto, said frame having an open lower edge for the insertion of an address-card, a spring within said frame for retaining the address-card in place, and projections upon the hasp engaging the lower edge of the frame A to prevent the removal of the address-card when the parts are locked, substantially as set forth.

2. The combination, with the trunk-lock, of a frame, A, having a groove or recess formed therein across the back, the hasp C, having longitudinal projections *e*, and a trunk-strap, D, having longitudinal openings at *d* and passing through the groove of the frame A and behind the hasp and between its projections, the staple of the hasp passing through one of the openings of the strap into the lock, substantially as set forth.

3. The combination, with the trunk-lock, of a frame, A, and the hasp C, pivoted thereto and having longitudinal projections *e* for stiffening the same and forming stops against the lower edge of the frame A, substantially as set forth.

399,785. FLOUR-BIN. FREDERICK SANDERSON, Prospect Park, Ill. Filed Oct. 6, 1888. Serial No. 287,403. (No model.)



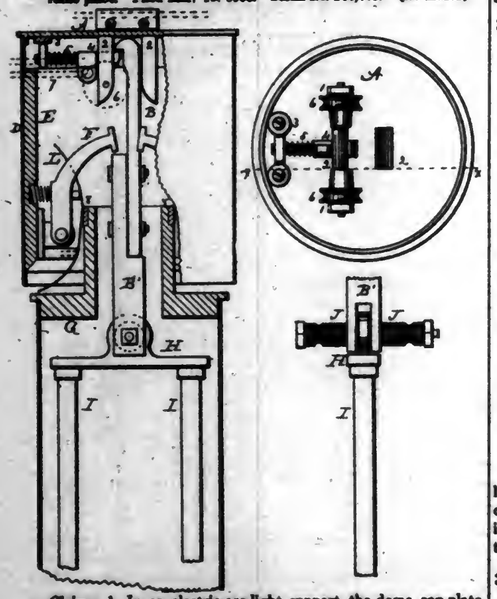
Claim.—1. The combination of a cylindrical bin, a hollow truncated cone secured within the bin near its base, a sleeve secured horizontally in the bottom of the cone, an open-work vibrator placed on the sleeve having a handle extending beyond the bin, cross-pieces

secured within the bin a short distance above the cone, a round-headed screw and a screw-threaded nail having a thumb-piece passing through a side of the cylinder, respectively near its upper and lower ends, and a section of strap-iron soldered to the outside of the bin near said nail at right angles to the longitudinal axis of the bin and having its outer surface plane, substantially as and for the purposes specified.

2. The combination of a flour-bin, A, formed with the holes d' and d^3 in its side in a line parallel with its longitudinal axis, the cap d^3, secured to the side of the bin to cover the hole d' and being made with a lateral diameter greater than that of the hole, the round-headed screw d, having its head enter said hole, the screw-threaded nail e, made with the thumb-piece e' and passing through the hole d^2 from within the bin, the hollow truncated cone A', secured in the bin near its lower end, the sieve b, secured in the cone at its bottom, and the vibrator b', made with the handle b^2 and placed on the sieve, substantially as and for the purposes specified.

399,786. ELECTRIC-LIGHT SUPPORT.

BENJAMIN SCHARDT and GIDEON JONES, Dayton, Ohio, assignors of one-third to John B. Fletcher, same place. Filed Mar. 19, 1888. Serial No. 267,773. (No model.)



Claim.—1. In an electric-arc-light support, the dome cap-plate A, having lugs 2 and 3, holding the spring-actuated catch 4, in combination with a shouldered arm-support attached to the top of an arc lamp to support the same in an electric circuit formed through the connective parts of said dome, substantially as set forth.

2. In an electric-arc-light support, the dome cap-plate A, with supporting-lugs to retain a horizontally-sliding catch held in a locking position by a spiral spring, which surrounds the rear part of said catch, to engage a supporting-arm attached to an electric-arc lamp, substantially as set forth.

3. In an electric-arc-light support, the dome-plate having lugs 2 2, with rounded ends, to guide the arm attached to an arc lamp, thereby engaging the spring-actuated catch held in said lugs, substantially as set forth.

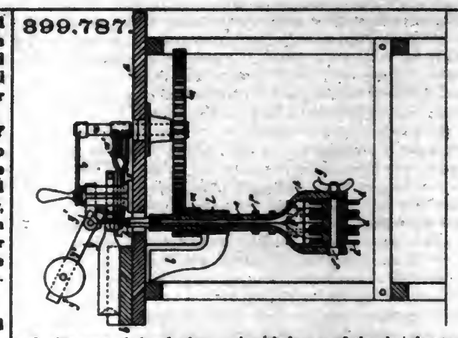
399,787. MACHINE FOR WIRING BOTTLES.

ALWIN SCHRADER and OTTO STURM, Dessau, Anhalt, Germany. Filed July 11, 1888. Serial No. 279,680. (No model.)

Claim.—1. A machine for wiring bottles, comprising a revolving wire-supply, c, having the twisting-head A, the tongs $y\,y'\,y^2\,y^3$, for holding the wires so arranged that some of the wires may be passed around the neck of the bottle, while other wires may be passed over the cork, and the shearing-tongs x, all substantially as and for the purpose set forth.

2. In a machine for wiring bottles, the combination of the revolving wire-supply c, having the twisting-head A, the treadle e, pivoted at i, and connected by means of link r and lever q to the wire-supply, and the tongs $y\,y'y^2y^3$, all substantially as and for the purpose set forth.

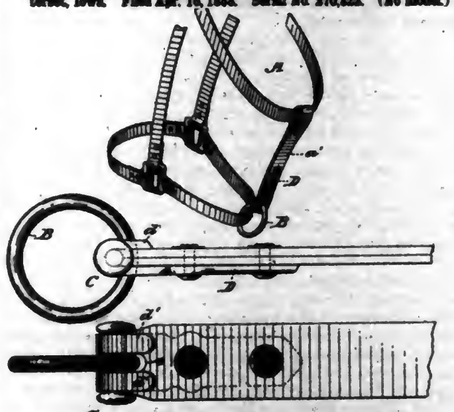
3. In a machine for wiring bottles, the combination of wire-supply c, tongs y, shearing-tongs x, and revolving head A, substantially as set forth, with crank o, wheels n m, to turn the hollow spindle c,



and with arms $r'\,r'$ and pins $w\,w'$, with legs x of the shearing-tongs, to cut off the twisted wire, all substantially as described.

399,788. HALTER BOLT-CLIP.

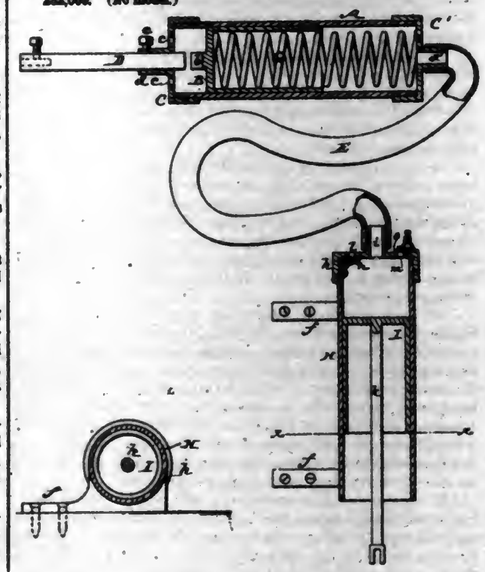
CHRISTIAN C. SCHWABE, Winterset, Iowa. Filed Apr. 16, 1888. Serial No. 270,822. (No model.)



Claim.—The combination, with the clip, bifurcated and bent into hooks at one end, of the ring and headed bolt secured in the bifurcated and hooked portion of the clip, and the bifurcated strap having the ends of the bifurcated portion setting well up against the bolt, to prevent rattling and wear, substantially as specified.

399,789. PNEUMATIC DEVICE FOR TRANSMITTING POWER.

WILLIAM G. SCOTT, Startville, Miss. Filed Aug. 6, 1888. Serial No. 282,060. (No model.)



Claim.—In a pneumatic device for transmitting power, the combination, with a fixed air-compressing cylinder and its piston, of a loose cylinder, a flexible tube or hose connecting the latter in its rear with the fixed compressing-cylinder, a spring-controlled piston within the loose cylinder provided with a head-piece or hammer-head on its front face, a bar or device connected with the forward end of the loose cylinder and adapted to be struck by the head-piece of the piston in the loose cylinder, and spring-controlled air inlet and outlet valves applied to the compression end of the fixed cylinder, substantially as specified.

399,790. MEAT-CUTTER.

ABEL SHEPARD, Plainville, assignor to the Peck, Stow and Wilcox Company, Southington, Conn. Filed Aug. 1, 1888. Serial No. 281,984. (No model.)



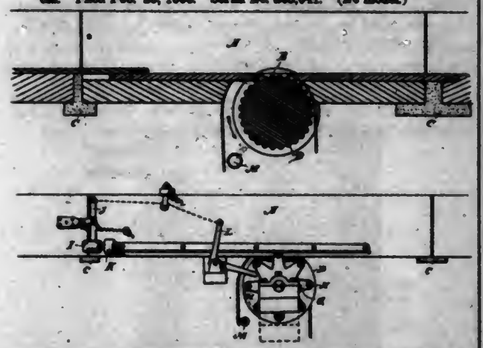
Claim.—1. In a meat-cutter having a perforated plate and knives in contact with said plate and a case provided with stationary forcing-ribs, the rotary forcing device whose ribs and core gradually thicken toward the discharge end, while the spaces between its forcing-ribs gradually diminish toward the discharge end of the case and substantially vanish at their junction with the perforated plate, substantially as described, and for the purpose specified.

2. In a meat-cutter having a case, stationary and moving forcing-ribs, and a rotatory perforated plate, a cylindrical flange, e, at the discharge end of the case, and the separately-formed ring C, fitted within said flange and having the knives c on one side of said ring for contact with the perforated plate, substantially as described, and for the purpose specified.

3. In a meat-cutter having a case provided with stationary forcing-ribs and knives at the discharge end of said ribs, a forcing device within the ribs of the case, and a perforated plate at the end of said forcing device whose perforations are outside the greatest diameter of said forcer, while the inner face of said perforated plate and perimeter of said forcer meet each other at an angle, substantially as described, and for the purpose specified.

399,791. CONCENTRATOR.

FREDERICK SLETCHER, San Francisco, Cal. Filed Feb. 23, 1888. Serial No. 265,041. (No model.)



Claim.—1. A concentrator comprising a converging sluice or flume having an independent or movable section in its length, inverted-T-shaped springs or cushions between the ends of said section and the adjacent ends of the flume or sluice, whereby they serve as rests and elastic joints, a transverse opening in the bottom of the movable section, a drum or roller revolving with its upper periphery in said opening, and means for imparting an end motion to said section, substantially as herein described.

2. A sluice or flume having an independent movable section, a transverse opening, and a drum rotated with its upper surface within this opening, in combination with ⊥-shaped cushions at the ends of the movable section and serving as rests and elastic joints, a hammer or hammers and mechanism for operating the same, and lugs upon the side of the movable flume-section upon which the hammers fall when released, substantially as herein described.

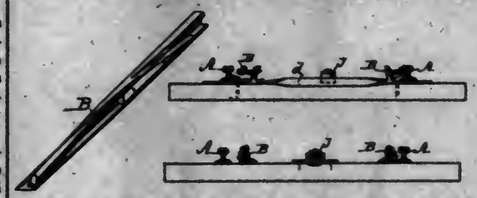
3. An independent movable flume-section having the transverse opening, a drum revolving with its upper periphery within this opening, a toothed wheel or wheels, and a lever operated by the teeth, in combination with yielding ⊥-shaped cushions at the ends of the movable sections, serving as rests and elastic joints, the hammer or hammers connected with the lever, and a lug or lugs upon the side of the movable flume-section, upon which the hammers fall, so as to give blows in the direction of the downward flow of the pulp or water, substantially as herein described.

4. A flume or sluice having a movable section interposed in its length, in combination with inverted-T-shaped elastic cushion-rests interposed between the ends of the movable and stationary portion of the flume, whereby a tight but elastic joint is formed, substantially as and for the purpose described.

5. The flume having the movable interposed section provided with lugs, ⊥-shaped elastic cushions at the ends of the movable section serving as rests and elastic joints, a transverse slot or opening in the bottom of the movable section, and the drum revolving with its upper periphery within this opening, in combination with the hammer or hammers and operating mechanism whereby the hammers strike upon said lugs and produce a jarring motion in the direction of its length, and the water-tube with its jets discharging upon the drum, substantially as described.

399,792. RAILWAY-SWITCH.

SHAW STEWART, Stuart, Iowa, assignor of two-thirds to J. G. Crockett, same place, and Shaw Stewart, Sr., Chicago, Ill. Filed May 17, 1887. Serial No. 238,555. (No model.)

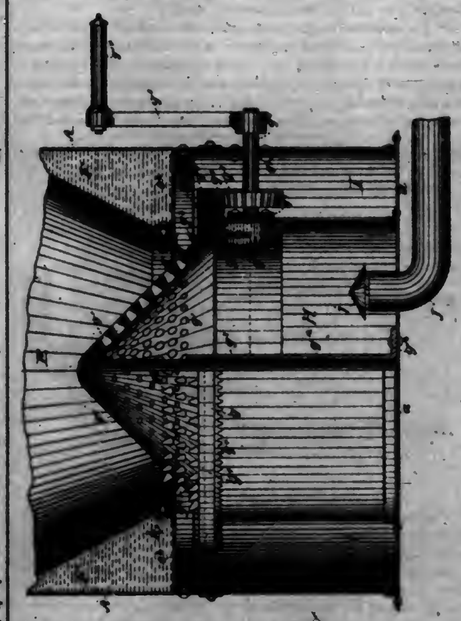


Claim.—1. A twisted switch-rail having a groove in the side of its ball and a tapering bar fixed to its web to produce an inclined plane, for the purposes stated.

2. In a railway-switch, the combination of twisted switch-rails with fixed track-rails, for the purposes stated.

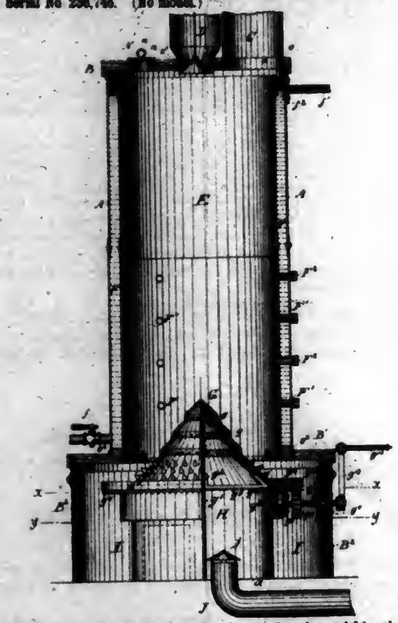
399,793. GAS-PRODUCER.

WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed Dec. 31, 1888. Serial No. 293,112. (No model.)



Claim.—The herein-described gas-producer with a bottom having narrow openings therein arranged in radial rows and mounted on a post which is supported in a housing, a cylindriform casing beneath the bottom forming an air or steam and air chamber, a pipe extending upward into said chamber, and means, as described, for rotating said bottom, substantially as and for the purposes set forth.

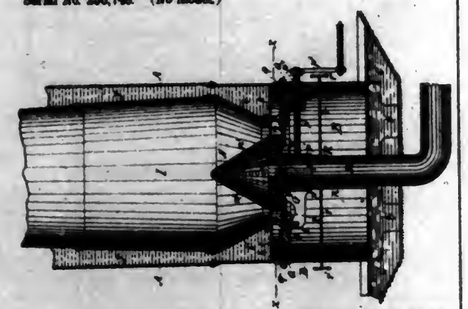
399,794. GAS-PRODUCER. WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed May 2, 1887. Serial No. 236,746. (No model.)



Claim.—1. A gas-producer having a chamber within the ash-chamber thereof and a receptacle formed around the upper exterior portion of the casing of said chamber, in combination with a blast-pipe extending upward into said chamber, a bottom with a flange projecting into said receptacle and forming a seal, a post supporting said bottom, and mechanism, as described, for rotating said bottom substantially as and for the purposes set forth.

2. The combination, in a gas-producer, of a conical-shaped bottom having radial rows of small openings therein and a flange formed therewith, a vertical post for supporting said bottom, a chamber with a channel formed around the upper portion of the casing of said chamber, a pipe extending into said chamber, and mechanism, as described, for rotating said bottom, substantially as and for the purposes set forth.

399,795. GAS-PRODUCER. WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed May 2, 1887. Serial No. 236,748. (No model.)



Claim.—1. The combination, in a gas-producer, of a stationary conical-shaped device having radial rows of narrow perforations therein, a blast-pipe formed integral with said device and supporting the same in position, a bracket secured to said pipe having guide-rollers journaled in said brackets, a circular bottom with points arranged around the top surface of said bottom, and means, substantially as described, for rotating said bottom, substantially as and for the purposes set forth.

2. The combination, in a gas-producer, of a conical-shaped stationary device having radial rows of narrow openings therein, a blast-pipe secured to said device and supporting the same in position, a circular depending flange formed with the base of said device, a bracket secured to said pipe having supporting and guide rollers, a circular bottom with an inner vertical flange mounted on said bracket and guided by said rollers, and means, as described, for rotating said bottom, substantially as and for the purposes set forth.

3. The combination, in a gas-producer, of a conical-shaped device having a series of narrow V-shaped openings therein, a blast-pipe secured to said device and supporting the same in position, a bracket having guide-rollers journaled thereto and said bracket secured to said pipe, a circular bottom with radial rows of points cast therewith, rollers journaled in brackets secured to the inner edge of said bottom, and means, as described, for rotating said bottom, substantially as and for the purposes set forth.

4. The combination, in a gas-producer, of one or more scrapers secured to the base-plate of the producer, a stationary conical-shaped device having radial rows of narrow openings therein, a blast-pipe formed integral with said device and supporting the same in position, a bracket with horizontal arms and to which guide-rollers are journaled, a circular flat bottom, and means, as described, for rotating the same, substantially as and for the purposes set forth.

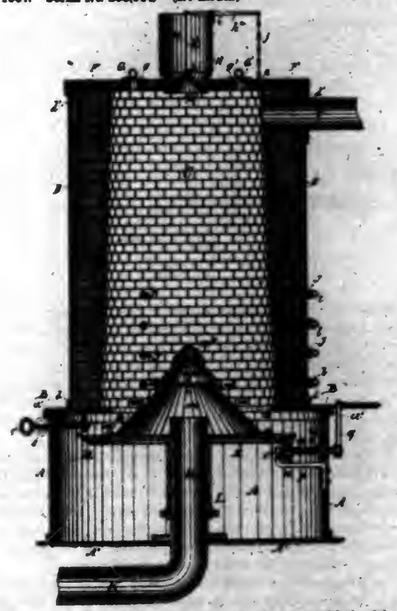
5. The combination, in a gas-producer, of a conical-shaped stationary device having radial rows of narrow openings therein and a blast-pipe formed integral with said device and supporting the same in position, a bracket having rollers journaled thereto and said bracket secured to said pipe, a circular solid bottom having radial rows, points cast with the same, means, as described, for rotating said bottom, and a series of points secured to the plate supporting the combustion-chamber and depending therefrom, substantially as and for the purposes described.

6. The combination, in a gas-producer, of a conical-shaped stationary device having radial rows of narrow openings therein, and a blast-pipe formed integral with said device and supporting the same in position, one or more dampers in said blast-pipe having rods and handles for opening and closing said dampers, substantially as and for the purposes set forth.

7. The combination, with a gas-producer mounted in a receptacle, C, for containing water, of a blast-pipe provided with a stationary device having rows of narrow openings therein and extending upward through said receptacle into the combustion-chamber thereof, a bracket secured to said pipe having rollers journaled thereto, a circular solid bottom mounted thereon, and means, as described, for rotating said bottom, substantially as and for the purposes set forth.

8. In a gas-producer, the stationary device N, formed integral with the conduit M, the bracket O, rigidly secured to said conduit, the solid bottom P, mounted on said bracket, and means, as described, for rotating the same, and the curved scrapers T, substantially as and for the purposes set forth.

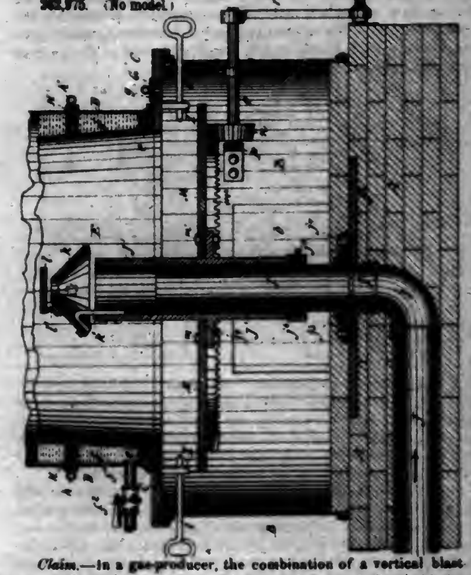
399,796. GAS-PRODUCER. WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed May 21, 1887. Serial No. 238,964. (No model.)



Claim.—1. In combination, a gas-producer provided with a vertical blast-pipe having a flange which rigidly supports said pipe in the base of the ash-chamber thereof, a collar supported in position on said pipe by means of screws, a bottom with a sleeve fitting onto said pipe, and means, as described, for rotating said bottom, substantially as and for the purposes set forth.

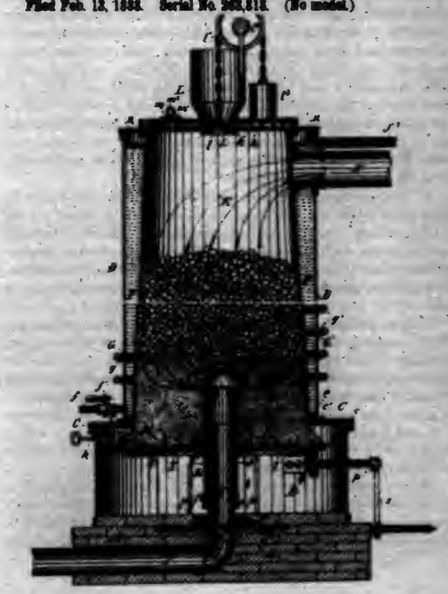
2. The combination of a gas-producer provided with a rotatable bottom, depending eyes r, and agitating-bars s, supported in said eyes above said bottom, said bars operating to cause accumulating non-combustible material in the combustion-chamber of the producer to be ground downward faster in one place than another over said bottom, and means, as described, for revolving said bottom, as shown and described, and for the purposes set forth.

399,797. ROTARY BOTTOM OR GRATE APPLICABLE TO FURNACES, &c. WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed Feb. 4, 1888. Serial No. 262,975. (No model.)



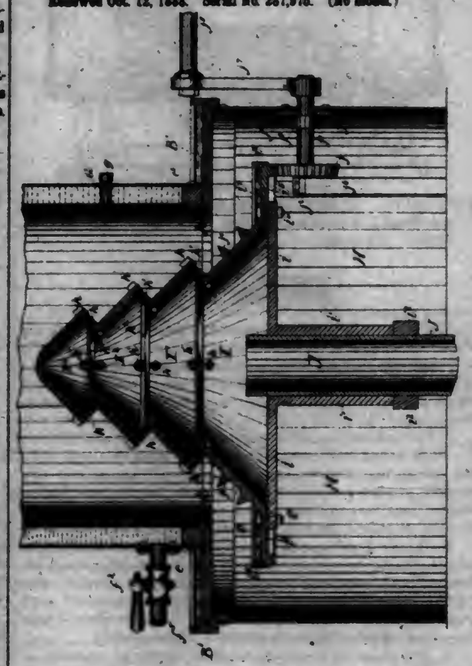
Claim.—In a gas-producer, the combination of a vertical blast-pipe, a collar held to place on said pipe, a sleeve encircling said pipe and having a flange, a solid bottom rigidly secured to the flange of said sleeve, and means, as described, for rotating said bottom to cause non-combustible material supported on said bottom to be discharged over the periphery thereof, substantially as shown and described.

399,798. METHOD OF MAKING GAS. WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed Feb. 13, 1888. Serial No. 263,818. (No model.)



Claim.—The method of making gas, which consists in placing and then maintaining a deep bed of ash under a bed of incandescent fuel and blasting through the ash and fuel, substantially as and for the purposes set forth.

399,799. GAS-PRODUCER. WILLIAM J. TAYLOR, Chester, assignor to the Taylor Gas Producer Company, Camden, N. J. Filed May 2, 1887. Renewed Oct. 12, 1888. Serial No. 287,976. (No model.)



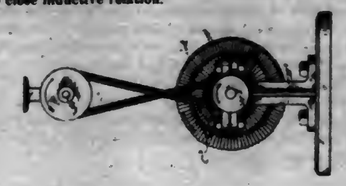
Claim.—1. The combination of a bottom composed of two or more frustums of cones, sleeves between the frustums, bolts inserted through the sleeves and frustums, a plate having a depending sleeve connected with the lower frustum, a blast-pipe on which said bottom is mounted, and means, as described, for rotating said bottom, substantially as and for the purposes set forth.

2. The combination of a bottom composed of two or more frustums and a hood, sleeves and bolts between said frustums and hood, a base-plate attached to the lower frustum, a blast-pipe extending upward into said bottom, a collar adjustable on said pipe, and mechanism, as described, for rotating said bottom, substantially as and for the purposes set forth.

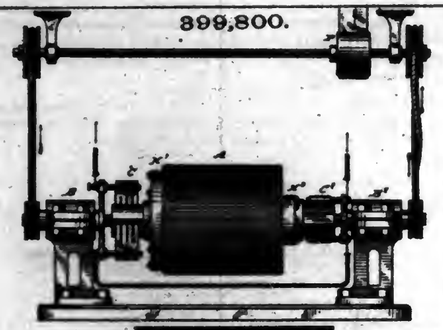
3. In a gas-producer, the combination of a bottom consisting of two or more hollow frustums of cones and a hood, bolts inserted through sleeves between the frustums and hood, a base-plate secured to the lower frustum with a sleeve, a blast-pipe extending upward through said sleeve, and a collar secured to said pipe, all arranged for supporting fuel and permitting of the admission of the air or steam and air directly into the combustion-chamber, and means, as described, for rotating said bottom, and thereby permitting of the discharge of accumulating non-combustible material over the periphery of the bottom while the producer is in operation.

399,800. DYNAMO-ELECTRIC MACHINE. ELIHU THOMSON, New Britain, Conn., assignor to the Thomson-Houston Electric Company, of Connecticut. Filed May 25, 1888. Serial No. 94,062. (No model.)

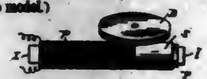
Claim.—The combination, substantially as described, with two systems of coils, each system wound over a suitable core or cores and revolving in opposite directions, of a commutator for each system and a stationary bridge-piece or pieces of iron for bringing the two systems into close inductive relation.



399,800.



399,801. ALTERNATE-CURRENT INDUCTOR. ELIHU THOMSON and MERLE J. WEBSTHAM, Lynn, Mass. Filed Aug. 3, 1888. Serial No. 282,376. (No model.)



Claim.—1. The combination, with a pulsating or alternating inductor, of a modifier or retarder of the inductive action applied in the field of said inductor for causing a lagging of the pulsations in a portion of the field or fields of induction, thus producing a compound field of induction having inductive waves or pulsations displaced in phase.

2. The combination, with an alternating-current coil or conductor, of a closed-circuit conductor subjected to the action of a part of the field of induction of said coil or conductor and concentric or substantially concentric with the magnetic axis, whereby the field of induction may have adjoining parts whose phases of alternation are displaced, as and for the purpose described.

3. The combination, with an alternating inductor consisting of a coil or conductor traversed by alternating currents, of a locally-applied modifier or retarder of the alternations placed in the field of action of said inductor for producing a compound field having sets of alternations displaced in phase, as described, and an armature in the influence of both phases of alternations of said compound field.

4. As a means for producing a field of electric or magnetic induction having two sets of alternations whose respective phases are displaced, a coil traversed by alternating electric currents and a closed-circuit conductor concentric with the magnetic axis or extension of the magnetic axis in said coil and applied to the part thereof over which the portions of field having its alternations retarded are to be produced.

5. The combination, with an alternating-current coil, of a closed induced circuit applied to a part of the magnetic field or electric field of induction of said coil and concentric with the magnetic or extension of the magnetic axis, and an armature in the influence of the parts of field thus produced and which have alternations displaced in phase.

6. The combination, with an alternating-current coil and an induction-retarder concentric with the magnetic axis or extension of magnetic axis for said coil, of a closed-circuit armature mounted so as to be within the inductive field or extension of the inductive field of the retarder and the coil.

7. The combination, with the alternating inductor, of two retarders each consisting of a closed inductive circuit, an armature, and means for closing either inductive circuit at will to determine the direction of revolution of the apparatus.

8. A single alternating-current coil or conductor having adjoining fields of induction, electric or magnetic, displaced or differing in phase, in combination with an armature acted upon by portions of said field differing in phase.

9. The combination, with an alternating coil having an iron core, of a closed induced circuit concentric with said core or extension thereof and a closed-circuit armature in the field of said induced-circuit conductor as well as the field of a free portion of the alternating-current coil.

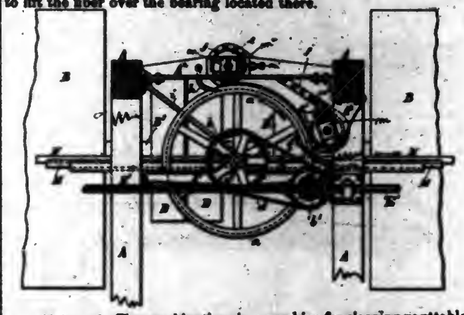
10. The combination of an alternating-current coil, a closed-circuit conductor in which alternations are set up directly by said coil, and an armature exposed simultaneously to the alternating inductive actions whose alternations are the resultant, respectively, of the action of the alternating coil and of the closed-circuit conductor in which said coil induces alternations.

11. The combination, with the alternating inductor having a closed-circuit modifier, of the closed-circuit armature and means for changing the relation of the closed-circuit modifier and armature, as and for the purpose described.

12. The combination, with an alternating inductor, of a local phase distorter or modifier and an armature subjected to the simultaneous action of the inductor and the distorter or modifier.

399,802. MACHINE FOR CLEANING VEGETABLE FIBER. THEOTEO VILLARREAL, Merida, Yucatan, Mexico. Filed Sept. 20, 1888. Serial No. 286,729. (No model.)

Brief.—One end of the leaf having been cleaned by the first machine, the other end is guided by a finger into the nip between a grooved wheel and chain, which draw the leaf through the carrying-chains, which for the proper interval relax their grip upon the leaf. The leaf being carried along, an inclined arm engages the bight of the leaf between the wheel and carrying-chains and throws the leaf over upon guide-arms, when the end is released from the grooved wheel and its chain, and by said arms the uncleaned end is directed into the second machine. The actuating-pulleys of the carrying-chains have equal speeds, and a looped wire is placed at the end of the machine to lift the fiber over the bearing located there.



Claim.—1. The combination, in a machine for cleaning vegetable fiber, with the scrapers and traveling chains or conveyor, of the grooved wheel *a* and devices for rotating said wheel, and an endless chain, *f*, moved around a portion of the circumference thereof, for grasping and elevating the stalk or leaf, and with curved or inclined arms for engaging and turning over the leaf, substantially as set forth.

2. The combination, in a machine for cleaning vegetable fiber, with the scraping-wheels and endless chains or conveyers, of the grooved wheel *a* and devices for rotating said wheel, the endless chain or conveyer *f*, engaging the grooved wheel *a* for a portion of its circumference, said wheel and conveyer moving in line with and at one side of the main chains or conveyer, a curved arm or finger, *g*, for guiding the stalk or leaf between the grooved wheel and chain *f*, a downwardly-inclined arm, *i*, the segmental scraping-board D^3, and arms connected to one side of the same and adapted to receive the unfinished end of the stalk or leaf as it falls, substantially as and for the purposes set forth.

3. The combination, in a machine for cleaning vegetable fiber, with the scraping-wheels and endless chains or conveyers, of the grooved wheel *a* and devices for rotating said wheel, the endless chain or conveyer *f*, engaging the grooved wheel *a* for a portion of its circumference, said wheel and conveyer moving in line with and at one side of the main chains or conveyer, a curved arm or finger, *g*, for guiding the stalk or leaf between the grooved wheel and chain *f*, a curved finger, *h*, for removing the same from the grooved wheel, a downwardly-inclined arm, *i*, the segmental scraping-board D^3, and the arms *k*, extending out from one side of the same and adapted to receive the unfinished end of the stalk or leaf as it falls, substantially as and for the purposes set forth.

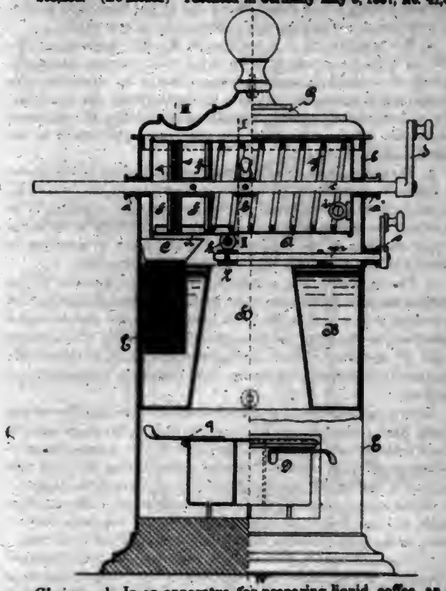
4. The combination, with the main frame A, the cross-frame A^2, and bracket A^3, of the endless chain or conveyer *f*, rollers *e f* for the same, sliding blocks, screw-bolts, and springs forming adjustable bearings for the shafts of said rollers, the grooved wheel *a*, supporting-frames and bearings for the shaft of said wheel, and mechanism, substantially as specified, for operating said wheel, substantially as set forth.

5. In a machine for cleaning vegetable fiber, the combination, with the scraping-wheels B, of the shaft B' for both of said scrapers, the pulleys D and band H, for operating said scrapers, the pulleys B^2 B^3, the belt G, the shafts F E E' E^2, and the bevel-wheels connecting the ends of said shafts, the shafts *c* and *d* the toothed wheels *b b'*, and chain *d*, the grooved wheel *a*, and the endless chains or conveyers N, M, and *f*, and their respective pulleys, and the arms *g*, *h*, *i*, and *k*, the parts being connected and operated in substantially the manner and for the purposes herein shown and described.

6. In a machine for cleaning vegetable fibers, the combination, with the conveying-belts L and the two scraping-wheels B and their segmental scraping-boards, of the endless chains or conveyers N M, passing entirely through the length of the double machine, the pulleys I, I^1, and K, around which said chains pass, and mechanism, substantially as shown and described, for revolving said pulleys at a uniform speed, substantially as set forth.

7. In a machine for cleaning vegetable fibers, the combination, with the scraping-wheel and endless chains or conveyers and their pulleys, of the bent or loop wire *e*, upon which the cleaned fiber is raised and turned over after being scraped, substantially as set forth.

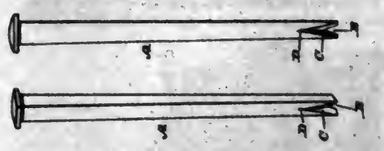
399,803. APPARATUS FOR PREPARING LIQUID COFFEE. CARL WAGNER, Dresden, Saxony, Germany. Filed Mar. 23, 1888. Serial No. 268,232. (No model.) Patented in Germany May 3, 1887, No. 41,642.



Claim.—1. In an apparatus for preparing liquid coffee, an inclosing-case, a drum for roasting the green berries, a grinding device in connection with the drum, a boiler below the grinding device with a passage thereto for delivering the ground coffee into the water, a heating device below the boiler, and a flue leading to the roasting-drum, substantially as described, for the purpose specified.

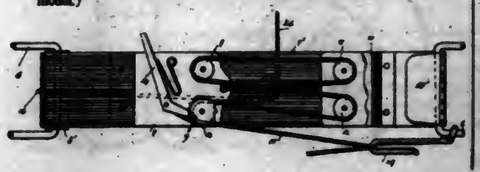
2. In an apparatus for preparing liquid coffee, an inclosing-case, a drum for roasting the green berries, a grinding device in connection with the drum, a boiler below the grinding device, a strainer within the boiler having its upper end below the grinding device, a passage from the grinding device to the said strainer, a heating device below the boiler, and a flue leading to the drum, substantially as described for the purposes specified.

399,804. NAIL. ADAM S. WALL, Oakland, Cal. Filed Jan. 2, 1889. Serial No. 295,215. (No model.)

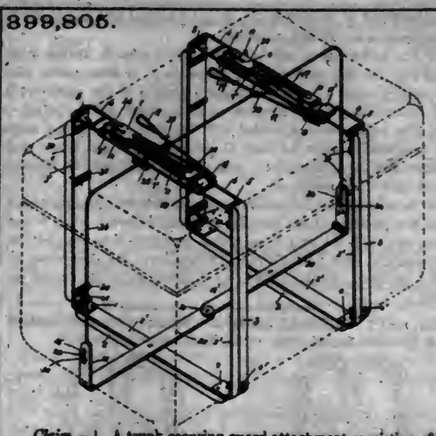


Claim.—A nail the point of which has a central V-shaped notch diverging from the apex so as to form two cutting-edges at the end, and having a longitudinal converging channel extending up the sides of the nail upon each side of the central apex, substantially as and for the purpose herein described.

399,805. TRUNK-SECURING GUARD ATTACHMENT. JOSEPH WARE, Brooklyn, N. Y. Filed Nov. 14, 1888. Serial No. 290,890. (No model.)



399,805.



Claim.—1. A trunk-securing guard attachment consisting of battens connected together to extend over a trunk, and blocks and tackles connecting two of the battens together for tightening and securing the battens to the trunk, substantially as shown and described.

2. A trunk-securing guard attachment consisting of battens connected together to extend over a trunk, with elastic cushions upon their inner surface to bear against the trunk, and blocks and tackles connecting two of the battens together for tightening and securing the battens to the trunk, substantially as shown and described.

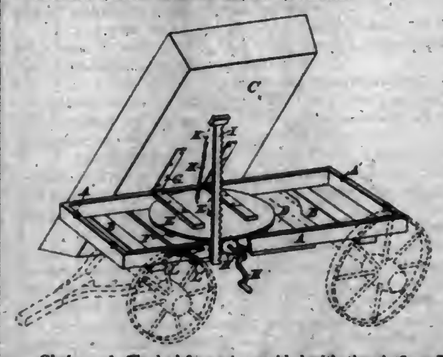
3. A trunk-securing guard attachment consisting of folding battens hinged together to extend over a trunk, a bar connecting the battens together, and blocks and tackles connecting two of the battens together for securing and tightening the battens and their connecting-bar on a trunk, substantially as specified.

4. In a trunk-securing guard attachment, the combination, with battens 1 and 3, hinged to batten 2, and having loops 6 at their upper end, of a tackle consisting of a block, 10, with horizontal pulleys 11 and 12, a block, 7, with horizontal pulleys 8 and 9, and a pawl, 14, engaging a ratchet on pulley 9, the blocks 7 and 10 being connected by a strap, 7', extending over one of the loops 6, and the bracket 10 having a hook, 10', engaging the other loop 6, with a rope, 17, connected to block 7, and passing over pulleys 11, 8, 12, and 9, substantially as described.

5. In a trunk-securing guard attachment, battens connected together with elastic cushions on their inner surface, and means for securing the battens to a trunk, substantially as shown and described.

6. In a trunk-securing guard attachment, a block and tackle consisting of a pair of blocks having pulleys, and a tackle connecting the blocks and passing over the pulleys, one of the pulleys having a ratchet engaging a pawl on the block, the pawl having a projection which bears against the tackle and prevents the point of the pawl from slipping past the teeth of the ratchet, substantially as described.

399,806. COAL-WAGON. HENRY P. WAYMAN, Trenton, N. J. Filed Dec. 4, 1888. Serial No. 292,734. (No model.)



Claim.—1. The bed-frame A, provided with the platform D, in combination with the circular platform E, pivoted upon said platform D and provided with the bearing-wheels F and bearing the body C, connected to said circular platform E by the hinges G, and the chain K, as shown and described.

2. The bed-frame A, provided with the catches L, having stops L', in combination with the body C, pivoted thereto by means of the

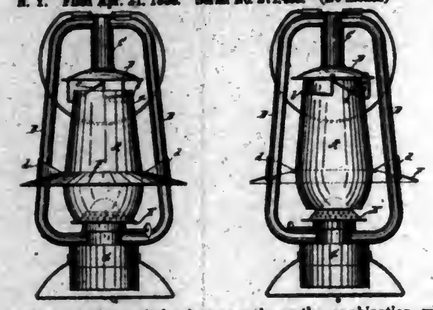
platforms D and E, pivot E', hinge G, and provided with the chain K, substantially as shown and described.

3. The bed-frame A, provided with the catches L, having stops L', and also provided with the bearing-wheels A', in combination with the body C, pivoted to such bed-frame by means of the platforms D and E, pivot E', and hinge G, substantially as shown and described.

4. The bed-frame A, provided with the catches L, having stops L', in combination with the body C, pivoted thereto, as shown and described, and the hoisting-bar I, gear-wheel H', and crank H, substantially as shown and described.

5. In combination, the bed-frame A, provided with bearing-wheels A' and the platform D, the circular platform E, having pivot E' and bearing-wheels F, the body C, connected by hinges G to the platform E, the chain K, with hooks K', the hoisting-bar I, the gear-wheel H', and the catches L, having stops L', all substantially as shown and described.

399,807. TUBULAR LANTERN. William Whitlaks, Brooklyn, N. Y. Filed Apr. 21, 1888. Serial No. 271,455. (No model.)

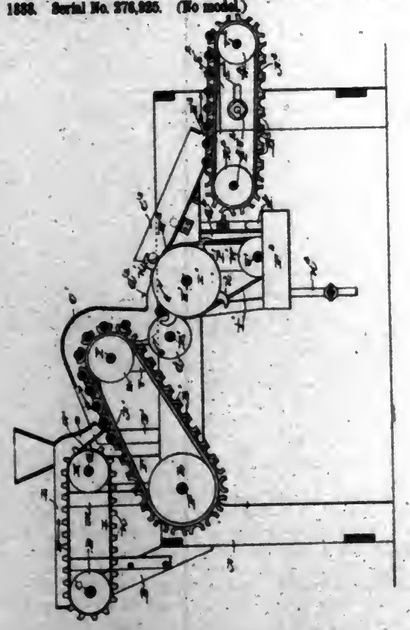


Claim.—1. In a tubular lantern or lamp, the combination, with the globe having a projection at top, of the two inclined ways secured to the dome, the said ways being separated from each other at the front and arranged to operate substantially as shown and described.

2. In a tubular lantern or lamp, the combination of an annular reflector surrounding the globe mounted upon the side tubes above the position of the flame and below the top of the globe, the oil-pot, and an open base applied on said oil-pot, substantially as and for the purposes explained.

3. In a tubular lantern or lamp, the combination of an annular reflector mounted upon the side tubes, contracted bottom plate, contracted oil-pot, and open base secured to the oil-pot, substantially as and for the purposes set forth.

399,808. MACHINE FOR DIPPING CIGARETTES. Charles H. Whitaker and Walter B. Whitaker, Durham, N. C. Filed June 13, 1888. Serial No. 276,925. (No model.)



Claim.—1. The combination, in a machine for dipping cigarettes, of the revolving disks G', the revolving drum I', in proximity thereto having the peripheral fingers K', and means, substantially as set forth, to apply the paraffine to the cigarettes while the same is revolving in contact with the drum and disks.

2. The combination of the revolving disks, the revolving drum in proximity thereto, whereby a cigarette fed to said drum and disks will be positively rotated by frictional contact with their moving surfaces, the trough or vessel to contain melted paraffine, and the endless belt working on a pulley in the contents of the said trough or vessel and passing over a pulley at one end of the drum and in contact with the revolving cigarette, substantially as described.

3. The combination, in a machine for dipping cigarettes, of the revolving disks, the revolving drum in proximity thereto, means, substantially as set forth, to apply melted paraffine to the cigarettes while the same are in succession revolving in contact with the drum and disks, and the conveyer having the holders B', to deliver the cigarettes in succession between the disks and the drum, substantially as described.

4. The combination, in a cigarette-dipping machine, of the revolving disks, the drum in proximity thereto and having the fingers K', and the inclined delivery-table having its upper end in proximity to one side of the revolving drum, and means, substantially as set forth, to apply paraffine to the cigarette while the latter is revolving in contact with the drum and disks, substantially as described.

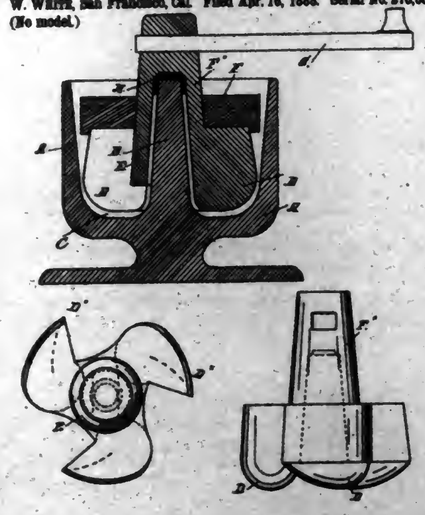
5. The combination, in a machine for dipping cigarettes, of the revolving drum I' and the revolving disks in proximity thereto, with the inclined delivery-table, the latter having its upper end arranged in proximity to the drum and being provided at one side with a groove or slot, F⁵, and the conveyer having the holders B', to deliver the cigarettes in succession between the disks and drum, substantially as described.

6. In a cigarette-machine, the combination of the paraffine trough or case having the surrounding case F³, whereby a steam-space is formed between said trough and said case F³, the steam-pipe communicating with said case, the drum or pulley having its lower side arranged in the trough, the revolving drum I', having the pulley L', the endless belt connecting said pulley with the pulley in the paraffine-trough, and the disks in proximity to one side of the drum and revolving in the same direction therewith, substantially as described.

7. The combination, with the disks and fingered drum arranged in proximity to each other and revolving in the same direction, of the conveyer having the holders B', to deliver the cigarettes in succession between the disks and drum, the inclined delivery-table having its upper end bearing against one side of the drum, and the endless belt or carrier A⁵, arranged below the lower end of the delivery-table, substantially as described.

8. The combination, in a machine for dipping cigarettes, of the disks and drum arranged in proximity to each other and revolving in the same direction, the pulley at one end of the drum, the paraffine-feeding belt passing over said pulley, the conveyer A', and the guide C', to deliver the cigarettes from the conveyer between the disks and the drum, and the gage-plates G² on opposite sides of the drum and pulley, substantially as described.

399,809. GRINDING AND AMALGAMATING MORTAR. George W. White, San Francisco, Cal. Filed Apr. 16, 1888. Serial No. 270,856 (No model.)

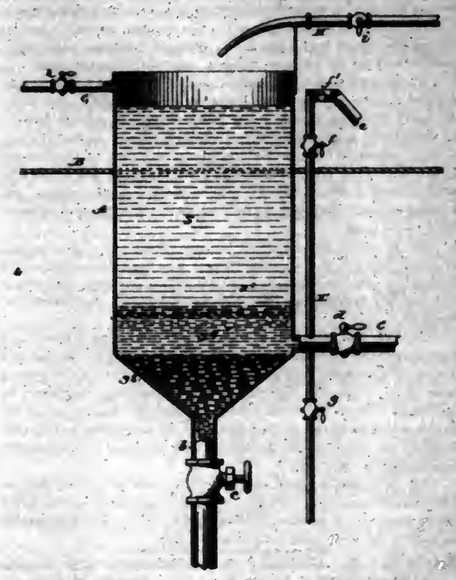


Claim.—1. In an ore grinder and amalgamator, the combination, with a mortar provided with an upright journal and an annular groove surrounding the base of said journal, of the triturating-muller having two or more pear-shaped grinding-faces with circulating channels or passages between them, journaled upon the journal of the mortar, and working in the groove thereof, as set forth.

2. In an ore grinder and amalgamator, the combination, with a suitable mortar, of a muller composed of two or more pear-shaped grinding-faces cast with wings or stirrers and connected by webs, whereby channels or ore-circulating passages are formed between the wings and underneath the webs, in the manner described.

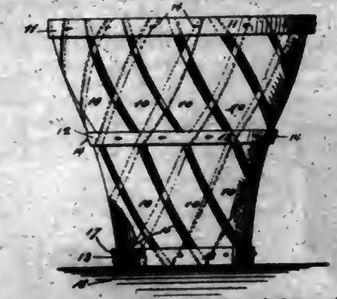
3. In an ore grinder and amalgamator, the combination of a mortar provided with an upright shaft or journal, a grinding and amalgamating muller rotating thereon, and the adjustable thimble for raising or lowering the muller, substantially as described.

399,810. RENDERING. Frederick Wetter, Allegheny, Pa. Filed Mar. 10, 1888. Serial No. 266,833. (No specimens.)



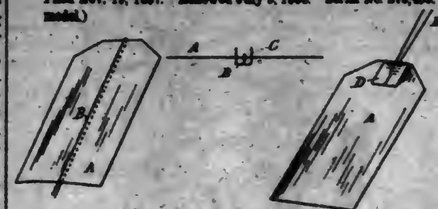
Claim.—In the process herein described of manufacturing neutral stock from crude animal fat, first reducing the fat to a pulp, then passing the same onto a body of heated water, next subjecting the fat to a stream of heated water from above, whereby the melting of the fat is completed, and slush, tissue, and foreign matters soluble in water are washed out of and removed from the fat, and subsequently, and after settling, drawing off the clear fat, essentially as set forth.

399,811. BASKET OR CARRIER. Isaac J. W. Adams, Laurel, Del. Filed Nov. 2, 1888. Serial No. 289,800. (No model.)



Claim.—A carrier comprising a body formed of two series of inner and outer oppositely-inclined crossing slats 10, the hoops 11 12, fastenings driven through said hoops and through the slats at their points of crossing, the bottom 15, the hoop 16 under it, the outer hoop, 13, the fastenings 17 driven through said hoop and lower overlapped ends of the slats into the bottom, and other fastenings driven through the hoop 13 and said overlapped lower ends into the inner hoop, 16.

399,812. SHIPPING-TAG. Frank R. Aldrman, Denver, Mich. Filed Nov. 19, 1887. Renewed July 9, 1888. Serial No. 279,490. (No model.)



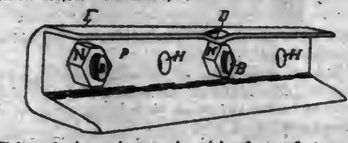
Claim.—1. The combination, with a tag, of a wire embracing the end of said tag and a staple securing said wire in place within the loops of the return-bends thereof upon opposite sides of the tag, thus forming double strands of the wire above the point of attachment, substantially as described.

2. In a tag, the combination of a tag, a wire embracing the end of said tag, a staple clinched through the tag and embracing the wire within the return-bends thereof, and a re-enforcing tab, substantially as described.

3. In a shipping-tag, the combination of the tag A, attaching-wire B, staple C, and a re-enforcing tab, D, the parts being constructed, arranged, and operating substantially in the manner and for the purposes described.

4. The combination, with the blank of a shipping-tag, of an attaching wire or cord formed in one piece, with a central loop adapted to embrace the edge of the blank to form means for securing it thereto without passing it through the blank, forming double strands of the wire upon each side of the blank, and means, as the staple C, for securing the wire or cord to the blank, substantially as described.

399,813. NUT-LOCK. Homer H. Allen, Hanover, assignor of one-half to Julius C. Brown, Los Angeles, Cal. Filed Oct. 16, 1883. Serial No. 288,665. (No model.)



Claim.—1. As an improved article of manufacture, a fish-plate provided with a pliable laterally-extending flange adapted to be bent down upon the nut to be locked.

2. In combination with the rails, the fish-plates applied thereto, a bolt extending through the plates and rails and provided with a nut, and a pliable laterally-extending flange projecting from the upper edge of one of the plates and adapted to be bent down upon the nut, all substantially as shown.

399,814. SULKY-PLOW. Charles Anderson, South Bend, Ind., assignor to the South Bend Iron Works, same place. Filed Nov. 1, 1888. Serial No. 289,736. (No model.)

Claim.—1. In a sulky-plow, the combination, with a sectional crank-axle, and wheels and plow-beam secured to the axle, of lever mechanism for moving the wheels forwardly and rearwardly relative to the point of attachment of the beam to the axle and for inclining one of said wheels, substantially as set forth.

2. In a plow, the combination, with a beam, an axle, and wheels, of a lever for moving one or both of the wheels relative to the axle and regulating the inclination of one wheel.

3. In a plow, the combination, with a beam, an axle, and wheels, of a hand-lever for moving one or both of the wheels to raise or lower the plowshare and change the inclination of one wheel, and a foot-lever adapted to act in conjunction with the hand-lever.

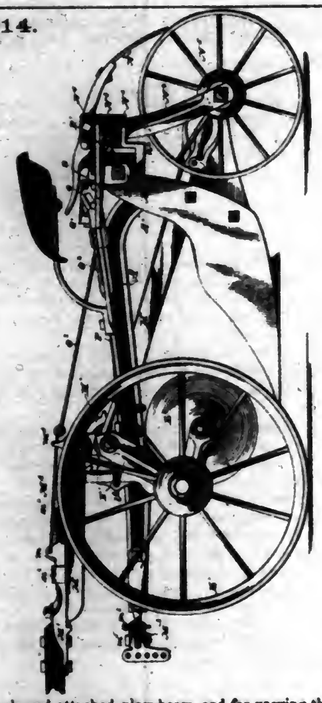
4. In a plow, the combination, with a beam, a crank-axle, and wheels, of a single hand-lever for adjusting the crank-axle, whereby the plow is raised and lowered and also for changing the angle of the furrow-wheel relative to the axle.

5. In a plow, the combination, with a crank-axle made in sections, a box mounted thereon and carrying the plow-beam, and wheels mounted on the ends of the axle, of a hand-lever rigidly secured to one section of the axle and detachably connected to the other section, and devices for locking the lever to the box, substantially as set forth.

6. In a plow, the combination, with a box and an axle mounted thereon, of a saddle adapted to be adjusted laterally on the box, and a plow-beam adjustably secured to the saddle, substantially as set forth.

7. In a plow, the combination, with a crank-axle, a saddle adapted to be adjusted laterally thereon, a plow-beam secured to the saddle and adapted to be adjusted longitudinally therein, and wheels on the ends of the crank-axle, of a single hand-lever for raising and lowering

899,814.



the crank-axle and attached plow-beam and for varying the inclination of the furrow-wheel.

8. In a plow, the combination, with a beam, a swivel caster-wheel, and adjustable tongue, of means for locking said wheel and tongue in alignement with each other and means for breaking the locks simultaneously, substantially as set forth.

9. In a plow, the combination, with a beam, a swivel caster-wheel at one end and a jointed tongue at the other, of devices for locking said wheel and tongue in alignment, and a link connecting said devices whereby the two locking devices may be drawn simultaneously.

10. In a plow, the combination, with a crank-axle made in sections and wheels journaled on said axle, of foot and hand levers rigidly secured to one of said sections, the hand-lever being detachably connected to the other section.

11. In a plow, the combination, with a sectional crank-axle and a box mounted thereon, of a saddle adjustably secured to the box and a plow-beam adjustably secured to the saddle.

12. In a plow, the combination, with a beam, a sectional crank-axle, a box thereon, and saddle for securing the beam to the box, of a sector fixed to the box, a sector loosely mounted on one section of the axle and connected to the other, and a lever secured to one section of the axle and adapted to be detachably connected to the loose sector.

13. In a plow, the combination, with a crank-axle, of a box journaled thereon, a saddle adapted to be adjusted laterally on the box, and a plow-beam adapted to be adjusted longitudinally in the saddle, the saddle, box, and beam being secured together by one set of clips or bolts, substantially as set forth.

14. In a plow, the combination, with an axle and a box thereon, of a laterally-adjustable saddle secured on the box, a sod-cutter carried by the saddle, and a plow-beam secured to the saddle, substantially as set forth.

15. In a plow, the combination, with an axle, a box, a saddle adjustably secured thereto, and a beam secured to the saddle, of a tongue-supporting arm pivoted to the saddle and a tongue-socket pivoted to said arm, and means for locking the arm and socket together.

16. In a plow, the combination, with a beam, a saddle having lugs on its lower face to straddle the beam and admit of longitudinal adjustment thereon, and clips for holding the saddle, of a tongue-arm pivoted to the saddle, a tongue-socket pivoted on the forward end of the arm and having a rounded notched rear end, a spring-latch adapted to engage said notch, and means for withdrawing the latch, substantially as set forth.

17. In a plow, the combination, with a sectional crank-axle, and wheels journaled thereon, of a foot-lever adjustably secured to one of said sections, and a hand-lever secured to the same section and detachably connected to the other section, substantially as set forth.

18. In a plow, the combination, with a section of a crank-axle, a box mounted on said section and provided with an inclined projection, and a section of the axle loosely mounted on the projection, of a rigid sector, a loose sector connected to the section of the axle having the inclined projection, a hand-lever, and means for locking the same to either sector, substantially as set forth.

19. In a plow, the combination, with an axle having spindles, and sleeves loosely mounted on said spindles and provided with screw-threaded outer ends, of keys for locking the sleeves on the spindles, and wheels secured to the sleeves and caps covering the keys and ends of the spindles and secured to the screw-threaded ends of the sleeves, substantially as set forth.

20. In a plow, the combination, with a crank-axle, wheels and plow-beam secured to said axle, of a rearwardly-extending seat-frame secured to the axle and to the plow-standard, substantially as set forth.

21. In a plow, the combination, with a beam and a plow proper having an integral upwardly-projecting arm, of a swinging bracket, a caster-wheel pivotally supported in this bracket, means for locking the wheel-support to the bracket in different positions, and a draw-bolt for locking the swinging bracket, substantially as set forth.

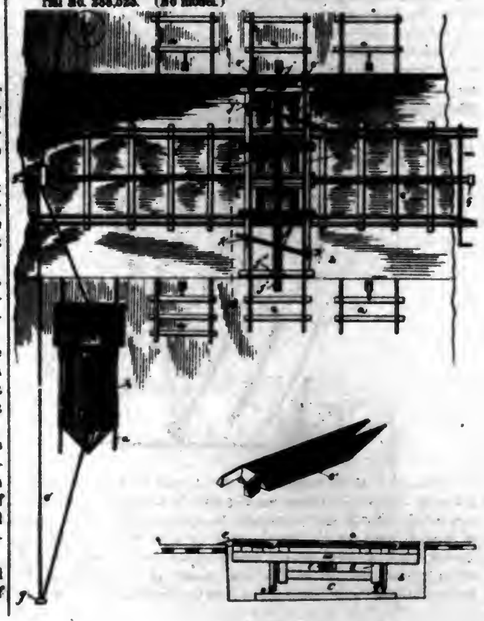
22. In a plow, the combination, with a beam and a plow proper secured thereto, and having an upwardly-projecting arm, of a swinging bracket having crown-teeth on its upper arm and a notch forward of these teeth, a bifurcated arm pivotally supported in the bracket, a wheel journaled between the branches of said arm, an arm secured to the bifurcated arm and carrying a mud-scraper, and a gravity-latch adapted to engage the crown-teeth on the swinging bracket, and a spring-actuated draw-bolt for locking the swinging bracket, substantially as set forth.

23. In a plow, the combination, with a beam and a plow proper, of a swinging bracket swiveled thereto, a spring-actuated draw-bolt for locking said bracket, and a lever having a cam-slot, with which the bolt has engagement for withdrawing the bolt, substantially as set forth.

24. In a plow, the combination, with a beam, a plow proper, and a tongue-supporting arm and pivoted socket and device for locking said socket, of a swinging bracket, a draw-bolt for locking the bracket, a lever having a cam-slot with which the draw-bolt has engagement, an adjustable wrist on the lever, and a link connecting said wrist and the device which locks the pivoted socket to the tongue-supporting arm, whereby the two locking devices may be unlocked simultaneously, substantially as set forth.

25. In a plow, the combination, with a crank-axle, a box thereon, and a saddle mounted on the box, of a beam adjustably secured to the saddle, and a seat-supporting frame mounted on the axle and adjustably secured to the plow, substantially as set forth.

899,815. SWITCHING OR TRANSFERRING CARS. JACKSON ARNIL and ROBERT M. SEEBER, Nevada, Mo. Filed Oct. 13, 1888. Serial No. 288,523. (No model.)



899,815.



Claim.—1. A car-transferring apparatus comprising a truck operating in a lowered way severing several tracks, a transverse track-section carried by the truck to register with the track-sections, locking-levers pivoted at one end at each severed track to allow their free ends a vertical swing into or out of notches or recesses in the truck, the way being of greater width than the truck and having a double track, whereby the truck can receive or deliver upon either side of the same, substantially as described.

2. A car-transferring apparatus comprising a lowered way severing several railroad-tracks, a double track in said way, a truck to operate on the tracks in the way and provided with a transverse track to register with the severed tracks, said transverse track being shorter than the width of the cut, and a switch to throw the truck upon either track in the way, for the purpose set forth.

3. A car-switching apparatus comprising a cut transversely severing several lines of track, a double track in the bottom of said cut, consisting of rails of different heights, and a car-conveying truck operating on said tracks in the cut and provided with a section of track to register with the tracks severed by the cut, said truck being held in an inclined position by the track when delivering a car, for the purpose described.

4. A car-transferring apparatus comprising a truck operating in a lowered way severing several lines of track and carrying a track-section to register with the severed tracks and shorter than the width of the way, and grooved and notched rail-sections to removably bridge the space between the truck-rails and track-rails, as set forth.

5. The combination, with a car-conveying truck provided with a track-section to receive a car, of pivoted stops to hold the car upon said track, substantially as described.

6. The combination, with a car-conveying truck provided with a transverse track-section to receive a car, of pivoted stops to hold the car upon the rails and horizontally-movable levers to operate said stops, substantially as described.

7. The combination of a lowered track severing several parallel tracks, a car-conveying truck provided with a transverse track-section to register with any one of said severed tracks, and removable independent frogs or rail-sections to bridge the breaks between the truck-rails and the track-rails, substantially as described.

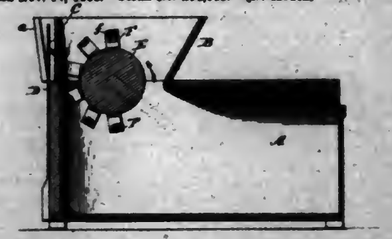
8. A car-transferring apparatus comprising a lowered way severing several railroad-tracks, a double track in said way, each track having its rails on one side in a higher plane than the rails on the other side, and a switch in the way to close or open the passage to either track, as and for the purpose set forth.

9. A car-transferring apparatus comprising a lowered track in a way severing several railroad-tracks and having the rails on one side in a higher plane than those on the other side, a truck to operate on said track and having a track-section to register with said severed tracks, and pivoted stops carried by the truck to hold a car upon the track-section, substantially as set forth.

10. A car-transferring truck having a longitudinal passage extending therethrough and one or more rollers journaled in the same to support the cable operating the car and extending through the passage, as and for the purpose set forth.

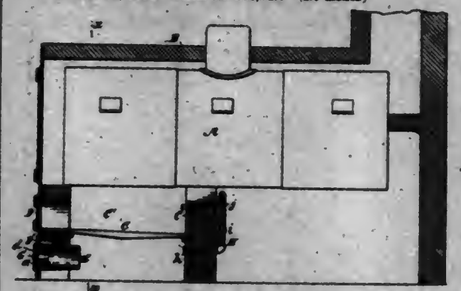
11. A car-transferring apparatus comprising a truck operating on a track in a transverse lowered way severing several lines of tracks, a transverse track-section carried by the truck to register with the severed tracks, pulleys mounted at the ends of the severed way and also to one side of the same, and cables secured to the opposite ends of the truck and passing around said pulleys and adapted to be secured to opposite ends of a locomotive located upon one of the severed tracks, whereby the truck is moved by the movement of the locomotive, as set forth.

899,816. ROOT-CUTTER. WILLIAM H. ARNOTT, Martinsburg, Neb. Filed Nov. 17, 1888. Serial No. 291,063. (No model.)



Claim.—The combination, in a vegetable or root cutter, with a receptacle, A, having a hopper, B, and spring-board C, of a cylinder mounted between the hopper and receptacle, said cylinder being provided with semicircular cutters arranged spirally upon the cylinder, substantially as shown, and for the purpose set forth.

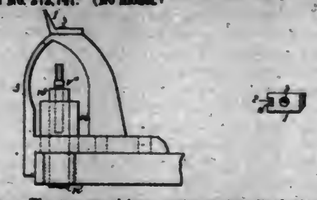
899,817. SMOKE-CONSUMER. ALCIDE C. BADAR, New York, N.Y. Filed Mar. 23, 1888. Serial No. 268,245. (No model.)



Claim.—1. The combination, with the furnace, of an injector comprising a perforated pipe, an open-ended tube beneath the furnace, through which air is forced by the injector, a bridge-wall, and an air-distributer consisting of a pipe having a perforated portion arranged at the rear of the bridge-wall, a vertically-extending portion, also at the rear of the bridge-wall, and a horizontally-extending portion extending through the bridge-wall and opening into the ash-pit, said pipe being otherwise independent of the bridge-wall, substantially as specified.

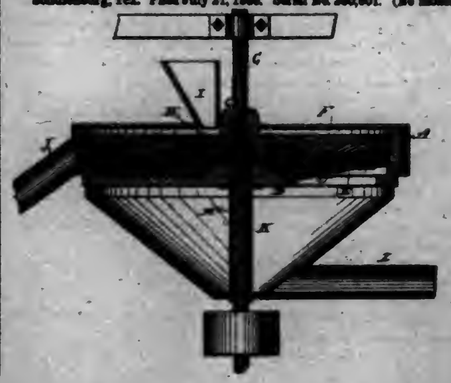
2. The combination, with a furnace, of an injector comprising a perforated pipe, an open-ended tube beneath the furnace, through which air is forced by the injector, a bridge-wall, and an air-distributer consisting of a pipe having a curved perforated portion arranged at the rear of the bridge-wall, vertically-extending portions, also at the rear of the bridge-wall, and horizontally-extending portions extending through the bridge-wall and opening into the ash-pit, said pipe being otherwise independent of the bridge-wall, substantially as specified.

899,818. SEWING-MACHINE. JONATHAN BARTLETT, Epping, and GEORGE B. WIGGIN, South New Market, N. H., assignors of one-half to John W. Heard, Providence, R. I. Original application filed July 26, 1887, Serial No. 245,561. Divided and this application filed May 3, 1888. Serial No. 272,747. (No model.)



Claim.—The improved horn and rest described, the rest being a pivoted angled piece, 3, having an opening at the rear of its base and the horn having a fixed pin projecting into such opening, which opening is larger than the body of the pin and serving to limit in both directions the swinging movements of such rest.

899,819. COTTON-SEED CLEANER. CHRISTIAN RAUSCHARTH, Schulenburg, Tex. Filed July 21, 1888. Serial No. 280,601. (No model.)



Claim.—A cotton-seed cleaning-machine consisting of the horizontal circular fixed table B, having alternating emery-slabs and perforated plates, a casing, A, inclosing the table and provided with hopper I on its top and the seed-outlet J on its side, the cone-shaped receptacle K, under the table and having the tubular central jacket, N, extending from its bottom upwardly through the center of the table, the outlet L at the bottom of the receptacle, the shaft G, extending through the casing and jacket K, and the circular brush on the shaft within the casing and having openings H, substantially as set forth.

899,820. FARE-BOX. TIMOTHY L. BRANAN, Knoxville, Tenn. Filed Apr. 18, 1888. Serial No. 271,048. (No model.)



Claim.—1. The combination, with a fare-box having a slot and opposite grooves in its walls registering therewith, and a glass or transparent plate slipped through said slot into the grooves, of a plug inserted in the slot outside the plate, and fastenings securing the plug at the inside of the box, substantially as described, whereby the glass cannot be removed through the slot without first disengaging the plug-fastenings inside the box, as and for the purposes set forth.

2. The combination, in a fare-box, of opposite side walls A A, grooved at *g g*, top, bottom, and front plates, *a a' a² a³ a⁴*, fixed to the side walls, and said top plate slotted at g^6, a glass, G, held in the grooves *g*, a strip, H, closing the slot g^6, and fastenings securing said strip at the inside of the box, substantially as herein set forth.

3. The combination, in a fare-box, of opposite side walls having grooves or ways and fixed top, bottom, and front plates, *a a' a² a³ a⁴*, and said top plate *a* slotted at g^6, a glass, G, held in the grooves *g*, fastenings above the glass at the inside of the box, a strip, H, closing the slot g^6, and fastenings securing said strip at the inside of the box, substantially as herein set forth.

4. In a fare-box, the door made to lock behind an upper plate of the box, combined with a fare-deposit drawer locking at the outside of the lower part of the door, substantially as herein set forth.

5. In a fare-box, the door made to lock behind an upper plate of the box and fitted at the sides into rabbets of the box-frame, combined with a fare-deposit drawer locking at the outside of the lower part of the door, substantially as herein set forth.

6. In a fare-box, the door made to lock behind an upper plate of the box, combined with a fare-deposit drawer locking at the outside of the lower part of the door, and said door provided with a bolt holding it up into place when the fare-drawer is removed, substantially as herein set forth.

7. In a fare-box, the door made to lock behind an upper plate of the box, combined with a fare-deposit drawer overlapping the outside of the lower part of the door, and lock-fastenings for said drawer, substantially as herein set forth

8. In a fare-box, the combination, with side wall A A and top, bottom, and front plates, *a a' a² a³ a⁴*, fixed thereto, and said top plate *a* slotted and provided in said slot with a removable strip, H, having fastenings inside the box, of a removable plate, B, giving access to the fastenings of said strip H, substantially as herein set forth.

9. In a fare-box made with side walls A A and top, bottom, and front plates, *a a' a² a³ a⁴*, fixed thereto, and said top *a*, slotted and fitted with a removable strip, H, having fastenings inside the box, substantially as specified, the combination, with said parts, of a removable plate, B, tongued and grooved into the parts A A *a*, and also having an outer lower tongue, b^4, a door, C, fitted to the side walls A A and provided with a rear upper tongue, *c*, locking behind the tongue b^4, and having a front rabbet, c^4, at its lower end, and a fare-deposit drawer at the bottom of the box, having a projection entering the rabbet c^4 and provided with a lock or locks, substantially as herein set forth.

10. In a fare-box, a fare-chute interposed between the pay chute or hole and the fare-rests, and having relatively-fixed outer side walls and provided between or within said outside walls with one or more yielding walls, substantially as herein set forth.

11. In a fare-box, a fare-chute having a discharge mouth or opening having no direct lateral or marginal communication with the side walls of the box, and formed with relatively-fixed outside walls and with one or more interior yielding walls normally allowing free passage of fares, and providing one or more robbing-implement pockets or traps within the chute and behind and below said yielding wall or walls, substantially as herein set forth.

12. In a fare-box, a fare-chute, F, interposed between the pay-chute and fare-rests and formed with side walls M M and front and rear walls N O, disposed to deflect and stop a robbing implement and to provide a discharge opening or mouth which has no communication with the side walls of the box, a wall or plate, P, next the wall O, and adapted to yield at its lower end, and a trap, R, arranged below and behind said yielding wall, substantially as herein set forth.

13. A fare-box fare-chute made as an independent structure, adapted for interposition between the pay-chute and fare-rests of the box and formed so as to separate the pay-chute and fare-rest or deposit-compartments of the box, and provided with a downwardly-ranging discharge-mouth having fixed outer side walls, and provided with one or more interior yielding walls normally allowing free passage of fares, and providing one or more robbing-implement pockets or traps within the chute and behind and below said yielding wall or walls, substantially as herein set forth.

14. The combination, in a fare-box and with a fare-chute therein having a mouth which has no direct lateral or marginal communication with the side walls of the box, of a valve fitted within the chute and closing its mouth should the fare-box be inverted, substantially as herein set forth.

15. In a fare-box, the fare-chute next the pay chute or hole, provided at its mouth with a guard plate or valve, combined with a weight which normally holds the plate open and closes it should the box be inverted, substantially as herein set forth.

16. In a fare-box, a fare-chute interposed between the pay chute or hole and the fare-rests and having a mouth which has no communication with the side walls of the box, and said fare-chute provided with a wall, N, a yielding wall, P, a trap, R, and an interior plate-valve, S, substantially as herein set forth.

17. In a fare-box, a lower fare-chute fitted at or above the final fare-deposit compartment of the box, and having a discharge opening or mouth which projects into the fare-deposit compartment and has no direct lateral or marginal communication with the side walls of this compartment or a drawer placed therein, substantially as herein set forth.

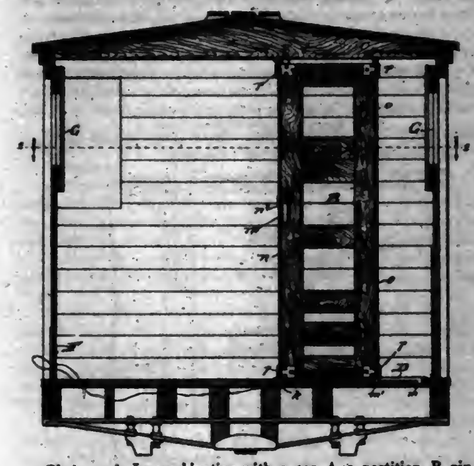
18. In a fare-box, a lower fare-chute fitted at or above the final fare-deposit compartment of the box, and having a discharge opening or mouth which projects into the fare-deposit compartment and has no direct lateral or marginal communication with the side walls of this compartment, combined with a hinged plate or valve fitted within the chute and closing it should the fare-box be inverted, substantially as herein set forth.

19. In a fare-box having fare-rests, as U' V', the combination, with said rests, of levers U V, adapted to tilt them, said lever U having an extension, U^3, cut away at v^6, at its lower forward corner or part, and said lever V having an extension, V^3, cut away at v^6, at its upper forward corner or part, said cut-away part v^6 normally facing the rounded portion of the plate U^3, and the cut-away part v^6 normally standing in front of the cut-away portion v^6, substantially as described, whereby the upper fare-rest, U', may be dumped independently of the next lower fare-rest, V', and the fare-rest V' cannot be dumped without first dumping the fare-rest U', as and for the purposes set forth.

20. In a fare-box having upper, intermediate, and lower fare-rests, as U' V' W', and operating-levers U V W therefor, said levers U V having segmental extensions U^3 V^3 cut away at v^6 v^6, respectively, and said levers V W connected by a link, X, which is pivoted to the lever W, and has a slot, *x'*, at its upper end engaging a pin, *v'*, on the lever V, substantially as described, for the purposes set forth.

21. In a fare-box having fare-rests, as V' W', and operating-levers V W, adapted for tilting the rests, said levers connected by a link, X, pivoted to the lever W, and having a slot-and-pin connection, *x' v'*, with the lever V, substantially as herein set forth.

899,821. STOCK-CAR. ELIAS U. DEERINGS, Aurora, Ill. Filed Nov. 26, 1888. Serial No. 291,667. (No model.)



Claim.—1. In combination with a car, A, a partition, B, pivotally supported to stand vertically in the car and disconnected from the side of the car against which it is to be folded, and guides extending transversely of the car from near one side thereof for the upper and lower edges of the partition, whereby the partition may be turned on its pivotal support to extend parallel with and be thus folded against an inner side of the car, and be turned from its folded position to extend in the direction of the said guides, and be slid toward the opposite inner side of the car, and thus form a stall, E, open between the rear edge of the partition and the adjacent car-wall, substantially as described.

2. In combination with a car, A, an overhead guideway, C, a guideway, D, having end sockets, *m* and *m'*, and secured to the car-floor in line with the guideway C, a thimble, *l*, and a thimble, *k*, in the car-floor, respectively adjacent to the wall and in line with the guideway D transversely of the car, and a partition, B, having rods *o* and *n* at opposite edges, substantially as described.

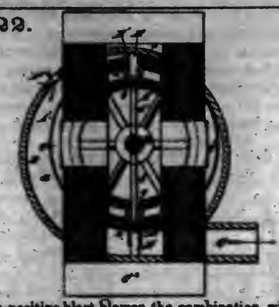
3. A convertible stock-car comprising, in combination with a car, A, overhead transverse timbers *r*, guideways C, supported on the timbers, guideways D, having end sockets, *m* and *m'*, and countersunk into the car-floor, one directly below each guideway C, to extend transversely from near a wall of the car, partitions B, having rods *o* and *n* at their opposite lateral edges, each rod *o* extending at its opposite ends into coincident guideways C and D, thimbles *l*, countersunk into the car-floor adjacent to the said wall of the car and located each to receive the lower end of a rod, *n*, when the partition is folded against the side of the car, and thimbles *k*, countersunk into the car-floor, one in line with each guideway D, and each located to receive the lower end of a rod, *n*, when the partition is drawn out, to cause its rod *o* to enter a socket, *m'*, substantially as described.

4. A convertible stock-car comprising, in combination with a car, A, overhead transverse timbers *r*, equidistant apart, guideways C, secured to the timbers, guideways D, having end sockets, *m* and *m'*, and countersunk into the car-floor, one directly below each guideway C, to extend transversely from near a wall of the car, partitions B, having rods *o* and *n* at their opposite lateral edges, each rod *o* extending at its opposite ends into coincident guideways C and D, thimbles *l*, countersunk into the car-floor adjacent to the said wall of the car and located each to receive the lower end of a rod, *n*, when the partition is folded against the side of the car, thimbles *k*, countersunk into the car-floor, one in line with each guideway D, and each located to receive the lower end of a rod, *n*, when the partition is drawn out, to cause its rod *o* to enter a socket, *m'*, latches *n'* on the upper ends of the rods *n*, and catches *i*, supported on the timbers *r* in positions to be engaged by the said latches, substantially as described.

899,822. ELECTRIC BLAST-BLOWER. HARRY H. BLADES, Detroit, Mich. Filed July 23, 1887. Serial No. 245,106. (No model.)

Claim.—1. A positive blast-blower consisting of the combination, with an electric motor, of a fan-case embracing its armature, said armature located eccentrically within the case and provided with yielding wings or blades and means for maintaining them in contact with the periphery of the case, said case having an air-admission port at its periphery and an air-delivery port, substantially as described.

899,822.



2. In a positive blast-blower, the combination, with the armature of an electric motor, of wings or pistons supported upon and having a reciprocatory motion through said armature, and a fan-case embracing said armature, said apparatus adapted to draw in air and deliver the same air under pressure through the exit-pipe, substantially as described.

3. In a positive blast-blower, a blower-case, an armature of an electric motor eccentrically journaled within said case and having wings adapted to reciprocate through said armature, and mechanism for maintaining said wings in contact with the inner periphery of the blower-case, substantially as described.

4. In a positive blast-blower, the combination, with an electric-motor armature, of supporting-arms sleeved through the shaft of said armature and having a reciprocatory motion therein, and spring-actuated wings or pistons E and supports E', all constructed and adapted to operate substantially as described.

5. In a positive blast-blower, the combination, with a blower-case, D, of an electric-motor armature, A, field-magnets C, having pole-pieces C' and yokes C^3, having extensions *c* to form supports for the case D, wings E, springs *c*, and supports E', secured to arms *c'*, said arms having a reciprocatory motion through the shaft of said armature, substantially as described.

899,823. NUTMEG-GRATER. CHARLES O. BLOOD, Lynn, Mass., assignor to Arthur J. Blood and Lillebridge K. Blood, both of same place. Filed May 26, 1888. Serial No. 275,295. (No model.)



Claim.—1. In a nutmeg-grater, an inclosing-case, 6, the grater-plate within the same and held above the bottom thereof, having rows of perforations parallel to each other, a passage in the top of the inclosing-case formed diagonally to the rows of perforations in the grater-plate by bending the edges of the case inward, a nutmeg-holder having grooves in its sides adapted to the inwardly-turned edges of the inclosing-case, and a plunger within the holder, substantially as described.

2. In a nutmeg-grater, an inclosing-case, 6, having inwardly-turned edges forming a diagonal passage, a nutmeg-holder having grooves in its sides adapted to said edges, and the grater-plate having downwardly-turned edges adapted to rest on the bottom of the plate 6, and grooved to fit corresponding ridges in the sides thereof, substantially as described.

3. In a nutmeg-grater, an inclosing-case, 6, having inwardly-turned flanges forming a diagonal passage, a nutmeg-holder having grooves fitted to said flanges, a grater-plate supported above the bottom of the inclosing-case, and a handle, 4, closing the space beneath the grater-plate at one end, said handle having a groove to support one end of the grater-plate, said plate having downwardly-turning edges resting against the bottom of the plate 6, substantially as described.

4. The combination of a grater-plate, 5, a holder, 7, movably supported on ways above the plate, and clearers 10, supported in the holder and movable therewith, and having downward projections extending into the corrugations of the grater-plate, substantially as described.

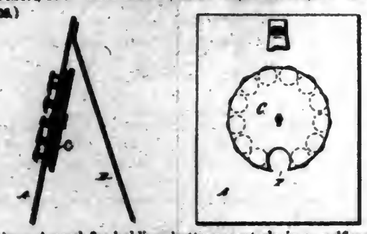
5. The combination of a grater-plate, 5, a holder, 7, supported movably above the same, and clearers 10, supported loosely in the holder and movable therewith, and provided with projections extending into the corrugations of the grater-plate, substantially as described.

6. The combination, with a grater-plate, 5, of the inclosing-case

6, the nutmeg-holder 7, and the guards or clearers, whereby the pieces are retained in the holder, substantially as described.

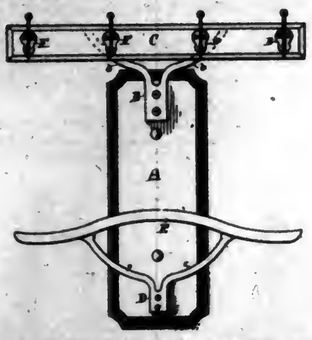
7. In combination, the inclosing-case 6, having inwardly-turned flanges, a grater-plate within the same, a holder having grooves to receive the inwardly-turned flanges, and means for limiting the movement of the holder and preventing its displacement, consisting of the bent ends 12 12 of the flanges, substantially as described.

399,824. CARD FOR BUTTONS OR STUDS. CHARLES G. BLOOMER, Pawtuxet, R. I. Filed Dec. 31, 1888. Serial No. 294,967. (No specimens.)



Claim.—A card for holding buttons or studs in a uniform position, consisting of a back, A, having a series of button-holes, in combination with a rotary movable disk, C, pivoted thereto and having a slot, F, in the circumference thereof movable into position corresponding to each of the button-holes, the whole constructed and operating in the manner substantially as described.

399,825. HAT AND CLOTHES RACK. HENRY A. BERCHELL and FRASER H. REESE, Defiance, Ohio. Filed Sept. 20, 1888. Serial No. 286,730. (No model.)



Claim.—As an improved article of manufacture, the within-described rack, consisting of the broad base A, a bifurcated bracket, B, attached to the upper end thereof, having upwardly and outwardly diverging arms, and a horizontal bar, C, supported by said arms and carrying hooks F, and the bifurcated bracket D, attached to the lower part of said base and having upwardly and outwardly diverging arms, and the curved bar E, supported on said arms and lying nearer to base A than bar C, all substantially in the manner and for the purpose specified.

399,826. ELECTRIC CONDUCTOR. ALFRED A. BROOKS, Cambridge Mass. Filed Sept. 10, 1888. Serial No. 284,971. (No model.)



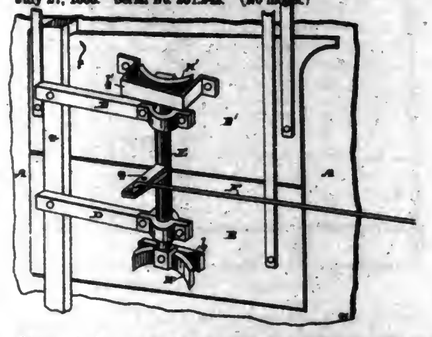
Claim.—1. An electric conductor consisting of a wire covered with a single-ply jacket composed of a single set of longitudinal yarns or warps, *b*, and two uniting woof or weft threads or yarns, *c c'*, which are both tightly wound around the said wire and interwoven with all of the said warps in parallel course or lines, said weft-threads being alternated with the said warp-threads, so that in the same course the thread *c* is beneath or inside of a warp-thread when a thread, *c'*, is above or outside of the same warp-thread, and vice versa, substantially as set forth.

2. An electric conductor consisting of a wire having an insulating layer or coating, *d*, and a single-ply tightly-woven jacket or covering composed of a single set of longitudinal yarns or warps, *b*, and two or more wefts interwoven with all the said warps and extending around the conductor in parallel course and passing alternately over and under the said warps, substantially as set forth.

3. An electric conductor consisting of a wire having a tightly-woven single-ply jacket composed of a single set of longitudinal warps, *b*, and two or more wefts, each of which is interwoven with all of the said warps and passing alternately over and under the same, said jacket having a water-proof coating, *e*, substantially as set forth.

4. An electric conductor consisting of a wire having an insulating layer or coating, *d*, and a single-ply tightly-woven jacket composed of a single set of warp-threads and two or more weft-threads, each of which is interwoven with all of the said warp-threads, and said jacket having a water-proof coating, *e*, substantially as set forth.

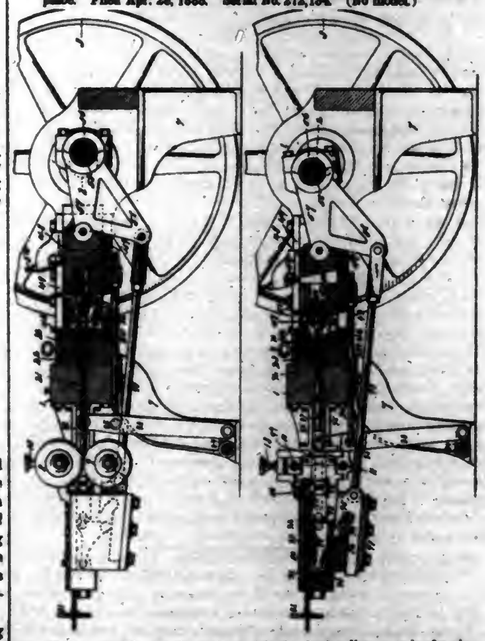
399,827. GRAIN-CLEANER. HENRY BRYAN, Modesto, Cal. Filed July 27, 1888. Serial No. 281,242. (No model.)



Claim.—1. In a grain-cleaner, the independently-vibrating shoes, one being provided with the bracket *b'*, in combination with the rock-shaft, the reversely-curved rockers on the shaft and working against the shoes, and the springs, substantially as herein described.

2. In a grain-cleaner, the shoes B B' and the springs for returning them, in combination with a stationary rock-shaft, a curved rocker on the lower end of the shaft bearing against the lower shoe, the oppositely-curved rocker on the upper end of the shaft bearing within a bracket upon the upper shoe, the rotary eccentric, the crank on the rock-shaft, and the connecting-link, all arranged substantially as herein described.

399,828. BOLT-HEADING MACHINE. ELLWOOD BURDSALL, Jr., Port Chester, N. Y., assignor of one-half to Richard H. Burdsall, same place. Filed Apr. 28, 1888. Serial No. 272,134. (No model.)



Claim.—1. The combination, with the feed-rollers, a tube for the wire, and cutter-tube 24, of receiver 59 and a sliding cutter acting between the receiver and tube 24 to sever the blank.

2. The combination, with the feed-rollers and a tube into which the wire passes, of receiver 59, having an adjustable stop whereby the length of the blank is determined.

3. The combination, with the receiver, the cutter-tube, and the sliding cutter, of the feed-rollers carried by shafts 10 and 11, a bracket to which shaft 10 is pivoted, and a set-screw whereby the pressure of the upper feed-roller is regulated.

4. The combination, with the cutter-tube, sliding cutter, and grippers, of cross-slide 27, to which the sliding cutter is adjustably secured, and slide 31, whereby the cross-slide is reciprocated.

5. Cross-slide 27, carrying the grippers, and slide 31, whereby said cross-slide is reciprocated, in combination with cross-head 36, connected to the cross-slide, rod 41, having a check-nut, lever 38, and spring 40, whereby the outward movement of the cross-slide and grippers is regulated.

6. The combination, with the cross-slide and the grippers, of cross-head 36, connected to the cross-slide, a lever pivoted to the cross-slide and to a link, 39, a spring acting to draw the cross-slide and cross-head outward, and a rod, 41, passing through the cross-head and having a nut at its outer end, whereby the outward movement of the cross-head and slide is limited, as and for the purpose set forth.

7. The combination, with tube 24, the cross-slide, and the grippers, of the cross-head connected to the cross-slide, lever 38, link 39, spring 40, and rod 41, passing through the cross-head and having a nut, 41ª, whereby the outward movement of the cross-slide and cross-head is adjusted, so that in the outward movement the grippers will stop at the exact position required to receive the wire from tube 24.

8. The combination with the cross-slide, block 26, having arms 26ª, and the grippers, of screws 28, engaging the cross-slide and having a collar engaged by said arms, whereby the grippers may be moved in or out relatively to the cross-slide, and a check-nut for locking the parts in position after adjustment.

9. The combination, with the heading-die, the cross-slide, and block 26, carrying the grippers, of screw 28, engaging the cross-slide and having a collar engaging said block, whereby the grippers may be adjusted relatively to the cross-slide, so that after forward movement the grippers will stop with the blank exactly before the recess in the heading-die.

10. The combination, with the header, heading-die, cross-slide, grippers, cutter 25, and tube 24, of screw 28, engaging the cross-slide and connected to the grippers, cross-head 36, acting to draw the cross-slide outward, and an adjustable stop to limit the outward movement of the cross-slide, whereby the grippers may be so adjusted as to receive the end of the wire in the outward movement and to leave the severed blank in front of the die in the inward movement.

11. The combination, with tube 24 and the receiver, of block 26, the grippers, and the cross-slide to which the block is adjustably secured.

12. The combination, with the heading-die and a receiver having an adjustable stop, of the cutter-tube and the cross-slide carrying cutter 25, and the grippers, whereby the length of the blank is determined and the severed blank is carried in front of the die.

13. The combination, with the cutter-tube and the cross-slide, of block 26, cutter 25, and the spring-grippers secured to the block and provided with steel dies 44.

14. The combination, with the heading-die and header, of tube 24, the cross-slide, block 26, carrying cutter 25 and spring-grippers, and means, substantially as described, for adjusting said block relatively to the cross-slide and for adjusting the outward movement of the cross-slide.

15. The combination, with the cutter-tube, sliding cutter, and the grippers, of receiver 59, into which the end of the wire passes, and an adjustable stop in said receiver which determines the length of the blank.

16. The combination, with the cutter-tube, sliding cutter, and grippers, of the receiver having a slot, 60, through which the severed blank is carried by the grippers.

17. The combination, with the cutter-tube, sliding cutter, and the grippers, of the receiver having slot 60, adjustable stop 61, and mechanism, substantially as described, whereby the stop may be adjusted and locked in position after adjustment.

18. The combination, with the receiver having a key, 59ª, and a threaded stop having a groove engaged by said key, of gear 62, which is socketed in the receiver and internally threaded to engage the stop, and means, substantially as described, for rotating said gear to adjust the stop.

19. The combination, with the receiver, threaded stop 61, and internally-threaded gear 62, engaging said stop, of shaft 64, having a bevel-gear, 65, and a gear engaging gear 62, a vertical shaft having a bevel-gear engaging gear 65, a tube inclosing the vertical shaft and slotted at its upper end, and a lock-nut which clamps the slotted end of the tube upon the vertical shaft to lock the parts in position after adjustment.

20. The combination, with the receiver, the cutter-tube, the sliding cutter, and the grippers, of heading-die 45 and the header.

21. The combination, with the heading-die and header, of the cutter-tube, the receiver, the sliding cutter, and the grippers, whereby the blank is severed and carried forward ready to be forced into the die by the header.

22. The combination, with the heading-die having a recess in which the bolt-head is formed and the header, of plunger 73, having a reduced and corresponding in diameter with the blank, a stop, 76, and a train of mechanism, substantially as described and shown, which permits said stop to yield in the formation of a bolt-head, so that in upsetting the metal it is forced into the forward portion of the recess in the heading-die.

23. The header, slide 48, and eccentric-rod 57, in combination with the plunger, stop 76, and a train of mechanism, substantially as described and shown, which permits said stop to yield in the formation of each bolt-head, as and for the purpose set forth.

24. The header, slide 48, and eccentric-rod 57, in combination with the plunger having a collar, 87, block 82, which slides on the plunger, and connecting mechanism, substantially as described, between said block and slide 48, whereby in the return movement said slide engages collar 87 and forces the plunger backward to expel the headed bolt.

25. The combination, with the slide, header, heading-die, and the plunger having collar 87, of block 82, sliding on the plunger, lever 83, pivoted to said block and to a link, 84, and rod 86, connecting said lever with the slide, as and for the purpose set forth.

26. In a bolt-heading machine, the combination, with slide 48, eccentric-rod 57, the header, heading-die, and plunger, of stop 76 and a train of mechanism, substantially as described and shown, which permits said stop to yield at predetermined times, as and for the purpose set forth.

27. The combination, with the header, heading-die, and plunger, of threaded top 76, slide 77, carrying said stop, and gearing, substantially as described, for adjusting the stop in the slide.

28. The combination, with the heading-die, the header, and plunger 73, of slide 77, having a key, 77ª, a threaded stop in said slide having a groove engaged by said key, gear 78, socketed in the slide and internally screw-threaded to engage the stop, and means, substantially as described, for rotating said gear to adjust the stop in or out.

29. The combination, with plunger 73, slide 77, and adjustable stop 76, of angle-block 89 and toggle 93.

30. The combination, with the header, heading-die, and plunger, of threaded stop 76, slide 77, internally-threaded gear 78, which is engaged by the stop and is socketed in the slide, and shaft 80, carrying a gear engaging gear 78, whereby the stop may be adjusted.

31. The combination, with the header, heading-die, plunger, and stop 76, of slide 77, by which the stop is carried, swinging angle-block 89, and toggle 93, engaging the slide and angle-block, whereby the slide is permitted to yield backward at a predetermined time.

32. The combination, with the eccentric-rod having downwardly-extending arm 58, the header, heading-die, plunger, and slide 77, carrying a stop, of angle-block 89, toggle 93, engaging the angle-block and slide 77, slide 96, having a cam-slot engaged by the angle-block, and a rod connecting slide 96 with arm 58.

33. The eccentric-rod having arm 58, the header, plunger, and slide 77, having a stop, in combination with angle-block 89, having a roller, 94, toggle 93, engaging slide 77 and the angle-block, slide 96, having a cam-groove engaged by said roller, and a rod connecting slide 96 with arm 58, whereby at a certain stage of the heading of a bolt slide 77, carrying the stop for the plunger, is allowed to yield, so that the blank is forced farther backward and a perfect head is formed without danger of binding in the die.

34. The combination, with the eccentric-rod having downwardly-extending arm 58, slide 48, the header, die, and plunger, of slide 77, carrying a stop, angle-block 89, toggle 93, slide 96, engaged by the angle-block, and an adjustable rod, 96, connecting slide 96 with arm 58.

35. The combination, with the plunger, of slide 77, carrying an adjustable stop, and mechanism—for example, an angle-block, toggle, and slide—which permits the stop to yield at a predetermined time.

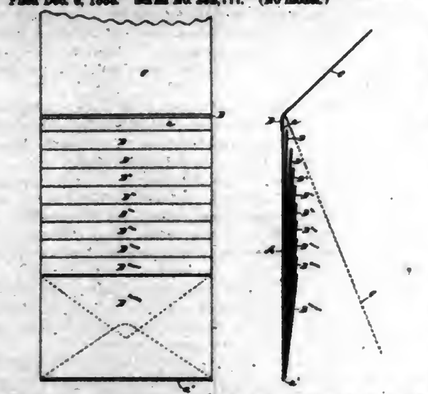
36. The combination, with the plunger, of slide 77, recessed in the frame-work, internally-threaded gear 78, recessed in said slide, threaded stop 76, engaging the gear, and a shaft carrying a gear engaging gear 78, whereby the stop may be adjusted.

37. In a bolt-heading machine, the combination, with slide 77, carrying stop 76, of angle-block 89, carrying roller 94, toggle 93, engaging the angle-block and the slide, and a slide, 96, having a cam-slot engaged by said roller.

38. The frame-work having recess 100, the stop 76, and slide 77, lying partly within said recess, in combination with the angle-block, toggle, and slide 96, whereby the slide and stop are held firmly during the first portion of the operation of heading and are then allowed to yield, as and for the purpose set forth.

39. The eccentric-rod, slide 48, the header, die, and the plunger having a collar, 87, in combination with blocks 82, through which the plunger slides, lever 83, pivoted to the block and to link 84, and an adjustable rod connecting lever 83 with slide 48, whereby the throw of the plunger in expelling the headed bolt may be regulated.

399,829. ENVELOPE-TABLET. ROBERT W. BURNS, Dayton, Ohio. Filed Dec. 6, 1888. Serial No. 292,777. (No model.)



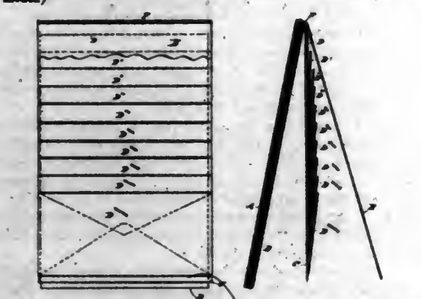
Claim.—1. An envelope-tablet consisting of a suitable backing having attached thereto a series of envelopes overlapping and breaking joints with each other, substantially as described.

2. An envelope-tablet consisting of a suitable backing having detachably connected thereto a series of envelopes overlapping and breaking joints with each other, substantially as described.

3. An envelope-tablet consisting of a suitable backing having attached thereto a series of envelopes overlapping and breaking joints with each other and a top or cover connected to said backing by a a flexible connection, substantially as described.

4. The envelope-tablet herein described, consisting of a backing of paper-board or equivalent stiff material, a series of envelopes overlapping and breaking joints with each other, having one margin detachably connected by adhesive material or otherwise to said backing, and a blotter top or cover united to said backing by a flexible connection, substantially as described.

399,830. COMBINED PAPER AND ENVELOPE TABLET. ROBERT W. BURNS, Dayton, Ohio. Filed Dec. 6, 1888. Serial No. 292,778. (No model.)



Claim.—1. A combined paper and envelope tablet consisting, essentially, of a body of writing-paper secured to a suitable base-board or backing, a series of envelopes overlapping and breaking joints with each other, secured to a suitable base-board or backing, and a flexible connection uniting said base-boards, substantially as described.

2. A combined paper and envelope tablet consisting of a body of writing-paper secured to a base-board or backing, a series of envelopes overlapping and breaking joints with each other, secured on one margin to a base-board or backing, a top board or cover, and a flexible connection uniting said base-boards and cover at one of their corresponding edges.

3. The combination paper and envelope tablet herein described, consisting of the paper base-board, the body of writing-paper secured thereto, the envelope base-board of greater width than the paper base-board, the series of envelopes overlapping and breaking joints with each other detachably connected thereto on one margin, the blotter top, and the flexible connection uniting said base-boards and top at their inner ends, substantially as described.

399,831. CLIP FOR WHIFFLETREES. WILLIAM W. BURNS, Chicago, Ill. Filed May 9, 1888. Serial No. 273,366. (No model.)



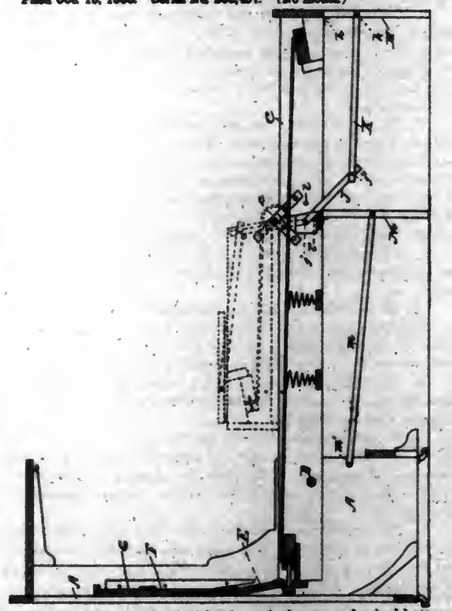
Claim.—1. A clip formed with two openings, the one which is to clasp the end of the wood having its inner end of less diameter than its outer, the other adapted to receive the draft-hook, having a connecting-bar between them adapted to clasp the end of the wood by the closing together of the sides of the clip at the union of the two openings, the connecting-bar being bent or upset in the operation, substantially as set forth.

2. A clip formed with two openings, the inner end being of less diameter than the outer end, provided with a connecting-bar and flanges or points on its inner end adapted to be closed upon the wood of the whiffletree by closing the sides of the clip between the two openings, substantially as set forth.

3. A clip having substantially a circular form to inclose the wood, except on one side, where the curve is re-entrant, provided with points or inwardly-projecting flanges on the inner end of the clip adapted to pierce and to clasp the wood by closing together the clip at the re-entrant curve, substantially as specified.

4. A clip having substantially a circular form to inclose the end of the whiffletree, except on one side, which is formed with a re-entrant curve adapted to clasp the wood by bringing the ends of the re-entrant curve nearer together, and a draft hook or ring connected therewith, substantially as set forth.

399,832. FOLDING BED. LEVI C. BUTTERFIELD, Somerville, Mass. Filed Oct. 18, 1888. Serial No. 288,467. (No model.)

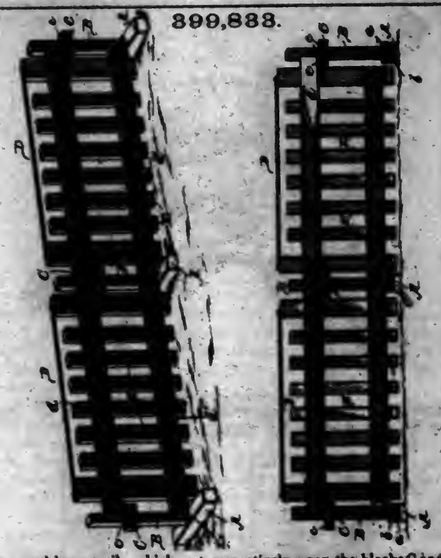


Claim.—In a folding bed having a bed-case and a bed-bottom pivotally connected therewith and having its outer portion adapted to fold upon its inner portion, the combination of a pair of legs, H, hinged to the outer portion of the bed-body, the two-part levers hinged to the said legs, to the inner portion of the bed-bottom, and to each other, and stops located one upon the outer and the other upon the inner portion of the bed-bottom, whereby the radial motion of the levers may be checked to cause the legs to be opened or folded as the outer end of the bed-bottom is opened or folded, substantially as set forth.

399,833. FENCE. WILLIAM W. CAMPBELL, Cambria, Ind. Filed Aug. 28, 1888. Serial No. 283,409. (No model.)

Claim.—In a portable fence, the combination of the sill placed on the ground transversely to the line of the fence and having sockets *a* and *a'*, the posts having reduced lower ends secured in the sockets *a*, and having blocks C attached to their front sides and provided with recesses *c*, and the panels composed of pickets connected by horizontal

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upper and lower rails, which rest, respectively, upon the blocks C and the sills, and are provided with downwardly-extending pins entering the sockets *c c'*, said horizontal rails being of such length that the ends of the rails of adjoining panels shall abut against each other, substantially as set forth.

399,834. COVER-FASTENER FOR VESSELS. JACOB H. CASSELT, Leavenworth, Kans. Filed Nov. 7, 1888. Serial No. 290,227. (No model.)

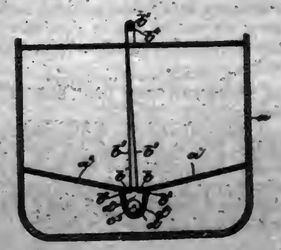


Claim.—1. The combination, with a vessel provided with hinged bails having loops, of a cover provided with a staple for engagement of the loops, and a key to engage with the staple for holding the loops thereon, substantially as and for the purpose set forth.

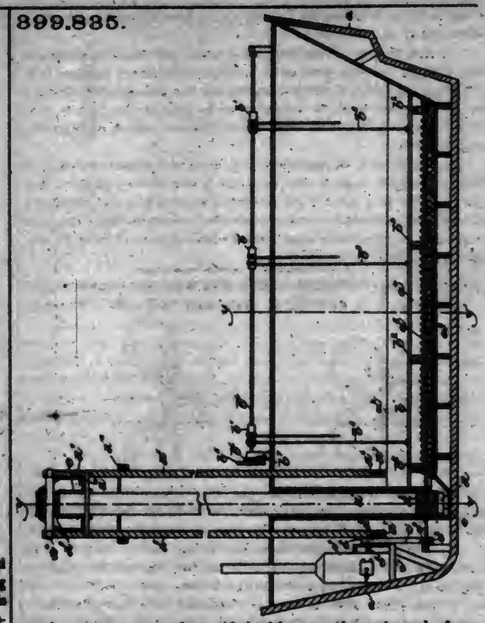
2. The combination, with a vessel having hinged bails with loops, of a cover having a staple and a key for engagement therewith, consisting of a split ring, substantially as and for the purpose specified.

399,835. CONVEYER. JONATHAN CLARK, Boston, Mass. Filed Aug. 11, 1887. Renewed July 19, 1888. Serial No. 280,454. (No model.)

Claim.—1. A barge or vessel provided with a trough or channel, a^4, extended longitudinally the length of the said vessel and forming pockets a^5 and *c*, a metallic screw, a^6, located in the trough a^4, and having its shaft c^3 extended through the pocket *c*, an endless chain of buckets or scoops driven from the shaft c^3, a pivoted chute, d^3, having an opening through which the endless chain of buckets passes, and means, substantially as described, to rotate the shaft c^3, substantially as specified.



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2. A barge or vessel provided with a trough or channel, a^4, extending lengthwise thereof, and having a chamber or pocket, *c*, a metallic screw, a^6, located in the said trough, and having its shaft c^3 extended through the said chamber or pocket *c*, an endless chain of buckets driven from the said shaft, a chute to receive the material discharged from the said buckets, hinged doors or sections $\delta\ \delta'$ to cover or partly cover the top of the said trough, and connections for operating said doors from above, substantially as set forth.

399,836. CATARRH REMEDY. PEMBLEY S. CHANDLER, Rockster Springs, assignor of three-fourths to A. L. Chandler, C. T. Chandler, and D. A. Chandler, all of Trenton, Mo. Filed Oct. 10, 1887. Renewed Jan. 28, 1889. Serial No. 297,820. (No specimens.)

Claim.—A medical compound for the treatment of catarrh, consisting of rain-water, sulphate of zinc, nitrate potassa, and juice of elderberries, in substantially the proportions specified.

399,837. MANUFACTURE OF BOOTS AND SHOES. GEORGE H. CLARK, Boston, Mass., assignor to the Clark Relasting and Shoe-Treeing Company, Portland, Me. Filed Nov. 7, 1887. Serial No. 254,473. (No model.)



Claim.—1. An improved mode of manufacturing boots and shoes, which consists in forming them upon a last in the ordinary manner, then removing said last and introducing for the subsequent finishing

a last distorted relatively to the last used to form the said boot or shoe, substantially as described.

2. The process of manufacturing boots and shoes, consisting in first forming the boot or shoe on a last in an ordinary manner, then removing the said last and introducing for the subsequent finishing a last distorted relatively to the last used in forming the boot or shoe by lateral enlargements near the ball of the shoe or boot, substantially as described.

3. The process of manufacturing boots and shoes, consisting in first forming the boot or shoe on a last in an ordinary manner, then removing the said last and introducing for the subsequent finishing a fore-part last distorted relatively to the last used in forming the boot or shoe by lateral enlargements near the ball of the shoe or boot, substantially as described.

399,838. BOLSTER-SPRING FOR WAGONS. EDWARD CLIFF, Rochester, N. Y. Filed May 21, 1888. Serial No. 274,503. (No model.)



Claim.—1. In combination with the bolster B and bar C, two separate coil-springs disposed axially vertically at opposite sides of the bolster and formed individually with bearings at opposite ends.

2. In combination with the bolster B and bar C, the coils D D, disposed axially vertically at opposite sides of the bolster, separate from each other, and supported on the bolster, and formed individually at their upper ends with eyes *e e*, disposed with their planes horizontally, and the plate P, provided with bolt-holes at opposite sides of its longitudinal central line and formed with sockets *i i* for the eyes *e e* of the coils, substantially as described and shown.

399,839. PENCIL-SHARPENER. DONALD CODD, Winnipeg, Manitoba, Canada, assignor to Robert D. Richardson, same place. Filed June 22, 1888. Serial No. 277,396. (No model.)



Claim.—1. A pencil-sharpener the cutting-edges of which consist of several separate and distinct series of saw-teeth, the lines of which teeth converge, substantially as described.

2. A pencil-sharpener which has, in combination, the frame and the saw-blades set in the frame, and the lines of the teeth on which saw-blades converge, substantially as described.

3. A pencil-sharpener and eraser which has, in combination, the frame and eraser attached to the frame, and the saw-blades set in the frame, substantially as described.

399,840. WATCH-CASE BOW. JONATHAN H. COOPER, Marshall, Tex. Filed Aug. 25, 1888. Serial No. 283,707. (No model.)



Claim.— The combination of a watch-pendant, a pair of radially-projecting annular bosses or flanges secured to or formed with the pendant and located diametrically opposite on the periphery of the same, a watch-bow having its ends provided with annular grooves and loosely fitting in said bosses, so that the grooves will also be located in the same, said bosses being provided with radial threaded openings, and set-screws extending from the periphery of the bosses through said openings removably into the annular grooves of the bow ends, for the purpose and in the manner substantially as described.

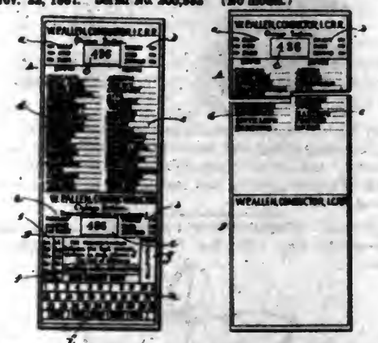
399,841. HORSE-COLLAR. WILLIAM COMER, San Francisco, Cal. Filed Aug. 1, 1888. Serial No. 281,667. (No model.)

Claim.—In a horse-collar, the back extended to form the cap-piece for covering and protecting the joist at the top of the collar, and an independent or separate piece inserted under the cap-piece and covering the straw or stuffing up to the joint, substantially as herein described.

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399,842. RAILROAD-TICKET. JAMES CHILTON, Odin, Ill. Filed Nov. 22, 1887. Serial No. 255,993. (No model.)



Claim.—A railroad-ticket, A, having the lists of stations *d e* arranged in reverse order, and having the receipt portion B, said ticket and receipt portion having the corresponding numbers *e*, substantially as described.

399,843. TEA-KETTLE. GEORGE DAKIN and HARRY L. DRILLARD, Buffalo, N. Y. Filed Nov. 15, 1888. Serial No. 290,899. (No model.)



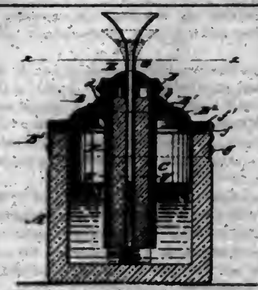
Claim.—1. The combination, with the ears *b*, provided with openings *b'*, of a bail or handle provided at its ends with hooks *c*, engaging in the openings *b'*, and lips *d*, formed on the bail and bearing against the upper edges of the ears, whereby the hooks of the bail are held in the openings of the ears, substantially as set forth.

2. The combination, with the ears *b*, provided with openings *b'*, of a bail or handle provided at opposite ends with hooks *c*, engaging in the openings *b'* of the ears, lips *d*, formed on the bail and bearing against the upper edges of the ears, and stops or projections formed on said ears and adapted to limit the swinging movement of the bail, substantially as set forth.

399,844. INKSTAND. BERT DAVIS, Kane, Pa. Filed Sept. 19, 1888. Serial No. 285,773. (No model.)

Claim.—1. The body or well A of the stand, having air-tight cover B, and tube C, fitted in said cover and reaching into the well and above the cover B, in combination with the float F, placed in the tube, the apertured cover E, closing the upper end of the tube C, and the tip funnel or tube G, held fast in the float F and projecting up through the said cover E, substantially as described.

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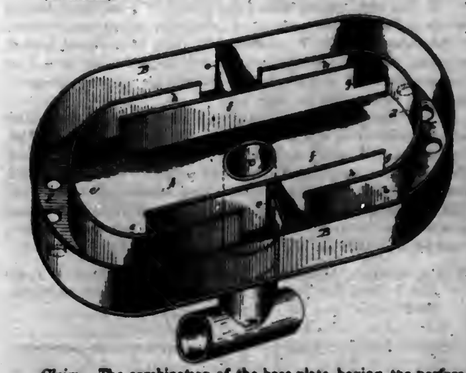


2. The outer annular cover, B^2, having screw-threaded flange B^3, adapted to be screwed upon the ink-well A, and the inner annular disk, B', of soft india-rubber, held at its outer edge air-tight between the well A and outer cover, B^2, in combination with the tube C, held air-tight in the disk B' and provided with the float F and dip-tube, substantially as described.

3. The outer annular cover, B^2, screwed upon the ink well or stand A, and the inner disk, B', of soft rubber, compressed between the outer cover, B^2, and the well A, in combination with the tube C, having flange *b*, held air-tight in the disk B', the upper ring, D, upon the upper end of the said tube, the float F, and the dip-tube, substantially as described.

4. The outer annular cover, B^2, screwed upon the ink-well, and the inner cover, B', of soft rubber, compressed between the cover B^2 and the upper edge of the ink-well, in combination with the tube C, having shoulder *b*, ring *d*, placed on said tube above the shoulder *b* and below the outer cover, B', and the ring D, screwed upon the upper end of the tube C, substantially as described.

399,845. FOUNTAIN ATTACHMENT FOR WASH-BOILERS. GEORGE W. DAY, Lansing, Kans. Filed Oct. 18, 1888. Serial No. 288,496. (No model.)



Claim.—The combination of the base-plate having the perforations therethrough near its ends, the flange secured to the edge of said plate, the curved partitions *c* and *d*, the short partitions *e*, the straight partitions *f*, having their ends reduced, the tube C, and the cross-tube telescoped on said tube C, substantially as described.

399,846. METHOD OF MAKING STRIPED PAPER BAGS. CHAS. A. DEAN and FREDERIC H. ROGUE, Boston, Mass. Filed July 21, 1888. Serial No. 280,660. (No model.)

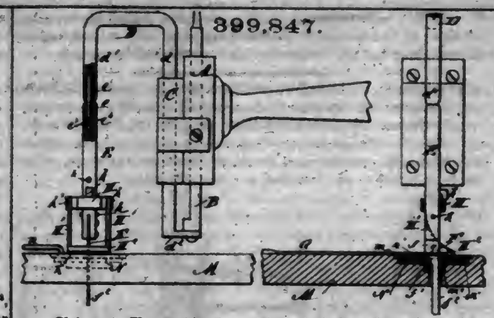


Claim.—The method of making striped paper bags herein disclosed, which consists in striping and simultaneously drying one side of a web and subsequently and continuously conducting said web to and through bag-forming mechanism.

399,847. MACHINE FOR CUTTING PATTERNS. JAMES W. DEARING, Brooklyn, N. Y. Filed Dec. 14, 1887. Serial No. 257,883. (No model.)

Brief.—This device is intended to be attached to either a sewing-machine, fret-saw, or other similar machine having a reciprocating part.

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Claim.—1. The combination, with the bed-plate, the tool-carrying bar, and means for operating it, of a yielding feeder connected at its upper end to the bar and inclined or curved downward and rearward from its point of attachment, to bear down upon the work in the downward movement of the bar, and thereby force or feed the work toward the front side of the said tool-carrying bar, substantially as set forth.

2. The combination, with the bed-plate, the tool-carrying bar, and means for operating it, of a yielding feeder having a limited movement upon the said bar above its tool-receiving end and inclined or curved downwardly to the rear side of the said bar, to bear down upon the work and force or feed it toward the front side of the bar in the downward movement thereof, substantially as set forth.

3. In a machine for cutting patterns, essentially as herein described, the combination, with a reciprocating arm, a vertical bar swiveled to said arm, and a knife carried by said bar above the top of the work-plate, of a block sliding upon the knife-bar and a spring-actuated feed-bar attached to said block at right angles to and in rear of the knife, all as and for the purposes herein set forth.

4. In a machine for cutting patterns, essentially as herein described, the combination, with a reciprocating arm, a vertical bar swiveled to said arm, and a knife carried by said bar, of a block sliding upon the knife-bar, provided with horizontal arms integral with the front face, rearwardly-extending curved springs attached to said arms, and a feed-bar carried horizontally by said springs, substantially as and for the purposes herein set forth.

5. In a machine for cutting patterns, essentially as herein described, the combination, with a reciprocating arm, a vertical bar swiveled to said arm, a knife carried by said bar, provided with an integral perpendicular guide, a block sliding upon the knife-bar, having horizontal arms integral with the front face, rearwardly-extending curved springs attached to said arms, and a feed-bar carried horizontally by said springs, of an apertured bed, a table rotating in said bed, provided with an aperture receiving the knife-guide, and means, substantially as described, for rotating the table, as and for the purposes herein set forth.

6. In a machine for cutting patterns, essentially as herein described, the combination, with a reciprocating arm, a vertical bar swiveled to said arm, a knife carried by said bar, provided with an integral perpendicular guide, a block sliding upon the knife-bar, having horizontal arms integral with the front face, rearwardly-extending curved springs attached to said arms, and a toothed or serrated feed-bar secured to said springs, of an apertured bed, a table rotating in said bed, provided with an aperture receiving the knife-guide, a presser-bar attached to the bed surrounding the knife and bearing upon the table, and means, substantially as described for rotating the table, as and for the purposes herein set forth.

7. The combination, with the machine-head, bar B, and vertically-grooved block C, secured to the head, of the V-shaped bar D, the arm *d* of which extends through the groove in block C, the arm d^3, connecting the arm *d* with the bar B, the knife-carrying bar E, swiveled to the lower end of the arm *d'*, the knife F on the lower end of said bar, and the vertically-slotted rotary table, down through which the knife extends, substantially as set forth.

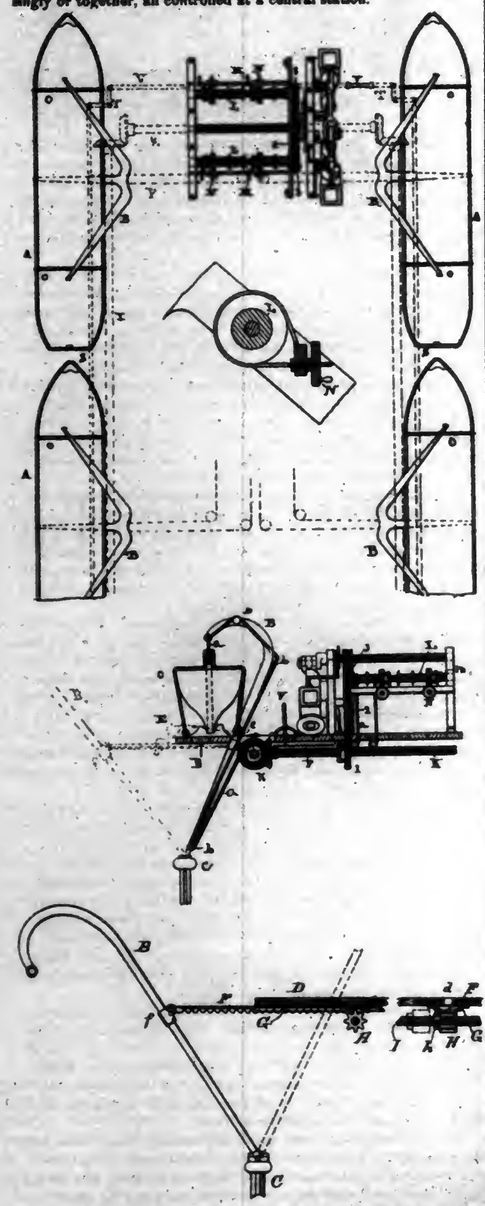
8. The combination, with the rotary vertically-slotted table and the reciprocating knife extending down therethrough, of the presser-foot formed of a spring fixed at right angles to the knife, and having its free end bent around the knife just above or along the upper face of the table, substantially as set forth.

9. The combination, with a rotary vertically-slotted table and a horizontal spring presser-foot extending across the upper face thereof and bent around the said slot, of a vertically-reciprocating knife-bar, having a knife extending down through the presser-foot and slotted table, and a collar or block loose upon the knife-arm, and having a horizontal yielding feed-bar at right angles to the cutting-edge of the knife and in rear thereof, said feed-bar operating beyond the presser bar, substantially as set forth.

10. In a pattern-cutting machine, the feeder comprising the collar or block H, the springs H', secured to opposite sides thereof, and the serrated feed-bar H^3, connecting the lower ends of the springs.

399,848. LAUNCHING BOATS IN SERIES. CHARLES W. DELAP, Wiscasset, Me., assignor to the American Ship Windlass Company, Providence, R. I. Filed Oct. 8, 1888. Serial No. 287,458. (No model.)

Brief.—Mechanism by which a series of ship's davits may be simultaneously operated and the boats launched therefrom either singly or together, all controlled at a central station.



Claim.—1. The combination, with a vessel provided with two or more boats along the side, of a movable davit for each boat, a reciprocating rack joined to each davit, a shaft extending lengthwise of the vessel adjacent to all the davits and carrying pinions engaging with the racks, and mechanism, substantially as described, for rotating the shaft, and thereby actuating all the davits simultaneously.

2. The combination, with a vessel, of two or more boats, suitable lashings for securing each boat, provided with detachable fastenings, and a rod connecting said fastenings, and extending to a central station for releasing said fastenings simultaneously, substantially as described.

3. The combination, with a vessel, of two or more davits movable in a vertical plane perpendicular to the side of the vessel and provided with suitable boat-falls leading to a central station, a rack and pinion for moving each davit, a connected series of shafts for rotating the pinions extending to the central station, and suitable mechanism located at the central station for operating both the falls and the shafts, substantially as described.

4. The combination, with a vessel, of two or more davits provided with suitable boat-falls leading to a central station, suitable lashings for the boats provided with detachable fastenings, a rod uniting said fastenings extending to and adapted to be actuated from the central station, and mechanism located at said station for operating the boat-falls, substantially as described.

5. The combination, with the movable davit B, of the rack F, attached to the davit, the pinion H, meshing with the rack, the shaft I, carrying the pinion, the shafts I and K, the bevel-gears *k*, uniting the shafts, and means for rotating the shaft K, substantially as described.

6. The combination, with the hinged davit B, of the slotted deck D, the rack F, having a sleeve, *f*, encircling the davit, the guide-bars G, located on each side of the slot and receiving the rack F, the pinion H, meshing with the rack and adjustably secured to the shaft I, and means for rotating the shaft, substantially as described.

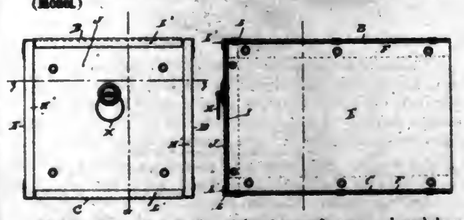
7. The combination, with a series of davits, B, provided with sheaves *b b'*, of the series of boat-falls *a*, running over said sheaves, and the winch located at a central station and provided with the loosely-mounted drums L, to each of which one boat's set of falls is attached, each drum being provided with a clutch, M, and a friction-band, N, substantially as described.

8. The combination, with two or more ship's boats, of lashings O, each secured at one end to the deck, and having at the other end an eye, *o*, forks P, receiving said eyes, hooks engaging the forks and the eyes, a rod uniting the hooks, and means for simultaneously actuating the rod, and thereby withdrawing all the hooks and releasing all the lashings, substantially as described.

9. The combination, with a ship's boat, of a lashing, O, secured at one end to the deck, and having at its other end an eye, *o*, a transversely-apertured fork, P, receiving said eye, a hook-shaped lever, R, engaging with said fork and eye, a rod, S, coupled to the lever R, an operating-lever, V, and connections between the rod and the operating-lever, substantially as described.

10. The combination, with a series of ship's boats, each suspended on a movable davit, of a rack and pinion for moving each davit, shafting carrying the pinions, a winch located at a central station, detachably connected with the shafting, and provided with several independently-actuated drums to receive and operate the several boat-falls, a series of lashings for securing the boats detachably connected to a series of hooks, an operating-lever near the winch, and connections between said hooks and said lever, substantially as described.

399,849. PAPER BOX. JOHN P. DEMEES, Elizabeth, N. J., and PAUL R. GOSON, New York, N. Y. Filed July 3, 1888. Serial No. 278,951. (Model.)

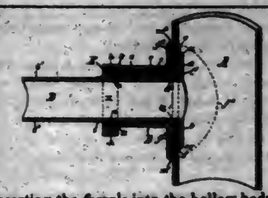


Claim.—As an improved article of manufacture, a knockdown paper box consisting in the sides E D, having angular metallic strips G riveted to it along its longitudinal edges and angular metallic strips H along its vertical edges or ends, the inwardly-extending flanges formed thereby being bent upon themselves, as at G' H', the front section, I J having inwardly-projecting flanges or folded edges interlocking with the parts H' of the sides, and the top and bottom B C, having metallic strips riveted thereto along the longitudinal edges F, bent back upon themselves and interlocking with the parts G', and having angle-strips L riveted to their front ends and overlapping the upper and lower edges of the front I J, substantially as set forth.

399,850. SADDLE-HUB AND FERRULE COMBINATION. MARTIN F. DOLAN, Brooklyn, N. Y. Filed Dec. 7, 1887. Serial No. 257,360. (No model.)

Claim.—1. In a detachable pipe-joint applicable from the outside to a hollow body, the combination, with a pipe or ferrule provided with a stationary leg and with a stationary clamp or lug removable

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for purposes of inserting the ferrule into the hollow body, and with a saddle arranged to encircle the ferrule and to travel forward on the ferrule and clamp without turning and to rest against the exterior of the hollow body, of suitable devices whereby the saddle and the ferrule-legs may be clamped together and the whole rigidly secured to the hollow body, as and for the uses and purpose set forth.

2. The combination, with the pipe or ferrule B, provided with a clamp, C, of the jam-nut E and saddle-hub D, provided with a groove, *e*, and adapted to work back and forth upon the clamp C of the ferrule or pipe B, substantially as described.

3. The combination, with the jam-nut E, saddle-hub D, and with the pipe or ferrule B, provided with a stationary lug, *b*, and with a pin, *c*, of the detachable clamp C, provided with an aperture, *c*, adapted to contain the pin *c*, substantially as set forth.

4. The combination, with the pipe or ferrule B, provided with a stationary lug, *b*, and with the pin *c*, and also with the detachable clamp C, provided with a lug, *d*, and with the aperture *c*, adapted to contain the pin *c*, and also with the saddle-hub D, provided with a groove, *e*, and adapted to work on the clamp C of the ferrule B, of the jam-nut E, adapted to engage both with the pipe or ferrule B and the saddle-hub D, and thereby rigidly secure the parts together, substantially as described.

399,851. CIGAR-VENDING APPARATUS. WILLIAM C. DOUGLASS, Lima, Ohio, assignor to Bertha C. Doubleday, same place. Filed Sept. 10, 1888. Serial No. 285,061. (No model.)



Claim.—1. In a vending apparatus, the combination of an endwise-movable delivery-slide and a horizontal carrier supported above said delivery-slide and connected thereto, whereby the carrier is caused to travel across the slide at right angles to the path of movement of the slide when the latter is moved endwise, substantially as and for the purpose described.

2. In a vending apparatus, the combination of an endwise-movable delivery-slide adapted to be withdrawn by hand from the shell or case of the apparatus, a receptacle having an open lower end arranged above said slide at one side thereof, a slotted movable carrier, also supported above said delivery-slide and arranged below said receptacle, and gearing intermediate of the delivery-slide and the carrier to move the latter at right angles to the path of the slide, whereby the carrier is caused to reciprocate between the receptacle and delivery-slide to deposit the article received in its slot from the receptacle upon the delivery-slide, substantially as and for the purpose described.

3. In a vending apparatus, the combination of a vertical fixed coin-tube having an open lower end, an inclined coinway terminating immediately above said coin-tube to deposit the coins directly therein, an endwise-movable delivery-slide operating transversely below and across said coin-tube and having a coin-slot into which the coins are received after they pass through said coin-tube, and a locking device for normally locking the slide against withdrawal from the case and adapted to be operated by the coin thereon, substantially as described.

4. In a vending apparatus, the combination of an inclined coinway, a coin-tube arranged below said way to receive the coins directly therefrom, an endwise-movable delivery-slide operating across the coin-tube and having a coin-receiving slot into which the coins are received from said coin-tube, a fixed stop on said slide in rear of the slot therein, and a gravity-locking device normally arranged in the path of said stop and adapted to be raised by the coin in the slot of said slide a sufficient distance to permit said fixed stop to clear the locking device, substantially as and for the purpose described.

5. In a vending apparatus, the combination of an inclined way, a coin-tube, a pivoted plate arranged in the path of the coins that pass therethrough and having an arm adapted to operate an audible alarm mechanism, and a delivery-slide operating across the coin-tube below the pivoted plate therein, substantially as and for the purpose described.

6. In a vending apparatus, the combination of an inclined coinway, a coin-tube immediately below the lower extremity of said way, an endwise-movable delivery-slide having a coin-receiving slot in its rear end and a fixed shoulder or stop in rear of the front extremity of said slot, and a gravity-locking arm pivoted at one side of the coin-tube and normally lying in a horizontal position transversely across said delivery-slide and in the path of the fixed shoulder or stop on said slide, substantially as and for the purpose described.

7. In a vending apparatus, the combination of an inclined coinway, a coin-tube, a platform having a guide-groove and a slot, *p*, intersecting said groove, and a delivery-slide operating across said coin-tube and having a coin-receiving slot adapted to convey the coins from said tube to the slot *p*, substantially as and for the purpose described.

8. In a vending apparatus, the combination of a coinway, a coin-tube, an endwise-movable delivery-slide operating across said coin-tube, a carrier actuated by the delivery-slide, and a locking device for preventing the withdrawal of the slide and adapted to be released by the coin on the slide, substantially as and for the purpose described.

9. In a vending apparatus, the combination of a coinway, a coin-tube, a delivery-slide, a carrier operating above said slide, and gearing intermediate of said slide and the carrier for moving the latter at right angles to the path of the former, substantially as and for the purpose described.

10. In a vending apparatus, the combination of a delivery-slide, a support elevated above said slide and arranged at one side of the same, a carrier having a vertical opening and movable on a horizontal line between the support and the slide, and gear-connections intermediate of the slide and carrier for alternately moving the latter back and forth in a line at right angles to the path of the slide, substantially as and for the purpose described.

11. In a vending apparatus, the combination, with a delivery-slide and a bottomless support containing the articles to be delivered by said delivery-slide, of a carrier intermediate of said support and the delivery-slide and geared to the latter, said carrier having a corrugated surface and a transverse slot for receiving an article from the support when said slot aligns with the latter, substantially as described.

12. In a vending apparatus, the combination, with a case having a coin-slot and a horizontally-movable delivery-slide, of a horizontal lever, *d*, having its free end arranged above said delivery-slide and adapted to be depressed by the weight of the article resting on said slide, a coin-detaining rod arranged to slide transversely across said coin-slot when the free end of the lever is elevated, and connections intermediate of the lever and the coin-detaining rod, substantially as described.

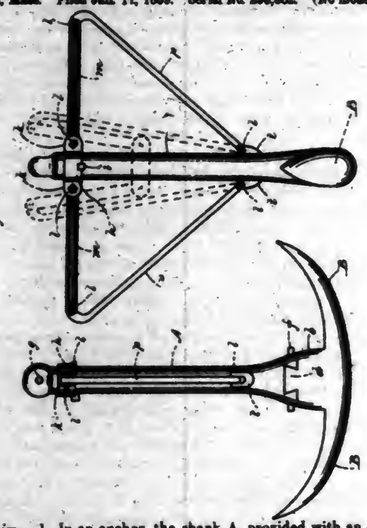
399,852. ROAD-CART SPRING. FREDERICK DRIFFILL, Sterling, assignor to the Eureka Company, Rock Falls, Ill. Filed Sept. 12, 1888. Serial No. 285,260. (No model.)



Claim.—1. In combination with the body and running-gears of a road-cart, the rods E E, relatively downwardly divergent, the loop F, the cross-plate G, provided with the enlarged opening H and flange N, the rod J, provided with loop J' and lower threaded exterior, the plate L, provided with boss M and threaded opening M', and the cushion P, provided with the opening R, substantially as shown, and for the purpose described.

2. In combination with the body and axle of a road-cart, the thills C, rods J, provided with the loop J', adapted to be attached to said thills, the rods E E, relatively downwardly divergent and provided with the loop F, adapted to be attached to the body of the vehicle, cross-plate G, provided with the enlarged opening H and flange N, the plate L, provided with boss M, and the cushion P, provided with the opening R, substantially as shown, and for the purpose described.

399,853. ANCHOR. CHARLES A. DUREE and EDWIN P. ELLIS, Boston, Mass. Filed Jan. 17, 1889. Serial No. 296,602. (No model.)



Claim.—1. In an anchor, the shank A, provided with an eye in one end and a dovetail groove in its opposite end, in combination with the blades B, provided with the dovetail *d*, and the pin *f*, for securing said blades to said shank, substantially as described.

2. In an anchor, the combination of a shank having a cable-eye at one end and a dovetail groove in its opposite end, smooth blades having their body portion dovetailed to enter said groove, and a pin for securing said shank thereto, substantially as described.

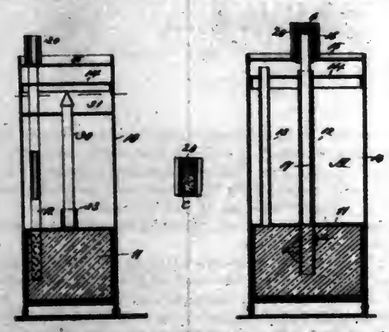
3. In an anchor, the combination of a shank provided with smooth blades, a sleeve fitted to slide on said shank, bars pivoted in lugs on said sleeve, rods pivoted to said bars and shank, and a pin for securing said sleeve in position on the shank, substantially as described.

4. In an anchor, the combination of a shank provided with a dovetail groove in its lower end, smooth blades having their body portion dovetailed to enter said groove, a pin for securing it therein, a sleeve fitted to slide on said shank and provided with slots, a pin passing through said shank and slots, a bar pivoted in ears on said sleeve at each side of the shank, and a rod pivoted to each bar and to said shank, substantially as described.

5. An anchor having its stock pivoted to the shank, and a rod pivoted to each end of the stock and to said shank, whereby the cable is prevented from fouling said anchor, substantially as described.

6. In an anchor, the combination of the shank A, having the eye *g* and a dovetail groove in its opposite end, the blades B B, having the dovetail *d*, the pin *f*, for securing said dovetail in said groove, the sleeve *h*, provided with lugs *k*, the bars *m*, pivoted in said lugs, the rods *p*, pivoted to said bars and shank, and the pin *i*, for securing said sleeve in position, all being arranged to operate substantially as set forth.

399,854. SIGNAL-BOMB. REGINALD H. EARLE, St. John, New foundland. Filed Oct. 17, 1888. Serial No. 288,312. (No model.)



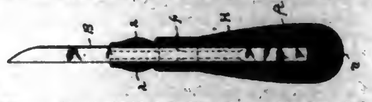
Claim.—1. A signal-bomb formed with an air-chamber, a chamber adapted to receive an explosive material and provided with a tube which leads from the explosive-receiving chamber through the air-chamber, said tube being adapted to receive a fuse, a disk arranged above the upper end of the tube, a nipple extending upward from the disk, and a cap formed with a roughened surface adapted to fit upon the nipple, substantially as described.

2. In a bomb, the combination, with a vessel, 10, of a vessel, 11, arranged therein, a disk, 14, also arranged within the vessel 10 and above the vessel 11, tubes 12 and 13, leading from the vessel 11 upward through the vessel 10 and through the disk 14, a disk, 15, arranged abve the disk 14, a nipple formed upon said disk, and a rough-ened-faced cap arranged in connection with the nipple, substantially as described.

3. In a bomb, the combination, with a vessel formed with an air-chamber and provided with a chamber adapted to receive an explosive below said air-chamber, of a rocket arranged within the air-chamber and a fuse-tube leading downward through the air-chamber to the explosive-chamber, substantially as described.

4. The combination, with a vessel provided with a nipple into which the fuse is adapted to project, of a cap fitting on the nipple and having a roughened surface, substantially as and for the purpose set forth.

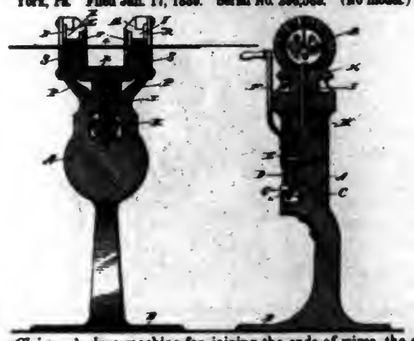
399,855. KNIFE-BLADE HOLDER. SHIRLEY V. ELLIS, Lynn, Mass. Filed Oct. 10, 1888. Serial No. 287,710. (No model.)



Claim.—1. In a knife-blade holder, the combination of the shell A, the holding-jaws *a*, fitting in slots in said shell and held from independent movement by their ends *e*, fitting recesses in the said shell, a handle or barrel, H, and means for changing the relative positions of the barrel and shell, substantially as described.

2. In a knife-blade holder, in combination with a handle or barrel, as H, the tubular shell A, recessed as described, the holding-jaws *a e*, ferrule *f*, and the nut *n*, substantially as described.

399,856. WIRE-TWISTING MACHINE. JOHN W. EISENHART, York, Pa. Filed Jan. 17, 1889. Serial No. 296,569. (No model.)

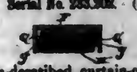


Claim.—1. In a machine for joining the ends of wires, the combination of two outer stationary twisting-plates radially slotted for the reception of the wires, two intermediate twisting-wheels carrying twisting-disks, and means for rotating the said intermediate twisting-wheels in opposite directions, as and for the purpose set forth.

2. In a machine for twisting the ends of wires and joining them together, the combination of two outer stationary twisting-plates, two intermediate twisting-wheels, and an intermediate bevel cog-wheel engaging the said twisting-wheels and adapted to rotate them in opposite directions, substantially as and for the purpose specified.

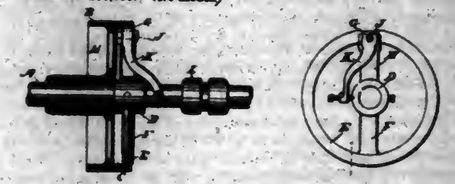
3. The combination of a frame, outer stationary slotted plates, S S, carried by the frame, intermediate twisting-wheels, L M, provided with bosses N, these wheels being journaled in the frame, rotating twisting slotted disks T upon the adjacent faces of the said twisting-wheels, a bevel cog-wheel, K, engaging the said twisting-wheels and adapted to rotate them in opposite directions, a bevel-pinion, H, secured upon the shaft of the said wheel K, and a driving bevel gear-wheel, D, engaging this latter wheel, all arranged substantially as described.

399,857. CURTAIN ATTACHMENT. JESSE EMBREE, Hardy, Nebr. Filed Aug. 20, 1888. Serial No. 283,202. (No model.)



Claim.—The herein-described curtain-cord holder, composed of the bracket having its ends bent at right angles and having pins projecting in from the bent ends of the bracket, and the coil-spring having its ends fitted on the said pins and extending between the same, substantially as specified.

399,858. FRICTION-CLUTCH. HERMAN ERDMAN, Cincinnati, Ohio, assignor to the G. A. Gray Company, same place. Filed Mar. 10, 1888. Serial No. 266,915. (No model.)



Claim.—In a friction-clutch, the combination, substantially as set forth, of pulley B, provided with a rim-bore, friction-ring E, fitting the rim-bore of the pulley and having gap G, spider-hub D, spider-arm F, rigidly uniting the hub and friction-ring, spider-arm H, projecting rigidly from the hub and having its outer end disposed behind the friction-ring at its gap, pivot J, projecting from the arm H forwardly through said gap, and cam-lever K, pivoted within the gap upon the pivot J.

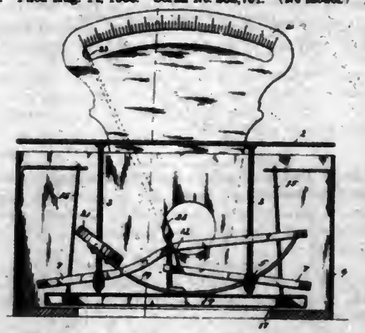
399,859. PLUMB-LEVEL. ALVAN R. EWING, Lewisburg, Tenn. Filed July 11, 1888. Serial No. 279,654. (No model.)



Claim.—1. A level having one horizontal edge formed with bevels 16, and an intermediate arc, 17, a slot formed in said arc, a mortise, 2, leading from said slot, and a pointed pendulum, 8, suspended in said mortise, substantially as described.

2. A plumb and level consisting of the stock 1, having one horizontal edge formed with bevels 16, a slotted intermediate arc, 17, and a mortise, 2, and one end provided with a slot and a similar mortise, and a pointed pendulum pivoted in each mortise, substantially as shown and described.

399,860. WEIGHING-SCALE. LUTHER C. FARMER, Minneapolis, Minn. Filed Aug. 14, 1888. Serial No. 282,701. (No model.)



Claim.—The combination, in a scale, with the bar 14, of the links 15, supporting said bar, the curved bar 19, mounted upon said bar 14 and adapted to turn freely thereon, the weight 21, secured to said bar 19 at one side of its bearing, the lever 7, connected with said bar at the opposite side of its bearing, the scale-platform supported upon said levers, the indicating-scale, and the pointer secured upon said curved bar, substantially as described.

399,861. FASTENING FOR WATCH-BOWS. FRANK G. FAXON, Mount Morris, N. Y. Filed Aug. 15, 1888. Serial No. 282,790. (No model.)



Claim.—1. The combination, with a watch-bow, of a divided pendant, between whose members the ends of the bow are clamped and which are relatively adjustable to bring them into closer relation, substantially as described.

2. The combination of the bow having headed ends, and the horizontally-divided pendant whose members are relatively adjustable to bring them in closer relation for taking up wear, substantially as described.

3. The combination of the part A, provided with the sleeve *g* and cavities *f*, the part B, fitted to the sleeve *g* and provided with the cavities *f*, the nut D, screwed on the end of the sleeve *g*, and the bow C, provided with the spheroidal ends *e*, substantially as described.

4. The combination of the part A, provided with the sleeve *g* and cavities *f*, and the rim *j*, the part B, fitted to the sleeve *g* and provided with the cavities *f*, the nut D, screwed on the end of the sleeve *g*, and the bow C, provided with the spheroidal ends *e*, substantially as described.

399,862. SIFTER. GEORGE H. FOUNTAIN, Plainfield, N. J. Filed July 31, 1888. Serial No. 281,518. (No model.)

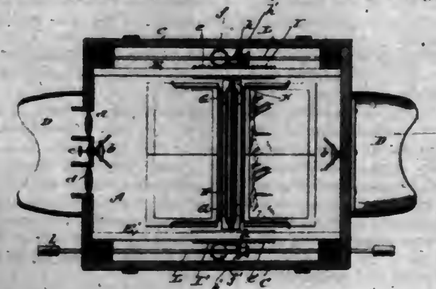


Claim.—1. The combination, with a drum adapted to be rotated and a door pivoted in said drum opening inward, of a shield extending from the sides of the drum inward over the door-opening, substantially as described, whereby material within the drum is prevented from clogging the door, as set forth.

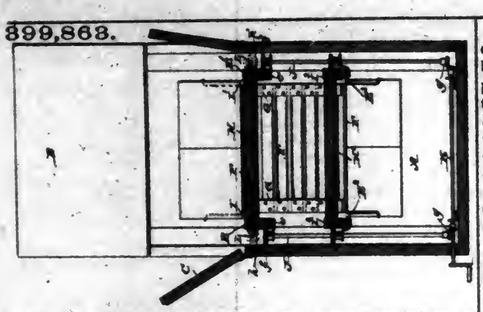
2. The combination, with the sifter-frame and a drum provided with a door pivoted in one side opening inward and closing by gravity, said door adapted to be held closed by the material when the drum is turned in one direction and to swing inward and open the feed-opening when turned in the opposite direction, of a door hinged near the lower front end of the sifter-frame, a similar door hinged near the upper rear end of the frame, and inclined blocks or stops attached to the inner wall of said frame, said doors adapted to swing inward and said front door adapted to engage the blocks and the rear door to engage the inner upper end of the front door when opened inward, thereby forming a chute or slide, substantially as and for the purposes specified.

399,863. STEREOSCOPE. ADELBERT E. FOUTCH, New Albany, Ind. Filed July 26, 1888. Serial No. 281,148. (No model.)

Claim.—1. The combination, in a stereoscope, of an endless series of view-holders distended upon rollers, a set of journal-plates arranged to slide horizontally in guides and carrying the said rollers, toothed gears for adjusting the plates horizontally, and a sliding bevel-gear



399,863.

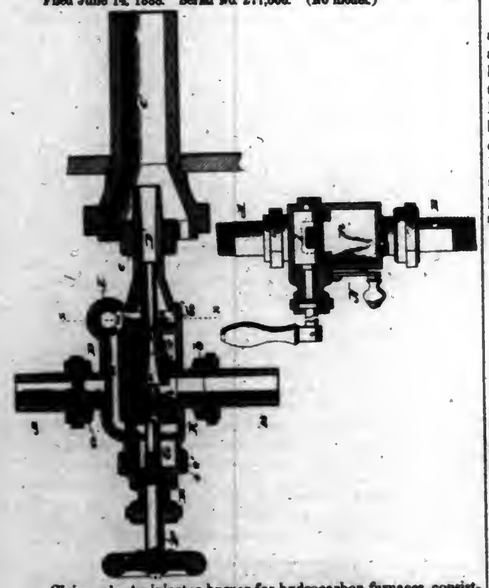


connection with the roller for rotating the series of view-holders, as described.

2. The combination, with the box or case, of the horizontally-slotted guide-bars E E' E² E³, the endless view-holder and rollers distending same, the plates I I' I² I³, carrying the journals of the rollers and provided with toothed rack-bars, the shaft J, with pinions *f f* and turning handle, the angular adjusting-shaft L, and a pair of bevel-gears connecting one of the rollers to the shaft J by a sliding connection, as described.

3. The combination, with a stereoscope having a series of rotary adjustable view-holders, of a case having a hinged top, and hinged side pieces, C C, for admitting light laterally to the views, substantially as described.

399,864. SPRAY-OIL BURNER. WILLIAM C. FISK, Toledo, Ohio. Filed June 14, 1888. Serial No. 277,066. (No model.)

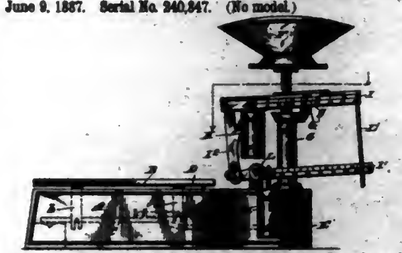


Claim.—1. An injector-burner for hydrocarbon furnaces, consisting of a casing communicating with oil and steam supply pipes, a steam-chamber and auxiliary steam-chamber arranged at opposite ends of the casing, a passage connecting the steam-chambers with the steam-supply, a valve to close communication between the auxiliary steam chamber and passage, an oil-chamber in direct communication with the oil-supply, a tubular jet-plug connecting the steam and oil chambers, an injector tube or nozzle leading from the auxiliary steam-chamber, a mixing-tube leading from the oil-chamber to the injector-tube, and a valve adapted to close the inlet end of the jet-plug, substantially as described.

2. An injector-burner for hydrocarbon-furnaces, consisting of a casing communicating with oil and steam supply pipes, a steam-chamber at one end of the casing, connected by a passage with the steam-supply, an oil-chamber communicating directly with the oil-supply, a tubular jet-plug connecting the steam and oil chambers, an air-chamber adjoining the oil-chamber, an injector-tube, a mixing-tube leading from the oil-chamber to the injector-tube and provided with lateral openings communicating with the air-chamber, a valved opening in the side of the air chamber, and a valve adapted to close the inlet end of the plug, substantially as described.

3. In a device of the character described, the combination of a casing communicating with oil and steam supply pipes, a steam-chamber and auxiliary steam-chamber at opposite ends of the casing, a passage connecting the steam-chamber with the steam-supply, a valve to close communication between the auxiliary steam-chamber and passage, an oil-chamber communicating directly with the oil-supply, an air-chamber between the oil and auxiliary steam-chambers having an opening in its outer wall, an open burner-tube flared at one end and projecting at its other end within a furnace, an injector-tube leading from the auxiliary steam-chamber and having its discharge end secured centrally within the flared end of the burner-tube, a mixing-tube extending from the oil-chamber to the injector-tube and provided with lateral openings communicating with the air-chamber, a valve or turn-button to close the opening in the wall of the air-chamber, and a valve adapted to close the inlet end of the jet-tube, substantially as described.

399,865. WEIGHING-SCALES. JOHN T. FRIEND, Irvine, Ky. Filed June 9, 1887. Serial No. 240,847. (No model.)



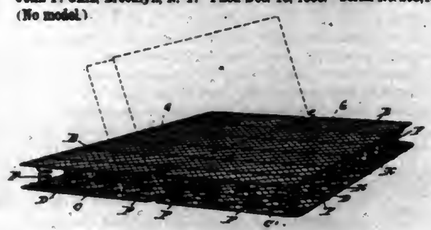
Claim.—In scales, the lower beam pivoted at L and graduated away from said pivot, and having a short arm on the side of the pivot away from said graduation, the upper beam connected with said lower beam by a bracket-arm, I², at the short arm of said lower beam, the standard G, to which said upper beam is pivoted, and the shaft E, pivotally attached to said upper beam, in combination with the lever C, resting at one end in the bearings *c'*, and attached at its other end to the bottom of said shaft E, and provided with pins *c²*, the lever D, resting in the bearings *d'*, pressing at its other end upon a point upon the lever C, and provided also with pins *c³*, and the platform B, provided with the legs *b*, bearing upon the pins *c³*, substantially as specified.

399,866. SINKER FOR FISH-LINES. JAMES R. GAGE, Concord, N. H. Filed Sept. 18, 1888. Serial No. 285,693. (No model.)



Claim.—A sinker or weight consisting of the body *a*, slitted longitudinally from end to end, having lips *c' c* at the ends thereof, and recesses *d d'*, opposite said lips, respectively adapted to receive the same when turned down upon them, substantially as and for the purpose described.

399,867. WOVEN-WIRE MATTRESS, &c. DANIEL H. GAIL and JOHN F. GAIL, Brooklyn, N. Y. Filed Dec. 10, 1888. Serial No. 293,158. (No model.)



Claim.—1. The combination, in an elastic woven-wire mattress or bed-bottom, of the unbroken or continuous upper section, A, of interwoven wires, the two frames B B, supporting the same and having the inturned meeting ends entering and engaging coils of said upper section and forming a hinge, whereby the bed-bottom may be folded, the two separate lower sections, C C', of similar wires, the interposed spiral springs connecting said upper and lower sections, substantially as and for the purpose described.

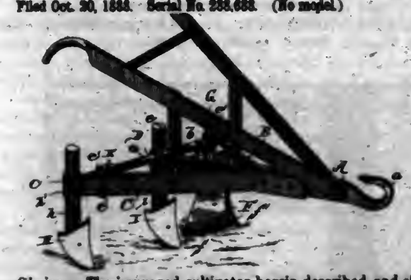
2. The combination, in an elastic woven-wire mattress or seat, of the continuous or unbroken upper web of interwoven spiral wires, the two-part wire frame upon which the same is stretched, and the transverse re-enforcing spiral coils or tie-wires formed in two sections, each united at one end to the wire frame and extending through the coils of the woven-wire web and attached to the central cord or wire thereof, substantially as specified.

3. The combination, in an elastic woven-wire mattress or seat, of the woven-wire facing, the helical springs having loops H H projecting from their outer coil, and the tie-wires carried transversely through said loops and within the spiral coils of the woven-wire facing, whereby the springs are connected to said facing, substantially in the manner and for the purpose set forth.

4. The combination, in an elastic woven-wire mattress or seat, of the two outer facings severally formed of metallic frames and woven wires stretched upon said metallic frames, the interposed helical springs having loops H H projecting from their outer coils to pass in between the coils of the woven wires, the transverse straight tie-wires passing through the coils of one of said facings and engaging the loops at one end of the springs, and the spiral tie-wires passing centrally and transversely through the coils of the woven wires and the loops at the opposite ends of said springs, all substantially in the manner and for the purpose herein set forth.

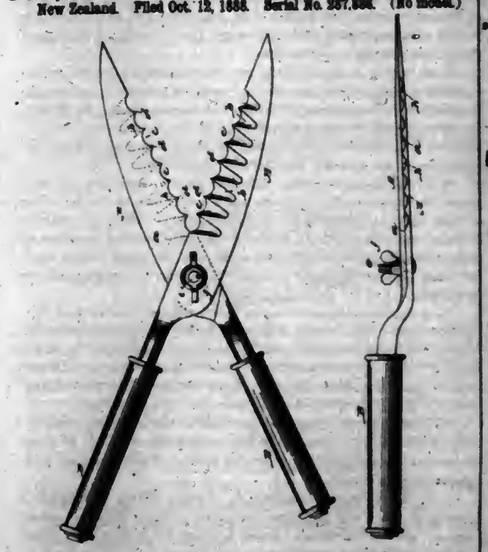
5. The combination, in a woven-wire bed-bottom, of a frame, a continuous woven-wire fabric attached thereto, and re-enforcing wires, spiral coils, or rods separate therefrom, running transversely of said bed-bottom, secured at their ends to said frame, and connected to the fabric by engaging the coils thereof, substantially as described.

399,868. CULTIVATOR. JAMES G. GAITHER, Williston, Tenn. Filed Oct. 30, 1888. Serial No. 288,682. (No model.)



Claim.—The improved cultivator herein described and shown, comprising the main beam A, having an eye, *a*, at its rear end and a hook, *a'*, at its front end, the diverging beams B C, having their front ends secured to the beam A and their rear ends provided with eyes *b c*, the standards adjustably secured in the eyes *a b c*, the diagonal brace-bar extending over and resting upon the rear ends of the beams A B C, the bolts inserted through said brace-bar and having integral hooks on their lower ends engaging the lower edges of the beams A B C, and the nuts on the upper ends of the bolts turning against the brace-bar, as set forth.

399,869. PRUNING-SHEARS. JAMES R. GASCOIGNE, Devonport New Zealand. Filed Oct. 12, 1888. Serial No. 287,886. (No model.)



Claim.—In hedge trimming or pruning shears, the combination of the pivoted blades A A, having flat meeting faces *a a*, and each constructed with a series of tapering flutes, *b*, in the back of the blade, of curvilinear form in transverse section and of increasing depth and width toward the cutting-edge of the blade, and leaving or forming sharp concave cutting-edges *c*, said flutes and concave cutting-edges of the two blades being arranged to lie opposite or in line with one another when the blades are closed, essentially as shown and described.

399,870. TUMBLER-HOLDER. JOSHUA W. GASKILL, Philadelphia, Pa., assignor to James Whitall, John M. Whitall, and John Whitall Nicholson, same place, John Mickle, Millville, N. J., C. Albert Tatum, New York, and Francis M. Underhill, Brooklyn, N. Y. Filed Dec. 31, 1888. Serial No. 295,009. (No model.)



Claim.—1. A tumbler-holder comprising a frame with pivoted levers extending on opposite sides of their pivoting-points to bear against the tumbler above and below those points, substantially as and for the purpose set forth.

2. A tumbler-holder comprising a frame with pivoted legs which have bearing-points for the tumbler above and below their pivots, substantially as and for the purpose set forth.

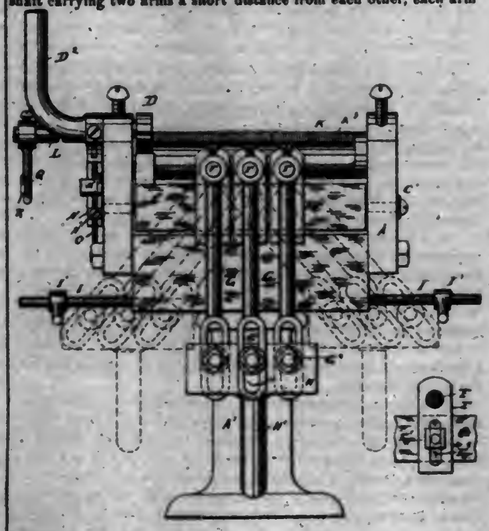
399,871. MACHINE FOR TURNING MOLDINGS. JULIUS F. GERHARDT, Port Chester, N. Y. Filed Oct. 1, 1888. Serial No. 286,627. (No model.)

Claim.—1. In a lathe attachment for turning moldings, the combination, with a frame, of a swinging frame in the same, a series of rock-shafts in said swinging frame, cutters on the rock-shafts, and rods uniting the several rock-shafts with a common handle, substantially as set forth.

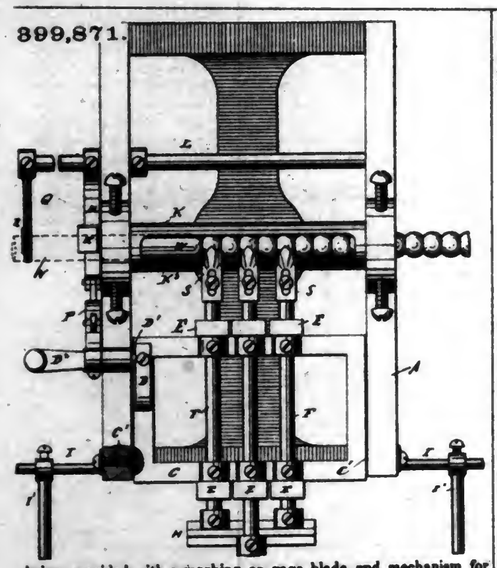
2. The combination, with a frame, of a swinging frame in the same, a spring for pressing said frame upward, a cam for pressing it downward, a series of rock-shafts in said frame and cutters on the rock-shafts, and rods uniting the several rock-shafts with a common handle, substantially as set forth.

3. The combination, with a frame, of a swinging frame in the same, vertically-adjustable independent bearing-pieces on the swinging frame, a rock-shaft in each pair of bearing-pieces, cutters on the rock-shafts, and rods uniting the several rock-shafts with a common handle, substantially as set forth.

4. The combination, with a frame, of a series of cutters, a rock-shaft carrying two arms a short distance from each other, each arm



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being provided with a marking or gage blade, and mechanism for manipulating said arms, substantially as set forth.

5. The combination, with a frame, of a swinging frame in the same, rocking shafts having cutters mounted in said swinging frame, a cam-lever acting on the swinging frame, a shaft provided with two arms a short distance from each other, marking-blades on said arms, one of said arms being connected with the cam-shaft, substantially as set forth.

6. The combination, with a frame, of a slotted guide-sleeve in the same, a swinging frame mounted in the above-mentioned frame, rocking shafts in the swinging frame, and cutters on said rocking shafts, substantially as set forth.

7. The combination, with a frame, of a swinging frame in the same, rocking shafts in said swinging frame, cutters on the rocking shafts, a rod on each shaft, the free ends of said rods being slotted, and a common handle-piece connected with the slotted ends of said bars, substantially as set forth.

399,872. **TENSION DEVICE FOR GRAIN-BINDERS.** JACOB S. GIBB, Norristown, Pa., assignor to the Bridgeport Twine Binder Company. Filed Apr. 20, 1887. Serial No. 235,511. (No model.)



Claim.—1. A tension device consisting of a fixed base-plate, an annular rim on said plate forming a chamber, a top plate mounted rotatably on the base-plate, a circumferential rim mounted on the top plate formed with openings to allow the passage of the cord, a band or ring fixed on the upper edge of the rim to close the openings thereof and prevent displacement of the cord, and a spring arranged in the chamber of the base-plate, having one end connected to said base-plate and the other end to the top plate, said parts operating substantially in the manner and for the purpose described.

2. A tension device consisting of a base-plate, an annular rim on said plate forming a chamber, a top plate mounted rotatably on the base-plate, a rim on the top plate having opposite openings therein, a surmounting band or ring on the rim closing said openings, shoulders or bearing-blocks on alternate sides of said openings, and a spring located in the chamber of the base-plate, having one end connected to said base-plate and the other end thereof connected to the rotatable plate, said parts operating substantially in the manner and for the purpose described.

3. A tension device consisting of the base-plate having attaching-ears, a rim forming a chamber, and central pivot-post formed with a recess, a top plate resting on the rim of the base-plate, having a depending flange fitting in the recess of the pivot-post of said base-plate, and a depending lug adapted to contact with one of the attaching-ears of the base-plate, a rim on the top plate having openings therein, shoulders or bearing-blocks at alternate sides of said openings, a surmounting band or ring on the said rim, and a spring arranged in the chamber of the base-plate, having one end connected to the said plate and the other end connected to the top plate, said parts being combined and operating substantially in the manner and for the purpose described.

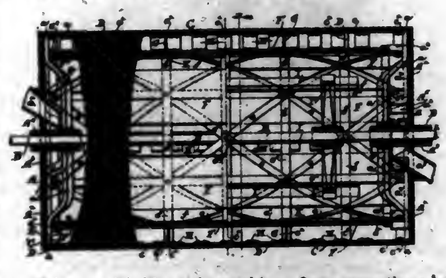
399,873. **GUIDING ATTACHMENT FOR SEWING-MACHINES.** HARRY C. GOODRICH, Chicago, Ill. Filed Apr. 26, 1887. Serial No. 236,239. (Model.)



Claim.—1. The combination, with the separator-blade B, of the plate C, adjustable with relation to said separator-blade and carrying guides E and F, having backwardly-turned tongues *e* and *f*, respectively, said guides being provided with openings *e'* *e''* and *f'* *f''*, respectively, and the plate C being provided with straight edges *g* and *h* opposite said guide-openings, substantially as described.

2. The combination, with the plate A and the separator-plate B, of the adjustable plate C, carrying guides E, F, and *i*, and the lever D, pivoted to the plate A and connected with the plate C, for the purpose of adjusting said plate C to bring the material acted upon into proper relation with the line of stitching, substantially as described.

399,874. **BOLTING-REEL.** WILLIAM R. GORTON, Moline, Ill. Filed Oct. 27, 1887. Serial No. 253,490. (No model.)



Claim.—1. A bolting-reel comprising a frame supporting a bolting-cloth, and a series of separate short deflectors located within the reel and side by side longitudinally of the latter, with their outer edges adjacent to the bolting-cloth and inclined inwardly and rearwardly with reference to the direction of motion of the reel, substantially as described.

2. A bolting-reel comprising an exterior frame covered with bolting-cloth, a wall supported upon the frame within the bolting-cloth, and a series of separate deflectors located side by side longitudinally of the reel between the bolting-cloth and inner wall and inclined inwardly and rearwardly with reference to the direction of motion of the reel, substantially as described.

3. A bolting-reel comprising an exterior frame provided with a covering of bolting-cloth, an interior apertured concentric wall or cylinder attached to said exterior frame, and a series of separate deflectors mounted side by side longitudinally of the reel between the bolting-cloth and inner wall, said deflectors being arranged opposite the apertures of the cylinder, substantially as described.

4. A reel comprising two connected parts or members—namely, an exterior cloth-supporting frame and an inner wall or cylinder—one of said parts or members being provided with oblique or spirally-directed ribs arranged to cross each other and secured together at their intersections to form a unitary truss, and the other part or member being supported from the said trussed member, substantially as described.

5. A bolting-reel comprising an exterior frame covered with bolting-cloth, one or more rings or annular partitions extending inwardly from the exterior frame at points between the ends of the reel, and a series of deflectors attached to the exterior frame between the said rings or partitions and acting to throw inwardly from the bolting-cloth the material resting thereon, substantially as described.

6. A bolting-reel comprising an exterior frame, bolting-cloth applied thereto, an inner concentric apertured wall, and rings or annular partitions located between the said exterior frame and inner wall, substantially as described.

7. A bolting-reel comprising an exterior frame, bolting-cloth thereon, an inner wall arranged concentric with the exterior frame, rings or annular partitions located between the said exterior frame and inner wall, and a series of deflectors located adjacent to the bolting-cloth between said bolting-cloth and the inner wall and between the said partitions, said deflectors acting to throw inwardly away from the cloth the material resting thereon, substantially as described.

8. A bolting-reel comprising a trussed frame formed by spirally-directed ribs arranged to cross each other and secured together at their intersected points, an exterior cloth-supporting frame, and annular partitions or rings located between the said trussed reel-frame and the exterior cloth-supporting frame, said partitions serving to support the said exterior frame from the interior trussed frame, substantially as described.

9. The combination, with a reel comprising an exterior frame covered with bolting-cloth and an interior concentric longitudinally-slotted wall attached to and moving with said exterior frame, of a series of revolving beaters located within said reel, substantially as described.

10. The combination, with a reel comprising an exterior frame covered with bolting-cloth, of an inner concentric longitudinally-slotted wall attached to and moving with said exterior frame, a series of separate inclined deflectors located between the exterior frame and interior wall, and a series of revolving beaters located within the reel, substantially as described.

11. The combination, with a reel comprising an exterior frame covered with bolting-cloth and an interior concentric apertured wall, of annular partitions or rings located between the said exterior frame and inner wall and a series of revolving beaters located within the reel, substantially as described.

12. The combination, with a reel comprising an exterior frame covered with bolting-cloth, annular partitions or rings, and inclined deflectors attached to the exterior frame between the said annular partitions, of a series of revolving beaters located within the said reel, substantially as described.

13. The combination, with a reel comprising an exterior frame covered with bolting-cloth, an interior apertured wall, annular partitions or rings located between the said inner wall and exterior frame, and inclined deflectors attached to the exterior frame between the said annular partitions, of a series of revolving beaters located within the said reel, substantially as described.

14. A bolting-reel comprising two heads, a trussed frame connecting said heads, and an exterior cloth-supporting frame arranged concentric with the trussed frame and attached to and supported by the same, said reel being provided with an exterior covering or bolting-cloth attached to the cloth-supporting frame, and with an interior concentric longitudinally-slotted wall or cylinder formed by strips of cloth or other flexible material attached to said trussed frame, substantially as described.

15. A bolting-reel comprising an exterior frame covered with bolting-cloth, an interior apertured wall arranged concentric with the exterior frame, and a series of separate deflectors attached to the said interior wall and extending inwardly from the latter, substantially as described.

16. A reel comprising an exterior frame covered with bolting-cloth, an interior apertured concentric wall provided with slots, annular partitions or rings located between the said inner wall and outer frame, and a series of short deflectors secured to the outer frame side by side, with spaces between them, substantially as described.

17. The combination, with a bolting-reel provided with an exterior cloth-supporting frame and with an inner apertured wall attached to said frame, of spirally-arranged deflectors attached to said inner wall and extending inwardly therefrom, substantially as described.

399,875. **WATER-FILTER.** JOTT GRANT, Boston, Mass. Filed July 6, 1888. Serial No. 279,195. (No model.)



Claim.—In a filter having shoulders for the diaphragms to rest against, the combination of two freely-moving diaphragms, D D', placed at the ends of the interior chamber and having between them loosely-packed filtering material H, with the spring S, adapted to hold the two diaphragms D and D' against the said shoulders and to yield under the sudden shock of the incoming water and then react automatically, so as to loosen the filtering material, all constructed substantially as described, and for the purpose set forth.

399,876. **CIRCUIT-CLOSING DEVICE FOR ELECTRICAL TORPEDO-FUSES.** JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Oct. 9, 1888. Serial No. 287,622. (No model.)

Claim.—1. The combination, with a torpedo-shell provided on the inside with an electric battery, the current from which is normally broken, of a spring-pressed circuit-closing plug seated in the shell and adapted to be moved forward to close the circuit by the pressure of the water when the torpedo has reached a predetermined depth in the water.

2. The combination, with a torpedo-shell provided on the inside with an electric battery, the current from which is normally broken, of a screw-threaded tube inserted in an opening in the shell, and a spring-pressed circuit-closing plug seated within said tube, the tube being provided with means for confining the spring, the tension of which is so regulated as to be overcome by the pressure of the water when the torpedo has reached a predetermined depth, and thus allow the plug to be moved forward to close the circuit, substantially as described.

3. The combination, with a torpedo-shell provided on the inside with an electric battery, the current from which is normally broken, of a tube inserted in an opening in the shell, the bore of the tube being larger at the inner end than at the outer end, a circuit-closing plug provided with a disk at its outer end seated in the larger bore of the tube, and a spring coiled around the plug, and bearing at one end against the disk and at the other end against a stop at the inner end of the tube, the tension of the spring being so regulated that it will be overcome by the pressure of the water when the torpedo has reached a predetermined depth, and thus allow the circuit-closing plug to be moved forward to close the circuit, substantially as described.

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399,877. **HIGH-EXPLOSIVE SHELL.** JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Oct. 9, 1888. Serial No. 287,629. (No model.)

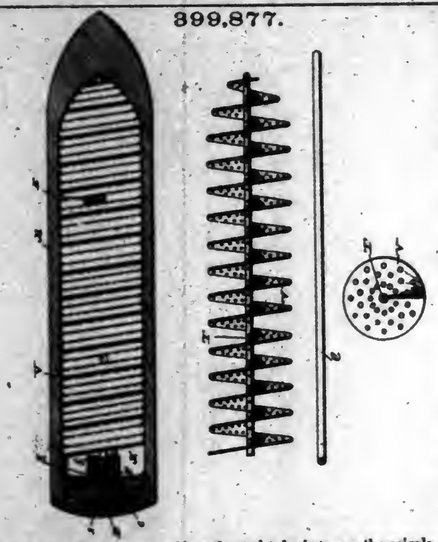
Claim.—1. In a high-explosive projectile for air-guns, the combination, with a shell, of a flexible tube containing the bursting-charge coiled within the shell, and devices for detonating said charge on the discharge of the gun, substantially as described.

2. In a high-explosive projectile for air-guns, the combination, with a shell, of a rigid perforated tube containing the detonating-charge extending longitudinally of the charge-chamber, a flexible tube containing the bursting-charge coiled around said perforated tube, and a device for firing the detonating-charge on the discharge of the gun, substantially as described.

3. In a high-explosive projectile for air-guns, the combination, with a shell, of a rigid perforated tube containing the detonating-charge extending longitudinally of the charge-chamber and provided with a spiral flange, a flexible tube containing the bursting-charge coiled around said perforated tube between the spirals of the flange, and a device for firing the detonating-charge, substantially as described.

4. In a high-explosive projectile for air-guns, the combination, with a shell, of a rigid perforated tube containing the detonating-charge extending longitudinally of the charge-chamber and provided with a perforated spiral flange, a flexible tube containing the burst-

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ing-charge coiled around said perforated tube between the spirals of the flange, and a device for firing the detonating-charge, substantially as described.

399,878. HIGH-EXPLOSIVE CHARGE. JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Oct. 9, 1888. Serial No. 287,630. (No specimens.)

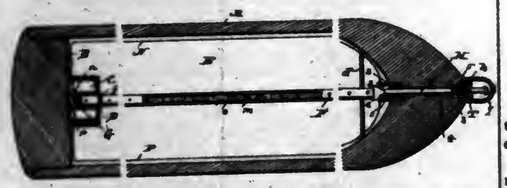


Claim.—1. A high-explosive charge for torpedo or artillery use, consisting of a quantity of high-explosive material inclosed in a flexible tube which is itself an explosive, the tube being laid in coils, substantially as described.

2. A high-explosive charge for torpedo or artillery use, consisting of a quantity of dynamite or other high explosive inclosed in a flexible tube rendered explosive by the application thereto of an active gas-producing material, the tube being laid in coils, substantially as described.

3. A high-explosive charge for torpedo or artillery use, consisting of a quantity of dynamite or other high explosive inclosed in a flexible absorbent tube saturated with nitro-glycerine and laid in coils, substantially as described.

399,879. ELECTRICAL FUSE FOR ORDNANCE-SHELLS. JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Oct. 9, 1888. Serial No. 287,631. (No model.)



Claim.—1. An electrical fuse for shells, consisting of a battery, a perforated fuse-tube containing the fuse material, said tube provided with a platinum disk and extending longitudinally of the charge-chamber in the shell, battery-wires normally out of circuit, and a movable plunger in one of the walls of the shell, adapted to be forced longitudinally between the ends of said wires to close the circuit, all combined substantially as described.

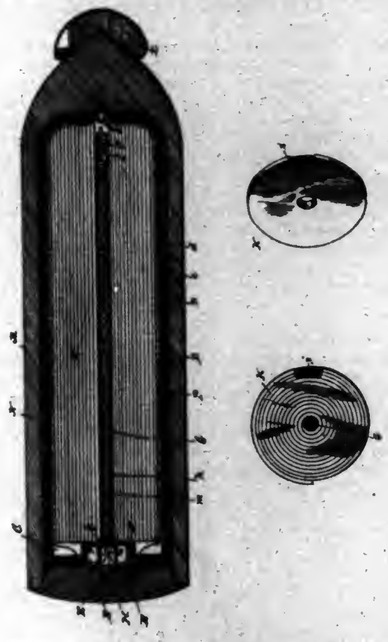
2. An electrical fuse for shells, consisting of a battery located at the rear end of the charge-chamber of the shell, a perforated fuse-tube containing the fuse material, said tube provided at its rear end with a platinum disk and extending longitudinally of the charge-chamber, binding-posts provided with contact-plates at the front end of the charge-chamber, battery-wires normally out of circuit leading to and connected with said binding-posts, and a movable plunger in the front wall of the shell, adapted to be forced longitudinally between said contact-plates to close the electric circuit, all combined substantially as set forth.

399,880. TAIL-GUIDE FOR PROJECTILES. JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Oct. 9, 1888. Serial No. 287,632. (No model.)



Claim.—The combination, with an elongated projectile for a pneumatic gun, of a flexible tail-guide secured at one end to the screw-plug of the projectile, and a telescopic rigid guide secured in the screw-plug and surrounding a portion of the flexible guide, substantially as described, and for the purposes stated.

399,881. SHELL. JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Nov. 8, 1888. Serial No. 290,283. (No model.)



Claim.—1. In a shell having a high-explosive bursting-charge, the combination, with the shell-casing, of a niter lining for the charge-chamber, for the purposes set forth.

2. In a shell having a high-explosive bursting-charge, the combination, with the shell-casing, of a pulverized-niter lining for the charge-chamber, for the purposes set forth.

3. In a shell having a high-explosive bursting-charge, the combination, with the shell-casing, of a lining for the charge-chamber composed of pulverized niter enveloped in a material which will not absorb moisture, for the purposes set forth.

4. In a shell having a high-explosive bursting-charge, the combination, with the shell-casing, of a lining for the charge-chamber composed of pulverized niter enveloped in a suitable fabric covered with paraffined paper, for the purposes set forth.

5. The combination, with a shell-casing, of a flexible porous sack containing oil secured to the point of the shell, for the purpose set forth.

6. In a shell, the combination, with the shell-casing, a fuse, and a device for igniting the fuse, of a high-explosive bursting-charge consisting of a cloth fabric saturated with nitro-glycerine, substantially as described.

7. In a shell, the combination, with a shell-casing, a fuse, and a device for igniting the fuse, of a high-explosive bursting-charge consisting of a cloth fabric saturated with nitro-glycerine and covered by a non-porous substance, substantially as described.

8. In a shell, the combination, with the shell-casing, a fuse extending longitudinally of the charge-chamber, and a device for firing the fuse, of a high-explosive cloth fabric surrounding the fuse, substantially as described.

9. In a shell, the combination, with a shell-casing, a fuse extending longitudinally of the charge-chamber, and an electrical device for firing the fuse, of a high-explosive cloth fabric wrapped around the fuse, substantially as described.

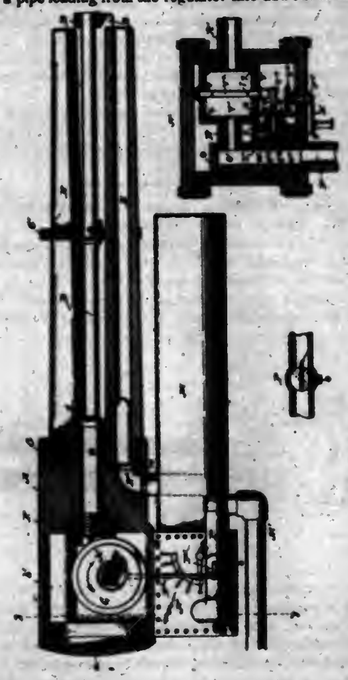
10. A shell comprising a shell-casing having a charge-chamber, a heat-resisting and gas-producing lining for said chamber, a perforated fuse-tube filled with fuse material extending longitudinally of the chamber, an electrical device for firing the fuse material, and a high-explosive cloth fabric surrounding the fuse-tube, all as described, and for the purposes set forth.

11. A shell comprising a shell-casing having a charge-chamber, a perforated fuse-tube filled with fuse material extending longitudinally of the chamber, an electrical device for firing the fuse material, a high-explosive cloth fabric surrounding the fuse-tube, and a flexible porous sack containing oil secured to the point of the shell, all as described, and for the purposes set forth.

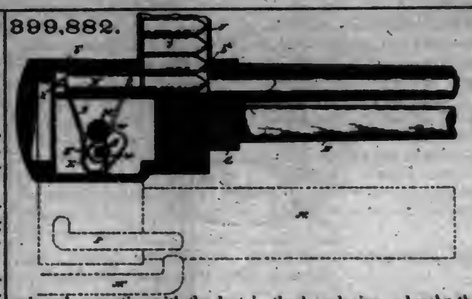
399,882. REVOLVING PNEUMATIC GUN. JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Nov. 8, 1888. Serial No. 290,229. (No model.)

Claim.—1. The combination, with the series of revoluble barrels, the breech-piece having a duct in register with one of said barrels when the latter is in position for discharge, and mechanism for revolving the barrels, of an air-reservoir, an automatic air-pressure regulator, a pipe provided with a shut-off cock, connecting the reservoir and regulator, and a pipe leading from the regulator to the duct in the breech-piece, whereby one of the barrels is discharged when the air exerts a predetermined degree of pressure in the regulator.

2. The combination, with the series of revoluble barrels, the breech-piece having a duct in register with the lower barrel when the latter is in position for discharge, and mechanism for revolving the barrels, of an air-reservoir, an automatic air-pressure regulator, a pipe provided with a shut-off cock, connecting the reservoir and regulator, and a pipe leading from the regulator into and out of the reservoir and connecting with the duct in the breech-piece, whereby the lower barrel is discharged when the air exerts a predetermined degree of pressure in the regulator.



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3. In a revolving air-gun constructed substantially as described, the combination, with the worm-wheel shaft, the reservoir, the automatic air-pressure regulator, and the pipe connecting the reservoir and regulator, of a shut-off cock in said pipe, and an eccentric-rod journaled on the worm-wheel shaft and connected to said cock, whereby air is admitted to the regulator from the reservoir in proper relation to the loading and revolving operations.

4. The combination, with the breech-piece provided with a guide-way in its upper portion, and a loading-piston in said guideway, of a link pivoted to the lower portion of the breech-piece and provided with an arm which engages with the loading-piston, a cam within the link, and mechanism for revolving the cam to rock the link, whereby the loading-piston is reciprocated in the guideway, for the purpose set forth.

5. The combination, with the breech-piece provided with a partially-open guideway in its upper portion, a magazine above the open part of the guideway, and a loading-piston in said guideway, of a link pivoted to the lower portion of the breech-piece and provided with an arm which engages with the loading-piston, a cam within the link, and mechanism for revolving the cam to rock the link, whereby the loading-piston is reciprocated in the guideway, for the purpose set forth.

6. The combination, with the breech-piece provided with a guide-way in its upper portion, and a loading-piston in the guideway, of the worm-wheel shaft journaled in the breech-piece and provided on its inner end with a gear-wheel, a link pivoted in the lower portion of the breech-piece and having an arm in engagement with the loading-piston, a short shaft journaled in the breech-piece and carrying a gear-wheel in mesh with the one on the worm-wheel shaft, and a cam within the link secured on said short shaft, substantially as described, and for the purposes stated.

399,883. HIGH-EXPLOSIVE CHARGE. JAMES W. GRAYDON, Washington, D. C., assignor to Robert Southworth Lawrence, London, England. Filed Nov. 8, 1888. Serial No. 290,293. (No specimens.)



Claim.—1. An explosive charge made of a sheet of suitable fabric saturated with nitro-glycerine and having a coating or covering capable of preventing the exudation of the nitro-glycerine.

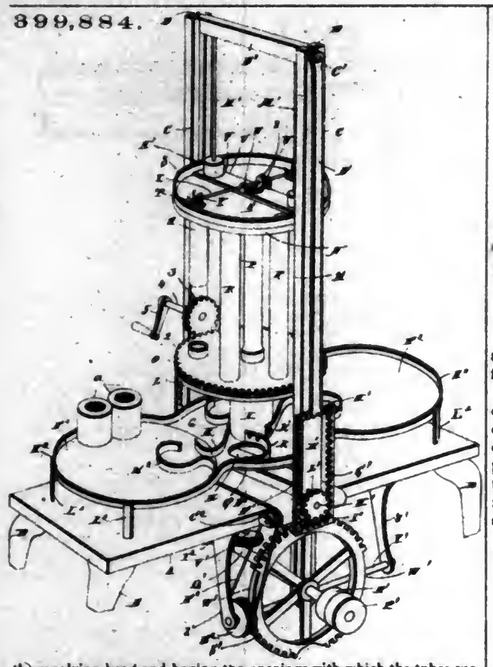
2. An explosive charge made of a sheet of suitable fabric saturated with nitro-glycerine and covered with paraffined paper, as described.

3. An explosive charge made of a sheet of suitable fabric saturated with nitro-glycerine covered with paraffined paper and formed into a roll, as described.

399,884. APPARATUS FOR FILLING AND PACKING CANS. SOLOMON L. GREGG, Greene, Pa. Filed Apr. 19, 1888. Serial No. 271,142. (No model.)

Claim.—1. The combination of the platform L, having the openings, the revoluble head, comprising the upper and lower circular plates and the tubes extending vertically between the same and adapted to align successively with said openings, and the hopper arranged above

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the revolving head and having the openings with which the tubes successively register, substantially as described.

2. The combination of the stationary platform G, having the openings H, the revoluble hub having the arms K, and the revoluble tables F^3, having the guides adapted to direct cans placed on said tables into the path of the arms K, substantially as described.

3. The combination of the revoluble head, comprising the plates N and O and the vertical tubes R, the hopper at the upper end of the head having the openings T and V, with which said tubes successively register, the platform L under the revoluble head, having the openings with which the tubes successively register, and the vertically-movable plungers adapted to pass through the tubes when the latter register with the openings V, substantially as described.

4. The combination of the revoluble shaft F, the revoluble head comprising the upper and lower circular plates and the tubes extending vertically between said plates, the wheel A' at the upper end of said shaft, the hopper at the upper end of the revoluble head, having the openings T, with which the tubes successively register, and the shaft X, journaled in the hopper, having the wheel Z, engaging wheel A', and provided with the stirrers Y, arranged over the openings T, substantially as described.

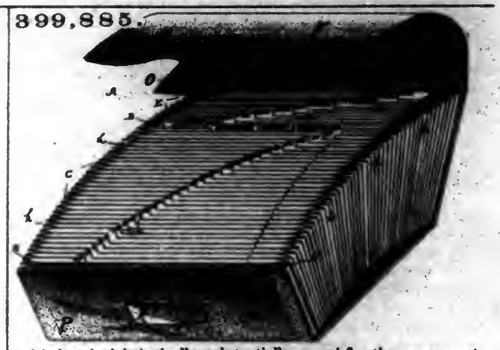
5. The combination of the revoluble head, comprising the plates N O and the tubes R, the stationary platform under said head having the openings with which the tubes successively register, the hopper at the upper end of the revoluble head, having the openings T and V, with which the tubes successively register, and the vertically-movable cross-heads having the plungers adapted to pass through the tubes which register with openings V, substantially as described.

6. The combination of the driving-shaft O', the revoluble measuring-head comprising the plates N O and the tubes R, the platform L under said head having the openings for the purpose set forth, the hopper at the upper end of the revoluble head having the openings T V, the vertically-movable cross-head having the plungers guided in the openings V, the oscillating depending arms D', connected to the cross-head and having the frames at their lower ends provided with the racks F', G', H', and I', and the pinions L', adapted to engage said racks and geared to the shaft O', substantially as described.

399,885. BANKER'S AND MERCHANT'S NOTE-CASE. J. B. THRASHER HALL, St. Louis, Mo. Filed Sept. 1, 1888. Serial No. 284,343. (No model.)

Claim.—1. A case for use in filing notes, &c., comprising, first, a series of thirty-one pockets connected at the ends and having their upper edges cut away, as described, and indexed by the succeeding days of the month, and twelve additional pockets which are similarly constructed and indexed by the months of the year, in combination with an inclosing-cover and an index-book having its leaves bound

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and indexed alphabetically, substantially as and for the purpose set forth.

2. A case for use in filing notes, &c., comprising the combination of, first, a series of thirty-one connected pockets indexed by the days of the month; second, twelve additional pockets indexed by months of the year, and, third, a removable and co-operative index-book composed of bound leaves indexed alphabetically and having opposite facing pages correspondingly numbered and provided with a list of months and corresponding rectangular blank spaces, substantially as set forth.

399,886. SHOEING-STAND. JOHN J. HALSTEAD, Kesler's Cross Lanes, W. Va. Filed Mar. 30, 1888. Serial No. 268,996. (No model.)



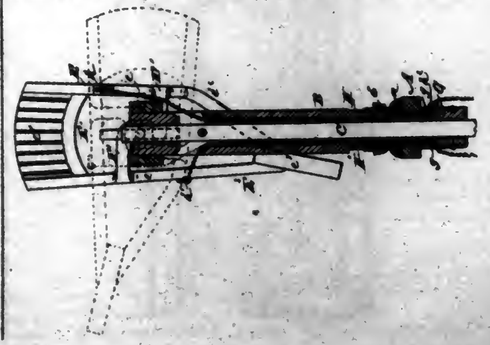
Claim.—1. A shoeing-stand having a box-like seat or rest, the walls of which are provided with grooves or ways C^2, combined with the keeper having portions fitted to said grooves C^2, whereby the keeper may be adjusted in said grooves within the seat or rest, and a lock for securing said keeper, substantially as set forth.

2. In a shoeing-stand, a seat or rest having its walls slotted at C' C^2, the keeper having portions fitted to said slots, and a lock for securing said keeper, substantially as set forth.

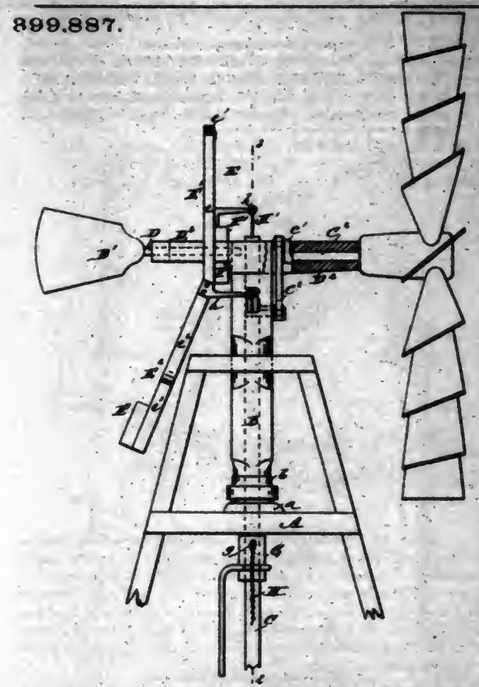
3. In a shoeing-stand, the rest or seat having its walls provided with a slot for the entrance of the keeper, and with a groove, C^2, intersecting said slot, and the keeper having portions fitted to the slot and groove, substantially as set forth.

399,887. WINDMILL. GEORGE W. HAINES, Adin, Cal. Filed Aug. 19, 1887. Serial No. 247,267. (No model.)

Claim.—In a windmill, the combination, with the turn-post B, the pump-rod C, the rudder-shaft D, and the governor E, secured to the rudder-shaft and provided with the arms A, of the swivel G, provided with the apertures *g* and mounted on the pump-rod, and the ropes or chains H H', secured to the arms *A* of the governor and passing down

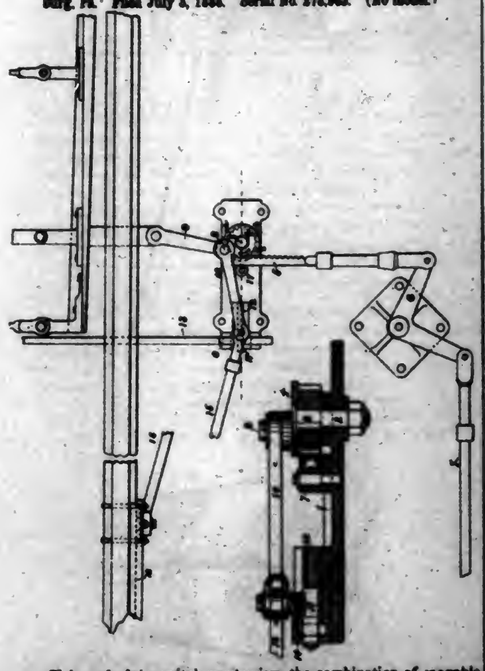


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through the turn-post and out through the apertures of the swivel, the chain H being provided with the button A^3, substantially as herein shown and described.

399,888. SWITCH MECHANISM. JAMES T. HAMBAY, Wilkinsburg, Pa. Filed July 3, 1888. Serial No. 278,963. (No model.)

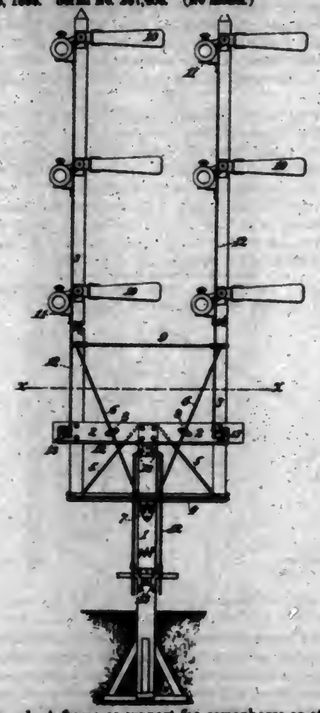


Claim.—1. In a switch mechanism, the combination of movable switch-rails, a locking-bar connected thereto, a locking-pin, and a rotating wheel, the locking-pin and switch-rails having independent connections to the wheel at the same or diametrically-opposite points, whereby a full movement of the pin preceding and succeeding a full movement of the switch-rails is secured, substantially as set forth.

2. In a switch mechanism, the combination of movable switch-rails, a locking-bar connected thereto, a locking-pin, and a rotating wheel, the locking-pin and switch-rails having connections to the same or diametrically-opposite points of the wheel, said connections being arranged at right angles to each other, substantially as set forth.

3. In a switch mechanism, the combination of movable switch-rails, a locking-bar connected thereto, a locking-pin, a detector-rail, and a rotating wheel, the locking-pin, detector-rail, and switch-rails having connections to the same or diametrically-opposite points of the wheel, the connections for the detector-rail and locking-pin being arranged at right angles to the connection of the switch-rail, substantially as set forth.

399,889. SIGNAL-POST. JAMES T. HAMBAY, Swissvale, Pa. Filed Oct. 6, 1888. Serial No. 287,402. (No model.)



Claim.—1. A frame or support for semaphores or other signals, having in combination a main post, cross-beams secured to said post, signal-posts supported by the cross-beams on opposite sides of the main post, the ends of the signal-posts extending below the cross-beams, and tie-beams connecting the lower ends of the signal-posts to each other and to the main posts, substantially as set forth.

2. A frame or support for semaphores or other signals, having in combination a main post, cross-beams secured to said post, signal-posts supported by the cross-beams and having their lower ends extending below the cross-beams, tie-beams connecting the lower ends of the signal-posts to each other and to the main post, and a strap connected to the lower ends of the signal-post and passing over the main post, substantially as set forth.

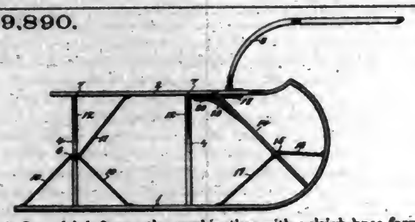
3. A frame or support for semaphores or other signals, having in combination a main post, cross-beams secured to said post, signal-posts supported by the cross-beams on opposite sides of the main posts, straining or queen posts secured to the cross-beams, and truss-rods having their ends connected to the main post and to the signal-posts at points above the cross-beams and passing over the straining-posts, substantially as set forth.

399,890. SLEIGH. WILLIAM J. HAMILL, St. Catharines, Ontario, Canada. Filed Dec. 15, 1888. Serial No. 293,703. (No model.)

Claim.—1. A sleigh-knee formed in arch shape and provided with a brace consisting of a curved truss formed on a center eccentric with that of the knee, the curve of the truss being greater than that of the knee, substantially as specified.

2. A sleigh-knee and bench formed in arch shape and provided with a curved truss, the curve of the truss being greater than that of the knee and the center thereof being eccentric with that of the knee, and devices for binding the knee and truss in relative position, substantially as specified.

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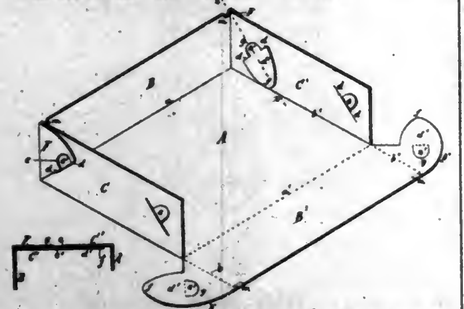
3. In a sleigh-frame, the combination, with a sleigh-knee formed on substantially a half-circle and provided with a truss formed on a half-circle, the radius of which is greater than that on which the knee is formed and the center thereof being eccentric with that of the knee, of a cross-piece secured to the knee, and bolts passing through the cross-piece, knee, and truss, substantially as specified.

4. The combination, with the runners 1, of the knees 4, the curved truss-braces 5, connected, as at 6, to the knees, substantially as specified.

5. The combination, with the runners 1, fenders 2, and front curved brace, 18, of the diagonal brace 14, secured to the fenders, and provided with the branch brace 19, secured to the curved brace, and the clip 15, having the braces 16 and 17, substantially as specified.

6. The combination, with the runners 1, having the knees 4, and trusses 5, secured thereto, as at 6, of the cross-pieces 7, secured to the knees and trusses, as at 8 and 19, and the interposed side braces, 12, secured to the cross-pieces at their upper ends and to the knees at their lower ends, as at 13, substantially as specified.

399,891. PAPER BOX. GEORGE W. T. HARLEY, Frederick, Md. Filed Jan. 10, 1889. Serial No. 296,926. (No model.)



Claim.—A paper box which comprises in its construction one or more walls having end flaps, F, provided with locking parts *e'*, in combination with one or more walls provided with a slit, *d*, and an opening, *e*, substantially as and for the purpose described.

399,892. EYE-SHADE. THOMAS H. HARRISON, London, England, assignor of one-half to Levy, Dreyfus & Co., New York, N. Y. Filed Dec. 19, 1888. Serial No. 294,094. (No model.)



Claim.—An eye shade or protector consisting of a main part or body formed of larger eye parts, and a connecting bridge-piece having a rearwardly-bent nose-rest, and of a retaining device for attaching the protector to the head, substantially as set forth.

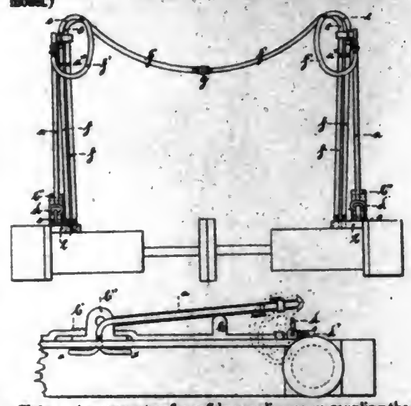
399,893. LEATHER-DRESSING. JAMES J. HAYWARD, Ballston, N. Y. Filed Nov. 1, 1888. Serial No. 289,735. (Specimens.)

Claim.—1. The herein-described composition of matter to be used for rendering substances impervious to water, consisting of paraffine, camphor, rosin, and naphtha, in proportions substantially as specified.

2. The herein-described composition of matter to be used for rendering substances impervious to water, consisting of paraffine, asphaltum, camphor, rosin, neat's-foot oil, and naphtha, in proportions substantially as specified.

3. The herein-described composition of matter to be used for rendering substances impervious to water, consisting of paraffine, asphaltum, camphor, rosin, and naphtha, in the proportions substantially as specified.

399,894. MEANS FOR SAFELY COUPLING OR UNCOUPLING THE PIPES OF PNEUMATIC BRAKES OR STEAM-HEATING APPARATUS ON RAILWAY-TRAINS. BARTHOLOMÄUS HEINRICHS, Cöblentz, Prussia, Germany. Filed Jan. 10, 1888. Serial No. 260,372. (No model.)

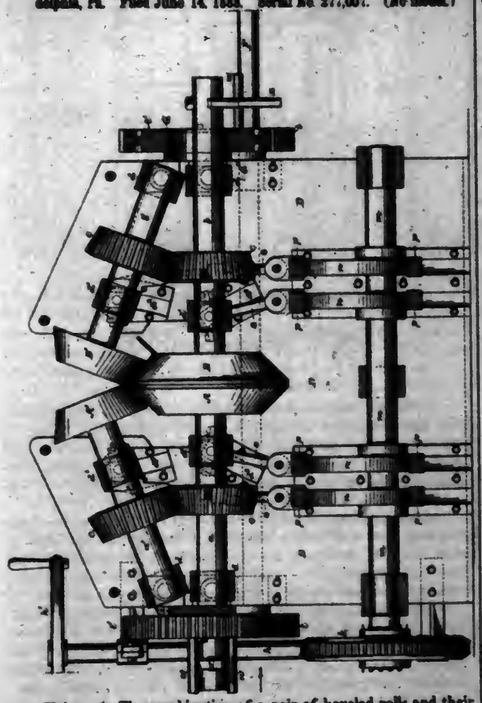


Claim.—An apparatus for safely coupling or uncoupling the pipes of pneumatic brakes or steam-heating apparatus on railway-trains, consisting of radius-rods *a* between the buffers of each carriage, the upper ends of said rods being in connection with each other by means of branch pipes *c*, toothed gears *a'*, secured to radius-rods *a*, sliding bars *b*, with racks *b'*, for turning the toothed gears *a'*, spring-catches *i i* in the sliding bars *b*, and projections *k'*, for catching spring-catches *i i*, substantially as set forth.

399,895. SNOW-PLOW. ERIC M. HEMELSON, Rockford, Minn. Filed Mar. 29, 1888. Serial No. 268,738. (No model.)

Claim.—In a snow-plow, the combination, with an inclined bottom, of a central vertical knife held on the said bottom, wings extending rearwardly from the rear end of the said central knife, extension-wings hinged to the top edges of the said wings, side knives secured to the sides of the said bottom near its front end, the said side knives extending upward and outward, a brace secured to the top edges of the said side knives and central knife, and wedge-shaped sides extending rearward from the said side knives and along the sides of the said bottom, substantially as shown and described.

399,896. MACHINE FOR CHANGING THE ANGLE OF THE FLANGES OF Z AND ANGLE BARS. WILLIAM R. HIGHFIELD, Philadelphia, Pa. Filed June 14, 1888. Serial No. 277,057. (No model.)

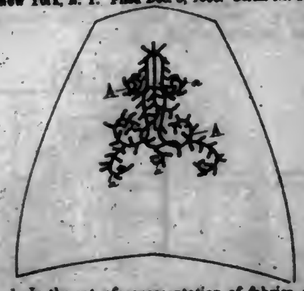


Claim.—1. The combination of a pair of beveled rolls and their shafts adapted to pivoted boxes, with an arm projecting laterally from the shaft of one roll, and a driving-wheel having longitudinally-projecting fingers for engaging with said arm, and a central opening of larger diameter than the shaft, whereby the swinging of the latter on its pivots is permitted, all substantially as specified.

2. The combination of a pair of bevel-wheels having shafts adapted to pivoted boxes, an arm projecting from the shaft of one roll, a driving-wheel having projecting fingers engaging with said arm, and a sleeve serving as a bearing for said wheel and having a vertical slot for the passage of the shaft, all substantially as specified.

3. The combination of the two pairs of beveled rolls and the pivoted shafts carrying the same, a shaft having cams, and connecting-rods whereby said cams are caused to act on the roll-shafts, a counter-shaft, worm-gearing whereby the counter-shaft is caused to operate the cam-shaft, and a hand-wheel whereby said counter-shaft may be directly operated, all substantially as specified.

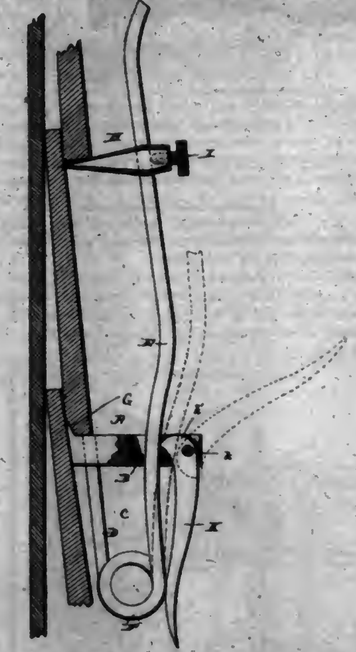
399,897. METHOD OF ORNAMENTING FABRICS. MICHAEL L. HILLER, New York, N. Y. Filed Dec. 5, 1888. Serial No. 292,726. (No model.)



Claim.—1. In the art of ornamentation of fabrics, an embroidered surface, the leaders of the design being composed of one or more lengths of cord sewed flatly in place, and having extending from said cord lengths of smaller members of the general design composed of a series of beaded work, substantially as described.

2. The within-described means for ornamenting surfaces of fabrics, which consists in the combination of leaders A, formed of lengths of cord sewed in place upon such surfaces, with extensions branched out therefrom composed of series of bead-work, as and for the purpose indicated, substantially as described.

399,898. SIDING-GAGE. SAMUEL G. HORACK, Ann Arbor, Mich. Filed June 21, 1888. Serial No. 277,736. (No model.)



Claim.—1. In a siding-gage, the combination of the slotted bar A, having an inclined or beveled inner end and provided with the spur flush with the said inner end, the spring-actuated arm passing upward through the slot in the said bar and provided with a pointed finger, and the cam-lever mounted in the slot and adapted to bear against the said arm, substantially as specified.

2. In a siding-gage, the combination, with the transverse bar A, having a slot, B, therein, and provided with a spur, G, of the movable arm E, passing through the slot B and provided at its lower end with a spring-coil, F, connected to the under side of the transverse bar, the adjustable finger arranged on the said arm, and the cam-lever mounted in the slot B and bearing against the arm, substantially as specified.

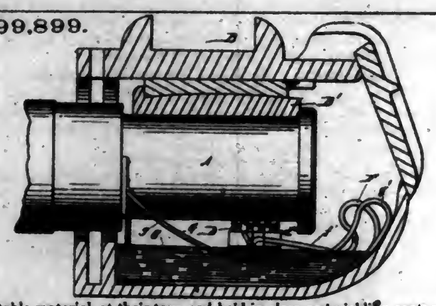
3. The herein-described siding-gage, comprising the transverse slotted bar A, having an inclined or beveled inner end and provided with the flat spur G, flush with the said end, the spring-rod C, provided with the short depending arm D, affixed at its upper end to the inner end of the bar A, the movable arm E, passing upward through the slot in the bar A, and the spring-coil F, connecting the lower ends of the arms D E and serving to press the movable arm outward, the adjustable finger H, mounted on the movable arm and provided with a thumb-screw to clamp it in the desired position, the inner end of the said finger being pointed to engage the siding, and the cam-lever mounted on a transverse pivot in the outer end of the slot in the bar A and adapted to bear against the movable arm E to force it inward against the strength of the spring-coil and engage the inner end of the finger in the siding, substantially as specified.

399,899. CAR-AXLE LUBRICATOR. CHARLES A. HOWARD, Pontiac, assignor to Henry G. Hodges and Charles G. Hodges, Detroit, Mich. Filed Nov. 6, 1888. Serial No. 290,094. (No model.)

Claim.—1. A car-axle lubricator consisting of a single grooved cylinder supported by a yielding spring-frame and adapted to be constantly held in rolling contact with the axle, and in combination therewith a spring-impelled collar at the back of the journal-box for preventing waste of the lubricant, substantially as described.

2. In a car-axle lubricator, the combination, with a single spring-impelled lubricating-roller, of a wiper consisting of the jaws H, pivoted at their bottoms and provided with the tips *h'*, of leather or other

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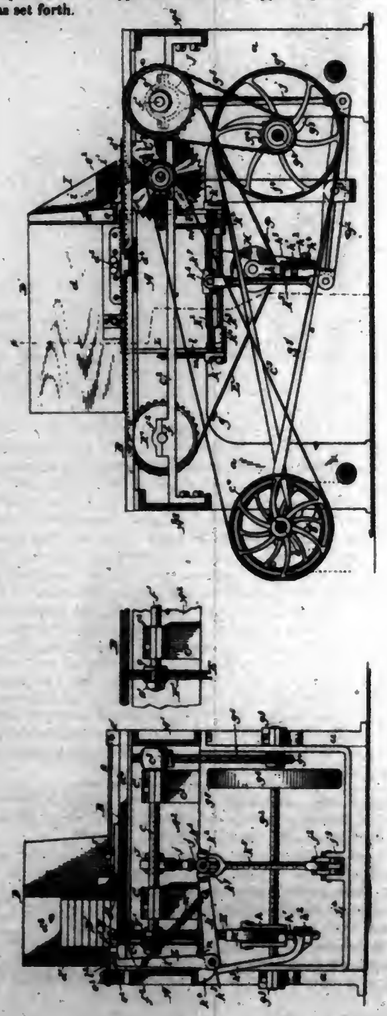


suitable material, at their tops, and held in close and yielding contact with the axle by the spring-arms *g*, substantially as described.

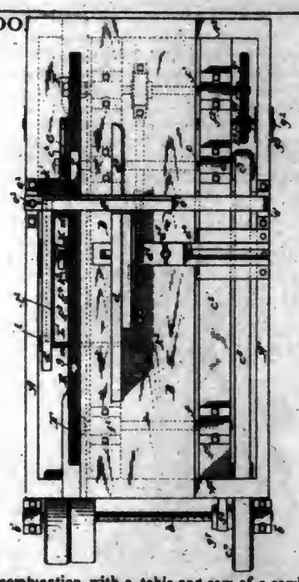
3. A wiper for car-axles, consisting of two curved jaws, H, pivoted at their bottoms and supported adjacent to the axle by the yielding spring-frame G, said jaws provided with the slots h^4, substantially as described.

399,900. SAWING-MACHINE. RICHARD H. HOYT, Buffalo, N. Y., assignor of one-half to Hobart B. Loomis, same place. Filed May 8, 1888. Serial No. 273,171. (No model.)

Claim.—1. The combination, with the supporting-frame, table, and saw of a sawing-machine, of a board-receptacle and an end gage-bar, *c*, pivoted at one end to said supporting-frame and made vertically adjustable at its opposite end on the supporting-frame, substantially as set forth.



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2. The combination, with a table and saw of a sawing-machine, of a board-receptacle arranged in front of said saw and having its end wall vertically adjustable, a yielding presser-foot secured to said rear wall and arranged adjacent to said saw, and an endless feed-chain, whereby the boards are successively fed under said end wall and presser-foot to said saw, substantially as set forth.

3. The combination, with the table and saw, of a board-receptacle arranged on said table, a side gage, a laterally-movable aligning frame, whereby the boards are successively moved against the side gage, and a feeding device whereby the boards contained in the receptacle are successively fed to the saw, substantially as set forth.

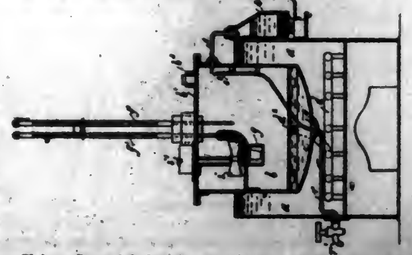
4. The combination, with the table and saw, of a board-receptacle having one of its side walls laterally adjustable on said table, a laterally-movable aligning frame, whereby the boards contained in the receptacle are successively moved against one of the side walls of said receptacle, and a longitudinal feeding device, whereby the boards contained in the receptacle are successively fed to the saw, substantially as set forth

5. The combination, with the table and saw, of a board-receptacle arranged on said table in front of said saw, a laterally-movable aligning frame, L, actuating-arms k k', and springs connecting the actuating-arms with the laterally-movable frame L, substantially as set forth.

6. The combination, with the table B, saw C, and the board-receptacle D, of a laterally-movable aligning frame, L, actuating-arms k k', springs m m', connecting the actuating-arms with the aligning frame L, and whereby the latter is moved in one direction, and studs n n, arranged on the arms k k', and whereby said aligning frame is moved in the opposite direction, substantially as set forth.

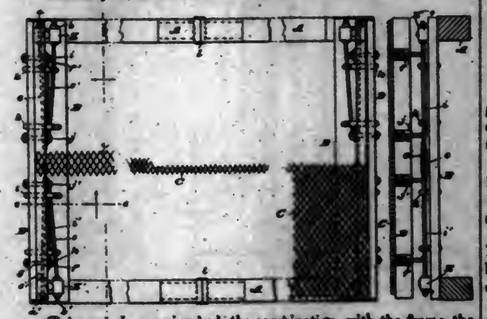
7. The combination, with the table B, saw C, and receptacle D, of a longitudinal feeding device, E, moving in said receptacle, a laterally-movable aligning frame, L, actuating-arms k k', connected yieldingly with said aligning frame, a rock-lever, j^3, connected with said actuating-arms, and an eccentric whereby the rock-lever j^3 is actuated, substantially as set forth.

399,901. INHALER. EMIL JAHR, Berlin, Germany. Filed June 13, 1888. Serial No. 277,090. (No model.)



Claim.—In an inhaler, the combination of the water-boiler *a*, in which the air-reservoir *b* is placed, with the spray-pipes *c*, and the double branch pipes a^2 b^2, with the india-rubber pipe *h*, arranged as described, whereby the air enters the spiral tube *d*, is warmed therein with steam and the desired medicament, and is finally drawn off through the double branch a^2 b^2, substantially as described.

399,902. SPRING-BED. FRANK M. JEFFERY, Jersey City, N. J. Filed July 25, 1888. Serial No. 280,969. (No model.)



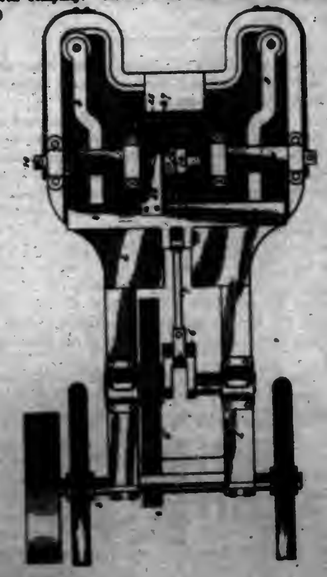
Claim.—1. In a spring-bed, the combination, with the frame, the fabric for supporting the bedding, and the end bars on said fabric, of the torsional springs secured at one end to the frame and having on their other ends upright spring-arms attached at their tops to the said end bars and carrying the latter, the torsional bodies of said springs being arranged substantially parallel with said bars, as set forth.

2. In a spring-bed, the combination, with the frame, the fabric for supporting the bedding, and the end bars on said fabric, of the torsional straining-springs secured at one end to the frame and having at their other ends spring-arms which carry the end bars on the fabric, and the tension-regulators for said springs, said tension-regulators being mounted on the bed-frame and the ends of the respective springs being set in sockets in the same, substantially as set forth.

3. The combination, with the bed-frame, the fabric for supporting the bedding, and the end bars on said fabric, of the main torsional springs provided with spring-arms attached to said end bars, the auxiliary torsional springs provided also with spring-arms attached to said end bars, and tension-regulators for said springs mounted on the bed-frame, said regulators comprising a socket-piece rotatively mounted in a block and provided with a socket which receives the squared end of the spring, a square to receive a wrench, and a brake to prevent backward rotation, as set forth.

4. The combination, with the frame and fabric, C, of the end bars, D, on the fabric, the torsion-springs *e e'*, provided with upright spring-arms *f f'*, the plates A, and the eyebolts *g*, which pass through said plates and the members of the bar D, as set forth.

399,903. DEVICE FOR UPSETTING AND BENDING METAL. MARTIN KENNEDY, Hopewell, Ill., assignor to the United States Rolling Stock Company. Filed Oct. 6, 1888. Serial No. 287,367. (No model.)



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Claim.—1. The dies 11 and 12, having in their opposing faces the grooves 16 and cavities 17, in combination with the plunger 24, the die 11 having also the cavity 15 and hole 28, and the die 12 having the punch 20, substantially as described.

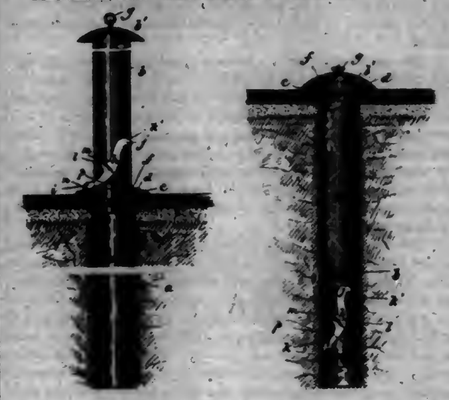
2. The dies 11 and 12, having in their opposing faces the grooves 16 and cavities 17, the die 11 having also the cavity 15 and groove 14, in combination with the plunger 24 and the arm 23, substantially as described.

3. The dies 11 and 12, having in their opposing faces the grooves 16 and cavities 17, in combination with the plunger 24, the die 11 having also the cavity 15, the hole 28, and the cleaner 29, and the die 12 having the punch 20, substantially as described.

4. The dies 11 and 12, having in their opposing faces the grooves 16 and cavities 17, the die 11 having also the cavity 15, hole 28, and groove 14, and the dies 12 having the punch 20, in combination with the plunger 24 and arm 23, substantially as described

5. The combination of the die 11, having the cavity 15 and the groove 14, with the die 12 and the arm 23, substantially as described.

399,904. HITCHING-POST. BYRON G. KNAPP, Sandy Hill, N. Y. Filed Jan. 21, 1889. Serial No. 296,904. (No model.)



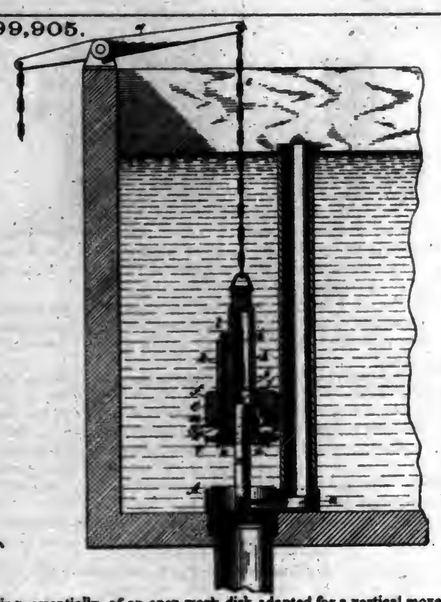
Claim.—The combination, in a hitching-post, of a tubular sheath adapted to be set in the ground, a flange or shed surrounding its upper extremity, an annular bead upon the upper surface of said flange, a tubular post arranged to slide vertically within said sheath, said post having perforations in its opposite sides, a gravitating locking-latch pivoted off the longitudinal center of the post, said latch having a recess in its lower end, and a cap upon the top of the post, said cap being provided with an annular recess upon its under surface to receive the bead upon said flange, all arranged and adapted to operate in the manner and for the purpose substantially as described.

399,905. WATER-CLOSET VALVE. EDWIN L. KNIGHT, Springfield, Mass. Filed Jan. 14, 1889. Serial No. 296,250. (No model.)

Claim.—1. The combination, with a valve-seat and a guiding-spindle supported therefrom, of a valve comprising two members, the upper of which consists of a body and an upwardly and downwardly projected hollow spindle open from its bottom, the bore of which is of two diameters, substantially as described, and having a laterally and downwardly extending passage, *k*, and a lifting-abutment, *l*, on said lower spindle-extension, and the lower member consisting, essentially, of an open-work disk adapted for a vertical movement with relation to said lower spindle-extension, substantially as described.

2. The combination, with a valve-seat and a guiding-spindle supported therefrom, of a valve comprising two members, the upper of which consists of a body and an upwardly and downwardly projected hollow spindle open from its bottom, the bore of which is of two diameters, substantially as described, and having a laterally and downwardly extending passage, *k*, and a lifting-abutment, *l*, vertically adjustable on said lower spindle-extension, and the lower member con-

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sisting, essentially, of an open-work disk adapted for a vertical movement with relation to said lower spindle-extension, substantially as described.

3. The combination, with a valve-seat and a guiding-spindle supported therefrom, of a valve comprising two members, the upper of which consists of a body and an upwardly and downwardly projected hollow spindle open from its bottom, the bore of which is of two diameters, substantially as described, and having a laterally and downwardly extending passage, *k*, and a regulating-screw therefor, and a lifting-abutment, *t*, on said lower spindle-extension, and the lower member consisting, essentially, of an open-work disk adapted for a vertical movement with relation to said lower spindle-extension, substantially as described.

4. The combination, with the valve-seat and a guiding-spindle supported therefrom, of a valve comprising two members, the upper of which consists of a cylindrical body recessed on its under side, having an upwardly and downwardly projected hollow spindle the bore of which is of two diameters, substantially as described, and having a lateral and downwardly extending passage, *k*, and the lower extension of the spindle screw-threaded and provided with an apertured abutment-nut, *t*, and the lower member consisting of a sleeve, a concentric collar, and radial connecting-arms *p*, and the said collar provided with a washer, *q*, attached at and extending outwardly from its edge, substantially as and for the purpose described.

5. The combination, with the valve-seat and a guiding-spindle supported therefrom, of a valve comprising two members, the upper of which consists of a cylindrical body, *f*, recessed on its under side, and an upwardly and downwardly projected hollow spindle open from its bottom, the bore of which is of two diameters, substantially as described, and having a lateral and downwardly extending passage and an adjusting-screw therefor, and provided with the apertured adjustable abutment-nut, *t*, and the lower member consisting of the sleeve *m*, the collar *n*, flanged and screw-threaded, and the connecting-arms *p*, and the washer *q*, and nut *s*, combined and operating substantially as and for the purpose described.

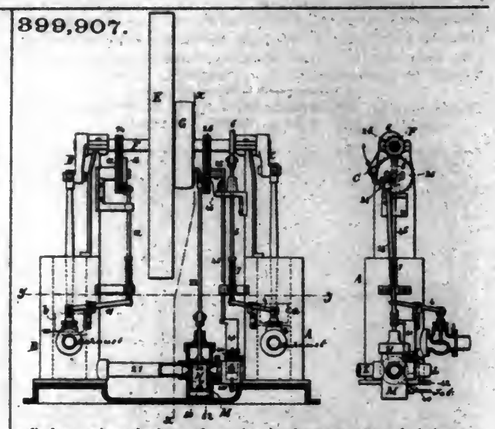
399,906. PROCESS OF REFINING WOOL-FAT. HUGO W. LANGBECK, Loughton, County of Essex, England. Filed Aug. 27, 1888. Serial No. 283,963. (Specimens.) Patented in England Sept. 2, 1886, No. 11,192.

Claim.—The process herein described of treating wool-fat to produce unguent or lubricant material, which consists in separating the fatty acids from the raw material by a solvent, treating the residue while in a melted or dissolved condition with prussiate waste by stirring it together with the same for a lengthened period, then dissolving the purified fat and removing the prussiate waste, and finally separating the solvent from the purified fat, substantially as described.

399,907. GAS-ENGINE. SAMUEL LAWSON, New York, N. Y., assignor to himself and Alonzo T. Welch, same place. Filed Feb. 6, 1888. Serial No. 263,140. (No model.)

Claim.—1. The combination, in a gas-engine with the separate

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cylinders and an ignitor, of a valve having ports for admitting gas and air, and pipes connecting said valve with each of the cylinders and forming a passage-way between the two cylinders, whereby the ignited gases of one cylinder can ignite the gases of the other cylinder, substantially as specified.

2. The combination, with the two cylinders, pistons, connecting-rods, cranks, and shaft in a gas-engine, of two discharge-valves, one to each cylinder, and mechanism for opening one of the valves during each descent of the piston, and mechanism for opening the other valve during every second descent of its piston, the pipe connecting the two cylinders, air and gas inlet pipes, and a valve at the junction of such pipes, and an ignitor, and mechanism for moving the same, whereby the gases in one cylinder are compressed before being ignited, and in the other cylinder there is a minus pressure for drawing in the flame, substantially as set forth.

3. The combination, with the cylinders A and B and the connecting-pipes 20 and 21, of the valve N and valve-case M and air-inlet and gas pipes, such valve N having ports that admit the air and gas to pass in and to commingle and to pass to the respective cylinders, and a second set of ports to allow the ignited gases in one cylinder to ignite the gases in the other cylinder, substantially as set forth.

4. The combination, in a gas-engine, with the cylinder and air and gas inlet valve, of a case having ports and a stationary burner, a tubular cut-off or ignitor having ports and adapted to form a chimney for the burner, and mechanism, substantially as specified, for moving the same within said case, substantially as set forth.

5. The combination, in a gas-engine with the cylinders and air and gas inlet valve, of a case, 42, having ports and a stationary burner, 40, a tubular cut-off or ignitor, 41, adapted to move within the case and having ports, a spring, 44, for elevating the ignitor, and a rod, 45, and cam 46, for depressing said ignitor, substantially as and for the purposes set forth.

399,908. GAS-ENGINE. SAMUEL LAWSON, New York, N. Y., assignor to himself and Alonzo T. Welch, same place. Filed Aug. 4, 1888. Serial No. 281,997. (No model.)

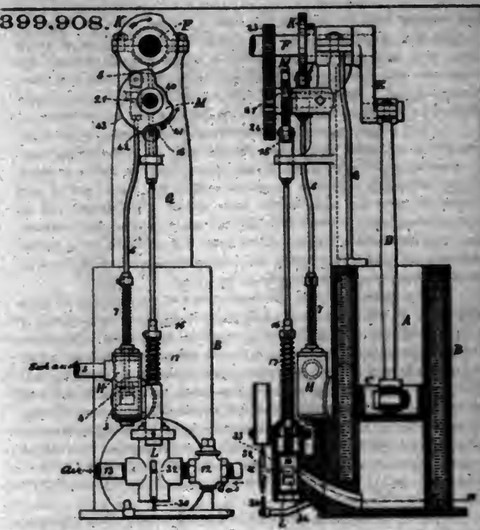
Claim.—1. In a gas-engine, the cylinder, piston, crank, and crank-shaft, and the escape-valve, cam, and rod for operating the same each revolution of the crank-shaft, in combination with the valve-case, air and gas supply pipes, and the ignitor, and a tubular valve having a single compartment closed at both ends and having ports for the admission of air and gas, and holes for the passage of the flame, and mechanism, substantially as specified, for reciprocating the valve once to each two strokes of the cylinder, substantially as set forth.

2. The valve 15, air and gas pipes, valve-case, and ports, in combination with the cylinder A, piston, connecting-rod, and crank, the cam M, having the respective surfaces 40 41 43 and the projection 42, for causing the igniting-openings to coincide, and the spring 17, for moving the valve in opposite directions to the cam, substantially as set forth.

3. In a gas-engine, the combination, with the valve-case, air and gas supply pipes, and the ignitor, of a tubular valve having a single compartment closed at both ends, and having ports for the admission



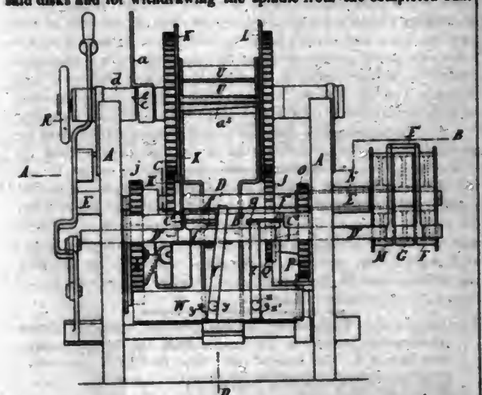
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of air and gas and holes for the passage of the flame, substantially as set forth.

399,909. MACHINE FOR FORMING BALLS OF FIBER OR SLIVER. WILLIAM B. LEE, Bradford, County of York, England. Filed Mar. 22, 1888. Serial No. 268,119. (No model.) Patented in England Aug. 27, 1887, No. 11,068.

Brief.—The invention resides in the mechanism for reducing the speed of revolution of the winding-disks after the ball of sliver has attained a certain size, and in the mechanism for easing back one of said disks and for withdrawing the spindle from the completed ball.



Claim.—1. In a machine for forming balls of fiber or sliver, the combination, with the disks K L, provided with gear-teeth, of a driving-shaft having pinions gearing with the teeth of said disks, a pulley rigidly mounted on said shaft, a sleeve loosely mounted on the said driving-shaft and having a pulley and a pinion mounted thereon, and intermediate reducing-gear connecting said sleeve-pinion with one of the pinions on the main shaft, substantially as described.

2. In a machine for forming balls of fiber or sliver, the combination, with disks K L, of a driving-shaft operatively connected with said disks, a pulley rigidly connected to said shaft, a pulley loosely mounted on said shaft, reducing-gearing connecting said loose pulley and the shaft, a sliding rod and a belt-shipper connected thereto, a spring, A', a bell-crank lever, X, and the tripping-arm Y, connected to said lever, substantially as described.

3. The combination, with the disks K L, of a driving-shaft operatively connected therewith, a sliding bar, and a belt-shipper mounted thereon, spring A', bell-crank lever X, and tripping-arm Y, connected with said bell-crank lever, substantially as described.

4. The combination, with the disks K L, of a driving-shaft operatively connected with the same, fast pulley F and loose pulleys G M on said shaft, reducing-gearing connecting said loose pulley M with said shaft, a sliding rod, a belt-shipper connected thereto, springs A' and F, adapted to move said rod in opposite directions, bell-crank lever X, and tripping-arms Y and Z, of different lengths, connected with said lever, substantially as described.

5. The combination, with a driving-shaft, of a sliding rod provided with a belt-shipper, a spring adapted to move said rod in one direction, a retaining device for said spring, a cam, and gearing for actuating it connected with the driving-shaft, and devices connecting said cam with said spring, whereby the said spring is moved to a position to effect the proper movement of the belt-shipper when released from its retaining device, substantially as described.

6. The combination of the driving-shaft, a sliding rod provided with a belt-shipper, a spring adapted to move the rod in one direction, a lever engaging said spring, and a wheel provided with a cam in gear with the driving-shaft for moving the lever and spring in the opposite direction, substantially as described.

7. The combination, with a driving-shaft, of a sliding rod provided with a belt-shipper, a spring adapted to move said rod in one direction, a lever engaging said spring, a wheel provided with a cam in gear with the driving-shaft and having a flange on its periphery broken away at one point, an arm pivoted on the said lever and engaging said flange, and a tripping-arm for said spring, substantially as described.

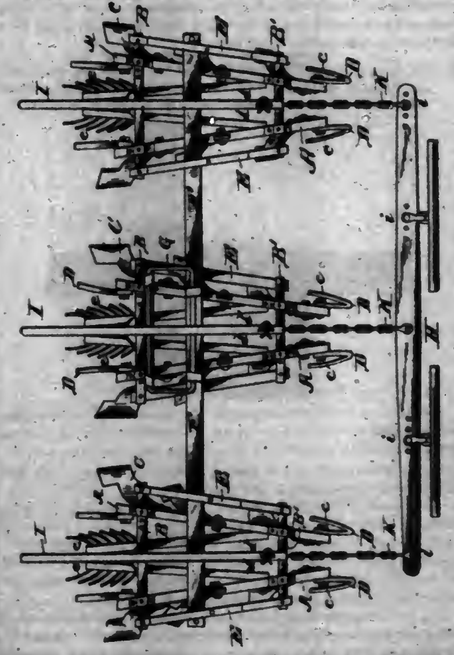
8. The combination, with the bearing *d*, of the disk K, provided with the sleeve *b*, mounted in said bearing, and the spindle a^3, longitudinally movable in said sleeve *b*, the said sleeve and said spindle being provided the one with a groove or gain and the other with a spline engaging the same, substantially as described.

9. The combination, with the bearing *d*, of the disk K, provided with the sleeve *b*, mounted in said bearing, the spindle a^3, longitudinally movable in said sleeve, the said spindle being screw-threaded at its outer end, and a hand-wheel, R, substantially as described.

10. The combination, with the bearing *d*, having its inner end provided with notches, as described, of the disk K, journaled in said bearing, and the lever *a*, provided with projections corresponding with the recesses in the bearing *d*, mounted on the journal of disk K, substantially as described.

11. The combination, with the spring-bar F', of the lever J', provided at its outer end with an incline, the shaft provided with the arm K', lever L', and devices connecting it with said shaft, substantially as described.

399,910. CULTIVATOR. AMOS LEWIS, Tarkio, Mo. Filed Aug. 3, 1888. Serial No. 281,909. (No model.)



Claim.—1. A cultivator-blade consisting of a bar portion to be attached to a beam and a dirt-moving portion forming a continuation of the bar portion and extending downward and rearward and then outward and having its outer portion extending upwardly, rearwardly, and inwardly, the share or front side of the bar being provided with a cutting-edge, whereby the earth is passed from the share side across

the dirt-moving portion to the bar side and is thrown inwardly to the corn by the rearwardly and inwardly extending edge, substantially as set forth.

2. In a cultivator, the combination, with a pair of rearwardly and outwardly diverging beams, of two or more cultivator-blades carried by each beam, each blade being formed in one piece and comprising a bar portion and a dirt-moving portion, the bar portion being secured to the beam so that the dirt-moving portion will extend downward and outward and continue outward and upward and backward and inward at its rear outer edge, whereby the dirt is thrown inwardly, as described, and the bars of the succeeding blades pass in the furrows formed by the dirt-moving portions of the preceding blades, as set forth.

3. In a lister-cultivator, the combination, with two or more cultivator-sections provided with slotted side beams, of a transverse connecting-bar extending across the sections and through the slotted side beams to connect the sections together and allow independent movement of the same, substantially as described.

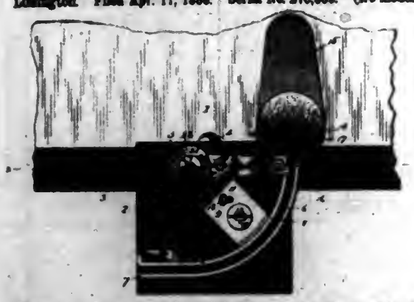
4. In a lister-cultivator, the combination, with the plow-beams, of a pair of guides adjustably secured to the same and curving forwardly and then rearwardly and downwardly, forming guiding edges or runners, having their lower ends bent outwardly to hold the cultivator in the center and cause it to follow the line of the list, substantially as described.

5. In a gang-cultivator, two or more cultivator-sections, each adapted to straddle a row, in combination with a rigid transverse connecting-bar extending across and loosely joining the sections together, and one or more links loosely joining the bar and one or more of said sections to allow independent vertical movement of said bar and section or sections, substantially as set forth.

6. In a gang-cultivator, the combination of one or more cultivator-sections, a transverse connecting-bar, a link loosely securing the bar to the central section, and side beams on the other sections, through which the bar loosely extends and in which it is confined, substantially as set forth.

7. In a gang lister-cultivator, the combination, with the cultivator-sections, each having guides running in the lists to hold the sections in the same, of a doubletree extending the distance between the sections, a vertically-adjustable draw-bar carried at the forward portion of each cultivator-frame, draft-chains directly attaching the doubletree to the lower ends of the draw-bars, and a rigid transverse connecting-bar loosely connecting the sections to allow variations of each section from the line of draft and yet prevent the same from overturning, substantially as set forth.

399,911. COMPOSING-STICK. FRANK J. LUDINGTON, Waterbury, and HENRY C. LELAND, New Haven, Conn.; said Leland assignor to said Ludington. Filed Apr. 17, 1883. Serial No. 270,889. (No model.)



Claim.—1. In a composing-stick, the combination, with a base-plate provided with means for securing it to a printer's case, and formed with a channel for supporting a row of type, of a flaring type-receiving mouth-piece at the end of said channel for guiding the type into said channel, substantially as described.

2. In a composing-stick, the combination, with a base-plate provided with means for securing it to a printer's case, and formed with a type-channel for supporting a line of type, of a flaring type-receiving mouth-piece arranged at the end of said channel, and a yielding and movable follower arranged in said channel for supporting the outer end of said line of type, substantially as described.

3. In a composing-stick, the combination of a type-channel, a spring-actuated movable follower fitted therein, and a concaved mouth-piece having its end converging to an inlet-opening which registers with the end of said type-channel, and formed with a vertical wall opposite the inner end of said channel, substantially as described.

4. In a composing-stick, the combination of a base-plate provided with a mouth-piece having an inlet-opening, with a partly-curved rigid flange or wall and with a stud or pin, a correspondingly-curved movable flange or wall provided with an extension or foot which projects horizontally from its concave side and is formed with two slots arranged in a radial line to the curve of the type-channel, one of which slides over said stud or pin, a set-screw which projects through the other slot into said base-plate and acts to adjustably hold said movable wall, and a spring-actuated follower fitted in the type-channel formed by said rigid and movable walls, substantially as described.

5. In a composing-stick, the combination of a partly-curved type-channel, a concaved mouth-piece formed with an inlet-opening communicating with the inner end of said channel, with an incline or bevel along its bottom, and with a vertical wall at the lower end of said incline or bevel and opposite the inner end of said channel, and an arm concentrically pivoted with the curved portion of said channel, and provided with a follower on its outer end, which is fitted within said channel, and with a spring for forcing the same toward the wall of said mouth-piece, substantially as described.

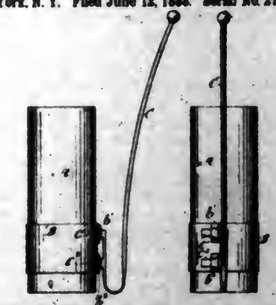
6. In a composing-stick, the combination of a partly-curved type-channel, a mouth-piece at one end thereof, which is formed with a vertical wall and with an incline or bevel in its bottom, a screw arranged concentrically with said type-channel and formed with a collar or flange and with a cylindrical head, a sleeve surrounding said screw and formed with a reduced upper end, an arm provided with an eye arranged upon the reduced end of said sleeve and secured thereon by said collar or flange of said screw, and provided with a follower at its outer end, which is fitted within said type-channel, and a helical spring, which is secured at one end in a perforation in the head of said screw and at the other end to a pin or stud upon said follower-arm, substantially as described.

7. A composing-stick provided with a type-channel having a general curvilinear shape, and formed of two flanges or walls having a straight portion at one end of each and a mouth-piece at the other end, the inner wall being formed with a vertical slot or aperture in its straight portion and with a guide finger or bar upon the upper edge of said straight portion, which projects over said slot and a short distance above the same, and with a follower-arm, which is pivoted concentrically with said channel and formed with a follower fitted therein and capable of passing out through said vertical slot or aperture, substantially as described.

8. In a composing-stick, the combination of a base-plate provided with a concaved mouth-piece having an inlet-opening at the converging lines of its sides, a flat vertical face at one side of said opening, and a curved rigid flange or wall which extends from the other side of said opening, a curved flange or wall which is adjustably secured to said base-plate for regulating its distance from said rigid flange or wall, and provided with a laterally-projecting lip which abuts against the flat face of said mouth-piece, substantially as described.

9. A composing-stick provided with the base-plate 2, having the generally-curved rigid wall 6, having the straight portion 7 and the concaved mouth-piece 14, formed with the bevel or incline 17, and the vertical wall 18, the generally-curved adjustable wall 8, having the straight portion 31, the slot or aperture 32, the guide finger or bar 33, and the horizontal extension or foot 9, formed with the slots 10 and 11, arranged in a radial line to the curve of the type-channel, the stud or pin 13, the set-screw 12, the post or screw 21, the sleeve 22, the follower-arm 23, formed with the follower 23', and the helical spring 27, substantially as described.

399,912. WICK-ADJUSTING MECHANISM. CHARLES H. LYMAN, Ansonia, Conn., assignor to the Ansonia Brass and Copper Company, New York, N. Y. Filed June 12, 1888. Serial No. 276,813. (No model.)



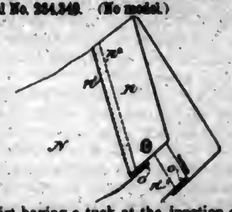
Claim.—In a wick-adjusting mechanism, the combination of the ring, adapted to engage a wick and provided with a loop, and a resilient rod turned upwardly at its lower end, and having a tongue extended laterally from said turned-up portion to engage the loop of the ring, substantially as specified.

399,913. SLEIGH-KNEE. TABOR G. MANDY, Stoughton, Wis. Filed Dec. 22, 1883. Serial No. 294,968. (No model.)

Claim.—1. A sleigh-knee constructed with a flat top provided with a central groove and two arms, the center portion of which is formed with a strengthening-ridge terminating in a tongue resting upon the top of the runner, the sides of the arms being bent down to form flanges terminating in lips which rest against and are secured to each side of the sleigh-runner, substantially as described.

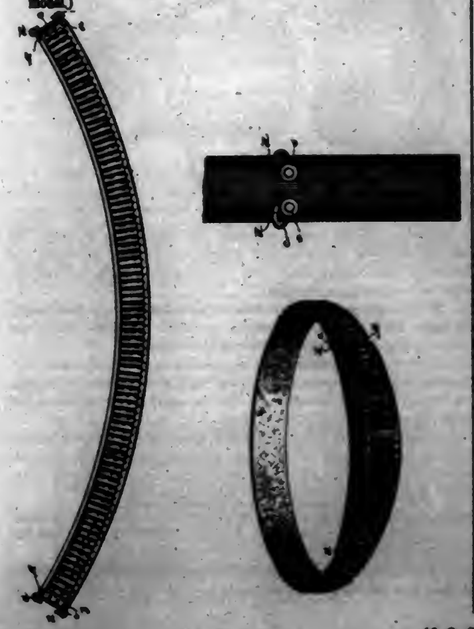
2. The combination, with a sleigh-knee constructed with a flat top provided with a central groove and two arms, the center portion of which is formed with a strengthening-ridge terminating in a tongue resting upon the top of the runner, the sides of the arms being bent down to form flanges terminating in lips which rest against and are secured to each side of the sleigh-runner, of a U-shaped bolt which fits in the central groove in the top and engages the cross-tie under the said flat portion, substantially as described.

399,914. SHIRT. SIMON MILLER, Philadelphia, Pa. Filed Sept. 1, 1888. Serial No. 284,349. (No model.)



Claim.—A shirt having a tuck at the junction of the sleeve and wristband, consisting of a portion of said sleeve folded under the wristband and concealed thereby and secured in place by a continuous line of stitching, whereby when said stitching is broken away the sleeve will be lengthened to the extent of the folded tuck, substantially as described.

399,915. FASTENING FOR CARTRIDGE AND OTHER BELTS. ARMON MILLS, U. S. Army. Filed Dec. 15, 1888. Serial No. 293,758. (No model.)



Claim.—1. A belt or band having upon its body a transverse rib or shoulder provided at one or both ends with double hooks adapted to catch over and embrace the opposite edges of the body of the belt and to bring up against a rib or shoulder upon said body, substantially as set forth.

2. A belt having thimbles or pockets upon its body for the reception of cartridges, and provided at one or both ends with a double hook adapted to catch over and embrace the opposite edges of the body of the belt and to enter the space which separates contiguous pockets.

3. A belt having thimbles or pockets upon its body for the reception of cartridges, and provided at one or both ends with a swiveled double hook adapted to catch over and embrace the opposite edges of the body of the belt and to enter the space which separates contiguous pockets.

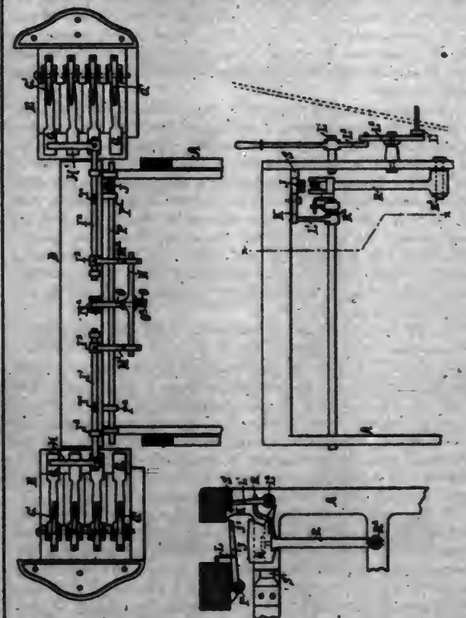
399,916. BELT FOR HOLDING CARTRIDGES AND CARTRIDGE-MAGAZINES. ARMON MILLS, U. S. Army. Filed Dec. 15, 1888. Serial No. 293,760. (No model.)



Claim.—The combination of the pocketed belt, the magazine or cartridge-receptacle, and the magazine-fastener composed of two members, of which one is carried by the magazine and the other by the belt, substantially as and for the purposes hereinbefore described.

399,917. STOP-MOTION FOR LOOMS. JOHN J. MCCOSKER, Providence, R. I., assignor of one-half to John J. Shanahan, same place. Filed Nov. 3, 1887. Serial No. 254,616. (No model.)

Brief.—By means of the devices set forth in the claims the loom is stopped either when both of the operative shuttle-boxes are full or when both of them are empty.



Claim.—1. The combination, as hereinbefore set forth, with the lay of a loom and the drop-boxes at the respective ends thereof provided with swells, of the independently-movable detector-fingers appropriate to engage the swells thereof and mounted on independent rocking shafts, the inner ends of which rocking shafts are provided with arms, a lever mounted on the rocker and connecting the arms of the two independent rock-shafts, the rocker, the stop-motion rod, and devices connecting said rocker with said rod, whereby the loom may be stopped when the detector-fingers assume certain predetermined positions, substantially as and for the purpose herein described.

2. The combination, with the lay of a loom, the drop-boxes provided with swells, the independently-movable detector-fingers, the detector-shafts for the fingers, the arms attached to the detector-shafts, the rocker, the connecting-lever mounted on said rocker and operated by the said arms, and the stop-motion rod provided with the stop-finger and connected to the said rocker by the link, of the push-piece or vibrating arm constructed to operate a shipping device, substantially as herein described.

3. The combination, as hereinbefore set forth, with the lay and the drop-boxes therefor provided with the swell-fingers, of the independently-movable detector-shafts, each provided with a detector-finger for engaging the swells of the respective drop-boxes, a stop-motion rod and the rocker connected therewith and operating the rod, the connecting-lever swiveled to the rocker, and the arm rigidly mounted on each detector-shaft and loosely connected with the respective ends of the connecting-lever, substantially as described.

4. The combination, as hereinbefore set forth, with the lay D, provided with the drop-boxes E, having the swells G, of the independently-movable detector-fingers H and H', the shafts I' and I², the arms M' and M², the connecting-lever N, the rocker O, and the stop-motion rod P, connected therewith and provided with the stop-finger J, the push-piece K, vibrating arm R, and the devices operated thereby, whereby the loom may be stopped when the detector-fingers and stop-finger are similarly deflected, substantially as herein shown and described.

5. The combination, as hereinbefore set forth, with the lay D, having the drop-boxes E, provided with the swells G, of the independently-movable detector-fingers H and H', engaging the sets of swells of the respective drop-boxes, the rocking detector-shafts I' and I², upon which the said respective detector-fingers are mounted, the stop-motion rod P, and the pivoted rocker O, connected therewith and actuating the same, the connecting-lever N, swiveled to the rocker O, and the arms M' and M², intermediate the respective detector-shafts I' and I² and the ends of the connecting-lever N, substantially as and for the purpose herein described.

6. The combination, as hereinbefore set forth, with the lay, the drop-boxes therefor, and the swells, of the independently-operating detector-shafts I' and I², provided with the detector-fingers H and H', respectively, and having the arms M' and M² mounted thereon, respectively, the stop-rod P, the pivoted rocker O, and the link O² and bar P', intermediate the stop-rod and the rocker, and the connecting-lever N, swiveled to the rocker and engaging with its ends the said arms M' and M², respectively, substantially as and for the purpose herein described.

7. The combination, as hereinbefore set forth, with the independently-movable detector-shafts I' and I², provided with the detector-fingers H and H' and the arms M' and M², respectively, of the stop-rod provided with the hooked stop-finger J, the pivoted rocker O, and the link O² and bar P', intermediate the said rocker and stop-rod, the connecting-lever N, swiveled on rocker O and engaging with the ends the said respective arms M' and M², the shipper-shaft L², provided with the turn-bar R² and the shipper-arm L', the pivoted push-piece K, for engaging the said shipper-arm, and the vibrating arm R, provided with the hooked head Q and having the hooked extension R', for engaging the turn-bar R², substantially as and for the purpose herein described.

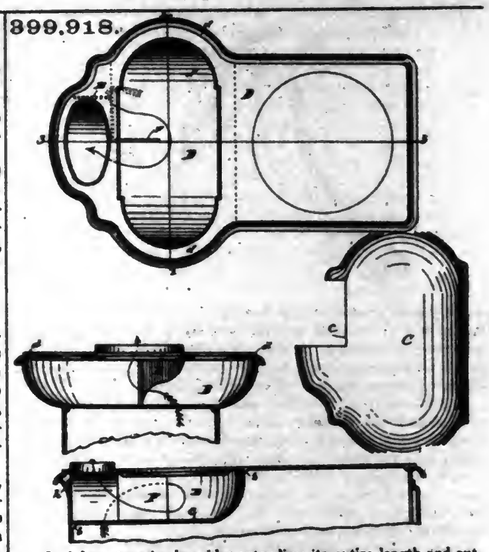
8. The combination, as hereinbefore set forth, with the independently-movable detector-shafts I' and I², provided with the detector-fingers H and H' and the fixed arms M' and M², respectively, of the stop-rod P, provided with the hooked stop-finger J, the pivoted rocker O, and the link O² and bar P', intermediate the rod P and rocker O, the connecting-lever N, swiveled on the rocker O and engaging the arms M' and M², respectively, the shipper-shaft L², provided with the turn-bar R², and the vibrating arm R, having the hooked head and provided with the hooked extension R', for engaging the bar R², substantially as and for the purpose herein described.

9. The combination, as hereinbefore set forth, with the independently-movable detector-shafts I' and I², provided with the detector-fingers H and H' and the fixed arms M' and M², respectively, of the stop-rod P, provided with the stop-finger J, the pivoted rocker O, and the link O² and bar P', intermediate the rod P and rocker O, the connecting-lever N, swiveled to the rocker O, the shipper-shaft L², provided with the shipper-arm L', and the pivoted push-piece K, engaged by the finger J, substantially as and for the purpose herein described.

399,918. COMBINED BOX AND COOKING STOVE. JOHN MCMASTER, Dayton, Ohio. Filed Aug. 31, 1888. Serial No. 284,235. (No model.)

Claim.—1. A stove having substantially flat sides and ends, the sides cut away at their upper edge to provide for a heating-chamber, and a plate of greater width than the body of the stove, forming the front and sides of said chamber, with a flat stove-top covering the entire stove, substantially as set forth.

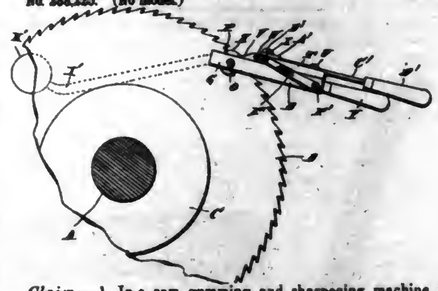
399,918.



2. A box-stove having sides extending its entire length and cut away, as at *a*, in combination with a plate resting on said cut-away sides extending laterally beyond the same, and having its sides and front turned up to form walls for the heat-chamber, and a flat stove-top of irregular width to cover said heat-chamber and the front of the stove, substantially as set forth.

3. In a box-stove having a heat-chamber formed therein separate from the stove-body, the following elements in combination: straight sides cut away along their upper edges, as at *a*, a plate with upwardly-curved front and side portions wider than the stove-body and resting on the cut-away side portions and flush on top with the uncut edge thereof, said plate having an opening, as *e*, for the passage of heat into the heat-chamber, a flat stove-top covering the entire stove, and plates to direct the heat into the body of the heat-chamber, substantially as set forth.

399,919. MACHINE FOR GUMMING AND SHARPENING GIN-SAWS. TURNER H. NANCE, Talladega, Ala. Filed Oct. 10, 1888. Serial No. 288,225. (No model.)



Claim.—1. In a saw gumming and sharpening machine, the laterally-movable punch pivoted directly on the body or frame, and having its outer cutting end beveled on its upper side to form a cutting-edge, substantially as described.

2. In a saw gumming and sharpening machine, the punch having the gage V clamped to one side and movable toward and from the cutting-point of the punch, substantially as described.

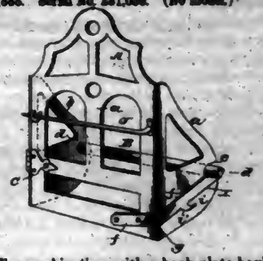
3. In a saw gumming and sharpening machine, the laterally-movable punch pivoted on the body or frame, and the screw G', engaging the upper side of the cutting end of the punch to prevent the latter from rising, substantially as described.

4. In a saw gumming and sharpening machine, the punch pivoted directly to the frame or body and laterally movable thereon, the operating-cam bearing on one side of the punch, and the spring bearing on the opposite side thereof, substantially as described.

399,920. FINISHING COMPOUND FOR PLASTERED WALLS. THOMAS J. HEAVITT, Austin, Tex. Filed Aug. 17, 1888. Serial No. 282,980. (No specimens.)

Claim.—A finishing compound for plastered surfaces, consisting of glue, gum-arabic, and glycerine, as and for the purposes set forth.

399,921. SPOOL-HOLDER. THOMAS W. HORTON, Shamokin, Pa. Filed July 25, 1888. Serial No. 281,080. (No model.)



Claim.—1. The combination, with a back plate having a fixed wing at one side and a hinged wing at the other side, of a spool-supporting rod fixed to one wing and means upon the other wing for engaging the rod, whereby the said wings are held in closed adjustment, substantially as set forth.

2. The combination, with a back plate having a fixed wing on one end and a hinged wing on the other end, one of said wings having a notch in its edge and a spring projecting yieldingly over an edge of the notch, of a spool-supporting rod fixed to one wing, its other end being adapted to enter the notch in the other and be held therein by the spring, substantially as set forth.

3. The combination, with a back plate having a fixed wing on one end and a hinged wing on the other end, one wing having a notch in its edge and a spring beveled at the end projecting partly over the notch, said spring having a knife projecting therefrom, of a spool-supporting rod fixed to one wing, and adapted to enter the notch in the other wing and be held therein by the spring, substantially as set forth.

4. The combination, with a back plate, a wing fixed to one end, and one hinged to the opposite end, the rigid wing having a notch in its edge, of a spool-supporting rod fixed to the hinged wing, with its free end in position to enter the notch in the edge of the other wing, a spring secured to the back plate and bent around the fixed wing, so as to project partly over the notch therein, in order to hold the spool-supporting rod therein, a knife on this spring, and a pin hinged to the back of the back plate, for the purpose substantially as set forth.

5. The combination, with frame, a device to pin the frame on the person of a user, a fixed wing having a notch, and a hinged parallel wing, of a spool-supporting rod fastened by one end to the hinged wing and adapted to enter the open notch in the fixed wing, a plate-spring which latches over the spool-supporting rod, and a thread-cutting lip or ear formed on the spring latch-plate, substantially as set forth.

399,922. LUNCH-HEATER. TIMOTHY O'MAHONY, Felton, Cal. Filed Dec. 1, 1888. Serial No. 292,431. (No model.)



Claim.—1. The cylindrical heater constructed of sheet metal and having an open top, and provided with inwardly-projecting arms for supporting the dinner-pail, and notched lugs for connecting with studs on the pail, as shown and described.

2. The combination of the pail having laterally-projecting studs with the heater having vertical notched lugs and supports for said pail, substantially as shown and described.

399,923. PACKING CARTRIDGES FOR TRANSPORTATION AND DISTRIBUTION. THOMAS C. ORMSBY, Worcester, Mass. Filed Dec. 19, 1888. Serial No. 294,045. (No model.)

Claim.—The herein-described method of packing cartridges for transportation and distribution, consisting in first storing the cartridges

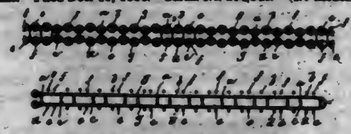


399,928.



in belts or bands provided with pockets closed at one end, each cartridge being placed in its own pocket, so as to be isolated from others on the same band, and then packing said bands in a suitable box or receptacle, with the heads of the cartridges in one band opposite the closed ends of the pockets in the next adjoining band or bands, whether in the same row or pile or in contiguous rows or piles, substantially as hereinbefore set forth.

399,924. CARTRIDGE-BELT. THOMAS C. ORMSBY, Worcester, Mass. Filed Dec. 19, 1888. Serial No. 294,046. (No model.)



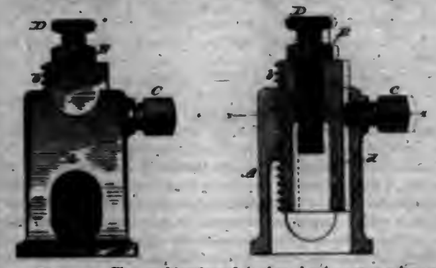
Claim.—A cartridge-belt composed of multiply fabric, provided with cartridge-pockets integral therewith formed by the plies and closed along one edge of the fabric, as hereinbefore set forth.

399,925. IRONING-BOARD. HENRY C. PERRY, Coffeyville, Kans. Filed June 26, 1888. Serial No. 278,163. (No model.)



Claim.—The combination, with the board B, hinged at one end, and the transverse cleat *b*, secured to the under side of said board, of the inclined leg hinged to the under side of said board between its hinged end and said cleat, with the hinged end of said leg bearing against the under side of the board and against the inner edge of the cleat, substantially as and for the purpose described.

399,926. MACHINIST'S BLOCKING. CHARLES H. POLLARD, Middletown, Conn., assignor of one-half to Edmund S. Stiles, same place. Filed Feb. 11, 1888. Serial No. 263,259. (No model.)



Claim.—1. The combination of the base having an opening vertically through it, one wall of the base roughened, a set-screw through the opposite wall of the base, a slide arranged in the opening of the base, its face roughened corresponding to the roughened surface of the base, the said set-screw arranged to bear upon the back of the slide and hold the roughened surfaces of the base and slide in engagement, the width of the slide being less than the distance between the

face and screw side of the opening in the base, substantially as described.

2. The combination of the base A, having an opening vertically through it, one wall of the opening roughened, a set-screw, C, through the opposite wall, a slide, B, arranged in the opening of the base, its face roughened corresponding to the roughened surface of the base, a screw arranged to bear upon the back of said slide to engage the base and slide, the slide less in width from its roughened surface to the back than the corresponding width of the opening in the base, and a screw, D, adjustably set into the upper end of the slide B, substantially as described.

399,927. SPREADER AND STOPPER FOR BOTTLES. ELTWEED POMEROY, Newark, N. J. Filed Jan. 23, 1888. Serial No. 297,846. (No model.)

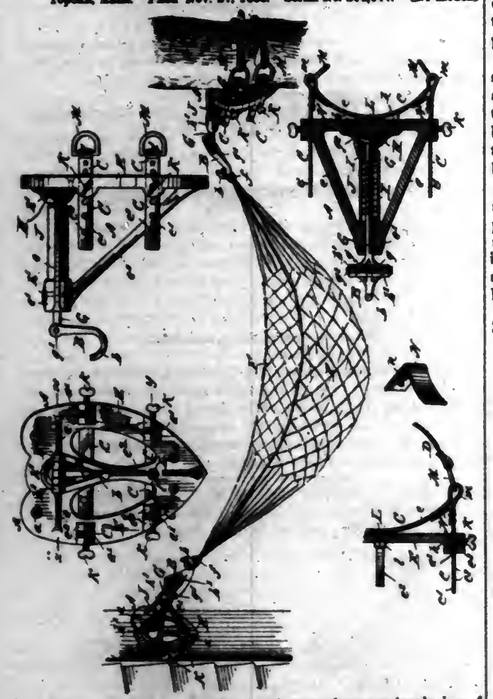


Claim.—1. A combined spreader and stopper for liquid-receptacles, having a slit across the truncated top of the spreader, for the purposes set forth.

2. A combined stopper and spreader for liquid-receptacles, having a slit across the truncated top of the spreader and provided with strengthening ridges or ribs around said slit, for the purposes set forth.

3. A combined spreader and stopper for liquid-receptacles, having a slit and strengthening ridges or ribs around the same, said slit and ridges extending across the top and part way down the opposite sides of the spreader, substantially as and for the purposes set forth.

399,928. HAMMOCK-SUSPENSION DEVICE. JOHN D. PRITCHARD, Topeka, Kans. Filed Nov. 27, 1888. Serial No. 291,977. (No model.)



Claim.—1. The combination, in a hammock-suspension device, of a bracket, a shaft journaled thereto, a hook connected to the shaft and adapted to support the hammock, and a spring connected to the hook-shaft and its support and adapted by its reaction to swing the hook and hammock, substantially as herein set forth.

2. The combination, in a hammock-suspension device, of a bracket, a shaft journaled thereto for axial movement, and a hook pivoted to the shaft for swinging movement endwise of an attached hammock, substantially as herein set forth.

3. The combination, in a hammock-suspension device, of a bracket, a shaft journaled thereto for axial movement, a hook pivoted to the shaft for swinging movement endwise of an attached hammock, and a spring connected to the hook-shaft and its support and adapted by its reaction to swing the hook and hammock sidewise, substantially as herein set forth.

4. The combination, in a hammock-suspension device, of a bracket comprising a plate, E, having arms c c^2 c^3 and a bearing, c', a shaft journaled at its outer end in the bearing c' and having at its inner end a semi-spherical head, a corresponding cupped bearing on the bracket-plate, a hook, B, pivoted to the outer end of the shaft, and a spring, I, connected to the shaft and its cupped bearing, all arranged substantially as herein set forth.

5. In a hammock-suspension device, the combination, with a bracket-support, of a horizontal shaft journaled thereto for axial movement and having a forked outer end, and a hook adapted to sustain a hammock and having a bifurcated or branched upper end hinged or pivoted to the forked end of the shaft, substantially as herein set forth.

6. In a hammock-suspension device, the combination, with a bracket or plate sustaining a hammock-supporting hook, of one or more clamp-plates having a central portion adapted to a tree or post, and end parts passed outward through the bracket or plate, fastening devices for the ends of the clamp-plates at the bracket-plate, and cords, straps, or bands connected to the clamp-plate and adapted with said plate to suspend a hammock from a tree or post, substantially as herein set forth.

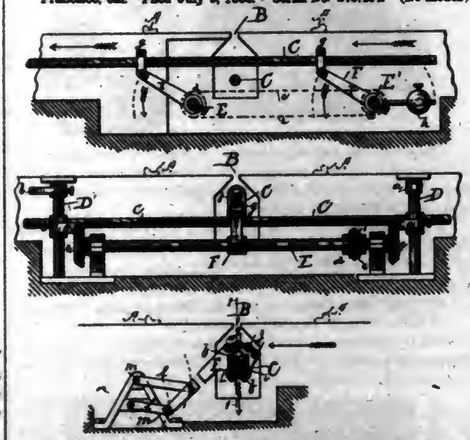
7. In a hammock-suspension device, the combination, with the main bracket-plate having slots a' and removable tree or post clamp-plates having bent perforated end parts adapted to the slots, of retaining-screws K, fitted in pairs of lugs on the plates and in the outer lugs of the pair of lugs by a screw-thread, and in the inner lugs and in the clamp-plate holes by plain parts k, substantially as herein set forth.

8. In a hammock-suspension device, the combination, with the main bracket-plate having slots a' and retaining screws or pins in said slots, of removable tree or post clamp-plates having bent perforated end parts adapted to the slots and to receive the retainers, and detachable bolt or screw fastenings connecting the centers of the clamp-plates to the main bracket-plate, substantially as herein set forth.

9. In a hammock-suspension device, the combination, with the slotted main bracket-plate, of tree and post clamp-plates held thereto and having bent ends entering the main plate-slots, and reteiners for the plates at said slots, said plates having loop-strap eyes m at their bends, and strap or cord loops M in said eyes, of guards N, held at the plate-bends to retain the loops M in the eyes m, substantially as herein set forth.

10. In a hammock-suspension device, the combination, with the main bracket-plate sustaining a hammock-supporting hook, of clamp-plates C, formed with central and end parts, c c' c', the latter passed through slots of the bracket-plate, bolts or detachable fastenings holding the center of the clamp-plates to the bracket-plate, screws K, connecting the plates C adjustably to the main plate, and cords or straps D, connected to the clamp-plates, substantially as herein set forth.

399,929. CABLE-RAILWAY CROSSING. GUSTAVE PROVOST, San Francisco, Cal. Filed July 9, 1888. Serial No. 279,464. (No model.)



Claim.—1. In a crossing for cable railways, the combination of the shafts D D', upholding reciprocating arms a b, which are set in such a way that while one of said arms lies across the path of the actuating car-grip the other is parallel thereto, the bevel-gears e e, the shafts E E', the sprocket-wheels d d, the endless chain c, the depressing-levers F, and the adjustable counterpoise A, substantially as described.

2. The depressing-levers E, provided with anti-friction rollers f with concave surfaces, set in an independent frame, g, jointed to the end of said levers and clutching the cables C, substantially as shown for the purpose specified.

399,930. DIE FOR FORGING THE FOLLOWERS OF EXTENSIBLE RAILWAY-CAR PLATFORMS. JAMES RESLEY and CLARK BURNHAM, Buffalo, N. Y. Filed Dec. 8, 1888. Serial No. 292,908. (No model.)



Claim.—1. The herein-described dies, consisting of a lower die having a flat face, d, provided with a circular shaping-cavity, d', and an upper die having a recess, e, and shaping-cavities f f, arranged in said recess, substantially as set forth.

2. The herein-described dies, consisting of a lower die having a flat face, d, provided with a circular shaping-cavity, d', and an upper die having a recess, e, and shaping-cavities f f, arranged in said recess, and projections g g, arranged in said recess on the inner sides of the shaping-cavities f f, substantially as set forth.

3. The combination, with the lower die provided with a recess, h, a rectangular shaping-depression, i, and a semicircular cavity, j^3, of the upper die provided with a similar recess, j, shaping-depression j', and cavity j^3, substantially as set forth.

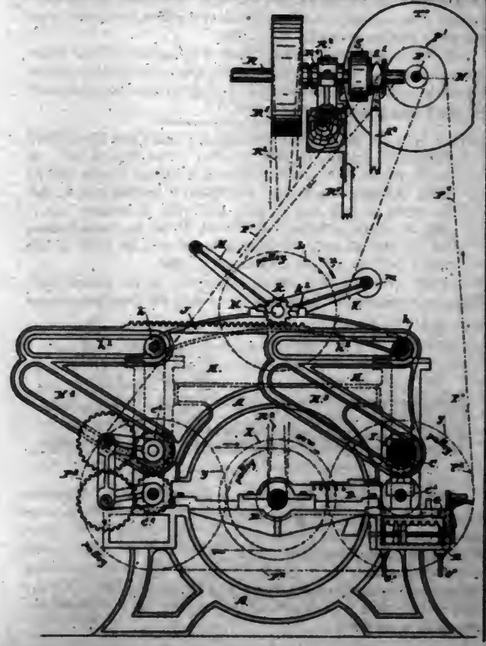
4. The combination, with the lower die provided with a flat face, d, having a circular shaping-cavity, d', and with a recess, h, shaping-depression i, and semicircular cavity j^3, of the upper die provided with a recess, e, and shaping-cavities f f, arranged above the flat face d, and with a recess, j, rectangular shaping-depression j', and cavity j^3, corresponding to the similar parts of the lower die, substantially as set forth.

5. The combination, with the lower die provided with an anvil, l, having a circular opening, l', of the upper die provided with two parallel cutters, k k, and with cavities n n, substantially as set forth.

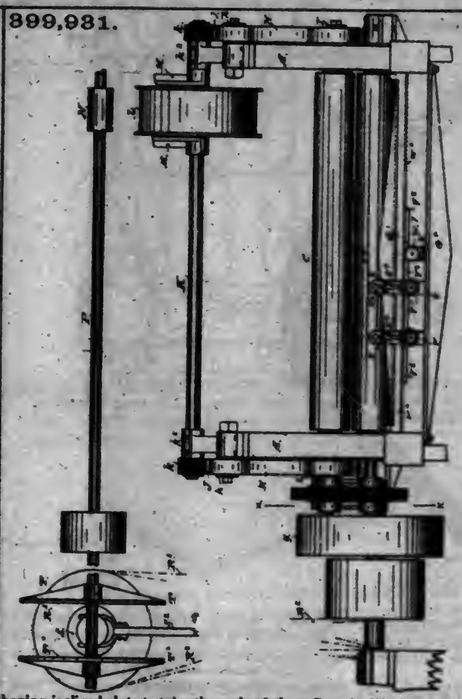
399,931. GANG-EDGER. HERBERT C. ROSS, San Francisco, Cal. Filed Jan. 5, 1888. Serial No. 259,922. (No model.)

Claim.—1. In combination with the feed-rolls of a gang-edger, the sliding plate or frame H, having inclined slots H^3 H^4, in which the ends of the upper feed-rolls are set, the rack J, pinion-shaft K, geared into said rack, a driven shaft, P, and mechanism, substantially as described, by which the pinion-shaft is connected with and disconnected from the driven shaft, to actuate the same and move the slides, as set forth.

2. A feed-roll-lifting mechanism consisting, essentially, of the slotted frames H, mounted for rectilinear movement, as described, and



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having inclined slots to take the ends of the rolls to be lifted, a shaft, K, carrying pinions engaging racks on said frames, a driven shaft, P, capable of reversible motion, and mechanism, as a belt and a pulley, and a tightener-pulley which is adapted to connect and disconnect the pinion-shaft to and from the driven shaft, substantially as hereinbefore described.

3. The feed-rolls and the sliding plates H, having inclined slots which are adapted to engage the ends of a roll to be lifted and mounted for rectilinear movement, as described, and mechanism, in combination therewith, actuated by or from a driven shaft, by which said plates are moved and the rolls raised, substantially as hereinbefore described.

4. The combination of the sliding frame H, having inclined slots H^3 H^4, the feed-rolls, the upper of which have rollers I I that rest in the inclined slots, the pinion-shaft K above the frames, having pinions that engage racks on frames H H, the overhead reversible shaft P, the pulley L on shaft K, connected by belt with pulley N on shaft P, the belt P^x, carried from shaft P, for driving the feed-rolls of both sets, the friction-disks T and T^x, fast on shaft P, the driving-shaft R, and the friction-wheel S thereon, which is capable of lateral movement, as described, to bring it in contact with one or the other of said disks, substantially as described, for operation as set forth.

399,932. PAVEMENT. FREDERIC C. ROSS, Morristville, N. J., assignor to Ivan Provaznik, Philadelphia, Pa. Filed Aug. 10, 1888. Serial No. 282,494. (No specimens.)

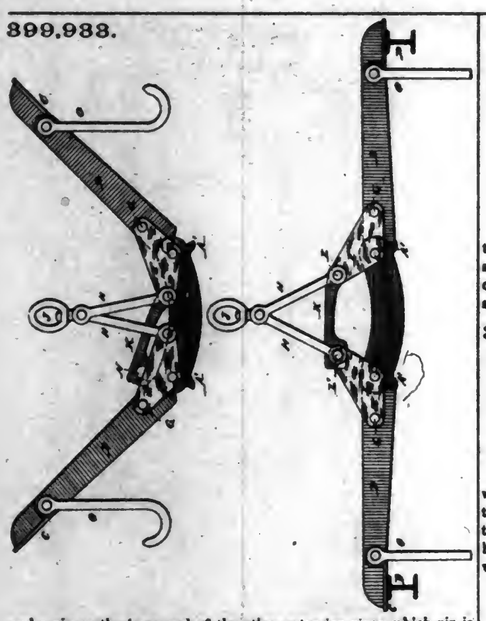
Claim.—A paving material composed of natural bituminous sandrock—that is, a sandstone or sand naturally impregnated with bitumen in such proportions as to adapt it for paving purposes without any special treatment affecting its composition—in combination with resin incorporated therewith, substantially as set forth.

399,933. DEVICE FOR SPREADING CARCASSES. GOTTLIEB P. SCHMIDT, Schmiedeberg, Saxony, Germany. Filed Aug. 17, 1888. Serial No. 283,089. (No model.) Patented in Germany Dec. 11, 1886, No. 40,402.

Claim.—1. In a device for spreading carcasses, the combination, with a center piece, of levers pivoted to the ends of the same, extension-pieces secured to the levers and pivoted on the center piece, and a swivel-eye connected by links with the inner ends of said extension-pieces, substantially as shown and described.

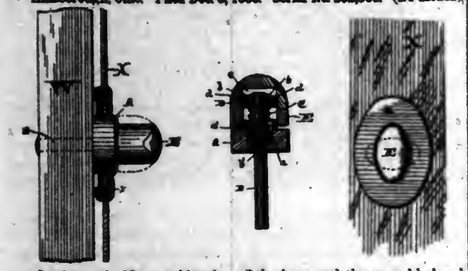
2. In a device for spreading carcasses, the combination, with a center piece, of a lever pivoted to each end of the same, an extension-piece connected with the inner end of each lever and pivoted to the center piece, a swivel-eye connected by two links with the adjacent ends of the extension-pieces, a locking-lever pivoted to the inner end of one extension-piece and provided on its swinging end with a notch,

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and a pin on the inner end of the other extension-piece, which pin is adapted to pass into the notch of the lever, and hooks on the swinging ends of the levers, substantially as shown and described.

399,934. CARRIAGE-CURTAIN FASTENER. SAMUEL P. SCOTT, Hillsborough, Ohio. Filed Dec. 3, 1888. Serial No. 292,500. (No model.)



Claim.—1. The combination of the base and the movable head having a closed bore, with the pin provided with lugs on its end, the collar on said pin secured in the bore of the head, and the controlling-spring, also concealed in said bore, all substantially as described.

2. The combination of the base and pin attached thereto having lugs on its outer end, with a movable head having a closed bore, the collar placed on said pin and secured in the bore of the head and provided with slots engaging the lugs, and the coiled spring surrounding the pin and bearing against the collar and the base, substantially as described.

3. The combination of the base having a central shouldered bore, the pin passed therethrough and secured thereto, the coiled spring, and the collar on said pin, with the movable head having a closed bore covering the ends of the pin and spring, and in which the collar is secured, all substantially as described.

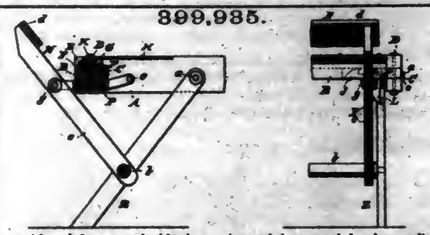
4. The combination of the base A, having a central opening and an annular flange, as described, the pin secured thereto having lugs on its upper end, and the coiled spring surrounding the outer portion of the pin, with the slotted collar D, playing on said pin, and the head E, having a bore in which collar D is seated and fitted over the end of the pin, substantially as described.

5. The combination of the base A, having a central shouldered opening and flange, *a'*, and the pin B, projecting through and secured to said base, and having lugs *b b* on its outer end, with the coiled spring C, the milled and notched collar D, and the head E, having a closed bore, *e*, all constructed and arranged substantially as described.

399,935. FOLDING COT. CHARLES T. SHEAR, Utica, N. Y. Filed Aug. 25, 1888. Serial No. 283,739. (No model.)

Claim.—The combination of the side bars, the pivoted legs applied thereto, the end frame pivoted to said legs, the braces pivoted

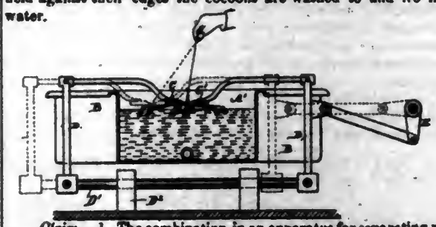
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to said end frame and side bars, the end bars, and hooks applied to said end bars, said end bars being connected to said side bars, and said catch-hooks engaging with said braces when the cot is extended, substantially as specified.

399,936. APPARATUS FOR SEPARATING WASTE FLOSS FROM COCOONS. EDWARD W. SERRELL, Jr., New York, N. Y. Filed July 11, 1887. Serial No. 243,973. (No model.) Patented in France Mar. 14, 1887, No. 182,100; in Italy Mar. 17, 1887, XLIII, 162; in England Apr. 27, 1887, No. 6,121; in Belgium Apr. 27, 1887, No. 77,229; in Germany May 6, 1887, No. 42,313; in Spain June 30, 1887, No. 6,909; in Turkey July 20, 1887, No. 85; in China Dec. 15, 1887; in India Dec. 20, 1887, No. 205, and in Austria-Hungary Feb. 6, 1888, 36/143.

Brief.—The apparatus consists of plates supported above the water of the basin, against the edges of which plates, at a point near the surface of the water, the cocoons to be cleaned are held. To these plates motion is imparted, so that when the ends of the silk are held against their edges the cocoons are washed to and fro in the water.



Claim.—1. The combination, in an apparatus for separating waste floss from cocoons, of a hot-water basin and guides or plates, against which a portion of the floss is held, and mechanism for giving to the plates a reciprocating motion, so as thereby to move the cocoons in the water and detach the floss, substantially as specified.

2. The combination, with the basin A B and the guides C C, of supports for the same passing above the edge of the basin and holding them in the required position in relation to each other, leaving a free passage from one end to the other of the said guides for the passage of the waste floss, substantially as specified.

3. The combination, with the basin A B, guides C C, and framework for the same, of mechanism, substantially as specified, for imparting to the guides the requisite motion during the operation of separating the floss, substantially as specified.

399,937. APPARATUS FOR REELING SILK FROM THE COCOON. EDWARD W. SERRELL, Jr., New York, N. Y. Filed Sept. 10, 1887. Serial No. 249,291. (No model.) Patented in England June 30, 1887, No. 9,374; in France June 30, 1887, No. 184,834; in Belgium June 30, 1887, No. 78,006; in Italy June 30, 1887, XLIII, 483; in Germany July 19, 1887, No. 43,568; in Turkey July 30, 1887, No. 86; in Austria-Hungary Nov. 15, 1887, No. 2,322/37; in Spain Nov. 30, 1887, No. 7,233; in India Mar. 7, 1888, No. 243, and in China Apr. 5, 1888.

Brief.—The invention resides in the devices for automatically filling with cocoons the magazines for reeling silk from the cocoons.



Claim.—1. The combination, in a filament-supplying apparatus, of a charging-basin containing water to float the cocoons, a wheel for giving motion to the water, a pipe or false bottom for the return of the water, and a magazine having pockets into which the cocoons are floated successively by the action of the water, and mechanism, substantially as specified, for discharging the cocoons from the magazine, and a reeling-basin into which such cocoons are discharged, substantially as set forth.

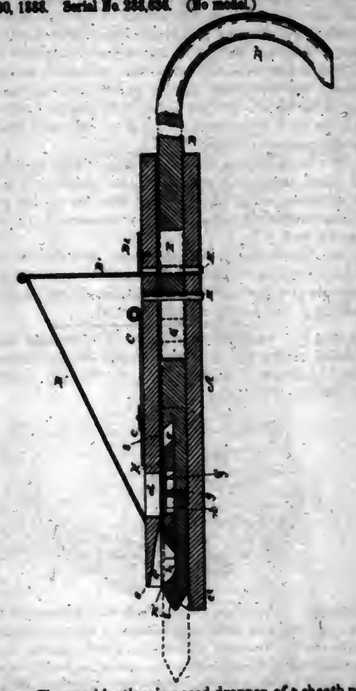
2. The charging-basin 5, to contain water in which the cocoons are floated, in combination with the pipe 11, for conveying a supplemental current of water, the return-channel below the false bottom 9, for the water, a casing, 6, a motor, 7, for causing the water to circulate, and a magazine into which the cocoons are floated, substantially as set forth.

3. The revolving wheel or motor 7 and the charging-basin 5, near one end of which the motor-wheel is placed, a case for said motor-wheel having an opening at 8, a false bottom, 9, beneath which the water returns to the motor-wheel, a pipe, 11, having openings for the supplemental currents of water, and a magazine near the other end of the basin and containing pockets into which the cocoons are floated, substantially as set forth.

4. The combination, with the reeling-basin and filament-supplying device, of a charging-basin for receiving the cocoons, a magazine for receiving the cocoons in the charging-basin, mechanism for giving motion to the water in the charging-basin to float the cocoons into the magazine, and mechanism for delivering the cocoons successively from the magazine into the reeling-basin, substantially as set forth.

5. The combination, with the magazine having pockets, of the toothed wheel 17, a catch-lever, 19, for holding the magazine, the revolving shaft 16 and pin 22, for moving the lever 19 and unlocking the magazine, the tooth 24, for turning the magazine, the spring *s* and arm 26, for raising the cocoon from the upper pocket in the magazine, the cam 28, for giving motion to the arm 26, the dome 30 and arm 31, and the mechanism for moving the same to project the cocoon into the reeling-basin, substantially as set forth.

399,938. HAND SEED-PLANTER. JAMES R. SHAW, Bishopville, S. C., assignor of one-half to Lauchlin McKinnon, Lynchwood, N. C. Filed Oct. 20, 1888. Serial No. 288,636. (No model.)

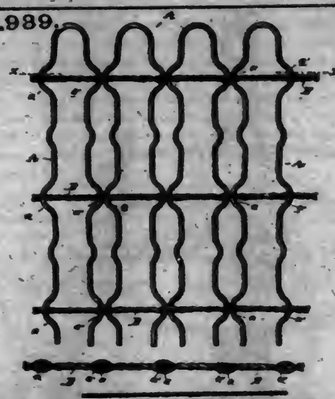


Claim.—The combination, in a seed-dropper, of a sheath provided with a hopper, a flaring discharge-passage, *d'*, a discharge-aperture, *d*, a sliding cut-off therefor, and an extended foot, *c'*, a staff or dropper-rod, D, recessed, as described, and provided in this recess with a double-beveled adjustable and slotted cut-off, the plate n^3, for closing the slot in this cut-off, the said staff having slots E G, the removable pin H, and the double-beveled nose, all constructed and adapted to operate as specified.

399,939. FENCE. EDWARD P. SHELLABERGER, Beaver Falls, Pa. Filed Jan. 17, 1889. Serial No. 296,609. (No model.)

Claim.—As an improved article of manufacture, a fence composed of hair-pin-shaped pickets having the opposing limbs of independent pickets provided with corresponding bends or curves, and longitudinal cables having their strands embracing the said bends or curves in a single twist, substantially as hereinbefore set forth, for the purpose described.

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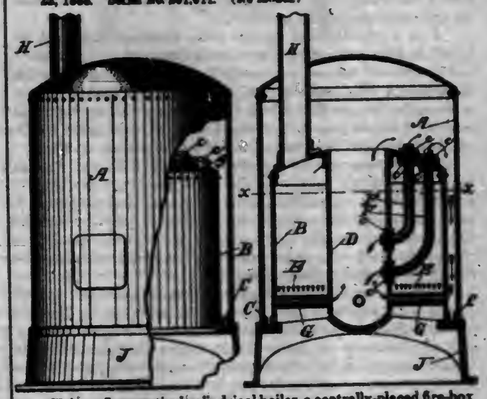


399,940. PAD FOR CONVENIENCE IN HANDLING AND PICKING UP COINS. ALBERT H. L. G. ALSTORPH, London, England. Filed Nov. 16, 1888. Serial No. 291,083. (No model.) Patented in England Sept. 12, 1888, No. 13,222.



Claim.—As an improved article of manufacture, the herein-described coin-mat for show-cases and counters, consisting of a base or foundation piece provided with numerous connected rubber fibers rising therefrom and constituting a continuous cellular absorbent top layer of spongy rubber, substantially as described.

399,941. BOILER. JAMES T. SMITH, Baltimore, Md. Filed Nov. 22, 1888. Serial No. 291,611. (No model.)



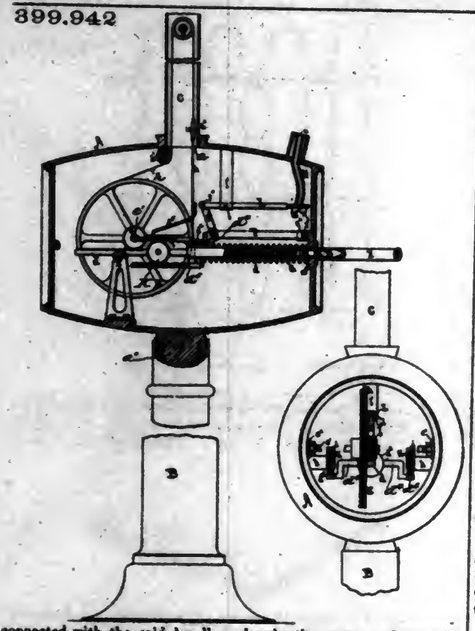
Claim.—In a vertical cylindrical boiler, a centrally-placed fire-box having a heater dependent from its crown, combined with a series of water-tubes which connect the side of the said heater with the crown of the fire-box, and another series of water-tubes which unite the lower end of the said heater with the water-space around the said fire-box, substantially as and for the purpose specified.

399,942. COIN-CONTROLLED STRENGTH-TESTER. GUSTAV SCHEDDIN, Philadelphia, Pa. Filed Oct. 15, 1888. Serial No. 288,150. (No model.)

Claim.—1. In a coin-controlled strength-tester, the combination of the two movable handles, one within the other and moving in opposite directions in a parallel plane, a helical spring resisting the movement of the handles, a pair of gear-wheels, racks connected with the handles and transmitting their motion to the wheels, a registering device, and intermediate mechanism controlling the registering device, as and for the purpose set forth.

2. In a coin-controlled strength-tester, the combination of the movable handles, one within the other, a helical spring resisting the movement of the handles, a registering device consisting of a straight vertical scale and a vertically-moving pointer, the gear-wheels and mechanism intermediate the gear-wheels and the register, and rack-

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connected with the said handles, whereby the amount of muscular strength exerted on said handles is indicated, as and for the purpose set forth.

3. In a coin-controlled strength-tester, the combination, with the handle D and the handle I, having the rack *i* and the pinion K, of the grooved wheel E and the shaft *e'*, the pinion *e* on said shaft, the idler *k'*, the pulley *c*, the cord A, and the indicator H A^3, all combined for operation substantially as described.

4. In a coin-controlled strength-tester, the combination, with the handle D, having the spring-encircled rod *d*, the rack *d'*, the arms d^4, and the racks d^3 thereon, the handle I, having the racks *i* thereon, the pinions K and *e*, and the conveyer N, of the bent wire d^6, secured in the rod *d*, the pin f^4, the lever L, pivoted on the pin f^4, and the receiver M on said lever L, whereby the wire d^6, striking the pin f^4, will jar the coin off the receiver, as and for the purpose set forth.

5. In a coin-controlled strength-tester, the combination, with the handle D, having the spring-encircled rod *d*, the racks *d'*, the arms d^4, and the racks d^3, the handle I, having the racks *i*, and the pinions K and *e*, engaged by said racks, of the coin-lever L, provided with the ring M, the coin-conveyer N, the said conveyer and ring operating to change the coin from a perpendicular to a horizontal position on said ring, as and for the purpose set forth.

6. In a coin-controlled strength-tester, the combination, with the case A, of the handles D and I, the rod *d*, the helical spring G on said rod, the collar d^5, carrying the forked arms d^6, the racks d^3, *i*, and *d'*, shaft *e'*, journaled in the bosses f^6 and carrying the pinion *e*, and the wheel E, the cord A, the idler *k'*, the pulley *c*, the indicator H A^3, the pipe C, the conveyer N, the lever L, the ring M, the hanger *l'*, the locking-bar F, having the head *f*, the bar *f'*, the wire d^8, the pin f^4, and the upright E', all combined and arranged for operation substantially as described.

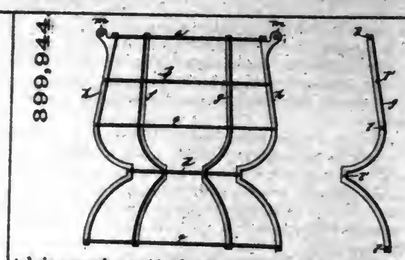
399,943. PUNCH. GEORGE W. SOUTHWICK, Stamford, Conn. Filed July 7, 1888. Serial No. 279,201. (No model.)



Claim.—In a combined gage and punch, the combination, with a stock having recesses at one end in opposite edges, a blade held in one recess and projecting from said end of the stock, and a sliding gage-pin in the end of the stock, said sliding gage-pin being located a greater distance from one recessed edge of the stock than the other, substantially as herein shown and described.

399,944. LANTERN-FRAME. FURMAN D. SPEAR, Brooklyn, N. Y. Filed July 21, 1888. Serial No. 280,632. (No model.)

Claim.—1. In a lantern-frame, a series of three or more horizontal ring-guards, combined with a series of upright guards, the upright guards being locked in place by the ring-guards to form a self-sustaining frame, substantially as set forth



2. In a lantern-frame, a series of three or more notched horizontal ring-guards, combined with a series of upright guards, and the parts being interlocked and arranged or woven together, substantially as and for the purposes set forth.

3. In a lantern-frame, a series of three or more horizontal ring-guards, combined with a series of notched upright guards, and the parts being interlocked and arranged or woven together, substantially as and for the purposes set forth.

4. In a lantern-frame, a series of three or more horizontal ring-guards, combined with a series of upright guards, both being notched and the parts being interlocked and arranged or woven together, substantially as and for the purposes set forth.

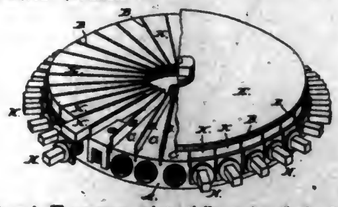
5. In a lantern-frame, a series of three or more horizontal ring-guards, of which series the rings are alternately notched on the interior and exterior, combined with a series of upright guards notched on opposite faces, the parts being interlocked and arranged or woven together, substantially as and for the purposes set forth.

6. In a lantern-frame, the combination of three or more flat metal ring-guards and flat metal upright guards, the ring-guards being notched or halved into or upon the upright guards, which are also notched, the parts being interlocked and interwoven, substantially as and for the purposes set forth.

7. In a lantern-frame, the combination of three or more continuous flat metal ring-guards and flat metal upright guards, the ring-guards being notched or halved into or upon the upright guards, the parts being interlocked and interwoven, substantially as and for the purposes set forth.

8. In a lantern-frame, the combination, with three or more horizontal flat metal rings or bands, of flat metal uprights connected with said rings and arranged in planes passing through the axis of the frame, substantially as and for the purposes set forth.

399,945. PROCESS OF MOLDING TYPE-WHEELS AND OTHER CURVED SURFACES. BURNET L. TABOR, Brooklyn, assignor to the New York Stencil Works, New York, N. Y. Filed Nov. 16, 1886. Serial No. 219,014. (No model.)



Claim.—1. The process, substantially as described, of manufacturing a type-wheel or other object having a curved surface bearing characters thereon in relief or intaglio, which consists in filling a series of radial cells formed about the curved or circular surface of a suitable pattern with a plastic composition or molten alloy adapted to conform to the type or other characters on the surface of the pattern, allowing the composition or alloy to harden into blocks in contact with the pattern, so as to retain the impression thereof, withdrawing radially within their cells these sectional mold-blocks far enough to disengage them from the pattern, removing the pattern from between the blocks, moving back the radial mold-blocks to their original positions, casting the material for the finished object in the matrix or recess previously occupied by the pattern, and finally again withdrawing the mold-blocks radially to disengage them from the casting.

2. The process, substantially as described, of manufacturing a type-wheel or other object having a curved surface bearing characters thereon in relief or intaglio, which consists in filling a series of radial cells formed about the circular or curved surface of a suitable pattern with a plastic composition or a molten alloy adapted to conform to the type or other characters on the said surface of the pattern, allowing the composition or alloy to harden into blocks in contact with the pattern, so as to retain the impression thereof, withdrawing radially within their cells these sectional mold-blocks far enough to disengage them from the pattern, removing the pattern from between the blocks, moving back the radial mold-blocks to their original positions, placing a previously-formed hub or body-piece of smaller diameter than the pattern centrally in the recess encircled by the radial mold-blocks, filling the space between the hub or body-piece and the encircling mold-blocks with rubber, celluloid, or other equivalent plastic compound, subjecting the same to heat to harden the compound, and finally withdrawing the mold-blocks radially from the periphery of the compound device thus produced to permit of its withdrawal from the mold.

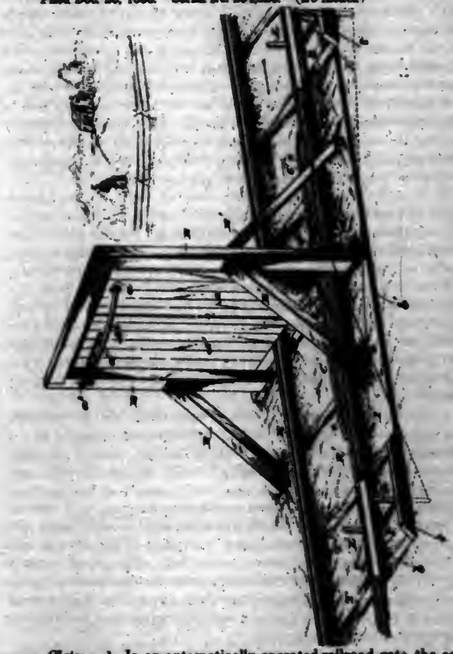
399,946. WIRE-TIGHTENER. SHAPLEY P. R. TAYLOR and STEPHEN S. CLARK, Denison, Tex. Filed June 13, 1888. Serial No. 276,963. (No model.)



Claim.—1. The combination, with a bar having a forked end bent to form hooks, as described, of a lever-handle fulcrumed to the bar A and having its end extended between the hooks to form a discharging device for the wire, as set forth.

2. The combination of the bar A, having a longitudinal slot, with knife-edge *k* and forked twisting-hooks *a a*, and the offsetting lever-handle B, having flat portion *b*, with notch or wire-seat *c*, fulcrumed in the slot of the bar A, and having its outer end extended in the form of a prong between the twisting-hooks *a a*, substantially as and for the purpose described.

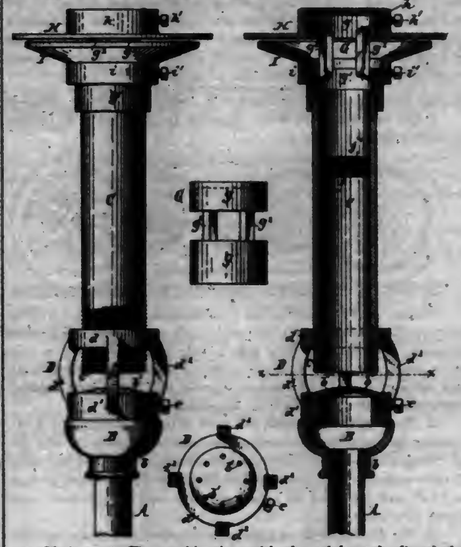
399,947. RAILROAD-GATE. DAVID C. THOMAS, Trimble, Ohio. Filed Dec. 20, 1888. Serial No. 294,230. (No model.)



Claim.—1. In an automatically-operated railroad-gate, the combination of the doors or gates having a top connection, and one of which has an outwardly-projecting arm from the lower hinge thereof, the rails having slotted bars therein, the levers mounted in said slotted bars and connected to similar levers arranged at a distance from and parallel therewith, the cords or cables running from the outer levers to the arm of the one door, and the metallic strip on the inside of one track-rail attached to levers which are connected to the aforesaid levers, substantially as described.

2. In an automatically-operating railroad door or gate, the combination of the double doors connected to operate simultaneously, one of which has a projecting arm, the slotted bars arranged on each side of the doors in one line of rail, the double throw-levers, one of each pair of which is mounted in said slotted bars, the metallic strip inside of one rail between the throw-levers, attached to and supported by other levers, and the cords or cables connecting the several levers with themselves and the projecting arm of the one door, substantially as described.

399,948. GAS-BURNER. WILLIAM P. TIBBINS, Buffalo, N. Y., assignor of three-fourths to Martin B. Daly, same place. Filed Jan. 19, 1888. Serial No. 261,250. (No model.)



Claim.—1. The combination, with the mixing-tube C and the open frame or cage G, secured to the upper end thereof and composed of a cap, *g*, a ring, *g'*, and connecting-arms g^2, of an upper deflecting-plate, H, secured to the cap *g*, and a lower deflecting-plate, I, made vertically adjustable on the ring *g'*, substantially as set forth.

2. The combination, with the mixing-tube C and the open frame or cage G, secured to the upper end thereof and composed of a cap, *g*, a ring, *g'*, and connecting-arms g^2, of an upper deflecting-plate, H, secured to the cap *g* by a set-screw, *k'*, and a lower deflecting-plate, I, secured to the ring *g'* by a set-screw, *i'*, substantially as set forth.

3. The combination, with the gas-supply pipe, of a gas-chamber having gas-escape openings, an open frame secured to said chamber, a mixing-tube secured with one end to said frame and made adjustable therein toward and from said gas-chamber, an open frame secured to the opposite end of said mixing-tube, an upper deflecting-plate secured to said frame, and a lower deflecting-plate also secured to said frame and made adjustable thereon toward and from the upper deflecting-plate, whereby the admission of air to the mixing-tube and the size of the flame can be regulated to correspond and produce perfect combustion, substantially as set forth.

399,949. TAKE-UP MECHANISM FOR SEWING-MACHINES. JAKOB TREPP, New York, N. Y. Filed Dec. 4, 1888. Serial No. 292,616. (No model.)



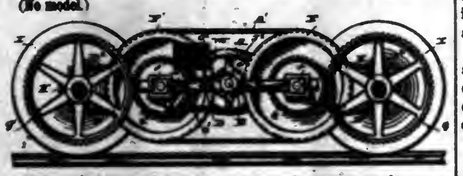
Claim.—1. In a sewing-machine, the combination, with the head, the needle-bar and actuating mechanism for the latter, of a take-up

rock-shaft having take-up and cam-slotted arms, an auxiliary take-up carried by said needle-bar, and a co-operating thread-guide adjustably secured to the face-plate adjacent to said auxiliary take-up.

2. In a sewing-machine, the combination, with the head, the needle-bar, and actuating mechanism for the latter, of a take-up rock-shaft within said head, and having take-up and cam-slotted arms, an auxiliary take-up or slack-controller carried by the said needle-bar, and a co-operating thread-guide secured to the face-plate of the head adjacent to the path of the said auxiliary take-up or slack-controller.

3. In a sewing-machine, the combination, with the head thereof having a face-plate provided with a vertical slot, the needle-bar-actuating shaft, and the needle-bar operatively connected with the said shaft, of a rock-shaft having a swinging take-up arm outside of the said face-plate and a cam-slotted arm within said head, a crank-pin engaging the slot of the last-named arm, and an auxiliary take-up or slack-controller carried by the said needle-bar and extending outward through the said vertical slot in the face-plate.

399,950. FRICTION-GEAR FOR ELECTRIC MOTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Oct. 31, 1888. Serial No. 289,694. (No model.)



Claim.—1. The combination, with the axles of a car and a motor for propelling the same, of a support for said motor comprising beams extending longitudinally from axle to axle, journal-bearings on said axles, and double-acting spring-connections between the journal-bearings and the ends of said tie-beams, whereby said beams form a spring-supported frame, substantially as described.

2. The combination, with two pairs of carrying-wheels, of a car, a motor for propelling the same, and a frame or support for said motor, comprising a pair of tie-beams extending between and journaled at their ends upon the said axles and carried by double-acting springs, as d^2 d^3, and arranged to sustain opposite ends of the motor and power connections.

3. The combination, with the axles of a car and a motor and connections for propelling the same, of a support for said motor, and connections comprising beams extending longitudinally between said axles, journal-bearings mounted on said axles and engaging the extremities of the motor-supporting beams, and springs connecting the ends of the beams and journal-bearings both above and below the axle, substantially as described.

4. The combination, with the axles of a car-truck and a motor for propelling the same, of a support for said motor, comprising tie-beams, as D D' extending between and springs supported above and below said axles, said tie-beams being provided with bearings for the power-connections between the motor and the axles and arranged to flexibly sustain the motor and connections.

5. The combination, with the separately-movable axles, of a car-truck and a motor and gearing extending between the armature-shaft of the motor and said axles for propelling the same, said gearing including a yielding gear-wheel arranged to accommodate any changes of position in said axles with respect to the gearing, substantially as described.

6. The combination of a truck having separately-movable axles and carrying-wheels, a motor and gearing extending between the armature-shaft of the motor and said axles for propelling the same, said gearing including a yielding gear-wheel, and a frame for supporting the motor and gearing, comprising longitudinally-extending beams attached to and uniting the parts of the gearing and separately journaled at their ends upon the axles of the truck, substantially as described.

7. The combination, with a car having carrying-wheels united by separately-movable axles, of a motor for propelling said car, and power-connections between the armature-shaft and the said axles, and a frame for supporting said motor and connections, comprising tie-beams connected with the motor and journaled at their ends upon the said axles, gear-wheels upon the axles to be driven, and a flexible gear.

8. The combination, with the axles of a car and a motor for propelling the same, of a support for said motor, comprising beams extending longitudinally from axle to axle, said beams being formed of detachable portions, journal-bearings on said axles, and spring-connections between the journal-bearings and the ends of said supporting-beams, whereby said beams form a removable spring-supported frame, substantially as described.

9. A friction-gearing for electric motors, comprising a friction-pinion on the armature-shaft, movable counter-shafts on opposite sides of said pinion, friction gear-wheels adapted to engage the pinion, driving-pulleys also on said counter-shafts, connections between the driving-pulleys and the axle or axles to be driven, and means, substantially as described, for moving the counter-shafts to connect or disconnect the friction-gear.

10. An automatic friction-gearing for electric motors, comprising a friction-pinion on the armature-shaft, movable counter-shafts on opposite sides of said pinion, friction gear-wheels on said shafts adapted to engage opposite sides of said pinion, driving-pulleys on said counter-shafts, connections extending between said driving-pulleys and the axles to be driven, and means for holding the movable friction-wheels in engagement with the driving-pinion with a pressure proportionate to the pull of the motor upon the parts to be driven, substantially as described.

11. An automatic friction-gearing for electric motors, comprising a friction-pinion on the armature-shaft, movable counter-shafts on opposite sides of said pinion, friction gear-wheels on said shafts adapted to engage opposite sides of said pinion, driving-pulleys on said counter-shafts, connections extending between said driving-pulleys and the axles to be driven, and means for holding the movable friction-wheels in engagement with the pinion on the armature-shaft with an adjustable pressure, substantially as described.

12. An automatic friction-gearing for electric motors, comprising a friction-pinion on the armature-shaft, movable counter-shafts on each side thereof, friction-wheels on said counter-shafts adapted to engage the pinion, driving-pulleys on the counter-shafts, connections extending from said driving-pulleys to the axles to be driven, and means for moving the counter-shafts and gear-wheels into or out of engagement with the armature-pinion, substantially as described.

13. An automatic friction-gearing for electric motors, comprising a gear-pinion on the armature-shaft, movable counter-shafts on opposite sides of said pinion, gear-wheels on said counter-shafts adapted to engage with said pinion, resilient spring-belting passing around the gear-wheels and acting to press the same together against opposite sides of the pinion, means for forcibly separating said gear-wheels to free the pinion at desired times, driving-wheels upon the counter-shafts, and connections extending between the driving-wheels and the axles to be driven, substantially as described.

14. An automatic friction-gearing for electric motors, comprising a pinion on the armature-shaft, a pair of hinged counter-shafts arranged on opposite sides thereof, a tie-beam in which the outer ends of the counter-shafts are movably journaled, driving-wheels on said counter-shafts, mechanical connections between said driving-wheels and the axles to be driven, a lever mounted concentrically with the armature-shaft and mechanically connected to the movable ends of the counter-shafts, and means, substantially as described, for forcibly moving the counter-shaft and gear-wheels outwardly and away from the armature-pinion to free the same or toward and into engagement therewith to operatively connect the gearing.

15. A friction-gearing for electric motors, comprising a pinion on the armature-shaft, a pair of hinged counter-shafts arranged on opposite sides thereof, a tie-beam in which the outer ends of the counter-shafts are movably journaled, gear and driving wheels on said counter-shafts, mechanical connections between said driving-wheels and the axles to be driven, a lever mounted concentrically with the armature-shaft and mechanically connected to the movable ends of the counter-shafts, and means, substantially as described, comprising an electric motor and a retracting-spring for forcibly moving the counter-shaft and gear-wheels outwardly and away from the armature-pinion to free the same or toward and into engagement therewith to operatively connect the gearing.

16. A friction-gearing for electric motors, comprising a pinion on the armature-shaft, a pair of hinged counter-shafts arranged on opposite sides thereof, a tie-beam in which the outer ends of the counter-shafts are movably journaled, gear and driving wheels on said counter-shafts, and spring-belts upon said gear-wheels holding them against the pinion, mechanical connections between said driving-wheels and the axles to be driven, a lever mounted concentrically with the armature-shaft and mechanically connected to the movable ends of the counter-shafts, and means, substantially as described, comprising an electromotor and retracting-spring for forcibly moving the counter-shaft and gear-wheels outwardly and away from the armature-pinion to free the same or toward and into engagement therewith to operatively connect the gearing.

17. The combination of a truck having separately-movable axles and carrying-wheels, a motor, and gearing extending between the armature-shaft of the motor and said axles, said gearing including a yielding member or wheel and a frame for supporting the motor and gearing comprising longitudinally-extending beams attached to and uniting the parts of the gearing and separately journaled at their ends upon the axles of the truck.

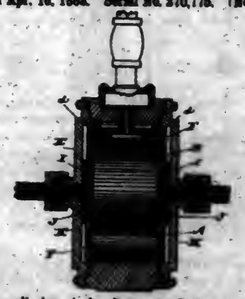
18. The combination, with a car having carrying-wheels united by separately-movable axles, of a motor for propelling said car and power-connections between the armature-shaft and the said axles, and a frame for supporting said motor, and connections comprising tie-beams connected with the motor and journaled at their ends upon the said axles, gear-wheels upon the axle to be driven, and a flexible connection between the gear-wheel on the axles and the counter-shafts.

399,951. BURIAL-CASE. JOSEPH H. WALKER, Grand Rapids Mich., assignor to the Powers & Walker Casket Company, same place. Filed Aug. 1, 1888. Serial No. 281,694. (No model.)



Claim.—In a burial-casket, the combination with the shell or body thereof, of a top panel or cover constructed in two leaves or parts, each leaf hinged at or about its under central portion to a connecting-flap, which flap is hinged to the body of the case, whereby when the casket is closed, but one central joint is exposed, all as and for the purpose described.

399,952. ROTARY ENGINE. CHARLES WARD, Toronto, Ontario, Canada. Filed Apr. 16, 1888. Serial No. 270,775. (No model.)

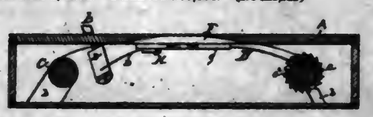


Claim.—1. A cylinder, A, having ports B C, a curved block between them, and an adjustable block in said curved block, in combination with the piston-head D, having plates E fixed thereto, and wings F, provided with the adjustable blocks *d* and pivoted in said plates, substantially as described.

2. A cylinder, A, having ports B and C, separated by the curved block G, in combination with the piston-head D, the adjustable block in said curved block, wings F, having spindle H, extending through holes made in the plates E, which are fixed to the piston D, the adjustable blocks *d* in said wings, and wipers I, fixed to the spindles H and acting against the cam J, formed on the outer heads, K, substantially as and for the purpose specified.

3. A cylinder, A, having ports B and C, separated by the curved block G, having adjustable blocks *g* and *h*, actuated by springs *i* and *j* and designed to press against the piston D, in combination with the piston-head D, wings F, having adjustable blocks *d* arranged within them, as described, and connected to a spindle, H, extending through holes made in the plates E, which are fixed to the piston D, and wipers I, fixed to the spindles H and acting against the cam J, formed on the outer heads, K, substantially as and for the purpose specified.

399,953. CASH-RECORDER. JAMES M. WARNER, London, Ohio. Filed Nov. 2, 1887. Serial No. 253,813. (No model.)



Claim.—1. In a recorder, the combination, with the casing having an opening in its upper side, a glass arranged over part of the opening-rollers mounted in the end portions of the casing, one being removable and the other having a ratchet-wheel thereon, a spring-pawl, as D, constructed of a single piece of metal, one end of which is placed in contact with the ratchet-wheel, the pivoted clasp D', in which the opposite end of the spring is secured, a key on the clasp extending through the casing, the tablet G, removably held below the opening in the casing, and the spring E, substantially as described.

2. In a recorder, the combination, with the casing having an opening in its top and a recess, as F, in the under side of the top of brackets *g*, arranged at the sides of the recess, the tablet G, removably held in the brackets below the opening, the rollers C and C', the ratchet-wheel on one of the rollers, and the pawl and key for actuating the same, substantially as described.

399,954. HINGE-JOINT FOR ELECTRIC BELTS. NICHOLAS WARRELL, Farragut, Iowa. Filed Oct. 17, 1888. Serial No. 288,348. (No model.)



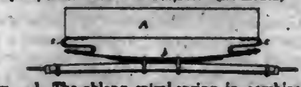
Claim.—1. In an electric belt, a hinge-section made of wire and having the spaced eyes or loops, the cross-bar, and a seat formed at a point in rear of the eyes or loops, and a plate, to which said hinge-section is connected, fitted tightly in said seat, substantially as described, for the purpose set forth.

2. In an electric belt, a plate or element and a hinge-section secured to said plate and having one end thereof extended beyond the plate, said hinge-section having a seat into which the end of the plate or element is tightly fitted, substantially as described, for the purpose set forth.

3. In an electric belt, a plate or element and a hinge-section bent from a single piece of wire and consisting of the spaced eyes or loops, the parallel arms, and a cross arm or bar arranged at one side of said parallel arms and in rear of the eyes to form a space or seat for the reception of one end of said plate, substantially as described, for the purpose set forth.

4. In an electric belt, a plate or element having the perforations *a a'* and *b b'*, and a wire hinge-section having a seat formed between its bars *g g'* and the cross-bar *c* at a point in rear of the loops, said arms *g g'* being passed through the perforations and resting against opposite faces of the plate, substantially as described, for the purpose set forth.

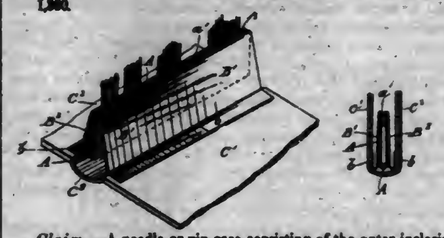
399,955. VEHICLE-SPRING. JEREMIAH W. WETHERILL, Erie, Pa. Filed Apr. 2, 1888. Serial No. 269,234. (No model.)



Claim.—1. The oblong spiral spring, in combination with the body of the vehicle and the semi-elliptical base, substantially as described.

2. The combination of the spiral spring of irregular shape with the semi-elliptical spring and the body of the vehicle, substantially as described.

399,956. NEEDLE OR PIN CASE. RICHARD WERATLEY, Jr., Birmingham, County of Warwick, England. Filed Sept. 24, 1888. Serial No. 286,266. (No model.) Patented in England Jan. 28, 1887, No. 1,360.



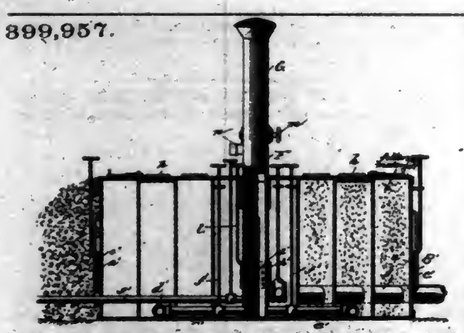
Claim.—A needle or pin case consisting of the outer inclosing-casing, the supporting-pieces extending upwardly therefrom, and a pocket for the reception of the needles or pins, said pocket being located between the supporting-pieces, the edges of which are secured to the pocket, substantially as described.

399,957. FILTER. ALFRED WILSON, Allegheny, assignor of one-half to Benj. H. Lightner, Pittsburg, Pa. Filed Mar. 13, 1888. Serial No. 267,004. (No model.)

Claim.—1. A filter consisting of a central chamber, a series of filtering-chambers surrounding the same, a conveyer-pipe communicating with the central chamber, a flushing pipe or pipes also connected with said chamber, a series of pipes communicating with said flushing-pipe and extending to one or more of the outer filtering-chambers, and a perforated ring connecting said pipes, substantially as described.

2. A filter consisting of an inner chamber, filtering-chambers surrounding the same, a perforated ring in the bottom of one of the filtering-chambers, pipes connecting said ring with the inner chamber,

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valves in said pipes, and a flushing pipe or pipes in communication with said connecting-pipes for supplying the ring or rings with water and a conveyer-pipe, substantially as described.

3. A filter consisting of the central chamber, a series of concentric cylinders surrounding the same, with filtering material between their walls, said cylinders being made perforated, a stand-pipe within the central chamber, a flushing-pipe in connection therewith, distributing-pipes leading from said stand-pipe to the filtering chamber or chambers, and a perforated delivery-pipe connecting therewith, substantially as described.

4. A filter consisting of a central chamber, a series of concentric chambers outside the same containing filtering material, a stand-pipe within the inner chamber, a flushing-pipe in connection therewith, distributing-pipes leading therefrom, and a valved passage between the stand-pipe and the inner chamber for flushing the same, substantially as described.

5. A filter consisting of a central chamber, a series of concentric chambers outside the same containing filtering material, a stand-pipe within the inner chamber, a flushing-pipe in connection therewith, distributing-pipes leading therefrom, and a sliding sleeve upon said stand pipe adapted to cut off communication between said stand-pipe and the interior chamber, substantially as described.

6. A filter consisting of a central chamber, a series of concentric chambers outside the same containing filtering material, a stand-pipe within the inner chamber, a flushing-pipe in connection therewith, distributing-pipes leading therefrom, suitable valves in said pipes, and an extension for said stand-pipe having a rose on its upper end adapted to spread the water, substantially as described.

7. A filter consisting of a central chamber, a series of concentric chambers outside the same containing filtering material, a stand-pipe within the inner chamber, a flushing-pipe in connection therewith, distributing-pipes leading therefrom, and an extension for said stand-pipe having a pipe secured thereto adapted to be connected with a source of steam-supply, substantially as described.

8. In the described filter, the combination of the following elements: a central chamber, a series of concentric chambers outside the same containing filtering material, gates in the wall of the outer chamber for the admission of water, a conveyer-pipe provided with a suitable valve extending from the inner chamber to the outside of the filter, a stand-pipe within the central chamber having an extension surmounted by a rose, a flushing-pipe leading from the outside to the stand-pipe, an annular perforated pipe in one of said chambers, distributing-pipes leading from the stand-pipe to said perforated pipe, whereby water forced from the outside through the flushing-pipe will, through the annular perforated pipe, cleanse the filtering material, and a cover for said filter for preventing the escape of the filtering material or other material, substantially as described.

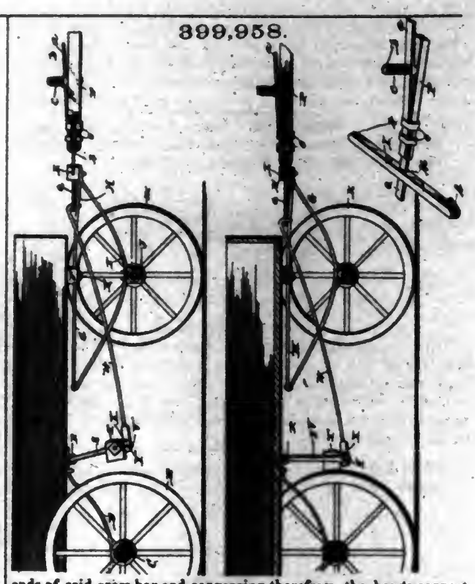
9. A filter consisting of a series of concentric chambers containing filtering material, a conveyer-pipe, and a flushing-pipe with branches to the concentric chambers, and a perforated ring for covering the concentric chamber or chambers, whereby the filtering material is prevented from washing off in the flushing operation, substantially as described.

399,958. WAGON-BRAKE. BENAJAH WILCOX, Woodhull, N. Y. Filed Dec. 11, 1888. Serial No. 293,295. (No model.)

Claim.—1. In an automatic wagon-brake, the combination, with the wagon-body and front axle, of the spring secured to and projected forward from the same, the cross-bar secured to the front ends of said spring, the bands supported by said cross-bar, the tongue supported by the said bands and cross-bar and adapted to move longitudinally, the rock-shaft journaled on the under side of the wagon-body and carrying the brake-shoes, and connections between the said tongue and said rock-shaft, as set forth.

2. The combination of the wagon-body, the springs projecting forward from the front end of the same, the cross-bar secured to said springs, having the central horizontal slot, the braces secured to the

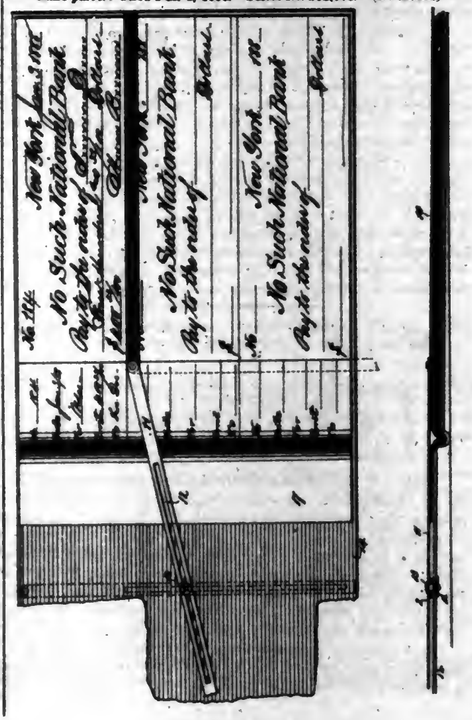
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ends of said cross-bar and converging therefrom, the bands connecting the front ends of said braces, the tongue having its rear end mounted in said bands, the strap secured to the tongue and projecting through the slot in the cross-bar, the rock-shaft journaled on the under side of the wagon-body and carrying the brake-shoes and having a depending central crank-arm, and the connecting-rod having its front end pivoted to the strap secured to the rear end of the tongue and its rear end pivoted to the central crank-arm of the rock-shaft, as specified.

3. The combination of the band, the tongue, the headed stud, the lever fulcrumed on said stud, and the spring coiled around said stud and bearing on the lever, as set forth.

399,959. CUTTING ATTACHMENT FOR CHECK-BOOKS. HENRY R. WILSON, Brooklyn, N. Y., assignor of one-half to Chatham F. Bedell, same place. Filed Feb. 1, 1888. Serial No. 262,673. (No model.)



Claim.—1. The combination, with the book, of the strip or bar swiveled thereto, whereby it may be swung or moved in a plane approximately parallel to that of the leaves of the book, and the cutter-arm pivotally connected with the strip or bar, substantially as set forth.

2. In a check-book attachment, the combination, with a spring strip or bar formed with a longitudinal slot, of a cutter-arm pivotally connected to one end of the strip or bar, and a stud or bolt arranged to pass through the longitudinal slot of the spring-strip, said bolt being arranged for connection with a book-cover, substantially as described.

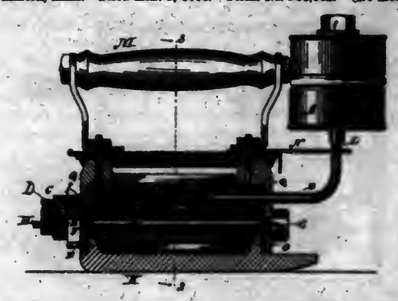
3. The combination, with the cover of a book and a cutter-arm, of a flexible connection pivoted to the arm, swiveled to the cover, and arranged to slide lengthwise on its swivel-connection, substantially as described.

4. The combination, with a book-cover, of a flexible spring-strip formed with a longitudinal slot, a washer arranged between the strip and the cover, a bolt passing through the slot in the flexible strip, the washer, and an aperture in the book-cover, a nut or washer with which the bolt engages, and a cutter-arm pivoted to the spring-strip.

5. The combination, with a book, of the connection-piece supporting a cutter-arm and adjustably connected with said book, whereby it may be moved pivotally or lengthwise, substantially as described and for the purposes specified.

6. As an improvement in check-cutters, a cutter-arm and a support to which said arm is pivoted, the axis of said pivot being approximately at right angles to the plane of the check, whereby the cutter-arm may be set to cut the side or end edge of the check, substantially as and for the purposes specified.

399,960. SAD-IRON-HEATING APPARATUS. JAMES M. WISHART, Marion, Kans. Filed Mar. 3, 1888. Serial No. 266,062. (No model.)



Claim.—The combination, with a hollow cast-iron, of an oil-tank, A, a jointless pipe, B, coiled over a perforated hollow burner and leading from the oil-tank to the gas-receiver, the receiver C, provided with a gas-reservoir, D, and an open recess, F, the adjustable screw-pin H in the receiver to admit gas to open recess F, and the hollow perforated burner G, connected with the receiver at one end in line with the screw-pin and supported by the frame Q at the other, all these parts being joined by screw-connections, so as to be readily attachable and detachable, substantially as set forth.

399,961. DEVICE FOR CHECKING HORSES. FREDERICK T. AIKINS, Toronto, Ontario, Canada. Filed June 23, 1888. Serial No. 277,060. (No model.)

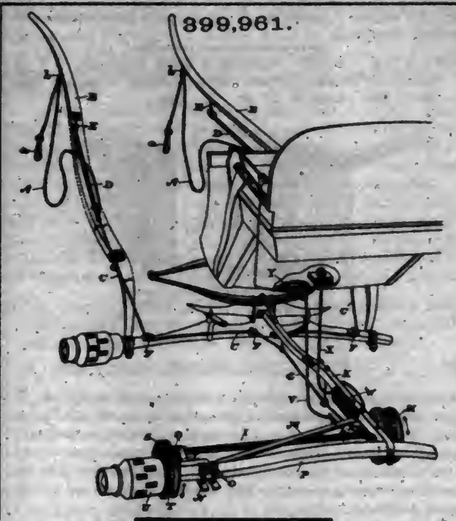
Claim.—1. The L-shaped bracket N, secured to the axle P by the clips Q, and having a slotted passage-way made in it to receive the lever M, which is pivotally connected to the arm L, on the end of which the shaft I is journaled, in combination with a pin, R, fixed in the slot of the bracket N and passing through an elongated slot, *f*, in the lever M, in which detachable blocks *g* are inserted for the purpose of readily altering the position of the fulcrum of the lever, substantially as and for the purpose specified.

2. The lever M, connected to the shaft I, as described, and having a cord, V, attached for the purpose of operating it, as described, in combination with a spring, Y, connected to the cord V, arranged to hold the said cord so that the portion next to the lever M will be slack when the said lever is locked to the spring-plate W, as specified.

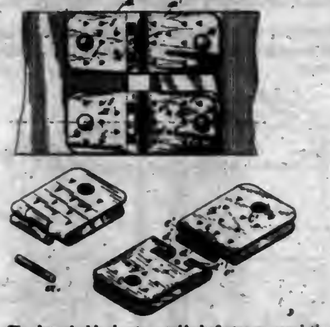
3. The arm L, pivotally connected to the lever M, in combination with the shaft I, passing through a ball-bearing formed in the end of the arm L, and protected by the collars O, fixed to the shaft I on either side of the said bearing, substantially as and for the purpose specified.

4. The shaft I, journaled on the end of an arm pivotally connected to the lever M, in combination with an L-shaped bracket secured to the axle and carrying an adjustable fulcrum for the lever M, substantially as and for the purpose specified.

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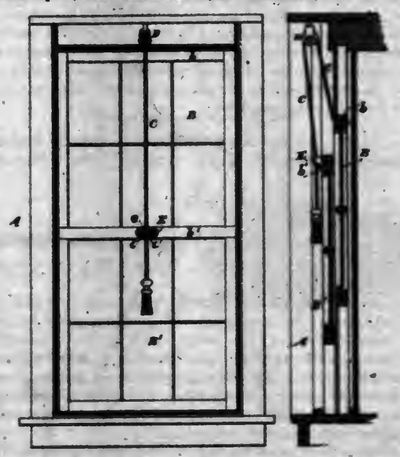


399,962. BELT-FASTENER. WILLIAM G. AVERY, Cleveland, Ohio, assignor to the W. G. Avery Manufacturing Company, same place. Filed Nov. 12, 1888. Serial No. 290,589. (No model.)



Claim.—The detachable sheet-metal belt-fastener, consisting of the piece A, having a T-slot, and the opposing piece A', having a T-head formed integral therewith, both pieces being provided with inwardly-projecting teeth and rivet-holes, substantially as shown.

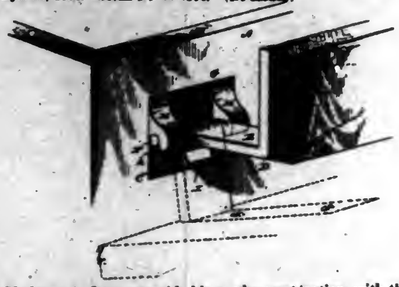
399,963. SASH-BALANCE. CLINCY BALDWIN, Tonganoxie, Kans. Filed Apr. 5, 1888. Serial No. 269,696. (No model.)



Claim.—In window-sash balances, the clasp E, having the two elastic side pieces, *e' e'*, meeting, or nearly so, at the top, forming a subjacent guide-channel for the cord C, and making an upwardly-taper-

ing intermediate slot, *e*, whereby it may be used in connection with the cord, as set forth.

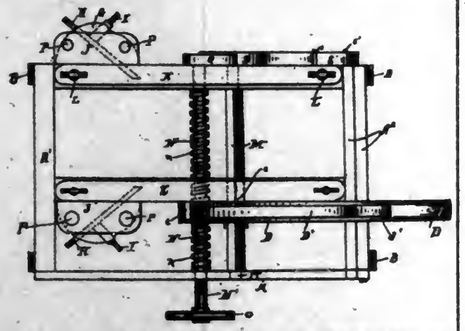
399,964. HINGE. LAURENCE V. BENET, Washington, D. C., assignor to the Hotchkiss Ordnance Company, (Limited,) of England. Filed Apr. 19, 1888. Serial No. 271,196. (No model.)



Claim.—1. In a separable hinge, the combination, with the T-shaped leaf D, having the pin F, of the leaf G, the knuckles H H, projecting from the face of and curved downward and back to the leaf G, leaving sufficient space between the ends of the knuckles and the leaf for the admission of the pin F, and having enlarged bases with the inner sides perpendicular to the leaf G, substantially as and for the purpose described.

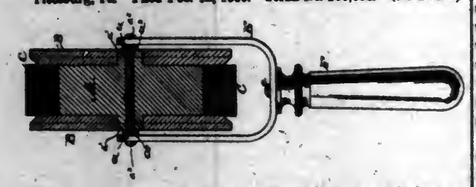
2. In a separable hinge, the combination, with the T-shaped leaf D, having the pin F, of the leaf G, having the curved downward-projecting knuckles H H, for the admission and retention of the pin F, and the stud I, substantially as described.

399,965. STRAP, TRACE, AND LACE TRIMMER AND CUTTER. JAMES BRADLEY, Dundee, N. Y. Filed July 18, 1888. Serial No. 280,348. (No model.)



Claim.—In a leather-cutting machine, the adjustable side rails, F, guided by spindles L, joined by cross-bar K, and encircled by spiral springs *l*, in combination with the actuating-shaft M, having cam R, the operating-lever D, the segments E Q, the former of which has teeth *e* to engage lever D', whose bifurcated ends *d' d*[1] serve, respectively, for manual operation and for pivotal connections to the lever D, and block G, having perforations at right angles to each other to accommodate the knife H and set-screw I.

399,966. ROTARY MEASURING-WHEEL. ROBERT J. BUCHANAN, Pittsburg, Pa. Filed Feb. 12, 1889. Serial No. 299,631. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the frame, its handle, the rotary disk, wheel, or roller pivoted to the frame and having scales of distances marked on its side, and an index or pointer pivoted concentric with the disk, wheel, or roller and weighted and pointed at its lower end.

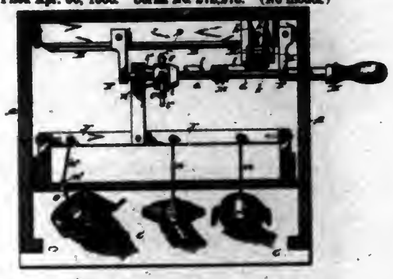
2. The combination, substantially as hereinbefore set forth, of the frame, the rotary disk, wheel, or roller, the scale marked on its side and near its periphery in accordance with one unit of measure, a second scale or scales within the outer scale divided according to a different unit or different units of measure, and an index or pointer pivoted concentric with the disk, wheel, or roller, having its lower arm weighted and pointed and extending to the outer scale and its upper arm made light, narrow, and pointed, and extending to the inner scale or scales, for the purpose herein specified.

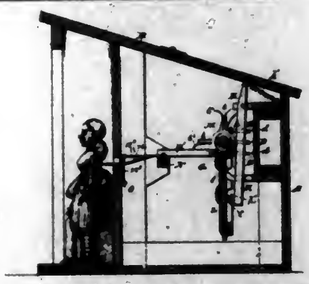
3. The combination, substantially as hereinbefore set forth, of the bushing or core, the circular graduated plates on each side of the bushing and beveled on their inner sides at the periphery, the tire or rim of soft flexible material between the plates and around the bushing or core and extending beyond the edges of the plates, the bosses of the bushing extending centrally through the plates, the axle or shaft, the frame to which it is secured, and an index or pointer pivoted concentric with the circular graduated plates.

4. The combination, substantially as hereinbefore set forth, of the central bushing or core, its laterally-projecting bosses having the extensions a^3, the metallic plates secured to the bushing around the bosses and having their inner sides tapered or beveled, as described, and marked on their outer sides with scales divided in accordance with suitable units of measure, the tire or rim of soft flexible material secured around the bushing and between the plates and extending beyond the outer edges or peripheries of the plates, the frame, its handle, the axle secured to the frame and extending through the bushing and its extensions, and the indexes or pointers pivoted on the extensions a^3.

5. The combination, substantially as hereinbefore set forth, of the disk, wheel, or roller, having a circular scale on its side and around its periphery divided into inches and a circular scale within the outer scale divided proportionately to represent miles, the frame to which the disk, wheel, or roller is pivoted, and the freely-suspended pointer or index adjacent to the disk, wheel, or roller.

399,967. MUSICAL TOY. DANIEL A. A. BUSH, Cheshire, Conn. Filed Apr. 30, 1888. Serial No. 272,273. (No model.)





Claim.—1. In a musical toy, the combination, with a series of musical strings, of a rotary striker for setting such strings in vibration, tone-changing mechanism for changing the vibratory length of the strings, jointed automatons, an operating-shaft adapted to be turned by hand, and connection between such shaft and the said striker, the automatons and the tone-changing mechanism, whereby, when the shaft is turned, the strings are set in vibration and automatically changed in vibratory length and the automatons set in motion, substantially as set forth.

2. In a musical toy, the combination, with a series of musical strings, of a rotary head, spring-arms carried by such head and adapted to strike the strings and set them in vibration, mechanism for varying the vibratory length and hence the tone of the strings, and operating-connections for operating the rotary head and the said tone-changing mechanism together, substantially as set forth.

3. In a musical toy, the combination, with a sounding-board provided with frets, a series of musical strings stretched across such board and over the frets thereof, stop-levers to press the strings upon the frets and so vary their vibratory length, cams mounted for rotation in engagement with the stop-levers, which they actuate, and means for rotating the cams, substantially as set forth.

4. In a musical toy, the combination, with a series of musical strings, of a rotatable hub, radial curved spring-arms carried by such hub and each adapted to strike the strings and set them in vibration, mechanism for changing the vibratory length, and hence the tone produced by the strings, and operating-connections for vibrating the hub and actuating the tone-changing mechanism together, substantially as set forth.

5. As a means for causing music-strings to vibrate, a rotatable hub which is provided with radial rigid pins, and radial spring arms or strikers that are partly supported by said pins and have curved outer ends which are adapted to engage with and move over said strings as the hub revolves, substantially as and for the purpose set forth.

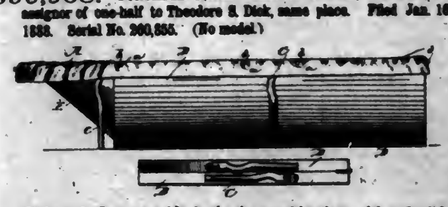
6. As a means for causing music-strings to vibrate, a rotatable hub which is provided with radial rigid pins, and radial spring arms or strikers that are partly supported by said pins, and buffers or dampers which are placed between said strikers and the contiguous sides of said pins, substantially as and for the purpose shown and described.

7. A musical toy in which are combined music-strings that are stretched across a sounding-board, a rotatable hub which is provided with radial spring striker-arms, cam-actuated levers that are adapted to press said strings upon frets and thus change their operative lengths, automatons that are adapted to represent the movements of a banjo-player and jig-dancers, and operating mechanism by which all of said parts are actuated, substantially as and for the purpose specified.

8. In a musical toy, the combination, with a series of musical strings, means for automatically striking the same and setting them vibrating, automatic stops or keys for engaging with the strings and changing their vibratory length, an operating-shaft, and connections between the striking mechanism and the stops or keys and the said shaft whereby the strings are automatically struck and changed in vibratory length when the shaft is turned, substantially as set forth.

9. In a musical toy, the combination, with a series of musical strings, means for striking the same and setting them vibrating, stops or keys for engaging with the strings to change their vibratory length, cams for operating such stops or keys, and operating-connections between the striking mechanism and the cams, whereby the said mechanism and cams operate together, substantially as set forth.

399,968. PORTABLE BATH. SANFORD S. BURR, Winnetka, Ill., assignor of one-half to Theodore S. Dick, same place. Filed Jan. 16, 1888. Serial No. 260,855. (No model.)



Claim.—1. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for said tub or receptacle formed of flexible material extending around the bottom and sides of the tub, substantially as described.

2. In a portable bath, the combination, with a flexible tub or receptacle of water-proof material, of a support for said tub or receptacle formed of separable sections divided transversely the length of the tub, and a suitable stay or brace for holding said sections in position, substantially as described.

3. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for said tub or receptacle composed of divided sections of flexible material extending around the bottom and sides of the tub, substantially as described.

4. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for said tub or receptacle formed of flexible material, and a suitable stay or brace for holding said flexible material in position, substantially as described.

5. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for said tub or receptacle formed of flexible material, and a stay or brace for said support consisting of a top frame and suitable legs connected thereto, substantially as described.

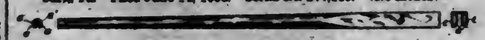
6. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for said receptacle formed of flexible material and comprising one or more body-sections and a head-section, and a suitable stay or brace for holding said sections in position, substantially as described.

7. In a portable bath, the combination, with the flexible water-proof tub or receptacle, of a support for the sides and bottom of said receptacle, said support being formed of transversely-divided sections extending around the bottom and sides of the tub, and a stay or brace for said divided sections consisting of a frame extending around the top thereof and detachably connected therewith, said frame having legs and being provided with suitable means for detachably connecting thereto the flexible tub or receptacle, the said several parts being arranged and combined for relative co-operation, substantially as described.

8. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for said tub or receptacle consisting of the flexible divided end and body sections, and a stay or brace for said sections extending around the upper portion thereof and having legs movably connected thereto, substantially as described.

9. In a portable bath, the combination, with a flexible water-proof tub or receptacle, of a support for the sides and bottom of said tub or receptacle consisting of transversely-divided sections, and a stay or brace for said sections comprising a frame, B, transversely divided and detachably connected with the sections, substantially as described.

399,969. METAL BLANK FOR VEHICLE-TONGUES, &c. CYRUS M. CARNAHAN, Coraopolis, assignor to Charles C. Dickey, trustee, Pittsburg, Pa. Filed June 14, 1888. Serial No. 277,116. (No model.)

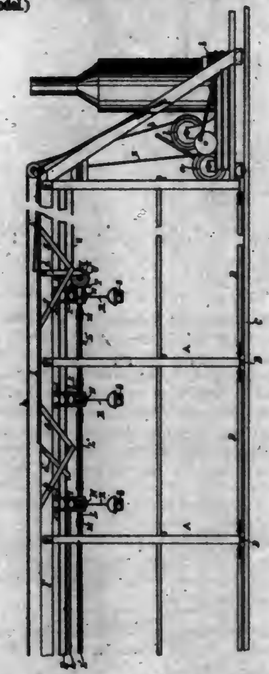


Claim.—1. A metal blank for vehicle-irons, consisting of a trough-shaped piece of iron having its sides reflexed inwardly, as at *c'*, substantially as and for the purposes described.

2. A metal blank for vehicle-irons, consisting of a trough-shaped piece of iron having its sides reflexed inwardly, as at *c'*, with the edges of the reflexed sides in contact with the inner portion or base of the trough, substantially as and for the purposes described.

3. A metal blank for vehicle-irons, consisting of a trough-shaped piece of iron having its sides reflexed inwardly, as at *c'*, the inner sides of the reflexed portions *c'* being in contact, substantially as and for the purposes described.

399,970. APPARATUS FOR RAISING AND MOVING EARTH. HOWARD A. CARSON, Boston, Mass. Filed Apr. 2, 1888. Serial No. 269,236. (No model.)



Claim.—1. In an apparatus for raising earth or other material, a train of drums, N, attached to a continuous shaft adapted to travel and hung from rail H, in combination with the ratchet-wheels P and pawls Q, substantially as and for the purpose set forth.

2. In an apparatus for raising and moving earth or other material, a train of drums adapted to travel, secured to short shafts mounted in bearings hung from the track, in combination with short shafts connected to the shafts of the drums by universal joints, substantially as and for the purpose set forth.

3. In an apparatus for raising and moving earth or other material, a train of drums, N, adapted to travel, secured to shafts L, mounted in bearings K, hung from the track H, in combination with shafts L',

connected to the shafts L by universal joints M, bevel-gears T U shaft V, driving-drum Y, and rope Z, substantially as shown and described.

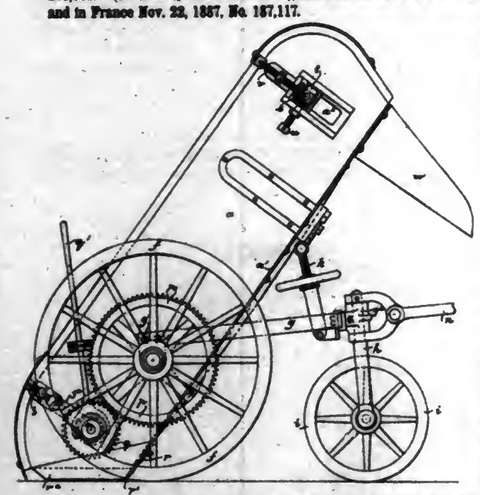
4. The ring-buffers *m*, in combination with the shaft V, carrying the driving-drum Y and bevel-gear U, and the counter-buffers *d*, substantially as and for the purposes set forth.

5. A train of drums mounted upon a shaft and supported in bearings hung from the track, in combination with bevel-gears T U, driving-drum Y, and rope Z, substantially as and for the purposes set forth.

6. In combination with a movable frame supporting a track, a train of drums secured to a shaft mounted in bearings hung from the track, said shafts consisting of sections secured together by universal joints and driven by bevel-gears from a counter-shaft, which is driven by a rope passing around a drum on said shaft, substantially as shown and described.

7. In combination with a movable frame supporting a track, a train of drums secured to a shaft mounted in bearings hung from the track, and driven by bevel-gear from a counter-shaft, which is driven by a rope passing around a drum on said shaft, substantially as shown and described.

399,971. ROAD-SWEEPING MACHINE. WILLIAM T. CARTER and JAMES KEEBLE, Bury St. Edmunds, County of Suffolk, assignors to Albert William Collins, London, England. Filed Apr. 13, 1888. Serial No. 270,532. (No model.) Patented in England Dec. 13, 1886, No. 16,246, and in France Nov. 22, 1887, No. 187,117.



Claim.—1. The combination, substantially as hereinbefore set forth, of the front and rear wheels, the frame connecting them, the inclined box or casing, the axle of the rear wheels to which the box or casing is pivoted, the adjustable support for the front end of the box, the endless series of brushes, the support therefor at the upper end of the casing, the bearing for said support adjustable both longitudinally and laterally, the support for the lower end of the series of brushes, and the bearing therefor adjustable in an arc concentric with the axis of the casing.

2. The combination of the inclined box or case, the endless series of brushes, and the adjustable plate secured to the lower end of the box, substantially as herein set forth.

3. The combination of the inclined box or case, the endless series of brushes within the case, the adjustable plate secured to the lower end of the box, and the flexible lip on the lower end of the adjustable plate, substantially as herein set forth.

399,972. COIN-CONTROLLED TURNSTILE. HENRY CASPAR, New Orleans, La. Filed Jan. 30, 1888. Serial No. 262,490. (No model.)



Claim.—1. The combination, with the turnstile, of a sliding bolt and a sliding frame in the path of the same, the frame having a lug in the line of travel of the bolt and at a distance therefrom sufficient to receive a coin, and a supporting-plate for the coin below the said bolt and the lug, and having an arm projecting in the path of the turnstile, substantially as specified.

2. The combination, with the turnstile provided with a pawl and ratchet, as described, of a sliding spring-actuated bolt having a beveled face in the path of the turnstile, a spring-actuated frame projecting into the path of the turnstile and provided with a lug at a distance from and in the line of travel of the bolt, a coin guide or passage leading between said bolt and the lug, and a pivoted spring-actuated coin-supporting plate below the bolt and the lug and provided with an arm in the path of the door, substantially as described.

399,973. ROTARY FAN FOR FRUIT-DRIERS. JOHN W. CASSIDY, Petaluma, Cal. Filed Dec. 17, 1887. Serial No. 258,240. (No model.)



Claim.—1. The herein-described improved rotary fan for fruit-driers, having wings B^1, hinged to the vanes at *b b*, substantially as described.

2. The combination, with the fan B, having wings B^1, hinged to the vanes at *b b*, the spindle B^x, mounted in the bearings *d d*, of the bracket D and suitable actuating mechanism for the fan, substantially as described.

3. The herein-described improved rotary fan for fruit-driers, consisting of the fan-shaft and the vanes, which are provided with deflecting-wings that are capable of adjustment to take different angular positions across the circle of rotation of the fan, as set forth.

399,974. BLUING-PACKAGE. THEODORE F. CONKLIN, Chicago, Ill., assignor of one-half to Nathan S. Lappert, same place. Filed Sept. 14, 1888. Serial No. 285,490. (No model.)

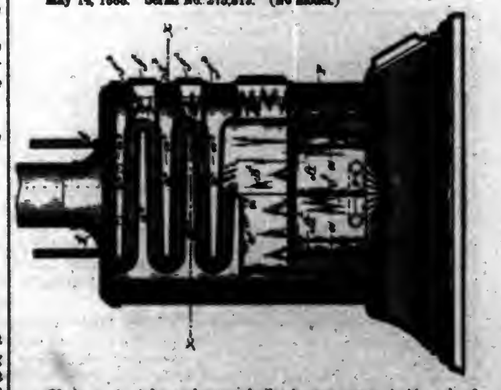


Claim.—1. A package of laundry-bluing consisting of multiple thicknesses of suitable material coated with thick bluing, the bluing being arranged in layers between the thicknesses of material whereon it is applied, the various thicknesses of material and layers of thick bluing being held together and fastened within a receptacle having a water-tight portion to catch the drip, substantially as described.

2. A package of laundry-bluing consisting of multiple layers or thicknesses of suitable material coated with thick bluing, the said bluing being arranged in multiple layers between the material whereon it is applied and permanently held within a suitable water-tight portion to catch the drip, said receptacle being of considerably larger size than the layers or thicknesses of coated material in order to permit the access of water around the edges or surface of the coated layers, substantially as described.

3. A package of laundry-bluing consisting of multiple layers or thicknesses of lamp-wicking or like pervious material coated with thick bluing, the said bluing being arranged in multiple layers between the material whereon it is applied and permanently held within a receptacle having a water-tight portion to catch the drip, substantially as described.

399,975. BOILER. JOHN H. CUNNINGHAM, Chelsea, Mass. Filed May 14, 1888. Serial No. 273,812. (No model.)



Claim.—1. A house-heating boiler in two parts, A A', each of which is integral or in one casting and has horizontal sections of the width of the cavity of the boiler arranged to extend into integral horizontal spaces in the other to form a sinuous flue, all substantially as and for the purposes described.

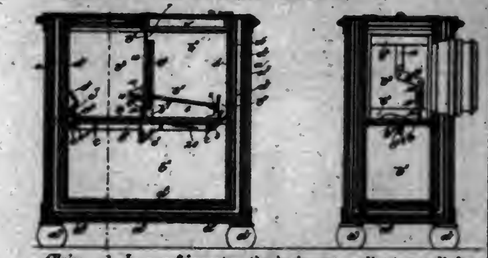
2. The combination, in a heating-boiler, of the parts A A', having thin flat overlapping sections a^3 a^3, and the pipes D D', fastening or securing the two parts together, substantially as described.

3. The combination, in a heating-boiler, of the parts A A', the lower connecting circulating pipe or pipes D, and the threaded inlet projections *d*, extending therefrom, substantially as described.

4. In a house-heating boiler, the combination of the part A, having the horizontal flat extensions a^3 and intermediate recesses, the part A', having the horizontal extensions a^3, and the circulating-pipes D D', connecting the parts A A', substantially as described.

5. A house-heating boiler comprising the parts A A', having the flat sections a^3 a^3, arranged to form the sinuous smoke-flue B, and openings *f* in one of the parts A A' to the courses of the smoke-flue, and doors for closing the said openings, substantially as described.

399,976. REFRIGERATOR. NATHANIEL DAVIS, Montpelier, Vt., assignor of one-half to George L. Davis, North Andover, Mass. Filed Aug. 13, 1888. Serial No. 282,565. (No model.)

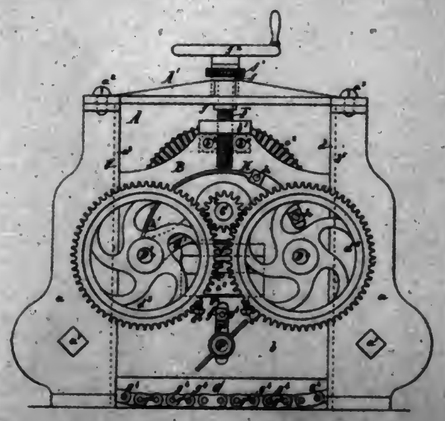


Claim.—1. In a refrigerator, the body and a division-wall, *b*, to form ice and food compartments within said body, the auxiliary bottom b^3 in said ice-compartment, and passages or ports c b^4 to establish communication between said compartments, combined with valves c^3 and 3, to control said ports or passages, respectively, said valves being connected by the spring-controlled sliding rod c^3, having the projection c^7 thereon, to be acted on by the cam c^8 of the food-compartment door to open said passages when the door is closed, substantially as and for the purpose specified.

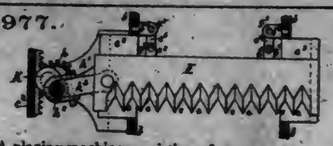
2. In a refrigerator, the body division-walls *b* b^3, forming chambers b' b^3 b^4, and having formed therein ports or passages to establish communication between said chambers b^3 b^4 for the cold air, combined with valves b^3 b^5, to control the ports or passages 7 and b^7, said valves being connected by rods 10 12 and pivoted lever 13, and the projection 15 on said rod 10, and the cam 16 on the door of the chamber b^3, to co-operate therewith, whereby the said valves are opened when the door is shut, substantially as described.

399,977. PLANING-MACHINE. WILLIAM R. DAVIS, San Antonio, Tex., assignor to Phineas J. Davis, same place. Filed June 30, 1888. Serial No. 278,030. (No model.)

Claim.—1. In a planing-machine, in combination, a planing-cutter, a supporting-frame, connections for giving a horizontal oscillatory movement to the cutter over the surface of the material being planed, and a supporting feed-bed, substantially as and for the purpose described.



399,977.

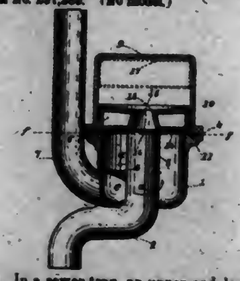


2. A planing-machine consisting of a cutter-bar having toothed cutting-edge and oscillating on links having fixed fulcra, and a suitable feed-motion, said cutter having an advancing draw-cut movement while moving sidewise, substantially as and for the purpose described.

3. The combination of a stationary frame having an endless carrier-apron of anti-friction rollers with a vertically-adjustable frame fitted into the stationary frame and carrying the feed-motion, and a horizontally-oscillating cutter-bar, substantially as and for the purpose described.

4. The combination of vertically-adjustable feed-rollers and an oscillating cutter-bar which advances and recedes while moving sidewise back and forth, with an endless apron having horizontal anti-friction rollers and a foundation-plate, substantially as and for the purpose described.

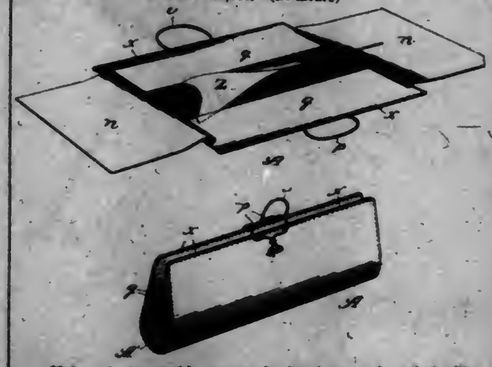
399,978. SEWER-TRAP. DAVID H. DONALDSON, Buffalo, N. Y., assignor to himself and Oliver G. Donaldson, same place. Filed Jan. 23, 1888. Serial No. 267,289. (No model.)



Claim.—1. In a sewer-trap, an upper and lower case secured together gas-tight, in combination with a valve-seat surrounding the upper portion of the lower case, an outlet-pipe projecting up into the lower case and having a valve-seat at its upper end, an inlet-pipe having its opening in the lower part of the lower case, and a valve having a central opening through it, adapted to fit the valve-seats and rise and fall with the rise and fall of the water in the trap, substantially as and for the purposes described.

2. A sewer-trap consisting of an upper and lower case secured together gas-tight, the lower case having an outlet-pipe passing up inside substantially even with the top of the same, and an inlet-pipe passing down into the lower side, in combination with a spiral diaphragm surrounding the outlet-pipe to cause a rotation of the water as it passes in, and a valve having an opening through it, adapted to float or rise up as the water passes up into the trap and down through the outlet-pipe, and to drop again to its seat as the level of the water falls below the valve-seat, substantially as and for the purposes described.

399,979. PORTFOLIO. ANNIE G. DYRENFORTH, Riverside, Ill. Filed Jan. 26, 1888. Serial No. 267,636. (No model.)

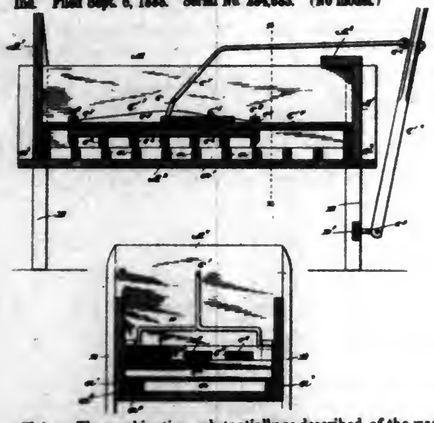


Claim.—1. A portable receptacle for sheet-music and the like comprising a flexible back or body portion, A', having pockets *g*, opening toward each other and sealed at the lateral edges, and a securing

device upon each outer edge of the back or body portion A', whereby the article to be carried may be inserted at its opposite edges into both pockets *q*, and the opposite edges of the back fastened together without creasing the body portion or the article carried therein, substantially as described.

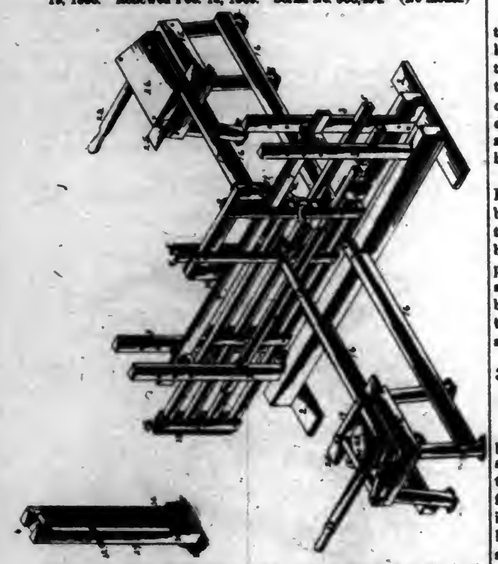
2. A portable receptacle for sheet-music and the like, substantially as described, comprising, in combination, a flexible body portion, A', pockets *q* on one surface toward opposite edges of the body portion and opening toward each other, whereby the article to be carried may be inserted at its opposite edges into the pockets *q*, and the receptacle be bent to cause the edges to approach each other without producing a sharp angle in the body portion or contents of the receptacle, a handle, *e*, and means for securing the edges together, substantially as described.

399,980. WASHING-MACHINE. HENRY H. FISHER, New Paris, Ind. Filed Sept. 6, 1888. Serial No. 284,683. (No model.)



Claim.—The combination, substantially as described, of the washing-box having fixed transverse rubber strips, the reciprocating rubber frame provided with similar rubber strips and having its end pieces mortised, the transverse strips a^3, secured at the ends of the box and extending above the rubber strips, the rack-frame having a central cross-piece and longitudinal bars extending through the mortises of the rubber frame and resting at their ends on the transverse strips a^3 and a handle and connecting-rod for reciprocating the rubber frame

399,981. GATE. MARK W. FOSTER, Pocatonica, Ill. Filed Mar 19, 1888. Renewed Feb. 12, 1889. Serial No. 300,494. (No model.)



Claim.—1. The combination, with a supporting-frame, of a horizontal trackway, a gate having a rail extending rearward of a vertical line drawn at the rear of the points of contact of the gate with the said trackway, and a counter-balance adjustably secured to the rear extension of said rail, substantially as set forth.

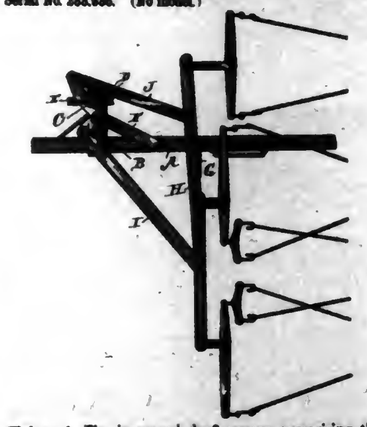
2. The combination of a supporting-frame, a horizontal trackway secured in stable adjustment to and made vertically adjustable in its connection with the supporting-frame, a gate supported on said trackway, and a counter-balance secured to the gate at a point to the rear of the points where the gate engages said trackway, substantially as set forth.

3. The combination of a supporting-frame, a horizontal trackway, a carriage secured to the vertical supports of the gate in stable adjustment and engaging said trackway, the gate suspended from the said carriage, a roller between the vertical supports of the gate to engage the under edge of the trackway, and a weight adjustably secured at one end to counterbalance its opposite end, substantially as set forth.

4. The combination of an operating-lever having a pivotal connection with the pedestal-support, an eccentric and hand lever having a pivotal support within an open frame secured to the operating-lever, and a link-connection of the operating-lever with the gate, substantially as set forth.

5. The combination, with the latch-post, of a gate having a V-formed guide to enter within the latch-post, a vertically-adjustable rod, and a safety-catch to engage the rod, substantially as set forth.

399,982. DRAFT-EVENER. JOSEPH W. GAEBLE, Adair, Iowa, assignor of one-half to Jacob McCarney, same place. Filed Oct. 30, 1888. Serial No. 288,686. (No model.)



Claim.—1. The improved draft-evener, comprising the tongue, the bracket B, secured to the tongue near its rear end, the evener-lever mounted on said bracket, the double-hinge bracket G, pivoted to the tongue in advance of the bracket B, the brace-bar pivoted to the ends of the bracket B, the draw-bars I, extending between one end of the brace-bar and the shorter arm of the evener-lever, and the draw-bars J, extending between the longer arm of the evener-lever and the brace-bar, the said draw-bars being constructed of parallel bars, as set forth.

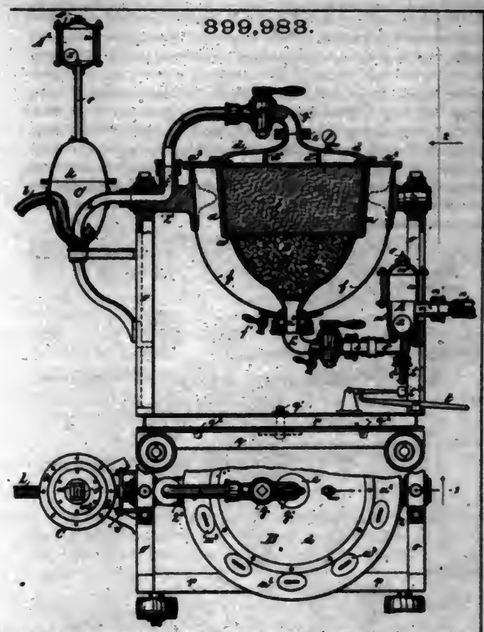
2. The improved draft-evener, comprising the tongue, the bracket B, secured to the tongue and projecting to one side thereof, the bracket G, pivoted to the tongue and projected to the opposite side, the evener-lever pivoted on the bracket B, the brace-bar pivoted between its ends to the end of the bracket G, the draw-bars I, composed of parallel plates extending between the end of the brace-bar and the shorter arm of the evener-lever, the draw-bars J, extending between the brace-bar and the longer arm of the evener-lever, and the brace extending from the pivot of the evener-lever to the tongue, as specified.

399,983. FILTERING APPARATUS. HEINRICH GERBER and ADOLF WOHLFARRT, Berlin, Germany. Filed Jan. 18, 1888. Serial No. 261,156. (No model.) Patented England June 30, 1888, No. 9,533.

Claim.—1. In a pressure-filter, the shell *a*, having an inwardly-projecting contraction or ledge, *a'*, and with an approximately trumpet-shaped portion between said ledge and the inlet-opening, in combination with a removable receptacle, *b*, containing filtering material, which fits within said shell and rests against said ledge, said receptacle having a perforated bottom and a removable perforated top, a cover, *d*, having an outlet-opening, said cover fitting over the larger end of said shell and bearing against said receptacle, and elastic cushions or props *d'* between the cover *d* and the top of said receptacle.

2. The combination, with a beer-filter, of an air-extractor consisting of a chamber communicating with the pipe or passage through

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which the beer flows, an outlet-opening at the top of said chamber, and a float-valve within said chamber adapted to rise and close said outlet upon the rise of the level of the beer therein.

3. The combination, with a beer-filter, of an air-extractor consisting of a chamber in communication with the pipe through which the beer flows, an outlet-opening from the top of said chamber, a lip-valve opening outwardly from said opening, and a float-valve in said chamber adapted, when lifted by the rise of the liquid therein, to close said outlet-opening.

4. The combination, with a beer-filter, of an air-extractor consisting of a chamber in communication with the pipe through which the beer flows, an air-outlet opening from the top of said chamber, and a float-valve in said chamber consisting of an elastic ball adapted, when lifted by the rise of liquid in said chamber, to close said outlet-opening.

5. The combination, with a beer-filter, of an air-extractor for removing the air from the beer before it passes through the filter, consisting of a chamber formed with a beer-inlet at its side, a beer-outlet at its bottom leading to the filter, and an air-outlet opening at its top, and a float-valve in said chamber, consisting of an elastic ball adapted to close either said beer-outlet at the bottom or said air-outlet at the top.

6. In a beer-filter, an air-extractor chamber, an inlet-pipe opening into the same, and an outlet-pipe leading from the bottom thereof, and a float ball-valve which closes said outlet-passage, in combination with an automatically-acting elastic air-outlet lip-valve at the top of said chamber opening outwardly therefrom, the opening to said lip-valve being closed by said float-valve when the liquid rises in said chamber.

7. The combination, with a beer-filter, of an air-extractor for removing the air from the beer before the latter passes to the filter, consisting of a chamber formed with a beer-inlet, an air-outlet at its top, and a beer-outlet at its bottom leading to the filter, a valve in said chamber adapted to close said outlet, a sliding pin beneath said valve and passing out through a stuffing-box, and a lever for forcibly moving said pin against said valve inside the latter.

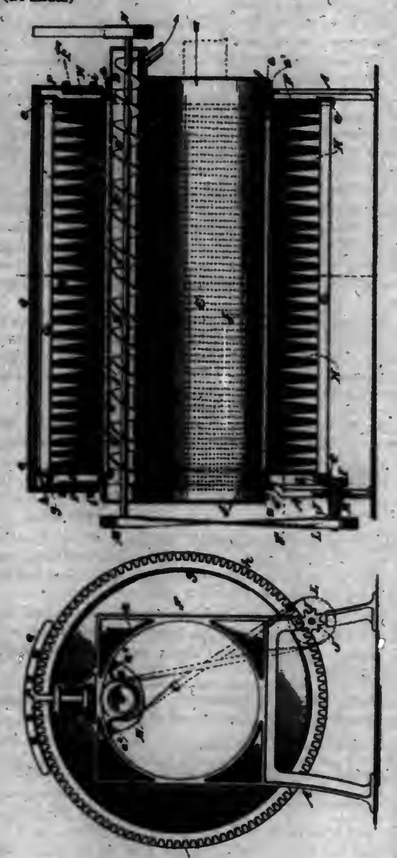
8. The combination, with a beer-filter, of a foam-destroyer consisting of a closed vessel, the outlet-pipe from the filter opening outwardly into the lower part of said vessel, and an outlet-pipe from said vessel opening upwardly therein.

9. The combination, with a beer-filter, of a foam-destroyer consisting of a closed chamber or vessel, an inlet-pipe connecting said filter with said vessel, the outlet-mouth of said pipe opening into said vessel below the liquid-level thereof, and an outlet-pipe leading from said vessel, with its receiving-mouth below the liquid level.

10. The combination, with a foam-destroyer consisting of a closed vessel, with a beer-inlet pipe opening outwardly in the lower part thereof and a beer-outlet pipe opening upwardly therein, of a pipe extending upwardly from the upper part of said chamber, and an air-extractor consisting of a chamber into which said pipe opens formed with an air-outlet at its top and provided with a float-valve therein adapted, when lifted by the rise of said liquid, to close said outlet.

11. In a beer-filter, an air-extractor chamber, an inlet-pipe opening into the same, an outlet-pipe leading therefrom, and a float ball-valve which closes said outlet-passage, in combination with a sliding pin adapted when lifted to unseat said valve, a retracting-spring for said pin, a treadle, and a hammer pivoted to said treadle and adapted to strike said sliding pin on the depression of the treadle.

399,984. DUST-COLLECTOR. ANTON GERR, Buffalo, N. Y., assignor to Faustin Prinz, Milwaukee, Wis. Filed Aug. 11, 1885. Renewed Apr. 20, 1886. Again renewed June 6, 1887. Serial No. 240,442. (No model.)



Claim.—1. In a dust-collector, a dust-collecting medium composed of brushes for separating the dust from the air, substantially as described.

2. In a dust-collector, the combination of a brush dust-collecting medium and an air-conduit for directing the air to the said medium, substantially as described.

3. In a dust-collector, the combination of a brush dust-collecting medium, an air-conduit for directing air thereto, and a trough to receive dust deposited from the brushes, substantially as described.

4. In a dust-collector, the combination of a brush dust-collecting medium, a conduit for directing air thereto, a clearer for the brushes, and a trough to receive the dust deposited from the brushes, substantially as described.

5. In a dust-collector, the combination of a brush dust-collecting medium, an air-conduit for directing air thereto, a clearer for the brushes, a trough to receive dust deposited from the brushes, and a shut-off opposite to the trough, substantially as described.

6. In a dust-collector, the combination of a brush dust-collecting medium, an air-conduit for directing air thereto, a trough to receive dust deposited from the brushes, and a shut-off opposite to the trough, substantially as described.

7. In a dust-collector, the combination of a brush dust-collecting medium, a conduit for directing air to the dust-collecting surface, a portion of said conduit being perforate and a portion imperforate,

and a trough adjacent to the imperforate portion of the conduit to receive dust deposited from the collecting medium, substantially as described.

8. In a dust-collector, the combination, with a dust-collecting medium, of a conduit for directing air thereto, a portion of said conduit being perforate and a portion imperforate, and a trough at the imperforate portion of the conduit to receive dust from the collecting medium, substantially as described.

9. In a dust-collector, the combination of a conduit for dust-laden air, a portion thereof being perforate and a portion imperforate, and a trough at the imperforate portion of the conduit having an extension of its sides above the wall of the conduit, substantially as described.

10. In a dust-collector, the combination of a rotating brush-cylinder, a perforated or reticulated conduit within said cylinder for directing air thereto, and a trough to receive dust deposited from the brushes of the cylinder, substantially as described.

11. In a dust-collector, the combination of a rotating brush-cylinder and a perforated or reticulated conduit within said cylinder to direct air thereto, the brushes terminating a distance from said conduit to leave a space between the brushes and conduit, substantially as described.

12. In a dust-collector, the combination of the end frames, the revolving brush-cylinder supported by said frames and having a gear at one end, a perforated or reticulated conduit within said cylinder, a trough to said conduit, a shaft carrying a conveyer in the trough, a gear meshing with the gear of the cylinder, and pulleys and connecting-band for revolving the conveyer and cylinder, substantially as described.

13. In a dust-collector, the combination of the end frames, the revolving brush-cylinder supported thereby, the perforated or reticulated conduit within the cylinder, the conveyer-trough to the conduit, the shut-off above the trough, and the arms connected with the end frames to support the shut-off, substantially as described.

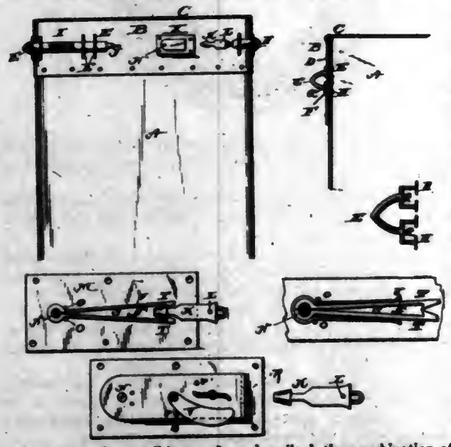
399,985. INTERNASAL TUBE. DAVID H. GOODWILLIE, New York, N. Y. Filed July 28, 1888. Serial No. 281,269. (No model.)



Claim.—1. A nasal intubation-tube consisting of a neck and an enlarged part or bulb of elastic material at one end of the same, and provided with a passage extending entirely through it, substantially as shown and described.

2. As an article of manufacture, the nasal intubation-tube consisting of the neck *a* and the enlarged part or bulb *b* at one end of the same, made in one piece and of elastic material, substantially as shown and described.

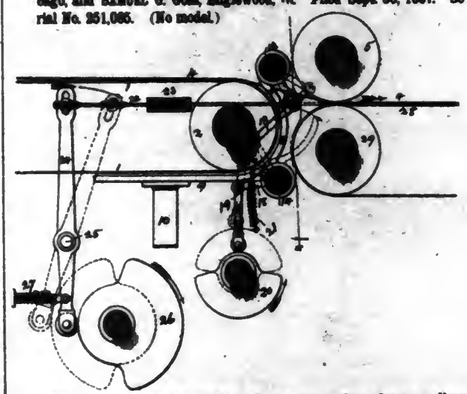
399,986. MAIL-BAG FASTENING. JAMES S. GOODWIN, Emerald, Wis. Filed Feb. 6, 1888. Serial No. 263,077. (No model.)



Claim.—1. In a mail-bag such as described, the combination of the staples E, secured in position around the said bag and adapted to extend through perforations provided in the flap, a chain, I, for extending through the said staples, consisting of a number of small chains secured together and the whole covered with a flexible material to prevent the chain catching in the staples, and a lock, X, for securing the ends of the chain together, substantially as described.

2. In a mail-bag such as described, the combination of the staples E, secured in position upon the bag and extending through perforations provided in the flap, a chain, I, adapted to pass through the said staples and provided upon the end with a barbed head, K, and a lock to receive and hold the said head, consisting of two arms, S, the rear ends of which are formed to a semicircle to engage a post, N, upon which they turn, and the front ends are formed to hooks T, the barbs of which meet to close behind any protuberance passed between them, the spring W, passed around the post N outside the arms S and extending along the sides of the same, the pins O O, placed to retain the spring W in position to maintain a pressure upon the arms S, and the double dog U, pivoted between the arms S and adapted to spread the same, substantially as described.

399,987. PAPER-FOLDING MACHINE. FREDERICK L. GOSS, Chicago, and SAMUEL G. GOSS, Englewood, Ill. Filed Sept. 30, 1887. Serial No. 251,065. (No model.)



Claim.—1. In a paper-folding machine, a series of tape-pulleys, as 2, and two series of tapes, as 1 and 4, in combination with movable guides 11 and 13 and a reciprocating folding-blade, substantially as and for the purposes specified.

2. In a paper-folding machine, a series of tape-pulleys, as 2, and two series of tapes, as 1 and 4, in combination with movable guides 11 and 13, a reciprocating folding-blade, and a series of tapes, as 28, substantially as and for the purposes specified.

3. In a paper-folding machine, a series of tape-pulleys, as 2, and two series of tapes, as 1 and 4, in combination with movable guides 11 and 13, sheet-supports 9, and a folding-blade, substantially as and for the purposes specified.

4. In a paper-folding machine, a series of tape-pulleys, as 2, and two series of tapes, as 1 and 4, in combination with movable guides 11 on a shaft, 12, movable guides 13 on a shaft, 14, cam 20, and levers and connecting-bars for operating the guides, substantially as and for the purposes specified.

5. In a folding-machine, two series of tapes, as 1 and 4, and a series of tape-pulleys, as 2, in combination with guides 11 and 13, cam 20, intermediate devices, substantially as described, for operating the guides by means of said cam, a reciprocating folding-blade, lever 24, and cam 26, substantially as and for the purposes specified.

6. In a folding-machine, the combination of tape-pulleys 2, guides 11 and 13, reciprocating blade, devices, substantially as described, for operating the guides which first conduct the forward end of the sheet around the tape-pulley and then are moved out of the path of the folding-blade and the sheet to be folded, devices for operating the folding-blade, substantially as described, two folding-rollers, as 48, a folding-blade, 49, and suitable conducting-tapes, 1, 4, 28, and 50, substantially as and for the purpose specified.

399,988. SHOCK-FORMING TABLE FOR CORN-HARVESTERS. ARTEMUS H. HADLEY, Indianapolis, Ind. Filed Oct. 8, 1888. Serial No. 287,478. (No model.)



Claim.—1. The combination, with the main frame and the cutters of a corn-harvester, of a turn-table mounted on the main frame at the rear of the cutters and arranged to receive the cut stalks therefrom, and a support for the stalks mounted on said turn-table, so as to rotate therewith and adapted to sustain the stalks in an upright position.

2. The combination, with the main frame, the driving-shaft, and the cutters of a corn-harvester, of a circular table mounted on the main frame at the rear of the cutters and arranged to receive the cut stalks therefrom, a support for the stalks mounted on said table, so as to rotate therewith, and intermediate connecting mechanism connecting the table and the driving-shaft, whereby the table is rotated, substantially as and for the purpose set forth.

3. In a corn-harvester, the combination, with the rotating table arranged to receive the cut stalks, of a pair of intersecting arms extending horizontally across the table and detachably supported thereon above its surface, substantially as and for the purpose specified.

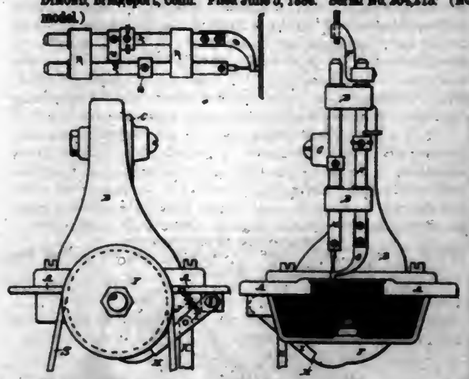
4. In a corn-harvester, the combination of the rotating table and the pair of bent standards mounted thereon and having each a horizontal arm, said arms being arranged to intersect above the center of the table and to interlock at the point of intersection, all substantially as and for the purpose specified.

399,989. METALLIC WHEEL. THOMAS HILL, Quincy, Ill. Filed June 12, 1883. Serial No. 278,796. (No model.)



Claim.—As a new article of manufacture, a metal wheel having the hub and the inner ends of the arms or spokes cast integral and the outer ends of the arms or spokes welded to the inner ends, substantially as and for the purpose set forth.

399,990. SEWING-MACHINE. JAMES A. HOUSE and CHARLES H. DIMOND, Bridgeport, Conn. Filed June 5, 1886. Serial No. 204,313. (No model.)



Claim.—1. In a sewing-machine for flossing, the driving-wheel having a stop-shoulder projecting therefrom, in combination with a pawl pivoted to the bed of the sewing-machine, a spring adapted to throw the extremity of said pawl behind said shoulder, whereby the movement of said wheel may be arrested at a predetermined time, and means—as a treadle-and-rod connection—for disengaging said pawl from said shoulder, substantially as shown and set forth.

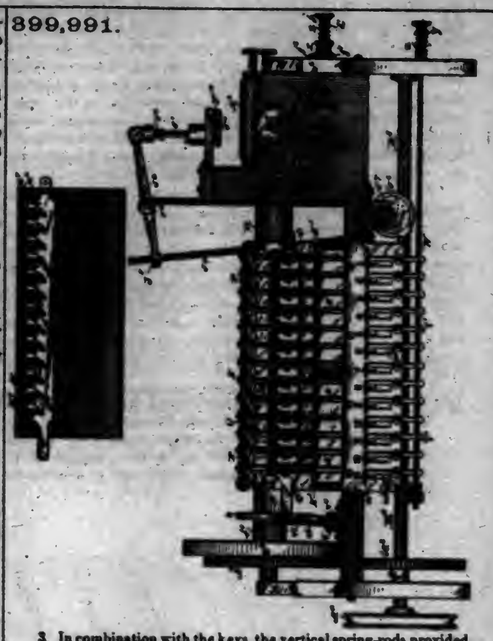
2. The combination, with the main driving-shaft, needle-lever, and needle-bar, of the presser-foot and its bar and an upward extension of said presser-foot bar projecting over the needle-bar and adjustable relatively thereto, substantially as described.

399,991. NUMBERING-MACHINE. JAMES D. HUMPHREY, Towanda, Pa. Filed Apr. 4, 1887. Serial No. 233,667. (No model.)

Claim.—1. In a printing and stamping machine, the combination, with the driving-shaft, of a drive-wheel, a sliding collar, and a type-wheel, all on said shaft, and a sleeve over said shaft, connected at its opposite ends to said collar and type-wheel, the said sliding collar adapted to engage with a hub of the drive-wheel, whereby when the shaft is rotated the said remaining parts will also rotate, substantially as described.

2. In a printing and stamping machine, in combination with a rotating shaft, a sleeve on said shaft, a type-wheel carried by said shaft and provided with a hub to which said sleeve is secured, the sliding collar and its hub on the opposite end of the shaft, to which the sleeve is also secured, the drive-wheel provided with a hub having a conical head, and the spring within said sleeve and around said shaft, whereby the said collar is pressed against the drive-wheel and the said cylinder and type-wheel given a rotary movement, substantially as described.

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3. In combination with the keys, the vertical spring-rods provided with pins, the plate provided with slots through which said pins extend, the toothed bar, the rocking shaft to which said toothed bar is connected, the yoke and its arms carried by said shaft, and the sliding collar, to which is attached the sleeve carrying the pins, whereby the tension of the said sleeve on the driving-wheel is released, substantially as described.

4. In combination with the keys, the vertical rods provided with upper and lower adjustable collars, against which lower collars the said keys bear, the springs on the rods in connection with and between a plate and the upper adjustable collars, and the shouldered levers across the top, whereby the tension of said springs and the force of the keys on said rods and levers can be regulated, substantially as described.

5. In combination with the rotating sleeve provided with the pins arranged spirally, the vertical rods and holding-arms, the plate M, having characters and provided with slots m^2, the keys M', the levers Y', pivoted to plate M and provided with the shouldered and inclined heads, and the horizontal spring-rods W, to which said levers are connected, whereby a key when operated to fix the said sleeve is held at a certain character until released by the pressure of a successive key, or by pressure on the end of the horizontal spring-rod, substantially as described.

6. In combination with the wheel F^2, provided with a number of type and one blank space, a hub, f^2, and a cog, g, and the spindle for turning the same, provided with a cog, h, meshing with cog g, the spring holding device I, consisting of thumb-piece j, spring L, and the plate j' on said spindle, the pointer j^2, and characters printed on the end of the machine around said pointer, corresponding with those on the type-wheel F^2, the said plate j' provided with recesses j^3, corresponding in number with the number of type-spaces in the wheel F^2, and the pin K, projecting from the end of the frame A', whereby the said type-wheel is turned and fixed at the desired character, substantially as described.

7. The independent type-wheels, each provided with a toothed disk, in combination with a shaft on which said wheels and disks are closely mounted, and separate spindles, each provided with a toothed disk to engage with a disk on a type-wheel, whereby each of the type-wheels is separately and independently adjusted, substantially as and for the purpose described.

8. In combination with the adjustable type-wheels, the separate spindles and the toothed disks on the wheels and spindles for adjusting each of said wheels independently of each other, a ratchet on each of said spindles, and a pawl for each ratchet secured to the frame, the teeth of said ratchets corresponding in number to the types in said wheels, whereby on turning a spindle one notch a new number is presented on the type-wheel, substantially as described.

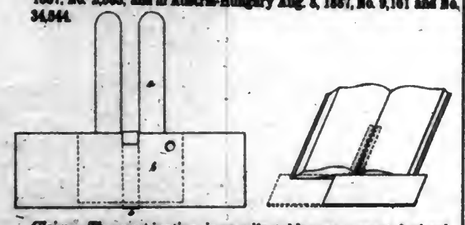
399,992. PROCESS OF MANUFACTURING SING. HENRY A. HERRICK, St. Louis, Mo. Filed Nov. 26, 1888. Serial No. 291,862. (No specimens.)

Claim.—1. The herein-described process of manufacturing zinc, the same consisting in preheating the ore, fuel, and flux separately, as described, then introducing them so heated, together with air, into a reduction-chamber, and therein and at the temperature at which carbonic monoxide reduces zinc oxide combining the ore and carbon monoxide and producing zinc vapor, then conducting the zinc vapor, carbon monoxide—carbonic acid—gaseous current past heated carbon, and reducing the carbonic acid of the current to carbonic monoxide, and then transferring the current to a condenser and liquefying the zinc and discharging the carbonic monoxide.

2. The herein-described process of manufacturing zinc, the same consisting in introducing the zinc ore, fuel, and flux, together with air, into a reduction-chamber, and therein and at the temperature at which carbonic monoxide reduces zinc oxide combining the ore and carbonic monoxide and producing zinc vapor, carbonic monoxide, and carbonic acid, then conducting the zinc vapor, carbonic monoxide—carbonic acid—gaseous current into a separate chamber and into contact with carbon heated, as described, therein, and reducing the carbonic acid of the current to carbonic monoxide, and then transferring the current to a condenser and liquefying the zinc and discharging the carbonic monoxide.

399,993. ADJUSTABLE ARM-SUPPORT FOR BOOK-KEEPERS

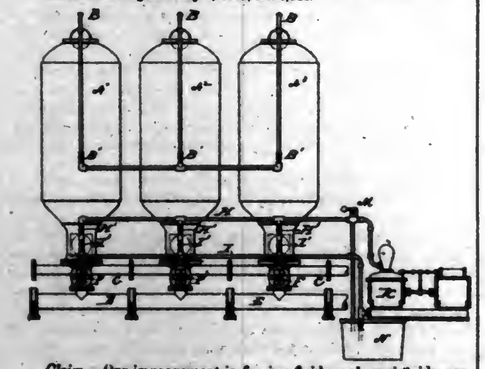
RUDOLPH HERTHNER, Halberstadt, Prussia, Germany. Filed Apr. 2, 1887. Serial No. 233,374. (No model.) Patented in Germany Nov. 16, 1886, No. 39,716; in Belgium Feb. 14, 1887, No. 76,246; in England Feb. 15, 1887, No. 2,333, and in Austria-Hungary Aug. 8, 1887, No. 9,161 and No. 34,844.



Claim.—The combination, in an adjustable arm-support for book-keepers, of the bifurcated plate *a*, the plate *b*, with flange and slot *b'*, adjustable laterally on the plate *a*, the metal hoop *c*, connected with the plate *a*, for the purpose of keeping the plate C, and the screw b^3, to secure plate *b* against the bifurcated plate *a*, substantially as described.

399,994. METHOD OF FORCING FLUIDS AND SEMI-FLUIDS BY MEANS OF COMPRESSED AIR.

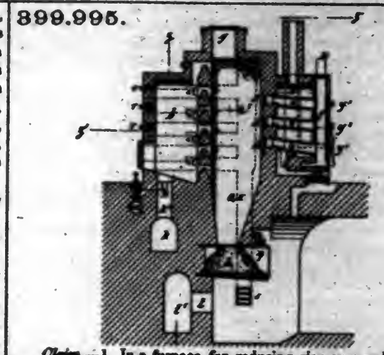
SAMUEL H. JOHNSON and CHRISTOPHER C. HUTCHINSON, West Ham, County of Essex, England. Filed Mar. 8, 1887. Renewed Oct. 22, 1888. Serial No. 288,879. (No model.) Patented in England July 4, 1885, No. 8,141.



Claim.—Our improvement in forcing fluids and semi-fluids, consisting of introducing water under pressure into a vessel containing compressed air, thereby causing the compressed air to pass into another vessel containing the fluid or semi-fluid and to eject the same, this operation being repeated with the same compressed air successively transferred, without being allowed to expand, from the vessel so discharged to another one charged with the material to be ejected, and thus used over and over, so as to avoid the waste of the energy expended in compressing the air, substantially as described.

399,995. FURNACE FOR WORKING ZINC ORES.

LUDWIG KLEMANN, Myslowitz, Prussia, Germany. Filed Dec. 26, 1888. Serial No. 293,756. (No model.) Patented in Germany Apr. 1, 1879, No. 7,411, Sept. 22, 1880, No. 14,497, and Apr. 14, 1885, No. 30,036; in Belgium Nov. 4, 1885, No. 70,726; in England Nov. 3, 1885, No. 13,960, and in France Nov. 4, 1885, No. 173,056.



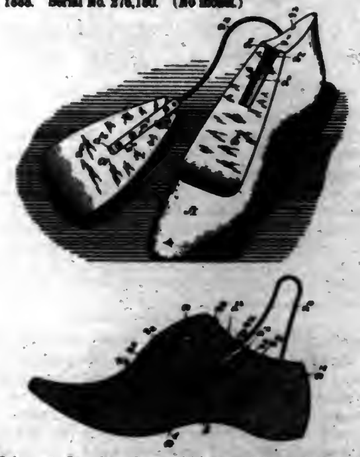
Claim.—1. In a furnace for reducing zinc ores and compounds, the combination of the vertical reduction-chamber *a'*, the combustion-chamber *b*, located at the back of the reduction-chamber and communicating therewith through a vertical row of openings, *c*, the chamber Z, located in front of said reduction-chamber, the vertical row of retorts *e*, supported in the chamber Z and communicating with the reduction-chamber at their inner ends by means of a vertical row of openings, *d*, and at their other ends with a tube, *f*, common to all, said tube *f* communicating at its top with condensing-tubes *f'*, which in turn communicate with the bottom of the chamber Z, substantially as described.

2. In a furnace for reducing zinc ores and compounds, the combination, with a vertical reduction-chamber, *a'*, a combustion-chamber located in the rear thereof and communicating therewith through a vertical row of openings, *c*, and communicating at its bottom with air and gaseous-fuel inlets, a chamber, Z, located in front of the reduction-chamber and having a vertical row of retorts supported therein and communicating with a vertical row of openings in the reduction-chamber, and an air-heating chamber located below and communicating with and closing the lower end of the reduction-chamber, said air-heating chamber being provided with an inlet for introducing air or gas to drive off the residual zinc-vapor, substantially as described.

3. In a furnace for reducing zinc ores and compounds, the combination, with a reduction-chamber, *a'*, a combustion-chamber, *b*, communicating therewith by a vertical row of openings, *c*, and provided with heating-flues *r*, and passages *i*, located in the walls of the reduction-chamber to utilize the surplus gases from the combustion-chamber for heating the reduction-chamber, substantially as described.

399,996. LAST.

JOHN W. LAMPHIER, Lynn, Mass. Filed June 6, 1888. Serial No. 276,180. (No model.)

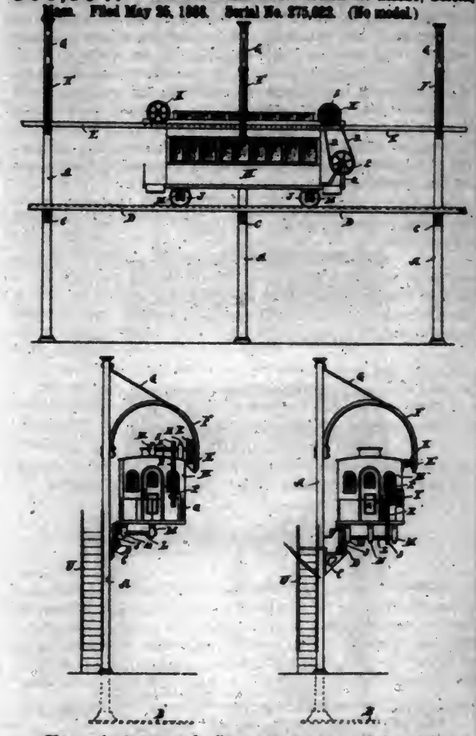


Claim.—1. In a last, the combination of the main part A, having a recess in the upper part of its surface *a'*, extending to the top of the last and having a metal dovetail secured therein, which is provided with the flaring end a^9 and hole a^{14}, with the instep-block *a*, having the metal dovetail tongue a^{11}, the spring latch-plate a^{15}, secured to the tongue and having the pin a^{13} and eye a^{16}, and a cord, a^{17}, preferably fastened to the heel end of the last and extending through the eye and secured to the instep-block, substantially as described.

2. In a last, the combination of the main part A, having a dovetail recess open at its upper end, with an instep-block having a tongue to fit the dovetail recess, a latch for locking the instep-block to the main part of the last, a cord connected with the instep-block and with the latch, and another cord extending from the side of the instep-block to the heel end of the last to fasten the two parts together, substantially as described.

399,997. ELEVATED RAILWAY.

HORACE W. LISSEY, Boston, Mass. Filed May 25, 1888. Serial No. 275,022. (No model.)

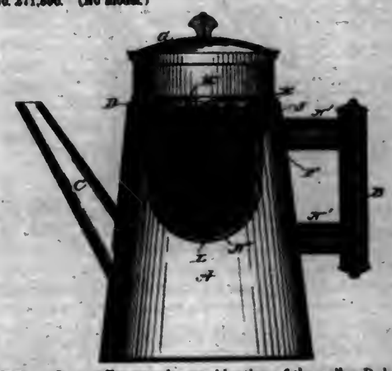


Claim.—1. An elevated railway and support consisting of the columns A, arch F, brace G, bracket C, and rails D E, substantially as shown and described.

2. In an elevated railway, a car provided on one side with wheels below the car and on the other side with wheels at the top of the car, in combination with a track or way consisting of a lower and an upper rail, both supported from a single row of columns, substantially as set forth.

399,998. COFFEE-POT.

MOSES B. LORACH, Denver, Colo., assignor of one-half to H. N. Palmer, same place. Filed Apr. 26, 1888. Serial No. 271,896. (No model.)



Claim.—In a coffee-pot, the combination of the collar D, having the inward-projecting flange F formed on its lower end, the concaved plate H, having the opening K and wire loops L, the outward-projecting flange J, adapted to engage the flange F, and the filter-cloth N, arranged beneath the loops L and secured between the flanges F and J, substantially as described.

399,999. INSECTICIDE COMPOSITION.

THOMAS MANARAN, New York, N. Y. Filed Jan. 19, 1889. Serial No. 296,881. (No specimens.)

Claim.—A composition for treating paper and other fabrics, which consists of naphthaline, glycerine, and essence of mirbane, about in the proportions hereinbefore set forth.

400,000. METHOD OF MAKING TYPE.

MORTIMER G. MERRITT, Springfield, Mass., assignor, by mesne assignments, to the Farmers Loan and Trust Company, trustee, New York, N. Y. Filed Mar. 24, 1887. Serial No. 232,289. (No model.)



Claim.—The method of making type, which consists in arranging a tapering type-blank in front of a die provided with a sunken character and by pressure or a blow breaking down the blank and causing it to conform to the character in the die, substantially as set forth.

400,001. DIE FOR TRIMMING TYPE.

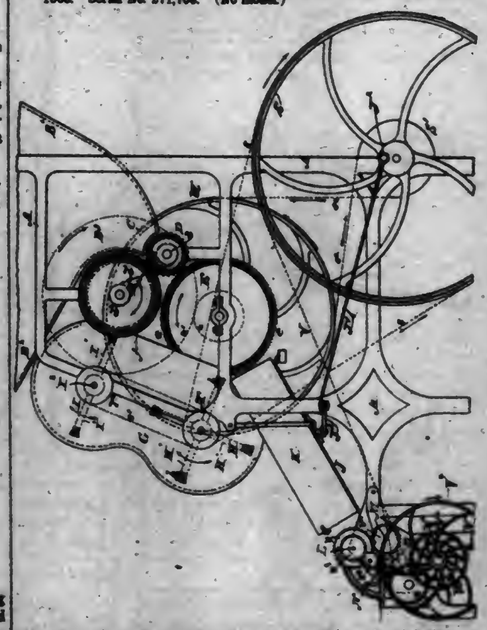
MORTIMER G. MERRITT, Springfield, Mass., assignor to the Yost Writing Machine Company, New York, N. Y. Filed Sept. 10, 1887. Serial No. 249,266. (No model.)



Claim.—As a means for removing surplus metal from type, the combination of a die provided with an opening to receive the shank of a type and a die provided with an opening to receive the bed and face of a type, the said dies being thus adapted to be brought together and enabled to shear or cut off the surplus metal of the type, substantially as set forth.

400,002. MACHINE FOR OPENING, CLEANING, AND GINNING SEED-COTTON.

JOHN R. MONTAGUE, Auburn, N. Y., assignor to the Montague Roller Cotton Gin Company, Toledo, Ohio. Filed Apr. 24, 1888. Serial No. 271,708. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the hopper having a discharge-opening, the toothed rollers having a differential speed, means for imparting to said rollers their respective speeds, the feed-roller interposed between the toothed roll-

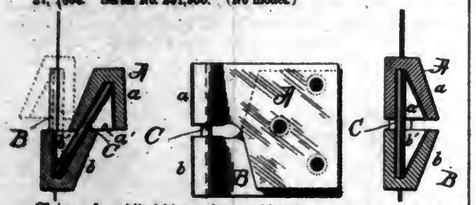
ers and the discharge-opening of the hopper, and means for driving the feed-roller.

2. The combination, substantially as hereinbefore set forth, of the hopper having a discharge-opening, the lower toothed roller, the upper toothed roller of smaller diameter than the lower roller, means for driving the rollers, the feed-roller interposed between the toothed rollers and the discharge-opening of the hopper, means for driving the feed-roller, the beaters for clearing the toothed rollers, and means for actuating them.

3. The combination, substantially as hereinbefore set forth, of the flattening-rolls, means for actuating them, the ginning-rolls, means for actuating them, the feed-roller having radially-reciprocating ribs to grasp and retard the seed-cotton and insure its regular delivery to the ginning-rolls, means for driving the roll and actuating the ribs, and the separating-block between the feed-roller and the lower flattening-roll.

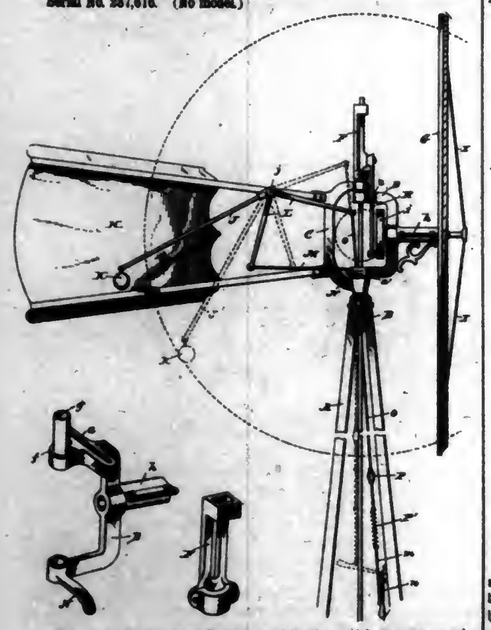
4. The combination, substantially as hereinbefore set forth, of the ginning-rolls, means for driving them, the flattening-rolls, means for driving them, the feeding and retarding roll interposed between the ginning-rolls and the flattening-rolls, means for driving the feeding and retarding roll, and a table over which the cotton is carried by the feed-roll.

400,003. HINGE. RICHMOND E. HOLLEY, Atlanta, Ga. Filed Nov. 27, 1888. Serial No. 291,965. (No model.)



Claim.—In a blind-hinge, the combination, with the pin C, of the hinge-leaves A B, provided, respectively, with knuckles *a b*, having the oblong tapering recesses *a' b'*, wherein said pin is seated, one side of said recess being parallel to the axis of the hinge and the opposite side oblique thereto, whereby when the blind is open the pin will lean over to the sides of the recess oblique to the axis of revolution of the hinge, as and for the purpose specified.

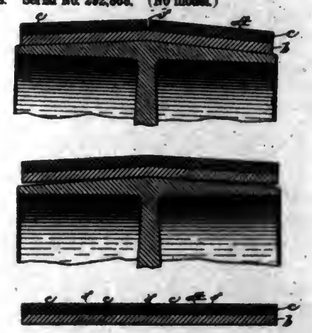
400,004. WINDMILL. CHARLES R. OLDS, Fairbury, Nebr., assignor of one-half to Hugh R. McEwen, same place. Filed Oct. 9, 1888. Serial No. 287,616. (No model.)



Claim.—1. In a windmill, the combination, with the tower, the wheel, its casting, and the tail-vane, of the lever J, pivoted on the tail-vane and carrying at its free end the weight K, the bell-crank lever L, pivoted on the pivot of the lever J on the tail-vane, the rod M, connected at one end to the wheel-casting and at the other to one end of one of the arms of the bell-crank lever, the lever *n*, pivoted to the tower, the rod O, connected at one end to the other arm of said bell-crank lever, the spring *p'*, connected to the other end of the rod O, and the arm *m*, connecting the other end of the spring with the lever *n*, substantially as shown and described.

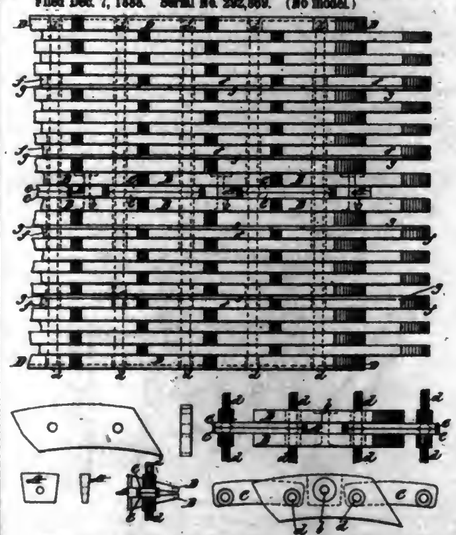
2. In a windmill, the combination, with the tower, the wheel, its casting, and the tail-vane, of the lever J, pivoted on the tail-vane and carrying at its free end a weight, K, the bell-crank lever L, pivoted on the pivot of the lever J rigid with said lever, the rod M, connected at one end to the wheel-casting and at the other to one of the arms of the bell-crank lever, the lever *n*, pivoted on the tower, the rod O, connected at one end to the other arm of said bell-crank lever, formed of two parts connected by the turn-buckle P, the spring *p'*, connected to the other end of the rod O, and the arm *m*, connecting the other end of the spring with the lever *n* near its pivot, substantially as and for the purpose specified.

400,005. BELTING. GEORGE F. PAGE, Concord, N. H. Filed Dec. 7, 1888. Serial No. 292,868. (No model.)



Claim.—A driving-belt composed of a layer or thickness of leather or suitably-prepared rawhide, consisting of a single strip forming the inner or wearing surface or portion, combined with an outer layer or thickness, consisting of two or more independent longitudinal strips of fabric separated from each other on a line or lines parallel with the edges of the belt, substantially as and for the purpose described.

400,006. MACHINE-BELTING. GEORGE F. PAGE, Concord, N. H. Filed Dec. 7, 1888. Serial No. 292,869. (No model.)



Claim.—1. In a leather-link driving-belt, the combination, with a series of links connected together by transverse bolts extending from the outer edges of the belt to its center, of the herein-described flexible or hinge joint composed of links B B, secured together near the center in pairs by bolts or rivets, substantially in the manner and for the purpose set forth.

2. In a link belt, the double washers C, composed of metal or other suitable material, and placed upon the heads of the transverse bolts along the line of the hinge or flexible joint and between the links B B, secured together by the central rivet, *b*, substantially as described.

3. In a link belt, the combination, with the leather links and their transverse connecting-bolts *d*, of the double metal washers *c*, placed over the ends of said bolts upon the outer edges of the belt, substantially in the manner and for the purpose set forth.

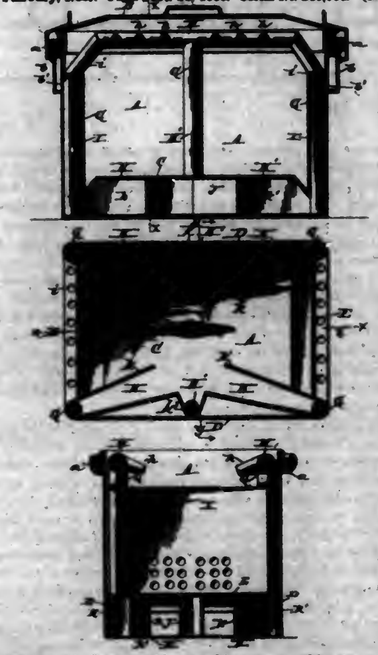
4. In a link belt, the combination, with the leather links and their transverse connecting-bolts, of the equalizing-links *f*, composed of leather or other suitable material, having inserted upon one side a piece, *g*, of metal or other suitable material, said equalizing-links being placed upon the bolts *d* in the main body of the belt, substantially in the manner and for the purpose set forth.

5. A driving-belt composed of links of leather or other suitable material of substantially rhomboidal shape, connected together by transverse bolts, in combination with a hinge or flexible joint, substantially as described, the double washers C, arranged along the line of the hinge-joint, the double washers *c*, placed over the ends of the bolts at the outer edges of the belt, and the equalizing-links *f*, inserted within the body of the belt, all constructed and operating substantially in the manner and for the purpose set forth.

6. In a link belt, the combination, with the usual links of leather or other suitable material connected together by transverse bolts, of links narrower than the thickness of the belt and V shape in form, inserted longitudinally between the outer edges of the belt, substantially as described.

7. In a link belt, the combination, with the usual links of leather or other suitable material, connected together by transverse bolts, of equalizing-links narrower than the thickness of the belt inserted longitudinally between the outside edges of the belt, substantially as described.

400,007. WASH-BOILER. CHARLES R. POOR and GEORGE MARTIN, Fairbury, Nebr. Filed Sept. 21, 1888. Serial No. 285,902. (No model.)

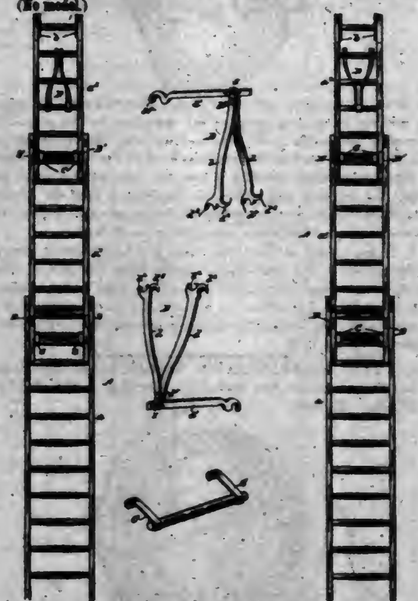


Claim.—1. In a washing-machine, the combination, with the vessel, of the false bottom having corner and intermediate side elevating-pipes, G and K', respectively, the horizontal pipes H H, one on each side of the vessel and having a series of downwardly-inclined discharge-nozzles, *h h*, the partitions *k* and *k'*, arranged to form the converging ducts K for the corner pipes G, the partitions k^2, uniting the opposing ends of the partitions *k'* and forming ducts for the intermediate pipes G, and the divider J, substantially as and for the purpose described.

2. In a washing-machine, the combination, with the false bottom having elevating-pipes and having side and end walls, of the partitions *k* and *k'*, arranged to form converging ducts for the end or corner elevating-pipes, the partitions k^2, uniting the opposing ends of the partitions *k'* and forming ducts for the intermediate elevating-pipes, and the divider J, substantially as described, for the purposes specified.

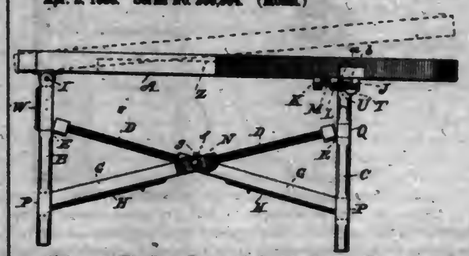
3. The combination, in a washing-machine, with the false bottom having elevating-pipes and the horizontal discharge-pipes, of the end partitions arranged between the end pipes and having perforations near their lower ends and having ledges at their upper ends, which ledges are perforated, substantially as described, for the purposes specified.

400,008. EXTENSION-LADDER AND SCAFFOLD ATTACHMENT. IRA H. RAGOZ, Wadsworth, Ohio. Filed May 9, 1888. Serial No. 273,298. (No model.)



Claim.—The combination, with an extensible ladder, of the bracket herein described, having the two divergent arms provided with outer double-hooked ends and apertures at their inner ends, the single arm having an outer hooked end and a series of apertures at its inner end, and the bolt passed through coincident apertures of the series thereof in said arms, substantially as shown and described.

400,009. IRONING-TABLE. ANDREW RIEBEN, Chicago, Ill. Filed Apr. 2, 1888. Serial No. 269,264. (Model.)



Claim.—1. The legs B, provided with the box W and cross-bar P, and the legs C, provided with the cross-bars Q and P, in combination with the small braces D, hinged to the box W and cross-bar Q, and the large hollow braces G, each of which is provided with a rod, H, each of said bars P being provided with a notch to receive the end of a hollow brace, and a staple for the reception and retention of a rod, H, substantially as and for the purpose set forth.

2. The recessed table-top A, provided with the cleats K J, the latter provided with the recess *b*, in combination with the spring-pressed bar L, the legs C, connected by the bars P Q U, the latter provided with the lip *a*, the braces D and G, the braces G having rods H, and the legs B, having box W and cross-bar P, the cross-bar P on each set of legs having a staple, R, substantially as and for the purpose specified.

400,010. PROCESS OF CONVERTING CRUDE IRON INTO MALLEABLE IRON OR STEEL. GUSTAVE L. ROBERT, Stenay, France, assignor to John Wesley Bookwalter, Springfield, Ohio. Filed Nov. 19, 1888. Serial No. 291,128. (No model.)

Claim.—1. The within-described improvement in the conversion of crude iron into malleable iron or steel, consisting in applying a

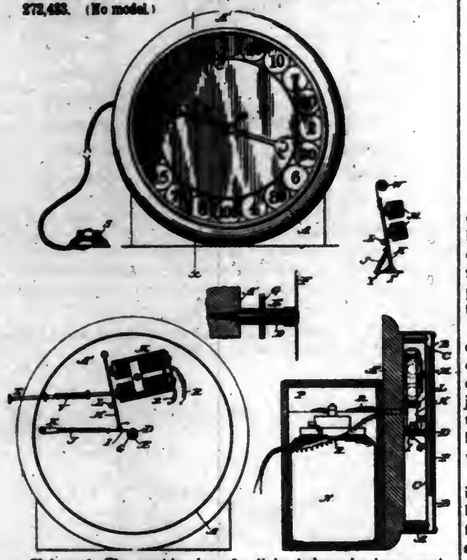
400,010.



blast of air to the surface portion of a body of molten metal at a maximum pressure at the beginning of the operation for the purpose of overcoming the inertia of the metal and imparting thereto the proper speed of gyratory motion, lowering the level of the blast as the process continues without carrying it into the body of the metal, and varying the pressure and volume of the blast to meet the requirements of the reduction in the combustible elements of the iron and the increased fluidity of the metal, substantially as set forth.

2. In the process of converting crude iron into malleable iron or steel by the action of a blast applied locally upon the surface of the mass of molten metal, varying the level of the blast and the volume and pressure thereof in proportion as the metal increases in speed of gyration and fluidity and as the combustible elements are eliminated, substantially as set forth.

400,011. GAME APPARATUS. THOMAS B. ROGERS, Brooklyn, and SAMUEL H. BARTLETT, New York, N. Y. Filed May 1, 1888. Serial No. 272,483. (No model.)



Claim.—1. The combination of a dial, a balanced pointer revolving over its face, a ratchet-wheel carried by the pointer, an electro-magnet, a swinging lever serving as the armature for the electro-magnet, a pawl pivoted to the free end of the lever in position to strike the ratchet tangentially in the movement of the lever, a battery included with the magnet in an electric circuit, and a switch device for opening and closing said circuit, all substantially in the manner and for the purpose herein set forth.

2. The combination, with the ratchet-wheel G, the swinging lever H, the pawl I, pivoted to said lever in position to be swung by the lever tangentially against the teeth of the ratchet, and the retracting-spring J, attached to the outer end of said pivoted oscillating pawl of a pivoted arm, K, to which the opposite end of the spring is attached for adjustment, substantially in the manner and for the purpose herein set forth.

400,012. TRUCK. BENNET SHANER, Huntington, Ind. Filed Sept. 6, 1888. Serial No. 284,739. (No model.)

Claim.—1. The combination, with the sides and the upright H, of the screw L, having its end secured, and a pawl and ratchet secured to its opposite end, and a plate secured to said upright, through which said screw passes, substantially as described.

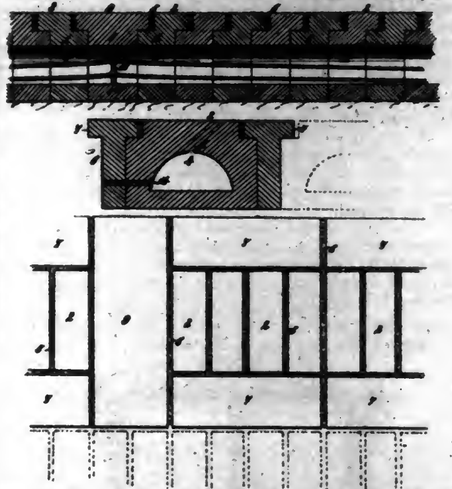
2. The combination of the sides A, having ends B and rollers C,

400,012.



the rollers F, the uprights G and H, and the screw L, having a pawl and ratchet secured thereon for turning the same, whereby one of the uprights is moved, substantially as described.

400,013. PAVEMENT OR ROADWAY. HENRY STEINBERG, Washington, D. C. Filed Nov. 20, 1888. Serial No. 291,402. (No model.)



Claim.—1. A pavement composed of a series of rectangular conduit-blocks, each provided with an opening and having an overhanging surface plate or block resting partly upon the adjacent block, in combination with rectangular end blocks having double-flanged surface-plates resting upon the exposed ends of the two adjacent and parallel series of blocks, said end blocks presenting their longer faces to the butts or ends of the conduit-blocks, substantially as described.

2. A pavement or road-bed formed of a series of rectangular conduit-blocks having openings and each provided with a surface plate or block formed on and projecting beyond a portion of the top of the conduit block, a series of end blocks having their surface-plates projecting on both sides of the same and overlying the adjacent ends of two parallel series of conduit-blocks, an interstitial space being left between the adjacent edges of the several surface-plates and packed with a suitable filling, substantially as described.

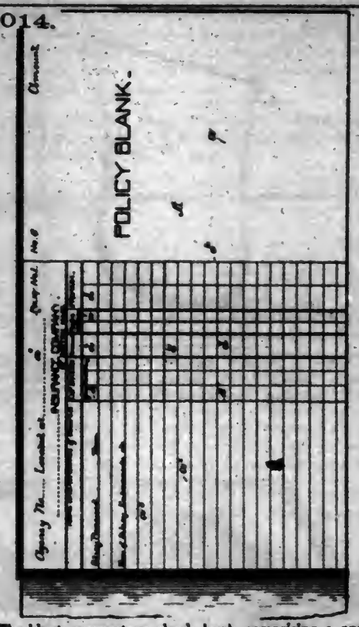
3. In a pavement composed of a series of rectangular blocks having openings forming a conduit, a removable section consisting of a block formed in two parts united by dowels, one of which is separable from the other, said block having a surface-plate projecting upon all sides and resting upon the adjacent blocks, substantially as described.

4. In a pavement, the combination, with two or more parallel series of rectangular conduit-blocks having suitable openings and each provided with a surface plate or block rising from and projecting beyond a part of the top of the conduit-block, of a series of end blocks placed lengthwise between the parallel series, said blocks having surface-plates projecting beyond their longer parallel faces and resting upon the ends of the conduit-blocks in two adjacent series, and removable sections consisting of bottom plates having dowels and body portions having surface-plates projecting on all sides, said blocks being of a size to lie flush with the outer surfaces of the end plates inclosing the conduit-blocks, and an interstitial space being left between the adjacent edges of the surface-plates and filled with a suitable material, substantially as described.

400,014. ACCOUNT-BOOK. REWARD G. STEVENS, Clinton, Mass. Filed Oct. 1, 1888. Serial No. 286,851. (No model.)

Claim.—1. An account or check book comprising a number of sheets or leaves, each of which sheets or leaves comprises the section *a*, which is a blank form or blank paper, and which is detachable from the remainder of the sheet or leaf, and the sections a^1, each of which varies in length from the top of the page downward and in regular order from the first to the last, as and for the purposes described.

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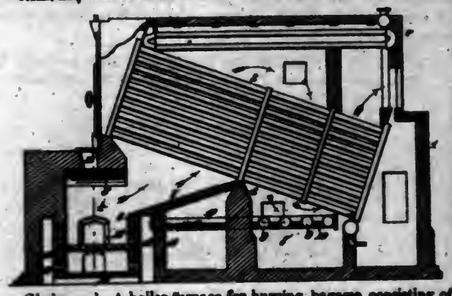
2. The blank account or check book comprising a number of leaves or sheets, each of which has the detachable section *a*, and the removable section a^2, and the section a^1, each sheet of the removable section a^2 varying in size and regularly from the first to the last sheet or leaf, substantially as and for the purposes specified.

400,015. LUMBER-RACK. GABRIEL STRECK, Oshkosh, Wis. Filed Oct. 22, 1888. Serial No. 288,771. (No model.)



Claim.—A removable lumber-rack adapted to be placed on a truck or wagon, consisting of a frame, transverse rollers, one of said rollers projecting above the other to support the load and provided with a crank, D, on the end to rotate it, a detent to normally lock the crank, and an adjustable chain and binding-lever to lock the load on the rack, substantially as and for the purpose described.

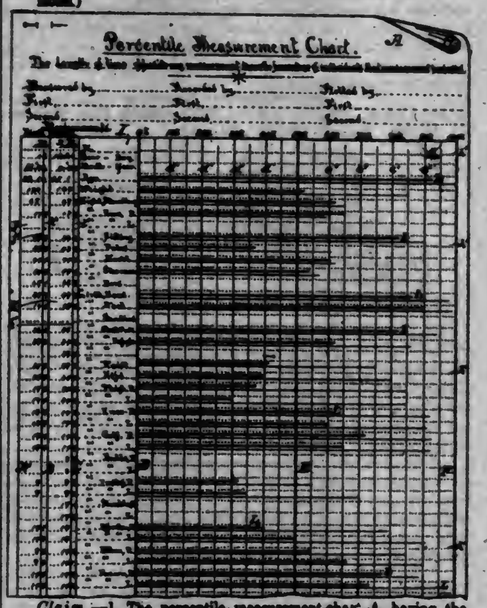
400,016. BAGASSE-FURNACE. WILLIAM W. SUTCLIFFE, New Orleans, La., Filed Dec. 31, 1888. Serial No. 295,053. (No model.)



Claim.—1. A boiler-furnace for burning bagasse, consisting of the combustion-chamber having a reverberatory arch and extending longitudinally from the front wall of the furnace, the air-blast chambers located, respectively, at the front and rear of the combustion-chamber, communicating by a connecting-passage and provided with tuyere-openings located above and below the fire-grate, a bridge-wall supporting the boiler, a refractory fire-bed inclined from above the rear air-blast chambers to the bridge-wall, an air-heater, and an air-forcer for forcing air through the heater into one of the air-blast chambers, substantially as described.

2. In a bagasse-furnace, the combination, with a combustion-chamber having front and rear air-chambers provided with tuyeres entering the fire-box above and below the grate, said air-chambers connected by a passage beneath the combustion-chamber, of a tube entering one of said air-chambers, passing through the bridge-wall and into a return-heat chamber behind the bridge-wall, manifold pipes connected at one end with said tube and at the other end with an air-pipe, and a blower supplying said air-pipe, substantially as described.

400,017. PERCENTILE MEASUREMENT-CHART. PRESCOTT SWAIN, Indianapolis, Ind. Filed Apr. 26, 1888. Serial No. 271,891. (No model.)



Claim.—1. The percentile-measurement-chart A, having the columns J K, for recording the measurements, and the spaces for indicating by per cent. the relative magnitude of the measurements, with a column of names of the parts measured printed between them, substantially as shown and described.

2. The percentile measurement-chart A, having the two measurement-columns J K, the title-column I, or column in which the names of the parts measured are printed, and per-cent. spaces and lines, with per-cent.-indicating marks or figures at their upper ends, in combination with the horizontal lines L, to indicate the magnitude of the measurements drawn from column I to a space or a line in the body of the chart indicating the per cent. equaled or surpassed by said measurement, substantially as shown and described.

3. The percentile measurement-chart A, having three vertical lines, D E F, thereon, representing the minimum, maximum, and average or mean per cents., as described, with the per-cent. spaces between them, subdivided so that the intermediate per-cent. spaces and lines are equidistant and proportional throughout, substantially as shown and specified.

4. In a percentile measurement-chart, A, having suitable measurement-recording columns, J K, a column representing the names of the measurements, and a series of lines and spaces marked with per-cent. figures to designate the magnitude of the measurements, in combination with a line or lines, L, drawn from and in a line with the different measurements to a line or space in the chart representing the per cent. that measurement equals or surpasses, substantially as shown and described.

5. The percentile measurement-chart A, having the numbers representing the measurements which occur in the percentile table printed in the body of the chart between the lines D F in the per-cent. spaces, or upon the lines representing the per cents., substantially as shown and specified.

6. A percentile measurement-chart consisting of the printed sheet A, having the two measurement-columns J K, divided to form the decimal-column I', the title-column I, or column in which the names of the parts are printed, the vertical per-cent. lines D E F, and the subdividing lines d' d' at the left and right of the meridian or typical line E, and horizontal lines L, extending from the column I in a line with the names of the parts therein to any per-cent. line or space between per-cent. lines in the body of the chart, substantially as and for the purpose set forth.

7. A percentile measurement-chart, A, having a suitable title thereon, and having the two vertical columns J K divided by the decimal-lines j' k', in which to record the measurements, the column I, having the number, date, age, weight, height, and names representing the kinds of measurements and the different parts of the body measured therein, the heavy vertical per-cent. lines D E F, representing the minimum, the medium or typical, and the maximum per cents., respectively, and the subdividing per-cent. lines d' d' and the per-cent. marks thereon, substantially as shown, and for the purpose set forth.

8. The chart A, having a suitable title and heading, as shown, and ruled or printed to form the two vertical measurement-columns J K, the descriptive or name column I, and per-cent. lines D E F d' d', with the per-cent. figures thereon, the horizontal bisecting lines h', and the horizontal measurement-lines L thereon, substantially as shown, and for the purpose described.

400,018. BUCKLE. SALLIE C. TUCKER, Garnett, Kans. Filed Feb. 17, 1888. Serial No. 264,345. (No model.)

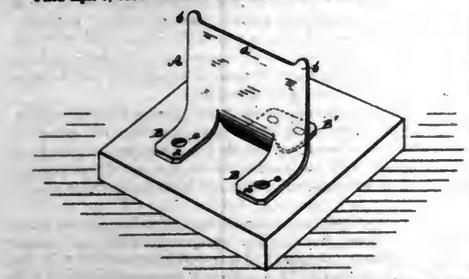


Claim.—1. The combination, with a buckle having passages crossing each other at right angles, an inclined penetrating-point projecting across one passage from the outer wall thereof, and a pivoted tongue for the other passage having a serrated cross-bar at its free end, of the two crossing measuring-tapes passing through said passages one tape being engaged by the penetrating-point and the other by the serrated cross-bar, substantially as set forth.

2. The herein-described buckle, comprising two parallel end loops, one of which loops has an inwardly-projecting penetrating-point, the horizontal connecting-loop connecting the end loops, the cross-bar connecting said end loops below the horizontal loop, and the tongue pivoted on the said cross-bar and extending up to the horizontal loop, substantially as set forth.

3. The herein-described buckle, consisting in the vertical end loops, 40 40, the cross-bar 42, connecting the outer sides of said loops at or near their lower ends, the horizontal loop 44, connecting the outer sides of the loops above said cross-bar and having one of its bars extended to form the penetrating-point 41, and the ⌐-shape tongue 43, pivoted on cross-bar 42, extending up to said loop 44, substantially as set forth.

400,019. FOOT-SCRAPER. WILLIAM H. TYLER, Devil City, Nebr. Filed Apr. 9, 1888. Serial No. 270,069. (No model.)



Claim.—As an improved article of manufacture, a foot-scraper consisting of a sheet-metal plate, A, having the scraping-edge a, the rounded ears b b at the ends of the said edge, and the opposing projecting and apertured feet B B', formed from the body of the plate, as set forth.

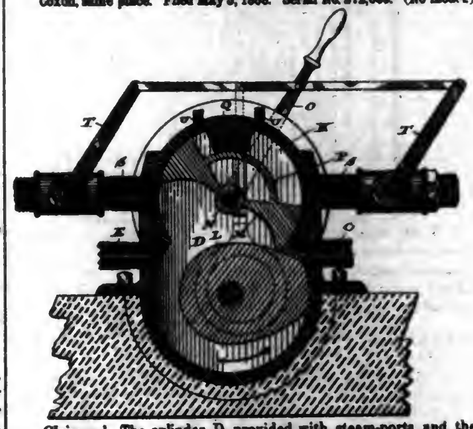
400,020. SELF-CLOSING TOBACCO-BAG. CHARLES W. VAN ALSTINE, Newton, Mass. Filed Aug. 28, 1888. Serial No. 283,967. (No model.)

Claim.—1. A bag provided with a spring, consisting of coil B arms C, and terminal hooks for said arms, the spring being arranged within the mouth of the bag, for the purpose of closing the same automatically, and the hooks fitting detachably over the edge of said mouth, as set forth.

2. A spring provided with the central coil, B, the arms C, extending upward and outward, and the hooks D, having shoulders d, curved proximate parts d', and outwardly-turned tips d^2, all specially adapted, as described, to hold the mouth of a bag together and allow the convenient attachment and detachment of said spring to and from said bag, for the purposes set forth.



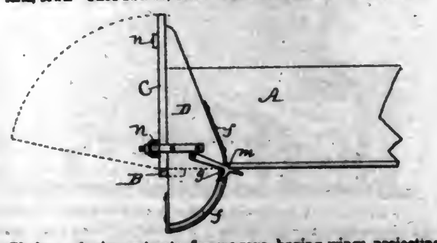
400,021. ROTARY ENGINE. JOHN H. VENABLES and JOSEPH HUGHES, Toronto, Ontario, Canada, assignors of one-third to Samuel Coxon, same place. Filed May 3, 1888. Serial No. 272,669. (No model.)



Claim.—1. The cylinder D, provided with steam-ports, and the cylinder K, connected to and forming part of said cylinder D, substantially as described, and provided with exhaust-ports, and the block Q, combined with the piston L, the two-winged cam fitting the cylinder K, and having a curved connection between the wings fitting under the block Q, and a handle to said cam connected with the valves to said exhaust-ports, substantially as described.

2. A piston, L, carried on the shaft G, within the cylinder D, against the inner surface of which it fits, the steam-ports E, entering the cylinder D immediately opposite to each other, as shown, in combination with the two-winged cam M, fitting the cylinder K and carried on the spindle N, the exhaust-ports S, entering the cylinder K immediately opposite to each other, the curved bridge P, connecting together the two wings of the cam M and fitting against the block Q, and the steam-pipes U, arranged substantially as and for the purpose specified.

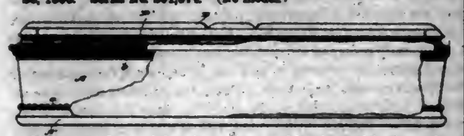
400,022. END-GATE FOR WAGONS. BARNEY A. WALTZ, Valeria, Iowa. Filed Dec. 27, 1888. Serial No. 294,223. (No model.)



Claim.—1. An end-gate for wagons, having wings projecting forward from its ends and circular slots or bearings at the lower ends of the wings, and hooks pivoted to the outside of said wings, in combination with a wagon-box having a cross-piece at its rear end and bottom to support the end-gate, and a rod or sliding bolts attached to its bottom and extended through the curved slots or bearings in the wings of the end-board, to operate substantially as set forth, for the purposes stated.

2. An end-gate, C, having wings D, provided with curved slots or bearings by means of strap-irons f, in combination with a wagon-box, A, having a fixed cross-piece, B, and sliding bolts g, and hooks m, pivoted to the said wings to engage the said bolts, substantially as shown and described, for the purposes stated.

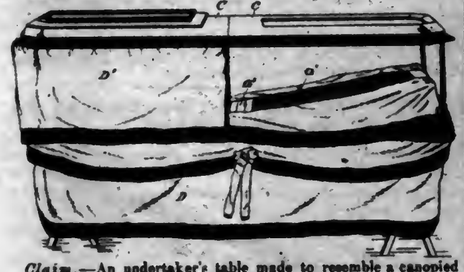
400,023. COFFIN. ADOLPH WERNICKE, Cleveland, Ohio, assignor to the Cleveland Burial Case Company, same place. Filed Nov. 26, 1888. Serial No. 291,874. (No model.)



Claim.—1. In burial-caskets, the combination, with the casket-cover having the usual molding struck along the edges thereof, of a separate molding planted on the edge of such cover, such different moldings being preferably covered with other material than that applied to the casket generally, substantially as set forth.

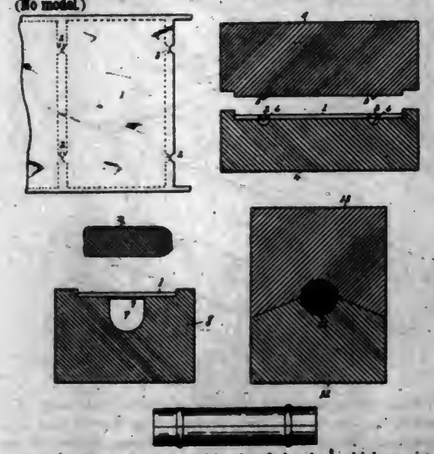
2. The combination, with the body of a burial-casket, having a base-molding of a different molding planted on the casket next above and apparently forming a continuation of such base-molding, such different molding being preferably covered with different material from that applied to the casket generally, substantially as set forth.

400,024. CANOPY-TABLE FOR UNDERTAKERS USE. MICHAEL R. WELSH, Chelsea, Mass. Filed June 21, 1888. Serial No. 277,789. (No model.)



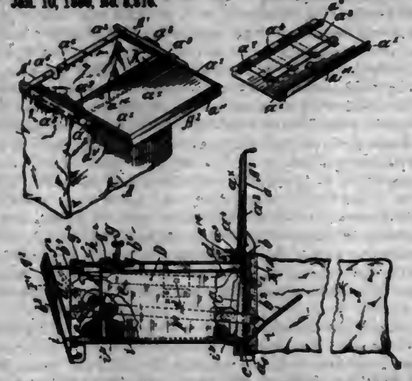
Claim.—An undertaker's table made to resemble a canopied casket and composed of the hinged and movable top plate, one portion of which is provided with a glass and having legs or supports hinged to said top plate, and draperies adapted to be attached to the top plate to form the sides of the casket, substantially as described.

400,025. METHOD OF MAKING BEADED TUBES. SAMUEL R. WILMOT, Bridgeport, Conn., assignor to the Wilmot & Hobbs Manufacturing Company, same place. Filed Jan. 28, 1888. Serial No. 297,754. (No model.)



Claim.—The method of making beaded tubes, which consists in forming blanks having teats at the edges where beads are required in the finished tubes, grooving the blanks across transversely in the line of the teats, and finally rolling the grooved blank about a mandrel and closing the edges firmly together, the grooves forming the beads in the completed tube and the metal of the teats serving to close the joint tightly at the beads.

400,026. MAIL-BOX AND POUCH. WENZEL WLESAK, Gratz, Austria-Hungary, assignor of two-thirds to Hanns Müller and Max Kalz, same place. Filed Nov. 1, 1888. Serial No. 288,703. (No model.) Patented in France Oct. 9, 1888, No. 196,412; in Belgium Oct. 9, 1888, No. 83,881; in Luxemburg Oct. 9, 1888, No. 1,067; in Norway Oct. 9, 1888, No. 1,067; in Italy Nov. 30, 1888, XXII, 24,197, XLVII, 433, and in Spain Jan. 10, 1889, No. 8,816.



Claim.—1. A mail-box comprising an outer case, a hinged lid, and hinged bottom therefor and having a slot, h, in its front wall, a chamber formed in and communicating with the slot h of said case, said chamber being open at bottom only, locking devices for locking the hinged bottom to the case, and intermediate mechanism controlled by said lid operating to lock said locking devices against operation, as and for the purposes specified.

2. A mail-box comprising an outer case, a hinged lid, and hinged bottom therefor and having a slot, h, in its front wall, a chamber formed in said outer case, open at bottom only and communicating with slot h, independent locking devices for locking the lid and bottom to the case, intermediate mechanism operating to lock said locking devices out of operation, and a locking-bar operating to lock the key for the locking devices of the lid against withdrawal, said intermediate mechanism and locking-bar being controlled by the lid, for the purposes specified.

3. A mail-box provided with a hinged lid and bottom and having on its front wall a support for a time-plate, f, in combination with locking mechanism for locking the bottom to the box, and a locking-lever controlled by said locking devices and by the hinged lid, respectively, to unlock said time-plate from or lock it to its support, substantially as and for the purposes specified.

4. A mail-box comprising an outer case, a hinged lid, and hinged bottom therefor and having a slot, h, and a holder for a time-plate, f, in and on its front wall, respectively, a chamber formed in said outer case open at bottom only and communicating with slot h, locking devices for locking the hinged bottom to the case, a locking-lever operating to lock the time-plate to its holder, the movement of said lever in one direction being controlled by the locking devices and in the reverse direction by the hinged lid, and intermediate mechanism controlled by said lid and operating to lock the locking devices against operation, as and for the purposes specified.

5. The combination, with a mail-pouch provided with a rectangular frame at its mouth, a cover arranged to slide in grooves in said frame, and a lock for locking said cover to the frame, of a mail-box having a hinged bottom and provided with a support for the mail-pouch below such bottom, and a key permanently secured to the box and operating to unlock the cover of said pouch when applied to the support therefor, substantially as described.

6. The combination, with a mail-pouch provided with a groove on opposite sides of the open end thereof, a sliding cover to close said open end, and a lock consisting of a plurality of elastic arms, each carrying a locking-pin adapted to engage holes in a transverse bar at the rear of said open end of the pouch, said cover being provided with slots along its rear edge registering with the free end of the elastic arms, of mail-box provided with a hinged bottom, guide-tongues on opposite sides of said bottom adapted to fit into the grooves in the mail-pouch frame, and a key permanently secured to the front edge of the box, the bit of said key consisting of vertical lugs adapted to engage the slots under the elastic arms of the pouch-cover, whereby when said mail-pouch cover is hooked onto the lugs said cover will be automatically unlocked and prevented from sliding under the box with the pouch, substantially as described.

7. The combination, with a mail-box provided with an aperture in its front wall and with outwardly-projecting tongues or flanges at its lower opposite edges, a hinged bottom for said box, and a locking mechanism for locking the bottom to the box, of a mail-pouch pro-

vided with guide-grooves for the reception of said tongues on the mail-box, and a lug or pin adapted to enter the aperture in the front wall of said box, said lug or pin operating upon the locking mechanism to unlock the bottom when said pouch is slid under the box, as described.

8. A mail-pouch having its open end connected to a rectangular rigid frame whose rear transverse bar is provided with holes a^3 and whose lateral bars have interior longitudinal guide-grooves, a cover for said pouch adapted to slide in said grooves and composed of two plates connected to form an intermediate space, and a rearwardly-extending flange, said flange being provided with a plurality of slots and with a perforation in front of each slot, spring-arms arranged between the two plates, the free ends of which arms project over the slots in the flange, and a pin depending from each spring-arm and projecting through the perforations, said pins fitting into the holes in the rear transverse box of the pouch-frame when the cover is pushed in to lock the latter to said frame, in combination with a mail-box provided with a hinged bottom and with tongues adapted to fit the grooves in the pouch-frame, and means for unlocking the pouch-cover arranged at the lower front edge of the box, consisting of vertical lugs equal in number to that of the spring-arms of the pouch-cover, said lugs fitting into the slots of said cover, substantially as and for the purposes specified.

9. A mail box comprising an outer case provided with a hinged lid and bottom, an inner chamber of less dimension, open at bottom only, and independent locking mechanisms for the lid and bottom arranged in the spaces formed between the chamber and outer case, substantially as described, for the purposes specified.

10. A mail-box comprising an outer case provided with a hinged lid and bottom, an inner chamber of less dimension, open at bottom only, independent locking devices for said lid and bottom, and intermediate mechanism controlled by the lid to lock the locking devices for the hinged bottom against operation, said locking devices and intermediate mechanism being arranged in the spaces formed between the inner chamber and outer case, substantially as described, for the purposes specified.

11. The combination, with the hinged bottom of the mail-box, of locking devices comprising an eccentric provided with a peripheral notch, a link connected to the eccentric and bottom, and a locking-lever operating to engage the notch of the eccentric when the hinged bottom is closed, substantially as and for the purposes specified.

12. A mail-box provided with a perforation in and near the lower edge of its front wall and a hinged bottom for said box, in combination with locking devices comprising an eccentric, a link connected to said eccentric and bottom, and a locking-lever one end of which is adapted to engage a peripheral notch in the eccentric when the bottom of the box is closed, the other end of said lever projecting over the perforation in the front wall of the box, whereby said lever may be tripped by the insertion of a pin into said perforation and the bottom of the box unlocked, substantially as described.

13. A mail-box, provided on its front wall with a holder for a time-plate, *f*, and with a hinged bottom, in combination with locking mechanisms for said plate and bottom, comprising an eccentric, a link connected thereto and to the hinged bottom, a locking-lever operating to engage a peripheral notch in said eccentric when the bottom of the box is closed, and a locking-lever having hooked ends, one of said ends projecting over the time-plate when in its holder and the other lying in the path of a pin projecting from the eccentric, whereby when the eccentric is released by its locking-lever and caused to rotate under the weight of the hinged bottom the projecting pin will engage one of the hooked ends of the time-plate-locking lever and tilt the same to unlock said plate, substantially as described.

14. The combination, with a mail-box provided with a hinged lid and bottom, locking devices comprising an eccentric, a link connected thereto and to the hinged bottom, and a spring-actuated lever adapted to engage a peripheral notch in said eccentric when the bottom of the box is closed, of a locking-lever one end of which is arranged to engage the spring-actuated lever and a spring-actuated locking-rod adapted to engage the said locking-lever, the movement of said rod in one direction being controlled by the hinged lid of the box, substantially as and for the purposes specified.

15. The combination, with a mail-box provided with a hinged lid and bottom and with a holder for a time-plate, of locking mechanisms for said hinged bottom and time-plate, consisting of an eccentric connected with the hinged bottom, a spring-actuated lever adapted to engage a peripheral notch in the eccentric when the bottom is closed, and the lever F, having hooked ends f^8 f^{10}, said hooked end f^{10} lying in the path of a pin projecting from the eccentric, and the hook f^9 projecting over the holder for the time-plate, substantially as and for the purposes specified.

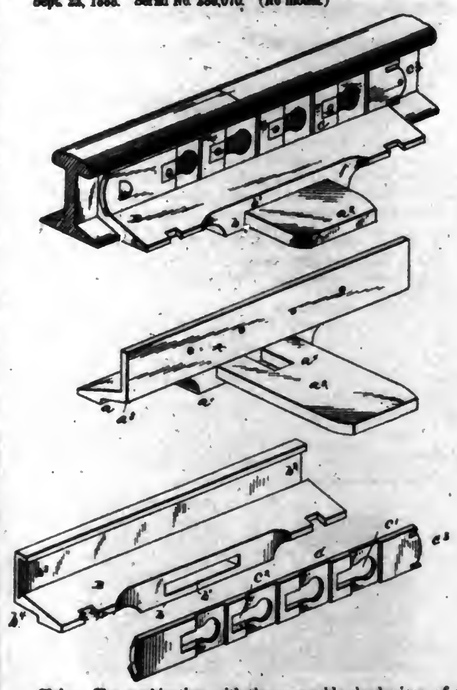
16. The combination, with a mail-box provided with a hinged lid and bottom, a lock for said lid and locking devices for the bottom comprising an eccentric connected with the bottom, and a locking-lever adapted to engage a peripheral notch in the eccentric when the bottom is closed, of the rod b^4 and the spring-actuated locking-bar b^5, connected with said rod, whereby when the lid is unlocked said rod and bar will move upward to lift the lid and lock the key against withdrawal from the lid-lock, substantially as and for the purposes specified.

17. The combination, with a mail-box provided with apertures b^3 in its front wall and with a hinged lid and bottom, and an interior chamber open at bottom only, said chamber being of smaller dimension than the mail-box, to leave space between its front, top, and end walls and the corresponding walls of said box, of locking devices comprising a crank-shaft arranged between the box-lid and top wall of the interior chamber, an eccentric at each end of said shaft, links connecting the eccentrics with the bottom, spring-actuated levers adapted to engage a peripheral notch in the eccentric when the bottom of the box is closed, the lever C, provided with the arms or lugs *c*, projecting through slots at the rear edge of the hinged bottom, and the spring-actuated rod *i*, substantially as and for the purposes specified.

18. The combination, with the mail-box having a perforation, b^3 in its front wall, a hinged lid, a hinged bottom, and tongues b^2 at opposite ends, the eccentric b', connected with said bottom, the locking-lever D, adapted to engage a peripheral notch in said eccentric when the hinged bottom is closed, the foot of said lever projecting in front of the perforation in the front wall of the box, the lever C, provided with an extension, *c*, projecting through slots at the rear edge of the hinged bottom, and the rod *i*, in combination with a mail-pouch having its open end connected to a rigid frame, said frame having guide-grooves in its lateral bars, and pins or lugs a^5 projecting therefrom, substantially as and for the purposes specified.

19. The combination, with a mail-box having a hinged lid and a holder for a time-plate, *f*, on its front wall, of an eccentric provided with a projecting pin, and a locking-lever, F', having hooked ends f^8 f^{10}, pivoted near the lid, said parts being arranged and operating substantially as and for the purposes specified.

400,027. RAIL-CHAIR. ALLEN I. WOLFE, Newbury, Ind. Filed Sept. 22, 1888. Serial No. 286,070. (No model.)

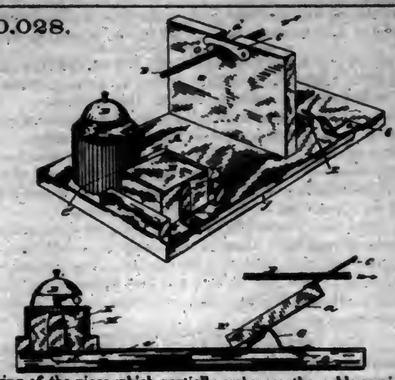


Claim.—The combination, with the removable cheek-piece, of a dovetailed slot cut in one side and designed for the reception of a bar provided with key-hole slots designed to engage the nuts of the bolts for holding the device intact, substantially as described.

400,028. ELECTRIC ALARM-SIGNAL FOR CABLES. WILLIAM H. WOODRING and CLARENCE S. GILBERT, Kansas City, Mo. Filed July 2, 1888. Serial No. 278,009. (No model.)

Claim.—1. In combination, a cable, a swinging piece partially surrounding the cable, a guard pivoted to said swinging piece above said cable, an electric circuit comprising a battery, and an alarm, the swinging of the piece which partially embraces the cable serving to close the circuit, substantially as set forth.

400,028.

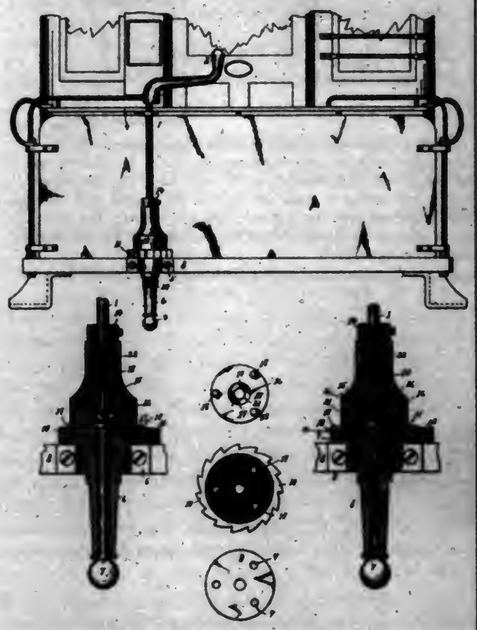


2. In combination, a base, a cable, a drop hinged to the base and partially embracing the cable, a guard pivoted to said drop above the cable, a normally-open circuit comprising a battery and alarm, and contact-pieces engaged one with the drop and one with the base and adapted to be brought into contact by the falling of the drop, substantially as set forth.

3. In combination, a drop constructed to partially surround a cable, and a pivoted guard or finger constructed to rest normally over the cable, the said finger having a bearing against the side of the drop in the direction in which the cable moves when the drop is upright and free to swing on its pivot and release the cable when the drop is tilted, substantially as set forth.

4. In combination, a cable, a base, a drop hinged to the base and provided with a recess to receive the cable, a pivoted guard extending over the cable across the recess, an electric circuit comprising a battery and alarm, a spring contact-piece connected with the base, and a contact-piece connected with the drop, the relative positions of the contact-pieces being such that the tilting of the drop in the direction which the cable runs will throw them into engagement, substantially as set forth.

400,029. CAR-BRAKE. BENTON L. WRIGHT, Bridgeport, Conn., assignor of two-thirds to Samuel A. Burns, same place. Filed Dec. 26, 1888. Serial No. 294,631. (No model.)



Claim.—1. The combination, with a brake-staff having cams, and a winding-drum to which the chain is connected, of a winding-sleeve on said staff, which is adapted to engage the drum and is engaged by the cams, so that when the staff is turned forward the sleeve and drum are carried thereby, and when the staff is turned backward the sleeve is raised and disengaged from the drum.

2. In a car-brake, a staff having cams, a winding-drum loose on said staff, and a winding-sleeve having lugs to engage the winding-drum, and inclines and shoulders engaged by said cams and adapted to engage the drum, whereby when the staff is turned forward the winding-sleeve and cone are turned to set the brake, and when the staff is turned backward the winding-sleeve is raised to release the cone, substantially as described.

3. In combination, a brake-staff having cams, a winding-drum loose upon the staff to which the chain is connected and which is provided with openings in its upper side, and a winding-sleeve having inclines and shoulders engaged by the cams, and lugs adapted to engage the openings in the drum, whereby when the staff is turned forward the winding sleeve and drum are carried thereby, and when turned backward the winding-sleeve is raised, as and for the purpose set forth.

4. In combination, a brake-staff having cams, substantially as shown, a winding-drum loose upon the staff to which the chain is connected, and which is provided with openings in its upper side, a ratchet having openings adapted to register therewith in one position only, a winding-sleeve having inclines and shoulders adapted to be engaged by the cams, and lugs engaging the openings in the ratchet, and adapted to engage the openings in the drum, whereby when the staff is turned forward the winding-sleeve, ratchet, and drum are carried thereby, and when the staff is turned backward the winding-sleeve is raised and the lugs are disengaged from the drum, leaving the latter free to be turned backward by the tension of the chain.

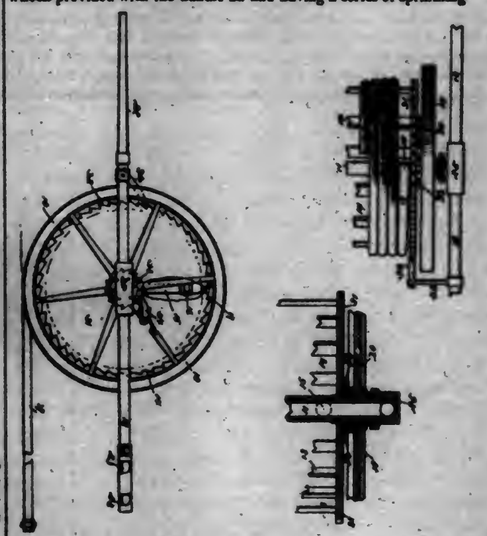
5. In combination, a brake-staff having cams, substantially as shown, a winding-drum loose upon the staff to which the chain is connected and which is provided with openings in its upper side, a ratchet having openings adapted to register therewith in one position only, a winding-sleeve having inclines and shoulders adapted to be engaged by the cams, lugs engaging the openings in the ratchet and adapted to engage the openings in the drum, and a spring acting to hold said lugs in engagement with said openings, as and for the purpose set forth.

6. The combination, with a brake-staff having cams, a winding-drum loose on said staff and having openings 9, and a ratchet having openings 19, of a housing, substantially as shown, a winding-sleeve within said housing having inclines and shoulders adapted to be engaged by said cams, lugs engaging openings 19 and 9, and a spring bearing against the upper end of the housing and the winding-sleeve, as and for the purpose set forth.

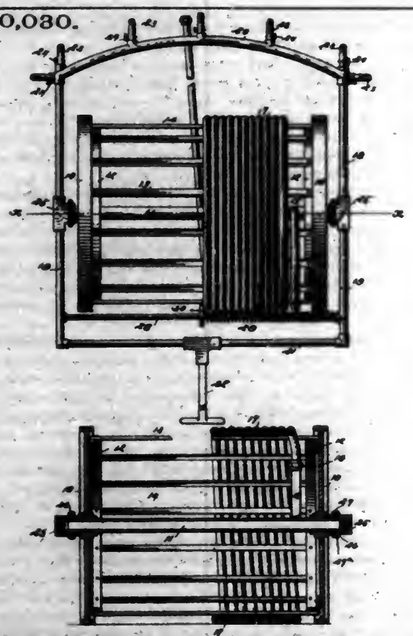
7. A base-plate, a winding-drum journaled thereon and having a flange resting thereon and provided with openings in its upper side, a ratchet having a recess in its under side to receive said flange, and openings 19, in combination with the brake-staff passing through said drum and ratchet, cams upon said staff, a winding-sleeve having lugs to engage the winding-drum, inclines and shoulders engaged by said cams, and a foot-dog adapted to engage the ratchet.

400,030. COMBINED REEL AND SPRINKLER. RICHARD WYLIE, Napa, Cal. Filed Sept. 27, 1888. Serial No. 286,543. (No model.)

Claim.—1. The combination of the tubular frame mounted on wheels provided with the handle 22 and having a series of sprinkling-



400,030.



sozzles, 23, secured upon its front end, the tubular axle having a tubular connection with the sides of said frame, a reel mounted on the axle, and a hose adapted to be wound on the reel and connecting with the axle, as shown and described, whereby when the machine is pushed or drawn along the passage of water through the axle and frame may be maintained, as specified.

2. The combination of the tubular frame having sozzles at its front end, a tubular axle journaled in said frame and communicating with it, wheels applied to the axle, the reel mounted on the latter, a hose connecting with the axle, a ratchet affixed to the reel, and a pawl pivoted on the frame, and a second ratchet and pawl attached to the wheel hub and reel, respectively, and arranged as shown, whereby when said frame is oscillated vertically the reel is revolved independently of the wheels and the hose thereby wound on the reel, as shown and described.

3. The combination, with a tubular frame, a tubular axle journaled in said frame, wheels mounted upon said axle, and a reel secured to said wheels, of a hose attached to the axle and wound upon the reel, a spring-actuated sliding collar engaging the inner coil of the hose, and sprinkling-tubes attached to the said frame, substantially as shown and described.

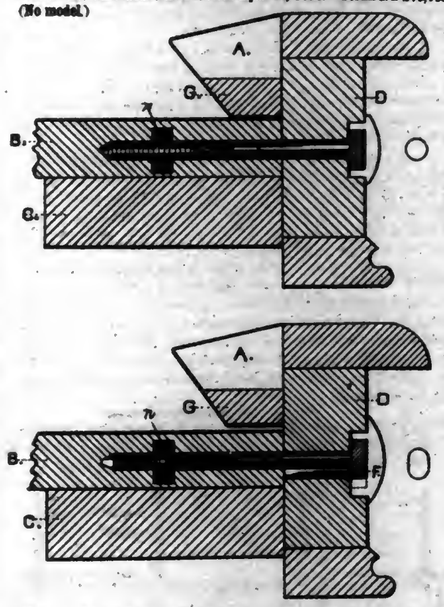
4. The combination, with a tubular frame, an axle journaled in said frame and connected therewith, and a reel mounted upon the said axle, of a hose coiled upon the reel and connected with the axle, a transverse bar at one side of the reel, a spring-actuated collar sliding upon said bar and engaging the inner coil of the hose, sprinkling-tubes connected with the frame, and a valve located in said tubes, all combined to operate substantially as and for the purpose specified.

400,031. METHOD OF MOUNTING AND PRESERVING PHOTOGRAPHIC PROOFS AND COPIES. DANIEL K. ZUHWALT, Visalia, Cal. Filed Sept. 13, 1887. Serial No. 249,606. (No specimens.)

Claim.—1. The herein-described improvement in the art of mounting photographic proofs or prints of deeds or other subjects, which consists in placing and permanently uniting two of the same back to back by means of gum or other cement, substantially as set forth, whereby the tendency of the printed sheets to cockle or curl inward toward the albuminized or printed sides is neutralized.

2. The herein-described improvement in the art of mounting and preserving photographic copies of manuscript or printed deeds and other documents, which consists in first placing and permanently uniting two of said copies back to back, and then collecting and binding a number of the same into book form, substantially as and for the purpose specified.

400,032. BILLIARD-TABLE RAIL AND CUSHION. CHARLES G. BROOKWAY, Pine Bluff, Ark. Filed Apr. 14, 1888. Serial No. 270,715. (No model.)



Claim.—The combination, in a billiard-table, with the bed having a horizontal bolt-hole and a stationary nut in the bed with its aperture in line with said bolt-hole, of the vertically-adjustable cushion-carrying rail having a transverse vertical slot, and a bolt passing through said slot into the bolt-hole and nut, whereby the said rail may be adjusted vertically without carrying the bolt and nut with it, substantially as set forth.

PHOTO LITH. NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

COMMISSIONER'S DECISIONS.

EX PARTE WARD.

Decided March 6, 1889.

1. PRACTICE OF WITHHOLDING NOTICE TO CAVEATORS UNTIL QUESTION OF PATENTABILITY IS SETTLED.

Decision in *ex parte Kenney* (C. D., 1889, 97) considered and modified and the following practice directed: Whenever an application is filed showing subject-matter interfering with any pending caveat, the notice which the statute provides shall be sent to the caveator should be sent at once and not delayed until the invention shall have been favorably passed upon and the application found to be ready for allowance.

2. RIGHTS OF CAVEATOR.

The statute confers no rights upon the caveator, nor does it give him any status in the Office as an applicant. It extends, as matter of grace, to him the right to be notified of the pendency of an application relating to the subject-matter of his caveat. It is not intended that he shall have the benefit of an examination of his caveat before he has filed an application, which substantially results when the notice is withheld until the patentability of the invention of another applicant is determined.

3. RIGHTS OF APPLICANT.

An applicant who has completed his invention and diligently and successfully prosecuted his application for patent ought not to be delayed in the issuance of his patent by a caveator who is under no obligation to be diligent or to file his application for patent.

ON petition.

DISINTEGRATING-MACHINE.

Application of Randolph G. Ward filed February 15, 1888, No. 264,061.

Mr. E. B. Stocking for the applicant.

HALL, *Commissioner:*

A caveat was filed in the Office on June 28, 1887, which was renewed on June 27, 1888. The present application was filed on February 15, 1888, 8 months after the filing of the caveat. It appears that the caveat was overlooked and the application allowed for issue on February 9, 1889, or almost one year and eight months after the filing of the caveat. The second caveat, of June 27, 1888, can in nowise figure in the case, and no further reference need be made to it. Immediately after the application was allowed the caveat was discovered, and on February 12, 1889, the case was withdrawn from the issue in order to take the necessary steps to give notice to the caveator, &c. Thereupon the applicant, having ascertained which claim was supposed to be in interference with the subject-matter of the caveat, filed an amendment eliminating the broad claim for the purpose of avoiding the caveat. This was permitted; but the examiner called applicant's attention to the decision of the Commissioner in *ex parte Roberts*, (40 O. G., 573,) in view of the fact that the eliminated claim, which applicant proposed to present in a subsequent application, was broad and generic, and left in the application only specific claims to the subject-matter. The intimation was of course that the issuing of the patent upon the allowed claims might possibly operate as a bar to the proposed second application. In the meantime applicant, before the notice of the caveat had been given and while laboring under the belief that there was nothing standing in the way of his patent, started for Japan for the purpose of taking out Letters Patent. He had also sent an application to Mexico, intending to take out patents under that government, where the term is but 10 years, as I am advised. In this condition of things, it being apparent that the applicant would be prejudiced whatever course he might pursue, he has presented the present petition, asking to be allowed to reinstate the broad claim which he canceled under the suggestion of the examiner, and that a patent issue to him, notwithstanding the impending interference. I am disposed to grant the request so far as to permit him to amend by restoring the claim. The whole situation has grown out of a mistake on the part of the Office, prejudicial in both directions, and it seems only just that applicant shall be reinstated in this respect. I find myself unable, however, to grant the request that the patent may be issued without reference to the interference.

Under the statute, section 4902, it is provided that a caveat filed in the Office shall be operative for the term of 1 year from the time of its filing, and that if within that year any person filed an application for a patent with which such caveat would in any manner interfere such application shall be deposited in the confidential archives of the Office and notice thereof be given to the caveator, who shall thereupon, if he desired to do so, file his application within 3 months from the time of placing the notice in the post-office, &c. This statute confers no rights upon the caveator, nor does it give him any status in the Office as an applicant. It extends as matter of grace to him the right to be notified of the pendency of an application relating to the subject-matter of his caveat. The caveat is operative for 1 year. This does not mean that the caveator is under any obligation to file an application, nor that he can excuse himself from any lack of diligence in filing it. The operativeness is not upon the caveator, but upon the Office to give the notice required. There is no limitation of the period within which the caveator may file his application, and hence it has been held, properly, that when the application

of another inventor has been filed on the last day of the year within which the caveat is operative, notice shall be issued, and the caveator shall have 3 months thereafter within which to file his application. Although it is true that the caveat is operative for 1 year, and such notice may have the effect of giving the caveator 15 months within which to file his application, so, also, the time may be curtailed the space of 3 months—for instance, were an application filed in the Office later in the day on which the caveat was filed. It must follow, I think, that the provision of the statute which requires the caveator to file his application within 3 months from the date of the notice of an application is rather for the protection of the applicant who has been diligent in filing an application than for the caveator who, as stated above, acquires no right or status as an applicant and is not entitled to be hastened by the Office, that being a matter of his own choice and interest. In other words, when an applicant comes into the Office he ought not to be delayed in the consideration of his application and the issuance of a patent by a caveator unless the caveator shall file his application within the specified time.

In the present case, as stated above, on February 9, 1889, when the application was allowed and passed to issue, a year and eight months nearly had elapsed since the caveat was filed, and yet the caveator had not seen proper to complete his invention and file an application therefor. His caveat was withheld from the public and withheld from the applicant who had completed his invention and who had diligently and successfully prosecuted his application, and now, after this lapse of time, applicant finds his case arrested in order that a caveator who has allowed so long a period to elapse may be notified and have another 3 months within which to file his application. Yet, under these circumstances and in view of the decision of Commissioner Fisher, *ex parte Kenney*, (C. D., 1869, 97,) I find it impossible to afford either of the parties any relief. The notice must be given, if it has not been already, to the caveator, who must be allowed the requisite time within which to file his application, and the interference proceedings must follow if the examiner sees proper to institute them.

I have called attention to the peculiar features of this case with a view to effecting a change in the practice as far as can be done without recommending a new rule upon the subject. In the decision of Commissioner Fisher, to which reference has been made, it is shown that at that time it was the practice of the Office before issuing notice to a caveator to determine the patentability of the invention claimed in the application, and that rule, as I am advised, has prevailed to the present time, although, as shown by the examiner in his report on this application, there is a variance between Rule 196 of the edition of Rules of Practice of March 1, 1884, and present Rule 205. In my judgment, the safer and better practice will be to give the notice contemplated by the statute to a caveator whenever an application of another applicant is filed which shows interfering matter and not wait until the application has gone through an examination and is ready for allowance. An examination of the records shows that as a consequence of the present practice a number of patents have issued pending caveats and other difficulties have arisen. Although hardship would have arisen in any event in the present case, growing out of the fact that the caveat was overlooked, yet I cannot but feel that it would be safer for applicants and for the Office that the notice be issued as soon as it is discovered or ascertained that an application contains interfering subject-matter.

It was suggested by Commissioner Fisher in the case referred to above:

> But it has not been the practice of the Office to give this notice unless the device presented was deemed patentable. In any other case the caveator would be put to unnecessary expense, for the Office would not inform him in advance that the device was not considered novel. Such a notice would, in fact, constitute a preliminary examination.

I have just stated that the statute is not intended to confer upon the caveator any right other than that a notice of a pending application be given him. It is not intended that he shall have the benefit of an examination for his caveat before he has filed an application because another applicant more diligent has completed the invention and filed his application in the Office. When that application is filed in the secret archives of the Office, as the statute contemplates, that applicant takes his chances as to the question of patentability, and I see no reason why a caveator should not be placed in the same position.

Under these circumstances I reach the conclusion that the better practice and a strict and literal compliance with the statute require that upon the filing of an application which it is ascertained contains interfering subject-matter with a caveat the application should be placed in the secret archives and the caveator notified without delay.

ELGES *v.* MILLER.

Decided March 7, 1889.

1. HOW FAR A CAVEAT MAY BE USED AS EVIDENCE OF INVENTION IN AN INTERFERENCE PROCEEDING.

   The statute authorizing the filing of a caveat does not intend to confer upon the caveator any right as an inventor, nor to save him from the effect of negligence or give him any advantage over any other inventor who has conceived the invention and prosecuted his application with diligence. The statute authorizing a caveat does not compel a caveator to file any application. It is not intended as a stimulus to prod and drive him to perfect his invention, nor is it intended to extend the time in any manner within which he may complete the invention; but it simply provides, as matter of grace, that the caveator shall be notified of the filing of any application which comes into the Office within a year, covering the subject-matter of his caveat.

2. SAME.

   The filing of a caveat does not give to the caveator the standing of an applicant with respect to what is called "Constructive Reduction to Practice." The caveat is a procedure kept in the secret archives of the Office and in itself contains no declaration or purpose on the part of the caveator that he will ever complete or finish his invention or give it to the world. The statute does not contemplate that a caveator shall stand as an obstruction to the diligent efforts of other inventors in the same field of art.

MOTION for rehearing.

CIGAR-MOLDS.

Application of Gottlieb D. Elges filed April 30, 1887, No. 236,688. Application of Frederick C. Miller filed January 3, 1887, No. 223,232.

Messrs. Knight Brothers and *Mr. M. F. Halleck* for Elges.

Messrs. Knight Brothers for Miller.

HALL, *Commissioner:*

This is a motion for rehearing of the decision of the Assistant Commissioner affirming the judgment of the Examiners-in-Chief which reversed the decision of the Examiner of Interferences and awarded priority to Elges.

The issues are as follows:

A.

1. A revoluble drum having the cups or members of a cigar-mold arranged parallel with its axis, in combination with the cups or members which are supplementary to those carried by the drum, having hinged connection with said drum.
2. The revoluble drum having the cups of a cigar-mold arranged parallel with its axis, in combination with the complementary cups or members and the arms, each of said arms being connected at one end to one of said cups and hinged at the other so as to be carried by the drum.
3. The combination, with the revoluble drum having the cups or members of a cigar-mold arranged parallel with its axis, of the complementary cups or members, the arms each connected at one end to one of said cups or members and the brackets secured to the drum and to which said arms are hinged.

B.

A revoluble drum having the cups or members of a cigar-mold arranged parallel with its axis, in combination with the complementary cups or members each having at one end hinged connection with said drum, and means for engaging the said hinged members with the members carried by the drum.

Elges conceived the invention, disclosed it to others, made a drawing of it, and filed a caveat fully illustrating and disclosing it on June 14, 1886. This was before Miller had made any conception of the invention. It is fully established that Miller conceived the invention about July 1, 1886, immediately reduced it to practice in an operative machine, and filed his application on January 3, 1887. Elges did nothing more, either to mature the invention or to reduce it to practice until as caveator he was notified by the Office on March 4, 1887, of Miller's application, under the statute relating to caveats. He then filed his application on April 30, 1887.

The Examiner of Interferences awarded priority to Miller. Upon appeal the Examiners-in-Chief reversed his decision and awarded priority to Elges, the caveator. There is no question but that Miller conceived the invention pending Elges's caveat, at once reduced it to practice, and filed his application, so that he must be regarded as the original first inventor, unless Elges can be given the status of priority by virtue of his conception and the filing of his caveat.

In *ex parte Ward*, March 6, 1889, I had occasion to give expression to my views as to the nature and effect of a caveat. I held, in substance, that the statute which authorizes the filing of a caveat does not intend to confer upon the caveator any right as an inventor, nor to save him from the effect of negligence or give him any advantage over any other inventor who has conceived the invention and prosecuted it with diligence under the law. The statute authorizing a caveat does not compel a caveator to file any application whatever. It is not intended as a stimulus to him to prod him and drive him to perfect his invention, nor is it intended to extend the time in any manner within which he may complete the invention; but the statute provides, as a matter of grace, that the caveator shall be notified of the filing of any application which comes into the Office within a year covering the subject-matter of his caveat. It is also true that the filing of a caveat does not give to the caveator the standing of an applicant with respect to what is called "constructive reduction to practice." It has long been the practice in the Office to regard the filing of an allowable application as a constructive reduction to practice, and if a patent issue upon it no other inventor can antedate such patent and application, except by showing an actual reduction to practice of an earlier date. This status is not attained by a caveator. His caveat is a secret procedure kept in the secret archives of the Office, and in itself contains no declaration or purpose on the part of the inventor that he will ever complete or finish his invention or give it to the world, and by adopting such secret procedure it was not intended that he should stand as an obstruction to the diligent efforts of other men in the same field of art.

In this case Elges did nothing more toward completing or perfecting his invention after he filed his caveat, but allowed the matter to rest there. It is suggested by the Examiners-in-Chief that he then completed his invention; but so far as relates to what Elges himself had done this statement is not strictly accurate.

As stated above, the filing of a caveat is not a completion of an invention. It is not constructive reduction to practice, for that is recognized and allowed only to one who comes forward with an application in which he fully discloses his invention and asks that the same should be patented and made public in order that the public may have the benefit of it.

If it be true that Elges had completed his conception of the invention so that he could describe it in a written specification and by drawings, he was in a condition to have filed his application on the date at which he filed his caveat, and that was the proper course for him to have pursued. The fact that he failed to do this indicates a belief, at least, on his part that such was not the case, and in either event it is a necessary conclusion that he was negligent in not then filing his application or doing something toward completing his invention. If his invention was complete, he allowed some eight or nine months to pass without any reason for the delay or any excuse for it, while in the meantime another inventor had conceived and completed the invention, reduced it to practice, and filed his application.

Under these circumstances the motion for rehearing is granted. Inasmuch, however, as all the merits of the case were fully argued before me, judgment is at the same time hereby entered. The decision of the Assistant Commissioner is vacated, and priority of invention awarded to Miller.

GREEN *v.* HALL *v.* SIEMENS *v.* FIELD.

Decided March 6, 1889.

1. EVIDENCE OF INVENTION IN FOREIGN COUNTRY.

   Evidence of invention in a foreign country cannot be received in an interference proceeding unless such evidence is in the form of a publication or patent, or is for the purpose of showing that some one of the contestants is not an original inventor.

2. PRIORITY WITH INVENTOR WHO REDUCES TO PRACTICE.

   The purpose of the law is to benefit the public as well as to protect the inventor, and the inventor who reduces his invention to practice in such a complete way that he at once perfects it as an invention, and at the same time practically demonstrates its utility, is clearly to be preferred to one who merely made hints and suggestions to others and failed himself to act upon them.

3. CONTINUING APPLICATIONS.

A second application cannot legally be considered a continuation of a first or earlier application by the same inventor unless it contains *the same invention*.

4. MODELS NOT EVIDENCE OF REDUCTION TO PRACTICE.

It is well-settled law that a working model, designed and intended as such, is not a reduction to practice. Mere working models, allowed to rest in oblivion for many years, will not prevail to establish priority when application for patent is delayed and not filed until after another and more diligent inventor has entered the same field of invention and established his claim as an independent inventor.

APPEAL from Examiners-in-Chief.

ELECTRIC RAILWAYS.

Application of Geo. F. Green filed May 15, 1886, No. 202,287. Application of Thomas Hall filed July 22, 1885, No. 172,325. Application of Ernst W. Siemens filed October 25, 1884, No. 146,478. Application of Stephen D. Field filed March 10, 1880, No. 4,752.

Mr. R. D. O. Smith and *Mr. G. W. Dyer* for Green.

Mr. E. N. Dickerson and *Messrs. Foster & Freeman* for Hall.

Mr. C. S. Whitman for Siemens.

Mr. F. L. Pope, *Mr. F. W. Whitridge*, and *Messrs. Marble & Mason* for Field.

HALL, *Commissioner:*

The issue in controversy is as follows:

The combination of a stationary dynamo-electric generator driven by a suitable motor, a circuit of conductors composed in part of an insulated or detached section of the line of rails of a railroad-track, a wheeled vehicle movable upon or along said section of track, an electro-magnetic motor mounted upon said vehicle for propelling the same and included in said circuit of conductors, and a circuit-controlling device placed upon said vehicle.

In order to adjudicate the rights of the parties involved in this contest it will be necessary to give an interpretation to the issue, inasmuch as the various contestants have adopted several diverse views of the meaning of the subject-matter in controversy.

The principal points of difference relate to the interpretation of the words "stationary dynamo-electric generator," occurring in the first line of the issue, and the words "circuit-controlling device," appearing in the last line of the same.

A comparison of the different applications, including both their specifications and drawings, will throw important light upon this question, because the intention of the examiner who declared the interference must be construed to have been to follow the rules, and therefore he must have regarded each application as at least exhibiting every element of the invention which he declared formed the basis for the interference.

It is contended by one of the contestants that the term "stationary dynamo-electric generator" cannot be held to include the ordinary magneto-electric generator, but is limited to a special form of self-exciting generator, such as was invented by Siemens and is employed by him and also by Field and Green. This construction does not harmonize with the declaration of interference, for Hall certainly could not be involved if we accept the restricted definition of dynamo-electric generator. Another circumstance which is useful in this connection is the history of the applications, considered individually, before the interference was declared. It appears that Field was rejected upon certain patents and his case appealed to the Examiners-in-Chief, who, in comparing his invention with the references, analyzed the claim to the extent of dividing it into five portions or elements, one of which was a "stationary dynamo-electric generator." The references showed magneto-electric generators and the Board found no fault with their pertinency on this account, but pointed out the difference as consisting in the circuit-controller, which they alleged was the essential feature lacked by the patents cited against the application. Thus we see the patentability of the claim was not made to depend upon a restricted meaning of the term "dynamo-electric generator." Furthermore, some of the highest authorities use the expression "dynamo-electric generator" as a generic one, including all kinds of magneto-generators. This is especially so in the noted work on dynamo-electric generators by Thomson. In view of these considerations I am compelled to hold that the expression is generic and covers all forms of magneto-electric generators.

In regard to the term "circuit-controller" Siemens wishes it to be defined as a device which not only makes, breaks, and reverses the circuit, but also modifies the *current*, as, for instance, in its strength or in other particulars. Such an interpretation would also seem to be antagonistic to the theory of the examiner in declaring the interference, for the reason that neither Hall nor Field has any such arrangement. Besides, this is not the usual interpretation of the expression. At the time of the declaration of this interference it was quite common for circuit-breakers and circuit-makers to be included under the generic title of circuit-controllers, and I see no evidence in the record which leads me to believe that a more narrow definition was intended. In discussing the question of priority I shall therefore consider the term "dynamo-electric generator" as a broad one, designed to include magneto-electric generators, and the term "circuit-controller" as including devices for making and breaking the circuit and reversing the same.

In the view I take of this case it will facilitate the arrival at a conclusion to find the dates of invention which can be allowed Field and compare the dates of his competitors with them. On the 21st of May, 1879, Field filed a caveat which, as I view it, fully disclosed the invention in controversy, and this date may therefore be given him as his date of conception. It appears that this caveat was renewed within the year and a short time after renewal—to wit, on the 10th of March, 1880—Field's application was filed. The testimony also shows that Field's conception was disclosed to Mr. Pope sometime previous to the filing of the application with a view of having him prepare an application, but owing to press of business and other reasons Mr. Pope did nothing with it for sometime. It certainly is clear that no negligence on the part of Field in filing his application is made out, and as under the decisions an application must be held to be a constructive completion of the invention it results that Field is entitled to carry the date of his invention back to the time of the filing of his caveat. It is furthermore proven that in 1881 Field constructed a railway comprising the elements called for by the issue, and that in 1883 still another railway embodying his invention was constructed and proved a commercial success.

Siemens cannot, under the statute, be permitted to give evidence of having invented the subject-matter of the interference in a foreign country, unless such evidence is in the form of a publication or patent, or is for the purpose of showing that some one of the contestants is not an original inventor. It is fairly shown that no one of the opponents of Siemens gained his knowledge of the invention from the efforts of Siemens in a foreign country, and therefore this branch of Siemens's case fails. The date of the publications of Siemens is later than that found as Field's date of invention, and consequently, as between Field and Siemens, Field must be adjudged to be the prior inventor.

Green, at least as early as the winter of 1874–'5, put in operation a kind of electric railroad having some of the features embraced in the claim in controversy, but lacking the dynamo-electric generator. Instead of the dynamo-electric generator Green at this time employed a battery. In 1878 Green operated publicly a larger-sized railroad with car and electrical apparatus, but in this also he employed a battey as the generator. In August, 1879, Green filed an application for a patent upon his electric-railway invention, but in this also he showed a battery as the generator. It is in evidence that at each of these experiments Green suggested that it might be well to use a dynamo-electric generator instead of the battery; yet he seemed merely to have this idea and made no attempt to put it into practical operation. No matter what the difficulties were which influenced him, still all practical manifestations of his invention, both in the form of experiments and in the form of his application, resulted in the illustration of a battery rather than a dynamo. It is true that in the application it was broadly stated that any known and suitable source of electricity might be employed; but the form which he actually did employ up to this time seemed in every instance to be the battery. I do not believe that these mere suggestions to various persons that he might use a dynamo instead of a battery can be taken to indicate a conception of the invention within the meaning of the law, or that it can be accepted as adequate proof of anticipation of inventions like those made by Field and Siemens, the practicability of which was clearly demonstrated by expensive and difficult experiments. The purpose of the law was to benefit the public, as well as to protect the inventor, and the man who reduced his invention to practice in such a complete way that he at once perfected it as an invention and at the same time demonstrated its utility in a practical sense is clearly to be preferred to one who rested in hints or suggestions to others and failed himself to act upon the same. I think Green's application is to be construed in the light of his acts, in consonance with the rule which a learned and eminent justice announced when he said:

Tell me how the parties acted under the contract and I will tell you what they meant by it.

Some years after the filing of his first application Green requested to be included in an interference, but was excluded for the very reason that his application did not contain a dynamo, as originally filed, and that the amendment which brought in such dynamo was improper because it involved new matter. This action was sustained by the Commissioner, and I am unable to concur in the reasoning of the Examiners-in-Chief, who, in the face of this decision, seemed to construe such application as involving an interference and to hold that Green—

Has a right to rest upon that application and the action of the Office upon it as evidence of his having disclosed the invention therein at that time.

In May, 1886, Green filed another application in which a dynamo-electric generator was specifically shown and described: but manifestly, in view of the decision of the Commissioner, before referred to, that the old application did not properly include any such style of generator, this later application is an entirely independent one. I cannot concur in the proposition of the Examiners-in-Chief that "while this last application cannot properly be considered a division of the first, yet it is evidently a continuation of it." Legally it cannot be regarded as a continuation of the first application unless it contains *the same* invention. The earliest date which can be found for Green is May 15, 1886, which is the date of his second application.

Hall, the last party to be considered herein, claims to have made the invention at a very early date and produced certain publications and models as tangible proof of that fact. As to the Hall Exhibit No. 5, it may be said that the illustration is entirely insufficient, for the reason that it contains no intrinsic evidence that the source of electricity operating the electro-magnetic motor was a stationary dynamo-electric machine or a magneto-electric machine. In reference to the various models it must be said that they were not reductions to practice in any proper sense of that expression. It is not merely a question of size, as counsel for Hall ingeniously put it, but a question of design and purpose. Hall's models were illustrative, like drawings. They were intended to exemplify his theories and not carry them into effect. It is alleged by counsel for Hall that these models could be made practically useful for carrying parcels, letters, and the like, and were of a size sufficient to be used upon a railway in a cash-carrier system; but the point is that there is not sufficient evidence that they were intended at the time they were constructed to accomplish these ends. The purposes for which they were sold and the uses to which they were put with Hall's knowledge are not such as would carry out his counsel's theory. Philosophical laboratories and learned professors rather than commercial houses and business men received and employed them. It is well-settled law that a working model, designed and intended as such, is not a reduction to practice. Hall's devices manifestly were mere working models and nothing more. After more than a score of years had passed the efforts of others called to Hall's mind his former experience and he then concluded to file his application and claim the invention as his own.

In the decision of *Gaylord* v. *Wilder* the Supreme Court of the United States have put their condemnation upon a case of a similar character, but much stronger than is the case of Hall, for in the Court case the structure which had been allowed to rest in oblivion for many years was a completed full-size structure

and not a mere illustrative model. I feel constrained to hold that Hall does not anticipate Field.

Judgment of priority must therefore be rendered in favor of Stephen D. Field. I am impressed, however, with the similarity between the invention involved in this interference and that set forth in the British patent to Clark, to which the Examiners-in-Chief have called my attention and which has also been brought before me by certain motions, and I therefore direct the case of Field to be returned to the Primary Examiner, who will consider whether the invention covered therein is patentable in view of Clark's patent, taken in connection with the other state of the art.

There remain to be considered the motions to dissolve this interference on the ground that no interference in fact exists, or that some of the parties were improperly included therein. The remarks I have heretofore made render it unnecessary for me to consider these questions at length. I merely decide that an interference did exist at the time the examiner declared the same and the parties involved were properly included.

DECISIONS OF THE U. S. COURTS.

U. S. Circuit Court—Southern District of New York.

LEARY *et al. v.* HOHENSTEIN.

Decided February 9, 1889.

LEARY—SHADE OR GLOBE HOLDERS FOR CANDLES—INFRINGEMENT.

Letters Patent No. 257,027, granted April 25, 1882, to David Leary, for an improvement in shade or globe holders for candles, *Held* valid, and infringed by the defendant's device, which is a copy of the plaintiffs', which latter, while not made according to the specific device described in the patent, is equivalent thereto and accomplishes the same result in the same manner.

Mr. H. Aplington for the complainants.
Mr. Louis C. Raegner for the defendant.

WHEELER, *J.*:

This suit is brought upon Letters Patent No. 257,027, dated April 25, 1882, and granted to Daniel Leary, for a shade or globe holder for candles. The defenses set up and relied upon are want of novelty and of patentability. No prior structures are produced or shown by evidence to have existed to bear upon the question of novelty. That defense rests wholly upon an English patent, dated in 1842, to Ward and Freeman, and an American patent, dated in 1868, to William H. H. Hinds, for candlesticks, and an English patent, dated in 1850, to William Henry Jones, and another, dated in 1864, to Henry Charles Stearn and Frank Alexander Steane, for apparatus to prevent candles from guttering. These patents do show parts of Leary's structure, and notably a cap-shaped piece fitting over the upper end of the candle, with a hole for the blaze, to support the structure, and gearing below to keep it upright. But none of them show a shade-holder for a shade above the blaze of the candle, nor anything like his complete apparatus or that would answer its purpose. Therefore he was not anticipated by any or all of them. (*Parks* v. *Booth*, 102 U. S., 96.) These prior patents are also relied upon to limit the field open to Leary, and counsel for the defendant urges, in support of the other defense, that there was no room for patentable invention between them and his shade-holder; that a workman might by the skill of his trade put the shade-holder onto this cap-shade piece. If the candle was to stand unchanged, this would be easier, but there was more to be done than to place the shade-holder upon a permanent standard. The candle must be of material which would melt with heat and be consumed as it melted. The device must be so arranged as not only to hold the shade-holder upright in the beginning, but to maintain it so, and do this by means that would not melt the candle below and weaken and waste it, and would let it melt about the wick and burn. Apparatus which would extend down upon the candle without becoming hot enough to melt it and extend above for the shade holder was to be contrived. This would seem to require calculation and ingenuity beyond that of a mechanic in the mere exercise of his calling. No mechanic or other person appears to have accomplished this before Leary did. When he had done it, his device went into extensive use. This shows that it was wanted, and that ordinary workmanship had not brought it. What he did appears to amount to invention which is patentable.

The patent describes the supports of the shade as being attached to a ring resting about the cap-shaped piece over the end of the candle, and as being attached directly to that piece. Both of the claims include that ring in the arrangement. Neither the plaintiffs' device made under the patent nor the alleged infringement has that ring. Generally a patent for a combination or arrangement of several parts is not infringed by taking less than the whole of them. (*McMurray* v. *Mallony*, 111 U. S., 97; *Voss* v. *Fisher*, 113 U. S., 213.) But taking some of the parts, with equivalents producing the same result for the others, is an infringement. (*Water Meter Company* v. *Desper*, 110 U. S., 332; *Rowell* v. *Lindsay*, 113 U. S., 97.) The cap-shaped piece, with the supports of the shade attached to it, is the equivalent of the same and the ring with the supports attached to that, and accomplishes the same result in the same manner. The plaintiffs' device therefore appears to be made according to the patent. The defendant's device, which is a copy of the plaintiffs', appears for the same reasons to be an infringement.

These conclusions have not been arrived at without noticing carefully the decision upon the motion for a preliminary injunction in this case. (*Leary* v. *Hohenstein*, 32 Fed. Rep., 832.) The case does not appear to have been so fully presented on proofs then as now. The question was somewhat different, and was in some measure reserved to final hearing.

As the case is now understood the patent is valid and the defendant infringes; therefore the orators appear to be entitled to a decree.

Let a decree be entered that the patent is valid; that the defendants infringe, and for an injunction and an account according to the prayer of the bill, with costs.

THE
OFFICIAL GAZETTE
OF THE
United States Patent Office.
[BY AUTHORITY OF CONGRESS.]

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Notice.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., January 28, 1888.

Hereafter all drafts, bills of exchange, and money-orders sent to this Office must be made payable to the Commissioner of Patents as payee, and all checks must be certified and made payable to the Commissioner of Patents.

BENTON J. HALL,
Commissioner.

NOTE.—A failure to observe this rule compels the return of uncertified checks and paper not payable to the Commissioner and causes delay to parties sending them.

BENTON J. HALL,
Commissioner.

Additional Sub-Classes.

(ORDER No. 536.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., March 16, 1889.

The following additional sub-classes are hereby established in Class 145, Wood-Working Tools:

33. Spiral tool-drivers.
34. Augers, gage attachments.

BENTON J. HALL,
Commissioner.

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Issue of March 26, 1889.

Patents	389	No. 400,033 to No. 400,421, inclusive.
Designs	3	No. 18,974 to No. 18,976, inclusive.
Trade-Marks	14	No. 16,413 to No. 16,426, inclusive.
Labels	6	No. 5,854 to No. 5,859, inclusive.
Reissues	2	No. 10,991 to No. 10,992, inclusive.
Total issue	414	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	7	.....	Nebraska	2	.....
Arizona Territory	1	.....	Nevada	.....	.....
Arkansas	3	.....	New Hampshire	3	.....
California	8	.....	New Jersey	33	.....
Colorado	.....	.....	New Mexico Terri'y	.....	.....
Connecticut	10	.....	New York	71	7
Dakota Territory	2	.....	North Carolina	1	.....
Delaware	.....	.....	Ohio	27	.....
District of Columbia	4	.....	Oregon	1	.....
Florida	1	.....	Pennsylvania	40	3
Georgia	2	.....	Rhode Island	2	.....
Illinois	31	.....	South Carolina	.....	.....
Indian Territory	.....	.....	Tennessee	2	.....
Indiana	7	.....	Texas	5	.....
Iowa	5	.....	Utah Territory	1	.....
Kansas	3	1	Vermont	.....	.....
Kentucky	4	.....	Virginia	3	.....
Louisiana	3	.....	Washington Terri'y	.....	.....
Maine	1	1	West Virginia	.....	.....
Maryland	5	2	Wisconsin	9	.....
Massachusetts	25	3	Wyoming Terri'y	.....	.....
Michigan	14	.....	U. S. Army	.....	.....
Minnesota	3	.....	U. S. Navy	.....	.....
Mississippi	.....	.....			
Missouri	9	.....	Total to citizens of the United States	348	17
Montana Territory	.....	.....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Austria-Hungary	2	.....	Germany	10	.....
Barbadoes	.....	.....	India	.....	.....
Belgium	1	.....	Ireland	1	1
Bermuda	.....	.....	Netherlands	.....	.....
Brazil	.....	.....	Queensland	.....	.....
Canada	4	.....	Russia	1	.....
Canary Islands	.....	.....	Scotland	.....	.....
Colombia, U. S. of	.....	.....	Sweden	.....	.....
Cuba	.....	.....	Switzerland	1	1
Denmark	.....	.....	Victoria	.....	.....
Ecuador	.....	.....			
England	18	1	Total to citizens of foreign countries	44	3
France	6	.....			

DESIGNS.

18,974 to 18,976, inclusive.—HANDLE FOR BRUSHES, &c.—*Henry Berry*, Shelton, Conn., assignor to *The Derby Silver Company*, same place. Applications filed February 16, 1889. Serial Nos. 300,169 to 300,171, inclusive. Term of patents 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,413.—PAINT RENEWER AND PRESERVER.—*Baker & Co.*, Poughkeepsie, N. Y. Application filed February 2, 1889. Used since August 10, 1888.

"A quadrilateral figure divided into six equal spaces, of which three spaces at one side show bright colors and the three spaces at the other side show respectively the same colors as dull or faded."

16,414.—CONDUCTING-HOSE.—*Stephen Ballard & Co.*, New York, N. Y. Application filed February 15, 1889. Used since December 15, 1888.

"The words 'IRON CLAD.'"

16,415.—ADJUSTABLE SPOUT FOR OIL AND OTHER CANS OR RECEPTACLES.—*George W. Banker*, New York, N. Y. Application filed December 20, 1888. Used since 1881.

"The representation of a portion of a can broken away so as to disclose the spout in one of its positions within the can, the spout being also shown in its other position externally of the can, one or the other of said positions of the spout being shown in dotted or broken lines."

16,416.—CIGARS AND CHEROOTS.—*Emery Bemis, Jr.*, Boston, Mass. Application filed January 7, 1889. Used since September 12, 1873.

"The words 'HARVARD CLUB.'"

16,417.—MINERS' LAMPS.—*Demmler Bros.*, Pittsburg, Pa. Application filed February 19, 1889. Used since 1878.

"The word 'CHIRAY.'"

16,418.—CASED WATCHES.—*Dubail, Monnin, Frossard & Co.*, Porentruy, Switzerland. Application filed December 29, 1888. Used since November 7, 1888.

"The representation of a star and crescent combined with the initials 'D M F & Co.'"

16,419.—RUFFLING FOR GARMENTS.—*Heidelberger, Frank & Co.*, Philadelphia, Pa. Application filed February 16, 1889. Used since 1884.

"The word 'FASHION.'"

16,420.—PHOTOGRAPHIC OUTFITS.—*Edward I. Horsman*, New York, N. Y. Application filed January 2, 1889. Used since December 1, 1886.

"The word 'ECLIPSE.'"

16,421.—BOILED OILS.—*Thomas Hubbuck & Son*, London, England. Application filed June 7, 1888. Used since February, 1887.

"Two concentric circles having between them at the top the word 'HUBBUCK'S,' the circles being broken horizontally by a band."

16,422.—EMBROCATIONS AND PILLS.—*Harriet A. King*, Salina, Kans. Application filed February 2, 1888. Used since September 1, 1888.

"A dark-colored rectangular background containing spots of a different color from the background and resembling fever-sores."

16,423.—INSECTICIDES.—*J. Robt. Moechel & Co.*, Philadelphia, Pa. Application filed February 21, 1889. Used since November 15, 1887.

"The word 'EUODINE.'"

16,424.—COMPOSITION FOR COLORING AND PRESERVING SAUSAGES.—*S. Oppenheimer & Co.*, New York, N. Y. Application filed December 26, 1888. Used since December 10, 1888.

"The representation of a Maltese cross, the word 'SMOKINE,' and the words 'LIQUID SMOKE.'"

16,425.—WHISKY.—*John Power & Son*, Dublin, Ireland. Application filed January 31, 1889. Used since 1791.

"The word 'POWER.'"

16,426.—RUBBER BELTING, HOSE, AND PACKING.—*Revere Rubber Company*, Boston, Mass. Application filed February 20, 1889. Used since January 1, 1869.

"The word 'NEPTUNE.'"

LABELS.

5,854.—Title: "THE MOST VALUABLE MEDICINE YET FOUND."—*Mary E. Chadbourne*, Boston, Mass. Application filed February 12, 1889.

5,855.—Title: "MADAME AGNES' BALM."—*Honora Agnes McAllister*, Albany, N. Y. Application filed February 14, 1889.

5,856.—"SAP MAPLE SYRUP."—*George D. Powell*, Brooklyn, N. Y. Application filed September 28, 1888. (Trade-Mark Registered.)

5,857.—Title: "DR. THOS. WM. SPRANKLIN'S LINIMENT."—*Thos. Wm. Spranklin*, Baltimore, Md. Application filed January 19, 1889.

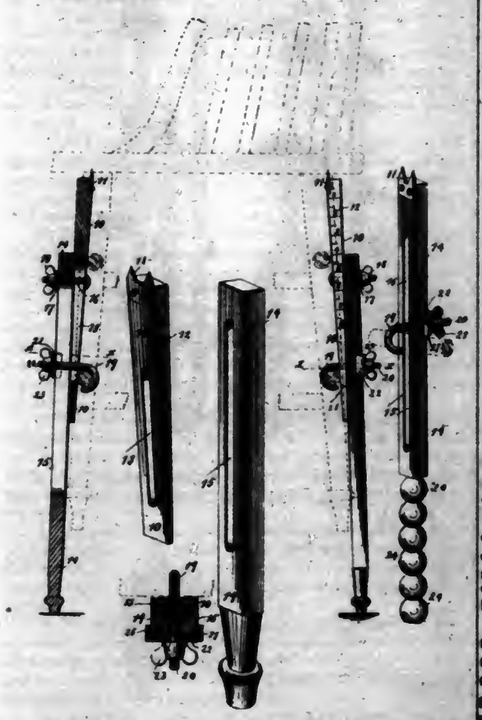
5,858.—Title: "DR. THOS. WM. SPRANKLIN'S COLIC MIXTURE."—*Thos. Wm. Spranklin*, Baltimore, Md. Application filed January 19, 1889.

5,859.—Title: "WRIGHT'S MAGNETIC ELECTRIFIER," (FOR A MEDICINE.)—*Frank A. Wright*, Lewiston, Me. Application filed February 6, 1889. (Trade-Mark Registered.)

PATENTS

GRANTED MARCH 26, 1889.

400,033. ADJUSTABLE LEG ATTACHMENT FOR CHAIRS, &c. HABBUCK ALLISER, Rondout, N. Y. Filed June 27, 1888. Serial No. 278,334. (No model.)



Claim.—1. An auxiliary leg for chairs, having penetrating-points at its upper end to engage the seat-frame and a hook-bolt between its ends to engage a chair-round, substantially as set forth.

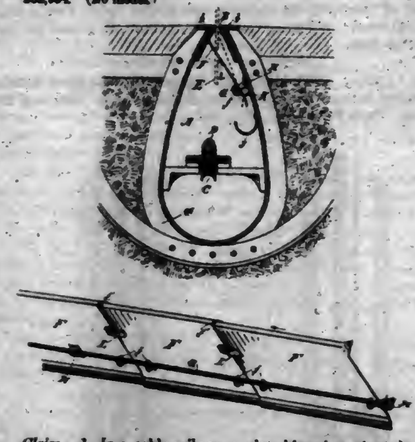
2. An auxiliary chair-leg formed in two longitudinally-slotted overlapping sections, a transverse hooked bolt passing through said slots to adjust the two sections and secure them to a chair-round, and penetrating-points at the upper end of the upper section, substantially as set forth.

3. An adjustable leg attachment for chairs, consisting of a slotted wedge-block provided with teeth upon its upper end, a slotted auxiliary leg adjustably secured to said block, and a hook provided with a nut and passing through the slots of the block and leg, substantially as shown and described.

4. The combination, with a chair or similar article of furniture, of a wedge-block provided with teeth upon its upper end, auxiliary legs attached to said block, and an adjustable hook adapted to engage a round of the chair, substantially as and for the purpose specified.

5. The combination, with a chair or similar article of furniture, of a longitudinally-slotted wedge-block provided with teeth at its upper extremity, a similarly longitudinally-slotted auxiliary leg adjustably secured to said block, and a hook passing through the slots of said auxiliary leg and wedge-block adapted to engage the round of a chair, and a lock-nut secured upon said hook, all combined to operate substantially in the manner and for the purpose specified.

400,034. TUBE OR TUNNEL PROTECTOR FOR CABLE ROADS. HENRY F. ASCHEIM, San Francisco, Cal. Filed Aug. 16, 1888. Serial No. 282,984. (No model.)



Claim.—1. In a cable railway, a plate hinged or pivoted within the tube or tunnel, to one side thereof, said plate crossing the vertical plane of the grip-slot and resting against the opposite side of the tube or tunnel, substantially as herein described.

2. In a cable railway, a plate hinged or pivoted within the tube or tunnel, to one side thereof, said plate extending at an upward inclination to and resting against the opposite side, whereby when at rest it crosses the vertical plane of the grip-slot and can be moved over to one side of said plate by the passing grip, substantially as herein described.

3. In a cable railway, a plate within the tube or tunnel crossing the vertical plane of the grip-slot and resting against one side of said tube or tunnel, said plate having a hinge or pivot connection with the other side of the tube or tunnel on a line below the center of the plate, whereby it finds its seat by gravity, substantially as herein described.

4. In a cable railway, the tube or tunnel having a fixed rod secured to one side thereof, in combination with a plate hinged or pivoted on said rod and crossing the vertical plane of the grip-slot to the other side, where it finds a rest, substantially as herein described.

5. In a cable railway, the tube or tunnel having a fixed rod secured to one side thereof, in combination with a plate hinged or pivoted on said rod on a line below its center, whereby it finds its seat by gravity, said plate extending at an upward inclination across the vertical plane of the grip-slot and resting on the other side, substantially as herein described.

6. In a cable railway, the series of hinged plates within the tube or tunnel and crossing the vertical plane of the grip-slot, said plates having flanges overlapping the edge of the plate adjacent, substantially as herein described.

7. In a cable railway, the series of hinged plates within the tube or tunnel and crossing the vertical plane of the grip-slot, said plates having flanges overlapping the edge of the plate adjacent and having a play in their hinge-connection, whereby only those plates in the vicinity of the passing grip-shank will be moved, substantially as herein described.

8. In a cable railway, the tube or tunnel having the fixed rod, in combination with the series of plates within the tube or tunnel and crossing the vertical plane of the grip-slot, said plates having over-

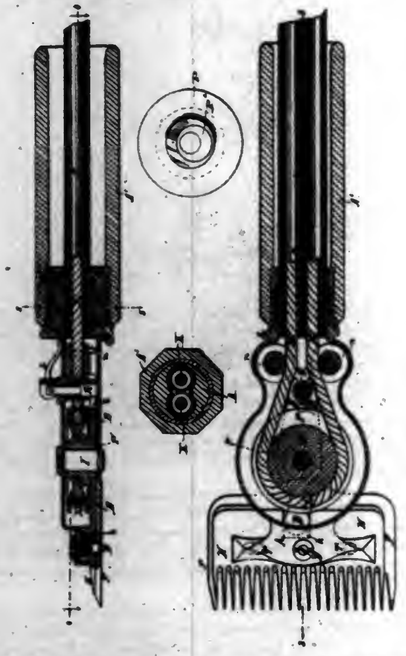
lapping flanges, and the staples or eyes loosely embracing the rod, whereby the plates are hinged thereto, substantially as herein described.

400,035. PACKAGE OF FLY-PAPER. EDWARD F. BAKER, Chicago, Ill. Filed Jan. 24, 1888. Serial No. 261,791. (No specimens.)



Claim.—The combination, with a package of fly-paper, of a spring-clamp consisting of the double end bars, d d d' d', and the side bars, d^2 d^2, running at right angles thereto, the end bars being bent to pass around the back of the package, whereby the same is compressed from both sides on a line between the border of the composition and the edge of the paper, the terminal ends of said spring overlapping and being wired together, as shown, all substantially as and for the purpose set forth.

400,036. ANIMAL-SHEARS. EMILE BARIQUAND, Paris, France, assignor to the Société Bariquand et Fils, same place. Filed Sept. 29, 1888. Serial No. 286,714. (No model.)



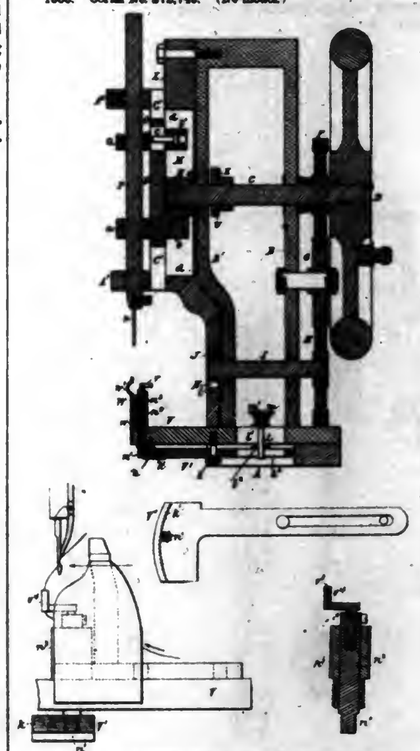
Claim.—1. The combination, with a hand shearing-machine having a pulley for driving its movable comb, of a motor having a driving-pulley, an endless cord or belt for transmitting motion from the motor-pulley to the shearing-machine pulley, and a flexible tube or cable extending from one of said pulleys to the other, inclosing the portion of the belt between them, and constructed to resist longitudinal compression between them and serve to hold the pulleys spaced apart and keep the belt taut.

2. The combination, with a hand shearing-machine and a motor, of a flexible tube or cable extending from the one to the other and constructed with two separate tubular conduits, and a cord or belt receiving motion from the motor and transmitting it to the movable comb of the shearing-machine, the one part of said cord passing through one of said conduits and the other part through the other conduit, whereby the portions of the cord moving in opposite directions are separated.

3. A shearing-machine consisting of a handle, a fixed blade or comb, a movable comb mounted to slide against the fixed comb, a rotary pulley having an eccentric boss, a movable lever of the third class having an opening receiving said eccentric boss, connecting at its free end with the movable comb, and slotted at its other end, and a stationary pivot-pin entering said slotted end, whereby the lever oscillates with said eccentric boss and vibrates about said stationary pin.

4. A shearing-machine consisting of a handle, a fixed blade or comb, a movable comb mounted to slide against the fixed comb, a rotary pulley having an eccentric boss, a slotted movable lever arranged to be vibrated by contact with said eccentric boss, connecting at its free end with the movable comb; and a stationary pivot-pin entering the slot in said lever, whereby the lever vibrates about said stationary pin, and a latch for moving said pin out of engagement with the lever, whereby the latter is thrown out of gear and the movable comb is no longer driven.

400,037. SEWING-MACHINE. JONATHAN BARTLETT, Epping, and GEORGE B. WIGGIN, South New Market, N. H., assignors of one-half to John W. Hoard, Providence, R. I. Original application filed July 28, 1887, Serial No. 245,561. Divided and this application filed May 3, 1888. Serial No. 272,746. (No model.)



Claim.—1. In combination with the vibratory frame L, and with a vibratory and reciprocating needle-bar and needle carried by such frame, the lever V', having an interior segmental rack, k', the post n^3, its pinion n', engaging with said rack, and the crank-shaped and tubular thread-carrier v^4, all substantially as shown and described.

2. The combination, with the vibratory frame and with the vibratory needle carried by such frame, of the work-supporting horn, the post n^3, pinion n', crank-shaped tubular thread-carrier v^4, carried by and vibrating with the said frame, devices, substantially as described, for operating said carrier, and the supporting-sleeve n^3, all substantially as shown and described.

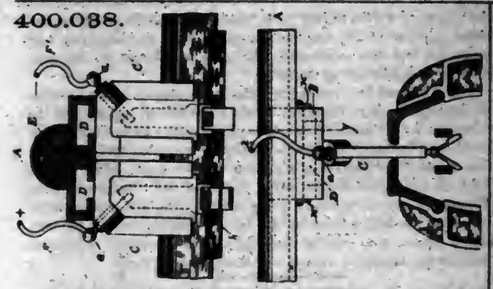
400,038. ELECTRIC-RAILWAY PLOW. EDWARD M. BENTLEY, New York, N. Y. Filed Dec. 5, 1888. Serial No. 292,606. (No model.)

Claim.—1. The combination, in an electric railway, of a conduit and supply-conductors therein, with two independent plows for making contact with the said conductors, respectively, and independent sliding bearings for said plows, allowing each plow freedom of lateral movement independent of the other.

2. The combination, in an electric railway, of a conduit and supply-conductors of opposite polarity therein, with two plows, each carrying a contact-surface for engagement with one of said supply-conductors, and independent sliding bearings for each plow, whereby each is independent in its movement of the other.

3. In an electric railway, the combination of a conduit and supply-conductors of opposite polarity therein, with two contact devices

400,038.



engaging with the said conductors, respectively, and extending down into the conduit, and sliding bearings outside the conduit, allowing each contact device a movement independent of the other.

4. In an electric railway, the combination of a conduit and supply-conductors of opposite polarity therein, with two contact devices engaging the said conductors, respectively, and extending down into the conduit, a support therefor outside of the conduit, having transverse guides and sliding connections between the guides and the contact devices, allowing each contact device an independent lateral movement.

5. In an electric railway, the combination of a conduit and supply-conductors of opposite polarity therein, with a vehicle, two insulated contact devices for engagement with the conductors, respectively, and sliding bearings for the same upon the vehicle, allowing each contact device a movement independent of the other.

6. The combination, in an electric railway, of a conduit and supply-conductors of opposite polarity therein, with a vehicle, transverse guides upon the vehicle, and a contact device for engagement with each of said conductors independently movable along said guides.

7. The combination, in an electric railway, of a conduit, conductors of opposite polarity therein, a contact device for engagement with each conductor, sliding bearings therefor, allowing each contact device a movement independent of the other, and yielding electrical conductors extending directly from said contact devices and leading to the vehicle.

8. The combination, in an electric railway, of a conduit, conductors of opposite polarity therein, and a plow for engagement with each such conductor, with a vehicle, transverse guides upon the vehicle, along which the plows have independent movement, and yielding electrical conductors extending directly from said plows and leading to the vehicle.

9. The combination, in an electric railway, of a conduit, a supply-conductor therein, and a vehicle with a single support movably connected with the vehicle, and two contact devices connected to said support outside of the conduit and movable laterally relative to the support.

10. The combination, in an electric railway, of a conduit, supply-conductors therein, and a vehicle with a single support or frame, sliding bearings permitting the same to move relatively to the vehicle, and two contact devices having sliding bearings on the support and in engagement with the supply-conductors.

11. In an electric railway, the combination of a conduit and supply-conductors therein, with a traveling vehicle and a contact device connected thereto, consisting of a supporting-frame having guides thereon at a point outside of the conduit, and contact devices movable independently along said guides and extending into the conduit for contact with the conductors.

12. In an electric railway, the combination of a conduit and one or more supply-conductors therein, with a support connected to a vehicle, guides on the under surface of said support, and contact devices independently movable in said guides.

13. The combination of a conduit, an inclosed conductor, and a transverse guide outside the conduit, with a contact-plow movably connected with said guide and consisting of a guard or frame and a single conductor supported by the frame, whereby the plow may be made narrow and thus pass curves without binding.

14. The combination of a conduit, inclosed conductors, and transverse guides outside the conduit, with two independent contact devices movably connected to the said guides for engagement with the conductors, respectively, whereby the contact devices may be made narrow and pass curves without binding.

15. The combination of a vehicle having transverse guides and supply-conductors of opposite polarity, with an independent contact device for each conductor and laterally-sliding connections between the contact devices and the guides, whereby each device has an independent movement.

16. In an electric railway, the combination of the supply-conductors and an electrically-propelled vehicle, with an intermediate current-collector consisting of the single support or frame, sliding bearings permitting movement of the same relative to the vehicle, and the two contact devices in engagement with the supply-conductors, and having transversely-traveling connections with the support or frame.

17. In a current-collector, the combination of the transverse guide carried by a vehicle, with the frame or support engaging said guide, two guides upon the support, and two contact devices engaging said guides.

18. A contact-plow for engagement with the supply-conductor inclosed in a slotted conduit, consisting of the traveler adapted to engage a transverse guide, a narrow frame or guard, and a single conducting-core supported and protected by said guard, whereby the plow is adapted to pass curves without difficulty.

19. The combination of a vehicle and conductor inclosed in a conduit, with two contact devices having an independent transverse sliding movement, and each consisting of a frame having depending legs, and a single conductor inclosed in an insulating-panel between said legs.

20. In a current-collector for electric railways, the combination of a support, a guide thereon, and a contact device having a head moving freely along such guide, with a bearing for said contact device independent of the head, and relieving the head of strain.

21. In an electrically-propelled vehicle, the combination of a guide extending over the path of movement of a contact device and embracing the same, whereby the engaging surfaces are protected, with a contact device having a head engaging said guide, and abutting bearing-surfaces upon the guide and contact device, whereby the head is relieved from strains.

22. The combination of the guide, the contact device engaging therewith, and abutting shoulders between the guide and contact device, with the electrical conductors leading from the contact device at the upper end of the same and by the side of the guide.

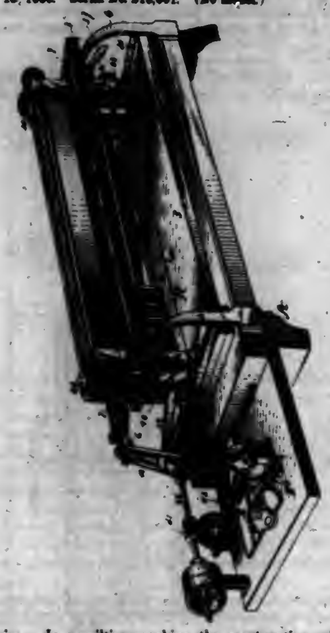
23. The combination, in an electric railway, of the two contact devices, and suitable guides and connections allowing the contact devices a limited independent sliding movement, and electrical conductors extending directly from the contact devices and partaking of their movement.

24. In a current-collector for electric railways, the combination of the conducting-strip having an enlarged or broadened bearing, and a contact-shoe connected to said bearing.

25. In a current-collector for electric railroads, the combination of the insulated conducting-strip enlarged or broadened at its lower end, and a contact-shoe pivoted thereto.

26. The combination of the plow extending into a slotted conduit, and a conducting-strip connected to said plow and broadened or enlarged at its lower end, with a contact-shoe attached to said end.

400,039. QUILTING-MACHINE. ARTHUR BECK, Chicago, Ill. Filed Nov. 15, 1886. Serial No. 218,861. (No model.)



Claim.—In a quilting-machine, the combination, with a transverse feed, of two sewing-machines having horizontal and vertically-

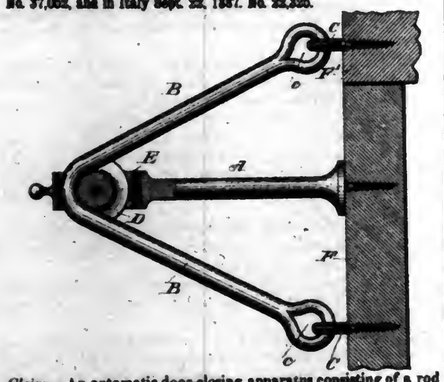
reciprocating needle-bars, a bar, E, connected directly to one of said machines and by a pivoted lever to the other machine, and a cam for operating said bar E, in the manner and for the purpose set forth.

400,040. BUGGY-BOOT. CHARLES A. BEELER, Cincinnati, Ohio. Filed Aug. 17, 1888. Serial No. 282,997. (No model.)



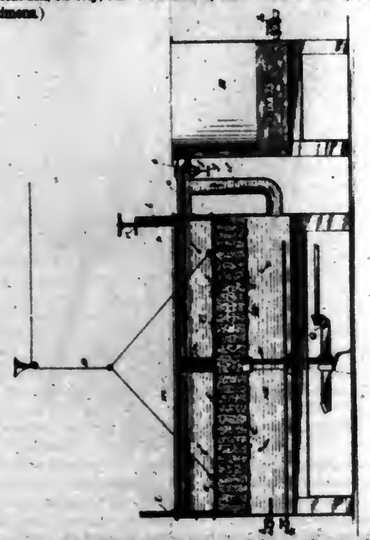
Claim.—In a buggy-boot, the shouldered frame F and its covering C, of any suitable material, in combination with molding M, which embraces the edges of said covered frame, thereby holding the parts firmly together without other aid, substantially as shown and described.

400,041. DOOR-SPRING. EDOUARD BENDER and EMANUEL STEVENS, Brussels, Belgium. Filed Apr. 2, 1888. Serial No. 269,410. (No model.) Patented in Belgium June 25, 1887, No. 77,958; in France Sept. 3, 1887, No. 185,643; in England Sept. 5, 1887, No. 12,014; in Germany Sept. 20, 1887, No. 44,469; in Austria-Hungary Sept. 30, 1887, No. 37,002, and in Italy Sept. 22, 1887, No. 23,325.



Claim.—An automatic door-closing apparatus consisting of a rod or stem having one end formed for attachment to a door and the other end carrying a pulley, and an elastic cord or similar device adapted to be passed over said pulley and have one end attached to said door and the other end attached to the door-frame, substantially as herein described.

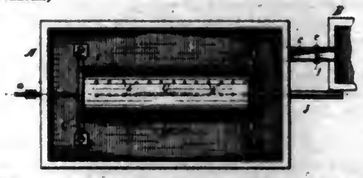
400,042. PROCESS OF PURIFYING PARAFFINE-WAX. JOHN R. BICKNELL, Oil City, Pa. Filed Dec. 2, 1886. Serial No. 220,489. (No specimens.)



Claim.—1. A process for purifying or refining a substance having portions of different fusibility, the same consisting in forcing through the substance a fluid heated to or above the liquefying-point of the softer portions of the substance, simultaneously disintegrating said substance, and then withdrawing the portions liquefied at that temperature, substantially as set forth.

2. A process for purifying or refining a substance having portions of different fusibility, the same consisting in forcing up through the substance a fluid heated to or above the liquefying-point of the softer portions of the substance, simultaneously disintegrating said substance, then gradually withdrawing a portion of the upper portion of said fluid, simultaneously floating off a portion of the substance treated liquefied at said temperature, and gradually introducing beneath the substance the fluid withdrawn and forcing it again through the substance treated, thus causing said fluid to have a constant circulation through the substance treated, substantially as set forth.

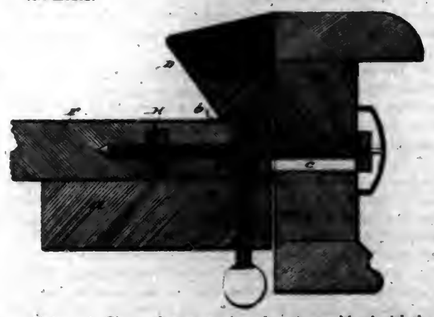
400,043. PROCESS OF PURIFYING PARAFFINE-WAX. JOHN R. BICKNELL, Oil City, Pa. Filed Nov. 21, 1887. Serial No. 255,690. (No specimens.)



Claim.—1. A process of purifying or refining a substance having portions of different fusibility, the same consisting in reducing the substance to a finely-divided condition and then subjecting it to the action of a fluid having a temperature substantially equal to or above the liquefying-point of the softer portion of said substance and below the liquefying-point of the harder portion of said substance, and withdrawing the liquefied portion from the hard portion, substantially as set forth.

2. A process of purifying or refining a substance—such as paraffine or other like substance containing portions respectively of different points of fusibility—the same consisting in reducing the substance to a finely-divided condition and then passing through said substance a fluid having a temperature substantially equal to or above the liquefying-point of the softer portion of said substance and below the liquefying-point of the harder portion of said substance, and removing the liquefied portion from the solid portion of said substance, substantially as set forth.

400,044. BILLIARD-TABLE RAIL AND CUSHION. CHARLES G. BROCKWAY, Pine Bluff, Ark. Filed Dec. 5, 1888. Serial No. 292,746. (No model.)



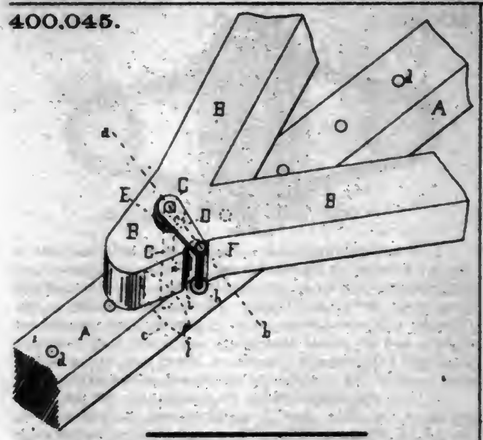
Claim.—1. The washer or spacing-piece A, combined with the rail E, having cushion D and vertical slot *e*, the slate bed F, nut H, embedded in the same, and the horizontal clamping-bolt B, fastening the rail and slate bed together on opposite sides of piece A, substantially as described.

2. The washer or spacing-piece A, combined with the rail E, having cushion D and vertical slot *e*, the slate bed F, having horizontal bolt-hole with nut H embedded therein, the clamp-bolt B, fastening the rail and bed together upon opposite sides of the spacing-piece A, the wooden frame G, and the vertical set-screw C, tapped through the wooden frame and the slate bed and bearing against the lower side of the cushion, substantially as and for the purpose described.

400,045. WAGON-PERCH-CROTCH COUPLING. THOMAS R. BROWN, Rockwoodtown, N. J. Filed Dec. 15, 1888. Serial No. 293,677. (No model.)

Claim.—The combination, with a wagon pole and crotch, A B, of a headed screw-bolt, C, a nut-arm, D, and a loose stay-bolt, F, for the purpose shown and described.

400,045.



400,046. METHOD OF MECHANICALLY TREATING AND ANNEALING SLAG. ST. GEORGE T. C. BRYAN, Birmingham, Ala. Filed Apr. 24, 1888. Serial No. 271,697. (No specimens.)

Claim.—1. The herein-described process of treating slag mechanically by rotation in a suitable vessel when in a molten state, so as to separate impurities from it through the action of gravity and centrifugal force, and after the removal of such impurities stirring the slag, so as to make the mass practically homogeneous and of uniform temperature and quality, substantially as set forth.

2. The herein-described process of treating slag mechanically by rotation in a suitable vessel when in a molten state, so as to separate impurities from it through the action of gravity and centrifugal force, and after the removal of such impurities stirring the slag, so as to make the mass homogeneous and of uniform temperature and quality, then depositing it in slow-cooling molds for further annealing and toughening it, substantially as set forth.

400,047. METHOD OF TREATING SLAG. ST. GEORGE T. C. BRYAN, Birmingham, Ala. Filed July 25, 1888. Serial No. 280,991. (No specimens.)

Claim.—1. The method of treating slag herein described, for the purpose of making it cellular, which consists in forcing into it and intimately mingling with it, when in a molten state, carbonic-acid gas and hydrogen gas, substantially as set forth.

2. The method of treating molten slag herein described, which consists in placing carbon, preferably in the form of coke, in a vessel, delivering molten slag therein and forcing steam against the hot carbon for the evolution of carbonic-acid and hydrogen gases, and their distribution through the mass of molten slag to eliminate the sulphur and give the mass a porous structure, substantially as set forth.

400,048. MANUFACTURE OF SLAG. ST. GEORGE T. C. BRYAN, Birmingham, Ala. Filed July 26, 1888. Serial No. 281,094. (No model.)



Claim.—1. As a new article of manufacture, an artificial paving or building block of slag made in part solid and in part cellular, substantially as set forth.

2. The combination, with a cellular artificial block of slag made for paving or building purposes, of a plastic substance or covering forming a bond with the slag by entering its cells, substantially as set forth.

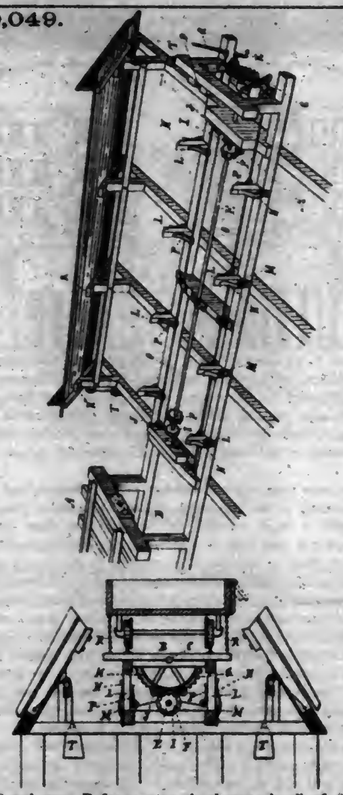
400,049. DEVICE FOR UNLOADING CARS. JOHN L. BRYANT, Hillsdale, Mich. Filed June 16, 1888. Serial No. 277,401. (No model.)

Claim.—1. In a device for unloading cars upon railroad-tracks, the combination of a section of track, pivotally secured at the end of a connecting-track, and gearing for operating and rollers for supporting the pivoted track mounted on the same shaft, substantially as described.

2. The combination with a tilting track and its trunnions, of a semicircular flange and a segmental gear connected thereto, a shaft centrally arranged beneath the same, a gear-wheel meshing with said segmental gear, and a roller on which the flange rests, both gear-wheel and roller being on the same shaft, substantially as described.

3. The combination of the tilting track, two series of movable props beneath the track supporting the same on opposite sides, the

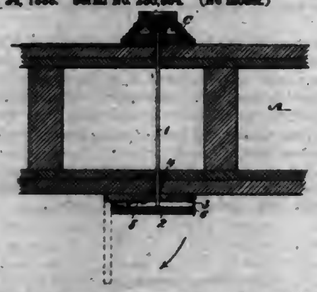
400,049.



shafts O and arms P, for moving simultaneously all of either set of said props, and the central gear-connection for tilting the track in either direction, substantially as described.

4. The combination, with the tilting section of track, of the stationary buffer secured alongside said track and the sliding counterweighted chutes supported thereon, substantially as described.

400,050. ANNUNCIATOR. IRA S. BUNKER, Nevada, Mo. Filed July 24, 1888. Serial No. 280,804. (No model.)



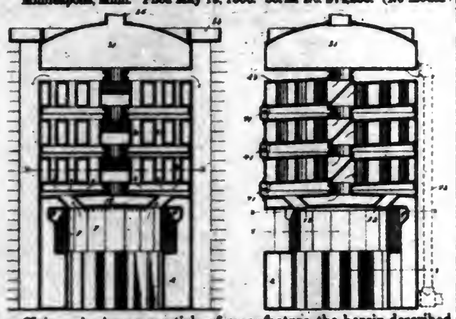
Claim.—1. In an electric annunciator, the combination, with the push-button and rod thereof, of a movable indicating-plate, substantially as described.

2. The push-button C of an electric annunciator, in combination with the rod 1, attached thereto, and the swinging plate 2, secured to a frame adapted to be projected by the operation of said push-button, substantially as described.

3. An additional indicator for an electric annunciator, consisting of a rod secured thereto and operated by the push-button of the annunciator, and movable plate secured to a frame adapted to be operated by contact with said rod, said parts being combined substantially as described.

4. The combination of a push-button, a rod, a back plate through which said rod passes, a movable plate connected to said back plate and adapted to be operated by the movement of said rod, a spring between said back plate and movable plate, and a catch adapted to hold said movable plate in closed position, substantially as described.

400,051. BOILER. FREDERIC A. CAMP and FREDERIC G. CORNER, Minneapolis, Minn. Filed May 14, 1888. Serial No. 274,253. (No model.)



Claim.—1. As a new article of manufacture, the herein-described heater-section consisting of the outer wall, the top and bottom plates, each provided with a single central opening, a series of flues extending through said top and bottom plates upon opposite sides of said opening, and a diaphragm extending from the top plate on one side of the top opening to the bottom plate on the other side of the bottom opening.

2. As a new article of manufacture, the herein-described heater-section consisting of the outer wall, the top and bottom plates, each provided with a single opening, the two series of flues extending through said top and bottom plates, and the diaphragm extending from the top plate on one side of its opening to the bottom plate on the other side of its opening and between the two inner flues, substantially as described.

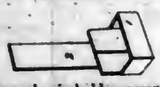
3. The combination, in a heater, of the water-jacket provided with a central single opening, the series of heater-sections, each provided with a single central opening at its top and bottom, and the diaphragm extending from the top of the section on one side of the opening to the bottom of the section on the opposite side, and the threaded couplings connecting said sections and connecting the lower section and the water-jacket, substantially as described.

4. The combination, in a heater of the class described, of the series of sections, each provided with a central threaded opening in its top and bottom and with an inclined diaphragm extending from the top of the section on one side of the opening to the bottom of the section upon the opposite side of the opening, and the threaded couplings securing said sections together, substantially as described.

5. The combination, in a heater of the class described, of a series of sections, each provided with inclined top and bottom walls and with an opening in each of the walls, a diaphragm extending from the top wall on one side of its opening to the bottom wall on the opposite side of its opening, a series of flues extending through each of the sections, and means for securing all of said sections together, substantially as described.

6. The combination, in a heater of the class described, of the series of sections secured together and communicating with each other, each provided with a single central opening in its top and bottom, a diaphragm arranged between said openings and with inclined top and bottom walls forming an upwardly-inclined space from the bottom opening to the top opening, and flues extending through said sections, for the purpose set forth.

400,052. COIN-PACKAGE. GEORGE I. CASTNER, Memphis, Tenn. Filed Dec. 13, 1887. Serial No. 257,796. (No model.)



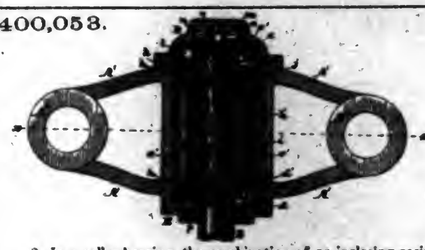
Claim.—1. The improved coin-holder composed of the binding-strip 2 and the holder proper, 1, which is made of a strip whose ends abut each other, the said binding-strip being united to the said ends at right angles to the holder 1, and both the parts 1 and 2 being made of less width than the coins the holder is designed to contain, and the holder proper, 1, being made of less cubical capacity than the largest cross-section of the coins to be contained in it, as shown and described.

2. The combination of a series of binding-strips, 2, a backing-piece, 3, to which they are pasted, and the strip 1, bent, as shown, and pasted to the part 3 at points intervening the binding-strips 2, as specified.

400,053. ROLLER-JOURNAL BEARING. CYRIL B. CHAPLIN, Boston, Mass. Filed Nov. 17, 1883. Serial No. 291,061. (No model.)

Claim.—1. In a roller-bearing, the combination of an outer casing and a cylindrical bushing divided longitudinally into two parts, the plane of division being oblique to its axis.

400,053.



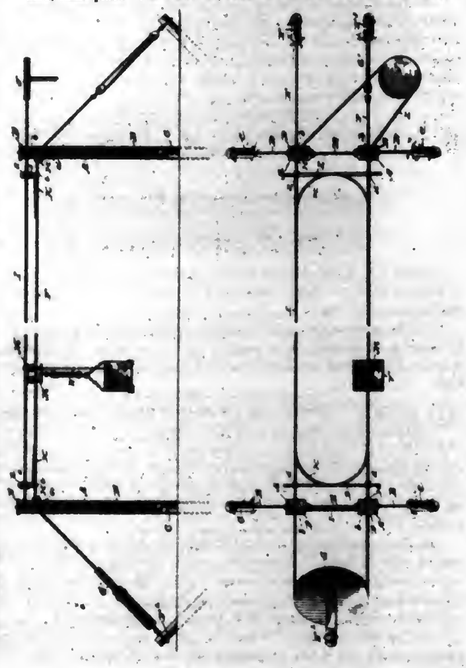
2. In a roller bearing, the combination of an inclosing casing or box, a roller-carrying frame composed of two annular heads or collars connected together by a series of tie-rods, a series of bearing-rolls lying loosely between said heads or collars, a corresponding number of smaller rolls having frusto-conical bearing ends and arranged one between each two of said bearing-rolls, each of said heads being provided with a corresponding number of curved slots having inclined sides to receive the frusto-conical bearing ends of said smaller rolls.

3. In a roller-journal bearing, the combination, with the axle or journal, of the collars *e* and *f*, secured thereon, the roller-carrying frame *h h h'*, fitted to said journal between said collars and revoluble thereon, the bearing-rollers C C, resting loosely between the heads of said revoluble frame without bearings therein, the smaller rolls, *i*, alternating with said bearing-rolls and having bearings in said heads, and an outer casing or box inclosing the whole and having a cylindrical inner surface upon which the bearing-rollers travel as the journal or axle is revolved.

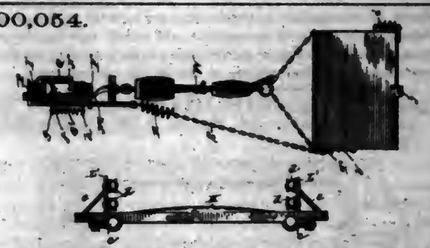
4. In combination with the axle or journal and the outer casing or box, the annular collar *k*, secured in a fixed position in the outer end of said casing, the collar *e*, secured to the end of said axle or journal and having formed in its inner face an annular groove or pocket, a ball fitted in said groove or pocket and arranged to bear against the collar *k*, and to take the thrust of the shaft or axle in one direction, the cap D, inclosing said collar *e*, the annularly-grooved disk *m*, fitted to a recess in said cap, the steel disk *c'*, set in the outer face of the collar *e*, and a ball or balls interposed between the disk *c'* and the annularly-grooved disk *m*, so as to take the thrust of the shaft or axle in the opposite direction.

5. The combination of the casing or box, the axle or journal, the collars *e* and *k*, the cap D, the disk *m*, the balls *l* and *n*, and the ball-carrier *o*, all constructed, arranged, and operating substantially as and for the purposes described.

400,054. ELEVATED RAILWAY. JOHN R. CHAPMAN, Montgomery, Ala., assignor of two-thirds to Charles P. Ball and Charles T. Pollard, same place. Filed Nov. 13, 1888. Serial No. 290,749. (No model.)



400,054.



Claim.—1. The combination of the upright posts, the tiller-rope passing around sheaves supported by the posts, means for moving said rope, stake-posts to the rear of the upright posts, the track-rope passed around sheaves supported by the upright posts and connected to the stake-posts, means for keeping said track-rope taut, and a carriage moving over said track-rope and provided with a grip clamping said tiller-rope and adapted to be released therefrom to stop the movement of one carriage while the tiller-rope continues to travel to move another carriage, substantially as and for the purposes described.

2. The combination of the upright posts, the traveling tiller-rope supported by said posts, means for moving said rope, stake-posts to the rear of said upright posts, a track-rope in said upright posts and connected at one end of the structure to a stake-post by block and tackle and at the other end of the structure passed around a sheave-block connected to the stake-post, and a carriage moving over said track-rope and provided with a grip clamping said tiller-rope and adapted to be released therefrom to stop the movement of one carriage while the tiller-rope continues to travel to move another carriage, substantially as and for the purposes set forth.

3. The combination of the double elevated track, the traveling tiller-rope, the carriage running upon said track and provided with a grip connecting it with the tiller-rope, the switch-track connecting the two tracks upon which the carriage runs, for the purpose of shifting the carriage from one track to the return track, and a brace connecting the main track and tiller-rope, said brace clasping the tiller-rope and main track on both their upper and lower faces to insure the movement of one with the other and prevent disconnection of either from the other, substantially as and for the purposes set forth.

4. The combination, with the tiller-rope and the main track, of the switch composed of the cross-bar resting upon the main track, the curved track secured to said bar and connecting with the main track, and the upright braces provided with the friction-rolls, between which the tiller-rope passes, substantially as and for the purposes set forth.

5. The combination of the double elevated track, the traveling tiller-rope, the carriage running upon said track, the vertically-moving grip connected to the carriage and adapted to clamp the tiller-rope, the lever connected with said grip to clamp and lock it to the tiller-rope, and the spring connected with the frame and the grip to disconnect the grip from the tiller-rope when the lever is released, substantially as and for the purposes set forth.

6. The combination, with the carriage and spring-actuated grip and lever, of the second spring interposed between the lever and spring-grip to relieve the grip of too sudden application, substantially as and for the purposes set forth.

7. The combination, with the double elevated track, of the switch-track connecting the two tracks and provided with means for connecting the track and tiller-rope, said means embracing both the track and tiller-rope on their upper and lower faces, to hold them together, and adjustable along the length of the tracks, substantially as and for the purposes set forth.

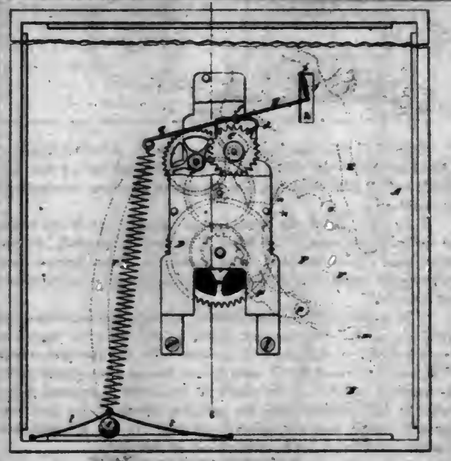
400,055. MECHANICAL TOY. WILLIAM D. CRANE, Hackensack, N. J. Filed Nov. 12, 1888. Serial No. 290,536. (No model.)

Claim.—1. The combination, with a driving mechanism and a rotary reciprocating arbor, *f*, of the crank *g*, connected with said arbor, and the figure E, pivotally connected with said crank, and the pin *m*, placed higher than the lowest portion of the figure and upon which the figure may strike to be deflected laterally, substantially as described.

2. The combination of a driving mechanism having a rotary reciprocating arbor, *f*, with the laterally-extending crank *g*, having a vertical end part, figure E, horizontal pin *i*, for supporting said figure, and sleeve *j*, carrying said pin, said sleeve embracing the vertical part of the crank *g*, substantially as described.

3. The combination, with a reciprocating figure, E, having jointed lower part, F, that is supported by the figure and free to swing on its pivot, and means, substantially as described, for reciprocating said figure, of the spring *n*, connecting the body of the figure with the pivoted extremity for regulating the swinging movement of the part F, substantially as described.





4. The combination, with a reciprocating figure, having jointed lower part, F, pivotally suspended therefrom, and means, substantially as described, for reciprocating said figure, with the spring *n*, connecting the body of the figure with the pivoted extremity and with the weight *p*, carried by said extremity, substantially as described.

5. The combination, with a driving mechanism and a rotary reciprocating arbor, *f*, substantially as described, of the crank *g*, carried by said arbor, spring *r*, connected with said crank, and the weight *s*, carried by said spring, substantially as described.

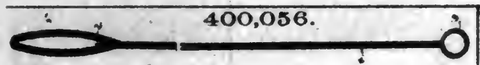
6. The combination, with a driving mechanism and a rotary reciprocating arbor, *f*, substantially as described, of the crank *g*, carried by said arbor, spring *r*, connected to said crank, weight *s*, and cords *t*, all arranged substantially as described, whereby an irregular motion is given to the arbor *f*, substantially as specified.

7. The combination, with a driving mechanism and a rotary reciprocating arbor, *f*, substantially as described, of the crank *g*, carried by said arbor, and a figure, E, pivotally connected with said crank, and of the crank *q* and spring *r*, connected with said crank, and the weight *s* on the spring *r*, all arranged for operation, substantially as described.

400,056. MEDICATED BOUGIE. THOMAS CERESTY, London, England. Filed Oct. 4, 1888. Serial No. 287,172. (No model.) Patented in England Aug. 23, 1888, No. 12,137.

Claim.—1. A medicated instrument or bougie constructed with a stem, 1, consisting of a straight wire, 2, bent at one end to form a

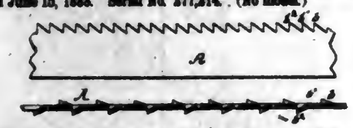
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ring-handle, 3, and having a wire, 4, wound around the wire 2, and at its end forming a frame, 5, bulging in the middle and tapering at the ends, substantially as shown and described.

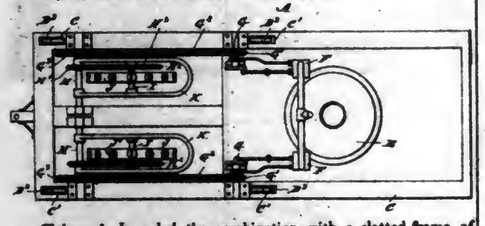
2. A medicated instrument or bougie constructed with a stem, 1, consisting of a straight wire, 2, bent at one end to form a ring-handle, 3, and having a wire, 4, wound about the wire 2, and at its end forming a frame, 5, bulging in the middle and tapering at the ends, which is covered with a medicated composition, 6, forming a head, 7, bulging in the center and having conical ends, substantially as described.

400,057. HACK-SAW. GEORGE H. CLEMSON, Middletown, N. Y. Filed June 15, 1888. Serial No. 277,314. (No model.)



Claim.—As an improved article of manufacture, a hack-saw provided with the teeth b b' b^2, all of the same form and height and having their cutting-edges square, the teeth b' lying in the plane of the blade and the teeth b b^2 set in opposite directions, as set forth.

400,058. STEAM-SLED. JAMES F. COSHIFF, Oconto, Wis. Filed July 24, 1888. Serial No. 280,894. (No model.)



Claim.—1. In a sled, the combination, with a slotted frame, of runners pivoted to the under side of the frame and having their upwardly-curved ends projecting into the slots of the frame, substantially as described.

2. In a steam-sled, the combination, with the shaft H and means for operating the same, of the frame K, pivoted on the shaft, the propeller-wheel I, journaled in the said frame, and means for operating the propeller-wheel from the said shaft, substantially as herein shown and described.

3. In a steam-sled, the combination, with a supporting-frame, the shafts G, provided with sprocket-wheels G', and means for operating the said shafts, of the shafts H, provided with the sprocket-wheels G^2 H', the sprocket-chain G^3, passing over the sprocket-wheels G' G^2, the frames K, pivoted on the shafts H, the shafts I, mounted in the frames K and provided with the sprocket-wheels H^3, the sprocket-chains H, passing over the sprocket-wheels H' H^3, and the propeller-wheels J on the said shafts, substantially as described.

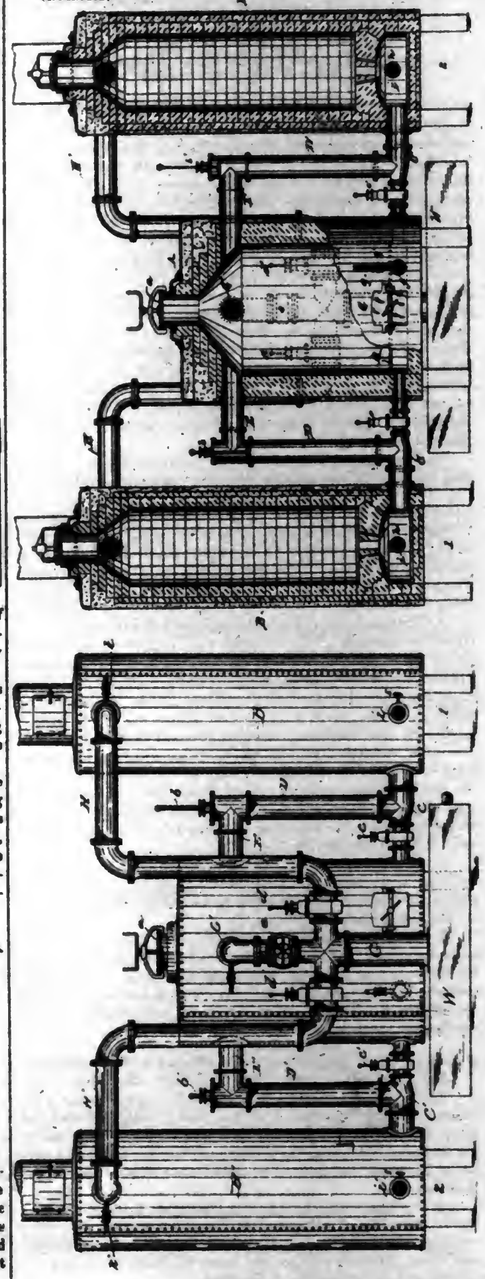
400,059. PAGE-INDEX. JOHN A. COOK, Buffalo, N. Y. Filed Sept. 5, 1887. Serial No. 248,843. (No model.)



Claim.—1. A book having a page-index and page-number combined, substantially as described, the page-numbers of the even series being placed on one side and those of the odd series on the opposite side of the book, said numbers running along the edges of the leaves from top to bottom in multiples of rows, the book being provided with a mark dividing the even and odd series, as and for the object stated.

2. A page-index for books to locate the pages, consisting, essentially, of two divisions, one having a series of even numbers placed upon the left-hand side and the other having the series of odd numbers on the right-hand side, each page-number being placed upon a spot in its respective division other than the top corner of the page and the rest of said page in the index cut away below said numbers, whereby all the numbers in the divisions are exposed to view simultaneously when the book is opened in the middle between the two divisions, said book being provided with a marker indicating the place where the two divisions separate, as and for the purpose stated.

400,060. APPARATUS FOR THE MANUFACTURE OF GAS. WILLIAM M. CONN, Baltimore, Md. Filed Jan. 12, 1888. Serial No. 260,505. (No model.)

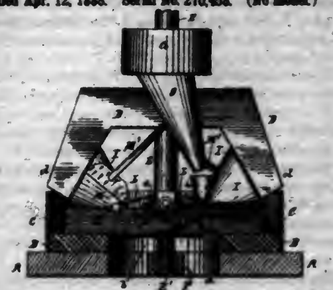


Claim.—1. In combination, a generator, A, provided with a grate, a, and with a steam and air pipe communicating with said generator beneath the grate thereof, and provided, also, with a hydrocarbon and steam supply pipe communicating with the upper part of the generator, a superheater or fixer having a combustion-chamber in its lower part provided with an air-pipe, a steam-supply pipe communicating with the upper part of the superheater or fixer, a pipe, C, connecting said combustion-chamber with the space beneath the grate of the generator and provided with a valve, c, a pipe, D E, having a valve and leading from the upper part of the generator into the combustion-chamber of the superheater or fixer, and an exit-pipe for the superheater or fixer, the parts being constructed and arranged to operate substantially as and for the purpose set forth.

2. In combination, a generator, A, provided with a grate, a, and with a steam and air supply pipe communicating with said generator below the grate thereof, and provided, also, with a hydrocarbon-supply pipe communicating with the top of the generator, superheaters or fixers B and B', each having a steam-supply pipe communicating with its upper part and a combustion-chamber in its lower part provided with an air-supply pipe, pipes C C', connecting the combustion-chambers with the space in the generator beneath the grate, valves in these pipes, pipes D E and D' E', with their respective valves, connecting the top of the generator with the combustion-chambers of the superheaters or fixers, respectively, and an exit-pipe from each of the superheaters and fixers, all substantially as and for the purpose set forth.

3. In combination, a generator, A, provided with a grate, a, and with steam and air supply pipes communicating with said generator below the grate thereof, and provided, also, with a hydrocarbon-supply pipe communicating with the top of the generator, superheaters or fixers B B', each having a steam-supply pipe communicating with its upper part and a combustion-chamber in its lower part provided with an air-supply pipe, pipes C C', connecting the combustion-chambers with the space in the generator beneath the grate, valves in these pipes, pipes D E and D' E', with their valves, connecting the top of the generator with the combustion-chambers of the superheaters or fixers, respectively, an exit-pipe, G, from the top of the generator, having a valve, c, and pipes H and H', leading from the top of the superheaters and fixers and uniting with the pipe G at a point below the valve c, said pipes H and H' being provided each with a valve, all substantially as and for the purpose set forth.

400,061. GRAIN-CRUSHING MILL. JAMES CURTIS, Moscow Mills, Mo. Filed Apr. 12, 1888. Serial No. 270,458. (No model.)

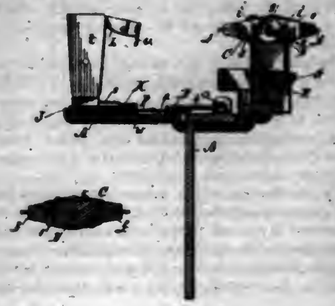


Claim.—1. A grain-crusher feed-box, H, constructed with the hopper A, bearing k', concave projections A^2, and opening A^3, in combination with a grain-crushing roll, I, as and for the purpose set forth.

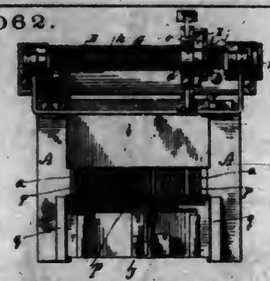
2. In a grain-crusher, an upright shaft, yoke, crushing-rolls, and arms J, mounted on said upright shaft, in combination with the arms L, pivotally fastened to the arms J of scrapers, and feed-boxes pivotally mounted on opposite sides of said arms L, as shown and described.

400,062. TRANSFERRING MECHANISM FOR KNIT WEBS. ALBERT T. L. DAVIS, Lake Village, and GEORGE E. STEVENS, Laconia, assignors to the Pitman Manufacturing Company, Laconia, N. H. Filed Dec. 19, 1887. Serial No. 258,341. (No model.)

Claim.—1. A knocking-on wheel, in combination with a set of transferring-points, substantially as set forth.



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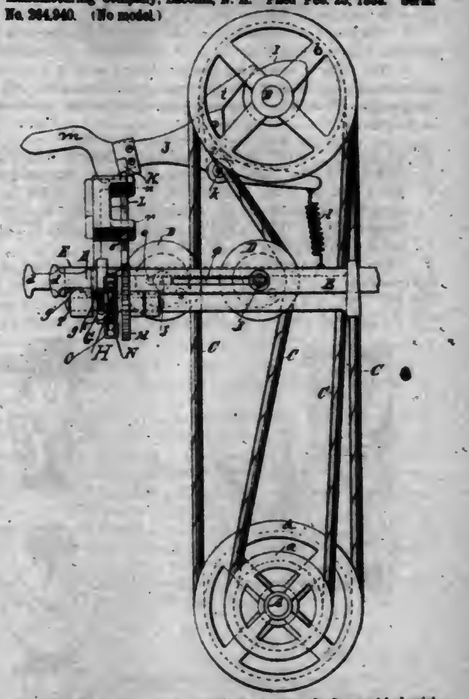
2. In combination with a set of transferring-points, a knocking-on wheel adapted to have a traveling movement along the said transferring-points and means for imparting a traveling movement to the said knocking-on wheel, substantially as herein set forth.

3. A knocking-on wheel having elastically-yielding wings e, in combination with a set of transferring-points, substantially as herein set forth.

4. The combination of a supporting-frame, A, a set, B, of transfer-points a a, a transfer, J, having corresponding points, p p, and guides q q, for holding the transfer in proper position in relation to the said points a a, substantially as and for the purpose herein specified.

5. A transfer, J, provided with a sliding plate, K, having a set of fingers, w w, extending down between the points p p of the transfer, substantially as and for the purpose herein set forth.

400,063. STOP-MOTION MECHANISM FOR KNITTING-MACHINES. ALBERT T. L. DAVIS, Lake Village, assignor to the Pitman Manufacturing Company, Laconia, N. H. Filed Feb. 23, 1888. Serial No. 264,940. (No model.)

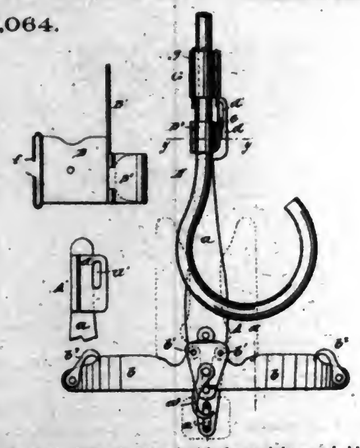


Claim.—The combination, with the power-shaft provided with the pulleys a a, driving-shaft B, provided with the pulleys b b and cam I, belts C C, binding-pulleys D D, binder-bars E E, catch-bar G, and lifting-bar H, of the vibratory lever J, actuated by the cam I and provided with the cam K, the pawl L, ratchet-wheel M, sprocket-wheel N, and pattern-chain O, provided with cam projections r r, substantially as and for the purpose herein set forth.

400,064. UMBRELLA-HOLDER. ADOLF DENHARD, Bonn, Germany. Filed Nov. 15, 1888. Serial No. 290,894. (No model.)

Claim.—1. The umbrella-holder herein shown and described, consisting of the main body-frame A, the holder B, attached to said frame, and the clasp G, attached to the umbrella-handle and adapted to be attached to the holder B, substantially as described.

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2. The body-frame A, formed with the upright *a* and side pieces, *b b*, in combination with means for attaching the frame to the clothing, and the projection A', and means for holding the umbrella-handle, substantially as described.

3. The upright *a* of the body-frame A, adapted to hold the umbrella, in combination with the hinged side pieces, *b*, and means for attaching the frame to the clothing, substantially as described.

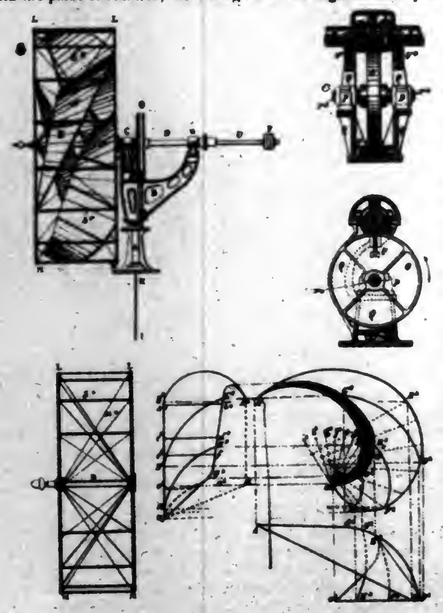
4. The body-frame A, provided with the projection A', and the holder B, applied thereto and formed with the plate B', in combination with the clasp G, having loop g^6, substantially as described.

5. The holder B, adapted to be attached to the body-frame and provided with the plate B' and hook B^2, substantially as described.

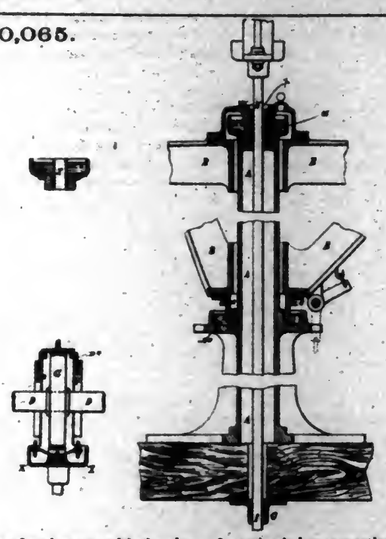
6. The clasp G, comprising the two hinged sections *g g'*, one of said sections being formed with the loop g^6, in combination with the upright piece B', attached to a main part of the holder, substantially as described.

400,065. WIND-MOTOR. ALEXANDRE DUMONT, Paris, France. Filed Apr. 14, 1885. Serial No. 162,163. (No model.) Patented in Spain Apr. 4, 1882, No. 3,735; in France Oct. 17, 1882, No. 151,626; in Belgium Nov. 30, 1882, No. 59,735; in England Dec. 1, 1882, No. 5,743; in Germany Dec. 14, 1882, No. 23,934; in Italy Dec. 31, 1882, XXIX, 426, and in Austria-Hungary Oct. 26, 1883, No. 42,864.

Claim.—1. The rotary vane of a wind-motor constructed on the demi-parabola $a^2 b^2 c^2 d^2 e^2 f^2 g^2 h^2 i^2$ and forming the curves $A^2 B^2$ $C^2 D^2$ $E^2 F^2$ $G^2 H^2$, said curves lying in planes that form varying angles with the plane of rotation, the cotangent of the angle formed by the



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plane of each curve with the plane of rotation being proportionate to the distance between each curve and its center, as specified.

2. In a windmill, the combination of the wind-wheel E and its shaft D, having steel bushing R, with the supporting-roller O, bearings P P, oil-chamber T, containing a wick that contacts the roller O and screws U^6 U^6, whereby the shaft D may be adjusted with relation to the roller O, as specified.

3. The wind-wheel E and its shaft D, combined with the eccentric G, eccentric-yoke D^4, having slots V^2, through which the shaft D passes, roller X, that engages the shaft D to lubricate the same, roller Y, that engages the eccentric G, and rod H I, substantially as herein shown and described.

4. The wind-wheel E and its shaft D, combined with the swiveled supporting-frame B, post A, passing through and supporting the frame B, cap W, secured to the frame B over the post, and the annular step Z, surrounded by the cap W and carried by the post A within its upper end, substantially as herein shown and described.

5. The wind-wheel E and its shaft D, combined with the swiveled supporting-frame B, post A, passing through and supporting said frame, cap W, secured to the frame B, annular step Z, carried by the post A at its upper end and within the cap W, collar a^6 on frame B at a distance below the cap W, and with an annular cavity, A^2, on the post A, into which said collar a^6 dips, as specified.

6. The wind-wheel E and its shaft D, combined with the toothed wheels *l m*, the wheel *l* being driven by the shaft D, and the wheel *m* driven by the wheel *l*, lever-arm *n*, actuated by the wheel *m*, weight *p* on the arm *n*, eccentric G on the shaft D, and rod H I, connected with the eccentric G, substantially as herein shown and described.

400,066. RAILROAD-CAR SEAT. ERIK RENQUIST, Brooklyn, N. Y. Filed Nov. 6, 1888. Serial No. 290,078. (No model.)

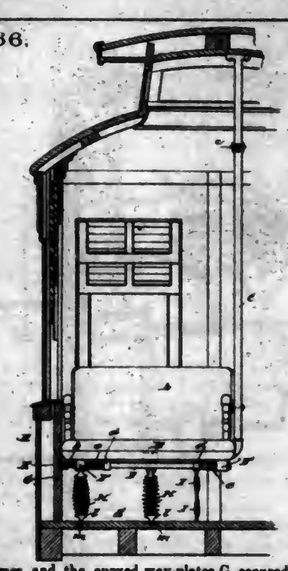
Claim.—1. The combination, with a seat having a slide at one end and curved ways in which the slide moves, of a depending swinging support, to the lower end of which the opposite end of the seat is secured, substantially as set forth.

2. The combination, with a railroad passenger-car body, of a series of swinging seats suspended above their own range of motion from or near the roof of the car, one in front of the other, depending supports from which said seats are so suspended, and springs extending from the seats to the floor of the car, tying said seats to said floor and adapted to yield in concert with the swinging action of the seats, essentially as set forth.

3. The combination, with a railroad passenger-car body, of the seats B, the pivoted suspension-rods C at the one end of said seats, connected at their lower ends with said seats and at their upper ends with the car-body at or near its roof, the slides E, provided with rollers at the opposite ends of the seats, and the fixed plates G, constructed to form curved ways and supports for said slides of like radius with the suspension-rods, substantially as specified.

4. The combination, with a railroad passenger-car body, of the swinging supports suspended from or near the roof of the car, the seats connected at one end to the lower ends of said supports, the frames attached to the under sides of said seats, composed of back and front longitudinal rods, D, and cross or opposite end connecting-bars, D', slides E, provided with rollers and attached to the one end

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of said frames, and the curved way-plates G, secured to the side of the car and adapted to form a guide and support for the slide E, essentially as described,

5. In a suspended and swinging car-seat, B, the combination, with said seat, apertured lugs or ears *d* on its lower side, and the car-body, of suspension-connections uniting the outer ends of the seats with the car-body at or near its roof, a frame attached to the under side of the seat, composed of longitudinal sliding rods D D, passed through said ears or lugs, cross rods or bars D' D', springs *e e* on the rods D, between the cross-bars and the ears or lugs, controlling the sliding movement of the rods D D, the slide attached to the inner one of said cross-bars, and the curved way-plate G, secured to the side of the car and adapted to form a guide and support for the slide E, substantially as described.

6. In a suspended and swinging car-seat, B, the combination, with said seat and the car-body, of a suspension-connection, C, uniting said seat with the car-body at or near its roof, the frame D D', attached to the under sides of said seat, the slide E, pivoted to the inner end of said frame, the springs *h h*, interposed between said end of said frame and the slide, and the curved way-plate G, secured to the side of the car and adapted to form a guide and support for the slide E, essentially as described.

7. In a suspended and swinging car-seat, B, the combination, with said seat and the car-body, of a suspension-connection, C, uniting said seat with the car-body at or near its roof, and the diagonally-arranged springs I I, uniting said seat with the floor of the car, substantially as shown and described.

8. In a suspended and swinging car-seat, B, the combination, with said seat and the car-body, of a suspension-connection, C, uniting said seat with the car-body at or near its roof, the supporting-springs H, connected at their upper ends with the seat and having toe-pieces *l* at their lower ends, and the sockets *m* in the floor of the car adapted to receive said toe-pieces loosely within them, essentially as shown and described.

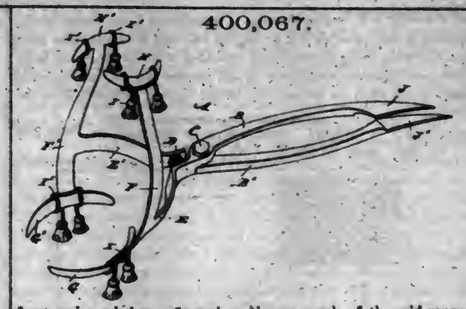
9. The combination, with a railroad passenger-car body, of a series of swinging supports arranged one in front of the other, suspended at their upper ends from or near the roof of the car, the seats connected at one end to the lower ends of said supports and supported by an attached slide working in a fixed guide at their other end, springs tying said seats to the floor of the car adapted to admit of the swinging of the seat, and supporting-springs connected at their upper ends to the seat, and having a loose fit at their lower ends within the floor of the car, substantially as specified.

400,067. TONGS. JOHN T. EVANS, Rhinerville, Utah. Filed June 9, 1888. Serial No. 276,601. (No model.)

Claim.—1. An improved lamp-tongs comprising two pivoted and spring-pressed prongs, B B', having their front ends, E E', curved outwardly, the curved arms F F', secured to and extending above and below the said ends, and the curved cross-pieces G G' and H H' on the lower and upper ends, respectively, of the said curved arms, substantially as herein shown and described.

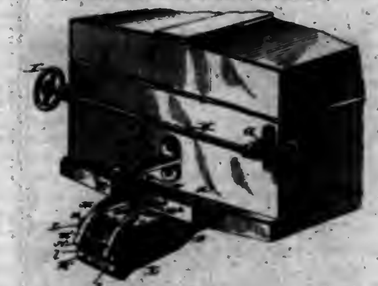
2. A pair of combined tongs and wick-trimmer, comprising two prongs pivoted together, a spring placed between the front ends of the said prongs, arms having cross-pieces and secured on the said

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front ends, and shears formed on the rear ends of the said prongs, substantially as shown and described.

400,068. CAR-COUPLING. ROBERT L. EVANS, Scottsborough, Ala. Filed Aug. 7, 1888. Serial No. 282,187. (No model.)

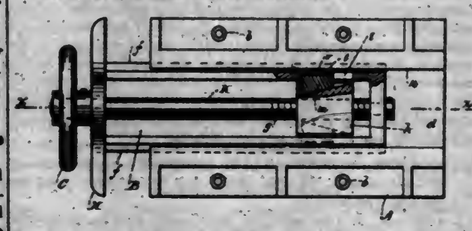


Claim.—1. In a car-coupler, the combination, with the draw-head B, the pin C, having a fixed collar, c^6, and means, substantially as described, for raising the pin, of a ∩-shaped pin-holder adapted to engage the collar c^6 of the pin C, said holder pivoted to the draw-head and provided with extending arms *m m*, adapted to be struck by the draw-head of an approaching car, substantially as and for the purposes described.

2. In a car-coupler, the combination, with the draw-head B, provided with grooves L L and recesses *n*, and the ∩-shaped pin-holder pivoted in the grooves L, the upper portion, m^2, thereof extending upwardly and rearwardly over the draw-head, the lower extending arms, *m m*, fitting the grooves L L, and springs N, seated in the recesses *n n* and adapted to normally throw the arms *m m* outwardly, of the coupling-pin C, said pin consisting of the lower portion, *c*, the upper extended portion, *c'*, provided with a fixed collar, c^6, and means, substantially as described, for raising the link, whereby the collar is adapted to be engaged by the holder M, substantially as and for the purposes described.

3. In a car-coupler, the combination, with transverse shaft G, provided with operating-wheels H, and the bracket D, having an elongated slot, *d*, of the pin C, its upper end passing through slot *d* in the bracket D and connected with the shaft G, and provided with a fixed collar, c^6, the spring E, mounted on said pin and disposed between the collar c^6 and the bracket D, and the ∩-shaped supporter M, pivoted on the draw-head adapted to hold said pin in its elevated position, all arranged substantially as and for the purpose specified.

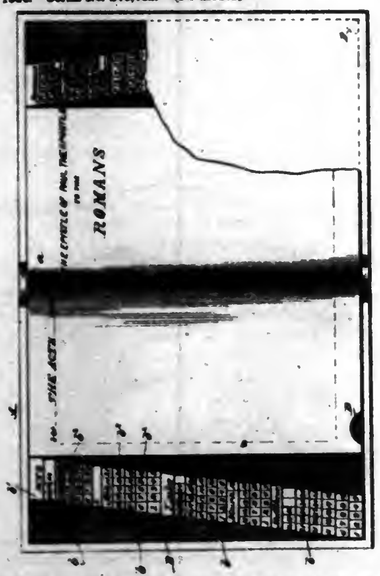
400,069. VISE. FREDERIC R. FARWELL, Fitchburg, Mass. Filed Oct. 4, 1888. Serial No. 287,185. (No model.)



Claim.—The combination of a fixed jaw having an attaching-plate provided with ways, a movable jaw provided with a box-shaped flanged frame adapted to slide in said ways and having slots in its sides, a rod journaled in the ends of said frame and provided with a screw-thread near its inner end, a nut adapted to travel on said rod

and provided with inclined grooves in its opposite faces, wedge-blocks disposed in said grooves and projecting into said slots, the outer faces of said blocks being serrated and provided with recesses, and laterally-expanding springs adjusted in said recesses and bearing upon the edges of said ways for forcing said blocks inward, substantially as described.

400,070. INDEX. JOHN P. FINDLEY, Blanchard, Pa. Filed July 12, 1888. Serial No. 279,782. (No model.)



Claim.—1. A book having its index formed in sections on opposite sides of a central or intermediate starting-point, and having the leaves of each said sections cut away from said starting-point to expose in the direction thereof portions of the leaves corresponding to each desired division and subdivision of the subject-matter of the book, substantially as and for the purposes specified.

2. A book having an index formed in sections on opposite sides of a central or intermediate starting-point, and provided with a nick or nicks cut in the edges of the leaves and terminating at one of the leaves which mark the intermediate starting-point, substantially as set forth.

3. A book having an index arranged in sections on opposite sides of an intermediate starting-point, each section being formed of a number of series facing toward the intermediate starting-point, and each of said series having a heading and subdivisions thereunder corresponding to the desired divisions and subdivisions of the subject-matter of the book, all substantially as and for the purposes specified.

4. A book having its index formed in sections on opposite sides of a central or intermediate starting-point, the ends of both sections of the index adjacent said starting-point being arranged at the same end of the leaves of the book, whereby the edge of the book is formed with a channel gradually widening toward one end, substantially as set forth.

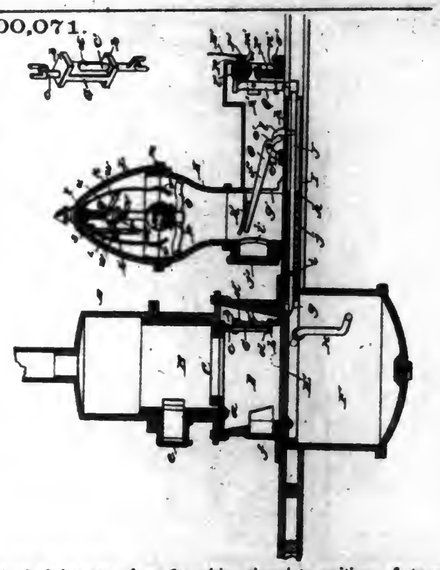
5. A book having its index formed on opposite sides of a central or intermediate starting-point, and having the leaves of each said sections cut away from said starting-point to expose in the direction thereof portions of the leaves corresponding to each desired division and subdivision of the subject-matter, the ends of both said sections adjacent the starting-point being arranged at the same end of the leaves of the book, whereby the edge of the book is formed with a channel gradually widening toward one end, and a nick or nicks, D, being provided in the edges of the leaves and arranged to terminate at one of the leaves which mark the intermediate starting-point, all substantially as and for the purposes specified.

400,071. SAFETY CAR LAMP AND STOVE. OWEN FRANKS and WILLIAM CARROLL, Columbus, Ohio. Filed Dec. 1, 1887. Serial No. 256,614. (No model.)

Claim.—1. In a car-stove, the combination, with the stove-body A, provided with tight fire and ash-pit doors, of the hinged grate C, the hinged ash-pit bottom E, the shackle G, connecting the grate and the ash-pit bottom, the reservoir F, containing a fire-extinguishing liquid, and a fastener for holding the ash-pit bottom in the position of use, substantially as described.

2. The combination, with the heater having a connected grate

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and ash-pit bottom, a lever for raising them into position, a fastener for sustaining them, and a lever for operating the fastener, of a loosely-supported weight above the lever to operate the same by its fall, substantially as set forth.

3. The combination, with a stove, A, provided with the movable grate C, the movable ash-pit bottom E, and the reservoir F, of the tubular column K, the weight-supporting cup *p*, the spherical weight M, the lever O, arranged to be struck by the falling of the weight M, and the retaining and releasing rod J, substantially as described.

4. The combination, with the tubular column K, weight-supporting cup *p* therein, and the spherical weight M, of the adjustable springs *u*, extending at opposite sides of the weight, substantially as described.

5. The combination, with the tubular column K, the weight-supporting cup *p*, and the spherical weight M, of the cap L, the springs *u*, the screw-threaded rod N, depending from the inner upper end of the cap, the follower *q* on the rod, the links *w*, connecting the springs and follower, the scale *a'*, and the index carried by the follower *b'*, substantially as described.

6. In a safety car stove and lamp, the combination, with a swinging grate and the sliding supporting-rod J, its releasing-lever, and the weight, of the lever Q, engaging the rod J with its lower end, the trigger R, having a tooth, *l'*, at one side engaging the upper end of lever Q and a stud, *m'*, at its outer side, and connections between the lamps and said stud, substantially as set forth.

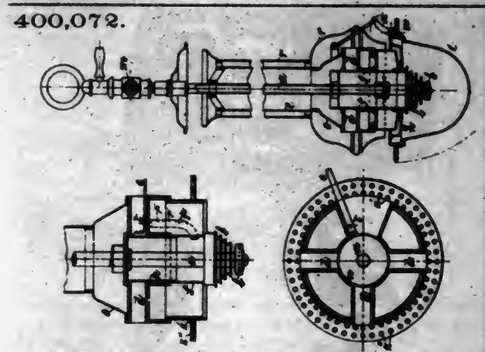
7. The combination, with the slotted casing I, and the spring-actuated rod J, projecting at both ends therethrough and having a lug, *l*, extending up through said slot, of the hollow column K above said casing, a weight, M, loosely supported therein, the pivoted lever O, engaging the lug *l* with its toe *c'*, and at its other end entering the column K in the path of the weight, the lever Q, engaging at its lower end the outer projecting end of the rod J, and the pivoted trigger R, having a tooth engaging the upper end of the lever Q and having a stud at its opposite end, substantially as set forth.

8. A combined safety-stove and lamp-extinguishing apparatus for cars, comprising the stove having a pivoted grate, a pivoted ash-pit bottom connected with the grate, a reservoir under the ash-pit, a locking-rod entering the reservoir and engaging the ash-pit bottom, the lug *l* on said rod, the column K, the weight M, supported loosely therein, the lever O, engaging the lug *l* and extending into the column in the path of the said weight, the lever Q, engaging the outer end of the rod J, the trigger R, engaging the upper end of the lever Q, the wick-operating devices, a rod connecting them, and a connection leading from said rod to the trigger, whereby when the weight falls the trigger, grate, and fire-pot bottom will be released, substantially as set forth.

400,072. REGENERATIVE GAS-BURNER. EDWIN FULLFORD and HENRY T. VAN LAUN, London, England. Filed July 18, 1888. Serial No. 280,304. (No model.) Patented in Belgium May 3, 1888, No. 81,673.

Claim.—1. The combination of the gas-pipe *a* and burner *b*, transparent globe or bowl *c*, with the tube *f*, chimney *e*, having the outlet-passages *d*, and mechanism for raising and lowering said chimney, substantially as set forth.

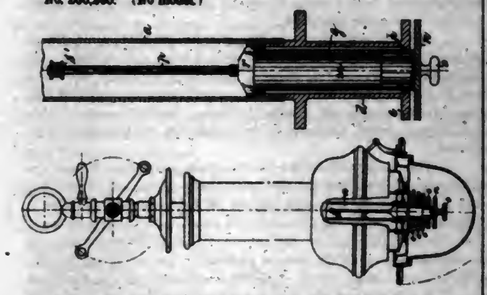
400,072.



2. The combination of the hinged frame *w*, lever or arm *x*, and link, with the chimney *e*, having rising and falling passages *d* movable therewith, and supporting devices for said chimney and said frame, whereby the lowering of the latter raises the former, substantially as set forth.

3. The combination, with the tube *f* and burner *b*, of the perforated pipe *p* and a casing having in its top above said pipe the hole *t*, substantially as set forth.

400,073. REGENERATIVE GAS-BURNER. EDWIN FULLFORD and HENRY T. VAN LAUN, London, England. Filed July 18, 1888. Serial No. 280,305. (No model.)



Claim.—1. In burners for regenerative and other gas-lamps, the combination, with the gas-supply pipe *a*, of the outer flanged tube, *d*, the inner tube, *g*, perforated near its base, flange *k*, below the perforations *l* through the tube, notched or perforated flange *i*, inner cylinder or plug, *m*, flange *n*, handle *o*, and screwed nut or cross-bar *r*, substantially as herein set forth.

2. The combination, with the cylinder or plug *m* and screwed nut or cross-bar *r*, of the spindle *p*, nut or stop *z*, the outer tube, *d*, the inner tube, *g*, the lower flange, *n*, and spindle *t*, said tube *g* having a notched flange at the top and a series of perforations near the bottom, substantially as set forth.

400,074. VELOCIPEDE. PETER GENDRON, Toledo, Ohio, assignor to the Gendron Iron Wheel Company, same place. Filed Nov. 15, 1887. Renewed Jan. 23, 1889. Serial No. 297,297. (No model.)



Claim.—1. In a velocipede, the combination, with the drive-wheel and its axle, of a bifurcated standard provided at its lower ends with half-bearings integrally formed therewith, and with half-bearings hinged thereto and provided with stubs forming complementary parts of the standard, and having jointly therewith an oval cross-section of slightly-increasing area toward the lower ends of said standard, and locking oval sleeves upon said standard, substantially as described.

2. In a velocipede, a detachable connection between the back frame and the standard, the same consisting of two rearwardly-projecting ears formed on the standard, one above the other, and provided with vertical bearings, the upper one of which is enlarged at its lower end, of a head formed on the end of the back frame and adapted to engage between the ears on the standard and have a vertical play between, of two pintles on said head engaging into the bearings formed in said ears of the standard, and of a saddle-strap provided at its forward end with a slotted locking-plate adapted to secure the parts detachably together, substantially as described.

3. In a velocipede, the detachable connection between the back frame and the standard, the same consisting of two rearwardly-projecting ears formed on the standard, one above and one below, a head formed on the front end of the back frame and adapted to engage between the ears on the standard and have a limited vertical play between the same, of two pintles on said head adapted to engage in vertical bearings formed in the ears of the standard, the upper one of which bearings is enlarged toward its lower end, of a saddle-strap provided at its forward end with a slotted locking-plate adapted to detachably secure the head of the back frame to the standard, of a wedge-shaped fin formed on top of the back frame, and a crotch formed on the metallic saddle-strap adapted to engage with said fin on the back frame, substantially as described.

4. In a velocipede, the detachable connection between the back frame and the standard, the same consisting of two rearwardly-projecting ears formed on the standard, one above and one below, a head formed on the front end of the back frame, and adapted to engage between the ears on the standard and have a limited vertical play between the same, of two pintles on said head adapted to engage in vertical bearings formed in the ears of the standard, the upper one of which bearings is enlarged toward its lower end, of a saddle-strap provided at its forward end with a slotted locking-plate adapted to detachably secure the head of the back frame to the standard, and of a saddle secured by an upwardly-dissolving connection with the back frame, substantially as shown.

5. In a velocipede, the combination, with a front drive-wheel, a bifurcated standard in which said drive-wheel is journaled, a rear axle, two rear wheels journaled upon said rear axle, and a back frame, of a triangular vertical truss in one piece pivotally connected at the forward end to the standard and secured at the rear end to the center of the rear axle, and of two lateral bifurcated braces, the bifurcated front ends of which are secured to the main frame upon opposite sides thereof, and the rear ends of which are secured to the rear axle near the outer ends thereof, substantially as described.

6. In a velocipede, the combination of a front drive-wheel, a bifurcated standard in which said drive-wheel is journaled, a rear axle, two hind wheels journaled upon said rear axle, a back frame consisting of a main frame in one piece, substantially of the form of a triangular vertical truss, pivotally connected to the standward and at the rear end secured to the center of the rear axle, and two lateral bifurcated braces upon opposite sides, with their bifurcated front ends secured to webs formed in the corners of the truss integral therewith, and with their rear ends secured at the ends of the rear axle, respectively, substantially as described.

7. The combination, with the back frame and bracket K, of the bearing-plate L, the S-spring secured thereto and provided with a hole in its free end, the saddle P, and the saddle-iron *n*, provided with the pin *w* and loop *v*, all arranged to operate substantially as described.

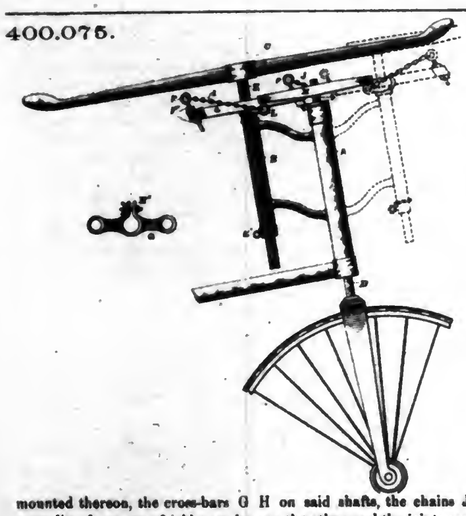
8. The combination, with the back frame and bracket K, of the bearing-plate L, adjustably secured upon said bracket, of the adjusting-screw *r*, journaled in stationary bearings in the bracket, and of the S-spring secured at one end to the bearing-plate and connected at the other end to the saddle and the saddle-strap, all substantially as described.

9. The combination, with the back frame, of the bracket K, having the upwardly-projecting lugs *p q*, the adjustable bearing-plate L, carrying the saddle-slot *m*, threaded lug *n*, and mortise *o*, formed on said bearing-plate, and the adjusting-screw *r*, all arranged substantially as described.

400,075. VELOCIPEDE. WILLIAM GOULDER, Lea Bridge Road, Clapton, County of Middlesex, England. Filed Dec. 20, 1887. Serial No. 258,883. (No model.) Patented in England Oct. 18, 1887, No. 14,144; in France Nov. 19, 1887, No. 174,198, and in Germany Nov. 19, 1887, No. 45,162.

Claim.—1. In combination with the steering-wheel of a velocipede and the rod D rising therefrom, the rod E, the steering-handle C,

400,075.



mounted thereon, the cross-bars G H on said shafts, the chains J, extending from one of said cross-bars to the other, and the joints connecting said chains to said cross-bars, these joints having up-and-down motion, but rigidly laterally, substantially as set forth.

2. In combination with the steering-wheel of a velocipede and a rod, D, connecting thereto a second rod, E, having a steering-handle thereon, cross-bars on said rods, connections between said cross-bars, a hollow cylinder, B, which holds said rod and clips E' E^2, and their thumb-screws for adjusting rod E, substantially as set forth.

3. The method of adjustment of the rod E of the cylinder B, for raising or lowering the handle-bar C or turning it on one side or parallel with the wheels by aid of the clips E' E^2 and thumb-screws Fig. 2.

400,076. **DEVICE FOR HOLDING TILE-SETTINGS.** ALFRED GREENAWAY, Louisville, Ky. Filed May 5, 1888. Serial No. 272,935. (No model.)



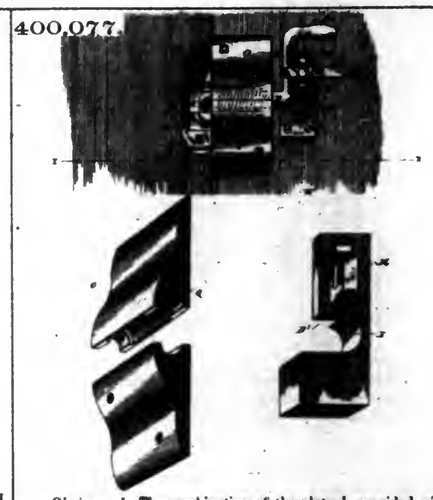
Claim.—1. In a tile-holder for fire-places, the combination, with the casing comprising the back and the sides bent at an angle thereto, of a longitudinal strip secured along said back and provided with projecting portions, substantially as and for the purpose set forth.

2. In a tile-holder for fire-places, the combination, with the casing, of a longitudinal strip secured along the back of the casing, said strip comprising the central secured portion and the angular projections extending therefrom, substantially as and for the purpose set forth.

3. In a tile-holder for fire-places, the combination, with the casing adapted to be disposed at the edge of the fire-place and comprising the back and the sides bent at an angle to the latter, of a longitudinal strip having its main portion secured to said back and provided with angular projecting portions, and transverse retaining-braces secured to the sides, substantially as and for the purpose set forth.

400,077. **FREIGHT-CAR LOCK.** JACOB HAHN, De Kalb, Ill. Filed Dec. 1, 1887. Serial No. 256,715. (No model.)

400,077.



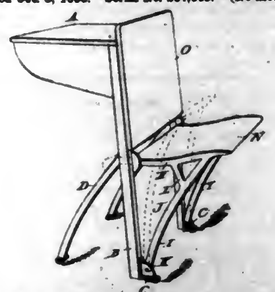
Claim.—1. The combination of the plate J, provided with the recess K and cross-bar F, the box O, provided with recess Q, the bolt B, having angular end seated in said box, the cleat C, provided with recesses D and D', and spring E and the lug G, substantially as shown, and for the purpose described.

2. In combination with the freight-car I, the plate J, rigidly attached to said car near the door opening therein and provided with the recess K, the door W, provided with cleat C, having recesses D and D' therein, and a bolt, B, seated on said door and provided with the engaging end H, and adapted to engage the said recess K when said door is closed, substantially as shown, and for the purpose described.

3. The combination of the box O, seated on the door W, and provided with recess Q therein, the bolt B, pivotally seated in said box and provided with the engaging end H, the spring E, the plate J, affixed to the car I, and provided with recess K and engaging-bar F, and the cleat C, provided with recesses D and D', whereby said bolt is adapted to be partially rotated and held in and out of engagement with the car I, substantially as shown, and for the purpose described.

4. In combination with the car I, having formed exteriorly thereon the recess K and engaging-bar F, the door W, provided with rock-bolt B, having the engaging end H, and the lug G, said bolt being adapted, substantially as shown, to be drawn and held in and out of engagement with said recess K, for the purpose described.

400,078. **SCHOOL DESK AND SEAT.** GUSTAVUS HAMEL, De Soto, Mo. Filed Oct. 3, 1888. Serial No. 287,065. (No model.)

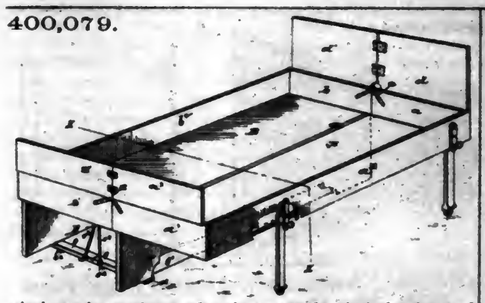


Claim.—In a combined desk and seat, the combination, with the desk-supporting standards B, of the braces D, secured to the floor at their lower ends and at their upper ends to the standards B, and carrying the pins F on their inner faces, the angle-iron C, secured to the lower end of the desk-standard, and the seat-brackets I, pivotally secured at their lower ends to the angle-irons, the upper arms of such seat-brackets being provided with hook G and stop-bars L, whereby the motion of the seat is limited, substantially as shown and described.

400,079. **COMBINED SOFA AND BED.** CHARLES T. HARD, East Liverpool, assignor to Thomas H. Hard, Newburg, Ohio. Filed Mar. 10, 1888. Serial No. 266,822. (No model.)

Claim.—1. In a combined sofa and bed, the combination of a body, a base-section hinged to one side or edge of the body, facing-boards hinged to opposite sides of the body and serving to conceal

400,079.



the base when used as a sofa and supports for the body when used as a bed, and sectional end hinged head and foot boards on body and base sections, respectively, substantially as described.

2. In a combined sofa and bed, the combination, with the body and base section, each having one open side or edge and hinged together at their open sides or edges, of facing-boards hinged to opposite sides of the body and serving to conceal the base when used as a sofa and supports for the body when used as a bed, pivoted and hinged braces for holding and supporting the facing-boards, and sectional and hinged head and foot boards on the body and base section, respectively, substantially as herein shown and described.

3. In a combined sofa and bed, the combination, with a base-section and a body hinged together, of facing-boards hinged to the said body and brace-strips hinged to the said facing-boards, the strips of the opposing facing-boards abutting when the said strips are extended, substantially as herein shown and described.

4. In a combined sofa and bed, the combination, with a base-section, A, having an open side and provided with pivoted legs, of the body B, hinged to the base-section and having an open side, the head and foot boards b d' and b' E, the facing-boards hinged to the body and provided with the hinged brace-strips o, and the boards a^2 d, hinged to the foot-board E and head-board d', respectively, substantially as herein shown and described.

400,080. **FEED-TROUGH.** CHRISTIAN F. HARDER, Chicago, Ill. Filed Jan. 2, 1889. Serial No. 295,236. (No model.)



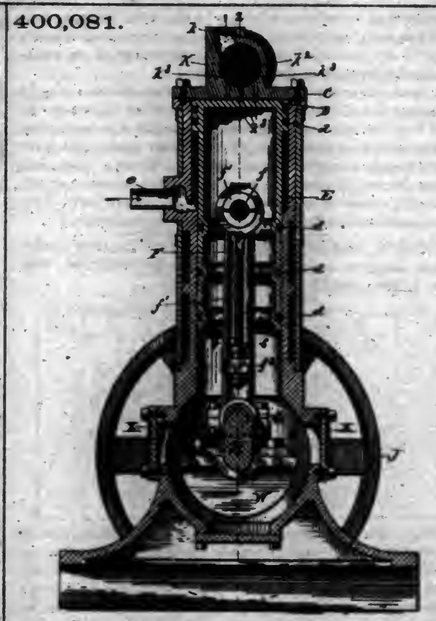
Claim.—1. As an attachment to a vehicle-tongue having sockets, four standards removably inserted in these sockets on relative flaring positions, and having eyed upper ends holding the four corners of a flexible trough by means of a rope hemmed into the upper edges thereof and passed through the eyes of the standards, all substantially as set forth.

2. As an attachment to a vehicle-tongue having sockets, four standards removably inserted in these sockets on relative flaring positions, and having eyed upper ends holding the four corners of a flexible trough by means of a rope hemmed into the upper edges thereof and passed through the eyes of the standards, with the ends of the rope protruding from the hems to enable contracting and tying, all substantially as set forth.

400,081. **STEAM-ENGINE.** DEXTER D. HARDY, Chicago, Ill. Filed Mar. 13, 1888. Serial No. 267,122. (No model.)

Claim.—1. In combination with an engine having differential areas of pistons, the steam-chest having two separate ports, one of said ports being for the admission of steam to the larger area of said

400,081.



piston and the other of said ports being for the exhaust of steam from the larger area of said piston, said steam-chest being provided with two separate valves, one for the admission of the steam to the larger area of the piston and the other for the exhaust of the steam from the larger area of the piston, both of said ports and both of said valves being arranged in one and the same steam-chest, substantially as described.

2. In a steam-engine wherein the steam is exhausted from one end of the cylinder only, the combination of a steam-chest having one or more openings in the valve-seat for the admission of steam to the cylinder and one or more openings in the valve-seat for the exhaust of the steam from the cylinder, all contained in one and the same steam-chest, valves for the admission and exhaust openings in the valve-seats corresponding in form to the form of the valve-seats and having openings corresponding therewith for the admission and the exhaust of the steam, said valves being of substantially uniform diameter throughout their length and fitted to their valve-stems in a way which permits of their free movement in a radial direction from their center of rotation under the pressure of the steam, whereby the valves are properly held in contact with their seats by steam-pressure regardless of their wear, substantially as described.

3. In an engine having a cylinder exhausting steam from but one end and a double-acting piston working therein, the combination of a steam-chest at its outer end parallel with the crank-shaft, two separate valves arranged in the opposite ends of the steam-chest and working independently of each other, having their valve-stems extending out of the ends of the steam-chest, and crank-arms connecting the valve-stems to independent eccentric-rods, whereby the admission and exhaust of steam is controlled, substantially as described.

4. In an engine having a cylinder exhausting steam from but one end and a double-acting differential-area piston working therein, the combination of a pin, f, a two-part box surrounding the same and connected by the pin to the piston, and loop rod or rods f', holding the parts of the box around the pin and adjustable in length, substantially as described.

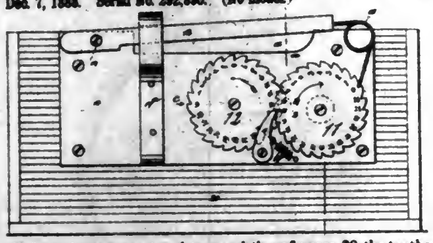
5. In an engine having a cylinder exhausting steam from but one end and a double-acting piston working therein, the combination of an inclosed crank-chamber into which the end of the steam-cylinder opens, a shaft passing through the crank-chamber and having its crank working therein, a rod connecting the piston with the crank, and loop rod or rods f', adjustable in length to take up the loss in the length of the connecting-rod, substantially as described.

6. In combination with an engine having differential areas of piston, a steam-chest supplying steam to the larger area of the piston only and provided with two separate sets of ports located near its ends, respectively, two valves arranged in the steam-chest to open and close the ports and adjustably attached in a radial direction to their respective valve-stems, valve-stems with their outer ends passing out through the opposite heads of the steam-chest and provided with crank-arms pivotally attached to eccentric-rods, and eccentric-rods of which one

is attached to an eccentric, revolving with the main shaft operating the exhaust-valve, and the other attached to a compound eccentric operated by the main shaft, regulating the movements of the admission-valve, substantially as described.

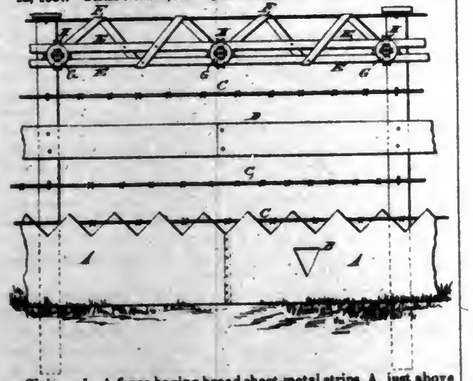
7. In an engine having but one cylinder with a double-acting differential-area piston working therein and from which the steam is exhausted from the larger area only, the combination of a steam-chest, admission and exhaust ports arranged in the chest, valves opening and closing the ports, eccentric-rods operating the valves, a crank-shaft operating the eccentric-rods and moving the piston up and down, and a steam-pipe constantly supplying steam to the smaller area of the piston to produce its upward stroke, substantially as described.

400,082. EGG-COUNT REGISTER. ALVIN F. HARRISON, Greeley, Kans., assignor to himself and William H. Harrison, same place. Filed Dec. 7, 1888. Serial No. 292,895. (No model.)



Claim.—An egg-count register consisting of a case, 20, the toothed and numbered disks 11 and 12, slightly overlapping each other, the disks 11 being provided with the pin 2, the pivoted lever 13, provided with the spring-arm 15, engaging the teeth of the disk 11, the stop 17ª, projecting over the lever, the spring 16ª, arranged beneath the lever, the pawl 16, engaging the teeth of the disk 11, and the spring 17, for holding the pawl in engagement with said disk, substantially as herein shown and described.

400,083. FENCING. ELISHA HAWES, Sacramento, Cal. Filed Feb. 12, 1887. Serial No. 227,431. (No model.)



Claim.—1. A fence having broad sheet-metal strips, A, just above and extending down to the ground, said strips being provided with vertical V-shaped openings B, with their lower corners at a distance of a few inches above the ground, for the purpose set forth, substantially as described.

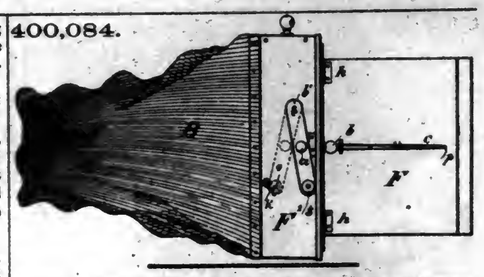
2. A fence having broad sheet-metal strips A just above and extending down to the ground, said strips being provided with the vertical V-shaped openings B, the lower corners of which are at a distance of a few inches above the ground, and the V-shaped tongues formed integrally with the strips and adapted to be bent into and thereby close the openings, substantially as described.

3. In a fence, the upper wire and parallel strips E, in combination with the zigzag strip F strung between said wire and strips, and the cross-pieces H and rosettes riveted together and arranged on opposite sides of strips E at the angles of strips F, substantially as described.

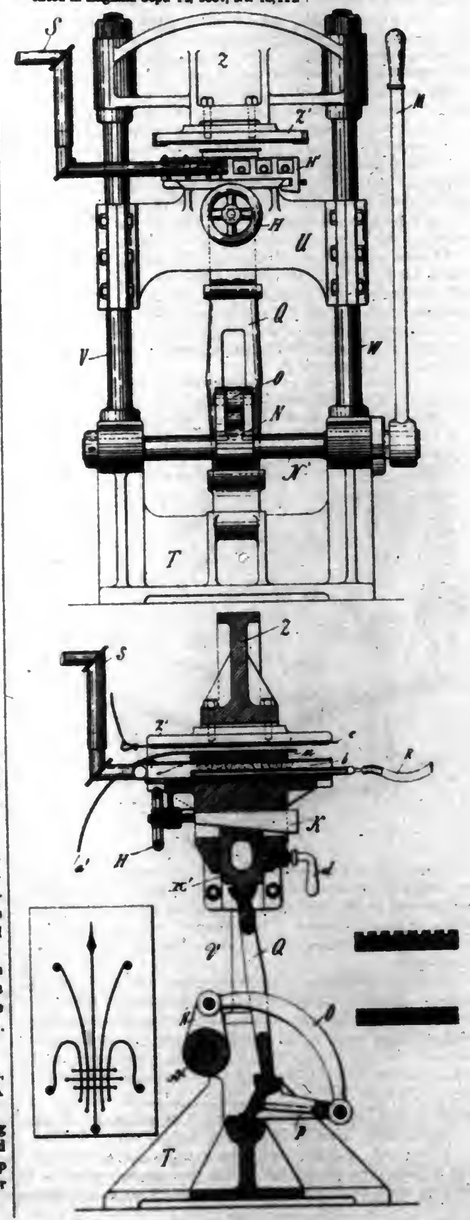
400,084. PHOTOGRAPHIC SHUTTER. HENRY HERBERT, London, County of Middlesex, England. Filed Jan. 4, 1889. Serial No. 295,304. (No model.) Patented in England Oct. 10, 1888, No. 14,545.

Claim.—The improved shutter hereinbefore described, consisting of a hinged flap closed by a thread or cord which is fixed to and operated by a screw stud attached upon a pivoting-bar, said flap opening automatically under the action of an india-rubber band or spring, for the purpose set forth.

400,084.



400,085. METHOD OF PRODUCING FANCY FIGURED WOODEN PLATES. ROBERT HIRNEL, Berlin, Prussia, assignor to Leo Seligsohn, same place. Filed Apr. 23, 1888. Serial No. 271,635. (No model.) Patented in England Sept. 14, 1887, No. 12,444.



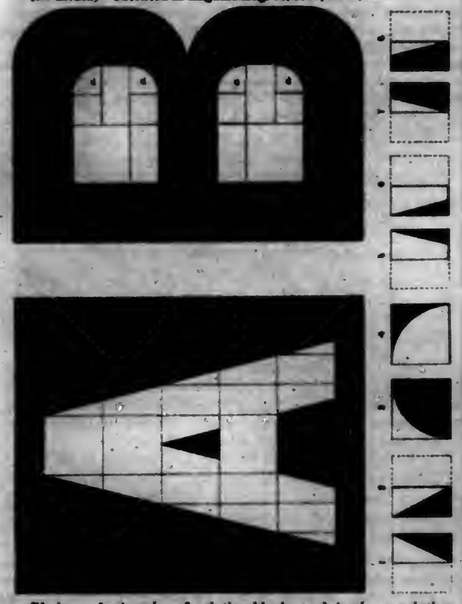
Claim.—1. The herein-described method of producing fancy figured wooden plates, which consists in first pressing the wooden plates between two metallic surfaces, one of which is figured and heated, and then passing the burned plate between pressing-rolls, substantially as and for the purpose described.

2. The herein-described method of producing fancy figured wooden plates, which consists in pressing the wooden plates between two metallic surfaces, one of which is figured and heated, then passing the burned plate through pressing-rolls to smooth the embossed plate, and subsequently polishing the smoothed burned plate by rolls or other suitable means, substantially as described, whereby a figured plate is produced closely resembling genuine inlaid-work.

400,086. PHENACETINE. OSKAR HINSBERG, Barmen, Germany, assignor to the Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. Filed June 29, 1887. Serial No. 243,063. (Specimens.)

Claim.—The product herein described, which has the following characteristics: it crystallizes in white leaves, melting at 135° centigrade; not coloring on addition of acids or alkalies; is little soluble in cold water, more so in hot water; easily soluble in alcohol, ether, chloroform, or benzole; is without taste, and has the general composition $C_{10}H_{13}O_2N$.

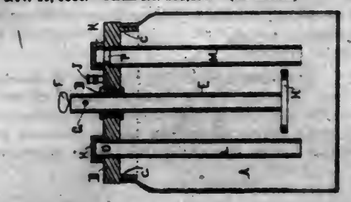
400,087. PRINTING BLOCK OR TYPE. SAMUEL JOHN, Tranmere, County of Chester, England. Filed Apr. 13, 1886. Serial No. 198,744. (No model.) Patented in England Aug. 18, 1886, No. 9,782.



Claim.—1. A series of printing-blocks each having a printing-surface corresponding in form and size to a given portion of a letter of the alphabet, the series embracing one or more blocks corresponding with every part of each and every letter of the alphabet, whereby said blocks are adapted to be combined to produce a printing type or block for every letter of the alphabet.

2. A font of printing-blocks each of a given size or multiple thereof, and each bearing a geometric form corresponding in form and dimensions with a definite part of a letter of the alphabet, the font containing a number of such blocks corresponding with each part of the several letters of the alphabet, whereby they are adapted to produce, when properly combined, each and every letter of the alphabet.

400,088. GALVANIC BATTERY. CARL E. KASEMEYER, Chicago, Ill., assignor to the Electrical Supply Company, Augusta, Conn. Filed Nov. 19, 1888. Serial No. 291,193. (No model.)



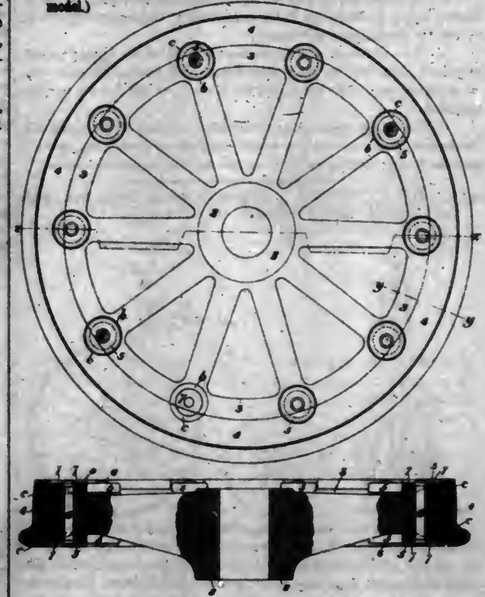
Claim.—1. In a battery, the combination of a cover composed of metal which expands when cooling with elements some of which are cast in such cover.

2. In a battery, the combination of a cover with elements some of which are provided with heads inclosed within the substance of such cover and cast therewith and shaped so as to form shoulders bearing upon such substance within the cover.

3. In a battery, the combination of a metal cover with elements the heads of some of which are inclosed within the metal of such cover and connected by the portion of the metal of the cover about the heads of the elements.

4. In a battery, the combination of a cover with elements the heads of which are inserted within such cover and provided with integral shoulders, so as to be secured thereto.

400,089. FASTENING DEVICE FOR CAR-WHEEL TIRES. JULIAN KENNEDY, Latrobe, Pa. Filed Dec. 15, 1888. Serial No. 293,737. (No model.)



Claim.—1. As means for connecting wheel-tires to the centers, a series of fasteners set on opposite sides of the wheel, each of said fasteners having flanges fitted in seats on the faces of the tire and wheel-center, and having also a bolt or rivet connecting it to the wheel-center, substantially as and for the purposes described.

2. As means for connecting wheel-tires to the centers, a series of fasteners set on opposite sides of the wheel and having flanges fitted in seats on the tire and wheel-center, and bolts or rivets connecting the opposite fasteners, substantially as and for the purposes described.

3. As means for securing tires to wheel-centers, a fastener having a circular retaining-flange, which is set in a correspondingly-shaped seat on the wheel center and tire and is secured in place thereon, substantially as and for the purposes described.

4. The combination of the wheel-center having a series of lateral marginal projections, 7, a circular seat formed on the tire and wheel-center at said projections, and fasteners having circular retaining-flanges which are placed on said seats, and bolts or rivets which pass through the wheel-center and secure the opposite fasteners, substantially as and for the purposes described.

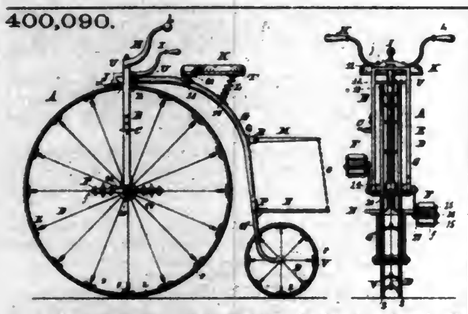
400,090. VELOCIPEDE. JOSEPH KNAPP, Buffalo, N. Y. Filed Jan. 15, 1889. Serial No. 296,418. (No model.)

Claim.—1. The double-tired wheel A, having the bridge-pieces E, connecting said rims or tires, said bridge-pieces having the passage for the spokes D, and the hub 10, as and for the purpose set forth.

2. In bicycles and tricycles, a main wheel consisting of two rims connected together by a series of bridge-pieces, a single hub, and spokes, as described, in combination with the fork B, backbone G, seat K, and trailing wheel V, the whole being constructed and combined as and for the purpose set forth.

3. The combination, with the fork B, having cross-pieces 11 12, of the backbone G, pivoted between said cross-pieces, the handle H, having the notch *j*, and the brake-lever I, with fork J and brake-shoes 21 22, as and for the object stated.

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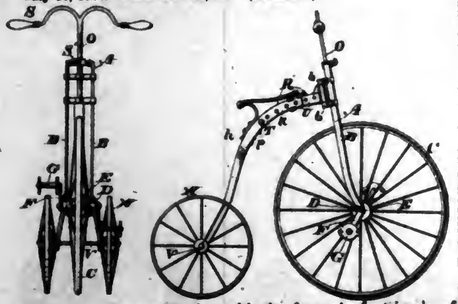


4. The combination, with the backbone G, of the parcel-carrier N, hinged to the backbone at P and supported by the supporting-rod M, as and for the purpose mentioned.

5. The combination, with the backbone G, of the hinged parcel-carrier N, supported by the supporting-rod M, having suitable stop, R, engaging the double eye Q, and the chain O, as and for the purpose specified.

6. The bridge-pieces E, as described, consisting of the plates 3 3, cross-piece 5, and central eye, 4, said bridge-piece having the spoke D secured by the locking-nuts 7 8, as and for the purpose set forth.

400,091. TRICYCLE. FREDERICK R. KOHLER, Canton, Ohio. Filed July 16, 1888. Serial No. 280,015. (No model.)



Claim.—1. The combination, with the frame A of a tricycle, of the adjustable frame K, having cross-bars, as L, with loops to embrace the parallel sides of said frame A, rearwardly-projected eyes to pivotally engage the front portion of the back frame, R, and handle-support O, and means for securing the frame K in desired adjustment in the frame A, substantially as set forth.

2. In combination, the inverted-U frame A, adjustable frame K, and means of securing said frame K in vertical adjustment, substantially as described, and for the purpose set forth.

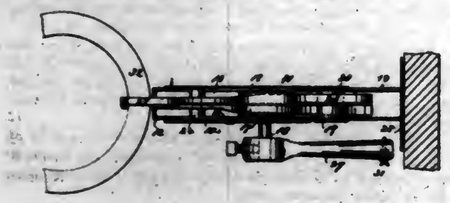
3. In a tricycle, a back frame composed, essentially, of the parts T and U, having the loops *m*, fingers A, perforations *n*, and bolt *p*, substantially as described, and for the purpose set forth.

4. The combination, with the frame A of a tricycle, of the adjustable frame K, having cross-bars L, with loops to embrace the parallel sides of frame A, back frame, R, pivotally secured to said frame, handle-support O, and means for securing said frame and handle-support O in desired adjustment in the frame A, substantially as described, and for the purpose set forth.

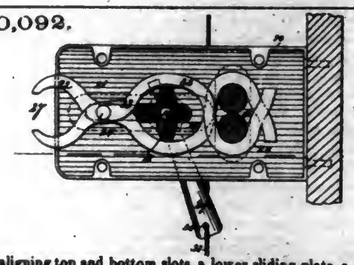
5. The combination, with the frame A of a tricycle, of a frame, K, consisting of cross-bars formed with central apertures and provided with looped ends to embrace the parallel sides of the frame A, the said cross-bars constructed to pivotally engage the front portion of the back frame, a handle-support, K, an apertured boss, J, and a set-screw, S', substantially as set forth.

400,092. DEVICE FOR DETACHING ANIMALS. ISAIAH J. KUHATH, New York, N. Y. Filed Nov. 3, 1888. Serial No. 290,209. (No model.)

Claim.—1. The combination, with a casing provided with verti-



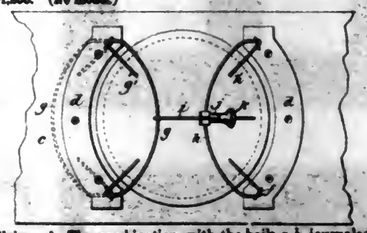
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cally-aligning top and bottom slots, a lower sliding plate, a pintle projecting upward through the plate and carrying an essentially-elliptical cam, and a lever secured to the lower end of the said pintle, of pivoted gripping-fingers bent upon themselves to form a central circular section inclosing the cam, and an outer hooked section, all combined for operation substantially as shown and described.

2. The combination, with a casing provided with vertically-aligning top and bottom slots, a lower sliding plate, a pintle projecting upward through the plate and carrying an essentially-elliptical cam, and a lever secured to the lower end of said pintle, of stops secured between the upper and lower walls of the casing to the rear of the said slots, pivoted gripping-fingers held to slide within the slots of the casing and bent upon themselves to form a central circular section inclosing the cam, a rear circular section inclosing the stops, and an outer hooked section, all combined for operation substantially as shown and described.

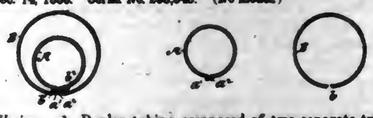
400,093. CLOSURE FOR CHURNS. WILLIAM H. LE SUER and FRED R. BARNEY, Aberdeen, Dak. Filed July 27, 1888. Serial No. 281,263. (No model.)



Claim.—1. The combination, with the bails *g h*, journaled on the loops *f* on the churn-head and having the ends *g' h'* extending through the loops *f* and resting on the churn-cover, of a means for drawing the central portions of the bails together, whereby the bail ends are pressed upon the cover and the cover is held in place.

2. The combination, with the bails *g h*, journaled in the loops *f* on the churn-head and having the ends *g' h'* extending through the loops *f* and resting on the churn-cover, of the threaded bolt *i*, having the hook engaging the bail *g*, the slide J, having the loop engaging the bail *h*, and the threaded nut *k*, as and for the purpose stated.

400,094. DUPLEX TUBING. ALEXANDER H. LEBOUF, Waterbury, Conn., assignor to Holmes, Booth & Haydens, New York, N. Y. Filed Dec. 14, 1888. Serial No. 293,545. (No model.)



Claim.—1. Duplex tubing composed of two separate tubes, an inner tube provided with a rib, and an outer tube provided with an opening receiving and engaging with said rib, the two tubes being closed and united, substantially as specified.

2. Duplex tubing composed of two separate tubes, an inner tube provided with a rib, made of two abutting flanges, and an outer tube provided with an opening receiving and engaging with said rib, all the tubes being closed and united, substantially as specified.

3. Duplex tubing composed of two separate tubes, an inner tube provided with a rib, made of two abutting flanges, and an outer tube provided with an opening furnished with inwardly-turned flanges and receiving and engaging with said rib, all the tubes being closed and united, substantially as specified.

400,095. REVERSIBLE EXCENTRIC. WILLIAM W. LOCKWOOD, Freeport, Kans. Filed Sept. 3, 1888. Serial No. 284,304. (No model.)

Claim.—1. The combination, with the shaft and the eccentric, of the support *c*, fixedly secured to the shaft, and the bell-crank lever interposed between the said support and the eccentric, substantially as set forth.

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2. The combination, with the shaft, the eccentric, and the support, of the bell-crank lever pivoted to the support, and having its outer end adjustably connected with the said eccentric, substantially as described.

3. The combination, with the shaft, of the block having an arm, the eccentric mounted on the block, the support secured to the shaft, and the bell-crank lever pivoted to the support, and having its short arm in engagement with the arm of the block, and having its outer end adjustably connected with the eccentric, substantially as described.

4. The combination, with the shaft and the eccentric, of the support C, fixedly secured to said shaft, the block mounted on said shaft, the bell-crank lever pivoted on said support, with one end engaging an extension of said block, and the connection between the lever and the eccentric, substantially as shown and described.

5. The combination, with the shaft and the eccentric, of the support on said shaft, the block B, mounted on said shaft and formed with an arm, *b*, provided with a slot, *b'*, the bell-crank lever pivoted on said support and formed with a lateral projection, *d*, engaging said slot, and the rod F, connecting the lever and the eccentric, substantially as shown and described.

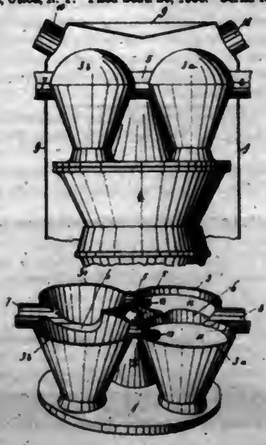
6. The combination of the shaft, the block mounted on the shaft, the eccentric placed on the said block, the support secured to the shaft, the bell-crank lever pivoted to the support, and having its inner end in engagement with the said block, and having its outer end adjustably connected with the eccentric, and the lever G, having its arms at about right angles to one another, one arm being connected with the eccentric and the other arm connected with the sliding collar on the shaft, substantially as and for the purpose set forth.

400,096. CARBURETING-LAMP. JAMES P. MAGENIS, North Adams, Mass. Filed May 22, 1888. Serial No. 274,704. (No model.)



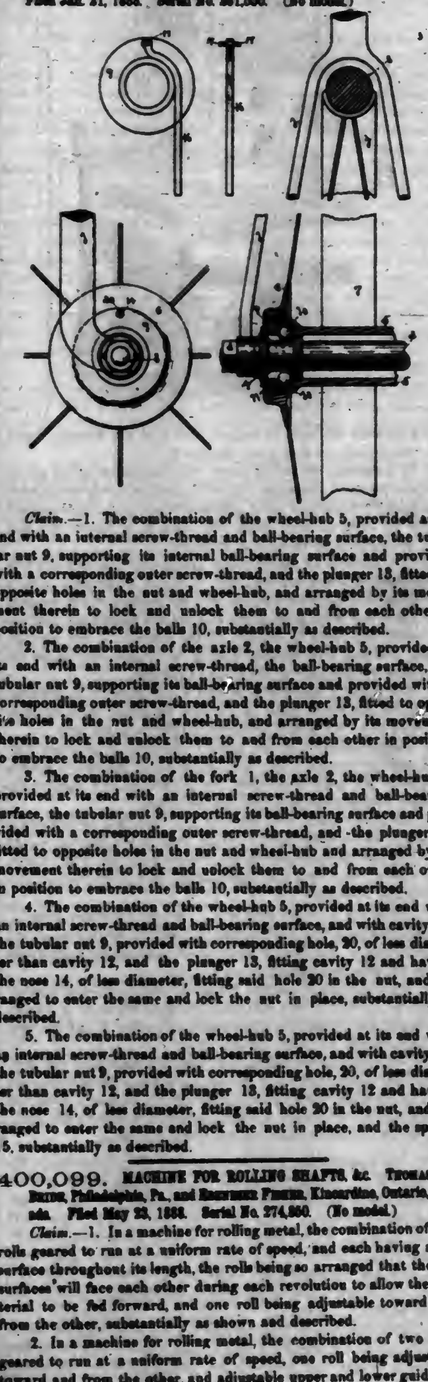
Claim.—In a carbureting-lamp, the combination, with the annular burner, of the conical or downwardly-tapered hydrocarbon-receptacle E, having a removable cap and arranged above and concentric with said burner in the described proximity thereto, whereby the flame may impinge on its lower portion, the two gas-conducting tubes extending axially through the said receptacle nearly to the top and one arranged within the other, and the horizontal tubes *c*, which connect the burner with the lower portion of the outer tube, as shown and described.

400,097. HEAT-RADIATOR FOR HOT-AIR FURNACES. CHAS. J. MANNING, Utica, N. Y. Filed Sept. 20, 1888. Serial No. 285,356. (No model.)



Claim.—A furnace having a radiator and a series of oval-shaped domes disposed radially around the center, said domes connected by flues, in combination with diaphragm-plates 11, resting on lugs in the oval-shaped domes nearest to the smoke-exit, said diaphragm-plates being provided with opening 13, adjacent to flue 5, substantially set forth, for the purposes stated.

400,098. VELOCIPEDE. JOHN M. MARLIN, New Haven, Conn. Filed Jan. 21, 1888. Serial No. 261,550. (No model.)



Claim.—1. The combination of the wheel-hub 5, provided at its end with an internal screw-thread and ball-bearing surface, the tubular nut 9, supporting its internal ball-bearing surface and provided with a corresponding outer screw-thread, and the plunger 13, fitted to opposite holes in the nut and wheel-hub, and arranged by its movement therein to lock and unlock them to and from each other in position to embrace the balls 10, substantially as described.

2. The combination of the axle 2, the wheel-hub 5, provided at its end with an internal screw-thread, the ball-bearing surface, the tubular nut 9, supporting its ball-bearing surface and provided with a corresponding outer screw-thread, and the plunger 13, fitted to opposite holes in the nut and wheel-hub, and arranged by its movement therein to lock and unlock them to and from each other in position to embrace the balls 10, substantially as described.

3. The combination of the fork 1, the axle 2, the wheel-hub 5, provided at its end with an internal screw-thread and ball-bearing surface, the tubular nut 9, supporting its ball-bearing surface and provided with a corresponding outer screw-thread, and the plunger 13, fitted to opposite holes in the nut and wheel-hub and arranged by its movement therein to lock and unlock them to and from each other in position to embrace the balls 10, substantially as described.

4. The combination of the wheel-hub 5, provided at its end with an internal screw-thread and ball-bearing surface, and with cavity 12, the tubular nut 9, provided with corresponding hole, 20, of less diameter than cavity 12, and the plunger 13, fitting cavity 12 and having the nose 14, of less diameter, fitting said hole 20 in the nut, and arranged to enter the same and lock the nut in place, substantially as described.

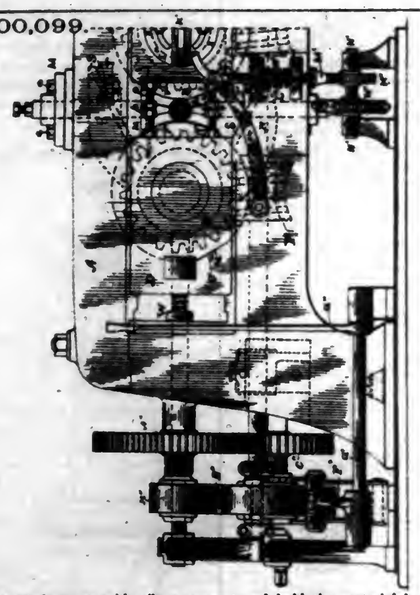
5. The combination of the wheel-hub 5, provided at its end with an internal screw-thread and ball-bearing surface, and with cavity 12, the tubular nut 9, provided with corresponding hole, 20, of less diameter than cavity 12, and the plunger 13, fitting cavity 12 and having the nose 14, of less diameter, fitting said hole 20 in the nut, and arranged to enter the same and lock the nut in place, and the spring 15, substantially as described.

400,099. MACHINE FOR ROLLING SHAFTS, &c. THOMAS MCBRIDE, Philadelphia, Pa., and REUBEN FISHER, Kincardine, Ontario, Canada. Filed May 23, 1888. Serial No. 274,860. (No model.)

Claim.—1. In a machine for rolling metal, the combination of two rolls geared to run at a uniform rate of speed, and each having a flat surface throughout its length, the rolls being so arranged that the flat surfaces will face each other during each revolution to allow the material to be fed forward, and one roll being adjustable toward and from the other, substantially as shown and described.

2. In a machine for rolling metal, the combination of two rolls geared to run at a uniform rate of speed, one roll being adjustable toward and from the other, and adjustable upper and lower guides or

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supports between said rolls to support and hold the material being rolled, substantially as shown and described.

3. In a machine for rolling metal, the combination of the roll B, mounted in permanent bearings, the roll C, mounted in adjustable bearings, adjustable upper and lower guides between said rolls to support and hold the material being rolled, and yokes R, to control the said guides, substantially as shown and described.

4. In a machine for rolling metal, having two rolls, one of which has stationary bearings and the other of which is movable toward and from the first, the combination, with the journals of the movable roll, of upper and lower guide-plates to guide and support the material being rolled, and yokes R, secured to the journals of the movable roll, and provided with inclined arms S, to engage and adjust the guide-plates, substantially as shown and described.

5. The guides P, adjustably secured to the plates O, in combination with the adjustable plates M, whereby the guides are adapted to be adjusted in a vertical and horizontal direction, as set forth.

6. The combination of the plates O, the yoke R, provided with arms S, and the wedges T, the said wedges being adapted to engage the edges of the arms S, whereby the guides are held against displacement, substantially as shown and described.

7. The combination, with the rolls B C and their journal-boxes or housings, of the screw-bolts *o*, having heads *p* and jam-nuts *m*, the bolts in opposite boxes projecting into contact with each other, whereby the rolls are prevented from approaching each other, substantially as shown and described.

8. The roll B, provided with disk I" and the adjustable bolts K", in combination with the lever L', bar L", pawl M', ratchet-wheel M", sprocket-wheel N", and chain O', whereby the material is automatically fed into the rolls, as set forth.

9. The combination, with the journal-boxes of roll C, of the screw-shafts W W', connected with said boxes, the gear-wheels A' A" on said screw-shafts, and a connection between the wheels A' A" and the main shaft, substantially as shown and described.

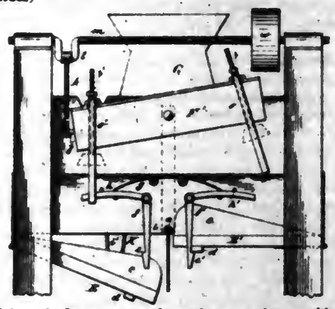
10. In a machine for rolling iron, having a stationary and movable roll, the combination, with the journal-boxes of the movable roll, of screws connected therewith to move said roll back and forth, and a reversing-gear connected with said screws to turn them in one direction or the other, substantially as shown and described.

11. The combination, with the roll C and its journal-boxes, the screw-shaft W W', connected with said boxes, the gear-wheels A' A" on said shafts and a friction-wheel on one of the same, of a shaft, C', carrying a friction-wheel, C', and a pinion, the latter being in gear with both the wheels A' A", the toggle-levers D, and the friction-wheel B", mounted thereon, a main driving shaft and a friction-wheel, B', thereon, and a lever and connections for throwing the friction-wheel B" into contact with either of the wheels B' or C', substantially as and for the purpose set forth.

12. The combination, with the rolls of a machine for rolling metal, of a work guide and support consisting of a rotating thimble or box mounted in a supporting arm or bracket, and adapted to embrace and hold the article being rolled and to turn therewith, substantially as shown and described.

13. A mechanism for adjusting the article to be rolled to the proper rolling center, consisting of the combination of the bar R", bolts *b"*, cross-bar C', indicating-plate S', and nuts *c"*, as shown and described.

400,100. AUTOMATIC GRAIN-MEASURING MACHINE. WILLIAM MCCONAGHIE, Belleville, Ont. Filed May 7, 1888. Serial No. 273,010. (Model.)



Claim.—1. In an automatic grain-measuring machine, the combination, with a box divided into two compartments and alternately opening and closing doors for the bottom of the compartments, of catches pivoted to the side of the box for locking the doors closed, a locking-lever pivoted to the box, means for operating said lever, and catch-releasing mechanism carried by the said rocking lever and having arms or rods projecting down into the compartments to be operated by the mass of grain, substantially as herein shown and described.

2. In a grain-measuring machine, the combination, with a box divided into two compartments and alternately opening and closing doors for said compartments, of catches for holding the said doors closed, a rocking lever, angle-levers pivoted to the rocking lever and adapted to engage the catches to release the same, and feet projecting from the angle-levers into the compartments, substantially as described.

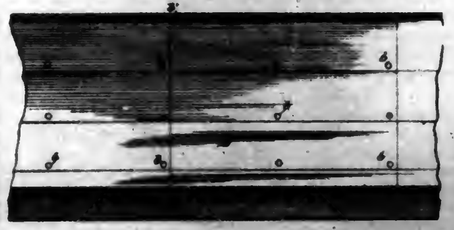
3. In an automatic grain-measuring machine, the combination, with the doors E E', arranged to move in alternation with each other, of the spring-actuated catch-levers *f f'*, the lever F', the angled levers *o o'*, carried by the lever F' and provided with rods *p p'*, the downwardly-projecting arms of the levers *o o'* being arranged to engage the catch-levers *f f'*, and the feet *q q'*, for engaging the mass of material being measured, substantially as specified.

4. In a grain-measuring machine, the combination, with a box divided into two compartments, alternately opening and closing doors for said compartments, a hopper above the box, and a deflector pivoted in the hopper and operated by the movement of the doors, of catches for holding the doors closed, a rocking lever, and angle-levers pivoted on the rocking lever and having their vertical arms engaging the catches to release them and provided with feet projecting from the horizontal arms into the compartments of the box, substantially as herein shown and described.

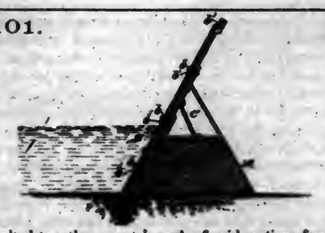
5. In an automatic grain-measuring machine, the combination, with a box divided into two compartments and provided with a hopper, and alternately opening and closing doors for the said compartments, and a deflector pivoted in the hopper, of pivoted and spring-actuated catches for holding the doors closed, a rocking lever, means for operating said lever, catch-releasing mechanism carried by the rocking lever and having arms or rods projecting down into the compartments to be operated by the mass of grain, and a connection between the deflector in the hopper and one of the doors, substantially as herein shown and described.

400,101. LEVEE-PROTECTOR. JAMES M. MCLEMORE and CHARLES D. JOHNS, Coushatta, La. Filed Oct. 3, 1888. Serial No. 287,117. (No model.)

Claim.—1. The combination, with the levee structure A, of the shield B, applied to the front of the levee, said shield consisting of



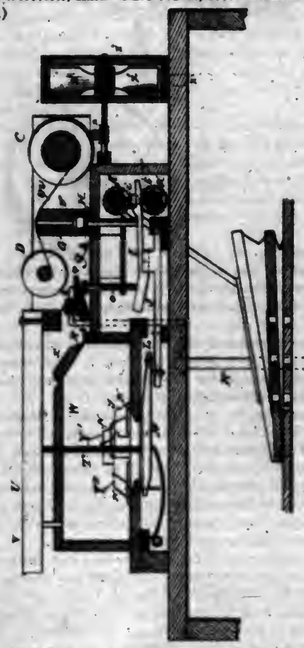
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sections bolted together, as at *b*, each of said sections formed with a rabbet, *b'*, on which the overlapping section fits, whereby a smooth front and a water-tight joint are formed, substantially as and for the purpose described.

2. The combination, with the levee A of the usual form, of the shield B, applied to the water-front of said levee, said shield formed of metallic sections secured together, the lower section extended below the levee and entered into the river-bed, the upper portion of said shield projected above the levee, and an angle-brace, C, formed substantially as shown, its upright arm connected to the rear of the upper projecting portion of said shield, its horizontal member resting on the levee top, substantially as shown and described.

400,102. AUTOMATIC MUSICAL INSTRUMENT. JOHN MCTAMANY, Worcester, Mass. Filed Oct. 22, 1886. Serial No. 180,722. (No model.)



Claim.—1. In an automatic musical instrument, a set of valves controlling the ducts of the respective reeds or sound-producing devices, in combination with a series of air-passages not connected with said valves, but controlled by the music-sheet, intervening valve-operating devices adapted to be moved by mechanical power, and pneumatically-actuated devices for connecting and disconnecting said valve-operating devices with the power-transmitting mechanism as the said air-passages are opened and closed by the perforated and non-perforated portions of the music-sheet, substantially as hereinbefore set forth.

2. In combination with a reed-valve and a longitudinally-movable bar linked thereto, a pivoted piece attached to said bar, a plunger which depresses one end of said pivoted piece when forced down by atmospheric pressure, and a fluted roll which engages the said piece thus depressed and forces it back to open the valve, substantially as set forth.

3. In combination with a reed-valve, a longitudinally-movable bar operating thereon and a doubly-shouldered piece pivoted at or near its middle to said bar, two fluted rolls engaging, respectively, with the shoulders of said piece, the one operating to force back said bar, the other to bring it forward, a plunger acting on one end of said pivoted piece to force it into engagement with one of said fluted rolls, and a rod acting on the other end of said pivoted piece to force it into engagement with the other one of said fluted rolls, substantially as set forth.

4. In combination with a set of reed-valves and movable bars and pivoted pieces acting thereon, a fluted roll for actuating said bars, a set of rods resting on said pivoted pieces, a bar pressing on said rods, and a rod or wire connecting said bar to the bellows, so that the exhaustion of the latter may by drawing on said rod or wire hold said pivoted pieces out of contact with said fluted roll, substantially as set forth.

5. The roll-gudgeon formed of the intermatching blocks or sections D D', provided with the crank-handle *d'*, that passes through the casing, in combination with the bearing-cover E, fitting over the interlocking joint in said sections and having its upper half hinged to swing away from the other half, and the spring E', for retaining said swinging portion in place when closed, substantially as shown and described.

6. In combination with a set of movable bars and pieces which actuate the reed-valves and a fluted roll whereby they are operated, a set of rods extending from said pieces to the outside of the case to receive the atmospheric pressure and thereby hold said pieces out of accidental engagement with said fluted roll, substantially as set forth.

7. The combination, in a musical instrument, of a series of valves controlling the passage of air through the reeds or sound-producing devices, a power-operated mechanism for actuating said valves brought into effect by pneumatic devices controlled by a perforated music-sheet, and a set of manual keys with connections for working said valves, whereby said sounding devices can be controlled either manually or mechanically, as preferred.

8. The fluted roll K, pivoted piece I, longitudinally-movable bar M, and a reed-valve, in combination with a link connecting said reed-valve to said bar, said link serving to open said valve and also to move said pivoted piece out of reach of said fluted roll, substantially as set forth.

9. A set of reeds having valves controlling their air-ducts and a manual having pitmen-pins extending from the keys to said valves, in combination with a music-sheet and an intervening mechanism composed of a series of operating-bars connected with said valves, a mechanically-operated actuating mechanism, and pneumatic devices controlled by the music-sheet for connecting and disconnecting said bars and actuating mechanism, as set forth, whereby said reeds may be operated by said music-sheet or by the keys, substantially as described.

10. In a mechanical musical instrument, the combination of a wind-wheel motor and the music-sheet winding apparatus.

11. The combination, with the music-sheet winding-roll in an automatic musical instrument, of a wind-motor operated by a wind-current induced by the bellows or other wind-inducing apparatus, a hand-crank, and adjustable gearing, whereby said roll mechanism can at will be coupled for operation either by hand or by the wind-motor, substantially as set forth.

12. In an automatic musical instrument, the combination, with the tilting levers I and pressure-pins O, of the bar Q, operating-wire R, and means connecting said wire with the bellows-reservoir, whereby inflation of said reservoir raises said bar for releasing said pins and levers and collapse of said reservoir causes said bar to depress said pins, substantially as set forth.

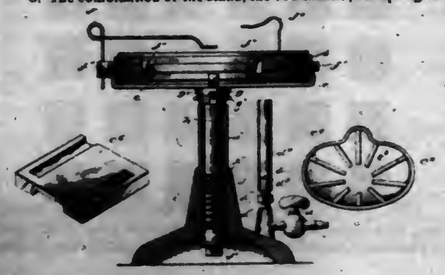
13. In combination with the winding-roll, driving-shaft, the gear-wheels carried by said roll and shaft, and an interposed endwise-movable shaft carrying a power-transmitting gear-wheel, the endwise motion of said shaft leaving the said roll free to turn backward, substantially as set forth.

400,103. BLOW-PIPE BED. GEORGE W. MELOTTE, Ithaca, N. Y. Filed July 30, 1888. Serial No. 281,419. (No model.)

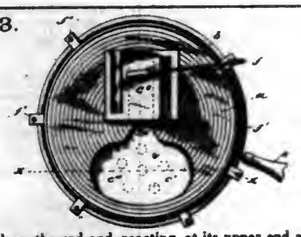
Claim.—1. The pad consisting of an asbestus ribbon or strip coiled upon itself, whereby pins may be inserted between the layers or coils of the pad, for the purpose set forth, substantially as described.

2. The pad consisting of tightly-coiled asbestus ribbon, and having the inclosing-band *b* on its perimeter, substantially as described.

3. The combination of the stand, the rod therein, the spring bear-



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ing downward on the rod and reacting at its upper end against the stand, the holding-arms *c*, having the cap *g*, hinged to the upper end of the rod, and the pad supported on the arms, substantially as described.

4. The revolubie asbestus block *a*, supported on the stand and provided with the excavation *c*, and aperture *c'* in the excavation, and the Bunsen burner *d*, fast to the stand *i* and arranged to register with the aperture *c* when the block *a* is rotated.

5. The stand *i*, provided with the round rod *h* in its upright post, in combination with the arms *e*, the pad *a*, and the cap *g*, its joint made by the tongue *g* of rod *h* in the slot of the cap and with the spring *j*, and the cap resting on the top of the post of the stand, whereby the arms *e* and the cushion-block *a* may be tipped, as set forth.

6. The movable cup *c''*, provided with the ribs *c⁴* on its under side, in combination with a perforated excavated cup, *c*, in the block *a*, and a Bunsen burner, *d*, the said parts being suitably supported by the stand *i*, as set forth.

7. The combination of the ingot-mold *c⁴* with the block *a*, having the excavation *c* and aperture *c'*, and the removable cup *c''*, as set forth.

8. The cushion *a*, flat on one side and provided with a band, *b*, having a portion, *b'*, at right angles to the plane of the cushion, the mold *c⁴*, and means for securing the mold to portion *b'*, in combination with the cup *c''*, having spout *c⁵*, as set forth.

400,104. MUSICAL BOX. ARI B. METLAN, Ste. Croix, Switzerland. Filed Aug. 31, 1888. Serial No. 284,209. (No model.)



Claim.—1. A device in the mechanism of musical boxes provided with the following elements, constructed and arranged as described, to wit: a cylinder revolving upon two rest-bars which enter the center of the cylinder at the ends, the bar at the extremity of the cylinder farthest from the mainspring being fixed to the raised portion of the bed-plate, the other being the shaft to which the spring is attached and which is also fixed (except when the spring is being wound up) and bears upon the raised portion of the bed-plate at this end of the cylinder, the mainspring, which furnishes the motive power and causes the cylinder to revolve, being placed at one end and inside of the cylinder, with one end of the spring riveted or otherwise attached to the cylinder on the inside and the other end attached to the shaft that forms the rest upon which this end of the cylinder revolves, as above described.

2. A shaft in the end of the cylinder containing the mainspring, which serves both as a fixed rest upon which this end of the cylinder revolves and as the means by which the mainspring is wound up, one end of the spring being attached to the shaft, as above described.

400,105. MONOGRAM-PATTERN. JAMES W. MILLER, Denville, N. J. Filed May 26, 1888. Serial No. 275,061. (No model.)

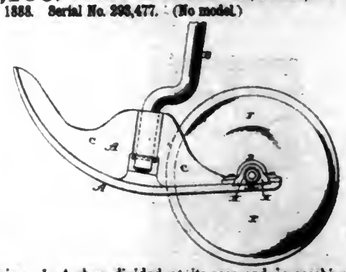


Claim.—1. A card or sheet upon which is shown a series of monograms, each having for one of its letters the same letter of the alphabet heretofore described as the basis letter, combined with another letter, which last-named letter is different in each such combination, thereby forming monograms for the purpose of facilitating the production of monograms on sleeve-buttons and other articles of jewelry and other analogous articles not strictly classed as jewelry.

2. A card or sheet upon which is shown a series of monograms, each having for one of its letters the same letter of the alphabet heretofore described as the basis letter, which basis letter is an exact representation of the initial letter upon sleeve-buttons or other articles of jewelry or other analogous articles sold in the open market, combined with another letter, which last-named letter is different in each combination, thereby forming monograms for the purpose of facilitating the production of monograms on sleeve-buttons and other articles of jewelry and other analogous articles not strictly classed as jewelry.

3. A book consisting of a series of cards or sheets, upon each of which is shown a series of monograms, each series having for one of its letters the same letter of the alphabet heretofore described as the basis letter, which basis letter must be an exact representation of the initial letter upon sleeve-buttons or other articles of jewelry or other analogous articles which are sold in the open market, combined with another letter, which last-named letter is different in each such combination of the series, the monograms forming the series being arranged in a regular order, and the series forming the book being also arranged in a regular order, for the purpose of facilitating the production of monograms on sleeve-buttons and other articles of jewelry and other analogous articles not strictly classed as jewelry.

400,106. COLTER. DE WITT A. MOOR, Orlando, Fla. Filed Dec. 13, 1888. Serial No. 293,477. (No model.)



Claim.—1. A shoe divided at its rear end, in combination with the colter F and boxes for the colter-shaft placed upon the two ends of the shoe, which extend upon both sides of the colter, substantially as shown.

2. The combination of the revolving colter, the recessed collars between which the colter is held, the shaft G, which extends beyond each of the collars, and the two boxes E, supported upon the two ends of the shoe, substantially as described.

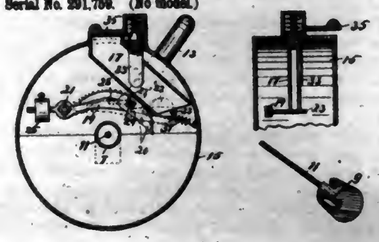
3. The combination of the colter, the two recessed collars between which the colter is clamped, the colter-shaft, the shoe provided with recessed or divided ends, so as to project upon both sides of the colter, the boxes E, and the covers D, provided with the flanges L, and the flanges N upon the shoe, substantially as described.

4. The combination of the colter-shaft, the boxes E, provided with the scrapers O, and recessed collars, between which the colter is clamped, substantially as specified.

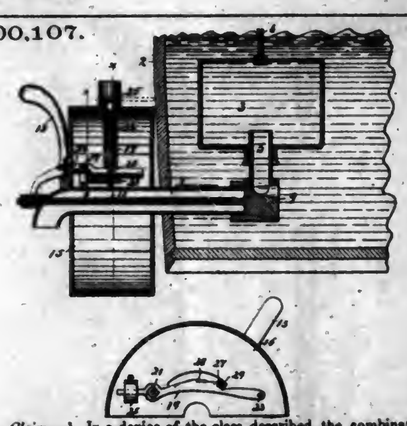
5. The combination of the shoe provided with the recessed end, so as to extend upon both sides of the colter, and provided with the flanges H, the boxes E, placed between the flanges, and the covers D, which are placed over the boxes, so as to hold them in position with the colter-shaft G, the recessed collars I, and the scrapers O upon the inner ends of the boxes, substantially as shown and described.

6. The combination of the shoe having a pronged end, the boxes which are applied to these pronged ends, and the covers which are placed over the boxes, the ends of the shoe and the inner sides of the covers being rounded, so that the boxes can have a rocking movement, substantially as set forth.

400,107. AUTOMATIC FLUID-RELEASER. BARTON S. MOLYNEUX, Minneapolis, Minn., assignor, by direct and mesne assignments, to the National Water Supply Company, of Minnesota. Filed Nov. 24, 1888. Serial No. 291,769. (No model.)



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Claim.—1. In a device of the class described, the combination, with a reservoir and a receiving-chamber, 3, located in the reservoir, having a suitable air-vent, 6, and suitable port, 5, of the valve 9, adapted when operated to alternately connect said port 5 with the reservoir and with the pipe 7, a suitable handle, 13, connected to said valve and adapted to operate the same, a suitable weighted lever, 19, adapted to engage said handle 13 and to lock the same, so as to prevent the operation of said valve, and also adapted to be thrown out of engagement with said handle 13 by the weight of a coin, so as to permit the handle to be moved and the valve to be operated, substantially as described.

2. The combination, with a reservoir and a receiving-chamber, 3, of the valve 9, adapted to alternately connect said chamber with the reservoir and with the outlet-pipe, and having a suitable handle, 13, by which it may be operated, and the weighted lever 19, adapted to lock said handle 13, and adapted to be depressed by the weight of a suitable coin and thrown out of engagement with said handle, substantially as described.

3. In a device of the class described, the combination, with a suitable handle, 13, fitted with the spring 31, and adapted by suitable connections to operate the valve of the device, of the weighted lever 19, adapted when in its normal position to engage with and lock said handle 13, and adapted to be depressed by the weight of a suitable coin and thrown out of engagement with said handle, substantially as described.

4. In a device of the class described, the combination, with the valve-actuating lever 13 and the weighted lever 19, engaging the same, of the conduit 17, having the cut-off 33, and adapted to convey a suitable coin onto said lever, so as to depress the same and to throw it out of engagement with said lever 13, substantially as described.

5. The combination, in a liquid-releasing device, of a suitable reservoir, a receiver adapted to receive liquid from said reservoir, a valve controlling the passage of liquid from said reservoir to said receiver, a coin-conduit, and a latch adapted to lock said valve and to be released by a coin passed through said conduit, substantially as described.

400,108. TRIPLE VALVE FOR AUTOMATIC BRAKE MECHANISMS. FRANK MOORE, Pittsburg, Pa. Filed Dec. 21, 1888. Serial No. 294,296. (No model.)



Claim.—1. In a triple-valve device for automatic brake mechanisms, a piston-chamber having the inner surface of its wall provided with a recharging groove or channel for the passage of fluid under pressure past the valve-operating piston from the brake-pipe to the auxiliary reservoir during the period of application of the brakes, substantially as set forth.

2. In a triple-valve device for automatic brake mechanisms, a piston-chamber having a recharging groove or channel formed in the inner surface of its wall, said groove being located in position to permit of the passage of fluid under pressure through the chamber past a valve-operating piston working therein in the position of rest of said piston after the application of the brakes, substantially as set forth.

3. In a triple-valve device for automatic brake mechanisms, the combination of a valve-operating piston, a connected valve controlling brake-cylinder supply and exhaust ports, and a piston-chamber communicating at opposite ends with a brake-pipe and with an auxiliary reservoir, respectively, and having the inner surface of its wall provided with a recharging groove or channel adapted to admit of the passage of fluid under pressure through the piston-chamber and past the piston when in position to effect the closure by the valve of both the supply and the exhaust ports of the brake-cylinder, substantially as set forth.

400,109. WAGON-JACK. WILLIAM B. MOORE, Unionville, Pa. Filed July 7, 1887. Serial No. 243,680. (No model.)



Claim.—In a wagon-jack of the character described, a standard having a lifting-lever, the longer arm of which has an eye or staple secured at the end thereof, through which a metal loop passes, one end of said loop being prolonged to form a stirrup and terminating in a hook which engages a similar hook on the shorter end of the loop for binding the stirrup against the standard, substantially as described.

400,110. BEATING-ENGINE. JOSHUA NORTON, Jr., Portneuf, Quebec, Canada. Filed June 26, 1888. Serial No. 278,090. (No model.) Patented in Canada Apr. 4, 1884, No. 26,796.



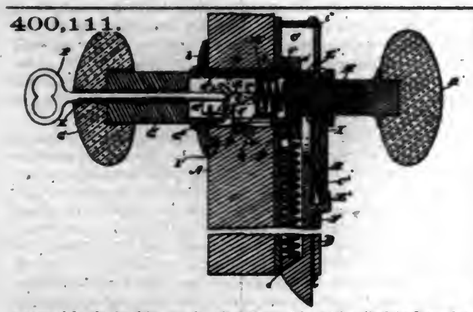
Claim.—1. In a beating-engine, the combination, with a suitable tub, of a beating-roll mounted therein, a bed-plate approximately tangent to said roll, and a mid-feather extending upwardly from near said roll and capable of vertical adjustment.

2. The combination of the tub A, the roll B, mounted within and near the bottom thereof, the bed-plate C, adjustably fixed in a recess in said tub and approximately tangent to said roll, and the curved mid-feather D, substantially as set forth.

400,111. LATCH AND LOCK COMBINED. THOMAS OVERTON, Corpus Christi, Tex. Filed June 29, 1888. Serial No. 278,563. (No model.)

Claim.—1. In a combined latch and lock, the combination, with a lock-case, a spring-actuated bolt mounted therein, a cylindrical bushing extending through the door and communicating with the case, a slot in said bushing, a knob-spindle having a cylindrical portion

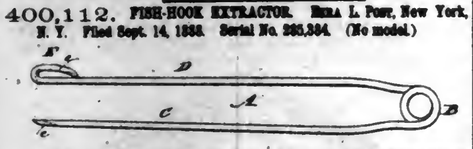
400,111.



mounted in the bushing, a chamber formed in said cylindrical portion and having a slot adapted to register with the slot in the bushing when the spring-bolt is extended, intermediate actuating mechanism connecting the spindle and bolt, and a key-hole in one knob communicating with the hollow chamber, of a locking-latch pivoted in the chamber in the spindle and having an arm projecting on one side of the pivot, a spring-actuated follower engaging with said arm to hold the latch in a locked or unlocked position, and two oppositely-inclined cam-surfaces formed on the latch on the side of the pivot opposite the follower and adapted to be engaged by the key-bit to throw the end of the latch in or out of slot in the spindle, to engage with the slot in the bushing or to withdraw it from said slot, so as to lock or unlock the spindle, all constructed, arranged, and operating substantially as shown and described.

2. In a lock, the combination, with the bushing B, extending through and rigidly secured to the door and having a screw-thread, b^3, on its inner end, of the lock-case C, having the circular screw-threaded aperture c, into which the threaded end of the bushing is screwed, the spring-actuated bolt E, and knob-spindle connected therewith, and the outer plate, D, having the notch d', engaging with the lug c^3 on the case, and the downwardly-projecting side pieces, d, provided with screw-holes, all constructed and arranged substantially as shown and described.

400,112. FISH-HOOK EXTRACTOR. REBA I. POST, New York, N. Y. Filed Sept. 14, 1888. Serial No. 285,384. (No model.)



Claim.—1. A disgorger consisting of a two-armed tongs one of the arms of which is grooved at the end and the other bent upon itself and grooved at the end and along the bend, substantially as shown and described.

2. A disgorger consisting of two united arms one of which is grooved at the end and the other of which is bent upon itself at the end to form an eye and grooved along the outer face of said eye, said groove being deepened centrally of said face, substantially as shown and described.

3. A disgorger consisting of the arm C, having grooved end, and the arm D, having grooved eye E, provided with the pocket e, substantially as shown and described.

400,113. HITCHING DEVICE FOR VEHICLES. CYRUS B. PRICE, Stoneham, Mass. Filed July 16, 1888. Serial No. 280,099. (No model.)

Claim.—1. In a hitching device for vehicles, the combination, with sliding rod a, provided with one or more claws, a', of carrier a^2 and clamp a^3, sliding rod a being adjustable in carrier a^2, all arranged and operating substantially as and for the purpose set forth.

2. In a hitching device for vehicles, the combination of a rod, a, provided with claws a' and clamp a^3, with rod a^2, connecting rod c and clamp a^3, the connecting-rod being pivoted to the clamp, all arranged and operating substantially as and for the purpose set forth.

3. In a hitching device for vehicles, the combination of rod a, provided with one or more claws, a', clamp a^4, and connecting-rod a^5, a portion, a^{10}, of the connecting-rod a^5 being in a plane at right angles to the axle, all substantially as and for the purpose set forth.

4. In a hitching device for vehicles, the combination of rod a, having one or more claws, a', clamp a^2, and rod a^5, which connects rod a and clamp a^2, rod a^5 being pivoted to clamp a^2, and member a^{10} of connecting-rod a^5, having a lip, a^{11}, which overlaps portion a^{10} of member a^5 to cause the members a^{10} a^5 to move together, all substantially as and for the purpose set forth.

5. In a hitching device, the combination of the grip with the checkrein b and with bits of the bridle, the bridle being provided with the auxiliary strap b^5, having rings or the like through which pass straps connecting the grip and bits, all arranged and operating substantially as and for the purpose set forth.

6. In a hitching device, the combination, with the bits of a bridle provided with the auxiliary head-strap b^5, of a wheel-grip and checkrein connecting the bits and grip and supported by the auxiliary head-strap b^5, substantially as and for the purpose set forth.

7. In a hitching device for vehicles, the combination of rod a, having one or more claws, a', clamp a^3, and rod a^5, connecting rod a and clamp a^3, rod a^5 being pivoted to the clamp at a^4, all substantially as and for the purpose set forth.

400,114. AMALGAMATOR. NATHAN L. RABER, Corvallis, Oreg. Filed May 9, 1888. Serial No. 273,370. (No model.)

Claim.—1. In an amalgamator, the combination of the base, the drum, the pedestal having its upper face inclined downward from its center outward and provided near its outer edge with an upwardly-inclined portion, the feed-wheel fitted over said pedestal down close to the upper face thereof, and provided with passages for the pulp, &c., such passages having their open outer ends arranged adjacent to the upwardly-inclined portion of the pedestal, and the cover-tube, all substantially as and for the purposes specified.

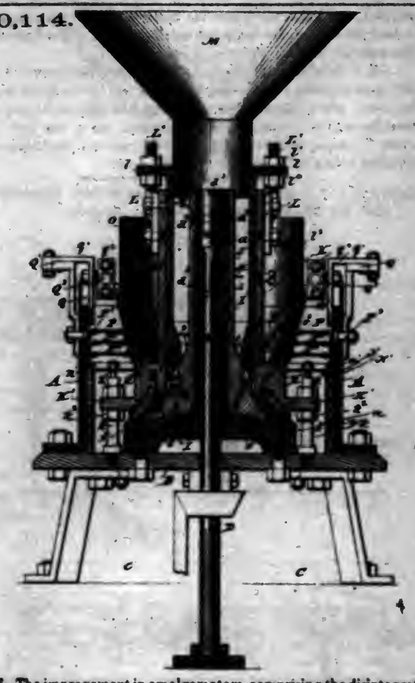
2. In an amalgamator, a disintegrating feed-wheel formed with flutes and having the outer ends or portions of said flutes covered with a ring-like cover-plate, which is attached to and revolves with the wheel, forming closed passage-ways opening out of the rim of said wheel, said cover-plate having an edge or extension, 9, just above said passage-ways, whereby to guide the pulp, &c., thereinto, substantially as set forth.

3. The combination of the feed-wheel having a beveled circular face, 2, the cover-tube, the regulator-tube fitted within said cover-tube and over the feed-wheel, and having a beveled circular face, L^3, corresponding to and concentric with face 2 of the feed-wheel, said regulator-tube having lateral arms engaging studs on the cover-tube, and nuts on said studs, whereby the regulator-tube may be adapted to set the faces L^3 and 2 together or apart, substantially as set forth.

4. The combination, in an amalgamator, with the feed-wheel and the cover-tube, of the regulator-tube fitted over the feed-wheel in the cover-tube, and adjustable supports for said regulator-tube independent of the cover-tube, whereby the regulator may be adjusted independently of the cover-tube, substantially as set forth.

5. In an amalgamator, the combination of the cover-tube, the feed-wheel, the regulator-tube fitted over the feed-wheel and having lateral arms at its upper end, studs or standards mounted on the cover-tube and passing through openings in the lateral arms of the regulator-tube, and nuts on said studs above and below such arms, substantially as set forth.

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6. The improvement in amalgamators, comprising the disintegrating feed-wheel having a face, 2, the cover-tube and the regulator-tube fitted over the feed-wheel and having a beveled face, L^3, corresponding to the face 2 of the feed-wheel, such regulator-tube being also provided above the face L^3 with a beveled or inclined face, L^4, inclined approximately in a reverse direction to such face L^3, substantially as and for the purposes specified.

7. In an amalgamator, the combination of the base, the drum, the pedestal having its upper face provided near its outer edge with an upwardly-inclined portion, the feed-wheel fitted over said pedestal and having passages formed through it and opening out of its rim, the cover-tube, the adjustable regulator-tube, and the annular check-valve, substantially as set forth.

8. In an amalgamator, the combination of the pedestal, the feed-wheel, the cover-tube having its lower outer edge arranged in a plane above the outer edge of the pedestal, forming a passage-way between said cover-tube and pedestal, and the annular check-valve supported above the said passage-way and extended down over the same and bearing on the pedestal, substantially as and for the purposes specified.

9. In an amalgamator, the combination of the pedestal, the feed-wheel, the cover-tube arranged over and concentric with the pedestal and having its lower end formed of less diameter than the pedestal-base, and the annular check-valve supported on the cover above the pedestal and bearing at its lower end on said pedestal, substantially as set forth.

10. In an amalgamator, the combination of the feed-wheel having closed passage-ways opening out of its rim and provided at the inner end of and just above said passage-ways with an edge or extension, 9, whereby to guide the pulp, &c., thereinto, and the cover-tube having an annular groove receiving such extension 9, substantially as set forth.

11. In an amalgamator, the combination of the drum having a mercury-space and provided with an internal upwardly-facing shoulder or offset, and a separator arranged above said shoulder or offset and having its outer plate or edge extended down close to said offset, the mercury-space being provided below the offset of the drum, substantially as and for the purposes specified.

12. The combination of the base and the drum, having an offset, n, with the pedestal and the cover-tube having an offset, K^3, forming an annular mercury-space between them whose height is exactly the height of said offsets, with an annular separator and water-reservoir arranged just above but quite clear of said mercury-space, the outer ring of the separator being just above offset n' and the water-reservoir being just above offset K^3, said separator consisting, essentially, of a number of perforated annular silver-plated copper plates arranged in different horizontal planes connected together and suitably supported substantially as set forth.

13. In an amalgamator, the combination of the drum having the mercury-space, the guides or rails rigidly supported at the upper end of said drum, the separator arranged in the drum above the mercury-space and close to the inner wall or surface of said drum, and the hangers connected with said separator and extended to and having portions engaging and sliding on the guides or rails, whereby to support the separator, so it may be oscillated, substantially as set forth.

14. The combination of the drum, the guides or rails, the separator having hangers arranged to engage said rails, the balls on said hangers, the connecting-rod having at one end ball-sockets receiving said balls and having eccentric-straps at their opposite ends, and the shaft having eccentric-disks fitting within said straps, substantially as set forth.

15. In an amalgamator, the combination, with the drum and the cover-tube and feeder therein, of the annular water-reservoir encircling the cover-tube and made of an external diameter considerably less than the internal diameter of the drum, and adapted for use, substantially as set forth, whereby the water, pulp, &c., may pass upward between the water-reservoir and drum and be discharged at the top of the latter, as and for the purposes specified.

16. The combination, in an amalgamator, of the drum, the cover-tube having an upwardly-facing shoulder, the reservoir arranged above said shoulder, and the feeder arranged in said cover-tube, substantially as set forth.

17. In an amalgamator, the combination of the drum, the feeder and cover-tube concentrically within the drum, the annular water-reservoir encircling the cover-tube, and the separator connected at its inner edge with the water-reservoir and extending to and fitted at its outer edge snugly against the inner surface of the drum, such separator and reservoir being suitably connected, whereby they may be oscillated, substantially as set forth.

18. In an amalgamator, the combination of the drum having an internal upwardly-facing shoulder, the cover-tube arranged concentrically in said drum and having an external upwardly-facing shoulder, the separator having its outer edge or plate arranged over the shoulder of the drum, and the reservoir connected with the separator and arranged above the shoulder of the cover-tube, substantially as set forth.

19. In an amalgamator, the drum having an inner concentric lining-plate of less external diameter than the internal diameter of the body of the drum, and a filling between said lining-plate and drum-body, said lining-plate being shorter than the drum-body, providing an internal upwardly-facing shoulder, substantially as set forth.

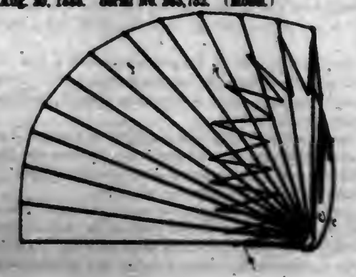
20. The combination of the base, the drum, the pedestal mounted on the base centrally within the drum, the feed-wheel over said pedestal, the cover-tube fitted over said feed-wheel, the adjustable regulator-tube within said cover-tube, the annular separator, and the annular water-reservoir within the drum and encircling the cover-tube, all substantially as and for the purposes specified.

21. In an amalgamator, the combination of the drum, the revolving feed-wheel, the pedestal centrally within the drum, the cover fitted over the feed-wheel, the check-valve, the perforated partition-plate N', located within the mercury-space of the drum, the separator, and the reservoir encircling the cover, substantially as and for the purposes specified.

22. In an amalgamator, a feed-wheel having its lower flared portion formed on its upper side with flutes leading to its outer edge and provided with a ring-like cover-plate secured to and revolving with the said wheel and arranged over the outer ends of said flutes, forming closed passage-ways between the said flutes at their outer ends, substantially as set forth.

23. An amalgamator comprising a drum or casing having a mercury-space, a feeder arranged to discharge the pulp, &c., into said mercury-space, and a separator and a water-reservoir arranged within said drum and above the mercury-space, such reservoir and separator being connected, substantially as set forth.

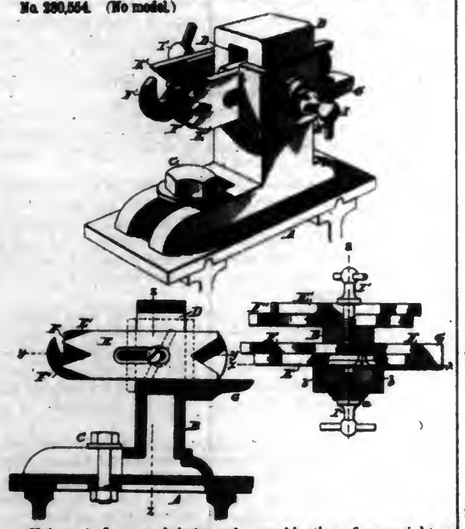
400,115. BUSTLE. LEONARD T. RIDGLEY, Ashland, Ohio. Filed Aug. 25, 1888. Serial No. 283,732. (Model.)



Claim.—1. In a bustle, the combination, with a single coiled-wire spring having its lower side gathered, of a spring coiled on and securing said gathered portion, the ends of said spring being carried out in opposite directions and secured, respectively, to the front and rear coil of said spring, and a coiled spring within said spiral spring, substantially as described.

2. In a bustle, the combination, with a single coiled spring having a cross-bar, as B, on its forward coil and its lower portion gathered, of springs, as C, coiled on said gathered portion, the ends *c* and *c'* of said latter springs being extended out in opposite directions and secured, respectively, to said cross-bar and the outer coil of the spiral spring, substantially as described.

400,116. **WORK-HOLDER.** ISAAC H. ROBERTS, Norristown, Pa., assignor to Mary A. Roberts, same place. Filed July 20, 1888. Serial No. 280,554. (No model.)



Claim.—1. In a work-holder, the combination of an upright or standard, a pair of independently-adjustable jaws mounted therein side by side and each provided with a seat to receive and hold the work, and a set-screw or clamp adapted to hold the jaws in their adjusted positions.

2. In combination with the upright or standard, two separate and independent pairs of clamping-jaws arranged with their seats in approximately the same horizontal plane, and means for clamping them to the standard.

3. In combination with the slotted upright or standard, two or more jaws mounted therein, a set-screw for clamping the jaws to the standard, and an arm or extension projecting from the standard and arranged, substantially as shown, to maintain one of the jaws in the same horizontal plane with the lathe-centers.

4. In combination with an upright or standard, a jaw, E, provided with a V-shaped notch in its end, a jaw, F, also mounted in the standard by the side of the jaw E and provided with a curved seat, and a set-screw for clamping the jaws to the standard.

5. In combination with the slotted upright provided with a threaded hole, two or more jaws mounted in the slot, a block, H, applied to the standard and adapted to bear against the jaws, and a screw provided with a collar to bear upon the block.

6. In a work holder or support for use in turning, the combination, with an upright or standard, of two or more jaws mounted therein and projecting from the same face thereof, one of said jaws being adjustable relatively to the standard toward and from the material operated upon in the same horizontal plane therewith, and a set-screw or clamp.

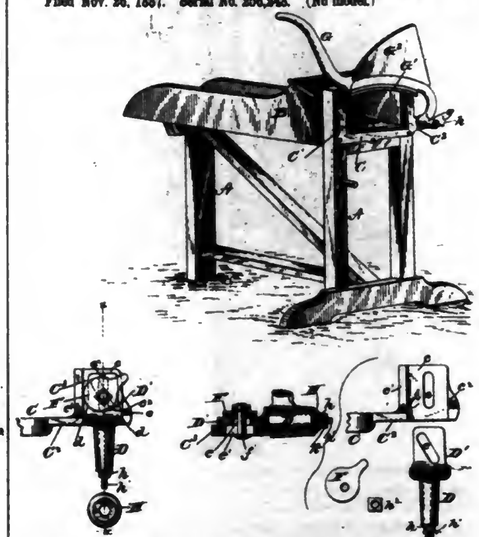
7. In combination with an upright or standard, a pair of jaws mounted therein side by side and adjustable one upon the other and relatively to the standard, and a set-screw or clamp for holding the jaws in their adjusted positions.

8. In combination with the slotted upright or standard, a pair of jaws mounted within the slot, a set-screw for clamping the jaws in position, and a second pair of jaws mounted upon the side face of the standard and provided with a clamp or set-screw.

9. In combination with an upright or standard, a jaw, E, mounted therein and provided with a V-shaped notch in its end, the apex of the notch being in the same horizontal plane with the lathe-centers, a jaw, F, also mounted in the standard by the side of the jaw E and provided with a seat to receive the material being operated upon and to hold the same in the V-shaped notch of jaw E, and a fastening device adapted to clamp the jaws in position.

10. In combination with an upright or standard provided with a slot, jaws mounted therein and of a thickness less than the width of the slot, a block, H, provided with wings *b b*, adapted to project beyond the wall of the slot and to bear against one of the jaws, and a screw, I, passing freely through the block and into the standard and provided with a collar to bear upon the block.

400,117. **FEED-CUTTER.** ELMORE W. ROSS, Springfield, Ohio. Filed Nov. 26, 1887. Serial No. 256,945. (No model.)



Claim.—1. The slotted pivot-supporting arm on the feed-cutter frame, in combination with a slotted pivot-plate or shank, the slot in one of said parts being in oblique relation to the slot in the other part, substantially as and for the purposes described.

2. The slotted knife-pivot support on the cutter-frame, in combination with the slotted plate having the knife-pivot formed upon it, the slot in the pivot-plate crossing obliquely the slot in the support and the through-bolt uniting said parts, whereby the knife-pivot is made both longitudinally and pivotally adjustable, and is retained at the desired adjustment by a single bolt, substantially as described.

3. The combination, with the slotted knife-pivot support, of the slotted plate having the tapering knife-pivot formed upon it and provided with a slot crossing obliquely the slot in the pivot-support, and a single through-bolt uniting said parts and permitting both the longitudinal and pivotal adjustment of said pivot, substantially as described.

4. A knife-pivot bracket or support having a side wall or flange, in combination with a knife-pivot arm supported by and having its fulcrum on said side wall of said bracket, one of said parts being provided with a slot, and a through-bolt for uniting said bracket and knife-pivot arm and permitting the adjustment of the latter on its side fulcrum-point, substantially as described.

5. The combination, with the knife-supporting bracket, of the knife-pivot plate supported by said bracket, one of said parts being slotted, the through fastening-bolt, the cam adjustable on said bolt, and a bearing for said cam to press against to adjust and hold the knife-pivot plate, substantially as described.

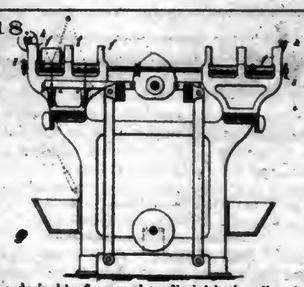
6. The combination, with the slotted and socketed knife-supporting bracket, of the slotted knife-pivot plate pivotally supported on the side walls of the bracket-socket, the clamping through-bolt, and the cam adjustable on said bolt, substantially as described.

7. The combination, with the knife-supporting arm C^3, having the socket and slot, as described, of the slotted and pivotally and longitudinally adjustable pivot-plate D', the tapering pivot on said plate, and the through-bolt for securing the plate D' to the arm or bracket C^3, and the cam-plate F on said bolt, all substantially as described.

400,118. **MACHINE FOR WINDING YARN.** FERDINAND ROSSOTTER, Accrington, County of Lancaster, England. Filed Nov. 17, 1888. Serial No. 219,142. (No model.) Patented in England Jan. 9, 1884, No. 1,051, and Dec. 30, 1885, No. 16,008; in Germany Dec. 20, 1885, No. 36,088, and in Austria-Hungary Oct. 19, 1886, No. 31,376.

Brief.—The object of the invention is to enable the yarn to be

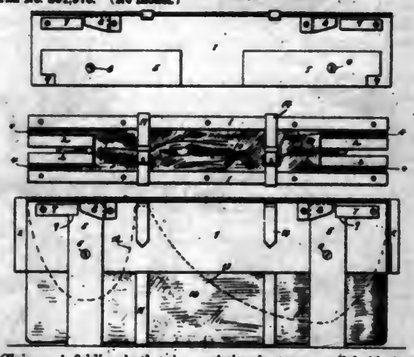
400,118.



wound into a desirable form and to diminish the vibrations resulting from the sudden reversal of the yarn-guiding devices.

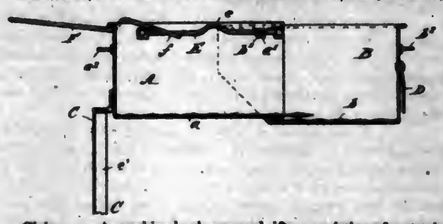
Claim.—In a machine for winding yarn, a thread-guiding motion consisting of the combination of a movable thread-guide rod, *e*, a pivoted lever mounted thereon, a pigtail or thread-guide, *g*, mounted upon the upper end of said lever, a retractile spring for said lever, attached to its lower end and to the said thread-guide rod, and a stop, *m*, for said lever, substantially as and for the purpose described.

400,119. **FOLDING BATH-TUB.** RANSOM SABIN, Shelby, assignor to himself and Erwin Stanhope, Mears, Mich. Filed Nov. 27, 1888. Serial No. 291,970. (No model.)



Claim.—A folding bath-tub consisting in two parallel side bars, 1, having sockets 8 8 near their opposite ends, and latches 7 pivoted in front of the open sides of said sockets, the legs 5 5, pivoted between their ends to the side bars below the sockets, the upper ends of the legs entering the sockets when swung into vertical position, and having notches to receive the latches 7, the end pieces, 2 2, hinged together at their adjacent ends, and at their opposite ends hinged to the ends of the side bars to swing inwardly, the bolt 15, crossing the meeting ends of said end pieces, and the water-proof sheet 10, substantially as set forth.

400,120. **COMBINED ASH PAN AND SIFTER.** JAMES F. SAYER, Gouverneur, N. Y. Filed Jan. 21, 1889. Serial No. 296,986. (No model.)



Claim.—1. A combined ash pan and sifter consisting of two telescoping sections having overlapping screen-bottoms and an imperforate bottom pan held thereto to temporarily retain the ashes, substantially as herein set forth.

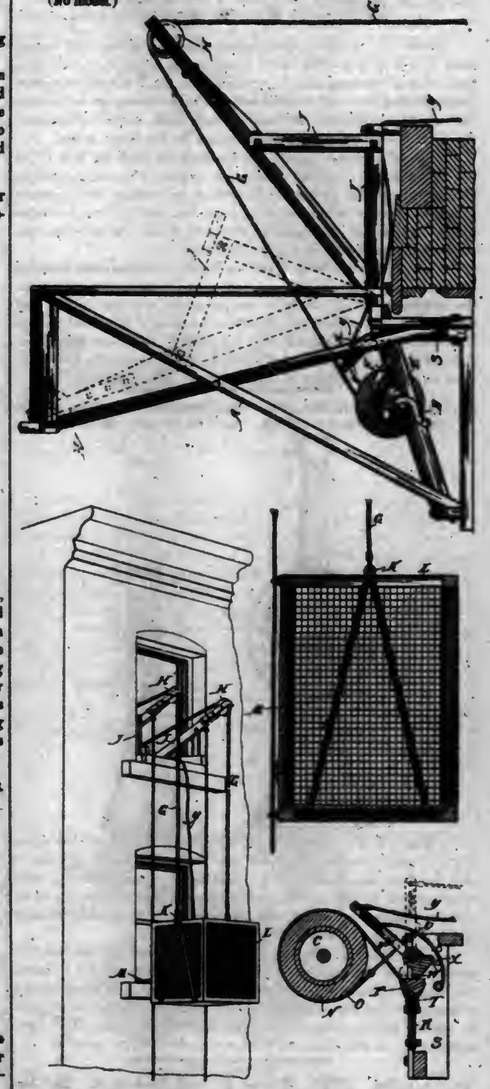
2. A combined ash pan and sifter consisting of two telescoping sections having overlapping screen-bottoms, lugs or stops on the sections limiting their extensibility, and an imperforate bottom pan held to the sections to temporarily retain the ashes, substantially as herein set forth.

3. A combined ash pan and sifter consisting of two telescoping sections having overlapping screen-bottoms, an imperforate bottom pan hinged to one section, and a latch device for the bottom pan when closed to the contracted sections, substantially as herein set forth.

4. The combination, in an ash pan and sifter, of two telescoping sections having overlapping screen-bottoms, an imperforate bottom hinged to one section and provided at its free end with an eye, *d*, and a hook, D, on the other section for securing the closed bottom pan to the contracted sifter-section, substantially as herein set forth.

5. The combination, in an ash pan and sifter, of two telescoping sections, A B, having overlapping screen-bottoms, an imperforate bottom pan held to said sections to temporarily retain the ashes, said section A having side rods, E, provided with offsets *e*, and a bail, F, fitted loosely on said rods and adapted to their offsets, substantially as herein set forth.

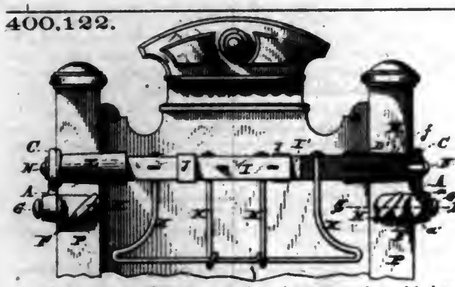
400,121. **COMBINED WINDOW-CLEANER AND FIRE-ESCAPE.** AMALIE SCHAEFER, Chicago, Ill. Filed Nov. 9, 1888. Serial No. 290,368. (No model.)



Claim.—The combination of a vertically-moving car with a windlass and ropes therefrom to support the car, and a friction-strap about such windlass and connected at one end with a spring-actuated slide, and a pivoted lever which engages such slide at one end, and a rope secured to the other end of the lever, so that by rocking such lever on its pivotal point the slide may be reciprocated to loosen or tighten the friction-belt, and thus control the rotation of the windlass.

400,122. **PILLOW-SHAM HOLDER.** GEORGE W. SCHIFFER and ARTHUR L. KNIGHT, Buffalo, N. Y. Filed July 16, 1888. Serial No. 280,094. (No model.)

400,122.

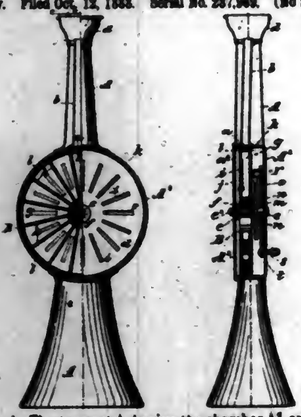


Claim.—1. In pillow-sham holders, the combination, with slotted arms A, having projecting claws B and lateral projecting heads C, of the L-shaped clamping-arm F, provided with the T-shaped projection G and catches *a a'*, said catches being arranged to engage with serrations or notches E along the inner opposite edges of the slotted aperture D in said arm A, substantially as and for the object stated.

2. In pillow-sham holders, the combination, with the bars I I', of the socket-pieces L L', held in frictional contact with and projecting beyond the ends of said bars, as specified, to produce the chambers *f*, spiral springs M, thumb-screws N, and brackets A, having suitable heads, C, to operate in conjunction with said screws and spiral springs, substantially as and for the object described.

3. In pillow-sham holders, the combination, with a suitable bracket having heads C, with apertures *c*, of the slats I I', having tapering ends, the socket-pieces L L', fitted to and projecting over the ends of said slats or bars I I', to form an adjustable chamber, *f*, the spiral springs M, located in such chamber, and the bolts N, said bolts being constructed to draw the ends of the bars I I' farther into the sockets L L' to compress the springs M, as and for the object specified.

400,123. MUSICAL TOY. JEAN SCHOENER, Nuremberg, Bavaria, Germany. Filed Oct. 12, 1888. Serial No. 287,969. (No model.)



Claim.—1. The trumpet A, having the chamber A^2, and the opening *a* in said chamber, combined with the rotary drum B, hung in said chamber, said drum having a number of compartments, *g*, each compartment having a reed, *j*, to produce a musical sound, and an opening adapted to register with the opening *a*, for the admission of air, substantially as described.

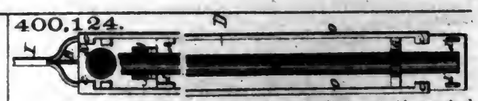
2. The trumpet A, having the chamber A^2, and the opening *a* in said chamber communicating with the mouth-piece of the trumpet, combined with the drum B, hung in said chamber, said drum having a number of separate chambers, *g*, each chamber being provided with an opening for the admission of air and with a reed, *j*, and with means, substantially as described, for rotating the drum B, as specified.

400,124. PUMP. WILLIAM M. SCOTT, Elmwood, Ill. Filed Jan. 14, 1888. Serial No. 260,794. (No model.)

Brief.—A pump so constructed that the working-cylinders can be removed without disturbing the delivery-pipe.

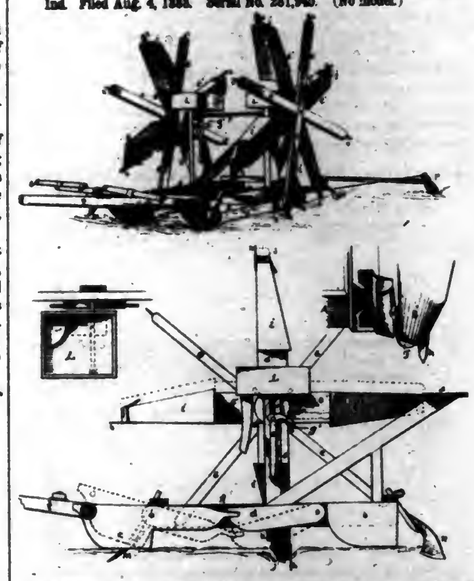


400,124.



Claim.—In a pump, the combination of cylinders A A', attached to bed-plate C, a discharge-pipe, E, a plate, D, attached to the discharge-pipe E, openings K K', connecting cylinders A A' and discharge-pipe E, lugs *d d d' d'* on plate D, lugs *c c c' c'* on bed-plate C, spring-clamps G G, attached to bed-plate C, projecting ribs J J on discharge-pipe E, and a rod, H, attached to bed-plate C, substantially as set forth in foregoing drawings and specification.

400,125. CORN-PLANTER. HENRY C. SHANAHAN, Mishawaka, Ind. Filed Aug. 4, 1888. Serial No. 281,945. (No model.)



Claim.—1. In a runner corn-planter, the forward runners pivoted to the frame at or near their back ends, combined with the supplemental arms or runners *d*, pivoted to the frame and jointed to said forward runners, substantially as set forth.

2. In a runner corn-planter, a pair of front runners pivoted to the main frame at or near the rear ends of said runners provided with rearward extensions, and the supplemental runners pivoted to the frame and jointed to said rearward extensions, so that as the front ends of said forward runners encounter an obstruction they rise on said obstruction by turning on their pivots, and the supplemental runners are thrown down to support the machine without changing the horizontality of the machine.

3. In a corn-planter, a transverse shaft having at each end of the planter a revolving rimless wheel provided with planter-boots spaced to plant at the proper distance between hills, and additional actuating-spokes *e* upon each of said wheels and intermediate between said boots, whereby the turning of the shaft is effected from either side of the planter while said boots are clear of the ground.

4. In a corn-planter, a revolving planting-wheel provided with planting-boots, as described, in combination with a carrying-frame having bearings which loosely engage the axle of said wheel and permit said axle and wheel to move vertically independently of said frame, and the boot levers G, carried by said frame, having their pivotal points below the axle and adapted to raise said axle by a cam action and sustain it in the upper part of said bearings to clear the planting-wheel of the ground, as set forth.

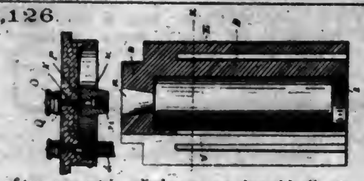
5. In a planter, the combination, with the axle carrying the planting devices, and a frame having bearings which loosely engage the axle, of levers pivoted upon the frame adapted to engage and elevate the axle, and having sockets into which the axle may drop and thereby hold the said levers in position, substantially as described.

400,126. GALVANIC BATTERY. FRANK SHAW, New York, N. Y. Filed Jan. 3, 1889. Serial No. 295,328. (No model.)

Claim.—1. The carbon or negative element of a galvanic battery, consisting, essentially, of two concentric carbon cylinders attached together at one end.

2. The carbon or negative element for galvanic batteries, consisting of two concentric cylinders or cup-shaped bodies formed with a head, B, as and for the purpose described.

400,126.



3. A negative element for galvanic batteries, consisting of two concentric cylinders of carbon attached together, the outer of said cylinders having a slot in its side, as and for the purpose described.

4. A negative element for galvanic batteries, consisting of two concentric cylinders of carbon, the outer of which is open at its lower end, while the inner has a slot in its side.

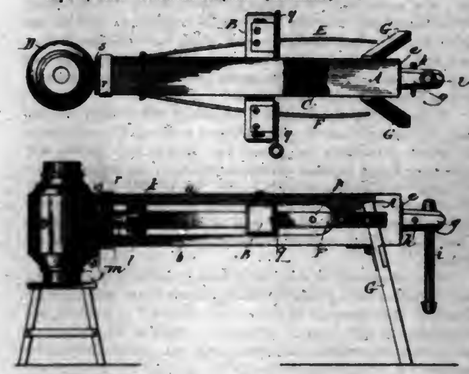
5. As a new article of manufacture, the carbon element for galvanic batteries, consisting of two concentric cylinders or cup-shaped bodies of carbon formed integral with a common head, the inner of said cylinders being provided with a slot in its side.

6. In a galvanic battery, the combination, with the two concentric cylinders forming the negative element, of a positive element consisting of a zinc electrode supported in a slot or opening in the outer cylinder.

7. In a galvanic battery, a negative element consisting of two concentric hollow cylinders of carbon projecting from a common head, the inner of said cylinders forming a magazine for the battery chemical and being provided with an opening in its side.

8. The combination, with the carbon element, of a supporting metal rod passing through the battery-cover and having a carbon head fitting into a socket in said element.

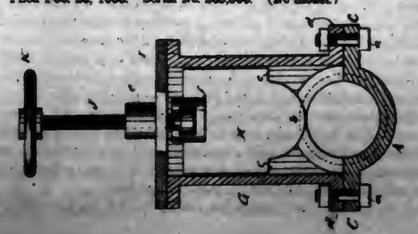
400,127. MACHINE FOR DRAWING SPOKES. WILLIAM SHELLY, Chicago, Ill., assignor to himself and George Oswald, same place. Filed Sept. 3, 1888. Serial No. 284,449. (No model.)



Claim.—1. A block, as A, provided with two arms, *a b*, in combination with a sliding cross-bar, B, provided with a nut, *c*, a screw, C, which fits the nut *c* and passes through a hole which is not screw-threaded in the block A, and bars E F, which pass through slots in the cross-bar B, substantially as and for the purposes specified.

2. A block, as A, provided with two arms, *a b*, in combination with a sliding cross-bar, B, provided with a nut, *c*, a screw, C, which fits the nut *c* and passes through a hole which is not screw-threaded in the block A, a clamp, as *k m*, adapted to be placed on a spoke or other article, and bars E F, which pass through slots in the cross-bar B and are adapted at their inner ends to engage with the clamp, substantially as and for the purpose specified.

400,128. GATE-VALVE. CHARLES H. SHEPHERD, New York, N. Y. Filed Feb. 28, 1888. Serial No. 265,566. (No model.)



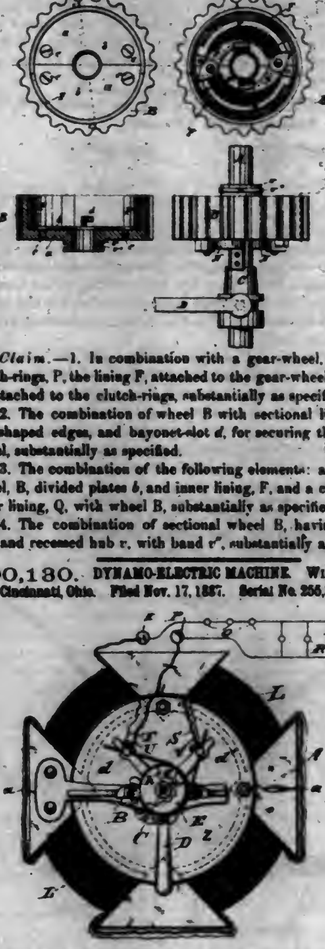
400,128.



Claim.—1. The combination, with the pipe A, provided with the collar B, the apertured ears C, and the transverse slot D, of the semi-circular cover E, provided with the central rib, E', fitting in the slot D, and with the apertured ears F, resting upon and bolted to the ears C of the pipe, substantially as herein shown and described.

2. The combination, with a transversely-slotted pipe, of an interchangeable cover and casing adapted to be secured to the pipe over the slot, the cover being provided with a rib and the casing with a sliding valve to enter the slot of the pipe when the cover or casing is in place, substantially as described.

400,129. CAR BRAKE AND STARTER. GIOVANNI B. SICCARDI, New York, N. Y. Filed Jan. 16, 1889. Serial No. 296,714. (No model.)



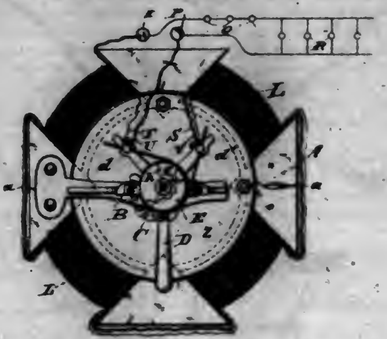
Claim.—1. In combination with a gear-wheel, B, and internal clutch-rings, P, the lining F, attached to the gear-wheel, and the lining Q, attached to the clutch-rings, substantially as specified.

2. The combination of wheel B with sectional lining F, having step-shaped edges, and bayonet-slot *d*, for securing the lining to the wheel, substantially as specified.

3. The combination of the following elements: a sectional gear-wheel, B, divided plates *b*, and inner lining, F, and a clutch, P, having outer lining, Q, with wheel B, substantially as specified.

4. The combination of sectional wheel B, having disks *a*, and split and recessed hub *r*, with band *r''*, substantially as specified.

400,130. DYNAMO-ELECTRIC MACHINE. WILLIAM L. SILVEY, Cincinnati, Ohio. Filed Nov. 17, 1887. Serial No. 255,276. (No model.)



Claim.—1. A field-magnet for dynamo-electric machines, cast in a single piece and broken into two or more parts by means of wedges driven into holes where the divisions are desired for the purpose of facilitating the winding of the coils of wire thereon.

2. The field-magnet A, having the hole *a* therein for facilitating the fracture or division of the magnet for the purpose of winding.

3. The field-magnet of a dynamo-electric machine, the pole-pieces broken apart and united by sutures, as set forth.

4. The field-magnet of a dynamo-electric machine, the polar extensions united by a ragged, broken, or irregular joint for forming a more perfect magnetic joint, as set forth.

400,131. HAMMOCK. HERBERT M. SHALL, Baldwinsville, Mass. Filed June 19, 1888. Serial No. 277,573. (No model.)

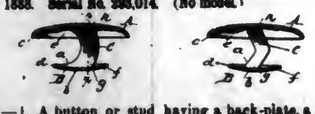


Claim.—1. A hammock consisting in a seat and back portion, hooks at the upper end of the back portion, a looped rope secured at its ends to the forward corners of the seat portion, and adjustable hooks on the parallel parts of the rope, the looped part of the rope forming a foot-rest, substantially as set forth.

2. A hammock constructed with supporting-hooks at one end, and having at its other end a curved recess, and supporting-hooks with a rope passing through eyes in the shanks of the hooks and attached at its ends to the corners of the recessed end of the hammock, substantially as shown and described.

3. A hammock constructed with main portion 1, having curved recess 2, supporting-hooks 3 at one end and the looped rope 4 with its ends secured at the recessed end of the main portion 1, and the supporting-hooks 3, having eyes 5, through which rope 4 passes, substantially as shown and described.

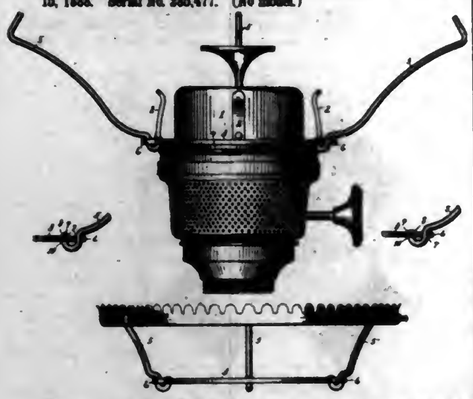
400,132. BUTTON. THOMAS W. F. SMITTEN, Brooklyn, N. Y. Filed Dec. 8, 1888. Serial No. 293,014. (No model.)



Claim.—1. A button or stud having a back-plate, a post, and a head, all rigidly attached together, the post being of greater width than thickness or in alignment with the button-hole when applied and of practically uniform width from the lower surface of the head to the top of the shoe, one edge of said post being inclined to and forming an angle with the outer side of the back-plate, substantially as and for the purposes set forth.

2. A button or stud having a back-plate, a post, and a head, all rigidly attached together, the post being of greater width than thickness or in alignment with the button-hole when applied and of practically uniform width from the lower surface of the head to the top of the shoe, one edge of said post being inclined to and forming an angle with the outer side of the back-plate, the points of attachment between the head and the back-plate being in practically the same vertical plane, substantially as and for the purpose set forth.

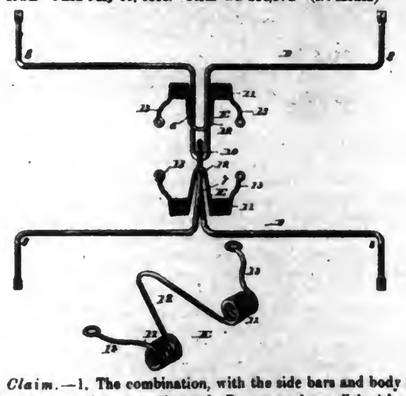
400,133. SHADE-HOLDER. GEORGE H. SOMERS, Bridgeport, Conn., assignor to The Bridgeport Brass Company, of Connecticut. Filed Sept. 15, 1888. Serial No. 285,477. (No model.)



Claim.—1. A shade-holder consisting of a ring having openings 7 and 8 and shade-arms, the lower ends of which are curved so as to pass through both openings, and are provided with shoulders 10, which rest against the under side of the ring, and reduced ends 9, which are headed down upon the top of the ring.

2. A shade-holder consisting of a metallic ring having ears 6, bent at an angle thereto, said ring and ears having openings, as shown, and shade-arms 5, having reduced ends and shoulders 10, said arms being passed through the openings in said ears and ring, the shoulders resting against the under side of the ring and the reduced ends headed down, as shown.

400,134. CARRIAGE-SPRING. BURRE M. SOULE, Cedar Rapids, Iowa. Filed July 30, 1888. Serial No. 281,374. (No model.)



Claim.—1. The combination, with the side bars and body of a road-vehicle, of the supporting-rods D, arranged parallel with each other and formed with loop forms or bails, which are linked together one within the other and having the ends shackled to the bars of the running-gear, substantially as shown and described.

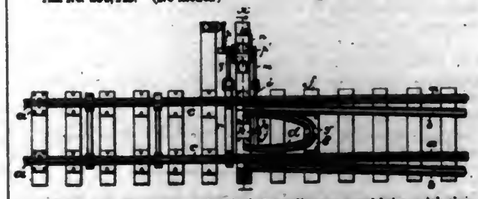
2. The combination, with the supporting rails or bars and body of a road-vehicle, of supporting-rods mounted in bearings on the body and formed at their middle with bails or loops linked together one within the other, and the ends of the bars shackled to the bars of the body-frame, and a spring, E, mounted on the bottom of the body-frame and formed to bear with its force on the interlinked loops of supporting-rods, substantially as and for the purpose specified.

3. The combination, with the supporting rails or bars and the body of a road-vehicle, of supporting-bars mounted in bearings on the bottom of the body and formed with loops linked together one within the other, and having the ends of the bars shackled to supports, and springs E, mounted on the bottom of the body-frame and adapted to bear with their force on the interlinked loops of the supporting-bars, substantially as described.

4. The combination, with the supporting rails or bars and the body of a road-vehicle, of supporting-bars A, mounted in bearings on the bottom of the body and formed with loops at their middle, said loops being linked together one within the other, and having the ends of the bars shackled to supports on the running-gear of the vehicle, and springs E, mounted on the bottom of the body, said springs consisting of spirals connected by a loop, arranged to bear on the interlinked loops of the supporting-bars, substantially as shown and described.

5. In a road-vehicle, the combination of parallel body-supporting bars, formed at their middle portions with loops linked one within the other and their free ends adapted to be connected to supports, and springs formed with loops to set over the loops of the supporting-bars to impart a resilient movement to the bars, substantially as described.

400,135. RAILWAY-SWITCH. WILLIAM SPIELMAN, Newark, N. J., assignor to Simeon J. Nasmburg, same place. Filed Dec. 20, 1887. Serial No. 258,443. (No model.)

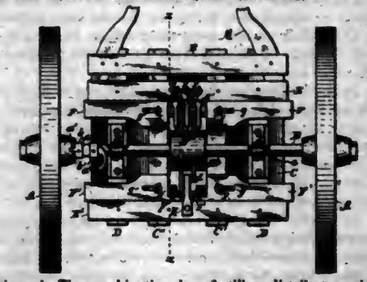


Claim.—1. The improved switch for railways, combining with ties *f*, main rails *a a'*, siding-rails *b b*, and switch-rails *c c*, a double rail, *d*, having a continuous curve providing bearings at right angles to the direction of movement of the car-wheels and at its extremity inwardly curved, as at *d'*, said double rail being pivoted on a chair, *e*, having lips *g' g'* of the tie *f* at a point between the rails *a a b b*, and having its curved extremities *d' d'* extend forward toward the joint between the said switch-rails and the rails *a a* or *b b*, where the said extremities are held in fixed relation by tie-bars, one of which extends under the rails *a b* and connects with a connecting-rod, *m*, a crank-shaft, and a connecting rod or rods which join the said bent rail to the switch-rails, substantially as and for the purposes set forth.

2. In a switch, the combination, with rails *a b c*, of a bent rail piv

oted between said rails *a b* and at its extremities *d' d'* held apart by a bar, *j*, having pins *j' j'*, and a laterally-extending bar, *i*, bolted, as at K, to said bar *j*, and connected with the switch through the medium of connecting-rods and a crank-shaft, substantially as and for the purpose set forth.

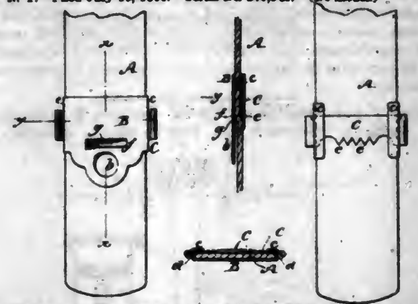
400,136. FERTILIZER-DISTRIBUTER. NAPOLEON B. SPRADLEY, Ashville, Ala., assignor of one-half to Joseph P. Caldwell, same place. Filed Dec. 29, 1888. Serial No. 294,918. (No model.)



Claim.—1. The combination, in a fertilizer-distributer, with the open-bottomed hopper and the revolving hub carrying the radial blades *d*, said blades being arranged staggering across said hub, of the curved stationary blades adjustably secured to the frame of the machine, substantially as described.

2. In a fertilizer-distributer, the combination of the open-bottomed hopper, the hub having the series of radial blades arranged staggering across the same, the cross-bar having a slot therein, the stationary blades adjustably secured in said slot, the cross-bar E^2, the stationary clearing-blade secured to said bar E^2, and the adjustable slide arranged in front and in rear of said central hub, substantially as described.

400,137. SUSPENDER-BUCKLE. LOUIS STEINBERGER, New York, N. Y. Filed July 10, 1888. Serial No. 279,549. (No model.)

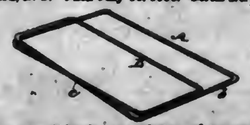


Claim.—1. The combination, with the buckle slide or body, of a loosely-attached laterally sliding and buckling spring bar or plate arranged on one side or face of said body and for operation in connection therewith, essentially as herein set forth.

2. In combination with the buckle slide or body, the loosely-attached laterally sliding and buckling spring bar or plate on one side or face of said body, provided with teeth or gripping points or projections, substantially as specified.

3. The combination of the buckle slide or body B, having a gripping-lip, *g*, on its inner surface, and the loosely-attached sliding and buckling spring bar or plate C, having teeth or projections *e* for operation together, essentially as shown and described.

400,138. SPRING-CLASP FOR HOLDING LETTERS. LOUIS STEINBERGER, New York, N. Y. Filed July 10, 1888. Serial No. 279,550. (No model.)



Claim.—1. An expansible clasp consisting of two parallel frames connected at one end only and movable toward and from each other, the clasp being open at its other marginal sides and end to receive and clasp a book or other article, substantially as set forth.

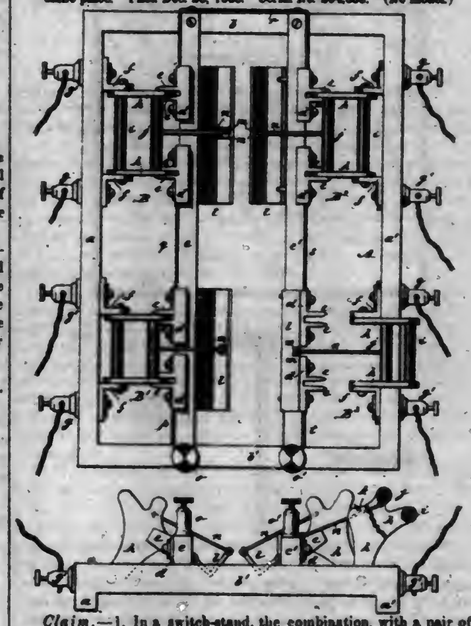
2. An expansible clasp consisting of two parallel frames connected at one end by a diagonal arm extending from opposite corners thereof, the clasp being open at its opposite end and at both sides, substantially as set forth.

3. An expansible clasp consisting of two parallel frames and two crossed arms connecting opposite corners of the said frames at one end of the clasp only, whereby the opposite end of the clasp and its opposite sides will be unobstructed to allow of the insertion of a book or other article, substantially as set forth.

4. An expansible clasp consisting of two parallel frames formed of a single wire crossed from opposite corners of the frames at one end of the clasp, the sides and opposite ends of the clasp being adapted to receive a book or other article, substantially as set forth.

5. A clasp consisting of two parallel frames formed of a single piece of wire crossed at one end of the clasp only to opposite corners of the two frames, one frame being smaller than the other, substantially as set forth.

400,139. SWITCH-STAND FOR DYNAMO-STATIONS. ROBERT R. STEWART, Dallas, Tex., assignor to himself and John Hugh Spivey, same place. Filed Dec. 28, 1888. Serial No. 294,855. (No model.)



Claim.—1. In a switch-stand, the combination, with a pair of electrical contacts and a pair of swinging arms insulated from each other and adapted to be moved together to engage the contacts, of a movable plate connected with the swinging arms and fitted to touch both electrical contacts, substantially as specified.

2. In a switch-stand, the combination of interrupted outside circuit-conductors provided with spring-contacts on opposite sides of the breaks of the circuit, one or more pairs of arms, each pair being connected with the terminals of a dynamo, and plates arranged to close the circuit between the contacts, substantially as specified.

3. In a switch-stand, the combination of the frame A, contacts *d*, attached to the frame, arms *h*, adapted to engage the contacts, the plates *l*, and the rods *n*, substantially as specified.

4. In a switch-stand, the combination of the frame A, the spring-contacts *d*, attached to the frame, the angle-plates *f*, the arms *h*, provided with ears *k*, the insulating-bars *i j*, connecting the said arms *h*, the hinged angled plates *l*, the connecting-rods *n*, and the circuit-connections, substantially as specified.

400,140. LANTERN OR LAMP. GEORGE W. STOCKLY, Cleveland, Ohio. Filed Sept. 18, 1888. Serial No. 285,066. (No model.)

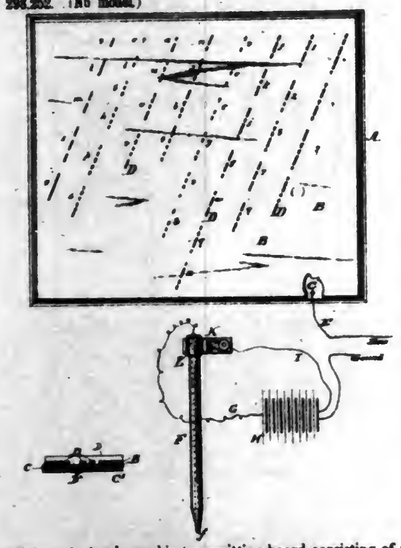


Claim.—1. In a photographic dark-room lamp or lantern, a frame having an opening therein, and a non-actinic screen made in sections differing in degrees of transparency or translucency to the passage of light.

2. In a photographic dark-room lamp or lantern, the combination of a source of light, a screen of non-actinic colored material arranged to interpose two or more different degrees of transparency or translucency to the passage of light, and an outside case or body provided with one or more openings through which light can be transmitted from within, substantially as set forth.

3. The combination, with a box or casing having one or more openings, of a movable cylinder therein, portions of the outside of which are made up of from one to several different layers of non-actinic material, and a source of light within the cylinder, substantially as set forth.

400,141. TELEGRAPHIC TRANSMITTER. ROSS C. STONE, New York, N. Y.; Samuel Wesley Smith administrator of said Ross C. Stone, deceased. Filed Dec. 1, 1887. Renewed Jan. 31, 1889. Serial No. 298,252. (No model.)

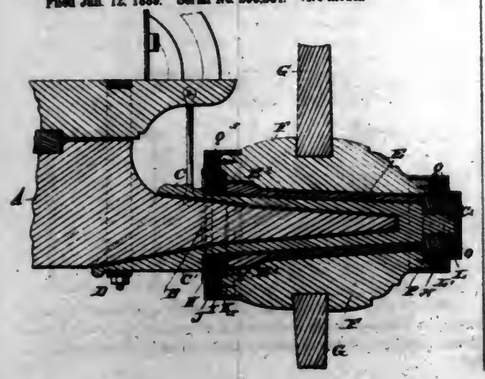


Claim.—1. A telegraphic transmitting-board consisting of an insulated metallic plate capable of connection to the line-wire and an integral non-conducting covering for said plate, said covering being pierced by apertures representing the characters of a signal and covering the entire surface of said metallic plate except where perforated.

2. The combination, with an insulated metallic plate, of an integral non-conducting covering extending over the surface of said plate, said covering having apertures representing the characters of a signal, and separate guiding-grooves proximate to said apertures.

3. In combination, an insulated plate forming a base and connected to a line-wire, an integral sheet of non-conducting material perforated, as described, with the characters representing a signal alphabet or code, covering said base-plate except where perforated, and a stylus having a non-conducting handle and a single metallic point connected to a battery-wire, the whole constituting a telegraphic transmitting apparatus, substantially as described.

400,142. AXLE-BEARING. FRIEDRICH STRAUB, La Crosse, Wis. Filed Jan. 12, 1889. Serial No. 296,201. (No model.)



Claim.—1. In an axle-bearing, the combination, with a skein provided near its inner end with a shoulder, of a collar held on the said skein near the said shoulder, and provided with an annular groove, a rubber washer fitting into the said groove, and a hub to which the said rubber washer is fastened and carrying the journal turning on the skein, substantially as shown and described.

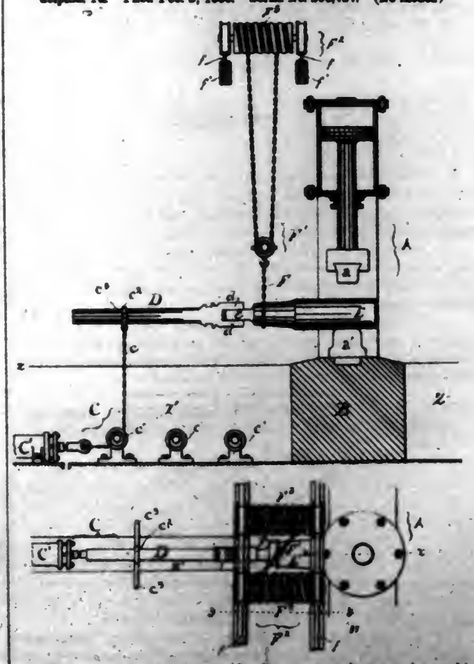
2. In an axle-bearing, the combination, with a skein provided near its outer end with a reduced screw-threaded extension, of a nut screwing on the said threaded extension and provided with an annular groove, a rubber washer fitting into the said annular groove, and a hub on which is secured said rubber washer, the said hub being mounted to rotate on the said skein, substantially as shown and described.

3. In an axle-bearing, the combination, with a skein provided near its outer end with a reduced screw-threaded extension, of a nut screwing on the said threaded extension and provided with an annular groove, a rubber washer fitting into the said annular groove, a hub on which said rubber washer is secured, said hub being mounted to rotate on the said skein, and a cap secured on the outside of the said rubber washer, substantially as shown and described.

4. In an axle-bearing, the combination, with a skein provided on its inner end with a shoulder and on its outer end with a screw-threaded extension, of a journal held to rotate on the said skein, a hub secured on the said journal, a collar held on the said skein between the said shoulder and the inner end of the said journal, said collar being provided with an annular groove in its rim, a rubber washer held in the said annular groove and secured to the said hub, a nut screwing on the threaded extension of the said skein, and also provided with an annular groove, and a second rubber washer fitted in the said annular groove and secured to the outer face of the said hub, substantially as shown and described.

5. In an axle-bearing, the combination, with a skein provided on its inner end with a shoulder and on its outer end with a screw-threaded extension, of a journal held to rotate on the said skein, a hub secured on the said journal, a collar held on the said skein between the said shoulder and the inner end of the said journal, said collar being provided with an annular groove in its rim, a rubber washer held in the said annular groove and secured to the said hub, a nut screwing on the threaded extension of the said skein, and also provided with an annular groove, a second rubber washer fitted in the said annular groove and secured to the outer face of the said hub, and caps fastened to the outside of the said rubber washers, substantially as shown and described.

400,143. FORGING MECHANISM. FREDERICK W. TAYLOR, Philadelphia, Pa. Filed Feb. 5, 1889. Serial No. 298,727. (No model.)



Claim.—1. As a forging mechanism, a steam-hammer, in combination with a suspending device, whereby the forging is sustained, a

tilting device, whereby the floating of the forging is effected, and mechanism for altering the length of one or both of said devices, so as to enable the forging to be manipulated under the hammer, substantially as and for the purpose specified.

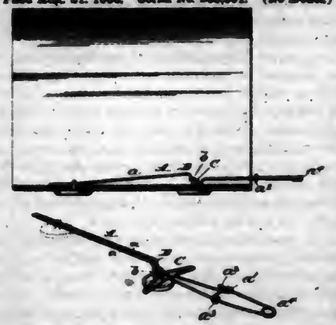
2. In a forging mechanism, a steam-hammer and a furnace, in combination with a traveling suspending device, whereby the forging is sustained and transferred from said furnace to said hammer, a tilting device, whereby the floating of the forging is effected, and mechanism for altering the length of one or both of said devices, so as to enable the forgemen not only to transfer a forging from furnace to hammer, but also to manipulate it under said hammer, substantially as and for the purpose hereinbefore described.

3. In a forging mechanism, a steam-hammer and a furnace, in combination with an overhead traveling and traversing trolley-crane, whereby the forging is sustained, a traveling tilting device, whereby the level of said forging is regulated when suspended, a rail system, whereby said tilting device is anchored and guided, the whole co-operating to enable the forgemen not only to transfer a forging from furnace to hammer, but also to manipulate it mechanically under said hammer, substantially as and for the purposes hereinbefore described.

4. In a forging mechanism, a steam-hammer, in combination with one or more furnaces, a fulcrum, and an underneath inverted downwardly-acting traveling trolley-crane, the length of whose tackle, being alterable at will, enables the forgemen to suspend the forging upon said fulcrum in a floating and preponderating condition, so as to traverse it to, manipulate it beneath, and rest it upon the anvil of said steam-hammer, substantially as and for the purposes hereinbefore described.

5. In a forging mechanism, the combination of a steam-hammer, a crane, one or more furnaces, an underneath switch, provided anchorage-railway leading from said hammer to said furnace or furnaces, a truck adapted to run along and be guided by said rail system, and an anchor-bridle attached to said truck and adapted to steer and maintain forgings when suspended on said crane in a floating posture, substantially as and for the purposes hereinbefore described.

400,144. CUFF-HOLDER. STEPHEN V. THOMAS, West Branch, Mich. Filed Aug. 21, 1888. Serial No. 283,301. (No model.)



Claim.—1. The cuff-holder herein described, adapted to fit in the eye or loops of a cuff-button, and having an offset or shoulder that springs past the eye or loop of one button, and is provided upon the opposite side of said eye or loop with a spring that flexes or bows outward to hold said offset or shoulder out of alignment with the button eye or loop, substantially as set forth.

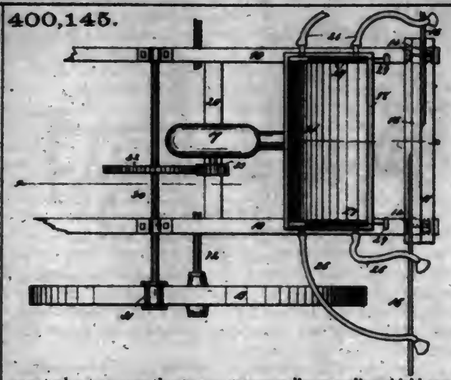
2. The cuff-holder herein described formed of a wire doubling upon itself into two lengths or portions, each formed with an offset or shoulder and a short distance from said offset or shoulder with lateral arms or loops deflected or inclined outward and downward and jointly forming a spring, substantially as specified.

3. The cuff-holder consisting of a wire doubling upon itself into two lengths or portions, each formed with an offset or shoulder, and a short distance from said shoulder or offset with lateral arms or loops deflected or inclined outward and downward and jointly forming a spring, one length or portion having its inner end formed with an open eye or loop and thence extended laterally and terminating in an end eye or loop, while the other portion or length is extended through said end eye or loop of the opposite portion or length and beyond the same, and provided with a spring-pin engaging with the other eye or loop of the opposite portion or length, substantially as specified.

400,145. POISON-DISTRIBUTER. WILEY P. TOWNS, Delta, La. Filed July 19, 1888. Serial No. 280,383. (No model.)

Claim.—1. In a machine for distributing poison, the combination, with a powder-receptacle having openings at the sides and flexible tubes or hose connected with said openings, of a blower entering said

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receptacle at or near the top, a downwardly-extending shield covering the blower-opening of the receptacle, and a gate controlling the exit-openings of the said receptacle, as and for the purpose specified.

2. In a machine for distributing poison, the combination, with a powder-receptacle having an inclined bottom and exit-apertures produced in the ends and a gate or valve controlling said exit-apertures, of a blower entering the powder-receptacle at the center and near the top, a shield covering the blower-openings in the receptacle extending vertically downward within a distance of the bottom, and flexible tubes secured in the exit-apertures provided with a rose at the extremity, substantially as shown and described.

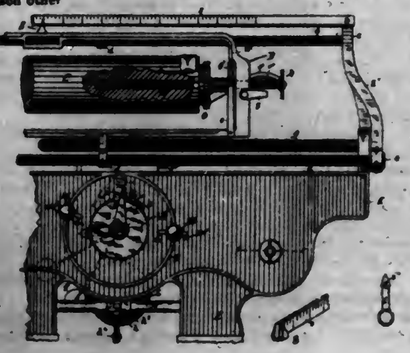
3. In a machine for distributing poison, the combination, with a frame, a vertically-adjustable supporting-bar at the rear of said frame, laterally-adjustable arms attached to said supporting-bar, a powder-receptacle adjacent to the supporting-bar, having an inclined bottom, and exit-apertures produced in the sides, of a gate or valve controlling said exit-apertures, a blower leading into the powder-receptacle at or near the top, a downwardly-extending shield covering the blower-opening in the receptacle, and flexible tubes secured within the exit-apertures and supported upon the said arms, substantially as shown and described.

4. In a machine for distributing poison, the combination, with a frame, drive-wheels, a vertically-adjustable supporting-bar at the rear of the frame, arms laterally adjusted to said supporting-bar, a powder-receptacle having an inclined bottom and provided with exit-apertures in the ends, and a valve controlling said apertures, of a blower entering the powder-receptacle at one side, a downwardly-extending shield covering the blower-opening in the receptacle, a pinion attached to the fan-shaft of the blower, a drive-shaft provided with a friction-roller engaging the periphery of the drive-wheel, a gear-wheel secured to said drive-shaft meshing with the pinion, and flexible tubes secured in the exit-openings of the powder-receptacle supported by said arms, substantially as shown and described.

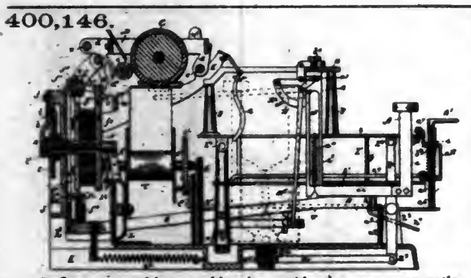
400,146. TYPE-WRITING MACHINE. HENRY H. URE, Philadelphia, Pa. Filed Mar. 14, 1887. Serial No. 230,767. (No model.)

Claim.—1. In a type-writing machine, a series of type-operating keys, each of said keys having two vertical arms, and a rod or bar connecting said arms, the inner of said arms standing radially.

2. In a type-writing machine, type-operating keys having two vertical arms, and a rod or bar connecting said vertical arms, and type-bars equal in number to said type-operating keys and connected at their outer ends with said type-operating keys at the upper end of said inner vertical arms, said connecting rods or bars being parallel to each other



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3. In a type-writing machine, in combination, a type-operating key having two vertical arms, and a rod or bar connecting said arms, said inner vertical arm having a slot or orifice, a spring in said orifice, a plate, *b*, one end of said spring being attached to the plate *b* and the other end to the type-operating key.

4. In a type-writing machine, in combination, a type-operating key having two vertical arms, and a rod or bar connecting said vertical arms, and a type-bar connected at its outer end with said type-operating key at the upper end of said inner vertical arm.

5. In a type-writing machine, in combination, a rack carrying carrier-operating frame, a rod (a portion of the main frame) upon which said rack carrying carrier-operating frame travels, a rack attached to said rack carrying carrier-operating frame, mechanism, substantially as described, to operate said rack, and a platen-carrier which travels on a rod independent of the rod upon which the rack carrying carrier-operating frame travels, and means, substantially as described, to provide contact between said platen-carrier and the rack carrying carrier-operating frame.

6. In a type-writing machine, in combination, a rack carrying carrier-operating frame, a rod, *g*, (a portion of the main frame,) upon which said rack carrying carrier-operating frame travels, a rack, fixed lugs on the main frame to guide said rack, a spring-actuated drum, and a gear of said spring-actuated drum into which said rack works, whereby when the spring-actuated drum operates the rack is driven forward and guided.

7. In a type-writing machine, in combination, a rack carrying carrier-operating frame which travels upon the main frame, a rack attached to said rack carrying carrier-operating frame, a main frame, a platen-carrier attached to said main frame so as to have only a lateral motion on said main frame, a portion of said main frame being pivoted, and a contact-arm connecting said platen-carrier and rack carrying carrier-operating frame in such a manner that ecatact is retained between them when the pivoted portion of the main frame is swung.

8. In combination, the vibrating spacing-frame and type-operating key having two vertical arms, and a rod or bar connecting said arms, said rod or bar projecting beyond said type-operating key a distance sufficient to rest above the outer end of said vibratory spacing-frame.

9. In the vertical reciprocating sliding frame of a type-writing machine, in combination, a rod in said frame, a spring upon said rod, a dog pivoted to said rod, a spring-actuated drum, and a ratchet upon said spring-actuated drum in which said pawl rests, whereby the paw is rigid in one direction of movement of said drum, but presents no obstacle to the opposite movement of the drum.

10. In a type-writing machine, in combination, a spacing-frame and spacing mechanism, and an adjustable spacing-key.

11. In a type-writing machine, in combination, a spacing-frame, a spacing-key, and an extension-finger projecting from said spacing-frame to a point beneath said spacing-key.

12. In a type-writing machine, in combination, a spacing-frame, an adjustable spacing-key, the plates *b* and *b'*, and orifices in said plates wherein the key rests and is secured.

13. In a type-writing machine, in combination, a spacing-frame, an adjustable spacing-key, the plates *b* and *b'*, orifices in said plates wherein the key rests and is secured, and extension-fingers a^9, projecting from the end of said spacing-frame.

14. In a type-writing machine, in combination, a rack carrying carrier-operating frame which travels upon the main frame, a rack, said rack having slots and being connected through said slots with the rack carrying carrier-operating frame by screws or similar means, which screws hold the rack in a fixed position on the rack carrying carrier-operating frame when said screws are in position, but when said screws are withdrawn a small distance the rack may be moved up, and a gear on said spring-actuated drum in which said rack normally rests, whereby when said rack is moved up the rack is released from the gear of the spring-actuated drum.

15. In combination, a spacing-frame, and a reciprocating sliding frame having the dog f^9, said dog f^9 having a reciprocating sliding motion independent of and in a plane parallel to the movement of the reciprocating sliding frame.

16. In a type-writing machine, in combination, a reciprocating sliding frame, a dog, f^9, connected to said frame, a spring surrounding said dog and retaining it normally in its most extended position, and a lever, f^{12}, pivoted upon the main frame, the outer end of said lever being in path of movement of said reciprocating frame.

17. In a type-writing machine, in combination, a spacing-frame, a reciprocating sliding frame connected with said spacing-frame and provided with dogs f' f^9, a lever, f^{12}, pivoted upon the main frame, a spring surrounding said dog f^9, a projection, f^{20}, on the reciprocating sliding frame, a spring-actuated drum, and a ratchet on said spring-actuated drum, in which said dog f' normally rests, whereby, when the sliding frame is elevated beyond its normal movement, both dogs f' f^9 are held free from the ratchet of said spring-actuated drum and the spring-actuated drum can revolve freely.

18. In a type-writing machine, in combination, a reciprocating sliding frame, dogs f' and f^9, said dog f^9 being connected with said frame by a pin, said pin projecting beyond the frame, a spring surrounding said dog and retaining it normally in its most extended position, a lever, f^{12}, pivoted upon the main frame, a projection, f^{20}, on the reciprocating sliding frame, and a spacing-frame, whereby, when the spacing-frame is depressed the required distance, both dogs are released.

19. In a type-writing machine, the combination of an adjustable drum-stop and spring-actuated drum.

20. In a type-writing machine, in combination, a bell-trip, a spring-actuated drum, and a bell-operator and bell.

21. In a type-writing machine, in combination, a bell-trip, a spring-actuated drum, a bell-operator, a loose shaft, an arm, *k*, of said shaft, a clapper, and a bell.

22. In a type-writing machine, the combination of an adjustable bell-trip and drum-stop with the bell and spring-actuated drum.

23. In a type-writing machine, in combination, an adjustable drum-stop, a spring-actuated drum, and a wheel revolving with said drum having teeth or orifices, in any of which teeth or orifices in said wheel said adjustable drum-stop may be placed.

24. In a type-writing machine, in combination, an adjustable bell-trip, a spring-actuated drum, and a wheel revolving with said drum having teeth or orifices, into any of which teeth or orifices in said wheel said adjustable trip may be placed.

25. In a type-writing machine, in combination, an adjustable bell-trip, a spring-actuated drum, a wheel revolving with said drum having teeth or orifices, into any of which orifices in said wheel said adjustable bell-trip may be placed, and said bell-trip having a projection, a bell-operator attached to the main frame, having a projection on its under side, a loose shaft, K, having an arm, *k*, and a bell and bell-clapper, whereby when the drum is moving in its forward motion and the adjustable bell-trip strikes the bell-operator the bell is rung, but on the return movement the adjustable bell-trip passes the bell-operator, but without affecting the arm *k*.

26. In a type-writing machine, the combination of the platen-carrier-actuating mechanism, a stop upon said platen-carrier-actuating mechanism, and a lug attached to the main frame, said stop and lug being relatively adjustable with respect to each other.

27. In a type-writing machine, in combination, a spring-actuated drum, an adjustable drum-stop, and an adjustable lug, M, secured to the main frame.

28. In a type-writing machine, in combination, a spring-actuated drum, an adjustable drum-stop, a rim, J, secured to the main frame, and adjustable lugs M, secured to said rim at the desired point.

29. In a type-writing machine, in combination, a platen-carrier, a platen, a plunger mounted upon and traveling with said platen-carrier, said plunger passing into said platen, and a driving-pawl.

30. In a type-writing machine, in combination, a platen-carrier, a platen, a plunger mounted upon and traveling with said platen-carrier, said plunger passing into said platen, and a driving-pawl, and a spring to return said plunger when it is forced into the platen.

31. In a type-writing machine, in combination, a platen-carrier, a platen, a plunger mounted upon and traveling with said platen-carrier, and a driving-pawl.

32. In a type-writing machine, in combination, a platen-carrier and platen, a plunger, a pawl attached to the platen-carrier frame, said pawl having a cam-shaped slot, a projection on the plunger which travels in said slot, a spring-tooth on the inner end of said pawl, a ratchet-wheel on the end of said platen, into which said pawl works, and a holding ratchet and pawl.

33. In a type-writing machine, in combination, a platen-carrier, a platen, a plunger, and a pawl having a cam-shaped slot.

34. In a type-writing machine, in combination, a platen-carrier, a platen, a plunger, a pawl having a cam-shaped slot and a spring-tooth at its inner end, and a ratchet-wheel on the end of said platen

35. In a type-writing machine, in combination, a platen-carrier, a platen, and two ratchet-wheels having a space between them, a driving-pawl which works in one ratchet-wheel, and a holding-pawl which works in the other.

36. In a type-writing machine, in combination, a platen-carrier and platen, a main frame, a portion of the main frame being pivoted, and a pointer flexibly attached to the pivoted portion of the main frame.

37. In a type-writing machine, in combination, a platen-carrier, a platen, a main frame, a portion of said main frame being pivoted, and a flexible pointer attached to said pivoted portion of the main frame, said pointer being adjustable, whereby when the pivoted portion of the main frame is swung said pointer will also swing, but is prevented from resting on the platen at the point of impact of the type.

38. In a type-writing machine, in combination, a platen-carrier and platen, a main frame, a portion of said main frame being pivoted, and a pointer attached to said pivoted portion of the main frame.

39. In a type-writing machine, in combination, a platen-carrier having a double-pointed pointer fixedly attached to said carrier, a main frame, a portion of said main frame being pivoted, and a double-faced scale fixedly attached to the pivoted portion of the main frame.

40. In a type-writing machine, in combination, ribbon-spools, ratchet-wheels on the shafts of said spools, an independent ribbon-operating bar, driving-pawls on the ends of said bar adapted to operate either ratchet-wheel, and operating-keys which rest above the outer end of said ribbon-operating bar, said ribbon-operating bar being capable of movement across the machine.

41. In a type-writing machine, in combination, ribbon-spools, ratchet-wheels on the shafts of said spools, an independent ribbon-operating bar, pawls on the ends of said bar adapted to operate either of said ratchet-wheels, and a series of type-operating keys.

42. In a type-writing machine, in combination, ribbon-spools, ratchet-wheels on the shafts of said spools, an independent ribbon-operating bar, pawls on the inner ends of said bar adapted to operate either ratchet-wheel, type-operating keys having two vertical arms, and a rod or bar connecting said arms, said rods or bars projecting beyond said type-operating keys a distance sufficient to rest above the outer end of said ribbon-operating bar.

43. In a type-writing machine, in combination, ribbon-spools, ratchet-wheels on the shafts of said ribbon-spools, an independent ribbon-operating bar, and driving-pawls on the inner ends of said ribbon-operating bar, said bar being pivoted at or near its inner end and being capable of lateral motion across the machine, whereby the corresponding pawls are engaged with or disengaged from their ratchet-wheels.

44. In a type-writing machine, in combination, ribbon-spools, ratchet-wheels on the shafts of said ribbon-spools, an independent ribbon-operating bar, pawls on the inner ends of said ribbon-operating bar, said bar being pivoted at or near its inner ends and being capable of lateral motion across the machine, and a retaining-spring, whereby the ribbon-operating bar is held fixed in its different lateral positions.

45. In a type-writing machine, in combination, ribbon-spools, ratchet-wheels on the shafts of said spools, an independent ribbon-operating bar, and pawls at the ends of said bar adapted to operate either ratchet-wheel, and a spring attached to the main frame and resting under said ribbon-operating bar, against which said ribbon-operating bar works.

46. In a type-writing machine, in combination, a type-bar, a type-bar hanger, and a guide made integral with said type-bar hanger, said type-bar being attached to said hanger, so that said type-bar may have a swinging movement and be guided by said hanger in said movement.

47. In a type-writing machine, an inverted-L-shaped type-bar hanger having a quadrantal guide.

48. In combination, a type-bar hanger, a type-bar suspended therein, and a direct-operating key, said operating-key being below the point of suspension of the type-bar in the hanger.

49. In a type-writing machine, in combination, a series of type-bars, a series of operating-keys to operate said type-bars, a vibratory frame on which said operating-keys and type-bars are mounted, and a vibratory spacing-frame.

50. In a type-writing machine, in combination, a vibratory spacing-frame having its front and rear ends parallel, a series of operating-keys having two vertical arms, the inner arms standing radially and the outer arms arranged in arcs of circles, and rods or bars connecting said arms, and a vibratory frame on which said keys are mounted.

51. In the shifting mechanism of a type-writing machine, in combination, shifting-keys, a sliding stop, and connecting-arm.

52. In the shifting mechanism of a type-writing machine, in combination, a connecting-arm, a sliding stop in which said arm normally rests, a spring to hold said stop in and return it to its normal position, shifting-keys, said keys being adapted to rest on a projection on the sliding stop, and a cam-shaped end on said keys, whereby when the shifting-keys are operated the connecting-arm is released from the sliding stop and shifted.

53. In the shifting mechanism of a type-writing machine, in combination, a connecting-arm, a sliding stop in which said arm normally rests, and two shifting-keys, said keys being adapted to rest on the sliding stop, and opposite cam-shaped ends on said keys, whereby when one of the shifting-keys is operated the projection of the connecting-arm is released from the sliding stop, and according as to which shifting-key is operated the connecting-arm is shifted forward or backward.

54. In a type-writing machine, in combination, a vibratory type-bar-carrying frame, a lever to which said frame is pivoted, a connecting-arm, a link connecting said vibratory type-bar-carrying frame and said connecting-arm, a projection on the end of said arm, a sliding stop in which said projection normally rests, and shifting-keys, a projection on said keys which rests on a projection on the sliding stop, and cam-shaped ends on said keys, whereby when the shifting-keys are operated the projection of the connecting-arm is released from the sliding stop and the vibratory type-bar-carrying frame is shifted.

55. In a type-writing machine, in combination, a vibratory type-bar-carrying frame, a lever to which said frame is pivoted, a connecting-arm, a link connecting said vibratory type-bar-carrying frame and said connecting-arm, a projection on the end of said arm, a sliding stop in which said projection normally rests, and two shifting-keys, projections on the opposite sides of said keys which rest on a projection on the sliding stop, and opposite cam-shaped ends on said keys, whereby when one of said shifting-keys is operated the projection of the connecting-arm is released from the sliding stop, and according as to which shifting-key is operated the vibratory type-bar-carrying frame is shifted forward or backward.

56. In the shifting mechanism of a type-writing machine, in combination, a shifting-key, a frame in which said key operates, a spring-stop, and a detent in the operating-key in such a position that said stop rests in said detent when the key is out of operation, said detent being of limited extent sufficient to sustain the key at rest, but a slight movement of the key when operating forces it out of said detent, of such construction that when the key is operated upon the sliding stop the stop is forced out of said detent.

57. In the shifting mechanism of a type-writing machine, in combination, a shifting-key, a frame in which said key operates, a spring-stop, a detent in the operating-key in such a position that said stop can be forced into said detent when the operating shifting-key has reached the limit of its travel, and it is held in such a position by said stop until released.

58. In the shifting mechanism of a type-writing machine, in combination, a connecting-arm, a vibratory frame, shifting-keys, a sliding stop in which said arm rests, and a spring-stop, whereby when one of the shifting-keys is operated the keys, the vibratory frame, and intermediate mechanism are held in a fixed position.

59. In a type-writing machine, in combination, a platen, ribbon-spools, shafts upon which said ribbon-spools rest, and intermediate supports for said ribbon between said ribbon-spools, said ribbon-supports being below said platen and pivoted to the main frame, so they can swing up on their pivoted supports toward the platen.

400,147. BINDER. EMIL WASSLEBEN, Crefeld, Prussia, Germany, assignor to Henry Rohr, St. John, Kans. Filed Oct. 20, 1888. Serial No. 288,710. (No model.)



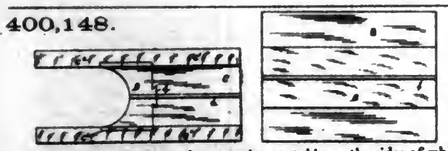
Claim.—1. The combination, with a portfolio or similar cover, of a binder consisting of a rigid pin-carrying bar, a detachable apertured bar, springs held to slide upon said detachable bar, and sleeves sliding over the bar and springs, substantially as shown and described.

2. The combination, with a portfolio or similar cover, of a binder consisting of a rigid pin-carrying bar, a detachable apertured bar, springs held to slide upon said detachable bar, sleeves sliding over the bar and springs, and needles constructed of a wire rod bent to form a series of staples, substantially as shown and described.

3. A binder consisting of brackets, a pin-carrying bar secured to the brackets, a detachable apertured bar, springs sliding upon the same, sleeves sliding over the detachable bar and springs, and needles constructed of a wire rod bent to form a series of connected staples, all combined substantially as shown and described.

400,148. DIE FOR UPSETTING METAL BARS. WILLIAM R. WEBSTER, Philadelphia, Pa. Filed Jan. 12, 1889. Serial No. 296,186. (No model.)

400,148.



Claim.—1. A plunger for upsetting metal bars, the sides of which are re-enforced by ribs of greater thickness than the plunger, substantially as and for the purpose specified.

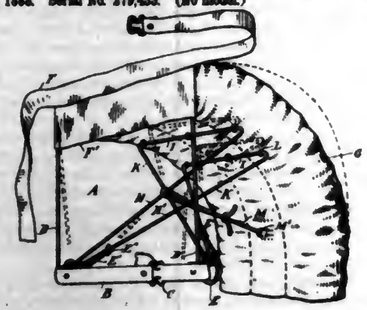
2. A plunger for upsetting metal bars, the front end of which is removable, substantially as and for the purpose specified.

3. A plunger for upsetting metal bars, having re-enforcing side ribs extended beyond the face of the plunger to form side walls for the dies.

4. A plunger for upsetting metal bars, the sides of which are re-enforced by ribs of greater thickness than the plunger and the front end of which is removable.

5. A plunger for upsetting metal bars, the sides of which are re-enforced by ribs of greater thickness than the plunger and which extend both above and below the plunger proper.

400,149. BUSTLE. CHARLES W. WHITE, Toledo, Ohio. Filed July 9, 1888. Serial No. 279,433. (No model.)



Claim.—1. In a bustle, a vertical frame provided with eyes at each lower extremity and coiled springs attached at their upper ends to the upper edge of said vertical frame, in combination with one or more bails connected at their lower ends with the eyes of the vertical frame and extending obliquely upward and outward to a connection with the under side of said coiled springs, and a flexible diaphragm connecting the lower ends of the vertical frame and serving to contract the same for raising the coils, substantially as described.

2. In a bustle, the combination of a vertical frame having side bars formed with eyes at their lower ends, said eyes terminating in spring-arms, said arms having loops which embrace the bails, coiled springs attached to the upper portion of the vertical frame, bails connected with said coiled springs and with the eyes of the side bars, and an adjusting-strap connected to the side bars of the vertical frame for contracting the same, substantially as set forth.

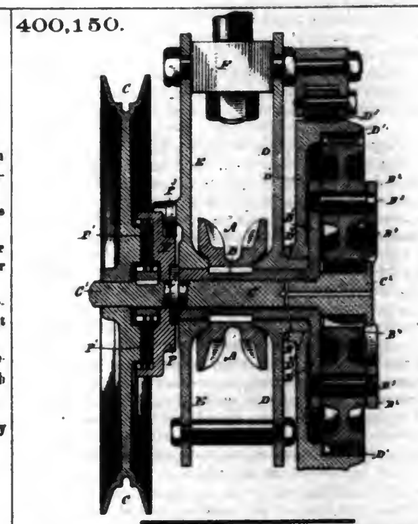
400,150. HOISTING MECHANISM. THOMAS A. WHITON, Stamford, Conn., assignor to The Yale & Towne Manufacturing Company same place. Filed Apr. 14, 1888. Serial No. 270,706. (No model.)

Claim.—1. The combination, with a hoist-frame, of a driving-pulley provided with a safety lowering device exterior to the hoist frame upon one side thereof, a train of sun-and-planet gearing provided with a friction-brake exterior to the hoist-frame upon the other side thereof, and a main lifting-sheave within the hoist-frame, substantially as set forth.

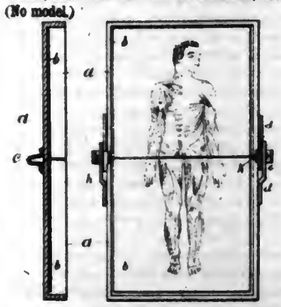
2. The combination, with a hoist-frame, of a driving-pulley, C, connected by a safety frictional lowering device with the driving-shaft C', a ratchet-wheel, P, and pawl or check device P^a, and a train of gearing provided with a friction-brake, substantially as set forth.

3. The combination, with a hoist-frame, of a gearing consisting of the driving-sheave C, driving-shaft C', having pinion C^2, pinion B^4, pivoted to the driving-flange B', annular wheel D', and a brake whereby the said internal annular gear-wheel is frictionally coupled with the hoist-frame or released therefrom, hollow main shaft B, attached to the flange B' and journaled at each end in a bearing in the hoist-frame, and a lifting-sheave, A, attached to the shaft B, substantially as set forth.

4. The combination, with the shaft B, of the sheave A^5, provided with the internal ratchet-teeth, A', and loose upon the shaft, a collar, B^3, and the pawl-disk A^3, provided with the projection A^4 and keyed to the shaft B, and the pivoted spring-pawl A^5, substantially as set forth.



400,151. MOUNTING AND BOXING ANATOMICAL CHARTS. JAMES T. WHITE, New York, N. Y. Filed Feb. 24, 1888. Serial No. 265,217. (No model.)



Claim.—A mounting for charts, &c., consisting of a plurality of box-sections hinged together by lock-hinges, so as to be held open in flat position, the joints being covered by flexible material, as described, and a sectional chart having its separate sections secured to the box-sections, so as to open with the box and be secured in flat position when open, all in combination, substantially as described.

400,152. LOOM-SHUTTLE. CHESTER F. WICKWIRE and THEODORE H. WICKWIRE, Cortland, N. Y. Filed May 4, 1888. Serial No. 272,844. (No model.)



Claim.—1. The combination, with the shuttle-body provided with an annular case and a rigidly-attached central spindle, of a collar loose on the spindle and adapted to engage and rotate with the spool, a coil-spring connected to said collar and trailing in the case, and a keeper placed removably across the free end of the spindle, substantially as specified.

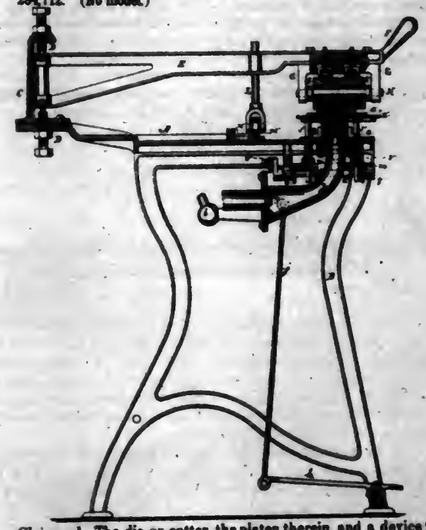
2. The combination, with the shuttle-body having an annular case and a central spindle rigidly secured to said body, of a collar loosely mounted on said spindle and adapted to engage and rotate with the spool, a coil-spring connected to said collar and trailing in the annular case, and a keeper reaching across the spool and the free end of the spindle, said keeper hinged at one end to the shuttle-body and the other end engaging a catch on the other end of the shuttle-body, substantially as specified.

3. The combination of the shuttle-body formed with an annular central portion, A, elongated end portions, each of which is provided with a groove, the spindle *b*, the keeper I, hinged in the groove *a*, and having its free end provided with a notch, *n*, and the spring-actuated bolt *c*, adapted to engage the notch on the keeper, substantially as specified.

4. The combination, with the shuttle-body having an annular case and a rigidly-attached central spindle, of a keeper extending across the spool and free end of the spindle, one end of said keeper hinged in a groove formed in the shuttle-body and the other end provided with a notch, *n*, and a spring-actuated bolt adapted to engage the notch *n*, substantially as specified.

5. The within-described shuttle, formed with the annular central portion, A, annular recess *r*, and elongated end portions, A' A'', having, respectively, grooves *a a'*, the spindle *b*, the collar *d*, mounted on said spindle and provided with lugs *e e*, the spring *f*, connected at one end to said collar and having its free end trailing in frictional contact with the periphery of the recess *r*, the plate covering said spring and detachably connected to the shuttle-body, the keeper I, hinged in the groove *a* and extending across the free end of the spindle, and provided with a notch, *n*, and the spring-actuated bolt *c*, located in the groove *a*, and adapted to engage the notch *n*, all constructed and arranged substantially as described and shown.

400,153. MACHINE FOR CUTTING OUT CIGAR WRAPPERS OR BINDERS. JOHN R. WILLIAMS, Newark, N. J., assignor to the John R. Williams Company, New York, N. Y. Filed Sept. 6, 1888. Serial No. 284,712. (No model.)



Claim.—1. The die or cutter, the platen therein, and a device for pressing the leaf against the cutter, combined with the rolling-table encompassing the cutter, mechanism, substantially as described, for imparting a vertical movement to said table from a foot-treadle, an air-exhaust for the cutter, and mechanism, substantially as described, for applying or cutting off said exhaust from a foot-treadle, substantially as set forth.

2. The die or cutter, the platen therein, and a device for pressing the leaf on the cutter, combined with rods within the cutter for supporting the platen, the bed-plate having elongated slots for said rods, the revoluble disks covering said slots, and an air-exhaust for the cutter, substantially as set forth.

3. The die or cutter, the platen therein, and a device for pressing the leaf on the cutter, combined with the rods W W, supporting the platen, the revoluble disks Y, the bed-plate having slots X, the caps Z, and an air-exhaust for the cutter, substantially as set forth.

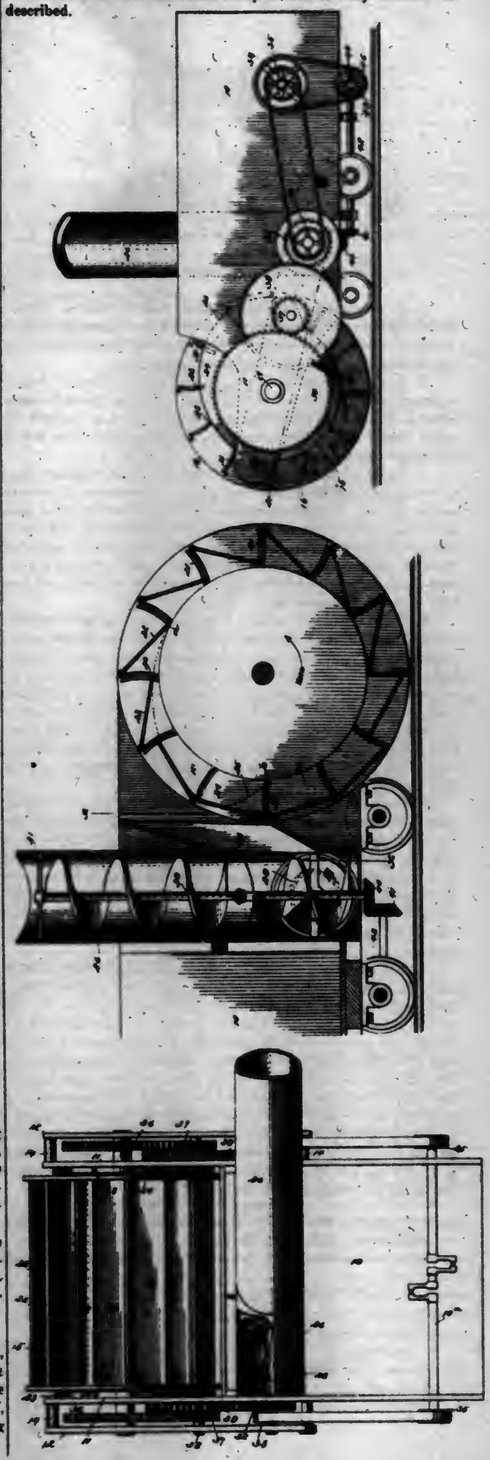
4. In a machine for cutting and rolling, the die or cutter mounted upon a bed-plate and a platen within the cutter held upon yielding supports, combined with the rolling-table encompassing the cutter, the plate *n* below the cutter, the frame encompassing plate *n*, rods J', connecting the plate *n* with the rolling-table, mechanism, substantially as described, for moving said plate *n* vertically, and an air-exhaust for the cutter, substantially as set forth.

5. In a machine for cutting and rolling, the die and the platen therein, combined with the plates M', forming a rolling-table encompassing said die, the springs connecting said plates, the supporting-guides Q' for the plates M', mechanism, substantially as described, for moving said rolling-table vertically, and an air-exhaust for the cutter substantially as set forth.

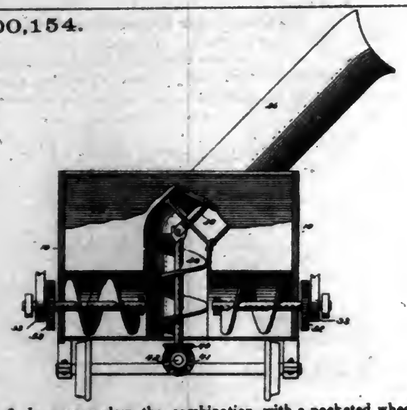
6. In a machine for cutting and rolling cigar wrappers or binders, the die or cutter mounted upon a bed-plate and a platen within the cutter, combined with the rolling-table encompassing the cutter, the suspended frame *m*, plate *n*, shafts *o l*, cams *u* on said shafts, wheel A', chain B', rod D', foot-treadle E', rod G', arm H', and rods connecting the plate *n* with the rolling-table, substantially as set forth.

400,154. SNOW-PLOW. OREN WILLIAMS, Gouverneur, N. Y. Filed Nov. 27, 1888. Serial No. 291,962. (No model.)

Claim.—1. In a snow-plow, the combination, with a pocketed wheel, of horizontal conveyers and an essentially vertical conveyer located between the horizontal conveyers, substantially as shown and described.



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2. In a snow-plow, the combination, with a pocketed wheel, of horizontal conveyers arranged end to end and an essentially vertical conveyer between the opposing ends of the said horizontal conveyers, substantially as and for the purpose specified.

3. In a snow-plow, the combination, with a pocketed wheel, of horizontal conveyers arranged end to end, a vertical conveyer located between the ends of the horizontal conveyers, and an inclined conveyer hinged to and driven from the vertical conveyer, as and for the purpose specified.

4. The combination, with a pocketed wheel and discharge-plates pivoted in the pockets of said wheel, of horizontal conveyers arranged end to end, one having a right-hand and the other a left-hand pitch, a vertical conveyer journaled between the approaching ends of the horizontal conveyers, an inclined conveyer attached to and driven from the vertical conveyer, and a hopper adapted to receive the contents of the pockets and deliver the same to the conveyers, substantially as shown and described.

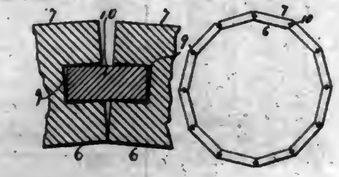
5. The combination, with a pocketed wheel, a discharge-plate pivoted in each of the pockets, provided at its free end with outwardly-extending pins, and a stationary trip-plate provided with a cam-surface adapted for contact with said pins, of horizontal conveyers arranged end to end, one having a right-hand and the other a left-hand pitch, a vertical conveyer journaled between the approaching ends of the horizontal conveyers, an inclined conveyer attached to and driven from the vertical conveyer, and a hopper adapted to receive the contents of the pockets and deliver the same to the conveyers, substantially as shown and described.

6. The combination, with the frame of a snow-plow, a wheel journaled in the forward end of the frame, provided with end flanges having radial slots therein, transverse partitions located at the rear of each slot, dividing said wheel into pockets, a discharge-plate pivoted in each pocket above the partitions, and pins secured to the free ends of the plates and passing through said slots, of a stationary trip-plate attached to the frame, provided with a circular upper cam-surface adapted for contact with the pins of the discharge-plates, substantially as shown and described.

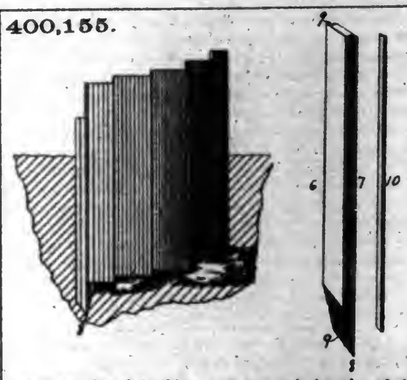
7. The combination, with the frame of a snow-plow, a wheel journaled in the forward end of the frame, provided with end flanges having radial slots therein, transverse partitions located at the rear of each slot, dividing said wheel into pockets, a discharge-plate pivoted in each pocket above the partitions, and pins secured to the free ends of the plates and passing through said slots, of a stationary trip-plate attached to the frame, provided with a circular upper cam-surface adapted for contact with the pins of the discharge-plates, approaching horizontal conveyers journaled to the rear of the wheel, a combined vertical and inclined conveyer journaled between the approaching ends of the horizontal conveyers, and a hopper adapted to receive the snow from the discharge-plates and deliver the same to the conveyers, substantially as and for the purpose specified.

400,155. WELL-CRIB. WILLIAM H. WILLSCRAFT, Juniper, Ariz. Filed June 20, 1888. Serial No. 277,622. (No model.)

Claim.—The combination, in a well-crib, of a series of staves made

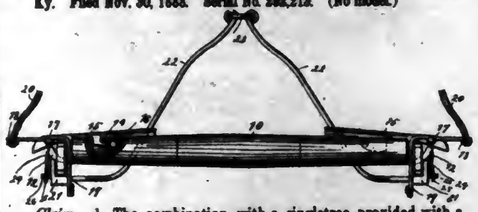


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wedge-shaped in their thickness at one end, the edge of the wedge being at one face of the stave, the two edges similarly grooved, and a tongue-strip adapted to loosely fit the grooves, substantially as shown and described, whereby the staves are interchangeable and reversible and may each be driven independently of the others.

400,156. HORSE-DETACHER. CHARLES R. WILSON, Bear Wallow, Ky. Filed Nov. 30, 1888. Serial No. 292,213. (No model.)



Claim.—1. The combination, with a singletree provided with a hook at its ends and a spring-actuated lever bearing upon the said hooks, of an angled releasing-lever pivoted upon the outer extremity of the singletree-lever and extending downward over the hook and horizontally outward from the said singletree-lever, and means, substantially as shown and described, for manipulating the said releasing lever, as and for the purpose specified.

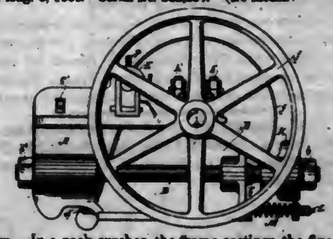
2. The combination, with a singletree provided at each end with an outwardly-projected and upwardly-curved hook, and a lever pivoted upon the upper surface of the singletree, extending outward beyond the ends of the same over the said hooks, of an angled releasing-lever fulcrumed upon the outer end of the singletree-lever, the vertical member whereof is extended downward at each side of the said hooks, and a horizontal member carried upward over and beyond the hook, and a strap or equivalent device attached to the outer extremity of the said releasing-lever, all combined for operation substantially as shown and described.

3. The combination, with a singletree provided at each end with an outwardly-extending and upwardly-curved hook adapted to receive the trace, a lever pivoted in the upper surface of the singletree, extending over and beyond each hook, and an angled releasing-lever pivoted upon the outer extremity of each singletree-lever, of a trace-holder consisting of angled blocks, arms secured to the said blocks, having their inner ends connected, and a spring-actuated clamping device attached to the trace-blocks, substantially as shown and described.

4. The combination, with a singletree provided at each end with an outwardly and upwardly curved hook, a lever pivoted upon the upper surface of the singletree, extending beyond and over the hook, and an angled releasing-lever pivoted to the outer end of the singletree-lever, passing downward over the hook of the said singletree, of angled trace-blocks, an arm secured to each block, said arms having their approaching ends united and carried over the singletree to the rear, a spring clamping device attached to the said trace-blocks, and a strap, rope, or chain secured to the outer extremity of the releasing-lever, all combined for operation substantially as shown and described.

5. The combination, with a singletree provided at each end with an outwardly and upwardly curved hook, a lever pivoted upon the upper surface of the singletree, extending beyond and over the hook, and an angled releasing-lever pivoted to the outer end of the singletree-lever, passing downward over the hook of the said singletree, of angled trace-blocks, an arm secured to each block, said arms having their ends united and carried over the singletree to the rear, a spring clamping device attached to the said trace-blocks, a strap, rope, or chain secured to the outer extremity of the releasing-lever, an angled bracket adapted for attachment to the dash-board of the vehicle, having a hood secured to the horizontal member of the bracket, and a spring-actuated lever-arm fulcrumed upon the said horizontal member beneath the hood, adapted for the reception of the united ends of the trace-block arms, all combined substantially as shown and described, and for the purpose specified.

400,157. ROCK-CRUSHER. GEORGE E. ANES, San Francisco, Cal. Filed Aug. 8, 1888. Serial No. 282,257. (No model.)



Claim.—In a rock-crusher, the frame-castings, the fixed jaw, the movable jaw, and the means for operating said movable jaw, consisting of an eccentric, the depending connecting-rod, and the arm between said rod and the movable jaw, in combination with the longitudinal bolts passing through the castings for holding them together and receiving the strain, said bolts having shoulders b', projecting rear ends, nuts b^2, the sliding support K, mounted on the projecting rear ends of the bolts outside of the frame-castings, the nuts for moving said support K, and the arm J between the connecting-rod and the support K, substantially as herein described.

400,158. COMBINED STEP-LADDER AND IRONING AND BREAD BOARD. JOHN C. ARMSTRONG, Hudson, Mich. Filed May 29, 1888. Serial No. 275,478. (No model.)

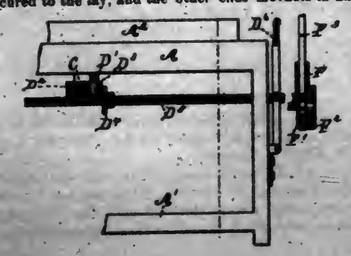


Claim.—1. The combination, with the step-ladder A, having the platform a, with the slots a' therein, hooks F F on the standards, and the back brace composed of two members, B' B^2, pivoted together and having the cross-bar g, of a board having ends f, which engage the slots a', as set forth.

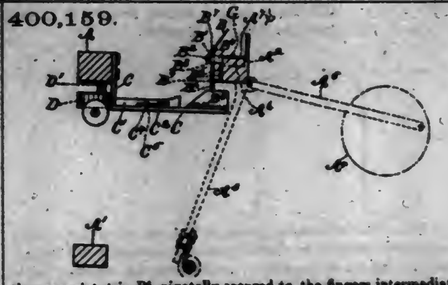
2. The combination of the step-ladder having the hooks F F and the back brace comprising an upper member pivoted to the step-ladder and a lower member pivoted to the upper member, and having a cross-bar, g, provided with notches g', adapted to engage the hooks F, as specified.

400,159. WEFT STOP MECHANISM FOR LOOMS. GEORGE M. ATCHISON, West Troy, N. Y., assignor of one-half to John Picken, same place. Filed Jan. 3, 1889. Serial No. 295,312. (No model.)

Claim.—In a loom, the combination, with a shipping mechanism, of the lay provided with a cross-slot, fingers B, having one end pivotally secured to the lay, and the other ends movable in and out of

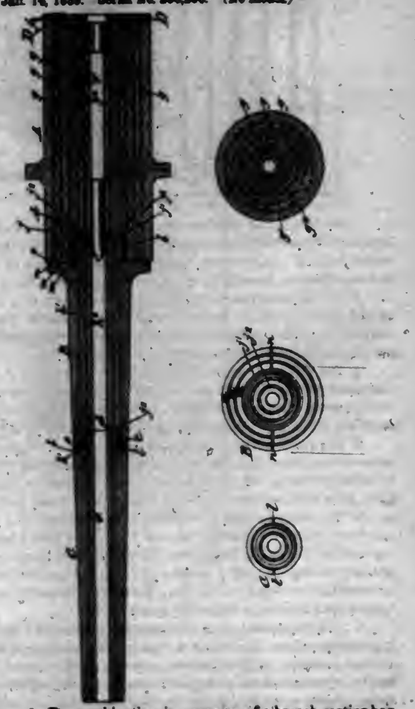


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the cross-slot, trip B^1, pivotally secured to the fingers intermediately of their ends and vertically movable in a slideway secured to the lay, an inclined slideway, C^2, for the trip, rammer C', having a diagonal slot and supported at one end by a pin passing through such slot, and a rammer engaging lever-cam pivotally secured to the breast-beam, and a cam-engaging stop fixed upon the shipper-actuating slide-rod, substantially as described.

400,160. ORDNANCE. BENJAMIN T. BARNETT, New York, N. Y. Filed Jan. 14, 1889. Serial No. 296,290. (No model.)



Claim.—1. The combination, in a cannon, of a breech-section having a series of tubes provided within and through its walls parallel with the bore, a water-box at the breech communicating with said tubes for introducing water through them for cooling the cannon, and a second section connected with the first-mentioned section in front thereof, the two sections having between their abutting faces channels communicating with said tubes and lateral channels for the escape of the water at the side of the cannon, substantially as herein described.

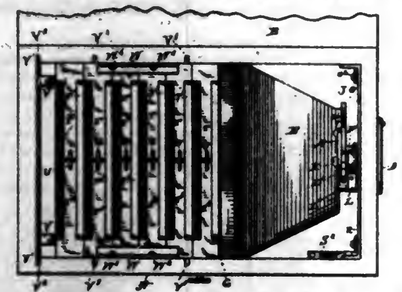
2. The combination, in a cannon, of a breech-section having a series of tubes provided within and through its walls parallel with the bore, a water-box at the breech communicating with said tubes for introducing water through them for cooling the cannon, a second section connected with the first-mentioned section and also provided with tubes for water, and a third section connected with said second section, the first and second sections having between their abutting faces channels through which the tubes in both communicate, and the second and third sections having between their abutting faces channels communicating with the tubes of the second section and lateral outlet-channels for the escape at the side of the gun of the water which has circulated through the tubes of the first and second sections, substantially as herein described.

400,161. BOLT-HEAD. OSCAR F. RALSTON, Brooklyn, N. Y. Filed Aug. 17, 1888. Serial No. 283,043. (No model.)



Claim.—The bolt-head A, having on its under side a part, *b*, being of a diameter between the diameters of the bolt-head A and the bolt proper, having one or more lips, *c*, running from the swelling *b* to the bolt proper, as shown in Figs. 1, 3, 4, and 6, all as described above, and for the purpose set forth.

400,162. PHOTOGRAPHIC CAMERA. ERASTUS B. BARKER, Newark, N. J. Filed Oct. 26, 1888. Serial No. 289,237. (No model.)



Claim.—1. The combination, in a photographic camera, of a shutter of segmental form attached to the front of the box and stopped at the limit of its movement by contact with the sides of the same, and an adjustable lens-carrying cone or box, substantially as set forth.

2. The combination, in a photographic camera, of a shutter attached to the front of the camera-box, an adjustable lens-carrying cone or box, and a chamber in rear thereof adapted to receive a number of plate-holders, substantially as set forth.

3. The combination, in a photographic camera, of a shutter, a lens cone or box, the rear end whereof is provided with a light-excluding cushion, and a plate-holder pressed by spring-pressure into substantially light-tight contact therewith, substantially as set forth.

4. The combination, in a photographic camera, of an adjustable lens-bearing cone or box, the rear end whereof is provided with a light-excluding cushion, and means to press the plate-holders into substantially light-tight contact therewith, substantially as set forth.

5. The combination, in a photographic camera, of a shutter, a lens cone or box, the rear end whereof is provided with a light-excluding cushion, a chamber in the rear thereof adapted to receive a number of plate-holders, and a spring at the rear of the plate-holders, constructed and arranged to press the plate-holders forwardly against the rear of the lens-cone, substantially as set forth.

6. The combination, in a photographic camera, of a light-excluding shutter, a lens cone or box, a chamber in rear thereof adapted to receive a number of plate-holders, a spring at the rear of the plate-holders, constructed and arranged to press the plate-holders forwardly, and inwardly-projecting ledges on the sides of the box, whereby the plate-holders are held in position during the removal of the one last exposed, substantially as set forth.

7. The combination, in a photographic camera, of a light-excluding shutter and adjustable lens cone or box, a chamber in rear thereof adapted to receive a number of plate-holders, a spring in the rear of the plate-holders, constructed and arranged to press the plate-holders forward, and adjustable inwardly-projecting ledges on the sides of the box, whereby the plate-holders are held in position during the removal of the one last exposed, substantially as set forth.

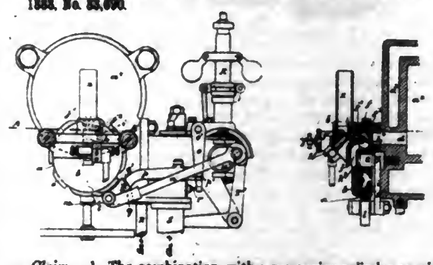
8. The combination, in a photographic camera, of a shutter attached to the front of the camera-box, a lens-carrying cone or box provided with a light-excluding cushion at its rear end, a chamber in the rear thereof adapted to receive a number of plate-holders, a spring in rear of the plate-holders, constructed and arranged to press the plate-holders into substantially light-tight contact with the cushion on the lens cone or box, and inwardly-projecting ledges on the sides of the box, substantially as set forth.

9. The combination, in a photographic camera, of a shutter attached to the front of the box, an adjustable lens cone or box provided with a light-excluding cushion at its rear end, a chamber in rear thereof adapted to receive a number of plate-holders, a spring in rear of the plate-holders, and adjustable inwardly-projecting ledges on the sides of the box, substantially as set forth.

10. In a photographic camera, the combination of an apertured spring-actuated shutter of segmental form, provided with a holding-pawl operated from the exterior of the box, with an adjustable stop-pawl constructed and arranged to be operated from the exterior of the box and to engage with a projection or detent on the shutter and to hold the opening therein in alignment with the light-aperture in the front of the box, substantially as set forth.

11. A camera-box having a lens cone or box independent of the camera-box, and provided with a thumb-screw constructed and arranged to pass through the opening in the side of the camera-box and clamp the lens-cone in position within the same, whereby it may be readily removed for change of lenses, substantially as set forth.

400,163. GAS-ENGINE. TOM R. BARKER, Birmingham, County of Warwick, England. Filed Jan. 5, 1889. Serial No. 295,955. (No model.) Patented in England Oct. 15, 1887, No. 14,027, and in Belgium Nov. 15, 1888, No. 83,690.



Claim.—1. The combination, with a gas-engine cylinder provided with a single ignition-port and a cover-plate provided with a fixed ignition gas-duct and with openings for lighting the traveling ignition gas-jet and supplying it with air, of an intermittently-revoluble ignition-plate journaled between the said cover-plate and the cylinder, and provided with a series of equidistant similar cavities, each having openings communicating with the ignition-port in the cylinder and with the said openings in the cover-plate, an ignition gas-jet passage opening into each cavity and adapted to communicate with the fixed gas-duct in the cover-plate, and a hole for placing said gas-jet passage in communication with the port in the cylinder just before the cavity itself communicates with the said port, all arranged substantially as and for the purpose set forth.

2. The combination, with a gas-engine cylinder provided with a single ignition-port, a cover-plate provided with a fixed ignition gas-duct and with openings for lighting the traveling ignition gas-jet and supplying it with air, and a continuously-revoluble ignition-plate journaled between the said cover-plate and the cylinder, and having a series of equidistant ignition-cavities provided with traveling gas-jet passages and with openings, substantially as set forth, of ratchet mechanism connected to said ignition-plate for revolving it intermittently and suddenly, whereby at each movement of said plate an ignition-cavity is moved across the port in the cylinder but is not entirely cut off from communication with it and the next following ignition-cavity is simultaneously placed in communication with the openings in the cover-plate.

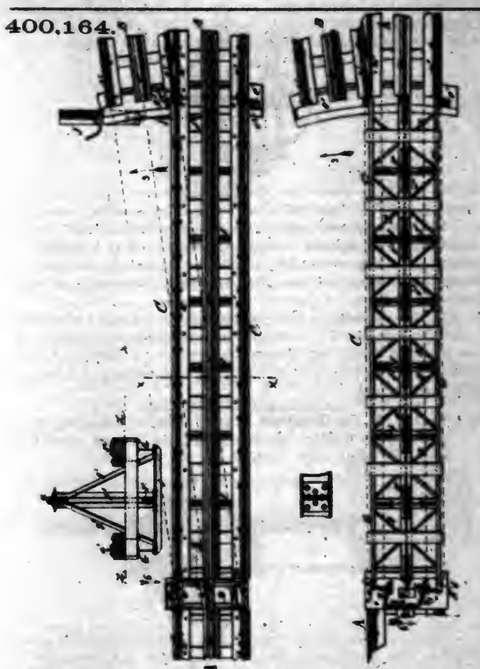
3. In a gas-engine, the combination, with a revoluble ignition-plate having a series of equidistant ignition-cavities, of ratchet mechanism connected to said ignition-plate for revolving it intermittently, a tappet-valve for supplying gas to the cylinder, a speed-governor, and a tappet or lever controlled by the said speed-governor and adapted to simultaneously open the said tappet-valve and permit the said ratchet mechanism to engage with the ignition-plate.

4. In a gas-engine, the combination, with a revoluble ignition-plate having a series of equidistant ignition-cavities and ratchet-teeth, of a pivoted continuously-reciprocating pawl for revolving said plate intermittently, a pivoted lever provided with a pin engaging with a slot in said pawl and holding it clear of the ratchet-teeth, a speed-governor, and a tappet or lever controlled by the said speed-governor and adapted to simultaneously open the said tappet-valve and disengage the said pin from the pawl, substantially as and for the purpose set forth.

400,164. SWITCH FOR CENTER-RAIL ELEVATED RAILROADS. FRANCIS A. BARTHOLOMEW, Bloomfield, N. J. Filed Aug. 6, 1886. Serial No. 210,167. (No model.)

Claim.—1. The combination, with a main track and a branch track, of a swing-track or swinging section and a sliding section or switch-carriage, both moving simultaneously, the latter transversely to the former, substantially as and for the purpose set forth.

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2. The combination, with a main track and a branch track, of a swing-track or swinging section and a sliding section or switch-carriage, both moving simultaneously, the latter operated automatically by the movement of the former.

3. The combination, with a main track and a branch track and with a swing-track or swinging section, and a sliding section or switch-carriage moving transversely to the track, of a hydraulic motor, J, having piston-rod connected to the said switch-track, substantially as and for the purpose set forth.

4. In combination with a main track and a branch track, a rigid swing-track pivoted at one end in its longitudinal center line to a stationary part of the structure and supported at its other end to admit of a circular movement horizontally on the said pivot, a sliding section or switch-carriage movable transversely to the track at the pivoted end of the said swing-track, and movable connections, substantially as described, transmitting motion from the said swing-track to the said switch-carriage, as hereinbefore set forth.

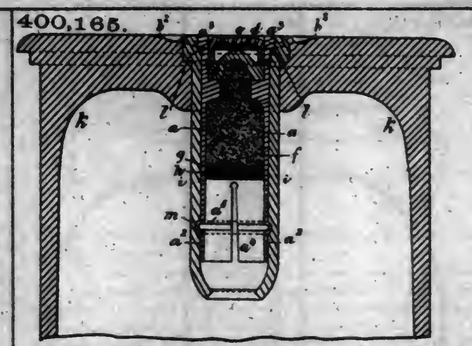
5. In combination with a main track and a branch track and with a switch-carriage, D, provided with switch-rails *a a'* and *b b'* and arranged to move transversely to the track, the swing-track C, pivoted at one end in its longitudinal center line to a stationary part of the structure and having at opposite sides of its pivot-point pivotal links *c'*, the elbow-levers H, pivoted to the said structure, and the rod I, pivoted to the said switch-carriage for operating the latter automatically by the movement of the said switch-track.

6. In combination with a main track and a branch track and with a switch-carriage, D, provided with switch-rails *a a'* and *b b'* and arranged to move transversely to the track, the swing-track C, composed of the center beam or girder, F, and side beams, G, connected by suitable transoms and braces, *f* and *g*, supporting a center rail, *a*, and side rails, *a'*, and pivoted with one end of the said central beam to a stationary part of the structure, the links *c'*, pivoted to the ends of the said side beams, G, the elbow-levers H, connected to the said links and pivoted upon the structure, and the bar I, movably connected to the said elbow-levers and also to the said switch-carriage, substantially as and for the purpose herein set forth.

400,165. PRIMER FOR CARTRIDGES. THOMAS R. BAYLISS, Northfield, County of Worcester, England. Filed Nov. 10, 1887. Serial No. 254,908. (No model.) Patented in England May 14, 1887, No. 7,066.

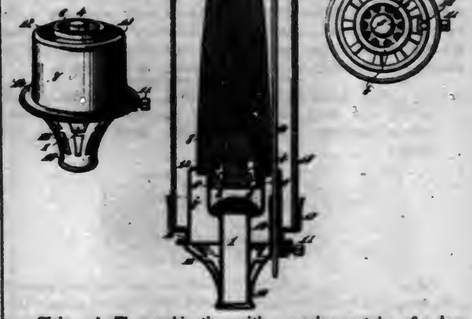
Claim.—1. The combination, with a cartridge-case, *k*, of the tubular chamber *i*, seated in the base of the cartridge-case, the tube *a*, having an inner split end and an outer rim, a^3, seated in the outer end of the tubular chamber and provided with a cavity, *b*, containing the anvil *c*, said tube containing the priming charge of powder, *f*, and powder-retaining wad *h* between its inner split end, and the anvil and the percussion-cap *e*, located in the cavity of the tube, substantially as described.

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2. The combination, with the cartridge-case *k*, of the tubular chamber secured in the base thereof and provided with the annular seat *l* in its outer end, the tube *a*, having an inner split end and a lateral rim, a^3, at its outer end, located in the annular seat of the tubular chamber, and provided with the cavity *b* and anvil *c*, said internal tube containing the priming charge of powder, *f*, and the powder-retaining disk *g* and wad *h* between its split end, and the anvil and the percussion-cap *e* in the cavity of the tube, substantially as described.

400,166. INCANDESCENT GAS-BURNER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 273,456. (No model.)



Claim.—1. The combination, with a gas-burner tube, of a deep annular deflector surrounding the burner-tip and having converging arms connected with the burner-tube and a vertically-elongated lug perforated longitudinally to receive a rod or wire for supporting an incandescent device, substantially as described.

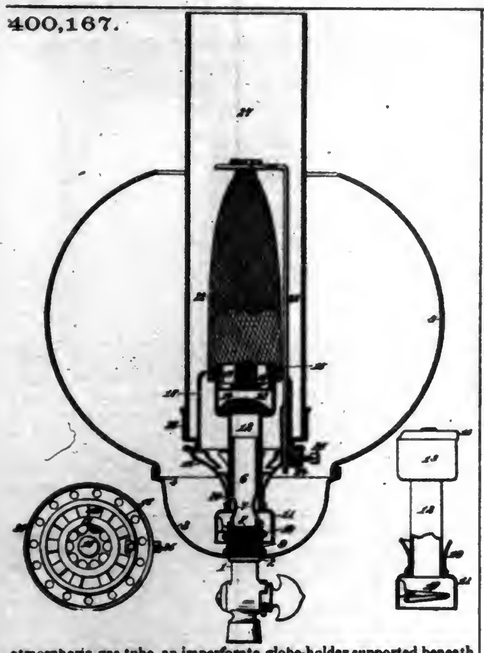
2. The combination of the gas-burner and its tube 1, the annular deflector 7, having a vertically-elongated and longitudinally-perforated lug, 10, and provided with converging arms 15, connected with the burner-tube, the rod 9, and mantle 8, substantially as described.

400,167. INCANDESCENT GAS-LAMP. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 273,458. (No model.)

Claim.—1. In an incandescent atmospheric gas-lamp, the combination of an atmospheric gas-tube having lateral air-inlets, a vertically-adjustable burner-tube surrounding the atmospheric gas-tube and movable thereon to control its air-inlets, an imperforate globe-holder supported beneath the air-inlets of the atmospheric gas-tube, a globe, a gas-burner, and a chimney for said burner, substantially as described.

2. In an incandescent atmospheric gas-lamp, the combination of an atmospheric gas-tube having lateral air-inlets, a vertically-adjustable bell-shaped shield movable on said tube, a vertically-adjustable burner-tube movable with said shield to control the air-inlets of the

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atmospheric gas-tube, an imperforate globe-holder supported beneath the air-inlets of the atmospheric gas-tube, a globe, a gas-burner, an annular deflector surrounding said burner, a perforated chimney-gallery, a glass chimney, and an incandescing device suspended within said chimney above the burner, substantially as described.

3. In an incandescent atmospheric gas-lamp, the combination of an atmospheric gas-tube having lateral air-inlets, an imperforate globe-holder supported beneath said air-inlets, a shield supported on the atmospheric gas-tube and surrounding the lateral air-inlets to prevent the flashing back of gas, and means for controlling the quantity of air admitted through said air-inlets, substantially as described.

400,168. ATMOSPHERIC GAS-BURNER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed May 10, 1888. Serial No. 273,459. (No model.)



Claim.—1. In an atmospheric gas-burner, the combination, with a diaphragm having a central gas-passage, of a regulating-screw having a square or unpointed end located in said diaphragm transverse the direction in which the gas escapes through the central gas-passage of said diaphragm to control the flow of gas through said passage, substantially as described.

2. In an atmospheric gas-burner, the combination, with a diaphragm having a central gas-passage, of the regulating-screws having squared or unpointed ends and located end to end in said diaphragm transverse the direction in which the gas escapes through the central gas-passage of said diaphragm to control the flow of gas, substantially as described.

3. An atmospheric gas-burner having lateral air-inlets, a diaphragm provided with a central gas-passage, a regulating-screw located in said diaphragm transverse the direction in which the gas escapes through the central gas-passage of said diaphragm to control the flow of gas through said passage, and means for regulating the size of the lateral air-inlets to control the quantity of air admitted to the burner, substantially as described.

400,169. INCANDESCENT GAS-BURNER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed June 21, 1888. Serial No. 277,713. (No model.)

Claim.—1. In an incandescent gas-burner, the combination of an atmospheric gas-tube, a vertically-adjustable bell-shaped shield carrying a tube or sleeve that projects downward within said shield to control the lateral air-inlets of the atmospheric gas-tube, and a combined burner and gallery supported on said shield, substantially as described.



2. The combination, with the externally-screw-threaded base 1 and atmospheric gas-tube 5, of the bell-shaped shield 3, having an internal spiral ring or wire nut, 2, and carrying the tube or sleeve 7, having its lower end projecting downward within said sleeve, substantially as described.

3. The combination, with the atmospheric gas-tube 5 and vertically-adjustable shield 3, having a downward-projecting sleeve, 7, of the combined gallery and burner supported on said shield and comprising tube 9, gallery-shell 10, burner 13, and deflector 15, substantially as described.

400,170. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed July 2, 1888. Serial No. 278,732. (No model.)



Claim.—1. In a gas-governor or gas-regulating burner, the combination, with the annular chamber 6, having an outlet-opening, 8, and the tubular stem 5, having gas-passages 18, and guide 14, of the hollow conical float 15, having a bottom plate, 16, provided with perforations 19 and carrying a tubular upward-projecting valve, 17, substantially described.

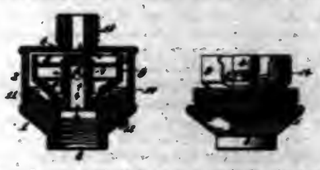
2. In a gas-governor or gas-regulating burner, the combination of the lower shell, 1, having a tubular stem, 5, provided with gas-exits, the guide 14, projecting above said stem, the annular chamber 6, having outlet-opening 8, the hollow conical float 15, having perforated bottom plate, 16, tubular valve 17, and gas-passages 19, the upper shell, 2, and the gas-passages 18 and 20 between said shells, substantially as described.

400,171. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed July 2, 1888. Serial No. 278,734. (No model.)



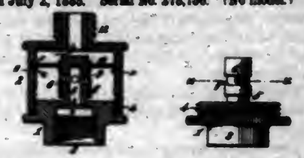
Claim.—In a gas-governor or gas-regulating burner, the combination of the base 1, having neck 3, flange 4, cup 5, and tubular stem 6, provided with exits 9 and guide 10, the shell 2, and the float-valve 8, having lower lip, 11, and perforated tube 13, an annular gas-passage, 12, being provided between the said lip and cup, substantially as described.

400,172. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed July 2, 1888. Serial No. 278,735. (No model.)



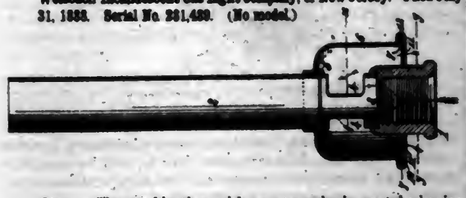
Claim.—In a gas-governor or gas-regulating burner, the combination of the base 1, having a tubular perforated stem, 4, and a cup 9, provided with an inclined perforated bottom, the shell 2, the annular gas-passage 11, the screw 12, and the tubular perforated valve 6, provided with disk-float 8, substantially as described.

400,173. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed July 2, 1888. Serial No. 278,736. (No model.)



Claim.—In a gas-governor or gas-regulating burner, the combination of the base 1, having a tubular stem, 5, closed at the top and provided with lateral gas-exits 6, located in an annular countersink, 7, the upper shell, 2, and the tubular valve 8, having lateral openings 9 and provided with a disk-float, 10, fitting loosely in the surrounding shell, an annular gas-passage, 11, being provided between said float and shell, substantially as described.

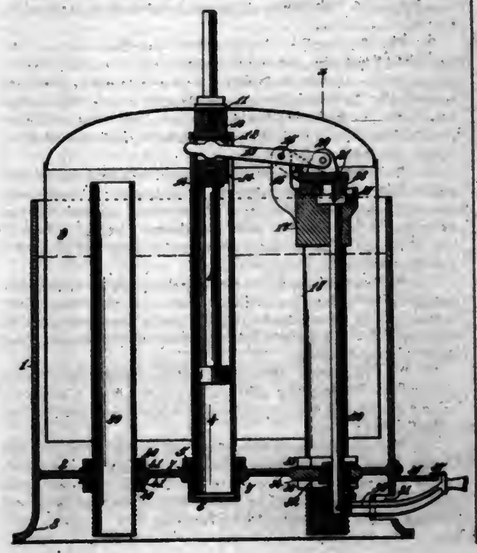
400,174. AIR-REGULATING DEVICE FOR ATMOSPHERIC GAS-BURNERS. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed July 31, 1888. Serial No. 281,489. (No model.)



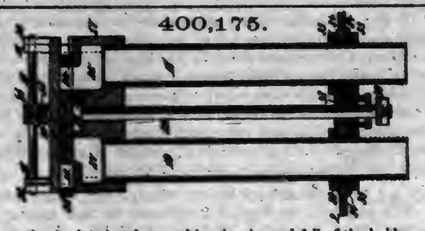
Claim.—The combination, with an atmospheric gas-tube having lateral air-inlets, and a bell-shaped shield, 6, supported on said tube above the air-inlets, surrounding and extending below the latter, and provided at its lower edge with an annular laterally-projecting flange, 7, of a stationary perforated disk, 8, having its periphery spun over and around said flange, and a rotatable perforated disk, 10, having a turned-over edge, 12, loosely spun around the periphery of the stationary disk to regulate the admission of air into the atmospheric gas-tube, substantially as described.

400,175. GAS AND AIR MIXER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Sept. 6, 1888. Serial No. 284,731. (No model.)

Claim.—1. In a gas and air mixing machine, the combination, with a water-tank, a gas-holder resting in said tank, and gas and air inlet pipes and a delivery-pipe located in said tank and holder, of a chambered block located upon and communicating with said inlet-pipes, a hinged valve adapted to control the admission of gas or vapor and air through the inlet-pipes and chambered block to the holder, a transverse rod on which said valve is hinged, and a lever fulcrumed on said rod and connected with said valve and gas-holder, whereby



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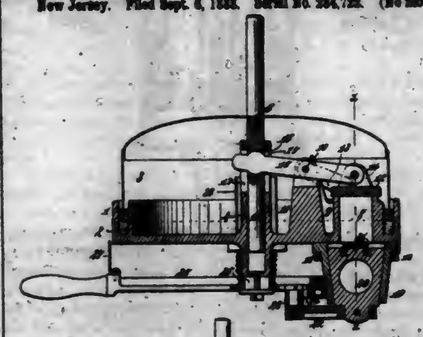


the valve is closed and opened by the rise and fall of the holder, substantially as described.

2. In a gas and air mixing machine, the combination of a water-tank, a gas-holder resting in said tank, gas and air inlet pipes and a delivery-pipe located in said tank and holder, a chambered block communicating with said gas and air inlet pipes, a slide-valve adapted to control the relative proportions of gas and air admitted through said inlet-pipes, a rock-shaft provided at one end with an eccentric that connects with said slide-valve, a hand-lever on the other end of said rock-shaft, an index and scale adapted to indicate the relative proportions of gas or vapor and air admitted into the machine by the setting of the hand-lever, and a valve having lever-connections with the gas-holder, whereby said valve is closed and opened by the rise and fall of the holder, substantially as described.

3. In a gas and air mixing machine, the combination of a water-tank having a central vertically-slotted guide-tube open at its top and closed at its bottom, a gas-holder resting in the tank and having a central guide engaged in said tube, gas and air inlet pipes and a delivery-pipe located in the tank and holder, a chambered block communicating with said inlet-pipes, a slide-valve seated in said block and adapted to control the proportionate quantities of gas or vapor and air admitted into the machine, means, substantially as described, for operating the said slide-valve, a hinged valve seated above the slide-valve and adapted to control the admission of gas and air into the holder, and a lever connecting said hinged valve with the holder, whereby said valve is closed and opened by the rise and fall of the holder, substantially as described.

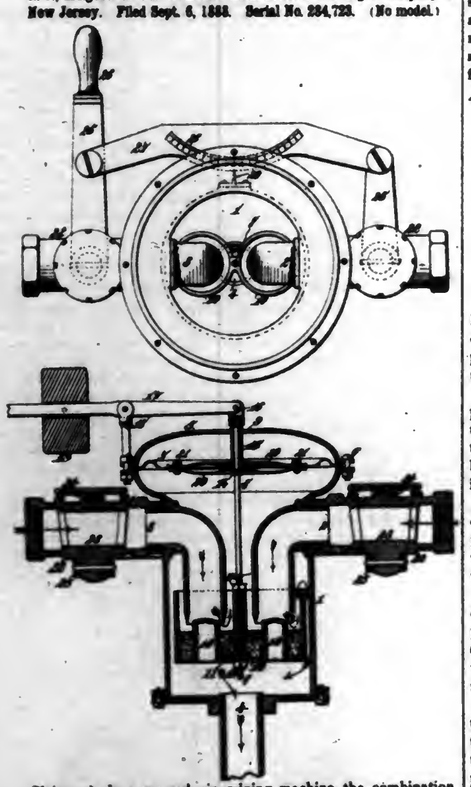
400,176. GAS AND AIR MIXER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Sept. 6, 1888. Serial No. 284,732. (No model.)



Claim.—1. In a gas and air mixing machine, the combination, with a tank having gas and air inlet pipes and an outlet-pipe, of a valve-casing secured to the bottom of said tank below the inlet-pipes, spring-seated valve-plugs located in said casing and adapted to control the proportionate quantities of gas and air admitted into the machine, a hand-lever fulcrumed beneath the tank, and links connecting said lever with the valve-plugs, substantially as described.

2. In a gas and air mixing machine, the combination of a tank having gas and air inlet pipes and an outlet-pipe, a gas-holder resting in said tank, a valve located above the inlet-pipes, a lever so connected with said valve and gas-holder that the rise and fall of the gas-holder will close and open the valve, so as to control the admission of gas and air into the holder, a valve-casing secured to the bottom of the tank below the inlet-pipes, and valve-plugs located in said casing and adapted to control the proportionate quantities of gas and air admitted into the said inlet-pipes, substantially as described.

400,177. GAS AND AIR MIXER. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Sept. 6, 1888. Serial No. 284,723. (No model.)



Claim.—1. In a gas and air mixing machine, the combination, with a tank having gas and air inlet pipes projecting downwardly within said tank, of cup-valves suspended beneath the open ends of said pipes and containing mercury, a vertical valve-rod attached to said valves and projecting through an air-opening in the top of the tank, a flexible diaphragm located in the upper part of the tank and centrally attached to the said valve-rod, and a balance-arm fulcrumed above the tank in pivotal connection with the valve-rod and carrying an adjustable weight, substantially as described.

2. In a gas and air mixing machine, the combination, with a tank having gas and air inlet pipes, and valve-casings communicating with said pipes, of valve-plugs located in said casings, arms attached to said valve-plugs, one of said arms being provided with a hand-lever, a link connecting said arms, a scale on said link, and a stationary index finger or pointer, substantially as described.

400,178. DRAWING-PEN. GEORGE BENNETT, Philadelphia, Pa. Filed Sept. 3, 1888. Serial No. 284,405. (No model.)



Claim.—1. A drawing-pen with blades having two adjustments for producing lines of two different widths, the nibs of the blades being brought into one adjustment by means of a spring and changed to the other adjustment by pressure from a finger of the hand, substantially as described.

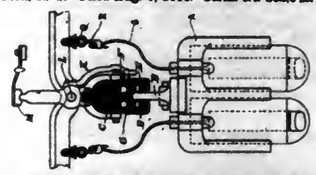
2. A drawing-pen having hinged or jointed blades, a spring acting between said blades, and adjustable stop-screws to regulate the space between the nibs of said blades, substantially as herein described.

3. In a drawing-pen, the combination of two jointed blades having adjustable stop-screws to regulate the space between the nibs of said blades, said screws being located each side of said joint, with a spring acting between said blades, substantially as described, and for the purpose set forth.

4. A drawing-pen comprising the blades *a* and *b*, jointed at *c*, the stop-screws *e* and *d*, and the spring *f*, substantially as described, and for the purpose set forth.

5. A drawing-pen having blades provided with an adjustable stop-screw to regulate the space between the nibs of said blades when they are forced toward each other, and another adjustable stop-screw to regulate the space between the nibs of said blades when said blades are forced apart, substantially as described, and for the purpose set forth.

400,179. ELECTRIC-RAILWAY CONTACT. EDWARD M. BENTLEY, New York, N. Y. Filed Aug. 9, 1888. Serial No. 282,342. (No model.)



Claim.—1. The combination, with an electrically-propelled vehicle, of a contact device leading to a supply-conductor in a conduit outside of the track, and a transverse guide for said contact device permitting a normal movement thereof, but having an extension permitting an abnormal movement of the contact device.

2. The combination, in an electric railway, with an electrically-propelled vehicle, of a contact device for maintaining traveling electrical connection with a supply-conductor inclosed in a conduit outside the track, and a movable guide, upon which said contact device moves, having an abnormal transverse movement, and provided with a retractile spring for restoring it to its normal position.

3. The combination, with an electrically-propelled vehicle, of a contact device for maintaining the electrical connection with a supply-conductor inclosed in a conduit outside the track, a primary transverse guide therefor, and a secondary intermediate guide upon which the contact device moves.

4. The combination, with an electrically-propelled vehicle, of a contact device for maintaining the electrical connection with a supply-conductor inclosed in a conduit, a transverse mechanical guide for said contact device, and a transverse insulated electrical guide, with which the conductor of the said contact device has a traveling connection.

5. The combination, with an electrically-propelled vehicle, of a transversely-movable contact device for maintaining traveling electrical connection with a supply-conductor inclosed in a conduit outside the track, and a transverse insulated electrical guide connected to the propelling-motor, with which the conductor of the contact device has traveling connection.

6. The combination of an electrically-propelled vehicle, a contact device for engagement with the supply-conductor, and a mechanical connection between the contact device and vehicle, permitting movement of the contact device relative to the vehicle, with an electrical conductor leading to the contact device and having a detachable connection at its free end, with a conductor upon the vehicle in circuit with the propelling-motor.

7. The combination, with an electrically-propelled vehicle, of a supply-conductor below the vehicle, a contact device for engagement therewith, mechanically connected to the vehicle and movable relatively thereto, and a flexible electrical conductor leading to the contact device and having at its upper free end a spring-jack connection with the conductor upon the vehicle.

8. The combination, with an electrically-propelled vehicle, of a contact device maintaining electrical connection with a supply-conductor inclosed in a slotted conduit, a moving transverse guide for said contact device, a segment upon said guide, and an actuating-rope wound upon said segment.

9. The combination, with an electrically-propelled vehicle, of a contact device maintaining electrical connection with a conductor inclosed in a conduit, and a transversely-movable guide on which said contact device travels.

10. The combination, with an electrically-propelled vehicle and a supply-conductor, of a contact device for maintaining electrical connection with said conductor, and a movable guide upon which said contact device moves, having an abnormal transverse movement, and provided with a retractile spring for restoring it to its normal position.

11. The combination of the contact device and two independent sliding connections between the contact device and vehicle, permitting different ranges of movement.

12. In an electric railway, the combination of the primary transverse guide and a support engaging said guide, with a contact device having a transversely-traveling connection with said support.

13. The combination, in an electric railway, of a vehicle with a contact device extending into a slotted conduit for engagement with the supply-conductor therein, and two transversely-traveling connections between the contact device and vehicle, one having a longer range of movement than the other.

14. In an electric railway, the combination of a support traveling along suitable guides, with a contact device for engagement with the supply-conductor, inclosed in a conduit connected with and having an independent movement relative to said support, and stops for limiting this latter movement.

15. The combination, in an electric railway, of a vehicle, a support having sliding bearings permitting movement in a horizontal plane, and a contact device having a transversely-traveling connection with said support and in engagement with the supply-conductor.

16. The combination, in an electric railway, of a vehicle, a support having sliding bearings permitting movement in a horizontal plane, and a contact device having a transversely-traveling connection with said support and in engagement with the supply-conductor housed in the slotted conduit.

17. In an electric railway, the combination of a vehicle and a contact device for engagement with a supply-conductor housed in a slotted conduit, with a support for the contact device outside the conduit and connected to the vehicle in such a manner as to be movable relative thereto, and a connection between the contact device and the support, allowing a limited lateral movement between the two, whereby slight irregularities of movement may be compensated by the independent movement of the contact device.

18. In an electric railway, the combination of a vehicle and a contact device for engagement with a supply-conductor inclosed in a slotted conduit, with an intermediate support between the vehicle and the contact device, and connections permitting lateral movement between the vehicle and support and the support and contact device, respectively, whereby movement of the contact device either alone or with the support allows for irregularities in the line of the conduit.

19. The combination, with an electrically-propelled vehicle, of a contact device for engagement with the supply-conductor movable relatively to the vehicle, an independent conductor-guide, and a traveler moving therealong and in circuit with the contact device.

20. The combination of the contact device having a transversely-sliding connection with an electrically-propelled vehicle, an independent conductor-guide, a traveler moving therealong, and a flexible electrical connection between the contact device and traveler.

21. The combination, with a transverse conductor-guide upon a vehicle and a traveler therefor, of a contact device movable relatively to the vehicle and extending into a slotted conduit for engagement with the supply-conductor, and a flexible electrical connection between the contact device and traveler.

22. The combination, with an insulated conductor-guide upon an electrically-propelled vehicle and a traveler therefor, of a supply-conductor, a contact device movable relatively to the vehicle, and a flexible electrical connection between the contact device and traveler.

23. The combination of a contact device having a transversely-movable connection with an electrically-propelled vehicle, with an independent conductor extending along in proximity to the path of movement of the said contact device, and a traveler in circuit with the contact device and moving in contact with the said conductor.

24. The combination, with a movable transverse guide upon an electrically-propelled vehicle, and a contact device having a traveling connection therewith, of a fixed conductor-slide, a traveler therefor in circuit with the contact device, and a yielding electrical connection between the traveler and contact device, permitting movement of the contact device into and out of operative position.

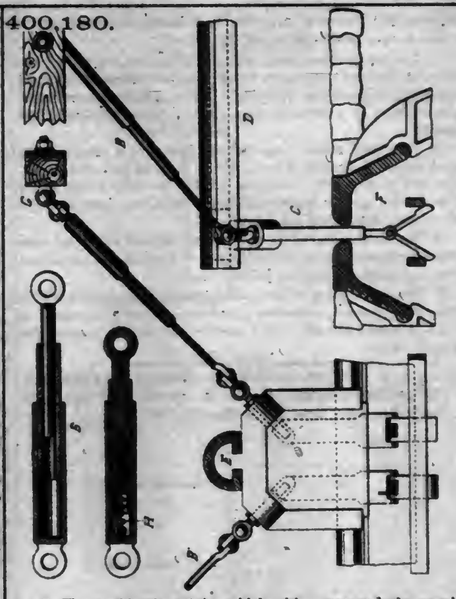
25. The combination, in an electrically-propelled vehicle, with a transverse mechanical guide extending beyond the car-wheel, and a contact device movable along said guide, of a conductor-slide terminating at a point between the wheels, a traveler therefor, and a flexible electrical connection between the traveler and contact device.

400,180. ELECTRIC-RAILWAY PLOW. EDWARD M. BENTLEY, New York, N. Y. Filed Dec. 5, 1888. Serial No. 292,697. (No model.)

Claim.—1. The combination of a vehicle and a contact device for engagement with a supply-conductor, with an intermediate mechanical connection permitting movement of the contact device relative to the vehicle, and an extensible electrical connection between the contact device and vehicle.

2. The combination of a vehicle and a guide thereon with the contact device movable along said guide, and an extensible connection between the contact device and the vehicle.

400,180.



3. The combination of the vehicle with a contact device capable of being shifted from point to point upon the vehicle, and an extensible connection between the contact device and the vehicle.

4. The combination of the vehicle and a transverse guide thereon with a contact device movable along said guide, and an extensible electrical connection between the contact device and vehicle.

5. The combination, in an electric railway, of two line-conductors and a collector having contact-surfaces engaging with said conductors with extensible connections in circuit with said contact-surfaces and leading to the vehicle.

6. The combination of a vehicle with a contact device having a sliding movement thereupon and a connecting-link between the contact device and the vehicle, consisting of two or more sections extensible to one another.

7. The combination of a vehicle with a contact device capable of being shifted from point to point upon the vehicle, and a connecting-link between the contact device and the vehicle, consisting of a plurality of sections of conducting material extensibly connected together.

8. The combination of the conduit, the inclosed conductor, the vehicle, and transverse guide thereon, with the contact device movable along said guide, and an extensible connection between the contact device and the vehicle.

9. The combination of the conduit, the inclosed supply-conductors, the vehicle, and transverse guide thereon, with the plow movable along said guide, the contact-conductors carried by said plow, and the extensible electrical connections leading therefrom to the vehicle.

10. The combination of the conduit and inclosed supply-conductor with a contact device movable relatively to the vehicle, and an intermediate extensible connection one end of which is connected to the contact device and the other to the car.

11. The combination of the vehicle, a conduit, an inclosed conductor, and a contact device therefor, with a mechanical connection permitting movement of the contact device relatively to the vehicle and an extensible electrical connection between the contact device and the vehicle.

12. The combination of the vehicle, a conduit, and inclosed conductor, with a plow or current collector movable laterally relative to the vehicle, and an extensible connection between the plow and vehicle.

13. The combination of the conduit, the inclosed conductor, the vehicle, and contact device capable of being shifted from point to point upon the vehicle, with an extensible connection between the contact device and vehicle.

14. The combination of a conduit, a conductor therein, and a contact device with an electrical connection between the contact device and car, consisting of telescoping sections of conducting material.

15. The combination of the conduit and inclosed conductor with a vehicle, a contact device connected thereto, and an extensible link between the contact device and the vehicle.

16. The combination of a vehicle and a plow having a movable

connection therewith with extensible links leading from each side of the plow to the vehicle and bracing the plow.

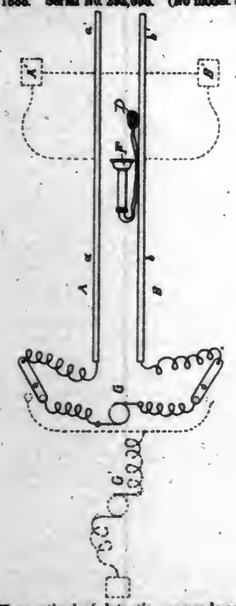
17. The combination, in an electric railway, of the vehicle, the conduit, and inclosed conductor, with the contact device therefor and a connecting-link between the contact device and vehicle connected to one of them by a universal joint, thereby permitting freedom of movement.

18. The combination, in an electric railway, of a vehicle and a contact device connected thereto, with a conduit, an inclosed conductor, and an electrical connection between the contact device and vehicle, consisting of an extensible link of conducting material and a universal-joint attachment for the same.

19. The combination of the conduit and inclosed conductor with the transversely-moving contact device for the same, and an extensible spring-connection leading to the vehicle.

20. The combination of the conduit and inclosed conductor with the plow, a mechanical connection permitting transverse movement of the plow, and an extensible spring electrical connection between the plow and vehicle.

400,181. METHOD OF DETECTING GROUNDS IN AN ELECTRIC DISTRIBUTING SYSTEM. EDWARD M. BENTLEY, New York, N. Y. Filed Dec. 5, 1888. Serial No. 292,698. (No model.)



Claim.—1. The method of detecting grounds on an electric railway having a normally-insulated line-conductor, which consists in first sending an irregular current through the grounded conductor, then moving along in proximity thereto an induction-coil connected to an accessible indicator, and noting on the indicator the variation in the induced current caused by the coil passing the grounded point.

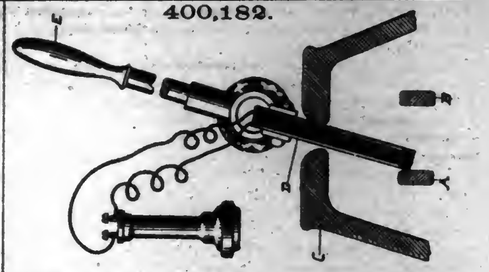
2. The method of detecting grounds on an electric railway having an inclosed conductor, which consists in first sending an irregular current through the conductor, then moving along in the inclosure in proximity to the conductor an induction-coil connected to an accessible indicator, and noting on the indicator the variation in the induced current caused by the coil passing the grounded point.

3. The method of detecting faults upon an electric railway or other circuit having a normally-insulated line-conductor, which consists in first sending an irregular current over the conductor, inducing therefrom a secondary current, and applying an indicator to the secondary current, substantially as described.

4. The method of detecting grounds or short circuits on an electric railway having a normally-insulated line-conductor, which consists in first sending an irregular current through the faulty conductor, then inducing therefrom a series of secondary currents at various points along the line, and, lastly, noting the variation in the induced currents, and thereby locating the fault.

400,182. FAULT-DETECTOR FOR ELECTRIC RAILWAYS. EDWARD M. BENTLEY, New York, N. Y. Filed Dec. 17, 1888. Serial No. 293,837. (No model.)

Claim.—1. The combination of a normally-insulated line-conductor grounded at a point between its two ends, and an electric circuit



supplied with an irregular current and including the line-conductor and the grounded return, with an induction-coil adapted to be brought into proximity to the line-conductor at points preceding and succeeding the ground, and an indicator controlled by the current in the induction-coil.

2. The combination of a line-conductor normally insulated from its return, and a circuit including a portion only of the line-conductor, with a source of electricity sending an irregular current over said circuit, and an indicator operated by induction and adapted to be brought into proximity with the line-conductor at various points, for the purpose set forth.

3. The combination of a bared supply-conductor of low resistance adapted normally to supply current to the traveling motors upon an electric railway, and having a fault thereon at a point between its two ends, with an electric circuit, including a portion of the supply-conductor and the fault and traversed by an irregular current, an induction-coil in proximity to the supply-conductor at any desired point, and an indicator controlled thereby for detecting the presence of the irregular current in the corresponding portion of the supply-conductor, and thereby locating the fault.

4. The combination of a bared supply-conductor of low resistance extending along an electric railway and grounded at an intermediate point along its length, with an irregular-current generator in circuit with the supply-conductor and ground, whereby a complete circuit is established, including only a portion of the supply-conductor, and an induction-indicator adapted to be brought into proximity with the supply-conductor at successive points, for the purpose set forth.

5. A ground-detector for an electric railway having an inclosed conductor, which consists of an induction-coil adapted to move along in the inclosure in proximity to the conductor, having a connection attached thereto extending out through the slot of the inclosure and provided with an indicator in circuit therewith.

6. A ground-detector for an electric railway having an inclosed conductor, which consists of an induction-coil having a thickness less than the width of the slot, so as to be inserted and withdrawn therethrough, and provided with a connection extending through the slot, and an external indicator in circuit therewith.

7. A detector-coil for a conduit electric railway, having one straight longitudinal side adapted to be placed in proximity to the line-wire, the opposite side being arranged out of the immediate inductive field of said wire, and provided with a connection extending through the slot of the conduit, and with an external indicator.

8. A fault-detector adapted to be placed in proximity to a line-conductor for detecting a fault thereon, consisting of the induction-coil D, the telephone in circuit with the induction-coil, and the supporting rod or pole E, substantially as described.

9. The combination of a housed line-conductor traversed by an irregular electric current, with an accessible indicator, an intermediate induction-coil, and connections, whereby the indicator responds to changes in the current upon the inclosed conductor.

10. The combination of a slotted conduit, two line-conductors therein adapted to form the direct and return branches of an electric circuit and located on opposite sides of and away from the slot, with a narrow induction-coil movable from side to side within the conduit, and an indicator controlled thereby, whereby the current upon either conductor may be tested without interference from the other.

11. The combination of a slotted conduit and a supply-conductor housed therein, with an induction-coil adapted to be brought into proximity to the conductor, and a telephone outside the conduit, in circuit with the induction-coil, for testing the line.

12. The combination of a plurality of line-conductors inclosed in a common conduit and located at intervals apart, with an induction-coil movable in the conduit into proximity with any desired one of the conductors, and an indicator controlled by the induction-coil.

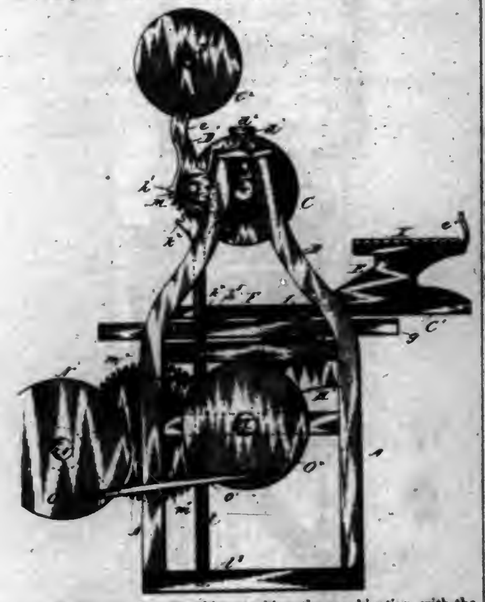
13. The combination of a metallic conduit and a line-conductor therein, with an induction-coil adapted to be brought into proximity to the inclosed conductor, and an indicator controlled by the induction-coil.

400,183. AUTOMATIC FOLDING CHAIR. HENRY H. BLAKE, Pittsburg, Pa., assignor to himself and Thomas A. Noble. Filed Feb. 17, 1887. Serial No. 227,994. (No model.)



Claim.—In an automatic folding chair, the combination of a seat supported by and adapted to swing backwardly upon a cross-bar having triangularly-shaped ends loosely pivoted in slots or bearings in the forward upper part of the arms or sides of the same, springs secured within the arms or sides of the same, adapted when extended to support the ends of the cross-bar in the upper part of the slots or bearings and when compressed to sink toward the bottom of the same, and springs attached to the arms or sides of the chair at the upper rear end of the slots or openings, and projecting downwardly and terminating near the bottom thereof, adapted to engage the acute edges of the triangularly-shaped ends of the cross-bar when said bar is thrown upward, whereby the seat is tilted or thrown vertically toward the back of the chair, substantially as and for the purpose herein described.

400,184. STARCHING-MACHINE. THOMAS J. BLAKE, Wilkinsburg, Pa. Filed Feb. 14, 1888. Serial No. 263,961. (No model.)



Claim.—1. In a starching-machine, the combination, with the carrier upon which the articles to be starched are laid, of a pressure-roll consisting of a hollow perforated metallic cylinder, substantially as and for the purpose set forth.

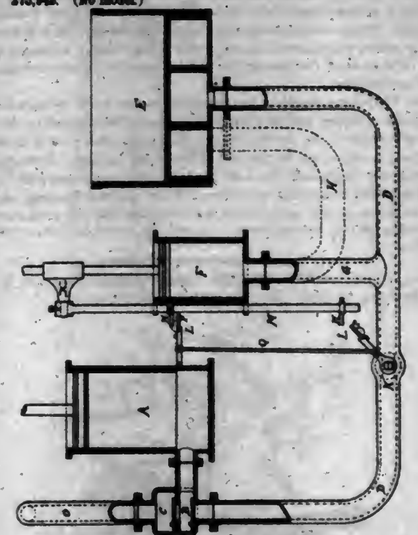
2. In a starching-machine, a detachable wiping-roll consisting of a cylinder mounted on adjustable arms and capable of being lowered upon and raised from the starching table or carrier, substantially as described.

3. In a starching-machine, the combination, with the reciprocating starching-table, of the pivotal arms D D', toothed segment k' upon one of said arms, the toothed lever k^2, mounted on the frame of the machine, lever l, pivotally connected to lever k^2, wheel N', having offset m^2, pinion N', and transverse shaft N, substantially as described.

4. In a starching-machine, the combination of the following elements, to wit: the wiping-roll, the toothed lever supporting the same, the toothed segmental lever, the swinging bar, the toothed wheel having a cam or offset on its face, and the pinion engaging with said wheel and mounted on the shaft, substantially as described.

5. In a starching-machine, the combination, with the reciprocating starching-table, the pressure-roll, and the wiping-roll, of the transverse shafts through which motion is conveyed to the table and to the arms supporting the wiping-roll, the crank-wheels on said shafts, and the connecting-pitman, substantially as described.

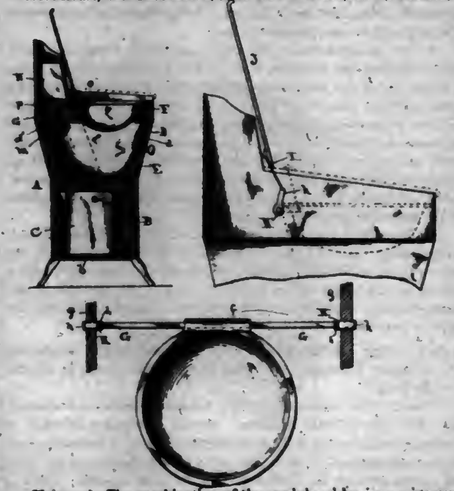
400,185. APPARATUS FOR ACCELERATING THE PASSAGE OF LIQUIDS THROUGH FILTER-BEDS. WILLIAM D. BOSH, Acton, London, County of Middlesex, England. Filed June 4, 1888. Serial No. 275,949. (No model.)



Claim.—1. The combination, with a filter of an ordinary suction-pump drawing liquid by suction through a filter-bed, of an auxiliary single-acting pump without valves and connected to the filter-casing, substantially as and for the purposes described.

2. The combination, with a filter, of a delivery-pump, A, connected with its casing, an auxiliary pump, F, for causing a reflux through the filter-bed, connected suction-pipes D and G, a valve, K, in said pipe D, between the delivery-pump and the union of said pipe G, and mechanism, substantially as described, for opening and closing said valve in time with the reciprocations of the piston of the auxiliary pump, substantially as hereinbefore specified.

400,186. PORTABLE WASH-STAND. NATHAN G. BOND, Fairfax Court-House, Va. Filed Nov. 9, 1888. Serial No. 290,342. (No model.)



Claim.—1. The combination of the wash-bowl having a side extension provided with a rectangular opening, the rod fitted in the opening of said extension, the sockets fitted to the ends of the rod and forming journals therefor, and having arms, the set-screws for holding the sockets on the rod, the cover, and the links connecting the said arms with the said cover, substantially as set forth, for the purposes described.

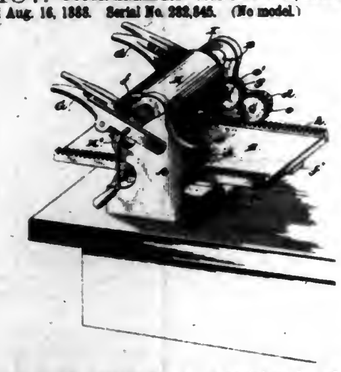
2. In a wash-stand, the combination, with the cabinet and the

tilting wash-bowl, of the drawer or slide, and the combined splash and guide bowl supported by said drawer or slide having a discharge-opening in its bottom, and having the upper portion of its rear edge cut away to give clearance for the said wash-bowl when drawing the said slide out, substantially as set forth.

3. A portable cabinet wash-stand consisting of a frame or casing having a portion adapted to contain a slop-pail, a pivoted rocking bowl and tilting mechanism therefor secured to its top, and a drawer and splash-bowl supported thereby, said drawer being arranged to slide in and out of the case between the slop-pail and bowl, substantially as described.

4. The herein-described portable cabinet wash-stand, composed of the frame or casing having a bottom to support the slop-pail, a door to admit access to the interior of the cabinet, the drawer or slide, the splash-bowl supported by the said drawer and having a discharge-opening, the water-tank, the wash-bowl, the rod connected with the wash-bowl, the sockets fitted to the ends of the rods and forming journals for the same, and having arms, the cover, and the link connecting the said arms with the said cover, substantially as and for the purpose set forth.

400,187. DOUGH-KNEADER. JOHN H. BOWERS, Mound City, Mo. Filed Aug. 16, 1888. Serial No. 282,845. (No model.)



Claim.—1. The combination, in a dough-kneader, of the side frames carrying pinions *g* and *e*, and having rack-teeth in one part of the edge thereof, bifurcated levers G G, pivoted to said frame; said levers forming bearings for a crank-shaft carrying a geared roller, and spring-actuated pawls adapted to engage the rack-teeth on the side frames for adjusting the bifurcated levers and roller, the said frames having slots through which the roller-shaft passes, and a kneading-board having rack-teeth, the parts being organized substantially as shown, and for the purpose set forth.

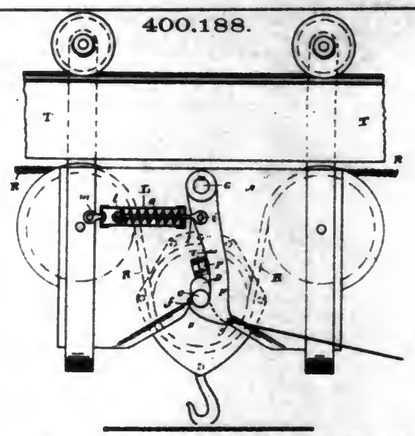
2. In a dough-kneader, the combination of a frame, a reciprocating kneading-bed mounted therein having an integral guide-spline at the center of the bottom thereof, grooved rollers journaled in said frame, with the grooves of which the guide-spline of the kneading-bed is in engagement, adjusting-levers pivoted to upper extensions of the frame on each side thereof, a crank-shaft having bearings in said levers, and a revoluble kneading-roll attached to said crank-shaft operating to reciprocate the kneading-bed and adapted to have a temporary stationary adjustment toward or away from said bed by means of the levers, substantially as described.

3. In a dough-kneader, the combination, with a frame having a reciprocating kneading-bed therein, adjusting-levers pivoted to the upper part of said frame on each side thereof, a crank-shaft having bearing in said levers, and a revoluble kneading-roll attached to said crank-shaft and adapted to reciprocate said kneading-bed, substantially as described.

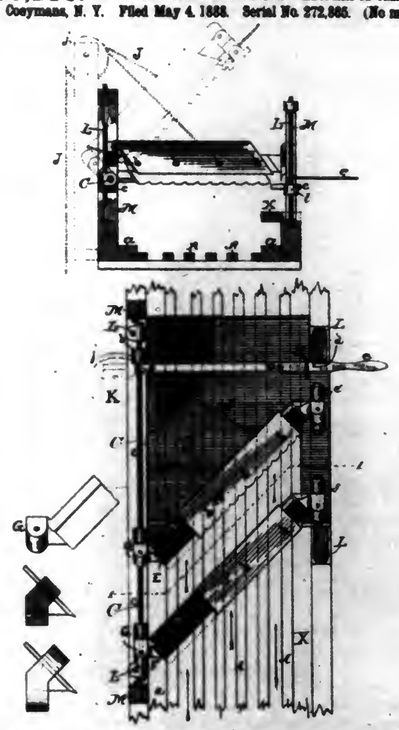
400,188. HOISTING AND CONVEYING MACHINE. ALEXANDER B. BROWN, Cleveland, Ohio. Filed Mar. 16, 1887. Serial No. 231,090. (No model.)

Claim.—The combination of the following-named instrumentalities: first, any suitable tramway; second, a tramway-carriage or trolley mounted to travel on said tramway; third, a hoist-rope having one end secured to a stationary point of attachment and the other end connected with the hoist-engine in the usual manner; fourth, a sheave-block in engagement with said hoist-rope, and which is supported by said rope only when being raised or lowered; fifth, the hooks P *f*, formed with depressed seats to accommodate the engaging devices of the sheave-block, and from which said devices can be released only by lifting the sheave-block, and, sixth, suitable means for the manipulation of said hooks by an attendant, said combination of instrumentalities operating substantially in the manner and for the purposes set forth.

400,188.



400,189. MACHINE FOR PLANING ICE. LEONARD R. CARHART, Coeymans, N. Y. Filed May 4, 1888. Serial No. 272,865. (No model.)



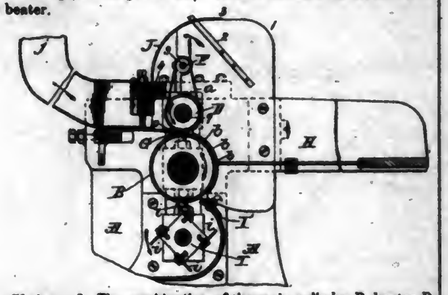
Claim.—1. In an ice-cutting machine, the combination of a knife provided with a notched cutting-edge, placed diagonally across and in combination with the chute of an ice-elevator, the shaft C, to which said knife is hinged, and the frame B, to which said knife is connected, all substantially as described, and for the purpose set forth.

2. In an ice-cutting machine, the combination of the knife I, having an unbroken cutting-edge, with the knife H, having its cutting-edge provided with right-angled notches, each of said knives placed diagonally across the chute of an ice-elevator, the shaft C, to which said knives are hinged, the frame B, to which said knives are attached, and the latch-lever *e*, attached to the frame B, with the notched rack *d*, with which said latch-lever engages, all substantially as described, and for the purpose set forth.

3. In an ice-cutting machine, the combination of the frame B, extending across the chute of an ice-elevator, the shaft C, to which said frame is hinged on one side, the bar *c*, to which said shaft is attached, the nuts *l l* at each end of said bar *c*, the bolts L L, provided with threads, with which the nuts *l l* mesh, the knives H and I, placed diagonally across said chute, hinged to said shaft C, and connected with the said frame B, the latch-lever *e*, attached to the frame B, hinged on the said shaft C, the notched rack *d*, with which the said latch-lever engages, the chain or cable J, attached to said frame, the sheave *j*, and the weight *k*, attached to said chain or cable, all substantially as described, and for the purpose set forth.

400,190. ROLLER-GIN. DANIEL S. CHAPIN, Milford, Mass. Filed Aug. 16, 1888. Serial No. 282,842. (No model.)

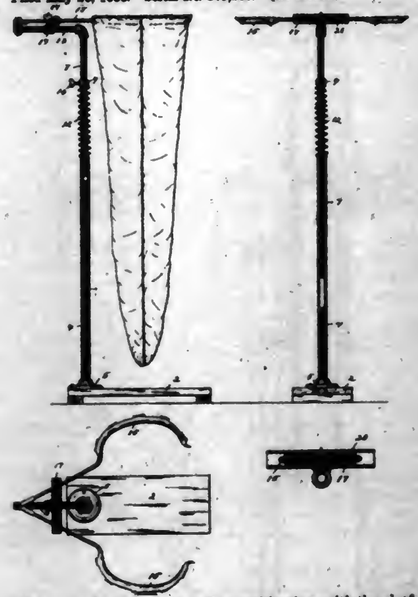
Brief.—A revolving fan above the beater prevents cotton from being carried over the beater, and the feed is quickened by a hood and exhaust-pipe arranged to draw the cotton toward the seed-arrester and beater.



Claim.—1. The combination of the main cylinder B, beater D, seed-arrester G, and fan F, substantially as and for the purpose set forth.

2. The combination of the main cylinder B, beater D, seed-arrester G, and hood J, provided with draft-pipe *j*, substantially as and for the purpose set forth.

400,191. BAG-HOLDER. EDWARD W. CLARK, Rochester, Minn. Filed May 23, 1888. Serial No. 275,288. (No model.)

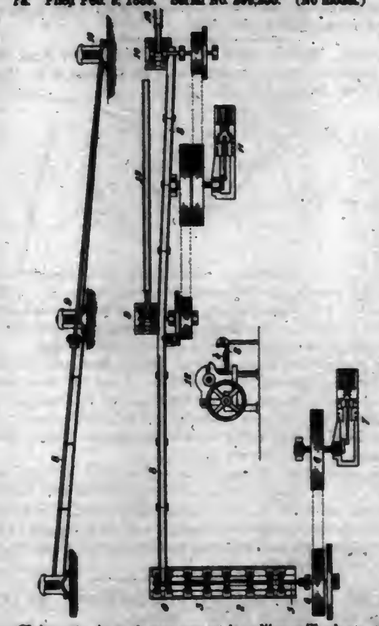


Claim.—1. In a bag-holder, the combination, with the platform, of the standard 4, secured to said platform, a spindle, 7, sliding within the standard and provided with suitable jaws which receive the bag, the collar 9, adjustably secured to the said spindle, and the spring 12, acting against the said collar to partially support the weight, substantially as described.

2. In a bag-holder, the combination, with a suitable support, of the jaws 15, pivoted upon the support, a spring, 20, for distending the jaws, and a cross-head carrying said spring 20 and adjustably secured to the said support to vary the spread of the jaws, substantially as described.

3. In a bag-holder, the combination, with the platform, of the standard 4, secured to said platform, the spindle 7, provided with the adjustable collar 9, the spring 12, arranged upon said spindle and resting upon the top of said standard, the jaws 15, pivoted upon said spindle, the adjustable cross-head 17, through which said jaws extend, and the spring 20, arranged within said cross-head between said jaws, substantially as described.

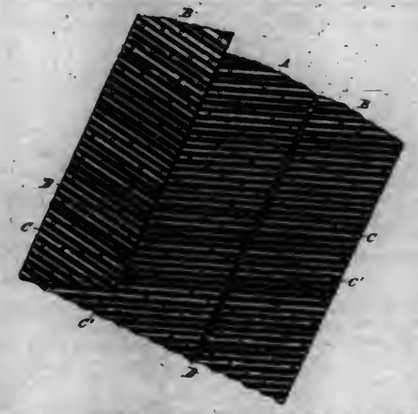
400,192. ROLLING-MILL PLANT. EDWARD L. CLARK, Pittsburg, Pa. Filed Feb. 9, 1888. Serial No. 263,235. (No model.)



Claim.—1. As an improvement in rolling-mill plants, the combination of the rolls 4 and 10, the intermediate rolls, 9, and the shears adjacent to the rolls 9, substantially as and for the purposes described.

2. As an improvement in rolling-mill plants, the combination of the sets of rolls 4 and 10, the guide-trough 8, leading from the one set to the other, the set of rolls 9, arranged at the side of the trough, and the adjacent shears 12, substantially as and for the purposes described.

400,198. CARPET-LINING. CHARLES H. COLE, Little Rock, Ark. Filed Feb. 1, 1888. Serial No. 262,648. (No specimens.) Patented in Canada Aug. 13, 1887, No. 27,416.



Claim.—1. A carpet-lining provided with diagonal corrugations from edge to edge and folded upon itself, for the purpose substantially as described.

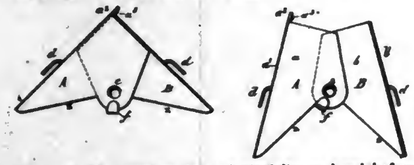
2. A carpet-lining provided with perforated diagonal corrugations from edge to edge and folded upon itself from both sides, the perforations of the folded side sections non-registering with the perforations of the main or middle section, for the purpose substantially as described.

3. A carpet-lining provided with diagonal perforated corrugations from edge to edge and folded upon itself from both sides, the folded side sections in the aggregate being of the same width as the

main or middle section, forming a double lining, for the purpose substantially as described.

4. A carpet-lining consisting of three attached sections and transverse weakening-grooves, the two outside sections being folded under the main or middle section, forming a double lining in one piece, for the purpose substantially as described.

400,194. MOUTH-PIECE FOR BAGS. GEORGE W. DEAN, New York, assignor of one-half to James Steel, Jr., Brooklyn, N. Y. Filed Jan. 8, 1889. Serial No. 295,762. (Model.)



Claim.—1. The combination, substantially as hereinbefore set forth, in a bag mouth-piece of general triangular shape, of two like sections, *a a' b b'*, hinged to each other, one of the sections having an extension or lip, a^3, on the upper edge of its middle portion, projecting beyond the corresponding edge of the opposite section.

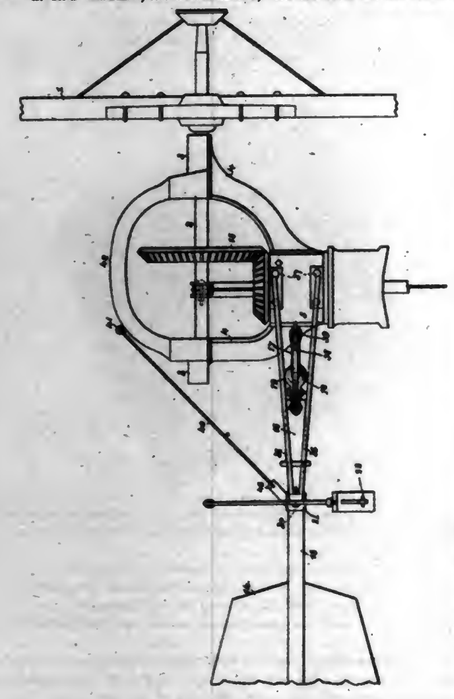
2. The combination, substantially as hereinbefore set forth, in a bag mouth-piece of general triangular shape, of two like three-sided sections, *a a' b b'*, hinged to each other, one of the sections having an extension or lip, a^3, on the upper edge of its middle portion, projecting beyond the corresponding edge of the opposite section, and a catch or fastening device formed on the lip.

3. The combination, substantially as hereinbefore set forth, in a bag mouth-piece of general triangular shape, of two like sections hinged to each other and of rectangular shape in cross-section, each section being formed with an inclined edge, *z*, on each side and an ear or projection, *f*, on one section turned over the edge of the other section of the mouth-piece.

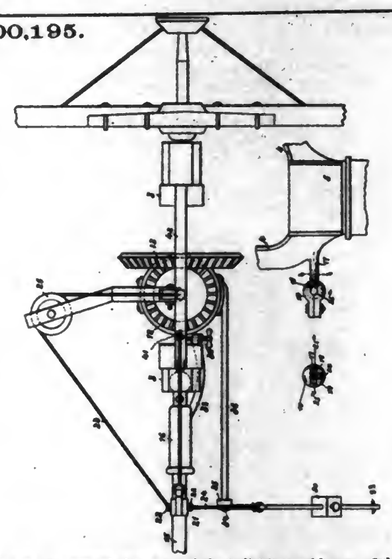
400,195. WINDMILL. GUSTAV DIETERT, Kentville, Tex. Filed May 31, 1888. Serial No. 275,567. (Model.)

Claim.—1. The combination, with the revoluble wheel-support having the yoke 42, and the tail or rudder having a stem, of a ball and-socket joint, by which said stem is secured to said wheel-support, a collar or ring, 21, on said stem, and a rigid arm projecting upwardly from said ring and connected with said yoke, substantially as set forth.

2. In a windmill, the combination, with the stem 15, the collar 5,

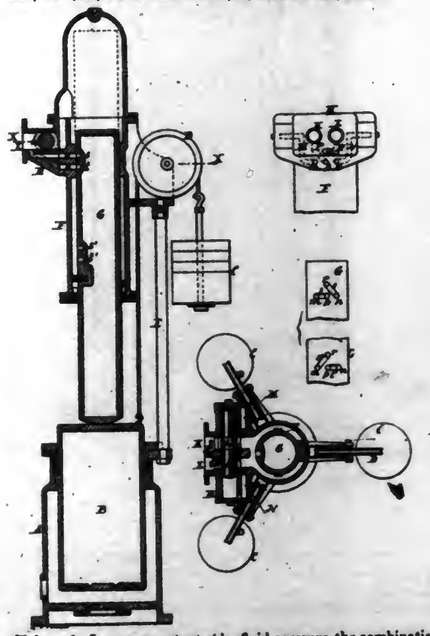


400,195.



the arm 17, secured thereto, and the ball 18 on said arm, of the stock 16, receiving said stem, the socket 19, made integral with stock 16, receiving said ball, and the arm 36, made integral with said stock and carrying a set-screw, as set forth.

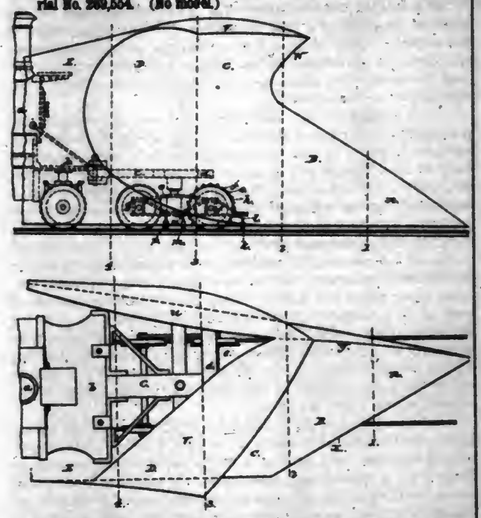
400,196. PUMP ACTUATED BY FLUID-PRESSURE. WILLIAM DONALDSON, Westminster, County of Middlesex, England. Filed Nov. 15, 1888. Serial No. 290,961. (No model.) Patented in England June 19, 1886, No. 8,165, and in India Oct. 17/24, 1887, No. 130/1,362.



Claim.—1. In a pump actuated by fluid-pressure, the combination of the pump-cylinder A, its plunger B, the power-cylinder F and its plunger G, butting on B, the counter-weights C and the guide-pulleys and the chains attached to the plunger B, and the valve-box H, arranged to alternate the supply and discharge of the working-fluid, substantially as described.

2. In a pump actuated by fluid-pressure, the valve-box H, having slide-plunger k, with groove *k'*, the passages M N P R and their ports *m n p r*, in combination with the recessed passages *s t* and *s' t'* in the plunger G, arranged and operating substantially as described.

400,197. SNOW-PLOW. MATTHIAS B. EATON, Boston, Mass., assignor to William W. Eaton, Hartford, Conn. Filed Apr. 4, 1888. Serial No. 269,554. (No model.)



Claim.—1. A one-sided snow-plow having its mold-board concave, forming a ledge for receiving and sustaining a quantity of snow or ice to weight the plow in use, and the concave landside, whereby the plow is balanced in use.

2. A one-sided snow-plow having its mold-board concave, forming a ledge for receiving and sustaining a quantity of snow or ice to weight the plow in use, and the overhanging portion and the concave landside, substantially as described.

3. A one-sided snow-plow having its mold-board concave, forming a ledge for receiving and sustaining a quantity of snow and having the overhanging portion, and the concave landside having the overhanging portion.

4. A one-sided railway snow-plow having the point, the concave mold-board increasing in concavity from front to rear and forming the ledge or projection for receiving and sustaining a quantity of snow or ice, whereby the plow is steadied and held in place, and the landside provided with the overhanging portion, substantially as described.

5. A one-sided railway snow-plow having the point, as described, the concave mold-board, the bottom slightly flattened, and the landside extending outward at an angle to the line-draft and inclined from a perpendicular inward, and the rear shields extending beyond the head of the locomotive, substantially as described.

6. The ice breaking and clearing wheel, having the diagonal grooves or indentations at each side extending partly across the tread of the wheel, leaving a portion thereof smooth, substantially as and for the purpose described.

7. The combination, with the wheel having the diagonal grooves or indentations at each side extending partly across the tread of the wheel, leaving a portion thereof smooth, of the ice-cutters, substantially as set forth.

8. The combination, with an ice breaking and clearing wheel having the diagonal grooves or indentations at each side extending partly across the tread of the wheel, leaving a portion thereof smooth, of an ice-cutter and of a spring drag or drags, substantially as described.

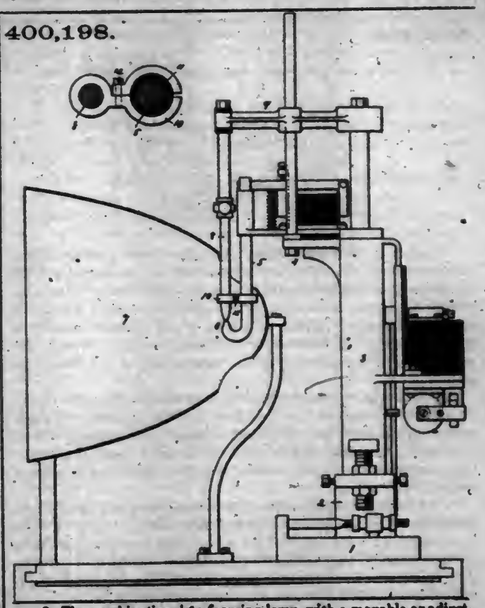
9. The combination, with an ice breaking and clearing wheel having the diagonal grooves or indentations at each side extending partly across the tread of the wheel, leaving a portion thereof smooth, of the ice-cutters, of spring drags or scrapers and a brush, substantially as and for the purpose set forth.

10. In a snow-plow, the shoe provided with the burner or heat-generator and with the partitions *c b'*, the partition *b'* being perforated, substantially as and for the purpose set forth.

400,198. ELECTRIC-ARC LAMP. EDGAR A. EDWARDS, Cincinnati, Ohio. Filed Dec. 1, 1886. Serial No. 220,360. (No model.)

Claim.—1. In a focusing arc lamp, the combination, with a movable or adjustable electrode and mechanism to adjust the same, of a non-consuming electrode and a guide embracing the movable electrode at or near the tip thereof, substantially as and for the purpose set forth.

400,198.

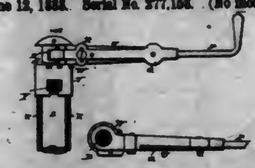


2. The combination, in a focusing-lamp, with a movable or adjustable electrode of carbon or equivalent material, of an electrode of copper and a guide embracing the movable carbon electrode at or near the point thereof, substantially as set forth.

3. In a focusing arc lamp, the combination, with a movable or adjustable electrode, of a non-consuming electrode and a clamp secured to the fixed electrode at or near the tip thereof and having a guide to receive the movable electrode at or near the tip thereof, said clamp being insulated from one of the electrodes, substantially as and for the purpose set forth.

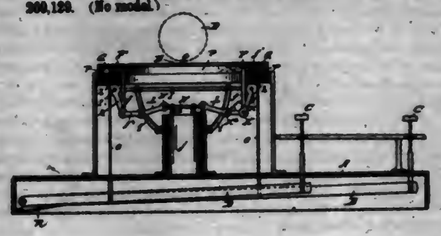
4. The combination, in an electric lamp, with an automatically movable or adjustable carbon electrode, of an opposite electrode of copper, a tip or point of deposited carbon upon the end of said copper electrode, and a guide arranged to guide the movable carbon electrode at or near the point thereof, substantially as herein set forth.

400,199. CAR-STARTER. MARY E. FARNHAM, New Orleans, La. Filed June 12, 1888. Serial No. 277,158. (No model.)

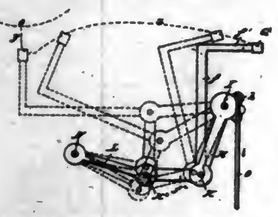


Claim.—In a car-starter, the combination, with the axles and gearing, substantially as described, of the hollow post K, the gear A thereon, the rod L, having a head, M, provided with apertures in its under side and passing through the said hollow post, the barrel V, adjusted to the upper end of the said post, the handle P, journaled on the said rod, the lever U, pivoted to the handle and provided at its forward end with studs, as shown, and suitable belt-connections, substantially as specified.

400,200. TYPE-WRITING MACHINE. JACOB FRIEDL and ANDREW W. STRIKER, New York, N. Y., assignors to the Writing Machine Manufacturing Company, same place. Filed Mar. 31, 1888. Serial No. 269,129. (No model.)



400,200.



Claim.—1. In a type-writing machine, a type-carrier pivoted at one point to the free end of one pivoted link and at another point to the free end of another pivoted link, the said links being arranged to vibrate in opposite directions and cause the type to move in two well-defined paths, first in substantially a horizontal direction radially inward to the common center and then substantially in a straight line and axially to the printing-surface, substantially as shown and described.

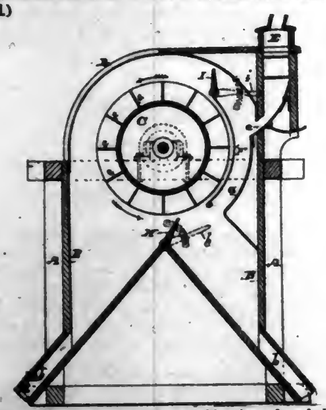
2. In a type-writing machine, the combination of a centrally-arranged fulcrum-support, a series of links, L, radiating therefrom, a concentric and exteriorly-arranged fulcrum-support, another series of links, H, radiating therefrom toward the links L, and a series of type-carriers pivoted to said duplex series of radiating links H and L, substantially as set forth.

3. In a type-writing machine, the combination of a series of pivoted links, H, extending inwardly and downwardly, a series of links, L, pivoted nearer the center of the machine and extending outwardly and downwardly, and a series of type-carriers consisting of the arms f f' f^2, disposed as described, and pivoted to the free ends of the links H and L at the points K K^2, substantially as set forth.

4. In a type-writing machine, the combination of a series of inwardly-extending pivoted links, H, a platen above said links, a circular inking-surface above said links and between them and the platen, a series of outwardly-extending pivoted links, L, and a series of type-carriers, each pivoted at two points to the free ends of a pair of said links, H L, substantially as and for the purpose set forth.

5. In a type-writing machine, the combination, with an inking-surface, as P, and a platen above the same, of the type-carrier F, and the oppositely-arranged links H and L, adapted to move the type from the inking-surface, give it a quarter-turn, and then move it to the platen, as set forth.

400,201. SEPARATOR. JOHN M. PEIRCE, Crockett, and JOHN R. CROSS, San Francisco, Cal. Filed Oct. 19, 1888. Serial No. 288,580. (No model.)



Claim.—1. In a separator, the combination of a shell or casing having independent discharges or outlets at its base, a rotary cylinder operating freely within the shell or casing, whereby a rotary current or body of air is created and accompanies the cylinder, and a feed-inlet for the material to the casing, by which it is directed into the sphere of the uprising portion of the current or body of air, whereby the particles of different specific gravities are separated and are carried to the different discharge-outlets, substantially as herein described.

2. In a separator, the combination of a shell or casing, a rotary cylinder operating freely within the shell or casing, whereby a rotary current or body of air is created and accompanies said cylinder, a feed-inlet for the material, for directing it into the uprising portion of the current or body of air, and a fixed shield-plate opposite the feed-inlet and protecting the periphery of the cylinder over its uprising portion, substantially as herein described.

3. In a separator, the combination of a shell or casing, a rotary cylinder operating freely within it, whereby a rotary current or body of air is created and accompanies the cylinder, a feed-inlet for the material, for directing it into the sphere of the uprising portion of the current or body of air, a fixed shield-plate protecting the uprising portion of the cylinder, and an opposing fixed plate forming a passage for the material within the sphere of the current or body of air, substantially as herein described.

4. In a separator, the combination of a shell or casing having independent discharges or outlets at its base, a rotary cylinder operating freely within the shell or casing, whereby a rotary current or body of air is created and accompanies it, a feed-inlet for directing the material into the sphere of the uprising portion of the current or body of air, and an adjustable valve within the shell or casing and extending into the sphere of the current or body of air for regulating it, substantially as herein described.

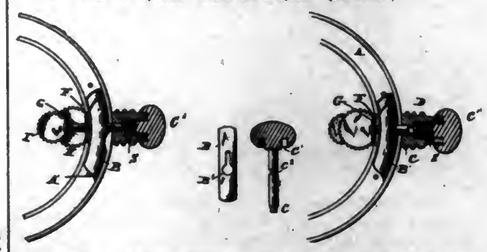
5. In a separator, the combination of a shell or casing having independent discharges or outlets at its base, a rotary cylinder operating freely within the shell or casing, whereby a rotary current or body of air is created and accompanies it, a feed-inlet for directing the material within the sphere of the uprising portion of the body or current of air, a fixed shield-plate covering and protecting the uprising portion of the cylinder, and an adjustable valve within the shell or casing below the cylinder for regulating the current or body of air, substantially as herein described.

6. In a separator, the combination of a shell or casing having independent discharges or outlets at its base, a rotary cylinder operating freely within the shell or casing, whereby a rotary current or body of air is created and accompanies it, a feed-inlet for directing the material within the sphere of the uprising portion of the body or current of air, and an adjustable valve within the shell or casing at the upper portion of the uprising current or body of air for regulating the suspension of the material, substantially as herein described.

7. In a separator, the combination of a shell or casing having independent discharges or outlets at its base, a rotary cylinder operating freely within the shell or casing, whereby a rotary current or body of air is created and accompanies it, a feed-inlet for directing the material within the sphere of the uprising portion of the body or current of air, an adjustable valve within the shell or casing below the cylinder for regulating the current or body of air, and an adjustable valve within the shell or casing at the upper portion of the uprising current or body of air for regulating the suspension of the material, substantially as herein described.

8. In a separator, the combination of a shell or casing having a feed-inlet and independent discharge-outlets at its base, a rotary cylinder having fan-blades on its periphery journaled in said casing and operating freely therein, whereby a rotary air-current is created, a fixed shield parallel with and protecting the uprising portion of the said cylinder, an adjustable valve journaled centrally within the shell or casing below for regulating the air-current, an adjustable valve journaled at the upper end of the fixed shield within the shell or casing, and the plate G, parallel to said shield, substantially as herein described.

400,202. STEM WINDING AND SETTING WATCH. AUGUST FISCHER, Winchester, assignor of one-half to James F. Potts, Whitehall, Ill. Filed Nov. 5, 1888. Serial No. 290,068. (No model.)



Claim.—1. The combination, with the sliding winding-bar of a stem-winding watch, of a gravity-catch in the case in position to engage and hold said bar against longitudinal movement, substantially as described.

2. The combination, with the winding-bar of a stem-winding watch and a spring bearing the same outward, of a sliding gravity-catch in the casing, and stops to limit the movement of said catch, substantially as stated.

3. The combination, with the grooved winding-bar of a stem-winding watch, of a sliding gravity-catch having a perforation through which said bar passes, said perforation being of unequal width, so as to embrace and hold the grooved portion of the bar when in one position, as set forth.

400,208. AUTOMATIC TWINE-WINDER. COMRAN FLEMING, Jr., Sewickley, Pa. Filed Apr. 23, 1888. Serial No. 271,682. (No model.)



Claim.—The combination, with the casing having a spool detachably connected to one side, of the cutter-bar rigidly secured to the same side as the spool and having a transverse aperture in its body portion and a knife-edge at one end thereof, whereby the twine is evenly wound upon the spool and cut as required, substantially as specified.

400,204. VELOCIPEDE. WILLIAM GOLDING, Moss Side, County of Lancaster, assignor to the Clavigor Cycle Company, (Limited,) Manchester, England. Filed July 14, 1887. Serial No. 244,240. (No model.) Patented in England Oct. 9, 1885, No. 11,990, June 17, 1886, No. 8,049, July 16, 1886, No. 9,234, Jan. 27, 1887, No. 1,304, and June 27, 1887, No. 9,001; in Belgium July 15, 1887, No. 73,050; in France Oct. 27, 1887, No. 184,164, and in Germany Apr. 21, 1888, No. 43,827.



Claim.—1. In a bicycle or tricycle, the combination, with the pedal-lever having the pedal at one end and connected at the opposite end to the crank connected by gearing to the axle of the driving-wheel, of the shifting fulcrum for said lever, located between the pedal and axle, substantially as described.

2. In a bicycle or tricycle, the combination, with the pivoted pedal-lever having the pedal at one end and connected at the opposite end to the axle of the driving-wheel, of a shifting fulcrum, on which said lever pivots, consisting of the plane surface and the roller on the lever bearing thereon, substantially as described.

3. In a bicycle or tricycle, the combination, with the drive wheel and steering-wheel, the frame carried thereby, and pivoted pedal-lever having the pedal at one end and connected to the drive-axle at the opposite end, of a shifting fulcrum, on which said lever pivots, formed by the plane surface carried by the lower rear portion of the frame, and a roller on the lever for engaging said surface, substantially as described.

4. In a bicycle or tricycle, the combination, with the driving-wheel axle and the pivoted pedal-lever connected thereto through intermediate gearing, of a shifting fulcrum, on which said lever pivots, located between the pedal and axle, and consisting of the plane surface carried by the frame, and the bearing on the lever engaging therewith.

5. In a bicycle or tricycle, the combination, with the driving-axle and the pedal-lever pivoting on a shifting fulcrum, of the sun-and-planet gearing between said lever and axle, substantially as described.

6. In a bicycle or tricycle, the combination, with the driving-wheel and pedal-lever pivoting on a shifting fulcrum, of the gear connected rigidly to the drive-wheel, and the gear engaging therewith connected rigidly to the pedal-lever, whereby a differential movement is given said parts, substantially as described.

7. In a rear-driving bicycle or tricycle, the combination, with the frame and driving-wheel, of the gear-wheel rigidly connected to the driving-wheel, the gear-wheel carried by the frame, the forwardly-extending pedal-lever connected to said last-mentioned gear and having the pedal at its forward end, and the shifting fulcrum between said pedal and gear-wheel, substantially as described.

8. In a bicycle or tricycle, the combination, with the sun-and-planet driving-gearing and the pedal-lever pivoting on a shifting fulcrum rigidly connected to the planet-gear, of the axle passing through the center of the sun-gear, the pedal-lever connected to said axle, and the crank connecting the axle and planet-gear, substantially as described.

9. In a bicycle or tricycle, the combination, with the sun-wheel rigidly secured to the drive-wheel, of the planet-wheel mounted in slots in its supporting-arm, whereby different-sized gears may be employed and the pedal-lever connected to said planet-wheel.

10. In a bicycle or tricycle, the combination, with the driving-wheel having the gear-wheel connected rigidly thereto, and the loose axle passing through the center of the driving-wheel, of the gear-wheel carried by said axle and engaging the gear-wheel on the driving-wheel, the crank on said axle, and the pedal-levers pivoting on a shifting fulcrum and connected to said axle, substantially as described.

11. The combination, in a tricycle having the front steering-wheels and axle, and the rearwardly-extending frame and drive-wheel, of the bearing for the neck on the rearwardly-extending frame mounted below the steering-wheel's axle forward of the center of such wheels and inclined from the top backward, whereby the drive-wheel and frame are tilted in turning, substantially as described.

12. In a tricycle, the combination, with the two front steering-wheels and the rear driver, of the arched axle for the steering-wheels having the bearing for the drive-wheel frame below the same and inclined from the top backward, substantially as described.

13. In a tricycle, the combination, with the two front steering-wheels and the rear driver, of the forwardly-inclined arched axle for the steering-wheels having the bearing for the drive-wheel frame below the same and inclined from the top backward, substantially as described.

14. In a tricycle or bicycle, the combination, with the drive-axle and crank, of the pivoted pedal-lever connected to said crank and having a pedal-extension and pedal on each side of its pivotal point, whereby two riders may drive with a single lever, substantially as described.

15. In a bicycle or tricycle, the combination, with the drive-axle and the pedal-lever pivoting on a shifting fulcrum and connected with said axle, of the pedal-extension and pedal on each side of the pivotal point of said lever, substantially as described.

16. In a bicycle or tricycle, the combination, with the drive-wheels, the pedal-lever pivoting on a shifting fulcrum, and intermediate gearing connecting the same, of the pedal-extension and pedal on each side of the pivotal point of said lever, substantially as described.

17. In a bicycle or tricycle, the combination, with the drive-wheels, the pedal-lever pivoting on a shifting fulcrum, and intermediate gearing connecting the lever and drive-wheel, of the pedal-extension and pedal on each side of the pivotal point of said lever, substantially as described.

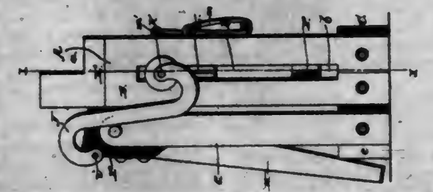
18. The combination, with the drive-axle and the pivoted pedal-lever connected therewith, of the curved slot in the end of said lever and the pedal mounted therein, substantially as described.

19. The combination, with the pivoted pedal-lever, of a bearing therefor formed of the concavities on each side of the same, the adjustable screws having concavities therein, and the single ball fitting in said concavities, substantially as described.

20. The combination, with the tubular head and the steering-bar passing through the same, of the rubber buffers at top and bottom carried by the washers, having flanges for preventing contact of the rubber with the steering-bar, substantially as described.

21. The combination, with the steering-head of a tricycle, of the steering-wheel and frame, and the top and bottom coil-springs connecting the said head and steering-frame, substantially as described.

400,205. LIFTING-JACK. HENRY GORTNER, New Albany, Ohio. Filed July 10, 1888. Serial No. 279,565. (No model.)



Claim.—1. In a lifting-jack, the combination of the main frame composed of two parallel side frames provided with guide-slots, the lifting-frame arranged between the said side frames and provided with blocks extending into the said guide-slots, and the pivoted lever H, connected by suitable links to the lifting-frame.

2. In a lifting-jack, the combination of the main frame composed of side frames, B B, provided with guide-slots b b, the lifting-frame located between the side frames, B, and provided with a foot-block,

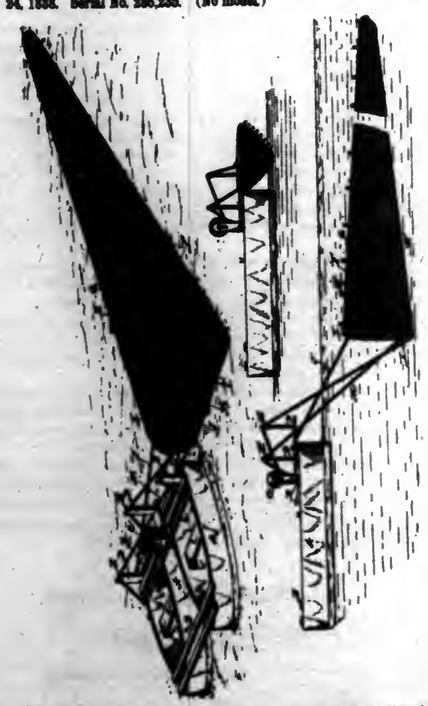
F, which extends into the guide-slots *b*, the guide-block L, adjustably connected to the lifting-frame and extending into the guide-slots, and the pivoted lever H, connected by suitable links to the block L, substantially as described.

3. In a lifting-jack, the combination, with the main frame composed of side frames, B, provided with guide-slots *b b* and connected near their upper ends by the transverse bar D, of the lifting-frame arranged between the frames B B and provided with a longitudinal slot, c^2, registering with the slots *b* and sliding on the bar D, the adjustable bar L, arranged in the slot c^2 and provided with a series of perforations, *l*, adapted to register with perforations N in the sliding frame, the removable pin M, engaging the said registering apertures, and the pivoted lever connected by suitable links to the block L, substantially as specified.

4. In a lifting-jack, the main frame A, composed of the slotted side frames, B B, which are arranged on a suitable base, C, and connected by a transverse bar, D, in combination with the lifting-frame E, provided with a slot, e^2, embracing the bar D, and having a foot-bar, F, extending into the slots of the side frames, the adjustable block L, arranged in the slot e^2 and held in place by a pin, M, engaging registering apertures in the lifting-frame and the block L, the pivoted lever H, and the S-shaped or sigmoid links J, connecting the lever to the opposite ends of the bar L, substantially as specified.

5. In a lifting-jack, the main frame provided with opposite guide-slots *b b*, and the lifting-frame mounted in the main frame and provided with slots extending into the guide-slots, in combination with the swinging standards G, pivoted to the base of the main frame, the lever pivoted between the upper ends of the standards, and the S-shaped or sigmoid links connecting the lever to the lifting-frame, substantially as specified.

400,206. FISH-TRAP. JOHN R. GREEN, Bremond, Tex. Filed Sept. 24, 1888. Serial No. 286,235. (No model.)



Claim.—1. The combination of two boats arranged side by side or parallel with each other and connected by scantlings B with a trap-net secured to the stems of said parallel boats, and draw-ropes and ropes for attaching the trap-net to the boats, substantially as specified.

2. The combination, with the boats secured together, of a trap-net flexibly connected to the sterns of said boats, a standard secured to the said boats and provided with a pulley in its upper end, and a draw-rope secured to the said net in the manner set forth, and having its free end passing over the said pulley, substantially as and for the purpose herein set forth.

3. The combination, with two boats secured together, of a trap-net flexibly connected to the sterns of the said boats, a standard secured upon the said boats and having a pulley mounted in its upper end, a windlass mounted upon the said boats, and a draw-rope secured to the trap-net in the manner herein described, passing with its free end over the said pulley in the standard and around the said windlass, substantially as and for the purpose herein described.

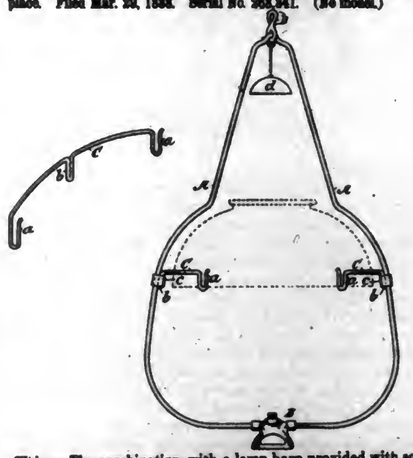
4. The combination, with the two boats secured together, of standards secured to the same and provided with pulleys in their tops, a trap-net connected to the standards by ropes, ropes secured to the mouth of the net and passing over the pulleys of the end standards, and a draw-rope secured to the said net, in the manner substantially as described, and passing over the pulley in the upper end of the middle standard, substantially as set forth.

5. The combination, with the two boats secured together, of the standards secured to the said boats and provided with pulleys in their upper ends, a trap-net flexibly connected to the sterns of the said boats, and having each flap of its mouth provided with a cross-rod, ropes attached to the ends of the lower rod and passing over the pulleys in the two end standards, and a draw-rope secured to the trap-net, in the manner herein set forth, and passing over the pulley in the upper end of the middle standard, all arranged to operate in substantially the manner herein set forth.

400,207. PROCESS OF MAKING AMMONIUM NITRATE. CECIL H. HAKE, Westminster, England. Filed Nov. 21, 1888. Serial No. 291,488. (No specimens.)

Claim.—The process of making nitrate of ammonia in a dry or solid form or state of powder by bringing together in either of the ways herein specified nitric acid and ammonia so as to effect their direct combination while both are in a gaseous or finely-divided form, and under such circumstances that the temperature caused by the combination does not rise sufficiently high to produce simultaneous decomposition of the nitrate of ammonia.

400,208. SUPPORT FOR LAMP-SHADES. WILLIAM HARPER, Brooklyn, N. Y., assignor of one-third to Edward H. Fessenden, same place. Filed Mar. 29, 1888. Serial No. 268,841. (No model.)

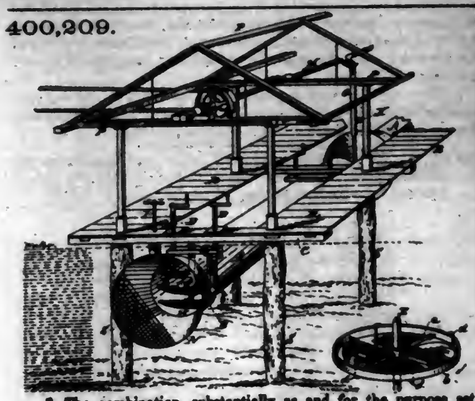


Claim.—The combination, with a lamp-harp provided with sockets, of supports for a shade, comprising two single wires having central shanks for engaging the sockets, the arms of said supports extending laterally at each side of the harp-wire substantially concentric with the shade and provided at their ends with hook-seats for the shade, substantially as specified.

400,209. SUB-SURFACE WATER-MOTOR. DAVID G. HASKINS, Cambridge, Mass. Filed Feb. 20, 1888. Serial No. 264,647. (No model.)

Claim.—1. The combination, substantially as and for the purpose set forth, of a structure erected in or over a water-way and having a floor or platform above the water-level, a conduit or tube adjustably supported beneath said floor or platform and capable of being submerged in the water, said conduit or tube being provided with valves or gates to regulate the flow of water through the conduit, mechanism upon the platform for raising and depressing the conduit, a shaft extending longitudinally through the center of the conduit and rotating in the same, hangers supporting said shaft attached to the support for the conduit, a series of propelling-blades upon said shaft acting by the impact of the water flowing through the conduit to cause the rotation of the shaft, mechanism for operating the valves or gates in the conduit from the platform, a power-shaft above or near the platform, and a crank, gearing, or other means for conveying power connected adjustably to the power-shaft and to the shaft in the conduit.

400,209.

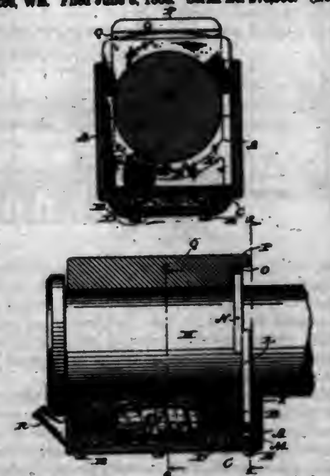


2. The combination, substantially as and for the purpose set forth, of a structure erected in or over a water-way and having a floor or platform above the water-level, a conduit or tube adjustably supported from said structure and provided with gates or valves for regulating the flow of water through the conduit, mechanism for operating said valves or gates from the platform, a shaft extending longitudinally through said conduit and rotating in the same, radial rods *a a*, arranged at intervals on said shaft, and blades *c*, swinging by one of their edges on said rods and limited in their movement to any desired angle on either side of a plane at right angles to the axis of the shaft.

3. The combination, substantially as and for the purpose set forth, of a structure erected in or over a water-way and having a floor or platform above the water-level, U-shaped adjustable hangers depending from the cross-beams supporting said platform, a conduit or tube supported in said hangers and capable of being removed from the same, a shaft extending longitudinally through the conduit and capable of rotation in the same, hangers attached to the U-shaped hanger and supporting the shaft in the center of the conduit, blades upon the shaft acting by the impact of the water flowing through the conduit to cause the rotation of the shaft, and mechanism upon the platform for raising and lowering said U-shaped hangers and conduit supported thereby.

4. The combination, substantially as and for the purpose set forth, of the conduit A, the U-shaped hanger B, supporting the same, the cross-bar G, connecting the ends of the hanger B, the hanger or bar F, dependent from the cross-bar G and extending to the center of the conduit, the shaft E, supported in the hangers or bars F, the cross-beam C, and the screws D D, extending through the cross-beam C and the bar G, whereby the hanger B is raised or depressed.

400,210. JOURNAL-BOX. THOMAS R. HAYES and ALBERT J. READ, Milwaukee, Wis. Filed June 8, 1888. Serial No. 276,003. (No model.)



Claim.—1. The combination, with a journal-box, of a longitudinal slotted web arranged above the bottom of said journal-box, to extend the full length of the latter and from side to side thereof, one or a series of longitudinal wicks passed through the slotted web, and a slotted spring-plate engaging each wick and arranged to rest upon said web, substantially as set forth.

2. The combination of the journal-box A, having the bottom plate, D, the web B, provided with the longitudinal slots F and transverse slot K, the wicks G, passed through said longitudinal slots, the slotted spring-plates I, engaging said wicks, the non-absorbent plate L, passed through said transverse slot in the web B, the non-absorbent plate N, overlapping the one L, and the springs M O, arranged to exert their pressure against said plates L N, substantially as and for the purpose set forth.

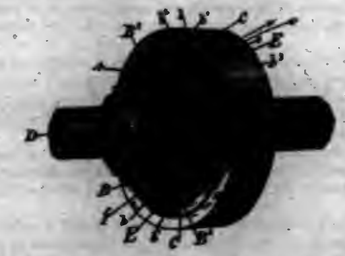
400,211. HARNESS ATTACHMENT. ISAAC HINES, Hartford, Wis. Filed Sept. 22, 1888. Serial No. 286,308. (No model.)



Claim.—1. The harness attachment herein described, consisting of a spring having two arms bent in opposite directions and adapted to be placed in contact with the hames and the saddle, respectively, whereby the former is raised, substantially as described.

2. In a harness, the combination, with the saddle and hames, of the coiled spring secured on said saddle, having its ends extending out in opposite directions and secured to said hames and saddle, respectively, substantially as described.

400,212. FRICTION-CLUTCH. HARRY W. HILL, Cleveland, Ohio. Filed Oct. 31, 1887. Serial No. 253,813. (No model.)



Claim.—1. The combination of the following integral parts, to wit: a hub, two arms united therewith on opposite sides of the center, and two semi-rings, each united at one end to one of said arms, with a clutch-rim and radially-moving blocks, inclined on one side and straight on the other, for expanding said semi-rings, substantially as and for the purpose specified.

2. The combination of a hub, two arms united therewith on opposite sides of the center, and two semi-rings, each united at one end with one of said arms, with a clutch-rim and radially-moving blocks inclined on the side which engages with the free end of one semi-ring, the other side and the face of the arm against which it bears being parallel to the axial line in which it moves, substantially as and for the purpose specified.

3. In a friction-clutch, the combination of a hub, two arms united therewith on opposite sides of the center, and two expansion semi-rings, each secured at one end to one of said arms, with a clutch-rim, A, radially-moving blocks C of the form described, the lugs b^3, and levers for moving said blocks, substantially as and for the purpose specified.

4. In a friction-clutch, the combination of a hub, two arms united therewith on opposite sides of the center, and two expansion semi-rings, each secured at one end to one of said arms, with a clutch-rim, A, radially-moving blocks C of the form described, the lugs b^3, levers for moving said blocks, and adjustable screws connecting said blocks and levers.

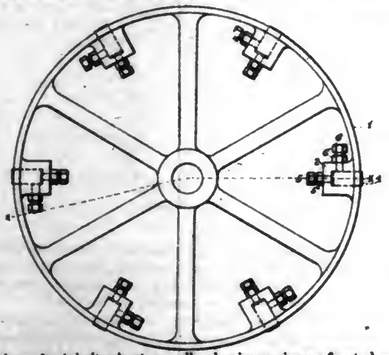
5. In a friction-clutch, a male clutch member consisting of a hub, two arms united therewith on opposite sides of the center, and two

semi-rings, each united at one end with one of said arms, the whole being cast in a single piece, for the purpose specified.

6. In a friction-clutch, a male clutch member consisting of a hub, two arms connected therewith on opposite sides of the center, and two semi-rings, each connected at one end to one of said arms, the periphery of each of said rings being depressed at and near the point of union with said arms, the whole being cast in a single piece, substantially as and for the purpose specified.

7. In a friction-clutch, a male clutch member consisting of the following integral parts, to wit: a hub, two arms united therewith on opposite sides of the center, and two semi-rings, each united at one end to one of said arms, the periphery of each of said semi-rings being depressed at and near its point of union with its arm, and the periphery of said clutch member being made in the form of a double eccentric, substantially as and for the purpose specified.

400,218. PULLEY. JOHN EITENBAUGH, Smithton, Pa. Filed July 12, 1888. Serial No. 279,706. (No model.)



Claim.—1. A belt wheel or pulley having a rim perforated with rectangular holes equidistant from each other therein, the short side of said holes being parallel with the edge of said rim, said rim having a pocket extending radially from each of said holes, each of said pockets having two sets of set-screws, one set fixed in the side, the other the bottom of said pocket, and each having fixed therein an adjustable plate and block, substantially as and for the purposes described.

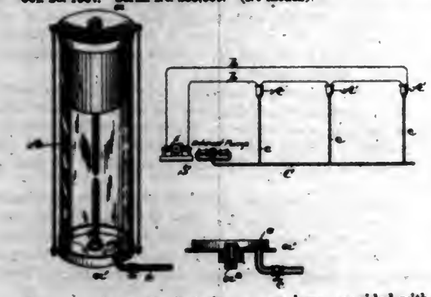
2. A belt wheel or pulley having the rim 1, in which are holes 7, provided with pockets 2, which have set-screws 5 and 6, being in bottom 9 and side 8 thereof, and being provided with their jam-nuts 5' 6', respectively, and in which are adjustable plate 3 and adjustable block 4, substantially as and for the purposes described.

3. A band-pulley provided with frictional blocks of elastic or fibrous material arranged at intervals around the periphery of the pulley and extending slightly beyond its face or rim, all substantially as described.

4. A band-pulley provided with frictional blocks of elastic material, arranged at intervals around its periphery and extending slightly beyond its face or rim, and devices for adjusting the blocks to the face of the pulley, all substantially as described.

5. A band-pulley provided with pockets opening into its rim or face, and arranged at intervals around its periphery, and blocks of elastic or fibrous material arranged in said pockets and extending slightly beyond its face or rim, all substantially as described.

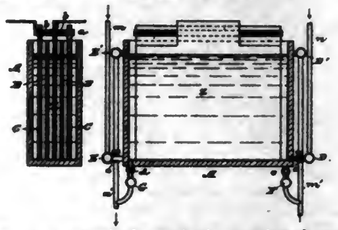
400,214. ELECTRIC-LIGHTING SYSTEM. WILLIAM I. HORNE, Meriden, assignor to the Horne Vacuum Company, Hartford, Conn. Filed Oct. 28, 1887. Serial No. 253,639. (No model.)



Claim.—1. A case for inclosing an arc lamp, provided with an aperture at the top for the removal of the upper carbon, a closure for the same, and aperture at the bottom for the removal of the lower carbon, and a closing-plug for said aperture, provided with a socket for receiving and holding the lower carbon in proper position, substantially as described.

2. An air-tight inclosing-case for an arc lamp, an exhaust-pipe opening into and communicating with said case, and a valve above the opening within the case, substantially as described.

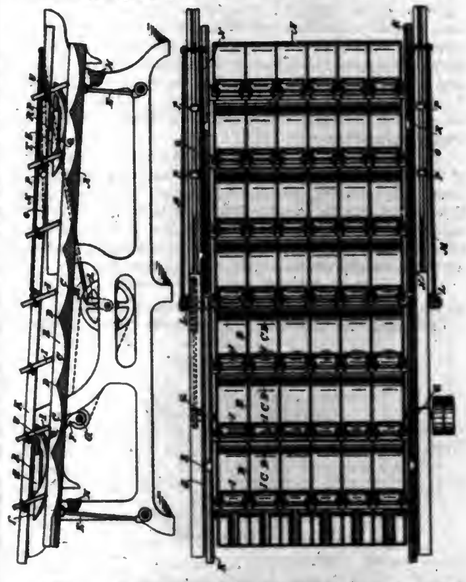
400,215. GALVANIC BATTERY. ALEXANDER IMCHENETSKY, St. Petersburg, Russia. Filed July 21, 1888. Serial No. 280,586. (No model.) Patented in France June 29, 1888, No. 191,498.



Claim.—1. A galvanic element having a carbon electrode, a zinc electrode, and two liquids in which the said electrodes are respectively immersed, the liquid about the carbon consisting of dilute manganic acid and the liquid about the zinc consisting of a solution of a sulphite or hyposulphite of an alkaline metal.

2. The combination, with a battery element having different compartments and liquids for the electrodes, of the supply-pipes *m* and *n*, the distributing-pipes D and E, the overflow-pipes D', E', *m'*, and *n'*, and the drainage-pipes F and G, said drainage-pipes being connected with the pipes *m'* and *n'*, respectively, substantially as set forth.

400,216. CONCENTRATOR. JOSEPH A. JOHNSON, San Francisco, Cal. Filed Aug. 31, 1888. Serial No. 284,290. (No model.)



Claim.—1. In a concentrator, an inclined table having its surface divided into longitudinal lanes or channels, the surfaces of which are formed into wave-like basins or depressions, and a series of rakes or scrapers adapted to move through said channels and depressions, in combination with a mechanism whereby said rakes or scrapers are drawn through the basins toward the upper end or head of the table and returned, substantially as herein described.

2. An inclined concentrating percussive table having lanes or channels, with the surfaces formed into wave-like depressions or basins, rakes or scrapers adapted to travel from end to end of said depressions, and side bars to which said scrapers are attached, in combination with cranks and connecting-rods by which the bars are actuated, the guide-channels Q, and the oscillating latches or bars S, by which the scrapers are returned after each upward stroke out of contact with the depression or basins, substantially as herein described.

400,217. THRASHING-MACHINE. ARTHUR JOHNSTON, Lockport, N. Y. Filed Jan. 5, 1886. Renewed May 28, 1888. Serial No. 275,323. (No model.)



Claim.—1. The combination, with the revolving cylinder of a thrashing-machine, of the end plates, B B, provided with ribs *l l*, and the adjustable concave-supporting segments D D, having projecting lugs *o o*, substantially as and for the purpose set forth.

2. The combination, with the end plates and the adjustable concave-supporting segments of a thrashing-machine, of the slotted collars *n* and bolts *f*, substantially as described.

3. The combination, with the cylinder-bars of a thrashing-machine provided with oval tapering openings having their longest dimensions arranged parallel to the plane of revolution, of the reversible teeth having oval tapered shanks adapted to fit the openings in the bars, and to secure the teeth in proper position when reversed, substantially as and for the purposes described.

400,218. CHEVRON. FRANCIS S. JOHNSTON, Philadelphia, Pa. Filed Aug. 23, 1888. Serial No. 283,544. (No specimens.)



Claim.—1. A chevron composed of a single piece of lace or ribbon having woven integral with the fabric continuous stripe of contrasting color or material running in parallel lines lengthwise of the tape or ribbon, and having woven selvaged and finished edges, substantially as described.

2. A chevron formed from a single piece of lace or ribbon in which stripe of contrasting color or material are woven integral with the fabric and in continuous parallel lines lengthwise of the tape or ribbon, the chevron being folded at the center and mitered by a single row of stitching, substantially as described.

400,219. OIL PROCESS IN BUTTER-MAKING. BYRON KANAMLE, Marion, Ohio. Filed Mar. 21, 1888. Serial No. 267,988. (No model.)

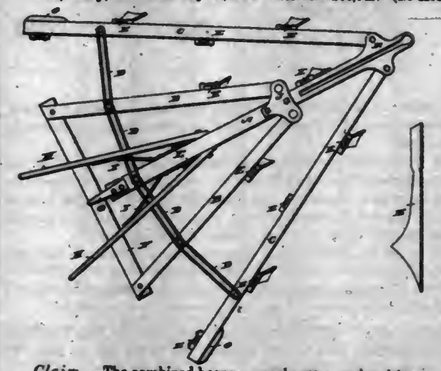


Claim.—1. A process for determining the exact amount of oil contained in a sample of cream, consisting of the withdrawal of a sample taken vertically through the contents of the creamery-pail or other gaged vessel, then decanting the mixed contents of the extractor, then churning the cream, and finally exposing the churned cream to the heat of a flame the temperature of which is sufficiently high to drive off the water held in suspension by the oil, substantially as set forth.

2. The process for determining accurately the amount of oil contained in a quantity of cream, consisting, essentially, in securing a sample vertically through the contents of a cream-pail, churning the sample, and finally exposing the churned sample to the action of a degree of heat sufficient to drive off the water contained in the oil, substantially as set forth.

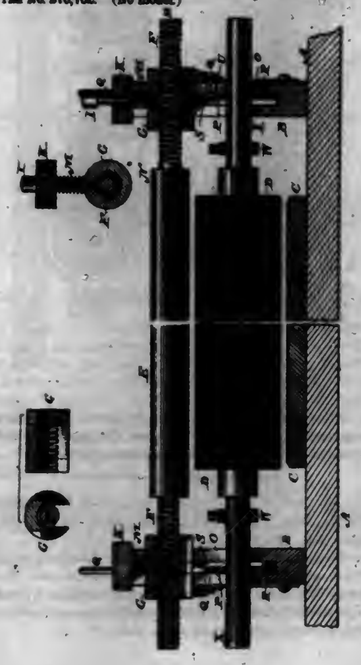
3. The process for determining the amount of oil contained in a quantity of cream, consisting in taking a sample vertically through the contents of a cream-pail, churning the same, exposing the cream sample to the action of a degree of heat sufficient to drive the oil to the top, and finally expelling the water therefrom, substantially as set forth.

400,220. HARROW AND CULTIVATOR. SAMUEL W. KILPATRICK, Gilroy, Cal. Filed July 24, 1888. Serial No. 280,945. (No model.)

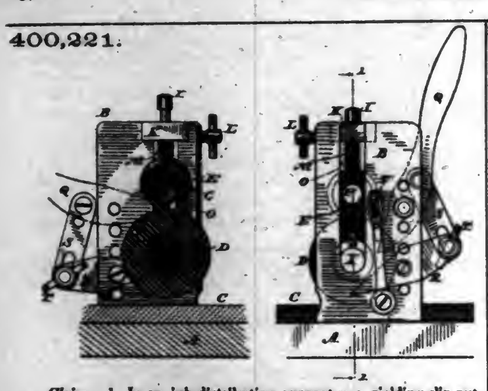


Claim.—The combined harrow, weed-cutter, and cultivator described, consisting, essentially, of the forward plate, K, the central beam, A, secured at its forward end thereto, the lateral beams C, having their forward ends pivoted to the said plate K, the intermediate short beams, B, pivotally secured to said beam A by plate J, the slotted links D, connecting the rear portions of the respective beams, and also connecting the said beams to the central beam, the weed-cutter F, secured at opposite ends to the intermediate beams, and the brace G, extending from said cutter to the rear end of the central beam, the handles and the teeth and cushions secured to the beams, substantially as specified.

400,221. INK-DISTRIBUTING APPARATUS FOR PRINTING-MACHINES. JOHN T. KING, Madison, Wis. Filed Apr. 14, 1888. Serial No. 270,702. (No model.)



400,221.

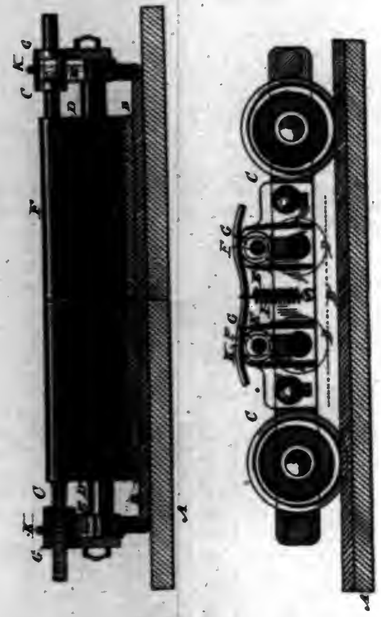


Claim.—1. In an ink-distributing apparatus, a yielding slip-nut, in combination with a threaded shaft of a screw-vibrator, substantially as set forth.

2. In an ink-distributing apparatus, the combination, with the rollers adapted to be lifted from their bearings, of the lifting-levers acting upon them separately, but connected by a pivoted link, so as to raise the upper roller simultaneously with the lower, but to a greater height than the lower is raised, substantially as set forth.

3. In an ink-distributing apparatus, the combination, with the rollers, lifting-levers, and link, arranged and operating as described, of a catch or fastening for holding the levers in the position for supporting the rollers when out of action, substantially as set forth.

400,222. INK-DISTRIBUTING APPARATUS FOR PRINTING-MACHINES. JOHN T. KING, Madison, Wis. Filed Apr. 21, 1888. Serial No. 271,445. (No model.)

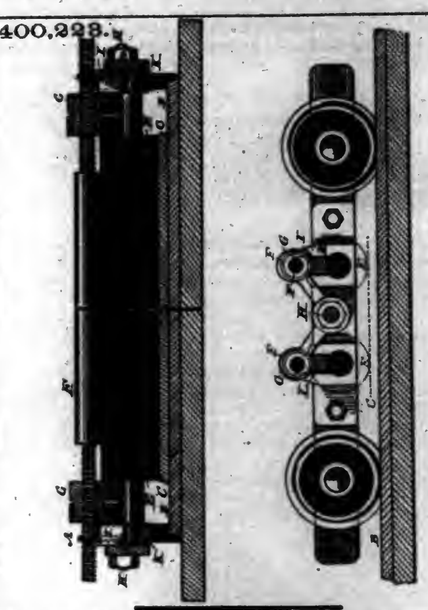


Claim.—The combination, with a car for an ink-distributing apparatus, of the screw vibrators, the slip-nuts, the springs I, and the yokes K, arranged and operating substantially as set forth.

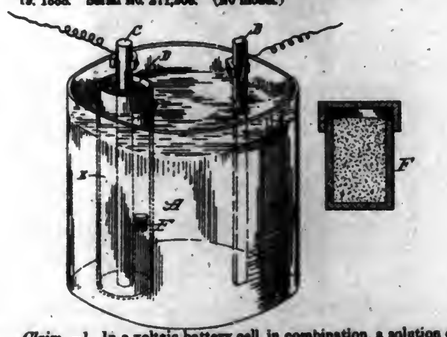
400,223. INK-DISTRIBUTING APPARATUS FOR PRINTING-MACHINES. JOHN T. KING, Madison, Wis. Filed Apr. 21, 1888. Serial No. 271,446. (No model.)

Claim.—The combination, with a car for an ink-distributing apparatus, of the composition rollers, the screw vibrators, and the slip-nuts loosely pivoted to the shaft H, so as to cause the screw vibrators to bear by the yielding force of gravity upon the upper peripheries of the composition rollers, substantially as set forth.

400,223.



400,224. VOLTAIC BATTERY. ISIDOR KITSEE, Cincinnati, Ohio, assignor to Mayer Sulzberger, trustee, Philadelphia, Pa. Filed Apr. 19, 1888. Serial No. 271,208. (No model.)

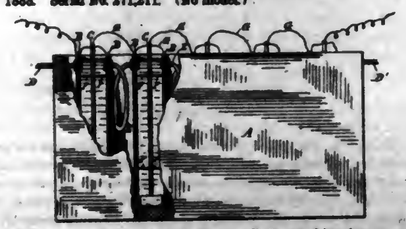


Claim.—1. In a voltaic-battery cell, in combination, a solution of chloride of ammonia, or of chloride of soda, or of other chloride, bisulphate of mercury, and positive and negative elements immersed in said solution, as specified.

2. In a voltaic-battery cell, in combination, a solution of chloride of ammonia, or of chloride of soda, or of other chloride, bisulphate of mercury contained in a porous capsule, and positive and negative elements immersed in said solution, as specified.

3. In a voltaic-battery cell, in combination, a battery-fluid, a porous capsule immersed in the fluid in the porous cup in which the negative element is contained, and provided with material to prevent the polarization of said element or to restore the vitality of said fluid, as specified.

400,225. VOLTAIC BATTERY. ISIDOR KITSEE, Cincinnati, Ohio, assignor to Mayer Sulzberger, trustee, Philadelphia, Pa. Filed Apr. 19, 1888. Serial No. 271,211. (No model.)



Claim.—1. In a voltaic-battery cell, in combination, a carbon-cup negative element, means at one side of said cup for the supply of

battery-fluid thereto, means at the other side of said cup for the escape of said battery-fluid therefrom, a positive element contained and supported in said carbon cup, and at or near its lower end provided with an opening or orifice, the construction and arrangement of said parts being such that the battery-fluid is permitted to flow into said cup, downwardly and upwardly in contact with the interior surfaces of said cup and the exterior surfaces of said positive element, and out of said cup, as specified.

2. In a multiple-cell voltaic battery, in combination, a series of two or more couples, each consisting of a carbon-cup negative element, means at one side of said cup for the supply of battery-fluid thereto, means at the other side of said cup for the escape of said battery-fluid therefrom, a positive element contained and supported in said carbon cup, and at or near its lower end provided with an opening or orifice, means for the supply of battery-fluid to the first cup of the series, means for the escape of said battery-fluid from the last cup of said series, and tubes, each extending from the battery-fluid-escape orifice of one cell to the battery-fluid-supply orifice of the next cell, as specified.

3. In a voltaic battery, in combination, a cell or cup provided with positive and negative elements, a battery-fluid reservoir connected therewith by a supply-pipe, a battery-fluid-discharge pipe leading from said cell, and a re-enforcing cell or reservoir provided with substances from which the battery-fluid is made, connected with the battery-fluid-discharge opening of the first-named cell and with the battery-fluid-supply orifice of the next cell of the series, as specified.

4. In a voltaic battery, in combination, a cell provided with means for the supply of the battery-fluid thereto and with means for the escape of the battery-fluid therefrom, positive and negative elements so constructed and arranged as to permit said battery-fluid to flow through said cell in contact with said elements, one or more re-enforcing cells provided with material from which the battery-fluid is formed, means for the escape of the battery-fluid from the first-named cell to said re-enforcing cell, means for the escape of said battery-fluid from said re-enforcing cell, a battery-fluid reservoir connected by a pipe or by other means with the first cell of said series, a second battery-fluid reservoir connected by a pipe or by other means with the last cell of said series, and means for alternately at will raising either reservoir and simultaneously lowering the other, substantially as set forth.

400,226. SECONDARY BATTERY. ISIDOR KITSEE, Cincinnati, Ohio, assignor to Mayer Sulzberger, trustee, Philadelphia, Pa. Filed May 10, 1888. Serial No. 273,430. (No model.)



Claim.—1. An electrode for a secondary battery, consisting of a plate of lead or other "element" substance backed and supported by a supporting-plate of suitable material unsusceptible to electrolysis or to corrosive action.

2. An electrode for a secondary battery, consisting of a supporting-plate unsusceptible to electrolysis or to corrosive action enveloped by lead or other "element" substance, substantially as set forth.

3. An electrode for a secondary battery, consisting of a supporting-plate formed of a substance unsusceptible to electrolysis or to corrosive action, and provided as to its surface with a layer or coating of lead or other "element" substance, substantially as set forth.

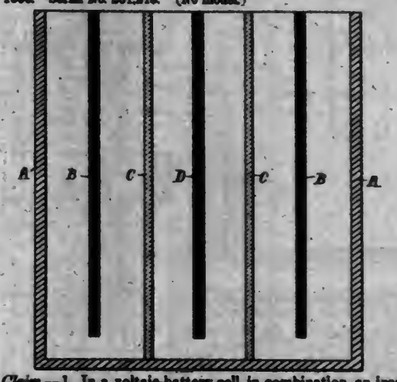
4. An electrode for a secondary battery, consisting of a supporting-plate formed of a substance unsusceptible to electrolysis or to corrosive action, provided as to a part or all of its surface with red lead or other "active" material, and also provided with an outer layer or coating of lead or other "element" substance, substantially as set forth.

5. An electrode for a secondary battery, consisting of a supporting-plate formed of a substance unsusceptible to electrolysis or to corrosive action having a series of holes, perforations, or cavities, provided as to the whole or part of its surface with red lead or other "active" material, and also provided with an outer layer or coating of lead or other "element" substance which enters and passes through the perforations, substantially as set forth.

6. An electrode for a secondary battery, consisting of a supporting-plate formed of a substance unsusceptible to electrolysis or to corrosive action having a series of holes, perforations, or cavities, provided with an outer layer or coating of lead or other "element" substance which extends through so as to line the perforations, and which is also provided with red lead or other "active" material within the lead-lined perforations, substantially as set forth.

7. The combination, to form a secondary battery, of a containing-vessel, a series of positive electrodes, each consisting of a supporting-plate and an "element" substance, a series of negative electrodes, each consisting of a supporting-plate and an "element" substance and interdisposed between the positive electrodes, and separating devices to maintain the respective electrodes out of contact, substantially as set forth.

400,227. VOLTAIC BATTERY. ISIDOR KITSEE, Cincinnati, Ohio, assignor to Mayer Sulzberger, trustee, Philadelphia, Pa. Filed July 27, 1888. Serial No. 281,212. (No model.)



Claim.—1. In a voltaic-battery cell, in combination, an iron electrode immersed in a battery-fluid containing chlorate of sodium or a chlorate of other material, and a carbon electrode immersed in a battery-fluid containing sulphuric acid, as specified.

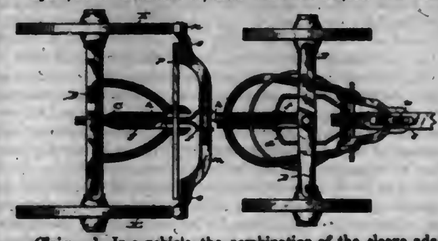
2. In a voltaic-battery cell, in combination, an iron electrode immersed in a battery-fluid containing chlorate of sodium or a chlorate of other material, and a carbon electrode immersed in a battery-fluid containing sulphuric and nitric acids, as specified.

3. In a voltaic-battery cell, in combination, an iron electrode immersed in a battery-fluid containing chlorate of sodium and hydrochloric acid, and a carbon electrode immersed in a battery-fluid containing sulphuric acid, as specified.

4. In a voltaic-battery cell, in combination, an iron electrode immersed in a battery-fluid containing chlorate of sodium and hydrochloric acid, and a carbon electrode immersed in a battery-fluid containing sulphuric and nitric acids, as specified.

5. In a voltaic battery, in combination, an iron electrode immersed in a battery-fluid containing chlorate of sodium or a chlorate of other material, and a carbon electrode immersed in a battery-fluid containing acid, as specified.

400,228. WAGON-BRAKE. LEVI E. LANE and GEORGE HILLIARD, Lyons, N. Y. Filed Nov. 17, 1888. Serial No. 291,169. (No model.)



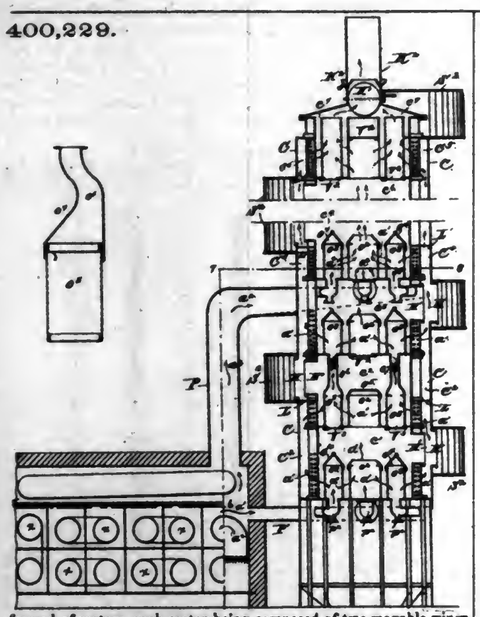
Claim.—1. In a vehicle, the combination of the sleeve adapted to slide longitudinally on the tongue, the yoke *d*, also adapted to slide, connected to the sleeve and having its curved rear portion, the lever *f*, pivoted to the reach and having its lower end engaging the curved portion of the yoke, the lever *g*, also pivoted to the reach, the rod *h*, connecting the upper ends of levers *f g*, the brake-bar suspended from and having the supporting-yokes sliding on the reach, and the bar *k*, connecting the lower end of the lever *g* to the brake-bar, substantially as described.

2. In an automatic vehicle-brake apparatus, the brake-bar, the brake-shoes pivoted thereon and adapted to turn axially, and the inverted-V-shaped springs *v*, each having one end secured to the pivotal part of the brake-bar and the other end attached to one of the brake-shoes, for the purpose set forth, substantially as described.

400,229. MALT-KILN. PHILIPPE LAUTE, Carcassonne, France. Filed Aug. 20, 1888. Serial No. 283,231. (No model.)

Claim.—1. In a malt-kiln, a drying-chamber having its floor

400,229.



formed of sectors, each sector being composed of two movable wings forming a gate, substantially as and for the purposes specified.

2. In a malt-kiln, a drying-chamber having its floor formed of sectors, each sector being composed of two movable wings forming a gate, in combination with covering-plates arranged along the lines of division of the sectors, substantially as and for the purposes set forth.

3. In a malt-kiln, a drying-chamber having its floor formed of sectors, each sector being composed of two movable wings forming a gate, in combination with covering-plates E, having the form of an inverted V, arranged along the lines of division of the sectors, the said plates forming chutes, whereby the entire contents of the chamber are discharged when the gates are thrown open, substantially as and for the purposes specified.

4. In a malt-kiln, a drying-chamber having its floor formed of sectors, each sector being composed of two movable wings, a shaft for each of said wings, and gearing for imparting a partial revolution to all of the shafts simultaneously, substantially as and for the purposes specified.

5. In a malt-kiln, a drying-chamber having its floor formed of sectors, each sector being composed of two movable wings, a shaft for each of said wings, and gearing for imparting a partial revolution to all of the shafts simultaneously, and a locking device, substantially as described, to lock the shafts against backward motion when rotated in a given direction, substantially as and for the purposes specified.

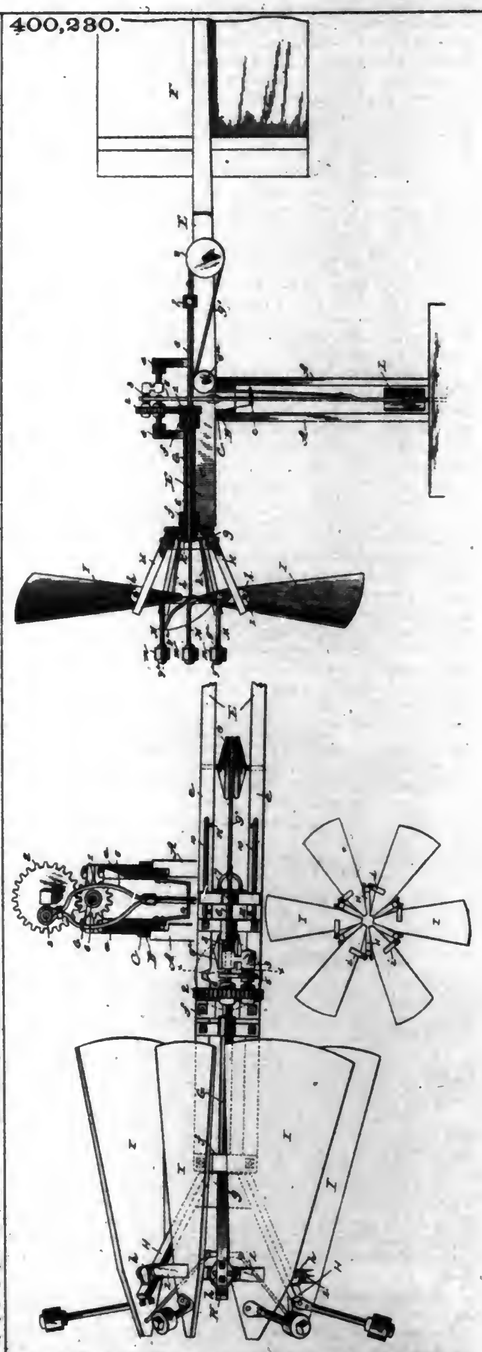
6. In a malt-kiln, a drying-chamber having its floor formed of sectors, each sector being composed of two movable wings, a shaft for each of said wings, and a pinion on each of said shafts, and in combination therewith, the operating-ring R, provided with the toothed portions r r' r^2, and the ratchet-teeth r^3, the pawl r^4, and the gear-wheel W', substantially as and for the purposes specified.

7. The herein-described malt-kiln, consisting of a plurality of superposed drying-chambers having partly perforate and partly imperforate walls, heat-distributing pipes o^3 o^3 for each chamber, having likewise partly perforate and partly imperforate walls, valves or dampers for said pipes o^3, arranged alternately at the inlet and outlet thereof, valves or dampers for the pipes o^3, arranged alternately at the inlet and outlet thereof, a connection between the upper open end of the pipes o^3 of one chamber and the like lower ends of the same pipes in the chambers next above, an imperforate inclosing-casing of greater diameter than the drying-chambers divided horizontally into annular air-ducts, and a heating-furnace connected with the heat-distributing pipes of the lower chamber, substantially as and for the purposes specified.

400,230. WINDMILL. BENJAMIN F. LEFEVER, Hayfield, Pa. Filed Aug. 4, 1888. Serial No. 281,941. (No model.)

Claim.—1. In combination with the hollow main shaft of a windengine, the flaring dish-shaped head, arms bolted to its outer surface, vanes mounted on shafts pivoted in the outer ends of said arms, the regulator-shaft within the hollow main shaft, the regulator-head on the end of said shaft, and rods connecting said head to the inner ends of the vanes, also in combination with governor-arms and weights carried on the ends of said arms and extended to the front, substantially as described.

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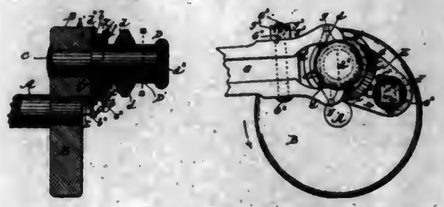


2. In combination, the posts A A, the main beam E, the hollow main shaft, the pivoted vanes, the operating-rod 6, extending through the hollow shaft, the rods k and head K, connecting the vanes with the operating-rod, the vertical rod, the gear-and-pinion connection between the same and the main shaft, a sliding cross-head, 7, having the operating-rod swiveled thereon, the rope g', pulleys 8 and 8* for directing said rope from the cross-head to within the posts A A, and the weight L on the vertical rod, substantially as described.

3. In combination, the vanes, the main shaft, and the connection between the said shaft and the rod, consisting of the pinion 1 on the shaft, the crank-shaft in bearings 4 4, the gear 2, carried thereby and in mesh with the pinion, and the pitman connected to the crank-shaft and vertical rod, substantially as described.

4. In combination, the hollow main shaft, the pivoted vanes, the rod 6, extending through said hollow shaft and connected at its rear end to suitable controlling-weight, the vertical rod and the connection between said vertical rod and the hollow main shaft, consisting of the pinion 1, gear 2, crank 3, and the pitman 5, said pitman being in loop form to avoid the operating-rod 6, substantially as described.

400,231. JOURNAL-BOX FOR CRANK-PINS. PAUL W. LEFFLER, Grinnell, Iowa, assignor to Craver, Steele & Austin, same place. Filed Dec. 3, 1888. Serial No. 290,611. (No model.)



Claim.—1. In combination, a crank-shaft, crank-wheel, crank-pin, journal-box, and a clamp-plate secured to the crank-wheel to bear against the journal-box and hold it on the crank-pin, substantially as described.

2. In combination, a crank-wheel and a crank-pin, a journal-box having an annular flange, and a clamp-plate secured to the crank-wheel to bear against said flange and hold the journal-box on the crank-pin, substantially as described.

3. In combination, a crank-wheel and crank-pin, a journal-box having an oil-hole, and a plate secured to the crank-wheel and provided with a recess fitted over the journal-box in the same plane as the oil-hole and adapted to cover the oil-hole during a portion of the revolution of the crank-pin and journal-box, substantially as described.

4. In combination, a crank-wheel and crank-pin, a journal-box having an enlarged outer end to form a receptacle for waste and lubricant and having an oil-hole, and a plate secured to the crank-wheel and provided with a recess fitted over the journal-box in same plane as and adapted to cover the oil-hole during a portion of the revolution of the crank-pin and journal-box, substantially as described.

5. In combination, a crank-wheel and crank-pin, a journal-box having an annular flange and an oil-hole, and a plate secured to the crank-wheel with a recess in one end fitted over the journal-box in same plane as the oil-hole and resting against the annular flange to hold the journal-box in place on the crank-pin and cover the oil-hole during a portion of the revolution of the crank-pin and journal-box, substantially as described.

6. In combination, a crank-wheel and crank-pin, a journal-box having an enlarged outer end for waste and lubricant, an annular flange on its inner end, and an oil-hole, and a clamp-plate secured to the crank-wheel, with a recess in one end fitted over the journal-box in the same plane as the oil-hole and resting against the annular flange to hold the journal-box in place on the crank-pin and to cover the oil-hole during a portion of the revolution of the crank-pin and journal-box, substantially as described.

7. The combination of the crank-wheel B, crank-pin C, journal-box D, having a flange, d^3, upon its inner end, an oil-hole, d^2, and a closed and enlarged outer end, d^3, and a clamp-plate, E, secured to the crank-wheel, substantially as described.

8. In combination, a crank-wheel, crank-pin, a journal-box having an oil-hole and annular flange at its inner end seated in a recess in the crank-wheel, and a clamp-plate secured to the crank-wheel and adapted to hold the journal-box on the crank-pin and intermittingly cover the oil-hole, substantially as and for the purpose described.

9. In combination, a crank-wheel, crank-pin, a journal-box having an oil-hole and annular flange at its inner end seated in a recess in the crank-wheel, and an enlarged outer end for an oil-reservoir, and a clamp-plate secured to the crank-wheel and adapted to hold the journal-box on the crank-pin and intermittingly cover the oil-hole, substantially as and for the purpose described.

10. In combination, a crank-wheel and crank-pin, a journal-box having an enlarged outer end for an oil-reservoir, an annular flange on its inner end, an oil-hole and pintles d, a pitman having bearings g for the pintles d, and a clamp-plate secured to the crank-wheel and adapted to hold the journal-box in place and intermittingly cover and uncover the oil-hole, substantially as and for the purpose specified.

11. In combination with the crank-wheel and crank-pin, the journal-box constructed substantially as described and seated in a recess in the crank-wheel, and pitman having straps with bearings g for the pintles d of the journal-box, substantially as and for the purpose specified.

12. The combination, with the crank-wheel and crank-pin, of journal-box D, having oil-holes d^2 and pintles d, a pitman fulcrumed upon said pintles, and a clamp-plate, E, secured to the crank-wheel by a set-bolt, F, to revolve with the crank-wheel and cover the oil-hole d^2 during a portion of the revolution of the crank-pin and journal-box and admit of free lateral movement of the pitman, substantially as described.

13. In combination with the crank-wheel and crank-pin, a journal-box, D, having an annular flange, d^3, and pintles d, a pitman fulcrumed upon said pintles, and a clamp-plate, E, secured to the crank-wheel to revolve therewith and rest against the flange d^3 to hold the journal-box in place, substantially as described.

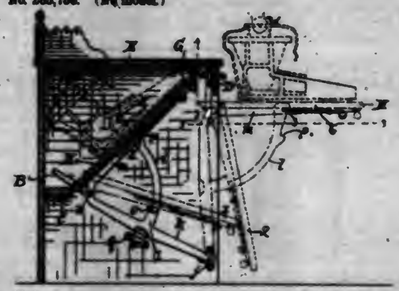
400,232. PUSH-BUTTON. JOSEPH H. LEHMAN, Philadelphia, Pa. Filed Aug. 8, 1888. Serial No. 282,230. (No model.)



Claim.—1. An electric signaling push-button consisting of a base-piece supporting an electro-magnet connected in the line-circuit, spring terminals secured to the base-piece at each side of and having their ends over the magnet, a button for closing the terminals, and an armature for the magnet connected to one of the terminals, substantially as described.

2. An electric signaling push-button consisting of a base-piece, an electro-magnet the core of which has an extended end secured to the base-piece, spring terminals also secured to the base-piece and having their free ends over the magnet, and one of the terminals being provided with a bent portion forming the armature of the magnet, substantially as described.

400,233. COMBINED DESK AND TYPE-WRITER CABINET. CHARLES H. LEONARD, Indianapolis, Ind. Filed Sept. 18, 1888. Serial No. 285,736. (No model.)



Claim.—1. A combined desk and cabinet consisting of the following elements, namely: a pair of side walls, a back wall, and a desk-top, all secured together in a fixed relation to each other, a pair of brackets each consisting of two arms pivoted together so as to fold one upon the other, one of said arms being pivoted to the side wall of the cabinet, a table mounted on said folding arms, means for securing the table in different positions relative to the arms of the brackets which are pivoted to the side walls, and means for locking said arms in a vertical position, all combined and arranged to co-operate substantially as and for the purpose specified.

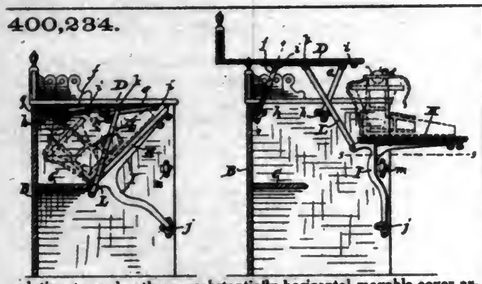
2. In combination with the side walls of a type-writer cabinet, the pair of folding brackets, each having an arm, k, arm m, pivoted thereto, and a brace, l, said brace being provided with a series of stops, the table secured to said brackets, and the catch-levers arranged to engage said stops, all combined and arranged to co-operate substantially as specified.

3. The combination of a desk having a fixed top, a pair of brackets pivoted to the supports of said desk-top, and each having a folding arm, a table secured to said folding arms and arranged to swing beneath said desk-top, all arranged to co-operate substantially as specified, whereby the table is folded beneath and projected below and in front of the desk-top, substantially as and for the purpose specified.

400,234. TYPE-WRITER CABINET. CHARLES H. LEONARD, Indianapolis, Ind. Filed Sept. 18, 1888. Serial No. 285,737. (No model.)

Claim.—1. A cabinet consisting of the following elements, namely: a pair of side walls suitably connected, so as to bear a fixed

400,234.

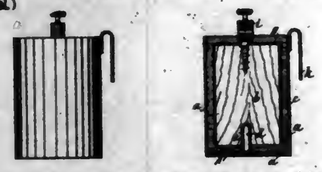


relation to each other, a substantially horizontal movable cover arranged to close the opening between said side walls at the top, a swinging table arranged below said cover between said walls and pivoted thereto, folding supports connecting the cover with the side walls, and intermediate connecting mechanism connecting said cover and table, all combined and arranged to co-operate substantially as specified, whereby the cover is raised and lowered in a substantially horizontal position by the swinging movement of the table.

2. A cabinet consisting of the following elements, namely: a pair of side walls suitably connected, so as to bear a fixed relation to each other, a substantially horizontal movable cover arranged to close the opening between said side walls at the top, folding supports connecting the cover with the side walls, whereby the cover is held in a horizontal position when raised, and a swinging table arranged below said cover between the side walls, pivoted thereto and arranged to swing outward therefrom, all combined and arranged to co-operate, substantially as specified, to form a table adapted to support a type-writer in position for use and an inclosed receptacle for the same when not in use.

3. In a type-writer cabinet, the combination, with a cabinet having a movable top and an open front, of the brackets I I, pivoted at one end to the opposed interiors of the side walls of the cabinet, arranged to swing toward the front edge thereof, and having the table H rigidly secured to their free ends and extending from wall to wall, and suitable stops arranged to limit the swinging movement of the brackets, whereby the table is projected outward from the front of the cabinet to form a horizontal support for a type-writer and withdrawn to form an inclined front cover for the upper portion of the cabinet, substantially as specified.

400,235. GALVANIC BATTERY. EDUARD LIEBERT and SALLY A. ROSENTHAL, Berlin, Germany. Filed Nov. 30, 1888. Serial No. 292,360. (No model.)

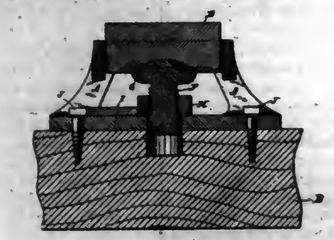


Claim.—1. An electrode for an electric battery, consisting of a non-conducting base, a coating or covering of foliated or leaf silver applied thereto, and chloride of silver applied to said coating, substantially as described.

2. An exciting-liquid for silver and zinc batteries, consisting of one hundred parts, by weight, of water, from twelve to twenty parts of sulphate of zinc, from one to four parts of sulphuric acid, and from two to ten parts of perchloride of mercury or protochloride of mercury.

3. A dry exciting agent for electric batteries, consisting of water, sulphate of zinc, sulphuric acid, perchloride or protochloride of mercury, and tragacanth, in or about the proportions specified.

400,236. SIDE BEARING FOR RAILWAY-CARS. JOHN J. MARR, New York, N. Y. Filed Nov. 8, 1888. Serial No. 290,277. (No model.)

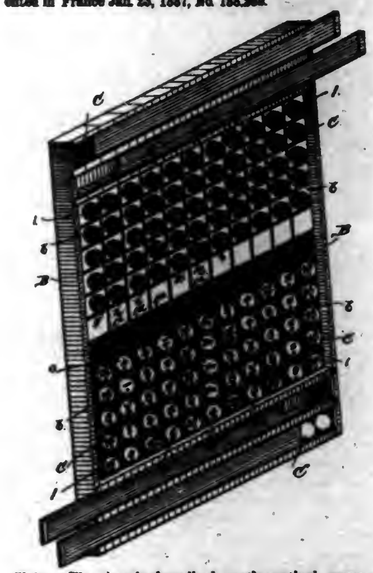


Claim.—1. In combination with the body of a car and its truck, side bearings arranged between the truck and the car and provided with vertically-adjustable bearing-surfaces.

2. In a side bearing for railway-cars, the combination of a frame inclosing a vertically-adjustable bearing-block with an adjusting-screw supported on said frame and beneath said block.

3. In a side bearing for railway-cars, the combination of a frame inclosing a vertically-moving bearing-block with a screw for vertically adjusting the block, a nut for supporting and operating the screw, and a key for securing said nut against rotation.

400,237. MATHEMATICAL GAME. LOUIS MARTAIN, Paris, France. Filed May 14, 1888. Serial No. 273,780. (No model.) Patented in France Jan. 23, 1887, No. 183,209.



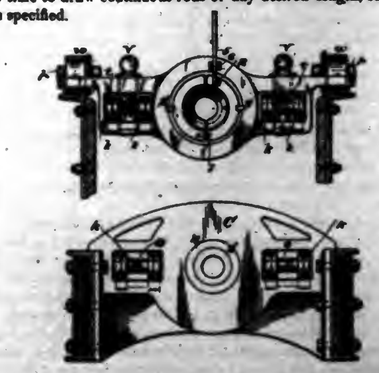
Claim.—The herein-described mathematical game, consisting, essentially, of a board divided into squares, as described, and checkers bearing numbers, mathematical signs, the word "Proof," and blank checkers, substantially as and for the purposes described.

400,238. DRAWING METALS. WILLIAM A. MCCOOL, Beaver Falls, Pa., assignor of one-half to H. W. Hartman, same place. Filed Oct. 1, 1888. Serial No. 286,837. (No model.)

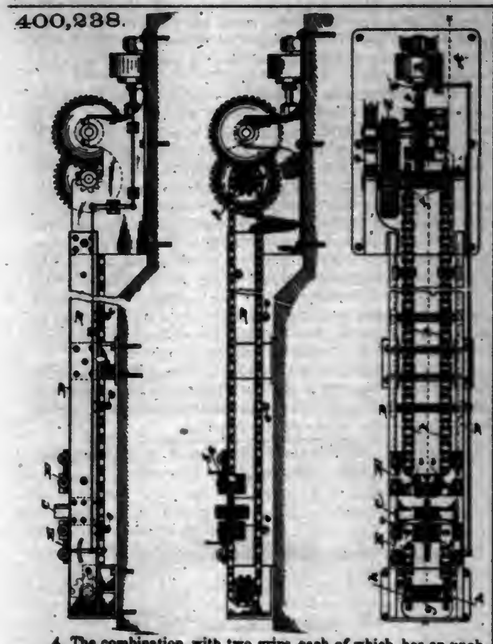
Claim.—1. The combination, with a fixed drawing-die, of grip mechanism adapted to first force and then pull the article operated on, substantially as and for the purposes specified.

2. The combination, with two grips, of an interposed fixed die and mechanism for actuating the grips, substantially as and for the purposes specified.

3. The combination, with a fixed drawing-die, of a grip having an unobstructed axial opening throughout its length, and power mechanism for actuating said grip, said power mechanism arranged at one side, or off the axial or center line of the die and grip, whereby the hold of the grip on the rod being drawn may be advanced from time to time to draw continuous rods of any desired length, substantially as specified.



400,238.



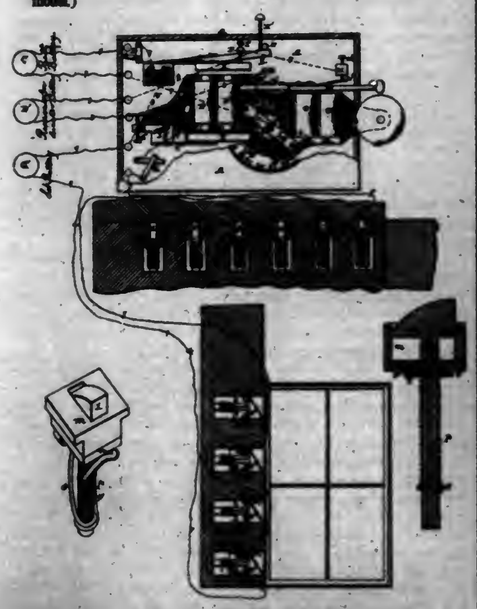
4. The combination, with two grips, each of which has an unobstructed axial opening throughout its length, of an interposed die, substantially as and for the purposes specified.

5. In a metal-drawing machine, the combination, with a grip-truck having a tapering annular orifice or grip-seat, of a tapering annular sectional grip, substantially as and for the purposes specified.

6. In a metal-drawing machine, the combination, with a grip-truck having a tapering grip-seat, of a tapering sectional grip, a grip-lever having a fulcrum on the truck, and a pin for actuating the grip-sections, substantially as and for the purposes specified.

7. The combination, with a fixed drawing-die, of a pushing-grip arranged in front of said die, and power mechanism for actuating said grip, substantially as and for the purposes specified.

400,239. ELECTRIC BURGLAR-ALARM. JOSEPH Y. MCKINNEY, New Wilmington, Pa. Filed Dec. 17, 1888. Serial No. 293,677. (No model.)



Claim.—1. In an electric burglar-alarm, the combination, with a bell-battery, a set battery, and a reserve battery, of two sets of magnets, the armature K, which breaks the bell-battery when the magnets P are charged, the set armature S, which closes the set battery when forced inward, and closes the reserve battery when the current is broken, and the armature Y for operating upon an indicator, substantially as described.

2. In an electric burglar-alarm, the combination, with a set battery, a bell-battery, and a reserve battery, of two sets of magnets, the armature K, for opening and closing the bell-battery, contact I', the set armature S, provided with the operating-pin H', and posts T and R, with which the armature S engages, for the purpose of closing the reserve battery when the circuit is broken, and for the purpose of closing the set battery when it is forced inward by means of the operating-rod H', substantially as set forth.

3. In an electric burglar-alarm, the combination, with the bell battery, set battery, and reserve battery, of the magnets P and O, the armatures K S, contacts I' N', posts R T, armature N, contact N', armature Y, the escapement secured to its end, and the escapement-wheel, the dial and indicator being secured to the shaft of the escapement-wheel, whereby the indicator is moved when the circuit is opened or closed, for the purpose substantially as described.

400,240. BLOW-PIPE BED. GEORGE W. MILOTTE, Ithaca, N. Y. Filed Dec. 19, 1888. Serial No. 294,009. (No model.)



Claim.—1. The asbestus pad or cushion having the encircling band provided with the transverse grooves B, and the loops D, in alignment therewith, substantially as described.

2. The combination, with the asbestus cushion, of the band encircling the same and having the inwardly-bent portions C engaging the periphery of the cushion, and the outwardly-bent portions D, substantially as described.

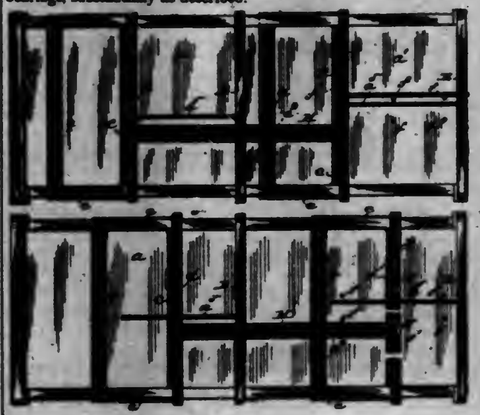
3. The combination, with the cushion and the clamps, of the block K, having the depending pivotal pin or stem, and provided with the longitudinal and transverse openings adapted for the reception and adjustment of the arm of the clamps, substantially as described.

4. The asbestus cushion having the band provided with loops or openings D, in combination with the detachable handle having the bent arms adapted to engage said loops or openings, substantially as described.

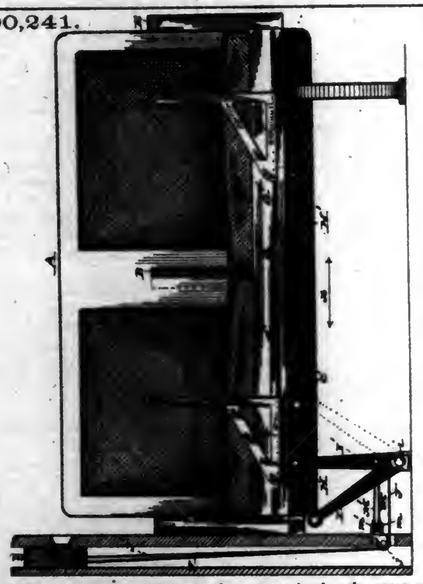
400,241. ADJUSTABLE CAR-SEAT AND INDICATOR. OSBORNE R. MERRIAM, St. Louis, Mo. Filed Mar. 2, 1888. Serial No. 265,960. (No model.)

Brief.—The adjustment of the seat to whole or half fare or free causes a corresponding indicator to be displayed.

Claim.—1. The combination of the car-seat, the movable arm C, the rod H, lever I, cord J, indicator-target, the car, and the cord-bearings, substantially as described.



400,241.

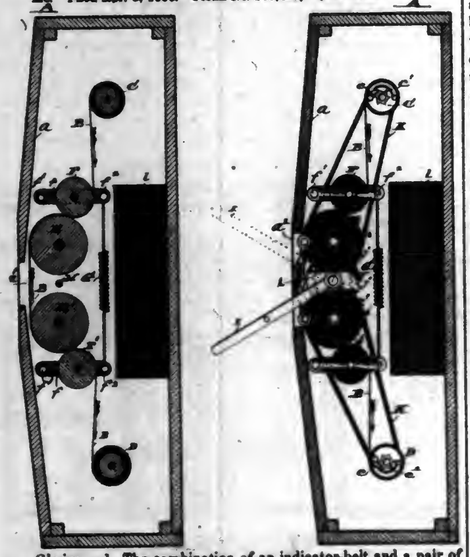


2. The combination of the car, the car-seat having the compartments *a a'*, the arms C D, the rods H H', the levers I I', the cords J J', and the indicator and target, substantially as described.

3. The combination, with a seat having a laterally-adjustable arm, of an indicator and actuating devices arranged to be operated by said arm for different indications according to the adjustment of the latter, substantially as set forth.

4. The combination of the car-seat, the laterally-adjustable arm the dog, and the key, substantially as described.

400,242. STATION-INDICATOR. OSBORNE R. MICHAUD, St. Louis Mo. Filed Apr. 3, 1888. Serial No. 269,429. (No model.)



Claim.—1. The combination of an indicator-belt and a pair of rollers, E E', over which it passes for presentation to view, with additional rollers F F, mounted in movable bearings and in contact with said belt above and below said rollers E E', and a spring-tie attached to said movable bearing for drawing said rollers F F' against said belt, the latter passing in front of rollers E E' and behind rollers F F', substantially as and for the purpose set forth.

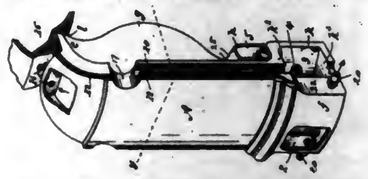
2. An indicating-belt and a pair of rolls over which it passes for presentation to the eye, in combination with gear-wheels *e e'*, turning with said rolls, a shaft provided with a gear-wheel, *h*, which meshes with said gear-wheels *e e'*, a lever turning on said shaft having lateral play thereon and provided with a lateral pin, and a disk fast on said shaft and provided with perforations for receiving said pin, in order that the indicator-belt may be operated by moving said lever, substantially as set forth.

3. The combination of the indicator-belt B and the rollers C D, on which the ends of said belt are wound, with the casing A, having an opening in its front opposite the middle of said belt, the rolls E E', arranged above and below said opening, in order that the belt may pass over and before them vertically behind said opening, the rolls F F', arranged in front of said belt above and below said rolls E E', the pivoted bearings *f*, in which said rolls F F' are mounted, and the spring-tie G, connecting the free ends of said levers, substantially as set forth.

4. In combination with a case having an opening and an indicator-belt arranged behind said opening, a pair of rolls journaled in fixed bearings before which said belt passes, a pair of rolls arranged in front of said belt above and below the pair first mentioned and mounted in movable bearings, a spring-tie for drawing said movable bearings toward each other, and a lever-shaft and gearing for operating the pair of rolls first above mentioned, substantially as set forth.

5. In combination with a traveling belt and pair of rolls before which it passes, a pair of movable tightening-rolls arranged in front of said belt, and spring-pressed against said belt above and below the former pair of rolls, for the purpose described.

400,248. SECTIONAL BOILER. JOHN H. MILLS, Boston, Mass. Filed June 16, 1888. Serial No. 277,357. (No model.)



Claim.—1. The combination, with a series of chambered boiler-sections arranged and joined together to form an inclosed combustion-chamber and having a direct water communication the one with the other, of a common receiver-drum having communicating-passages leading therefrom to the upper portion of each boiler-section, substantially as described.

2. The combination, with a series of chambered boiler-sections arranged and joined together to form an inclosed combustion-chamber, each of said sections being intermediate of its height formed with an inwardly-extended portion which is transversely inwardly converging, and said sections having a direct water communication the one with the other, of a common receiver-drum, having communicating-passages leading therefrom to the upper portion of each boiler-section, substantially as described.

3. The combination, with a series of chambered boiler-sections, A, arranged and joined together to form an inclosed combustion-chamber and having water communication with each other at their lower ends, of a common receiver-drum, 15, resting on the top of said sections and having water communications between it and the upper ends of said sections, substantially as described.

4. A series of boiler-sections arranged and joined together to form an inclosed combustion-chamber and having a direct water communication the one with the other, a grate supported in said combustion-chamber, the radial flues 17, the base-flue 3, in communication with a smoke-pipe, and vertical flues between said radial and base flues, combined with a common receiver-drum having communicating-passages leading therefrom to the upper portion of each boiler-section, substantially as described.

5. A series of chambered boiler-sections, each formed at its lower portion with its water-space of contracted width, as at 2, and having the additional integral partition-walls *k*, k^3, and k^3, open at their ends inside thereof, and said sections having formed in adjacent edges at their upper portions the radial recesses 17 and vertical recesses from said radial recesses to and through said wall k^3, said sections being arranged and joined together to form an inclosed combustion-chamber, a circular base-flue, 3, radial flues and vertical flues 10 between and in communication with said radial and base flues, and stoppers closing the outer ends of said radial flues, and the nipples 20, connecting and forming communication between said chambered sections at the lower portions thereof, in combination with the common drum 15 at the top of said sections, and the nipples 16, connecting the upper end of each of said sections and said drum, substantially as described

6. A sectional boiler consisting of a series of chambered boiler-sections arranged and joined together to form an inclosed combustion-chamber and having a direct water communication the one with the other, and having formed therein the radial flues 17, the base-flue 3, and a smoke-pipe in communication with said base-flue, and vertical flues 10 between said radial and base flues, the circular perforated conduit 5, an air-pipe leading thereto, and the common drum 15, having communicating passages leading therefrom to the upper portion of each boiler-section, substantially as described.

7. A sectional boiler consisting of a series of chambered boiler-sections arranged and joined together to form an inclosed combustion-chamber and having a direct water communication the one with the other, and having formed therein the radial flues 17, the base-flue 3, and vertical flues 10 between said radial and base flues, the circular perforated conduit 5, the distributing-box 8, with which said conduit communicates, an air-pipe leading to said distributing-box, and the common drum 15, having communicating passages leading therefrom to the upper portion of each boiler-section, substantially as described.

8. A sectional boiler consisting of a series of boiler-sections arranged and joined together to form an inclosed combustion-chamber and having a direct water communication the one with the other, the radial flues 17, the base-flue 3 in communication with a smoke-pipe, the vertical flues between radial and base flues, a grate supported in said combustion-chamber, the perforated circular conduit 5, formed of the arc-sections A, joined to said boiler-sections, the distributing-box 8, with which said conduit 5 communicates, the circular pipe 4, disposed in the base-flue, the pipe J, leading thereto, and the vertical passages 24, connecting said pipe 4 and distributing-box, substantially as described.

9. A sectional boiler consisting of a series of chambered boiler-sections formed, joined, and arranged together to form an inclosed combustion-chamber, base-flue 3, radial flues 17, and vertical flues 10, and the circular perforated air-conduit 5, substantially as described, said chambers having a direct water communication the one with the other, of a smoke-pipe connected with said base-flue, a distributing-box, 8, with which said circular conduit 5 is connected, the circular pipe 4, disposed within the base-flue, the air-inlet pipe J, leading thereto, the vertical passages 24, connecting said pipe 4 with said distributing-box, the grate supported in said combustion-chamber below said perforated conduit 5, the common drum having communicating-passages leading therefrom to the upper portion of each boiler-section, the pipe 37, leading from said drum, and the return-pipe 18, leading into the lower portion of one of the said boiler-sections, substantially as described.

400,244. LETTER-BOX. ROBERT J. MITCHELL, Seneca, Mo. Filed July 11, 1888. Serial No. 279,651. (No model.)



Claim.—1. In a mail-box having an opening for the insertion of mail-matter, the combination of a door for closing the said opening, the device G, for holding the said door shut, and the alarm mechanism for operating the device G for disengaging it from the said door, substantially as described.

2. In a mail-box, the combination, with the door for closing the opening through which the mail is inserted, of the device G, for locking the door, the crank-shaft E, for operating and fastening the device G, and the alarm mechanism for moving the said crank-shaft, substantially as and for the purpose described.

3. In a mail-box, the combination, with the door for closing the opening through which the mail is inserted, of the lifter connected with the said door and the alarm mechanism for operating the said lifter, substantially as described, for the purpose set forth.

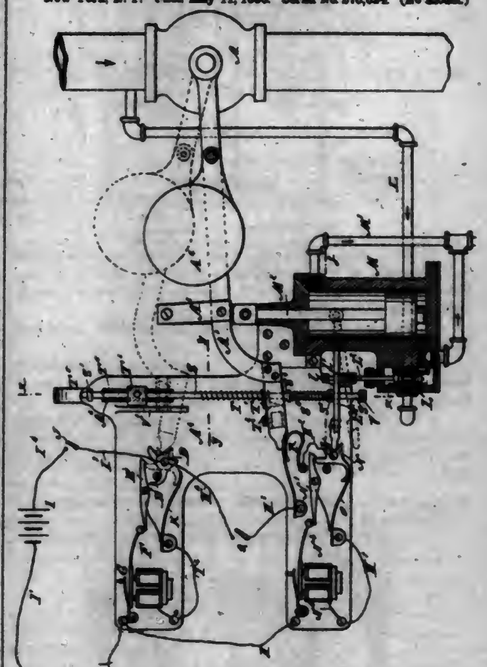
4. The combination, in a mail-box, of the door for closing the opening through which the mail is inserted, the lifter connected with the said door and arranged to hold it shut, the crank-shaft constructed to operate the lifter and to fasten the lifter down, and the alarm mechanism for operating the said crank-shaft, substantially as and for the purpose described.

5. The combination, with the mail-box and the door for closing the opening through which the mail is inserted, of an indicator-sign, a shield for covering the said indicator-sign, the arm connected with the shield, and the arm connected with the said door and constructed to engage with and operate the arm connected with the shield when the said door is opened, substantially as described.

6. In a mail-box, the combination of the door for closing the opening through which the mail is inserted, the indicator-sign, the shield for covering the indicator-sign, the arm connected with the shield and projected within the path of and operated from the door, the lifter for opening the door, and the alarm mechanism, substantially as and for the purpose described.

7. In a mail-box, the combination, with the indicator-sign and the shield for covering the indicator-sign, of the door and a connection between the said door and the said shield, substantially as and for the purpose described.

400,245. THROTTLE-VALVE CONTROLLER. GUSTAVE S. NEU, New York, N. Y. Filed May 11, 1888. Serial No. 273,694. (No model.)



Claim.—1. In a device of the character described, the combination, with the cylinder, piston, ports, and slide-valve of a fluid-power motor, of a forked lever, L^3, embracing the cylinder and pivoted on opposite sides thereto, the stem of the slide-valve working loosely through said lever and having stops *l l'* on opposite sides thereof, substantially as described.

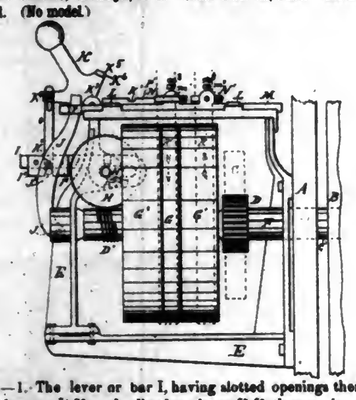
2. The combination, with the arm A' of a self-acting valve, of a catch, E, for restraining the arm A', a catch-tripping device, F, a fluid-power motor arranged to return said arm A' to the restraint of its catch, a valve for said motor having an operating-arm, a locking and releasing device for the motor-valve, a rod, S, working loosely through the main arm A' and the motor-valve arm, a spring, S^2, coiled on said rod between the two arms and adapted to be compressed by the arm A', stops S^3 and V on the rod S on opposite sides of the motor-valve arm, and another stop, T^3, connected to the rod and arranged to be moved by the arm A', so as to reset the motor-valve, substantially as described.

3. The combination, with the arm A' of a self-acting valve, of a catch, E, arranged to automatically engage and restrain the arm A', a catch-tripping device, F, a fluid-power motor arranged to operate the arm A', a motor-controlling valve having an operating-arm, a self-locking and a releasing device for the motor-valve, a rod, S, connected to the motor-valve arm and working loosely through the main arm A', a spring, S^2, arranged to be compressed by the arm A' and to act on the motor-valve arm, a stop, T^3, connected to said rod above the arm A', a spring arranged to be compressed by the arm A' and to act on the stop T^3, a self-acting catch, T^4, arranged to restrain the stop T^3, and a tripper, U, for said catch arranged to be operated from the arm A', substantially as described.

4. The supporting-frame A^4, having a rigid forward and downward projecting guide, V', to receive and retain the arm A' against lateral movement, as and for the purpose specified.

5. The swinging arm A', provided with a sliding bearing, T', through which the longitudinally-movable rod S is passed, and on which rests the spring T, coiled on said rod, as and for the purpose specified.

400,246. REVERSING-GEARING FOR WASHING-MACHINES. JOHN M. OAKLEY, Brooklyn, N. Y. Filed Feb. 10, 1887. Serial No. 227,201. (No model.)



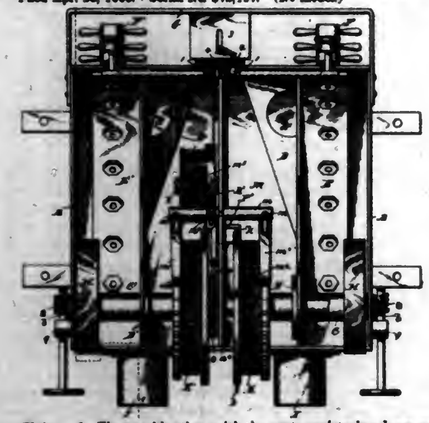
Claim.—1. The lever or bar I, having slotted openings therein and projections, as I^4 I^5, and adjusting-pieces I^3 I^2 thereon, in combination with the operating-lever J, belt-shifting bar M, and frame E, substantially as described.

2. The weighted lever K, the frame E, link or bar O, and slotted bar I, all in combination, as set forth.

3. The wheel H, having pin H^3, in combination with the shaft F, having worm D', bar I, having projections I^4 and I^5, link O, lever J, having pin J^2, and weighted lever K, substantially as set forth.

4. The combination of the bar I, having projections I^4 I^5, wheel H, having pin H^3, lever J, having pin J^3, lever K, bar M, frame E, shaft F, worm D', pulleys G G' G^2, and pinion D, substantially as set forth.

400,247. CASH-INDICATOR. AVEN PEARSON, Washington, D. C. Filed Apr. 28, 1888. Serial No. 272,117. (No model.)



Claim.—1. The combination, with the cents-registering drum provided with projecting pins and mechanism for turning it, of the dollars-drum, a toothed wheel secured to the side of said drum, and a lever provided with a hinged pawl to turn the said wheel, the lever being operated by the pins on the cents-drum, whereby the dollars-drum is caused to move faster than the cents-drum, for the purpose stated.

2. The combination, with the cents-drum provided with radial pins and mechanism for turning it, of the dollars-drum, a toothed wheel secured to the side of said drum, and a lever provided with a hinged pawl to turn the said wheel, and having an arm extending laterally into the path of the radial pins on the cents-drum, whereby the dollars-drum is caused to move faster than the cents-drum, for the purpose stated.

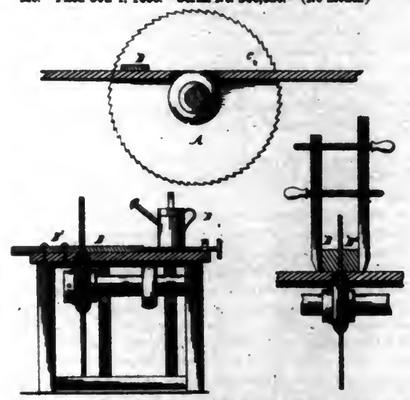
3. The combination, with the cents-drum provided with projecting pins and mechanism for moving it, of the dollars-drum, a toothed wheel secured to the side of said drum, and an adjustable lever provided with a hinged pawl to turn the said wheel, the lever being operated by the pins on the cents-drum, substantially as described, and for the purpose stated.

4. The combination, with a registering-drum, of an adjustable pawl having an integral laterally-extending indicating-finger, substantially as described, and for the purposes stated.

5. The combination, with the main shaft, a loose sleeve encircling said shaft, and a frame-piece rigidly secured on said sleeve and carrying a curved plate, of a retracting-spring, and a drum to which one end of said spring is attached, an arbor on which the drum is mounted, a toothed wheel on one end of the arbor, and a worm-screw in engagement with said wheel for regulating the tension of said spring, for the purpose set forth.

6. In a cash-register of the class described, the combination, with the casing, the shaft, a sleeve encircling said shaft, a frame-piece carrying a curved plate, and a spring for retracting said frame-piece, of an air-cushion attached to the casing and a plunger attached to the curved plate, substantially as described, and for the purpose set forth.

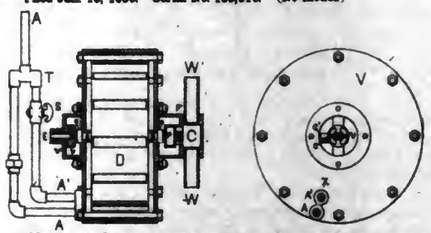
400,248. PROCESS OF TEMPERING SAWS. JOSEPH PELTS, Vinolt, Mo. Filed Oct. 1, 1888. Serial No. 286,836. (No model.)



Claim.—1. The method hereinbefore described of tempering saws and removing rim-bound kinks, &c., which consists in pressing a rubbing-piece firmly against the face of the saw while in rapid motion, thus heating a part of the blade, then suddenly cooling the same, substantially as described.

2. The method hereinbefore described of removing blisters, kinks, &c., from saws, which consists in drilling holes in the blade at proper places, then driving the saw at a high speed and heating a portion by pressing a rubbing-block against it, and then suddenly cooling, substantially as described.

400,249. AUTOMATIC VALVE. THOMAS O. PERRY, Chicago, Ill. Filed Jan. 18, 1886. Serial No. 189,010. (No model.)



Claim.—1. In combination, substantially as set forth, a case containing water, a drum journaled horizontally in such case, comprising circumferentially-successive chambers having each an opening by which it communicates with the case, a pipe communicating with the case below the horizontal plane of the drum's axis, whereby air may be forced into the case and enter the chambers on one side of the drum, and a pocket revolved by the drum and communicating as it revolves alternately with the case and with an exterior water-supply, whereby the water in the case is replenished by pocketfuls at a time.

2. In combination with the case containing water, a drum journaled horizontally in such case, comprising chambers circumferentially successive, having each an opening by which it communicates with the case, a pipe communicating with the case below the horizontal plane of the drum's axis, by which air may be forced into the case and caused to enter the chambers on one side of the drum, a valve revolved by the drum controlling the escape of air from the case, and a pocket also revolved by the drum and communicating as it revolves alternately with the case and with an exterior water-supply, whereby as the air carries off water the pocket may supply it.

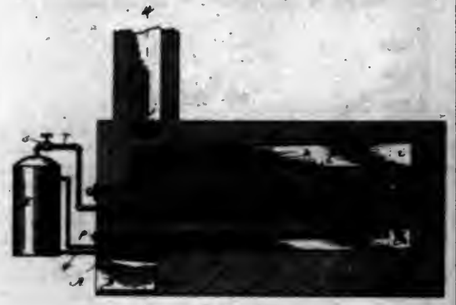
3. In combination with the case containing liquid and the chambered drum revolved therein, substantially as set forth, the valve E, which controls eduction from the case, and the pocket P, which furnishes water to the case, flexibly connected, and gearing which communicates motion from the drum to one of them, and thence through such flexible connection to the other, whereby they may severally adjust themselves to their respective seats, substantially as set forth.

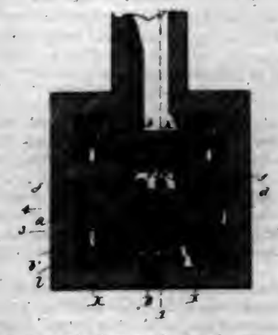
4. In combination with the case and drum, constructed and operating substantially as described, the water-chamber C, communicating through a port with the case, the pocket P, covering said port and actuated by the drum, and having an aperture which coincides with the port at one position of the pocket, and at another position thereof stands uncovered and constitutes communication from the pocket to the case, whereby the pocket communicates alternately with the case and with the chamber C, and never with both at once, substantially as and for the purpose set forth.

5. In combination with the case and the chambered drum and the air-pipe admitting air forced into the case below the drum, the branch pipe A' of such air-pipe admitting air from the same source opening into the case at one side of the drum and provided with the regulating-cock S, substantially as and for the purpose set forth.

6. In combination with the case containing liquid, and the chambered drum revolved therein in the manner described, the valve E, which controls eduction from the case, the pocket P, which imports water into the case in the manner described, a shaft which connects said valve and pocket being loosely joined to them both, and a spring reacting between said valve and pocket to force them apart and hold them against their seats, respectively, substantially as set forth.

400,250. BAKER'S OVEN. EDUARD A. C. PETERSEN, Lake View, Ill. Filed Nov. 27, 1888. Serial No. 292,084. (No model.)





Claim.—1. In a baker's oven, direct and return gas-flues below the hearth or baking-chamber and an air-flue interposed between the direct gas-flues and hearth, with a register for regulating the amount of air to be admitted, substantially as and for the purpose set forth.

2. In a baker's oven, central direct flues provided below the hearth or baking-chamber divided vertically by a horizontal iron plate, the lower halves of the flues to conduct the gases from the fire-chamber and the upper to conduct a current of air regulated by a register, all substantially as set forth, for the purpose specified.

400,251. MEASURING-FAUCET. ELI S. REED, Chattanooga, Tenn. Filed Nov. 21, 1888. Serial No. 291,500. (No model.)

Claim.—The combination of the vessel A, having the scale of graduations upon its sides, the cap-plate B, the base-plate C, the tie-rods H, connecting said cap and base plates, said cap-plate B having lugs d' d, and said base-plate C having lugs c' c, whereby the plates are attached to the support, substantially as described.

400,251.



400,252. FIRE-KINDLER. MICHAEL REILLY, Brooklyn, N. Y. Filed Sept. 10, 1887. Serial No. 249,296. (No model.)



Claim.—As a new article of manufacture, a fire-kindler composed of spent bone-black saturated with oil and a binding material, the whole being formed into a block or brick, substantially as specified.

400,253. FOUNTAIN-PEN. BERNIE ROSENTHAL, Williamsport, Pa. Filed Aug. 22, 1888. Serial No. 283,408. (No model.)



Claim.—1. In a fountain-pen, the combination of the reservoir with a laterally-moving valve provided with a projection and a suitable tube connected to the valve and which conveys the ink to the pen, substantially as shown.

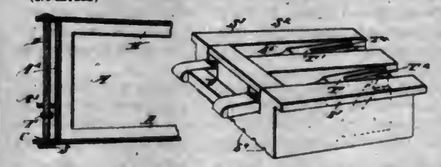
2. In a fountain-pen, the combination of a reservoir having a tapering or conical end, a laterally-moving spring-actuated valve provided with a projection to receive the pressure of the finger, and a movable supply-pipe connected to the valve, substantially as described.

3. In a fountain-pen, the combination of the reservoir provided with an air-opening, a laterally-moving valve for closing its lower end, and a rod secured to the valve and provided with a valve at its upper end for closing the air-opening in the side of the reservoir, substantially as set forth.

4. The combination, in a fountain-pen, of a reservoir, a valve for closing its lower end, a projection for moving the valve, a supply-pipe for conveying the ink to the pen, and a thimble, L, provided with a guide for the supply-pipe, substantially as specified.

5. In a fountain-pen, the combination of the holder provided with an opening through one side, the reservoir secured inside of the holder and provided with an air-opening and made conical or tapering at its lower end, a spring-actuated valve provided with a projection, a rod for operating a valve which controls the supply of air to the reservoir, and which rod is secured to the valve, a tube for supplying ink to the pen connected to the valve, and a thimble, L, provided with a guide through which the end of the supply-pipe passes, substantially as shown and described.

400,254. APPARATUS FOR EXTRACTING OIL FROM OIL-CAKES. THORLEY A. SCHOOLAR, Avondale, Ala., (executor of John L. Moss, deceased,) and NORRIS LITTELL, Emporia, Kans., assignors of one-third to Edward W. Doe, Tallahassee, Fla. Filed Sept. 6, 1887. Serial No. 248,880. (No model.)

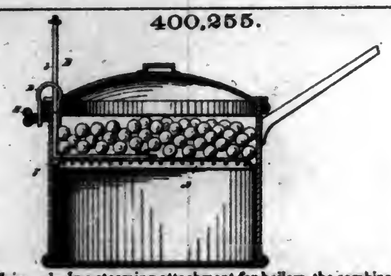


Claim.—1. The combination of the platen, the levers T^3, pivoted within the platen, and the draw-bars arranged within the platen and projecting therefrom and having their inner ends pivoted to the upper ends of said levers T^3, as set forth.

2. The combination of the platen having the recesses S^2 and S^3, the draw-bars arranged in the recesses S^2 and connected together, and the levers T^3, pivoted in the recesses S^3 and connected to the draw-bars, as set forth.

400,255. CULINARY APPARATUS. ANNA O. SCHOCKMAN, Lincoln, Nebr. Filed Nov. 14, 1888. Serial No. 290,802. (No model.)

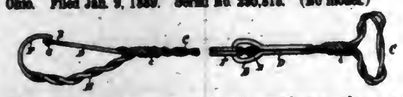
400,255.



Claim.—1. In a steaming attachment for boilers, the combination of the perforated disk A, the elbow-shaped standard having its foot riveted or bolted to the center of the disk and its upright at right angles with the rim, and the clevis-shaped clamp D, adapted to slide upon the upright and provided with a slot, *a*, and set-screw E, for adjusting same upon the standard, substantially as described.

2. The concavo-convex perforated disk A, the elbow-shaped arm B, having its foot secured to the center of the convex face of the disk, and the clevis-shaped clamp-hook D, provided with the slot *a*, to receive the arm and adapt the hook to slide thereon, and the set-screw E, to adjust it to position, all combined and arranged substantially as and for the purpose described.

400,256. WIRE SNAP-HOOK. SAMUEL P. SCOTT, Hillsborough, Ohio. Filed Jan. 9, 1889. Serial No. 295,818. (No model.)



Claim.—As an improved article of manufacture, the snap-hook herein described, consisting of the loop C, twisted shank *c*, a tongue, D, formed of doubled wire and having an eye, B, and an arm, E, having a hook, F, at its extremity, said hook being formed with a downwardly and inwardly inclined tooth, G, adapted to engage said eye, all formed of a continuous wire, substantially in the manner and for the purpose specified.

400,257. SEWING-MACHINE-ATTACHMENT HOLDER. EDWARD SEITZ, Peoria, Ill. Filed Mar. 24, 1888. Serial No. 268,443. (No model.)

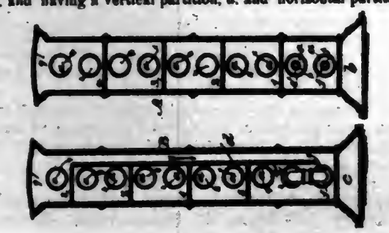


Claim.—The combination, with the presser-bar, having a transverse recess in its lower end, of a sewing-machine attachment provided with a transversely-grooved shank fitting said recess and a lever-actuated rock-shaft mounted in said presser-bar above and transverse to said shank and provided with a bend or offset greater than the shaft's distance above the shank, whereby rocking of the shaft may throw the offset into the shank's groove and draw the shank into or force it out of position, according to the direction of the motion.

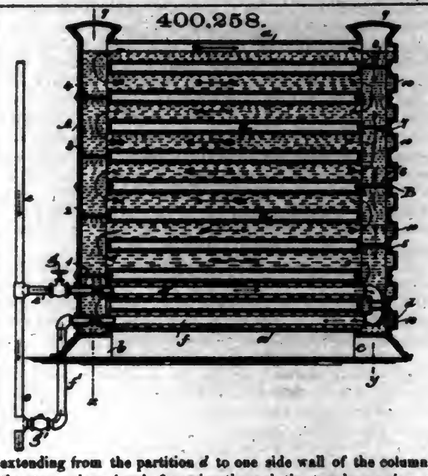
400,258. RADIATOR. JOSEPH SHACKLETON, New York, N. Y. Filed Feb. 13, 1888. Serial No. 263,608. (No model.)

Claim.—1. The combination, with the horizontal pipes *a*, of the end column, A, having horizontal partitions and connected to the pipes *a*, and the end column, B, having horizontal partitions and vertical partition, and pipes for the supply of steam passing into and through the pipes in the lower portion of the radiator, substantially as set forth.

2. The combination, with the horizontal pipes *a*, of the end column, A, connected to said pipes and having horizontal partitions between the pairs of pipes *a*, the end column, B, also connected to the pipes *a*, and having a vertical partition, *d*, and horizontal partitions

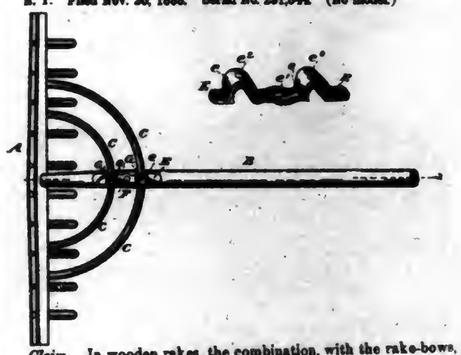


400,258.



extending from the partition *d* to one side wall of the column, and the steam-pipes *e* and *f* passing through the two lower pipes *a* and connected to the steam-supply, substantially as and for the purposes set forth.

400,259. WOODEN RAKE. JAMES A. SHAFER, Richmondville, N. Y. Filed Nov. 30, 1888. Serial No. 291,344. (No model.)



Claim.—In wooden rakes, the combination, with the rake-bows, of the rivets G G and a clasp, E, having the bridge-holes e^2 e^2 to receive said rivets, whereby the bows are only riveted to the clasp and not to the handle, as shown and described.

400,260. LOOM FOR WEAVING CHENILLE, &c. HALCYON SKINNER and EUGENE TYRRELL, Yonkers, N. Y., assignors to the Alexander Smith & Sons Carpet Company, same place. Filed Feb. 7, 1887. Serial No. 226,837. (No model.)

Claim.—1. The combination, substantially as before set forth, of the shifting yarn-holder constructed with a series of yarn-cases and the corresponding series of yarn-tubes which hold the ends of the yarn and which are connected with said yarn-holder so as to be shifted with it.

2. The combination, substantially as before set forth, of the shifting yarn-holder constructed with yarn-cases, with a tension device to prevent the yarns from rendering too freely from the yarn-cases.

3. The combination, substantially as before set forth, of the shifting yarn-holder with an index of the yarn-cases, which index is arranged upon the yarn-holder and moves with it.

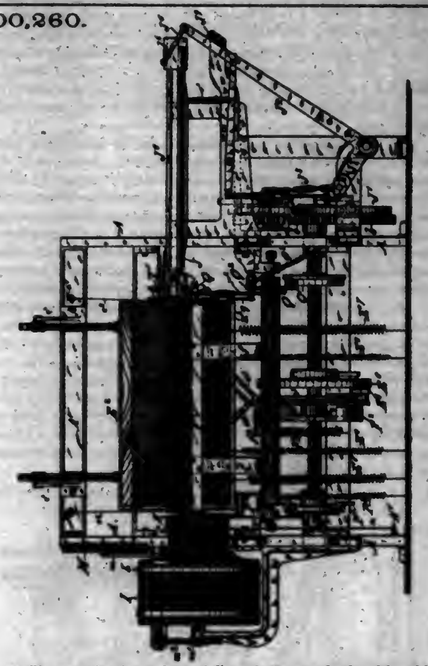
4. The combination, substantially as before set forth, of the shifting yarn-holder with a face index of the yarn-cases.

5. The combination, substantially as before set forth, of the shifting yarn-holder constructed with yarn-cases, with the stop by which the said yarn-holder is held when a yarn is to be drawn from one of the yarn-cases.

6. The combination, substantially as before set forth, of the shifting yarn-holder constructed with yarn-cases, with a yarn-drawing device, by means of which the yarn is drawn from the yarn-cases across the loom.

7. The combination, substantially as before set forth, of the shifting yarn-holder constructed with yarn-cases and the yarn-drawing device, with the yarn-cutter by means of which the drawn strand of yarn is cut loose from the yarn-holder.

400,260.



8. The combination, substantially as before set forth, with a shifting yarn-holder constructed with yarn-cases, of the yarn-drawing device and the selvage-trimmer, whereby the ends of the strands of yarn which have been seized by the yarn-drawing device are trimmed to a substantially uniform length.

9. The combination, substantially as before set forth, of the yarn-tube and the yarn-drawing device constructed with spring-nippers adapted to be opened by being forced against the mouth of said yarn-tube.

10. The combination, substantially as before set forth, of the spring-nippers of the yarn-drawing device with the rod by which they are moved, and the intervening sliding shank and spring.

11. The combination, substantially as before set forth, of the nipper-jaws of the yarn-drawing device with the opener by which they are opened when their grip upon the yarn is to be relaxed, and the opening-cam by which said opener is operated.

12. The combination, substantially as before set forth, of the nippers of the yarn-drawing device, the opener, and a cam for imparting the supplementary backward movement to the nippers.

13. The combination, substantially as before set forth, of the yarn-drawing device with the rebound-stop.

14. The combination, substantially as before set forth, of the drop-heddles, the tension device for the warp-threads controlled by said heddles, and the tension-relaxing device by which the acting force of said tension device is varied.

15. The combination, substantially as before set forth, of the whip-roll, the tension-weight thereof, the tension-lever, and the tension-cam by which said lever is operated.

16. The combination, substantially as before set forth, of the three leaves of heddles, the heddle-lever, the connecting-rods between two of said leaves and the said heddle-lever, and the connections between one of said two leaves and the third leaf of heddles.

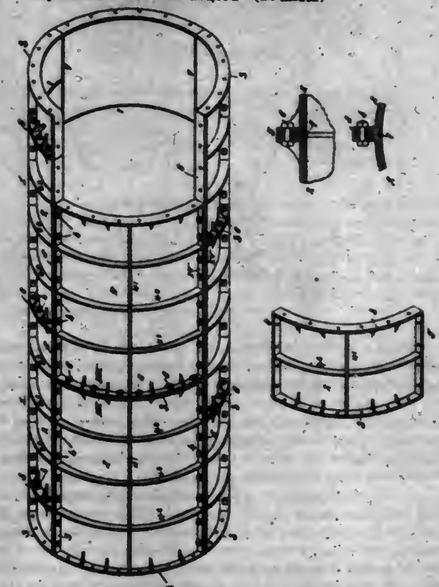
400,261. DEVICE FOR APPLYING HEAT TO THE BODY. DEXTER M. SMALL, Providence, R. I. Filed Feb. 24, 1888. Serial No. 265,221. (Model.)



Claim.—1. A device for making continuous warm or hot applications to the body, which consists of a receptacle for heating water, a hollow air-tight appliance suitable for contact with the person, and flexible tubes E and F, connecting the appliance and receptacle, all constructed and combined so as to operate substantially as set forth.

2. The heater constructed with an enlarged top and base separated by a contracted intervening neck, and having one or more sets of tubes extending out from the sides thereof, for the purpose specified, each set consisting of two tubes, one above the other, substantially as described.

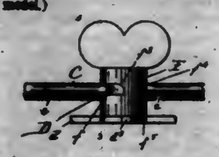
400,262. CONDUCTING-PIPE. GEORGE C. SMITH, Chicago, Ill. Filed May 22, 1888. Serial No. 274,084. (No model.)



Claim.—1. A conducting-pipe composed of sections, each having joining flanges and ribs, the distance from rib to flange and rib to rib being equal in all the sections, whereby the sections may be put together in break-joint style and the flange of one section be caused to coincide with a rib of the contiguous section, substantially as set forth.

2. A pipe composed of sections or segments having transverse joining flanges and ribs, such sections being put together in lap or break-joint style with their ribs and flanges meeting or coinciding throughout the circumference of the pipe, and the distance between the transverse flanges of some of said sections being different from the distance between such flanges of the other sections, whereby the ends of the pipe may be finished evenly, substantially as set forth.

400,263. TRANSOM-LIFTER. JOHN W. SMITH, Chicago, Ill., assignor to Edward Payson, same place. Filed May 21, 1883. Serial No. 274,800. (No model.)

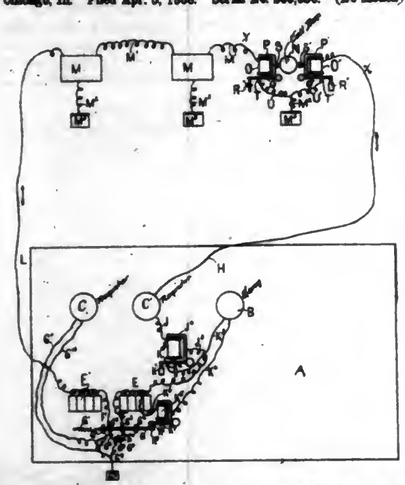


Claim.—1. In a transom-lifter, the combination of the transom and its lifting-rod with a stationary eye-piece for the lifting-rod to pass through, and a revolving thumb-piece journaled on said eye-piece and provided with a projection adapted to engage the lifting-rod and hold it in position, substantially as specified.

2. The combination of the lifting-rod C having recesses *c*, and eye-piece D, having a base-flange, *d*, provided with a recess, d^3, with the revoluble thumb-piece F, provided with a sleeve having oblong slots f^2 f^2, the projecting edges *f* whereof are adapted to engage the recesses of the lifting-rod, and provided also with a stop, f^3, to engage the recess d^3 of the base-flange, substantially as and for the purpose set forth.

3. In a transom-lifter, the combination of a notched lifting-rod with a stationary eye-piece for the lifting-rod to pass through, a revolving thumb-piece swiveled on said eye-piece and carrying a projection adapted to engage the notches in said lifting-rod, and a spring or its equivalent for throwing it into such engagement, substantially as specified.

400,264. AUTOMATIC GROUNDING DEVICE. ELMER A. SPERRY, Chicago, Ill. Filed Apr. 5, 1888. Serial No. 269,656. (No model.)



Claim.—1. The combination of a main normally-closed metallic circuit with an electro-magnet therein, a ground circuit and contact, a pivoted armature-lever adapted to move between such contact and such magnet, such armature held to such magnet by the influence of the current passing over the main line, and a motion-retarding device connected with such armature-lever, which permits the same to leave the magnet and engage the contact only when the current is discontinued for a considerable period of time.

2. The combination of a main normally-closed metallic circuit with an electro-magnet therein, a ground circuit and contact, a pivoted armature-lever adapted to move between such contact and such magnet, such armature held to such magnet by the influence of the current passing over the main line, and a retarding device connected with such armature-lever, which permits the same to leave the magnet and engage the contact only when the circuit is discontinued for a considerable period of time.

3. The combination of a main normally-closed metallic circuit with a call-box therein, an electro-magnet on each side of said call-box in the main circuit, a pivoted armature-lever controlled by each of said magnets, a ground-line and two contacts, one in the path of each of such levers, said levers attracted to the magnets by the influence of the current passing over the main line, and two motion-retarding devices connected with such armature-levers, which permit the same to leave the magnets and engage the contacts only when the current is discontinued for a considerable period of time.

4. The combination of a main normally-closed metallic circuit with an electro-magnet therein, a local circuit and a contact, a pivoted armature-lever adapted to move between such contact and such magnet, such armature held to such magnet, said local circuit containing an electro-magnet, in combination with a grounding-switch controlled by said magnet and connected with the battery, so as to ground the same when the main line is broken.

5. The combination of a main normally-closed metallic circuit with an electro-magnet therein, a local circuit and a contact, a pivoted armature-lever adapted to move between such contact and such magnet, such armature held to such magnet, said local circuit containing an electro-magnet, in combination with a grounding-switch controlled by said magnet and connected with the batteries, so as to ground the same when the main line is broken, and a second electro-magnet in the main line, with a pivoted armature-lever, and a ground-line and a contact-point in the path of said armature-lever.

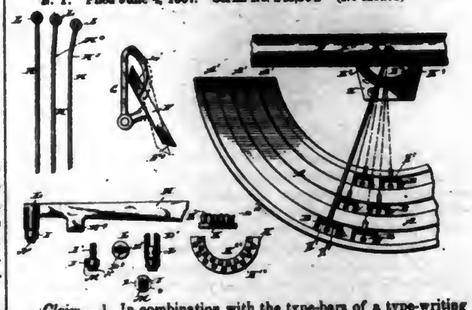
6. The combination of a normally-closed metallic circuit with an electro-magnet therein, a pivoted armature-lever controlled by said magnet, a ground-line and a contact-point in the path of such lever, a second electro-magnet in the main line, a pivoted armature-lever controlled thereby, a local circuit with contact-point in the path of said lever, an electro-magnet in such local circuit, a battery in the main circuit, a ground-line, and a switch controlled by said last-mentioned magnet and adapted to ground the battery, so that when the main line is broken it is grounded at the battery and on the line, so as to make a circuit, part ground and part metallic circuit.

7. The combination of a normally-closed metallic circuit with an electro-magnet therein, a pivoted armature-lever controlled by said magnet, a ground-line and a contact-point in the path of such lever, a second electro-magnet in the main line, a pivoted armature-lever controlled thereby, a local circuit containing an alarm, with contact-point in the path of said lever, an electro-magnet in such local circuit, a battery in the main circuit, a ground-line, and a switch controlled by said last-mentioned magnet and adapted to ground the battery, so that when the main line is broken it is grounded at the battery and on the line, so as to make a circuit, part ground and part metallic circuit.

8. The combination of a normally-closed metallic circuit with a series of call-boxes therein, an electro-magnet on each side of each box, a pivoted armature-lever attracted to such magnet by the influence of the current passing therethrough, a ground-line and contact-point in the path of each of such levers, a central-station magnet in such main line with similar armature-lever, a local circuit having a contact-point in the path of such lever and containing an electro-magnet, a ground-line contact-point, battery, and battery-grounding switch, the latter controlled by the electro-magnet in the local circuit.

9. The combination of a normally-closed metallic circuit with a series of call-boxes therein, an electro-magnet on each side of each box, a pivoted armature-lever attracted to such magnet by the influence of the current passing therethrough, a ground-line and contact-point in the path of each of such levers, a central-station magnet in such main line with similar armature-lever, a local circuit containing an alarm and having a contact-point in the path of such lever and containing an electro-magnet, a ground-line contact-point, a battery, and battery-grounding switch, the latter controlled by the electro-magnet in the local circuit.

400,265. TYPE-WRITING MACHINE. CHARLES SPIRO, New York, N. Y. Filed June 4, 1887. Serial No. 240,304. (No model.)



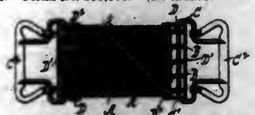
Claim.—1. In combination with the type-bars of a type-writing machine, a locking-rib having slots, the slots and type-bars being relatively constructed so that two or more bars are locked by one and the same slot in the rib, substantially as specified.

2. In a type-writing machine, a series of type-bars pivoted in brackets mounted in a series of grooves concentric with the printing-point, in combination with a locking-plate having a rib concentric with the printing-point, and provided with slots for the reception of the type-bars, substantially as specified.

3. The combination of a type-bar, a block slotted to embrace the same and longitudinally bored for the reception of a type-bearing ping, the bore of the block extending from end to end thereof and forming passages at each side of the bar, substantially as specified.

4. A type-plug having a roughened shank, in combination with a block bored longitudinally to receive the same loosely, and slotted to a width less than that of the bore, and with a type-bar, substantially as specified.

400,266. ELASTIC STRAP. LEWIS STEIN, New York, N. Y. Filed Nov. 15, 1888. Serial No. 290,870. (No model.)



Claim.—In an elastic adjusting-strap for garments, a series of spiral springs, A, each having its free ends formed into coils B at right angles to the springs, combined with wire links C, having plain straight members inserted in said end coils at the opposite ends of the springs, thereby preserving the full elasticity of the springs, and sheet-metal housings D, folded to embrace said members of the links and the end portions of the springs for producing a direct connection of both the springs and the housings with said links, substantially as shown and described, for the purpose set forth.

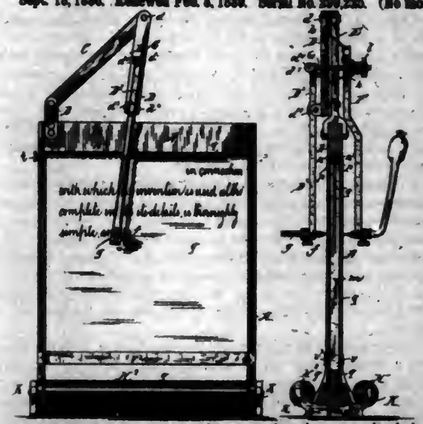
400,267. GAS-PRESSURE INDICATOR. ALFRED THOMAS, West Cowes, Isle of Wight, and PHILIP THOMAS, Buckingham, County of Bucks, England. Filed July 11, 1888. Serial No. 279,695. (No model.) Patented in England Jan. 30, 1888, No. 1,266.

400,267.



Claim.—A gas-pressure indicator having no fixed joints, and consisting of a supporting back piece provided with a shelf, an outer liquid-containing tube closed at its bottom and supported on said shelf, a cap secured to the upper end of the outer tube and provided with a central orifice, and an inner tube centered in the outer tube and having its lower end open and in free communication with the outer tube above the closed bottom thereof, said inner tube extending upward through the cap and having its upper open end adapted to connect with a gas-inflow tube for passing gas down the inner tube and causing the liquid therein to pass through the open lower end of said inner tube into the base of the outer tube, substantially as described.

400,268. APPARATUS FOR PRODUCING CHARACTERS IN THEIR REVERSE. CHARLES A. THOMPSON, New York, N. Y., assignor to the Rapid Duplicating and Copying Machine Company, same place. Filed Sept. 13, 1888. Renewed Feb. 8, 1889. Serial No. 299,235. (No model.)



Claim.—1. In an apparatus for producing characters in their reverse, the combination, with a tablet, of an arm supported to be moved in a plane parallel to one face of the tablet, and having a tracing-point at its end, and an arm connected to the movable arm to move in a plane parallel to the other face of the tablet in conjunction with the tracing-arm, and having a marking-point at its end, as shown and set forth.

2. In an apparatus for producing characters in their reverse, the combination, with a tablet, of an arm supported to be moved in a plane parallel to one face of the tablet, and having a tracing-point at its end, and an arm having a marking-point at its end and connected to be moved in conjunction with the movable arm in a plane parallel to the other face of the tablet, and having a connection with the said arm for being moved toward and from the face of the tablet in a manner corresponding with the motion to and from the tablet of the same, as shown and set forth.

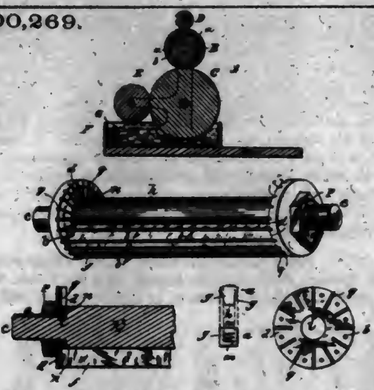
3. The combination, with a tablet or board, A, of bars D D^2, the one pivoted to the other, and the bar D^2 carrying at its end a pencil or tracing point, and the bar D hung to said tablet through a suitable joint, and of bar F, connected to said bar D by a spring-strip, E, and a rod, G, hung to the end d^2 of the bar D, passing to and secured in contact with the said bar F, substantially as described, for the purpose specified.

4. The combination, with a tablet or board, A, of bars D D^2, the one pivoted to the other, and the bar D^2 carrying at its end a pencil or tracing point, and the bar D hung to said tablet through a suitable joint, and of bar F, connected to said bar D by a spring-strip, E, and a rod, G, hung by a swivel-joint to the end d^2 of the bar D^2, passing to and loosely through the end of said bar F_2, and having a thumb-screw, *l*, substantially as described, for the purpose specified.

5. A tablet made hollow or chambered and having a pair of feed-rollers, *p p*, a slot, *s*, and a spring-strip, *v*, in combination with a stand, L, for supporting said tablet, provided with paper-roll H, substantially as described, for the purpose specified.

400,269. ROTARY PRINTING-MACHINE. CHARLES A. THOMPSON, New York, N. Y. Filed May 16, 1887. Renewed Feb. 8, 1889. Serial No. 299,354. (No model.)

400,269.



Claim.—1. In a printing-machine, the type-cylinder consisting of the cylinder having journal-bearings provided with screw-threads and longitudinal grooves *e*, the collars *d d*, having radial-face grooves, and splines *i*, matching the journal-grooves, the clamping-nuts, and the type-confining rules or plates, the latter and the collars being removable for interchangeable parts to suit the desired size and style of type to be used, substantially as described.

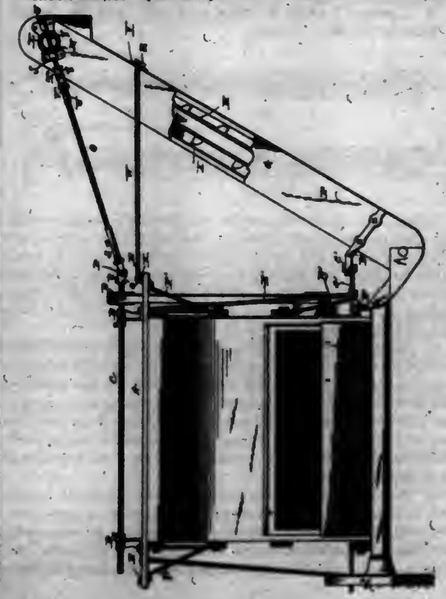
2. In a printing-machine, the type-cylinder having collars at each end, provided with radial grooves on their inner faces, and rules or plates bound within said grooves and maintained in axial alignment by means which clamp and lock the collars to the cylinder, as herein set forth.

3. In a printing-machine, the combination, with a type-cylinder, of an impression-roller, a squeezing-roller, and a tank for containing water, arranged to immerse the lower portion of said impression-roller, substantially as described, for the purpose specified.

4. In a printing cylinder or drum, the combination of a spindle having shoulders near its ends, collars upon the spindle and bearing against the said shoulders and formed with radiating grooves, clamping-nuts upon the ends of the spindle bearing against the collars, and ribs or rules extending longitudinally of the spindle, and having their ends in the grooves of the collars, as shown and set forth.

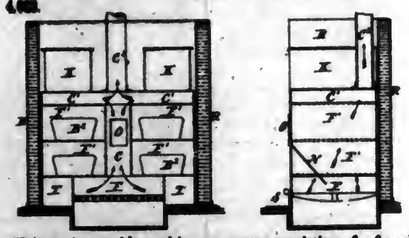
5. The combination of a type cylinder or drum having longitudinal pockets formed by longitudinal and radial partitions or rules, and type having two sides or edges beveled or converging toward the inner end to fit in the pockets, and having the face formed in an arc corresponding to and concentric with the circumference of the drum, as shown and described.

400,270. GRAIN-ELEVATOR ATTACHMENT FOR THRASHING-MACHINES. ELIJU M. THORPE, Wapella, Ill. Filed Feb. 28, 1888. Serial No. 265,606. (No model.)



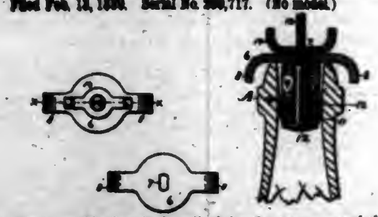
Claim.—A grain-elevator attachment for thrashing-machines, comprising the yoke D', pivoted to a strip, A', the forked brace W, pivoted to a socket-plate at one end and attached to the elevator at the other end, said strip and socket-plate being suitably braced and secured to a thrashing-machine near its top and bottom, respectively, the shaft C, journaled in bearings secured to the separator, the short shaft K of the elevator, the short shaft N, journaled in bearings attached to the side of the elevator, the beveled gear-wheels connecting the shafts K and N, the tumbling-shaft capable of moving longitudinally in the sleeve S, and the universal joints P and T, which respectively connect the shaft C and the shaft N to the tumbling-shaft, substantially as specified.

400,271. PORTABLE COOKING-STOVE. ALFRED S. TOMKINS, Holmwood, Caterham, County of Surrey, England. Filed Nov. 7, 1888. Serial No. 290,294. (No model.) Patented in England Mar. 26, 1888, No 4,022.



Claim.—A portable cooking apparatus consisting of a fire-place, F, flues C and C', chimney C², ovens F', and boilers K, in combination with the water-casing R, substantially as described.

400,272. BOTTLE-STOPPER. JOSEPH A. TRAUT, New Britain, Conn. Filed Feb. 13, 1889. Serial No. 299,717. (No model.)



Claim.—The herein-described bottle-stopper, consisting of the cap-plate provided with an oblong opening and handles, a conical-ended plug, an expansible block, the bolt 12, having a flattened shank, and the thumb-nut 14 secured thereon, substantially as described, and for the purpose specified.

400,273. TABLE IMPLEMENT. LOUIS P. VALIQUET, Brooklyn, N. Y., assignor to Louise W. Strong, same place. Filed Oct. 26, 1887. Serial No. 253,432. (No model.)

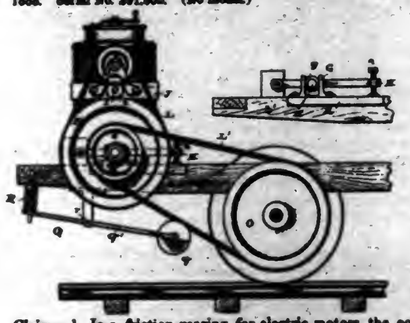


Claim.—1. A table implement consisting of a handle or stem with a hooked jaw fixed thereto, in combination with a sliding rod arranged to slide in said handle, a movable spur fixed on the lower end of said sliding rod, whereby when said rod is depressed said spur is moved toward said fixed jaw, and a retracting-spring in said handle engaging said rod and adapted to draw said movable spur away from said hooked jaw, substantially as set forth.

2. A table implement consisting of a handle or stem with a hooked jaw fixed thereto, said jaw being formed with two tines spread apart, in combination with a sliding rod arranged to slide in said handle, a movable spur fixed on the lower end of said sliding rod, whereby when said rod is depressed said spur is moved toward the space between said tines, and a retracting-spring in said handle engaging said rod and adapted to draw said movable spur away from said hooked jaw, substantially as set forth.

3. The combination of tubular handle A, having recess G, hooked jaw B, fixed to said handle and formed with two tines spread apart, movable spur C, adapted to said fixed jaw and co-operating therewith, rod E, sliding through said handle carrying said movable spur, and having shoulder *a* near its upper end, and retracting-spring F within said recess G, and bearing against the shoulder *a*, whereby said spur C is normally held away from said fixed jaw B, substantially as set forth.

400,274. FRICTION-GEAR FOR ELECTRIC MOTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed July 14, 1887. Renewed Nov. 24, 1888. Serial No. 291,302. (No model.)

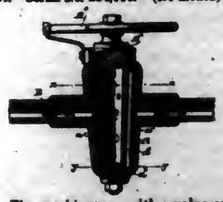


Claim.—1. In a friction-gearing for electric motors, the combination of a friction-pinion on the armature-shaft, a friction-pulley pressed against said pinion from one direction, a friction-pulley separately mounted and pressing thereagainst from another direction, elastic belts passing over both the friction pulleys and acting to hold them against said pinion, a driving-pulley on the counter-shaft, a pulley on the axle to be driven, and belts between the driving-pulley and the axle-pulley, whereby the motion of the armature-shaft is communicated thereto, substantially as described.

2. A gearing for electric motors, comprising a friction-pinion on the armature-shaft, a counter-shaft mounted in movable bearings and adjustable to and from the armature-shaft, a friction-pulley on the counter-shaft engaging the pinion, a friction-pulley independently mounted, and also in contact with the pinion, flexible belts connecting the friction-pulleys and acting to press them oppositely upon the pinion, a driving-pulley also on the said counter-shaft, and connections between the driving-pulley and the axle of the car, substantially as described.

3. In a gear for electric motors, the combination, with the motor having a friction-pinion on its armature-shaft, of a counter-shaft mounted in adjustable bearings, means for adjusting said bearings with respect to the armature-shaft, consisting of a pivoted lever and adjusting-screw, a friction-pulley in contact with the armature-shaft pinion, an additional friction-pulley, also in contact therewith, spring-belting connecting the friction-wheels and acting to press them together upon the friction-pinion, a driving pulley or pulleys also upon said counter-shaft, one or more pulleys on the axle to be driven, and spring-belting extending between the counter-pulley and the pulleys to be driven, substantially as set forth.

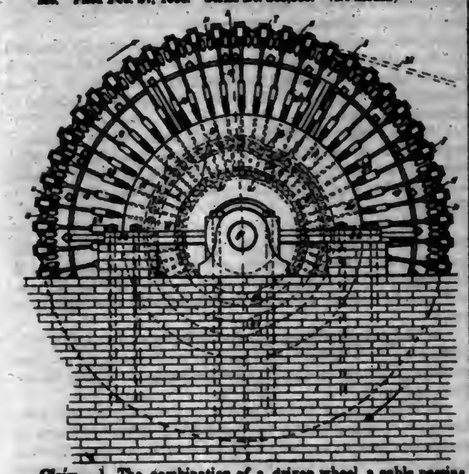
400,275. REGULATING-VALVE. WILLIAM VOGEL, Chicago, Ill., assignor to the Vogel Petroleum Heating Company, same place. Filed Apr. 15, 1887. Serial No. 234,908. (No model.)



Claim.—1. The combination, with a valve-casing provided with a single channel for the passage of the fluid therethrough, of a valve-plug fitted to turn in said casing, and provided with a series of passages of unequal size adapted to be brought separately into register with the said channel of the valve-casing and arranged at such distances apart that one only of the said passages can be brought into register at the same time, a stem extending from the plug for turning the same, and a hand-wheel or other device engaging said stem and carrying figures or characters indicating which of the passages in the plug is in position to give passage to the fluid, substantially as described.

2. The combination, with the valve-casing provided with recesses *a a'*, constituting a single channel for the passage of fluid therethrough, of a hollow valve-plug formed with a plurality of openings of unequal size in the walls thereof, said openings being adapted to be brought separately into register with the recess *a*, and passages extending from the interior of the plug to the recess *a'*, substantially as described.

400,276. GRIP-PULLEY WHEEL. RICHARD P. WALSH, St. Louis, Mo. Filed Feb. 27, 1888. Serial No. 265,262. (No model.)



Claim.—1. The combination of a driven wheel, a cable passing thereabout, clamps carried by said driven wheel, two series of rods connected to said clamps, a guide-wheel holding said rods in position and revolving with said driven wheel, and cams controlling said rods to intermittently clamp the cable to the driven wheel, for the purpose described.

2. The combination of a driven wheel, a cable passing over said wheel, clamps intermittently clamping said cable to said wheel, rods having elastic sockets in them intermediate of their ends, which rods are connected to said clamps, and a disk having cam-grooves controlling said rods, whereby said elastic sockets compensate for any irregularity of adjustment and operation and prevent undue pressure being thrown upon the cable.

3. A grip-pulley wheel having clamps arranged around the periphery thereof, rods connected to said clamps, and a stationary disk with cam-groove controlling said rods, whereby the cam-disk puts on and takes off the clamps.

4. A grip-pulley wheel having clamps arranged around the periphery of said wheel, two rods connected to each clamp, one of which rods throws said clamp in and out of the plane of the cable, and the other of which raises said clamp and draws it down upon said cable, and a disk having cam-grooves controlling said rods.

5. A grip-pulley wheel having clamps pivoted in movable bearings journaled in the periphery of said wheel, a rod connected to the clamp, a second rod connected to said movable bearings, whereby the clamps are swung into and out of the plane of the cable and the cable is clamped and unclamped, and a disk having cam-grooves controlling said rods.

6. A grip-pulley wheel having clamps pivoted in movable bearings journaled in the periphery of said wheel, rods for said clamps, a stationary disk provided with cam-grooves which control said rods, and a guide-wheel revolving with said grip-pulley, substantially as described.

7. The combination, substantially as hereinbefore set forth, of the driven wheel 3, carrying the clamps 7, journaled in the bifurcated piece 9, the rods 13 15, connected to said bifurcated piece 9, and the clamps 7, respectively, a disk having grooves controlling said rods, a cable, and a guide-wheel, 14.

8. The combination, substantially as hereinbefore set forth, of the wheel 3, driven by the gear-wheel 2, the rim 6, carried thereby, the clamps 7, as described, journaled on said rim, the rods 13 15, the guide-wheel 14, mounted on the hub of said wheel 3, a stationary disk carrying the cam-grooves 21 22, controlling said rods, and clamps to intermittently clamp the cable.

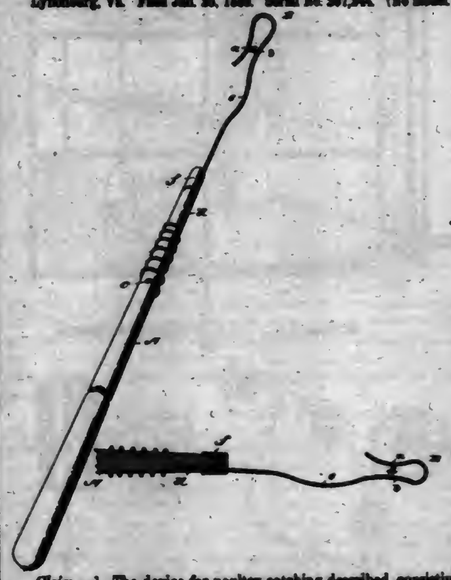
9. The combination, substantially as hereinbefore set forth, of the driven wheel 3, the rim 6, secured to the same, the clamp 7, carried by said rim and mounted in the part 9, the rods 13 and 15, the guide-wheel 14 for said rods, a spring-socket in said rods, rollers carried by said rods at their inner ends, and a cam-disk, 20, bearing the two cam-grooves 21 22, in which said rollers travel, as and for the purpose described.

10. The combination, as hereinbefore set forth, of the wheel 3, clamps 7, pivoted in the bifurcated piece 9, journaled eccentrically in the periphery of said wheel, a rod connected with said bifurcated piece, a rod connected with said clamp, a guide-wheel revolving with the aforementioned wheel, forming bearings for said rods, and a stationary disk having two cam-grooves controlling the two series of rods.

11. The combination of a wheel, as 3, a cable, and a grip-pulley therefor secured directly upon said wheel, for the purpose described.

12. The combination of the spur-wheel 3, a rim, 6, mounted upon said wheel, forming a pulley for a cable, clamps for intermittently clamping said cable to said rim, and a pinion-wheel for driving said spur-wheel intermeshing with the same, substantially as and for the purpose described.

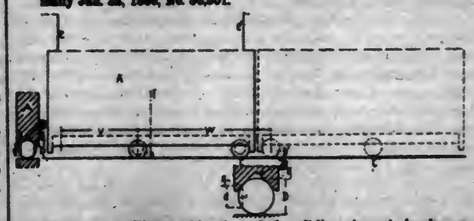
400,277. DEVICE FOR CATCHING POULTRY. JACOB I. WALK, Lynchburg, Va. Filed Jan. 23, 1888. Serial No. 297,244. (No model.)



Claim.—1. The device for poultry-catching described, consisting of the wooden handle A and wire extension B, united by attaching one end of the wire to the handle, winding it around the same, and finally securing it in a groove in said handle, by a band, *f*, substantially as specified.

2. An improved article of manufacture, consisting of a handle, the wire secured thereto, as shown, and having at its outer end a hook with inward bends *a b*, to form a contracted entrance, and also a bend, *c*, adjacent to the hook, substantially as specified.

400,278. DOOR-HANGER. STEPHEN WERNER, Vienna, Austria-Hungary. Filed Apr. 6, 1887. Serial No. 233,903. (Model.) Patented in Austria-Hungary Aug. 6, 1884, No. 17,895 and No. 36,155, and in Germany Jan. 22, 1886, No. 36,501.



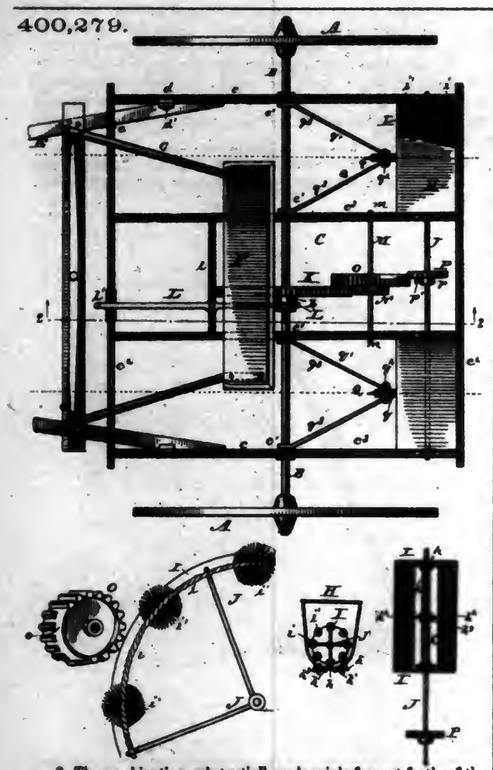
Claim.—1. The combination of the sliding door A, having an angular groove, two balls, *b c*, and a surface supporting the balls, the door straddling the balls with its grooved portion, substantially as and for the purpose described.

2. The combination, with the sliding door A, of a bar, *k*, having an angular groove, two balls, *b c*, and a surface supporting the balls, the said bar *k* straddling the balls with its grooved portion, substantially as and for the purpose specified.

400,279. MACHINE FOR DISTRIBUTING INSECT-POWDER, &c. JAMES H. WHITE, McDonough, N. Y. Filed Sept. 21, 1888. Serial No. 285,973. (No model.)

Claim.—1. The combination, substantially as hereinbefore set forth, of the carrying-wheels, the axle, the main frame or body mounted thereon and free to rock in bearings on the axle, the hopper on the rear end of the frame, the shafts connected to the front end of the frame, the downwardly-extending plates secured to the side beams of the frame and having curved slots, and the bolts adjustable in the slots and connecting the rear ends of the shafts with the plates.

400,279.



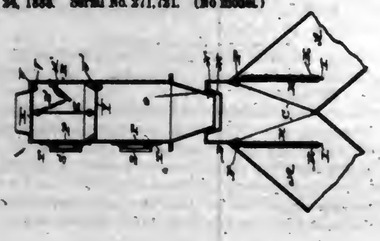
2. The combination, substantially as hereinbefore set forth, of the frame or body, the carrying-wheels, their axle mounted in bearings in the frame or body, the cog-wheel mounted on the axle and adjustable longitudinally thereon, the hopper on the rear end of the frame, the agitator therein, the agitator-shaft, and gearing between the agitator-shaft and the cog-wheel on the main axle.

3. The combination, substantially as hereinbefore set forth, of the main frame or body, the carrying-wheels, their axle, the cog-wheel mounted on the axle and adjustable longitudinally thereon, the hopper on the rear end of the frame, the agitator within the hopper, and the agitator-shaft, the cog-wheel longitudinally adjustable on said shaft and gearing between the cog-wheel on the agitator-shaft and the cog-wheel on the main axle.

4. The combination, substantially as hereinbefore set forth, of the main frame or body, the carrying-wheels, their axle, the cog-wheel longitudinally adjustable on the axle, the hopper on the rear end of the frame, the agitator therein, the agitator-shaft, the cog-wheel on the agitator-shaft, the small cog-wheel engaging with the cog on the main axle, the shaft to which it is secured, and the cog-wheel on said shaft, provided with a continuous series of teeth on one side of its periphery and a broken series of teeth on its opposite side, for the purpose specified.

5. The combination, substantially as hereinbefore set forth, of the hopper having a longitudinal opening at its lower end, the agitator-shaft extending longitudinally through the hopper, the disks mounted thereon, the twisted wires stretched between the disks, and the bristles twisted in with the wires.

400,280. FUEL-FEEDING PIPE. W. ALANSO WILCOX, Grand Rapids, Mich., assignor to Foster Stevens & Co., same place. Filed Apr. 24, 1888. Serial No. 271,731. (No model.)



Claim.—1. The combination of the inclined pipes A, having the shoulders or offsets C at their upper ends, and the valves H, hinged or pivoted in the said pipes and adapted to close against the said shoulders or offsets, substantially as described.

2. The combination of the inclined pipes A, having the shoulders or offsets C at their upper ends, and the valves hinged or pivoted in the said pipes and provided with the packings I, of rubber or suitable material, projecting beyond the edges of the valves and adapted to effect tight joints with the pipes, substantially as described.

3. The combination of the inclined pipes A, the box B, connecting the upper ends of said pipes and forming the shoulders or offsets C, and the valves H, hinged or pivoted in the upper ends of the pipes and adapted to close against said shoulders or offsets, substantially as described.

4. The combination of the box B, having the opening D and the slide or cover for said opening, the pipes A, having their upper ends connected to and communicating with the box, and the valves H, hinged or pivoted in the pipes, adapted to open and close the same and provided with the operating crank-handles G, substantially as described.

5. The double safety-gate for fuel-feeding pipes, having two doors with an air-space between them, said two doors connected and operated simultaneously by one movement in opening and closing, substantially as described.

6. In combination with a double safety-gate for fuel-feeding pipes, such gate consisting of two doors connected together and simultaneously operated by one movement and with an air-space between, a slide or door in the pipe between the two parts of the gate, whereby such intervening air-space can be exposed to the outer air, substantially as described.

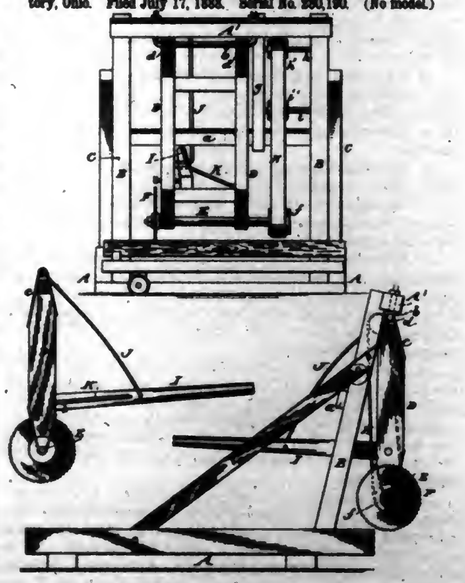
7. The combination, with the box O, of the valves X Y, hinged or pivoted therein and arranged one above the other, and the link arranged within the box O and connecting the said valves, whereby they may be closed simultaneously and caused to form an air-space in the box between them, substantially as described.

8. The combination of the box O, having the opening on one side, the valves X Y, hinged in the said box, one of said valves having the arm W, whereby it may be operated, and the link connecting the said valves, substantially as described.

9. The combination of the box O, having the opening R on one side, the valves X Y, hinged in the said box at a distance apart, for the purpose set forth, the valve A', hinged to one side of the box above the opening R, and the link connecting said valve to the valve X, substantially as described.

10. In fuel-feeding-pipes for furnaces, the two inclined pipes forming branches of the main pipe, each of said inclined pipes having at or near the point of bifurcation an independent valve or gate adapted to close that pipe and direct the entire current of air through the other, said gates also adapted to be both opened at the same time entirely out of the passage-way, substantially as described.

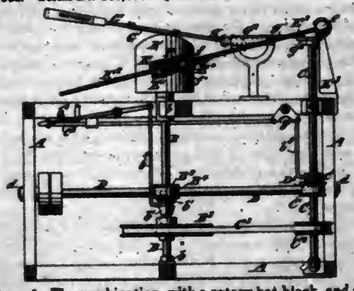
400,281. SWINGING SAW. EDWARD R. WILLIAMS, Mount Victory, Ohio. Filed July 17, 1888. Serial No. 280,190. (No model.)



Claim.—1. The combination, with the upright frame, the ball *b*, and the saw-frame pivotally supported at its upper end on said ball and carrying the saw, of the lever attached at one end to the cross-bar of the saw-frame, the inclined brace-rod J, attached at one end to said lever and at its other end to the said ball, and the horizontal brace-rod K, extending at substantially right angles to the brace-rod J and attached at one end to the lever and at its other end to one of the side bars of the saw-frame, substantially as and for the purpose specified.

2. The combination, with the upright frame, the ball *b* on the under side of the top cross-bar of said frame, and the saw-frame pivotally supported at its upper end on said ball, of the shaft A, arranged eccentric to the line of said ball, the saw-arbor carried by the saw-frame, the pulley *f* thereon, the pulley *h'* on the shaft *h*, and the belt connecting and passing over said pulleys, substantially as shown and described.

400,282. MACHINE FOR POUNCING HATS. JOHN C. WILSON, Yonkers, N. Y., assignor to John T. Waring, same place. Filed July 19, 1888. Serial No. 280,404. (No model.)



Claim.—1. The combination, with a rotary hat-block, and a roller having a pouncing-surface, and which is free to be rotated by contact with the rotating hat on said block, of an elastic pouncing-pad and a movable support common to both said roller and pouncing-pad, whereby said roller and pouncing-block may be together moved toward and from the rotary hat-block, substantially as and for the purpose herein described.

2. The combination, with a rotary hat-block and pouncing-roller, of a movable support for the said roller, and an elastic pouncing-pad carried by said support in such relation to said roller that in the movement of the said roller toward the hat on the block the said pad will first reach the hat, substantially as herein described.

3. The combination, with a rotary hat-block, and a roller having a pouncing-surface, and which is free to be rotated by contact with a hat on said block, of a movable support for the said roller, and an elastic pouncing-pad carried by said support in such relation to said roller that when not subjected to pressure toward the hat-block it may hold the said roller out of contact with the hat thereon, but when pressed against the hat may permit the roller also to come in contact therewith, substantially as and for the purpose herein described.

4. The combination, with a rotary hat-block, and a roller having a pouncing-surface, and which is free to be rotated by contact with a hat on said block, of a movable holder for said roller, and an elastic pouncing-pad connected with said holder in a position which brings a portion of the surface of said pouncing-pad nearer than the periphery of the said roller to the hat-block, substantially as and for the purpose herein described.

5. The combination, with a rotary hat-block, a pouncing-roller capable of being rotated by contact with a rotating hat on said block, of a pouncing-pad, and a holder for said roller and pad, and means, substantially as herein described, for changing and securing the positions of the said pouncing pad and roller relatively to each other in said holder, substantially as herein described.

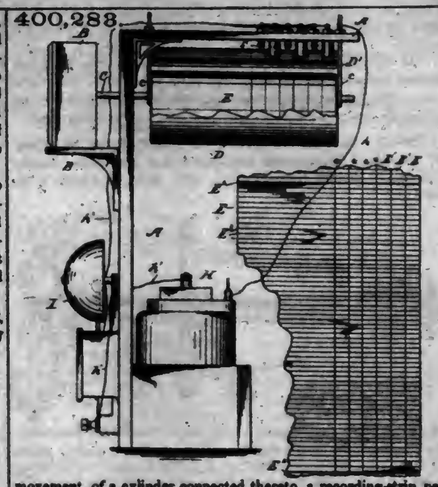
6. A pouncing-pad for pouncing hats, having an elastic flexible portion projecting beyond the body of said pad and capable of bending over the said body, substantially as and for the purpose herein described.

7. The combination, with a rotary hat-block, a pouncing-roller which is free to be rotated by contact with a hat on such block, and a pouncer having a reciprocating motion, of two separate hand-levers, one for carrying said roller and the other for carrying said reciprocating pouncer, substantially as herein described, whereby the said roller and reciprocating pouncer may be manipulated together or separately, as herein set forth.

400,288. TIME-RECORDER. HARVEY R. ADAMS, Marseilles, Ill. Filed Apr. 16, 1888. Serial No. 270,853. (No model.)

Claim.—1. In a time-recorder, the combination, with a clock-movement, of a cylinder connected thereto, a recording-strip passing over said cylinder and moving with the same, independent recording-levers for marking or perforating the recording-strip, and independent keys which engage their respective levers to operate the same both when inserted and when withdrawn, substantially as and for the purposes specified.

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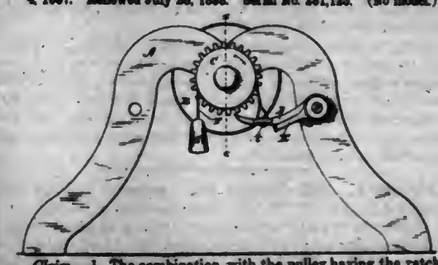


2. In a time-recorder, the combination, with the clock-movement, of a cylinder connected therewith, a suitably-divided recording-strip passing over said cylinder, a series of recording-levers arranged to mark or perforate the recording-strip at different distances from its lateral edges, the slotted sleeves into which the ends of said levers extend, and independent keys, one for each lever, adapted to fit the corresponding slotted sleeves, and when inserted therein to engage with and operate the recording-levers both when inserted and when withdrawn, substantially as and for the purposes specified.

3. In a time-recorder, the combination, with the clock-movement, the cylinder connected thereto, and the recording-strip passing over said cylinder, of the levers F, each provided with a tail-piece, F^2, pivoted to yield downward, but not upward, a suitable fulcrum for said tail-piece when depressed, the slotted sleeve F^3, into which the end of said tail-piece projects, and a spring-key, G, having cam or enlargement *g'* to engage the end of said tail-piece both when inserted and when withdrawn, substantially as and for the purposes specified.

4. In a time-recorder, the combination, with the clock-movement, of the cylinder connected thereto and provided with a covering of tin-foil or other conductive material, a suitably-divided recording-strip of paper or other non-conductive material passing over and actuated by said cylinder, a series of recording-levers, each provided with a point constructed of conducting material, keys for operating said levers to cause them to pierce the recording-strip and come in contact with the conducting-surface of the cylinder, a battery or other source of electricity, one pole of which is connected to the cylinder and the other pole of which is connected to each of the lever-points, and an alarm or bell arranged in the circuit and adapted to operate when the circuit is closed, substantially as and for the purposes specified.

400,284. DEVICE FOR PREVENTING THE BACKWARD MOVEMENT OF MACHINERY. JAMES A. ALLEN, Adams, Mass. Filed Oct. 4, 1887. Renewed July 26, 1888. Serial No. 281,123. (No model.)



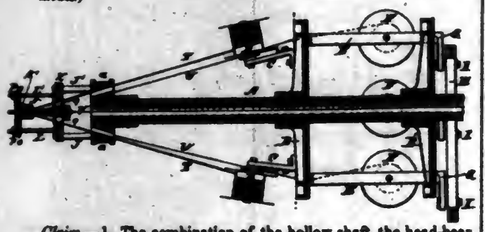
Claim.—1. The combination, with the pulley having the ratchet-teeth, of the pawl, the belt or strap, and the weight, substantially as described.

2. The combination, with the pulley having the ratchet-teeth, of

the pawl, the belt or strap, the weight, and the stop E, substantially as described.

3. The combination, with the pulley and ratchet, of the strap held in frictional contact with the pulley, the pawl attached to one end of the strap and the counterbalancing weight to the other, and the stop for limiting the movement of the pawl, substantially as described.

400,285. MACHINE FOR MAKING STRANDS FOR WIRE ROPES, &c. THOMAS C. BARRACLOUGH and JOHN F. KAY, Manchester, County of Lancaster, England. Filed Nov. 13, 1886. Serial No. 218,305. (No model.)



Claim.—1. The combination of the hollow shaft, the head-bearing, the lay-plate, the guide-ring Q, the dies, and the conical nozzle supported between the dies and the lay-plate, substantially as set forth.

2. The combination of the hollow shaft, the lay-plate carried by said shaft, the die-studs having their inner ends fastened to the lay-plate, the cross-bar adjustably held upon the free ends of the die-studs, the dies, and the conical nozzle supported between the lay-plate and said dies, substantially as shown and described.

3. The combination of the hollow shaft and the head-bearing, the lay-plate, the guide-ring, the dies, and the conical nozzle carried by one end of the hollow shaft, the two rings keyed near the opposite end of said shaft, the brackets having bobbin-supporting arms fastened to the inner ring, the fliers having corresponding bobbin-supports journaled between the rings, and means, as the cranks and crank-ring, for moving said fliers about their axis, substantially as and for the purpose described.

400,286. TOOL-HOLDING BOX. GEORGE H. BARTLETT, Short Hills, N. J. Filed Oct. 29, 1888. Serial No. 289,490. (No model.)



Claim.—1. A tool holder or receptacle provided with a plurality of cells or compartments, combined with a recessed cover, a rod rigidly attached to the cover, and a second rod having pivotal or hinged connection with the rod first mentioned, said tool holder or receptacle being provided with a guide for the rods adapted to engage both of the same when the latter are in alignment with each other and the cover is in place upon the receptacle, substantially as described.

2. A tool holder or receptacle consisting of a block of wood provided with a plurality of cells or compartments, combined with a recessed cover, a rod rigidly attached to the said cover, and a second rod having pivotal or hinged connection with the rod first mentioned, said block being provided with internal guide-apertures adapted to receive both of said rods when the latter are placed in alignment with each other, substantially as described.

3. A tool holder or receptacle comprising a plurality of slabs or layers grooved upon their adjacent faces to form a series of cells or compartments to receive the tools, a recessed cover, a rod rigidly attached to said cover, and a second rod hinged or pivoted to the said rod first mentioned, said slabs or layers being provided also with grooves upon their adjacent faces, which form a recess to receive said rods, substantially as described.

400,287. TOOL-HOLDING BOX. GEORGE H. BARTLETT, Short Hills, N. J. Filed Oct. 29, 1888. Serial No. 289,491. (No model.)

Claim.—1. As a novel article, a tool holder or receptacle consisting of two exterior slabs or layers provided with grooves upon their inner faces which terminate short of the lower ends of the said slabs or layers, and one or more intermediate layers provided with similar grooves upon both faces, said layers being secured together with the grooves therein opposite each other to form a series of compartments

400,287.



or cells, and a cover connected with the upper end thereof, said cover being recessed in its inner face to receive the ends of the tools which project from the compartments or cells, substantially as described.

2. As a novel article, a tool holder or receptacle consisting of two exterior slabs or layers grooved upon their inner faces, and one or more intermediate layers grooved upon both faces, said layers being secured together with the grooves therein opposite each other to form a series of straight rows of compartments or cells, and a cover provided on its inner face with a plurality of grooves arranged severally over the rows of compartments or cells, and forming recesses to receive the ends of the tools which project from said compartments or cells, substantially as described.

3. A tool holder or receptacle consisting of a wooden block provided with a plurality of cells or compartments, combined with a recessed cover and a cylindric rod attached to the cover and fitting and sliding within a guide-recess formed in the said block, substantially as described.

4. A tool holder or receptacle provided with a plurality of compartments or cells, combined with a recessed cover, a cylindric rod rigidly attached to the cover and having sliding and rotating connection with the receptacle, and a second shorter rod secured in said cover and having sliding connection with the receptacle, substantially as described.

5. A tool holder or receptacle comprising a plurality of slabs or layers grooved on their adjacent faces to form a series of cells or compartments to receive the tools, a cover, and a cylindric rod rigidly attached to the cover, said slabs or layers being provided also with grooves upon their adjacent faces, which form a guide-recess to receive said rod, substantially as described.

400,288. TOOL-HOLDING BOX. GEORGE H. BARTLETT, Short Hills, N. J. Filed Jan. 31, 1889. Serial No. 298,195. (No model.)



Claim.—1. As a novel article, a tool-holding box or receptacle consisting of a block formed of a plurality of slabs or layers provided with grooves upon their adjacent faces, said layers being secured together with the grooves therein opposite each other to form a series of compartments or cells, and a series of plugs inserted in the said grooves at the lower end of said block to close the lower ends of the compartments or cells therein, substantially as described.

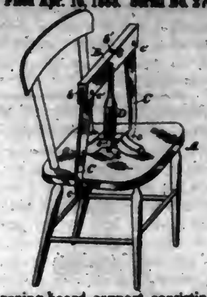
2. As a novel article, a tool-holding box or receptacle consisting of a block formed of a plurality of slabs or layers provided with grooves upon their adjacent faces, said layers being secured together with the grooves therein opposite each other to form a series of compartments or cells, and a series of plugs inserted in said grooves at the lower end of said block to close the lower ends of the compartments or cells therein, said plugs being made of unequal lengths, substantially as described.

400,289. SASH-FASTENER. ALBERT H. BENDER, Manhattan, Kans. Filed Nov. 16, 1888. Serial No. 290,294. (No model.)



Claim.—In a sash-fastener operated by a key, the escutcheon indented or hollowed to receive a nut screwed onto the body of the key and provided with slots, into which to insert lugs on the end of the detachable key-stem, substantially as shown and described.

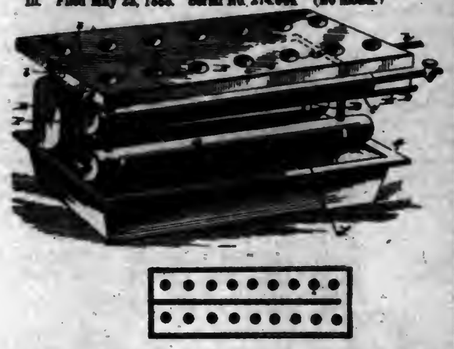
400,290. SUPPORT FOR IRONING-BOARDS. WILLIAM R. BURRT, Williamsport, Pa. Filed Apr. 16, 1888. Serial No. 270,897. (No model.)



Claim.—1. An ironing-board support consisting of a top piece having a hooked arm pivotally secured at each end and a central brace adapted to be raised or lowered, substantially as described.

2. The ironing-table support herein described, consisting of the top piece, B, straight-edged on its upper side, the hooked arms C, pivotally attached at its ends, the shaft D, movable up and down in said top piece, and the brace E, pivotally attached to its end, substantially as described.

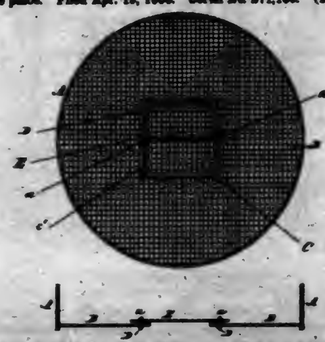
400,291. RETORT VAPORIZER AND SUPERHEATER. STELLA D. BIDDISON, Fort Worth, Tex., assignor to Samuel M. Biddison, Chicago, Ill. Filed May 23, 1888. Serial No. 274,644. (No model.)



Claim.—1. As an improvement in retort-vaporizers, the combination, with the series of pipes, of the upper horizontally-disposed spreader and superheater arranged over said pipes and divided into two chambers communicating at one end, and having a series of holes or apertures extending through said chambers, substantially as set forth.

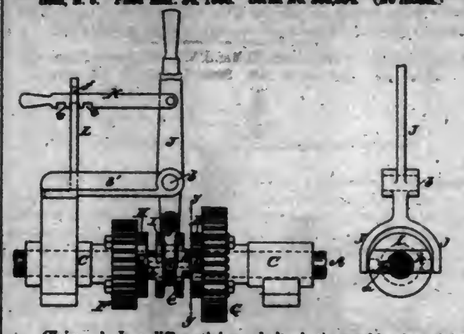
2. The combination, with the boiler and the oil and vapor pipes, of the upper horizontally-disposed spreader and superheater divided by a central partition into two communicating chambers and having a series of vertical holes or apertures extending therethrough, and the short pipes connecting said oil and vapor pipes with said spreader and superheater, substantially as set forth.

400,292. DEVICE FOR MENDING SIEVES. EDWARD A. DOLAN, Hamilton, Ontario, Canada, assignor of one-half to William L. Venster, same place. Filed Apr. 19, 1888. Serial No. 271,189. (No model.)



Claim.—An article of manufacture—to wit, a patch for mending holes in sieve fabrics, comprising a piece of wire-netting, a frame, D, thereto formed with projecting loops *a*, and a rod or wire, F, for securing said frame and netting in place, substantially as and for the purpose specified.

400,293. DIFFERENTIAL SPEED-CLUTCH. JOHN BROOKS, Plainfield, N. J. Filed Mar. 24, 1888. Serial No. 268,264. (No model.)

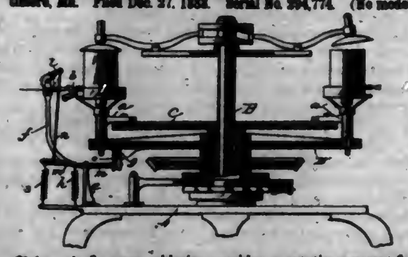


Claim.—1. In a differential speed-clutch, the combination of the differently-proportioned fast and loose companion gears located, respectively, upon the driving and driven shafts, opposite clutch-disks upon the loose gears, having grooves located upon the faces of the said opposite disk, the sliding clutch-collar that is operative between said loose gears, having transverse ribs intersecting the grooves eccentrically to their axis, and adapted thereby to interlock at a single point of revolution of the adjacent disks, as and for the purposes set forth.

2. The combination, with the loose gears of the herein-described differential speed-clutch mechanism, of the clutch-disks rotatively adjustable thereupon to engage at different points with the sliding clutch-collar, as set forth.

3. The combination, with the loose gears of the herein-described differential speed-clutch mechanism, of the rotatively-adjustable clutch-disks thereon, the concentric slots extending through said loose gears, and the clamping-bolts projected from the disks through said slots, adapted to secure them at variable points of adjustment, as described.

400,294. CAN-SOLDERING MACHINE. WILLIAM D. BROOKS, Baltimore, Md. Filed Dec. 27, 1888. Serial No. 294,774. (No model.)



Claim.—1. In a can-soldering machine, a rotating support for the can-carriers, means for revolving the cans carried by the said carriers, solder-feeding devices supported in line with the carriers, a movable support for said feeding devices, and means for moving the support to and from the table, substantially as described.

2. In a can-soldering machine, a plurality of solder-feeding devices, movable supports for said devices, means for moving said supports, and means for operating the feeding devices of the series simultaneously, substantially as described.

3. In a can-soldering machine, a solder-feeding device, a movable support therefor, means for automatically moving the feeding device forward, and means for feeding the solder at the same time, substantially as described.

4. In a can-soldering machine, a plurality of solder-feeding devices, movable supports for the same, connections from one of said supports and from one of said feeding devices to the machine for automatically operating the same, and intermediate connections from said support and said feeding devices to the other supports, and feeding devices of the series for operating the same by the operation of the first-named support and device, substantially as described.

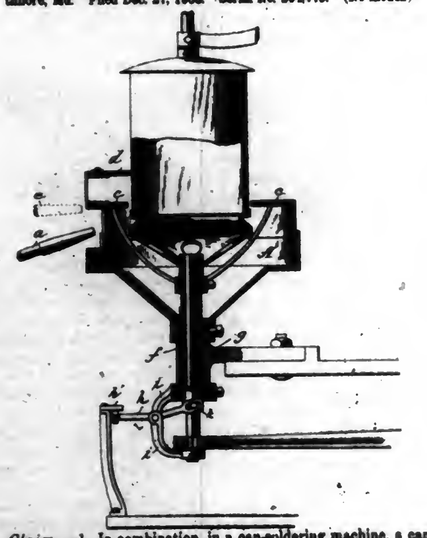
5. In a can-soldering machine, a rocking support for the solder-feeding devices, consisting of an arm, *f*, a solder-feeding device carried on the upper end thereof, a cam on the master-wheel for operating the arm *f*, a cam, *o*, and connections from said cam to the solder-feeding devices, substantially as described.

6. In combination with a can-seat, a plate, *c*, arranged above the

level of the said seat, a bulge formed on said plate, and an opening through the center of the bulge for applying solder to the can, substantially as described.

7. In combination with a revolving can-seat, a flame-chamber therefor, the top plate, *c*, of which is slightly above the level of the seat, a bulge formed on said top plate, and an opening through the same for directing solder to the can, substantially as described.

400,295. CAN-SOLDERING MACHINE. WILLIAM D. BROOKS, Baltimore, Md. Filed Dec. 27, 1888. Serial No. 294,775. (No model.)



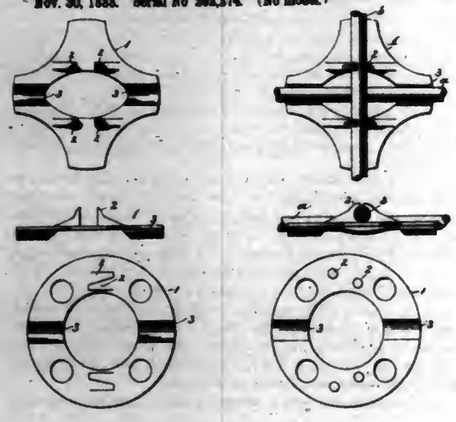
Claim.—1. In combination, in a can-soldering machine, a can-seat, solder-feeding devices, a flame-chamber, a flame-tube, *a*, for directing heat to the flame-chamber, a second flame-tube arranged above the level of the first for applying heat to the periphery of the can, a segmental shield supported from the upper plate of the flame-chamber, and a solder-tube arranged on approximately the same level as the second flame-tube, substantially as described.

2. In combination, in a can-soldering machine, a can-seat, a vertically-movable plate, *c*, a series of heating devices having their flame-tubes below the level of the plate *c* in its raised position, and solder and heating tubes arranged upon a higher plane than the flame-tubes of the heating-stations, substantially as described.

3. In combination, a can-seat, a vertically-movable plate, *c*, a series of heating devices having their flame-tubes below the level of the plate *c*, a segmental shield on said plate, and flame and solder tubes in approximately the same horizontal plane and in line with the edge of the can to be soldered, substantially as described.

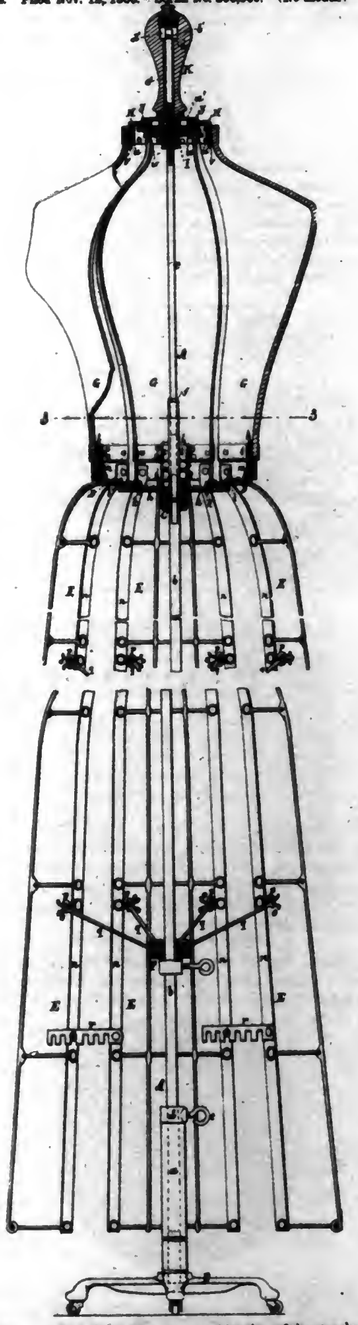
4. In combination, a can-seat, a flame-chamber, a vertically-movable plate, *c*, forming the upper part of the flame-chamber, and means for raising said plate, consisting of a cam, *N*, the sleeve *f*, and connections between the sleeve and cam, substantially as described.

400,296. CLAMP. GEORGE F. BROTT, Washington, D. C. Filed Nov. 30, 1888. Serial No. 292,574. (No model.)



Claim.—A clamp for securing crossed wires together by clasping only one of them, consisting of a plate provided on its rear side with projections for clasping around the rear wire on both sides of the crossing-point of the wires, and having a groove also in its rear side, for the reception of the front wire on both sides of said crossing-point, substantially as described.

400,297. DRESS-FORM. FREDERICK W. BROWN, Cambridgeport, Mass. Filed Nov. 12, 1888. Serial No. 290,569. (No model.)



Claim.—1. In a dress-form, the combination of the standard made in sections detachable from each other and from the foot, as described, with the flanged collar C, secured to one of said sections and provided

with arms *h*, slotted and having at their outer ends projections *i*, and the skirt-sections provided with the slotted arms D, the projections *i* being to enter the slots in the arms D, and the arms D having the projections *k* to enter the slots in the arms *h*, all essentially as shown and set forth.

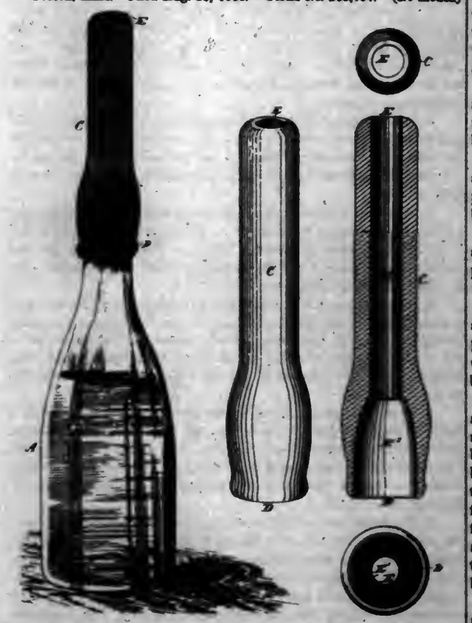
2. In a dress-form, the combination of the standard made in sections detached from each other and from the foot, as described, with the flanged collar C, secured to one of said sections and provided with arms slotted and having the projections *i*, and the skirt-sections having the extension-arms D, also slotted and provided with the projections *k* and *l*, the former, *k*, to enter the slot in the arms *h*, and the latter, *l*, to enter sockets in the skirt-section and waist-sections of the form to support the same, all essentially as shown and set forth.

3. In a dress-form, the standard made in sections detachable each from the other, the collar C, fixed to one of the said sections and provided with arms *h*, slotted as shown, and having the projections *i*, in combination with the skirt-sections provided with the arms D, slotted and having the projections *k* and *l*, the sockets *m*, and with the notched arms *r* and headed studs *s* for connecting the said sections to each other, all substantially as shown and set forth.

4. The knob K, provided with the flange *d'*, and having a passage through it to receive the upper end portion of the standard, also a groove, *e'*, leading out of said passage, and a chamber, *d'*, communicating with said passage and groove, in combination with the standard provided with the stud *b'*, and having fixed to it the collar I, with the slotted arms *x* and projections *y*, the slotted arms H, having the downward projections *v* and *w*, the former entering the sockets *u* in the form-sections and the latter the slots in the said arms *x*, the flange of said knob bearing on said arms H, and the stud *b'* resting on the bottom of chamber *d'*, all substantially as shown, and for the purpose described.

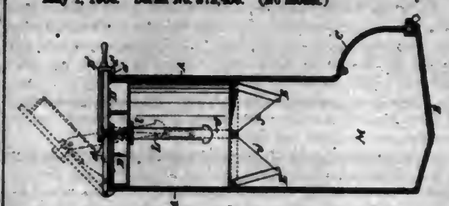
5. In a dress-form, the standard-made sections, detachable each from the other and from the foot, for the purpose described, the collar C, fixed to one of said sections and provided with arms slotted, as shown, and having projections *i*, and the arms D, slotted, and having the projections *k* and *l*, in combination with the skirt-sections provided with sockets *m* and spring-catches *o*, the rods *g*, pivoted to a collar on the standard and connected to the said spring-catches, and the said collar F, adjustable on the standard, all essentially as shown and set forth.

400,298. VETERINARY DRENCHER. CHARLES C. CARRASCO, Boston, Mass. Filed Aug. 25, 1888. Serial No. 283,797. (No model.)



Claim.—An elastic rubber nipple for administering medicines and liquids to horses and other dumb animals, consisting of a cylinder with rounded edges and an enlarged end, and having a circular opening or cavity, E E, through its entire length, said opening being enlarged at one end, E', to receive the neck of a bottle, all as shown and described in the accompanying drawings and specification.

400,299. LETTER-BOX. THOMAS C. CHAPPELL and EVERETT D. MOORE, Baltimore, Md.; said Moore assignor to said Chappell. Filed May 1, 1888. Serial No. 272,453. (No model.)



Claim.—1. A box for the reception of mail-matter, in combination with a cover provided with locking mechanism, and a false bottom also provided with locking mechanism, and means for unlocking the cover and closing and locking the false bottom simultaneously.

2. A box for the reception of mail-matter, in combination with a cover provided with locking mechanism, a false bottom also provided with locking mechanism, and means for locking the cover and unlocking the false bottom simultaneously.

3. A box for the reception of mail-matter, in combination with a cover which is provided with locking mechanism, and a false bottom also provided with locking mechanism, and mechanism attached to the false bottom and controlling the locking mechanism of the cover and false bottom, whereby from the exterior of the box the false bottom may be closed and locked and the cover unlocked simultaneously, or the cover when closed may be locked and the false bottom unlocked and opened simultaneously.

4. A box for the reception of mail-matter, in combination with a cover which is provided with locking mechanism, and a false bottom also provided with locking mechanism, and a lever suitably pivoted to a part of the box attached to the false bottom and controlling the locking mechanism of the cover and false bottom, whereby from the exterior of the box the false bottom may be closed and locked and the cover unlocked simultaneously, or the cover when closed may be locked and the false bottom unlocked and opened simultaneously.

5. A box for the reception of mail-matter, in combination with a cover and a false bottom and a lever suitably pivoted to a part of the box and attached to the false bottom, and a locking mechanism for the false bottom which operates automatically to lock the false bottom when it is raised and closed, and a locking mechanism for the cover controlled by the lever by which the false bottom is raised, in such a manner that the cover will be unlocked when the lever has raised the false bottom and its locking mechanism has locked it, substantially as described.

6. A box for the reception of mail-matter, in combination with a cover provided with locking mechanism, and a false bottom also provided with locking mechanism, and means for locking the false bottom by mechanism which operates to unlock the cover.

7. A box for the reception of mail-matter, in combination with a cover provided with locking mechanism, and a false bottom also provided with locking mechanism, with means for locking the false bottom operated by the same mechanism which unlocks the top.

8. A box for the reception of mail-matter, in combination with a cover provided with locking mechanism, and a false bottom also provided with locking mechanism, and means for locking the cover when closed by mechanism which operates to unlock the false bottom.

9. A box for the reception of mail-matter, in combination with a cover provided with locking mechanism, and a false bottom also provided with locking mechanism, and means for locking the cover when closed operated by the same mechanism which unlocks the false bottom.

10. A box for the reception of mail-matter, in combination with a cover, and provided with locking mechanism which consists of a rod secured thereto, and a bolt suitably located on the interior of the box in position to engage said rod and lock the cover, and a false bottom also provided with a rod secured thereto and operating within the box and connected with a bolt engaging said rod, whereby the false bottom when closed may be locked, and means connected to the false-bottom rod whereby the false bottom may be raised and locked, and means secured to or operated by the false-bottom rod whereby the locking mechanism of the cover will be released when the false bottom has been raised and locked, substantially as described.

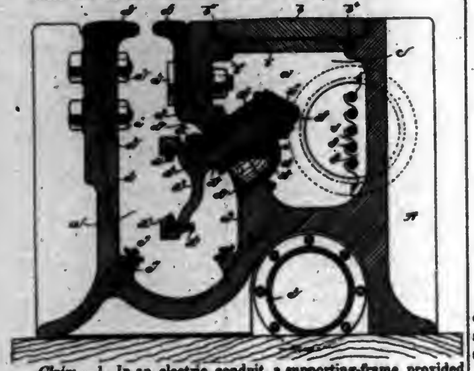
11. A box for the reception of mail-matter, in combination with a cover which is provided with locking mechanism, which consists of a rod secured to the cover, and a bolt suitably mounted on the interior of the box in position to engage the hole in or offset upon said rod, whereby the cover may be locked, and a false bottom also provided with a rod, and a bolt suitably located on the interior of the box in position to engage a hole in or projection upon said rod, whereby the false bottom may be locked when closed and a lever pivoted to a

suitable part of the box and attached to the false bottom, and mechanism operated by said lever whereby, when the false bottom is closed and locked, the cover will be unlocked.

12. A box for the reception of mail-matter, in combination with a false bottom provided with a rod which engages a bolt suitably located within the box to engage a hole in or projection upon said rod and lock the false bottom when closed, a cover for said box also provided with a rod, and the bolt suitably located within said box to engage a hole in or projection upon said rod, and means operated by the cover whereby the false bottom will be unlocked and opened when the cover is closed and locked.

13. A box for the reception of mail-matter having an opening in the bottom and a door hinged to one side of said opening, the two opposite sides of the box between which the door swings extending below the level of the other two sides and being provided with devices to limit the fall of the door, substantially as described.

400,800. ELECTRIC CONDUIT. HENRY A. CHASE, Boston, Mass. Filed Nov. 30, 1888. Serial No. 292,172. (No model.)



Claim.—1. In an electric conduit, a supporting-frame provided with a division-wall having an opening and forming within the said frame a slot-chamber and an accessible chamber, a removable cover for said accessible chamber, and end walls for said chamber provided with an opening, as c', whereby communication may be established between the accessible chambers of adjacent supporting-frames, substantially as described.

2. In an electric conduit, the combination, with a series of supporting-frames, each provided with a slot-chamber and an accessible chamber in communication with each other, of slot-rails secured to said supporting-frame, and a pipe, as c^3, secured to the said frames to establish communication between the accessible chambers of the said supporting-frames, substantially as described.

3. In an electric conduit, the combination, with a conductor, of an insulator therefor, and a hydrocabon-barrier carried by the said insulator, whereby leakage of current is obviated, substantially as described.

4. In an electric conduit having a slot-chamber and an accessible chamber provided with ledges b^3 b^3 in communication with the said slot-chamber, a removable cover for said accessible chamber resting upon said ledges and provided with a circumferential groove, and a band, b^4, of packing material located in said groove and bearing against the walls of the said accessible chamber, whereby a water-tight joint is effected without the use of bolts, &c., substantially as described.

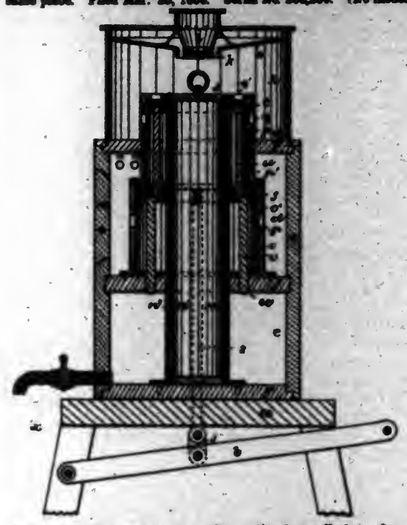
5. In an electric conduit, a slot-chamber and an accessible chamber communicating with the said slot-chamber and provided with a removable cover, and a conductor in said slot-chamber, combined with an insulator to support said conductor and with a hydrocarbon-barrier carried by the said insulator, whereby leakage of current is prevented, substantially as described.

6. In an electric conduit, a series of supporting-frames, each having a slot-chamber having its walls provided with shoulders, combined with slot-rails having slots 40 in their web, which rest on the said shoulders, and secured to the said walls, substantially as described.

7. In an electric conduit, the herein-described supporting frame or casting formed in one piece, and having the intermediate wall, a^3, provided with an opening, and forming with the walls of the said frame or casting a slot-chamber and accessible chamber, the bottom of the accessible chamber extending to substantially near the bottom of the casting, whereby increased space is obtained in the accessible chamber, substantially as described.

8. In an electric conduit, a slot-chamber and an accessible chamber communicating with the said slot-chamber and provided with a removable cover, and a conductor in said slot-chamber, combined with an insulator to support said conductor having a trough, and with an oil located in said trough, substantially as described.

400,801. WATER RENOVATING AND PURIFYING DEVICE. LEWIS S. GROSSMEYER, Newark, N. J., assignor to Carrol Phillips Bassett, same place. Filed Mar. 23, 1888. Serial No. 268,269. (No model.)



Claim.—1. The combination, with a filtering-cylinder, of a case or structure having an unfiltered-water chamber, an air-chamber, and a filtered-water chamber formed thereabout in a series, substantially as and for the purposes set forth.

2. In a filter, in combination, a cylindrical filter forming the vertical chamber *a*, around which is formed an outer chamber, *p*, and a piston-head adapted to force the water through the said cylinder into the said chamber *a*, and means for operating said piston-head, substantially as and for the purposes set forth.

3. In combination, in a case, *e*, having partitions *f* and *g*, forming chambers *h*, *d*, and *e*, a porous pipe or cylinder extending through said partition into said chambers, cylinders *o p*, piston-heads *s t*, and means, as described, for operating said piston-heads, whereby water and air are forced through said porous pipe, substantially as and for the purposes set forth.

4. In combination with a partitioned case having a series of chambers therein and a porous cylinder or pipe extending into or through said chambers, suitable cylinders, *o p*, and piston-heads for forcing air and water through said porous pipe, substantially as and for the purposes set forth.

5. In a filter, the combination, with a porous pipe or cylinder and a piston-head working thereon, and a suitable co-operating cylinder, of a perforated facing providing a bearing or wearing surface for said piston and adapted to allow the passage of water to said porous pipe or cylinder, substantially as set forth.

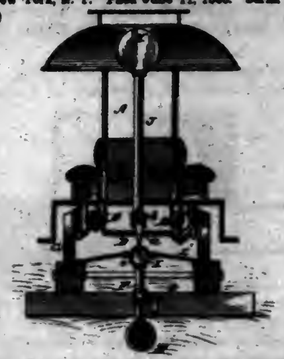
6. In combination with a case having unfiltered and filtered water chambers and an air-chamber, a porous pipe or cylinder extending through or into said chambers, suitable cylinders, piston-heads, and a rod or rods for operating said heads, and a hand-lever, all said parts being arranged and adapted to operate substantially as and for the purposes set forth.

7. In combination, a suitable case partitioned off to provide a filtered-water chamber at the bottom, an unfiltered-water chamber above, and an intermediate air-chamber, porous media forming walls for said chambers, and means for forcing air through said filtering media into contact with water filtered from the upper chamber, substantially as set forth.

8. In combination, a suitable casing having a filtered-water chamber, an air-chamber, and an unfiltered-water chamber, and a chamber formed by porous walls extending vertically through or into said chambers, and a coagulant-chamber adapted to supply coagulating material to the unfiltered water, and piston-heads and suitable cylinders therefor for forcing the unfiltered water supplied with coagulant through said porous walls and into said filtered-water chamber, a lever, and means for connecting said piston-head with said lever, substantially as set forth.

9. The improved water-renovator, combining therein a case partitioned off into a filtered-water chamber, and air-chamber, an unfiltered-water chamber and a coagulant-chamber, a porous pipe or cylinder, cylinders *o p*, having openings *r* and *q q'*, piston-heads *s* and *t*, connecting-rods, a lever, links connecting said connecting-rods with said lever, suitable openings in said case to allow the introduction of air and ice into said air-chamber, and a faucet for drawing off the pure water, as and for the purposes set forth.

400,802. AUTOMATIC AIR-SUPPLY FOR PROPELLING CARS. JOHN T. CLARK, La Grange, Ga., assignor of three-fourths to Lonsdine C. Pressley, New York, N. Y. Filed June 11, 1888. Serial No. 276,780. (No model.)



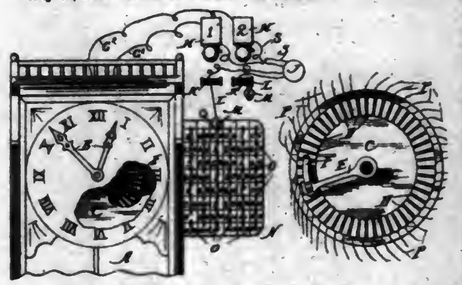
Claim.—1. The combination, with a continuous air-pipe, E, of valved branches F G, arranged at intervals along the same and terminating in slotted valve-sections I, bent downwardly at their ends and provided with a longitudinal slot-valve composed of continuous elastic flaps, substantially as shown and described.

2. The combination, with a car having a compressed-air reservoir and a mouth-piece, *a*, leading therefrom and projecting below the car, of the underground pipe E, having branch pipe F, with stop-cock or valve G, the slot-valve I *e*, with flexible strips *c c*, the brace-arms I', connecting the slot-valve to the rails, and the brace-arms H, connecting the slot-valve to the pipe E, substantially as and for the purpose described.

400,803. PRESERVING COCOANUT. WILLIAM P. CLOTWORTHY, Baltimore, Md. Filed Jan. 19, 1889. Serial No. 296,855. (No specimens.)

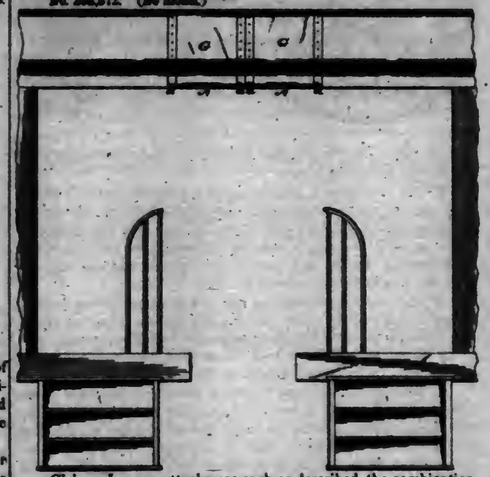
Claim.—The method of preparing the kernel of the cocoanut for preservation and storing by granulating it and then torrefying in a metal cylinder which is revolved over a moderate fire, and when cool adding for every pound of the roasted meat a solution of ten grains of salicylate of soda dissolved in one ounce of absolute alcohol, as described

400,804. HOTEL-CALL. EDWARD J. COLBY, Chicago, Ill. Filed May 10, 1888. Serial No. 273,393. (No model.)



Claim.—In a hotel-call, the combination of the clock A, provided with the dial and hands in the ordinary manner, with an insulating-disk, C, back of the dial, commutator-strips D D, secured upon such insulating-disk in a circle concentric with the dial of the clock, an arm, E, and trail or brush F, adapted to rotate with the hands of the clock and to travel over the commutator-strips, a board, N, having thereon a series of hooks, O O, each designated by an hour and minute mark a series of wires extending one from each commutator-strip to the corresponding hook, an electrical circuit in metallic connection with the clock mechanism and containing a battery and wires passing throughout the hotel, a series of bells, one in each room, in circuit, a wire passing from each of such bells, a spring-roller, K, in the hotel-office, a series of such rollers, one for each room or bell, a series of tags, one for each room and roller, numbered to correspond with the room and perforated at its lower extremity, a series of flexible connectors, each connecting one tag with its proper bell and roller, so that by connecting any of said tags with any of said hooks a circuit will be made through the clock, battery, bell of the connected room and connectors, tag, hook, wire connecting such hook with the commutator-strip, and thence through the brush and arm at the hour when such brush is on the strip which corresponds with the number indicated on the hook to which the tag is attached.

400,805. ROOF-CONNECTION FOR RAILWAY-CARS. JAY F. COLE and BELL W. PARRO, Grouse, Iowa. Filed Dec. 3, 1888. Serial No. 292,572. (No model.)



Claim.—In a car attachment such as described, the combination, with the parallel bars connected by a flexible covering, of expanding springs connecting said bars, the brackets having a perforated lug adapted to receive the ends of the springs, and a perforated aperture communicating with the perforation in the lug, and a set-screw adapted to engage the ends of the spring and secure the same in position, substantially as specified.

400,806. CAR-COUPLING. HARRISON V. CONWAY, Boone, Iowa. Filed Jan. 3, 1888. Serial No. 295,278. (No model.)



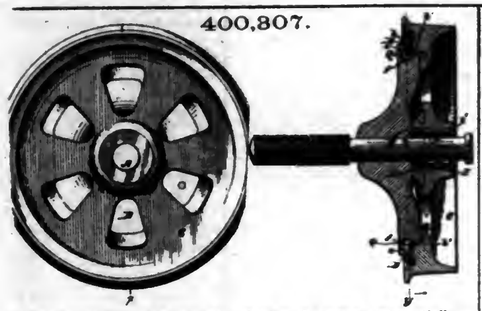
Claim.—1. The herein shown and described car-coupling, composed of the following elements: the draw-bar having vertical standards grooved on their opposing sides, and having the openings *a* and *a'*, the swing-pin C, having lateral projections which work in the grooved standards, the levers E E and F, connected with pin C, the supplemental pin H, adapted to be inserted through an opening in the bottom of the draw-bar, and the slide A, for supporting the said pin H, substantially as and for the purpose described.

2. In a car-coupling, the combination, with the pin H, which is adapted to be removed and inserted through an opening in the bottom of the draw-bar, of the slide for supporting the said pin, substantially as and for the purpose described.

400,807. CAR-WHEEL. JOHN W. COOPER, Atlanta, Ga. Filed June 26, 1888. Serial No. 278,072. (No model.)

Claim.—1. The combination, with the axle and the center having a groove in its periphery, of the wheel having a portion encircling the center and having a groove which coincides with the groove in the said center, and the rollers let into the grooves through a suitably-

400,307.



located opening and locking the wheel to the center, substantially as and for the purpose described.

2. The combination, with the axle and the center having a groove in its edge, of the wheel having an annular flange which encircles the center and having a groove on its inner side coinciding with the groove in the center, and having an opening extending from the groove, and the rollers let into the said grooves through the said opening, substantially as and for the purpose described.

3. The combination, with the axle and the center having its outer corner rounded, of the wheel having a portion encircling the center, and having a corresponding rounded portion to fit the rounded corner of the center, and rollers confined in coinciding grooves in the center and the wheel, substantially as and for the purpose described.

4. The herein shown and described car-wheel, composed of the axle having the center B secured thereto, the wheel having an annular flange which encircles the center, the rollers fitted in coinciding grooves in the flange and the edge of the center, being let into the grooves through an opening in the flange, which opening is closed by a plug, and the roller-bearing fitted in an enlarged portion of the bore and held therein between the center and a shoulder in the said bore, substantially as specified, for the purpose described.

400,308. METHOD OF CONSTRUCTING UNDERGROUND CONDUITS. WILLIAM C. CRANMER and SYDNEY W. ARNOLD, Philadelphia, Pa. Filed Oct. 19, 1888. Serial No. 288,601. (No model.)



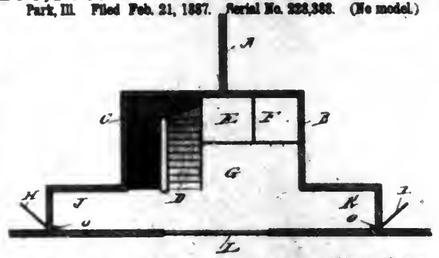
Claim.—1. The method herein described of forming continuous underground conduits of plastic material for electric and other wires in a ditch or trench direct, which consists in providing a flexible casing composed of non-conducting material having a core of water, air, sand, sawdust, or the like and temporarily hermetically closed at both ends, in building the conduit material around said casing, and subsequently freeing the core therefrom, substantially as described.

2. The method herein described of forming continuous underground conduits of plastic material for electric and other wires in a ditch or trench direct, which consists in providing a flexible casing having a core of water, air, sand, sawdust, or the like and temporarily hermetically closed at both ends, in building the conduit material around said casing and subsequently freeing the core therefrom, and finally withdrawing the casing, substantially as described.

3. The method herein described of forming continuous underground conduits of plastic material for electric and other wires in a ditch or trench direct, which consists in providing a flexible casing composed of non-conducting material having a core of water, air, sand, sawdust, or the like and temporarily hermetically closed at both ends, in further providing suitable means for retaining the casing in position, and finally in building the conduit material around said casing and subsequently freeing the core therefrom, substantially as shown and described.

4. The method herein described of forming continuous underground conduits of plastic material for electric and other wires in a ditch or trench direct, which consists in providing a flexible casing having a core of water, air, sand, sawdust, or the like and temporarily hermetically closed at both ends, in further providing suitable means for retaining the casing in position, in further building the conduit material around said casing and subsequently freeing the core therefrom, and finally withdrawing the casing, substantially as shown and described.

400,309. FIRE-PROOF BUILDING. ROBERT S. CRITCHELL, Oak Park, Ill. Filed Feb. 21, 1887. Serial No. 228,388. (No model.)



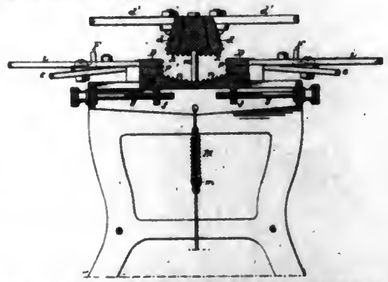
Claim.—1. A building provided with combustible portions separated by a fire-proof wall, an intermediate vacant portion formed by two secondary fire-proof walls, and doors located at the rear end of angular recesses or extensions formed by said secondary walls, the doors communicating, respectively, with the said combustible portions, substantially as described.

2. A building provided with a fire-proof partition-wall, A, secondary fire-proof walls C and B, connecting said partition-wall with the exterior wall of the building and forming recesses J and K therewith, and doors H and I, located in said recesses J and K and opening, respectively, into the separated main portions of the building, substantially as described.

3. In a building, the combination, with combustible portions separated from each other in part by a fire-proof partition and in part by an inclosed portion provided with fire-proof walls, of elevators, stairways, or the like located in the rear part of said inclosed portion for communication between the several floors of the building, and recesses or extensions in the front part of said inclosed portion provided with doors opening into the combustible portions, substantially as described.

4. In a fire-proof building, the combination of fire-proof wall A, walls C and B, connecting said wall A with one of the exterior walls of the building, sheet-metal plates M, window-glass L, and communicating doors H I, substantially as and for the purpose set forth.

400,310. MACHINE FOR FORMING SHEET-METAL PIPES. FREDERICK W. DAVIDSON, Philadelphia, Pa. Filed July 5, 1888. Serial No. 279,066. (No model.)



Claim.—1. The combination, in a machine for forming rectangular sheet-metal pipes or tubes, of the presser-bar consisting of a fixed central portion having projecting wings, and independent side strips, adjustable laterally on said wings, the opposite side dies, means for adjusting the latter, and the opposite gages for the strip to be bent, substantially as specified.

2. The combination, in a machine for forming rectangular sheet-metal pipes or tubes, of the presser-bar having adjustable side strips, the opposite side dies having laterally-projecting wings, the opposite gages carried by said wings, and means for laterally adjusting the presser-bar strips, side dies, and gages to suit the different sizes of pipe to be manufactured, substantially as specified.

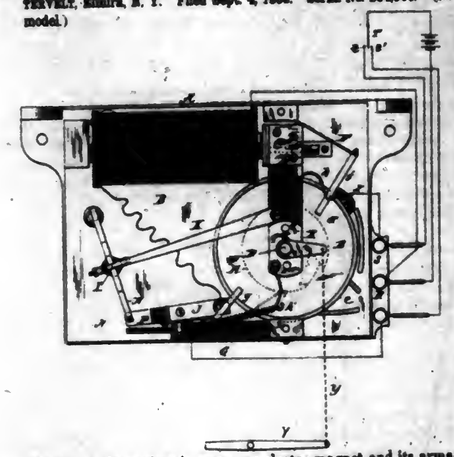
3. The combination of the presser-bar having a ribbed end with the side dies having ribbed projections forming counterparts of the ribbed end of the presser-bar to effect the crimping of the end of the pipe, all substantially as specified.

4. The combination of the presser-bar having a ribbed end with the side pressers laterally movable and also ribbed at one end, all substantially as specified.

5. The combination of the presser-bar having a ribbed end, the side dies having ribbed projections at one end, and the supplementary side pressers also ribbed at one end, all substantially as specified.

6. The combination of the presser-bar ribbed at the ends, the side dies having ribbed projections at the ends, the supplementary side pressers mounted on the side dies and also ribbed at the ends, and the connected cams for operating said side pressers, substantially as specified.

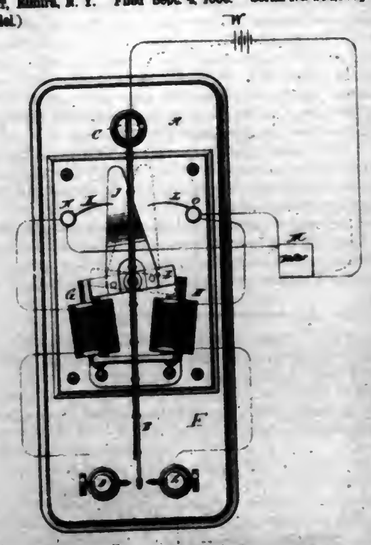
400,311. ELECTRIC MOTOR. ETHA H. DAVIS and REUBEN WESTERVELT, Elmira, N. Y. Filed Sept. 4, 1888. Serial No. 284,563. (No model.)



Claim.—1. In an electric motor, an electro-magnet and its armature, and an arm attached to the latter and having a yoke which carries a roller, all in combination with an adjustable pivoted contact-lever, within an opening in which the roller plays, as and for the purpose set forth.

2. In an electric motor, an electro-magnet and its armature, and an arm attached to the latter and having a closed yoke which incloses a portion of an adjustable pivoted contact-lever and is adapted to operate the same, as and for the purpose set forth.

400,312. THERMOSTAT. ETHA H. DAVIS and REUBEN WESTERVELT, Elmira, N. Y. Filed Sept. 4, 1888. Serial No. 284,570. (No model.)

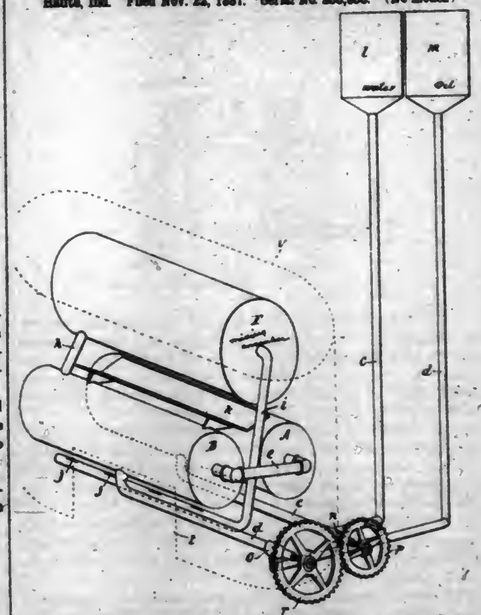


Claim.—1. In a thermostat, an expansible piece forming a terminal of an electric circuit, contact-pieces forming corresponding terminals, each located in a separate branch circuit, and a pair of electro-magnets—one in each branch—the two magnets having a common armature, all in combination with a short-circuit terminal on each side of the armature, whereby the contact-points on either side will be automatically short-circuited, as and for the purpose set forth.

2. In a thermostat, an expansible piece forming a terminal of an electric circuit, contact-pieces forming corresponding terminals, each located in a separate branch circuit, and a pair of electro-magnets—one in each branch—the two magnets having a common armature and a moving arm connected therewith, all in combination with a short-circuit terminal on each side of the armature, whereby the contact-points on either side will be automatically short-circuited, as and for the purpose set forth.

3. The combination, with an electro-magnetic motor and a pair of branch circuits connected therewith, of a thermostat adapted to close one branch or the other on an increase or decrease of the temperature, and an electro-magnetic cut-out for closing a short circuit around the thermostat-contacts, such cut-out consisting of a magnet in each branch circuit, the two magnets having a common armature, which co-operates in its reverse positions with the terminals of the short circuit, which are also elements of the combination, as and for the purpose set forth.

400,313. HYDROCARBON-VAPORIZER. HENRY C. DAVIS, Terre Haute, Ind. Filed Nov. 22, 1887. Serial No. 255,855. (No model.)



Claim.—1. The combination, with a stove having a grate, of a hydrocarbon-burner, a vaporizing-retort, a steam-generating retort, and a mixing-chamber, all situated within the fire-pot of the stove, a removable metal casing surrounding the said parts and resting on the grate, and having an opening, *t*, in its side adjacent to the grate, whereby heat from burning material upon the grate will pass through the said opening and heat the said parts when it is wished to start the burner, and a mass of refractory material within said casing, substantially as described.

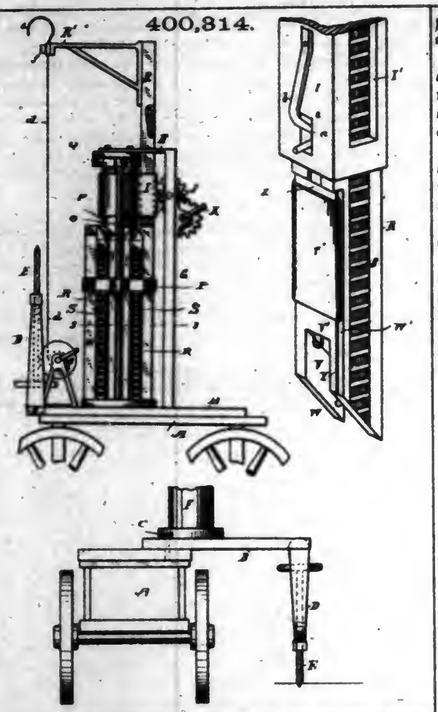
2. In a hydrocarbon-burner, the combination of the water and oil retorts A and B, lying side by side, the burner situated below the said retorts, a reservoir, F, situated above the retorts, the deflector *k*, situated between the retorts and below the reservoir, the water and oil supply pipes *c* and *d*, lying side by side, the rotary needle-valves regulating the flow through the said pipes, and the gear-wheels *r* and *p*, mounted upon the stems of the said valves and meshing with each other, substantially as set forth.

400,314. FIRE-ESCAPE. EUGENE DELIA, Cincinnati, Ohio. Filed Sept. 3, 1888. Serial No. 284,685. (No model.)

Claim.—1. A fire-escape comprising a plurality of separate bars adapted for connection end to end, a revolving frame turning about a vertical axis and sustaining the same side by side in a vertical position, and a stationary guide for the bars, substantially as described.

2. A fire-escape comprising a plurality of separate bars adapted for connection end to end, a revolving frame turning about a vertical axis and sustaining the bars side by side in a vertical position, a stationary guide for the bars, and a flexible ladder attached to the upper end of the uppermost bar, substantially as described.

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3. A fire-escape comprising a plurality of separate bars adapted for connection end to end, a revolving frame turning about a vertical axis and sustaining the bars side by side in a vertical position, a stationary guide for the bars, a flexible ladder attached to the upper end of the uppermost bar, and a hook on the upper end of said ladder for supporting the same, substantially as described.

4. A fire-escape comprising a plurality of toothed bars adapted for connection end to end, a revolving frame turning about a vertical axis and sustaining the said bars side by side in a vertical position, a stationary guide for the bars, and a gear-wheel engaging said bars, substantially as described.

5. A fire-escape comprising a plurality of bars adapted for connection end to end, a revolving frame sustaining the bars, a stationary guide for the bars, and a spring applied to said frame for turning the same, substantially as described.

6. The combination, with a stationary column, of a plurality of bars adapted for connection end to end, a revolving table surrounding the base of the column, a revolving keeper-ring, also surrounding the column, vertical standards rigidly connected to said table and keeper-ring, and a stationary guide for the bars located above the keeper-ring, substantially as described.

7. The combination, with a stationary column, of a plurality of bars adapted for connection end to end, a revolving frame consisting of a table surrounding the base of the column, a revolving keeper-ring, also surrounding the column, and vertical standards rigidly connecting said table and keeper-ring, a stationary guide for the bars, and a coiled spring connected with the column and revolving frame for turning the latter, substantially as described.

8. A fire-escape comprising a plurality of bars, a revolving frame sustaining the same, and a stationary guide for the bars, said bars being provided upon their ends with interlocking mortises and tenons arranged at right angles to radial lines of the frame, whereby the bars may be connected with each other by the turning of the frame, substantially as described.

9. A fire-escape comprising a plurality of bars, a revolving frame sustaining the same, and a stationary guide for the bars, said bars being provided on their ends with interlocking mortises and tenons adapted to engage each other by a lateral movement of the bars, and slides on the bars for holding the same from disconnection, substantially as described.

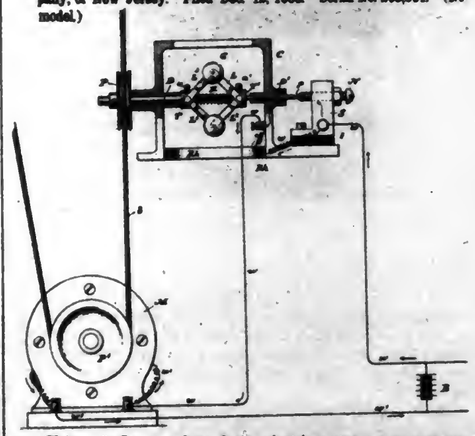
10. The combination, with a revolving frame and stationary guide, of a plurality of bars provided with interlocking mortises and tenons, the shoulders of which are oblique, the ends of each tongue being provided with a groove containing a prong, and the sides of the tongues having detent-notches, and each mortise having an eye to fit over the prong, and lugs to engage the detent-notches, substantially as described.

11. The combination, with a revolving bar-supporting frame and a stationary guide, of a plurality of bars provided with interlocking mortises and tenons and having guide-flanges adjacent to their ends, and slides engaged with said flanges for holding the bars from disconnection, substantially as described.

12. The combination, with a revolving bar-supporting frame and a stationary guide, of a plurality of bars provided with interlocking mortises and tenons and having guide-flanges adjacent to their ends, and slides engaged with said flanges, said stationary guide being provided with a spring-arm adapted to engage and move the slide, substantially as described.

13. The combination, with a fire-escape truck and an extensible column, of a platform supporting said column, said platform being pivoted by means of a vertical pivot to the truck, and an adjustable supporting-leg hinged to the outer or free end of said platform, substantially as described.

400,315. REGULATOR FOR ELECTRIC MOTORS. ROBERT S. DOBBIE, New York, N. Y., assignor to the American Electric Motor Company, of New Jersey. Filed Dec. 12, 1888. Serial No. 293,381. (No model.)



Claim.—1. In a regulator for an electric motor, a governor consisting of a two-part shaft connected together by hinged links and balls, one of said two-part shafts having longitudinal as well as rotary motion, substantially as described.

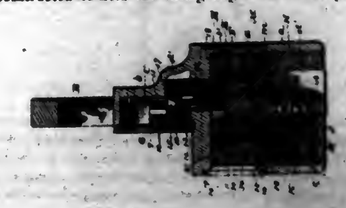
2. A regulator for an electric motor, consisting of the following combination of elements: a two-part shaft, one of which parts carries a pulley, the other being adapted to slide as well as rotate, a link or ball governor connecting said shafts, a spring normally holding the sliding shaft at its extreme position with a contact-point against which said sliding shaft may contact, and circuit-connections for connecting said regulator in circuit with the motor and source of electrical supply, substantially as described.

3. A governor adapted for use in an electric regulator, consisting of a two-part shaft connected together by links and an expansible spring, one of said shafts carrying a pulley and the other a contact-point, substantially as described.

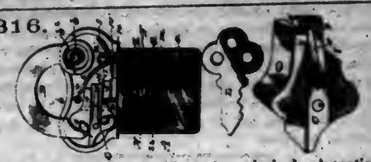
4. A regulator for an electric motor, consisting of a metallic box or case sustaining a ball-governor connected to a two-part shaft, one of which parts carries a pulley and the other a contact-point, in combination with a rheostat and circuit-connections, substantially as described.

400,316. LOCK. WILLARD D. DORRIEN, Washington, D. C., assignor to the Corbin Cabinet Lock Company, New Britain, Conn. Filed Jan. 3, 1889. Serial No. 295,577. (No model.)

Claim.—1. In a lock, the combination, with the lock-shackle, of a tilting dog mounted on a stationary bearing, and a lock-spindle, the latter constructed to hold the tilting dog in its locked position and



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to release it and allow the shackle to be unlocked, substantially as set forth.

2. The combination, with the lock-shackle and a tilting locking-dog, of a lock-spindle constructed and arranged to support the locking-dog on its extreme end and provided with a cut-away portion to enable the dog to tilt and release the shackle, substantially as set forth.

3. The combination, with a lock-shackle and a dog for locking and releasing the shackle of the spindle, of a pin-tumbler lock and serial registering mechanism, said spindle being constructed to support the dog in its locked position and to allow it to tilt and release the shackle, substantially as set forth.

4. In a serial registering-lock, the combination, with a lock-shackle and a tilting dog for locking and releasing the shackle, of a series of registering-rings, a spindle and gearing for actuating said rings by turning said spindle, the latter being constructed to support the locking-dog in its locked position and to allow it to be released from the shackle when it is desired to unlock the lock, substantially as set forth.

5. In a lock, the combination, with a shackle and a tilting or pivoted dog adapted to be engaged with and released from the free end of the shackle, of a spindle constructed to support the dog in its locked position and to allow the dog to tilt and release the shackle, and a device for preventing the spindle from being rotated backwardly, substantially as set forth.

6. In a lock, the combination, with a shackle and a tilting or pivoted dog provided with a spring-actuated pawl, of a spindle provided with a cut-away portion at its end which allows the dog to tilt and release the shackle, the yielding pawl allowing the spindle to be rotated after the dog has tilted and released the shackle, substantially as set forth.

7. In a serial registering-lock, the combination, with a pivoted shackle and a pivoted or tilting dog, of a spindle constructed and arranged to support the dog in a position to lock the shackle, said spindle being provided with teeth or notches, and a spring-pawl adapted to engage the teeth and prevent the backward rotation of the spindle, substantially as set forth.

8. In a serial registering-lock, the combination, with a pivoted shackle a locking device engaging the free end of said shackle, and a spindle constructed and arranged to hold said locking device in contact with the free end of the shackle and release it from engagement therewith, of a series of registering-rings and means for locking the rings against forward movement after the entire series of numbers has been exposed to view, substantially as set forth.

9. In a serial registering-lock, the combination, with a pivoted shackle, a locking device engaging the free end of said shackle, and a spindle constructed and arranged to hold the locking devices in contact with the free end of the shackle and release it from engagement therewith, of a series of registering-rings arranged to encircle the spindle and be actuated thereby, substantially as set forth.

10. In a serial registering-lock, the combination, with a pivoted shackle, a locking device engaging the free end thereof, and a spindle constructed and arranged to hold the locking devices in contact with the free end of the shackle and release it from engagement therewith, of a series of registering-rings arranged to encircle the spindle, gearing for actuating said rings, and devices for preventing the rings from being rotated in either direction only when a ring is shifted to present a new number to view, substantially as set forth.

11. In a serial registering-lock, the combination, with a lock-casing, a shackle, and a locking device engaging the free end thereof, of a series of registering-rings fitted to and supported within the casing, a pin-lock secured within the outer end of the casing, and a spindle that is common to both the pin-lock and to the series of registering-rings, and arranged to hold said shackle-locking device in contact with the free end of the shackle and release it from engagement therewith, substantially as set forth.

12. A serial registering-lock comprising a pin-tumbler lock, a series of registering-rings, a pivoted or tilting dog for locking and releasing the lock-shackle, and a spindle constructed and adapted to actuate the pin-tumbler lock, the series of registering-rings, and to control the tilting dog, substantially as set forth.

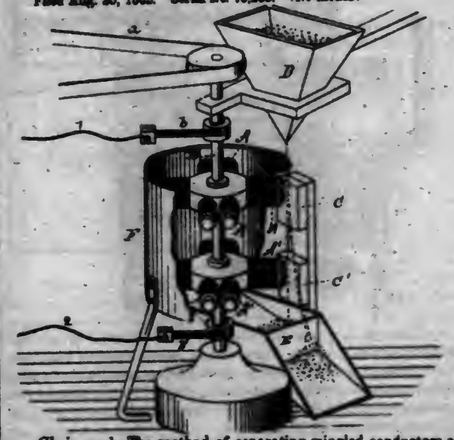
13. In a serial registering-lock, the combination, with the spindle of a pin-tumbler lock, of a tilting dog provided with an arm, which is engaged and moved by the free end of the shackle, so as to be supported by the end of the spindle, substantially as set forth.

14. In a serial registering-lock, the combination, with the spindle of a pin-tumbler lock and a series of registering-rings, of a tilting or pivoted dog provided at one end with an arm with which engages the free end of the shackle, a spring for tilting the dog to release the shackle therefrom, said spindle being constructed to support the dog in its locked position and to allow it to tilt and release the shackle, substantially as set forth.

15. In a lock, the combination, with a lock-shackle and a tilting locking-dog, of a lock-spindle, and stops to restrain the movement of the spindle in either direction when it has been rotated, so that the pin-tumblers register and permit of the withdrawal of the key, substantially as set forth.

16. In a lock, the combination, with a cylindrical casing having an opening therein, of an adjustable ring encircling the casing, said ring being formed with an opening adapted to register with the opening in the casing, substantially as set forth.

400,317. ORE-SEPARATOR. THOMAS A. EDISON, Menlo Park, N. J., assignor to the Edison Ore Milling Company, (Limited,) New York, N. Y. Filed Aug. 20, 1883. Serial No. 70,289. (No model.)

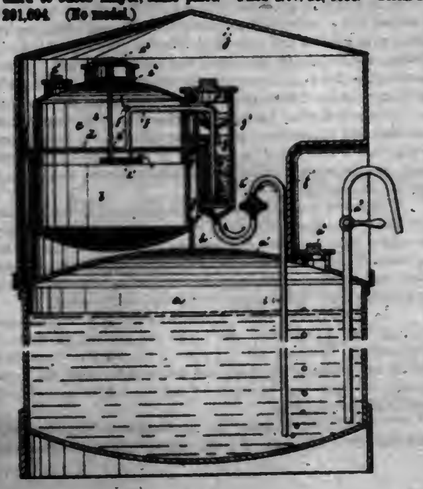


Claim.—1. The method of separating mingled conductors and non-conductors of electricity, consisting in causing them to fall together through a magnetic field whose lines of force are constantly shifting, whereby the trajectory of the conducting substances is changed, substantially as set forth.

2. The combination of magnets and armatures which are relatively movable, and a hopper situated over the space between said magnets and armatures, whereby the trajectory of material falling from said hopper may be changed, substantially as set forth.

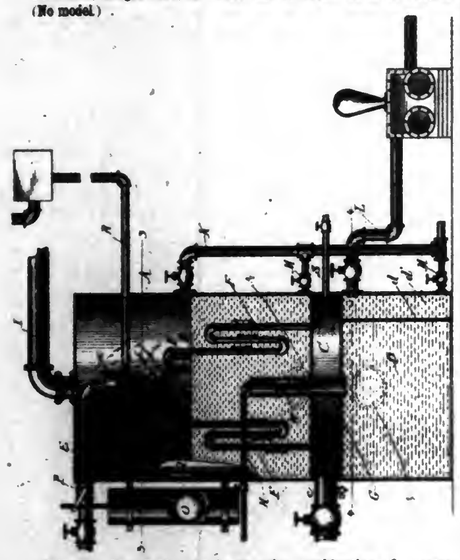
3. The combination of the revolving electro-magnets, the stationary armatures, and the hopper situated over the space between said magnets and armatures, whereby the trajectory of material falling from said hopper may be changed, substantially as set forth.

400,318. VESSEL FOR HOLDING LIQUIDS UNDER PRESSURE. JOHN A. FIELD and JOHN SEDGWICK, New York, N. Y., assignors of one-third to Jacob Mayer, same place. Filed Nov. 28, 1888. Serial No. 291,694. (No model.)



Claim.—The combination of vessel *a* with the vessels *b c*, tube *f*, vessel *g*, having double walls g^4 g^5, and offset g', resting upon flange g^6 of vessel *c*, and with the tubes *h i*, substantially as specified.

400,319. FEED-WATER HEATER AND PURIFIER. CHARLES E. FERREIRA, Morgan Park, Ill. Filed Jan. 15, 1889. Serial No. 296,446. (No model.)



Claim.—1. In a feed-water heater, the combination of a water-chamber provided with a water-inlet, a steam-chamber under the water-chamber, provided with a steam-inlet, a pipe communicating with the steam-chamber and extending into the water-chamber for conducting steam through the water, and an outlet for drawing off the water, substantially as described.

2. In a feed-water heater, the combination of a water-chamber provided with a water-inlet, a steam-chamber provided with a steam-inlet, a pipe communicating with the steam-chamber and extending into the water-chamber for conducting steam through the water, a settling-chamber, a pipe communicating between the water-chamber and the settling-chamber for conducting the water into the settling-chamber, and an outlet for drawing off the water, substantially as described.

3. In a feed-water heater, the combination of a water-chamber provided with a water-inlet, a steam-chamber under the water-chamber, provided with a steam-inlet, a pipe communicating with the steam-chamber and extending into the water-chamber for conducting steam through the water, a settling-chamber under the steam-chamber, a pipe communicating between the water-chamber and the settling-chamber for conducting the water into the settling-chamber, and an outlet for drawing off the water, substantially as described.

4. In a feed-water heater, the combination of a water-chamber provided with a water-inlet and a water-outlet, and a pipe communicating with a boiler and extending into the water-chamber for conducting steam through the water and terminating in a horizontal nozzle above the water-level, whereby the steam is distributed above the water and back-pressure prevented, substantially as described.

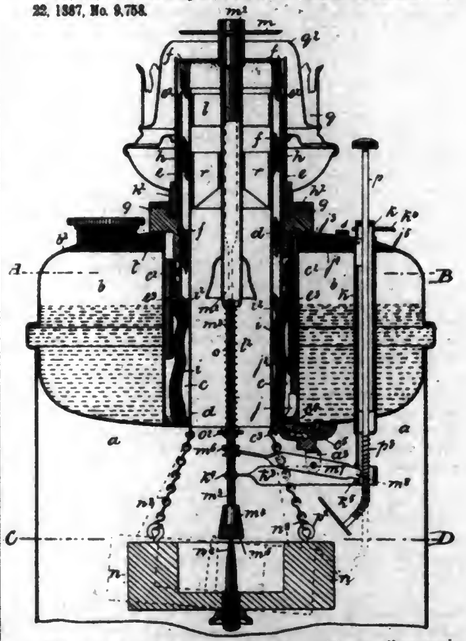
5. In a feed-water heater, the combination of a water-chamber provided with a water-inlet and a water-outlet, and a pipe communicating with a boiler and terminating in the water-outlet, whereby steam may be introduced directly into the outflowing water to superheat it, substantially as described.

6. In a feed-water heater, the combination of a water-chamber provided with a water-inlet and a water-outlet, a pipe communicating with a boiler and extending into the water-chamber for conducting steam through the water and terminating in a horizontal nozzle above the water-level, and a pipe communicating with the boiler and terminating in the water-outlet, substantially as described.

7. In a feed-water heater, the combination of a water-chamber provided with a water-inlet, and a pipe for drawing off the water, terminating at its upper end at a point in the chamber between the surface and bottom of the water and substantially below the surface, whereby the water may be drawn off and most of the impurities left, substantially as described.

8. In a feed-water heater, the combination of a water-chamber provided with a water-inlet, a steam-chamber provided with a steam-inlet, a pipe communicating with the steam-chamber and extending into the water-chamber for conducting steam through the water, a settling-chamber under the steam-chamber provided with a vertical partition perforated in its lower portion, a pipe communicating between the water-chamber and the settling-chamber, terminating at its upper end at a point in the water-chamber between the surface and bottom of the water, and an outlet for drawing off the water, substantially as described.

400,320. OIL-LAMP. WILLIAM FRASER, London, County of Middlesex, England. Filed Sept. 23, 1887. Serial No. 250,512. (No model.) Patented in England Oct. 1, 1886, No. 12,456; in Belgium July 28, 1887, No. 58,167; in France July 28, 1887, No. 172,129, and in Germany Aug. 22, 1887, No. 9,758.



Claim.—1. In a lamp, the combination, with an oil-reservoir entirely closed above the oil-level, of an annular wick-chamber communicating with said oil-reservoir below the level of the oil, and a supplementary cover to said oil-reservoir forming a space communicating with said wick-chamber and provided with a ventilating-opening, substantially as described.

2. In a lamp, the combination, with an oil-reservoir, *b*, a central annular wick-chamber, *c*, and an intervening passage, c^2, of a valve, *j*, adapted to close said passage, and mechanism, substantially as described, for operating the same, as set forth.

3. In a lamp, the combination, with extinguisher-plate *m*, tube m^3, supporting said plate, and rod m^2, connected to tube m^3, of pivoted lever m^7, connected to said rod, and slide *k*, connected with said lever and provided with pusher k^2, all substantially as described.

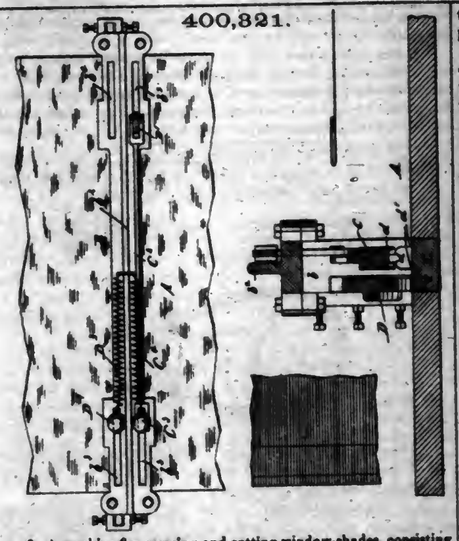
4. In a lamp, the combination, with deflector *m*, sliding tube m^3, rod m^2, spring *o*, pivoted lever m^7, and slide *k*, of sliding shutter *l*, rods l^2 l^3, and forked lever k^3, connected to said rods l^2 l^3 and to the slide *k*, substantially as described.

5. In a lamp, the combination, with deflector-plate *m*, and tubes m^2 m^3, supporting said deflector, of suspended weight *n*, spike n^3, projecting from said weight and supporting the tube m^2 m^3, sliding rod *p*, and plate p^3, the latter being arranged to contact with and displace said weight, thereby extinguishing the lamp, substantially as described.

400,321. MACHINE FOR CREASING AND CUTTING WINDOW-SHADE CLOTH. FRITZ GARTH, New York, N. Y., assignor to F. L. Hunninghaus & Co., same place. Filed Aug. 1, 1888. Serial No. 281,638. (No model.)

Claim.—1. A machine for creasing and cutting window-shades, which consists of a supporting-table having a transverse bar provided in its upper surface with two parallel longitudinal grooves, a vertically-reciprocating creaser above said bar, and provided with two parallel creasing-blades that can pass into the grooves of the bar, and a vertically-reciprocating cutting-knife, all combined substantially as set forth.

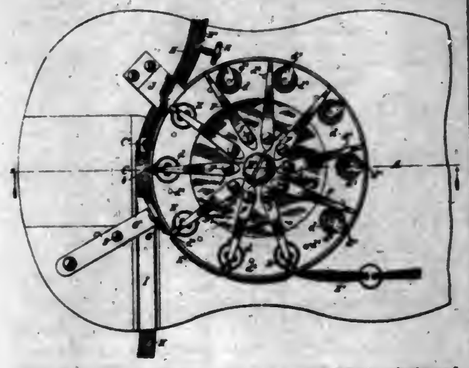
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2. A machine for creasing and cutting window-shades, consisting of a supporting-table having a grooved transverse bar, a yoke-shaped supporting-frame having guide-recesses, a vertically-reciprocating creaser, and a vertically-reciprocating cutter sidewise of and parallel to said creaser, substantially as set forth.

3. The combination, with a supporting-table having a grooved transverse bar, a transverse yoke-shaped supporting-frame, a vertically-reciprocating creaser, elbow-levers for operating said creaser, and a vertically-oscillating cutting-knife operated by a fulcrumed and spring-actuated elbow-lever, said knife being located sidewise of and parallel to the creaser, substantially as set forth.

400,322. BUTTON-ATTACHING DEVICE FOR SEWING-MACHINES. MARSHALL GARDNER, Aurora, Ill., assignor, by mesne assignments, of two-thirds to Alice M. Ball, same place, and Elizabeth Florsheim, Chicago, Ill. Filed Dec. 1, 1887. Serial No. 256,594. (No model.)



Claim.—1. The combination, with the stitch-forming devices of a sewing-machine, of a revolving plate provided with a cylindric peripheral surface and with button-recesses near its margin, and notches extending therefrom outwardly through said cylindric surface, and independent clamps provided with prongs entering the notches for engaging and holding the tape or cord loops resting therein, substantially as described.

2. The combination, with the revolving plate D, provided with button-recesses near its periphery and notches extending therefrom outwardly through the peripheral surface of the plate, of independent spring clamp-arms F F, pivoted to the plate and provided with prongs f' f', entering said notches, substantially as described.

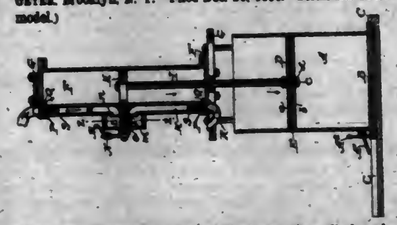
3. The combination, with the work-plate and needle of a sewing-machine, of a revolving plate provided with a cylindric peripheral surface and with button-recesses opening outwardly through the cylindric surface of the plate, said plate being mounted upon the work-plate with its margin in contact with said work-plate, and a presser in contact with the cylindric peripheral surface of the plate acting on the tape to force and hold the latter downwardly against the work-plate in passing the needle, substantially as described.

4. The combination, with the work-plate, needle, and presser-foot of a sewing-machine, of a revolving plate provided with a cylindric peripheral surface located adjacent to the needle and in contact with the presser-foot, said plate being provided with peripheral button-recesses opening outwardly through the said cylindric surface of the plate, and a roller, G, acting to press toward the work-plate the tape or cord placed about the said peripheral surface of the plate, substantially as described.

5. The combination, with the revolving plate D, provided with peripheral notches, as d', and with spring clamp-arms F, engaging the notches, of a stationary cam-plate located in position to engage said clamp-arms, substantially as described.

6. The combination, with the plate D, provided with button-recesses and with notches d' d', of spring clamp-arms F F, provided with prongs f' f', entering said notches d' d', and with prongs f^3 f^3, and a stationary cam-plate engaging said prongs f^3 f^3, substantially as described.

400,323. HYDRAULIC SAUSAGE-STUFFING MACHINE. HENRY GEYER, Brooklyn, N. Y. Filed Dec. 20, 1888. Serial No. 294,129. (No model.)

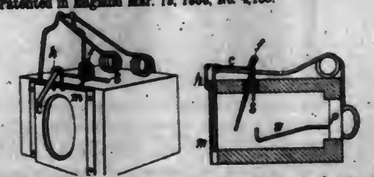


Claim.—1. The combination of the hydraulic cylinder, the piston working therein, the inlet-pipes communicating with either end of said cylinder, the rotating two-way valve controlling said pipes, the counterbalanced lever actuating said valve, and the spring-actuated valves governing the exhaust-port at each end of the cylinder, said valves being fitted within the inlet-pipes, each to be closed by the pressure of water admitted thereto and be automatically opened by its spring when the pressure ceases, substantially in the manner and for the purpose herein set forth.

2. The combination of the hydraulic cylinder, the piston working therein, the inlet-pipes communicating with either end of said cylinder, the rotating two-way valve controlling said pipes, the counterbalanced lever actuating said valve, the spring-actuated valves governing the exhaust-port at each end of the cylinder and fitted within the inlet-pipes, each to be closed by the pressure of water admitted thereto and be automatically opened by its spring when the pressure ceases, the pressing-cylinder mounted beneath the hydraulic cylinder, the piston therein connected with the piston of said hydraulic cylinder, the valve-actuating rod moving in unison with the piston, the lever projecting from the spindle of the rotating inlet-valve for the hydraulic cylinder, the tappets fitted on the valve-actuating rod to engage said lever, and the counterbalancing-lever projecting radially from said valve-spindle, whereby when said lever is carried by the movement of the actuating-rod to and by its center of gravity above the valve to close one inlet-port it will automatically drop to open the other port and thereby reverse the movement of the piston, substantially in the manner and for the purpose herein set forth.

3. The combination, with the inlet pipe and port of the hydraulic piston-cylinder, as described, of a discharge-pipe connected directly with said inlet-pipe beyond said port, a valve closing said discharge-pipe and subjected to the pressure within the inlet-pipe, and a spring actuating the valve to open it automatically when it is relieved from said pressure, substantially in the manner and for the purpose herein set forth.

400,324. ANIMAL-TRAP. DAVID GILMORE, Belfast, County of Antrim, Ireland. Filed Oct. 30, 1888. Serial No. 289,577. (Model.) Patented in England Mar. 19, 1888, No. 4,185.

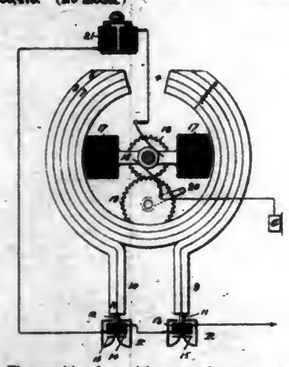


Claim.—1. In a setting device for a small-animal trap, the combination of a staple, *s*, having hinged to said staple a fork, *f*, said fork passing down through an aperture in the body of the trap to near the

under side of the hole or chamber, where the bait is placed, and a staple, *h*, having hinged to it a holder or catch, *e*, of flattened wire or sheet metal, to engage with the fork *f*, substantially as described.

2. A removable plug, *p*, having attached to it a wire bait-holder, *w*, the said plug *p* fitting into a hole in the back of trap, substantially as shown and described, and for the purpose set forth.

400,325. TELEPHONE. NOEL B. GINOCHIO, New York, N. Y., assignor of one-half to Elias M. Greene, same place. Filed July 20, 1888. Serial No. 280,475. (No model.)



Claim.—1. The combination, with an annular magnet, of an armature arranged to rotate therein, extension-pieces connected to the annular magnet, soft-iron cores mounted on said extension-pieces, and coils surrounding said cores connected in the main line, and diaphragms for said coils, substantially as described.

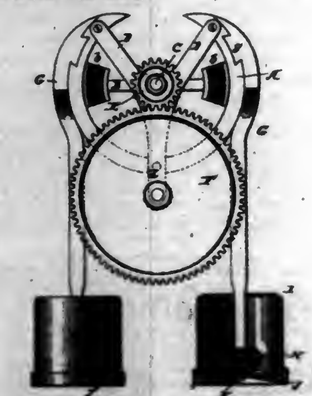
2. The combination, with the end of the permanent magnet, as 10, of a core mounted thereon sustaining a coil connected to the main line, a box also mounted on the magnet, a mouth-piece mounted in said box, and a case supporting a diaphragm connected to and operated by the mouth-piece, substantially as described.

3. A magneto-telephone having a permanent magnet, a core fixed thereon supporting a coil, a case surrounding the coil supporting a diaphragm, and means for adjusting the diaphragm and case with relation to the core and magnet, substantially as described.

4. In a magneto-telephone, a diaphragm of pyroxyline having magnetic material embedded in one surface thereof, the said material being distributed over the surface so as to be concentrated at or near the center of the diaphragm and gradually diminishing toward the edges thereof, substantially as described.

5. In a magneto-telephone, a diaphragm of pyroxyline having magnetic material embedded in one surface, substantially as described.

400,326. TELEPHONE. NOEL B. GINOCHIO, New York, N. Y., assignor of one-half to Elias M. Greene, same place. Filed Nov. 16, 1888. Serial No. 290,993. (No model.)

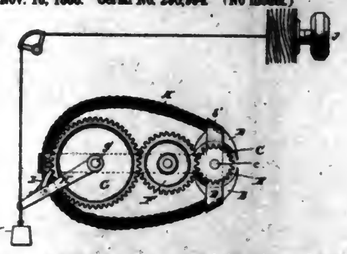


Claim.—1. The combination, with an annular magnet, of an armature arranged to rotate therein, extension-pieces connected to the magnet and formed with tapering ends, and coils secured to said ends, substantially as described.

2. The combination, with an annular compound magnet, of bearing-pieces secured to the sides thereof, an armature-shaft supported in said bearings and carrying an armature adapted to rotate within the magnet, and extension-pieces adapted to fit a portion of said magnet and to be secured thereto by dovetailed grooves, substantially as described.

3. The combination, with an annular compound magnet, of an armature arranged to rotate therein and supported in bearings secured to the sides of the magnet, extension-pieces connected to the annular magnet by dovetailed joints having tapering ends, and telephone-coils secured to said ends, substantially as described.

400,327. MAGNETO-ELECTRIC GENERATOR. NOEL B. GINOCHIO, New York, N. Y., assignor of one-half to Elias M. Greene, same place. Filed Nov. 16, 1888. Serial No. 290,994. (No model.)

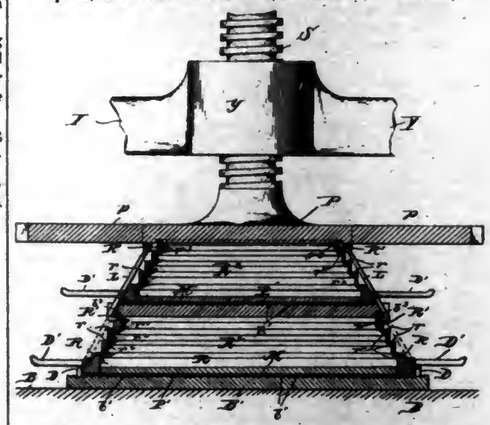


Claim.—1. A permanent magnet consisting of a number of strands twisted together, each strand consisting of a series of independent steel wires, substantially as described.

2. A magneto-generator in which the permanent magnets are made up of a cable or rope composed of a series of strands of steel wires twisted together, polar extensions connected to said wires, an armature rotating between the poles, and driving-gear for said armature supported upon the magnet, substantially as described.

3. A hand-operated magneto-machine consisting, essentially, of a permanent magnet in the form of a cable made up of a number of strands of steel threads twisted together, polar extensions connected to said magnet, an armature rotating between said extensions, driving-gear mounted on said magnet, a drum connected to said gear, and a spring-retracted chain for operating said drum, substantially as described.

400,328. OIL-PRESS. LOUIS GIMONDI, Marseilles, France. Filed Apr. 12, 1888. Serial No. 270,509. (No model.)



Claim.—1. In a press of the class described, a holder composed of a plurality of telescopic elements provided with a flange at their upper and lower edges, the flange at the upper edge of one element interlocking with the flange at the lower edge of the element next above, substantially as and for the purposes specified.

2. In a press of the class described, a holder composed of a plurality of telescopic elements, the lower or inner edge of which is beveled, whereby when said elements are telescoped such inner edges will form a hollow truncated cone, substantially as and for the purpose specified.

3. In a press of the class described, the combination of a power-screw and a platen or follower with a plurality of superposed holders for the material operated upon, each composed of a set of interlocking telescopic elements, and an impermeable channeled plate interposed between each two holders, substantially as and for the purpose specified.

4. In a press of the class described, the combination of a power-screw and a platen or follower with a plurality of superposed holders for the material operated upon, each composed of a set of interlock

ing telescopic elements, and a locking device for locking the inner or smaller element of the lower holder to the platen, substantially as and for the purpose specified.

5. In a press of the class described, the combination of a power-screw and a platen or follower with a plurality of superposed telescopic holders for the material to be operated upon, a locking device for locking the lowermost holder to the bed-plate of the press, and a locking device for locking the inner or smaller element of said lowermost holder to the platen, whereby all the superposed holders are locked to said platen, substantially as described.

6. In a press of the class described, the combination, with a plurality of superposed holders for the material operated upon, each composed of a set of interlocking telescopic elements, of a bottom plate for each holder, said bottom plate having its upper face channeled, and having a groove formed in its under side for the reception of the upper edge of the smaller element of the holder below it, substantially as and for the purposes specified.

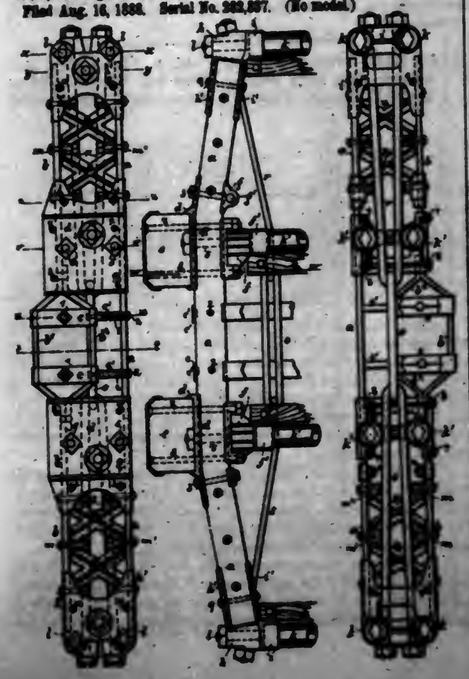
7. In a press of the class described, the combination, of a power-screw and a platen with a plurality of superposed holders, plate or bottom for each holder having a channeled upper surface, and a groove formed in the lower face for the reception of the upper edge of the smaller element of the next holder below to lock the holders together, a locking device to lock the plate of the lower holder to the bed-plate of the press, and a locking device to lock the smaller element of said lower holder to the platen, substantially as and for the purpose specified.

8. In a press of the class described, a telescopic holder for the material to be operated upon, in combination with a bottom for said holder, and stay-rods connected with said bottom and adapted to engage the smaller element of the telescopic sections of the holder to hold the same drawn out, substantially as described.

9. In a press of the class described, a telescopic holder for the material to be operated upon, in combination with a detachable bottom for such holder, having its upper face channeled, a foraminous plate interposed between the two, and a foraminous mat arranged upon the foraminous plate and within the holder, substantially as and for the purpose specified.

10. The herein-described hand-press, comprising a frame of the form of a letter-press, a power-screw carrying a hand-wheel at one end and a platen at the other, and a plurality of telescopic holders for the material to be operated upon, said holders being arranged one upon the other between the bed-plate and platen, and an impermeable dividing-plate between each two holders, having its upper face channeled, and a groove formed in the lower face thereof, into which fits the upper edge of the inner or smaller element of a telescopic section, substantially as and for the purpose specified.

400,329. END SILL FOR RAILWAY-CARS. JAMES T. GOODWILLOW, Huntingdon, Pa., assignor to the Iron Car Company, of Connecticut. Filed Aug. 16, 1888. Serial No. 282,857. (No model.)



Claim.—1. An end sill for railroad-car bodies composed of two or more horizontal boat plates, *a b*, the face-plate *d*, the central sills, *f f'*, the end caps, *h i*, and bolts for connecting the respective parts together, and the brace system of links *o*, *r*, and *s*, substantially as set forth.

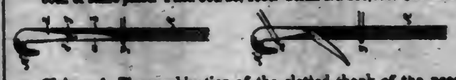
2. The combination, with the horizontal plate *a*, of the plate *b*, having a bowed portion, *b'*, the bowed plate *b²*, and the bracket-piece *e* and supports *e'*, substantially as set forth.

3. The combination, with the horizontal top and bottom plates, *a b*, of the central sills, *f f'*, connected therewith and adapted to receive longitudinal tubes, and the end caps *h*, connected to end caps *i*, and bolts for securing the said parts to the top and bottom plates, substantially as set forth.

4. The combination, with the horizontal top and bottom plates, *a b*, of the head-blocks *m m'* and bolts for connecting said head-blocks to said plates, and the X-shaped stude or frames *n*, adapted to be received between the plates *a b* and the blocks *m m'*, substantially as set forth.

5. The combination, with the horizontal top and bottom plates, *a b*, and the end caps, *h i*, of the two-part central sills, *f f'*, and the bolts for connecting the same to the top and bottom plates, the link-brace system *o*, *r*, and *s*, secured at its ends in the end caps, *h i*, and passing behind and bearing upon the sills *f'*, substantially as and for the purposes set forth.

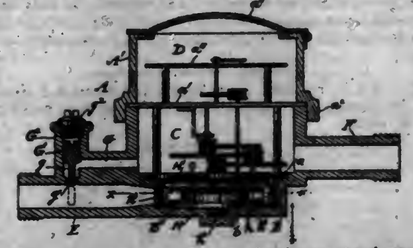
400,330. KNITTING-MACHINE NEEDLE. SAMUEL H. GOODMAN, Philadelphia, Pa., assignor to Conyers Button and Martin L. Firstbrook, both of same place. Filed Oct. 26, 1888. Serial No. 289,066. (No model.)



Claim.—1. The combination of the slotted shank of the needle and the pivoted latch adapted to lie within the slot, with a latch-operator having a portion projecting inward beyond the shank of the needle at or near the hooked upper end of the same, said latch-operator being independent of the latch, all substantially as specified.

2. The combination of the slotted shank of the needle and the pivoted latch adapted to lie within the slot, with a pivoted lever bearing on said latch and having a portion projecting inward beyond the shank of the needle at or near the hook of the same, all substantially as specified.

400,331. WATER-METER. GEORGE A. GRAHAM, Chicago, Ill. Filed July 9, 1888. Serial No. 279,574. (No model.)



Claim.—In a water-meter, a metered and non-metered passage, the one communicating with the induction-pipe and the other with a duct leading to said induction-pipe, in combination with a screw-plug arranged in said duct and having an extension, *g'*, in communication with said induction-pipe, whereby said duct may be closed or opened at will or the water-passage in the induction-pipe more or less obstructed, substantially as described.

400,332. CHECK-HOOK. SAMUEL H. HAAS, Philadelphia, Pa. Filed June 23, 1888. Serial No. 277,977. (No model.)



Claim.—1. A combined check hook and terret having a stationary jaw, a post stepped in said stationary jaw, a plate secured to said post and having a recess therein, a movable jaw with heel pivoted to said plate, a spring in said recess bearing against said heel, and a nut working on a screw-threaded lower end of said post, said parts combined substantially as described.

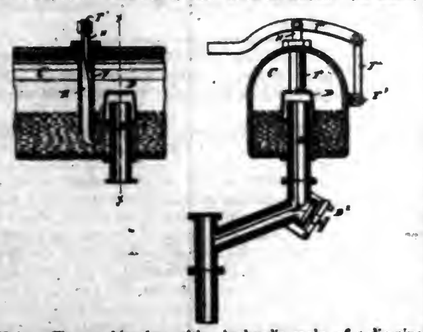
2. The combined check hook and terret herein described, con-

sisting of the stationary jaw A, with nose *b'*, and movable jaw with nose *b* and heel E, the bifurcated plate C, having recess G, the post H, stepped in jaw A, and the spring F, the said heel E being pivoted to plate C, and the spring F being seated in recess G and bearing against the heel E, and the said movable jaw being substantially in horizontal position when closed, said parts being combined substantially as described.

3. In a check hook and terret, a movable jaw with a removable supporting-post having the shoulder K and screw-stem H', in combination with a stationary jaw having an opening in its base portion, said stem being adapted to pass through said opening in base and portion of harness attached, and secured thereto by a nut on said stem below said harness, substantially as and for the purpose set forth.

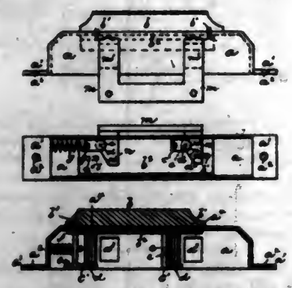
4. A combined check hook and terret consisting of a fixed jaw with base having opening therein, a movable jaw with heel, a bifurcated plate with recess, a spring seated in said recess and bearing against the said heel, a supporting-post for said plate having the shoulder K and screw H' passing through the base of said fixed jaw, and a nut adapted to work on screw-stem, said parts being combined substantially as described.

400,883. SEAL FOR HYDRAULIC MAINS. ROBERT HABERTUR, New York, N. Y. Filed Dec. 8, 1888. Serial No. 293,082. (No model.)



Claim.—The combination, with a hydraulic main, of a dip-pipe extending through the bottom of the same and above the level of the liquid in the same, an inverted cap above the upper open end of said dip-pipe, a U-shaped rod, a lever pivoted to said rod, a guide-pipe extending from the top of the main into the liquid in the main, and a friction-spring interposed between the guide-rod and guide-pipe, so as to retain the sealing-cap in any suitable position, substantially as set forth.

400,884. BAG-LOCK. JULIUS HANNEMANN, Newark, N. J., assignor to R. Neumann & Co., same place. Filed Jan. 31, 1888. Serial No. 262,374. (No model.)



Claim.—1. In a bag-lock provided with a lock-case and hasp or tongue, a slide or finger piece, with studs or pins secured thereto, and anti-friction rollers revolving on said pins or studs and adapted to engage with slots in said hasp or tongue, as shown, and for the purpose set forth.

2. In a bag-lock provided with a lock-case and openings and a slide or finger piece, a tongue or hasp with tapering ends, and provided with slots adapted to receive and hold anti-friction rollers rotating on pins or studs attached to the finger-piece within the lock-case, as shown, and for the purposes set forth.

3. In a bag-lock, the combination of a lock-case provided with openings on the side, a slide or finger piece secured to said case and adapted to slide on said case, pins or studs secured to said finger-piece, rollers rotating on said pins, and a tongue or hasp with beveled end and semicircular sockets adapted to receive and hold said rollers, all as shown, and for the purpose set forth.

400,885. PLASTIC MINERAL COMPOSITION. JAMES L. HASTINGS, Philadelphia, Pa., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Sept. 27, 1888. Serial No. 286,562. (No specimens.)

Claim.—1. A composition for forming a refractory compound, containing magnesium oxide, uranium oxide, calcium fluoride, starch, and a prepared gum or mucilaginous substance.

2. A composition for forming a refractory compound, containing magnesium oxide, uranium oxide, calcium fluoride, starch, and gum-tragacanth or bassorine, and a solution of one or more salts of acetate, chloride, or nitrate of magnesium, strontium, calcium, or aluminum.

400,886. PLASTIC MINERAL COMPOSITION. JAMES L. HASTINGS, Philadelphia, Pa., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Sept. 27, 1888. Serial No. 286,563. (No specimens.)

Claim.—A refractory compound containing strontia oxide, strontia carbonate, (native rock,) strontia sulphate, (native rock,) calcium oxide, calcium carbonate, magnesium oxide, magnesium carbonate, calcium fluoride, magnesium chloride, magnesium sulphate, uranium oxide, and starch, substantially as described.

400,887. BUTTON. GOTTLIEB HEIDMANN, EMIL HÜTTER, and CARL HOHN, Barmen, Prussia, Germany, assignors to Heidmann & Hüttger, same place. Filed Sept. 5, 1887. Serial No. 248,870. (No model.)

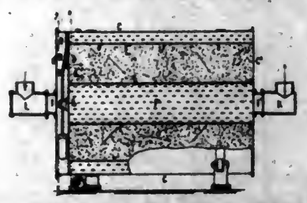


Claim.—1. As an improved article of manufacture, a blank for cloth-covered buttons, consisting of a button head or disk provided with an upturned peripheral flange, a cloth shank, and a dished or outwardly-flaring cloth-retaining plate, *f*, said parts being permanently assembled for the reception of the cloth cover, substantially as described.

2. As an improved article of manufacture, a button-frame for cloth-covered buttons, comprising the herein-described button head or disk, a cloth shank, a shank-retaining plate, and a cloth-cover-retaining plate, said parts being all united together, as described, and ready for the reception and securing thereto of the cloth covering through the medium of the cover-retaining plate, substantially as and for the purpose specified.

3. The herein-described button-frame, consisting of a button head or disk, a cloth shank, and a shank-retaining plate secured to the disk by upsetting the edges thereof over the edges of said plate, in combination with the dished or flaring cover-retaining plate or disk *f'*, connected with the other elements of the button-frame, substantially as described.

400,888. PNEUMATIC MALTING-DRUM. JULIUS HENNIES, Charlottenburg, near Berlin, Germany. Filed Sept. 20, 1888. Serial No. 286,772. (No model.) Patented in Belgium Feb. 20, 1888, No. 80,706.

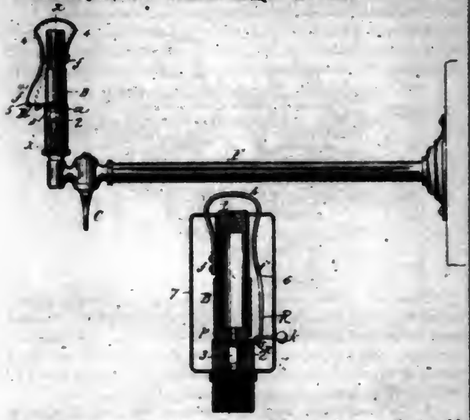


Claim.—1. A rotating malting-drum having the head-plates C C², with central apertures, I I', the partition-plate D, and the perforated conduits E and F, in combination with means, substantially as described, for creating a current of air from one of the apertures I I' to the other, the conduit or conduits through which the air issues from the drum having their perforations widening out in the direction in which the air-current passes through them, substantially as and for the purpose described.

2. The combination, with a rotating malting-drum having the head-plates C C², with central apertures, I I', the partition-plate D, and the perforated conduits E and F, of the obturating-plate O, whereby the conduits E are closed during a part of the rotation of the drum, substantially as and for the purpose specified.

3. A rotating malting-drum having the head-plates C C², with central apertures, I I', the partition-plate D, forming with the plate C an air-passage, N, in one end of the drum, the peripheral conduits E, having inward apertures, and the central perforated or apertured conduit F, the partition-plate D having apertures opposite the chamber in the body portion of the drum, substantially as set forth.

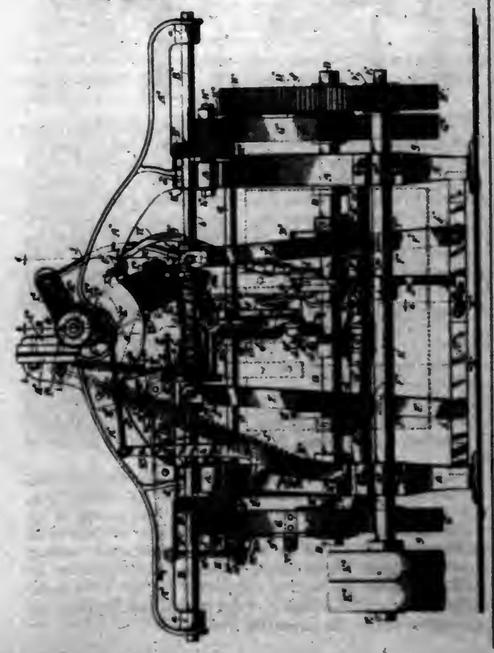
400,889. AUTOMATIC SHUT-OFF FOR GAS-BURNERS. REMI J. HENRY, Jr., Jersey City, N. J., and WILLIAM J. KASSLER, Brooklyn, N. Y. Filed July 28, 1887. Serial No. 245,563. (No model.)



Claim.—1. In an automatic shut-off for gas-burners, the combination, with a gas pipe and burner, of a valve held in a suitable seat in the burner, and provided with an arm or stem, and a U-shaped expansion spring-plate placed over the burner-tip, having one end fixed and the other positively connected with the valve-stem, and freely movable therewith at all times to open and close the valve, the construction being such that the valve is kept closed by the spring-plate, whatever the condition of the cock, unless the gas is lighted, substantially as specified.

2. The combination, with the gas pipe and burner, of a valve provided with an arm and held in a suitable seat in the burner, a U-shaped expansion-plate placed over the burner-tip and having one end fixed and the other movable, but positively and permanently connected with the arm of the valve, the cylindrical casing 7, inclosing said valve-arm and expansion-plate, and a rod, R, provided with a projection that extends outside of said case through a suitable opening therein, substantially as specified.

400,840. SPRING-MAKING MACHINE. CHRISTIAN C. HILL, Chicago, Ill., assignor to Charles L. Ames and Abel H. Frost, same place. Filed July 5, 1888. Serial No. 279,001. (No model.)



Claim.—1. A machine for making conical wire springs, comprising two rotating conical mandrels arranged end to end, and which are movable longitudinally toward and from each other, and a wire-guide which is movable in a direction longitudinally of the mandrels, substantially as described.

2. A machine for making conical wire springs, comprising two rotating conical mandrels located end to end, with their smaller ends together, and an oscillating wire-guide moving in an arc approximately corresponding with the form or outline of one side of the mandrels, substantially as described.

3. The combination, with two conical mandrels placed end to end, of means for giving intermittent rotary motion to said mandrels, means for giving reciprocatory motion to said mandrels toward and from each other, and a wire-guide movable in a direction longitudinally of the mandrels, substantially as described.

4. The combination, with two conical mandrels arranged end to end, of two shafts supporting said mandrels, said shafts being mounted in bearings affording both longitudinal and rotary motion thereto, means for giving intermittent rotary motion to said shafts, means giving intermittent endwise reciprocatory motion to said shafts, and a wire guide movable endwise with relation to the mandrels, substantially as described.

5. The combination, with two conical mandrels arranged end to end, of two shafts supporting the same, said shafts being mounted in bearings affording both endwise and rotary motion of the shafts, said shafts being provided with longitudinal grooves, of rotating sleeves surrounding said shafts and provided with feathers engaging said grooves in the shafts, driving-connections engaging said sleeves and giving intermittent rotary motion thereto, levers arranged transversely with relation to the shafts and engaged at their ends therewith, a shaft provided with two cams acting upon said levers to give endwise motion to the shafts, and a wire-guide movable endwise with relation to the mandrels, substantially as described.

6. The combination, with the rotating and longitudinally-movable conical mandrels arranged end to end, of a wire-guide movable longitudinally with reference to the mandrels, a wire-gripper on one of said mandrels, and an intermittingly-acting wire-feeding device connected to and moving with said wire-guide, substantially as described.

7. The combination, with two rotating and longitudinally-movable conical mandrels arranged end to end, of a wire-guide movable longitudinally with reference to the mandrels, a wire-gripper on one of said mandrels, an intermittingly-acting wire-feeding device connected to and moving with said wire-guide, and a tension device, also connected and moving with the wire-guide, substantially as described.

8. The combination, with two revolving and longitudinally-reciprocating mandrels arranged end to end, of a wire-gripper upon one of said mandrels, a wire-guide movable longitudinally with relation to said mandrels, an intermittingly-acting feeding device movable with said wire-guide and engaging the wire passing through the same, and a cutting device arranged in alignment with the said wire-guide when the latter is at the limit of its movement away from the wire-gripper, substantially as described.

9. The combination, with two rotating and longitudinally-reciprocating conical mandrels, of a wire-guide movable longitudinally with relation to the mandrels, a wire-gripper upon one of said mandrels, an oscillating arm carrying said wire-guide, a feeding device mounted upon said arm, and a cutting device arranged opposite the larger end of the other of said mandrels, substantially as described.

10. The combination, with two longitudinally-reciprocating revolving conical mandrels arranged end to end, of an oscillating wire guide, a pivotally-supported arm carrying said wire-guide, and means for giving oscillatory movement to said pivoted arm, substantially as described.

11. The combination, with two rotating and longitudinally-reciprocating conical mandrels, of a wire-guide, a pivotally-supported oscillating arm carrying said guide, feeding-rollers mounted upon said arm and engaging the wire passing through the guide, a wire-gripper upon one of said conical mandrels, and means giving intermittent rotary motion to said feed-rollers constructed to turn the rollers as the wire-guide approaches said wire-gripper, substantially as described.

12. The combination, with two revolving longitudinally-reciprocating conical mandrels arranged end to end, of a wire-guide movable longitudinally with relation to the mandrels, a pivotally-supported swinging arm carrying a rigid arm extending outwardly from the said wire-guide-carrying arm, a rotating cam, a lever engaging said cam, and a connecting-rod connecting said lever with the said arm of the wire-guide-carrying arm, substantially as described.

13. The combination, with two rotating and longitudinally-reciprocating conical mandrels arranged end to end, of a wire-guide, a pivotally-supported oscillating arm carrying said guide, feed-rollers mounted upon said arm, one of said feed-rollers being movable toward and from the other feed-roller, means giving intermittent rotary movement to said feed-rollers, and means for moving one of said rollers toward and from the other roller, substantially as described.

14. The combination, with two rotating and longitudinally-reciprocating conical mandrels arranged end to end, of a wire-guide, a pivotally-supported oscillating arm carrying said wire-guide, feed-rollers mounted upon said oscillating arm, and means for giving intermittent rotary movement to said feed-rollers, comprising a shaft, K, connected with one of said feed-rollers, gearing connecting said shaft K with the other feed-roller, a shaft, K^2, arranged concentrically with relation to the pivotal axis of the said oscillating arm, gearing connecting said shafts K and K^2, an oscillating arm, K^3, a pawl-and-ratchet connection between said arm K^3 and the shaft K^2, and means for giving intermittent oscillatory movement to said arm K^3, substantially as described.

15. The combination, with the rotating and longitudinally-reciprocating conical mandrels C and C', of a wire-guide, a pivotally-supported arm carrying said wire-guide, feed-rollers mounted upon said arm, a shaft, K, mounted upon said arm and giving motion to said feed-rollers, a shaft, K^2, arranged concentric with the pivotal axis of the said arm, gearing connecting said shafts K and K^2, an oscillating arm, K^3, mounted concentrically with the shaft K^2, a pawl-and-ratchet connection between said oscillating arm K^3 and the shaft K^2, a lever, K^4, connected with the said oscillating arm K^3, a spring applied to said lever K^4 for moving the latter in one direction, and a drive-wheel, G, by which rotary motion is given to one of said mandrels, said wheel being provided with a cam, K', which engages and actuates the said lever K^4, substantially as described.

16. The combination, with the oscillating arm I and feed-rollers L L', of shafts K K', supporting said feed-rollers, an eccentric-plug, K^2, supporting the shaft K', an arm, L, attached to the said eccentric-plug K^2, toggle-arms L' L^2, connected with said arm L and with the arm I, and stops or detents L^4 L^5, engaging and moving said toggle-arms as the said arm I is oscillated, substantially as described.

17. The combination, with the mandrels C C', an oscillating arm, I, and a wire-guide mounted thereon, of intermittingly-rotating feed-rollers mounted upon said oscillating arm I, shafts K and K', supporting said feed-rollers, an eccentric-plug, K^2, mounted in the arm and affording bearing for the shaft K', an arm, L, upon said eccentric-plug, toggle-arms L' L^2, connected with the arm I and with the said arm L, a spring, L^3, acting to hold said toggle-arms in their flexed position, a spring-detent, L^5, engaging one of said toggle-arms for flexing the same, and an arm, L^6, attached to the actuating-lever F' and acting upon said toggle-arms to straighten out the latter, substantially as described.

18. The combination, with two rotating longitudinally-reciprocating conical mandrels arranged end to end, of a wire-gripper on one of said mandrels, comprising a stationary jaw and a movable jaw, said movable jaw being attached to a sliding bar mounted in the mandrel and constructed for actuation by the endwise pressure of the other mandrel when said mandrels are brought together, substantially as described.

19. The combination, with two revolving and longitudinally-reciprocating conical mandrels arranged end to end, and a wire-guide movable endwise with relation to the mandrels, of stationary guard pins or fingers I^2 I^3 I^4, surrounding the end of one of the mandrels, substantially as described.

20. The combination, with two rotating longitudinally-reciprocating conical mandrels arranged end to end, and a wire-guide movable longitudinally with relation to the mandrels, of means for discharging finished springs, consisting of a plurality of revolving arms located beneath the said mandrels, and means giving intermittent rotary motion to said arms, substantially as described.

21. The combination, with rotating and longitudinally-movable conical mandrels arranged end to end, and a wire-guide movable longitudinally with relation to said mandrels, of a wire-cutting device embracing stationary and movable cutters arranged in alignment with the wire-guide when the latter is at the extreme limit of the forward movement, a pivoted lever supporting said movable cutter, a pivoted dog, N^4, connected with said lever, and a wheel carrying a pin, N^5, constructed to engage said dog for actuating the movable cutter, substantially as described.

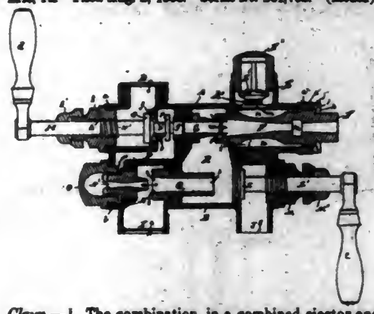
400,841. PEN-EXTRACTOR OR DEVICE FOR REMOVING PENS FROM THEIR HOLDERS. ADOLPH G. HOUSTATTER, New York, N. Y. Filed Jan. 19, 1889. Serial No. 296,801. (No model.)



Claim.—1. The pen-extractor consisting, substantially as described, of a piece of elastically-yielding material having a longitudinal transversely-curved slit in one end thereof.

2. The pen-extractor formed in two longitudinal divisions united at one end, and having a longitudinal transversely-curved groove in the inner face of the one division and a counterpart rib formed in the opposite face of the other division to enter said groove, substantially in the manner and for the purpose herein set forth.

400,842. COMBINED EJECTOR AND INJECTOR. PARKER P. HOUSE, Erie, Pa. Filed Aug. 2, 1888. Serial No. 281,782. (Model.)

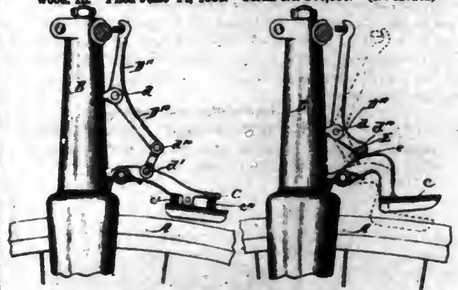


Claim.—1. The combination, in a combined ejector and injector having steam and water passages connecting them together, of a valve-stem, having a steam-inlet valve secured thereon and operating on a valve-seat, with a piston-valve secured on the end of said valve-stem, operating loosely in the end of injector-tube, substantially as and for the purpose set forth.

2. The combination, in an injector-tube, of a peripheral shoulder or flange on its inner end, adapted to fit tightly against a seat in the injector-body, with a flange on its outer end concaved out on one side, so as to adapt it to be forced up to and seated against the end of the injector-body, substantially as and for the purpose set forth.

3. The combination, in an injector valve-stem, of a steam-shut-off valve operating upon a seat and a piston-valve operating in the end of the injector jet-tube, with a valve on said stem between said first-named valves adapted to regulate the flow of steam, substantially as and for the purpose set forth.

400,843. VELOCIPEDE-BRAKE. THOMAS B. JEFFERY, Ravenswood, Ill. Filed June 14, 1888. Serial No. 277,036. (No model.)



Claim.—1. In a velocipede, in combination with the wheel and the head, the brake-carrying lever pivoted to the head, and an auxiliary lever, also pivoted to the head, and an intermediate piece pivoted to said auxiliary lever and actuating the brake-carrying lever, the distance from the pivot of the auxiliary lever to the contact of said intermediate piece with the brake-carrying lever, when the brake-shoe is in closest contact with the wheel, being nearly equal to the sum of the distances from the pivot of said auxiliary lever on the head to the pivot to said lever of the intermediate piece and the distance from the last-named pivot to the contact of the intermediate piece with the brake-carrying lever, substantially as and for the purpose set forth.

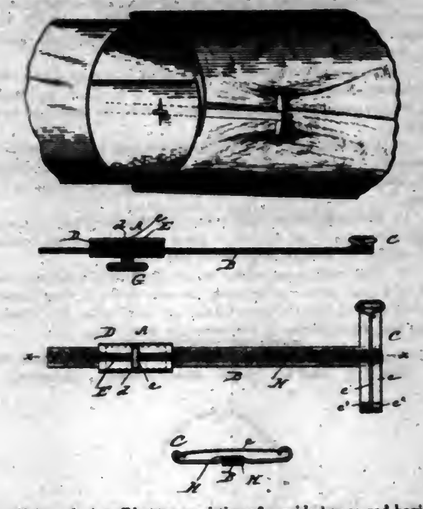
2. In combination with the wheel and the head, the brake-carrying lever pivoted to the head, and an auxiliary lever, also pivoted to the head, and a link connecting said auxiliary lever to the brake-carrying lever, the sum of the lengths of said link and the auxiliary lever being slightly greater than the distance between their pivots to said brake-carrying lever and head, respectively, when the brake-shoe is in contact with the wheel, substantially as and for the purpose set forth.

3. In a velocipede, in combination with the wheel and the head, the brake-carrying lever pivoted to the head, and an auxiliary lever, also pivoted to the head, the brake-carrying lever having an upwardly-extending arm, and a link connected from said arm to the auxiliary lever, the sum of the lengths of said links and auxiliary lever being slightly greater than the distance from the pivot of the auxiliary lever on the head to the pivot of the link to the brake-carrying lever when the brake-shoe is in contact with the wheel, substantially as and for the purpose set forth.

4. In a velocipede, in combination with the head and the wheel, the brake-carrying lever pivoted to the head, and the brake-shoe pivoted to said lever, and a spring reacting between the shoe and the lever forward of the pivot of the shoe to force the shoe toward the wheel, and a stop to limit such movement of the shoe about its pivot, substantially as and for the purpose set forth.

5. In a velocipede, in combination with the wheel and the head, the brake-carrying lever having the brake-shoe pivoted to it and provided with two springs, one in front and one behind its pivot, reacting between it and the lever, substantially as and for the purpose set forth.

400,844. CUFF-HOLDER. GEORGE R. G. JOHN, Louisville, Ky. Filed Nov. 13, 1888. Serial No. 290,727. (No model.)



Claim.—1. A cuff-holder consisting of a guide bar or rod having a clasp at one end for detachably connecting the same to the wearer's sleeve, a sliding sleeve fitted on said bar to move longitudinally thereon and having a stud for attaching a cuff thereto, and a friction-spring arranged within and attached to the sliding sleeve to move therewith and normally bearing on said rod to hold the sliding sleeve at any desired longitudinal adjustment thereon, substantially as and for the purpose described.

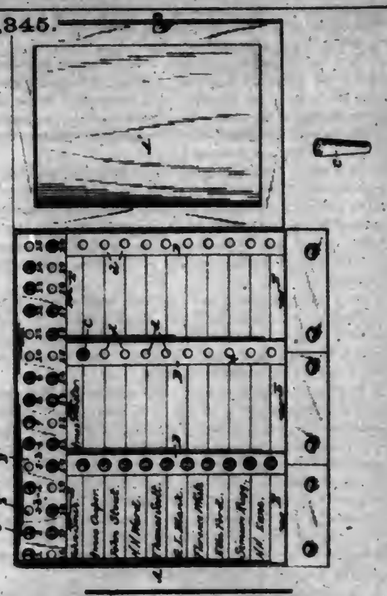
2. A cuff-holder consisting, essentially, of a guide bar or rod, an adjustable sleeve fitted thereon, a tension-spring detachably connected to the sleeve and arranged within the latter between one of the sides thereof and the bar to normally ride against said bar, and a headed stud permanently secured to the sleeve exteriorly thereto, substantially as described.

3. A cuff-holder consisting of a guide bar or rod, a sleeve fitted thereon and having a transverse slot therein, and a spring arranged within the sleeve and having a raised rib at its middle, which rib fits in the slot to detachably connect the spring to the sleeve and permit both ends of said spring to bear against the bar and sleeve, substantially as described.

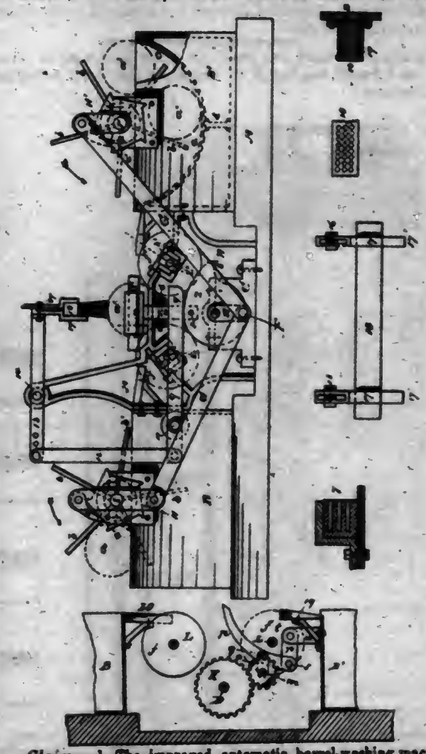
4. A cuff-holder consisting, essentially, of a guide bar or rod having longitudinal strips of fabric permanently united thereto, and an adjustable clasp fitted on said bar and provided with a spring which bears against the fabric strip to hold said clasp on the bar by frictional contact therewith, substantially as described.

5. A cuff-holder consisting of a guide-bar, an attaching-pin having a flat plate permanently secured to one end thereof, said plate having a pin pivoted to one end and a notched keeper at its other end, and an adjustable clasp fitted on the guide-bar to slide longitudinally thereon and having a friction-spring which is fitted within the sleeve between one of the sides thereof and the bar to normally bear against said bar, substantially as described.

400,845. [illegible]



400,846. BARREL-WASHING MACHINE. HENRY R. KLANT, Newark, N. J. Filed Apr. 12, 1888. Serial No. 270,468. (No model.)



Claim.—1. The improved automatic barrel-washing machine herein described, combining a tank adapted for filling the barrels with water, top and end brushes operated by levers for washing and scrubbing said barrels, a tank adapted for cleansing and rinsing the barrels after being washed and scrubbed, rollers to cause the barrel to revolve, and an arm for automatically transferring the barrel to the rinsing-tank, as and for the purposes set forth.

2. An automatic barrel-washer combining a plurality of washing-tanks, a carrier for conveying or transferring the keg or barrel from

400,845. INDICATOR. GEORGE W. KENNEDY, Zanesville, Ohio. Filed Jan. 11, 1888. Serial No. 296,081. (No model.)

Claim.—In a record device, a board or plate having holes or perforations formed therein and fixed numbers adjacent to the holes or perforations corresponding to the articles or books to be loaned and removable pegs to fit the holes or perforations, in combination with a name-column provided with holes or perforations to receive the numbered pegs when removed from the board or plate, substantially as and for the purpose set forth.

one tank to the next, and a scrubber or washer for removing the adhering dirt in the transfer, as set forth.

3. In a barrel-washing machine, a water-tank, a revolving shaft provided with arms for receiving, holding, and automatically discharging the barrel from the tank, pawl-and-ratchet wheel for regulating the motion of the shaft, crank, levers, and rods connecting said shaft with the main driving-shaft of the machine, substantially as described, and for the purposes set forth.

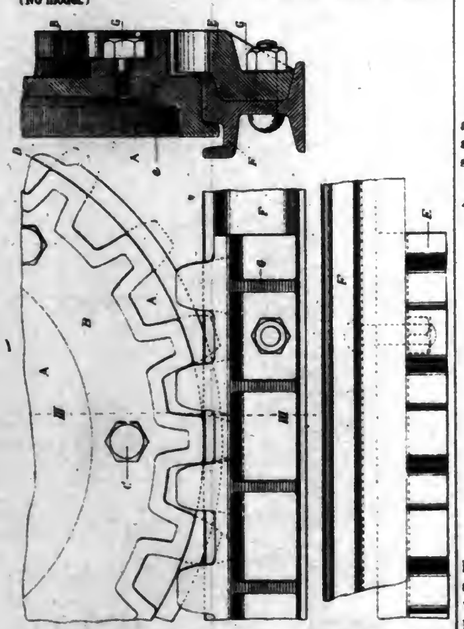
4. In a barrel-washing machine, a washing and scrubbing mechanism consisting of two revolving shafts provided with rubber rollers, on which the barrel rests and with which it revolves, brushes adapted and arranged to automatically brush and scrub the ends and sides of the barrel, and an arm disposed to automatically lift and remove the barrel from the rollers, substantially as described, and for the purposes set forth.

5. In a barrel-washing machine, the combination, with main driving-shaft D, provided with crank E, of tanks B B', shafts I I', cranks H H', arms *b b*, for holding the barrels, pawls and ratchets *c c'*, and rods G G', connecting cranks H H' to crank E, substantially as described, and for the purposes set forth.

6. In a barrel-washing machine, the combination, with main driving-shaft D, of gear-wheel K on said shaft, gear-wheel *l*, meshing into said gear-wheel K, crank *o*, and link *r*, arm *p*, pin *t*, cam-wheels 2 2 on main driving-shaft, pivoted levers 4 4, having their lower ends resting against said cam-wheels, brushes 7 7, secured to the upper ends of said levers, pivoted lever 9, having one end resting upon the periphery of cam-wheel 2 and operated by projection 8 on said cam-wheel, pivoted lever 13, rod 12, connecting levers 9 and 13, rocker-shaft 15, to which are secured levers 13 and 16, and brush and clamps 17, secured to the ends of levers 13 16, all said parts being arranged and combined as herein shown, and for the purposes set forth.

7. In a barrel-washing machine, the combination, with main driving-shaft D, provided with gear-wheel K, of a gear-wheel, *l*, shaft *m*, crank *o*, arm *p*, link *r*, pin *t*, and lugs *u u*, secured to the frame of the machine, all said parts being arranged and combined as shown, and for the purposes set forth.

400,347. RACK AND GEAR FOR INCLINED RAILWAYS. WALTER H. KNIGHT, New York, N. Y. Filed Oct. 16, 1888. Serial No. 288,243. (No model.)



Claim.—1. The combination, with the driving-wheel of a vehicle, of a gear-wheel having its pitch-circle substantially coincident with the tread of the wheel, and teeth terminating substantially at the pitch-circle.

2. The combination, with the bearing-rail of a railway, of a rack thereon having its teeth projecting above the tread of the rail, and a driving-wheel on a vehicle provided with a gear whose pitch-circle is substantially coincident with the tread of the wheel and whose teeth terminate at the pitch-circle.

3. The combination, with the bearing-rail of a railway, of an outside rack attached thereto and a driving-wheel of a vehicle having a gear on the outside adapted to engage with the said rack, the said gear having its pitch-circle substantially coincident with the tread of the wheel and its teeth terminating at the pitch-circle.

4. The combination, with the bearing-rail of a railway, of a sectional rack-rail attached thereto, the sections of the rack terminating at a point between two adjacent teeth.

5. The combination, with a girder-rail on a railway having a contracted upright web, of a rack-rail fitted to the web of the said girder-rail and attached thereto, substantially as described.

6. The combination of a bearing-rail of a railway having a single contracted web, with a rack-rail fitted thereto, and fastening devices for the rack-rail passing through the web of the bearing-rail.

7. The combination of a bearing-rail of a railway having a contracted web and broadened bearing-flanges, with a rack-rail fitted thereto and having a substantially continuous bearing upon the bottom flange of said track-rail.

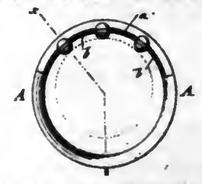
8. The combination of a bearing-rail of a railway with a rack-rail having a bearing by its under face on the track-rail, and fastening devices securing the rack-rail to the web of the track-rail, as set forth.

9. The combination, with the bearing-rail of a railway having a contracted web and broadened bearing-surface, of a separately-formed rack shaped to fit the said rail, and fastenings holding the rack in place.

10. The combination, with a bearing-rail of a railway, of a separately formed rack-rail secured in place by the side of the bearing-rail and having strengthening-ribs at intervals.

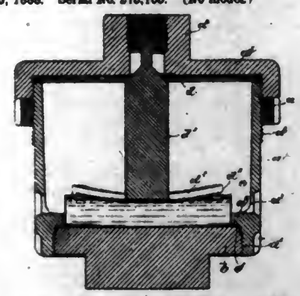
11. The combination, with a rack by the side of a railway-track rail, of a gear, fastenings securing the gear to the driving-wheel of the vehicle, and suitable intermediate stops holding the two wheels in place and thereby relieving the fastenings from strain.

400,348. CURTAIN-POLE RING. CHARLES W. LAWRENCE, New York, N. Y. Filed Nov. 8, 1888. Serial No. 290,311. (No model.)



Claim.—A curtain-pole ring provided with a central annular bead and a pivot-wire secured into said bead, and with anti-friction rollers applied to said wire and located in openings of the curtain-ring, substantially as set forth.

400,349. STEAM-TRAP. JOHN F. LIGHTFORD, Portland, Me., assignor to the Sewall Safety Car Heating Company, same place. Filed May 25, 1888. Serial No. 275,105. (No model.)



Claim.—1. In a steam-trap, the cylinder or shell *a*, containing at its lower end the thermostatic vessel and at its upper end the valve-seat, the thermostatic vessel consisting of an inverted-cup-shaped device secured by flanges to the shell, combined with the valve or plunger, as *d'*, resting upon the diaphragm of the thermostatic vessel and adapted to co-operate with the valve-seat, substantially as described.

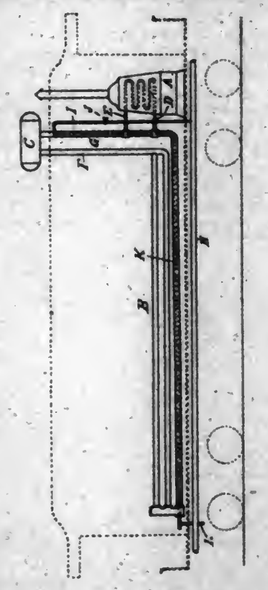
2. In a steam-trap, the shell or case *a*, having exits, and the bottom plate, *b*, combined with the thermostatic vessel consisting of an inverted-cup-shaped device provided with flanges secured between the shell and bottom plate, and the valve or plunger resting upon said thermostatic vessel, and the valve-seat with which the said plunger co-operates, said plunger having guides at each end, substantially as described.

3. In a steam-trap, the shell *a*, having the flange a^3, and the bottom plate, *b*, combined with the inverted-cup-shaped shell *c*, having the flange *c'*, which, together with the said bottom plate, forms the thermostatic vessel, substantially as described.

4. In a steam-trap, the shell *a*, having exits, the bottom plate, *b*, and shell *c*, combined with the vertically-movable plunger *d'*, having the spider d^3, spanning the diaphragm of the shell *c*, substantially as described.

5. In a steam-trap, the shell *a*, having lateral exits a^3, the bottom plate, *b*, and the inverted-cup-shaped shell *c*, rising above the bottom plate in front of the exits and secured by its flange between the shell *a* and bottom plate, combined with a valve moved by the said shell *c*, and the top plate and cap a^5, substantially as described.

400,350. SYSTEM FOR HEATING CARS. JAMES F. MCELROY, Lansing, assignor to the McElroy Car Heating Company, Detroit, Mich. Filed Dec. 2, 1887. Serial No. 256,764. (No model.)



Claim.—In a car-heating system, the combination, with the lower branch, K, of the radiating-pipes of a circulating hot-water system and the heater, of the riser G, connecting said branch with the expansion-drum, the steam-pipe I, entering the riser G near the top thereof and running downwardly through the riser and through the pipe K, and the outgoing and ingoing connections D E between the riser G and the heater, substantially as described.

400,351. SEEDER, HARROW, AND ROLLER. WM. G. MICHAEL, Harrison City, assignor of two-thirds to Low W. Bott and M. L. Painter, Greensburg, Pa. Filed June 4, 1888. Serial No. 275,905. (No model.)

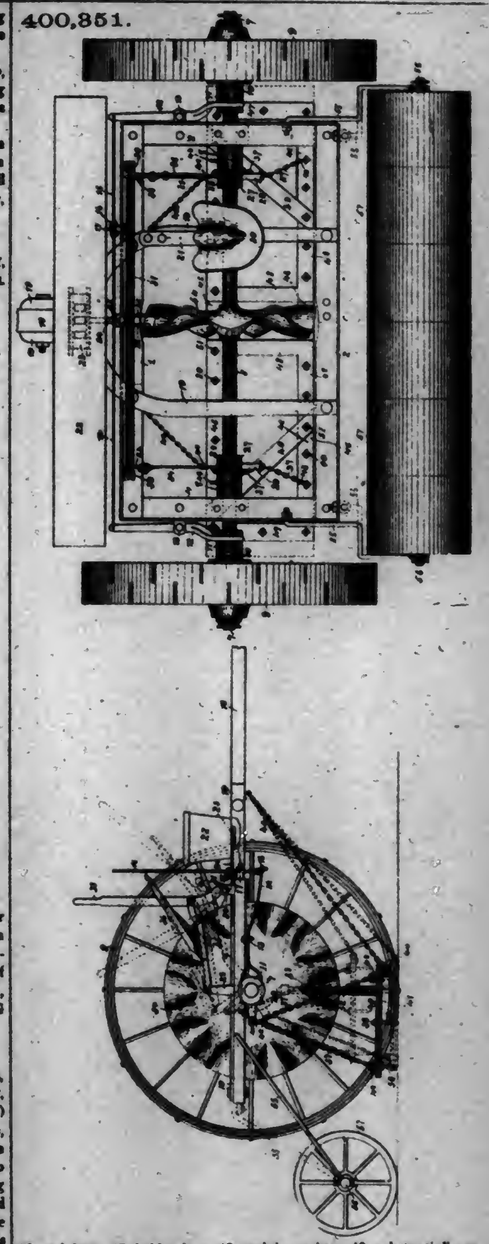
Claim.—1. The combination of the main frame, the drive-axle, the supporting-wheels, the rearwardly-extending arms secured to the front and rear plates of the main frame, the seed-hopper secured to the arms in front of the main frame, having a seed-slide, the swinging bar pivoted to the main frame, connected with the seed-slide, and having rearwardly-extending arms, and a cam-wheel fixed to the axle and working between the arms of the swinging bar, substantially as described and shown.

2. The combination of the main frame, the drive-axle, the bell-crank levers mounted on the axle, having upper and lower arms, the rock-shaft having a crank-arm at one end and a lever at the other end, a pitman connecting the crank-arm with one of the upper arms, a ratchet-bar connecting the lever with the other upper arm, a pawl pivoted to the lever and engaging the ratchet-bar, a harrow-frame, and chains by which the harrow-frame is suspended from the lower arms, substantially as described and shown.

3. The combination of the main frame, the drive-axle having a cam-wheel, the harrow-frame, the bell-crank levers by which the harrow-frame is suspended underneath the drive-axle, having vertical posts between which the cam-wheel works, and lever mechanism connected with the bell-crank levers, substantially as described and shown.

4. The harrow-frame constructed with a front bar, 45, rear bar, 46, end bars, 47, bridge-bars 48, and brace-bars 49, substantially as shown and described.

400,351.



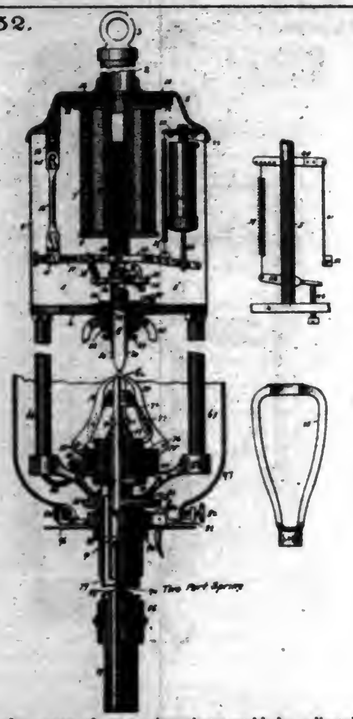
400,352. ARC LAMP. WILLIAM H. MILLER, New York, N. Y. Filed June 26, 1888. Serial No. 278,251. (No model.)

Claim.—1. In an arc lamp, the combination of an actuating-lever connected to the core of the controlling-magnet, and an adjustable hanger, to which said lever is pivotally connected by means of an interposed fulcrum-block carried by the lever and adjustable lengthwise therewith, substantially as described.

2. The combination of the hollow solenoid-core 18, lever 16, pivoted thereto, link 38, pivoted clutch-bar 34, having engaging edge or blade, and sleeve 32, to which said clutch-bar is pivoted, substantially as described.

3. In an arc lamp in which one of the carbons is propelled continuously through the aperture formed by abutments bearing against its breast behind the point, the combination, with a stationary frame

400,852.



or holder, of a group of converging abutment-blades adjustable in said frame, and means for adjusting said blades in the frame or holder.

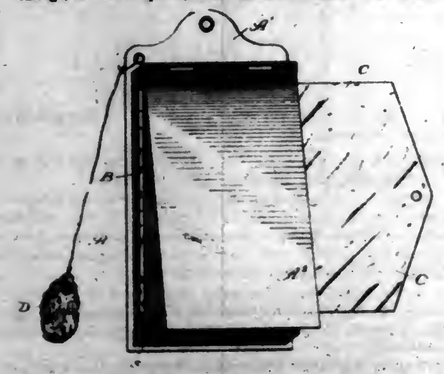
4. The combination of an abutment-frame with removable blades forming the abutment at their apex, substantially as described.

5. The combination of an abutment-frame, pivoted blades thereon converging toward a center above the pivotal level, and a movable adjusting device movable on said frame in operative connection with and adapted to effect the joint and simultaneous movement of said blades, substantially as described.

6. In an arc lamp, the combination, with the lower yoke and a tube projecting downwardly therefrom, of a globe-holder movable vertically on said tube and supported thereby below the yoke, a disk below said globe-holder, and a supporting-ring for said disk having a bayonet-lock on said tube, adapting it to vertical movement on the tube independently of the globe-holder.

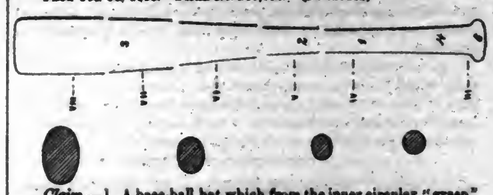
7. In an arc lamp wherein one carbon is propelled constantly against a fixed abutment by a spring, the combination, with the carbon-inclosing tube and abutment, of a two-part spring composed of a main and supplementary part, the latter being adjacent to the carbon and constituting a removable section of the propelling-spring, substantially as described.

400,853. BUTTON AND ORNAMENT PASTER. MORRIS MOORE, Chicago, Ill. Filed Apr. 21, 1888. Serial No. 271,410. (No model.)



Claim.—As a new article of manufacture, a button and ornament paster comprising sheets of paper gummed on one side and fastened together into blocks toward two opposite edges, substantially as described.

400,854. BASE-BALL BAT. CHARLES H. MORRIS, Cincinnati, Ohio. Filed Oct. 31, 1888. Serial No. 289,696. (No model.)



Claim.—1. A base-ball bat which from the inner circular "grasp" gradually merges into an oval or approximately oval transverse section at the striking portion, substantially as and for the purposes set forth.

2. A base-ball bat which from a circular handle or inner grasp, 1, becomes gradually of oval cross-section to outer grasp, 2, and the striking portion 3, said handle being formed of gradually-greater circular cross-section 4 to the guard or hilt 5.

3. A base-ball bat which from the inner circular grasp gradually merges into an oval or approximately oval transverse section at the striking portion, and has a mark or sight, 6, on its edge portion," as designated.

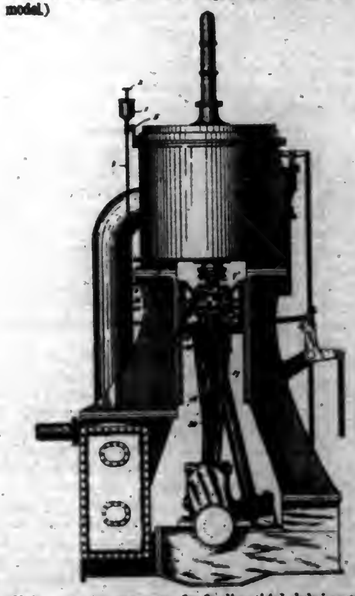
400,855. PRESSER-FOOT FOR SEWING-MACHINES. WILLIAM A. NEELY, Lynn, Mass., assignor to The Wheeler & Wilson Manufacturing Company, Bridgeport, Conn. Filed Sept. 18, 1888. Serial No. 285,602. (No model.)



Claim.—1. In a sewing-machine having two closely-adjacent needles, the combination, with a roller presser-foot, of an independent presser-foot consisting of a thin blade-like device arranged edgewise vertically between said needles, substantially as set forth.

2. In a sewing-machine having two closely-adjacent needles, the combination, with a roller presser-foot, of an independent presser-foot consisting of a thin blade-like device arranged edgewise vertically between said needles and having a yielding or spring connection with the arm or shank to which it is attached, substantially as set forth.

400,856. LUBRICATOR. HENRY O'CONNELL and STEPHEN A. CAHILL, Manistee, Mich. Filed Aug. 2, 1888. Serial No. 281,812. (No model.)



Claim.—1. An apparatus for feeding thick lubricants to the moving parts of an engine, consisting of the combination of an externally-closed stationary grease-cup provided with a back-pressure plunger, an externally-closed pipe which communicates with said cup, and which has at opposite ends means of support on the stationary frame and on a moving part of the engine and flexible between such points of support, and a pipe or duct which communicates with the moving part to be lubricated, and which is connected to said flexible pipe at its point of support on the moving part of the engine, substantially as and for the purposes set forth.

2. In an apparatus for feeding thick lubricants to the moving member of an engine, the combination of a stationary externally-closed grease-cup having a pressure-plunger and externally-closed pipes 4 14 16, connected by hollow hinged joints with each other and with the grease-cup and moving member, respectively, substantially as set forth.

3. In an apparatus for feeding thick lubricants to the moving member of an engine, the combination of the following elements, to wit: a stationary externally-closed grease-cup, 1, having a pressure plunger or follower, 2, a hollow jointed pipe, 4, leading therefrom, a pipe, 14, connected with said pipe 4 by a hollow hinge adapted to allow the passage of the lubricant without atmospheric contact, and a pipe, 16, hinged at one end to the free end of the pipe 14 by hollow joint and adapted to be connected at its other end to the moving member to be lubricated, the said joint having on one side a stud to fasten it to one of said pipes, a spindle, 8, having a flange, 9, occupying said joint, and a plug for holding the said spindle within said joint, substantially as set forth.

4. In an apparatus for feeding thick lubricants to the moving members of the engine, the combination of an externally-closed stationary grease-cup having means of optional back-pressure, the pipe 4, connected with said cup by the hollow stationary joint 7, to which said pipe is connected, the pipe 14, hinged to said joint and having connection therethrough with said pipe 4, the pipe 16, connected to said pipe 14 by hollow hinged joint at one end and having its other end communicatively connected with pipe 18 by a hinged joint adapted to be mounted on and communicate with the engine cross-head pin-strap and lubricate the pin, as set forth.

5. In an apparatus for feeding thick lubricants to the moving members of an engine, the combination of the externally-closed stationary grease-cup 1, having a pressure follower or plunger, 2, hollow-jointed pipes 14 16, connected thereto and supported on the engine cross-head pin-strap, the pipe or duct 18, connected both with the crank-pin and the said pipe 16, and also supported on said cross-head pin-strap, and a branch pipe or duct, 19, conducting to the said cross-head pin, substantially as set forth.

6. The combination of the grease-cup 1, the pipe 4, the stationary joint 7, connecting said pipe 4 with pipe 14 and supporting same, the swing or vibrating joint 15, the connecting-pipes 14 and 16, the stationary joint 7, adapted to be fixed to the engine cross-head pin-strap connecting and supporting pipes 16 18, and the branch pipe or duct 20 from pipe 18, all arranged and adapted to operate substantially as and for the purposes set forth.

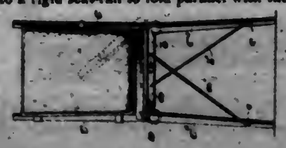
7. The combination of grease-cup 1, jointed pipes 14 and 16, connected thereto and supported on cross-head 17, pipe 18, connected with the crank-pin and the pipe 16, and also supported on said cross-head pin-strap, and a branch pipe, 19, connected with the cross-head pin, substantially as set forth.

8. The combination of grease-cup 1, pipe 4, stationary joint 7, connecting said pipe 4 with pipe 14 and supporting same, swing-joint 15, connecting-pipes 14 and 16, stationary joint 7', adapted to be fixed to cross-head pin-strap 17, and connecting and supporting pipes 16 and 18.

9. The combination of a stationary grease-cup, 1, having pipe 4 connected therewith, a stationary hollow joint, 7, to which said pipe is connected, the pipe 14, hinged to said joint and having connection therethrough with pipe 4, the pipe 16, connected to pipe 14 by a hollow hinged joint at one end, and having at its other end connection with a pipe, 18, by a hinged joint adapted to be mounted on the cross-head pin-strap of said engine, substantially as set forth.

400,857. FOLDING CHAIR. HUGH O'HARE, Mount Pleasant, Iowa, assignor to John F. Leech, same place. Filed Aug. 2, 1888. Serial No. 281,796. (No model.)

Claim.—1. In a chair, the combination of two parallel rigid sections, two hinged seat-rails connecting said sections, brace-rods pivoted at their lower ends to the respective sections, and at their upper ends to the hinged seat-rails of the opposite section, and the rigid seat-frame hinged to a rigid seat-rail to fold parallel with the sections.

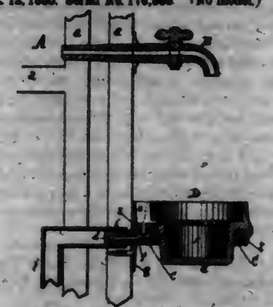


400,857.



2. In a chair, the combination of two parallel rigid sections, two hinged seat-rails connecting said sections, brace-rods pivoted at their lower ends to the respective sections and at their upper ends to the hinged seat-rails of the opposite section, and a rigid centrally-divided seat-frame supported by the hinged seat-rails and connected to the rigid seat-rails to fold parallel with the chair-sections.

400,858. COMBINED GOBLET-HOLDER AND DRIP-CUP ATTACHMENT FOR REFRIGERATORS. ANDREW J. PAGE, Philadelphia, Pa. Filed Sept. 12, 1885. Serial No. 176,886. (No model.)

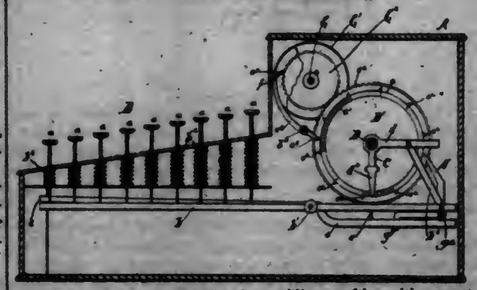


Claim.—1. The combination, with a cup having a peripheral shoulder, the said cup at or near the shoulder being non-circular in horizontal cross-section, and a perforated diaphragm located within the cup, of a bracket having an opening conforming in shape to the cup at the non-circular portion thereof and adapted to form a seat for the shoulder on the cup, substantially as set forth.

2. The combination, with a water-cooler and a detachable drip-cup located beneath the faucet of the cooler and provided with a diaphragm having an orifice through which the drip is adapted to fall directly from the faucet, of a waste-pipe leading from a point just beneath the diaphragm of the cup to the cooler-support, substantially as set forth.

3. The combination, with a water-cooler located within a refrigerator, of a drip-cup and goblet-holder supported beneath the faucet of the water-cooler, and a waste-pipe adapted to conduct the water from the drip-cup to the waste-pipe of the refrigerator, substantially as set forth.

400,859. ADDING-MACHINE. JOHN PFEIFER, Springfield, Ohio. Filed Aug. 29, 1888. Serial No. 284,070. (No model.)



Claim.—1. The combination, in an adding-machine, with a counting-wheel, a clutch mechanism, and its operating-lever, of a stop-lever arranged parallel with said operating-lever and pivoted so as to move in a parallel plane therewith, and a series of keys arranged over said levers, said key-stems each being provided with two bearing-faces adapted to engage the respective levers, whereby the stop-lever is forced into

an engagement with the counting-wheel when the key is depressed sufficiently to turn said counting-wheel a number of notches corresponding to the number on the said key, substantially as specified.

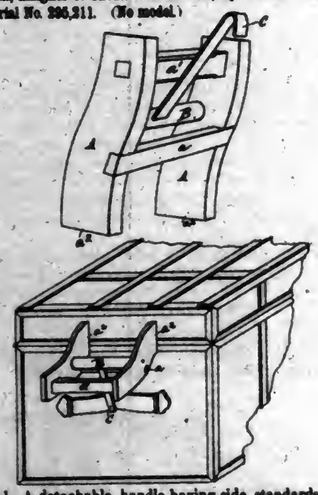
2. The combination, in an adding-machine, with a counting-wheel and its operating-lever and a series of keys over said operating-lever, of indicating-wheels geared to said counting-wheel, a stop-lever pivoted alongside of said operating-lever, the key-stems being provided with different bearing-faces adapted to engage said operating and stop levers, substantially as and for the purpose set forth.

3. The combination, with an operating-lever and its keys, as described, of a counting-wheel having a laterally-projecting rim and ratchet-teeth on the face thereof, and a clutch mechanism consisting of a bell-crank and a pivoted pawl connected to said operating-lever and adapted to engage with the teeth on said projecting rim, said pawl being pivoted within said rim and extended outwardly and downwardly, so as to engage by gravity with the teeth on said rim, substantially as specified.

4. The combination, with the counting-wheels, the indicating-wheels geared thereto, and a laterally-projecting rim with projections on the periphery thereof, of a bell-crank lever adapted to be engaged on one arm by said projections and at the other to engage with the indicating-wheel of the next higher order, and a stop-lever connection adapted to be engaged by said projections and thus stop the counting-wheel of the next higher order when its indicating-wheel has moved one notch, substantially as specified.

5. The combination, in an adding-machine of the outer casing, of the keys arranged in series, the operating-levers under said keys, counting-wheels connected to said levers by suitable clutch mechanism, indicating-wheels geared to said counting-wheels, said indicating-wheels being provided with numerals on the periphery thereof adapted to show through openings in said casing, stop-levers alongside of said operating-lever and adapted to be engaged by a bearing-face on the key-stems and provided with projections adapted to engage and stop said counting-wheels when each key is depressed to the proper distance, and operating mechanism adapted to move the indicating-wheel of one column when the counting-wheel of the next preceding column has moved ten notches, and stop mechanism adapted to stop said counting-wheel when it has moved one notch of the next succeeding indicating-wheel.

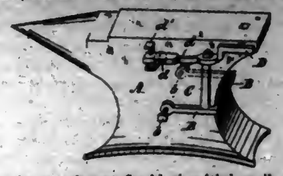
400,360. DETACHABLE HANDLE. DANIEL PHILBRICK, Amesbury, Mass., assignor to Thomas Ira Marden, Rye, N. H. Filed Jan. 2, 1889. Serial No. 295,211. (No model.)



Claim.—1. A detachable handle having side standards, A, connected by upper and lower transverse braces, *a a'*, and provided intermediately of said braces with a revoluble roller, B, pivoted to said standards, said roller having midway of its length and at right angles thereto an extending hook, C, as and for the purpose indicated, substantially as described.

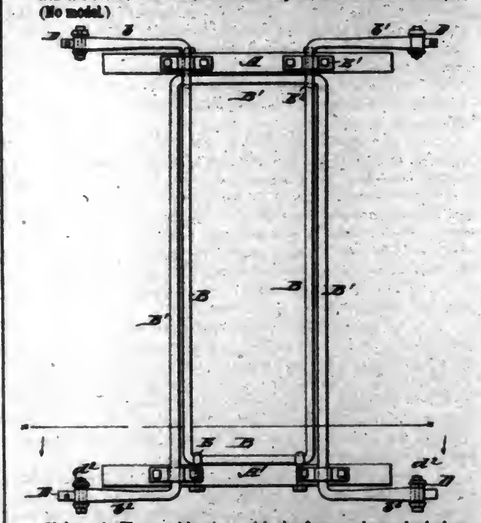
2. As a new article of manufacture, a detachable handle for temporary connection to removable packages, consisting of a pair of vertical standards, curved at their upper and lower ends in opposite directions, connected by under and upper transverse braces, *a a'*, and a roller pivoted to and between the standards, said roller having an extending hook and bar, C, adapted to mesh with the connections of a package and to be swung against the transverse braces, whereby when the lever ends a^2 of the standards are impinged against the surface of a package a compound leverage purchase will be secured, as and for the purpose indicated, substantially as described.

400,361. ATTACHMENT FOR ANVILS. BENJAMIN R. ROGERS, Lyn, Ontario, Canada. Filed Jan. 26, 1889. Serial No. 297,648. (No model.)



Claim.—An attachment for blacksmiths' anvils, comprising a yoke, B, provided at the ends with a clamping-screw, *b*, and having a post, C, a horizontal lever, D, sleeved pivotally on said post, and provided with a cam or key at one end to force the opposite end sidewise toward the anvil when the yoke is attached, as set forth.

400,362. SPRING FOR VEHICLES. WILLIAM S. ROGERS and HORACE C. ROGERS, Townville, Pa. Filed May 16, 1888. Serial No. 274,058. (No model.)

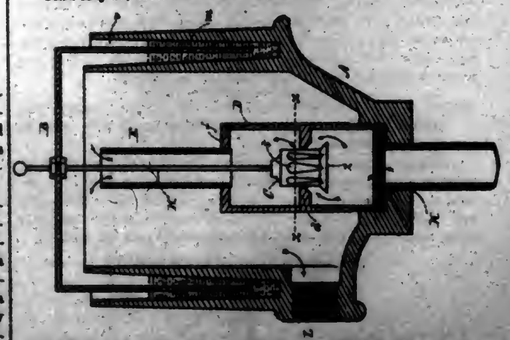


Claim.—1. The combination, with the front and rear body-bars, of U-shaped springs, each secured to the inner face of one bar and to the under surface of the other bar and provided with outwardly-projecting arms, substantially as described.

2. The combination, with the front and rear body-bars, of U-shaped springs, each secured to the inner face of one bar and to the under face of the other bar and provided with outwardly-projecting arms carrying pivoted plates adapted to be secured to the side bars, substantially as herein shown and described.

3. The combination, with the front and rear body-bars, of U-shaped springs, each secured to the inner face of one bar and to the under face of the other bar and provided with outwardly-projecting arms, the arms of one spring being longer than the arms of the other, substantially as herein shown and described.

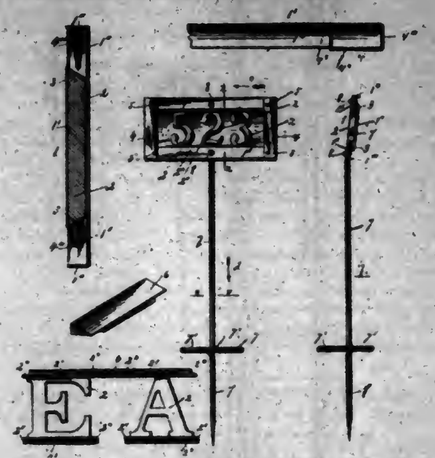
400,363. GAS-REGULATOR. JAMES H. REID, Providence, R. I. Filed May 28, 1888. Serial No. 275,150. (No model.)



Claim.—The combination of a gas-regulator body having a screw-threaded socket on the inner face of its bottom and a screw-threaded

inlet-opening of smaller diameter than said socket extending through said bottom, said body being provided with an annular groove for mercury and with an outlet, a dome movable in said mercury-groove, a vertical tube of larger diameter than said inlet-opening inserted in said socket and provided with an interior valve-seat and with a head at its upper end, a pipe of smaller diameter than said tube inserted in the head thereof, a valve within said tube, and a valve-rod connecting said valve with the dome, substantially as set forth.

400,364. SIGN. GEORGE W. SANDERSON, Shirley Village, Mass. Filed Jan. 12, 1889. Serial No. 296,126. (No model.)



Claim.—1. In a sign or guide-board, the combination, with a sheet-metal back or frame having longitudinal grooves therein, of removable letters or symbols provided with extensions or flanges to extend into said grooves, and projecting ends to butt against each other, to serve as separating devices, and to retain the letters or symbols in their proper position on said back or frame, substantially as shown and described.

2. In a sign or guide-board, the combination, with a sheet-metal back or frame having longitudinal grooves therein, of removable letters or symbols to extend into said grooves, and supplemental separating-stops to extend between the letters or symbols to separate the same, substantially as shown and described.

3. The combination, with a metallic sign or guide-board, consisting of a sheet-metal back or frame with longitudinal grooves therein, and removable letters or symbols held in said grooves, of a post or standard made of an iron rod, bent at its upper parts to receive the sign or guide-board, and bent at its lower part to furnish horizontal projecting surfaces for the purpose stated, substantially as shown and described.

400,365. SAFETY-HOOK. FRITZ SCHLEY, Berlin, Germany, assignor of one-half to Paul Bouvenne, same place. Filed Aug. 22, 1888. Serial No. 283,427. (No model.) Patented in Germany Oct. 11, 1887, No. 43,290.



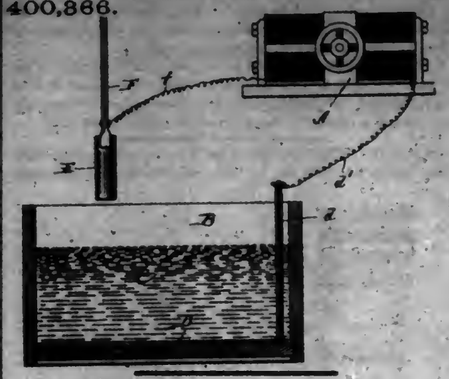
Claim.—1. A hook forming the one element of a safety-hook connection, and having a blade or tongue-piece, *c*, as described, and for the purpose stated.

2. The combination of a hook having the blade or tongue-piece *c* with a loop having thereon the elastic small plate *d'*, as described, and for the purpose stated.

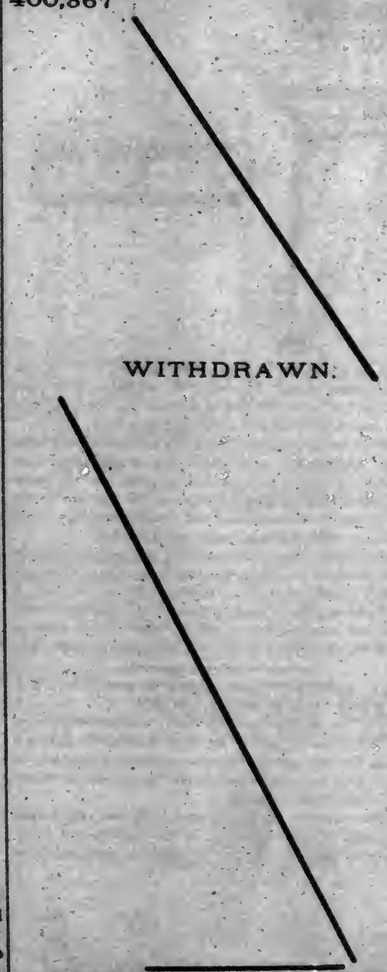
400,366. PROCESS OF HARDENING STEEL. FREDERICK OTTO WERK, Oak Park, Ill. Filed July 7, 1888. Serial No. 279,302. (No model.)

Claim.—The process of treating steel herein set forth, the same consisting in first heating the steel, then immersing it in a bath of cooling-liquid, and simultaneously passing an electric current through it and the liquid, substantially as specified.

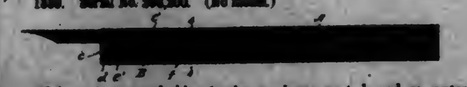
400,366.



400,367



400,368. PEN-HOLDER. TOM R. STUART, Washington, D. C., assignor to the Eagle Pencil Company, New York, N. Y. Filed Jan. 12, 1889. Serial No. 296,203. (No model.)

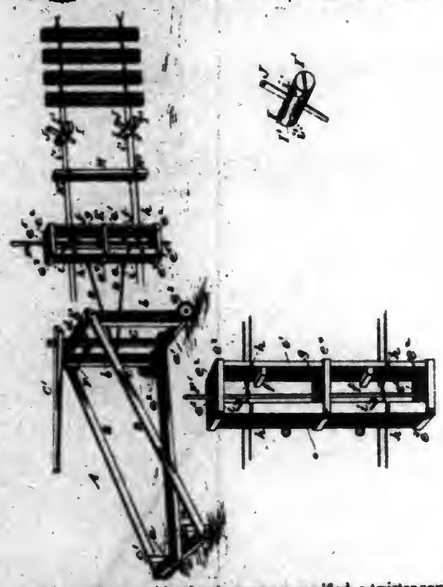


Claim.—1. A pen-holder having an inner part, *b*, and an outer part, C, between which two parts is the pen-slot *c*, said outer part, C;

being hinged or pivoted at or near its front end to the body of the holder, so as to be capable of tilting longitudinally with reference to the part *a*, as hereinbefore shown and described.

2. The combination, with the inner part, *b*, of the holder, of the outer part, C, hinged to the body of the holder at or near its front end and provided with a spring fastening device by which when it is turned down it is secured to the body of the holder, as set forth.

400,[illegible]. FENCE-MAKING MACHINE. CALVIN L. STULTING, Stribling [illegible], Va. Filed Jan. 15, 1889. Serial No. 296,434. (No model.)



Claim.—1. In a machine for the purpose specified, a twister comprising a body formed at each end with a slot extending lengthwise of said body, and with a handle passed through said body at right angles to said slots, substantially as shown and described.

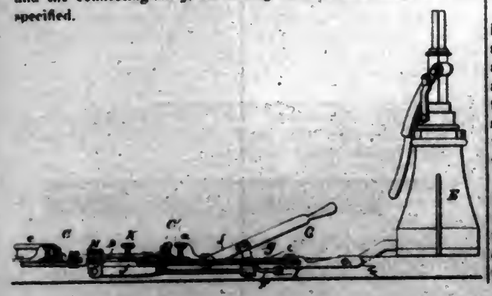
2. In a device for the purpose described, a tension device consisting of the two uprights, the bars c^3 at the ends of said uprights between the same, the piece *g* between said uprights near the center thereof, the strap-bands around said uprights at the ends and center and the tension-rod F', removably inserted through openings in said bars c^3 and piece *g*, substantially as shown and described.

3. In a device for the purpose specified, the tension device described, composed of the two uprights *c* and *c'*, formed upon their opposite edges with the notches *h*, the end bars, c^3, the central piece, *g*, the strap-bands, the vertical removable tension-bar F', passed through openings in the end bars and piece *g*, and the hooks *i* in the edges of the upright *c*, all substantially as shown, and for the purpose specified.

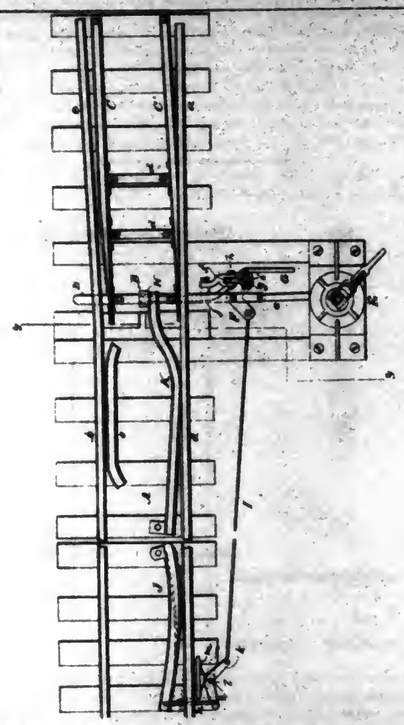
400,870. RAILWAY-SWITCH. JAMES B. SUFFERN, Hilburn, N. Y. Filed Oct. 4, 1888. Serial No. 287,180. (No model.)

Claim.—1. The combination, with the switch-operating bar, of a slide placed on the bar, a locking device for holding the slide in a fixed position on the bar, and a track-lever arranged in proximity to one of the track-rails and adapted to engage the slide on the switch-operating bar, substantially as specified.

2. In a railway-switch, the combination, with the switch-operating bar and slide H, carried thereby, of the hand-lever G, bar *g*, and the connecting-rod *j*, for locking the said slide, substantially as specified.

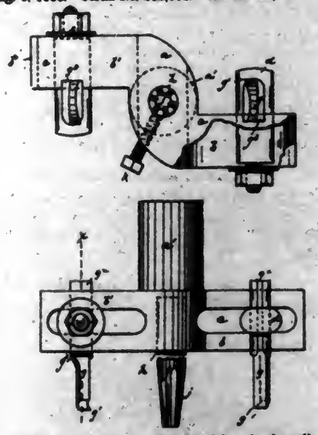


400,870.



3. In an automatic railway-switch, the combination, with the switch-bar D, of the angled lever F, the hand-lever G, the bar *g*, connecting-rod *j*, the slide H, and the track-lever K, substantially as specified.

400,871. CUTTER-HEAD. CORNELIUS SULLIVAN, Newark, N. J. Filed Aug. 6, 1888. Serial No. 282,062. (No model.)



Claim.—1. The improved cutter-head herein described, consisting of a hub, *a*, a shank made integral therewith, a drill or reamer adapted to fit in a socket in the center of said hub as a center guide, arms extending from said hub, as described, longitudinal slots in said arms, cutter-stocks adjustable in said slots, and means for securing them to said arms, slots in said cutter-stocks adapted to receive the shanks of the cutters, and cutters formed as described and provided with shanks adapted to fit in the slots in the cutter-stocks, substantially in the manner as and for the purpose set forth.

2. The improved cutter-head herein described, consisting of a hub, a shank made integral therewith, a drill or reamer adapted to fit in a socket in the center of said head as a center guide, arms extending from said hub, as described, longitudinal slots in said arms, cutter-stocks adapted to fit into said slots, and means for securing them to said arms, slots in said cutter-stocks adapted to receive the shanks of the cutters, formed as described, and provided with shanks adapted to fit in the slots in the cutter-stocks, and transverse recesses in said arms adapted to receive and hold the shanks of said cutters, substantially in the manner and as and for the purpose set forth.

3. The improved cutter-head having arms extending from the hub, as described, so as to bring the cutters on a diametrical line with the hub, and provided with slots parallel to the edges of said arms, cutter-stocks secured in said slots, and curved cutters secured in cutter-stocks, substantially as and for the purpose set forth.

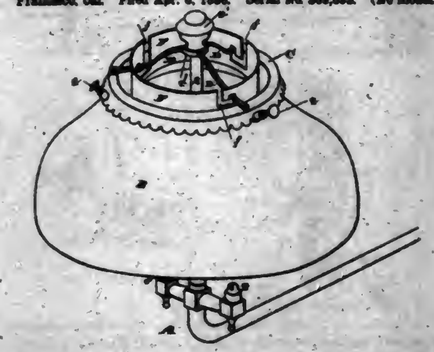
4. In a cutter-head provided with extending slotted or recessed arms, a cutting-tool curved in the form of a segment of a circle, as described, and provided with a shank, and means for securing said cutting-tool to said arm, substantially as described, and for the purposes set forth.

5. In a cutter-head provided with a central socket and extending slotted or recessed arms, a drill or reamer secured in said central socket as a center guide, and cutting-tools curved in the form of a segment of a circle, as described, and provided with shanks, and means for securing said cutting-tools to said arms, substantially as described, and for the purposes set forth.

6. In a cutter-head provided with extending slotted or recessed arms, a cutting-tool curved in the form of a segment of a circle of the size of the hole to be cut and provided with shanks, and shoulders formed on said shanks, and means for securing said cutting-tool to said arms, substantially as described, and for the purposes set forth.

7. The combination, with a cutter-head provided with a central socket and extending slotted or recessed arms, of a drill or reamer and center guide, curved cutting-tools, said cutting-tools being provided with shoulder-shanks, and means for securing said drill or reamer and cutting-tools to said cutter-head, substantially in the manner and as and for the purposes set forth.

400,872. LAMP-SHADE PROTECTOR. GUSTAVE A. TANK, San Francisco, Cal. Filed Apr. 6, 1888. Serial No. 269,892. (No model.)



Claim.—1. In combination with the shade or globe, the protector E, of translucent or transparent material—such as mica—and the metal ring F, to which the protector is secured by its top, said ring passing up into and through the top of the shade, substantially as herein described.

2. In combination with the shade or globe and its supporting-ring with arms, the protector E, of translucent or transparent material—such as mica—the metal ring F, secured to the top of the protector, and a connection between the arms of the shade-supporting ring and the metal ring of the protector, substantially as herein described.

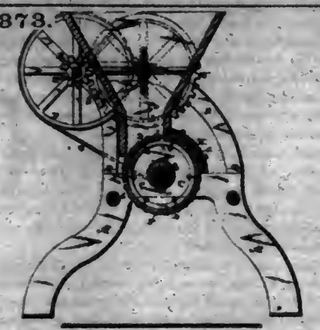
3. In combination with the shade or globe and its supporting-ring with arms, the protector E, of translucent or transparent material—such as mica—and the metal ring F, secured to the top of the protector and having the L-shaped slots *f*, whereby it may be suspended from the arms of the shade-holding ring, substantially as herein described.

4. The protector for lamp and gas shades or globes, consisting of a ring of mica having a metal ring secured to its top, in which said metal ring are made L-shaped slots, whereby the protector may be suspended from the shade or globe holding frame, substantially as herein described.

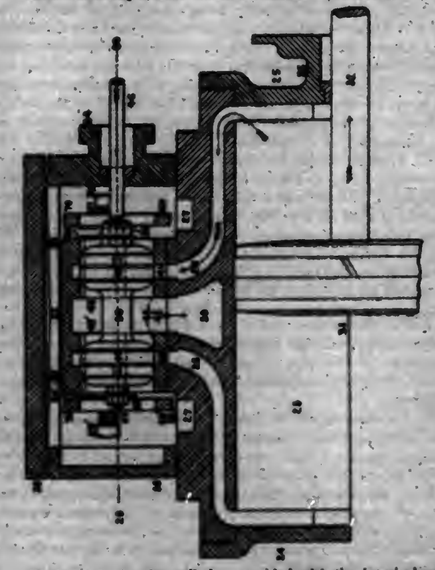
400,873. COTTON-SEED MILL. WOODLIFFE B. TRAYLOR, Rocky Mount, N. C. Filed Aug. 3, 1888. Serial No. 282,203. (No model.)

Claim.—In a cotton-seed mill, the combination of a revolving cylinder provided with teeth F, arranged in spirals and slightly separated from each other, each tooth being provided with a cutting-edge and a vertical and an inclined side, with a concave also provided with teeth F, arranged in spirals, but extending in an opposite direction from those on the cylinder, substantially as shown.

400,873.



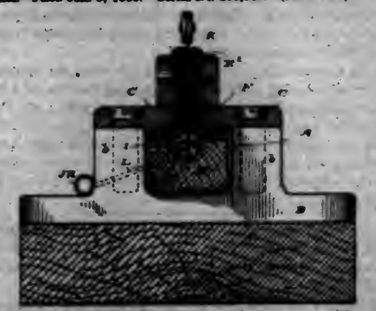
400,874. VALVE FOR LOCOMOTIVES. THOMAS TRIPP, Avon, assignor to the Tripp Anti-Friction Journal Bearing Company, Boston, Mass. Filed May 3, 1888. Serial No. 272,701. (No model.)



Claim.—1. A valve-cylinder provided with the interiorly-constructed ports extending from its supply port or ports to its exhaust-port, the connection between said supply-ports and exhaust-port being controlled by the puppet-plate devices, substantially as described.

2. The valve-cylinder 37, provided with ports 40, 41, and 42, 47, 51, 52, 53, 47', 51', 52', and 53', in combination with the puppet-plates 58 and 58', operatively constructed and arranged substantially as and for the purposes set forth.

400,875. PNEUMATIC FLEXIBLE-SLOT CONDUIT FOR ELECTRIC-RAILWAY CONDUCTORS. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Jan. 5, 1889. Serial No. 295,867. (No model.)



Claim.—1. A conduit for electric conductors, comprising a slotted exterior casing and means for supplying compressed air thereto and for maintaining an air-pressure therein, substantially as described

2. A conduit for electric conductors, comprising a slotted exterior casing, flexible slot-closing strips normally in contact to close the

conduit, and means for supplying compressed air to the interior of the conduit, substantially as described.

3. A conduit for electric conductors, comprising a slotted exterior casing, flexible slot-closing strips normally in contact to close the conduit, insulating-supports within the conduit and an electric conductor thereon, and means for supplying compressed air to the interior of the conduit, substantially as described.

4. A slotted conduit for electric conductors, comprising an exterior slotted casing, an interior insulating-support and an electric conductor thereon, flexible insulating slot-closing strips located between the casing and the interior insulation, and means for supplying compressed air to the interior of the conduit for excluding or expelling water, substantially as described.

5. A slotted conduit for electric conductors, comprising an exterior slotted casing, an interior insulating-support and an electric conductor thereon, flexible insulating slot-closing strips located between the edges of the casing and the interior insulation, and means for supplying compressed air to the interior of the conduit for excluding or expelling water, substantially as described.

6. A slotted conduit for electric conductors, comprising an exterior casing, an interior insulating lining or support, an electric conductor or conductors upon said support, flexible insulating slot-closing strips located between the casing and the interior insulation, a thin traveling-contact device extending upwardly from the conductor and acting to forcibly separate the slot-closing strips during its passage, and means for supplying compressed air to the interior of the conduit for preventing the ingress of water around the traveling-contact device, substantially as described.

7. A slotted conduit for electric conductors, comprising an exterior metallic casing, an interior insulating lining or support, an electric conductor or conductors upon said support, flexible insulating slot-closing strips located between the metallic casing and the interior insulation, a thin traveling-contact device extending upwardly from the conductor and acting to forcibly separate the slot-closing strips during its passage, and means for supplying compressed air to the interior of the conduit for preventing the ingress of water around the traveling-contact device, substantially as described.

8. The combination, with a closed slotted conduit, of means for supplying compressed air thereto, comprising one or more air-compressors, and an inlet pipe or pipes connecting the conduit and compressors, whereby a substantially equal pressure may be maintained throughout.

9. A conduit for electric conductors, comprising an exterior metallic casing, an electric conductor within said conduit, and suitable insulating-supports therefor, slot-closing strips formed of flexible insulating material and located so as to close the surface-slot, means for supplying compressed air, comprising one or more air-compressors, a system of inlet-pipes from the air compressor or compressors to points along the conduit, and connections between said inlet-pipes, whereby a substantially equal pressure may be maintained in all parts thereof, substantially as described.

10. The combination, with a closed slotted conduit, of means for supplying compressed air thereto, comprising one or more air-compressors, and connecting-pipes leading therefrom to the interior of the conduit, a motor for actuating each compressor, and a motor-controlling device under the influence of and actuated by the variations of pressure in the air-pipes to start, stop, or regulate each motor, substantially as described.

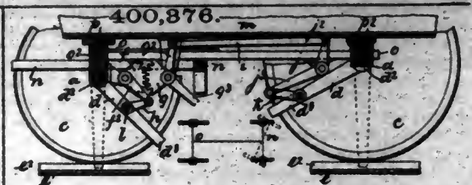
11. In a slotted conduit for electric conductors, the combination, with an exterior casing, of a tubular or hollow main-supply conductor or conductors within the conduit, a contact device extending from the exterior of the conduit into contact with the inner surface of said conductor or conductors, and flexible insulating slot-closing strips at the edges of the exterior casing and closing about the upward extension of the traveling-contact device.

12. In a slotted conduit for electric conductors, the combination, with an exterior casing and an insulating-lining therefor, of a tubular or hollow main-supply conductor or conductors within the lining, a contact device extending from the exterior of the conduit into contact with the inner surface of said conductor or conductors, and flexible insulating slot-closing strips at the edges of the exterior casing and closing about the upward extension of the traveling-contact device, substantially as described.

400,376. WHEELED VEHICLE. FRITZ B. VON WERNSDAR, Hanover, Germany. Filed Apr. 11, 1888. Serial No. 270,266. (No model.) Patented in Germany Apr. 5, 1887, No. 41,294, and in England Sept. 5, 1887, No. 11,906.

Claim.—1. A track-arm, d, with its inner end formed into a screw-box, d^2, for the taking upon a screwed part of the neck of an axle, for the purpose substantially as described and set forth.

2. Adjusting a wheel upon its axle-arm by means of a screw-box, d^2, of an arm, d, taking upon a screwed part, a^2, of a parallel axle-arm, a^2, which slides within an axle-box, b, whose inner flanged end

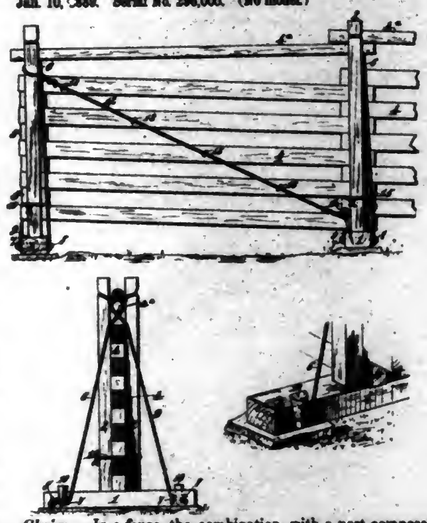


is connected with the inner returned or flanged end of the axle-box d^2, and which said parts are constructed and arranged in combination with the axle a, wheel c, and hub c^2, as described and set forth.

3. The combination, with the swiveling track-arm d, wheel c, and track $c\ c^2$, of the toothed quadrants $f\ g$, arms $f^3\ g^3\ g^4$, link h, connecting-rod i, and coupling-rod l of the fore part of a vehicle, substantially as described and set forth.

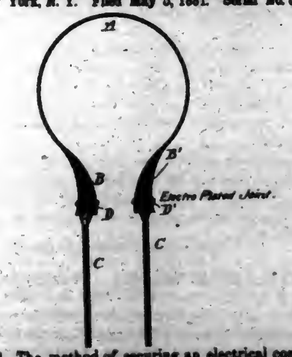
4. The combination, with the hind track-arm, d, of a vehicle, of a crank-lever, $j\ j^3\ j^3$, link k, and coupling-rod l, substantially as described and set forth.

400,377. FENCE. EDWARD A. WELDS, Reading, Mich. Filed Jan. 10, 1889. Serial No. 296,005. (No model.)



Claim.—In a fence, the combination, with a post composed of two parallel sections, between which the ends of the rails are inclosed, of independent wires attached to said sections above the rails and crossed over the upper rail, a sill supporting the post and having two connections on each side of the fence, the wire being passed through one of the connections and fastened to the other, and a wedge inserted between each pair of said connections and between the wire and the sill, substantially as shown and described.

400,378. INCANDESCENT ELECTRIC LAMP. EDWARD WESTON, Newark, N. J., assignor to the United States Electric Lighting Company, New York, N. Y. Filed May 5, 1881. Serial No. 32,553. (No model.)

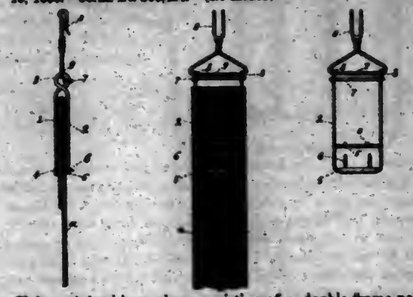


Claim.—1. The method of securing an electrical connection between the carbon conductor and metallic wires of an electric lamp, which consists in securing their respective ends in contact, as described, and then submerging the joints thus formed in an electroplating-bath

until a metallic coating of the desired thickness is deposited on and around the same, as set forth.

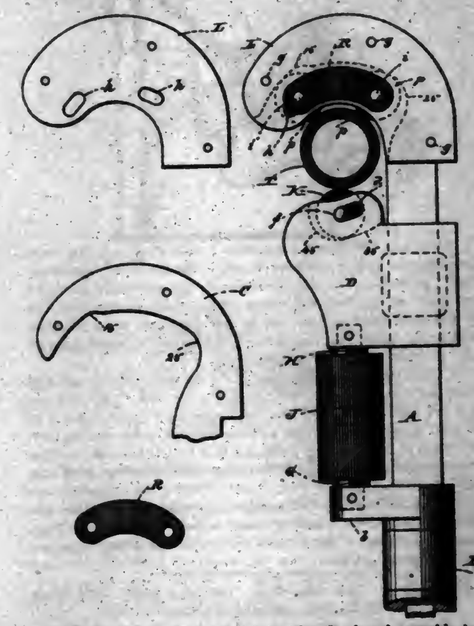
2. In an incandescent electric lamp, the combination of the supporting-conductors and a carbon strip attached thereto by electro-deposited metallic connections, substantially as described.

400,379. BUCKLE. HENRY P. WEBB, Buffalo, N. Y. Filed Jan. 15, 1888. Serial No. 296,431. (No model.)



Claim.—A buckle or clasp consisting of a double frame portion formed by wire doubled upon itself so as to form two frames with an opening between them, a tongue member pivoted to the lower end of one of the frame portions adapted to swing over and rest its end portions on the lower cross part of the other frame portion, and a holding-hook pivoted to the upper portion of the frame, substantially as described.

400,380. WRENCH. WILLIAM C. WORTHEN and GORDON PENDLETON, Jr., Boston, Mass., assignors to themselves and John D. Walworth, same place. Filed Nov. 9, 1888. Serial No. 290,367. (Model.)

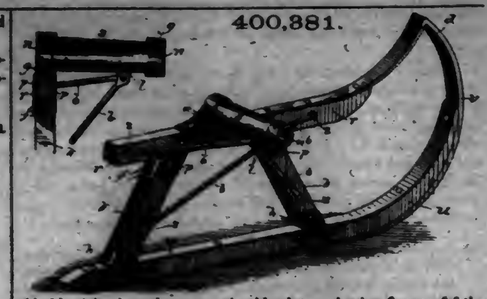


Claim.—In a wrench provided with a fixed and movable jaw having involute recesses in their adjacent edges, the combination of two rolls journaled in curved slots in said fixed jaw and a single roll journaled in similar slots in the movable jaw, said slots being formed on the same circle and the fixed-jaw rolls connected by straps, whereby they maintain the same relative position to the roll in the movable jaw, substantially as set forth.

400,381. SLEIGH-RUNNER FOR WHEELED VEHICLES. DAVID G. WYETH, Newark, Ohio. Filed Mar. 2, 1883. Serial No. 286,941. (No model.)

Claim.—1. The combination, in a sleigh-runner for wheeled vehicles, of the thimble a, having the wings $w\ w$ and the lugs l, integral therewith, and having the grooves $g\ g$ and the packing $n\ n$, the side plates, p, with flanges $f\ f$, and the T-plates t with flanges $h\ h$, and the braces b, all substantially as set forth.

2. The combination, in a sleigh-runner for wheeled vehicles, of the



thimble a', having wings $w\ w$, the side plate, p, having flanges $f\ f$, the clip B, and the braces c, running from the rave and knees of the sleigh-runner from the inside to and so arranged with said clip as to make a working-joint at the connection of said braces and clip, all substantially as set forth.

3. The combination, in a sleigh-runner for wheeled vehicles, of the thimble a, having lugs l and wings $w\ w$, integral therewith, and the braces b, all substantially as set forth.

4. The thimble a, having wings $w\ w$ and lugs l, integral therewith, and having also the annular grooves $g\ g$ to receive a packing, substantially as set forth, for the purpose specified.

5. The thimble a', having wings $w\ w$ and the lugs l, integral therewith, substantially as shown, for the purpose specified.

6. The thimble a', having wings $w\ w$ and lugs l, integral therewith, substantially as shown, for the purpose specified.

7. The thimble a, having wings $w\ w$, integral therewith, and with annular grooves $g\ g$ for the reception of a packing, substantially as set forth, for the purpose specified.

8. The combination, in a sleigh-runner attachment for wheeled vehicles, of the clamp C, packing R, and the side plate, P, having the pivotal point i, in connection with a detached thimble, a', and braces b, all substantially as set forth.

9. The combination, in a sleigh-runner for wheeled vehicles, of the clamp C, packing R, and the side plate, P, having the pivotal point i, substantially as set forth.

10. The combination, in a sleigh-runner for wheeled vehicles, of the clamp C, packing R, two side plates, P, one of said side plates having the pivotal point i, and both having flanges $f\ f$ in connection with unmortised and untenoned knees and rave $k\ k$ and r, substantially as set forth.

11. The combination, in a sleigh-runner for wheeled vehicles, of the thimble a', having wings $w\ w$ and lugs l, and the braces b, substantially as set forth.

12. The combination, in a sleigh-runner for wheeled vehicles, of two side plates, $p\ p$, each having four flanges, f, with unmortised and untenoned knees and rave $k\ k$ and r, substantially as set forth.

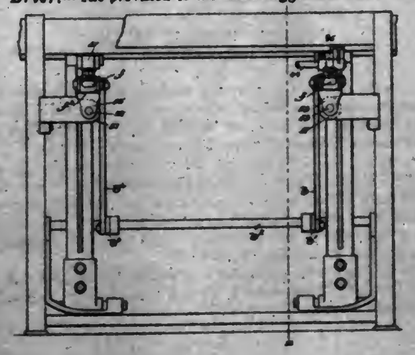
13. The combination, in a sleigh-runner for wheeled vehicles, of the thimble a', having wings $w\ w$, the clip B, and the braces c, substantially as set forth.

14. The combination, in a sleigh-runner for wheeled vehicles, of the thimble a', having the wings $w\ w$ and the lugs l, the braces b, and the side plates, p, all substantially as set forth.

15. The combination, in a sleigh-runner for wheeled vehicles, of the thimble a', having wings $w\ w$ and lugs l, the braces b, the shortened rave and runner r and n, and the extended shoe v, all substantially as set forth.

400,382. STOPPING MECHANISM FOR LOOMS. HORACE WYMAN, Worcester, Mass., assignor to the Crompton Loom Works, same place. Filed Jan. 30, 1888. Serial No. 262,206. (No model.)

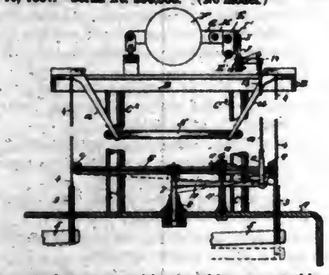
Brief.—The provision of the extra dagger and bunter relieves



the parts from the strain encountered when but one set of devices is employed and lessens the danger of breakage of the lay and crank-shaft.

Claim.—The lay of the loom, its two lugs or projections rigidly attached thereto and extended toward the breast-beam, and the two bunters, and means to support them at opposite sides of the loom-frame at or near the breast-beam, combined with the rock-shaft b^3, extended across the loom, the arms b' b^2 thereon, and the links b b^4 intermediate said arms and bunters, whereby the two bunters at opposite sides of the loom are caused to move upward and downward in unison, and a device acting upon one of the said bunters to throw the bunters into position to engage the lugs on the lay, substantially as described.

400,883. TYPE-WRITING MACHINE. GEORGE W. N. YOST, New York, N. Y., and CHARLES R. MERRITT, Springfield, Mass., assignors to the Writing Machine Manufacturing Company, New York, N. Y. Filed May 16, 1887. Serial No. 238,353. (No model.)



Claim.—1. In a type-writing machine, the combination, with a letter-spacing mechanism, of a circular universal bar supported at its hub or center and arranged to operate as a lever of the second order, substantially as set forth.

2. In a type-writing machine, the combination, with the letter-space-feeding mechanism, of a universal lever made ring-like or circular, and connecting-rods arranged around said lever and adapted to operate the same, substantially as set forth.

3. In a type-writing machine, a circular universal bar, in combination with a letter-space-feeding mechanism, type-bars, key-levers, and vertically-arranged connecting-rods, the latter being disposed about the periphery of said universal bar and adapted to actuate the same at each depression of a key-lever, substantially as set forth.

4. In a type-writing machine, the combination of a circular universal bar supported at its hub or center and arranged to act as a lever, the connecting-rods formed or provided with means, substantially as described, for actuating said bar, the rocker-bar, and connections between the latter and the universal bar, substantially as set forth.

5. In a type-writing machine, the combination of the circular universal bar mounted upon a sliding support, the connecting-rods formed or provided with projecting portions, the lever 10, the rocker-bar connected to said lever, and a spring for returning the several parts, substantially as set forth.

6. In a type-writing machine, the combination of the circular universal bar having a flaring opening in its hub, the sliding stem or support reduced in diameter within said opening, and the connecting-rods constructed to actuate said universal bar, substantially as set forth.

400,884. TYPE-WRITING MACHINE. GEORGE W. N. YOST, New York, N. Y., assignor to the Writing Machine Manufacturing Company, same place. Filed Sept. 10, 1887. Serial No. 249,231. (No model.)

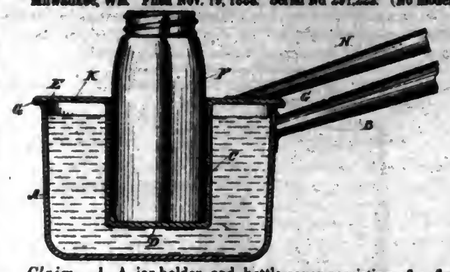


Claim.—1. In a type-writing machine, the combination of a vertically-arranged connecting-rod, a horizontally arranged key-lever, or its described equivalent, and an offset or lateral connection between the two, substantially as and for the purpose set forth.

2. In a type-writing machine, and in combination, type-bars arranged in a circle, type-bar-operating rods arranged in a circle, means, substantially as described, for actuating said rods, and offsets or cross-connections of varying lengths between said means and said rods for such of said rods as lie substantially within the same longitudinal vertical planes, substantially as set forth.

3. In a type-writing machine, a connecting-rod provided with an offset, consisting of the socket 2, the arm 3, and the leg 4, as and for the purpose set forth.

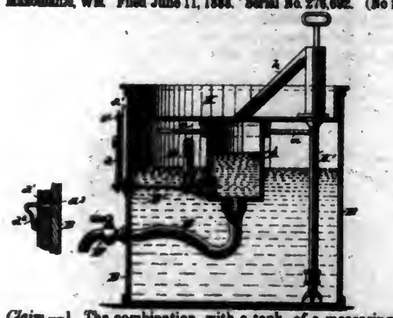
400,885. JAR-HOLDER AND KETTLE-COVER. IDA ZABDER, Milwaukee, Wis. Filed Nov. 19, 1888. Serial No. 291,222. (No model.)



Claim.—1. A jar-holder and kettle-cover consisting of a flat sheet of metal with a downwardly-extending flange at its edge adapted to retain the cover in position on a kettle, which cover is turned downwardly centrally at a distance from its outer edge, forming a single well or receptacle with vertical walls, and an imperforate bottom for the reception of a fruit-jar therein, a spout leading from the wall to the outer edge of the cover, and a handle affixed rigidly to the cover for lifting it, in combination with a receiving and supporting kettle, substantially as described.

2. The combination of the receptacle formed of the case C and imperforate bottom D, integral therewith, with the flange E and spout I, substantially as described.

400,886. FLUID-MEASURING VESSEL. THOMAS R. ARMITSTEAD, Manomanie, Wis. Filed June 11, 1888. Serial No. 276,692. (No model.)



Claim.—1. The combination, with a tank, of a measuring-vessel carried by the tank, a level-tube pivoted in the side of the measuring-vessel, a pointer connected to the level-tube and working in front of a dial, a pipe leading from the bottom of the measuring-vessel through the tank to a faucet on one side of the said tank, and a pump for pumping the liquid from the tank into the measuring-vessel, substantially as herein shown and described.

2. The combination, with a tank, of a measuring-vessel supported within the tank, an angular tube pivoted in the side of the said vessel, a rod connected to said tube and projecting through the side of the tank, a pointer on the rod, a dial on the tank, a pipe leading from the bottom of the measuring-vessel to a faucet of the tank, and a pump for pumping the liquid from the tank into the measuring-vessel, substantially as described.

3. The combination, with a measuring-vessel, of a level-tube pivoted in the side of the measuring-vessel, a rod connected to the tube, a pointer on the end of the rod, and a dial provided with spring-stops, substantially as described.

400,887. CAR-AXLE BOX. STEPHEN J. AUSTIN, Terre Haute, Ind. Filed Oct. 22, 1888. Serial No. 288,781. (No model.)



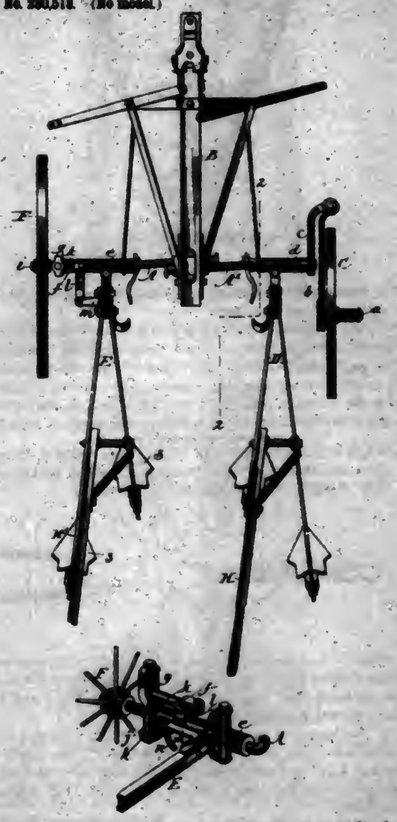
Claim.—1. The combination of the box provided with oil-chambers, axle, and a grooved collar rigidly secured to the axle and snugly fitted in the box in contact therewith and bearing thereon, said groove forming a chamber communicating with the oil-chambers of the box, substantially as and for the purpose set forth.

2. The combination of a box provided with upper and lower oil-chambers, axle, and a collar rigidly secured to the axle and having a groove forming an annular chamber communicating with the upper and lower chambers, substantially as and for the purpose set forth.

3. The combination of the box formed in two parts, each part having an oil-chamber, axle, collar secured to the axle and bearing on said box, and communication between the upper and lower oil-chambers and the bearing-surface between the collar and box, substantially as and for the purpose set forth.

4. The combination of a box having parts 4 and 5, oil-chambers 9 and 10 in the respective parts, ports 15 in the upper part of the box, opening 17 in the lower part of the box, axle, and collar 7 on the axle, substantially as set forth.

400,888. CULTIVATOR. ROBERT H. AVERY, Peoria, Ill., assignor to the Avery Planter Company, same place. Filed July 20, 1888. Serial No. 280,518. (No model.)



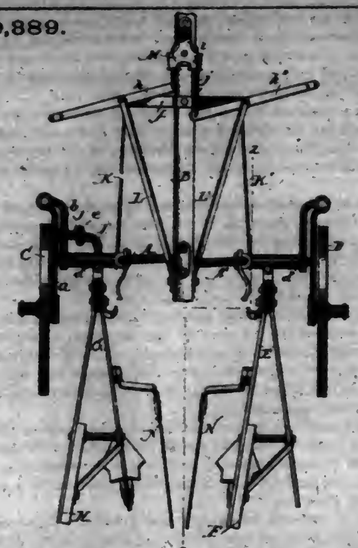
Claim.—In a cultivator, the combination of an arched axle or frame, swinging shovel-beams loosely connected with such axle or frame, a caster-wheel, C, on one side and wheel F on the other side supported on a short axle, *i*, pivotally connected with the main frame, and connections between such short axle *i* and the adjoining shovel-beam, whereby, when the shovels are moved out of line to the right or left, the wheels and frame will move in the direction in which the shovels travel, substantially as specified.

400,889. CULTIVATOR. LEONARD R. BURDICK, Peoria, Ill., assignor to the Avery Planter Company, same place. Filed Aug. 8, 1888. Serial No. 282,208. (No model.)

Claim.—1. In a cultivator, the combination of an arched axle, two caster-wheels, each supported by a bar, as *a*, pivoted at its forward end to an arm, as *b*, secured to the main part of the axle, plow-beams connected with the horizontal parts of the main axle and having vertical and lateral movement, and connections between one of the plow-beams and the support for one of the caster-wheels, whereby, when the plow-beam is moved to the right or left, the wheels and frame will be correspondingly moved, substantially as and for the purpose specified.

2. In a cultivator, the combination of a frame, a tongue, B, bar *f*, secured to the tongue, bars or levers *h k*, pivoted to the bar *f*, pulley *i*, chain *j*, and brace-rods L L', substantially as and for the purpose specified.

400,889.



3. In a cultivator, a feeder, M, consisting of a casting, *k*, provided with short lugs *m m'* and longer lugs, *n*, in combination with rods *l*, held in place between the lugs *m m'* by bending the longer lugs *n* over the rods, substantially as specified.

400,890. AUTOMATIC RAILWAY GATE AND SIGNAL. JOSEPH BOLZ, Schuylkill Haven, assignor of three-fifths to J. W. Meyer and John H. Williams, Pottsville, Pa. Filed July 2, 1888. Serial No. 278,726. (No model.)



Claim.—1. In a combined railway gate and signal, the shaft M, provided with pulleys N and pins *p* thereon, in combination with the slotted levers or arms I and suitable connections between said arms and the gate-arms, substantially as and for the purpose specified.

2. In a combined railway gate and signal, the shaft M, provided with trip device H', and the pulleys N with pins *p*, in combination with the slotted levers or arms I, the connections *j*, and weighted arms *i*, pivoted to the gate-arms, substantially as and for the purpose set forth.

3. In a combined railway gate and signal, the hinged or pivoted gate-arms F and the shanks *d*, in combination with the wire *l*, the shaft L, and the trip device G' thereon, substantially as and for the purpose specified.

4. In a combined railway gate and signal, the standards E, provided at their upper ends with tracks *a*, and the shanks *d*, supported in bearings on said standards, in combination with the hinged or pivoted gate-arms having extensions *g*, provided with anti-friction rollers *h*, substantially as and for the purpose described.

5. In a combined railway gate and signal, the hinged or pivoted gate-arms F and the shanks *d*, provided with arms *c*, in combination with the connecting-rod G, whereby said shanks and gate-arms will be operated upon simultaneously, substantially as and for the purpose specified.

6. In a combined railway gate and signal, the standards E, the hinged or pivoted gate-arms F, the shanks *d*, with arms *c*, and the slotted arms I, connecting with weighted arms *i*, in combination with the shaft M, having trip device H', and pulleys N, connecting with the slotted arms to operate them, and the rod G, connecting the arms *c*, substantially as and for the purpose set forth.

7. In a combined railway gate and signal, the combination, with suitable gate-arms and the wire *l* for operating them, of the shaft L, provided with trip device G', said shaft adapted to slide longitudinally in its bearings to bring the trip device from contact with the wheels of the train, and means for holding the shaft stationary, substantially as and for the purpose specified.

8. In a combined railway gate and signal, the sliding shaft L, having trip device G' connected thereto, in combination with the bell-crank lever D', notched wheel F', and pawl *n'*, for holding the shaft stationary, and means for operating the lever, substantially as and for the purpose described.

9. In a combined railway gate and signal, the sliding shaft L, provided with means for operating it and carrying the trip device G', in combination with means for bringing the shaft back to its normal position, consisting of the springs *m'* and *o'*, substantially as and for the purpose set forth.

10. In a combined railway gate and signal, the shaft S and spring T and the tread-plate W, in combination with the wire *c'*, bell-crank lever D', and the shaft L, carrying trip device G', substantially as and for the purpose set forth.

11. In a combined railway gate and signal, the shaft M, provided with the trip device H', and intermediate means for connecting it with the gate-arms, in combination with the tread-plate W, the shaft S, shaft L, with the trip device G', and the several wire connections between the shafts and gate-arms, substantially as and for the purpose specified.

12. In a combined railway gate and signal, the shanks *d*, having hinged or pivoted gate-arms F, wire *l*, connecting therewith and with the shaft L, having trip device G', and the shaft S and tread-plate W, for operating it, in combination with the wire *r* and shaft M, to which it is connected, and the trip device H' on said shaft, and the wire *c'*, connecting the shaft S with means for operating the shaft L, substantially as and for the purpose set forth.

13. In a combined railway gate and signal, the shaft S and tread-plate W, for operating it, and the spring T, for bringing the shaft to its normal position after pressure is removed from the plate, in combination with the shaft L, provided with trip device G', and means for sliding said shaft longitudinally, consisting of the bell-crank lever D', and the wire connection *c'* between it and the shaft S, substantially as and for the purpose specified.

14. In a combined railway gate and signal, the combination, with the hinged or pivoted gate-arms and operating mechanism connecting therewith, and the wires *l r c'*, of the shafts M S L, the trip devices H' G', and means, substantially as described, for operating the shafts, substantially as and for the purpose set forth.

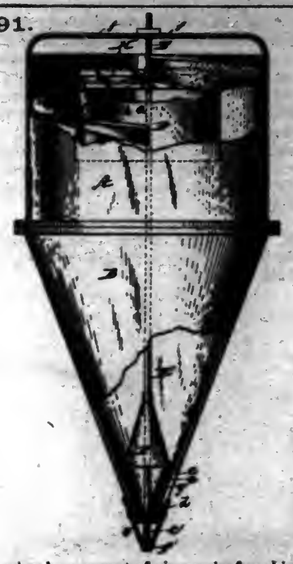
400,891. DUST-COLLECTOR. EUGENE BATTEY, Indianapolis, Ind., assignor to the Brutney Dust Collector Company, same place. Filed Sept. 22, 1887. Serial No. 250,623. (No model.)

Claim.—1. The combination, with a cylindrical dust-collecting chamber having a conical bottom provided with a suitable outlet-opening and a concentric tube within said chamber, of a spirally-curved or winding partition arranged between the inner surface of the wall of the chamber and the outer surface of the wall of the tube, said chamber having an inlet-opening adapted to receive the current of dust-laden air at a tangent to the wall of the chamber, and a suitable deflector, as set forth.

2. The combination, with a cylindrical dust-collecting chamber having a tapering bottom provided with a discharge-outlet, a tube secured within said chamber, a spirally-curved and inclined partition surrounding said tube, and an inlet in said chamber opening between the ends of said partition, of a deflector supported in the tapering bottom, so that the dust may escape between it and the wall of the bottom, as set forth.

3. The combination, with a cylindrical dust-collecting chamber having a conical bottom, inlet and outlet openings, and a concentric tube within said chamber, of a spirally-curved and inclined partition connecting the inner surface of the chamber with the outer surface

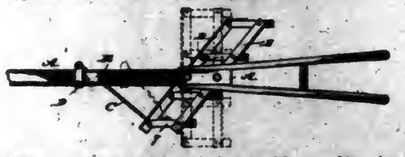
400,891.



of the tube, whereby a current of air may be forced into said chamber, substantially as described.

4. The combination, with a cylindrical dust-collecting chamber having a conical bottom, inlet and outlet openings, and a spirally-curved and inclined partition, of a concentric tube having a slot in its wall, an air-spout entering said chamber, and a vent or opening adjacent to the mouth of said spout, whereby a draft is created through the slot in the tube above the partition, substantially as described.

400,892. HARROW AND CULTIVATOR. JOHN C. BRYAN, Fordyce, Ark., assignor of one-half to James G. Cheatham, same place. Filed July 16, 1888. Serial No. 280,134. (No model.)



Claim.—1. A standard formed of a bar of flat metal bent between its ends, forming arms 1 and 2, the arm 2 being twisted at 6 at a point above the bend, such twist operating to hold the arms 1 and 2 apart to form the slot 4, substantially as set forth.

2. The improved standard herein described, consisting of a bar of metal bent upon itself, forming arms 1 and 2, the arm 2 being twisted at 6 and inclined rearwardly above such twist, and the arm 7 extended forward from the upper end of the arm 2, all substantially as set forth.

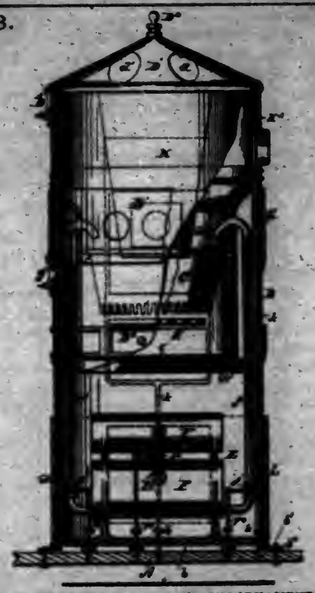
3. The combination of the beam, the cross-bars pivoted to the beam, and the standards formed of bars of metal bent upon themselves forming arms 1 and 2, the arms 2 being twisted at 6, and such arms being inclined rearwardly above such twist, and the arm 7 projected forward from the upper end of such arm 2, the standard being pivoted to the cross-bars, substantially as set forth.

400,893. SAFETY CAR-HEATER. MYRON M. BURTON, Rawsonville, Mich. Filed Mar. 5, 1888. Serial No. 266,195. (No model.)

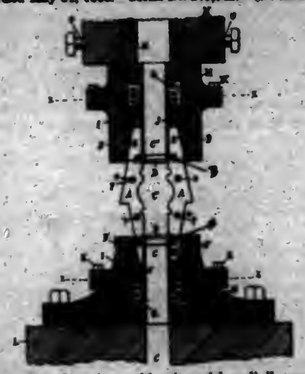
Claim.—1. A safety car-heater consisting of the combination, with a car-stove, of a chemical fire-extinguisher with discharge-pipes adapted to discharge its contents upon the bed of incandescent fuel, said chemical fire-extinguisher provided with valves to govern the commingling of its contents and the opening of its discharge-pipes, said valves having valve-rods connected with the floor of the car, the construction being such that as the stove is tilted or dislodged from place the strain upon said rods will bring the extinguisher into operation and open its discharge-pipes, substantially as and for the purpose described.

2. In a safety car-heater, the combination, with a car-stove and a chemical fire-extinguisher having pipes leading therefrom to the stove and adapted to discharge their contents upon the incandescent fuel, of valves situated in said pipes and connected to the car-floor by rods so arranged that the said valves will be opened when the heater is tilted and dislodged from place, substantially as described.

400,893.



400,894. MECHANISM FOR IMPRESSING ORNAMENTAL FORMS OR DESIGNS UPON METALLIC TUBING. JOHN BURKHARDT, New York, N. Y. Filed May 31, 1888. Serial No. 275,542. (No model.)



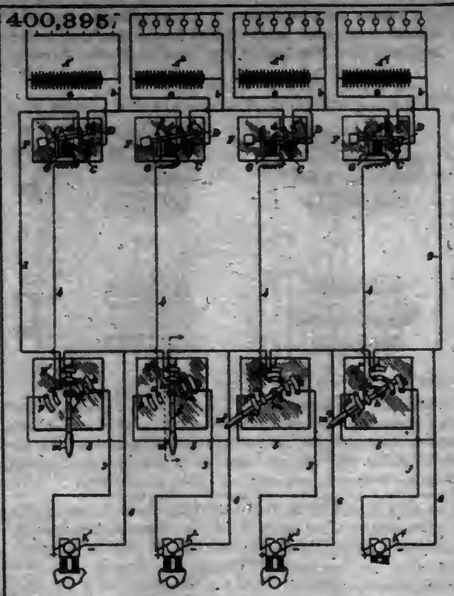
Claim.—1. Die-plates in combination with radially-grooved disks, substantially as and for the purpose specified.

2. The sectional chambered counter-dies D D', springs G, and tubular disk-holders J, in combination with the disks B, substantially as and for the purpose specified.

3. The set of die-plates A, retained in vertical planes, respectively, by the retracting spring-wires *y*, working in holes *z* of the die-plates, and the grooves in the inner faces of disks B, in combination with the counter-dies D D', substantially as described.

4. The triple-faced die-plates, with three series of undulating faces or working-edges, P Q R, for gradually forming indented designs or ornamental configurations upon the perimeters of tubing, substantially as described.

400,895.



400,895. ELECTRIC DISTRIBUTION BY STORAGE-BATTERIES. STANLEY G. G. CURRIE, Philadelphia, Pa., assignor to the United Electric Improvement Company, Gloucester, N. J. Filed May 16, 1888. Serial No. 274,061. (No model.)

Claim.—1. In a system of electrical distribution, the combination, with a main-line conductor, one or more electric generators normally out of circuit with said conductor, and an equivalent number of groups of accumulators, secondary batteries, or equivalent electric storage devices, of a manually-operated switch appropriated to each generator, constructed and arranged so as to throw said generator into or out of the main-line circuit, an electro-magnetically-operated switch having its operating-magnet in a shunt of the main-line circuit, constructed and arranged so as to throw its appropriate accumulator into or out of the main-line circuit, and of a conductor leading to the accumulator, whereby the operation of the manual switch will simultaneously throw its generator and accumulator into the main-line circuit, substantially as described.

2. In a system of electrical distribution, the combination, with a plural number of electric generators and a plural number of electric distributing devices, as storage-batteries or the like, and a main-line conductor, of a manually-operated switch, and an electrically-operated switch appropriated to each generator and connected by a conductor and so arranged that the movement of the manual switch will establish circuit through said electrically-operated switch, and thereby throw its generator and battery into the main-line circuit simultaneously, substantially as described.

3. In a system of electrical distribution, the combination, with a main-line conductor and a plural number of accumulators or secondary batteries, of means comprising manually-operated and electrically-operated switches having contact-points connected with the main-line conductors and with conductors leading to said accumulators and connected by shunt-lines, whereby a generator and its appropriate accumulators may be simultaneously thrown into and out of the main-line circuit by the movement of a single lever, substantially as described.

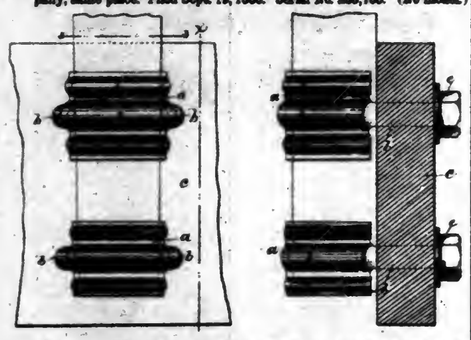
4. In a system of electrical distribution, the combination, with the main-line conductor, an electric generator, an accumulator, a manually-operated switch, and an electro-magnetically-operated switch and a shunt-line connecting the two switches, of an automatic circuit-breaker arranged in said shunt-line and constructed and arranged to break the shunt-circuit, and thereby cause the switches therein to simultaneously cut out the generator and the accumulator from the main-line circuit, substantially as described.

5. In a system of electrical distribution, the combination of a plural number of electric generators, a plural number of accumulators or secondary batteries with a series of branch or supplementary main conductors, each permanently connected to one pole of an accumulator, and a switch by means of which said branch conductors may be electrically connected with the main conductor, and the said supplementary conductors having their terminals so arranged as to be readily connected, substantially as described.

6. In a system of electrical distribution, the combination, with a main-line conductor, an electric generator, and an accumulator, of a supplementary main conductor, lamp circuits or wires connected to said main conductor, and an electric switch by means of which the supplementary conductor and the accumulator may be thrown in circuit with the main conductor, substantially as described.

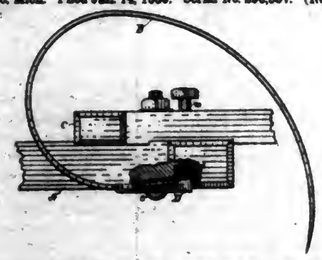
7. In a system of electrical distribution, the combination of a main-line conductor, a number of electric generators, a number of accumulators, a number of branch or supplementary conductors, electrically-operated switches arranged one in the vicinity of each supplementary line, manually-operated switches connected to said electrically-operated switches by a shunt-line, and an automatic circuit-breaker arranged on said shunt, said circuit-breaker having its operating-magnet in an independent circuit controlled by the condition of the accumulator, substantially as described.

400,396. STAKE-POCKET FOR PLATFORM-CARS. CHARLES H. DUNHAM, Boston, Mass., assignor to the Dunham Manufacturing Company, same place. Filed Sept. 19, 1888. Serial No. 285,765. (No model.)



Claim.—1. The improved stake socket or holder composed of a single piece comprising the bent body and the screw-threaded bolts formed on the ends of said body, the latter being made wider than the diameter of the bolts and provided with longitudinal corrugations, whereby the body is strengthened and stiffened, as set forth.

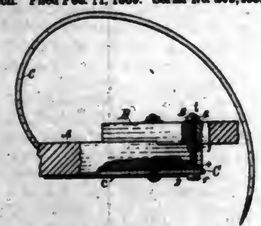
400,397. HARROW-TOOTH HOLDER. DAVID O. EVERETT, Pine Grove, assignor of one-half to the Williams Manufacturing Company, Kalamazoo, Mich. Filed Jan. 14, 1889. Serial No. 296,337. (No model.)



Claim.—1. The combination of a tooth-beam, a binding-plate, bolts attaching said plate to the beam, and a screw-bolt passed through the beam, and a tooth between the end of the screw-bolt and the plate, whereby the tooth and plate are adjusted, substantially as set forth.

2. The combination of the tooth-beam having the wedge-shaped recess, a tooth or share, a wedge-shaped plate, side bolts attaching said plate to the beam, and a screw-bolt passed through the beam for adjusting the tooth and plate, substantially as set forth.

400,398. HARROW-TOOTH HOLDER. DAVID O. EVERETT, Pine Grove, assignor of one-half to the Williams Manufacturing Company, Kalamazoo, Mich. Filed Feb. 11, 1889. Serial No. 299,465. (No model.)



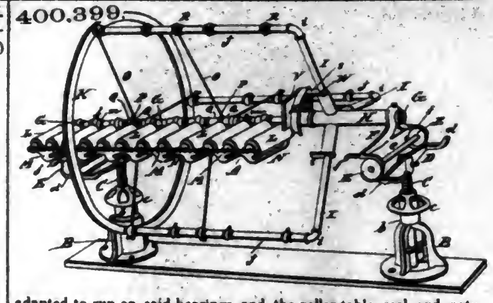
Claim.—The combination of a harrow-beam having the inclined recess, a tooth or share, a binding-plate clamping the tooth to the beam at one side of the recess, and an adjusting-bolt attached to the frame and to the shank of the tooth, substantially as set forth.

400,399. CUTTING-TABLE FOR BRICK OR TILE MACHINES. ROBERT M. FERRIS, Plymouth, and JOHN W. WOLCOTT, Fremont, assignors to Pate & Freese, Plymouth, Ohio. Filed Nov. 14, 1888. Serial No. 290,842. (No model.)

Claim.—1. The combination of the table, revolving cutting-reel, and automatic gate, substantially as and for the purpose set forth.

2. The combination of the fixed vertically-adjustable standards or supports, the table, reel, and gate forming parts of and moving in unison with the table, substantially as and for the purpose set forth.

3. The combination of the fixed vertically-adjustable standards having horizontal bearings at their upper ends, the traveler-wheels



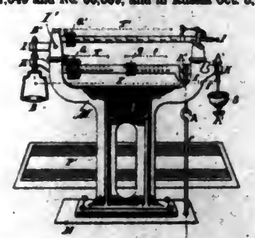
adapted to run on said bearings, and the roller-table, reel, and gate supported on bearings resting upon the traveler-wheels, substantially as and for the purpose set forth.

4. The combination of the fixed central shaft, adjustable roller-brackets, revolving cutting-reel, and revolving hubs for the attachment of the inner ends of the cutting-wires, substantially as and for the purpose set forth.

5. The combination of the fixed central shaft, adjustable roller-brackets, adjustable collars, and hubs adapted to revolve between the said collars and provided with means for the attachment of the inner ends of the cutting-wires, substantially as and for the purpose set forth.

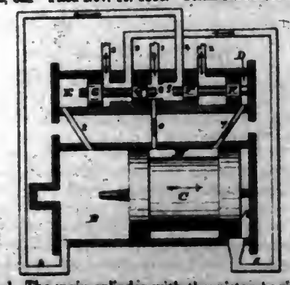
6. The combination of the revolving cutting-reel, the collars fastened adjustably upon the horizontal reel-arms, and provided with means for attachment of the cutting-wires, the cutting-wires, the hubs forming means of attachment for the inner ends of the wires, the fixed reel-shaft, and the table, substantially as and for the purpose set forth.

400,400. WEIGHING-MACHINE. PIERRE GUILLAUMIN, Voiron, France. Filed Jan. 9, 1888. Serial No. 260,248. (No model.) Patented in France May 2, 1881, and Sept. 19, 1887, No. 185,930; in England May 6, 1887, No. 6,686; in Belgium Sept. 9, 1887, No. 78,827; in Luxemburg Sept. 9, 1887, No. 890; in Italy Sept. 10, 1887, No. 22,944; in Germany Sept. 16, 1887, No. 43,850; in Austria-Hungary Sept. 21, 1887, No. 37,049 and No. 66,089, and in Russia Oct. 3, 1887, No. 8,760.



Claim.—In a weighing apparatus, the combination of the platform P', the levers L *l*, the connecting-lever C, the connecting-rod *o*, and the stand M, with the beams K K and I I, the counterpoise S, attached to said beam K K, the link A, attaching the beam K K and the connecting-rod *o*, the jointed link B', connecting the two said beams and supporting the receptacle B, the P'ˣ Q, *q*, and Q', the graduations T, *t*, and T', and the weights V, substantially as and for the purpose set forth.

400,401. PISTON WATER-METER. FREDERICK GUTZKOW, San Francisco, Cal. Filed Nov. 10, 1888. Serial No. 290,484. (No model.)

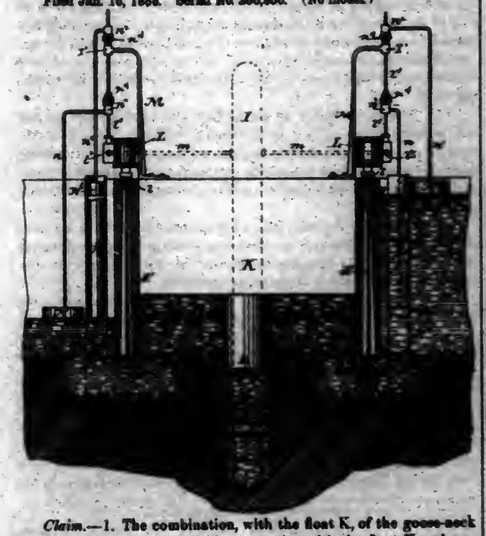


Claim.—1. The main cylinder with the piston having the chamber H, the valve-chamber with the two independent reciprocating valves having each two unequally-sized flanges or heads, and supply and discharge passages connecting with the cylinders, as shown, in

combination with the pipes or passages 6, 7, and 8, substantially as and for the purpose herein described.

2. In a meter, the main cylinder with a reciprocating piston having a chamber at its central portion, and a valve-chamber the ends of which are of larger diameter than the intermediate connecting portion, in combination with independent valves, each having heads or flanges of different diameters fitting the ends and intermediate portion of the valve-chamber, the supply and exhaust pipes opening into the valve-chamber, the pipes connecting the valve-chamber with the ends of the main cylinder, and the supplemental passages 6, 7, and 8, substantially as herein described.

400,402. WATER-MOTOR. JOHN H. HAGERTY, Lowell, Mass. Filed Jan. 16, 1888. Serial No. 260,850. (No model.)



Claim.—1. The combination, with the float K, of the goose-neck M, adapted to be reciprocated in connection with the float K and provided at its ends with a cupped collar, with the floats N N', their float-rods *n n'*, provided with eyes n^2, carrying the clamps n^4, and with the valve-stem P^1, passing through said clamps, and valves operated thereby, substantially as and for the purpose described.

2. In a water-motor, the combination, with the float K, of an upwardly-extending goose-neck attached to the said float and having a cup, I', a water-engine, its piston-rod, a valve connected with the said piston-rod, a valve-stem, P^1, of the said water-engine, a float having an upwardly-extending stem provided with an eye surrounding said stem P^1, and clamps n^4, hinged to said eye and arranged to be engaged by said cup as the said float K rises or falls, substantially as set forth.

3. The combination, with the water-engine, its valve-stem P^1, and a valve operated by said water-engine, of a float having an upwardly-extending stem provided with an eye surrounding said valve-stem, the clamps hinged to said eye, and a float having a goose-neck provided with a cup to engage said clamps, substantially as set forth.

4. The combination, with the float K, a water-engine, L, and the piston-rod of the latter, of the engine valve-stem P^1, the clutches n^4, the floats N N', by which said clutches are supported, a goose-neck, M, having a cup to operate said clutches, and a valve connected with the said piston-rod, substantially as set forth.

400,403. WINDOW-STOP. HERBERT A. HODGE, Jackson, Mich., administrator of William Pendleton, deceased. Filed Dec. 21, 1888. Serial No. 293,981. (No model.)

Claim.—The combination of a window-casing, vertically-playing inside blinds, suitable weights and cords, and a window-stop grooved



400,403.



in the back for the weights to run in between said stop and the casing, substantially as set forth.

400,404. SECONDARY BATTERY. RUDOLPH M. HUNTER, Philadelphia, Pa. Filed Jan. 14, 1889. Serial No. 296,288. (No model.)



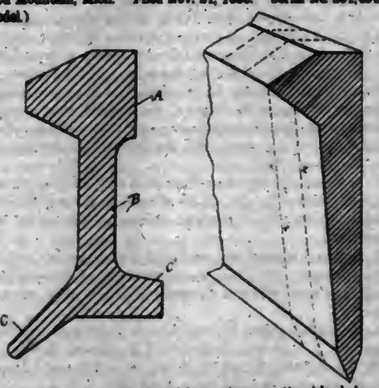
Claim.—1. A secondary-battery element or plate for holding active material, formed of lead, bismuth, and mercury, intimately associated, substantially as set out.

2. A secondary battery having both its positive and negative plates formed of lead, bismuth, and mercury, intimately associated, substantially as set forth.

3. A secondary battery having the bridging piece or pieces connecting the plates of one polarity formed of lead and a hardening metal—such as bismuth and mercury—intimately associated, substantially as set forth.

4. A secondary battery having its plates and bridging-pieces formed of lead and a hardened metal like bismuth and mercury, intimately associated and connected by a burned or fused joint, substantially as set forth.

400,405. MANUFACTURE OF RAILWAY-SPIKES. JOHN T. JONES, Iron Mountain, Mich. Filed Nov. 21, 1888. Serial No. 291,494. (No model.)



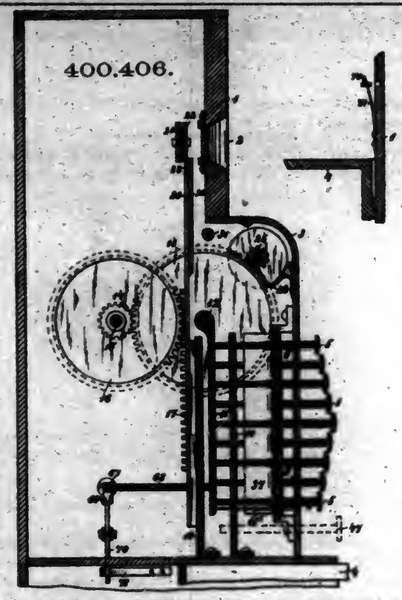
Claim.—The method of making railway-spike blank-bars from steel rails, which consists in rolling the said rail into the form of the desired spike-blank bar, and in this operation rolling or forcing into the web or body of the rail one of the flanges and bending down the remaining flange so that it shall be in line with and form a prolongation of said web, and shaping the bar to the form shown in Fig. 4, substantially as and for the purposes hereinbefore set forth.

400,406. CASH-INDICATOR. GEORGE F. KOLB, Philadelphia, Pa. Filed Apr. 21, 1888. Serial No. 271,400. (No model.)

Claim.—1. In a cash indicator and register, a casing, a shaft mounted therein, an arm depending loosely therefrom, a series of keys adapted to contact with the arm and move the same different distances, an indicator-plate having a row of different numbers thereon, and mechanism connected with said plate and operated by the movement of the arm to move the indicator-plate different distances to indicate the different numbers thereon, substantially in the manner and for the purpose described.

2. In a cash-register, a key, in combination with an oscillating arm, a rock-shaft with gear-wheel mounted thereon, a second shaft with wheel operated by the oscillation of said rock-shaft and wheel, a rising and falling rack meshing with said second wheel, and an indicator-plate secured to said rack, substantially as and for the purpose set forth.

400,406.



3. In a cash-register, indicating-plates lettered as described, and provided with arms or extensions 23, substantially as and for the purpose set forth.

4. In a cash-register, the combination of the board 21, with a leaf pivoted thereto, and an indicator-plate, 20, with extension or arm 23, adapted to engage and raise said leaf, substantially as and for the purpose set forth.

5. In a cash-register, keys having ribs 41 thereon, guides or uprights in which said keys are moved, and the pivoted spring-pressed plates 37, said parts being combined substantially as described.

6. In a cash-register, the keys having the ribs 41 thereon, in combination with the uprights 10, in which said keys are guided, the brackets 38, secured to the frame of said register, the pivoted plates 37, linked in pairs, and springs bearing against said plates and adapted to keep the plates in contact with the said ribs, substantially as and for the purpose set forth.

7. In a cash-register, the combination of the sliding bar 42 with guides and having the pins 44, the pivoted spring-pressed plates 37, and the keys with ribs 41 thereon, substantially as and for the purpose set forth.

8. In a cash-register, the combination of the key 47, with lug 50, the elbow-lever 46, the sliding bar 42, with pins 44, the spring-pressed plates 37, and keys with ribs 41, engaged by said plates, substantially as described

9. In a cash-register, the combination of the keys, an oscillating arm operated by said keys, a shaft with gear-wheel thereon rotated by said arm, a shaft with pinion 25 thereon, and having a registering-wheel, 26, thereon, substantially as described.

10. In a cash-register, the combination of a fixed shaft with pinion 25 and rotary units and tens registering wheels thereon, a second fixed shaft connected by arms to said first shaft, sleeves on said second shaft carrying the arms 33 35 and an arm, 36, and a pawl on said arm 36, adapted to engage with a ratchet on said tens-wheel, substantially as and for the purpose set forth.

11. The combination of a fixed shaft with the pinions 25 mounted thereon, and the rotary units and tens registering wheels with ratchets thereon, a second shaft connected by arms to said fixed shaft, sleeves loosely mounted on said second shaft carrying the arms 33, 35, and 36, a projection on said units-wheel adapted to engage the arm 34, and a pawl secured to the arm 36 and adapted to engage the ratchet of the tens-wheel, substantially as and for the purpose set forth.

12. In a cash-register, a fixed shaft with an angle-arm, a rotary sleeve on said shaft, and provided with an arm adapted to rest on said angle-arm of said shaft, substantially as and for the purpose set forth.

13. A fixed shaft with registering units and tens wheels thereon, a second shaft connected by arms to said fixed shaft and having an angle-arm, a sleeve carrying the arm 35, adapted to be engaged by a projection on the units-wheel, the arm 36, with pawl adapted to engage the ratchet of the tens-wheel, and the arm 33, adapted to abut against the angle-arm, thereby preventing further rotation of the sleeve, said parts being combined substantially as and for the purpose set forth.

14. In a cash-register, a series of sliding keys, in combination with a movable arm, gear-wheels operated by said movable arm, and a rising and falling indicator-plate, with rack operated by said gear-wheels, substantially as described.

15. The combination of an operating-key, an oscillating arm operated by said key, the pivoted sleeve 63×, with arms 64 and 65, the spring-bar 51, with lug 54× and spring 55 on outer end, the pivoted spring-lever 56, with hammer, and the alarm 59, substantially as described.

16. The combination of an operating-key, an oscillating arm operated by said key, a spring-bar with lug 54 thereon, and the spring-pressed lever 61, substantially as and for the purpose described.

17. In a cash-register, the combination of the casing, the spring 71, secured thereto at one end, the pivoted lever 70, having the other end of the spring 71 secured thereto, the sliding bar 67, pivotally connected to the upper end of said lever 70, and having the arm 68 connected thereto, the oscillating arms 11, and the cash-drawer 4, adapted when closed to engage said spring, substantially as and for the purpose set forth.

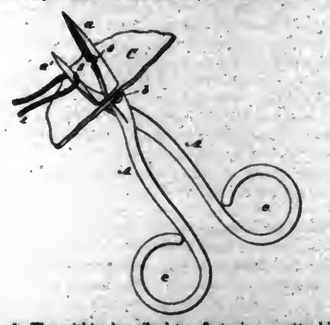
18. In a cash-register, an oscillating arm, keys for moving said arm different distances, gearing operated by said arm, and a rack carrying a plate or tablet combining different numbers, said rack being operated upon by said gearing to elevate the plate different heights to indicate the different numbers thereon, substantially in the manner described.

19. In a cash-register, indicating-tablets having each a row of different numbers thereon, in combination with gearing for elevating said tablets different distances to indicate the desired number or designation, substantially in the manner described.

20. In a cash-register, a shaft with movable arm thereon, keys for moving said arm different distances, gearing operated by the oscillation of said arm, and a tablet or plate containing different numbers operated upon by the gearing to elevate the tablet different distances to designate the desired number thereon, substantially in the manner described.

21. In a cash-register, the combination of a shaft, a sleeve on said shaft carrying a gear-wheel, a pinion meshing with said gear-wheel, a gear-wheel rotated by said pinion, a rack meshing with the said last-named gear-wheel, and an indicating-tablet carried by said rack having different numbers thereon adapted to be indicated by the movement of the rack, all substantially in the manner described.

400,407. TAG-FASTENER. WILLIAM H. D. LUDLOW, Tecumseh, Nebr. Filed July 9, 1888. Serial No. 279,384. (No model.)



Claim.—1. The within-described tag fastening or attaching instrument, consisting of the pivoted crossing levers or limbs A A, having forward and shorter pointed arms, *a a'*, of unequal length and cross-grooved to receive and hold the cord when closed one against or within the other, substantially as specified.

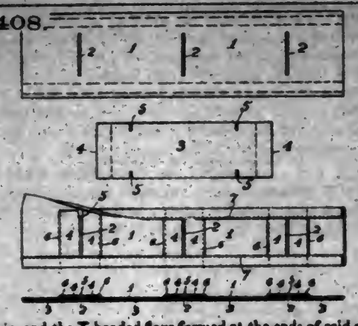
2. As an improved article of manufacture, an instrument for attaching tags, consisting of the pivoted levers A A, having their shorter arms, *a a'*, pointed and formed with notches *c* and their longer arms provided with loops *e*, the arms *a a'* being of unequal length and the longer one grooved longitudinally to receive the shorter one, as set forth.

400,408. BUTTON-HOLE STRIP. HENRY W. LYON, Bridgeport, Conn. Filed Dec. 26, 1888. Serial No. 294,696. (No model.)

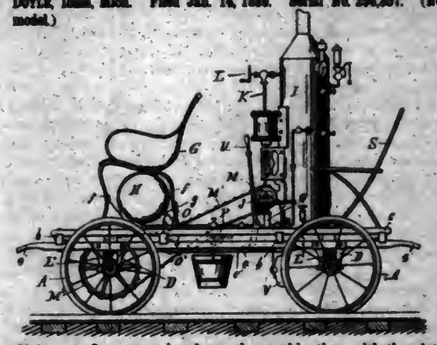
Claim.—1. In a button-hole strip provided with binding-edges, as described, the combination, with a body-strip having cut therein the button-holes, of separate short strips which extend beneath said body-strip between consecutive button-holes, and are provided with T-headed flaps, which are bound around the neighboring edges of said consecutive button-holes, substantially as set forth

2. The combination of the body-strip provided with binding-edges, as described, and having cut therein the button-holes, the separate strips which extend between consecutive button-holes beneath the body-strip, and the T-headed flaps formed at the ends of said separate strips and bound around the neighboring edges of said consecutive button-holes, the binding-edges of the body-strip being secured across the ends of the button-holes, substantially as shown, and for the purposes set forth.

400,408.



400,409. STEAM HAND-CAR. TIMOTHY MORRISSEY and JOHN DOYLE, Ionia, Mich. Filed Jan. 14, 1889. Serial No. 296,257. (No model.)



Claim.—1. In a steam hand-car, the combination, with the platform and car, of the generator I, supported on the rear end thereof, the engine mounted on the front side thereof and having its crank-shaft J in proximity to the platform, the sprocket-wheel M, mounted on said shaft, the sprocket-wheel M^3, mounted on the front axle of the car, the drive-chain M', and the idlers O and O', the latter having a yielding connection with the platform, substantially as described.

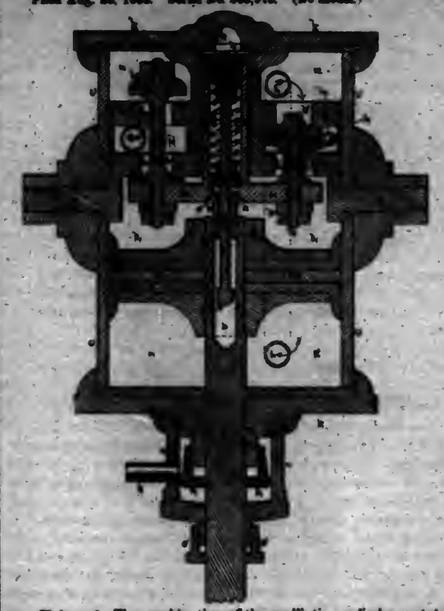
2. The combination, with a car provided with a platform, F, constructed substantially as described and mounted on springs E, of the seat G, supported on the front end of said car, the water-tank H, secured under said seat, the boiler I, mounted on the rear end of the car, the engine mounted upon the front side of the boiler and with its crank-shaft in proximity to the platform of the car, the sprocket-wheel M, mounted on said shaft, the sprocket-wheel M^3, mounted on the front axle of the car, the drive-chain M', the fixed idler O, and the idler O', secured in sliding bearings and provided with the spring *o*, substantially as described.

400,410. CHECK-HOOK. CHARLES H. MOSS, West Troy, N. Y. Filed May 1, 1888. Serial No. 272,402. (No model.)



Claim.—A safety check-hook which consists of a stationary body-piece, A, comprising a hook, 1, a main body, 3, having a pendent stud, 5, by which the device is secured to the harness, and an after-body, 4, of smaller diameter than said main body, said after-body having a collar, 10, provided with a tongue, 12, secured thereto, a sliding guard, B, having the form of a chambered sleeve and provided with an arm, 7, that is fitted to engage against the end of the hook 1, and having a slot, 13, in which the tongue 12 engages to guide said sliding guard, and a coiled spring, 9, which surrounds said after-body and is interposed between the collar 10 and a shoulder formed by the chambered bore of the sliding guard, the latter being fitted to have a sliding movement on and to be guided by the body 3 and collar 10, as and for the purpose herein specified.

400,411. HYDRAULIC MOTOR. JOHN A. MYERS, Louisville, Ky. Filed Aug. 22, 1888. Serial No. 283,073. (No model.)



Claim.—1. The combination of the oscillating cylinder, a stationary casting which is placed therein and provided with four openings and corresponding valve-seats, a reciprocating-valve carriage to which all of the valves are connected, the piston, and a rod which connects the valve-carriage and piston together and operates the valve-carriage, substantially as described.

2. The combination of the oscillating cylinder, the piston, the stationary casting provided with the inlet and outlet openings and receiving and discharge chambers, the reciprocating-valve carriage, the valves secured to and operated by the carriage, and a connecting-rod which loosely connects the piston and the valve-carriage together, one end of the rod being made to extend into an opening in the piston-rod and the other end to extend through the valve-carriage, and provided with a head or stop upon each of its ends, substantially as set forth.

3. The combination of the oscillating cylinder, the stationary casting placed therein and provided with inlet and outlet openings and the inlet and outlet chambers, the pipes connected to the chambers, the valve-carriage, the valve secured thereto, the piston, the pipe which connects the two ends of the cylinder together, and the spring-actuated rod for connecting the valve-carriage and the piston together, substantially as shown.

4. The combination of the oscillating cylinder, the pipe T, for connecting its two ends together, the piston, the casting provided with inlet and outlet openings and inlet and outlet chambers, the pipes connected to the two chambers, the valve-carriage, the valve secured thereto, the endwise-moving rod for connecting the piston and valve-carriage together, and which is provided with a stop upon each of its ends, the bearings C, placed inside of the carriage, and the spring placed between the openings and the nut D', substantially as described.

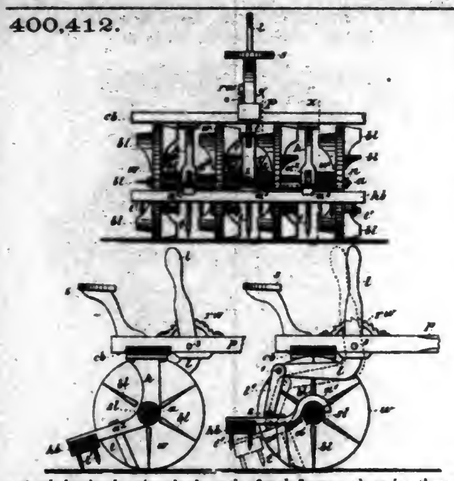
5. The combination of the cylinder, the piston-rod provided with an opening in its end, the projection X, the rod V, the casting in which the water-passages, the valve-seats, and the supply and escape chambers are formed, the valve-carriage, the valves secured thereto, a spring placed inside of the carriage, and the ends of the rod V being provided with stops, substantially as described.

6. The combination of the cylinder, the casting provided with water-passages, valve-seats, and a delivery and escape chamber, the valve-carriage, the valves secured to the carriage, the springs placed inside of the carriage, the bearings for the ends of the springs, the rod V, which extends through the carriage, the extension connected to the end of the piston-rod, the rod which is provided with stops upon its ends, and the piston, substantially as set forth.

400,412. COMBINED HARROW AND PULVERIZER. JOSEPH B. ORNY, Indianapolis, Ind., assignor of one-half to Joseph C. Worth, same place. Filed Oct. 15, 1888. Serial No. 288,128. (No model.)

Claim.—1. A combined harrow and pulverizer comprising a frame-work, hangers connected beneath the top thereof, a longitudi-

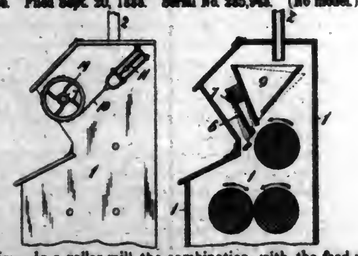
400,412.



sal axle having bearings in the ends of such frame and passing through sleeves upon which such hangers are mounted, wheels mounted on such axle comprising a central disk, with cutting-blades upon either side and at right angles to the plane thereof, a series of arms mounted upon the sleeves, through which the axle passes, and connected to such hangers and extending rearward, and a harrow connected to the rear end of such arms, with suitable mechanism for raising and lowering such harrow mechanism, substantially as shown and described.

2. In a combined harrow and pulverizer, a frame-work, a series of hangers connected beneath the top thereof, mounted upon sectional sleeves supported upon the axle, an axle having bearings in the ends of the frame and passing through such hangers, a series of wheels composed of central disks with lateral blades having sharpened edges mounted on such axle between the adjacent ends of the sleeves, arms also mounted upon the sleeves, connected to such hangers, and extending rearward between each pair of disks, a harrow-frame connected to such arms, and a series of cutting-teeth, also connected thereto between the axle of the machine and the harrow-frame, with means, substantially as described, for elevating and lowering such harrow mechanism.

400,413. ROLLER-MILL FEED-HOPPER. WILLIAM J. PURDY, Carberry, Manitoba, Canada, assignor of one-half to John H. Lyons, same place. Filed Sept. 20, 1888. Serial No. 285,948. (No model.)



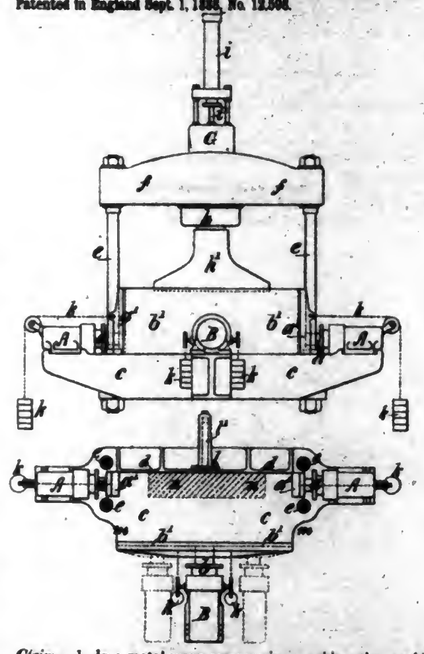
Claim.—In a roller-mill, the combination, with the feed-roller 3, of a hopper, 9, connected to a feed-board, 6, endwise pivoted or journaled through the mill-casing, a wheel, 19, on said journal to rock the feed-board, and a spring tension-regulator, 11, connected to said wheel by a chain or cord, 10, whereby the hopper, when overcharged, will overcome the resistance of the spring and actuate the feed-board to allow an abnormal quantity of grain to escape to the feed and reduction rollers until the tension of the spring overcomes the gravity of the hopper, the feed-board then returning to its normal position.

400,414. HYDRANT. WILLIAM RYLE, Paterson, N. J., assignor to Alfred B. Watson and James A. Watson, same place. Filed Sept. 24 1887. Serial No. 250,541. (No model.)



Claim.—A hydrant-nozzle cap consisting of an internally-screw-threaded brass bush open at each end and having one end of larger exterior diameter than the other end, and provided with a series of recesses, D, extending lengthwise in the tapering outer surface of the bush, substantially parallel with the internal screw-thread, in combination with an outer frame of iron cast about the said bush, closing the opening at the larger end of it and engaging with the said recesses, substantially as and for the purpose set forth.

400,415. APPARATUS FOR COMPRESSING SCRAP METAL. JAMES W. SUMNERS and TREVELYAN SHARP, Stalybridge, County of Lancaster, England. Filed Dec. 6, 1888. Serial No. 292,709. (No model.) Patented in England Sept. 1, 1886, No. 12,606.



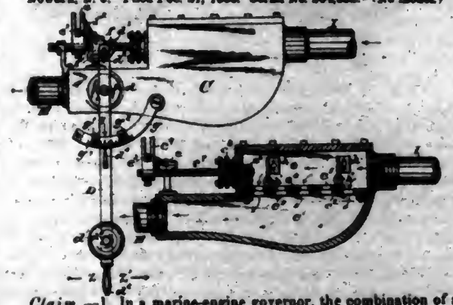
Claim.—1. In a metal-scrap-compressing machine, the combination of the three horizontal hydraulic rams and ram-heads, with a third vertically-acting ram and head, which is forced downward to give the final pressure, substantially as set forth.

2. The combination of the two horizontal hydraulic rams *a a*, the third horizontal ram, *b*, the fourth vertical and downward acting ram, *A*, the solid-surfaced bed *c*, and the strong vertical wall *d*, substantially as and for the purpose set forth.

3. In a metal-scrap-compressing machine, the horizontally-acting hydraulic ram, in combination with the vertically downward-acting hydraulic ram provided with a hydraulic piston working in a cylinder, *i*, for raising the last-named ram after each pressure, substantially as set forth.

4. In a metal-scrap-compressing machine, the combination of horizontal hydraulic rams with a vertically-acting ram or pair or set of rams, a vertical wall, *d*, opposite one of the horizontal rams, and a discharging-ram situated in said wall, substantially as set forth.

400,416. GOVERNOR FOR MARINE ENGINES. DANIEL SWEENEY, Newark, N. J. Filed Feb. 21, 1888. Serial No. 264,862. (No model.)



Claim.—1. In a marine-engine governor, the combination of a sliding valve arranged within a chambered valve-box having induction and eduction pipes on opposite sides of said sliding valve, a connecting-rod secured to said sliding valve and projecting and working through said valve-box, a weighted lever pivotally secured to said valve-box, a crank co-operating with a fork arranged on said connecting-rod to move the same and the sliding valve, and an adjustable plate secured to said crank and pivotally and adjustably connected with one end of said weighted lever, for the purposes set forth.

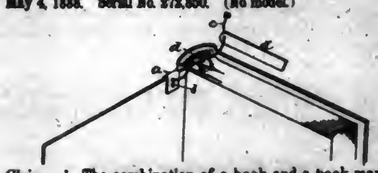
2. In a marine-engine governor, the combination of a sliding valve and a valve-seat provided with steam-ports therein, a valve-box in which said sliding valve and valve-seat are contained, a connecting-rod secured to said sliding valve and projecting and working through a stuffing-box on said valve-box, a fork attached to said connecting-rod, a crank engaging with said fork and journaled in suitable bearings, a slotted plate secured to said crank, a weighted lever pivotally secured to said valve-box and provided with a slot in the upper end thereof, and connecting-pin adjustably secured in the slotted plate attached to the crank and engaging with the slot in the end of the weighted lever, for the purposes set forth.

3. In a marine-engine governor, the combination of a sliding valve, a valve-box, a pivoted and weighted lever pivoted to said box, a connecting-rod whereby the movement of said lever is communicated to said valve, said rod projecting and working through a stuffing-box on said valve-box, a fork attached to said rod engaging with a crank journaled in suitable bearings, and adjustable stops with which the said swinging lever engages, for the purposes set forth.

4. In a marine-engine governor, the combination of a sliding valve, a valve-box, a pivoted and weighted lever pivoted to said valve-box, a connecting-rod secured to said sliding valve and projecting and working through a stuffing-box on said valve-box, a fork attached to said connecting-rod engaging with a crank journaled in suitable bearings, a slotted plate secured to said crank, said plate having a handle thereon, the weighted lever being provided with a slot in the upper end thereof and a connecting-pin adjustably arranged in the slotted plate and attached to the crank and engaging with the slot in the end of the weighted lever, and an arm secured to said valve-box, having an indicator thereon and extending down along the path of the lever adjacent to a pointer on said lever, substantially as and for the purposes set forth.

5. In a marine-engine governor, the combination of a sliding valve, a valve-box, said valve-box being provided with a slotted plate having rollers adjustably secured to the sides of said box, a pivoted and weighted lever pivoted to said box and having a pointer thereon, connecting devices whereby the swinging movement of said lever is communicated to the valve, and an indicator on which the pointer on said swinging lever indicates the relative position of the valve to the swinging lever, said indicator being secured to said box and extending down along the path of the lever adjacent to the pointer, for the purposes set forth.

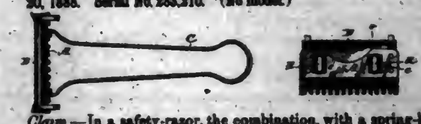
400,417. BOOK-MARKER. ISAAC J. TURNER, Princeton, N. J. Filed May 4, 1888. Serial No. 272,850. (No model.)



Claim.—1. The combination of a book and a book-marker consisting of a flexible cord attached to the book at or near its upper end and adapted to be arranged transversely across the top of the book, and having one or more markers loosely strung thereon and adapted to be arranged between the leaves of the book, substantially as set forth.

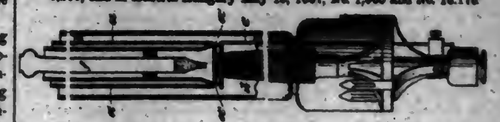
2. The combination of the book and a book-marker consisting of a flexible cord having markers loosely strung thereon and provided with a fastener attached to the book at or near its upper end, said flexible cord being adapted to be arranged transversely across the top of the book, and said markers being adapted to be arranged between the leaves of the book, substantially as set forth.

400,418. SAFETY-RAZOR. JOSEPH TURNER, Worcester, Mass., assignor to the J. R. Torrey Razor Company, same place. Filed Aug. 20, 1888. Serial No. 283,310. (No model.)



Claim.—In a safety-razor, the combination, with a spring-handle having inwardly-turned lips *c*, of a blade-holding guard-plate, A, provided in its rear side, between its ends, with ears or recesses to be engaged by the said lips, substantially as set forth.

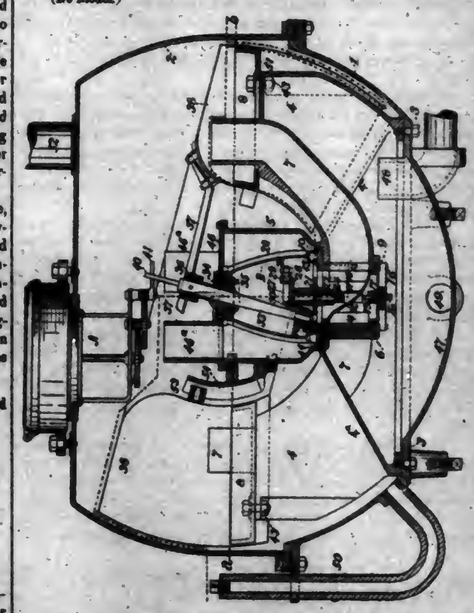
400,419. APPARATUS FOR REGENERATING INCANDESCENT MANTLES. CARL AUER VON WELSBACH, Vienna, Austria-Hungary, assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Mar. 31, 1888. Serial No. 269,190. (No model.) Patented in Germany Jan. 26, 1887, No. 44,016; in England Apr. 23, 1887, No. 6,238, and in Austria-Hungary May 13, 1887, No. 1,963 and No. 16,176.



Claim.—1. In an apparatus for applying a coating of regenerating-solution to mantles, the combination, with the tube *b*, having secured across its lower end a strip of porous material, *c*, of the tube *f*, centrally supported in the tube *b* above said porous material, and provided at its lower end with a small capillary opening for the escape of the regenerating-fluid, substantially as described.

2. In an apparatus for applying a coating of regenerating-solution to mantles, the combination of the tube *a*, having inward-turned projections *a'*, the tube *b*, supported within the tube *a* and resting on said projections, the strip of porous material *c*, secured across the lower end of the tube *b*, and the tube *f*, supported centrally in the tube *b* above said porous material, substantially as described.

400,420. FLUID-METER. GEORGE WESTINGHOUSE, Jr., and CHAUNCEY M. DUTTON, Pittsburg, Pa. Filed July 30, 1888. Serial No. 281,406. (No model.)



Claim.—1. In a fluid-meter, the combination of a substantially spherical inclosing-case provided with inlet and outlet pipes, an annular spherical sector measuring-shell divided into a series of separate compartments and adapted to receive a progressive wave-like movement about its center, and a valve connected to and actuated by the movements of the measuring-shell and controlling the flow of fluid to and from the several compartments thereof, substantially as set forth.

2. In a fluid-meter, the combination of an inclosing-case provided with inlet and outlet pipes, a measuring-shell composed of a series of compartments journaled on and adapted to successively oscillate about a common central bearing, and a valve connected to and actuated by the movements of the measuring-shell and provided with a partition and ports controlling the simultaneous admission of fluid to be measured into two or more adjacent compartments and its simultaneous delivery from two or more oppositely-arranged compartments, substantially as set forth.

3. In a fluid-meter, the combination of an inclosing-case, a diaphragm dividing said case into two compartments and provided with a central tube, a measuring-shell composed of a series of compartments adapted to oscillate successively about a common center in one of the compartments of the case, and a valve connected to and actuated by the measuring-shell and controlling the passage of fluid from one compartment of the case through the tube of the diaphragm into

the measuring-compartments and from the measuring-compartments into the other compartment of the case, substantially as set forth.

4. In a fluid-meter, the combination of an inclosing-case, a diaphragm dividing said case into two compartments and provided with a central tube, a series of bosses or displacers projecting from the diaphragm into one of the compartments, a measuring-shell composed of a series of compartments which respectively surround the several bosses or displacers and are adapted to oscillate successively about a common center in the compartment of the case containing the same, and a valve connected to and actuated by the measuring-shell and controlling the passage of fluid from said compartment of the case through the tube of the diaphragm into the measuring-compartments and from the measuring-compartments into the other compartment of the case, substantially as set forth.

5. In a fluid-meter, the combination of a case adapted to contain a sealing-fluid, a series of measuring-compartments working within the case, and a series of equalizing-chambers, each fixed to the case and projecting within and fitting closely adjacent to the inner surface of one of the measuring-compartments, substantially as set forth.

6. In a fluid-meter, the combination of an inclosing-case, an annular measuring-shell divided into a series of compartments, a series of circularly-arranged displacers, each fixed to the case and projecting into one of the measuring-compartments, and a series of equalizing-chambers removably connected to the displacers, substantially as set forth.

7. In a fluid-meter, the combination of an inclosing-case in the form of a segment of a sphere and composed of two sections, a series of circularly-arranged displacers connected to the lower section of the case, and a series of equalizing-chambers connected removably to the displacers, the displacers and equalizing-chambers projecting above the upper face of the lower section of the case, substantially as set forth.

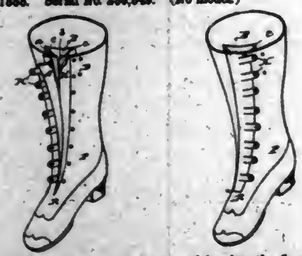
8. In a fluid-meter, the combination of an inclosing-case, a measuring-shell composed of a series of compartments journaled on and adapted to successively oscillate about a common central bearing, a series of tubes leading to the compartments and converging in a valve-casing concentric therewith, and a valve connected to and actuated by the measuring-shell and controlling the flow of fluid through the tube, substantially as set forth.

9. In a fluid-meter, the combination of a measuring-shell composed of a series of compartments arranged about a common center and having a progressive wave-like movement, a valve governing the flow of fluid to and from said compartments, and a guide or stop to prevent revolution of the measuring-shell around its center, substantially as set forth.

10. In a fluid-meter, the combination of an inclosing-case, a diaphragm arranged transversely of said case, pipes for conducting fluid to and from said case and connected thereto on opposite sides of the diaphragm, a valve controlling an opening through the diaphragm, and a sediment-chamber below the diaphragm, substantially as set forth.

11. In a fluid-meter, the combination of an inclosing-case provided with inlet and outlet pipes, a series of measuring-compartments, a valve controlling the flow of fluid to and from said compartments, mechanism connecting the measuring-compartments and valve, and a removable valve seat or support having the connecting mechanism attached thereto and removable therewith, substantially as set forth.

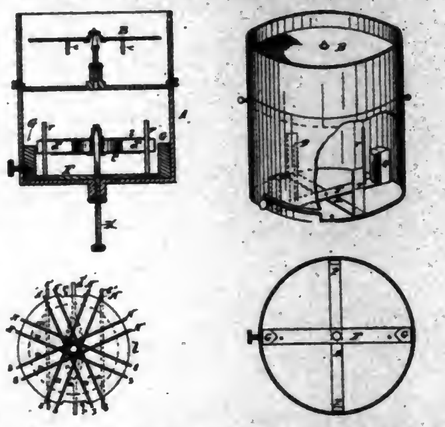
400,421. RUBBER BOOT. MARY T. WYNKOOP, Utica, N. Y. Filed Nov. 3, 1888. Serial No. 289,849. (No model.)



Claim.—A boot-leg open in front and having the flaps A *a* and H *b* on opposite sides, the said flaps being adapted to close one upon the other when the boot-leg is closed, and the gore or tongue B, having its edges attached to the inner sides of the flanges *a b*, substantially as described.

REISSUES.

10,991. SHIP'S COMPASS. LÉON SIRIEIX, San Francisco, Cal., assignor to the Sirietx Mariners Compass Company. Filed Feb. 26, 1889. Serial No. 301,296. Original No. 373,523, dated Feb. 22, 1888.



Claim.—1. A correcting-compass, *l l*, provided with two sets of magnetic bars, one set being underneath the card of the compass and the other set on its top, in combination with a prime compass having magnetic bars, substantially as set forth.

2. In a compensating compass, the combination, with a prime compass and a correcting-compass, of the soft-iron blocks G, mounted and moved with the correcting-compass, as set forth.

3. In a compensating compass, the combination, with a prime compass and a correcting-compass, of the soft-iron blocks G, mounted and moved with the correcting-compass, and means, substantially as described, for adjusting the said blocks and correcting-compass in a horizontal plane, as set forth.

4. In a compensating compass, the combination, with the prime compass and a correcting-compass, of the soft-iron blocks G G and bar F, on the ends of which they are mounted and the guides or stops *r r* on bar F, to hold the correcting-compass, as set forth.

5. In a compensating compass, the combination of a prime compass and a correcting-compass and the soft irons P, arranged and held in place on bar M, to compensate the influence due to the induced magnetism in the vertical and horizontal soft iron of the ship, substantially as described.

10,992. REFRIGERATOR. WILLIAM C. SWEET, Schenectady, N. Y. Filed Feb. 14, 1889. Serial No. 300,234. Original No. 355,067, dated Jan. 4, 1887.



Claim.—1. The combination, with a refrigerator having way or guide strips, of an ice-receptacle having rollers to travel thereon, and a flexible pipe connecting the ice-receptacle with an eduction pipe or opening, substantially as set forth.

2. A refrigerator comprising a casing and a lining of light porous wood, arranged to leave a space between them, and a filling in said space, consisting of salt, lime, and sawdust, substantially as set forth.

R. PETERS, Photo-Lithographer, Washington, D. C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

COMMISSIONER'S DECISIONS.

EX PARTE YOUNG.

Decided December 18, 1888.

STATEMENT OF THE CASE.

The claims have been rejected on the ground that they cover a process which is "evidently and necessarily the operation contemplated in the construction of the machine" and "the inevitable result of such operation."

1. PROCESSES WHICH DEPEND UPON PARTICULAR MECHANISM.

It being conceded that a process is not patentable which is merely the effect or function of specific mechanism, the question necessarily arises in every case whether the process claimed is capable of being performed by a machine differently organized from that described, or even without an organized machine—by ordinary tools or by hand. *Held* in the case under consideration that the processes set forth in the claims do not depend for their performance on the particular machine described.

2. WHEN ENTITLED TO THE PROCESS.

An inventor who proceeds to invent a machine designed solely to carry out a particular process, and the only function of which is to execute that process, is entitled to protection. A process which is distinct and separate from the machine does not lose its identity because of any course pursued by the inventor in prosecuting his claims for a patent, or from the fact that he may not at the time of completing his machine have been fully conscious that he had also invented the process. Should applicant, however, take out his patent for the machine without defining or claiming his process, he probably would unconsciously dedicate the process to the public; but if at any time before he comes to the Office or takes out his patent he discovers or becomes conscious of the fact that his invention is of a twofold character—viz., that it constitutes both the machine and the process which it executes—and prepares his application accordingly, there can be no reason for holding that he has merged the two inventions or that the two are in fact one.

3. CONSCIOUS AND UNCONSCIOUS INVENTION, WHEN COMPLETED.

At the time applicant becomes conscious of the fact that there exists in his mental operations and discoveries a distinct process as well as a concrete machine he completes not only the invention of the process, but perfects his knowledge of it, and comes into the status of an inventor who may obtain the security of the patent laws.

4. DECISIONS REVIEWED.

APPEAL from Examiners-in-Chief.

ART OF AND MACHINES FOR MAKING BOXES, &c.

Application of McClintock Young filed August 30, 1886, No. 212,210.

Messrs. Baldwin, Davidson & Wright for the applicant.

HALL, *Commissioner.*

The invention described in this application consists in producing from a continuous strip of paper a series of connected, longitudinally-pasted, flattened box-tubes, having their surface printed upon, which, being separated from one another and expanded or opened, are converted into boxes. This continuous strip of box-blanks may be separated at will. Applicant has devised a complex machine by which the various steps of printing, creasing and cutting, pasting, and rolling are performed in their proper order. He has presented claims to cover the process by which the roll of completed box-blanks is produced and for some of the sub-processes, which are as follows:

1. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of preparing the connected blanks for pasting and folding, consisting in intermittingly advancing the strip, and during intermissions in its advance movement cutting and creasing to successively and completely form the respective blanks of a series of unfolded unpasted blanks connected at their ends by narrow necks, substantially as set forth.

2. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of preparing the connected printed blanks for pasting and folding, consisting in intermittingly advancing the strip, successively printing the respective blanks during intermissions in the advance movement of the strip, and cutting and creasing the other blank also during intermissions in the advance movement of the strip to successively complete the respective blanks of a series of unfolded unpasted blanks connected at their ends by narrow necks, substantially as set forth.

3. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of producing the connected box-tubes, consisting in intermittingly advancing the strip, during intermissions in its advance movement cutting and creasing it to successively completely form the respective unfolded unpasted blanks of a series with the narrow necks connecting them at their ends, applying paste to the successive blanks, and during intermissions in the advance movement of the strip folding previously cut and creased pasted blanks into flattened connected box-tubes, substantially as set forth.

4. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of producing and compactly bundling and compressing the connected box-tube, consisting in intermittingly advancing the connected cut and creased blanks, applying paste, folding into flattened connected box-tubes, and winding them under tension into a compact roll, substantially as set forth.

5. As an improvement in the art of manufacturing boxes from a strip of paper, &c., the described method of preparing the connected blanks and producing and compactly bundling and compressing the connected box-tubes, consisting in intermittingly advancing the strip, cutting and creasing it to successively form the respective blanks of a series with the narrow necks connecting them, applying paste to the blanks, folding the blanks, and finally winding them into a compact roll, substantially as set forth.

The examiner has rejected these claims on the ground that they cover a process which is "evidently and necessarily the operation contemplated in the construction of the machine," and "the inevitable result of such operation." In this position he has been affirmed by the Examiners-in-Chief. The authorities relied upon both by the Primary Examiner and the Examiners-in-Chief are *Burr* v. *Duryee*, (2 Whit., 69;) *Corning* v. *Burden*, (15 How., 252;) *New* v. *Warren*, (C. D., 1882, 371;) *Brainard* v. *Cramme*, (C. D., 1882, 382,) and the Commissioner's decision in *ex parte Harrison*, (C. D., 1876, 170.) The bearing of all these authorities on the propriety of allowing the claims under consideration is not strikingly apparent. The question in *Burr* v. *Duryee* was one relating to the reissue of a machine patent so as to cover a process

recognized by the court as known and practiced prior to the invention of the machine, and the court rightly declared against such reissue, saying:

Much less can any inference be drawn from the statute that an inventor who has made an improvement in a machine, and thus effects the desired result in a better or cheaper manner than before, can include all previous inventions and have a claim to the whole art, discovery, or machine he has improved.

In *Corning* v. *Burden* the question was on the interpretation of Patent No. 1,890, December 10, 1840, whether it was to be regarded as for a machine or a process. The claim was what is now called "functional," and really covered the accomplishment of the result by several distinct mechanisms, but in all the action of particular means was relied upon. The inventor stated, moreover, that his invention was for an "improvement in the process which consists in the employment of a new and useful machine for rolling puddling-balls." The court rightly held that such a patent was for a machine and not for a process, and, further, that a patent could not be granted for the function or abstract effect of a machine. A process was declared to be patentable as distinguished from a machine; but I do not see wherein the word "process" as defined by the court fails to include such processes as are the subject of the present claims.

In *New* v. *Warren* the court held that a machine patent could not be broadened in a reissue to cover a process described in the original, and declared that in addition to a patent on the machine there could not be a patent for its mere operation.

In *Brainard* v. *Cramme* it was held that the process claimed in the reissue was merely for the operation of the apparatus described in the original patent, but it was conceded that since everything essential to the process had been pointed out in the original patent nine years before and in the meantime other inventors had occupied the ground covered by the general subject-matter of the invention, whatever was therein pointed out and not claimed was to be deemed to be dedicated to the public. There is nothing in this case that bears on the question now before me.

In *ex parte Harrison* the Commissioner held that—

If in the present case we separate the process or method proper from the operation or effect of the machine, we have the simple process of charring wood in a closed vessel, which is too old to be patented.

This amounts to a rejection of the process claim for want of novelty, in view of the fact that in so far as the process depended on the operation of the machine it was not patentable.

The general consensus of these decisions, as well as the many others that might have been cited, is in accordance with what is said in *ex parte Herr*, (41 O. G., 463:)

The necessary effects or operations of specific mechanism are not necessarily processes or methods within the meaning of the patent law. * * * A method or process such as the law recognizes as patentable must have an existence independent of the machine or appliances by which it is carried out to its result. It must be a method or process that can be carried out by hand or by various kinds or forms of mechanism or appliances.

I am not able to fully agree with the examiner and Examiners-in-Chief in the position which they have taken. It being conceded that a process is not patentable which is merely the effect or function of specific mechanism, the question necessarily arises in every case whether the process claimed is of that character—that is, whether it is capable of being performed by a machine differently organized from that described, or even without an organized machine, by ordinary tools or by hand. If it is capable of being so performed, then, so far as the examiner's view is concerned, it may be a patentable process.

It is clear to my mind that the processes set forth in the claims do not depend for their performance on the particular machine described. They can be carried out by other organizations of mechanism, by machines more or less complex, by appliances not worthy to be classed as machines, or by simple hand-tools. It seems possible for an inventor with one of these claims before him, or with the finished product before him, to conceive of an organization of mechanism to carry out the process claimed, or to construct a machine to make the product, which would differ so materially from the applicant's machine as not to infringe it. Hence the processes claimed are not included among those processes which by the general consensus of decisions are held not to be patentable, but they are such as have, to quote again the language of *ex parte Herr*—

an existence independent of the machine or appliances by which they are carried out to their result.

That a process may be patented irrespective of the particular form of instrumentalities used to carry it out is clearly set forth in *Eastern Paper Bag Co.* v. *Standard Paper Bag Co.*, (41 O. G., 231,) in which *Cochran* v. *Deener* (94 U. S., 780) is quoted with approval. The court in the paper-bag case sustained Patent No. 258,272, granted to Daniel Appel May 23, 1882, the claim in which is as follows:

The herein-described improvement in the art or method of manufacturing satchel-bottom paper bags from a tube, which consists, first, in forming the diamond fold, then cross-folding the leading corner of the diamond fold, and subsequently completing the satchel-bottom by cross-folding the rearmost corner of the diamond fold, and together with it the main body of the bag-blank, on the line of this second cross-fold, substantially as and for the purpose described.

This process was carried out by machinery which produced the bags with such rapidity that the court said it was difficult to assign any limit to the speed with which they could be made. But irrespective of the machine the court held that the claim described a patentable process.

In *Globe Nail Co.* v. *United States Horse Nail Co.* (19 Fed. Rep., 819) the court held the following claim to be good:

The process of curving the bodies of nails and beveling their points by spreading the metal laterally and afterward forcing them through an open die to shear off superfluous metal, substantially as and for the purpose specified.

In *Wallace* v. *Noyes* (13 Fed. Rep., 172) the court said:

Where the patentee attained the result by a succession of processes, which, though separately old, had not been practically grouped together in the order in which he used them, it is a patentable novelty in process.

In all these cases in which mechanical processes are held to be patentable the inventor of the process has proceeded further to invent a machine designed particularly to carry it out, and when such a machine has been constructed its sole purpose and function must necessarily be to perform the process—that is to say, the process is "evidently and necessarily the operation contemplated in the construction of the machine," which has been regarded by the Primary Examiner and the Examiners-in-Chief as sufficient ground for refusal of the present claims. The decisions of the court do not appear to me to sustain such a position, but, on the contrary, to recognize as patentable novel mechanical processes, notwithstanding the fact that machines have been devised of which the processes are the evident and necessary operation.

In view of the decisions of the courts, and in view particularly of such claims as have been sustained by them, I see no reason why the claims now in controversy may not be accepted as valid for mechanical processes. I observe in this application that the claims rejected which relate to the processes set forth are joined with other claims covering the machine by which these processes are executed, and it has been suggested that these claims for the processes and for the machine are united in the same application. The legitimate and necessary inference is that the applicant invented the processes and the machine at the same time, and has chosen or elected to regard them as constituting but a single invention. So it may be said the invention of the processes has in this manner become merged in the invention of the machine and that applicant can only maintain these claims for the machine. This conclusion appears to be reached, probably, upon the ground that it is unlawful for an applicant to unite claims for two separate and distinct inventions in the same application. The proposition is stated in this wise:

If the inventor of a new and patentable process contrives subsequently a machine or apparatus by which to carry it out, it is evident that the two—the process and the machine—are not the same invention. They are distinct in their nature and distinct chronologically and cannot be identical. But when a case arises in which the inventor has never consciously discovered or contrived a new mechanical process, but has purposed to invent a machine only, it would appear that the operation of the machine, though perhaps a true and novel mechanical process, is in fact inseparable as an invention from the machine itself.

I am not able to accept this proposition, and do not see how it is possible for a process which is distinct and separable from the machine by which it may be executed to lose its identity in any way by the course which the inventor may pursue in prosecuting his claims for a patent, or from the fact that at the time he completed his machine he may not have been fully conscious of the fact that he had invented a distinct and separable process. It is of course difficult to say that a man can have invented a process of which he was not cognizant; but in the case supposed the inventor's attention may have been so occupied with the mechanical construction of his machine that for the time being he failed to know, by reason of his ignorance or otherwise, he had invented also a new process, and if his unconsciousness should not be removed and he should come to the Patent Office and apply for a patent without describing or defining or claiming his process, and should take out his patent accordingly, he probably would dedicate the process to the public as unconsciously as he had invented it, and thus be barred from asserting claim thereto; but if at any time before he comes into the Office or takes out his patent he discovers or becomes conscious of the fact that his invention is of a twofold character—viz., that it constitutes both the machine and the process which it executes—and prepares his application accordingly, there certainly can be no reason for holding that he has merged the two inventions or that the two are in fact one. At the time an applicant becomes conscious of the fact that there exists in his mental operations and discoveries a distinct process, as well as the concrete machine which he has created, he completes not only the invention of the process, but perfects his knowledge of it and comes into the status of an inventor who may obtain the security of the patent laws. In this case the application has been allowed to proceed to the present time without any objection being made to the fact that it contained claims for the process and claims for the machine. If the practice alluded to had been carried out originally, applicant would have been required to divide, and would then have occupied a status which would be fatal to the objection which is suggested in this particular.

The decision of the Examiners-in-Chief is reversed.

EX PARTE JAEGER.

Decided January 4, 1889.

PATENTABILITY—PROCESS.

A method or process which depends for its novelty upon the preparation of an adhesive stay and the various steps employed to carry such article forward to the final act of affixing it to the corners of boxes for the purpose of strengthening the corners *Held* to be not a proper method or process, but the mere operation of the machine.

APPEAL from Examiners-in-Chief.

PROCESS OF APPLYING CORNER-STAYS TO BOXES.

Application of Gustave L. Jaeger filed March 29, 1888, No. 268,830.

Messrs. Van Santvoord & Havff for the applicant.

HALL, *Commissioner:*

Applicant appeals from the decision of the Examiners-in-Chief affirming the action of the Primary Examiner in rejecting this application.

The claims appealed are as follows:

1. The method herein described of staying box-corners, which consists in preparing a series of detached superposed corner-stays, each of the required size, automatically picking up the stays one after another and carrying them over the corners of a box, automatically rendering the stays adhesive one after another in transit to the box-corners, and pressing the median line of the stays on the box-corners, substantially as set forth.

2. The method herein described of staying box-corners, which consists in preparing a series of detached corner-stays of the required size, superposing the said stays, automatically picking up the stays successively at uniform intervals and carrying them over the box-corners, and while in transit thereto automatically rendering them adhesive one after another, and pressing the stays on the box-corner.

The Examiners-in-Chief affirm the decision of the Primary Examiner in the following language:

We concur with the examiner in finding nothing in this case but the operation of the machine set forth and described in the application, and we affirm his decision.

I fully concur in the opinion of the Examiners-in-Chief. It may be well to add, however, that an examination of the application with its claims satisfies me for other reasons than those expressed by the Examiners-in-Chief that no method exists in this case. The result of the alleged method is the fastening of the side pieces of a box where they meet at the corners by means of an adhesive stay, which is prepared of the required size and rendered adhesive and then pasted over the corners of the box. The thing done is the staying of the corners of the box by this stay, which is conceded to be old and very common; but the applicant attempts to take the preparation of the stay itself as an independent article, divide it into "steps," as he calls them, and carry them forward to the final act of affixing the stay to the corner of the box, and by reason of these various steps he claims to have found a process. Now, it is apparent that the stay is

a separate and independent article until it has been applied to the corners of the box; that its being cut into rectangular shape, pasted, piled in convenient form, &c., are mere steps in its preparation and wholly independent of the final act affixing it to the corners of the box to accomplish the purpose of the supposed invention—viz., staying the corners of the box.

When properly considered, the only thing which is shown in the application or which can be claimed in the way of invention is the applying of rectangular pieces of paper, properly pasted, to the corners of the box for the purpose of strengthening or staying such corners. The supposed method or process of thus staying the box begins and ends with the applying of the stay to the corners of the box. It is impossible to carry that process or method back so as to embrace or include the steps which may be taken to prepare the stays. As well might it be attempted to claim a method for strengthening or staying the corners of the box by nails by beginning with the origin of the nails, their manufacture and form, following them through the devious processes of manufacture, and alleging that those various steps were steps in the process of strengthening and staying the box into which the nails were driven.

The action of the Examiners-in-Chief is affirmed.

EX PARTE LATIMER.

Decided March 12, 1889.

1. NATURAL PRODUCT OF NATURE NOT PATENTABLE.

A product of nature, although conceded to be valuable and useful, such as fiber which is procured, derived, or freed from a certain species of pine, by means of a new and novel process for which patent has been granted to applicant, *Held* to be not such a patentable invention as is required by the statute.

2. SAME.

The product has not been affected, changed, or altered by the process, and whatever there is of invention resides in or consists of the process itself, by which the fiber can be taken from the natural sheath or membrane of the leaf or pine-needle in which it has been developed or produced by the processes of nature.

3. SAME.

A contrary ruling would result in granting to one inventor the exclusive use of one species of fiber, and so on, successively, patents might be obtained upon the fibers of the various trees of the forest and the plants of the earth, which, because being natural products, are no more the subjects of patents when eliminated from their surroundings than wheat which has been cut by some new method of reaping can be patented *as wheat* cut by such a process.

APPEAL from Examiners-in-Chief.

FIBERS.

Application of William Latimer filed December 10, 1888, No. 293,067.

Messrs. Munn & Co. for the applicant.

HALL, *Commissioner:*

Applicant appeals from the decision of the Examiners-in-Chief upon the following claim:

As a new article of manufacture, the fiber herein described, consisting of the cellular tissues of the *Pinus australis* eliminated in full lengths from the silicious, resinous, and pulpy parts of the pine-needles and subdivided into long pliant filaments adapted to be spun and woven, as described.

In the original rejection a patent to Adolph Roque January 1, 1867, No. 60,940, and also a publication contained in the *Franklin Journal*, vol. 54, pp. 412–414, are cited.

The examiner held:

The claim and description do not set forth any physical characteristics by which the fiber can be distinguished from other vegetable fibers. The material out of which the fiber is made does not constitute a physical characteristic, nor does the length of the fiber distinguish it from the fiber produced from other vegetable substances, although it may from those derived from other species of pine. Hence, since the fiber claimed is not, and cannot be, distinguished from other fibers by any physical characteristic, the claim therefor must be refused. (See *Cochrane* v. *Badische Anilin and Soda Fabrik*, 27 O. G., 813.)

The claim is also refused, as the fiber produced from any vegetable substance does not differ from other vegetable fibers and is not the subject for patent protection. This exact question, so far as the examiner is aware, has never been considered by the courts or by the Commissioner; but analogous cases are found in paper-pulp made from various substances, which, as products, have been declared not to be patentable by the Commissioner in *ex parte Sturgis*, (MS. Dec., vol. 2, 145,) and *ex parte Cushman*, (MS. Dec., vol. 2, 64,) and by the Supreme Court in *The American Wood Paper Co.* v. *The Fibre Disintegrating Co.*, (23 Wall., 566, 593.)

After the case had been appealed to the Examiners-in-Chief it appears that applicant submitted to them a number of additional affidavits relative to the character and quality of the fiber produced by his process. The senior member of the Examiners-in-Chief, after intimating that the flax fiber produced from the needle of the *Pinus australis* was patentable, and that the views of the examiner, in so far as he held that such a fiber was not patentable *per se*, were erroneous, and, doubting the applicability of *The American Wood Paper Co.* v. *The Fibre Disintegrating Co.* to the question, remanded the application to the Primary Examiner, in order that he might take original jurisdiction of the application again with the new affidavits as a part of the record and make such action therein as he might see proper.

The Primary Examiner thereupon, having considered the evidence submitted through the order of the Examiner-in-Chief, returned the case to the Board with an affirmance of his former action. The majority of the Examiners-in-Chief then affirmed the action of the Primary Examiner, holding:

We are also of opinion that the said references furnish a substantial anticipation of the supposed new article of manufacture, and must therefore affirm the examiner's decision in refusal of the patent.

The references referred to are those originally given, viz: patent to Adolph Roque, No. 60,940, and the disclosure contained in the *Franklin Journal*.

The senior member of the Board entertained a doubt as to whether the invention was properly anticipated by these references, and held that the doubt should be resolved in favor of the applicant and the decision of the examiner reversed. Applicant, by appeal from the decision of the majority of the Examiners-in-Chief, has now brought the case before the Commissioner for his consideration.

Applicant has filed two applications, one for the process by which the fiber in question is taken from the needles of the *Pinus australis*, the other for the product itself. He has obtained a patent for his process, but his claim for the product has, as above stated, been rejected. What is this product which applicant claims? It is not asserted or pretended in the present application that the product, which is the result of applicant's process, is in any manner affected or produced by the process, or that its natural condition as a fiber has in any wise been affected, changed, or altered. Fiber, whether of plants—such as hemp, flax, cotton—or of the leaves of trees—such as the *Pinus sylvestris*—or of the wood of trees and shrubs, is a well-known material, the knowledge of which is almost coextensive with the human family. It has been

employed from time immemorial in the manufacture of threads, cordage, fabrics, and textiles. It is also well known that the pure fiber after it has been eliminated from the natural matrix of the leaf or stalk or wood in which nature forms and develops it is essentially the same thing and possesses the same construction. The chemical formula for this cellulose in all these varieties of plants, I am advised, is the same. The different fibers differ in characteristics as to length, strength, fineness, &c.; but these differences are not at all due to the processes by which they are removed from the matrices in which they have grown, but to the processes of nature in developing and growing them. The fiber of the needle of the *Pinus australis* grows from ten to twenty inches, while that of the leaf of the *Pinus sylvestris* is only three, four, or five inches in length, and this is true for precisely the same reason that the needle itself of the one is much longer than the leaf of the other. Nature made them so and not the process by which they are taken from the leaf or the needle.

It cannot be said that the applicant in this case has made any discovery, or is entitled to patent the idea, or fact, rather, that fiber can be found in the needle of the *Pinus australis*, or that it is a longer fiber than can be found in other leaves, or that it possesses more or less strength or fineness, because the mere ascertaining of the character or quality of trees that grow in the forest and the construction of the woody fiber and tissue of which they are composed is not a patentable invention, recognized by the statute, any more than to find a new gem or jewel in the earth would entitle the discoverer to patent all gems which should be subsequently found, so that generally it may be said that fiber such as is described in this application is old, and even if such were not the fact and this were the first time that man had discovered that a fiber existed in the leaves and needles of the trees which could be removed by certain processes and made useful for mankind, it is doubtful whether the invention would consist of anything more than the process by which the fiber could be taken from the natural leaf or needle in which it is produced by natural processes. Otherwise it would be possible for an element or a principle to be secured by patent, and the patentee would obtain the right, to the exclusion of all other men, of securing by his new process from the trees of the forest (in this case the *Pinus australis*) the fiber which nature has produced and which nature has intended to be equally for the use of all men. The result would be that an alleged inventor in Germany would acquire a patent which would give him the exclusive use of the *Pinus sylvestris*, the applicant in this case would secure a patent for the fiber of the *Pinus australis*, and thus, successively, patents might be obtained upon the trees of the forest and the plants of the earth, which of course would be unreasonable and impossible.

The references cited by the examiner show that the fiber of the leaves of the *Pinus sylvestris* has been taken from the leaves by a process very similar to that employed by applicant, although not identical with it. The fiber in all these cases is located within the external sheath or membrane of the leaf or needle, the intermediate space between the sheath and fiber being filled with resinous matter, and the intercellular spaces of the fiber itself being also filled with resinous matter. In order to obtain the fiber it is necessary to disintegrate and remove the material constituting the sheath, and also the resinous matter, and wash it entirely away, leaving the perfect and natural structure of the fiber free. This is accomplished by the process; but the fiber, when it is made free, is in nowise changed or different from its natural construction. There is no chemical combination effected by the treatment which frees it by which the fiber becomes something new or different from the fiber in its natural state. No chemical combination occurs or is alleged to occur by which the fiber is rendered stronger or possesses any new feature or characteristic, so that in selecting and obtaining this fiber from the trees the applicant has done little more than one who gathers the pebbles along the seashore, where the forces of nature have placed them. In the latter case the action of the waves has freed the pebbles from their surroundings or covering as in the former the applicant frees the fiber by his process. The invention resides wholly and exclusively in the process which enables him to procure the fiber in its natural free state. These views, I think, are well established by the decisions cited by the senior officer of the Examiners-in-Chief. In his opinion he says:

If a new article be produced by a new process from a sow's ear or potato-vine presenting a new stock for weaving or knitting into cloths or garments, it is essentially a new "manufacture" within the law.

I refer to this statement because it is a strong one, but, in my judgment, improperly applied to the conditions of this case. Unquestionably if the constituents of the ear or any portion of the stalk were to be treated so as to form a new material—for instance, a mucilaginous substance which could be drawn out into twine, and, by being dried, become a strong flexible twine—such article would be a new and useful product. The reason is that a new form has been produced, made out of the changed material and construction of matter in the flesh, and this new form is useful; but if there were within the ear a bone and the result of the process was to remove that bone in its natural condition, or, if the new process were to remove the bristles growing upon the ear, it is evident that the bone or the bristles, when removed by a new process, would still be the same bone or bristles which had formerly been removed by the knife or by the hand, and while the process itself might be new the product would be old and therefore not patentable. So in the present case the fiber not only is old, as shown by the citations made by the Primary Examiner, but it is a natural product and can no more be the subject of a patent in its natural state when freed from its surroundings than wheat which has been cut by a reaper or by some new method of reaping can be patented as wheat cut by such a process.

I have given this application no little consideration, and have experienced an anxiety, if possible, to secure to the applicant a patent. The alleged invention is unquestionably very valuable, and one, according to the statements presented to me, of immense benefit to the people of the country in which the *Pinus australis* grows. The fiber, it is said, is stronger, more durable, and can be produced at much less expense than jute, and will undoubtedly supersede that article in the

manufacture of many fabrics; but while the production may be thus regarded as a very valuable one, the invention resides, I am compelled to say, exclusively in the process and not at all in the product.

If applicant's process had another final step by which the fiber thus withdrawn or separated from the leaf or needle in its natural state were changed, either by curling it or giving it some new quality or function which it does not possess in its natural condition as fiber, the invention would probably cover a product, because the natural fiber, passing through the exigencies of such a process, would be treated and become something new or different from what it is in its natural state. Natural fibers, hair, and many other substances have been allowed as patentable products which have been changed by some such treatment; but I am not aware of any instance in which it has been held that a natural product is the subject of a patent, although it may have existed from creation without being discovered.

I think the authorities cited by the examiner fully support these propositions, and therefore affirm the decision of the Examiners-in-Chief.

BEARDSLEE *v.* MOESLEIN.

Decided March 16, 1889.

1. A patentee involved in interference who refused to take testimony, relying upon his record dates, and rested his case upon the weakness of his adversary's presentation rather than upon the strength of his own, will not be permitted, after testing the opinion of all the tribunals in the Office and after final decision, to have the case reopened on the ground "that the public interests require an investigation as to prior knowledge or use, and that two patents ought not to issue for the same invention."
2. An interference is declared between an applicant and a patentee for the sole purpose of determining whether a patent shall issue or be refused to the applicant, and when the question is settled the patentee has no further interest or concern in the case.
3. A degree of conclusiveness attaches to a correct decision based upon the record and the evidence which cannot be disturbed by a motion which admits a party's willful and deliberate omission to take evidence and simply asks, after trial, that the very evidence which might have been originally taken may now be introduced. If such a motion could prevail, there would be no end to interference proceedings.

MOTION for rehearing.

HAT SWEAT-BANDS.

Application of William F. Beardslee filed March 12, 1887, No. 230,588. Patent granted Valentine Moeslein December 28, 1886, No. 354,924.

Mr. John R. Bennett for Beardslee.

Mr. T. D. Stetson and *Mr. A. Pollok* for Moeslein.

HALL, *Commissioner:*

Moeslein, the senior party to this interference, is a patentee. Beardslee, the junior party, took his evidence. Moeslein declined to take evidence and submitted the case upon his record. The Examiner of Interferences awarded priority to Beardslee. This decision was reversed by the Examiners-in-Chief, who gave priority to Moeslein, and their decision was reversed by the Assistant Commissioner, by whom priority was awarded to Beardslee. A motion for rehearing was submitted to and denied by the Assistant Commissioner. Moeslein then presented a petition to the Commissioner, requesting that the case be reopened for the purpose of permitting him to take evidence in support of his preliminary statement, which carries his date of invention anterior to his record dates. This petition discloses no other reason for the request than that the petitioner, when he declined to take his evidence originally, did not think it was necessary to do so. He believed Beardslee's evidence insufficient—that is, he rested upon the weakness of his adversary's case rather than upon the strength of his own. He did not pretend that he had found any newly-discovered evidence or that he had been taken by surprise or was in any manner misled. He had simply made an error of judgment as to the force and effect of Beardslee's evidence. This request to have the case reopened was denied. Moeslein now comes and renews this request upon precisely the same grounds, supporting it by the affidavits of himself and several witnesses. His counsel urge that the public interests require an investigation as to prior knowledge or use, and that two patents ought not to issue for the same invention.

It is evident that Moeslein having received his patent is beyond the power or control of the Commissioner. An interference is declared between an applicant and a patentee for the sole purpose of determining whether a patent shall issue or be refused to the applicant, and when the question is determined the patentee has no further interest or concern. In this case the interference procedure was properly instituted and concluded. Having been correctly decided upon the record and the evidence, a degree of conclusiveness attaches to that decision which cannot be disturbed by a motion which admits the party's willful and deliberate omission to take evidence and simply asks to be allowed now, after trial, to take the very evidence which he might originally have taken. If such a motion could prevail, there would be no end to such proceedings and no final determination could be reached.

Moeslein asserts in his petition that he actually made the invention at an earlier date than his record shows, and that the evidence of the witnesses he names will establish the fact; but this is merely a repetition of the assertion he made in his original preliminary statement. He then had the very chance to do what he now proposes to do. He omitted or failed to establish the facts. From his omission there was a strong presumption that he was unable to do so. It is not at all unreasonable to assert that if the opportunity were again given him and his witnesses were subjected to the test of cross-examination he might fail to establish his alleged earlier dates, so that the adjudication in the case is stronger against the allegation of earlier invention than is his present *prima facie* showing, founded on his *ex parte* affidavit in favor of it.

Procedure of all kinds must be governed by rules which are to a greater or less extent general. This is especially true of motions and petitions of this character. It will sometimes occur in a particular instance that such rules operate with some appearance of injustice; but it is better that they be enforced, even in such instances, than to have no rules or than to have all cases special, for under the latter condition much greater injustice will necessarily follow.

In the present case there have been four trials in the Patent Office, which surely ought to be sufficient. The petition now urged ought to have been presented, if at all, long before the case reached the Examiners-in-Chief or the Commissioner. The petitioner, however, saw proper to test the opinion of all the tribunals, and, having been unsuccessful, he now seeks to go back and begin again. While it is true he asserts that a different result will be reached, yet, in view of what has already occurred, that is merely an opinion or belief.

There is no such thing known to the practice in this Office as a prior-knowledge-or-use inquiry, and while it is barely possible that two patents may be issued for the same invention I do not think it is a matter which justifies my interference with the regular and orderly procedure. Moeslein has his patent, and his status in the courts is secure. The Office has determined that Beardslee is now entitled to a patent. Any further controversy will appropriately be disposed of in the courts.

EX PARTE JOHNSTON.

Decided March 20, 1889.

A patentee who shows but does not claim a certain invention which is distinct and separate from that claimed in his prior patent, and which could not have been prosecuted in that application and ought not to have been shown in such patent, does not necessarily dedicate such unclaimed invention to the public.

APPEAL from Examiners-in-Chief.

EYEGLASS-FRAMES.

Application of George Johnston filed March 2, 1887, No. 229,441.

Mr. N. S. Wright and *Mr. E. C. Seward* for the applicant.

HALL, *Commissioner:*

Applicant appeals from the decision of the Examiners-in-Chief affirming the action of the Primary Examiner in rejecting the following claims:

1. The combination, with the glass-frames, of a connecting-spring, nose-guards engaged at the base with said glass-frames, and rigid angular arms offset from the plane of the glass-frames and provided with vertically-extended arms having a slot-and-tongue engagement with the upper extremities of said nose-guards, whereby said guards will be automatically adjustable, substantially as described.
2. The combination, with eyeglass-frames, of a connecting-spring, nose-guards engaged at the base with said frames, and rigid angular arms offset from the plane of the glass-frames having a slot-and-tongue engagement with the upper extremities of said guards, whereby the upper ends of said nose-guards will offset from the plane of the glass-frames and be automatically adjustable upon said frames, substantially as described.
3. The combination, with the eyeglass-frames, of a connecting-spring, nose-guards engaged at the base with lugs on said glass-frames, and angular arms offset from the plane of said glass-frames and engaged therewith by intervening posts *a a'*, said arms and said guards having a slot-and-tongue engagement, said posts flanged at their upper ends to engage the edges of said arms, substantially as and for the purposes described.
4. The combination, with the eyeglass-frames and their connecting-spring, of rigid offset arms and nose-guards engaged at one end upon said frames and at the other end having a self-adjusting engagement with said offset arms, substantially as described.

The rejection is based upon reference to two patents—one to the applicant himself, No. 348,018, patented August 24, 1886, and the other to Wells, No. 343,876, June 15, 1886. Johnston's patent shows the invention, but does not claim it. There are shown in that patent two figures illustrating eyeglass-frames, and originally the applicant presented a claim broad enough to cover both constructions; but upon reference being cited which anticipated the broad claim he eliminated it and presented a specific claim covering Figure 1 alone. The correct practice would then, in my judgment, have required that applicant should eliminate from the drawing Figure 2 and all reference thereto in the specification, for the reason that the two inventions shown by the respective figures, 1 and 2, were distinct and separate, and could not be claimed or prosecuted in the same application. This course was not pursued, however, and undoubtedly the applicant supposed that the claim which was allowed covered both figures of the drawing; but, inasmuch as he voluntarily eliminated the claim which covered one construction, he is now without remedy by reissue.

The rejection, both by the Primary Examiner and by the Examiners-in-Chief, is based entirely upon the doctrine that one who shows but does not claim an invention presented in his application and patent dedicates it to the public.

In *ex parte Roberts*, (C. D. 1887, 61) I had occasion to call attention to the practice in question, and held as follows:

> It is undoubtedly true that when a patent issues for an invention, all of which is shown but only part of which is claimed, there is a dedication to the public of that part which is unclaimed. In such case the law conclusively infers an intention to make the dedication and the inference cannot be overcome by evidence. The applicant, however, always has it in his power in a certain class of cases to prevent this inference from arising if he acts in time. In cases which are divisional—that is, when, as in the present case, the features not claimed in the first application are independent of those claimed—an applicant may expressly assert in his application a reservation of his right to claim them in another or subsequent application, and he should present and prosecute such application without delay. He may also file his second application so as to have it pending concurrently with the first. Such course anticipates and prevents the inference of dedication. This proposition is fully sustained by many authorities. (*The Suffolk Co. v. Hayden*, 6 Wall., 316; *Singer & Clark v. Braunsdorf & Weil*, 7 Blatch., 521; *McMillin et al. v. Rees et al.*, 17 O. G., 1222; *Graham v. McCormick*, 11 Fed. Rep., 859; *Hatch v. Moffit*, 15 Fed. Rep., 252; *ex parte Derby*, 26 O. G., 1309; *ex parte Holt*, C. D. 1884, 43; 29 O. G., 171.) It is to be observed, however, in this connection that the practice of inserting reservation clauses is not intended hereby to be sanctioned or approved. It not only increases the labor of the Office, but endangers the rights of the patentee. Should he be in error as to the fact of divisibility of his invention, not only does he increase the cost and expense of procuring his patents, but his first patent fails to cover the scope of his invention, and the second patent is void. Even though the invention be divisible, slight negligence or delay in filing his second application may be held equivalent to abandonment in the courts and his patent declared void.
>
> But when the invention is not capable of division and a patent issues, a different rule applies. (*Sickels v. The Falls Co.*, 4 Blatch., 508; *O'Reilly v. Morse*, 15 How., 62; *Odiorne v. The Amesbury Nail Factory*, 1 Robb, 300; *Smith v. Ely*, 5 McLean, 76; *Jones v. Sewall*, 3 Cliff., 575; *James v. Campbell*, 104 U. S., 356; *ex parte Ransom*, 39 O. G., 119 *ante* 22.)

I have neither the time nor the disposition to examine at length the decisions above cited to show that they relate to an invention in its entirety, where either features or elements thereof were omitted to be claimed in the original application. It results from the necessary conditions under which the patent issues that when an applicant fails to claim an element, part, or feature of his invention, which he might have claimed, he dedicates such unclaimed element to the public. The omitted thing is a part of the original invention, necessary to its operation and use; but in all these cases there was no proposition like the one now before me—viz., where an absolutely independent invention is shown, which had no connection by way of arrangement or combination with the other distinct and separate invention shown and claimed, would be dedicated to the public.

I think it must be apparent that there is a dividing line somewhere between inventions which are shown

and those which are claimed when the former are not dedicated to the public. For instance, if there be shown two such separate and distinct inventions, as an improvement upon a locomotive and an improvement upon a chair to be used in a sleeping-car, and the Office should fail to require division, or the elimination of the description of the chair for the sleeping-car, and the improvement upon the locomotive alone should be claimed in the patent, it seems to me absurd that the invention relating to the chair for the sleeping-car has been abandoned or dedicated. To explain somewhat more fully, take for illustration a patent containing a claim for a combination of three elements, A, B, and C. The element C is entirely new, and a claim for it could properly have been presented and prosecuted, but the applicant failed to do this. It is evident that no one can derive any benefit from the invention shown in the combination except when allowed to use the unclaimed element C. The dedication to the public is an inevitable necessity. So, too, it may be said, when the two inventions are so related to each other that one cannot be used without the employment of the other, the unclaimed one may be dedicated to the public, as in the case of process and apparatus. Yet in the *Eastern Paper Bag Co.* v. *Standard Paper Bag Co.* (30 Fed. Rep., 63) Judge Colt held, with reference to such a case, as follows:

> But it is said that the description of this process found in the Appel machine patent of August 31, 1880, operates as an abandonment of any claim Appel might have had for a process patent. The patent in suit was applied for September 29, 1881. The process forming its subject-matter was described, but not claimed, in the machine patent by the same inventor, dated August 31, 1880. A little more than a year elapsed between the date of the prior description and the date of the application for the patent in suit. Under these circumstances has the invention been abandoned to the public? The language of the Supreme Court in *Miller* v. *Brass Co.*, (104 U. S., 350;) *James* v. *Campbell*, (Id., 356,) and *Mahn* v. *Harwood*, (112 U. S., 354; 5 Sup. Ct. Rep., 174) is cited as sustaining the proposition that the omission of Appel to claim his process invention in the machine patent was in law a dedication of that invention to the public. The Supreme Court in these cases was dealing with the subject of reissues under the statute. In this case we are not dealing with the law of reissues. Appel could not have secured his claim to a process by reissuing his machine patent, because it is not for the same invention. (*Powder Co.* v. *Powder Works*, 98 U. S., 126; *Eachus* v. *Broomall*, 115 U. S., 429; 6 Sup. Ct. Rep., 229.) The question we have to decide is whether the description of another invention in a prior patent by the same inventor forfeits his right to take out a subsequent patent for such invention. I do not understand that the Supreme Court have held that such prior description is a dedication to the public of the second invention. The invention of a machine and a process employed in the use of the machine being different things, it is difficult to see how the application for a patent on one should operate as an abandonment of any claim to a patent on the other, provided, of course, the application for the second patent is made before the statutory forfeiture of two years' prior use has run. This view is in harmony with the decisions of the circuit court where the question has arisen. (*Vermont Farm-Machine Co.* v. *Marble*, 19 Fed. Rep., 307; 20 Fed. Rep., 117; *Graham* v. *McCormick*, 11 Fed. Rep., 850; *Graham* v. *Geneva Lake C. Manuf'g Co.*, Id., 138; *McMillin* v. *Rees*, 1 Fed. Rep., 722; *Hatch* v. *Moffitt*, 15 Fed. Rep., 252; *Cahn* v. *Wong Town On*, 19 Fed. Rep., 494; *Collender* v. *Griffith*, 18 Blatchf., 110, 2 Fed. Rep., 206.) The patent in suit having been applied for within two years from the date of the machine patent, there was no abandonment of the second invention, though a description of such invention was found in the prior patent.

The case before me is a much stronger one than this. The inventions are wholly separate and distinct, and neither is at all necessary for the employment, use, or enjoyment of the other. They are as separate and distinct (although closely allied to each other by reason of the narrowness of invention in view of the state of the art) as if one were for a hoisting-machine and the other for a steam-boiler. In such a case, in my judgment, there is no abandonment or dedication as matter of law.

It is proper to say in this connection that the patent to Wells, issued June 15, 1886, was not cited as a reference to Johnston's earlier application, nor was an interference declared, and the fact that the Wells patent issued is a distinct declaration by the Office as to the statement made by me that the invention as shown in the present application and in Fig. 2 of the original patent is a different invention from that claimed in the latter.

I therefore reverse the decision of the Examiners-in-Chief, and remand the application to the Primary Examiner.

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DIGEST OF DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS

IN THE MATTER OF

PATENTS, TRADE-MARKS, &c.

OFFICIAL GAZETTE—January–March, 1889.

DIGEST OF DECISIONS.

[Decisions of United States courts designated by an asterisk (*), and of State courts by a double dagger (‡).]

ABANDONMENT.

INVENTION SHOWN BUT NOT CLAIMED.

A patentee who shows but does not claim a certain invention which is distinct and separate from that claimed in his prior patent, and which could not have been prosecuted in that application and ought not to have been shown in such patent, does not necessarily dedicate such unclaimed invention to the public. [*Ex parte* Johnston, 1641.

AGENTS.

(See Service of Process.)

AGGREGATION.

(See Combinations.)

1. COMBINATION—COACTION.

A claim consisting of a number of elements which do not coact to produce a new and useful result is a mere aggregation and not a patentable combination.

[*Brinkerhoff *v.* Aloe, 338.

2. SAME—BETTER RESULTS NOT PROOF OF INVENTION.

Where several old elements are so combined as to produce a better instrument than was formerly in use, but each of the old elements does only what it formerly did in the instrument from which it was borrowed and in the old way, *Held* that the combination is not a patentable one. [*Id.

AMENDMENTS.

(See Interference, 3.)

1. AMENDMENT REFUSED.

Applicant proposes to amend his claim so as to limit his invention to a metallic diaphragm, and such amendment has been refused admission. [*Ex parte* Gray, 1277.

2. RIGHT TO AMEND LOST.

When the Office has called the attention of an applicant to his right to cover in his claim certain specific matter and advised him to amend accordingly, and the applicant, declining to do so, enters into an interference contest upon the broad issue, in which he is finally defeated, he cannot, after acquiescing for a long period in such award of priority and waiting nearly ten years after filing his application, return to the Office for the purpose of proposing the amendment suggested by the Office and declined by him, and which, if admitted, would result in a new interference. [Id.

3. DECISIONS ON ISSUE IN INTERFERENCE CONCLUSIVE.

The tribunals adjudicating the interference discussed and considered the specific invention and intimated that a motion to dissolve and re-form the issue would be entertained; but applicant declined to avail himself of the suggested remedy. *Held* that the decisions, involving the very question presented in the amendment now insisted upon, are final and conclusive upon Gray's right to claim the subject-matter presented in the proposed amendment. [Id.

ANALOGOUS DEVICES.

(See Particular Patents, 5, 9, 10, 16.)

ANTICIPATION.

(See Construction of Specifications and Patents.)

MATERIAL NOT ESSENTIAL.

Where an element of a claim does not depend for its novelty in the material of which it is made it will be anticipated by a like element in a like instrument of different material.

[*Brinkerhoff *v.* Aloe, 338.

APPEALS.

(See Division of Application, 1.)

APPEALS TO COMMISSIONER AND EXAMINERS-IN-CHIEF, RESPECTIVELY.

There is no rule or requirement that an appeal which, though made because relating to form, involves the absolute merits of a claim shall be taken to the Commissioner merely to save applicant the appeal fee. If applicant be put to the trouble and expense of a second appeal after the requirement of division has been complied with and the application has reached the stage for full consideration upon its entire merits, the fault is with applicant who has presented his application under such conditions rather than due to the Office or its practice.

[*Ex parte* Carter, 1391.

APPLICATIONS.

(See Continuous Application; Priority of Invention, 2.)

ASSIGNMENT OF VOID PATENTS.

VOID PATENT NOT ASSIGNABLE.

As a patent thus obtained confers no title or right upon the patentee, a court of equity will not order him to assign it.

[*Kennedy *v.* Hazelton, 973.

ASSIGNMENTS.

(See Rehearing, 5.)

1. ENFORCEMENT OF CONTRACT UNDER VOID PATENT.

A court of chancery cannot decree specific performance of an agreement to convey property which has no existence, or to which defendant has no title.

[*Kennedy *v.* Hazelton, 973.

2. SAME.

A bill by vendee against vender for specific performance, which does not show any title in defendant, is bad on demurrer.

[*Id.

3. ASSIGNMENT OF A PATENT DOES NOT CARRY CLAIMS FOR PAST INFRINGEMENTS UNLESS SPECIFICALLY STATED THEREIN.

Mere intention, not signified in an assignment of Letters Patent, to include therein claims for infringements previously committed, will not suffice to invest the assignee with any equitable title to those claims, and such assignee, after bill filed, in a suit for infringement brought by him, having procured an assignment of said claims, will not be permitted in that suit to set up by a supplemental bill this post assignment.

[*Emerson, Smith & Co., (Limited,) *v.* Hubbard *et al.*, 976.

CAVEATS.

1. Practice of Withholding Notice to Caveators until Question of Patentability is Settled.
Decision in *ex parte Kenney* (C. D., 1869, 97) considered and modified and the following practice directed: Whenever an application is filed showing subject-matter interfering with any pending caveat, the notice which the statute provides shall be sent to the caveator should be sent at once and not delayed until the invention shall have been favorably passed upon and the application found to be ready for allowance.
[*Ex parte* Ward, 1513.

2. Rights of Caveator.
The statute confers no rights upon the caveator, nor does it give him any status in the Office as an applicant. It extends, as matter of grace, to him the right to be notified of the pendency of an application relating to the subject-matter of his caveat. It is not intended that he shall have the benefit of an examination of his caveat before he has filed an application, which substantially results when the notice is withheld until the patentability of the invention of another applicant is determined.
[Id.

3. Rights of Applicant.
An applicant who has completed his invention and diligently and successfully prosecuted his application for patent ought not to be delayed in the issuance of his patent by a caveator who is under no obligation to be diligent or to file his application for patent.
[Id.

4. How far a Caveat may be used as Evidence of Invention in an Interference Proceeding.
The statute authorizing the filing of a caveat does not intend to confer upon the caveator any right as an inventor, nor to save him from the effect of negligence or give him any advantage over any other inventor who has conceived the invention and prosecuted his application with diligence. The statute authorizing a caveat does not compel a caveator to file any application. It is not intended as a stimulus to prod and drive him to perfect his invention, nor is it intended to extend the time in any manner within which he may complete the invention; but it simply provides, as matter of grace, that the caveator shall be notified of the filing of any application which comes into the Office within a year, covering the subject-matter of his caveat.
[Elges *v.* Miller, 1514.

5. Same.
The filing of a caveat does not give to the caveator the standing of an applicant with respect to what is called "Constructive Reduction to Practice." The caveat is a procedure kept in the secret archives of the Office and in itself contains no declaration or purpose on the part of the caveator that he will ever complete or finish his invention or give it to the world. The statute does not contemplate that a caveator shall stand as an obstruction to the diligent efforts of other inventors in the same field of art.
[Id.

CHANGE OF MATERIAL.

(See Anticipation; Construction of Specifications and Patents.)

CHANGE OF STRUCTURE.

Infringement—Change of Location of Parts.
A change in the position of a part of a machine will not avoid infringement where the part transposed continues to perform the same function as before. (Citing *Adams* v. *Manufacturing Company*, 3 Banning & A., 1.)
[*Schlicht & Field Company *v.* Chicago Sewing Machine Company *et al.*, 1394.

CITIZENSHIP.

Validity of Patent—Oath as to Citizenship.
It is not a valid defense to a suit for the infringement of Letters Patent granted under the Revised Statutes that the patentee in his application therefor made oath that he was a citizen of the United States when he was not, such misstatement as to his citizenship having been made innocently through mistake, without any improper design whatever.
[*Tondeur *v.* Chambers, 1110.

CLAIMS.

(See Division of Application.)

COMBINATIONS.

(See Division of Application.)

Second Claim is an Aggregation and Void.
The second claim of the Brinkerhoff patent covers a slotted tube having an incline and a slide. *Held* that the incline acted precisely as it did when placed in the forward end of a slotted tube not provided with a slide, and that therefore the claim covered an aggregation only and was void.
[*Brinkerhoff *v.* Aloe, 338.

CONSTRUCTION OF CLAIMS.

(See Anticipation.)

CONSTRUCTION OF RULES.

(See Particular Patents, 6, 7.)

CONSTRUCTION OF SPECIFICATIONS AND PATENTS.

(See Aggregation; Assignment of Void Patents; Change of Structure; Citizenship; Combinations; Invention, 1, 2; Joint Invention; Limitation of United States Patents by Foreign Patents Previously Granted; Particular Patents; Patents; Public Use.)

Material not Essential.
The slide employed in the Brinkerhoff instrument and covered, broadly, by the first claim of the patent is made of metal. The patent makes no mention of any novelty existing in the material of which the slide is composed. *Held* that the claim is anticipated by a glass slide in a similar instrument.
[*Brinkerhoff *v.* Aloe, 338.

CONSTRUCTION OF STATUTES.

(See Limitation of United States Patents by Foreign Patents Previously Granted; Oath of Applicant, 1; Patents, 2.)

CONTINUOUS APPLICATION.

Continuing Applications.
A second application cannot legally be considered a continuation of a first or earlier application by the same inventor unless it contains *the same invention*.
[Green *v.* Hall *et al.*, 1515.

CONTRACTS.

(See Assignments, 1; Rehearing, 5.)

COPYRIGHTS.

1. Copyright.
Although there can be no copyright in the opinions of judges, or in the work done by them in their official capacity as judges, yet there is no ground of public policy on which a reporter who prepares a volume of law reports, of the character of those in this case, can, in the absence of a prohibitory statute, be debarred from obtaining a copyright for the volume, which will cover the matter which is the result of his intellectual labor.
[*Callaghan *et al. v.* Myers, 585.

2. Same—Rights of Reporter of Decisions Thereto.
Even though a reporter may be a sworn public officer, appointed by the authority of the government which creates the court of which he is made the reporter, and even though he may be paid a fixed salary for his labors, yet, in the absence of any inhibition forbidding him to take a copyright for that which is the lawful subject of copyright in him, or reserving a copyright to the government as the assignee of his work, he is not deprived of the privilege of taking out a copyright, which would otherwise exist.
[*Id.

CORPORATIONS.

(See Service of Process.)

CORRECTION OF DEFECTIVE PATENT.

(See Defective Patents, 3, 4, 5.)

COURT OF CHANCERY.

(See Assignments, 1.)

DAMAGES AND PROFITS.

(See Suits for Infringement.)

What Profits to be Accounted for.
In this instance there can be no accounting for profits earned subsequently to the suit, which was not tenable at the date of its commencement.
[*Marsh *et al. v.* Nichols, Shepherd & Company, 239.

DATE OF DEFECTIVE PATENT.

(See Defective Patents, 4, 5.)

DEDICATION TO THE PUBLIC.

(See Abandonment.)

DEFECTIVE PATENTS.

(See Damages and Profits; Patents, 3.)

1. Statement—Patent Defective by Reason of the Omission of the Signature of the Secretary of the Interior—Proceedings Against.
The patent had not at the date of the suit been signed by the Acting Secretary of the Interior, but was subsequently signed by him. The circuit court dismissed the bill. Complainant took an appeal in 1885 to this Court. In 1887 Congress passed an act for relief of patentees, making the patent legal, valid, complete, and operative from its original date, December 28, 1880. *Held*, while a patent of the United States can be attacked for defects upon its face only by regular proceedings instituted for that purpose, and is not open to collateral attack, except where specially provided by statute, this rule applies only to such patents as have been in fact executed under proper authority, and does not apply to any others.
[*Marsh *et al. v.* Nichols, Shepherd & Company, 239.

2. Same—Certain Defects Specified.
Thus it may be shown that the patent was never executed by the person whose name appears on it, or that it was wrongly dated, or was never signed by the person who appeared to have signed it, or was signed after the official was out of office.
[*Id.

3. Defective Grant may be Corrected by Existing Officers of the Department.
Such grants, if defective from insufficient execution, may be corrected subsequently, upon application to the proper Department; but the correction must be made by the existing officers of the Department.
[*Id.

4. Same—But Date of Correction becomes the True Date of Patent.
The correction by the same Acting Secretary of the Interior is sufficient, the Commissioner of Patents remaining the same at the date of the correction, which is the true date of the patent.
[*Id.

5. Date of Correction may be Established by Proof.
In this instance the actual date of correction, being more than six months after the date written in the patent, may be shown by proof.
[*Id.

DEFECTS.

(See Interference, 1, 2.)

DEFENSE.

(See Citizenship; Joint Invention, 1.)

DELAY.

(See Amendments, 2, 3; Priority of Invention, 2; Rehearing, 1, 8, 10, 11.)

DELAY IN BRINGING SUIT.

Infringement—Delay in Bringing Suit.
While there was such delay in bringing suit as to preclude recovery of damages for prior infringement, there was neither conduct nor negligence which could be held to destroy the right to prevention of further injury.
[*Menendez *et al. v.* Holt *et al.*, 971.

DEMURRER.

(See Assignments, 2.)

DESIGNS.

(See Trade-Marks, 3.)

DIVISION OF APPLICATION.

(See Appeals; Process.)

1. Jurisdiction of Examiners-in-Chief in Cases Involving Merits.
One of the claims in an application has been rejected because it covered an illegitimate combination or an aggregation of elements. Applicant appealed from such rejection to the Examiners-in-Chief. The Board refused to take jurisdiction of the appeal and remanded the case to the Primary Examiner for reconsideration and such action as would dispose of the merits of all the claims. The examiner referred the case to the Commissioner for instructions. Whenever a claim for an illegitimate combination is presented in an application which also contains claims for different elements constituting distinct and separate inventions which ought not to be claimed in the same application, a vital objection as to form is presented, and the claim may be rejected for the purpose of enabling the Office to require division. Such a rejection, though relating to form, involves merits, and an appeal therefrom should lie to the Examiners-in-Chief.
[*Ex parte* Carter, 1391.

2. Reasons for Requiring Division.
Division must be required for two reasons: *first*, because the distinct subjects of invention ought not to be embraced in one application; *second*, because the applicant has not the right by aggregating claims to any number of distinct inventions under a false claim to a combination to force the Office to examine and act upon his several inventions.
[Id.

ENLARGEMENT OF CLAIMS.

(See Particular Patents, 12; Reissues.)

EQUITABLE RIGHTS.

(See Rehearing, 5.)

EVIDENCE.

Evidence—Tests.
An *ex parte* test made by the defendant and a defective test made by the complainant *Held* to be entitled to no weight in evidence.
[*Fernoline Chemical Company *v.* Carolina Oil and Creosote Company, 974.

EVIDENCE OF INVENTION ABROAD.

Evidence of Invention in Foreign Country.
Evidence of invention in a foreign country cannot be received in an interference proceeding unless such evidence is in the form of a publication or patent, or is for the purpose of showing that some one of the contestants is not an original inventor.
[Green *v.* Hall *et al.*, 1515.

EXAMINATION OF APPLICATIONS.

(See Amendments; Appeals; Caveats; Division of Application.)

EX PARTE TESTS.

(See Evidence.)

EXPIRATION OF PATENTS.

(See Suits for Infringement.)

FOREIGN INVENTION.

(See Evidence of Invention Abroad.)

FOREIGN PATENT.

(See Evidence of Invention Abroad; Limitation of United States Patents by Foreign Patents Previously Granted; Particular Patents, 2.)

FOREIGN PUBLICATION.

(See Evidence of Invention Abroad.)

FORMER DECISIONS AFFIRMED.

(See Rehearing, 3, 4, 5, 6.)

FORMER DECISIONS CONSTRUED.

FORMER DECISIONS CONSTRUED.
Smith & Griggs Manufacturing Co. v. *Sprague* and *City of Elizabeth* v. *Pavement Co.* applied and explained.
[*Root v. Third Avenue Railroad Company, 1393.

FRAUD.

(See Rehearing, 2.)

FUNCTION.

(See Change of Structure; Process, 1.)

GRANT OF PATENT.

(See Defective Patents; Patents.)

INFRINGEMENT.

(See Assignments, 3; Change of Structure; Particular Patents, 1, 4, 5, 6, 7, 9, 10, 12, 16, 19; Suits for Infringement.)

SHOREY—MACHINE FOR FORMING STAPLE-SEAMS IN LEATHER—INFRINGEMENT.
The infringement of the third claim of Letters Patent No. 136,340, granted February 23, 1873, to Samuel W. Shorey, for an improvement in machines for forming staple-seams in leather by the use of defendant's rest or supporter, which has no incline or bevel, doubtful. Motion for injunction denied.
[*Thompson *et al.* v. Rand-Avery Supply Company, 1112.

INJUNCTION.

(See Suits for Infringement.)

INTERFERENCE.

(See Amendments, 2, 3; Caveats; Evidence of Invention Abroad, 1; Rehearing.)

1. DEFECTS CURED BY VERDICT.
It is a fundamental principle in the common law of pleading that when there is any defect, imperfection, or omission, whether in substance or form, which would have been a fatal objection upon demurrer, (motion to dissolve or re-form,) if the issue joined be such as necessarily required on the trial proof of the facts so defectively or imperfectly stated or omitted, or without which it is not to be presumed either that the judge would have directed the jury to give or the jury would have given the verdict, such defect, imperfection, or omission is cured by the verdict.
[*Ex parte* Gray, 1277.

2. SAME.
In the matter of issues in interferences there is no rule applicable except that which provides the motion to dissolve. Clearly, however, when an issue has received a construction as to its meaning by the court and has been tried under that construction and the parties have acquiesced in it the case becomes one in which the issue must be held to be complete and to read according to the construction thus given it.
[Id.

3. ADJUDICATION OF PETITIONS TO REOPEN CONCLUSIVE AS TO PROPOSED AMENDMENT.
The adjudication of the petitions to reopen the interference is conclusive as to the subject-matter of the proposed amendment.
[Id.

4. PURPOSE OF INTERFERENCE.
An interference is declared between an applicant and a patentee for the sole purpose of determining whether a patent shall issue or be refused to the applicant, and when the question is settled the patentee has no further interest or concern in the case.
[*Beardslee v. Moeslein, 1640.

INVENTION.

(See Aggregation; Process, 1, 2, 3.)

1. PATENTABILITY—WHAT DOES NOT AMOUNT TO INVENTION.
A speculum consisting of a tube with a slide and a closed end was old. *Held* that adding an incline to the closed end to prevent the impaction of pile-tumors did not involve invention.
[*Brinkerhoff v. Aloe, 338.

2. SAME—THIRD CLAIM VOID FOR WANT OF INVENTION.
The third claim of the Brinkerhoff patent covers a speculum composed of a tube with a closed end and a slide and having an incline at the closed end. *Held* void for want of invention.
[*Id.

3. NATURAL PRODUCT OF NATURE NOT PATENTABLE.
A product of nature, although conceded to be valuable and useful, such as fiber which is procured, derived, or freed from a certain species of pine, by means of a new and novel process for which patent has been granted to applicant, *Held* to be not such a patentable invention as is required by the statute.
[*Ex parte* Latimer, 1638.

4. SAME.
The product has not been affected, changed, or altered by the process, and whatever there is of invention resides in or consists of the process itself, by which the fiber can be taken from the natural sheath or membrane of the leaf or pine-needle in which it has been developed or produced by the processes of nature.
[Id.

5. SAME.
A contrary ruling would result in granting to one inventor the exclusive use of one species of fiber, and so on, successively, patents might be obtained upon the fibers of the various trees of the forest and the plants of the earth, which, because being natural products, are no more the subjects of patents when eliminated from their surroundings than wheat which has been cut by some new method of reaping can be patented *as wheat* cut by such a process.
[Id.

INVENTION SHOWN BUT NOT CLAIMED.

(See Abandonment.)

JOINT INVENTION.

1. JOINT INVENTOR CANNOT IMPEACH HIS OATH TO DESTROY ANOTHER'S INTEREST IN THE PATENT.
A party applying for a patent as a joint invention of himself and another should be estopped as against a *bona fide* owner of the patent from defeating it by proof tending to show that he took a false oath or otherwise imposed upon the Patent Office. Having given life to the patent by one oath, he cannot be heard to destroy it by another.
[*Schlicht & Field Company v. Chicago Sewing Machine Company *et al.*, 1394.

2. JOINT INVENTORS.
Where two parties work together in the making of an invention, each making suggestions to the other, the invention covered by a joint patent will generally be considered as the result of their joint efforts or contributions.
[*Id.

JURISDICTION:

(See Rehearing, 5; Service of Process.)

LIMITATION OF UNITED STATES PATENTS BY FOREIGN PATENTS PREVIOUSLY GRANTED.

1. TERM OF PATENT AS AFFECTED BY THE TERM OF A CANADIAN PATENT.
Where the Canadian statute under which the extensions of the Canadian patent were granted was in force when the United States patent was issued, and also when that patent was applied for, and where, by the Canadian statute, the extension of the patent for Canada was a matter entirely of right, at the option of the patentee, on his payment of a required fee, and where the 15 years' term of the Canadian patent has been continuous and without interruption, the United States patent does not expire before the end of the 15 years' duration of the Canadian patent.
[*Bate Refrigerating Company v. Hammond *et al.*, 689.

2. TERM OF PATENT AS LIMITED BY THE UNITED STATES STATUTES BY REASON OF FOREIGN PATENT PREVIOUSLY OBTAINED.
The provisions of the act of 1870 and of the Revised Statutes mean that the United States patent shall not expire so long as the foreign patent continues to exist, not extending beyond 17 years from the date of the United States patent, but shall continue in force, though not longer than 17 years from its date, so long as the foreign patent continues to exist. Under section 4887, although the United States patent may on its face run for 17 years from its date, it is to be so limited by the courts, as a matter to be adjudicated on evidence *in pais*, as to expire at the same time with the foreign patent, not running in any case more than 17 years; but, subject to the latter limitation, it is to be in force as long as the foreign patent is in force.
[*Id.

3. NOT NECESSARY THAT THE UNITED STATES PATENT SHOULD ON ITS FACE BE LIMITED IN DURATION TO THE DURATION OF THE FOREIGN PATENT.
While it may be proper in a case where the date of a foreign patent issued prior to the granting of a United States patent to the same patentee for the same invention is made known to the Patent Office prior to the granting of the United States patent, to insert in that patent a statement of the limitation of its duration, in accordance with the duration of the foreign patent, it does not affect the validity of the United States patent if such limitation is not contained on its face.
[*Id.

MACHINES AND PROCESS.

(See Process, 1, 2, 3.)

MECHANICAL SKILL.

(See Aggregation, 2; Invention, 1.)

MODEL.

(See Priority of Invention, 2.)

OATH OF APPLICANT.

(See Assignment of Void Patents; Citizenship; Trade-Marks, 4.)

1. VALIDITY OF PATENT—APPLICATION—OATH.
The patent law makes it essential to the validity of a patent that it shall be granted on the application, supported by the oath of the original and first inventor.
[*Kennedy v. Hazelton, 973.

2. SAME—SAME—WHEN VOID.
A patent which is not supported by the oath of the inventor, but applied for by one who is not the inventor, is unauthorised by law, and void.
[*Id.

OLD ELEMENTS.

(See Aggregation, 2; Combinations.)

PARTICULAR PATENTS.

(See Infringement.)

1. ANDERSON—DRAWERS.
Letters Patent No. 265,783, granted October 10, 1882, to Robert H. Anderson, for an improvement in drawers, not infringed by an article manufactured by the appellees for more than two years prior to the appellant's application for a patent.
[*Anderson v. Miller *et al.*, 448.

2. BATE—PRESERVING MEATS DURING TRANSPORTATION AND STORAGE.
Letters Patent No. 197,314, granted to John J. Bate November 20, 1877, for the term of 17 years, did not expire with the term of the first Canadian patent obtained for 5 years, but continued in force till the end of the extended term of 15 years—to wit, January 9, 1892—said Canadian patent having never ceased to exist, but having been in force continuously from January 9, 1877.
[*Bate Refrigerating Company v. Hammond *et al.*, 689.

3. BRINKERHOFF—RECTAL SPECULUMS.
The first claim of Letters Patent No. 224,991, granted to A. W. Brinkerhoff March 2, 1880, for an improvement in rectal speculums, is for a slide extending the entire length of the tube. *Held* anticipated by the older art.
[*Brinkerhoff v. Aloe, 338.

4. GORHAM—WASH-BOARD FRAMES.
Letters Patent No. 223,338, granted January 8, 1880, to John M. Gorham, for an improvement in wash-board frames, construed and *Held* not to cover a protector which does not have the yielding, elastic, or resilient function described in claim 3, and is not accompanied by a spring or constructed substantially as described in the specification.
[*Sargent *et al.* v. Burgess, 693.

5. SAME—INFRINGEMENT.
Said patent is not infringed by a protector constructed in accordance with the description contained in Letters Patent No. 255,555, granted to Charles H. Williams March 28, 1882, having no spring and no elastic or resilient quality, and which does not yield to pressure, and has no capacity of returning automatically to its normal position.
[*Id.

6. GRAHAM—HARVESTERS.
Letters Patent No. 74,342, granted to Alvaro B. Graham February 11, 1868, for an improvement in harvesters, construed, and claims 1 and 2 *Held*, in view of the state of the art and of the special limitations put upon them on the requirement of the Patent Office, to be limited to the special construction and arrangement set forth in the claims.
[*McCormick *et al.* v. Whitmer, 443.

7. SAME—SAME—INFRINGEMENT.
Under this construction of claims 1 and 2 of the plaintiff's patent the defendants have not infringed.
[*Id.

8. HANSEN AND SMITH—APPARATUS FOR DISTILLING WOOD.
Letters Patent No. 333,750, granted to Hansen and Smith January 5, 1886, for improvement in apparatus for distilling wood, compared with the Stanley reissue Patent No. 10,689, granted February 6, 1883, for an apparatus for distilling turpentine, and *Held* to cover substantial improvements.
[*Fernoline Chemical Company v. The Carolina Oil and Creosote Company, 974.

9. KENDALL—CULTIVATORS.
The essential characteristics of Letters Patent No. 174,664, granted March 14, 1876, to Thomas W. Kendall, for an improvement in cultivators, are the rigidity of the runners and the resulting automatic action, and are not infringed by the appellee's machine, which does not contain runners constructed as the Kendall runners are, in the rigid form, and operated by the draft of the team to keep them off, or by the weight of the plows to keep them on, the ground, and so lacks the distinctive features of the Kendall patent, and which is not automatic, but requires manipulation every time the use is changed.
[*Pattee Plow Company v. Kingman & Company *et al.*, 1107.

10. LEARY—SHADE OR GLOBE HOLDERS FOR CANDLES.
Letters Patent No. 257,027, granted April 25, 1882, to David Leary, for an improvement in shade or globe holders for candles, *Held* valid, and infringed by the defendant's device, which is a copy of the plaintiffs', which latter, while not made according to the specific device described in the patent, is equivalent thereto and accomplishes the same result in the same manner
[*Leary *et al.* v. Hohenstein, 1518.

11. PATTEE—CULTIVATORS—No. 187,899.
Letters Patent No. 187,899, granted February 27, 1877, to Henry H. Pattee, for an improvement in cultivators covering the use of parallel bars and the attachment of the bars to the end plates, embraces nothing that is not old and really nothing that is patentable—that is, which involves invention rather than mechanical skill.
[*Pattee Plow Company v. Kingman & Company *et al.*, 1107.

12. PATTEE—CULTIVATORS—REISSUE No. 6,080.
Reissue Letters Patent No. 6,080, granted to James H. Pattee October 6, 1874, for an improvement in cultivators, *Held* to have been illegally expanded. Even if valid, when limited to what alone could be claimed as new, is not infringed by the appellee.
[*Id.

13. ROOT—CABLE RAILWAYS.
Letters Patent No. 262,162, granted August 1, 1882, to Henry Root, for an improvement in the construction of cable railways, declared invalid by reason of public use more than two years prior to application.
[*Root v. Third Avenue Railroad Company, 1393.

14. SHANNON—TEMPORARY BINDERS.
The first claim of Letters Patent No. 217,907, granted July 29, 1879, to James S. Shannon, for improvements in temporary binders, as modified by a disclaimer limiting the combination by the addition of the words, "when the fixed and vibrating wires are used in pairs, whether operating simultaneously or each separately," *Held* void, in view of the prior state of the art, as a mere duplication.
[*The Schlicht & Field Company v. The Sherwood Letter File Company, 242.

15. SHANNON—PAPER-FILE.
The first claim of Letters Patent No. 254,847, granted March 14, 1882, to James S. Shannon, for an improvement in paper-files, *Held* void as covering only an aggregation of parts, and not a patentable combination.
[*The Schlicht & Field Company v. The Sherwood Letter File Company, 243.

16. SMITH AND SHANNON—PAPER-HOLDERS.
The first, second, third, fourth, fifth, and seventh claims of Patent No. 217,909, granted July 29, 1879, to Frederick W. Smith and James S. Shannon, for an improvement in paper-holders, sustained, (citing *Shannon* v. *Printing Company*, 9 Fed. Rep., 205,) and *Held* to be infringed by a letter-file having its receiving-wires arranged to rock forward instead of backward out of contact with its arched wires.
[*Schlicht & Field Company v. Chicago Sewing Machine Company *et al.*, 1394.

17. STANLEY—APPARATUS FOR DISTILLING TURPENTINE, &c.
Reissued Letters Patent No. 10,689, granted to James D. Stanley February 16, 1886, for an apparatus for distilling turpentine and for the purification of the crude products of the distillation thereof, *Held* to rest for its validity upon a very narrow margin of invention.
[*Fernoline Chemical Company v. Carolina Oil and Creosote Company, 974.

18. STUART—COMPOSITE PAVEMENTS.
Letters Patent No. 269,490, granted December 19, 1882, to Peter Stuart, for an improvement in composite pavements, again sustained and *Held* not anticipated by Patent No. 90,825, June 1, 1869, to Dotch and Duempelman.
[*Stuart v. Thorman *et al.*, 342.

19. TONDEUR—GLASS-ANNEALING FURNACES.
Letters Patent No. 258,156, dated May 16, 1882, granted to Cleon Tondeur, for improvements in glass-annealing furnaces, sustained, and the defendants adjudged to infringe the same. (Following *Tondeur* v. *Stewart*, 28 Fed. Rep., 561.)
[*Tondeur v. Chambers, 1110.

PARTIES IN INTEREST.

(See Interference, 4.)

PATENTABILITY.

(See Aggregation; Invention; Process, 1, 2, 3.)

PATENTS.

(See Assignment of Void Patents; Damages and Profits; Defective Patents; Joint Inventors, 2; Oath of Applicant, 1.)

1. PATENTS DEFINED—WHAT IS SECURED BY THE GRANT.
A patent for an invention conveys nothing which the Government owns or its predecessor ever owned, is the evidence of the inventor's exclusive right, and creates for him a property interest, which Government secures to him by a grant.
[*Marsh *et al. v.* Nichols, Shepherd & Company, 239.

2. WHAT IS REQUIRED TO SECURE THE GRANT.
This grant, however, is regulated by statute, and requires the signatures of all the officials required by statute. [*Id.

3. PATENT PRIMA FACIE EVIDENCE OF VALIDITY.
A patent issued to an applicant is only *prima facie* evidence that he is the inventor.
[*Kennedy *v.* Hazelton, 973.

PETITION TO REOPEN.

(See Rehearing, 1.)

PRACTICE IN THE COURTS.

(See Appeals; Defective Patents, 1, 2; Delay in Bringing Suit; Evidence.)

PRACTICE IN THE PATENT OFFICE.

(See Abandonment; Amendments, 2; Caveats; Continuous Application; Division of Application; Evidence of Invention Abroad; Interference; Priority of Invention; Process, 1, 2, 3; Rehearing, 1, 3, 5, 7, 10, 11.)

PRIMA FACIE EVIDENCE.

(See Patents, 3.)

PRIORITY OF INVENTION.

(See Evidence of Invention Abroad; Rehearing, 10.)

1. PRIORITY WITH INVENTOR WHO REDUCES TO PRACTICE.
The purpose of the law is to benefit the public as well as to protect the inventor, and the inventor who reduces his invention to practice in such a complete way that he at once perfects it as an invention, and at the same time practically demonstrates its utility, is clearly to be preferred to one who merely made hints and suggestions to others and failed himself to act upon them. [Green *v.* Hall *et al.*, 1515.

2. MODELS NOT EVIDENCE OF REDUCTION TO PRACTICE.
It is well-settled law that a working model, designed and intended as such, is not a reduction to practice. Mere working models, allowed to rest in oblivion for many years, will not prevail to establish priority when application for patent is delayed and not filed until after another and more diligent inventor has entered the same field of invention and established his claim as an independent inventor. [Id.

PROCESS.

(See Invention, 3, 4, 5.)

The claims have been rejected on the ground that they cover a process which is "evidently and necessarily the operation contemplated in the construction of the machine" and "the inevitable result of such operation."

1. PROCESSES WHICH DEPEND UPON PARTICULAR MECHANISM.
It being conceded that a process is not patentable which is merely the effect or function of specific mechanism, the question necessarily arises in every case whether the process claimed is capable of being performed by a machine differently organized from that described, or even without an organized machine—by ordinary tools or by hand. *Held* in the case under consideration that the processes set forth in the claims do not depend for their performance on the particular machine described. [*Ex parte* Young, 1635.

2. WHEN ENTITLED TO THE PROCESS.
An inventor who proceeds to invent a machine designed solely to carry out a particular process, and the only function of which is to execute that process, is entitled to protection. A process which is distinct and separate from the machine does not lose its identity because of any course pursued by the inventor in prosecuting his claims for a patent, or from the fact that he may not at the time of completing his machine have been fully conscious that he had also invented the process. Should applicant, however, take out his patent for the machine without defining or claiming his process, he probably would unconsciously dedicate the process to the public; but if at any time before he comes to the Office or takes out his patent he discovers or becomes conscious of the fact that his invention is of a twofold character—viz., that it constitutes both the machine and the process which it executes—and prepares his application accordingly, there can be no reason for holding that he has merged the two inventions or that the two are in fact one. [Id.

3. CONSCIOUS AND UNCONSCIOUS INVENTION, WHEN COMPLETED.
At the time applicant becomes conscious of the fact that there exists in his mental operations and discoveries a distinct process as well as a concrete machine he completes not only the invention of the process, but perfects his knowledge of it, and comes into the status of an inventor who may obtain the security of the patent laws. [Id.

4. PATENTABILITY—PROCESS.
A method or process which depends for its novelty upon the preparation of an adhesive stay and the various steps employed to carry such article forward to the final act of affixing it to the corners of boxes for the purpose of strengthening the corners *Held* to be not a proper method or process, but the mere operation of the machine. [*Ex parte* Jaeger, 1637.

PRODUCT OF NATURE.

(See Invention, 3, 4, 5.)

PROPERTY INTERESTS.

(See Patents, 1.)

PUBLIC USE.

(See Particular Patents, 1, 13.)

PUBLIC USE.
Use of an invention for business purposes or profit and in which the test of its success and value was only incidental will defeat a patent if it occurred more than two years before application. [*Root *v.* Third Avenue Railroad Company, 1393.

REDUCTION TO PRACTICE.

(See Priority of Invention.)

REHEARING.

(See Interference, 4.)

Statement of the litigation growing out of the several interferences declared between the patents granted to A. G. Bell and the applications of later applicants; the inventions distinguished and compared with the previous state of the art, and the decisions rendered by the various tribunals in the Office considered and discussed.

1. GRAY'S PETITION TO REOPEN.
Held that the petition "is of no avail for any purpose whatever;" that Gray proposes no new evidence as to dates, nature, or the character of his own invention; that it was conclusively shown in the evidence that Gray, at the time of filing his caveat, while having a conception of the telephone, did not understand the invention, and was unable to explain the mode of its operation; that he adhered to the idea that articulate speech must be transmitted upon the multiple-telegraph principle; that he positively conceded that he did not reduce his invention to practice for a long time after the issuance of patent to Bell; that he regarded the invention patented to Bell as trivial, and called it a "scientific toy," and turned his attention to other and, in his opinion, more important inventions; that he negligently omitted to file his application for a patent until 2 years after the grant of Bell's patent, and was then stimulated to do so only by other parties, who had acquired an interest in his inventions; and that his present petition, filed without notice to the adverse parties, was delayed for 3 years and 5 months after the decision of the Examiner of Interferences awarding priority to Bell, and was then accompanied by a request that it should not be acted upon until further motion was made.
[McDonough *v.* Gray *et al.*, 1345.

2. CHARGES OF FRAUD.
For reasons stated, the charges in Gray's petition that Bell had fraudulently secured access to his caveat, purloined his invention, and interpolated a description thereof in his application *Held* not sustained. [Id.

3. PRIORITY OF INVENTION AND VALIDITY OF BELL'S PATENT.
Held that the decision of Commissioner Butterworth, of March 3, 1885, was elaborately considered and deliberately rendered, and that a rehearing could only be justified upon clear and satisfactory evidence showing in such decision error in the conclusions of fact or in the application of the law, and that evidence could be produced establishing that Gray could antedate Bell's invention, that he could prove a prior conception and reduction to practice, or that, having made an earlier conception, he had diligently prosecuted it to a reduction to practice. In the absence of showing the existence of such evidence, upon the testimony filed before and considered by the various tribunals in the Office, *Held* that "the award of priority of invention was justly given to Bell," and in view of the construction given by the Office and the courts to the patent, the grant was properly issued, and the protection afforded the inventor was authorized. [Id.

4. EXTENDING THE MONOPOLY.
The public has a direct and immediate interest in the further prosecution of Gray's application for a patent. If the award of priority given to Bell can be vacated and set aside, it should only be done upon a showing of merits that would entitle Gray to a patent. Such patent would run for a period of 17 years from its date, and would dominate and control all devices relating to the telephone for another period of 17 years. The effect would be to subject the public to a renewed monopoly in all nearly, if not quite, thirty-four years. Such result would be in contravention of the spirit of the statute, and, in view of the liberal provisions of the patent system, cannot be tolerated except when the inflexible rules of law and justice compel it, especially in the present case, wherein it is clearly shown that the Bell Company is the "equitable if not the legal owner of Gray's telephone inventions." [Id.

5. TITLES AND RIGHTS UNDER ASSIGNMENTS.
The Commissioner has no equitable jurisdiction over the rights of parties claiming under assignments and grants of inventions and patents. He cannot set aside or vacate such instruments, nor can he recognize equitable rights growing out of transactions between inventors and applicants and other parties. While the Commissioner is authorized to recognize formal legal assignments, and when they have been filed in the Patent Office before patent issues may give the assignee control of the management and prosecution of an application and direct the patent to issue in the name of the assignee, yet he cannot recognize equitable rights under executory or other equitable contracts; but where the relief asked, as in a petition for rehearing, is founded upon an alleged state of the title to the invention, the Commissioner possesses the power to determine the allegation as to title in order to exercise his discretion in granting or refusing the relief. [Id.

6. MCDONOUGH'S PETITIONS.
As to the petition of McDonough that he be allowed to demonstrate the operativeness of the make-and-break principle, the Commissioner holds the decisions of his predecessors are conclusive on that question; that McDonough never claimed to be the original inventor of the telephone, but a mere improver upon Reis's instruments; that he accepted and still accepts the make-and-break system of Reis as the foundation of his invention; and, in view of the settled judgment of the Patent Office that speech cannot be transmitted by an instrument which operates solely by the making and breaking of the circuit, and also in view of the fact that the Supreme Court of the United States has also definitely settled this question with reference to Reis, he must regard the matter *res adjudicata*. [Id.

7. NO INTERFERENCE BETWEEN MCDONOUGH AND BELL.
As to the petition to reopen on the merits, the Commissioner holds that McDonough's original claim for the receiver having been rejected on reference to Bell's patent, and he submitting thereto and canceling the claim, and McDonough having been brought into the interference in consequence of the later applicants, so as to compel them to establish an earlier date of invention than himself, it follows, inasmuch as there could have been no interference between McDonough and Bell alone, that when Gray and the other later applicants were defeated and taken out of the interference there could be left no contest between McDonough and Bell. [Id.

8. CLAIMS VOLUNTARILY CANCELED.
Whether an applicant who has voluntarily eliminated his claims and apparently abandoned them should be permitted, after the invention has been publicly introduced and made commercially valuable, to return after 11 years and amend and claim an interference with a patent so long outstanding is a serious question, and the right to relief should be most convincing. [Id.

9. PETITIONS DENIED—INSUFFICIENT SHOWING.
Petitions denied because the showing is deemed insufficient to justify the Commissioner in setting aside former decisions and decrees, since he is fully convinced that another trial on the question of priority would result in another award in favor of Bell. [Id.

10. REFUSAL TO TAKE TESTIMONY.
A patentee involved in interference who refused to take testimony, relying upon his record dates, and rested his case upon the weakness of his adversary's presentation rather than upon the strength of his own, will not be permitted, after testing the opinion of all the tribunals in the Office and after final decision, to have the case reopened on the ground "that the public interests require an investigation as to prior knowledge or use, and that two patents ought not to issue for the same invention."
[Beardslee *v.* Moeslein, 1640.

11. A degree of conclusiveness attaches to a correct decision based upon the record and the evidence which cannot be disturbed by a motion which admits a party's willful and deliberate omission to take evidence and simply asks, after trial, that the very evidence which might have been originally taken may now be introduced. If such a motion could prevail, there would be no end to interference proceedings. [Id.

REISSUES.

REISSUES—ENLARGEMENT OF ORIGINAL PATENT.
It is well settled that a reissue can only be granted for the same invention intended to be embraced by the original patent, and the specification cannot be substantially changed, either by the addition of new matter or the omission of important particulars, so as to enlarge the invention as intended to be originally claimed.
[*Pattee Plow Company *v.* Kingman & Company *et al.*, 1107.

REJECTED CLAIMS.

(See Division of Application, 1; Rehearing, 7, 8.)

SERVICE OF PROCESS.

1. JURISDICTION—SUIT AGAINST NON-RESIDENT CORPORATION—SERVICE OF PROCESS.
A corporation not a resident of this district cannot be sued in this court. Service of process upon the agent or officer of a non-resident corporation insufficient.
[*Preston *v.* Fire Extinguisher Manufacturing Company *et al.*, 124.

2. SAME—SAME.
A corporation created and existing solely under the laws of another State, and having its principal office and place of business in another State and district, cannot be said to be an inhabitant of this district and be sued here, even though such corporation may do business in this district through agents.
[*Id.

SIGNATURE TO PATENTS.

(See Defective Patents, 1, 2; Patents, 2.)

STATE OF THE ART.

(See Particular Patents, 3, 6, 11, 14.)

SUITS FOR INFRINGEMENT.

(See Assignments, 3; Citizenship; Delay in Bringing Suit; Service of Process.)

EXPIRATION OF PATENT—INJUNCTION THEREAFTER.
Under the law the monopoly secured by a patent ceases with the expiration of the patent, and articles made during the life of the patent in infringement of it cannot be enjoined after its expiration, and an injunction already granted as to such articles will be dissolved.
[*Westinghouse *v.* Carpenter, 344.

TERM OF PATENT.

(See Limitation of United States Patents by Foreign Patents Previously Granted.)

TESTIMONY IN INTERFERENCE PROCEEDINGS.

(See Rehearing, 10, 11.)

TITLE TO PATENT.

(See Joint Invention, 1.)

TRADE-MARKS.

1. EXCLUSIVE PROPERTY IN EMBLEMS USED BY SOCIETIES.
Applicant presented for registration as a Trade-Mark an exact representation of the well-known badge of the Grand Army of the Republic, which he proposed to use as a water-mark on writing-paper. The fact that the Grand Army of the Republic have adopted a certain design for their badge, or for the letter-head of writing-paper used by them, does not secure to such organization such exclusive property in the particular representation as would deprive an applicant who has complied with all the requirements of the statute of his right to register the same as a Trade-Mark. It is well settled that emblems which have been used by societies possess no sanctity or sacredness which precludes their being used and applied as Trade-Marks.
[*Ex parte* King, 119.

2. TRADE-MARKS WHICH EMBELLISH.
The objection of the examiner that the Trade-Mark embellishes the paper is not approved. It may be said that scarcely any Trade-Mark can be applied to paper without incidentally embellishing it. If the design is a legitimate subject of a Trade-Mark and is not prohibited by law, the fact that it incidentally embellishes the page on which it appears cannot deprive it of its lawful quality as a Trade-Mark. [Id.

3. REPRESENTATIONS PATENTED AS DESIGNS NOT BARRED FROM REGISTRATION AS TRADE-MARKS.
The fact that the Grand Army of the Republic have previously obtained a Design patent for this representation, the term of which has expired, does not constitute a legitimate bar to the employment of this design as a Trade-Mark in commerce with foreign nations. The mere fact that the organization originated the design would make no difference whatever if the design has been donated to the world to be used in all the ways of which it is capable. The Grand Army of the Republic retained no proprietary right after the term of their design patent expired. There is no property in the Design itself vested in any one. Any person may apply the design as a Trade-Mark to a certain class of merchandise, and when thus applied it acquires the quality of property and becomes vested in him who first makes such new and distinct application of the design, and registration will be granted, provided the applicant has complied with all the requirements of the statute and the mark is used in commerce with foreign nations. [Id.

4. OFFICE BOUND BY THE OATH OF APPLICANT.
The Patent Office has not the means to investigate the question whether the applicant in the present case is simply seeking to obtain the guise of security round his Trade-Mark, when he really means to use it as an attractive embellishment for a particular class of persons in this country. The Office is bound by the oath of the applicant, and such a question as the above must be settled by the courts. [Id.

WORDS DESCRIPTIVE OF A CLASS OF GOODS CANNOT BE APPROPRIATED AS A TRADE-MARK.
The name "Goodyear Rubber Company" is not one capable of exclusive appropriation as a Trade-Mark. "Goodyear Rubber" are terms descriptive of well-known classes of goods produced by the process known as Goodyear's invention. Names which are thus descriptive of a class of goods cannot be adopted as Trade-Marks and be thereby appropriated to the exclusive right of any one.
[*Goodyear's India Rubber Glove Manufacturing Company *et al. v.* Goodyear Rubber Company, 122.

6. SAME—ADOPTED AS A CORPORATE NAME.
Nor will the incorporation of a company in the name of an article of commerce, without other specification, create any exclusive right to the use of the name. [*Id.

7. RIGHT ACQUIRED BY THE PUBLIC IN THE USE OF WORDS.
It appearing that the mode in which the complainants packed their cigars, the kind of boxes used by them, the number of cigars in each bunch, the particular color of ribbon or tape around each bunch, and the size and shape of the cigars were all old in the trade, and that the name "La Normanda" had been used for cigars resembling the "La Norman 1" cigars in size and shape, &c., in different parts of the country several years prior to the adoption of the words "La Normand!" by the complainants or their assignor, the adoption of these words as a Trade-Mark and their registration could not take away the right previously acquired by the public in the use of the words "La Normanda" as indicating a particular kind of cigars.
[*Stachelberg *et al. v.* Ponce, 337.

8. THE WORD "SLEUTH."
The word "Sleuth," being a word having a place and meaning in the language, cannot be appropriated as a Trade-Mark for a book or periodical.
[†Munro *v.* Beadle *et al.*, 448.

9. FLOUR.
Messrs. Holt & Co., New York, N. Y., adjudged to have acquired and to hold the exclusive right to the use of the words "La Favorita," registered by them February 28, 1882, as a trade-mark for flour.
[*Menendez *et al. v.* Holt *et al.*, 971.

VALIDITY OF PATENTS.

(See Joint Invention, 1; Oath of Applicant, 1.)

VALID PATENTS.

(See Particular Patents, 4, 6, 8, 9, 10, 16, 17, 18, 19.)

VOID PATENTS.

(See Assignments, 1; Assignment of Void Patents; Oath of Applicant, 2; Particular Patents, 1, 3, 11, 12, 13, 14, 15; Public Use; Reissues, 1.)

ALPHABETICAL LIST OF PATENTEES

FOR

THE QUARTER ENDING MARCH 31, 1889.

[Claims and drawings of Designs do not appear in the Monthly Volumes or the Gazette. Separate indexes for Designs, Trade-Marks, Labels, and Disclaimers follow this.]

Name, residence, and invention.	No.	Date.	Monthly volume. Specification.	Monthly volume. Drawing.	Official Gazette. Volume.	Official Gazette. Page.
Abbe, Charles C., Brooklyn, N. Y. Multiple-cylinder engine	396,451	Jan. 22	1747	448, 449	46	365
Abbe, Edwin W., New Britain, Conn. Sash-cord fastener	397,680	Feb. 12	898	237	46	756
Abbe, Horatio H., East Hampton, Conn. Spoon-rest	397,185	Feb. 19	1177	315	46	829
Abbot, Arthur V., Closter, N. J., and F. C. F. Knaak, assignors, by mesne assignments, to National Heating Company, New York, N. Y. Automatic valve and coupling	398,111	Feb. 19	1522	403	46	893
Abbott, Alpheus A., Auburn, Me., assignor to S. Moore, Newton, and F. T. Fuller, Boston, Mass. Crimping-machine	398,567	Feb. 26	2194	578	46	1032
Abbott, Arthur A., Chicago, Ill. Two-wheeled vehicle	396,640	Jan. 22	2039	524	46	420
Abbott Buggy Company. (See Baker, Clayton L., assignor.)						
Abbott Buggy Company. (See McCauley, James, assignor.)						
Abbott, William H. (See Taylor, John J., assignor.)						
Abendroth & Root Manufacturing Company. (See Rice and Volkmann, assignors.)						
Abraham, Thomas D. (See Clapp, George, assignor.)						
Abrahamson, Peter, San Francisco, Cal. Ventilator	396,134	Jan. 15	1267	324	46	208
Abrams, Charles E., Chatham, N. Y. Ratchet-wrench	395,865	Jan. 8	881	226	46	184
Absterdam, John, New York, N. Y. Fire-kindler	397,576	Feb. 12	724	187, 188	46	722
Accles, James G., 41 Craven Street, Strand, county of Middlesex, England. Cartridge-feed case	396,523	Jan. 22	1859	477	46	380
Ackerman, William J., Grand Rapids, Mich. Burglar-alarm	396,452	Jan. 22	1749	449	46	365
Actien-Gesellschaft für Anilin Fabrikation. (See Strasburger, Josef, assignor.)						
Adams, Alonzo P. (See Norris, George E., assignor.)						
Adams, George B., Irvington, N. J. Scarf-holder	397,955	Feb. 19	1276	340	46	846
Adams, Harvey E., Marseilles, Ill. Time-recorder	400,263	Mar. 26	2241	587	46	1395
Adams, Isaac J. W., Laurel, Del. Barrel	397,325	Feb. 5	335	87	46	641
Adams, Isaac J. W., Laurel, Del. Basket or carrier	399,811	Mar. 19	1549	400	46	1451
Adams, James, Newark, N. J. Pool-table pocket	395,883	Jan. 8	784	203	46	164
Adams, Luther J., Melrose, assignor to Thompson, Perley & Waite, Baldwinsville, Mass. Child's chair or carriage	398,304	Feb. 19	1811	478	46	950
Adams, Marvin C. (See Weeks, Joseph H., assignor.)						
Adams, Orsemas T. X. (See Adams, Phineas H., Jr., and O. T. X.)						
Adams, Orsemas T. X., Chicago, Ill., assignor to American Slag Furnace Company. Smelting-furnace slag steam-generating furnace and plant	395,643	Jan. 1	520	130, 131	46	104
Adams, Orsemas T. X., Chicago, Ill., assignor to American Slag Furnace Company. Slag-furnace	395,644	Jan. 1	524	131, 132	46	105
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,111	Mar. 5	451	123	46	1199
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,112	Mar. 5	455	123, 124	46	1201
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,113	Mar. 5	457	124	46	1201
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,114	Mar. 5	460	124, 125	46	1202
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,115	Mar. 5	462	125	46	1205
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,116	Mar. 5	464	125, 126	46	1203
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,117	Mar. 5	466	126	46	1204
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,118	Mar. 5	467	126, 127	46	1204
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,119	Mar. 5	470	127	46	1204
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,120	Mar. 5	471	127, 128	46	1205
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,121	Mar. 5	473	128	46	1205
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,122	Mar. 5	475	128, 129	46	1205

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Apparatus for use in decomposing metallic salts and desulphurizing ores	399,123	Mar. 5	476	129	46	1206
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Plant for use in smelting ores	399,124	Mar. 5	479	129, 130	46	1206
Adams, Phineas H., Jr., and O. T. X., assignors to M. Peck, Chicago, Ill. Plant for use in smelting ores	399,125	Mar. 5	481	130, 131	46	1207
Adams, Robert, Southwark, county of Surrey, England. Pneumatic door-check	397,326	Feb. 5	336	88	46	641
Adame, Samuel, Beaver, Pa. Well-boring machine	398,211	Feb. 19	1664	440	46	919
Adams, Stephen G. (See Seymour, John B., Jr., assignor.)						
Adams & Westlake Company. (See Willits, Ward W., assignor.)						
Adamson, Andrew J., Sabetha, Kans. Rolling harrow and cultivator	399,644	Mar. 19	1297	333	46	1401
Adamson, James H., North Melbourne, Victoria, Australia. Rotary seed-sower	396,251	Jan. 15	1445	368	46	301
Addington, Joseph C. (See Smith, Daniel W., assignor.)						
Adler, Francis C. (See Schenkel and Magruder, assignors.)						
Adler, Samuel C., Philadelphia, Pa. Merchandise-cabinet	395,939	Jan. 8	984	253	46	204
Afialo, Moses, assignor of one-half to J. A. Game, London, England. Blotting-pad	396,060	Jan. 15	1164	295	46	247
Aiken, Henry. (See Lash, Aiken, and Park.) (Reissue.)						
Aikins, Frederick T., Toronto, Ontario, Canada. Device for checking horses	399,961	Mar. 19	1761	455	46	1463
Aitken, John, New York, N. Y. Fire-escape	395,681	Jan. 8	583	147	46	127
Akers, William P., and J. C. Lindsey, Jr., Jacksborough, Tex. Car-starter	397,327	Feb. 5	337	88, 89	46	641
Alber, Hermann. (See Purdy and Alber.)						
Albers, Joseph, Wells, Oreg. Gate	395,804	Jan. 8	785	203	46	164
Albert, Daniel W., Plymouth, Ind. Broom-maker's thimble	398,812	Mar. 5	1	1	46	1115
Albion Manufacturing Company. (See Gale, Horatio, assignor.)						
Albrecht, Henry R., Moline, Ill. Car-heater	397,886	Feb. 19	1177	315	46	829
Albree, Edward E., Boston, Mass. Account-book	397,681	Feb. 12	899	237, 238	46	756
Alden Type Machine Company. (See Johnson and Low, assignors.)						
Alden Type Machine Company. (See Low, A. Augustus, assignor.)						
Alderman, Frank R., Detroit, Mich. Shipping-tag	399,812	Mar. 19	1550	400	46	1451
Aldinger, John L., assignor to E. C. Stearns & Co., Syracuse, N. Y. Warp-tension-regulating device for looms	398,017	Feb. 19	1392	367, 368	46	867
Aldrich, William H., Keokuk, Iowa. Windmill	399,645	Mar. 19	1299	333	46	1402
Aldrich, William N., Red Oak, Iowa. Self-winding reel for check-row planters	398,872	Mar. 5	83	23	46	1130
Alexander, Charles L., Charlotte, N. C. Automatic gas-extinguisher	395,940	Jan. 8	986	253	46	204
Alexander, Walter, *et al.* (See Aspinwall, Lewis A., assignor.)						
Allard, Louis A., St. Louis, Mo. Mustache-trainer	398,925	Mar. 5	160	42	46	1144
Allen & Co. (See Hofele, Ferdinand W., assignor.)						
Allen, David H., and M. Loree, Miamisburg, Ohio. Lock-nut	397,103	Feb. 5	1	1	46	579
Allen, Eben S. (See Hofele, Ferdinand W., assignor.)						
Allen, Edward B., assignor of one-half to W. B. Sawyer, Portland, Me. Channel-cutting device for sole-sewing machines	398,305	Feb. 19	1812	478	46	951
Allen, Homer H. (See Kolb, Allen, and St. Clair.)						
Allen, Homer H., Elsinor, assignor of one-half to J. C. Brown, Los Angeles, Cal. Nut-lock	399,813	Mar. 19	1551	401	46	1451
Allen, James A., Adams, Mass. Device for preventing the backward movement of machinery	400,284	Mar. 26	2243	587	46	1595
Allen, John C., Brookston, Ind. Mole-plow	397,682	Feb. 12	900	238	46	756
Allen, John F., New York, N. Y. Cut-off governor	395,876	Jan. 1	103	27	46	23
Allen, Richard N., Cleveland, Ohio. Car-wheel	396,721	Jan. 29	2125	553	46	451
Allen, Standhope I., Crossville, Ala. Plow-handle	396,524	Jan. 22	1960	478	46	336
Alley, Squire B., Selma, Kans. Check-row planter	396,797	Jan. 29	2282	583	46	476
Alley, Stephen, and J. A. MacLellan, Glasgow, county of Lanark, Scotland. Apparatus for making molds	397,683	Feb. 12	902	238	46	756
Alley, Stephen, and J. A. MacLellan, Glasgow, county of Lanark, Scotland. Turn-table for molders	397,684	Feb. 12	903	239	46	756
Allfree, James B., Indianapolis, Ind. Flour-bolt	396,851	Jan. 29	2352	602, 603	46	492
Alliger, Hasbrouck, Rondout, N. Y. Adjustable leg attachment for chairs, &c	400,033	Mar. 26	1865	485	46	1521
Allis & Company, Edward P. (See Finch and Gray, assignors.)						
Allward, Judson J., Columbiaville, Mich. Artificial arm and hand	396,061	Jan. 15	1161	295	46	247
Alsing, Johan R., New York, N. Y. Triturating-mill	396,453	Jan. 22	1752	449	46	366
Alsop, Henry, Chicago, Ill. Car-door	395,805	Jan. 8	787	204	46	164
Altman, John B., Cascade, Iowa. Cockeye	395,767	Jan. 8	706	181	46	150
Alvord, Bruce C. (See Shultz, John A. J., assignor.)						
Ambler, Augustin I., assignor to R. N. Ambler, Washington, D. C. Electric train-brake apparatus	395,682	Jan. 8	584	147, 148	46	127
Ambler, Roseline N. (See Ambler, Augustin I., assignor.)						
Ambler, Russell P., De Funiak Springs, Fla. Burner	396,798	Jan. 29	2282	584	46	476
Ambruster, Charles S. (See Watson and Ambruster.)						
American Arithmometer Company. (See Burroughs, William S., assignor.)						
American Bell Telephone Company. (See Carty, John J., assignor.)						
American Brake Company. (See Guels, Herman, assignor.)						
American Brake Company. (See Poor, George H., assignor.)						
American Brake Company. (See Wahlert, Henry A., assignor.)						
American Button Fastener Company. (See Richards, Francis H., assignor.)						
American Carrier Rocket Company. (See Cunningham, Patrick, assignor.)						
American Electric Motor Company. (See Dobbie, Robert S., assignor.)						
American Heeling Machine Company. (See Pope, Joseph H., assignor.)						
American Patents Company. (See Carroll, Alfred L. and B. J., assignors.)						
American Ring Company. (See Fiske, Henry P., assignor.)						
American Semaphore Company. (See Stitzel and Weinedel, assignors.)						
American Ship Windlass Company. (See Delon, Charles W., assignor.)						
American Slag Furnace Company. (See Adams, Orsemas T. X., assignor.)						
American Slag Furnace Company. (See Peck, Orren B., assignor.)						
American Telephone and Telegraph Company. (See Barrett, John A., assignor.)						
American Whiffletree Company. (See Roblin, Stephen H., assignor.)						
American Wire Company. (See Day, Patrick L., assignor.)						
Ames, Charles L., *et al.* (See Hill, Christian C., assignor.)						
Ames, Charles L., *et al.* (See Wagner, Awsbert H., assignor.)						
Ames, Ezra J., Austin, Minn. Forming molds for casting	396,454	Jan. 22	1754		46	306
Ames, George E., San Francisco, Cal. Rock-crusher	400,157	Mar. 26	2049	536	46	1559
Ames, Joseph H. (See Warren and Ames.)						
Ames, Leonard, Jr., Oswego, N. Y. Coupling for vehicle-axles	396,641	Jan. 22	2040	524	46	420
Ammon, Jacob S., Reading, Pa. Apparatus for combining anæsthetics	395,683	Jan. 8	590	148	46	128

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Amor, William G., Cleveland, Ohio. Lamp-stove	395,535	Jan. 1	343	87	46	72
Amos, Alexander M., Buffalo, N. Y. Odorless and smokeless griddle	395,305	Jan. 1	1	1	46	3
Ams, Max, New York, N. Y. Evaporating apparatus	399,311	Mar. 12	795	206	46	1294
Ancel, John W., Fort Buford, Dak. Ter. Combined stove-pipe and tent-support	396,846	Jan. 29	2346	601	46	491
Andersen, Niels, Decorah, Iowa. Window-mirror	398,994	Mar. 5	280	77	46	1168
Anderson, Charles, assignor to South Bend Iron Works, South Bend, Ind. Sulky-plow	399,814	Mar. 19	1551	401, 402, 403	46	1451
Anderson, Edwin, Tryon City, N. C. Shingle-sawing machine	397,328	Feb. 5	340	89	46	642
Anderson, George, Madras, India. Plant for laying tracks	397,577	Feb. 12	726	188, 189	46	723
Anderson, George J., West Superior, Wis. Hoisting-machine	397,621	Feb. 12	810	211, 212	46	738
Anderson, Henry, Oakland, and H. Elias, San Francisco, Cal., assignors of part to R. W. King, F. Cavagnaro, J. Gambetta, M. Monaco, J. A. Orr, B. F. Kohlberg, H. O. Haas, R. E. Murray, A. Reilly, and J. M. McCarty. Pile-covering	395,866	Jan. 8	882	226	46	184
Anderson, J. Burnham, assignor to G. H. Heath, Boston, Mass. Waxing paper	395,645	Jan. 1	529	132	46	106
Anderson, J., Burnham, assignor to G. H. Heath, Boston, Mass. Portable heating or cooking stove	395,730	Jan. 8	654	167	46	141
Anderson, James C. (See Hull and Anderson.)						
Anderson, James S., Crescent Bay, Wash. Ter. Lid-raiser	396,972	Jan. 29	2527	652	46	529
Anderson, John. (See McCoy, Andrew T., assignor.)						
Anderson, John W. (See Cox and Anderson.)						
Anderson, John W., South Bend, Ind. Sprinkling-nozzle	396,059	Jan. 15	1163	295	46	247
Anderson, Luke, assignor of one-half to L. B. Stevens, London, county of Surrey, England. Reversible back-stop	396,188	Jan. 15	1353	347	46	284
Anderson, William F. (See Cohen, Robert L., assignor.)						
André, Oscar, Paris, assignor of one-half to G. V. A. Berteaux, Neuilly, France. Skylight	395,306	Jan. 1	2	1	46	3
Andrews, A. Edwin, assignor of one-half to G. I. Cornwall, Hartford, Conn. Electric switch	397,926	Feb. 12	1100	294	46	795
Andrews, Chancy C., Nottawa, Mich. Wagon-tongue lock	396,189	Jan. 15	1354	348	46	284
Andrews, Fairman L., Miles Grove, Pa. Fork	395,941	Jan. 8	987	253	46	204
Andrews, Willard J. (See Musick and Andrews.)						
Andrews, William S. (See Robbins, Arthur C., assignor.)						
Angel, Joseph R., Bald Mount, Pa., assignor of one-half to S. C. Fulton, Denver, Colo. Station-indicator	396,019	Jan. 8	1108	281	46	227
Angle, Edward H., Minneapolis, Minn. Dental tooth-regulating screw	399,177	Mar. 5	586	150, 151	46	1228
Annin, James, Le Roy, N. Y. Fishing-rod	396,909	Jan. 29	2440	627	46	510
Annin, Joseph, Brooklyn, N. Y. Wheelbarrow	399,723	Mar. 19	1469	382	46	1424
Ansonia Brass and Copper Company. (See Lyman, Charles H., assignor.)						
Ansty, John, *et al.* (See Roberts, Thomas, assignor.)						
Appleton Manufacturing Company. (See Raymond, George and A., assignors.)						
Appleton Manufacturing Company. (See Stone, Herbert F., assignor.)						
Appleton, Robert M., Lake Village, N. H. Knit fabric	395,942	Jan. 8	988	253	46	205
Arbogast, Charles, and J. W. Kunzler, Pittsburg, Pa. System and apparatus for extinguishing fires	396,385	Jan. 22	1644	423	46	345
Arbogast, Robert S., Selma, Ind. Straw-stacker	399,312	Mar. 12	796	206	46	1294
Argersinger, Chancey E., *et al.* (See McKie, William, assignor.)						
Armbruster, Jacob H. (See Snell, Prince A., assignor.)						
Armil, Jackson, and R. M. Sebree, Nevada, Mo. Switching or transferring cars	399,815	Mar. 19	1557	403	46	1452
Armistead, Thomas E., Mazomanie, Wis. Fluid-measuring vessel	400,386	Mar. 26	2399	628	46	1621
Armstrong, John C., Hudson, Mich. Combined step-ladder and ironing and bread board	400,158	Mar. 26	2050	536, 537	46	1559
Armstrong Manufacturing Company. (See Carstensen, Larns F., assignor.)						
Armstrong, Mitchell & Co., W. G. (See Grenfell, Hubert H., assignor.)						
Armstrong, Mitchell & Co., W. G. (See Vavasseur, Josiah, assignor.)						
Arndt, August, Albion, Mich. Tedder	395,307	Jan. 1	4	2	46	3
Arnett, William D., Springfield, Ohio. Seeding-machine	398,112	Feb. 19	1524	403, 404	46	893
Arnett, William E., and G. M. Price, Fairmont, W. Va. Fence	397,956	Feb. 19	1277	341	46	847
Arnold, Henry F., Manchester, Iowa. Blotter-bath	397,531	Feb. 12	648	169	46	709
Arnold, James M., Chicago, Ill. Lubricator for elevators	398,685	Feb. 26	2378	631	46	1069
Arnold, Sydney W. (See Cranmer and Arnold.)						
Arthur, Lemuel J. (See Wayne, Alonzo, assignor.)						
Asbury, William H., Martinsburg, Nebr. Root-cutter	399,816	Mar. 19	1559	404	46	1453
Ascheck, Henry F., San Francisco, Cal. Tube or tunnel protector for cable roads	400,034	Mar. 26	1866	485	46	1521
Ashen, Peter, assignor to S. Y. L'Hommedieu & Co., New York, N. Y. Wire hook	396,847	Jan. 29	2347	601	46	491
Ashley, Charles. (See Clark and Ashley.)						
Ashley, Dwight, Paterson, N. J. Stop-motion for quilling-machines	396,384	Jan. 22	1643	423	46	345
Ashley, Lucius E. (See Clark and Ashley, assignors.)						
Ashley, Robert A. (See Clark and Ashley.)						
Ashley, Thomas C. (See Bartholomew, Albert W., assignor.)						
Ashton, Henry G., Somerville, Mass. Safety-valve	395,536	Jan. 1	343	87	46	72
Ashworth, Elijah. (See Ashworth, George and E.)						
Ashworth, Elijah, *et al.* (See Ormerod and Haworth, assignors.)						
Ashworth, George, *et al.* (See Ormerod and Haworth, assignors.)						
Ashworth, George and E., Manchester, county of Lancaster, England. Device for securing card-clothing to the flats of carding-engines	397,265	Feb. 5	240	62	46	622
Ashworth, George and E., Manchester, county of Lancaster, England. Doffer-comb head for carding-engines	397,266	Feb. 5	241	63	46	622
Ashworth, George and E., Manchester, county of Lancaster, England. Apparatus for attaching card-clothing to flat-bars	397,267	Feb. 5	242	63	46	622
Ashworth, George and E., Manchester, county of Lancaster, England. Means for driving carding-engine cylinders	397,268	Feb. 5	244	64	46	623
Ashworth, George and E., Manchester, county of Lancaster, England. Apparatus for truing bars for carding-engine flats	398,018	Feb. 19	1394	368	46	867
Ashworth, George and E., Manchester, county of Lancaster, England. Stripping mechanism for carding-engines	398,019	Feb. 19	1396	369	46	868
Ashworth, George and E., Manchester, county of Lancaster, England. Apparatus for flattening card-wire at intervals	398,212	Feb. 19	1665	440, 441	46	919
Aspinwall, F. E., *et al.* (See Aspinwall, Lewis A., assignor.)						
Aspinwall, Lewis A., assignor to W. Alexander, M. E. Bean, Three Rivers, Mich., and F. E. Aspinwall, Loudonville, N. Y. Artificial honey-comb	397,046	Jan. 29	2629	678	46	549

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Aspinwall, Lewis A., assignor to Aspinwall Manufacturing Company, Three Rivers, Mich. Corn-planter	397,771	Feb. 12	1020	272	46	780
Aspinwall Manufacturing Company. (See Aspinwall, Lewis A., assignor.)						
Atchison, George M., assignor of one-half to J. Picken, West Troy, N. Y. Weft stop mechanism for looms	400,159	Mar. 26	2051	537	46	1559
Atkinson, Charles E., Pennsville, N. J. Cultivator	397,484	Feb. 12	581	151	46	697
Atkinson, Herbert, and G. W. Hull, Wallingford, Conn.; said Atkinson assignor to said Hull. Whistle	398,213	Feb. 19	1667	441	46	920
Atterbury, Thomas B., Pittsburg, Pa. Manufacturing ornamental glass	398,995	Mar. 5	281	77	46	1168
Atwood, Benjamin S., Whitman, Mass. Shipping-case	397,214	Feb. 5	173	46	46	609
Atwood, Dustin, Milwaukee, Wis. Fastening for railway-stringers	399,232	Mar. 12	677	177	46	1273
Atwood, Julia E., Swanton, Vt. Suspenders	397,061	Jan. 29	2651	692	46	553
Aughenbangh, Robert M., Beaver, and G. E. Ruffley, Glenfield, Pa. Magazine fire-arm	399,464	Mar. 12	1015	266	46	1338
Auguste, Armand, Paris, France. Machine for sawing stone	398,113	Feb. 19	1526	404 / 405	46	893
Augustine, William R., Aspen, Colo. Letter-box	395,306	Jan. 1	6	2	46	4
Austin, Alonzo O. (See Stone and Austin.)						
Austin, Frederick C. (See Durkee, George B., assignor.)						
Austin, Stephen J. Terre Haute, Ind. Car-axle box	400,387	Mar. 26	2400	628	46	1624
Austin, William W., Lowell, Mass. Carbureting-lamp	397,485	Feb. 12	582	151	46	697
Autenrieth, Ernst F. (See Hutchinson and Autenrieth.)						
Autenrieth, Ernst F., New York, assignor to Glen Cove Machine Company, (limited,) Green Point, Brooklyn, N. Y. Variable driving mechanism for machinery	395,471	Jan. 1	243	62, 63	46	53
Autenrieth, Ernst F., New York, assignor to Glen Cove Machine Company, (limited,) Green Point, Brooklyn, N. Y. Mechanical movement	398,214	Feb. 19	1668	441	46	920
Automatic Battery Company. (See Williams and Roovers, assignors.)						
Automatic Selling Machine Company. (See Leavitt, Frank M., assignor.)						
Averell, John D., Brooklyn, N. Y., assignor, by mesne assignments, to J. F. Toraya, Philadelphia, Pa. Apparatus for the manufacture of gas	398,306	Feb. 19	1813	479	46	951
Avery, Andrew J., Norway, Me. Paneling and striping implement	399,233	Mar. 12	678	177	46	1273
Avery Manufacturing Company, W. G. (See Avery, William G., assignor.)						
Avery Planter Company. (See Avery, Robert H., assignor.)						
Avery Planter Company. (See Berrien, Leonard B., assignor.)						
Avery, Richard B., New York, N. Y. Apparatus for generating and burning gaseous fuel	398,873	Mar. 5	84	23, 24	46	1130
Avery, Robert H., assignor to Avery Planter Company, Peoria, Ill. Cultivator	400,388	Mar. 26	2400	628	46	1625
Avery, William G., assignor to W. G. Avery Manufacturing Company, Cleveland, Ohio. Belt-fastener	399,902	Mar. 19	1762	455	46	1493
Avis, Theodore C., *et al.* (See Randall, Franklin S., assignor.)						
Ayer, Ellery S., Boston, Mass. Salt-box	397,104	Feb. 5	2	1	46	579
Ayer, Richard L., Cincinnati, Ohio. Mechanical movement	395,415	Jan. 1	158	40	46	34
Ayers, William C., Plymouth, N. C. Garlic-separator	396,678	Jan. 22	2088	537	46	430
Aylward, Francis M., Memphis, Mo. Fire-wood drag-saw	397,957	Feb. 19	1278	341	46	847
Aylworth, George H., Brighton, Ill. Sash-fastener	396,320	Jan. 15	1545	390	46	318
Ayres, Romeyn B., *et al.* (See Huson, Lewis C., assignor.)						
Ayres, Saxton T., Philadelphia, Pa. Machine for packing flour	397,411	Feb. 5	465	122 / 123	46	667
Ayton, Phinehas E., and S. Hill; said Hill assignor to T. Pemberton & Sons, Birmingham, England. Door spring and check	398,996	Mar. 5	282	77, 78	46	1169
Baatz, August F., Bellingham, Wash. Ter. Automatic fog-horn	398,367	Feb. 26	1919	505	46	979
Babbitt, Benjamin T., New York, N. Y. Ordnance	400,160	Mar. 26	2052	537	46	1559
Babin, Telesphore. (See Trahan and Babin.)						
Bach, Conrad, St. Gallo, Switzerland. Automatic picture-exhibitor	396,455	Jan. 22	1755	449	46	366
Bach, Jacques. (See Kranich and Bach.)						
Bachman, Joseph A., Austin, Tex. Shutter-fastener	399,724	Mar. 19	1411	362	46	1424
Badan, Alcide C., New York, N. Y. Smoke-consumer	399,817	Mar. 19	1560	404	46	1453
Badische Anilin and Soda Fabrik. (See Bohn, René, assignor.)						
Bagaley, Ralph, and F. M. Rites, assignors to Westinghouse Machine Company, Pittsburg, Pa. Crank-case door	397,002	Jan. 29	2651	692	46	553
Bailey, Cyrus, Akron, Ohio. Rotary-engine reversing-gear	395,646	Jan. 1	530	132 / 133	46	106
Bailey, Cyrus, Akron, Ohio. Rotary engine	395,647	Jan. 1	532	133 / 134	46	107
Bailey, Ephraim E. E. (See Ruddock and Bailey.)						
Bailey, Farrell & Co. (See Franklin, Edward A., assignor.)						
Bailey, Royal F., Galva, Ill. Dust-pan	398,997	Mar. 5	283	78	46	1169
Bailey, Sterling L., Hyde Park, Ill. Ventilation of buildings	398,674	Mar. 5	86	24, 25	46	1130
Baily, Percy H., London, county of Middlesex, England, assignor of one-half to B. F. Smith, Chicago, Ill. Biscuit	396,456	Jan. 22	1756	.....	46	367
Bainbridge, William, Omaha, Nebr. Wire-coupling	399,465	Mar. 12	1016	266	46	1338
Bains, James, Cincinnati, Ohio. Oil-burner	396,525	Jan. 22	1861	478	46	386
Baird, Joseph H., Oakville, Conn. Sectional jack	396,331	Jan. 15	1546	391	46	318
Bairstow, William H., Kidderminster, county of Worcester, England. Double-pile-fabric loom	395,472	Jan. 1	244	63 / 64 / 65	46	53
Baker, Albert R. (See Brown, John F., assignor.)						
Baker, Carr & Co. (See Baker, Joseph, assignor.)						
Baker, Clayton L., Englewood, assignor of one-half to Abbott Buggy Company, Chicago, Ill. Dash-board for vehicles	397,329	Feb. 5	343	90	46	643
Baker, Edward F., Chicago, Ill. Package of fly-paper	400,035	Mar. 26	1868	485	46	1522
Baker, Frank A. (See McErlain, John J., assignor.)						
Baker, George C., Des Moines, Iowa. Making rods, rails, &c.	395,684	Jan. 8	592	148	46	128
Baker, John D. (See Barrow, Jacob, assignor.)						
Baker, Joseph, assignor to Baker, Carr & Co., Andover, N. H. Molding-machine	398,568	Feb. 26	2195	578 / 579	46	1033
Baker, Owen T., Fort Worth, Tex. Door-check	398,763	Feb. 26	2492	660	46	1092
Baker, Scipio E., Springfield, Ohio. Portable grave-vault	395,537	Jan. 1	344	87, 88	46	72
Baker, William R., assignor to McCormick Harvesting Machine Company, Chicago, Ill. Mower	398,307	Feb. 19	1814	479	46	951
Baker, William S. G., Baltimore, Md. Car-truck	399,466	Mar. 12	1017	267	46	1339
Baker, William S. G., Baltimore, Md. Car-axle box	399,467	Mar. 12	1019	267 / 268	46	1339
Baker, William S. G., Baltimore, Md. Car-truck	399,468	Mar. 12	1021	268 / 269	46	1339
Baldwin, Arthur, and J. Clement, Prairie du Sac, Wis. Fence-wire-winding machine	398,215	Feb. 19	1670	442	46	920

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Baldwin, David C., New York, N. Y. Detonating toy	395,867	Jan. 8	883	226	46	184
Baldwin, Quincy, Tonganoxie, Kans. Sash-balance	399,903	Mar. 19	1763	456	46	1493
Baldwin, Stephen G., Marion, Ind. Inkstand	397,330	Feb. 5	344	90	46	643
Baldwin, Thomas J., St. Louis, Mo. Wood-sawing machine	397,622	Feb. 12	812	212	46	730
Balet, Joseph W., assignor of one-half to R. Dunlap and L. F. Cozans, New York, N. Y. Electric-current regulator	398,926	Mar. 5	161	42 / 43 / 44	46	1144
Balet, Joseph W., assignor of one-half to R. Dunlap and L. F. Cozans, New York, N. Y. Electric-current regulator	398,927	Mar. 5	170	44	46	1145
Balet, Joseph W., assignor of one-half to R. Dunlap and L. F. Cozans, New York, N. Y. Dynamo-electric machine	399,646	Mar. 19	1301	334	46	1402
Ball, Albert, assignor to Sullivan Machine Company, Claremont, N. H. Friction-clutch	396,642	Jan. 22	2041	524	46	421
Ball, Albert, assignor to Sullivan Machine Company, Claremont, N. H. Steam-actuated valve	396,643	Jan. 22	2042	524 / 525	46	421
Ball, Alice M., *et al.* (See Gardner, Marshall, assignor.)						
Ball and Socket Fastener Company. (See Richardson, William S., assignor.)						
Ball, Charles P., *et al.* (See Chapman, John R., assignor.)						
Ball, George N., Argentine, Mich. Farm-gate	398,998	Mar. 5	285	78	46	1169
Ball, Samuel E., Dayton, Ohio. Candy-mold	398,368	Feb. 26	1920	505	46	979
Ballard, Frank S., Burlington, Vt. Match-safe and automatic lighter	396,135	Jan. 15	1269	325	46	208
Ballard, James W. (See Fisher and Ballard.)						
Ballard, John J., Terrell, Tex. Planter	397,215	Feb. 5	173	46	46	609
Balls, John J., Jacksonville, Fla. Water-closet	398,020	Feb. 19	1397	369	46	868
Baisy, Armand C. F., Paris, France. Folding table-top	397,486	Feb. 12	583	151	46	697
Balston, Oscar F., Brooklyn, N. Y. Bolt-head	400,161	Mar. 26	2054	538	46	1560
Banks, George L., assignor to L. S. Trusler, Fall River, Kans. Check-rowing attachment	396,848	Jan. 29	2348	601	46	492
Banks, Henry, Jr., La Grange, Ga. Addressing-machine	396,457	Jan. 22	1757	450	46	367
Bannatyne, Archibald, assignor to Waterbury Clock Company, Waterbury, Conn. Repeating-clock	399,647	Mar. 19	1302	334 / 335	46	1402
Bannatyne, Archibald, assignor to Waterbury Clock Company, Waterbury, Conn. Alarm-clock	399,725	Mar. 19	1412	363	46	1424
Bannier, Otto, assignor to A. Hinrichsen & Co., Hamburg, Germany. Corset-busk	398,569	Feb. 26	2196	579	46	1033
Bannister, Jesse. (See Davidson and Bannister.)						
Banowetz, Mathias B., Brown's Station, Iowa. Corn or cotton stalk cutter	398,216	Feb. 19	1671	442	46	921
Bansen, Wilhelm, Kattowitz, Prussia, Germany. Universal rolling-train	399,726	Mar. 19	1415	363 / 364	46	1425
Banta, William E., Springfield, Ohio. Hair-pin	397,164	Feb. 5	98	25	46	596
Barber, Emmet N., Kent, Ohio. Speed-indicator	398,928	Mar. 5	172	44, 45	46	1146
Barber, Emmet N., Kent, Ohio. Speed-indicator	398,929	Mar. 5	174	45	46	1146
Barber, Francis M., Washington, D. C. Ship's locker	395,648	Jan. 1	534	134	46	108
Barber, Henry W., Rock Creek, Ohio. Fence	399,648	Mar. 19	1306	335	46	1403
Barbour, Charles C., assignor of one-half to Foster, Stevens & Co., Grand Rapids, Mich. Safety-gate for furnace feed-pipes	396,020	Jan. 8	1109	281	46	227
Barbour, George H. (See Smith and Barbour.)						
Barclay, James A., St. Paul, Minn. Hatchway	396,849	Jan. 29	2349	602	46	492
Bardsley, James, Oldham, county of Lancaster, England. Gas-regulator	398,021	Feb. 19	1398	369	46	868
Baringer, John I., Waterford, N. Y. Sash-fastener	395,685	Jan. 8	592	148	46	128
Bariquand, Emile, assignor to Société Bariquand et Fils, Paris, France. Animal-shears	400,030	Mar. 26	1868	485 / 486	46	1522
Barkelew, Henry A., Williamstown, Mo. Hay-stacker	398,114	Feb. 19	1531	406	46	894
Barker, Erastus B., Newark, N. J. Photographic camera	400,162	Mar. 26	2054	538	46	1560
Barker, Henry C., assignor of one-half to H. P. Scott, Kansas City, Mo. Drink-registering attachment for liquor-bottles	396,021	Jan. 8	1110	281	46	227
Barker, Herman, Somerville, Mass. Obtaining gluten and starch	399,727	Mar. 19	1417	364	46	1425
Barker, Hugh J. (See Laforge and Barker.)						
Barker, Tom B., Birmingham, county of Warwick, England. Gas-engine	400,163	Mar. 26	2057	538 / 539	46	1560
Barker, William S., Troy, Ohio. Device for twisting fence-wire	396,973	Jan. 29	2527	652	46	529
Barlow, John W., Lawrence, Mass. Loom-picker	398,570	Feb. 26	2197	579	46	1033
Barlow, Peleg C., Buckhannon, W. Va. Churn	399,728	Mar. 19	1418	365	46	1426
Barnard, Edward, Rome, N. Y. Check-loop	398,764	Feb. 26	2494	661	46	1092
Barnard, George D., St. Louis, Mo. Book	399,469	Mar. 12	1023	269	46	1340
Barnard, Heman A., assignor to Barnard & Leas Manufacturing Company, Moline, Ill. Flour-packer	398,999	Mar. 5	286	78, 79	46	1169
Barnard & Leas Manufacturing Company. (See Barnard, Heman A., assignor.)						
Barnes Manufacturing Company. (See Mac, Horace F., assignor.)						
Barnes, Nebraskus H., Wahoo, Nebr. Heating drum or radiator	398,115	Feb. 19	1532	406	46	894
Barnes, W. W., *et al.* (See Trabue, William, assignor.)						
Barney, Bruce B. (See Bradley, Millard F., assignor.)						
Barney, James B., and S. B. Bryar, Pittsburg, Pa. Chimney-flue	396,458	Jan. 22	1759	450	46	368
Barnhart, Clarence L., Flint, Mich. Car-mover	396,190	Jan. 15	1356	348	46	284
Barnhart, Henry M., Marion, Ohio. Car-unloader	397,165	Feb. 5	99	26	46	596
Barnstead, Robert P., assignor of part to R. H. Spalding, Boston, and J. C. Bullard, Cambridge, Mass. Apparatus for heating water	398,022	Feb. 19	1400	370	46	868
Barnstead, William J., Galesburg, Ill. Apparatus for heating and circulating water	398,217	Feb. 19	1673	443	46	921
Barnum, Russel S., assignor to H. C. Goodrich, Chicago, Ill. Attachment-holder for sewing-machines	397,887	Feb. 19	1178	315	46	829
Barr, Charles, Chicago, Ill. Wood-splitting machine	396,722	Jan. 29	2157	573	46	454
Barr, Cyrus H., Dwight, Ill. Veterinary medical apparatus	399,234	Mar. 12	680	177	46	1273
Barr, Matt. (See Snyder, Staples, and Barr.)						
Barr, Pinckney F., St. Paul, Minn. Cable railway	398,369	Feb. 26	1921	505	46	979
Barraclough, Thomas C., and J. F. Kay, Manchester, county of Lancaster, England. Machine for making strands for wire ropes, &c	400,285	Mar. 26	2244	588	46	1596
Barranoff, Andrian I., Bangor, Me. Steam-boiler	398,116	Feb. 19	1533	406	46	895
Barranoff, Andrian I., Bangor, Me. Steam-boiler	398,370	Feb. 26	1922	505	46	979
Barras, Samuel T., Philadelphia, assignor of one-half to W. A. Cheyney, Thornbury, Pa. Profile-cutting machine	397,888	Feb. 19	1180	315 / 316	46	829
Barrath, Edward, assignor to V. E. Knecht, Cincinnati, Ohio. Coal-hod	396,974	Jan. 29	2528	652	46	529
Barrath, Edward, assignor to V. E. Knecht, Cincinnati, Ohio. Coal-hod	396,975	Jan. 29	2529	653	46	529
Barrath, Edward, assignor to V. E. Knecht, Cincinnati, Ohio. Coal-hod	397,047	Jan. 29	2530	678	46	540
Barrett, Frederick W., Springfield, Ohio. Tally-sheet	399,235	Mar. 12	680	178	46	1273
Barrett, John A., Brooklyn, N. Y., assignor to American Telephone and Telegraph Company, of New York. Telephone circuit and apparatus	397,331	Feb. 5	345	90	46	643
Barrett, Josiah, Allegheny, Pa. Lifting-jack	399,470	Mar. 12	1024	270	46	1340

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Barron, Andrew F. (See Clarke, Reuben, assignor.)						
Barrow, Jacob, assignor of one-half to J. D. Baker, Windfall, Ind. Pressure-regulator	397,063	Jan. 29	2653	683	46	553
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Direct-acting engine	397,166	Feb. 5	99	26	46	596
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Carriage for direct-acting rock-drills	397,622	Feb. 12	813	212	46	739
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Carriage for direct-acting rock-drills	397,827	Feb. 12	1101	294 295	46	795
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Direct-acting steam or pneumatic engine	397,958	Feb. 19	1281	341 342	46	847
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Direct-acting engine	397,959	Feb. 19	1282	342	46	848
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Cock	398,117	Feb. 19	1534	400 407	46	895
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Tool for mining purposes	398,308	Feb. 19	1817	480	46	952
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Trunnion for cylinders	398,571	Feb. 26	2198	580	46	1033
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Steam-actuated valve	398,930	Mar. 5	175	46	46	1147
Barth, Gustav A., assignor to P. Chouteau, St. Louis, Mo. Piston-rod-guide packing	398,931	Mar. 5	177	47	46	1147
Bartholomew, Albert W., assignor of one-third to T. C. Ashley, Boston, Mass. Die-stock	395,686	Jan. 8	593	149	46	129
Bartholomew, Francis A., Bloomfield, N. J. Rail-support for elevated roads	398,023	Feb. 19	1402	370	46	869
Bartholomew, Francis A., Bloomfield, N. J. Switch for center-rail elevated railways	400,164	Mar. 26	2059	539	46	1560
Bartlett, Charles M., Chicago, Ill. Wheel-pit and mechanism for the admission of water thereto	398,309	Feb. 19	1818	480	46	952
Bartlett, Edward C., assignor to J. L. McCague, Omaha, Nebr. Seal-lock	398,371	Feb. 26	1923	506 507	46	980
Bartlett, Elbridge G. W. (See Venn, Isaac H., assignor.)						
Bartlett, George H., Short Hills, N. J. Tool-holding box	400,286	Mar. 26	2246	588	46	1506
Bartlett, George H., Short Hills, N. J. Tool-holding box	400,287	Mar. 26	2248	588	46	1506
Bartlett, George H., Short Hills, N. J. Tool-holding box	400,288	Mar. 26	2250	589	46	1506
Bartlett, John W., assignor to Moline Plow Company, Moline, Ill. Check-row device for planters	398,485	Feb. 26	2062	548	46	1011
Bartlett, Jonathan, Epping, and G. B. Wiggin, South New Market, N. H., assignors of one-half to J. W. Hoard, Providence, R. I. Sewing-machine	397,579	Feb. 12	733	190	46	724
Bartlett, Jonathan, Epping, and G. B. Wiggin, South New Market, N. H., assignors of one-half to J. W. Hoard, Providence, R. I. Sewing-machine	399,818	Mar. 19	1561	404	46	1453
Bartlett, Jonathan, Epping, and G. B. Wiggin, South New Market, N. H., assignors of one-half to J. W. Hoard, Providence, R. I. Sewing-machine	400,037	Mar. 26	1870	486 487	46	1522
Bartlett, Marcus J., Providence, R. I. Animal-trap	395,309	Jan. 1	7	2	46	4
Bartlett, Samuel H. (See Rogers and Bartlett.)						
Bartley, Joseph D., Bridgeport, Conn. Combined book mark and clip	395,473	Jan. 1	247	65	46	53
Barton, Charles B. (See Barton, George F., assignor.)						
Barton, George F., assignor of one-half to C. B. Barton, Warehouse Point, Conn. Boiler for cleaning or boiling rags	395,416	Jan. 1	161	41	46	34
Barton, Martin V., Bath, N. Y. Pipe-wrench	398,118	Feb. 19	1535	407	46	895
Barwick, William H., Everett, assignor to himself, C. O. Benton, Cambridge, and F. J. Hutchinson, Boston, Mass. Railway-switch	396,679	Jan. 22	2089	537	46	430
Bascom, Frank A., Greenville, Pa. Sash-fastener	396,386	Jan. 22	1646	423	46	345
Bascom, John R. (See Wolfe, Harvey R., assignor.)						
Baskam, Mendel, New York, N. Y. Ornamental box	395,417	Jan. 1	162	41	46	34
Bassett, Carrol P. (See Chichester, Lewis S., assignor.)						
Bassett, Dewitt C., Woonsocket, Dak. Ter. Car-coupling	397,412	Feb. 5	466	123	46	668
Bassett, Fred R. (See Le Sner and Bassett.)						
Bassett, Herbert H. (See Clarke and Bassett.)						
Bassett, Nathan H. (See Ransweiler, William, assignor.)						
Bassford, Isaac F., assignor of one-half to D. Young, Springfield, Ohio. Mowing-machine cutter-bar	397,685	Feb. 12	904	239	46	757
Batchelder, James H. (See Maloy, Michael T., assignor.)						
Batcheller, Alfred H. (See Lytle, Harry S., assignor.)						
Bates, David, Bonham, Tex. Liniment	398,024	Feb. 19	1403	.....	46	869
Bates, Emory H., Washington, D. C. Shifting seat for vehicles	396,062	Jan. 15	1166	296	46	247
Bates, Francis G. (See Ruprecht and Bates.)						
Bates, John C., *et al.* (See Prince, Jerome, assignor.)						
Batman, John J., Sunbury, Pa. Radial drill	395,943	Jan. 8	989	254	46	205
Battey, David C., Florence, Kans. Water or liquid elevator	397,889	Feb. 19	1182	317	46	830
Bauer, Edward H., Carbon Centre, Pa. Gate	397,216	Feb. 5	175	47	46	609
Bauer, Fred, *et al.* (See Shannon, Patrick H., assignor.)						
Baughn, Ollie, Tobias, Nebr. Potato-planting attachment	398,119	Feb. 19	1536	407	46	895
Baumann, Eugen, Freiburg, Baden, assignor to Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. Sulphur compound	396,526	Jan. 22	1863	.....	46	387
Baumgarten, Albert. (See Morgan, Edgar H. and C., assignors.)						
Baumgarten, Christian, Schulenburg, Tex. Cotton seed cleaner	399,819	Mar. 19	1562	404	46	1453
Bauschke, Joseph, assignor to E. M. Heiber, Breslau, Prussia, Germany. Boiler-cleaner	395,649	Jan. 1	535	135	46	108
Bautain, Auguste C. T., Paris, France. Wagon-brake	399,471	Mar. 12	1027	270	46	1341
Baxter, Whitfield W. (See Fisher, John E., assignor.)						
Bay State Whip Company. (See Cowles, Henry A., assignor.)						
Bayaud, George D. (See O'Kelly, James M., assignor.)						
Bayer, Friedrich, assignor to Farbenfabriken, vormals Friedr. Bayer & Co., Elberfeld, Germany. Manufacture of dye-stuffs or coloring-matters	395,474	Jan. 1	248	.....	46	53
Bayles, James C., New York, N. Y. Drain-valve for steam-pipes	395,607	Jan. 1	456	116	46	93
Bayless, William C., and J. C. Nichols, Mossy Creek, Tenn. Water filter and cut-off	398,218	Feb. 19	1675	443	46	922
Bayley, William. (See Whiteley, Bayley, and Perrigo.)						
Baylis, John D., Philadelphia, Pa. Composition for printers' inking-rollers	396,387	Jan. 22	1647	.....	46	345
Baylies, Thomas R., Northfield, county of Worcester, England. Primer for cartridges	400,165	Mar. 26	2061	539 540	46	1561
Beach, Charles A., Albany, N. Y. Tramway-switch	396,910	Jan. 29	2441	627	46	511
Beach, Milo D., Litchfield, Conn. Hillside-plow	399,000	Mar. 5	288	79, 80	46	1170
Beach, Milo D., Litchfield, Conn. Hillside-plow	399,001	Mar. 5	292	80	46	1171
Beadle, Elwood, Centre Star, Ala. Baling-press	399,472	Mar. 12	1028	271	46	1341
Beale, Forrest W., and J. H. Reed, Lynn, Mass. Rivet-setting machine	395,868	Jan. 8	883	226 227	46	185
Beaman, Timothy L., Knoxville, Tenn. Fare-box	399,820	Mar. 19	1563	405 406	46	1454
Bean, Eben. (See Miller, James M. A., assignor.)						
Bean, Edward C., Buckland, Portsmouth, county of Hants, England. Sewing-machine	398,765	Feb. 26	2495	661 662	46	1093
Bean, Mary E., *et al.* (See Aspinwall, Lewis A., assignor.)						
Beane, George E., Whitestone, Va. Washing-machine	398,486	Feb. 26	2063	548	46	1011

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Beardsley, William F., Boston, Mass., assignor to Hat Sweat Manufacturing Company, New York, N. Y. Sweat-band for hats	399,729	Mar. 19	1419	365	46	1426
Beare, Ernest, Chester, Ill. Steam-engine	396,850	Jan. 29	2351	602	46	492
Bearly, David, New Castle, Ind. Lawn-mower	395,869	Jan. 8	886	227	46	185
Beaton, William L., Hallock, Minn. Attachment for gang cheese-presses	398,933	Mar. 5	178	47	46	1147
Beauregard, Napoleon, San Francisco, Cal. Bibb-hilter	396,769	Jan. 29	2284	584	46	476
Beauvalet, Ernest E. and L. C., Paris, France. Stop-cock	397,332	Feb. 5	347	91	46	643
Beauvalet, Léon C. (See Beauvalet, Ernest E. and L. C.)						
Becht, Louis A., assignor to E. Viollier, Paris, France. Permutation-lock	399,002	Mar. 5	294	81	46	1171
Beck, August, Chicago, Ill. Quilting-machine	400,039	Mar. 26	1876	488	46	1523
Beck, Robert M., Chambersburg, Pa. Device for operating steam-engine indicators	398,686	Feb. 26	2379	631 632	46	1009
Becker, Andreas. (See Schill and Becker.)						
Becker, E. John M., New York, N. Y. Grain scale and measure	399,473	Mar. 12	1031	271	46	1341
Becker, Frederick G., assignor to D. S. Morgan & Company, Brockport, N. Y. Grain-binder	396,976	Jan. 29	2530	653	46	529
Becker, Henry L., *et al.* (See Latz, Charles J., assignor.)						
Beckfeld, J. Charles, assignor of one-half to A. Schmid, Allegheny, Pa. Gas-engine	396,022	Jan. 8	1111	281 282 283	46	228
Bedell, Chatham F. (See Wilson, Henry R., assignor.)						
Beebe, Enoch M. (See Sweetland, Jerome B., assignor.)						
Beers, Charles B., Bridgeport, Conn. Electrically-operated door-lock	396,723	Jan. 29	2158	554	46	451
Beers, Charles B., Bridgeport, Conn. Electrically-operated door-lock	396,724	Jan. 29	2160	554	46	452
Beeson, Jonathan, and J. H. Hirschfeld, Saline City, Ind. Bee-hive	396,800	Jan. 29	2285	584 585	46	477
Behan, William, and P. Friensehner, Texarkana, Tex. Feed device for gin-saw sharpeners	400,040	Mar. 26	1877	489	46	1524
Behnisch, Carl H., Luckenwalde, Prussia, Germany, assignor of one-half to C. Schreibler, Methuen, Mass. Apparatus for brushing up designs on fabrics	397,004	Jan. 29	2654	683 684	46	553
Behr, Hermann, assignor of one-half to G. W. Friedgen, Philadelphia, Pa. Velocipedo	396,349	Jan. 15	1384	401	46	325
Behrens, Ernst A., Bremen, Germany. Bleaching and refining resins and other substances	395,731	Jan. 8	656	168	46	141
Beidler, George A., Middletown, Pa. Jack-a-lantern	396,252	Jan. 15	1446	368	46	301
Beidler, Jacob A., Lanark, Ill. Book holder and marker	397,893	Feb. 19	1154	317	46	830
Belcher, Henry F., Irvington, N. J. Making mosaics of glass	396,911	Jan. 29	2442	627	46	511
Belcher, Henry F., Irvington, N. J. Making mosaics	396,912	Jan. 29	2443	628	46	511
Belfield, Reginald, assignor to Westinghouse Electric Company, Pittsburg, Pa. Electric discharge device. (Reissue)	10,986	Feb. 19	1915	504	46	970
Bell, David, Toronto, Ontario, Canada. Paint	397,105	Feb. 5	2	.....	46	579
Bell, Harold J., Woodbury, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent gas-burner	396,253	Jan. 15	1447	369	46	301
Bell, Harold J., Woodbury, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent gas-burner	396,254	Jan. 15	1449	369	46	302
Bell, Harold J., Gloucester City, assignor to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Gas-incandescent	396,322	Jan. 15	1547	391	46	318
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Atmospheric gas-burner	396,255	Jan. 15	1451	369	46	302
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Atmospheric gas-burner	396,256	Jan. 15	1452	370	46	302
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-regulating burner	396,257	Jan. 15	1453	370	46	302
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-regulating burner	396,258	Jan. 15	1454	370	46	303
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-regulating burner	396,259	Jan. 15	1456	370	46	303
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent gas-burner	396,260	Jan. 15	1457	371	46	303
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent gas-burner	400,166	Mar. 26	2063	540	46	1561
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent gas-lamp	400,167	Mar. 26	2063	540	46	1561
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Atmospheric gas-burner	400,168	Mar. 26	2065	540	46	1562
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent gas-burner	400,169	Mar. 26	2066	541	46	1562
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-governor	400,170	Mar. 26	2067	541	46	1562
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-governor	400,171	Mar. 26	2069	541	46	1562
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-governor	400,172	Mar. 26	2069	541	46	1562
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas-governor	400,173	Mar. 26	2070	542	46	1563
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Air-regulating device for atmospheric gas-burners	400,174	Mar. 26	2071	542	46	1563
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas and air mixer	400,175	Mar. 26	2072	542	46	1563
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas and air mixer	400,176	Mar. 26	2074	543	46	1563
Bell, Harold J., Gloucester City, N. J., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Gas and air mixer	400,177	Mar. 26	2075	543	46	1564
Bellows, Edwin S., New York, N. Y. Scarf-tip	399,730	Mar. 19	1420	365	46	1426
Belton, Guy M., Knoxville, Tenn. Car-step	395,687	Jan. 8	895	149	46	129
Bement, Clarence E., Lansing, Mich. Harrow	399,731	Mar. 19	1421	365	46	1426
Bemis, Jason, Owatonna, Minn. Grain-tally	396,063	Jan. 15	1167	296	46	248
Bemis, Sumner A., Springfield, Mass., and L. Pingst, New York, N. Y. Railway	398,687	Feb. 26	2381	632	46	1009
Bender, Albert N., Manhattan, Kans. Sash-fastener	400,220	Mar. 26	2251	589	46	1596
Bender, Edouard, and E. Stevens, Brussels, Belgium. Door-spring	400,641	Mar. 26	1978	489	46	1524
Bender, Fritz, Frankfort-on-the-Main, assignor to A. Leonhardt & Co., Mulheim-on-the-Main, Germany. Production of coloring-matter	396,527	Jan. 22	1863	.....	46	387
Bendick, Max, New York, N. Y. Machine for perforating paper patterns	398,572	Feb. 26	2109	580	46	1033
Bending, William P., assignor of nine-sixteenths to V. S. Seltzer, A. B. Robinson, and W. H. Slade, Columbus, Ohio. Domestic or railway-car heater	398,573	Feb. 26	2200	580	46	1033

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Benedict, Elias U., Aurora, Ill. Stock-car	399,821	Mar. 19	1568	406	46	1455
Benedict, George H., Chicago, Ill. Scale for surface measurement	397,686	Feb. 12	965	239 240	46	757
Benedict, Theodore H. (See Fry, Frederick, assignor.)						
Benét, Laurence V., Washington, D. C., assignor to Hotchkiss Ordnance Company, (limited,) of England. Hinge	399,964	Mar. 19	1764	456	46	1494
Bengel, Edward. (See Heine and Bengel.)						
Benjamin, Frank P., New York, N. Y. Railway signaling device	399,474	Mar. 12	1685	272	46	1342
Benjamin, George H. (See Richards, William G., assignor.)						
Benjamin, George H., New York, N. Y., assignor to Safety Car Heating and Lighting Company, of New Jersey. Apparatus for heating railway-cars	398,487	Feb. 26	2064	549	46	1011
Benkendorf, Otto A., Wilmot, Kans. Air-draft engine	395,418	Jan. 1	162	41	46	34
Benker, Christ, assignor of one-half to E. B. Matthews, Pittsburg, Pa. Machine for forming skelp-iron	398,120	Feb. 19	1537	408	46	895
Benner, Lorenzo D., Peoria, Ill. Bag	396,388	Jan. 22	1648	424	46	345
Benner, Lorenzo D., Peoria, Ill. Bag	396,389	Jan. 22	1649	424	46	346
Benner, Lorenzo D., Peoria, Ill., assignor to Union Paper Bag Machine Company, Philadelphia, Pa. Paper bag	397,217	Feb. 5	176	47	46	610
Benner, Lorenzo D., Peoria, Ill., assignor to Union Paper Bag Machine Company, Philadelphia, Pa. Paper-bag machine	397,772	Feb. 12	1022	273 274	46	780
Bennett, Franklin, assignor of two-thirds to Billings Brothers, Canal Fulton, and Ohio Stoneware Company, Akron, Ohio. Crock-press	399,178	Mar. 5	588	151	46	1228
Bennett, George, Philadelphia, Pa. Drawing-pen	400,178	Mar. 26	2076	544	46	1564
Bennett, Isaac E., Newton, Iowa. Harness-buckle	398,372	Feb. 26	1928	507	46	981
Bennett, Martin, Eureka, Cal. Handle for crosscut-saws	397,580	Feb. 12	736	191	46	725
Bennett, Sanford S. (See Regan, Daniel S., assignor.)						
Bennett, Walter E., Boston, Mass. Attaching shank-buttons to fabrics	397,960	Feb. 19	1284	342	46	848
Bennett, Walter E., assignor to Morley Button Sewing Machine Company, Boston, Mass. Loop removing and spreading mechanism for button-sewing machines	399,179	Mar. 5	589	151 152	46	1228
Bennion, Charles. (See Pearson and Bennion.)						
Benoit, Charles H., San José, Cal. Shuttle for sewing-machines	397,269	Feb. 5	245	64	46	623
Benson, Phillip G., Aurora, Ill. Attachment for brick-machines	398,813	Mar. 5	2	1	46	1115
Benson, William H., assignor of one-half to C. F. Heller, Reading, Pa. Combination bank-book	398,875	Mar. 5	88	25	46	1131
Benster, Emory M., Toledo, Ohio. Wheel	399,475	Mar. 12	1039	273	46	1343
Bentley, Charles E., New York, N. Y. Velocipede	399,003	Mar. 5	297	81	46	1172
Bentley, Edward M., New York, N. Y. Electric-railway plow	400,038	Mar. 26	1873	488	46	1522
Bentley, Edward M., New York, N. Y. Electric-railway contact	400,179	Mar. 26	2078	544	46	1564
Bentley, Edward M., New York, N. Y. Electric-railway plow	400,180	Mar. 26	2080	544	46	1565
Bentley, Edward M., New York, N. Y. Detecting grounds in an electric distributing system	400,181	Mar. 26	2082	544 545	46	1566
Bentley, Edward M., New York, N. Y. Fault-detector for electric railways	400,182	Mar. 26	2083	545	46	1566
Benton, Colbee O., *et al.* (See Barwick, William H., assignor.)						
Benton, Francis E., Stoughton, Mass. Fastening for whip-sockets	396,321	Jan. 15	1548	391	46	318
Berbecker, Julius, New York, N. Y. Sheet-metal knob	399,476	Mar. 12	1040	273	46	1343
Berdrow, James G., and F. A. Pelkey, Seward, Nebr. Fire-escape	396,852	Jan. 29	2354	603 604	46	493
Berg, Per T., Braddock, Pa. Valve-seat for hot-blast stoves	398,933	Mar. 5	179	47, 48	46	1147
Berger, John C., Michigan City, Ind. Refrigerator	396,361	Jan. 15	1458	371	46	303
Berger, Wilson C., Canton, Ohio. Metal roofing	399,004	Mar. 5	300	82	46	1172
Bergman, Claes. (See Reilley and Bergman.)						
Bergmann, Sigmund, New York, N. Y. Insulating pipe-coupling	397,218	Feb. 5	178	47	46	610
Bergmann, Sigmund, New York, N. Y. Equalizer for electric currents	398,121	Feb. 19	1538	408	46	896
Bergmann, Theodor F., Lilienstein, near Königstein, Saxony, Germany. Assaying-glass for testing wine	397,961	Feb. 19	1285	343	46	848
Beriew, Daniel, Springfield, Ohio. Horse-power	397,219	Feb. 5	178	48	46	610
Berlin Machine Works. (See Perry, James L., assignor.)						
Berlizheimer, Louis. (See Tysdal, John, assignor.)						
Bernhardt, Ernst, Newport, Ky. Cigar-perforating machine	396,801	Jan. 29	2287	585	46	477
Bernstein Electric Light Manufacturing Company. (See Bussmann, Oscar S., assignor.)						
Berri, William, Brooklyn, N. Y. Printing-cylinder	396,390	Jan. 22	1650	424	46	346
Berrien, Leonard B., assignor to Avery Planter Company, Peoria, Ill. Cultivator	400,389	Mar. 26	2402	629	46	1625
Berry, Henry C., Philadelphia, Pa. Device for leveling billiard-tables	399,126	Mar. 5	490	131	46	1209
Berry, Marcellus F., Brooklyn, N. Y. File-binder	398,574	Feb. 26	2202	580 581	46	1034
Berry, Thomas, North Fork, Ky. Stacker	398,934	Mar. 5	180	48	46	1148
Berry, William E., Williamsport, Pa. Support for ironing-boards	400,290	Mar. 26	2252	589	46	1597
Berry, William F., Blanchard, Iowa. Cultivator	396,853	Jan. 29	2356	604	46	493
Berryman, Edwin C. (See Geer, Adelbert L., assignor.)						
Berryman, Mathew W., assignor to M. N. Johnson, New York, N. Y. Printer's quoin	399,368	Mar. 12	881	229	46	1310
Berst, Conrad, Kansas City, Mo. Churn-dasher	398,488	Feb. 26	2085	549	46	1011
Berteaux, Georges V. A. (See André, Oscar, assignor.)						
Bertrand, Peter, South Lyon, Mich. Flower-stand	396,459	Jan. 22	1760	451	46	368
Bess, Albert, Hamilton, Ohio. Paper-cutter	398,575	Feb. 26	2204	581	46	1035
Bessire, Albin E. (See Bovet and Bessire.)						
Beth, Adolph. (See Morhard, Joseph, assignor.)						
Betts, Lewis F., assignor of two-thirds to R. E. Dietz Company, New York, and Steam Gauge and Lantern Company, Rochester, N. Y. Lantern	397,624	Feb. 12	814	213	46	739
Betts, Lewis F., assignor of two-thirds to R. E. Dietz Company, New York, and Steam Gauge and Lantern Company, Rochester, N. Y. Tubular lantern	397,625	Feb. 12	815	213	46	740
Beu, Christian, assignor of one-half to J. D. Dunlap, Moline, Kans. Shock-binder	398,935	Mar. 5	182	48	46	1148
Beveridge, Winfield E., Baltimore, Md. Steam-cooker	397,687	Feb. 12	907	240	46	757
Bicknell, John E., Oil City, Pa. Purifying paraffine-wax	400,042	Mar. 26	1679	489	46	1524
Bicknell, John E., Oil City, Pa. Purifying paraffine-wax	400,043	Mar. 26	1681	489	46	1524
Bidauld, Louis, Lyons, France. Screw-propeller	395,539	Jan. 1	346	88	46	73
Biddison, Samuel M. (See Biddison, Stella D., assignor.)						
Biddison, Stella D., Fort Worth, Tex., assignor to S. M. Biddison, Chicago, Ill. Retort vaporizer and superheater	400,291	Mar. 26	2253	589 590	46	1597
Biddlecombe, Thomas. (See Brown and Biddlecombe.)						
Bideiman, Robert M. (See Bury and Bideiman.)						
Bierline, Jacob. (See Bierline, Michael and J.)						
Bierline, Michael and J., Chaska, Minn. Machine for tempering clay	398,373	Feb. 26	1929	507	46	981
Bigley, Richard, Toronto, Ontario, Canada. Sectional water-heater	395,688	Jan. 8	566	149	46	129

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Billings, Andrew W., Brooklyn, N. Y. Manufacturing beer or ale	398,374	Feb. 26	1930	508	46	981
Billings Brothers *et al.* (See Bennett, Franklin, assignor.)						
Billings, George W., Cleveland, Ohio. Vapor-burner	398,689	Feb. 26	2383	633	46	1070
Billings, George W., Cleveland, Ohio. Mechanism for preventing the pulsation of burning jets in vapor-stoves	398,690	Feb. 26	2385	633	46	1070
Billings, George W., Cleveland, Ohio. Initial lighting device for gasoline-vapor stoves	398,691	Feb. 26	2386	633	46	1070
Bills, Edwin P. (See Duren and Bills.)						
Bingham, Charles H., *et al.* (See Payne, William J., assignor.)						
Bingham, Horace A. (See Winters and Bingham.)						
Bingham, John E., *et al.* (See Payne, William J., assignor.)						
Bingham, Solon, Conklingville, assignor to A. A. Sumner, Albany, N. Y. Wash-board	395,650	Jan. 1	537	135	46	108
Binnington, Bartholomew, Hull, county of York, England. Bottle-cleaning machine	399,477	Mar. 12	1041	273	46	1343
Bird, Horace G. (See Clark, William H., assignor.)						
Bird, John, Warren, Ill. Envelope-opener	397,333	Feb. 5	348	91	46	644
Bird, Joseph C. (See Waring and Bird.)						
Bird, Joseph C., Rising Sun, Md. Cultivator	395,475	Jan. 1	249	65	46	53
Bird, Joseph C., Rising Sun, Md. Cultivator-tooth	397,902	Feb. 19	1286	343	46	848
Birdsall, Edward T., New York, N. Y. Static-induction generator	398,122	Feb. 19	1539	409	46	896
Birk, Carl V., Borup, Denmark. Horse-power	399,478	Mar. 12	1042	273	46	1343
Bishop, Thomas B., Clifton, N. J. Car-axle lubricator	399,360	Mar. 12	883	229	46	1311
Bissell Carpet Sweeper Company. (See Drew, Walter J., assignor.)						
Bister, John, *et al.* (See Gottschald, Ernst L., assignor.)						
Bittlinger, Hans, assignor to G. Luther, Brunswick, Germany. Shaking-bolt	398,692	Feb. 26	9388	634	46	1071
Bittle, James E., Littlestown, Pa. Folding chair	398,693	Feb. 26	2389	634	46	1071
Björkström, Adolf F., Kansas City, Mo. Plow	397,891	Feb. 19	1185	318	46	831
Black Diamond Mining Tool Company. (See Moats, Andrew T., assignor.)						
Blackburn, James. (See Bower and Blackburn.)						
Blades, Harry H., Detroit, Mich. Device for controlling electric motors	396,725	Jan. 29	2162	554	46	452
Blades, Harry H., Detroit, Mich. Regulating-switch for electric motors	397,773	Feb. 12	1026	274	46	781
Blades, Harry H., Detroit, Mich. Electric blast-blower	399,822	Mar. 19	1570	407	46	1453
Blair, John A., Philadelphia, Pa. Inside calipers or gage	396,064	Jan. 15	1168	296	46	248
Blair, John B., assignor to himself and U. Blickenederfer, Chicago, Ill. Electric railway	399,236	Mar. 12	682	178	46	1274
Blair, William H., assignor of one-third to C. A. Stix, St. Louis, Mo. Smoke-consumer	398,688	Feb. 26	2383	632	46	1070
Blaisdell, Harry, assignor of one-third to C. A. Stix, St. Louis, Mo. Smoke-consumer	399,739	Mar. 19	1421	366	46	1426
Blake, Edward, Boston, Mass. Electric-railway switch	396,065	Jan. 15	1169	296	46	248
Blake, Edwin D., assignor of two-fifths to F. Scales, Chicago, Ill. Wagon-tongue support	396,977	Jan. 29	2331	654	46	530
Blake, Evans, Rockford, Ill. Clutch-pulley	395,476	Jan. 1	251	66	46	54
Blake, Francis, Weston, Mass. Speaking-telephone						
Blake, Henry, East Pepperell, Mass., assignor to himself and J. A. Greene, Brooklyn, N. Y. Belt-fastener	396,528	Jan. 22	1864	478	46	367
Blake, Henry H., Pittsburg, Pa., assignor to himself and T. A. Noble. Automatic folding chair	400,183	Mar. 26	2084	545	46	1567
Blake, Henry T., New Haven, Conn. Electrical tramway	398,814	Mar. 5	3	1, 2	46	1115
Blake, John A., Watertown, assignor to Prentiss Vise Company, New York, N. Y. Vise	396,066	Jan. 15	1170	297	46	248
Blake, Thomas J., Wilkinsburg, Pa. Starching-machine	400,184	Mar. 26	2085	546	46	1567
Blakeman, George H., Birmingham, Conn. Vehicle-spring	395,608	Jan. 1	457	116	46	94
Blakeman, Wilbert C., Shelton, Conn. Toy fortune-wheel	398,576	Feb. 26	2205	581	46	1035
Blakeslee, John R., Cuyahoga Falls, Ohio. Machine for general forging	395,606	Jan. 8	788	204 205	46	164
Blanke, Ferdinand J., Whitewater, Wis. Swivel-plow	396,460	Jan. 22	1760	451	46	368
Blankman, John S., Washington, D. C. Sight for fire-arms	395,944	Jan. 8	991	254	46	205
Blasdel, Henry G., San Francisco, Cal. Ore-washer	397,581	Feb. 12	737	191	46	725
Blaxter, George H. (See Herman, Reinhold, assignor.)						
Blazier, Oscar V., Gillette, N. J. Snap-hook	399,005	Mar. 5	301	82	46	1172
Blessing, James H., Albany, N. Y. Apparatus for purifying water	395,651	Jan. 1	538	135	46	108
Blickenderfer, Ulric. (See Blair, John B., assignor.)						
Blickenderfer, Ulric, Chicago, Ill. Ditching-machine	396,391	Jan. 22	1652	425	46	346
Bliss, William H., deceased, Newport, R. I.; E. Newton administrator. Furnace for destroying refuse matter	395,807	Jan. 8	792	205 206	46	165
Blood, Arthur J., *et al.* (See Blood, Charles O., assignor.)						
Blood, Charles O., assignor to A. J. and L. K. Blood, Lynn, Mass. Nutmeg-grater	399,823	Mar. 19	1572	407	46	1455
Blood, Lillebridge K., *et al.* (See Blood, Charles O., assignor.)						
Bloom, John C., Kalamazoo, Mich., assignor of one-half to Emerson, Talcott & Co., Rockford, Ill. Mower	396,023	Jan. 8	1113	283	46	228
Bloomer, Charles G., Pawtuxet, R. I. Card for buttons or studs	399,824	Mar. 19	1573	407	46	1456
Blount, Eugene L. (See Currier and Blount.)						
Blount, James R. (See Southerland, Milton B., assignor.)						
Blount, John G., Boston, Mass. Belt-tightener for buffing-machines	395,732	Jan. 8	650	168	46	142
Bluntschli, Theodor, Schaffhausen, Switzerland. Machine for cutting and polishing precious stones, &c.	399,006	Mar. 5	301	82	46	1172
Blydenburgh, Charles M., Riverhead, N. Y. Vehicle	395,870	Jan. 8	889	228	46	186
Blydenburgh, Charles M., Riverhead, N. Y. Vehicle-gear	396,978	Jan. 29	2332	654	46	530
Blydenburgh, Charles M., Riverhead, N. Y. Vehicle-gear	395,539	Jan. 1	347	88	46	73
Bockenbenser, Christian, Kenosha, Wis. Combined chair and step-ladder	397,270	Feb. 5	246	64, 65	46	622
Boda, Abia Z., Columbus, Ohio. Electric railway-signal	395,945	Jan. 8	993	255	46	205
Boda, William J., Dayton, Ohio. Finishing of house interiors						
Bodenstab, William. (See Marohn, Ferdinand, assignor.)						
Bodey, Howard, Norristown, Pa. Kindergarten teaching apparatus	396,067	Jan. 15	1171	297	46	249
Boehme, Emil, assignor to S. Leutner & Co., Breslau, Prussia, Germany. Friction-clutch	399,733	Mar. 19	1423	366	46	1426
Boehncke, Max A. T., assignor to Continuous Kiln Company, Omaha, Nebr. Combined brick drier and kiln	395,689	Jan. 8	598	150 151	46	130
Boersig, Richard, New Albany, Ind. Stove	398,694	Feb. 26	2390	634	46	1071
Bofinger, Gustav, New York, N. Y. Type-writer ciphograph	396,529	Jan. 22	1865	478 479	46	367
Bogenschutz, Charles, Jr., Covington, Ky. Molder's flask	398,219	Feb. 19	1677	444	46	922
Bogue & Mills Manufacturing Company. (See Mills, Mortimer B., assignor.)						
Bohm, William D., Acton, London, county of Middlesex, England. Apparatus for accelerating the passage of liquids through filter-beds	400,185	Mar. 26	2087	546	46	1567
Bohmann, Joseph, Chicago, Ill. Violin-rest	397,454	Feb. 5	538	141	46	681
Bohn, Adam, Mercer, Pa. Pruning implement	399,370	Mar. 12	884	229	46	1311
Bohn, René. Ludwigshafen-on-the-Rhine, Bavaria, assignor to Badische Anilin and Soda Fabrik, Mannheim, Germany. Alizarine-green	399,479	Mar. 12	1043	.....	46	1343
Bohn, René. Ludwigshafen-on-the-Rhine, Bavaria, assignor to Badische Anilin and Soda Fabrik, Mannheim, Germany. Alizarine-blue sulpho-acid	399,480	Mar. 12	1044	.....	46	1343
Bohn, René. Ludwigshafen-on-the-Rhine, Bavaria, assignor to Badische Anilin and Soda Fabrik, Mannheim, Germany. Alizarine-blue sulphuric acid	399,481	Mar. 12	1045	.....	46	1343

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Bohn, René. Ludwigshafen-on-the-Rhine, Bavaria, assignor to Badische Anilin and Soda Fabrik, Mannheim, Germany. Alizarine indigo-blue	399,482	Mar. 12	1046	.....	46	1343
Boland, Hamilton, Columbus, Ga. Wheel	396,262	Jan. 15	1459	371	46	304
Bolick, Jerome, Conover, N. C. Vehicle-wheel	396,461	Jan. 22	1762	451	46	363
Bollinger, Jesse, Carrollton, Md. Harrow and roller	396,068	Jan. 15	1173	297, 298	46	240
Bolmer, Emanuel, *et al.* (See Myers, Samuel, assignor.)						
Bolt, Joseph, Schuylkill Haven, assignor of three-fifths to J. W. Moyer and J. H. Williams, Pottsville, Pa. Automatic railway gate and signal	400,390	Mar. 26	2403	629, 630	46	1025
Bolton, Alfred S. and T., Oakamoor Mills, near Cheadle, county of Stafford, England. Drawing wire	397,271	Feb. 5	251	65	46	023
Bolton, Alfred S. and T., Oakamoor Mills, near Cheadle, county of Stafford, England. Apparatus for drawing wire	397,272	Feb. 5	252	65, 66	46	024
Bolton, George M., Dailey Branch, Nebr. Corn-planter	398,695	Feb. 26	2391	635	46	1072
Bolton, Thomas. (See Bolton, Alfred S. and T.)						
Bolus, Edward A., assignor of one-half to W. L. Venater, Hamilton, Ontario, Canada. Device for mending sieves	400,292	Mar. 26	2254	590	46	1507
Bolusa Air Brake Company. (See Bolusa, Alfred R., assignor.)						
Bolusa, Alfred R., Norwood, Ohio, assignor to Bolusa Air Brake Company, Jersey City, N. J. Air-brake	398,310	Feb. 19	1820	480	46	952
Bolzano, André, Augsburg, Bavaria, Germany. Fixing rail-chairs on timber-sleepers	399,483	Mar. 12	1047	274	46	1343
Boman, Claes W., New York, N. Y. Cigar wrapping or rolling machine	396,263	Jan. 15	1460	372	46	304
Boman, Claes W., New York, N. Y. Cigar-trimming machine	396,530	Jan. 22	1866	479	46	387
Boman, E. F., *et al.* (See Wundes, John H., assignor.)						
Bond, Nathan O., Fairfax Court House, Va. Wash-stand	397,963	Feb. 19	1288	343, 344	46	849
Bond, Nathan O., Fairfax Court-House, Va. Portable wash-stand	400,186	Mar. 26	2088	546, 547	46	1567
Bonnet, Victor, H. Lissagaray, A. and A. Richard, Paris, France. Device for exhibiting pictures	399,127	Mar. 5	491	131	46	1210
Bookwalter, John W. (See Robert, Gustav L., assignor.)						
Booth, Walter W., Elmsford, assignor to himself and C. F. Stone, New York, N. Y. Lining for safes	396,680	Jan. 22	2091	538	46	431
Boppel, Jacob, Newark, N. J. Sewing-machine	396,979	Jan. 29	2533	654, 655	46	530
Borchard, Charles, Detroit, Mich. Bolt	395,540	Jan. 1	348	89	46	73
Borden, Henry C., *et al.* (See Speake, Rufus H., assignor.)						
Bordenave, Jean, Paris, France. Mechanism for making coils for metal skeletons for composite structures	399,484	Mar. 12	1047	274	46	1344
Bork, Joseph. (See Krake, John A., assignor.)						
Borley, Isaac S., *et al.* (See Moore, Albert E., assignor.)						
Borsch, Henry, Chicago, Ill. Opera-glass holder	395,946	Jan. 8	995	255	46	206
Borsch, Henry, Chicago, Ill. Eyeglasses	396,264	Jan. 15	1462	372	46	304
Borst, George, assignor of one-half to B. R. Kollofski, Rochester, N. Y. Necktie-fastener	396,913	Jan. 29	2446	628	46	511
Bosche, Philip, New Philadelphia, Ohio. Buggy-boot	397,578	Feb. 12	732	189	46	724
Bosa, Martin P., San Francisco, Cal. Grinding-pan	398,936	Mar. 5	184	49	46	1149
Bostian, Charles P., Milton, assignor of one-half to J. F. Meekly, Watsontown, Pa. Needle-clamp for sewing-machines	396,350	Jan. 15	1586	402	46	325
Boston Type Writer Company. (See Currier and Blount, assignors.)						
Boston Woven Hose Company. (See Cowen, Robert, assignor.)						
Bott, Low W., *et al.* (See Michael, William G., assignor.)						
Bouchard, John, assignor of one-half to G. H. Webster, Chicago, Ill. Switch for overhead tracks	399,007	Mar. 5	304	83	46	1173
Bouchard, John, assignor of one-half to M. Cuhady, Chicago, Ill. Switch for overhead tracks	399,008	Mar. 5	305	83	46	1173
Bouck, John M., Gouverneur, N. Y. Car-coupling	398,123	Feb. 19	1541	409	46	896
Bouillet, Léon J. B. A. J., London, county of Middlesex, England. Manufacture of ultramarine	398,375	Feb. 26	1931	508	46	981
Bourne, Theodore F., Clifton, assignor to A. L. Shipman's Sons, New York, N. Y. Binder	396,980	Jan. 29	2536	655	46	530
Bourne, Theodore F., Clifton, assignor to A. L. Shipman's Sons, New York, N. Y. Fountain-pen	397,413	Feb. 5	467	123	46	668
Bouveron, Paul. (See Schley, Frits, assignor.)						
Bovet, Frits, and A. E. Bessire, assignors to H. Bovet, Bienne, Switzerland. Stop-watch	396,914	Jan. 29	2447	628, 629	46	512
Bovet, H. (See Bovet and Bessire, assignors.)						
Bowe, Silas A., Huron, Dak. Ter. Mining-caisson	397,688	Feb. 12	908	240	46	757
Bowen, James H., Philadelphia, Pa. Surgical appliance	397,106	Feb. 5	3	1	46	579
Bowen, Richard E., New York, N. Y. Velocipede	396,854	Jan. 29	2357	604, 605	46	494
Bowen, Thomas E., *et al.* (See White, Charles W., assignor.)						
Bower, Byron, Bainbridge, Ga. Water-motor	396,069	Jan. 15	1175	298	46	249
Bower, George, Fayette, Mo. Furniture-drawer	395,419	Jan. 1	164	42	46	35
Bower, Robert W. (See Bower and Blackburn.)						
Bower, Thomas, Hull, R. W. Bower, Leeds, and J. Blackburn, Woodlesford, county of York, England. Machine for cutting coal	399,485	Mar. 12	1049	274	46	1344
Bowers, Charles T., *et al.* (See Bowman, William H., assignor.)						
Bowers, John E. (See Camp, Benjamin F., assignor.)						
Bowers, John H., Mound City, Mo. Dough-kneader	400,187	Mar. 26	2000	547	46	1568
Bowman, Alexander H., Packerton, Pa., and W. P. Widdifield, Uxbridge, Ontario, assignors to said Widdifield and A. T. Button, Uxbridge, and S. S. Fuller, Stratford, Canada. Electric brake for railway-trains	398,577	Feb. 26	2206	581, 582, 583, 584	46	1035
Bowman, John D., Altoona, Pa. Apparatus for testing steam or other pressure gages	398,815	Mar. 5	6	2	46	1115
Bowman, William H., assignor to A. B. Lukens, C. T. Bowers, and C. P. Pancake, South Solon, Ohio. Thill-coupling	397,455	Feb. 5	530	141	46	681
Bown, George W., Philadelphia, Pa. Ash-sifter	399,371	Mar. 12	885	230	46	1311
Boyce, Frank F., Rye, N. H. Car-coupling link	396,726	Jan. 29	2163	555	46	452
Boyce, Sidney S., New York, N. Y. Disintegrating fibrous substances	396,981	Jan. 29	2538	.....	46	531
Boyd, John F. S., *et al.* (See Caughey, Robert C., assignor.)						
Boyle, Homer L., Grand Rapids, assignor of one half to H. B. Peck, Allegan, Mich. Mail-bag fastening	397,689	Feb. 12	910	241	46	757
Boyle, John. (See Brass, Robert, assignor.)						
Boyle, John, Brooklyn, N. Y. Grommet	395,477	Jan. 1	252	66	46	54

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Boynton Furnace Company. (See Boynton, Nathaniel A., assignor.)						
Boynton, Joshua E., and W. Crisp, Elyria, Ohio. Device for cushioning loose joints	395,310	Jan. 1	8	2	46	4
Boynton, Nathaniel A., assignor to Boynton Furnace Company, New York, N. Y. Hot-water heating apparatus	396,802	Jan. 29	2289	585, 586	46	477
Boysen, George H., Philadelphia, Pa. Folding table for the use of paper-hangers	396,531	Jan. 22	1667	480	46	387
Brachet, Philipp L., Philadelphia, Pa. Music-stand	395,808	Jan. 8	703	206	46	166
Bradford, Horace C., Milwaukee, Wis. Pipe-tap	397,167	Feb. 5	103	27	46	597
Bradford, Peleg S., Bridgewater, Mass. Folding crank for extensible ladders	399,313	Mar. 12	797	206	46	1294
Bradley, Charles S., Yonkers, N. Y. Electric-railway system	399,372	Mar. 12	886	230, 231	46	1311
Bradley, Edward H., Layton, Pa. Coke-oven front	397,107	Feb. 5	3	1	46	579
Bradley, James, Dundee, N. Y. Strap, trace, and lace trimmer and cutter	399,965	Mar. 19	1765	456, 457	46	1494
Bradley, James G., Allegheny, Pa. Fruit-gatherer	395,947	Jan. 8	995	255, 256	46	206
Bradley Manufacturing Company. David. (See Packer, John F., assignor.)						
Bradley, Millard F., assignor of one-third to B. B. Barney, Chicago, Ill. Traction-cable system	395,809	Jan. 8	794	207	46	166
Bradley, Richard M. (See Cabot and Bradley.)						
Bradshaw, Ira W., Richland Centre, Wis. Post-driver	397,892	Feb. 19	1187	318	46	831
Bradshaw, James M., and W. E. Meek, Eastonville, Colo. Bag-holder	399,373	Mar. 12	892	231	46	1312
Bradshaw, James M., and W. E. Meek, Table Rock, Colo. Separator	399,486	Mar. 12	1050	275	46	1344
Brady, James, Nauvoo, Ill. Corn-planter	397,690	Feb. 12	911	241	46	758
Brady, James, Brooklyn, assignor to Dunn Safety Ticket and Register Company, New York, N. Y. Tape and ribbon delivering device	395,948	Jan. 8	996	256	46	206
Brady, Thomas H., New Britain, Conn. Support for electric-railway wires	398,489	Feb. 26	2086	550	46	1012
Bragg, John. (See Page and Bragg.)						
Braillard, Francis F., Brooklyn, N. Y. Lock for satchels, &c.	397,487	Feb. 12	585	152	46	697
Braillard, Francis F., Brooklyn, N. Y. Book-cover	399,734	Mar. 19	1424	366	46	1427
Brainerd, Frank W., Chicago, Ill. Self-winding electric clock	399,128	Mar. 5	493	132	46	1210
Braley, Hartwell, Langeville, Ohio. Car-coupling	395,733	Jan. 8	609	168	46	142
Brallier, Jacob L., assignor to himself and W. Campbell, Philadelphia, Pa. Necktie-fastener	398,696	Feb. 26	2392	635	46	1079
Bramwell, William C., Hyde Park, Mass. Endless apron for feeding or other machines	396,582	Jan. 22	1869	480	46	388
Brand, Harrison, assignor of one-half to A. M. Ross, Ilion, N. Y. Shovel	397,964	Feb. 19	1289	344	46	849
Brandreth, William, Sing Sing, assignor to Mineral Reduction Company, New York, N. Y. Producing cobalt matte from cobalt ores	399,009	Mar. 5	307	.....	46	1173
Brandreth, William, Sing Sing, assignor to Mineral Reduction Company, New York, N. Y. Producing nickel matte from nickel ores	399,010	Mar. 5	308	.....	46	1173
Brangs, Paul H., Newark, N. J., assignor to United States Electric Lighting Company, New York, N. Y. Electrical switch	395,609	Jan. 1	458	117	46	94
Brann, Alonzo R., San Francisco, Cal. Animal-releasing device	398,578	Feb. 26	2211	585	46	1036
Branson, Joseph H., Belmont, N. Y. Pump	398,930	Feb. 19	1678	444	46	922
Brass, Robert, assignor to J. Boyle, Brooklyn, N. Y. Grommet	395,478	Jan. 1	253	66	46	54
Brass, Robert, assignor to J. Boyle, Brooklyn, N. Y. Eyelet	395,479	Jan. 1	254	66	46	54
Bray, Mellen N., Boston, Mass. Shoe-clasp	399,237	Mar. 12	685	179	46	1274
Bray, Morris P., Ansonia, Conn., assignor of one-half to J. Kendrick, Chicago, Ill. Garment-stay	396,533	Jan. 22	1670	480	46	388
Bray, William H., Boston, and C. Nickerson, Chelsea, Mass. Automatic safety-valve for water-gages	399,735	Mar. 19	1425	367	46	1427
Brayer, Nicholas, assignor to Co-Operative Foundry Company, Rochester, N. Y. Hot-air furnace	395,490	Jan. 1	164	42	46	35
Brearley, Harvey G., *et al.* (See Hansen, Soren, assignor.)						
Brechbill, Henry A., and F. H. Ensign, Dedance, Ohio. Hat and clothes rack	399,825	Mar. 19	1574	408	46	1456
Breher, Engelbert, Chaska, Minn. Water-closet-seat protector	396,803	Jan. 29	2292	587	46	478
Brennan, Ann, *et al.* (See Harney, Michael C., assignor.)						
Brennan & Co. South Western Agricultural Works *et al.* (See Wolfe, Harvey R., assignor.)						
Brennan, Daniel, Jr., Salteraville, N. J. Conveying-belt	396,136	Jan. 15	1270	325, 326	46	208
Brennan, William N., *et al.* (See Harney, Michael C., assignor.)						
Brennand, James, *et al.* (See Snedden, George, assignor.)						
Brenner, Adam F., and J. A. Myers, Finney, Kans. Protector for chimneys	396,855	Jan. 29	2359	605	46	494
Brennicke, Paul, *et al.* (See Noll, Otto, assignor.)						
Bresmen, John. (See Hooper, Henry O., assignor.)						
Bretney Dust Collector Company. (See Bretney, Eugene, assignor.)						
Bretney, Eugene, assignor to Bretney Dust Collector Company, Indianapolis, Ind. Dust-collector	397,046	Jan. 29	2631	678	46	549
Bretney, Eugene, assignor to Bretney Dust Collector Company, Indianapolis, Ind. Dust-collector	400,391	Mar. 26	2407	630	46	1026
Breuillard, Charles, Paris, France. Inhaler and respirator	399,736	Mar. 19	1426	367	46	1427
Breul, Richard A., Bridgeport, Conn., assignor to Bridgeport Chain Company. Chain attachment for sash-balances	398,221	Feb. 19	1679	444	46	923
Brewer, William J., London, England. Roller-bearing for car-axles	396,324	Jan. 15	1548	391, 392, 393	46	318
Brewis, John J., Chicago, Ill. Brick-machine	395,871	Jan. 8	800	222, 223	46	166
Brewster, James B., *et al.* (See White, William, assignor.)						
Brewster, William F., East Orange, N. J. Fish-hook	395,480	Jan. 1	254	67	46	54
Bridgeport Brass Company. (See Somers, George E., assignor.)						
Bridgeport Chain Company. (See Breul, Richard A., assignor.)						
Bridgeport Twine Binder Company. (See Gibbs, Jacob S., assignor.)						
Bridwell, James W., assignor to Star Manufacturing Company, Hillsborough, Ohio. Package-carrier	399,180	Mar. 5	591	152	46	1228
Bried, Henry R., Newark, N. J. Hanging device for clothes-lines	398,490	Feb. 26	2087	550	46	1012
Brigel, Leo A., Cincinnati, Ohio. Pump-spout	397,532	Feb. 12	649	170	46	709
Briggs, George D., Providence, R. I. Locket	397,774	Feb. 12	1028	274	46	781
Briggs, James E., Brooklyn, N. Y. Binocular glass	395,872	Jan. 8	893	229	46	186
Briggs, John G., and F. Cavallaro; said Cavallaro assignor of one-half to A. S. MacKenzie, San José, Cal. Fruit-pitter	397,091	Feb. 12	912	241, 242	46	758
Briggs, John N., Coeymans, N. Y. Automatic apparatus for lowering ice from store-houses	399,011	Mar. 5	309	83	46	1174
Briggs, John N., Coeymans, N. Y. Heater for ice-elevators	399,012	Mar. 5	312	84	46	1174
Briggs, Joseph H. (See Kester, Jesse F., assignor.)						
Briggs, Samuel M., Washington, D. C. Device for lubricating car-wheels	397,168	Feb. 5	104	27	46	597
Brigham, Hopkins & Co. (See Brigham, William T., assignor.)						
Brigham, Walter L., South Framingham, Mass. Device for curling hair	396,534	Jan. 22	1871	481	46	388

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Brigham, William T., assignor to Brigham, Hopkins & Co., Baltimore, Md. Hat-band	397,065	Jan. 29	2656	684	46	554
Bright, Joseph D., Lampasas, Tex. Machine for polishing shoes	398,124	Feb. 19	1543	409	46	897
Bright, Richard A., assignor to W. A. Peck, trustee, Providence, R. I. Preparing filler material for the manufacture of cigars	398,876	Mar. 5	89	25	46	1131
Bright, Richard A., assignor to W. A. Peck, trustee, Providence, R. I. Filler material for cigars	398,877	Mar. 5	90	25	46	1131
Brill, John A., Philadelphia, Pa. Railway-car	398,222	Feb. 19	1680	444 445	46	923
Brin, Arthur, 59 Bromton Crescent, county of Middlesex, England, and L. Q. Brin, Paris, France. Bleaching fibrous substances	396,325	Jan. 15	1350	392	46	319
Brin, Léon Q. (See Brin, Arthur and L. Q.)						
Brine, William E., St. Margaret's Bay, Nova Scotia Canada. Liniment	396,804	Jan. 29	2294	.....	46	478
Brinkerhoff, Milford H., Upper Sandusky, and N. M. Brinkerhoff, Melmore, Ohio. Cord-tension alarm for grain-binders	396,191	Jan. 15	1357	348	46	284
Brinkerhoff, Nelson M. (See Brinkerhoff, Milford H. and N. M.)						
Brinkman, Max R., New Haven, Conn. Foot-shield for piano and organ cases	396,137	Jan. 15	1273	326	46	269
Brinkmann, Augustus H. (See Buschmann, Victor H., assignor.)						
Brion, Adolph E., Brooklyn, N. Y. Screw-cutting die	395,810	Jan. 8	796	208	46	167
Britt, Lucas P., New York, N. Y. Safety bridle-bit	397,273	Feb. 5	254	66	46	624
Britto, John R. (See Knapp and Britto.)						
Britton, Louis H. (See Holton and Britton.)						
Brock, George F. (See King, John M., assignor.)						
Brockway, Charles G., Pine Bluff, Ark. Billiard-table rail and cushion	400,032	Mar. 19	1863	483	46	1512
Brockway, Charles G., Pine Bluff, Ark. Billiard-table rail and cushion	400,044	Mar. 26	1884	490	46	1524
Brockway, Damon W., Dover, Me. Shawl-strap	398,125	Feb. 19	1545	410	46	897
Brodnax, John T., New Orleans, La. Combined shirt or vest and suspenders	399,238	Mar. 12	686	179	46	1274
Brogan, Anthony D., and A. M. Malloch, Firhill, Glasgow, county of Lanark, Scotland. Apparatus for rolling glass plates	396,535	Jan. 22	1872	481	46	388
Brogan, Francis and W. J., Hartford, Kans. Fence-post	395,541	Jan. 1	340	89	46	73
Brogan, William J. (See Brogan, Francis and W. J.)						
Bromley, John C., Rock Island, Ill. Steam-actuated valve	398,491	Feb. 26	2088	550	46	1012
Bronson, Miles H., *et al.* (See Wilson, George T., assignor.)						
Brooks, Alfred A., Cambridge, Mass. Electric conductor	399,826	Mar. 19	1574	408	46	1456
Brooks, C. Bankes, *et al.* (See Lumley, Edwin J., assignor.)						
Brooks & Company, E. J. (See Brooks, Edward J., assignor.)						
Brooks, Edward J., East Orange, N. J., assignor to E. J. Brooks & Company, New York, N. Y. Seal	395,481	Jan. 1	257	67	46	55
Brooks, Franklin W., New York, N. Y. Coin-operated calculating-machine	399,129	Mar. 5	494	132 133	46	1210
Brooks, George H., Morganfield, Ky. Combined tool	399,649	Mar. 19	1307	335	46	1403
Brooks, James W., trustee. (See Glidden, Charles W., assignor.)						
Brooks, James W., *et al.*, trustees. (See Goddu, Louis, assignor.)						
Brooks, John, Plainfield, N. J. Differential speed-clutch	400,293	Mar. 26	2254	590	46	1507
Brooks, Luther F., Boston, Mass. Ear-ring	398,126	Feb. 19	1545	410	46	897
Brooks, Thomas J. (See Peterson, Albon C., assignor.)						
Brooks, William D., Baltimore, Md. Can-soldering machine	400,294	Mar. 26	2256	590	46	1507
Brooks, William D., Baltimore, Md. Can-soldering machine	400,295	Mar. 26	2259	591	46	1508
Brooks, Wriley S., Bainbridge, Ga. Fruit-gatherer	397,374	Feb. 5	349	91	46	644
Brott, George F., Washington, D. C. Clamp	400,296	Mar. 26	2261	591	46	1508
Brouse, Reuben. (See Ruch and Brouse.)						
Brower, Henry J., Brooklyn, assignor to T. H. McAllister, New York, N. Y. Magic lantern	399,596	Mar. 12	1227	316 317	46	1376
Brown, A. F. Allen, *et al.* (See Roberts, Henry P., assignor.)						
Brown, Alexander E., Cleveland, Ohio. Hoisting and conveying machine	395,873	Jan. 8	894	229	46	186
Brown, Alexander E., Cleveland, Ohio. Machine for weighing traveling loads	399,487	Mar. 12	1051	275	46	1344
Brown, Alexander E., Cleveland, Ohio. Machine for weighing traveling loads	399,488	Mar. 12	1054	275	46	1345
Brown, Alexander E., Cleveland, Ohio. Hoisting and conveying machine	400,188	Mar. 26	2091	547	46	1508
Brown, Alfred G., Egan, Dak. Ter. Draft-equalizer	395,874	Jan. 8	896	230	46	187
Brown, Asa C., Eugene City, Oreg. Rotary harrow	398,937	Mar. 5	185	49	46	1149
Brown, Calvin, assignor of one-half to J. H. Miller, San Francisco, Cal. Artificial slate	399,374	Mar. 12	894	232	46	1312
Brown, Charles, and T. Biddlecombe, Port Huron, Mich. Floating dry-dock	398,223	Feb. 19	1683	445	46	924
Brown, Charles B., Chicago, Ill. Vehicle-axle	399,013	Mar. 5	313	84	46	1174
Brown, Charles H. (See Guild, George, assignor.)						
Brown, Clara P., New York, N. Y. Insect-trap	395,542	Jan. 1	350	89	46	73
Brown, Daniel, Wrentham, Mass. Machine for grading and reeling straw braid	395,734	Jan. 8	662	168 169	46	142
Brown, Frederick W., Cambridgeport, Mass. Dress-form	400,297	Mar. 26	2261	591 592	46	1508
Brown, Frederick W., Cambridgeport, assignor to O. Whyte & Co., Boston, Mass. Dress-form	399,181	Mar. 5	592	152	46	1228
Brown, George F., Philadelphia, Pa. Combined waste and overflow tube for sanitary structures	398,224	Feb. 19	1685	446	46	924
Brown, George R. and J. W., Pledger, Tex. Machine for distributing poison on plants	397,636	Feb. 12	817	214	46	740
Brown, Henry C., Jr., Brooklyn, N. Y. Combination-lock	397,893	Feb. 19	1188	319	46	631
Brown, Herbert O., Auckland, New Zealand. Music or book holder	397,627	Feb. 12	819	214	46	740
Brown, Ira, Milford, Ill. Two-wheeled vehicle	399,650	Mar. 19	1307	335	46	1403
Brown, Irving H., New York, N. Y. Temporary binder for photographic cards	396,727	Jan. 29	2164	535	46	452
Brown, John. (See Chappell and Brown.)						
Brown, John D. (See Dodge, Christopher G., assignor.)						
Brown, John F., assignor to A. R. Baker, Indianapolis, Ind. Temporary binder	399,737	Mar. 19	1427	367	46	1427
Brown, John H., assignor to G. C. Tewksbury, New York, N. Y. Insect-trap	396,024	Jan. 8	1114	283	46	228
Brown, John N., New London, Conn. Reach-connection for vehicles	395,610	Jan. 1	460	117	46	94
Brown, John W. (See Brown, George R. and J. W.)						
Brown, Joseph S., Huntington, Fla. Fruit-box	396,138	Jan. 15	1274	326	46	269
Brown, Joseph W., Miltonvale, Kans. Cultivator for listed corn	396,805	Jan. 29	2294	587	46	478
Brown, Julius C. (See Allen, Homer H., assignor.)						
Brown, Obadiah B., and H. L. Moody, Malden, Mass. Combined palette and easel	397,108	Feb. 5	4	2	46	579
Brown, Perry, assignor to D. E. Doherty, Louisville, Ky. Vise	399,014	Mar. 5	314	84, 85	46	1174
Brown, Reinhart L. (See Smith, Daniel G., assignor.)						
Brown, Robert, Miamisburg, Ohio. Album	396,536	Jan. 22	1873	481	46	388
Brown, Robert B., Washington, D. C. Tennis-racket	397,220	Feb. 5	186	48	46	610
Brown, Robert M., Fort Gaines, Ga. Hoe	396,856	Jan. 29	2360	605	46	494
Brown, Rufus H., assignor, by mesne assignments, of one-third to F. W. Stanley, Peabody, Mass. Single-rail railway	396,139	Jan. 15	1275	326 327	46	269

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Brown & Sharpe Manufacturing Company. (See Worsley, Samuel L., assignor.)						
Brown, Thomas E., Blackwoodtown, N. J. Wagon-perch-crotch coupling	400,045	Mar. 26	1884	490	46	1524
Brown, Thomas T., Chicago, Ill. Slide-valve	395,735	Jan. 8	663	169	46	143
Brown, Warren C., Tarrytown, N. Y. Insulator	398,025	Feb. 19	1404	370	46	860
Brown, William. (See Chappell and Brown.)						
Brown, William H., Bolton, county of Lancaster, England. Musical pneumatic toy	398,697	Feb. 26	2393	635	46	1072
Brown, William J., assignor of one-half to R. T. Means, Jersey City, N. J. Fastener for shoes or gloves	395,768	Jan. 8	707	182	46	151
Brown, William S. (See Hudson, Frederick W., assignor.)						
Brown, Wirt H., Sycamore, Ohio. Fence-post	398,698	Feb. 26	2394	636	46	1073
Browne, Walker G., Atlanta, Ga., assignor of one-half to R. B. Winder, Baltimore, Md. Rubber-dam clamp	396,537	Jan. 22	1874	481	46	389
Brownlow, John H. (See Brownlow and Warner, assignors.)						
Brownlow, William H., Brockville, Ontario, Canada, and J. S. Warner, assignors of one-third to J. H. Brownlow, Ogdensburg, N. Y. Means for attaching eyeglasses to head-apparel	395,811	Jan. 8	797	208	46	167
Brownson, Ralph, assignor of one-half to P. R. L. Hardenbergh, St. Paul, Minn. Horse-collar	397,006	Jan. 29	2657	684	46	554
Bruce, Avery C., South Pittsburg, Tenn. Pipe-molding apparatus	399,651	Mar. 19	1309	336	46	1404
Bruner, Martin, Buckland, Ohio. Pulverizing-harrow	396,644	Jan. 22	2044	525	46	421
Brunswick-Balke-Collender Company. (See Hjort, Axel F., assignor.)						
Brunton, William H. H., Elk City, Kans. Grain weighing and registering machine	397,098	Feb. 19	680	214 215	46	740
Brush, Charles F., Cleveland, Ohio. Secondary-battery charging	396,681	Jan. 22	2092	538	46	431
Brush, Charles F., assignor to Brush Electric Company, Cleveland, Ohio. Secondary-battery charging	395,377	Jan. 1	104	27	46	93
Brush, Charles F., assignor to Brush Electric Company, Cleveland, Ohio. Secondary-battery charging	395,376	Jan. 1	106	28	46	94
Brush, Charles F., assignor to Brush Electric Company, Cleveland, Ohio. Secondary-battery charging	395,379	Jan. 1	109	28	46	95
Brush Electric Company. (See Brush, Charles F., assignor.)						
Brush Electric Company. (See Pfannkuche, Gustav, assignor.)						
Bryan, Henry, Modesto, Cal. Grain-cleaner	399,827	Mar. 19	1575	408	46	1456
Bryan, John C., assignor of one-half to J. C. Cheatham, Fordyce, Ark. Harrow and cultivator	400,392	Mar. 26	2409	631	46	1636
Bryan, St. George T. C., Birmingham, Ala. Mechanically treating and annealing slag	400,046	Mar. 26	1885	.....	46	1525
Bryan, St. George T. C., Birmingham, Ala. Treating slag	400,047	Mar. 26	1887	.....	46	1525
Bryan, St. George T. C., Birmingham, Ala. Manufacture of slag	400,048	Mar. 26	1887	490	46	1525
Bryant, Forrester, New Haven, Conn., assignor to Bryant Nail Company, Portland, Me., Wire-nail machine	397,067	Jan. 29	2658	684 685	46	554
Bryant, John L., Hillsdale, Mich. Device for unloading cars	400,049	Mar. 26	1889	490 491	46	1525
Bryant Nail Company. (See Bryant, Forrester, assignor.)						
Bryant, William H., North Amherst, Ohio. Channeling-machine	396,402	Jan. 22	1763	451 452	46	369
Bryar, Samuel B. (See Barney and Bryar.)						
Bryson, John R. (See De Monnin, John, assignor.)						
Buchanan, Robert J., Pittsburg, Pa. Rotary measuring-wheel	399,966	Mar. 19	1766	457	46	1494
Buck, Daniel A. A., Cheshire, Conn. Musical toy	399,967	Mar. 19	1768	457 458	46	1494
Buck & Hoyt *et al.* (See Jones, John B., assignor.)						
Buckeye Engine Company. (See Thompson, Joseph W., assignor.)						
Buckley, William H., Jr., Philadelphia, Pa. Garbage box or receiver	398,579	Feb. 26	2212	585	46	1030
Budlong, Edward L., Bowmanville, Ill. Belt-fastener	399,489	Mar. 12	1058	276	46	1345
Buell, Andrew L. and E., Clinton, Conn., assignors to F. T. L. Lane, New York, N. Y. Saw-set	399,490	Mar. 12	1059	276	46	1345
Buell, Edgar. (See Buell, Andrew L. and E.)						
Buhrman, L. H. (See Schwemberger and Groeschel, assignors.)						
Buick, David D., Detroit, Mich. Lawn-sprinkler	397,775	Feb. 12	1029	275	46	781
Bukawietis, Kazimieras, assignor of one-half to M. Pianko, Brooklyn, and A. Moren, New York, N. Y. Window-stand	399,491	Mar. 12	1060	276	46	1345
Bulett, William S., Delta, Pa. Road-cart	397,776	Feb. 12	1030	275	46	782
Bulger, Aaron Z., Martinsburg, Pa. Road-cart	397,777	Feb. 12	1031	275	46	782
Bulkley, William M., St. Louis, Mo. Signaling device for cable railways	397,335	Feb. 5	350	91, 92	46	644
Bullard, Aldis F., *et al.* (See Moore, Albert E., assignor.)						
Bullard, Edwin A., Vassar, Mich. Exhibitor for window-shades, maps, &c.	396,463	Jan. 22	1765	452	46	369
Bullard, James H., Springfield, Mass. Apparatus for burning hydrocarbons	397,336	Feb. 5	353	92	46	645
Bullard, James H., Springfield, Mass. Apparatus for burning hydrocarbons	397,337	Feb. 5	354	92	46	645
Bullard, John C., *et al.* (See Barnstead, Robert P., assignor.)						
Bullock, Chester, Kansas City, Kans. Safety-brake for cable cars	395,736	Jan. 8	665	170	46	143
Bullough, John. (See Tweedale and Mills, assignors.)						
Bumgarner, George W., Baltimore, Md. Machine for threading pipe	398,580	Feb. 26	2213	585	46	1030
Bumpus, Myron M., Rawsonville, Mich. Safety car-heater	400,393	Mar. 26	2410	631	46	1636
Bunker, Ira S., Nevada, Mo. Annunciator	400,050	Mar. 26	1890	491	46	1525
Bunker, William L., Chicago, Ill. Spring attachment for rocking-chairs	397,274	Feb. 5	256	66	46	624
Bunker, William L., assignor to Rocker Spring Company, Chicago, Ill. Attachment for rocking-chairs	397,828	Feb. 12	1103	295	46	796
Bunting, William, Jr., Brooklyn, assignor to Meyer-Sniffen Company, (limited,) New York, N. Y. Means for raising and lowering valves	397,829	Feb. 19	1104	296	46	796
Burbank, Henry A. (See Griffith and Burbank.)						
Burden, James A., Troy, N. Y. Magnetic separator	399,375	Mar. 12	895	228 229	46	1312
Burdsall, Ellwood, Jr., assignor of one-half to R. H. Burdsall, Port Chester, N. Y. Bolt-heading machine	399,828	Mar. 19	1576	408 409	46	1456
Burdsall, Richard H. (See Burdsall, Ellwood, Jr., assignor.)						
Bureau Can and Manufacturing Company. (See Dolan, Edward J., assignor.)						
Burfoot, Joseph B., Mobile, Ala. Mechanical toy	399,015	Mar. 5	315	85	46	1175
Burgess, Charles M., assignor to Russell & Erwin Manufacturing Company, New Britain, Conn. Lock-case	396,915	Jan. 29	2448	629	46	512
Burgess, Charles M., assignor to Russell & Erwin Manufacturing Company, New Britain, Conn. Latch-case	396,916	Jan. 29	2448	629	46	512
Burgess, Charles M., assignor to Russell & Erwin Manufacturing Company, New Britain, Conn. Sheet-metal lock-case	399,239	Mar. 12	688	179	46	1275
Burgess, Charles M., assignor to Russell & Erwin Manufacturing Company, New Britain, Conn. Lock-case	399,240	Mar. 12	688	179	46	1275

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Burhance, Elias, South Kent, Conn. Road-scraper	398,581	Feb. 26	2214	585, 586	46	1037
Burke, Edward, assignor to Gateway Manufacturing Company, Lemars, Iowa. Means for converting motion	399,492	Mar. 12	1060	276	46	1346
Burkhardt, John, New York, N. Y. Mechanism for impressing ornamental forms or designs upon metallic tubing	400,394	Mar. 26	2411	631	46	1627
Burley, Thomas W., Long Island City, N. Y. Device for operating and locking switches	397,414	Feb. 5	469	124	46	668
Burley, Thomas W., Long Island City, N. Y. Interlocking apparatus for railway signals and switches	398,766	Feb. 26	2496	662	46	1093
Burmeister, Carl C., Copenhagen, Denmark. Motor	398,767	Feb. 26	2498	662, 663	46	1093
Burnett, William, assignor to J. B. Gray, New York, N. Y. Railway-car heater	398,816	Mar. 5	8	2	46	1115
Burnett, William, assignor to J. B. Gray, New York, N. Y. Railway-car heater	398,878	Mar. 5	92	26	46	1131
Burnley, William, *et al.* (See Hitchcock, Charles A., assignor.)						
Burnley, William, North East, assignor of two-thirds to S. A. Davenport, Erie, and C. A. Hitchcock, North East, Pa. Electrical battery	397,965	Feb. 19	1290	344	46	849
Burnley, William, North East, assignor of two-thirds to S. A. Davenport, Erie, and C. A. Hitchcock, North East, Pa. Telegraph system	399,314	Mar. 12	798	206	46	1295
Burns, James R., Friendship, Me. Pound for lobsters	399,241	Mar. 12	690	180	46	1275
Burns, Robert W., Dayton, Ohio. Envelope-tablet	399 829	Mar. 19	1582	409	46	1458
Burns, Robert W., Dayton, Ohio. Combined paper and envelope tablet	399,830	Mar. 19	1583	410	46	1458
Burns, Samuel A. (See Wright, Berton L., assignor.)						
Burnside, Myron C., *et al.* (See White, Charles W., assignor.)						
Burr, Sanford S., assignor of one-half to T. S. Dick, Winnetka, Ill. Portable bath	399,968	Mar. 19	1770	458	46	1495
Burrage, William R., Toronto, Ontario, Canada. Bag-holder	398,817	Mar. 5	9	3	46	1116
Burrill, Frank H., and G. G. Russell, Concord, Mass. Scale-pan	399,315	Mar. 12	801	207	46	1295
Burroughs, William S., assignor to American Arithmometer Company, St. Louis, Mo. Ribbon-winding device	396,070	Jan. 15	1176	298	46	250
Burson, William W., Chicago, Ill. Clip for whiffletrees	399,831	Mar. 19	1584	410	46	1458
Burton, Benjamin, assignor of one-half to E. A. Giles, Chicago, Ill. Automatic measuring device for liquids	395,652	Jan. 1	541	136	46	109
Burton, Henry G. (See Clark, Charles B., assignor.)						
Burton, John E., *et al.* (See Odell, Levi J., assignor.)						
Burton, Oscar F., Brooklyn, N. Y. Water-elevating device	395,482	Jan. 1	259	67	46	55
Bury, Richard A., and R. M. Bidelman, Adrian, Mich. Carburetor	398,225	Feb. 19	1686	446	46	924
Busby, Nahum J., Maplewood, Mass. Alarm for doors, &c	399,242	Mar. 12	691	180	46	1275
Buscher, John. (See Frey and Buscher.)						
Buschmann, Victor H., assignor to A. H. Brinkmann, Baltimore, Md. Bustle	396,025	Jan. 8	1115	283	46	298
Busmann, Oscar S., Somerville, Mass., assignor to Bernstein Electric Light Manufacturing Company, Portland, Me. Switch and cut-out for electric light and other electrical devices	397,109	Feb. 5	5	2	46	580
Butcher, Charles, Cambridge, Mass. Inlaid floor or wood covering	396,917	Jan. 29	2149	629	46	512
Butler, Abel, Dale, Ind. Protractor	395,875	Jan. 8	896	230	46	187
Butler, Bauman, St. Johnsbury Centre, Vt. Implement for dropping fertilizer	396,371	Jan. 15	1588	402	46	326
Butler, Constant B., Alliance, assignor of one-half to P. W. Harrison, Paris, Tex. Wire-tightener	396,682	Jan. 22	2097	538	46	432
Butler, Henry A., assignor of one-half to W. P. Shepard, Syracuse, N. Y. Knockdown table	396,918	Jan. 29	2450	630	46	512
Butler, Thomas L., Blackstone, Mass. Driving mechanism for spinning-spindles	397,629	Feb. 12	822	215	46	741
Butterfield, George F., Stoneham, Mass. Boot or shoe	399,130	Mar. 5	498	133	46	1211
Butterfield, Levi C., Somerville, Mass. Folding bed	399,832	Mar. 19	1585	410	46	1458
Butterworth, Alexander W., New York, N. Y. Stretcher for mechanical-telephone-line wires	399,016	Mar. 5	316	85	46	1175
Butterworth, Richard E., *et al.* (See Grzybowski, Julian T., assignor.)						
Button, Anson T., *et al.* (See Bowman and Widdifield, assignors.)						
Button, Conyers, *et al.* (See Goodman, Samuel N., assignor.)						
Butts, William, assignor of one-half to J. F. Somes, Chicago, Ill. Dish-washer	397,533	Feb. 12	649	170	46	709
Butts, William L., Nashville, Tenn. Pump	398,938	Mar. 5	186	50	46	1149
Buxton, William S., Springfield, Mass. Ratchet-and-pawl device	395,737	Jan. 8	666	170	46	143
Busby, Franklin T., and A. H. Snyder, South Bend, Ind.; said Busby assignor to said Snyder. Automatic fan	398,311	Feb. 19	1822	481	46	953
Byce, Lyman C., Petaluma, Cal. Chicken-brooder	395,876	Jan. 8	898	230	46	187
Byrne, Robert E. (See Schmedlen and Byrne.)						
Byrne, Samuel, Toronto, Ontario, Canada. Car-coupling	398,026	Feb. 19	1404	370	46	869
Bywaters, Joseph K., Paris, Tex. Baling-press	398,312	Feb. 19	1823	481	46	953
Cable, John, Cable, Minn. Dumping-cart	396,982	Jan. 29	2539	656	46	531
Cabot, William B., West Medford, and R. M. Bradley, Boston, Mass. Elevator	398,699	Feb. 26	2395	636	46	1073
Cade, Baylus, Louisburg, N. C. Railway-telegraph	396,983	Jan. 29	2540	656	46	531
Cade, Baylus, Louisburg, N. C. Railway-telegraphy	397,049	Jan. 29	2633	679	46	549
Cade, George, assignor of one-half to J. W. Maumee, Memphis, Tenn. Device for handling shelf goods, &c	395,949	Jan. 8	997	256	46	207
Cadwell, Edward L. (See Cadwell, Marvin S. and E. L.)						
Cadwell, Lydia J., Chicago, Ill. Pavement	398,939	Mar. 5	187	50	46	1150
Cadwell, Lydia J., Chicago, Ill., assignor to Metal Block Pavement Company, of Illinois. Pavement	398,940	Mar. 5	188	50	46	1150
Cadwell, Marvin S. and E. L., Lansing, Mich. Plow-point	396,728	Jan. 29	2165	555	46	453
Cadwell, Marvin S. and E. L., Lansing, Mich. Mold-board or breaking plow	397,415	Feb. 5	471	124	46	669
Cadwell, William H., Chicago, Ill. Folding crate	397,594	Feb. 19	1191	319	46	832
Cady, Edward W., Rockwell, Iowa. Corn-harvester	396,538	Jan. 22	1875	482	46	389
Cady, Henry G., Pine Bluff, Ark. Fence-machine	398,236	Feb. 19	1688	446	46	924
Cael, Joseph D., and G. L. Ogle, Wilmington, Del. Car-coupling	396,919	Jan. 29	2451	630	46	513
Cahill, Stephen A. (See O'Connell and Cahill.)						
Cain, Cornelius T., Owensborough, Ky. Photograph transferring and printing frame	398,941	Mar. 5	189	51	46	1150
Cain, Harry M., Denver, Colo. Butter-cutter	398,879	Mar. 5	94	26	46	1131
Caldera, Andrea L., Turin, Italy. Key-board musical instrument	395,543	Jan. 1	351	90	46	74
Caldwell, Eli, East Las Vegas, New Mex. Tool-box	398,700	Feb. 26	2397	636, 637	46	1073
Caldwell, Joseph E., Goodland, Kans. Carpet-fastener	398,492	Feb. 26	2089	550	46	1012
Caldwell, Joseph P. (See Spradley, Napoleon B., assignor.)						
Caldwell, William H. (See Rosentreter, Frank L., assignor.)						
Caldwell, William L., Indianapolis, Ind. Advertising device	398,227	Feb. 19	1689	447	46	925
Callahan Company, Cornelius. (See Callahan, Cornelius, assignor.)						
Callahan, Cornelius, assignor to C. Callahan Company, Boston, Mass. Hose-coupling	395,877	Jan. 8	899	230	46	187
Callender, William M., New York, N. Y. Junction-box for electrical conductors	397,221	Feb. 5	180	48	46	610
Caller, Annie, assignor to herself and A. J. Putnam, Albany, N. Y. Meat-broiler	398,493	Feb. 26	2090	551	46	1013
Calley, Freeman A., assignor to E. Jenks Manufacturing Company, Pawtucket, R. I. Tension device for knitting-machines, &c	398,127	Feb. 19	1546	410	46	897

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Cambria Iron Company. (See Coffin, John, assignor.)						
Cameron, Henry F. D., assignor to Woodward Electrical Company, Detroit, Mich. Insulating support for secondary-battery electrodes	395,311	Jan. 1	9	3	46	4
Cameron, John R., Pittsburg, Pa. Apparatus for creating a vacuum for motive power	395,690	Jan. 8	600	151, 152	46	130
Camier, Isaac, Chicago, Ill. Spokesshave	395,732	Jan. 8	667	170	46	143
Camp, Benjamin F., assignor, by mesne assignments, of one-half to J. E. Bowers, Clinton, Ky. Wood-sawing machine	396,026	Jan. 8	1116	284	46	228
Camp, Frederic A., and F. G. Corser, Minneapolis, Minn. Boiler	400,054	Mar. 26	1891	491	46	1598
Campbell, Allan, Chicago, Ill. Heat-absorbing plate for cooling-coils	399,493	Mar. 12	1061	277	46	1346
Campbell, Andrew D. (See Taylor, Benjamin F., assignor.)						
Campbell Burner Company. (See Todd, Cornelius B., assignor.) (Reissue.)						
Campbell, Calvin A., Montreal, Quebec, Canada. Binding-case	396,464	Jan. 22	1706	452, 453	46	369
Campbell, Charles G. (See Wiedersum, Philip H., assignor.)						
Campbell, Daniel W., West Troy, assignor of one-half to F. H. Stowe, Albany, N. Y. Ornamental fabric for table-spreads	399,182	Mar. 5	803	153	46	1220
Campbell, Henry F., Malden, Mass. Presser-bar	395,380	Jan. 1	113	28	46	25
Campbell, Henry H., assignor of one-half to N. W. Taylor, Cleveland, Ohio. Device for feeding fuel	395,730	Jan. 8	668	171	46	143
Campbell, James A., New Orleans, La. Barrel-head	399,494	Mar. 12	1062	277	46	1346
Campbell, John S., London, England. Dental engine	397,169	Feb. 5	106	27	46	597
Campbell, Joseph H., New York, N. Y. Utilizing aqua-ammonia as a motive power in engines	399,131	Mar. 5	499	133	46	1211
Campbell, Joseph H., New York, N. Y. Utilizing aqua-ammonia as a motive power in engines	399,132	Mar. 5	502	133	46	1212
Campbell, Joseph H., New York, N. Y. Ammonia-vapor engine	399,133	Mar. 5	505	134	46	1213
Campbell, Robert A. (See Teal and Campbell.)						
Campbell, William. (See Brallier, Jacob L., assignor.)						
Campbell, William A., Hyde Park, Ill. Sample-holder	399,017	Mar. 5	317	85	46	1175
Campbell, William W., Cambria, Ind. Fence	399,833	Mar. 19	1586	411	46	1458
Campion, William. (See Payne and Campion.)						
Canda, Ferdinand E., New York, N. Y. Dumping-car	396,140	Jan. 15	1276	327	46	269
Cannan, John J., Rochester, N. Y. Coupling and automatic circuit-breaker for fire-alarm circuits	399,738	Mar. 19	1429	367	46	1428
Cantrell, Thomas G., *et al.* (See Kennedy, Hugh, assignor.)						
Capehart, Baldy A., assignor of one-half to J. R. Littell, Washington, D. C. Pocket-book	399,376	Mar. 12	897	223	46	1313
Capek, John V., Brooklyn, assignor to himself and E. H. Johnson, New York, N. Y. Electrical heating	395,950	Jan. 8	998	256, 257	46	207
Carbon Iron Company. (See Eames, Charles J., assignor.)						
Card, George F., Covington, Ky., assignor to G. F. Card Manufacturing Company, Cincinnati, Ohio. Electric time-meter	396,645	Jan. 22	2046	525	46	421
Card Manufacturing Company, George F. (See Card, George F., assignor.)						
Carey, George H., and W. McArthur, Dollarville, Mich. Sounder attachment	396,465	Jan. 22	1767	453	46	370
Carey, William A., Malden, Mass. Electric-current indicator	397,966	Feb. 19	1292	345	46	849
Carhart, Leonard R., Coeymans, N. Y. Sleigh-truck	396,646	Jan. 22	2047	526	46	422
Carhart, Leonard R., Coeymans, N. Y. Scraper	396,647	Jan. 22	2048	526	46	422
Carhart, Leonard R., Coeymans, N. Y. Machine for planing ice	400,189	Mar. 26	2093	518	46	1568
Carleton, Granville E., Rockport, Me. Kiln for calcining stone, &c	399,495	Mar. 12	1063	277	46	1346
Carleton, Granville E., Rockport, Me. Calcining rock	399,496	Mar. 12	1065	278	46	1346
Carleton, Roswell, *et al.* (See Graf, Anton, assignor.)						
Carlisle, Frederick, Franklin, assignor of part to C. E. Hoffman, Jersey City, N. J. Apparatus for absorbing gases	395,691	Jan. 8	601	152	46	130
Carman, Alvin O., Potterville, Mich. Harvester-reel	399,652	Mar. 19	1310	336	46	1404
Carmichael, Henry, Malden, Mass. Treating fiber ware	395,251	Jan. 8	1000	.....	46	207
Carmichael, Henry, Malden, Mass. Machine for molding fibrous ware	397,778	Feb. 12	1032	276	46	782
Carnahan, Cyrus M., Cornopolis, assignor to C. C. Dickey, trustee, Pittsburg, Pa. Metal blank for vehicle-tongues, &c	399,969	Mar. 19	1772	458	46	1495
Carnegie, Phipps & Co. (See Simpson, James H., assignor.)						
Carpenter, Amos H., *et al.* (See Lawrence, Victor V., assignor.)						
Carpenter, James W. (See Shawhan, Jabez F., assignor.)						
Carpenter, Wilber M., St. Louis, Mo. Cane	396,027	Jan. 8	1117	284	46	229
Carper, Kent H., Salem, Va. Spark-conductor	398,818	Mar. 5	10	3	46	1116
Carr, Charles, Boston, Mass. Machine for molding multitubular pipe	395,740	Jan. 8	669	171	46	144
Carr, Charles, Boston, Mass. Hydrant	396,326	Jan. 15	1551	392, 393	46	319
Carr, Charles, Boston, Mass. Tile-machine	396,466	Jan. 22	1768	453	46	370
Carr, John F., Tiverton, R. I. Incubator	395,483	Jan. 1	261	67	46	55
Carr, John F., Tiverton, R. I. Incubator	395,484	Jan. 1	262	68	46	55
Carrasco, Charles C., Boston, Mass. Veterinary drencher	400,298	Mar. 26	2263	592	46	1599
Carroll, Alfred L. and B. J., New Brighton, N. Y., assignors to American Patents Company, of Pennsylvania. Sandal	397,967	Feb. 19	1293	345	46	850
Carroll, Bradish J. (See Carroll, Alfred L. and B. J.)						
Carroll, John E., assignor to Certright Metal Roofing Company, Philadelphia, Pa. Gable-end finish for roofing	397,534	Feb. 12	651	170	46	709
Carroll, John E., assignor to Certright Metal Roofing Company, Philadelphia, Pa. Hip-covering and corner-finish for roofing	397,535	Feb. 12	652	171	46	710
Carroll, William. (See Franks and Carroll.)						
Carsley, Robert B., New Bedford, Mass., assignor to Triumph Heat and Light Company, Portland, Me. Burner	397,630	Feb. 12	823	215	46	741
Carsley, Robert B., New Bedford, Mass., assignor to Triumph Heat and Light Company, Portland, Me. Vaporizer	397,631	Feb. 12	825	216	46	741
Carson, Howard A., Boston, Mass. Apparatus for raising and moving earth	399,970	Mar. 19	1773	459	46	1495
Carson, John, *et al.* (See Roberts, Thomas, assignor.)						
Carstensen, Larus F., Bridgeport, Conn. Bicycle	398,228	Feb. 19	1691	447	46	925
Carstensen, Larus F., Bridgeport, Conn., assignor to Armstrong Manufacturing Company. Wrench	396,857	Jan. 29	2361	605	46	485
Carter, Charles D., Spring Arbor, Mich. Road-cart	395,952	Jan. 8	1002	257	46	207
Carter, Edward D., Celeste, Tex. Combined cultivator and planter	398,701	Feb. 26	2398	637	46	1073
Carter, Edwin E., assignor to J. S. Scully, Pittsburg, Pa. Mining-machine	398,313	Feb. 19	1825	482, 483	46	953
Carter, George T., Pittsburg, Pa., assignor of one-half to W. M. Smith, Rochester, N. Y. Trousers-strap	397,968	Feb. 19	1294	345	46	850
Carter, Henry L., Philadelphia, Pa., and T. H. Savery, Wilmington, Del. Paper-making machine	397,275	Feb. 5	257	66, 67	46	624

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Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Carter, Thomas E., Augusta, Kans. Cultivator and harrow	397,632	Feb. 12	826	216	46	741
Carter, William E. (See Thomas, Jabez, assignor.)						
Carter, William T., and J. Keeble, Bury St. Edmunds, county of Suffolk, assignors to A. W. Collins, London, England. Road-sweeping machine	399,971	Mar. 19	1774	459 460	46	1496
Cartwright, Robert F. (See McAdams, John, assignor.)						
Carty, John J., New York, N. Y., assignor to American Bell Telephone Company, Boston, Mass. Electric circuit	399,377	Mar. 12	898	234	46	1313
Carver, Albert N., and N. J. Stone, Boston, Mass. Relief-valve	396,858	Jan. 29	2362	606	46	495
Cary & Co., L. K., *et al.* (See Holley, Clarence E., assignor.)						
Case Threshing Machine Company, J. I. (See Dingee, William, W., assignor.)						
Cashmore, Edwin J. (See Cooper and Cashmore.)						
Casler, Benjamin G., Cleveland, Ohio. Supplemental bearer for coffin or casket stools	395,381	Jan. 1	113	29	46	25
Casler, Benjamin G., Cleveland, Ohio. Show-rack	398,027	Feb. 19	1406	371	46	870
Caspar, Henry, New Orleans, La. Coin-controlled turnstile	399,972	Mar. 19	1776	460	46	1496
Cassidy, Jacob H., Leavenworth, Kans. Cover-fastener for vessels	399,634	Mar. 19	1587	411	46	1459
Cassidy, John C., East Orange, N. J. Combined gas and electric light fixture	399,497	Mar. 12	1066	278	46	1347
Cassidy, John W., Petaluma, Cal. Rotary fan for fruit-driers	399,973	Mar. 19	1777	460	46	1496
Castle, Oliver H., Indianapolis, Ind. Steam-engine governor	399,653	Mar. 19	1311	336	46	1404
Castner, George L., Memphis, Tenn. Coin-package	400,052	Mar. 26	1893	492	46	1526
Caston, George W., Boston, Mass. Manufacturing shoes	397,488	Feb. 12	586	152	46	698
Caston, James P., and L. C. Smith, Polkton, N. C. Music-book holder	398,128	Feb. 19	1548	410	46	898
Castor, Lewis F., Philadelphia, Pa. Road-cart	396,392	Jan. 22	1654	425	46	346
Castree Mallery Company. (See Youngs, Edwin J., assignor.)						
Caswell, Richard H., Ingersoll, Ontario, Canada. Curd-mill	398,880	Mar. 5	95	26	46	1132
Catlin, Chester C. (See Warner, Charles E., assignor.)						
Caughey, Robert C., Leet, assignor of three-fourths to J. F. S. Boyd, J. E. Williamson, and D. E. Zinn, Allegheny, Pa. Wire-support	397,830	Feb. 12	1105	296	46	796
Cauthers, William J. (See Fisher, Samuel, assignor.)						
Cavagnaro, Frank, *et al.* (See Anderson and Elias, assignors.)						
Cavallaro, Frank. (See Briggs and Cavallaro.)						
Cawthorne, Edward, Darlington, Wis. Automatic cut-off for cistern-pipes	397,416	Feb. 5	473	124	46	669
Caylor, Edward H., Columbus, Ohio, and C. H. McCreery, Belvidere, Ill. Spring-bed	396,806	Jan. 29	2295	587	46	479
Celluloid Novelty Company. (See Furman, John A., assignor.)						
Chamberlain, Charles. (See Colhapp, John L., assignor.)						
Chamberlain, J. Chester, New York, N. Y. Electric cut-out device	396,920	Jan. 29	2458	630	46	513
Chamberlain, William D. (See Murphey, Frank P., assignor.)						
Chambers, Fannie, New York, N. Y. Chalk-holder	395,812	Jan. 8	798	208	46	167
Chambers, Matthew C., Brooklyn, N. Y. Drawing-press	398,229	Feb. 19	1693	448	46	926
Champion, William S., Goliad, assignor of one-half to B. Peck, Goliad County, Tex. Hay-press	397,338	Feb. 5	355	92, 93	46	645
Chandler, Norris S., Springfield, Mass. Combined jug-holding device and shipping-case	396,984	Jan. 29	2541	656	46	531
Chandler & Price. (See Price, William H., Jr., assignor.)						
Chapin, Chalmers, Holyoke, Mass. Suction-plate for paper-machines	395,544	Jan. 1	354	91	46	74
Chapin, Daniel S., Milford, Mass. Roller-gin	400,190	Mar. 26	2094	548 549	46	1569
Chaplin, Orril R., Boston, Mass. Roller-journal bearing	400,053	Mar. 26	1894	492	46	1526
Chapman, Denison W., South Park, Ill. Preparation of peptonized foods	397,222	Feb. 5	181	.....	46	610
Chapman, John R., assignor of two-thirds to C. P. Ball and C. T. Pollard, Montgomery, Ala. Elevated railway	400,054	Mar. 26	1895	492 493	46	1526
Chapman, William. (See O'Neill, Charles Z., assignor.)						
Chappel, Charles H., Dayton, Ohio. Gluing-machine for binding-strips	395,692	Jan. 8	603	152	46	130
Chappell, George H., W. and J. Brown, Brownton, Minn. Head-protector	396,141	Jan. 15	1278	327	46	270
Chappell, Thomas C. (See Moore, Everett D., assignor.)						
Chappell, Thomas C., Baltimore, Md. Car-coupling	398,702	Feb. 26	2400	637	46	1074
Chappell, Thomas C., and E. D. Moore, Baltimore, Md.; said Moore assignor to said Chappell. Letter-box	400,299	Mar. 26	2263	592 593	46	1599
Charles, Robert S., St. Louis, Mo. Egg or cake beater	397,831	Feb. 12	1105	296	46	797
Chase, Denison, Orange, and W. L. Chase, Worcester, Mass. Machine for sawing shingles	398,230	Feb. 19	1694	448 449	46	926
Chase, Henry A., Boston, Mass. Electric conduit	400,300	Mar. 26	2267	593	46	1600
Chase, Isaac M., Washington, D. C. Conservatory for paper	397,276	Feb. 5	259	67	46	625
Chase, John F., Augusta, Me. Condensing apparatus	396,539	Jan. 22	1677	483	46	389
Chase, Jonathan, Boston, Mass. Coal-elevator	399,835	Mar. 19	1588	411 412	46	1459
Chase, Margaret H. (See Welch, Howard F., assignor.)						
Chase, Milton, and M. H. Foster, assignors to Combination Nail Machine Company, Haverhill, Mass. Nail-machine	397,068	Jan. 29	2661	685 686	46	554
Chase, Sherwood M., Navarre, Ohio. Float-valve for water-works	397,895	Feb. 19	1192	320	46	832
Chase, William A., assignor of one-half to F. B. Livingston, Morrisville, Vt. Indicator for lamps, lanterns, &c.	396,540	Jan. 22	1678	483	46	389
Chase, William D., Hackensack, N. J. Mechanical toy	400,055	Mar. 26	1896	493	46	1527
Chase, William L. (See Chase, Denison and W. L.)						
Chatterson, Wright, assignor to O. W. Hawkins, Portsmouth, and J. W. Hawkins, South Bay City, Mich. Tongue-tip for vehicles	396,683	Jan. 22	2098	538	46	432
Cheatham, James C. (See Bryan, John C., assignor.)						
Cheatham, William T., Pulaski, Tenn. Fifth-wheel	396,265	Jan. 15	1463	372	46	304
Cheesman, Charles D., Birmingham, Conn. Buckle	396,266	Jan. 15	1464	373	46	304
Cheever, Benjamin H. (See Stevens, Benjamin D., assignor.)						
Chemical Carbon Company. (See Morris, John, assignor.)						
Cheney, David W., assignor of one-half to T. O. Thorbus, Sparta, Wis. Walking-plow	397,582	Feb. 12	738	191	46	725
Cheesebrough, Robert A., New York, N. Y. Pneumatic propelling and steering apparatus	397,223	Feb. 5	183	49	46	611
Cheshier, A. L., *et al.* (See Cheshier, Presley S., assignor.)						
Cheshier, C. T., *et al.* (See Cheshier, Presley S., assignor.)						
Cheshier, D. A., *et al.* (See Cheshier, Presley S., assignor.)						
Cheshier, Presley S., Excelsior Springs, assignor of three-fourths to A. L., C. T., and D. A. Cheshier, Trenton, Mo. Catarrh remedy	399,836	Mar. 19	1589	.....	46	1459
Chevallier, Louis, Brooklyn, N. Y. Photographic camera	398,231	Feb. 19	1698	449	46	927
Cheyne, John, Paterson, N. J. Machine for softening jute, hemp, &c.	395,741	Jan. 8	671	172	46	144
Cheyney, William A. (See Barras, Samuel T., assignor.)						
Chesem, Andrew, Sergeant Bluffs, Iowa. Weed-cutter and horse-hoe	398,376	Feb. 26	1934	508	46	981
Chicago Sash Pulley Company. (See Phillips, Francis V., assignor.)						
Chichester, Lewis S., assignor to C. P. Bassett, Newark, N. J. Water-renovator	398,494	Feb. 26	2091	551 552	46	1013
Chichester, Lewis S., assignor to C. P. Bassett, Newark, N. J. Water renovating and purifying device	400,301	Mar. 26	2268	593 594	46	1600

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Child, Brainard W. (See Wemple, George W., assignor.)						
Childs, Charles H., Cleveland, Ohio. Vapor-burner	399,183	Mar. 5	594	153	46	1229
Chinnery, Luther G. and S. M., London, England. Gasogene or apparatus for making aerated beverages	399,739	Mar. 19	1429	368	46	1428
Chinnery, Swarts M. (See Chinnery, Luther G. and S. M.)						
Chisholm, John A. (See Scott and Chisholm.)						
Chorpenning, John C., Springfield, Ohio. Writing-tablet	397,970	Feb. 19	1296	346	46	850
Chonteau, Pierre. (See Barth, Gustav A., assignor.)						
Christy, Thomas, London, England. Medicated bougie	400,056	Mar. 26	1899	493	46	1527
Christy, Thomas J., St. Louis, Mo., assignor to Economy Folding Bed Company, East St. Louis, Ill. Folding bed	397,779	Feb. 12	1034	276	46	782
Chubb, Edwin A., Cortland, N. Y. Side spring for carriages	396,071	Jan. 15	1178	298	46	250
Chubb, Thomas H., Post Mill Village, Vt. Fishing-fly book	399,507	Mar. 12	1229	317	46	1376
Church, Charles L., Bangor, Me. Combined envelope and letter-sheet	396,985	Jan. 29	2543	657	46	532
Church, Duane H., Newton, Mass. Dust-band for watches	396,267	Jan. 15	1465	373	46	304
Churchill & Alden. (See Griffin, John H., assignor.)						
Clamer, Francis J., and J. G. Hendrickson, Philadelphia, Pa. Protecting the negative plates of electrical batteries	397,489	Feb. 12	588	153	46	698
Clapp, Dwight C., assignor of one-half to D. M. Estey, Owosso, Mich. Furniture-drawer	399,598	Mar. 12	1230	317	46	1376
Clapp, George, Philadelphia, assignor of one-half to T. D. Abraham, Upper Merson, Pa. Gun-wad	396,986	Jan. 29	2544	657	46	532
Clark, Abbie L., Easton, Pa. Knife-blade	397,692	Feb. 12	914	242	46	759
Clark, Albert V., and E. T. Mapel, Alameda, Cal. Oil-burning limekiln	396,541	Jan. 22	1879	483	46	389
Clark, Alexander E., Buckholts, Tex. Trace-carrier	399,498	Mar. 12	1068	278	46	1347
Clark, Alvan G., Cambridgeport, Mass. Photographic lens	399,499	Mar. 12	1068	279	46	1347
Clark, Anna J. (See Clark, Thomas, assignor.)						
Clark, Asa, R. A. and C. Ashley, assignors to said Clark and R. A. and L. E. Ashley, Stockton, Cal. Endless cutting apparatus	397,224	Feb. 5	184	49	46	611
Clark, Charles B., New Britain, Conn., assignor of one-half to H. G. Burton, U. S. Army. Composition for cleaning the teeth	396,192	Jan. 15	1358	.....	46	284
Clark, Edson P., and A. T. Crossley, Northampton, Mass. Cash and parcel carrier	399,018	Mar. 5	319	86	46	1175
Clark, Edward L., Pittsburg, Pa. Rolling-mill plant	397,339	Feb. 5	356	93, 94	46	646
Clark, Edward L., Pittsburg, Pa. Rolling metal strips	397,693	Feb. 12	914	242	46	759
Clark, Edward L., Pittsburg, Pa. Rolling-mill plant	400,192	Mar. 26	2097	549	46	1569
Clark, Edward W., Rochester, Minn. Bag-holder	400,191	Mar. 26	2096	549	46	1569
Clark, Gates A., assignor to Clark's Coking and Smokeless Furnace Company, Rochester, N. Y. Coking-furnace	399,378	Mar. 12	901	234	46	1314
Clark, Gates A., assignor to Clark's Coking and Smokeless Furnace Company, Rochester, N. Y. Coking-furnace	399,379	Mar. 12	902	234	46	1314
Clark, George H., Boston, Mass., assignor to Clark Relasting and Shoe Treeing Company, Portland, Me. Manufacture of boots and shoes	399,637	Mar. 19	1500	412	46	1459
Clark, Henry A. (See Tregurtha, Alfred T., assignor.)						
Clark, Isaac, Morris Plains, N. J. Thill-coupling	397,633	Feb. 12	628	216	46	742
Clark, James T., deceased, Milwaukee, Wis.; M. F. Clark administratrix. Railway-crossing	396,907	Jan. 29	2296	587 588	46	479
Clark, John M., assignor of one-half to C. L. Hinton, Dayton, Ohio. Coal-oil burner or heating apparatus	397,971	Feb. 19	1297	346	46	850
Clark, John T., La Grange, Ga., assignor of three-fourths to L. C. Pressley, New York, N. Y. Automatic air-supply for propelling cars	400,302	Mar. 26	2272	594	46	1601
Clark, Leander. (See Fisher and Ballard, assignors.)						
Clark, Mary F., administratrix. (See Clark, James T.)						
Clark, Morris W., Camden, N. J. Spring-block	395,545	Jan. 1	355	91	46	74
Clark, Oliver H., Pittsburg, Pa. Railway-crossing gate	396,072	Jan. 15	1179	299 300	46	250
Clark Relasting and Shoe Treeing Company. (See Clark, George H., assignor.)						
Clark, Stephen S. (See Taylor and Clark.)						
Clark, Thomas, assignor to A. J. Clark, Brooklyn, N. Y. Device for advertising	395,953	Jan. 8	1004	257	46	208
Clark, Walter B., Covington, Ky. Brake for street-railway cars	399,740	Mar. 19	1431	368	46	1428
Clark, William H., assignor to H. G. Bird, Chicago, Ill. Sand-box for railway-cars	396,352	Jan. 15	1588	402	46	330
Clarke, Charles D., Merrill, Wis. Lumber-pile	397,490	Feb. 12	588	153	46	698
Clarke, Fred, and H. H. Bassett, Piqua, Ohio. Lathe attachment	397,694	Feb. 12	916	242	46	759
Clarke, Freeman. (See Scofield, Henry L., assignor.)						
Clarke, George, Jersey City, N. J., assignor to H. G. Phillips, Wilmington, Del. Coffer-dam for vessels	398,232	Feb. 19	1700	449	46	927
Clarke, James W. (See Clarke, Jeanie P. and J. W.)						
Clarke, Jeanie P. and J. W., Boston, Mass. Game	398,233	Feb. 19	1701	450	46	928
Clarke, John, and R. W. Savage, Tyler, Tex. Radial-tube boiler	396,393	Jan. 22	1655	425	46	347
Clarke, Reuben, Toronto, assignor of one-half to A. F. Barron, Sarnia, Ontario, Canada. Door-hanger	395,693	Jan. 8	604	154	46	131
Clarke, Robert, Gravesend, N. Y. Manufacture of plumbers' traps	399,243	Mar. 12	692	180	46	1275
Clarke, Samuel, Child's Hill, county of Middlesex, England. Cup for food-warmers	399,741	Mar. 19	1434	369	46	1429
Clark's Coking and Smokeless Furnace Company. (See Clark, Gates A., assignor.)						
Clans, John. (See Crevert and Clans.)						
Claviger Cycle Company. (See Golding, William, assignor.)						
Clayton, John N., assignor of one-half to J., J. E., C. R., and B. L. Lambert, Ypsilanti, Mich. Vapor-burner	396,353	Jan. 15	1590	403	46	398
Cleary, James K., Washington, D. C. Can or similar vessel	398,234	Feb. 19	1704	450	46	928
Cleaveland, John B., Indianapolis, Ind. Fence	397,110	Feb. 5	7	2	46	560
Cleaver, Frank C., Terre Haute, Ind. Slide-valve	397,170	Feb. 5	107	28	46	598
Clement, Francis M., Marion, Ky. Bee-hive	399,742	Mar. 19	1435	369	46	1429
Clement, John. (See Baldwin and Clement.)						
Clements, Thomas, and G. H. Royce, assignors to J. Cunningham Son & Company, Rochester, N. Y. Apparatus for framing and setting up vehicle-bodies	395,485	Jan. 1	265	68	46	56
Clemson, George N., Middletown, N. Y. Hack-saw	400,057	Mar. 26	1900	494	46	1528
Cleveland Burial Case Company. (See Weckmiller, Adolph, assignor.)						
Cliff, Edward, Rochester, N. Y. Bolster-spring for wagons	399,638	Mar. 19	1501	412	46	1460
Cliff, James, Scriba, assignor of one-half to L. E. Todd, Oswego, N. Y. Wagon-bolster spring	397,632	Feb. 12	1107	296	46	797
Clifford, John, assignor to L. Wolff Manufacturing Company, Chicago, Ill. Hose-nozzle	399,654	Mar. 19	1313	336	46	1405
Cline, George J., Goshen, Ind. Fence-machine	398,377	Feb. 26	1934	509	46	981
Clinton, Merle E., Washington, D. C., assignor to Schicht & Field Company, New York, N. Y. File-box	395,312	Jan. 1	10	3	46	4
Closson, David B., Boston, assignor of one-half to W. B. Rice, Quincy, Mass. Boot or shoe	396,542	Jan. 22	1680	483	46	390
Clotworthy, William P., Baltimore, Md. Preserving cocoanut	400,303	Mar. 26	2273	.....	46	1601

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Cloud, William H., assignor of one-half to W. Styer, Kokomo, Ind. Pump	396,193	Jan. 15	1359	349	46	284
Clouette, Narcisse, assignor of one-half to E. C. Willey, Manchester, N. H. Combined trap and dirt-collector	395,313	Jan. 1	10	3	46	4
Clough, Edwin R., and E. M. Easley, Lebanon, Mo. Leveling-instrument	397,695	Feb. 12	917	243	46	759
Clough, Edwin R., and F. Jones, Lebanon, Mo. Fire-kindler	397,696	Feb. 12	917	243	46	759
Clow, George E., Chicago, Ill. Detachable leg and standard for stools or tables	397,225	Feb. 5	186	49	46	611
Coad, Theophilus, Forest Gate, county of Essex, England. Voltaic battery	395,169	Jan. 8	708	182	46	151
Coates, John, Erie, Pa. Water-motor	396,729	Jan. 29	2168	556	46	453
Cobb, Henry B., Wilmington, Del. Underground system of electric wires	396,543	Jan. 22	1881	484	46	390
Cobb, John J., assignor to S. Hall and M. L. Sweet, Grand Rapids, Mich. Coupling for bent sleigh-knees	395,679	Jan. 1	578	145	46	117
Coble, Anthony, and J. H. Mounts, Montgomery City, Mo. Car-coupling	396,268	Jan. 15	1467	373	46	305
Coburn, George H., Laconia, N. H. Knitting-machine	395,314	Jan. 1	11	3, 4	46	5
Cochler, George W., Belleville, Kans. Gage-head for pocket-rules	396,808	Jan. 29	2298	588	46	479
Cochran, Hugh M., McConnelsville, Ohio. Respirator	396,809	Jan. 29	2298	588	46	480
Cockburn, Arthur C., London, England. Safety device for use in electric circuits	395,421	Jan. 1	166	42	46	35
Codd, Donald, assignor to R. D. Richardson, Winnipeg, Manitoba, Canada. Pencil-sharpener	399,529	Mar. 19	1592	413	46	1460
Codling, Robert B., Bristol, Conn. Machine for finishing caster-rollers	398,378	Feb. 26	1935	509	46	982
Codman & Shurtleff. (See Shurtleff, Asahel M., assignor.)						
Coerper, Carl, Cologne, Prussia, assignor to Helios Actien-Gesellschaft für Elektrisches Licht und Telegraphenbau, Ehrenfeld, Germany. Electro-dynamic machine	396,989	Jan. 15	1468	373	46	305
Coffin, Charles L., Detroit, Mich. Electric welding	395,678	Jan. 8	899	231	46	187
Coffin, Charles L., Detroit, Mich. Electric welding	396,270	Jan. 15	1469	374	46	305
Coffin, Charles L., Detroit, Mich. Electric welding	399,019	Mar. 5	320	86	46	1176
Coffin, David W. (See Reed, John C., assignor.)						
Coffin, John, Johnstown, Pa. Apparatus for toughening steel bars	399,381	Mar. 12	905	235	46	1315
Coffin, John, Johnstown, Pa., assignor to Cambria Iron Company, of Pennsylvania. Toughening steel axles	399,380	Mar. 12	903	235	46	1314
Coffin, John, Johnstown, Pa., assignor to Cambria Iron Company, of Pennsylvania. Continuously annealing and plating wire	399,382	Mar. 12	907	235	46	1315
Cogan, Jesse J., and E. A. Said, assignors of one-third to F. H. Ellis, St. Louis, Mo. Envelope	398,768	Feb. 26	2499	663	46	1094
Coghlan, John, assignor to C. W. Sherburne, Boston, Mass. Hose-coupling	396,684	Jan. 22	2099	539	46	432
Cohen, Robert L., Camden, N. J., assignor of one-half to W. F. Anderson, Philadelphia, Pa. Dynamo	397,340	Feb. 5	359	94	46	646
Cohn, Reuben, New York, N. Y. Ear-protector	397,583	Feb. 12	739	192	46	725
Cohn, Rika, *et al.* (See Mundt, Wilhelm, assignor.)						
Coiner, Gabriel D., Koiner's Store, Va. Tension device for use in making fences	399,383	Mar. 12	909	236	46	1315
Colam, William N., London, county of Middlesex, England. Cable-tramway gripper	395,422	Jan. 1	167	43, 44	46	35
Colam, William N., London, county of Middlesex, England. Pulley-carrier for cable tramways	395,423	Jan. 1	169	44, 45	46	36
Colam, William N., London, county of Middlesex, England. Cable tramway	395,424	Jan. 1	170	45	46	36
Colam, William N., London, county of Middlesex, England. Cable tramway	395,425	Jan. 1	171	45	46	37
Colbert, John M., Mantua, assignor to J. H. and F. Ferguson, Bridgeton, N. J. Can-soldering machine	399,020	Mar. 5	321	86	46	1176
Colby, Arthur. (See Colby and Coppersmith, assignors.)						
Colby, Caleb K., Brooklyn, and W. Coppersmith, New York, assignors to themselves and A. Colby, Brooklyn, N. Y. Bracelet	397,833	Feb. 12	1109	297	46	797
Colby, Edward J., Chicago, Ill. Galvanic battery	397,111	Feb. 5	9	2	46	580
Colby, Edward J., Chicago, Ill. Gas-regulator	398,881	Mar. 5	96	26	46	1132
Colby, Edward J., Chicago, Ill. Hotel-call	400,304	Mar. 26	2273	595	46	1601
Cole, Charles H., Little Rock, Ark. Carpet-lining	400,193	Mar. 26	2098	549	46	1569
Cole, George P., Johnstown, N. Y. Buckle	398,028	Feb. 19	1408	371	46	870
Cole, Henry, Denver, Colo. Manure and urine conduit	398,379	Feb. 26	1937	509	46	982
Cole, James A., Julian, Cal. Reversible plow	396,142	Jan. 15	1279	328	46	270
Cole, Jay F., and E. W. Parno, Greene, Iowa. Roof-connection for railway-cars	400,305	Mar. 26	2274	595	46	1601
Cole, Marshal T., Claremont, Minn. Clevis	396,859	Jan. 29	2363	606	46	495
Coleman, John A., Providence, R. I. Machine for feeding horseshoe-nails	396,467	Jan. 22	1771	453, 454, 455	46	370
Coleman, John A., Providence, R. I. Horseshoe-nail	397,896	Feb. 19	1193	320	46	832
Coleman, John P., Swissvale, Pa. Electric signaling apparatus	395,315	Jan. 1	12	4	46	5
Colhapp, John L., assignor of two-thirds to C. Chamberlain, Chicago, Ill. Paper pail	396,028	Jan. 8	1119	284	46	229
Collins, Albert W. (See Carter and Keeble, assignors.)						
Collins, Harry C., Springfield, Mass. Device for supporting and giving vibrating motion to hose-pipes	395,611	Jan. 1	460	117	46	94
Collins, James F., Allegheny, Pa. Spike-machine	399,500	Mar. 12	1069	279	46	1347
Collins, Paul E., Lynn, Mass. Boat-propelling mechanism	398,703	Feb. 26	2404	638	46	1075
Collyer, Robert H., New Orleans, La. Machine for decorticating fibrous plants	397,536	Feb. 12	653	171	46	710
Colquitt, George F., Purcell, Indian Ter. Tobacco-pipe	395,486	Jan. 1	267	69	46	56
Colton, Arthur L., Cleveland, Ohio. Fastener	398,819	Mar. 5	12	3	46	1116
Colton, George A., Phœnix, N. Y. Letter-box indicator	397,341	Feb. 5	360	94	46	646
Colwell, Evander N., assignor of one-half to C. F. Kenneweg, Allegheny, Pa. Car-coupling	397,277	Feb. 5	260	67	46	625
Colwell, Evander N., Allegheny, assignor of one-half to C. F. Kenneweg, Allegheny County, Pa. Producing forged articles from scraps of metal	397,278	Feb. 5	261	68	46	625
Combination Nail Machine Company. (See Chase and Foster, assignors.)						
Comrie, Jennings, Gloversville, N. Y. Glove	395,954	Jan. 8	1005	258	46	208
Comstock, Frank A., Columbus, Ohio. Vehicle-seat	396,194	Jan. 15	1300	349	46	285
Conacher, Alexander, Windsor, county of Berks, England. Refrigerating-machine	396,730	Jan. 29	2169	556, 557	46	453
Conacher, Alexander, Augusta, Ga. Air-pump	397,780	Feb. 19	1035	277	46	783
Conant, Luther, Oak Park, Ill. Feed-gage for printing-presses	399,384	Mar. 12	910	236	46	1316
Condict, George H., Philadelphia, Pa. Regulator for electrical machinery	399,509	Mar. 12	1231	318	46	1376
Condit, Ezekiel C., Kansas City, Mo. Furnace	397,697	Feb. 12	918	241	46	759
Conkey, Leonard L., Benton Harbor, Mich. Buckle	395,742	Jan. 8	672	172	46	141
Conklin, Edward R., Wauseon, Ohio. Wheel-cultivator	396,468	Jan. 22	1779	455, 456	46	371
Conklin, Theodore F., assignor of one-half to N. S. Lapperr, Chicago, Ill. Bluing-package	399,974	Mar. 19	1778	461	46	1496
Connelly, John S., *et al.* (See Wiedling, Carl T. A. H., assignor.)						
Connelly, Thomas E., *et al.* (See Wiedling, Carl T. A. H., assignor.)						
Conner, Edward G., Valatie, assignor to Tompkins Brothers, Troy, N. Y. Electrical stop-motion mechanism for knitting-machines	397,537	Feb. 12	655	171, 172	46	710

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Conner, Francis M., Aurelia, Iowa. Sled	395,879	Jan. 8	900	231	46	187
Conner, William A., Pittsburg, Pa. Electric cable	395,546	Jan. 1	356	91	46	74
Conniff, James F., Oconto, Wis. Steam-sled	400,058	Mar. 26	1901	494	46	1528
Connor, John P., Boston, Mass. Pastry-oven	398,380	Feb. 26	1938	510	46	982
Considine, Thomas A., Chicago, Ill. Molding-machine	398,704	Feb. 26	2406	638	46	1075
Consolidated Agency Company of London. (See Frampton, Robert C., assignor.)						
Consolidated Patents Company. (See Goodell, Etta A., assignor.)						
Continuous Kiln Company. (See Boehncke, Max A. T., assignor.)						
Converse, Edmund C., New York, N. Y. Tubing	399,244	Mar. 12	893	180	46	1276
Converse, Edmund C., New York, N. Y. Manufacture of tubing	399,245	Mar. 12	895	181	46	1276
Conway, Harrison V., Boone, Iowa. Car-coupling	400,306	Mar. 26	2275	595	46	1601
Conyers, Walter P. (See Luce, David S., assignor.)						
Cook, Frederick W., San Francisco, Cal. Saw-mill set-works	398,942	Mar. 5	191	51	46	1150
Cook, George W., Mountain View, Cal. Track-clearer	397,524	Feb. 12	740	192	46	726
Cook, John A., Buffalo, N. Y. Page-index	400,059	Mar. 26	1902	494	46	1528
Cook, John H., Washington, D. C. Combination-tongs	398,129	Feb. 19	1540	411	46	808
Cook, Winfield S. (See Westbrook and Cook.)						
Cooper, Charles. (See Cooper, George, assignor.)						
Cooper, Charles F. (See Hermite, Paterson, and Cooper.)						
Cooper, Frank J., Emporia, Kans. Shears	397,698	Feb. 12	919	243	46	760
Cooper, George, assignor of one-half to C. Cooper, Bennington, Vt. Circular-knitting machine	397,417	Feb. 5	473	125	46	609
Cooper, George L. (See Rhind and Cooper.)						
Cooper, Henry H., *et al.* (See Shannon, Patrick H., assignor.)						
Cooper, John W., Atlanta, Ga. Car-wheel	400,307	Mar. 26	2276	595	46	1601
Cooper, Jonathan H., Marshall, Tex. Watch-case bow	399,840	Mar. 19	1593	413	46	1460
Cooper, William M., and E. J. Cashmore, Toronto, Ontario, Canada; said Cashmore assignor to said Cooper. Magazine fire-arm	398,130	Feb. 19	1549	411	46	808
Co-Operative Foundry Company. (See Brayer, Nicholas, assignor.)						
Cooprider, Henry, Jr., Clay City, Ind. Traction-tongue for thrashing-machines	395,547	Jan. 1	357	91	46	74
Coplen, John D., Denver, Colo. Combined separator and concentrator	397,585	Feb. 12	742	192	46	726
Coplen, John D., Denver, Colo. Ore-crusher	399,600	Mar. 12	1234	318	46	1377
Coppersmith, William. (See Colby and Coppersmith.)						
Corbett, George, Bradford, Pa. Rig for drilling and pumping wells	396,544	Jan. 22	1883	484, 485	46	390
Corbett, Joseph, New York, N. Y., assignor to G. H. Hobart, Jersey City, N. J., and S. G. Donaldson, New York, N. Y. Snow-plow	395,548	Jan. 1	358	92	46	75
Corbin, Amasa, Jr., Gouverneur, N. Y. Vehicle-axle	398,925	Feb. 19	1705	450	46	928
Corbin Cabinet Lock Company. (See Doremus, Willard D., assignor.)						
Corey, John H., Pittsfield, Mass. Bottle-stopper	398,495	Feb. 26	2095	552	46	1013
Cork, Harrison T., Marshall, Ill. Folding step	398,496	Feb. 26	2096	552	46	1014
Corken, George C., *et al.* (See Simpson, David J., assignor.)						
Corliss, Emily A., administratrix. (See Corliss, George H.)						
Corliss, George H., deceased, Providence, R. I.; E. A. Corliss administratrix. Machine for finishing engine-bed castings	396,967	Jan. 29	2544	657	46	532
Cormack, George H., Rockford, Ill. Preparing grain. (Reissue)	10,978	Jan. 1	580	146	46	118
Cornely, Emil, Paris, France. Embroidering-machine	395,549	Jan. 1	360	92	46	75
Cornish, John A., Nashville, Ark. Grate	398,131	Feb. 19	1552	411	46	899
Cornwall, George L. (See Andrews, L. Edwin, assignor.)						
Cornwall, John D., Sanford, Fla. Construction of vessels	396,648	Jan. 22	2049	526	46	422
Corser, Frederic G. (See Camp and Corser.)						
Corssen, Dettmar J. M., Effingham, Ill. Oiler	397,050	Jan. 29	2635	679	46	549
Cortright Metal Roofing Company. (See Carroll, John E., assignor.)						
Cory, George W., Kane, Ill. Embroidery-frame	396,073	Jan. 15	1184	300	46	251
Cory, Henry W. (See Kennard and Cory.)						
Cosbie, William, San Francisco, Cal. Horse-collar	399,841	Mar. 19	1594	413	46	1460
Cosh, William M., Baltimore, Md. Apparatus for the manufacture of gas	400,060	Mar. 26	1903	495	46	1528
Costigan, Joseph P., St. Paul, Minn. Fishing-reel	396,469	Jan. 22	1780	456	46	372
Coston, Samuel B., Scranton, Pa. Griddle greasing and oiling utensil	396,860	Jan. 29	2364	607	46	495
Coulston, Joseph W., Philadelphia, Pa. Signal-light for vessels	395,880	Jan. 8	901	231	46	188
Coursen, George H., Baltimore, Md. Combined tobacco-pipe and cane	395,426	Jan. 1	172	45	46	37
Court, Nicholas, Will's Creek, Ohio. Egg-tester	398,236	Feb. 19	1707	450	46	929
Courtad, Henry, Sandusky, Ohio. Whiffletree	398,705	Feb. 26	2407	638	46	1075
Covel, Milo, Chicago, Ill. Saw-sharpening machine	398,030	Feb. 19	1410	372	46	870
Covel, Milo, Chicago, Ill. Device for holding and dressing saws	398,031	Feb. 19	1411	373	46	871
Covel, Milo, Chicago, Ill. Saw-swaging machine	398,032	Feb. 19	1413	373, 374	46	871
Covel & Osborn, *et al.* (See Snedden, George, assignor.)						
Covel, William L., Biloxi, Miss. Railway-car	398,029	Feb. 19	1409	372	46	870
Cowan, Alexander, Urbana, Ohio. Flood-fence	395,770	Jan. 8	1708	189	46	151
Cowan, Harry W., Gros, Dak. Ter. Automatic grain-measure	395,743	Jan. 8	673	172, 173	46	145
Cowen, Robert, assignor to Boston Woven Hose Company, Boston, Mass. Device for securing hose to couplings	396,582	Feb. 26	2216	586	46	1037
Cowles, Alfred H. (See Cowles, Eugene H. and A. H.)						
Cowles, Eugene H., Cleveland, Ohio. Manufacturing iron or steel	397,491	Feb. 12	589	.....	46	698
Cowles, Eugene H. and A. H., Cleveland, Ohio. Alloy	397,609	Feb. 12	920	.....	46	760
Cowles, Henry A., assignor to Bay State Whip Company, Westfield, Mass. Whip	397,456	Feb. 5	541	142	46	681
Cowles, William, Brooklyn, N. Y. Steam-boiler	396,545	Jan. 22	1887	485, 486, 487	46	391
Cowley, James T., Lowell, assignor to Lamson Store Service Company, Boston, Mass. Store-service apparatus	395,316	Jan. 1	14	4, 5	46	5
Cox, Henry F., Altoona, Pa. Rail-chair	398,381	Feb. 26	1939	510	46	983
Cox, Samuel B., and J. W. Anderson, Lancaster, Pa.; said Cox assignor to said Anderson. Fifth-wheel	396,810	Jan. 29	2299	588	46	480
Cox, William H., Virden, Ill. Gate	398,706	Feb. 26	2408	638, 639	46	1075
Coxon, Samuel. (See Venables and Hughes, assignors.)						
Cozans, Luke F., *et al.* (See Balet, Joseph W., assignor.)						
Crabb, Walter H. (See Heath, Emery, assignor.)						
Crafts, Francis H., assignor to E. & B. Holmes, Buffalo, N. Y. Pressure-plate for planing-machines	395,467	Jan. 1	289	69	46	57
Crafts, Francis H., assignor to E. & B. Holmes, Buffalo, N. Y. Chip-breaker	397,834	Feb. 12	1110	297	46	797

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Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Craig, Warren H., Lawrence, Mass. Steam-engine lubricator	397,972	Feb. 19	1298	347	46	851
Craig, Warren H., Lawrence, Mass. Lubricator	398,583	Feb. 26	2216	586	46	1037
Craigie, Hugh H., Stamford, Conn. Water-closet	397,781	Feb. 12	1037	277	46	783
Craigie, Hugh H., Stamford, Conn. Plunger water-closet	397,782	Feb. 12	1040	277, 278	46	783
Craigie, Hugh H., assignor to J. Craigie, Stamford, Conn. Siphon water-closet	399,184	Mar. 5	595	153, 154	46	1229
Craigie, Julia. (See Craigie, Hugh H., assignor.)						
Crain, William O., assignor of two-thirds to Wise Brothers, Baltimore, Md. Machine for compressing and bundling goods	397,457	Feb. 5	541	142	46	681
Crandall, Emmet N., and T. H. Turner, St. Joseph, Mo. Hot-air generator	395,813	Jan. 8	798	208, 209	46	167
Crandall, Henry F. (See Graham, Martincourt, and Crandall.)						
Crandall, Henry F., assignor to Milwaukee Harvester Company, Milwaukee, Wis. Grain-binder	398,382	Feb. 26	1940	510	46	983
Crandall, Jesse A., assignor of one-half to G. A. Hurd, Brooklyn, N. Y. Folding chair	398,943	Mar. 5	192	52	46	1150
Crandall, Joseph E., Washington, D. C. Protector for electrical instruments	397,418	Feb. 5	477	125	46	670
Crandall, Henry A., Harrison, Ark. Fruit-drier	398,584	Feb. 26	2218	586	46	1037
Crane, Calvin D., St. Louis, Mo. Paper-holder	395,771	Jan. 8	709	183	46	151
Crane, Carson P., Columbus, Ohio. Suspenders	396,861	Jan. 29	2366	607	46	496
Crane Elevator Company. (See Heermans, Thaddeus, assignor.)						
Crane, John S., Lake Village, N. H. Stopping device for knitting-machines	397,973	Feb. 19	1300	347, 348	46	851
Crane, Julian A., Vining, Kans. Protector for carpets, curtains, &c	396,327	Jan. 15	1555	393	46	319
Cranmer, William C., and S. W. Arnold, Philadelphia, Pa. Constructing underground conduits	400,308	Mar. 26	2277	596	46	1602
Crary, William P., New York, N. Y. Bottle-stopper	398,944	Mar. 5	193	52	46	1151
Craven, Albert W. (See Kaban and Craven.)						
Craver, Steele & Austin. (See Leffler, Paul W., assignor.)						
Crawford, Robert, Belfast, Ireland. Ironing or calendering machine	397,586	Feb. 12	743	192	46	796
Creamer, William G., Brooklyn, N. Y. Automatic car-ventilator	396,882	Mar. 5	97	27	46	1132
Credlebaugh, Henry S., New Carlisle, Ohio. Luggage-carrier for bicycles	398,945	Mar. 5	194	52	46	1151
Creed, William H., assignor one-half to J. T. Jones, Manilla, Ind. End-gate	398,237	Feb. 19	1707	451	46	929
Crees, George W. B., Wingfield, county of Wilts, England. Machine for washing dishes, &c.	397,783	Feb. 12	1044	278, 279	46	784
Crevert, William F., and J. Claus, New York, N. Y. Ironing-machine	397,700	Feb. 12	921	244	46	760
Crisp, William. (See Boynton and Crisp.)						
Criswell, Francis M. (See Waters, George F., assignor.)						
Critchell, Robert S., Oak Park, Ill. Fire-proof building	400,309	Mar. 26	2278	596	46	1602
Crocken, Harry M. (See Robison and Crocken.)						
Crockett, J. G., *et al.* (See Stewart, Shaw, assignor.)						
Crofut, Eber R., Newburyport, Mass., assignor to Solid Fiber Company, Portland, Me. Apparel-collar	396,685	Jan. 22	2101	539	46	432
Crome, Herman E., Jersey City, N. J. Vehicle-wheel	397,897	Feb. 19	1195	320	46	832
Cromer, Thomas L., O'Daniel, Tex. Planter	395,694	Jan. 8	604	153	46	131
Crommer, Robert, Philadelphia, Pa. Combined spice-caddy	398,383	Feb. 26	1942	510, 511	46	963
Crompton Loom Works. (See Wyman, Horace, assignor.)						
Crompton, Ralph, Elton, near Bury, county of Lancaster, England. Apparatus for dyeing and drying tissue and other paper	397,069	Jan. 29	2663	686, 687	46	555
Crooke, Walter. (See Massicks and Crooke.)						
Crosby, Edward H., Boston, Mass. Hose-pipe	397,171	Feb. 5	108	28	46	598
Cross, Eben D., Chicago, Ill. Galvanic battery	397,969	Feb. 19	1295	346	46	850
Cross, Eben D., Chicago, Ill. Galvanic battery	398,132	Feb. 19	1553	412	46	899
Cross, John R. (See Finch and Cross.)						
Cross, Sterling P. (See Nott, Henry W., assignor.)						
Crossley, Azro T. (See Clark and Crossley.)						
Crouse, John J., *et al.* (See Roberts, Thomas, assignor.)						
Crow, Charles, *et al.* (See Robinson, James R., assignor.)						
Crow, Goodlet, *et al.* (See Robinson, James R., assignor.)						
Crowell, George H., Berlin Falls, N. H. Automatic damper	395,382	Jan. 1	115	29	46	26
Crowell, John H., Vineyard Haven, Mass. Fountain-pen	395,695	Jan. 8	606	153	46	131
Crowell, Luther C., Brooklyn, N. Y. Web-feeding mechanism	396,470	Jan. 22	1782	456, 457	46	372
Cruikshank, John W., Troy, Ohio. Stub-file envelope	396,074	Jan. 15	1184	300	46	251
Cruzan, Isaac, Waggoner, Ill. End-gate	399,246	Mar. 12	697	181	46	1276
Cuba Marble Company. (See Nathan, Lewis, assignor.)						
Cuhady, Michael. (See Bouchard, John, assignor.)						
Culbertson, William C., Girard, Pa. Rotary engine	396,143	Jan. 15	1280	328	46	270
Culmer, John W., assignor to J. H. Logan, New Brighton, Pa. Gas-meter	398,707	Feb. 26	2410	639	46	1076
Culmer, John W., assignor to J. H. Logan, New Brighton, Pa. Plural-piston gas-meter	398,708	Feb. 26	2413	639	46	1076
Culmer, John W., assignor to J. H. Logan, New Brighton, Pa.	398,709	Feb. 26	2415	640	46	1076
Culp, Charles M., South Bend, Ind. Rail joint or chair	399,842	Mar. 19	1595	413	46	1460
Culton, James, Odin, Ill. Railway-ticket						
Cuming, Mari A. (See Foster, William C., assignor.)						
Cummings, Henry H., Malden, assignor to Union Button Sewing Machine Company, Boston, Mass. Button-sewing machine	397,587	Feb. 12	744	193, 194	46	726
Cummings, Henry H., Malden, assignor to Union Button Sewing Machine Company, Boston, Mass. Button-sewing machine	397,588	Feb. 12	750	194, 195, 196	46	727
Cummings, Henry H., Malden, assignor to Union Button Sewing Machine Company, Boston, Mass. Button-sewing machine	398,585	Feb. 26	2220	587	46	1038
Cummings, Henry H., Malden, assignor to Union Button Sewing Machine Company, Boston, Mass. Button-sewing machine	398,586	Feb. 26	2224	587, 588	46	1038
Cunningham, John. (See Wakeham and Cunningham.)						
Cunningham, John H. (See Fuller and Cunningham.)						
Cunningham, John H., Chelsea, Mass. Boiler	399,975	Mar. 19	1780	461, 462	46	1496
Cunningham, Murty, Bellefonte, Pa. Composite pavement	398,946	Mar. 5	195	------	46	1151
Cunningham, Patrick, assignor to American Carrier Rocket Company, New Bedford, Mass. Line-carrying rocket	395,881	Jan. 8	903	231	46	188
Cunningham Son & Company, James. (See Clements and Royce, assignors.)						
Cupit, John W. (See Durell, Frank H., assignor.)						
Curlett, Lewis K., Chicago, Ill. Heating apparatus for street-cars	397,898	Feb. 19	1196	320	46	832

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Curley, Terence F., and A. S. Granger, Brooklyn, N. Y.; said Granger assignor to said Curley. Safety-guard for razors	398,947	Mar. 5	196	52, 53	46	1151
Curley, Terence F., and A. S. Granger, Brooklyn, N. Y.; said Granger assignor to said Curley. Safety-guard for razors	398,948	Mar. 5	197	53	46	1152
Curlin, Seth, Union City, Tenn. Decoy	395,612	Jan. 1	462	117	46	95
Currie, Stanley C. C., Philadelphia, Pa., assignor to United Electric Improvement Company, Gloucester City, N. J. Electric-circuit coupler	398,769	Feb. 26	2500	663, 664	46	1094
Currie, Stanley C. C., Philadelphia, Pa., assignor to United Electric Improvement Company, Gloucester, N. J. Electric distribution by storage-batteries	400,395	Mar. 26	2413	632	46	1627
Currier, George O., assignor of one-half to J. & J. Murdock, Leicester, Mass. Device for holding card-clothing on grinding-machines	398,497	Feb. 26	2007	533	46	1014
Currier, Henry A., Almont, Mich. Sleigh	395,955	Jan. 8	1007	258	46	206
Currier, Herbert L., Lynn, Mass. Stop mechanism for steam-engines	398,314	Feb. 19	1828	463	46	954
Currier, James H., and E. I. Blount, Somerville, assignors to Boston Type Writer Company, Boston, Mass. Type-writing machine	396,686	Jan. 22	2102	539, 540	46	432
Curry, John V. (See Roberts, Squire, assignor.)						
Curtis, James, Moscow Mills, Mo. Grain-crushing mill	400,061	Mar. 26	1905	495	46	1529
Curtis, Philander M., Lebanon, Ind. Siding gage and square	396,075	Jan. 15	1185	300	46	251
Curtis, Wallace B. (See Kaspar and Curtis.)						
Curtiss, Samuel N. (See Curtiss, Theodore, assignor.)						
Curtiss, Theodore, assignor of one-half to S. N. Curtiss, Reading, Mich. Joint for chairs	397,899	Feb. 19	1197	321	46	833
Cushen, George, Hamilton, Ontario, Canada. Car-coupling	396,667	Jan. 22	2103	540	46	433
Cushing, John P., Beverly, Mass. Feed-water regulator	397,974	Feb. 19	1302	348	46	851
Cushing, Nichols B., Jersey City, N. J. Dredging-scoop	396,921	Jan. 29	2454	631, 632	46	513
Cuthbert, George, assignor of one-half to R. P. Metz, Philadelphia, Pa. Pneumatic chuck	397,835	Feb. 12	1111	297	46	797
Cutler, Eben J., Cleveland, Ohio. Sight for fire-arms	398,315	Feb. 19	1829	463	46	954
Cutler, Henry H., Newton, Mass. Support for aerial electric conductors	395,814	Jan. 8	900	209	46	167
Cutler, Henry H., Newton, Mass. Electric meter	397,538	Feb. 12	657	172	46	711
Cutler, Lyman B., Monmouth, assignor of one-half to W. Greene, Freeport, Ill. Bag-lock	396,029	Jan. 8	1120	284	46	229
Cutler, Samuel, Millwall, county of Middlesex, England. Apparatus for supplying steam to cups of telescopic gas-holders	397,836	Feb. 12	1111	297	46	798
Cutler, William P., Baltimore, Md. Sail	397,589	Feb. 12	754	190	46	728
Cutter, Martin A., Allegheny, Pa. Window-head stop	397,837	Feb. 12	1112	298	46	798
Czapull, Julius J., assignor to himself and B. Doscher, Charleston, S. C. Self-heating sad-iron	398,949	Mar. 5	198	53	46	1152
D'Andrimont, Julien. (See Plom and D'Andrimont.)						
D'Humy, Paul R. D., Clapham Rise, county of Surrey, England. Galvanic battery	396,329	Jan. 15	1557	393, 394	46	320
Daft, Leo, Plainfield, N. J. Armature for dynamo-electric machines	396,195	Jan. 15	1361	349	46	285
Daft, Leo, Plainfield, N. J. Insulator-support for electric conductors	396,196	Jan. 15	1362	349	46	285
Daggett, Homer M., Jr. (See Dillon, Louis W., assignor.)						
Dahl, Carl F., Dantzic, Prussia, Germany. Recovering soda	396,546	Jan. 22	1891	487, 488, 489	46	392
Dahl, Olof, Brooklyn, N. Y. Conductor for electric railways	398,498	Feb. 26	2008	533	46	1014
Dahlgren, Adolf, Nashville, Tenn. Yarn beam or spool	397,539	Feb. 12	661	172	46	711
Dailey, Thomas, Jackson, Mich. Fence-post	399,021	Mar. 5	322	87	46	1176
Dakin, Archelaus C., Clinton, Mass. Grate for furnaces	398,950	Mar. 5	199	53	46	1152
Dakin, George, and H. L. Drullard, Buffalo, N. Y. Tea-kettle	399,843	Mar. 19	1596	414	46	1460
Dale, Henry J., Chicago, Ill. Eyeglass-holder	396,144	Jan. 15	1361	328	46	271
Dale, James, Chicago, Ill. Manufacture of electrotype or stereotype plates	395,498	Jan. 1	209	69	46	67
Daley, John J., Brooklyn, N. Y. Belt-shifting mechanism	399,501	Mar. 12	1071	279, 280	46	1347
Dallett, George A., *et al.* (See Dallett, William P., assignor.)						
Dallett, Thomas H., *et al.* (See Dallett, William P., assignor.)						
Dallett, William P., Philadelphia, assignor to himself, T. H. and G. A. Dallett, Thornbury, Pa. Drilling-machine	397,701	Feb. 12	923	244	46	760
Daly, Martin B. (See Tibbens, William P., assignor.)						
Daly, William J., McKeesport, assignor of one-half to W. S. Foster, Pittsburg, Pa. Pipe-threading machine	396,988	Jan. 29	2546	658	46	532
Damon, Charlie A., Fenton, Mich. Stenographic machine	399,247	Mar. 12	698	181	46	1276
Dandurand, Joseph P., Virginia City, Nev. Key	396,499	Feb. 26	2180	534	46	1014
Danforth, George E., assignor of one-half to A. B. Hoffmann, Lynn, Mass. Machine for stretching hides or skins	396,811	Jan. 29	2300	589	46	490
Daniels, George, Reddish, county of Lancaster, England. Clamping apparatus for paper-cutting machines	399,743	Mar. 19	1435	369	46	1429
Daniels, Joseph, Cleveland, Ohio. Watch-maker's and jeweler's pliers	399,655	Mar. 19	1315	337	46	1405
Daniels, Nathan H. (See Pearson, William E., assignor.)						
Daniels, William H., *et al.* (See Trowbridge, Augustus S., assignor.)						
Dann, Jesse W., Columbus, Ohio. Machine for the manufacture of fellies	397,900	Feb. 19	1198	321	46	833
Danziger, Jacob C. and S., Cincinnati, Ohio. Sheet-feeding machine for printing-presses	398,710	Feb. 26	2416	640, 641	46	1077
Danziger, Samuel. (See Danziger, Jacob C. and S.)						
Darby, Elijah F. (See Darby, Joseph, assignor.)						
Darby, Joseph, assignor of one-fourth to E. F. Darby, Springfield, Ohio. Hydrocarbon-burner	397,784	Feb. 12	1045	279	46	784
Darling, Joseph, Petrolia, Pa. Pump	395,772	Jan. 8	712	183	46	151
Darling, Robert F., Seneca Falls, N. Y. Saw-clamping device	396,145	Jan. 15	1281	328	46	271
Darrow, William M., Salem, N. Y. Pipe-coupling for car-brakes	398,033	Feb. 19	1415	374	46	872
Davenport, Samuel A., *et al.* (See Burnley, William, assignor.)						
Davenport, Samuel A., *et al.* (See Hitchcock, Charles A., assignor.)						
Davenport, William S., St. Johnsbury, Vt. Coin-controlled weighing-machine	396,394	Jan. 22	1657	426	46	347
Davidson, Fredrick W., Philadelphia, Pa. Machine for forming sheet-metal pipes	400,310	Mar. 26	2280	596, 597	46	1602
Davidson, James, and J. Bannister, New Bedford, Mass. Picker-check for looms	399,656	Mar. 19	1315	337	46	1405
Davidson, Marshall T. (See Foster, Percy R., assignor.)						
Davidson, Thomas, *et al.* (See Noble, William, assignor.)						
Davidson, Ward, Oakland, Cal. Turn-table for cable or electric railways	396,640	Jan. 22	2050	527	46	423
Davis, Albert H. and J. H., Loveland, Colo. Harrow and roller	397,344	Feb. 5	362	95	46	646
Davis, Albert T. L., Lake Village, assignor to Pitman Manufacturing Company, Laconia, N. H. Stop-motion mechanism for knitting-machines	400,063	Mar. 26	1908	496, 497	46	1529
Davis, Albert T. L., Lake Village, and G. E. Stevens, assignors to Pitman Manufacturing Company, Laconia, N. H. Transferring mechanism for knit webs	400,062	Mar. 26	1906	496	46	1529

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Davis, Benjamin A., Bermuda, assignor to G. Davis, Petersburg, Va. Automatic vehicle-brake	396,030	Jan. 8	1121	285	46	229
Davis, Charles. (See Lodge and Davis.)						
Davis, David P., Allendale, N. J. Governor for engines	395,882	Jan. 8	904	232	46	188
Davis, Elmer C., Friendship, N. Y. Wagon	399,502	Mar. 12	1072	2-0	46	1348
Davis, Emry, Kane, Pa. Inkstand	399,844	Mar. 19	1507	414	46	1460
Davis, Etna H., and R. Westervelt, Elmira, N. Y. Electric motor	400,311	Mar. 26	2281	597	46	1603
Davis, Etna H., and R. Westervelt, Elmira, N. Y. Thermostat	400,312	Mar. 26	2283	597	46	1603
Davis, Frederick J., Waltham, Mass. Coal-gas condenser	396,384	Feb. 26	1944	511	46	963
Davis & Furber Machine Company. (See Stone, Joseph M., assignor.)						
Davis & Furber Machine Company. (See Wright, Edward, assignor.)						
Davis, George. (See Davis, Benjamin A., assignor.)						
Davis, George L. (See Davis, Nathaniel, assignor.)						
Davis, Henry C., Terre Haute, Ind. Hydrocarbon-vaporizer	400,313	Mar. 26	2284	598	46	1603
Davis, Henry T., New York, N. Y. Quilting-frame for sewing-machines	396,328	Jan. 15	1556	393	46	320
Davis, Isaac, Oil City, Pa. Twine-holder	399,601	Mar. 12	1235	318	46	1378
Davis, John H. (See Davis, Albert H. and J. H.)						
Davis, John H., Covington, Ky. Door-spring	395,383	Jan. 1	116	29	46	26
Davis, John M., Marathon, N. Y. Railway-tie	397,785	Feb. 12	1046	279	46	784
Davis, John R., Racine, Wis. Whiffletree-hook	397,112	Feb. 5	10	3	46	581
Davis, John R., Racine, Wis. Draft-equalizer	397,343	Feb. 5	363	95	46	647
Davis-Moore Sewing Machine Company. (See Moore and Davis, assignors.)						
Davis, Nathan H., Philadelphia, Pa. Die for the manufacture of lids for journal-boxes	397,786	Feb. 12	1047	279, 2-0	46	785
Davis, Nathaniel, Montpelier, Vt., assignor to G. L. Davis, North Andover, Mass. Water-cooler	396,770	Feb. 26	2501	664	46	1094
Davis, Nathaniel, Montpelier, Vt., assignor of one-half to G. L. Davis, North Andover, Mass. Refrigerator	399,976	Mar. 19	1781	462	46	1497
Davis, Phineas J. (See Davis, William E., assignor.)						
Davis, Thomas S., Cape Girardeau, Mo., and W. W. Davis, Lawrence, Kans., assignors of one-third to T. Johnson, Cape Girardeau, Mo. Mechanical telephone	396,688	Jan. 22	2104	540	46	433
Davis, Wells R., Alberta, Mo. Curry-comb	398,820	Mar. 5	13	4	46	1116
Davis, Willard A. (See Moore and Davis.)						
Davis, William E., assignor to P. J. Davis, San Antonio, Tex. Planing-machine	399,977	Mar. 19	1783	462, 463	46	1497
Davis, William W. (See Davis, Thomas S. and W. W.)						
Davy, John W., Kingston, Ontario, Canada. Wire stretcher and holder	399,185	Mar. 5	597	154	46	1230
Dawson, David R., Dundee, county of Forfar, Scotland. Overedge sewing-machine	399,744	Mar. 19	1438	370	46	1430
Dawson, James, assignor of one-half to J. H. Dawson, Harrisburg, Pa. Roller-mill	399,186	Mar. 5	598	154, 155	46	1230
Dawson, James, assignor of one-half to J. H. Dawson, Harrisburg, Pa. Feed-regulator	399,187	Mar. 5	600	155, 156	46	1230
Dawson, John H. (See Dawson, James, assignor.)						
Dawson, William R. (See Waggoner, Albert, assignor.)						
Day, George. (See Leis, Frederick, assignor.)						
Day, George W., Lansing, Kans. Fountain attachment for wash-boilers	399,845	Mar. 19	1598	414	46	1461
Day, John, Malta Bend, Mo. Forge-blower	395,956	Jan. 8	1008	258	46	208
Day, John, New York, N. Y. Curtain-ring	397,419	Feb. 5	479	125	46	670
Day, Oscar A. (See Ferguson, Robert G., assignor.)						
Day, Patrick L., Cleveland, Ohio, assignor to American Wire Company, of Ohio. Guide for rolling-mills	398,771	Feb. 26	2502	664	46	1094
Day, Patrick L., Cleveland, Ohio, assignor to American Wire Company, of Ohio. Device for reeling wire	398,772	Feb. 26	2503	664	46	1094
Dayton, Charles L., Meriden, Conn. Drawer-pull	398,238	Feb. 19	1709	451	46	929
Dayton, Melville E., Chicago, Ill., assignor to C. F. Lomb, Rochester, N. Y. Paper-file	398,316	Feb. 19	1831	483	46	955
De Aguero, Miguel E., New York, N. Y. Combined latch and lock	397,226	Feb. 5	188	49	46	612
De Barthe, John B., North Wales, Pa. Boiler	396,731	Jan. 29	2173	558	46	454
De Baun, Samuel, Kansas City, Mo. Electric belt	398,133	Feb. 19	1556	412	46	899
De Garmo, Daniel. (See Gordon and De Garmo.)						
De Geer, Louis. (See Hirst, Matthew, assignor.)						
De Hemptinne, Paul, Ghent, Belgium, assignor to Flachstuch Gesellschaft, Cologne, Prussia, Germany. Loom for weaving unspun plant-stalks	399,745	Mar. 19	1440	370, 371	46	1430
De Lamater, Cornelius H. (See Lassoe, Valdemar F., assignor.)						
De Long, Frank E., assignor to C. L. Lockwood, Philadelphia, Pa. Lock for paper boxes	397,227	Feb. 5	189	50	46	612
De Monnin, John, assignor of one-half to J. R. Bryson, Corvallis, Oreg. Mechanism for converting motion	396,147	Jan. 15	1283	329	46	271
De Normanville, Samuel A., Kensington, county of Middlesex, England. Fountain-pen	396,547	Jan. 22	1805	469	46	392
De Redon, Constant F., assignor to F. L. Wellman, New York, N. Y. Vending apparatus	397,975	Feb. 19	1304	348, 349, 350	46	851
Dean, Charles A., and F. H. Robie, Boston, Mass. Making striped paper bags	399,846	Mar. 19	1599	415	46	1461
Dean, Elizabeth, Hastings, county of Sussex, England. Sunshade	397,172	Feb. 5	109	28	46	598
Dean, George H., St. Louis, Mo. Lamp-covering	396,146	Jan. 15	1282	329	46	271
Dean, George W., New York, assignor of one-half to J. Steel, Jr., Brooklyn, N. Y. Mouthpiece for bags	400,194	Mar. 26	2099	550	46	1570
Dean, James C. A., Chicago, Ill. Copy holder and register	399,503	Mar. 12	1074	280	46	1348
Dearing, James W., Brooklyn, N. Y. Machine for cutting patterns	399,847	Mar. 19	1600	415	46	1461
Decker, Gideon W., Willowemoc, N. Y. Car-coupling	399,316	Mar. 12	802	207	46	1295
Decuir, Joseph A., New Orleans, La. Harmenigraph or music-recording device	398,951	Mar. 5	200	54, 55, 56	46	1152
Dee, Edward W. (See Moss and Littell, assignors.)						
Deeble, John, Southington, Conn., assignor to Scranton Forging Company, Scranton, Pa. Ox-shoe	398,034	Feb. 19	1416	374	46	872
Deere, Mansur & Co. (See Stewart, John A., assignor.)						
Deere, Wells & Co. (See Torman, James W., assignor.)						
Deering & Company, William. (See Simpson, Josiah M., assignor.)						
Degood, Alexander K., Millsborough, Pa. Cigar-bunching machine	396,732	Jan. 29	2176	558	46	455
Deisenberg, Bronislav, *et al.* (See Gmür and Flats, assignors.)						
Delany, Patrick B., New York, N. Y. Automatic telegraphy	395,497	Jan. 1	173	46	46	37
Delia, Eugene, Cincinnati, Ohio. Fire-escape	400,314	Mar. 26	2285	598, 599	46	1603
Delon, Charles W., Wiscasset, Me., assignor to American Ship Windlass Company, Providence, R. I. Launching boats in series	399,848	Mar. 19	1603	415, 416	46	1462

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Demarest, Cornelius B., Brooklyn, N. Y. Folding chair	396,271	Jan. 15	1470	374	46	305
Deming, Charles G., Leeds, N. Y. Truck	399,348	Mar. 1	700	182	46	1276
Demuth, John A., Toledo, Ohio. Tallying apparatus for grain-hoppers	398,821	Mar. 5	14	4	46	1117
Denhard, August, Bonn, Germany. Umbrella-holder	400,064	Mar. 26	1909	497	46	1539
Denio, William L., Rochester, N. Y. Electric signaling and alarm apparatus	397,538	Feb. 12	1113	298	46	798
Denison, Julian F., New Haven, Conn. Electric motor	397,702	Feb. 12	924	244, 245	46	761
Dennett, Fred A. (See Gale, Herbert N., assignor.)						
Denney, Samuel L., assignor to I. L. Landis, Lancaster, Pa., and Ohio Rake Company, Dayton, Ohio. Combined hay tedder and rake	395,550	Jan. 1	361	93	46	76
Dennis, Frederick W., Beatrice, Nebr. Brick-kiln	396,733	Jan. 29	2181	559	46	455
Denton, Daniel T., Soudan, Minn. Friction-clutch	399,385	Mar. 12	911	236	46	1316
Derbec, Etienne, San Francisco, Cal. Pulverizer and amalgamator	395,957	Jan. 8	1009	259	46	209
Derbec, Etienne, San Francisco, Cal. Ore-separator	397,070	Jan. 29	2065	687, 688, 689	46	555
Derbec, Etienne, San Francisco, Cal. Water-wheel	397,071	Jan. 29	2068	689	46	556
Derby, Willis M., Minneapolis, Minn. Lubricator	396,471	Jan. 22	1785	457	46	372
Desant, William F. Z. (See Hayden and Desant.)						
Detroit Patent Brush Company. (See Porter, Edwards W., assignor.)						
De Vitra, Benjamin F., and G. R. Roth, Reading, assignors to W. W. Lesher, Mosserville, Pa. Window	398,239	Feb. 19	1710	451, 452	46	929
Devlin & Co., T. (See Finnegan, John, assignor.)						
Devore, Levi M., assignor to Stover Manufacturing Company, Freeport, Ill. Spring-hinge	396,989	Jan. 29	2350	659	46	533
Devore, Levi M., and F. W. Hoefer, assignors to Stover Manufacturing Company, Freeport, Ill. Spring-hinge	396,031	Jan. 8	1122	285	46	230
Devore, Levi M., and F. W. Hoefer, assignors to Stover Manufacturing Company, Freeport, Ill. Spring-hinge	396,650	Jan. 22	2052	527	46	423
Dewease, Levi L. (See Effinger, Dewease, Koons, and Metzger.)						
Dewey, Mark W., assignor of two-thirds to E. Laass and C. H. Duell, Syracuse, N. Y. Electro-harmonic telegraphy	395,613	Jan. 1	464	118	46	95
Dewey, Mark W., assignor of two-thirds to E. Laass and C. H. Duell, Syracuse, N. Y. Printing-telegraph	395,614	Jan. 1	466	118	46	95
Dewey, Mark W., assignor of two-thirds to E. Laass and C. H. Duell, Syracuse, N. Y. Electric signaling apparatus	395,958	Jan. 8	1010	259	46	209
Dewey, Mark W., assignor of two-thirds to E. Laass and C. H. Duell, Syracuse, N. Y. Electric signaling apparatus	395,959	Jan. 8	1015	259	46	210
Dewey, Mark W., assignor of two-thirds to E. Laass and C. H. Duell, Syracuse, N. Y. Octuplex telegraph	396,734	Jan. 29	2183	559	46	456
Dewey, Otis E., *et al.* (See Knowlton, Ephraim H. B., assignor.)						
Dexter, Charles H., Annapolis, Md. Sash-fastener	396,548	Jan. 22	1808	490	46	393
Diamond, Abraham, and O. Kohnert, New York, N. Y. Pantaloons-protector	397,703	Feb. 12	927	245	46	761
Diamond, Abraham, and O. Kohnert, New York, N. Y. Pantaloons-protector	397,704	Feb. 12	927	245	46	761
Dick, Theodore S. (See Burr, Sanford S., assignor.)						
Dickerson, Edward N., Jr., New York, N. Y. System of electrical distribution	396,549	Jan. 22	1900	490	46	393
Dickey, Charles C., trustee. (See Carnahan, Cyrus M., assignor.)						
Dickson, Gilbert J., Albany, N. Y. Transom-lifter	398,240	Feb. 19	1713	452	46	930
Diehl, John, Franksville, Wis. Vehicle-spring	396,272	Jan. 15	1470	374	46	305
Diemer, John F., Elizabeth, N. J., and P. E. Gonon, New York, N. Y. Paper box	399,849	Mar. 19	1605	416	46	1462
Dieter, Louis F., Springfield, Ohio. Straw-stacker	399,188	Mar. 5	602	156, 157	46	1231
Dietert, Gustav, Kerrville, Tex. Windmill	400,195	Mar. 26	2100	550	46	1570
Dietz Company, R. E., *et al.* (See Betts, Lewis F., assignor.)						
Dietz Company, R. E., *et al.* (See Dietz, Frederick, assignor.)						
Dietz, Frederick, assignor to R. E. Dietz Company, New York, and Steam Gauge and Lantern Company, Rochester, N. Y. Tubular lantern	395,489	Jan. 1	271	69	46	57
Dieuleveult, Urbain, Tréguier, Côtes-du-Nord, France. Floating telegraph-station	398,035	Feb. 19	1417	375	46	872
Digge, Harvey H., Farmland, Ind. Post-hole-boring machine	399,317	Mar. 12	804	207	46	1296
Dill, John F., and S. A. Rote, Ridgway, Pa. Pipe-coupling	396,550	Jan. 22	1901	490	46	393
Dillon, Louis W., North Attleborough, assignor of one-half to H. M. Daggett, Jr., Attleborough, Mass. Electric-lamp fixture and switch	399,134	Mar. 5	510	134	46	1214
Dillon, Louis W., North Attleborough, assignor of one-half to H. M. Daggett, Jr., Attleborough, Mass. Electric switch	399,135	Mar. 5	512	134	46	1214
Dilworth, John C., Pittsburg, Pa. Oil-tank	395,551	Jan. 1	365	94	46	76
Dimond, Charles H. (See House and Dimond.)						
Dingee, William W., assignor to J. I. Case Threshing Machine Company, Racine, Wis. Straw-stacker	399,504	Mar. 12	1076	281	46	1348
Dinsmore, Alfred S., Boston, Mass. Gas-stove	399,022	Mar. 5	323	87	46	1176
Dische, William, Newark, N. J., assignor to Iron Clad Manufacturing Company, New York, N. Y. Watering-pot	399,602	Mar. 12	1236	319	46	1378
Ditzell, Henry A., Romulus, N. Y. Combined letter-sheet and envelope	398,822	Mar. 5	16	4	46	1117
Divine, Joseph C. (See Heidt, Allen P., assignor.)						
Dixon, George E., Chicago, Ill. Automatic draft-regulator	397,173	Feb. 5	110	28	46	598
Doan, Riley R., assignor of one-half to J. H. Roberts, Sacramento, Cal. Road-engine	397,976	Feb. 19	1308	350, 351	46	852
Doane, William H., Cincinnati, Ohio. Wood-worker	397,113	Feb. 5	11	3	46	581
Dobbie, Robert S., New York, N. Y., assignor to American Electric Motor Company, of New Jersey. Regulator for electric motors	400,315	Mar. 26	2288	599	46	1604
Dobbins, Nancy J., Denver, Colo. Knockdown box and blank therefor	395,815	Jan. 8	801	209	46	168
Dobbins, Nancy J., Denver, Colo. Book or album	399,249	Mar. 12	700	182	46	1276
Dobler, Anton, New York, N. Y. Grinding-mill	396,990	Jan. 29	2550	659	46	533
Dobson, Benjamin A., Bolton, county of Lancaster, England. Adjustable shaft-bearing	395,428	Jan. 1	177	47	46	38
Dodd, David, Orange, assignor to National Lock Washer Company, Newark, N. J. Ribbed conoidal washer	398,952	Mar. 5	205	56	46	1153
Dodge, Christopher G., assignor to J. D. Brown, New York, N. Y. Tap-hole plug	397,839	Feb. 12	1115	298	46	798
Dodge Coal Storage Company. (See Dodge, James M., assignor.)						
Dodge, James M., Philadelphia, Pa., assignor to Ewart Manufacturing Company, of Illinois. Chain conveyer	395,883	Jan. 8	906	232	46	189
Dodge, James M., Philadelphia, Pa., assignor, by mesne assignments, to Dodge Coal Storage Company, Naugatuck, Conn. Chain conveyer for unloading cars	396,197	Jan. 15	1363	350	46	285
Dodson, Darien W., Wilkes-Barré, Pa., and F. H. Richards, Springfield, Mass.; said Richards assignor to said Dodson. Mechanical movement	399,746	Mar. 19	1441	371, 372	46	1431
Doerfler, Conrad and E., Springfield, Ill.; said E. Doerfler assignor to said Conrad Doerfler. Brick-machine	398,134	Feb. 19	1353	412	46	899

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Doerfler, Edward. (See Doerfler, Conrad and E.)						
Doering, J. H. (See Haslup, William, assignor.)						
Doherty, Daniel E. (See Brown, Perry, assignor.)						
Dolan, Edward J., Philadelphia, Pa., assignor, by mesne assignments, to Bureau Can and Manufacturing Company, of Delaware. Soldering-machine	399,386	Mar. 12	912	236, 237	46	1316
Dolan, Edward J., Philadelphia, Pa., assignor, by mesne assignments, to Bureau Can and Manufacturing Company, of Delaware. Hand soldering-iron	399,387	Mar. 12	914	237	46	1316
Dolan, Martin F., Brooklyn, N. Y. Saddle-hub and ferrule combination	399,850	Mar. 19	1606	416	46	1462
Dolge, Alfred. (See Millet, John W., assignor.)						
Dolsen, Ninian H., assignor to Everett & Connors, St. Ignace, Mich. Machine for removing bark from timber	397,114	Feb. 5	12	3	46	581
Domann, Charles F., Lake View, assignor to W. Reetz, Chicago, Ill. Jewelry-case	399,603	Mar. 12	1237	319	46	1378
Donaldson, David H., assignor to himself and O. G. Donaldson, Buffalo, N. Y. Sewer-trap	399,978	Mar. 19	1734	463	46	1497
Donaldson, George H., New York, N. Y. Folding hanger for garments	395,884	Jan. 8	908	233	46	189
Donaldson, Oliver G. (See Donaldson, David H., assignor.)						
Donaldson, Richard A., *et al.* (See Hipperling, William, assignor.)						
Donaldson, Samuel G., *et al.* (See Corbett, Joseph, assignor.)						
Donaldson, William, Westminster, county of Middlesex, England. Pump actuated by fluid-pressure	400,196	Mar. 26	2101	551	46	1570
Donmoyer, Rudolph W., South Bend, Ind. Wheel	396,991	Jan. 29	2551	659	46	533
Donnell, Edward P., Chicago, Ill. Machine for cutting indexes	399,250	Mar. 12	701	182, 183	46	1276
Donnelley, Michael. (See McCormick and Farish, assignors.)						
Doran, George A., Menominee, Mich. Veterinary drenching-horn	395,744	Jan. 8	676	173	46	145
Doremus, Willard D., Washington, D. C., assignor to Corbin Cabinet Lock Company, New Britain, Conn. Lock	400,316	Mar. 26	2289	599, 600	46	1604
Dornbirer, Jacob, Sandusky, Ohio. Temporary binder	395,552	Jan. 1	367	94	46	76
Dorwart, George, Philadelphia, Pa. Heeling, nailing, and finishing jack	396,076	Jan. 15	1126	301	46	251
Doscher, Berend. (See Czepull, Julius J., assignor.)						
Doubleday, Bertha C. (See Doubleday, William C., assignor.)						
Doubleday, William C., assignor to B. C. Doubleday, Lima, Ohio. Cigar-vending apparatus	399,851	Mar. 19	1608	416, 417	46	1463
Doud, Brenson, Peru, Ind. Fence	396,735	Jan. 29	2187	560	46	457
Douds, Byron J., Canton, Ohio. Permutation-lock	396,273	Jan. 15	1472	374, 375	46	306
Douglass, John, London, county of Middlesex, England, assignor to H. S. Taylor, Brooklyn, and J. E. Nugent, New York, N. Y. Theatrical stage	399,318	Mar. 12	805	208	46	1296
Dove, John S., Jr., Philadelphia, Pa. Type-writing machine	396,587	Feb. 26	2227	588	46	1039
Dowling, Robert H., assignor of two-thirds to C. and C. H. Follett, Newark, Ohio. Car-coupling	396,032	Jan. 8	1123	285	46	230
Downen, Kyran C. (See Van Nouhuys and Downes.)						
Downes, William J., Springfield, Burnt Ash Hill, Lee, county of Kent, England. Note-book	397,540	Feb. 12	662	173	46	711
Downie, W. G. (See Prall, Joseph W., assignor.)						
Downs, Benjamin J., Somerville, Mass. Machine for lining journal-boxes	396,588	Feb. 26	2227	588	46	1039
Downs, George N., Chicago, Ill. Centrifugal machine	397,051	Jan. 29	2636	679	46	550
Doyal, Ira C., Chumley, Ala. Car-coupling	396,500	Feb. 26	2100	554	46	1014
Doyle, John. (See Morrissey and Doyle.)						
Drake, John E., Quincy, Mass. Edge-setting machine	396,883	Mar. 5	98	27	46	1132
Draper, Jabez, Stockton, Cal. Harvesting-machine	396,711	Feb. 26	2424	641, 642	46	1078
Draper, John, Toronto, Ontario, Canada. Sled-propeller	395,553	Jan. 1	368	94	46	77
Draper & Sons, George. (See Speakman, Thomas H., assignor.)						
Dreibelbiss, John. (See Lomont, Francis A., assignor.)						
Dressel, George C. (See Helbig, Charles W., assignor.)						
Dressler, Charles E. (See Meyrowitz and Dressler.)						
Dressler, Charles E., New York, N. Y. Telegraphy	397,977	Feb. 19	1312	351	46	853
Drew, Le Roy O., Carthage, Dak. Ter. Traction-wheel	396,602	Jan. 29	2366	607	46	496
Drew, Walter J., assignor to Bissell Carpet Sweeper Company, Grand Rapids, Mich. Carpet-sweeper	395,900	Jan. 8	1017	260	46	210
Drew, Walter J., assignor to Bissell Carpet Sweeper Company, Grand Rapids, Mich. Carpet-sweeper	399,136	Mar. 5	515	134, 135	46	1214
Dreyfuss, Isidor, New York, N. Y. Machine for applying adhesive material	398,135	Feb. 19	1559	413	46	899
Driffill, Frederick, Sterling, assignor to Eureka Company, Rock Falls, Ill. Runner for wheeled vehicles	395,653	Jan. 1	542	136	46	109
Driffill, Frederick, Sterling, assignor to Eureka Company, Rock Falls, Ill. Runner for wheeled vehicles	398,385	Feb. 26	1945	512	46	984
Driffill, Frederick, Sterling, assignor to Eureka Company, Rock Falls, Ill. Harness	398,589	Feb. 26	2228	589	46	1039
Driffill, Frederick, Sterling, assignor to Eureka Company, Rock Falls, Ill. Road-cart spring	399,652	Mar. 19	1611	417	46	1463
Driscoll, Lawrence J., Somerville, Mass., assignor, by mesne assignments, to Union Button Sewing Machine Company. Button-sewing machine	395,384	Jan. 1	117	30	46	26
Drown, Frederick E., Pawtucket, R. I. Bleaching cotton	396,551	Jan. 22	1902	.....	46	393
Drullard, Harry L. (See Dakin and Drullard.)						
Du Bois, Howard M., Philadelphia, Pa. Tire for vehicle-wheels	397,458	Feb. 5	543	142	46	682
Du Bois, Howard M., Philadelphia, Pa. Tire for vehicle-wheels	397,459	Feb. 5	543	143	46	682
Du Laney, George L., Philadelphia, Pa. Pneumatic railway	399,319	Mar. 12	807	208	46	1296
Du Laney, George L., New York, N. Y. Dynamo-machine	399,320	Mar. 12	808	209	46	1297
Duarte, Joaquim J., Boston, Mass. Steering apparatus for vessels	396,736	Jan. 29	2188	560	46	457
Dubéy, Edward A., assignor of one-half to T. B. Rutan, Brooklyn, N. Y. Sign for electric lights	395,317	Jan. 1	16	5	46	6
Dubey, Edward A., assignor of one-half to T. B. Rutan, Brooklyn, N. Y. Translucent sign	397,072	Jan. 29	2609	689	46	556
Ducker, William M., New York, N. Y. Corset-fastening	398,036	Feb. 19	1418	375	46	872
Ducker, William M., New York, N. Y. Corset-fastening	398,136	Feb. 19	1560	413	46	900
Dudgeon, Richard. (See Weeks, John, assignor.)						
Dudley Electric Manufacturing Company. (See Dudley, Walter J., assignor.)						
Dudley, Walter J., Everett, Mass., assignor to Dudley Electric Manufacturing Company, Concord, N. H. Transmitting-instrument for electric signaling apparatus	399,505	Mar. 12	1079	281, 282	46	1349
Duell, Charles H., *et al.* (See Dewey, Mark W., assignor.)						
Duffield, Thomas C. (See Izard, Stanger, and Duffield.)						
Duffin, John R., Chester, Ill. Combined plotter and protractor	398,501	Feb. 26	2101	554	46	1014
Dufner, Bernhard, and E. Freiner, Buffalo, N. Y. Target	399,604	Mar. 12	1238	319	46	1378
Dugdale, William, *et al.* (See Roberts, Thomas, assignor.)						
Dührkop, Fritz, New York, N. Y. Baker's oven	396,305	Jan. 22	1660	427	46	347

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Dummer, Edward, Auburndale, (Newton,) Mass. Support for spindles and rings of ring-spinning machines, &c.	396,148	Jan. 15	1284	329	46	271
Dumont, Alexandre, Paris, France. Wind-motor	400,065	Mar. 26	1910	497, 498	46	1530
Dunbar, William O., Altoona, Pa. Axle-lubricator	397,901	Feb. 19	1199	321, 322	46	833
Duncan, Alexander L., assignor of one-half to T. L. Lindsay, Roscoe, N. Y. Wrench	396,669	Jan. 22	2106	540	46	433
Duncan, James, Coshocton, Ohio. Mop-holder	396,330	Jan. 15	1560	395	46	320
Duncan, James, Coshocton, Ohio. Circular coaster	396,472	Jan. 22	1786	458	46	372
Duncan, Jeremiah M. (See Masterson, Carson A., assignor.)						
Duncan, Joseph M., Silver Springs, N. Y. Evaporating-pan	396,331	Jan. 15	1561	395	46	321
Duncan, William, East Somerville, Mass. Device for opening and closing the apertures of ke_s, &c	397,787	Feb. 12	1048	280	46	785
Duncan, William, Hinsdale, assignor to himself and A. S. Johnston, Chicago, Ill. Sheet-metal binding	397,279	Feb. 5	202	68	46	626
Dunham, Charles H., assignor to Dunham Manufacturing Company, Boston, Mass. Stake-pocket for platform-cars	400,396	Mar. 26	2416	632	46	1628
Dunham, Clarkson C. (See Mallory, Frank B., assignor.)						
Dunham, Joseph M. (See Van Valkenburg, Levi D., assignor.)						
Dunham Manufacturing Company. (See Dunham, Charles H., assignor.)						
Dunkle, Abram B., Steelton, Pa. Extension-strip for window-shade rollers	398,137	Feb. 19	1561	413	46	900
Dunlap, John D. (See Ben, Christian, assignor.)						
Dunlap, Robert, *et al.* (See Balet, Joseph W., assignor.)						
Dunn, Harriette N. (See Dunn, William H. and H. N.)						
Dunn, Herbert O., Washington, D. C. Anchor	395,499	Jan. 1	178	47	46	38
Dunn, James J., Meadville, Pa. Folding confessional	399,388	Mar. 12	915	237	46	1317
Dunn, Robert M., Rew, Pa. Discharge-valve for oil-well stand-pipes	397,115	Feb. 5	14	4	46	582
Dunn Safety Ticket and Register Company. (See Brady, James, assignor.)						
Dunn, William, Philadelphia, Pa. Machine for making nut-locks	397,840	Feb. 12	1115	298, 299	46	798
Dunn, William H. and H. N., assignors of one-half to C. S. Harmon, Chicago, Ill. Baby-carriage	399,389	Mar. 12	916	238	46	1370
Dupuy, John, San Francisco, Cal. Wheelbarrow	398,773	Feb. 26	2504	665	46	1095
Durell, Frank H., assignor of one-half to J. W. Cuplt, Bay City, Mich. Pen-holder	396,317	Feb. 19	1332	484	46	955
Duren, Charles A., and E. P. Bills, Boston, Mass. Anchor	399,853	Mar. 19	1613	417	46	1464
Durham, John F., assignor of one-half to J. Schuholz, Detroit, Mich. Furnace	397,174	Feb. 5	111	28	46	598
Durkee, George B., assignor to F. C. Austin, Chicago, Ill. Grading and ditching machine	397,841	Feb. 12	1117	299, 300	46	799
Dush, E. F. (See Hawke, James, assignor.)						
Dustin, Charles E. (See Sterling, Clarence C., assignor.)						
Dustin, John E., Lawrence, Mass. Expanding pulley	395,816	Jan. 8	802	209	46	168
Dustin, Warren P., *et al.* (See Rowland, Alexander M., assignor.)						
Dutton, Chauncey N. (See Westinghouse and Dutton.)						
Dutton, Rufus, assignor to Mower Knife Grinder Company, New York, N. Y. Machine for grinding mower-knives	395,615	Jan. 1	468	118, 119	46	90
Dutton, William A., and C. J. Meek, Rural Retreat, Va. Cultivator	397,842	Feb. 12	1122	300	46	800
Dwyer, Patrick V., St. Paul, Minn. Pipe-joint	396,354	Jan. 15	1591	403	46	326
Dwyer, Patrick V., St. Paul, Minn. Flush-tank valve	399,506	Mar. 12	1086	282	46	1350
Dwyre, William L., Albany, Oreg. Attachment for pin-and-link couplers	396,863	Jan. 29	2368	608	46	496
Dybile, Julius A., and E. L. Heidenreich, Chicago, Ill. Clutch mechanism for winding-drums	398,502	Feb. 26	2104	554	46	1015
Dyer, Isaac T., assignor of five-eighths to P. Fish, G. Monrath, Chicago, Ill., and G. C. Ewing, Jr., Enfield, Mass. Dynamo-electric machinery	396,353	Jan. 15	1591	403	46	326
Dyer, Richard N., East Orange, N. J. Electrical store-service apparatus	395,961	Jan. 8	1018	260	46	210
Dyer, Richard N., East Orange, N. J., assignor to W. S. Lamson, Lowell, Mass. Electrical store-service apparatus	399,137	Mar. 5	517	135	46	1215
Dykes, Hugh J., Berkeley, Cal. Carburetor	395,616	Jan. 1	472	120	46	96
Dyrenforth, Annie G., Riverside, Ill. Portfolio	399,979	Mar. 19	1735	463	46	1497
Eagan, Richard, Syracuse, N. Y. Measuring milk-can	397,788	Feb. 12	1049	280	46	785
Eagle Lock Company. (See Roche, James, assignor.)						
Eagle Manufacturing Company. (See Porter, Stephen, assignor.)						
Eagle Pencil Company. (See Holzworth, Louis, assignor.)						
Eagle Pencil Company. (See Stuart, Tom R., assignor.)						
Eames, Charles J., assignor to Carbon Iron Company, New York, N. Y. Compound graphitic hearth for metallurgic furnaces	396,992	Jan. 29	2552	659	46	533
Eames, Robert C. (See McLean, Alexander, assignor.)						
Eareckson, Henry B., New York, N. Y. Gas-check for water-pipes	399,300	Mar. 12	918	238	46	1370
Earle, John E. (See Van Ness, John P., assignor.)						
Earle, Reginald H., St. John, Newfoundland. Signal-bomb	399,854	Mar. 19	1614	417	46	1464
Earle, William P., trustee. (See Wardwell, Simon W., Jr., assignor.)						
Earle, Zack T., White Castle, La. Car for carrying sugar-cane	398,138	Feb. 19	1563	414	46	900
Easley, Edward M. (See Clough and Easley.)						
East, Francis, Dundee, Scotland. Wall-case for exhibiting photographs	398,953	Mar. 5	206	56, 57	46	1153
Eastwick, Edward P., Jr., New York, N. Y. Car-coupling	395,817	Jan. 8	804	210	46	168
Eatman, Joseph B., Charleston, S. C. Scuttle for barrels	399,657	Mar. 19	1316	337	46	1405
Eaton, Matthias B., Boston, Mass., assignor to W. W. Eaton, Hartford, Conn. Snow-plow	400,197	Mar. 26	2102	551, 552	46	1571
Eaton, Minerva J., Hot Springs, Dak. Ter. Trunk	395,617	Jan. 1	474	120	46	96
Eaton, William H., Fitchburg, Mass. Cake, biscuit, and doughnut cutter	398,139	Feb. 19	1564	414	46	900
Eaton, William W. (See Eaton, Matthias B., assignor.)						
Eberhardt, Jacob, Chicago, Ill. Sash-fastener	398,884	Mar. 5	99	27	46	1132
Eberhart, Lloyd, *et al.* (See Osborn, Luke W., assignor.)						
Eberle, Charles R., *et al.* (See Speake, Rufus H., assignor.)						
Eberson, Theodore J. (See Knox and Eberson.)						
Eckardt, Heinrich, Dortmund, Prussia, Germany. Making alloys of chrome, iron, and manganese	399,023	Mar. 5	324	.....	46	1176
Eckert, Owen, Hickory Run, Pa. Truss-pad	397,345	Feb. 5	364	95	46	647
Eckhart, Bernard A. (See Swan, James, assignor.)						
Eclipse Cigar Machine Company. (See Logan, Ralph H., assignor.)						
Economy Folding Bed Company. (See Christy, Thomas J., assignor.)						
Eddy, Arthur H., Hartford, Conn. Switch for electric motors	399,507	Mar. 12	1068	282, 283	46	1350
Edgar, Joseph M., Argentine, Kans., assignor to J. Z. Rorabaek, Kansas City, Mo. Lock	399,189	Mar. 5	607	158	46	1231

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Edge Moore Iron Company. (See Sellers, George H., assignor.)						
Edison Electric Light Company. (See Edison, Thomas A., assignor.)						
Edison Ore Milling Company. (See Edison, Thomas A., assignor.)						
Edison, Thomas A., Menlo Park, N. J. Incandescent-lamp filament	395,963	Jan. 8	1021	260	46	211
Edison, Thomas A., Menlo Park, N. J. Incandescent electric lamp	398,774	Feb. 26	2505	665	46	1095
Edison, Thomas A., Llewellyn Park, N. J. Phonograph recorder and reproducer	397,280	Feb. 5	263	68	46	626
Edison, Thomas A., Llewellyn Park, N. J. Winding field-magnets	397,705	Feb. 12	928	245	46	761
Edison, Thomas A., Llewellyn Park, N. J. Phonograph	397,706	Feb. 12	928	245	46	761
Edison, Thomas A., Menlo Park, N. J., assignor to Edison Electric Light Company, New York, N. Y. Manufacturing electric lamps	395,902	Jan. 8	1021	.....	46	211
Edison, Thomas A., Menlo Park, N. J., assignor to Edison Ore Milling Company, (limited,) New York, N. Y. Ore-separator	400,317	Mar. 26	2293	600	46	1605
Edison, Thomas A., Llewellyn Park, N. J., assignor to Edison Ore Milling Company, (limited,) New York, N. Y. Magnetic separator	396,356	Jan. 15	1593	403	46	326
Edwards, Asa C., Westfield, Mass. Heat-radiator apparatus	395,818	Jan. 8	806	210	46	169
Edwards, Edgar A., Cincinnati, Ohio. Electric-arc lamp	400,198	Mar. 26	2104	552	46	1571
Edwards, George, Berkeley, Cal. Cork-extractor	395,618	Jan. 1	475	121	46	97
Edwards, Henry F. (See Mesker and Edwards.)						
Edwards, Joseph, Brooklyn, N. Y. Dredging-machine	399,251	Mar. 12	703	183, 184	46	1277
Edwards, Joseph, Brooklyn, N. Y. Driven-well head	399,747	Mar. 19	1444	372	46	1431
Edwards, William H., Foxburg, Pa. Casing-spear for wells	395,318	Jan. 1	17	5	46	6
Effinger, August, L. D. Deweese, C. W. Koons, and W. H. Metzger, Canton, Ohio; said Koons and Metzger assignors to said Effinger and Deweese. Saw-setting device	399,391	Mar. 12	920	239	46	1318
Egan, Charles E., assignor of one-fortieth to J. D. H. McKinley, Columbus, Ohio. Galvanic battery	397,116	Feb. 5	16	4	46	582
Egan, Charles E., Columbus, Ohio, assignor of one-tenth to N. W. Halley, Tipton, Ind. Incandescent electric-lamp socket	399,748	Mar. 19	1446	372	46	1431
Egen, Carl. (See Heidmann, Höttges, and Egen.)						
Eggers, Anton C., Bath Beach, assignor to Ideal Rubber Company, Brooklyn, N. Y. Rubber bed-pan	399,508	Mar. 12	1089	284	46	1350
Ehnborn, Carl E., Long Island City, N. Y. Means for mounting the grip on cable-railway cars	398,580	Feb. 26	2230	589	46	1039
Ehrhardt, Charles, Chicago, Ill. Drinking-fountain and show-stand	398,591	Feb. 26	2231	589	46	1040
Ehrlich, Friedrich E. P., Gohlis, near Leipsic, Saxony, and G. A. F. Müller, Berlin, assignors to Fabrik Leipziger Musikwerke, vormals Paul Ehrlich & Co., Gohlis, near Leipsic, Germany. Musical box	398,241	Feb. 19	1714	452	46	930
Eichelberger, Abdiel W., Hanover, Pa. Railway cattle-guard	398,592	Feb. 26	2232	589	46	1040
Eickemeyer, Rudolf, Yonkers, N. Y. Unipolar dynamo-electric machinery	396,149	Jan. 15	1286	330	46	272
Eickemeyer, Rudolf, Yonkers, N. Y. Brush for electric generators	397,492	Feb. 12	591	153	46	698
Eisengart, George J., Jr. (See Rittinger and Eisengart.)						
Eisenhart, John W., York, Pa. Positive shuttle-motion for looms	399,138	Mar. 5	520	135	46	1215
Eisenhart, John W., York, Pa. Wire-twisting machine	399,856	Mar. 19	1616	418	46	1464
Eisenhart, John W., York, Pa. Wire-twisting machine	398,885	Mar. 5	100	27, 28	46	1133
Eissner, Carl A., Lugau, Saxony, Germany. Tile-cutting machine	395,554	Jan. 1	369	95	46	77
Elder, George L., Wilmington, Ind. Chart for educational purposes	395,819	Jan. 8	807	210	46	169
Elder, Herbert, Harrisburg, Pa. Whip-socket	399,605	Mar. 12	1240	319	46	1379
Elder, James F., Philadelphia, Pa. Stock-car						
Electric Storage Battery Company. (See Payen, Clément, assignor.)						
Electrical Accumulator Company. (See Sellon, John S., assignor.)						
Electrical Accumulator Company. (See Shaw, William A., assignor.)						
Electrical Supply Company. (See Kammeyer, Carl E., assignor.)						
Electro-Automatic Transit Company of Baltimore City. (See Weems, David G., assignor.)						
Electro Dynamic Company. (See Griscom and Weidner, assignors.)						
Elges, Gottlieb D., Davenport, Iowa. Die for stamping metallic cigar-molds	398,954	Mar. 5	207	57	46	1153
Elgin, Samuel T., Astoria, Ill. End-gate for wagons	397,789	Feb. 12	1051	280, 281	46	786
Elias, Hugh. (See Anderson and Elias.)						
Elliot, Henry, St. Louis, Mo. Automatic switch-stand	395,964	Jan. 8	1022	260	46	211
Elliott, Abraham, *et al.* (See Latz, Charles J., assignor.)						
Elliott, E. E. (See Sedwick, Calvin W., assignor.)						
Elliott, Edward, assignor of one-half to J. P. Fitzgerald, Stillwater, Minn. Harness-hook	399,392	Mar. 12	921	239	46	1318
Elliott, William, E., Chicago, Ill. Railway-car	397,702	Feb. 19	1203	322, 323	46	834
Elliott, William P., and A. Farrar, Chicago, Ill. Gate	395,885	Jan. 8	909	233	46	189
Ellis, Benjamin F., Wayne, Ill. Bag-holder	397,346	Feb. 5	365	96	46	647
Ellis, Frank H. (See Cogan and Said, assignors.)						
Ellis, Shirley V., Lynn, Mass. Knife-blade holder	399,855	Mar. 19	1615	418	46	1464
Ellis, Stephen, Jacksonville, Ill. Lamp-burner	398,503	Feb. 26	2106	555	46	1015
Ellis, William, Pekham, county of Surrey, England. Machinery for cutting wood for matches, splints, and match boxes	398,593	Feb. 26	2232	590, 591	46	1040
Ellis, William G., Amesbury, Mass. Street car	398,594	Feb. 26	2235	591	46	1040
Ellison, Arthur R. (See Oakes, Alonzo, assignor.)						
Ellithorpe, Frank N., Port Clinton, Ohio. Fruit-assorter	399,509	Mar. 12	1090	284	46	1350
Ellwood, Everett C., Green's Farms, Conn. Carpet-stretcher	398,318	Feb. 19	1633	434	46	955
Ellwood, Hiram. (See Gent, William, assignor.)						
Elmes, Charles F. (See Mosher, Silas H., assignor.)						
Elsbury, Charles, Eyota, Minn. Fire-escape	396,552	Jan. 22	1902	490	46	393
Elsom, William J., Cortland, N. Y. Calendar	395,385	Jan. 1	120	30, 31	46	26
Emerick, Garrett M., Brooklyn, N. Y. Mechanism for operating dumb-waiters	397,228	Feb. 5	190	50	46	612
Emerson, Charles W., Somerville, Mass. Stove	395,430	Jan. 1	178	47	46	38
Emerson, Elisha, Providence, R. I. Cathode for an electro-depositing apparatus	395,173	Jan. 8	713	184	46	152
Emerson, James E. (See Midgley, Thomas, assignor.)						
Emerson, Talcott & Co. (See Bloom, John C., assignor.)						
Emery, Charles E., Brooklyn, N. Y. Working-beam	398,955	Mar. 5	208	57	46	1154
Emery, Charles E., Brooklyn, N. Y. Working-beam for steam-engines	398,956	Mar. 5	209	58	46	1154
Emery, Charles G. (See Emery, William H., assignor.)						
Emery, William, *et al.* (See Taber, John, assignor.)						
Emery, William H., assignor to C. G. Emery, Brooklyn, N. Y. Paper box	395,886	Jan. 8	912	234	46	189
Emmens, Stephen H., London, England. Gun and projectile for throwing high explosives	397,052	Jan. 29	2639	680	46	550
Emmens, Stephen H., London, England. Cartridge	398,326	Feb. 26	1946	512	46	994
Emmens, Stephen H., London, England. Gun and projectile for the same	398,595	Feb. 26	2236	592	46	1041
Emmens, Stephen H., London, England. Cartridge	398,843	Mar. 5	17	5	46	1117
Emmert, Jesse, Hardy, Nebr. Curtain attachment	399,857	Mar. 19	1617	418	46	1464

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Emmons, Alma, Galena, Kans. Ore-separator	399,658	Mar. 19	1317	337, 338	46	1405
Enequist, Erik, Brooklyn, N. Y. Railway-car seat	400,066	Mar. 26	1914	498, 499	46	1530
Endean, Theodore, Cleveland, Ohio. Photographic chair	398,712	Feb. 26	2425	642	46	1079
Endemann, Hermann, Brooklyn, N. Y. Fertilizer	396,274	Jan. 15	1475	.....	46	306
Enewold, Lawrence C., *et al.* (See Skow, Matts, assignor.)						
Engel, William C., Ashland, Pa. Plate-holder	399,024	Mar. 5	325	87	46	1177
England, James, New York, N. Y. Suspender-buckle	397,634	Feb. 12	829	216	46	742
Engstrom, Jacob B. (See Tuah and Engstrom.)						
Enos, John A., assignor to E. Shapleigh, Boston, Mass., and H. W. Morton, Kemptville, Nova Scotia. Stock-indicator	398,713	Feb. 26	2426	642, 643	46	1079
Ensign, Francis H. (See Brechbill and Ensign.)						
Enyeart, John L., Shirleysburg, Pa. Wire-stretcher	398,596	Feb. 26	2238	592	46	1041
Equitable Electric Company. (See Holcombe, Alfred G., assignor.)						
Equitable Pottery Company. (See Machin, Herbert, assignor.)						
Erdman, Herman, assignor to G. A. Gray Company, Cincinnati, Ohio. Friction-clutch	399,858	Mar. 19	1617	419	46	1465
Erickson, John G., Hadley, Minn. Sash-fastener	396,150	Jan. 15	1290	330	46	272
Ericsson, Rudolph. (See Sjöberg, Rudolf, assignor.)						
Erie County Light Company. (See Wood, Montraville M., assignor.)						
Erue, Jesse W., *et al.* (See Pennock, Lee J., assignor.)						
Escott, Matthew H. (See Gates, Henry L., assignor.)						
Esmond, William V., Chicago, Ill. Sluk-cleaner	399,321	Mar. 12	810	209	46	1297
Espiussse, Cénemon P., Montauban, France. Combined rail-chair and sleeper	396,473	Jan. 22	1787	458	46	373
Essig, Ozia A., Canton, Ohio. Plow-clevis	396,474	Jan. 22	1788	458	46	373
Essig, Ozia A., assignor to Universal Plow Company, Canton, Ohio. Clevis	395,386	Jan. 1	121	31	46	27
Estes, Hubert R. (See McGimsey, Charles P., assignor.)						
Estey, David M. (See Clapp, Dwight C., assignor.)						
Ethridge, Martin V. B., Boston, Mass., assignor of two-thirds to J. Swann, New York, N. Y., and H. E. Waite, West Newton, Mass. Time-piece dial	395,696	Jan. 8	607	153	46	131
Ethridge, Martin V. B., assignor of nine-twentieths to A. Leavitt, Boston, Mass. Machine for labeling cans	398,775	Feb. 26	2506	665, 666	46	1095
Euchenhofer, Edward E., assignor of one-half to C. J. Weniman, Dayton, Ohio. Device for preventing incrustation	396,033	Jan. 8	1124	285	46	230
Eureka Company. (See Driffill, Frederick, assignor.)						
Evans, James, Philadelphia, Pa. Clay pulverizer and conveyer	399,025	Mar. 5	326	87	46	1177
Evans, John T., Minersville, Utah Ter. Tongs	400,067	Mar. 26	1916	499	46	1531
Evans, Robert L., Scottsborough, Ala. Car-coupling	400,068	Mar. 26	1916	499	46	1531
Evenstad, Ole, and O. Senstad, Rasten, Storelvedalen, Norway. Machine for making packing-shavings	397,221	Feb. 5	265	68, 69	46	626
Everding, Charles, Branford, Conn. Edge-trimmer for grass-borders	397,843	Feb. 12	1123	300	46	800
Everest, David O., Pine Grove, assignor of one-half to Williams Manufacturing Company, Kalamazoo, Mich. Harrow-tooth holder	400,397	Mar. 26	2417	633	46	1628
Everest, David O., Pine Grove, assignor of one-half to Williams Manufacturing Company, Kalamazoo, Mich. Harrow-tooth holder	400,398	Mar. 26	2418	633	46	1628
Everett & Connors. (See Dolsen, Ninian H., assignor.)						
Everit, William L., New Haven, Conn. Car-floor	397,420	Feb. 5	480	123	46	671
Everitt, Jesse, assignor of one-half to J. W. Hathaway, Knoxville, Pa. Kitchen table and cabinet	397,073	Jan. 29	2609	690	46	556
Everitt, Percival, London, England. Automatic brake	395,555	Jan. 1	371	95	46	77
Ewart Manufacturing Company. (See Dodge, James M., assignor.)						
Ewing, Alvan B., Lewisburg, Tenn. Plumb-level	399,859	Mar. 19	1618	419	46	1465
Ewing, George C., Jr., *et al.* (See Dyer, Isaac T., assignor.)						
Ewing, Thomas K. (See Paul and Kleinsteuber, assignors.)						
Eyges, William, Boston, Mass. Hanger for wearing-apparel	399,510	Mar. 12	1092	284	46	1351
Faber, William A., Danbury, Conn. Hatter's brush	396,812	Jan. 29	2302	589	46	481
Fabrik Leipziger Musikwerke, vormals Paul Ehrlich & Co. (See Ehrlich and Müller, assignors.)						
Facer, Wilson E., Cleveland, Ohio. Oil burner	397,493	Feb. 12	593	153	46	698
Facile Bottle Stopple Company. (See Fullerton, George A., assignor.)						
Faddis, Robert P., Socorro, N. Mex. Ter. Railway	398,037	Feb. 19	1490	375	46	873
Faller, Thomas, Lebanon, Pa. Furnace-filling barrow	399,303	Mar. 12	921	239	46	1318
Fairbanks, Henry, St. Johnsbury, Vt. Manufacture of pails, &c., from paper-pulp	396,198	Jan. 15	1364	350	46	285
Fairbanks, Horace S., Racine, Wis. Carriage seat and body	398,597	Feb. 26	2239	592	46	1041
Fairer, Richard O. (See Rhodes, William T., assignor.)						
Fairweather, Lydia, Richmond Hill, N. Y. Snow shovel and scraper	399,394	Mar. 12	922	239	46	1318
Fant, Parker, Wilmington, Ill. Tailor's and dress-maker's square	396,396	Jan. 22	1661	427	46	347
Farbenfabriken, vormals Fr. Bayer & Co. (See Baumann, Eugen, assignor.)						
Farbenfabriken, vormals Fr. Bayer & Co. (See Grün, Gottfried, assignor.)						
Farbenfabriken, vormals Fr. Bayer & Co. (See Hinsburg, Oskar, assignor.)						
Farbenfabriken, vormals Friedr. Bayer & Co. (See Bayer, Friedrich, assignor.)						
Fargason, John T. (See Rossi, James C., assignor.)						
Faries, Robert, Decatur, Ill. Machine for forming interlocking eyes	397,175	Feb. 5	112	29, 30	46	598
Faries, Robert, Decatur, Ill. Rest for display-frames	398,686	Mar. 5	101	28	46	1133
Farish, Frederick. (See McCormick and Farish.)						
Farmer, David, Piedmont, Ohio. Fire-place back	395,697	Jan. 8	610	153	46	131
Farmer, George P., Montclair, N. J. Safety-pin	398,140	Feb. 19	1565	414	46	901
Farmer, George P., Montclair, N. J. Safety-pin	398,141	Feb. 19	1566	414	46	901
Farmer, Luther C., Minneapolis, Minn. Weighing-scale	399,800	Mar. 19	1619	419	46	1465
Farmers Loan and Trust Company, trustee. (See Merritt, Mortimer G., assignor.)						
Farnham, Mary E., New Orleans, La. Car-starter	400,199	Mar. 26	2105	552	46	1571
Farnsworth, Charles F., Memphis, Tenn. Wheelbarrow-wheel	397,347	Feb. 5	366	96	46	647
Farr, William M., Olean, N. Y. Self-locking load-binder	398,714	Feb. 26	2428	643, 644	46	1079
Farrar, Arthur. (See Elliott and Farrar.)						
Farrar, Chilion M., Buffalo, N. Y. Balanced valve	396,737	Jan. 29	2189	560, 561	46	457
Farrar, William B., Greensborough, N. C. Adjustable vehicle-shaft	395,820	Jan. 8	808	211	46	169
Farrer, Charles S., Dunmore, Pa. Automatic device for dumping coal-cars	398,598	Feb. 26	2240	593	46	1041
Farrington, Zenas R., Portland, Me. Rotary steam-engine	397,707	Feb. 12	929	246, 247	46	761
Farwell, Charles F. (See McCloskey, John, assignor.)						
Farwell, Frederic E., Fitchburg, Mass. Vise	400,069	Mar. 26	1917	500	46	1531
Fate & Freese. (See Freese and Wolcott, assignors.)						
Fauber, William H., Chicago, Ill. Door-bell	396,993	Jan. 29	2554	600	46	534

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Faucette, James B., Little Rock, Ark. Dividing-engine	398,504	Feb. 26	2107	535	46	1015
Faulkner, James J., Jackson, Mich. Flour-bolt	396,922	Jan. 29	2456	632	46	514
Faulkner, John B. (See Schmalz and Faulkner.)						
Faulkner, Martha. (See Hammond, Frank, assignor.)						
Fawcett, Thomas C., Leeds, county of York, England. Machine for pressing fabrics	399,511	Mar. 12	1093	285	46	1351
Faxon, Frank G., Mount Morris, N. Y. Watch-case pendant	398,957	Mar. 5	212	58	46	1151
Faxon, Frank G., Mount Morris, N. Y. Fastening for watch-bows	399,661	Mar. 19	1620	420	46	1405
Fay, Henry R., Boston, Mass. Knife and fork cleaner	398,142	Feb. 19	1567	415	46	901
Fay, Winslow L., Elyria, Ohio. Tricycle	397,348	Feb. 5	367	96	46	647
Fear, Frederick, New York, N. Y. Electro-magnetic attachment for eyeglasses	397,790	Feb. 12	1053	281	46	768
Fearey, Frederick T. (See Gartner, Alfred, assignor.)						
Felbel, Jacob, and A. W. Steiger, assignors to Writing Machine Manufacturing Company, New York, N. Y. Type-writing machine	400,200	Mar. 26	2106	552	46	1571
Feld, John A., and J. Siebrecht, assignors of one-third to J. Mayer, New York, N. Y. Vessel for holding liquids under pressure	400,318	Mar. 26	2294	600	46	1605
Fell, Ambrose G., New York, N. Y. Making a lead pigment	396,275	Jan. 15	1477	.....	46	306
Felt, Dorr E., assignor to himself and R. Tarrant, Chicago, Ill. Adding-machine	396,034	Jan. 8	1125	286	46	230
Felt, Dorr E., assignor of one-fourth to R. Tarrant, Chicago, Ill. Lathe-chuck	396,035	Jan. 8	1126	286	46	231
Felt, Seth C., New Boston, Mich. Road-cart	398,242	Feb. 19	1716	452	46	931
Fenerty, Edward L., Halifax, Nova Scotia, Canada. Shovel	398,887	Mar. 5	101	28	46	1133
Fenner, George H. (See Fenner, Henry J. and G. H.)						
Fenner, Henry J., Brookeholme, St. John's Park, Blackheath, county of Kent, and G. H. Fenner, 38 Hillsboro Road, Dulwich, county of Surrey, England. Apparatus for the manufacture of naphthaline	399,139	Mar. 5	521	136	46	1216
Ferdinand, Anthony B., Oshkosh, Wis. Telephone or analogous electric system	397,176	Feb. 5	124	30, 31	46	599
Ferguson, Frank, *et al.* (See Colbert, John M., assignor.)						
Ferguson, George J., Greenville, Tex. Recording door-lock	395,319	Jan. 1	19	5, 6	46	6
Ferguson, Harry, New York, N. Y. Machine for finishing poles or rods	398,243	Feb. 19	1717	453	46	931
Ferguson, Hugh, *et al.* (See Wellens, Robert, assignor.)						
Ferguson, James H., *et al.* (See Colbert, John M., assignor.)						
Ferguson, Robert G., assignor of one-half to O. A. Day, Saratoga Springs, N. Y. Portable steam generator and radiator combined	399,512	Mar. 12	1094	285, 286	46	1351
Fernau, Magnus, Flatonia, Tex. Bedstead-tie	397,708	Feb. 12	931	247	46	762
Ferrall, Thomas R., Boston, Mass. Anti-friction bearing	399,662	Mar. 19	1325	339	46	1406
Ferreira, Charles E., Morgan Park, Ill. Feed-water heater and purifier	400,319	Mar. 26	2295	600, 601	46	1606
Ferriott, Charles L., assignor to J. M. Weems, Dawson, Tex. Peach-stoner	399,513	Mar. 12	1097	286	46	1352
Ferris, Henry L., Harvard, Ill., assignor to Hunt, Helm & Ferris. Hay-carrier	399,140	Mar. 5	523	136	46	1216
Ferris, Sherwood B., Lakewood, N. J. Clasp or buckle	395,965	Jan. 8	1024	261	46	212
Fessenden, Edward H. (See Harper, William, assignor.)						
Fessenden, William N., Candor, N. Y. Snap-hook	398,599	Feb. 26	2240	593	46	1041
Fest, Charles P., assignor of one-half to W. G. Toplis, Germantown, Pa. Air-heating apparatus	398,715	Feb. 26	2429	644	46	1080
Fetherstonhaugh, Frederic B., Toronto, Ontario, Canada. Corn-cob holder	395,698	Jan. 8	610	154	46	132
Ffrost, Henry C. A., Sydney, New South Wales. Means for reciprocating ink-distributing rolls of printing-machines	395,966	Jan. 8	1024	261	46	212
Field, Isaac F., Sandy Lake, Pa. Washing-machine	397,349	Feb. 5	367	96	46	647
Field, Stephen D., Stockbridge, Mass. Vibratory multiplex telegraphy	395,556	Jan. 1	372	95, 96	46	77
Field, Wallace L., assignor to J. Strange, Menasha, Wis. Pulley	397,978	Feb. 19	1318	352	46	854
Fiester, John C., Reading, Pa. Hat-block	397,117	Feb. 5	12	4	46	562
Figarotta, Vincent L. (See Leach and Figarotta.)						
Filer, William H., Grove City, Pa. Steam cooking apparatus	397,709	Feb. 12	931	247	46	762
Filley, Giles F., St. Louis, Mo. Heating-stove	397,710	Feb. 12	933	248	46	762
Filley, Giles F., St. Louis, Mo. Cooking-stove	397,844	Feb. 12	1124	301	46	800
Finch, John M., Crockett, and J. R. Cross, San Francisco, Cal. Separator	400,201	Mar. 26	2108	553	46	1572
Finch, John M., and W. D. Gray, assignors to E. P. Allis & Company, Milwaukee, Wis. Rotary bolt	398,388	Feb. 26	1949	512, 513	46	985
Finch, John W., and J. B. Park, Clay Centre, Kans. Bier	398,776	Feb. 26	2510	667	46	1096
Finch, Thomas F. N., Worcester, county of Worcester, England. Car-axle lubricator	395,887	Jan. 8	913	234	46	190
Finckel, Martin L., *et al.* (See Goodman, Samuel N., assignor.)						
Findley, John P., Blanchard, Pa. Index	400,070	Mar. 26	1918	500	46	1532
Finn, Richard, Chicago, Ill. Supply and waste valve	396,151	Jan. 15	1291	331	46	272
Finnegan, James, and W. Mies, Ferney, Dak. Ter. Wheel-harrow	398,600	Feb. 26	2241	593	46	1042
Finnegan, John, assignor to T. Devlin & Co., Philadelphia, Pa. Transom-lifter	396,357	Jan. 15	1594	404	46	327
Firestone, Truman L. (See Smith and Firestone.)						
Firm, Joseph L., Jersey City, N. J. Printing newspapers or pamphlets	399,659	Mar. 19	1319	338	46	1406
Firth, Edwin A. and I. Tompkins, Troy, N. Y. Die for making axle-nuts	396,864	Jan. 29	2370	608	46	497
Firth, Edwin A., and I. Tompkins, Troy, N. Y. Making axle-nuts	396,865	Jan. 29	2371	608	46	497
Fischer, August, Winchester, assignor of one-half to J. F. Potts, Whitehall, Ill. Stem winding and setting watch	400,202	Mar. 26	2110	553	46	1572
Fish, Peter, *et al.* (See Dyer, Isaac T., assignor.)						
Fish, Samuel H., Hinsdale, Ill. Paper-punch	395,320	Jan. 1	24	6	46	7
Fisher, Alfred G., assignor to M. D. Goetting, Springfield, Mass. Temporary binder	397,845	Feb. 12	1125	301	46	801
Fisher, Charles C. (See Fisher, Samuel C. and C. C.)						
Fisher, Ebenezer. (See McBride and Fisher.)						
Fisher, Harvey L., and J. W. Ballard, assignors of one-third to L. Clark, Toledo, Iowa. Railway-scales	398,624	Mar. 5	18	5	46	1117
Fisher, Henry H., New Paris, Ind. Washing-machine	399,960	Mar. 19	1786	463	46	1498
Fisher, James S., Chicago, Ill. Sash-fastener	395,321	Jan. 1	25	6	46	7
Fisher, John E., assignor of one-third to W. W. Baxter, Boston, Mass. Vehicle-wheel	397,711	Feb. 12	934	248	46	762
Fisher, Joseph H., Deerfield, assignor to A. J. Sands, Chicago, Ill. Can-opener	399,252	Mar. 12	707	184	46	1278
Fisher, Marion O., assignor to S. C. McClure, Dayton, Ohio. Coupon pass-book	397,494	Feb. 12	595	154	46	699
Fisher, Samuel, Mount Washington, Md., assignor of one-half to W. J. Cauthers, Fordham, N. Y. Bridle-bit	398,319	Feb. 19	1835	484	46	955
Fisher, Samuel C. and C. C., Steubenville, Ohio. Draw-bar for railway-cars	398,716	Feb. 26	2430	644	46	1080
Fisk, Frank E. (See Storrs, Charles L., assignor.)						
Fisk, William C., Toledo, Ohio. Spray-oil burner	399,864	Mar. 19	1623	421	46	1466
Fiske, Bradley A., U. S. Navy. Electric appliance for discharging guns	396,199	Jan. 15	1367	350	46	286
Fiske, Henry P., assignor to American Ring Company, Waterbury, Conn. Forming metal blanks for capping nails	395,888	Jan. 8	914	234	46	190
Fiske, Henry P., assignor to American Ring Company, Waterbury, Conn. Die used in making decorative nails	396,200	Jan. 15	1370	351	46	286
Fiske, Henry P., assignor to American Ring Company, Waterbury, Conn. Machine for finishing decorative nails	398,038	Feb. 19	1421	376	46	873

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Fiske, John D. (See Price, George W., assignor.)						
Fiske, William S., assignor to Hopkins & Dickinson Manufacturing Company, Brooklyn, N. Y. Lock	399,026	Mar. 5	327	88	46	1177
Fiske, William S., assignor to Hopkins & Dickinson Manufacturing Company, Brooklyn, N. Y. Lock	399,141	Mar. 5	524	137	46	1216
Fitch, W. & E. T. (See Hubbard, George M., assignor.)						
Fite, George W., New Richmond, Ohio. Steam-engine	395,967	Jan. 8	1026	261	46	212
Fitton, John R., assignor of one-half to T. Howard, Worcester, Mass. Loom	397,074	Jan. 29	2670	690	46	556
Fitz, Viola, Richmond, Ind. Crib attachment for bedsteads	399,660	Mar. 19	1323	339	46	1406
Fitzgerald, Daniel F., *et al.* (See Hulford, William J., assignor.)						
Fitzgerald, Daniel P., Newark, N. J. Button	397,350	Feb. 5	368	97	46	648
Fitzgerald, James P. (See Elliott, Edward, assignor.)						
Fitzgerald, Jasper D., Eldon, Iowa. Corn-planter	397,351	Feb. 5	369	97	46	648
Flachstuch Gesellschaft. (See De Hemptinne, Paul, assignor.)						
Flatau, Louis S., Pittsburg, Tex. Wire-tightener	397,635	Feb. 12	830	217	46	742
Flather, Joseph, Nashua, N. H. Machine for turning and grinding tapers	396,077	Jan. 15	1189	301, 302	46	232
Flather, Joseph, Nashua, N. H. Engine-lathe	398,601	Feb. 26	2243	594	46	1042
Flatman, Henry A., and J. Seed, Southbrook, New Zealand. Sash-holder	398,039	Feb. 19	1423	376	46	873
Flatz, Otto. (See Gmür and Flatz.)						
Flautt, John B., Sparta, Wis. Paint-brush attachment	398,244	Feb. 19	1718	453	46	931
Fleischer, A., agt., *et al.* (See King, Corydon C., assignor.)						
Fleming, Cochran, Jr., Sewickley, Pa. Automatic twine-winder	400,203	Mar. 26	2111	553	46	1573
Flesher, John, Edgington, Ontario, Canada. Saw-mill dog	397,636	Feb. 12	831	217	46	743
Flesher, Thomas, Dunkirk, N. Y. Pipe-coupling	399,661	Mar. 19	1324	339	46	1406
Fletcher, Elmer, Needham, assignor of one-half to I. M. Hall, Boston, Mass. Exhibiting or advertising device	398,602	Feb. 26	2244	594	46	1042
Fletcher, George, Brooklyn, N. Y. Ratchet-drill	395,774	Jan. 8	714	184	46	152
Fletcher, John R. (See Schardt and Jones, assignors.)						
Florsheim, Elizabeth, *et al.* (See Gardner, Marshall, assignor.)						
Floyd, Frank W., Detroit, Mich. Toe-weight	399,253	Mar. 12	708	184	46	1278
Floyd, James R., New York, N. Y. Apparatus for elevating the covers of gas-purifiers	396,332	Jan. 15	1564	396	46	321
Fogel, Martin L., Superior, Nebr. Tag-holder and tag	399,395	Mar. 12	923	240	46	1318
Follett, Charles, *et al.* (See Dowling, Robert H., assignor.)						
Follett, Charles H., *et al.* (See Dowling, Robert H., assignor.)						
Folmer, William F., Brooklyn, N. Y. Illuminating apparatus	397,903	Feb. 19	1205	323	46	834
Folmer, William F., assignor of one-half to W. E. Schwing, New York, N. Y. Gas-burner for billiard-tables	397,904	Feb. 19	1206	323	46	834
Folsom, George F., Boston, Mass. Shutter-fastener	395,557	Jan. 1	379	96	45	78
Foos Manufacturing Company. (See Winchell, James F., assignor.)						
Foot, Joseph L., San Diego, Cal. Bee-hive	398,387	Feb. 26	1948	512	46	984
Foote, Frederick S., New York, N. Y. Knife	395,821	Jan. 8	809	211	46	170
Forbes, Frank, St. Ansgar, Iowa. Pitman-connection	398,717	Feb. 26	2431	644, 645	46	1080
Forbes, Malcom, Warwick, N. Y. Scarf-holder	396,994	Jan. 29	2555	660	46	534
Forbes, Walter T., Atlanta, Ga. Refrigerator	397,791	Feb. 12	1053	281	46	786
Forbes, Walter T., Atlanta, Ga., and G. Leder, Demopolis, Ala. Extracting oil	397,792	Feb. 12	1055	281	46	786
Ford, Charles S., Sr., assignor to C. T. Hallowell and F. W. Shriver, Philadelphia, Pa. Apparatus for regulating and controlling the exit of gas or liquids	396,078	Jan. 15	1192	302	46	252
Ford, Edward S., Hoxton, county of Middlesex, England, assignor to O. Uhlman, Bavaria, Germany. Vending-machine	398,245	Feb. 19	1719	453, 454	46	931
Ford, Edwin H., Hartford City, Ind. Automatic gas-regulator and cut-off	395,387	Jan. 1	122	31	46	27
Ford, George, New Harmony, Ind. Gate	398,718	Feb. 26	2433	645	46	1080
Foreman, Milton, Philadelphia, Pa. Apparatus for delivering ashes from cellars	396,923	Jan. 29	2458	639	46	514
Forest, Alphonse. (See Scheurer and Forest.)						
Forest, John W., Thayer, and S. H. Scott, Chanute, Kans. Car-coupling	396,901	Jan. 15	1371	351	46	287
Forman, Jonathan C., Cleveland, Ohio. Blank-book tool	398,825	Mar. 5	20	5	46	1118
Foster, Benjamin O., Humboldt Park, Ill. Suspenders	399,514	Mar. 12	1099	286	46	1352
Foster, Edwin J. (See Gail, Daniel H., assignor.)						
Foster, Edwin J., Cleveland, Ohio. Cot-bed	399,254	Mar. 12	708	185	46	1278
Foster, George E., Pleasant Valley, Cal. Adjusting and supporting device for drills	396,866	Jan. 29	2372	608	46	497
Foster, Mark W., Pecatonica, Ill. Gate	399,981	Mar. 19	1788	464	46	1498
Foster, Matthew H. (See Chase and Foster.)						
Foster, Percy R., assignor to M. T. Davidson, Brooklyn, N. Y. Steam-engine valve	398,777	Feb. 26	2512	667	46	1096
Foster, Stevens & Co. (See Barbour, Charles C., assignor.)						
Foster, W. S. (See Daly, William J., assignor.)						
Foster, William C., Jersey City, N. J., assignor to M. A. Cuming, New York, N. Y. Stitching fabrics	397,495	Feb. 12	597	154	46	699
Foster, William C., Jersey City, N. J., assignor to M. A. Cuming, New York, N. Y. Sewing-machine	397,496	Feb. 12	598	155	46	699
Foster, William C., and H. W. Merritt, Somerville, Mass. Tricycle	399,190	Mar. 5	609	158, 159	46	1232
Foulke, John F., Philadelphia, Pa. Machine for overthrowing trees	396,738	Jan. 29	2190	561	46	457
Fountain, George H., Plainfield, N. J. Sifter	399,862	Mar. 19	1621	420	46	1465
Fontch, Adelbert E., New Albany, Ind. Stereoscope	399,863	Mar. 19	1622	420, 421	46	1465
Fowle, John L., assignor to W. F. Fowle, Woburn, Mass. Machinery for grinding metallic bands	396,553	Jan. 22	1903	491	46	394
Fowle, Walter F. (See Fowle, John L., assignor.)						
Fowler, Alfred B., and G. E. Warren, assignors to Rockingham Machine Company, Exeter, N. H. Heel-finishing machine	396,690	Jan. 22	2107	541, 542	46	433
Fowler, Charles F., North Springfield, Mo. Fence	397,905	Feb. 19	1208	323	46	835
Fowler, Charles M., Salem, Mass. Fire-escape	398,836	Mar. 5	20	6	46	1118
Fowler, Herbert E., New Haven, Conn. Machine for bending pipe	397,712	Feb. 12	935	249	46	763
Fowler, Herbert E., New Haven, Conn. Machine for bending pipe	397,713	Feb. 12	936	249	46	763
Fowler, Herbert E., New Haven, Conn. Machine for bending and coiling pipe	397,793	Feb. 12	1056	282	46	786
Fowler, John W., Brooklyn, N. Y. Brake-handle	396,924	Jan. 29	2459	633	46	515
Fowler, Joinville F., Alliance, assignor of one-half to H. M. Silver, Salem, Ohio. Stove-foot	397,714	Feb. 12	940	249	46	764
Fowler, Joseph. (See Morrison, John R., assignor.)						
Fox, Charles, Stamford, Conn. Cut-off and reversing-gear for engines	399,191	Mar. 5	611	159	46	1232
Fox, Ellis L., Shannonville, Pa. Horse-releasing device	398,827	Mar. 5	22	6	46	1118
Fox, George H., Boston, Mass. Button-fastener	395,745	Jan. 8	676	173	46	145
Fox, Josiah B., Emlinton, Pa. Means for obtaining motive power from water and air currents	397,118	Feb. 5	19	5	46	582

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Fox, Samson, Harrogate, county of York, England. Manufacture of frame-plates for rolling-stock	397,177	Feb. 5	118	31	46	399
Fox, Samson, Harrogate, county of York, England. Apparatus for the manufacture of frame-plates for rolling-stock	397,178	Feb. 5	120	31, 32	46	600
	397,179	Feb. 5	122	33, 34	46	600
Fox, Samson, Harrogate, county of York, England. Manufacturing frame-plates	10,990	Mar. 12	1294	332	46	1389
Fox, William S., Short Creek, Ohio. Attachment for mowing-machines. (Reissue)	397,653	Jan. 29	2641	680	46	551
Frampton, Robert C., London, England, assignor to Consolidated Agency Company of London, England. Fountain-pen	396,813	Jan. 29	2303	589	46	481
France, John M. D., St. Joseph, Mo. Book-shelf	395,388	Jan. 1	124	31	46	27
Francis, James H. (See Nicholls, Walter, assignor.)	396,651	Jan. 22	2053	527	46	421
Francisco, William J., Cereaco, Mich. Three-wheeled vehicle	397,119	Feb. 5	20	5	46	583
Franco, Chris, Livermore, Cal. Bale-tie twister	399,027	Mar. 5	328	88	46	1177
Frank, Henry C., New York, N. Y. Cuff-fastener	395,968	Jan. 8	1027	262	46	212
Frank, Siegmund, Hamburg, Germany. Braces or suspenders	396,358	Jan. 15	1595	404, 405, 406, 407	46	327
Franke, Friedrich O., St. Gall, Switzerland. Metallic stuffing-box packing	396,359	Jan. 15	1601	408, 409, 410, 411	46	329
Franklin, Edward A., Brenham, Tex., assignor to Bailey, Farrell & Co., Pittsburg, Pa. Cartridge-loading machine	395,431	Jan. 1	180	47	46	33
Franklin, Edward A., Brenham, Tex., assignor to Bailey, Farrell & Co., Pittsburg, Pa. Cartridge-loading machine	395,969	Jan. 8	1028	262	46	212
Franklin, John, Cincinnati, Ohio. Lamp	396,995	Jan. 29	2556	660	46	534
Franklin, John, Cincinnati, Ohio. Regulator for gas-lamps	400,071	Mar. 26	1920	500, 501	46	1532
Franks, Owen, and W. Carroll, Columbus, Ohio. Safety car lamp and stove	399,142	Mar. 5	526	137	46	1216
Frantz, Eugene L., assignor of one-half to F. N. Ruggles, Sweet Valley, Pa. Drill	396,958	Mar. 5	213	59	46	1154
Fraser, John, assignor to himself and G. A. Upper, Simcoe, Ontario, Canada. Vehicle-brake	395,889	Jan. 8	915	235	46	190
Fray, John S., Bridgeport, Conn. Ratchet-brace	395,822	Jan. 8	810	211	46	170
Frazer, Daniel A., Mancelona, Mich. Steam-engine	400,320	Mar. 26	2297	601, 602	46	1606
Frazer, William, London, county of Middlesex, England. Oil-lamp	398,246	Feb. 19	1721	454	46	971
Frederick, John S., *et al.* (See Roberts, Thomas, assignor.)	397,422	Feb. 5	483	126, 127	46	671
Frederick, Samuel C., Arcadia, Kans. Metallic roofing	397,460	Feb. 5	544	143	46	682
Fredericks, John H., Lock Haven, Pa., assignor of one-half to St. Louis Stamping Company, St. Louis, Mo. Cooking utensil	397,847	Feb. 12	1128	302	46	801
Frederiksen, Johan D. (See Jespersen, Wilhelm, assignor.)	395,890	Jan. 8	916	235	46	190
Freeman, Leander W., Liberty, Ind. Machine for making wire fencing	397,846	Feb. 12	1127	301	46	801
Freeman, Thomas F., Brooklyn, N. Y. Amalgamator	400,399	Mar. 26	2418	633, 634	46	1628
Freese, Egbert M., Plymouth, and J. W. Wolcott, Fremont, assignors to Fate & Freese, Plymouth, Ohio. Cutting-table for brick or tile machines	395,775	Jan. 8	715	184	46	152
Freiner, Emil. (See Dufner and Freiner.)	397,637	Feb. 12	833	217	46	743
French, Francis J., assignor to J. E. Killian, Miles Grove, Pa. Clothes-drier	395,490	Jan. 1	272	70	46	57
French, John C., Concord, N. H. Car-axle box	397,282	Feb. 5	266	69	46	627
French, Matthew, Haverhill, Mass. Device for feeding and watering poultry	395,776	Jan. 8	717	185	46	153
Frenzel, Franz, Jr., New York, N. Y. Tubular racing-boat	397,848	Feb. 12	1129	302	46	801
Frey, Gustave. (See Frey and Buscher, assignors.)	399,255	Mar. 12	710	185	46	1278
Frey, John, Van Wert, Ohio. Car-coupling	399,865	Mar. 19	1025	421	46	1466
Frey, Rudolph E., and J. Buscher, assignors of one-third to G. Frey, St. Louis, Mo. Book-binding	396,333	Jan. 15	1565	396	46	321
Friedgen, G. William. (See Behr, Hermann, assignor.)	399,396	Mar. 12	924	240	46	1319
Friedrich, John, Iron Mountain, Mich. Condenser for charcoal-kilns	398,888	Mar. 5	102	28, 29, 30	46	1133
Friend, John T., Irvine, Ky. Weighing-scales	398,247	Feb. 19	1722	454	46	932
Frienschner, Paul. (See Behan and Frienschner.)	399,029	Mar. 5	329	.....	46	1177
Frita, Milton C., La Harpe, Ill. Gate	399,256	Mar. 12	712	185	46	1279
Frommel & Brother, Oscar. (See Lindsey, George W., assignor.)	397,229	Feb. 5	192	51	46	612
Frost, Abel H., *et al.* (See Hill, Christian C., assignor.)	397,421	Feb. 5	481	126	46	671
Frost, Abel H., *et al.* (See Wagner, Awsbert H., assignor.)	395,746	Jan. 8	677	173	46	145
Fry, Dan T. (See Fulmer and Fry.)	395,491	Jan. 1	273	70	46	58
Fry, Ellwood E., Brooklyn, N. Y. Snare-strainer for drums	396,554	Jan. 22	1905	491, 492	46	394
Fry, Frederick D., assignor of one-half to T. H. Benedict, Danbury, Conn. Wire-twisting machine	399,397	Mar. 12	925	240, 241	46	1319
Fry, Henry, Eugene City, Oreg. Plane	395,492	Jan. 1	273	70	46	58
Fry, Laura A., Camp Dennison, Ohio. Decorating pottery-ware	396,382	Jan. 15	1637	420	46	334
Frye, George C., Portland, Me. Show-case supporter and card-holder	397,039	Feb. 12	835	218	46	743
Fryer, Aaron. (See Van Decar, Emery, assignor.)	399,809	Mar. 19	1630	422	46	1467
Füchter, Bernhard, assignor to J. Lighton, Syracuse, N. Y. Coin-controlled lifting-machine	397,870	Feb. 12	1059	282	46	787
Fuel Gas and Electric Engineering Company. (See Wellman, Samuel T., assignor.)	397,795	Feb. 12	1060	282	46	787
Fuermann, Henry, Chicago, Ill. Cartridge-reloading implement	397,849	Feb. 12	1130	302	46	802
Fuller, Charles, and J. H. Cunningham, Ludell, Kans. Vehicle brake-gear						
Fuller, Charles A. (See Jacoby and Fuller.)						
Fuller, Charlotte W., Lincoln, Me. Bread-board						
Fuller, Frank R. (See Jacoby and Fuller, assignors.)						
Fuller, Frank T., *et al.* (See Abbott, Alpheus A., assignor.)						
Fuller, George W. (See Powers, Daniel E., assignor.)						
Fuller, Hiram E., London, England. Rolling nails						
Fuller, Hiram E., London, England. Machine for rolling nails						
Fuller & Johnson Manufacturing Company. (See Hart, Henry C., assignor.)						
Fuller, Samuel S., *et al.* (See Bowman and Widdifield, assignors.)						
Fuller, William H., Bladen, Nebr. Cultivator						
Fullerton, George A., Boston, Mass. Machine for making compound fabrics						
Fullerton, George A., Boston, Mass., assignor to Facile Bottle Stopple Company, of New York. Bottle-stopper						
Fullerton, James A., Mounts, Ind. Corn-planter						
Fullford, Edwin, and H. T. Van Laun, London, England. Regenerative gas-burner						
Fullford, Edwin, and H. T. Van Laun, London, England. Regenerative gas-burner						
Fulmer, George W., and D. T. Fry, Water Valley, Miss. Car-axle box and bearing						

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Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Fulton, James C., Rockport, Tex. Mechanical movement	395,971	Jan. 8	1030	263	46	213
Fulton, John, Biggs, Oreg. Brake	399,515	Mar. 12	1100	286	46	1352
Fulton, Louis B., Pittsburg, Pa. Pressure-regulator	395,559	Jan. 1	380	97	46	79
Fulton, Louis B., Pittsburg, Pa. Cut-off device for gas	395,560	Jan. 1	383	97	46	79
Fulton, Silas C. (See Angel, Joseph R., assignor.)						
Fulwider, Horace M., Redmon, Ill. Machine for automatically weighing grain	395,561	Jan. 1	384	98	46	80
Funk, Frank, Decatur, Ill. Metallic joint	398,321	Feb. 19	1836	485	46	956
Furman, John A., Newark, N. J., assignor of one-half to Celluloid Novelty Company, New York, N. Y. Horizontally-divided die	395,619	Jan. 1	476	121	46	97
Fuzzey, William W., Havelet, Guernsey, England. Marine safe	396,902	Jan. 15	1572	351	46	287
Fyler, Silas B., East Syracuse, N. Y. Car-coupling	395,823	Jan. 8	811	211	46	170
Gaertner, August H., St. Louis, Mo. Harmonica-holder	397,541	Feb. 12	663	173	46	711
Gaertner, Gustavus, Vienna, Austria-Hungary. Exercising-machine	397,352	Feb. 5	370	97	46	648
Gaeth, Fritz, assignor to F. L. Hunninghaus & Co., New York, N. Y. Machine for creasing and cutting window-shade cloth	400,321	Mar. 26	2300	602	46	1606
Gage, Charles H., Richmond, Wis. Cultivator	398,959	Mar. 5	214	59	46	1155
Gage, George F., Huntingdon, Pa. Railway-switch stand	395,891	Jan. 8	918	236	46	191
Gage, James E., Concord, N. H. Sinker for fish-lines	399,856	Mar. 19	1627	421	46	1466
Gail, Daniel H., assignor to E. J. Foster, Cleveland, Ohio. Spring-bed	399,257	Mar. 12	713	186	46	1279
Gail, Daniel H. and J. F., Brooklyn, N. Y. Woven-wire mattress, &c.	399,867	Mar. 19	1627	422	46	1466
Gail, John F. (See Gail, Daniel H. and J. F.)						
Gaither, Charles P., executor. (See Moore and Davis.)						
Gaither, James G., Williston, Tenn. Cultivator	399,868	Mar. 19	1629	422	46	1467
Gale, Herbert N., Bristol, Conn., assignor of one-half to F. A. Dennett, Sheboygan, Wis. Steam-engine	398,143	Feb. 19	1568	415	46	901
Gale, Horatio, assignor to Albion Manufacturing Company, Albion, Mich. Spring-tooth for cultivators	395,502	Jan. 1	388	98	46	80
Galiano, Abelardo C., Madrid, Spain. Obstetrical forceps	399,749	Mar. 19	1448	372	46	1431
Gallagher, Patrick, New York, N. Y. Tricycle	397,638	Feb. 12	834	218	46	743
Galvin, James A., Steelton, Pa. Electric-lighting system	397,906	Feb. 19	1209	324	46	835
Gambetta, John, *et al.* (See Anderson and Elias, assignors.)						
Gamble, Alphonso A., Waveland, Iowa. Hay-press	396,203	Jan. 15	1373	351	46	287
Gamble, Joseph W., assignor of one-half to J. McCarney, Adair, Iowa. Draft-evener	399,982	Mar. 19	1789	464	46	1498
Game, James A. (See Afialo, Moses, assignor.)						
Ganter, Francis X., Baltimore, Md. Machine for mitering the metal of show-case moldings	398,603	Feb. 26	2246	595	46	1043
Ganter, Francis X., Baltimore, Md. Revolving show-case	398,604	Feb. 26	2247	595	46	1043
Ganter, Francis X., Baltimore, Md. Show-case	398,605	Feb. 26	2248	596	46	1043
Gard, Ivora A., *et al.* (See Patten, Jefferson, assignor.)						
Gardner, Marshall, assignor, by mesne assignments, of two-thirds to A. M. Ball, Aurora, and E. Florsheim, Chicago, Ill. Button-attaching device for sewing-machines	400,322	Mar. 26	2302	603	46	1607
Garrett, William, Joliet, Ill. Reel for wire rods	396,925	Jan. 29	2460	633	46	515
Garsed, Joshua. (See Garsed and Mason.)						
Garsed, Richard and J., and W. Mason, Philadelphia, Pa. Warp-linking machine						
Garst, Edwin, assignor to himself and W. Heathman, Dayton, Ohio. Valve-gear						
Gartner, Alfred, assignor to F. T. Fearey, Newark, N. J. Regulator						
Garver, Charles. (See Terrell and Garver.)						
Garver, David A., and C. H. Straight, deceased, (L. W. Wilder, administrator,) Bryan, Ohio. Two-wheeled vehicle						
Garvin, John C., and H. Moody, Leadville, Colo. Apparatus for the manufacture of gas						
Gascoigne, James R., Devenport, New Zealand. Pruning-shears						
Gaskill, Joshua W., assignor to J. and J. M. Whitall, J. W. Nicholson, Philadelphia, Pa., J. Mickle, Millville, N. J., C. A. Tatum, New York, and F. M. Underhill, Brooklyn, N. Y. Tumbler-holder						
Gates, Alfonso D., Cleveland, Ohio. Manufacture of wrenches						
Gates, Henry L., assignor of one-half to M. H. Escott, Milwaukee, Wis. Stopper for bungs, tap-holes of casks, &c.						
Gates, Philetus W., deceased, Chicago, Ill.; R. I. Gates executor. Stone or ore conveyer						
Gates, Ralph I., executor. (See Gates, Philetus W.)						
Gateway Manufacturing Company. (See Burke, Edward, assignor.)						
Gatling, Richard J., Hartford, Conn. Combined torpedo and gun boat	399,516	Mar. 12	1100	287	46	1352
Gawn, Thomas E. (See Laganke and Gawn.)						
Gaylord, Charles, East Wilson, N. Y. Revolving mold-board for plows	396,397	Jan. 22	1662	427	46	348
Gaylord, Robert F., assignor to J. Gwatkins, New York, N. Y. Alarm-clock	397,850	Feb. 12	1131	303	46	802
Geary, John, assignor to Shaw & Geary, Philadelphia, Pa. Door-spring connection for electric burglar-alarms	398,144	Feb. 19	1570	415	46	901
Gebhardt, Julius F., Port Chester, N. Y. Machine for turning moldings	399,871	Mar. 19	1631	423	46	1467
Geddes, George, Fairmount, N. Y. Road-cart	396,475	Jan. 22	1790	458	46	373
Gedney, Jacob M. R., Little Falls, N. J. Wear-iron for vehicles	395,432	Jan. 1	181	48	46	38
Geer, Adelbert L., assignor of one-half to E. C. Berryman, Midland, Mich. Vignette-holder	399,750	Mar. 19	1449	373	46	1432
Gehring, George L., Rapid City, Dak. Ter. Burial apparatus	397,263	Feb. 5	267	69, 70	46	627
Gehrke, Heinrich, and A. Wohlfahrt, Berlin, Germany. Filtering apparatus	399,983	Mar. 19	1790	464	46	1498
Gehrung, Gottlieb, Jamaica Plain, Mass. Sash-fastener	398,889	Mar. 5	111	30	46	1135
Geigy & Co., John R. (See Walter, Johannes, assignor.)						
Gelbach, George, *et al.* (See Kendall, Franklin B., assignor.)						
Gelwicks, Anna M., Decatur, Ill. Inflatable dress-form	399,332	Mar. 12	811	210	46	1207
Gendron Iron Wheel Company. (See Gendron, Peter, assignor.)						
Gendron, Peter, Toledo, Ohio. Machine for trimming wire spokes	396,814	Jan. 29	2303	589, 590	46	481
Gendron, Peter, assignor to Gendron Iron Wheel Company, Toledo, Ohio. Velocipede	400,074	Mar. 26	1925	502, 503	46	1533
Genevay, Emile F., Corinth, Miss. Cartridge-loading machine	396,398	Jan. 22	1664	427, 428	46	348
Gennert, Ernest T., New York, N. Y. Machine for delinting cotton-seed	396,996	Jan. 29	2557	661	46	534
Gent, Joseph F., Columbus, Ind. Machine for making sheet or flake products	395,893	Jan. 8	921	237	46	191
Gent, William, Rockford, assignor to H. Ellwood, De Kalb, Ill. Forming fence-wire barbs	395,892	Jan. 8	920	236	46	191
Gentry, Nancy K., Denver, Colo. Cosmetic cream	395,824	Jan. 8	811	.....	46	171
Geesl, Anton, Buffalo, N. Y., assignor to F. Prinz, Milwaukee, Wis. Dust-collector	399,984	Mar. 19	1793	465	46	1499
Getman, Timothy W., West Troy, N. Y. Machine for trimming soft-metal linings of car-axle bearings	396,652	Jan. 22	2054	527, 528	46	423
Getten, Albert C., Chicago, Ill. Feed-trough	399,258	Mar. 12	716	186	46	1279

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Getz, William, assignor of two-thirds to J. B. Miller and V. E. Underwood, Kent, Ohio. Match-making machine	398,322	Feb. 19	1837	485	46	956
Geyer, Henry, Brooklyn, N. Y. Hydraulic sausage-stuffing machine	400,323	Mar. 26	2304	603	46	1607
Gibbins, James, Springfield, Mass. Clutch	396,079	Jan. 15	1193	302, 303	46	252
Gibbon, Thomas H., assignor to Metallic Street Railway Supply Company, Albany, N. Y. Street-railway track	396,036	Jan. 8	1128	286	46	231
Gibbons, James, Jersey City, N. J. Burner	398,505	Feb. 26	2116	555	46	1016
Gibbs, Jacob S., Norristown, Pa., assignor to Bridgeport Twine Binder Company. Tension device for grain-binders	399,872	Mar. 19	1633	423	46	1468
Gibson, Charles D. P., New York, N. Y. Storage-battery plate	397,796	Feb. 12	1061	283	46	787
Gibson, Franklin S., *et al.* (See Randall, Franklin S., assignor.)						
Gibson, George W., Kimbolton, Ohio. Corn-cutter	396,152	Jan. 15	1293	331	46	272
Giese, August. (See Rupp and Giese.)						
Gifford, Cyrus P., North East, Pa. Child's adjustable chair	397,851	Feb. 12	1133	303	46	802
Gifford, George S., *et al.* (See Roberts, Henry P., assignor.)						
Gifford, Livingston. (See Parrott, Richard D. A., assignor.)						
Gilbert, Charles, Omaha, Nebr. Oil-burner	399,517	Mar. 12	1104	287	46	1353
Gilbert, Clarence S. (See Woodring and Gilbert.)						
Gilbert, Edmund D. (See Gordon and Gilbert.)						
Gilbert, George H., Philadelphia, Pa. Circular-knitting machine	398,145	Feb. 19	1571	416	46	901
Gilbert, James, assignor of one-half to C. E. Lee, Omaha, Nebr. Smoke-consuming furnace	397,353	Feb. 5	371	97, 98	46	648
Gilbert, James, assignor of one-half to C. E. Lee, Omaha, Nebr. Gas-generating furnace	397,907	Feb. 19	1211	324	46	835
Gilbert, Oscar L., St. Paul, Minn. Brake	397,120	Feb. 5	21	5	46	583
Giles, Charles K., Chicago, Ill. Watch-case	399,606	Mar. 12	1241	320	46	1379
Giles, Edwin A. (See Burton, Benjamin, assignor.)						
Gilham, Thomas H., Cortez, Nev. Can-opener	396,555	Jan. 22	1906	492	46	394
Gill, Owen A., Baltimore, Md. Mechanism for weighing package tea, coffee, &c	399,192	Mar. 5	612	159	46	1232
Gillespie, George C., Brooklyn, N. Y. Machine or engine for the application of explosive energy to mechanical power	396,739	Jan. 29	2192	561	46	458
Gillett, Lester A., Leonardville, Kans. Combined harvester and thrashing-machine	396,153	Jan. 15	1294	331, 332	46	273
Gilliam, John A., Kansas City, Mo. Pipe-joint	396,080	Jan. 15	1195	303	46	253
Gillies, George, Gananoque, Ontario, Canada. Spring-tooth harrow	395,699	Jan. 8	611	154	46	132
Gilman, John H., assignor to King & Hamilton Company, Ottawa, Ill. Corn-sheller	398,146	Feb. 19	1572	416, 417	46	902
Gilmore, David, Belfast, county of Antrim, Ireland. Animal-trap	400,324	Mar. 26	2307	603	46	1607
Gilmour, Robert H., and F. G. Kellogg, Huntington, Ind. Apparatus for extinguishing the fires in railway-car stoves	399,398	Mar. 12	928	241	46	1319
	399,323	Mar. 12	811	210	46	1298
Gilson, Henry E., Somerville, Mass. Trunk-trimming	396,334	Jan. 15	1566	397	46	321
Gilson, Samuel H., Salt Lake City, Utah Ter. Overhead insulator	399,259	Mar. 12	717	186	46	1280
Gilstrap, Abner L., Macon, Mo. Steam-generator						
Ginna, Stephen A., *et al.* (See Hipperling, William, assignor.)						
Ginochio, Noel B., assignor of one-half to E. M. Greene, New York, N. Y. Telephone	400,325	Mar. 26	2308	604	46	1608
Ginochio, Noel B., assignor of one-half to E. M. Greene, New York, N. Y. Telephone	400,326	Mar. 26	2310	604	46	1608
Ginochio, Noel B., assignor of one-half to E. M. Greene, New York, N. Y. Magneto-electric generator	400,327	Mar. 26	2311	604	46	1608
Giovanni, Balzarini, San Francisco, Cal. Hand-guard for rock-drills	395,700	Jan. 8	612	154	46	132
Giraud, John M., Warwick, Md. Fifth-wheel	396,476	Jan. 22	1791	450	46	374
Giroux, Eugene L., Albina, Oreg. Ore separator and amalgamator	397,542	Feb. 12	664	173, 174	46	712
Gismondi, Louis, Marseilles, France. Oil-press	400,328	Mar. 26	2312	605	46	1608
Given, John L., Melrose, Mass. Pneumatic cash-carrier apparatus	397,354	Feb. 5	373	98	46	648
Gladding, George S., Chester, Conn. Cylindrical brush	397,076	Jan. 29	2673	691	46	556
Glasgow, William, Chicago, Ill. Signal-operating device for trains	399,193	Mar. 5	614	160	46	1232
Glass, John C., Verona, Pa. Pressure-regulator	399,663	Mar. 19	1326	340	46	1407
Glatz, Josef. (See Trench, Arthur W., assignor.)						
Glauber, Isaac N., Cleveland, Ohio. Hose-strap	397,180	Feb. 5	124	34	46	600
Glazebrook, Henry G. T., Woodhouse, Ontario, Canada. Hydraulic engine	396,556	Jan. 22	1908	492, 493	46	395
Glen Cove Machine Company. (See Autenrieth, Ernst F., assignor.)						
Glen Cove Machine Company. (See Hutchinson, Alfred B., assignor.)						
Glen Cove Machine Company. (See Hutchinson and Autenrieth, assignors.)						
Glenck, Hans H., Notting-Hill, county of Middlesex, England. Hair-tonic	398,890	Mar. 5	112	.....	46	1135
Glendinning, John. (See Wilkinson and Glendinning.)						
Glidden, Charles W., Lynn, assignor to J. W. Brooks, trustee, Cambridge, Mass. Manufacturing heels	399,607	Mar. 12	1242	320	46	1379
Glidden, Charles W., Lynn, assignor to J. W. Brooks, trustee, Cambridge, Mass. Heel-cutting die	399,608	Mar. 12	1243	320	46	1379
Glidden, Elliott E. (See Glidden, Greenlief, assignor.)						
Glidden, Greenlief, assignor to E. E. Glidden, Buchanan, Mich. Hand plow and weeder	399,143	Mar. 5	527	137	46	1216
Gmeblin, Paul, New York, N. Y. Piano-case	397,121	Feb. 5	22	5, 6	46	583
Gmür, Berthold, Schänis, and O. Flatz, Niederurnen, Switzerland, assignors of one-half to B. Deisenberg, Travnik, Bosnia, and J. Gmür, Schänis, Switzerland. Dynamo for telegraphic purposes	396,557	Jan. 22	1916	493, 494	46	395
Gmür, Joseph, *et al.* (See Gmür and Flatz, assignors.)						
Godding, Milon O., Monrovia, Cal. Bevel-gage	395,433	Jan. 1	182	48	46	39
Goddu Improvement Company. (See Goddu, Louis, assignor.)						
Goddu, Louis, Winchester, assignor to J. W. Brooks, trustee, Cambridge, and F. F. Stanley, associate trustee, Boston, Mass. Wire-nailing machine	398,606	Feb. 26	2249	596	46	1043
Goddu, Louis, Winchester, Mass., assignor to Goddu Improvement Company, Portland, Me. Nail-making machine	398,891	Mar. 5	113	30, 31	46	1135
Godefroy, Richard, Washington, D. C. Rotary fan	395,630	Jan. 1	477	121, 122	46	97
Godfrey, Alfred H., Jamaica, Iowa. Gate	396,558	Jan. 22	1913	494	46	395
Goetting, Mary D. (See Fisher, Alfred G., assignor.)						
Gold, Edward E., New York, N. Y. Steam-trap	398,719	Feb. 26	2435	645, 646	46	1081
Golden, Richard H., South Norwalk, Conn. Ankle-supporter	398,892	Mar. 5	116	31	46	1136
Golding, William, Moss Side, county of Lancaster, assignor to Claviger Cycle Company, (limited,) Manchester, England. Velocipede	400,304	Mar. 26	2112	553, 554, 555, 556	46	1573
Goldsmith, John S., New York, N. Y. Ventilated garment	397,543	Feb. 12	668	174	46	712

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Goldsmith, Nathaniel O. (See Weir and Goldsmith.)						
Goldsmith, Nathaniel O., assignor to Weir Frog Company, Cincinnati, Ohio. Street-railway switch	398,248	Feb. 19	1723	454	46	932
Gonon, Paul E. (See Diemer and Gonon.)						
Good, Brent. (See Gotendorf, James N., Jr., assignor.)						
Good, John, Chicago, Ill. Grinding-mill	399,518	Mar. 12	1105	287	46	1353
Goodell Company. (See Oaks, William A. C., assignor.)						
Goodell, Etta A., assignor to Consolidated Patents Company, Chicago, Ill. Ventilator	397,122	Feb. 5	24	6	46	583
Goodfellow, James T., Huntingdon, Pa., assignor to Iron Car Company, of Connecticut. End sill for railway-cars	400,329	Mar. 26	2314	606	46	1609
Gooding, Albert R. (See Hayden and Desant, assignors.)						
Goodman, Herbert E. (See Sperry, Elmer A., assignor.)						
Goodman, John R., Calumet, Mo. Drag and harrow	398,960	Mar. 5	216	59, 60	46	1155
Goodman, Samuel N., assignor to C. Button and M. L. Finckel, Philadelphia, Pa. Knitting-machine needle	400,330	Mar. 26	2316	606	46	1609
Goodrich, Harry C. (See Barnum, Russel S., assignor.)						
Goodrich, Harry C., Chicago, Ill. Ruffler and gatherer for sewing-machines	397,908	Feb. 19	1213	325	46	835
Goodrich, Harry C., Chicago, Ill. Guiding attachment for sewing-machines	399,873	Mar. 19	1634	424	46	1468
Goodrich, Joseph F., New Haven, Conn. Vehicle-seat	397,590	Feb. 12	754	196, 197	46	728
Goodsell, Charles H. (See Helms, Charles H., assignor.)						
Goodwillie, David H., New York, N. Y. Internasal tube	399,985	Mar. 19	1705	465	46	1500
Goodwin, George A., and W. F. How, Westminster, county of Middlesex, England. Manufacture of lock-nuts	396,477	Jan. 22	1792	459	46	374
Goodwin, James S., Emerald, Wis. Mail-bag fastening	399,986	Mar. 19	1706	466	46	1500
Goodyear, Andrew, assignor to South Bend Chilled Plow Company, South Bend, Ind. Wheel-plow	398,961	Mar. 5	218	60	46	1155
Gordon, Alexander, and D. De Garmo, Rochester, N. Y. Machine for cutting tobacco	397,544	Feb. 12	669	174	46	713
Gordon, Charles M. (See Morgan, Edward D., assignor.)						
Gordon, Fred. W., assignor to Gordon, Strobel & Laurean, Philadelphia, Pa. Converter	395,434	Jan. 1	183	48	46	39
Gordon, Strobel & Laureau. (See Gordon, Fred. W., assignor.)						
Gordon, William, Melrose, Mass. Sole-edge-burnishing tool	399,609	Mar. 12	1244	320	46	1379
Gordon, William J., and E. D. Gilbert, Philadelphia, Pa. Sheet-metal pipe-elbow	399,664	Mar. 19	1328	340	46	1407
Gore, Henry A. (See Ru Ton and Gore.)						
Gore, Henry A., assignor of two-thirds to E. W. Walker and H. W. Ru Ton, Goshen, Ind. Carpet-sweeper	395,654	Jan. 1	544	136	46	109
Gorham, Chester R. (See Gorham, Ezra S. and C. R.)						
Gorham, Ezra S. and C. R., Euclid, Ohio. Rotary-cutting veneer-machine	397,181	Feb. 5	125	34	46	600
Gortner, Henry, New Albany, Ohio. Lifting-jack	400,205	Mar. 26	2119	556	46	1573
Gorton, James S., assignor to Wilcox & Gibbs Sewing Machine Company, New York, N. Y. Automatic tension apparatus for sewing-machines	397,640	Feb. 12	837	218	46	744
Gorton, William E., Moline, Ill. Belting-reel	399,874	Mar. 19	1637	424	46	1468
Gosling, Charles, Brooklyn, N. Y. Raised stone incrusted letter	395,563	Jan. 1	388	99	46	80
Goss, Frederick L., Chicago, and S. G. Goss, Englewood, Ill. Paper-folding machine	399,987	Mar. 19	1708	466, 467	46	1500
Goss, Lucius, Upper Montclair, N. J. Stereotype-plate	395,435	Jan. 1	186	48, 49	46	39
Goss, Lucius, Upper Montclair, N. J., and S. W. Trew, Brooklyn, N. Y. Machine for trimming, planing, and sawing stereotype-plates	396,478	Jan. 22	1793	459	46	374
Goss, Samuel G. (See Goss, Frederick L. and S. G.)						
Goss, Sherman M., Council Bluffs, Iowa. Parallel ruler	398,928	Mar. 5	23	7	46	1119
Goss, William H., Yonkers, N. Y. Washing-machine	399,610	Mar. 12	1245	321	46	1379
Gosselin, Frank X., West Troy, N. Y. Thimble	395,322	Jan. 1	25	7	46	8
Gotendorf, James N., Jr., Paris, France, assignor to B. Good, New York, N. Y. Button-machine	396,081	Jan. 15	1196	303, 304	46	253
Gott, Mamie B., *et al.* (See Roberts, Thomas, assignor.)						
Gottschald, Ernst L., Dresden, Germany, assignor to J. Bister, Brooklyn, N. Y., and J. Schmitt, Hoboken, N. J. Making ferrules	396,037	Jan. 8	1128	287	46	231
Gould, Aaron P., Canton, Ohio. Surgical chair	397,077	Jan. 29	2673	691, 692	46	556
Gould, Aaron P., Canton, Ohio. Head-rest	398,893	Mar. 5	117	32	46	1136
Gould, Albert J., Pittsburg, Pa. Splash-board holder for boats	398,989	Feb. 26	1950	513	46	985
Goulden, William, Lea Bridge Road, Clapton, county of Middlesex, England. Velocipede	400,075	Mar. 26	1998	503	46	1533
Grace, Frederick A., Hickory, N. C. Device for sharpening rock-drills	397,230	Feb. 5	193	51	46	612
Grace, John D., New Orleans, La. Street-car truck	398,040	Feb. 19	1425	376, 377	46	873
Grace, Mary A., *et al.* (See Harney, Michael C., assignor.)						
Graeser, George A., Chicago, Ill. Water-meter	400,331	Mar. 26	2317	606	46	1609
Graf, Anton, Georgetown, assignor of two-thirds to A. McDuffee and R. Carleton, Haverhill, Mass. Fire-box for steam-generators	397,852	Feb. 12	1134	303	46	802
Graf, Anton, Georgetown, assignor of two-thirds to G. H. Meader, Boston, Mass. Packing for safes, &c	398,607	Feb. 26	2250	596	46	1044
Graham, Charles T., assignor to G. W. Plumley, Philadelphia, Pa. Watch-movement box	397,853	Feb. 12	1135	303	46	803
Graham, James, *et al.* (See Kelsey, Frank N., assignor.)						
Graham, James A., assignor to Milwaukee Harvester Company, Milwaukee, Wis. Knotter for grain-binders	397,355	Feb. 5	375	98, 99	46	649
Graham, James A., assignor to Milwaukee Harvester Company, Milwaukee, Wis. Binder-shifting mechanism	397,356	Feb. 5	377	99, 100	46	649
Graham, James A., C. Martincourt, and H. F. Crandall, assignors to Milwaukee Harvester Company, Milwaukee, Wis. Harvester	398,349	Feb. 19	1704	455	46	932
Graham, John W., Nyack, N. Y. Extension car-step	395,625	Jan. 8	814	212	46	171
Graham, Nancy J., Jackson, Ohio. Stove	399,630	Mar. 5	330	88	46	1177
Granger, Albert S. (See Curley and Granger.)						
Grant, George B., Maplewood, Mass. Gear-cutting machine	398,506	Feb. 26	2113	556	46	1017
Grant, James A., Mount Pleasant, Iowa. Ribbon-holder	395,701	Jan. 8	613	154	46	132
Grant, Jott, Boston, Mass. Water-filter	399,675	Mar. 19	1642	424	46	1469
Grant, Oscar F., Pittsburg, Pa. Fountain-pen	397,123	Feb. 5	25	6	46	583
Grant, Perrin, Baltimore, Md. Dynamo-electric machine	396,867	Jan. 29	2373	609	46	498
Graves, Henry B. (See Norcross, Leander N., assignor.)						
Gray Company, G. A. (See Erdman, Herman, assignor.)						
Gray, John, Jefferson, Iowa. Hame and tug coupling	397,182	Feb. 5	128	35	46	601
Gray, John B. (See Burnett, William, assignor.)						
Gray, Joseph, Chicago, Ill. Hot-air furnace	397,979	Feb. 19	1390	352	46	854

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Gray, William D. (See Finch and Gray.)						
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. Circuit-closing device for electrical torpedo-fuses	399,876	Mar. 19	1643	425	46	1469
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. High-explosive shell	399,877	Mar. 19	1644	425	46	1469
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. High-explosive charge	399,878	Mar. 19	1645	425	46	1470
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. Electrical fuse for ordnance-shells	399,879	Mar. 19	1646	425	46	1470
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. Tail-guide for projectiles	399,880	Mar. 19	1647	426	46	1470
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. Shell	399,881	Mar. 19	1648	426	46	1470
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. Revolving pneumatic gun	399,882	Mar. 19	1650	426	46	1471
Graydon, James W., Washington, D. C., assignor to R. S. Lawrence, London, England. High-explosive charge	399,883	Mar. 19	1653	427	46	1471
Graydon, Thomas W. (See Sullivan, John J., assignor.)						
Greaves, Charles, Mount Lebanon, N. Y. Fertilizer-distributer	399,399	Mar. 12	930	241	46	1320
Greaves, John, St. Louis, Mo. Demagnetizing watches, &c	397,423	Feb. 5	485	127	46	671
Greely, Benjamin J., Boston, Mass. Trousers, overalls, &c	396,926	Jan. 29	2462	634	46	515
Greely, Harvard, Ellsworth, Me. Combined funnel and can-top	398,390	Feb. 26	1951	513	46	985
Green, Benjamin P., Etchetah, Mont. Ter. Planter	395,655	Jan. 1	544	136	46	109
Green, Frank D. (See Green, Robert M. and F. D.)						
Green, John C., Peoria, Ill. Nippers for cutting pegs from boots or shoes	397,909	Feb. 19	1216	325	46	936
Green, John E., Bremond, Tex. Fish-trap	400,206	Mar. 26	2120	556	46	1574
Green, Myron S., New York, N. Y. Inhaling-tip	395,436	Jan. 1	186	49	46	46
Green, Robert M. and F. D., Philadelphia, Pa. Measuring-faucet	397,854	Feb. 12	1136	304	46	803
Green, Thomas, East Davenport, Iowa. Calipers and dividers	396,479	Jan. 22	1794	460	46	374
Greenaway, Alfred, Louisville, Ky. Device for holding tile-settings	400,016	Mar. 26	1929	503	46	1534
Greene & Co., William C. (See King, Thomas, assignor.)						
Greene, Elias M. (See Ginochio, Noel B., assignor.)						
Greene, J. Ashton. (See Blake, Henry, assignor.)						
Greene, Wallace. (See Cutler, Lyman B., assignor.)						
Greenio, Harris S., St. Louis, Mo. Truss	397,545	Feb. 12	670	175	46	713
Greenwood, William H. (See Kelsey, John R., assignor.)						
Gregg, Solomon L., Greene, Pa. Apparatus for filling and packing cans	399,884	Mar. 19	1653	427	46	1471
Gregory, David J., Scranton, Pa. Dining-table fan	398,250	Feb. 19	1725	455	46	932
Greider, Jacob M. (See Minnich, Simon B., assignor.)						
Grelle, Henry W., New Orleans, La. Filter	399,031	Mar. 5	331	80	46	1178
Grenfell, Hubert H., assignor to W. G. Armstrong, Mitchell & Co., (limited,) Newcastle-upon-Tyne, county of Northumberland, England. Luminous sight for fire-arms	399,144	Mar. 5	528	138	46	1217
Gretzler, Frederick, Bennington, N. Y. Brake for sleds	397,231	Feb. 5	195	52	46	613
Griebel, William J., Fort Wayne, Ind. Folding bedstead	397,183	Feb. 5	129	35	46	601
Griest, John M., Bayonne, N. J., assignor to Singer Manufacturing Company of New Jersey. Box	397,980	Feb. 19	1320	352	46	854
Griffin, George H., Abingdon, Va. Nut-lock	396,691	Jan. 22	2111	542	46	434
Griffin, James. (See Haughey, Micheal, assignor.)						
Griffin, John B., assignor to J. F. Griffin and T. H. Keefe, Chicago, Ill. Pedal bell-signal device	396,668	Jan. 29	2376	609	46	498
Griffin, John H., assignor of one-half to Churchill & Alden, Brockton, Mass. Sewing-machine	398,323	Feb. 19	1841	486	46	956
Griffin, Julia F., *et al.* (See Griffin, John B., assignor.)						
Griffith, Amenzo, Springfield, and H. A. Burbank, Westfield, Mass. Telephone call-box	397,284	Feb. 5	270	70	46	627
Griffiths, Owen J., Chicago, Ill. Album	399,324	Mar. 12	813	210	46	1298
Griffiths, Owen J., Chicago, Ill. Album	399,325	Mar. 12	814	210	46	1298
Griggs, Albert C., Wilmington, Del. Coupling for electric circuits	399,326	Mar. 12	815	211	46	1298
Griggs, John J., *et al.* (See Lumley, Edwin J., assignor.)						
Grimmett, Samuel T., West Plains, Mo. Car-coupling	395,437	Jan. 1	18	49	46	40
Grinnell, Frederick, Providence, R. I. Automatic fire-extinguisher	399,520	Mar. 12	1107	288	46	1354
Grinnell, Frederick, Providence, R. I. Automatic fire-extinguisher	399,521	Mar. 12	1109	289	46	1354
Grinnell, Frederick, Providence, R. I. Automatic fire-extinguisher	399,522	Mar. 12	1111	289	46	1354
Grinnell, Frederick, Providence, R. I. Automatic fire-extinguisher	399,523	Mar. 12	1112	289	46	1355
Grinnell, Frederick and R. W., Providence, R. I. Automatic fire-extinguisher	399,519	Mar. 12	1106	288	46	1354
Grinnell, Richard W. (See Grinnell, Frederick and R. W.)						
Gripp, John, *et al.* (See Rosamyer, Henry, Jr., assignor.)						
Griscom, William W., Haverford College, and H. N. Weidner, assignors to Electro Dynamic Company, Philadelphia, Pa. Connection of electrical circuits	397,424	Feb. 5	485	127	46	672
Griswold, Fred E., assignor of one-half to L. E. Munsell, Naples, N. Y. Cultivator	398,041	Feb. 19	1496	377	46	874
Groeschel, Anton. (See Schwemberger and Groeschel.)						
Groh, Jacob, Coshocton, Ohio. Draw-iron for wagons	395,389	Jan. 1	124	32	46	27
Grosscup, Manias G., Milwaukee, Wis. Hay-carrier track	397,124	Feb. 5	26	7	46	583
Grove, David, Berlin, Germany. Shower-bath	398,894	Mar. 5	118	32	46	1136
Grubb, John M., Ironton, Ohio. Sash-holder	395,894	Jan. 8	924	238	46	192
Grubbs, John W., Fair Play, S. C. Tether	396,276	Jan. 15	1479	375	46	306
Grün, Gottfried, assignor to Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. Printing of induline dye-stuffs	396,692	Jan. 22	2112	.....	46	434
Grüne, Gustav E. F., Unterlüss, Prussia, Germany. Preparing dynamite	397,285	Feb. 5	273	.....	46	628
Grünzweig, Carl, Ludwigshafen-on-the-Rhine, Germany. Water-proof compound containing cork	395,438	Jan. 1	188	.....	46	40
Graybowski, Julian T., assignor of one-half to B. E. Butterworth and J. Lowe, Grand Rapids, Mich. Machine for grooving lumber	396,399	Jan. 22	1667	428	46	349
Guarantee Trust and Safe Deposit Company, trustee. (See Lowe, Thaddeus S. C., assignor.)						
Gude, Benjamin, St. Anthony, Ind. Ironing-board	395,895	Jan. 8	925	238	46	192
Guels, Herman, assignor to American Brake Company, St. Louis, Mo. Valve for fluid-pressure brakes	396,154	Jan. 15	1297	333	46	273
Guels, Herman, assignor to American Brake Company, St. Louis, Mo. Valve for fluid-pressure brakes	397,125	Feb. 5	28	7	46	584
Gueth, John C. (See Koepp and Gueth.)						
Guild, George, assignor of one-half to C. H. Brown, Knoxville, Tenn. Boiler-cleaner	396,400	Jan. 22	1669	428	46	349
Guild, George M., assigner to H. E. Guild, Boston, Mass. Stringing and tuning device for pianos	396,335	Jan. 15	1567	397	46	322
Guild, George M., assignor to H. E. Guild, Boston, Mass. Stringing and tuning device for pianos	396,740	Jan. 29	2193	561	46	458

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Guild, H. E. (See Guild, George M., assignor.)						
Guild, Henry G., New York, N. Y. Comb	399,032	Mar. 5	333	80	46	1178
Guild, Henry M., Pittsburg, Pa. Reflector-bracket	395,972	Jan. 8	1032	263	46	213
Guillaumin, Pierre, Voiron, France. Weighing-machine	400,400	Mar. 26	2420	634	46	1628
Gumtow, Hermann D. R., Vienna, Austria-Hungary, and M. A. Lutzner, Berlin, Germany. Apparatus for moistening and cooling air	395,896	Jan. 8	925	238	46	192
Gunckel, Winfield O., Terre Haute, Ind. Steam-boiler feeder	398,778	Feb. 26	2513	668	46	1096
Gunn, John C., assignor of one-half to C. E. Prescott, Knoxville, Tenn. Dumping-cart	395,439	Jan. 1	489	50	46	40
Guntz, George, Wilkes-Barré, Pa. Measuring steam-trap	397,184	Feb. 5	130	35	46	601
Gutmann, Ludwig, Fort Wayne, Ind. Electric converter	397,461	Feb. 5	546	143	46	682
Gutmann, Ludwig, New York, N. Y. Electric converter	397,910	Feb. 19	1217	325	46	896
Gutzkow, Frederick, San Francisco, Cal. Piston water-meter	400,401	Mar. 26	2422	634	46	1628
Gwatkins, James. (See Gaylord, Robert F., assignor.)						
Haarlander, August, Allegheny, Pa. Flushing-tank for water-closets	396,927	Jan. 29	2463	634	46	515
Haas, Herman O., *et al.* (See Anderson and Elias, assignors.)						
Haas, Samuel H., Philadelphia, Pa. Check-hook	400,332	Mar. 26	2316	607	46	1609
Haas, William, Brooklyn, N. Y. Machine for making sheet-metal hinges	399,033	Mar. 5	334	89, 90	46	1178
Haberkorn, Theodore H., Fort Wayne, Ind. Pipe-coupling for air-brakes	398,829	Mar. 5	24	7	46	1119
Haberkorn, Theodore H., Fort Wayne, Ind. Combination-valve for operating air-brake mechanisms	398,830	Mar. 5	25	7	46	1119
Haberman, Frederick, New York, N. Y. Slop-jar cover	397,425	Feb. 5	487	128	46	672
Habermann, Jacob, *et al.* (See Mundt, Wilhelm, assignor.)						
Haberstroh, Albert, Boston, Mass. Embossing and ornamenting plastered walls and other surfaces	397,054	Jan. 29	2643	.....	46	551
Haberthür, Robert, New York, N. Y. Seal for hydraulic mains	400,333	Mar. 26	2319	607	46	1610
Hackney, George, Topeka, Kans. Stock-car	395,323	Jan. 1	27	7	46	8
Haddock, Worcester, Cincinnati, Ohio. Cable-grip	399,034	Mar. 5	336	90, 91	46	1178
Haddock, Worcester, Cincinnati, Ohio. Cable-railway sheave	399,035	Mar. 5	340	91	46	1179
Haddock, Worcester, Cincinnati, Ohio. Crossing for cable railways	399,036	Mar. 5	341	91, 92	46	1179
Haddock, Worcester, Cincinnati, Ohio. Cable-conduit curve	399,037	Mar. 5	343	92, 93	46	1180
Haddock, Worcester, Cincinnati, Ohio. Cable-railway-conduit construction	399,145	Mar. 5	530	138 / 139	46	1217
Hadley, Artemus N., Indianapolis, Ind. Shock-forming table for corn-harvesters	399,968	Mar. 19	1800	467	46	1500
Hadley, Charles E. (See Koch and Hadley.)						
Haefner, Hugo, Linden, assignor to Ohl & Haefner, Newark, N. J. Filter	399,260	Mar. 12	719	187	46	1220
Hagan, Elijah J., Bayard, Iowa. Thill for vehicles	397,357	Feb. 5	378	100	46	649
Hagerty, John H., Lowell, Mass. Supply of water to water-motors	398,779	Feb. 26	2515	668	46	1096
Hagerty, John H., Lowell, Mass. Water-motor	400,402	Mar. 26	2423	635	46	1629
Haggett, Jotham C., Dunkirk, N. Y. Universal metal joint	397,981	Feb. 19	1321	353	46	854
Hagqvist, Anders, South Bend, Ind. Plow	396,204	Jan. 15	1377	352	46	287
Hahn, John, New York, N. Y. Automatic danger-signal	397,546	Feb. 12	672	175	46	713
Haines, Edwin, Paddock Wood, county of Kent, England. Friction-hinge	399,751	Mar. 19	1450	373	46	1432
Haines, George W., Stockton, Cal. Sulky-plow	396,480	Jan. 22	1797	460	46	375
Haines, George W., Adin, Cal. Windmill	399,887	Mar. 19	1658	428	46	1472
Haish, Jacob, De Kalb, Ill. Platform-door for cars	395,324	Jan. 1	29	7	46	8
Haish, Jacob, De Kalb, Ill. Door for railway-cars	398,147	Feb. 19	1575	417	46	902
Haish, Jacob, De Kalb, Ill. Vehicle-hub	398,148	Feb. 19	1577	418	46	902
Haish, Jacob, De Kalb, Ill. Freight-car lock	400,077	Mar. 26	1930	504	46	1534
Hake, Cecil N., Westminster, England. Making ammonium nitrate	400,207	Mar. 26	2122	.....	46	1574
Haldy, Henri L., assignor of one-half to J. Stark, Waltham, Mass. Watch-case-shaping machine	398,251	Feb. 19	1726	455	46	933
Hale, Francis W., Boston, Mass. Piano-forte	396,155	Jan. 15	1299	333 / 334	46	273
Hale, Francis W., Boston, Mass. Attachment for pianos	396,156	Jan. 15	1304	334	46	274
Hale, Frank A. (See Stone, Gardner H., assignor.)						
Haley, Charles C., Newark, N. J. Apparatus for bottling soda-water, &c	396,928	Jan. 29	2464	635	46	516
Haley, Isaac N., Baltimore, Md. Sponge-top bottle	395,564	Jan. 1	389	99	46	80
Halford, Thomas E., and R. Morant, London, county of Middlesex, assignors to D. Rylands, Stairfoot, England. Making metal articles with a glass lining	397,641	Feb. 12	838	.....	46	744
Hall, Alexander W., New York, N. Y. Mechanical telephone	398,507	Feb. 26	2115	556	46	1017
Hall, Fanny E., Catskill, N. Y. Portable kiln for firing decorated china, glass, &c	397,642	Feb. 12	839	219	46	744
Hall, Frank C., Philadelphia, Pa. Grinding-mill	396,759	Jan. 22	1914	494	46	396
Hall, Henry C., assignor of one-half to E. L. Vickers, Canton, Ohio. Wash-board	397,591	Feb. 12	756	197	46	729
Hall, Hiram F., Toledo, Ohio. Screen-frame	397,797	Feb. 12	1061	283	46	788
Hall, Isaac M. (See Fletcher, Elmer, assignor.)						
Hall, J. B. Thrasher, St. Louis, Mo. Banker's and merchant's note-case	399,885	Mar. 19	1656	428	46	1472
Hall, John S., New York, N. Y. Oil-cup	396,336	Jan. 15	1568	397 / 398	46	322
Hall, Joseph L., Cincinnati, Ohio. Interlocking joint for the doors and frames of safes, &c	398,608	Feb. 26	2251	597	46	1044
Hall, Joseph L., Cincinnati, Ohio. Means for fastening the doors of safes, &c	398,609	Feb. 26	2253	597 / 598	46	1044
Hall, Joseph L., Cincinnati, Ohio. Safe or vault	398,610	Feb. 26	2255	598 / 599	46	1045
Hall, Joseph L., Cincinnati, Ohio. Means for fastening movable bars or bolts in doors, &c	398,611	Feb. 26	2256	599	46	1045
Hall, Judson W., Worcester, Mass. Swill-receptacle	396,401	Jan. 22	1671	429	46	350
Hall, Lewis D., assignor of one-half to S. D. Houston, Jr., Concordia, Kans. Lawn-mower	396,938	Jan. 8	1129	287	46	231
Hall, Sherwood, *et al.* (See Cobb, John J., assignor.)						
Hall, William H., Tiffin, Ohio. Double-deck barrow	397,358	Feb. 5	379	100	46	649
Halley, N. W. (See Egan, Charles E., assignor.)						
Hallowell, Charles T., *et al.* (See Ford, Charles S., Sr., assignor.)						
Hallwood, Henry S., Columbus, Ohio. Street-curb and subsoil drain	399,194	Mar. 5	616	160	46	1233
Halpin, Joseph P., Wyandotte, Mich. Car-mover	397,911	Feb. 19	1218	325	46	836
Halstead, John J., Kesler's Cross Lanes, W. Va. Shoeing-stand	399,886	Mar. 19	1657	428	46	1472
Hambay, James T., Wilkinsburg, Pa. Switch mechanism	399,888	Mar. 19	1659	429	46	1473
Hambay, James T., Swissvale, Pa. Signal-post	399,889	Mar. 19	1661	429	46	1473
Hamblin, Silvanus and S. M., Plymouth, Mass. Let-off motion for looms	399,195	Mar. 5	617	160	46	1233
Hamblin, Stephen M. (See Hamblin, Silvanus and S. M.)						
Hambruch, Heinrich F., assignor to A. F. Richter, Hamburg, Germany. Button or stud	395,973	Jan. 8	1033	264	46	214
Hamel, Gustavus, De Soto, Mo. School desk and seat	400,078	Mar. 26	1931	504	46	1534
Hamill, William J., St. Catherines, Ontario, Canada. Sleigh	399,890	Mar. 19	1661	429	46	1473
Hamilton, Charles K., *et al.* (See Patten, Jefferson, assignor.)						
Hamlin, Earl W., assignor to G. G. Wickson, San Francisco, Cal. Compound cabinet-engine	399,524	Mar. 12	1113	289 / 290	46	1355
Hammann, Carl H., Offenbach-on-the-Main, Germany. Photograph-album	396,929	Jan. 29	2467	635	46	516

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Hammann, Edward, Brooklyn, assignor to J. L. Mott Iron Works, New York, N. Y. Valve for water-closets, &c	398,149	Feb. 19	1579	418	46	902
Hammer, Thorvald F., Branford, Conn. Expansible and collapsible tap	397,126	Feb. 5	29	7	46	584
Hammer, William J., Boston, Mass. Safety device for electrical circuits	397,715	Feb. 12	941	250	46	764
Hammersley, Harry D., Bristol, assignor of one-third to B. Landreth, Bloomsdale, Pa. Bag-filling machine	395,390	Jan. 1	125	32	46	27
Hammesfahr, Julius, assignor to R. Neumann & Co., Newark, N. J. Bag-lock	400,334	Mar. 26	2320	607	46	1610
Hamnon, Clarence D., Delavan, Minn. Tire-tightener	397,962	Feb. 19	1323	352	46	855
Hammond, Frank, assignor of one-half to M. Faulkner, Homer, N. Y. Writing-desk or secretary	398,391	Feb. 26	1958	513	46	985
Hammond, Richard, Buffalo, N. Y. Multiple drilling-machine	398,962	Mar. 5	222	61, 62	46	1156
Hammond, Thomas D., assignor of one-half to E. J. Keller, Syracuse, N. Y. Carpet-fastener	399,038	Mar. 5	345	93	46	1180
Hampton, Charles G. (See Lewis, James H., assignor.)						
Handlen, Henry C., Thorntown, Ind. Portable oil-bath for wheels	397,643	Feb. 12	840	219	46	744
Haney, William T., Childersburg, Ala. Boiler-cleaner	398,612	Feb. 26	2258	599	46	1045
Hanford, Melancthon, Malden, Mass. Elevator	397,912	Feb. 19	1218	326	46	836
Hankinson, William H., New York, N. Y. Carpet-beating machinery	396,997	Jan. 29	2558	661	46	534
Hanna, Charles E., Middlebourne, Ohio. Combined feed-trough and hay-rack	397,497	Feb. 12	509	155	46	699
Hannas, A. J. (See Kent, George R., assignor.)						
Hannay, David L., Grapeville, N. Y. Baling-press	396,481	Jan. 22	1800	461	46	375
Hansbro, Abraham E. (See Redfield and Hansbro.)						
Hänsel, Max, Christianstadt, Prussia, Germany, assignor to R. Hänsel, Breslau, N. Y. Apparatus for leveling and squaring stone	397,286	Feb. 5	274	71	46	628
Hänsel, Richard. (See Hänsel, Max, assignor.)						
Hansen, Soren, assignor of one-half to J. C. Stephens, Leadville, M. E. Stephens and H. G. Brearley, Denver, Colo. Apparatus for saving slimes	395,826	Jan. 8	815	212	46	171
Hansing, Siegfried, New York, N. Y. Muffler for upright pianos	398,150	Feb. 19	1580	419	46	903
Hansing, Siegfried, New York, N. Y. Upright-piano action	398,151	Feb. 19	1581	419	46	903
Hanson, Charles, Rock Island, Ill. Riding attachment for plows	399,039	Mar. 5	346	93	46	1180
Hanson, Eli, assignor to the Self Retaining Hair Pin Company, New York, N. Y. Machine for bending wire	396,930	Jan. 29	2468	636	46	516
Hanson, Joseph. (See Hartley, Kedar, assignor.)						
Hanson, Paul, St. Paul, Minn. Cutting mechanism for harvesters	395,403	Jan. 1	275	71	46	58
Happe, Henry B., Pittsburg, Pa. Wire-nail machine	397,592	Feb. 12	756	197, 198	46	729
Hard, Charles T., East Liverpool, assignor to T. H. Hard, Newburg, Ohio. Combined sofa and bed	400,079	Mar. 26	1932	504	46	1534
Hard, Thomas H. (See Hard, Charles T., assignor.)						
Hardenberg, Peter R. L. (See Brownson, Ralph, assignor.)						
Harder, Charles N. (See Sagendorph, Longley L., assignor.)						
Harder, Christian F., Chicago, Ill. Feed-trough	400,080	Mar. 26	1933	505	46	1535
Hardie, James. (See Robertson, John, assignor.)						
Hardie, Robert W., Albany, N. Y. Lever	398,152	Feb. 19	1582	420	46	903
Harding, Richard O. (See Prouty, George W., assignor.)						
Harding, Silas H., Chatham, Mass. Fish-weir	397,644	Feb. 12	841	219	46	744
Hardy, Dexter D., Chicago, Ill. Vibrating engine	399,327	Mar. 12	817	211, 212	46	1290
Hardy, Dexter D., Chicago, Ill. Steam-engine	400,081	Mar. 26	1934	505, 506	46	1535
Hardy, Hester V. (See Scott, William H., assignor.)						
Hare, Duncan D., Allegheny, Pa. Shaft attachment for vehicles	399,525	Mar. 12	1115	290	46	1355
Harker, Henry K., assignor of fifty-one one-hundredths to L. A. Harris, Cincinnati, Ohio. Spring-lock	398,392	Feb. 26	1953	514	46	985
Harkins, Charles H., St. Louis, Mo. Siphon-valve for water-closets	397,359	Feb. 5	381	100	46	650
Harley, George W. T., Frederick, Md. Paper box	399,891	Mar. 19	1663	430	46	1474
Harmon, Charles S. (See Dunn, William H. and H. N., assignors.)						
Harney, Michael C., assignor of one-half to W. N. and A. Brennan and M. A. Grace, St. Louis, Mo. Seal-lock	399,526	Mar. 12	1116	290	46	1356
Harp, John P., Donaldsonville, La. Barrel-cover	398,153	Feb. 19	1583	420	46	904
Harper, William, assignor of one-third to E. H. Fessenden, Brooklyn, N. Y. Support for lamp-shades	400,208	Mar. 26	2123	556	46	1574
Harpst, Edgar S., Tyler, Tex. Steam-engine	395,325	Jan. 1	30	7, 8	46	8
Harrell, John, Plymouth, Cal. Dried-fruit cleaner	395,621	Jan. 1	480	122	46	97
Harrell, Joseph J., assignor to J. H. Logan, trustee, New Brighton, Pa. Gas-meter	398,721	Feb. 26	2440	646	46	1081
Harris Button Hole Attachment Company. (See Williams, Henry J., assignor.)						
Harris, Elbridge, Boston, Mass. Binding sheet-music	397,360	Feb. 5	382	101	46	650
Harris, Elijah T., Chicago, Ill. Counter	396,815	Jan. 29	2305	590	46	481
Harris, Fradelshon, St. Louis, Mo. Furnace	396,869	Jan. 29	2377	610	46	498
Harris, Frank H., Toledo, Ohio. Wagon running-gear	396,062	Jan. 15	1198	304	46	254
Harris, Frank H., Toledo, Ohio. Velocipede	396,063	Jan. 15	1200	304	46	254
Harris, Hiram S., Cincinnati, Ohio. Gate	395,827	Jan. 8	817	212	46	171
Harris, John B., Eutaw, Ala. Window burglar-guard	396,157	Jan. 15	1305	334	46	274
Harris, L. A. (See Harker, Henry K., assignor.)						
Harris, Samuel, New York, N. Y. Indicator-bolt	398,722	Feb. 26	2442	646	46	1082
Harris, William H. (See Martin and Harris.)						
Harris, William H., and W. H. Ryer, Steele City, Nebr. Bucket for storing and burning trash	397,799	Feb. 12	1065	284	46	788
Harrison, Aaron E. (See Harrison, Henry H., assignor.)						
Harrison, Alvin F., assignor to himself and W. H. Harrison, Greeley, Kans. Egg-count register	400,082	Mar. 26	1937	506	46	1536
Harrison, Henry. (See Murray and Harrison.)						
Harrison, Henry H., assignor to A. E. Harrison, New York, N. Y. Printing-machine	398,042	Feb. 19	1426	377, 378	46	874
Harrison, Josiah S., Lebanon, and J. M. Howard, Thorntown, Ind. Tax-receipt blank	396,560	Jan. 22	1915	495	46	396
Harrison, Pleasant W. (See Butler, Constant B., assignor.)						
Harrison, Thomas H., London, England, assignor of one-half to Levy, Dreyfus & Co., New York, N. Y. Eye-shade	399,892	Mar. 19	1664	430	46	1474
Harrison, Thomas W., Emmetsburg, Iowa. Bag-holder	396,561	Jan. 22	1917	495	46	396
Harrison, William H. (See Harrison, Alvin F., assignor.)						
Harrop, George W., Manhattan, Kans. Hame-fastener	396,653	Jan. 22	2056	528	46	422
Harroun, Edward, Princeton, Wis. Panel-fastener	399,261	Mar. 12	719	187	46	1280
Hart, Frederick, Poughkeepsie, N. Y. Horse-power regulator	396,931	Jan. 29	2470	636, 637	46	516
Hart, Frederick, Poughkeepsie, N. Y. Speed-regulator	397,716	Feb. 12	942	250	46	764

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Hart, George R., Viola, Iowa. Cultivating-plow	398,303	Feb. 26	1954	514	46	986
Hart, Henry C., Wannakee, assignor to Fuller & Johnson Manufacturing Company, Madison, Wis. Adjustable cultivator-shovel	396,377	Jan. 15	1480	375	46	306
Hartford, Joseph R., Carthage, Ill. Paper-hanging machine	398,154	Feb. 19	1584	420, 421	46	904
Hartley, Kedar, assignor of one-half to J. Hanson, Philadelphia, Pa. Loom for weaving chenille and fringe	396,905	Jan. 15	1379	352, 353	46	288
Hartley, Marcellus, New York, N. Y., and A. J. Hobbs, assignors to Union Metallic Cartridge Company, Bridgeport, Conn. Shot-cartridge	395,897	Jan. 8	988	238	46	192
Hartman, Edward S., Allegheny, Pa. Plow-standard cap	398,631	Mar. 5	26	8	46	1119
Hartman, H. W. (See McCool, William A., assignor.)						
Hartman, H. W. (See McCool and Hartman.)						
Hartman, John M., Philadelphia, Pa. Blast apparatus for blast-furnaces	399,262	Mar. 12	720	187, 188	46	1280
Hartman, John M., Philadelphia, Pa. Tuyere	399,263	Mar. 12	722	188	46	1281
Hartshorn, Edwin A., Troy, N. Y. Retting flax	396,158	Jan. 15	1307	.....	46	274
Hartshorn, Henry A., West Haven, Conn. Buckle	397,717	Feb. 12	944	251	46	764
Hartung, Emil, Denver, Colo. Cut-off and governor	397,361	Feb. 5	383	101	46	650
Hartung, Hugo, Berlin, Germany. Fire-bar	396,482	Jan. 22	1803	461, 462	46	376
Harvey, Hayward A., Orange, N. J. Railway-spike	395,898	Jan. 8	927	239	46	192
Harvey, Wirt B., Memphis, Tenn. Electric-circuit protector	399,400	Mar. 12	932	242	46	1321
Harwood, Harrison, *et al.* (See Newell, Benjamin B., assignor.)						
Harwood, Harrison, Natick, Mass. Machine for winding balls	397,362	Feb. 5	384	101	46	651
Harwood, Henry G., *et al.* (See Newell, Benjamin B., assignor.)						
Hasey, Harvey W., New York, N. Y. Brush	398,043	Feb. 19	1428	378	46	874
Hasey, Sydney P., New York, N. Y. Photographic camera	395,899	Jan. 8	929	239	46	192
Haskell, Frank, Westbrook, Me. Machine for spooling yarn	396,816	Jan. 29	2307	590, 591	46	482
Haskin, Samuel E., Avoca, N. Y. Vulcanizing wood	399,196	Mar. 5	618	160	46	1233
Haskins, David G., Cambridge, Mass. Sub-surface water-motor	400,209	Mar. 26	2122	557	46	1574
Haslett, William B. (See Wilson, David Y., assignor.)						
Haslup, William, Sidney, assignor of one-half to J. H. Doering, Wapakoneta, Ohio. Vehicle-wheel	397,078	Jan. 29	2676	692	46	557
Hassman, William, Richmond, Va. Tire-heating apparatus	397,593	Feb. 12	760	198	46	729
Hastie, Robert B., Washington, D. C. Matrix impression-guard for type-forms	397,232	Feb. 5	195	52	46	613
Hastings, James L. (See Stewart and Hastings.)						
Hastings, James L., Philadelphia, Pa., assignor, by mesne assignments, to Welsbach Incandescent Gas Light Company, Gloucester City, N. J. Producing refractory compounds	396,693	Jan. 22	2113	.....	46	434
Hastings, James L., Philadelphia, Pa., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Plastic mineral composition	400,335	Mar. 26	2321	.....	46	1610
Hastings, James L., Philadelphia, Pa., assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Plastic mineral composition	400,336	Mar. 26	2323	.....	46	1610
Hastings, John B., assignor of two-thirds to J. M. Tripp and J. M. Lively, Jackson, Ohio. Wire-nail machine	397,496	Feb. 5	488	128	46	672
Hat Sweat Manufacturing Company. (See Beardslee, William F., assignor.)						
Hatch, Andrew J., San Francisco, Cal. Drier	396,502	Jan. 22	1919	495	46	397
Hatch, George, South Windham, Conn. Instrument-holder	398,508	Feb. 26	2116	556	46	1017
Hatch, Moses E. (See Waters, Benjamin E., assignor.)						
Hatcher, George W. and S. D., Cleveland, Ohio. Step-ladder	397,913	Feb. 19	1221	326	46	837
Hatcher, Singleton D. (See Hatcher, George W. and S. D.)						
Hathaway, Jerome W. (See Everitt, Jesse, assignor.)						
Hatt, Samuel, assignor to G. Sanderson, Montreal, Quebec, Canada. Brake-shoe	399,665	Mar. 19	1329	340	46	1407
Haughey, Michael, assignor of one-half to J. Griffin, St. Louis, Mo. Street-sprinkling apparatus	397,287	Feb. 5	275	71	46	628
Haven, William H., Jr., Oxford, assignor of one-half to J. Ritchie, Brookline, Mass. Channeling-machine	398,155	Feb. 19	1585	421	46	904
Havey, Michael, Chicago, Ill. Water-heater	395,396	Jan. 1	31	8	46	9
Haviland, J. C., *et al.* (See Lumley, Edwin J., assignor.)						
Hawes, Elisha, Sacramento, Cal. Fencing	400,083	Mar. 26	1938	506	46	1536
Hawke, James, assignor of one-half to E. F. Dush, Long Run, Ohio. Plow-point	397,855	Feb. 12	1137	304	46	803
Hawkins, Franklin P., Plano, Ala. Oiling-machine	395,778	Jan. 8	721	185, 186	46	153
Hawkins, Frederick H., New York, N. Y. Apparatus for collecting and conveying ashes, &c	397,718	Feb. 12	946	251	46	765
Hawkins, John W., *et al.* (See Chatterson, Wright, assignor.)						
Hawkins, Lucian B., assignor of one-half to J. Schwartz, Danville, Ind. Grocer's bin	399,197	Mar. 5	620	161	46	1233
Hawkins, Orren W., *et al.* (See Chatterson, Wright, assignor.)						
Hawkins, William, St. Louis, Mo. Feed-trough	396,563	Jan. 22	1922	496	46	397
Hawley, Wallace A., Napoleon, Mich. Fence-making machine	399,040	Mar. 5	347	93	46	1180
Haworth, George. (See Ormerod and Haworth.)						
Hay, Abraham T., Burlington, Iowa. Sponge for reducing gold and silver and other ores	399,527	Mar. 12	1117	.....	46	1356
Hay, Abraham T., Burlington, Iowa. Manufacturing steel	399,528	Mar. 12	1118	.....	46	1356
Hay, Abraham T., Burlington, Iowa. Reducing gold, silver, &c	399,529	Mar. 12	1118	.....	46	1356
Hay, Abraham T., Burlington, Iowa. Manufacture of iron	399,611	Mar. 12	1246	.....	46	1379
Hay, Abraham T., Burlington, Iowa. Manufacture of steel	399,612	Mar. 12	1247	.....	46	1379
Hayden, Horace, Jr., and W. F. Z. Desant, assignors of one-third to A. R. Gooding, New York, N. Y. Electrical railway-signal	398,613	Feb. 26	2259	600	46	1045
Haydock, William T. (See Rice, James N., assignor.)						
Hayes, Charles C., Penn Yan, N. Y. Vehicle-spring	398,156	Feb. 19	1586	421	46	904
Hayes, Edward J., and J. T. Ochs, Baltimore, Md. Float for fishing-lines	395,900	Jan. 8	932	240	46	193
Hayes, Hammond V., Cambridge, and A. C. White, Boston, Mass. Electrical measuring apparatus	395,974	Jan. 8	1034	264	46	214
Hayes, Henry T., Oakland, Cal. Fire extension-ladder	396,564	Jan. 22	1924	496	46	398
Hayes, Henry T., Oakland, Cal. Fire extension-ladder	396,565	Jan. 22	1926	496	46	398
Hayes, Joel A., San Francisco, Cal. Dynamo-armature	399,328	Mar. 12	818	212, 213	46	1290
Hayes, John, St. Louis, Mo. Steering apparatus	395,565	Jan. 1	300	99, 100	46	80
Hayes, Richmond S., East Bloomfield, N. Y. Dental articulator	396,566	Jan. 22	1927	496	46	398
Hayes, Thomas E., and A. J. Read, Milwaukee, Wis. Journal-box	400,210	Mar. 26	2125	557	46	1575
Hayes, William, Los Angeles, Cal. Car-axle	395,901	Jan. 8	932	240	46	193
Haynes, Daniel, Sealy, Tex. Making mattresses	399,641	Mar. 5	349	94	46	1181
Hayward, James J., Ballston, N. Y. Leather-dressing	399,893	Mar. 19	1664	.....	46	1474

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Hayward, Oliver C., New York, N. Y. Indicator for elevators	396,159	Jan. 15	1308	335	46	274
Hazard, Vincent G., Wilmington, Del. Paper-machine	39-,394	Feb. 26	1955	514	46	986
Hazlett, John C., Muscatine, Iowa. Indicating device for cash registers and indicators	396,483	Jan. 22	1803	462	46	376
Head, Dallas F., Arcadia, assignor of one-half to N. W. Warren, Mount Lebanon, La. Wagon-seat	398,252	Feb. 19	1729	456	46	933
Healey, Charles, *et al.* (See Slocum, George S., assignor.)						
Healey, Frank E., Morrisville, Vt. Book-support	396,741	Jan. 29	2194	562	46	458
Healey, George H., Stoneham, Mass. Last	399,227	Mar. 5	668	174	46	1243
Healy, Clarence L., Brooklyn, N. Y. Quadruplex telegraphy	398,614	Feb. 26	2261	600	46	1046
Hearitey, George W. (See McDonald, Theodore R., assignor.)						
Heath, Emery, assignor of one-half to W. H. Crabb, Curtis, Nebr. Poke	397,079	Jan. 29	2677	692	46	557
Heath, George H. (See Anderson, J. Burnham, assignor.)						
Heath, Starling F., and H. A. Thayer, Fitchburg, Mass. Car-coupling	395,391	Jan. 1	128	32	46	28
Heathman, Wilber. (See Garst, Edwin, assignor.)						
Heathorn, Thomas B., London, England. Apparatus for propelling and steering vessels	399,530	Mar. 12	1119	290, 291	46	1356
Hebden, Frank, Philadelphia, Pa. Shuttle-box pattern mechanism for looms for weaving fabrics having end borders	399,613	Mar. 12	1248	321	46	1380
Heberer, Adam, Alameda, Cal. Feed-water purifier	395,779	Jan. 8	722	186	46	154
Heberer, Adam, Alameda, Cal. Steam-boiler	395,780	Jan. 8	724	186	46	154
Heer, David. (See Koehler and Heer.)						
Heermans, Thaddeus W., Chicago, Ill. Car-motor	398,723	Feb. 26	2443	647	46	1062
Heermans, Thaddeus W., Chicago, Ill., assignor to Crane Elevator Company, of Illinois. Hydraulic valve	396,206	Jan. 15	1384	354	46	289
Heermans, Thaddeus W., Chicago, Ill., assignor to Crane Elevator Company, of Illinois. Variable-pressure hydraulic elevator	398,044	Feb. 19	1420	378, 379	46	874
Heffner, William E., Huntingdon, Pa. Car-axle box	397,233	Feb. 5	197	52	46	613
Heiber, Emile M. (See Banschke, Joseph, assignor.)						
Heidel, Gustavos, assignor to National Self Heating Sad Iron Company, St. Louis, Mo. Self-heating sad-iron	396,998	Jan. 29	2559	661	46	535
Heidenreich, Eyvind L. (See Dybite and Heidenreich.)						
Heidmann, Gottlieb, E. Höttges, and C. Egen, assignors to Heidmann & Höttges, Barmen, Prussia, Germany. Button	400,337	Mar. 26	2324	607	46	1610
Heidmann & Höttges. (See Heidmann, Höttges, and Egen, assignors.)						
Heidt, Allen P., assignor to himself and J. C. Divine, New York, N. Y. Window-blind	395,902	Jan. 8	934	240	46	193
Heikes, Rolla O., Dayton, Ohio. Gun hand-protector	397,719	Feb. 12	948	251	46	765
Heimsoeth, Bartholomaeus, Coblentz, Prussia, Germany. Means for safely coupling or uncoupling the pipes of pneumatic brakes or steam-heating apparatus on railway-trains	399,894	Mar. 19	1665	430	46	1474
Heindl, Joseph J., Brooklyn, N. Y. Steam-engine valve-gear	399,531	Mar. 12	1121	291	46	1356
Heine, August, Silver Creek, N. Y. Grain-scourer	397,720	Feb. 12	948	252	46	765
Heine, Frederick, and E. Bengel, Cincinnati, Ohio. Device for operating hatchway-gates	398,615	Feb. 26	2263	600	46	1046
Heinemann, Henry, St. Louis County, Mo. Sulky	399,231	Mar. 5	672	175	46	1243
Heinrichs, Charles F., assignor of one-half to W. F. Widmayer, New York, N. Y. Electric battery	396,870	Jan. 29	2379	610	46	499
Heinrichs, Charles F., assignor of one-half to W. F. Widmayer, New York, N. Y. Electric battery	396,871	Jan. 29	2381	611	46	499
Heinsohn, Ernst T., and J. Hoffmann, Freiseburg, Tex. Motor	397,288	Feb. 5	276	71	46	628
Heisel, Charles T., Cleveland, Ohio. Folding case or package	397,914	Feb. 19	1222	326	46	837
Helbig, Charles W., assignor to G. C. Dressel, New York, N. Y. Lens-holder for signal-lamps	398,253	Feb. 19	1731	456	46	933
Held, Christian, Indianapolis, Ind. Machine for making maccaroni and noodles	396,567	Jan. 22	1930	497	46	399
Heliker, Benjamin S., *et al.* (See Jones, John B., assignor.)						
Helios Actien-Gesellschaft für Elektrisches Licht und Telegraphenbau. (See Coerper, Carl, assignor.)						
Hellen, William F., assignor of one-half to T. A. Mitchell, Washington, D. C. Drafting-ruler	396,568	Jan. 22	1931	497	46	399
Heller, Charles F. (See Benson, William H., assignor.)						
Helms, Charles H., assignor to himself and C. H. Goodsell, Poughkeepsie, N. Y. Heel-burnishing machine	396,999	Jan. 29	2560	661	46	535
Helms, Charles H., assignor to himself and C. H. Goodsell, Poughkeepsie, N. Y. Heel-trimmer	397,000	Jan. 29	2561	662	46	535
Helms, Charles H., assignor to himself and C. H. Goodsell, Poughkeepsie, N. Y. Heel-trimmer	397,001	Jan. 29	2562	662	46	535
Helms, Charles H., assignor to himself and C. H. Goodsell, Poughkeepsie, N. Y. Heel-trimming machine	397,055	Jan. 29	2643	681	46	551
Hemenway, Charles F., assignor of two-thirds to J. F. McKissock, Lowell, Mass. Device for opening and closing doors	397,498	Feb. 12	600	155, 156	46	699
Henckels, Johann A., Solingen, Germany. Button-hole scissors	398,509	Feb. 26	2117	557	46	1017
Henderson, Charles C., Jamestown, N. Y. Burglar and fire alarm	398,254	Feb. 19	1731	456	46	934
Henderson, Homer, and F. N. Johnston, Columbus, Ohio. Oven-thermometer	397,127	Feb. 5	33	7	46	584
Henderson, Mary F., St. Louis, Mo. Movement-cure machine	398,255	Feb. 19	1733	457	46	934
Henderson, William A., Malden, Mass. Joint for soft-metal pipes	396,654	Jan. 22	2057	528	46	424
Hendrick, Alexander W., Paw Paw, Mich. Hay-binder	396,278	Jan. 15	1481	375	46	306
Hendricks, Gay, Beardstown, Tex. Nail-box	398,724	Feb. 26	2445	647	46	1062
Hendricks, Simeon B., assignor to Skandia Plow Company, Rockford, Ill. Harrow	399,614	Mar. 12	1249	322	46	1380
Hendrickson, Joseph G. (See Clamer and Hendrickson.)						
Hendy, John H. (See Hendy, Joshua and J. H.) (Reissue.)						
Hendy, Joshua and J. H., San Francisco, Cal. Ore-feeder. (Reissue)	10,983	Feb. 5	574	149	46	687
Henion, William, Ritchey, Ill. Electric signaling apparatus	396,207	Jan. 15	1385	355	46	289
Henius, Max W., Bridgeport, Conn. Corset-clasp	396,484	Jan. 22	1805	463	46	376
Henjum, Ole, Minneapolis, Minn. Pump-operating mechanism	396,485	Jan. 22	1807	463	46	376
Henkle, Benjamin F., Woodensburg, Md. Inkstand	397,963	Feb. 19	1324	353	46	855
Henkle, Leonard, Rochester, assignor to C. S. Upton, New York, N. Y. Wick-raiser for lamps	398,725	Feb. 26	2446	647, 648	46	1062
Henkmann, Richard, Berlin, Germany. Bottle-stopper	398,832	Mar. 5	27	8	46	1119
Henley, Micajah C., Richmond, Ind. Fence-machine	396,279	Jan. 15	1462	376	46	307
Henley, Thomas C., Randleman, N. C. Drawing board or table	397,427	Feb. 5	491	128, 129, 219, 220	46	673
Hennessy, David, New York, N. Y. Hose-pipe coupling for railway-cars	397,645	Feb. 12	842	220	46	745
Henney, Burnett M., Springfield, Ill. Incrustation preventive	397,547	Feb. 12	673	72	46	713
Henning, Charles F., Chicago, Ill. Garment-collar	397,229	Feb. 5	278	72	46	627
Henning, Julius, Charlottenburg, near Berlin, Germany. Pneumatic malting-drum	400,338	Mar. 26	2325	608	46	1610
Henry, Benjamin T., New Haven, Conn. Axle-box	397,731	Feb. 12	950	252	46	765

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Henry, Remi J., Jr., Jersey City, N. J., and W. J. Kassler, Brooklyn, N. Y. Automatic shut-off for gas-burners	400,339	Mar. 26	2327	608	46	1611
Henry, William, Alpena, Mich. Marine vehicle	396,486	Jan. 22	1808	463	46	377
Hent, Reuben W., San Francisco, Cal. Roller-bearing	399,615	Mar. 12	1250	322	46	1380
Henthorn, John T., Providence, R. I. Automatic pressure-regulator for the receivers of compound engines	395,828	Jan. 8	618	212, 213	46	172
Herbert, Henry, London, county of Middlesex, England. Photographic shutter	400,084	Mar. 26	1939	506	46	1536
Heringshausen, Friedrich W., New York, N. Y. Sofa	397,800	Feb. 12	1066	284	46	788
Herman, Reinhold, Crafton, assignor to G. H. Blaxter, Pittsburg, Pa. Coupling for gas and electric-light fixtures	396,039	Jan. 8	1130	287	46	231
Hermite, Eugene, E. J. Paterson, and C. F. Cooper, London, England. Apparatus for bleaching by electrolysis	398,645	Feb. 19	1431	379	46	874
Herndon, George P., Washington, D. C. Water-bandage	396,208	Jan. 15	1387	355	46	289
Herndon, Thomas H., Birmingham, Ala. Weighing-scale	396,569	Jan. 22	1932	497	46	399
Heron, Alexander, Delaware, Ontario, Canada. Car-coupling	399,532	Mar. 12	1121	292	46	1357
Herrin, Thomas, Stockville, Nebr. Hopple	397,722	Feb. 12	952	252	46	766
Herrington, George H., Wichita, Kans. Duplicating phonograms	399,264	Mar. 12	724	188	46	1281
Herrington, George H., Wichita, Kans. Duplicating phonograms	399,265	Mar. 12	725	188	46	1281
Herrington, George H., Wichita, Kans., assignor to himself and E. H. Johnson, New York, N. Y. Recording speech	397,856	Feb. 12	1138	304	46	803
Herron, James, *et al.* (See Herron, Michael, assignor.)						
Herron, John, *et al.* (See Herron, Michael, assignor.)						
Herron, Michael, assignor of one-half to J. and J. Herron, Bordentown, N. J. Chute for dredging-machines	397,985	Feb. 19	1327	354	46	855
Herron, William J., *et al.* (See Hoke, Quinton J., assignor.)						
Herwig, Hermann, Media, Pa. Clock	396,655	Jan. 22	2058	528	46	424
Hess, Edward B., New York, N. Y., and W. X. Stevens, Washington, D. C.; said Stevens assignor to said Hess. Refrigerator	397,984	Feb. 19	1326	353, 354	46	855
Hess, Nels P., and C. Vestergard, Belgrade, Minn. Windmill	396,084	Jan. 15	1201	304, 305	46	254
Hesselbom, Eric M., Rushford, Minn. Snow-plow	399,895	Mar. 19	1666	431	46	1474
Hester, Stephen J., Fulton, Ky. Scale-measure	397,128	Feb. 5	34	8	46	585
Hetherington, Frederick A., Brooklyn, assignor of one-half to H. A. W. Wood, New York, N. Y. Magazine plate-holder for photographic plates	396,656	Jan. 22	2059	529	46	424
Hetherington, John M., Manchester, county of Lancaster, England. Apparatus for controlling the grinding of carding-engine flats	399,533	Mar. 12	1125	292	46	1357
Heverly, James M., Coalport, Pa. Railway block-signal	398,256	Feb. 19	1735	457	46	934
Hewes, Fletcher W., Bloomfield, N. J. Indexing-machine	396,742	Jan. 29	2196	562, 563	46	458
Hewett, Reginald W., Birmingham, county of Warwick, England. Boiler	397,915	Feb. 19	1222	326, 327	46	837
Hewitt, Horace L., Indianapolis, Ind. Grain-cradle	396,743	Jan. 29	2203	564	46	459
Hewlett, Maddra J., Paducah, Ky. Letter-box	396,360	Jan. 15	1609	411	46	330
Heysinger, Isaac W., Philadelphia, Pa. Crossing-conduit for electric railways	398,963	Mar. 5	225	63	46	1157
Heywood, Benjamin, New York, N. Y. Commutator for dynamo-electric machines and electric motors	399,329	Mar. 12	819	213	46	1299
Hickok, Franklin K., and R. M. Lambie, New York, N. Y. Combined carriage-jack, wrench, and bit-stock	397,499	Feb. 12	603	156	46	700
Hicks, Frank M., Chicago, Ill. Tile-machine	396,985	Jan. 15	1202	305, 306	46	255
Hicks, Horatio F., Ashland, Oreg. Vehicle-wheel	396,872	Jan. 29	2382	611	46	499
Hicks Induction-Light and Motor Company. (See Hicks, Thomas H., assignor.)						
Hicks, Isaac, Hartford, Wis. Harness attachment	400,211	Mar. 26	2126	557	46	1575
Hicks, James J., Hatton Gardens, county of Middlesex, England. Specific-gravity apparatus	398,726	Feb. 26	2447	648	46	1063
Hicks, Thomas H., Detroit, Mich., assignor to Hicks Induction-Light and Motor Company, of Michigan. System of electrical distribution and conversion	399,534	Mar. 12	1127	292	46	1357
Higby, Charles W., Jackson, Mich. Corset-waist	397,801	Feb. 12	1067	284, 285	46	789
Higgins, Frederick H. W., London, England. Printing-telegraph	398,833	Mar. 5	28	8, 9, 10	46	1119
Higgins, John C. (See Springer and Higgins.)						
Higgins, John D., Mount Liberty, Ohio. Animal-poke	395,372	Jan. 1	129	33	46	28
Higgins, John J., New York, N. Y. Photographic camera	397,428	Feb. 5	492	129, 130	46	673
Higgins, John J., New York, N. Y. Photographic camera	397,429	Feb. 5	496	130, 131	46	674
Higham, Charles C., Rome, N. Y. Slack-adjuster for car-brakes	398,257	Feb. 19	1736	457	46	935
Higham, Daniel, Philadelphia, Pa. Dynamo-electric machine	399,403	Mar. 12	938	242	46	1321
Higham, Daniel, Philadelphia, Pa., assignor to Higham Electric Light Company, Rockland, Me. Prevention of sparking in dynamo-electric machines and electric motors	399,401	Mar. 12	935	242	46	1321
Higham, Daniel, Philadelphia, Pa., assignor to Higham Electric Light Company, Rockland, Me. Prevention of sparking in electric generators and motors	399,402	Mar. 12	936	242	46	1321
Higham, Daniel, Philadelphia, Pa., assignor to Higham Electric Light Company, Rockland, Me. Dynamo-electric machine	399,404	Mar. 12	938	243	46	1322
Higham Electric Light Company. (See Higham, Daniel, assignor.)						
Highfield, William E., Philadelphia, Pa. Machine for changing the angle of the flanges of Z and angle bars	399,896	Mar. 19	1667	431, 432	46	1475
Hill, Alexander, Kansas City, Mo. Plastering-trowel	397,129	Feb. 5	35	8	46	585
Hill, Christian C., assignor to C. L. Ames and A. H. Frost, Chicago, Ill. Spring-making machine	400,340	Mar. 26	2328	608, 609	46	1611
Hill, Harry W., Cleveland, Ohio. Friction-clutch	400,212	Mar. 26	2128	557, 558	46	1575
Hill, Henry, Chester Cross Roads, Ohio. Evaporator	397,916	Feb. 19	1223	327	46	837
Hill, Samuel. (See Ayton and Hill.)						
Hill, Thomas, Quincy, Ill. Metallic wheel	399,989	Mar. 19	1802	467	46	1501
Hill, Warren S., Boston, Mass. Electric switch	398,510	Feb. 26	2118	557	46	1017
Hiller, Gustav, Zittau, Saxony, Germany. Tool or instrument for cutting cords and tying strips of sheet metal	397,290	Feb. 5	279	72	46	627
Hiller, Michael L., New York, N. Y. Ornamenting fabrics	399,897	Mar. 19	1669	432	46	1475
Hilliard, George. (See Lane and Hilliard.)						
Hillman, William, and J. F. Ripple, Schulenburg, Tex. Baling-press	397,917	Feb. 19	1225	327, 328	46	838

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Hills, Carl C. (See Hills, Cleon L. and C. C.)						
Hills, Cleon L. and C. C. Bloomington, Ill. Self-raising flour	395,747	Jan. 8	678	.....	46	145
Himes, John C. (See Himes Joseph B., assignor.)						
Himes, Joseph B. assignor of one-half to J. C. Hines, Ladoga, Ind. Cultivator	397,185	Feb. 5	132	36	46	602
Himmel, Robert, assignor to L. Seligsohn, Berlin, Germany. Producing fancy-figured wooden plates	400,085	Mar. 26	1939	507	46	1536
Hiney, Jacob W., Albany, N. Y. Candlestick	398,395	Feb. 26	1956	515	46	986
Hinrichsen & Co., Adolph. (See Bannier, Otto, assignor.)						
Hinsburg, Oskar, Barmen, assignor to Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. Phenacetine	400,086	Mar. 26	1941	.....	46	1537
Hinson Car Coupler Company. (See Hinson, James A., assignor.)						
Hinson, James A., assignor to Hinson Car Coupler Company, Des Moines, Iowa. Car-coupling	398,324	Feb. 19	1843	486	46	957
Hinton, C. L. (See Clark, John M., assignor.)						
Hipkins, Henry, Birmingham, county of Warwick, England. Sleeper	396,160	Jan. 15	1309	335	46	275
Hipkins, Stephen, Jr., Martin's Ferry, Ohio. Glass-mold	397,186	Feb. 5	133	36	46	602
Hipperling, William, New York, N. Y., assignor to S. A. Ginna, Plainfield, N. J., and R. A. Donaldson, Brooklyn, N. Y. Can-soldering machine	399,042	Mar. 5	350	94	46	1181
Hirschfeld, John H. (See Beeson and Hirschfeld.)						
Hirschler, Sigmund S. (See Welti, Jacob, assignor.)						
Hirst, Matthew, Philadelphia, Pa., assignor to L. De Geer, New York, N. Y. Hitching device	398,780	Feb. 26	2516	668	46	1097
Hitchcock, Charles A., *et al.* (See Burnley, William, assignor.)						
Hitchcock, Charles A., assignor of two-thirds to S. A. Davenport and W. Burnley, North East, Pa. Telephone-transmitter	399,666	Mar. 19	1329	340	46	1407
Hitchcock, William F., Homer, N. Y. Positive shuttle-motion for looms	395,829	Jan. 8	892	213	46	172
Hitchcock, William F., Homer, N. Y. Positive shuttle-motion for looms	398,964	Mar. 5	228	63	46	1158
Hixenbaugh, John, Smithton, Pa. Pulley	400,213	Mar. 26	2129	558	46	1576
Hjort, Axel F., assignor to Brunswick-Balke-Collender Company, Chicago, Ill. Machine for ornamenting billiard-cue handles, &c.	395,494	Jan. 1	277	71	46	58
Hoadley, Silvester, Gosport, Ind. Drafting-instrument	397,500	Feb. 12	604	156	46	700
Hoard, John W. (See Bartlett and Wiggin, assignors.)						
Hobart, George H., *et al.* (See Corbett, Joseph, assignor.)						
Hobbie, Alonzo D., Bergen Point, N. J. Folding or knockdown crate	396,727	Feb. 26	2448	{648 649}	46	1063
Hobbs, Alfred J. (See Hartley and Hobbs.)						
Hobson, Joseph W., Bergen Point, N. J. Pawl-and-ratchet clutch mechanism	397,802	Feb. 12	1069	285	46	789
Hodge, Herbert A., administrator. (See Pendleton, William.)						
Hodges, Charles C., *et al.* (See Howard, Charles A., assignor.)						
Hodges, Henry C., *et al.* (See Howard, Charles A., assignor.)						
Hodkinson, Samuel, Steubenville, Ohio, and G. E. Raymond, Chicago, Ill. Machine for waxing paper	396,402	Jan. 22	1671	429	46	350
Hoefer, Frederick W. (See Devore and Hoefer.)						
Hofele, Ferdinand W., assignor to E. S. Allen, New York, N. Y. Clothes-line frame	396,817	Jan. 29	2309	591	46	482
Hofele, Ferdinand W., assignor to Allen & Co., New York, N. Y. Sled	397,060	Jan. 29	2678	693	46	558
Hofele, Ferdinand W., assignor to Allen & Co., New York, N. Y. Sled	397,061	Jan. 29	2679	693	46	558
Hoffman, Charles E. (See Carlisle, Frederick, assignor.)						
Hoffmann, Anton B. (See Danforth, George E., assignor.)						
Hoffmann, Carl, assignor to Siemens & Halske, Berlin, Germany. Synchronizing device for dynamo-electric machines	396,086	Jan. 15	1210	306	46	256
Hoffmann, Carl G., Leipsic, Saxony, Germany. Telethermometer	397,548	Feb. 12	674	{175 176}	46	713
Hoffmann, John. (See Heinsohn and Hoffmann.)						
Hoffmeier, Amos K., Lancaster, Pa. Railway-tie	399,330	Mar. 12	890	213	46	1300
Hofmeister, Louis, and O. E. Schwabe, New York, N. Y. Overflow-alarm	395,830	Jan. 8	823	213	46	172
Hofstatter, Adolph G., New York, N. Y. Pen-extractor or device for removing pens from their holders	400,341	Mar. 26	2336	609	46	1612
Hogan, John, St. Louis, Mo. Attachment for chairs, lounges, &c	395,975	Jan. 8	1039	{264 265}	46	215
Hogan, Peter, Milton, N. Y. Fertilizer	397,056	Jan. 29	2645	.....	46	552
Hogeland, Israel, Indianapolis, Ind. Car-wheel	398,325	Feb. 19	1844	486	46	957
Hogue, Parker P., Erie, Pa. Combined ejector and injector	400,342	Mar. 26	2337	610	46	1612
Hoke, Quinton J., Yorkville, assignor to himself, W. J. Herron, Winnsborough, J. R. Lindsay, and S. L. Miller, Yorkville, S. C. Spark extinguisher and arrester	397,363	Feb. 5	385	{101 102}	46	651
Holcomb Brothers & Co. (See Morton, William F., assignor.)						
Holcombe, Alfred G., assignor to Equitable Electric Company, New York, N. Y. Electric communicating system	397,364	Feb. 5	388	{102 103}	46	651
Holden, Burton, Geneva, Ohio. Carpet-stretcher	395,903	Jan. 8	935	240	46	194
Holden, Horace, East Orange, N. J. Sounding-lead	398,396	Feb. 26	1957	515	46	986
Holland, James M., Mount Pleasant, Iowa. Road-grading machine	397,291	Feb. 5	280	72	46	629
Holle, Gustav, Philadelphia, Pa. Opera-glass	396,657	Jan. 22	2060	529	46	424
Hollerith, Herman, New York, N. Y. Compiling statistics	395,781	Jan. 8	725	{187 188}	46	154
Hollerith, Herman, New York, N. Y. Compiling statistics	395,782	Jan. 8	736	{188 189}	46	156
Hollerith, Herman, New York, N. Y. Apparatus for compiling statistics	395,783	Jan. 8	739	189	46	156
Holley, Clarence E., assignor of two-thirds to H. J. Palmer and L. K. Cary & Co., Fort Fairfield, Me. Sled-brake	399,405	Mar. 12	940	243	46	1322
Holley, William A., and U. Malin, Holland, Mich. Electro-magnetic grain-scale	397,594	Feb. 12	762	199	46	730
Hollis, Charles R., Pittsfield, Mass. Garment fastener and support	398,046	Feb. 19	1433	380	46	875
Holloway, William, Gilroy, Cal. Gang-plow	395,831	Jan. 8	824	213	46	173
Hollowell, Harry, Longville, Pa. Stump-extractor	396,067	Jan. 15	1212	306	46	256
Holmes, Booth & Haydens. (See Limont, Alexander H., assignor.)						
Holmes, K. & B. (See Crafts, Francis H., assignor.)						
Holmes, George H., Ogdensburg, N. Y. Saw	397,646	Feb. 12	844	220	46	745
Holmes, John P., Oak Valley, Kans. Air-ship	397,647	Feb. 12	845	{220 221}	46	745
Holt, Arthur J., deceased, Grand Rapids, Mich.; F. S. Holt administratrix. Regulator for dynamo-electric machines	396,932	Jan. 29	2472	637	46	517
Holt, Frances S., administratrix. (See Holt, Arthur J.)						
Holt, Hiland A., Nashua, N. H. Lock	397,501	Feb. 12	605	156	46	700
Holt, Newton W., Bennington, Vt. Dentist's lathe	399,406	Mar. 12	941	243	46	1322
Holton, John L., and L. H. Britton, New Lisbon, Ohio. Hose-coupling	397,187	Feb. 5	134	36	46	602
Holzmark, Isaac, Kansas City, Kans. Dish-drainer	395,393	Jan. 1	130	33	46	29

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Holzworth, Louis, assignor to Eagle Pencil Company, New York, N. Y. Pen-holder	399,043	Mar. 5	353	94	46	1182
Homan & Co. (See Homan, Louis, assignor.)						
Homan, Louis, assignor to Homan & Co., Cincinnati, Ohio. Candle-molding machine	397,918	Feb. 19	1226	328	46	838
Homan, William C., assignor to E. Miller & Company, Meriden, Conn. Suspension device for lamps	397,462	Feb. 5	547	144	46	662
Homan, William C., assignor to E. Miller & Company, Meriden, Conn. Gas-cock	398,610	Feb. 26	2264	601	46	1047
Hooper, Henry O., San Francisco, assignor of one-half to J. Breamen, Eureka, Cal. Safety attachment for elevators	398,728	Feb. 26	2450	649	46	1063
Hooper, William J., Rincon, N. Mex. Ter. Combined head-chair and connecting-rod	396,487	Jan. 22	1809	463	46	377
Hoover, Francis A., Kimeo, Kans. Door-check	396,488	Jan. 22	1810	464	46	377
Hoover, Isaac W., Avery, Ohio. Potato-digger	396,818	Jan. 29	2309	591	46	482
Hopkins, Charles H., Lyndonville, assignor to S. S. Thompson, Lyndon, Vt. Jack-screw	398,617	Feb. 26	2266	601	46	1047
Hopkins & Dickinson Manufacturing Company. (See Fiske, William G., assignor.)						
Hopkins, George L., Manchester, N. H. Circuit-closer for railway-car telegraphs	399,228	Mar. 5	669	174	46	1243
Hopkins, Herbert, and J. R. Perry, Wilkes-Barré, Pa. Heating-stove	395,327	Jan. 1	34	9	46	9
Horne Vacuum Company. (See Horne, William L., assignor.)						
Horne, William L., Meriden, assignor to Horne Vacuum Company, Hartford, Conn. Electric-lighting system	400,214	Mar. 26	2131	558	46	1576
Hornig, Julius L., Jersey City, N. J. Steering apparatus	397,919	Feb. 19	1227	328	46	838
Hornig, Julius L., Jersey City, N. J. Steering apparatus	398,326	Feb. 19	1845	487	46	957
Horrocks, William, assignor of one-half to F. F. Lathrop, Herkimer, N. Y. Drawer-guide	399,752	Mar. 19	1451	373	46	1432
Horry, William S. (See Kitson and Horry.)						
Horton Manufacturing Company. (See Treadway, Charles S., assignor.)						
Horton, Thomas, and J. P. Whitehouse, Garrett, Ill. Sod-cutter, stalk-cutter, and roller	397,502	Feb. 12	607	157	46	701
Hosack, Samuel G., Ann Arbor, Mich. Siding-gage	399,698	Mar. 19	1669	432	46	1475
Hosford, Frederick J., Brooklyn, N. Y. Record or other file	396,068	Jan. 15	1213	307	46	257
Hoshall, David W., Little Rock, Ark. Planter	397,549	Feb. 12	676	176	46	713
Hosie, John H., *et al.* (See Huson, Lewis C., assignor.)						
Hotchkiss, Frederick G., Brooklyn, N. Y. Paper box	396,570	Jan. 22	1933	498	46	399
Hotchkiss Ordnance Company. (See Benét, Laurence V., assignor.)						
Höttges, Emil. (See Heidmann, Höttges, and Egen.)						
Houck, William A. (See Rose, William G., assignor.)						
Hough, John D., *et al.* (See Wilson, George T., assignor.)						
Hough, John T., Chicago, Ill., assignor to National Safe Deposit and Vault Manufactnring Company, Pittsburg, Pa. Roof for vaults and other structures	396,040	Jan. 8	1132	{287 288}	46	232
House, James A., and C. H. Dimond, Bridgeport, Conn. Sewing-machine	399,900	Mar. 19	1802	{467 468}	46	1501
Houston, S. D., Jr. (See Hall, Lewis D., assignor.)						
Hovey, Francis T. Homer, N. Y. Adjustable angle-trowel	398,781	Feb. 26	2517	669	46	1097
Hovis, John T., Clintonville, Pa. Vehicle-spring	396,744	Jan. 29	2205	564	46	460
How, William F. (See Goodwin and How.)						
Howard, Abel T. (See Sickles, Gerard, Jr., assignor.)						
Howard, Charles A., assignor to A. G. North, Pontiac, Mich. Wagon-spring	396,694	Jan. 22	2115	542	46	435
Howard, Charles A., Pontiac, assignor to H. C. and C. C. Hodges, Detroit, Mich. Car-axle lubricator	399,899	Mar. 19	1670	{432 433}	46	1475
Howard, Clement W. (See Hunter, Ben W., assignor.)						
Howard, Frank B., Montreal, Quebec, Canada. Apparatus for manufacturing hollow ware from pulp	398,397	Feb. 26	1958	515	46	986
Howard, Hiram, *et al.* (See Parks, George W., assignor.)						
Howard, John M. (See Harrison and Howard.)						
Howard, Stephen C., *et al.* (See Parks, George W., assignor.)						
Howard, Thomas J., Highland, Kans. Gate	395,976	Jan. 8	1041	265	46	215
Howard, Tom. (See Fitton, John R., assignor.)						
Howe, Daniel K., Portland, Oreg. Cover for shipping-receipts	399,407	Mar. 12	942	244	46	1322
Howe, Eleanor E., Bridgeport, Conn. Body-brace	398,511	Feb. 26	2119	557	46	1018
Howe, Otis, Cambridgeport, Mass. Wire mattress	396,695	Jan. 22	2116	543	46	435
Howell, Charles B., Wilmington, N. C. Spring-bed or upholstered springs	397,234	Feb. 5	198	52	46	613
Howell, Henry W., Jr., Elizabeth, N. J. Car-brake	399,408	Mar. 12	943	244	46	1323
Howell, Samuel C., Newark, N. J. Japanning leather	397,803	Feb. 12	1070	285	46	789
Howell, William E., assignor of one-half to G. S. Marygold, Los Angeles, Cal. Shirt-wrist-band	397,920	Feb. 19	1228	328	46	838
Howell, William H., New York, N. Y. Cotton-chopper	397,804	Feb. 12	1071	285	46	789
Howenstine, David J., Canal Fulton, Ohio. Windmill	396,489	Jan. 22	1812	464	46	377
Howland, Ephraim, Pontiac, Mich. Steam-thrasher regulator	398,695	Mar. 5	120	32	46	1137
Hoyt, George E., San Francisco, Cal. Collar-stuffing machine	397,292	Feb. 5	282	73	46	630
Hoyt, James B., Troy, N. Y. Horse-boot	398,634	Mar. 5	32	11	46	1120
Hoyt, Joseph M., *et al.* (See Slocum, George S., assignor.)						
Hoyt, Richard H., assignor of one-half to H. B. Loomis, Buffalo, N. Y. Sawing-machine	399,900	Mar. 19	1672	{433 434}	46	1476
Hoyt, William G., *et al.* (See Slocum, George S., assignor.)						
Hubbard, George M., assignor to W. & E. T. Fitch, New Haven, Conn. Buckle-guard	395,904	Jan. 8	937	241	46	194
Hubbell, Herbert G., Havana, N. Y. Tool for splicing wire	396,819	Jan. 29	2310	592	46	482
Huber, Joseph L., Hamburg, Germany. Secondary battery	399,535	Mar. 12	1129	293	46	1356
Huckabay, George W., Garfield, La. Tire-fastener	398,398	Feb. 26	1959	515	46	987
Huckabay, George W., Garfield, La. Vehicle-brake	398,399	Feb. 26	1960	516	46	987
Huckabay, George W., Garfield, La. Mechanical movement	398,400	Feb. 26	1961	516	46	987
Huckabay, George W., Garfield, La. Cane-mill	398,401	Feb. 26	1964	516	46	987
Hudson, Frederick W., Leominster, assignor to W. S. Brown, Boston, Mass. Egg-beater	398,258	Feb. 19	1737	458	46	935
Hudson, James F., Cheyenne Wells, Colo. Device for cleaning wells	399,044	Mar. 5	354	95	46	1182
Hueffner, Henry A., Palmer, Ill. Bolting-reel	397,057	Jan. 29	2645	681	46	552
Huffman, Samuel, Matanzas, Kans. Corn-planter	396,490	Jan. 22	1813	465	46	378
Huggins, William, Bushnell, Mich. Scraper and roller	395,784	Jan. 8	743	190	46	157
Hughes, Charles, Matanzas, Cuba. Cane-mill	395,832	Jan. 8	825	214	46	173
Hughes, Frederick J., Watford, Ontario, Canada. Car-coupling	397,058	Jan. 29	2646	681	46	552
Hughes, George R., Savoy, Tex. Wire-stretcher	398,047	Feb. 19	1434	380	46	875
Hughes, Joseph. (See Venables and Hughes.)						
Huguet de Vars, Hilarion A. B., Paris, France. Electric spray-producing apparatus	398,327	Feb. 19	1847	487	46	957
Hulford, William J., assignor of two-thirds to D. F. Fitzgerald and E. R. Williams, Lawrence, Mass. Insulating jacket or covering	396,933	Jan. 29	2474	637	46	517
Hull, Erle S., Chicago, Ill. Hand-rest	399,266	Mar. 12	727	189	46	1281
Hull, Gurdon W. (See Atkinson and Hull.)						
Hull, Hubert H., Jersey City, N. J. Fuel-burner	398,729	Feb. 26	2451	649	46	1063
Hull, Selah A. (See Meeker, George E., assignor.)						
Hull, William S., Sheffield, Ala., and J. C. Anderson, Charleston, N. C. Electric railway switch and alarm	399,331	Mar. 12	822	{213 214}	46	1300

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Humphrey, H. Hubert, Detroit, Mich. Tufting-machine	397,082	Jan. 29	2680	693	46	558
Humphrey, James D., Towanda, Pa. Numbering-machine	399,991	Mar. 19	1803	468, 469	46	1501
Hunicke, Henry A., St. Louis, Mo. Manufacturing zinc	399,992	Mar. 19	1806	.....	46	1501
Hunninghaus & Co., F. L. (See Gaeth, Fritz, assignor.)						
Hunt, Charles A., Fall River, Mass. Device for hitching animals	398,965	Mar. 5	230	63	46	1158
Hunt, George G., Bristol, assignor to Plano Manufacturing Company, Plano, Ill. Grain-binder	399,536	Mar. 12	1130	293, 294	46	1358
Hunt, Helm & Ferris. (See Ferris, Henry L., assignor.)						
Hunter, Ben W., assignor of four-fifths to C. W. Howard, Washington, D. C. Pavement	399,645	Mar. 5	355	.....	46	1182
Hunter, John, South Melbourne, near Melbourne, Victoria. Elastic composition	395,394	Jan. 1	131	.....	46	29
Hunter, John, Maple Bay, Minn. Railway-switch	396,873	Jan. 29	2383	611, 612	46	500
Hunter, Joseph L., Pittsburg, Pa. Feed-water heater	398,966	Mar. 5	231	64	46	1158
Hunter, Malcom, Long Island City, N. Y. Life-saving net	396,491	Jan. 22	1814	465	46	378
Hunter, Rudolph M., Philadelphia, Pa. Forming secondary-battery electrodes	397,235	Feb. 5	198	53	46	613
Hunter, Rudolph M., Philadelphia, Pa. Dynamo-electric machine	397,550	Feb. 12	677	177	46	714
Hunter, Rudolph M., Philadelphia, Pa. Apparatus for heating cars by electricity	397,857	Feb. 12	1139	304	46	803
Hunter, Rudolph M., Philadelphia, Pa. Current-collecting device for electric railways	398,402	Feb. 26	1963	516	46	987
Hunter, Rudolph M., Philadelphia, Pa. Conductor for electric railways	349,409	Mar. 12	944	245	46	1323
Hunter, Rudolph M., Philadelphia, Pa. Secondary battery	400,404	Mar. 26	2425	635	46	1629
Hunter, William G., Traver, Cal. Hay or grain unloader	397,551	Feb. 12	682	177	46	715
Huntington, Joseph D., Providence, R. I. Tool for turning and shaping emery-wheels	397,503	Feb. 12	608	157	46	701
Hurd, Edward P., Boston, Mass., assignor to McKay & Copeland Lasting Machine Company, Portland, Me. Nail-machine	399,410	Mar. 12	945	245	46	1323
Hurd, George A. (See Crandall, Jesse A., assignor.)						
Hurd, Hutson R., Cleveland, Ohio. Respirator for firemen	396,161	Jan. 15	1310	335	46	275
Hurdle, Rebecca, Washington, D. C. Dress-cutter's scale	395,566	Jan. 1	392	100	46	81
Hurford, Oliver P., Chicago, Ill. Screen for bolting flour	399,616	Mar. 12	1255	322	46	1382
Hurth, Michael, Poughkeepsie, N. Y. Machine for polishing stones	396,162	Jan. 15	1312	335, 336	46	275
Hurty, John N., Indianapolis, Ind. Manufacturing starch	395,977	Jan. 8	1042	265	46	215
Huson, Lewis C., Elmira, assignor to R. B. Ayres, Hammondsport, N. Y., J. H. Hosie, Scranton, Pa., and Huson Motor Company, (limited.) Rotary engine	398,512	Feb. 26	2120	557, 558	46	1018
Huson, Lewis C., Elmira, assignor to R. B. Ayres, Hammondsport, N. Y., J. H. Hosie, Scranton, Pa., and Huson Motor Company, (limited.) Rotary engine	398,782	Feb. 26	2518	669	46	1097
Huson Motor Company *et al.* (See Huson, Lewis C., assignor.)						
Husted, Peter V., New York, N. Y. Wire	398,259	Feb. 19	1739	458	46	935
Husted, Peter V., New York, N. Y. Barbed nail	398,260	Feb. 19	1739	458	46	935
Huston, Harrison, and E. J. Martin, Idaho Springs, Colo. Machine for operating rock-drills	396,745	Jan. 29	2206	564	46	460
Hutchins, George F., assignor to Knowles Loom Works, Worcester, Mass. Shedding mechanism, &c., for looms	397,858	Feb. 12	1141	305	46	804
Hutchins, George F., assignor to Knowles Loom Works, Worcester, Mass. Pattern mechanism for looms	398,328	Feb. 19	1848	487, 488	46	958
Hutchins, George F., assignor to Knowles Loom Works, Worcester, Mass. Shedding mechanism for looms	398,618	Feb. 26	2267	601	46	1017
Hutchinson, Alfred B., assignor to Glen Cove Machine Company, Green Point, Brooklyn, N. Y. Wood-planing machine	395,495	Jan. 1	279	72	46	59
Hutchinson, Alfred B., assignor to Glen Cove Machine Company, (limited,) Brooklyn, N. Y. Wood-planing machine	396,934	Jan. 29	2475	637	46	517
Hutchinson, Alfred B., and E. F. Autenrieth, assignors to Glen Cove Machine Company, (limited,) Brooklyn, N. Y. Wood-planing machine	398,048	Feb. 19	1435	380	46	875
Hutchinson, Christopher C. (See Johnson and Hutchinson.)						
Hutchinson, Fred J., *et al.* (See Barwick, William H., assignor.)						
Hutton, George H., Baltimore, Md. Thill for vehicles	399,537	Mar. 12	1138	294, 295	46	1359
Hutzel, Titus F., Ann Arbor, Mich. Water-front for stoves	398,783	Feb. 26	2520	670	46	1097
Huyck, Francis C., *et al.* (See McKie, William, assignor.)						
Hyatt, John W., Newark, N. J. Roller-bearing	398,329	Feb. 19	1849	488	46	958
Hyatt, William F., Brooklyn, N. Y. Safety-pin	399,667	Mar. 19	1331	341	46	1408
Hyde, Wesley M., Youngstown, Ohio, assignor of one-half to J. E. Johnston, Meade Center, Kans. Constructing wire fence	399,267	Mar. 12	728	189	46	1281
Hyland, Henry H., assignor of one-half to T. H. Phelps, Pittsburg, Pa. Injector for burning petroleum in furnaces	395,785	Jan. 8	744	190, 191	46	157
Hyland, Henry H., assignor of one-half to T. H. Phelps, Pittsburg, Pa. Petroleum-burner and steam-generator	395,786	Jan. 8	746	191, 192	46	157
Hyland, Joseph, Buffalo, assignor of one-half to E. P. Sullivan, Eagle Village, N. Y. Leaf-holder for books	399,411	Mar. 12	947	245	46	1323
Hyman, Anna C. (See Hyman, Theodore B., assignor.)						
Hyman, Theodore B., assignor to A. C. Hyman, Goldsborough, N. C. Mechanism for conveying and distributing lumber	395,978	Jan. 8	1045	265	46	216
Hyntzsch, Rudolf, Halberstadt, Prussia, Germany. Adjustable arm-support for book-keepers	399,993	Mar. 19	1808	469	46	1502
Ianke, Leopold, Louisville, Ky. Apparatus for converting cast-iron	397,365	Feb. 5	393	103	46	652
Iddings, Henry A., and J. P. Megeath, Omaha, Nebr. Door-knob attachment	396,571	Jan. 22	1935	498	46	400
Iddings, Warren, Warren, Ohio. Preserving and hardening wood	398,619	Feb. 26	2268	.....	46	1047
Ide, Albert L., Springfield, Ill. Engine-frame	396,209	Jan. 15	1388	355	46	289
Ide, Albert L., Chicago, Ill. Lubricating device for engines	397,293	Feb. 5	283	73	46	630
Ideal Rubber Company. (See Eggers, Anton C., assignor.)						
Ihnen, Harro, Jersey City, N. J. Fence	399,617	Mar. 12	1257	323	46	1382
Imschenetzky, Alexander, St. Petersburg, Russia. Galvanic battery	400,215	Mar. 26	2132	558, 559	46	1576
Ingersoll, Robert H., New York, N. Y. Key-ring	398,835	Mar. 5	33	11	46	1120
Ireland, James. (See Mooney and Ireland.)						
Iresen, Charles L., Boston, Mass. Belt-stretching machine	396,874	Jan. 29	2384	612	46	500
Iron Car Company. (See Goodfellow, James T., assignor.)						
Iron Clad Manufacturing Company. (See Diacho, William, assignor.)						
Isaacs, Edward A., assignor of three-fourths to J. C. Van Syckle and H. C. Tindall, Macon, Ga. Back-band hook	397,002	Jan. 29	2564	602	46	536
Ishe, Albert. (See Landis and Ishe.)						
Israel, Joseph C., New York, N. Y. Printer's brush	398,049	Feb. 19	1438	381	46	876
Izzard, Howard, F. A. Stanger, Glassborough, and T. C. Duffield, Woodbury, N. J. Glass tile	398,730	Feb. 26	2452	650	46	1084

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Ithaca Gun Company. (See Smith, Leroy H., assignor.)						
Ives & Co., Hobart B. (See Smith, Thomas S., assignor.)						
Ives, James, Mount Carmel, Conn. Carriage-pole	395,702	Jan. 8	614	155	46	133
Ivey, James B., Macon, Ga. Sawing-machine	396,935	Jan. 29	2476	638, 639	46	517
Ivory, Theodore W., Glenwood, Iowa. Mail-bag lock	398,157	Feb. 19	1587	421	46	904
Jaccard, Gustave J., New York, N. Y. Stop-motion for music-boxes	395,440	Jan. 1	189	50	46	40
Jackson, Calvin, Jacksonwald, Pa. Velocipede	395,441	Jan. 1	190	50, 51	46	40
Jackson, David, Pawtucket, R. I. Spindle for spinning-machines	399,046	Mar. 5	335	95	46	1182
Jacobs, Benjamin F., Milford, assignor of one-half to M. Luther, Hartwick, N. Y. Hop-shovel	398,330	Feb. 19	1850	488	46	958
Jacobs, Jean A., London, England. Letter-box	397,532	Feb. 12	6-3	178	46	715
Jacobs, Joseph, San Francisco, Cal. Mail-bag fastening	398,967	Mar. 5	231	64	46	1158
Jacobs, Maurice, New York, N. Y. Puzzle	399,146	Mar. 5	531	139	46	1217
Jacobs, Waldemar W., Chicago, Ill. Fringe fabric	399,332	Mar. 12	825	214	46	1301
Jacoby, William H., and C. A. Fuller; said C. A. Fuller assignor to F. R. Fuller, Minneapolis, Minn. Neckband-shaper and shirt-bosom board	398,331	Feb. 19	1851	488, 489	46	958
Jacquemier, Marie J. R., Paris, France. Electric meter	396,403	Jan. 22	1673	429, 430, 431	46	350
Jaeger, Alexander. (See Jaeger, Otto and A.)						
Jaeger, Godfrey, Jr. (See Stine, William, assignor.)						
Jaeger, Gustav L., New York, N. Y. Machine for applying corner-stays to boxes	395,567	Jan. 1	393	100, 101	46	81
Jaeger, Otto and A., Philadelphia, Pa. Automatic adjustable picture-hanger	396,280	Jan. 15	1427	377	46	307
Jahr, Emil, Berlin, Germany. Inhaler	399,901	Mar. 19	1674	434	46	1476
James, Campbell E., Frankfort, Ky. Vehicle-wheel	398,403	Feb. 26	1966	517	46	988
James, Jack W., Cuba, Tenn. Electrical bathing-machine	398,731	Feb. 26	2452	650	46	1084
Jamieson, Robert W., Prince Albert, Saskatchewan, Northwest Territory, Canada. Knife-cleaner	396,492	Jan. 22	1815	466	46	379
Janes, Henry E., *et al.* (See Kniffin, George G., assignor.)						
Janes, Henry E., New York, N. Y. Stove or range	398,050	Feb. 19	1439	381	46	876
Janes, Herbert, *et al.* (See Kniffin, George G., assignor.)						
Jansen, Edmund, Solingen, Prussia, Germany. Pocket-knife	399,047	Mar. 5	356	95	46	1182
Jaquet, Julius, Milwaukee, Wis., assignor of one-half to J. L. Mather, Lanark, Ill. Machine for coating and sanding shingles	398,332	Feb. 19	1854	489	46	959
Jarrell, Edwin, assignor of one-half to H. W. McMunn, Harper, Kans. Vehicle-spring	395,496	Jan. 1	280	72	46	59
Jarrell, Edwin, assignor to H. W. McMunn, Harper, Kans. Vehicle-spring	397,366	Feb. 5	394	103, 104	46	652
Jeenel, Adolf, Breslau, Prussia, Germany. Car-starter	395,656	Jan. 1	545	137	46	110
Jeenel, Adolf, Breslau, Prussia, Germany. Vehicle-brake	399,668	Mar. 19	1332	311	46	1408
Jeffery, Frank M., Jersey City, N. J. Spring-bed	399,902	Mar. 19	1675	434	46	1477
Jeffery, Thomas B., Ravenswood, Ill. Pedal for velocipedes	397,188	Feb. 5	195	36	46	602
Jeffery, Thomas B., Ravenswood, Ill. Forming vehicle-wheels	397,189	Feb. 5	135	37	46	602
Jeffery, Thomas B., Ravenswood, Ill. Velocipede	398,158	Feb. 19	1549	422	46	905
Jeffery, Thomas B., Ravenswood, Ill. Velocipede	398,159	Feb. 19	1551	423	46	905
Jeffery, Thomas B., Ravenswood, Ill. Velocipede-brake	400,343	Mar. 26	2338	610	46	1612
Jenison, Orien A., Lansing, Mich. Latch	399,268	Mar. 12	729	189	46	1281
Jenkins, Louisa M. (See Jenkins, Luke E., assignor.)						
Jenkins, Luke E., East Boston, Mass., assignor, by mesne assignments, to L. M. Jenkins. Fire-proof curtain	397,648	Feb. 12	848	221, 222	46	746
Jenkins, Nicholas, Waterbury, Conn. Stiffening fabric for garments	396,820	Jan. 29	2311	592	46	483
Jenkins, William H., Philadelphia, Pa. Mining-drill	396,875	Jan. 29	2386	612, 613	46	500
Jenkins, Wilton F., Richmond, Va. Trolley for electric railways	395,703	Jan. 8	617	155	46	133
Jenkinson, James, Brooklyn, N. Y. Axle	396,572	Jan. 22	1936	498	46	400
Jenks Manufacturing Company, E. (See Calley, Freeman A., assignor.)						
Jennings, Byron, San José, Cal. Conduit electric railway	395,442	Jan. 1	198	51, 52	46	42
Jennings, Simeon H., Deep River, Conn. Face-shield for atomizers	396,936	Jan. 29	2478	639	46	518
Jennings & Sons, A. G. (See Payne, Henry B., assignor.)						
Jennings & Sons, A. G. (See Payne and Campion, assignors.)						
Jensen, Nicholay, Washington, D. C. Cleaner for slates, blackboards, &c	395,905	Jan. 8	937	241	46	194
Jerome, Samuel B., assignor of one-half to T. F. Rowland, New York, N. Y. Car-wheel	395,568	Jan. 1	395	101	46	82
Jespersen, Wilhelm, Nykjöbing, Falster, Denmark, assignor to J. D. Frederiksen, Little Falls, N. Y. Cheese-press	396,493	Jan. 22	1816	466	46	379
Jewell, Charles E., assignor of one-half to A. M. Nye, Auburn, N. Y. Spring-tooth harrow	396,696	Jan. 22	2117	543	46	435
Jewell, M. Romeyn, assignor to Schlicht & Field Company, Rochester, N. Y. Metal shelving	395,328	Jan. 1	36	9	46	10
Jewell, William M., Pine, Colo., assignor to S. H. Templeton, Scranton, Iowa, and J. A. McAnulty, Denver, Colo. Feed mechanism for roller-mills. (Reissue)	10,979	Jan. 8	1161	294	46	237
Jobes, Leslie D., Erie, Pa. Steam-fitting for railway-cars	398,620	Feb. 26	2269	601	46	1047
Johansson, Carl A., Stockholm, Sweden. Extracting butter-fat from milk	399,618	Mar. 12	1258	323	46	1382
Johnson, Alfred W., New Brunswick, N. J. Running-gear for vehicles	396,494	Jan. 22	1818	466, 467	46	379
Johnson, Alonzo, Springfield, Mass., assignor, by mesne assignments, to Springfield Envelope Company, of Massachusetts. Gumming device for envelope-machines	397,796	Feb. 12	1063	283	46	788
Johnson, Calvin R. (See Selser, Johnson, and Perry.)						
Johnson, Daniel, Kansas City, Mo. Rotary dining-table	396,089	Jan. 15	1214	307	46	257
Johnson, Delbert E., Ottumwa, Iowa. Track-laying apparatus	399,048	Mar. 5	357	95, 96	46	1182
Johnson, Edward H. (See Capek, John V., assignor.)						
Johnson, Edward H. (See Herrington, George H., assignor.)						
Johnson, Edwin T., assignor to Saxton & Phillips, Minneapolis, Minn. Means for heating and ventilating buildings	395,395	Jan. 1	132	33	46	29
Johnson, Frank G. (See Johnson, Frank R. and F. G.)						
Johnson, Frank G., New York, N. Y. Regenerative gas-burner	398,404	Feb. 26	1967	517	46	988
Johnson, Frank R. and F. G., New York, N. Y. Hydraulic air-pump	398,405	Feb. 26	1968	517, 518	46	988
Johnson, Frederick, Buffalo, N. Y. Car-coupling	399,333	Mar. 12	826	215	46	1301
Johnson, Frederick L., Wallingford, Conn. Bicycle-whistle	396,821	Jan. 29	2313	592	46	483
Johnson, Garey W. (See Johnson, William and G. W.)						
Johnson, George W., Geneva, N. Y. Odometer	396,210	Jan. 15	1390	356	46	290
Johnson, George W., Dallas, Oreg. Fence-machine	399,412	Mar. 12	948	245, 246	46	1324
Johnson, Henry H., New York, N. Y. Sample package or wrapper	396,090	Jan. 15	1216	307	46	257
Johnson, James H., San Francisco, Cal. Camera-carrying case and plate-changing box	396,573	Jan. 22	1936	499	46	400
Johnson, John, Brooklyn, N. Y. Racking-off apparatus for beer, wine, and other liquids	398,261	Feb. 19	1740	458	46	935

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Johnson, John A., assignor to J. J. Tobin, Austin, Tex. Artist's easel and attachable rest	396,658	Jan. 22	2062	529	46	425
Johnson, Joseph A., San Francisco, Cal. Concentrator	400,216	Mar. 26	2134	559	46	1576
Johnson, Louis K., and A. A. Low, Brooklyn, assignors to Alden Type Machine Company, New York, N. Y. Compositor's type-case	397,003	Jan. 29	2565	663 664	46	536
Johnson, M. Nicholas. (See Berryman, Mathew W., assignor.)						
Johnson, Manville D. (See Moore, Cantnell J., assignor.)						
Johnson, Nelson, Knoxville, Pa. Ink-bottle and attachment therefor	396,495	Jan. 22	1830	467	46	380
Johnson, Samuel H., and C. C. Hutchinson, West Ham, county of Essex, England. Forcing fluids and semi-fluids by means of compressed air	399,994	Mar. 19	1808	470	46	1502
Johnson, Warren S., Milwaukee, Wis. Automatic pressure-regulating valve	397,805	Feb. 12	1072	2-6	46	789
Johnson, Warren S., Milwaukee, Wis. Steam-trap	399,198	Mar. 5	621	161 162	46	1234
Johnson, William and G. W., Portland, Oreg. Amalgamator	398,406	Feb. 26	1072	518	46	989
Johnson, William A., San Francisco, Cal. Dress-form	397,986	Feb. 19	1328	354	46	856
Johnson, William G., London, England. Battery for electric belts	397,806	Feb. 12	1073	286	46	799
Johnson, William H., Racine, Wis. Rolling-die machine	396,361	Jan. 15	1610	412	46	330
Johnson, William M. (See Nation, Edmund C., assignor.)						
Johnson Steel Street Rail Company. (See McLain, Will, assignor.)						
Johnson, Thomas. (See Davis, Thomas S. and W. W., assignors.)						
Johnson, Walter B., Fredericktown, Ohio. Smoke, spark, and cinder arrester	396,697	Jan. 22	2118	543	46	435
Johnston, Alexander S. (See Duncan, William, assignor.)						
Johnston, Arthur, Lockport, N. Y. Thrashing-machine	400,217	Mar. 26	2135	559	46	1577
Johnston, Edward P., Washington, D. C. Swimming apparatus	397,059	Jan. 29	2647	682	46	552
Johnston, Francis S., Philadelphia, Pa. Chevron	400,218	Mar. 26	2137	559 560	46	1577
Johnston, Frank N. (See Henderson and Johnston.)						
Johnston, John E. (See Hyde, Wesley M., assignor.)						
Johnston, Joseph M., Allegheny, Pa. Dampening-machine	398,333	Feb. 19	1856	489	46	959
Johnston, William C., Jr., Lynn, Mass. Electric coupling for railway-train signaling	397,553	Feb. 12	685	178	46	716
Joly Stopper Company. (See Lloyd, Edwin L., assignor.)						
Jones, Augustus H. (See Miller and Jones.)						
Jones, Augustus H. (See Peck and Jones.)						
Jones, Charles D. (See McLemore and Jones.)						
Jones, Charles S. (See Jones, George, F. R., G. H., H. O., and C. S.)						
Jones, Francis R. (See Jones, George, F. R., G. H., H. O., and C. S.)						
Jones, Franklin. (See Clough and Jones.)						
Jones, Fred B., Dallas, Tex., assignor to himself and Rock Island Plow Company, Rock Island, Ill. Cultivator	395,329	Jan. 1	38	10	46	10
Jones, George. (See Schardt and Jones.)						
Jones, George, F. R., G. H., H. O., and C. S., Stoke-upon-Trent, England. Covered dish	399,753	Mar. 19	1452	374	46	1432
Jones, George H. (See Jones, George, F. R., G. H., H. O., and C. S.)						
Jones, George L., and E. M. Miles, Chippewa Falls, Wis. Ventilating attachment for stove-pipes	398,968	Mar. 5	273	64	46	1159
Jones, George R. G., Louisville, Ky. Cuff-holder	400,344	Mar. 26	2340	611	46	1613
Jones, Horace O. (See Jones, George, F. R., G. H., H. O., and C. S.)						
Jones, John B., assignor to B. S. Heliker, L. C. Kellogg, and Buck & Hoyt, Battle Creek, Mich. Spring bed-bottom	398,334	Feb. 19	1857	489 490	46	959
Jones, John E., New York, N. Y. Weather-strip	399,413	Mar. 12	949	246	46	1324
Jones, John E., New York, N. Y. Weather-strip	399,414	Mar. 12	950	246	46	1324
Jones, John T. (See Creed, William H., assignor.)						
Jones, John T., Iron Mountain, Mich. Manufacture of railway-spikes	400,405	Mar. 26	2426	636	46	1629
Jones, Richard E., Goldsborough, N. C. Road-cart spring	397,236	Feb. 5	200	53	46	613
Jones, Samuel, Tranmere, county of Chester, England. Printing block or type	400,087	Mar. 26	1942	507 508	46	1537
Jones, Wesley C., Waxahachie, Tex. Gas-retort	396,746	Jan. 29	2208	565	46	461
Jones, Wesley C., Waxahachie, Tex. Broom-rack	397,723	Feb. 12	953	252	46	766
Jones, William E., Braddock, Pa. Apparatus for removing ingots from molds	395,330	Jan. 1	39	10	46	10
Jones, Willis C., and W. S. Rogers, Cincinnati, Ohio. Friction-clutch	397,859	Feb. 12	1142	305	46	804
Jordan, Joseph, Bridgeport, Pa. Gas-generator	398,051	Feb. 19	1439	381 382	46	876
Joslin, David K. (See Rheiner, Henry S., assignor.)						
Jowitt, William. (See Walker and Jowitt.)						
Joyce, Frank I., Dayton, Ohio. Hydraulic jack	398,784	Feb. 26	2521	670	46	1098
Junker, Jules, Philadelphia, Pa. Baking-oven	395,979	Jan. 8	1047	266	46	216
Just, John and P., Sauk City, Wis. Heating apparatus	395,980	Jan. 8	1048	266	46	216
Just, Peter. (See Just, John and P.)						
Justin, Helen D. (See Justin, J. Gilbert, assignor.)						
Justin, J. Gilbert, assignor to H. D. Justin, Syracuse, N. Y. Atomizer	398,513	Feb. 26	2121	558	46	1018
Kaasa, Ole K., Oslo, Minn. Hay rake and loader	398,160	Feb. 19	1594	423	46	906
Kaestner, Charles, Chicago, Ill. Brewer's mashing-machine	398,621	Feb. 26	2270	602	46	1048
Kaffenberger, Phillip, Springfield, Mo. Folding book-case	399,415	Mar. 12	951	247	46	1324
Kahan, Samuel, and A. W. Craven, Melbourne, Victoria. Electric alarm-clock	398,896	Mar. 5	122	33	46	1137
Kahler, Clarence H., Wilmington, Ill. Cash indicator and register	397,554	Feb. 12	686	178 179	46	716
Kaldenberg, Frederick R., New York, N. Y. Handle for cutlery	396,091	Jan. 15	1217	308	46	257
Kammerer, Christopher, assignor to J. F. Stillman, Boston, Mass. Steam-trap	398,622	Feb. 26	2271	602	46	1048
Kammeyer, Carl E., Chicago, Ill., assignor to Electrical Supply Company, Ansonia, Conn. Galvanic battery	400,068	Mar. 26	1943	508	46	1537
Kanable, Byron, Marion, Ohio. Sample-cream extractor	397,004	Jan. 29	2568	664	46	537
Kanable, Byron, Marion, Ohio. Oil process in butter-making	400,219	Mar. 26	2138	560 561	46	1577
Kane, George O., Providence, R. I. Car-brake	396,876	Jan. 29	2301	613	46	501
Kane, John, Philadelphia, Pa. Fire-extinguisher	395,906	Jan. 8	939	241	46	194
Kane, Thomas, *et al.* (See Linn, Allen D., assignor.)						
Karr, Charles A., Green Elm, Kans. Leveling-instrument	397,294	Feb. 5	285	73, 74	46	630
Karthaus, Ernest, Huntsville, Ala. Mainspring for watches	397,504	Feb. 12	610	157	46	701
Karthaus, Ernest, Huntsville, Ala. Inserting mainsprings and removing the same	397,505	Feb. 12	612	158	46	701
Karwiese, Gustavus A., New York, N. Y. Locomotive-boiler	396,161	Feb. 19	1595	423	46	906
Kaspar, John A., and W. B. Curtis, Pomeroy, Ohio. Top-prop for vehicles	396,937	Jan. 29	2479	639	46	518
Kassler, William J. (See Henry and Kassler.)						
Kanaler, John F., Sheboygan, Wis. Bar and beer-cooler	395,331	Jan. 1	40	10	46	11
Kants, George, assignor to himself and L. A. Kants, Albany, N. Y. Mason's float	398,732	Feb. 26	2454	650	46	1064
Kants, Lewis A. (See Kants, George, assignor.)						
Kavanaugh, Daniel, Orange, N. J. Thill-coupling	398,969	Mar. 5	235	65	46	1159

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Kay, John F. (See Barraclough and Kay.)						
Kaye, William H., Wenonah, N. J. Crank for machinery	397,367	Feb. 5	395	104	46	652
Keane, M. Joseph, New Haven, Conn. Bottle-tap	398,102	Feb. 19	1597	423	46	907
Kearney, Joseph G., San Francisco, Cal. Coin-controlled lifting-machine	397,295	Feb. 5	287	74	46	631
Kearns, John C., Maitland, Pa. Churn	397,921	Feb. 19	1229	329	46	839
Keasbey, Henry G., Ambler, assignor of one-half to R. V. Mattison, Philadelphia, Pa. Machine for molding tubes or cylinders	397,860	Feb. 12	1143	305 306	46	804
Keasling, Samuel W., Bickwell, Ind. Gate	399,619	Mar. 12	1260	324	46	1382
Keats, John, Bagnal, near Stoke-upon-Trent, county of Stafford, England. Machine for heeling boots or shoes	398,733	Feb. 26	2455	650 651	46	1064
Keeble, James. (See Carter and Keeble.)						
Keefe, Patrick O. (See Powers, Michael L., assignor.)						
Keefe, Thomas H., *et al.* (See Griffin, John B., assignor.)						
Keeler, Calvin, and H. Lewis, Hobart, N. Y. Can-fastener	397,555	Feb. 12	690	179	46	716
Keene, Joseph, Chicago, Ill. Spring-hinge	397,190	Feb. 5	136	37	46	603
Keep, William J., Detroit, Mich. Testing-machine	399,754	Mar. 19	1452	374 375	46	1432
Keeton, James, assignor of one-half J. Welling, Brooklyn, N. Y. Pattern-wheel for warp-knitting machines	398,623	Feb. 26	2272	603	46	1049
Kegler, William, Bellevue, Iowa. Pump	399,189	Mar. 5	624	162	46	1234
Keir, Henry A. and J., Greensborough Bend, Vt. Heater for stock-watering troughs	396,052	Feb. 19	1442	362	46	877
Keir, John. (See Keir, Henry A. and J.)						
Keller, C. Martin, Columbus, Ind. Mast-arm	399,334	Mar. 12	827	215	46	1301
Keller, Ellen J. (See Hammond, Thomas D., assignor.)						
Keller, Hugo, assignor to H. A. Parr, New York, N. Y. Securing diamonds in cutting-tools	398,053	Feb. 19	1444	362	46	877
Keller, Joseph, assignor to Keller Piano Company, Bridgeport, Conn. Device for muting pianos	396,698	Jan. 22	2120	544	46	435
Keller, Lester, Fire Creek, W. Va. Folding chair	399,049	Mar. 5	359	96	46	1163
Keller Piano Company. (See Keller, Joseph, assignor.)						
Kelley, George B., assignor to Rockford Silver Plate Company, Rockford, Ill. Burnishing-machine	399,669	Mar. 19	1334	342	46	1408
Kelley, Harry E., Niagara Falls, N. Y. Chain-link	396,404	Jan. 22	1678	431	46	351
Kelley, Lewis, Bowne, Mich. Sleigh	399,335	Mar. 12	828	215	46	1301
Kelley, Richard, *et al.* (See White, William, assignor.)						
Kellogg, Charles, Buffalo, N. Y., assignor to Kellogg Seamless Tube and Manufacturing Company, Boston, Mass. Machine for rolling seamless tubing	397,724	Feb. 12	953	253 254	46	766
Kellogg, Fortunatus G. (See Gilmour and Kellogg.)						
Kellogg, Loyal C., *et al.* (See Jones, John B., assignor.)						
Kellogg Seamless Tube and Manufacturing Company. (See Kellogg, Charles, assignor.)						
Kellogg, Warren T., Lansingburg, N. Y. Burner for liquid hydrocarbons and vapors thereof	397,595	Feb. 12	764	199 200	46	730
Kellogg, William L., Mound City, Ill. Stave-making machine	399,670	Mar. 19	1335	342	46	1408
Kelly, Adam L. (See Pipes and Kelly.)						
Kelly Axe Manufacturing Company. (See Kelly, William C., assignor.)						
Kelly, George, Chicago, Ill. Making flat coiled springs	397,861	Feb. 12	1145	306	46	805
Kelly, Harold, Biddeford, Me. Loom-picker	397,649	Feb. 12	851	222	46	746
Kelly, John F., assignor to United States Electric Lighting Company, New York, N. Y. Dynamo-electric machine	395,622	Jan. 1	460	123	46	98
Kelly, John W., Minneapolis, Minn. Switch-board	399,269	Mar. 12	730	190	46	1222
Kelly, William C., assignor to Kelly Axe Manufacturing Company, Louisville, Ky. Ax-poll	397,368	Feb. 5	396	104	46	653
Kelly, William C., assignor to Kelly Axe Manufacturing Company, Louisville, Ky. Die for making ax-polls	397,369	Feb. 5	397	104	46	653
Kelly, William E., New Brunswick, N. J. Steam-boiler	397,130	Feb. 5	36	8, 9	46	585
Kelsey, Frank N., assignor of part to J. C. Peck, New Haven, and J. Graham, Orange, Conn. Switch-signal	399,538	Mar. 12	1138	295	46	1350
Kelsey, John R., Bethnal Green, county of Middlesex, assignor to W. H. Greenwood, London, England. Manufacture of soft hats	398,734	Feb. 26	2457	.....	46	1065
Kelz, Max, *et al.* (See Wleck, Wenzl, assignor.)						
Kemble, Chambers E., Wilmington, Del. Paper-bag and twine holder	399,671	Mar. 19	1338	343	46	1408
Kemmler, John A., assignor of one-half to W. Soistmann, Philadelphia, Pa. Exercising-machine	396,938	Jan. 29	2480	639	46	519
Kemp, Jacob C., Tiffin, Ohio. Fence	397,370	Feb. 5	397	105	46	653
Kemp, Joseph S., Magog, Quebec, Canada. Wheeled stump or stone lifter	397,807	Feb. 12	1075	286	46	799
Kempkey, Augustus, San Francisco, Cal. Hip rein-support	397,922	Feb. 19	1230	329	46	839
Kempster, Daniel E., Boston, Mass. Folding convertible chair	396,496	Jan. 22	1822	468	46	380
Kendall, Franklin B., assignor to himself, G. Gelbach, Tumwater, and R. S. Western, Olympia, Wash. Ter. Windmill	398,054	Feb. 19	1445	362 363	46	878
Kendall, W. Devereaux. (See Lackey, George E., assignor.)						
Kendrick, John. (See Bray, Morris P., assignor.)						
Kenison, John B., Lynn, Mass. Conductor for stand-pipes	398,735	Feb. 26	2458	651	46	1065
Kennard, Frederick A., and H. W. Cory, St. Paul, Minn. Closet for railway-cars	397,005	Jan. 29	2569	664	46	537
Kennedy, Charles H., Greenburg, N. Y. Wrench	396,877	Jan. 29	2492	614	46	501
Kennedy, George W., Zanesville, Ohio. Indicator	400,345	Mar. 26	2342	611	46	1613
Kennedy, Hugh, Sharpsburg, Pa. Hot-blast stove	398,970	Mar. 5	236	65	46	1159
Kennedy, Hugh, assignor to L. C. Marshuts and T. G. Cantrell, San Francisco, Cal. Hoisting apparatus	398,785	Feb. 26	2523	670	46	1097
Kennedy, Julian, Latrobe, Pa. Machine for cutting flanged beams	395,569	Jan. 1	396	101 102	46	82
Kennedy, Julian, Latrobe, Pa. Fastening device for car-wheel tires	400,089	Mar. 26	1944	508	46	1537
Kennedy, Martin, Hegewisch, Ill., assignor to United States Rolling Stock Company. Device for upsetting and bending metal	399,903	Mar. 19	1677	435	46	1477
Kenneweg, Christian F. (See Colwell, Evander N., assignor.)						
Kenney, Thomas M., Cambridge, Mass. Cash-carrier	397,237	Feb. 5	201	53	46	614
Kent, George R., assignor of one-half to A. J. Hannas, Burlington, Wis. Butcher's wagon	397,725	Feb. 12	957	254 255	46	767
Kent, Henry A., Kingsland, county of Middlesex, England. Oil-lamp	398,163	Feb. 19	1598	424	46	907
Kent, James W., and R. Orr, Brooklyn, N. Y. Anti-freezing device for water-pipes	395,748	Jan. 8	679	174	46	145
Kent, Lee, Hot Springs, Ark. Combination-hook	395,704	Jan. 8	617	155	46	133
Kent, William, Passaic, assignor to Springer Torsion Balance Company, Jersey City, N. J. Truss for torsion-balances and the like	396,497	Jan. 22	1824	468	46	380
Kenworthy, Louis E., Ackworth, Iowa. Wall-paper hanger	395,443	Jan. 1	201	52	46	42
Kern, Alfred, Basle, Switzerland. Formation of purple coloring-matter	396,574	Jan. 22	1837	.....	46	400
Kerr, William, Cleveland, Ohio. Sewer-trap	395,907	Jan. 8	941	242	46	195

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Kester, Jesse F., assignor of three-fourths to J. H. Briggs, Terre Haute, Ind. Regulator for dynamo-electric machines	397,006	Jan. 29	2570	664	46	537
Kester, Jesse F., assignor of three-fourths to J. H. Briggs, Terre Haute, Ind. Dynamo-electric machine	397,007	Jan. 29	2572	665	46	537
Kester, Jesse F., assignor of three-fourths to J. H. Briggs, Terre Haute, Ind. Regulator for dynamo-electric machines	399,147	Mar. 5	532	139	46	1217
Ketcham, James H. (See Ketcham, John E., J. H., and S. E.)						
Ketcham, John E., J. H., and S. E., Anamosa, Iowa. Ditching-spade	396,659	Jan. 22	2063	530	46	425
Ketcham, Squire E. (See Ketcham, John E., J. H., and S. E.)						
Ketchem, John E., Morrilltown, Ark. Drilling and centering tool	395,833	Jan. 8	896	214	46	173
Ketchum, Landon, Saugatuck, Conn. Gas-stove	396,575	Jan. 22	1938	{499 500}	46	400
Ketchum, Landon, Saugatuck, Conn. Gas-stove	396,576	Jan. 22	1941	500	46	401
Ketchum, Nathaniel S., Marshalltown, Iowa. Wagon-axle	397,131	Feb. 5	40	9	46	586
Keton, Walter, North Attleborough, Mass. Thill-coupling	395,396	Jan. 1	133	33	46	29
Keyes, John W., Pana, Ill. Grate	395,397	Jan. 1	135	34	46	29
Keyser, George, Philadelphia, Pa., assignor to Lamson Store Service Company, Boston, Mass. Store-service apparatus	395,332	Jan. 1	41	10, 11	46	11
Kibbe, Alonzo R., New Richmond, Wis. Wash-board	397,430	Feb. 5	498	131	46	674
Kidd, James, administrator. (See Kidd, Joshua.)						
Kidd, Joshua, deceased; J. Kidd administrator and assignor to W. J. Kidd, Newark, N. J. Carbureting-lamp	396,041	Jan. 8	1134	288	46	232
Kidd, Walter J. (See Kidd, Joshua, assignor.)						
Kidder, James H., Lawrence, Mass. Dental engine	397,556	Feb. 12	690	{179 180}	46	716
Kilbourn, Washington H., Olean, N. Y. Automatic horse-check	395,333	Jan. 1	43	11	46	11
Kilham, John T., Lowville, N. Y. Theatrical appliance	395,623	Jan. 1	481	123	46	98
Killian, John E. (See French, Francis J., assignor.)						
Killip, John, Jr. (See Tate and Killip.)						
Kilpatrick, Samuel W., Gilroy, Cal. Harrow and cultivator	400,220	Mar. 26	2141	561	46	1577
Kilroy, M. J., *et al.* (See Roberts, Thomas, assignor.)						
Kimball, Arden D., Miles, Iowa. Tobacco-box	399,050	Mar. 5	360	97	46	1183
Kimball, Charles W., Chicago, Ill. Hose-reel	397,987	Feb. 19	1329	354	46	856
Kimball, Charles W., Chicago, Ill. Thumb-nut wrench	397,988	Feb. 19	1331	355	46	856
Kimball, George S., Detroit, Mich. Pipe-joint deflueator	397,132	Feb. 5	41	9, 10	46	586
Kinder, Arthur H., Boston, Mass. Horse-blanket	399,672	Mar. 19	1340	343	46	1409
King, Carlos C., Montezuma, Ind. Dumping-car	398,262	Feb. 19	1742	459	46	936
King, Charles A., Meriden, Conn. Clutch mechanism	397,238	Feb. 5	902	53	46	614
King, Charles R., Lampasas, Tex. Combination door check and alarm	397,726	Feb. 12	958	255	46	767
King, Charlie C., and A. D. Trimble, Forth Worth, Tex. Band-cutter and feeder	398,407	Feb. 26	1974	{518 519}	46	989
King, Corydon C., assignor of two-thirds to Wiseman & Co., and A. Fleischer, agt., Pittston, Pa. Storm-apron for vehicles	395,749	Jan. 8	682	174	46	146
King, Frank, Fulham, county of Middlesex, England. Electrical distribution by secondary batteries	399,755	Mar. 19	1454	{375 376}	46	1433
King, George R., New Brighton, N. Y. Compound to restrain the setting of plaster, &c	397,296	Feb. 5	289	.....	46	631
King & Hamilton Company. (See Gilman, John H., assignor.)						
King & Hamilton Company. (See Snelling, David, assignor.)						
King, John M., assignors of one-half to G. F. Brock, Stecoah, N. C. Rectal speculum	395,705	Jan. 8	618	155	46	133
King, John T., Madison, Wis. Ink-distributing apparatus for printing-machines	400,221	Mar. 26	2142	{561 562}	46	1577
King, John T., Madison, Wis. Ink-distributing apparatus for printing-machines	400,222	Mar. 26	2144	562	46	1578
King, John T., Madison, Wis. Ink-distributing apparatus for printing-machines	400,223	Mar. 26	2144	{562 563}	46	1578
King, Obed H., Houghton, Iowa. Hay-stacker	397,431	Feb. 5	499	{131 132}	46	674
King, Paul, Washington, D. C. Harness	399,651	Mar. 5	361	97	46	1183
King, Robert, Brooklyn, N. Y. Machine for making cylindrical pins and tubes of wood	397,727	Feb. 12	959	255	46	767
King, Robert W., *et al.* (See Anderson and Elias, assignors.)						
King, Sidney D., Pittston, Pa. Car-coupling	395,750	Jan. 8	683	{174 175}	46	146
King, Thomas, assignor to himself and W. C. Greene & Co., Providence, R. I. Bracelet	396,939	Jan. 29	2481	640	46	519
Kingsford, Thomson. (See Tonkin, John J., assignor.)						
Kingsland, William, Gunnersbury, county of Middlesex, England. Secondary battery	397,650	Feb. 12	852	222	46	747
Kingsley, Albert F. (See Pennybacker, Morgan, assignor.)						
Kingston, Charles P. (See Stone and Kingston, assignors.)						
Kingston, John W. (See Stone and Kingston.)						
Kinne, Theodore Y. (See Watson, William C., assignor.)						
Kinney, Ariel, Lowell, Mass. Automatic oiler	397,432	Feb. 5	501	132	46	675
Kirchgraber, George, St. Lawrence, Dak. Ter. Flour-chest	398,736	Feb. 26	2459	{651 652}	46	1065
Kirkaldy, John, 40 West India Dock Road, county of Middlesex, England. Feed-water heater	398,263	Feb. 19	1744	{459 460}	46	936
Kirkpatrick, Christian M., assignor of one-half to J. M. Taylor, Indianapolis, Ind. Automatic cut-off for gas	395,334	Jan. 1	45	11	46	11
Kisinger, William S., Bellevue, Ky., assignor of two-thirds to A. C. Stiebel, St. Louis, Mo., and H. G. Stiebel, Jr., Cincinnati, Ohio. Sheave	398,197	Mar. 5	124	33	46	1137
Kisner, David P., Manly, Iowa. Combined fork and spoon	398,264	Feb. 19	1746	460	46	936
Kitchen, Emanuel W., Furlong, Pa. Bathing apparatus	398,514	Feb. 26	2122	{558 559}	46	1018
Kitsee, Isidor, Cincinnati, Ohio. Dry voltaic battery	395,766	Jan. 8	618	156	46	133
Kitsee, Isidor, Cincinnati, Ohio, assignor to M. Sulzberger, trustee, Philadelphia, Pa. Voltaic battery	400,224	Mar. 26	2145	563	46	1578
Kitsee, Isidor, Cincinnati, Ohio, assignor to M. Sulzberger, trustee, Philadelphia, Pa. Voltaic battery	400,225	Mar. 26	2146	{563 564}	46	1578
Kitsee, Isidor, Cincinnati, Ohio, assignor to M. Sulzberger, trustee, Philadelphia, Pa. Secondary battery	400,226	Mar. 26	2149	564	46	1579
Kitsee, Isidor, Cincinnati, Ohio, assignor to M. Sulzberger, trustee, Philadelphia, Pa. Voltaic battery	400,227	Mar. 26	2151	564	46	1579
Kitson, Arthur, and W. S. Horry, assignors to Kitson Gaslight Improvement Company, Philadelphia, Pa. Carbureting-lamp	395,834	Jan. 8	827	215	46	174
Kitson Gaslight Improvement Company. (See Kitson and Horry, assignors.)						
Klamt, Henry E., Newark, N. J. Barrel-washing machine	400,346	Mar. 26	2343	{611 612}	46	1613

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Kleemann, Ludwig, Myslowitz, Prussia, Germany. Furnace for working zinc ores	399,905	Mar. 19	1810	{470 471}	46	1502
Klein, Marcus, Chicago, Ill. Apparatus for cutting hair	395,444	Jan. 1	202	52	46	43
Kleinsteuber, Oscar D. (See Paul and Kleinsteuber.)						
Kling, Isaac, Louisville, Ky. Car-coupling	396,878	Jan. 29	2393	614	46	502
Kling, Isaac, Louisville, Ky. Car-coupling	396,879	Jan. 29	2396	614	46	502
Klinglesmith, John F., St. Louis, Mo. Spring-gun	398,265	Feb. 19	1746	461	46	937
Klipstein, Frederick C., Leland, Wis. Sleigh	397,728	Feb. 12	961	256	46	767
Kloeckner, Daniel, *et al.* (See Waffen, John, assignor.)						
Knaak, Frank C. F. (See Abbot and Knaak.)						
Knapp, Albert M., Providence, R. I. Syringe	397,060	Jan. 29	2650	682	46	553
Knapp, Byron G., Sandy Hill, N. Y. Hitching-post	399,904	Mar. 19	1678	435	46	1477
Knapp, Joseph, Buffalo, N. Y. Velocipede	400,090	Mar. 26	1946	509	46	1537
Knapp, Philip N., and J. R. Britto, South Norwalk, Conn. Hat	395,335	Jan. 1	47	11	46	12
Knapp, William A. (See Scofield, Almaron J., assignor.)						
Knecht, Victor E. (See Barrath, Edward, assignor.)						
Knickerbocker Company. (See Mundy, John G., assignor.)						
Knifin, George G., Brooklyn, assignor to H. E. and H. Janes, New York, N. Y. Stove or range	398,515	Feb. 26	2124	559	46	1019
Knight, Arthur L. (See Schiffer and Knight.)						
Knight, Edwin L., Springfield, Mass. Water-closet valve	399,905	Mar. 19	1679	436	46	1477
Knight, Jefferson V. (See McLean, Arthur, assignor.)						
Knight, Walter H., New York, N. Y. Rack and gear for inclined railways	400,347	Mar. 26	2345	612	46	1614
Knipe, William A. (See Smith, George E., assignor.)						
Knoche, Johann E., San José, Cal. Pavement	398,055	Feb. 19	1447	383	46	878
Knode, Robert S., assignor of one-half to E. L. Siver, Fort Wayne, Ind. Atomizer	399,539	Mar. 12	1140	295	46	1360
Knorpp, Philipp, and G. A. Mayer, Stapleton, N. Y. Tin brilliant ornament	397,083	Jan. 29	2682	694	46	558
Knowles, Edward R., Brooklyn, N. Y. Electric switch or cut-out	396,880	Jan. 29	2397	615	46	502
Knowles, Edward R., Brooklyn, N. Y. Automatic electric cut-out	396,940	Jan. 29	2482	640	46	519
Knowles, Edward R., Brooklyn, N. Y. Secondary-battery plate	397,557	Feb. 12	692	180	46	717
Knowles, Edward R., Brooklyn, N. Y., assignor to Mutual Electric Manufacturing Company, of New York. Armature-winding for dynamo-electric machines	396,941	Jan. 29	2483	640	46	519
Knowles, Edward R., Brooklyn, N. Y., assignor to Mutual Electric Manufacturing Company, of New York. Commutator for dynamo-electric machines	396,942	Jan. 29	2484	640	46	520
Knowles, Edward R., Brooklyn, N. Y., assignor to Mutual Electric Manufacturing Company, of New York. Automatic switch for electric-arc lamps	397,729	Feb. 12	963	256	46	768
Knowles, Edward R., Brooklyn, assignor, by mesne assignments, to Mutual Electric Manufacturing Company, New York, N. Y. Secondary battery	399,052	Mar. 5	361	97	46	1183
Knowles, Ernest, Mossfield Mill, Bolton, county of Lancaster, England. Valve mechanism for automatically starting steam-pumps	395,908	Jan. 8	943	242	46	195
Knowles, Fred C. (See Magee and Knowles.)						
Knowles Loom Works. (See Hutchins, George F., assignor.)						
Knowles Loom Works. (See Wattie, William, assignor.)						
Knowlton, Dexter A. (See Knowlton, William A., assignor.)						
Knowlton, Ephraim H. B., assignor of three-fourths to A. C. Mellette, J. J. Owsley, Sr., and O. E. Dewey, Watertown, Dak. Ter. Car-coupling	398,056	Feb. 19	1448	383	46	878
Knowlton, William A., Rockford, Ill., assignor to D. A. Knowlton. Mowing-machine	395,981	Jan. 8	1049	{266 267}	46	216
Knox, John A., and T. J. Eberson, assignors to P. P. Sherry, Lynn, Mass. Button-hole finishing and staying machine	398,335	Feb. 19	1858	490	46	959
Knutzen, William, Donahue, Iowa. Combined clod-crusher and roller	395,787	Jan. 8	748	192	46	157
Koch, Julius J., St. Louis, Mo. Hydraulic brick-machine	397,730	Feb. 12	963	{256 257}	46	768
Koch, Walter E., Sharpsburg, Pa. Apparatus for casting steel pipes	396,747	Jan. 29	2209	565	46	461
Koch, William, New York, N. Y. Numbering-machine	398,624	Feb. 26	2274	603	46	1049
Koch, William, New York, N. Y. Cash indicator and recorder	398,625	Feb. 26	2277	{603 604}	46	1049
Koch, William, New York, N. Y. Stop device for adding and registering wheels	398,627	Feb. 26	2291	604	46	1051
Koch, William, New York, N. Y., and C. E. Hadley, Washington, D. C.; said Hadley assignor to said Koch. Cash indicator and register	398,626	Feb. 26	2283	{604 605}	46	1050
Koehler, Charles F., St. Louis, Mo. Apparatus for the pasteurization of beer	399,200	Mar. 5	625	162	46	1234
Koehler, Benjamin C., and D. Heer, Philadelphia, Pa. Coffin-handle	395,962	Jan. 8	1051	267	46	217
Koehn, Alfred, New York, N. Y. Adjustable standard for music-racks	398,408	Feb. 26	1976	519	46	989
Koenig, Michael, assignor to S. Zinn, New York, N. Y. Frame for pocket-books or other articles	397,868	Feb. 12	1145	306	46	805
Koepp, Ferdinand, and J. C. Gueth, Pittsburg, Pa. Carpet-stretcher and tack-driver	395,497	Jan. 1	282	72	46	60
Kohlberg, Benjamin F., *et al.* (See Anderson and Elias, assignors.)						
Kohler, Frederick E., Canton, Ohio. Tricycle	400,091	Mar. 26	1947	509	46	1538
Kohnert, Otto. (See Diamond and Kohnert.)						
Kolb, George F., Philadelphia, Pa. Cash indicator and register	395,570	Jan. 1	400	{102 103}	46	83
Kolb, George F., Philadelphia, Pa. Cash-indicator	400,406	Mar. 26	2427	{636 637}	46	1629
Kolb, Jonathan F., H. H. Allen, and C. F. St. Clair, Oceanside, Cal.; said Allen and St. Clair assignors to said Kolb. Buggy-bow support	396,211	Jan. 15	1392	356	46	290
Koller, Martin. (See Richard, William, assignor.)						
Kollofski, Bernhardt R. (See Borst, George, assignor.)						
Kookogey Electric Company. (See Kookogey, William P., assignor.)						
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Preparing solution compounds for galvanic batteries	395,835	Jan. 8	829	.....	46	174
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Apparatus for charging and discharging secondary batteries	395,836	Jan. 8	830	215	46	174
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Preparing solution compounds for galvanic batteries	395,837	Jan. 8	834	.....	46	175
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Electrical railway-signal	396,748	Jan. 29	2210	565	46	461
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Railway-signal	396,749	Jan. 29	2212	566	46	462
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Railway-signal	396,750	Jan. 29	2213	566	46	462
Kookogey, William P., Brooklyn, N. Y., assignor to Kookogey Electric Company. Mercury-holder for battery-zincs	398,737	Feb. 26	2460	652	46	1065
Koons, Charles W. (See Effinger, Deweese, Koons, and Metzger.)						
Koons, Joseph K., Montgomery, Pa. Lathe for turning bodies having elliptical cross-sections	395,838	Jan. 8	834	216	46	175

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Krake, John A., assignor of one-half to J. Bork, Buffalo, N. Y. Grain-separator	399,148	Mar. 5	533	140	46	1218
Kranich, Hellmuth, and J. Bach, New York, N. Y.. Piano-forte action	397,239	Feb. 5	203	54	46	614
Kraus, Leopold, Birmingham, Conn. Manufacture of ornamental corsets	395,707	Jan. 8	619	156	46	133
Kraushaar, George J., assignor to himself and M. A. Rourke, Cleveland, Ohio. Pillow-sham holder	397,084	Jan. 29	2683	694	46	558
Kreiss, Peter L. (See Lindemuth, Harry H., assignor.)						
Kreppe, Virgil A. (See Wagner, Gustavus G., assignor.)						
Krom, John J., St. Augustine, Fla. Door-check	395,751	Jan. 8	685	175	46	146
Kromer, Otto, assignor of one-half to F. Rinkleff, Sandusky, Ohio. Cut-off valve for engines	395,657	Jan. 1	547	137	46	110
Kronenberg, Edward, Philadelphia, Pa. Electric gas-lighter	399,416	Mar. 12	952	247	46	1325
Krug, Louis, Brooklyn, N. Y. Ear-ring	397,432	Feb. 5	502	132	46	675
Krug, Louis, New York, N. Y. Setting for jewelry	397,434	Feb. 5	503	132	46	675
Kruse, Charles. (See Weiss, Charles W., assignor.)						
Krutsch, Willis W., assignor of one-half to S. A. Van Buskirk, Fort Scott, Kans. Wood-engraving machine	398,336	Feb. 19	1460	491	46	959
Kubalz, Ignatz J., New York, N. Y. Device for detaching animals	400,092	Mar. 26	1948	509	46	1538
Kubelka, Josef, Vienna, Austria-Hungary. Manufacturing dolls and busts	397,463	Feb. 5	549	141	46	683
Kuhlman, David D., Kansas City, Mo. Ditching and grading machine	398,786	Feb. 26	2524	670, 671	46	1098
Kuhlmann, Carl. (See Kuhlmann, Heinrich, C., and H. E.)						
Kuhlmann, Heinrich, C., and H. E., Glückstadt, Prussia, Germany. Machine for cracking and shelling nuts	397,863	Feb. 12	1146	306, 307	46	805
Kuhlmann, Heinrich E. (See Kuhlmann, Heinrich, C., and H. E.)						
Kuhn, Edmond, New York, N. Y. Photographic shutter	396,699	Jan. 22	2121	544	46	436
Kuhn & Fièche. (See Schütz, Hippolyte, assignor.)						
Kull, Matthaus, Newark, N. J. Adjustable scaffold	396,163	Jan. 15	1313	336	46	275
Kumpf, August and H., Philadelphia, Pa. Artificial wreath	399,370	Mar. 12	732	190	46	1282
Kumpf, Henry. (See Kumpf, August and H.)						
Künzel, Charles A., Philadelphia, Pa. Balloon	399,271	Mar. 12	732	190	46	1282
Kunzler, John W. (See Arbogast and Kunzler.)						
Kutner, David, Brooklyn, N. Y. Gem-setting	396,092	Jan. 15	1218	308	46	257
Kynett, William H., Battle Creek, Mich. Hand-loom	396,281	Jan. 15	1488	377	46	308
L'Hommedieu & Co., Sylvester Y. (See Ashen, Peter, assignor.)						
La Casse, Henry. (See Wile and La Casse.)						
La Fever, George A., Selkirk, N. Y. Bell-cord attachment	395,839	Jan. 8	836	216	46	175
La Mar, William, Pleasantville, Iowa. Gate	395,336	Jan. 1	48	12	46	12
La Port, Charles D., Carson, Iowa. Washing-machine	396,498	Jan. 22	1825	468	46	380
Lasas, Emil, *et al.* (See Dewey, Mark W., assignor.)						
Laforge, Frederick H., Waterbury, Conn., and H. J. Barker, Philadelphia, Pa. Direct-acting steam-engine	398,164	Feb. 19	1600	424	46	907
Laforge, Frederick H., Waterbury, Conn., and H. J. Barker, Philadelphia, Pa. Friction-clutch	398,628	Feb. 26	2292	606, 607	46	1051
Laganke, Charles F., Lorain, and T. E. Gawn, North Amherst, assignors to Lorain Wrench Company, Lorain, Ohio. Wrench attachment	398,751	Jan. 29	2214	566	46	463
Laidler, Thomas. (See Laidler, William H. and T.)						
Laidler, William H. and T., Meldon House, No. 9 Leopold Street, Burdett Road, Bow, county of Middlesex, England. Wire rope or cable	397,371	Feb. 5	399	105	46	653
Laird, James, and W. Mendham, Philadelphia, Pa. Roller for marking designs in artificial stone	397,731	Feb. 12	968	257	46	769
Lake, George A., Sherman, Mich. Harrow-tooth	396,093	Jan. 15	1218	308	46	257
Lalor, Jerome, Independence, Iowa. Tanning process	396,337	Jan. 15	1569	.....	46	322
Lamar, James S., Valdosta, Ga. Vibrating propeller	398,629	Feb. 26	2295	607	46	1052
Lamb, Austin F., Stockbridge, Vt. Carpet stretcher and tacker	395,445	Jan. 1	204	53	46	43
Lamb, Levi L., assignor to Whitman & Barnes Manufacturing Company, Akron, Ohio. Apparatus for tempering mowing-machine sections	399,673	Mar. 19	1340	343, 344	46	1409
Lambert, Bert L., *et al.* (See Clayton, John N., assignor.)						
Lambert, Charles R., *et al.* (See Clayton, John N., assignor.)						
Lambert, John E., *et al.* (See Clayton, John N., assignor.)						
Lambert, Joshua, *et al.* (See Clayton, John N., assignor.)						
Lambie, Robert M. (See Hickok and Lambie.)						
Lambing, John A. (See Whysall and Lambing.)						
Lamon, William H., Baltimore, Md. Combination-tag	399,756	Mar. 19	1459	376	46	1434
Lamphier, John W., Lynn, Mass. Last	399,996	Mar. 19	1812	471	46	1502
Lamson Store Service Company. (See Cowley, James T., assignor.)						
Lamson Store Service Company. (See Keyser, George, assignor.)						
Lamson, William S. (See Dyer, Richard N., assignor.)						
Lancaster, John P., Goshen, Ind. Rail-joint	397,008	Jan. 29	2574	665	46	538
Landee, Frank A., Moline, Ill. Wire-stretcher	399,053	Mar. 5	363	97	46	1184
Lander, William H., Pendleton, Oreg. Hay or grain fork	396,881	Jan. 29	2398	615	46	503
Landes, Enos, Reserve, Kans. Cultivator	399,757	Mar. 19	1460	376	46	1434
Landfear, William R., Brooklyn, N. Y., assignor to Willimantic Linen Company, Willimantic, Conn. Machine for winding sewing-machine bobbins, &c.	398,057	Feb. 19	1449	383	46	879
Landis, Israel L. (See Shank, Samuel B., assignor.)						
Landis, Israel L., *et al.* (See Denney, Samuel L., assignor.)						
Landis, Israel L., Lancaster, Pa. Border-plate for flower-beds	397,732	Feb. 12	969	257, 258	46	769
Landis, Israel L., Lancaster, Pa. Pavement-curb	398,630	Feb. 26	2296	607	46	1052
Landis, Israel L., and A. Iske, Lancaster, Pa.; said Iske assignor to said Landis. Combined hay rake and tedder	398,165	Feb. 19	1602	424, 425	46	908
Landolt, Henry J. (See Sparks and Landolt.)						
Landon, Henry, Massillon, Ohio. Lamp-lighting device	397,923	Feb. 19	1231	329	46	839
Landreth, Burnet. (See Hammersley, Harry D., assignor.)						
Lane, David, Hayt's Corners, N. Y. Cattle-stanchion	399,630	Mar. 12	1261	324	46	1382
Lane, Ebenezer P., Swanzey, N. H. Toy	396,094	Jan. 15	1219	308	46	258
Lane, Francis T. L. (See Buell, Andrew L. and E., assignors.)						
Lane, George, Bethel, Conn. Hat-support and packing-ring	399,201	Mar. 5	626	162	46	1234
Lane, George M., Asbury Park, N. J. Electric-arc lamp	399,054	Mar. 5	364	98	46	1184
Lane, John, Brooklyn, N. Y. Indexing book-mark	399,417	Mar. 12	953	247	46	1325
Lane, Levi E., and G. Hilliard, Lyons, N. Y. Wagon-brake	400,228	Mar. 26	2172	564	46	1579
Lang, Alois, Atlanta, Ga. Saw-mill feed mechanism	395,840	Jan. 8	837	216, 217	46	175
Lang, Edward M., Falmouth, Me. Electrode for secondary batteries	398,409	Feb. 26	1977	.....	46	990
Langbeck, Hugo W., Longhton, county of Essex, England. Refining wool-fat	399,906	Mar. 19	1681	.....	46	1478
Langdon, George W., Clinton, Mass. Watering-trough	399,418	Mar. 12	954	247	46	1325

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Langhammer, Paul, New Orleans, La. Rotary brake	398,058	Feb. 19	1452	384	46	879
Langill, Theophilus W., New York, N. Y. Vault light and ventilator	399,419	Mar. 12	955	248	46	1325
Langlands, Daniel D. G., and O. E. Moulton, Dover, N. H. Steam-heater	397,651	Feb. 12	853	223	46	747
Langlands, Daniel G., and O. E. Moulton, assignors to Somersworth Machine Company, Dover, N. H. Reamer-head for taps	395,909	Jan. 8	944	242	46	195
Lankford, Tilghman W., Pocomoke City, Md. Basket-cover	395,708	Jan. 8	620	156	46	134
Lanyon, Robert H., assignor of one-half to W. E. Poundstone, Carterville, Mo. Brake-block	399,055	Mar. 5	366	98	46	1184
Lapish, Joseph S., American Fork, Utah Ter. Air-brake	399,420	Mar. 12	956	248, 249	46	1326
Lapperr, Nathan S. (See Conklin, Theodore F., assignor.)						
Laraway, George W., assignor of one-half to J. F. Selberling, Akron, Ohio. Paper-barrel machine	396,752	Jan. 29	2215	566, 567	46	463
Larsen, Hakon S., Christiania, Norway. Cork-cutting machine	396,882	Jan. 29	2399	615, 616	46	503
Lasch, Carl L., Reudnitz, Leipsic, Saxony, Germany. Wire-stitching machine	397,372	Feb. 5	400	105, 106	46	654
Lash, Horace W., Pittsburg, H. Aiken, Homestead, and D. E. Park, Pittsburg, Pa. Open-hearth furnace. (Reissue)	10,984	Feb. 5	577	149	46	688
Lassoe, Valdemar F., Brooklyn, assignor of one-half to C. H. De Lamater, New York, N. Y. Steering-gear for vessels and floating bodies	398,631	Feb. 26	2297	608	46	1052
Lathrop, Frank E., Wichita, Iowa. Brake for hay-wagons	396,822	Jan. 29	2313	592	46	483
Lathrop, Frank F. (See Horrocks, William, assignor.)						
Latimer, William, Wilmington, N. C. Making fiber from pine-needles	397,240	Feb. 5	204	54	46	614
Latshaw, Hezekiah, Batavia, N. Y. Horse-detacher	397,733	Feb. 12	971	258	46	770
Latshaw, Hezekiah, Batavia, N. Y. Hame	397,734	Feb. 12	972	258	46	770
Latta, Emmit G., Friendship, N. Y., assignor to Pope Manufacturing Company, Portland, Me. Velocipede	396,164	Jan. 15	1314	336	46	276
Lattan, Louis, and H. Tripp, Chicago, Ill. Water-closet for cars	398,516	Feb. 26	2126	559	46	1019
Latulip, Frederick, assignor to C. S. Nutting and L. A. Williams, Syracuse, N. Y. Spring	397,989	Feb. 19	1331	355	46	856
Latz, Charles J., assignor of three-fourths to H. L. Becker, A. Elliott, Rochester, and J. R. Van Marter, Lyons, N. Y. Guard for elevators	397,085	Jan. 29	2684	694, 695	46	559
Lanbe, Godfried, Huron, Dak. Ter. Coal-hod	398,410	Feb. 26	1977	519	46	990
Lanckert, Edward F. H. H., Charlton, county of Kent, assignor to Siemens Brothers & Company, (limited,) Westminster, England. Electric meter	399,336	Mar. 12	820	216	46	1301
Laundry, Andrew, Montreal, Quebec, Canada, assignor of one-half to H. H. Warren, Massena, N. Y. Die for shaping the claws of hammer-heads	398,166	Feb. 19	1604	425	46	908
Lauth, Philippe, Carcassonne, France. Malt-kiln	400,229	Mar. 26	2153	565	46	1579
Lawler, George W., *et al.* (See Spear, Ephraim W., assignor.)						
Lawrence, Alvin, Lowell, Mass. Compensation pendulum	396,095	Jan. 15	1220	309	46	258
Lawrence, Charles E., New Brighton, N. Y. Hand-level	396,883	Jan. 29	2402	616	46	504
Lawrence, Charles W., New York, N. Y. Curtain-pole ring	400,348	Mar. 26	2246	612	46	1614
Lawrence, Eugene R., Napoleon, Mich. Road-cart	399,056	Mar. 5	367	99	46	1184
Lawrence, Robert S. (See Graydon, James W., assignor.)						
Lawrence, Victor V., Waterford, Vt., assignor of one-half to I. F. Paul, Boston, Mass., and A. H. Carpenter, Waterford, Vt. Cutter-head for planing-machines	399,758	Mar. 19	1461	377	46	1434
Lawrence, William, Worcester, Mass. Ambulance	398,517	Feb. 26	2126	560	46	1019
Lawrence, William, Worcester, Mass. Flangeway-rail for railway crossings and bridges	399,149	Mar. 5	336	140	46	1218
Lawson, Henry, Baltimore, Md. Oyster-dredge windlass	398,167	Feb. 19	1606	426	46	908
Lawson, James, Denver, Colo. Flush-tank	399,674	Mar. 19	1342	344	46	1409
Lawson, Samuel, assignor to himself and A. T. Welch, New York, N. Y. Gas-engine	399,907	Mar. 19	1652	436	46	1478
Lawson, Samuel, assignor to himself and A. T. Welch, New York, N. Y. Gas-engine	399,908	Mar. 19	1695	437	46	1478
Le Page Glue and Cement Company. (See Martin, David N., assignor.)						
Le Suer, William H., and F. R. Bassett, Aberdeen, Dak. Ter. Closure for churns	400,093	Mar. 26	1950	509	46	1538
Lea, Edwin H., and W. B. Marks, Richmond, Va. Seal-lock	398,411	Feb. 26	1978	520	46	990
Leach, Frederick, New York, N. Y., and V. L. Figarotta, Jersey City, N. J. Watch-maker's tool	397,191	Feb. 5	139	37	46	603
Leahy, Martin J., assignor of two-thirds to J. Shriver, Westminster, and T. H. Shriver, Union Mills, Md. Canning-house truck	399,621	Mar. 12	1292	324	46	1383
Leavitt, Albert. (See Ethridge, Martin V. B., assignor.)						
Leavitt, Frank M., assignor to Automatic Selling Machine Company, Brooklyn, N. Y. Vending apparatus	397,297	Feb. 5	290	74, 75	46	631
Leavitt, Frank M., Brooklyn, N. Y., and E. Norton, Maywood, assignors to said Norton and O. W. Norton, Chicago, Ill. Can forming and soldering machine	395,788	Jan. 8	749	192, 193, 194	46	157
Lechner Manufacturing Company. (See Schenck, Edward, assignor.)						
Leconitre, Isaac E., Lausanne, Switzerland. Interrupter for electric circuits	399,057	Mar. 5	368	99	46	1185
Leder, George. (See Forbes and Leder.)						
Lee, Charles A., Herkimer, N. Y. Type-writer cabinet and copy-holder	398,738	Feb. 26	2460	652	46	1096
Lee, Charles E. (See Gilbert, James, assignor.)						
Lee Company, J. Ellwood. (See Lee, John E., assignor.)						
Lee, Henry A., Glen Ridge, N. J. Metal sheet for surfacing walls, &c.	397,226	Feb. 5	294	75	46	632
Lee, John E., assignor to J. E. Lee Company, Conshohocken, Pa. Surgical drainage-tube	399,540	Mar. 12	1141	296	46	1360
Lee, William B., Bradford, county of York, England. Machine for forming balls of fiber or sliver	399,909	Mar. 19	1686	437	46	1479
Leech, John F. (See O'Hare, Hugh, assignor.)						
Leeds, Pulaski, Louisville, assignor to R. T. Miller, Covington, Ky. Device for shaping material to the arc of any desired circle	399,675	Mar. 19	1343	344	46	1410
Leedy, John K., Tom's Brook, assignor of two-thirds to N. W. Solenberger and G. Smith, Winchester, Va. Automatic compressed-air water-elevator	396,405	Jan. 22	1679	431	46	351
Leedy, John K., Tom's Brook, assignor of two-thirds to N. W. Solenberger and G. Smith, Winchester, Va. Pneumatic signal for railways	398,632	Feb. 26	2408	608	46	1052
Leek, Ira G., San Francisco, Cal. Dental engine	397,990	Feb. 19	1332	335	46	856
Lefavour, Woodbury P., Beverly, Mass. Boot or shoe	398,412	Feb. 26	1980	520	46	990
Lefeber, John J., Jonesburg, Wis. Cow-milking machine	396,577	Jan. 22	1943	500, 501	46	401
Lefever, Benjamin F., Hayfield, Pa. Windmill	400,230	Mar. 26	2156	566	46	1580
Leffler, Paul W., assignor to Craver, Steele & Austin, Grinnell, Iowa. Journal-box for crank-pins	400,231	Mar. 26	2158	566	46	1581
Legan, John, Xenia, Ohio. Sealing device for fruit-jars	398,633	Feb. 26	2300	608	46	1053
Lehman, Joseph H., Philadelphia, Pa. Push-button	400,232	Mar. 26	2160	566	46	1581
Lehy, Geoffrey B., Medford, assignor of one-half to B. J. Noyes, Boston, Mass. Burglar-alarm	396,701	Jan. 22	2125	544	46	436
Leilich, Francis T., Bridgeport, Conn. Rotary-shuttle sewing-machine	397,652	Feb. 12	854	223, 224	46	747

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Leiss, Frederick, assignor of one-half to G. Day, New York, N. Y. Torch	397,009	Jan. 29	2575	666	46	538
Leith, Lawrence C., Galveston, Tex. Book carriage and protector	399,759	Mar. 19	1463	377	46	1434
Leitelt, Adolph, Grand Rapids, Mich. Countersink	397,483	Feb. 5	573	148	46	687
Leland, Edwin A., assignor to L. Richardson, Brooklyn, N. Y. Brake-hose coupling	398,059	Feb. 19	1453	384	46	879
Leland, Henry C. (See Ludington and Leland.)						
Lemieux, Timothy W., Duluth, Minn. Apparatus for transmitting power	395,446	Jan. 1	905	53	46	43
Lemieux, Timothy W., Duluth, Minn. Transmitting power	397,506	Feb. 12	613	158	46	701
Lennon, George D. W., Boston, Mass. Vehicle-top	398,168	Feb. 19	1607	426	46	908
Lentz, William O., Mauch Chunk, Pa. Apparatus for elevating water	398,518	Feb. 26	2128	560	46	1020
Leonard, Charles N., Indianapolis, Ind. Combined desk and type-writer cabinet	400,233	Mar. 26	2161	567	46	1581
Leonard, Charles N., Indianapolis, Ind. Type-writer cabinet	400,234	Mar. 26	2163	567	46	1581
Leonard, William E., Lincoln, Nebr. Revolving-piston steam-engine	397,299	Feb. 5	295	76	46	632
Leonhardt & Co., A. (See Bender, Fritz, assignor.)						
Leschen, Henry, St. Louis, Mo. Wire cable	395,983	Jan. 8	1051	267	46	217
Lesher, William W. (See Dettra and Roth, assignors.)						
Lesley, Robert W., Philadelphia, Pa. Manufacture of cement	397,373	Feb. 5	402	.....	46	654
Leslie, James W., Everett, Mass. Automatic railway-switch	398,169	Feb. 19	1608	427	46	909
Lester, James, assignor of one-half to H. C. Moseley, Prosperity, S. C. Cotton-stalk crusher	398,413	Feb. 26	1981	{520 {521	46	991
Letteller, John G., Los Angeles, Cal. Fruit-box	398,739	Feb. 26	2462	653	46	1086
Leuner, Oscar, Dresden, Saxony, Germany. Apparatus for indicating the flexion of bridges, rails, &c	399,676	Mar. 19	1344	345	46	1410
Leutner & Co., Stanislaus. (See Boehme, Emil, assignor.)						
Leverich, Edward B., New York, N. Y. Washing-machine	398,170	Feb. 19	1609	427	46	909
Levin, Alexander, Chicago, Ill. Lumberman's apron	396,282	Jan. 15	1489	377	46	308
Levy, Dreyfus & Co. (See Harrison, Thomas H., assignor.)						
Lewallen, James F., Wilmore, Ky. Bead-plane	399,760	Mar. 19	1464	377	46	1435
Lewellen, Andrew M., Rosendale, Mo. Hook	398,060	Feb. 19	1454	384	46	879
Lewis, Amos, Tarkio, Mo. Cultivator	399,910	Mar. 19	1689	438	46	1479
Lewis, Anthony J., and F. A. Sauer, Wilkes-Barré, Pa. Saw-set	396,406	Jan. 22	1690	431	46	352
Lewis, Harvey. (See Keeler and Lewis.)						
Lewis, Henry A., Fort Worth, Tex. Hydrostatic indicator for weighing-scales	397,464	Feb. 5	550	144	46	683
Lewis, James, Brockley, county of Surrey, assignor to G. Matthey, J. S. Sellon, E. and R. D. Matthey, London, England. Burner	397,653	Feb. 12	838	224	46	748
Lewis, James A., Binghamton, N. Y. Street-railway-track cleaner	399,421	Mar. 12	958	249	46	1396
Lewis, James H., assignor of one-half to C. G. Hampton, Detroit, Mich. Potato-digger	395,571	Jan. 1	403	108	46	83
Lewis, Leroy S., Hartford, Conn., assignor of one-half to H. B. Mitchell, Malden, Mass. Vehicle-tool	395,658	Jan. 1	548	137	46	110
Lewis, Oliver L., Nebraska City, Nebr. Plumb-level	397,010	Jan. 29	2576	666	46	538
Lewis, Thomas E., Dublin, Tex. Sleigh-runner	395,398	Jan. 1	136	35	46	30
Lewis, William E., Corry, Pa. Thermostat	398,740	Feb. 26	2463	653	46	1086
Leyneu-Hougaerts, Jean A. H., Brussels, Belgium. Lamp or night light	397,011	Jan. 29	2578	666	46	539
Libbey, Hosea W., Boston, Mass. Elevated railway	399,997	Mar. 19	1814	471	46	1503
Lichtenstein, Benjamin, *et al.* (See Smith, James E., assignor.)						
Lieb, Charles A., New York, N. Y. Pneumatic dispatch-tube	398,414	Feb. 26	1982	{521 {522	46	991
Lieb, Charles A., New York, N. Y. Switch for pneumatic tubes	398,836	Mar. 5	34	11	46	1120
Lieb, Theodore, New York, N. Y. Spring-scale for weighing liquids	399,058	Mar. 5	369	99	46	1185
Liebbe, Henry, Des Moines, Iowa. Smoke-consuming bridge-wall cap	398,415	Feb. 26	1980	522	46	992
Liebert, Eduard, and S. A. Rosenthal, Berlin, Germany. Galvanic battery	400,235	Mar. 26	2164	568	46	1582
Lightfoot, Benjamin H. (See Wilbur, Alfred, assignor.)						
Lightford, John F., assignor to Sewall Safety Car Heating Company, Portland, Me. Steam-trap	400,349	Mar. 26	2347	612	46	1614
Lighton, John. (See Füchter, Bernhard, assignor.)						
Limont, Alexander H., Waterbury, Conn., assignor to Holmes, Booth & Haydens, New York, N. Y. Duplex tubing	400,094	Mar. 26	1950	510	46	1538
Lindemuth, Harry H., Mount Joy, assignor of one-half to P. L. Kreiss, Florin, Pa. Steam-generator	398,267	Feb. 19	1750	462	46	937
Linderman, Albert T., Whitehall, Mich. Crate	396,165	Jan. 15	1317	337	46	276
Linderman, Ira M., Elmira, N. Y. Sulky-plow	398,266	Feb. 19	1748	461	46	937
Lindgren, Johan F., Crookston, Minn. Remedy for rheumatism, &c	397,192	Feb. 5	141	.....	46	603
Lindsay, J. Robert, *et al.* (See Hoke, Quinton J., assignor.)						
Lindsay, Thomas L. (See Duncan, Alexander L., assignor.)						
Lindsay, William E., assignor to J. M. McClintock and W. H. Richardson Baltimore, Md. Cotton-chopper	398,416	Feb. 26	1987	522	46	992
Lindsay, William E., assignor to J. M. McClintock and W. H. Richardson, Baltimore, Md. Cotton-chopper	398,417	Feb. 26	1989	523	46	992
Lindsey, George W., Baltimore, Md., assignor of one-third to O. Frommel & Brother, New York, N. Y. Stencil-frame	397,864	Feb. 12	1147	307	46	805
Lindsey, John C., Jr. (See Akers and Lindsey.)						
Linn, Allen D., Racine, Wis., assignor to T. Kane, Chicago, Ill., and Racine Hardware Manufacturing Company, Racine, Wis. Means for automatically regulating the flow of liquid fuel to injector-burners for steam-boilers	398,418	Feb. 26	1991	523	46	993
Linsley, Newton, Freeport, Ill. Spring-hinge	395,337	Jan. 1	49	12	46	12
Linton, John R., New Bedford, Mass. Vehicle-spring	399,677	Mar. 19	1345	345	46	1410
Lippincott, Willis, Smith Centre, Kans. School-desk	399,272	Mar. 12	734	191	46	1282
Lippitt, Anna L., *et al.* (See Lippitt, Elihu, assignor.)						
Lippitt, Elihu, Zanesville, assignor to A. L. Lippitt, Muskingum County, Ohio, H. H. Sturtevant, and J. Martin. Circular-knitting machine	396,578	Jan. 22	1946	{501 {502 {503	46	402
Lissagaray, Hippolyte. (See Bonnet, Lissagaray, and Richard.)						
Littell, J. Reed. (See Capehart, Baldy A., assignor.)						
Littell, Norris. (See Moss and Littell.)						
Little, Thomas. (See Penney and Little.)						
Littlefield, Charles A., Fall River, assignor of one-half to E. A. Tuttle and J. T. Milne, Bristol County, Mass. Shuttle-check for looms	395,841	Jan. 8	840	217	46	176
Littlefield, Charles A., Fall River, assignor of one-half to E. A. Tuttle and J. T. Milne, Bristol County, Mass. Shuttle-operating mechanism for looms	395,842	Jan. 8	842	218	46	176
Littlefield, Dennis G., Albany, N. Y. Grate for stoves, &c. (Reissue)	10,987	Feb. 19	1915	504	46	970
Littlejohn, Charles F., Bridgeport, Conn., assignor of one-half to E. B. Welch, Cambridge, Mass. Sewing-machine	397,808	Feb. 12	1076	286	46	790
Littleton, William H., Clayton, Mich. Egg-poacher	399,422	Mar. 12	960	250	46	1326
Liveley, James M., *et al.* (See Hastings, John B., assignor.)						
Livengood, Winfield S., Kansas City, Mo. Baling-press	396,096	Jan. 15	1221	309	46	258

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Livengood, Winfield S., Kansas City, Mo. Baling-press	396,097	Jan. 15	1223	{309 {310	46	258
Livingston, Fred. B. (See Chase, William A., assignor.)						
Livingstone, John, Toronto, Ontario, Canada. Superheater and burner	399,541	Mar. 12	1142	296	46	1360
Lloyd, Edwin L., assignor to Joly Stopper Company, Philadelphia, Pa. Bottle-stopper	395,910	Jan. 8	944	243	46	196
Lloyd, Harlan P. (See Sagendorph, Longley L., assignor.)						
Lobach, Eugene B., assignor of one-half to H. N. Palmer, Denver, Colo. Coffee-pot	399,998	Mar. 19	1814	472	46	1503
Locher, James, Decatur, Ill. Automatic grain-scales	399,678	Mar. 19	1346	{345 {346	46	1410
Locke, Sylvanus D., Hoosick Falls, N. Y. Wire and pipe supporting and snow-removing apparatus. (Reissue)	10,980	Jan. 29	2713	701	46	564
Lockwood, Charles L. (See De Long, Frank E., assignor.)						
Lockwood, William W., Freeport, Kans. Reversible eccentric	400,095	Mar. 26	1951	510	46	1538
Lodge, William, Cincinnati, Ohio. Lathe-carriage	396,700	Jan. 22	2124	544	46	436
Lodge, William, and C. Davis, Cincinnati, Ohio. Automatic feed-stopping device for drilling-machines	396,499	Jan. 22	1826	469	46	381
Loewenbach, Hugo, Milwaukee, Wis. Receipt and record book	399,060	Mar. 5	374	101	46	1186
Loftie, Henry, Syracuse, N. Y. Fishing-rod case	396,702	Jan. 22	2126	545	46	436
Loftin, Alonzo K. (See McLaughen and Loftin.)						
Logan, Alexander, Monterey, Cal. Saw-setting machine	396,923	Jan. 29	2314	593	46	483
Logan, John H. (See Culmer, John W., assignor.)						
Logan, John H., trustee. (See Harrell, Joseph J., assignor.)						
Logan, Ralph H., Allegheny, assignor to Eclipse Cigar Machine Company, (limited,) Pittsburg, Pa. Cigar-bunching machine	395,659	Jan. 1	549	{137 {138	46	110
Lohman, Louis, Jacksonville, Fla. Water-power	398,208	Feb. 19	1752	{462 {463	46	938
Loker, George H., Jr., St. Louis, Mo. Ribbon-shield for type-writing machines	398,837	Mar. 5	35	11	46	1121
Lomb, Carl F. (See Dayton, Melville E., assignor.)						
Lomont, Francis A., assignor of one-half to J. Dreibelbiss, Fort Wayne, Ind. Pulley	395,572	Jan. 1	404	104	46	84
Long, John J., Cooksville, Miss. Cotton-planter	399,273	Mar. 12	735	191	46	1283
Long, John V., Jersey City, N. J. Electrical body-wear	396,212	Jan. 15	1393	356	46	290
Long, Philip, Perrysville, Ohio. Overshoe	395,338	Jan. 1	50	12	46	12
Loomis Electric Manufacturing Company. (See Loomis, Osborn P., assignor.)						
Loomis, Harry E., *et al.* (See Noichter, John A., assignor.)						
Loomis, Hobart B. (See Hoyt, Richard H., assignor.)						
Loomis, Osborn P., Somerville, Mass., assignor to Loomis Electric Manufacturing Company, of New York. Wiring-block for electrical circuits	396,579	Jan. 22	1949	503	46	403
Loomis, Osborn P., Somerville, Mass., assignor to Loomis Electric Manufacturing Company, of New York. Coupling dynamos	396,580	Jan. 22	1951	503	46	403
Loomis, Osborn P., Somerville, Mass., assignor to Loomis Electric Manufacturing Company, of New York. Coupling for dynamos and motors	396,581	Jan. 22	1953	504	46	403
Loomis, Osborn P., Somerville, Mass., assignor to Loomis Electric Manufacturing Company, of New York. Automatic ground-detector for electric circuits	396,582	Jan. 22	1954	504	46	404
Loomis, Osborn P., Somerville, Mass., assignor to Loomis Electric Manufacturing Company, of New York. Incandescent-lamp socket	396,583	Jan. 22	1955	504	46	404
Lorain Wrench Company. (See Laganke and Gawn, assignors.)						
Lord, Charles E., Boston, Mass. Cash indicator and register	398,898	Mar. 5	125	33, 34	46	1137
Loree, Manfred. (See Allen and Loree.)						
Lorenz, Wilhelm, Carlsruhe, Baden, Germany. Lining for corrugated sheet-metal roofs	396,894	Jan. 29	2317	593	46	484
Loughlin, Frank H., Syracuse, N. Y. Music-leaf turner	397,941	Feb. 5	206	54	46	614
Love, Charles W., Fairpoint, Ohio. Divider-shoe	397,809	Feb. 12	1077	287	46	790
Love, George W., Grayling, Mich. Combined strawberry-vine cutter and cultivator	396,098	Jan. 15	1225	310	46	259
Love, Thomas C., Jr., Philadelphia, Pa. Book-binding	397,865	Feb. 12	1148	307	46	805
Low, A. Augustus. (See Johnson and Low.)						
Low, A. Augustus, Brooklyn, assignor to Alden Type Machine Company, New York, N. Y. Lead and rule holder for type-compositors' use	395,984	Jan. 8	1053	{267 {268	46	217
Low, Garrett W. (See Shakespeare and Low.)						
Low, Garrett W., assignor to B. W. Shepardson, Kalamazoo, Mich. Tree-feller	396,825	Jan. 29	2318	593	46	484
Lowe, James, *et al.* (See Graybowski, Julian T., assignor.)						
Lowe, Stephen A., Marion Station, Miss. Planter	396,884	Jan. 29	2404	616	46	504
Lowe, Thaddeus S. C., Norristown, Pa., assignor to Guarantee Trust and Safe Deposit Company, trustee, of Pennsylvania. Apparatus for the manufacture of gas	396,338	Jan. 15	1570	388	46	322
Lowrie, Harvey C., Denver, Colo. Railway-crossing	398,269	Feb. 19	1754	463	46	938
Loyd, John. (See Miner, Isaac P., assignor.)						
Luce, David S., assignor of one-half to W. P. Conyers, Chicago, Ill. Hinge	396,660	Jan. 22	2061	530	46	425
Luckey, George E., assignor of one-half to W. D. Kendall, Paris, Tenn. Portable hay-press	396,042	Jan. 8	1136	289	46	233
Ludington, Frank J., Waterbury, and H. C. Leland, New Haven, Conn.; said Leland assignor to said Ludington. Composing-stick	399,911	Mar. 19	1693	{438 {439	46	1480
Ludlow, William H. D., Tecumseh, Nebr. Tag-fastener	400,407	Mar. 26	2431	637	46	1630
Lugo, Orazio, New York, N. Y. Secondary battery	396,213	Jan. 15	1395	.....	46	291
Lugo, Orazio, New York, N. Y. Secondary battery	396,214	Jan. 15	1396	.....	46	291
Lugo, Orazio, New York, N. Y. Electric motor	399,059	Mar. 5	370	100	46	1185
Lukens, Alexander B., *et al.* (See Bowman, William H., assignor.)						
Lukens, George B., Camden, N. J. Machine for spinning and twisting yarn	398,270	Feb. 19	1755	463	46	939
Lumley, Edwin J., assignor of part to T. A. Mitchell, C. B. Brooks, S. D. Webb, J. J. Griggs and J. C. Haviland, Washington, D. C. Cigarette-machine	395,789	Jan. 8	753	{194 {195	46	158
Lumley, Frances. (See Lumley, William, assignor.)						
Lumley, William, Chicago, Ill. Adjustable bracket for ink-bottles	397,558	Feb. 12	694	180	46	717
Lumley, William, assignor to F. Lumley, Chicago, Ill. Partition-support for pigeon-holes and drawers	397,866	Feb. 12	1149	307	46	805
Lund, William, Philadelphia, Pa. Wool-washing machine	395,498	Jan. 1	283	73	46	60
Lundborg, Charles G. (See Wiberg, Martin, assignor.)						
Lunn, Osmon, St. Paul, Minn. Harrow	397,193	Feb. 5	141	38	46	603
Lupton, William B., Pittsburg, Pa. Composition for the manufacture of tarred paper	398,337	Feb. 19	1862	.....	46	960
Lutcher, Henry J., Orange, Tex. Temperature-regulator	396,215	Jan. 15	1399	357	46	291
Lutcher, Henry J., Orange, Tex. Fire-extinguisher	396,216	Jan. 15	1400	357	46	291
Luther, G. (See Bittinger, Hans, assignor.)						
Luther, Marcus. (See Jacobs, Benjamin F., assignor.)						
Luthy, Adolph, assignor to A. Luthy & Co., New York, N. Y. Stud or other jewelry	396,661	Jan. 22	2065	530	46	425
Luthy, Adolph, assignor to A. Luthy & Co., New York, N. Y. Ear-ring or other jewelry	396,787	Feb. 26	2226	671	46	1089
Luthy & Co., A. (See Luthy, Adolph, assignor.)						
Lutton, William J., Paterson, N. J. Take-up mechanism for looms	397,066	Jan. 29	2665	695	46	559
Lutz, Frederick J., Brooklyn, N. Y. Flying toy	397,435	Feb. 5	506	133	46	675
Lutz, Katie A., Clinton, Mo. Dress-maker's square	396,099	Jan. 15	1226	310	46	259

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Lutz, Samuel. (See Phillipi, Frank A., assignor.)						
Lutzner, Maximilian A. (See Gumtow and Lutzner.)						
Lux, Frederick E., Walla Walla, Wash. Ter. Self-cleaning weed-cutter	399,337	Mar. 12	829	216	46	1302
Lyman, Charles H., Ansonia, Conn., assignor to Ansonia Brass and Copper Company, New York, N. Y. Wick-adjusting mechanism	399,912	Mar. 19	1696	439	46	1480
Lyman, William, Middlefield, Conn. Clamping operating-handle for adjusting-screws	395,985	Jan. 8	1056	268	46	217
Lyman, William, Middlefield, Conn. Folding sight for fire-arms	396,043	Jan. 8	1137	289	46	233
Lynch, John, Washington, D. C. Electric-wire conduit	396,407	Jan. 22	1622	432	46	352
Lynd, Ives and W. T., Troy, N. Y. Rail-joint	397,242	Feb. 5	208	54, 55	46	615
Lynd, Walter T. (See Lynd, Ives and W. T.)						
Lynde, Frederick C., Manchester, county of Lancaster, England. Coin-controlled indicating apparatus	398,519	Feb. 26	2129	560, 561	46	1020
Lynde, Frederick C., Manchester, county of Lancaster, England. Coin-controlled indicating apparatus	398,520	Feb. 26	2131	561, 562	46	1020
Lynde, Frederick C., Manchester, county of Lancaster, England. Coin-controlled indicating apparatus	398,521	Feb. 26	2132	562	46	1020
Lyon, Henry W., Bridgeport, Conn. Making button-hole stripe	399,061	Mar. 5	375	101	46	1186
Lyon, Henry W., Bridgeport, Conn. Button-strip for garments	399,338	Mar. 12	830	217	46	1302
Lyon, Henry W., Bridgeport, Conn. Button-hole strip	400,408	Mar. 26	2432	637	46	1630
Lyon, John M. P., Leeds, Ala. Cotton chopper, scraper, and harrow	397,133	Feb. 5	43	10	46	586
Lyons, James A., Nashville, Tenn. Library-case	397,012	Jan. 29	2579	666	46	539
Lyons, John H. (See Purdy, William J., assignor.)						
Lyte, Farnham M., Cotford, Oakhill Road, Putney, county of Surrey, England. Making basic lead salts	396,703	Jan. 22	2127	.....	46	437
Lytle, Harry S., North Brookfield, assignor to A. H. Batcheller, Boston, Mass. Eyeleting-machine	397,597	Feb. 12	768	200	46	730
Maas, John B., Negaunee, Mich. Car-coupling	396,943	Jan. 29	2485	641	46	520
MacCormack, John, *et al.* (See Van Zile, Harry L., assignor.)						
MacDonald, Alexander, U. S. Army. Veterinary surgical scraper	397,013	Jan. 29	2580	667	46	539
MacKenzie, A. S. (See Briggs and Cavallaro, assignors.)						
MacLellan, John A. (See Alley and MacLellan.)						
Macdonald, David, assignor to W. Stone, Toronto, Ontario, Canada. Sign-plate	396,704	Jan. 22	2128	545	46	437
Macdonald, James, Chicago, Ill. Belt conveyer and tripper	396,500	Jan. 22	1827	469	46	381
Mace, Stewart R., Moulton, Iowa. Liquid-holding vessel	398,061	Feb. 19	1455	385	46	880
Machin, Herbert, assignor to Equitable Pottery Company Trenton, N. J. Coupling for water-closet bowls, &c	398,838	Mar. 5	36	12	46	1124
Mack, William, Terre Haute, Ind. Opera or marine glass	399,542	Mar. 12	1144	296	46	1360
Mack, William, Terre Haute, Ind. Opera-glass holder	399,543	Mar. 12	1145	297	46	1360
Mack, William B., Boston, Mass. Electric-wire conduit	397,300	Feb. 5	297	76	46	633
Mackey, Arthur D., Lawrence, Kans., assignor to L. B. Mackey. Hotel-register	399,622	Mar. 12	1263	325	46	1383
Mackey, L. B. (See Mackey, Arthur D., assignor.)						
Mackie, David, Philadelphia, Pa. Machine for rubbing or dressing stone	398,634	Feb. 26	2300	609	46	1053
Mackinnon, John A., Brooklyn, N. Y. Split pulley	397,654	Feb. 12	859	224	46	748
Mackintosh, Edward D., Brooklyn, assignor to P. Pryibil, New York, N. Y. Swing-saw machine	396,217	Jan. 15	1402	357	46	292
Mackintosh, Edward D., Brooklyn, assignor to P. Pryibil, New York, N. Y. Swing-saw machine	396,218	Jan. 15	1403	358	46	292
Mackintosh, Edward D., Brooklyn, assignor to P. Pryibil, New York, N. Y. Lathe for turning spiral forms	396,283	Jan. 15	1490	377, 378	46	308
Macleod, Malcolm, Philadelphia, Pa. Wood-block flooring or paving	398,002	Feb. 19	1456	385	46	880
Macracon Storage Battery Company. (See Paget, Leonard, assignor.)						
Macready, Robert A., New York, N. Y. Tail-piece for violins	396,408	Jan. 22	1683	432	46	352
Maddin, Mary. (See Maddin, Samuel D., assignor.)						
Maddin, Samuel D., Miamisburg, Ohio, assignor to M. Maddin, Sarnia, Ontario, Canada. Harvester	396,409	Jan. 22	1683	432	46	352
Maddin, Samuel D., assignor to M. Maddin, Sarnia, Ontario, Canada. Mower	397,924	Feb. 19	1232	329, 330	46	839
Maddox, Charles O., Belle View, Fla. Faucet	397,374	Feb. 5	403	106	46	654
Madson, Abraham, Frenchville, Wis. Sod-cutter and pulverizing-harrow	396,166	Jan. 15	1318	337	46	276
Maetzel, George H., Columbus, Ohio. Strengthening and locking appliance for doors	396,584	Jan. 22	1957	504	46	404
Magee, Boon. (See Mead and Magee.)						
Magee, C. L., *et al.* (See Reese, Abram, assignor.)						
Magee, Robert E., and F. C. Knowles, Oil City, Pa. Pipe-tongs	396,753	Jan. 29	2218	567	46	463
Magenis, James P., North Adams, Mass. Carbureting-lamp	400,096	Mar. 26	1952	510	46	1539
Magruder, Richard B. (See Schenkel and Magruder.)						
Mahar, Michel W., assignor of one-half to G. Rentz, Dayton, Ohio. Combined bulletin-board and broom-holder	397,465	Feb. 5	551	144	46	683
Main, Charles T., Lawrence, Mass. Regulator for compound engines	397,507	Feb. 12	614	158, 159	46	702
Maiser, Charles P., Allegheny, Pa. Stopper-fastener	396,885	Jan. 29	2405	617	46	504
Maish, Jacob, Warsaw, Ind. Door-check	396,219	Jan. 15	1404	358	46	293
Makemson, William D., Prescott, Kans. Churn	399,761	Mar. 19	1465	376	46	1435
Malchow, Louis, Chicago, Ill. Reciprocating table for holding moldings to be polished	399,762	Mar. 19	1466	376	46	1435
Males, Samuel, Winton Place, Ohio. Remedy for catarrh, &c	398,239	Mar. 5	37	12	46	1121
Malin, Ulrik. (See Holley and Malin.)						
Mallebré, Henry, New York, N. Y. Upright-piano action-frame	398,635	Feb. 26	2302	609	46	1053
Mallet, Anatole, Paris, France. Locomotive for single-rail railways	399,679	Mar. 19	1347	346	46	1410
Malloch, Andrew M. (See Brogan and Malloch.)						
Mallory, Alonzo R., Madison, Ga. Plow	395,573	Jan. 1	405	104	46	84
Mallory, Elwyn A., Cincinnati, Ohio. Adjustable hinge	398,636	Feb. 26	2302	609	46	1053
Mallory, Frank B., assignor of one-fourth to C. C. Dunham, Flemington, N. J. Car-window	396,585	Jan. 22	1959	505	46	404
Maloney, Michael, Ironton, Ohio. Railway-tie	395,447	Jan. 1	207	53	46	44
Maloy, James W., Marietta, Ga. Implement for cutting stone, &c	399,680	Mar. 19	1349	346	46	1411
Maloy, Michael T., assignor to J. H. Batchelder, Chicago, Ill. Folding poultry-coop	398,338	Feb. 19	1863	491	46	960
Maltbie, Lewis D. (See Maltbie, Paul L., assignor.)						
Maltbie, Paul L., assignor to L. D. Maltbie, Newark, N. J. Latch	399,423	Mar. 12	961	250	46	1327
Manahan, Thomas, New York, N. Y. Apparatus for coating paper and other material	399,544	Mar. 12	1146	297	46	1360
Manahan, Thomas, New York, N. Y. Insecticide composition	399,999	Mar. 19	1815	.....	46	1503
Mandt, Targe G., Stoughton, Wis. Sleigh-knee	399,913	Mar. 19	1697	439	46	1480
Manisty, Edward. (See McGrath and Manisty.)						
Mann, John J., New York, N. Y. Side bearing for railway-cars	400,236	Mar. 26	2165	568	46	1582
Manning, Charles J., Utica, N. Y. Heat-radiator for hot-air furnaces	400,097	Mar. 26	1953	511	46	1539
Manning, Frank, Narberth, Pa., assignor to Manning Machine Company, of New Jersey. Machine for dressing stone	395,843	Jan. 8	844	218	46	177

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Manning, Frank, Narberth, Pa., assignor to Manning Machine Company, of New Jersey. Machine for dressing stone	396,044	Jan. 8	1139	289	46	233
Manning Machine Company. (See Manning, Frank, assignor.)						
Mansfield, Horace H., Boston, Mass. Car-coupling	397,375	Feb. 5	404	107	46	654
Mansfield, James B., Millbridge, Me. Weeding-machine	397,735	Feb. 12	973	258	46	770
Manson, George W., assignor to Self Retaining Hair Pin Company, New York, N. Y. Machine for making hair-pins	397,991	Feb. 19	1333	355, 356	46	857
Mapel, Elgha T. (See Clark and Mapel.)						
Marcheter, Henry, Wallaceburg, Ontario, Canada. Automatic gate for swing-bridges	395,752	Jan. 8	686	175	46	146
Marconnot, Pierre, *et al.* (See Rassinier, Adolph, assignor.)						
Marden, Thomas I. (See Philbrick, Daniel, assignor.)						
Marion Manufacturing Company. (See Strobel, Frederick, assignor.)						
Markle, Robert B., Westport, Cal. Pile	395,448	Jan. 1	208	54	46	44
Marks, Charles, St. Louis, Mo. Easel	396,362	Jan. 15	1612	412	46	330
Marks, James, Bayonne, N. J. Wall-paper cutter	397,736	Feb. 12	974	259	46	770
Marks, Walter B. (See Lea and Marks.)						
Marlin, John M., New Haven, Conn. Velocipede	400,098	Mar. 26	1954	511	46	1539
Marohn, Ferdinand, assignor of one-fourth to W. Bodenstab, Austin, Ill. Automatic safety-gate for draw-bridges	397,867	Feb. 12	1150	308	46	806
Maroney, James L., Albertville, Ala. Machine for dressing millstones	397,014	Jan. 29	2581	667	46	539
Marsh, George W., Oakland, Cal. Automatic air-brake	396,284	Jan. 15	1494	378	46	309
Marshall, Charles H., Wood River, Nebr. Flour holder and sifter	397,737	Feb. 12	976	259	46	770
Marshall, George M., Kilbourn City, Wis. Chain pipe-wrench	395,790	Jan. 8	756	196	46	159
Marshall, Hawdon, *et al.* (See Simpson, David J., assignor.)						
Marshall, Martha B., *et al.* (See Roberts, Henry P., assignor.)						
Marshuts, Leon C., *et al.* (See Kennedy, Hugh, assignor.)						
Martane, Louise, Paris, France. Mathematical game	400,237	Mar. 26	2166	568	46	1582
Martignoni, Johannes, Frankfort-on-the-Main, Prussia, Germany. Mechanism for driving wheeled vehicles	398,899	Mar. 5	126	34	46	1138
Martin, David N., assignor to Le Page Glue and Cement Company, Gloucester, Mass. Vessel for holding liquid glue	396,586	Jan. 22	1960	505	46	405
Martin, Elwin J. (See Huston and Martin.)						
Martin, Frederick W., Waukegan, Ill. Steering apparatus for vessels	398,900	Mar. 5	126	34	46	1138
Martin, George. (See Poor and Martin.)						
Martin, James N., and W. H. Harris, Newberry, S. C. Chair and lock-joint for railway-rails	398,522	Feb 26	2134	562	46	1021
Martin, James N., and W. H. Harris, Newberry, S. C. Car-coupling	398,523	Feb. 26	2135	563	46	1021
Martin, John, Kew, near Melbourne, Victoria. Candle-lamp	395,574	Jan. 1	407	104, 105	46	84
Martin, John, Daylesford, Victoria. Combined life-boat and mattress	395,966	Jan. 8	1060	268, 269	46	218
Martin, John, *et al.* (See Lippitt, Elihu, assignor.)						
Martin, Joseph C., Burlington, Vt. Conveying apparatus	399,150	Mar. 5	537	140, 141	46	1219
Martin, Morris, Malden, Mass. Multiple-signal transmitter	397,194	Feb. 5	143	38	46	603
Martin, Thomas A., Brainerd, Minn. Shearing and clipping machine	399,763	Mar. 19	1467	378	46	1435
Martincourt, Charles. (See Graham, Martincourt, and Crandall.)						
Marty, John M., assignor of one-half to F. J. Wing, Cleveland, Ohio. Apparatus for utilizing hydraulic pressure	395,844	Jan. 8	847	219	46	178
Marty, Louis K. (See Schickner and Marty.)						
Marvin, Harry N., Syracuse, N. Y. Electro-magnetic rock-drill	395,575	Jan. 1	408	105	46	84
Marx, William, Beaver Falls, Pa. Die for forming teeth in vegetable-graters	397,559	Feb. 12	697	181	46	718
Marygold, George S. (See Howell, William E., assignor.)						
Maslin, John, Jersey City, N. J. Steam-pump	397,738	Feb. 12	977	259	46	771
Mason, James H., Detroit, Mich. Safety-door for heaters	398,371	Feb. 19	1756	464	46	939
Mason, John L., Davenport, Iowa. Shifting seat for vehicles	398,419	Feb. 26	1993	523	46	993
Mason, Thomas B., Trenton, N. J. Horse-boot	396,167	Jan. 15	1390	338	46	277
Mason, Volney W., Providence, R. I. Hoisting-machine	397,243	Feb. 5	209	55	46	615
Mason, William. (See Garsed and Mason.)						
Massicks, Horace, and W. Crooke, Milhom, county of Cumberland, England, assignors to G. W. McClure and L. Schuler, executrix, Pittsburg, Pa. Hot-blast stove	398,840	Mar. 5	38	12	46	1121
Mast, Louis L., West Milton, Ohio. Lightning-rod	395,399	Jan. 1	137	35	46	30
Masters, Mark J., assignor of three-fourths to B. D., C. D., and A. D. Vassiliades, New York, N. Y. Stamping designs in metal leaf	396,220	Jan. 15	1405	.....	46	293
Masterson, Carson A., Decatur, assignor of one-half to J. M. Duncan, Lintner, Ill. Agricultural heater	397,195	Feb. 5	145	38	46	604
Mather, Alonzo C., Chicago, Ill. Stock-car	396,100	Jan. 15	1227	310, 311	46	259
Mather, John L. (See Jaquet, Julius, assignor.)						
Matteson, George A., Cridersville, Ohio. Valve	397,134	Feb. 5	45	10	46	586
Matthews, Ebenezer B. (See Bouker, Christ, assignor.)						
Matthey, Edward, *et al.* (See Lewis, James, assignor.)						
Matthey, George, *et al.* (See Lewis, James, assignor.)						
Matthey, Richard D., *et al.* (See Lewis, James, assignor.)						
Mattison, Richard V. (See Keasbey, Henry G., assignor.)						
Maulick, William F., Columbia, Pa. Hook for awnings, &c	396,587	Jan. 22	1962	505	46	405
Maumee, John W. (See Cale, George, assignor.)						
Mauser, Paul, assignor to Waffenfabrik Mauser, Oberndorf-on-the-Neckar, Würtemberg, Germany. Breech-loading fire-arm	398,063	Feb. 19	1458	385	46	880
Mauser, Paul, assignor to Waffenfabrik Mauser, Oberndorf-on-the-Neckar, Würtemberg, Germany. Cartridge-ejector for breech-loading fire-arms	398,064	Feb. 19	1460	386	46	881
Mawhood, Jonathan D., assignor to Richmond City Mill Works, Richmond, Ind. Roller-mill	398,339	Feb. 19	1865	492	46	960
Maxim, Hiram S., London, England. Machine-gun	395,791	Jan. 8	758	196, 197	46	159
Maxson, Erwin W., West Lenox, Pa. Cover-fastener for butter-tubs	398,594	Feb. 26	2136	563	46	1021
May, Edward S., Washington, D. C. Calendar	395,709	Jan. 8	821	157	46	134
Mayer, Alvarado, Detroit, Mich. Relief-valve for steam fire-engines	398,841	Mar. 5	39	12	46	1121
Mayer, Charles, El Paso, Tex. Car-brake	399,764	Mar. 19	1470	379	46	1436
Mayer, Frank. (See Schaus and Mayer.)						
Mayer, Gustave A. (See Knorpp and Mayer.)						
Mayer, Jacob. (See Feld and Siebrecht, assignors.)						
Mayer, John E., Blair, Wis. Milk-pail	396,898	Jan. 29	2319	554	46	485
Mayes, Thomas T., Belton, Tex. Hay-press	397,196	Feb. 5	146	39	46	604
Mayfield, Reuben N., Boulder, Colo. Catheter	396,754	Jan. 29	2218	568	46	463

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Maynard, William C., Mount Pleasant, Mich. Breech-loading gun	398,065	Feb. 19	1462	386	46	881
McAdams, John, New York, assignor of one-half to R. F. Cartwright, Brooklyn, N. Y. Hydraulic engine	399,204	Mar. 5	629	163	46	1235
McAllister, Cyrus A., Rochester, N. Y. Elevator-hatchway	397,197	Feb. 5	116	39	46	604
McAllister, Thomas H. (See Brower, Henry J., assignor.)						
McAnulty, J. A., *et al.* (See Jewell, William M., assignor.) (Reissue.)						
McArthur, William. (See Carey and McArthur.)						
McAuliffe, Samuel, Rochester, N. Y. Machine for printing cards, &c	395,499	Jan. 1	284	73, 74	46	60
McBride, Thomas, Philadelphia, Pa., and E. Fisher, Kincardine, Ontario, Canada. Device for conveying grain, ice, coal, &c	399,063	Mar. 5	377	102	46	1187
McBride, Thomas, Philadelphia, Pa., and E. Fisher, Kincardine, Ontario, Canada. Machine for rolling shafts, &c	400,099	Mar. 26	1956	511, 512, 513	46	1539
McCague, John L. (See Bartlett, Edward C., assignor.)						
McCarney, Jacob. (See Gamble, Joseph W., assignor.)						
McCarthy, Laurence A., Brooklyn, N. Y. Electric burglar-alarm	398,420	Feb. 26	1995	524	46	993
McCarty, James M., *et al.* (See Anderson and Elias, assignors.)						
McCarty, Michael, Montrose, Colo. Hay-press	398,066	Feb. 19	1464	386, 387	46	881
McCaughey, Elijah S., Sioux City, Iowa. Paving composition	398,421	Feb. 26	1996	.....	46	994
McCauley, James, Auburn Park, assignor to Abbott Buggy Company, Chicago, Ill. Fifth-wheel for vehicles	397,739	Feb. 12	978	260	46	771
McCausland, Albert. (See McCausland, James M., assignor.)						
McCausland, James M., assignor of one-fourth to A. McCausland, Pepperell, Mass. Machine for coating paper	399,151	Mar. 5	542	141	46	1219
McCleary, Carson L., Jerusalem, Ohio. Carpet-fastener	397,598	Feb. 12	766	200	46	731
McClintock, James M., McKenzie, Tenn. Horse hay-rake	399,765	Mar. 19	1471	379	46	1436
McClintock, John M., *et al.* (See Lindsay, William E., assignor.)						
McCloskey, John, assignor of one-half to C. F. Farwell, Boston, Mass. Expansion device	398,525	Feb. 26	2137	563, 564	46	1021
McCloskey, John, assignor of one-half to C. F. Farwell, Boston, Mass. Expansion device	398,526	Feb. 26	2138	564	46	1022
McCloskey, William T., Westport, Pa. Mill-pond waste-water gate	398,842	Mar. 5	40	13	46	1122
McCloud, Sidney, Chicago, Ill. Machine for reducing old rails	395,339	Jan. 1	50	12, 13	46	12
McClure, George W., *et al.* (See Massicks and Crooke, assignors.)						
McClure, Samuel, and C. F. Phillips, Sharon, Pa. Device for protecting furnaces or like structures	397,376	Feb. 5	405	107	46	654
McClure, Samuel C. (See Fisher, Marion O., assignor.)						
McCollum, John A., Riverside, Cal. Apparatus for the manufacture of gas	395,449	Jan. 1	209	54	46	45
McComish, John J., assignor of one-half to J. J. Shanahan, Providence, R. I. Stop-motion for looms	399,917	Mar. 19	1701	440, 441	46	1481
McConachie, William, Belleville, Dak. Ter. Automatic grain-measuring machine	400,100	Mar. 26	1959	513, 514	46	1540
McConnell, A. C., *et al.* (See Stump, Ira E., assignor.)						
McConnell, George T., *et al.* (See Stump, Ira E., assignor.)						
McConnon, Thomas J. (See Potter and McConnon.)						
McCool, William A., assignor of one-half to H. W. Hartman, Beaver Falls, Pa. Machine for straightening metal bars, tubes, &c	395,400	Jan. 1	138	35, 36	46	30
McCool, William A., assignor of one-half to H. W. Hartman, Beaver Falls, Pa. Drawing metals	400,238	Mar. 26	2168	508, 509	46	1582
McCord, Andrew J., Louisville, Ky., assignor of one-half to J. F. McGregor, Columbia, Tenn. Combined snap-hook and buckle	395,663	Jan. 1	556	139	46	112
McCormick, Charles W., Emporia, Kans. Cash-carrier apparatus	399,428	Mar. 12	966	251, 252	46	1328
McCormick Harvesting Machine Company. (See Baker, William R., assignor.)						
McCormick, Michael, and F. Fariah, assignors of one-third to M. Donnelley, Toronto, Ontario, Canada. Signaling device for railway-trains	398,067	Feb. 19	1466	387	46	882
McCoy, Andrew T., Boston, Mass., assignor to J. Anderson, New York, N. Y. Printing-telegraph	397,466	Feb. 5	552	145	46	683
McCoy, Dewitt C. Bushnell, Fla. Car-coupling	399,278	Mar. 12	742	193	46	1284
McCoy, Joseph, Baltimore, Md. Velocipede	397,015	Jan. 29	2582	667, 668	46	539
McCreary, Alfred T. (See McCreary, Nathan B. and A. T.)						
McCreary, Nathan B., Rockport, and A. T. McCreary, St. Joseph, Mo. Device for setting tires on wagon or other wheels	398,843	Mar. 5	41	13	46	1122
McCreery, Charles H. (See Caylor and McCreery.)						
McCulloch, James, Manchester, England. Rock-drill	398,637	Feb. 26	2303	609, 610, 611	46	1053
McCulloch, Thomas H., Omaha, Nebr. Purifier for water or other liquids	399,429	Mar. 12	969	252	46	1328
McDermaid, John, Rockford, Ill. Closure for churns	399,681	Mar. 19	1349	347	46	1411
McDonald, Alexander E., Brooklyn, N. Y. Hat-measure	398,340	Feb. 19	1868	492	46	961
McDonald, Fred C., New York, N. Y. Starting and draft mechanism for street-cars	397,740	Feb. 12	979	260	46	771
McDonald, Theodore R., assignor to G. W. Heartley, Northville, Mich. Hat-hanger	397,599	Feb. 12	767	201	46	731
McDougall, Alexander, Duluth, Minn. Transporting sand, &c	397,741	Feb. 12	981	260	46	772
McDowell, John J., Boston, Mass. Egg-beater	397,655	Feb. 12	861	225	46	748
McDowell, Magdalene H., Lexington, Ky. Fire-back plate	397,742	Feb. 12	982	261	46	772
McDowell, Jonas P., Foote, Iowa. Draft-equalizer	399,766	Mar. 19	1474	380	46	1437
McDuffee, Augustus, *et al.* (See Graf, Anton, assignor.)						
McElroy Car Heating Company. (See McElroy, James F., assignor.)						
McElroy, James F., Lansing, assignor to McElroy Car Heating Company, Detroit, Mich. System for heating cars	400,350	Mar. 26	2348	613	46	1615
McErlain, John J., assignor of one-half to F. A. Baker, South Bend, Ind. Split pulley	396,161	Jan. 15	1229	311	46	260
McEuen, Charles A., *et al.* (See Speake, Rufus H., assignor.)						
McEwan, James, Detroit, Mich. Coupling for parallel pipes	398,068	Feb. 19	1467	388	46	882
McEwen, Hugh R. (See Olds, Charles E., assignor.)						
McFeely, Ronald F., and H. V. Potter, Pittsburg, Pa. Electrical appliance for stopping and starting elevators	399,341	Mar. 12	834	217, 218	46	1302
McGimsey, Charles P., Arkadelphia, Ark., assignor of one-half to H. R. Estes, St. Louis, Mo. Joint for furniture	396,588	Jan. 22	1903	505	46	405
McGinnis, William B., Nevada, Mo. Stove	399,767	Mar. 19	1475	380	46	1437
McGinniss, Cornelius, Chicago, Ill. Smoke-consuming furnace	397,135	Feb. 5	46	10	46	587
McGrath, John, Danbury, Conn. Ice-boat	395,848	Jan. 8	851	220	46	179
McGrath, John, Laragh, county of Monaghan, and E. Manisty, Dundalk, county of Louth, Ireland. Apparatus for scutching flax, &c	396,171	Feb. 19	1610	427, 428	46	909

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
McGregor, J. F. (See McCord, Andrew J., assignor.)						
McGrew, James M. (See Parkison and Pullinger, assignors.)						
McGruder, Bernard, Cleveland, Ohio. Tuyere	396,102	Jan. 15	1231	312	46	260
McHugh, Hugh, New Bedford, Mass. Making rolls for embossing plastic material	396,589	Jan. 22	1964	506	46	405
McIndoe, John H., and W. Meredith, Mount Pleasant, Pa. Exhaust-nozzle	396,168	Jan. 15	1321	338	46	277
McIntire, Dewitt C., Salamanca, N. Y. Portable heater	395,576	Jan. 1	413	106	46	85
McKay & Copeland Lasting Machine Company. (See Hurd, Edward P., assignor.)						
McKay, Sara, administratrix. (See McKay, William F.)						
McKay, William F., deceased, Toronto, Ontario, Canada; S. McKay administratrix. Stencil	396,410	Jan. 22	1686	433	46	353
McKee, Thomas A., Beloit, Kans. Perpetual calendar	398,172	Feb. 19	1612	428	46	909
McKeever, Timothy W., Brooklyn, and J. M. Smith, New York, N. Y. Ash or garbage can	397,301	Feb. 5	298	77	46	633
McKenty, Samuel D., Philadelphia, Pa. Shoe-horn	396,411	Jan. 22	1687	433	46	353
McKenzie, John, West Troy, N. Y. Tapping-bush for barrels	397,377	Feb. 5	407	107	46	655
McKie, William, assignor of one-half to F. C. Huyck and C. E. Argersinger, Albany, N. Y. Boot	395,664	Jan. 1	558	139	46	112
McKinley, John D. H. (See Egan, Charles E., assignor.)						
McKinney, Joseph Y., New Wilmington, Pa. Electric burglar-alarm	400,239	Mar. 26	2169	569	46	1583
McKinnon, Lanchlin. (See Shaw, James E., assignor.)						
McKinny, George W., Marshalltown, Iowa. Barb-feeding mechanism for barb-wire machines	397,925	Feb. 19	1234	330	46	839
McKissock, James F. (See Hemenway, Charles F., assignor.)						
McKivett, James, Garrison, Iowa. Corn-harvester	397,656	Feb. 12	802	225, 226	46	749
McLachlan, Duncan. (See Wright, Luther S., assignor.)						
McLain, Will, Johnstown, Pa., assignor to Johnson Steel Street Rail Company, of Kentucky. Two-part self-locking-lug chair	396,500	Jan. 22	1965	506	46	405
McLaughen, George W., and A. K. Loftin, Gastonia, N. C. Horse-detacher	395,990	Jan. 8	1066	270	46	290
McLaughlin, James F., Philadelphia, Pa. Apparatus for depositing torpedoes upon railway-tracks	397,378	Feb. 5	408	108	46	655
McLean, Alexander, Reservoir Road, Brockley, county of Surrey, assignor of one-half to R. C. Eames, London, England. Brick-mold	399,064	Mar. 5	378	102	46	1187
McLean, Arthur, Belington, assignor of one-half to J. V. Knight, Orpha, W. Va. Car-coupling	397,600	Feb. 12	768	201	46	731
McLean, Horace G., McPherson, Kans. Snap-hook	397,136	Feb. 5	47	11	46	587
McLean, James, Pueblo, Colo., assignor to McLean Rapid Transit Machine Company, of Colorado. Driving mechanism for street-cars	399,152	Mar. 5	544	141	46	1220
McLean Rapid Transit Machine Company. (See McLean, James, assignor.)						
McLemore, James M., and C. D. Jones, Coushatta, La. Levee-protector	400,101	Mar. 26	1961	514	46	1540
McLoughlin, George, Carson, Nev. Coin-adjuster	399,065	Mar. 5	380	102, 103	46	1187
McLoughlin, John, New York, N. Y. Cut toy figure	397,302	Feb. 5	299	77	46	633
McMahon, James, assignor to D. C. & H. C. Reed & Co., Kalamazoo, Mich. Harrow-frame	396,944	Jan. 29	2487	641	46	520
McManus, William S., Chester, Pa. Ball for tube-welding mandrels	398,638	Feb. 26	2305	611	46	1054
McMaster, John, Dayton, Ohio. Combined box and cooking stove	399,918	Mar. 19	1703	441	46	1482
McMillan, Calvin S., East Saginaw, Mich. Saw-gummer	399,066	Mar. 5	381	103	46	1187
McMullen, Roger B., Chicago, Ill. Fence	395,500	Jan. 1	286	74	46	60
McMunn, Harry W. (See Jarrell, Edwin, assignor.)						
McMurchey, Harvey. (See Tomlinson, Charles, assignor.)						
McMurtray, Thomas O., Yazoo, Miss. Car-coupling	398,844	Mar. 5	42	13	46	1122
McNeill, John G., Ottawa, Kans. Weighing and price scale	396,285	Jan. 15	1490	379	46	309
McNerney, James, assignor to Wheaton, Richards & Co., Attleborough, Mass. Button	397,508	Feb. 12	617	159	46	702
McPherson, Henry, assignor to Sweet & Clark Manufacturing Company, Troy, N. Y. Curry-comb	397,926	Feb. 19	1235	331	46	840
McPherson, William, New York, N. Y. Snarling-machine	396,412	Jan. 22	1688	433	46	353
McQuaide, James P., *et al.* (See Phipps, Edward H., assignor.)						
McQuown, Thomas H., Biggsville, Ill. Skate	396,413	Jan. 22	1688	433	46	353
McTammany, John, Worcester, Mass. Automatic musical instrument	400,102	Mar. 26	1962	514	46	1541
McTighe, James J., Pittsburg, Pa. Manufacturing steel	397,743	Feb. 12	984	.....	46	772
McWhorter, Levi S., Chicago, Ill. Corkscrew	398,286	Jan. 15	1498	379	46	309
McWillie, William, Canton, Miss. Fortune-telling fan	395,340	Jan. 1	53	13	46	13
Mead, John T., and J. Thomson, Cleveland, Ohio. Flue-cleaner	397,509	Feb. 12	619	159	46	702
Mead, Ransom G., and B. Magee, Warren, Pa. Sand or mud pump	396,501	Jan. 22	1698	469	46	381
Meader, George H. (See Graf, Anton, assignor.)						
Meaker, John W., assignor to Railway Register Company, Chicago, Ill. Fare-register	397,601	Feb. 12	769	201, 202, 203	46	731
Meaker, John W., assignor to Railway Register Company, Chicago, Ill. Fare-register	397,602	Feb. 12	769	203, 204	46	733
Meaker, John W., assignor to Railway Register Company, Chicago, Ill. Fare-register	397,603	Feb. 12	786	204, 205, 206	46	734
Means, Robert T. (See Brown, William J., assignor.)						
Meckly, John F. (See Bostian, Charles P., assignor.)						
Medbery, Horace J., Ballston, N. Y. Machine for forming seamless tubes from pulp	396,103	Jan. 15	1232	312, 313	46	260
Medynski, Fred. V., Des Moines, Iowa. Feed-water purifier	397,810	Feb. 12	1079	287	46	790
Meek, Charles J. (See Dutton and Meek.)						
Meek, William E. (See Bradshaw and Meek.)						
Meeker, George E., assignor of one-half to S. A. Hull, Meriden, Conn. Brush-holder	398,173	Feb. 19	1612	428	46	909
Megeath, Joseph P. (See Iddings and Megeath.)						
Megga, Thomas E., assignor to St. Lawrence Steel and Wire Company, (limited,) Gananoque, Ontario, Canada. Carpet-stretcher	395,341	Jan. 1	54	13	46	13
Megrath, William A., Macon, Ga. Railway-ticket	396,501	Jan. 22	1965	506	46	405
Mehrer, Henrietta L., New York, N. Y. Book-mark	399,768	Mar. 19	1477	380	46	1437
Meise, Eduard, Pittsburg, Pa. Seal-lock	395,792	Jan. 8	761	197	46	160
Meisel, Otto J., Terre Haute, Ind. Guard for step-ladders	396,886	Jan. 29	2406	617	46	504
Meisselbach, August F. and W., Newark, N. J. Fishing-reel	397,196	Feb. 5	149	39, 40	46	604
Meisselbach, William. (See Meisselbach, August F. and W.)						
Meister, Edward. (See Yarrick and Meister.)						
Melaney, William H., Pittsburg, assignor of one-half to R. C. Totten, Allegheny, Pa. Car-wheel	397,927	Feb. 19	1236	331	46	840

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Melaney, William H., Pittsburg, assignor of one-half to R. C. Totten, Allegheny, Pa. Safe or armor plate	397,928	Feb. 19	1239	331	46	840
Melaney, William H., Pittsburg, assignor of one-half to R. C. Totten, Allegheny, Pa. Hammer or like die	397,929	Feb. 19	1241	331	46	840
Melchior, Edward, Chicago, Ill. Barber's chair	398,639	Feb. 26	2306	611	46	1054
Melchior, Ludwig, and F. Meyer, Wilmington, Del. Stone-sawing-machine gage	397,244	Feb. 5	210	55	46	615
Mellette, Arthur C., *et al.* (See Knowlton, Ephraim H. B., assignor.)						
Meloney, Joseph E., Bloomer, Wis. Truss	396,414	Jan. 22	1090	434	46	353
Melotte, George W., Ithaca, N. Y. Blow-pipe bed	400,103	Mar. 26	1905	515	46	1541
Melotte, George W., Ithaca, N. Y. Blow-pipe bed	400,240	Mar. 26	2172	569	46	1588
Melsa, Vincent, Brooklyn, N. Y. Spool-stand	399,709	Mar. 19	1477	381	46	1437
Mendham, William. (See Laird and Mendham.)						
Meredith, William. (See McIndoe and Meredith.)						
Meriden Bronze Company. (See Miller, John C., assignor.)						
Meriden Bronze Company. (See Miller and Jones, assignors.)						
Meriden Bronze Company. (See Peck, Eugene H., assignor.)						
Meriden Bronze Company. (See Peck and Jones, assignors.)						
Merkel, Gottfried H., Boston, Mass. Apparatus for manufacturing ozone	397,992	Feb. 19	1336	356	46	857
Merrifield, Charles F., Bernardstown, Mass. Try-square and bevel	399,424	Mar. 12	963	250	46	1327
Merrill, George B., Lock Haven, Pa. Brick-drying apparatus	399,275	Mar. 12	737	192	46	1263
Merrill, Henry E., Akron, Ohio. Machine for making crock-rims	398,640	Feb. 26	2307	612	46	1054
Merriman, Charles D. (See Tilden, Frank W., assignor.)						
Merriman, Seymour V., Syracuse, N. Y. Knockdown cupboard	398,422	Feb. 26	1997	524	46	994
Merritt, Charles E. (See Yost and Merritt.)						
Merritt, Henry A., Brooklyn, N. Y. Extensible car-step	395,660	Jan. 1	552	138	46	111
Merritt, Henry W. (See Foster and Merritt.)						
Merritt, Mortimer G., Springfield, Mass., assignor, by mesne assignments, to Farmers Loan and Trust Company, trustee, New York, N. Y. Making type	400,000	Mar. 19	1816	472	46	1503
Merritt, Mortimer G., Springfield, Mass., assignor to Yost Writing Machine Company, New York, N. Y. Die for trimming type	400,001	Mar. 19	1818	472	46	1503
Meschter, Jacob K., Philadelphia, Pa. Incubator	397,016	Jan. 29	2583	668	46	540
Meserole, Abraham V., New York, N. Y. Secondary-battery electrode	399,274	Mar. 12	736	191	46	1263
Mesker & Brother. (See Mesker, Frank, assignor.)						
Mesker & Brother. (See Mesker and Edwards, assignors.)						
Mesker, Frank, assignor to Mesker & Brother, St. Louis, Mo. Plate-metal column	397,868	Feb. 12	1152	308	46	806
Mesker, Frank, and H. F. Edwards, assignors to Mesker & Brother, St. Louis, Mo. Plate-metal column	399,202	Mar. 5	627	163	46	1235
Mess, John. (See Storch, Ferdinand, assignor.)						
Messimer, Henry E., Williamsport, Pa. Buckle	397,811	Feb. 12	1080	287	46	790
Mestern, Max, Turin, Italy. Element for thermo-electric batteries	398,272	Feb. 19	1757	464	46	939
Metal Block Pavement Company. (See Cadwell, Lydia J., assignor.)						
Metallic Street Railway Supply Company. (See Gibbon, Thomas H., assignor.)						
Metcalf, William, Lake, Ill. Car-coupling	397,017	Jan. 29	2585	668	46	540
Metz, Robert P. (See Cuthbert, George, assignor.)						
Metzger, William H. (See Effinger, Deweese, Koons, and Metzger.)						
Meyer, Emil, Ottleben, Prussia, Germany. Automatic alarm apparatus	397,657	Feb. 12	864	{226 / 227}	{46 / 46}	749
Meyer, Emil, Berlin, assignor to C. Uhl & Co., Brunswick, Germany. Obtaining ammonia and oxalic acid from sugar waste	396,705	Jan. 22	2128	.....	46	437
Meyer, Emil L., Brooklyn, N. Y. Paper box	398,971	Mar. 5	237	66	46	1159
Meyer, Friedrich. (See Melchior and Meyer.)						
Meyer-Sniffen Company. (See Bunting, William, Jr., assignor.)						
Meyers, Frank B., assignor of one-half to C. S. Tanner, Fort Plain, N. Y. Hydrocarbon-burner	399,770	Mar. 19	1479	381	46	1438
Meyers, John G., Washington, D. C., assignor to New Mausoleum Company, Alexandria, Va. Preserving corpses	397,379	Feb. 5	412	109	46	655
Meylan, Ami B., Ste. Croix, Switzerland. Musical box	400,104	Mar. 26	1967	515	46	1542
Meyrowitz, Emil B., and C. E. Dressler, New York, N. Y.; said Dressler assignor to said Meyrowitz. Optician's measuring-instrument	397,744	Feb. 12	985	261	46	772
Michael, William G., Harrison City, assignor of two-thirds to L. W. Bott and M. L. Painter, Greensburg, Pa. Seeder, harrow, and roller	400,351	Mar. 26	2349	613	46	1615
Michaud, Jules, Paris, France. Rotary printing-machine	396,592	Jan. 22	1968	{506 / 507}	{46 / 46}	406
Michaud, Onesime E., St. Louis, Mo. Adjustable car-seat and indicator	400,241	Mar. 26	2173	570	46	1583
Michaud, Onesime E., St. Louis, Mo. Station-indicator	400,242	Mar. 26	2175	{570 / 571}	{46 / 46}	1584
Michel, Frank, Blair, Nebr. Adjustable strut for vises	396,755	Jan. 29	2219	568	46	464
Michell, Richard H., Redruth, county of Cornwall, England. Consuming smoke	399,062	Mar. 5	376	101	46	1186
Michelson, Sigismund M., Milwaukee, Wis. Stocking	396,945	Jan. 29	2487	641	46	520
Michelson, Sigismund M., assignor of one-half to G. Sylvester, Milwaukee, Wis. Caster	398,641	Feb. 26	2308	612	46	1054
Michigan Radiator and Iron Manufacturing Company. (See Taylor, Harrison H., assignor.)						
Mickey, Simon P., Wood Lawn, Va. Car-coupling	397,137	Feb. 5	48	11	46	587
Mickle, John, *et al.* (See Gaskill, Joshua W., assignor.)						
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Wire belting	398,423	Feb. 26	1998	524	46	994
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Manufacture of wire belting	398,424	Feb. 26	1999	525	46	994
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Hose or tubing	398,425	Feb. 26	2000	525	46	994
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Hose or tubing	398,426	Feb. 26	2001	525	46	994
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Wire belting	398,427	Feb. 26	2002	525	46	995
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Wire tubing	398,428	Feb. 26	2003	526	46	995
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Wire belting	398,429	Feb. 26	2004	526	46	995
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Hose or tubing	398,430	Feb. 26	2004	526	46	995
Midgley, Thomas, assignor of one-half to J. E. Emerson, Beaver Falls, Pa. Manufacture of wire belting	398,431	Feb. 26	2005	526	46	995
Mieble, Robert, Chicago, Ill. Sheet-delivery apparatus for printing-machines	395,710	Jan. 8	629	157	46	134
Mieble, Robert, Chicago, Ill. Sheet-delivery apparatus for printing-machines	398,642	Feb. 26	2309	612	46	1054
Mierson, Max. (See Pierce, William O., assignor.)						
Miles, William. (See Finnegan and Miles.)						
Miles, Eusebius M. (See Jones and Miles.)						
Miles, Purches, Brooklyn, N. Y. Hook	396,169	Jan. 15	1322	338	46	277
Miles, Purches, Brooklyn, N. Y. Hook	396,756	Jan. 29	2220	568	46	464
Miles, Purches, Brooklyn, N. Y. Hook	396,757	Jan. 29	2221	568	46	464
Miller, Alex. McV. (See Wood, Marshall, assignor.)						
Miller, Cassius M., Canton, Ohio. Valve-gear for duplex steam-pumps	399,203	Mar. 5	628	163	46	1235

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Miller & Company, Edward. (See Homan, William C., assignor.)						
Miller & Company, Edward. (See Miller, Edward, assignor.)						
Miller & Company, Edward. (See Rhind, Frank, assignor.)						
Miller & Company, Edward. (See Rhind and Cooper, assignors.)						
Miller, Edward, assignor to E. Miller & Company, Meriden, Conn. Lamp-hanger	395,845	Jan. 8	848	219	46	178
Miller, Edward W. (See Steiner, Henry W., assignor.)						
Miller, Francis J., Carrollton, Ky. Thill-coupling	399,682	Mar. 19	1350	347	46	1411
Miller, Frederick A., Oakland, Cal. Pop safety-valve	395,911	Jan. 8	946	243	46	196
Miller, Fredrick C., Newport, Ky. Cigar-cutter	396,339	Jan. 15	1572	398	46	322
Miller, George D. (See Phelps, Homer L., assignor.)						
Miller, George W., *et al.* (See Rosanwyer, Henry, Jr., assignor.)						
Miller, Gustavus A., Butler, Pa. Washing-machine	399,425	Mar. 12	964	250	46	1327
Miller, James B., *et al.* (See Getz, William, assignor.)						
Miller, James M., Washington, D. C. Apparatus for dredging, washing, and separating sand and gravel	395,624	Jan. 1	482	123	46	98
Miller, James M. A., San Mateo, assignor to E. Bean, Jacksonville, Fla. Preparing insecticides	398,527	Feb. 26	2130	.....	46	1022
Miller, James W., Denville, N. J. Monogram-pattern	400,105	Mar. 26	1968	515	46	1542
Miller, John C., assignor to Meriden Bronze Company, Meriden, Conn. Central-draft lamp	395,912	Jan. 8	947	243	46	196
Miller, John C., and A. H. Jones, assignors to Meriden Bronze Company, Meriden, Conn. Lamp-standard	396,946	Jan. 29	2488	642	46	520
Miller, John G., Champaign, Ill. Flame-tug. (Reissue)	10,981	Jan. 29	2774	709	46	584
Miller, John H. (See Brown, Calvin, assignor.)						
Miller, John T. and S. W., Thayer, Kans. Window-shutter	395,577	Jan. 1	415	106	46	86
Miller, Joseph M., Chicago, Ill. Fire-extinguisher	398,643	Feb. 26	2310	613	46	1055
Miller, Leroy, assignor of one-half to W. F. Walker, Albia, Iowa. Portable hay-stacking machine	396,645	Jan. 8	1141	290	46	334
Miller, Lewis, Akron, Ohio. Grain-binding harvester	396,758	Jan. 29	2223	569	46	464
Miller, R. T. (See Leeds, Pulaski, assignor.)						
Miller, Samuel L., *et al.* (See Hoke, Quinton J., assignor.)						
Miller, Simon, Philadelphia, Pa. Shirt	399,914	Mar. 19	1698	439	46	1481
Miller, Solomon W. (See Miller, John T. and S. W.)						
Miller, Walter L., Winneconne, Wis. Pillow or head-rest	397,993	Feb. 19	1337	356	46	857
Miller, William D., Florence, Mass. Dish-washer	399,426	Mar. 12	964	251	46	1327
Miller, William H., New York, N. Y. Arc lamp	400,352	Mar. 26	2351	614	46	1615
Miller, William R., Baltimore, Md. Hammer for fire-arms	395,913	Jan. 8	948	244	46	196
Miller, William R., Polo, assignor of two-thirds to F. Sanford, Englewood, and J. F. Sanford, Dixon, Ill. Stamp-affixing machine	397,087	Jan. 29	2687	695	46	559
Millet, John W., assignor to A. Dolge, Dolgeville, N. Y. Fulling apparatus	397,612	Feb. 12	1021	{287 / 288}	{46 / 46}	791
Millet, John W., assignor to A. Dolge, Dolgeville, N. Y. Fulling-machine	397,613	Feb. 12	1022	288	46	791
Milliken, Benjamin D., Somerville, Mass. Apparatus for mixing liquid and powdered substances	399,276	Mar. 12	730	192	46	1264
Mills, Anson, U. S. Army. Fastening for car ridge and other belts	399,915	Mar. 19	1699	440	46	1481
Mills, Anson, U. S. Army. Belt for holding cartridges and cartridge magazines	399,916	Mar. 19	1700	440	46	1481
Mills, Charles. (See Tweedale and Mills.)						
Mills, John H., Boston, Mass. Sectional boiler	400,243	Mar. 26	2176	{571 / 572}	{46 / 46}	1584
Mills, Mortimer B., Chicago, Ill. Valve	395,501	Jan. 1	288	74	46	61
Mills, Mortimer B., assignor to Bogue & Mills Manufacturing Company, Chicago, Ill. Valve	397,088	Jan. 29	2689	695	46	560
Mills, Willard F., Kalamazoo, Mich. Machine for making metal sash	399,545	Mar. 12	1147	297	46	1361
Mills, Willard F., Kalamazoo, Mich. Machine for bending metal sash	399,683	Mar. 19	1332	347	46	1412
Mills, William O., San Francisco, Cal. Hot-air blast	396,947	Jan. 29	2489	642	46	521
Milne, James T., *et al.* (See Littlefield, Charles A., assignor.)						
Milne, John. (See White and Milne.)						
Milwaukee Harvester Company. (See Crandall, Henry F., assignor.)						
Milwaukee Harvester Company. (See Graham, James A., assignor.)						
Milwaukee Harvester Company. (See Graham, Martincourt, and Crandall, assignors.)						
Mindt, Carl, Lisbon, N. H. Rotary engine	396,750	Jan. 29	2225	{569 / 570}	{46 / 46}	465
Miner, Isaac P., assignor to J. Loyd, Brooklyn, N. Y. Twine-balling machine	399,339	Mar. 12	231	217	46	1302
Mineral Reduction Company. (See Brandreth, William, assignor.)						
Mingay, Richard, Jr., Saratoga Springs, N. Y. Gripper for platen printing-presses	396,502	Jan. 22	1830	469	46	381
Minnich, Simon B., assignor to J. M. Greider, Landisville, Pa. Broom-holder	396,432	Feb. 26	2006	527	46	996
Minnigh, William, Bradleytown, Pa. Seed grader and cleaner	396,867	Jan. 29	2407	{617 / 618}	{46 / 46}	504
Mishler, Pharez M., Hagerstown, Md. Portable fence	397,511	Feb. 12	622	160	46	703
Mitchell, Benjamin A., Jr., Philadelphia, Pa. Door-check	397,380	Feb. 5	412	109	46	655
Mitchell, Harris B. (See Lewis, Leroy S., assignor.)						
Mitchell, Nathaniel C., Philadelphia, Pa. Recovering rubber from waste	395,987	Jan. 8	1002	260	46	219
Mitchell, Robert J., Seneca, Mo. Letter-box	400,244	Mar. 26	2179	572	46	1585
Mitchell, Samuel, Southington, Conn. Making steel-trap springs	395,246	Jan. 8	849	219	46	178
Mitchell, Thomas A. (See Hellen, William F., assignor.)						
Mitchell, Thomas A., *et al.* (See Lumley, Edwin J., assignor.)						
Mitscherlich, Alexander, Freiburg, Baden, Germany. Manufacturing thread from short fibers	395,914	Jan. 8	948	244	46	196
Mittag, Thomas E. (See Renner, Joshua, assignor.)						
Moats, Andrew T., assignor to Black Diamond Mining Tool Company, Pleasantville, Iowa. Mining-machine	397,089	Jan. 29	2690	696	46	560
Moats, George N., Ironton, Ohio. Car-coupling	395,968	Jan. 8	1064	269	46	219
Mock, George, Springfield, Ky. Car-coupling	397,018	Jan. 29	2587	668	46	541
Moen, Ole, Manistee, Mich. Draw-bridge gate	396,662	Jan. 22	2068	{530 / 531}	{46 / 46}	425
Moliere, George W., Ocean View, Cal. Hame-tug	395,847	Jan. 8	850	219	46	178
Mollin, Charles G., Brooklyn, N. Y. Measuring apparatus for liquids	398,528	Feb. 26	2140	564	46	1022
Moline Plow Company. (See Bartlett, John W., assignor.)						
Molyneux, Barton S., Minneapolis, Minn., assignor to National Water Supply Company, of Minnesota. Automatic coin-operated device	399,643	Mar. 12	1293	332	46	1389
Molyneux, Barton S., Minneapolis, Minn., assignor to National Water Supply Company, of Minnesota. Automatic fluid-releaser	400,107	Mar. 26	1970	516	46	1542
Monaco, Marino, *et al.* (See Anderson and Elias, assignors.)						
Monaghan, William F., *et al.* (See Noble, Henry C., assignor.)						
Monnett, John P., Bucyrus, Ohio. Fence	397,994	Feb. 19	1338	357	46	857

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Montague, John R., Auburn, N. Y., assignor to Montague Roller Cotton Gin Company, Toledo, Ohio. Machine for opening, cleaning, and ginning seed-cotton	400,002	Mar. 19	1819	472, 473	46	1503
Montague Roller Cotton Gin Company. (See Montague, John R., assignor.)						
Montanye, Charles D. (See Moore and Montanye.)						
Montgomery, James, East Millstone, N. J. Stock-car	397,199	Feb. 5	150	40	46	605
Montgomery, Roderick N., Melbourne, Victoria. Billiard-scoring board	397,019	Jan. 29	2588	669	46	541
Montrosa, Levi H., Toronto, Ontario, Canada. Metallic roofing or siding	397,381	Feb. 5	413	109	46	656
Moody, Henry. (See Garvin and Moody.)						
Moody, Henry L. (See Brown and Moody.)						
Moon, De Witt A., Orlando, Fla. Colter	400,106	Mar. 26	1969	516	46	1542
Moonelis, Adolph, *et al.* (See Smith, James E., assignor.)						
Mooney, Daniel A., and J. Ireland, Troy, N. Y. Combined thread-tension and lubricating device for sewing-machines	398,433	Feb. 26	2007	527	46	996
Moore, Albert E., assignor to I. S. Borley and A. F. Bullard, St. Albans, Vt. Spittoon	397,200	Feb. 5	153	41	46	605
Moore, Alfred M., Malden, Mass. Boot-tree	395,753	Jan. 8	867	175	46	147
Moore, Alfred M., Malden, Mass. Boot-tree	399,684	Mar. 19	1353	347	46	1412
Moore, Burchell R., and C. D. Montanye, Kansas City, Kans. Street-car motor	397,658	Feb. 12	866	227	46	749
Moore, Cantnell J., assignor of one-half to M. D. Johnson, Webster, Iowa. Gate	396,046	Jan. 8	1142	290	46	234
Moore, Charles H., Yonkers, N. Y. Bath-tub	398,644	Feb. 26	2313	613	46	1055
Moore, Charles K., Elizabeth, N. J. Check-valve and trap	396,503	Jan. 22	1831	470	46	392
Moore, Edward J., Philadelphia, Pa. Feed-water heater	398,645	Feb. 26	2314	613	46	1056
Moore, Edward Y., Milwaukee, Wis. Shielded sliding door	397,560	Feb. 12	698	181	46	718
Moore, Everett D. (See Chappell and Moore.)						
Moore, Everett D., assignor to T. C. Chappell, Baltimore, Md. Mail-bag	398,529	Feb. 26	2141	565	46	1022
Moore, Everett D., assignor to T. C. Chappell, Baltimore, Md. Hermetic mouth-piece for mail-bags	398,530	Feb. 26	2142	565	46	1022
Moore, Frank, Pittsburg, Pa. Triple valve for automatic brake mechanisms	400,108	Mar. 26	1972	516	46	1543
Moore, George H., Norwich, Conn. Filter and apparatus for automatically cleaning the same	395,625	Jan. 1	484	123, 124	46	98
Moore, Hollis W., Olean, N. Y. Vehicle fifth-wheel	398,434	Feb. 26	2008	527	46	996
Moore, Jennie M., White Sulphur Springs, W. Va. Calendar	396,760	Jan. 29	2227	570	46	465
Moore, John P., Fremont, Ohio. Removable seat for vehicles	396,827	Jan. 29	2320	594	46	485
Moore, Lee E., deceased, (C. P. Gaither, executor,) and W. A. Davis, Boston, Mass., assignors to Davis-Moore Sewing Machine Company, Saco, Me. Take-up device for sewing-machines	399,685	Mar. 19	1353	348	46	1412
Moore, N. Grier, Chicago, Ill. Type-writing machine	398,646	Feb. 26	2316	614, 615	46	1056
Moore, Ripley A., Hickory Plains, Ark. Colter-clamp	397,138	Feb. 5	49	11	46	587
Moore, Stephen, *et al.* (See Abbott, Alpheus A., assignor.)						
Moore, Theophilus W., Fruit Cove, Fla. Orange-grader	395,793	Jan. 8	764	198	46	160
Moore, Thomas B., assignor of one-half to J. H. Scott, Philadelphia, Pa. Trimming attachment for sewing-machines	395,626	Jan. 1	492	124	46	99
Moore, William, Kokomo, Ind. Apparatus for separating liquids from natural gas	399,427	Mar. 12	965	251	46	1327
Moore, William M. (See Sime and Moore.)						
Moore, William R., Unionville, Pa. Wagon-jack	400,109	Mar. 26	1974	517	46	1543
Moorman, Zach B., Honey Grove, Tex. Dental chair	396,828	Jan. 29	2321	594, 595	46	485
Moose, Moris, Chicago, Ill. Button and ornament paster	400,353	Mar. 26	2355	614	46	1616
Morant, Robert. (See Halford and Morant.)						
Morden, William J. (See Young, William H., assignor.)						
Morden, William J., Chicago, Ill. Tie-bar for railway-switches	397,090	Jan. 29	2691	696	46	560
Morehead, James C., Greencastle, Pa. Nut-lock	397,436	Feb. 5	506	133	46	675
Moren, Adam, *et al.* (See Bukawietis, Kazimieras, assignor.)						
Morgan, Charles. (See Morgan, Edgar H. and C.)						
Morgan, Charles B., Telluride, Colo. Screw-driver	395,450	Jan. 1	211	54	46	45
Morgan, Charles R., Akron, Ohio. Feed mechanism for saw-tables	397,930	Feb. 19	1243	332	46	840
Morgan & Company, D. S. (See Becker, Frederick G., assignor.)						
Morgan, Doctor F., Akron, Ohio. Cleaning-door for boilers	397,561	Feb. 12	700	182	46	718
Morgan, Edgar H. and C., assignors of one-third to A. Baumgarten, Freeport, Ill. Coffee-mill	399,686	Mar. 19	1354	348	46	1412
Morgan, Edward D., Delair, N. J., assignor of one-half to C. M. Gordon, Philadelphia, Pa. Vise	395,661	Jan. 1	554	138	46	111
Morgan, Elisha, Springfield, Mass. Paper-cutting machine	398,341	Feb. 19	1870	492	46	961
Morgan, Robert W., New York, N. Y. Rubber sleeve for tennis-rackets	399,340	Mar. 12	833	217	46	1302
Morgan, William T., Muncie, Ind. Sash-fastener	396,363	Jan. 15	1613	412	46	330
Morhard, Joseph, assignor of one-half to A. Beth, San Francisco, Cal. Brick-machine	397,604	Feb. 12	790	206	46	734
Morisseau, Auguste, Nantes, France. Countersink and drill	396,663	Jan. 22	2070	531	46	426
Morley Button Sewing Machine Company. (See Bennett, Walter E., assignor.)						
Morningstar, Benjamin F., Brooklyn, N. Y. Grain-sampler	399,687	Mar. 19	1355	349	46	1412
Morrill, Dell B. and F. S., Blackberry, Ill. Floor-clamp	396,104	Jan. 15	1234	313	46	260
Morrill, Frank S. (See Morrill, Dell B. and F. S.)						
Morris, Charles A., Bloomfield, N. J. Elevating and discharging apparatus	395,502	Jan. 1	229	75	46	61
Morris, Charles N., Cincinnati, Ohio. Base-ball bat	400,354	Mar. 26	2356	614	46	1616
Morris, Edward E. (See Norton, Henry M., assignor.)						
Morris, Jesse, Sioux Rapids, Iowa. Hay-stacker	397,512	Feb. 12	623	161	46	703
Morris, John, assignor to Chemical Carbon Company, (limited,) Shirley Cottage, South View, Basingstoke, England. Combustible vaporizing-case	399,236	Mar. 5	671	175	46	1243
Morris, John M., Chicago, Ill. Post-office furniture	395,989	Jan. 8	1065	270	46	219
Morris, William E., *et al.* (See Prince, Jerome, assignor.)						
Morrison, John L., and A. D. Rowe, Holyoke, Mass. Machine for grinding rotary disk-cutters	398,741	Feb. 26	2464	653	46	1086
Morrison, John R., assignor of one-half to J. Fowler, Glens Falls, N. Y. Device for folding the edges of fabrics	396,415	Jan. 22	1691	434	46	353
Morrissey, Timothy, and J. Doyle, Ionia, Mich. Steam hand-car	400,409	Mar. 26	2433	637, 638	46	1631
Morrow, John, London, county of Middlesex, England. Mechanical toy	396,221	Jan. 15	1406	358	46	293
Mors, Charles H., West Troy, N. Y. Check-hook	400,410	Mar. 26	2435	638	46	1631
Morse, Henry T., Boston, Mass. Rotary engine	395,711	Jan. 8	624	158	46	134
Mortimer, Charles G., assignor of one-half to G. W. Thompson, New York, N. Y. Machine for ornamenting paper	397,091	Jan. 29	2692	696	46	561
Morton, Benjamin, Five Forks, Pa. Coupling-link	395,794	Jan. 8	765	198	46	160
Morton, Howard W., *et al.* (See Enos, John A., assignor.)						
Morton, Luther B., Stuart, Iowa. Hay-stacker	396,761	Jan. 29	2227	570	46	465
Morton, William F., assignor of one-half to Holcomb Brothers & Co., New Haven, Conn. Spoke-tenon	397,995	Feb. 19	1339	357	46	858

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Morton, William S., Edinburgh, county of Mid-Lothian, Scotland. Embossing canvas for decorating walls and other surfaces	395,915	Jan. 8	951	245	46	197
Moseley, Handson C. (See Lester, James, assignor.)						
Mosher, Silas H., assignor of one-half to C. F. Elmes, Chicago, Ill. Packing	396,222	Jan. 15	1407	359	46	293
Moskovits, Maximilian H., Kansas City, Mo. Furnace-grate	399,688	Mar. 19	1356	349	46	1413
Moss, John L., deceased, (T. A. Schoolar, Avondale, Ala., executor,) and N. Littell, Emporia, Kans.; said Schoolar and Littell assignors of one-third to E. W. Dee, Tallahassee, Fla. Apparatus for extracting oil from oil-cakes	400,254	Mar. 26	2197	576	46	1587
Mott Iron Works, J. L. (See Hammann, Edward, assignor.)						
Mott Iron Works, J. L. (See Mott, Jordan L., Jr., assignor.)						
Mott, Jordan L., Jr., assignor to J. L. Mott Iron Works, New York, N. Y. Cistern for water-closets	397,659	Feb. 12	867	227, 228	46	749
Mould, Enoch, White Barn, near Newcastle, county of Stafford, England. Appliance for breaking loose or splitting all kinds of minerals	398,742	Feb. 26	2466	654	46	1087
Moulton, Otis E. (See Langlands and Moulton.)						
Mount, James H., Jamesburg, N. J. Shirt-ironing table	396,416	Jan. 22	1692	434	46	354
Mounts, James H. (See Coble and Mounts.)						
Mourath, Gustav, *et al.* (See Dyer, Isaac T., assignor.)						
Mower Knife Grinder Company. (See Dutton, Rufus, assignor.)						
Moyer, Harvey A., Syracuse, N. Y. Spring-vehicle	396,223	Jan. 15	1409	359	46	293
Moyer, J. W., *et al.* (See Bolt, Joseph, assignor.)						
Mozingo, Lewis W., and L. Stiers, Kansas City, Mo. Filter	396,287	Jan. 15	1498	380	46	309
Mudge, Richard C., and E. M. Wasson, Detroit, Mich. Paper garment	397,437	Feb. 5	506	133	46	676
Mueller, August, Kansas City, Mo. Lamp-wick	399,277	Mar. 12	741	193	46	1284
Mueller, Maximilian L., Schandau, Saxony, Germany. Advertising-lid for beer-glasses	396,224	Jan. 15	1410	359	46	294
Mulford, Clarence C., Streator, Ill. Steam-generator	396,105	Jan. 15	1235	313	46	261
Mull, William H., Lawrence, Kans. Self-heating sad-iron	398,743	Feb. 26	2467	654	46	1087
Müller, Friedrich W., Jr., Berlin, Germany. Sewing-machine	397,996	Feb. 19	1340	357	46	858
Müller, Gustav A. F. (See Ehrlich and Müller.)						
Muller, Hanns, *et al.* (See Wicek, Wenzl, assignor.)						
Mullins, George G., Los Angeles, Cal., assignor to Mullins Silicated Iron and Steel Company, East St. Louis, Ill. Purifying iron. (Reissue)	10,988	Feb. 26	2553	.....	46	1106
Mullins Silicated Iron and Steel Company. (See Mullins, George G., assignor.) (Reissue.)						
Mundt, Wilhelm, Brooklyn, assignor of two-thirds to J. Habermann and R. Cohn, New York, N. Y. Braiding-machine	399,623	Mar. 12	1264	325	46	1383
Mundy, Charles H., *et al.* (See Patten, Jefferson, assignor.)						
Mundy, John G., assignor to Knickerbocker Company, Jackson, Mich. Dust-collector	398,788	Feb. 26	2528	671	46	1099
Munger, Robert S., Dallas, Tex. Saw-gin	396,706	Jan. 22	2129	545	46	437
Munsell, Lucien E. (See Griswold, Fred E., assignor.)						
Munson, Andrew M., Lee, Ill. Automatic stop for wire-barbing machines	395,712	Jan. 8	625	158, 159	46	135
Munson, John B., Scranton, Pa. Baking and roasting pan	397,869	Feb. 12	1152	308	46	806
Murdock, J. & J. (See Currier, George O., assignor.)						
Murphey, Frank P., assignor of one-half to W. D. Chamberlain, Decatur, Ill. Corn-planter	398,789	Feb. 26	2530	672, 673	46	1100
Murphy, Daniel H., Hartford, Conn. Work-stand	399,546	Mar. 12	1140	298	46	1361
Murphy, Frank J., and A. M. Rundle, Danbury, Conn. Machine for stiffening hats	396,829	Jan. 29	2322	595	46	485
Murphy, Hugh A., Elk City, Kans. Harrow	397,605	Feb. 12	773	207	46	735
Murphy, John, Brooklyn, N. Y. Hose-machine	399,547	Mar. 12	1150	298	46	1361
Murphy, William, St. John, New Brunswick, Canada. Canvas-stretcher for picture-frames	397,139	Feb. 5	50	11	46	587
Murray, A. Gordon, Cedar Rapids, Iowa. Sash-holder	396,830	Jan. 29	2327	595	46	487
Murray, Archibald B., and H. Harrison, San Rafael, Cal. Ventilating and warming railway-cars	397,092	Jan. 29	2694	696, 697	46	561
Murray, Charles W., Westborough, Mo. Car-brake	395,662	Jan. 1	555	139	46	112
Murray, Peter, Jr., Newark, N. J. Power-fan	399,669	Mar. 19	1358	349	46	1413
Murray, Robert E., *et al.* (See Anderson and Elias, assignors.)						
Murtha, Philip, Philadelphia, Pa. Shoe-maker's anvil	396,106	Jan. 15	1236	314	46	261
Musick, John U., and W. J. Andrews, St. Louis, Mo. Cooking-stove	398,790	Feb. 26	2531	673	46	1100
Musser, W. B., *et al.* (See Wundes, John H., assignor.)						
Mutimer, Frederick, assignor of one-half to Rockford Bolt Works, Rockford, Ill. Bolt-heading tool	398,342	Feb. 19	1871	492	46	961
Mutton, James, Frisco, Utah Ter. Car-coupling	396,888	Jan. 29	2409	618	46	505
Mutual Electric Manufacturing Company. (See Knowles, Edward R., assignor.)						
Myers, Henry C., New York, N. Y., assignor to United States Cigar Machinery Company, of New York. Cigar-bunch-wrapping machine	397,510	Feb. 12	619	159, 160	46	702
Myers, Jacob, Eureka, Cal. Guard for fish-nets	396,948	Jan 29	2490	642	46	521
Myers, John A. (See Brenner and Myers.)						
Myers, John A., Louisville, Ky. Hydraulic motor	400,411	Mar 26	2435	638, 639	46	1631
Myers, Samuel, assignor of two-thirds to E. Bolmer and E. W. Shue, Manheim, Pa. Car-coupling	396,047	Jan. 8	1144	290	46	234
Naber, Joseph, Jr., Collins, N. Y. Sprinkler	398,901	Mar. 5	198	35	46	1138
Nagel, Carl. (See Sattler and Nagel.)						
Nageldinger, John, New York, N. Y. Pressure-regulating valve	399,548	Mar. 12	1151	298	46	1362
Nagle, Augustus F., Chicago, Ill. Safety-gage	398,069	Feb. 19	1467	388	46	862
Nakashjian, Stephen T., Boston, Mass. Punch	395,342	Jan. 1	55	13	46	13
Nance, Turner H., Talladega, Ala. Machine for gumming and sharpening gin-saws	399,919	Mar. 19	1704	441	46	1482
Nase, John, Syracuse, N. Y. Buckle	397,562	Feb. 12	700	182	46	718
Nason, James H., Brooklyn, N. Y. Bottle-tilting device	395,504	Jan. 1	292	76	46	62
Nathan, Lewis, assignor to Cuba Marble Company, New York, N. Y. Manufacturing artificial marble	396,225	Jan. 15	1411	.....	46	294
Nation, Edmund C., Passaic, assignor to W. M. Johnson, Hackensack, N. J. Apparatus for concentrating acids	395,505	Jan. 1	293	76	46	62
National Heating Company. (See Abbot and Knaak, assignors.)						
National Lock Washer Company. (See Dodd, David, assignor.)						
National Safe Deposit and Vault Manufacturing Company. (See Hough, John T., assignor.)						
National Self Heating Sad Iron Company. (See Heidel, Gustavus, assignor.)						
National Tube Works Company. (See Paterson, Andrew, assignor.)						
National Water Supply Company. (See Molyneux, Barton S., assignor.)						
Naumburg, Simson J. (See Spielman, William, assignor.)						
Neavitt, Thomas J., Austin, Tex. Finishing compound for plastered walls	399,920	Mar. 19	1706	.....	46	1482
Nebergall, James W., assignor of one-half to C. G. Thomas, Prairie Creek, Ind. Railway-gate	399,624	Mar. 12	1265	325	46	1383
Neef, Hermann, Jefferson City, Mo. Stove-hood	399,430	Mar. 12	971	252	46	1329

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Neely, Samuel M., Smith's Turn Out, S. C. Needle for sewing bags, &c	398,531	Feb. 26	2144	565	46	1023
Neely, William A., Lynn, Mass., assignor to Wheeler & Wilson Manufacturing Company, Bridgeport, Conn. Presser-foot for sewing-machines	400,355	Mar. 26	2256	615	46	1616
Neichter, John A., assignor of two-thirds to H. E. Loomis and L. D. Seward, Akron, Ohio. Fruit-juice extractor	397,467	Feb. 5	554	145	46	684
Neilson, Alexander, Inkermann, county of Renfrew, and J. Taylor, Linlithgow, county of Linlithgow, Scotland. Oil spray or vapor lamp	397,745	Feb. 12	988	261	46	773
Nelson, Charles H., North Grafton, Mass. Boot or shoe	398,436	Feb. 26	2009	528	46	996
Nelson, William D., San Francisco, Cal. Grease-extractor	395,401	Jan. 1	141	36	46	30
Neu, Gustave S., New York, N. Y. Throttle-valve controller	400,245	Mar. 26	2181	573	46	1585
Neuman, David M. (See Osborn, Enoch L. S., assignor.)						
Neumann & Co., R. (See Hammesfahr, Julius, assignor.)						
Neville, Sylvester M., Cleveland, Ohio. Dye	396,417	Jan. 22	1693		46	354
Nevin, Robert E., Enon Valley, Pa. Tile-ditching machine	397,997	Feb. 19	1342	358	46	858
New Haven Clock Company. (See Tyrrill, Alfred D., assignor.)						
New Mausoleum Company. (See Meyers, John G., assignor.)						
New York Stencil Works. (See Tarbox, Eugene L., assignor.)						
Newell, Benjamin B., Boston, assignor to H. G. and H. Harwood, Natick, Mass. Base-ball winding and rolling machine	397,303	Feb. 5	300	77	46	633
Newell, George E., Pawtucket, R. I. Hoisting-bucket	396,664	Jan. 22	2070	531	46	426
Newell, John F. (See Richards and Newell.)						
Newell, William H., Philadelphia, Pa. Tank or water valve	399,690	Mar. 19	1359	350	46	1413
Newell, William H., Philadelphia, Pa. Secret supply, waste, and overflow for basins and baths	399,691	Mar. 19	1361	350	46	1413
Newell, William H., Philadelphia, Pa. Tank and water valve	399,692	Mar. 19	1361	350, 351	46	1414
Newlin, Edward T., Brooklyn, N. Y. Coffee-pot	399,431	Mar. 12	972	253	46	1329
Newlin, Franklin, Pottstown, Pa. Metal-roll-cooling device	395,713	Jan. 8	629	159	46	135
Newsom, John Q. A., Seymour, Ind. Steam-plow	396,170	Jan. 15	1323	339, 340	46	277
Newton, Edward, administrator. (See Bliss, William H.)						
Newton, James L., Cleveland, Ohio. Hydrocarbon-burner	396,226	Jan. 15	1412	360	46	294
Ney, Jacob. (See Ney, Volentine L. and J.)						
Ney, Volentine L. and J., Canton, Ohio. Hay-elevator track	395,714	Jan. 8	630	159	46	136
Neynaber, Adolphus F. W., Detroit, Mich. River-power engine	398,070	Feb. 19	1469	388	46	883
Nicholls, Walter, assignor of one-half to J. H. Francis, New Britain, Conn. Spur	397,304	Feb. 5	301	77	46	633
Nichols, Bayard B., Chicago, Ill. Book-support or music-stand	395,715	Jan. 8	631	160	46	136
Nichols Harvester Company. (See Nichols, Marion L., assignor.)						
Nichols, James C. (See Baylese and Nichols.)						
Nichols, Marion L., assignor to Nichols Harvester Company, New York, N. Y. Grain-binder	395,991	Jan. 8	1068	270, 271, 272, 273	46	220
Nichols, Samuel O., Weare, N. H. Whiffletree-hook	397,201	Feb. 5	154	41	46	605
Nicholson, John W., *et al.* (See Gaskill, Joshua W., assignor.)						
Nicholson, Thomas J., Louisville, Ky. Ventilating-top for chimneys	399,067	Mar. 5	382	103	46	1187
Nickerson, Cornelius. (See Bray and Nickerson.)						
Nickerson, William E., Cambridge, Mass. Fluid speed-regulator for elevators	396,107	Jan. 15	1237	314	46	---
Nickerson, William E., Cambridge, Mass. Fluid speed-regulating device	396,108	Jan. 15	1237	314	46	261
Nickerson, William E., Cambridge, Mass. Fluid speed-regulator for elevators	396,889	Jan. 29	2410	618	46	505
Nickerson, William E., Cambridge, Mass. Fluid speed-regulator for elevators	396,949	Jan. 29	2491	642	46	521
Nickerson, William E., Cambridge, Mass. Fluid speed-regulator for elevators	396,950	Jan. 29	2492	643	46	522
Nickerson, William E., Cambridge, Mass. Grip device for elevators, &c	397,393	Feb. 5	414	109	46	656
Nickerson, William E., Cambridge, Mass. Elevator attachment	397,746	Feb. 12	989	262	46	773
Nickerson, William E., Cambridge, Mass. Speed-regulator for elevators	398,979	Mar. 5	239	66	46	1160
Nickerson, William E., Cambridge, Mass. Speed-regulator for elevators	399,068	Mar. 5	384	103	46	1188
Nicolai, Frank and M., Benton, Ind. Fence-machine	397,814	Feb. 12	1083	289	46	791
Nicolai, Michael. (See Nicolai, Frank and M.)						
Nicolas, Louis, *et al.* (See Rassinier, Adolph, assignor.)						
Niles & Scott Company. (See Zimmerman, George J., assignor.)						
Nilson, Nils, Minneapolis, Minn. Steam-engine	399,771	Mar. 19	1480	381, 382	46	1438
Nivison, George F. (See Nivison, William W. and G. F.)						
Nivison, William W. and G. F., Lester, Mich. Post-hole machine	397,383	Feb. 5	415	110	46	656
Nixon, Abram H., Dayton, Ohio. Pump	396,504	Jan. 22	1832	470	46	382
Noble, Henry C., assignor of two-thirds to W. F. Monaghan, New York, and C. W. Swan, Brooklyn, N. Y. Apparatus for sanding railways	398,174	Feb. 19	1613	408	46	910
Noble, Oscar L., Boston, Mass. Heel-trimmer	399,153	Mar. 5	545	141	46	1220
Noble, Oscar L., Boston, Mass. Tool for trimming heels	399,625	Mar. 12	1266	326	46	1384
Noble, Thomas A. (See Blake, Henry H., assignor.)						
Noble, William, assignor of one-half to W. H. Wolf and T. Davidson, Milwaukee, Wis. Feed-water heater	397,870	Feb. 12	1153	308	46	806
Nolan, Francis. (See Reynolds, Thomas J., assignor.)						
Nolan, John W., Chicago, Ill. Book-clip	396,505	Jan. 22	1832	470	46	382
Noll, Otto, assignor to T. Schiller and P. Brennicke, Berlin, Germany. Steam-motor	399,772	Mar. 19	1483	382, 383	46	1439
Nolley, David D., and R. L. Wyatt, Wilson, N. C. Curtain-holder	399,773	Mar. 19	1484	383	46	1439
Nolley, Richmond E., Atlanta, Ga. Hinge	400,003	Mar. 19	1821	473	46	1503
Noortwyck, Conrad H. A., Berlin, Germany. Remedy for diphtheria	396,435	Feb. 26	2009		46	996
Norcross, Leander N., assignor of one-half to H. B. Graves, Philadelphia, Pa. Wood-turning lathe	396,227	Jan. 15	1414	360	46	294
Norcross, Orlando W., Worcester, Mass. Fastening for roof-slates	396,503	Jan. 22	1970	507	46	406
Nordberg, Bruno V. (See Reynolds and Nordberg.)						
Norris, George E., Troy, assignor of one-half to A. P. Adams, Albany, N. Y. Machine for making match-splints	397,513	Feb. 12	624	161, 162	46	704
Norris, James M., Wilkes-Barré, Pa. Car-wheel	398,437	Feb. 26	2010	528	46	996
North, Albert G. (See Howard, Charles A., assignor.)						
North, Charles L., Fresno, Cal. Raisin-steemmer	395,916	Jan. 8	932	245	46	197
Norton, Edwin. (See Leavitt and Norton.)						
Norton, Edwin, Maywood, assignor to himself and O. W. Norton, Chicago, Ill. Can forming and soldering machine	395,795	Jan. 8	766	198, 199, 200	46	160
Norton, Edwin, Maywood, assignor to himself and O. W. Norton, Chicago, Ill. Soldering caps on filled cans	395,796	Jan. 8	771	200	46	161

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Norton, Henry M., assignor of one-half to E. E. Morris, Louisville, Ky. Railway-switch signal	399,342	Mar. 12	836	218	46	1303
Norton, Joshua, Jr., Portneuf, Quebec, Canada. Refining-pulp engine	398,845	Mar. 5	43	13, 14	46	1122
Norton, Joshua, Jr., Portneuf, Quebec, Canada. Beating-engine	400,110	Mar. 26	1975	517	46	1543
Norton, Oliver W. (See Leavitt and Norton, assignors.)						
Norton, Oliver W. (See Norton, Edwin, assignor.)						
Norton, Thomas W., Shamopin, Pa. Spool-holder	399,921	Mar. 19	1706	442	46	1483
Nott, Henry W., assignor of one-half to S. P. Cross, Cameron, Tex. Combined shaft-holder and wrench	396,048	Jan. 8	1145	291	46	235
Nowill, Ernest, West Dulwich, county of Surrey, England. Button-hole cutter	397,438	Feb. 5	508	133	46	676
Noyes, Bernice J. (See Lehy, Geoffrey B., assignor.)						
Noyes, La Verne W., Chicago, Ill. Harvester	395,343	Jan. 1	56	14	46	13
Noyes, La Verne W., Chicago, Ill. Machine for shearing metal	397,020	Jan. 29	2390	609	46	541
Noyes, La Verne W., Chicago, Ill. Metal-shearing machine	397,021	Jan. 29	2392	670	46	542
Noyes, La Verne W., Chicago, Ill. Cord-knotter for grain-binders	398,175	Feb. 19	1614	429	46	910
Nugent, James E., *et al.* (See Douglass, John, assignor.)						
Nunn, Charles H., Rochester, N. Y. Oil-cup	397,202	Feb. 5	154	41	46	605
Nurse, William, Toronto, Ontario, Canada. Feeding apparatus for printing-machines	396,288	Jan. 15	1500	380	46	310
Nuttall, James, Bury, county of Lancaster, England. Machine for cutting rags or other materials	398,273	Feb. 19	1759	464, 465	46	939
Nuttall, James, Fall River, Mass. Loom-temple	398,791	Feb. 26	2533	673	46	1100
Nutting, Charles S., *et al.* (See Latulip, Frederick, assignor.)						
Nutting Electric Manufacturing Company. (See Nutting, Samuel E., assignor.)						
Nutting, Samuel E., assignor to Nutting Electric Manufacturing Company, Chicago, Ill. Magnetic regulator	398,744	Feb. 26	2468	654	46	1087
Nye, Albert M. (See Jewell, Charles E., assignor.)						
Nye, Sherman R., Chicopee Falls, Mass. Truss	398,343	Feb. 19	1872	493	46	961
Nyström, Johan P., Carlstad, Sweden. Organ stop-action	395,503	Jan. 1	291	75	46	62
O'Brien, Thomas, New York, N. Y. Bicycle	399,774	Mar. 19	1485	383	46	1439
O'Connell, Henry, and S. A. Cahill, Manistee, Mich. Lubricator	400,356	Mar. 26	2357	615	46	1616
O'Connor, Michael, South Pittsburg, Tenn. Molding device	396,831	Jan. 29	2398	596	46	487
O'Connor, Thomas F., New York, N. Y. Coin-operated blow-tester	395,578	Jan. 1	416	106	46	86
O'Hare, Hugh, assignor to J. F., Leech, Mount Pleasant, Iowa. Folding chair	400,357	Mar. 26	2359	616	46	1617
O'Kelly, James M., assignor of eleven-twentieths to G. D. Bayaud, New York, N. Y. Automatic vending apparatus	396,228	Jan. 15	1415	360	46	294
O'Mahony, Timothy, Felton, Cal. Lunch-heater	399,922	Mar. 19	1708	442	46	1483
O'Neil, John, New York, N. Y. Automatic telegraphy	399,154	Mar. 5	546	142, 143	46	1220
O'Neill, Charles Z., assignor to W. Chapman, New York, N. Y. Street-sweeping machine	395,627	Jan. 1	493	125	46	100
Oakes, Alonzo, assignor of one-half to A. R. Ellison, Taylor, Wis. Saw	398,792	Feb. 26	2533	674	46	1100
Oakley, John M., Brooklyn, N. Y. Reversing-gearing for washing-machines	400,246	Mar. 26	2183	573	46	1586
Oakman, Richard N., Jr., *et al.* (See Rowland, Alexander M., assignor.)						
Oaks, William A. C., assignor to Goodell Company, Antrim, N. H. Seed-sower	397,606	Feb. 12	785	207	46	735
Oaks, William A. C., assignor to Goodell Company, Antrim, N. H. Apple-parer and corer	397,871	Feb. 12	1154	309	46	807
Ochs, John T. (See Hayes and Ochs.)						
Ocobock, Malinda K., Maple Rapids, Mich. Wash-boiler	399,432	Mar. 12	972	253	46	1329
Odell, Benjamin C., Kingston, N. Y., assignor to Thompson, Perley & Waite, Baldwinsville, Mass. Convertible chair	399,069	Mar. 5	385	104	46	1188
Odell, Charles H., *et al.* (See Odell, Levi J., assignor.)						
Odell, Levi J., Beloit, assignor of three-fourths to J. E. Burton, Lake Geneva, Wis., and C. H. Odell, Rockford, Ill. Type-writing machine	399,205	Mar. 5	631	164	46	1236
Oelenheimer, Sigmund, New Orleans, La. Warp-dressing machine	398,647	Feb. 26	2319	615	46	1056
Oehler, K. (See Rudolph, Christian, assignor.)						
Oehler, K. (See Rudolph and Priebs, assignors.)						
Oerlein, Robert, New Orleans, La. Drum attachment for banjos	398,176	Feb. 19	1618	429	46	910
Ogle, Graham L. (See Cael and Ogle.)						
Ohio Rake Company *et al.* (See Denney, Samuel L., assignor.)						
Ohio Stoneware Company *et al.* (See Bennett, Franklin, assignor.)						
Ohl & Haefner. (See Haefner, Hugo, assignor.)						
Ohlson, John E., Rockford, Wash. Ter. Potato-planter	398,071	Feb. 19	1470	389	46	883
Okey, Joseph B., assignor of one-half to J. C. Worth, Indianapolis, Ind. Combined harrow and pulverizer	400,412	Mar. 26	2438	630	46	1631
Olds, Charles E., assignor of one-half to H. R. McEwen, Fairbury, Nebr. Windmill	400,004	Mar. 19	1822	473, 474	46	1504
Olinger, John J. (See Westphal, Friedrich F., assignor.)						
Olive, Richard H., Wayland, Mich. Bob-sleigh	397,747	Feb. 12	990	262	46	773
Oliver, David B., Allegheny, Pa. Roll	397,503	Feb. 12	701	182	46	719
Oliver, George T. (See Roberts, Henry, assignor.)						
Oliver, Joseph P., Oakland, Cal. Furnace	395,344	Jan. 1	58	15	46	14
Olsen, Engelbrecht, Walkerville, Mont. Ter. Signal-bell	397,245	Feb. 5	212	55	46	616
Olsen, Hans F., Stoughton, Wis. Machine for irrigating hills for plants	399,279	Mar. 12	743	193	46	1284
Olsen, Isak, Manitowoc, Wis. Farm-gate	395,579	Jan. 1	417	106	46	86
Olsen, Tinius, Philadelphia, Pa. Testing and recording machine	399,549	Mar. 12	1153	299	46	1302
Olsson, Joseph. (See Storey and Olsson.)						
Ormerod, Benjamin, and G. Haworth, assignors to G. and E. Ashworth, Blackburn, county of Lancaster, England. Bearing for pulleys or wheels	398,274	Feb. 19	1760	465	46	940
Orndorff, Thomas C., Worcester, Mass. Packing cartridges for transportation and distribution	399,923	Mar. 19	1709	442	46	1483
Orndorff, Thomas C., Worcester, Mass. Cartridge-belt	399,924	Mar. 19	1710	443	46	1483
Orr, James A., *et al.* (See Anderson and Elias, assignors.)						
Orr, Robert. (See Kent and Orr.)						
Osborn, Enoch L. S., assignor of two-thirds to D. M. Neuman, Waxahachie, Tex. Keyboard attachment for pianos	397,815	Feb. 12	1084	289	46	791
Osborn, Jane C., St. Louis, Mo. Ginning cotton	399,206	Mar. 5	634	164	46	1236
Osborn, Luke W., assignor to D. Robertson, I. D. Stevens, and L. Eberhart, Joliet, Ill. Corn harvester and husker	397,098	Feb. 19	1344	358, 359	46	659
Osborne, Owen, Philadelphia, Pa. Making stockings	398,532	Feb. 26	2145	506	46	1023
Osborne, Theodore B., Plainfield, N. J. Stand for Christmas-trees, &c	397,305	Feb. 5	302	78	46	634
Osburn, William H., Burrton, Kans. Driving device for horse-powers	399,280	Mar. 12	744	194	46	1284
Osgood, Elijah R., Columbus, Ohio. Tail-stock for lathes	398,564	Feb. 12	703	183	46	719
Osteman, Carl G., Boston, Mass. Surface-gage	398,109	Jan. 15	1238	314	46	261
Oster, Louis W., Cleveland, Ohio. Nursing-bottle	395,992	Jan. 8	1073	273	46	221
Ostrom, Freeland W., assignor to Wheeler & Wilson Manufacturing Company, Bridgeport, Conn. Clamp-operating mechanism for button-hole sewing-machines	398,344	Feb. 19	1873	493	46	961

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Oswald, George. (See Shelly, William, assignor.)						
Overman, Albert H., Newton, assignor to Overman Wheel Company, Boston, Mass. Velocipede	398,533	Feb. 26	2146	566	46	1024
Overman Wheel Company. (See Overman, Albert H., assignor.)						
Overton, Thomas, Corpus Christi, Tex. Latch and lock combined	400,111	Mar. 26	1976	517	46	1543
Owen, Alva, Chicago, Ill. Truss	399,433	Mar. 12	973	253	46	1329
Owen, Herbert S., Washington, D. C. Bicycle	398,745	Feb. 26	2471	654	46	1068
Owens, William J., assignor to Sayre, Owens & Co., Utica, N. Y. Check-draft	395,917	Jan. 8	953	245	46	197
Owsley, John J., Sr., *et al.* (See Knowlton, Ephraim H. B., assignor.)						
Packard, James W., New York, N. Y. Revolving photometer-stand	396,951	Jan. 29	2493	643	46	522
Packard, James W., New York, N. Y. Milling-machine	396,952	Jan. 29	2494	643, 644	46	522
Packer, John F., assignor to D. Bradley Manufacturing Company, Chicago, Ill. Cultivator	396,364	Jan. 15	1614	413	46	330
Paddock, Gustavus A., Beaver Dam, Wis. Harrow	397,514	Feb. 12	627	162	46	705
Pagan, Emile J., Paris, France. Drag-anchor	396,229	Jan. 15	1416	361	46	295
Page, Albert A., assignor to Sargent & Company, New Haven, Conn. Transom-lifter	396,953	Jan. 29	2496	644	46	523
Page, Andrew J., Philadelphia, Pa. Combined goblet-holder and drip-cup attachment for refrigerators	400,358	Mar. 26	2360	616	46	1617
Page, Augustus U., and J. Bragg, Cleveland, Ohio. Oil-burner	396,049	Jan. 8	1146	291	46	235
Page, George F., Concord, N. H. Belting	400,005	Mar. 19	1824	474	46	1504
Page, George F., Concord, N. H. Machine-belting	400,006	Mar. 19	1825	474	46	1504
Paget, Leonard, assignor to Macracon Storage Battery Company, New York, N. Y. Preparing electrodes for secondary batteries	397,607	Feb. 12	796	207	46	735
Paget, Leonard, assignor to Macracon Storage Battery Company, New York, N. Y. Electrode for secondary batteries	397,608	Feb. 12	798	208	46	736
Paige, James H., Leadville, Colo. Lamp-extinguisher	397,931	Feb. 19	1244	332	46	841
Painter, M. L., *et al.* (See Michael, William G., assignor.)						
Paiste, Harry T., West Chester, Pa. Electric switch	399,550	Mar. 12	1157	300	46	1363
Palmenberg, Raymond P., New York, N. Y. Bracket	397,748	Feb. 12	991	262	46	773
Palmer Brothers. (See Palmer, William H., Jr., assignor.)						
Palmer, Cortlandt E., Rico, Colo. Apparatus for sampling ores	398,275	Feb. 19	1761	466	46	940
Palmer, Dolphus D., Waltham, Mass. Cannon-pinion for watches	395,754	Jan. 8	689	176	46	147
Palmer, Ellen M., *et al.* (See Palmer, Seymour C., assignor.)						
Palmer, H. N. (See Lobach, Eugene B., assignor.)						
Palmer, Harlan J., *et al.* (See Holley, Clarence E., assignor.)						
Palmer, Henry J., Brooklyn, N. Y. Electrical railway signaling apparatus	399,155	Mar. 5	552	143	46	1221
Palmer, James W., North Springfield, Mo. Wire gate	396,230	Jan. 15	1418	361	46	295
Palmer, John H., Rockaway, N. J. Car-starter	398,438	Feb. 26	2011	528	46	996
Palmer, Seymour C., assignor to E. M. Palmer and A. Solmans, South Norwalk, Conn. Hat-forming machine	399,551	Mar. 12	1158	300	46	1363
Palmer, Timothy G., Schultzville, N. Y. Point for switch-rails	397,306	Feb. 5	303	79	46	674
Palmer, William A., South Pittsburg, Tenn. Apparatus for molding pipes	396,506	Jan. 22	1833	470	46	382
Palmer, William H., Jr., Norwich, assignor to Palmer Brothers, Montville, Conn. Locking device for sewing machine heads	398,534	Feb. 26	2147	567	46	1024
Pancake, C. P., *et al.* (See Bowman, William H., assignor.)						
Paramore, Edward F., Oconto, Wis. Suspender-hook	399,775	Mar. 19	1486	383	46	1440
Paramore, Samuel L., assignor to Tewart Manufacturing Company, St. Louis, Mo. Washing-fluid	399,626	Mar. 12	1206	.....	46	1384
Pardee, William H., Columbia, Dak. Ter. Duplicating-tablet	398,072	Feb. 19	1471	389	46	883
Pardee, William H., Columbia, Dak. Ter. Temporary binder	398,073	Feb. 19	1472	389	46	883
Parent, Charles. (See Sawyer and Parent.)						
Parent, Charles, Boston, Mass. Water-drainer and pop safety-valve	399,070	Mar. 5	386	104	46	1188
Park, David E. (See Lash, Aiken, and Park.) (Reissue.)						
Park, John B. (See Finch and Park.)						
Parker, George T., Glasgow, Ky. Horse-detacher	399,434	Mar. 12	974	253	46	1329
Parker, George W., Terre Haute, Ind. Axle-lubricator for cars	399,627	Mar. 12	1267	326	46	1384
Parker, Joel C., Grand Rapids, Mich. Line-guide for fishing-rods	396,707	Jan. 22	2132	516	46	437
Parker, Lewis C., assignor of one-half to R. Simpson, Jr., Cincinnati, Ohio. Clothes-wringer	398,793	Feb. 26	2534	674	46	1101
Parkhurst, Augustus G., Minneapolis, Minn. Combined curb and gutter	398,074	Feb. 19	1473	389	46	883
Parkhurst, Edward B., Woburn, Mass. Wire-nail machine	397,022	Jan. 29	2597	670, 671	46	543
Parkison, Allen R., and J. Pullinger, assignors of one-third to J. M. McGrew, Monongahela City, Pa. Apparatus for treating middlings	395,580	Jan. 1	418	107	46	86
Parks, George W., Brooklyn, N. Y., assignor to H. and S. C. Howard, Providence, R. I. Pocket-box	396,110	Jan. 15	1239	315	46	262
Parlin & Orendorff Company. (See Parlin, William H., assignor.)						
Parlin, William H., assignor to Parlin & Orendorff Company, Canton, Ill. Cultivator	398,177	Feb. 19	1618	429, 430	46	911
Parmeter, Addison J., Frederick, Dak. Ter. Plow attachment	395,994	Jan. 8	1074	273	46	221
Parno, Emil W. (See Cole and Parno.)						
Parr, Henry A. (See Keller, Hugo, assignor.)						
Parr, Jacob, Irwin, Pa. Bob-sled	395,993	Jan. 8	1073	273	46	221
Parrott, Richard D. A., Arden, N. Y., assignor to L. Gifford, Jersey City, N. J. Apparatus for gathering mineral wool	396,050	Jan. 8	1147	291	46	235
Parry, David M., Indianapolis, Ind. Shaft-coupling for vehicles	396,231	Jan. 15	1419	361	46	296
Parry, David M., Indianapolis, Ind. Hub-boring machine	397,816	Feb. 12	1086	289	46	792
Parry, David M. and T. H., Indianapolis, Ind. Two-wheeled vehicle	395,506	Jan. 1	294	76	46	63
Parry, David M. and T. H., Indianapolis, Ind. Two-wheeled vehicle	398,178	Feb. 19	1621	430	46	911
Parry, David M. and T. H., Indianapolis, Ind. Vehicle-seat	398,179	Feb. 19	1622	430	46	911
Parry, David M. and T. H., Indianapolis, Ind. Spring-support for vehicles	398,180	Feb. 19	1623	430	46	912
Parry, Edward G., Ithaca, N. Y. Breech-loading fire-arm	395,849	Jan. 8	852	220	46	179
Parry, Thomas H. (See Parry, David M. and T. H.)						
Parsons, A. Ingram, deceased, St. Louis, Mo.; H. F. Parsons administrator, and assignor, by mesne assignments to Parsons Block, Switch and Frog Company, New York, N. Y. Automatic railway-switch	356,418	Jan. 22	1694	435	46	354
Parsons Block, Switch and Frog Company. (See Parsons, A. Ingram, assignor.)						
Parsons Block, Switch and Frog Company. (See Parsons, Henry F., assignor.)						
Parsons, Francis W., Philadelphia, Pa. Car-coupling	395,402	Jan. 1	142	36	46	31
Parsons, Frank, Russell Springs, Kans. Door-check	398,439	Feb. 26	2014	528	46	997
Parsons, H. F., administrator. (See Parsons, A. Ingram.)						
Parsons, Henry, Marlborough, Mass. Frictional driving mechanism	395,507	Jan. 1	296	76	46	63
Parsons, Henry F., assignor, by mesne assignments, to Parsons Block, Switch and Frog Company, New York, N. Y. Railway switch and signal	396,419	Jan. 22	1696	435, 436	46	355

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Parsons Henry F., assignor, by mesne assignments, to Parsons Block, Switch and Frog Company, New York, N. Y. Continuous-rail frog for railways	396,420	Jan. 22	1700	436	46	355
Parsons, Henry F., assignor, by mesne assignments, to Parsons Block, Switch and Frog Company, New York, N. Y. Automatic block-signaling system and apparatus for railways	396,421	Jan. 22	1701	436, 437	46	356
Parsons, John G., Columbus, Ohio. Two-wheeled vehicle	397,515	Feb. 12	628	163	46	705
Paterson, Andrew, McKeesport, Pa., assignor to National Tube Works Company, Boston, Mass. Vehicle-axle	396,763	Jan. 29	2229	570	46	465
Paterson, Andrew, McKeesport, Pa., assignor to National Tube Works Company, Boston, Mass. Vehicle-axle stock	397,609	Feb. 12	799	208	46	736
Paterson, Edward J. (See Hermite, Paterson, and Cooper.)						
Paterson, James, Glasgow, county of Lanark, Scotland. Self-indicating target	395,581	Jan. 1	421	107	46	87
Paterson, James and W., Stockton, Cal. Plow	398,648	Feb. 26	2320	615	46	1057
Paterson, Thomas W., Victoria, British Columbia, Canada. Car-coupling	398,440	Feb. 26	2015	529	46	997
Paterson, William. (See Paterson, James and W.)						
Paton, James, Johnstone, county of Renfrew, Scotland. Appliance for hanging and exhibiting boot or shoe laces	399,552	Mar. 12	1160	300	46	1363
Patrick, John J. R., Belleville, Ill. Combination dental tool	399,071	Mar. 5	388	104	46	1189
Patten, Francis J., New York, N. Y. Dynamo-electric machine and motor	397,439	Feb. 5	509	134, 135	46	676
Patten, Francis J., assignor to J. M. Seymour, New York, N. Y. Multiplex telegraphy	395,508	Jan. 1	297	77	46	63
Patten, Francis J., assignor to J. M. Seymour, New York, N. Y. Multiplex telegraphy	395,509	Jan. 1	302	77	46	64
Patten, Francis J., assignor to J. M. Seymour, New York, N. Y. Multiplex telegraphy	395,510	Jan. 1	305	78	46	65
Patten, Francis J., assignor to J. M. Seymour, New York, N. Y. System of synchronizing electric motors	397,817	Feb. 12	1087	289, 290	46	792
Patten, Francis J., assignor to J. M. Seymour, New York, N. Y. System of synchronizing electric motors	398,794	Feb. 26	2535	674	46	1101
Patten, Jefferson, Green Point, assignor of part to C. K. Hamilton, Jr., Summit, I. A. Gard, Bergen Point, and C. H. Mundy, Metuchen, N. J. Hydrocarbon-burner	397,749	Feb. 12	991	263	46	774
Patten, Thomas W., Baltimore, Md. Nut-lock	398,585	Feb. 26	2149	567	46	1024
Patterson, Carlisle D., Girard, Kans. Feed-regulator	398,746	Feb. 26	2472	655	46	1068
Patterson, Clara E., New York, N. Y. Coin-controlled opera-glass	395,345	Jan. 1	59	15	46	14
Patterson, Clara E., New York, N. Y. Automatic picture-exhibitor	399,553	Mar. 12	1161	301	46	1364
Patterson, James W. (See Spiegel, William G., assignor.)						
Patterson, William E., Cologne, Minn. Sawing-machine	397,203	Feb. 5	155	41	46	606
Patterson, William R., assignor to Western Electric Company, Chicago, Ill. Telegraph-cable	398,441	Feb. 26	2016	529	46	997
Patterson, William R., assignor to Western Electric Company, Chicago, Ill. Telegraph-cable	398,442	Feb. 26	2017	529	46	998
Paul, Isaac F., *et al.* (See Lawrence, Victor V., assignor.)						
Paul, William C., and O. D. Kleiusteuber, assignors of one-third to T. K. Ewing, Milwaukee, Wis. Railway-signal	396,365	Jan. 15	1615	413, 414	46	331
Pawlowski, Jacob, Cincinnati, Ohio, assignor of one-half to A. Winter, West Covington, Ky. Holder for electric-arc lamps	395,755	Jan. 8	689	176	46	147
Payen, Clément, Philadelphia, Pa., assignor to Electric Storage Battery Company, Gloucester City, N. J. Furnace for heating metals	398,443	Feb. 26	2018	529, 530	46	998
Payne, Edwin W., Morrison, Ill. Wood-carrier	398,902	Mar. 5	129	35	46	1139
Payne, Henry B., Nottingham, England, assignor of one-half to A. G. Jennings & Sons, Brooklyn, N. Y. Straight-knitting machine	397,141	Feb. 5	54	13, 14	46	588
Payne, Henry B., and W. Campion, Radford, county of Nottingham, England; said Campion assignor, by mesne assignments, to A. G. Jennings & Sons, Brooklyn, N. Y. Warp-knitting machine	397,140	Feb. 5	51	12, 13	46	588
Payne, Henry B., and W. Campion, Nottingham, England; said Campion assignor, by mesne assignments, to A. G. Jennings & Sons, Brooklyn, N. Y. Circular-warp-knitting machine	397,142	Feb. 5	56	14	46	588
Payne, William J., London, assignor to J. E. and C. H. Bingham, Sheffield, England. Apparatus for withdrawing effervescing or gaseous liquids from corked receptacles	396,708	Jan. 22	2133	516	46	438
Paynter, John P., Pomona, Kans. Mining-drill and channel-cutter	395,716	Jan. 8	633	160	46	136
Payson, Edward. (See Smith, John W., assignor.)						
Pearce, Joseph A., assignor of one-half to M. B. Stewart, Grand Rapids, Mich. Cultivator	399,628	Mar. 12	1269	326	46	1384
Pearson, Aven, Washington, D. C. Cash-indicator	400,247	Mar. 26	2185	573, 574	46	1586
Pearson, George S., Waterbury, Conn. Drawer-pull	398,181	Feb. 19	1624	431	46	912
Pearson, Marshall H., and C. Bennion, Leicester, county of Leicester, England. Punching and eyeleting machine	396,890	Jan. 29	2411	619, 620	46	505
Pearson, William B., Jacksonville, Ill. Cover for writing-tablets	396,508	Jan. 22	1835	471	46	382
Pearson, William E., Sangus, assignor to N. H. Daniels, Boston, Mass. Steam-muffler	396,507	Jan. 22	1835	471	46	382
Peart, Adam, Corning, N. Y. Heat-radiator	399,776	Mar. 19	1457	384	46	1440
Pease, Robert R., Hartford, Conn. Woven-wire mat and scraper	399,554	Mar. 12	1163	301	46	1364
Pech, Gustavus, Storm Lake, Iowa. Well-boring machine	398,649	Feb. 26	2322	616	46	1057
Peck, Barton. (See Champion, William S., assignor.)						
Peck, Duncan W. (See Van Zandt, Jacob, assignor.)						
Peck, Eugene H., assignor to Meriden Bronze Company, Meriden, Conn. Drawer-pull	398,183	Feb. 19	1627	431	46	912
Peck, Eugene H., and A. H. Jones, assignors to Meriden Bronze Company, Meriden, Conn. Metal table	398,182	Feb. 19	1626	431	46	912
Peck, Horace B. (See Boyle, Homer L., assignor.)						
Peck, Joseph C., *et al.* (See Kelsey, Frank N., assignor.)						
Peck, Melinda. (See Adams, Phineas H., Jr., and O. T. X., assignors.)						
Peck, Orren B., Chicago, Ill., assignor to American Slag Furnace Company. Slag steam-generator	395,665	Jan. 1	559	139	46	112
Peck, Stow & Wilcox Company. (See Shepard, Amos, assignor.)						
Peck, Walter A., trustee. (See Bright, Richard A., assignor.)						
Pedersen, Johannes T., New York, N. Y. Secondary battery	398,075	Feb. 19	1473	390	46	884
Peel, James A., Springport, Ky. Vehicle-shaft support	398,076	Feb. 19	1475	390	46	884
Peet, Walter F., Philadelphia, Pa. Hair-pin	395,582	Jan. 1	424	107	46	87
Pelkey, Frank A. (See Berdrow and Pelkey.)						
Pellatt, William C., Brockley, county of Kent, England. Appliance for spacing or fanning out envelope-blanks or sheets of paper for gumming or bordering	396,594	Jan. 22	1972	507	46	406
Pelts, Joseph, Vincit, Mo. Tempering saws	400,248	Mar. 26	2187	574	46	1586
Pemberton & Sons, Thomas. (See Ayton and Hill, assignors.)						
Pendergast, Daniel. (See Pendergast, John and D.)						
Pendergast, John, Boston, and D. Pendergast, Merrimac, Mass. Cone or former for felt-hardening machines	399,072	Mar. 5	389	105	46	1189
Pendleton, Gurdon, Jr. (See Worthen and Pendleton.)						
Pendleton, William, deceased; H. A. Hodge, Jackson, Mich., administrator. Window-stop	400,403	Mar. 26	2434	635	46	1629

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr's.	Official Gazette. Vol.	Official Gazette. Page.
Penfield, Charles R., Rochester, N. Y. Machine for sawing staves	396,763	Jan. 29	2229	571	46	465
Penney, Joseph, Grand Rapids, Mich. Folding bedstead	397,307	Feb. 5	304	79	46	634
Penney, Joseph, Grand Rapids, Mich. Folding bed	397,308	Feb. 5	306	80	46	634
Penney, William L., and T. Little, Pittsburg, Pa. Underground electric-wire conduit	399,343	Mar. 12	838	218	46	1303
Pennock, Lee J., assignor of two-thirds to E. A. Taylor and J. W. Eroe, Jamestown, N. Y. Spring-coiling machine	395,511	Jan. 1	310	78, 79	46	66
Penny, Sanford A., Rochester, N. Y. Lathe	398,077	Feb. 19	1475	390, 391	46	884
Pennybacker, Morgan, assignor of one-half to A. F. Kingsley, Washington, D.C. Nut-lock	398,795	Feb 26	2537	675	46	1101
Penoyer, Hiram, Western Saratoga, Ill. Bee-hive	399,281	Mar. 12	747	194	46	1285
Perkins, George H., Philadelphia, Pa. Distilling petroleum	399,073	Mar. 5	389	105	46	1189
Perkins, Loftus, Gray's Inn Road, county of Middlesex, England. Refrigerating and freezing apparatus	399,307	Mar. 5	634	164, 165, 166	46	1226
Perkins, William C., New Haven, Conn. Wire hinge	395,403	Jan. 1	143	36	46	31
Perot, Edward S., *et al.* (See Phippe, Edward H., assignor.)						
Perrigo, Oscar E. (See Whiteley, Bayley, and Perrigo.)						
Perry, Daniel W., Harrisburg, Pa. Guide for band and scroll saws	395,797	Jan. 8	772	200	46	161
Perry, Francis L., Brooklyn, N. Y. Vehicle-gear	397,932	Feb. 19	1245	332	46	841
Perry, Henry C., Coffeyville, Kans. Ironing-board	399,925	Mar. 19	1711	443	46	1483
Perry, James L., Watertown, assignor to Berlin Machine Works, Beloit, Wis. Polishing-cylinder	399,629	Mar. 12	1270	326	46	1324
Perry, Joseph R. (See Hopkins and Perry.)						
Perry, Marlow F., West Oneonta, N. Y. Road grader and ditcher	395,451	Jan. 1	212	54	46	45
Perry, Morgan B. (See Selser, Johnson, and Perry.)						
Perry, Thomas A., Abilene, Kans. Trough for watering stock	396,595	Jan. 22	1973	508	46	407
Perry, Thomas O., Tecumseh, Mich. Pneumatic water-elevator	398,184	Feb. 19	1628	431	46	912
Perry, Thomas O., Chicago, Ill. Automatic valve	400,249	Mar. 26	2188	574, 575	46	1586
Peter, John S., Lincoln, Nebr. Oil-can nozzle	396,891	Jan. 29	2415	620	46	506
Peters, Gershom M., Cincinnati, Ohio. Cartridge-loading machine	398,650	Feb 26	2322	616, 617, 618	46	1057
Peters, Gershom M., Cincinnati, Ohio. Feeding mechanism for cartridge loading machines	398,651	Feb 26	2322	619	46	1059
Petersen, Eduard A. C., Lake View, Ill. Baker's oven	400,250	Mar. 26	2192	575	46	1587
Petersen, Jens M., Clinton, Iowa. Machine for fitting the ends of band-saws	399,344	Mar. 12	839	219	46	1303
Peterson, Albon C., assignor of one-half to T. J. Brooks, Arcadia, La. Fence-post	398,078	Feb. 19	1478	391	46	885
Peterson, Alfred, St. Paul, Minn. Padlock	396,506	Jan. 22	1974	508	46	407
Peterson, Edward, *et al.* (See Skow, Matts, assignor.)						
Peterson, Silas T., and M. Reed, Whitman, Mass. Metallic shank for boots or shoes	395,628	Jan. 1	406	125	46	106
Petherick, Vernon, Brisbane, Queensland. Animal-shears	396,532	Jan. 29	2328	596	46	487
Petry, Nicholas, Rockport, Mo. Saw	398,079	Feb. 19	1478	391	46	885
Pettenkofer, Edward. (See Reiss and Pettenkofer.)						
Pfannkuche, Gustav, assignor to Brush Electric Company, Cleveland, Ohio. Regulation of alternate-current generators	396,422	Jan. 22	1704	437	46	356
Pfeifer, John, Philadelphia, Pa. Apparatus for scouring, cleansing, and polishing metal, &c.	395,583	Jan. 1	424	108	46	88
Pfeifer, John, Springfield, Ohio. Adding-machine	400,359	Mar. 26	2361	616	46	1617
Pfenning, Carl A., Barmen Rittershausen, Prussia, Germany. Button-machine	396,423	Jan. 22	1707	437	46	357
Pfenning, Carl A., Barmen Rittershausen, Prussia, Germany. Button-machine	396,424	Jan. 22	1709	438, 439	46	357
Pfenning, Carl A., Barmen Rittershausen, Prussia, Germany. Button-machine	396,425	Jan. 22	1711	439, 440	46	358
Pfenning, Carl A., Barmen Rittershausen, Prussia, Germany. Button-machine	396,426	Jan. 22	1712	440	46	358
Pfenning, Carl A., Barmen Rittershausen, Prussia, Germany. Button-machine	396,427	Jan. 22	1713	440	46	359
Pfingst, Louis. (See Bemis and Pfingst.)						
Pfingst, Louis, Pullman, assignor to G. M. Pullman, Chicago, Ill. Sash-holder	396,709	Jan. 22	2135	546	46	438
Pfingsten, Carl G., New York, N. Y. Pocket-book clasp	397,933	Feb. 19	1247	333	46	841
Pfister, Lewis, Martinsville, Ohio. Fence-making machine	398,796	Feb. 26	2538	675	46	1102
Pfueger, Ernest F., Akron, Ohio. Harness-pad	399,074	Mar. 5	391	105	46	1189
Phelps, Andrew J., Syracuse, N. Y. Metallic seal	397,384	Feb. 5	416	110	46	656
Phelps, Homer L., assignor of one-half to G. D. Miller, Athens, Pa. Car-brake	398,797	Feb. 26	2538	675	46	1102
Phelps, Thomas H. (See Hyland, Henry H., assignor.)						
Phelps, William S., San Francisco, Cal. Cable or electric street-railway	397,385	Feb. 5	417	110	46	656
Phenix, William, Chicago, Ill. Automatic switch for cable railways	397,610	Feb. 12	799	208	46	736
Phenix, William, Chicago, Ill. Tension appliance for traction cables	397,611	Feb. 12	801	208	46	736
Philbrick, Daniel, Amesbury, Mass., assignor to T. I. Marden, Rye, N. H. Detachable handle	400,300	Mar. 26	2364	617	46	1618
Philbrick, Frank B., assignor of one-half to F. B. Webber, Waterville, Me. Cylinder planer	397,946	Feb. 5	213	56	46	616
Phillips, Ferdinand, Philadelphia, Pa. Machine for fitting nuts on bolts	396,597	Jan. 22	1974	508	46	407
Phillips, Horace G. (See Clarke and Phillips.)						
Phillipi, Frank A., assignor of one-half to S. Lutz, Reading, Pa. Cigar-cutter	398,345	Feb. 19	1875	493	46	902
Phillips, Charles F. (See McClure and Phillips.)						
Phillips Economical Cable Grip Construction Company. (See Phillips, Elwood C., assignor.)						
Phillips, Elwood C., St. Louis, Mo., assignor to Phillips Economical Cable Grip Construction Company, Chicago, Ill. Grip for cable railways	399,075	Mar. 5	392	106	46	1189
Phillips, Francis V., assignor to Chicago Sash Pulley Company, Chicago, Ill. Mortising-machine	399,435	Mar. 12	975	254	46	1330
Phillips, William H., Jenkintown, Pa. Rail-bending tool	399,630	Mar. 12	1272	327	46	1325
Phinney, Nathan D., New Bedford, Mass. Goods-rack	397,750	Feb. 12	993	263	46	774
Phippe, Edward H., New Haven, Conn., assignor to E. S. Perot and J. P. McQuaide. Conduit for electric wires or cables	395,584	Jan. 1	425	108	46	88
Phippe, Henry G. (See Stiggins, Edward A., assignor.)						
Planko, Mendel, *et al.* (See Bukawietis, Kazimieras, assignor.)						
Picken, John. (See Atchison, George M., assignor.)						
Piel Brothers. (See Piel, Michael, assignor.)						
Piel, Michael, East New York, assignor to Piel Brothers, Brooklyn, N. Y. Absorber for refrigerating-machines	395,512	Jan. 1	313	79	46	66
Pierce, Andrew J., Racine, Wis. Steam-engine	398,444	Feb. 26	2019	530	46	998
Pierce, Andrew J., Racine, Wis. Oil-burner	398,536	Feb. 26	2150	567	46	1024
Pierce, Arthur M., Lyndhurst, N. J. Automaton	398,276	Feb. 19	1763	466	46	940
Pierce, Octavius, Chicago, Ill. Fire-extinguisher	395,756	Jan. 8	690	176	46	147
Pierce, Thomas A., and I. H. Wadleigh, East Greenwich, R. I. Brush-holder	398,537	Feb. 26	2151	567	46	1025
Pierce, William O., Sacramento, assignor of one-half to M. Mierson, Placerville, Cal. Gate	398,798	Feb. 26	2539	675, 676	46	1102

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr's.	Official Gazette. Vol.	Official Gazette. Page.
Pietzka, Gottfried, Witkowitz, Moravia, Austria-Hungary. Rotary double-flame furnace	398,973	Mar. 5	839	66, 67	46	1160
Pipes, William W., and A. L. Kelly, Wheeling, W. Va. Tool for lathes and planers	396,764	Jan. 29	2231	571	46	466
Pitcairn, Robert, *et al.* (See Reese, Abram, assignor.)						
Pitcher, Henry A., Neillsville, Wis. Magazine-gun	397,143	Feb. 5	61	15	46	589
Pitman Manufacturing Company. (See Davis, Albert T. L., assignor.)						
Pitman Manufacturing Company. (See Davis and Stevens, assignors.)						
Plano Manufacturing Company. (See Hunt, George G., assignor.)						
Platt, James F., Sterling, Ill. Bob-sleigh	396,232	Jan. 15	1420	361	46	296
Plessy, Gabriel, Paris, France. Handle for opera-glasses	398,277	Feb. 19	1766	466, 467	46	941
Plom, Léopold, Retinne, and J. D'Andrimont, Liege, Belgium. Blasting	397,440	Feb. 5	516	13	46	677
Plom, Leopold, Retinne, and J. D'Andrimont, Liege, Belgium. Reamer for forming blast-holes	399,156	Mar. 5	554	143	46	1222
Plumley, George W. (See Graham, Charles T., assignor.)						
Poe, Alonzo M., Lakeport, Cal. Cough-mixture	395,346	Jan. 1	61		46	15
Poehlman, Henry E., San Francisco, Cal. Camera-adjuster	399,345	Mar. 12	840	219	46	1304
Pollard, Charles E., assignor of one-half to E. S. Stiles, Middletown, Conn. Machinist's blocking	399,926	Mar. 19	1712	443	46	1483
Pollard, Charles T., *et al.* (See Chapman, John R., assignor.)						
Pomeroy, Eltweed, Newark, N. J. Spreader and stopper for bottles	399,927	Mar. 19	1713	443	46	1484
Pool, Francis W., Norwich, Conn. Tricycle	398,892	Jan. 29	2416	620, 621	46	506
Poole, Edward L. (See Pope and Poole.)						
Poole, William H., Oxford, Iowa. Clock striking mechanism	396,598	Jan. 22	1976	508, 509	46	407
Poor, Charles E., and G. Martin, Fairbury, Nebr. Wash-boiler	400,007	Mar. 19	1698	475	46	1585
Poor, George H., assignor to American Brake Company, St. Louis, Mo. Valve for fluid-pressure brakes	396,171	Jan. 15	1327	340	46	278
Poore, Graydon, and W. C. Storey, London, county of Middlesex, England. Submarine vessel	399,683	Mar. 19	1363	351	46	1414
Pope, John L., Cleveland, Ohio. Automatic lock-joint for railway-rails	395,916	Jan. 8	954	245	46	197
Pope, Joseph H., assignor to American Heeling Machine Company, Brockton, Mass. Heel-nailing machine	399,631	Mar. 12	1273	327, 328	46	1325
Pope, Joseph H., Brockton, Mass., assignor to American Heeling Machine Company, of Maine. Heel-nailing machine	399,777	Mar. 19	1488	381	46	1440
Pope Manufacturing Company. (See Latta, Emmit G., assignor.)						
Pope, William R., and E. L. Poole, Baltimore, Md. Automatic photographic apparatus	396,498	Jan. 22	1714	440, 441	46	359
Porchers, Wilmot D. (See Sheppard, John L., assignor.)						
Porter, Edwards W., assignor to Detroit Patent Brush Company, Detroit, Mich. Brush-machine	396,954	Jan. 29	2498	644, 645	46	523
Porter, Frederick E., Baltimore, Md. Paper-bag machine	398,278	Feb. 19	1767	467	46	941
Porter, Joseph E. (See Price, Benjamin F., assignor.)						
Porter, Stephen, Boston, Mass., assignor, by mesne assignments, to Eagle Manufacturing Company, of Maine. Metallic brush	396,299	Jan. 15	1302	381	46	310
Porter, Thomas W., Chelsea, Mass. Vehicle-pole	397,934	Feb. 19	1248	333	46	841
Portmann, Henry G., assignor of one-half to W. W. Portmann, St. Louis, Mo. Spring-gear for children's carriages	395,585	Jan. 1	426	108	46	88
Portmann, William W. (See Portmann, Henry G., assignor.)						
Posse, Vito M., Paris, France. Advertising device	396,299	Jan. 15	1503	381	46	311
Post, Ezra L., New York, N. Y. Fish-hook extractor	400,112	Mar. 26	1977	517	46	1544
Potter, Arthur W., and T. J. McCormon, Wilkes-Barré, Pa. Desk attachment	396,665	Jan. 22	2071	532	46	427
Potter, Ephraim, Bowling Green, Ky. Fence	398,974	Mar. 5	242	67	46	1160
Potter, Henry V. (See McFeely and Potter.)						
Potter, Hobert B., Hillburn, N. Y. Interlocking switch and signal	395,452	Jan. 1	213	55	46	46
Potter, James C., Pawtucket, R. I. Evening mechanism for cotton-openers, &c	399,076	Mar. 5	394	106	46	1190
Potter, James C., Pawtucket, R. I. Evening mechanism for cotton-openers, &c	399,077	Mar. 5	396	107	46	1190
Potts, George, Indianapolis, Ind. Mold-sanding machine	397,247	Feb. 5	215	56	46	616
Potts, James F. (See Fischer, August, assignor.)						
Poulsson, Jared, Passaic, N. J. Tube scraper and cleaner	399,346	Mar. 12	841	219	46	1304
Poundstone, William E. (See Lanyon, Robert H., assignor.)						
Powel, Ricard L., Silver City, N. Mex. Ter. Car-coupling	396,509	Jan. 22	1837	471	46	383
Powell, Edward, Newtown, county of Montgomery, England. Apparatus for delivering goods in exchange for coin	398,279	Feb. 19	1769	468	46	942
Powell, James, Cincinnati, Ohio. Device for preventing the loosening of nuts	397,935	Feb. 19	1250	333	46	842
Powell, Maurice M., Kerrtown, Pa. Machine for finishing bottles	398,280	Feb. 19	1772	468	46	942
Power, Augustus D., assignor of one-half to E. A. Stouffer, Akron, Ohio. Gas-trap for tuyeres and conducting-pipes	396,765	Jan. 29	2233	572	46	466
Powers, Adelbert G., Billsborough, N. Y. Cultivator	396,533	Jan. 29	2330	507	46	457
Powers, Daniel E., assignor of one-half to G. W. Fuller, New York, N. Y. Rotary steam-engine	397,516	Feb. 12	629	163, 164	46	705
Powers, David J., Chicago, Ill. Sash-fastener	395,513	Jan. 1	314	80	46	66
Powers, David J., Chicago, Ill., assignor to Union Wire Mattress Company, of Illinois. Upright or folding bed	398,747	Feb. 26	2473	655	46	1088
Powers, Edward B., assignor to Reed & Barton, Taunton, Mass. Blow-pipe	395,453	Jan. 1	216	55	46	46
Powers, Michael L., assignor to P. O. Keefe, Miller's Falls, Mass. Machinery for grinding and polishing the handles of cutlery	399,908	Mar. 5	638	166	46	1237
Powers & Walker Casket Company. (See Walker, Joseph H., assignor.)						
Poyton, Josiah, assignor to C. R. Vincent, New York, N. Y. Machine for making weather-strips	398,346	Feb. 19	1876	493, 494	46	902
Prahar, Louis B., Brooklyn, N. Y. Album-clasp	395,454	Jan. 1	219	56	46	47
Prahar, Louis B., Brooklyn, N. Y. Fastening for pocket-book, purse, or satchel frames	397,248	Feb. 5	216	57	46	617
Prall, Joseph W., assignor of three-fourths to W. G. Downie, Pomeroy, Ohio. Lock-cap cleatless roofing	397,693	Jan. 29	2086	607	46	561
Prater, William A., Paw Paw, Mich. Fence-post	395,995	Jan. 8	1075	274	46	221
Pratt & Cady Company. (See Pratt, Rufus N., assignor.)						
Pratt & Cady Company. (See Seaver, Frank W., assignor.)						
Pratt, Charles A., Toledo, Ohio. Door-check	396,429	Jan. 22	1717	441	46	359
Pratt, Clara B. (See Pratt, Samuel B. and C. B.)						
Pratt, Philip W. (See White, Frank, assignor.)						
Pratt, Ronello F., Boston, Mass. Pop safety-valve	398,445	Feb. 26	2020	530	46	998
Pratt, Ronello F., Revere, and C. D. Wainwright, Medford, Mass., assignors to Wainwright Manufacturing Company, Portland, Me. Feed-water heater	395,347	Jan. 1	62	15	46	15
Pratt, Rufus N., assignor to Pratt & Cady Company, Hartford, Conn. Valve	397,751	Feb. 12	993	264	46	774

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Pratt, Samuel B., Boston, Mass. Spindle for spools of thread	398,000	Feb. 19	1356	360	46	860
Pratt, Samuel B. and C. B., Boston, Mass. Thread-holder for spools	397,999	Feb. 19	1355	359	46	860
Pratt & Whitney Company. (See Richards, Francis H., assignor.)						
Pratt & Whitney Company. (See Smith, Thomas L., assignor.)						
Pratt & Whitney Company. (See Woodbridge, James E., assignor.)						
Prentiss, Charles H., Cleveland, Ohio. Hydrocarbon-oil burner for stoves, &c	397,672	Feb. 12	1156	309	46	807
Prentiss Vise Company. (See Blake, John A., assignor.)						
Prescott, Clande E. (See Gunn, John C., assignor.)						
Prescott, Samuel A., Wilkinsonville, Mass. Card-grinding machine	399,694	Mar. 19	1366	351, 352	46	1415
Pressley, Leonidas C. (See Clark, John T., assignor.)						
Preston, Albert F., Lynn, Mass., assignor to Preston Lasting Machine Company, Portland, Me. Lasting-machine	395,629	Jan. 1	496	125, 126	46	100
Preston, Albert F., Lynn, Mass., assignor to Preston Lasting Machine Company, Portland, Me. Lasting-machine for boots or shoes	395,630	Jan. 1	500	126, 127	46	101
Preston, Harvey L., Hudson, Wis. Brake-beam	396,383	Jan. 15	1639	420, 421	46	335
Preston Lasting Machine Company. (See Preston, Albert F., assignor.)						
Preusse, Carl E., Reudnitz, Leipsic, Saxony, Germany. Book-stapling machine	399,555	Mar. 12	1164	301	46	1364
Price, Bally M. V. B., Arroyo Grande, Cal. Veterinary remedy	396,111	Jan. 15	1240	.....	46	202
Price, Benjamin F., Bloomington, assignor of one-half to J. E. Porter, Ottawa, Ill. Hot-air furnace	397,660	Feb. 12	868	228	46	750
Price, Charles B., Pittsburg, Pa. Railway-frog	398,975	Mar. 5	243	67, 68	46	1140
Price, Cyrus E., Stoneham, Mass. Hitching device for vehicles	400,113	Mar. 26	1978	518	46	1544
Price, George M. (See Arnett and Price.)						
Price, George W., assignor to J. D. Fiske, Baltimore, Md. Steam-engine	397,468	Feb. 5	535	145	46	684
Price, John A., Scranton, Pa. Stove-panel	395,919	Jan. 8	936	246	46	198
Price, William H., Jr., assignor to Chandler & Price, Cleveland, Ohio. Gripper mechanism for platen printing-presses	399,282	Mar. 12	749	194, 195	46	1285
Prichard, Richard M., assignor of one-half to J. J. Williams, New Rockland, Quebec, Canada. Surfacing-machine	395,631	Jan. 1	507	127	46	102
Priebs, Bernhard. (See Rudolph and Priebs.)						
Priest, Augustus F., Fort William, Ontario, Canada. Track-cleaner	398,347	Feb. 19	1877	494	46	962
Priestman, Samuel. (See Priestman, William D. and S.)						
Priestman, William D. and S., Hull, county of York, England. Working hydrocarbureted-air engines	397,517	Feb. 12	631	164	46	706
Prince, Jerome, Milford, assignor to W. E. Morris, Boston, Mass., and J. C. Bates, Aspen, Colo. Danger-signal for railways	397,469	Feb. 5	535	145	46	684
Prince, William V., Vineland, N. J. Adjustable saw-gage	396,666	Jan. 22	2072	532	46	427
Prinz, Faustin. (See Gessl, Anton, assignor.)						
Pritchard Brake Company. (See Pritchard and Templon, assignors.)						
Pritchard, Frederick, Meriden, Conn. Pneumatic action for organs	396,955	Jan. 29	2501	645	46	524
Pritchard, John D., Topeka, Kans. Hammock-suspension device	399,928	Mar. 19	1714	444	46	1464
Pritchard, Nathaniel J., and J. S. Templon, Milnes, assignors to Pritchard Brake Company, Roanoke, Va. Automatic piston for air-brakes	399,157	Mar. 5	556	143, 144	46	1222
Pritchard, Nathaniel J., and J. S. Templon, Milnes, assignors to Pritchard Brake Company, Roanoke, Va. Air-brake	399,158	Mar. 5	558	144	46	1222
Pritchard, Nathaniel J., and J. S. Templon, Milnes, assignors to Pritchard Brake Company, Roanoke, Va. Device for applying pressure to railway-brakes	399,159	Mar. 5	560	144, 145	46	1223
Prittie, James, Denver, Colo. Aerial railway or wire tramway and appliances therefor	399,283	Mar. 12	750	195	46	1286
Prout, William, Brooklyn, N. Y. Support for persons cleaning windows	397,249	Feb. 5	217	57	46	617
Prouty, George W., assignor of one-half to R. O. Harding, Boston, Mass. Fishing-reel	396,956	Jan. 29	2504	645	46	524
Provost, Gustave, San Francisco, Cal. Cable-railway crossing	399,929	Mar. 19	1716	444	46	1464
Provost, Peter, Menominee, Mich. Grain-scourer	398,538	Feb. 26	2152	568, 569	46	1025
Prowattain, Ivan. (See Ross, Fredrick C., assignor.)						
Prunty, John E., Baltimore, Md. Fire-extinguishing apparatus, &c	396,710	Jan. 22	2136	546, 547	46	438
Pryibil, Paul. (See Mackintosh, Edward D., assignor.)						
Pueschel, Paul, Milwaukee, Wis. Wagon-brake	398,799	Feb. 26	2541	676	46	1102
Pullen, Jabez J. (See Sumner and Pullen.)						
Pullinger, James. (See Parkison and Pullinger.)						
Pullman, George M. (See Pfinget, Louis, assignor.)						
Pullman's Palace Car Company. (See Rapp, August, assignor.)						
Pullman's Palace Car Company. (See Sessions, Henry H., assignor.)						
Purdy, Markwell S., and H. Alber, Corning, N. Y.; said Purdy assignor to said Alber. Alcohol disinfecting-lamp	399,078	Mar. 5	397	107	46	1190
Purdy, William J., assignor of one-half to J. H. Lyons, Carberry, Manitoba, Canada. Roller-mill feed-hopper	400,413	Mar. 26	2439	639	46	1632
Putnam, Alice J. (See Caller, Annie, assignor.)						
Putnam, Theodore A. B., assignor to Railway Cab Electric Signal Company, New York, N. Y. Electric-railway signal	399,556	Mar. 12	1166	302	46	1364
Quackenbush, Andrew W., Moberly, Mo. Blow-off apparatus for steam-boilers	397,565	Feb. 12	704	183	46	719
Quick, Christopher T., Temple Hill, Ky. Vehicle-brake	399,557	Mar. 12	1169	302	46	1365
Quinan, Allen B., Baltimore, Md. Mail-bag	398,185	Feb. 19	1631	422	46	913
Quinn, John T., Riverside, Cal. Household sifter	396,834	Jan. 29	2333	597	46	488
Rabbeth, Francis J., Boston, Mass. Nut-cracker	397,023	Jan. 29	2509	671	46	543
Rabe, Carl, assignor to Sangerhäuser Actien-Maschinen-Fabrik and Eisengiesserei, vorm. Hornung & Rabe, Sangerhäuser, Prussia, Germany. Sugar-cane-slicing machine	398,348	Feb. 19	1880	495	46	963
Raber, Nathan L., Corvallis, Oreg. Amalgamator	400,114	Mar. 26	1980	518, 519, 520	46	1544
Racine Hardware Manufacturing Company *et al.* (See Linn, Allen D., assignor.)						
Rae, Julio H., San Francisco, Cal. Electric amalgamator	399,209	Mar. 5	639	167	46	1237
Railway Cab Electric Signal Company. (See Putnam, Theodore A. B., assignor.)						
Railway Register Company. (See Meaker, John W., assignor.)						
Raithel, George J., Middleville, N. Y. Hub	398,652	Feb. 26	2329	619	46	1059
Railo, Costantino P., Washington, D. C. Stand for water-coolers	398,446	Feb. 26	2021	531	46	998
Rand, McNally & Co. (See Timroth, Rudolph, assignor.)						
Randall, Franklin S., assignor of two-thirds to F. S. Gibson and T. C. Avis, Philadelphia, Pa. Composition for making articles of commerce and art	397,612	Feb. 12	802	.....	46	736
Randall, James D. (See Randall, Silas H., assignor.)						
Randall, Silas H., assignor of one-half to J. D. Randall, Wyoming, Ohio. Photograph-burnisher	397,309	Feb. 5	307	80	46	635

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Ra kin, James E., Elk Rapids, Mich. Construction of buildings	399,778	Mar. 19	1469	384	46	1440
Ra som, Ezra, assignor of two-thirds to O. Storn and E. B. Woodin, Flint, Mich. Picket-fence machine	395,586	Jan. 1	428	108, 109	46	88
Ra sweiler, William, assignor to N. H. Bassett, Akron, Ohio. Curry-comb	398,001	Feb. 19	1357	360	46	861
Ra id Duplicating and Copying Machine Company. (See Thompson, Charles A., assignor.)						
Ra p, August, Pullman, assignor to Pullman's Palace Car Company, Chicago, Ill. Window opener and closer	396,509	Jan. 22	1978	509	46	408
Ra mussen, Andrew L., Clermont, Iowa. Combined corn harvester and husker	396,510	Jan. 22	1838	471, 472, 473	46	383
Ra nick, Noah W., Stratton, Va. Attachment for bandsaws	399,695	Mar. 19	1368	352	46	1416
Ra or, Ira H., Wadsworth, Ohio. Extension-ladder and scaffold attachment	400,008	Mar. 19	1829	475	46	1505
Re sinier, Adolph, assignor to himself, P. Marconnet, and L. Nicolas, Louisville, Ky. Nut-lock	399,696	Mar. 19	1369	352	46	1416
Re tan, Volney, San Francisco, Cal. Fruit-grader	399,770	Mar. 19	1491	384	46	1441
Ra r, Simon B., Sheffield, Iowa. Horse-collar pad	395,404	Jan. 1	144	37	46	31
Ra , Samuel H., assignor of one-half to G. S. Tyler, St. Louis, Mo. Nut-lock	395,348	Jan. 1	63	16	46	15
Re , William R., Los Angeles, Cal. Wall for houses	399,284	Mar. 12	752	195	46	1286
Re mond, Albert. (See Raymond, George and A.)						
Ra mond & Co., George E. (See Raymond, Silas H., assignor.)						
Ra mond, Freeborn F., 2d, Newton, Mass. Heel-nailing machine	398,846	Mar. 5	44	14	46	1122
Ra mond, George and A., Chicago, Ill., assignors to Appleton Manufacturing Company, Appleton, Wis. Grinding-mill	397,618	Feb. 12	1091	290, 291	46	793
Ra mond, George E. (See Hodkinson and Raymond.)						
Ra mond, Silas H., assignor to G. E. Raymond & Co., Grand Rapids, Mich. Vehicle-spring	399,210	Mar. 5	641	167	46	1237
Re ch, Robert, Philadelphia, Pa. Exercising apparatus	397,386	Feb. 5	418	111	46	657
Re ch, Robert, Philadelphia, Pa. Exercising apparatus	399,632	Mar. 12	1279	328	46	1385
Re d, Albert J. (See Hayes and Read.)						
Re d, Thaddeus C., Fostoria, Ohio. Lock-hinge	397,936	Feb. 19	1251	334	46	842
Re dy, Ida V., Brooklyn, N. Y. Device for assisting in putting on garments	397,752	Feb. 12	994	264	46	774
Re ruden, Joseph M., Chicago, Ill. Device for protecting shores	398,060	Feb. 19	1479	392	46	885
Re son, Henry, Brighton, county of Essex, England. Magazine toy gun	395,798	Jan. 8	773	200, 201	46	161
Re mann, Christian, Napa, Cal. Vineyard-cultivator	395,587	Jan. 1	429	109	46	88
Re ding, Marius A., New York, N. Y. Swing-bridge	399,347	Mar. 12	842	230	46	1304
Re dy, Edward, Little Falls, N. Y. Apparatus for making molds	396,803	Jan. 29	2418	621	46	507
Re emann, Henry M. (See Tilford and Redemann.)						
Re emann-Tilford Steel Company. (See Tilford and Redemann, assignors.)						
Re field, John H. and S. H., and A. E. Hansbro, Glendale, Oreg. Mower	395,349	Jan. 1	65	16	46	15
Re field, Samuel H. (See Redfield and Hansbro.)						
Re l & Barton. (See Powers, Edward B., assignor.)						
Re l, C. M., *et al.* (See Reese, Abram, assignor.)						
Re d & Co., D. C. & H. C. (See McMahon, James, assignor.)						
Re d, Eli S., Chattanooga, Tenn. Measuring-faucet	400,251	Mar. 26	2193	576	46	1587
Re d, Ira J. (See Sharp and Reed.)						
Re d, J. H. (See Showalter, Wasson C., assignor.)						
Re d, James H. (See Beale and Reed.)						
Re d, John C., assignor of one-half to D. W. Coffin, Indianapolis, Ind. Closure for buckets	396,601	Jan. 22	1930	509	46	408
Re d, Marshall. (See Peterson and Reed.)						
Re der, William S., St. Louis, Mo. Shiftable stacker	399,211	Mar. 5	642	168	46	1237
Re s, Thomas W., assignor of one-half to T. W. Snowden and R. T. Stockman, Philadelphia, Pa. Range-boiler	396,957	Jan. 29	2506	646	46	524
Re s, Thomas W., assignor of one-half to T. W. Snowden and R. T. Stockman, Philadelphia, Pa. Range-boiler	399,558	Mar. 12	1170	302	46	1365
Re se, Abram, Pittsburg, Pa. Apparatus for rerolling old rails	395,350	Jan. 1	67	16, 17	46	15
Re se, Abram, assignor to C. L. Magee, R. Pitcairn, and C. M. Reed, Pittsburg, Pa. Safety car-stove	398,800	Feb. 26	2542	676	46	1103
Re se, Jacob, Pittsburg, Pa. Manufacture of window and plate glass	396,511	Jan. 22	1841	.....	46	383
Re se, Jacob, Pittsburg, Pa. Manufacture of glass	396,512	Jan. 22	1843	473	46	384
Re tz, William. (See Domann, Charles F., assignor.)						
Re an, Daniel S., San Francisco, assignor to himself and S. S. Bennett, Alameda, Cal. Governor for gas-engines	397,753	Feb. 12	995	264	46	774
Re fuss, George, *et al.* (See Rehfuss, Martin O., assignor.)						
Re fuss, J. George, *et al.* (See Rehfuss, Martin O., assignor.)						
Re fuss, Martin O., assignor to himself, G. and J. G. Rehfuss, Philadelphia, Pa. Target	398,186	Feb. 19	1632	432	46	913
Re kopf, Fredrick, Memphis, Tenn. Harness-saddle	399,697	Mar. 19	1370	353	46	1416
Re hel, Carl H. W., New York, N. Y. Differential pulley-and-cord hoisting-gearing	396,430	Jan. 22	1718	442	46	359
Re d, Adam P. (See Wilson, David Y., assignor.)						
Re d, Charles H., Danbury, Conn. Chuck	398,447	Feb. 26	2022	531	46	998
Re d, Charlie R., Heidelberg, Miss. Seed-planter and fertilizer-distributer	399,559	Mar. 12	1171	303	46	1365
Re d, Hugh, Derby, county of Derby, England. Switch and signal interlocking apparatus	395,588	Jan. 1	431	110	46	89
Re d, James. (See Reid, John C. and J.)						
Re d, John, Rio de Janeiro, Brazil. Duplex pump and condenser	399,780	Mar. 19	1492	385	46	1441
Re d, John C. and J., Leeds, county of York, England. Weather-strip	398,187	Feb. 19	1633	432, 433	46	913
Re d, Oliver P. (See Stukes and Reid.)						
Re illey, James, and C. Bergman, Buffalo, N. Y. Die for forging the followers of extensible railway-car platforms	399,930	Mar. 19	1718	444	46	1465
Re illy, A., *et al.* (See Anderson and Elias, assignors.)						
Re illy, James, Brooklyn, N. Y. Radiator	399,079	Mar. 5	398	107	46	1191
Re illy, Michael, Brooklyn, N. Y. Fire-kindler	400,252	Mar. 26	2193	576	46	1587
Re illy, Patrick, Mattoon, Ill. Steam-brake for locomotives	397,024	Jan. 29	2501	671	46	543
Re ily, Thomas, Glencoe, Iowa. Wire-tightener	396,172	Jan. 15	1328	341	46	278
Re inhard, Samuel E., Baltimore, Md. Combined coat and vest	399,436	Mar. 12	977	254	46	1330
Re inhardt, Christoph, Newark, N. J. Candle-holder for Christmas-trees	395,514	Jan. 1	315	80	46	66
Re isch, Michael, Buffalo, N. Y. Jack-screw	397,387	Feb. 5	480	111	46	657
Re isa, Rudolph A., Hoboken, N. J., and E. Pettenkofer, New York, N. Y. Fire-escape	395,455	Jan. 1	220	56	46	47
Re itz, Daniel G., Berlin, Pa. Belting-reel	397,937	Feb. 19	1252	334	46	842
Re msen, William H., Cedar Rapids, Iowa. Vise	397,470	Feb. 5	537	146	46	684
Re mer, Joshua, assignor of one-half to T. E. Mittag, Hagerstown, Md. Automatic railway-switch	398,748	Feb. 26	2474	655	46	1088
Re ntz, George. (See Mahar, Michel W., assignor.)						
Re sseger, Henry. (See Rupp and Resseger.)						
Re tsloff, Otto C., Winnebago City, Minn. Cash-registering device	399,080	Mar. 5	400	108	46	1191
Re use, Albert C., Belleville, Ill. Flying target	395,996	Jan. 8	1076	274	46	222

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Rew, Richard A., Mankato, Minn. Ventilating mechanism	399,437	Mar. 12	978	254 255	46	1330
Rex, Ross E., Pueblo, Colo. Fence-machine	398,281	Feb. 19	1773	469	46	943
Reynolds, Edwin, Providence, R. I. Rubber stamp	396,233	Jan. 15	1421	302	46	296
Reynolds, Edwin, Milwaukee, Wis. Steam-boiler	399,560	Mar. 12	1173	303	46	1366
Reynolds, Edwin, and B. V. Nordberg, Milwaukee, Wis. Brake	395,717	Jan. 8	634	161	46	137
Reynolds, Edwin, and B. V. Nordberg, Milwaukee, Wis. Valve mechanism for ore-stamps	398,903	Mar. 5	130	35,36	46	1139
Reynolds, Thomas J., assignor of one-half to F. Nolan, Brooklyn, N. Y. Steam-generator	399,781	Mar. 19	1404	385 386	46	1442
Rheiner, Henry S., assignor of one-half to D. K. Joslin, Camden, N. J. Electric-light carbon	397,754	Feb. 12	996	.....	46	774
Rhind, Frank, assignor of one-half to E. Miller & Company, Meriden, Conn. Wick-lifting device	395,757	Jan. 8	692	176 177	46	148
Rhind, Frank, and G. L. Cooper, assignors to E. Miller & Company, Meriden Conn. Suspension device for lamps, &c	397,518	Feb. 12	632	164	46	706
Rhodes, William T., assignor of one-half to R. O. Faires, Flatonia, Tex. Plow	396,051	Jan. 8	1150	292	46	235
Rice, E. Wilbur, Jr., and A. L. Rohrer, Lynn, Mass. System of electrical distribution	396[illegible]03	Jan. 22	1984	510	46	409
Rice, Edwin W., Jr., Lynn, Mass. Combination of electric generators	396,602	Jan. 22	1981	510	46	408
Rice, Edwin W., Jr., Lynn, Mass. Regulation of dynamos	397,613	Feb. 12	802	209	46	737
Rice, Harvey D., Brooklyn, and E. Volkmann, assignors to Abendroth & Root Manufacturing Company, New York, N. Y. Boiler-tube cleaner	398,749	Feb. 26	2475	656	46	1089
Rice, Henry G., *et al.* (See Shepherd, Thomas W., assignor.)						
Rice, James N., Pittston, Pa., assignor to W. T. Haydock, St. Louis, Mo. Spring-bending machine	399,160	Mar. 5	563	145 146	46	1223
Rice, John V., Jr., Chester, Pa. Eccentric valve-gear	399,081	Mar. 5	402	109	46	1191
Rice, Thomas J., Beulah, Colo. Wheel	396,366	Jan. 15	1616	414	46	331
Rice, Walter P., Cleveland, Ohio. Hydraulic excavator	396,112	Jan. 15	1240	315 316	46	202
Rice, William B. (See Closson, David B., assignor.)						
Rich, Elisha B., Chicago, Ill. Meat-roaster	399,561	Mar. 12	1174	304	46	1366
Richard, Alfred. (See Bonnet, Lissagaray and Richard.)						
Richard, Armand. (See Bonnet, Lissagaray, and Richard.)						
Richard, William, assignor of one-half to M. Koller, Bloomville, Ohio. Shears	396,291	Jan. 15	1504	381	46	311
Richards, Francis H. (See Dodson and Richards.)						
Richards, Francis H., Hartford, Conn. Implement-joint	397,389	Feb. 5	422	112	46	658
Richards, Francis H., Springfield, Mass., assignor of one-half to Pratt & Whitney Company, Hartford, Conn. Gum-box for envelope-machines	396,711	Jan. 22	2139	547	46	439
Richards, Francis H., Hartford, assignor to American Button Fastener Company, New Britain, Conn. Button-setting implement	397,388	Feb. 5	421	111	46	657
Richards, Francis H., Hartford, assignor to American Button Fastener Company, New Britain, Conn. Button-setting implement	397,471	Feb. 5	558	146	46	685
Richards, George M., New Brunswick, N. J. Hydrocarbon-engine	399,348	Mar. 12	846	220 221 222	46	1305
Richards, John T., and J. F. Newell, Gardiner, Me. Dust-guard for vehicle-hubs	395,666	Jan. 1	561	140	46	113
Richards, Philip, Seymour, Conn. Cold-rolling sheet metal	399,562	Mar. 12	1175	304	46	1366
Richards, William A. (See Watts and Richards.)						
Richards, William G., assignor of one-half to G. H. Benjamin, New York, N. Y. Pipe-coupling	398,448	Feb. 26	2023	531	46	999
Richardson, Arthur S., Reading, Mass. Wax-thread sewing-machine	398,653	Feb. 26	2330	619	46	1059
Richardson, Ingraham G., Minneapolis, Minn. Trunk	397,938	Feb. 19	1254	334	46	842
Richardson, Leonard. (See Leland, Edwin A., assignor.)						
Richardson, Robert D. (See Codd, Donald, assignor.)						
Richardson, Victor P., *et al.* (See Smith, Maurice, assignor.) (Reissue.)						
Richardson, William H., *et al.* (See Lindsay, William E., assignor.)						
Richardson, William S., Boston, Mass., assignor to Ball and Socket Fastener Company, Nashua, N. H. Glove-fastener	399,161	Mar. 5	567	146	46	1224
Richardson, William S., Boston, Mass., assignor to Ball and Socket Fastener Company, Nashua, N. H. Glove-fastening	399,162	Mar. 5	568	146	46	1224
Richey, Frank W., Armourdale, Kans. Stop or throttle valve	399,782	Mar. 19	1406	326	46	1442
Richmond, Charles C. (See Sullivan, Cornelius F., assignor.)						
Richmond City Mill Works. (See Mawhood, Jonathan D., assignor.)						
Richmond, Edmond C., Shelburne Falls, Mass. Roof	396,292	Jan. 15	1505	381	46	311
Richmond, Rome B., Decatur, Ill. Watch-regulator	395,351	Jan. 1	70	17	46	16
Richter, Aug. F. (See Hambruch, Heinrich F., assignor.)						
Ricketson, James C., Milwaukee, Wis. Electric signal for engine-shafts	399,163	Mar. 5	569	146	46	1224
Ridge, Isaac M. (See Snyder, Charles L., assignor.)						
Ridgley, Leonard T., Ashland, Ohio. Bustle	400,115	Mar. 26	1984	520	46	1545
Ridgway, Charles L., Boston, Mass., assignor to Ridgway Furnace and Stove Company, Nashua, N. H. Heating stove and furnace	395,352	Jan. 1	71	17	46	16
Ridgway, Charles L., Everett, Mass., assignor to Ridgway Furnace and Stove Company, Nashua, N. H. Heating-stove	395,353	Jan. 1	73	18, 19	46	17
Ridgway Furnace and Stove Company. (See Ridgway, Charles L., assignor.)						
Rieckert, Herman A. J., New York, N. Y. Air-ship	399,783	Mar. 19	1497	386 387 388 389	46	1442
Riersen, Andrew, Chicago, Ill. Ironing-table	400,009	Mar. 19	1490	475	46	1505
Riesenberg, Harry, St. Louis, Mo. Horse-detacher	395,589	Jan. 1	432	110	46	89
Rietzel, Adolph F. (See Weller and Rietzel.)						
Rifle, Stephen R., Foley, Mo. Attachable brake for wagon-beds	396,340	Jan. 15	1573	398	46	323
Rigaud, Fernand, Alais, Gard, France. Blast-furnace for reducing zinc	397,025	Jan. 29	2602	672	46	543
Riggs, Alonzo B. (See Vaughn, Francis E. and M. E., assignors.)						
Riglander, Jacob W., New York, N. Y. Temporary case for mainsprings	397,566	Feb. 19	705	183	46	719
Riley, Harvey C., assignor to himself and R. M. Wilson, Perryville, Mo. Gate	396,173	Jan. 15	1329	341	46	278
Rimmer, Harold, Sandside, Ulverston, county of Lancaster, England. Purifying ferric carbide	399,082	Mar. 5	403	109	46	1191
Ring, George E., Vermont, Ill. Tongue-support	396,766	Jan. 29	2234	572	46	467
Rings, Julius, Detroit, Mich. Ring for curtain-poles	396,604	Jan. 22	1985	510	46	409
Riukleff, Frank. (See Kromer, Otto, assignor.)						
Ripple, Joseph F. (See Hillman and Ripple.)						
Ritchie, John. (See Haven, William H., Jr., assignor.)						
Rites, Francis M. (See Ragsley and Rites.)						
Rites, Francis M. (See Westinghouse and Rites.)						
Rittinger, George H., and G. J. Eisengart, Jr., New York, N. Y. Book-case	398,188	Feb. 19	1635	433	46	914

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Ritty, John, Dayton, Ohio. Machine for hulling green corn	395,997	Jan. 8	1077	274	46	222
Roach, John, New York, N. Y. Hatchway	399,563	Mar. 12	1178	304	46	1366
Roake, John S., Brooklyn, N. Y. Water heater and filter	396,234	Jan. 15	1422	302	46	296
Robb, Herbert C., San Francisco, Cal. Gang-edger	399,931	Mar. 19	1730	444 445	46	1485
Robb, John, Oxford, Nova Scotia, Canada. Carding-machine for making mottled rovings	395,632	Jan. 1	508	128	46	109
Robbins, Arthur C., Brooklyn, assignor to W. S. Andrews, New York, N. Y. Burglar-alarm	396,667	Jan. 22	2074	533	46	427
Robbins, Edward R., Sacramento, Cal. Pool-register	398,061	Feb. 19	1489	362	46	895
Robbins, Fred A., Waterville, Me. Tag attachment	397,939	Feb. 19	1255	331	46	843
Robbins, Ira, Camden, N. J. Motor for railway-cars	398,449	Feb. 26	2025	531 532	46	999
Robbins, Royal E. (See Scales, William S., assignor.)						
Robert, Gustave L., Stenay, France, assignor to J. W. Bookwalter, Springfield, Ohio. Converting crude iron into malleable iron or steel	395,633	Jan. 1	510	128	46	109
Robert, Gustave L., Stenay, France, assignor to J. W. Bookwalter, Springfield, Ohio. Converting crude iron into malleable iron or steel	400,010	Mar. 19	1831	475	46	1505
Roberts-Brevoort Electric Company. (See Roberts, Isaiah L., assignor.)						
Roberts, Edward C., Broadford, Va. Tilting drawer	397,567	Feb. 12	708	183	46	730
Roberts, Henry, assignor of one-half to G. T. Oliver, Pittsburg, Pa. Protecting the interior walls of furnaces	398,450	Feb. 26	2026	532	46	999
Roberts, Henry P., Jamestown, N. Y., assignor of three-fourths to A. F. A. Brown, G. S. Gifford, and M. B. Marshall. Vapor stove and burner	399,212	Mar. 5	643	168	46	1238
Roberts, Isaac N., assignor to M. A. Roberts, Norristown, Pa. Work-holder	400,116	Mar. 26	1985	520	46	1546
Roberts, Isaiah L., Brooklyn, assignor to Roberts-Brevoort Electric Company, (limited,) New York, N. Y. Secondary battery	396,367	Jan. 15	1617	.....	46	331
Roberts, Isaiah L., Brooklyn, assignor to Roberts-Brevoort Electric Company, (limited,) New York, N. Y. Secondary battery	396,368	Jan. 15	1617	414	46	331
Roberts, Isaiah L., Brooklyn, assignor to Roberts-Brevoort Electric Company, (limited,) New York, N. Y. Secondary battery	396,369	Jan. 15	1619	415	46	331
Roberts, John H. (See Doan, Riley R., assignor.)						
Roberts, Mary A. (See Roberts, Isaac N., assignor.)						
Roberts, Squire, assignor of one-half to J. V. Curry, Cleckheaton, county of York, England. Foundation of card-clothing	397,441	Feb. 5	517	136	46	677
Roberts, Thomas, assignor of one-half to J. S. Frederick, J. Carson, M. B. Gott, M. J. Kilroy, and W. Dugdale, Baltimore, Md. Street-locomotive	396,113	Jan. 15	1242	316 317	46	202
Roberts, Thomas, assignor of one-half to J. J. Crouse, Philadelphia, and J. Ansty, Lansdale, Pa. Apparatus for sizing barrels	396,370	Jan. 15	1621	415	46	332
Roberts, William B., Indianapolis, Ind. Cultivator	398,654	Feb. 26	2231	619 620	46	1060
Robertson, Carie B. (See Robertson, Christopher W., assignor.)						
Robertson, Christopher W., assignor of one-half to C. B. Robertson, Somerville, Tenn. Chewing-gum locket	395,515	Jan. 1	316	80	46	67
Robertson, Daniel, *et al.* (See Osborn, Luke W., assignor.)						
Robertson, James H., Rutherford, N. J. Dynamo-electric machine	399,213	Mar. 5	645	169	46	1238
Robertson, John, assignor of one-half to J. Hardie, Brooklyn, N. Y. Apparatus for manufacturing solder-rods	398,976	Mar. 5	246	68	46	1161
Robertson, William T., Montgomery, Ala. Cigar-box	396,114	Jan. 15	1245	317	46	263
Robie, Frederic H. (See Dean and Robie.)						
Robin, Charles, Chester, Conn. Boring and reaming tool	395,920	Jan. 8	957	246	46	198
Robinson, A. B., *et al.* (See Bending, William P., assignor.)						
Robinson, Benjamin E., Lyn, Ontario, Canada. Attachment for anvils	400,361	Mar. 26	2365	617	46	1618
Robinson, Clark, assignor of one-fourth to M. J. Young, Hartley, Iowa. Inside blind	396,115	Jan. 15	1246	318	46	263
Robinson, Edgar. (See Varney, Joseph T., assignor.)						
Robinson, Harry. (See Thorpe, Edward E., assignor.)						
Robinson, James R., Cornelia, assignor of two-thirds to G. and C. Crow, Shawnee Mound, Mo. Wagon-brake	395,516	Jan. 1	316	80	46	67
Robinson, Thomas, Cambridge, assignor to Stalactite Decorative Company, Brookline, Mass. Decorating surfaces	396,116	Jan. 15	1246	.....	46	263
Robinson, Thomas C., Boston, Mass. Wash-boiler	397,873	Feb. 12	1157	309	46	807
Robison, Robert F., Kansas City, Kans. Brick-machine	399,698	Mar. 19	1371	353 354	46	1416
Robison, Robert F., assignor of one-half to H. A. Williams, Kansas City, Kans. Elevated railway	397,519	Feb. 12	634	165	46	706
Robison, Robert F., and H. M. Crocken, said Crocken assignor, by mesne assignments, to H. A. Williams, Kansas City, Kans. Elevated street-railway	395,921	Jan. 8	958	246	46	198
Roblin, Stephen H., assignor to American Whiffletree Company, Bay City, Mich. Horse-detacher	398,977	Mar. 5	248	69	46	1162
Roche, James, assignor to Eagle Lock Company, Terryville, Conn. Lock	399,083	Mar. 5	406	109	46	1192
Rock, Isaac L., Mooers, N. Y. Shipping-package	398,539	Feb. 26	2156	569	46	1025
Rock Island Plow Company. (See Jones, Fred B., assignor.)						
Rocker Spring Company. (See Bunker, William L., assignor.)						
Rockford Belt Works. (See Mutimer, Frederick, assignor.)						
Rockford Silver Plate Company. (See Kelley, George B., assignor.)						
Rockingham Machine Company. (See Fowler and Warren, assignors.)						
Rockwell, Rufus E. (See Watkins, Alfred E., assignor.)						
Rodman, Arthur, Holder, Ill. Band-cutting fork	396,431	Jan. 22	1719	442	46	360
Roemer, William, Newark, N. J. Bag-frame	398,540	Feb. 26	2156	569	46	1026
Roemer, William, Newark, N. J. Frame for traveling-bags	398,541	Feb. 26	2157	570	46	1026
Roemer, William, Newark, N. J. Bag-fastener	398,542	Feb. 26	2158	570	46	1026
Roemer, William, Newark, N. J. Catch for bag-frames	398,543	Feb. 26	2159	570	46	1026
Rogers, Charles, Allegheny, assignor of one-half to I. Vance and T. I. Vandergrift, Pittsburg, Pa. Pressure-regulator	398,849	Mar. 5	48	14, 15	46	1123
Rogers, Charles R., St. Peter, Minn. Kitchen-cabinet	399,438	Mar. 12	979	255	46	1330
Rogers, Frank H., Golden, Colo. Pitman	395,850	Jan. 8	853	220	46	179
Rogers, George W., Baltimore, Md. Stalk-puller	396,894	Jan. 29	2418	621 622	46	507
Rogers, Hamilton J. (See Welsh and Rogers.)						
Rogers, Thomas B., Brooklyn, and S. H. Bartlett, New York, N. Y. Game apparatus	400,011	Mar. 19	1832	476	46	1506
Rogers, Winfield S. (See Jones and Rogers.)						
Rohr, Henry. (See Wansleben, Emil, assignor.)						
Rohrer, Albert L. (See Rice and Rohrer.)						
Roland, Daniel W., Akron, Ohio. Rain-water cut-off	395,908	Jan. 8	1060	275	46	222
Rollins, Charles G., Minneapolis, Minn. Hydrocarbon vaporizer and burner	397,940	Feb. 19	1256	335	46	843
Romine, Joseph B., Germantown, Nebr. Cultivator	396,712	Jan. 22	2140	547	46	439

Alphabetical list of patentees, January to March, inclusive—Continued.

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Rood, Richard, Portswood, Southampton, England. Register for ships' logs	397,661	Feb. 12	869	228	46	750
Roovers, Albert W. (See Williams and Roovers.)						
Roraback, John Z. (See Edgar, Joseph M., assignor.)						
Rorem, Ommund, Elliott, Ill. Harrow	399,564	Mar. 12	1177	304	46	1367
Rosamyer, Henry, Jr., assignor of one-half to G. W. Miller, Rochester, and J. Gripp, Pittsburg, Pa. Closure for jar-caps	397,094	Jan. 29	2697	697	46	561
Rose, Aaron G., Greencastle, Ind. Bicycle	399,285	Mar. 12	733	195	46	1287
Rose, David, Lancaster, Pa. Umbrella	396,235	Jan. 15	1425	362	46	296
Rose, George P., Fenton, Mich. Railway splice-bar	395,922	Jan. 8	959	246	46	198
Rose, George P., Fenton, Mich. Railway splice-bar	395,923	Jan. 8	960	247	46	199
Rose, George P., Fenton, Mich. Railway splice-bar	395,924	Jan. 8	960	247	46	199
Rose, George P., Fenton, Mich. Railway-spike	395,925	Jan. 8	961	247	46	199
Rose, Henry M., Waterman, Ill. Disk cultivator	396,895	Jan. 29	2420	622	46	507
Rose, Samuel J. (See Shakespeare and Rose.)						
Rosenthal, Bernie, Williamsport, Pa. Fountain-pen	400,253	Mar. 26	2196	576	46	1587
Rosenthal, Sally A. (See Liebert and Rosenthal.)						
Rosentreter, Frank L., Cleveland, Ohio, assignor, by mesne assignments, to W. H. Caldwell, Rochester, N. Y. Sash-balance	397,941	Feb. 19	1257	335	46	843
Ross, Abbott Q. (See Winheim, Gustav, assignor.)						
Ross, Abbott Q., Cincinnati, Ohio. Roll-paper holder and cutter	398,750	Feb. 26	2476	656	46	1089
Ross, Albert M. (See Brand, Harrison, assignor.)						
Ross, Alexis H., Waukon, Iowa. Combined stove-pipe heater and ventilator	395,999	Jan. 8	1081	275	46	223
Ross, Elmore W., Springfield, Ohio. Feed-cutter	400,117	Mar. 26	1967	520	46	1546
Ross, Fredrick C., Merchantville, N. J., assignor to I. Prowattain, Philadelphia, Pa. Pavement	399,932	Mar. 19	1722	.....	46	1485
Ross, George, South Butte, Mont. Ter. Railway coupon-ticket rack	395,354	Jan. 1	76	19	46	17
Ross, George W. (See White, Maurice W., assignor.)						
Ross, James P. (See Stevens, Charles W., assignor.)						
Ross, William G., Decatur, Ill., assignor of one-half to W. A. Houck, Rochester, N. Y. Scratch-gage	396,371	Jan. 15	1021	415	46	332
Rossi, James C., Perth Amboy, N. J., assignor, by mesne assignments, to J. T. Fargason, Memphis, Tenn. Machine for manufacturing ice	397,819	Feb. 12	1092	291	46	793
Rossi, James C., Perth Amboy, N. J., assignor, by mesne assignments, to J. T. Fargason, Memphis, Tenn. Machine for manufacturing ice and for cooling purposes	397,820	Feb. 12	1094	292	46	793
Rosskothen, Ferdinand, Accrington, county of Lancaster, England. Machine for winding yarn	400,118	Mar. 26	1969	521	46	1546
Rote, Samuel A. (See Dill and Rote.)						
Roth, George R. (See Dottra and Roth.)						
Rothenbücher, George, New York, N. Y. Valve-motion for Corliss steam-engines	398,751	Feb. 26	2477	656	46	1089
Rounds, Horace C. (See Rounds, William S. and H. C.)						
Rounds, William S. and H. C., Townville, Pa. Spring for vehicles	400,362	Mar. 26	2365	617	46	1618
Rountree, Henry W., Richmond, Va. Trunk	399,439	Mar. 12	980	255	46	1331
Rourk, Francis, London, Ontario, Canada. Mechanism for converting motion	397,520	Feb. 12	635	165	46	706
Rourke, John, Norwich, Conn. Rotary mop	397,521	Feb. 12	635	{165 166	46	707
Rourke, M. A. (See Kranshaar, George J., assignor.)						
Rowe, Amos D. (See Morrison and Rowe.)						
Rowell, Luther H., South Thomaston, Me. Bush-hammer	396,174	Jan. 15	1331	341	46	279
Rowen, Nelson, Rockvale, Colo. Railway-rail-joint fastener	396,236	Jan. 15	1426	362	46	297
Rowland, Alexander M., Brooklyn, N. Y., assignor to R. N. Oakman, Jr., Greenfield, and W. P. Dustin, Turner's Falls, Mass. Glass-cutter	396,600	Jan. 22	1979	509	46	408
Rowland, Thomas F. (See Jerome, Samuel B., assignor.)						
Rowland, Thomas F., New York, N. Y. Iron column	398,451	Feb. 26	2027	532	46	999
Rowlands, David J. (See Rowlands, Evan and D. J.)						
Rowlands, Evan and D. J., Youngstown, Ohio. Sole-protector for boots or shoes	397,250	Feb. 5	218	57	46	617
Royce, George H. (See Clements and Royce.)						
Ru Ton, Hiram W., *et al.* (See Gore, Henry A., assignor.)						
Ru Ton, Hiram W., and H. A. Gore, Goshen, Ind. Carpet-sweeper	397,204	Feb. 5	156	42	46	606
Ruch, John C., and R. Brouse, Northumberland, Pa. Car-coupling	396,237	Jan. 15	1427	363	46	297
Ruddock, Austin E., and E. E. E. Bailey, assignors to T. S. Ruddock & Son, Haverhill, Mass. Machine for feather-edging soles for boots and shoes	398,282	Feb. 19	1775	469	46	943
Ruddock & Son, T. S. (See Ruddock and Bailey, assignors.)						
Rudolph, Christian, assignor to K. Oehler, Offenbach-on-the-Main, Germany. Tetrazo dye-stuff	396,293	Jan. 15	1507	.....	46	311
Rudolph, Christian, and B. Priebs, assignors to K. Oehler, Offenbach-on-the-Main, Germany. Orange azo dye-stuff	395,634	Jan. 1	511	.....	46	102
Rudolph, Christian, and B. Priebs, assignors to K. Oehler, Offenbach-on-the-Main, Germany. Yellow coloring-matter	396,294	Jan. 15	1508	.....	46	311
Rudolph, Frank, Beason, Ill. Two-wheeled vehicle	398,801	Feb. 26	2544	677	46	1103
Rudolph, Justus H., Elmira, N. Y., assignor to Sterling Slate Company, Walnutport, Pa. Revolving surface-planer	397,568	Feb. 12	708	184	46	720
Rudrauff, Joseph, Union, N. J. Snow-plow	398,283	Feb. 19	1776	{469 470	46	943
Rueff, Emil, New York, N. Y. Pressure-regulating stop-cock	399,565	Mar. 12	1178	305	46	1367
Rufe, John J. and M. A., Doylestown, Pa. Sectional steam-boiler	397,026	Jan. 29	2604	672	46	544
Rufe, Michael A. (See Rufe, John J. and M. A.)						
Ruffley, George E. (See Aughenbaugh and Ruffley.)						
Ruggles, F. N. (See Frantz, Eugene L., assignor.)						
Rüllmann, John D., San Antonio, Tex. Fire-escape	396,175	Jan. 15	1332	{342 343	46	279
Rumely, William N., La Porte, Ind. Governor	398,452	Feb. 26	2028	533	46	1000
Rumpf, Charles C., Baltimore, Md. Ice-box for holding beer-kegs	396,341	Jan. 15	1575	399	46	323
Rundle, Anthony M. (See Murphy and Rundle.)						
Rankle, Tully, Farmersville, assignor of one-half to J. F. Yeager, Prairie Creek, Ind. Baling-press	395,718	Jan. 8	636	161	46	137
Rupp, Frederick, Milford, Ind. Two-wheeled vehicle	395,355	Jan. 1	76	20	46	18
Rupp, William, Fort Lee, N. J., and A. Giese, Brooklyn, N. Y. Oil-distributing rocket	397,522	Feb. 12	637	166	46	707
Rupp, William X., and H. Resseger, Ella, W. Va. Machine for cooling wagon-tires	397,942	Feb. 19	1258	{335 336	46	843
Ruprecht, Frank, Syracuse, N. Y., and F. G. Bates, Philadelphia, Pa. Car-heater	399,633	Mar. 12	1280	328	46	1386
Ruse, James H., Providence, R. I. Gas-regulator	400,363	Mar. 26	2366	618	46	1618
Russell, Andrew H., U. S. Army. Magazine-gun	396,835	Jan. 29	2333	598	46	488
Russell, Andrew H., U. S. Army. Reflector for inspecting guns	399,286	Mar. 12	754	196	46	1287
Russell, Charles P., Kalamazoo, Mich. Harrow	396,117	Jan. 15	1247	318	46	263

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Russell & Erwin Manufacturing Company. (See Burgess, Charles M., assignor.)						
Russell, George G. (See Burrill and Russell.)						
Russell, George H., Pittsfield, Mass. Gage attachment for planes	399,287	Mar. 12	755	196	46	1287
Russom, Charles H., Springfield, Ill. Micrometer-gage	397,442	Feb. 5	517	136	46	677
Rust, Charles M., Rocky Fork, W. Va. Corn-planter	395,356	Jan. 1	77	20	46	18
Rutan, Thomas B. (See Dubéy, Edward A., assignor.)						
Ruth, Louis D., Philadelphia, Pa. Basin-rack for bath-tubs	398,349	Feb. 19	1881	495	46	963
Rutherford, Reuben C., New York, N. Y. Restoring fulled woolen fabrics to their original dimensions	398,847	Mar. 5	46	.....	46	1123
Rutzler, Enoch, Brooklyn, N. Y. Boiler	397,874	Feb. 12	1158	309	46	807
Ryan, George, Brantford, Ontario, Canada. Feed-regulator for machines for spinning hemp, &c	398,848	Mar. 5	47	14	46	1123
Ryder, Edwin P., Port Jefferson, N. Y. Chimney cap or ventilator	399,566	Mar. 12	1179	305	46	1367
Ryer, William H. (See Harris and Ryer.)						
Rylands, Dan. (See Halford and Morant, assignors.)						
Ryle, William, assignor to A. B. and J. A. Watson, Paterson, N. J. Hydrant	400,414	Mar. 26	2440	639	46	1632
Saar, Otto, Council Bluffs, Iowa. Wire-reel	397,943	Feb. 19	1259	336	46	843
Sabin, Ransom, Shelby, assignor to himself and E. Stanhope, Mears, Mich. Folding bath-tub	400,119	Mar. 26	1990	521	46	1547
Sachs, William, Berlin, Germany. Exercising apparatus	399,009	Mar. 19	1374	354	46	1417
Safety Car Heating and Lighting Company. (See Benjamin, George H., assignor.)						
Safety Car Heating and Lighting Company. (See Towne, Henry R., assignor.)						
Safety Car Heating and Lighting Company. (See Wilder, Francis M., assignor.)						
Sage, Carlton, Elkhart, Ind. Urethral powder-applier	398,904	Mar. 5	132	36	46	1139
Sagendorph, Longley L., Cincinnati, Ohio, assignor of one-half to C. N. Harder, Philmont, N. Y. Metallic roofing	396,605	Jan. 22	1966	511	46	409
Sagendorph, Longley L., assignor of one-half to H. P. Lloyd, Cincinnati, Ohio. Machine for locking sheet-metal joints	398,655	Feb. 26	2332	630	46	1060
Sager, Johann J., Berne, Switzerland. Lock for trunks, &c	399,784	Mar. 19	1504	389	46	1443
Sager, Marcus S., Washington Court-House, Ohio. Domestic or portable oven	399,567	Mar. 12	1180	{305 306	46	1367
Sahlmann, Bengt A., and J. Schenousky, Marinette, Wis. Lifting-jack	395,517	Jan. 1	317	81	46	67
Said, Emery A. (See Cogan and Said.)						
Saltor, George, West Bromwich, county of Stafford, England. Coin-operated weighing-machine	395,926	Jan. 8	962	{247 248	46	199
Sams, Hezekiah K., Johnson City, Tenn. Road-engine	397,144	Feb. 5	63	15, 16	46	590
Samuels, Marks, New York, N. Y. Folding bed	398,656	Feb. 26	2333	620	46	1060
Sanderson, Frederick, Prospect Park, Ill. Flour-bin	399,785	Mar. 19	1505	389	46	1443
Sanderson, George. (See Hatt, Samuel, assignor.)						
Sanderson, George W., Shirley Village, Mass. Sign	400,364	Mar. 26	2367	618	46	1619
Sandford, Micheal, Gallitzin, Pa. Coke-oven	399,634	Mar. 12	1221	329	46	1386
Sands, Arthur J. (See Fisher, Joseph H., assignor.)						
Sands, Josias J., Hartland, Wis. Machine for preparing feathers for dusters	398,850	Mar. 5	50	15	46	1123
Sands, Josias J., Merton, Wis. Bottle-stopper	399,440	Mar. 12	981	256	46	1331
Sanford, Fernando, *et al.* (See Miller, William R., assignor.)						
Sanford, J. F., *et al.* (See Miller, William R., assignor.)						
Sangerhäuser Actien-Maschinen-Fabrik and Eisengiesserei, vorm. Hornung & Rabe. (See Rabe, Carl, assignor.)						
Sargent & Company. (See Page, Albert A., assignor.)						
Sargent & Company. (See Sparks and Landolt, assignors.)						
Sargent, Jacob T., Carlinville, Ill. Gate	396,189	Feb. 19	1636	433	46	914
Sartell, Egbert P., St. Cloud, Minn. Car-heater	396,000	Jan. 8	1062	275	46	223
Sater, Hans H., Dubuque, Iowa. Wheel-plow	396,606	Jan. 22	1986	511	46	409
Sattler, George, Sr., and C. Nagel, St. Louis, Mo., assignors of one-half to G. Sattler, Jr., East St. Louis, Ill. Making brick	395,590	Jan. 1	434	.....	46	89
Saucier, Joseph A., Holland, Vt. Planing-machine	396,513	Jan. 22	1845	473	46	384
Sauer, Albert, Pittsburg, Pa. Attachment for compressed-air engines	395,456	Jan. 1	221	56	46	47
Sauer, Albert, Pittsburg, Pa. Regenerating exhaust	396,713	Jan. 22	2142	548	46	439
Sauer, Frederick A. (See Lewis and Sauer.)						
Saul, Peter F., Humboldt, Iowa. Twine-holder	399,700	Mar. 19	1375	354	46	1417
Saunders, Theodore. Danbury, Conn. Car-axle lubricator	395,758	Jan. 8	694	177	46	148
Saunders, William, West Point, N. Y. Invalid-bed	396,607	Jan. 22	1989	512	46	410
Savage, Robert W. (See Clarke and Savage.)						
Savery, Thomas H. (See Carter and Savery.)						
Sawyer, Charles R., Braintree, and C. Parent, Boston, Mass. Pneumatic bell-alarm	396,608	Jan. 22	1990	{512 513	46	410
Sawyer, Walter B. (See Allen, Edward B., assignor.)						
Saxton & Phillips. (See Johnson, Edwin T., assignor.)						
Sayer, James F., Gouverneur, N. Y. Combined ash pan and sifter	400,120	Mar. 26	1991	521	46	1547
Saylor, Francis H., Philadelphia, Pa. Turn-table	396,118	Jan. 15	1248	318	46	264
Sayre, Owens & Co. (See Owens, William J., assignor.)						
Scales, Frank. (See Blake, Edwin D., assignor.)						
Scales, William S., Somerville, assignor to R. E. Robbins, Boston, Mass. Controlling device for the regulating members of clocks	395,357	Jan. 1	78	20	46	18
Scanlan, Thomas F., Boston, Mass. Advertising-vehicle	398,802	Feb. 26	2545	677	46	1103
Schaadt, Henry S., St. Louis, Mo. Letter-box	396,767	Jan. 29	2235	572	46	467
Schaefer, Amalie, Chicago, Ill. Combined window-cleaner and fire-escape	400,121	Mar. 26	1993	{521 522	46	1547
Schardt, Benjamin, and G. Jones, assignors of one-third to J. R. Fletcher, Dayton, Ohio. Electric-light support	399,786	Mar. 19	1506	389	46	1444
Scharf, Gregory H., Toledo, Ohio. Temporary binder	396,001	Jan. 8	1084	{275 276	46	223
Schaus, Nikolas, and F. Mayer, Collins, N. Y. Vehicle-wheel	396,514	Jan. 22	1847	474	46	384
Scheer, Peter, and J. G. States, Bliss, Nebr. Handle for sliding doors	398,978	Mar. 5	250	69	46	1102
Scheithauer, Bernhard, Halle-on-the-Saale, Germany. Galvanic battery	396,342	Jan. 15	1576	399	46	323
Schelp, Fred, Jr., St. Louis, Mo. Cable-grip	397,755	Feb. 12	996	{264 265	46	774
Schemmel, August, Milwaukee, Wis. Musical game apparatus	395,635	Jan. 1	512	128	46	103
Schenck Belt Holder and Shifter Company of New York. (See Schenck, Unico H. W., assignor.)						
Schenck, Edward, assignor to Lechner Manufacturing Company, Columbus, Ohio. Draft-equalizer	396,609	Jan. 22	1995	513	46	411
Schenck, Unico H. W., Brooklyn, assignor to Schenck Belt Holder and Shifter Company of New York, New York, N. Y. Belt holder and shifter	395,591	Jan. 1	434	{110 111	46	89

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Schenkel, John H., and R. B. Magruder, Baltimore, Md., assignors to F. C. Adler, Philadelphia, Pa. Lamp attachment	397,569	Feb. 12	711	184	46	720
Schenousky, Josef. (See Sahlmann and Schenousky.)						
Schepp, Leopold, New York, N. Y. Cocoanut compound	398,082	Feb. 19	1481	.....	46	886
Schepp, Leopold, New York, N. Y. Cocoanut compound	398,083	Feb. 19	1482	.....	46	886
Scheuermann, Philip, *et al.* (See Waffen, John, assignor.)						
Scheurer, Oscar, and A. Forest, Paris, France. Ornamenting feathers	395,358	Jan. 1	79	20, 21	46	18
Schickner, William G., and L. K. Marty, Cincinnati, Ohio. Cash indicator and register	398,979	Mar. 5	251	69	46	1162
Schierstedt, Louis, Chicago, Ill. Two-wheeled vehicle	399,288	Mar. 12	756	196	46	1227
Schiffer, George W., and A. L. Knight, Buffalo, N. Y. Pillow-sham holder	400,122	Mar. 26	1993	522	46	1547
Schill, Emil, and A. Becker, Newark, N. J. Jewelry	398,657	Feb. 26	2334	621	46	1060
Schiller, John G., Washington, D. C. Wire fence	398,460	Feb. 26	2041	535	46	1002
Schiller, Theodor, *et al.* (See Noll, Otto, assignor.)						
Schiltz, Mathias V., Cologne, Germany. Petroleum-engine	399,569	Mar. 12	1183	306	46	1368
Schilz, Frank, Milwaukee, Wis. Match package	397,756	Feb. 12	969	265	46	775
Schirm, John W. C. C., Breslau, Prussia, Germany. Semaphore	395,405	Jan. 1	145	37	46	31
Schirm, John W. C. C., Breslau, Prussia, Germany. Magnesium lighting apparatus for taking photographic pictures	398,084	Feb. 19	1482	392	46	886
Schkade, August, Giddings, Tex. Tramper attachment for cotton-presses	399,441	Mar. 12	982	256	46	1231
Schley, Fritz, assignor of one-half to P. Bouveron, Berlin, Germany. Safety-hook	400,365	Mar. 26	2369	618	46	1619
Schlicht & Field Company. (See Clinton, Merle E., assignor.)						
Schlicht & Field Company. (See Jewell, M. Romeyn, assignor.)						
Schlosser, Peter, De Iance, Ohio. Tire apparatus	397,390	Feb. 5	423	112	46	658
Schmalz, John B., and J. B. Faulkner, Norfolk, Va. Conch for applying electrical treatment	399,084	Mar. 5	408	110	46	1192
Schmedlen, William H., and H. E. Byrne; said Byrne assignor to said Schmedlen, Coldwater, Mich. Road-cart	396,052	Jan. 8	1151	292	46	235
Schmelz, Henry, New York, N. Y. Suppository	398,085	Feb. 19	1484	392	46	886
Schmid, Albert. (See Beckfeld, J. Charles, assignor.)						
Schmid, Albert, Pittsburg, Pa. Gas-engine	396,238	Jan. 15	1427	363	46	297
Schmidt, Gottlieb P., Schmiedeberg, Saxony, Germany. Safety-cover for key-noses	399,570	Mar. 12	1187	307	46	1369
Schmidt, Gottlieb P., Schmiedeberg, Saxony, Germany. Device for spreading carcasses	399,933	Mar. 19	1723	445	46	1485
Schmitt, Joseph, *et al.* (See Gottschalk, Ernst L., assignor.)						
Schmitt, Louis, New York, N. Y. Adjustable shelf-support	397,251	Feb. 5	220	57	46	617
Schnarr, Henry, Nora Springs, Iowa. Shank-protector	398,453	Feb. 26	2030	533	46	1000
Schneider, Henri, Paris, France. Buffer for gun-mountings	397,027	Jan. 29	2606	{672 / 673}	46	544
Schneider, Henri, Paris, France. Loading apparatus for turret-guns	397,310	Feb. 5	308	80, 81	46	635
Schneider, Max, Doos, near Nuremberg, Germany. Draft-regulating device for stoves or furnaces	399,085	Mar. 5	408	110	46	1192
Schoenner, Jean, Nuremberg, Bavaria, Germany. Musical toy	400,123	Mar. 26	1995	522	46	1548
Schoff, Frederic, Philadelphia, Pa. Drilling-machine	397,311	Feb. 5	308	81	46	635
Schofield, John, New Haven, Conn. Toy	396,295	Jan. 15	1508	382	46	311
Schofield, John, New Haven, Conn. Vending apparatus	396,296	Jan. 15	1510	382	46	312
Schofield, John, New Haven, Conn. Vending apparatus	396,297	Jan. 15	1512	{382 / 383}	46	312
Schofield, John, New Haven, Conn. Wood-working machine	396,298	Jan. 15	1515	383	46	313
Schoolar, Thomley A., executor. (See Moss and Littell.)						
Schoolberr, Charles, Beatrice, Nebr. Tag-fastener	396,610	Jan. 22	1996	514	46	412
Schrader, Alwin, and O. Sturm, Dessau, Anhalt, Germany. Machine for wiring bottles	399,787	Mar. 19	1507	390	46	1444
Schrader, Henry C., Wheeling, W. Va. Punting-machine	398,454	Feb. 26	2030	533	46	1000
Schreiber, Charles. (See Behnisch, Carl H., assignor.)						
Schreiber, Charles C., assignor to L. Schreiber & Sons Company, Cincinnati, Ohio. Barrel-stand	396,372	Jan. 15	1623	415	46	332
Schreiber & Sons Company, L. (See Schreiber, Charles C., assignor.)						
Schreuder, Jens G., Swissvale, Pa. Fluid-pressure engine	396,239	Jan. 15	1428	363	46	297
Schroeder, Christina. (See Strasser, Carl A., assignor.)						
Schroyer, Charles A., Chicago, Ill. Spring-buffer for railway-cars	397,312	Feb. 5	310	81	46	635
Schroyer, Charles A., Chicago, Ill. Car-coupling	398,056	Feb. 19	1485	393	46	886
Schubert, Gustav A., Berlin, Germany. Driving mechanism for velocipedes	398,455	Feb. 26	2032	534	46	1001
Schuckman, Anna O., Lincoln, Nebr. Culinary apparatus	400,255	Mar. 26	2198	577	46	1587
Schuhols, John. (See Durham, John F., assignor.)						
Schuler, Louisa, executrix, *et al.* (See Massicks and Schuler, assignors.)						
Schultz, Louis, New York, N. Y. Shuttle-driving mechanism for sewing-machines	399,701	Mar. 19	1376	355	46	1418
Schulze-Berge, Hermann, Rochester, Pa. Graduating thermometers	398,451	Mar. 5	51	15	46	1124
Schütz, Hippolyte, assignor to Kuhn & Flèche, Reconvillier, Switzerland. Stem winding and setting watch	397,313	Feb. 5	312	82	46	636
Schwabe, Otto E. (See Hofmeister and Schwabe.)						
Schwahn, Heinrich F. D., Kansas City, Mo. Making soap	396,343	Jan. 15	1577	.....	46	323
Schwaner, Christian C., Winterset, Iowa. Halter-square	398,087	Feb. 19	1486	393	46	886
Schwaner, Christian C., Winterset, Iowa. Halter bolt-clip	399,788	Mar. 19	1508	390	46	1444
Schwartz, Joseph. (See Hawkins, Lucian B., assignor.)						
Schwartz, Louis H. A., assignor to J. A. Wiedersheim, Philadelphia, Pa. Stop-motion for warping-machines	395,851	Jan. 8	855	221	46	179
Schwärzler, Martin, New York, N. Y. Feed attachment for drilling-machines	395,592	Jan. 1	437	111	46	90
Schwelbold, Henry, Toledo, Ohio. Display-model	398,658	Feb. 26	2335	621	46	1060
Schwemberger, Matthias, and A. Groeschel, assignors of one-third to L. H. Buhrman, Cincinnati, Ohio. Rung	399,086	Mar. 5	409	110	46	1192
Schwing, Walter E. (See Folmer, William F., assignor.)						
Scofield, Almaron J., assignor to W. A. Knapp, Beloit, Wis. Compound for preventing boiler incrustation	397,523	Feb. 12	638	.....	46	707
Scofield, Henry L., assignor to F. Clarke, Rochester, N. Y. Carpet-stretcher and tack-driver	396,611	Jan. 22	1997	514	46	412
Scollay, George W., New York, N. Y. Making paint from oil foots	396,432	Jan. 22	1720	.....	46	360
Scotford, Louis K., Chicago, Ill. Dating device for hand-stamps	395,518	Jan. 1	319	81	46	67
Scott, Addison M., Charleston, W. Va. Movable dam	398,088	Feb. 19	1487	{393 / 394}	46	886
Scott, Edwin M., Auburn, N. Y. Lemon-squeezer	399,229	Mar. 5	670	175	46	1243
Scott, Helen M., *et al.* (See Scott, William J., assignor.)						
Scott, Henry P. (See Barker, Henry C., assignor.)						
Scott, Jacob C. E., *et al.* (See Scott, William J., assignor.)						
Scott, James W., Uhrichsville, Ohio. Potato-digger	396,433	Jan. 22	1721	{442 / 443}	46	360
Scott, John, Willimantic, assignor to Willimantic Linen Company, Hartford, Conn. Bobbin	398,002	Feb. 19	1358	360	46	861

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Scott, John H. (See Moore, Thomas B., assignor.)						
Scott, Martha J., *et al.* (See Scott, William J., assignor.)						
Scott, Robert P., Baltimore, Md., and J. A. Chisholm, Oakville, Ontario, Canada. Peahuller	399,702	Mar. 19	1377	355	46	1418
Scott, Robert W., Philadelphia, Pa. Knitting widened tubular fabrics	398,190	Feb. 19	1637	434	46	914
Scott, Robert W., Philadelphia, Pa. Widened tubular knit fabric	398,191	Feb. 19	1639	434	46	914
Scott, Robert W., and L. N. D. Williams, Philadelphia, Pa. Circular-knitting machine	395,927	Jan. 8	964	248	46	199
Scott, Samuel H. (See Forest and Scott.)						
Scott, Samuel P., Hillsborough, Ohio. Carriage-curtain fastener	399,934	Mar. 19	1724	445	46	1486
Scott, Samuel P., Hillsborough, Ohio. Wire snap-hook	400,256	Mar. 26	2199	577	46	1588
Scott, Walter, Plainfield, N. J. Inking apparatus for printing-machines	396,612	Jan. 22	1999	{514 / 515}	46	412
Scott, Walter, Plainfield, N. J. Sheet-delivery apparatus for printing-machines	396,896	Jan. 29	2422	622	46	507
Scott, Walter, Plainfield, N. J. Means for collecting and evening up sheets for printing-machines	397,314	Feb. 5	312	82	46	636
Scott, Walter, Plainfield, N. J. Sheet-delivery apparatus for printing-machines	397,662	Feb. 12	870	229	46	750
Scott, Walter, Plainfield, N. J. Sheet-delivery apparatus for printing-machines	398,544	Feb 26	2160	{570 / 571}	46	1027
Scott, William G., Starkville, Miss. Pneumatic device for transmitting power	399,789	Mar. 19	1509	390	46	1444
Scott, William H., assignor of one-half to H. V. Hardy, Toronto, Canada. Clothes-stick	398,089	Feb. 19	1489	394	46	887
Scott, William J., assignor to J. C. E., H. M., and M. J. Scott, Albany, N. Y. Combined hair-brush and comb	397,614	Feb. 12	803	209	46	737
Scott, William M., Elmwood, Ill. Pump	400,124	Mar. 26	1996	523	46	1548
Scott, William S., Eminence, Ind. Automatic grain weigher and measurer	399,164	Mar. 5	571	147	46	1224
Scranton Forging Company. (See Deeble, John, assignor.)						
Scudder, Clifton C. (See Smith, Eugene C., assignor.)						
Scully, John S. (See Carter, Edwin E., assignor.)						
Seabury, Charles L., New York, N. Y. Sectional steam-boiler	399,571	Mar. 12	1187	307	46	1369
Searles, Edward B., Baltimore, Md. Car-door	395,457	Jan. 1	223	57	46	48
Searls, Austin D., Sr., Seward, A. D. Searls, Jr., Channahon, and D. C. Searls, Troy, Ill. Pulverizing-machine	398,905	Mar. 5	133	36, 37	46	1139
Searls, Dewitt C. (See Searls, Austin D., Sr., A. D., Jr., and D. C.)						
Sears, Frank S., Atkinson, Ill. End-gate	395,852	Jan. 8	856	221	46	180
Seaver, Frank W., assignor to Pratt & Cady Company, Hartford, Conn. Valve	397,757	Feb. 12	969	265	46	775
Sebree, Robert M. (See Arnull and Sebree.)						
Secor, John A., Brooklyn, N. Y. Engine for marine propulsion	398,659	Feb. 26	2336	621	46	1060
Secor, John A., Brooklyn, assignor to Secor Marine Propeller Company, New York, N. Y. Engine	398,456	Feb. 26	2033	534	46	1001
Secor Marine Propeller Company. (See Secor, John A., assignor.)						
Sedgwick, Frederick, Oak Park, Ill. Hardening steel	400,366	Mar. 26	2370	618	46	1619
Sedwick, Calvin W., assignor of one-half to E. E. Elliott, Callensburg, Pa. Scroll-sawing machine	398,803	Feb. 26	2546	678	46	1104
Seed, James. (See Flatman and Seed.)						
Seeger, Louis F., Kewaunee, Wis. Revolving chair and stand	395,406	Jan. 1	146	37	46	31
Seeley, William F., Detroit, Mich. Street or station indicator	396,613	Jan. 22	2000	515	46	413
Seeley, William W., Albany, N. Y. Power baling-press	399,568	Mar. 12	1181	306	46	1368
Segar, Charles T., Utica, N. Y. Folding cot	399,935	Mar. 19	1726	446	46	1486
Selberling, John F. (See Laraway, George W., assignor.)						
Selberling, John F., Akron, Ohio. Grain-binder	399,703	Mar. 19	1379	{355 / 356}	46	1418
Seifert, John J., Gilmore City, Iowa. Heat-protector for bake-ovens	398,192	Feb. 19	1641	434	46	914
Seiser, George F., C. R. Johnson, and M. B. Perry, Port Royal, Ky. Permutation-padlock	398,600	Feb. 26	2339	621	46	1061
Seitz, Edward, Peoria, Ill. Ruffling and gathering attachment for sewing-machines	398,193	Feb. 19	1641	434	46	914
Seitz, Edward, Peoria, Ill. Sewing-machine-attachment holder	400,257	Mar. 26	2200	587	46	1588
Self, Edward D., South Orange, N. J. Gas-machine	396,768	Jan. 29	2237	573	46	467
Self, Edward D., South Orange, N. J. Gas-machine	397,205	Feb. 5	158	42	46	606
Self Retaining Hair Pin Company. (See Hanson, Eli, assignor.)						
Self Retaining Hair Pin Company. (See Manson, George W., assignor.)						
Seligsohn, Leo. (See Himmel, Robert, assignor.)						
Sellers, George H., Ridley Park, Pa., assignor to Edge Moor Iron Company, Edge Moor, Del. Steam-boiler setting	396,373	Jan. 15	1624	{416 / 417}	46	332
Sellon, John S., *et al.* (See Lewis, James, assignor.)						
Sellon, John S., Hatton Garden, county of Middlesex, England, assignor to Electrical Accumulator Company, of New York. Secondary battery	396,769	Jan. 29	2241	573	46	468
Sellon, John S., Hatton Garden, county of Middlesex, England, assignor to Electrical Accumulator Company, of New York. Secondary battery	396,770	Jan. 29	2242	573	46	468
Sellon, John S., Hatton Garden, county of Middlesex, England, assignor to Electrical Accumulator Company, of New York. Secondary battery	396,958	Jan. 29	2507	646	46	525
Seltzer, Van S., *et al.* (See Bending, William P., assignor.)						
Senstad, Olaus. (See Evenstad and Senstad.)						
Sentman, Edwin E., Philadelphia, Pa. Motor for railway-cars	399,572	Mar. 12	1189	307	46	1369
Serrell, Edward W., Jr., New York, N. Y. Apparatus for separating waste floss from cocoons	399,936	Mar. 19	1727	446	46	1486
Serrell, Edward W., Jr., New York, N. Y. Apparatus for reeling silk from the cocoon	399,937	Mar. 19	1728	{446 / 447}	46	1486
Serve, Jean P., Givors, France. Tubular boiler	398,003	Feb. 19	1358	360	46	861
Sessions, Henry H., Pullman, assignor to Pullman's Palace Car Company, Chicago, Ill. Mechanism for operating car brakes and couplings	396,614	Jan. 22	2001	{515 / 516}	46	413
Sessions, John H. (See Taylor, Charles A., assignor.)						
Sewell Safety Car Heating Company. (See Lightfoot, John T., assignor.)						
Seward, Lewis D., *et al.* (See Neichter, John A., assignor.)						
Seybold, Charles, Cincinnati, Ohio. Perforating-machine	396,240	Jan. 15	1420	364	46	298
Seymour, Charles J., Brookline, Mass. Lock-hinge	398,752	Feb. 26	2478	657	46	1069
Seymour, J. M. (See Patten, Francis J., assignor.)						
Seymour, John B., Jr., assignor of one-half to S. G. Adams, St. Louis, Mo. Telephone paper-pad holder	397,472	Feb. 5	559	146	46	685
Seymour, William T., Stockton-on-Tees, county of Durham, England. Lid or cover for metallic or other receptacles	397,301	Feb. 5	424	112	46	658
Shackleton, Joseph, New York, N. Y. Radiator	400,258	Mar. 26	2201	577	46	1588
Shafer, James A., Richmondville, N. Y. Wooden rake	400,259	Mar. 26	2202	578	46	1588
Shakespeare, Benjamin F., and S. J. Rose, Chester, Pa.; said Rose assignor to said Shakespeare. Brick-kiln	397,665	Feb. 12	875	230	46	751
Shakespeare, William, Jr., and G. W. Low, Kalamazoo, Mich. Camera-shutter	398,980	Mar. 5	253	70	46	1169

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Shallenberger, Oliver B., Rochester, assignor to Westinghouse Electric Company, Pittsburg, Pa. Armature for dynamo-electric machines	397,392	Feb. 5	425	112	46	658
Shallenberger, Oliver B., Rochester, assignor to Westinghouse Electric Company, Pittsburg, Pa. Alternate-current electric motor	398,457	Feb. 26	2037	535	46	1001
Shallenberger, Oliver B., Rochester, assignor to Westinghouse Electric Company, Pittsburg, Pa. Alternate-current electric motor	398,458	Feb. 26	2039	535	46	1002
Shanahan, Henry C., Mishawaka, Ind. Corn-planter	400,125	Mar. 26	1997	523	46	1548
Shanahan, John J. (See McComish, John J., assignor.)						
Shank, Samuel B., Millersville, assignor to I. L. Landis, Lancaster, Pa. Combined hay rake and tedder	396,002	Jan. 8	1085	276	46	223
Shanklin, Henry D. (See Yarrington and Shanklin.)						
Shanks, Emmett, Huntington, Ind. Truck	400,012	Mar. 19	1834	476	46	1506
Shanks, John, Barrhead, county of Renfrew, Scotland. Water-closet basin	396,959	Jan. 29	2508	646	46	525
Shannon, Patrick H., assignor of one-half to F. Bauer and H. H. Cooper, Jamestown, N. Y. Apparatus for heating railway-cars	396,615	Jan. 22	2003	516	46	413
Shapleigh, Edwin, *et al.* (See Enos, John A., assignor.)						
Sharp, Isaiah, Red Key, Ind. Steam-generator	396,053	Jan. 8	1151	292	46	236
Sharp, Orvis B., and I. J. Reed, Marengo, Iowa. Fence-wire-laying machine	395,359	Jan. 1	80	21	46	19
Sharp, Trevelyan. (See Sommers and Sharp.)						
Sharples, William E., Fall River, Mass. Clearer for removing waste, &c., from the top of spinning-frames, &c	396,616	Jan. 22	2004	516	46	414
Shaver Corporation. (See Shaver, George F., assignor.)						
Shaver, George F., assignor to Shaver Corporation, New York, N. Y. Telephone-line cable	399,635	Mar. 12	1283	329	46	1386
Shaw, Frank, New York, N. Y. Galvanic battery	400,126	Mar. 26	1998	523	46	1548
Shaw & Geary. (See Geary, John, assignor.)						
Shaw, Hiram M., Genoa, N. Y. Potato-digger	398,545	Feb. 26	2162	571	46	1027
Shaw, James E., Bishopville, S. C., assignor of one-half to L. McKinnon, Linchwood, N. C. Hand seed-planter	399,938	Mar. 19	1730	447	46	1487
Shaw, John, Sr., Bayonne, N. J. Drainage-trap	399,442	Mar. 12	984	256	46	1331
Shaw, John H., Chicago, Ill. Book-binder's press-board	399,573	Mar. 12	1190	308	46	1369
Shaw, Joseph W., Shelburne Falls, Mass. Box-fastener	398,981	Mar. 5	255	70	46	1163
Shaw, William A., Brooklyn, assignor to Electrical Accumulator Company, New York, N. Y. Secondary battery	397,443	Feb. 5	519	136	46	677
Shawhan, Jabez F., assignor of one-half to J. W. Carpenter, Dayton, Ohio. Headlight	396,241	Jan. 15	1434	365	46	298
Shawhan, Jabez F., assignor of one-half to J. W. Carpenter, Dayton, Ohio. Electric lighting and heating cars	396,836	Jan. 29	2335	598	46	488
Shay, William, Ansonia, Conn. Combination shaving utensil	397,028	Jan. 29	2607	673	46	545
Shea, Daniel E., Rochester, N. Y. Railway-switch	395,407	Jan. 1	147	37, 38	46	31
Shearer, Herbert A., assignor to L. G. Wetmore, Rochester, N. Y. Newspaper-file	399,704	Mar. 19	1382	356	46	1419
Shears, Albert L., assignor to himself and W. S. Turk, St. Louis, Mo. Boat	395,458	Jan. 1	224	57	46	48
Shedd, Charles F., Fairfield, Nebr. Combined stall and stock-handling apparatus	397,306	Feb. 5	161	42, 43	46	606
Shellaberger, Edward F., Beaver Falls, Pa. Wire fabric	396,771	Jan. 29	2243	574	46	468
Shellaberger, Edward F., Beaver Falls, Pa. Fence	399,939	Mar. 19	1731	447	46	1487
Shelly, William, assignor to himself and G. Oswald, Chicago, Ill. Machine for drawing spokes	400,127	Mar. 26	1999	523	46	1549
Shepard, Amos, Plainsville, assignor to Peck, Stow & Wilcox Company, Southington, Conn. Meat-cutter	399,790	Mar. 19	1510	391	46	1445
Shepard, William P. (See Butler, Henry A., assignor.)						
Shepardson, Byron W. (See Low, Garrett W., assignor.)						
Shepherd, Charles H., New York, N. Y. Gate-valve	400,128	Mar. 26	2000	524	46	1549
Shepherd, Thomas W., assignor to E. W. Upton, H. G. Rice, Peabody, and H. Torrey, Hanover, Mass. Holder for thermometers or other indicators	398,804	Feb. 26	2547	678	46	1104
Shepley, Granville T., Townsend, Mass. Drive-saw	398,350	Feb. 19	1882	496	46	964
Sheppard, John L., assignor of one-half to W. D. Porchers, Charleston, S. C. Milling rice	397,944	Feb. 19	1261	336	46	843
Sherburne, Charles W. (See Coghlan, John, assignor.)						
Sheridan, Frank, Rockford, Minn. Draft-equalizer	396,617	Jan. 22	2007	516	46	414
Sheridan, John S., Columbia, Dak. Ter. Seed-drill	398,459	Feb. 26	2040	535	46	1002
Sheriff, Joseph M., Mercer, Pa. Fence	396,299	Jan. 15	1518	384	46	313
Sherman, Caroline M., executrix. (See Sherman, Edwin F.)						
Sherman, Edwin F., deceased, Springfield, Mass.; C. M. Sherman executrix. Harrow	396,374	Jan. 15	1626	417	46	332
Sherman, James A., Buffalo, N. Y. Cast chilled reamer	399,349	Mar. 12	857	222	46	1306
Sherry, P. P. (See Knox and Eberson, assignors.)						
Shields, Henry C., Troy, N. Y. Apparatus for the manufacture of gas	399,087	Mar. 5	410	111	46	1192
Shields, John, Jersey City, N. J. Boring-tool	395,459	Jan. 1	225	57	46	49
Shinn, John, Philadelphia, Pa. Manufacture of heavy guns, shafts, &c	397,029	Jan. 29	2608	673	46	545
Shipman's Sons, Asa L. (See Bourne, Theodore F., assignor.)						
Shippee, Charles W., *et al.* (See Trowbridge, Augustus S., assignor.)						
Shockey, Robert V., Hastings, Nebr. Shoulder-brace	396,837	Jan. 29	2337	598	46	489
Shoemaker, Joseph E., Durango, Colo. Roping attachment for trunks, &c	398,546	Feb. 26	2163	571	46	1027
Shoeninger, Adolph. (See Unzicker, Otto, assignor.)						
Short, Sidney H., Columbus, Ohio. Electric-railway trolley and support	396,618	Jan. 22	2008	517	46	414
Short, Sidney H., Columbus, Ohio. Insulating-support for electric conductors	398,661	Feb. 26	2141	622	46	1061
Short, Sidney H., Columbus, Ohio. Electric railway	398,662	Feb. 26	2342	622	46	1061
Short, Sidney H., Columbus, Ohio. Switch mechanism for electric railways	398,663	Feb. 26	2344	622	46	1062
Showalter, Wasson C., assignor of one-half to J. H. Reed, Lancaster, Wis. Mechanical motion	396,003	Jan. 8	1089	277	46	324
Shreffler, Samuel, Jr., Joliet, Ill. Track for door-hangers	396,772	Jan. 29	2244	574	46	468
Shriver, Frank W., *et al.* (See Ford, Charles S., Sr., assignor.)						
Shriver, James, *et al.* (See Leahy, Martin J., assignor.)						
Shriver, T. Herbert, *et al.* (See Leahy, Martin J., assignor.)						
Shue, Ephraim W., *et al.* (See Myers, Samuel, assignor.)						
Shultz, Charles H. (See Voltz and Shultz.)						
Shultz, John A. J., assignor to B. C. Alvord, St. Louis, Mo. Belt-pulley	399,636	Mar. 12	1283	329	46	1386
Shuman, Andrew D., Toledo, Ohio. Can	396,515	Jan. 22	1848	474	46	384
Shunk, Thomas W., Bucyrus, Ohio. Plow	396,434	Jan. 22	1723	443	46	361
Shurtleff, Asahel M., assignor to Codman & Shurtleff, Boston, Mass. Atomizer	397,315	Feb. 5	315	82, 83	46	637
Sibley, Guy C., *et al.* (See Trabue, William, assignor.)						
Siccardi, Giovanni B., New York, N. Y. Car brake and starter	400,129	Mar. 26	2001	524	46	1549
Sickels, Gerard, Jr., assignor of one-half to A. T. Howard, Brooklyn, N. Y. Machine for making envelopes or similar receptacles	398,284	Feb. 19	1777	470, 471	46	944
Sidnell, William E., Norwalk, Ohio. Stone-planing machine	399,705	Mar. 19	1383	356, 357	46	1419
Siebrecht, John. (See Feld and Siebrecht.)						
Sieghold, Christian, Salinas, Cal. Oil-feed for lamps	395,460	Jan. 1	226	57	46	49

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Siegrist, August, Buffalo, N. Y. Suspending electric-light lamps	396,897	Jan. 29	2424	623	46	508
Siemens Brothers & Company. (See Lauckert, Edward F. H. H., assignor.)						
Siemens, Frederick, Dresden, Saxony, Germany. Gas-lamp	399,289	Mar. 12	757	197	46	1287
Siemens, Frederick, Dresden, Saxony, Germany. Regenerative gas-burner	399,290	Mar. 12	758	197	46	1287
Siemens & Halske. (See Hoffmann, Carl, assignor.)						
Siemens & Halske. (See Siemens, Werner, assignor.)						
Siemens & Halske. (See Siemens, Wilhelm, assignor.)						
Siemens, Werner, assignor to Siemens & Halske, Berlin, Germany. Hydraulic press for covering electrical conductors with soft metal	399,291	Mar. 12	759	197	46	1288
Siemens, Wilhelm, assignor to Siemens & Halske, Berlin, Germany. Electrical measuring and controlling apparatus	399,292	Mar. 12	761	198	46	1288
Sievert, Louis, St. Louis, Mo. Button	397,030	Jan. 29	2610	674	46	545
Sigwalt, John, Jr., Chicago, Ill. Printing-stamp	399,089	Mar. 5	414	112	46	1193
Silas, Ferdinand, Vienna, Austria-Hungary. Luminous oil projectile	397,031	Jan. 29	2611	674	46	545
Silver, Homer M. (See Fowler, Joinville F., assignor.)						
Silvey, William L., Lima, Ohio. Arc lamp	398,906	Mar. 5	134	37	46	1140
Silvey, William L., Lima, Ohio. Electric-arc lamp	398,907	Mar. 5	136	37	46	1140
Silvey, William L., Lima, Ohio. Dynamo-electric machine	399,088	Mar. 5	413	111, 112	46	1193
Silvey, William L., Cincinnati, Ohio. Dynamo-electric machine	400,130	Mar. 26	2002	524	46	1549
Sime, Alexander, and W. M. Moore, Emmetsburg, Iowa. Gate-latch	398,351	Feb. 19	1883	496	46	964
Simon, Jacob P., Grigsby's Bluff, Tex. Fire-escape	396,242	Jan. 15	1436	365	46	298
Simon, Robert, Weehawken, N. J. Knife-sharpener for double-pile-fabric looms	399,293	Mar. 12	765	199	46	1289
Simon, Simon B., New York, N. Y. Combined match-box and cane	397,663	Feb. 12	872	229	46	751
Simpkin, William, Richmond, Va. Piston	396,004	Jan. 8	1089	277	46	224
Simpson, Anson D., Troy, N. Y. Three-throw split switch	399,090	Mar. 5	415	112	46	1193
Simpson, David J., Pittsburg, assignor of one-half to G. C. Corken and H. Marshall, Allegheny County, Pa. Electric coupling for hose-pipes	396,176	Jan. 15	1334	343	46	280
Simpson, James H., assignor to Carnegie, Phipps & Co., (limited,) Pittsburg, Pa. Car-coupling	397,473	Feb. 5	560	146	46	685
Simpson, Josiah M., assignor to W. Deering & Company, Chicago, Ill. Die-carrying head for bolt-threading machines	397,664	Feb. 12	873	229	46	751
Simpson, Robert, Jr. (See Parker, Lewis C., assignor.)						
Singer Manufacturing Company of New Jersey. (See Griest, John M., assignor.)						
Sirieix, Léon, San Francisco, Cal., assignor to Sirieix Mariners Compass Company. Ship's compass. (Reissue)	10,991	Mar. 26	2452	642	46	1634
Sirieix Mariners Compass Company. (See Sirieix, Léon, assignor.) (Reissue.)						
Sise, Horace F., New York, N. Y., assignor to Barnes Manufacturing Company, New Haven, Conn. Padlock	396,960	Jan. 29	2509	647	46	525
Sisson, Henry H., New York, N. Y. Dental disk-holder	399,350	Mar. 12	r58	222	46	1306
Sisum, William H. H., Brooklyn, N. Y. Pipe-coupling	399,351	Mar. 12	859	222	46	1307
Sisum, William H. H., Brooklyn, N. Y. Stock-car	399,574	Mar. 12	1191	308	46	1369
Sisung, James, Newport, Mich. Gate	395,360	Jan. 1	81	21	46	19
Siver, Emmett L. (See Knode, Robert S., assignor.)						
Sjöberg, Rudolf, Stockholm, Sweden, assignor to R. Ericsson, New Britain, Conn. Blasting compound	397,095	Jan. 29	2608	.....	46	502
Skandia Plow Company. (See Hendricks, Simeon B., assignor.)						
Skeels, Charles, Brooklyn, N. Y. Whisk-broom	399,575	Mar. 12	1192	308	46	1370
Skinner, Halcyon, and E. Tymeson, assignors to A. Smith & Sons Carpet Company, Yonkers, N. Y. Loom for weaving chenille, &c	400,260	Mar. 26	2302	578, 579, 580	46	1588
Skow, Matts, assignor of two-thirds to L. C. Enewold and E. Peterson, Omaha, Nebr. Harrow	397,145	Feb. 5	67	16	46	501
Slade, William H., *et al.* (See Bending, William P., assignor.)						
Slater, Henry B., Detroit, Mich. Extracting zinc from ores containing precious metals	399,706	Mar. 19	1385	.....	46	1419
Slauson, William G., Middletown, N. Y. Stereotype-plate holder	398,852	Mar. 5	52	15	46	1124
Slazenger, Albert E. L., London, England. Pad for convenience in handling and picking up coins	399,940	Mar. 19	1733	447	46	1487
Sleeper, Charles W., Island Pond, Vt. Carrying-wheel	398,664	Feb. 26	2347	623	46	1062
Sleeper, Charles W., Island Pond, Vt. Device for feeding and cutting solder	398,665	Feb. 26	2347	623	46	1062
Sleeper, J. A., *et al.* (See Williams, John H., assignor.)						
Sleeper, J. C., *et al.* (See Williams, John H., assignor.)						
Sleutz, Albertice O., Canton, Ohio. Counter-stool for stores	397,615	Feb. 12	803	209	46	737
Sletcher, Frederick, San Francisco, Cal. Concentrator	399,791	Mar. 19	1511	391	46	1445
Sloan, James D., Rushville, Ind. Hose-coupling	396,435	Jan. 22	1725	444	46	361
Slocum, George S., Newport, R. I., assignor to J. M. and W. G. Hoyt and C. Healey, Lynn, Mass. Bottle-washer	399,576	Mar. 12	1193	308, 309	46	1370
Smades, Hiram N., Little Rock, Ark. Baling press	397,303	Feb. 5	426	113	46	658
Small, Dexter M., Providence, R. I. Device for applying heat to the body	400,261	Mar. 26	2300	580	46	1589
Small, Herbert M., Baldwinsville, Mass. Hammock	400,131	Mar. 26	2004	525	46	1550
Small, Thomas, Philadelphia, Pa. Steam-actuated valve	395,503	Jan. 1	440	112	46	90
Smalley, William W., Bound Brook, N. J. Journal-bearing	398,547	Feb. 26	2164	571	46	1027
Smallwood, George T., Washington, D. C. Ink-eraser	395,504	Jan. 1	442	112	46	91
Smead, Isaac D., Toledo, Ohio. Furnace and grate therefor	399,294	Mar. 12	767	199	46	1289
Smedes, Levi K., New York, N. Y. Embalming-board	397,394	Feb. 5	428	114	46	630
Smillie, Robert T., Newark, N. J. Burglar-alarm	395,519	Jan. 1	321	81	46	68
Smith, A. Hyatt, *et al.* (See Smith, Maurice, assignor.) (Reissue.)						
Smith, Abia B., Pittsburg, Pa. Swath-board for mowing and reaping machines	398,853	Mar. 5	54	16	46	1124
Smith, Anthony P., Newark, N. J. Apparatus for tapping and connecting mains	396,177	Jan. 15	1337	343	46	280
Smith, B. F. (See Baily, Percy H., assignor.)						
Smith, Charles H., Beaumont, Kans. Spring-motor	396,243	Jan. 15	1436	365	46	298
Smith, Charles W., Brooklyn, N. Y. Pan for ice-boxes	396,619	Jan. 22	2009	517	46	415
Smith, Daniel G., assignor to R. L. Brown, Pocatello, Idaho Ter. Electric railway-signal	395,667	Jan. 1	561	140	46	113
Smith, Daniel W., assignor of one-half to J. C. Addington, St. Louis, Mo. Steam-generator	399,165	Mar. 5	573	147, 148	46	1225
Smith, Edward E., New York, N. Y. Ash-sifter for stoves	396,178	Jan. 15	1339	344	46	280
Smith, Eugene C., assignor of one-half to C. C. Scudder, St. Louis, Mo. Speed-indicator	397,305	Feb. 5	429	114	46	630
Smith, F. Rollin, Bennington, Vt. Mop-wringer	396,436	Jan. 22	1727	444	46	361
Smith, Frederic, Halifax, county of York, England. Wire-drawing machine	398,982	Mar. 5	256	70	46	1163
Smith, Fredrick H., and J. W. Wright, assignors of one-third to S. E. Stranathan, Kansas City, Mo. Petroleum-burner	398,352	Feb. 19	1884	496	46	964
Smith, Friend W., Jr., Bridgeport, Conn. Apparatus for manufacturing seamless dress-shields	399,637	Mar. 12	1284	329, 330	46	1386
Smith, George C., Chicago, Ill. Conducting-pipe	400,262	Mar. 26	2210	580	46	1589
Smith, George E., assignor of one-half to W. A. Knipe, Haverhill, Mass. Last	395,668	Jan. 1	563	140	46	113

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Smith, George P., Bridgeport, Conn. Walking-stilt	398,854	Mar. 5	55	16	46	1125
Smith, German, *et al.* (See Leedy, John K., assignor.)						
Smith, Harry W., Newark, N. J. Electric railway	399,091	Mar. 5	417	113	46	1194
Smith, Harry W., Newark, N. J. Electric car	399,092	Mar. 5	419	113, 114	46	1194
Smith, Henry A., Atlanta, Ga. Intermittent grip device	396,241	Jan. 15	1438	366	46	299
Smith, Herbert, Worcester, Mass. Wire-drawing machine	396,437	Jan. 22	1738	444, 445	46	361
Smith, Hezekiah B., Smithville, N. J. Steam-tricycle	398,548	Feb. 26	2165	572	46	1027
Smith, James E., assignor of two-thirds to A. Moonelis and B. Lichtenstein, New York, N. Y.) Machine for bunching cigars	397,396	Feb. 5	430	114, 115, 116	46	660
Smith, James L., *et al.* (See Spear, Ephraim W., assignor.)						
Smith, James T., New York, N. Y. Umbrella	398,666	Feb. 26	2348	623	46	1063
Smith, James T., Baltimore, Md. Boiler	399,941	Mar. 19	1732	448	46	1487
Smith, John M. (See McKeever and Smith.)						
Smith, John P., Exeter, N. H. Machine for finishing heels of boots or shoes	396,620	Jan. 22	2010	517, 518	46	415
Smith, John T., San Francisco, Cal. Steam or water packing	398,461	Feb. 26	2042	536	46	1003
Smith, John W., assignor to E. Payson, Chicago, Ill. Transom-lifter	400,263	Mar. 26	2211	581	46	1589
Smith, Leonidas C. (See Caston and Smith.)						
Smith, Leroy H., Lisle, assignor to Ithaca Gun Company, Ithaca, N. Y. Breech-loading fire-arm	399,214	Mar. 5	616	169	46	1236
Smith, Levi F., Philadelphia, Pa. Automatic stop-valve bung	396,961	Jan 29	2310	647	46	525
Smith, Lyman, Kansas City, Mo. Adjustable curved pipe-section	396,773	Jan. 29	2244	574	46	468
Smith, Maurice, assignor of two-thirds to A. H. Smith and V. P. Richardson, Janesville, Wis. Tobacco-transplanter. (Reissue)	10,992	Jan. 29	2715	702	46	564
Smith, Meritt W., Waverly, N. Y. Rail-drill	398,983	Mar. 5	257	71	46	1163
Smith, Millard F., and T. L. Firestone, Fredericksburg, Ohio. Egg-crate	399,215	Mar. 5	649	169	46	1239
Smith, Orlando F., and G. H. Barbour, Washington, D. C. Seal for dip-pipes	397,632	Jan. 29	2312	674	46	545
Smith, Richard, Stoke-on-Trent, county of Stafford, England. Preparing wheat for food	396,621	Jan. 22	2014	518	46	416
Smith, Richard, Boston, Mass. Paper-making machine	398,091	Feb. 19	1190	334, 335	46	687
Smith, Richard, Boston, Mass. Rotary elevator for raising liquids	398,855	Mar. 5	56	16	46	1125
Smith, Roland H., Pittsburg, Pa. Apparatus for the manufacture of gas	397,397	Feb. 5	436	116, 117	46	661
Smith, Ruben J., Osceola, Iowa. Horse-power for hay-stackers	398,462	Feb. 26	2043	536	46	1003
Smith, Samuel W., administrator. (See Stone, Ross C.)						
Smith, Sanford C. (See Tag and Smith.)						
Smith, Sidney U., assignor of one-half to A. L Wilcox, Canisteo, N. Y. Metallic railway-tie	398,004	Feb. 19	1360	361	46	861
Smith & Sons Carpet Company, Alexander. (See Skinner and Tymeson, assignors.)						
Smith, Thomas L., Reedsburg, Wis., assignor to Pratt & Whitney Company, Hartford, Conn. Screw-cutting die	399,707	Mar. 19	1386	357	46	1420
Smith, Thomas S., Washington, D. C., assignor to H. B. Ives & Co., New Haven, Conn. Sash-fastener	398,549	Feb. 26	2168	572	46	1028
Smith, Uriah R., West Liberty, Iowa. Dish washer and drainer	396,516	Jan. 22	1649	474	46	384
Smith, Wendell M. (See Carter, George T., assignor.)						
Smith, William E., near May, Ark. Tricycle	398,005	Feb. 19	1360	361	46	861
Smith, William H., Florence, Mass. Tooth-brush	396,898	Jan. 29	2425	623	46	508
Smith, William H., Chicago, Ill. Feed-water purifier and heater	398,856	Mar. 5	58	16	46	1125
Smith, William P., Renton, Wash. Ter. Horse-checking device	399,708	Mar. 19	1387	357, 358	46	1420
Smith, Winfred J., Rochester, N. Y. Fire-escape	399,709	Mar. 19	1389	358	46	1420
Smith, Zalmon W., Addison, N. Y. Corn-shocking machine	398,463	Feb. 26	2044	536	46	1003
Smitten, Thomas W. F., Brooklyn, N. Y. Button	400,132	Mar. 26	2005	525	46	1550
Snedden, George, assignor of two-thirds to J. Brennand, New Bedford, and Covel & Osborn, Fall River, Mass. Pulley	395,669	Jan. 1	564	141	46	113
Snedeker, Edgar W., Jamesburg, N. J. Sawing-machine	395,719	Jan. 8	637	161, 162	46	137
Snedeker, Charles T., New York, N. Y. Waterproofing compound	396,622	Jan. 22	2015	.....	46	416
Snell, Adolphus G., New Haven, Conn. Canopy for children's carriages	398,667	Feb. 26	2349	623	46	1063
Snell, Prince A., assignor to himself and J. H. Armbruster, Philadelphia, Pa. Quartz-mill	395,670	Jan. 1	564	141	46	113
Snelling, David, Adams, assignor to King & Hamilton Company, Ottawa, Ill. Corn-sheller	396,375	Jan. 15	1628	417	46	333
Sniffen, Samuel F., New York, N. Y. Water-closet	396,623	Jan 22	2016	518	46	416
Snow, James, Cleveland, Ohio. Belt-fastener	398,857	Mar. 5	59	17	46	1125
Snowden, Thomas W., *et al.* (See Rees, Thomas W., assignor.)						
Snyder, Alfred H. (See Buzby and Snyder.)						
Snyder, Charles L., assignor of one-half to I. M. Ridge, Kansas City, Mo. Curve for cable railways	396,054	Jan. 8	1152	292, 293	46	236
Snyder, Henry, H. Staples, and M. Barr, Battle Creek, Mich. Slat-and-wire-fence machine	395,853	Jan. 8	858	222	46	180
Société Bariquand et Fils. (See Bariquand, Emile, assignor.)						
Soeding, Gustav, Philadelphia, Pa. Coin-controlled strength-tester	399,942	Mar. 19	1733	448	46	1487
Soltmann, Werner. (See Kemmler, John A., assignor.)						
Solenberger, Noah W., *et al.* (See Leedy, John K., assignor.)						
Solid Fiber Company. (See Crofut, Eber R., assignor.)						
Solmans, Alden, *et al.* (See Palmer, Seymour C., assignor.)						
Solter, John, Baltimore, Md. Soldering-machine	397,758	Feb. 12	1000	265, 266	46	776
Soltmann, Edward G., New York, N. Y. Indian-ink and color slab	397,146	Feb. 5	68	16	46	591
Somerby, Lorenzo H., Boston, Mass. Stand for charts, &c	397,759	Feb. 12	1003	266	46	776
Somers, George E., Bridgeport, Conn., assignor to Bridgeport Brass Company, of Connecticut. Shade-holder	400,133	Mar. 26	2007	525	46	1550
Somersworth Machine Company. (See Langlands and Moulton, assignors.)						
Somerville, Samuel, Cloquet, Minn. Liniment	397,033	Jan. 29	2614	.....	46	546
Somes, James F. (See Butts, William, assignor.)						
Sommer, Adolph, Berkeley, Cal. Paint-oil	396,774	Jan. 29	2246	.....	46	469
Sommerfeld, Heinrich, Canton, Kans. Car-coupling	395,361	Jan. 1	83	22	46	19
Sornson, John, Brayton, Iowa. Fence-machine	398,090	Feb. 19	1489	394	46	887
Sonle, Buren M., Cedar Rapids, Iowa. Carriage-spring	400,134	Mar. 26	2008	525, 526	46	1550
South Bend Chilled Plow Company. (See Goodyear, Andrew, assignor.)						
South Bend Iron Works. (See Anderson, Charles, assignor.)						
Southerland, Milton B., assignor of one-half to J. R. Blount, East Perryville, Tenn. Vehicle-hub	399,577	Mar. 12	1195	309	46	1370
Southwick, George W., Stamford, Conn. Lace-hole protector for driving-belts	397,259	Feb. 5	241	58	46	618

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Southwick, George W., Stamford, Conn. Punch	399,943	Mar. 19	1735	448	46	1488
Southworth, Clara M., Bridgeport, Conn. Under-arm pad	397,570	Feb. 12	712	184	46	720
Spahn, Rudolph, Brooklyn, N. Y. Buttou-hole-cutting attachment for sewing-machines	399,638	Mar. 12	1286	330	46	1387
Spalding, Reuben J., Rosita, Colo. Flying-machine	398,984	Mar. 5	259	71, 72	46	1164
Spalding, Rufus H., *et al.* (See Barnstead, Robert P., assignor.)						
Spangenberg, Robert F., New Orleans, La. Brush for cotton-gins	395,368	Jan. 1	84	22	46	19
Sparks, Edward G., Brooklyn, N. Y. Waxed-paper bag	395,320	Jan. 1	322	81	46	68
Sparks, William F., and H. J. Landolt, assignors to Sargent & Company, New Haven, Conn. Gong-bell	398,285	Feb. 19	1784	472	46	944
Spaulding, Albion K., North Belgrade, Me. Wrench	395,595	Jan. 1	442	113	46	91
Speake, Rufus H., assignor of two-thirds to C. A. McEuen, C. R. Eberle, and H. C. Borden, Washington, D. C. Automatic gas-governor	396,809	Jan. 29	2425	623	46	508
Speakman, Thomas H., Ware, assignor to G. Draper & Sons, Hopedale, Mass. Traveler-clearer for ring-spinning frames	398,550	Feb. 26	2171	573	46	1028
Spear, Ephraim W., assignor of two-thirds to G. W. Lawler and J. L. Smith, Boston, Mass. Overflow-check nozzle	396,376	Jan. 15	1629	418	46	333
Spear, Furman D., Brooklyn, N. Y. Lantern-frame	399,944	Mar. 19	1736	449	46	1488
Spear, William H., Humboldt, Iowa. Sleigh-knee	396,005	Jan. 8	1001	277	46	224
Speer, John S., Du Bois, Pa. Load-binder	398,226	Feb. 19	1765	472	46	945
Spencer, Elijah H., Winona, Miss. Cultivator	397,253	Feb. 5	221	58	46	618
Spencer, George F., Thompson, Pa. Roller	399,443	Mar. 12	985	257	46	1332
Spencer, Joseph, Chicago, Ill. Sash-balance	399,216	Mar. 5	651	170	46	1239
Sperl, Henry, Susquehanna, Pa. Steam-heater	396,438	Jan. 22	1730	445	46	362
Sperry, Charles, Port Washington, N. Y. Rotatable drawing-board and mechanical ruler	397,147	Feb. 5	67	17	46	591
Sperry Electric Company. (See Sperry, Elmer A., assignor.)						
Sperry, Elmer A., Chicago, Ill. Automatic grounding device	400,264	Mar. 26	2212	581	46	1590
Sperry, Elmer A., Chicago, Ill., assignor, by mense assignments, to H. E. Goodman, Boston, Mass. Electrical switch	396,439	Jan. 22	1732	445	46	362
Sperry, Elmer A., assignor to F. S. Terry, Chicago, Ill. Electric battery	397,945	Feb. 19	1262	336	46	844
Sperry, Elmer A., assignor to Sperry Electric Company, Chicago, Ill Regulator for dynamo-electric machines	398,668	Feb. 26	2350	624	46	1063
Spicer, Pratt A., Marshall, Mich. Dust-pan	396,668	Jan. 22	2075	533	46	427
Spicer, Pratt A., Marshall, Mich. Dust-pan	396,669	Jan. 21	2076	533	46	428
Spicer, Pratt A., Marshall, Mich. Spring-tooth harrow	398,858	Mar. 5	60	17	46	1126
Spiegel, William G., assignor to J. W. Patterson, New York, N. Y. Automaton	397,398	Feb. 5	438	117, 118	46	661
Spielman, William, assignor to S. J. Naumburg, Newark, N. J. Railway-switch	400,135	Mar. 26	2009	526	46	1550
Spiller, Joseph D., Malden, Mass. Boot-tree	399,146	Mar. 5	575	148	46	1225
Spiro, Charles, New York, N. Y. Type-writing machine	395,789	Jan. 8	773	201	46	162
Spiro, Charles, New York, N. Y. Type-writing machine	400,265	Mar. 26	2215	581	46	1590
Spivey, John H. (See Stewart, Robert E., assignor.)						
Spivey, Thomas S., assignor to Victor Safe and Lock Company, Cincinnati, Ohio. Combined safe and copying-press	396,670	Jan. 22	2077	533	46	428
Splitdorf, Henry, assignor to Splitdorf Wire Company, New York, N. Y. Machine for covering wire	395,363	Jan. 1	84	22	46	19
Splitdorf Wire Company. (See Splitdorf, Henry, assignor.)						
Splittstoser, Ferdinand, North Branch, Minn. Automatic locking-hook	396,775	Jan. 29	2248	574	46	469
Sponseller, John, Fort Apache, Ariz. Ter. Nippers	398,464	Feb. 26	2045	537	46	1003
Spooner, Frederick B., Brooklyn, N. Y. Clasp	397,034	Jan. 29	2615	674	46	546
Spradley, Napoleon B., assignor of one-half to J. P. Caldwell, Ashville, Ala. Fertilizer-distributer	400,136	Mar. 26	2010	526	46	1551
Sprague Electric Railway and Motor Company. (See Sprague, Frank J., assignor.)						
Sprague, Frank J., assignor to Sprague Electric Railway and Motor Company, New York, N. Y. Overhead line for electric railways	397,675	Feb. 12	1159	310	46	807
Sprague, Herbert M., Parishville, N. Y. Joint for boats	396,776	Jan. 29	2249	575	46	469
Sprake, Charles, Detroit, Mich. Ice velocipede	398,465	Feb. 26	2046	537	46	1003
Springer, Martin B., Indianapolis, Ind. Latch for match-flasks	397,309	Feb. 5	444	118	46	663
Springer, Martin B., Brightwood, and J. C. Higgins, Indianapolis, Ind. Snap flask-lock	397,035	Jan. 29	2616	675	46	546
Springer Torsion Balance Company. (See Kent, William, assignor.)						
Springfield Envelope Company. (See Johnson, Alonzo, assignor.)						
Sproul, Robert, Pittsburg, Pa. Vehicle-spring	396,671	Jan. 22	2078	534	46	428
Squires, George J., Aurora, Ill. Washing-machine	395,506	Jan. 1	443	113	46	91
St. Clair, Charles F. (See Koh, Allen, and St. Clair.)						
St. Clair, John, Newton Stewart, county of Wigtown, Scotland. Device for lighting and extinguishing lights in railway carriages, stations, &c	395,760	Jan. 8	697	178	46	149
St. John, Alexander P., Mobile, Ala. Paper-file	396,841	Jan. 29	2341	599	46	490
St. John, Bela, Torrington, Conn. Abdominal supporter	396,962	Jan. 29	2512	647	46	536
St. John, William W., Brooklyn, N. Y. Metallic packing for stuffing-boxes	396,190	Jan. 15	1250	319	46	264
St. Lawrence Steel and Wire Company. (See Meggs, Thomas E., assignor.)						
St. Louis Stamping Company. (See Fredericks, John H., assignor.)						
Stafford, George J., Aztec Springs, Colo. Excavator	395,854	Jan. 8	859	222	46	180
Staib, Gustav, Tompkinsville, N. Y. Cover-fastener	397,907	Feb. 5	264	43	46	607
Stalactite Decorative Company. (See Robinson, Thomas, assignor.)						
Stanbrough, Joel R., Sheridan, Ind. Gate	396,517	Jan. 22	1650	474, 475	46	385
Stanford, Lewis A., Bradford, Pa. Steam-power apparatus for screwing pipes together	397,400	Feb. 5	445	119	46	663
Stanger, Francis A. (See Izard, Stanger, and Duffield.)						
Stanhope, Erwin. (See Sabin, Ransom, assignor.)						
Stanley Electric Company. (See Stanley, Lucius T., assignor.)						
Stanley, Frank F., *et al.*, trustees. (See Goddu, Louis, assignor.)						
Stanley, Frank F., Swampscott, Mass. Leather-splitting machine	395,759	Jan. 8	696	177	46	148
Stanley, Frank W. (See Brown, Rufus H., assignor.)						
Stanley, Lucius T., Brooklyn, N. Y., assignor to Stanley Electric Company, Philadelphia, Pa. Therapeutical electrode	397,474	Feb. 5	561	147	46	685
Staples, Hiram. (See Snyder, Staples, and Barr.)						
Star Manufacturing Company. (See Bridwell, James W., assignor.)						
Starbird, Walter B., Stockton, Cal. Aerated tonic beverage	396,440	Jan. 22	1734	.....	46	363
Stark, Charles A., Buffalo, N. Y. Locking-clasp for traveling-bags, pocket-books, &c	398,287	Feb. 19	1786	472	46	945
Stark, John. (See Haldy, Henri L., assignor.)						
Starkey, Helen A., Sioux Falls, Dak. Ter. Lap-desk	398,669	Feb. 26	2354	624	46	1064
Starr, Ferdinand W., Springfield, Ohio. Polishing-wheel	395,729	Jan. 8	698	182	46	158
Starr, Ferdinand W., Springfield, Ohio. Metallic fastening device	396,960	Jan. 29	2428	624	46	536
Starrett, Leroy S., Athol, Mass. Micrometer caliper-square	399,167	Mar. 5	576	148	46	1226

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
States, John G. (See Scheer and States.)						
Steam Gauge and Lantern Company *et al.* (See Betts, Lewis F., assignor.)						
Steam Gauge and Lantern Company *et al.* (See Dietz, Frederick, assignor.)						
Stearns & Co., E. C. (See Aldinger, John L., assignor.)						
Stearns, George M., *et al.* (See Taber, John, assignor.)						
Stebbins, Wallace, Baltimore, Md. Hose-nozzle	396,119	Jan. 15	1249	318	46	264
Steck, George, New York, N. Y. Piano	399,710	Mar. 19	1390	358	46	1421
Stedman, Oscar F., Ravenna, Ohio. Stem winding and setting watch	396,777	Jan. 29	2250	575	46	469
Steel, James, Jr. (See Dean, George W., assignor.)						
Steele, James C., Statesville, N. C. Brick-truck	398,985	Mar. 5	265	72	46	1165
Steele, James H., Butte City, Mont. Ter. Brick-press	397,666	Feb. 12	878	230	46	752
Stefany, Felix, New York, N. Y. Bottle-faucet	397,667	Feb. 12	879	231	46	752
Steiger, Andrew W. (See Felbel and Steiger.)						
Stein, Lewis, New York, N. Y. Elastic strap	400,366	Mar. 26	2217	581	46	1590
Steinbach, Philip, Sr. (See Will, Julius E. and H., assignors.)						
Steinberg, Henry, Washington, D. C. Pavement of roadway	400,013	Mar. 19	1835	476	46	1506
Steinberger, Louis, New York, N. Y. Suspender-buckle	400,137	Mar. 26	2012	527	46	1551
Steinberger, Louis, New York, N. Y. Spring-clasp for holding letters	400,138	Mar. 26	2013	527	46	1551
Steiner, Henry W., assignor of one-half to E. W. Miller, Easton, Pa. Lawn-rake	395,721	Jan. 8	639	162	46	138
Steinhagen, Julie, Boltenhagen, Mecklenburg, Germany. Curtain-fixture	398,859	Mar. 5	61	17	46	1126
Steinhilber, Adam, New York, N. Y. Gas-extinguisher	398,805	Feb. 26	2548	678	46	1104
Stenard, Josef, Sr., Troy, N. Y. Mechanism for propelling ships	396,672	Jan. 22	2079	534, 535	46	428
Stephens, James C., *et al.* (See Hansen, Soren, assignor.)						
Stephens, Mary E., *et al.* (See Hansen, Soren, assignor.)						
Stephenson, Edwin N., Waco, Tex. Mattress-stuffing machine	399,093	Mar. 5	420	114, 115	46	1194
Stephenson, John, New York, N. Y. Cable-car-truck support	396,838	Jan. 29	2338	599	46	489
Stephenson, John, New York, N. Y. Axle-box for cable-car trucks	396,839	Jan. 29	2339	599	46	489
Sterling, Clarence C., assignor to C. E. Dustin, Hartford, Conn. Switch for electric circuits	398,288	Feb. 19	1789	472, 473	46	946
Sterling Slate Company. (See Rudolph, Justus H., assignor.)						
Stern, Henry, Shelbyville, Ky. Neckscarf	396,840	Jan. 29	2340	599	46	490
Sternheimer, Friedman, New York, N. Y. Folding fan	398,092	Feb. 19	1492	395	46	887
Steussy, David, Monticello, Wis. Conductor-support	397,036	Jan. 29	2618	675	46	546
Steussy, David, Monticello, Wis. Conductor-support	397,037	Jan. 29	2619	675	46	547
Stevens, Aaron L., Little Falls, Wash. Ter. Foot-board for wood-choppers	399,444	Mar. 12	987	257	46	1332
Stevens, Benjamin D., Burlington, Vt., assignor to himself and B. H. Cheever, Lowell, Mass. Roll for loom-temples	399,445	Mar. 12	988	257	46	1333
Stevens, Charles W., Yonkers, N. Y., assignor of one-half to J. P. Ross, Newark, N. J. Hat-pouncing machine	398,551	Feb. 26	2171	573	46	1028
Stevens & Co., Foster. (See Wilcox, William A., assignor.)						
Stevens, Edward G., Clinton, Mass. Account-book	400,014	Mar. 19	1837	477	46	1506
Stevens, Emanuel. (See Bender and Stevens.)						
Stevens, George E. (See Davis and Stevens.)						
Stevens, George J., Boston, Mass. Paper bag	398,908	Mar. 5	137	37	46	1140
Stevens, Irving D., *et al.* (See Osborn, Luke W., assignor.)						
Stevens, John, Neenah, Wis. Fountain-brush	397,940	Feb. 19	1264	337	46	844
Stevens, John S., London, England. Edging-plow	396,714	Jan. 22	2143	548	46	440
Stevens, Leicester B. (See Anderson, Luke, assignor.)						
Stevens, William X. (See Hess and Stevens.)						
Stevenson, Alfred C., Oakdale Station, Pa. Window-ventilation	396,901	Jan. 29	2429	624	46	508
Stevenson, Martin V. B., Jessup, Iowa. Feed-trough	395,855	Jan. 8	862	222	46	181
Stevenson, William. (See Turkington, William J., assignor.)						
Steward, John F., Chicago, Ill. Platform-adjusting device for harvesters	396,006	Jan. 8	1091	277	46	225
Steward, John F., Chicago, Ill. Harvester-frame	396,245	Jan. 15	1438	366	46	299
Steward, John F., Chicago, Ill. Bundle-carrier for grain-harvesters	396,518	Jan. 22	1852	475	46	385
Steward, John F., Chicago, Ill. Corn-harvester	398,860	Mar. 5	62	17, 18	46	1126
Stewart, Benjamin F., New Philadelphia, Ohio. Grain-binder	398,466	Feb. 26	2047	537, 538	46	1004
Stewart, George W., Rising Sun, Ind. Sliding gate	398,861	Mar. 5	67	18	46	1127
Stewart, John A., Houston, Tex., assignor to Deere, Mansur & Co., St. Louis, Mo. Plow	399,217	Mar. 5	652	170	46	1239
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,300	Jan. 15	1518	.....	46	313
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,301	Jan. 15	1519	.....	46	313
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,302	Jan. 15	1520	.....	46	314
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,303	Jan. 15	1521	.....	46	314
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,304	Jan. 15	1521	.....	46	314
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,305	Jan. 15	1522	.....	46	314
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,306	Jan. 15	1523	.....	46	314
Stewart, John L., and J. L. Hastings, Philadelphia, Pa., assignors, by mesne assignments, to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Plastic mineral composition, &c	396,307	Jan. 15	1524	.....	46	314
Stewart, Milo B. (See Pearce, Joseph A., assignor.)						
Stewart, Robert E., assignor to himself and J. H. Spivey, Dallas, Tex. Switch-stand for dynamo-stations	400,139	Mar. 26	2014	527	46	1551
Stewart, Shaw, assignor of two-thirds to J. G. Crockett, Stuart, Iowa, and S. Stewart, Sr., Chicago, Ill. Railway-switch	399,792	Mar. 19	1513	391	46	1445
Stewart, Walter H., Franklin, N. H. Circular-knitting machine	397,444	Feb. 5	520	137	46	678
Stewart, William H., assignor of one-half to W. S. Whittaker, Kansas City, Mo. Weighing-scale	399,446	Mar. 12	989	258	46	1333

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Stickle, Charles S., Pekin, Ill. Harvester	398,467	Feb. 26	2049	538	46	1004
Stickney, Randolph L., Peabody, assignor of one-half to K. Upton, Salem, Mass. Guard or shield for projecting surfaces	398,909	Mar. 5	138	38	46	1140
Stiebel, A. C., *et al.* (See Kisinger, William S., assignor.)						
Stiebel, Henry G., Jr., *et al.* (See Kisinger, William S., assignor.)						
Stieglitz, Siegmund, New York, N. Y. Ball of thread	395,636	Jan. 1	513	129	46	102
Stiers, Isaac. (See Mozingo and Stiers.)						
Stiggins, Edward A., assignor of one-half to H. G. Phipps, Brockton, Mass. Waxing device for wax-thread sewing-machines	399,578	Mar. 12	1196	309	46	1371
Stiles, Edmund S. (See Pollard, Charles E., assignor.)						
Stiles, Fred P., Sparta, Wis. Anti-rattler for thill-couplings	399,447	Mar. 12	990	258	46	1333
Stillman, Joseph F. (See Kammerer, Christopher, assignor.)						
Stillman, Willett D., Madison, Wis. Fence-post	395,800	Jan. 8	778	202	46	162
Stillwell, Lewis B., assignor to Westinghouse Electric Company, Pittsburg, Pa. Regulator for systems of electrical distribution	399,218	Mar. 5	652	170	46	1239
Stillwell, Lewis B., assignor to Westinghouse Electric Company, Pittsburg, Pa. Regulation for systems of electrical distribution	399,219	Mar. 5	655	171	46	1240
Stine, William, assignor of one-half to G. Jaeger, Jr., Elmore, Ohio. Eaves-trough hanger	398,468	Feb. 26	2050	539	46	1004
Stitzel, Frederick, and C. Weinedel, assignors to American Semaphore Company, Louisville, Ky. Semaphore-signal	398,353	Feb. 19	1886	496, 497	46	964
Stitzel, Frederick, and C. Weinedel, assignors to American Semaphore Company, Louisville, Ky. Semaphore-signal	399,579	Mar. 12	1198	309, 310	46	1371
Stix, Charles A. (See Blaisdell, Harry, assignor.)						
Stixrud, Martinius, Seattle, Wash. Ter. Planing-machine	399,711	Mar. 19	1391	359	46	1421
Stocking, Edgar B., Washington, D. C. Cash or parcel carrier	396,778	Jan. 29	2251	575	46	469
Stockly, George W., Cleveland, Ohio. Lantern or lamp	400,140	Mar. 26	2015	527	46	1551
Stockman, Richard T., *et al.* (See Rees, Thomas W., assignor.)						
Stoddard, Oscar, Detroit, Mich. Key	399,094	Mar. 5	424	115	46	1195
Stoddard, Solomon P., Brookville, Ind. Car-truck	399,580	Mar. 12	1203	311	46	1371
Stokes, Philip S., Tennent, N. J. Rasp-cutting machine	397,254	Feb. 5	222	58 59	46	618
Stone, Charles F. (See Booth, Walter W., assignor.)						
Stone, Gardner H., assignor of one-half to F. A. Hale, Syracuse, N. Y. Toy furniture	396,903	Jan. 29	2513	647	46	526
Stone, Herbert F., assignor to Appleton Manufacturing Company, Appleton, Wis. Grinding-mill	397,445	Feb. 5	524	137, 138	46	678
Stone, James, Aurora, Ill. Making button-strips	395,522	Jan. 1	325	82	46	68
Stone, Joseph H., *et al.*, administrators. (See Stone, Joseph M.)						
Stone, Joseph M., deceased; S. F. and J. H. Stone administrators and assignors to Davis & Furber Machine Company, North Andover, Mass. Warp-beaming machine	396,035	Jan. 8	1154	293	46	236
Stone, Josephus, T. and B. A. Watson, Burton, Tex. Cotton or corn planter	398,006	Feb. 19	1363	361	46	892
Stone, Lorenzo, and A. O. Austin, Providence, R. I. Enameling bobbins; &c	398,670	Feb. 26	2350	625	46	1064
Stone, Norman J. (See Carver and Stone.)						
Stone, Ross C., deceased, New York, N. Y., S. W. Smith, administrator. Telegraphic transmitter	400,141	Mar. 26	2016	528	46	1552
Stone, Royal A., Kalamazoo, Mich. Case for sulkies	396,779	Jan. 29	2253	575	46	470
Stone, Stephen, and J. W. Kingston, assignors of one-third to C. P. Kingston, Rochester, N. Y. Middlings-purifier	395,637	Jan. 1	513	129	46	103
Stone, Susan F., *et al.*, administrators. (See Stone, Joseph M.)						
Stone, William. (See Macdonald, David, assignor.)						
Stonemetz, John H., assignor to Stonemetz Printer's Machinery Company, Millbury, Mass. Combined point-feed and drop-roll-feed book-folding machine	396,308	Jan. 15	1524	384, 385	46	314
Stonemetz Printer's Machinery Company. (See Stonemetz, John H., assignor.)						
Stopple, John J., Belleville, Tex. Grindstone-fixture	398,753	Feb. 26	2479	657	46	1090
Storch, Ferdinand, assignor of one-half to J. Mess, Chicago, Ill. Machine for smoothing leather	397,821	Feb. 12	1095	293	46	794
Storey, Julius W., and J. Olsson, Cotton Gin, Tex. Self-cooling journal-box	397,638	Jan. 29	2620	676	46	547
Storey, William C. (See Poore and Storey.)						
Storn, Oren, *et al.* (See Ransom, Ezra, assignor.)						
Storrs, Charles L., assignor to himself and F. E. Fisk, Boston, Mass. Printer's gage	397,876	Feb. 12	1161	311	46	808
Story, Ephraim J., Washington, D. C. Fire-grate	398,007	Feb. 19	1364	362	46	892
Stott, John, Aurora, Ill. Smoke-preventing stove	398,862	Mar. 5	68	19	46	1127
Stouffer, Edward A. (See Power, Augustus D., assignor.)						
Stout, John R., Brooklyn, N. Y. Lace for confectioners' use	397,446	Feb. 5	526	138	46	678
Stover, Daniel C., Freeport, Ill. Wire fabric	396,007	Jan. 8	1092	278	46	225
Stover Manufacturing Company. (See Devore, Levi M., assignor.)						
Stover Manufacturing Company. (See Devore and Hoefer, assignors.)						
Stowe, Frederick H. (See Campbell, Daniel W., assignor.)						
Straight, Clarence H. (See Garver and Straight.)						
Strait, Andrew V., Sidney, N. Y. Advertising-clock	397,148	Feb. 5	72	17	46	592
Stranathan, Samuel E. (See Smith and Wright, assignors.)						
Strang, Lew K., assignor to himself and J. D. Weldon, Haverhill, Mass. Binding-machine	397,524	Feb. 12	639	166	46	707
Strange, John. (See Field, Wallace L., assignor.)						
Strasburger, Josef, Moscow, Russia, assignor to Actien-Gesellschaft für Anilin Fabrikation, Berlin, Germany. Making a brown dye	399,581	Mar. 12	1206	.....	46	1372
Strasser, Carl A., assignor, by mesne assignments, of one-half to C. Schroeder, Baltimore, Md. Screw-driver	398,966	Mar. 5	266	73	46	1165
Stratton, James and W. J., Brooklyn, N. Y. Shade for burners	397,668	Feb. 12	880	231	46	752
Stratton, Thomas A., Lincoln, Nebr. Tree-planting machine	398,754	Feb. 26	2480	657, 658	46	1090
Stratton, William J. (See Stratton, James and W. J.)						
Strauss, Fridrich, La Crosse, Wis. Axle-bearing	400,142	Mar. 26	2017	528	46	1552
Streeper, Daniel H., Norristown, Pa. Water-discharge regulator for steam-radiators	398,552	Feb. 26	2176	573	46	1029
Street, John W., Chicago, Ill. Preparing meats for transportation	395,344	Jan. 15	1578	399	46	321
Streich, Gabrell, Oshkosh, Wis. Lumber-rack	400,015	Mar. 19	1838	477	46	1507
Strickler, Benjamin H. (See Winfield and Strickler.)						
Stringer, George, Auburn, N. Y. Fruit-drier	398,469	Feb. 26	2052	539	46	1005
Stringer, George, Auburn, N. Y. Steam-boiler	398,470	Feb. 26	2053	539	46	1005
Strobel, Charles, Philadelphia, Pa. Loom for weaving terry fabrics	396,964	Jan. 29	2513	648	46	526
Strobel, Frederick, assignor to Marion Manufacturing Company, Marion, Ohio. Straw-carrier	396,345	Jan. 15	1579	400	46	324
Strodtmann, John G., Petersburg, Ill. Seal-press	395,521	Jan. 1	323	82	46	68
Strom, Axel A., Austin, Ill. Lifting-jack	395,928	Jan. 8	965	248	46	200
Strom, Axel A., Austin, Ill. Railway-frog	395,929	Jan. 8	967	248, 249	46	200
Strom, Axel A., Austin, Ill. Tie-rod for switch-rails	395,930	Jan. 8	969	249	46	201

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Strom, Axel A., Austin, assignor to Strom Manufacturing Company, Chicago, Ill. Manufacture of clips for connecting tie-bars with switch-rails	397,447	Feb. 5	528	139	46	679
Strom, Axel A., Austin, assignor to Strom Manufacturing Company, Chicago, Ill. Switch-stand	398,354	Feb. 19	1890	497	46	965
Strom Manufacturing Company. (See Strom, Axel A., assignor.)						
Strong, Louise W. (See Valiquet, Louis P., assignor.)						
Stuart, Addison A., Cedar Rapids, Iowa. Harrow	395,638	Jan. 1	514	129	46	103
Stoart, Tom R., Washington, D. C., assignor to Eagle Pencil Company, New York, N. Y. Pen-holder	400,368	Mar. 26	2371	619	46	1619
Stubbers, Joseph, Cincinnati, Ohio. Gasoline apparatus for illuminating and heating purposes	397,255	Feb. 5	225	59	46	618
Stuckert, J. Franklin, Philadelphia, Pa. Automatic fire-extinguisher	395,856	Jan. 8	863	222	46	181
Studte, Hermann, Saronty, Prussia, Germany. Water-motor	397,696	Jan. 29	2699	697	46	562
Stüfee, Ludwig, Cozaddale, Ohio. Wagon-brake	396,789	Jan. 29	2254	576	46	470
Stukes, John M., and O. P. Reid, Aguilases, Tex. Combined corn-sheller and wash-board	396,902	Jan. 29	2490	624	46	509
Stulting, Calvin L., Stribling Springs, Va. Fence-making machine	400,369	Mar. 26	2372	620	46	1620
Stump, Ira E., Richville, assignor of one-half to A. C. and G. T. McConnell, Cleveland, Ohio. Rotary harrow	395,364	Jan. 1	86	23	46	90
Sturm, Otto. (See Schrader and Sturm.)						
Sturtevant, H. H., *et al.* (See Lippitt, Elihu, assignor.)						
Styer, William. (See Cloud, William H., assignor.)						
Suckow, Edmund, Buffalo, N. Y. Current-motor	397,097	Jan. 29	2700	698	46	562
Sudmann, Johann, Hamburg, Germany. Metallic thermometer	398,755	Feb. 26	2483	658	46	1090
Suffern, James B., Hilburn, N. Y. Railway-switch	400,370	Mar. 26	2373	620	46	1620
Sugden, Edmonds J., Pittsburg, Pa. Whiffletree or neck-yoke iron	398,553	Feb. 26	2176	574	46	1029
Suhr, William M., New York, N. Y. Covering	397,822	Feb. 12	1096	293	46	794
Sullivan, Cornelius, Newark, N. J. Cutter-head	400,371	Mar. 26	2374	621	46	1620
Sullivan, Cornelius F., assignor, by mesne assignments, to C. C. Richmond, Boston, Mass. Hinge	399,582	Mar. 12	1207	311	46	1372
Sullivan, E. P. (See Hyland, Joseph, assignor.)						
Sullivan, John J., assignor of one-half to T. W. Graydon, Cincinnati, Ohio. Book-binding	395,408	Jan. 1	149	38	46	32
Sullivan Machine Company. (See Ball, Albert, assignor.)						
Sullivan, Otho O., Stonington, Conn. Bobbin	396,008	Jan. 8	1093	278	46	225
Sullivan, Philip B., Tuscarora, Nev. Elevator safety attachment	396,965	Jan. 29	2515	648	46	596
Sullivan, Thomas P., St. Louis, Mo. Machine for delinting cotton-seed	397,448	Feb. 5	529	139	46	679
Sullivan, Timothy J. (See Williams, David F., assignor.)						
Sulzberger, Mayer, trustee. (See Kitsee, Isidor, assignor.)						
Summers, James W., and T. Sharp, Stalybridge, county of Lancaster, England. Apparatus for compressing scrap metal	400,415	Mar. 26	2441	640	46	1632
Summerton, George, San Francisco, Cal. Rotary bolt	395,680	Jan. 1	579	145, 146	46	117
Sumner, Alanson A. (See Bingham, Solon, assignor.)						
Sumner, Charles O., and J. J. Pullen, Scammonville, Kans. Coal-drilling machine	398,289	Feb. 19	1790	473	46	946
Sunderman, John H., Quincy, Ill. Revolving handle for rolling-pins, &c	397,149	Feb. 5	73	18	46	592
Sutcliffe, William W., New Orleans, La. Bagasse-furnace	400,016	Mar. 19	1839	477, 478	46	1507
Sutton, Benjamin F., Brooklyn, N. Y. Syringe	397,256	Feb. 5	230	60	46	620
Suydam, Hiram L., Geneva, N. Y. Spring-motor	398,355	Feb. 19	1891	497	46	966
Swaim, John B., Newbern, Ind. Car brake and starter	395,461	Jan. 1	227	58	46	49
Swain, Fred F., Chicago, Ill. Packing for piston-rods	398,556	Feb. 26	2484	650	46	1091
Swain, Fremont, Indianapolis, Ind. Percentile measurement-chart	400,017	Mar. 19	1840	478	46	1507
Swan, Charles W., *et al.* (See Noble, Henry C., assignor.)						
Swan, James, Seymour, Conn. Die for making chisels	398,916	Mar. 5	139	38	46	1141
Swan, James, assignor of one-half to B. A. Eckhart, Chicago, Ill. Water-power device	396,056	Jan. 8	1155	293	46	236
Swan, William W., Andover, Dak. Ter. Reamer	397,525	Feb. 12	640	167	46	708
Swann, John, *et al.* (See Ethridge, Martin V. B., assignor.)						
Sweeney, Daniel, Newark, N. J. Governor for marine engines	400,416	Mar. 26	2442	640	46	1632
Sweet & Clark Manufacturing Company. (See McPherson, Henry, assignor.)						
Sweet, Martin L., *et al.* (See Cobb, John J., assignor.)						
Sweet, William C., Schenectady, N. Y. Refrigerator. (Reissue)	10,992	Mar. 26	2454	643	46	1634
Sweetland, Alvah, Syracuse, N. Y. Curtain-roller	399,448	Mar. 12	991	258	46	1333
Sweetland, Jerome B., Pontiac, Mich. Tidy-holder	398,757	Feb. 26	2485	659	46	1091
Sweetland, Jerome B., Pontiac, Mich., assignor to E. M. Beebe, Huron, Dak. Ter. Flour and meal bin and sifter	395,639	Jan. 1	516	129	46	103
Swett, Greenleaf L., Boston, Mass. Apparatus for burning kerosene-oil for fuel	397,150	Feb. 5	74	18	46	592
Swezey, Moses C., New Haven, Conn. Cash-carrier	398,356	Feb. 19	1892	498	46	966
Swift, Albert E., Buffalo, N. Y. Paper-weight	396,519	Jan. 22	1853	475	46	385
Sykes, John, Lindley, near Huddersfield, county of York, England. Apparatus for grinding the cards of carding-engines	398,806	Feb. 26	2548	678	46	1105
Sylvan, Emil W., Savannah, Ga. Attachment for musical instruments	397,677	Feb. 12	1162	311	46	808
Sylvester, George. (See Michelson, Sigismund M., assignor.)						
Taber, John, South Wolfborough, N. H., assignor to himself, W. Emery, Alfred, Me., and G. M. Stearns, Boston, Mass. Brick-kiln	396,966	Jan. 29	2516	649, 650	46	527
Taber, John, Wolfborough, N. H., assignor to himself, W. Emery, Alfred, Me., and G. M. Stearns, Boston, Mass. Tile or brick pressing machine	396,967	Jan. 29	2519	650, 651	46	527
Tabor Knitting Mills. (See Vermilyea, Eugene, assignor.)						
Tag, William, and S. C. Smith, Philadelphia, Pa. Electric cigar-lighting device	399,168	Mar. 5	577	149	46	1296
Taggart, William H., Freeport, Ill. Apparatus for forming abrading-wheels	395,365	Jan. 1	87	23	46	90
Talmadge, Frank S., Palmer, Mass. Try-square, bevel, and protractor	396,781	Jan. 29	2253	576	46	470
Tangenberg, Christian, Grand Rapids, Mich. Flour-bin	397,760	Feb. 12	1004	266	46	777
Tank, Gustave A., San Francisco, Cal. Lamp-shade protector	400,372	Mar. 26	2376	621	46	1621
Tanner, Charles S. (See Meyers, Frank B., assignor.)						
Tarbox, Eugene L., Brooklyn, assignor to New York Stencil Works, New York, N. Y. Molding type-wheels and other curved surfaces	399,945	Mar. 19	1738	449	46	1488
Tarrant, Robert. (See Felt, Dorr E., assignor.)						
Tarring, Lida A., Baltimore, Md. Holder for strainers	397,257	Feb. 5	231	60	46	620
Tate, Henry, Jr., and J. Killip, Jr., Liverpool, county of Lancaster, England. Governor for engines	398,554	Feb. 26	2178	574	46	1030
Tatum, C. Albert, *et al.* (See Gaskill, Joshua W., assignor.)						
Taylor, Benjamin F., assignor to himself and A. D. Campbell, Newark, N. J. Means for heating railway-cars	396,715	Jan. 22	2144	548, 549	46	440
Taylor, Charles, Elizabeth, Pa. Vehicle-wheel	395,923	Jan. 1	396	88	46	69
Taylor, Charles A., Chicago, Ill. Trunk-fixture	396,567	Jan. 1	444	113	46	91
Taylor, Charles A., Chicago, Ill., assignor to J. H. Sessions, Bristol, Conn. Trunk-fastener	397,676	Feb. 12	1164	311	46	809

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Taylor, Charles H., Boston, Mass. Ore-concentrator	398,863	Mar. 5	70	19	46	1128
Taylor, Charles M., Toronto, Ontario, Canada. Ballot-box	398,911	Mar. 5	140	38	46	1141
Taylor, Eddson A., *et al.* (See Peacock, Lee J., assignor.)						
Taylor, Edward E. and W. S., Newport, R. I. Street-car	397,947	Feb. 19	1266	337, 338, 528, 529	46	844
Taylor, Frederick W., Philadelphia, Pa. Forging mechanism	400,143	Mar. 26	2018	528, 529	46	1592
Taylor Gas Producer Company. (See Taylor, William J., assignor.)						
Taylor, George, Hillsborough, Tex. Cotton-compress	395,857	Jan. 8	864	233	46	181
Taylor, George B., New Brunswick, N. J. Spark-arrester	397,258	Feb. 5	232	60	46	620
Taylor, Hal. S., *et al.* (See Douglass, John, assignor.)						
Taylor, Harrison H., assignor to Michigan Radiator and Iron Manufacturing Company, Detroit, Mich. Foaming-machine	399,352	Mar. 12	861	223	46	1307
Taylor, Harrison H., assignor to Michigan Radiator and Iron Manufacturing Company, Detroit, Mich. Screw-tapping machine	399,353	Mar. 12	863	224	46	1307
Taylor, Horace H., assignor to himself and C. R. Wheelock, Santa Rosa, Cal. Cultivator and pulverizer	396,441	Jan. 22	1735	445	46	363
Taylor, James. (See Neilson and Taylor.)						
Taylor, John C., Arpinger, N. Mex. Ter. Stirrup	396,179	Jan. 15	1343	344	46	281
Taylor, John J., assignor to himself and W. H. Abbott, Philadelphia, Pa. Shutter-bower	396,442	Jan. 22	1736	446	46	363
Taylor, Joseph M. (See Kirkpatrick, Christian M., assignor.)						
Taylor, Nathan W. (See Campbell, Henry H., assignor.)						
Taylor, Shapley P. R., and S. S. Clark, Denison, Tex. Wire-tightener	399,946	Mar. 19	1740	449	46	1489
Taylor, Thomas, and J. Warburton, Bolton, county of Lancaster, England. Figured fabric	395,402	Jan. 1	229	58, 59	46	50
Taylor, Warren H., assignor to Yale & Towne Manufacturing Company, Stamford, Conn. Mouth-piece for bags or receptacles	398,093	Feb. 19	1493	395	46	888
Taylor, William, Buffalo, N. Y. Handle for umbrellas, walking-canes, &c	399,449	Mar. 12	902	250	46	1333
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Gas-producer	399,793	Mar. 19	1514	392	46	1445
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Gas-producer	399,794	Mar. 19	1517	392, 393	46	1446
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Gas-producer	399,795	Mar. 19	1519	393	46	1446
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Gas-producer	399,796	Mar. 19	1523	394	46	1446
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Rotary bottom or grate applicable to furnaces, &c	399,797	Mar. 19	1525	394	46	1447
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Making gas	399,798	Mar. 19	1527	394	46	1447
Taylor, William J., Chester, assignor to Taylor Gas Producer Company, Camden, N. J. Gas-producer	399,799	Mar. 19	1527	394, 395	46	1447
Taylor, William S. (See Taylor, Edward E. and W. S.)						
Teal, Thomas H., and R. A. Campbell, Jonesborough, Tex. Sash-fastener	399,169	Mar. 5	578	149	46	1296
Teed, Edgar G., Brooklyn, N. Y. Refuse-burner	398,671	Feb. 26	2357	625	46	1064
Teetor, Abraham L., assignor of one-half to W. C. Whitehead, Indianapolis, Ind. Sand-molding machine	397,316	Feb. 5	318	83, 84	46	637
Teets, David, New York, N. Y. Chimney-cowl	397,609	Feb. 12	881	231	46	753
Teichmann, Richard, Brooklyn, N. Y. Movable toy	398,672	Feb. 26	2359	625, 626	46	1065
Templeton, Samuel H., *et al.* (See Jewell, William M., assignor.) (Reissue.)						
Tempion, James S. (See Pritchard and Tempion.)						
Terman, James W., New Sharon, assignor to Deere, Wells & Co., Council Bluffs, Iowa. Portable corn thrasher and separator	397,879	Feb. 12	1165	311, 312	46	809
Terrell, Jephthae M., and C. Garver, Spring Hill, Ohio. Fence-post	397,039	Jan. 29	2620	676	46	547
Terrill, Delancy E. Copenhagen, N. Y. Changeable bill of fare	396,716	Jan. 22	2146	549	46	441
Terry, Alfred W., Brooklyn, N. Y. Anti-friction bearing	396,968	Jan. 29	2522	651	46	528
Terry, Frank S. (See Sperry, Elmer A., assignor.)						
Terry, Le Grand, Horseheads, N. Y. Door-hanger	396,346	Jan. 15	1580	400	46	324
Teske, Charles, Hartford, Conn. Watch-regulator	398,987	Mar. 5	967	73	46	1106
Tesla, Nikola, Smiljan, Lika, Austria-Hungary. Thermo-magnetic motor	396,121	Jan. 15	1251	319	46	264
Teupe, Frank, Louisville, Ky. Awning	396,309	Jan. 15	1526	385	46	315
Tewksbury, George C. (See Brown, John H., assignor.)						
Tewksbury, Lyman K., Brooklyn, Pa. Butter-tub	396,969	Jan. 29	2523	651	46	528
Texas Fire-Clay Manufacturing Company. (See White, George W., assignor.)						
Thayer, Charles G., Dunkirk, N. Y. Pipe-coupler	395,671	Jan. 1	506	142	46	114
Thayer, Hayden A. (See Heath and Thayer.)						
Thayer, Horace N., Erie, Pa. Wheel	396,782	Jan. 29	2255	576	46	470
Thayer, Horace N., Erie, Pa. Wheel	396,783	Jan. 29	2256	576	46	470
Thayer, James F., Providence, R. I. Tool for nicking heads of screws	397,208	Feb. 5	164	43	46	607
Thayer, Russell, Philadelphia, Pa. Electrically-operated cutting device	395,624	Jan. 1	327	83	46	69
Theller, Reinhold, Lucerne, Switzerland. Corset-stay	397,401	Feb. 5	447	119	46	663
Thom, William, Indianapolis, Ind. Machine for flanging sheet-metal cylinders	398,673	Feb. 26	2360	626, 627	46	1065
Thom, William, Indianapolis, Ind. Flanging-machine	398,674	Feb. 26	2363	627, 628	46	1066
Thomas, Alfred, West Cowes, Isle of Wight, and P. Thomas, Buckingham, county of Bucks, England. Gas-pressure indicator	400,267	Mar. 26	2218	582	46	1500
Thomas, Amos W., Philadelphia, Pa. Vehicle-wheel tire	399,354	Mar. 12	864	224	46	1308
Thomas, Amos W., Philadelphia, Pa. Wheel-tire	399,355	Mar. 12	865	225	46	1308
Thomas, Amos W., Philadelphia, Pa. Wheel-tire	399,356	Mar. 12	867	225	46	1308
Thomas, Amos W., Philadelphia, Pa. Wheel-tire	399,357	Mar. 12	868	225	46	1308
Thomas, Amos W., Philadelphia, Pa. Wheel-tire	399,358	Mar. 12	869	225	46	1308
Thomas, Amos W., Philadelphia, Pa. Rim and tire for wheels	399,359	Mar. 12	869	226	46	1308
Thomas, Amos W., Philadelphia, Pa. Wheel tire and felly	399,360	Mar. 12	871	226	46	1309
Thomas, Amos W., Philadelphia, Pa. Wheel tire and felly	399,361	Mar. 12	872	226	46	1309
Thomas, Amos W., Philadelphia, Pa. Vehicle-wheel	399,362	Mar. 12	873	226, 227, 549, 550	46	1309
Thomas, Benoni F., North East, Md. Can-filling machine	396,717	Jan. 22	2147	550	46	441
Thomas, Charles L., York, Pa. Spool-holder for sewing-machines	399,095	Mar. 5	425	115	46	1195
Thomas, Curtis G. (See Nebergall, James W., assignor.)						
Thomas, David C., Trimble, Ohio. Railway-gate	399,947	Mar. 19	1741	449, 450	46	1489
Thomas, Henry, Fort Omaha, Nebr. Tent-closing device	396,842	Jan. 29	2342	600	46	490

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Thomas, Jabez, Darlington, assignor of one-half to W. E. Carter, Platteville, Wis. Flour-bolt	397,761	Feb. 12	1005	266	46	777
Thomas, James F., Alexandria, Nebr. Vehicle-spring	395,463	Jan. 1	231	59	46	59
Thomas, James F., Alexandria, Nebr. Side spring for vehicles	398,008	Feb. 19	1367	362	46	863
Thomas, John, Kansas City, Kans. Apparatus for use in dressing hogs	396,520	Jan. 22	1854	476	46	385
Thomas, John R. (See Woods and Thomas.)						
Thomas, John R., Boston, Mass., assignor to S. A. Woods Machine Company, of Massachusetts. Rolls for planing-machines	397,151	Feb. 5	74	18	46	592
Thomas, Philip. (See Thomas, Alfred and P.)						
Thomas, Richard B., Lydbrook, county of Gloucester, England. Cleaning metal plates or sheets	398,094	Feb. 19	1404	395, 396	46	888
Thomas, Stephen V., West Branch, Mich. Cuff-holder	400,144	Mar. 26	2022	529	46	1553
Thomas, William B., Green Camp, Ohio. Post-holder	396,624	Jan. 22	2018	518	46	416
Thompson, Adelbert L., East Avon, N. Y. Tightener and fastener for fence-wires	395,525	Jan. 1	328	82	46	69
Thompson, Charles A., Galveston, Tex. Letter-copying press	399,583	Mar. 12	1208	312	46	1372
Thompson, Charles A., New York, N. Y. Apparatus for duplicating manuscript, &c	398,471	Feb. 26	2054	540	46	1005
Thompson, Charles A., New York, N. Y. Making duplicate copies of writings, &c	398,675	Feb. 26	2364	628	46	1066
Thompson, Charles A., New York, N. Y. Apparatus for obtaining duplicate copies of writings	398,864	Mar. 5	71	20	46	1128
Thompson, Charles A., New York, N. Y. Rotary printing-machine	400,269	Mar. 26	2220	582	46	1591
Thompson, Charles A., assignor to Rapid Duplicating and Copying Machine Company, New York, N. Y. Apparatus for producing characters in their reverse	400,268	Mar. 26	2219	582	46	1591
Thompson, Colin M., Brooklyn, N. Y. Galvanic battery	397,526	Feb. 12	642	.....	46	708
Thompson, George W. (See Mortimer, Charles G., assignor.)						
Thompson, Herbert L., Waltham, Mass. Desk	398,095	Feb. 19	1495	396	46	888
Thompson, James V., Fort Madison, Iowa. Cartridge-loader	395,858	Jan. 8	866	223	46	182
Thompson, Joseph W., assignor of one-half to Buckeye Engine Company, Salem, Ohio. Valve-gear for engines	396,377	Jan. 15	1630	418	46	333
Thompson, Joseph W., assignor of one-half to Buckeye Engine Company, Salem, Ohio. Nail-machine	398,009	Feb. 19	1368	363	46	863
Thompson, Perley & Waite. (See Adams, Luther J., assignor.)						
Thompson, Perley & Waite. (See Odell, Benjamin C., assignor.)						
Thompson, Rosewell, Bridgeport, Conn. Loop removing and spreading mechanism for button-sewing machines	398,010	Feb. 19	1374	363, 364	46	864
Thompson, Samuel, Englewood, Ill. Fountain-brush and sponge-holder	397,670	Feb. 12	882	231	46	753
Thompson, Sumner S. (See Hopkins, Charles H., assignor.)						
Thomson Electric Welding Company. (See Thomson, Elihu, assignor.)						
Thomson, Elihu, Lynn, Mass. Electric welding	396,011	Jan. 8	1097	279	46	225
Thomson, Elihu, Lynn, Mass. Apparatus for electric welding and working metals	396,012	Jan. 8	1098	279	46	226
Thomson, Elihu, Lynn, Mass. Electric pipe-joining and pipe-work	396,013	Jan. 8	1099	279	46	226
Thomson, Elihu, Lynn, Mass. Electric metal working	396,014	Jan. 8	1101	279	46	226
Thomson, Elihu, Lynn, Mass. Electric riveting	396,015	Jan. 8	1102	280	46	226
Thomson, Elihu, Lynn, Mass. Regulating and motive device for alternating currents	397,616	Feb. 12	805	210	46	737
Thomson, Elihu, Lynn, Mass. Manufacturing screws and bolts by electricity	398,912	Mar. 5	141	38	46	1141
Thomson, Elihu, Lynn, Mass. Electrical welding-machine	398,913	Mar. 5	142	39	46	1141
Thomson, Elihu, Lynn, Mass. Electric metal working and welding machine	398,914	Mar. 5	144	39	46	1142
Thomson, Elihu, Lynn, assignor to Thomson Electric Welding Company, Boston, Mass. Forming, brazing, and welding of metals by electricity	396,009	Jan. 8	1094	278	46	225
Thomson, Elihu, Lynn, assignor to Thomson Electric Welding Company, Boston, Mass. Electric forging	396,010	Jan. 8	1095	278	46	225
Thomson, Elihu, New Britain, Conn., assignor to Thomson-Houston Electric Company, of Connecticut. Dynamo-electric machine	399,800	Mar. 19	1529	395, 396	46	1447
Thomson, Elihu, and M. J. Wightman, Lynn, Mass. Alternate-current inductor	399,801	Mar. 19	1531	396	46	1448
Thomson-Houston Electric Company. (See Thomson, Elihu, assignor.)						
Thomson, John. (See Mead and Thomson.)						
Thorbus, Timothy O. (See Cheney, David W., assignor.)						
Thorne, Joseph, Port Richmond, N. Y. Rotary engine	395,722	Jan. 8	641	162, 163, 164	46	138
Thorpe, Edward E., assignor to himself and H. Robinson, New York, N. Y. Eyeglass-polisher	399,450	Mar. 19	993	259	46	1334
Thorpe, Elihu M., Wapella, Ill. Grain-elevator attachment for thrashing-machines	400,270	Mar. 26	2222	582, 583	46	1591
Thorsen, Thor A., Chicago, Ill. Planing-machine	397,671	Feb. 12	882	232	46	753
Thuemler, Edward, Chicago, Ill. Bicycle	398,195	Feb. 19	1646	435	46	915
Thum, Hugo, Grand Rapids, Mich. Press-copying device	398,758	Feb. 26	2486	650	46	1091
Thum, Otto. (See Thum, William and O.)						
Thum, Otto, Grand Rapids, Mich. Hose-clamp	396,625	Jan. 22	2019	519	46	417
Thum, William and O., Grand Rapids, Mich. Fly-paper	395,640	Jan. 1	517	130	46	103
Thurman, James P., assignor of one-half to J. T. Thurman, Atlanta, Ga. Cutter-head	396,626	Jan. 22	2020	519	46	417
Thurman, John T. (See Thurman, James P., assignor.)						
Tibbens, William P., assignor of three-fourths to M. B. Daly, Buffalo, N. Y. Gas-burner	398,948	Mar. 19	1742	450	46	1489
Tickle, Arthur, Brooklyn, N. Y. Rotary engine	398,988	Mar. 5	259	73, 74	46	1166
Tiffany, George S., Tecumseh, Mich. Cuff or collar button	398,096	Feb. 19	1497	396	46	888
Tiffany, Walton C., New York, N. Y. Graduated blank for paper boxes or wrappers	397,475	Feb. 5	563	147	46	686
Tiffany, William, Creswell, Oreg. Hasp-lock	399,451	Mar. 12	994	259	46	1334
Tigner, James A., Rome, Ga. Truss	396,180	Jan. 15	1344	345	46	281
Tilden, Frank W., assignor of one-half to C. D. Merriman, Hinsdale, N. H. Sled-shoe	397,617	Feb. 12	807	210	46	738
Tilford, Robert J., and H. M. Redemann, assignors to Redemann-Tilford Steel Company, Louisville, Ky. Manufacture of steel	397,476	Feb. 5	564	.....	46	686
Tilford, Robert J., and H. M. Redemann, assignors to Redemann-Tilford Steel Company, Louisville, Ky. Manufacture of steel	397,477	Feb. 5	565	.....	46	686
Tilford, Robert J., and H. M. Redemann, assignors to Redemann-Tilford Steel Company, Louisville, Ky. Manufacture of steel	397,478	Feb. 5	567	.....	46	686
Timmis, Illius A., 2 Great George Street, Westminster, county of Middlesex, England. Secondary battery	398,194	Feb. 19	1645	435	46	915
Timroth, Rudolph, assignor to Rand, McNally & Co., Chicago, Ill. Adjustable fly-table for printing-presses	399,220	Mar. 5	657	171	46	1240
Tindall, Harry C., *et al.* (See Isaacs, Edward A., assignor.)						
Tobin, John, Newark, N. J. Handle	399,170	Mar. 5	579	149	46	1226
Tobin, John J. (See Johnson, John A., assignor.)						
Todd, Cornelius B., assignor to Campbell Burner Company, (limited,) Pittsburg, Pa. Gas-burner. (Reissue)	10,985	Feb. 12	1173	314	46	812
Todd, Llewellyn E. (See Cliff, James, assignor.)						
Todd, Marquis J., Corning, N. Y. Plow	397,317	Feb. 5	323	84, 85	46	638

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Toffler, Simon, New York, N. Y. Door-mat	397,402	Feb. 5	448	119	46	663
Tomkins, Alfred S., Holmwood, Caterham, county of Surrey, England. Portable cooking-stove	400,271	Mar. 26	2223	583	46	1592
Tomlinson, Charles, assignor to H. McMurchey, Syracuse, N. Y. Gun-cleaner	399,452	Mar. 12	994	259, 260	46	1334
Tomlinson, Joseph, Folsom, Cal. Wrench	398,989	Mar. 5	272	74	46	1167
Tompkins, Albert. (See Firth and Tompkins.)						
Tompkins Brothers. (See Conner, Edward G., assignor.)						
Tompkins, Ira. (See Firth and Tompkins.)						
Tompkins, Samuel D., and T. H. Williams, Jersey City, N. J. Steam or hot-water radiator	397,527	Feb. 12	642	167, 168	46	708
Tonge, John, Minneapolis, Minn. Throttle-valve	397,672	Feb. 12	885	232	46	753
Tonkin, John J., assignor to T. Kingsford, Oswego, N. Y. Cross-head for steam-engines	397,318	Feb. 5	328	85	46	639
Toplis, William G. (See Fest, Charles P., assignor.)						
Toraya, José F. (See Averell, John D., assignor.)						
Torrance, Francis J., Allegheny, Pa. Culinary vessel	397,098	Jan. 29	2704	699	46	563
Torres, Leonardo, Portelin, Spain. Suspended ropeway	398,097	Feb. 19	1498	396, 397	46	888
Torrey, Herbert, *et al.* (See Shepherd, Thomas W., assignor.)						
Torrey Razor Company, J. R. (See Turner, Joseph, assignor.)						
Totman, Edsell, La Grange, Ill. Tenoning-machine	395,526	Jan. 1	329	83, 84	46	69
Totten, Robert C. (See Melaney, William H., assignor.)						
Totten, Robert C., Allegheny, Pa. Roll and pinion	399,295	Mar. 12	768	200	46	1290
Toulmin Electric Railway Gate Company. (See Toulmin, Morton, assignor.)						
Toulmin, Morton, assignor to Toulmin Electric Railway Gate Company, Baltimore, Md. Electrical railway-gate	397,880	Feb. 12	1166	312	46	809
Tower, Augustus C. and J. D., Mendota, Ill. Cultivator	399,296	Mar. 12	770	200	46	1290
Tower, Clement B., Hyde Park, Mass. Acid gelatine	398,915	Mar. 5	147	.....	46	1142
Tower, Clement B., Hyde Park, Mass. Acid gelatine	398,916	Mar. 5	147	.....	46	1142
Tower, Justus D. (See Tower, Augustus C. and J. D.)						
Tower Manufacturing Company. (See Paramore, Samuel L., assignor.)						
Towne, Henry R., Stamford, Conn., assignor to Safety Car Heating and Lighting Company, of New Jersey. Apparatus for heating railway-cars	397,152	Feb. 5	76	19	46	593
Towne, Henry R., Stamford, Conn., assignor to Safety Car Heating and Lighting Company, of New Jersey. Car-heating apparatus	398,472	Feb. 26	2056	540, 541, 542	46	1006
Towne, Wiley P., Delta, La. Poison-distributer	400,145	Mar. 26	2023	530	46	1553
Townsend, Frederick J., Painted Post, N. Y. Wire-stretcher	398,759	Feb. 26	2487	659	46	1091
Townsend, Israel, Portsmouth, Va. Paint	398,917	Mar. 5	148	.....	46	1142
Townsend, Zachariah P., Sauquoit, N. Y. Windmill	399,171	Mar. 5	580	149, 150	46	1227
Trabue, William, assignor of two-thirds to W. W. Barnes and G. C. Sibley, Louisville, Ky. Saw-setting device	398,357	Feb. 19	1803	498	46	966
Tracy, Dwight, Suffern, N. Y. Double safety-switch crossing	395,672	Jan. 1	568	142	46	114
Trahan, George W., Houma, La. Hand water-sprinkler	397,762	Feb. 12	1007	267	46	777
Trahan, George W., and T. Babin, Houma, La. Voting-machine	398,196	Feb. 19	1648	435	46	915
Transue, Peter S., Delaware Water Gap, Pa. Rein-holder for wagons	398,290	Feb. 19	1792	473	46	946
Trask, Albert F., Onondaga, Mich. Harness	395,527	Jan. 1	332	84	46	70
Trask, Charles H., Lynn, Mass. Boot or shoe trimming machine	396,378	Jan. 15	1633	418, 419	46	333
Trant, Justus A., New Britain, Conn. Box-handle	395,528	Jan. 1	333	84	46	70
Trant, Justus A., New Britain, Conn. Bottle-stopper	397,449	Feb. 5	530	140	46	679
Traut, Justus A., New Britain, Conn. Bottle-stopper	400,272	Mar. 26	2224	583	46	1592
Traver, C. Bradley, Brooklyn, N. Y. Milk-refrigerator	395,464	Jan. 1	231	59	46	59
Traylor, Woodliffe B., Rocky Mount, N. C. Cotton-seed mill	400,373	Mar. 26	2377	621, 622	46	1621
Treadway, Charles S., assignor to Horton Manufacturing Company, Bristol, Conn. Fishing-rod	395,931	Jan. 8	970	249	46	201
Tregurtha, Alfred T., Everett, assignor to H. A. Clark, Boston, Mass. Sole-laying machine	398,358	Feb. 19	1805	498	46	966
Trench, Arthur W., assignor to J. Glats, Brooklyn, N. Y. Recovering glycerine from spent soap-lyes	399,028	Mar. 5	329	.....	46	1177
Trench, Arthur W., assignor to J. Glats, Brooklyn, N. Y. Recovering glycerine from spent soap-lyes	399,172	Mar. 5	581	.....	46	1227
Trew, Samuel W. (See Goss and Trew.)						
Trier, Conrad, Chicago, Ill. Car-door	396,903	Jan. 29	2431	625	46	509
Trimble, Alonzo D. (See King and Trimble.)						
Trimont Manufacturing Company. (See Vinton, John H., assignor.)						
Triphagen, Charles H., Portland, Mich. Combined corner-iron and tightening device for wire mattresses	396,122	Jan. 15	1253	319	46	264
Tripp Anti-Friction Journal Bearing Company. (See Tripp, Thomas, assignor.)						
Tripp, Herman. (See Lattan and Tripp.)						
Tripp, James, New York, N. Y. Shuttle-operating mechanism for sewing-machines	398,291	Feb. 19	1793	474	46	947
Tripp, James, New York, N. Y. Take-up mechanism for sewing-machines	399,949	Mar. 19	1744	450	46	1489
Tripp, James M., *et al.* (See Hastings, John B., assignor.)						
Tripp, Thomas, Avon, assignor to Tripp Anti-Friction Journal Bearing Company, Boston, Mass. Valve for locomotives	400,374	Mar. 26	2378	622, 623	46	1621
Triumph Heat and Light Company. (See Carsley, Robert B., assignor.)						
Trott, Samuel, Halifax, Nova Scotia, Canada. Conduit for electric railways	395,761	Jan. 8	698	178	46	149
Trowbridge, Augustus S., assignor of two-thirds to C. W. Shippee, Milford, and W. H. Daniels, Boston, Mass. Attachment for lasts	399,096	Mar. 5	425	116	46	1195
Trumble, Henry E., Kalamazoo, Mich. Water-motor	395,529	Jan. 1	333	85	46	70
Trumble, Henry E., Kalamazoo, Mich. Water-motor	395,530	Jan. 1	335	85	46	71
Trump, John G., Richville, Mich. Cultivator	396,627	Jan. 22	2020	519	46	417
Trusler, Leslie S. (See Banks, George L., assignor.)						
Tryon, Clarence E. (See Tryon, Le Roy C., assignor.)						
Tryon, Le Roy C., Marseilles, assignor of one-half to C. E. Tryon, Ottawa, Ill. Grain-weighing apparatus	398,473	Feb. 26	2062	542	46	1007
Tsheppe, Adolph, New York, N. Y. Naphthaline paper	397,259	Feb. 5	234	60	46	620
Tucker, Edwin W., San Francisco, Cal. Boiler-tube plug	397,450	Feb. 5	531	140	46	679
Tucker, George H., Brownville, Me. Combined tool	399,297	Mar. 12	773	200	46	1291
Tucker, Sallie C., Garnett, Kans. Buckle	400,018	Mar. 19	1843	478	46	1508
Tucker, William, East Brookfield, Mass. Shuttle-motion for looms	397,823	Feb. 12	1097	293	46	794
Tufts, Charles R., Utica, N. Y. Bustle	398,474	Feb. 26	2063	542	46	1007
Tufts, Elmer E., Springfield, Vt. Pedal for velocipedes	396,673	Jan. 22	2021	535	46	429

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Tallius, Julius, New York, N. Y. Station-indicator	397,824	Feb. 12	1098	294	46	795
Turk, William S. (See Shears, Albert L., assignor.)						
Turkington, William J., assignor to W. Stevenson, Aurora, Ontario, Canada. Attachment for flesh or bath brushes	398,292	Feb. 19	1795	474	46	947
Turlington, James, near Morrison, Va. Insecticide	398,807	Feb. 26	2349	.....	46	1105
Turner, Isaac J., Princeton, N. J. Book-marker	400,417	Mar. 26	2445	640	46	1633
Turner, Jacob W., Van Wert, Ohio. Band-cutter and feeder for thrashing-machines	396,643	Jan. 29	2343	600	46	490
Turner, James, Coudersport, Pa. Folding table	399,221	Mar. 5	658	171	46	1241
Turner, Joseph, assignor to J. R. Torrey Razor Company, Worcester, Mass. Safety-razor	400,418	Mar. 26	2445	641	46	1633
Turner, Julius A., Southfield, Mass. Racer for braiding-machines	397,153	Feb. 5	78	19	46	593
Turner, Lewis W., Yalesville, Conn. Hot-air furnace	397,154	Feb. 5	79	20	46	593
Turner, Orrin S., New Vineyard, Me. Rocking-chair	399,584	Mar. 12	1209	312	46	1372
Turner, Thomas H. (See Crandall and Turner.)						
Tush, Elwood, Manchester, Iowa. Tooth for horse hay-rakes	397,155	Feb. 5	81	20	46	594
Tush, Elwood, and J. B. Engstrom, Manchester, Iowa; said Tush assignor to said Engstrom. Horse hay-rake	398,808	Feb. 26	2350	679	46	1105
Tuttle, Elias A., *et al.* (See Littlefield, Charles A., assignor.)						
Tvedter, Torger, Cambridge, Iowa. Agricultural boiler or barrel heater	395,762	Jan. 8	699	179	46	149
Tweedale, Edmund and S., and C. Mills, assignors to J. Bullough, Accrington, county of Lancaster, England. Driving apparatus for carding-engines	397,881	Feb. 12	1169	313	46	810
Tweedale, Samuel. (See Tweedale and Mills.)						
Tweedale, Samuel, Accrinton, county of Lancaster, England. Roving-frame, &c	396,718	Jan. 22	2149	{550 551}	46	442
Twyman, Aaron, Pullman, Ill. Car-truck connection	395,859	Jan. 8	867	223	46	182
Tyler, Charles H., St. Louis, Mo. Office-chair	398,293	Feb. 19	1796	474	46	947
Tyler, George S. (See Ray, Samuel H., assignor.)						
Tyler, William H., David City, Nebr. Foot-scraper	400,019	Mar. 19	1844	479	46	1508
Tymeson, Eugene. (See Skinner and Tymeson.)						
Tynan, Joseph E., Paterson, N. J. Machine for throwing silk	398,359	Feb. 19	1898	499	46	967
Tyrrill, Alfred D., assignor to New Haven Clock Company, New Haven, Conn. Clock-case	399,097	Mar. 5	426	116	46	1195
Tysdal, John, Lee, assignor to L. Berlizheimer, Chicago, Ill. Mitten	399,222	Mar. 5	658	172	46	1241
Uhl & Co., Carl. (See Meyer, Emil, assignor.)						
Uhlinger, William P., Philadelphia, Pa. Machine for lacing Jacquard cards	397,763	Feb. 12	1008	{267 268}	46	777
Uhlman, Oscar. (See Ford, Edward S., assignor.)						
Uhlmann, Charles R., Peoria, Ill. Key-hole guard	396,123	Jan. 15	1253	320	46	264
Underhill, Francis M., *et al.* (See Gaskill, Joshua W., assignor.)						
Underwood, Henry A., Lamoure, Dak. Ter. Band-cutter and feeder	398,197	Feb. 19	1650	436	46	916
Underwood, Vernon E., *et al.* (See Getz, William, assignor.)						
Union Button Sewing Machine Company. (See Cummings, Henry H., assignor.)						
Union Button Sewing Machine Company. (See Driscoll, Lawrence J., assignor.)						
Union Button Sewing Machine Company. (See Wing, Lingan C., assignor.)						
Union Metallic Cartridge Company. (See Hartley and Holbs, assignors.)						
Union Paper Bag Machine Company. (See Benner, Lorenzo D., assignor.)						
Union Wire Mattress Company. (See Powers, David J., assignor.)						
United Electric Improvement Company. (See Currie, Stanley C. C., assignor.)						
United States Cigar Machinery Company. (See Myers, Henry C., assignor.)						
United States Electric Lighting Company. (See Branga, Paul H., assignor.)						
United States Electric Lighting Company. (See Kelly, John F., assignor.)						
United States Electric Lighting Company. (See Weston, Edward, assignor.)						
United States Machine Company. (See Weis, Francis J., assignor.)						
United States Rolling Stock Company. (See Kennedy, Martin, assignor.)						
United States Signal Clock Company. (See Zoeller, Theodore J., assignor.)						
Universal Plow Company. (See Essig, Ozia A., assignor.)						
Unz, Henry H., Philadelphia, Pa. Type-writing machine	400,146	Mar. 26	2025	{530 531}	46	1553
Unzicker, Otto, Chicago, assignor to A. Shoeninger, Lake View, Ill. Velocipede	397,099	Jan. 29	2705	699	46	563
Upper, G. A. (See Fraser, John, assignor.)						
Upton, Charles S. (See Henkle, Leonard, assignor.)						
Upton, Edgar W., *et al.* (See Shepherd, Thomas W., assignor.)						
Upton, King. (See Stickney, Randolph L., assignor.)						
Urbahn, Alwill, Nagelsbaum, near Burscheid, Germany. Loom	397,156	Feb. 5	81	20, 21	46	594
Valiquet, Louis P., assignor to L. W. Strong, Brooklyn, N. Y. Table implement	400,373	Mar. 26	2224	583	46	1592
Van Alstine, Charles W., Newton, Mass. Self-closing tobacco-bag	400,020	Mar. 19	1844	479	46	1508
Van Ausdall, John, Keokuk, Iowa. Wrench	396,970	Jan. 29	2524	651	46	528
Van Buskirk, Samuel A. (See Krutsch, Willis W., assignor.)						
Van Camp, Gilbert, Geneva, Ind. Breast-yoke	398,198	Feb. 19	1652	437	46	916
Van Decar, Emery, East Albany, assignor of one-half to A. Fryer, Bath-on-the-Hudson, N. Y. Lubricator for journals of railway-wheel axles	398,556	Feb. 26	2179	574	46	1030
Van Denburgh, Orville W., Schuylersville, N. Y. Weighing and price scale	397,040	Jan. 29	2621	676	46	547
Van Depoele, Charles J., Chicago, Ill. Traveler for electric railways	396,310	Jan. 15	1527	386	46	315
Van Depoele, Charles J., Lynn, Mass. Hooked suspender for electric-railway conductors	396,311	Jan. 15	1529	386	46	315
Van Depoele, Charles J., Lynn, Mass. Suspension device for electric-railway conductors	396,312	Jan. 15	1530	{386 387}	46	315
Van Depoele, Charles J., Lynn, Mass. Adjustable crossing and switch for overhead conductors	396,313	Jan. 15	1533	387	46	316
Van Depoele, Charles J., Lynn, Mass. Commutator-brush carrier for electric motors	396,314	Jan. 15	1535	387	46	316
Van Depoele, Charles J., Lynn, Mass. Overhead contact and switch	397,451	Feb. 5	533	140	46	680
Van Depoele, Charles J., Lynn, Mass. Cable-railway system	398,294	Feb. 19	1797	{474 475}	46	948
Van Depoele, Charles J., Lynn, Mass. Friction-gear for electric motors	399,950	Mar. 19	1745	{450 451}	46	1490
Van Depoele, Charles J., Lynn, Mass. Friction-gear for electric motors	400,274	Mar. 26	2225	584	46	1592
Van Depoele, Charles J., Lynn, Mass. Pneumatic flexible-slot conduit for electric-railway conductors	400,375	Mar. 26	2380	{623 624}	46	1621
Van Derveer, Milton T., Amsterdam, N. Y. Ore-concentrator	398,475	Feb. 26	2064	543	46	1007
Van Dyke, James, Brooklyn, N. Y. Box for ice-cream	396,443	Jan. 22	1736	446	46	363
Van Hoevenbergh, Henry, New York, N. Y. Lock	396,638	Jan. 22	2022	520	46	417
Van Laun, Henry T. (See Fullford and Van Laun.)						
Van Marter, Joseph R., *et al.* (See Latz, Charles J., assignor.)						
Van Ness, John P., Little Falls, N. J., assignor of one-half to J. E. Earle, Middletown, N. Y. Wedge-bolt for locomotives	395,763	Jan. 8	700	179	46	149

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Van Nouhuys, Edwin C., Albany, and K. C. Downes, Greenbush, N. Y. Fan attachment for baby-carriages	399,585	Mar. 12	1210	312	46	1372
Van Pelt, Elbridge G., Centre Hall, Pa. Seed-planter	398,476	Feb. 26	2067	{543 544}	46	1008
Van Pelt, Elbridge G., Centre Hall, Pa. Seed-planter and fertilizer-distributer	398,477	Feb. 26	2070	545	46	1008
Van Pool, John T., Tiptonville, Tenn. Combined harrow and roller	395,366	Jan. 1	68	23, 24	46	90
Van Syckle, John C., *et al.* (See Isaacs, Edward A., assignor.)						
Van Valkenburg, Ellis M., and F. L. Wood, Union Grove, Wis. Vehicle-spring	398,011	Feb. 19	1376	364	46	865
Van Valkenburg, Levi D., assignor of one-half to J. M. Dunham, Holyoke, Mass. Bobbin-support for spinning-spindles	398,809	Feb. 26	2351	679	46	1105
Van Wagoner, Cornelius S., Brooklyn, N. Y. Hook	397,157	Feb. 5	83	21	46	594
Van Zandt, Jacob, assignor of one-half to D. W. Peck, Syracuse, N. Y. Tapping-bung	399,173	Mar. 5	582	150	46	1227
Van Zile, Harry L., Albany, assignor of two-thirds to O. E. Van Zile, Troy, and J. MacCormack, Albany, N. Y. Traction mechanism for self-propelling vehicles	399,298	Mar. 12	775	201	46	1291
Van Zile, Harry L., Albany, assignor of two-thirds to O. E. Van Zile, Troy, and J. MacCormack, Albany, N. Y. Traction mechanism	399,299	Mar. 12	777	202	46	1291
Van Zile, Oscar E., *et al.* (See Van Zile, Harry L., assignor.)						
Vance, Isaac, *et al.* (See Rogers, Charles, assignor.)						
Vance, Isaac, Washington, Pa. Potato-digger	399,363	Mar. 12	874	227	46	1309
Vandegrift, James A., Newark, N. J. Incandescent-lamp manufacture	397,479	Feb. 5	568	147	46	680
Vandegrift, T. L., *et al.* (See Rogers, Charles, assignor.)						
Vansize, William B., Plainfield, N. J. Telephone-exchange. (Reissue)	10,989	Mar. 5	673	176	46	1244
Vanstone, Samuel, Providence, R. I. Metal-bending machine	395,722	Jan. 8	644	{164 165}	46	139
Varney, Joseph T., South Wareham, assignor of one-fourth to E. Robinson, Wareham, Mass. Mop and scrubbing-brush holder	399,223	Mar. 5	660	172	46	1241
Vassiliades, Alexander D., *et al.* (See Masters, Mark J., assignor.)						
Vassiliades, Basil D., *et al.* (See Masters, Mark J., assignor.)						
Vassiliades, Constantine D., *et al.* (See Masters, Mark J., assignor.)						
Vaughan, Louis, Blair, Nebr. Plant-propagating nest	396,784	Jan. 29	2256	577	46	470
Vaughn, Francis E. and M. E., assignors of one-third to A. B. Riggs, Richmond, Ind. Boiler-feeder	399,586	Mar. 12	1211	312	46	1372
Vaughn, John W., Jersey City, N. J. Automatic selling-machine	396,674	Jan. 22	2022	{535 536}	46	429
Vaughn, John W., Jersey City, N. J. Vending apparatus	397,319	Feb. 5	329	85	46	640
Vaughn, Marion E. (See Vaughn, Francis E. and M. E.)						
Vavasseur, Josiah, London Ordnance Works, Bear Lane, Southwark, county of Surrey, assignor to W. G. Armstrong, Mitchell & Co., (limited,) Newcastle-upon-Tyne, England. Mounting for ordnance	397,764	Feb. 12	1011	{268 269}	46	778
Venables, John H., and J. Hughes, assignors of one-third to S. Coxon, Toronto, Ontario, Canada. Rotary engine	400,021	Mar. 19	1845	479	46	1508
Venater, William L. (See Bolus, Edward A., assignor.)						
Venn, Isaac H., assignor of one-half to E. G. W. Bartlett, Yonkers, N. Y. Hydraulic elevator-valve	398,098	Feb. 19	1500	{397 398}	46	889
Vermehren, Johannes, Copenhagen, Denmark. Calculating-machine	398,360	Feb. 19	1902	499	46	968
Vermilyea, Eugene, assignor to Tabor Knitting Mills, Waterford, N. Y. Circular-knitting machine	395,764	Jan. 8	701	{179 180}	46	149
Verniaud, Claudius, Quincy, Ill. Retaining device for barrel-hoops	397,100	Jan. 29	2706	{699 700}	46	563
Vernon, George W., assignor of one-half to R. L. Vernon, Greensborough, N. C. Auxiliary hose-coupling for steam and air hose	395,673	Jan. 1	569	142	46	114
Vernon, Robert L. (See Vernon, George W., assignor.)						
Vestergard, Chris. (See Hess and Vestergard.)						
Vickers, E. L. (See Hall, Henry C., assignor.)						
Victor Safe and Lock Company. (See Spivey, Thomas S., assignor.)						
Viele, Nicholas V., Corning, N. Y. Car-starter	397,158	Feb. 5	84	21	46	594
Viele, Platt B., Rochester, N. Y. Leak-stopper for holds of vessels	396,016	Jan. 8	1104	280	46	226
Vien, Francis X., Brooklyn, N. Y. Safety-valve	398,557	Feb. 26	2181	575	46	1039
Villamor, Timoteo, Merida, Yucatan, Mexico. Machine for cleaning vegetable fiber	399,802	Mar. 19	1536	387	46	1448
Vincent, Charles R. (See Poyton, Josiah, assignor.)						
Vinton, John H., Boston, Mass., assignor to Trimont Manufacturing Company, Portland, Me. Pipe-wrench	397,618	Feb. 12	808	210	46	738
Violiier, Edouard. (See Becht, Louis A., assignor.)						
Vogel Petroleum Heating Company. (See Vogel, William, assignor.)						
Vogel, William, assignor to Vogel Petroleum Heating Company, Chicago, Ill. Regulating-valve	400,275	Mar. 26	2227	584	46	1592
Voigt, Karl, Newark, N. J. Hand-cultivator	399,300	Mar. 12	779	202	46	1292
Volkmann, Ernst. (See Rice and Volkmann.)						
Voltz, George M., and C. H. Shultz, St. Joseph, Mo. Oven for vapor-stoves	399,301	Mar. 12	781	203	46	1292
Vom Hofe, Edward C., Brooklyn, N. Y. Snell	396,246	Jan. 15	1440	306	46	299
Von Frankenberg, Victor, Pine Bluff, Ark. Tuning-pin for musical instruments	399,712	Mar. 19	1394	359	46	1421
Von Wechmar, Fritz B., Hanover, Germany. Wheeled vehicle	400,376	Mar. 26	2385	624	46	1622
Von Welsbach, Carl A., Vienna, Austria-Hungary, assignor to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Re-enforcing mantles of refractory incandescing earths	396,347	Jan. 15	1581	400	46	324
Von Welsbach Carl A., Vienna, Austria-Hungary, assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Incandescent device	399,174	Mar. 5	563	150	46	1227
Von Welsbach, Carl A., Vienna, Austria-Hungary, assignor to Welsbach Incandescent Gas Light Company, of New Jersey. Apparatus for regenerating incandescent mantels	400,419	Mar. 26	2446	641	46	1633
Wacks, Leopold, London, county of Middlesex, England. Artificial fuel	398,810	Feb. 26	2532	.....	46	1106
Waddell, Robert R., Hillsborough, Ohio. Snap-hook	397,948	Feb. 19	1267	338	46	845
Waddington, Harry H., Manchester, county of Lancaster, England. Lawn-tennis ball	398,558	Feb. 26	2182	575	46	1040
Wade, David K., McPherson, Kans. Delineator	395,724	Jan. 8	645	165	46	139
Wade, David K., McPherson, Kans. Drawing apparatus	398,865	Mar. 5	73	20	46	1128
Wade, Fred M., Campello, Mass. Last	395,465	Jan. 1	232	59	46	50
Wadleigh, Isaac H. (See Pierce and Wadleigh.)						
Waffen, John, assignor to himself, D. Kloeckner, and P. Scheuermann, Hancock, Mich. Dynamite	398,559	Feb. 26	2182	.....	46	1040
Waffenfabrik, Manser. (See Manser, Paul, assignor.)						
Waggoner, Albert, Columbus, Ohio. Vehicle-dash	395,509	Jan. 1	447	114	46	92
Waggoner, Albert, assignor of one-half to W. R. Dawson, Columbus, Ohio. Combination-tool	395,508	Jan. 1	445	114	46	91
Wagner, Awsbert H., assignor to A. H. Frost and C. L. Ames, Chicago, Ill. Thrashing-machine	396,785	Jan. 29	2258	577	46	471

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Wagner, Benton, Milton, Ind. Cultivator attachment	397,403	Feb. 5	449	120	46	664
Wagner, Carl, Dresden, Saxony, Germany. Apparatus for preparing liquid coffee	399,803	Mar. 19	1538	397	46	1449
Wagner, Frank C., Ann Arbor, Mich. Electric regulator	399,224	Mar. 5	660	172	46	1241
Wagner, Gustavus G., Mount Vernon, assignor to V. A. Krepps, Kensico, N. Y. Fare box and register	396,786	Jan. 29	2258	577	46	471
Wagner, Martin V., Marshall, Mich. Compress	398,199	Feb. 19	1653	437	46	917
Wahlert, Henry A., assignor to American Brake Company, St. Louis, Mo. Steam-pump	396,247	Jan. 15	1440	{366 {367	{46	300
Wainwright, Charles D. (See Pratt and Wainwright.)						
Wainwright Manufacturing Company. (See Pratt and Wainwright, assignors.)						
Wait, John H., Portsmouth, Ohio. Attachment for grates	399,098	Mar. 5	428	116	46	1195
Waite, Henry E., *et al.* (See Ethridge, Martin V. B., assignor.)						
Waite, Henry E., New York, N. Y. Medical battery	395,932	Jan. 8	971	{249 {250	{46	201
Wakeham, John, and J. Cunningham, Toronto, Ontario, Canada. Grate	396,248	Jan. 15	1443	367	46	300
Walb, Wilhelm, Heidelberg, Germany. Handle for surgical instruments	397,949	Feb. 19	1268	{338 {339	{46	845
Walker, Charles W., St. Paul, Minn. Railway-switch	396,629	Jan. 22	2023	520	46	417
Walker, Edward W., *et al.* (See Gore, Henry A., assignor.)						
Walker, Gilbert, London, England. Dental rubber	395,600	Jan. 1	447	114	46	92
Walker, Gilbert, London, England. Artificial denture	395,601	Jan. 1	448	114	46	92
Walker, Joseph, Belleville, Kans. Weather-strip	396,181	Jan. 15	1344	345	46	282
Walker, Joseph A., Melvern, Kans. Washing-machine	399,099	Mar. 5	429	116	46	1196
Walker, Joseph H., assignor to Powers & Walker Casket Company, Grand Rapids, Mich. Burial-case	399,951	Mar. 19	1750	451	46	1491
Walker, Martin W., and W. Jowitt, Sing Sing, N. Y. Molding and mold-distributing machine	395,466	Jan. 1	233	60	46	50
Walker, William A., Rome, N. Y. Steam-engine valve	395,725	Jan. 8	647	{165 {166	{46	139
Walker, William F. (See Miller, Leroy, assignor.)						
Wall, Adam S., Oakland, Cal. Nail	399,804	Mar. 19	1540	398	46	1449
Wallace, Paul, Milnesbridge, county of York, England. Spinning-machine, &c	398,676	Feb. 26	2365	628	46	1066
Wallach, Solomon J., New York, N. Y. Lot-ticket and sizer	396,904	Jan. 29	2433	625	46	509
Wallis, James W., Birmingham, Ala. Cotton-picker	397,209	Feb. 5	165	44, 45	46	607
Wallis William J., assignor of one-half to H. Wulff, Chicago, Ill. Automatic corn-planter	395,674	Jan. 1	570	143	46	115
Walsh, John H., Mason City, Iowa. Rotary bolt	398,478	Feb. 26	2072	545	46	1009
Walsh, Richard P., St. Louis, Mo. Grip pulley-wheel	400,276	Mar. 26	2229	{584 {585	{46	1503
Walter, Henry, Jersey City, N. J. Foot-rest for bicycles	396,182	Jan. 15	1346	345	46	282
Walter, Johannes, assignor to J. R. Geigy & Co., Basle, Switzerland. Making a yellow dye	398,990	Mar. 5	273	.....	46	1167
Walter, John, Winter Haven, Fla. Sprinkling or irrigating apparatus	395,726	Jan. 8	649	166	46	140
Walter, Samuel, Dallas City, Ill. Saw-tightener	395,367	Jan. 1	89	24	46	20
Walther, William, New York, N. Y. Sugar creaming and mixing machine	399,100	Mar. 5	430	117	46	1196
Waltz, Earnest A., Valleria, Iowa. End-gate for wagons	400,022	Mar. 19	1847	480	46	1508
Walworth, John D. (See Worthen and Pendleton, assignors.)						
Walz, Jacob L., Lynchburg, Va. Device for catching poultry	400,277	Mar. 26	2232	585	46	1503
Wansleben, Emil, Crefeld, Prussia, Germany, assignor to H. Rohr, St. John, Kans. Binder	400,147	Mar. 26	2034	531	46	1555
Warburton, Jacob. (See Taylor and Warburton.)						
Ward, Charles, Toronto, Ontario, Canada. Rotary engine	399,952	Mar. 19	1751	452	46	1491
Ward, Joseph G., Irvington, N. J. Making dental plates by electro-deposition	397,320	Feb. 5	331	86	46	640
Ward, Narris, Lena, Ill. Shoe	396,787	Jan. 29	2262	578	46	472
Wardwell, Simon W., Jr., Providence, R. I. Shuttle for sewing-machines	396,631	Jan. 22	2026	521	46	418
Wardwell, Simon W., Jr., Woonsocket, R. I., assignor to W. P. Earle, trustee, Brooklyn, N. Y. Thread-gripping device	396,183	Jan. 15	1346	345	46	282
Wardwell, Simon W., Jr., Woonsocket, R. I., assignor to W. P. Earle, trustee, Brooklyn, N. Y. Feeding mechanism for sewing-machines	396,630	Jan. 22	2025	521	46	418
Ware, Elijah, Omaha, Nebr. Valve	399,302	Mar. 12	782	203	46	1292
Ware, Joseph, Brooklyn, N. Y. Trunk-securing guard attachment	399,805	Mar. 19	1540	398	46	1449
Waring, John T. (See Wilson, John C., assignor.)						
Waring, William, Colora, Md. Cultivator	398,678	Feb. 26	2369	629	46	1067
Waring, William, Colora, and J. C. Bird, Rising Sun, Md. Wheel-cultivator	398,677	Feb. 26	2367	629	46	1067
Warner, Alexander, New York, N. Y. Covering hams, &c	395,368	Jan. 1	91	.....	46	21
Warner, Charles E., Melvern, Kans. Washing-machine	398,666	Mar. 5	75	20	46	1128
Warner, Charles E., assignor of one-half to C. C. Catlin, Melvern, Kans. Automatic grain-weighing machine	397,101	Jan. 29	2708	700	46	563
Warner, Daniel, Bronson, Mich. Fence	396,949	Jan. 15	1443	367	46	300
Warner, Grace C. (See Williams, Humphrey J., assignor.)						
Warner, James M., London, Ohio. Cash-recorder	399,953	Mar. 19	1752	452	46	1491
Warner, Joel S. (See Brownlow and Warner.)						
Warner, Louis P., Rochester, N. Y. Machine for making carriage-tufts	399,225	Mar. 5	662	173	46	1241
Warner, Thomas S., Frankfort, Kans. Cultivator	397,404	Feb. 5	449	120	46	664
Warrell Nicholas, Farragut, Iowa. Hinge-joint for electric belts	399,954	Mar. 19	1753	453	46	1491
Warren, Charles, Ipswich, county of Suffolk, England. Machine for mashing potatoes, &c	399,587	Mar. 12	1213	313	46	1373
Warren, Edward K., and J. H. Ames, Three Oaks, Mich. Bosom-pad	396,444	Jan. 22	1737	446	46	363
Warren, George E. (See Fowler and Warren.)						
Warren, Gerald P., San Antonio, Tex. Railway-car	395,860	Jan. 8	869	224	46	182
Warren, Henry H. (See Laundry, Andrew, assignor.)						
Warren, Nathaniel W. (See Head, Dallas F., assignor.)						
Warren, Thomas, Centralia, Ill. Wrench	396,017	Jan. 8	1105	280	46	227
Warwick Cycle Manufacturing Company. (See Warwick, George T., assignor.)						
Warwick, George T., Springfield, Mass. Vehicle-wheel	399,453	Mar. 12	996	260	46	1334
Warwick, George T., Springfield, Mass. Bicycle	399,454	Mar. 12	997	{260 {261	{46	1334
Warwick, George T., Springfield, Mass. Safety-bicycle	399,455	Mar. 12	1000	261	46	1335
Warwick, George T., Springfield, Mass. Ball-bearing for velocipedes	399,456	Mar. 12	1002	262	46	1335
Warwick, George T., assignor to Warwick Cycle Manufacturing Company, Springfield, Mass. Forming backbones and rear forks of bicycles from a single blank	397,405	Feb. 5	450	120	46	664
Washburn, Charles H., Racine, Wis. Line-guide for fishing-rods	399,588	Mar. 12	1213	313	46	1373
Washburn, George W., West New Brighton, N. Y. Ear-jewel	396,788	Jan. 29	2263	578	46	472
Wasson, Edgar M. (See Mudge and Wasson.)						
Waterbury Clock Company. (See Bannatyne, Archibald, assignor.)						
Waters, Benjamin E., Brockton, assignor of one-half to M. E. Hatch, New Bedford, Mass. Time-switch	396,632	Jan. 22	2028	521	46	418

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Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
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Waters, George F., assignor of one-half to F. M. Criswell, Washington, D. C. Reversible tumbler-holder	395,608	Jan. 1	149	38	46	32
Watkins, Alfred E., South Orange, N. J., assignor of one-half to R. E. Rockwell, Boston, Mass. Mining-machine	396,719	Jan. 22	2150	551	46	442
Watson, Alfred B., *et al.* (See Ryle, William, assignor.)						
Watson, Branch A. (See Stone and Watson.)						
Watson, James A., *et al.* (See Ryle, William, assignor.)						
Watson, Jeremiah S., Yorktown, and C. S. Ambruster, Elmer, N. J. Furrower, marker, and coverer	395,604	Jan. 1	449	115	46	92
Watson, Talbot, Baltimore, Md. Button	396,445	Jan. 22	1738	446	46	363
Watson, Talbot, Baltimore, Md. Dust-collector	399,713	Mar. 19	1395	359	46	1422
Watson, Thomas. (See Stone and Watson.)						
Watson, William C., assignor of one-half to T. Y. Kinne, Paterson, N. J. Car-coupling	397,673	Feb. 12	886	233	46	754
Watson, William C., assignor of one-half to T. Y. Kinne, Paterson, N. J. Car-coupling	397,674	Feb. 12	887	233	46	754
Wattle, William, assignor to Knowles Loom Works, Worcester, Mass. Pattern mechanism for looms, &c	396,057	Jan. 8	1156	293	46	237
Watts, John I., and W. A. Richards, Sandbach, county of Chester, England. Salt of sodium	399,175	Mar. 5	584	.....	46	1227
Watts, John I., and W. A. Richards, Sandbach, county of Chester, England. Making a sodium salt	399,176	Mar. 5	585	.....	46	1228
Wayland, Francis, Waukegan, Ill. Harness attachment	398,295	Feb. 19	1799	475	46	948
Wayman, Henry P., Trenton, N. J. Coal-wagon	399,806	Mar. 19	1542	398	46	1449
Waymouth, Augustine D., Fitchburg, Mass. Lathe	397,528	Feb. 12	644	{168 {169	{46	708
Wayne, Alonzo, assignor of one-half to L. J. Arthur, Lancaster, Wis. Hemmer for sewing-machines	396,379	Jan. 15	1634	419	46	334
Weaver, Henry B., Burlington, N. J. Indicator for bottles	398,612	Feb. 19	1378	365	46	865
Weaver, John W., Brooklyn, N. Y. Fire-escape	399,479	Feb. 26	2074	546	46	1009
Webb, George B., Newark, N. J., assignor to Wyckoff, Seamans & Benedict, New York, N. Y. Tension-adjuster	398,099	Feb. 19	1502	398	46	889
Webb, Samuel D., *et al.* (See Lumley, Edwin J., assignor.)						
Webb, Thomas W., Stourbridge, county of Worcester, England. Ornamenting glass	398,100	Feb. 19	1503	398	46	889
Webber, Frank B. (See Philbrick, Frank B., assignor.)						
Webber, William O., Lawrence, Mass. Portable pumping-engine	395,933	Jan. 8	974	259	46	902
Weber, Nicholas, Lynn, Mass. Machine for stretching, scraping, and finishing hides	395,727	Jan. 8	651	166	46	140
Webster, George H. (See Bouchard, John, assignor.)						
Webster, Harold A., Haverhill, Mass. Heel for boots or shoes	397,041	Jan. 29	2023	676	46	547
Webster, Warren, Philadelphia, Pa. Feed-water heater and purifier	396,971	Jan. 29	2525	652	46	528
Webster, William, Jr., Lee Park, Lee, county of Kent, England. Apparatus for purifying sewage by electricity	397,407	Feb. 5	452	121	46	664
Webster, William, Jr., Lee Park, Lee, county of Kent, England. Purifying sewage by electricity	398,101	Feb. 19	1504	398	46	889
Webster, William R., Philadelphia, Pa. Die for upsetting metal bars	400,148	Mar. 26	2035	532	46	1555
Weckmiller, Adolph, assignor to Cleveland Burial Case Company, Cleveland, Ohio. Coffin	400,023	Mar. 19	1848	480	46	1509
Weeber, William, Philadelphia, Pa. Brick-machine	395,765	Jan. 8	703	{180 {181	{46	150
Weeke, Henry C., St. Charles, Mo. Dyke	396,446	Jan. 22	1739	447	46	363
Weeks, John, assignor to R. Dudgeon, New York, N. Y. Hydraulic punch, &c	395,675	Jan. 1	572	{143 {144	{46	115
Weeks, Joseph H., Battle Creek, Mich., assignor of one-half to M. C. Adams, Indianapolis, Ind. Dust-collector	395,801	Jan. 8	779	202	46	162
Weeks, Nelson, Jr., Long Island City, N. Y. Cash-carrier apparatus	399,457	Mar. 12	1003	262	46	1335
Weems, David G., Baltimore, Md., assignor to Electro-Automatic Transit Company of Baltimore City, Maryland. Electric-railway system	396,633	Jan. 22	2029	{521 {522	{46	418
Weems, James M. (See Ferriott, Charles L., assignor.)						
Welcknm, Georg, Vienna, Austria-Hungary. Door-hanger	400,278	Mar. 26	2233	585	46	1503
Weidner, Henry N. (See Griscom and Weidner.)						
Weigert, Louis, Berlin, Germany. Inhaler for warm air	398,991	Mar. 5	273	75	46	1167
Weiglein, John E., Cincinnati, Ohio. Hame-tug	399,458	Mar. 12	1006	263	46	1336
Weil, Joseph, New York, N. Y. Necktie-fastener	397,042	Jan. 29	2024	677	46	548
Weilbach, Philip, Copenhagen, Denmark. Car brake and starter	397,765	Feb. 12	1012	{269 {270	{46	778
Weinedel, Charles. (See Stitzel and Weinedel.)						
Weir, Fredric C., Cincinnati, Ohio. Connecting-rod for switches	398,102	Feb. 19	1506	399	46	890
Weir, Fredric C., Cincinnati, Ohio. Blind-switch	398,103	Feb. 19	1506	399	46	890
Weir, Fredric C., Cincinnati, Ohio. Spring-frog	398,104	Feb. 19	1507	399	46	890
Weir, Fredric C., Cincinnati, Ohio. Cable-railway crossing	398,106	Feb. 19	1509	400	46	891
Weir, Fredric C., Cincinnati, Ohio. Cable-railway crossing	398,202	Feb. 19	1656	437	46	917
Weir, Fredric C., Cincinnati, Ohio. Railway-frog	398,203	Feb. 19	1656	438	46	917
Weir, Fredric C., Cincinnati, Ohio. Street-railway switch	398,204	Feb. 19	1657	438	46	918
Weir, Fredric C., Cincinnati, Ohio. Railway-frog	398,205	Feb. 19	1658	438	46	918
Weir, Fredric C., Cincinnati, Ohio. Cable or railway crossing	398,206	Feb. 19	1659	438	46	918
Weir, Fredric C., and N. O. Goldsmith, assignors to Weir Frog Company, Cincinnati, Ohio. Slot-rail switch	398,105	Feb. 19	1508	400	46	890
Weir, Fredric C., and N. O. Goldsmith, assignors to Weir Frog Company, Cincinnati, Ohio. Cable-railway switch	398,200	Feb. 19	1654	437	46	917
Weir, Fredric C., and N. O. Goldsmith, assignors to Weir Frog Company, Cincinnati, Ohio. Railway-frog	398,201	Feb. 19	1655	437	46	917
Weir Frog Company. (See Goldsmith, Nathaniel O., assignor.)						
Weir Frog Company. (See Weir and Goldsmith, assignors.)						
Weis, Francis J., assignor to United States Machine Company, Jersey City, N. J. Driving mechanism for cars	398,207	Feb. 19	1659	439	46	918
Weis, Francis J., assignor to United States Machine Company, Jersey City, N. J. Driving mechanism for cars	398,208	Feb. 19	1660	439	46	919
Weis, Francis J., assignor to United States Machine Company, Jersey City, N. J. Driving mechanism for cars	398,209	Feb. 19	1661	439	46	919
Weiss, Charles W., Brooklyn, assignor of one-half to C. Kruse, New York, N. Y. Sewing-machine	399,364	Mar. 12	875	{227 {228	{46	1309
Welch, Alonzo T. (See Lawson, Samuel, assignor.)						
Welch, E. B. (See Littlejohn, Charles F., assignor.)						
Welch, Howard F., Richfield Springs, assignor to M. H. Chase, New York, N. Y. Shaft-supporter for vehicles	395,641	Jan. 1	518	130	46	103
Welch, Lyman W., Sparta, Mich. Folding bed or bedstead	397,766	Feb. 12	1015	270	46	778
Welch, Orrin T., Topeka, Kans. Seal-lock	397,210	Feb. 5	168	45	46	608

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Weldon, John D. (See Strang, Lew K., assignor.)						
Weldon, Richard W., Rockford, Ill. Hair crimper and curler	397,159	Feb. 5	85	21	46	594
Welds, Edward A., Reading, Mich. Fence	400,377	Mar. 26	2387	624	46	1622
Welker, Louis G., Toledo, Ohio. Liquid or gas meter	396,013	Feb. 19	1379	365	46	865
Wellens, Joseph, *et al.* (See Wellens, Robert, assignor.)						
Wellens, Robert, assignor to himself, J. Wellens, and H. Ferguson, Pittsburg, Pa. Electric stop-valve	397,260	Feb. 5	235	61	46	621
Weller, Franklin A., and A. F. Rietzel, Lynn, Mass. Electric switch	396,560	Feb. 26	2183	575	46	1030
Weller, Franklin A., and A. F. Rietzel, Lynn, Mass. Electric switch	396,561	Feb. 26	2185	575	46	1031
Welling, Job. (See Keeton, James, assignor.)						
Wellington, Darius, Boston, Mass. Car-coupling	395,369	Jan. 1	92	24	46	21
Wellman, Francis L. (See De Redon, Constant F., assignor.)						
Wellman, Samuel T., Cleveland, Ohio, assignor to Fuel Gas and Electric Engineering Company, (limited,) Pittsburg, Pa. Apparatus for compacting fuel in gas-furnaces	395,676	Jan. 1	575	144	46	116
Wells, Clark H., Kansas City, Mo. Suspended switch for electric railways	396,124	Jan. 15	1254	320 / 321	46	265
Wells, Edward W., Oskaloosa, Iowa. Hot-air furnace	396,905	Jan. 29	2434	625	46	509
Wells, Francis H., Racine, Wis. Metallic pole for vehicles	397,767	Feb. 12	1016	270	46	779
Wells, J. Henry, Fall River, Mass. Bobbin	399,589	Mar. 12	1214	313	46	1373
Wells, Osbern, Newberry, S. C. Car-coupling	397,675	Feb. 12	889	234 / 235	46	754
Wells, Solomon D., Fairmont, Minn. Gate-hinge	395,370	Jan. 1	93	24	46	21
Wells, Willet C., Tiffin, Ohio. Well-drilling machine	399,459	Mar. 12	1007	263 / 264	46	1336
Welsbach Incandescent Gas Light Company. (See Beil, Harold J., assignor.)						
Welsbach Incandescent Gas Light Company. (See Hastings, James L., assignor.)						
Welsbach Incandescent Gas Light Company. (See Stewart and Hastings, assignors.)						
Welsbach Incandescent Gas Light Company. (See Von Welsbach, Carl A., assignor.)						
Welsbach Incandescent Gas Light Company. (See Williams, Frederick D., assignor.)						
Welsh, Alexander, and H. J. Rogers, Bennett's Station, Pa. Fire-escape	395,467	Jan. 1	235	60	46	51
Welsh, Michael E., Chelsea, Mass. Canopy-table for undertaker's use	400,024	Mar. 19	1848	480	46	1509
Welti, Jacob, assignor of one-half to S. S. Hirschler, New York, N. Y. Composition for waterproofing textile materials	395,410	Jan. 1	151	.....	46	32
Wemple, George W., assignor of nine-twentieths to B. W. Child, Boston, Mass. Horseshoe	396,52.	Jan. 22	1857	476	46	386
Weniman, Christian J. (See Enchenhofer, Edward E., assignor.)						
Werden, Rodolphus D., Cincinnati, Ohio. Spirit-level	397,043	Jan. 29	2625	677	46	548
Werts, William, Camden, N. J. Machine for threading sheet-metal rings	396,789	Jan. 29	2265	578 / 579	46	473
Wertz, Charles W., Toledo, Ohio. Bustle	400,149	Mar. 26	2036	532	46	1556
Wesel, Ferdinand, New York, N. Y. Machine for cutting printers' rules	395,728	Jan. 8	653	167	46	140
Wesel, Ferdinand, New York, N. Y. Printer's galley	395,934	Jan. 8	975	251	46	202
Weser, Calvin L., New York, N. Y. Piano-truck	395,371	Jan. 1	94	25	46	21
Wesselmann, Bruno, Hamburg, Germany. Mechanical lid-shutter for cans	399,714	Mar. 19	1397	359	46	1422
West, Henry F., Gloucester City, N. J. Car-axle lubricator	396,125	Jan. 15	1257	321	46	265
West, Jacob, Bolivar, Pa. Steam-engine	399,101	Mar. 5	439	117	46	1196
West, Joseph A., San Rafael, Cal. Vehicle-seat	396,250	Jan. 15	1444	368	46	300
Westaway, Walter C., Decorah, Iowa. Plunger-rod for pumps	397,882	Feb. 12	1170	313	46	811
Westbrook, Frank A., Port Jervis, N. Y. Fire-escape	398,210	Feb. 19	1663	439	46	919
Westbrook, Frank A., Port Jervis, and W. S. Cook, Middletown, N. Y.; said Cook assignor to said Westbrook. Metallic packing	396,634	Jan. 22	2031	522	46	419
Westbrook, Moses A., Carthage, Miss. Corn-planter	399,102	Mar. 5	433	117 / 118	46	1196
Western Electric Company. (See Patterson, William R., assignor.)						
Western Electric Company. (See Wilson, Charles H., assignor.)						
Western Electric Company. (See Young, John, assignor.)						
Western Publishing House. (See Yaggy, Levi W., assignor.)						
Western, Royal S., *et al.* (See Kendall, Franklin B., assignor.)						
Westervelt, Reuben. (See Davis and Westervelt.)						
Westinghouse Electric Company. (See Belfield, Reginald, assignor.) (Reissue.)						
Westinghouse Electric Company. (See Shallenberger, Oliver B., assignor.)						
Westinghouse Electric Company. (See Stillwell, Lewis B., assignor.)						
Westinghouse, George, Jr., Pittsburg, Pa. Brake-shoe	399,103	Mar. 5	434	118	46	1196
Westinghouse, George, Jr., Pittsburg, Pa. System of electrical distribution	399,639	Mar. 12	1288	331	46	1388
Westinghouse, George, Jr., and C. N. Dutton, Pittsburg, Pa. Fluid-meter	400,420	Mar. 26	2447	641 / 642	46	1633
Westinghouse, Henry H., and F. M. Rites, Pittsburg, Pa. Distributing motive fluid in compound engines	395,935	Jan. 8	976	251	46	202
Westinghouse, Henry H., and F. M. Rites, Pittsburg, Pa. Steam-engine	396,635	Jan. 22	2033	522	46	419
Westinghouse Machine Company. (See Bagaley and Rites, assignors.)						
Westlake, William, Brooklyn, N. Y. Tubular lantern	399,807	Mar. 19	1543	398	46	1450
Weston, Edward, Newark, N. J., assignor to United States Electric Lighting Company, New York, N. Y. Incandescent electric lamp	400,378	Mar. 26	2388	625	46	1622
Weston, Thomas A., assignor to Yale & Towne Manufacturing Company, Stamford, Conn. Friction-clutch	396,315	Jan. 15	1536	388	46	316
Weston, Thomas A., assignor to Yale & Towne Manufacturing Company, Stamford, Conn. Hoisting mechanism	400,150	Mar. 26	2037	532 / 533	46	1556
Westphal, Friedrich F., assignor of one-half to J. J. Olinger, Jersey City, N. J. Press	396,906	Jan. 29	2435	625	46	509
Westphal, Henry, Chicago, Ill. Holder for revolving standards	395,766	Jan. 8	705	181	46	150
Westphal, Peter J., Holyoke, Mass. Bushing-casing for casks	397,261	Feb. 5	236	61	46	621
Wetmore, Jerome W., Erie, Pa. Vehicle-spring	399,955	Mar. 19	1754	453	46	1491
Wetmore, Lansing G. (See Shearer, Herbert A., assignor.)						
Weyer, August, Atlanta, Ga. Glass-pot furnace	398,296	Feb. 19	1801	475 / 476	46	948
Whalen, Mary A. (See Whalen, Mary E., assignor.)						
Whalen, Mary E., assignor, by mesne assignments, to M. A. Whalen, New York, N. Y. Dress-supporting steel	396,184	Jan. 15	1349	346	46	283
Whaley, Henry E., St. Paul, Minn. Pocket for garments	395,729	Jan. 8	653	167	46	141
Whatley, John, Syracuse, N. Y. Lathe-tool	398,918	Mar. 5	149	39	46	1142
Wheat, Corydon, Geneva, N. Y. Boiler	395,603	Jan. 1	450	115	46	[illegible]
Wheatley, Richard, Jr., Birmingham, county of Warwick, England. Needle or pin case	399,956	Mar. 19	1755	453	46	1491
Wheaton, Richards & Co. (See McNerney, James, assignor.)						
Wheeler, Norman W., New York, N. Y. Ejector-condenser	399,715	Mar. 19	1397	360	46	1422
Wheeler, Seth, Albany, N. Y. Toilet or wrapping paper roll	396,675	Jan. 22	2084	536	46	429

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Wheeler, William H., Sciotoville, Ohio. Turn-table for cranes	398,867	Mar. 5	76	21	46	1129
Wheeler & Wilson Manufacturing Company. (See Neely, William A., assignor.)						
Wheeler & Wilson Manufacturing Company. (See Ostrom, Freeland W., assignor.)						
Wheelock, Charles R. (See Taylor, Horace H., assignor.)						
Whelpley, James A., Keene, N. H. Skate	399,365	Mar. 12	877	228	46	1310
Whipps, James, Carlisle, Ind. Harrow	398,480	Feb. 26	2076	546	46	1010
Whisler, John H., Broadway, Va. Ironing-board and step-ladder	398,297	Feb. 19	1803	476	46	949
Whitaker, Charles H. and W. B., Durham, N. C. Machine for dipping cigarettes	399,608	Mar. 19	1544	399	46	1450
Whitaker, Edward H., Baltimore, Md. Freight-car door	397,322	Feb. 5	332	86	46	640
Whitaker, Walter B. (See Whitaker, Charles H. and W. B.)						
Whitall, James, *et al.* (See Gaskill, Joshua W., assignor.)						
Whitall, John M., *et al.* (See Gaskill, Joshua W., assignor.)						
Whitcomb, Edwin W., assignor to G. D. Whitcomb, Chicago, Ill. Mining-machine	398,298	Feb. 19	1804	476	46	949
Whitcomb, Edwin W., assignor to G. D. Whitcomb, Chicago, Ill. Lubricator for mining-machines	398,299	Feb. 19	1805	476	46	949
Whitcomb, George D. (See Whitcomb, Edwin W., assignor.)						
White, Anthony C. (See Hayes and White.)						
White, Charles W., assignor of three-fourths to T. E. Bowen, J. A. White, and M. C. Burnside, Sleepy Eye, Minn. Mechanical movement	395,677	Jan. 1	576	145	46	116
White, Fernando, assignor of one-half to W. Yagle & Co., (limited,) Pittsburg, Pa. Gas-burner	399,104	Mar. 5	436	118	46	1197
White, Frank, Philadelphia, Pa., assignor to P. W. Pratt, Boston, Mass. Vacuum-arrow	397,950	Feb. 19	1270	339	46	845
White, Frank, Philadelphia, Pa., assignor to P. W. Pratt, Boston, Mass. Vacuum-hook	398,679	Feb. 26	2369	629	46	1067
White, Frederick R., Boston, Mass. Coin-controlled finger-pull	397,160	Feb. 5	86	22	46	595
White, George W., San Francisco, Cal. Grinding and amalgamating mortar	399,800	Mar. 19	1547	400	46	1450
White, George W., Waco, assignor to Texas Fire-Clay Manufacturing Company, Fort Worth, Tex. Fire-clay heater	398,919	Mar. 5	150	39	46	1142
White, George W., Waco, assignor to Texas Fire-Clay Manufacturing Company, Fort Worth, Tex. Fluid-burner fire-log	398,920	Mar. 5	151	40	46	1142
White, Howard, Lansdowne, Pa. Corner-shield	396,126	Jan. 15	1259	321	46	266
White, James H., McDonough, N. Y. Machine for distributing insect-powder, &c	400,279	Mar. 26	2234	586	46	1503
White, James T., New York, N. Y. Mounting and boxing anatomical charts	400,151	Mar. 26	2039	533	46	1556
White, Jeremiah R., Raymond, Miss. Plow	395,861	Jan. 8	670	224	46	183
White, John, Hartford, Conn. Fire-escape	398,992	Mar. 5	274	75	46	1167
White, John A., *et al.* (See White, Charles W., assignor.)						
White, Maurice W., assignor of one-half to G. W. Ross, Boston, Mass. Bridge for stringed instruments	398,107	Feb. 19	1509	400	46	891
White, Millard F., Gleeson Station, Tenn. Seed-drill	399,460	Mar. 12	1010	264	46	1337
White, Peter, St. Louis, Mo. Water-closet	397,571	Feb. 12	713	185	46	721
White, Peter, St. Louis, Mo. Water-closet valve	398,680	Feb. 26	2370	629	46	1067
White, Peter, St. Louis, Mo. Tank-valve	398,681	Feb. 26	2371	630	46	1067
White, Samuel J., Bearden, Ark. Reversing-gear	397,676	Feb. 12	892	235	46	754
White, Thomas, and J. Milne, New York, N. Y.; said Milne assignor to said White. Trousers-stretcher	396,380	Jan. 15	1635	419	46	334
White, William, White Plains, N. Y. Street-railway switch	396,127	Jan. 15	1260	322	46	266
White, William, White Plains, N. Y. Street-railway switch	396,128	Jan. 15	1261	322	46	266
White, William, Mount Vernon, assignor to J. B. Brewster and R. Kelley, New York, N. Y. Centrifugal amalgamator	399,500	Mar. 12	1215	313	46	1373
White, William M., Tacoma, Wash. Ter. Hay-loader	398,688	Feb. 26	2373	630	46	1068
White, William R., Neoga, Ill. Gate	397,572	Feb. 12	714	185	46	721
Whitehead, William C. (See Teetor, Abraham L., assignor.)						
Whitehill, Robert, Milwaukee, Wis. Saw-hammering machine	399,366	Mar. 12	879	228	46	1310
Whitehouse, Joseph P. (See Horton and Whitehouse.)						
Whiteley, William N., W. Bayley, and O. E. Perrigo, Springfield, Ohio, assignors to said W. N. Whiteley. Grain-binding harvester	398,921	Mar. 5	154	40, 41	46	1143
Whiting, Harold, Cambridge, Mass. Toning blue prints	397,480	Feb. 5	570	.....	46	686
Whitlock, Wilbur M., Newark, N. J. Trip-valve gearing	398,014	Feb. 19	1380	306	46	865
Whitman & Barnes Manufacturing Company. (See Lamb, Levi L., assignor.)						
Whitney, George Q., Hartford, Conn. Feed-reversing attachment for lathes	395,531	Jan. 1	336	85	46	71
Whitney, Justin, Boston, Mass. Apparatus for making malt	395,468	Jan. 1	237	60, 61	46	51
Whitney, Pardon A., Southington, Conn. Means for imparting a radial movement to the cutting-tool of a rotary head	398,481	Feb. 26	2077	546	46	1010
Whittaker, William S. (See Stewart, William H., assignor.)						
Whitton, Weston, Unity, Me. Hopple	398,683	Feb. 26	2375	630	46	1068
Whittier, Charles, Boston, Mass. Electrically-controlled hydraulic elevator	399,716	Mar. 19	1398	360	46	1422
Whittingham, George H., Baltimore, Md. Automatic switch for electric motors	396,791	Jan. 29	2268	580	46	473
Whysall, George, Toledo, Ohio, and J. A. Lambing, Wilkinsburg, Pa. Gas-furnace for steam-boilers	398,482	Feb. 26	2078	547	46	1010
Whyte & Co., Oliver. (See Brown, Frederick W., assignor.)						
Wiberg, Martin, Stockholm, Sweden, assignor to C. G. Lundborg, New York, N. Y. Letter-box	395,802	Jan. 8	780	203	46	163
Wickson, G. G. (See Hamlin, Earl W., assignor.)						
Wickwire Brothers. (See Wickwire, Chester F., assignor.)						
Wickwire, Chester F., assignor to Wickwire Brothers, Cortland, N. Y. Positive shuttle-motion for looms	396,522	Jan. 22	1858	476	46	386
Wickwire, Chester F. and T. H., Cortland, N. Y. Loom-shuttle	400,152	Mar. 26	2040	533	46	1556
Wickwire, Theodore H. (See Wickwire, Chester F. and T. H.)						
Widdifield, Watson P. (See Bowman and Widdifield.)						
Widmayer, William F. (See Heinrichs, Charles F., assignor.)						
Wiebrock, Frederick A., Humbolt, Kans. Fence for intercepting insects	395,678	Jan. 1	577	145	46	117
Wiecking, Christian W., Walhalla, S. C. Stool or seat	397,044	Jan. 29	2625	677	46	548
Wiedersheim, John A. (See Schwartz, Louis H. A., assignor.)						
Wiedersum, Philip H., assignor of one-half to C. G. Campbell, Newark, N. J. Carpet-sweeper	397,102	Jan. 29	2709	700 / 701	46	564
Wiedling, Carl T. A. H., New York, N. Y., assignor to J. S. Connelly, Plainfield, N. J., and T. E. Connelly, Brooklyn, N. Y. Gas-motor	398,108	Feb. 19	1510	401 / 402	46	891
Wiesebrock, Frederick W., Long Island City, N. Y. Smoke-consuming furnace and air-heater	398,684	Feb. 26	2376	631	46	1068
Wigal, John A., assignor of one-half to T. M. Wigal, Tyner, W. Va. Belt-tightener	398,361	Feb. 19	1904	500	46	968
Wigal, Thomas M. (See Wigal, John A., assignor.)						
Wiggin, George B. (See Bartlett and Wiggin.)						
Wiggin, George B., South Newmarket, N. H. Oxidizing oils or other liquids	396,636	Jan. 22	2034	522	46	419
Wightman, Merle J. (See Thomson and Wightman.)						
Wightman, Merle J., Hartford, Conn. Regulator for incandescent electric-lighting systems	395,936	Jan. 8	979	251 / 252	46	202

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Name, residence, and invention.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Wikle, Wilber S., Union, W. Va. Hand-planter	396,185	Jan. 15	1350	346	46	283
Wilbur, Alfred, Allegheny, assignor of one-half to B. H. Lightfoot, Pittsburg, Pa. Filter	399,957	Mar. 19	1756	454	46	1491
Wilby, Richard, Mirfield, county of York, England. Valve-gear	397,323	Feb. 5	332	86, 87	46	640
Wilcomb, Frank, assignor to Wilcomb Manufacturing Company, Providence, R. I. Take-up and tension device for knitting-machines	396,907	Jan. 29	2436	626	46	510
Wilcomb, Frank, Providence, R. I., assignor to Wilcomb Manufacturing Company, San Francisco, Cal. Knitting-machine	397,408	Feb. 5	454	121	46	665
Wilcomb Manufacturing Company. (See Wilcomb, Frank, assignor.)						
Wilcox, Alonzo I. (See Smith, Sidney U., assignor.)						
Wilcox, Alonzo I. (See Wynkoop, Jehiel F., assignor.)						
Wilcox, Benajah, Woodhull, N. Y. Wagon-brake	399,958	Mar. 19	1758	454	46	1492
Wilcox, William A., assignor to F. Stevens & Co., Grand Rapids, Mich. Fuel-feeding pipe	400,280	Mar. 26	2236	586	46	1594
Wilcox, William R., Portland, Colo. Sleigh-brake	396,844	Jan. 29	2345	600	46	491
Wilder, Francis M., Binghamton, N. Y., assignor, by mesne assignments, to Safety Car Heating and Lighting Company, of New Jersey. Apparatus for heating railway-cars	397,161	Feb. 5	88	22	46	595
Wilder, L. W., administrator. (See Garver and Straight.)						
Wilder, Moses G., Philadelphia, Pa. Volumetric gas-regulator	397,573	Feb. 12	715	185	46	721
Wildin, George M., Melvern, Kans. Trussed suspension-bridge	399,105	Mar. 5	437	118, 119	46	1197
Wildman, Henry W., Leon, Ill. Riding-plow	396,793	Jan. 29	2274	581	46	475
Wile, Sol, Rochester, and H. La Casse, Syracuse, N. Y.; said La Casse assignor to said Wile. Corking and wiring corks to bottles	399,303	Mar. 12	783	203	46	1292
Wiler, John U., Mansfield, Ohio. Flue-cleaner	398,483	Feb. 26	2079	547	46	1010
Wiley, Emma A., Los Angeles, Cal. Catamenial sack	395,411	Jan. 1	151	38	46	32
Wilkening, Gottlieb, Dayton, Ohio. Game-wheel	399,717	Mar. 19	1402	360	46	1423
Wilkens, John D., New York, N. Y. Dental plugger	395,604	Jan. 1	452	116	46	93
Wilkins, Hartwell A., New York, N. Y. Dump-cart	398,562	Feb. 26	2187	576	46	1031
Wilkinson, Thomas, and J. Glendinning, Kansas City, Mo. Slack-burning furnace	397,951	Feb. 19	1271	339	46	845
Wilks, Stephen, Chicago, Ill. Dish-washer	398,760	Feb. 26	2489	660	46	1091
Will, Henry. (See Will, Julius E. and H.)						
Will, Julius E. and H., assignors of one-third to P. Steinbach, Sr., Bethel, Mo. Hay-stacker	399,106	Mar. 5	439	119, 120	46	1197
Willcox, Charles H., assignor to Willcox & Gibbs Sewing Machine Company, New York, N. Y. Feed mechanism for sewing-machines	398,300	Feb. 19	1807	477	46	949
Willcox, Charles H., assignor to Willcox & Gibbs Sewing Machine Company, New York, N. Y. Connecting-rod	398,761	Feb. 26	2491	660	46	1092
Willcox & Gibbs Sewing Machine Company. (See Gorton, James S., assignor.)						
Willcox & Gibbs Sewing Machine Company. (See Willcox, Charles H., assignor.)						
Willey, Eben C. (See Clonette, Narcisse, assignor.)						
Willford, George W., Sheffield, county of York, England. Railway-chair and securing rails therein	398,563	Feb. 26	2188	576, 577	46	1031
Williams Company, John R. (See Williams, John R., assignor.)						
Williams, David F., Plattsburg, assignor of one-third to T. J. Sullivan, Albany, N. Y. Machine for forging horseshoe-nails	399,226	Mar. 5	665	173, 174	46	1242
Williams, Edward E., Mount Victory, Ohio. Swinging saw	400,281	Mar. 26	2238	586	46	1594
Williams, Emry N., Bonita, Kans. Corn-planter	398,868	Mar. 5	77	21	46	1129
Williams, Evan R., *et al.* (See Halford, William J., assignor.)						
Williams, Frederick D., London, England, assignor to Welsbach Incandescent Gas Light Company, Jersey City, N. J. Incandescent gas-burner	396,316	Jan. 15	1538	388	46	316
Williams, Henry C., New Britain, Conn. Bustle	395,409	Jan. 1	239	61	46	52
Williams, Henry J., assignor to Harris Button Hole Attachment Company, New York, N. Y. Button-hole attachment for sewing-machines	399,304	Mar. 12	784	204	46	1292
Williams, Howard A. (See Robison, Robert F., assignor.)						
Williams, Howard A. (See Robison and Crocker, assignors.)						
Williams, Humphrey J., New York Mills, N. Y., assignor, by mesne assignments, of one-half to G. C. Warner, Penn, Fla. Machine for wrapping oranges, &c	398,015	Feb. 19	1383	366, 367	46	865
Williams, James M., Renick, Mo. Fifth-wheel	398,869	Mar. 5	79	22	46	1129
Williams, James W., Brooklyn, N. Y. Lamp	396,348	Jan. 15	1562	401	46	324
Williams, Jesse S., Beaver Dam, Ky. Car-wheel and bearing	397,677	Feb. 12	893	235	46	755
Williams, John H., *et al.* (See Bolt, Joseph, assignor.)						
Williams, John H., assignor of one-half to J. C. and J. A. Sleeper, Boston, Mass. Means for securing metallic bands to boxes	397,202	Feb. 5	237	61, 62	46	621
Williams, John J. (See Prichard, Richard M., assignor.)						
Williams, John R., Newark, N. J., assignor to J. R. Williams Company, New York, N. Y. Machine for cutting out cigar wrappers or binders	400,153	Mar. 26	2041	534	46	1557
Williams, John T., Mount Vernon, N. Y. Electro-magnetic transmitter	396,792	Jan. 29	2270	580, 581	46	474
Williams, Louis N. D. (See Scott and Williams.)						
Williams, Lucy A., *et al.* (See Latulip, Frederick, assignor.)						
Williams Manufacturing Company. (See Everest, David O., assignor.)						
Williams, Oren, Gouverneur, N. Y. Snow-plow	400,154	Mar. 26	2043	534, 535	46	1557
Williams, Percy G., and A. W. Roovers, assignors to Automatic Battery Company, Brooklyn, N. Y. Coin-operated induction-coil	399,501	Mar. 12	1216	314	46	1374
Williams, Thomas H. (See Tompkins and Williams.)						
Williams, William J., Camden, N. J. Phosphatic fertilizer	395,532	Jan. 1	337	.....	46	71
Williams, William J., Camden, N. J. Treating fibers or yarns	397,409	Feb. 5	456	.....	46	665
Williams, William J., Camden, N. J. Mordant	398,564	Feb. 26	2189	.....	46	1032
Williamson, David, New York, N. Y. Chalk-holder	397,952	Feb. 19	1272	340	46	846
Williamson, James E., *et al.* (See Caughey, Robert C., assignor.)						
Willimantic Linen Company. (See Landfear, William E., assignor.)						
Willimantic Linen Company. (See Scott, John, assignor.)						
Willingham, William A., Chattanooga, Tenn. Split pulley	396,637	Jan. 22	2035	523	46	419
Willis, Edgar E., Decatur, Ill. Washing-machine	397,211	Feb. 5	169	45	46	608
Willscraft, William H., Juniper, Ariz. Ter. Well-crib	400,155	Mar. 26	2045	535	46	1558
Willits, Ward W., assignor to Adams & Westlake Company, Chicago, Ill. Car-lamp	395,937	Jan. 8	982	252	46	208
Willits, Warren C., Denver, Colo. Hose-holder	396,129	Jan. 15	1263	313	46	267
Willoughby, Hugh L., Newport, R. I. Snell	396,130	Jan. 15	1264	323	46	267
Willson, Albert A., Brooklyn, N. Y. Combined centrifugal and screw pump	398,301	Feb. 19	1808	477	46	950
Willson, Freeman R., Sr., Columbus, Ohio. Whiffletree	396,676	Jan. 22	2085	536	46	430
Wilmot & Hobbs Manufacturing Company. (See Wilmot, Samuel R., assignor.)						
Wilmot, Samuel R., assignor to Wilmot & Hobbs Manufacturing Company, Bridgeport, Conn. Making beaded tubes	400,025	Mar. 19	1849	481	46	1509
Wilson, Andrew C., Victor, Iowa. Four-horse equalizer	399,718	Mar. 19	1403	361	46	1423

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Wilson, Charles H., Jersey City, N. J. Axle	396,845	Jan. 29	2346	601	46	491
Wilson, Charles H., Columbus, Ohio, assignor to Western Electric Company, Chicago, Ill. Lightning-arrester	399,305	Mar. 12	787	204	46	1293
Wilson, Charles R., Bear Wallow, Ky. Horse-detacher	400,156	Mar. 26	2047	536	46	1558
Wilson, David Y., Gum Tree, assignor of one-half to W. B. Haslett, Parkesburg, Pa. Railway-car	395,412	Jan. 1	152	39	46	32
Wilson, David Y., Gum Tree, assignor of one-half to A. P. Reid, Parkesburg, Pa. Car-coupling	396,447	Jan. 22	1740	447	46	364
Wilson, Fred, New York, N. Y. Theatrical appliance	397,678	Feb. 12	894	236	46	755
Wilson, George T., assignor of two-thirds to J. D. Hough and M. H. Bronson, Lowville, N. Y. Thill-coupling	398,922	Mar. 5	158	41	46	1143
Wilson, Henry R., assignor of one-half to C. F. Bedell, Brooklyn, N. Y. Cutting attachment for check-books	399,930	Mar. 19	1759	454	46	1492
Wilson, Horace M., Cambridge, Mass. Coin-operated perfuming apparatus	397,574	Feb. 12	718	186	46	721
Wilson, James G., New York, N. Y. Hanger for Venetian blinds	398,484	Feb. 26	2011	547	46	1010
Wilson, John C., assignor to J. T. Waring, Yonkers, N. Y. Machine for pouncing hats	400,282	Mar. 26	2239	587	46	1595
Wilson, Robert J., Pittsburg, Pa. System of and apparatus for heating cars	399,592	Mar. 12	1221	314	46	1374
Wilson, Robert M. (See Riley, Harvey C., assignor.)						
Wilson, William T., Marshfield, Oreg. Saw	398,302	Feb. 19	1800	478	46	950
Winchell, James F., assignor to Foos Manufacturing Company, Springfield, Ohio. Crushing and grinding mill	395,413	Jan. 1	153	39, 40	46	32
Winchell, James F., assignor to Foos Manufacturing Company, Springfield, Ohio. Feed-regulator for grinding-mills	396,058	Jan. 8	1159	294	46	237
Winchell, James F., assignor to Foos Manufacturing Company, Springfield, Ohio. Crushing and grinding mill	396,448	Jan. 22	1741	447, 448	46	364
Winchell, James F., assignor to Foos Manufacturing Company, Springfield, Ohio. Feed-regulating mechanism	397,045	Jan. 29	2027	677, 678	46	548
Winder, Richard B. (See Browne, Walker G., assignor.)						
Windisch, John H., Oak Harbor, Ohio. Refrigerator	399,307	Mar. 12	791	205	46	1293
Winfield, John Q., and B. H. Strickler, Broadway, Va. Car-heater	395,470	Jan. 1	240	61, 62	46	52
Wing, Francis J. (See Marty, John M., assignor.)						
Wing, Lingan C., Boston, Mass., assignor to Union Button Sewing Machine Company, of Massachusetts. Button-sewing machine	395,372	Jan. 1	96	25	46	21
Wing, Lingan C., assignor to Union Button Sewing Machine Company, Boston, Mass. Needle for sewing-machines	397,619	Feb. 12	809	210	46	738
Winheim, Gustav, Carlyle, Ill., assignor to A. Q. Ross, Cincinnati, Ohio. Roll-paper holder and cutter	398,762	Feb. 26	2492	660	46	1092
Winslow, George E., Waltham, Mass. Apparatus for indicating and recording changes at a distant point	395,862	Jan. 8	871	225	46	183
Winter, Andrew. (See Pawlowski, Jacob, assignor.)						
Winter, Frederick, Allegheny, Pa. Rendering	399,810	Mar. 19	1548	400	46	1451
Winter, John B., Louisville, Ky. Stove for heating sad-irons	399,719	Mar. 19	1403	361	46	1423
Winter, Otto A., Buxtehude, Prussia, Germany. Machine for cutting wood into chips	399,107	Mar. 5	440	120	46	1198
Winters, Frank, and H. A. Bingham, Orillia, Ontario, Canada. Liquid-measuring device	397,452	Feb. 5	536	141	46	680
Wirt, Paul E., Bloomsburg, Pa. Fountain-pen	399,306	Mar. 12	788	204	46	1293
Wise Brothers. (See Crain, William O., assignor.)						
Wiseman & Co. *et al.* (See King, Corydon C., assignor.)						
Wiseman, Phillip S., Springfield, Ohio. Pipe-coupling for railway-cars	396,908	Jan. 29	2432	626, 627	46	510
Wiser, Henry P., Buffalo, N. Y. Buckle	400,379	Mar. 26	2289	625	46	1623
Wishart, James M., Marion, Kans. Sad-iron-heating apparatus	399,960	Mar. 19	1760	455	46	1493
Wissler, Jacob S., Canton, Ohio. Fodder-cutter	396,794	Jan. 29	2276	582	46	475
Withington, Charles B., Janesville, Wis. Grain-binder	399,108	Mar. 5	441	120, 121, 122	46	1198
Witmer, John A., Wakarusa, Ind. Vehicle-spring	396,317	Jan. 15	1539	388	46	317
Wleck, Wenzl, assignor of two-thirds to H. Müller and M. Kelz, Gratz, Austria-Hungary. Mail box and pouch	400,026	Mar. 19	1850	481	46	1509
Wohlfahrt, Adolf. (See Gebrke and Wohlfahrt.)						
Wolbach, Michael. (See Wolfsohn, Otto, assignor.)						
Wolcott, Clayton, Hartford, Conn. Mat	397,453	Feb. 5	537	141	46	681
Wolcott, John W. (See Freese and Wolcott.)						
Wolf, Henry L. R., Dayton, Ohio. Oyster-bucket	396,131	Jan. 15	1264	323	46	267
Wolf, William H., *et al.* (See Noble, William, assignor.)						
Wolfe, Allen I., Newbury, Ind. Rail-chair	400,027	Mar. 19	1856	481	46	1510
Wolfe, Harvey R., assignor to J. R. Bascom and Brennan & Co. South Western Agricultural Works, Louisville, Ky. Saw-mill dog	395,373	Jan. 1	99	26	46	22
Wolfe, Harvey R., assignor of one-half to J. R. Bascom, Louisville, Ky. Water-motor	396,318	Jan. 15	1540	389	46	317
Wolff, George S., Philadelphia, Pa. Swab for liquid blacking	396,790	Jan. 29	2267	580	46	473
Wolff, Ludwig, assignor to L. Wolff Manufacturing Company, Chicago, Ill. Thimble for coupling lead and cast-iron pipes	399,720	Mar. 19	1404	361	46	1423
Wolff Manufacturing Company, L. (See Clifford, John, assignor.)						
Wolff Manufacturing Company, L. (See Wolff, Ludwig, assignor.)						
Wolfsohn, Otto, assignor of one-half to M. Wolbach, New York, N. Y. Machine for piling textile fabrics	396,780	Jan. 22	2132	551	46	442
Wolstenholme, Thomas, Camden, N. J. Dyeing-machine	397,481	Feb. 5	571	148	46	686
Wood, Alvilnus B., Ann Arbor, Mich. Tent	399,640	Mar. 12	1289	331	46	1388
Wood, Edgar J., Brooklyn, N. Y. Apparatus for handling and distributing granular or lumpy substances	397,679	Feb. 12	895	236, 237	46	755
Wood, Frank L. (See Van Valkenburg and Wood.)						
Wood, Harry C., New Brighton, Pa. Glass-cutting machine	398,565	Feb. 26	2190	577	46	1032
Wood, Henry A. W. (See Hetherington, Frederick A., assignor.)						
Wood, James J., Brooklyn, N. Y. Hanger-board for arc lamps	398,870	Mar. 5	79	22	46	1130
Wood, Marshall, assignor to himself and A. M. Miller, Alderson, W. Va. Apparatus for heating railway passenger-cars	397,212	Feb. 5	170	45, 46	46	608
Wood, Montraville M., assignor of one-half to Erie County Light Company, Erie, Pa. Electric-lamp hanger	397,953	Feb. 19	1273	340	46	846
Wood, Walter D., Pittsburg, Pa. Manufacturing planished sheet-iron	395,605	Jan. 1	453	.....	46	93
Woodbridge, James E., assignor to Pratt & Whitney Company, Hartford, Conn. Screw-cutting die	399,367	Mar. 12	880	229	46	1310
Woodin, Edwin B., *et al.* (See Ransom, Ezra, assignor.)						
Woodring, William H., and C. S. Gilbert, Kansas City, Mo. Electric alarm-signal for cables	400,028	Mar. 19	1856	482	46	1510
Woodruff, Edmund W., Washington, D. C. Wash-stand	399,461	Mar. 12	1011	264, 265	46	1237

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Woodruff, Oliver D., Southington, Conn. Tubular lantern	395,863	Jan. 8	876	225	46	183
Woodruff, Oliver D., Southington, Conn. Lantern	395,864	Jan. 8	879	225	46	184
Woods, Granville T., Cincinnati, Ohio. Automatic safety cut-out for electric circuits	395,533	Jan. 1	338	85	46	71
Woods, Lewis P., Blairsville, Pa. Grate	395,606	Jan. 1	455	116	46	93
Woods Machine Company, S. A. (See Thomas, John R., assignor.)						
Woods Machine Company, S. A. (See Woods and Thomas, assignors.)						
Woods, Solomon A., Boston, Mass. Wood-planing machine	398,362	Feb. 19	1905	500, 501, 502	46	968
Woods, Solomon A., and J. R. Thomas, Boston, Mass., assignors to S. A. Woods Machine Company, of Massachusetts. Planing-machine	397,575	Feb. 12	721	186, 187	46	722
Woodward, Edward C., assignor of two-thirds to E. C. Wright and H. F. Woodward, Brockton, Mass. Last	398,923	Mar. 5	159	41	46	1143
Woodward Electrical Company. (See Cameron, Henry F. D., assignor.)						
Woodward, Horace F., *et al.* (See Woodward, Edward C., assignor.)						
Woodworth, Orson H., Columbia City, Ind. Filter-pump	397,263	Feb. 5	238	62	46	621
Woolcott, John H., Cincinnati, Ohio. Roller reduction-mill	395,534	Jan. 1	340	86, 87	46	72
Wooley, Charles D., Walden, N. Y. Auxiliary steering device for vessels	396,186	Jan. 15	1352	346	46	283
Woolley, Leonidas G., Grand Rapids, Mich. Treadle	398,363	Feb. 19	1910	503	46	969
Woolworth, Charles M., Ottumwa, Iowa. Drilling-machine	396,018	Jan. 8	1106	280	46	227
Wooster, George H., New York, N. Y. Material for the treatment of walls	397,529	Feb. 12	646	.....	46	709
Wootten, John E., Reading, Pa. Atomizer	396,449	Jan. 22	1743	448	46	364
Worrall, George, Chicago, Ill. Combined latch and lock	398,016	Feb. 19	1398	357	46	867
Worrall, Harvey, Topeka, Kans. Harmonic damper for pianos	398,924	Mar. 5	159	42	46	1143
Worsley, Samuel L., Taunton, Mass., assignor to Brown & Sharpe Manufacturing Company, Providence, R. I. Stop-motion for lathes	398,871	Mar. 5	82	23	46	1130
Worswick, William W., Cleveland, Ohio. Journal-box	399,721	Mar. 19	1406	362	46	1423
Worth, John D. (See Worth, William O. and J. D.)						
Worth, Joseph C. (See Okey, Joseph B., assignor.)						
Worth, William O. and J. D., Cedar Rapids, Iowa. Steam-engine	399,593	Mar. 12	1222	315	46	1375
Worthen, William C., and G. Pendleton, Jr., assignors of one-third to J. D. Walworth, Boston, Mass. Wrench	397,954	Feb. 19	1274	340	46	846
Worthen, William C., and G. Pendleton, Jr., assignors to themselves and J. D. Walworth, Boston, Mass. Wrench	400,380	Mar. 26	2389	625	46	1623
Worthington, David L., Toledo, Ohio. Clothes-drier	398,811	Feb. 26	2552	679	46	1106
Worthington, Thomas P., Southshore, Blackpool, county of Lancaster, England. Sewer-ventilator	396,187	Jan. 15	1352	347	46	283
Wright, Berton L., assignor of two-thirds to S. A. Burns, Bridgeport, Conn. Car-brake	400,029	Mar. 19	1858	462	46	1511
Wright, Edward, Worcester, assignor to Davis & Furber Machine Company, North Andover, Mass. Top roll for spinning-machines	395,938	Jan. 8	983	252	46	204
Wright, Ellery C., *et al.* (See Woodward, Edward C., assignor.)						
Wright, Henry H., Paola, Kans. Hat-mark	397,768	Feb. 12	1017	271	46	779
Wright, John, Hoosick Falls, N. Y. Whisk-broom	399,308	Mar. 12	792	205	46	1293
Wright, John H., Bridgeport, Conn. Street-car brake	395,414	Jan. 1	155	40	46	33
Wright, John W. (See Smith and Wright.)						
Wright, Luther S., assignor of one-half to D. McLachlan, Groton, N. Y. Coffee or tea pot	397,883	Feb. 12	1171	313	46	811
Wright, William, Plymouth, county of Devon, England. Whip-socket	395,374	Jan. 1	101	26	46	22
Wright, William H. S., Kansas City, Mo. Electric cut-out	398,566	Feb. 26	2192	578	46	1052
Wright, William J., Cooperstown, Pa. Stave jointing and planing machine	398,993	Mar. 5	275	75, 76, 77	46	1167
Wright, William R., Port Huron, Mich. Drill-head	397,769	Feb. 12	1018	271	46	779
Wright, William W., Willink, N. Y. Chimney cap and protector	399,594	Mar. 12	1225	315	46	1375
Writing Machine Manufacturing Company. (See Felbel and Steiger, assignors.)						
Writing Machine Manufacturing Company. (See Yost, George W. N., assignor.)						
Writing Machine Manufacturing Company. (See Yost and Merritt, assignors.)						
Wuerpel, Morris, St. Louis, Mo. Balanced valve	397,825	Feb. 12	1099	294	46	795
Wuerpel, Morris, St. Louis, Mo. Pneumatic switch for railways	398,364	Feb. 19	1911	503	46	970
Willhecke, Henry V., San Francisco, Cal. Wire splicer and cutter	395,642	Jan. 1	518	130	46	104
Wulff, Henry. (See Wallis, William J., assignor.)						
Wundes, John H., assignor to E. F. Boman and W. B. Musser, Lancaster, Pa. Tool-handle	399,641	Mar. 12	1291	331	46	1388
Wyatt, Robert L. (See Nolley and Wyatt.)						
Wyckoff, Edwin, Camden, N. J. Marker, furrower, and coverer	399,309	Mar. 12	793	205	46	1293
Wyckoff, Frank T., Williamsport, Pa. Auger-bit	399,595	Mar. 12	1226	315	46	1375
Wyckoff, Seamans & Benedict. (See Webb, George B., assignor.)						
Wyeth, David G., Newark, Ohio. Sleigh-runner for wheeled vehicles	400,381	Mar. 26	2390	625, 626	46	1623
Wylie, Richard, Napa, Cal. Combined reel and sprinkler	400,030	Mar. 19	1860	482, 483	46	1511
Wyman, Horace, assignor to Crompton Loom Works, Worcester, Mass. Take-up mechanism for narrow-ware looms	398,365	Feb. 19	1912	503, 504	46	970
Wyman, Horace, assignor to Crompton Loom Works, Worcester, Mass. Stopping mechanism for looms	400,382	Mar. 26	2393	626	46	1623
Wynkoop, Jehiel F., Brooklyn, N. Y., assignor of one-half to A. I. Wilcox, Bradford, Pa. Table-knife for green corn	399,109	Mar. 5	448	122	46	1199
Wynkoop, Mary T., Utica, N. Y. Rubber boot	400,421	Mar. 26	2451	642	46	1634
Xander, George A., Hamburg, and J. G. Xander, Reading, Pa. Sewing	399,310	Mar. 12	794	205	46	1294
Xander, John G. (See Xander, George A. and J. G.)						
Yaggy, Levi W., assignor to Western Publishing House, Chicago, Ill. Anatomical chart	396,381	Jan. 15	1636	420	46	334
Yagle & Co., William. (See White, Fernando, assignor.)						
Yale, Charles O., Rome, N. Y. Sulky	395,375	Jan. 1	102	26	46	23
Yale & Towne Manufacturing Company. (See Taylor, Warren H., assignor.)						
Yale & Towne Manufacturing Company. (See Weston, Thomas A., assignor.)						
Yarrick, John, and E. Meister, Philadelphia, Pa. Brake for cars	396,132	Jan. 15	1265	324	46	267
Yarrington, John D., Lexington, and H. D. Shanklin, Clark County, Ky., assignors to said John D. Yarrington. Railway-signal	397,884	Feb. 12	1172	314	46	811
Yeager, James F. (See Runkle, Tully, assignor.)						
Yeoman, Edward, Chicago, Ill. Spring bed-bottom	397,324	Feb. 5	334	87	46	640
Yingst, Cyrus, Annville, Pa. Hand-propelled vehicle	399,110	Mar. 5	448	122, 123	46	1199
Yost, George W. N., assignor to Writing Machine Manufacturing Company, New York, N. Y. Type-writing machine	400,384	Mar. 26	2396	626, 627	46	1624
Yost, George W. N., New York, N. Y., and C. E. Merritt, Springfield, Mass., assignors to Writing Machine Manufacturing Company, New York, N. Y. Type-writing machine	400,383	Mar. 26	2394	626	46	1624

Alphabetical list of patentees, January to March, inclusive—Continued.

Name, residence, and invention.	No.	Date.	Monthly volume.		Official Gazette.	
			Spec.	Dr'g	Vol.	Page.
Yost Writing Machine Company. (See Merritt, Mortimer G., assignor.)						
Yonmans, J. Hatfield, Asbury Park, N. J. Self-locking galley	397,964	Feb. 5	239	62	46	621
Young, Daniel. (See Beaford, Isaac F., assignor.)						
Young, Frederick A., Aurora, Ind. Wagon-brake	398,303	Feb. 19	1810	478	46	950
Young, Henry Z., Seville, Fla. Tile-machine	397,770	Feb. 12	1019	271, 272	46	779
Young, Hugh, New York, N. Y. Machine for cutting stone	397,410	Feb. 5	456	121, 122	46	665
Young, Humphrey B., Brockville, Ontario, Canada. Attachment for blacksmiths' anvils	397,530	Feb. 12	647	169	46	709
Young, John, assignor to Western Electric Company, Chicago, Ill. Electric signaling apparatus	396,795	Jan. 29	2278	582	46	475
Young, McClintock, Frederick, Md. Machine for bending hinge-blanks	396,319	Jan. 15	1541	389, 390	46	317
Young, McClintock, Frederick, Md. Art of and machine for making boxes, &c	397,162	Feb. 5	89	22, 23, 24, 25	46	595
Young, Moses J. (See Robinson, Clark, assignor.)						
Young, William H., assignor of one-half to W. J. Morden, Chicago, Ill. Cable-railway structure	396,638	Jan. 22	2036	523	46	490
Youngblood, William, Jamaica, N. Y. Preserving wood	398,366	Feb. 19	1914	.....	46	970
Young, John, Sanford M., Amsterdam, N. Y. Device for utilizing waste broom-corn	397,422	Feb. 5	572	148	46	687
Youngs, Edwin J., assignor to Castree Mallery Company, Flint, Mich. Sleigh-knee	399,642	Mar. 12	1292	331	46	1389
Zander, Ida, Milwaukee, Wis. Jar-holder and kettle-cover	400,395	Mar. 26	2398	627	46	1624
Zerr, William B., Spring, Pa. Device for cleaning windows	396,133	Jan. 15	1266	334	46	267
Zimmerman, George J., assignor to Niles & Scott Company, La Porte, Ind. Machine for making metal wheels	396,796	Jan. 29	2279	583	46	475
Zimmerman, John, Cincinnati, Ohio, assignor to Zimmerman Machine Company. Car-heater	396,639	Jan. 22	2037	523	46	490
[illegible]mmerman Machine Company. (See Zimmerman, John, assignor.)						
[illegible]merman, William P., Freeport, Ill. Device for fastening conductors	396,677	Jan. 22	2087	537	46	490
[illegible], Daniel E., *et al.* (See Caughey, Robert C., assignor.)						
Zinn, John H., Gettysburg, Pa. Sulky-plow	399,462	Mar. 12	1012	365, 366	46	1338
Zinn, Simon. (See Koenig, Michael, assignor.)						
Zinser, William, Jr., New York, N. Y. Can-jacket	397,163	Feb. 5	96	25	46	596
Zoeller, Theodore J., assignor, by mesne assignments, to United States Signal Clock Company, Louisville, Ky. Municipal telegraph system	396,450	Jan. 22	1745	448	46	365
Zonker, Edward, Corunna, Ind. Fire-kindler	399,463	Mar. 12	1014	366	46	1338
Zumwalt, Daniel K., Visalia, Cal. Mounting and preserving photographic proofs and copies	400,031	Mar. 19	1862	.....	46	1512
Zwickart, Carl, Salzwedel, Prussia, Germany. Seal-lock	399,722	Mar. 19	1406	362	46	1424
Zwiebel, Edward, Pottsville, Pa. Hydrant	397,213	Feb. 5	172	46	46	609
Zwietusch, Otto, Milwaukee, Wis. Apparatus for filtering and filling liquids under pressure	398,109	Feb. 19	1515	402	46	892
Zwietusch, Otto, Milwaukee, Wis. Filtering material	398,110	Feb. 19	1521	403	46	893

ALPHABETICAL LIST OF PATENTEES OF DESIGNS.

Name, residence, and design.	No.	Date.	Official Gazette. Volume.	Page.
Allen, John H., assignor to Meyer Bros. & Co., St. Louis, Mo. Knob	18,917	Feb. 12	46	696
Armstrong, Henry C., Providence, R. I. Wagon-body	18,830	Jan. 1	46	2
Bachmann, Maximilian, assignor to H. F. Smith, Sr., Philadelphia, Pa. Bust	18,854 to 18,855	Jan. 15	46	245
Bailey, Banks & Biddle. (See Burns, William W., assignor.)				
Ballin, Meyer, Chicago, Ill. Brooch	18,929	Feb. 19	46	828
Barnes & Beyer. (See Hartley, William F. R., assignor.)				
Barnhart Bros. & Spindler. (See Heyer, Charles E., assignor.)				
Barnhart Bros. & Spindler. (See Lauschke, Ernst, assignor.)				
Bawden, John, *et al.* (See Calely, Edward L., assignor.)				
Bawden, John H., *et al.* (See Calely, Edward L., assignor.)				
Bell, Thomas M., assignor to C. Scott Spring Company, Philadelphia, Pa. Plate for car-springs	18,838	Jan. 8	46	126
Benton, George H., Boonton, N. J. Paper-weight	18,936	Feb. 26	46	978
Bernhard, Feodore A., New York, N. Y. Ornament for shields	18,918	Feb. 12	46	696
Berry, Henry, assignor to Derby Silver Company, Shelton, Conn. Brush or mirror back	18,943 to 18,944	Mar. 5	46	1114
Berry, Henry, assignor to Derby Silver Company, Shelton, Conn. Mirror-frame	18,963	Mar. 19	46	1400
Berry, Henry, assignor to Derby Silver Company, Shelton, Conn. Handle for brushes, &c	18,974 to 18,976	Mar. 26	46	1520
Block & Germer. (See Germer and Guenther, assignors.)				
Borgner, Henry C., Philadelphia, Pa. Century monument	18,891	Feb. 5	46	578
Bowers, Frank K., Baltimore, Md. Box	18,839	Jan. 8	46	126
Bray, Morris P., Ansonia, assignor to Warner Bros., Bridgeport, Conn. Ornamentation of corsets	18,840	Jan. 8	46	126
Bray, Morris P., Ansonia, assignor to Warner Bros., Bridgeport, Conn. Ornamentation of corsets	18,856 to 18,857	Jan. 15	46	245
Brogan, Anthony D., and A. M. Malloch, Firhill, Glasgow, county of Lanark, Scotland. Surface ornamentation of glass	18,892 to 18,894	Feb. 5	46	578
Bromley & Sons, John. (See Fox, George B., assignor.)				
Bromley & Sons, John. (See Pegel, Julius, assignor.)				
Bromley & Sons, John. (See Petzold, Adolph, assignor.)				
Burger & Lee. (See Burger, Theodore W., assignor.)				
Burger, Theodore W., Dunnellen, N. J., assignor to Burger & Lee, New York, N. Y. Gas or oil stove	18,945	Mar. 5	46	1114
Burns, William W., Governor's Island, N. Y., assignor to Bailey, Banks & Biddle, Philadelphia, Pa. Button-hole decoration	18,880	Jan. 29	46	450
Calely, Edward L., assignor to G. Combs, J. and J. H. Bawden, Philadelphia, Pa. Portable fire-place grate	18,895	Feb. 5	46	578
Calely, Edward L., assignor to G. Combs, J. and J. H. Bawden, Philadelphia, Pa. Fire-place lining	18,896	Feb. 5	46	578
Camp, Walter, assignor to New Haven Clock Company, New Haven, Conn. Ornamentation of clock-cases	18,841	Jan. 8	46	126
Carpeles, Philip, Milwaukee, Wis. Corner-iron for trunk-tops	18,874	Jan. 22	46	344
Carpeles, Philip, Milwaukee, Wis. Trunk	18,875	Jan. 22	46	344
Carver, James W., Pawlet, Vt., assignor to himself and G. L. Kelty, Brooklyn, N. Y. Ax-handle	18,881	Jan. 29	46	450
Cleveland Burial Case Company. (See Hatcher, Isaiah G., assignor.)				
Clinton, David L., Clintonville, Conn. Receiving-card	18,951	Mar. 12	46	1272
Coffin, Francis A., Indianapolis, Ind. Desk	18,964	Mar. 19	46	1400
Combs, Gilbert, *et al.* (See Calely, Edward L., assignor.)				
Corscaden, Thomas. (See Hart and Corscaden.)				
Curtis, Seymour A., Stratford, Conn. Picture-support	18,960	Mar. 12	46	1272
Dater, Charles W., Brunswick, N. Y. Collar	18,965	Mar. 19	46	1400
Davis, Charles A., Washington, D. C. Revolver-handle	18,966	Mar. 19	46	1400
Derby Silver Company. (See Berry, Henry, assignor.)				
Doyle, John B., Lansingburg, assignor of one-half to J. F. Young, New York, N. Y. Foot warmer or support	18,961	Mar. 12	46	1272
Edelmann, Johann C. F., and A. H. Kursheedt, assignors to Kursheedt Manufacturing Company, New York, N. Y. Trimming	18,930	Feb. 19	46	828
Edelmann, Johann C. F., and A. H. Kursheedt, assignors to Kursheedt Manufacturing Company, New York, N. Y. Trimming	18,952 to 18,953	Mar. 12	46	1272
Everitt, Percival, New York, N. Y. Syringe	18,931	Feb. 19	46	828
Fairchild, Le Roy W., New York, N. Y. Flask	18,932	Feb. 19	46	828
Fatoux, Alexis, Meriden, Conn. Bell	18,937	Feb. 26	46	978
Fisher, Edwin, New York, N. Y., assignor to Lowell Manufacturing Company, Lowell, Mass. Carpet	18,842	Jan. 8	46	126
Fisher, Edwin, New York, N. Y., assignor to Lowell Manufacturing Company, Lowell, Mass. Carpet	18,897 to 18,901	Feb. 5	46	578
Fiske, J. W. (See Hanna, William C., Jr., assignor.)				
Fox, George B., assignor to J. Bromley & Sons, Philadelphia, Pa. Rug	18,843 to 18,848	Jan. 8	46	126
Friederich, William, Washington, D. C. Medal or badge	18,902	Feb. 5	46	578
Gaskill, Joshua W. (See Nicholson and Gaskill.)				
Germer, Otto, and G. H. Guenther, assignors to Block & Germer, Erie, Pa. Heating-stove	18,831	Jan. 1	46	2
Graham, John, Chicago, Ill. Font of combination type ornaments	18,946	Mar. 5	46	1114
Griffin, Alonzo J., Wilkes-Barré, Pa. Wire screen	18,954	Mar. 12	46	1272
Griswold, Catharine A., New York, N. Y. Ornamentation of corsets	18,919 to 18,923	Feb. 12	46	696
Guenther, Gustave H. (See Germer and Guenther.)				
Hamilton, William B., Toronto, Ontario, Canada. Pattern for shoes	18,938	Feb. 26	46	978

Alphabetical list of patentees of designs, January to March, inclusive—Continued.

Name, residence, and design.	No.	Date.	Official Gazette. Vol.	Page.
Hanna, William C., Jr., assignor to J. W. Fiske, New York, N. Y. Railing	18,858	Jan. 15	46	245
Hanna, William C., Jr., assignor to J. W. Fiske, New York, N. Y. Newel-post	18,882	Jan. 29	46	450
Hardin, William H., New York, N. Y. Advertising-frame	18,955	Mar. 12	46	1272
Harley, George W. T., Frederick, Md. Ornamentation of textile fabrics	18,933	Feb. 19	46	828
Hart, Henry C., Detroit, Mich. Mail-box	18,939	Feb. 26	46	978
Hart, William H., and T. Corscaden, assignors to Stanley Works, New Britain, Conn. Hinge	18,956	Mar. 12	46	1272
Hartley, William F. R., assignor to Barnes & Beyer, Philadelphia, Pa. Curtain	18,883	Jan. 29	46	450
Hatcher, Isaiah G., Chicago, Ill., assignor to Cleveland Burial Case Company, Cleveland, Ohio. Pedestal for burial-caskets	18,859	Jan. 15	46	245
Hauber, Gottlob, New York, N. Y. Surface ornamentation of canes, &c	18,849	Jan. 8	46	126
Hellenberg, Adolph, New York, N. Y. Necktie	18,903	Feb. 5	46	578
Hertenstein, Michael. (See Merion and Hertenstein.)				
Heyer, Charles E., assignor to Barnhart Bros. & Spindler, Chicago, Ill. Type	18,967 to 18,968	Mar. 19	46	1400
Hopson, John, Jr., New London, Conn. Radiator	18,832	Jan. 1	46	2
Ifland, Franz, assignor to C. Rakenius & Co., Berlin, Germany. Lamp	18,934	Feb. 19	46	828
Ihlenburg, Herman, assignor to MacKellar, Smiths & Jordan Company, Philadelphia, Pa. Font of combination type ornaments	18,884 to 18,885	Jan. 29	46	450
Jackson, William W., assignor to MacKellar, Smiths & Jordan Company, Philadelphia, Pa. Type	18,940	Feb. 26	46	978
Jacobs, Winthrop L., East Orange, N. J., assignor to Lowell Manufacturing Company, Lowell, Mass. Carpet	18,904 to 18,905	Feb. 5	46	578
Janes, Albert H. (See Leggett, Jones, and Wallace.)				
Jennings & Co., A. G (See Spooner, Spencer, assignor.)				
Kaldenberg, Frederick R., New York, N. Y. Cane-handle	18,886	Jan. 29	46	450
Kelty, Gibbons L. (See Carver, James W., assignor.)				
Koster, Charles H., assignor to Unexcelled Fireworks Company, Brooklyn, N. Y. Decorative fabric	18,941	Feb. 26	46	978
Kursheedt, Alphonse H. (See Edelmann and Kursheedt.)				
Kursheedt Manufacturing Company. (See Edelmann and Kursheedt, assignors.)				
Lauschke, Ernst, assignor to Barnhart Bros. & Spindler, Chicago, Ill. Type	18,969 to 18,971	Mar. 19	46	1400
Lawrence, Charles W., New York, N. Y. Curtain-pole end	18,887	Jan. 29	46	450
Leavitt, John L., Grant, N. Mex. Ter. Hanging stand	18,972	Mar. 19	46	1400
Leggett, Francis H., A. H. Jones, and L. Wallace, New York, N. Y. Bottle	18,942	Feb. 26	46	978
Little, Andrew, New York, N. Y. Type	18,860	Jan. 15	46	246
Lowell Manufacturing Company. (See Fisher, Edwin, assignor.)				
Lowell Manufacturing Company. (See Jacobs, Winthrop L., assignor.)				
Lowell Manufacturing Company. (See Swapp, Charles W., assignor.)				
MacKellar, Smiths & Jordan Company. (See Ihlenburg, Herman, assignor.)				
MacKellar, Smiths & Jordan Company. (See Jackson, William W., assignor.)				
Maidhof, Joachim, New York, N. Y. Dress-trimming	18,957	Mar. 12	46	1272
Malloch, Andrew M. (See Brogan and Malloch.)				
Matzen, Herman, Bedford, Ohio. Chair-back	18,833	Jan. 1	46	2
Meagher, Thomas E., assignor to Schofield, Mason & Co., Philadelphia, Pa. Rug	18,947 to 18,948	Mar. 5	46	1114
Merion, Frank, and M. Hertenstein, Columbus, Ohio. Heating-stove	18,834	Jan. 1	46	2
Mersereau, William T., South Orange, N. J. Japanese tea-stand	18,835	Jan. 1	46	2
Mesker & Brother. (See Symonds, Herbert, assignor.)				
Meyer Bros. & Co. (See Allen, John H., assignor.)				
Meyer, Charles T. and V. E., Bergen, N. J., assignors to E. C. Sampson, New York, N. Y. Oil-cloth	18,861 to 18,868	Jan. 15	46	246
Meyer, Victor E. (See Meyer, Charles T. and V. E.)				
Micker, John, *et al.* (See Nicholson and Gaskill, assignors.)				
Miller, Frederick S. (See Porteous and Miller.)				
New Haven Clock Company. (See Camp, Walter, assignor.)				
Nicholson, John W., and J. W. Gaskill, assignors to J. and J. M. Whitall, J. W. Nicholson, Philadelphia, Pa., J. Micker, Millville, N. J., C. A. Tatum, New York, and F. M. Underhill, Brooklyn, N. Y. Glass ointment-pot	18,836	Jan. 1	46	2
Niver, David R., assignor to R. S. Thain, Oak Park, Ill. Book and cover	18,924	Feb. 12	46	696
Ovington, Irene H., Brooklyn, N. Y. Bed-pan	18,958	Mar. 12	46	1272
Pegel, Julius, assignor to J. Bromley & Sons, Philadelphia, Pa. Rug	18,850 to 18,852	Jan. 8	46	126
Petzold, Adolph, assignor to J. Bromley & Sons, Philadelphia, Pa. Rug	18,869	Jan. 15	46	246
Pine, James K. P., Lansingburg, N. Y. Collar	18,925	Feb. 12	46	696
Plaut, Hugo H., New York, N. Y. Artificial feather	18,962	Mar. 12	46	1272
Porteous, George M., and F. S. Miller, Chicago, Ill. Photograph-exhibitor case	18,853	Jan. 8	46	126
Porteous, George M., and F. S. Miller, Chicago, Ill. Photograph-exhibitor stand	18,870	Jan. 15	46	246
Porteous, George M., and F. S. Miller, Chicago, Ill. Photograph-exhibitor-case body	18,871	Jan. 15	46	246
Porteous, George M., and F. S. Miller, Chicago, Ill. Photograph-exhibitor stand	18,872 to 18,873	Jan. 15	46	246
Porteous, George M., and F. S. Miller, Chicago, Ill. Photograph-exhibitor-case body	18,876 to 18,878	Jan. 22	46	344
Post, Emeline C., Yorktown, Va. Therapeutic bottle	18,879	Jan. 22	46	344
Price, John A., Scranton, Pa. Heating-stove	18,837	Jan. 1	46	2
Quackenbush, Henry M., Herkimer, N. Y. Nut-cracker	18,888	Jan. 29	46	450
Rakenius & Co., Carl. (See Ifland, Franz, assignor.)				
Sampson, Edward C. (See Meyer, Charles T. and V. E., assignors.)				
Schofield, Mason & Co. (See Meagher, Thomas E., assignor.)				
Schuck, Valentine G., New York, N. Y., assignor to Sutro Brothers Braid Company, of New York. Braid	18,889	Jan. 29	46	450
Scott, George A., New York, N. Y. Curling and crimping comb	18,926	Feb. 12	46	696
Scott Spring Company, Charles. (See Bell, Thomas M., assignor.)				
Shirley, Frederick S., New Bedford, Mass. Ornamentation of glassware	18,950	Mar. 12	46	1272
Smith, Harper F., Sr. (See Bachmann, Maximilian, assignor.)				
Smith, William T., Philadelphia, Pa. Rug	18,906 to 18,907	Feb. 5	46	578
Soltmann, Edward G., New York, N. Y. Screw-head	18,973	Mar. 19	46	1400
Spooner, Spencer, assignor to A. G. Jennings & Co., Brooklyn, N. Y. Knitted fabric	18,927	Feb. 12	46	696
Stanley Works. (See Hart and Corscaden, assignors.)				
Stewart, Lizzie S., New Castle, Pa. Lady's hat	18,908	Feb. 5	46	578
Stimpson, Edwin B., Brooklyn, N. Y. Ornamentation of straps	18,928	Feb. 12	46	696

Alphabetical list of patentees of designs, January to March, inclusive—Continued.

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Sutro Brothers Braid Company. (See Schuck, Valentine G., assignor.)				
Swapp, Charles W., New York, N. Y., assignor to Lowell Manufacturing Company, Lowell, Mass. Carpet	18,910 to 18,916	Feb. 5	46	578
Sweetland, William W., Edwardsburg, Mich. Floor-register	18,909	Feb. 5	46	578
Symonds, Herbert, assignor to Mesker & Brother, St. Louis, Mo. Pinnacle	18,935	Feb. 19	46	828
Tatum, C. Albert, *et al.* (See Nicholson and Gaskill, assignors.)				
Thain, Richard S. (See Niver, David R., assignor.)				
Tingue, Edward W., New York, N. Y., assignor to Tingue Manufacturing Company, Seymour, Conn. Upholstery plush	18,890	Jan. 29	46	450
Tingue Manufacturing Company. (See Tingue, Edward W., assignor.)				
Torrance, Francis J., Allegheny, Pa. Bath-tub	18,949	Mar. 5	46	1114
Underhill, Francis M., *et al.* (See Nicholson and Gaskill, assignors.)				
Unexcelled Fireworks Company. (See Koster, Charles H., assignor.)				
Walker, David, Newark, N. J. Stair-button	18,950	Mar. 5	46	1114
Wallace, Lewis. (See Leggett, Janes, and Wallace.)				
Warner Bros. (See Bray, Morris P., assignor.)				
Whitall, James, *et al.* (See Nicholson and Gaskill, assignors.)				
Whitall, John M., *et al.* (See Nicholson and Gaskill, assignors.)				
Young, John F. (See Doyle, John B., assignor.)				

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Name, residence, and title.	No.	Date.	Official Gazette. Volume.	Page.
Allcock & Co., Samuel, Redditch, county of Worcester, England. Sprout-hooks and other fish-hooks.	16,357	Mar. 12	46	1272
American Aristotype Co., Jamestown, N. Y. Photographic papers, instruments, specialties, and supplies	16,327	Mar. 5	46	1114
American Lead Pencil Company, Hoboken, N. J. Carpenters' pencils	16,358	Mar. 12	46	1272
American Lead Pencil Company, Hoboken, N. J. Carpenters' pencils	16,359	Mar. 12	46	1272
American Lead Pencil Company, Hoboken, N. J. Carpenters' pencils	16,360	Mar. 12	46	1272
American Lead Pencil Company, Hoboken, N. J. Carpenters' pencils	16,361	Mar. 12	46	1272
Ane Fque Vacheron & Constantin, (limited,) Geneva, Switzerland. Watches and their component parts	16,328	Mar. 5	46	1114
Armour Packing Co., Kansas City, Kans. Compressed cooked beef	16,164	Jan. 8	46	136
Armstrong, Angeline, New York, N. Y. Aromatic liquid dentifrice	16,303	Feb. 26	46	978
Armstrong, Bro. & Co., Pittsburg, Pa. Cork and cork articles	16,251	Feb. 12	46	696
Arnold, Carlton & McCord, Atlanta, Ga. Plug-tobacco for chewing and tobacco for smoking	16,277	Feb. 19	46	838
Arnold, Carlton & McCord, Atlanta, Ga. Chewing and smoking tobacco	16,362	Mar. 12	46	1272
Aspinwall Manufacturing Company, Three Rivers, Mich. Potato-planters and potato-diggers	13,131	Jan. 1	46	2
Atkins, George T., Dallas, Tex. Oil or liniment	16,278	Feb. 19	46	838
Baker & Co., Poughkeepsie, N. Y. Paint renewer and preserver	16,413	Mar. 26	46	1520
Ballard & Co., Stephen, New York, N. Y. Conducting-hose	16,414	Mar. 26	46	1520
Banker, George W., New York, N. Y. Adjustable spout for oil and other cans or receptacles	16,415	Mar. 26	46	1520
Banner & Co., Samuel. (See Hoppe & Sons, Alfred, and S. Banner & Co.)				
Barnes, Thomas, Pittsburg, Pa. Safes and locks	16,220	Jan. 29	46	450
Barrett, Mary C., Fredonia, N. Y. Tonic medicine	16,151	Jan. 8	46	136
Batterson, William T., M. F. Welsh, and J. F. Funk, Springfield, Ohio. Tonic emmenagogue	16,386	Mar. 19	46	1400
Bauernschmidt, George, Baltimore, Md. Lager-beer	16,262	Feb. 12	46	696
Beaver & Co., Dayton, Ohio. Toilet and laundry soap	16,132	Jan. 1	46	2
Bemis, Emery, Jr., Boston, Mass. Cigars and cheroots	16,416	Mar. 26	46	1520
Benners, Edwin H., Elizabeth, N. J. Lubricating compound	16,221	Jan. 29	46	450
Bensdorp & Co., Amsterdam, Netherlands. All goods made from the cocoa-bean	16,295	Feb. 26	46	978
Bergner & Engel Brewing Company, Philadelphia, Pa. Beer of a light color and superior quality	16,329	Mar. 5	46	1114
Besly & Co., Charles H., Chicago, Ill. Metal-working tools, brass and copper supplies, and platers' and polishers' supplies	16,387	Mar. 19	46	1400
Best Brewing Company, Phillip, Milwaukee, Wis. Beer	16,381	Mar. 12	46	1272
Billups, Cealy, Norfolk, Va. Plows	16,296	Feb. 26	46	978
Binder, Richard, Philadelphia, Pa. Hair-wash made of extract of herbs, roots, and flowers	16,222	Jan. 29	46	450
Blockshear, William S. (See Moore, Robinson, and Blockshear.)				
Bolling Drug Company, Little Rock, Ark. Cuticle ointments	16,197	Jan. 22	46	344
Booth Packing Company, A., Chicago, Ill.; Baltimore, Md.; St. Paul, Duluth, and Minneapolis, Minn.; Kansas City and St. Louis, Mo.; Louisville, Ky.; Omaha, Nebr.; Indianapolis, Ind.; Escanaba and Manistique, Mich.; Astoria, Oreg.; Bayfield, Wis., and Port Arthur, Canada. Oysters	16,236	Feb. 5	46	578
Booth Packing Company, A., Chicago, Ill.; Baltimore, Md.; St. Paul, Duluth, and Minneapolis, Minn.; St. Louis, Mo.; Louisville, Ky.; Omaha, Nebr.; Indianapolis, Ind.; Bayfield, Wis.; Astoria, Oreg.; Manistique, Mich., and Port Arthur, Canada. Canned oysters	16,252	Feb. 12	46	696
Boott Cotton Mills, Lowell, Mass. Blue drillings	16,131	Jan. 1	46	2
Boott Cotton Mills, Lowell, Mass. Sheetings and shirtings	16,330	Mar. 5	46	1114
Boss & Son, C. D., New London, Conn. Crackers, biscuits, and kindred articles	16,304	Feb. 26	46	978
Bowe, John C., Syracuse, N. Y. Vermin-exterminators	16,305	Feb. 26	46	978
Boyle, William, and J. McGlinn, Philadelphia, Pa. Whisky	16,297	Feb. 26	46	978
Bridgeport Chain Company, West Stratford, Conn. Halter, dog, picture, and similar chains formed from wire	16,134	Jan. 1	46	2
Bridgeport Chain Company, West Stratford, Conn. Sash, safety, and similar chains formed from sheet metal	16,135	Jan. 1	46	2
Briscoe & Son, William, London, county of Middlesex, England. Kerosene-oil	16,375	Mar. 12	46	1272
Burton Bros. & Co., New York, N. Y. Cotton linings	16,376	Mar. 12	46	1272
Burton Bros. & Co., New York, N. Y. Cotton linings	16,388	Mar. 19	46	1400
Burton Bros. & Co., New York, N. Y. Cotton linings	16,389	Mar. 19	46	1400
Cady, Hutchins C., Columbus, Ohio. Ointment	16,363	Mar. 12	46	1272
Caldwell, William J., Reading, Pa. Cotton-bats	16,331	Mar. 5	46	1114
Caldwell, William J., Reading, Pa. Cotton-bats	16,332	Mar. 5	46	1114
Canton Steel Roofing Company, Canton, Ohio. Metal roofing	16,333	Mar. 5	46	1114
Chamberlin Cartridge Company, Cleveland, Ohio. Shotgun-cartridges	16,263	Feb. 12	46	696
Chamberlin Cartridge Company, Cleveland, Ohio. Shotgun-cartridges	16,390	Mar. 19	46	1400
Chamberlin Cartridge Company, Cleveland, Ohio. Shotgun-cartridges	16,391	Mar. 19	46	1400
Chanteaud, Charles, Paris, France. Sedlitz powder	16,253	Feb. 12	46	696
Cigarmakers Co-Operative Association, Boston, Mass. Cigars	16,167	Jan. 15	46	246
Clarke, Charles E., New York, N. Y. Specifics for hog-cholera and swine-plague	16,306	Feb. 26	46	978
Clinton Metallic Paint Company, Kirkland and New York, N. Y. Red hematite, a coloring material for mortar, brick, tiles, and all clay products	16,223	Jan. 29	46	450
Columbia Chemical Works, Brooklyn, N. Y. Detergents containing ammonia	16,136	Jan. 1	46	2
Cooper, Elijah T., Allegheny, Pa. Bitters	16,334	Mar. 5	46	1114
Crosfield & Sons, Joseph, Warrington, county of Lancaster, England. Soap	16,335	Mar. 5	46	1114
Cunningham & De Fourier Company, (limited,) London, England. Preserved meats	16,198	Jan. 22	46	344
Cunningham, Mary A., St. Albans, Vt. Sirup for the cure of asthma	16,377	Mar. 12	46	1272
Dalsimer, Fannie, Philadelphia, Pa. Boots, shoes, and slippers	16,199	Jan. 22	46	344
Davidson, Samuel C., Belfast, Ireland. Teas and coffees	16,170	Jan. 15	46	246
De Graaw, Aymar & Co., New York, N. Y. Oars, handspikes, and capstan-bars	16,137	Jan. 1	46	2
Demmler Bros., Pittsburg, Pa. Miners' lamps	16,417	Mar. 26	46	1520
Dick, Friedrich, Esslingen, Wurtemberg, Germany. Butchers' knives and steels	16,154	Jan. 8	46	136
Draper Manufacturing Company, North Attleborough, Mass. Gas-burner tips	16,382	Mar. 12	46	1272
Duball, Monnin, Frossard & Co., Porentruy, Switzerland. Cased watches	16,418	Mar. 26	46	1520
Duffy, Michael H., Paterson, N. J. Soap	16,224	Jan. 29	46	450

Alphabetical list of registrants of trade-marks, January to March, inclusive—Continued.

Name, residence, and title.	No.	Date.	Official Gazette. Vol.	Page.
Darrell Bros., Cincinnati, Ohio. Shoes having solid insoles and heel-counters	16,307	Feb. 26	46	978
Elderkin Taylor Company, Rochester, N. Y. Shoes	16,300	Jan. 22	46	344
Electric Chemical Co., New Haven, Conn. Bluing-capsules	16,225	Jan. 29	46	450
Empire Wringer Company, Auburn, N. Y. Laundry articles, such as clothes wringers and driers	16,279	Feb. 19	46	828
Enright, Denis J., Boston, Mass. Liniment and like compounds	16,237	Feb. 5	46	578
Eppenstein & Co., M. C., Chicago, Ill. Watches	16,155	Jan. 8	46	126
Erie Preserving Company, Brant, N. Y. Preserved fruits, vegetables, meats, and poultry	16,226	Jan. 29	46	450
Eureka Belting Manufacturing Company, New York, N. Y. Fabric machine-belting	16,171	Jan. 15	46	246
Eureka Manufacturing Company, Baltimore, Md. Tonic beverage	16,264	Feb. 12	46	696
Evans, Marie P., New Orleans, La. Washing compound	16,336	Mar. 5	46	1114
Fairbank & Company, N. K., Chicago, Ill. Oleaginous food substances	16,201	Jan. 22	46	344
Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. New hypnotic	16,308	Feb. 26	46	978
Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. New hypnotic	16,309	Feb. 26	46	978
Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. New hypnotic	16,310	Feb. 26	46	978
Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Germany. New hypnotic	16,311	Feb. 26	46	978
Farbenfabriken, vormals Fr. Bayer & Co., Elberfeld, Prussia, Germany. Febrifuges or fever curatives	16,302	Mar. 19	46	1400
Farwell & Rhines, Watertown, N. Y. Barley-flour known as flakes	16,165	Jan. 8	46	126
Fitch, Asa M., Seymour, Ind. Chewing-gum	16,265	Feb. 12	46	696
Flint & Walling Manufacturing Company, Kendallville, Ind., Kansas City, Mo., and Fort Worth, Tex. Iron and wood pumps	16,172	Jan. 15	46	246
Fuchs, Louis C., Chicago, Ill. Wipers made of silk waste woven into cloth	16,173	Jan. 15	46	246
Fuller, Charles D. and F. D., Kalamazoo, Mich. Wash-boards	16,394	Mar. 19	46	1400
Fuller, Charles D. and F. D., Kalamazoo, Mich. Wash-boards	16,395	Mar. 19	46	1400
Fuller, Frank D. (See Fuller, Charles D. and F. D.)				
Funk, John F. (See Batterson, Welsh, and Funk.)				
Garcia, Antonio F., Havana, Cuba. Cigars	16,393	Mar. 19	46	1400
Garcia, Manuel, Havana, Cuba. Cigars	16,174	Jan. 15	46	246
Gilbert & Bennett Manufacturing Company, Georgetown, Conn., and New York, N. Y. Wire fencing	16,280	Feb. 19	46	828
Gilbert & Bennett Manufacturing Company, Georgetown, Conn., and New York, N. Y. Wire fencing	16,281	Feb. 19	46	828
Gilbert & Bennett Manufacturing Company, Georgetown, Conn., and New York, N. Y. Window-screen wire-cloth	16,282	Feb. 19	46	828
Gloy Manufacturing Co., London, county of Middlesex, England. Sizing for fabrics	16,364	Mar. 12	46	1272
Goldberg, Samuel W., Dallas, Tex. Blank account-books	16,365	Mar. 12	46	1272
Gossage & Sons, William, Widnes and Liverpool, county of Lancaster, England. Chemical alkalies	16,245	Feb. 5	46	578
Graef & Schmidt, New York, N. Y. Cutlery	16,202	Jan. 22	46	344
Green, Robert M., and M. E. Ogborn, San Francisco, Cal. Laxative medicine	16,283	Feb. 19	46	828
Green, Shipton, New York, N. Y. Kerosene	16,284	Feb. 19	46	828
Hahn, Philip, New York, N. Y. Razors and razor-strops	16,227	Jan. 29	46	450
Halford, William, deceased; W. C. Nicholson, Boston, Mass., administrator. Table-sauce	16,145	Jan. 1	46	2
Hanan & Son, New York, N. Y. Leather, cloth, and rubber boots and shoes	16,175	Jan. 15	46	246
Hanford, George C., Syracuse, N. Y. Baking-powder	16,203	Jan. 22	46	344
Hard, Bradley A., New York, N. Y. Writing-paper and envelopes	16,204	Jan. 22	46	341
Haviland & Co., L. P., Camden, N. Y. Meats, vegetables, fruits, oysters, and fish	16,396	Mar. 19	46	1400
Hayem, Simon, Aîné, Paris, France. Collars, cuffs, neck-wear, shirts, and underwear	16,337	Mar. 5	46	1114
Heidelberger, Frank & Co., Philadelphia, Pa. Buffing for garments	16,419	Mar. 26	46	1520
Henry, George C., Burlington, Iowa. Soda-water and similar carbonated beverages	16,299	Feb. 26	46	978
Herbert & Rapp Company, Boston, Mass. Shoe-elastic	16,338	Mar. 5	46	1114
Herrman & McLean, Cleveland, Ohio. Medicated powder for animals and poultry	16,301	Feb. 26	46	978
Hesslein Bros., Chicago, Ill. Cigars	16,300	Feb. 26	46	978
Hiss Manufacturing Company, P. Hanson, Baltimore, Md., and Washington, D. C. Furniture-polish	16,298	Feb. 26	46	978
Hodges, Frank F., Boston, Mass. Ladies' and misses' hats and bonnets	16,285	Feb. 19	46	828
Hollyday, George T., Baltimore, Md. Medicine for the cure of heaves in horses	16,238	Feb. 5	46	578
Holmes & Coutts, New York, N. Y. Biscuits, crackers, wafers, and similar articles	16,339	Mar. 5	46	1114
Hooper, Frank B., New York, N. Y. Twines, ropes, cordage, nets, lines, yarns, and the like	16,228	Jan. 29	46	450
Hoppe & Sons, Alfred, and S. Banner & Co., Liverpool, England. Refined petroleum	16,397	Mar. 19	46	1400
Horner, James, Pittsburg, Pa. Compounded spices and herbs for flavoring meats, puddings, headcheese, &c	16,254	Feb. 12	46	696
Horner, James, Pittsburg, Pa. Preserving-salt for curing and preserving meat, &c	16,255	Feb. 12	46	696
Horner, Joshua, Jr., Baltimore, Md. Artificial fertilizers	16,138	Jan. 1	46	2
Horrell, Irwin N., Latrobe, Pa. Boots and shoes	16,266	Feb. 12	46	696
Horsman, Edward I., New York, N. Y. Photographic cameras	16,286	Feb. 19	46	828
Horsman, Edward I., New York, N. Y. Photographic outfits	16,420	Mar. 26	46	1520
Horton & Co., New York, N. Y. Leather	16,156	Jan. 8	46	126
Hubbuck & Son, Thomas, London, England. Boiled oils	16,421	Mar. 26	46	1520
Hull, Charles S., Boston, Mass. Leather for the uppers of shoes	16,205	Jan. 22	46	344
Humphreys Homeopathic Medicine Company, New York, N. Y. Special preparations of extract of hamamelis	16,267	Feb. 12	46	696
Humphreys Homeopathic Medicine Company, New York, N. Y. Homeopathic specifics	16,268	Feb. 12	46	696
Hunt, Henry J., Yokohama, Japan, London, England, and Chicago, Ill. Japan tea	16,206	Jan. 22	46	344
Jackson, Gaylord M., Los Angeles, Cal. Stove-polish	16,340	Mar. 5	46	1114
Jackson, Thomas, Manchester, county of Lancaster, England. Cachoux	16,176	Jan. 15	46	246
Jacobs, Benjamin T., Stapleton, N. Y. Cough medicine for internal use	16,207	Jan. 22	46	344
Jacobs, Maurice, New York, N. Y. Metal link puzzle	16,270	Feb. 12	46	696
Jaros Hygienic Underwear Company, Chicago, Ill. Underwear	16,166	Jan. 8	46	126
Johns Manufacturing Company, H. W., New York, N. Y. Boiler and pipe coverings, fillings, linings, and the like	16,177	Jan. 15	46	246
Jones, James W., Americus, Ga. Medicines for diseases of the blood and for female diseases	16,239	Feb. 5	46	578
Jordan, Andrew J., St. Louis, Mo. Razors, pocket-knives, scissors, shears, and like articles of cutlery	16,246	Feb. 5	46	578
Kansas City Times Newspaper Company, Kansas City, Mo. Newspaper or weekly pamphlet	16,398	Mar. 19	46	1400
Kearns, John C., Maitland, Pa. Churns	16,287	Feb. 19	46	828
Kent, Benjamin, Paterson, N. J. Cologne	16,208	Jan. 22	46	344
Kent, Benjamin, Paterson, N. J. Nerve tonic and stimulant	16,209	Jan. 22	46	344
Kiesel & Company, Fred. J., Ogden, Utah Ter. Whisky	16,229	Jan. 29	46	450
Kiesel & Company, Fred. J., Ogden, Utah Ter. Whisky	16,312	Feb. 26	46	978
King, David, Springfield, Ohio. Writing-paper	16,178	Jan. 15	46	246
King, Harriet A., Salina, Kans. Embrocations and pills	16,422	Mar. 26	46	1520
Kipling, Edward E., New York, N. Y. Artificial diamonds	16,139	Jan. 1	46	2
Kirker, Greer & Co., (limited,) Belfast, county of Antrim, Ireland. Whisky	16,140	Jan. 1	46	2
Knox, John K., Skaneateles, N. Y. Cement for making blackboard-surfaces	16,341	Mar. 5	46	1114
Koch, Sons & Company, New York, N. Y., and Berlin, Germany. Photograph-albums	16,158	Jan. 8	46	126

Alphabetical list of registrants of trade-marks, January to March, inclusive—Continued.

Name, residence, and title.	No.	Date.	Official Gazette. Vol.	Page.
Kohlberg, Earnest, El Paso, Tex. Cigars and cigarettes	16,141	Jan. 1	46	2
Lalor, Robert D., London, England. Medicinal preparation for the treatment of general debility and brain and nerve diseases	16,399	Mar. 19	46	1400
Le Prince, Henry, Paris, France. Corsets	16,194	Jan. 15	46	246
Leggett & Co., Francis H., New York, N. Y. Nuts	16,159	Jan. 8	46	126
Lever Bros., Warrington, county of Lancaster, England. Soaps and detergents	16,313	Feb. 26	46	978
Lever Bros., Warrington, county of Lancaster, England. Soaps and detergents	16,314	Feb. 26	46	978
Lever Bros., Warrington, county of Lancaster, England. Fancy soaps and toilet perfumery	16,315	Feb. 26	46	978
Lever Bros., Warrington, county of Lancaster, England. Fancy soaps and toilet perfumery	16,316	Feb. 26	46	978
Levinstein, Ivan, Manchester, England. Antipyretic drug	16,167	Jan. 8	46	126
Levinstein, Ivan, Manchester, county of Lancaster, England. Antipyretic drug	16,179	Jan. 15	46	246
Lewis & Co., James W., New York, N. Y. Playing-cards	16,288	Feb. 19	46	828
Lockwood, Frederick J., Bridgeport, Conn. Bank-check punches	16,289	Feb. 19	46	828
Lopez, Antonio, Havana, Cuba. Cigars	16,180	Jan. 15	46	246
Lyman, Wilfred C., Chicago, Ill. Steam-exhaust heads	16,366	Mar. 12	46	1272
Lynde & Son, B. A., Buffalo, N. Y. Laundry and toilet soap	16,342	Mar. 5	46	1114
Lyon & Healy, Chicago, Ill. Guitars, mandolins, zithers, and banjos	16,247	Feb. 5	46	578
Mack, Heinrich, Ulm, Wurtemberg, Germany. Perfumed tablets for bath and toilet use	16,181	Jan. 15	46	246
Mack, Heinrich, Ulm, Wurtemberg, Germany. Perfumery preparations for the bath	16,182	Jan. 15	46	246
Mack, Heinrich, Ulm, Wurtemberg, Germany. Perfumery preparations for the bath	16,183	Jan. 15	46	246
Mackenzie, Chase & Co., New York, N. Y. Fresh and pickled eggs	16,363	Mar. 12	46	1272
Manufacturers' Record Company, Baltimore, Md. Newspaper or weekly pamphlet	16,376	Mar. 12	46	1272
Mase, Fanny G., Brooklyn, N. Y. Medicine for external use	16,379	Mar. 12	46	1272
Mather Brothers, Albany, N. Y. Illuminating-oil	16,290	Feb. 19	46	828
Mather Brothers, Albany, N. Y. Illuminating-oil	16,343	Mar. 5	46	1114
Mather Manufacturing Co., Philadelphia, Pa. Type, printers' rules, printers' leads, and other printers' furniture	16,269	Feb. 12	46	696
McEwan, Walter, Albany, N. Y. Coffee	16,160	Jan. 8	46	126
McGill, John A., South Bend, Ind. Medical compounds for the cure of female diseases	16,344	Mar. 5	46	1114
McGuinness, James H., New York, N. Y. External remedies	16,400	Mar. 19	46	1400
Mederaf, Fredrick W., Syracuse, N. Y. Crackers and cakes	16,184	Jan. 15	46	246
Merrell & Soule, Syracuse, N. Y. Condensed mince-meat for pies	16,240	Feb. 5	46	578
Merriman, Francis E., Boston, Mass. Prepared whalebone	16,367	Mar. 12	46	1272
Michaelis & Son, M., New York, N. Y. Mixture or compound for making ginger-ale	16,210	Jan. 22	46	344
Miller Bros. & Co., Baltimore, Md. Canned oysters, fruits, and vegetables	16,241	Feb. 5	46	578
Miller Brothers, New York, N. Y. Corn-salve	16,302	Feb. 26	46	978
Miller, Case & Clausen, New York, N. Y. Degerminated meal, corn-flour, cornmeal, hominy, grits, and feed	16,248	Feb. 5	46	578
Miller Match Company, Akron, Ohio. Friction parlor-matches	16,142	Jan. 1	46	2
Miller Match Company, Akron, Ohio. Friction parlor-matches	16,143	Jan. 1	46	2
Minnesota Soap Company, St. Paul, Minn. Soap	16,144	Jan. 1	46	2
Moechel & Co., J. Robt., Philadelphia, Pa. Insecticides	16,423	Mar. 26	46	1520
Mooney, Reuben C., Jasper, Tenn. Preparation for piles	16,230	Jan. 29	46	450
Moore, James I., R. Robinson, and W. S. Blockshear, Waco, Tex. Remedies for all diseases of the nose, throat, and bronchial tubes	16,185	Jan. 15	46	246
Moran & Saunderson, New York, N. Y. Steam and hydraulic combination piston-packing	16,186	Jan. 15	46	246
Mosbacher & Co., New York, N. Y. Ornamental jewelry	16,256	Feb. 12	46	696
Muscatine Oat Meal Company, Muscatine, Iowa. Flour	16,231	Jan. 29	46	450
Muscatine Oat Meal Company, Muscatine, Iowa. Cereal products	16,317	Feb. 26	46	978
Mutual Union Cigar Company, Chicago, Ill. Cigars	16,187	Jan. 15	46	246
New York Belting and Packing Company, New York, N. Y. Medium-grade rubber belting	16,211	Jan. 22	46	344
New York Phosphate Company, Jersey City, N. J., and New York, N. Y. Baking-powder	16,232	Jan. 29	46	450
Nicholson, Samuel, Washington, D. C. Tonic and alterative remedy	16,188	Jan. 15	46	246
Nicholson, William C., administrator. (See Halford, William.)				
Ogborn, Marshall E. (See Green and Ogborn.)				
Ogburn, Mathew L., Winston, N. C. Plug chewing and prepared smoking tobacco	16,189	Jan. 15	46	246
Oppenheimer & Co., S., New York, N. Y. Composition for coloring and preserving sausages	16,424	Mar. 26	46	1520
Ostrander, Francis A., Troy, N. Y. Fire-brick, stove-linings, and articles made wholly or partly of fire-clay	16,380	Mar. 12	46	1272
Packard & Field, Brockton, Mass. Boots, shoes, and slippers	16,318	Feb. 26	46	978
Palmer, Lyman F., Topeka, Kans. Sirup and sugar	16,212	Jan. 22	46	344
Parker, Holmes & Co., Boston, Mass. Boots and shoes	16,401	Mar. 19	46	1400
Parkinson & Co., C. E., Bradford, county of York, England. Linings and summer coatings	16,409	Mar. 19	46	1400
Peabody & Co., Henry W., Boston, Mass. Kerosene-oil	16,291	Feb. 19	46	828
Peabody & Co., Henry W., Boston, Mass. Kerosene-oil	16,292	Feb. 19	46	828
Peabody & Co., Henry W., Boston, Mass. Kerosene-oil	16,293	Feb. 19	46	828
Peters Cartridge Company, Cincinnati and King's Station, Ohio. Shot-gun cartridges	16,152	Jan. 8	46	126
Peters Cartridge Company, Cincinnati and King's Station, Ohio. Shot-gun cartridges	16,153	Jan. 8	46	126
Peters Cartridge Company, King's Mills and Cincinnati, Ohio. Shotgun-cartridges	16,190	Jan. 15	46	246
Peters Cartridge Company, King's Mills and Cincinnati, Ohio. Shotgun-cartridges	16,191	Jan. 15	46	246
Peters Cartridge Company, King's Mills and Cincinnati, Ohio. Shotgun-cartridges	16,192	Jan. 15	46	246
Peters Cartridge Company, King's Mills and Cincinnati, Ohio. Shotgun-cartridges	16,193	Jan. 15	46	246
Poole, Charles W., St. Louis, Mo. Patent medicine for curing gonorrhœa and gleet	16,257	Feb. 12	46	696
Potter Drug and Chemical Co., Boston, Mass. Medicinal plasters	16,242	Feb. 5	46	578
Powell, George D., Brooklyn, N. Y. Maple-sirup	16,345	Mar. 5	46	1114
Power & Son, John, Dublin, Ireland. Whisky	16,346	Mar. 5	46	1114
Power & Son, John, Dublin, Ireland. Whisky	16,425	Mar. 26	46	1520
Prando, Peter P., St. Xavier Mission, (Fort Custer,) Mont. Ter. Liniments	16,319	Feb. 26	46	978
Pratt, Henry E., Lambertville, N. J. Copying-books	16,271	Feb. 12	46	696
Price Baking Powder Company, Chicago, Ill. Flavoring-extracts for food	16,347	Mar. 5	46	1114
Procter & Gamble, Cincinnati, Ohio. Laundry-soap	16,249	Feb. 5	46	578
Prosser, Charles O., Westerly, R. I. Remedies for female complaints	16,368	Mar. 12	46	1272
Prunty, Charles E., St. Louis, Mo. Maize or Indian corn	16,213	Jan. 22	46	344
Quartier, Emile, Flis, Brenets, Switzerland. Watches, watch-movements, and watch-cases	16,188	Jan. 8	46	126
Quick Meal Stove Company, St. Louis, Mo. Stoves and stove ware and furniture	16,272	Feb. 12	46	696
Ramsay, Walter J., New Bedford, Mass. Metal-polishing paste	16,369	Mar. 12	46	1272
Randall & Co., Cincinnati, Ohio. Stitching-horses	16,402	Mar. 19	46	1400
Revere Rubber Company, Boston, Mass. Hose of rubber, cotton, or linen	16,370	Mar. 12	46	1272
Revere Rubber Company, Boston, Mass. Hose of rubber, cotton, or linen	16,371	Mar. 12	46	1272
Revere Rubber Company, Boston, Mass. Hose of rubber, cotton, or linen	16,372	Mar. 12	46	1272
Revere Rubber Company, Boston, Mass. Rubber and cotton hose, metal-covered	16,403	Mar. 19	46	1400
Revere Rubber Company, Boston, Mass. Rubber, linen, or cotton hose	16,404	Mar. 19	46	1400
Revere Rubber Company, Boston, Mass. Rubber belting, hose, and packing	16,426	Mar. 26	46	1520
Richards Medicine Co., A. B., Sherman, Tex. Liniment for man or beast	16,146	Jan. 1	46	2

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Richmond, Samuel A., Tuscola, Ill. Nervine	16,405	Mar. 19	46	1400
Riley & Co., W. B., Philadelphia, Pa. Horse-covers, lap-dusters, horse-blankets, and hoods	16,147	Jan. 1	46	2
Riverside Paper Company, Holyoke, Mass. Writing-paper	16,314	Jan. 22	46	344
Robinson & Bro., C. E., Philadelphia, Pa. Shoe-polish	16,273	Feb. 12	46	696
Robinson, Henry. (See Moore, Robinson, and Blockshear.)				
Rogers, Henry R., Boston, Mass. Medical compounds to cure diseases of the nerves, liver, and stomach	16,406	Mar. 19	46	1400
Rogers & Irvin, New York, N. Y., and Doncaster, England. Pills	16,157	Jan. 8	46	126
Rogers, Peet & Co., New York, N. Y. Collars and cuffs	16,195	Jan. 15	46	246
Sands, Charles, Norristown, Pa. Liniment	16,233	Jan. 29	46	450
Sauerhammer, Clifton G., Littlestown, Pa. Cigars	16,384	Mar. 12	46	1272
Sayres, Knun B., Cincinnati, Ohio. Baking-powder	16,215	Jan. 22	46	344
Schaeffner, Antoine, Paris, France. Photographic paper	16,320	Feb. 26	46	978
Schlep, William, Mount Pleasant, Iowa. Cigars	16,407	Mar. 19	46	1400
Shepard, Charles G. and W. J., Buffalo, N. Y. Ice-cream freezers	16,162	Jan. 8	46	126
Shepard, Walter J. (See Shepard, Charles G. and W. J.)				
Shoemaker & Co., Robert, Philadelphia, Pa. White lead	16,258	Feb. 12	46	696
Shoemaker & Co., Robert, Philadelphia, Pa. Ready-mixed paints	16,259	Feb. 12	46	696
Sidle, Fletcher, Holmes Company, Minneapolis, Minn. Wheat-flour	16,148	Jan. 1	46	2
Smith, Albert L., Palatine, Ill. Perfumery	16,274	Feb. 12	46	696
Smith, Baker & Co., of Japan, New York, N. Y. Japan tea	16,216	Jan. 22	46	344
Smith & Co., H. D., Cincinnati, Ohio. Chewing-gum	16,348	Mar. 5	46	1114
Smith, Hogg & Gardner, New York, N. Y. Cotton or partly cotton and wool and partly wool woven fabric	16,217	Jan. 22	46	344
Smokeless Powder Company, (limited,) London, England. Explosives	16,349	Mar. 5	46	1114
Snell, Varanus, Brockton, Mass. Heel-shaves	16,408	Mar. 19	46	1400
Soler & Guardias, New York, N. Y. Medicines for external use	16,243	Feb. 5	46	578
South Bend Iron Works, South Bend, Ind. Plows	16,350	Mar. 5	46	1114
Southern Company of New York, New York, N. Y. Medicine for infants	16,260	Feb. 12	46	696
St. Paul Roller Mill Company, St. Paul, Minn. Flour, wheaten grits, farina, oatmeal, cornmeal, and hominy	16,218	Jan. 22	46	344
Stager & Co., Chas., Toledo, Ohio. Clover-seed	16,351	Mar. 5	46	1114
Stevens & Sons, M. T., North Andover, Mass. Worsted, woolen, and part-woolen goods	16,149	Jan. 1	46	2
Stewart, Henry C., Cincinnati, Ohio. Salve	16,261	Feb. 12	46	696
Stivers, Rufus M., New York, N. Y. Road-wagon the body of which is supported between side bars by cross-springs	16,352	Mar. 5	46	1114
Stults & Co., Charles E., Savannah, Ga. Whisky	16,275	Feb. 12	46	696
Swartwout, Emma J., New York, N. Y. Corsets and attachments for supporting underwear	16,163	Jan. 8	46	126
Syracuse Stove Works, Syracuse, N. Y. Stoves, ranges, and furnaces	16,234	Jan. 29	46	450
Terraline Company, Washington, D. C. Medicinal petroleum products	16,410	Mar. 19	46	1400
Thomas Manufacturing Company, E. M., Jersey City, N. J., and New York, N. Y. Medicine for the cure of indigestion, dyspepsia, and liver complaint	16,353	Mar. 5	46	1114
Thompson, William J., Pittsburg, Pa. Liniment	16,235	Jan. 29	46	450
Turner & Harrison, Philadelphia, Pa. Metallic pens	16,250	Feb. 5	46	578
Usine Genevoise de Dégrossissage D'or, Geneva, Switzerland. Spiral or volute springs for watches	16,354	Mar. 5	46	1114
Usine Genevoise de Dégrossissage D'or, Geneva, Switzerland. Balance-wheels for watches	16,355	Mar. 5	46	1114
Van Vleet & Co., Memphis, Tenn. Remedy for chills and fever and liver-pills	16,321	Feb. 26	46	978
Wachsmuth & Co., L. C., Chicago, Ill. Outer garments for men and boys	16,164	Jan. 8	46	126
Waldo, Egbert B., Syracuse, N. Y. Liquid remedy for abrasions and other external injuries and diseases of the skin	16,219	Jan. 22	46	344
Walworth Manufacturing Company, Boston, Mass. Die-plates for threading steam, gas, and other pipes	16,411	Mar. 19	46	1400
Wauregan Paper Company, Holyoke, Mass. Fine writing-paper	16,294	Feb. 19	46	828
Webb, Charles H., New York, N. Y. Adding-machines	16,322	Feb. 26	46	978
Welsh, Millard F. (See Batterson, Welsh, and Funk.)				
Wenigmann, Ernest, New York, N. Y. Cigars, cheroots, cigarettes, and manufactured tobacco	16,196	Jan. 15	46	246
White, Lucy N., New York, N. Y. Zinc powder and compounds containing zinc, for external use	16,324	Feb. 26	46	978
Whitehall, Samuel, South Bend, Ind. Preparations for curing headache	16,323	Feb. 26	46	978
Wineman, J. & L., Chicago, Ill. Ready-made clothing for men, boys, and children	16,244	Feb. 5	46	578
Wingenroth, Adolf, Mannheim, Baden, Germany. Wood-preserving oil	16,373	Mar. 12	46	1272
Winternitz & Bro., Samuel G., Baltimore, Md. Horseshoe-nails	16,412	Mar. 19	46	1400
Wolff & Coleman, I. & M., Chicago, Ill. Drying houses or kilns for drying lumber, bricks, &c.	16,150	Jan. 1	46	2
Woods, Samuel, Montreal, Quebec, Canada. Insecticide	16,325	Feb. 26	46	978
Wright, Frank A., Lewiston, Me. Liquid medicine for external and internal use	16,356	Mar. 5	46	1114
Wunderle, Philip, Philadelphia, Pa. Confectionery	16,276	Feb. 12	46	696
Wunderle, Philip, Philadelphia, Pa. Confectionery	16,385	Mar. 12	46	1272
Zobel & Failmeager, Brooklyn, N. Y. Stomach-tonic	16,326	Feb. 26	46	978
Zobel & Failmeager, Brooklyn, N. Y. Toilet waters and lotions	16,374	Mar. 12	46	1272

ALPHABETICAL LIST OF REGISTRANTS OF LABELS.

Name, residence, and title.	No.	Date.	Official Gazette. Volume.	Page.
Achard, Julia A., Lodi, Cal. "Mrs Julia A. Achard's Liniment"	5,824	Feb. 19	46	828
Ball, Joseph G., Boston, Mass. "Dr. Ball's Cream." (for the toilet)	5,847	Mar. 19	46	1400
Behrend & Sons, M., New York, N. Y. "M. Behrend & Son's Descriptive School Book Labels"	5,843	Mar. 12	46	1272
Binswanger & Pollock, Philadelphia, Pa. "Amber" (for Paints and Colors)	5,792	Jan. 15	46	246
Bolling Drug Company, Little Rock, Ark. "Bolling's Crystal Cream" (for cuticle ointments)	5,833	Mar. 5	46	1114
Brock, Joseph B., Riverton, Va. "Baldwin's Perfection Salve"	5,834	Mar. 5	46	1114
Brock, Joseph B., Riverton, Va. "Baldwin's Perfection Skin-Cure"	5,835	Mar. 5	46	1114
Bruce, Charles W., Philadelphia, Pa. "Non-Porous" (for paint)	5,848	Mar. 19	46	1400
Buell, Mary, Chicago, Ill. "Miss Buell's Lotion" (for chapped hands)	5,785	Jan. 8	46	126
Carty, William C., Graniteville, Mo. "Carty's Augue Cure"	5,836	Mar. 5	46	1114
Central Lard Company, New York, N. Y. "Manteca Chicharron Preparda Espresamente Para Los Climas Calidos Endurecida"	5,786	Jan. 8	46	126
Chadbourne, Mary E., Boston, Mass. "The most Valuable Medicine yet found"	5,854	Mar. 26	46	1520
Conine, Martin F., Plainwell, Mich. "M. F. Conine's German Scrofular Salve"	5,849	Mar. 19	46	1400
Cottingham, William H., Noblesville, Ind. "Cottingham's Stomach and Kidney Renovator"	5,830	Feb. 26	46	978
Cottou Oil Product Company, New York, N. Y. "The Cotton Oil Product Co's Cotton Seed Lard"	5,793	Jan. 15	46	246
Cotton Oil Product Company, New York, N. Y. "The Cotton Oil Product Co's for the Nursery," (for a purgative medicine)	5,794	Jan. 15	46	246
Cotton Oil Product Company, New York, N. Y. "The Cotton Oil Product Co's Toilet Cotton Seed Soap"	5,795	Jan. 15	46	246
Cotton Oil Product Company, New York, N. Y. "The Cotton Oil Product Co's Soap Powder"	5,796	Jan. 15	46	246
Cotton Oil Product Company, New York, N. Y. "The Cotton Oil Product Co's Laundry Cotton Seed Soap"	5,797	Jan. 15	46	246
Cotton Oil Product Company, New York, N. Y. "The Cotton Oil Product Co's Bath Soap"	5,837	Mar. 5	46	1114
Derby, Emma A., Boston, Mass. "Eustachian Snuff for Catarrh"	5,780	Jan. 1	46	2
Doliber-Goodale Company, Portland, Me., and Boston, Mass. "Mellins Food for Infants and Invalids"	5,787	Jan. 8	46	126
Doliber-Goodale Company, Portland, Me., and Boston, Mass. "Mellin's Food for Infants and Invalids"	5,798	Jan. 15	46	246
Dunlap, Lawton & Hall, Chicago, Ill. "Guarantee" (for Rubber and Oil Clothing)	5,838	Mar. 5	46	1114
Egersdorff, Jennie G., Kansas City, Mo. "Tapeworm Specific"	5,850	Mar. 19	46	1400
Eppinger, Frederick, New York, N. Y. "Swiss Stomach Bitters"	5,820	Feb. 12	46	696
Fenstemaker, Charles D., Philadelphia, Pa. "Crystalized Vegetable Combination". (for a Compound for Painting Purposes)	5,781	Jan. 1	46	2
Field, Thomas H., Chicago, Ill. "Melilotus Cream" (for a compound for the complexion)	5,839	Mar. 5	46	1114
Gladding, William J., New York, N. Y. "Gladding's Whale Oil and Tar Hoof Dressing and Liniment"	5,821	Feb. 12	46	696
Godley Brothers, Madison, Wis. "The Celebrated Lincolnshire Chutney"	5,808	Jan. 29	46	450
Green & Bentley, Oskaloosa, Iowa. "Balsam of Tulu and White Pine"	5,809	Jan. 29	46	450
Groesfeld, Phillipp, Washington, D. C. "White's Glove-Fitting Ready-Cut Waist Lining"	5,782	Jan. 1	46	2
Hawley & Co., Edward T., Detroit, Mich. "Hawley's Spavin Cure"	5,788	Jan. 8	46	126
James, Charles A., San Francisco, Cal. "Dr James' Sure Cure" (for remedy for Catarrh, Cough and Consumption)	5,851	Mar. 19	46	1400
Jamieson, Peter, Aberdeen, Scotland. "P. Jamieson, Aberdeen." (for Harness Composition)	5,811	Jan. 29	46	450
Jamieson, Peter, Aberdeen, Scotland. "P. Jamieson's noted Harness Composition"	5,812	Jan. 29	46	450
Jamieson, Peter, Aberdeen, Scotland. "P. Jamieson's Harness Composition"	5,813	Jan. 29	46	450
Jenroux, Joseph, Detroit, Mich. "Prof. Jenroux's Indian Herbal Tonic"	5,825	Feb. 19	46	828
Johnston Optical Co., Detroit, Mich. "Label for Lenses"	5,799	Jan. 15	46	246
Johnston Optical Co., Detroit, Mich. "Label for Lenses"	5,800	Jan. 15	46	246
Johnston Optical Co., Detroit, Mich. "Label for Lenses"	5,801	Jan. 15	46	246
Johnston Optical Co., Detroit, Mich. "Label for Lenses"	5,802	Jan. 15	46	246
Johnston Optical Co., Detroit, Mich. "Label for Lenses"	5,803	Jan. 15	46	246
Lever Bros., Warrington, county of Lancaster, England. "Sunlight Soap"	5,827	Feb. 19	46	828
Libbey, George A., Kansas City, Kans. "Protection Check" (for Blank Bank Checks)	5,840	Mar. 5	46	1114
Lighthill, August P., Boston, Mass. "Antiseptic Catarrh Cure"	5,789	Jan. 8	46	126
Little, Adelbert P., Rochester, N. Y. "Serrated Ribbon" (for Typewriter ribbons)	5,841	Mar. 5	46	1114
Logan, Swift & Brigham Envelope Company, Worcester, Mass. "Caledonia Mills" (for Envelopes and Paper)	5,822	Feb. 12	46	696
Lorentzen, John, Chicago, Ill. "Condensed Coffee"	5,852	Mar. 19	46	1400
Manahan, Margaret E., New York, N. Y. "Manahan's Double Strength Pine Tar Oakum Paper for Preventing Moths"	5,783	Jan. 1	46	2
Manahan, Margaret E., New York, N. Y. "Brand A" (for Sheathing Paper)	5,810	Jan. 29	46	450
McAllister, Honora A., Albany, N. Y. "Madame Agnes' Balm"	5,855	Mar. 26	46	1520
Meech, Harrison R., Omaha, Nebr. "Gold and Silver Solution" (for a Medicinal remedy)	5,804	Jan. 15	46	246
Merchant & Co., Philadelphia, Pa. "Iridium Anti-Friction." (for Metals)	5,790	Jan. 8	46	126
Merchant & Co., Philadelphia, Pa. "Iridium" (for Anti-Friction Metal)	5,791	Jan. 8	46	126
Merriman, Francis E., Boston, Mass. "Warranted Genuine Whalebone"	5,844	Mar. 12	46	1272
Mineralized Rubber Company, New York, N. Y. "Mineralized Rubber" (for rubber goods)	5,828	Feb. 19	46	828
Oliphant, Louis, Philadelphia, Pa. "Oliphant's Invaluable Rheumatic Remedy"	5,784	Jan. 1	46	2
Oliver Iron and Steel Company, Pittsburg, Pa. "Oval Heads and Forged Nuts." (for Carriage Bolts)	5,853	Mar. 19	46	1400
Pierson, Nancy A., Winfield, Kans. "Dr. Nancy A. Pierson's Cholera Specific for Hogs and Fowls"	5,816	Feb. 5	46	578
Powell, George D., Brooklyn, N. Y. "Sap Maple Syrup"	5,856	Mar. 26	46	1520
Ramey, Alfred H., Aurora, Ill. "Ramey's Celebrated German Kidney Cure"	5,817	Feb. 5	46	578
Ramsay, Walter J., New Bedford, Mass. "The Standard Metal Polish"	5,845	Mar. 12	46	1272
Riley, Albert, New York, N. Y. "Practically Indestructible" (for Pianos)	5,814	Jan. 29	46	450
Rivers, Frank E., Charleston, S. C. "River's Liniment"	5,829	Feb. 19	46	828
Rogers & Diamond, Chicago, Ill. "Rogers & Diamond's Celebrated Cough Cure"	5,806	Jan. 22	46	344
Rogers & Diamond, Chicago, Ill. "Injection Alba" (for a medicinal mixture)	5,818	Feb. 5	46	578
Schaeffer, Elizabeth, Charlestown, W. Va. "Dr. Schaeffer's Dentifrice"	5,805	Jan. 15	46	246
Searle & Hereth Company, Omaha, Nebr. "Compound Digestive Powder"	5,819	Feb. 5	46	578
Shade, John H., Wellington, Kans. "Dr. Hamilton's Liniment"	5,815	Jan. 29	46	450

Alphabetical list of registrants of labels, January to March, inclusive—Continued.

Name, residence, and title.	No.	Date.	Official Gazette. Vol.	Page.
Sieke, Anthony, New York, N. Y. "Rheumatism and Gout" (for a Medicine)	5,831	Feb. 26	46	978
Sieke, Anthony, New York, N. Y. "Sieke's recipe for Rheumatism and Gout"	5,846	Mar. 12	46	1272
Spranklin, Thomas W., Baltimore, Md. "Dr. Thos. Wm. Spranklin's Liniment"	5,857	Mar. 26	46	1520
Spranklin, Thomas W., Baltimore, Md. "Dr. Thos. Wm. Spranklin's Colic Mixture"	5,858	Mar. 26	46	1520
Stearns, Oscar S., New York, N. Y. "The Great Indian Salve and Plaster"	5,807	Jan. 22	46	344
Stillwell, A. H., Philadelphia, Pa. "Rock Candy"	5,826	Feb. 19	46	828
White, David W., Collingswood, N. J. "Collingswood" (for Spring Water)	5,832	Feb. 26	46	978
Woodman, Mary M., New York, N. Y. "Household Salve"	5,823	Feb. 12	46	696
Wright, Frank A., Lewiston, Me. "Wright's Magnetic Electrifier," (For a Medicine)	5,859	Mar. 26	46	1520
Young, Frances E., New York, N. Y. "Young's Indian Salve"	5,842	Mar. 5	46	1114

DISCLAIMER.

Name, residence, and invention.	No.	Filed.	Official Gazette. Vol.	Page.
Hake, Philip, Hoboken, N. J.; disclaimer to second claim. Visiting-cards	219,464	Mar. 6, 1889	46	1272

ALPHABETICAL LIST OF INVENTIONS.

Invention.	Name.	No.	Date.	Monthly volume. Specification.	Drawing.	Official Gazette. Volume.	Page.
Abdominal supporter	B. St. John	398,962	Jan. 29	2512	647	46	596
Acid. Alizarine-blue sulpho	R. Bohn	399,480	Mar. 12	1044	.....	46	1343
Acid. Alizarine-blue sulphuric	R. Bohn	399,481	Mar. 12	1045	.....	46	1343
Acids. Apparatus for concentrating	E. C. Nation	395,505	Jan. 1	293	76	46	62
Adding and registering wheels. Stop device for	W. Koch	398,627	Feb. 26	2291	606	46	1051
Adding-machine	D. E. Felt	396,034	Jan. 8	1125	286	46	330
Adding-machine	J. Pfeifer	400,359	Mar. 26	2361	616	46	1617
Addressing-machine	H. Banks, Jr	396,457	Jan. 22	1757	450	46	367
Adhesive material. Machine for applying	I. Dreyfuss	398,135	Feb. 19	1559	413	46	699
Advertising device	W. L. Caldwell	398,227	Feb. 19	1649	447	46	925
Advertising device	T. Clark	395,953	Jan. 8	1004	257	46	208
Advertising device	V. M. Posse	396,290	Jan. 15	1503	381	46	311
Advertising device	J. Prittie	399,263	Mar. 12	750	195	46	1226
Aerial railway or wire tramway and appliance therefor.	T. Tvedter	395,762	Jan. 8	699	179	46	149
Agricultural boiler or barrel heater	C. A. Masterson	397,195	Feb. 5	145	38	46	804
Agricultural heater	H. D. R. Gumtow and M. A. Lutzner	395,896	Jan. 8	925	238	46	192
Air. Apparatus for moistening and cooling	A. R. Bolues	398,310	Feb. 19	1820	480	46	952
Air-brake	J. S. Lapish	399,490	Mar. 12	956	248, 249	46	1326
Air-brake	N. J. Pritchard and J. S. Templon	399,158	Mar. 5	558	144	46	1222
Air-brake	G. W. Marsh	396,224	Jan. 15	1494	378	46	309
Air-brake. Automatic	N. J. Pritchard and J. S. Templon	399,157	Mar. 5	556	143, 144	46	1222
Air-brakes. Automatic piston for	T. H. Haberkorn	398,929	Mar. 5	24	7	46	1119
Air-brakes. Pipe-coupling for	O. A. Benkendorf	395,418	Jan. 1	162	41	46	34
Air-draft engine	J. P. Holmes	397,647	Feb. 12	845	220, 221, 386	46	745
Air-ship	H. A. J. Rieckert	399,783	Mar. 19	1497	387, 388, 389	46	1442
Alarm: *See* Bell-alarm. Burglar-alarm. Burglar and fire alarm. Overflow-alarm.							
Alarm apparatus. Automatic	E. Meyer	397,657	Feb. 12	864	226, 227	46	749
Alarm for doors, &c	N. J. Busby	399,242	Mar. 12	691	180	46	1275
Album	R. Brown	396,536	Jan. 22	1873	461	46	388
Album	O. J. Griffiths	399,324	Mar. 12	813	210	46	1298
Album	O. J. Griffiths	399,325	Mar. 12	814	210	46	1298
Album-clasp	L. B. Prahar	395,454	Jan. 1	219	56	46	47
Album. Photograph-	E. H. Hammann	396,929	Jan. 29	2467	635	46	516
Alizarine-green	R. Bohn	399,479	Mar. 12	1043	.....	46	1343
Alizarine indigo-blue	R. Bohn	399,482	Mar. 12	1046	.....	46	1343
Alloy	E. H. and A. H. Cowles	397,609	Feb. 12	920	.....	46	760
Alloys of chrome, iron, and manganese. Making	H. Eckardt	399,021	Mar. 5	324	.....	46	1176
Amalgamator	T. F. Freeman	397,646	Feb. 12	1127	301	46	801
Amalgamator	W. and G. W. Johnson	398,406	Feb. 26	1972	518	46	989
Amalgamator	N. L. Raber	400,114	Mar. 26	1980	518, 519, 520	46	1544
Amalgamator. Centrifugal	W. White	399,300	Mar. 12	1215	313	46	1373
Amalgamator. Electric	J. H. Rae	399,209	Mar. 5	639	167	46	1237
Ambulance	W. Lawrence	398,517	Feb. 26	2126	560	46	1019
Ammonia and oxalic acid from sugar waste. Obtaining	E. Meyer	396,705	Jan. 22	2128	.....	46	437
Ammonia as a motive power in engines. Utilizing aqua-	J. H. Campbell	399,131	Mar. 5	499	133	46	1211
Ammonia as a motive power in engines. Utilizing aqua-	J. H. Campbell	399,132	Mar. 5	502	133	46	1212
Ammonia-vapor engine	J. H. Campbell	399,133	Mar. 5	505	134	46	1213
Ammonium nitrate. Making	C. N. Hake	400,207	Mar. 26	2122	.....	46	1574
Anæsthetics. Apparatus for combining	J. S. Ammon	395,683	Jan. 8	590	149	46	128
Anchor	H. O. Dunn	395,429	Jan. 1	178	47	46	36
Anchor	C. A. Dureu and E. P. Bills	399,833	Mar. 19	1613	417	46	1464
Anchor. Drag-	E. J. Pagan	396,229	Jan. 15	1416	361	46	295
Animal-detaching device	I. J. Kubatz	400,092	Mar. 26	1948	509	46	1538
Animal-hitching device	C. A. Hunt	396,865	Mar. 5	230	63	46	1158
Animal-releasing device	A. R. Brann	396,578	Feb. 26	2211	585	46	1036
Animal-shears	E. Bariquand	400,036	Mar. 26	1868	485, 486	46	1522
Animal-shears	V. Petherick	396,832	Jan. 29	2328	596	46	487
Animal-trap	M. J. Bartlett	395,309	Jan. 1	7	2	46	4
Animal-trap	D. Gilmore	400,324	Mar. 26	2307	603	46	1607
Ankle-supporter	R. H. Golden	398,892	Mar. 5	116	31	46	1126
Annunciator	I. S. Bunker	400,050	Mar. 26	1890	491	46	1525
Anvil attachment	B. E. Robinson	400,361	Mar. 26	2365	617	46	1618

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Anvils. Attachment for blacksmiths'	H. B. Young	397,530	Feb. 12	647	169	46	709
Apron. Lumberman's	A. Levin	396,292	Jan. 15	1489	377	46	308
Arm and hand. Artificial	J. J. Allward	396,061	Jan. 15	1164	295	46	247
Arm-support for book-keepers. Adjustable	R. Hyultzsch	399,993	Mar. 19	1808	469	46	1502
Armature. Dynamo-	J. A. Hayes	399,328	Mar. 12	818	212 / 213	46	1299
Armature for dynamo-electric machines	L. Daft	396,195	Jan. 15	1361	349	46	285
Armature for dynamo-electric machines	O. B. Shallenberger	397,392	Feb. 5	425	112	46	658
Armature-winding for dynamo-electric machines	E. R. Knowles	396,941	Jan. 29	2483	640	46	519
Arrow. Vacuum	F. White	397,950	Feb. 19	1270	339	46	845
Ash or garbage can	T. W. McKeever and J. M. Smith	397,301	Feb. 5	398	77	46	634
Ash pan and sifter. Combined	J. F. Sayer	400,120	Mar. 26	1991	521	46	1547
Ashes, &c. Apparatus for collecting and conveying	F. H. Hawkins	397,718	Feb. 12	946	251	46	765
Atomizer	J. G. Justin	398,513	Feb. 26	2121	558	46	1018
Atomizer	R. S. Knode	399,539	Mar. 12	1140	295	46	1360
Atomizer	A. M. Shurtleff	397,315	Feb. 5	315	82 83	46	637
Atomizer	J. E. Wootten	396,449	Jan. 22	1743	448	46	364
Atomizers. Face-shield for	S. H. Jennings	396,936	Jan. 29	2478	639	46	518
Auger-bit	F. T. Wyckoff	399,595	Mar. 12	1226	315	46	1375
Automatic brake	P. Everitt	395,555	Jan. 1	371	95	46	77
Automaton	A. M. Pierce	398,276	Feb. 19	1763	466	46	940
Automaton	W. G. Spiegel	397,398	Feb. 5	438	117 / 118	46	661
Awning	F. Teupe	396,309	Jan. 15	1526	385	46	315
Ax-poll	W. C. Kelly	397,368	Feb. 5	396	104	46	653
Ax-polls. Die for making	W. C. Kelly	397,369	Feb. 5	397	104	46	653
Axle	J. Jenkinson	396,572	Jan. 22	1936	498	46	400
Axle	C. H. Wilson	396,845	Jan. 29	2346	601	46	491
Axle-bearing	F. Strauss	400,142	Mar. 26	2017	528	46	1552
Axle bearings. Machine for trimming soft-metal linings of car-	T. W. Getman	396,652	Jan. 22	2054	527 / 528	46	423
Axle-box	B. T. Henry	397,721	Feb. 12	950	252	46	765
Axle box and bearing. Car-	G. W. Fulmer and D. T. Fry	395,777	Jan. 8	719	185	46	153
Axle box. Car-	S. J. Austin	400,387	Mar. 26	2400	628	46	1624
Axle box. Car-	W. S. G. Baker	399,467	Mar. 12	1019	267 / 268	46	1339
Axle box. Car-	J. C. French	397,637	Feb. 12	833	217	46	743
Axle box. Car-	W. E. Heffner	397,233	Feb. 5	197	52	46	613
Axle-box for cable-car trucks	J. Stephenson	396,839	Jan. 29	2339	599	46	489
Axle. Car-	W. Hayes	395,901	Jan. 8	932	240	46	193
Axle-lubricator	W. O. Dunbar	397,901	Feb. 19	1199	321 / 322	46	833
Axle lubricator. Car-	T. B. Bishop	399,369	Mar. 12	883	229	46	1311
Axle lubricator. Car-	T. F. N. Finch	395,887	Jan. 8	913	234	46	190
Axle lubricator. Car-	C. A. Howard	399,899	Mar. 19	1670	432 / 433	46	1475
Axle lubricator. Car-	G. W. Parker	399,627	Mar. 12	1267	328	46	1384
Axle lubricator. Car-	T. Saunders	395,758	Jan. 8	894	177	46	148
Axle lubricator. Car-	H. F. West	396,125	Jan. 15	1257	321	46	265
Axle-nuts. Die for making	E. Firth, A. and I. Tompkins	396,864	Jan. 29	2370	608	46	497
Axle-nuts. Making	E. Firth, A. and I. Tompkins	396,865	Jan. 29	2371	608	46	497
Axle stock. Vehicle-	A. Paterson	397,609	Feb. 12	789	208	46	726
Axle. Vehicle-	C. B. Brown	399,013	Mar. 5	313	84	46	1174
Axle. Vehicle-	A. Corbin, Jr.	398,235	Feb. 19	1705	450	46	988
Axle. Vehicle-	A. Paterson	396,762	Jan. 29	2229	570	46	465
Axle. Wagon-	N. S. Ketchum	397,131	Feb. 5	40	9	46	586
Axles. Coupling for vehicle-	L. Ames, Jr	396,641	Jan. 22	2040	524	46	420
Axles. Lubricator for journals of railway-wheel	E. Van Decar	398,556	Feb. 26	2179	574	46	1030
Axles. Roller-bearing for car-	W. J. Brower	396,324	Jan. 15	1548	391 / 392	46	318
Axles. Toughening steel	J. Coffin	399,360	Mar. 12	903	235	46	1314
Back-band hook	E. A. Isaacs	397,002	Jan. 29	2564	662	46	536
Back-stop. Reversible	L. Anderson	396,188	Jan. 15	1358	347	46	284
Bag: *See* Mail-bag. Tobacco-bag. Paper bag.							
Bag	L. D. Benner	396,388	Jan. 22	1648	424	46	315
Bag	L. D. Benner	396,389	Jan. 22	1649	424	46	346
Bag-fastener	W. Roemer	398,542	Feb. 26	2158	570	46	1026
Bag-filling machine	H. D. Hammersley	395,390	Jan. 1	125	32	46	97
Bag-frame	W. Roemer	398,540	Feb. 26	2156	569	46	1026
Bag-frame catch	W. Roemer	398,543	Feb. 26	2159	570	46	1026
Bag-holder	J. M. Bradshaw and W. E. Meek	399,373	Mar. 12	892	231	46	1312
Bag-holder	W. R. Burrage	398,817	Mar. 5	9	3	46	1116
Bag-holder	E. W. Clark	400,191	Mar. 26	2096	549	46	1569
Bag-holder	B. F. Ellis	397,346	Feb. 5	365	96	46	647
Bag-holder	T. W. Harrison	396,561	Jan. 22	1917	495	46	396
Bag-lock	L. B. Cutler	396,029	Jan. 8	1120	284	46	229
Bag-lock	J. Hammesfahr	400,334	Mar. 26	2320	607	46	1610
Bags. Mouth-piece for	G. W. Dean	400,104	Mar. 26	2099	550	46	1570
Bags or receptacles. Mouth-piece for	W. H. Taylor	398,093	Feb. 19	1493	395	46	898
Bagasse-furnace	W. W. Sutcliffe	400,016	Mar. 19	1839	477 / 478	46	1507
Baking and roasting pan	J. B. Munson	397,869	Feb. 12	1152	308	46	806
Bale-tie twister	C. Franco	396,651	Jan. 22	2053	527	46	421
Baling-press	E. Beadle	399,472	Mar. 12	1028	271	46	1341
Baling-press	J. K. Bywaters	398,312	Feb. 19	1523	401	46	953
Baling-press	D. L. Hanney	396,481	Jan. 22	1500	461	46	375
Baling-press	W. Hillman and J. F. Ripple	397,917	Feb. 19	1225	327 / 328	46	838
Baling-press	W. S. Livengood	396,096	Jan. 15	1221	309	46	258
Baling-press	W. S. Livengood	396,097	Jan. 15	1223	309 / 310	46	258
Baling-press	T. Runkle	395,718	Jan. 8	636	161	46	137

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Baling-press	H. N. Smades	397,393	Feb. 5	426	113	46	658
Baling-press. Power	W. W. Seely	399,568	Mar. 12	1181	306	46	1368
Balling machine. Twine-	I. P. Miner	399,339	Mar. 12	831	217	46	1302
Balloon	C. A. Künzel	399,271	Mar. 12	732	190	46	1292
Ballot-box	C. M. Taylor	399,911	Mar. 5	140	38	46	1141
Balls. Machine for winding	H. Harwood	397,362	Feb. 5	384	101	46	651
Band-cutter and feeder	C. C. King and A. D. Trimble	398,407	Feb. 26	1974	518 / 519	46	989
Band-cutter and feeder	H. A. Underwood	398,197	Feb. 19	1650	436	46	916
Band-cutting fork	A. Rodman	396,431	Jan. 22	1719	442	46	360
Bandage. Water-	G. P. Herndon	396,208	Jan. 15	1367	355	46	289
Banjos. Drum attachment for	R. Oerlein	398,176	Feb. 19	1618	429	46	910
Bar: *See* Fire-bar. Presser-bar. Mowing-machine cutter-bar. Railway splice-bar.							
Bar and beer-cooler	J. F. Kausler	395,331	Jan. 1	40	10	46	11
Bars. Machine for changing the angle of the flanges of Z and angle	W. E. Highfield	399,896	Mar. 19	1667	431 / 432	46	1475
Barbed nail	P. V. Husted	398,260	Feb. 19	1739	458	46	935
Barber's chair	E. Melchior	396,639	Feb. 26	2306	611	46	1054
Bark from timber. Machine for removing	N. H. Dolsen	397,114	Feb. 5	12	3	46	581
Barrel	I. J. W. Adams	397,325	Feb. 5	335	87	46	641
Barrel-cover	J. P. Harp	398,153	Feb. 19	1583	420	46	904
Barrel-head	J. A. Campbell	399,494	Mar. 12	1062	277	46	1346
Barrel-hoops. Retaining device for	C. Verniaud	397,100	Jan. 29	2706	699 / 700	46	563
Barrel-stand	C. C. Schreiber	396,372	Jan. 15	1623	415	46	332
Barrel-washing machine	H. E. Klamt	400,346	Mar. 26	2343	611 / 612	46	1613
Barrels. Apparatus for sizing	T. Roberts	396,370	Jan. 15	1621	415	46	332
Barrels. Scuttle for	J. B. Eatman	399,657	Mar. 19	1316	337	46	1405
Barrow. Double-deck	W. H. Hall	397,358	Feb. 5	379	100	46	649
Base-ball bat	C. N. Morris	400,354	Mar. 26	2356	614	46	1616
Base-ball winding and rolling machine	B. B. Newell	397,303	Feb. 5	300	77	46	633
Basins and baths. Secret supply, waste, and overflow for	W. H. Newell	399,691	Mar. 19	1361	350	46	1413
Basket-cover	T. W. Lankford	395,708	Jan. 8	620	156	46	134
Basket or carrier	I. J. W. Adams	399 811	Mar. 19	1549	400	46	1451
Bath: *See* Blotter-bath. Portable bath. Oil-bath. Shower-bath.							
Bath-tub	C. H. Moore	398,644	Feb. 26	2313	613	46	1055
Bath-tub. Folding	H. Saleh	400,119	Mar. 26	1990	521	46	1547
Bath-tubs. Basin-rack for	L. D. Ruth	398,349	Feb. 19	1661	495	46	963
Bathing apparatus	E. W. Kiffe Ben	398,514	Feb. 26	2122	558 / 559	46	1018
Bathing-machine. Electrical	J. W. James	398,731	Feb. 26	2452	650	46	1084
Batteries. Apparatus for charging and discharging secondary	W. P. Kookogey	395,836	Jan. 8	830	215	46	174
Batteries. Element for thermo-electric	M. Meitern	398,272	Feb. 19	1757	464	46	939
Batteries. Preparing solution compounds for galvanic	W. P. Kookogey	395,835	Jan. 8	829	.....	46	174
Batteries. Preparing solution compounds for galvanic	W. P. Kookogey	395,837	Jan. 8	834	.....	46	175
Batteries. Protecting the negative plates of electrical	F. J. Clamer and J. G. Hendrickson	397,469	Feb. 12	598	153	46	698
Battery: *See* Electric battery. Medical battery. Electrical battery. Secondary battery. Galvanic battery. Voltaic battery.							
Battery charging. Secondary-	C. F. Brush	395,377	Jan. 1	104	27	46	23
Battery charging. Secondary-	C. F. Brush	395,378	Jan. 1	106	28	46	24
Battery charging. Secondary-	C. F. Brush	395,379	Jan. 1	109	28	46	25
Battery charging. Secondary-	C. F. Brush	396,681	Jan. 22	2092	538	46	431
Battery charging. Secondary-	E. R. Knowles	397,557	Feb. 12	992	180	46	717
Battery plate. Secondary-	C. D. P. Gibson	397,706	Feb. 12	1061	283	46	787
Battery plate. Storage-	W. P. Kookogey	398,737	Feb. 26	2460	652	46	1065
Battery-zincs. Mercury-holder for	J. Kennedy	395,569	Jan. 1	396	101 / 102	46	82
Beams. Machine for cutting flanged	T. R. Ferrell	399,662	Mar. 19	1325	339	46	1406
Bearing. Anti-friction	A. W. Terry	396,968	Jan. 29	2522	651	46	528
Bearing. Anti-friction	B. Ormerod and G. Haworth	398,274	Feb. 19	1760	465	46	940
Bearing for pulleys or wheels	R. W. Hent	399,615	Mar. 12	1250	322	46	1380
Bearing. Roller-	J. W. Hyatt	398,329	Feb. 19	1649	488	46	958
Bearing. Roller-	J. Norton, Jr	400,110	Mar. 26	1975	517	46	1543
Beating-engine	J. B. Jones	398,334	Feb. 19	1657	489 / 490	46	959
Bed-bottom. Spring	E. Yeoman	397,324	Feb. 5	334	87	46	640
Bed-bottom. Spring	E. J. Foster	399,234	Mar. 12	708	185	46	1278
Bed. Cot-	L. C. Butterfield	399,832	Mar. 19	1585	410	46	1458
Bed. Folding	T. J. Christy	397,779	Feb. 12	1034	276	46	782
Bed. Folding	J. Penney	397,308	Feb. 5	306	80	46	634
Bed. Folding	M. Samuels	398,656	Feb. 26	2333	610	46	1060
Bed. Invalid-	W. Saunders	396,607	Jan. 22	1909	512	46	410
Bed or bedstead. Folding	L. W. Welch	397,766	Feb. 12	1015	270	46	778
Bed or upholstered springs. Spring-	C. B. Howell	397,234	Feb. 5	198	52	46	612
Bed-pan. Rubber	A. C. Eggers	399,508	Mar. 12	1069	284	46	1350
Bed. Spring-	E. H. Caylor and C. H. McCreery	396,806	Jan. 29	2295	587	46	479
Bed. Spring-	D. H. Gail	399,257	Mar. 12	713	186	46	1279
Bed. Spring-	F. M. Jeffery	399,902	Mar. 19	1675	434	46	1477
Bed. Upright or folding	D. J. Powers	398,747	Feb. 26	2473	655	46	1068
Bedstead. Folding	W. J. Griebel	397,163	Feb. 5	129	35	46	601
Bedstead. Folding	J. Penney	397,307	Feb. 5	304	79	46	634
Bedstead-tie	M. Fernan	397,708	Feb. 12	931	247	46	762
Bedsteads. Crib attachment for	V. Fitz	399,660	Mar. 19	1323	330	46	1406
Bee-hive	J. Beeson and J. H. Hirschfeld	396,724	Jan. 29	2160	554	46	452

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Bee-hive	F. M. Clement	399,742	Mar. 19	1435	369	46	1429
Bee-hive	J. I. Foot	398,387	Feb. 26	1948	512	46	984
Bee-hive	H. Penoyer	399,281	Mar. 12	747	194	46	1285
Beer. Apparatus for the pasteurization of	C. F. Koehler	399,200	Mar. 5	025	162	46	1234
Beer-kegs. Ice-box for holding	C. C. Rumpf	396,341	Jan. 15	1575	399	46	323
Beer or ale. Manufacturing	A. W. Billings	398,374	Feb. 26	1930	508	46	981
Bell-alarm. Pneumatic	C. R. Sawyer and C. Parent	396,608	Jan. 22	1990	512 513	46	410
Bell-cord attachment	G. A. La Fever	395,839	Jan. 8	F36	216	46	175
Bell. Door	W. H. Fauber	396,903	Jan. 29	2554	660	46	534
Bell. Gong	W. E. Sparks and H. J. Landolt	398,285	Feb. 19	1784	472	46	944
Bell. Signal	E. Olsen	397,345	Feb. 5	212	55	46	616
Belt conveyer and tripper	J. Macdonald	396,500	Jan. 22	1827	469	46	381
Belt. Conveying	D. Brennan, Jr	396,136	Jan. 15	1270	325 326	46	268
Belt. Electric	S. De Baun	398,133	Feb. 19	1556	412	46	899
Belt-fastener	W. G. Avery	399,992	Mar. 19	1762	455	46	1493
Belt-fastener	H. Blake	396,528	Jan. 22	1964	478	46	387
Belt-fastener	E. L. Budlong	399,489	Mar. 12	1058	276	46	1345
Belt-fastener	J. Snow	398,857	Mar. 5	59	17	46	1125
Belt holder and shifter	U. H. W. Schenck	395,591	Jan. 1	434	110 111	46	89
Belt-shifting mechanism	J. J. Daley	399,501	Mar. 12	1071	279 280	46	1347
Belt-stretching machine	C. L. Ireson	396,874	Jan. 29	2384	612	46	500
Belt-tightener	J. A. Wigal	398,361	Feb. 19	1904	500	46	968
Belts. Battery for electric	W. G. Johnson	397,806	Feb. 12	1073	286	46	789
Belts. Hinge-joint for electric	N. Warrell	399,954	Mar. 19	1753	453	46	1491
Belts. Lace-hole protector for driving	G. W. Southwick	397,252	Feb. 5	221	58	46	618
Belting	G. F. Page	400,005	Mar. 19	1824	474	46	1504
Belting. Machine	G. F. Page	400,006	Mar. 19	1825	474	46	1504
Belting. Manufacture of wire	T. Midgley	398,424	Feb. 26	1999	525	46	994
Belting. Manufacture of wire	T. Midgley	398,431	Feb. 26	2005	526	46	995
Belting. Wire	T. Midgley	398,423	Feb. 26	1998	524	46	994
Belting. Wire	T. Midgley	398,427	Feb. 26	2002	525	46	995
Belting. Wire	T. Midgley	398,429	Feb. 26	2004	526	46	995
Bevel-gage	M. O. Godding	395,433	Jan. 1	182	48	46	39
Beverage. Aerated tonic	W. B. Starbird	396,440	Jan. 22	1734	.....	46	363
Bicycle	L. F. Carstensen	398,228	Feb. 19	1691	447	46	925
Bicycle	T. O'Brien	399,774	Mar. 19	1485	383	46	1439
Bicycle	H. S. Owen	398,745	Feb. 26	2471	654	46	1068
Bicycle	A. G. Rose	399,285	Mar. 12	753	195	46	1287
Bicycle	E. Thuemler	398,195	Feb. 19	1646	435	46	915
Bicycle	G. T. Warwick	399,454	Mar. 12	997	260 261	46	1334
Bicycle. Safety	G. T. Warwick	399,455	Mar. 12	1000	261	46	1335
Bicycles. Foot-rest for	H. Walter	396,182	Jan. 15	1346	345	46	282
Bicycles from a single blank. Forming backbones and rear forks of	G. T. Warwick	397,405	Feb. 5	450	120	46	664
Bicycles. Luggage-carrier for	H. S. Credlebaugh	398,945	Mar. 5	194	52	46	1151
Bier	J. W. Finch and J. B. Park	398,776	Feb. 26	2510	667	46	1096
Bill of fare. Changeable	D. E. Terrill	396,716	Jan. 22	2146	549	46	441
Billiard-cue handles, &c. Machine for ornamenting	A. F. Hjort	395,494	Jan. 1	277	71	46	58
Billiard-scoring board	R. N. Montgomery	397,019	Jan. 29	2568	669	46	541
Billiard-table rail and cushion	C. G. Brockway	400,032	Mar. 19	1863	483	46	1512
Billiard-table rail and cushion	C. G. Brockway	400,044	Mar. 26	1884	490	46	1524
Billiard-tables. Device for leveling	H. C. Berry	399,126	Mar. 5	490	131	46	1209
Bin: *See* Flour-bin. Grocer's bin. Flour and meal bin.							
Binder	T. F. Bourne	396,980	Jan. 29	2536	655	46	530
Binder	E. Wanaleben	400,147	Mar. 26	2034	531	46	1555
Binder. Load	J. S. Speer	398,286	Feb. 19	1785	473	46	945
Binder. Self-locking load	W. M. Farr	398,714	Feb. 26	2428	643 644	46	1079
Binder-shifting mechanism	J. A. Graham	397,356	Feb. 5	377	99 100	46	649
Binder. Temporary	J. F. Brown	399,737	Mar. 19	1427	367	46	1427
Binder. Temporary	J. Dornbirer	395,552	Jan. 1	367	94	46	76
Binder. Temporary	A. G. Fisher	397,845	Feb. 12	1125	301	46	801
Binder. Temporary	W. H. Pardee	398,073	Feb. 19	1472	389	46	883
Binder. Temporary	G. H. Scharf	396,001	Jan. 8	1084	275 276	46	223
Binding-case	C. A. Campbell	396,464	Jan. 22	1766	452 453	46	369
Binding-machine	L. K. Strang	397,524	Feb. 12	619	166	46	707
Binocular glass	J. E. Brigge	395,872	Jan. 8	893	229	46	186
Biscuit	P. H. Baily	396,456	Jan. 22	1756	.....	46	367
Bit: *See* Auger-bit. Bridle-bit.							
Blacking. Swab for liquid	G. S. Wolff	396,790	Jan. 29	2267	580	46	473
Blank-book tool	J. C. Forman	398,825	Mar. 5	20	5	46	1118
Blast apparatus for blast-furnaces	J. M. Hartman	399,262	Mar. 12	720	187 188	46	1280
Blast. Hot-air	W. O. Miller	396,947	Jan. 29	2489	642	46	521
Blasting	L. Plom and J. D'Andrimont	397,440	Feb. 5	516	136	46	677
Blasting compound	R. Sjöberg	397,095	Jan. 29	2698	.....	46	562
Bleaching by electrolysis. Apparatus for	E. Hermite, E. J. Paterson, and C. F. Cooper.	398,045	Feb. 19	1431	379	46	874
Bleaching cotton	F. E. Drown	396,551	Jan. 22	1902	.....	46	393
Bleaching fibrous substances	A. and L. Q. Brin	396,325	Jan. 15	1556	392	46	319
Blind. Inside	C. Robinson	396,115	Jan. 15	1246	318	46	263
Blind-switch	F. C. Weir	398,103	Feb. 19	1506	399	46	890
Blind. Window	A. P. Heidt	395,902	Jan. 8	934	240	46	193

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Blinds. Hanger for Venetian	J. G. Wilson	398,484	Feb. 26	2081	547	46	1010
Block: *See* Brake-block. Printing-block. Hat-block. Spring-block.							
Blotter-bath	H. F. Arnold	397,531	Feb. 12	648	169	46	709
Blotting-pad	M. Afialo	396,060	Jan. 15	1161	295	46	247
Blotting-pad	E. H. Powers	395,453	Jan. 1	216	55	46	46
Blow-pipe	G. W. Melotte	400,103	Mar. 26	1965	515	46	1541
Blow-pipe bed	G. W. Melotte	400,240	Mar. 26	2172	569	46	1563
Blow-pipe bed	T. F. O'Conner	395,878	Jan. 1	416	106	46	86
Blow-tester. Coin-operated	H. H. Blades	399,922	Mar. 19	1570	407	46	1455
Blower. Electric blast	J. Day	395,956	Jan. 8	1006	258	46	208
Blower. Forge	T. F. Conklin	399,974	Mar. 19	1778	461	46	1496
Bluing-package							
Board: *See* Billiard-scoring board. Drawing-board. Embalming-board. Book-binder's press-board. Ironing-board. Switch-board. Bread-board. Vehicle dash-board. Bulletin-board. Wash-board.							
Boat: *See* Ice-boat. Racing-boat. Life-boat. Torpedo and gun boat.							
Boat	A. L. Sheats	395,458	Jan. 1	224	57	46	46
Boat-joint	H. M. Sprague	396,776	Jan. 29	2249	575	46	469
Boats in series. Launching	C. W. Delon	399,848	Mar. 19	1603	415 416	46	1462
Boats. Splash-board holder for	A. J. Gould	398,389	Feb. 26	1950	513	46	985
Bobbin	J. Scott	398,002	Feb. 19	1358	360	46	861
Bobbin	O. O. Sullivan	396,008	Jan. 8	1063	278	46	225
Bobbin	J. H. Wells	399,589	Mar. 12	1214	313	46	1373
Body-brace	E. B. Howe	398,511	Feb. 26	2119	557	46	1018
Boiler: *See* Agricultural boiler. Steam-boiler. Locomotive-boiler. Tube-boiler. Range-boiler. Tubular boiler. Sectional boiler. Wash-boiler.							
Boiler	F. A. Camp and F. G. Corser	400,051	Mar. 26	1891	491	46	1526
Boiler	J. H. Cunningham	399,975	Mar. 19	1780	461 462	46	1496
Boiler	J. B. De Barthe	396,731	Jan. 29	2173	554	46	454
Boiler	R. W. Hewett	397,915	Feb. 19	1222	326 327	46	837
Boiler	E. Rutzler	397,674	Feb. 12	1158	309	46	807
Boiler	J. T. Smith	399,941	Mar. 19	1732	448	46	1487
Boiler	G. F. Spencer	399,443	Mar. 12	985	257	46	1332
Boiler	C. Wheat	395,823	Jan. 1	450	115	46	92
Boiler-cleaner	J. Banschke	395,649	Jan. 1	535	135	46	108
Boiler-cleaner	G. Guild	396,400	Jan. 22	1669	428	46	349
Boiler-cleaner	W. T. Haney	398,612	Feb. 26	2258	599	46	1045
Boiler-feeder	F. E. and M. E. Vaughn	399,586	Mar. 12	1211	312	46	1373
Boiler feeder. Steam	W. O. Gunckel	398,778	Feb. 26	2513	668	46	1096
Boiler for cleaning or boiling rags	G. F. Barton	395,416	Jan. 1	161	41	46	34
Boiler incrustation. Compound for preventing	A. J. Scofield	397,523	Feb. 12	638	.....	46	707
Boiler setting. Steam	G. H. Sellers	396,373	Jan. 15	1624	416 417	46	332
Boiler-tube cleaner	H. D. Rice and E. Volkmann	398,749	Feb. 26	2475	656	46	1089
Boiler-tube plug	E. W. Tucker	397,450	Feb. 5	531	140	46	679
Boilers. Blow-off apparatus for steam	A. W. Quackenbush	397,565	Feb. 12	704	183	46	719
Boilers. Cleaning-door for	D. F. Morgan	397,561	Feb. 12	700	182	46	718
Boilers. Means for automatically regulating the flow of liquid fuel to injector-burners for steam	A. D. Linn	396,418	Feb. 26	1901	523	46	993
Bolster-spring for wagons	E. Cliff	399,838	Mar. 19	1591	412	46	1460
Bolt: *See* Flour-bolt. Shaking-bolt. Indicator-bolt. Wedge-bolt. Rotary bolt.							
Bolt	C. Borchard	395,540	Jan. 1	348	89	46	73
Bolt-head	O. F. Balston	400,161	Mar. 26	2054	538	46	1560
Bolt-heading machine	E. Burdsall, Jr	399,828	Mar. 19	1576	408 409	46	1456
Bolt-heading tool	F. Mutimer	398,342	Feb. 19	1871	492	46	961
Bolt-threading machines. Die-carrying head for	J. M. Simpson	397,664	Feb. 12	873	229	46	751
Bolting-reel	W. E. Gorton	399,874	Mar. 19	1637	424	46	1468
Bolting-reel	H. A. Hueffner	397,057	Jan. 29	2645	681	46	552
Bolting-reel	D. G. Reitz	397,937	Feb. 19	1252	334	46	842
Bomb. Signal	R. H. Earle	399,854	Mar. 19	1614	417	46	1464
Book	G. D. Barnard	399,469	Mar. 12	1023	269	46	1340
Book. Account	E. C. Albree	397,681	Feb. 12	899	237 238	46	756
Book. Account	E. G. Stevens	400,014	Mar. 19	1887	477	46	1506
Book-binder's press-board	J. H. Shaw	399,573	Mar. 12	1190	308	46	1369
Book-binding	R. R. Frey and J. Buscher	397,848	Feb. 12	1129	302	46	801
Book-binding	T. C. Love, Jr	397,865	Feb. 12	1148	307	46	805
Book-binding	J. J. Sullivan	395,408	Jan. 1	149	38	46	32
Book carriage and protector	L. C. Leith	399,750	Mar. 19	1463	377	46	1434
Book-case	G. H. Rittinger and G. J. Eisengart, Jr.	398,188	Feb. 19	1635	433	46	914
Book-case. Folding	P. Kaffenberger	399,415	Mar. 12	951	247	46	1324
Book-clip	J. W. Nolan	396,505	Jan. 22	1832	470	46	382
Book. Combination bank	W. H. Benson	398,875	Mar. 5	88	25	46	1131
Book. Coupon pass	M. O. Fisher	397,494	Feb. 12	595	154	46	699
Book-cover	F. F. Braillard	399,734	Mar. 19	1424	366	46	1427
Book-folding machine. Combined point-feed and drop-roll-feed	J. H. Stonemetz	396,308	Jan. 15	1594	364 365	46	314

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page
Book holder and marker	J. A. Beidler	397,890	Feb. 19	1184	317	46	850
Book-mark	H. L. Mehrer	399,768	Mar. 19	1477	380	46	1437
Book mark and clip. Combined	J. D. Bartley	395,473	Jan. 1	247	65	46	53
Book-mark. Indexing	J. Lane	399,417	Mar. 12	953	247	46	1325
Book-marker	L. J. Turner	400,417	Mar. 26	2445	640	46	1633
Book. Note-	W. J. Downes	397,540	Feb. 12	662	173	46	711
Book or album	N. J. Dobbins	399,249	Mar. 12	700	182	46	1276
Book. Receipt and record	H. Loewenbach	399,060	Mar. 5	374	101	46	1186
Book-stapling machine	C. E. Preusse	399,555	Mar. 12	1164	301	46	1364
Book-support	F. E. Healey	396,741	Jan. 29	2194	502	46	458
Book-support or music-stand	B. B. Nichols	395,715	Jan. 8	631	160	46	136
Books. Cutting attachment for check-	H. R. Wilson	399,959	Mar. 19	1759	454	46	1462
Books. Leaf-holder for	J. Hyland	399,411	Mar. 12	947	245	46	1323
Boot	W. McKie	395,664	Jan. 1	558	139	46	112
Boot or shoe	G. F. Butterfield	399,130	Mar. 5	498	133	46	1211
Boot or shoe	D. B. Closson	396,542	Jan. 22	1880	483	46	390
Boot or shoe	W. P. Lefavour	398,412	Feb. 26	1980	520	46	990
Boot or shoe	C. H. Nelson	398,436	Feb. 26	2009	528	46	996
Boot or shoe heel	H. A. Webster	397,041	Jan. 29	2623	676	46	547
Boot or shoe heel finishing machine	J. P. Smith	396,620	Jan. 22	2010	517, 518	46	415
Boot or shoe heeling machine	J. Keats	398,733	Feb. 26	2455	650, 651	46	1084
Boot or shoe lasting machine	A. F. Preston	395,630	Jan. 1	500	126, 127	46	101
Boot or shoe sole protector	E. and D. J. Rowlands	397,250	Feb. 5	218	57	46	617
Boot or shoe trimming machine	C. H. Trask	396,378	Jan. 15	1633	418, 419	46	333
Boot-tree	A. M. Moore	395,753	Jan. 8	687	175	46	147
Boot-tree	A. M. Moore	399,684	Mar. 19	1353	347	46	1412
Boot-tree	J. D. Spiller	399,166	Mar. 5	575	148	46	1225
Boots and shoes. Machine for feather-edging soles for	A. E. Ruddock and E. E. E. Bailey	398,292	Feb. 19	1775	469	46	943
Boots and shoes. Manufacture of	G. H. Clark	399,837	Mar. 19	1590	412	46	1459
Boots or shoes. Metallic shank for	S. T. Peterson and M. Reed	395,628	Jan. 1	496	125	46	100
Boots or shoes. Nippers for cutting pegs from	J. C. Green	397,909	Feb. 19	1216	325	46	846
Boring and reaming tool	C. Robin	395,920	Jan. 8	957	246	46	198
Boring-tool	J. Shields	395,459	Jan. 1	225	57	46	49
Bosom-pad	E. K. Warren and J. H. Ames	396,444	Jan. 22	1737	446	46	363
Bottle-cleaning machine	B. Binnington	399,477	Mar. 12	1041	273	46	1343
Bottle-finishing machine	M. M. Powell	398,280	Feb. 19	1772	468	46	942
Bottle-indicator	H. B. Weaver	398,012	Feb. 19	1378	365	46	865
Bottle. Nursing-	L. W. Oster	395,992	Jan. 8	1073	273	46	221
Bottle. Sponge-top	I. N. Haley	395,564	Jan. 1	389	99	46	80
Bottle-stopper	J. H. Corey	398,495	Feb. 26	2075	552	46	1013
Bottle-stopper	W. P. Crary	398,944	Mar. 5	193	52	46	1151
Bottle-stopper	G. A. Fullerton	395,558	Jan. 1	379	97	46	79
Bottle-stopper	R. Henkmann	398,632	Mar. 5	27	8	46	1119
Bottle-stopper	E. L. Lloyd	395,910	Jan. 8	944	243	46	196
Bottle-stopper	J. J. Sands	399,440	Mar. 12	981	256	46	1331
Bottle-stopper	J. A. Traut	397,449	Feb. 5	530	140	46	679
Bottle-stopper	J. A. Traut	400,272	Mar. 26	2224	583	46	1592
Bottle-tap	M. J. Keane	398,162	Feb. 19	1597	423	46	907
Bottle-tilting device	J. H. Nason	395,504	Jan. 1	292	76	46	62
Bottle-washer	G. S. Slocum	399,576	Mar. 12	1193	308, 309	46	1370
Bottle-wiring machine	A. Schrader and O. Sturm	399,767	Mar. 19	1507	390	46	1444
Bottles. Drink-registering attachment for liquor-	H. C. Barker	396,021	Jan. 8	1110	281	46	227
Bottles. Spreader and stopper for	E. Pomeroy	399,927	Mar. 19	1713	443	46	1484
Bottling soda-water, &c. Apparatus for	C. C. Haley	396,928	Jan. 29	2464	635	46	516
Bougie. Medicated	T. Christy	400,056	Mar. 26	1899	493	46	1527
Box: *See* Axle-box. Ballot-box. Cigar-box. Fare-box. File-box. Fruit-box. Garbage-box. Ice-cream box. Journal-box. Knockdown box. Letter-box. Mail-box. Match-box. Musical box. Ornamental box. Paper box. Pocket-box. Salt-box. Telephone call-box. Tobacco-box. Tool-box. Tool-holding box. Watch-movement box.							
Box	J. M. Griest	397,990	Feb. 19	1320	352	46	854
Box-fastener	J. W. Shaw	398,991	Mar. 5	255	70	46	1163
Box-handle	J. A. Traut	395,528	Jan. 1	333	84	46	70
Boxes, &c. Art of and machine for making	M. Young	397,102	Feb. 5	89	22, 23, 24, 25	46	595
Boxes. Machine for applying corner-stays to	G. L. Jaeger	395,567	Jan. 1	393	100, 101	46	81
Boxes. Means for securing metallic bands to	J. H. Williams	397,202	Feb. 5	237	61, 62	46	621
Brace: *See* Body-brace. Ratchet-brace. Shoulder-brace.							
Braces or suspenders	S. Frank	399,027	Mar. 5	398	88	46	1177
Bracelet	C. K. Colby and W. Coppersmith	397,833	Feb. 12	1109	297	46	797
Bracelet	T. King	396,939	Jan. 29	2481	640	46	519
Bracket: *See* Reflector-bracket.							
Bracket	R. P. Palmenberg	397,748	Feb. 12	991	262	46	773
Braiding-machine	W. Mundt	399,623	Mar. 12	1264	325	46	1383
Braiding-machines. Racer for	J. A. Turner	397,153	Feb. 5	78	19	46	593

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page
Brake: *See* Air-brake. Automatic brake. Car-brake. Rotary brake. Sled-brake. Sleigh-brake. Vehicle-brake. Velocipede-brake. Wagon-brake.							
Brake	J. Fulton	399,515	Mar. 12	1100	286	46	1359
Brake	O. L. Gilbert	397,120	Feb. 5	21	5	46	593
Brake	E. Reynolds and B. V. Nordberg	395,717	Jan. 8	634	161	46	137
Brake apparatus. Electric train	A. I. Ambler	395,682	Jan. 8	584	147, 148	46	127
Brake-beam	H. L. Preston	396,383	Jan. 15	1639	420, 421	46	335
Brake-block	R. H. Lanyon	399,055	Mar. 5	366	96	46	1184
Brake-handle	J. W. Fowler	396,924	Jan. 29	2459	633	46	515
Brake-shoe	S. Hatt	399,665	Mar. 19	1329	340	46	1407
Brake-shoe	G. Westinghouse, Jr	399,103	Mar. 5	434	118	46	1196
Bread-board	C. W. Fuller	395,491	Jan. 1	273	70	46	58
Brick drier and kiln. Combined	M. A. T. Boehnoke	395,689	Jan. 8	598	150, 151	46	130
Brick-drying apparatus	G. B. Merrill	399,275	Mar. 12	737	192	46	1283
Brick-kiln	F. W. Dennis	396,733	Jan. 29	2181	559	46	455
Brick-kiln	B. F. Shakespeare and S. J. Rose	397,665	Feb. 12	875	230	46	751
Brick-kiln	J. Taber	396,966	Jan. 29	2516	649, 650	46	527
Brick-machine	J. J. Brewis	395,871	Jan. 8	890	228, 229	46	186
Brick-machine	C. and E. Doerfler	398,134	Feb. 19	1558	412	46	899
Brick-machine	J. Morhard	397,604	Feb. 12	790	206	46	734
Brick-machine	R. F. Robison	399,698	Mar. 19	1371	353, 354	46	1416
Brick-machine	W. Weeber	395,765	Jan. 8	703	180, 181	46	150
Brick-machine attachment	P. G. Benson	398,213	Mar. 5	2	1	46	1115
Brick-machine. Hydraulic	J. J. Koch	397,730	Feb. 12	963	256, 257	46	768
Brick. Making	G. Sattler, Sr., and C. Nagel	395,590	Jan. 1	434	.....	46	89
Brick-mold	A. McLean	399,064	Mar. 5	378	102	46	1187
Brick or tile machines. Cutting-table for	E. M. Freese and J. W. Wolcott	400,399	Mar. 26	2418	633, 634	46	1628
Brick-press	J. H. Steele	397,666	Feb. 12	878	230	46	752
Bridge gate. Draw-	O. Moen	396,662	Jan. 22	2068	530, 531	46	425
Bridge. Swing-	M. A. Redding	399,347	Mar. 12	842	220	46	1304
Bridge. Trussed suspension-	G. M. Wildin	399,105	Mar. 5	437	118, 119	46	1197
Bridges. Automatic gate for swing-	H. Marcheter	395,752	Jan. 8	686	175	46	146
Bridges. Automatic safety-gate for draw-	F. Marohn	397,867	Feb. 12	1150	308	46	806
Bridges, rails, &c. Apparatus for indicating the flexion of	O. Leuner	399,676	Mar. 19	1344	345	46	1410
Bridle-bit	S. Fisher	398,319	Feb. 19	1635	434	46	955
Bridle-bit. Safety	L. P. Britt	397,273	Feb. 5	254	66	46	634
Broiler. Meat-	A. Caller	398,493	Feb. 26	2090	551	46	1013
Broom-corn. Utilizing waste	S. M. Youngjohn	397,482	Feb. 5	572	148	46	687
Broom-holder	S. B. Minnich	398,432	Feb. 26	2006	527	46	996
Broom-maker's thimble	D. W. Albert	398,812	Mar. 5	1	1	46	1115
Broom-rack	W. C. Jones	397,723	Feb. 12	953	252	46	786
Brush	H. W. Hasey	398,043	Feb. 19	1428	378	46	874
Brush and comb. Combined hair	W. J. Scott	397,614	Feb. 12	803	200	46	737
Brush and sponge holder. Fountain	S. Thompson	397,670	Feb. 12	882	231	46	753
Brush attachment. Paint-	J. B. Flautt	398,244	Feb. 19	1718	453	46	931
Brush. Cylindrical	G. S. Gladding	397,076	Jan. 29	2673	691	46	556
Brush. Fountain-	J. Stevens	397,946	Feb. 19	1264	337	46	844
Brush. Hatter's	W. A. Faber	396,812	Jan. 29	2302	589	46	481
Brush-holder	G. E. Meeker	398,173	Feb. 19	1612	428	46	900
Brush-holder	T. A. Pierce and I. H. Wadleigh	398,537	Feb. 26	2151	567	46	1025
Brush-machine	E. W. Porter	396,954	Jan. 29	2498	644, 645	46	522
Brush. Metallic	S. Porter	396,289	Jan. 15	1502	381	46	310
Brush. Printer's	J. C. Israel	398,049	Feb. 19	1438	381	46	876
Brush. Tooth-	W. H. Smith	396,898	Jan. 29	2425	623	46	508
Brushes. Attachment for flesh or bath	W. J. Turkington	398,292	Feb. 19	1795	474	46	947
Bucket for storing and burning trash	W. H. Harris and W. H. Ryer	397,790	Feb. 12	1085	284	46	788
Bucket. Oyster-	H. L. R. Wolf	396,131	Jan. 15	1264	333	46	267
Buckets. Closure for	J. C. Reed	396,601	Jan. 22	1980	509	46	408
Buckle	C. D. Cheesman	396,966	Jan. 15	1464	373	46	364
Buckle	G. P. Cole	398,028	Feb. 19	1408	371	46	870
Buckle	L. L. Conker	395,742	Jan. 8	672	172	46	144
Buckle	H. A. Hartsboru	397,717	Feb. 12	944	251	46	744
Buckle	H. E. Measimer	397,811	Feb. 12	1080	287	46	790
Buckle	J. Nase	397,562	Feb. 12	760	192	46	718
Buckle	S. C. Tucker	400,018	Mar. 19	1643	478	46	1608
Buckle	H. P. Wiser	400,379	Mar. 26	2389	625	46	1623
Buckle-guard	G. M. Hubbard	395,904	Jan. 8	937	241	46	194
Buckle. Harness-	I. E. Bennett	398,372	Feb. 26	1928	507	46	981
Buckle. Suspender-	J. England	397,634	Feb. 12	929	246	46	742
Buckle. Suspender-	L. Steinberger	400,137	Mar. 26	2012	527	46	1551
Bulling-machines. Belt-tightener for	J. G. Blount	395,732	Jan. 8	659	169	46	142
Buggy-boot	C. A. Beblen	400,040	Mar. 26	1877	489	46	1594
Buggy-boot	P. Bosche	397,578	Feb. 12	732	189	46	754
Buggy-bow support	J. F. Kolb, H. H. Allen, and C. F. St. Clair.	396,811	Jan. 15	1392	356	46	290
Buildings. Construction of	J. E. Rankin	399,778	Mar. 19	1489	384	46	1449
Bulletin-board and broom-holder. Combined	M. W. Mahar	397,465	Feb. 5	551	144	46	633

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Bung	M. Schwemberger and A. Groeschel	399,086	Mar. 5	409	110	46	1192
Bung. Automatic stop-valve	L. F. Smith	396,961	Jan. 29	2510	647	46	525
Bungs, tap-holes of casks, &c. Stopper for	H. L. Gates	397,795	Feb. 12	1060	282	46	787
Burglar-alarm	W. J. Ackerman	396,458	Jan. 22	1749	449	46	365
Burglar-alarm	G. B. Lehy	396,701	Jan. 22	2125	544	46	426
Burglar-alarm	A. C. Robbins	396,667	Jan. 22	2074	533	46	427
Burglar-alarm	R. T. Smillie	395,519	Jan. 1	331	81	46	68
Burglar-alarm	L. A. McCarthy	398,420	Feb. 26	1995	524	46	993
Burglar-alarm. Electric	J. Y. McKinney	400,239	Mar. 26	2169	569	46	1563
Burglar-alarms. Door-spring connection for electric	J. Geary	398,144	Feb. 19	1570	415	46	901
Burglar and fire alarm	C. C. Henderson	398,254	Feb. 19	1731	456	46	934
Burial apparatus	G. L. Gebring	397,283	Feb. 5	267	69, 70	46	627
Burial-case	J. H. Walker	399,851	Mar. 19	1750	451	46	1491
Burner: *See* Fuel-burner. Lamp-burner. Gas-burner. Oil-burner. Gas-regulating burner. Petroleum-burner. Refuse-burner. Hydrocarbon-burner. Vapor-burner.							
Burner	R. P. Ambler	396,798	Jan. 29	2282	584	46	476
Burner	R. B. Carsley	397,630	Feb. 12	823	215	46	741
Burner	J. Gibbons	396,505	Feb. 26	2110	555	46	1016
Burner	J. Lewis	397,653	Feb. 12	858	224	46	748
Burner for liquid hydrocarbons and vapors thereof	W. T. Kellogg	397,595	Feb. 12	764	{199, 200}	46	730
Burners. Shade for	J. and W. J. Stratton	397,668	Feb. 12	880	231	46	752
Burnishing-machine	G. B. Kelley	399,649	Mar. 19	1334	342	46	1408
Bustle	V. H. Buschmann	396,025	Jan. 8	1115	283	46	298
Bustle	L. T. Ridgley	400,115	Mar. 26	1964	520	46	1545
Bustle	C. R. Tufts	398,474	Feb. 26	2063	542	46	1007
Bustle	C. W. Werts	400,149	Mar. 26	2036	532	46	1556
Bustle	H. C. Williams	395,469	Jan. 1	239	61	46	59
Butter-cutter	H. M. Cain	398,879	Mar. 5	94	26	46	1131
Butter-fat from milk. Extracting	C. A. Johansson	399,618	Mar. 12	1258	323	46	1382
Butter-making. Oil process in	B. Kansble	400,219	Mar. 26	2138	{560, 561}	46	1577
Butter-tub	L. K. Tewksbury	396,969	Jan. 29	2523	651	46	508
Butter-tub-cover fastener	E. W. Maxson	398,524	Feb. 26	2136	563	46	1021
Button	D. P. Fitzgerald	397,350	Feb. 5	368	97	46	648
Button	G. Heidmann, E. Höttges, and C. Egen.	400,337	Mar. 26	2324	607	46	1610
Button	J. McNerney	397,508	Feb. 12	617	159	46	702
Button	L. Sievert	397,030	Jan. 29	2610	674	46	545
Button	T. W. F. Smitten	400,132	Mar. 26	2005	525	46	1550
Button	T. Watson	396,445	Jan. 22	1738	446	46	363
Button and ornament paster	M. Moose	400,353	Mar. 26	2355	614	46	1616
Button. Cuff or collar	G. S. Tiffany	398,096	Feb. 19	1497	396	46	888
Button-fastener	G. H. Fox	395,745	Jan. 8	676	173	46	145
Button-hole cutter	E. Nowill	397,438	Feb. 5	508	133	46	676
Button-hole finishing and staying machine	J. A. Knox and T. J. Eberson	398,335	Feb. 19	1858	490	46	959
Button-hole strip	H. W. Lyon	400,408	Mar. 26	2432	637	46	1630
Button-hole stripe. Making	H. W. Lyon	399,061	Mar. 5	375	101	46	1186
Button-machine	J. N. Gotendorf, Jr	396,081	Jan. 15	1196	{303, 304}	46	253
Button-machine	C. A. Pfenning	396,423	Jan. 22	1707	437	46	357
Button-machine	C. A. Pfenning	396,424	Jan. 22	1709	{438, 439}	46	357
Button-machine	C. A. Pfenning	396,425	Jan. 22	1711	{439, 440}	46	358
Button-machine	C. A. Pfenning	396,426	Jan. 22	1712	440	46	358
Button-machine	C. A. Pfenning	396,427	Jan. 22	1713	440	46	359
Button or stud	H. F. Hambruch	395,973	Jan. 8	1033	264	46	214
Button-setting implement	F. H. Richards	397,388	Feb. 5	421	111	46	657
Button-setting implement	F. H. Richards	397,471	Feb. 5	558	146	46	685
Button-strip for garments	H. W. Lyon	399,338	Mar. 12	830	217	46	1302
Button-stripe. Making	J. Stone	395,522	Jan. 1	325	82	46	68
Buttons to fabrics. Attaching shank	W. E. Bennett	397,960	Feb. 19	1284	342	46	848
Cabinet. Merchandise	S. C. Adler	395,939	Jan. 8	984	253	46	204
Cable-conduit curve	W. Haddock	399,037	Mar. 5	343	92, 93	46	1180
Cable-grip	W. Haddock	399,034	Mar. 5	336	90, 91	46	1178
Cable-grip	F. Schelp, Jr.	397,755	Feb. 12	996	{264, 265}	46	774
Cable or railway crossing	F. C. Weir	398,206	Feb. 19	1459	438	46	918
Cable roads. Tube or tunnel protector for	H. F. Ascheck	400,034	Mar. 26	1966	485	46	1521
Cable system. Traction	M. F. Bradley	395,809	Jan. 8	794	207	46	166
Cable tramway	W. N. Colam	395,424	Jan. 1	170	45	46	36
Cable tramway	W. N. Colam	395,425	Jan. 1	171	45	46	37
Cable-tramway gripper	W. N. Colam	395,422	Jan. 1	167	43, 44	46	35
Cable tramways. Pulley-carrier for	W. N. Colam	395,423	Jan. 1	169	44, 45	46	36
Cable. Wire	H. Leschen	395,963	Jan. 8	1051	267	46	217
Cables. Electric alarm-signal for	W. H. Woodring and C. S. Gilbert	400,028	Mar. 19	1856	482	46	1510
Cables. Tension appliance for traction	W. Phenix	397,611	Feb. 12	801	208	46	736
Caddy. Combined spice	R. Crommer	398,389	Feb. 26	1942	{510, 511}	46	963
Cake, biscuit, and doughnut cutter	W. H. Eaton	398,139	Feb. 19	1564	414	46	900
Calcining rock	G. E. Carleton	399,496	Mar. 12	1065	278	46	1346
Calcining stone, &c. Kiln for	G. E. Carleton	399,495	Mar. 12	1063	277	46	1346
Calculating-machine	J. Vermehren	398,360	Feb. 19	1902	499	46	968
Calculating-machine. Coin-operated	F. W. Brooks	399,129	Mar. 5	494	{132, 133}	46	1210
Calendar	W. J. Elsom	395,385	Jan. 1	129	30, 31	46	26
Calendar	E. S. May	395,709	Jan. 8	621	157	46	134
Calendar	J. M. Moore	396,760	Jan. 29	2227	570	46	465
Calendar. Perpetual	T. A. McKee	398,172	Feb. 19	1612	428	46	909

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Calipers and dividers	T. Green	396,479	Jan. 22	1794	460	46	374
Calipers or gage. Inside	J. A. Blair	396,064	Jan. 15	1168	296	46	248
Camera: *See* Photographic camera.							
Camera-adjuster	H. E. Poehlman	399,345	Mar. 12	840	219	46	1304
Camera-carrying case and plate-changing box	J. H. Johnson	396,573	Jan. 22	1936	499	46	400
Camera-shutter	W. Shakespeare, Jr., and G. W. Low	398,960	Mar. 5	253	70	46	1162
Can: *See* Ash or garbage can. Milk-can.							
Can	A. D. Shuman	396,515	Jan. 22	1848	474	46	384
Can-fastener	C. Keeler and H. Lewis	397,555	Feb. 12	690	179	46	716
Can filling and packing apparatus	S. L. Gregg	399,884	Mar. 19	1653	427	46	1471
Can-filling machine	B. F. Thomas	396,717	Jan. 22	2147	{549, 550}	46	441
Can forming and soldering machine	F. M. Leavitt and E. Norton	395,788	Jan. 8	749	{192, 193, 194}	46	157
Can forming and soldering machine	E. Norton	395,795	Jan. 8	766	{198, 199, 200}	46	160
Can-jacket	W. Zinsser, Jr.	397,163	Feb. 5	96	25	46	596
Can nozzle. Oil	J. S. Peter	396,891	Jan. 29	2415	620	46	506
Can-opener	J. H. Fisher	399,222	Mar. 12	707	184	46	1278
Can-opener	T. H. Gilham	396,555	Jan. 22	1906	492	46	394
Can or similar vessel	J. K. Cleary	398,234	Feb. 12	1704	450	46	928
Cans. Mechanical lid-shutter for	B. Wesselmann	399,714	Mar. 19	1397	359	46	1422
Candle-holder for Christmas-trees	C. Reinhardt	395,514	Jan. 1	315	80	46	66
Candle-molding machine	L. Homan	397,918	Feb. 19	1226	328	46	838
Candlestick	J. W. Hiney	398,395	Feb. 26	1956	515	46	986
Candy-mold	S. E. Ball	398,368	Feb. 26	1920	505	46	979
Cane	W. M. Carpenter	396,027	Jan. 15	1117	284	46	229
Cane-mill	G. W. Huckabay	398,401	Feb. 19	1963	516	46	967
Cane-mill	C. Hughes	395,832	Jan. 8	825	214	46	173
Car-brake	H. W. Howell, Jr.	399,408	Mar. 12	943	244	46	1323
Car-brake	G. O. Kane	396,876	Jan. 29	2391	613	46	501
Car-brake	C. Mayer	399,764	Mar. 19	1470	379	46	1436
Car-brake	C. W. Murray	395,662	Jan. 1	555	139	46	112
Car-brake	H. L. Phelps	398,797	Feb. 26	2538	675	46	1102
Car-brake	B. L. Wright	400,039	Mar. 19	1858	482	46	1511
Car-brake	J. Yarrick and E. Meister	396,132	Jan. 15	1265	324	46	267
Car brake and starter	G. B. Siccardi	400,129	Mar. 26	2001	524	46	1549
Car brake and starter	J. B. Swaim	395,461	Jan. 1	227	58	46	49
Car brake and starter	P. Weilbach	397,765	Feb. 12	1012	{269, 270}	46	778
Car brake. Street	J. H. Wright	395,414	Jan. 1	155	40	46	33
Car brake. Street-railway	W. B. Clark	399,740	Mar. 19	1431	368	46	1428
Car brakes and couplings. Mechanism for operating	H. H. Sessions	396,614	Jan. 22	2001	{515, 516}	46	413
Car-brakes. Pipe-coupling for	W. M. Darrow	398,033	Feb. 19	1415	374	46	872
Car-brakes. Slack-adjuster for	C. C. Higham	398,257	Feb. 19	1736	457	46	935
Car-coupling	D. C. Bassett	397,412	Feb. 5	466	123	46	688
Car-coupling	J. M. Bouck	398,123	Feb. 19	1541	409	46	896
Car-coupling	H. Braley	395,733	Jan. 8	660	168	46	142
Car-coupling	S. Byrne	398,026	Feb. 19	1404	370	46	809
Car-coupling	J. D. Cael and G. L. Ogle	396,919	Jan. 29	2451	630	46	513
Car-coupling	T. C. Chappell	398,702	Feb. 26	2400	637	46	1074
Car-coupling	A. Coble and J. H. Mounts	396,268	Jan. 15	1467	373	46	305
Car-coupling	E. N. Colwell	397,277	Feb. 5	260	67	46	625
Car-coupling	H. V. Conway	400,306	Mar. 26	2275	595	46	1601
Car-coupling	G. Cushen	396,687	Jan. 22	2103	540	46	433
Car-coupling	G. W. Decker	399,316	Mar. 12	802	207	46	1295
Car-coupling	R. H. Dowling	396,032	Jan. 8	1123	285	46	230
Car-coupling	I. C. Doyal	398,500	Feb. 26	2100	554	46	1014
Car-coupling	E. P. Eastwick, Jr	395,817	Jan. 8	804	210	46	168
Car-coupling	R. L. Evans	400,068	Mar. 26	1916	499	46	1531
Car-coupling	J. W. Forest and S. H. Scott	396,201	Jan. 15	1371	351	46	287
Car-coupling	J. Frey	395,776	Jan. 8	717	185	46	153
Car-coupling	S. B. Fyler	395,823	Jan. 8	811	211	46	170
Car-coupling	S. T. Grimmett	395,437	Jan. 1	187	49	46	40
Car-coupling	S. F. Heath and H. A. Thayer	395,391	Jan. 1	128	32	46	28
Car-coupling	A. Heron	399,532	Mar. 12	1123	292	46	1357
Car-coupling	J. A. Hinson	398,324	Feb. 19	1843	486	46	957
Car-coupling	F. J. Hughes	397,058	Jan. 29	2646	681	46	552
Car-coupling	F. Johnson	399,333	Mar. 12	826	215	46	1301
Car-coupling	S D. King	395,750	Jan. 8	683	{174, 175}	46	146
Car-coupling	I. Kling	396,878	Jan. 29	2393	614	46	502
Car-coupling	I. Kling	396,879	Jan. 29	2396	614	46	502
Car-coupling	E. H. B. Knowlton	398,056	Feb. 19	1448	383	46	878
Car-coupling	J. B. Maas	396,943	Jan. 29	2485	641	46	520
Car-coupling	H. H. Mansfield	397,375	Feb. 5	404	107	46	654
Car-coupling	J. N. Martin and W. H. Harris	398,523	Feb. 26	2135	563	46	1021
Car-coupling	D. C. McCoy	399,278	Mar. 12	742	193	46	1284
Car-coupling	A. McLean	397,600	Feb. 12	768	201	46	731
Car-coupling	T. O. McMurtray	398,844	Mar. 5	42	13	46	1122
Car-coupling	W. Metcalf	397,017	Jan. 29	2585	668	46	540
Car-coupling	S. P. Mickey	397,137	Feb. 5	48	11	46	587
Car-coupling	G. N. Moats	395,988	Jan. 8	1064	269	46	219
Car-coupling	G. Mock	397,018	Jan. 29	2587	668	46	541
Car-coupling	J. Mutton	396,888	Jan. 29	2409	618	46	505
Car-coupling	S. Myers	396,047	Jan. 8	1144	290	46	234

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Invention.	Name.	No.	Date.	Monthly volume		Official Gazette.	
				Spec.	Dr'g.	Vol.	Page.
Car-coupling	F. W. Parsons	395,402	Jan. 1	142	36	46	31
Car-coupling	T. W. Paterson	398,440	Feb. 26	2015	529	46	997
Car-coupling	R. L. Powel	396,509	Jan. 22	1837	471	46	383
Car-coupling	J. C. Ruch and R. Brouse	396,237	Jan. 15	1427	363	46	297
Car-coupling	C. A. Schroyer	398,086	Feb. 19	1485	393	46	886
Car-coupling	J. H. Simpson	397,473	Feb. 5	560	146	46	685
Car-coupling	H. Sommerfeld	395,361	Jan. 1	83	22	46	19
Car-coupling	W. C. Watson	397,673	Feb. 12	866	233	46	754
Car-coupling	W. C. Watson	397,674	Feb. 12	867	233	46	754
Car-coupling	D. Wellington	395,369	Jan. 1	92	24	46	21
Car-coupling	O. Wells	397,675	Feb. 12	889	234, 235	46	754
Car-coupling	D. Y. Wilson	396,447	Jan. 22	1740	447	46	364
Car-coupling link	F. F. Boyce	396,726	Jan. 29	2163	555	46	452
Car-door	H. Alsop	395,805	Jan. 8	787	204	46	164
Car-door	E. B. Searles	395,457	Jan. 1	223	57	46	48
Car-door	C. Trier	396,903	Jan. 29	2431	625	46	509
Car-door	E. H. Whitaker	397,332	Feb. 5	332	86	46	640
Car door. Freight-	J. Haish	398,147	Feb. 19	1575	417	46	902
Car door. Railway-	J. McLean	399,152	Mar. 5	544	141	46	1220
Car-driving mechanism. Street-	F. E. Canda	396,140	Jan. 15	1276	327	46	269
Car. Dumping-	C. C. King	398,262	Feb. 19	1742	459	46	936
Car. Dumping-	H. W. Smith	399,092	Mar. 5	419	113, 114	46	1194
Car. Electric-	W. L. Everit	397,420	Feb. 5	489	126	46	671
Car-floor	Z. T. Earle	398,138	Feb. 19	1363	414	46	900
Car for carrying sugar-cane	H. R. Albrecht	397,886	Feb. 19	1177	315	46	829
Car-heater	F. Raprecht and F. G. Bates	399,633	Mar. 12	1280	398	46	1386
Car-heater	E. P. Sartell	396,000	Jan. 8	1089	275	46	223
Car-heater	J. Q. Winfield and B. H. Strickler	395,470	Jan. 1	240	61, 62	46	52
Car-heater	J. Zimmerman	396,639	Jan. 22	2037	523	46	420
Car heater. Domestic or railway-	W. P. Bending	398,573	Feb. 26	2200	580	46	1034
Car heater. Railway-	W. Barnett	398,816	Mar. 5	8	2	46	1115
Car heater. Railway-	W. Burnett	398,878	Mar. 5	92	26	46	1131
Car-heater. Safety-	M. M. Bumpus	400,393	Mar. 26	2410	631	46	1626
Car-heating apparatus	H. R. Towne	398,472	Feb. 26	2056	540, 541, 542	46	1006
Car-heating apparatus. Railway-	H. R. Towne	397,159	Feb. 5	76	19	46	593
Car-heating apparatus. Railway-	F. M. Wilder	397,161	Feb. 5	88	22	46	595
Car-heating apparatus. Railway passenger-	M. Wood	397,212	Feb. 5	170	45, 46	46	608
Car-heating apparatus. Street-	L. K. Curlett	397,808	Feb. 19	1196	320	46	832
Car lock. Freight-	J. Haish	400,077	Mar. 26	1930	504	46	1534
Car-motor	T. W. Heermans	398,723	Feb. 26	2443	647	46	1082
Car motor. Railway-	I. Robbins	398,449	Feb. 26	2025	531, 532	46	999
Car motor. Railway-	E. E. Sentman	399,572	Mar. 12	1189	307	46	1369
Car motor. Street-	B. R. Moore and C. D. Montanye	397,658	Feb. 12	866	227	46	749
Car-mover	C. L. Barnhart	396,190	Jan. 15	1356	348	46	284
Car-mover	J. P. Halpin	397,911	Feb. 19	1218	325	46	836
Car platforms. Die for forging the followers of extensible railway-	J. Reilley and C. Bergman	399,930	Mar. 19	1718	444	46	1485
Car. Railway-	J. A. Brill	398,222	Feb. 19	1680	444, 445	46	923
Car. Railway-	W. L. Covel	398,029	Feb. 19	1409	372	46	870
Car. Railway-	W. E. Elliott	397,902	Feb. 19	1203	322, 323	46	834
Car. Railway-	G. P. Warren	395,860	Jan. 8	869	224	46	182
Car. Railway-	D. Y. Wilson	395,412	Jan. 1	152	39	46	32
Car seat and indicator. Adjustable-	O. E. Michaud	400,241	Mar. 26	2173	570	46	1583
Car seat. Railway-	E. Enequist	400,066	Mar. 26	1914	498, 499	46	1530
Car-starter	W. P. Akers and J. C. Lindsey, Jr.	397,327	Feb. 5	337	88, 89	46	641
Car-starter	M. E. Farnham	400,199	Mar. 26	2105	552	46	1571
Car-starter	A. Jeenel	395,656	Jan. 1	545	137	46	110
Car-starter	J. H. Palmer	398,434	Feb. 26	2011	528	46	996
Car-starter	N. V. Viele	397,158	Feb. 5	84	21	46	594
Car. Steam hand-	T. Morrissey and J. Doyle	400,409	Mar. 26	2433	637, 638	46	1631
Car-step	G. M. Belton	395,687	Jan. 8	595	149	46	129
Car-step. Extensible-	H. A. Merritt	395,660	Jan. 1	552	138	46	111
Car-step. Extension-	J. W. Graham	395,825	Jan. 8	814	212	46	171
Car. Stock-	E. U. Benedict	399,231	Mar. 19	1568	406	46	1455
Car. Stock-	J. F. Elder	399,605	Mar. 12	1240	319	46	1379
Car. Stock-	G. Hackney	395,323	Jan. 1	27	7	46	8
Car. Stock-	A. C. Mather	396,100	Jan. 15	1227	310, 311	46	259
Car. Stock-	J. Montgomery	397,199	Feb. 5	150	40	46	605
Car. Stock-	W. H. H. Sisum	399,574	Mar. 12	1191	308	46	1369
Car. Street-	W. G. Ellis	398,594	Feb. 26	2235	591	46	1040
Car. Street-	E. E. and W. S. Taylor	397,947	Feb. 19	1266	337, 338	46	844
Car-unloader	H. M. Barnhart	397,165	Feb. 5	90	26	46	596
Car-ventilator. Automatic-	W. G. Creamer	398,882	Mar. 5	97	27	46	1132
Car-wheel	R. N. Allen	396,721	Jan. 29	2153	553	46	451
Car-wheel	J. W. Cooper	400,307	Mar. 26	2276	595	46	1601
Car-wheel	I. Hegeland	398,325	Feb. 19	1444	496	46	957
Car-wheel	S. B. Jerome	395,568	Jan. 1	395	101	46	82
Car-wheel	W. H. Melaney	397,927	Feb. 19	1236	331	46	840
Car-wheel	J. M. Norris	398,437	Feb. 26	2010	529	46	996
Car-wheel and bearing	J. S. Williams	397,677	Feb. 12	893	235	46	754
Car-wheel tires. Fastening device for-	J. Kennedy	400,089	Mar. 26	1944	508	46	1537
Car-wheels. Device for lubricating-	S. M. Briggs	397,168	Feb. 5	104	27	46	597

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume		Official Gazette.	
				Spec.	Dr'g.	Vol.	Page.
Car-window	F. R. Mallory	396,585	Jan. 22	1950	505	46	404
Cars. Apparatus for heating railway-	G. H. Benjamin	398,487	Feb. 26	2084	549	46	1011
Cars. Apparatus for heating railway-	P. H. Shannon	396,615	Jan. 22	2003	516	46	413
Cars. Automatic air-supply for propelling	J. T. Clark	400,302	Mar. 26	2273	594	46	1601
Cars. Automatic device for dumping coal-	C. S. Farrer	398,598	Feb. 26	2240	593	46	1041
Cars by electricity. Apparatus for heating-	R. M. Hunter	397,857	Feb. 12	1139	304	46	803
Cars. Chain conveyer for unloading	J. M. Dodge	396,197	Jan. 15	1363	350	46	285
Cars. Closet for railway-	F. A. Kennard and H. W. Cory	397,005	Jan. 29	2569	664	46	537
Cars. Device for unloading	J. L. Bryant	400,049	Mar. 26	1889	490, 491	46	1525
Cars. Draw-bar for railway-	S. C. and C. C. Fisher	398,716	Feb. 26	2430	644	46	1060
Cars. Driving mechanism for-	F. J. Weis	398,307	Feb. 19	1659	439	46	918
Cars. Driving mechanism for-	F. J. Weis	398,308	Feb. 19	1660	439	46	919
Cars. Driving mechanism for-	F. J. Weis	398,309	Feb. 19	1661	439	46	919
Cars. Electric lighting and heating	J. F. Shawhan	396,836	Jan. 29	2335	598	46	488
Cars. End-sill for railway-	J. T. Goodfellow	400,329	Mar. 26	2314	606	46	1600
Cars. Hose-pipe coupling for railway-	D. Hennessy	397,645	Feb. 12	842	219, 220	46	745
Cars. Means for heating railway-	B. F. Taylor	396,715	Jan. 22	2144	548, 549	46	440
Cars. Means for mounting the grip on cable-railway-	C. E. Ebnborn	398,590	Feb. 26	2230	589	46	1039
Cars. Pipe-coupling for railway-	P. S. Wiseman	396,908	Jan. 29	2438	626, 627	46	510
Cars. Platform-door for	J. Haish	395,324	Jan. 1	29	7	46	8
Cars. Roof-connection for railway-	J. F. Cole and E. W. Parno	400,305	Mar. 26	2274	595	46	1601
Cars. Safety-brake for cable	C. Bullock	395,736	Jan. 8	665	170	46	143
Cars. Sand-box for railway-	W. H. Clark	396,352	Jan. 15	1588	402	46	326
Cars. Side bearing for railway-	J. J. Mann	400,236	Mar. 26	2165	568	46	1582
Cars. Spring-buffer for railway-	C. A. Schroyer	397,312	Feb. 5	310	81	46	635
Cars. Stake-pocket for platform-	C. H. Dunham	400,306	Mar. 26	2416	632	46	1628
Cars. Starting and draft mechanism for street-	F. C. McDonald	397,740	Feb. 12	979	260	46	771
Cars. Steam-fitting for railway-	L. D. Jobes	398,020	Feb. 26	2269	601	46	1047
Cars. Switching or transferring	J. Armil and R. M. Sebree	399,815	Mar. 19	1557	403	46	1452
Cars. System for heating	J. F. McElroy	400,350	Mar. 26	2348	613	46	1615
Cars. System of and apparatus for heating	R. J. Wilson	399,592	Mar. 12	1221	314	46	1374
Cars. Ventilating and warming railway-	A. B. Murray and H. Harrison	397,092	Jan. 29	2694	696, 697	46	561
Cars. Water-closet for	L. Lattan and H. Tripp	398,516	Feb. 26	2125	559	46	1019
Carburetor	R. A. Bury and R. M. Bidelman	398,225	Feb. 19	1656	446	46	904
Carburetor	H. J. Dykes	395,616	Jan. 1	472	120	46	96
Carcasses. Device for spreading	G. P. Schmidt	399,933	Mar. 19	1723	445	46	1485
Card-clothing. Foundation of	S. Roberts	397,441	Feb. 5	517	136	46	677
Card-clothing on grinding-machines. Device for holding	G. O. Currier	398,497	Feb. 26	2097	553	46	1014
Card-clothing to flat-bars. Apparatus for attaching-	G. and E. Ashworth	397,267	Feb. 5	242	63	46	622
Card for buttons or studs	C. G. Bloomer	399,924	Mar. 19	1573	407	46	1456
Card-grinding machine	S. A. Prescott	399,694	Mar. 19	1366	350, 351, 352	46	1415
Card-wire at intervals. Apparatus for flattening-	G. and E. Ashworth	398,212	Feb. 19	1665	440, 441, 442, 443	46	919
Cards. Machine for lacing Jacquard	W. P. Uhlinger	397,763	Feb. 12	1008	267, 268	46	777
Carding-engine cylinders. Means for driving	G. and E. Ashworth	397,268	Feb. 5	244	64	46	623
Carding-engine flats. Apparatus for controlling the grinding of	J. M. Hethbrington	399,533	Mar. 12	1125	292	46	1357
Carding-engine flats. Apparatus for truing bars for	G. and E. Ashworth	398,018	Feb. 19	1394	368	46	867
Carding-engines. Apparatus for grinding the cards of	J. Sykes	398,806	Feb. 26	2548	678	46	1105
Carding-engines. Device for securing card-clothing to the flats of	G. and E. Ashworth	397,265	Feb. 5	240	62	46	622
Carding-engines. Doffer-comb head for	G. and E. Ashworth	397,266	Feb. 5	241	63	46	622
Carding-engines. Driving apparatus for	E. and S. Tweedale and C. Mills	397,981	Feb. 12	1169	313	46	810
Carding-engines. Stripping mechanism for	G. and E. Ashworth	398,019	Feb. 19	1396	369	46	868
Carding-machine for making mottled rovings	J. Robb	395,632	Jan. 1	508	128	46	102
Carpet-beating machinery	W. H. Hankinson	396,997	Jan. 29	2558	661	46	534
Carpet-fastener	J. E. Caldwell	398,492	Feb. 26	2089	550	46	1012
Carpet-fastener	T. D. Hammond	399,038	Mar. 5	345	93	46	1180
Carpet-fastener	C. L. McCleary	397,508	Feb. 12	766	200	46	731
Carpet-fastener	C. H. Cole	400,193	Mar. 26	2098	549	46	1569
Carpet-lining	E. C. Ellwood	398,318	Feb. 19	1833	484	46	955
Carpet-stretcher	B. Holden	395,903	Jan. 8	935	240	46	194
Carpet-stretcher	T. E. Meggs	395,341	Jan. 1	54	13	46	13
Carpet-stretcher	F. Koepp and J. C. Gueth	395,497	Jan. 1	282	72	46	60
Carpet-stretcher and tack-driver	H. L. Scofield	396,611	Jan. 22	1997	514	46	412
Carpet-stretcher and tack-driver	A. F. Lamb	395,445	Jan. 1	204	53	46	43
Carpet stretcher and tacker	W. J. Drew	395,960	Jan. 8	1017	260	46	210
Carpet-sweeper	W. J. Drew	399,136	Mar. 5	515	134, 135	46	1214
Carpet-sweeper	H. A. Gore	395,654	Jan. 1	544	136	46	109
Carpet-sweeper	H. W. Ra Tou and H. A. Gore	397,904	Feb. 5	156	42	46	606
Carpet-sweeper	P. H. Wiedersum	397,102	Jan. 29	2709	700, 701	46	564
Carpets, curtains, &c. Protector for	J. A. Crane	396,327	Jan. 15	1355	393	46	319
Carriage. Baby-	W. H. and H. N. Dunn	399,399	Mar. 12	916	238	46	1317
Carriage canopy. Child's	A. G. Snell	398,667	Feb. 26	2249	623	46	1063
Carriage-curtain fastener	S. P. Scott	399,934	Mar. 19	1724	445	46	1486
Carriage-jack, wrench, and bit-stock. Combined	F. K. Hickok and R. M. Lambie	397,499	Feb. 12	603	156	46	700
Carriage seat and body	H. S. Fairbanks	398,567	Feb. 26	2239	592	46	1041
Carriage-spring	B. M. Soule	400,134	Mar. 26	2008	525, 526	46	1550
Carriage-tufts. Machine for making	L. P. Warner	399,225	Mar. 5	662	173	46	1241
Carriages. Fan attachment for baby-	E. C. Van Nouhuys and K. C. Downes	399,585	Mar. 12	1210	312	46	1372
Carriages. Spring-gear for children's	H. G. Portmann	395,585	Jan. 1	496	108	46	98

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Carrier:							
See Cash-carrier. Package-carrier.							
Cash and parcel carrier. Straw-carrier.							
Hay-carrier. Trace-carrier.							
Wood-carrier.							
Carrying-wheel	C. W. Sleeper	398,664	Feb. 26	2347	623	46	1002
Cart. Dump-	H. A. Wilkins	398,562	Feb. 26	2187	576	46	1031
Cart. Dumping-	J. Cable	396,982	Jan. 29	2539	656	46	531
Cart. Dumping-	J. C. Gunn	395,439	Jan. 1	189	50	46	40
Cart. Road-	W. S. Bulett	397,776	Feb. 12	1030	275	46	782
Cart. Road-	A. Z. Bulger	397,777	Feb. 12	1031	275	46	782
Cart. Road-	C. D. Carter	395,952	Jan. 8	1002	257	46	207
Cart. Road-	L. F. Castor	396,392	Jan. 22	1654	425	46	346
Cart. Road-	S. C. Felt	398,242	Feb. 19	1716	452	46	931
Cart. Road-	G. Geddes	396,475	Jan. 22	1790	458	46	373
Cart. Road-	E. R. Lawrence	399,056	Mar. 5	367	99	46	1184
Cart. Road-	W. H. Schmedlen and R. E. Byrne	396,052	Jan. 8	1151	292	46	235
Cart spring. Road-	F. Driffill	399,852	Mar. 19	1611	417	46	1463
Cart spring. Road-	R. E. Jones	397,236	Feb. 5	200	53	46	613
Cartridge	S. H. Emmens	398,386	Feb. 26	1946	512	46	984
Cartridge	S. H. Emmens	398,823	Mar. 5	17	5	46	1117
Cartridge and other belts. Fastening for	A. Mills	399,915	Mar. 19	1699	440	46	1481
Cartridge-belt	T. C. Orndorff	399,924	Mar. 19	1710	443	46	1483
Cartridge-feed case	J. G. Accles	396,523	Jan. 22	1859	477	46	386
Cartridge-loader	J. V. Thompson	395,858	Jan. 8	866	223	46	182
Cartridge-loading machine	E. A. Franklin	396,358	Jan. 15	1595	404, 405, 406, 407	46	327
Cartridge-loading machine	E. A. Franklin	396,359	Jan. 15	1601	408, 409, 410, 411	46	328
Cartridge-loading machine	E. F. Genevay	396,398	Jan. 22	1664	427, 428	46	348
Cartridge-loading machine	G. M. Peters	398,650	Feb. 26	2322	616, 617, 618	46	1057
Cartridge-loading machines. Feeding mechanism for	G. M. Peters	398,651	Feb. 26	2128	619	46	1059
Cartridge-primer	T. R. Bayliss	400,165	Mar. 26	2061	539, 540	46	1561
Cartridge-reloading implement	H. Fuermann	397,421	Feb. 5	481	126	46	671
Cartridge. Shot-	M. Hartley and A. J. Hobbs	395,897	Jan. 8	926	238	46	192
Cartridges and cartridge-magazines. Belt for holding	A. Mills	399,916	Mar. 19	1700	440	46	1481
Cartridges for transportation and distribution. Packing	T. C. Orndorff	399,923	Mar. 19	1709	442	46	1483
Case:							
See Binding-case. Library-case.							
Book-case. Lock-case.							
Burial-case. Needle or pin case.							
Camera-carrying case. Note-case.							
Piano-case.							
Cartridge-feed case. Shipping-case.							
Clock-case. Show-case.							
Fishing-rod case. Type-case.							
Folding case. Vaporizing-case.							
Jewelry-case. Watch-case.							
Latch-case.							
Cash and parcel carrier	E. P. Clark and A. T. Crossley	399,018	Mar. 5	319	86	46	1175
Cash-carrier	T. M. Kenney	397,237	Feb. 5	201	53	46	614
Cash-carrier	M. C. Swezey	398,356	Feb. 19	1892	498	46	966
Cash-carrier apparatus	C. W. McCormick	399,428	Mar. 12	966	251, 252	46	1328
Cash-carrier apparatus	N. Weeks, Jr.	399,457	Mar. 12	1003	262	46	1335
Cash-carrier apparatus. Pneumatic	J. L. Given	397,354	Feb. 5	373	98	46	648
Cash-indicator	G. F. Kolb	400,406	Mar. 26	2427	636, 637	46	1629
Cash-indicator	A. Pearson	400,247	Mar. 26	2185	573, 574	46	1586
Cash indicator and recorder	W. Koch	398,625	Feb. 26	2277	603, 604	46	1049
Cash indicator and register	C. H. Kahler	397,554	Feb. 12	686	178, 179	46	716
Cash indicator and register	W. Koch and C. E. Hadley	398,626	Feb. 26	2283	604, 605	46	1050
Cash indicator and register	G. F. Kolb	395,570	Jan. 1	400	102, 103	46	83
Cash indicator and register	C. E. Lord	398,898	Mar. 5	125	33, 34	46	1137
Cash indicator and register	W. G. Schickner and L. K. Marty	398,979	Mar. 5	251	69	46	1162
Cash or parcel carrier	E. B. Stocking	396,778	Jan. 29	2251	575	46	469
Cash-recorder	J. M. Warner	399,953	Mar. 19	1752	452	46	1491
Cash-registering device	O. C. Retsloff	399,060	Mar. 5	400	108	46	1191
Cash registers and indicators. Indicating device for	J. C. Hazlett	396,483	Jan. 22	1803	462	46	376
Casks. Bushing-casing for	P. J. Westphal	397,261	Feb. 5	236	61	46	621
Caster	S. M Michelson	398,641	Feb. 26	2308	612	46	1054
Caster-rollers. Machine for finishing	R. B. Codling	398,378	Feb. 26	1935	509	46	982
Casting. Forming molds for	E. J. Ames	396,454	Jan. 22	1754	.....	46	366
Casting steel pipes. Apparatus for	W. E. Koch	396,747	Jan. 29	2209	565	46	461
Catamenial sack	E. A. Wiley	395,411	Jan. 1	151	38	46	32
Catheter	R. N. Mayfield	396,754	Jan. 29	2218	568	46	463
Cathode for an electro-depositing apparatus	E. Emerson	395,713	Jan. 8	713	184	46	152
Cellars. Apparatus for delivering ashes from	M. Foreman	396,923	Jan. 29	2458	633	46	514
Cement. Manufacture of	R. W. Lesley	397,373	Feb. 5	402	.....	46	654

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Centrifugal machine	G. N. Downs	397,051	Jan. 29	2036	679	46	550
Chain-link	H. E. Kelley	396,404	Jan. 22	1678	431	46	351
Chair:							
See Barber's chair. Head-chair.							
Child's chair. Lug-chair.							
Child's adjustable chair. Office-chair.							
Photographic chair.							
Convertible chair. Rail-chair.							
Dental chair. Railway-chair.							
Folding chair. Revolving chair.							
Folding convertible chair. Rocking-chair.							
Surgical chair.							
Chair and step-ladder. Combined	C. Bockenheuser	395,539	Jan. 1	347	88	46	73
Chair-joint	T. Curtiss	397,899	Feb. 19	1197	321	46	833
Chairs, &c. Adjustable leg attachment for	H. Alliger	400,033	Mar. 26	1865	485	46	1521
Chairs. Attachment for rocking-	W. I. Bunker	397,828	Feb. 12	1103	295	46	796
Chairs, lounges, &c. Attachment for	J. Hogan	395,975	Jan. 8	1039	264, 265	46	215
Chairs. Spring attachment for rocking-	W. I. Bunker	397,274	Feb. 5	256	66	46	624
Chalk-holder	F. Chambers	395,812	Jan. 8	798	208	46	167
Chalk-holder	D. Williamson	397,952	Feb. 19	1272	340	46	846
Channeling-machine	W. H. Bryant	396,462	Jan. 22	1763	451, 452	46	369
Channeling-machine	W. H. Haven, Jr	398,155	Feb. 19	1585	421	46	904
Characters in their reverse. Apparatus for producing	C. A. Thompson	400,268	Mar. 26	2219	592	46	1591
Chart. Anatomical	L. W. Yaggy	396,381	Jan. 15	1636	420	46	334
Chart for educational purposes	G. L. Elder	395,554	Jan. 1	369	95	46	77
Chart. Percentile measurement	F. Swain	400,017	Mar. 19	1840	478	46	1507
Charts. Mounting and boxing anatomical	J. T. White	400,151	Mar. 26	2039	533	46	1556
Check-hook	S. H. Haas	400,332	Mar. 26	2318	607	46	1609
Check-hook	C. H. Mors	400,410	Mar. 26	2435	638	46	1631
Check-loop	E. Barnard	398,764	Feb. 26	2494	661	46	1092
Check-rowing attachment	G. L. Banks	396,848	Jan. 29	2348	601	46	492
Cheese-press	W. Jesperson	396,493	Jan. 22	1816	466	46	379
Cheese-presses. Attachment for gang	W. L. Beaton	398,932	Mar. 5	178	47	46	1147
Chest:							
See Flour-chest.							
Chevron	F. S. Johnston	400,218	Mar. 26	2137	559, 560	46	1577
Chicken-brooder	L. C. Byce	395,876	Jan. 8	898	230	46	187
Child's adjustable chair	C. P. Gifford	397,951	Feb. 12	1133	303	46	802
Child's chair or carriage	L. J. Adams	398,304	Feb. 19	1811	478	46	950
Chimney cap and protector	W. W. Wright	399,564	Mar. 12	1225	315	46	1375
Chimney cap or ventilator	E. P. Ryder	399,566	Mar. 12	1179	305	46	1367
Chimney-cowl	D. Teets	397,669	Feb. 12	881	231	46	753
Chimney-flue	J. B. Barney and S. B. Bryar	396,458	Jan. 22	1759	450	46	368
Chimney-protector	A. F. Brenner and J. A. Myers	396,855	Jan. 29	2359	605	46	494
Chimneys. Ventilating top for	T. J. Nicholson	399,067	Mar. 5	382	103	46	1187
Chip-breaker	F. H. Crafts	397,834	Feb. 12	1110	297	46	797
Chisels. Die for making	J. Swan	398,910	Mar. 5	139	38	46	1141
Chopper:							
See Cotton-chopper.							
Christmas-trees, &c. Stand for	T. B. Osborne	397,305	Feb. 5	302	78	46	634
Chuck	C. H. Reid	398,447	Feb. 26	2022	531	46	998
Chuck. Lathe-	D. E. Felt	396,035	Jan. 8	1126	286	46	231
Chuck. Pneumatic	G. Cuthbert	397,835	Feb. 12	1111	297	46	797
Churn	P. C. Barlow	399,728	Mar. 19	1418	364	46	1426
Churn	J. C. Kearns	397,921	Feb. 19	1229	329	46	839
Churn	W. D. Makemson	399,761	Mar. 19	1465	378	46	1435
Churn	W. H. Le Sner and F. R. Bassett	400,093	Mar. 26	1950	509	46	1538
Churn-closure	J. McDermaid	399,681	Mar. 19	1349	347	46	1411
Churn-closure	C. Berat	398,488	Feb. 26	2095	549	46	1011
Churn-dasher	W. T. Robertson	396,114	Jan. 15	1245	317	46	963
Cigar-box	H. C. Myers	397,510	Feb. 12	619	159, 160	46	702
Cigar-bunch-wrapping machine	A. K. Degood	396,732	Jan. 29	2176	558	46	455
Cigar-bunching machine	R. H. Logan	395,650	Jan. 1	549	137, 138	46	110
Cigar-bunching machine	J. E. Smith	397,396	Feb. 5	430	114, 115, 116	46	660
Cigar-cutter	F. C. Miller	396,339	Jan. 15	1572	398	46	322
Cigar-cutter	F. A. Philippi	398,345	Feb. 19	1875	493	46	962
Cigar-lighting device. Electric	W. Tag and S. C. Smith	399,168	Mar. 5	577	149	46	1226
Cigar-molds. Die for stamping metallic	G. D. Elges	398,954	Mar. 5	207	57	46	1133
Cigar perforating machine	E. Bernhardt	396,891	Jan. 29	2287	585	46	477
Cigar-trimming machine	C. W. Boman	396,530	Jan. 22	1866	479	46	387
Cigar-vending apparatus	W. C. Doubleday	399,851	Mar. 19	1608	416, 417	46	1463
Cigar wrappers or binders. Machine for cutting out	J. R. Williams	400,153	Mar. 26	2041	534	46	1557
Cigar wrapping or rolling machine	C. W. Boman	396,263	Jan. 15	1460	372	46	204
Cigars. Filler material for	R. A. Bright	398,877	Mar. 5	90	25	46	1131
Cigars. Preparing filler material for the manufacture of	R. A. Bright	398,876	Mar. 5	89	25	46	1131
Cigarette-machine	E. J. Lumley	395,789	Jan. 8	753	194, 195	46	158
Cigarettes. Machine for dipping	C. H. and W. B. Whitaker	399,808	Mar. 19	1544	399	46	1450
Clamp:							
See Colter-clamp. Rubber-dam clamp.							
Floor-clamp. Sewing-machine needle-clamp.							
Hose-clamp.							
Clamp	G. F. Brott	400,296	Mar. 26	2261	591	46	1596

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Clasp: *See* Album-clasp. Pocket-book clasp. Corset-clasp. Shoe-clasp. Locking-clasp. Spring-clasp.							
Clasp	F. B. Spooner	397,034	Jan. 29	2615	674	46	546
Clasp or buckle	S. B. Ferris	395,965	Jan. 8	1024	261	46	212
Clay pulverizer and conveyer	J. Evans	399,025	Mar. 5	396	87	46	1177
Clay-tempering machine	M. and J. Bierline	396,373	Feb. 26	1929	507	46	981
Cleaner: *See* Boiler-cleaner. Knife and fork cleaner. Boiler-tube cleaner. Railway-track cleaner. Flue-cleaner. Seed-cleaner. Fruit-cleaner. Sink-cleaner. Grain-cleaner. Track-cleaner. Gun-cleaner. Window-cleaner. Knife-cleaner.							
Clevis	M. T. Cole	396,859	Jan. 29	2363	606	46	495
Clevis	O. A. Essig	395,386	Jan. 1	121	31	46	27
Clevis. Plow	O. A. Essig	396,474	Jan. 22	1788	458	46	373
Clip: *See* Book-clip. Whiffletree-clip. Halter bolt-clip.							
Clips for connecting tie-bars with switch-rails. Manufacture of	A. A. Strom	397,447	Feb. 5	528	139	46	679
Clock	H. Herwig	396,655	Jan. 22	2058	528	46	424
Clock. Advertising	A. V. Stralt	397,148	Feb. 5	72	17	46	592
Clock. Alarm	A. Bannatyne	399,725	Mar. 19	1412	363	46	1424
Clock. Alarm	R. F. Gaylord	397,850	Feb. 12	1131	303	46	802
Clock-case	A. D. Tyrrill	399,097	Mar. 5	426	116	46	1195
Clock. Electric alarm	S. Kahan and A. W. Craven	398,896	Mar. 5	122	33	46	1137
Clock. Repeating	A. Bannatyne	399,647	Mar. 19	1302	334, 335	46	1402
Clock. Self-winding electric	F. W. Brainerd	399,128	Mar. 5	493	132	46	1210
Clock striking mechanism	W. H. Poole	396,598	Jan. 22	1976	508, 509	46	407
Clocks. Controlling device for the regulating members of	W. S. Scales	395,357	Jan. 1	78	20	46	18
Clod-crusher and roller. Combined	W. Knutzen	395,787	Jan. 8	748	192	46	157
Closet: *See* Water-closet.							
Clothes-drier	F. J. French	395,775	Jan. 8	715	184	46	152
Clothes-drier	D. L. Worthington	398,811	Feb. 26	2552	679	46	1106
Clothes-line frame	F. W. Hofele	396,817	Jan. 29	2309	591	46	482
Clothes-lines. Hanging device for	H. R. Bried	398,490	Feb. 26	2087	550	46	1012
Clothes-stick	W. H. Scott	398,089	Feb. 19	1489	394	46	887
Clothes-wringer	L. C. Parker	398,793	Feb. 26	2534	674	46	1101
Clutch	J. Gibbins	396,079	Jan. 15	1193	302, 303	46	252
Clutch. Differential speed	J. Brooks	400,293	Mar. 26	2254	590	46	1597
Clutch. Friction	A. Ball	396,642	Jan. 22	2041	524	46	421
Clutch. Friction	E. Boehme	399,733	Mar. 19	1423	366	46	1426
Clutch. Friction	D. T. Denton	399,385	Mar. 12	911	236	46	1316
Clutch. Friction	H. Erdman	399,858	Mar. 19	1617	419	46	1465
Clutch. Friction	H. W. Hill	400,212	Mar. 26	2128	557, 558	46	1575
Clutch. Friction	W. C. Jones and W. S. Rogers	397,859	Feb. 12	1142	305	46	804
Clutch. Friction	F. H. Laforge and H. J. Barker	398,628	Feb. 26	2292	606, 607	46	1051
Clutch. Friction	T. A. Weston	396,315	Jan. 15	1536	388	46	316
Clutch mechanism	C. A. King	397,238	Feb. 5	302	53	46	614
Clutch mechanism for winding-drums	J. A. Dyblie and E. L. Heidenreich	398,502	Feb. 26	2104	554	46	1015
Clutch mechanism. Pawl-and-ratchet	J. W. Hobson	397,802	Feb. 12	1069	285	46	789
Coal-drilling machine	C. O. Summer and J. J. Pullen	398,289	Feb. 19	1790	473	46	946
Coal-elevator	J. Chase	399,835	Mar. 19	1588	411, 412	46	1459
Coal-hod	E. Barrath	396,974	Jan. 29	2593	652	46	529
Coal-hod	E. Barrath	396,975	Jan. 29	2593	653	46	529
Coal-hod	E. Barrath	397,047	Jan. 29	2630	678	46	549
Coal-hod	G. Laube	398,410	Feb. 26	1977	519	46	990
Coal. Machine for cutting	T. and R. W. Bower and J. Blackburn	399,495	Mar. 12	1049	274	46	1344
Coaster. Circular	J. Duncan	396,472	Jan. 22	1786	458	46	372
Coat and vest. Combined	S. E. Reinhard	399,436	Mar. 12	977	254	46	1330
Cobalt matte from cobalt ores. Producing	W. Brandreth	399,009	Mar. 5	307	.....	46	1173
Cock	G. A. Barth	398,117	Feb. 19	1534	406, 407	46	895
Cock. Gas	W. C. Homan	398,616	Feb. 26	2264	601	46	1047
Cock. Pressure-regulating stop	E. Rueff	399,565	Mar. 12	1178	305	46	1367
Cock. Stop	E. E. and L. C. Beauvalet	397,332	Feb. 5	347	91	46	643
Cockeye	J. B. Altman	395,767	Jan. 8	706	181	46	150
Cocoanut compound	L. Schepp	398,082	Feb. 19	1481	.....	46	886
Cocoanut compound	L. Schepp	398,083	Feb. 19	1482	.....	46	886
Cocoanut. Preserving	W. P. Clotworthy	400,303	Mar. 26	2273	.....	46	1601
Cocoon. Apparatus for reeling silk from the	E. W. Serrell, Jr	399,037	Mar. 19	1728	446, 447	46	1486
Cocoons. Apparatus for separating waste floss from	E. W. Serrell, Jr	399,936	Mar. 19	1727	446	46	1486
Coffee. Apparatus for preparing liquid	C. Wagner	399,603	Mar. 19	1538	397	46	1449
Coffee-mill	E. H. and C. Morgan	399,686	Mar. 19	1354	348	46	1412
Coffee or tea pot	L. S. Wright	397,883	Feb. 12	1171	313	46	811
Coffee-pot	E. B. Lobach	399,998	Mar. 19	1614	472	46	1503
Coffee-pot	E. T. Newlin	399,491	Mar. 12	972	253	46	1329
Coffer-dam for vessels	G. Clarke	398,232	Feb. 19	1700	449	46	937
Coffin	A. Weckmiller	400,022	Mar. 19	1648	430	46	1509
Coffin-handle	B. C. Koehler and D. Heer	395,982	Jan. 8	1051	267	46	217

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Coin-adjuster	G. McLoughlin	399,065	Mar. 5	390	102, 103	46	1187
Coin-operated device. Automatic	B. S. Molyneux	399,643	Mar. 19	1393	338	46	1389
Coin-package	G. L. Castner	400,052	Mar. 26	1693	402	46	1526
Coins. Pad for convenience in handling and picking up	A. E. L. Slazenger	399,940	Mar. 19	1732	447	46	1487
Coke-oven	M. Sandford	399,634	Mar. 12	1981	329	46	1386
Coke-oven front	E. H. Bradley	397,107	Feb. 5	3	1	46	579
Coking-furnace	G. A. Clark	399,378	Mar. 12	901	234	46	1314
Coking-furnace	G. A. Clark	399,379	Mar. 12	902	234	46	1314
Collar. Apparel	E. R. Crofut	396,685	Jan. 22	2101	539	46	432
Collar. Garment	C. F. Henning	397,289	Feb. 5	278	72	46	629
Collar. Horse	R. Brownson	397,066	Jan. 29	2657	684	46	554
Collar. Horse	W. Crable	399,841	Mar. 19	1594	413	46	1460
Collar pad. Horse	S. B. Raw	395,404	Jan. 1	144	37	46	31
Collar-stuffing machine	G. E. Hoyt	397,292	Feb. 5	282	73	46	630
Coloring-matter. Formation of purple	A. Kern	396,574	Jan. 22	1937	.....	46	400
Coloring-matter. Production of	F. Bender	396,527	Jan. 22	1863	.....	46	367
Coloring-matter. Yellow	D. A. Moon	396,294	Jan. 15	1508	.....	46	311
Colter	R. A. Moore	400,106	Mar. 26	1909	516	46	1542
Colter-clamp	T. F. Rowland	397,138	Feb. 5	49	11	46	587
Column. Iron	F. Meeker	396,451	Feb. 26	2027	532	46	909
Column. Plate-metal	F. Meeker and H. F. Edwards	397,668	Feb. 12	1152	308	46	806
Column. Plate-metal		399,202	Mar. 5	627	163	46	1235
Comb: *See* Curry-comb.							
Comb	H. G. Guild	399,032	Mar. 5	333	80	46	1178
Combination-hook	L. Kent	395,704	Jan. 8	617	155	46	133
Combination-lock	H. C. Brown, Jr.	397,893	Feb. 19	1188	319	46	831
Compass. Ship's	L. Sirieix. (Reissue)	10,991	Mar. 26	2452	642	46	1634
Composing-stick	F. J. Ludington and H. C. Leland	399,911	Mar. 19	1663	438, 439	46	1480
Composition for making articles of commerce and art	F. S. Randall	397,612	Feb. 12	802	.....	46	736
Compound cabinet-engine	E. W. Hamlin	399,524	Mar. 12	1113	289, 290	46	1355
Compress	M. V. Wagner	398,199	Feb. 19	1653	437	46	917
Concentrator	J. A. Johnson	400,216	Mar. 26	2134	559	46	1576
Concentrator	F. Sletcher	399,791	Mar. 19	1511	391	46	1445
Condenser. Ejector	N. W. Wheeler	399,715	Mar. 19	1397	360	46	1422
Condenser for charcoal-kilns	J. Friedrich	399,255	Mar. 12	710	185	46	1278
Condensing apparatus	J. F. Chase	396,539	Jan. 22	1877	483	46	389
Conducting-pipe	G. C. Smith	400,202	Mar. 26	2210	580	46	1589
Conductor-support	D. Stenssy	397,036	Jan. 29	2618	675	46	546
Conductor-support	D. Stenssy	397,037	Jan. 29	2619	675	46	547
Conductors. Adjustable crossing and switch for overhead	C. J. Van Depoele	396,313	Jan. 15	1533	387	46	316
Conductors. Device for fastening	W. P. Zimmerman	396,677	Jan. 22	2087	537	46	430
Conduit. Electric	H. A. Chase	400,300	Mar. 26	2267	593	46	1600
Conduits. Constructing underground	W. C. Cranmer and S. W. Arnold	400,308	Mar. 26	2277	596	46	1602
Confectioners' use. Lace for	J. R. Stout	397,446	Feb. 5	526	126	46	678
Confessional. Folding	J. J. Dunn	399,388	Mar. 12	915	237	46	1317
Connecting-rod	C. H. Willcox	398,761	Feb. 26	2491	660	46	1092
Contact and switch. Overhead	C. J. Van Depoele	397,451	Feb. 5	533	140	46	680
Converter	F. W. Gordon	395,434	Jan. 1	183	48	46	39
Convertible chair	B. C. Odell	399,069	Mar. 5	385	104	46	1186
Conveyer. Chain	J. M. Dodge	395,983	Jan. 8	906	238	46	189
Conveyer. Stone or ore	P. W. Gates	397,849	Feb. 12	1130	302	46	802
Conveying apparatus	J. C. Martin	399,150	Mar. 5	537	140, 141	46	1219
Conveying grain, ice, coal, &c. Device for	T. McBride and E. Fisher	399,063	Mar. 5	377	102	46	1187
Cooker. Steam	W. E Beveridge	397,687	Feb. 12	907	240	46	757
Cooking apparatus. Steam	W. H. Filer	397,709	Feb. 12	931	247	46	762
Cooking utensil	J. H. Fredericks	397,847	Feb. 12	1128	302	46	801
Cooler: *See* Water-cooler.							
Coop. Folding poultry	M. T. Maloy	398,338	Feb. 19	1863	491	46	960
Copies of writings. Apparatus for obtaining duplicate	C. A. Thompson	398,664	Mar. 5	71	20	46	1136
Copies of writings, &c. Making duplicate	C. A. Thompson	398,675	Feb. 26	2364	628	46	1066
Copy holder and register	J. C. A. Dean	399,503	Mar. 12	1074	280	46	1349
Copying device. Press	H. Thum	398,758	Feb. 26	2486	659	46	1091
Copying press. Letter	C. A. Thompson	399,593	Mar. 12	1208	312	46	1373
Cords and tying strips of sheet metal. Tool or instrument for cutting	G. Hiller	397,290	Feb. 5	279	72	46	629
Cork-cutting machine	H. S. Larsen	396,882	Jan. 29	2399	615, 616	46	503
Cork-extractor	G. Edwards	395,618	Jan. 1	475	121	46	97
Corking and wiring corks to bottles	S. Wile and H. La Casse	399,303	Mar. 12	783	203	46	1292
Corkscrew	L. S. McWhorter	396,286	Jan. 15	1406	379	46	309
Corn-cob holder	F. B. Fetherstonhaugh	395,698	Jan. 8	610	154	46	132
Corn-cutter	G. W. Gibson	396,152	Jan. 15	1293	331	46	272
Corn. Machine for hulling green	J. Ritty	395,997	Jan. 8	1077	274	46	222
Corn-sheller	J. H. Gilman	396,146	Feb. 19	1572	416, 417	46	902
Corn-sheller	D. Snelling	396,375	Jan. 15	1628	417	46	333
Corn-sheller and wash-board. Combined	J. M. Stukes and O. P. Reid	396,902	Jan. 29	2430	624	46	509
Corn-shocking machine	Z. W. Smith	398,463	Feb. 26	2044	536	46	1003
Corner-shield	H. White	396,126	Jan. 15	1259	321	46	266
Corpses. Preserving	J. G. Meyers	397,379	Feb. 5	412	109	46	655
Corset-busk	O. Bannler	398,569	Feb. 26	2196	579	46	1033
Corset-clasp	M. W. Henius	396,484	Jan. 22	1805	463	46	376
Corset-fastening	W. M. Ducker	398,636	Feb. 19	1418	375	46	872
Corset-fastening	W. M. Ducker	398,136	Feb. 19	1560	413	46	909
Corset-stay	R. Theller	397,401	Feb. 5	447	119	46	663

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Corset-waist	C. W. Higby	397,801	Feb. 12	1067	284, 285	46	789
Corsets. Manufacture of ornamental	L. Kraus	395,707	Jan. 8	619	156	46	133
Cosmetic cream	N. K. Gentry	395,894	Jan. 8	814	.....	46	171
Cot. Folding	C. T. Segar	399,935	Mar. 19	1726	446	46	1486
Cotton-chopper	W. H. Howell	397,804	Feb. 12	1071	295	46	799
Cotton-chopper	W. E. Lindsay	398,416	Feb. 26	1987	522	46	992
Cotton-chopper	W. E. Lindsay	398,417	Feb. 26	1989	523	46	992
Cotton chopper, scraper, and harrow	J. M. P. Lyon	397,133	Feb. 5	43	10	46	596
Cotton-compress	G. Taylor	395,857	Jan. 8	864	223	46	181
Cotton. Ginning	J. C. Osborn	399,206	Mar. 5	634	164	46	1236
Cotton-gins. Brush for	R. F. Spangenberg	395,362	Jan. 1	84	22	46	19
Cotton. Machine for opening, cleaning, and ginning seed	J. R. Montague	400,002	Mar. 19	1819	472, 473	46	1503
Cotton-openers, &c. Evening mechanism for	J. C. Potter	399,076	Mar. 5	394	106	46	1190
Cotton-openers, &c. Evening mechanism for	J. C. Potter	399,077	Mar. 5	396	107	46	1190
Cotton-picker	J. W. Wallis	397,209	Feb. 5	165	44, 45	46	607
Cotton-presses. Tramper attachment for	A. Schkade	399,441	Mar. 12	982	256	46	1331
Cotton-stalk crusher	J. Lester	398,413	Feb. 26	1981	520, 521	46	991
Cough-mixture	A. M. Poe	395,346	Jan. 1	61	.....	46	15
Counter	E. T. Harris	396,815	Jan. 29	2305	590	46	481
Countersink	A. Leitelt	397,483	Feb. 5	573	148	46	687
Countersink and drill	A. Morisseau	396,663	Jan. 22	2070	531	46	426
Coupling: *See* Car-coupling. Electric-circuit coupling. Hame and tug coupling. Hose-coupling. Pipe-coupling. Shaft-coupling. Thill-coupling. Wagon-perch-crotch coupling. Wire-coupling.							
Coupling-link	B. Morton	395,794	Jan. 8	765	198	46	160
Cover-fastener	G. Staib	397,207	Feb. 5	164	43	46	607
Cover-fastener for vessels	J. H. Cassidy	399,834	Mar. 19	1587	411	46	1459
Covering	W. M. Suhr	397,822	Feb. 12	1096	293	46	794
Crank-case door	R. Bagaley and F. M. Rites	397,062	Jan. 29	2651	682	46	553
Crank for machinery	W. H. Kaye	397,367	Feb. 5	395	104	46	652
Crate	A. T. Linderman	396,165	Jan. 15	1317	337	46	276
Crate. Folding	W. H. Cadwell	397,894	Feb. 19	1191	319	46	832
Crate. Folding or knockdown	A. D. Hobbie	398,727	Feb. 26	2448	648, 649	46	1083
Cream extractor. Sample	B. Kanable	397,004	Jan. 29	2568	664	46	537
Crimping-machine	A. A. Abbott	398,567	Feb. 26	2194	578	46	1032
Crock-press	F. Bennett	399,178	Mar. 5	588	151	46	1228
Crock-rims. Machine for making	H. E. Merrill	398,640	Feb. 26	2307	612	46	1054
Crusher: *See* Clod-crusher. Cotton-stalk crusher. Ore-crusher. Rock-crusher.							
Crushing and grinding mill	J. F. Winchell	395,413	Jan. 1	153	39, 40	46	32
Crushing and grinding mill	J. F. Winchell	396,448	Jan. 22	1741	447, 448	46	364
Cuff-fastener	H. C. Frank	397,119	Feb. 5	20	5	46	583
Cuff-holder	G. R. G. Jones	400,344	Mar. 26	2340	411	46	1613
Cuff-holder	S. V. Thomas	400,144	Mar. 26	2022	529	46	1553
Culinary apparatus	A. O. Schuckman	400,255	Mar. 26	2196	577	46	1587
Culinary vessel	F. J. Torrance	397,098	Jan. 29	2704	699	46	563
Cultivator	C. E. Atkinson	397,484	Feb. 12	581	151	46	697
Cultivator	R. H. Avery	400,388	Mar. 26	2400	628	46	1625
Cultivator	L. B. Berrien	400,389	Mar. 26	2402	629	46	1625
Cultivator	W. F. Berry	396,853	Jan. 29	2356	604	46	493
Cultivator	J. C. Bird	395,475	Jan. 1	249	65	46	53
Cultivator	W. A. Dutton and C. J. Meek	397,842	Feb. 12	1122	300	46	800
Cultivator	W. H. Fuller	397,075	Jan. 29	2672	691	46	556
Cultivator	C. H. Gage	399,959	Mar. 5	214	59	46	1155
Cultivator	J. G. Gaither	399,868	Mar. 19	1629	422	46	1467
Cultivator	F. E. Griswold	396,041	Feb. 19	1426	377	46	874
Cultivator	J. B. Himes	397,185	Feb. 5	132	36	46	602
Cultivator	F. B. Jones	395,329	Jan. 1	39	10	46	10
Cultivator	E. Landes	399,757	Mar. 19	1460	376	46	1434
Cultivator	A. Lewis	399,910	Mar. 19	1669	433	46	1479
Cultivator	J. F. Packer	396,364	Jan. 15	1614	413	46	330
Cultivator	W. H. Parlin	398,177	Feb. 19	1618	429, 430	46	911
Cultivator	J. A. Pearce	399,628	Mar. 12	1269	326	46	1384
Cultivator	A. G. Powers	396,833	Jan. 29	2330	597	46	487
Cultivator	W. B. Roberts	398,654	Feb. 26	2331	619, 620	46	1060
Cultivator	J. R. Romine	396,712	Jan. 22	2140	547	46	439
Cultivator	E. H. Spencer	397,253	Feb. 5	221	58	46	618
Cultivator	A. C. and J. D. Tower	399,296	Mar. 12	770	200	46	1290
Cultivator	J. G. Trump	396,927	Jan. 22	2020	519	46	417
Cultivator	W. Waring	398,678	Feb. 26	2369	609	46	1067
Cultivator	T. S. Warner	397,404	Feb. 5	449	120	46	664
Cultivator	T. E. Carter	397,632	Feb. 12	826	216	46	741
Cultivator and harrow	E. D. Carter	398,701	Feb. 26	2398	637	46	1073
Cultivator and planter. Combined	H. H. Taylor	396,441	Jan. 22	1735	445	46	363
Cultivator and pulverizer	B. Wagner	397,403	Feb. 5	449	120	46	664
Cultivator attachment	H. M. Rose	396,895	Jan. 29	2420	622	46	507
Cultivator. Disk	J. W. Brown	396,805	Jan. 29	2294	587	46	478
Cultivator for listed corn	K. Voigt	399,800	Mar. 12	779	202	46	1292
Cultivator. Hand	H. C. Hart	396,277	Jan. 15	1480	375	46	306
Cultivator-shovel. Adjustable	J. C. Bird	397,962	Feb. 19	1286	343	46	848
Cultivator-tooth	C. Rebmann	395,567	Jan. 1	429	109	46	86

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Cultivator. Wheel	E. R. Conklin	396,468	Jan. 22	1779	455, 456	46	371
Cultivator. Wheel	W. Waring and J. C. Bird	398,677	Feb. 26	2367	620	46	1067
Cultivators. Spring-tooth for	H. Gale	395,562	Jan. 1	388	98	46	80
Cup: *See* Oil-cup.							
Cupboard. Knockdown	S. V. Merriman	398,422	Feb. 26	1997	524	46	994
Curb and gutter. Combined	A. G. Parkhurst	398,074	Feb. 19	1473	389	46	863
Curd-mill	R. H. Casewell	398,280	Mar. 5	95	26	46	1122
Current-motor	E. Sackow	397,097	Jan. 29	2700	698	46	562
Currents. Regulating and motive device for alternating	E. Thomson	397,616	Feb. 12	805	210	46	737
Curry-comb	W. R. Davis	398,290	Mar. 5	13	4	46	1116
Curry-comb	H. McPherson	397,936	Feb. 19	1235	331	46	840
Curry-comb	W. Rauseweiler	398,001	Feb. 19	1357	360	46	861
Curry-comb	J. Emmert	399,857	Mar. 19	1617	418	46	1464
Curtain attachment	J. Steinhagen	398,859	Mar. 5	61	17	46	1126
Curtain-fixture	D. D. Nolley and R. L. Wyatt	399,773	Mar. 19	1484	383	46	1439
Curtain-holder	C. W. Lawrence	400,348	Mar. 26	2246	612	46	1614
Curtain-pole ring	J. Day	397,419	Feb. 5	479	125	46	670
Curtain-ring	A. Sweetland	399,448	Mar. 12	991	258	46	1333
Curtain-roller	E. Hartung	397,361	Feb. 5	383	101	46	650
Cut-off and governor	C. Fox	399,191	Mar. 5	611	159	46	1232
Cut-off and reversing-gear for engines	E. Cawthorne	397,416	Feb. 5	473	124	46	669
Cut-off for cistern-pipes. Automatic	J. F. Allen	395,376	Jan. 1	103	27	46	23
Cut-off governor	D. W. Roland	395,998	Jan. 8	1060	275	46	222
Cut-off. Rain-water	F. R. Kaldenberg	396,091	Jan. 15	1217	308	46	257
Cutlery-handle							
Cutter: *See* Band-cutter. Butter-cutter. Button-hole cutter. Cake, biscuit, and doughnut cutter. Cigar-cutter. Corn-cutter. Feed-cutter. Fodder-cutter. Glass-cutter. Meat-cutter. Paper-cutter. Root-cutter. Sod-cutter. Stalk-cutter. Strawberry-vine cutter. Wall-paper cutter. Weed-cutter.							
Cutter-head	C. Sullivan	400,371	Mar. 26	2374	621	46	1620
Cutter-head	J. P. Thurman	396,626	Jan. 22	2020	519	46	417
Cutting apparatus. Endless	A. Clark, R. A. and C. Ashley	397,294	Feb. 5	184	49	46	611
Cutting device. Electrically-operated	R. Thayer	395,524	Jan. 1	327	83	46	69
Cutting-tools of a rotary head. Means for imparting a radial movement to the	P. A. Whitney	398,481	Feb. 26	2077	546	46	1010
Cylinder engine. Multiple	C. C. Abbe	396,451	Jan. 22	1747	448, 449	46	365
Dam. Movable	A. M. Scott	398,068	Feb. 19	1487	393, 394	46	886
Dampening-machine	J. M. Johnston	398,333	Feb. 19	1656	489	46	950
Damper. Automatic	G. H. Crowell	395,382	Jan. 1	115	29	46	26
Danger-signal. Automatic	J. Hahn	397,546	Feb. 12	672	175	46	713
Decorating surfaces	T. Robinson	396,116	Jan. 15	1246	.....	46	263
Decoy	S. Curlin	395,612	Jan. 1	462	117	46	95
Delineator	D. K. Wade	395,724	Jan. 8	645	165	46	139
Dental articulator	R. S. Hayes	396,566	Jan. 22	1927	496	46	398
Dental chair	Z. B. Moorman	396,828	Jan. 29	2321	594, 595	46	485
Dental disk-holder	H. H. Siesen	399,350	Mar. 12	858	228	46	1306
Dental engine	J. S. Campbell	397,169	Feb. 5	106	27	46	597
Dental engine	J. H. Kidder	397,556	Feb. 12	690	179, 180	46	716
Dental engine	I. G. Lock	397,990	Feb. 19	1332	355	46	856
Dental plates by electro-deposition. Making	J. G. Ward	397,320	Feb. 5	331	86	46	640
Dental plunger	J. D. Wilkens	395,604	Jan. 1	452	116	46	93
Dental rubber	G. Walker	395,600	Jan. 1	447	114	46	92
Dental tool. Combination	J. J. R. Patrick	399,071	Mar. 5	388	104	46	1169
Dental tooth-regulating screw	E. H. Angle	399,177	Mar. 5	596	150, 151	46	1228
Dentist's lathe	N. W. Holt	399,406	Mar. 12	941	243	46	1322
Denture. Artificial	G. Walker	395,601	Jan. 1	448	114	46	92
Desk	H. L. Thompson	398,095	Feb. 19	1495	396	46	866
Desk and seat. School	G. Hamel	400,078	Mar. 26	1931	504	46	1534
Desk and type-writer cabinet. Combined	C. N. Leonard	400,233	Mar. 26	2161	567	46	1581
Desk attachment	A. W. Potter and T. J. McConnon	396,665	Jan. 22	2071	532	46	427
Desk. Lap	H. A. Starkey	398,669	Feb. 26	2354	624	46	1064
Desk or secretary. Writing	F. Hammond	398,391	Feb. 26	1952	513	46	985
Desk. School	W. Lippincott	399,272	Mar. 12	734	191	46	1282
Detachable handle	D. Philbrick	400,360	Mar. 26	2364	617	46	1618
Dial. Time-piece	M. V. B. Ethridge	395,696	Jan. 8	607	153	46	131
Diamonds in cutting-tools. Securing	H. Keller	398,053	Feb. 19	1444	392	46	877
Die: *See* Hammer or like die. Heel-cutting die. Horizontally-divided die. Screw-cutting die.							
Die machine. Rolling	W. H. Johnson	396,361	Jan. 15	1610	412	46	330
Die-stock	A. W. Bartholomew	395,696	Jan. 8	593	149	46	129
Digger: *See* Potato-digger.							
Dining-table. Rotary	D. Johnson	396,089	Jan. 15	1214	307	46	257
Direct-acting engine	G. A. Barth	397,166	Feb. 5	99	26	46	596
Direct-acting engine	G. A. Barth	397,959	Feb. 19	1282	342	46	848
Direct-acting engine	G., F. R., G. H., H. O., and C. S. Jones	399,753	Mar. 19	1452	369	46	1462
Dish. Covered	I. Holsmark	395,393	Jan. 1	130	33	46	29
Dish-drainer	W. Butts	397,533	Feb. 12	649	170	46	709
Dish-washer	W. D. Miller	399,426	Mar. 12	964	251	46	1327

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Dish-washer	S. Wilks	398,760	Feb. 26	2489	660	46	1091
Dish washer and drainer	U. B. Smith	396,516	Jan. 22	1849	474	46	384
Dishes, &c. Machine for washing	G. W. B. Crees	397,783	Feb. 12	1044	278, 279	46	784
Display-frames. Rest for	R. Faries	398,886	Mar. 5	101	28	46	1133
Distilling petroleum	G. H. Perkins	399,073	Mar. 5	389	105	46	1189
Ditching and grading machine	D. D. Kuhlman	398,786	Feb. 26	2524	670, 671	46	1098
Ditching-machine	U. Blickensderfer	396,391	Jan. 22	1652	425	46	346
Ditching machine. Tile-	R. E. Nevin	397,997	Feb. 19	1342	358	46	858
Divider-shoe	C. W. Love	397,809	Feb. 12	1077	287	46	790
Dividing-engine	J. B. Faucette	398,504	Feb. 26	2107	555	46	1015
Dock. Floating dry-	C. Brown and T. Biddlecombe	398,223	Feb. 19	1683	445	46	924
Dolls and busts. Manufacturing	J. Kubelka	397,463	Feb. 5	549	144	46	683
Door-check	O. T. Baker	398,763	Feb. 26	2493	660	46	1092
Door-check	F. A. Hoover	396,488	Jan. 22	1810	464	46	377
Door-check	J. J. Krom	395,751	Jan. 8	685	175	46	146
Door-check	J. Maish	396,219	Jan. 15	1404	358	46	293
Door-check	B. A. Mitchell, Jr	397,380	Feb. 5	412	109	46	655
Door-check	F. Parsons	398,439	Feb. 26	2014	528	46	997
Door-check	C. A. Pratt	396,429	Jan. 22	1717	441	46	359
Door-check	C. R. King	397,726	Feb. 12	958	255	46	767
Door-check and alarm. Combination	R. Adams	397,326	Feb. 5	336	88	46	641
Door-check. Pneumatic	P. Scheer and J. G. States	398,978	Mar. 5	250	69	46	1162
Door handle. Sliding-	R. Clarke	395,693	Jan. 8	604	152	46	131
Door-hanger	L. Terry	396,346	Jan. 15	1580	409	46	324
Door-hanger	G. Weickum	400,278	Mar. 26	2233	585	46	1593
Door-hanger	S. Shreffler, Jr	396,772	Jan. 22	2244	574	46	468
Door-hangers. Track for	C. B. Beers	396,723	Jan. 22	2158	554	46	451
Door-lock. Electrically-operated	G. J. Ferguson	395,319	Jan. 1	19	5, 6	46	6
Door-lock. Recording	S. Toffler	397,402	Feb. 5	448	119	46	663
Door-mat	C. F. Hemenway	397,498	Feb. 12	600	155, 156	46	699
Door opening and closing device	E. Y. Moore	397,560	Feb. 12	698	181	46	718
Door. Shielded sliding	E. Bender and E. Stevens	400,041	Mar. 26	1878	489	46	1524
Door-spring	J. H. Davis	395,383	Jan. 1	116	29	46	26
Door-spring	P. E. Ayton and S. Hill	398,996	Mar. 5	282	78	46	1169
Door spring and check	J. L. Hall	398,611	Feb. 26	2256	599	46	1045
Doors, &c. Means for fastening movable bars or bolts in	G. H. Maetzel	396,584	Jan. 22	1957	504	46	404
Doors. Strengthening and locking appliance for	W. J. Owens	395,917	Jan. 8	953	245	46	197
Draft. Check-	A. G. Brown	395,674	Jan. 8	896	230	46	187
Draft-equalizer	J. R. Davis	397,343	Feb. 5	363	95	46	647
Draft-equalizer	J. P. McDowell	399,766	Mar. 19	1474	380	46	1437
Draft-equalizer	E. Sebenck	396,609	Jan. 22	1995	513	46	411
Draft-equalizer	F. Sheridan	396,617	Jan. 22	2007	516	46	414
Draft-equalizer	J. W. Gamble	399,982	Mar. 19	1789	464	46	1498
Draft-evener	M. Schneider	399,065	Mar. 5	448	110	46	1192
Draft-regulating device for stoves or furnaces	G. E. Dixon	397,173	Feb. 5	110	28	46	598
Draft-regulator. Automatic	S. Hoadley	397,500	Feb. 12	604	156	46	700
Drafting-instrument	J. R. Goodman	396,960	Mar. 5	216	59, 60	46	1155
Drag and harrow	J. Shaw, Sr	399,443	Mar. 12	984	256	46	1331
Drainage-trap	G. Bower	395,419	Jan. 1	164	42	46	35
Drawer. Furniture-	D. C. Clapp	399,598	Mar. 12	1230	317	46	1376
Drawer. Furniture-	W. Horrocks	399,752	Mar. 19	1451	373	46	1432
Drawer-guide	C. L. Dayton	398,238	Feb. 19	1709	451	46	929
Drawer-pull	G. S. Pearson	398,181	Feb. 19	1694	431	46	912
Drawer-pull	E. H. Peck	398,183	Feb. 19	1697	431	46	912
Drawer-pull	E. C. Roberts	397,567	Feb. 12	708	183	46	720
Drawer. Tilting	D. K. Wade	398,965	Mar. 5	73	20	46	1128
Drawing apparatus	C. Sperry	397,147	Feb. 5	69	17	46	591
Drawing-board and mechanical ruler. Rotatable	T. C. Henley	397,427	Feb. 5	491	128, 129	46	673
Drawing board or table	M. C. Chambers	398,220	Feb. 19	1693	448	46	926
Drawing-press	J. Edwards	399,251	Mar. 12	703	183, 184	46	1277
Dredging-machine	M. Herron	397,985	Feb. 19	1327	354	46	855
Dredging-machines. Chute for	N. B. Cushing	396,921	Jan. 29	2454	631, 632	46	513
Dredging-scoop	F. W. Brown	399,181	Mar. 5	592	152	46	1228
Dress-form	F. W. Brown	400,297	Mar. 26	2361	591, 592	46	1598
Dress-form	W. A. Johnson	397,986	Feb. 19	1328	354	46	856
Dress-form. Inflatable	A. M. Gelwicks	399,322	Mar. 12	811	210	46	1297
Dress-shields. Apparatus for manufacturing seamless	F. W. Smith, Jr	399,637	Mar. 12	1284	329, 330	46	1386
Dress-supporting steel	M. E. Whalen	396,184	Jan. 15	1349	346	46	283
Drier: *See* Brick-drier. Clothes-drier. Fruit-drier.							
Drier	A. J. Hatch	396,562	Jan. 22	1919	495	46	397
Drill: *See* Mining-drill. Radial drill. Rail-drill. Ratchet-drill. Rock-drill. Seed-drill.							
Drill	E. L. Frantz	399,142	Mar. 5	526	137	46	1216
Drill-head	W. R. Wright	397,769	Feb. 12	1018	271	46	779
Drills. Adjusting and supporting device for	G. E. Foster	396,866	Jan. 29	2372	608	46	497
Drilling and centering tool	J. E. Ketchem	395,833	Jan. 8	826	214	46	173
Drilling-machine	W. P. Dallett	397,701	Feb. 12	923	244	46	760
Drilling-machine	F. Schoff	397,311	Feb. 5	308	81	46	635
Drilling-machine	C. M. Woolworth	396,018	Jan. 8	1106	289	46	227
Drilling-machine. Multiple	R. Hammond	398,962	Mar. 5	222	61, 62	46	1156

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Drilling-machines. Automatic feed-stopping device for	W. Lodge and C. Davis	396,499	Jan. 22	1826	469	46	381
Drilling-machines. Feed attachment for	M. Schwärsler	395,592	Jan. 1	437	111	46	90
Drinking-fountain and show-stand	C. Ehrhardt	398,591	Feb. 26	2231	589	46	1040
Driving mechanism for machinery. Variable	E. F. Autenrieth	395,471	Jan. 1	243	62, 63	46	53
Driving mechanism. Frictional	H. Parsons	395,507	Jan. 1	296	76	46	63
Drum or radiator. Heating	N. H. Barnes	398,115	Feb. 19	1532	406	46	894
Drums. Snare-strainer for	E. E. Fry	399,396	Mar. 12	994	240	46	1319
Dumb-waiters. Mechanism for operating	G. M. Emerick	397,228	Feb. 5	190	50	46	612
Duplicating manuscripts, &c. Apparatus for	C. A. Thompson	398,471	Feb. 26	2054	540	46	1005
Dust-collector	E. Bretney	397,048	Jan. 29	2631	678	46	549
Dust-collector	E. Bretney	400,391	Mar. 26	2407	630	46	1626
Dust-collector	A. Gessl	399,984	Mar. 19	1783	465	46	1499
Dust-collector	J. G. Mundy	398,788	Feb. 26	2588	671	46	1099
Dust-collector	T. Watson	399,713	Mar. 19	1395	359	46	1422
Dust-collector	J. H. Weeks	395,801	Jan. 8	779	202	46	162
Dust-collector	R. F. Bailey	398,997	Mar. 5	283	78	46	1169
Dust-pan	P. A. Spicer	396,669	Jan. 22	2075	533	46	427
Dust-pan	P. A. Spicer	396,669	Jan. 22	2076	533	46	428
Dye	S. M. Neville	396,417	Jan. 22	1693	.....	46	354
Dye. Making a brown	J. Strasburger	399,581	Mar. 12	1206	.....	46	1372
Dye. Making a yellow	J. Walter	398,990	Mar. 5	273	.....	46	1167
Dye-stuff. Orange azo	C. Rudolph and B. Prieba	395,634	Jan. 1	511	.....	46	102
Dye-stuff. Tetrazo	C. Rudolph	396,293	Jan. 15	1507	.....	46	311
Dye-stuffs or coloring-matters. Manufacture of	F. Bayer	395,474	Jan. 1	248	.....	46	53
Dye-stuffs. Printing of indoline	G. Grün	396,692	Jan. 29	2112	.....	46	434
Dyeing-machine	T. Wolstenholme	397,491	Feb. 5	571	148	46	686
Dyke	H. C. Weeke	396,446	Jan. 22	1739	447	46	363
Dynamite	J. Waffen	396,559	Feb. 26	2182	.....	46	1030
Dynamite. Preparing	G. E. F. Grüne	397,285	Feb. 5	373	.....	46	628
Dynamo	R. L. Cohen	397,340	Feb. 5	359	94	46	646
Dyname-machine	G. L. Du Laney	399,320	Mar. 12	808	209	46	1297
Dynamo-stations. Switch-stand for	R. E. Stewart	400,139	Mar. 26	2014	527	46	1551
Dynamos and motors. Coupling of	O. P. Loomis	396,581	Jan. 22	1953	504	46	403
Dynamos. Coupling	O. P. Loomis	396,580	Jan. 22	1951	503	46	403
Dynamos. Regulation of	E. W. Rice, Jr	397,613	Feb. 12	802	209	46	737
Ear-jewel	G. W. Washburn	396,788	Jan. 29	2263	578	46	472
Ear-protector	R. Cohn	397,583	Feb. 12	739	192	46	725
Ear-ring	L. F. Brooks	398,126	Feb. 19	1545	410	46	897
Ear-ring	L. Krug	397,433	Feb. 5	502	132	46	675
Ear-ring or other jewelry	A. Luthy	398,787	Feb. 26	2586	671	46	1099
Earth. Apparatus for raising and moving	H. A. Carson	399,970	Mar. 19	1773	459	46	1495
Easel	C. Marks	396,362	Jan. 15	1612	412	46	330
Easel and attachable rest. Artist's	J. A. Johnson	396,658	Jan. 22	2062	529	46	425
Eaves-trough hanger	W. Stine	398,468	Feb. 26	2050	539	46	1004
Eccentric. Reversible	W. W. Lockwood	400,095	Mar. 26	1951	510	46	1538
Edge-setting machine	J. E. Drake	398,863	Mar. 5	98	27	46	1132
Edge-trimmer for grass borders	C. Everding	397,843	Feb. 12	1123	300	46	800
Edger. Gang-	H. C. Robb	399,931	Mar. 19	1730	444, 445	46	1485
Effervescing or gaseous liquids from corked receptacles. Apparatus for withdrawing	W. J. Payne	396,708	Jan. 22	2133	546	46	436
Egg-beater	F. W. Hudson	398,258	Feb. 19	1737	458	46	935
Egg-beater	J. J. McDowell	397,655	Feb. 12	861	225	46	748
Egg-count register	A. F. Harrison	400,082	Mar. 26	1937	506	46	1536
Egg-crate	M. F. Smith and T. L. Firestone	399,215	Mar. 5	649	169	46	1239
Egg or cake beater	R. S. Charles	397,731	Feb. 12	1106	296	46	797
Egg-poacher	W. H. Littleton	399,422	Mar. 12	980	250	46	1336
Egg-tester	N. Court	398,236	Feb. 19	1707	450	46	929
Ejector and injector. Combined	P. P. Hogue	400,342	Mar. 26	2337	610	46	1612
Elastic composition	J. Hunter	395,304	Jan. 1	131	.....	46	49
Elastic strap	L. Stein	400,266	Mar. 26	2217	581	46	1590
Electric battery	C. F. Heinrichs	396,670	Jan. 29	2379	610	46	499
Electric battery	C. F. Heinrichs	396,671	Jan. 29	2381	611	46	499
Electric battery	E. A. Sperry	397,945	Feb. 19	1262	336	46	844
Electric battery	W. A. Conner	395,546	Jan. 1	356	91	46	74
Electric cable	J. J. Carty	399,377	Mar. 12	898	234	46	1313
Electric circuit	S. C. C. Currie	398,769	Feb. 26	2500	663, 664	46	1094
Electric-circuit coupler	A. C. Griggs	399,326	Mar. 12	815	211	46	1298
Electric-circuit coupling	L. E. Leconitre	399,057	Mar. 5	368	99	46	1185
Electric-circuit interrupter	W. B. Harvey	399,400	Mar. 12	932	242	46	1321
Electric-circuit protector	C. C. Stirling	398,288	Feb. 19	1789	472, 473	46	946
Electric circuits. Automatic ground-detector for	O. P. Loomis	396,582	Jan. 22	1954	504	46	404
Electric circuits. Automatic safety cut-out for	G. T. Woods	395,533	Jan. 1	338	85	46	71
Electric circuits. Safety device for use in	A. C. Cockburn	395,421	Jan. 1	166	42	46	35
Electric communicating system	A. G. Holcombe	397,364	Feb. 5	388	102, 103	46	651
Electric conductor	A. A. Brooks	399,926	Mar. 19	1574	408	46	1456
Electric conductors. Insulator-support for	L. Daft	396,196	Jan. 15	1362	349	46	285
Electric conductors. Support for aerial	H. H. Cutler	395,814	Jan. 8	800	209	46	167
Electric converter	L. Gutmann	397,461	Feb. 5	546	143	46	682
Electric converter	L. Gutmann	397,910	Feb. 19	1217	325	46	836
Electric-current indicator	W. A. Carey	397,966	Feb. 19	1292	345	46	849
Electric-current regulator	J. W. Balet	396,926	Mar. 5	161	42, 43, 44	46	1144
Electric-current regulator	J. W. Balet	398,927	Mar. 5	170	44	46	1145
Electric currents. Equaliser for	S. Bergmann	398,121	Feb. 19	1538	408	46	896
Electric cut-out	W. H. S. Wright	398,566	Feb. 26	2192	578	46	1032
Electric cut-out. Automatic	E. R. Knowles	396,940	Jan. 29	2482	640	46	519
Electric cut-out device	J. C. Chamberlain	396,920	Jan. 29	2452	630	46	513
Electric discharge device	R. Belfield. (Reissue)	10,966	Feb. 19	1915	504	46	970

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Electric distributing system. Detecting grounds in an	E. M. Bentley	400,181	Mar. 26	2082	544, 545	46	1566
Electric distribution by storage-batteries	S. C. C. Currie	400,395	Mar. 26	2413	632	46	1627
Electric-generator brush	R. Eickemeyer	397,492	Feb. 12	501	153	46	698
Electric generator. Magneto-	N. B. Ginochio	400,327	Mar. 26	2311	604	46	1608
Electric generators and motors. Prevention of sparking in	D. Higham	399,402	Mar. 12	936	242	46	1321
Electric generators. Combination of	E. W. Rice, Jr.	396,602	Jan. 22	1981	516	46	408
Electric light and other electrical devices. Switch and cut-out for	O. S. Bussmann	397,109	Feb. 5	5	2	46	580
Electric-light carbon	H. S. Rheiner	397,754	Feb. 12	996	.....	46	774
Electric-light support	B. Schardt and G. Jones	399,756	Mar. 19	1506	389	46	1444
Electric lights. Sign for	E. A. Dubéy	395,317	Jan. 1	16	5	46	6
Electric-lighting system	J. A. Galvin	397,800	Feb. 19	1209	324	46	835
Electric-lighting system	W. L. Horne	400,214	Mar. 26	2131	558	46	1576
Electric-lighting systems. Regulator for incandescent	M. J. Wightman	395,936	Jan. 8	979	251, 252	46	202
Electric machine and motor. Dynamo-	F. J. Patten	397,439	Feb. 5	509	134, 135	46	676
Electric machine. Dynamo-	J. W. Balet	399,646	Mar. 19	1301	334	46	1402
Electric machine. Dynamo-	I. T. Dyer	396,355	Jan. 15	1591	403	46	326
Electric machine. Dynamo-	P. Grant	396,867	Jan. 29	2373	610	46	498
Electric machine. Dynamo-	D. Higham	399,403	Mar. 12	938	242	46	1321
Electric machine. Dynamo-	D. Higham	399,404	Mar. 12	938	243	46	1322
Electric machine. Dynamo-	R. M. Hunter	397,550	Feb. 12	677	177	46	714
Electric machine. Dynamo-	J. F. Kelly	395,622	Jan. 1	480	123	46	98
Electric machine. Dynamo-	J. F. Kester	397,007	Jan. 29	2572	665	46	537
Electric machine. Dynamo-	J. H. Robertson	399,213	Mar. 5	645	169	46	1238
Electric machine. Dynamo-	W. L. Silvey	399,088	Mar. 5	413	111, 112	46	1193
Electric machine. Dynamo-	W. L. Silvey	400,130	Mar. 26	2002	524	46	1549
Electric machine. Dynamo-	E. Thomson	399,800	Mar. 19	1529	395, 396	46	1447
Electric-machine regulator	A. J. Holt	396,932	Jan. 29	2472	637	46	517
Electric-machine regulator. Dynamo-	J. F. Kester	397,006	Jan. 29	2570	664	46	537
Electric-machine regulator. Dynamo-	J. F. Kester	399,147	Mar. 5	532	139	46	1217
Electric-machine regulator. Dynamo-	E. A. Sperry	398,668	Feb. 26	2350	624	46	1063
Electric machines and electric motors. Commutator for dynamo-	B. Heywood	399,329	Mar. 12	819	213	46	1299
Electric machines and electric motors. Prevention of sparking in dynamo-	D. Higham	399,401	Mar. 12	935	242	46	1321
Electric machines. Commutator for dynamo-	E. R. Knowles	396,942	Jan. 29	2484	640	46	520
Electric machines. Synchronizing device for dynamo-	C. Hoffmann	396,066	Jan. 15	1210	306	46	256
Electric machinery. Unipolar dynamo-	R. Eickemeyer	396,149	Jan. 15	1286	330	46	272
Electric meter	H. H. Cutler	397,538	Feb. 12	657	172	46	711
Electric meter	M. J. R. Jacquemier	396,403	Jan. 22	1673	429, 430, 431	46	350
Electric meter	E. F. H. H. Lauckert	399,336	Mar. 12	829	216	46	1301
Electric motor	E. H. Davis and R. Westervelt	400,311	Mar. 26	2281	597	46	1603
Electric motor	J. F. Denison	397,702	Feb. 12	924	244, 245	46	761
Electric motor	O. Lugo	399,059	Mar. 5	370	100	46	1185
Electric motor. Alternate-current	O. B. Shallenberger	398,457	Feb. 26	2037	535	46	1001
Electric motor. Alternate-current	O. B. Shallenberger	398,458	Feb. 26	2039	535	46	1002
Electric-motor regulator	R. S. Dobbie	400,315	Mar. 26	2288	599	46	1604
Electric-motor switch	A. H. Eddy	399,507	Mar. 12	1088	262, 263	46	1350
Electric motors. Automatic switch for	G. H. Whittingham	396,791	Jan. 29	2268	580	46	473
Electric motors. Commutator-brush carrier for	C. J. Van Depoele	396,314	Jan. 15	1535	387	46	316
Electric motors. Device for controlling	H. H. Blades	396,725	Jan. 29	2102	554	46	452
Electric motors. Friction-gear for	C. J. Van Depoele	399,950	Mar. 19	1745	450, 451	46	1490
Electric motors. Friction-gear for	C. J. Van Depoele	400,274	Mar. 26	2225	584	46	1592
Electric motors. Regulating-switch for	H. H. Blades	397,773	Feb. 12	1026	274	46	781
Electric motors. System of synchronizing	F. J. Patten	397,817	Feb. 12	1087	289, 290	46	792
Electric motors. System of synchronizing	F. J. Patten	398,794	Feb. 26	2535	674	46	1101
Electric regulator	F. C. Wagner	399,224	Mar. 5	660	172	46	1241
Electric switch	A. E. Andrews	397,826	Feb. 12	1100	294	46	795
Electric switch	L. W. Dillon	399,135	Mar. 5	512	134	46	1214
Electric switch	W. S. Hill	398,510	Feb. 26	2118	557	46	1017
Electric switch	H. T. Paiste	399,550	Mar. 12	1157	300	46	1363
Electric switch	F. A. Weller and A. F. Rietzel	398,566	Feb. 26	2183	575	46	1050
Electric switch	F. A. Weller and A. F. Rietzel	398,561	Feb. 26	2185	575	46	1051
Electric switch	E. R. Knowles	396,880	Jan. 29	2397	615	46	502
Electric switch or cut-out	J. Lynch	396,407	Jan. 22	1682	432	46	352
Electric-wire conduit	W. B. Mack	397,300	Feb. 5	297	76	46	633
Electric-wire conduit	W. L. Penney and T. Little	399,343	Mar. 12	838	218	46	1303
Electric wires or cables. Conduit for	E. H. Phipps	395,584	Jan. 1	425	108	46	88
Electric wires. Underground system of	H. B. Cobb	396,543	Jan. 22	1681	434	46	390
Electrical battery	W. Burnley	397,965	Feb. 19	1200	344	46	849
Electrical body-wear	J. V. Long	396,212	Jan. 15	1303	356	46	290
Electrical circuits. Connection of	W. W. Griscom and H. N. Wiedner	397,424	Feb. 5	485	127	46	672
Electrical circuits. Safety device for	W. J. Hammer	397,715	Feb. 12	941	250	46	764
Electrical circuits. Wiring-block for	O. P. Loomis	396,579	Jan. 22	1949	503	46	403
Electrical conductors. Junction-box for	W. M. Callender	397,221	Feb. 5	180	48	46	610
Electrical conductors. Junction-box for. System of	T. H. Hicks	399,534	Mar. 12	1127	292	46	1357
Electrical distribution by secondary batteries	F. King	399,755	Mar. 19	1454	375, 376	46	1433
Electrical distribution. Regulation for systems of	L. B. Stillwell	399,219	Mar. 5	655	171	46	1240
Electrical distribution. Regulator for systems of	L. B. Stillwell	399,218	Mar. 5	652	170	46	1239
Electrical distribution. System of	E. N. Dickerson, Jr	396,549	Jan. 22	1900	490	46	393
Electrical distribution. System of	E. W. Rice, Jr., and A. L. Rohrer	396,603	Jan. 22	1984	510	46	409

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Electrical distribution. System of	G. Westinghouse, Jr.	399,639	Mar. 12	1288	331	46	1388
Electrical instruments. Protector for	J. E. Crandall	397,418	Feb. 5	477	125	46	670
Electrical-machinery regulator	G. H. Condict	399,549	Mar. 12	1231	318	46	1376
Electrical switch	P. H. Brange	395,609	Jan. 1	458	117	46	94
Electrical switch	E. A. Sperry	396,439	Jan. 22	1732	445	46	362
Electrical treatment. Couch for applying	J. B. Schmals and J. B. Faulkner	399,024	Mar. 5	408	110	46	1192
Electro-dynamic machine	C. Coerper	396,269	Jan. 15	1468	373	46	305
Electro-magnetic transmitter	J. T. Williams	396,792	Jan. 29	2370	580, 581	46	474
Electrode for secondary batteries	E. M. Lang	398,409	Feb. 26	1977	.....	46	999
Electrode for secondary batteries	L. Paget	397,608	Feb. 12	798	208	46	736
Electrode. Secondary-battery	A. V. Meserole	399,274	Mar. 12	736	191	46	1283
Electrode. Therapeutical	L. T. Stanley	397,474	Feb. 5	561	147	46	695
Electrodes for secondary batteries. Preparing	L. Paget	397,607	Feb. 12	796	207	46	735
Electrodes. Forming secondary-battery	R. M. Hunter	397,235	Feb. 5	198	53	46	613
Electrodes. Insulating-support for secondary-battery	H. F. D. Cameron	395,311	Jan. 1	9	3	46	4
Electrotype or stereotype plates. Manufacture of	J. Dale	395,488	Jan. 1	260	69	46	57
Elevating and discharging apparatus	C. A. Morris	395,502	Jan. 1	289	75	46	61
Elevator: *See* Coal-elevator. Water-elevator. Hydraulic elevator. Water or liquid elevator. Rotary elevator.							
Elevator	W. B. Cabot and R. M. Bradley	398,699	Feb. 26	2395	636	46	1073
Elevator	M. Hanford	397,912	Feb. 19	1218	326	46	836
Elevator	W. E. Nickerson	397,746	Feb. 12	989	262	46	773
Elevator attachment	C. J. Lata	397,065	Jan. 29	2684	694, 695	46	559
Elevator-guard	O. C. Hayward	396,159	Jan. 15	1308	335	46	274
Elevator-indicator	J. M. Arnold	398,685	Feb. 26	2378	631	46	1069
Elevator-lubricator	H. O. Hooper	398,728	Feb. 26	2450	649	46	1083
Elevator safety attachment	P. B. Sullivan	396,965	Jan. 29	2515	648	46	526
Elevator safety attachment	W. E. Nickerson	398,972	Mar. 5	220	66	46	1160
Elevator speed-regulator	W. E. Nickerson	399,068	Mar. 5	384	103	46	1188
Elevators. Electrical appliance for stopping and starting	R. F. McFeely and H. V. Potter	399,341	Mar. 12	834	217, 218	46	1302
Elevators. Fluid speed-regulator for	W. E. Nickerson	396,107	Jan. 15	1237	314	46	261
Elevators. Fluid speed-regulator for	W. E. Nickerson	396,880	Jan. 29	2410	618	46	505
Elevators. Fluid speed-regulator for	W. E. Nickerson	396,949	Jan. 29	2491	642	46	521
Elevators. Fluid speed-regulator for	W. E. Nickerson	396,950	Jan. 29	2492	643	46	522
Elevators, &c. Grip device for	W. E. Nickerson	397,382	Feb. 5	414	109	46	656
Embalming-board	L. K. Smedes	397,384	Feb. 5	428	114	46	659
Embossing and ornamenting plastered walls and other surfaces.	A. Haberstroh	397,654	Jan. 29	2643	.....	46	551
Embossing canvas for decorating walls or other surfaces.	W. S. Morton	395,915	Jan. 8	951	245	46	197
Embossing plastic material. Making rolls for	H. McHugh	396,589	Jan. 22	1964	506	46	405
Embroidering-machine	E. Cornely	395,549	Jan. 1	360	92	46	75
Embroidery-frame	G. W. Cory	396,073	Jan. 15	1184	300	46	251
Emery-wheels. Tool for turning and shaping	J. D. Huntington	397,503	Feb. 12	608	157	46	701
Enameling bobbins, &c	L. Stone and A. O. Austin	398,670	Feb. 26	2356	625	46	1064
End-gate	W. H. Creed	398,237	Feb. 19	1707	451	46	729
End-gate	I. Cruzan	399,946	Mar. 12	697	181	46	1276
End-gate	F. S. Sears	395,852	Jan. 8	856	221	46	180
End-gate. Wagon	S. T. Elgin	397,789	Feb. 12	1051	280, 281	46	786
End-gate. Wagon	E. A. Waltz	400,022	Mar. 19	1847	480	46	1508
Engine: *See* Ammonia-vapor engine. Petroleum-engine. Pressure-engine. Beating-engine. Pulp-engine. Compound cabinet-engine. Pumping-engine. River-power engine. Dental engine. Road-engine. Direct-acting engine. Rotary engine. Dividing-engine. Steam-engine. Gas-engine. Steam or pneumatic engine. Hydraulic engine. Vibrating engine. Hydrocarbon-engine.							
Engine	J. A. Secor	398,456	Feb. 26	2033	534	46	1001
Engine-bed castings. Machine for finishing	G. H. Corliss	396,987	Jan. 29	2544	657	46	532
Engine cross-head. Steam-	J. J. Tonkin	397,318	Feb. 5	3[illegible]	85	46	639
Engine for marine propulsion	J. A. Secor	398,659	Feb. 26	2336	621	46	1060
Engine-frame	A. L. Ide	396,209	Jan. 15	1388	355	46	289
Engine indicators. Device for operating steam-	R. M. Beck	398,686	Feb. 26	2379	631, 632	46	1069
Engine-lubricating device	A. L. Ide	397,293	Feb. 5	283	73	46	630
Engine lubricator. Steam-	W. H. Craig	397,972	Feb. 19	1298	347	46	851
Engine regulator. Compound-	C. T. Main	397,507	Feb. 12	614	158, 159	46	702
Engine-shafts. Electric signal for	J. C. Ricketson	399,163	Mar. 5	569	146	46	1224
Engines. Attachment for compressed-air	A. Sauer	395,456	Jan. 1	221	56	46	47
Engines. Automatic pressure-regulator for the receivers of compound	J. T. Henthorn	395,828	Jan. 8	818	212, 213	46	178
Engines. Distributing motive fluid in compound	H. H. Westinghouse and F. M. Rites	395,935	Jan. 8	976	251	46	202
Engines. Stop mechanism for steam-	H. L. Carrier	398,314	Feb. 19	1928	483	46	954
Engines. Working hydrocarbureted-air	W. D. and S. Priestman	397,517	Feb. 12	631	164	46	706
Engraving machine. Wood-	W. W. Krutsch	398,336	Feb. 19	1860	491	46	959
Envelope	J. J. Cogan and E. A. Said	398,768	Feb. 26	2499	663	46	1094
Envelope and letter-sheet. Combined	C. L. Church	396,985	Jan. 29	2543	657	46	532
Envelope-blanks or sheets of paper for gumming or bordering. Appliance for spacing or fanning out	W. C. Pellatt	396,594	Jan. 22	1972	507	46	406
Envelope-machines. Gum-box for	F. H. Richards	396,711	Jan. 22	2139	547	46	439
Envelope machines. Gumming device for	A. Johnson	397,796	Feb. 12	1063	263	46	788

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Envelope-opener	J. Bird	397,333	Feb. 5	348	91	46	644
Envelopes or similar receptacles. Machine for making	G. Sickels, Jr	398,384	Feb. 19	1777	470, 471	46	944
Equalizer. Four-horse	A. C. Wilson	399,718	Mar. 19	1403	361	46	1423
Eraser. Ink	G. T. Smallwood	395,594	Jan. 1	442	112	46	91
Evaporating apparatus	M. Ams	399,311	Mar. 12	795	206	46	1294
Evaporating-pan	J. M. Duncan	396,331	Jan. 15	1561	395	46	321
Evaporator	H. Hill	397,916	Feb. 19	1223	327	46	837
Excavator	G. J. Stafford	395,854	Jan. 8	859	222	46	180
Excavator. Hydraulic	W. P. Rice	396,112	Jan. 15	1240	315, 316	46	202
Exercising apparatus	R. Reach	397,386	Feb. 5	418	111	46	657
Exercising apparatus	R. Reach	399,632	Mar. 12	1279	328	46	1385
Exercising apparatus	W. Sachs	399,699	Mar. 19	1374	354	46	1417
Exercising-machine	G. Gaertner	397,352	Feb 5	370	97	46	648
Exercising-machine	J. A. Kemmler	396,938	Jan. 29	2480	639	46	519
Exhaust. Regenerating	A. Sauer	396,713	Jan. 22	2142	548	46	439
Exhibiting or advertising device	E. Fletcher	398,602	Feb. 26	2244	594	46	1042
Expansion device	J. McCloskey	398,525	Feb. 26	2137	563, 564	46	1021
Expansion device	J. McCloskey	398,526	Feb. 26	2138	564	46	1022
Explosive charge. High-	J. W. Graydon	399,878	Mar. 19	1645	425	46	1470
Explosive charge. High-	J. W. Graydon	399,883	Mar. 19	1653	427	46	1472
Explosive energy to mechanical power. Machine or engine for the application of	G. C. Gillespie	396,739	Jan. 29	2192	561	46	458
Extractor: *See* Cork-extractor. Cream-extractor. Fish-hook extractor. Fruit-juice extractor. Grease-extractor. Pen-extractor. Stump-extractor.							
Eye-shade	T. H. Harrison	399,892	Mar. 19	1664	430	46	1474
Eyes. Machine for forming interlocking	R. Faries	397,175	Feb. 5	112	29, 30	46	598
Eyeglass-holder	H. J. Dale	396,144	Jan. 15	1281	328	46	271
Eyeglass-polisher	E. E. Thorpe	399,450	Mar. 12	993	259	46	1334
Eyeglasses	H. Borsch	396,264	Jan. 15	1462	372	46	304
Eyeglasses. Electro-magnetic attachment for	F. Fear	397,790	Feb. 12	1053	281	46	786
Eyeglasses to head-apparel. Means for attaching	W. H. Brownlow and J. S. Warner	395,611	Jan. 8	797	208	46	167
Eyelet	R. Brass	395,479	Jan. 1	254	66	46	54
Eyeleting-machine	H. S. Lytle	397,597	Feb. 12	766	200	46	730
Fabric: *See* Figured fabric. Fringe fabric. Knit fabric. Stiffening fabric. Wire fabric.							
Fabrics. Apparatus for brushing up designs on	C. H. Behnisch	397,064	Jan. 29	2654	683, 684	46	553
Fabrics. Machine for making compound	G. A. Fullerton	398,320	Feb. 19	1835	484	46	955
Fabrics. Ornamenting	M. L. Hiller	399,497	Mar. 19	1669	432	46	1475
Fan. Automatic	F. T. Busby and A. H. Snyder	398,311	Feb. 19	1822	481	46	953
Fan. Dining-table	D. J. Gregory	398,250	Feb. 19	1725	455	46	932
Fan. Folding	F. Sternheimer	398,092	Feb. 19	1492	395	46	887
Fan. Fortune-telling	W. McWillie	395,340	Jan. 1	53	13	46	13
Fan. Power	P. Murray, Jr	399,689	Mar. 19	1358	349	46	1413
Fan. Rotary	R. Godeffroy	395,620	Jan. 1	477	121, 122	46	97
Fare-box	T. L. Beaman	399,820	Mar. 19	1563	405, 406	46	1454
Fare box and register	G. G. Wagner	396,786	Jan. 29	2258	577	46	471
Fare-register	J. W. Meaker	397,601	Feb. 12	769	301, 302, 303	46	731
Fare-register	J. W. Meaker	397,602	Feb. 12	780	303, 304	46	733
Fare-register	J. W. Meaker	397,603	Feb. 12	786	304, 305, 306	46	734
Farm-gate	G. N. Ball	398,908	Mar. 5	285	78	46	1169
Farm-gate	I. Olsen	395,579	Jan. 1	417	108	46	86
Fastener	A. L. Colton	398,619	Mar. 5	13	3	46	1116
Faucet	C. O. Maddox	397,374	Feb. 5	403	106	46	654
Faucet. Bottle	F. Stefany	397,667	Feb. 12	879	231	46	752
Faucet. Measuring	R. M. and F. D. Green	397,854	Feb. 12	1136	304	46	903
Faucet. Measuring	E. S. Reed	400,251	Mar. 26	2193	576	46	1587
Feathers for dusters. Machine for preparing	J. J. Sands	398,850	Mar. 5	50	15	46	1123
Feathers. Ornamenting	O. Schenrer and A. Forest	395,358	Jan. 1	79	20, 21	46	18
Feed-cutter	E. W. Rose	400,117	Mar. 26	1967	520	46	1546
Feed-regulating mechanism	J. F. Winchell	397,045	Jan. 29	2627	677, 678	46	548
Feed-regulator	J. Dawson	399,187	Mar. 5	600	155, 156	46	1230
Feed-regulator	C. D. Patterson	398,746	Feb. 26	2472	655	46	1068
Feed-trough	A. C. Getten	399,258	Mar. 12	716	186	46	1279
Feed-trough	C. F. Harder	400,669	Mar. 26	1653	505	46	1535
Feed-trough	W. Hawkins	396,563	Jan. 22	1922	496	46	397
Feed-trough	M. V. B. Stevenson	395,855	Jan. 8	862	222	46	181
Feed-trough and hay-rack. Combined	C. E. Hanna	397,497	Feb. 12	599	155	46	699
Feed-water heater	J. L. Hunter	396,966	Mar. 5	231	64	46	1158
Feed-water heater	J. Kirkaldy	398,263	Feb. 19	1744	459, 460	46	936
Feed-water heater	E. J. Moore	398,645	Feb. 26	2314	613	46	1056
Feed-water heater	W. Noble	397,870	Feb. 12	1153	308	46	806
Feed-water heater	R. F. Pratt and C. D. Wainwright	395,347	Jan. 1	62	15	46	15
Feed-water heater and purifier	C. E. Ferreira	400,319	Mar. 26	2295	600, 601	46	1606
Feed-water heater and purifier	W. Webster	396,971	Jan. 29	2525	652	46	528

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Feed-water purifier	A. Heberer	395,779	Jan. 8	722	186	46	154
Feed-water purifier	F. V. Medynski	397,810	Feb. 12	1079	287	46	790
Feed-water purifier and heater	W. H. Smith	398,656	Mar. 5	58	16	46	1125
Feed-water regulator	J. P. Cushing	397,974	Feb. 19	1302	348	46	851
Feeding and watering poultry. Device for	M. French	395,490	Jan. 1	272	70	46	57
Feeding or other machines. Endless apron for	W. C. Bramwell	396,532	Jan. 22	1469	480	46	388
Fellies. Machine for the manufacture of	J. W. Dana	397,400	Feb. 19	1198	321	46	833
Felt-hardening machines. Cone or former for	J. and D. Pendergast	399,672	Mar. 5	389	105	46	1189
Fence	W. E. Arnett and G. M. Price	397,956	Feb. 19	1277	341	46	847
Fence	H. W. Barber	399,648	Mar. 19	1306	335	46	1403
Fence	W. W. Campbell	399,833	Mar. 19	1586	411	46	1458
Fence	J. B. Cleaveland	397,110	Feb. 5	7	2	46	580
Fence	B. Doud	396,735	Jan. 29	2187	560	46	457
Fence	C. F. Fowler	397,905	Feb. 19	1208	323	46	835
Fence	H. Ihnen	399,617	Mar. 12	1257	323	46	1382
Fence	J. C. Kemp	397,370	Feb. 5	397	105	46	653
Fence	R. B. McMullen	395,500	Jan. 1	286	74	46	60
Fence	J. P. Monnett	397,994	Feb. 19	1338	357	46	857
Fence	E. Potter	398,974	Mar. 5	242	67	46	1160
Fence	E. F. Shellsberger	399,930	Mar. 19	1731	447	46	1487
Fence	J. M. Sheriff	396,299	Jan. 15	1518	384	46	313
Fence	D. Warner	396,249	Jan. 15	1443	367	46	309
Fence	E. A. Wells	400,377	Mar. 26	2367	624	46	1622
Fence	W. M. Hyde	399,267	Mar. 12	728	189	46	1281
Fence. Constructing wire	A. Cowan	395,770	Jan. 8	708	182	46	151
Fence. Flood	F. A. Wiebrock	395,678	Jan. 1	577	145	46	117
Fence for intercepting insects	H. G. Cady	398,226	Feb. 19	1688	446	46	924
Fence-machine	G. J. Cline	398,377	Feb. 26	1934	509	46	981
Fence-machine	M. C. Henley	396,279	Jan. 15	1482	376	46	307
Fence-machine	G. W. Johnson	399,412	Mar. 12	948	245, 246	46	1324
Fence-machine	F. and M. Nicolai	397,814	Feb. 12	1063	289	46	791
Fence-machine	R. E. Rex	398,281	Feb. 19	1773	469	46	943
Fence-machine	J. Sornson	398,690	Feb. 19	1489	394	46	887
Fence machine. Picket	E. Ransom	395,586	Jan. 1	428	108, 109	46	88
Fence machine. Slat-and-wire	H. Snyder, H. Staples, and M. Barr	395,853	Jan. 8	858	222	46	180
Fence-making machine	W. A. Hawley	399,040	Mar. 5	347	93	46	1180
Fence-making machine	L. Pfister	398,796	Feb. 26	2538	675	46	1102
Fence-making machine	C. L. Stulting	400,369	Mar. 26	2372	620	46	1620
Fence. Portable	P. M. Miehler	397,511	Feb. 12	622	160	46	703
Fence-post	F. and W. J. Brogan	395,541	Jan. 1	349	89	46	73
Fence-post	W. H. Brown	398,698	Feb. 26	2394	636	46	1073
Fence-post	T. Dailey	399,021	Mar. 5	322	87	46	1176
Fence-post	A. C. Peterson	398,078	Feb. 19	1478	391	46	885
Fence-post	W. A. Prater	395,995	Jan. 8	1075	274	46	221
Fence-post	W. D. Stillman	395,800	Jan. 8	778	202	46	162
Fence-post	J. M. Terrell and C. Garver	397,039	Jan. 29	2080	676	46	547
Fence-post	J. G. Schiller	398,460	Feb. 26	2041	535	46	1002
Fence. Wire	W. Gent	395,802	Jan. 8	930	236	46	191
Fence-wire barbs. Forming	W. S. Barker	396,973	Jan. 29	2327	652	46	529
Fence-wire. Device for twisting	O. B. Sharp and I. J. Reed	395,359	Jan. 1	80	21	46	19
Fence-wire-laying machine	A. L. Thompson	395,525	Jan. 1	328	83	46	69
Fence-wire tightener and fastener	A. Baldwin and J. Clement	398,215	Feb. 19	1670	442	46	920
Fence-wire-winding machine	G. D. Coiner	399,383	Mar. 12	909	236	46	1315
Fences. Tension device for use in making	E. Hawes	400,663	Mar. 26	1938	506	46	1536
Fencing	L. W. Freeman	395,890	Jan. 8	916	235	46	190
Fencing. Machine for making wire	H. Rimmer	399,662	Mar. 5	403	109	46	1191
Ferric carbide. Purifying	R. L. Gottschald	396,637	Jan. 8	1128	287	46	231
Ferrules. Making	H. Endemann	396,274	Jan. 15	1475	.....	46	306
Fertilizer	P. Hogan	397,256	Jan. 29	2645	.....	46	552
Fertilizer-distributer	C. Greavee	399,399	Mar. 12	930	241	46	1320
Fertilizer-distributer	N. B. Spradley	400,136	Mar. 26	2010	526	46	1551
Fertilizer. Implement for dropping	B. Butler	396,351	Jan. 15	1568	402	46	326
Fertilizer. Phosphatic	W. J. Williams	395,539	Jan. 1	337	.....	46	71
Fiber from pine-needles. Making	W. Latimer	397,940	Feb. 5	204	54	46	614
Fiber or sliver. Machine for forming balls of	W. B. Lee	399,909	Mar. 19	1680	437	46	1479
Fiber ware. Treating	H. Carmichael	395,951	Jan. 8	1000	.....	46	207
Fibers. Machine for cleaning vegetable	T. Villamor	399,802	Mar. 19	1536	397	46	1448
Fibers or yarns. Treating	W. J. Williams	397,409	Feb. 5	456	.....	46	665
Fibrous plants. Machine for decorticating	R. H. Collyer	397,536	Feb. 12	653	171	46	710
Fibrous substances. Disintegrating	S. S. Boyce	396,981	Jan. 29	2538	.....	46	531
Fifth-wheel	W. T. Cheatham	396,265	Jan. 15	1461	378	46	304
Fifth-wheel	S. B. Cox and J. W. Anderson	396,810	Jan. 29	2299	588	46	490
Fifth-wheel	J. M. Girand	396,476	Jan. 22	1791	459	46	374
Fifth-wheel	J. M. Williams	398,669	Mar. 5	79	22	46	1129
Fifth-wheel. Vehicle	J. McCauley	397,730	Feb. 12	978	260	46	771
Fifth-wheel. Vehicle	H. W. Moore	398,434	Feb. 26	2008	527	46	996
Figured fabric	T. Taylor and J. Warburton	395,402	Jan. 1	229	58, 59	46	50
File-binder	M. F. Berry	398,574	Feb. 26	2202	580, 581	46	1634
File-box	M. E. Clinton	395,312	Jan. 1	10	3	46	4
File envelope. Stub	J. W. Cruikshank	396,074	Jan. 15	1184	300	46	251
File. Newspaper	H. A. Shearer	399,704	Mar. 19	1382	356	46	1419
File. Paper	M. E. Dayton	398,316	Feb. 19	1831	483	46	955
File. Paper	A. P. St. John	396,841	Jan. 29	2241	569	46	490
File. Record or other	F. J. Hosford	396,068	Jan. 15	1213	307	46	257
Filter	H. W. Grelle	399,031	Mar. 5	331	89	46	1178
Filter	H. Haefner	399,260	Mar. 12	719	187	46	1280
Filter	L. W. Mesingo and L. Stiers	396,227	Jan. 15	1496	390	46	309
Filter	A. Wilbur	399,957	Mar. 19	1756	454	46	1491
Filter and apparatus for automatically cleaning the same	G. H. Moore	395,625	Jan. 1	484	123, 124	46	98
Filter and cut-off. Water	W. C. Bayless and J. C. Nichols	398,218	Feb. 19	1675	443	46	922

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Filter-beds. Apparatus for accelerating the passage of liquids through	W. D. Bohm	400,185	Mar. 26	2067	546	46	1567
Filter. Bib-	N. Beauregard	396,799	Jan. 29	2224	584	46	476
Filter. Water-	J. Grant	399,875	Mar. 19	1642	424	46	1469
Filtering and filling liquids under pressure. Apparatus for	O. Zwietusch	398,109	Feb. 19	1515	402	46	892
Filtering apparatus	H. Gehrke and A. Wohlfahrt	399,983	Mar. 19	1700	464	46	1498
Filtering material	O. Zwietusch	398,110	Feb. 19	1521	403	46	893
Finger-pull. Coin-controlled	F. R. White	397,160	Feb. 5	80	22	46	595
Fire-alarm circuits. Coupling and automatic circuit-breaker for	J. J. Cannan	399,738	Mar. 19	1498	367	46	1426
Fire-arm. Breech-loading	P. Mauser	398,063	Feb. 19	1458	385	46	880
Fire-arm. Breech-loading	E. G. Parry	395,849	Jan. 8	852	220	46	179
Fire-arm. Breech-loading	L. H. Smith	399,214	Mar. 5	646	160	46	1238
Fire-arm. Breech-loading	R. M. Aughenbaugh and G. E. Ruffley	399,464	Mar. 12	1015	266	46	1338
Fire-arm. Magazine	W. M. Cooper and E. J. Cashmore	398,130	Feb. 19	1549	411	46	898
Fire-arm. Magazine	J. S. Blankman	395,944	Jan. 8	991	254	46	205
Fire-arm sight	E. J. Cutler	398,315	Feb. 19	1829	483	46	954
Fire-arm sight	P. Mauser	398,064	Feb. 19	1460	386	46	881
Fire-arms. Cartridge-ejector for breech-loading	W. Lyman	396,043	Jan. 8	1137	289	46	233
Fire-arms. Folding sight for	W. R. Miller	395,913	Jan. 8	948	244	46	196
Fire-arms. Hammer for	H. H. Grenfell	398,144	Mar. 5	528	138	46	1217
Fire-arms. Luminous sight for	M. H. McDowell	397,742	Feb. 12	982	261	46	772
Fire-back plate	H. Hartung	396,482	Jan. 22	1803	{461 462	46	576
Fire-bar	G. W. White	398,919	Mar. 5	150	39	46	1142
Fire-clay heater	J. Aitken	395,681	Jan. 8	583	147	46	127
Fire-escape	J. G. Berdrow and F. A. Pelkey	396,852	Jan. 29	2354	{603 604	46	493
Fire-escape	E. Delia	400,314	Mar. 26	2285	{598 599	46	1603
Fire-escape	C. Elsbury	396,552	Jan. 22	1902	490	46	393
Fire-escape	C. M. Fowler	398,826	Mar. 5	20	6	46	1118
Fire-escape	R. A. Beiss and E. Pettenkofer	395,455	Jan. 1	220	56	46	47
Fire-escape	J. D. Rüllmann	396,175	Jan. 15	1332	{342 343	46	279
Fire-escape	J. P. Simon	396,242	Jan. 15	1426	365	46	298
Fire-escape	W. J. Smith	399,709	Mar. 19	1389	358	46	1420
Fire-escape	J. W. Weaver	398,479	Feb. 26	2074	546	46	1009
Fire-escape	A. Welsh and H. J. Rogers	395,467	Jan. 1	235	60	46	51
Fire-escape	F. A. Westbrook	398,210	Feb. 19	1663	439	46	919
Fire-escape	J. White	398,992	Mar. 5	274	75	46	1167
Fire-escape	J. Kane	395,906	Jan. 8	939	241	46	194
Fire-extinguisher	H. J. Lutcher	396,216	Jan. 15	1400	357	46	291
Fire-extinguisher	J. M. Miller	398,643	Feb. 26	2310	613	46	1055
Fire-extinguisher	O. Pierce	395,756	Jan. 8	690	176	46	147
Fire-extinguisher	F. Grinnell	399,520	Mar. 12	1107	288	46	1354
Fire-extinguisher. Automatic	F. Grinnell	399,521	Mar. 12	1109	289	46	1354
Fire-extinguisher. Automatic	F. Grinnell	399,522	Mar. 12	1111	289	46	1354
Fire-extinguisher. Automatic	F. Grinnell	399,523	Mar. 12	1112	289	46	1355
Fire-extinguisher. Automatic	F. Grinnell	399,519	Mar. 12	1106	288	46	1354
Fire-extinguisher. Automatic	F. and R. W. Grinnell	399,518	Mar. 12	1105	288	46	1354
Fire-extinguisher. Automatic	J. F. Stuckert	395,856	Jan. 8	863	222	46	181
Fire-extinguishing apparatus, &c	J. E. Prunty	396,710	Jan. 22	2136	{506 507	46	438
Fire-kindler	J. Absterdam	397,576	Feb. 12	724	{187 188	46	722
Fire-kindler	E. R. Clough and F. Jones	397,606	Feb. 12	917	243	46	759
Fire-kindler	M. Reilly	400,252	Mar. 26	2195	576	46	1587
Fire-kindler	E. Zonker	399,463	Mar. 12	1014	266	46	1338
Fire-log. Fluid-burner	G. W. White	398,920	Mar. 5	151	40	46	1142
Fire-place back	D. Farmer	395,697	Jan. 8	610	153	46	131
Fire-proof building	R. S. Critchell	400,300	Mar. 26	2278	596	46	1602
Fire-proof curtain	L. E. Jenkins	397,648	Feb. 12	848	{221 222	46	746
Fires in railway-car stoves. Apparatus for extinguishing the	R. H. Gilmour and F. G. Kellogg	399,398	Mar. 12	928	241	46	1319
Fires. System and apparatus for extinguishing	C. Arbogast and J. W. Kunzler	396,385	Jan. 22	1644	423	46	345
Fish-hook	W. F. Brewster	395,480	Jan. 1	254	67	46	54
Fish-hook extractor	E. L. Post	400,112	Mar. 26	1977	517	46	1544
Fish-lines. Sinker for	J. E. Gage	399,866	Mar. 19	1627	421	46	1466
Fish-net guard	J. Myers	396,948	Jan. 29	2490	642	46	521
Fish-trap	J. E. Green	400,206	Mar. 26	2120	556	46	1574
Fish-weir	S. H. Harding	397,644	Feb. 12	841	219	46	744
Fishing-fly book	T. H. Chubb	399,597	Mar. 12	1229	317	46	1376
Fishing-lines. Float for	E. J. Hayes and J. T. Ochs	395,900	Jan. 8	932	240	46	193
Fishing-reel	J. P. Costigan	396,469	Jan. 22	1780	456	46	372
Fishing-reel	A. F. and W. Meisselbach	397,198	Feb. 5	149	39, 40	46	604
Fishing-reel	G. W. Prouty	396,956	Jan. 29	2564	645	46	524
Fishing-reel	J. Annin	396,909	Jan. 29	2440	627	46	510
Fishing-rod	C. S. Treadway	395,931	Jan. 8	970	249	46	201
Fishing-rod	H. Loftie	396,702	Jan. 22	2126	545	46	436
Fishing-rod case	J. C. Parker	396,767	Jan. 22	2132	546	46	437
Fishing-rods. Line-guide for	C. H. Washburn	399,588	Mar. 12	1213	313	46	1353
Flanging-machine	W. Thom	398,674	Feb. 26	2363	{627 628	46	1066
Flanging sheet-metal cylinders. Machine for	W. Thom	398,673	Feb. 26	2360	{626 627	46	1065
Flask: *See* Molders' flask.							
Flask-lock. Snap	M. B. Springer and J. C. Higgins	397,035	Jan. 29	2616	675	46	546
Flax, &c. Apparatus for scutching	J. McGrath and E. Manisty	398,171	Feb. 19	1610	{427 428	46	909
Flax. Retting	E. A. Hartshorn	396,158	Jan. 15	1307	.....	46	274
Floor-clamp	D. B. and F. S. Morrill	396,104	Jan. 15	1234	313	46	260

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Floor or wood covering. Inlaid	C. Butcher	396,917	Jan. 29	2449	629	46	512
Flooring or paving. Wood-block	M. Macleod	398,662	Feb. 19	1456	385	46	880
Flour and meal bin and sifter	J. B. Sweetland	395,639	Jan. 1	516	129	46	103
Flour-bin	F. Sanderson	399,785	Mar. 19	1505	389	46	1443
Flour-bin	C. Tangenberg	397,760	Feb. 12	1004	266	46	777
Flour-bolt	J. B. Allfree	396,851	Jan. 29	2352	{602 603	46	492
Flour-bolt	J. J. Faulkner	396,922	Jan. 29	2456	632	46	514
Flour-bolt	J. Thomas	397,761	Feb. 12	1005	266	46	777
Flour-chest	G. Kirchgraber	398,736	Feb. 26	2459	{651 652	46	1085
Flour holder and sifter	C. H. Marshall	397,737	Feb. 12	976	259	46	770
Flour. Machine for packing	S. T. Ayres	397,411	Feb. 5	465	{122 123	46	667
Flour-packer	H. A. Barnard	398,999	Mar. 5	286	78, 79	46	1169
Flour. Screen for bolting	O. P. Harford	399,616	Mar. 12	1255	332	46	1382
Flour. Self-raising	C. L. and C. C. Hills	395,747	Jan. 8	678	.....	46	145
Flower-beds. Border-plate for	I. L. Landis	397,732	Feb. 12	969	{257 258	46	769
Flower-stand	P. Bertrand	396,459	Jan. 22	1760	451	46	368
Flue-cleaner	J. T. Mead and J. Thomson	397,509	Feb. 12	619	159	46	702
Flue-cleaner	J. U. Wiler	398,481	Feb. 26	2079	547	46	1010
Fluid-meter	G. Westinghouse, Jr., and C. N. Dutton.	400,420	Mar. 26	2447	{641 642	46	1633
Fluid-releaser. Automatic	B. S. Molyneux	400,107	Mar. 26	1970	516	46	1542
Fluids and semi-fluids by means of compressed air. Forcing	S. H. Johnson and C. C. Hutchinson	399,904	Mar. 19	1608	470	46	1502
Flush-tank	J. Lawson	399,674	Mar. 19	1342	344	46	1409
Fly-paper	W. and O. Thum	395,640	Jan. 1	517	130	46	103
Fly-paper. Package of	E. F. Baker	400,035	Mar. 26	1868	485	46	1522
Flying-machine	R. J. Spalding	398,984	Mar. 5	259	71, 72	46	1164
Fodder-cutter	J. S. Wiesler	396,794	Jan. 29	2276	582	46	475
Fog-horn. Automatic	A. F. Baatz	398,367	Feb. 26	1919	505	46	979
Folding case or package	C. T. Heisel	397,914	Feb. 19	1222	326	46	837
Folding chair	J. F. Bittle	398,693	Feb. 26	2389	634	46	1071
Folding chair	J. A. Crandall	398,943	Mar. 5	192	52	46	1150
Folding chair	C. B. Demarest	396,271	Jan. 15	1470	374	46	305
Folding chair	L. Keller	399,049	Mar. 5	359	96	46	1183
Folding chair	H. O'Hare	400,357	Mar. 26	2350	616	46	1617
Folding chair. Automatic	H. H. Blake	400,183	Mar. 26	2084	545	46	1567
Folding convertible chair	D. E. Kempster	396,496	Jan. 22	1822	468	46	380
Folding table	J. Turner	399,221	Mar. 5	658	171	46	1241
Folding the edges of fabrics. Device for	J. R. Morrison	396,415	Jan. 22	1691	434	46	353
Food-warmers. Cup for	S. Clarke	399,741	Mar. 19	1434	369	46	1429
Foods. Preparation of peptonized	D. W. Chapman	397,222	Feb. 5	181	.....	46	610
Forging. Electric	E. Thomson	396,010	Jan. 8	1095	278	46	225
Forging. Machine for general	J. R. Blakeslee	395,906	Jan. 8	788	{204 205	46	164
Forging mechanism	F. W. Taylor	400,143	Mar. 26	2018	{528 529	46	1552
Fork: *See* Band-cutting fork. Hay or grain fork.							
Fork	F. L. Andrews	395,941	Jan. 8	967	253	46	204
Fork and spoon. Combined	D. P. Kisner	398,264	Feb. 19	1746	460	46	936
Fountain: *See* Drinking-fountain.							
Frame: *See* Bag-frame. Piano-action frame. Clothes-line frame. Roving-frame. Embroidery-frame. Screen-frame. Engine-frame. Sewing-machine quilting-frame. Harrow-frame. Harvester-frame. Stencil-frame. Lantern-frame. Traveling-bag frame.							
Frame-plates for rolling-stock. Apparatus for the manufacture of	S. Fox	397,178	Feb. 5	120	31, 32	46	600
Frame-plates for rolling-stock. Manufacture of	S. Fox	397,177	Feb. 5	118	31	46	599
Frame-plates. Manufacturing	S. Fox	397,179	Feb. 5	122	33, 34	46	600
Fringe fabric	W. W. Jacobs	399,332	Mar. 12	825	214	46	1301
Frog. Spring-	F. C. Weir	398,104	Feb. 19	1507	390	46	890
Fruit-assorter	F. N. Ellithorpe	399,509	Mar. 12	1050	284	46	1350
Fruit-box	J. S. Brown	396,138	Jan. 15	1274	330	46	269
Fruit-box	J. G. Letellier	398,739	Feb. 26	2462	653	46	1086
Fruit cleaner. Dried-	J. Harrell	395,621	Jan. 1	490	122	46	97
Fruit-drier	H. A. Crandell	398,584	Feb. 26	2218	586	46	1037
Fruit-drier	G. Stringer	398,469	Feb. 26	2052	539	46	1005
Fruit-driers. Rotary fan for	J. W. Cassidy	399,973	Mar. 19	1777	466	46	1496
Fruit-gatherer	J. G. Bradley	395,947	Jan. 8	995	{255 256	46	206
Fruit-gatherer	W. S. Brooks	397,334	Feb. 5	349	91	46	644
Fruit-grader	V. Rattan	399,779	Mar. 19	1491	384	46	1441
Fruit-juice extractor	J. A. Neichter	397,467	Feb. 5	554	145	46	684
Fruit-pitter	J. G. Briggs and F. Cavallaro	397,691	Feb. 12	912	{241 242	46	758
Fuel: Artificial	L. Wacks	398,810	Feb. 26	2552	.....	46	1106
Fuel-burner	H. H. Hull	398,729	Feb. 26	2451	649	46	1063
Fuel. Device for feeding	H. H. Campbell	395,739	Jan. 8	968	171	46	143
Fuel-feeding pipe	W. A. Wilcox	400,280	Mar. 26	2236	586	46	1594
Fulling apparatus	J. W. Millet	397,812	Feb. 12	1081	{287 288	46	791
Fulling-machine	J. W. Millet	397,813	Feb. 12	1082	288	46	791
Funnel and can-top. Combined	H. Greely	398,300	Feb. 26	1951	513	46	985

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Furnace: *See* Bagasse-furnace. Coking-furnace. Gas-furnace. Gas-generating furnace. Glass-pot furnace. Hot-air furnace. Open-hearth furnace. Rotary double-flame furnace. Slack-burning furnace. Slag-furnace. Smelting-furnace. Smoke-consuming furnace.							
Furnace	E. C. Condit	397,697	Feb. 12	918	243	46	759
Furnace	J. F. Durham	397,174	Feb. 5	111	29	46	598
Furnace	F. Harris	396,669	Jan. 29	2377	610	46	498
Furnace	J. P. Oliver	395,344	Jan. 1	58	15	46	14
Furnace and grate therefor	I. D. Smead	399,294	Mar. 12	767	199	46	1289
Furnace feed-pipes. Safety-gate for	C. C. Barbour	396,020	Jan. 8	1109	281	46	227
Furnace-filling barrow	T. Faller	399,393	Mar. 12	921	239	46	1318
Furnace for destroying refuse matter	W. H. Bliss	395,807	Jan. 8	792	205, 206	46	165
Furnace for heating metals	C. Payen	398,443	Feb. 26	2018	529, 530	46	998
Furnace for working zinc ores	L. Kleemann	399,995	Mar. 19	1810	470, 471	46	1502
Furnace-grate	A. C. Dakin	398,950	Mar. 5	199	53	46	1152
Furnace-grate	M. H. Moskovits	399,686	Mar. 19	1356	349	46	1413
Furnaces and like structures. Device for protecting	S. McClure and C. F. Phillips	397,376	Feb. 5	405	107	46	654
Furnaces. Compound graphitic hearth for metallurgic	C. J. Eames	396,992	Jan. 29	2552	659	46	533
Furnaces. Protecting the interior walls of	H. Roberts	398,450	Feb. 26	2026	532	46	999
Furnaces, &c. Rotary bottom or grate applicable to	W. J. Taylor	399,797	Mar. 19	1525	394	46	1447
Furniture-joint	C. P. McGimsey	396,568	Jan. 22	1963	505	46	405
Furrower, marker, and coverer	J. S. Watson and C. S. Ambruster	395,602	Jan. 1	449	115	46	92
Fuse for ordnance-shells. Electrical	J. W. Graydon	399,879	Mar. 19	1646	425	46	1470
Fuses. Circuit-closing device for electrical torpedo-	J. W. Graydon	399,876	Mar. 19	1643	425	46	1469
Gage: *See* Bevel-gage. Micrometer-gage. Printer's gage. Safety-gage. Saw-gage. Scratch-gage. Siding-gage. Stone-sawing-machine gage. Surface-gage.							
Galley. Self-locking	J. H. Youmans	397,264	Feb. 5	239	62	46	621
Galvanic battery	E. J. Colby	397,111	Feb. 5	9	2	46	560
Galvanic battery	E. D. Cross	397,969	Feb. 19	1295	346	46	850
Galvanic battery	E. D. Cross	398,132	Feb. 19	1553	412	46	899
Galvanic battery	P. R. de F. D'Humy	396,329	Jan. 15	1557	393, 394	46	390
Galvanic battery	C. E. Egan	397,116	Feb. 5	16	4	46	582
Galvanic battery	A. Imschenetzky	400,215	Mar. 26	2132	558, 559	46	1576
Galvanic battery	C. E. Kammeyer	400,088	Mar. 26	1943	508	46	1537
Galvanic battery	E. Liebert and S. A. Rosenthal	400,235	Mar. 26	2164	568	46	1582
Galvanic battery	B. Scheithauer	396,342	Jan. 15	1576	399	46	323
Galvanic battery	F. Shaw	400,126	Mar. 26	1998	523	46	1548
Galvanic battery	C. M. Thompson	397,526	Feb. 12	642	.....	46	708
Game	J. P. and J. W. Clarke	398,233	Feb. 19	1701	450	46	928
Game apparatus	T. B. Rogers and S. H. Bartlett	400,011	Mar. 19	1832	476	46	1506
Game apparatus. Musical	A. Schemmel	395,635	Jan. 1	512	128	46	102
Game. Mathematical	L. Martane	400,237	Mar. 26	2166	568	46	1582
Game-wheel	G. Wilkening	399,717	Mar. 19	1402	360	46	1423
Garbage box or receiver	W. H. Buckley, Jr.	398,579	Feb. 26	2212	585	46	1036
Garlic-separator	W. C. Ayers	396,678	Jan. 22	2088	537	46	430
Garment fastener and support	C. R. Hollis	398,046	Feb. 19	1433	380	46	875
Garment. Ventilated	J. S. Goldsmith	397,543	Feb. 12	668	174	46	712
Garments. Device for assisting in putting on	I. V. Ready	397,752	Feb. 12	994	264	46	774
Garments. Folding hanger for	G. H. Donaldson	395,884	Jan. 8	908	233	46	189
Gas and air mixer	H. J. Bell	400,175	Mar. 26	2072	542	46	1563
Gas and air mixer	H. J. Bell	400,176	Mar. 26	2074	543	46	1563
Gas and air mixer	H. J. Bell	400,177	Mar. 26	2075	543	46	1564
Gas and electric light fixture. Combined	J. C. Cassidy	399,497	Mar. 12	1066	278	46	1347
Gas and electric-light fixtures. Coupling for	R. Herman	396,039	Jan. 8	1130	287	46	231
Gas. Apparatus for separating liquids from natural	W. Moore	399,427	Mar. 12	965	251	46	1327
Gas. Apparatus for the manufacture of	J. D. Averell	398,306	Feb. 19	1813	479	46	951
Gas. Apparatus for the manufacture of	W. M. Cosh	400,060	Mar. 26	1903	495	46	1528
Gas. Apparatus for the manufacture of	J. C. Garvin and H. Moody	397,639	Feb. 12	835	218	46	743
Gas. Apparatus for the manufacture of	T. S. C. Lowe	396,338	Jan. 15	1570	398	46	322
Gas. Apparatus for the manufacture of	J. A. McCollum	395,449	Jan. 1	209	54	46	45
Gas. Apparatus for the manufacture of	H. C. Shields	399,067	Mar. 5	410	111	46	1192
Gas. Apparatus for the manufacture of	R. H. Smith	397,397	Feb. 5	436	116, 117	46	661
Gas-burner	W. P. Tibbens	399,948	Mar. 19	1742	450	46	1489
Gas-burner	C. B. Todd. (Reissue)	10,985	Feb. 12	1173	314	46	812
Gas-burner	F. White	399,104	Mar. 5	436	118	46	1197
Gas-burner. Atmospheric	H. J. Bell	396,255	Jan. 15	1451	369	46	302
Gas-burner. Atmospheric	H. J. Bell	396,256	Jan. 15	1452	370	46	302
Gas-burner. Atmospheric	H. J. Bell	400,168	Mar. 26	2065	540	46	1562
Gas-burner for billiard-tables	W. F. Folmer	397,904	Feb. 19	1206	323	46	834
Gas-burner. Incandescent	H. J. Bell	396,253	Jan. 15	1447	369	46	301
Gas-burner. Incandescent	H. J. Bell	396,254	Jan. 15	1449	369	46	302
Gas-burner. Incandescent	H. J. Bell	396,260	Jan. 15	1457	371	46	303
Gas-burner. Incandescent	H. J. Bell	400,166	Mar. 26	2063	540	46	1561
Gas-burner. Incandescent	H. J. Bell	400,169	Mar. 26	2066	541	46	1562
Gas-burner. Incandescent	F. D. Williams	396,316	Jan. 15	1538	388	46	316
Gas-burner. Regenerative	E. Fullford and H. T. Van Laun	400,072	Mar. 26	1922	501, 502	46	1532
Gas-burner. Regenerative	E. Fullford and H. T. Van Laun	400,073	Mar. 26	1924	502	46	1533

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Gas-burner. Regenerative	F. G. Johnson	398,404	Feb. 26	1957	517	46	988
Gas-burner. Regenerative	F. Siemens	399,290	Mar. 12	758	197	46	1267
Gas-burners. Air-regulating device for atmospheric	H. J. Bell	400,174	Mar. 26	2071	542	46	1563
Gas-burners. Automatic shut-off for	R. J. Henry, Jr., and W. J. Kassler	400,339	Mar. 26	2327	608	46	1611
Gas condenser. Coal	F. J. Davis	398,384	Feb. 26	1944	511	46	983
Gas cut-off. Automatic	C. M. Kirkpatrick	395,334	Jan. 1	45	11	46	11
Gas. Cut-off device for	L. B. Fulton	395,560	Jan. 1	383	97	46	79
Gas-engine	T. B. Barker	400,163	Mar. 26	2057	538, 539	46	1560
Gas-engine	J. C. Beckfeld	396,022	Jan. 8	1111	281, 282, 283	46	298
Gas-engine	S. Lawson	399,907	Mar. 19	1682	436	46	1478
Gas-engine	S. Lawson	399,908	Mar. 19	1685	437	46	1478
Gas-engine	A. Schmid	396,238	Jan. 15	1427	363	46	297
Gas-extinguisher	A. Steinbilber	398,805	Feb. 26	2548	678	46	1104
Gas-extinguisher. Automatic	C. L. Alexander	395,940	Jan. 8	986	253	46	204
Gas-furnace for steam-boilers	G. Whysall and J. A. Lambing	398,482	Feb. 26	2078	547	46	1010
Gas-furnaces. Apparatus for compacting fuel in	S. T. Wellman	395,676	Jan. 1	575	144	46	116
Gas-generating furnace	J. Gilbert	397,907	Feb. 19	1211	324	46	835
Gas-generator	J. Jordan	398,051	Feb. 19	1439	381, 382	46	876
Gas-governor	H. J. Bell	400,170	Mar. 26	2067	541	46	1562
Gas-governor	H. J. Bell	400,171	Mar. 26	2069	541	46	1562
Gas-governor	H. J. Bell	400,172	Mar. 26	2069	541	46	1562
Gas-governor	H. J. Bell	400,173	Mar. 26	2070	542	46	1563
Gas-governor. Automatic	R. H. Speake	396,899	Jan. 29	2425	623	46	508
Gas-holders. Apparatus for supplying steam to cups of telescopic	S. Cutler	397,836	Feb. 12	1111	297	46	798
Gas-incandescent	H. J. Bell	396,322	Jan. 15	1547	391	46	318
Gas-lighter. Electric	E. Kronenberg	399,416	Mar. 12	952	247	46	1325
Gas-machine	E. D. Self	396,768	Jan. 29	2237	573	46	407
Gas-machine	E. D. Self	397,305	Feb. 5	158	42	46	606
Gas. Making	W. J. Taylor	399,798	Mar. 19	1527	394	46	1447
Gas-meter	J. W. Culmer	398,707	Feb. 26	2410	639	46	1076
Gas-meter	J. J. Harrell	398,721	Feb. 26	2440	646	46	1081
Gas-meter. Plural-piston	J. W. Culmer	398,708	Feb. 26	2413	639	46	1076
Gas-motor	C. T. A. H. Wiedling	398,108	Feb. 19	1510	401, 402	46	891
Gas or liquids. Apparatus for regulating and controlling the exit of	C. S. Ford, Sr.	396,078	Jan. 15	1192	202	46	252
Gas-pressure indicator	A. and P. Thomas	400,267	Mar. 26	2218	582	46	1590
Gas-producer	W. J. Taylor	399,793	Mar. 19	1514	392	46	1445
Gas-producer	W. J. Taylor	399,794	Mar. 19	1517	392, 393	46	1446
Gas-producer	W. J. Taylor	399,795	Mar. 19	1519	393	46	1446
Gas-producer	W. J. Taylor	399,756	Mar. 19	1523	394	46	1446
Gas-producer	W. J. Taylor	399,799	Mar. 19	1527	394, 395	46	1447
Gas-purifiers. Apparatus for elevating the covers of	J. R. Floyd	396,332	Jan. 15	1564	396	46	321
Gas-regulating burner	H. J. Bell	396,257	Jan. 15	1453	370	46	302
Gas-regulating burner	H. J. Bell	396,258	Jan. 15	1454	370	46	303
Gas-regulating burner	H. J. Bell	396,259	Jan. 15	1456	370	46	303
Gas-regulator	J. Bardsley	398,021	Feb. 19	1308	360	46	864
Gas-regulator	E. J. Colby	398,881	Mar. 5	96	26	46	1132
Gas-regulator	J. H. Ruse	400,303	Mar. 26	2366	618	46	1618
Gas regulator and cut-off. Automatic	E. H. Ford	395,387	Jan. 1	122	31	46	27
Gas-regulator. Volumetric	M. G. Wilder	397,573	Feb. 12	715	185	46	731
Gas-retort	W. C. Jones	396,746	Jan. 29	2208	565	46	461
Gas-trap for tuyeres and conducting-pipes	A. D. Power	396,765	Jan. 29	2233	572	46	466
Gases. Apparatus for absorbing	F. Carlisle	395,601	Jan. 8	601	152	46	130
Gaseous fuel. Apparatus for generating and burning	R. B. Avery	398,873	Mar. 5	84	23, 24	46	1130
Gasogene or apparatus for making aerated beverages	L. G. and S. M. Chinnery	399,739	Mar. 19	1429	368	46	1428
Gasoline apparatus for illuminating and heating purposes.	J. Stubbers	397,255	Feb. 5	225	59	46	618
Gate: *See* Bridge-gate. End-gate. Farm-gate. Railway-gate. Railway-crossing gate. Sliding gate. Water-gate. Wire gate.							
Gate	J. Albers	395,804	Jan. 8	785	203	46	164
Gate	E. H. Bauer	397,216	Feb. 5	175	47	46	609
Gate	W. H. Cox	398,706	Feb. 26	2408	638, 639	46	1075
Gate	W. P. Elliott and A. Farrar	395,885	Jan. 8	909	233	46	189
Gate	G. Ford	398,718	Feb. 26	2433	645	46	1080
Gate	M. W. Foster	399,961	Mar. 19	1788	464	46	1496
Gate	M. C. Frite	396,333	Jan. 15	1565	396	46	321
Gate	A. H. Godfrey	396,558	Jan. 22	1913	494	46	395
Gate	H. S. Harris	395,827	Jan. 8	817	212	46	171
Gate	T. J. Howard	395,976	Jan. 8	1041	265	46	215
Gate	S. W. Kessling	399,619	Mar. 12	1260	324	46	1382
Gate	W. Le Mar	395,336	Jan. 1	48	12	46	12
Gate	C. J. Moore	396,646	Jan. 8	1142	290	46	234
Gate	W. O. Pierce	398,798	Feb. 26	2539	675, 676	46	1102
Gate	H. C. Riley	396,173	Jan. 15	1329	341	46	278
Gate	J. T. Sargent	398,189	Feb. 19	1636	433	46	914
Gate	J. Sisung	395,360	Jan. 1	81	21	46	19
Gate	J. R. Stanbrough	396,517	Jan. 22	1850	474, 475	46	385
Gate	W. R. White	397,572	Feb. 12	714	185	46	721
Gear-cutting machine	G. B. Grant	396,506	Feb. 26	2113	556	46	1017

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Gear. Reversing	S. J. White	397,676	Feb. 12	892	235	46	754
Gelatine. Acid	C. B. Tower	398,915	Mar. 5	147	.....	46	1142
Gelatine. Acid	C. B. Tower	398,916	Mar. 5	147	.....	46	1142
Gem-setting	D. Kutner	396,092	Jan. 15	1218	308	46	257
Generator: *See* Electric generator. Induction-generator, Gas-generator. Steam-generator. Hot-air generator.							
Generators. Regulation of alternate-current	G. Pfannkuche	396,422	Jan. 22	1704	437	46	356
Glass: *See* Binocular glass. Opera or marine glass. Opera-glass.							
Glass-cutter	A. M. Rowland	396,600	Jan. 22	1979	509	46	408
Glass-cutting machine	H. C. Wood	398,565	Feb. 26	2190	577	46	1032
Glass. Manufacture of	J. Reese	396,512	Jan. 22	1843	473	46	384
Glass. Manufacture of window and plate	J. Reese	396,511	Jan. 22	1841	.....	46	383
Glass. Manufacturing ornamental	T. B. Atterbury	398,995	Mar. 5	281	77	46	1168
Glass-mold	S. Hipkins, Jr	397,186	Feb. 5	133	36	46	602
Glass. Ornamenting	T. W. Webb	398,100	Feb. 19	1503	398	46	889
Glass plates. Apparatus for rolling	A. D. Brogan and A. M. Malloch	396,535	Jan. 22	1872	481	46	388
Glass-pot furnace	A. Weyer	398,296	Feb. 19	1801	475	46	948
					476		
Glasses. Advertising-lid for beer-	M. L. Mueller	396,224	Jan. 15	1410	359	46	294
Glove	J. Comrie	395,954	Jan. 8	1005	258	46	208
Glove-fastener	W. S. Richardson	399,161	Mar. 5	567	146	46	1224
Glove-fastening	W. S. Richardson	399,162	Mar. 5	568	146	46	1224
Glue. Vessel for holding liquid	D. N. Martin	396,586	Jan. 22	1960	505	46	405
Gluing-machine for binding-strips	C. H. Chappel	395,692	Jan. 8	603	152	46	180
Gluten and starch. Obtaining	H. Barker	399,727	Mar. 19	1417	364	46	1425
Glycerine from spent soap-lyes. Recovering	A. W. Trench	399,028	Mar. 5	329	.....	46	1177
Glycerine from spent soap-lyes. Recovering	A. W. Trench	399,172	Mar. 5	561	.....	46	1227
Gold and silver and other ores. Sponge for reducing	A. T. Hay	399,527	Mar. 12	1117	.....	46	1356
Gold, silver, &c. Reducing	A. T. Hay	399,529	Mar. 12	1118	.....	46	1356
Goods, &c. Device for handling shelf-	G. Cade	395,949	Jan. 8	997	256	46	207
Goods in exchange for coin. Apparatus for delivering	E. Powell	398,279	Feb. 19	1769	468	46	942
Goods. Machine for compressing and bundling	W. O. Crain	397,457	Feb. 5	541	142	46	681
Goods-rack	N. D. Phinney	397,750	Feb. 12	993	263	46	774
Governor	W. N. Rumely	398,452	Feb. 26	2028	533	46	1000
Governor. Engine-	D. P. Davis	395,882	Jan. 8	904	232	46	188
Governor. Engine-	H. Tate, Jr., and J. Killip, Jr	398,554	Feb. 26	2178	574	46	1030
Governor for marine engines	D. Sweeney	400,416	Mar. 26	2442	640	46	1632
Governor. Gas-engine	D. S. Regan	397,753	Feb. 12	995	264	46	774
Governor. Steam-engine	O. H. Castle	399,653	Mar. 19	1311	336	46	1404
Grader and ditcher. Road-	M. F. Perry	395,451	Jan. 1	212	54	46	45
Grading and ditching machine	G. B. Durkee	397,841	Feb. 12	1117	299	46	799
					300		
Grading machine. Road-	J. M. Holland	397,291	Feb. 5	280	72	46	629
Grain-binder	F. G. Becker	396,976	Jan. 29	2530	653	46	529
Grain-binder	H. F. Crandall	398,362	Feb. 26	1940	510	46	983
Grain-binder	G. G. Hunt	399,536	Mar. 12	1130	293	46	1358
					294		
Grain-binder	M. L. Nichols	395,991	Jan. 8	1008	270 271 272 273	46	220
Grain-binder	J. F. Seiberling	399,703	Mar. 19	1379	355 356	46	1418
Grain-binder	B. F. Stewart	398,466	Feb. 26	2047	537 538	46	1004
Grain-binder	C. B. Withington	399,108	Mar. 5	441	120 121	46	1198
Grain-binders. Cord-knotter for	L. W. Noyes	398,175	Feb. 19	1614	429	46	910
Grain-binders. Cord-tension alarm for	M. H. and N. M. Brinkerhoff	396,191	Jan. 15	1357	348	46	284
Grain-binders. Knot-tyer for	J. A. Graham	397,355	Feb. 5	375	98, 99	46	649
Grain-binders. Tension device for	J. S. Gibbs	399,872	Mar. 19	1633	423	46	1468
Grain-cleaner	H. Bryan	399,827	Mar. 19	1575	408	46	1456
Grain-cradle	H. L. Hewitt	396,743	Jan. 29	2203	564	46	459
Grain-crushing mill	J. Curtis	400,061	Mar. 26	1905	495	46	1329
Grain. Preparing	G. H. Cormack. (Reissue)	10,978	Jan. 1	580	146	46	118
Grain-sampler	B. F. Morningstar	399,667	Mar. 19	1355	349	46	1419
Grain-scourer	A. Heine	397,726	Feb. 12	948	252	46	765
Grain-scourer	P. Provost	398,538	Feb. 26	2152	568	46	1025
					569		
Grain-separator	J. A. Krake	399,148	Mar. 5	533	140	46	1218
Granular or lumpy substances. Apparatus for handling and distributing	E. J. Wood	397,679	Feb. 12	895	236	46	755
					237		
Grate	J. A. Cornish	398,131	Feb. 19	1552	411	46	899
Grate	J. W. Keyes	395,397	Jan. 1	135	34	46	29
Grate	J. Wakeham and J. Cunningham	396,248	Jan. 15	1443	367	46	300
Grate	L. P. Woods	395,606	Jan. 1	455	116	46	93
Grate attachment	J. H. Wait	399,098	Mar. 5	428	116	46	1196
Grate. Fire-	E. J. Story	398,007	Feb. 19	1363	362	46	862
Grate for stoves, &c	D. G. Littlefield. (Reissue)	10,987	Feb. 19	1915	504	46	970
Grater. Nutmeg-	C. O. Blood	399,823	Mar. 19	1572	407	46	1455
Graters. Die for forming teeth in vegetable-	W. Marx	397,559	Feb. 12	697	181	46	718
Grease-extractor	W. D. Nelson	395,401	Jan. 1	141	36	46	30
Griddle greasing and oiling utensil	S. B. Coston	396,860	Jan. 29	2364	607	46	495
Griddle. Odorless and smokeless	A. M. Amos	395,305	Jan. 1	1	1	46	3
Grinding and polishing the handles of cutlery. Machinery for	M. L. Powers	399,208	Mar. 5	638	166	46	1237
Grinding metallic bands. Machinery for	J. L. Fowle	396,553	Jan. 22	1903	491	46	394
Grinding-mill	A. Dobler	396,990	Jan. 29	2550	659	46	533
Grinding-mill	J. Good	399,518	Mar. 12	1105	287	46	1353
Grinding-mill	F. C. Hall	396,559	Jan. 22	1914	494	46	396

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Grinding-mill	G. and A. Raymond	397,618	Feb. 12	1091	290	46	793
					291		
Grinding-mill	H. F. Stone	397,445	Feb. 5	524	137	46	678
					138		
Grinding-mills. Feed-regulator for	J. F. Winchell	396,058	Jan. 8	1139	294	46	237
Grinding-pan	M. P. Boss	398,936	Mar. 5	184	49	46	1149
Grinding rotary disk cutters. Machine for	J. L. Morrison and A. D Rowe	398,741	Feb. 26	2464	653	46	1066
Grindstone-fixture	J. J. Stoppie	398,753	Feb. 26	2479	657	46	1090
Grip device. Intermittent	H. A. Smith	396,244	Jan. 15	1438	366	46	299
Grocer's bin	L. B. Hawkins	399,197	Mar. 5	620	161	46	1233
Grommet	J. Boyle	395,477	Jan. 1	252	66	46	54
Grommet	R. Brass	395,478	Jan. 1	253	66	46	54
Grommet	E. A. Sperry	400,964	Mar. 26	2212	581	46	1590
Grounding device. Automatic							
Guard: *See* Buckle-guard. Ladder-guard. Fish-net guard. Railway cattle-guard. Elevator-guard. Razor safety-guard. Key-hole guard. Window burglar-guard.							
Guard or shield for projecting surfaces	R. L. Stickney	398,909	Mar. 5	138	38	46	1140
Gun and projectile for the same	S. H. Emmens	398,595	Feb. 26	2236	592	46	1041
Gun and projectile for throwing high explosives	S. H. Emmens	397,052	Jan. 29	2639	680	46	550
Gun. Breech-loading	W. C. Maynard	398,065	Feb. 19	1462	386	46	881
Gun-cleaner	C. Tomlinson	399,452	Mar. 12	994	250	46	1334
					260		
Gun hand-protector	R. O. Heikes	397,719	Feb. 12	948	251	46	765
Gun. Machine-	H. S. Maxim	395,791	Jan. 8	758	196	46	159
					197		
Gun. Magazine-	H. A. Pitcher	397,143	Feb. 5	61	15	46	589
Gun. Magazine-	A. H. Russell	396,835	Jan. 29	2333	598	46	488
Gun-mountings. Buffer for	H. Schneider	397,027	Jan. 29	2606	672	46	544
					673		
Gun. Revolving pneumatic	J. W. Graydon	399,882	Mar. 19	1650	426	46	1471
Gun. Spring-	J. F. Klinglesmith	396,265	Feb. 19	1746	461	46	937
Gun-wad	G. Clapp	396,986	Jan. 29	2544	657	46	532
Guns. Electric appliance for discharging	B. A. Fiske	396,199	Jan. 15	1367	350	46	296
Guns. Loading apparatus for turret-	H. Schneider	397,310	Feb. 5	308	80, 81	46	635
Guns. Reflector for inspecting	A. H. Russell	399,286	Mar. 12	754	196	46	1287
Guns, shafts, &c. Manufacture of heavy	J. Shinn	397,029	Jan. 29	2608	673	46	545
Hair crimper and curler	R. W. Weldon	397,159	Feb. 5	85	21	46	594
Hair-curling device	W. I. Brigham	396,534	Jan. 22	1871	481	46	388
Hair-cutting apparatus	M. Klein	395,444	Jan. 1	202	52	46	43
Hair-pin	W. E. Banta	397,164	Feb. 5	98	25	46	596
Hair-pin	W. F. Peet	395,582	Jan. 1	424	107	46	87
Hair-pins. Machine for making	G. W. Manson	397,991	Feb. 19	1333	355	46	857
					356		
Hair-tonic	H. H. Glenck	398,690	Mar. 5	112	.....	46	1135
Halter bolt-clip	C. C. Schwaner	399,788	Mar. 19	1508	390	46	1444
Halter-square	C. C. Schwaner	398,087	Feb. 19	1486	393	46	886
Hame	H. Latshaw	397,734	Feb. 12	972	258	46	770
Hame and tug coupling	J. Gray	397,182	Feb. 5	128	35	46	604
Hame-fastener	G. W. Harrop	396,653	Jan. 22	2056	528	46	423
Hammer. Bush-	L. H. Rowell	396,174	Jan. 15	1331	341	46	279
Hammer-heads. Die for shaping the claws of	A. Laundry	398,166	Feb. 19	1604	425	46	908
Hammer or like die	W. H. Melaney	397,929	Feb. 19	1241	331	46	840
Hammock	H. M. Small	400,131	Mar. 26	2004	525	46	1550
Hammock-suspension device	J. D. Pritchard	399,928	Mar. 19	1714	444	46	1484
Hams, &c. Covering	A. Warner	395,308	Jan. 1	91	.....	46	21
Hand-rest	E. S. Hull	399,206	Mar. 12	727	189	46	1281
Handle: *See* Box-handle. Door-handle. Brake-handle. Opera-glass handle. Coffin-handle. Plow-handle. Cutlery-handle. Saw-handle. Detachable handle. Tool-handle.							
Handle	J. Tebin	399,170	Mar. 5	579	149	46	1226
Hanger: *See* Door-hanger. Picture-hanger. Eaves-trough hanger. Wall-paper hanger. Hat-hanger. Wearing-apparel hanger. Lamp-hanger.							
Harmonica-holder	A. H. Gaertner	397,541	Feb. 12	663	173	46	711
Harmonigraph or music-recording device	J. A. Decuir	398,951	Mar. 5	200	54	46	1152
					55		
					56		
Harness	F. Driffill	398,589	Feb. 26	2228	589	46	1039
Harness	P. King	399,051	Mar. 5	361	97	46	1183
Harness	A. F. Trask	395,527	Jan. 1	332	54	46	70
Harness	I. Hicks	400,211	Mar. 26	2196	557	46	1575
Harness attachment	F. Wayland	398,295	Feb. 19	1799	475	46	948
Harness attachment	E. Elliott	399,392	Mar. 12	921	239	46	1315
Harness-hook	E. F. Pfueger	399,074	Mar. 5	391	105	46	1189
Harness-pad	C. E. Bement	399,731	Mar. 19	1421	365	46	1426
Harrow	S. B. Hendricks	399,614	Mar. 12	1249	322	46	1380
Harrow	O. Lunn	397,193	Feb. 5	141	38	46	603
Harrow	H. A. Murphy	397,605	Feb. 12	793	207	46	735
Harrow	G. A. Paddock	397,514	Feb. 12	627	162	46	705
Harrow	O. Rorem	399,564	Mar. 12	1177	304	46	1367
Harrow	C. P. Russell	396,117	Jan. 15	1347	318	46	283
Harrow	E. F. Sherman	396,374	Jan. 15	1626	417	46	332
Harrow	M. Skow	397,145	Feb. 5	67	16	46	591
Harrow	A. A. Stuart	395,638	Jan. 1	514	129	46	103
Harrow	J. Whipps	398,480	Feb. 26	2076	546	46	1010
Harrow and cultivator	J. C. Bryan	400,392	Mar. 26	2409	631	46	1632
Harrow and cultivator	S. W. Kilpatrick	400,220	Mar. 26	2141	561	46	1577
Harrow and cultivator. Rolling	A. J. Adamson	399,644	Mar. 19	1297	333	46	1401

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Harrow and pulverizer. Combined	J. B. Okey	400,412	Mar. 26	2438	639	46	1631
Harrow and roller	J. Bollinger	396,068	Jan. 15	1173	297, 298	46	249
Harrow and roller	A. H. and J. H. Davis	397,342	Feb. 5	362	95	46	646
Harrow and roller. Combined	J. T. Van Pool	395,366	Jan. 1	88	23, 24	46	20
Harrow-frame	J. McMahon	396,944	Jan. 29	2457	641	46	520
Harrow. Pulverizing	M. Bruner	396,644	Jan 22	2044	525	46	421
Harrow. Rotary	A. C. Brown	398,937	Mar. 5	185	49	46	1149
Harrow. Rotary	I. E. Stump	395,364	Jan. 1	86	23	46	20
Harrow. Spring-tooth	G. Gillies	395,699	Jan. 8	611	154	46	132
Harrow. Spring-tooth	C. E. Jewell	396,686	Jan. 22	2117	543	46	435
Harrow. Spring-tooth	P. A. Spicer	398,858	Mar. 5	60	17	46	1126
Harrow-tooth	G. A. Lake	396,093	Jan. 15	1218	308	46	257
Harrow-tooth holder	D. O. Everest	400,397	Mar. 26	2417	633	46	1628
Harrow-tooth holder	D. O. Everest	400,398	Mar. 26	2418	633	46	1628
Harrow. Wheel-	J. Finnegan and W. Mies	398,600	Feb. 26	2241	593	46	1042
Harvester	J. A. Grsham, C. Martincourt, and H. F. Crandall.	398,249	Feb. 19	1724	455	46	932
Harvester	S. D. Maddin	396,409	Jan. 22	1683	432	46	352
Harvester	L. W. Noyes	395,343	Jan. 1	56	14	46	13
Harvester	C. S. Stickle	396,467	Feb. 26	2049	538	46	1004
Harvester and husker. Combined corn	A. L. Rasmuson	396,510	Jan. 22	1838	471, 472, 473	46	383
Harvester and husker. Corn	L. W. Osborn	397,998	Feb. 19	1344	358, 359	46	859
Harvester and thrashing-machine. Combined	L. A. Gillett	396,153	Jan. 15	1294	331, 332	46	273
Harvester. Corn-	E. W. Cady	396,538	Jan. 22	1875	482	46	389
Harvester. Corn-	J. McKivett	397,656	Feb. 12	862	225, 226	46	749
Harvester. Corn-	J. F. Steward	398,860	Mar. 5	62	17, 18	46	1126
Harvester-frame	J. F. Steward	396,245	Jan. 15	1438	366	46	299
Harvester. Grain-binding	L. Miller	396,758	Jan. 29	2223	569	46	464
Harvester. Grain-binding	W. N. Whiteley, W. Bayley, and O. E. Perrigo.	398,921	Mar. 5	154	40, 41	46	1143
Harvester-reel	A. O. Carman	399,652	Mar. 19	1310	336	46	1404
Harvesters. Bundle-carrier for grain	J. F. Steward	396,518	Jan. 22	1852	475	46	385
Harvesters. Cutting mechanism for	P. Hanson	395,493	Jan. 1	275	71	46	58
Harvesters. Platform-adjusting device for	J. F. Steward	396,006	Jan. 8	1091	277	46	225
Harvesters. Shock-forming table for corn	A. N. Hadley	399,988	Mar. 19	1800	467	46	1500
Harvesting-machine	J. Draper	398,711	Feb. 26	2424	641, 642	46	1078
Hasp-lock	W. Tiffany	399,451	Mar. 12	994	259	46	1334
Hat	P. N. Knapp and J. R. Britto	395,335	Jan. 1	47	11	46	12
Hat and clothes rack	H. A. Brechbill and F. H. Ensign	399,225	Mar. 19	1574	408	46	1456
Hat-band	W. T. Brigham	397,065	Jan 29	2656	684	46	554
Hat-block	J. C. Fiester	397,117	Feb. 5	18	4	46	562
Hat-forming machine	S. C. Palmer	399,551	Mar. 12	1158	300	46	1363
Hat-hanger	T. R. McDonald	397,599	Feb. 12	767	201	46	731
Hat-mark	H. H. Wright	397,768	Feb. 12	1017	271	46	779
Hat-measure	A. E. McDonald	398,340	Feb. 19	1868	492	46	961
Hat-pouncing machine	C. W. Stevens	398,551	Feb. 26	2171	573	46	1028
Hat-pouncing machine	J. C. Wilson	400,282	Mar. 26	2239	587	46	1505
Hat-support and packing-ring	G. Lane	399,901	Mar. 5	626	162	46	1234
Hat sweat-band	W. F. Beardslee	399,729	Mar. 19	1419	365	46	1436
Hats. Machine for stiffening	F. J. Murphy and A. M. Rundle	396,820	Jan. 29	2322	595	46	485
Hats. Manufacture of soft	J. R. Kelsey	398,734	Feb. 26	2457	.....	46	1085
Hatchway	J. A. Barclay	396,649	Jan. 29	2349	602	46	492
Hatchway	J. Roach	399,563	Mar. 12	1176	304	46	1368
Hatchway. Elevator	C. A. McAllister	397,197	Feb. 5	146	39	46	604
Hatchway-gates. Device for operating	F. Heine and E. Bengel	398,615	Feb. 26	2263	600	46	1046
Hay-binder	A. W. Hendrick	396,278	Jan. 15	1481	375	46	306
Hay-carrier	H. L. Ferris	399,140	Mar. 5	523	136	46	1216
Hay-carrier track	M. G. Grosscup	397,124	Feb. 5	26	7	46	563
Hay-elevator track	V. L. and J. Ney	395,714	Jan. 8	630	159	46	136
Hay-loader	W. M. White	398,682	Feb. 26	2373	630	46	1068
Hay or grain fork	W. H. Lander	396,881	Jan. 29	2398	615	46	503
Hay or grain unloader	W. G. Hunter	397,551	Feb. 12	682	177	46	715
Hay-press	W. S. Champion	397,338	Feb. 5	355	92, 93	46	645
Hay-press	A. A. Gamble	396,303	Jan. 15	1373	351	46	287
Hay-press	T. T. Mayes	397,196	Feb. 5	146	39	46	604
Hay-press	M. McCarty	398,066	Feb. 19	1464	386, 387	46	881
Hay-press. Portable	G. E. Luckey	396,042	Jan. 8	1136	289	46	223
Hay rake and loader	O. K. Kaasa	398,160	Feb. 19	1594	423	46	906
Hay rake and tedder. Combined	I. L. Landis and A. Iske	398,165	Feb. 19	1602	424, 425	46	908
Hay rake and tedder. Combined	S. B. Shank	396,002	Jan. 8	1085	276	46	223
Hay-rake. Horse	J. M. McClintock	399,765	Mar. 19	1471	379	46	1436
Hay-rake. Horse	E. Tush and J. B. Engstrom	398,808	Feb. 26	2550	679	46	1105
Hay-rakes. Tooth for horse	E. Tush	397,155	Feb. 5	81	20	46	594
Hay-stacker	H. A. Barkelew	398,114	Feb. 19	1531	406	46	894
Hay-stacker	O. H. King	397,431	Feb. 5	499	131, 132	46	674
Hay-stacker	J. Morris	397,512	Feb. 12	623	161	46	703
Hay-stacker	L. B. Morton	396,761	Jan. 29	2227	570	46	465
Hay-stacker	J. E. and H. Will	399,106	Mar. 5	439	119, 120	46	1197
Hay-stacking machine. Portable	L. Miller	396,045	Jan. 8	1141	290	46	234
Hay tedder and rake. Combined	S. L. Denney	395,550	Jan. 1	361	93	46	76
Head-chair and connecting-rod. Combined	W. J. Hooper	396,487	Jan. 22	1809	463	46	377
Head-protector	G. H. Chappell, W. and J. Brown	396,141	Jan. 15	1278	327	46	270
Head-rest	A. P. Gould	398,893	Mar. 5	117	32	46	1136
Headlight	J. F. Shawhan	396,241	Jan. 15	1434	365	46	298

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Heat-absorbing plate for cooling-coils	A. Campbell	399,493	Mar. 12	1061	277	46	1346
Heat to the body. Device for applying	D. M. Small	400,261	Mar. 26	2209	580	46	1589
Heater: *See* Agricultural heater. Lunch-heater. Car-heater. Portable heater. Feed-water heater. Steam-heater. Fire-clay heater. Stove-pipe heater. Ice-elevator heater. Water-heater.							
Heaters. Safety-door for	J. H. Mason	398,271	Feb. 19	1756	464	46	939
Heating and ventilating buildings. Means for	E. T. Johnson	395,395	Jan. 1	132	33	46	29
Heating apparatus	J. and P. Just	395,960	Jan. 8	1048	266	46	216
Heating apparatus. Air-	C. P. Fest	398,715	Feb. 26	2429	644	46	1080
Heating apparatus. Hot-water	N. A. Boynton	396,602	Jan. 29	2289	585, 586	46	477
Heating. Electrical	J. V. Capek	395,950	Jan. 8	998	256, 257	46	207
Heel-burnishing machine	C. H. Helms	396,999	Jan. 29	2560	661	46	525
Heel-cutting die	C. W. Glidden	399,608	Mar. 12	1243	320	46	1379
Heel-finishing machine	A. B. Fowler and G. E. Warren	396,690	Jan. 22	2107	541, 542, 327, 328	46	433
Heel-nailing machine	J. H. Pope	399,631	Mar. 12	1273	384	46	1440
Heel-nailing machine	J. H. Pope	399,777	Mar. 19	1488	384	46	1440
Heel-nailing machine	F. F. Raymond, 2d	398,846	Mar. 5	44	14	46	1122
Heel-trimmer	C. H. Helms	397,000	Jan. 29	2561	662	46	535
Heel-trimmer	C. H. Helms	397,001	Jan. 29	2562	662	46	535
Heel-trimmer	O. L. Noble	399,453	Mar. 5	545	141	46	1220
Heel-trimming machine	C. H. Helms	397,655	Jan. 29	2643	681	46	551
Heel-trimming machine	O. L. Noble	399,625	Mar. 12	1266	326	46	1384
Heel-trimming tool	C. W. Glidden	399,607	Mar. 12	1242	320	46	1379
Heels. Manufacturing	G. Dorwart	396,076	Jan. 15	1186	301	46	251
Heeling, nailing, and finishing jack	N. Weber	395,727	Jan. 8	651	166	46	140
Hides. Machine for stretching, scraping, and finishing	G. E. Danforth	396,811	Jan. 29	2300	589	46	480
Hides or skins. Machine for stretching	L. V. Benét	399,964	Mar. 19	1764	456	46	1494
Hinge	D. S. Luce	396,660	Jan. 22	2064	530	46	425
Hinge	R. E. Nolley	400,003	Mar. 19	1821	473	46	1504
Hinge	C. F. Sullivan	399,582	Mar. 12	1207	311	46	1372
Hinge	E. A. Mallory	396,636	Feb. 26	2302	609	46	1033
Hinge. Adjustable	M. Young	396,319	Jan. 15	1541	389, 390	46	317
Hinge-blanks. Machine for bending	E. Haines	399,751	Mar. 19	1450	373	46	1432
Hinge. Friction-	S. D. Wells	395,370	Jan. 1	93	24	46	21
Hinge. Gate-	T. C. Read	397,836	Feb. 19	1251	334	46	842
Hinge. Lock-	C. J. Seymour	398,752	Feb. 26	2478	657	46	1089
Hinge. Lock-	L. M. Devore	396,989	Jan. 29	2550	659	46	533
Hinge. Spring-	L. M. Devore and F. W. Hoefer	396,081	Jan. 8	1122	285	46	230
Hinge. Spring-	L. M. Devore and F. W. Hoefer	396,650	Jan. 22	2052	527	46	423
Hinge. Spring-	J. Keene	397,190	Feb. 5	136	37	46	603
Hinge. Spring-	N. Linsley	395,337	Jan. 1	49	12	46	12
Hinge. Spring-	W. C. Perkins	395,403	Jan. 1	143	36	46	31
Hinge. Wire	W. Haas	399,033	Mar. 5	334	89, 90	46	1178
Hinges. Machine for making sheet-metal	M. Hirst	398,780	Feb. 26	2516	668	46	1097
Hitching device	C. E. Price	400,113	Mar. 26	1978	518	46	1544
Hitching device for vehicles	B. G. Knapp	399,904	Mar. 19	1678	435	46	1477
Hitching-post	R. M. Brown	396,856	Jan. 29	2360	605	46	494
Hoe	J. Thomas	396,590	Jan. 22	1854	476	46	385
Hogs. Apparatus for use in dressing	A. E. Brown	395,873	Jan. 8	894	220	46	186
Hoisting and conveying machine	A. E. Brown	400,188	Mar. 26	2091	547	46	1508
Hoisting and conveying machine	H. Kennedy	398,785	Feb. 26	2523	670	46	1098
Hoisting apparatus	G. E. Newell	396,664	Jan. 22	2070	531	46	426
Hoisting-bucket	G. J. Anderson	397,621	Feb. 12	810	211, 212	46	738
Hoisting-machine	V. W. Mason	397,243	Feb. 5	909	55	46	615
Hoisting mechanism	T. A. Weston	400,150	Mar. 26	2037	532, 533	46	1556
Holder: *See* Bag-holder. Pen-holder. Belt-holder. Pillow-sham holder. Book-holder. Plate-holder. Broom-holder. Post-holder. Brush-holder. Rein-holder. Chalk-holder. Ribbon-holder. Copy-holder. Sample-holder. Corn-cob holder. Sash-holder. Cuff-holder. Scarf-holder. Curtain-holder. Sewing-machine-attachment holder. Dental disk-holder. Eyeglass-holder. Sewing-machine spool-holder. Flour-holder. Harmonica-holder. Shade-holder. Harrow-tooth holder. Shaft-holder. Hose-holder. Spool-holder. Instrument-holder. Stereotype-plate holder. Jar-holder. Strainer-holder. Knife-blade holder. Tag-holder. Lead and rule holder. Telephone paper-pad holder. Mop-holder. Tidy-holder. Mop and scrubbing-brush holder. Tumbler-holder. Music-book holder. Twine-holder. Music or book holder. Umbrella-holder. Opera-glass holder. Vignette-holder. Paper-holder. Work-holder.							
Honey-comb. Artificial	L. A. Aspinwall	397,046	Jan. 29	2039	678	46	549

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Hook: *See* Back-band hook. Safety-hook. Check-hook. Snap-hook. Combination-hook. Suspender-hook. Fish-hook. Vacuum-hook. Harness-hook. Whiffletree-hook. Locking-hook. Wire hook.							
Hook	A. M. Lewellen	398,060	Feb. 19	1454	384	46	879
Hook	P. Miles	396,169	Jan. 15	1322	338	46	277
Hook	P. Miles	396,756	Jan. 29	2220	568	46	464
Hook	P. Miles	396,757	Jan. 29	2221	568	46	464
Hook	C. S. Van Wagoner	397,157	Feb. 5	83	21	46	594
Hook for awnings, &c	W. F. Maulick	396,587	Jan. 22	1962	505	46	405
Hop-shovel	B. F. Jacobs	398,330	Feb. 19	1850	488	46	958
Hopple	T. Herrin	397,722	Feb. 12	952	252	46	766
Hopple	W. Whitton	398,683	Feb. 26	2375	630	46	1068
Horizontally-divided die	J. A. Furman	395,619	Jan. 1	476	121	46	97
Horse-blanket	A. H. Kinder	399,672	Mar. 19	1340	343	46	1409
Horse-boot	J. B. Hoyt	398,834	Mar. 5	32	11	46	1120
Horse-boot	T. B. Mason	396,167	Jan. 15	1320	338	46	277
Horse-check. Automatic	W. H. Kilbourn	395,333	Jan. 1	43	11	46	11
Horse-checking device	F. T. Aikins	399,061	Mar. 19	1761	455	46	1493
Horse-checking device	W. P. Smith	399,708	Mar. 19	1367	357, 358	46	1420
Horse-detacher	H. Latshaw	397,733	Feb. 12	971	252	46	770
Horse-detacher	G. W. McLaughen and A. K. Loftin	395,990	Jan. 8	1066	270	46	220
Horse-detacher	G. T. Parker	399,434	Mar. 12	974	253	46	1329
Horse-detacher	H. Riesenberg	395,589	Jan. 1	432	110	46	89
Horse-detacher	S. H. Roblin	398,977	Mar. 5	248	69	46	1162
Horse-detacher	C. R. Wilson	400,156	Mar. 26	2047	536	46	1558
Horse-power	D. Berlew	397,219	Feb. 5	178	48	46	610
Horse-power	C. V. Birk	399,478	Mar. 12	1042	273	46	1343
Horse-power for hay-stackers	R. J. Smith	398,462	Feb. 26	2043	536	46	1003
Horse-power regulator	F. Hart	396,931	Jan. 29	2470	636, 637	46	516
Horse-powers. Driving device for	W. H. Osburn	399,280	Mar. 12	744	194	46	1284
Horse-releasing device	E. L. Fox	398,827	Mar. 5	22	6	46	1118
Horseshoe	G. W. Wemple	396,521	Jan. 22	1857	476	46	386
Horseshoe-nail	J. A. Coleman	397,696	Feb. 19	1193	320	46	832
Horseshoe-nails. Machine for feeding	J. A. Coleman	396,467	Jan. 22	1771	453, 454, 455	46	370
Horseshoe-nails. Machine for forging	D. F. Williams	399,226	Mar. 5	665	173, 174	46	1242
Hose-clamp	O. Thum	396,625	Jan. 22	2019	519	46	417
Hose-coupling	C. Callahan	395,877	Jan. 8	899	230	46	187
Hose-coupling	J. Coghlan	396,684	Jan. 22	2099	539	46	432
Hose-coupling	J. L. Holton and L. H. Britton	397,187	Feb. 5	134	36	46	602
Hose-coupling	J. D. Sloan	396,435	Jan. 22	1725	444	46	361
Hose coupling. Brake	E. A. Leland	398,059	Feb. 19	1453	384	46	879
Hose-coupling for steam and air hose. Auxiliary	G. W. Vernon	395,673	Jan. 1	569	142	46	114
Hose-holder	W. C. Willits	396,129	Jan. 15	1263	323	46	267
Hose-machine	J. Murphy	399,547	Mar. 12	1150	296	46	1361
Hose-nozzle	J. Clifford	399,654	Mar. 19	1313	336	46	1405
Hose-nozzle	W. Stebbins	396,119	Jan. 15	1249	318	46	264
Hose or tubing	T. Midgley	398,425	Feb. 26	2000	525	46	994
Hose or tubing	T. Midgley	398,426	Feb. 26	2001	525	46	994
Hose or tubing	T. Midgley	398,430	Feb. 26	2004	526	46	995
Hose-pipe	E. H. Crosby	397,171	Feb. 5	108	28	46	598
Hose-pipes. Device for supporting and giving vibrating motion to	H. C. Collins	395,611	Jan. 1	460	117	46	94
Hose-pipes. Electric coupling for	D. J. Simpson	396,176	Jan. 15	1334	343	46	280
Hose-reel	C. W. Kimball	397,997	Feb. 19	1329	354	46	856
Hose-strap	I. N. Glauber	397,180	Feb. 5	124	34	46	600
Hose to couplings. Device for securing	R. Cowen	398,582	Feb. 26	2216	586	46	1037
Hot-air furnace	N. Brayer	395,420	Jan. 1	164	42	46	35
Hot-air furnace	J. Gray	397,979	Feb. 19	1320	352	46	854
Hot-air furnace	B. F. Price	397,660	Feb. 12	868	228	46	750
Hot-air furnace	L. W. Turner	397,154	Feb. 5	79	20	46	593
Hot-air furnace	E. W. Wells	396,905	Jan. 29	2434	625	46	509
Hot-air generator	E. M. Crandall and T. H. Turner	395,813	Jan. 8	798	208, 209	46	167
Hotel-call	E. J. Colby	400,304	Mar. 26	2273	595	46	1601
Hotel-register	A. D. Mackey	399,622	Mar. 12	1263	325	46	1383
House interiors. Finishing of	W. J. Boda	395,945	Jan. 8	993	255	46	205
Hub	G. J. Raithel	396,652	Feb. 26	2329	619	46	1059
Hub-boring machine	D. M. Parry	397,816	Feb. 12	1086	289	46	792
Hub. Vehicle-	J. Haish	398,148	Feb. 19	1577	418	46	902
Hub. Vehicle-	M. B. Southerland	399,577	Mar. 12	1195	309	46	1370
Hubs. Dust-guard for vehicle-	J. T. Richards and J. F. Newell	395,666	Jan. 1	561	140	46	113
Huller: *See* Pea-huller.							
Hydrant	C. Carr	396,396	Jan. 15	1321	392, 393	46	319
Hydrant	W. Ryle	400,414	Mar. 26	2440	639	46	1632
Hydrant	E. Zwiebel	397,213	Feb. 5	172	46	46	609
Hydraulic elevator. Electrically-controlled	C. Whittier	399,716	Mar. 19	1398	360	46	1422
Hydraulic elevator. Variable-pressure	T. W. Heermans	398,044	Feb. 19	1429	378, 379	46	874
Hydraulic engine	H. G. T. Glazebrook	396,556	Jan. 22	1908	492, 493	46	395
Hydraulic engine	J. McAdams	399,204	Mar. 5	629	163	46	1235
Hydraulic jack	F. I. Joyce	396,784	Feb. 26	2521	670	46	1098
Hydraulic motor	J. A. Myers	400,411	Mar. 26	2435	638, 639	46	1631

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Hydraulic press for covering electrical conductors with soft metal	W. Siemens	399,291	Mar. 12	750	197	46	1288
Hydraulic pressure. Apparatus for utilizing	J. M. Marty	395,844	Jan. 8	847	219	46	178
Hydrocarbon-burner	J. Darby	397,784	Feb. 12	1045	279	46	784
Hydrocarbon-burner	F. B. Meyers	399,770	Mar. 19	1479	381	46	1438
Hydrocarbon-burner	J. L. Newton	396,226	Jan. 15	1412	360	46	294
Hydrocarbon-burner	J. Patten	397,749	Feb. 12	991	263	46	773
Hydrocarbon-engine	G. M. Richards	399,348	Mar. 12	846	220, 221, 222	46	1305
Hydrocarbons. Apparatus for burning	J. H. Bullard	397,336	Feb. 5	353	92	46	645
Hydrocarbons. Apparatus for burning	J. H. Bullard	397,337	Feb. 5	354	92	46	645
Ice and for cooling purposes. Machine for manufacturing	J. C. Rossi	397,820	Feb. 12	1094	292	46	793
Ice-boat	J. McGrath	395,848	Jan. 8	851	220	46	179
Ice-box pan	C. W. Smith	396,619	Jan. 22	2009	517	46	415
Ice-cream box	J. Van Dyk	396,443	Jan. 22	1736	446	46	363
Ice-elevator heater	J. N. Briggs	399,012	Mar. 5	312	84	46	1174
Ice from store-houses. Automatic apparatus for lowering	J. N. Briggs	399,011	Mar. 5	309	83	46	1174
Ice. Machine for manufacturing	J. C. Rossi	397,819	Feb. 12	1092	291	46	793
Ice-planing machine	L. R. Carhart	400,189	Mar. 26	2093	548	46	1568
Illuminating apparatus	W. F. Folmer	397,903	Feb. 19	1205	323	46	834
Implement-joint	F. H. Richards	397,389	Feb. 5	422	112	46	658
Incandescent device	C. A Von Welsbach	399,174	Mar. 5	583	150	46	1227
Incrustation. Device for preventing	E. E. Euchenhofer	396,033	Jan. 8	1124	285	46	230
Incrustation preventive	B. M. Henney	397,547	Feb. 12	673	.....	46	713
Incubator	J. F. Carr	395,483	Jan. 1	281	67	46	55
Incubator	J. F. Carr	395,484	Jan. 1	202	68	46	55
Incubator	J. K. Meschter	397,016	Jan. 29	2583	668	46	540
Index	J. P. Findley	400,070	Mar. 26	1918	500	46	1532
Index. Page-	J. A. Cook	400,059	Mar. 26	1902	494	46	1528
Indexes. Machine for cutting	E. P. Donnell	399,250	Mar. 12	701	182, 183	46	1276
Indexing-machine	F. W. Hewes	396,742	Jan. 29	2196	502, 503	46	458
Indicating and recording changes at a distant point. Apparatus for	G. E. Winslow	395,802	Jan. 8	871	225	46	183
Indicating apparatus. Coin-controlled	F. C. Lynde	398,519	Feb. 26	2129	560, 561	46	1020
Indicating apparatus. Coin-controlled	F. C. Lynde	398,520	Feb. 26	2131	561, 562	46	1020
Indicating apparatus. Coin-controlled	F. C. Lynde	398,521	Feb. 26	2132	562	46	1020
Indicator: *See* Bottle-indicator. Letter-box indicator. Cash-indicator. Speed-indicator. Electric-current indicator. Station-indicator. Elevator-indicator. Street and station indicator. Gas-pressure indicator. Stock-indicator.							
Indicator	G. W. Kennedy	400,345	Mar. 26	2342	611	46	1613
Indicator-bolt	S. Harris	398,722	Feb. 26	2142	646	46	1092
Induction-coil. Coin-operated	F. G. Williams and A. W. Roovers	399,591	Mar. 12	1216	314	46	1374
Induction generator. Static-	E. T. Birdsall	398,122	Feb. 19	1539	409	46	896
Inductor. Alternate-current	E. Thomson and M. J. Wightman	399,851	Mar. 19	1531	396	46	1448
Ingots from molds. Apparatus for removing	W. R. Jones	395,330	Jan. 1	39	10	46	10
Inhaler	E. Jahr	399,901	Mar. 19	1674	434	46	1476
Inhaler and respirator	C. Breuillard	399,736	Mar. 19	1426	367	46	1427
Inhaler for warm air	L. Welgert	398,991	Mar. 5	273	75	46	1167
Inhaling-tip	M. S. Green	395,436	Jan. 1	186	49	46	40
Ink and color slab. Indian-	E. G. Soltmann	397,146	Feb. 5	68	16	46	591
Ink-bottle and attachment therefor	N. Johnson	396,495	Jan. 22	1820	467	46	380
Ink-bottles. Adjustable bracket for	W. Lumley	397,558	Feb. 12	694	180	46	717
Inkstand	S. G. Baldwin	397,330	Feb. 5	344	90	46	643
Inkstand	E. Davis	399,644	Mar. 19	1597	414	46	1460
Inkstand	B. F. Henkle	397,983	Feb. 19	1324	353	46	855
Insect-powder, &c. Machine for distributing	J. H. White	400,279	Mar. 26	2234	586	46	1593
Insect-trap	C. P. Brown	395,542	Jan. 1	350	89	46	73
Insect-trap	J. H. Brown	396,024	Jan. 8	1114	283	46	228
Insecticide	J. Turlington	396,807	Feb. 26	2549	.....	46	1105
Insecticide composition	T. Manahan	399,999	Mar. 19	1815	.....	46	1503
Insecticides. Preparing	J. M. A. Miller	398,727	Feb. 26	2139	.....	46	1022
Instrument-holder	G. Hatch	398,506	Feb. 26	2116	556	46	1017
Insulating jacket or covering	W. J. Hulford	396,933	Jan. 29	2474	637	46	517
Insulating-support for electric conductors	S. H. Short	398,661	Feb. 26	2341	622	46	1061
Insulator	W. C. Brown	396,095	Feb. 19	1404	370	46	849
Insulator. Overhead	S. H. Gibson	396,334	Jan. 15	1566	397	46	321
Interlocking switch and signal	H. B. Potter	395,452	Jan. 1	213	55	46	46
Internasal tube	D. H. Goodwillie	399,985	Mar. 19	1795	465	46	1500
Iron: *See* Sad-iron. Whiffletree or neck-yoke iron. Soldering-iron.							
Iron. Apparatus for converting cast-	L. Iauke	397,365	Feb. 5	393	103	46	652
Iron into malleable iron or steel. Converting crude	G. L. Robert	395,633	Jan. 1	510	128	46	102
Iron into malleable iron or steel. Converting crude	G. L. Robert	400,010	Mar. 19	1831	475	46	1505
Iron. Machine for forming skelp	C. Benker	398,120	Feb. 19	1537	408	46	895
Iron. Manufacture of	A. T. Hay	399,611	Mar. 12	1246	.....	46	1379
Iron. Manufacturing planished sheet	W. D. Wood	395,605	Jan. 1	453	.....	46	93
Iron or steel. Manufacturing	E. H. Cowles	397,491	Feb. 12	589	.....	46	698
Iron. Purifying	G. G. Mullins. (Reissue)	10,998	Feb. 26	2553	.....	46	1106
Ironing board	R. Gude	395,895	Jan. 8	925	238	46	192
Ironing-board	H. C. Perry	399,925	Mar. 19	1711	443	46	1483
Ironing-board and step-ladder	J. H. Whisler	398,297	Feb. 19	1803	476	46	949

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Ironing-board support	W. E. Berry	400,290	Mar. 26	2252	589	46	1507
Ironing-machine	W. F. Crevert and J. Claus	397,700	Feb. 12	921	244	46	760
Ironing or calendering machine	R. Crawford	397,586	Feb. 12	743	192	46	726
Ironing-table	A. Riersen	400,009	Mar. 19	1620	475	46	1505
Ironing table. Shirt	J. H. Mount	396,416	Jan. 22	1692	434	46	354
Irrigating hills for plants. Machine for	H. F. Olsen	399,279	Mar. 12	743	193	46	1284
Jack:							
See Carriage-jack. Lifting-jack. Heeling, nailing, and sectional jack. finishing jack. Wagon-jack. Hydraulic jack.							
Jack-a-lantern	G. A. Beidler	396,259	Jan. 15	1446	368	46	301
Jar-caps. Closure for	H. Rosamyer, Jr	397,094	Jan. 29	2097	607	46	561
Jar cover. Slop	F. Haberman	397,425	Feb. 5	467	128	46	672
Jar-holder and kettle-cover	I. Zander	400,385	Mar. 26	2298	627	46	1624
Jars. Sealing device for fruit	J. Legan	398,633	Feb. 26	2900	808	46	1058
Jewelry	E. Schill and A. Becker	396,657	Feb. 26	2234	627	46	1060
Jewelry-case	C. F. Domann	399,603	Mar. 12	1237	319	46	1378
Jewelry-setting	L. Krug	397,434	Feb. 5	503	132	46	675
Joint:							
See Boat-joint. Metal joint. Chair-joint. Metallic joint. Furniture-joint. Pipe-joint. Implement-joint. Rail-joint.							
Joints. Device for cushioning loose	J. E. Boynton and W. Crisp	395,310	Jan. 1	8	2	46	4
Journal-bearing	W. W. Smalley	398,547	Feb. 26	2164	571	46	1027
Journal-bearing. Roller	O. R. Chaplin	400,053	Mar. 26	1894	492	46	1526
Journal-box	T. E. Hayes and A. J. Read	400,210	Mar. 26	2125	557	46	1575
Journal-box	W. W. Worswick	399,721	Mar. 19	1406	362	46	1423
Journal-box for crank-pins	P. W. Leffler	400,231	Mar. 26	2158	566	46	1581
Journal-box. Self-cooling	J. W. Storey and J. Olsson	397,038	Jan. 29	2020	676	46	547
Journal-boxes. Die for the manufacture of lids for	N. H. Davis	397,786	Feb. 12	1047	279 / 290	46	785
Journal-boxes. Machine for lining	B. J. Downs	398,588	Feb. 26	2227	588	46	1039
Jug-holding device and shipping-case. Combined	N. S. Chandler	396,984	Jan. 29	2541	656	46	531
Jute, hemp, &c. Machine for softening	J. Cheyne	395,741	Jan. 8	671	172	46	144
Kegs, &c. Device for opening and closing the apertures of	W. Duncan	397,787	Feb. 12	1048	280	46	785
Key	J. P. Dandurand	398,499	Feb. 26	2100	554	46	1014
Key	O. Stoddard	399,094	Mar. 5	424	115	46	1195
Key-hole guard	C. R. Uhlmann	396,123	Jan. 15	1253	320	46	265
Key-noses. Safety-cover for	G. P. Schmidt	399,570	Mar. 12	1187	307	46	1369
Key-ring	R. H. Ingersoll	398,835	Mar. 5	33	11	46	1120
Kiln:							
See Brick-kiln. Malt-kiln.							
Kiln for firing decorated china, glass, &c. Portable	F. E. Hall	397,642	Feb. 12	839	219	46	744
Kitchen-cabinet	C. B. Rogers	399,438	Mar. 12	979	255	46	1330
Kitchen table and cabinet	J. Everitt	397,073	Jan. 29	2069	690	46	556
Kneader. Dough	J. H. Bowers	400,187	Mar. 26	2090	547	46	1568
Knife:							
See Pocket-knife. Table-knife.							
Knife	F. S. Foote	395,821	Jan. 8	809	211	46	170
Knife and fork cleaner	H. R. Fay	398,742	Feb. 19	1567	415	46	901
Knife-blade	A. L. Clark	397,602	Feb. 12	914	242	46	759
Knife-blade holder	S. V. Ellis	399,855	Mar. 19	1615	418	46	1464
Knife-cleaner	R. W. Jamieson	396,492	Jan. 22	1815	466	46	379
Knit fabric	R. M. Appleton	395,942	Jan. 8	988	253	46	205
Knit fabric. Widened tubular	R. W. Scott	398,191	Feb. 19	1639	434	46	914
Knit webs. Transferring mechanism for	A. T. L. Davis and G. E. Stevens	400,062	Mar. 26	1906	496	46	1529
Knitting-machine	G. H. Coburn	395,314	Jan. 1	11	3, 4	46	5
Knitting-machine	F. Wilcomb	397,408	Feb. 5	454	121	46	665
Knitting machine. Circular	G. Cooper	397,417	Feb. 5	473	125	46	669
Knitting machine. Circular	G. H. Gilbert	398,145	Feb. 19	1571	416	46	901
Knitting machine. Circular	E. Lippitt	396,378	Jan. 22	1946	501 / 502 / 503	46	402
Knitting machine. Circular	R. W. Scott and L. N. D. Williams	395,927	Jan. 8	964	248	46	199
Knitting machine. Circular	W. H. Stewart	397,444	Feb. 5	520	137	46	678
Knitting machine. Circular	E. Vermilyea	395,764	Jan. 8	701	179 / 180	46	149
Knitting machine. Circular-warp	H. B. Payne and W. Campion	397,142	Feb. 5	56	14	46	588
Knitting-machine needle	S. N. Goodman	400,330	Mar. 26	2316	606	46	1609
Knitting-machine stop-motion mechanism	A. T. L. Davis	400,063	Mar. 26	1908	496 / 497	46	1529
Knitting machine. Straight	H. B. Payne	397,141	Feb. 5	54	13, 14	46	588
Knitting machine. Warp	H. B. Payne and W. Campion	397,140	Feb. 5	51	12, 13	46	588
Knitting-machines. Electrical stop-motion mechanism for	E. G. Conner	397,537	Feb. 12	635	171 / 172	46	710
Knitting machines. Pattern-wheel for warp	J. Keeton	398,623	Feb. 26	2273	603	46	1048
Knitting-machines. Stopping device for	J. S. Crane	397,973	Feb. 19	1300	347 / 348	46	851
Knitting-machines. Take-up and tension device for	F. Wilcomb	396,907	Jan. 29	2436	696	46	510
Knitting-machines, &c. Tension device for	F. A. Calley	398,127	Feb. 19	1546	410	46	897
Knitting widened tubular fabrics	R. W. Scott	398,190	Feb. 19	1637	434	46	914
Knob attachment. Door	H. A. Iddings and J. P. Megeath	396,571	Jan. 22	1935	498	46	400
Knob. Sheet-metal	J. Berbecker	399,476	Mar. 12	1040	273	46	1343
Knockdown box and blank therefor	N. J. Dobbins	395,615	Jan. 8	801	209	46	168
Knockdown table	H. A. Butler	396,918	Jan. 29	2450	630	46	512
Labeling machine Can	M. V. B. Ethridge	398,775	Feb. 26	2506	665 / 666	46	1096
Laces. Appliance for hanging and exhibiting boot or shoe	J. Paton	399,559	Mar. 12	1160	300	46	1363
Ladder and ironing and bread board. Combined step-	J. C. Armstrong	400,158	Mar. 26	2050	536 / 537	46	1559

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Ladder and scaffold attachment. Extension	I. H. Rasor	400,008	Mar. 19	1629	475	46	1505
Ladder. Fire extension	H. T. Hayes	396,564	Jan. 22	1934	496	46	398
Ladder. Fire extension	H. T. Hayes	396,565	Jan. 22	1936	496	46	398
Ladder guard. Step	O. J. Meisel	396,886	Jan. 29	2466	617	46	504
Ladder. Step	G. W. and S. D. Hatcher	397,913	Feb. 19	1221	336	46	837
Ladders. Folding crank for extensible	P. S. Bradford	399,313	Mar. 12	797	206	46	1294
Lamp	J. Franklin	395,969	Jan. 8	1098	282	46	212
Lamp	J. W. Williams	396,348	Jan. 15	1589	401	46	324
Lamp. Alcohol disinfecting	M. S. Purdy and H. Alber	399,078	Mar. 5	397	107	46	1190
Lamp and stove. Safety car	O. Franks and W. Carroll	400,071	Mar. 26	1920	500 / 501	46	1532
Lamp. Arc	W. H. Miller	400,352	Mar. 26	2351	614	46	1615
Lamp. Arc	W. L. Silvey	398,906	Mar. 5	134	37	46	1140
Lamp attachment	J. H. Schenkel and R. B. Magruder	397,569	Feb. 12	711	184	46	739
Lamp-burner	S. Ellis	398,503	Feb. 26	2106	555	46	1015
Lamp. Candle	J. Martin	395,574	Jan. 1	407	104 / 105	46	84
Lamp. Car	W. W. Willits	395,937	Jan. 8	982	252	46	203
Lamp. Carbureting	W. W. Austin	397,485	Feb. 12	582	151	46	697
Lamp. Carbureting	J. Kidd	396,041	Jan. 8	1134	288	46	232
Lamp. Carbureting	A. Kitson and W. S. Horry	395,834	Jan. 8	827	215	46	174
Lamp. Carbureting	J. P. Magenis	400,096	Mar. 26	1952	510	46	1539
Lamp. Central-draft	J. C. Miller	395,912	Jan. 8	947	243	46	196
Lamp-covering	G. H. Dean	396,146	Jan. 15	1292	329	46	271
Lamp. Electric-arc	E. A. Edwards	400,198	Mar. 26	2104	552	46	1571
Lamp. Electric-arc	G. M. Lane	399,054	Mar. 5	364	98	46	1184
Lamp. Electric-arc	W. L. Silvey	398,907	Mar. 5	136	37	46	1140
Lamp-extinguisher	J. H. Paige	397,891	Feb. 19	1244	332	46	841
Lamp filament. Incandescent	T. A. Edison	395,963	Jan. 8	1021	260	46	211
Lamp fixture and switch. Electric	L. W. Dillon	399,134	Mar. 5	510	134	46	1214
Lamp. Gas	F. Siemens	399,289	Mar. 12	757	197	46	1287
Lamp-hanger	E. Miller	395,845	Jan. 8	848	219	46	178
Lamp hanger. Electric	M. M. Wood	397,953	Feb. 19	1273	340	46	846
Lamp. Incandescent electric	T. A. Edison	398,774	Feb. 26	2505	665	46	1095
Lamp. Incandescent electric	E. Weston	400,378	Mar. 26	2388	625	46	1622
Lamp. Incandescent gas	H. J. Bell	400,167	Mar. 26	2063	540	46	1561
Lamp-lighting device	H. Landon	397,923	Feb. 19	1231	329	46	839
Lamp manufacture. Incandescent	J. A. Vandegrift	397,479	Feb. 5	508	147	46	686
Lamp. Oil	W. Brazer	400,320	Mar. 26	2297	601 / 602	46	1606
Lamp. Oil	H. A. Kent	398,163	Feb. 19	1598	424	46	907
Lamp. Oil spray or vapor	A. Neilson and J. Taylor	397,745	Feb. 12	988	261	46	773
Lamp or night light	J. A. H. Leynen-Hougaerts	397,011	Jan. 29	2578	666	46	539
Lamp-shade protector	G. A. Tank	400,372	Mar. 26	2376	621	46	1621
Lamp-shade support	W. Harper	400,998	Mar. 26	2122	556	46	1574
Lamp socket. Incandescent	O. P. Loomis	396,581	Jan. 22	1955	504	46	404
Lamp socket. Incandescent electric	C. E. Egan	399,748	Mar. 19	1446	372	46	1431
Lamp-standard	J. C. Miller and A. H. Jones	396,946	Jan. 29	2498	642	46	520
Lamps. Automatic switch for electric-arc	E. R. Knowles	397,729	Feb. 12	963	256	46	768
Lamps. Hanger-board for arc	J. J. Wood	398,870	Mar. 5	79	22	46	1130
Lamps. Holder for electric-arc	J. Pawlowski	395,735	Jan. 8	689	176	46	147
Lamps, lanterns, &c. Indicator for	W. A. Chase	396,540	Jan. 22	1978	481	46	389
Lamps. Lens-holder for signal	C. W. Helbig	398,253	Feb. 19	1731	456	46	933
Lamps. Manufacturing electric	T. A. Edison	395,903	Jan. 8	1021	.....	46	211
Lamps. Oil-feed for	C. Sieghold	395,460	Jan. 1	226	57	46	49
Lamps. Regulator for gas	J. Franklin	396,995	Jan. 29	2556	660	46	534
Lamps. Suspending electric-light	A. Siegrist	396,897	Jan. 29	2424	623	46	506
Lamps. Suspension device for	W. C. Homan	397,462	Feb. 5	547	144	46	682
Lamps, &c. Suspension device for	F. Rhind and G. L. Cooper	397,510	Feb. 12	632	164	46	706
Lantern	L. F. Betts	397,624	Feb. 12	914	213	46	739
Lantern	O. D. Woodruff	395,864	Jan. 8	879	225	46	184
Lantern-frame	F. D. Spear	399,944	Mar. 19	1736	449	46	1488
Lantern. Magic	H. J. Brower	399,596	Mar. 12	1227	316 / 317	46	1376
Lantern or lamp	G. W. Stockly	400,140	Mar. 26	2015	527	46	1551
Lantern. Tubular	L. F. Betts	397,625	Feb. 12	915	213	46	740
Lantern. Tubular	F. Dietz	395,489	Jan. 1	271	69	46	57
Lantern. Tubular	W. Westlake	399,807	Mar. 19	1543	398	46	1450
Lantern. Tubular	O. D. Woodruff	395,863	Jan. 8	876	225	46	183
Last	G. H. Healey	399,227	Mar. 5	668	174	46	1243
Last	J. W. Lamphier	399,996	Mar. 19	1812	471	46	1502
Last	G. E. Smith	395,668	Jan. 1	563	140	46	113
Last	F. M. Wade	395,465	Jan. 1	232	59	46	50
Last	E. C. Woodward	398,923	Mar. 5	159	41	46	1143
Last attachment	A. S. Trowbridge	399,096	Mar. 5	425	116	46	1195
Lasting-machine	A. F. Preston	395,629	Jan. 1	496	125 / 126	46	100
Latch	O. A. Jenison	399,268	Mar. 12	729	189	46	1281
Latch	P. L. Maltbie	399,423	Mar. 12	961	250	46	1327
Latch and lock. Combined	M. E. De Aguero	397,235	Feb. 5	188	49	46	612
Latch and lock. Combined	T. Overton	400,111	Mar. 26	1976	517	46	1543
Latch and lock. Combined	G. Worrall	398,016	Feb. 19	1388	367	46	867
Latch-case	C. M. Burgess	396,916	Jan. 29	2448	629	46	512
Latch. Gate	A. Sime and W. M. Moore	398,351	Feb. 19	1883	496	46	964
Lathe	S. A. Penny	398,077	Feb. 19	1475	390 / 391	46	884
Lathe	A. D. Waymouth	397,598	Feb. 12	644	168 / 169	46	706
Lathe attachment	F. Clarke and H. H. Bassett	397,694	Feb. 12	916	242	46	759
Lathe-carriage	W. Lodge	396,700	Jan. 22	2124	544	46	436
Lathe. Engine	J. Flather	398,601	Feb. 26	2243	594	46	1042
Lathe for turning bodies having elliptical cross-sections	J. K. Koons	395,838	Jan. 8	834	216	46	175
Lathe for turning spiral forms	E. D. Mackintosh	396,283	Jan. 15	1490	377 / 378	46	308

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Lathe-tool	J. Whatley	398,918	Mar. 5	149	39	46	1143
Lathe. Wood-turning	L. N. Norcross	396,227	Jan. 15	1414	360	46	294
Lathes and planers. Tool for	W. W. Pipes and A. L. Kelly	396,764	Jan. 29	2231	571	46	466
Lathes. Feed-reversing attachment for	G. Q. Whitney	395,531	Jan. 1	336	85	46	71
Lathes. Stop-motion for	S. L. Worsley	398,871	Mar. 5	82	23	46	1130
Lathes. Tail-stock for	E. R. Osgood	397,564	Feb. 12	703	183	46	719
Lawn-rake	H. W. Steiner	395,721	Jan. 8	639	162	46	138
Lawn-sprinkler	D. D. Buick	397,775	Feb. 12	1029	275	46	781
Lawn-tennis ball	H. H. Waddington	398,558	Feb. 26	2182	575	46	1030
Lead and rule holder for type-compositors' use	A. A. Low	395,984	Jan. 8	1053	{267 / 268}	46	217
Lead pigment. Making a	A. G. Fell	396,275	Jan. 15	1477	.....	46	306
Leather-dressing	J. J. Hayward	399,893	Mar. 19	1664	.....	46	1474
Leather. Japanning	S. C. Howell	397,803	Feb. 12	1070	285	46	789
Leather-smoothing machine	F. Storch	397,821	Feb. 12	1095	292	46	794
Leather-splitting machine	F. F. Stanley	395,750	Jan. 8	696	177	46	148
Lemon-squeezer	E. M. Scott	399,229	Mar. 5	670	174	46	1243
Letter-box	W. R. Augustine	395,308	Jan. 1	6	2	46	4
Letter-box	T. C. Chappell and E. D. Moore	400,299	Mar. 26	2263	{592 / 593}	46	1599
Letter-box	M. J. Hewlett	396,360	Jan. 15	1609	411	46	330
Letter-box	J. A. Jacobs	397,552	Feb. 12	663	178	46	715
Letter-box	R. J. Mitchell	400,244	Mar. 26	2179	572	46	1585
Letter-box	H. S. Schaadt	396,767	Jan. 29	2235	572	46	467
Letter-box	M. Wiberg	395,802	Jan. 8	780	203	46	163
Letter-box indicator	G. A. Colton	397,341	Feb. 5	360	94	46	646
Letter. Raised stone incrusted	C. Gosling	395,563	Jan. 1	388	99	46	80
Letter-sheet and envelope. Combined	H. A. Ditzell	398,822	Mar. 5	16	4	46	1117
Levee-protector	J. M. McLemore and C. D. Jones	400,101	Mar. 26	1961	514	46	1540
Level. Hand-	C. E. Lawrence	396,883	Jan. 29	2402	616	46	504
Level. Plumb-	A. B. Ewing	399,859	Mar. 19	1618	419	46	1465
Level. Plumb-	O. I. Lewis	397,010	Jan. 29	2576	666	46	538
Level. Spirit-	R. D. Werden	397,043	Jan. 29	2625	677	46	548
Leveling-instrument	E. R. Clough and E. M. Easley	397,695	Feb. 12	917	243	46	759
Leveling-instrument	C. A. Karr	397,294	Feb. 5	265	73, 74	46	630
Lever	R. W. Hardie	398,152	Feb. 19	1562	420	46	903
Library-case	J. A. Lyons	397,012	Jan. 29	2579	666	46	539
Lid or cover for metallic or other receptacles	W. T. Seymour	397,391	Feb. 5	424	112	46	658
Lid-raiser	J. S. Anderson	396,972	Jan. 29	2527	652	46	529
Life-boat and mattress. Combined	J. Martin	395,986	Jan. 8	1060	{268 / 269}	46	218
Life-saving net	M. Hunter	396,491	Jan. 22	1814	465	46	378
Lifter: *See* Stump or stone lifter. Transom-lifter.							
Lifting-jack	J. Barrett	399,470	Mar. 12	1024	270	46	1340
Lifting-jack	H. Gortner	400,205	Mar. 26	2119	556	46	1573
Lifting-jack	B. A. Sahlmann and J. Schenousky	395,517	Jan. 1	317	81	46	67
Lifting-jack	A. A. Strom	395,928	Jan. 8	965	248	46	200
Lifting-machine. Coin-controlled	B. Füchter	397,229	Feb. 5	192	51	46	612
Lifting-machine. Coin-controlled	J. G. Kearney	397,295	Feb. 5	287	74	46	631
Light: *See* Vault-light.							
Lightning-arrester	C. H. Wilson	399,305	Mar. 12	787	204	46	1293
Lightning-rod	L. L. Mast	395,399	Jan. 1	137	35	46	30
Limekiln. Oil-burning	A. V. Clark and E. T. Mapel	396,541	Jan. 22	1879	488	46	329
Liniment	D. Bates	398,024	Feb. 19	1403	.....	46	869
Liniment	W. E. Brine	396,804	Jan. 29	2294	.....	46	478
Liniment	S. Somerville	397,033	Jan. 29	2614	.....	46	546
Liquid-holding vessel	S. R. Mace	398,061	Feb. 19	1455	385	46	880
Liquid or gas meter	L. G. Welker	398,013	Feb. 19	1379	365	46	865
Liquids under pressure. Vessel for holding	J. A. Feld and J. Siebrecht	400,318	Mar. 26	2294	600	46	1605
Lobsters. Pound for	J. R. Burns	399,241	Mar. 12	690	180	46	1275
Lock: *See* Bag-lock. Car-lock. Combination-lock. Door-lock. Flask-lock. Hasp-lock. Mail-bag lock. Nut-lock. Paper-box lock. Permutation-lock. Seal-lock. Spring-lock. Tongue-lock.							
Lock	W. D. Doremus	400,316	Mar. 26	2289	{599 / 600}	46	1604
Lock	J. M. Edgar	399,189	Mar. 5	607	158	46	1231
Lock	W. S. Fiske	399,026	Mar. 5	527	88	46	1177
Lock	W. S. Fiske	399,141	Mar. 5	594	137	46	1216
Lock	H. A. Holt	397,501	Feb. 12	605	156	46	700
Lock	J. Roche	399,083	Mar. 5	406	109	46	1192
Lock	H. Van Hoevenbergh	396,628	Jan. 22	2022	520	46	417
Lock-case	C. M. Burgess	396,915	Jan. 29	2448	629	46	512
Lock-case	C. M. Burgess	399,240	Mar. 12	688	179	46	1275
Lock-case. Sheet-metal	C. M. Burgess	399,239	Mar. 12	688	179	46	1275
Lock for satchels, &c	F. F. Braillard	397,487	Feb. 12	585	152	46	697
Lock for trunks, &c	J. J. Sager	399,784	Mar. 19	1504	389	46	1443
Lock-nut	D. H. Allen and M. Loree	397,103	Feb. 5	1	1	46	579
Lock-nuts. Manufacture of	G. A. Goodwin and W. F. How	396,477	Jan. 22	1792	459	46	374
Locket	G. D. Briggs	397,774	Feb. 12	1028	274	46	781
Locket. Chewing-gum	C. W. Robertson	395,515	Jan. 1	316	80	46	67
Locking-clasp for traveling-bags, pocket-books, &c	C. A. Stark	398,287	Feb. 19	1756	472	46	945
Locking-hook. Automatic	F. Splittstoser	396,775	Jan. 29	2248	574	46	469
Locomotive-boiler	G. A. Karwiese	398,161	Feb. 19	1505	423	46	906
Locomotive for single-rail railways	A. Mallet	399,679	Mar. 19	1347	346	46	1410
Locomotive. Street-	T. Roberts	396,113	Jan. 15	1242	{316 / 317}	46	262
Locomotives. Steam-brake for	P. Reilly	397,024	Jan. 29	2601	671	46	543
Loom	J. R. Fitton	397,074	Jan. 29	2670	690	46	556

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Loom	A. Urbahn	397,156	Feb. 5	81	20, 21	46	594
Loom. Double-pile-fabric	W. H. Balratow	395,472	Jan. 1	244	{63 / 64 / 65}	46	53
Loom for weaving chenille, &c	H. Skinner and E. Tymeson	400,260	Mar. 26	2202	{578 / 579 / 580}	46	1588
Loom for weaving chenille and fringe	K. Hartley	396,205	Jan. 15	1379	{352 / 353}	46	288
Loom for weaving terry fabrics	C. Strobel	396,964	Jan. 29	2513	648	46	526
Loom for weaving unspun plant-stalks	P. de Hemptinne	399,745	Mar. 19	1440	{370 / 371}	46	1430
Loom. Hand-	W. H. Kynett	396,221	Jan. 15	1488	377	46	308
Loom let-off mechanism	S. and S. M. Hamblin	399,195	Mar. 5	617	160	46	1233
Loom-picker	J. W. Barlow	398,570	Feb. 26	2197	579	46	1033
Loom-picker	H. Kelly	397,649	Feb. 12	851	222	46	746
Loom picker-check	J. Davidson and J. Bannister	399,656	Mar. 19	1315	337	46	1405
Loom positive shuttle-motion	C. F. Wickwire	396,522	Jan. 22	1858	476	46	386
Loom-shedding mechanism	G. F. Hutchins	398,618	Feb. 26	2267	601	46	1047
Loom-shuttle	C. F. and T. H. Wickwire	400,152	Mar. 26	520	533	46	1556
Loom shuttle-motion	W. Tucker	397,823	Feb. 12	1097	293	46	794
Loom stop-motion	J. J. McComish	399,917	Mar. 19	2040	{440 / 441}	46	1481
Loom stopping mechanism	H. Wyman	400,382	Mar. 26	1701	626	46	1623
Loom take-up mechanism	W. J. Lutton	397,086	Jan. 29	2685	695	46	559
Loom-temple	J. Nuttall	398,791	Feb. 26	2533	673	46	1100
Loom-temples. Roll for	B. D. Stevens	399,445	Mar. 12	2103	257	46	1333
Loom weft stop mechanism	G. M. Atchison	400,159	Mar. 26	968	537	46	1559
Looms for weaving fabrics having end borders. Shuttle-box-pattern mechanism for	F. Hebden	399,613	Mar. 12	2051 1248	321	46	1380
Looms. Knife-sharpener for double-pile-fabric	R. Simon	399,293	Mar. 12		199	46	1289
Looms. Pattern mechanism for	G. F. Hutchins	398,398	Feb. 19	1848	{487 / 488}	46	958
Looms, &c. Pattern mechanism for	W. Wattie	396,057	Jan. 8	1156	293	46	237
Looms. Positive shuttle-motion for	J. W. Eisenhart	399,138	Mar. 5	765	135	46	1215
Looms. Positive shuttle-motion for	W. F. Hitchcock	395,829	Jan. 8	822	213	46	172
Looms. Positive shuttle-motion for	W. F. Hitchcock	398,964	Mar. 5	228	63	46	1158
Looms. Shedding mechanism, &c., for	G. F. Hutchins	397,858	Feb. 12	1141	305	46	804
Looms. Shuttle-check for	C. A. Littlefield	395,841	Jan. 8	840	217	46	176
Looms. Shuttle-operating mechanism for	C. A. Littlefield	395,842	Jan. 8	842	218	46	176
Looms. Take-up mechanism for narrow-ware	H. Wyman	398,365	Feb. 19	1912	{503 / 504}	46	970
Looms. Warp-tension-regulating device for	J. L. Aldinger	398,017	Feb. 19	1392	{367 / 368}	46	867
Lubricator: *See* Axle-lubricator. Elevator-lubricator. Engine-lubricator. Mintng machine lubricator.							
Lubricator	W. H. Craig	398,583	Feb. 26	2216	586	46	1037
Lubricator	W. M. Derby	396,471	Jan. 29	1785	457	46	372
Lubricator	H. O'Connell and S. A. Cahill	400,356	Mar. 26	2357	615	46	1616
Lug chair. Two-part self-locking	W. McLain	396,599	Jan. 22	1965	506	46	405
Lumber. Machine for grooving	J. T. Grzybowski	396,399	Jan. 22	1667	428	46	349
Lumber. Mechanism for conveying and distributing	T. B. Hyman	395,978	Jan. 8	1045	265	46	216
Lumber-piler	C. D. Clarke	397,490	Feb. 12	588	153	46	698
Lumber-rack	G. Streich	400,015	Mar. 19	1838	477	46	1507
Lunch-heater	T. O'Mahony	399,922	Mar. 19	1708	442	46	1463
Maccaroni and noodles. Machine for making	C. Held	396,567	Jan. 22	1930	497	46	399
Machinery. Device for preventing the backward movement of	J. A. Allen	400,284	Mar. 26	2243	587	46	1595
Machinist's blocking	C. E. Pollard	399,926	Mar. 19	1712	443	46	1483
Magnetic regulator	S. E. Nutting	398,744	Feb. 26	2468	654	46	1067
Magnetic separator	J. A. Burden	399,375	Mar. 12	895	{232 / 233}	46	1312
Magnetic separator	T. A. Edison	396,356	Jan. 15	1593	403	46	326
Magnets. Winding field	T. A. Edison	397,705	Feb. 12	928	245	46	761
Mail-bag	E. D. Moore	398,529	Feb. 26	2141	565	46	1022
Mail-bag	A. B. Quinan	398,185	Feb. 19	1631	432	46	913
Mail-bag fastening	H. L. Boyle	397,689	Feb. 12	910	241	46	757
Mail-bag fastening	J. S. Goodwin	399,966	Mar. 19	1796	466	46	1500
Mail-bag fastening	J. Jacobs	398,967	Mar. 5	231	64	46	1158
Mail-bag lock	T. W. Ivory	398,157	Feb. 19	1587	421	46	904
Mail-bags. Hermetic mouth-piece for	E. D. Moore	398,530	Feb. 26	2142	565	46	1022
Mail box and pouch	W. Wicek	400,026	Mar. 19	1750	481	46	1509
Mains. Seal for hydraulic	R. Haberthür	400,333	Mar. 26	2319	607	46	1610
Mainsprings and removing the same. Inserting	E. Karthaus	397,585	Feb. 12	612	158	46	701
Mainsprings. Temporary case for	J. W. Riglander	397,564	Feb. 12	705	183	46	719
Malt. Apparatus for making	J. Whitney	395,468	Jan. 1	247	60, 61	46	51
Malt-kiln	P. Lauth	400,229	Mar. 26	2153	565	46	1579
Malting-drum. Pneumatic	J. Henning	400,338	Mar. 26	2325	608	46	1610
Mantles. Apparatus for regenerating incandescent	C. A. Von Welsbach	400,419	Mar. 26	2446	641	46	1633
Mantles of refractory incandescing earths. Re-enforcing	C. A. Von Welsbach	396,347	Jan. 15	1581	400	46	324
Manure and urine conduit	H. Cole	398,379	Feb. 26	1937	509	46	962
Marble. Manufacturing artificial	L. Nathan	396,225	Jan. 15	1411	.....	46	294
Marine vehicle	W. Henry	396,496	Jan. 22	1808	463	46	377
Marker, furrower, and coverer	E. Wyckoff	399,309	Mar. 12	793	205	46	1293
Marking designs in artificial stone. Roller for	J. Laird and W. Mendham	397,731	Feb. 12	964	257	46	769
Mashing-machine. Brewer's	C. Kaestner	398,621	Feb. 26	2270	602	46	1048
Mashing potatoes, &c. Machine for	C. Warren	399,587	Mar. 19	1313	313	46	1373
Mason's float	G. Kantz	398,732	Feb. 26	2454	650	46	1084
Mast-arm	C. M. Keller	399,334	Mar. 12	827	215	46	1301
Mat: *See* Door-mat. Wire mat.							
Mat	C. Wolcott	397,452	Feb. 5	537	141	46	681

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Match-box and cane. Combined	S. B. Simon	397,663	Feb. 12	872	229	46	751
Match-flasks. Latch for	M. B. Springer	397,399	Feb. 5	444	118	46	663
Match-making machine	W. Getz	398,322	Feb. 19	1837	485	46	956
Match-package	F. Schilz	397,756	Feb. 12	999	265	46	775
Match-safe and automatic light	F. S. Ballard	396,135	Jan. 15	1269	325	46	268
Match-splints. Machine for making	G. E. Norris	397,513	Feb. 12	624	161, 162	46	704
Matches, splints, and match-boxes. Machinery for cutting wood for	W. Ellis	398,593	Feb. 26	2232	590, 591	46	1040
Mattress-stuffing machine	E. N. Stephenson	399,093	Mar. 5	420	114, 115	46	1194
Mattress. Wire	O. Howe	396,695	Jan. 22	2116	543	46	435
Mattresses. Combined corner-iron and tightening device for wire	C. H. Triphagen	396,122	Jan. 15	1253	319	46	264
Mattresses. Making	D. Haynes	399,041	Mar. 5	349	94	46	1181
Mattresses, &c. Woven-wire	D. H. and J. F. Gail	399,867	Mar. 19	1627	422	46	1466
Measure. Automatic grain	H. W. Cowan	395,743	Jan. 8	673	172, 173	46	145
Measuring and controlling apparatus. Electrical	W. Siemens	399,292	Mar. 12	761	198	46	1288
Measuring apparatus. Electrical	H. V. Hayes and A. C. White	395,974	Jan. 8	1034	264	46	214
Measuring apparatus for liquids	C. G. Mollu	398,528	Feb. 26	2140	564	46	1022
Measuring device for liquids. Automatic	B. Burton	395,652	Jan. 1	541	136	46	109
Measuring device. Liquid	F. Winters and H. A. Bingham	397,452	Feb. 5	536	141	46	680
Measuring machine. Automatic grain	W. McConachie	400,100	Mar. 26	1959	513, 514	46	1540
Measuring vessel. Fluid	T. E. Armistead	400,386	Mar. 26	2399	638	46	1624
Measuring-wheel. Rotary	R. J. Buchanan	399,966	Mar. 19	1766	457	46	1494
Meat-cutter	A. Shepard	399,790	Mar. 19	1516	391	46	1445
Meat-roaster	E. B. Rich	399,561	Mar. 12	1174	304	46	1366
Meats for transportation. Preparing	J. W. Street	396,344	Jan. 15	1578	399	46	323
Mechanical motion	W. C. Showalter	396,003	Jan. 8	1089	277	46	224
Mechanical movement	E. F. Antenrieth	398,214	Feb. 19	1668	441	46	920
Mechanical movement	R. L. Ayer	395,415	Jan. 1	158	40	46	34
Mechanical movement	D. W. Dodson and F. H. Richards	399,746	Mar. 19	1441	371, 372	46	1431
Mechanical movement	J. C. Fulton	395,971	Jan. 8	1030	263	46	213
Mechanical movement	G. W. Huckabay	398,400	Feb. 26	1961	516	46	987
Mechanical movement	C. W. White	395,677	Jan. 1	576	145	46	116
Medical battery	H. E. Waite	395,932	Jan. 8	971	249, 250	46	201
(Medicine.) Catarrh remedy	P. S. Cheshier	399,836	Mar. 19	1589	.....	46	1450
(Medicine.) Remedy for catarrh, &c	S. Males	398,639	Mar. 5	37	12	46	1121
(Medicine.) Remedy for diphtheria	C. H. A. Noortwyck	398,435	Feb. 26	2009	.....	46	996
(Medicine.) Remedy for rheumatism, &c	J. F. Lindgren	397,192	Feb. 5	141	.....	46	603
Metal. Apparatus for compressing scrap	J. W. Summers and T. Sharp	400,415	Mar. 26	2441	640	46	1632
Metal, &c. Apparatus for scouring, cleansing, and polishing	J. Pfeifer	395,563	Jan. 1	424	108	46	88
Metal articles with a glass lining. Making	T. E. Halford and R. Morant	397,641	Feb. 12	838	.....	46	744
Metal bars. Die for upsetting	W. R. Webster	400,148	Mar. 26	2035	539	46	1555
Metal bars, tubes, &c. Machine for straightening	W. A. McCool	395,400	Jan. 1	138	35, 36	46	30
Metal-bending machine	S. Vanstone	395,723	Jan. 8	644	164, 165	46	139
Metal. Device for upsetting and bending	M. Kennedy	399,903	Mar. 19	1677	435	46	1477
Metal joint. Universal	J. C. Haggett	397,961	Feb. 19	1321	352	46	854
Metal plates or sheets. Cleaning	R. B. Thomas	398,094	Feb. 19	1494	395, 396	46	888
Metal. Producing forged articles from scraps of	E. N. Colwell	397,278	Feb. 5	261	68	46	625
Metal-roll-cooling device	F. Newlin	395,713	Jan. 8	629	159	46	135
Metal-shearing machine	L. W. Noyes	397,020	Jan. 29	2590	669	46	541
Metal-shearing machine	L. W. Noyes	397,021	Jan. 29	2592	670	46	542
Metal sheet for surfacing walls, &c	H. A. Lee	397,298	Feb. 5	294	75	46	639
Metal skeletons for composite structures. Mechanism for making coils for	J. Bordenave	399,484	Mar. 12	1047	274	46	1344
Metal table	E. H. Peck and A. H. Jones	398,182	Feb. 19	1626	431	46	912
Metal working and welding machine. Electric	E. Thomson	398,914	Mar. 5	144	39	46	1142
Metal working. Electric	E. Thomson	396,014	Jan. 8	1101	279	46	226
Metals. Apparatus for welding and working	E. Thomson	396,012	Jan. 8	1098	279	46	226
Metals by electricity. Forming, brazing, and welding of	E. Thomson	396,009	Jan. 8	1094	278	46	225
Metals. Drawing	W. A. McCool	400,238	Mar. 26	2168	568, 569	46	1582
Metallic fastening device	F. W. Starr	396,900	Jan. 29	2428	624	46	508
Metallic joint	F. Funk	398,321	Feb. 19	1836	485	46	956
Metallic wheel	T. Hill	399,969	Mar. 19	1802	467	46	1501
Meter: *See* Electric meter. Fluid-meter. Gas-meter. Liquid or gas meter. Time-meter. Water-meter.							
Micrometer-gage	C. H. Russom	397,442	Feb. 5	517	136	46	677
Middlings. Apparatus for treating	A. R. Parkison and J. Pullinger	395,580	Jan. 1	418	107	46	86
Middlings-purifier	S. Stone and J. W. Kingston	395,637	Jan. 1	513	129	46	103
Milk-can. Measuring	R. Eagan	397,788	Feb. 12	1049	280	46	785
Milking machine. Cow	J. J. Lefeber	396,577	Jan. 22	1943	500, 501	46	401
Mill: *See* Cane-mill. Coffee-mill. Crushing and grinding mill. Curd-mill. Grain-crushing mill. Grinding-mill. Quartz-mill. Roller-mill. Roller reduction-mill. Seed-mill. Triturating-mill.							
Milling-machine	J. W. Packard	396,952	Jan. 29	2494	643, 644	46	522
Millstone-dressing machine	J. L. Maroney	397,014	Jan. 29	2581	667	46	539
Mineral wool. Apparatus for gathering	R. D. A. Parrott	396,050	Jan. 8	1147	291	46	235

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Minerals. Appliance for breaking loose or splitting all kinds of	E. Mould	398,742	Feb. 26	2406	654	46	1085
Mining-caisson	S. A. Bowe	397,688	Feb. 12	908	240	46	757
Mining-drill	W. H. Jenkins	396,875	Jan. 29	2386	612, 613	46	500
Mining-drill and channel-cutter	J. P. Paynter	395,716	Jan. 8	633	160	46	136
Mining-machine	E. E. Carter	398,313	Feb. 19	1825	482, 483	46	953
Mining-machine	A. T. Moats	397,089	Jan. 29	2090	696	46	560
Mining-machine	A. F. Watkins	396,719	Jan. 22	2150	551	46	442
Mining-machine	E. W. Whitcomb	398,298	Feb. 19	1804	476	46	949
Mining-machine lubricator	E. W. Whitcomb	398,299	Feb. 19	1805	476	46	949
Mining purposes. Tool for	G. A. Barth	398,308	Feb. 19	1817	480	46	952
Mirror. Window	N. Andersen	398,994	Mar. 5	280	77	46	1168
Mitering the metal of show-case moldings. Machine for	F. X. Ganter	398,603	Feb. 26	2246	595	46	1043
Mitten	J. Tysdal	399,222	Mar. 5	658	172	46	1241
Mixing liquid and powdered substances. Apparatus for	B. D. Milliken	399,276	Mar. 12	739	192	46	1284
Model. Display	H. Schweibold	398,658	Feb. 26	2335	621	46	1060
Mold: *See* Brick-mold. Candy-mold. Glass-mold.							
Molds. Apparatus for making	S. Alley and J. A. MacLellan	397,683	Feb. 12	902	238	46	756
Molds. Apparatus for making	E. Reddy	346,893	Jan. 29	2418	621	46	507
Molder's flask	C. Bogenschutz, Jr	398,219	Feb. 19	1677	444	46	922
Molder's turn-table	S. Alley and J. A. MacLellan	397,684	Feb. 12	903	239	46	756
Molding and mold-distributing machine	M. W. Walker and W. Jowitt	395,466	Jan. 1	233	60	46	50
Molding device	M. O'Connor	396,831	Jan. 29	2328	596	46	457
Molding fibrous ware. Machine for	H. Carmichael	397,778	Feb. 12	1032	276	46	782
Molding-machine	J. Baker	398,568	Feb. 26	2195	578, 579	46	1033
Molding-machine	T. A. Considine	398,704	Feb. 26	2406	638	46	1075
Molding machine. Sand	A. L. Teetor	397,316	Feb. 5	318	83, 84	46	637
Moldings. Machine for turning	J. F. Gebhardt	399,871	Mar. 19	1621	423	46	1467
Moldings to be polished. Reciprocating table for holding	L. Malchaw	399,762	Mar. 19	1466	378	46	1435
Monogram-pattern	J. W. Miller	400,105	Mar. 26	1908	515	46	1542
Mop and scrubbing-brush holder	J. T. Varney	399,223	Mar. 5	660	172	46	1241
Mop-holder	J. Duncan	396,330	Jan. 15	1589	395	46	320
Mop. Rotary	J. Rourke	397,521	Feb. 12	635	165, 166	46	707
Mop-wringer	F. R. Smith	396,436	Jan. 22	1727	444	46	361
Mordant	W. J. Williams	398,564	Feb. 26	2149	.....	46	1032
Mortar. Grinding and amalgamating	G. W. White	399,809	Mar. 19	1547	400	46	1450
Mortising-machine	F. V. Phillips	399,435	Mar. 12	975	254	46	1330
Mosaics of glass. Making	H. F. Belcher	396,911	Jan. 29	2442	627	46	511
Mosaics. Mold for making	H. F. Belcher	396,912	Jan. 29	2443	628	46	511
Motion. Means for converting	E. Burke	399,492	Mar. 12	1060	276	46	1346
Motion. Mechanism for converting	J. De Monnin	396,147	Jan. 15	1283	329	46	271
Motion. Mechanism for converting	F. Rourk	397,590	Feb. 12	635	165	46	706
Motor: *See* Car-motor. Current-motor. Electric motor. Hydraulic motor. Spring-motor. Steam-motor. Thermo-magnetic motor. Water-motor. Wind-motor.							
Motor	C. C. Burmeister	398,767	Feb. 26	2408	662, 663	46	1093
Motor	E. T. Heinsohn and J. Hoffmann	397,988	Feb. 5	276	71	46	628
Movement-cure machine	M. F. Henderson	398,255	Feb. 19	1733	457	46	934
Mower	W. R. Baker	398,307	Feb. 19	1814	479	46	951
Mower	J. C. Bloom	396,023	Jan. 8	1113	283	46	228
Mower	S. D. Maddin	397,924	Feb. 19	1232	329, 330	46	839
Mower	J. H. and S. H. Redfield and A. E. Hansbro.	395,349	Jan. 1	65	16	46	15
Mower-knives. Machine for grinding	R. Dutton	395,615	Jan. 1	468	118, 119	46	96
Mower. Lawn	D. Bearly	395,809	Jan. 8	686	227	46	185
Mower. Lawn	L. De Hall	396,038	Jan. 8	1129	287	46	231
Mowing and reaping machines. Swath-board for	A. B. Smith	398,853	Mar. 5	54	16	46	1124
Mowing-machine	W. A. Knowlton	395,981	Jan. 8	1049	266, 267	46	216
Mowing-machine attachment	W. S. Fox. (Reissue)	10,990	Mar. 12	1294	332	46	1389
Mowing-machine cutter-bar	I. F. Bassford	397,685	Feb. 12	904	239	46	757
Mowing-machine sections. Apparatus for tempering	L. L. Lamb	399,673	Mar. 19	1340	343, 344	46	1409
Music. Binding sheet	E. Harris	397,360	Feb. 5	382	101	46	650
Music-book holder	J. P. Caston and L. C. Smith	398,128	Feb. 19	1548	410	46	898
Music-boxes. Stop-motion for	G. J. Jaccard	395,440	Jan. 1	189	50	46	40
Music-leaf turner	F. H. Loughlin	397,241	Feb. 5	206	54	46	614
Music or book holder	H. O. Brown	397,627	Feb. 12	819	214	46	746
Music-racks. Adjustable standard for	A. Koehn	398,408	Feb. 26	1976	519	46	989
Music-stand	P. L. Brachet	395,808	Jan. 8	703	206	46	166
Musical box	F. E. P. Ehrlich and G. A. F. Müller	398,241	Feb. 19	1714	452	46	930
Musical box	A. B. Meylan	400,104	Mar. 26	1907	515	46	1542
Musical instrument. Automatic	J. McTammany	400,102	Mar. 26	1902	514	46	1541
Musical instrument. Key-board	A. L. Caldera	395,543	Jan. 1	351	90	46	74
Musical instruments. Attachment for	E. W. Sylvan	397,877	Feb. 12	1162	311	46	808
Musical instruments. Tuning-pin for	V. Von Frankenberg	399,712	Mar. 19	1304	330	46	1421
Mustache-trainer	L. A. Allard	398,925	Mar. 5	160	42	46	1144
Nail: *See* Barbed nail. Horseshoe-nail.							
Nail	A. S. Wall	399,804	Mar. 19	1540	398	46	1449

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Invention.	Name.	No	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Nail-box	G. Hendricks	398,724	Feb. 26	2445	647	46	1082
Nail-machine	M. Chase and M. H. Foster	397,068	Jan. 29	2661	685, 686	46	554
Nail-machine	E. P. Hurd	399,410	Mar. 12	945	245	46	1323
Nail-machine	J. W. Thompson	398,009	Feb. 19	1368	363	46	863
Nail machine. Wire	F. Bryant	397,067	Jan. 29	2658	684, 685	46	554
Nail machine. Wire	H. B. Happe	397,592	Feb. 12	756	197, 198	46	729
Nail machine. Wire	J. B. Hastings	397,426	Feb. 5	488	128	46	672
Nail machine. Wire	E. B. Parkhurst	397,022	Jan. 29	2597	670, 671	46	543
Nail-making machine	L. Goddu	398,891	Mar. 5	113	30, 31	46	1135
Nails. Die used in making decorative	H. P. Fiske	396,200	Jan. 15	1370	351	46	286
Nails. Forming metal blanks for capping	H. P. Fiske	395,888	Jan. 8	914	234	46	190
Nails. Machine for finishing decorative	H. P. Fiske	398,038	Feb. 19	1421	376	46	873
Nails. Machine for rolling	H. E. Fuller	397,460	Feb. 5	544	143	46	682
Nails. Rolling	H. E. Fuller	397,422	Feb. 5	483	126, 127	46	671
Nailing machine. Wire	L. Goddu	398,606	Feb. 26	2249	596	46	1043
Naphthaline. Apparatus for the manufacture of	H. J. and G. H. Fenner	399,139	Mar. 5	521	136	46	1216
Neckband-shaper and shirt-bosom board	W. H. Jacoby and C. A. Fuller	398,331	Feb. 19	1851	488, 489	46	958
Neckscarf	H. Stern	396,840	Jan. 29	2340	599	46	490
Necktie-fastener	G. Borst	396,913	Jan. 29	2446	628	46	511
Necktie-fastener	J. L. Brallier	398,696	Feb. 26	1392	635	46	1072
Necktie-fastener	J. Well	397,042	Jan. 29	2624	677	46	548
Needle for sewing bags, &c	S. M. Neely	398,531	Feb. 26	2144	565	46	1022
Needle or pin case	R. Wheatley, Jr	399,856	Mar. 19	1735	453	46	1491
Nickel matte from nickel ores. Producing	W. Brandreth	399,010	Mar. 5	306	.....	46	1173
Nippers	J. Sponseller	398,464	Feb. 26	2045	537	46	1003
Note-case. Banker's and merchant's	J. B. T. Hall	399,885	Mar. 19	1656	428	46	1472
Nozzle. Exhaust	J. H. McIndoe and W. Meredith	396,168	Jan. 15	1321	338	46	277
Nozzle. Overflow-check	E. W. Spear	396,376	Jan. 15	1629	418	46	333
Nozzle. Sprinkling	J. W. Anderson	396,059	Jan. 15	1163	295	46	247
Numbering-machine	J. D. Humphrey	399,991	Mar. 19	1803	468, 469	46	1501
Numbering-machine	W. Koch	398,624	Feb. 26	2274	603	46	1049
Nut-cracker	F. J. Rabbeth	397,023	Jan. 29	2599	671	46	543
Nut cracking and shelling machine	H., C., and H. E. Kuhlmann	397,863	Feb. 12	1146	306, 307	46	805
Nut-lock	H. H. Allen	399,813	Mar. 19	1551	401	46	1451
Nut-lock	G. H. Griffin	396,691	Jan. 22	2111	542	46	434
Nut-lock	J. C. Morehead	397,436	Feb. 5	506	133	46	675
Nut-lock	T. W. Patten	398,535	Feb. 26	2149	567	46	1024
Nut-lock	M. Pennybacker	396,795	Feb. 26	2537	675	46	1101
Nut-lock	A. Rassinier	399,696	Mar. 19	1369	352	46	1416
Nut-lock	S. H. Ray	395,348	Jan. 1	63	16	46	15
Nut-locks. Machine for making	W. Dunn	397,840	Feb. 12	1115	298, 299	46	798
Nut-wrench. Thumb	C. W. Kimball	397,988	Feb. 19	1331	355	46	856
Nuts. Device for preventing the loosening of	J. Powell	397,935	Feb. 19	1250	333	46	842
Nuts on bolts. Machine for fitting	F. Philips	396,597	Jan. 22	1974	508	46	407
Obstetrical forceps	A. C. Galiano	399,749	Mar. 19	1448	372	46	1431
Odometer	G. W. Johnson	396,210	Jan. 15	1300	356	46	290
Office-chair	C. H. Tyler	398,293	Feb. 19	1796	474	46	947
Oil-bath for wheels. Portable	H. C. Handlen	397,643	Feb. 12	840	219	46	744
Oil-burner	J. Bains	396,525	Jan. 22	1861	478	46	386
Oil-burner	W. E. Facer	397,493	Feb. 12	593	153	46	698
Oil-burner	C. Gilbert	399,517	Mar. 12	1104	287	46	1353
Oil-burner	A. U. Page and J. Bragg	396,049	Jan. 8	1146	291	46	235
Oil-burner	A. J. Pierce	398,536	Feb. 26	2150	567	46	1024
Oil burner for stoves, &c. Hydrocarbon	C. H. Prentiss	397,872	Feb. 12	1156	309	46	807
Oil burner or heating apparatus. Coal	J. M. Clark	397,971	Feb. 19	1297	346	46	850
Oil burner. Spray	W. C. Fisk	399,864	Mar. 19	1623	421	46	1466
Oil-cup	J. S. Hall	396,336	Jan. 15	1568	397, 398	46	322
Oil-cup	C. H. Nunn	397,202	Feb. 5	154	41	46	605
Oil-distributing rocket	W. Rupp and A. Giese	397,522	Feb. 12	637	166	46	707
Oil. Extracting	W. T. Forbes and Q. Leder	397,792	Feb. 12	1055	281	46	786
Oil for fuel. Apparatus for burning kerosene	G. L. Swett	397,150	Feb. 5	74	18	46	592
Oil from oil-cakes. Apparatus for extracting	J. L. Moss and N. Littell	400,254	Mar. 26	2197	576	46	1567
Oil. Paint	A. Sommer	396,774	Jan. 29	2246	.....	46	469
Oil-press	L. Gismondi	400,328	Mar. 26	2312	605	46	1608
Oil projectile. Luminous	F. Silas	397,031	Jan. 29	2611	674	46	545
Oil-tank	J. C. Dilworth	395,551	Jan. 1	365	94	46	76
Oils or other liquids. Oxidizing	G. B. Wiggin	396,636	Jan. 22	2034	522	46	419
Oiler	D. J. M. Corsaen	397,050	Jan. 29	2635	679	46	549
Oiler. Automatic	A. Kinney	397,432	Feb. 5	501	132	46	675
Oiling-machine	F. P. Hawkins	395,778	Jan. 8	721	185, 186	46	153
Open-hearth furnace	H. W. Lash, H. Aiken, and D. E. Park. (Reissue.)	10,984	Feb. 5	577	149	46	688
Opera-glass	G. Holle	396,657	Jan. 22	2060	529	46	424
Opera-glass. Coin-controlled	C. E. Patterson	395,345	Jan. 1	59	15	46	14
Opera-glass handle	G. Plessy	398,277	Feb. 19	1766	466, 467	46	941
Opera-glass holder	H. Borsch	395,946	Jan. 8	995	255	46	206
Opera-glass holder	W. Mack	399,543	Mar. 12	1145	297	46	1360
Opera or marine glass	W. Mack	399,542	Mar. 12	1144	296	46	1360
Optician's measuring-instrument	E. B. Meyrowitz and C. E. Dressler	397,744	Feb. 12	985	261	46	772
Orange-grader	T. W. Moore	395,793	Jan. 8	764	198	46	160
Oranges, &c. Machine for wrapping	H. J. Williams	398,015	Feb. 19	1383	366, 367	46	865
Ordnance	B. T. Babbitt	400,160	Mar. 26	2052	537	46	1559

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Ordnance-mounting	J. Vavasseur	397,764	Feb. 12	1611	268, 269	46	778
Ore-concentrator	C. H. Taylor	398,663	Mar. 5	70	19	46	1128
Ore-concentrator	M. T. Van Derveer	398,475	Feb. 26	2064	543	46	1007
Ore-crusher	J. D. Copien	399,600	Mar. 12	1234	318	46	1377
Ore-feeder	J. and J. H. Hendy. (Reissue)	10,983	Feb. 5	574	149	46	687
Ore-sampling apparatus	C. E. Palmer	398,275	Feb. 19	1761	466	46	940
Ore-separator	E. Derbec	397,070	Jan. 29	2665	687, 688, 689	46	535
Ore-separator	T. A. Edison	400,317	Mar. 26	2293	600	46	1605
Ore-separator	A. Emmons	399,658	Mar. 19	1317	337, 338	46	1405
Ore separator and amalgamator	E. L. Giroux	397,542	Feb. 12	604	173, 174	46	712
Ore-washer	H. G. Blasdel	397,581	Feb. 12	737	191	46	725
Organ stop-action	J. P. Nyström	395,503	Jan. 1	291	75	46	62
Organs. Pneumatic action for	F. Pritchard	396,945	Jan. 29	2501	645	46	594
Ornament. Tin brilliant	P. Knorpp and G. A. Mayer	397,083	Jan. 29	2622	694	46	558
Ornamental box	M. Baskam	395,417	Jan. 1	102	41	46	34
Oven. Baker's	F. Dührkop	396,395	Jan. 22	1660	427	46	347
Oven. Baker's	E. A. C. Petersen	400,250	Mar. 26	2192	575	46	1567
Oven. Baking	J. Junker	395,979	Jan. 8	1047	266	46	216
Oven. Domestic or portable	M. S. Sager	399,567	Mar. 12	1180	305, 306	46	1367
Oven for vapor-stoves	G. M. Yolts and C. H. Shultz	399,301	Mar. 12	791	203	46	1292
Oven. Pastry	J. P. Conner	398,380	Feb. 26	1938	510	46	962
Ovens. Heat-protector for bake	J. J. Seifert	398,192	Feb. 19	1641	434	46	914
Overflow-alarm	L. Hofmeister and O. E. Schwabe	395,830	Jan. 8	823	213	46	178
Overshoe	P. Long	395,338	Jan. 1	50	12	46	12
Ox-shoe	J. Deeble	398,034	Feb. 19	1416	374	46	879
Ozone. Apparatus for manufacturing	G. H. Merkel	397,993	Feb. 19	1336	356	46	857
Package-carrier	J. W. Bildwell	399,180	Mar. 5	501	132	46	1228
Package or wrapper. Sample	H. H. Johnson	396,090	Jan. 15	1216	307	46	257
Packing	S. H. Mosher	396,222	Jan. 15	1407	359	46	293
Packing for stuffing-boxes. Metallic	W. W. St. John	396,120	Jan. 15	1250	319	46	264
Packing. Metallic	F. A. Westbrook and W. S. Cook	396,634	Jan. 22	2031	522	46	419
Packing. Metallic stuffing-box	F. O. Franke	395,968	Jan. 8	1027	262	46	212
Packing. Piston-rod	F. F. Swain	398,756	Feb. 26	2464	650	46	1091
Packing. Piston-rod-guide	G. A. Barth	398,931	Mar. 5	177	47	46	1147
Packing. Steam or water	J. T. Smith	398,461	Feb. 26	2042	536	46	1003
Pad: *See* Bosom-pad, Collar-pad, Harness-pad, Truss-pad, Under-arm pad.							
Padlock	A. Peterson	396,596	Jan. 22	1974	508	46	407
Padlock	H. F. Sise	396,960	Jan. 29	2509	647	46	525
Padlock. Permutation	G. F. Seiser, C. R. Johnson, and M. B. Perry.	398,600	Feb. 26	2339	621	46	1061
Pail. Milk	J. E. Mayer	396,696	Jan. 29	2319	594	46	485
Paint	D. Bell	397,105	Feb. 5	2	.....	46	579
Paint	I. Townsend	398,917	Mar. 5	148	.....	46	1142
Paints from oil foots. Making	G. W. Scollay	396,439	Jan. 22	1720	.....	46	360
Palette and easel. Combined	O. B. Brown and H. L. Moody	397,108	Feb. 5	4	2	46	579
Pan: *See* Ash-pan, Baking and roasting pan, Bed-pan, Dust-pan, Evaporating-pan, Grinding-pan, Ice-box pan, Scale-pan.							
Panel-fastener	E. Harroun	399,261	Mar. 12	719	187	46	1280
Paneling and striping implement	A. J. Avery	399,233	Mar. 12	676	177	46	1273
Pantaloons-protector	A. Diamond and O. Kohnert	397,703	Feb. 12	927	245	46	761
Pantaloons-protector	A. Diamond and O. Kohnert	357,704	Feb. 12	927	245	46	761
Paper and other material. Apparatus for coating	T. Manahan	399,544	Mar. 12	1146	297	46	1360
Paper. Apparatus for dyeing and drying tissue and other	E. Crompton	397,069	Jan. 29	2663	686, 687	46	535
Paper bag	L. D. Benner	397,217	Feb. 5	176	47	46	610
Paper bag	G. J. Stevens	398,908	Mar. 5	137	37	46	1140
Paper-bag and twine holder	C. E. Kamble	399,671	Mar. 19	1338	343	46	1408
Paper-bag machine	L. D. Benner	397,772	Feb. 12	1022	273, 274	46	780
Paper-bag machine	F. E. Porter	398,278	Feb. 19	1767	467	46	941
Paper bag. Waxed	E. G. Sparks	395,520	Jan. 1	332	81	46	68
Paper bags. Making striped	C. A. Dean and F. H. Eoble	399,846	Mar. 19	1509	415	46	1461
Paper-barrel machine	G. W. Laraway	398,752	Jan. 29	2215	506, 507	46	463
Paper box	J. F. Diemer and P. E. Gonon	399,849	Mar. 19	1605	416	46	1462
Paper box	W. H. Emery	395,846	Jan. 8	912	234	46	189
Paper box	G. W. T. Harley	399,891	Mar. 19	1663	430	46	1474
Paper box	F. G. Hotchkiss	396,570	Jan. 22	1933	498	46	399
Paper box	E. L. Meyer	398,971	Mar. 5	237	66	46	1150
Paper-box lock	F. E. De Long	397,227	Feb. 5	189	50	46	612
Paper boxes or wrappers. Graduated blank for	W. C. Tiffany	397,475	Feb. 5	563	147	46	646
Paper-coating machine	J. M. McCausland	399,151	Mar. 5	542	141	46	1219
Paper. Composition for the manufacture of tarred	W. B. Lupton	398,337	Feb. 19	1402	.....	46	960
Paper. Conservatory for	I. M. Chase	397,276	Feb. 5	259	67	46	625
Paper-cutter	A. Bess	398,575	Feb. 26	2204	581	46	1035
Paper-cutting machine	E. Morgan	398,341	Feb. 19	1670	402	46	961
Paper-cutting machines. Clamping apparatus for	G. Daniels	399,743	Mar. 19	1435	360	46	1420
Paper-folding machine	F. L. and S. G. Goss	399,987	Mar. 19	1708	466, 467	46	1500
Paper garment	R. C. Mudge and E. M. Wasson	397,437	Feb. 5	506	133	46	676
Paper-hangers. Folding table for the use of	G. H. Boysen	396,531	Jan. 22	1867	480	46	387

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Paper-hanging machine	J. R. Hartford	398,154	Feb. 19	1584	{420 421}	46	904
Paper-holder	C. D. Crane	395,771	Jan. 8	709	183	46	151
Paper-holder and cutter. Roll-	A. Q. Ross	398,750	Feb. 26	2476	656	46	1069
Paper-holder and cutter. Roll-	G. Winhelm	398,702	Feb. 26	2492	660	46	1092
Paper-machine	V. G. Hazard	398,394	Feb. 26	1955	514	46	966
Paper-machines. Suction-plate for	C. Chapin	395,544	Jan. 1	354	91	46	74
Paper-making machine	H. L. Carter and T. H. Savery	397,275	Feb. 5	257	66, 67	46	624
Paper-making machine	R. Smith	398,091	Feb. 19	1490	{394 395}	46	887
Paper. Naphthaline	A. Taheppe	397,250	Feb. 5	234	60	46	620
Paper-ornamenting machine	C. G. Mortimer	397,091	Jan. 29	2602	696	46	561
Paper pail	J. L. Colhapp	396,028	Jan. 8	1119	284	46	229
Paper-pulp. Manufacture of pails, &c., from	H. Fairbanke	396,198	Jan. 15	1364	350	46	285
Paper roll. Toilet or wrapping	S. Wheeler	396,675	Jan. 22	2084	536	46	429
Paper. Waxing	J. R. Anderson	395,645	Jan. 1	529	132	46	106
Paper-waxing machine	S. Hodkinson and G. E. Raymond	396,402	Jan. 22	1671	429	46	350
Paper-weight	A. E. Swift	396,519	Jan. 22	1853	475	46	385
Paraffine-wax. Purifying	J. E. Bicknell	400,042	Mar. 26	1879	489	46	1524
Paraffine-wax. Purifying	J. E. Bicknell	400,043	Mar. 26	1881	489	46	1524
Parer and corer. Apple	W. A. C. Oaks	397,871	Feb. 12	1154	309	46	807
Pattern: *See* Monogram-pattern.							
Patterns. Machine for cutting	J. W. Dearing	399,847	Mar. 19	1600	415	46	1461
Pavement	L. J. Cadwell	398,939	Mar. 5	187	50	46	1150
Pavement	L. J. Cadwell	398,940	Mar. 5	188	50	46	1150
Pavement	B. W. Hunter	399,045	Mar. 5	355	.....	46	1182
Pavement	J. E. Knoche	398,055	Feb. 19	1447	383	46	878
Pavement	F. C. Ross	399,932	Mar. 19	1722	.....	46	1485
Pavement. Composite	M. Cunningham	398,946	Mar. 5	195	.....	46	1151
Pavement-curb	I. L. Landis	398,630	Feb. 26	2296	607	46	1052
Pavement or roadway	H. Steinberg	400,013	Mar. 19	1835	476	46	1506
Paving composition	E. S. McCaughey	398,421	Feb. 26	1996	.....	46	994
Pea-huller	R. P. Scott and J. A. Chisholm	399,702	Mar. 19	1377	355	46	1418
Peach-stoner	C. L. Ferriott	399,513	Mar. 12	1097	286	46	1339
Pen. Drawing-	G. Bennett	400,178	Mar. 26	2076	544	46	1564
Pen-extractor or device for removing pens from their holders.	A. G. Hofstatter	400,341	Mar. 26	2336	609	46	1612
Pen. Fountain-	T. F. Bourne	397,413	Feb. 5	467	123	46	668
Pen. Fountain	J. H. Crowell	395,695	Jan. 8	606	153	46	131
Pen. Fountain-	S. A. De Normanville	396,547	Jan. 22	1895	489	46	392
Pen. Fountain-	R. C. Frampton	397,053	Jan. 29	2641	680	46	551
Pen. Fountain-	O. F. Grant	397,123	Feb. 5	25	6	46	583
Pen. Fountain-	B. Rosenthal	400,253	Mar. 26	2196	576	46	1567
Pen. Fountain-	P. E. Wirt	399,306	Mar. 12	788	204	46	1293
Pen-holder	F. H. Durell	398,317	Feb. 19	1632	484	46	955
Pen-holder	L. Holzworth	399,043	Mar. 5	353	94	46	1182
Pen-holder	T. R. Stuart	400,364	Mar. 26	2371	619	46	1619
Pencil-sharpener	D. Codd	399,830	Mar. 19	1502	413	46	1460
Pendulum. Compensation	A. Lawrence	396,095	Jan. 15	1220	309	46	258
Perforating-machine	C. Seybold	396,240	Jan. 15	1430	364	46	298
Perforating paper patterns. Machine for	M. Bendick	398,572	Feb. 26	2199	580	46	1033
Perfuming apparatus. Coin-operated	H. M. Wilson	397,574	Feb. 12	718	186	46	721
Permutation-lock	L. A. Becht	399,002	Mar. 5	294	61	46	1171
Permutation-lock	B. J. Douds	396,273	Jan. 15	1472	{374 375}	46	306
Petroleum-burner	F. H. Smith and J. W. Wright	398,352	Feb. 19	1884	496	46	964
Petroleum-burner and steam-generator	H. H. Hyland	395,786	Jan. 8	746	{191 192}	46	157
Petroleum-engine	M. V. Schiltz	399,569	Mar. 12	1183	306	46	1368
Petroleum in furnaces. Injector for burning	H. H. Hyland	395,785	Jan. 8	744	{190 191}	46	157
Phenacetine	O. Hinsberg	400,086	Mar. 26	1941	.....	46	1537
Phonograms. Duplicating	G. R. Herrington	399,264	Mar. 12	794	188	46	1281
Phonograms. Duplicating	G. H. Herrington	399,265	Mar. 12	795	188	46	1281
Phonograph	T. A. Edison	397,706	Feb. 12	998	246	46	761
Phonograph recorder and reproducer	T. A. Edison	397,280	Feb. 5	263	68	46	626
Photograph-burnisher	S. H. Randall	397,309	Feb. 5	307	80	46	635
Photograph transferring and printing frame	C. T. Cain	398,941	Mar. 5	189	51	46	1150
Photographs. Wall-case for exhibiting	F. East	398,953	Mar. 5	206	56, 57	46	1153
Photographic apparatus. Automatic	W. R. Pope and E. L. Poole	396,428	Jan. 22	1714	{440 441}	46	359
Photographic camera	E. B. Barker	400,102	Mar. 26	2054	538	46	1560
Photographic camera	L. Chevallier	398,231	Feb. 19	1698	449	46	927
Photographic camera	S. P. Hasey	395,699	Jan. 8	929	239	46	192
Photographic camera	J. J. Higgins	397,428	Feb. 5	492	{129 130}	46	673
Photographic camera	J. J. Higgins	397,429	Feb. 5	496	{130 131}	46	674
Photographic cards. Temporary binder for	I. H. Brown	396,727	Jan. 29	2164	555	46	452
Photographic chair	T. Endean	398,712	Feb. 26	2425	642	46	1079
Photographic lens	A. G. Clark	399,499	Mar. 12	1068	279	46	1347
Photographic pictures. Magnesium lighting apparatus for taking	J. W. C. C. Schirm	398,084	Feb. 19	1482	392	46	886
Photographic plates. Magazine plate-holder for	F. A. Hetherington	396,656	Jan. 22	2059	529	46	424
Photographic proofs and copies. Mounting and preserving	D. K. Zumwalt	400,031	Mar. 19	1802	.....	46	1512
Photographic shutter	H. Herbert	400,084	Mar. 26	1930	506	46	1536
Photographic shutter	E. Kuhn	396,699	Jan. 22	2121	544	46	436
Photometer-stand. Revolving	J. W. Packard	396,951	Jan. 29	2493	643	46	522
Piano	G. Steck	399,710	Mar. 19	1390	358	46	1421
Piano-action frame. Upright	H. Mallebré	398,635	Feb. 26	2302	609	46	1053
Piano action. Upright	S. Hansing	398,151	Feb. 19	1581	419	46	903
Piano and organ cases. Foot-shield for	M. R. Brinkman	396,137	Jan. 15	1273	326	46	269

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Piano attachment	F. W. Hale	396,156	Jan. 15	1304	331	46	274
Piano-case	P. Gmehlin	397,121	Feb. 5	22	5, 6	46	583
Piano-forte	F. W. Hale	396,155	Jan. 15	1299	{333 334}	46	273
Piano-forte action	H. Kranich and J. Bach	397,239	Feb. 5	203	54	46	614
Pianos. Device for muting	J. Keller	396,696	Jan. 22	2120	544	46	435
Pianos. Harmonic damper for	H. Worrall	396,924	Mar. 5	159	42	46	1143
Pianos. Muffler for upright	E. L. S. Osborn	397,815	Feb. 12	1064	282	46	791
Pianos. Stringing and tuning device for	S. Hansing	398,150	Feb. 19	1580	419	46	903
Pianos. Stringing and tuning device for	G. M. Guild	396,335	Jan. 15	1567	397	46	332
Picker: *See* Cotton-picker.	G. M. Guild	396,740	Jan. 29	2193	561	46	458
Picture-exhibiting device	V. Bonnet, H. Lissagaray, A. and A. Richard.	399,127	Mar. 5	491	131	46	1216
Picture-exhibitor. Automatic	C. Bach	396,455	Jan. 22	1755	449	46	366
Picture-exhibitor. Automatic	C. E. Patterson	399,553	Mar. 12	1161	301	46	1364
Picture-frames. Canvas-stretcher for	W. Murphy	397,139	Feb. 5	50	11	46	587
Picture-hanger. Automatic adjustable	O. and A. Jaeger	396,260	Jan. 15	1487	377	46	307
Pigeon-holes and drawers. Partition-support for	W. Lumley	397,866	Feb. 12	1149	307	46	805
Pile	R. B. Markle	395,448	Jan. 1	208	54	46	44
Pile-covering	H. Anderson and H. Elias	395,866	Jan. 8	882	226	46	184
Pillow or head-rest	W. L. Miller	397,993	Feb. 19	1337	356	46	857
Pillow-sham holder	G. J. Kraushaar	397,084	Jan. 29	2663	694	46	558
Pillow-sham holder	G. W. Schiffer and A. L. Knight	400,122	Mar. 26	1993	522	46	1547
Pin: *See* Hair-pin. Safety-pin.							
Pin-and-link couplers. Attachment for	W. L. Dwyre	396,863	Jan. 29	2368	608	46	406
Pins and tubes of wood. Machine for making cylindrical	R. King	397,727	Feb. 12	959	255	46	767
Pipe: *See* Blow-pipe. Hose-pipe. Conducting-pipe. Tobacco-pipe. Fuel-feeding pipe.							
Pipe bending and coiling machine	H. E. Fowler	397,783	Feb. 12	1056	282	46	786
Pipe-bending machine	H. E. Fowler	397,712	Feb. 12	935	249	46	763
Pipe-bending machine	H. E. Fowler	397,713	Feb. 12	938	249	46	763
Pipe-coupler	C. G. Thayer	395,671	Jan. 1	566	142	46	114
Pipe-coupling	J. F. Dill and S. A. Rote	396,550	Jan. 22	1901	490	46	393
Pipe-coupling	T. Flesher	399,661	Mar. 19	1324	339	46	1406
Pipe-coupling	W. G. Richards	398,448	Feb. 26	2023	531	46	999
Pipe-coupling	W. H. H. Sisum	399,351	Mar. 12	859	222	46	1307
Pipe-coupling. Insulating	S. Bergmann	397,218	Feb. 5	178	47	46	610
Pipe coupling. Parallel-	J. McEwan	398,068	Feb. 19	1467	382	46	922
Pipe-elbow. Sheet-metal	W. J. Gordon and E. D. Gilbert	399,664	Mar. 19	1328	340	46	1407
Pipe-joining and pipe-work. Electric	E. Thomson	396,013	Jan. 8	1099	279	46	236
Pipe-joint	P. V. Dwyer	396,354	Jan. 15	1501	403	46	326
Pipe-joint	J. A. Gilliam	396,080	Jan. 15	1195	303	46	253
Pipe-joint delineator	G. S. Kimball	397,132	Feb. 5	41	9, 10	46	586
Pipe. Machine for molding multitubular	C. Carr	395,740	Jan. 8	669	171	46	144
Pipe-molding apparatus	A. C. Bruce	399,651	Mar. 19	1309	336	46	1404
Pipe seal. Dip-	O. F. Smith and G. H. Barbour	397,032	Jan. 29	2612	674	46	545
Pipe-section. Adjustable curved	L. Smith	396,773	Jan. 29	2244	574	46	468
Pipe-threading machine	G. W. Bumgarner	398,560	Feb. 26	2213	585	46	1036
Pipe-threading machine	W. J. Daly	396,968	Jan. 29	2546	658	46	532
Pipe-wrench	M. V. Barton	396,118	Feb. 19	1535	407	46	895
Pipe-wrench	J. H. Vinton	397,618	Feb. 12	868	210	46	778
Pipe-wrench. Chain	G. M. Marshall	395,790	Jan. 8	756	196	46	159
Pipes. Anti-freezing device for water-	J. W. Kent and R. Orr	395,748	Jan. 8	679	174	46	145
Pipes. Apparatus for molding	W. A. Palmer	396,506	Jan. 22	1833	470	46	382
Pipes. Conductor for stand-	J. B. Kenison	398,735	Feb. 26	2458	651	46	1085
Pipes. Gas-check for water-	H. B. Eareckson	399,390	Mar. 12	918	238	46	1317
Pipes. Joint for soft-metal	W. A. Henderson	396,654	Jan. 22	2057	528	46	424
Pipes. Machine for forming sheet-metal	F. W. Davidson	400,310	Mar. 26	2280	{506 507}	46	1602
Pipes. Thimble for coupling lead and cast-iron	L. Wolff	399,720	Mar. 19	1404	361	46	1423
Pipes together. Steam-power apparatus for screwing	L. A. Stanford	397,400	Feb. 5	445	119	46	662
Piston	W. Simpkin	396,004	Jan. 8	1049	277	46	234
Pitman	F. H. Rogers	395,850	Jan. 8	853	220	46	179
Pitman-connection	F. Forbes	398,717	Feb. 26	2431	{644 645}	46	1080
Plane	H. Fry	398,247	Feb. 19	1722	454	46	932
Plane. Bead-	J. F. Lewallen	399,760	Mar. 19	1464	377	46	1435
Planes. Gage attachment for	G. H. Russell	399,287	Mar. 12	755	196	46	1297
Planer. Cylinder	F. B. Philbrick	397,946	Feb. 5	213	56	46	616
Planer. Revolving surface	J. H. Rudolph	397,568	Feb. 12	708	184	46	720
Planing-machine	W. E. Davis	399,977	Mar. 19	1783	{462 463}	46	1497
Planing-machine	J. A. Saucier	396,513	Jan. 22	1845	473	46	384
Planing-machine	M. Stixrud	399,711	Mar. 19	1391	359	46	1421
Planing-machine	T. A. Thorsen	397,671	Feb. 12	882	232	46	753
Planing-machine	S. A. Woods and J. R. Thomas	397,575	Feb. 12	721	{166 167}	46	722
Planing-machine cutter-head	V. V. Lawrence	399,758	Mar. 19	1461	377	46	1434
Planing-machine rolls	J. R. Thomas	397,151	Feb. 5	74	18	46	592
Planing machine. Wood-	A. B. Hutchinson	395,495	Jan. 1	279	72	46	59
Planing machine. Wood-	A. B. Hutchinson	396,934	Jan. 29	2475	637	46	517
Planing machine. Wood-	A. B. Hutchinson and E. F. Antenrieth.	398,048	Feb. 19	1435	380	46	875
Planing machine. Wood-	S. A. Woods	398,382	Feb. 19	1905	{500 501 502}	46	968
Planing-machines. Pressure-plate for	F. H. Crafts	395,487	Jan. 1	269	69	46	57
Plant-propagating nest	L. Vaughan	396,784	Jan. 29	2256	577	46	479
Planter	J. J. Ballard	397,215	Feb. 5	173	44	46	609

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Planter	T. L. Cromer	395,694	Jan. 8	604	153	46	131
Planter	B. P. Green	395,655	Jan. 1	544	136	46	109
Planter	D. W. Hoshall	397,549	Feb. 12	676	176	46	713
Planter	S. A. Lowe	396,884	Jan. 29	2404	616	46	504
Planter	C. R. Reid	399,559	Mar. 12	1171	303	46	1365
Planter and fertilizer-distributer. Seed-	E. G. Van Pelt	398,477	Feb. 26	2070	545	46	1008
Planter and fertilizer-distributer. Seed-	W. J. Wallis	395,674	Jan. 1	570	143	46	115
Planter. Automatic corn-	S. B. Alley	396,797	Jan. 29	2282	583	46	477
Planter. Check-row	L. A. Aspinwall	397,771	Feb. 12	1020	272	46	760
Planter. Corn-	G. M. Bolton	398,695	Feb. 26	2391	635	46	1072
Planter. Corn-	J. Brady	397,690	Feb. 12	911	241	46	758
Planter. Corn-	J. D. Fitzgerald	397,351	Feb. 5	369	97	46	648
Planter. Corn-	J. A. Fullerton	395,970	Jan. 8	1029	{262 / 263}	46	213
Planter. Corn-	S. Huffman	396,490	Jan. 22	1813	465	46	378
Planter. Corn-	F. P. Murphey	398,789	Feb. 26	2530	{672 / 673}	46	1100
Planter. Corn-	C. M. Rust	395,356	Jan. 1	77	20	46	18
Planter. Corn-	H. C. Shanahan	400,125	Mar. 26	1997	523	46	1548
Planter. Corn-	M. A. Westbrook	399,102	Mar. 5	433	{117 / 118}	46	1196
Planter. Corn-	E. N. Williams	398,868	Mar. 5	77	21	46	1129
Planter. Cotton-	J. J. Long	399,273	Mar. 12	735	191	46	1283
Planter. Cotton or corn	J. Stone, T. and B. A. Watson	398,006	Feb. 19	1363	361	46	862
Planter. Hand-	W. S. Wikle	396,185	Jan. 15	1350	346	46	283
Planter. Hand seed-	J. E. Shaw	399,938	Mar. 19	1730	447	46	1467
Planter. Potato-	J. E. Ohlson	398,071	Feb. 19	1470	389	46	883
Planter. Seed-	E. G. Van Pelt	398,476	Feb. 26	2067	{543 / 544}	46	1008
Planters. Check-row device for	J. W. Bartlett	398,485	Feb. 26	2082	548	46	1011
Planters. Self-winding reel for check-row	W. N. Aldrich	398,872	Mar. 5	83	23	46	1130
Planting attachment. Potato-	O. Baughn	398,119	Feb. 19	1536	407	46	895
Planting machine. Tree-	T. A. Stratton	398,754	Feb. 26	2480	{657 / 658}	46	1090
Plaster, &c. Compound to restrain the setting of	G. R. King	397,296	Feb. 5	289	.....	46	631
Plastic mineral composition	J. L. Hastings	400,335	Mar. 26	2321	.....	46	1610
Plastic mineral composition	J. L. Hastings	400,336	Mar. 26	2323	.....	46	1610
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,300	Jan. 15	1518	.....	46	313
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,301	Jan. 15	1519	.....	46	313
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,302	Jan. 15	1520	.....	46	314
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,303	Jan. 15	1521	.....	46	314
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,304	Jan. 15	1521	.....	46	314
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,305	Jan. 15	1522	.....	46	314
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,306	Jan. 15	1523	.....	46	314
Plastic mineral composition, &c	J. L. Stewart and J. L. Hastings	396,307	Jan. 15	1524	.....	46	314
Plate-holder	W. C. Engel	399,024	Mar. 5	325	87	46	1177
Plate. Safe or armor	W. H. Melaney	397,928	Feb. 19	1239	331	46	840
Plotter and protractor. Combined	J. R. Duffin	398,501	Feb. 26	2101	554	46	1014
Plow	A. F. Björkström	397,891	Feb. 19	1185	318	46	831
Plow	A. Haggvist	396,204	Jan. 15	1377	352	46	287
Plow	A. R. Mallory	395,573	Jan. 1	405	104	46	84
Plow	J. and W. Paterson	398,648	Feb. 26	2320	615	46	1057
Plow	W. T. Rhodes	396,051	Jan. 8	1150	292	46	235
Plow	T. W. Shunk	396,434	Jan. 22	1723	443	46	361
Plow	J. A. Stewart	399,217	Mar. 5	652	170	46	1239
Plow	M. J. Todd	397,317	Feb. 5	322	84, 85	46	638
Plow	J. R. White	395,861	Jan. 8	870	224	46	183
Plow and weeder. Hand	G. Glidden	399,143	Mar. 5	527	137	46	1216
Plow attachment	A. J. Parmeter	395,994	Jan. 8	1074	273	46	221
Plow. Cultivating-	G. B. Hart	398,393	Feb. 26	1954	514	46	986
Plow. Edging-	J. S. Stevens	396,714	Jan. 22	2143	548	46	440
Plow. Gang-	W. Holloway	395,831	Jan. 8	824	213	46	173
Plow-handle	S. I. Allen	396,524	Jan. 22	1860	478	46	386
Plow. Hillside-	M. D. Beach	399,000	Mar. 5	288	79, 80	46	1170
Plow. Hillside-	M. D. Beach	399,001	Mar. 5	292	80	46	1171
Plow. Mold-board or breaking	M. S. and E. L. Cadwell	397,415	Feb. 5	471	124	46	669
Plow. Mole-	J. C. Allen	397,682	Feb. 12	900	238	46	756
Plow-point	M. S. and E. L. Cadwell	396,726	Jan. 29	2165	555	46	453
Plow-point	J. Hawke	397,855	Feb. 12	1137	304	46	803
Plow. Reversible	J. A. Cole	396,142	Jan. 15	1279	328	46	270
Plow. Riding-	H. W. Wildman	396,793	Jan. 29	2274	581	46	475
Plow-standard cap	E. S. Hartman	398,831	Mar. 5	26	8	46	1119
Plow. Steam-	J. Q. A. Newsom	396,170	Jan. 15	1323	{339 / 340}	46	277
Plow. Sulky-	C. Anderson	399,814	Mar. 19	1551	{401 / 402 / 403}	46	1451
Plow. Sulky-	G. W. Haines	396,480	Jan. 22	1797	460	46	375
Plow. Sulky-	I. M. Linderman	398,266	Feb. 19	1748	461	46	937
Plow. Sulky-	J. H. Zinn	399,402	Mar. 12	1012	{265 / 266}	46	1338
Plow. Swivel-	F. J. Blanke	396,460	Jan. 22	1760	451	46	368
Plow. Walking-	D. W. Cheney	397,582	Feb. 12	738	191	46	725
Plow. Wheel-	A. Goodyear	398,961	Mar. 5	218	60	46	1155
Plow. Wheel-	H. H. Sater	396,606	Jan. 22	1926	511	46	409
Plows. Revolving mold-board for	C. Gaylord	396,397	Jan. 22	1662	427	46	346
Plows. Riding attachment for	C. Hanson	399,039	Mar. 5	346	93	46	1180
Plumbers' traps. Manufacture of	R. Clarke	399,247	Mar. 12	992	180	46	1275
Pneumatic dispatch-tube	C. A. Lieb	398,414	Feb. 26	1982	{521 / 522}	46	991
Pneumatic-tube switch	C. A. Lieb	398,836	Mar. 5	34	11	46	1120
Pocket-book	B. A. Capehart	399,376	Mar. 12	897	233	46	1313
Pocket-book clasp	C. G. Pfingsten	397,933	Feb. 19	1247	333	46	841
Pocket-book, purse, or satchel frame fastening	L. B. Prahar	397,248	Feb. 5	216	57	46	617

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Pocket-books or other articles. Frame for	M. Koenig	397,862	Feb. 12	1145	306	46	885
Pocket-box	G. W. Parks	396,110	Jan. 15	1239	315	46	262
Pocket for garments	H. E. Whaley	395,729	Jan. 8	653	167	46	141
Pocket-knife	E. Jansen	399,047	Mar. 5	356	95	46	1192
Poison-distributer	W. P. Towne	400,145	Mar. 26	2023	530	46	1553
Poison on plants. Machine for distributing	G. R. and J. W. Brown	397,679	Feb. 12	817	214	46	740
Poke	E. Heath	397,079	Jan. 29	2577	692	46	557
Poke. Animal-	J. D. Higgins	395,392	Jan. 1	129	33	46	98
Pole. Carriage-	J. Ives	395,702	Jan. 8	614	155	46	133
Pole for vehicles. Metallic	F. H. Wells	397,767	Feb. 12	1016	270	46	779
Pole. Vehicle-	T. W. Porter	397,934	Feb. 19	1248	333	46	841
Poles or rods. Machine for finishing	H. Ferguson	398,243	Feb. 19	1717	453	46	931
Polishing-cylinder	J. L. Perry	399,629	Mar. 12	1270	326	46	1384
Polishing-wheel	F. W. Starr	395,730	Jan. 8	638	162	46	138
Pool-register	E. R. Robbins	398,081	Feb. 19	1480	392	46	885
Pool-table pocket	J. Adams	395,803	Jan. 8	784	203	46	164
Portable bath	S. S. Burr	399,968	Mar. 19	1770	458	46	1495
Portable heater	D. C. McIntire	395,576	Jan. 1	413	106	46	85
Portfolio	A. G. Dyrenforth	399,979	Mar. 19	1765	463	46	1497
Post: *See* Fence-post. Signal-post. Hitching-post.							
Post-driver	I. W. Bradshaw	397,892	Feb. 19	1187	318	46	831
Post-holder	W. B. Thomas	396,624	Jan. 22	2018	518	46	416
Post-hole-boring machine	H. H. Digga	399,317	Mar. 12	804	207	46	1296
Post-hole machine	W. W. and G. F. Nivison	397,363	Feb. 5	415	110	46	656
Post-office furniture	J. M. Morris	395,989	Jan. 8	1065	270	46	219
Pot: *See* Coffee-pot. Watering-pot. Coffee or tea pot.							
Potato-digger	I. W. Hoover	396,818	Jan. 29	2309	591	46	482
Potato-digger	J. H. Lewis	395,571	Jan. 1	403	103	46	83
Potato-digger	J. W. Scott	396,433	Jan. 22	1721	{442 / 443}	46	360
Potato-digger	H. M. Shaw	398,545	Feb. 26	2162	571	46	1027
Potato-digger	I. Vance	399,363	Mar. 12	874	227	46	1309
Pottery-ware. Decorating	L. A. Fry	399,029	Mar. 5	329	.....	46	1177
Poultry. Device for catching	J. L. Wals	400,277	Mar. 26	2232	585	46	1593
Power: *See* Horse-power. Water-power.							
Power. Apparatus for transmitting	T. W. Lemieux	395,446	Jan. 1	205	53	46	43
Power from water and air currents. Means for obtaining motive	J. B. Fox	397,118	Feb. 5	19	5	46	582
Power. Pneumatic device for transmitting	W. G. Scott	399,789	Mar. 19	1509	390	46	1444
Power. Transmitting	T. W. Lemieux	397,506	Feb. 12	613	158	46	701
Precious stones, &c. Machine for cutting and polishing	T. Blumtschll	399,006	Mar. 5	301	82	46	1172
Press: *See* Baling-press. Drawing-press. Brick-press. Hay-press. Cheese-press. Hydraulic press. Copying-press. Oil-press. Crock-press. Seal-press.							
Press	F. F. Westphal	396,906	Jan. 29	2435	625	46	509
Presser-bar	H. F. Campbell	395,380	Jan. 1	112	28	46	25
Pressing fabrics. Machine for	T. C. Fawcett	399,511	Mar. 12	1093	285	46	1351
Pressure engine. Fluid-	J. G. Schreuder	396,239	Jan. 15	1428	363	46	297
Pressure-regulator	J. Barrow	397,063	Jan. 29	2653	683	46	553
Pressure-regulator	L. B. Fulton	395,550	Jan. 1	380	97	46	79
Pressure-regulator	J. C. Glass	399,663	Mar. 19	1326	340	46	1407
Pressure-regulator	C. Rogers	398,849	Mar. 5	48	14, 15	46	1153
Printer's gage	C. L. Storrs	397,676	Feb. 12	1161	311	46	806
Printer's galley	F. Wesel	395,934	Jan. 8	975	251	46	202
Printers' inking-rollers. Composition for	J. D. Bavlis	396,387	Jan. 22	1647	.....	46	345
Printer's quoin	M. W. Berryman	399,368	Mar. 12	861	229	46	1310
Printers' rules. Machine for cutting	F. Wesel	395,728	Jan. 8	653	167	46	140
Printing block or type	S. Jones	400,087	Mar. 26	1942	{507 / 508}	46	1537
Printing cards, &c. Machine for	S. McAuliffe	395,499	Jan. 1	284	73, 74	46	60
Printing-cylinder	W. Berri	396,390	Jan. 22	1650	424	46	346
Printing-machine	H. H. Harrison	398,042	Feb. 19	1496	{377 / 378}	46	874
Printing-machine feeding apparatus	W. Nurse	396,288	Jan. 15	1500	380	46	310
Printing-machine inking apparatus	W. Scott	396,612	Jan. 22	1900	{514 / 515}	46	412
Printing-machine. Rotary	J. Michaud	396,502	Jan. 22	1968	{506 / 507}	46	408
Printing-machine. Rotary	C. A. Thompson	400,269	Mar. 26	2220	582	46	1591
Printing-machine sheet-delivery apparatus	R. Miehle	395,710	Jan. 8	622	157	46	134
Printing-machine sheet-delivery apparatus	R. Miehle	398,642	Feb. 26	2309	612	46	1054
Printing-machine sheet-delivery apparatus	W. Scott	396,896	Jan. 29	2422	622	46	507
Printing-machine sheet-delivery apparatus	W. Scott	397,662	Feb. 12	870	220	46	750
Printing-machine sheet-delivery apparatus	W. Scott	398,544	Feb. 26	2160	{570 / 571}	46	1027
Printing-machines. Ink-distributing apparatus for	J. T. King	400,221	Mar. 26	2142	{561 / 562}	46	1577
Printing-machines. Ink-distributing apparatus for	J. T. King	400,222	Mar. 26	2144	562	46	1578
Printing-machines. Ink-distributing apparatus for	J. T. King	400,223	Mar. 26	2144	{562 / 563}	46	1578
Printing-machines. Means for collecting and evening up sheets for	W. Scott	397,314	Feb. 5	312	82	46	636
Printing-machines. Means for reciprocating ink-distributing rolls of	H. C. A. Ffrost	395,966	Jan. 8	1024	261	46	212
Printing newspapers or pamphlets	J. L. Firm	399,650	Mar. 19	1319	338	46	1466

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Printing-press sheet-feeding machine	J. C. and S. Danziger	398,710	Feb. 26	2416	640, 641	46	1077
Printing-presses. Adjustable fly-table for	R. Timroth	399,220	Mar. 5	657	171	46	1240
Printing-presses. Feed-gage for	L. Conant	399,384	Mar. 12	910	236	46	1316
Printing-presses. Gripper for platen	R. Mingay, Jr	396,502	Jan. 22	1830	469	46	381
Printing-presses. Gripper mechanism for platen	W. H. Price, Jr	399,282	Mar. 12	749	194, 195	46	1285
Prints. Toning blue	H. Whiting	397,480	Feb. 5	570		46	686
Profile-cutting machine	S. T. Barras	397,888	Feb. 19	1180	315, 316	46	829
Projectiles. Tail-guide for	J. W. Graydon	399,880	Mar. 19	1647	426	46	1470
Propeller. Screw	L. Bidauld	395,538	Jan. 1	346	88	46	73
Propeller. Vibrating	J. S. Lamar	398,629	Feb. 26	2295	607	46	1082
Propelling and steering apparatus. Pneumatic	R. A. Chesebrough	397,223	Feb. 5	183	49	46	611
Propelling and steering vessels. Apparatus for	T. B. Heathorn	399,530	Mar. 12	1119	290, 291	46	1356
Propelling mechanism. Boat-	P. E. Collins	398,703	Feb. 26	2404	638	46	1075
Propelling ships. Mechanism for	J. Stenard, Sr	396,672	Jan. 22	2079	534, 535	46	428
Protector: *See* Boot or shoe protector. Lamp-shade protector. Chimney-protector. Levee-protector. Ear-protector. Pants-protector. Electric-circuit protector. Shank-protector. Gun hand-protector. Water-closet-seat protector.							
Protractor	A. Butler	395,875	Jan. 8	896	230	46	187
Pruning implement	A. Bohn	399,370	Mar. 12	884	229	46	1311
Pruning-shears	J. R. Gascoigne	399,869	Mar. 19	1630	422	46	1467
Puller: *See* Stalk-puller.							
Pulley	W. L. Field	397,978	Feb. 19	1318	352	46	854
Pulley	J. Hixenbaugh	400,213	Mar. 26	2129	558	46	1576
Pulley	F. A. Lomont	395,572	Jan. 1	404	104	46	84
Pulley	G. Snedden	395,669	Jan. 1	564	141	46	113
Pulley-and-cord hoisting-gearing. Differential	C. H. W. Reichel	396,430	Jan. 22	1718	442	46	359
Pulley. Belt-	J. A. J. Shultz	399,636	Mar. 12	1283	329	46	1386
Pulley. Clutch-	E. Blake	396,977	Jan. 29	2331	654	46	530
Pulley. Expanding	J. E. Dustin	395,816	Jan. 8	802	209	46	168
Pulley. Split	J. R. Mackinnon	397,654	Feb. 12	859	224	46	748
Pulley. Split	J. J. McErlain	396,101	Jan. 15	1229	311	46	260
Pulley. Split	W. A. Willingham	396,637	Jan. 22	2035	523	46	419
Pulley wheel. Grip-	R. P. Walsh	400,276	Mar. 26	2229	584, 585	46	1593
Pulp. Apparatus for manufacturing hollow ware from	F. B. Howard	398,397	Feb. 26	1958	515	46	986
Pulp engine. Refining-	J. Norton, Jr	398,845	Mar. 5	43	13, 14	46	1122
Pulverizer and amalgamator	E. Derbec	395,957	Jan. 8	1009	259	46	209
Pulverizing-machine	A. D., Sr., A. D., Jr., and D. C. Searls	398,905	Mar. 5	133	36, 37	46	1139
Pump	J. H. Branson	398,220	Feb. 19	1678	444	46	922
Pump	W. L. Butts	398,936	Mar. 5	186	50	46	1149
Pump	W. H. Cloud	396,193	Jan. 15	1359	349	46	284
Pump	J. Darling	395,772	Jan. 8	712	183	46	151
Pump	W. Kegler	399,199	Mar. 5	624	162	46	1224
Pump	A. H. Nixon	396,504	Jan. 22	1832	474	46	382
Pump	W. M. Scott	400,124	Mar. 26	1996	523	46	1548
Pump actuated by fluid-pressure	W. Donaldson	400,196	Mar. 26	2101	551	46	1570
Pump. Air-	A. Conacher	397,760	Feb. 12	1035	277	46	783
Pump and condenser. Duplex	J. Reid	399,780	Mar. 19	1492	385	46	1441
Pump. Combined centrifugal and screw	A. A. Willson	398,301	Feb. 19	1808	477	46	950
Pump. Filter-	O. H. Woodworth	397,263	Feb. 5	238	62	46	621
Pump. Hydraulic air-	F. R. and F. G. Johnson	398,405	Feb. 26	1968	517, 518	46	988
Pump-operating mechanism	O. Henjum	396,485	Jan. 22	1807	463	46	376
Pump. Sand or mud	R. G. Mead and B. Magee	396,501	Jan. 22	1828	469	46	381
Pump-spout	L. A. Brigel	397,532	Feb. 12	649	170	46	709
Pump. Steam-	J. Maslin	397,738	Feb. 12	977	259	46	771
Pump. Steam-	H. A. Wahlert	396,247	Jan. 15	1440	366, 367	46	300
Pumps. Plunger-rod for	W. C. Westaway	397,892	Feb. 12	1170	313	46	811
Pumps. Valve-gear for duplex steam-	C. M. Miller	399,203	Mar. 5	628	163	46	1235
Pumps. Valve mechanism for automatically starting steam-	E. Knowles	395,906	Jan. 8	943	242	46	195
Pumping-engine. Portable	W. O. Webber	395,933	Jan. 8	974	250	46	202
Punch	S. T. Nakashjian	395,342	Jan. 1	55	13	46	13
Punch	G. W. Southwick	399,943	Mar. 19	1735	448	46	1468
Punch, &c. Hydraulic	J. Weeks	395,675	Jan. 1	572	143, 144	46	115
Punch. Paper-	S. H. Fish	395,320	Jan. 1	24	6	46	7
Punching and eyeleting machine	M. H. Pearson and C. Bennion	396,890	Jan. 29	2411	619, 620	46	505
Punting-machine	H. C. Schrader	398,454	Feb. 26	2030	533	46	1009
Push-button	J. H. Lehman	400,232	Mar. 26	2160	566	46	1581
Puzzle	M. Jacobs	399,146	Mar. 5	531	139	46	1217
Quartz-mill	P. A. Snell	395,670	Jan. 1	564	141	46	113
Quilling-machines. Stop-motion for	D. Ashley	396,384	Jan. 22	1643	423	46	345
Quilting-machine	A. Beck	400,039	Mar. 26	1876	488	46	1523
Racing-boat. Tubular	F. Frenzel, Jr	397,282	Feb. 5	266	69	46	627
Rack: *See* Broom-rack. Lumber-rack. Goods-rack. Show-rack. Hat and clothes rack. Ticket-rack.							
Racking-off apparatus for beer, wine, and other liquids	J. Johnson	398,261	Feb. 19	1740	458	46	935
Radial drill	J. J. Batman	395,943	Jan. 8	989	254	46	205

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Radiator	J. Reilly	399,079	Mar. 5	398	107	46	1190
Radiator	J. Shackleton	400,258	Mar. 26	2101	577	46	1588
Radiator apparatus. Heat-	A. C. Edwards	395,818	Jan. 8	806	210	46	169
Radiator for hot-air furnaces. Heat-	C. J. Manning	400,097	Mar. 26	1953	511	46	1539
Radiator. Heat-	A. Peart	399,776	Mar. 19	1487	384	46	1440
Radiator. Steam or hot-water	S. D. Tompkins and T. H. Williams	397,527	Feb. 12	642	167, 168	46	708
Radiators. Water-discharge regulator for steam-	D. H. Streeper	398,552	Feb. 26	2176	573	46	1029
Rags or other material. Machine for cutting	J. Nuttall	398,273	Feb. 19	1759	464, 465	46	939
Rail-bending tool	W. H. Phillips	399,630	Mar. 12	1272	327	46	1385
Rail-chair	H. F. Cox	398,381	Feb. 26	1939	510	46	963
Rail-chair	A. I. Wolfe	400,027	Mar. 19	1856	481	46	1510
Rail-chair	C. P. Espinasse	396,473	Jan. 22	1787	458	46	373
Rail chair and sleeper. Combined	A. Belzano	399,483	Mar. 12	1047	274	46	1343
Rail-chairs on timber-sleepers. Fixing	M. W. Smith	398,903	Mar. 5	257	71	46	1163
Rail-drill	J. P. Lancaster	397,005	Jan. 29	2574	665	46	538
Rail-joint	I. and W. T. Lynd	397,242	Feb. 5	208	54, 55	46	615
Rail-joint	C. M. Culp	398,709	Feb. 26	2415	640	46	1076
Rail joint or chair	T. G. Palmer	397,306	Feb. 5	303	79	46	634
Rail point. Switch-	F. A. Bartholomew	398,023	Feb. 19	1402	370	46	869
Rail-support for elevated roads	F. C. Weir and N. O. Goldsmith	398,105	Feb. 19	1508	400	46	890
Rail switch. Slot-	S. McCloud	395,339	Jan. 1	50	12, 13	46	12
Rails. Machine for reducing old	A. A. Strom	395,930	Jan. 8	969	249	46	201
Rails. Tie-rod for switch-	S. A. Bemis and L. Pfingst	398,087	Feb. 26	2381	632	46	1069
Railway	R. P. Faddis	398,037	Feb. 19	1420	375	46	873
Railway	J. M. Heverly	398,256	Feb. 19	1735	457	46	934
Railway block-signal	N. J. Pritchard and J. S. Templon	399,159	Mar. 5	560	144, 145	46	1223
Railway-brakes. Device for applying pressure to	P. F. Barr	398,369	Feb. 26	1921	505	46	979
Railway. Cable	W. S. Phelps	397,395	Feb. 5	417	110	46	656
Railway. Cable or electric street-	J. St. Clair	395,760	Jan. 8	697	178	46	149
Railway carriages, stations, &c. Device for lighting and extinguishing lights in	A. W. Elchelberger	398,392	Feb. 26	2222	589	46	1040
Railway cattle-guard	G. W. Willford	398,563	Feb. 26	2188	576, 577	46	1031
Railway-chair and securing rails therein	C. J. Van Depoele	396,311	Jan. 15	1529	396	46	315
Railway conductors. Hooked suspender for electric-	C. J. Van Depoele	400,375	Mar. 26	2230	622, 624	46	1621
Railway conductors. Pneumatic flexible-slot conduit for electric-	C. J. Van Depoele	396,312	Jan. 15	1530	396, 397	46	315
Railway conductors. Suspension device for electric-	W. Haddock	399,145	Mar. 5	530	138, 139	46	1217
Railway-conduit construction. Cable-	B. Jennings	395,442	Jan. 1	198	51, 52	46	42
Railway. Conduit electric	E. M. Bentley	400,179	Mar. 26	2078	544	46	1564
Railway contact. Electric-	J. T. Clark	396,807	Jan. 29	2296	587, 588	46	479
Railway-crossing	H. C. Lowrie	398,269	Feb. 19	1754	463	46	938
Railway crossing	W. Haddock	399,036	Mar. 5	341	91, 92	46	1179
Railway crossing. Cable-	G. Provost	399,929	Mar. 19	1716	444	46	1484
Railway crossing. Cable-	F. C. Weir	398,106	Feb. 19	1509	400	46	891
Railway crossing. Cable-	F. C. Weir	398,202	Feb. 19	1656	437	46	917
Railway-crossing gate	O. H. Clark	396,072	Jan. 15	1179	299, 300	46	250
Railway crossings and bridges. Flangeway-rail for	W. Lawrence	399,149	Mar. 5	536	140	46	1218
Railway. Electric	J. B. Blair	399,236	Mar. 12	682	178	46	1274
Railway. Electric	S. H. Short	398,662	Feb. 26	2342	622	46	1061
Railway. Electric	H. W. Smith	399,091	Mar. 5	417	113	46	1194
Railway. Elevated	J. R. Chapman	400,054	Mar. 26	1895	492, 493	46	1596
Railway. Elevated	H. W. Libbey	399,997	Mar. 19	1814	471	46	1508
Railway. Elevated	R. F. Robison	397,519	Feb. 12	634	165	46	706
Railway. Elevated street-	R. F. Robison and H. M. Crocken	395,921	Jan. 8	958	246	46	198
Railway-frog	C. B. Price	398,975	Mar. 5	243	67, 68	46	1160
Railway-frog	A. A. Strom	395,929	Jan. 8	967	248, 249	46	200
Railway-frog	F. C. Weir	398,203	Feb. 19	1656	438	46	917
Railway-frog	F. C. Weir	398,205	Feb. 19	1658	438	46	918
Railway-frog	F. C. Weir and N. O. Goldsmith	398,201	Feb. 19	1655	437	46	917
Railway-gate	J. W. Nebergall	399,624	Mar. 12	1265	325	46	1383
Railway-gate	D. C. Thomas	399,947	Mar. 19	1741	449, 450	46	1489
Railway gate and signal. Automatic	J. Bolt	400,390	Mar. 26	2403	629, 630	46	1625
Railway-gate. Electrical	M. Tomlmin	397,880	Feb. 12	1166	312	46	809
Railway grip. Cable-	E. C. Phillips	399,075	Mar. 5	392	106	46	1189
Railway plow. Electric-	E. M. Bentley	400,038	Mar. 26	1873	488	46	1522
Railway plow. Electric-	E. M. Bentley	400,180	Mar. 26	2080	544	46	1565
Railway. Pneumatic	G. L. Du Laney	399,319	Mar. 12	807	208	46	1296
Railway-rail-joint fastener	N. Rowen	396,236	Jan. 15	1426	362	46	327
Railway-rails. Automatic lock-joint for	J. L. Pope	395,918	Jan. 8	954	245	46	197
Railway-rails. Chair and lock-joint for	J. N. Martin and W. H. Harris	398,522	Feb. 26	2134	562	46	1021
Railway sheave. Cable-	W. Haddock	399,035	Mar. 5	340	91	46	1179
Railway-signal	W. P. Kookogey	396,749	Jan. 29	2212	566	46	462
Railway-signal	W. P. Kookogey	396,750	Jan. 29	2213	566	46	462
Railway-signal	W. C. Paul and O. D. Kleinsteuber	396,365	Jan. 15	1615	413, 414	46	331
Railway-signal	J. D. Yarrington and H. D. Shanklin	397,884	Feb. 12	1172	314	46	811
Railway-signal. Electric	A. Z. Beda	397,270	Feb. 5	246	645	46	623
Railway-signal. Electric	T. A. B. Putnam	399,556	Mar. 12	1166	302	46	1364
Railway-signal. Electric	D. G. Smith	395,667	Jan. 1	561	140	46	113
Railway-signal. Electrical	H. Hayden, Jr., and W. F. Z. Desant	398,613	Feb. 26	2230	600	46	1045
Railway-signal. Electrical	W. P. Kookogey	396,748	Jan. 29	2210	565	46	461
Railway-signal. Pneumatic	J. K. Leedy	398,632	Feb. 26	2298	608	46	1052

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Railway signals and switches. Interlocking apparatus for	T. W. Burley	398,766	Feb. 26	2496	662	46	1093
Railway signaling apparatus. Electrical	H. J. Palmer	399,155	Mar. 5	552	143	46	1221
Railway signaling device	F. P. Benjamin	399,474	Mar. 12	1035	273	46	1342
Railway signaling device. Cable	W. M. Bulkley	397,335	Feb. 5	350	91, 92	46	644
Railway. Single-rail	R. H. Brown	396,139	Jan. 15	1275	326, 327	46	269
Railway-spike	H. A. Harvey	395,898	Jan. 8	927	239	46	192
Railway-spike	G. P. Rose	395,925	Jan. 8	961	247	46	199
Railway-spikes. Manufacture of	J. T. Jones	400,405	Mar. 26	2426	636	46	1629
Railway splice-bar	G. P. Rose	395,922	Jan. 8	959	246	46	198
Railway splice-bar	G. P. Rose	395,923	Jan. 8	960	247	46	199
Railway splice-bar	G. P. Rose	395,924	Jan. 8	960	247	46	199
Railway-stringers. Fastening for	D. Atwood	399,232	Mar. 12	677	177	46	1273
Railway structure. Cable	W. H. Young	396,638	Jan. 22	2036	523	46	420
Railway-switch	W. H. Barwick	396,679	Jan. 22	2089	537	46	430
Railway-switch	J. Hunter	396,873	Jan. 29	2383	611, 612	46	500
Railway-switch	D. E. Shea	395,407	Jan. 1	147	37, 38	46	31
Railway-switch	W. Spielman	400,135	Mar. 26	2009	526	46	1550
Railway-switch	S. Stewart	399,792	Mar. 19	1513	391	46	1445
Railway-switch	J. B. Suffern	400,370	Mar. 26	2373	620	46	1620
Railway-switch	C. W. Walker	396,629	Jan. 22	2023	520	46	417
Railway switch and alarm. Electric	W. S. Hull and J. C. Anderson	399,331	Mar. 12	822	213, 214	46	1300
Railway switch and signal	H. F. Parsons	396,419	Jan. 22	1696	435, 436	46	355
Railway-switch. Automatic	J. W. Leslie	398,169	Feb. 19	1608	427	46	909
Railway-switch. Automatic	A. I. Parsons	396,418	Jan. 22	1694	435	46	354
Railway-switch. Automatic	J. Renner	398,748	Feb. 26	2474	655	46	1088
Railway switch. Cable	F. C. Weir and N. O. Goldsmith	398,200	Feb. 19	1654	437	46	917
Railway switch. Center-rail elevated	F. A. Bartholomew	400,164	Mar. 26	2050	530	46	1560
Railway switch. Electric	E. Blake	399,732	Mar. 19	1421	366	46	1426
Railway-switch. Pneumatic	M. Wuerpel	398,364	Feb. 19	1911	503	46	970
Railway-switch signal	H. M. Norton	399,342	Mar. 12	896	218	46	1303
Railway switch-stand	G. F. Gage	395,891	Jan. 8	918	236	46	191
Railway switch. Street	N. O. Goldsmith	398,248	Feb. 19	1722	454	46	932
Railway switch. Street	F. C. Weir	398,204	Feb. 19	1657	438	46	918
Railway switch. Street	W. White	396,127	Jan. 15	1260	322	46	266
Railway switch. Street	W. White	396,128	Jan. 15	1261	322	46	266
Railway-switches. Tie-bar for	W. J. Morden	397,090	Jan. 29	2091	496	46	560
Railway system. Cable	C. J. Van Depoele	398,294	Feb. 19	1797	474, 475	46	948
Railway system. Electric	C. S. Bradley	399,372	Mar. 12	866	230, 231	46	1311
Railway system. Electric	D. G. Weems	396,633	Jan. 22	2029	521, 522	46	418
Railway-tie	J. M. Davis	397,785	Feb. 12	1046	279	46	784
Railway-tie	A. K. Hoffmeier	399,330	Mar. 12	820	213	46	1300
Railway-tie	M. Maloney	395,447	Jan. 1	207	53	46	44
Railway-tie. Metallic	S. U. Smith	398,004	Feb. 19	1360	361	46	861
Railway-track cleaner. Street	J. A. Lewis	399,421	Mar. 12	958	249	46	1326
Railway track. Street	T. H. Gibbon	396,036	Jan. 8	1128	286	46	231
Railway-tracks. Apparatus for depositing torpedoes upon	J. F. McLaughlin	397,378	Feb. 5	408	108	46	655
Railway-train signaling. Electric coupling for	W. C. Johnston, Jr.	397,553	Feb. 12	685	178	46	716
Railway-trains. Electric brake for	A. H. Bowman and W. P. Widdifield	396,577	Feb. 26	2206	581, 582, 583, 584	46	1035
Railway-trains. Means for safely coupling or uncoupling the pipes of pneumatic brakes or steam-heating apparatus on	B. Heimsoeth	399,894	Mar. 19	1665	430	46	1474
Railway-trains. Signaling device for	M. McCormick and F. Farish	398,067	Feb. 19	1466	387	46	882
Railway trolley and support. Electric	S. H. Short	396,618	Jan. 22	2008	517	46	414
Railway wires. Support for electric	T. H. Brady	398,489	Feb. 26	2086	550	46	1012
Railways. Apparatus for sanding	H. C. Noble	398,174	Feb. 19	1613	428	46	910
Railways. Automatic block-signaling system and apparatus for	H. F. Parsons	396,421	Jan. 22	1701	436, 437	46	356
Railways. Automatic switch for cable	W. Phenix	397,610	Feb. 12	799	208	46	736
Railways. Conductor for electric	O. Dahl	398,498	Feb. 26	2098	553	46	1014
Railways. Conductor for electric	R. M. Hunter	399,409	Mar. 12	944	245	46	1323
Railways. Conduit for electric	S. Trott	395,761	Jan. 8	898	178	46	149
Railways. Continuous rail-frog for	H. F. Parsons	396,420	Jan. 22	1700	436	46	355
Railways. Crossing-conduit for electric	I. W. Heysinger	398,963	Mar. 5	225	63	46	1157
Railways. Current-collecting device for electric	R. M. Hunter	398,402	Feb. 26	1963	516	46	987
Railways. Curve for cable	C. L. Snyder	396,054	Jan. 8	1152	292, 293	46	236
Railways. Danger-signal for	J. Prince	397,469	Feb. 5	535	145	46	684
Railways. Fault-detector for electric	E. M. Bentley	400,182	Mar. 26	2083	545	46	1566
Railways. Overhead line for electric	F. J. Sprague	397,875	Feb. 12	1159	310	46	807
Railways. Rack and gear for inclined	W. H. Knight	400,347	Mar. 26	2345	612	46	1614
Railways. Suspended switch for electric	C. H. Wells	396,124	Jan. 15	1254	320, 321	46	265
Railways. Switch mechanism for electric	S. H. Short	398,663	Feb. 26	2244	622	46	1002
Railways. Traveler for electric	C. J. Van Depoele	396,310	Jan. 15	1527	396	46	315
Railways. Trolley for electric	W. F. Jenkins	395,703	Jan. 8	617	155	46	133
Railways. Turn-table for cable or electric	W. Davidson	396,649	Jan. 22	2050	527	46	423
Raisin-stemmer	C. L. North	395,916	Jan. 8	952	245	46	197
Rake: *See* Hay-rake. Lawn-rake. Wooden rake.							
Range-boiler	T. W. Rees	396,957	Jan. 29	2506	646	46	524
Range-boiler	T. W. Rees	399,558	Mar. 12	1170	302	46	1365

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Rasp-cutting machine	P. S. Stokes	397,254	Feb. 5	222	58, 59	46	618
Ratchet-and-pawl device	W. S. Buxton	395,737	Jan. 8	666	170	46	143
Ratchet-brace	J. S. Fray	395,889	Jan. 8	915	235	46	190
Ratchet-drill	G. Fletcher	395,774	Jan. 8	714	184	46	154
Ratchet-drill	C. E. Abrams	395,895	Jan. 8	881	226	46	184
Ratchet-wrench	J. Turner	400,418	Mar. 26	2445	641	46	1633
Razor. Safety	T. F. Curley and A. S. Granger	398,947	Mar. 5	196	52, 53	46	1151
Razor safety-guard	T. F. Curley and A. S. Granger	398,948	Mar. 5	197	53	46	1152
Razor safety-guard	W. W. Swan	397,525	Feb. 12	640	167	46	708
Reamer	J. A. Sherman	399,349	Mar. 12	857	222	46	1306
Reamer. Cast chilled	L. Piom and J. D'Andrimont	399,156	Mar. 5	554	143	46	1222
Reamer for forming blast-holes	H. H. Taylor	399,352	Mar. 12	861	223	46	1307
Reaming-machine	D. K. Howe	399,407	Mar. 12	942	244	46	1322
Receipts. Cover for shipping							
Recorder: *See* Cash-recorder. Time-recorder.							
Reel: *See* Bolting-reel. Hose-reel. Fishing-reel. Wire-reel. Harvester-reel. Wire-rod reel.							
Reel and sprinkler. Combined	R. Wylie	400,030	Mar. 19	1860	482, 483	46	1511
Reflector-bracket	H. M. Guild	395,972	Jan. 8	1032	263	46	213
Refractory compounds. Producing	J. L. Hastings	396,693	Jan. 22	2113	.....	46	434
Refrigerating and freezing apparatus	L. Perkins	399,207	Mar. 5	634	164, 165, 166	46	1236
Refrigerating-machine	A. Comacher	396,730	Jan. 29	2169	536, 537	46	453
Refrigerating-machines. Absorber for	M. Piel	395,512	Jan. 1	313	79	46	96
Refrigerator	J. C. Berger	396,261	Jan. 15	1458	371	46	262
Refrigerator	N. Davis	399,976	Mar. 19	1761	462	46	1497
Refrigerator	W. T. Forbes	397,791	Feb. 12	1053	281	46	786
Refrigerator	E. B. Hess and W. X. Stevens	397,984	Feb. 19	1396	353, 354	46	855
Refrigerator	W. C. Sweet. (Reissue)	10,992	Mar. 26	2454	643	46	1634
Refrigerator	J. H. Windiech	399,307	Mar. 12	791	205	46	1293
Refrigerator. Milk	C. B. Traver	395,464	Jan. 1	231	59	46	50
Refrigerators. Combined goblet-holder and drip-cup attachment for	A. J. Page	400,358	Mar. 26	2360	616	46	1617
Refuse-burner	E. G. Teed	398,671	Feb. 26	2357	625	46	1064
Register: *See* Egg-count register. Hotel-register. Fare-register. Pool-register.							
Regulator: *See* Draft-regulator. Feed-regulator. Electric-current regulator. Feed-water regulator. Gas-regulator. Electric-machine regulator. Horse-power regulator. Magnetic regulator. Electrical-machinery regulator. Pressure-regulator. Speed-regulator. Elevator speed-regulator. Temperature-regulator. Thrasher-regulator. Engine-regulator. Watch-regulator.							
Regulator	A. Gartner	395,492	Jan. 1	273	70	46	58
Rein-holder for wagons	P. S. Transue	398,290	Feb. 19	1792	473	46	946
Rein-support. Hip	A. Kempkey	397,922	Feb. 19	1230	329	46	839
Rendering	F. Winter	399,810	Mar. 19	1548	400	46	1451
Rerolling old rails. Apparatus for	A. Reese	395,350	Jan. 1	67	16, 17	46	15
Resins and other substances. Bleaching and refining	E. A. Behrens	395,731	Jan. 8	656	168	46	141
Respirator	H. M. Cochran	396,809	Jan. 29	2206	568	46	480
Respirator for firemen	H. R. Hurd	396,161	Jan. 15	1310	335	46	275
Revolving chair and stand	L. F. Seeger	395,406	Jan. 1	146	37	46	31
Ribbed conoidal washer	D. Dodd	398,952	Mar. 5	205	56	46	1153
Ribbon-holder	J. A. Grant	395,701	Jan. 8	613	154	46	132
Ribbon-winding device	W. S. Burroughs	396,070	Jan. 15	1176	298	46	250
Rice. Milling	J. L. Sheppard	397,944	Feb. 19	1261	336	46	843
Ring: *See* Curtain-ring. Ear-ring. Curtain-pole ring. Key-ring.							
Ring for curtain-poles	J. Rings	396,604	Jan. 22	1985	510	46	409
River-power engine	A. F. W. Neynaber	398,070	Feb. 19	1469	368	46	883
Rivet-setting machine	F. W. Beale and J. H. Reed	395,868	Jan. 8	883	266, 267	46	185
Riveting. Electric	E. Thomson	396,015	Jan. 8	1102	280	46	226
Road-engine	R. R. Down	397,976	Feb. 19	1308	350, 351	46	852
Road-engine	H. K. Sams	397,144	Feb. 5	63	15, 16	46	590
Road-sweeping machine	W. T. Carter and J. Keeble	399,971	Mar. 19	1774	459, 460	46	1496
Roaster: *See* Meat-roaster.							
Rock-crusher	G. E. Ames	400,157	Mar. 26	2049	536	46	1559
Rock-drill	J. McCulloch	398,637	Feb. 26	2303	609, 610, 611	46	1053
Rock-drill. Electro-magnetic	H. N. Marvin	395,575	Jan. 1	408	105	46	84
Rock-drills. Carriage for direct-acting	G. A. Barth	397,623	Feb. 12	813	212	46	709
Rock-drills. Carriage for direct-acting	G. A. Barth	397,627	Feb. 12	1101	294, 295	46	795
Rock-drills. Device for sharpening	F. A. Grace	397,230	Feb. 5	193	51	46	618
Rock-drills. Hand-guard for	B. Giovanni	395,700	Jan. 8	612	154	46	132
Rock-drills. Machine for operating	H. Huston and E. J. Martin	396,745	Jan. 29	2206	564	46	460
Rocket. Line-carrying	P. Cunningham	395,881	Jan. 8	903	231	46	188

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Rocking-chair	O. S. Turner	399,584	Mar. 12	1209	312	46	1372
Rod: *See* Connecting-rod. Lightning-rod. Fishing-rod.							
Rods, rails, &c. Making	G. C. Baker	395,684	Jan. 8	502	148	46	128
Roll	D. B. Oliver	397,563	Feb. 12	701	182	46	719
Roll and pinion	R. C. Totten	399,295	Mar. 12	768	200	46	1290
Roller: *See* Curtain-roller.							
Roller-gin	D. S. Chapin	400,190	Mar. 26	2094	548, 549	46	1569
Roller-mill	J. Dawson	399,186	Mar. 5	598	154, 155	46	1230
Roller-mill	J. D. Mawhood	398,339	Feb. 19	1865	492	46	960
Roller-mill feed-hopper	W. J. Purdy	400,413	Mar. 26	2439	639	46	1632
Roller-mills. Feed mechanism for	W. M. Jewell. (Reissue)	10,979	Jan. 8	1161	294	46	237
Roller reduction-mill	J. H. Woolcott	395,534	Jan. 1	340	86, 87	46	72
Rolling metal strips	E. L. Clark	397,603	Feb. 12	914	242	46	759
Rolling-mill guide	P. L. Day	398,771	Feb. 26	2502	664	46	1094
Rolling-mill plant	E. L. Clark	397,339	Feb. 5	356	93, 94	46	646
Rolling-mill plant	E. L. Clark	400,192	Mar. 26	2097	549	46	1569
Rolling-pins, &c. Revolving handle for	J. H. Sunderman	397,149	Feb. 5	73	18	46	592
Rolling seamless tubing. Machine for	C. Kellogg	397,724	Feb. 12	953	253, 254	46	766
Rolling-shafts, &c. Machine for	T. McBride and E. Fisher	400,099	Mar. 26	1956	511, 512, 513	46	1539
Rolling-train. Universal	W. Bansen	399,726	Mar. 19	1415	363, 364	46	1425
Roof	E. C. Richmond	396,292	Jan. 15	1505	381	46	311
Roof for vaults and other structures	J. T. Hough	396,040	Jan. 8	1132	287, 288	46	232
Roof-slates. Fastening for	O. W. Norcross	396,593	Jan. 22	1970	507	46	406
Roofs. Lining for corrugated sheet-metal	W. Lorenz	396,824	Jan. 29	2317	593	46	484
Roofing. Gable-end finish for	J. E. Carroll	397,534	Feb. 12	651	170	46	709
Roofing. Hip-covering and corner-finish for	J. E. Carroll	397,535	Feb. 12	652	171	46	710
Roofing. Lock-cap cleatless	J. W. Prall	397,093	Jan. 29	2696	697	46	561
Roofing. Metal	W. C. Berger	399,004	Mar. 5	300	82	46	1172
Roofing. Metallic	S. C. Frederick	396,246	Feb. 19	1721	454	46	931
Roofing. Metallic	L. L. Sagendorph	396,605	Jan. 22	1986	511	46	409
Roofing. Metallic	L. H. Montross	397,381	Feb. 5	413	109	46	656
Roofing or siding. Metallic	W. H. Asbury	399,816	Mar. 19	1539	404	46	1453
Root-cutter	L. Torres	398,097	Feb. 19	1498	396, 397	46	888
Ropeway. Suspended	J. M. Finch and W. D. Gray	398,388	Feb. 26	1949	512, 513	46	985
Rotary bolt	G. Sunmerton	395,680	Jan. 1	579	145, 146	46	117
Rotary bolt	J. H. Walsh	398,478	Feb. 26	2073	545	46	1009
Rotary brake	P. Langhammer	398,058	Feb. 19	1459	384	46	879
Rotary double-flame furnace	G. Pietzka	398,973	Mar. 5	239	66, 67	46	1160
Rotary elevator for raising liquids	R. Smith	398,855	Mar. 5	56	16	46	1125
Rotary engine	C. Bailey	395,647	Jan. 1	592	133, 134	46	107
Rotary engine	W. C. Culbertson	396,143	Jan. 15	1280	328	46	270
Rotary engine	L. C. Huson	398,512	Feb. 26	2120	557, 558	46	1018
Rotary engine	L. C. Huson	398,782	Feb. 26	2518	669	46	1097
Rotary engine	C. Mindt	396,759	Jan. 29	2225	569, 570	46	465
Rotary engine	H. T. Morse	395,711	Jan. 8	624	158	46	134
Rotary engine	J. Thorne	395,722	Jan. 8	641	162, 163, 164	46	138
Rotary engine	A. Tickle	398,968	Mar. 5	269	73, 74	46	1166
Rotary engine	J. H. Venables and J. Hughes	400,021	Mar. 19	1845	479	46	1508
Rotary engine	C. Ward	399,952	Mar. 19	1751	452	46	1491
Rotary-engine reversing-gear	C. Bailey	395,646	Jan. 1	530	132, 133	46	106
Roving-frame, &c	S. Tweedale	396,718	Jan. 22	2149	550, 551	46	442
Rubber boot	M. T. Wynkoop	400,421	Mar. 26	2451	642	46	1634
Rubber-dam clamp	W. G. Browne	396,537	Jan. 22	1674	481	46	389
Rubber from waste. Recovering	N. C. Mitchell	395,987	Jan. 8	1062	269	46	219
Ruler. Drafting	W. F. Hellin	396,568	Jan. 22	1931	497	46	399
Ruler. Parallel	S. M. Goss	398,828	Mar. 5	22	7	46	1119
Rules. Gage-head for pocket	G. W. Cochler	396,806	Jan. 29	2298	588	46	479
Sad-iron-heating apparatus	J. M. Wishart	399,960	Mar. 19	1760	455	46	1493
Sad-iron. Self-heating	J. J. Czepull	398,949	Mar. 5	198	53	46	1152
Sad-iron. Self-heating	G. Heidel	396,998	Jan. 29	2559	661	46	535
Sad-iron. Self-heating	W. H. Mull	398,743	Feb. 26	2467	654	46	1087
Saddle. Harness	F. Rehkopf	399,697	Mar. 19	1570	353	46	1416
Saddle-hub and ferrule combination	M. F. Dolan	399,850	Mar. 19	1606	416	46	1462
Safe and copying-press. Combined	T. S. Spivey	396,670	Jan. 22	2077	533	46	428
Safe-lining	W. W. Booth	396,680	Jan. 22	2091	538	46	431
Safe. Marine	W. W. Fuzzey	396,202	Jan. 15	1372	351	46	387
Safe or vault	J. L. Hall	398,610	Feb. 26	2255	598, 599	46	1045
Safes, &c. Interlocking joint for the doors and frames of	J. L. Hall	398,608	Feb. 26	2251	597	46	1044
Safes, &c. Means for fastening the doors of	J. L. Hall	398,609	Feb. 26	2253	597, 598	46	1044
Safes, &c. Packing for	A. Graf	398,607	Feb. 26	2250	596	46	1044
Safety-gage	A. F. Nagle	398,069	Feb. 19	1467	388	46	882

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Safety-hook	F. Schley	400,365	Mar. 26	2389	618	46	1619
Safety-pin	G. P. Farmer	398,140	Feb. 19	1565	414	46	901
Safety-pin	G. P. Farmer	398,141	Feb. 19	1566	414	46	901
Safety-pin	W. F. Hyatt	399,667	Mar. 19	1331	341	46	1408
Sail	W. P. Cutler	397,589	Feb. 12	754	196	46	738
Salt-box	E. S. Ayer	397,104	Feb. 5	2	1	46	579
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,111	Mar. 5	451	123	46	1199
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,112	Mar. 5	455	123, 124	46	1201
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,113	Mar. 5	457	124	46	1201
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,114	Mar. 5	460	124, 125	46	1202
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,115	Mar. 5	462	125	46	1202
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,116	Mar. 5	464	125, 126	46	1203
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,117	Mar. 5	466	126	46	1204
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,118	Mar. 5	467	126, 127	46	1204
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,119	Mar. 5	470	127	46	1204
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,120	Mar. 5	471	127, 128	46	1205
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,121	Mar. 5	473	128	46	1205
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,122	Mar. 5	475	128, 129	46	1205
Salts and desulphurizing ores. Apparatus for use in decomposing metallic	P. H., Jr., and O. T. X. Adams	399,123	Mar. 5	476	129	46	1206
Salts. Making basic lead	F. M. Lyte	396,703	Jan. 22	2127		46	437
Sample-holder	W. A. Campbell	398,017	Mar. 5	317	85	46	1175
Sand and gravel. Apparatus for dredging, washing, and separating	J. M. Miller	395,624	Jan. 1	482	123	46	98
Sand, &c. Transporting	A. McDougall	397,741	Feb. 12	981	260	46	772
Sandal	A. L. and B. J. Carroll	397,967	Feb. 19	1293	345	46	850
Sanding machine. Mold	G. Potts	397,247	Feb. 5	215	54	46	616
Sash-balance	Q. Baldwin	399,963	Mar. 19	1763	456	46	1483
Sash-balance	F. L. Rosentreter	397,941	Feb. 19	1257	335	46	843
Sash-balance	J. Spencer	399,216	Mar. 5	651	170	46	1239
Sash-balances. Chain attachment for	R. A. Breul	398,221	Feb. 19	1679	444	46	913
Sash-cord fastener	E. W. Abbe	397,680	Feb. 12	898	237	46	756
Sash-fastener	G. H. Aylworth	396,720	Jan. 15	1545	390	46	318
Sash-fastener	J. I. Baringer	395,685	Jan. 8	592	148	46	128
Sash-fastener	F. A. Bascom	396,386	Jan. 22	1646	423	46	345
Sash-fastener	A. N. Bender	400,289	Mar. 26	2251	589	46	1596
Sash-fastener	C. H. Dexter	396,548	Jan. 22	1898	490	46	393
Sash-fastener	J. Eberhardt	398,884	Mar. 5	99	27	46	1132
Sash-fastener	J. G. Erickson	396,150	Jan. 15	1290	330	46	272
Sash-fastener	J. S. Fisher	395,321	Jan. 1	25	6	46	7
Sash-fastener	G. Gehrung	398,589	Mar. 5	111	30	46	1135
Sash-fastener	W. T. Morgan	396,363	Jan. 15	1613	412	46	330
Sash-fastener	D. J. Powers	395,513	Jan. 1	314	80	46	66
Sash-fastener	T. S. Smith	398,549	Feb. 26	2168	572	46	1028
Sash-fastener	T. H. Teal and R. A. Campbell	399,169	Mar. 5	578	149	46	1236
Sash-fastener	H. A. Flatman and J. Seed	398,039	Feb. 19	1423	376	46	873
Sash-holder	J. M. Grubb	395,894	Jan. 8	924	238	46	192
Sash-holder	A. G. Murray	396,830	Jan. 22	2327	595	46	467
Sash-holder	L. Pfingst	396,709	Jan. 22	2135	544	46	438
Sash-holder	W. F. Mills	399,683	Mar. 19	1352	347	46	1412
Sash. Machine for bending metal	W. F. Mills	399,545	Mar. 12	1147	297	46	1361
Sash. Machine for making metal	H. Geyer	400,323	Mar. 26	2304	603	46	1607
Sausage-stuffing machine. Hydraulic	G. H. Holmes	397,646	Feb. 12	844	220	46	745
Saw	A. Oakes	398,792	Feb. 26	2533	674	46	1100
Saw	N. Petry	398,079	Feb. 19	1478	391	46	885
Saw	W. T. Wilson	398,302	Feb. 19	1609	478	46	950
Saw attachment. Hand	N. W. Rasnicke	399,695	Mar. 19	1368	352	46	1416
Saw-clamping device	R. F. Darling	396,145	Jan. 15	1281	328	46	271
Saw. Drive	G. T. Shepley	398,350	Feb. 19	1692	496	46	964
Saw. Fire-wood drag	F. M. Aylward	397,957	Feb. 19	1278	341	46	847
Saw-gage. Adjustable	W. V. Prince	396,606	Jan. 22	2072	532	46	427
Saw-gin	R. S. Munger	396,706	Jan. 22	2129	545	46	437
Saw-gummer	C. S. McMillan	399,066	Mar. 5	381	103	46	1187
Saw. Hack	G. N. Clemson	400,057	Mar. 26	1900	494	46	1528
Saw-hammering machine	R. Whitehill	399,366	Mar. 12	879	228	46	1310
Saw handle. Crosscut	M. Bennett	397,580	Feb. 12	736	191	46	725
Saw machine. Swing	E. D. Mackintosh	396,217	Jan. 15	1402	357	46	292
Saw machine. Swing	E. D. Mackintosh	396,218	Jan. 15	1403	358	46	292
Saw-mill dog	J. Flesher	397,636	Feb. 12	831	217	46	743
Saw-mill dog	H. R. Wolfe	395,373	Jan. 1	99	26	46	22
Saw-mill feed mechanism	A. Lang	395,840	Jan. 8	837	216, 217	46	175
Saw-mill set-works	F. W. Cook	398,942	Mar. 5	191	51	46	1150
Saw-set	A. L. and E. Buell	399,490	Mar. 12	1059	276	46	1345
Saw-set	A. J. Lewis and F. A. Sauer	396,406	Jan. 22	1680	431	46	852
Saw-setting device	A. Effinger, L. L. Dewecse, C. W. Koons, and W. H. Metzger	399,391	Mar. 12	920	239	46	1318
Saw-setting device	W. Trabue	398,357	Feb. 19	1893	498	46	966
Saw-setting machine	A. Logan	396,823	Jan. 29	2314	593	46	483
Saw sharpeners. Feed device for gin	W. Behan and P. Frienschner	396,800	Jan. 29	2285	584, 585	46	477
Saw-sharpening machine	M. Covel	398,030	Feb. 19	1410	372	46	870

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Saw-swaging machine	M. Covel	398,032	Feb. 19	1413	{373 / 374}	46	871
Saw. Swinging	E. E. Williams	400,281	Mar. 26	2228	586	46	1594
Saw-tables. Feed mechanism for	C. R. Morgan	397,930	Feb. 19	1243	332	46	840
Saw-tightener	S. Walter	395,367	Jan. 1	89	24	46	20
Saws. Device for holding and dressing	M. Covel	398,031	Feb. 19	1411	373	46	871
Saws. Guide for band and scroll	D. W. Perry	395,797	Jan. 8	772	200	46	1303
Saws. Machine for fitting the ends of band	J. M. Petersen	399,344	Mar. 12	839	219	46	1462
Saws. Machine for gumming and sharpening gin	T. H. Nance	399,919	Mar. 19	1704	441	46	1482
Saws. Tempering	J. Pelts	400,248	Mar. 26	2187	574	46	1586
Sawing-machine	R. H. Hoyt	399,900	Mar. 19	1672	{433 / 434}	46	1476
Sawing-machine	J. B. Ivey	396,935	Jan. 29	2476	{638 / 639}	46	517
Sawing-machine	W. E. Patterson	397,203	Feb. 5	155	41	46	606
Sawing-machine	E. W. Snedeker	395,719	Jan. 8	637	{161 / 162}	46	137
Sawing machine. Scroll	C. W. Sedwick	398,803	Feb. 26	2546	678	46	1104
Sawing machine. Wood	T. J. Baldwin	397,622	Feb. 12	812	212	46	739
Sawing machine. Wood	B. F. Camp	396,026	Jan. 8	1116	284	46	228
Scaffold. Adjustable	M. Kull	396,163	Jan. 15	1313	336	46	275
Scale and measure. Grain	E. J. M. Becker	399,473	Mar. 12	1031	271	46	1341
Scale. Automatic grain	J. Locher	399,678	Mar. 19	1346	{345 / 346}	46	1410
Scale. Dress-cutter's	R. Hurlle	395,566	Jan. 1	392	100	46	81
Scale. Electro-magnetic grain	W. A. Holly and U. Malin	397,594	Feb. 12	762	199	46	730
Scale for surface measurements	G. H. Benedict	397,686	Feb. 12	905	{239 / 240}	46	757
Scale for weighing liquids. Spring	T. Lieb	399,052	Mar. 5	369	99	46	1185
Scale-measure	S. J. Hester	397,128	Feb. 5	34	8	46	585
Scale-pan	F. H. Burrill and G. G. Russell	399,315	Mar. 12	801	207	46	1295
Scale. Weighing	L. C. Farmer	399,860	Mar. 19	1619	419	46	1465
Scale. Weighing	T. H. Herndon	396,569	Jan. 22	1932	497	46	399
Scale. Weighing	W. H. Stewart	399,446	Mar. 12	989	258	46	1333
Scale. Weighing	J. G. McNeill	396,285	Jan. 15	1496	379	46	309
Scale. Weighing and price	O. W. Van Denburgh	397,040	Jan. 29	2621	676	46	547
Scale. Weighing and price	H. A. Lewis	397,464	Feb. 5	550	144	46	683
Scales. Hydrostatic indicator for weighing	H. L. Fisher and J. W. Ballard	398,824	Mar. 5	18	5	46	1117
Scales. Railway	J. T. Friend	399,865	Mar. 19	1625	421	46	1466
Scales. Weighing	G. B. Adams	397,955	Feb. 19	1276	340	46	846
Scarf-holder	M. Forbes	396,994	Jan. 29	2555	660	46	534
Scarf-tip	E. S. Bellows	399,730	Mar. 19	1420	365	46	1426
Scissors. Button-hole	J. A. Henckels	398,509	Feb. 26	2117	557	46	1017
Scourer: *See* Grain-scourer.							
Scraper	L. R. Carbart	396,647	Jan. 22	2048	526	46	422
Scraper and roller	W. Huggins	395,784	Jan. 8	743	190	46	157
Scraper. Foot	W. H. Tyler	400,019	Mar. 19	1844	479	46	1508
Scraper. Road	E. Burbance	398,581	Feb. 26	2214	{585 / 586}	46	1037
Scratch-gage	W. G. Rose	396,371	Jan. 15	1021	415	46	332
Screen-frame	H. F. Hall	397,797	Feb. 12	1061	283	46	788
Screw-cutting die	A. E. Brion	395,810	Jan. 8	796	208	46	167
Screw-cutting die	T. L. Smith	399,707	Mar. 19	1398	357	46	1420
Screw-cutting die	J. E. Woodbridge	399,367	Mar. 12	880	229	46	1310
Screw-driver	C. B. Morgan	395,450	Jan. 1	211	54	46	45
Screw-driver	C. A. Strasser	398,986	Mar. 5	266	73	46	1165
Screw. Jack	C. H. Hopkins	398,617	Feb. 26	2306	601	46	1047
Screw. Jack	M. Relsch	397,367	Feb. 5	420	111	46	657
Screw-tapping machine	H. H. Taylor	399,353	Mar. 12	863	224	46	1307
Screws and bolts by electricity. Manufacturing	E. Thomson	398,912	Mar. 5	141	38	46	1141
Screws. Clamping operating handle for adjusting	W. Lyman	395,965	Jan. 8	1056	268	46	217
Screws. Tool for nicking heads of	J. F. Thayer	397,208	Feb. 5	164	43	46	607
Seal	E. J. Brooks	395,481	Jan. 1	257	67	46	55
Seal-lock	E. C. Bartlett	398,371	Feb. 26	1923	{506 / 507}	46	980
Seal-lock	M. C. Harney	399,526	Mar. 12	1116	290	46	1356
Seal-lock	E. H. Lea and W. B. Marks	398,411	Feb. 26	1975	520	46	990
Seal-lock	E. Meise	395,792	Jan. 8	761	197	46	160
Seal-lock	O. T. Welch	397,210	Feb. 5	168	45	46	608
Seal-lock	C. Zwickart	399,722	Mar. 19	1408	362	46	1424
Seal. Metallic	A. J. Phelps	397,324	Feb. 5	416	110	46	656
Seal-press	J. G. Strodtmann	395,521	Jan. 1	322	82	46	68
Seat: *See* Car-seat. Carriage-seat. Valve-seat. Vehicle-seat. Wagon-seat.							
Secondary battery	J. L. Huber	399,535	Mar. 12	1129	293	46	1358
Secondary battery	R. M. Hunter	400,404	Mar. 26	2425	635	46	1629
Secondary battery	W. Kingsland	397,650	Feb. 12	852	222	46	747
Secondary battery	I. Kitsee	400,226	Mar. 26	2149	564	46	1579
Secondary battery	E. R. Knowles	399,052	Mar. 5	361	97	46	1183
Secondary battery	O. Lugo	396,213	Jan. 15	1395	.....	46	291
Secondary battery	O. Lugo	396,214	Jan. 15	1396	.....	46	291
Secondary battery	J. T. Pedersen	398,075	Feb. 19	1473	390	46	884
Secondary battery	I. L. Roberts	396,367	Jan. 15	1617	.....	46	331
Secondary battery	I. L. Roberts	396,368	Jan. 15	1617	414	46	331
Secondary battery	I. L. Roberts	396,369	Jan. 15	1619	415	46	331
Secondary battery	J. S. Sellon	396,769	Jan. 29	2241	573	46	468
Secondary battery	J. S. Sellon	396,770	Jan. 29	2242	573	46	468
Secondary battery	J. S. Sellon	396,956	Jan. 29	2507	646	46	525
Secondary battery	W. A. Shaw	397,443	Feb. 5	519	136	46	677
Secondary battery	I. A. Timmis	396,194	Feb. 19	1645	435	46	915

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Sectional boiler	J. H. Mills	400,243	Mar. 26	2176	{571 / 572}	46	1584
Sectional jack	J. H. Baird	396,321	Jan. 15	1546	391	46	318
Seed cleaner. Cotton	C. Baumgarten	399,819	Mar. 19	1562	404	46	1453
Seed-drill	J. S. Sheridan	398,450	Feb. 26	2040	535	46	1002
Seed-drill	M. F. White	399,460	Mar. 12	1010	264	46	1337
Seed grader and cleaner	W. Mlnigh	396,887	Jan. 29	2407	{617 / 618}	46	504
Seed. Machine for delinting cotton	E. T. Gennert	396,996	Jan. 29	2557	661	46	534
Seed Machine for delinting cotton	T. P. Sullivan	397,448	Feb. 5	529	139	46	679
Seed mill. Cotton	W. B. Traylor	400,373	Mar. 26	2377	{621 / 622}	46	1621
Seeder, harrow, and roller	W. G. Michael	400,351	Mar. 26	2349	613	46	1615
Seeding-machine	W. D. Arnett	398,112	Feb. 19	1524	{403 / 404}	46	893
Selling-machine. Automatic	J. W. Vaughn	396,674	Jan. 22	2062	{535 / 536}	46	429
Semaphore	J. W. C. C. Schirm	395,405	Jan. 1	145	37	46	31
Semaphore-signal	F. Stitzel and C. Weinedel	398,353	Feb. 19	1886	{496 / 497}	46	964
Semaphore-signal	F. Stitzel and C. Weinedel	399,579	Mar. 12	1198	{309 / 310}	46	1371
Separator: *See* Garlic-separator. Grain-separator. Magnetic separator. Ore-separator.							
Separator	J. M. Bradshaw and W. E. Meek	399,486	Mar. 12	1050	275	46	1344
Separator	J. M. Finch and J. R. Cross	400,201	Mar. 26	2108	553	46	1572
Separator and concentrator. Combined	J. D. Coplen	397,585	Feb. 12	742	192	46	736
Sewage by electricity. Apparatus for purifying	W. Webster, Jr	397,407	Feb. 5	452	121	46	664
Sewage by electricity. Purifying	W. Webster, Jr	396,101	Feb. 19	1504	396	46	889
Sewer-trap	D. H. Donaldson	399,978	Mar. 19	1784	463	46	1497
Sewer-trap	W. Kerr	395,907	Jan. 8	941	242	46	195
Sewer-ventilator	T. P. Worthington	396,187	Jan. 15	1352	347	46	283
Sewing	G. A. and J. G. Xander	399,310	Mar. 12	794	205	46	1294
Sewing-machine	J. Bartlett and G. B. Wiggin	397,579	Feb. 12	733	190	46	744
Sewing-machine	J. Bartlett and G. B. Wiggin	399,818	Mar. 19	1561	404	46	1453
Sewing-machine	J. Bartlett and G. B. Wiggin	400,037	Mar. 26	1870	{486 / 487}	46	1582
Sewing-machine	E. C. Bean	398,765	Feb. 26	2495	{661 / 662}	46	1093
Sewing-machine	J. Boppel	396,979	Jan. 29	2533	{654 / 655}	46	530
Sewing-machine	W. C. Foster	397,496	Feb. 12	598	155	46	699
Sewing-machine	J. H. Griffin	398,323	Feb. 19	1841	486	46	956
Sewing-machine	J. A. House and C. H. Dimond	399,990	Mar. 19	1802	{467 / 468}	46	1501
Sewing-machine	C. F. Littlejohn	397,808	Feb. 12	1076	286	46	790
Sewing-machine	F. W. Müller, Jr	397,996	Feb. 19	1340	357	46	858
Sewing-machine	C. W. Weise	399,364	Mar. 12	875	{227 / 228}	46	1309
Sewing-machine-attachment holder	R. S. Barnum	397,867	Feb. 19	1178	315	46	899
Sewing-machine-attachment holder	E. Seltz	400,257	Mar. 26	2200	577	46	1588
Sewing-machine bobbins, &c. Machine for winding	W. R. Landfear	398,057	Feb. 19	1449	383	46	879
Sewing machine. Button	H. H. Cummings	397,587	Feb. 12	744	{193 / 194}	46	736
Sewing machine. Button	H. H. Cummings	397,588	Feb. 12	750	{194 / 195 / 196}	46	737
Sewing machine. Button	H. H. Cummings	398,585	Feb. 26	2220	587	46	1038
Sewing machine. Button	H. H. Cummings	398,586	Feb. 26	2224	{587 / 588}	46	1038
Sewing machine. Button	L. J. Driscoll	395,384	Jan. 1	117	30	46	26
Sewing machine. Button	L. C. Wing	395,372	Jan. 1	96	25	46	21
Sewing-machine button-hole attachment	H. J. Williams	399,304	Mar. 12	784	204	46	1292
Sewing-machine button-hole-cutting attachment	R. Spahn	399,638	Mar. 12	1286	330	46	1387
Sewing-machine feed mechanism	C. H. Willcox	398,300	Feb. 19	1607	477	46	949
Sewing-machine feeding mechanism	S. W. Wardwell, Jr	396,630	Jan. 22	2025	591	46	418
Sewing-machine heads. Locking device for	W. H. Palmer, Jr	398,534	Feb. 26	2147	567	46	1094
Sewing-machine hemmer	A. Wayne	396,379	Jan. 15	1634	419	46	334
Sewing-machine needle	L. C. Wing	397,619	Feb. 12	809	211	46	738
Sewing-machine needle-clamp	C. P. Bostian	396,350	Jan. 15	1596	402	46	325
Sewing-machine. Overedge	D. R. Dawson	399,744	Mar. 19	1438	370	46	1430
Sewing-machine presser-foot	W. A. Neely	400,355	Mar. 26	2236	615	46	1616
Sewing-machine quilting-frame	H. T. Davis	396,328	Jan. 15	1556	393	46	320
Sewing-machine. Rotary-shuttle	F. T. Leilich	397,652	Feb. 12	854	{223 / 224}	46	747
Sewing-machine ruffler and gatherer	H. C. Goodrich	397,906	Feb. 19	1213	325	46	835
Sewing-machine ruffling and gathering attachment	E. Seltz	398,193	Feb. 19	1641	434	46	914
Sewing-machine shuttle	C. H. Benoit	397,369	Feb. 5	345	84	46	603
Sewing-machine shuttle	S. W. Wardwell, Jr	396,631	Jan. 22	2027	591	46	418
Sewing-machine shuttle-driving mechanism	L. Schultz	399,701	Mar. 19	1376	355	46	1418
Sewing-machine shuttle-operating mechanism	J. Tripp	398,291	Feb. 19	1793	474	46	947
Sewing-machine spool-holder	C. L. Thomas	399,095	Mar. 5	425	115	46	1195
Sewing-machine take-up device	L. E. Moore and W. A. Davis	399,685	Mar. 19	1353	348	46	1419
Sewing-machine take-up mechanism	J. Tripp	399,949	Mar. 19	1744	450	46	1489
Sewing-machine trimming attachment	T. B. Moore	395,626	Jan. 1	492	124	46	99
Sewing-machine. Wax-thread	A. S. Richardson	398,653	Feb. 26	2230	619	46	1052
Sewing-machines. Automatic tension apparatus for	J. S. Gorton	397,640	Feb. 12	837	216	46	744
Sewing-machines. Button-attaching device for	M. Gardner	400,322	Mar. 26	2302	603	46	1607
Sewing machines. Channel-cutting device for sole	E. B. Allen	398,305	Feb. 19	1812	476	46	951
Sewing-machines. Clamp-operating mechanism for button-hole	F. W. Ostrom	396,344	Feb. 19	1873	493	46	961
Sewing-machines. Combined thread-tension and lubricating device for	D. A. Mooney and J. Ireland	398,433	Feb. 26	2007	527	46	996
Sewing-machines. Guiding attachment for	H. C. Goodrich	399,873	Mar. 19	1634	424	46	1468

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg's.	Official Gazette. Vol.	Official Gazette. Page.
Sewing machines. Loop removing and spreading mechanism for button	W. E. Bennett	399,179	Mar. 5	589	151, 152	46	1228
Sewing machines. Loop removing and spreading mechanism for button	R. Thompson	398,010	Feb. 19	1374	363, 364	46	864
Sewing-machines. Waxing device for wax-thread	E. A. Stiggins	399,578	Mar. 12	1196	309	46	1371
Shade cloth. Machine for creasing and cutting window	F. Gaeth	400,321	Mar. 26	2300	602	46	1606
Shade-holder	G. E. Somers	400,133	Mar. 26	2007	525	46	1350
Shade rollers. Extension-strip for window	A. B. Dunkle	398,137	Feb. 19	1561	413	46	900
Shades, maps, &c. Exhibitor for window	E. A. Ballard	396,463	Jan. 22	1765	463	46	369
Shaft. Adjustable vehicle	W. B. Farrar	395,820	Jan. 8	808	211	46	169
Shaft attachment for vehicles	D. D. Hare	399,525	Mar. 12	1115	290	46	1355
Shaft-bearing. Adjustable	B. A. Dobson	395,428	Jan. 1	177	47	46	38
Shaft-coupling for vehicles	D. M. Parry	396,231	Jan. 15	1419	361	46	296
Shaft-holder and wrench. Combined	H. W. Nott	396,048	Jan. 8	1145	291	46	235
Shaft support. Vehicle	J. A. Peel	398,076	Feb. 19	1475	390	46	884
Shaft-supporter for vehicles	H. F. Welch	395,641	Jan. 1	518	130	46	103
Shaking-bolt	H. Bittinger	398,692	Feb. 26	2388	634	46	1071
Shank-protector	H. Schnarr	398,453	Feb. 26	2030	533	46	1000
Shaping material to the arc of any desired circle. Device for	P. Leeds	399,675	Mar. 19	1343	344	46	1410
Shaving utensil. Combination	W. Shay	397,028	Jan. 29	2607	673	46	545
Shavings. Machine for making packing	O. Evenstad and O. Senstad	397,281	Feb. 5	285	68, 69	46	626
Shawl-strap	D. W. Brockway	398,125	Feb. 19	1545	410	46	897
Shearing and clipping machine	T. A. Martin	399,763	Mar. 19	1467	378	46	1435
Shears. *See* Animal-shears. Pruning-shears.							
Shears	F. J. Cooper	397,698	Feb. 12	919	243	46	760
Shears	W. Richard	396,291	Jan. 15	1504	381	46	311
Shears	W. S. Kisinger	398,897	Mar. 5	124	33	46	1137
Sheave	W. Duncan	397,279	Feb. 5	282	68	46	626
Sheet-metal binding	P. Richards	399,502	Mar. 12	1175	304	46	1366
Sheet metal. Cold-rolling	L. L. Sagendorph	398,655	Feb. 26	2332	620	46	1060
Sheet-metal joints. Machine for locking	W. Werts	396,789	Jan. 29	2265	578, 579	46	473
Sheet-metal rings. Machine for threading	J. F. Gent	395,893	Jan. 8	921	237	46	191
Sheet or flake products. Machine for making	J. M. D. France	396,813	Jan. 29	2303	589	46	481
Shelf. Book	L. Schmitt	397,251	Feb. 5	220	57	46	617
Shelf-support. Adjustable	J. W. Graydon	399,881	Mar. 19	1648	426	46	1470
Shell	J. W. Graydon	399,877	Mar. 19	1644	425	46	1469
Shell. High-explosive							
Sheller: *See* Corn-sheller.							
Shelving. Metal	M. R. Jewell	395,328	Jan. 1	36	9	46	10
Shingle sawing machine	E. Anderson	397,328	Feb. 5	340	89	46	642
Shingle-sawing machine	D. and W. L. Chase	398,230	Feb. 19	1694	448, 449	46	926
Shingles. Machine for coating and sanding	J. Jaquet	398,332	Feb. 19	1854	489	46	959
Shipping-case	B. S. Atwood	397,214	Feb. 5	173	46	46	609
Shipping-package	I. L. Rock	398,839	Feb. 26	2156	569	46	1025
Ship's locker	F. M. Barber	395,648	Jan. 1	534	134	46	108
Ships' logs. Register for	R. Rood	397,661	Feb. 12	869	228	46	750
Shirt	S. Miller	399,914	Mar. 19	1698	439	46	1481
Shirt or vest and suspenders. Combined	J. T. Brodnax	399,238	Mar. 12	696	179	46	1274
Shirt-wristband	W. E. Howell	397,920	Feb. 19	1328	328	46	838
Shock binder	C. Ben	398,935	Mar. 5	182	48	46	1148
Shoe	N. Ward	396,787	Jan. 29	2262	578	46	472
Shoe-clasp	M. N. Bray	399,237	Mar. 12	665	179	46	1274
Shoe-horn	S. D. McKenty	396,411	Jan. 22	1657	433	46	353
Shoe-maker's anvil	P. Murtha	396,106	Jan. 15	1236	314	46	261
Shoe-polishing machine	J. D. Bright	398,124	Feb. 19	1543	400	46	897
Shoes. Manufacturing	G. W. Canton	397,488	Feb. 12	586	152	46	608
Shoes or gloves. Fastener for	W. J. Brown	395,778	Jan. 8	767	192	46	151
Shoeing-stand	J. J. Halstead	399,886	Mar. 19	1657	428	46	1472
Shores. Device for protecting	J. M. Rearden	398,080	Feb. 19	1479	392	46	865
Shoulder-brace	R. V. Shockey	396,837	Jan. 29	2337	598	46	489
Shovel: *See* Hop-shovel. Snow-shovel.							
Shovel	H. Brand	397,964	Feb. 19	1289	344	46	849
Shovel	E. L. Fenerty	398,887	Mar. 5	101	28	46	1133
Show-case	F. X. Ganter	398,605	Feb. 26	2248	596	46	1043
Show-case. Revolving	F. X. Ganter	398,604	Feb. 26	2247	595	46	1043
Show-case supporter and card-holder	G. C. Frye	399,256	Mar. 12	712	185	46	1279
Show-rack	B. G. Casler	398,027	Feb. 19	1406	371	46	870
Shower-bath	D. Grove	398,694	Mar. 5	118	32	46	1135
Shutter-bower	J. J. Taylor	396,442	Jan. 22	1736	446	46	363
Shutter-fastener	J. A. Baehman	399,734	Mar. 19	1411	363	46	1424
Shutter-fastener	G. F. Folsom	395,557	Jan. 1	379	96	46	78
Shutter. Window	J. T. and S. W. Miller	395,577	Jan. 1	415	106	46	86
Side spring for carriages	E. A. Chubb	396,071	Jan. 15	1178	298	46	250
Side spring. Vehicle	J. F. Thomas	398,008	Feb. 19	1367	362	46	863
Siding-gage	S. G. Hosack	399,898	Mar. 19	1669	432	46	1475
Siding gage and square	P. M. Curtis	396,075	Jan. 15	1185	300	46	251
Sieves. Device for mending	E. A. Bolus	400,292	Mar. 26	2254	590	46	1597
Sifter	G. H. Fountain	399,662	Mar. 19	1621	420	46	1465
Sifter. Ash	G. W. Bown	399,371	Mar. 12	885	230	46	1311
Sifter for stoves. Ash	E. E. Smith	396,178	Jan. 15	1339	344	46	280
Sifter. Household	J. T. Quinn	396,834	Jan. 29	2333	597	46	488
Sign	G. W. Sanderson	400,364	Mar. 26	2367	618	46	1619
Sign-plate	D. Macdonald	396,704	Jan. 22	2128	545	46	437
Sign. Translucent	E. A. Dubey	397,072	Jan. 29	2069	530	46	556
Signal: *See* Danger-signal. Semaphore-signal. Railway-signal. Switch-signal. Railway block-signal.							
Signal device. Pedal bell	J. B. Griffin	396,898	Jan. 29	2376	610	46	498

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg's.	Official Gazette. Vol.	Official Gazette. Page.
Signal-operating device for trains	W. Glasgow	399,193	Mar. 5	614	160	46	1232
Signal-post	J. T. Hambay	399,580	Mar. 19	1661	429	46	1473
Signal transmitter. Multiple	M. Martin	397,194	Feb. 5	143	38	46	603
Signaling and alarm apparatus. Electric	W. L. Denio	397,638	Feb. 12	1113	298	46	798
Signaling apparatus. Electric	J. P. Coleman	395,315	Jan. 1	12	4	46	5
Signaling apparatus. Electric	M. W. Dewey	395,958	Jan. 8	1010	259	46	209
Signaling apparatus. Electric	M. W. Dewey	395,959	Jan. 8	1015	259	46	210
Signaling apparatus. Electric	W. Henion	396,307	Jan. 15	1385	355	46	289
Signaling apparatus. Electric	J. Young	396,795	Jan. 29	2278	582	46	475
Signaling apparatus. Transmitting-instrument for electric	W. J. Dudley	399,505	Mar. 12	1079	281, 282	46	1349
Silk. Machine for throwing	J. E. Tynan	396,350	Feb. 19	1898	499	46	967
Sink-cleaner	W. V. Esmond	399,321	Mar. 12	810	209	46	1297
Skate	T. H. McQueown	396,413	Jan. 22	1688	433	46	353
Skate	J. A. Whelpley	399,365	Mar. 12	877	228	46	1310
Skylight	O. André	395,306	Jan. 1	2	1	46	3
Slack-burning furnace	T. Wilkinson and J. Glendinning	397,951	Feb. 19	1271	330	46	845
Slag-furnace	O. T. X. Adams	395,644	Jan. 1	524	131, 132	46	105
Slag. Manufacture of	S. T. C. Bryan	400,048	Mar. 26	1867	490	46	1625
Slag. Mechanically treating and annealing	S. T. C. Bryan	400,046	Mar. 26	1865	.....	46	1625
Slag. Treating	S. T. C. Bryan	400,047	Mar. 26	1867	.....	46	1625
Slate. Artificial	C. Brown	399,374	Mar. 12	894	239	46	1312
Slates, blackboards, &c. Cleaner for	N. Jensen	395,905	Jan. 8	937	241	46	194
Sled	F. M. Conner	395,879	Jan. 8	900	231	46	187
Sled	F. W. Hofele	397,060	Jan. 29	2678	603	46	558
Sled	F. W. Hofele	397,061	Jan. 29	2679	603	46	558
Sled. Bob	J. Parr	395,993	Jan. 8	1073	273	46	221
Sled-brake	F. Gretzler	397,231	Feb. 5	195	52	46	613
Sled-brake	C. E. Holley	399,405	Mar. 12	940	243	46	1322
Sled-propeller	J. Draper	395,553	Jan. 1	368	94	46	77
Sled-shoe	F. W. Tilden	397,617	Feb. 12	807	210	46	738
Sled. Steam	J. F. Conniff	400,058	Mar. 26	1901	494	46	1598
Sleeper	H. Hipkins	396,160	Jan. 15	1309	335	46	275
Sleigh	H. A. Currier	395,955	Jan. 8	1007	258	46	208
Sleigh	W. J. Hamill	399,890	Mar. 19	1661	429	46	1473
Sleigh	L. Kelley	399,335	Mar. 12	808	215	46	1301
Sleigh	F. C. Klipstein	397,728	Feb. 12	961	256	46	767
Sleigh. Bob	R. H. Olive	397,747	Feb. 12	990	262	46	773
Sleigh. Bob	J. F. Platt	396,232	Jan. 15	1420	361	46	296
Sleigh-brake	W. R. Wilcox	396,844	Jan. 29	2345	600	46	491
Sleigh-knee	T. G. Mandt	399,913	Mar. 19	1697	430	46	1480
Sleigh-knee	W. H. Spear	396,005	Jan. 8	1091	277	46	234
Sleigh-knee	E. J. Youngs	399,642	Mar. 12	1292	331	46	1389
Sleigh-kneee. Coupling for bent	J. J. Cobb	395,679	Jan. 1	578	145	46	117
Sleigh-runner	T. E. Lewis	395,398	Jan. 1	136	35	46	30
Sleigh-runner for wheeled vehicles	D. G. Wyeth	400,381	Mar. 26	2390	625, 626	46	1623
Sliding gate	G. W. Stewart	398,861	Mar. 5	67	18	46	1127
Slimes. Apparatus for saving	S. Hansen	395,826	Jan. 8	815	212	46	171
Smelting-furnace slag steam-generating furnace and plant	O. T. X. Adams	395,643	Jan. 1	520	129, 130, 131	46	104
Smelting ores. Plant for use in	P. H., Jr., and O. T. X. Adams	399,124	Mar. 5	479	129, 130, 131	46	1206
Smelting ores. Plant for use in	P. H., Jr., and O. T. X. Adams	399,123	Mar. 5	481	130, 131	46	1207
Smoke-consumer	A. C. Badan	399,817	Mar. 19	1560	404	46	1453
Smoke-consumer	H. Blaisdell	398,688	Feb. 26	2383	632	46	1070
Smoke. Consuming	R. H. Michell	399,062	Mar. 5	376	101	46	1186
Smoke-consuming bridge-wall cap	H. Liebbe	398,415	Feb. 26	1986	522	46	902
Smoke-consuming furnace	J. Gilbert	397,353	Feb. 5	371	97, 98	46	648
Smoke-consuming furnace	C. McGinnis	397,135	Feb. 5	46	10	46	587
Smoke-consuming furnace and air-heater	F. W. Wiesebrock	398,684	Feb. 26	2316	631	46	1068
Smoke, spark, and cinder arrester	W. B. Johnson	396,607	Jan. 22	2118	543	46	435
Snap-hook	O. V. Blanier	399,005	Mar. 5	301	82	46	1172
Snap-hook	W. N. Fessenden	398,599	Feb. 26	2240	593	46	1041
Snap-hook	H. G. McLean	397,136	Feb. 5	47	11	46	587
Snap-hook	R. R. Waddell	397,948	Feb. 19	1267	336	46	845
Snap-hook and buckle. Combined	A. J. McCord	395,963	Jan. 1	556	139	46	112
Snap-hook wire	S. P. Scott	400,256	Mar. 26	2199	577	46	1588
Snarling-machine	W. McPherson	396,412	Jan. 22	1638	433	46	353
Snell	E. C. Vom Hofe	396,246	Jan. 15	1440	366	46	299
Snell	H. L. Willoughby	396,130	Jan. 15	1264	323	46	247
Snow-plow	J. Corbett	395,548	Jan. 1	358	92	46	75
Snow-plow	M. B. Eaton	400,197	Mar. 26	2102	554, 555	46	1571
Snow-plow	E. M. Hesselbom	399,895	Mar. 19	1666	431	46	1474
Snow-plow	J. Rudrauff	398,982	Feb. 19	1776	469, 470	46	943
Snow-plow	O. Williams	400,154	Mar. 26	2043	534, 535	46	1557
Snow shovel and scraper	L. Fairweather	399,394	Mar. 12	922	239	46	1318
Soap. Making	H. T. D. Schwahn	396,343	Jan. 15	1577	.....	46	393
Sod-cutter and pulverizing-harrow	A. Madson	396,166	Jan. 15	1318	337	46	276
Sod-cutter, stalk-cutter, and roller	T. Horton and J. P. Whitehouse	397,502	Feb. 12	607	157	46	701
Soda. Recovering	C. F. Dahl	396,546	Jan. 22	1891	487, 488, 489	46	392
Sodium salt. Making a	J. I. Watts and W. A. Richards	399,176	Mar. 5	585	.....	46	1228
Sodium. Salt of	J. I. Watts and W. A. Richards	399,175	Mar. 5	564	.....	46	1227
Sofa	F. W. Heringshausen	397,400	Feb. 12	1066	284	46	736
Sofa and bed. Combined	C. T. Hard	400,079	Mar. 26	1932	504	46	1534
Solder. Device for feeding and cutting	C. W. Sleeper	398,645	Feb. 26	2247	623	46	1062
Solder-rods. Apparatus for manufacturing	J. Robertson	398,976	Mar. 5	946	66	46	1161

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Soldering caps in filled cans	E. Norton	395,796	Jan. 8	771	200	46	161
Soldering-iron. Hand	E. J. Dolan	399,387	Mar. 12	914	237	46	1316
Soldering-machine	E. J. Dolan	399,386	Mar. 12	912	236, 237	46	1316
Soldering-machine	J. Solter	397,758	Feb. 12	1000	265, 266	46	776
Soldering machine. Can-	W. D. Brooks	400,294	Mar. 26	2256	500	46	1597
Soldering machine. Can-	W. D. Brooks	400,295	Mar. 26	2259	501	46	1598
Soldering machine. Can-	J. M. Colbert	399,020	Mar. 5	321	86	46	1176
Soldering machine. Can-	W. Hippering	399,012	Mar. 5	330	94	46	1181
Sole-edge-burnishing tool	W. Gordon	399,009	Mar. 12	1244	320	46	1379
Sole-laying machine	A. T. Tregurtha	398,358	Feb. 19	1895	498	46	966
Sounder attachment	G. H. Carey and W. McArthur	396,465	Jan. 22	1767	433	46	370
Sounding-lead	H. Holden	398,396	Feb. 26	1957	515	46	998
Sower. Rotary seed-	J. H. Adamson	396,251	Jan. 15	1445	368	46	301
Sower. Seed-	W. A. C. Oaks	397,606	Feb. 12	795	207	46	735
Spade. Ditching-	J. E., J. H., and S. E. Ketcham	396,659	Jan. 22	2063	530	46	425
Spark-arrester	G. B. Taylor	397,258	Feb. 5	222	60	46	620
Spark-conductor	K. H. Carper	398,818	Mar. 5	10	3	46	1116
Spark extinguisher and arrester	Q. J. Hoke	397,363	Feb. 5	385	101, 102	46	651
Specific-gravity apparatus	J. J. Hicks	398,726	Feb. 26	2447	648	46	1083
Speculum. Rectal	J. M. King	395,705	Jan. 8	618	155	46	133
Speech. Recording	G. H. Herrington	397,456	Feb. 12	1138	304	46	903
Speed-indicator	E. N. Barber	398,928	Mar. 5	172	44, 45	46	1146
Speed-indicator	E. N. Barber	398,929	Mar. 5	174	45	46	1146
Speed-indicator	E. C. Smith	397,295	Feb. 5	429	114	46	659
Speed-regulating device. Fluid	W. E. Nickerson	396,108	Jan. 15	1237	314	46	261
Speed regulator	F. Hart	397,716	Feb. 12	942	250	46	764
Spike-machine	J. F. Collins	399,500	Mar. 12	1069	279	46	1347
Spinning and twisting yarn. Machine for	G. B. Lukens	398,270	Feb. 19	1735	463	46	930
Spinning-frames, &c. Clearer for removing waste, &c., from the top of	W. E. Sharples	396,616	Jan. 22	2004	516	46	414
Spinning frames. Traveler-clearer for ring-	T. H. Speakman	398,550	Feb. 26	2171	573	46	1028
Spinning hemp, &c. Feed-regulator for machines for	G. Ryan	398,848	Mar. 5	47	14	46	1123
Spinning-machine, &c	P. Wallace	398,676	Feb. 26	2365	628	46	1066
Spinning-machine spindle	D. Jackson	399,046	Mar. 5	355	95	46	1182
Spinning machines, &c. Support for spindles and rings of ring-	E. Dummer	396,148	Jan. 15	1284	329	46	271
Spinning-machines. Top roll for	E. Wright	395,938	Jan. 8	983	252	46	204
Spinning-spindles. Bobbin-support for	L. D. Van Valkenberg	398,809	Feb. 26	2351	679	46	1105
Spinning-spindles. Driving mechanism for	T. L. Butler	397,620	Feb. 12	822	215	46	741
Spittoon	A. E. Moore	397,200	Feb. 5	153	41	46	605
Spoke-tenon	W. F. Morton	397,995	Feb. 19	1339	357	46	856
Spokes. Machine for drawing	W. Shelly	400,127	Mar. 26	1999	523	46	1549
Spokes. Machine for trimming wire	P. Gendron	396,814	Jan. 29	2303	589, 590	46	481
Spokeshave	I. Camier	395,738	Jan. 8	667	170	46	143
Spool-holder	T. W. Norton	399,921	Mar. 19	1706	442	46	1483
Spool-stand	V. Melas	399,760	Mar. 19	1477	381	46	1437
Spools of thread. Spindle for	S. B. Pratt	398,000	Feb. 19	1356	360	46	860
Spools. Thread-holder for	S. B. and C. B. Pratt	397,999	Feb. 19	1355	359	46	860
Spoon-rest	H. H. Abbe	397,885	Feb. 19	1177	315	46	829
Spray-producing apparatus. Electric	H. A. B. Huguet de Vars	398,327	Feb. 19	1847	487	46	957
Spring: *See* Bolster-spring. Car-spring. Cart-spring. Door-spring. Side spring. Vehicle-spring. Wagon-spring. Wagon-bolster spring.							
Spring	F. Latulip	397,969	Feb. 19	1331	355	46	856
Spring-bending machine	J. N. Rice	399,160	Mar. 5	563	145, 146	46	1223
Spring-block	M. W. Clark	395,545	Jan. 1	355	91	46	74
Spring-clasp for holding letters	L. Steinberger	400,138	Mar. 26	2013	527	46	1551
Spring-coiling machine	L. J. Pennock	395,511	Jan. 1	310	78, 79	46	66
Spring-lock	H. K. Harker	398,392	Feb. 26	1953	514	46	985
Spring-making machine	C. C. Hill	400,340	Mar. 26	2328	608, 609	46	1611
Spring-motor	C. H. Smith	396,243	Jan. 15	1436	365	46	298
Spring-motor	H. L. Suydam	396,355	Feb. 19	1891	497	46	966
Springs. Making flat coiled	G. Kelly	397,861	Feb. 12	1145	306	46	805
Springs. Making steel-trap	S. Mitchell	395,846	Jan. 8	849	219	46	178
Sprinkler: *See* Lawn-sprinkler. Water-sprinkler.							
Sprinkler	J. Naber, Jr	398,901	Mar. 5	128	35	46	1138
Sprinkling or irrigating apparatus	J. Walter	395,726	Jan. 8	649	166	46	140
Spur	W. Nicholls	397,304	Feb. 5	301	77	46	633
Square and bevel. Try-	C. F. Merrifield	399,424	Mar. 12	963	250	46	1327
Square, bevel, and protractor. Try-	F. S. Talmadge	396,761	Jan. 29	2255	576	46	470
Square. Dress-maker's	K. A. Luta	396,099	Jan. 15	1226	310	46	259
Square. Micrometer caliper-	L. S. Starrett	399,167	Mar. 5	576	148	46	1236
Square. Tailor's and dress-maker's	P. Fant	396,396	Jan. 22	1661	427	46	347
Stacker	T. Berry	398,934	Mar. 5	180	48	46	1148
Stacker. Shiftable	W. S. Reeder	399,211	Mar. 5	641	168	46	1227
Stalk cutter. Corn or cotton	M. B. Banowets	398,216	Feb. 19	1671	442	46	921
Stalk-puller	G. W. Rogers	396,894	Jan. 29	2418	621, 622	46	507
Stall and stock-handling apparatus. Combined	C. F. Shedd	397,206	Feb. 5	161	42, 43	46	606
Stamp-affixing machine	W. R. Miller	397,087	Jan. 29	2087	695	46	559
Stamp. Printing-	J. Sigwalt, Jr	399,069	Mar. 5	414	112	46	1193
Stamp. Rubber-	E. Reynolds	396,233	Jan. 15	1421	362	46	296
Stamps. Dating device for hand-	L. K. Scotford	395,518	Jan. 1	319	81	46	67
Stamping designs in metal leaf	M. J. Masters	396,220	Jan. 15	1405	.....	46	293
Stanchion. Cattle-	D. Lane	399,630	Mar. 12	1261	324	46	1382

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Stand: *See* Barrel-stand. Christmas-tree stand. Flower-stand. Music-stand. Photometer-stand. Railway-switch stand. Shoeing-stand. Spool-stand. Switch-stand. Wash-stand. Water-cooler stand. Window-stand. Work-stand.							
Stand for charts, &c	L. B. Somerby	397,759	Feb. 12	1003	266	46	776
Standards. Holder for revolving	H. Westphal	395,766	Jan. 8	705	181	46	150
Starch. Manufacturing	J. N. Hurty	395,977	Jan. 8	1042	265	46	215
Starching-machine	T. J. Blake	400,184	Mar. 26	2085	546	46	1567
Station-indicator	J. R. Angel	396,019	Jan. 8	1108	281	46	227
Station-indicator	O. E. Miebaud	400,942	Mar. 26	2175	570, 571	46	1584
Station-indicator	J. Tullina	397,894	Feb. 12	1098	294	46	795
Statistics. Apparatus for compiling	H. Hollerith	395,783	Jan. 8	739	189	46	156
Statistics. Compiling	H. Hollerith	395,781	Jan. 8	725	187, 188, 189	46	154
Statistics. Compiling	H. Hollerith	395,782	Jan. 8	736	75, 76, 77	46	156
Stave jointing and planing machine	W. J. Wright	398,993	Mar. 5	275	76	46	1167
Stave-making machine	W. L. Kellogg	399,670	Mar. 19	1235	342	46	1408
Stave-sawing machine	C. R. Penfield	396,763	Jan. 29	2229	571	46	465
Stay. Garment-	M. P. Bray	396,533	Jan. 22	1870	480	46	388
Steam-boiler	A. I. Barranoff	396,116	Feb. 19	1533	408	46	895
Steam-boiler	A. I. Barranoff	396,376	Feb. 26	1922	505	46	979
Steam-boiler	W. Cowles	396,545	Jan. 22	1887	485, 486, 487	46	391
Steam-boiler	A. Heberer	395,780	Jan. 8	794	188	46	154
Steam-boiler	W. E. Kelly	397,190	Feb. 5	36	8, 9	46	585
Steam-boiler	R. Reynolds	399,560	Mar. 12	1173	303	46	1366
Steam-boiler	G. Stringer	398,470	Feb. 26	2053	539	46	1005
Steam-boiler. Sectional	J. J. and M. A. Rufe	397,026	Jan. 29	2004	672	46	544
Steam-boiler. Sectional	C. L. Seabury	399,571	Mar. 12	1187	307	46	1369
Steam-engine	E. Beare	396,850	Jan. 29	2351	692	46	492
Steam-engine	G. W. Fite	395,967	Jan. 8	1026	261	46	212
Steam-engine	D. A. Frazer	398,822	Jan. 8	810	211	46	170
Steam-engine	H. N. Gale	398,143	Feb. 19	1568	415	46	901
Steam-engine	D. D. Hardy	400,081	Mar. 26	1934	505, 506	46	1535
Steam-engine	E. S. Harpst	395,395	Jan. 1	30	7, 8	46	8
Steam-engine	N. Nilson	399,771	Mar. 19	1480	381, 382	46	1438
Steam-engine	A. J. Pierce	398,444	Feb. 26	2019	530	46	998
Steam-engine	G. W. Price	397,468	Feb. 5	555	145	46	684
Steam-engine	J. West	399,101	Mar. 5	432	117	46	1196
Steam-engine	H. H. Westinghouse and F. M. Rites	396,635	Jan. 22	2033	502	46	419
Steam-engine	W. O. and J. D. Worth	399,593	Mar. 12	1222	315	46	1375
Steam-engine. Direct-acting	F. H. Laforge and H. J. Barker	398,164	Feb. 19	1600	424	46	907
Steam-engine. Revolving-piston	W. E. Leonard	397,299	Feb. 5	295	76	46	632
Steam-engine. Rotary	Z. R. Farrington	397,707	Feb. 12	929	246, 247	46	761
Steam-engine. Rotary	D. E. Powers	397,516	Feb. 12	629	163, 164	46	705
Steam-generator	A. L. Gilstrap	399,250	Mar. 12	717	186	46	1280
Steam-generator	H. H. Lindemuth	398,267	Feb. 19	1750	462	46	937
Steam-generator	C. C. Mulford	396,105	Jan. 15	1235	313	46	261
Steam-generator	T. J. Reynolds	399,781	Mar. 19	1494	385, 386	46	1442
Steam-generator	I. Sharp	396,053	Jan. 8	1151	292	46	236
Steam-generator	D. W. Smith	399,165	Mar. 5	573	147, 148	46	1225
Steam generator and radiator combined. Portable	R. G. Ferguson	399,512	Mar. 12	1094	295, 296	46	1351
Steam-generator. Slag	O. B. Peck	395,665	Jan. 1	559	139	46	112
Steam-generators. Fire-box for	A. Graf	397,852	Feb. 12	1134	303	46	802
Steam-heater	D. D. G. Langlands and O. E. Moulton.	397,651	Feb. 12	853	223, 224	46	747
Steam-heater	H. Sperl	396,438	Jan. 22	1730	445	46	363
Steam-motor	O. Noll	399,772	Mar. 19	1483	382, 383	46	1439
Steam-muffler	W. E. Pearson	396,507	Jan. 22	1835	471	46	382
Steam or other pressure gages. Apparatus for testing	J. D. Bowman	398,815	Mar. 5	6	2	46	1115
Steam or pneumatic engine. Direct-acting	G. A. Barth	397,958	Feb. 19	1281	341, 342	46	849
Steam-trap	E. E. Gold	398,719	Feb. 26	2435	645, 646	46	1061
Steam-trap	W. S. Johnson	399,198	Mar. 5	621	161, 162	46	1234
Steam-trap	C. Kammerer	398,622	Feb. 26	2271	602	46	1048
Steam-trap	J. F. Lightford	400,349	Mar. 26	2147	612	46	1614
Steam-trap. Measuring	G. Gunts	397,184	Feb. 5	130	35	46	601
Steel bars. Apparatus for toughening	J. Coffin	399,381	Mar. 12	985	235	46	1315
Steel. Hardening	F. Sedgwick	400,366	Mar. 26	2370	618	46	1619
Steel. Manufacture of	A. T. Hay	399,612	Mar. 19	1947	.....	46	1379
Steel. Manufacture of	R. J. Tilford and H. M. Redemann	397,476	Feb. 5	564	.....	46	688
Steel. Manufacture of	R. J. Tilford and H. M. Redemann	397,477	Feb. 5	565	.....	46	688

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Steel. Manufacture of	R. J. Tilford and H. M. Redemann	397,478	Feb. 5	567	.....	46	686
Steel. Manufacturing	A. T. Hay	399,528	Mar. 12	1118	.....	46	1356
Steel. Manufacturing	J. J. McTighe	397,743	Feb. 12	984	.....	46	772
Steering apparatus	J. Hayes	395,565	Jan. 1	390	99, 100	46	80
Steering apparatus	J. L. Hornig	397,919	Feb. 19	1227	328	46	838
Steering apparatus	J. L. Hornig	398,326	Feb. 19	1845	487	46	957
Steering apparatus for vessels	J. J. Duarte	396,736	Jan. 29	2188	560	46	457
Steering apparatus for vessels	F. W. Martin	396,900	Mar. 5	126	34	46	1138
Steering device for vessels. Auxiliary	C. D. Wooley	396,166	Jan. 15	1352	346	46	283
Steering-gear for vessels and floating bodies	V. F. Lässoe	398,631	Feb. 26	2297	608	46	1052
Stencil	W. F. McKay	396,410	Jan. 22	1686	433	46	353
Stencil-frame	G. W. Lindsey	397,864	Feb. 12	1147	307	46	805
Stenographic machine	C. A. Damon	399,247	Mar. 12	698	181	46	1276
Step. Folding	H. T. Cork	398,496	Feb. 26	2096	552	46	1014
Stereoscope	A. E. Foutch	399,863	Mar. 19	1623	420, 421	46	1465
Stereotype-plate	L. Goss	395,435	Jan. 1	186	48, 49	46	39
Stereotype-plate holder	W. G. Slauson	398,852	Mar. 5	52	15	46	1124
Stereotype-plates. Machine for trimming, planing, and sawing	L. Goss and S. W. Trew	396,478	Jan. 22	1793	459	46	374
Stiffening fabric for garments	N. Jenkins	396,920	Jan. 29	2311	592	46	483
Stilt. Walking	G. P. Smith	398,854	Mar. 5	55	16	46	1125
Stirrup	J. C. Taylor	396,179	Jan. 15	1343	344	46	281
Stitching fabrics	W. C. Foster	397,495	Feb. 12	597	154	46	699
Stitching machine. Wire	C. L. Lasca	397,372	Feb. 5	400	105, 106	46	654
Stock-indicator	J. A. Enos	398,713	Feb. 26	2426	642, 643	46	1079
Stocking	S. M. Michelson	396,945	Jan. 29	2487	641	46	520
Stockings. Making	O. Osborne	398,532	Feb. 26	2145	566	46	1022
Stone. Apparatus for leveling and squaring	M. Hänsel	397,286	Feb. 5	274	71	46	628
Stone-cutting machine	H. Young	397,410	Feb. 5	456	121, 122	46	665
Stone-dressing machine	F. Manning	395,843	Jan. 8	844	218	46	177
Stone-dressing machine	F. Manning	396,044	Jan. 8	1139	289	46	233
Stone, &c. Implement for cutting	J. W. Maloy	399,680	Mar. 19	1349	346	46	1411
Stone-planing machine	W. E. Sidnell	399,705	Mar. 19	1383	356, 357	46	1419
Stone rubbing or dressing machine	D. Mackie	398,634	Feb. 26	2300	609	46	1053
Stone-sawing machine	A. Auguste	398,113	Feb. 19	1596	404, 405	46	893
Stone-sawing-machine gage	L. Melchior and F. Meyer	397,244	Feb. 5	210	55	46	615
Stones. Machine for polishing	M. Hurth	396,162	Jan. 15	1312	335, 336	46	275
Stool for stores. Counter	A. O. Sients	397,615	Feb. 12	803	209	46	737
Stool or seat	C. W. Wiecking	397,044	Jan. 29	2025	677	46	548
Stools or tables. Detachable leg and standard for	G. E. Clow	397,225	Feb. 5	186	49	46	611
Stools. Supplemental bearer for coffin or casket	B. G. Casler	395,381	Jan. 1	113	29	46	25
Stopper: *See* Bottle-stopper.							
Stopper-fastener	C. P. Maiser	396,685	Jan. 29	2405	617	46	504
Store-service apparatus	J. T. Cowley	395,316	Jan. 1	14	4, 5	46	5
Store-service apparatus	G. Keyser	395,332	Jan. 1	41	10, 11	46	11
Store-service apparatus. Electrical	R. N. Dyer	395,961	Jan. 8	1018	260	46	210
Store-service apparatus. Electrical	R. N. Dyer	399,137	Mar. 5	517	135	46	1215
Stove	R. Boersig	398,694	Feb. 26	2390	634	46	1071
Stove	C. W. Emerson	395,430	Jan. 1	178	47	46	38
Stove	W. B. Ginnis	399,767	Mar. 19	1475	380	46	1437
Stove	N. J. Graham	399,030	Mar. 5	330	88	46	1177
Stove and burner. Vapor	H. P. Roberts	399,212	Mar. 5	643	168	46	1238
Stove and furnace. Heating	C. L. Ridgway	395,332	Jan. 1	71	17	46	16
Stove. Combined box and cooking	J. McMaster	399,918	Mar. 19	1703	441	46	1462
Stove. Cooking	G. F. Filley	397,844	Feb. 12	1124	301	46	800
Stove. Cooking	J. U. Musick and W. J. Andrews	398,790	Feb. 26	2531	673	46	1100
Stove-foot	J. F. Fowler	397,714	Feb. 12	940	249	46	764
Stove for heating sad-irons	J. B. Winter	399,719	Mar. 19	1403	361	46	1423
Stove. Gas	A. S. Dinsmore	399,022	Mar. 5	323	87	46	1176
Stove. Gas	L. Ketchum	396,575	Jan. 22	1938	499, 500	46	400
Stove. Gas	L. Ketchum	396,576	Jan. 22	1941	500	46	401
Stove. Heating	G. F. Filley	397,710	Feb. 12	933	248	46	762
Stove. Heating	H. Hopkins and J. R. Perry	395,327	Jan. 1	34	9	46	9
Stove. Heating	C. L. Ridgway	395,333	Jan. 1	73	18, 19	46	17
Stove-hood	H. Neef	399,436	Mar. 19	971	262	46	1329
Stove. Hot-blast	H. Kennedy	398,976	Mar. 5	236	65	46	1150
Stove. Hot-blast	H. Massicks and W. Crooke	398,840	Mar. 5	88	12	46	1121
Stove. Lamp	W. G. Amor	395,535	Jan. 1	342	87	46	72
Stove or range	H. E. Janes	398,050	Feb. 19	1439	381	46	876
Stove or range	G. G. Kniffin	398,515	Feb. 26	2124	559	46	1019
Stove-panel	J. A. Price	395,919	Jan. 8	956	246	46	196
Stove-pipe and tent-support. Combined	J. W. Ancel	396,846	Jan. 29	2146	601	46	491
Stove-pipe heater and ventilator. Combined	A. H. Ross	395,999	Jan. 8	1061	275	46	223
Stove-pipes. Ventilating attachment for	G. L. Jones and E. M. Miles	396,968	Mar. 5	233	64	46	1159
Stove. Portable cooking	A. S. Tomkins	400,271	Mar. 26	2263	583	46	1502
Stove. Portable heating or cooking	J. B. Anderson	395,730	Jan. 8	654	167	46	141
Stove. Safety car	A. Reese	398,890	Feb. 26	2542	676	46	1103
Stove. Smoke-preventing	J. Stott	398,862	Mar. 5	68	19	46	1127
Stoves. Initial lighting device for gasoline-vapor	G. W. Billings	398,691	Feb. 26	2286	633	46	1070
Stoves. Mechanism for preventing the pulsation of burning jets in vapor	G. W. Billings	398,690	Feb. 26	2285	633	46	1070
Stoves. Water-front for	T. F. Hutzel	398,783	Feb. 26	2520	670	46	1097
Strainer-holder	L. A. Tarring	397,357	Feb. 5	231	60	46	630

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Strap: *See* Elastic strap. Hose-strap. Shawl-strap. Trousers-strap.							
Strap, trace, and lace trimmer and cutter	J. Bradley	399,965	Mar. 19	1765	456, 457	46	1494
Straw braid. Machine for grading and reeling	D. Brown	395,734	Jan. 8	602	168, 169	46	142
Straw-carrier	F. Strobel	396,345	Jan. 15	1379	400	46	324
Straw-stacker	R. S. Arbogast	399,312	Mar. 12	796	208	46	1204
Straw-stacker	L. F. Dieter	399,188	Mar. 5	602	156, 157	46	1231
Straw-stacker	W. W. Dingee	399,504	Mar. 12	1076	281	46	1348
Strawberry-vine cutter and cultivator. Combined	G. W. Love	396,098	Jan. 15	1225	310	46	259
Street-curb and subsoil drain	H. S. Hallwood	399,194	Mar. 5	616	160	46	1233
Street or station indicator	W. F. Seeley	396,613	Jan. 22	2000	515	46	413
Street-sprinkling apparatus	M. Haughey	397,287	Feb. 5	275	71	46	628
Street-sweeping machine	C. Z. O'Neill	395,627	Jan. 1	493	125	46	100
Strength-tester. Coin-controlled	G. Soeding	399,942	Mar. 19	1733	448	46	1467
Stringed instruments. Bridge for	M. W. White	396,107	Feb. 19	1509	400	46	891
Stud or other jewelry	A. Luthy	396,661	Jan. 22	2065	530	46	435
Stump-extractor	H. Hollowell	396,067	Jan. 15	1212	306	46	256
Stump or stone lifter. Wheeled	J. S. Kemp	397,807	Feb. 12	1075	286	46	790
Submarine vessel	G. Poore and W. C. Storey	399,693	Mar. 19	1363	351	46	1414
Sugar-cane-slicing machine	C. Rabe	398,348	Feb. 19	1880	495	46	963
Sugar creaming and mixing machine	W. Walther	399,100	Mar. 5	430	117	46	1196
Sulkies. Case for	R. A. Stone	396,779	Jan. 29	2253	575	46	470
Sulky	H. Heinemann	399,231	Mar. 5	672	175	46	1243
Sulky	C. O. Yale	395,375	Jan. 1	102	26	46	23
Sulphur compound	E. Baumann	[illegible]	Jan. 22	1863	.....	46	387
Sunshade	E. Dean	397,172	Feb. 5	109	28	46	598
Superheater and burner	J. Livingstone	399,541	Mar. 12	1142	296	46	1360
Supporter: *See* Abdominal supporter. Ankle-supporter. Shaft-supporter. Show-case supporter.							
Suppository	H. Schmels	398,085	Feb. 19	1484	392	46	886
Surface-gage	C. G. Osteman	396,109	Jan. 15	1238	314	46	261
Surfacing-machine	R. M. Prichard	395,631	Jan. 1	507	127	46	102
Surgical appliance	J. H. Bowen	397,106	Feb. 5	3	1	46	579
Surgical chair	A. P. Gould	397,077	Jan. 29	2673	691, 692	46	557
Surgical drainage-tube	J. E. Lee	399,540	Mar. 12	1141	296	46	1360
Surgical instruments. Handle for	W. Walb	397,949	Feb. 19	1968	388, 389	46	845
Suspender-hook	E. F. Paramore	399,775	Mar. 19	1486	383	46	1440
Suspenders	J. E. Atwood	397,061	Jan. 29	2651	682	46	553
Suspenders	C. P. Crane	396,861	Jan. 29	2366	607	46	496
Suspenders	B. O. Foster	399,514	Mar. 12	1099	286	46	1352
Swill-receptacle	J. W. Hall	396,401	Jan. 22	1671	429	46	350
Swimming apparatus	E. P. Johnston	397,059	Jan. 29	2647	682	46	552
Switch: *See* Blind-switch. Electric switch. Electric-circuit switch. Electric-motor switch. Electrical switch. Interlocking switch. Pneumatic-tube switch. Rail-switch. Railway-switch. Three-throw split switch. Time-switch. Tramway-switch.							
Switch and signal interlocking apparatus	H. Reid	395,588	Jan. 1	431	110	46	89
Switch-board	J. W. Kelly	399,289	Mar. 12	730	190	46	1282
Switch crossing. Double safety	D. Tracy	395,672	Jan. 1	568	149	46	114
Switch for overhead tracks	J. Bouchard	399,007	Mar. 5	304	82	46	1173
Switch for overhead tracks	J. Bouchard	399,008	Mar. 5	305	82	46	1173
Switch mechanism	J. T. Hambay	399,288	Mar. 19	1659	429	46	1473
Switch operating and locking device	T. W. Burley	397,414	Feb. 5	469	124	46	688
Switch-signal	F. N. Kelsey	399,538	Mar. 12	1138	295	46	1359
Switch-stand	A. A. Strom	398,354	Feb. 19	1890	497	46	965
Switch-stand. Automatic	H. Elliot	395,964	Jan. 8	1022	260	46	211
Switches. Connecting-rod for	F. C. Weir	398,102	Feb. 19	1506	399	46	890
Syringe	A. M. Knapp	397,060	Jan. 29	2650	682	46	553
Syringe	B. F. Sutton	397,256	Feb. 5	230	60	46	620
Table: *See* Billiard-table. Dining-table. Folding table. Ironing-table. Kitchen-table. Knock-down table. Metal table. Molder's turn-table. Turn-table.							
Table implement	L. P. Valiquet	400,273	Mar. 26	2294	583	46	1502
Table-knife for green corn	J. F. Wynkoop	399,109	Mar. 5	448	122	46	1199
Table-spreads. Ornamental fabric for	D. W. Campbell	399,182	Mar. 5	503	153	46	1229
Table-top. Folding	A. C. F. Baisy	397,466	Feb. 12	583	151	46	697
Tablet. Combined paper and envelope	R. W. Burns	399,530	Mar. 19	1563	410	46	1458
Tablet cover. Writing	W. B. Pearson	396,508	Jan. 22	1835	471	46	382
Tablet. Duplicating	W. H. Pardee	398,072	Feb. 19	1471	389	46	888
Tablet. Envelope	R. W. Burns	399,529	Mar. 19	1562	409	46	1458
Tablet. Writing	J. C. Chorpenning	397,976	Feb. 19	1296	346	46	850
Tag. Combination	W. H. Lamon	399,756	Mar. 19	1459	376	46	1434
Tag-fastener	W. H. D. Ludlow	400,407	Mar. 26	2431	637	46	1530
Tag-fastener	C. Schoolherr	396,610	Jan. 22	1996	514	46	412
Tag-holder and tag	M. L. Fogel	399,385	Mar. 12	923	248	46	1318
Tag. Shipping	F. R. Alderman	399,812	Mar. 19	1550	400	46	1451
Tally. Grain	J. Bemis	396,603	Jan. 15	1167	326	46	248
Tally-sheet	F. W. Barrett	399,215	Mar. 12	660	178	46	1273
Tallying apparatus for grain-hoppers	J. A. Demuth	396,621	Mar. 5	14	4	46	1117

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Tank: *See* Flush-tank. Water-closet flushing-tank. Oil-tank.							
Tanning	J. Lalor	396,337	Jan. 15	1569	.....	46	322
Tap. Expansible and collapsible	T. F. Hammer	397,126	Feb. 5	29	7	46	584
Tap-hole plug	C. G. Dodge	397,639	Feb. 12	1115	298	46	796
Tap. Pipe	H. C. Bradford	397,167	Feb. 5	103	27	46	597
Tape. Reamer-head for	D. G. Langlands and O. E. Moulton	395,909	Jan. 8	944	242	46	195
Tapping and connecting mains. Apparatus for	A. P. Smith	396,177	Jan. 15	1337	343	46	220
Tapping-bung	J. Van Zandt	399,173	Mar. 5	582	150	46	1227
Tapping-bush for barrels	J. McKenzie	397,377	Feb. 5	407	107	46	655
Tape and ribbon delivering device	J. Brady	395,948	Jan. 8	996	256	46	206
Tapers. Machine for turning and grinding	J. Flather	396,077	Jan. 15	1189	301, 302	46	252
Target	B. Dufner and E. Freiner	399,604	Mar. 12	1238	319	46	1378
Target	M. O. Rehfuss	398,186	Feb. 19	1612	432	46	913
Target. Flying	A. C. Reuss	395,996	Jan. 8	1076	274	46	222
Target. Self-indicating	J. Paterson	395,581	Jan. 1	421	107	46	87
Tax-receipt blank	J. S. Harrison and J. M. Howard	396,560	Jan. 22	1915	495	46	396
Tea-kettle	G. Dakin and H. L. Drullard	399,843	Mar. 19	1596	414	46	1460
Teaching apparatus. Kindergarten	H. Bodey	396,067	Jan. 15	1171	297	46	249
Tedder	A. Arndt	395,307	Jan. 1	4	2	46	3
Teeth. Composition for cleaning the	C. B. Clark	396,192	Jan. 15	1358	.....	46	284
Telegraph-cable	W. R. Patterson	398,441	Feb. 26	2016	529	46	997
Telegraph-cable	W. R. Patterson	398,442	Feb. 26	2017	529	46	998
Telegraph. Octuplex	M. W. Dewey	396,734	Jan. 29	2183	559	46	456
Telegraph. Printing	M. W. Dewey	395,614	Jan. 1	466	118	46	95
Telegraph. Printing	F. H. W. Higgins	398,833	Mar. 5	28	8, 9, 10	46	1119
Telegraph. Printing	A. T. McCoy	397,466	Feb. 5	552	145	46	683
Telegraph. Railway	B. Cade	396,963	Jan. 29	2540	656	46	531
Telegraph-station. Floating	U. Dieuleveult	398,035	Feb. 19	1417	375	46	872
Telegraph system	W. Barnley	399,314	Mar. 12	798	206	46	1295
Telegraph system. Municipal	T. J. Zoeller	396,450	Jan. 22	1745	448	46	365
Telegraphs. Circuit-closer for railway-car	G. I. Hopkins	399,228	Mar. 5	669	174	46	1243
Telegraphic purposes. Dynamo for	B. Gmür and O. Flatz	396,557	Jan. 22	1916	493, 494	46	395
Telegraphic transmitter	R. C. Stone	400,141	Mar. 26	2016	528	46	1532
Telegraphy	C. E. Dressler	397,977	Feb. 19	1312	351	46	853
Telegraphy. Automatic	P. B. Delany	395,427	Jan. 1	173	46	46	37
Telegraphy. Automatic	J. O'Neil	399,154	Mar. 5	546	142, 143	46	1220
Telegraphy. Electro-harmonic	M. W. Dewey	395,613	Jan. 1	464	118	46	95
Telegraphy. Multiplex	F. J. Patten	395,508	Jan. 1	297	77	46	63
Telegraphy. Multiplex	F. J. Patten	395,509	Jan. 1	302	77	46	64
Telegraphy. Multiplex	F. J. Patten	395,510	Jan. 1	305	78	46	65
Telegraphy. Quadruplex	C. L. Healy	398,614	Feb. 26	2261	600	46	1046
Telegraphy. Railway	B. Cade	397,049	Jan. 29	2633	679	46	549
Telegraphy. Vibratory multiplex	S. D. Field	395,556	Jan. 1	372	95, 96	46	77
Telephone	N. B. Ginochio	400,395	Mar. 26	2308	604	46	1608
Telephone	N. B. Ginochio	400,396	Mar. 26	2310	604	46	1608
Telephone call-box	A. Griffith and H. A. Burbank	397,284	Feb. 5	270	70	46	627
Telephone circuit and apparatus	J. A. Barrett	397,331	Feb. 5	345	90	46	643
Telephone-exchange	W. B. Vansize. (Reissue)	10,989	Mar. 5	673	176	46	1244
Telephone-line cable	G. F. Shaver	399,635	Mar. 12	1283	329	46	1386
Telephone-line wires. Stretcher for mechanical	A. W. Butterworth	399,016	Mar. 5	316	85	46	1175
Telephone. Mechanical	T. S. and W. W. Davis	396,688	Jan. 22	2104	540	46	433
Telephone. Mechanical	A. W. Hall	398,507	Feb. 26	2115	556	46	1017
Telephone or analogous electric system	A. B. Ferdinand	397,176	Feb. 5	114	30, 31	46	599
Telephone paper-pad holder	J. B. Seymour, Jr	397,422	Feb. 5	559	146	46	685
Telephone. Speaking	F. Blake	395,476	Jan. 1	251	66	46	54
Telephone-transmitter	C. A. Hitchcock	399,666	Mar. 19	1329	340	46	1407
Telethermometer	C. G. Hoffmann	397,548	Feb. 12	674	175, 176	46	713
Temperature-regulator	H. J. Lutcher	396,215	Jan. 15	1309	357	46	291
Tennis-racket	R. B. Brown	397,220	Feb. 5	180	48	46	610
Tennis-rackets. Rubber sleeve for	R. W. Morgan	399,340	Mar. 12	833	217	46	1302
Tenoning-machine	E. Totman	395,596	Jan. 1	329	83, 84	46	69
Tension-adjuster	G. B. Webb	398,009	Feb. 19	1502	398	46	889
Tent	A. B. Wood	399,640	Mar. 12	1289	331	46	1388
Tent-closing device	H. Thomas	396,842	Jan. 29	2242	600	46	490
Testing and recording machine	T. Olsen	399,549	Mar. 12	1153	299	46	1362
Testing-machine	W. J. Keep	399,754	Mar. 19	1452	374, 375	46	1432
Tether	J. W. Grubbs	396,276	Jan. 15	1479	375	46	306
Textile fabrics. Machine for piling	O. Wolfsohn	396,720	Jan. 22	2182	551	46	442
Theatrical appliance	J. T. Kilham	395,633	Jan. 1	481	123	46	98
Theatrical appliance	F. Wilson	397,678	Feb. 12	894	236	46	735
Theatrical stage	J. Douglass	399,318	Mar. 12	805	208	46	1296
Thermo-magnetic motor	N. Tesla	396,121	Jan. 15	1251	319	46	264
Thermometer. Metallic	J. Sudmann	398,755	Feb. 26	2483	658	46	1090
Thermometer. Oven	H. Henderson and F. N. Johnston	397,127	Feb. 5	33	7	46	584
Thermometers. Graduating	H. Schulze-Berge	398,851	Mar. 5	51	15	46	1124
Thermometers or other indicators. Holder for	T. W. Shepherd	398,804	Feb. 26	2547	678	46	1104
Thermostat	E. H. Davis and R. Westervelt	400,312	Mar. 26	2283	597	46	1603
Thermostat	W. E. Lewis	398,740	Feb. 26	2463	653	46	1086
Thill-coupling	W. H. Bowman	397,455	Feb. 5	539	141	46	681
Thill-coupling	I. Clark	397,633	Feb. 12	868	216	46	749
Thill-coupling	D. Kavanaugh	396,909	Mar. 5	235	65	46	1159
Thill-coupling	W. Keton	395,396	Jan. 1	133	53	46	29
Thill-coupling	F. J. Miller	399,682	Mar. 19	1350	347	46	1411
Thill-coupling	G. T. Wilson	398,923	Mar. 5	158	41	46	1143
Thill-couplings. Anti-rattler for	F. P. Stiles	399,447	Mar. 12	990	266	46	1333

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Thill. Vehicle	E. J. Hagan	397,357	Feb. 5	378	100	46	649
Thill. Vehicle	G. H. Hutton	399,537	Mar. 12	1138	294, 295	46	1359
Thimble	F. X. Gosselin	395,322	Jan. 1	25	7	46	8
Thrasher and separator. Portable corn	J. W. Terman	397,879	Feb. 12	1165	311, 312	46	809
Thrasher regulator. Steam	E. Howland	398,896	Mar. 5	120	32	46	1137
Thrashing-machine	A. Johnston	400,217	Mar. 26	2135	559	46	1577
Thrashing-machine	A. H. Wagner	396,765	Jan. 29	2258	577	46	471
Thrashing-machines. Band-cutter and feeder for	J. W. Turner	396,843	Jan. 29	2343	600	46	490
Thrashing-machines. Grain-elevator attachment for	E. M. Thorpe	400,270	Mar. 26	2222	582, 583	46	1591
Thrashing-machines. Traction-tongue for	H. Cooprider, Jr	395,547	Jan. 1	357	91	46	74
Thread. Ball of	S. Stieglitz	395,636	Jan. 1	513	129	46	102
Thread from short fibers. Manufacturing	A. Mitscherlich	395,914	Jan. 8	948	244	46	196
Thread-gripping device	S. W. Wardwell, Jr	396,183	Jan. 15	1346	345	46	282
Three-throw split switch	A. D. Simpson	399,090	Mar. 5	415	112	46	1193
Ticket and sizer. Lot	S. J. Wallach	396,904	Jan. 29	2433	625	46	509
Ticket rack. Railway coupon	G. Ross	395,354	Jan. 1	76	19	46	17
Ticket. Railway	J. Culton	399,742	Mar. 19	1505	413	46	1460
Ticket. Railway	W. A. Megrath	396,591	Jan. 22	1965	506	46	405
Tidy-holder	J. B. Sweetland	398,757	Feb. 26	2485	659	46	1091
Tie: *See* Bedstead-tie. Railway-tie.							
Tile-cutting machine	C. A. Elsaner	398,883	Mar. 5	100	27, 28	46	1133
Tile. Glass	H. Lazard, F. A. Stanger, and T. C. Duffield.	398,730	Feb. 26	2452	650	46	1084
Tile-machine	C. Carr	396,466	Jan. 22	1768	453	46	370
Tile-machine	F. M. Hicks	396,685	Jan. 15	1902	305, 306	46	255
Tile-machine	H. Z. Young	397,770	Feb. 12	1019	271, 272	46	779
Tile or brick pressing machine	J. Taber	396,967	Jan. 29	2519	650, 651	46	527
Tile-settings. Device for holding	A. Greenaway	400,076	Mar. 26	1929	503	46	1534
Time-meter. Electric	G. F. Card	396,645	Jan. 22	2046	525	46	421
Time-recorder	H. R. Adams	400,283	Mar. 26	2241	587	46	1505
Time-switch	B. E. Waters	396,632	Jan. 22	2028	521	46	418
Tire and felly. Wheel	A. W. Thomas	399,360	Mar. 12	871	226	46	1309
Tire and felly. Wheel	A. W. Thomas	399,361	Mar. 12	872	226	46	1309
Tire apparatus	P. Schlosser	397,390	Feb. 5	423	112	46	658
Tire-fastener	G. W. Huckabay	398,398	Feb. 26	1959	515	46	967
Tire-heating apparatus	W. Hassman	397,503	Feb. 12	760	198	46	729
Tire-tightener	C. D. Hammon	397,902	Feb. 19	1322	353	46	855
Tire. Vehicle-wheel	H. M. Du Bois	397,458	Feb. 5	543	142	46	682
Tire. Vehicle-wheel	H. M. Du Bois	397,459	Feb. 5	543	143	46	682
Tire. Vehicle-wheel	A. W. Thomas	399,354	Mar. 12	864	224	46	1306
Tire. Wheel	A. W. Thomas	399,355	Mar. 12	865	225	46	1306
Tire. Wheel	A. W. Thomas	399,356	Mar. 12	867	225	46	1308
Tire. Wheel	A. W. Thomas	399,357	Mar. 12	868	225	46	1308
Tire. Wheel	A. W. Thomas	399,358	Mar. 12	869	225	46	1308
Tires. Machine for cooling wagon	W. X. Rupp and H. Resseger	397,942	Feb. 19	1258	335, 336	46	843
Tires on wagon or other wheels. Device for setting	N. B and A. T. McCreary	398,843	Mar. 5	41	13	46	1122
Tobacco-bag. Self-closing	C. W. Van Alstine	400,020	Mar. 19	1844	479	46	1508
Tobacco-box	A. D. Kimball	399,050	Mar. 5	360	97	46	1183
Tobacco-cutting machine	A. Gordon and D. De Garmo	397,544	Feb. 12	669	174	46	713
Tobacco-pipe	G. F. Colquitt	395,486	Jan. 1	267	69	46	56
Tobacco-pipe and cane. Combined	G. H. Coursen	395,426	Jan. 1	172	45	46	37
Tobacco-transplanter	M. Smith. (Reissue)	10,982	Jan. 29	2715	702	46	564
Toe-weight	F. W. Floyd	399,253	Mar. 12	708	184	46	1278
Tongs	J. T. Evans	400,067	Mar. 26	1916	499	46	1581
Tongs. Combination	J. H. Cook	398,129	Feb. 19	1549	411	46	898
Tongs. Pipe	R. B. Magee and F. C. Knowles	396,753	Jan. 29	2218	567	46	463
Tongue lock. Wagon	C. C. Andrews	396,189	Jan. 15	1354	348	46	284
Tongue-support	G. E. Ring	396,766	Jan. 29	2234	572	46	467
Tongue support. Wagon	E. D. Blake	396,065	Jan. 15	1169	296	46	248
Tongue-tip for vehicles	W. Chatterson	396,663	Jan. 22	2008	538	46	432
Tongues, &c. Metal blank for vehicle	C. M. Carnahan	399,909	Mar. 19	1772	458	46	1495
Tool-box	E. Caldwell	398,700	Feb. 26	2397	636, 637	46	1073
Tool. Combined	G. H. Brooks	399,649	Mar. 19	1307	335	46	1403
Tool. Combined	G. H. Tucker	399,297	Mar. 12	773	200	46	1291
Tool. Combination	A. Waggoner	395,598	Jan. 1	445	114	46	91
Tool-handle	J. H. Wundes	399,641	Mar. 12	1291	331	46	1388
Tool-holding box	G. H. Bartlett	400,286	Mar. 26	2246	588	46	1596
Tool-holding box	G. H. Bartlett	400,287	Mar. 26	2248	588	46	1596
Tool-holding box	G. H. Bartlett	400,288	Mar. 26	2250	589	46	1596
Torch	F. Leiss	397,009	Jan. 29	2575	666	46	538
Torpedo and gun boat. Combined	R. J. Gatling	399,516	Mar. 12	1100	287	46	1359
Toy	E. F. Lane	396,094	Jan. 15	1219	308	46	258
Toy	J. Schofield	396,295	Jan. 15	1508	382	46	311
Toy. Detonating	D. Baldwin	395,667	Jan. 8	883	226	46	164
Toy figure. Cut	J. McLoughlin	397,302	Feb. 5	299	77	46	633
Toy. Flying	F. J. Lutz	397,435	Feb. 5	506	133	46	675
Toy fortune-wheel	W. C. Blakeman	398,576	Feb. 26	2205	561	46	1035
Toy furniture	G. H. Stone	396,963	Jan. 29	2513	647	46	526
Toy gun. Magazine	H. Reason	395,792	Jan. 8	773	200, 201	46	161
Toy. Mechanical	J. B. Barfoot	399,015	Mar. 5	315	85	46	1175
Toy. Mechanical	W. D. Chase	400,055	Mar. 26	1898	493	46	1527
Toy. Mechanical	J. Morrow	396,221	Jan. 15	1406	358	46	298
Toy. Movable	R. Teichmann	398,672	Feb. 26	2359	625, 626	46	1065

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Toy. Musical	D. A. A. Buck	399,967	Mar. 19	1768	457, 458	46	1494
Toy. Musical	J. Schöenner	400,123	Mar. 26	1995	522	46	1548
Toy. Musical pneumatic	W. H. Brown	398,697	Feb. 26	2393	635	46	1072
Trace-carrier	A. E. Clark	399,496	Mar. 12	1068	278	46	1247
Track-cleaner	A. F. Priest	398,347	Feb. 19	1877	494	46	962
Track-clearer	G. W. Cook	397,584	Feb. 12	740	192	46	726
Track-laying apparatus	D. E. Johnson	399,048	Mar. 5	357	95, 96	46	1182
Tracks. Plant for laying	G. Anderson	397,577	Feb. 12	726	188, 189	46	723
Traction mechanism	H. L. Van Zile	399,299	Mar. 12	777	202	46	1291
Traction-wheel	L. O. Drew	396,892	Jan. 29	2366	607	46	496
Tramway. Electrical	H. T. Blake	396,814	Mar. 5	3	1, 2	46	1115
Tramway-switch	C. A. Beach	396,910	Jan. 29	2441	627	46	511
Transom-lifter	G. J. Dickson	398,240	Feb. 19	1713	452	46	930
Transom-lifter	J. Finnegan	396,357	Jan. 15	1394	404	46	327
Transom-lifter	A. A. Page	396,953	Jan. 29	2496	644	46	523
Transom-lifter	J. W. Smith	400,263	Mar. 26	2211	581	46	1569
Trap: *See* Animal-trap. Insect-trap. Drainage-trap. Sewer-trap. Fish-trap. Steam-trap. Gas-trap.							
Trap and dirt-collector. Combined	N. Clouette	395,313	Jan. 1	10	3	46	4
Traveling-bag frame	W. Roemer	398,541	Feb. 26	2157	570	46	1026
Treadle	L. G. Woolley	398,363	Feb. 19	1910	503	46	969
Tree-feller	G. W. Low	396,825	Jan. 29	2318	593	46	484
Trees. Machine for overthrowing	J. F. Foulke	396,738	Jan. 29	2190	561	46	457
Tricycle	W. L. Fay	397,348	Feb. 5	367	96	46	647
Tricycle	W. C. Foster and H. W. Merritt	399,190	Mar. 5	609	158, 159	46	1232
Tricycle	P. Gallagher	397,638	Feb. 12	834	218	46	743
Tricycle	F. E. Kohler	400,091	Mar. 26	1947	509	46	1538
Tricycle	F. W. Pool	396,892	Jan. 29	2416	620, 621	46	506
Tricycle	W. E. Smith	398,005	Feb. 19	1360	361	46	861
Tricycle. Steam	H. B. Smith	396,548	Feb. 26	2165	572	46	1027
Trimmer: *See* Edge-trimmer. Strap, trace, and lace trimmer. Heel-trimmer.							
Triturating-mill	J. R. Alsing	396,453	Jan. 22	1752	449	46	366
Trough: *See* Feed-trough. Watering-trough.							
Trousers, overalls, &c	B. J. Greely	396,926	Jan. 29	2462	634	46	515
Trousers-strap	G. T. Carter	397,968	Feb. 19	1294	345	46	850
Trousers-stretcher	T. White and J. Milne	396,380	Jan. 15	1635	419	46	334
Trowel. Adjustable angle	F. T. Hovey	398,781	Feb. 26	2517	669	46	1097
Trowel. Plastering	A. Hill	397,129	Feb. 5	35	8	46	585
Truck	C. G. Deming	399,248	Mar. 19	700	182	46	1276
Truck	E. Shanks	400,012	Mar. 19	1834	476	46	1506
Truck. Brick	J. C. Steele	398,985	Mar. 5	265	72	46	1165
Truck. Canning-house	M. J. Leahy	399,621	Mar. 12	1202	324	46	1383
Truck. Car	W. S. G. Baker	399,466	Mar. 12	1017	267	46	1339
Truck. Car	W. S. G. Baker	399,468	Mar. 12	1021	268, 269	46	1339
Truck. Car	S. P. Stoddard	399,580	Mar. 12	1203	311	46	1371
Truck connection. Car	A. Twyman	395,859	Jan. 8	867	223	46	162
Truck. Piano	C. L. Weser	395,371	Jan. 1	94	25	46	91
Truck. Sleigh	L. R. Carhart	396,646	Jan. 22	2047	526	46	422
Truck. Street-car	J. D. Grace	398,040	Feb. 19	1425	376, 377	46	873
Truck support. Cable-car	J. Stephenson	396,838	Jan. 29	2338	599	46	489
Trunk	M. J. Eaton	395,617	Jan. 1	474	120	46	95
Trunk	I. G. Richardson	397,938	Feb. 19	1254	334	46	842
Trunk	H. W. Roundtree	399,439	Mar. 12	980	255	46	1331
Trunk-fastener	C. A. Taylor	397,878	Feb. 12	1164	311	46	809
Trunk-fixture	C. A. Taylor	395,597	Jan. 1	444	113	46	91
Trunk-securing guard attachment	J. Ware	399,805	Mar. 19	1540	398	46	1449
Trunk-trimming	H. E. Gilson	399,393	Mar. 12	911	210	46	1298
Trunks, &c. Roping attachment for	J. R. Shoemaker	398,546	Feb. 26	2163	571	46	1027
Trunnion for cylinders	G. A. Barth	398,571	Feb. 26	2198	580	46	1033
Truss	H. S. Greene	397,545	Feb. 12	670	175	46	713
Truss	J. R. Meloney	396,414	Jan. 22	1690	434	46	353
Truss	S. R. Nye	398,343	Feb. 19	1879	493	46	961
Truss	A. Owen	399,433	Mar. 12	973	253	46	1329
Truss	J. A. Tignor	396,180	Jan. 15	1344	345	46	281
Truss for torsion-balances and the like	W. Kent	396,497	Jan. 22	1694	468	46	380
Truss-pad	O. Eckert	397,345	Feb. 5	864	95	46	647
Tub: *See* Bath-tub. Butter-tub.							
Tube: *See* Internasal tube. Surgical drainage-tube. Pneumatic dispatch-tube. Waste and overflow tube.							
Tube boiler. Radial	J. Clarke and R. W. Savage	396,393	Jan. 22	1655	425	46	347
Tube scraper and cleaner	J. Ponlesson	399,346	Mar. 12	841	219	46	1304
Tube-welding mandrels. Ball for	W. S. McManus	398,638	Feb. 26	2305	611	46	1054
Tubes from pulp. Machine for forming seamless	H. J. Medbery	396,103	Jan. 15	1232	312, 313	46	260
Tubes. Making beaded	S. R. Wilmot	400,025	Mar. 19	1849	481	46	1509
Tubes or cylinders. Machine for molding	H. G. Keasbey	397,800	Feb. 12	1143	305, 306	46	804
Tubing	E. C. Converse	399,244	Mar. 12	693	180	46	1276
Tubing. Duplex	A. H. Limont	400,094	Mar. 26	1950	510	46	1538

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drgs.	Official Gazette. Vol.	Official Gazette. Page.
Tubing. Manufacture of	E. C. Converse	399,245	Mar. 12	695	181	46	1276
Tubing. Mechanism for impressing ornamental forms or designs upon metallic	J. Burkhardt	400,394	Mar. 26	2411	631	46	1627
Tubing. Wire	T. Midgley	398,498	Feb. 26	2003	526	46	995
Tubular boiler	J. P. Serve	398,003	Feb. 19	1358	360	46	861
Tufting-machine	H. H. Humphrey	397,092	Jan. 29	2380	693	46	558
Tug attachment	F. A. Robbins	397,939	Feb. 19	1255	335	46	843
Tug. Hame	J. G. Miller. (Reissue)	10,981	Jan. 29	2714	702	46	564
Tug. Hame	G. W. Moliere	395,847	Jan. 8	850	219	46	178
Tug. Hame	J. E. Weiglein	399,458	Mar. 12	1006	263	46	1336
Tumbler-holder	J. W. Gaskill	399,870	Mar. 19	1630	422	46	1467
Tumbler-holder. Reversible	F. H. Saylor	395,409	Jan. 1	149	38	46	32
Turn-table	W. H. Wheeler	396,118	Jan. 15	1248	318	46	264
Turn-table for cranes	H. Casper	398,867	Mar. 5	76	21	46	1139
Turnstile. Coin-controlled	J. M. Hartman	399,972	Mar. 19	1776	460	46	1496
Tuyere	B. McGroder	399,263	Mar. 12	722	188	46	1281
Tuyere	I. Davis	396,102	Jan. 15	1231	312	46	260
Twine-holder	P. F. Saul	399,601	Mar. 12	1235	318	46	1378
Twine-holder	C. Fleming, Jr	399,700	Mar. 19	1375	354	46	1417
Twine-winder. Automatic	L. K. Johnson and A. A. Low	400,203	Mar. 26	2111	553	46	1573
Type-case. Compositor's	M. G. Merritt	397,003	Jan. 29	2565	663, 664	46	536
Type. Die for trimming	R. B. Hastie	400,001	Mar. 19	1818	472	46	1503
Type-forms. Matrix impression-guard for	M. G. Merritt	397,232	Feb. 5	195	52	46	613
Type. Making	E. L. Tarbox	400,000	Mar. 19	1816	472	46	1503
Type-wheels and other curved surfaces. Molding	C. N. Leonard	399,945	Mar. 19	1738	449	46	1488
Type-writer cabinet	C. A. Lee	400,234	Mar. 26	2163	567	46	1561
Type-writer cabinet and copy-holder	G. Bofinger	398,738	Feb. 26	2160	652	46	1036
Type-writer ciphograph	J. H. Currier and E. I. Blount	396,529	Jan. 22	1865	478, 479, 539, 540	46	387
Type-writing machine	J. S. Dove, Jr	396,686	Jan. 22	2102	588	46	432
Type-writing machine	J. Felbel and A. W. Steiger	398,587	Feb. 26	2227	592	46	1039
Type-writing machine	N. G. Moore	400,200	Mar. 26	2106	614, 615	46	1571
Type-writing machine	L. J. Odell	398,646	Feb. 26	2316	631	46	1056
Type-writing machine	C. Spiro	399,205	Mar. 5	631	164	46	1236
Type-writing machine	C. Spiro	395,799	Jan. 8	773	201	46	162
Type-writing machine	H. H. Uns	400,265	Mar. 26	2215	581	46	1560
Type-writing machine	G. W. N. Yost	400,146	Mar. 26	2025	530, 531	46	1553
Type-writing machine	G. W. N. Yost and C. E. Merritt	400,384	Mar. 26	2396	626, 627	46	1624
Type-writing machine ribbon-shield	G. H. Loker, Jr	400,383	Mar. 26	2394	626	46	1624
Ultramarine. Manufacture of	L. J. B. A. J. Bouillet	398,837	Mar. 5	35	11	46	1121
Umbrella	D. Rose	398,375	Feb. 26	1931	508	46	961
Umbrella	J. T. Smith	396,235	Jan. 15	1425	362	46	296
Umbrella-holder	A. Denhard	398,606	Feb. 26	2348	623	46	1063
Umbrellas, walking-canes, &c. Handle for	W. Taylor	400,064	Mar. 26	1909	497	46	1529
Under-arm pad	C. M. Southworth	399,449	Mar. 12	992	259	46	1333
Undertaker's use. Canopy-table for	M. E. Welsh	397,570	Feb. 12	712	184	46	720
Urethral powder-applier	C. Sage	400,024	Mar. 19	1848	480	46	1509
Vacuum for motive power. Apparatus for creating a	J. R. Cameron	396,904	Mar. 5	132	36	46	1139
Vacuum-hook	F. White	395,690	Jan. 8	600	152, 153	46	130
Valve	G. A. Matteson	398,679	Feb. 26	2369	629	46	1067
Valve	M. B. Mills	397,134	Feb. 5	45	10	46	586
Valve	M. B. Mills	395,501	Jan. 1	288	74	46	61
Valve	R. N. Pratt	397,088	Jan. 29	2689	695	46	580
Valve	F. W. Seaver	397,751	Feb. 12	993	264	46	774
Valve	E. Ware	397,757	Feb. 12	999	265	46	775
Valve and coupling. Automatic	A. V. Abbot and F. C. F. Knaak	399,302	Mar. 12	782	203	46	1292
Valve and trap. Check	C. K. Moore	398,111	Feb. 19	1522	403	46	893
Valve. Automatic	T. O. Perry	396,503	Jan. 22	1831	470	46	382
Valve. Balanced	C. M. Farrar	400,249	Mar. 26	2188	574, 575, 560, 561	46	1586
Valve. Balanced	M. Wuerpel	396,737	Jan. 29	2189	560, 561	46	457
Valve controller. Throttle	G. S. Neu	397,225	Feb. 12	1099	294	46	795
Valve. Electric atop	R. Wellens	400,245	Mar. 26	2181	573	46	1585
Valve. Flush-tank	P. V. Dwyer	397,260	Feb. 5	235	61	46	621
Valve for automatic brake mechanisms. Triple	F. Moore	399,506	Mar. 12	1066	282	46	1350
Valve for engines. Cut-off	O. Kromer	400,108	Mar. 26	1972	516	46	1543
Valve for fluid-pressure brakes	H. Gnels	395,657	Jan. 1	547	137	46	110
Valve for fluid-pressure brakes	G. H. Poor	396,154	Jan. 15	1297	333	46	273
Valve for fluid-pressure brakes	R. M. Dunn	397,125	Feb. 5	28	7	46	584
Valve for oil-well stand-pipes. Discharge	T. H. Haberkorn	396,171	Jan. 15	1327	340	46	278
Valve for operating air-brake mechanisms. Combination	A. Mayer	397,115	Feb. 5	14	4	46	582
Valve for steam fire-engines. Relief	J. C. Bayles	398,630	Mar. 5	25	7	46	1119
Valve for steam-pipes. Drain	W. H. Bray and C. Nickerson	398,941	Mar. 5	80	12	46	1121
Valve for water-gages. Automatic safety	S. M. Chase	395,607	Jan. 1	456	116	46	93
Valve for water-works. Float	C. H. Shepherd	399,735	Mar. 19	1425	367	46	1427
Valve. Gate	E. Garst	397,595	Feb. 19	1192	320	46	832
Valve-gear	R. Wilby	400,128	Mar. 26	2000	524	46	1549
Valve-gear	J. V. Rice, Jr	399,323	Mar. 12	925	240, 241	46	1319
Valve-gear. Eccentric	J. W. Thompson	397,323	Feb. 5	332	86, 87	46	640
Valve-gear for engines	J. J. Heindl	399,081	Mar. 5	402	109	46	1191
Valve-gear. Steam-engine	W. M. Whitlock	396,377	Jan. 15	1630	418	46	333
Valve gearing. Trip	T. W. Heermans	399,531	Mar. 12	1121	291	46	1356
Valve Hydraulic		398,014	Feb. 19	1380	366	46	865
		396,206	Jan. 15	1384	354	46	229

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Valve. Hydraulic elevator	I. H. Venn	398,098	Feb. 19	1500	397 / 398	46	889
Valve. Locomotive	T. Tripp	400,374	Mar. 26	2378	622 / 623	46	1621
Valve mechanism for ore-stamps	E. Reynolds and B. V. Nordberg	398,902	Mar. 5	130	35, 36	46	1139
Valve-motion for Corliss steam-engines	G. Rothenbücher	398,751	Feb. 26	2477	656	46	1069
Valve. Pop safety	F. A. Miller	395,911	Jan. 8	946	243	46	196
Valve. Pop safety	R. F. Pratt	398,445	Feb. 26	2020	530	46	998
Valve. Pressure-regulating	J. Nageldinger	399,548	Mar. 12	1151	298	46	1362
Valve. Regulating	W. Vogel	400,275	Mar. 26	2227	584	46	1592
Valve. Relief	A. N. Carver and N. J. Stone	396,858	Jan. 29	2362	606	46	495
Valve. Safety	H. G. Ashton	395,536	Jan. 1	343	87	46	72
Valve. Safety	F. X. Vien	398,557	Feb. 26	2181	575	46	1030
Valve-seat for hot-blast stoves	P. T. Berg	398,933	Mar. 5	179	47, 48	46	1147
Valve. Slide	T. T. Brown	395,735	Jan. 8	663	169	46	143
Valve. Slide	F. C. Cleaver	397,170	Feb. 5	107	28	46	598
Valve. Steam-actuated	A. Ball	396,643	Jan. 22	2042	524 / 525	46	421
Valve. Steam-actuated	G. A. Barth	398,930	Mar. 5	175	46	46	1147
Valve. Steam-actuated	J. C. Bromley	398,491	Feb. 26	2088	550	46	1012
Valve. Steam-actuated	T. Small	395,592	Jan. 1	440	112	46	90
Valve. Steam-engine	P. R. Fester	398,777	Feb. 26	2512	667	46	1096
Valve. Steam-engine	W. A. Walker	395,725	Jan. 8	647	165 / 166	46	139
Valve. Stop or throttle	F. W. Richey	399,782	Mar. 19	1496	396	46	1449
Valve. Supply and waste	R. Finn	396,151	Jan. 15	1291	331	46	272
Valve. Tank	P. White	398,681	Feb. 26	2371	630	46	1067
Valve. Tank and water	W. H. Newell	399,692	Mar. 19	1361	350 / 351	46	1414
Valve. Tank or water	W. H. Newell	399,690	Mar. 19	1359	350	46	1413
Valve. Throttle	J. Tonge	397,672	Feb. 12	885	232	46	753
Valves. Automatic pressure-regulating	W. S. Johnson	397,895	Feb. 12	1072	286	46	799
Valves. Means for raising and lowering	W. Bunting, Jr.	397,899	Feb. 12	1104	296	46	796
Vapor-burner	G. W. Billings	398,689	Feb. 26	2383	633	46	1070
Vapor-burner	C. H. Childs	399,183	Mar. 5	594	153	46	1229
Vapor-burner	J. N. Clayton	396,353	Jan. 15	1590	403	46	326
Vaporizer	R. B. Carsley	397,631	Feb. 12	825	216	46	741
Vaporizer and burner. Hydrocarbon	C. G. Rollins	397,940	Feb. 19	1256	335	46	843
Vaporizer and superheater. Retort	S. D. Biddison	400,291	Mar. 26	2253	299 / 300	46	1597
Vaporizer. Hydrocarbon	H. C. Davis	400,313	Mar. 26	2284	598	46	1603
Vaporizing-case. Combustible	J. Morris	399,220	Mar. 5	671	174	46	1243
Vault light and ventilator	T. W. Langill	399,419	Mar. 12	955	248	46	1325
Vault. Portable grave	S. E. Baker	395,537	Jan. 1	344	87, 88	46	72
Vehicle	C. M. Blydenburgh	395,870	Jan. 8	889	228	46	186
Vehicle. Advertising	T. F. Scanlan	398,802	Feb. 26	2545	677	46	1103
Vehicle-bodies. Apparatus for framing and setting up	T. Clements and G. H. Royce	395,485	Jan. 1	265	68	46	56
Vehicle-brake	J. Fraser	398,958	Mar. 5	213	59	46	1154
Vehicle-brake	G. W. Huckabay	398,399	Feb. 26	1960	516	46	987
Vehicle-brake	A. Jeenel	399,668	Mar. 19	1339	341	46	1408
Vehicle-brake	C. T. Quick	399,557	Mar. 12	1169	302	46	1365
Vehicle-brake. Automatic	B. A. Davis	396,030	Jan. 8	1121	285	46	229
Vehicle brake-gear	C. Fuller and J. H. Cunningham	395,746	Jan. 8	677	173	46	145
Vehicle-dash	A. Waggoner	395,599	Jan. 1	447	114	46	92
Vehicle dash-board	C. L. Baker	397,329	Feb. 5	343	90	46	643
Vehicle-gear	C. M. Blydenburgh	396,978	Jan. 29	2532	654	46	530
Vehicle-gear	F. L. Perry	397,932	Feb. 19	1245	332	46	841
Vehicle. Hand-propelled	C. Yingst	399,110	Mar. 5	448	122 / 123	46	1199
Vehicle runner. Wheeled	F. Driffill	398,385	Feb. 26	1945	512	46	984
Vehicle running-gear	A. W. Johnson	396,494	Jan. 22	1818	466 / 467	46	379
Vehicle-seat	F. A. Comstock	396,194	Jan. 15	1300	349	46	285
Vehicle-seat	J. F. Goodrich	397,590	Feb. 12	754	196 / 197	46	728
Vehicle-seat	D. M. and T. H. Parry	398,179	Feb. 19	1022	430	46	911
Vehicle-seat	J. A. West	396,250	Jan. 15	1444	368	46	300
Vehicle-seat. Removable	J. P. Moore	396,827	Jan. 29	2320	594	46	485
Vehicle-seat. Shifting	J. L. Mason	398,419	Feb. 26	1993	523	46	993
Vehicle. Spring	H. A. Meyer	396,223	Jan. 15	1409	359	46	293
Vehicle-spring	G. H. Blakeman	395,608	Jan. 1	457	116	46	94
Vehicle-spring	J. Diehl	396,272	Jan. 15	1470	374	46	305
Vehicle-spring	C. C. Hayes	398,156	Feb. 19	1586	421	46	904
Vehicle-spring	J. T. Hovis	396,744	Jan. 29	2205	564	46	460
Vehicle-spring	E. Jarrell	395,496	Jan. 1	280	72	46	59
Vehicle-spring	E. Jarrell	397,366	Feb. 5	394	103 / 104	46	652
Vehicle-spring	J. R. Linton	399,677	Mar. 19	1345	345	46	1410
Vehicle-spring	S. H. Raymond	399,210	Mar. 5	641	167	46	1237
Vehicle-spring	W. S. and H. C. Rounds	400,362	Mar. 26	2305	617	46	1618
Vehicle-spring	R. Sproul	396,671	Jan. 22	2078	534	46	428
Vehicle-spring	J. F. Thomas	395,463	Jan. 1	231	59	46	50
Vehicle-spring	E. M. Van Valkenburg and F. L. Wood	398,011	Feb. 19	1376	364	46	865
Vehicle-spring	J. W. Wetmore	399,955	Mar. 19	1754	453	46	1491
Vehicle-spring	J. A. Witmer	396,317	Jan. 15	1539	388	46	317
Vehicle-spring support	D. M. and T. H. Parry	398,180	Feb. 19	1023	430	46	912
Vehicle. Three-wheeled	W. J. Francisco	395,388	Jan. 1	124	31	46	27
Vehicle-tool	L. S. Lewis	395,658	Jan. 1	548	137	46	119
Vehicle-top	G. D. W. Lennon	398,168	Feb. 19	1607	426	46	908
Vehicle-top prop	J. A. Kaspar and W. B. Curtis	396,937	Jan. 29	2479	639	46	518
Vehicle. Two-wheeled	A. A. Abbott	396,640	Jan. 22	2039	524	46	420
Vehicle. Two-wheeled	I. Brown	399,650	Mar. 19	1307	335	46	1403

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr'g.	Official Gazette. Vol.	Official Gazette. Page.
Vehicle. Two-wheeled	D. A. Garver and C. H. Straight	396,382	Jan. 15	1637	420	46	234
Vehicle. Two-wheeled	D. M. and T. H. Parry	395,508	Jan. 1	294	76	46	83
Vehicle. Two-wheeled	D. M. and T. H. Parry	398,178	Feb. 19	1021	430	46	911
Vehicle. Two-wheeled	J. G. Parsons	397,515	Feb. 19	628	163	46	705
Vehicle. Two-wheeled	F. Rudolph	398,901	Feb. 26	2544	677	46	1103
Vehicle. Two-wheeled	F. Rupp	395,355	Jan. 1	76	90	46	18
Vehicle. Two-wheeled	L. Schierstedt	399,289	Mar. 19	756	196	46	1297
Vehicle-wheel	J. Bolick	396,461	Jan. 22	1762	451	46	368
Vehicle-wheel	H. E. Crome	397,897	Feb. 19	1195	320	46	832
Vehicle-wheel	J. E. Fisher	397,711	Feb. 19	934	248	46	782
Vehicle-wheel	W. Haslup	397,078	Jan. 29	2676	692	46	557
Vehicle-wheel	H. F. Hicks	396,672	Jan. 29	2362	611	46	499
Vehicle-wheel	C. E. James	398,403	Feb. 26	1964	517	46	988
Vehicle-wheel	N. Schaus and F. Mayer	396,514	Jan. 22	1847	474	46	384
Vehicle-wheel	C. Taylor	395,523	Jan. 1	326	82	46	69
Vehicle-wheel	A. W. Thomas	399,362	Mar. 12	873	226 / 227	46	1309
Vehicle-wheel	G. T. Warwick	399,453	Mar. 12	996	260	46	1334
Vehicle. Wheeled	F. B. Von Wechmar	400,376	Mar. 26	2385	624	46	1622
Vehicles. Mechanism for driving wheeled	J. Martignoni	398,690	Mar. 5	196	34	46	1138
Vehicles. Reach-connection for	J. N. Brown	395,610	Jan. 1	469	117	46	94
Vehicles. Runner for wheeled	F. Driffill	395,653	Jan. 1	542	136	46	109
Vehicles. Shifting seat for	E. H. Bates	396,062	Jan. 15	1166	296	46	247
Vehicles. Storm-apron for	C. C. King	395,749	Jan. 8	662	174	46	146
Vehicles. Traction mechanism for self-propelling	H. L. Van Zile	399,296	Mar. 12	775	201	46	1291
Vehicles. Wear-iron for	J. M. R. Gedney	395,439	Jan. 1	181	48	46	38
Velocipede	H. Behr	396,349	Jan. 15	1584	401	46	325
Velocipede	C. E. Bentley	399,003	Mar. 5	297	81	46	1172
Velocipede	R. E. Bowen	396,854	Jan. 29	2357	604 / 605	46	494
Velocipede	P. Gendron	400,074	Mar. 26	1925	502 / 503	46	1533
Velocipede	W. Golding	400,204	Mar. 26	2112	553 / 554 / 555 / 556	46	1573
Velocipede	W. Goulden	400,075	Mar. 26	1928	503	46	1533
Velocipede	F. H. Harris	396,063	Jan. 15	1300	304	46	254
Velocipede	C. Jackson	395,441	Jan. 1	190	50, 51	46	40
Velocipede	T. B. Jeffery	398,158	Feb. 19	1589	422	46	905
Velocipede	T. B. Jeffery	398,159	Feb. 19	1591	423	46	905
Velocipede	J. Knapp	400,090	Mar. 26	1946	509	46	1537
Velocipede	E. G. Latta	396,164	Jan. 15	1314	336	46	276
Velocipede	J. M. Marlin	400,098	Mar. 26	1954	511	46	1539
Velocipede	J. McCoy	397,015	Jan. 29	2582	667 / 668	46	539
Velocipede	A. H. Overman	398,533	Feb. 26	2146	566	46	1024
Velocipede	O. Unsicker	397,099	Jan. 29	2705	699	46	563
Velocipede-brake	T. B. Jeffery	400,343	Mar. 26	2338	410	46	1612
Velocipede-driving mechanism	G. A. Schubert	398,455	Feb. 26	2032	534	46	1001
Velocipede. Ice	C. Sprake	398,465	Feb. 26	2046	537	46	1003
Velocipede-pedal	T. B. Jeffery	397,188	Feb. 5	135	36	46	602
Velocipede-pedal	E. E. Tufts	396,673	Jan. 29	2081	535	46	499
Velocipedes. Ball-bearing for	G. T. Warwick	399,456	Mar. 12	1002	262	46	1335
Vending apparatus	C. F. De Redon	397,975	Feb. 19	1304	348 / 349 / 350	46	851
Vending apparatus	F. M. Leavitt	397,297	Feb. 5	990	74, 75	46	631
Vending apparatus	J. Schofield	396,296	Jan. 15	1510	382	46	312
Vending apparatus	J. Schofield	396,297	Jan. 15	1512	382 / 383	46	312
Vending apparatus	J. W. Vaughn	397,319	Feb. 5	329	65	46	640
Vending apparatus. Automatic	J. M. O'Kelly	396,228	Jan. 15	1415	360	46	294
Vending-machine	E. S. Ford	398,245	Feb. 19	1719	452 / 454	46	931
Veneer-machine. Rotary-cutting	E. S. and C. R. Gorham	397,181	Feb. 5	125	34	46	600
Ventilating mechanism	R. A. Rew	399,437	Mar. 12	978	254 / 255	46	1330
Ventilation of buildings	S. L. Bailey	398,874	Mar. 5	86	24, 25	46	1130
Ventilation. Window	A. C. Stevenson	396,901	Jan. 29	2489	624	46	508
Ventilator: *See* Car-ventilator. Sewer-ventilator.							
Ventilator	P. Abrahamson	396,134	Jan. 15	1267	324	46	268
Ventilator	E. A. Goodell	397,122	Feb. 5	24	6	46	583
Vessels. Construction of	J. D. Cornwall	396,648	Jan. 22	2049	536	46	422
Vessels. Leak-stopper for holds of	P. B. Viele	396,016	Jan. 8	1104	280	46	226
Vessels. Signal-light for	J. W. Coulston	395,820	Jan. 8	901	231	46	188
Veterinary drencher	C. C. Carrasco	400,298	Mar. 26	2263	592	46	1589
Veterinary drenching-horn	G. A. Doran	395,744	Jan. 8	676	173	46	145
Veterinary medical apparatus	C. H. Barr	399,234	Mar. 12	980	177	46	1273
Veterinary remedy	B. M. V. Price	396,111	Jan. 15	1240	.....	46	262
Veterinary surgical scraper	A. MacDonald	397,013	Jan. 29	2580	667	46	539
Vibrating engine	D. D. Hardy	399,327	Mar. 12	817	211 / 212	46	1299
Vignette-holder	A. L. Geer	399,750	Mar. 19	1449	373	46	1432
Violin-rest	J. Bohmann	397,454	Feb. 5	538	141	46	681
Violin tail-piece	R. A. Macready	396,408	Jan. 22	1663	432	46	338
Vise	J. A. Blake	396,066	Jan. 15	1170	297	46	248
Vise	P. Brown	399,014	Mar. 5	314	84, 85	46	1174
Vise	F. E. Farwell	400,069	Mar. 26	1917	500	46	1531
Vise	E. D. Morgan	395,661	Jan. 1	554	138	46	111
Vise	W. H. Remsen	397,479	Feb. 5	557	146	46	644
Vises. Adjustable strut for	F. Michel	396,755	Jan. 29	2219	568	46	464
Voltaic battery	T. Coad	395,709	Jan. 8	708	182	46	151

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr's.	Official Gazette. Vol.	Official Gazette. Page.
Voltaic battery	I. Kitsee	400,224	Mar. 26	2145	563	46	1578
Voltaic battery	I. Kitsee	400,225	Mar. 26	2146	563 564	46	1579
Voltaic battery	I. Kitsee	400,227	Mar. 26	2151	564	46	1579
Voltaic battery. Dry	I. Kitsee	395,706	Jan. 8	618	156	46	133
Voting-machine	G. W. Traban and T. Babin	398,196	Feb. 19	1648	435	46	915
Vulcanizing wood	S. E. Haskin	399,196	Mar. 5	618	160	46	1223
Wagon	E. C. Davis	399,502	Mar. 12	1072	280	46	1348
Wagon-beds. Attachable brake for	S. R. Riffle	396,340	Jan. 15	1573	398	46	325
Wagon-bolster spring	J. Cliff	397,832	Feb. 12	1107	296	46	797
Wagon-brake	A. C. T. Bantain	399,471	Mar. 12	1027	270	46	1341
Wagon-brake	L. E. Lane and G. Hilliard	400,228	Mar. 26	2152	564	46	1579
Wagon-brake	P. Pueschel	398,799	Feb. 26	2541	676	46	1102
Wagon-brake	J. R. Robinson	395,516	Jan. 1	316	80	46	67
Wagon-brake	L. Stüfee	396,780	Jan. 29	2254	576	46	470
Wagon-brake	B. Wilcox	399,958	Mar. 19	1758	454	46	1492
Wagon-brake	F. A. Young	398,303	Feb. 19	1810	478	46	950
Wagon brake. Hay-	F. E. Lathrop	396,822	Jan. 29	2313	592	46	483
Wagon. Butcher's	G. R. Kent	397,725	Feb. 12	957	254 255	46	767
Wagon. Coal-	H. P. Wayman	399,806	Mar. 19	1542	398	46	1449
Wagon-jack	W. R. Moore	400,109	Mar. 26	1974	517	46	1543
Wagon-perch-crotch coupling	T. E. Brown	400,045	Mar. 26	1884	490	46	1534
Wagon running-gear	F. H. Harris	396,082	Jan. 15	1198	304	46	254
Wagon-seat	D. F. Head	398,252	Feb. 19	1720	456	46	933
Wagon-spring	C. A. Howard	396,694	Jan. 22	2115	542	46	434
Wagons. Draw-iron for	J. Groh	395,389	Jan. 1	124	32	46	27
Wall for houses	W. R. Ray	399,284	Mar. 12	752	195	46	1286
Wall-paper cutter	J. Marks	397,736	Feb. 12	974	259	46	770
Wall-paper hanger	L. E. Kenworthy	395,443	Jan. 1	201	52	46	42
Walls. Finishing compound for plastered	T. J. Neavitt	399,920	Mar. 19	1706	.....	46	1462
Walls. Material for the treatment of	G. H. Wooster	397,529	Feb. 12	646	.....	46	709
Warp-beaming machine	J. M. Stone	396,055	Jan. 8	1154	293	46	226
Warp-dressing machine	S. Odenheimer	398,647	Feb. 26	2319	615	46	1056
Warp-linking machine	R. and J. Garsed and W. Mason	396,554	Jan. 22	1905	491 492	46	394
Warping-machines. Stop-motion for	L. H. A. Schwartz	395,851	Jan. 8	855	221	46	179
Wash-board	S. Bingham	395,650	Jan. 1	537	135	46	106
Wash-board	H. C. Hall	397,591	Feb. 12	756	197	46	729
Wash-board	A. R. Kibbe	397,430	Feb. 5	498	131	46	674
Wash-boiler	M. K. Ocobock	399,432	Mar. 12	978	253	46	1329
Wash-boiler	C. E. Poore and G. Martin	400,007	Mar. 19	1823	475	46	1505
Wash-boiler	T. C. Robinson	397,873	Feb. 12	1157	300	46	807
Wash-boilers. Fountain attachment for	G. W. Day	399,845	Mar. 19	1598	414	46	1461
Wash-stand	N. O. Bond	397,963	Feb. 19	1288	343 344	46	849
Wash-stand	E. W. Woodruff	399,461	Mar. 12	1011	264 265	46	1337
Wash-stand. Portable	N. O. Bond	400,186	Mar. 26	2089	546 547	46	1567
Washer: *See* Bottle-washer. Ore-washer. Dish-washer. Ribbed conoidal washer.							
Washing-fluid	S. L. Paramore	399,626	Mar. 12	1266	.....	46	1384
Washing-machine	G. E. Beane	398,486	Feb. 26	2083	548	46	1011
Washing-machine	I. F. Field	397,349	Feb. 5	367	96	46	647
Washing-machine	H. H. Fisher	399,980	Mar. 19	1786	463	46	1496
Washing-machine	W. H. Goss	399,610	Mar. 12	1245	321	46	1379
Washing-machine	C. D. La Port	396,496	Jan. 22	1825	468	46	380
Washing-machine	E. B. Leverich	398,170	Feb. 19	1609	427	46	909
Washing-machine	G. A. Miller	399,425	Mar. 12	964	250	46	1327
Washing-machine	G. J. Squires	395,596	Jan. 1	443	113	46	91
Washing-machine	J. A. Walker	399,099	Mar. 5	429	116	46	1196
Washing-machine	C. E. Warner	398,866	Mar. 5	75	20	46	1128
Washing-machine	E. E. Willis	397,211	Feb. 5	169	45	46	608
Washing-machines. Reversing-gearing for	J. M. Oakley	400,246	Mar. 26	2183	573	46	1586
Waste and overflow tube for sanitary structures. Combined	G. F. Brown	398,224	Feb. 19	1685	446	46	924
Watch-bow fastening	F. G. Faxon	399,861	Mar. 19	1620	420	46	1465
Watch-case	C. K. Giles	399,606	Mar. 12	1241	320	46	1379
Watch-case bow	J. H. Cooper	399,840	Mar. 19	1503	413	46	1460
Watch-case pendant	F. G. Faxon	398,957	Mar. 5	212	58	46	1154
Watch case-shaping machine	H. L. Haldy	398,251	Feb. 19	1726	455	46	933
Watch-mainspring	E. Karthaus	397,504	Feb. 12	610	157	46	701
Watch-maker's and jeweler's pliers	J. Daniels	399,655	Mar. 19	1315	337	46	1405
Watch-maker's tool	F. Leach and V. L. Figarotta	397,191	Feb. 5	139	37	46	603
Watch-movement box	C. T. Graham	397,853	Feb. 12	1135	303	46	803
Watch-regulator	R. B. Richmond	395,351	Jan. 1	70	17	46	16
Watch-regulator	C. Teske	398,987	Mar. 5	267	73	46	1166
Watch. Stem winding and setting	A. Fischer	400,202	Mar. 26	2110	553	46	1572
Watch. Stem winding and setting	H. Schütz	397,313	Feb. 5	312	82	46	636
Watch. Stem winding and setting	O. F. Stedman	396,777	Jan. 29	2250	575	46	469
Watch. Stop-	F. Bovet and A. E. Bessire	396,914	Jan. 29	2447	628 629	46	512
Watches. Cannon-pinion for	D. D. Palmer	395,754	Jan. 8	689	176	46	147
Watches, &c. Demagnetizing	J. Greaves	397,423	Feb. 5	465	127	46	671
Watches. Dust-band for	D. H. Church	396,267	Jan. 15	1465	373	46	304
Water. Apparatus for elevating	W. O. Lentz	398,518	Feb. 26	2128	560	46	1020
Water-closet	J. J. Balla	398,023	Feb. 19	1397	369	46	888
Water-closet	H. H. Craigie	397,721	Feb. 12	1037	277	46	763
Water-closet	S. F. Snifen	396,023	Jan. 22	2016	518	46	416
Water-closet	P. White	397,571	Feb. 12	713	185	46	721
Water-closet basin	J. Shanks	396,959	Jan. 29	2508	646	46	585
Water-closet bowls, &c. Coupling for	H. Machin	398,838	Mar. 5	36	18	46	1121

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Dr's.	Official Gazette. Vol.	Official Gazette. Page.
Water-closet cistern	J. L. Mott, Jr	397,650	Feb. 12	867	227 228	46	749
Water-closet flushing-tank	A. Haarlander	396,927	Jan. 29	2463	634	46	515
Water-closet. Plunger	H. H. Craigie	397,722	Feb. 12	1040	277 278	46	763
Water-closet-seat protector	E. Breher	396,903	Jan. 29	2292	587	46	478
Water-closet. Siphon	H. H. Craigie	399,184	Mar. 5	595	153 154	46	1229
Water-closet valve	E. L. Knight	399,905	Mar. 19	1679	436	46	1477
Water-closet valve	P. White	398,680	Feb. 26	2370	629	46	1067
Water-closets. Siphon-valve for	C. H. Harkins	397,359	Feb. 5	381	100	46	650
Water-closets, &c. Valve for	E. Hanmann	398,149	Feb. 19	1579	418	46	902
Water-cooler	N. Davis	398,770	Feb. 26	2501	664	46	1094
Water-cooler stand	C. P. Rallo	398,446	Feb. 26	2021	531	46	998
Water-drainer and pop safety-valve	C. Parent	399,070	Mar. 5	386	104	46	1188
Water-elevating device	O. F. Burton	395,482	Jan. 1	250	67	46	55
Water-elevator. Automatic compressed-air	J. K. Leedy	396,405	Jan. 22	1679	431	46	351
Water-elevator. Pneumatic	T. O. Perry	398,184	Feb. 19	1628	431	46	912
Water gate. Mill-pond waste-	W. T. McCloskey	398,842	Mar. 5	40	13	46	1122
Water-heater	M. Havey	395,326	Jan. 1	31	8	46	9
Water heater and filter	J. S. Roake	396,234	Jan. 15	1422	362	46	296
Water-heater. Sectional	R. Bigley	395,688	Jan. 8	596	149	46	129
Water heating and circulating apparatus	W. J. Barnstead	398,217	Feb. 19	1673	443	46	921
Water-heating apparatus	R. P. Barnstead	398,022	Feb. 19	1400	370	46	868
Water-meter	G. A. Graeser	400,331	Mar. 26	2317	606	46	1609
Water-meter. Piston	F. Gutzkow	400,401	Mar. 26	2422	634	46	1628
Water-motor	B. B. Bower	396,069	Jan. 15	1175	298	46	249
Water-motor	J. Coates	396,729	Jan. 29	2168	550	46	453
Water-motor	J. H. Hagerty	400,402	Mar. 26	2423	635	46	1629
Water-motor	H. Studte	397,096	Jan. 29	2099	697	46	562
Water-motor	H. E. Trumble	395,529	Jan. 1	333	85	46	70
Water-motor	H. E. Trumble	395,530	Jan. 1	335	85	46	71
Water-motor	H. R. Wolfe	396,318	Jan. 15	1540	380	46	317
Water-motor. Sub-surface	D. G. Haskins	400,209	Mar. 26	2123	557	46	1574
Water or liquid elevator	D. C. Battey	397,869	Feb. 19	1182	317	46	810
Water or other liquids. Purifier for	T. H. McCulloch	399,429	Mar. 12	989	253	46	1328
Water-power	L. Lohman	398,968	Feb. 19	1752	462 463	46	938
Water-power device	J. Swan	396,056	Jan. 8	1155	293	46	236
Water-proof compound containing cork	C. Grünzweig	395,438	Jan. 1	188	.....	46	40
Water-purifying apparatus	J. H. Blessing	395,651	Jan. 1	538	135	46	106
Water renovating and purifying device	L. S. Chichester	400,301	Mar. 26	2208	563 564	46	1600
Water-renovator	L. S. Chichester	398,494	Feb. 26	2091	551 552	46	1013
Water-sprinkler. Hand	G. W. Traban	397,762	Feb. 12	1007	267	46	777
Water to water-motors. Supply of	J. H. Hagerty	398,779	Feb. 26	2515	668	46	1096
Water-wheel	E. Derbec	397,071	Jan. 29	2068	689	46	556
Watering-pot	W. Dischо	399,602	Mar. 12	1236	319	46	1378
Watering-trough	G. W. Langdon	399,418	Mar. 12	954	247	46	1325
Watering trough. Stock-	T. A. Perry	396,595	Jan. 22	1973	508	46	407
Watering troughs. Heater for stock-	H. A. and J. Keir	398,052	Feb. 19	1442	382	46	877
Waterproofing compound	C. T. Snedeker	396,622	Jan. 22	2015	.....	46	416
Waterproofing textile materials. Composition for	J. Welti	395,410	Jan. 1	151	.....	46	32
Wearing-apparel hanger	W. Egges	399,510	Mar. 12	1092	284	46	1351
Weather-strip	J. E. Jones	399,413	Mar. 12	949	246	46	1324
Weather-strip	J. E. Jones	399,414	Mar. 12	950	246	46	1324
Weather-strip	J. C. and J. Reid	398,187	Feb. 19	1633	432 433	46	913
Weather-strip	J. Walker	396,181	Jan. 15	1344	345	46	282
Weather-strips. Machine for making	J. Poyton	398,346	Feb. 19	1876	493 494	46	962
Web-feeding mechanism	L. C. Crowell	396,470	Jan. 22	1782	456 457	46	372
Wedge-bolt for locomotives	J. P. Van Ness	395,763	Jan. 8	700	179	46	149
Weed-cutter and horse-hoe	A. Chezem	398,376	Feb. 26	1934	508	46	981
Weed-cutter. Self-cleaning	F. E. Lux	399,337	Mar. 12	829	216	46	1302
Weeding-machine	J. B. Mansfield	397,735	Feb. 12	973	258	46	770
Weigher and measurer. Automatic grain	W. S. Scott	399,164	Mar. 5	571	147	46	1224
Weighing and registering machine. Grain	W. H. H. Brunton	397,628	Feb. 12	820	214 215	46	740
Weighing apparatus. Grain-	L. C. Tryon	398,473	Feb. 26	2062	542	46	1007
Weighing grain. Machine for automatically	H. M. Fulwider	395,561	Jan. 1	384	98	46	80
Weighing-machine	P. Guillaumin	400,400	Mar. 26	2420	634	46	1622
Weighing machine. Automatic grain	C. E. Warner	397,101	Jan. 29	2706	700	46	563
Weighing-machine. Coin-controlled	W. S. Davenport	396,394	Jan. 22	1657	426	46	347
Weighing-machine. Coin-operated	G. Salter	395,926	Jan. 8	962	247 248	46	199
Weighing package tea, coffee, &c. Mechanism for	O. A. Gill	399,192	Mar. 5	612	159	46	1232
Weighing traveling loads. Machine for	A. E. Brown	399,487	Mar. 12	1051	275	46	1344
Weighing traveling loads. Machine for	A. E. Brown	399,488	Mar. 12	1054	275	46	1345
Welding. Electric	C. L. Coffin	395,878	Jan. 8	899	231	46	187
Welding. Electric	C. L. Coffin	396,270	Jan. 15	1469	374	46	305
Welding. Electric	C. L. Coffin	399,019	Mar. 5	320	86	46	1176
Welding. Electric	E. Thomson	396,011	Jan. 8	1097	279	46	225
Welding-machine. Electrical	E. Thomson	398,913	Mar. 5	142	39	46	1141
Well-boring machine	S. Adams	398,211	Feb. 19	1664	440	46	919
Well-boring machine	G. Pech	398,649	Feb. 26	2322	616	46	1057
Well-cleaning device	J. F. Hudson	399,044	Mar. 5	354	95	46	1182
Well-crib	W. H. Williscraft	400,155	Mar. 26	2045	535	46	1558
Well-drilling machine	W. C. Wells	399,450	Mar. 12	1007	263 264	46	1336
Well head. Driven-	J. Edwards	399,747	Mar. 19	1443	372	46	1431
Wells. Casing-spear for	W. H. Edwards	395,318	Jan. 1	17	5	46	6

Alphabetical list of inventions, January to March, inclusive—Continued.

Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Wells. Rig for drilling and pumping	G. Corbett	396,544	Jan. 22	1883	484, 485	46	390
Wheat for food. Preparing	R. Smith	396,621	Jan. 22	2014	518	46	416
Wheel: *See* Car-wheel. Carrying-wheel. Fifth-wheel. Game-wheel. Measuring-wheel. Metallic wheel. Polishing-wheel. Pulley-wheel. Toy fortune-wheel. Traction-wheel. Vehicle-wheel. Water-wheel. Wheelbarrow-wheel.							
Wheel	E. M. Benster	399,475	Mar. 12	1039	273	46	1343
Wheel	H. Boland	396,292	Jan. 15	1459	371	46	304
Wheel	R. W. Donmoyer	396,991	Jan. 29	2551	659	46	533
Wheel	T. J. Rice	396,366	Jan. 15	1616	414	46	331
Wheel	H. N. Thayer	396,782	Jan. 29	2255	576	46	470
Wheel	H. N. Thayer	396,783	Jan. 29	2256	576	46	470
Wheel-pit and mechanism for the admission of water thereto.	C. M. Bartlett	398,309	Feb. 19	1818	480	46	952
Wheels. Apparatus for forming abrading	W. H. Taggart	395,365	Jan. 1	87	23	46	20
Wheels. Forming vehicle	T. B. Jeffery	397,189	Feb. 5	135	37	46	602
Wheels. Machine for making metal	G. J. Zimmerman	396,796	Jan. 29	2270	563	46	475
Wheels. Rim and tire for	A. W. Thomas	399,359	Mar. 12	989	226	46	1308
Wheelbarrow	J. Annin	399,723	Mar. 19	1409	362	46	1424
Wheelbarrow	J. Dupuy	398,773	Feb. 26	2504	665	46	1095
Wheelbarrow-wheel	C. F. Farnsworth	397,347	Feb. 5	366	96	46	647
Whiffletree	H. Courtad	398,705	Feb. 26	2407	638	46	1075
Whiffletree	F. R. Willson, Sr	396,676	Jan. 22	2085	536	46	430
Whiffletree-clip	W. W. Burson	399,831	Mar. 19	1584	410	46	1458
Whiffletree-hook	J. R. Davis	397,112	Feb. 5	10	3	46	581
Whiffletree-hook	S. O. Nichols	397,201	Feb. 5	154	41	46	605
Whiffletree or neck-yoke iron	E. J. Sugden	398,553	Feb. 26	2176	574	46	1029
Whip	H. A. Cowles	397,456	Feb. 5	541	142	46	681
Whip-socket	H. Elder	395,819	Jan. 8	807	210	46	189
Whip-socket	W. Wright	395,374	Jan. 1	101	26	46	22
Whip-socket fastening	F. E. Benton	396,323	Jan. 15	1548	391	46	318
Whisk-broom	C. Skeels	399,575	Mar. 12	1192	308	46	1370
Whisk-broom	J. Wright	399,308	Mar. 12	792	205	46	1293
Whistle	H. Atkinson and G. W. Hull	398,213	Feb. 19	1667	441	46	990
Whistle. Bicycle	F. L. Johnson	396,921	Jan. 29	2313	592	46	483
Wick-adjusting mechanism	C. H. Lyman	399,912	Mar. 19	1606	439	46	1480
Wick. Lamp	A. Mueller	399,277	Mar. 12	741	193	46	1284
Wick-lifting device	F. Rhind	395,757	Jan. 8	692	176, 177	46	148
Wick-raiser for lamps	L. Henkle	398,725	Feb. 26	2446	647, 648	46	1082
Wind-motor	A. Dumont	400,065	Mar. 26	1910	497, 498	46	1530
Winding yarn. Machine for	F. Rosskothen	400,118	Mar. 26	1989	521	46	1546
Windlass. Oyster-dredge	H. Lawson	398,167	Feb. 19	1606	426	46	906
Windmill	W. H. Aldrich	399,645	Mar. 19	1299	333	46	1402
Windmill	G. Dietert	400,195	Mar. 26	2100	550	46	1570
Windmill	G. W. Haines	399,887	Mar. 19	1658	428	46	1472
Windmill	N. P. Hess and C. Vestergard	396,084	Jan. 15	1201	304, 305	46	254
Windmill	D. J. Howenstine	396,489	Jan. 22	1812	464	46	377
Windmill	F. B. Kendall	398,054	Feb. 19	1445	382, 383	46	878
Windmill	B. F. Lefever	400,230	Mar. 26	2156	566	46	1589
Windmill	C. E. Olds	400,004	Mar. 19	1822	473, 474	46	1504
Windmill	Z. P. Townsend	399,171	Mar. 5	580	149, 150	46	1227
Window	B. F. Dettra and G. R. Roth	398,239	Feb. 19	1710	451, 452	46	929
Window-bead stop	M. A. Cutter	397,837	Feb. 12	1112	298	46	798
Window burglar-guard	J. B. Harris	396,157	Jan. 15	1305	334	46	274
Window-cleaner and fire-escape. Combined	A. Schaefer	400,121	Mar. 26	1993	521, 522	46	1547
Window opener and closer	A. Rapp	396,599	Jan. 22	1978	509	46	408
Window-stand	K. Rukawietia	399,491	Mar. 12	1060	276	46	1345
Window-stop	W. Pendleton	400,403	Mar. 26	2124	635	46	1629
Windows. Device for cleaning	W. B. Zerr	396,133	Jan. 15	1296	324	46	267
Windows. Support for persons cleaning	W. Pront	397,249	Feb. 5	217	57	46	617
Wine. Assaying-glass for testing	T. F. Bergmann	397,961	Feb. 19	1295	343	46	848
Wire	P. V. Husted	398,250	Feb. 19	1739	458	46	935
Wire and pipe supporting and snow-removing apparatus.	S. D. Locke. (Reissue)	10,980	Jan. 29	2713	701	46	564
Wire. Apparatus for drawing	A. S. and T. Bolton	397,272	Feb. 5	252	65, 66	46	624
Wire-barbing machines. Automatic stop for	A. M. Munson	395,712	Jan. 8	625	158, 159	46	135
Wire-bending machine	E. Hanson	396,930	Jan. 29	2468	636	46	516
Wire. Continuously annealing and plating	J. Collin	399,382	Mar. 12	907	235	46	1315
Wire-coupling	W. Bainbridge	399,465	Mar. 12	1016	266	46	1339
Wire. Drawing	A. S. and T. Bolton	397,271	Feb. 5	251	65	46	623
Wire-drawing machine	F. Smith	398,962	Mar. 5	256	70	46	1163
Wire-drawing machine	H. Smith	396,437	Jan. 22	1728	444, 445	46	361
Wire fabric	E. F. Shellaberger	396,771	Jan. 29	2243	574	46	468
Wire fabric	D. C. Stover	396,007	Jan. 8	1092	278	46	225
Wire gate	J. W. Palmer	396,230	Jan. 15	1418	361	46	295
Wire hook	P. Ashen	396,847	Jan. 29	2347	601	46	491
Wire. Machine for covering	H. Splitdorf	395,363	Jan. 1	84	22	46	19
Wire machines. Barb-feeding mechanism for barb	G. W. McKinny	397,925	Feb. 19	1234	330	46	839

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Invention.	Name.	No.	Date.	Monthly volume. Spec.	Monthly volume. Drg.	Official Gazette. Vol.	Official Gazette. Page.
Wire mat and scraper. Woven	R. R. Pease	399,554	Mar. 12	1163	301	46	1364
Wire-reel	O. Saar	397,943	Feb. 19	1259	336	46	843
Wire-reeling device	P. L. Day	398,772	Feb. 26	2503	664	46	1094
Wire-rod reel	W. Garrett	396,925	Jan. 29	2460	633	46	515
Wire rope or cable	W. H. and T. Laidler	397,371	Feb. 5	399	105	46	653
Wire ropes, &c. Machine for making strands for	T. C. Barraclough and J. F. Kay	400,285	Mar. 26	2244	588	46	1596
Wire splicer and cutter	H. V. Wülbecke	395,642	Jan. 1	518	130	46	104
Wire-splicing tool	H. G. Hubbell	396,819	Jan. 29	2310	592	46	462
Wire-stretcher	J. L. Euyeart	398,596	Feb. 26	2238	592	46	1041
Wire-stretcher	G. R. Hughes	398,047	Feb. 19	1434	380	46	875
Wire-stretcher	F. A. Landee	399,053	Mar. 5	363	97	46	1184
Wire-stretcher	F. J. Townsend	398,759	Feb. 26	2497	659	46	1091
Wire stretcher and holder	J. W. Davy	399,185	Mar. 5	597	154	46	1230
Wire-support	R. C. Caughey	397,830	Feb. 12	1105	296	46	796
Wire-tightener	C. B. Butler	396,682	Jan. 22	2097	538	46	432
Wire-tightener	L. S. Flatau	397,635	Feb. 12	830	217	46	742
Wire-tightener	T. Reily	396,172	Jan. 15	1328	341	46	278
Wire-tightener	S. P. R. Taylor and S. S. Clark	399,946	Mar. 19	1740	449	46	1489
Wire-twisting machine	J. W. Eisenhart	399,856	Mar. 19	1616	418	46	1464
Wire-twisting machine	F. D. Fry	398,888	Mar. 5	102	28, 29, 30	46	1133
Wood-carrier	E. W. Payne	398,902	Mar. 5	129	35	46	1139
Wood-choppers. Foot-board for	A. L. Stevens	399,444	Mar. 12	987	257	46	1332
Wood into chips. Machine for cutting	O. A. Winter	399,107	Mar. 5	440	120	46	1198
Wood. Preserving	W. Youngblood	398,366	Feb. 19	1914	.....	46	970
Wood. Preserving and hardening	W. Iddings	398,619	Feb. 26	2263	.....	46	1047
Wood-splitting machine	C. Barr	396,722	Jan. 29	2167	553	46	451
Wood-worker	W. H. Doane	397,113	Feb. 5	11	3	46	581
Wood-working machine	J. Schofield	396,298	Jan. 15	1515	383	46	313
Wooden plates. Producing fancy-figured	R. Himmel	400,085	Mar. 26	1939	507	46	1536
Wooden rake	J. A. Shafer	400,259	Mar. 26	2202	578	46	1588
Wool-fat. Refining	H. W. Langbeck	399,906	Mar. 19	1681	.....	46	1478
Wool-washing machine	W. Lund	395,498	Jan. 1	283	73	46	60
Woolen fabrics to their original dimensions. Restoring fulled	R. C. Rutherford	398,847	Mar. 5	46	.....	46	1123
Work-holder	I. N. Roberts	400,116	Mar. 26	1985	520	46	1546
Work-stand	D. H. Murphy	399,546	Mar. 12	1149	298	46	1361
Working-beam	C. E. Emery	398,955	Mar. 5	208	57	46	1154
Working-beam for steam-engines	C. E. Emery	398,956	Mar. 5	209	58	46	1154
Wreath. Artificial	A. and H. Kumpf	399,270	Mar. 12	732	190	46	1282
Wrench: *See* Nut-wrench. Pipe-wrench. Ratchet-wrench.							
Wrench	L. F. Carstensen	396,857	Jan. 29	2261	605	46	495
Wrench	A. L. Duncan	396,689	Jan. 22	2106	540	46	433
Wrench	G. E. Franklin	395,491	Jan. 1	180	47	46	38
Wrench	C. H. Kennedy	396,877	Jan. 29	2392	614	46	501
Wrench	A. K. Spaulding	395,595	Jan. 1	442	113	46	91
Wrench	J. Tomlinson	398,989	Mar. 5	272	74	46	1167
Wrench	J. Van Anadall	396,970	Jan. 29	2324	651	46	528
Wrench	T. Warren	396,617	Jan. 8	1105	280	46	227
Wrench	W. C. Worthen and G. Pendleton, Jr.	397,954	Feb. 19	1274	340	46	846
Wrench	W. C. Worthen and G. Pendleton, Jr.	400,380	Mar. 26	2329	625	46	1623
Wrench attachment	C. F. Loganke and T. E. Gawn	396,751	Jan. 29	2214	566	46	463
Wrenches. Manufacture of	A. D. Gates	397,794	Feb. 12	1059	282	46	787
Wringer: *See* Clothes-wringer. Mop-wringer.							
Yarn beam or spool	A. Dahlgren	397,539	Feb. 12	661	172	46	711
Yarn-spooling machine	F. Haskell	396,816	Jan. 29	2307	590, 591	46	489
Yoke. Breast	G. Van Camp	398,198	Feb. 19	1692	436	46	916
Zinc. Blast-furnace for reducing	F. Rigaud	397,025	Jan. 29	2602	672	46	543
Zinc from ores containing precious metals. Extracting	H. B. Slater	399,706	Mar. 19	1385	.....	46	1419
Zinc. Manufacturing	H. A. Hunicke	399,992	Mar. 19	1806	.....	46	1501

ALPHABETICAL LIST OF DESIGNS.

Design.	Name.	No.	Date.	Official Gazette. Volume.	Page.
Advertising-frame	W. H. Hardin	18,955	Mar. 12	46	1272
Ax-handle	J. W. Carver	18,881	Jan. 29	46	450
Bath-tub	F. J. Torrance	18,949	Mar. 5	46	1114
Bed-pan	I. H. Ovington	18,958	Mar. 12	46	1272
Bell	A. Patoux	18,937	Feb. 26	46	978
Book and cover	D. R. Niver	18,924	Feb. 12	46	606
Bottle	F. H. Leggett, A. H. Jones, and L. Wallace.	18,942	Feb. 26	46	978
Bottle. Therapeutic	E. C. Post	18,879	Jan. 22	46	344
Box	F. K. Bowers	18,839	Jan. 8	46	126
Braid	V. G. Schuck	18,869	Jan. 29	46	450
Brooch	M. Ballin	18,929	Feb. 19	46	828
Brush or mirror back	A. Berry	18,943 to 18,944	Mar. 5	46	1114
Brushes, &c. Handle for	H. Berry	18,974 to 18,976	Mar. 26	46	1520
Burial-caskets. Pedestal for	I. G. Hatcher	18,850	Jan. 15	46	245
Bust	M. Bachmann	18,854 to 18,855	Jan. 15	46	245
Button-hole decoration	W. W. Burns	18,880	Jan. 29	46	450
Cane-handle	F. R. Kaldenberg	18,886	Jan. 29	46	450
Canes, &c. Surface ornamentation of	G. Hauber	18,840	Jan. 8	46	126
Car-spring plate	T. M. Bell	18,838	Jan. 8	46	126
Card. Receiving	D. L. Clinton	18,951	Mar. 12	46	1272
Carpet	E. Fisher	18,842	Jan. 8	46	126
Carpet	E. Fisher	18,897 to 18,901	Feb. 5	46	578
Carpet	W. L. Jacobs	18,904 to 18,905	Feb. 5	46	578
Carpet	C. W. Swapp	18,910 to 18,916	Feb. 5	46	578
Chair-back	H. Matzen	18,833	Jan. 1	46	2
Clock-cases. Ornamentation of	W. Camp	18,841	Jan. 8	46	126
Collar	C. W. Dater	18,965	Mar. 19	46	1400
Collar	J. K. P. Pine	18,925	Feb. 12	46	606
Comb. Curling and crimping	G. A. Scott	18,926	Feb. 12	46	606
Corsets. Ornamentation of	M. P. Bray	18,840	Jan. 8	46	126
Corsets. Ornamentation of	M. P. Bray	18,856 to 18,857	Jan. 15	46	245
Corsets. Ornamentation of	C. A. Griswold	18,919 to 18,923	Feb. 12	46	606
Curtain	W. F. R. Hartley	18,863	Jan. 29	46	450
Curtain-pole end	C. W. Lawrence	18,887	Jan. 29	46	450
Decorative fabric	C. H. Koster	18,941	Feb. 26	46	978
Desk	F. A. Collin	18,964	Mar. 19	46	1400
Feather. Artificial	H. H. Plaut	18,962	Mar. 12	46	1272
Fire-place lining	E. L. Caley	18,896	Feb. 5	46	578
Flask	L. W. Fairchild	18,932	Feb. 19	46	828
Foot warmer or support	J. E. Doyle	18,961	Mar. 12	46	1272
Glass ointment-pot	J. W. Nicholson and J. W. Gaskill	18,836	Jan. 1	46	2
Glass. Surface ornamentation of	A. D. Brogan and A. M. Malloch	18,892 to 18,894	Feb. 5	46	578
Glassware. Ornamentation of	F. S. Shirley	18,959	Mar. 12	46	1272
Grate. Portable fire-place	E. L. Caley	18,895	Feb. 5	46	578
Hanging stand	J. L. Leavitt	18,972	Mar. 19	46	1400
Hat. Lady's	L. S. Stewart	18,908	Feb. 5	46	578
Hinge	W. H. Hart and T. Corscaden	18,956	Mar. 12	46	1272
Japanese tea-stand	W. T. Mercereau	18,835	Jan. 1	46	2
Knitted fabric	S. Spooner	18,927	Feb. 12	46	606
Knob	J. H. Allen	18,917	Feb. 12	46	606
Lamp	F. Ifland	18,934	Feb. 19	46	828
Mail-box	H. C. Hart	18,939	Feb. 26	46	978
Medal or badge	W. Friederich	18,902	Feb. 5	46	578
Mirror-frame	H. Berry	18,963	Mar. 19	46	1400
Monument. Century	H. C. Borgner	18,891	Feb. 5	46	578
Necktie	A. Hellenberg	18,903	Feb. 5	46	578
Newel-post	W. C. Hanna, Jr	18,882	Jan. 29	46	450
Nut-cracker	H. M. Quackenbush	18,888	Jan. 29	46	450
Oil-cloth	C. T. and V. E. Meyer	18,861 to 18,868	Jan. 15	46	246
Paper-weight	G. H. Benton	18,940	Feb. 26	46	978
Photograph-exhibitor case	G. M. Porteous and F. S. Miller	18,853	Jan. 8	46	126
Photograph-exhibitor-case body	G. M. Porteous and F. S. Miller	18,671	Jan. 15	46	246
Photograph-exhibitor-case body	G. M. Porteous and F. S. Miller	18,676 to 18,678	Jan. 22	46	344

Alphabetical list of designs, January to March, inclusive—Continued.

Design.	Name.	No.	Date.	Official Gazette. Vol.	Page.
Photograph-exhibitor stand	G. M. Porteous and F. S. Miller	18,870	Jan. 15	46	246
Photograph-exhibitor stand	G. M. Porteous and F. S. Miller	18,872 to 18,873	Jan. 15	46	246
Picture-support	S. A. tis	18,960	Mar. 12	46	1272
Pinnacle	H. Symonds	18,935	Feb. 19	46	828
Radiator	J. Hopson, Jr	18,832	Jan. 1	46	2
Railing	W. C. Hanna, Jr	18,858	Jan. 15	46	245
Register, Floor	W. W Sweetland	18,909	Feb. 5	46	578
Revolver-handle	C. A. Davis	18,966	Mar. 19	46	1400
Rug	G. B. Fox	18,843 to 18,848	Jan. 8	46	126
Rug	T. E. Meagher	18,947 to 18,948	Mar. 5	46	1114
Rug	J. Pegel	18,850 to 18,852	Jan. 8	46	126
Rug	A. Petzold	18,869	Jan. 15	46	246
Rug	W. T. Smith	18,906 to 18,907	Feb. 5	46	578
Screw-head	E. G. Soltmann	18,973	Mar. 19	46	1400
Shields. Ornament for	F. A. Bernhard	18,918	Feb. 12	46	696
Shoes. Pattern for	W. B. Hamilton	18,938	Feb. 26	46	978
Stair-button	D. Walker	18,950	Mar. 5	46	1114
Stove. Gas or oil	T. W. Burger	18,945	Mar. 5	46	1114
Stove. Heating	O. Germer and G. H. Guenther	18,831	Jan. 1	46	2
Stove. Heating	F. Merion and M. Hertenstein	18,834	Jan. 1	46	2
Stove. Heating	J. A. Price	18,837	Jan. 1	46	2
Stove. Heating	E. B. Stimpson	18,928	Feb. 12	46	696
Straps. Ornamentation of	P. Everitt	18,931	Feb. 19	46	828
Syringe	G. W. T. Harley	18,933	Feb. 19	46	828
Textile fabrics. Ornamentation of	J. C. F. Edelmann and A. H. Kursheedt.	18,930	Feb. 19	46	828
Trimming	J. C. F. Edelmann and A. H. Kursheedt.	18,952 to 18,953	Mar. 12	46	1272
Trimming. Dress	J. Maidhof	18,957	Mar. 12	46	1272
Trunk	P. Carpeles	18,875	Jan. 22	46	344
Trunk-tops. Corner-iron for	P. Carpeles	18,874	Jan. 22	46	344
Type	C. E. Heyer	18,967 to 18,968	Mar. 19	46	1400
Type	W. W. Jackson	18,940	Feb. 26	46	978
Type	E. Lauschke	18,909 to 18,971	Mar. 19	46	1400
Type	A. Little	18,860	Jan. 15	46	246
Type	J. Graham	18,946	Mar. 5	46	1114
Type ornaments. Font of combination	H. Ihlenburg	18,884 to 18,885	Jan. 29	46	450
Type ornaments. Font of combination	E. W. Tingue	18,890	Jan. 29	46	450
Upholstery plush	H. C. Armstrong	18,830	Jan. 1	46	2
Wagon-body	A. J. Griffin	18,954	Mar. 12	46	1272
Wire screen					

ALPHABETICAL LIST OF TRADE-MARKS.

Title.	Name.	No.	Date.	Official Gazette. Volume.	Page.
Adding-machines	C. H. Webb	16,322	Feb. 26	46	978
Albums. Photograph	Koch, Sons & Company	16,158	Jan. 8	46	126
Ale. Mixture or compound for making ginger	M. Michaelis & Son	16,210	Jan. 22	46	344
Baking-powder	G. C. Hanford	16,203	Jan. 22	46	344
Baking-powder	New York Phosphate Company	16,232	Jan. 29	46	450
Baking-powder	K. B. Sayres	16,215	Jan. 22	46	344
Beef. Compressed cooked	Armour Packing Co	16,161	Jan. 8	46	126
Beer	P. Best Brewing Company	16,381	Mar. 12	46	1272
Beer of a light color and superior quality	Bergner & Engel Brewing Company	16,329	Mar. 5	46	1114
Belting. Fabric machine	Eureka Belting Manufacturing Company.	16,171	Jan. 15	46	246
Belting, hose, and packing. Rubber	Revere Rubber Company	16,426	Mar. 26	46	1520
Belting. Medium-grade rubber	New York Belting and Packing Company	16,211	Jan. 22	46	344
Beverage. Tonic	Eureka Manufacturing Company	16,264	Feb. 12	46	696
Biscuits, crackers, wafers, and similar articles	Holmes & Coutts	16,339	Mar. 5	46	1114
Bitters	E. T. Cooper	16,334	Mar. 5	46	1114
Blackboard-surfaces. Cement for making	J. K. Knox	16,341	Mar. 5	46	1114
Bluing-capsules	Electric Chemical Co	16,225	Jan. 29	46	450
Boiler and pipe coverings, fillings, linings, and the like	H. W. Johns Manufacturing Company.	16,177	Jan. 15	46	246
Books. Blank account	S. W. Goldberg	16,365	Mar. 12	46	1272
Books. Copying	H. E. Pratt	16,271	Feb. 12	46	696
Boots and shoes	I. N. Horrell	16,266	Feb. 12	46	696
Boots and shoes	Parker, Holmes & Co	16,401	Mar. 19	46	1400
Boots and shoes. Leather, cloth, and rubber	Hanan & Son	16,175	Jan. 15	46	246
Boots, shoes, and slippers	F. Daisimer	16,199	Jan. 22	46	344
Boots, shoes, and slippers	Packard & Field	16,318	Feb. 26	46	978
Cachoux	T. Jackson	16,176	Jan. 15	46	246
Canned oysters, fruits, and vegetables	Miller Bros. & Co	16,241	Feb. 5	46	578
Cards. Playing	J. W. Lewis & Co	16,288	Feb. 19	46	828
Cartridges. Shotgun	Chamberlin Cartridge Company	16,263	Feb. 12	46	696
Cartridges. Shotgun	Chamberlin Cartridge Company	16,390	Mar. 19	46	1400
Cartridges. Shotgun	Chamberlin Cartridge Company	16,391	Mar. 19	46	1400
Cartridges. Shotgun	Peters Cartridge Company	16,152	Jan. 8	46	126
Cartridges. Shotgun	Peters Cartridge Company	16,153	Jan. 8	46	126
Cartridges. Shotgun	Peters Cartridge Company	16,190	Jan. 15	46	246
Cartridges. Shotgun	Peters Cartridge Company	16,191	Jan. 15	46	246
Cartridges. Shotgun	Peters Cartridge Company	16,192	Jan. 15	46	246
Cartridges. Shotgun	Peters Cartridge Company	16,193	Jan. 15	46	246
Cereal products	Muscatine Oat Meal Company	16,317	Feb. 26	46	978
Chains formed from sheet metal. Sash, safety, and similar	Bridgeport Chain Company	16,135	Jan. 1	46	246
Chains formed from wire. Halter, dog, picture, and similar	Bridgeport Chain Company	16,134	Jan. 1	46	2
Chemical alkalies	W. Gossage & Sons	16,245	Feb. 5	46	578
Churns	J. C. Kearns	16,287	Feb. 19	46	828
Cigars	Cigarmakers Co-Operative Association.	16,169	Jan. 15	46	2
Cigars	A. F. Garcia	16,393	Mar. 19	46	1400
Cigars	M. Garcia	16,174	Jan. 15	46	246
Cigars	Hesslein Bros	16,300	Feb. 26	46	978
Cigars	A. Lopez	16,180	Jan. 15	46	246
Cigars	Mutual Union Cigar Company	16,187	Jan. 15	46	246
Cigars	C. G. Sauerhammer	16,384	Mar. 12	46	1272
Cigars	W. Schliep	16,407	Mar. 19	46	1400
Cigars and cheroots	E. Bemis, Jr	16,416	Mar. 26	46	1520
Cigars and cigarettes	E. Kohlberg	16,141	Jan. 1	46	2
Cigars, cheroots, cigarettes, and manufactured tobacco	E. Wenigmann	16,196	Jan. 15	46	246
Clothing for men, boys, and children. Ready-made	J. & L. Wineman	16,244	Feb. 5	46	578
Cocoa-bean. All goods made from the	Bensdorp & Co	16,295	Feb. 26	46	978
Coffee	W. McEwan	16,160	Jan. 8	46	126
Collars and cuffs	Rogers, Peet & Co	16,195	Jan. 15	46	246
Collars, cuffs, neck-wear, shirts, and underwear	S. Hayem, Aîné	16,337	Mar. 5	46	1114
Cologne	B. Kent	16,208	Jan. 22	46	344
Confectionery	P. Wunderle	16,276	Feb. 12	46	696
Confectionery	P. Wunderle	16,385	Mar. 12	46	1272
Cork and cork articles	Armstrong, Bro. & Co	16,251	Feb. 12	46	696
Corsets	H. Le Prince	16,194	Jan. 15	46	246
Corsets and attachments for supporting underwear	E. J. Swartwout	16,163	Jan. 8	46	126
Cotton-bats	W. J. Caldwell	16,331	Mar. 5	46	1114
Cotton-bats	W. J. Caldwell	16,332	Mar. 5	46	1114
Cotton linings	Burton Bros. & Co	16,376	Mar. 19	46	1272
Cotton linings	Burton Bros. & Co	16,388	Mar. 19	46	1400
Cotton linings	Burton Bros. & Co	16,389	Mar. 19	46	1400
Crackers and cakes	F. W. Medcraf	16,184	Jan. 15	46	246
Crackers, biscuits, and kindred articles	C. D. Boss & Son	16,304	Feb. 26	46	978
Cutlery	Graef & Schmidt	16,202	Jan. 22	46	344
Dentifrice. Aromatic liquid	A. Armstrong	16,303	Feb. 26	46	978
Detergents containing ammonia	Columbia Chemical Works	16,136	Jan. 1	46	2
Diamonds. Artificial	E. E. Kipling	16,139	Jan. 1	46	2
Drillings. Blue	Boott Cotton Mills	16,133	Jan. 1	46	2
Drug. Antipyretic	L. Levinstein	16,167	Jan. 8	46	126

Alphabetical list of trade-marks, January to March, inclusive—Continued.

Title.	Name.	No.	Date.	Official Gazette. Vol.	Page.
Drug. Antipyretic	I. Levinstein	16,179	Jan. 15	46	246
Drying houses or kilns for drying lumber, bricks, &c	I. & M. Wolff & Coleman	16,150	Jan. 1	46	2
Eggs. Fresh and pickled	Mackenzie, Chase & Co	16,383	Mar. 12	46	1272
Embrocations and pills	H. A. King	16,422	Mar. 26	46	1520
Emmenagogue. Tonic	W. T. Batterson, M. F. Welsh, and J. F. Funk.	16,386	Mar. 19	46	1400
Explosives	Smokeless Powder Company	16,349	Mar. 5	46	1114
Extracts for food. Flavoring	Price Baking Powder Company	16,347	Mar. 5	46	1114
Febrifuges or fever curatives	Farbenfabriken, vormals Fr. Bayer & Co.	16,392	Mar. 19	46	1400
Fencing. Wire	Gilbert & Bennett Manufacturing Company.	16,280	Feb. 19	46	828
Fencing. Wire	Gilbert & Bennett Manufacturing Company.	16,281	Feb. 19	46	828
Fertilizers. Artificial	J. Horner, Jr	16,138	Jan. 1	46	2
Fire-brick, stove-linings, and articles made wholly or partly of fire-clay.	F. A. Ostrander	16,380	Mar. 12	46	1272
Flour	Muscatine Oat Meal Company	16,231	Jan. 29	46	450
Flour known as flakes. Barley	Farwell & Rhines	16,165	Jan. 8	46	126
Flour. Wheat	Sidle, Fletcher, Holmes Company	16,148	Jan. 1	46	2
Flour, wheaten grits, farina, oatmeal, cornmeal, and hominy	St. Paul Roller Mill Company	16,218	Jan. 22	46	344
Food substances. Oleaginous	N. K. Fairbank & Company	16,201	Jan. 22	46	344
Garments for men and boys. Outer	L. C. Wachsmuth & Co	16,164	Jan. 8	46	126
Gas-burner tips	Draper Manufacturing Company	16,382	Mar. 12	46	1272
Guitars, mandolins, zithers, and banjos	Lyon & Healy	16,247	Feb. 5	46	578
Gum. Chewing	A. M. Fitch	16,265	Feb. 12	46	696
Gum. Chewing	H. D. Smith & Co	16,348	Mar. 5	46	1114
Hair-wash made of extract of herbs, roots, and flowers	R. Binder	16,222	Jan. 29	46	450
Hamamelis. Special preparations of extract of	Humphreys Homeopathic Medicine Company.	16,267	Feb. 12	46	696
Hats and bonnets. Ladies' and misses'	F. F. Hodges	16,285	Feb. 19	46	828
Heel-shaves	V. Snell	16,408	Mar. 19	46	1400
Homeopathic specifics	Humphreys Homeopathic Medicine Company.	16,268	Feb. 12	46	696
Horse-covers, lap-dusters, horse-blankets, and hoods	W. B. Riley & Co	16,147	Jan. 1	46	2
Horseshoe-nails	S. G. Winternitz & Bro	16,412	Mar. 19	46	1400
Hose. Conducting	S. Ballard & Co	16,414	Mar. 26	46	1520
Hose, metal-covered. Rubber and cotton	Revere Rubber Company	16,403	Mar. 19	46	1400
Hose of rubber, cotton, or linen	Revere Rubber Company	16,370	Mar. 12	46	1272
Hose of rubber, cotton, or linen	Revere Rubber Company	16,371	Mar. 12	46	1272
Hose of rubber, cotton, or linen	Revere Rubber Company	16,372	Mar. 12	46	1272
Hose. Rubber, linen, or cotton	Revere Rubber Company	16,404	Mar. 19	46	1400
Hypnotic. New	Farbenfabriken, vormals Fr. Bayer & Co.	16,308	Feb. 26	46	978
Hypnotic. New	Farbenfabriken, vormals Fr. Bayer & Co.	16,309	Feb. 26	46	978
Hypnotic. New	Farbenfabriken, vormals Fr. Bayer & Co.	16,310	Feb. 26	46	978
Hypnotic. New	Farbenfabriken, vormals Fr. Bayer & Co.	16,311	Feb. 26	46	978
Ice-cream freezers	C. G. and W. J. Shepard	16,102	Jan. 8	46	126
Insecticide	S. Woods	16,423	Feb. 26	46	978
Insecticides	J. R. Moechel & Co	16,256	Mar. 26	46	1520
Jewelry. Ornamental	Mosbacher & Co	16,325	Feb. 12	46	696
Kerosene	S. Green	16,284	Feb. 19	46	828
Knives and steels. Butchers'	F. Dick	16,154	Jan. 8	46	126
Lager-beer	G. Bauernschmidt	16,262	Feb. 12	46	696
Lamps. Miners'	Demmler Bros	16,417	Mar. 26	46	1520
Laundry articles, such as clothes wringers and driers	Empire Wringer Company	16,279	Feb. 19	46	828
Lead. White	R. Shoemaker & Co	16,258	Feb. 12	46	696
Leather	Horton & Co	16,156	Jan. 8	46	126
Leather for the uppers of shoes	C. S. Hull	16,205	Jan. 22	46	344
Liniment	C. Sands	16,233	Jan. 29	46	450
Liniment	W. J. Thompson	16,235	Jan. 29	46	450
Liniment and like compounds	D. J. Enright	16,237	Feb. 5	46	578
Liniment for man or beast	A. B. Richards Medicine Co	16,146	Jan. 1	46	2
Liniments	P. P. Prando	16,319	Feb. 26	46	978
Linings and summer coatings	C. E. Parkinson & Co	16,409	Mar. 19	46	1400
Lubricating compound	E. H. Benners	16,221	Jan. 29	46	450
Maize or Indian corn	C. E. Prunty	16,213	Jan. 22	46	344
Matches. Friction parlor	Miller Match Company	16,142	Jan. 1	46	2
Matches. Friction parlor	Miller Match Company	16,143	Jan. 1	46	2
Meal, corn-flour, cornmeal, hominy, grits, and feed. Degerminated	Miller, Case & Clausen	16,248	Feb. 5	46	578
Meats. Preserved	Cunningham & De Fonrier Company	16,198	Jan. 22	46	344
Meats, vegetables, fruits, oysters, and fish	L. P. Havilland & Co	16,396	Mar. 19	46	1400
Medical compounds for the cure of female diseases	J. A. McGill	16,344	Mar. 5	46	1114
Medical compounds to cure diseases of the nerves, liver, and stomach.	H. R Rogers	16,406	Mar. 19	46	1400
Medicated powder for animals and poultry	Herrman & McLean	16,301	Feb. 26	46	978
Medicinal petroleum products	Terraline Company	16,410	Mar. 19	46	1400
Medicinal plasters	Potter Drug and Chemical Co	16,242	Feb. 5	46	578
Medicinal preparation for the treatment of general debility and brain and nerve diseases.	R. D. Lalor	16,399	Mar. 19	46	1400
Medicine for curing gonorrhea and gleet. Patent	C. W. Poole	16,257	Feb. 12	46	696
Medicine for external and internal use. Liquid	F. A. Wright	16,356	Mar. 5	46	1114
Medicine for external use	F. G. Mass	16,379	Mar. 12	46	1272
Medicine for infants	Southern Company of New York	16,260	Feb. 12	46	696
Medicine for internal use. Cough	B. T. Jacobs	16,207	Jan. 22	46	344
Medicine for the cure of heaves in horses	G. T. Hollyday	16,236	Feb. 5	46	578
Medicine for the cure of indigestion, dyspepsia, and liver complaint.	E. M. Thomas Manufacturing Company.	16,353	Mar. 5	46	1114
Medicine. Laxative	R. M. Green and M. E. Ogborn	16,283	Feb. 19	46	828
Medicine. Tonic	M. C. Barrett	16,151	Jan. 8	46	126

Alphabetical list of trade-marks, January to March, inclusive—Continued.

Title.	Name.	No.	Date.	Official Gazette. Vol.	Page.
Medicines for diseases of the blood and for female diseases	J. W. Jones	16,239	Feb. 5	46	578
Medicines for external use	Soler & Guardias	16,243	Feb. 5	46	578
Metal-polishing paste	W. J. Ramsay	16,369	Mar. 12	46	1272
Metal-working tools, brass and copper supplies, and platers' and polishers' supplies.	C. H. Besly & Co	16,387	Mar. 19	46	1400
Mince-meat for pies. Condensed	Merrell & Soule	16,240	Feb. 5	46	578
Nervine	S. A. Richmond	16,405	Mar. 19	46	1400
Newspaper or weekly pamphlet	Kansas City Times Newspaper Company.	16,308	Mar. 19	46	1400
Newspaper or weekly pamphlet	Manufacturers' Record Company	16,378	Mar. 12	46	1272
Nuts	F. H. Leggett & Co	16,159	Jan. 8	46	126
Oars, handspikes, and capstan-bars	De Grauw, Aymar & Co	16,137	Jan. 1	46	2
Oil. Illuminating	Mather Brothers	16,290	Feb. 19	46	828
Oil. Illuminating	Mather Brothers	16,343	Mar. 5	46	1114
Oil. Kerosene	W. Briscoe & Son	16,375	Mar. 12	46	1272
Oil. Kerosene	H. W. Peabody & Co	16,291	Feb. 19	46	828
Oil. Kerosene	H. W. Peabody & Co	16,292	Feb. 19	46	828
Oil. Kerosene	H. W. Peabody & Co	16,293	Feb. 19	46	828
Oil or liniment	G. T. Atkins	16,278	Feb. 19	46	828
Oil. Wood-preserving	A. Wingenroth	16,373	Mar. 12	46	1272
Oils. Boiled	T. Hubbuck & Son	16,421	Mar. 26	46	1520
Ointment	H. C. Cady	16,363	Mar. 12	46	1272
Ointments. Cuticle	Bolling Drug Company	16,197	Jan. 22	46	344
Oysters	A. Booth Packing Company	16,236	Feb. 5	46	578
Oysters. Canned	A. Booth Packing Company	16,252	Feb. 12	46	696
Packing. Steam and hydraulic combination piston	Moran & Saunderson	16,166	Jan. 15	46	246
Paint renewer and preserver	Baker & Co	16,413	Mar. 26	46	1520
Paints. Ready-mixed	R. Shoemaker & Co	16,259	Feb. 12	46	696
Paper and envelopes. Writing	B. A. Hard	16,204	Jan. 22	46	344
Paper. Fine writing	Wanregan Paper Company	16,294	Feb. 19	46	828
Paper. Writing	D. King	16,178	Jan. 15	46	246
Paper. Writing	Riverside Paper Company	16,214	Jan. 22	46	344
Pencils. Carpenters'	American Lead Pencil Company	16,358	Mar. 12	46	1272
Pencils. Carpenters'	American Lead Pencil Company	16,359	Mar. 12	46	1272
Pencils. Carpenters'	American Lead Pencil Company	16,360	Mar. 12	46	1272
Pencils. Carpenters'	American Lead Pencil Company	16,361	Mar. 12	46	1272
Pens. Metallic	Turner & Harrison	16,250	Feb. 5	46	578
Perfumed tablets for bath and toilet use	H. Mack	16,181	Jan. 15	46	246
Perfumery	A. L. Smith	16,274	Feb. 12	46	696
Perfumery preparations for the bath	H. Mack	16,182	Jan. 15	46	246
Perfumery preparations for the bath	H. Mack	16,183	Jan. 15	46	246
Petroleum. Refined	A. Hoppe & Sons and S. Banner & Co	16,307	Mar. 19	46	1400
Photographic cameras	E. I. Horsman	16,286	Feb. 19	46	828
Photographic outfits	E. I. Horsman	16,420	Mar. 26	46	1520
Photographic paper	A. Schaeffner	16,320	Feb. 26	46	978
Photographic papers, instruments, specialties, and supplies	American Aristotype Co	16,327	Mar. 5	46	1114
Pills. Preparation for	R. C. Mooney	16,230	Jan. 29	46	450
Pills	Rogers & Irvin	16,157	Jan. 8	46	126
Pipes. Die-plates for threading steam, gas, and other	Walworth Manufacturing Company	16,411	Mar. 19	46	1400
Planters and potato-diggers. Potato	Aspinwall Manufacturing Company	16,131	Jan. 1	46	2
Plows	C. Billups	16,296	Feb. 26	46	978
Plows	South Bend Iron Works	16,350	Mar. 5	46	1114
Polish. Furniture	P. H. Hiss Manufacturing Company	16,298	Feb. 26	46	978
Polish. Shoe	C. E. Robinson & Bro	16,273	Feb. 12	46	696
Preparations for curing headache	S. Whitehall	16,323	Feb. 26	46	978
Preserved fruits, vegetables, meats, and poultry	Erie Preserving Company	16,226	Jan. 29	46	450
Pumps. Iron and wood	Flint & Walling Manufacturing Company.	16,172	Jan. 15	46	246
Punches. Bank-check	F. J. Lockwood	16,289	Feb. 19	46	828
Puzzle. Metal link	M. Jacobs	16,270	Feb. 12	46	696
Razors and razor-strops	P. Hahn	16,227	Jan. 29	46	450
Razors, pocket-knives, scissors, shears, and like articles of cutlery.	A. J. Jordan	16,246	Feb. 5	46	578
Red hematite, a coloring material for mortar, brick, tiles, and all clay products.	Clinton Metallic Paint Company	16,223	Jan. 29	46	450
Remedies. External	J. H. McGuinness	16,400	Mar. 19	46	1400
Remedies for all diseases of the nose, throat, and bronchial tubes.	J. I. Moore, H. Robinson, and W. S. Blocksbear.	16,185	Jan. 15	46	246
Remedies for female complaints	C. O. Prosser	16,368	Mar. 12	46	1272
Remedy for abrasions and other external injuries and diseases of the skin. Liquid	E. B. Waldo	16,219	Jan. 22	46	344
Remedy for chills and fever and liver-pills	Van Vleet & Co	16,321	Feb. 26	46	978
Roofing. Metal	Canton Steel Roofing Company	16,333	Mar. 5	46	1114
Ruffling for garments	Heidelberger, Frank & Co	16,419	Mar. 26	46	1520
Safes and locks	T. Barnes	16,220	Jan. 29	46	450
Salt for curing and preserving meat, &c. Preserving	J. Horner	16,255	Feb. 12	46	696
Salve	H. C. Stewart	16,261	Feb. 12	46	696
Salve. Corn	Miller Brothers	16,302	Feb. 26	46	978
Sauce. Table	W. C. Nicholson	16,145	Jan. 1	46	2
Sausages. Composition for coloring and preserving	S. Oppenheimer & Co	16,424	Mar. 26	46	1520
Sedlitz powder	C. Chanteaud	16,253	Feb. 12	46	696
Seed. Clover	C. Stager & Co	16,351	Mar. 5	46	1114
Sheetings and shirtings	Boott Cotton Mills	16,330	Mar. 5	46	1114
Shoe-elastic	Herbert & Rapp Company	16,338	Mar. 5	46	1114
Shoes	Elderkin Taylor Company	16,200	Jan. 22	46	344
Shoes having solid insoles and heel-counters	Durrell Bros	16,307	Feb. 26	46	978
Sirup and sugar	L. F. Palmer	16,212	Jan. 22	46	344
Sirup for the cure of asthma	M. A. Cunningham	16,377	Mar. 12	46	1272
Sirup. Maple	G. D. Powell	16,345	Mar. 5	46	1114
Sizing for fabrics	Gloy Manufacturing Co	16,364	Mar. 12	46	1272
Soap	J. Crosfield & Sons	16,335	Mar. 5	46	1114
Soap	M. H. Duffy	16,224	Jan. 29	46	450
Soap	Minnesota Soap Company	16,144	Jan. 1	46	2
Soap. Laundry	Procter & Gamble	16,240	Feb. 5	46	578

Alphabetical list of trade-marks, January to March, inclusive—Continued.

Title.	Name.	No.	Date.	Official Gazette. Vol.	Page.
Soap. Laundry and toilet	R. A. Lynde & Son	16,342	Mar. 5	46	1114
Soap. Toilet and laundry	Beaver & Co	16,132	Jan. 1	46	2
Soaps and detergents	Lever Bros	16,313	Feb. 26	46	978
Soaps and detergents	Lever Bros	16,314	Feb. 26	46	978
Soaps and toilet perfumery. Fancy	Lever Bros	16,315	Feb. 26	46	978
Soaps and toilet perfumery. Fancy	Lever Bros	16,316	Feb. 26	46	978
Soda-water and similar carbonated beverages	G. C. Henry	16,299	Feb. 26	46	978
Specifics for hog-cholera and swine-plague	C. E. Clarke	16,306	Feb. 26	46	978
Spices and herbs for flavoring meats, puddings, head-cheese, &c. Compounded	J. Horner	16,254	Feb. 12	46	696
Spout for oil and other cans or receptacles. Adjustable	G. W. Banker	16,415	Mar. 26	46	1520
Sprout-hooks and other fish-hooks	S. Allcock & Co	16,357	Mar. 12	46	1272
Steam-exhaust heads	W. C. Lyman	16,306	Mar. 12	46	1272
Stitching-horses	Randall & Co	16,402	Mar. 19	46	1400
Stove-polish	G. M. Jackson	16,340	Mar. 5	46	1114
Stoves and stove ware and furniture	Quick Meal Stove Company	16,272	Feb. 12	46	696
Stoves, ranges, and furnaces	Syracuse Stove Works	16,234	Jan. 29	46	450
Tea. Japan	H. J. Hunt	16,206	Jan. 22	46	344
Tea. Japan	Smith, Baker & Co. of Japan	16,216	Jan. 22	46	344
Teas and coffees	S. C. Davidson	16,170	Jan. 15	46	246
Tobacco. Chewing and smoking	Arnold, Carlton & McCord	16,302	Mar. 12	46	1272
Tobacco for chewing and tobacco for smoking. Plug	Arnold, Carlton & McCord	16,277	Feb. 19	46	828
Tobacco. Plug chewing and prepared smoking	M. L. Ogburn	16,189	Jan. 15	46	246
Toilet waters and lotions	Zobel & Failmezger	16,374	Mar. 12	46	1272
Tonic and alterative remedy	S. Nicholson	16,188	Jan. 15	46	246
Tonic and stimulant. Nerve	B. Kent	16,209	Jan. 22	46	344
Tonic. Stomach	Zobel & Failmezger	16,326	Feb. 26	46	978
Twines, ropes, cordage, nets, lines, yarns, and the like	F. B. Hooper	16,228	Jan. 29	46	450
Type, printers' rules, printers' leads, and other printers' furniture.	Mather Manufacturing Co	16,269	Feb. 12	46	696
Underwear	Jaros Hygienic Underwear Company.	16,166	Jan. 8	46	126
Vermin-exterminators	J. C. Bowe	16,305	Feb. 26	46	978
Wagon the body of which is supported between side bars by cross-springs. Road-	R. M. Silvers	16,352	Mar. 5	46	1114
Wash-boards	C. D. and F. D. Fuller	16,394	Mar. 19	46	1400
Wash-boards	C. D. and F. D. Fuller	16,395	Mar. 19	46	1400
Washing compound	M. P. Evans	16,336	Mar. 5	46	1114
Watches	M. C. Eppenstein & Co	16,155	Jan. 8	46	126
Watches and their component parts	Anc. Fque. Vacheron & Constantin	16,398	Mar. 5	46	1114
Watches. Balance-wheels for	Usine Genevoise de Dégrossissage D'or.	16,355	Mar. 5	46	1114
Watches. Cased	Dubail, Monnin, Frossard & Co	16,418	Mar. 26	46	1520
Watches. Spiral or volute springs for	Usine Genevoise de Dégrossissage D'or.	16,354	Mar. 5	46	1114
Watches, watch-movements, and watch-cases	E. Quartier, Fils	16,168	Jan. 8	46	126
Whalebone. Prepared	F. E. Merriman	16,367	Mar. 12	46	1272
Whisky	W. Boyle and J. McGlinn	16,297	Feb. 26	46	978
Whisky	F. J. Kiesel & Company	16,229	Jan. 29	46	450
Whisky	F. J. Kiesel & Company	16,312	Feb. 26	46	978
Whisky	Kirker, Greer & Co	16,140	Jan. 1	46	2
Whisky	J. Power & Son	16,346	Mar. 5	46	1114
Whisky	J. Power & Son	16,425	Mar. 26	46	1520
Whisky	C. E. Stutts & Co	16,275	Feb. 12	46	696
Wipers made of silk waste woven into cloth	L. C. Fuchs	16,173	Jan. 15	46	246
Wire-cloth. Window-screen	Gilbert & Bennett Manufacturing Company.	16,282	Feb. 19	46	828
Worsted, woolen, and part-woolen goods	M. T. Stevens & Sons	16,149	Jan. 1	46	2
Woven fabric. Cotton or partly cotton and wool and partly wool	Smith, Hogg & Gardner	16,217	Jan. 22	46	344
Zinc powder and compounds containing zinc for external use	L. N. White	16,324	Feb. 26	46	978

ALPHABETICAL LIST OF LABELS.

Title.	Name.	No.	Date.	Official Gazette. Volume.	Page.
"Amber" (for Paints and Colors)	Binswanger & Pollock	5,792	Jan. 15	46	246
"Antiseptic Catarrh Cure"	A. Lightbill	5,789	Jan. 8	46	126
"Baldwin's Perfection Salve"	J. B. Brock	5,834	Mar. 5	46	1114
"Baldwin's Perfection Skin-Cure"	J. B. Brock	5,835	Mar. 5	46	1114
"Balsam of Tulu and White Pine"	Green & Bentley	5,809	Jan. 29	46	450
"Bolling's Crystal Cream" (for cuticle ointments)	Bolling Drug Company	5,833	Mar. 5	46	1114
"Brand A" (for Sheathing Paper)	M. E. Manahan	5,810	Jan. 29	46	450
"Caledonia Mills" (for Envelopes and Paper)	Logan, Swift & Brigham Envelope Company.	5,822	Feb. 12	46	696
"Carty's Ague Cure"	W. C. Carty	5,836	Mar. 5	46	1114
"Collingswood" (for Spring Water)	D. W. White	5,832	Feb. 26	46	978
"Compound Digestive Powder"	Searle & Hereth Company	5,819	Feb. 5	46	578
"Condensed Coffee"	J. Loretzen	5,852	Mar. 19	46	1400
"Cottingham's Stomach and Kidney Renovator"	W. H. Cottingham	5,830	Feb. 26	46	978
"Crystalized Vegetable Combination" (for a Compound for Painting Purposes.)	C. D. Fenstemaker	5,781	Jan. 1	46	2
"Dr. Ball's Cream." (for the toilet)	J. G. Ball	5,847	Mar. 19	46	1400
"Dr. Hamilton's Liniment"	J. H. Shade	5,815	Jan. 29	46	450
"Dr. James' Sure Cure" (for remedy for Catarrh, Cough and Consumption.)	C. A. James	5,851	Mar. 19	46	1400
"Dr. Nancy A. Pierson's Cholera Specific for Hogs and Fowls"	N. A. Pierson	5,816	Feb. 5	46	578
"Dr. Schaeffer's Dentrifrice"	E. Schaeffer	5,805	Jan. 15	46	246
"Dr. Thos. Wm. Spranklin's Colic Mixture"	T. W. Spranklin	5,858	Mar. 26	46	1520
"Dr. Thos. Wm. Spranklin's Liniment"	T. W. Spranklin	6,857	Mar. 26	46	1520
"Eustachian Snuff for Catarrh"	E. A. Derby	5,780	Jan. 1	46	2
"Gladding's Whale Oil and Tar Hoof Dressing and Liniment"	W. J. Gladding	5,821	Feb. 12	46	696
"Gold and Silver Solution" (for a Medicinal remedy)	H. B. Meech	5,804	Jan. 15	46	246
"Guarantee" (for Rubber and Oil Clothing)	Dunlap, Lawton & Hall	5,838	Mar. 5	46	1114
"Hawley's Spavin Cure"	E. T. Hawley & Co	5,788	Jan. 8	46	126
"Household Salve"	M. M. Wootman	5,823	Feb. 12	46	696
"Injection Alba" (for a medicinal mixture)	Rogers & Diamond	5,818	Feb. 5	46	578
"Iridium Anti-Friction." (for Metals)	Merchant & Co	5,790	Jan. 8	46	126
"Iridium" (for Anti-Friction Metal)	Merchant & Co	5,791	Jan. 8	46	126
"Label for Lenses"	Johnston Optical Co	5,799	Jan. 15	46	246
"Label for Lenses"	Johnston Optical Co	5,800	Jan. 15	46	246
"Label for Lenses"	Johnston Optical Co	5,801	Jan. 15	46	246
"Label for Lenses"	Johnston Optical Co	5,802	Jan. 15	46	246
"Label for Lenses"	Johnston Optical Co	5,803	Jan. 15	46	246
"M. Behrend & Son's Descriptive School Book Labels"	M. Behrend & Sons	5,843	Mar. 12	46	1272
"M. F. Conine's German Scrofular Salve."	M. F. Conine	5,849	Mar. 19	46	1400
"Madame Agnes' Balm"	H. A. McAllister	5,855	Mar. 26	46	1520
"Manahan's Double Strength Pine Tar Oakum Paper for Preventing Moths."	M. E. Manahan	5,783	Jan. 1	46	2
"Manteca Chicharron Preparda Espresamente Para Los Climas Calidos Endurecida."	Central Lard Company	5,786	Jan. 8	46	126
"Melilotas Cream" (for a compound for the complexion)	T. H. Field	5,839	Mar. 5	46	1114
"Mellin's Food for Infants and Invalids"	Doliber-Goodale Company	5,787	Jan. 8	46	126
"Mellin's Food for Infants and Invalids"	Doliber-Goodale Company	5,798	Jan. 15	46	246
"Mineralized Rubber" (for rubber goods)	Mineralized Rubber Company	5,828	Feb. 19	46	828
"Miss Buell's Lotion" (for chapped hands)	M. Buell	5,785	Jan. 8	46	126
"Mrs. Julia A. Achard's Liniment"	J. A. Achard	6,824	Feb. 19	46	828
"Non-Porous" (for paint)	C. W. Bruce	5,846	Mar. 19	46	1400
"Oliphant's Invaluable Rheumatic Remedy"	L. Oliphant	5,784	Jan. 1	46	2
"Oval Heads and Forged Nuts," (for Carriage Bolts)	Oliver Iron and Steel Company	5,853	Mar. 19	46	1400
"P. Jamieson, Aberdeen." (for Harness Composition)	P. Jamieson	5,811	Jan. 29	46	450
"P. Jamieson's Harness Composition"	P. Jamieson	5,813	Jan. 29	46	450
"P. Jamieson's noted Harness Composition"	P. Jamieson	5,812	Jan. 29	46	450
"Practically Indestructible" (for Pianos)	A. Riley	5,814	Jan. 29	46	450
"Prof. Jenroux's Indian Herbal Tonic"	J. Jenroux	5,825	Feb. 19	46	828
"Protection Check" (for Blank Bank Checks)	G. A. Libbey	5,840	Mar. 5	46	1114
"Ramey's Celebrated German Kidney Cure"	A. H. Ramey	5,817	Feb. 5	46	578
"Rheumatism and Gout" (for a Medicine)	A. Sicko	5,831	Feb. 26	46	978
"River's Liniment"	F. E. Rivers	5,829	Feb. 19	46	828
"Rock Candy"	A. H. Stillwell	5,826	Feb. 19	46	828
"Rogers & Diamond's Celebrated Cough Cure"	Rogers & Diamond	5,806	Jan. 22	46	344
"Sap Maple Syrup"	G. D. Powell	5,856	Mar. 26	46	1520
"Serrated Ribbon" (for Typewriter ribbons)	A. P. Little	5,841	Mar. 5	46	1114
"Sicko's recipe for Rheumatism and Gout"	A. Sicko	5,846	Mar. 12	46	1272
"Sunlight Soap"	Lever Bros	5,827	Feb. 19	46	828
"Swiss Stomach Bitters"	F. Eppinger	5,820	Feb. 12	46	696
"Tapeworm Specific"	J. G. Egersdorff	5,850	Mar. 19	46	1400
"The Celebrated Lincolnshire Chutney"	Godley Brothers	5,808	Jan. 29	46	450
"The Cotton Oil Product Co's Bath Soap"	Cotton Oil Product Company	5,837	Mar. 5	46	1114
"The Cotton Oil Product Co's Cotton Seed Lard"	Cotton Oil Product Company	5,793	Jan. 15	46	246
"The Cotton Oil Product Co's for the Nursery," (for a purgative medicine.)	Cotton Oil Product Company	5,794	Jan. 15	46	246
"The Cotton Oil Product Co's Laundry Cotton Seed Soap"	Cotton Oil Product Company	5,797	Jan. 15	46	246
"The Cotton Oil Product Co's Soap Powder"	Cotton Oil Product Company	5,796	Jan. 15	46	246
"The Cotton Oil Product Co's Toilet Cotton Seed Soap"	Cotton Oil Product Company	5,795	Jan. 15	46	246
"The Great Indian Salve and Plaster"	O. S. Stearns	5,807	Jan. 22	46	344

Alphabetical list of labels, January to March, inclusive—Continued.

Title.	Name.	No.	Date.	Official Gazette. Vol.	Page.
"The most Valuable Medicine yet found"	M. E. Chadbourne	5,854	Mar. 26	46	1520
"The Standard Metal Polish"	W. J. Ramsay	5,845	Mar. 12	46	1272
"Warranted Genuine Whalebone"	F. E. Merriman	5,844	Mar. 12	46	1272
"White's Glove-Fitting Ready-Cut Waist Lining"	P. Groezfeld	5,752	Jan. 1	46	2
"Wright's Magnetic Electrifier," (For a Medicine)	F. A. Wright	5,859	Mar. 26	46	1520
"Young's Indian Salve"	F. E. Young	5,842	Mar. 5	46	1114

DISCLAIMER.

Invention.	Patentee.	No. of patent.	Date of patent.	Disclaimer filed.	Official Gazette. Vol.	Page.
Visiting-cards	Philip Hake	219,464	Sept. 9, 1879	Mar. 6, 1889	46	1272

OFFICIAL GAZETTE

OF THE

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APRIL 2 TO JUNE 25, INCLUSIVE,

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INDEX OF PATENTS AND PATENTEES FOR THE QUARTER YEAR, APRIL TO JUNE, 1889.

ERRATA.

400,701, page 78, first claim, line 2, for "have" read *having*.

400,796, page 105, in title, name of assignee, for "Jennie A. Zinn" read *Jennie A. Zinns*.

401,262, page 247, in title, after residence of inventor, insert *assignor to The Barnett Brass Company, same place.*

401,751, page 413, in title, name of inventor, for "Frederick Le Bean" read *Frederick Le Beau.*

402,149, page 537, in title, name of inventor, for "Joseph P. M. Earty" read *Joseph P. McCarty.*

402,230 and **402,231**, page 559, in title, residence of assignee, for "New York, N. Y.," read *New Jersey.*

402,440, page 622, in title, after "(No model.)" insert *Patented in Germany Nov.* 26, 1888, *No.* 45,844.

402,566, page 667, strike out all after number—title, drawings, and claims—and insert WITHDRAWN.

402,756, page 720, in claim, line 1, for "vertical" read *horizontal.*

402,984, page 784, in title, for "Andrew Scull administrator" read *Andrew Scull executor.*

403,005 and **403,006**, pages 786 and 787, strike out all after number—title, drawings, and claims—and insert WITHDRAWN.

403,056, page 801, in title, name of assignee, for "Sherman Husted" read *Sherman Huston.*

403,267, page 876, in title, for "assignor of five-twentieths to Frank L. Pommer, Stapleton, N. Y.," read *assignor of eight-twentieths to Frank L. Pommer. Stapleton, William Meyer and Henry Osborne, New York, N. Y., and Johann Steneck, Hoboken. N. J.*

403,304, page 887, in title, for "Silver-Coiling Can for Carding-Machines" read *Sliver-Coiling Can for Carding-Machines*, and in claim, line 1, for "silver-coiling" read *sliver-coiling.*

403,434, page 924, in title, for "assignors of one-half to said Richardson and E. D. Libby" read *assignors of one-half to S. O. Richardson and E. D. Libby.*

403,730, page 1018, in title, for "assignor" read *assignor of one-half.*

403,994, page 1100, in title, names of patentees, for "Max Jurnick" read *Max Juruick.*

404,151, page 1152, in title, after residence of inventor, insert *assignor to George H. Heath, same place.*

404,359, page 1213, in title, after residence of inventor, insert *assignor of one-half to Robert W. Watchorn and Thomas H. Watchorn.*

404,407, page 1234, in title, name of assignee, for "Rand H. Simon" read *R. and H. Simon.*

404,515, page 1237, in title, after residence of inventor, insert *assignor to Julian Sale, same place.*

404,778, page 1341, in title, after "(No model)" insert *Patented in England Nov.* 20, 1888, *No.* 17,140.

404,805, page 1349, in title, name of assignee, for "George W. Leesintzer" read *George W. Leesnitzer.*

404,884, page 1380, strike out all after number—title, drawings, and claims—and insert WITHDRAWN.

404,918, page 1390, in title, name of assignee, for "H. Davis Northrup" read *H. Davis Northup.*

405,213, page 1475, in title, name of assignee, for "Hinds Induction-Light and Motor Company" read *Hicks Induction-Light and Motor Company.*

405,288, page 1505, in title, for "three-fourths" read *five-eighths.*

405,295, page 1508, in title, number of Belgian patent, for "No. 820,874" read *No.* 82,874.

405,444, page 1552, eighth claim, line 7, for "band-shaft" read *hand-shaft.*

405,542, page 1587, strike out all after number—title, drawings, and claims—and insert WITHDRAWN.

405,680, page 1628, in title, for "assignor to C. H. De Lamater" read *assignor to William De Lamater and Leander A. Bevin, both of New York, N. Y.*

405,849, page 1682, second claim, line 5, insert a comma after the word "water-outlet."

405,823, page 1674, strike out all after number—title, drawing, and claims—and insert WITHDRAWN.

405,898, page 1695, strike out all after number—title, drawing, and claim—and insert WITHDRAWN.

405,973, page 1716, in title, assignment, for "of one-third" read *of two-thirds.*

405,995, page 1723, in title, assignment, strike out "to said Gracey."

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OFFICIAL GAZETTE

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UNITED STATES PATENT OFFICE.

APRIL–JUNE, 1889.

THE

OFFICIAL GAZETTE

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United States Patent Office.

[BY AUTHORITY OF CONGRESS.]

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Notice to the Patrons of the Patent Office.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., March 23, 1889.

Attention is called to Rule 9 of the Rules of Practice, requiring that a separate letter should accompany each subject of inquiry or application, and that assignments, final fees, and orders for copies or abstracts must be sent in separate letters. A strict observance of the provisions of this rule would prevent confusion and delay, and would result in expediting the business, and it is urged that proper attention should be given to this matter.

BENTON J. HALL,
Commissioner.

Issue of April 2, 1889.

Patents	467	No. 400,422 to No. 400,888, inclusive.
Designs	29	No. 18,977 to No. 19,004, inclusive.
Trade-Marks	36	No. 16,427 to No. 16,462, inclusive.
Labels	4	No. 5,860 to No. 5,863, inclusive.
Reissue	1	No. 10,963.
Total issue	536	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama			Nebraska	3	
Arizona Territory			Nevada		
Arkansas	2		New Hampshire	1	
California	10	1	New Jersey	22	2
Colorado	3		New Mexico Terri'ty		
Connecticut	16	1	New York	100	6
Dakota Territory	2		North Carolina	2	
Delaware	1		Ohio	31	2
District of Columbia	4		Oregon		
Florida	1		Pennsylvania	47	2
Georgia	3		Rhode Island	2	
Idaho Territory			South Carolina		
Illinois	42	5	Tennessee	1	
Indian Territory			Texas	13	1
Indiana	8		Utah Territory	1	
Iowa	14		Vermont	3	
Kansas	9		Virginia	9	
Kentucky	5		Washington Territ'y		
Louisiana	6		West Virginia		
Maine	3	1	Wisconsin	13	
Maryland	6	3	Wyoming Territory		
Massachusetts	32	4	United States Army		
Michigan	12	1	United States Navy	2	
Minnesota	8	1	Total to citizens of the United States	457	31
Mississippi					
Missouri	20	1			
Montana Territory					

To citizens of foreign countries: Patents and Designs—38, Trade-Marks and Labels—9.

DESIGNS.

18,977.—TEXTILE FABRIC.—*Joseph Bleischwitz*, Boston, Mass., assignor to *Cheney Brothers*, South Manchester, Conn. Application filed February 23, 1889. Serial No. 300,946. Term of patent 3½ years.

18,978.—DRAWER-PULL.—*Francis A. Coffin*, Indianapolis, Ind. Application filed January 24, 1889. Serial No. 297,443. Term of patent 7 years.

18,979.—DISH.—*Jean Baptiste Gabriel Emile Coiffe*, Limoges, France, assignor to *Gustav Vogt*, same place. Application filed February 15, 1889. Serial No. 300,051. Term of patent 7 years.

18,980.—HORSESHOE.—*Henry J. Goldman*, Troy, N. Y. Application filed February 5, 1889. Serial No. 298,770. Term of patent 14 years.

18,981.—SEWER-TRAP.—*William H. Graham*, St. Louis, Mo. Application filed September 8, 1888. Serial No. 284,936. Term of patent 14 years.

18,982.—SEWING-MACHINE FRAME.—*Alfred Faulkner*, Jersey City, N. J., assignor to *Eli W. Broadbent*, New York, N. Y. Application filed January 12, 1889. Serial No. 295,990. Term of patent 14 years.

18,983.—COLLAR OR CUFF.—*Edward O. House*, Troy, N. Y. Application filed February 5, 1889. Serial No. 298,772. Term of patent 3½ years.

18,984 and 18,985.—CARPET.—*Winthrop L. Jacobs*, East Orange, N. J., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed February 27, 1889. Serial Nos. 301,400 and 301,401. Term of patents 3½ years.

18,986.—SHEET-METAL ELBOW.—*Arthur Langerfeld*, New York, N. Y., assignor to *James A. Miller* and *Robert B. Miller*, Chicago, Ill. Application filed January 25, 1889. Serial No. 297,575. Term of patent 14 years.

18,987.—OROAN-CASE TOP.—*Louis H. Marston*, Chicago, Ill. Application filed March 1, 1889. Serial No. 301,706. Term of patent 3½ years.

18,988.—CARPET.—*John McMann*, Boston, assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Application filed February 27, 1889. Serial No. 301,398. Term of patent 3½ years.

18,989.—ORNAMENTATION OF PLATES.—*Emile Morel*, Limoges, Haute-Vienne, France, assignor to *O. A. Gager & Company*, New York, N. Y. Application filed February 23, 1889. Serial No. 300,955. Term of patent 7 years.

18,990.—HEATING-STOVE.—*James Allison Orr*, Reading, Pa., assignor to *The Mount Penn Stove Works*, same place. Application filed November 7, 1888. Serial No. 290,243. Term of patent 14 years.

18,991 to 18,994, inclusive.—CARPET.—*Edward Poole*, Brooklyn, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed February 27, 1889. Serial Nos. 301,408, 301,409, 301,412, and 301,413. Term of patents 3½ years.

18,995.—CURLING AND CRIMPING COMB.—*George Augustus Scott*, New York, N. Y. Application filed February 27, 1889. Serial No. 301,426. Term of patent 7 years.

18,996.—RUG.—*Julius Strobeim*, New York, N. Y., assignor to *Schofield, Mason & Co.*, Philadelphia, Pa. Application filed February 16, 1889. Serial No. 300,201. Term of patent 3½ years.

18,997.—BOTTLE.—*Francis M. Underhill*, Brooklyn, assignor to *Whitall, Tatum & Co.*, New York, N. Y. Application filed February 6, 1889. Serial No. 298,905. Term of patent 14 years.

18,998.—CARPET.—*Lucy W. Valentine*, Boston, assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Application filed February 27, 1889. Serial No. 301,399. Term of patent 3½ years.

18,999.—CURTAIN FABRIC.—*Candace Wheeler*, New York, N. Y. Application filed February 20, 1889. Serial No. 300,627. Term of patent 7 years.

19,000 to 19,002, inclusive.—CARPET.—*George C. Wright*, New York, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed February 27, 1889. Serial Nos. 301,405 to 301,407, inclusive. Term of patents 3½ years.

19,003 and 19,004.—CARPET.—*George C. Wright*, New York, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed March 6, 1889. Serial Nos. 302,171 and 302,172. Term of patents 3½ years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,427.—OIL OR WATER-PROOF CLOTHING.—*John F. Carter*, Beverly, Mass. Application filed February 26, 1889. Used since December 1, 1888.
"The word 'CROWN' or the figure of a crown, or both combined."

16,428.—OARS, HANDSPIKES, AND CAPSTAN-BARS.—*De Grauw, Aymar & Co.*, New York, N. Y. Application filed February 6, 1889. Used since January 2, 1889.
"The representation or figure of a buffalo and the words 'NEW YORK.'"

16,429.—FERTILIZERS COMPOSED OF PHOSPHORIC ACID, POTASH, AND AMMONIA.—*Farmers Fertilizer Company*, Syracuse, N.Y. Application filed August 8, 1888. Used since February 1, 1886.
"The words 'FAIR & SQUARE.'"

16,430.—MEDICINES FOR COUGHS, COLDS, AND PULMONARY DISEASES. *Frank Gies*, Baltimore, Md. Application filed February 21, 1889. Used since January, 1889.
"The word 'HERBARIUM.'"

16,431.—SAWS.—*Samuel I. Goodall*, Philadelphia, Pa. Application filed February 16, 1889. Used since December, 1887.
"The words 'PENNSYLVANIA SAW MFG. CO.' and a monogram composed of the letters 'P. S. M.' and 'Co.'"

16,432.—TONICS AND LOTIONS FOR THE HAIR AND SCALP.—*Mnatzakan Hakoumoff*, London, county of Middlesex, England. Application filed February 26, 1889. Used since February 24, 1888.
"The word 'MAZAPER.'"

16,433.—GRAPE-VINE SLIPS.—*Stephen Hoyt's Sons*, New Canaan, Conn. Application filed February 26, 1889. Used since January 1, 1880.
"The words 'GREEN MOUNTAIN.'"

16,434.—MEDICAL TONIC.—*The Kerfall Drug and Chemical Co.*, Detroit, Mich. Application filed February 20, 1889. Used since November 1, 1888.
"The word 'SARSPA.'"

16,435.—PREPARATION FOR DISEASES OF THE LIVER AND KIDNEYS, FOR CONSTIPATION, AND NERVOUS AFFECTIONS.—*The Manhattan Therapeutic Company*, New York, N. Y. Application filed January 16, 1889. Used since August, 1888.
"The word 'CAS-CARRIA.'"

16,436.—BOOTS, SHOES, AND SLIPPERS OF ALL KINDS.—*Packard & Field*, Brockton, Mass. Application filed February 25, 1889. Used since February 11, 1889.
"The word 'BURTWELT.'"

16,437.—COTTON LACES FOR BOOTS AND SHOES.—*William Paton*, Johnstone, county of Renfrew, Scotland. Application filed November 24, 1888. Used since February, 1887.
"The character '£,' or mark representing pounds sterling."

16,438.—BAKING-POWDER.—*Price Baking Powder Company*, Chicago, Ill. Application filed February 25, 1889. Used since September 15, 1866.
"The word 'CREAM.'"

16,439.—REMEDY FOR RHEUMATISM.—*Samuel Allen Richmond*, Camargo, Ill. Application filed June 1, 1888. Used since April 1, 1888.
"The representation of a bottle bearing on a flat face and within double-curved lines obliquely pointing upward from the left the words 'RICHMOND'S RHEUMATIC LIGHTNING.'"

16,440.—BOOTS AND SHOES.—*Urner Bros.*, Baltimore, Md. Application filed February 25, 1889. Used since January 25, 1889.
"The word 'ANATO.'"

16,441.—TOILET BRUSHES, MIRRORS, AND ORNAMENTAL BOXES.—*William M. Welling*, New York, N. Y. Application filed February 23, 1889. Used since July, 1886.
"The word 'WINDMILL' or the representation of a windmill."

16,442.—CLEANING AND POLISHING COMPOUND.—*Emma J. Austin*, Carthage, N. Y. Application filed October 6, 1888. Used since July 1, 1887.
"The word 'SURPRISE.'"

16,443.—TOILET AND MEDICINAL SOAP AND A TOILET CREAM.—*Blondeau & Cie*, London, England. Application filed January 11, 1889. Used since February, 1888.
"The word "VINOLIA.'"

16,444.—SEMI-MONTHLY MAGAZINE.—*Buckeye Publishing Company*, Minneapolis, Minn. Application filed December 31, 1888. Used since January 1, 1878.
"The words 'THE HOUSEKEEPER.'"

16,445.—GALVANIC BATTERIES.—*Peter C. Burns*, St. Louis, Mo. Application filed January 19, 1889. Used since September 1, 1886.
"The word 'MICROPHONE.'"

16,446.—COMPOUNDS FOR COUGHS, COLDS, AND DISEASES OF THE THROAT AND LUNGS.—*Crescent Medical Co.*, Rockland, Me. Application filed February 13, 1889. Used since October 1, 1888.
"'CRESCENT COUGH CURE,' whether the crescent be shown pictorially or by word."

16,447.—CIGARS.—*Hesslein Bros.*, Chicago, Ill. Application filed January 15, 1889. Used since 1875.
"The representation of a bell."

16,448.—CIGARS.—*Hesslein Bros.*, Chicago, Ill. Application filed January 17, 1889. Used since 1875.
"The word "BELL.'"

16,449.—HEATING APPARATUS.—*Howard Furnace Company*, Syracuse, N. Y. Application filed February 20, 1889. Used since January 1, 1889.
"A Maltese cross and the representation of the front of a furnace thereon."

16,450.—PAINTS AND PAINTERS' SUPPLIES.—*Thomas Hubbuck & Son*, London, England. Application filed June 7, 1888. Used since May, 1885.
"The word 'SAILOR.'"

16,451.—PAINTS AND PAINTERS' SUPPLIES.—*Thomas Hubbuck & Son*, London, England. Application filed June 7, 1888. Used since October, 1884.
"The representation of the head and shoulders of a man dressed as a sailor."

16,452.—PAINTS AND PAINTERS' SUPPLIES.—*Thomas Hubbuck & Son*, London, England. Application filed June 7, 1888. Used since May, 1885.
"The word 'MARINER.'"

16,453.—METAL-DECRUSTATING COMPOUND.—*The Non-Corrosive Boiler Compound Company*, Dallas, Tex. Application filed January 30, 1889. Used since November 10, 1888.
"The words 'NON-CORROSIVE BOILER COMPOUND Co.' and the representation of a locomotive."

16,454.—DRESSING AND LUBRICATING COMPOUND FOR LEATHER.—*Porpoisine Manufacturing Company*, Hurffville, N. J., and Philadelphia, Pa. Application filed February 4, 1889. Used since January 15, 1889.
"The representation of the fish or porpoise in the act of leaping from the water and the word 'PORPOISINE.'"

16,455.—COLORING-MATTER.—*Alcide François Poirrier*, Paris, France. Application filed February 8, 1889. Used since May 31, 1873.
"The words 'CACHOU DE LAVAL.'"

16,456.—LIQUID COATING FOR IRON, STONE, CEMENT, WOOD, AND THE LIKE.—*Léon Pupat*, Romans, France. Application filed January 15, 1889. Used since October 15, 1888.
"The representation of an arch with keystones, foundation-blocks, and base-block."

16,457.—MEDICAL COMPOUNDS FOR THE CURE OF DISEASES OF THE NERVES, LIVER, AND STOMACH.—*Henry R. Rogers*, Boston, Mass. Application filed February 18, 1889. Used since November 1, 1888.
"The representation of a crown on the field or ground of a shield, and with beams of light radiating therefrom."

16,458.—MEDICAL COMPOUND FOR EXTERNAL AND INTERNAL USE.—*George H. Rundle*, Piqua, Ohio. Application filed January 29, 1889. Used since December, 1888.
"A monogram of the letters 'R P K.'"

16,459.—SHEARS.—*Henry Seymour Cutlery Company*, Holyoke, Mass. Application filed February 13, 1889. Used since July, 1884.
"A diamond-shaped panel and a curved scroll, which extends from it and horizontally across the label."

16,460.—LEATHER-GREASE.—*Adolph Sommer*, San Francisco, Cal. Application filed December 29, 1888. Used since February, 1888.
"The word 'VISCOL.'"

16,461.—CIGARS.—*Wengler & Mandell*, Chicago, Ill. Application filed October 4, 1888. Used since September, 1885.
"The words 'KING BEE.'"

16,462.—ELASTIC AND FLEXIBLE COMPOUND AND ARTICLES MADE THEREFROM.—*Annie M. Wood*, Westminster, England. Application filed October 6, 1888. Used since July 29, 1886.
"The word 'WOODITE.'"

LABELS.

5,860.—Title: "PARRISH'S GRANULATED YEAST PELLETS."—*F. M. Parrish & Co.*, Cumberland, Md. Application filed March 5, 1889.

5,861.—Title: "PORPOISINE" (FOR A DRESSING AND LUBRICATING COMPOUND FOR LEATHER.)—*Porpoisine Manufacturing Company*, Hurffville, N. J., and Philadelphia, Pa. Application filed February 4, 1889. (Trade-Mark Registered.)

5,862.—Title: "MICAJAH'S MEDICATED UTERINE WAFERS."—*Micajah & Co.*, Warren, Pa. Application filed March 7, 1889.

5,863.—Title: "SWEET WHEAT CHEWING GUM."—*Royal Remedy and Extract Company*, Dayton, Ohio. Application filed January 28, 1889.

DISCLAIMER.

8,388. (Reissue.)—*Augustus Day*, Detroit, Mich. Original patent, No. 125,547, dated April 9, 1872. Reissue patent dated August 27, 1878. IMPROVEMENT IN TRACK-CLEARERS. Disclaimer filed March 22, 1889, by the patentee.

Enters his disclaimer to claims 1 and 2 of said reissue patent, which are in the following words, to wit:

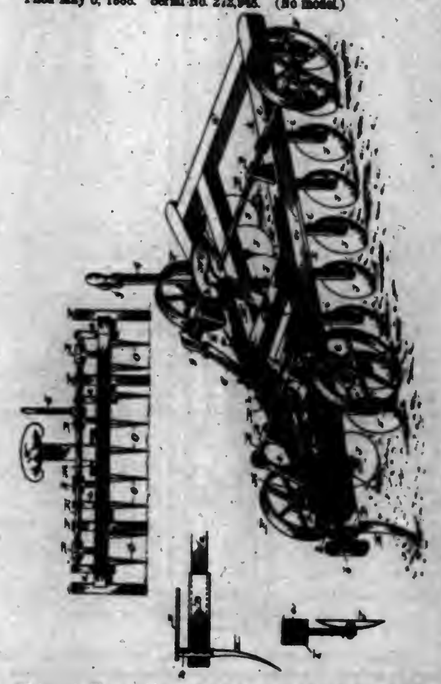
"1. In a railway-car, a pair of independently-acting scrapers, pivotally secured to the floor of the same, and resting upon the track, when in operation, wholly by their own weight, in combination with means for raising and lowering such scrapers simultaneously, substantially as and for the purpose set forth.

"2. In a track-cleaning device, the combination, with an independently-acting scraper, resting, when in operation, wholly by its own weight upon the track, of a draw-bar in the direct line of draft and a supplementary and diagonal draw-bar, which at the same time acts as a brace, the forward ends of both of said draw-bars being secured on the same axial line, substantially as and for the purpose set forth."

PATENTS

GRANTED APRIL 2, 1889.

400,422. DISK CULTIVATOR. JOSEPH ALBERTSON, Chicago, Ill. Filed May 5, 1888. Serial No. 272,948. (No model.)



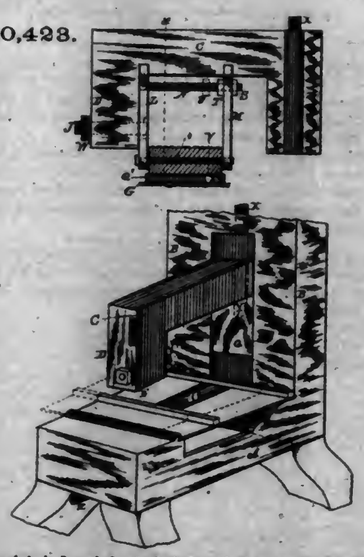
Claim.—1. The combination, with the triangular frame, of a plow at the point of intersection of the longitudinal beams of said frame, provided with a bearing portion journaled in a block, B, a lever for adjusting the plow rigidly secured to the upper end of said bearing portion and at right angles thereto, and a horizontally-disposed segmental rack-bar adapted to be engaged by a clutch upon the lever to retain the plow in adjusted position, substantially as and for the purpose set forth.

2. The herein-described plow, comprising the triangular frame carrying rotatable disks, the horizontally and transversely disposed axles having bearings thereon, crank-arms at the ends of said axles having carrying-wheels mounted thereon, levers rigidly secured to the axles and at right angles thereto, vertically-disposed segmental rack-bars adapted to be engaged by clutches upon the levers to retain the axles in adjusted position, a plow at the front end of the frame having a vertical bearing portion, an adjusting-lever rigidly secured to the latter at right angles thereto, a horizontally-disposed segmental rack-bar adapted to be engaged by a clutch upon said lever to retain the plow in adjusted position, a seat upon the frame, and a clevis at the front end of the latter, all arranged and adapted to be operated substantially as and for the purpose set forth.

400,423. MACHINE FOR ORNAMENTING WOOD. EDWARD W. ALLEN, Minneapolis, Minn. Filed Nov. 24, 1888. Serial No. 291,730. (No model.)

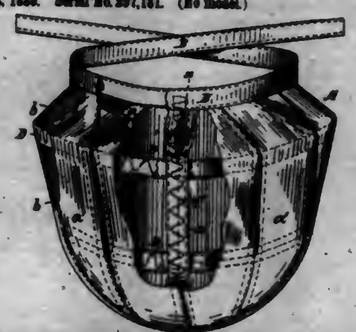
Claim.—In a machine for imprinting wood, the standards L and M, notched out at their top portions, in combination with the arm C D, which they engage, and the arm L, carrying the fixed screw-rod N,

400,428.



the fixed bolt J, and fixed shaft O, and the arm N, provided with bearings to receive the screw-rod N and shaft O, and the screw-rod carrying the jam-nut T, and a clamping-nut, S, with the die R and table D', and feed-roller G of the machine, as specified.

400,424. BUSTLE. CHARLES A. ALLEN, Chicago, Ill. Filed Jan 22, 1889. Serial No. 297,161. (No model.)

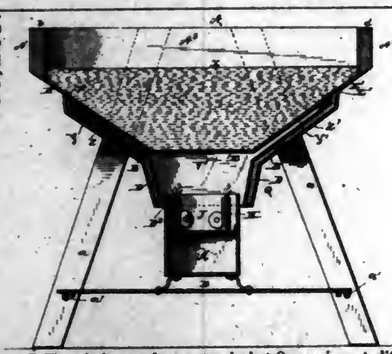


Claim.—As a new article of manufacture, a bustle structure consisting of a number of crimped-wire springs arranged vertically, a number of companion springs disposed at right angles with reference to the vertical springs, the pockets in which the series of springs are inserted, the outside covering, and the binding-wire secured in and extending around the edge of said covering, substantially as and for the purpose set forth.

400,425. WASH-BOILER TANK. JOHN W. ANDERSON, Lancaster, Pa. Filed June 10, 1888. Renewed Nov. 23, 1887. Serial No. 256,305. (No model.)

Claim.—1. The combination of the vessel A, having the hipped

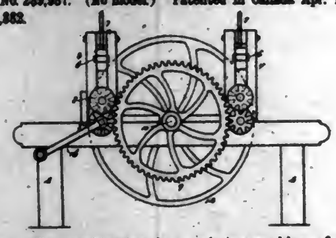
400,425.



bottom E E', and the pendent water-jacket Q, opening at different levels into vessel A, and comprising the side plates, V V', the fire-plates D D', forming the flues, and the skirting-sections Z Z', substantially as and for the purposes set forth.

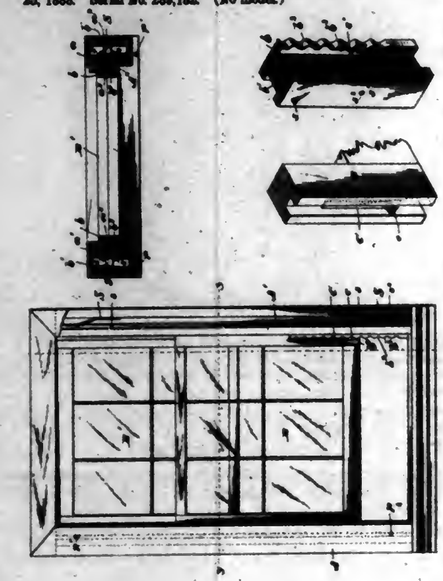
2. The combination of supporting-frame *a a'*, vessel A, having hipped bottom E E', depending water-jacket Q, opening into the vessel A at different levels and forming the confine and flues, support R, and the heater projecting into the confine, substantially as and for the purposes herein shown and described.

400,426. SHINGLE OR SHEET-METAL PAINTING MACHINE. GEORGE D. ARMSTRONG, Belleville, Ontario, Canada. Filed Nov. 5, 1888. Serial No. 289,967. (No model.) Patented in Canada Apr. 13, 1888. No. 23,882.



Claim.—The combination, in a painting-machine, of the two series of rollers having intermeshing gear-wheels, the central shaft, 10, wheel 9, secured thereon, pinions 11, with which said wheel gears, the bearing or support 20, secured to said shaft, and the springs having inner flanged or bent ends adjacent said bearing or support, substantially as set forth.

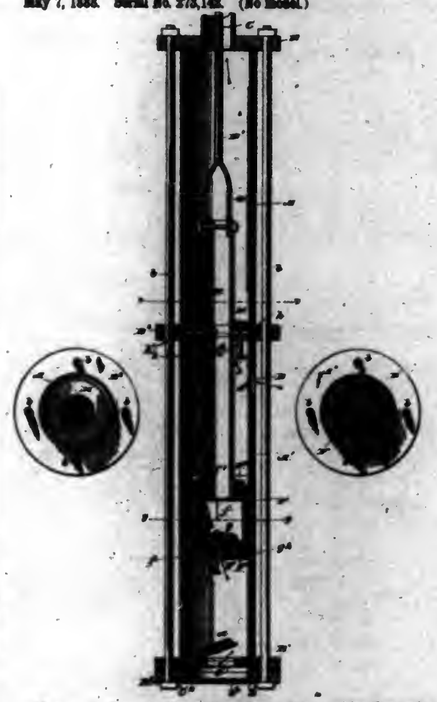
400,427. WINDOW. BRUNO ARCHENBACH, St. Joseph, Mo., assignor of one-half to George L. Herman Mueke, same place. Filed Oct. 25, 1888. Serial No. 289,132. (No model.)



Claim.—1. The combination, substantially as described, of a window-frame the sides of which are provided each with a slot, spring-pressed guide-strips loosely seated therein and having a central groove or channel in their outer faces to form inner and outer flanges, and the upper and lower sash having grooved stiles engaging, respectively, the outer and inner flanges of the guide-strips.

2. In a window, the combination of the slotted jambs having movable grooved or channeled guide-strips therein, having transverse apertures *d'* and *d³*, the springs in rear of and engaging said guides, the pins *e*, the pins *p* and *p'*, and the sash having grooved stiles sliding on the flanges of the channels or grooves in the guides, substantially as described.

400,428. PUMP. CHARLES BARLEY, Mechanicsville, Iowa. Filed May 7, 1888. Serial No. 273,142. (No model.)



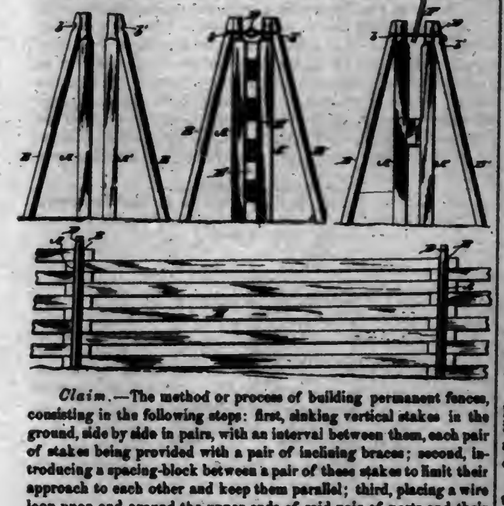
Claim.—1. In a double-acting pump, the combination, substantially as set forth, of a sectional cylinder having heads with a central and peripheral apertures, and the one face of each provided with a chamber or groove fitting, respectively, over the upper and lower ends of the upper and lower sections of said cylinder, the head of the lower section having a central valved opening and the upper part of one side of said section provided with a similar opening, a central disk or flat plate provided with grooves or channels in both face thereof fitting over and unitedly supporting the contiguous ends of the sections of the cylinders, having a valve-recess in its upper face, with a central piston-opening surrounded by valve-openings extending through the bottom of said recess and outer peripheral apertures, a hollow piston-rod or pipe having an open top connected at its upper end to a solid piston-rod, a chambered piston head or plunger attached to and in direct communication with the lower end of the hollow piston-rod, having an opening in the bottom thereof provided with a gravity-valve and dished packings at the upper and lower ends thereof, and the elongated tie-rods secured in connection with and passing through the peripheral apertures in the heads of the cylinders and through the peripheral apertures in the centrally-interposed disk-plate on the outside of the cylindrical sections.

2. In a double-acting pump, the combination, with the sectional cylinder, of the grooved or channeled heads projecting outwardly beyond said sections to provide flanges in which peripheral apertures are formed, the single central valve-disk or flat plate having grooves or channels therein inside of the periphery thereof for the reception and support of the contiguous ends of the cylinder-sections, and by the inner formation of the grooves or channels providing flanges projecting outwardly beyond the circumference of the said cylinders and having peripheral apertures therein, and the elongated tie-rods held in connection with the upper and lower heads of the cylinders and

freely passing through the peripheral apertures in the central disk or plate to secure said heads upon the ends of the cylinders and hold the cylinder-sections in rigid alignment by passing through the disk-plates, substantially as described.

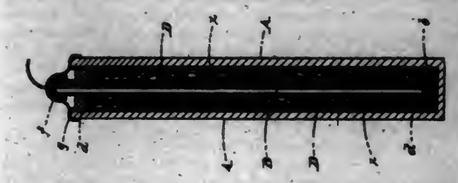
3. In a double-acting pump, the combination, with the lower cylindrical section, of a head, B', having a valved opening, C', therein, and a central recess, C³, in the lower side thereof communicating directly with the said valved opening, and a plate, B³, attached to the plate B', having a recess, *b'*, in its upper side conforming to and with the recess C³ in head B', forming a chamber under valved opening C', the bottom wall of said recess *b'* having a series of vertical apertures, *b³*, formed therein, substantially as described.

400,429. METHOD OF FENCE-BUILDING. DAVID R. BARTON, Centreville, Md. Filed Oct. 12, 1888. Serial No. 288,562. (No model.)



Claim.—The method or process of building permanent fences, consisting in the following steps: first, sinking vertical stakes in the ground, side by side in pairs, with an interval between them, each pair of stakes being provided with a pair of inclining braces; second, introducing a spacing-block between a pair of these stakes to limit their approach to each other and keep them parallel; third, placing a wire loop upon and around the upper ends of said pair of posts and their braces; fourth, twisting said loop to draw said stakes against said blocks; fifth, removing the spacing-block and using it as above with successive pairs of stakes until a sufficient number of them are complete, and, finally, inserting the rails between the pairs of stakes, all substantially as and for the purpose set forth.

400,430. GALVANIC BATTERY. EDWARD H. CROSBY, Boston, Mass. Filed Jan. 10, 1889. Serial No. 295,983. (No model.)



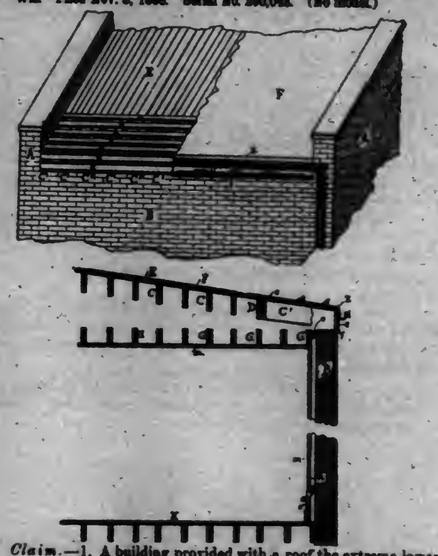
Claim.—1. In an electric battery, the combination of a zinc-containing jar, a carbon pencil disposed within said jar and insulated therefrom by hard-rubber rings, and a packing disposed around said pencil consisting of wool waste saturated with a solution of sal-ammoniac, substantially as described.

2. In an electric battery, the combination of a zinc-containing jar, a carbon pencil disposed in said jar and insulated therefrom, a packing around said pencil consisting of wool waste impregnated with sal-ammoniac, and a wire-connector on said pencil composed of lead and tin, substantially as described.

3. In an electric battery, the combination of a zinc-containing jar amalgamated on its inner face, an insulator in the bottom of said jar, a carbon pencil resting therein and provided with insulating-rings, a wire-connector on said pencil composed of lead and tin, an excitant consisting of sal-ammoniac suspended in a sponge-like material around said pencil, and an insulating-cap for said jar, substantially as described.

4. In an electric battery, the combination of the zinc-containing jar A, amalgamated at *x*, and provided with the insulator *b*, the pencil B, having the insulating-rings *d*, the packing D, disposed around said pencil and composed of wool waste saturated with sal-ammoniac, the wire-connector *f*, composed of a compound of tin and lead, and the insulating-cap *g*, all being arranged substantially as described.

400,431. FLAT-ROOFED BUILDING. JAMES G. BERELY, Oshkosh, Wis. Filed Nov. 5, 1888. Serial No. 290,042. (No model.)



Claim.—1. A building provided with a roof the extreme lower edges of which are in contact on one side with a body of air within the building, whereby the temperature of the roof is moderated at all points and snow readily shed.

2. The combination, with the walls of a building, of a roof supported thereby, the lower edges of the roof resting on the walls, an interior air-space being in contact with the roof between the walls and the lower edges, and being in communication with the under side of the roof at its extreme lower edge.

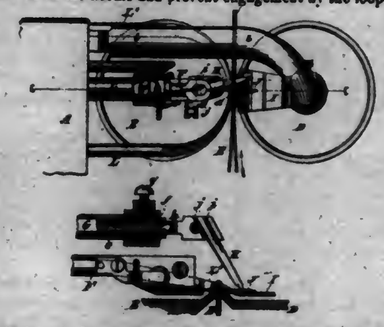
3. A building provided with a roof supported on the walls so that the under side of the roof is in contact throughout its entire surface, including the lower edges, with an interior air-space, and provided with warm-air ducts from lower floors to the air-space.

4. In a building, the combination of the walls, inclined roof supported on the walls and in contact at all points, including the extreme lower edges, with an interior air-space, supports for the roof spaced to permit direct contact with the interior air, and warm-air ducts from the lower stories opening into the air-space.

5. In a building, the combination of the walls supporting the roof, the header D, supporting the rear roof-joists, the opposite ends of which rest upon the top of the rear wall, slats across the top and lower end of these joists to support the roof-covering, and an air-space between the roof-covering and the top of the rear wall, connecting with ducts between the plastering and the rear wall extending upwardly from ventilators or openings from inside rooms, as and for the purpose set forth.

400,432. GLOVE-SEWING MACHINE. CLAUDE M. BOLAND, New York, N. Y. Filed May 12, 1888. Serial No. 273,704. (No model.)

Brief.—The looper is made so as to be adjustable as to height or length, so that the point may be accurately adjusted with regard to the needle. A guard-plate, I, has an oblique slot, which acts as a guard to hold down the needle and prevent engagement by the looper.



Claim.—1. In a sewing-machine, the needle guard or protector I, having an oblique slot for the needle, combined with the looper and needle and with fabric-feeding mechanism, substantially as described.

2. The needle guard or protector I, having an oblique slot for the needle, and a lip, *d*, that projects over the needle, combined with a looper and needle and with fabric-feeding mechanism, substantially as described.

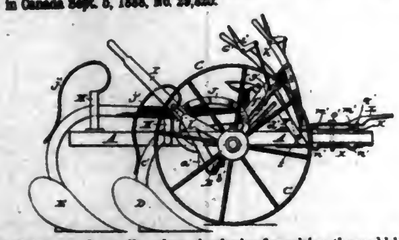
3. In a sewing-machine, the vertically and horizontally adjustable sectional looper A H, combined with complemental stitch-forming and feeding mechanism, substantially as described, and with the guard of protector I, having an oblique slot for a needle, substantially as specified.

4. The looper-bar G, having horizontal socket *e* extending from its end inwardly, combined with the rod *h*, having nearly-vertical socket *i*, the rod *h* passing within the horizontal socket *e*, and with the looper H, that is held in said socket *i*, and with a needle and feeding mechanism, substantially as described.

5. The combination, with the feed-disks B D, of the two guides L L^2 over the disk B, at opposite sides thereof, for keeping the edge of the fabric above the disk B from falling over, and with stitch-forming mechanism, whose needle J enters between the ends of said guides, as specified.

6. The combination of the feed-disks B and D with the needle-guard I and the guides L L^2 over the disk B, at opposite sides of the disk, and with stitch-forming mechanism, substantially as herein shown and described.

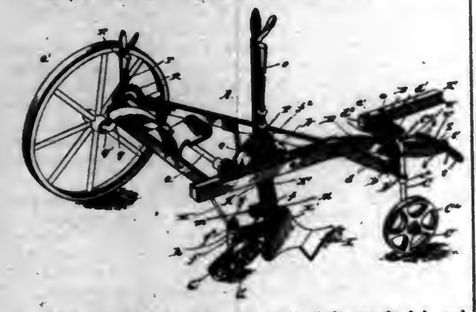
400,438. SULKY-PLOW. CHARLES BOULAY, St. Pie, Quebec, Canada. Filed Dec. 26, 1888. Serial No. 294,612. (No model.) Patented in Canada Sept. 5, 1888, No. 29,825.



Claim.—1. In a sulky-plow, the device for raising the mold-board, consisting of the bracket F and guide H, lever G, and link *f'*, and the curved beam *c'*, substantially as shown and described.

2. In a sulky-plow, the body A, supported by the swinging axle B, in combination with the slotted lever I, an arm, *l'*, secured to the axle and having a pin to engage with the lever, and an arc, J, all arranged substantially as shown.

400,484. HILLSIDE-PLOW. MARCELLUS J. BUSSELL, Taylor, Tex. Filed Nov. 15, 1888. Serial No. 290,889. (No model.)



Claim.—1. In a plow, the combination of the standard depending from the frame of the plow, the movable arm pivoted to the said standard near its lower end and having the plowshare fixed thereto, and the operating-lever mounted on the plow-frame and provided with a toothed sector meshing with a toothed T-head on the upper end of the said movable arm, substantially as specified.

2. In a plow, the combination, with a standard depending from the frame thereof, of the movable arm pivoted near its lower end and having the plowshare and mold-board affixed thereto, the operating-arm mounted on the said frame and provided with a toothed sector meshing with a toothed T-head on the upper end of the movable arm, and the brace-bar extending from the mold-board to the movable arm and provided at an intermediate point with a loop, *m*, operating on the standard, substantially as specified.

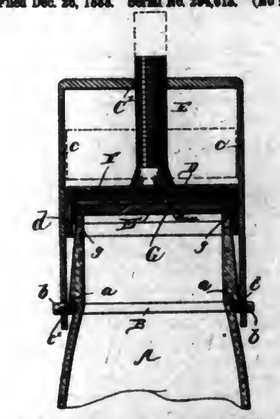
3. In a plow, the combination, with the beam, of the depending standard, the movable arm pivoted to the standard near its lower end, and provided at its lower end with a curved plate, *k*, and at its upper end with a toothed T-head, the plowshare secured to the said curved plate, the operating-lever mounted on a bracket arranged on the said beam and having a toothed sector meshing with the toothed T-head, and the spring-actuated latch mounted on the lever and engaging a toothed rack on the upper extended end of the standard to lock the lever in the desired position, substantially as specified.

400,485. HOLDBACK FOR VEHICLE-THILLS. MILTON R. CAMPANY, Hamilton, Mich. Filed Oct. 3, 1888. Serial No. 287,050. (No model.)



Claim.—In a holdback-strap attachment, the combination, with a base-plate provided near its rear end with a forwardly-projecting hook having an upturned point and formed with a recess in its inner upright portion, of a spring-plate provided with a perforation at its front end, through which it is adapted to be secured by one of the ordinary screws for securing the attachment to the thill, said spring-plate being curved upwardly, rearwardly, and downwardly under the hook, and provided with a contracted rear end projecting and playing within the recess of the hook, substantially as and for the purpose set forth.

400,486. BOTTLE-STOPPER. WILLIAM R. CHAMBERS, Newark, Ohio. Filed Dec. 26, 1888. Serial No. 294,613. (No model.)



Claim.—1. In a bottle-stopper, the combination of the revoluble yoke C, connected to a ring on the neck of the bottle, the cap fitting over the mouth of the bottle and provided with a vertical threaded stud engaging a central tapped aperture in the yoke, and the ground-glass disk E, secured loosely in the cap and adapted to bear on the mouth of the bottle, whereby the yoke may be rotated to raise or lower the cap without rotating the cap or the disk and the disk may be pressed against and removed from the mouth of the jar, substantially as specified.

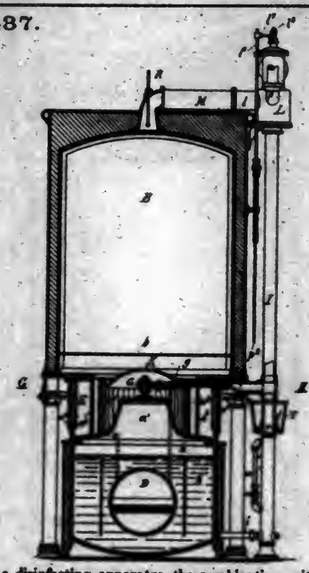
2. In a stopper, the combination, with a revoluble yoke connected to the neck of the bottle, of the cap provided with a threaded stud engaging a threaded aperture in the yoke, the glass disk arranged in the cap and bearing on the mouth of the bottle, the compressible cushion interposed between the said disk and the upper side of the cap, and the collar arranged below the disk to hold it in place, substantially as specified.

3. In a stopper, the combination, with a revoluble yoke connected to the neck of a bottle, of the cap provided with a threaded stud engaging a threaded aperture in the yoke, the glass disk arranged in the cap and bearing on the mouth of the bottle, the compressible cushion between the glass disk and the top of the cap, and the metallic disk interposed between the glass disk and the cushion, substantially as described.

400,487. DISINFECTING APPARATUS. HUGHS CLARENBACH, Berlin, Germany. Filed Mar. 10, 1888. Serial No. 266,872. (No model.) Patented in Norway Feb. 13, 1888, No. 980; in Italy Mar. 1, 1888, XXI, 22,889, and in Austria-Hungary June 1, 1888, No. 42,435 and No. 10,233.

Claim.—1. In a disinfecting apparatus, the combination, with the disinfecting-chamber, of a steam-generator, a valved duct for conducting the steam from the generator to said chamber, a heater interposed in the passage of the steam, and a deflector for deflecting such steam upon the heated walls of the heater, substantially as and for the purposes specified.

400,487.



2. In a disinfecting apparatus, the combination, with the disinfecting-chamber, of a steam-generator, a valved duct for admitting steam to said chamber, a heater interposed in the passage of the steam from the boiler to the disinfecting-chamber, and a valved air-duct connected with the heater and opening into the atmosphere, whereby steam or air, or both, may be admitted to the disinfecting-chamber and said air heated before its admission thereto, substantially as and for the purposes specified.

3. In a disinfecting apparatus, a disinfecting-chamber and a steam-generator connected with said chamber at one end thereof, and in combination therewith, of an exhaust-pipe connected with the generator and by a branch pipe with the opposite end of the disinfecting-chamber to that where it is connected with said generator, and a liquid seal interposed in the connection between the exhaust-pipe and the branch thereof, substantially as and for the purposes specified.

4. In a disinfecting apparatus, the combination, with the disinfecting-chamber, a steam-generator, and a valved duct connecting the generator with said chamber, of a valved air-duct connected with the heater, an exhaust-pipe connected with the generator, and a three-way cock interposed in the connection between the generator, the disinfecting-chamber, and the exhaust-pipe, whereby steam may be admitted to said chamber from the generator or exhausted from the latter by the manipulation of a single cock, substantially as and for the purposes specified.

5. In a disinfecting apparatus, the combination, with the disinfecting-chamber, a valve-casing, L, a pipe connecting the disinfecting-chamber with the valve-casing, an exhaust branch for said valve-casing, a deflector extending to near the bottom of the valve-casing to divide the same into two communicating chambers connected, respectively, with the exhaust branch thereof and the exhaust-pipe of the disinfecting-chamber, and a pipe projecting through the bottom of the valve-casing beyond the lower edge of the deflector, of a steam-generator, a valved duct connecting the generator with the disinfecting-chamber, and a return-pipe connected with the pipe projecting through the bottom of the valve-casing and with the steam-generator, substantially as and for the purposes specified.

6. In a disinfecting apparatus, the combination, with the disinfecting-chamber, a steam-generator, an exhaust-pipe, ducts connecting the generator with the disinfecting-chamber and exhaust-pipe, a three-way cock interposed in said ducts, and valved air-ducts communicating with the disinfecting-chamber, of a rock-shaft, an operating-lever secured thereto and connected with the three-way cock, and a like shaft and valve connected with the air-duct valves, said parts being arranged and operating substantially as shown and described.

7. In a disinfecting apparatus, the combination, with the disinfecting-chamber, of a steam-generator arranged below the chamber and provided with a steam-dome, a draft-flue connected with the generator-furnace encompassing the steam-dome to form between the two a heating-chamber, said chamber communicating with the disinfecting-chamber, a connection between the draft-flue and a chimney, and a partition, F', in said flue interposed between the inlet and outlet for the products of combustion, substantially as and for the purposes specified.

8. In a disinfecting apparatus, the combination, with the disinfecting-chamber, of a steam-generator arranged below the chamber and provided with a steam-dome, a draft-flue provided on its inner wall with heat-radiating ribs, said flue encompassing the steam-dome and forming a heating-chamber around the same—that is, in communication with the disinfecting-chamber—a furnace, a connection between the furnace and the draft-flue and between the latter and a chimney, and a partition, F', interposed in said draft-flue between the inlet and outlet for the products of combustion, substantially as and for the purposes specified.

9. The combination, with the disinfecting-chamber, of a steam-generator provided with a steam-dome having radiating-ribs on its outer surface, and a draft-flue encompassing the steam-dome having radiating-ribs formed on its inner surface, substantially as and for the purposes specified.

10. In a disinfecting apparatus, the combination, with the disinfecting-chamber, a steam-generator arranged below the same and provided with a steam-dome, a valved steam-duct extending vertically from the dome, and a hood or deflector arranged above the steam-duct, of a flue connected with the generator-furnace and with a chimney surrounding the steam-dome and forming a heating-chamber in communication with the disinfecting-chamber, substantially as and for the purposes specified.

11. In a disinfecting apparatus, the combination, with the steam-generator, an exhaust-pipe connected with both the steam and water spaces of the boiler, said pipe having feed-ports formed therein at a point intermediate of its connections, of a feed-hopper surrounding said ports, and a bell or hollow cone mounted on the pipe, with its open end below the feed-ports, substantially as and for the purposes specified.

12. In a disinfecting apparatus, the combination, with the disinfecting-chamber having a perforated bottom, of a steam-generator arranged below said chamber and provided with a steam-dome, a valved steam-duct extending vertically from the dome, a hood or deflector arranged over said duct, a flue surrounding the steam-dome and deflector connected with the generator-furnace, and a chimney and cold-air ducts connected with the space between the dome and surrounding flue, substantially as and for the purposes specified.

13. The combination, substantially as described, with the disinfecting-chamber, a steam-generator, a valved steam-duct in communication with the disinfecting-chamber, an exhaust-pipe, and a valved connection between the exhaust-pipe and steam-space of the boiler, of a valve-casing on the exhaust-pipe, into which said pipe projects slightly, a bell-mouthed pipe inclosing the upper end of the exhaust-pipe and opening into the atmosphere, a branch pipe connecting the casing with the disinfecting-chamber at a point above the upper edge of the exhaust-pipe exteriorly of the bell-mouthed pipe, a branch pipe for connection with a chimney, and a valve interposed between the latter pipe and the connection with the disinfecting-chamber, substantially as and for the purposes specified.

14. The combination, substantially as described, with the disinfecting-chamber, valved air-ducts communicating with said chamber, a steam-generator, an exhaust-pipe, connections between the steam-space of the generator, the exhaust-pipe, and the disinfecting-chamber, of a valve-casing on the exhaust-pipe, into which said pipe projects, a connection between the casing and the disinfecting-chamber, a bell-mouthed pipe inclosing the upper end of the exhaust-pipe and opening into the atmosphere, a branch for connecting the casing with a chimney, a valve arranged in the casing between the latter branch and the connection with the disinfecting-chamber, a rock-shaft, levers secured thereto, and connecting-rods connecting the levers with the valve in the valve-casing and the valves in the air-ducts, whereby all of said valves may be set at a single operation of the rock-shaft, substantially as and for the purposes specified.

400,488. ROD-PACKING. JOSEPH COCKFIELD and CLINTON D. HIGGINS, Boone, Iowa. Filed Oct. 23, 1888. Serial No. 288,986. (No model.)

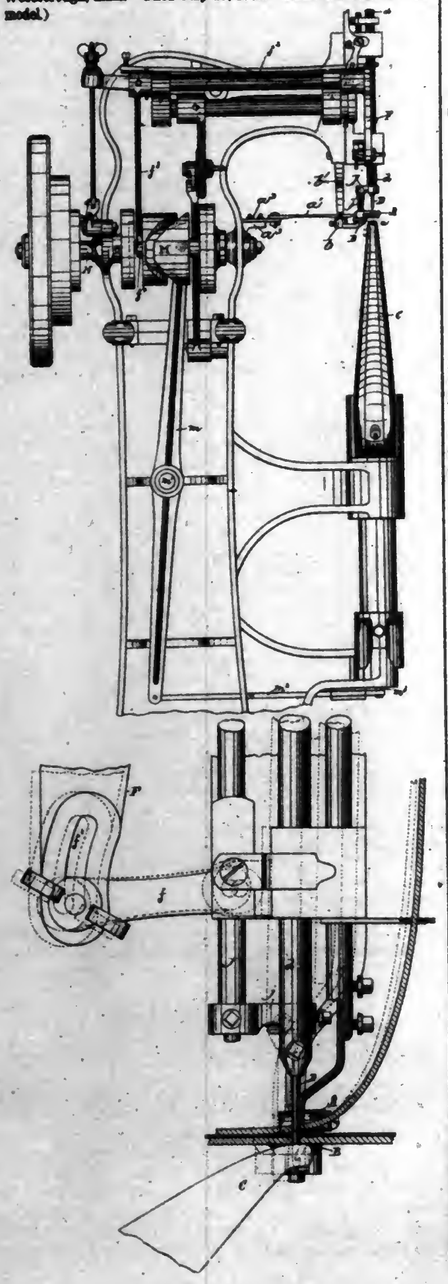


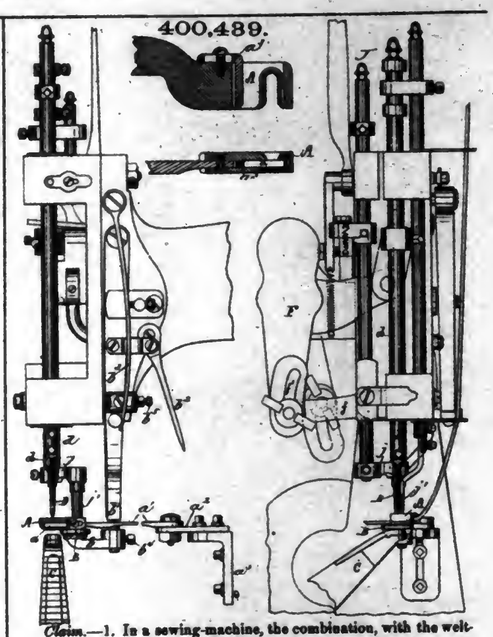
Claim.—1. The combination, with the companion packing-rings, of the backing or filling rings D D', having the adjacent edges beveled, as described, the sectional ring D^2, beveled on both edges to corre-

spond to and wedge in between the rings D D', and the compressing-ring b', inclosing the ring D^4, substantially as and for the purpose set forth.

2. In the metallic packing, the combination of the following elements: the companion sectional packing-rings, the sectional ring c, inclosing said packing-rings, a ring or spring band encircling the ring c, a gland having a recess on the inner end, a flange-sleeve seated in said recess, the backing-rings D D', having the joining edges beveled to form a V-shaped groove between the same, the ring D^3, correspondingly beveled on both edges to wedge into said groove, and the spring-compressing ring b', inclosing the sectional ring D^3, substantially as and for the purpose set forth.

400,439. BOOT OR SHOE SEWING MACHINE. WILLARD CONEY, Westborough, Mass. Filed July 23, 1884. Serial No. 138,670. (No model.)

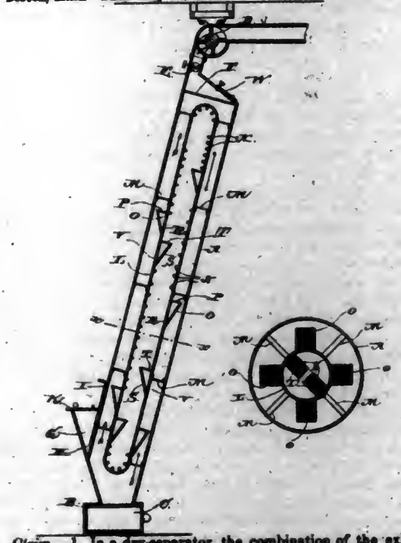




Claim.—1. In a sewing-machine, the combination, with the welt-guide A, having an orifice through which the welt passes, of the rotary horn C, the edge-guide B, and a presser-bar, all substantially as and for the purpose set forth.

2. In a sewing-machine, the combination of guide A, having a welt-passage through it, the presser *j j'*, bearing upon the welt-guide, the rotary horn C, and the gage B, arranged and operating substantially as and for the purpose set forth.

400,440. ORE-SEPARATOR. JOSEPH COOMBS, Portland, Me., assignor to the Coombs Mining and Dry Mineral-Separator Company, Boston, Mass. Filed May 12, 1888. Serial No. 273,607. (No model.)



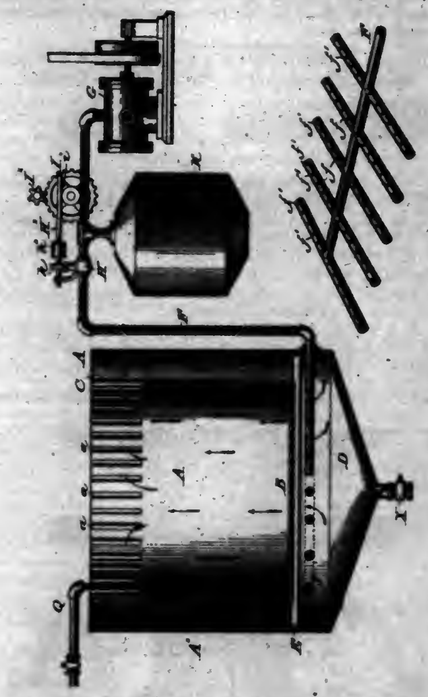
Claim.—1. In a dry-separator, the combination of the exhaust-fan, the exterior case, A, and the perforated case L, located within the same and provided with the internal and external pockets, for the purpose set forth, substantially as described.

2. The combination of the exhaust-fan, the exterior case, A, the perforated case L, located within the same, the pockets O on the outside of the interior case and communicating with the interior thereof, and the pockets L and communicating with the exterior thereof, for the purpose set forth, substantially as described.

3. The combination of the exterior case, A, having the hopper

G, the box B at the lower end of case A, the screen F in the upper end of said case, the exhaust-fan, the damper E to regulate the strength of the current, the perforated case L, located in the case A, the bars M, connecting the interior and exterior cases, and the pockets O and S on the outer and inner sides of the case L, for the purpose set forth, substantially as described.

400,441. PROCESS OF AGITATING HIDES OR LEATHER SCRAPS. CHARLES W. COOPER, Brooklyn, N. Y. Filed July 6, 1888. Serial No. 279,197. (No model.)



Claim.—1. The method of agitating or treating hides in liquids, which consists in treating said hides in a receptacle through the sides and bottom of which the liquid has egress and ingress, respectively, by alternately elevating said hides therein by the introduction of gaseous fluid beneath them and permitting them to sink by the action of gravity, as specified.

2. The method herein described of agitating hides and liquids contained in a vat, which consists in alternately causing said hides to rise therein by means of a current of air entering the bottom of said vat beneath them, and by the cessation of such current of air permitting them to descend by gravity, substantially as set forth.

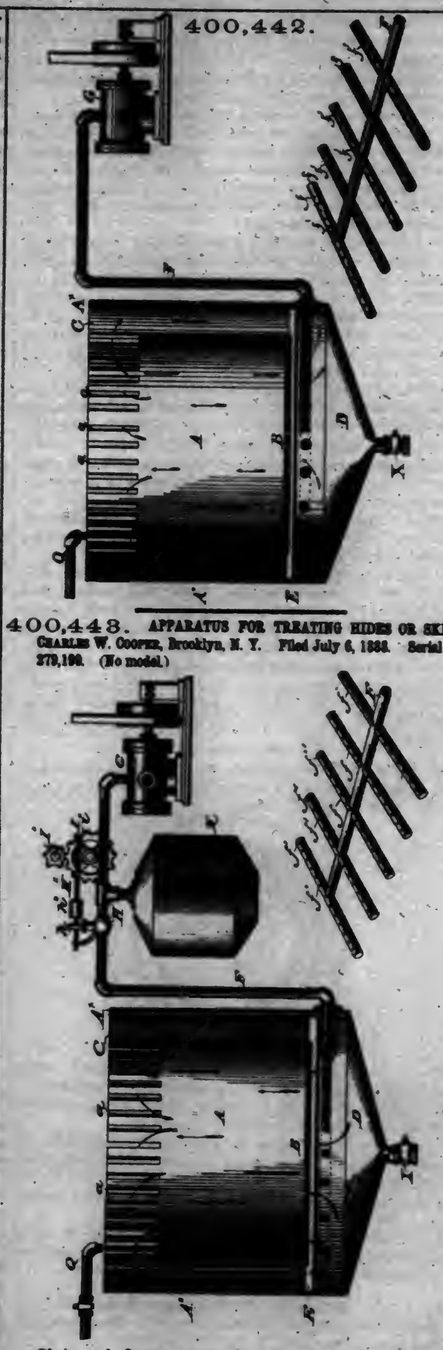
3. The method herein described of agitating hides and liquids contained in a vat, which consists in inducing an upward current of said hides and liquor by means of a gaseous fluid introduced into said tank beneath them, permitting part of said liquid to escape from above said hides and to re-enter the vat at a lower point and beneath the hides, and by interrupting the flow of said gaseous fluid and permitting said hides to sink by gravity through the liquid, as specified.

400,442. PROCESS OF AGITATING HIDES OR LEATHER SCRAPS. CHARLES W. COOPER, Brooklyn, N. Y. Filed July 6, 1888. Serial No. 279,198. (No model.)

Claim.—1. The method of agitating or treating hides in liquid, which consists in subjecting said hides in a receptacle (through orifices in the sides or bottom of which the said liquid may flow into and out from a common liquid-reservoir) to the action of currents of air introduced within and at or near the bottom of said receptacle, as specified.

2. The method of treating hides or glue-scraps in water or other liquid in the chemical treatment thereof or for the removal of impurities therefrom, which consists in feeding air or a suitable gas into and at or near the bottom of a vessel containing the mass to be treated, in such manner as to cause the hides or scraps treated to be agitated in contact with each other, and at the same time to cause the water or liquid in said vessel to flow or circulate from the upper part of said vessel to the lower part thereof and under the hides or scraps therein, as specified.

400,442.



400,443. APPARATUS FOR TREATING HIDES OR SKINS. CHARLES W. COOPER, Brooklyn, N. Y. Filed July 6, 1888. Serial No. 279,199. (No model.)

Claim.—1. In an apparatus for treating hides in water or other liquid, in combination, a tank adapted to contain the hides, having liquid-outlet orifices formed therein at or near the top thereof, and provided with a slatted bottom, an exterior tank inclosing said hide-containing tank, means for supporting said inner tank within said inclosing-tank and clear of the walls thereof, and air-pipes discharging into said hide-containing tank at or near the base thereof, substantially as set forth.

2. In an apparatus for treating hides in water or other liquid, a tank adapted to contain the hides, liquid inlet and outlet orifices formed therein at or near the bottom and top thereof, respectively,

an exterior tank inclosing said hide-containing tank, and an air-pipe furnished with outlet-provided branches, situated at the base of the hide-containing tank, all said outlets discharging within a space co-extensive and coincident with the slatted or perforated bottom of said hide-containing tank, substantially as set forth.

3. In an apparatus for treating hides in water or other liquid, a tank adapted to contain the hides, liquid inlet and outlet orifices formed therein at or near the bottom and top thereof, respectively, an exterior containing-tank between the walls of which and the perforated walls of the inner tank are liquid-spaces, an air-pipe discharging into the base of said hide-containing tank, a liquid-supply pipe, and a drawing-off cock, as specified.

4. In an apparatus for treating hides in water or other liquid, a tank adapted to contain the hides, liquid inlet and outlet orifices therein at or near the bottom and top thereof, respectively, and which open exteriorly into a common reservoir, an air-engine, an air-pipe leading from said air-engine to and discharging into the base of the hide-containing tank, a valve applied to the air-pipe, and a reservoir in communication with the air-pipe at a point between the engine and the air-pipe valve, as specified.

5. In an apparatus for treating hides in water or other liquid, a tank adapted to contain the hides, liquid inlet and outlet orifices formed therein at or near the bottom and top thereof, respectively, and which open exteriorly into a common reservoir, an air-engine, an air-pipe leading from said air-engine to and discharging into the base of the hide-containing tank, a valve applied to said air-pipe, a lever-arm attached to said valve, by the raising and lowering of which the valve is operated, a wheel having a pin projecting from its face adapted in the rotation of the wheel to operate said lever, and means for rotating said wheel, as specified.

6. In an apparatus for treating hides in liquor, in combination, a tank adapted to contain the hides, having liquid-outlet orifices formed therein at or near the top thereof, and provided with a slatted bottom, an exterior tank inclosing said hide-containing tank, means for inclosing said inner tank within said inclosing-tank so as to leave spaces between the opposing walls thereof, an air-pipe discharging into said hide-containing tank at or near the base thereof, a valve adapted to open and close said pipe, means for automatically operating said valve, an air-pump, and a reservoir in communication with said air-pump, as specified.

400,444. SULPHUR CANDLE. WILLIAM G. CRISSEY, East Orange, N. J., assignor to Seabury & Johnson, New York, N. Y. Filed Nov. 19, 1888. Serial No. 291,290. (Model.)



Claim.—1. A disinfectant candle comprising sulphur having wicks arranged transversely at the top, substantially as specified.

2. A disinfectant candle comprising sulphur having wicks arranged radially at the top, substantially as specified.

3. A sulphur candle having wicks arranged radially at the top and an intermediate wicking or tuft of fiber, substantially as specified.

4. A disinfectant candle comprising sulphur having at the top radial wicks embedded between their ends in the material of the candle, but exposed at both ends, substantially as specified.

5. A disinfectant candle comprising sulphur having its top or upper surface concaved from the outer wall toward the center and having transversely-extending wicks, substantially as specified.

400,445. SEAL-LOCK. OTIS E. DAVIDSON, Nashville, Tenn., assignor, by direct and mesne assignments, to W. W. Martin, same place. Filed May 12, 1888. Serial No. 273,673. (No model.)



Claim.—1. The combination, with the base having the recess in the under side, the turn-bolt provided with the shoulders for holding the hasp, and the ratchet and pawl for preventing the rotation of the bolt in one direction located in the recess in the base, of the large-headed studs on the turn-bolt and base, respectively, and the seal connecting said studs, for preventing the rotation of the bolt in the opposite direction, substantially as described.

2. The combination, with the base having the large-headed stud thereon, of a turn-bolt pivoting on said base having a corresponding large-headed stud thereon, the seal having the slot therein, with the widened portion at the center for connecting said studs and preventing the rotation of the bolt in one direction, and means, substantially as described, for preventing its rotation in the opposite direction, substantially as described.

400,446. MOUTH-PIECE FOR CIGARS. THERON S. E. DIXON, Chicago, Ill. Filed June 11, 1888. Serial No. 276,684. (No model.)

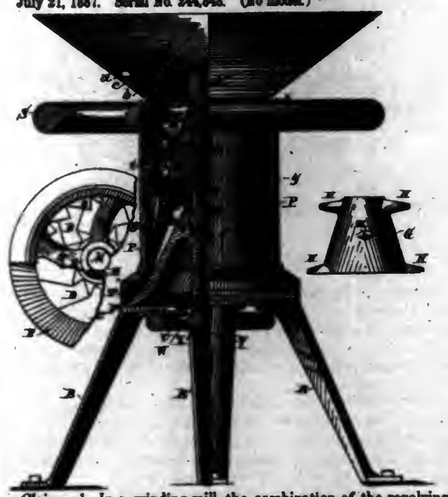


Claim.—1. A flexible mouth-piece for cigars, &c., substantially cylindrical in form and provided with an abrupt integral interior roll or flange, against which the end of the cigar may abut, substantially as and for the purpose set forth.

2. A flexible mouth-piece for cigars, &c., of substantially cylindrical form in the portion thereof which fits over the end of the cigar, and provided with an interior flange and slight exterior enlargement over the flange, substantially as described.

3. A flexible mouth-piece for cigars, &c., provided at one end with an interior annular flange integral with the mouth-piece and with a slight exterior enlargement over the flange, substantially as described.

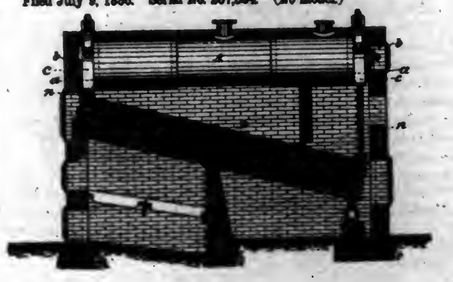
400,447. FEED-MILL. ADAM L. EFFLEY, Springfield, Ohio. Filed July 21, 1887. Serial No. 244,843. (No model.)



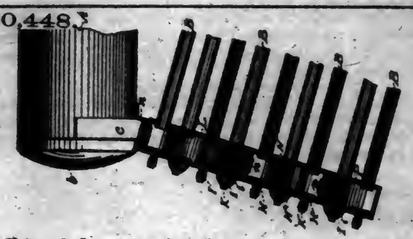
Claim.—1. In a grinding-mill, the combination of the revolving cylinder P, having the hub R formed thereon, the stationary cones G and C, formed with boxes in which the upper and lower ends of said hub work, the grinding-burrs attached, respectively, to the cone C and cylinder P, substantially as described.

2. The shaft M, the hub R, cylinder P, supported on the hub by the radial arms Q, the ring N forming a seat for hub R, and the regulating-wheel U, as and for the purpose set forth.

400,448. STEAM-BOILER. JOHN L. GILL, Jr., Philadelphia, Pa. Filed July 9, 1886. Serial No. 207,534. (No model.)



400,448.



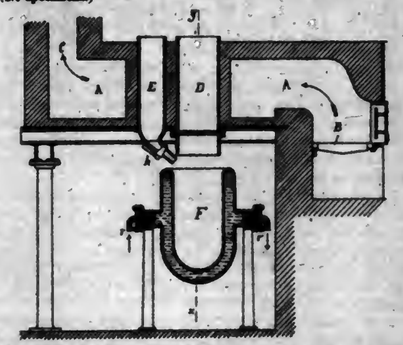
Claim.—1. In a water-tube boiler, a steam and water drum having at each end a head in which the lower half forms on each side the front of a pocket having a level base, or one dipping with the inclination of the tubes, and said pockets having vertical or inclined sides and openings in the base thereof for the reception of nipples or pipes, whereby said drum is brought into communication with the header or headers of the boiler, as shown and described, and for the purposes set forth.

2. In a water-tube boiler, a steam and water drum provided at each end with a pocket or pockets having convex or concave heads and angular sides, pipes or nipples expanded therein and into water-legs composed of headers or boxes, as described, having vertical or horizontal hand-hole openings, caps provided with one or more hubs inserted from the inside of the boxes, and arched dogs and bolts for securing the caps from the outside thereof, substantially as and for the purposes set forth.

3. In a water-tube boiler, a cap provided with one or more hubs projecting beyond the face of each box, in combination with a header or boxes, one or more horizontal oblong hand-hole openings, and arched dogs and bolts for securing the caps to the headers or boxes, substantially as described.

4. In a water-tube boiler, a longitudinal steam and water drum provided with end pockets having vertical sides, or sides inclined in the direction of the circumference of the drum, in combination with a series of pipes or nipples, front and back water-legs composed of a series of headers or boxes having vertical or horizontal oval or oblong hand-hole openings therein, caps with one or more hubs caused to project beyond the faces of the headers or boxes, and dogs and bolts for securing said caps to the headers or boxes, substantially as and for the purposes set forth.

400,449. PROCESS OF MANUFACTURING ALUMINIUM. LUDWIG GRABAU, Hanover, Germany. Filed Nov. 19, 1887. Serial No. 255,599. (No specimens.)



Claim.—1. The herein-described process of producing aluminium from pulverized aluminium fluoride by means of a metal of the alkalies, which consists, first, in infusing a metal of the alkalies; second, in pouring upon the fused metal pulverized aluminium fluoride, and allowing the reaction to take place without further heating and without the use of a flux, substantially as and for the purposes specified.

2. The herein-described process of producing aluminium from pulverized aluminium fluoride by means of a metal of the alkalies, which consists, first, in fusing a metal of the alkalies that will form a readily-fusible salt when combined with pulverized aluminium fluoride; second, heating pulverized aluminium fluoride; third, pouring the heated pulverized aluminium fluoride upon the fused alkali metal, and allowing the reaction to take place without further heating and without the use of a flux, substantially as described.

3. The herein-described process of producing aluminium from pulverized aluminium fluoride by means of a metal of the alkalies, which consists, first, in fusing a metal of the alkalies, and, second, pouring upon the fused metal the pulverized aluminium fluoride and cooling the surfaces of the receiver in which the reaction takes place to congeal a portion of the fused mass and form a lining for said vessel, substantially as and for the purposes specified.

400,450. IMITATION GEM. SAMUEL GROSSCOMB, Les Moussières, near Les Bouchoux, assignor to Richard A. Kipling, Paris, France. Filed July 11, 1888. Serial No. 279,889. (No model.) Patented in France July 2, 1887, No. 184,378.



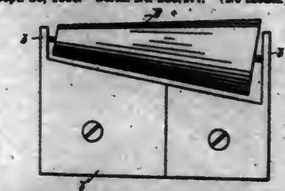
Claim.—1. The improvement in the manufacture of imitation gems, which consists in fusing upon one surface of a piece of straas a number of pieces of enamel, forming a ring or border within which the surface of the straas is exposed, substantially as described.

2. An imitation gem consisting of a piece of straas surrounded on one face by a border of enamel of darker hue, within which the surface of the lighter glass is exposed, substantially as described.

3. An imitation gem consisting of a piece of straas surrounded with a border of enamel so disposed as to form a design—such as a star—and having facets cut thereon, substantially as described.

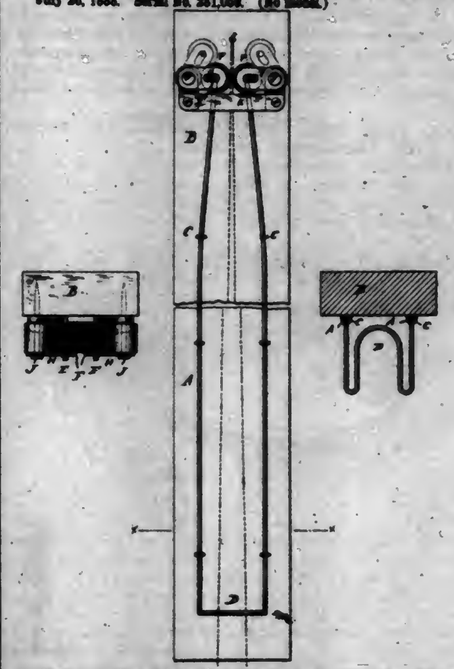
4. The faceted imitation gem composed of straas and enamel, the latter being disposed so as to produce a design—such as a star—of the exposed surface of the straas and having a light-reflecting medium on the back thereof, substantially as described.

400,451. VEHICLE RUB-IRON. DELBERT GILES, Fillmore, Ill. Filed Sept. 26, 1888. Serial No. 286,477. (No model.)



Claim.—The combination, with a wagon-body having an inclined groove or recess in its lower side edges, of the bracket having outwardly and downwardly projecting arms, one of which is longer than the other, and the inclined cone-shaped roll pivoted between said arms and located within said groove or recess, substantially as set forth.

400,452. WHIP-HOLDER. ALBERT HALL, Brooklyn, N. Y. Filed July 26, 1888. Serial No. 281,069. (No model.)



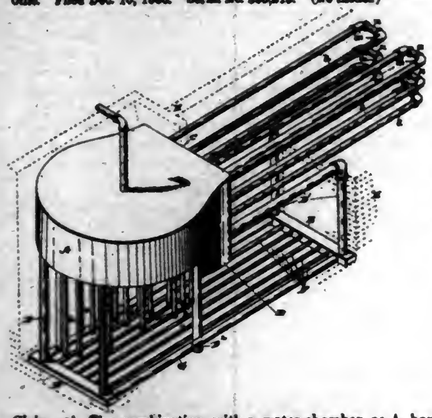
Claim.—1. In a whip-holder, the combination, with the swinging whip-grip, of a longitudinally-movable wire for operating the same, substantially as set forth.

2. In a whip-holder, the combination, with a pivoted link, of a whip-grip on the swinging end of the same, and a longitudinally-movable wire for swinging said link, substantially as set forth.

3. In a whip-holder, the combination, with swinging links, of whip-grips in the swinging ends of the same, a longitudinally-movable U-shaped wire connected with the swinging ends of the links and having its lower end bent outward and provided with a recess for receiving the thicker part of the whip, substantially as set forth.

4. In a whip-holder, the combination, with a board, D, of a longitudinally-movable wire, A, having pivots formed at its upper ends, the rollers F, mounted on said pivots, and the links H, substantially as set forth.

400,458. HEATING APPARATUS. LEWIS B. HARTUNG, Canton, Ohio. Filed Dec. 10, 1888. Serial No. 293,213. (No model.)

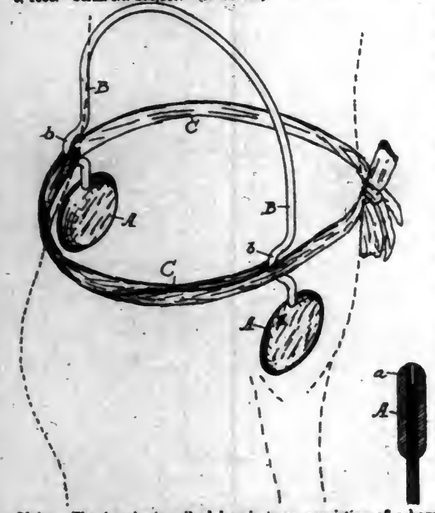


Claim.—1. The combination, with a water-chamber, as A, having a rearwardly and downwardly projected portion, as B, of the vertical tubes *h* and laterally-projected tubes *k*, substantially as described, and for the purpose set forth.

2. The combination, with the water-chamber, as hereinbefore described, having the vertical tubes *h*, having interior open-ended tubes, *k'*, of laterally-projected tubes *k* and supporting-tubes D and D^2, substantially as set forth.

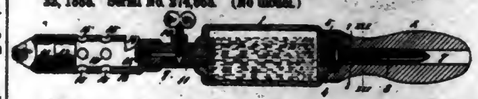
3. The combination, with the water-chamber having a rearwardly and downwardly projected portion, B, of the vertical tubes *h*, laterally-projected tubes *k*, supporting-pipes D D' D^2, and the fire-grate G, composed of the pipes E and F, communicating with chamber A through the pipes D and D', substantially as described, and for the purpose set forth.

400,454. TRUSS. JEREMIAH HAYDEN, Raymond, Me. Filed Nov 6, 1888. Serial No. 290,113. (No model.)



Claim.—The herein-described hernia-truss, consisting of a bow-shaped wire having near each of its ends a loop or bend, said ends having screw-threads cut thereon, pads provided with apertures in their edges adapted to be screwed onto the ends of said wire, combined with a bandage adapted to pass through said loops and thence around the body, whereby said wire is held obliquely up against the side, substantially as shown.

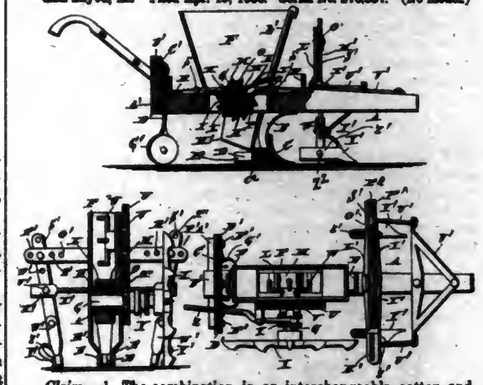
400,455. SELF-HEATING SOLDERING-IRON. GUSTAVUS HEIDEL and GUSTAVE FREY, St. Louis, Mo., assignors, by mesne assignments, to the National Self-Heating Sad-Iron Company, same place. Filed May 22, 1888. Serial No. 274,663. (No model.)



Claim.—1. In a self-heating soldering-iron, &c., the combination of the reservoir, handle secured to one end of the reservoir, pipe secured to the other end of the reservoir, and a cylinder provided with a point secured to the pipe, the handle having a central opening and being connected to the reservoir by means of a shank having wings to allow the circulation of air, substantially as and for the purpose set forth.

2. In a self-heating soldering-iron, &c., the combination of the reservoir, handle secured to one end of the reservoir, pipe secured to the other end of the reservoir, and a cylinder having a point secured to the pipe, the handle having a central opening and connected to the reservoir by means of a shank having wings 6 and notches 8, substantially as and for the purpose set forth.

400,456. PLANTER AND CULTIVATOR. DENNIS B. HENRY, Indian Bayou, La. Filed Apr. 13, 1888. Serial No. 270,537. (No model.)



Claim.—1. The combination, in an interchangeable cotton and corn planter, of the hopper, the revoluble seed disk or wheel H, having the peripheral seed cups or openings, the toothed feed-ring L, loosely mounted on said seed disk or wheel and provided with the discharge-opening N and the removable section M, and means, substantially as set forth, to lock the ring against rotation when the section M is removed, substantially as described.

2. The combination, in a planter, of the hopper, the revoluble seed wheel or disk arranged under the discharge-opening thereof and provided with the peripheral seed cups or depressions, the peripheral tooth-ring L, loosely mounted on the seed wheel or disk, having the opening N and the removable section M, and the slides R, adapted to engage and disengage the teeth of ring L, for the purpose set forth, substantially as described.

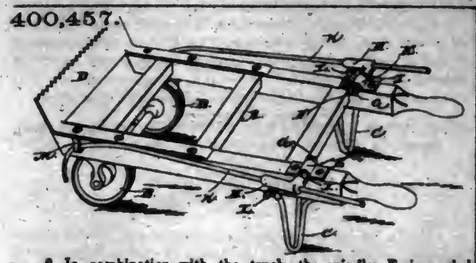
3. The combination, in a planter, of the pivoted link-arm C, the vertically-movable standards connected thereto, and the covering-disks journaled at the lower ends of said standards, substantially as described.

4. The combination, in a planter, of a frame or beam, the furrow-opener, the hopper, the driving-shaft having the operating-wheel engaging the ground, the seed wheel or ring secured to the shaft and arranged in the side opening of the hopper, the pinion loose on the shaft, the clutch to throw the same into or out of engagement with the shaft, the gear-wheel engaged by the pinion, and having the shaft journaled in the hopper and provided with the stirring-arms, substantially as described.

400,457. TRUCK-LOADER. JAMES D. HILL, Nashville, Mo. Filed May 11, 1888. Serial No. 273,612. (No model.)

Claim.—1. In a truck, the independent transverse spindles F, journaled on the truck, and the grappling-hooks pivoted to the outer ends of the spindles, so as to swing laterally of the truck independent of the spindles, the said spindles allowing the grappling-hooks a vertical movement, whereby both a vertical and a lateral movement is imparted to the said hooks, as set forth.

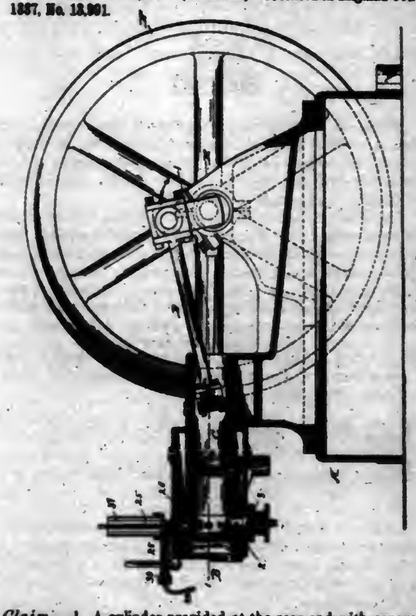
400,457.



2. In combination with the truck, the spindles F, journaled thereon, the sleeves H, pivoted on the outer ends of the spindles, so as to swing laterally independent of the turning of the spindles, and the grappling-hooks K, passed through and adjustable in the said sleeves, as set forth.

3. The combination, with a truck, of the independent grappling-hooks K, provided with laterally-extending spindles which are mounted in suitable bearings on the truck, and the spring clips or hooks M, attached to the truck and adapted to receive the grappling-hooks, substantially as described.

400,458. GAS-ENGINE. ARTHUR HINTON, Yonkers, assignor of one-half to Otis Brothers & Company, New York, N. Y. Filed Apr. 20, 1888. Serial No. 271,283. (No model.) Patented in England Oct. 13, 1887, No. 13,901.



Claim.—1. A cylinder provided at the rear end with separate ports communicating one with the external air and the other with a gas-supply pipe, an exhaust-port arranged to be uncovered on the forward movement of the piston, valves controlling the gas-passage, the air-port, and the exhaust-passage, and connections between the gas and exhaust valves, and an eccentric-rod operated by an eccentric upon the crank-shaft of the engine, substantially as set forth.

2. The combination, in a gas-engine, of a cylinder and reciprocating piston, an air-inlet in the cylinder provided with a valve, a separate gas-inlet in the cylinder, also provided with a valve, an exhaust provided with a valve, and a reciprocating rod supported in bearings outside of the cylinder, and separate connections between the said rod and both the gas and exhaust valves, substantially as set forth.

3. The combination, with the gas and exhaust valves of a gas-engine, of valve-stems extending through the valve-chests, springs bearing upon said stems to hold the said valves on their seats, a reciprocating rod arranged to contact with the independent stem of the gas-valve, and a lever connecting said rod with the stem of the exhaust-valve, substantially as set forth.

400,459. LATHE-CHUCK. SAMUEL IDE, Medina, N. Y. Filed Jan. 31, 1889. Serial No. 298,196. (No model.)

Claim.—1. A lathe-chuck jaw having clamping-screws, one or more, said screws having the annular biting-edges K at their inner ends, substantially as described.

400,459.



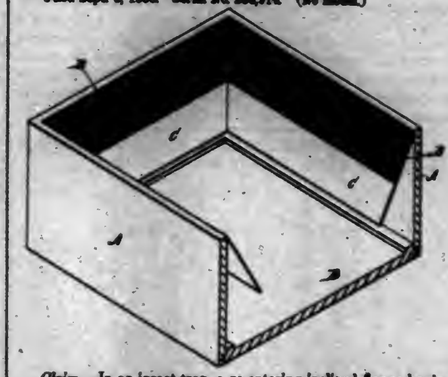
2. A lathe-chuck jaw having the clamping-screws G, with their inner ends having the conical sides H, and provided with the conical central recesses, I, whereby the cones H are truncated, and whereby annular biting-edges K are formed between the conical sides H and the sides of the openings I, substantially as described.

3. A lathe-chuck jaw having the steps or shoulders, the clamping-screws G, and the adjustable rods working in openings in said jaw, for the purpose set forth, substantially as described.

4. A lathe-chuck jaw having the adjustable rods M, one or more, provided with the recesses M, and the set-screws working in threaded openings in the jaw and engaging said recesses, substantially as described.

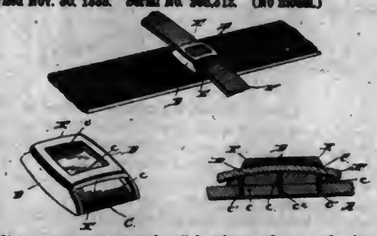
5. A centering-jaw having a series of steps or shoulders, the clamping-screws G, working through the jaw and communicating with the vertical faces of the steps or shoulders, adjustable rods M, working through the jaw on a level with the horizontal faces of the steps or shoulders, and set-screws to retain the adjustable rods.

400,460. INSECT-TRAP. CHARLES G. JENNINGS, Detroit, Mich. Filed Sept. 3, 1888. Serial No. 284,914. (No model.)



Claim.—In an insect-trap, a re-entering inclined flange having a roughened zone extending from its outer edge toward the center, and a polished zone extending from the roughened zone to the lower edge of the flange, both of said zones being located upon the same inclined surface.

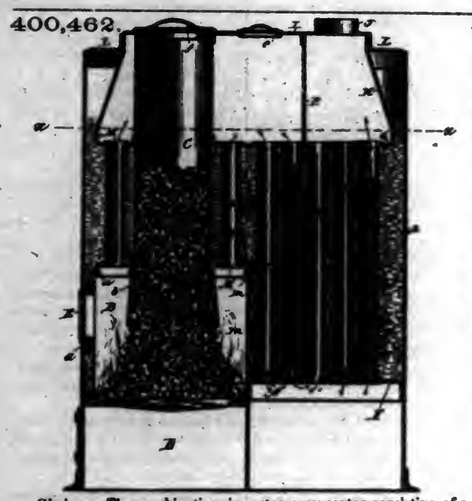
400,461. HARNESS-LOOP. EDMUND B. KNAPP, San Jacinto, Cal. Filed Nov. 30, 1888. Serial No. 292,212. (No model.)



Claim.—As an improved article of manufacture, the keeper for hip-straps, having a convexly-rounded base provided with a suitable number of perforations to receive rivets, the sides D D, integral with the base and adapted to bear against the edges of the strap, which is passed over the base, and the top bars, E E, connecting the corresponding ends of the sides D and extending over the said strap, the said bars being integral with the sides, all constructed and arranged substantially as specified.

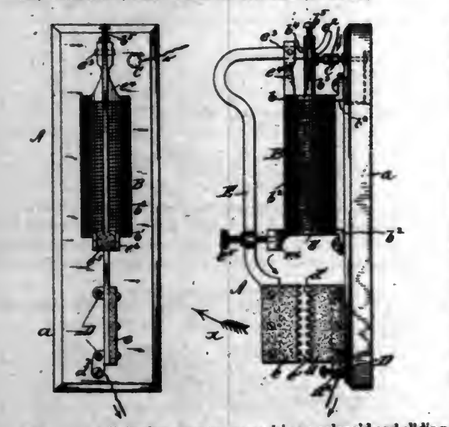
400,462. STEAM-BOILER. HERMAN A. KROESCHELL, Chicago, Ill., assignor to Kroeschell Brothers, same place. Filed July 27, 1888. Serial No. 280,191. (No model.)

400,462.



Claim.—The combination, in a steam-generator consisting of a water-jacket composed of an inner and outer shell, the latter extending the full height of the boiler and the former terminating on a line nearly with the grate-bars and the upper tube-sheet, of a second inner upper shell secured to the tube-sheet and to the crown-sheet of the boiler, provided at its lower end with an outwardly-deflecting flange and tapering inwardly to form an increased steam-space, said water-jacket being made of two oblong sections secured by angle-irons, a fire box and magazine surrounded by a nest of fire-tubes, a downward set of tubes, and a nest of upward return-tubes, each set of tubes communicating with a smoke-chamber common to two nests of tubes, the upper chamber being arranged to have the hot gases in contact with the steam-chamber and the tubes submerged, substantially as set forth.

400,463. LIGHTNING-ARRESTER. MYRON D. LAW, Philadelphia, Pa. Filed Oct. 2, 1888. Serial No. 286,962. (No model.)



Claim.—1. A lightning-arrester comprising a solenoid and sliding core having in its upper end an elongated slot, a fixed conductor or contact-plate located below the solenoid, a gravity-lever pivoted above the solenoid and having its upper end in engagement with said core-slot and at its lower end a companion contact-plate for said fixed plate, and circuit-connections, substantially as set forth.

2. In a lightning-arrester, the combination of a solenoid and its core, a bifurcated lug, c^4, on the end b' of the solenoid, fixed contact-plate d, gravity-lever E, pivoted to the upper end of the solenoid, and having an upper end engagement with the solenoid-core, a set or adjusting screw, c^4, on lever E, in contact with lug c^4, and a contact-plate, e, and circuit-connections, substantially as set forth.

3. A lightning-arrester comprising a low-resistance solenoid in a branch circuit having a fixed contact-plate, d, and a ground-connection, a pivoted gravity-lever, E, having an end engagement with the solenoid-core, and a contact-plate, e, and circuit-connections, substantially as set forth, whereby said lever E is moved by the solenoid to separate said contact-plates, and returns by gravity to its normal position to restore said contact-plates, as set forth.

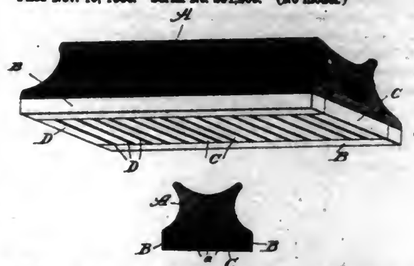
4. The combination of solenoid B, having end plates, b b', standard or arm c^4 on plate b, bifurcated bracket c^4 on plate b', lever E, pivoted to arm c^4 and having set-screw c^4, engaging with bracket c^4, electrode e on said lever, fixed electrode d, solenoid-core b^3, engaging with said lever, and circuit-connections, substantially as set forth.

400,464. LIGHTNING-ROD AND COUPLING. SPENCER R. LAWRIE, Chicago, Ill. Filed Oct. 15, 1888. Serial No. 288,176. (No model.)



Claim.—A coupling-burr provided at its ends with serrated flanges C C, having shoulders d d, which shoulders lock with the shoulders b b of the tenon A upon the flanges C C being forced down on the rod, all substantially as and for the purpose set forth.

400,465. CHALK-ERASER. WILLIAM H. LOUDENBACK, Lake, Ill. Filed Nov. 19, 1888. Serial No. 291,209. (No model.)



Claim.—1. An eraser comprising a handle-block having its under surface grooved or otherwise roughened, strips of felt or similar material secured lengthwise thereon at the side margins, and short strips of felt or similar material secured crosswise thereon between the long strips, substantially as described.

2. An eraser comprising a handle-block having little ribs or ridges in its under surface, two long strips of felt or similar material secured lengthwise thereon, and short strips of felt or similar material secured crosswise thereon at suitable distances apart, the cross-strips at each end coming up close to the side strips, whereby the erasing-surface is formed with square corners, tight joints at its corners, and spaces or crevices to receive the chalk-dust, substantially as described.

400,466. WELL-BORING APPARATUS. ABRAHAM L. LOWERY and JASPER H. WYATT, Francis, Nebr. Filed June 27, 1888. Serial No. 278,364. (No model.)



Claim.—1. The combination, with the main casing-pipe having an open-work extension and provided with a boring-tool, of an inner perforated pipe, C, provided with valves d, and a valve at its discharge end, which is adapted to be closed by contact with water in a well, substantially as set forth and described.

2. The combination, with the main casing-pipe, of the induction-pipe G, provided with an arm, p, and a swivel-connection with the main pipe, and a fixed vertical guide, which is provided with a slide which is connected with arm p, substantially as set forth and described.

3. The combination, with pipe A, having pipe F coupled thereto, of the pipe G, provided with band g, Babbitt-metal filling h, packing i, and perforated cap k, provided with arms m, connected with band n, substantially as set forth and described.

4. The combination of the main pipe with pipe G, which is provided with band g, suitable filling and packing around pipe G above said band, and a perforated cap, through which pipe G extends, said cap being adjustable in elevation, substantially as and for the purposes described.

400,467. YIELDING SHOVEL FOR CULTIVATORS. EDWARD P. LYNCH, Davenport, Iowa. Filed Sept. 27, 1888. Serial No. 286,554. (No model.)

Claim.—1. In a cultivator, the combination of a shank or support, a shovel connected thereto by an approximately vertical axis that it may turn horizontally from its operative position, and a spring resisting said motion, whereby the shovel is permitted to yield and pass obstructions encountered at the side.

2. In combination with a shank or support, a shovel-supporting block mounted thereon to rock both vertically and horizontally, in

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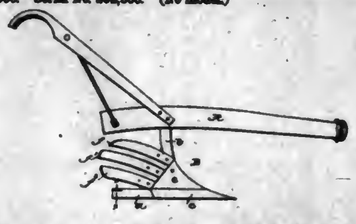
combination with a spring and intermediate connections tending to prevent said motions.

3. A shovel standard or support having vertical bearings at its two sides, in combination with the shovel-block seated on said bearings, the link acting on the block between the bearings, and a spring acting to urge the link rearward, whereby the shovel is held normally in operative position, but permitted to turn horizontally to the right or left under excessive strain.

4. The shovel-supporting block and the standard connected thereto by the horizontal trunnions and the vertical side bearings, in combination with the central link, the pivoted arm or plate E, rod F, and spring G.

5. In combination with the shank and the shovel-block journaled thereon to tip in a vertical plane, the substantially-horizontal link, the plate E, overlying the link and jointed thereto and to the shank, the rod jointed to the middle of the plate, and the spring, applied as shown.

400,468. PLOW. EDWARD P. LYNCH, Davenport, Iowa. Filed Dec. 6, 1888. Serial No. 292,800. (No model.)



Claim.—1. A mold-board plow comprising the foundation-plate C, with the share, the landside, the arms f f', and the plate e, independently and removably bolted thereto, the plate e being formed, as shown, to serve as the forward portion of the mold-board for erecting the slice in advance of the arms f f'.

2. A mold-board having the share, the solid portion e, immediately above the share to erect the slice, and the slatted portion at the rear to complete the turning over of the slice.

3. In a mold-board plow, a sustaining-plate, C, the share c, removably secured to its lower forward edge, the series of arms f f', removably secured to its rear edge, the independently-removable mold-board section e, located between the share and the arms f, as shown.

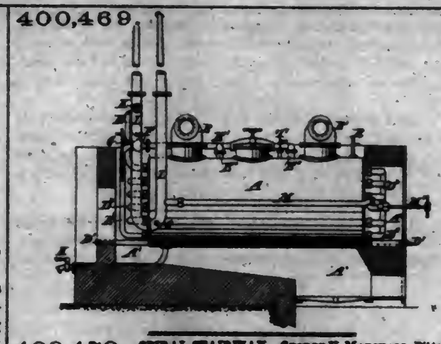
4. In combination with the notched landside and the sustaining-arm to which it is bolted, the wearing-plate having the body portion confined between said arms and landside, and the thickened base portion projected through the notch in and beyond the base of the landside, as shown.

5. In combination with the landside and the stationary arm to which it is bolted, the intermediate wearing-plate having projections h^3 on opposite faces and both opposite edges, and the through-bolt, said parts constructed and arranged, as shown, to permit the reversal of the wearing-plate, in the manner described.

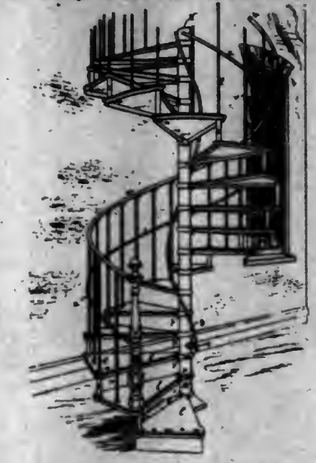
400,469. APPARATUS FOR DISTILLING FAT ACIDS. PAUL MARIX, Paris, France, assignor to the Société Industrielle des Glycerine et Acides Gras, same place. Filed June 27, 1888. Serial No. 278,317. (No model.) Patented in France Oct. 11, 1886, No. 178,973; in Belgium Oct. 14, 1886, No. 74,636; in Luxemburg Aug. 16, 1887, No. 574, and in Spain Mar. 7, 1888, No. 12,082.

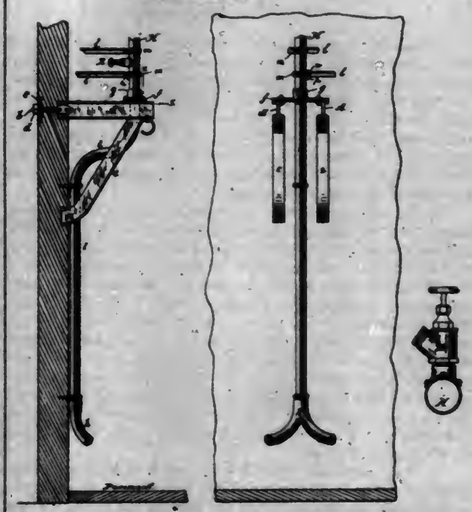
Claim.—The combination, in an apparatus for distilling fat acids, of a horizontal cylindrical boiler, A, and a furnace within the fires of which both ends of the said boiler are exposed, a train of steam-pipe for receiving steam from a source outside of said boiler and delivering the said steam thereinto, said steam-pipe comprising a coil of which straight portions D run lengthwise of the said boiler from end to end thereof, and of which bends D^a, for superheating the steam passing through said coil, are arranged within the flues outside the ends of the said boiler, a pipe, E', from the outlet of said coil, and a perforated steam-distributing tube, D', connected with said coil and arranged within and near the bottom of the boiler, substantially as and for the purpose herein described.

400,469



400,470. SPIRAL STAIRWAY. GEORGE V. MARSHALL, Pittsburg, Pa. Filed Apr. 30, 1888. Serial No. 271,330. (No model.)





Claim.—1. The combination, with a building, of a spiral stairway outside the building, a continuous pipe constituting the direct support of said stairway and extending below the foot of the stairway and inwardly toward the building and ending at a point within reach from the ground, and a bracket attached to the building at a height out of ordinary reach, forming the sole support from below for said pipe, whereby the structure can be erected on the front of a building without obstructing the sidewalk.

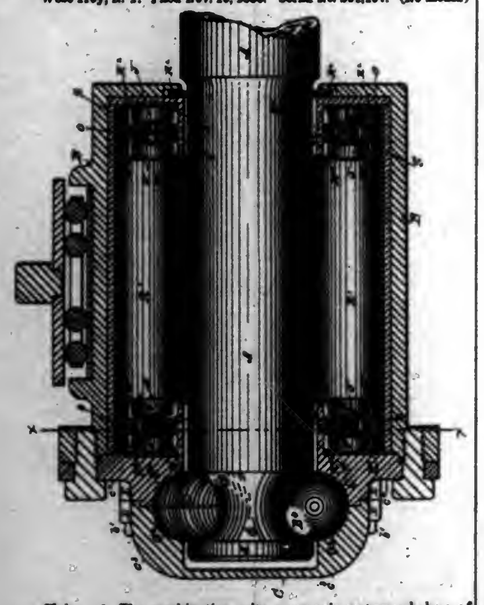
2. The combination, with a building, of a spiral stairway outside the building, a continuous pipe, constituting the direct support of said stairway, each step being independently and directly clamped to said

pipe, which extends below the foot of the stairway and inwardly toward the building to a point within reach from the ground, and a bracket attached to the building at a height out of ordinary reach, forming the sole support from below for said pipe, substantially as described.

3. The combination of the steps *l*, having baluster-slots at the outer corners for connection, step to step, with balusters *t*, and intermediate slots for and with the balusters *v*, substantially as described

4. The combination of pipe H, supporting the stairway, with I-beams A, plate *f*, and braces *e*, substantially as described.

400,471. ROLLER-BEARING. CHARLES D. MENEELY, Albany, and JOHN GIBSON, West Troy, assignors to the Meneely Bearing Company, West Troy, N. Y. Filed Nov. 19, 1888. Serial No. 291,197. (No model.)

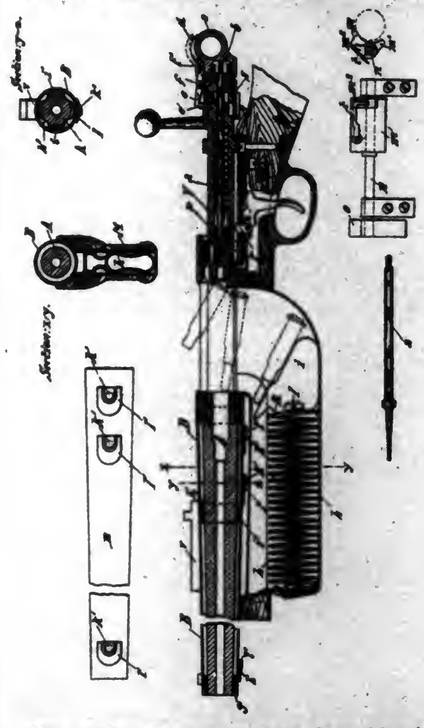


Claim.—1. The combination, with a car-axle and an axle-box, of anti-friction rollers having end journal-bearings smaller than the body of the rollers and formed with annular grooves in said bearings, interior tube-form tracks surrounding the axle at each end, separating-rollers formed with annular grooves and arranged at each end of the anti-friction rollers between the journal ends of the same, and a guide-ring arranged circumferentially about the journal ends of the anti-friction rollers and the separating-rollers and within the grooves in the same, substantially as described.

2. The combination, with a bearing-box that is made with an interior track at each end, and constructed with a cap at its outer end containing interiorly an encircling concave groove, substantially as described, of an axle made with an encircling concave groove at its outer end arranged to be in line with and correspond in reversed and opposite concavity with the groove made in the cap, an end-thrust ball arranged within the coincidently-made grooves of the cap and axle, friction-rollers having grooved and journaled ends arranged between the inner surface of said bearing-box and axle, a separating-roller having a grooved roller-face arranged at each end of the bearing between each two of the friction-roller journals and the adjacent end track, and a ring made to encompass said separating-rollers and to be within the grooves thereof, substantially in the manner as and for the purposes set forth.

3. The combination, with the axle A, made with the encircling-grooves G', of the bearing-box B, made with the cap C, having the interior encircling-groove, G^2, and the interior end tracks, T T, the end-thrust ball, B^4, arranged within the coincidently-placed grooves of the axle and bearing box cap, the friction-rollers R', made with end journals, J, arranged between said axle and bearing-box, and the separating-rollers R^3, each made with the groove g^3, with one of said separating-rollers arranged between each two of the friction-roller journals, and the adjacent inside track at each end of the bearing, and the rings O at each end of the bearing within the grooves of the separating-rollers, substantially in the manner as and for the purposes set forth.

400,472. MAGAZINE FIRE-ARM. ARNAUD MIEG, Leipsic, Saxony, and HUGO BSCHOFF, Berlin, Germany. Filed Oct. 13, 1887. Serial No. 252,249. (No model.) Patented in Germany Aug. 31, 1887, Nos. 43,491 and 43,576, and Jan. 13, 1888, No. 43,600; in France Sept. 22, 1887, No. 186,004; in Belgium Sept. 22, 1887, No. 78,966; in Portugal Nov. 9, 1887, No. 1,193; in Italy Nov. 30, 1887, XXI, 22,894, XLIV, 111; in Spain Jan. 2, 1888, No. 11,850; in Austria-Hungary Feb. 17, 1888, No. 37,068 and No. 2,754, and in England Sept. 22, 1888, No. 12,882.



Claim.—1. The combination, with the supplemental breech-bolt S, of the firing-pin *a* and a nut, *b*, secured to the end of the firing-pin, and having a flange lying against the end of the breech-bolt, said flange having lateral tappets *b' b'*, engaging the supplemental breech-bolt, substantially as shown and described.

2. The locking attachment consisting of a lever, *d e*, pivoted to the supplemental breech-bolt, one arm, *d*, of the said lever forming a handle, and the end of the other arm, *e*, having a cam which fits into a recess, e^2, of the main breech-bolt V, so that by turning the lever *d e* the cam *d* is pressed into a recess, e^2, to lock the supplemental breech-bolt, substantially as described.

3. The combination, with the supplemental breech-bolt, of the handle *c*, having an annular or other similar form, the firing-pin, and a nut, *b*, tapped on the firing-pin, and having a flange lying against the end of the breech-bolt, said flange having tappets *b' b'*, engaging with the supplemental breech-bolt, and a detent-lever attached to the supplemental breech-bolt, for the purpose of cocking the same without opening the breech-bolt, substantially as shown and described.

4. The combination, with a curved magazine for containing the cartridges arranged in an oblique position and having their pointed ends turned upward, of a spring, *h*, and a follower, *i*, of the form shown, having a loose pivotal connection at or about its middle portion with the spring *h*, substantially as shown and described.

5. In a magazine-gun, the combination, with the magazine-chamber M, of the coiled spring *h*, having an oblong form in cross-section, contracted at the central portions, and the follower *i*, pivotally connected to said spring at a point between the ends of said follower, substantially as described.

6. In combination with the gun-frame and breech-bolt, the head-piece P, having cams *p*, the levers *o o*, rigidly mounted on spindles *n n* within the path of said cams, the pawls *m m*, mounted on said spindles over the rear end of the magazine, and a feeding-spring acting upon the cartridges, substantially as described.

7. The combination, with the frame and breech-bolt, of the pawls *m m*, arranged in the rear end of the magazine and rigidly mounted on spindles *n n*, the head-piece P, having cams *p*, the levers *o o*, rigidly mounted on said spindles and having their ends lying in the path of said cams, and stops pivotally mounted in proximity to said levers *o o*, whereby the latter may be locked in position to arrest the cartridges in their passage to the breech, substantially as described.

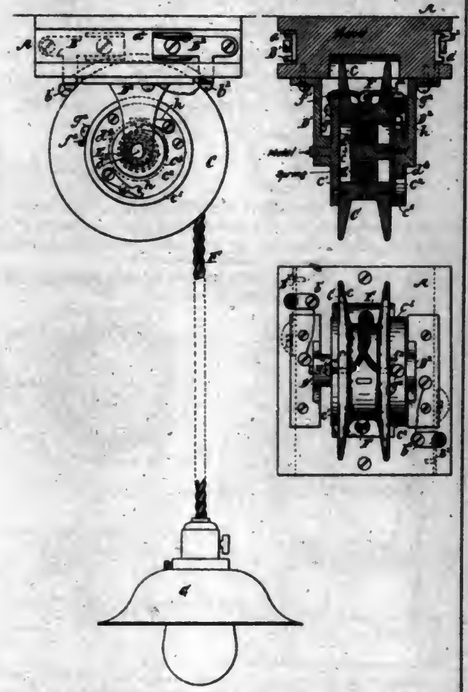
8. The combination, with the frame and breech-bolt, the former having the magazine M, of the head-piece P, having cams *p*, the spring *h*, the compound pawls *m m*, each composed of the part *m'* m^2, the part m^3 being mounted on and turning with spindles *n n*, and lying partly within the part *m'*, and a spring, *i*, whereby the part m^3 is normally thrown inward, substantially as described.

9. The combination, with the barrel A, of the tube B, surrounding said barrel, said tube being rigidly connected at its rear end to the barrel, and having at its forward end a ring, *g'*, fastened within the mouth of the tube and loose upon the end of the barrel, substantially as described.

10. The combination, with the barrel A, of the inclosing-tube B, having the ring *k'*, having bearing against both the tube and the barrel, and provided with openings *i'*, substantially as described.

11. The combination, with the barrel A, of the inclosing-tube B, having upon its under side openings *k'*, provided with protecting-caps *l'*, which overhang without closing said openings, substantially as described.

400,473. DEVICE FOR SUPPORTING ELECTRIC LAMPS. ALEXANDER T. MOORE, Jr., New Bedford, Mass., and HORACE A. PITCH, Schenectady, N. Y. Filed May 16, 1888. Serial No. 274,333. (No model.)



Claim.—1. In a fitting for a pendent electric lamp, the combination of an insulated block or wall-piece, metallic bracket-arms depending therefrom, one of said bracket-arms having a bearing-stud and notched flange, the other bracket-arm having a bearing for a trunnion, wires connecting the main wires and the bracket-arms, a rotary drum having a recess, metallic side pieces secured to said drum, one of said side pieces having an opening for the stud of the bracket-arm, and the other of said side pieces having a trunnion, a spring connected at one end to the stud and at the other end to the drum within the recess, pivoted dogs automatically engaging the notch of the notched flange, and a cable secured to said drum and in electrical connection with the side pieces, substantially as specified.

2. In a fitting for a pendent electric lamp, the combination of an insulated block or wall-piece, metallic bracket-arms secured thereon, wires electrically connecting the main wires and said bracket-arms, a rotary drum of insulating material having a central recess and metallic side pieces rotating therewith, one of said side pieces affording one of the bearings for said drum and a bracket-arm affording the other bearing, a spring connected at one end to the axle and at the other to the drum, said spring being located within said central recess, and a cable secured to said drum and in electrical connection with said cheek-pieces, substantially as specified.

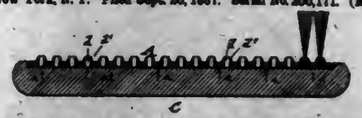
400,474. YOKE FOR DRAW-HEADS. ROBERT MORRIS, La Crosse, Wis. Filed July 27, 1888. Serial No. 281,182. (No model.)



Claim.—1. The combination, with a draw-head having grooves on its opposite sides, of a yoke having tongues at or near its free ends to enter said grooves, and a bolt passing through the draw-head and both members of the yoke, substantially as set forth.

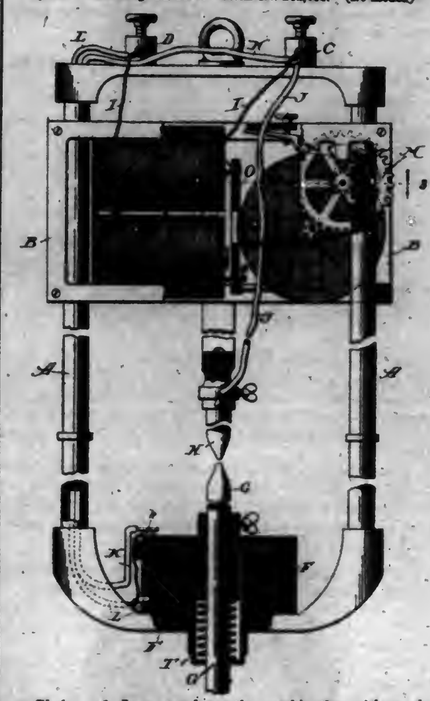
2. In a car-coupler, the combination, with a draw-head having two transverse grooves formed near its inner end, of a yoke having tongues integrally formed on it to mate the grooves and interlock therewith, and a bolt located between this interlocking connection of the yoke with the draw-head and the extremities of the yoke which project beyond its integral tongues, substantially as set forth.

400,475. MANUFACTURE OF BRUSHES. LOUIS W. HIRSCHEL, New York, N. Y. Filed Sept. 20, 1887. Serial No. 250,171. (No model.)



Claim.—A brush composed of a back, a metallic base-plate secured to said back, said base-plate having openings with tapering rims, and tufts of bristles inserted into said openings and retained by compressing the upper portion of the rims upon the bristle tufts, substantially as set forth.

400,476. ELECTRIC-ARC LAMP. SAMUEL R. HUTTING, Chicago, Ill., assignor to the Hutting Electric Manufacturing Company, same place. Filed Aug. 14, 1888. Serial No. 282,755. (No model.)



Claim.—1. In an arc lamp, the combination, with an electro-magnet consisting of two coils having their cores connected at one end, of an armature loosely attached at one end to the end of one of the cores and movable at the other end toward or from the end of the other one of the cores, a smooth-surfaced brake-wheel, a smooth-surfaced brake mounted on the armature, and a spring drawing the brake into contact with the brake-wheel against the attraction of the magnetism, substantially as described.

2. In an arc lamp, the combination, with an electro-magnet consisting of two coils having their cores connected at one end, of an armature loosely attached at one end to the end of one of the cores and movable at the other end toward or from the end of the other

one of the cores, a smooth-surfaced brake-wheel, a smooth-surfaced brake mounted on the armature, a spring drawing the brake into contact with the brake-wheel against the attraction of the magnetism, and a series of pinions and gears engaging with the brake-wheel and the main frame in which the parts are arranged, substantially as described.

3. In an arc lamp, the combination of a frame having a toothed bar, a frame movable up and down on the first-mentioned frame, a pinion engaging with the toothed bar, a gear-wheel mounted on the pinion-shaft with its teeth engaging a brake-pinion, a brake-pinion with its teeth engaging the gear-wheel, a smooth-surfaced brake-wheel mounted on the brake-pinion shaft, an electro-magnet, an armature loosely hung at one end and movable at the other end toward or from the electro-magnet, a smooth-faced brake connected with the armature and adapted to bear on the smooth-surfaced brake-wheel, and means for drawing the brake into contact with the brake-wheel against the attraction of the magnetism, substantially as described.

400,477. PAVING TILE OR BRICK. CHARLES M. O'CONNER, Lock Haven, Pa. Filed Oct. 22, 1888. Serial No. 288,786. (No specimens.)



Claim.—A paving-block having semi-spherical sockets within its edges and loose balls or spheres fitting within the sockets, as and for the purpose set forth.

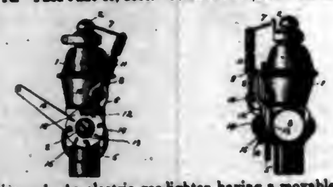
400,478. ROCKING-CHAIR. WILLIAM L. PAINE, Argenta, Ark. Filed June 6, 1888. Serial No. 276,288. (No model.)



Claim.—1. In combination with the front and rear legs of a rocking-chair and a rack secured to said rear legs, a lever pivoted to the front leg and having its rear end in engagement with said rack, and an arm attached to said lever and having its lower end adapted to rest upon the supporting-floor, substantially as and for the purpose described.

2. In combination with the front and rear legs of a chair and a rack secured to said rear legs, a lever pivoted to the front leg and having its rear end in engagement with said rack, and an arm pendent from said lever and bearing against the chair-support, substantially as and for the purpose described.

400,479. ELECTRIC GAS-LIGHTER. JOHN Y. PARKE, Philadelphia, Pa. Filed June 15, 1888. Serial No. 277,209. (No model.)



Claim.—1. An electric gas-lighter having a movable electrode adapted to be brought into contact with another electrode to create a spark, and a feathering carrier for the electrode, arranged to prevent contact between the electrode except when the gas is turned on, substantially as described.

2. An electric gas-lighter having a movable electrode adapted to make contact with another electrode to produce a spark, a lever for moving the first electrode, and a feathering electrode-carrier controlling the contact between the electrodes, substantially as described.

3. An electric gas-lighter having a movable electrode adapted to make contact with another electrode, a lever for moving the first electrode, a feathering carrier for the movable electrode, and a cam for controlling the position of the carrier, substantially as described.

4. An electric gas-lighter having a reciprocating electrode and a stationary electrode, a feathering carrier for the movable electrode, and a cam controlling the carrier, the said cam also operating to move the cock controlling the flow of gas, substantially as described.

5. In an electric gas-lighter, a stationary electrode, a cock, a ratchet-cam secured to the cock, a lever, and a movable electrode mounted on a carrier and controlled by the cam, substantially as described.

6. In an electric gas-lighter, a moving arm and a feathering electrode-carrier mounted on said arm in bearings formed integral with the arm, substantially as described.

7. In an electric gas-lighter, a feathering electrode-carrier and a controller therefor provided with projections on its side and notches on its edge, substantially as described.

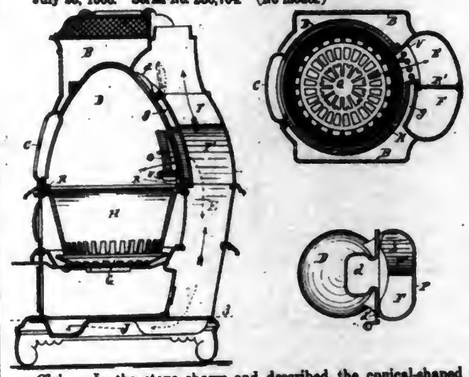
8. In an electric gas-lighter, the combination, with a fixed electrode, of a feathering moving electrode, substantially as described.

400,480. SCISSORS. EMIL PETERS, Merscheid, Germany. Filed June 4, 1888. Serial No. 275,934. (No model.)



Claim.—The combination of a pair of scissors with a blade, *c*, pivoted to scissor-blade *a*, and with the face-plate *e* and spring *d*, the spring being confined between the parts *a e*, substantially as specified.

400,481. HEATING-STOVE. ANDREW S. PHELPS, Chicago, Ill. Filed July 23, 1888. Serial No. 280,704. (No model.)



Claim.—In the stove shown and described, the conical-shaped dome D, forming the combustion-chamber and having a front feed opening or door, an opening leading to the indirect downflue E, opposite the feed-opening, and a direct-draft opening above said downflue-opening, leading to the upflue F and controlled by a damper, in combination with the perforated frame B, surrounding said dome, ring R, having the annular channel for dome D to rest in, fire-pot H, having a grate, downflue E, and upflue F, arranged to leave the air-space *g* between it and said dome, substantially as and for the purpose set forth.

400,482. CONDUIT FOR CABLE RAILWAYS. ELWOOD C. PHILLIPS, Garden City, Kans., assignor to the Phillips Economical Cable Grip Construction Company, Chicago, Ill. Filed Dec. 26, 1888. Serial No. 294,705. (No model.)



Claim.—1. A conduit for cable railways, having an opening in the top for the shank of the cable-grip and a pocket in the upper part of the conduit below said opening for catching the earth and rubbish which fall through the latter and preventing them from descending to the cable and the gripping devices, and the space for the latter being separated from said pocket by a wall inclining obliquely upward and also inwardly with regard to said space, substantially as set forth.

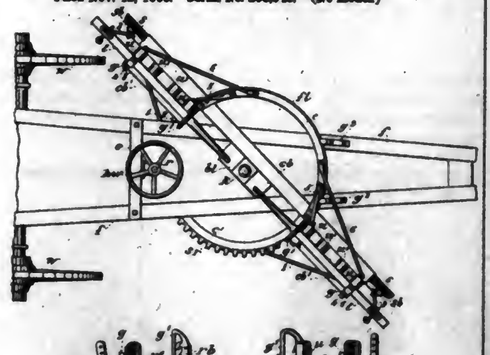
2. A conduit for cable railways, having the main space A for the cable and gripping devices, the pocket B in the upper part of said conduit, the curved wall C, extending obliquely between them and the opening *a* in the top of said conduit above said wall, substantially as set forth.

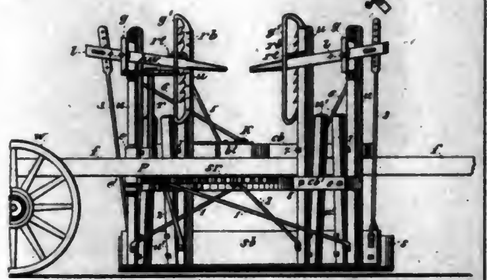
3. A conduit having an opening in its top and an inwardly-extending wall below said opening integral with said conduit, the hollow interior of said conduit being enlarged on one side above said wall to form a pocket, into which said wall directs the earth and rubbish falling through said opening, substantially as set forth.

4. A conduit having an opening in its top, a pocket for receiving the earth and rubbish which may fall through the same, and a downwardly-extending lip or corner on one side of said opening to aid in directing said earth or rubbish into said pocket, substantially as set forth.

5. A conduit having a main space, A, for the cable, a pocket, B, obliquely above the same, an opening, *a*, above said pocket, a wall, C, extending obliquely upward between said pocket and the main space of said conduit, and a lip extending downward on the same side of opening *a*, in order that said lip and wall may combine to direct dirt and rubbish into said pocket, substantially as set forth.

400,488. ROAD-SCRAPER. PETER RAAB, near Indianapolis, Ind. Filed Nov. 12, 1888. Serial No. 290,546. (No model.)



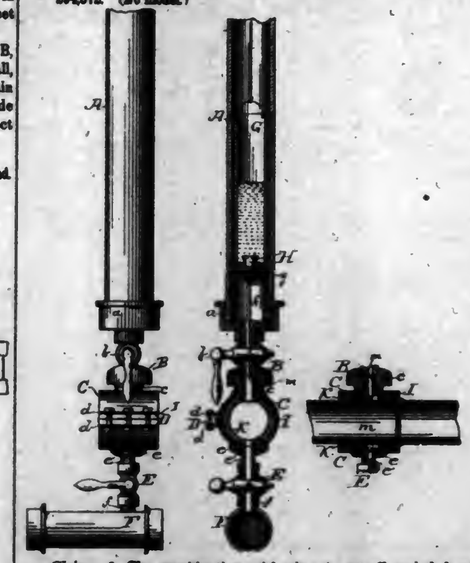


Claim.—1. A road grader and scraper comprising a frame-work mounted on trucks, the scraper sustained by such frame-work between the fore and aft wheels at any suitable angle to the line of draft, lever mechanism for raising and lowering the scraper, a ratchet device connected to the posts of the frame for locking the levers at different heights, a circular frame-work composed of two sections, the upper half resting upon the main frame-work of the machine having a metal flange at the bottom which is adapted to rotate beneath guides bolted to the frame-work, which hold it in place, the lower half sustained beneath such main frame-work provided with a segment-gear for engaging with a pinion mounted on a hand-wheel, the latter moving in bearings connected to a cross-bar of the frame, whereby the entire scraper mechanism may be rotated to change the angle of the scraper to the line of draft, all combined substantially as described.

2. In a road-grading machine, a frame-work mounted on trucks, a scraper carried thereon and adjustable in a vertical plane by means of lever mechanism for regulating the depth of the cut of the scraper-blade, such scraper mechanism connected to a secondary frame-work which is supported upon the frame-work that unites the truck and rotatable upon such frame-work by means of a circular frame, one half of which is supported upon the frame-work that unites the trucks, and the other beneath the same and provided with a segmental gear which engages with a pinion mounted upon a hand-wheel for rotating the scraper mechanism, all combined substantially as shown and described.

3. In a road-grading machine, the main frame *f*, uniting the fore and aft trucks of the wagon, the scraper-bar *ob*, having a scraper attached, and movable in a vertical plane by means of the levers *l l* and their connection to the scraper-bar, ratchet mechanism for locking the same in position, the circular segment *c*, fastened to the cross-bar *ob*, the whole resting upon the frame *f*, such segment having a flange, *fl*, moving beneath guides *g*, bolted to the frame-work *f*, the lower segment, *c*, having a segment-rack, *sr*, a hand-wheel, *hw*, moving in bearings connected to the cross-bar of the main frame, the pinion *p*, mounted on the lower end of the rod of the hand-wheel and engaging with the segment rack *sr*, the block *bl*, bolted to the cross-bar *ob*, and a king-bolt *kb*, uniting the parts, all combined substantially as shown and described.

400,484. SUBMARINE APPARATUS FOR SOLDERING PIPE-JOINTS. FRANK RAHN, Chicago, Ill. Filed Dec. 26, 1888. Serial No. 294,572. (No model.)



Claim.—1. The combination, with pipe A, cut-off cock *b*, band C, and packing therein, of the bucket G, having a valve, H, in its bottom, as and for the purpose set forth.

2. A pipe, A, cut-off cock connected to its lower end, band C, and packing therein, cut-off cock E, and drip-box F, in combination with a bucket, G, having a valve in its bottom, as and for the purpose set forth.

3. Pipe A, a coupling, *a*, screwed onto its lower end, cut-off cock *b*, nut B, as described, boss *c*, band C, and packing therein, in combination with the cock E and drip-box, as set forth.

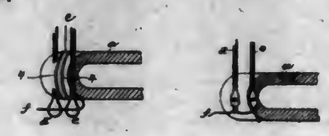
4. Pipe A, cut-off cock *b*, nut B, as described, boss *c*, band C, and packing therein, in combination with the cock E and drip-box, as set forth.

5. Pipe A, cut-off cock *b*, nut B, as described, boss *c*, a nipple having its lower end edges serrated, and band C, in combination with cock E and drip-box, as set forth.

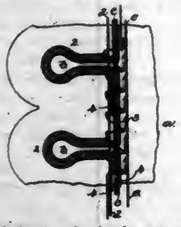
6. The combination, with pipe A, cock *b*, band C, and packing I and K therein, as described, of the cock E and the box F, as and for the purpose set forth.

7. The combination of pipe A, cock *b*, band C, and packing therefor, said band having an opening therein for draining therefrom the water which is inclosed in said band when it covers and is clamped around a pipe-joint, as and for the purpose set forth.

400,485. BUTTON-HOLE PIECE FOR BOOTS OR SHOES. JOHN REDIK, Boston, Mass. Filed Sept. 25, 1888. Serial No. 286,226. (No model.)

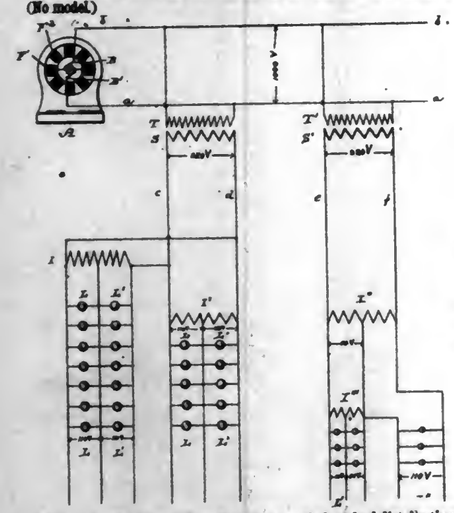


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Claim.—A button-hole piece having its stay-cord and thrum ends confined to the under side of the material by a thread interlocked with two other threads inserted in and showing only at the under side of the button-hole piece at opposite sides of and parallel to the stay-cord, where it extends from one to the next button-hole, substantially as described.

400,486. TRANSFER SYSTEM OF ELECTRIC DISTRIBUTION. EDWIN W. RICE, Jr., Lynn, Mass. Filed Oct. 31, 1888. Serial No. 289,653. (No model.)



Claim.—1. The herein-described system of electrical distribution, comprising alternating-current mains leading from a point of alternating-current supply, one or more converters or transformers of the ordinary description connected to said mains, leading wires or mains connected with the secondaries of said converters, and one or more induction transfer-coils connected across said leading wires and having connected with them two or more sub-circuits or distributing-wires, each two sub-circuits having a fraction of the transfer-coil included between them, as and for the purpose described.

2. The herein-described system of alternating-current distribution, comprising alternating-current mains leading from a suitable source of current-supply, converters or transformers connected in multiple across said mains, leading wires or mains connected to the secondaries of said converters, induction transfer-coils connected across said leading wires, and sub-circuits or distributing-wires leading from and including a fraction of said transfer-coils, said leading-wires supplying current to still other transfer-coils for the purpose of still further subdividing the potential, as and for the purpose described.

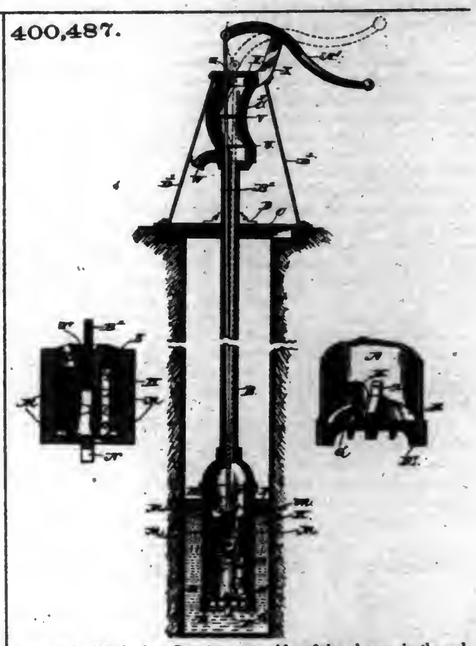
3. In an alternating-current system of distribution, the combination, with suitable transformers, of a system of induction transfer-coils supplied from the secondaries thereof, and other transfer-coils of smaller size supplied by wires, including a fraction only of the first-named coils, the subdivision of circuits and transfer-coils being carried to any desired extent, for the purpose of subdividing the potential.

400,487. LIFT-PUMP. ROBERT H. ROACH, Monroe, Iowa. Filed Dec. 18, 1888. Serial No. 294,007. (No model.)

Claim.—1. The pump having the submerged cylinder, the valve-seat E, screwed to the lower end thereof and having the strainer G, the clack-valves H and the lugs I on its upper side, the hollow plunger K in the cylinder having the clack-valves O in its lower side, the depending lugs N, for the purpose set forth, the opening S and flared opening T, communicating therewith, and the plunger-rod adapted to be screwed into the opening S, substantially as described.

2. The combination, with the cylinder having the valve-seat in its

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lower end with the lugs I on its upper side, of the plunger in the cylinder, and the lugs N on the plunger to engage the lugs I, said plunger being further provided with the threaded opening S, and the plunger-rod adapted to be screwed in the said opening, substantially as described.

400,488. MATCH-SAFE. JOHN K. ROBINSON, Chicago, Ill. Filed Nov. 14, 1887. Serial No. 255,164. (No model.)



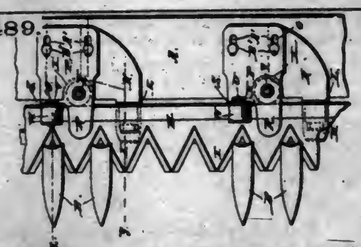
Claim.—1. A match-safe comprising a receptacle for matches and a receptacle for stubs, the receptacle for stubs having its sides permanently connected with the back and having a hinged portion curved to form its front and bottom when closed, and a chute discharging the match-stubs forwardly and downwardly when opened, substantially as described.

2. A match-safe comprising a receptacle for matches and a receptacle for stubs, the receptacle for stubs having its sides permanently connected with the back and having a hinged portion curved to form its front and bottom when closed, and a chute discharging the match-stubs forwardly and downwardly when opened and having lugs at its edges fitting into depressions in the sides of the box, substantially as described.

400,489. CUTTING APPARATUS FOR HARVESTERS. ROBERT J. ROBINSON and CYRUS F. COLLIER, Linneus, Mo. Filed June 28, 1888. Serial No. 278,430. (No model.)

Claim.—1. The combination, with the finger-bar and the fingers secured thereto, of the cutter-bar, the plates P, secured to and adjustable on the finger-bar, and having the vertical slotted arms S, the spindles U, adjustable in said slotted arms, the rollers W, journaled on said spindles and bearing on the cutter-bar, the plates K, secured to and adjustable on the finger-bar and having the downwardly-bent front sides, L, and the horizontal arms M, extending forward there-

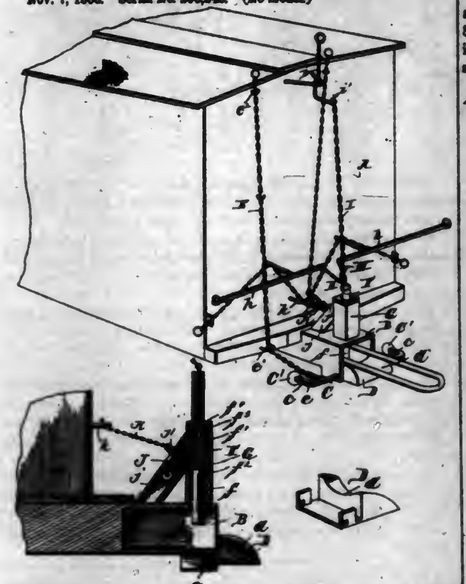
400,489.



from with the vertical arms m^2 near their front end, the rollers N, journaled in the sides and arms m^2 and bearing under the cutter-bar, the spindles Y, depending from said plates P, and the rollers Z, journaled on said spindles and bearing against the rear side of the cutter-bar, substantially as described.

2. The combination of the finger-bar, the fingers secured thereto, the cutter-bar supported on the fingers, the guide-bar secured on the fingers and bearing against the front side of the cutter-bar, the adjustable plates secured to the finger-bar, and the anti-friction rollers journaled to the said plates and bearing against the upper, lower, and rear sides of the cutter-bar, substantially as described.

400,490. CAR-COUPLING. FREEMAN T. ROGERS, Linton, Ky. Filed Nov. 7, 1888. Serial No. 290,240. (No model.)



Claim.—1. In a car-coupler, the combination, with the draw-head, of the shaft journaled in bearings depending from the lower outer corner of the draw-head, and having the weighted arms e at its ends on the sides of said draw-head, and the guide-block for the link secured on said shaft between the bearings thereof, and having its upper side concave and inclined inward and upward from its free edge, and extending in a direction opposite to and in the same plane as said weighted arms, whereby the guide-block will normally hold the link in the proper position preparatory to coupling, substantially as specified.

2. In a car-coupler, the combination, with the draw-head, of the shaft C, journaled in bearings depending from the outer lower corners of the draw-head, and provided with the arms c c and c, the guide-block D for the link, which block stands downward when said arms stand upward, and outward when the arms stand inward, and the chain E, extending downward from the end of the arm c to the staple d, and then upward through the staples d' d^2 to the top of the car, substantially as specified.

3. In a car-coupler, the combination, with the draw-head having the openings b b' in its roof and floor, respectively, and the sleeve G, standing vertically from the draw-head around the opening b, and rectangular in cross-section, of the coupling-pin F, having the lower cylindrical portion, f, the upper portion, f', rectangular in cross-section and fitting in the sleeve G, and the circumferential shoulder f^3, the chains H H and I, and the levers h h and i, all constructed and arranged substantially as and for the purpose specified.

4. In a car-coupler, the combination, with the draw-head, the sleeve G, rectangular in cross-section, the tube j, extending downward and inward from the sleeve, the detent J, pivoted in said tube, with its free end extending through a slot into the sleeve G, and provided with a staple, j', extending out of a slot in the tube j, and the chains K, passing through the staples k to the top and sides of the car, of the coupling-pin having the part f' rectangular in cross-section, fitting in the sleeve G, and provided on its rear or inner side with the transverse notch f^4, and means, substantially as described, whereby said pin can be raised, as specified.

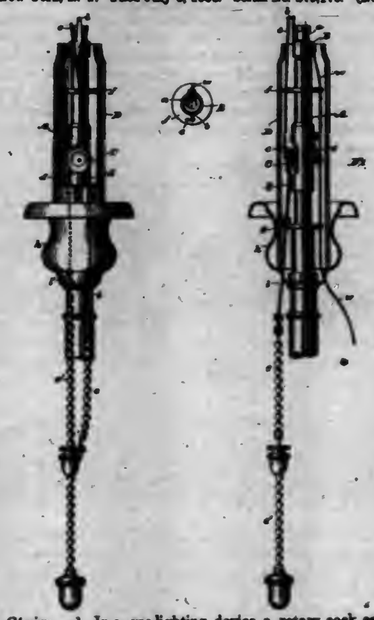
400,491. COMBINED SYRINGE AND MEDICINE-CASE. GEORGE R. ROSS, Buffalo, N. Y. Filed Dec. 20, 1888. Serial No. 294,914. (No model.)



Claim.—1. In a pocket medicine-case, the combination of an outer case, a syringe-body having a reduced end or nozzle adapted to fit the holding-case, a hollow cylindrical plunger for holding the medicine and operating the syringe, and having an opening at the outer end provided with a stopper for closing it, and a packing of soft material for insuring a tight joint for the piston within the body of the syringe, substantially as described.

2. The combination of the holding-case 1, provided with a cover and an elastic washer, 4, a syringe-case, 5, a hollow plunger or piston, 8, provided with a packing, 10, for holding the medicine and operating the syringe, and a stopper for closing the open end of the plunger, substantially as described.

400,492. ELECTRIC GAS-LIGHTING DEVICE. DAVID ROUSSEAU, New York, N. Y. Filed July 6, 1888. Serial No. 278,176. (No model.)



Claim.—1. In a gas-lighting device, a rotary cock carrying a pulley to which is pivoted a rod or stem bearing a wiping-electrode, said rod or stem having a sliding fulcrum in a yoke or arm attached to a gas-burner, in combination with a fixed electrode, also carried by the burner, and a manipulating cord or chain attached near its center to the pulley, substantially as described.

2. In a gas-lighting device, the combination of a fixed and a wiping electrode, the latter being pivoted to the gas-cock and having a sliding fulcrum or bearing through a fixed yoke or collar, substantially as described.

3. In a gas-lighting device, the combination of a fixed and a wiping electrode, the latter being pivoted to the gas-cock and having a sliding fulcrum or bearing through a fixed yoke or collar, all of said parts being surrounded by a protecting or concealing shield, substantially as described.

400,493. CLEVIS. ARTHUR W. RUSSELL, Kiowa, Kans. Filed June 5, 1888. Serial No. 276,158. (No model.)

400,493.



Claim.—1. In a clevis, the combination, with the clevis bars or sections provided with extended portions lapped together and having coincident openings, of an elongated link secured in said openings and constructed to secure the sections snugly together or to permit their movement apart when adjusted relatively thereto, substantially as described, and for the purposes specified.

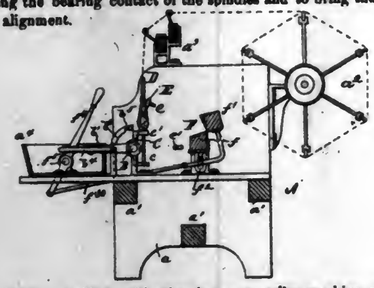
2. The herein-described improvement in clevises, consisting of the bars or sections provided at one end, the one with a bolt and the other with an opening or socket to receive said bolt, and having at their opposite ends extended portions provided with coincident openings and one having a flange or lip extended along the end of the other, and the elongated link secured in said openings and having a hook, substantially as set forth.

3. An improved clevis comprising bars or sections separable at one end and provided at their opposite ends with portions having coincident openings, and an elongated link passed through said openings and adjustable, whereby it may be set to secure the said portions together or to permit their movement apart, all substantially as and for the purposes specified.

4. A clevis consisting of bar or section A, having end portion, A', the bar or section B, having end portion, B', lapped against portion A', and provided at its end with a lip or flange, B^3, extended along the end of portion A', the parts A' and B' being provided with coincident openings, and the elongated link passed through said openings and adjustable, all substantially as and for the purposes specified.

400,494. YARN-REELING MACHINE. WILLIAM SCHOFIELD, Philadelphia, Pa. Filed Jan. 2, 1889. Serial No. 295,140. (No model.)

Brief.—The invention relates to yarn-reeling machines in which the cop-bearing spindles are moved to different positions to facilitate the unwinding of the yarn, and has for its object particularly to provide a support for the outer ends of the spindles, and devices for regulating the bearing contact of the spindles and to bring the spindles into alignment.



Claim.—1. The combination, in a yarn-reeling machine, of the reel a^3, the yarn-guides a^2, the movable bar B, having a number of spindles mounted thereon, actuating mechanism for moving bar B and locking it in its adjusted positions, and a movable supporting device, F, for the outer ends of the spindles, substantially as shown and described.

2. In a yarn-reeling machine, a movable spindle-supporting bar, B, in combination with a supporting device, F, for the outer ends of the spindles when moved to contact therewith, and actuating devices for said bar B and supporting device F, substantially as set forth.

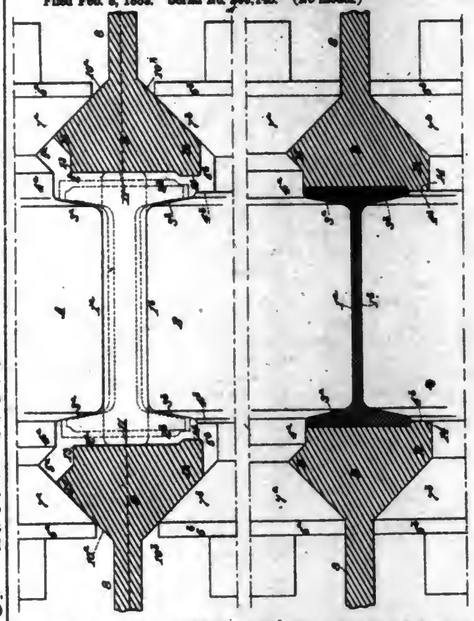
3. In a yarn-reeling machine, the combination, with a movable spindle-supporting bar, B, and its actuating device, of the supporting device F, comprising a fixed bar, *f*, and a movable bar, *f'*, and actuating mechanism for the latter, substantially as set forth.

4. In a yarn-reeling machine, the combination, with movable spindle-supporting bar B and its actuating mechanism, of the arms E E, having set-screws *e* secured to bar B, stops *d'* on the frame of the machine, and a supporting device, F, and actuating mechanism therefor, substantially as set forth.

5. In a yarn-reeling machine, the combination, with a movable spindle-supporting bar, B, and its actuating mechanism, of the vertically-adjustable bar *f'*, brackets f^3, composed of sections, one of which is a sliding section having a set-screw attachment with the other section for adjusting bar *f*, bar *f'*, hinged to bar *f*, and actuating mechanism for bar *f'*, substantially as set forth.

6. In a yarn-reeling machine, the combination, with a movable spindle-supporting bar, B, of the spindle-end-supporting device F, having all-around bearings for the spindle ends, substantially as set forth.

400,495. ROLLING-MILL. JOSEPH S. SEAMAN, Pittsburg, Pa. Filed Feb. 5, 1889. Serial No. 299,143. (No model.)



Claim.—1. In a metal-rolling machine, a vertical roll having a shouldered extension, 14, and operatively arranged between the ends of a pair of horizontal rolls, substantially as set forth.

2. In a metal-rolling machine, a vertical roll having a shouldered extension, 14, in combination with a pair of horizontal rolls, one of the horizontal rolls having a shoulder, 4^c, at the end of its operative portion 1^c, substantially as set forth.

3. In a metal-rolling machine, a vertical roll having a shouldered extension, 14, in combination with a pair of horizontal rolls having shoulders 4^c and 4^b at the ends of the operative portions 1^c and 1^b, respectively, substantially as set forth.

4. In a metal-rolling machine, a vertical roll having a shouldered extension, 14, and inwardly-beveled rims, in combination with a pair of horizontal rolls having beveled collars at or near their ends, one of the horizontal rolls having an edging-shoulder, 4^a, substantially as set forth.

5. In a metal-rolling machine, a vertical roll recessed at its ends and having extensions 14 and 15, in combination with a pair of horizontal rolls having grooves 2^a and 2^b and auxiliary grooves 5^a and 5^b, one of the horizontal rolls having an edging-shoulder, 4^a, substantially as set forth.

400,496. SHUTTER-WORKER. JOHN F. SHATUCK and ARTHUR O. SHATUCK, St. Louis, Mo. Filed Dec. 17, 1888. Serial No. 293,529. (No model.)

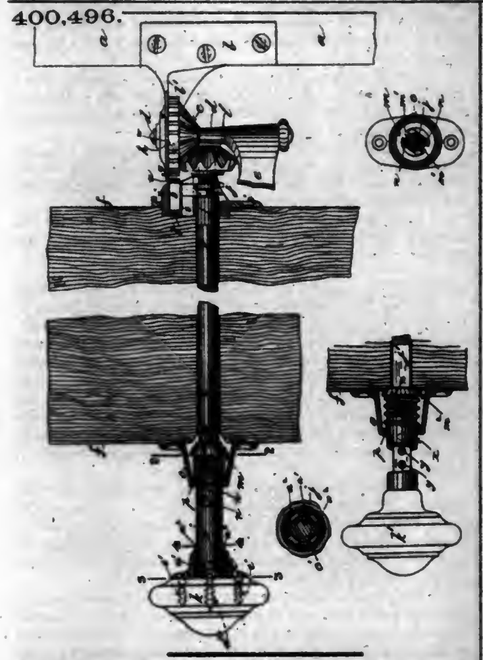
Claim.—1. In mechanism for opening and closing window-shutters, the combination of a longitudinally-movable spindle mounted horizontally within the window-frame and provided with a handle, a bolt operated by said spindle, and which is normally held in gear with a toothed spur-wheel or segment on the shutter by a spiral spring located between a collar adjustably fixed to the spindle, a shoulder or fulcrum projecting from the window-frame, a bevel-wheel fixed on said spindle with the bevel-wheel segment carried by the shutter, substantially as described.

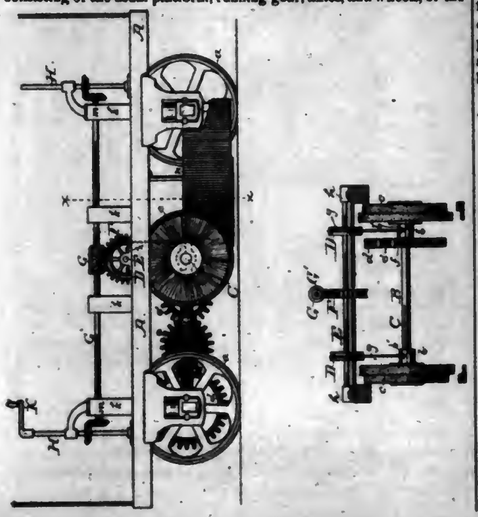
2. The combination of a bevel wheel or segment, *c*, carried by hinged shutter-blind *a*, and engaged by bevel-wheel *l* on spindle *j*, mounted in window-frame, and having adjustable ring or collar *m*, and spiral spring *p*, inclosed by casing *o*, groove *q* in spindle *j*, bolt *s*, having projection *r* and teeth *u*, and mounted between guides in window-frame, and spur wheel or segment *h* on bevel-segment *c*, with knob or handle *k*, substantially shown, and for the purpose described.

3. The combination of spindle *j*, having T-shaped end *d'*, and screw d^2, flange *d'*, having thoroughfare-slotway d^3, recesses d^4, and holes d^5, with knob or handle *k*, and screws *d'*, substantially as shown, and for the purpose described.

4. The combination of spindle *j*, having T-shaped end *d'*, flange *d'*, having thoroughfare-slotway d^3, and recesses d^4, with means for securing said flange to a knob or handle, substantially as described.

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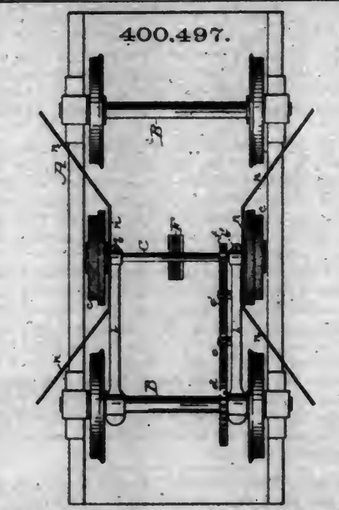
400,497. CAR-TRACK SWEEPER. CHARLES R. SHREVE, Chicago, Ill. Filed Nov. 13, 1888. Serial No. 290,604. (No model.)

Claim.—1. In a track-sweeper, the combination, with a car-truck consisting of the usual platform, running-gear, wheels, and axles, of the links *b*, loosely journaled on one of said axles, shaft C, journaled in extremities of said links, said axle and shaft extending entirely across the machine, and the axle carrying two of the carrying-wheels fast upon the same, and the shaft actuated therefrom, circular brushes *c* on the extremities of said shaft, whose peripheries are greater in diameter next their inner edges than next their outer edges, and devices for suspending the outer ends of said links, in which shaft C is journaled.

2. In a track-sweeper, the combination, with a car-truck consisting of the usual platform, running-gear, wheels, and axles, of the links *b*, loosely journaled on one of said axles, transverse shaft C, journaled in suitable bearings in the ends of said links, a train of gear for imparting the motion of the axles to said shaft, brushes *c c* on the extremities of said shaft, and cables *g g*, connected to the ends of said links extending beyond the bearing of shaft C, as set forth.

3. The combination, in a street-car-track sweeper, of the truck consisting of the usual platform, running-gear, axles, and wheels, of the

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links *b b*, loosely journaled on one of said axles and extending parallel to each other a corresponding distance to and under the center of length of said truck, shaft C, journaled in the end of said links, brushes *c c*, having the outer part of their peripheries less in diameter than the inner part thereof, said shaft and brushes being actuated through the medium of said axle, and cables *g*, for suspending the ends of the links in which shaft C is journaled.

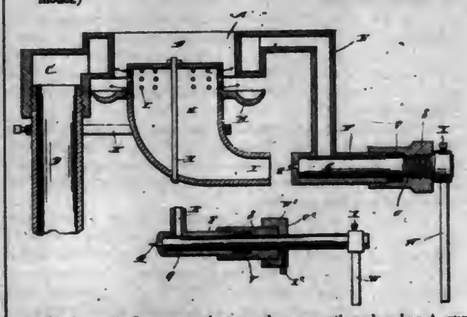
4. The combination, with a street-car truck consisting of the usual platform, running-gear, and axles and wheels, of the links *b*, loosely journaled on one of said axles, shaft C, journaled in the free extremities thereof, brushes *c c* on the ends of said shaft, cables *g g*, for suspending said free ends of the links, wheels D D, shaft E, worm-gear F, and worm G, as set forth.

5. The combination, with a street-car truck consisting of the usual platform, running-gear, axles, and wheels, of the links *b*, shaft C, journaled in the free ends of said links, brushes *c c* on the ends of said shaft C, cables *g g*, for suspending the free ends of said links, wheels D D, shaft E, worm-gear F, worm G, longitudinal shaft G', vertical shafts H, and bevel-gear for connecting said vertical and longitudinal shafts.

6. The combination, with a car-truck consisting of the usual platform, running-gear, axles, and wheels, of the links *b*, loosely journaled on one of the said axles, shaft G, journaled in the end of said links, gear *d*, fast on said axle, pinion *f*, fast on said shaft in alignment with gear *d*, and intermediate idle-gear, *e* and *e'*, for connecting gear *d* with pinion *f*, brushes *c c* on the ends of shaft C, having a stepped periphery, and cables *g*, for suspending the free ends of said links.

7. The combination, with a street-car truck consisting of the usual platform, running-gear, axles, and wheels, of the links *b*, shaft C, gear for imparting the motion of said axle to said shaft, brushes *c c* on the ends of said shaft, having a stepped periphery, and cables *g*, for suspending said links *b*, and shields *n*, as described, interposed obliquely across the tracks, said truck moving on in front of each brush *c* and between them and the wheels on corresponding sides, as set forth.

400,498. VAPOR-BURNER. CHARLES H. SHULTZ, St. Joseph, Mo. Filed May 17, 1887. Renewed Feb. 23, 1889. Serial No. 300,965. (No model.)



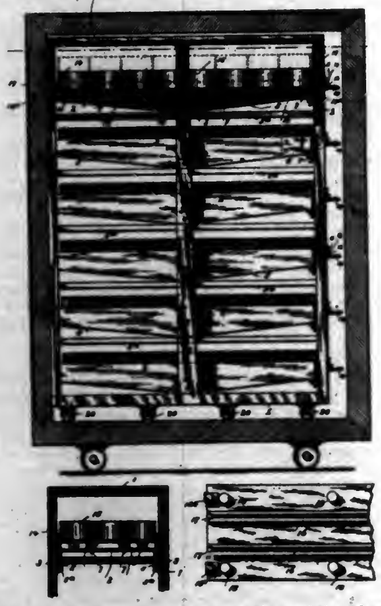
Claim.—1. In a vapor-burner, the generating-chamber A, surrounding a central space, B, which is entirely open both at the top

and bottom, combined with the burner-head arranged below the generating-chamber and having its upper end inserted part way into the open space B, the top of the burner being closed and imperforate, and two or more series of jet-openings, L, in the sides of the burner-head, one series being above the other, so that the openings L are both above and below the bottom of the generating-chamber, as set forth.

2. In a vapor-burner, the generating-chamber A, surrounding a central space, B, which is open at the top and bottom, and the combined mixing-chamber and burner H, arranged below the generating-chamber, the burner-head being inserted into the space B, and having a removable cap provided with a flanged extension, which forms an oil-cup, M, the top of the cap being imperforate, and the perforations L in the sides of said cap, as set forth.

3. In a vapor-burner, the generating-chamber A, surrounding a central space, B, which is open at the top and bottom, and the vapor-pipe E, extending from the chamber, in combination with the combined mixing-chamber and burner H, made separate from the generating-chamber and having its upper end inserted part way into the space B and its lower end formed with an integral tube, I, which is turned to one side toward the pipe E, and the needle-valve at the lower end of pipe E, adjacent to the end of tube I, and the jet-openings L in the sides of the burner, said openings being both above and below the bottom of the generating-chamber, the top of the burner being imperforate, as set forth.

400,499. SAFE OR VAULT. MICHAEL SIEBDORFER, Louisville, Ky. Filed Aug. 4, 1888. Serial No. 281,980. (No model.)



Claim.—1. A money or security receptacle consisting of one or more shelves, suitably secured and pivoted in a frame-work, in combination with a corresponding number of removable trays, as and for the purposes set forth.

2. A safe or vault for money, securities, &c., which consists of a suitable frame-work having cross-bars, as shown, and permanent shelves pivoted in the frame just above the cross-bars and provided with triangular-shaped sides projecting downwardly, which are adapted to seat on the cross-bars, as described, in combination with removable money-trays, as set forth.

3. In a safe or vault for money, securities, &c., the combination of the frame-work, and the shelves pivoted therein and provided with anti-friction wheels or rollers, with a corresponding number of removable money-trays, provided with grooved ways for traveling on the rollers, as shown and described.

4. In a safe or vault for the storage of money, securities, &c., the combination of a suitable frame-work, one or more shelves pivotally secured within the frame, means for tilting the pivoted shelves and locking them in either position, and a series of money-trays corresponding in number to the shelves, as and for the purposes set forth.

5. A device for storing money, securities, &c., which consists of a frame-work, preferably open and mounted on wheels, and which may be inserted in any vacant safe, vault, or closet, in combination with pivoted or tilting shelves and removable trays, as and for the purposes set forth.

6. The combination of a suitable frame-work, pivoted or tilting shelves hung therein, and the removable trays for the reception of money, &c., and subdivided, as shown, for indicating the exact amount contained within any one tray.

7. In combination with the safe or vault, substantially as herein-before described, the coin-receiving tray made removable for the purposes set forth, and provided with rubber or other padding upon the end and bottom to prevent jarring or scratching.

8. The safe for storing money, securities, &c., and provided with the stationary shelves having a tilting movement within the said safe, for the purposes set forth.

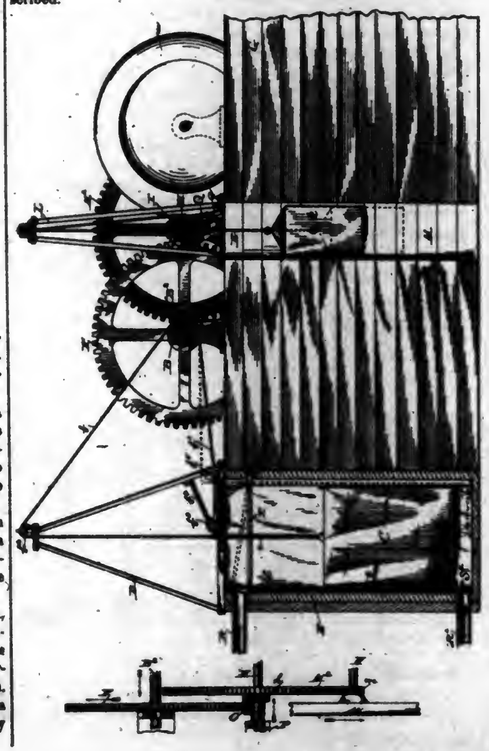
400,500. TIDE AND LOCK POWER ENGINE. ADA F. SMITH, Brooklyn, N. Y. Filed Nov. 15, 1888. Serial No. 290,911. (No model.)

Claim.—1. The herein-described machine for utilizing the buoyant properties of fluids and the varying level of the same as a power medium, the same being composed of a float, the two drums, the cables connecting the float with the drums and wound around the said drums in reverse directions, the power-shaft geared with the drums, and means, as the pinion O and the endwise-movable shaft B^3, for maintaining a continuous rotary movement of the power-shaft in the same direction whether the said float be rising or falling, substantially as described.

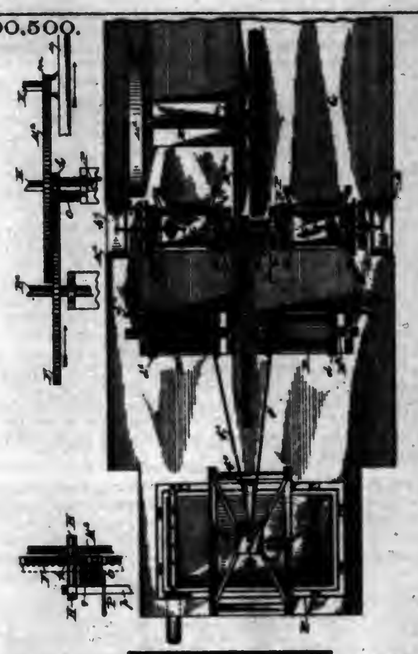
2. The herein-described mechanism for converting the buoyant properties of fluids and the change of level of the same into available power, consisting of the float, the two drums, the cables wound in reverse directions on the drums and connected with the said float, the power-shaft geared with the drums, and the shaft H, for storing the power, substantially as and for the purpose specified.

3. The combination of the float, the endwise-movable shaft B^3, the drums on the said shaft B^3, the cables wound in reverse directions on the drums and connected with the said float, the shaft H, the drums on the said shaft H, the weighted cables adapted to be wound on the said drums, the clutches for gearing the drums to the shaft H, the power-shaft geared with the said shaft H, the gear-wheel F, pinion *h*, and movable pinion O, substantially as and for the purpose specified.

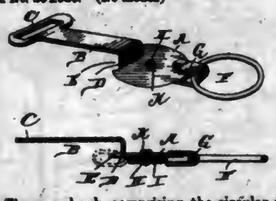
4. The combination, with the shaft H, the drums on the said shaft, the weighted cables wound in reverse directions on the drums, means for keying the drums to the shaft at will, and the power-shaft in gear with and revolved from the said shaft H, substantially as described.



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400,501. HOOK. CHARLES SMITH, Rogers, Ark. Filed Dec. 20, 1888. Serial No. 294,920. (No model.)

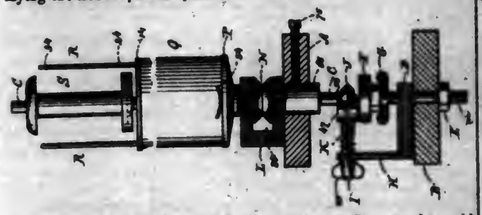


Claim.—1. The snap-hook comprising the circular disk A, having the notch E in one side, the shank B, projecting from the disk and having the offset or shoulder D at its inner end attached to the disk at the notched portion thereof, whereby the said shank extends over the notch and is in a different plane from the disk, and the hook G, having its inner end pivoted to the center of the disk, the point of the hook being adapted to sweep on and in contact with the disk until it reaches the notch E, substantially as described.

2. The snap-hook comprising the circular disk A and the integral shank B, said disk having the notch E in one side, and said shank having the offset or shoulder D and being arranged over the notch, and the hook G, having its inner end pivoted under the center of the disk, and having its point adapted to sweep on and in contact with the disk until it reaches the notch E, substantially as described.

400,502. SPINNING-SPINDLE. SAMUEL SMITH, Lawrence, and RICHARD GILL, Methuen, assignors to themselves, and WILLIAM H. BUTLER, Lawrence, Mass. Filed Oct. 9, 1888. Serial No. 287,609. (No model.)

Brief.—The invention relates to spindles designed for worsted spinning, and consists in the devices for regulating the drag and for laying the fibers upon the yarn as it is spun.



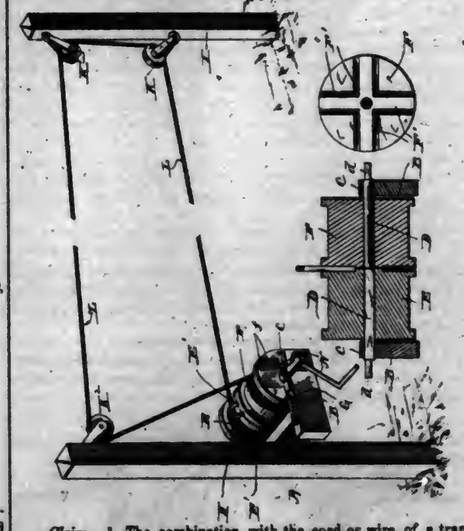
Claim.—1. The lifting-rail B, the spindle-step D, secured to said rail by the nut E and exteriorly screw-threaded at its upper end, the oil-cup F, having a screw-threaded hole at its bottom and mounted on the step D, and the felt ring 64, disposed in said cup, in combination with the spindle C, resting in said step and provided with the collet J, whereby friction may be exerted on the spindle by turning said cup upward to bring said ring in contact with the collet and the movement of the spindle thereby regulated, substantially as set forth.

2. The lifting-rail B, the step D, secured in said rail and provided with the bracket H, the upper portion of said step being exteriorly screw-threaded, the oil-cup F, having a screw-threaded hole in its bottom and mounted on said step, the pad or ring 64, disposed in said cup, and the rod I, fitted to slide in said bracket and provided with the nut 45, spring K, and head 47, in combination with the spindle C, provided with the collet J, substantially as described.

3. The cylinder Q, provided with an opening or openings through its side, in combination with the disk P, sleeve O, whirl N, spindle C, and flier-arm R, substantially as described.

4. The cylinder Q, provided with one or more crescent-shaped or curved openings, as 54, in combination with the disk P, sleeve O, whirl N, spindle C, and flier-arm R, substantially as described.

400,503. CLOTHES-LINE. FRANK P. STANLEY, Spencer, Iowa. Filed Aug. 21, 1888. Serial No. 283,337. (No model.)



Claim.—1. The combination, with the cord or wire, of a transverse shaft carrying a rigid reel to which is attached one end of the cord or wire, the loose reel mounted on the said shaft and having the other end of the cord or wire attached thereto, and the key engaging registering grooves in the contiguous ends of the said reels, substantially as specified.

2. The combination, with the cord or wire, of the transverse shaft D, provided with a squared portion and a round portion, the reel E, mounted on the squared portion of the shaft and adapted to turn with the same, the reel F, mounted on the round portion of the shaft, the contiguous ends of the reels being provided with radial grooves E' F', which are adapted to register, and the loop-shaped key H, having its arms A A inserted in the said registering grooves, substantially as specified.

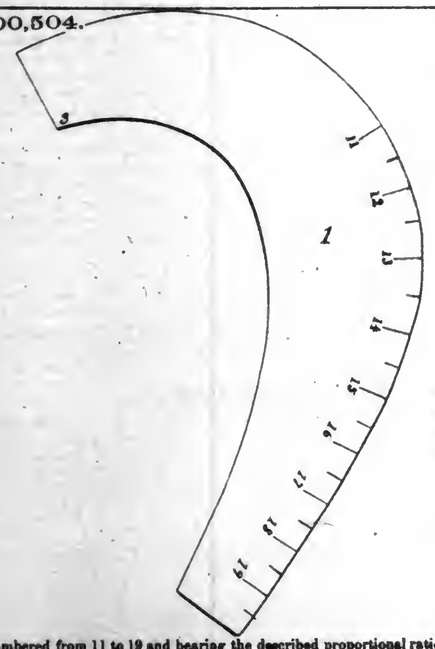
3. The combination, with a cord or wire, of the shaft having the rigid reel E and the movable reel F mounted thereon, and having the ends of the cord or wire attached respectively thereto, the key adapted to engage registering grooves in the contiguous ends of the reels, and the hook or latch adapted to engage a socket in the free end of the reel F, substantially as specified.

400,504. DRESS-CUTTER'S RULE. TERESSA I. STOCKMAN, Council Bluffs, Iowa. Filed Nov. 7, 1888. Serial No. 290,194. (Model.)

Claim.—A dress-cutter's rule having one side edge convex and the other concave, the curves of the said edges being partially elliptical, the ends being straight-edged and narrower than the midway portion, the convex edge being provided with a scale of graduations

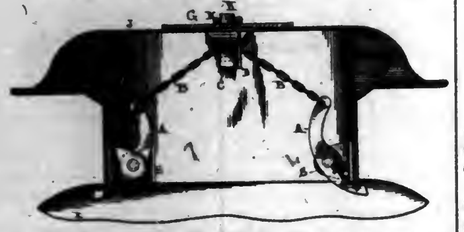


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numbered from 11 to 19 and bearing the described proportional ratio to the whole length of the rule, substantially as shown and described, whereby the concave curve of the rule may be located as a guide to draw an arm-scye on a dress, as set forth.

400,505. SEALED LOCK FOR CANS. WILLIAM H. STOOPS, Boonton, N. J., assignor to Joshua S. Salmon, same place. Filed Sept. 10, 1888. Serial No. 285,037. (No model.)



Claim.—1. The combination, with a can, of two or more levers pivoted to the inside of the cover, their lower ends being adapted to project under the shoulder of the can, and means for drawing toward each other the upper ends of the levers and retaining them in that position, substantially as described.

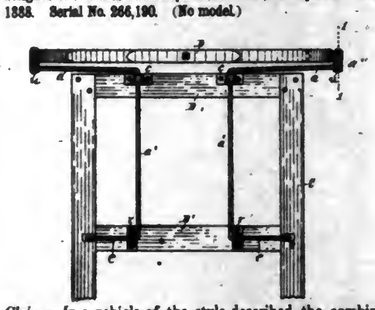
2. The combination, with a can, of the levers A, pivoted to the inside of the cover and adapted to engage with the shoulder of the can, a chain, B, loosely uniting the ends of the levers, and means for putting and retaining a tension on the chain, substantially as described.

3. The combination, with a can, of two or more levers, A, pivoted to the inside of the cover and adapted to engage with the shoulder of the can, a chain, B, loosely uniting the levers, a tongue, C, fastened to the inside of the cover and adapted to receive the chain B, and a safety-catch for retaining the chain upon the tongue, substantially as described.

4. The combination, with a can, of a cover having an opening therein, two or more levers pivoted to the inside of the cover and adapted to engage with the shoulders of the can, a chain, B, loosely uniting the levers, a tongue, C, fastened to the inside of the cover adjacent to the opening and adapted to receive the chain, B, a lid, G, for closing the opening in the cover, and means for sealing it when closed, substantially as and for the purpose set forth.

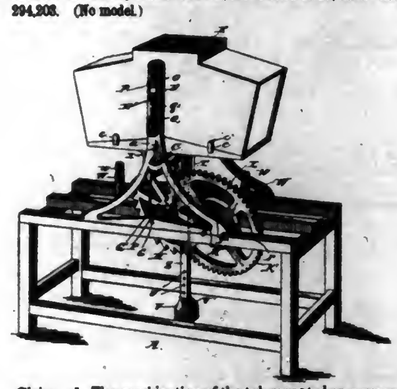
5. The combination, with a can, of the levers A, pivoted to the inside of the cover and adapted to engage with the shoulder of the can, a chain, B, loosely uniting the ends of the levers, means for putting and retaining a tension on the chain, and means for securing the chain from being tampered with without detection, substantially as described.

400,506. VEHICLE-SPRING. LUTHER STOUFFER, St. Joseph, Mo., assignor of two-fifths to Joseph W. Stouffer, same place. Filed Mar. 5, 1888. Serial No. 266,190. (No model.)



Claim.—In a vehicle of the style described, the combination of the torsions provided with the embossed eyes, the bolts larger in diameter at one end than the other, the larger ends being firmly driven into the eyes of the torsions, and the semi-elliptical springs having the eyed ends loose on the smaller ends of the bolts and the bolt-nuts, substantially as set forth.

400,507. MOTOR FOR CHURNS. WILLIAM H. STRICKLER and JAMES S. BRADDOCK, Mount Pleasant, Pa. Filed Dec. 20, 1888. Serial No. 294,208. (No model.)



Claim.—1. The combination of the tub mounted on a verge which is provided with a pallet engaging a suitable scape-wheel, and the power-shaft geared to the shaft of the scape-wheel, substantially as specified.

2. The combination of the verge carrying a churn-tub and having a pallet which engages a suitable scape-wheel, the power-shaft geared to the shaft of the scape-wheel and provided with a power-spring to rotate the shaft, the drum mounted on the power-shaft and adapted to be locked rigidly thereto, and the cord coiled on the drum and provided at its opposite end with a weight, substantially as specified.

3. The combination of the verge carrying a churn-tub and having a pallet which engages a suitable scape-wheel, the power-shaft provided with a spring and geared to the shaft of the scape-wheel, and the buffers arranged under the ends of the churn-tub and provided at their upper ends with coiled springs *w w*, which are adapted to be alternately compressed by the churn-tub, substantially as specified.

4. The combination of the verge provided with the rigid vibrating arms C C, the churn-tub removably secured to the said arms, the pallet arranged on the verge and engaging a suitable scape-wheel, and the power-shaft geared to the arbor of the scape-wheel, substantially as specified.

5. The combination of the verge provided with the arms C C, beveled on their upper sides from their centers toward the ends, the churn-tub provided with a double inclined bottom fitting on the upper edges of the said arms and removably secured thereto, the escapement arranged as described, and the power-shaft geared to the arbor of the scape-wheel, substantially as specified.

6. The combination, with the verge having the churn-tub attached thereto and provided with a pallet engaging a suitable scape-wheel, and the power-shaft geared to the arbor of the scape-wheel, of the pendulum suspended loosely on a suitable pivot-pin and the depending arm at the verge fitting at its lower end in a slot in the pendulum, substantially as specified.

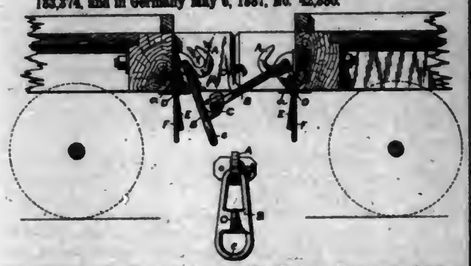
7. The combination, with the verge having a churn-tub attached at its center thereto and provided with a pallet engaging a suitable scape-wheel, and the power-shaft geared to the arbor of the scape-wheel, of the pendulum pivoted at its upper end and provided with a series of perforations, U, the depending arm T on the verge provided with a finger, *t*, fitting in a vertical slot in the pendulum, the pendulum-bob fitting on the lower end of the pendulum and provided with a perforation registering with one of the perforations U, and the pin engaging in the said perforations, substantially as specified.

8. The verge provided with the vibrating arms C C and the depending arm T, the churn-tub secured to the arms C, the pallet on the said verge engaging a suitable scape-wheel, and the power-shaft geared to the arbor of the scape-wheel, in combination with the pendulum pivoted at its upper end and connected to the lower end of the arm T, and the pendulum-bob fitting on the lower end of the pendulum and vertically adjustable thereon to counterbalance the weight of the contents of the churn-tub, substantially as specified.

9. The combination, with a verge carrying a churn-tub and provided with a pallet engaging a suitable scape-wheel, and the power-shaft geared to the arbor of the scape-wheel and carrying an actuating-spring, of the drum loosely mounted on the power-shaft and having a weighted cord wound thereon, and the pawl engaging a ratchet-wheel on the drum to lock the latter to the power-shaft, substantially as specified.

10. The combination, with a verge carrying a churn-tub and provided with a pallet which engages a suitable scape-wheel, and the power-shaft geared to the arbor of the scape-wheel and carrying an actuating-spring, of the drum mounted loosely on the power-shaft and having a weighted cord wound thereon, the pawl engaging a ratchet-wheel on the drum to lock the latter to the power-shaft, and the supplemental shaft R, adapted to be engaged by a key and geared to the drum, substantially as and for the purpose specified.

400,508. CAR-COUPLING. WILLIAM G. STUART, Hunhead, County of Surrey, assignor of one-half to Albert Henry Bellingham, Peckham, England. Filed Nov. 6, 1888. Serial No. 290,149. (No model.) Patented in England Mar. 14, 1887, No. 3,830; in France May 6, 1887, No. 183,374, and in Germany May 6, 1887, No. 42,380.



Claim.—In a car-coupling, the link B, depending from a hooked draw-bar head, A, having a link end, *e*, and hook C, in combination with a cranked rod, D, for raising same, having handles E, and being suitably attached to the car, substantially as described.

400,509. SOLDERING-IRON. ALFRED SUDDEN and SWAN B. MOLANDER, Mora, Minn. Filed Dec. 3, 1888. Serial No. 292,959. (No model.)



Claim.—The improved soldering-iron herein described and shown, comprising a body having a longitudinal internal recess, D, and a small longitudinal passage, E, leading from said recess, a hollow handle secured to the body, the wick arranged in the handle and entering the recess D, the valve mounted in the upper side of the body and entering the longitudinal passage E, the hollow soldering-point connected to and communicating with the body and having an open upper end, the cover pivoted to the body and adapted to close the open upper end of the point, and the cup hung on the body, as specified.

400,510. CIRCULAR-KNITTING MACHINE. CHARLES F. SWAIN, Methuen, Mass. Filed July 19, 1888. Serial No. 280,410. (No model.)

Claim.—1. The combination of the stationary frame, the needle-cylinder and spring-bearded needles, the plush-looper, the binder-looper, the blending-wheel, and the push-back provided in its lower edge with a recess having outwardly and downwardly inclined ends

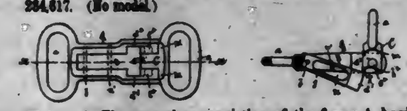


and arranged to operate after the binder-looper and before the blending-wheel to allow the fabric after passing the binder-looper to rise on the needles, carrying with it the plush-thread to a position just below the beards of the needles and to push said fabric down before reaching the blending-wheel, whereby said blending-wheel may operate upon said plush-thread and said binder-thread without interfering with said fabric, as and for the purpose specified.

2. The combination of the stationary frame, the needle-cylinder and spring-bearded needles, the plush-looper, the binder-looper, the blending-wheel, the push-back provided in its lower edge with a recess having outwardly and downwardly inclined ends, a riser arranged on the inner side of said push-back and having its upper edge above the lower edge of said push-back within said recess and having its ends inclined downwardly and outwardly, and a fabric-strainer arranged on the inner side of said riser and having its lower edge below the upper edge of said riser, and having its ends inclined upwardly and outwardly, said riser and said fabric-strainer being concentric with said push-back, and said push-back, riser, and fabric-strainer being arranged to operate after the binder-looper and before the blending-wheel to cause the fabric after passing the binder-looper to rise on the needles, carrying with it the plush-thread to a position just below the beards of the needles and to push said fabric down before reaching the blending-wheel, whereby said blending-wheel may operate upon said plush-thread and said binder-thread without interfering with said fabric, as and for the purpose specified.

3. The combination of the stationary frame, the needle-cylinder and spring-bearded needles, the plush-looper, the binder-looper, the blending-wheel, the face-looper, the landing-wheel and its presser, the knock-over wheel, the push-back provided in its lower edge with a recess having outwardly and downwardly inclined ends and arranged to operate after the binder-looper and before the blending-wheel to cause the fabric after passing the binder-looper to rise on the needles, carrying with it the plush-thread to a position just below the beards of the needles and to push said fabric down before reaching the blending-wheel, whereby said blending-wheel may operate upon said plush-thread and said binder-thread without interfering with said fabric, as and for the purpose specified.

400,511. SNAP-HOOK. JEREMIAH R. TAINTER, Menomonee, and NATHAN P. NOBLE, Rice Lake, Wis. Filed Sept. 5, 1888. Serial No. 284,617. (No model.)

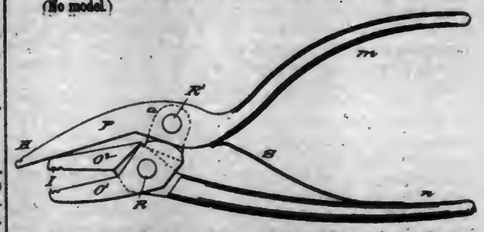


Claim.—1. The snap-clasp consisting of the frame A, having the recesses d^3 d^3 and cavities d', spring-tongue B, supported within said frame, and a head, C, having projections c^3 fitting said cavities, whereby said parts A and C are capable of being connected and disconnected, substantially as and for the purpose set forth.

2. In a snap-clasp, a frame, A, having recesses d^3 d^3 and cavities d', tongue B, supported within said frame, and a head, C, having projections c^3 fitting said cavities, and with prongs $k' k^3$, and adapted to depress said tongue when said head is oscillated upon said studs, substantially as and for the purpose set forth.

3. The snap-clasp consisting of the frame A, having the recesses d^3 d^3 and cavities d', head C, having projections c^3 fitting said cavities, and a tongue, B, supported within said frame, and with internal cavity, *u*, whereby the clogging of the tongue is prevented, substantially as and for the purpose set forth.

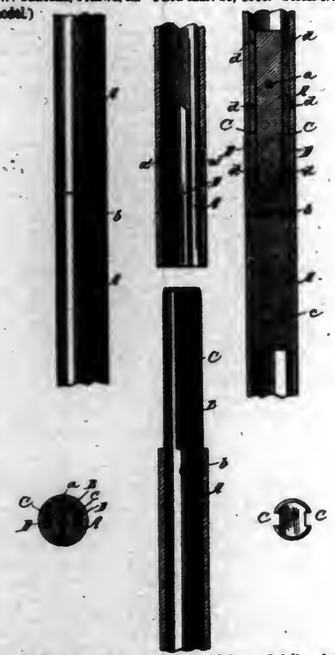
400,512. PLIERS FOR APPLYING COUPLINGS OF WIRE. HARVEY D. TAYLOR, Keeseville, N. Y. Filed Dec. 3, 1888. Serial No. 292,565. (No model.)



Claim.—The pliers described, consisting of two main members or arms and a short connecting member, the upper member, *m*, having

the extension P, and provided with a notch, H, the lower member, n, having an upper jaw, O², the connecting member having the jaw O and being pivoted to the lower member and also to the head of the upper member, as set forth.

400,513. LOCKING DEVICE FOR TUBE OR PIPE SECTIONS. JOHN W. TESTREL, Ottawa, Ill. Filed Mar. 23, 1888. Serial No. 268,247. (No model.)



Claim.—1. The plug B, having one end formed full and the other end provided with recesses C, for uniting tube or pipe sections, substantially as specified.

2. The combination, with tube or pipe sections having one end provided with splines or keys, of the plug D, having the grooves or recesses C, substantially as and for the purposes specified.

3. The combination, with the tube or pipe sections having one end provided with splines or keys, of the plug D, having the grooves or recesses C, and securing-rivets *a b c*, substantially as specified.

400,514. HORSESHOE AND PAD. SAMUEL THOMPSON, Chicago, Ill. Filed Mar. 24, 1888. Serial No. 268,440. (No model.)



Claim.—1. The combination, with a horseshoe, of a pad of elastic material the edges of which extend and are secured between the shoe and hoof and which is provided with a frog that projects down between the heels of the shoe to a plane below that of the bearing-surface thereof, and the projection of which gradually diminishes as said frog approaches the toe, and a spring-bar, D, secured to the toe of the shoe next the hoof and extending longitudinally to and terminating under the heel of the hoof, said bar having no other connection to said shoe except at the toe thereof and pressing upward against the frog of said pad to support the same, as set forth.

2. The combination, with a horseshoe and a leather sole secured between said shoe and the hoof, of an artificial frog of elastic material, the front end of which reaches to or under the toe of the shoe and which gradually increases in thickness as it extends longitudinally from the toe to between the heels of said shoe until it depends at the heel to a plane below that of the tread of said shoe, and a spring-bar which is secured next the hoof to the toe of shoe and which extends to the rear, resting within a longitudinal depression or groove in the outer surface of said frog, which it holds rigidly in place.

400,515. APPARATUS FOR REGULATING CURRENT OR POTENTIAL IN SECONDARY OF TRANSFORMERS. ELIHU THOMSON, Lynn, Mass. Filed Jan. 10, 1889. Serial No. 296,018. (No model.)



Claim.—1. An induction-coil or transformer having a partial magnetic shunt of determinate capacity for the magnetism threading the coils, whereby the potential of the secondary current may be automatically lowered on an increase of such current, as and for the purpose described.

2. In an induction-coil or transformer, a partially-closed magnetic circuit consisting of polar extensions or magnetic carriers from the parts of the core between the primary and secondary brought into close proximity, as and for the purpose described.

3. The combination, with an induction-coil or transformer having a magnetic shunt, of a conductor suspended or movable in the shunting-lines of force, as and for the purpose described.

4. The combination, with constant-potential mains, of a transformer, a secondary for said transformer feeding translating devices in series, and a magnetic shunt for the transformer having a definite or determinate capacity, such as described, proper for limiting the currents in the secondary, so as to keep or tend to keep the same of constant amount, as and for the purpose described.

5. The combination, with an iron core threading two alternating-current coils, of magnetic carriers or extensions for said core brought into close proximity and forming a magnetic shunt variable in amount automatically by the increase or decrease of current in one of said coils, as described.

6. The combination, with two alternating-current coils placed in inductive relation upon a suitable core, of a magnetic shunt for the magnetism threading said coils and of definite or determinate strength increasing automatically with an increase of current in the coil.

7. The combination, with two alternating-current coils wound on different parts of the same core, of iron masses tending to form a magnetic shunt for the portions of core between the coils and adjustable for the purpose of determinating the amount of the magnetic shunting.

8. The combination, with constant-potential mains, of a transformer having its primary fed therefrom, a secondary on a different portion of core, and a partial magnetic shunt for the portion of core between the coils.

9. The combination, with the primary, of two secondaries connected in series and applied to different parts of the same core, one near to and the other more remote from the primary, and a partial magnetic shunt for the core, as and for the purpose described.

10. The combination, with two alternating-current mains, of transformers having a variable resistance in their secondaries and partial magnetic shunts for the portion of cores threading the secondaries, as and for the purpose described.

11. A system of distribution for arc lighting, comprising constant-potential mains, transformers in multiple on said mains, arc-light circuits connected to the secondaries, and potential-regulators consisting of partially-closed magnetic circuits set up by the currents of either or both of said coils.

12. The combination, with primary and secondary alternating circuits in inductive relation, of an iron core forming a seat of alternating magnetism developed by one of said circuits, and having extensions brought into close proximity to form a partially-closed magnetic circuit of determinate amount variable automatically with the currents flowing.

13. The combination, with primary and secondary alternating-current circuits in inductive relation, of an iron core forming the seat of alternating magnetism developed by the current in the secondary and extensions from said core brought into proximity to form a partially-closed magnetic circuit of definite or determinate amount.

14. The combination, with an alternating-current main, of a transformer having a variable resistance in its secondary and a core which forms the seat of magnetism developed by the secondary currents, and is provided with extensions brought into proximity to form a partially-closed magnetic circuit of determinate amount, as and for the purpose described.

15. The combination, with an induction-coil or converter, of a partially-closed magnetic circuit excited by the current in each or either of the electric circuits and a conducting-plate movably suspended in a gap in such magnetic circuit, as and for the purpose described.

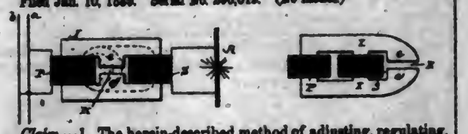
16. The combination, with an induction-coil or converter, of magnetic carriers—such as iron-core extensions—from a core excited by the current which flows in one of the coils of the converter, and means for adjusting the magnetic resistance between the parts of the core

partially shunted by said carriers or extensions, as and for the purpose described.

17. An induction-coil or converter having an endless iron core or magnetic circuit on which the primary and secondary coils are disposed at different points, and having parts or extensions of said core brought into determinate magnetic inductive proximity to form a partially-closed magnetic circuit of definite capacity independent of the closed magnetic circuit over the iron core and through the coils.

18. An induction-coil or converter having primary and secondary conductors wound on different parts of the core, and having parts of said core brought into proximity but separated by a magnetic shunting-space of definite or determinate capacity, as described, proper for keeping the current in the secondary approximately constant when the primary is supplied from a constant-potential source.

400,516. METHOD OF REGULATING CURRENT OR POTENTIAL IN SECONDARY OF TRANSFORMERS. ELIHU THOMSON, Lynn, Mass. Filed Jan. 10, 1889. Serial No. 296,019. (No model.)



Claim.—1. The herein-described method of adjusting, regulating, or determining the current or potential in the secondary of two coils or circuits placed in inductive relation, consisting in developing alternating magnetism through the action of the current in each or either of said circuits in a suitable iron core and variably closing the magnetic circuit of said core through a path independent, in whole or in part, of the core or portion of core in which magnetism is developed by the other coil or circuit.

2. The herein-described method of obtaining a fall of potential in the secondary circuit of an induction-coil fed from a constant-potential source, consisting in magnetizing a core by one of said circuits and partially closing the magnetic circuit of said core through a path of determinate or set value independent of the core or portion of core which is excited by the other circuit.

3. The herein-described method of regulating the current in the secondary circuit of a transformer, which consists in developing a magnetism by current in each or either circuit of the transformer and variably closing the magnetic circuit through a path independent of the core or portion of core carrying the coil or the other circuit of the transformer.

4. The herein-described method of obtaining a substantially-constant current in the variable-resistance circuit of a transformer fed from a constant-potential source, consisting in shunting the magnetism threading the two coils of the transformer in variable amount, as and for the purpose described.

5. The herein-described method of obtaining a constant current in a variable-resistance circuit from a constant-potential source, consisting in passing the current from said source through the primary of an induction-coil whose secondary is connected to the variable-resistance circuit, setting up rapid alternations of magnetism in a suitable core by current in each or either of said circuits, and causing a variable closure of the magnetic circuit for said core through a partial magnetic circuit which is independent of the core for the other.

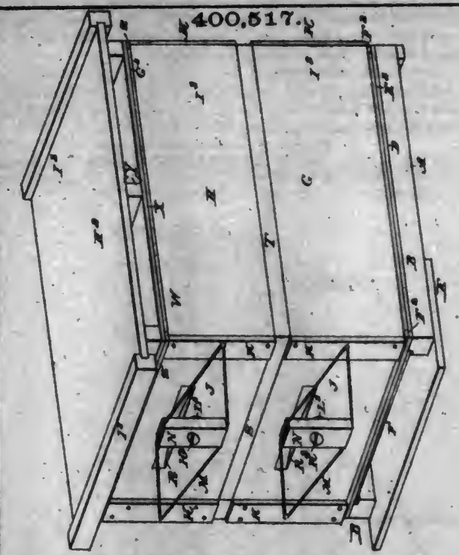
6. The herein-described method of regulating the current in the secondary circuit of an alternating transformer, consisting in setting up alternations of magnetism by the current in each or either of the coils of said transformer, partially closing the magnetic circuit, and adjusting a conducting plate or body transversely in a gap of such circuit to vary the closure.

7. The herein-described method of regulating the current in the secondary of an induction-coil, consisting in disposing the primary or secondary on different parts of an endless iron core and magnetically shunting the magnetism of the iron core in increased amount with an increase of current in the secondary.

400,517. BEE-HIVE. GEORGE L. TINKER, New Philadelphia, and WINFIELD S. KLINE, Bolivar, Ohio. Filed Aug. 27, 1887. Serial No. 248,063. (Model.)

Claim.—In a bee-hive, a brood or surplus-honey chamber composed of the side board, I, attached to the short end boards, J, the removable side board I², the cleats K, and the frames O, clamped between the side boards by suitable clamp devices, the said frames hav-





ing end bars of a total width exceeding the length of the end boards, the parts being combined for the purposes set forth.

400,518. PUSH-BAR FOR LOCOMOTIVES. MATTHEW D. TOOMEY, Galveston, Tex. Filed Dec. 21, 1888. Serial No. 294,221. (No model.)



Claim.—1. A push-bar for locomotives, comprising a horizontally-swinging draw-head and a coupling-bar carried by said draw-head and adapted to slide longitudinally therein, as set forth.

2. A push-bar for locomotives, comprising a draw-head having a vertical sleeve or cylinder on its upper side, a coupling-bar sliding in the draw-head and having an opening in its inner end, and a locking-pin mounted in the sleeve or cylinder and adapted to engage the opening in the coupling-bar, as set forth.

3. The combination, with the support E, of the draw-head pivoted thereto, the coupling-bar carried by the draw-head, the spring projecting from the upper end of the pivot-pin of the draw-head, and the supporting-pin secured to said spring and extending downward through the draw-head, and provided at its lower end with an annular shoulder bearing against the under side of the draw-head, as set forth.

4. The combination of the draw-head, having slots in its sides and provided with the vertical shoulders N, and the coupling-bar sliding in the draw-head and having lateral extensions projecting through the slots in the draw-head, and provided with the wings O, bearing against the sides of the draw-head and adapted to contact with the shoulders N, as set forth.

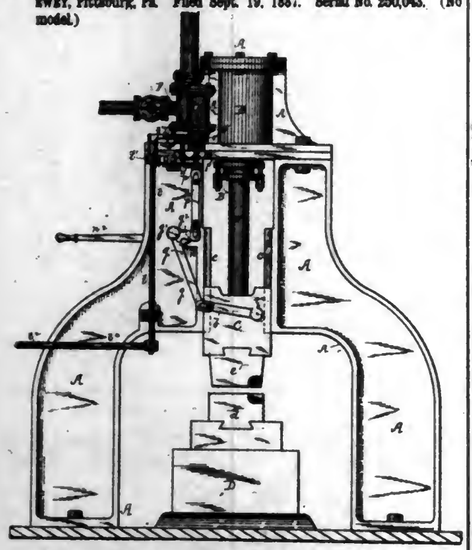
5. A push-bar for locomotives, comprising a horizontally-swinging draw-head pivoted to the front end of the locomotive, and carrying a coupling-bar which is adapted to slide longitudinally within the draw-head.

6. The improved push-bar for locomotives herein described and shown, comprising the support E, the horizontally-swinging draw-head, the coupling-bar carried by the draw-head and adapted to slide longitudinally therein, the casting adapted to receive the end of the coupling-bar when not in use, the pin pivoting the end of the draw-head to the support E, the spring projecting from the upper end of said pivot-pin, and the supporting-pin depending from said spring and supporting the draw-head, as specified.

7. A push-bar for locomotives, comprising a horizontally-swinging draw-head carrying a coupling-bar, and the pin for locking the draw-head to hold it from swinging, as set forth.

8. A push-bar for locomotives, comprising a horizontally-swinging draw-head carrying a coupling-bar, and the pin for locking the draw-head to hold it from swinging, and the castings C on either side to lock the draw-head when swung around, as set forth.

400,519. VALVE-GEAR FOR STEAM-HAMMERS. SAML. TRETHEWEY, Pittsburg, Pa. Filed Sept. 19, 1887. Serial No. 250,043. (No model.)



Claim.—1. The combination of the valve-chest and the cylindrical lining H, fitting within the valve-chest and having the ports L L' formed therein, and the annular recesses forming annular passages within said valve-chest, substantially as and for the purposes set forth.

2. The combination of the valve-chest having the cylindrical valve-chamber, the valve-rod M', having the collar m^2 and cup-valve m', sleeve m^3, and inverted cup-valve m, forming the cylindrical valve M, substantially as and for the purposes set forth.

3. In valve apparatus for steam-hammers, the combination of the steam-chest having the cylindrical valve-chamber therein and cylindrical sliding valve fitting within said steam-chest, automatic connections for reciprocating said valve, a link or arm connected to the valve-rod and carrying a socket at one end thereof, a gear-wheel mounted at the base of the valve-chest, and a pin extending down from said gear-wheel and passing through the socket of said arm, substantially as and for the purposes set forth.

4. In valve apparatus for operating steam-hammers, the combination of the steam-chest having the cylindrical valve-chamber therein and cylindrical reciprocating valve located in said chamber, a gear-wheel mounted on the steam-chest, connections between said gear-wheel and the valve-rod, and a segmental gear, T, meshing with said gear-wheel, and means for operating the same, substantially as and for the purposes set forth.

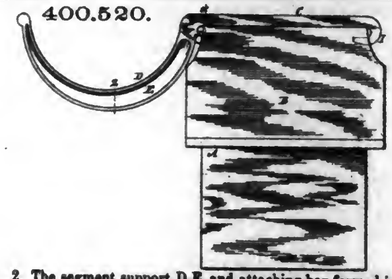
5. In valve apparatus for steam-hammers, the combination of the hammer-head, the steam-chest, lever mechanism between said hammer-head and steam-chest for imparting a reciprocating motion to the valve within said steam-chest, and a swivel-connection between said lever mechanism and the valve-rod, substantially as and for the purposes set forth.

6. In a valve apparatus for steam-hammers, the combination, with the hammer-head and the valve-chest having the sliding valve therein, of the valve-lever mechanism having a crank-lever, a crank-arm to which said crank-lever is pivoted, journaled in bearings in the frame of the hammer, and a friction-disk on said crank-arm for holding the same in whatever position it is placed, substantially as and for the purpose set forth.

400,520. ARM-SUPPORT FOR TELEPHONES. CLARENCE R. TUTTLE, Chicago, Ill. Filed Feb. 4, 1888. Serial No. 263,505. (No model.)

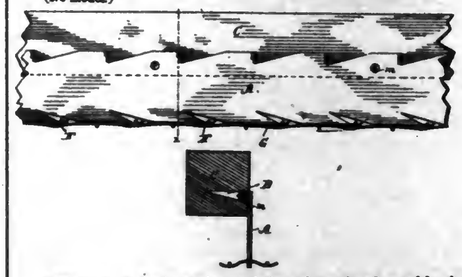
Claim.—1. An arm-support for telephones, consisting of the segment portion D E, terminating in an attaching-bar, and a hook at each end of the same for engaging the lid of the jar-box, as and for the purpose specified.

400,520.



2. The segment support D E, and attaching-bar formed in cross-section of a horizontal and vertical rib, and the bar provided with hooks at its under end portions, and the hooks projecting inward from the vertical rib, substantially as specified.

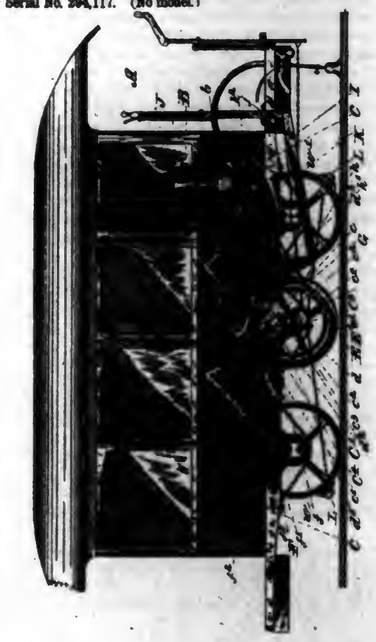
400,521. FURRING-STRIP FOR WALLS OR CEILINGS. JEROME TWICHELL, Kansas City, Mo. Filed Nov. 23, 1888. Serial No. 292,049. (No model.)



Claim.—1. A furring-strip consisting of a strip of metal having retaining-prongs cut from one edge and lath-holding prongs cut from the other edge, substantially as set forth.

2. The herein-described furring-strip, consisting of a strip of sheet metal having a series of prongs partially severed from one edge and turned out of the plane of the body portion of the holder to enter a support, and having a series of lath-holding prongs partially severed from its opposite edge and bent away from the edge to receive the lath, substantially as set forth.

400,522. RAILWAY-MOTOR. JOSEPH R. VALENTINE and ALEXANDER T. GRIGG, Pueblo, Colo., assignors to the Valentine & Grigg Motor Company, same place. Filed Apr. 23, 1888. Renewed Dec. 19, 1888. Serial No. 294,117. (No model.)

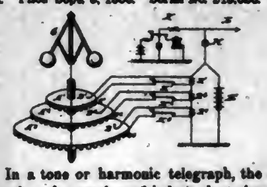


Claim.—1. The combination, with a car, of an engine which is fixed upon the car, a pair of driving-wheels mounted in the frame of the car impelled by such engine and movable in ways which are concentric with the axis of the engine-shaft, and a compound lever operable from the engine-platform either to lift the wheels from the track or to hold them in positive and rigid engagement therewith.

2. The combination, with a car, of an engine mounted upon such car, a pair of driving-wheels mounted upon such car and adjustable up or down in ways thereon, a connection between the driving-shaft of the engine and the axle of the driving-wheels, and a lever whereby the driving-wheels are movable either into or out of engagement with the car-track.

3. In a car which is provided with a brake-rod and with brake-chains and brakes, the combination of driving-wheels, an engine, a lever which is operable to adjust such wheels either upon or away from the track, and a chain which connects such operating-lever with the brake-chains, whereby both the driving-wheels and the supporting-wheels are controlled by a single operator.

400,523. HARMONIC TELEGRAPHY. FRANÇOIS VAN RYSSELBERGHE, Brussels, Belgium, assignor, by direct and mesne assignments, to himself and the Phono-Multiplex Telegraph Company, Baltimore County, Md. Filed Sept. 3, 1886. Serial No. 213,023. (No model.)



Claim.—1. In a tone or harmonic telegraph, the combination, with a rotating axis and a number of independent circuit-controlling wheels mounted thereon, normally out of circuit, of a number of brushes making contact with the wheels, a normally-open branch circuit for each wheel, and a key for closing each branch, substantially as described.

2. The combination, with a rotating axis, of a number of circuit-controlling wheels mounted thereon and insulated therefrom and from each other, a normally-open branch circuit for each wheel, and a key for closing each branch, substantially as described.

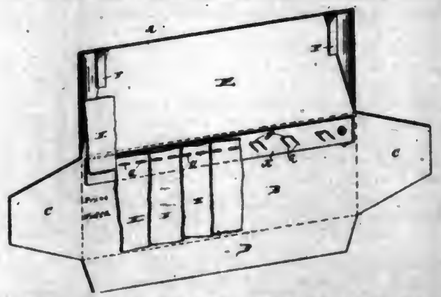
3. The combination, with a rotating axle and a number of insulated circuit-controlling wheels mounted thereon, of a branch circuit, including a series of resistances, and a shunt-circuit around each resistance, including one of the circuit-controlling wheels, substantially as described.

4. The combination, with a rotating axle and a number of circuit-controlling wheels mounted thereon and insulated therefrom and from each other, of normally-open branch circuits, including the wheels, a key for closing each branch, and an isochronic governor regulating the rotation of the wheels, substantially as described.

5. The combination of a magnetized tuning-fork, and one or more electro-magnets connected in the line-circuit for operating it, and a spherical resonator arranged in juxtaposition to the magnetized fork, substantially as described.

6. The combination, with a resonator, one end of which is covered with a diaphragm, of a pendulum in contact with the diaphragm a battery, and a circuit, one branch including the diaphragm and pendulum and the other branch including a sounder, substantially as described.

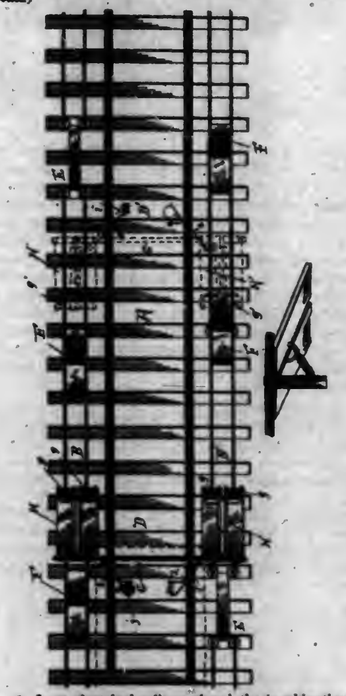
400,524. SAMPLE-ENVELOPE. GEORGE S. VAN WORMER, Catskill, N. Y. Filed Feb. 26, 1888. Serial No. 265,617. (No model.)



Claim.—1. The envelope having the main fold B, lower flap, D, and covering-flap E connected to the upper edge of the main fold, combined with the pliable spurs or points G, secured to the main fold near its upper edge to engage samples of fabrics, the lower flap, D, being adapted to fold upward over the lower ends of the said samples, substantially as specified.

2. In a sample-envelope, the main fold provided with a lower flap, D, and side flaps, C C, and having pliable points or spurs G, attached thereto, and the covering-flap E, closing over the main fold and covering the said flaps D and C, combined with the clips or hooks F, secured to the free edge of the covering-flap and engaging the lower edge of the main fold, substantially as specified.

400,525. ELECTRICAL RAILWAY-SIGNALING. WILLIAM H. WADDELL, Lexington, Va. Filed Aug. 21, 1888. Serial No. 283,367. (No model.)



Claim.—1. In an electrical railway-signal, the combination, with a track, of two parallel pairs of conductors normally out of circuit insulated from the ground and located on opposite sides of the track, each pair of conductors having no electrical communication with the other pair, and the conductors of each pair being parallel and insulated from each other and divided into non-communicating sections, the breaks between the sections of the pair of conductors on one side of the track being located approximately opposite the centers of the sections of the pair on the opposite side, for the purpose set forth.

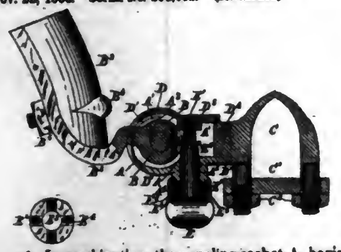
2. An electrical railway-signal comprising two pairs of parallel conductors insulated from each other and from the ground and located on opposite sides of a railroad-track, said conductors being normally out of circuit and the conductors of each pair insulated from each other and divided into non-communicating sections, two pairs of contacts carried by and on opposite sides of a car or engine, said contacts being insulated from each other and each electrically engaging and sliding on a separate conductor, the two contacts on one side being connected, respectively, with the opposite poles of a battery carried by the engine, and the two contacts on the opposite side being included in a circuit containing a bell or alarm, all operating in the manner and for the purpose substantially as set forth.

3. An electrical caution-signal for railways, comprising two pairs of parallel conductors located on opposite sides of a track and insulated from each other, two pairs of contacts carried on opposite sides of a car or engine and electrically engaging said conductors, and inclined circuit-breakers located a suitable distance apart along and rising above said conductors to momentarily throw the contacts from engagement with the conductors as they pass over them for the purpose of intermittently sounding the alarm, substantially as set forth.

4. In an electrical caution-signal for railways, two pairs of hinged or pivoted arms located in opposite sides of a car or engine and each carrying a contact insulated from the others, and each adapted to electrically engage a separate conductor extending along the track the two contacts on one side being electrically connected with the opposite poles and forming the terminals of a battery carried by the

car or engine, and the two contacts on the opposite side forming the terminals of a circuit including a bell or alarm, all operating substantially as set forth.

400,526. THILL-COUPLING. BRYANT E. WADE, Rockford, Ill.
Filed Nov. 22, 1888. Serial No. 291,602. (No model.)



Claim.—1. In combination, the coupling-socket A, having end plates provided with pintle-bearings A^3, and slots A^2 opening out of the latter, and a bearing, A^4, having a tubular passage therethrough, a coupling-knuckle of proper form and dimensions to be contained in said socket A, and provided with pintles B', adapted to enter the bearings A^3 in the end plates, A'; through the slots A^2 therein, a thill-iron integral with said knuckle, a coupling-socket cap having end plates, D', provided with curved recesses D^2 in their inner faces, adapted to admit the free ends of the pintles B', and furnish upper bearings, D^4, for the same, said cap also having a threaded recess, D^3, therein, and being hinge-jointed to the coupling-socket A, and a set-screw inserted through the passage in the bearing A^4 into the recess D^3 in the cap D, and securing all of the aforesaid parts together to prevent them from rattling, substantially as set forth.

2. In combination, the coupling-socket A, having end plates provided with pintle-bearings A^3 and slots A^2, the coupling-socket cap D, having end plates provided with curved recesses D^2, to receive said pintles, the set-screw E, the cap E^3, the washers E^5 E^6, and clip C, with its tie C'; substantially as described, and for the purpose set forth.

400,527. COMPOSITION FOR PIPES. JOHN H. WALSH, Boston, Mass. Filed Dec. 2, 1887. Serial No. 256,732. (No specimens.)

Claim.—The herein-described improved composition for pipe, composed of sand, Portland cement, Rosendale cement, and sulphur, as stated.

400,528. PIANO-STOOL. HENRY WALTHER, Brooklyn, N. Y. Filed June 27, 1888. Serial No. 278,358. (No model.)



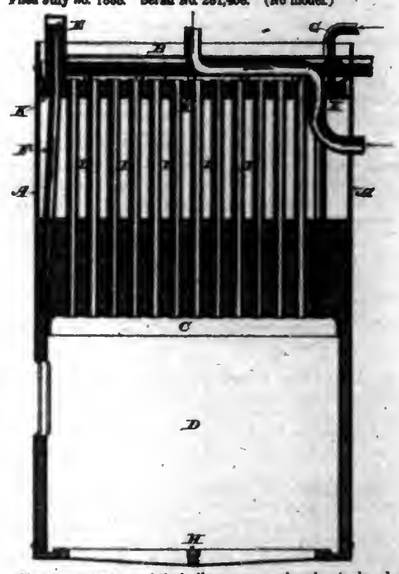
Claim.—1. In a piano-stool, the combination, with a support, of a rotative plate or disk, a screw secured to said plate or disk, a screw on the support, on which latter screw the screw secured to the plate works, a seat resting upon said plate, and a rod secured to the seat and preventing the same from turning, substantially as herein shown and described.

2. In a piano-stool, the combination, with a socket, of a fixed tubular screw extending upward from the bottom of the same, a vertical movable and rotative screw screwed on the outside of said fixed screw, a plate on the upper end of the rotative screw, a seat resting upon said plate, and a rod projecting from said seat into the opening of the fixed screw, in which it cannot turn, substantially as set forth.

3. The combination, with a socket, of a fixed tubular screw extending from the bottom of the socket and provided with longitudinal grooves in its bore, a rotative vertically-movable screw on the fixed screw, a plate on said rotative screw, a seat resting upon said plate, and a bar projecting from said seat through the rotative plate into the bore of the fixed screw, said bar having longitudinal ribs or splines that enter the longitudinal grooves in the bore of the fixed screw, substantially as herein shown and described.

4. The combination, with a socket, of a fixed tubular screw extending upward from the bottom of the same, a rotative and vertically-movable screw on the fixed screw, a plate fixed on said vertically-movable screw, a seat resting upon said plate, and a rod projecting from the seat through said plate into the bore of the fixed screw and shaped so as not to turn in said tubular fixed screw, substantially as herein shown and described.

400,529. BOILER. FREDERICK I. WATERBURY, South St. Paul, Minn.
Filed July 30, 1888. Serial No. 281,408. (No model.)

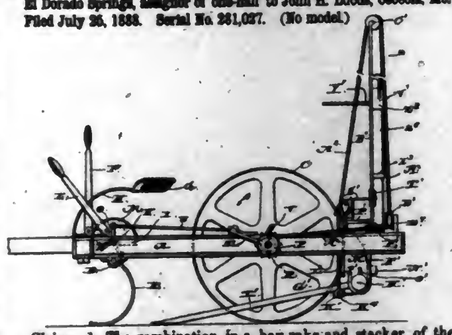


Claim.—1. In an upright boiler, a water-chamber inclosed around the upper end of the flues by the upper flue-sheet, and a diaphragm located a little below it, an overflow opening from said chamber above said flue-sheet, whereby water is maintained constantly in contact with said flue-sheet and the upper ends of the flues, substantially as and for the purposes set forth.

2. In an upright boiler, the combination, with the upper flue-sheet, of a diaphragm located a little below and inclosing therewith around the upper ends of the flues a water-space, a supply-pipe opening into said chamber, and an eduction-pipe leading out therefrom above said flue-sheet, substantially as and for the purposes set forth.

3. In an upright boiler, a water-chamber around the upper ends of the flues formed by a double head, consisting of the upper flue-sheet and a diaphragm located a little below it, a water-supply pipe leading into said chamber, a stand-pipe opening at its lower end into and extending above said chamber, and an eduction-pipe leading out of said stand-pipe above the upper flue-sheet into the lower part of the boiler, substantially as and for the purposes set forth.

400,530. HAY RAKE AND STACKER. WILLIAM D. WATKINS, El Dorado Springs, assignor of one-half to John H. Logue, Osceola, Mo.
Filed July 30, 1888. Serial No. 281,037. (No model.)

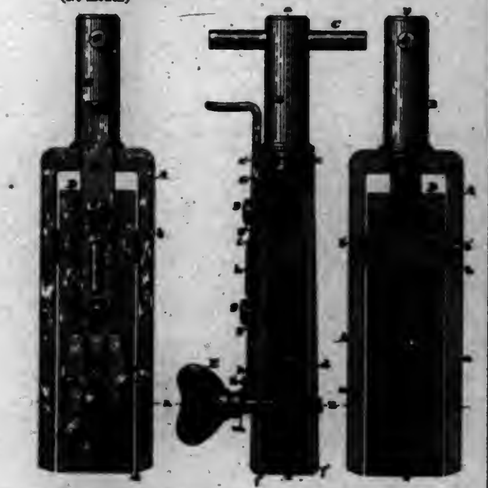


Claim.—1. The combination, in a hay rake and stacker, of the frame having the vertical standard, vertical guide-rod, the stacking-fork having the suspending bail guided on the guide-rod, the trip-lever pivoted to the bail and engaging the head of the fork, the arm pivoted to the bail and carrying a pulley engaging the guide-rod, the spring connecting said arm, and the bail to keep its pulley in contact with the guide-rod, an arm projecting from the standard to engage the bail, and an arm to strike the trip-lever, and thereby swing the stacking-fork to one side and discharge the same, and means, substantially as set forth, to raise and lower the stacking-fork, substantially as described.

2. The combination, in a hay rake and stacker, of the frame having the vertical standard, the slide movable on said standard and having the eccentric cam-lever, and the trip-arm Z', the vertical guide-rod, the stacker-fork having the supporting-bail guided on the guide-rod, an arm projecting from the standard to engage the bail, and the trip-lever pivoted to the bail and adapted to engage the stacking-fork, and means, substantially as set forth, to raise and lower the stacking-fork, substantially as described.

3. The combination, in a hay rake and stacker, of the main frame having the depending curved hooks at its rear end and the rake at its front end, the stacking-fork having the head adapted to be supported in the hooks when said stacking-fork is lowered, and the elevating devices to raise and lower the stacking-fork, substantially as described.

400,531. DEVICE FOR REMOVING CALKS FROM HORSESHOES. GEORGE W. WEMPLE, Boston, Mass., assignor of nine-twentieths to Brainard W. Child, same place. Filed July 2, 1888. Serial No. 278,290 (No model.)



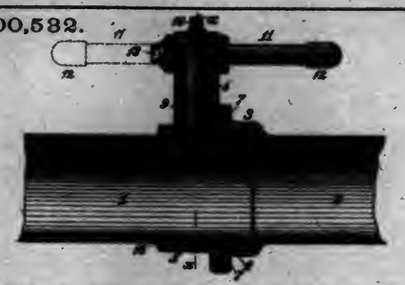
Claim.—1. In a device for removing calks from horseshoes, the combination of a frame having two standards, the ends of which rest upon the shoe when said device is in use, a jaw-piece mounted in said frame and provided with two jaws, a clamping-screw for clamping said jaws upon the calk, the inner end of the head of said screw being provided with a beveled surface, means for moving said jaw-piece lengthwise of the frame, two spring-actuated levers pivoted to said jaw-piece, and a bar mounted upon said jaw-piece and adapted to slide thereon and engage with said levers to force their inner sides into contact with the shank of the clamping-screw when the calk is being removed from the shoe or to be disengaged from contact with said levers to immediately release the jaws from the calk by moving said bar toward the handle.

2. In a device for removing calks from horseshoes, the combination of a frame having two standards, the ends of which rest upon the shoe when said device is in use, a jaw-piece mounted in said frame and provided with two jaws adapted to spring away from each other, a clamping-bolt for clamping said jaws upon the calk, the inner end of the head of said bolt being provided with a beveled shoulder, and a movable abutment adapted to be interposed between the head of said bolt and one of said jaws when it is desired to clamp said jaws upon the calk, and which may be readily disengaged from contact with said clamping-bolt to allow said jaws to spring away from each other, and thereby release their hold upon said calk.

400,532. SERVICE-PIPE CONNECTION FOR GAS-MAINS. GEORGE WESTINGHOUSE, Jr., Pittsburg, Pa. Filed Sept. 13, 1888. Serial No. 285,334. (No model.)

Claim.—1. The combination of two pipe-sections forming a joint, a casing closed at its ends around the pipe-sections adjacent to the joint and forming an annular chamber inclosing the same, and having a

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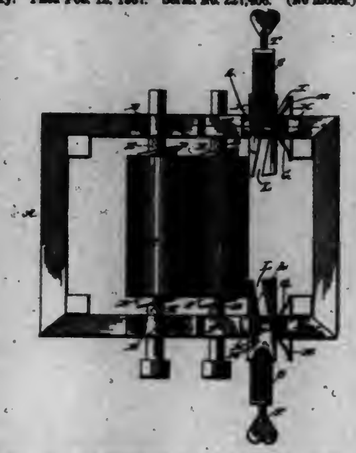


communicating vertical chamber provided with one or more end openings, and a gas-supply pipe wholly within said casing and leading directly from the adjacent pipe-section into the upper portion of said vertical chamber, substantially as set forth.

2. The combination of two pipe-sections forming a joint, an inclosing-casing, a liquid packing or hydraulic seal inclosed in the casing, a gas-supply pipe wholly within said casing and leading from one of the pipe-sections into the casing above the level of the packing, and a service-pipe leading out of the casing above the level of the packing, substantially as set forth.

3. The combination of two pipe-sections forming a joint, a casing inclosing the joint and having a vertical extension, said casing being adapted to contain liquid packing by being closed at its ends around the pipe-sections adjacent to the joint, a gas-supply pipe leading directly from one of the pipe-sections into the upper portion of said vertical extension, and a service pipe or pipes each connected to an opening in the upper portion of said vertical extension in line with the pipe-sections, substantially as set forth.

400,533. GRINDING-MILL. EDWARD T. WILLIAMS, Carrollton, Ky. Filed Feb. 12, 1887. Serial No. 227,408. (No model.)



Claim.—The combination of the case A, the roller C, and the roller O, the movable bearings F for said roller O, provided with the arms G, having the upwardly-projecting studs I, the keepers H, secured to the upper edges of the casing and guiding the arms G, the slide-blocks K, resting transversely in the keepers and provided with oblique slots L to receive the corresponding studs, I, the bearing-brackets S, secured to and standing out from the sides of the casing, the adjusting-screws T, passing through threaded openings in said brackets and having their inner ends swiveled in the outer ends of the blocks K, so that they will move the blocks either inward or outward, and the leaf-springs M, bearing against the keepers and the slide-blocks, substantially as specified.

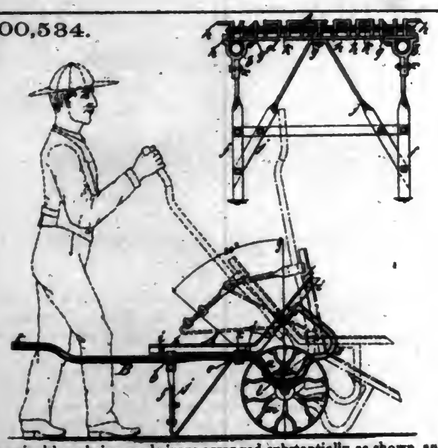
400,534. METALLIC WHEELBARROW. JOSEPH ANNIN, Brooklyn, N. Y. Filed Mar. 5, 1888. Serial No. 266,186. (No model.)

Claim.—1. A wheelbarrow having its tray or platform made of a series of parallel iron bars, set up edgewise and secured together, substantially as set forth.

2. A wheelbarrow having its tray or platform made of a series of iron bars, A A, set up edgewise and secured together in parallel lines, but bent at or about the middle, so that one half of the bars extends inclined to the other half, substantially as set forth.

3. A wheelbarrow having its tray or platform made of a series of parallel iron bars set up edgewise and secured together, the outer or

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marginal bars being angle-irons arranged substantially as shown and described.

4. A wheelbarrow having its tray or platform made of a series of parallel iron bars set up edgewise and secured together, the middle bar being a T-iron and the outer marginal bars angle-irons, arranged substantially as shown and described.

5. In a wheelbarrow, the combination, with the side bars or tubes, B, and cross-bars *d e*, secured thereto, of the tray-bars *h*, set up edgewise thereon in parallel files and secured thereto, substantially as shown and described.

6. The combination of the side bars, B B, clips *b c*, cross-bars *d e*, and tray-bars *h h*, secured together, substantially as shown and described.

7. In a wheelbarrow or its equivalent, the combination, with axle clips or bearings formed with a recess or socket, of the removable axle-boxes *o o*, arranged to fit into said sockets, and a fastening to hold the same in place and permit the removal and renewal of said boxes, substantially as herein set forth.

8. In a wheelbarrow or its equivalent, the combination with the side bars or tubes, B B, and bisected clips *l l*, embracing said bars to support the wheel-axle with the removable axle-boxes *o*, arranged to engage with said clips, substantially as and for the purpose set forth.

9. In a truck or barrow, the combination, with the side bars, B, of the bearing-clips *l*, arranged to be clasped thereon and formed with a recess or socket, *q*, of the removable axle-boxes *o o*, having a waist to fit said socket and overlapping flanges *p p* to embrace the clip, and a fastening to secure the box in place and permit of its removal and renewal, substantially as shown and described.

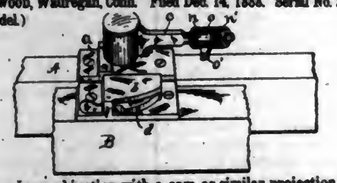
10. In a truck or barrow, the combination, with metallic handle-bars, of paper tubes incasing the bars at the handle ends and tightly secured thereon and forming the grasping portion of the handles, substantially as and for the purpose set forth.

11. In a truck or barrow, metallic handle-bars rolled down or reduced in diameter at the handle or grasping end, in combination with a tube or sheath of non-conducting material incasing the reduced end and secured thereto flush, or nearly so, with the remainder of the bar, substantially as shown and described.

12. In a truck or barrow, the combination, with the metallic tubular side bars, B B, rolled or reduced in diameter at the handle ends, of the paper tubes *t*, secured on said reduced parts and forming non-conducting handles thereon, substantially as shown and described.

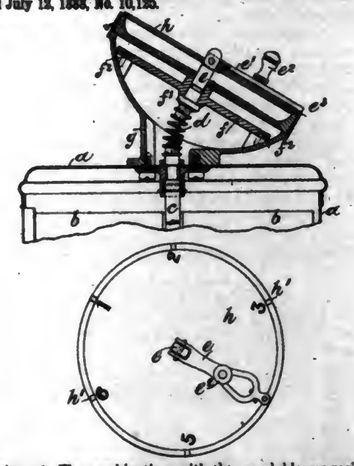
13. In combination with the metallic side or handle bars of a truck or barrow, sections of toughened paper, of the nature of parchmentized, vulcanized, or gelatinized fiber, secured to the ends of the metallic tubes and forming non-conducting, tough, and durable grasping-handles thereon, substantially as set forth.

400,535. FASTENER FOR MEETING-RAILS OF SASHES. JOHN W. ATWOOD, Wauregan, Conn. Filed Dec. 14, 1888. Serial No. 293,696. (No model.)



Claim.—In combination with a cam or similar projection on one sash, a lever-arm bearing an angular projection adjustable on said lever-arm, and adapted to swing into engagement with said cam, as set forth, and a check-nut on said lever-arm for retaining said angular projection in a given position, all substantially as and for the object specified.

400,536. APPARATUS FOR THE DELIVERY OF PREPAID GOODS. WILLIAM H. BAILEY, Salford, County of Lancaster, England. Filed Dec. 31, 1888. Serial No. 295,073. (No model.) Patented in England July 12, 1888, No. 10,125.

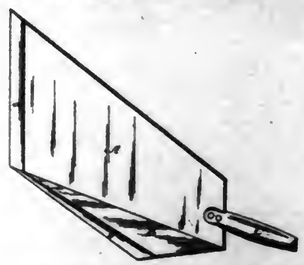


Claim.—1. The combination, with the revoluble magazine-shaft of a coin-freed apparatus, of an indicator-dial set at an oblique angle to the apparatus, an inclined spindle projecting through the dial and carrying a handle, and a connection between the inclined spindle and the magazine-shaft, substantially as described.

2. The combination, with the revoluble magazine-shaft of a coin-freed apparatus, of an indicator-dial set at an oblique angle to the apparatus, an inclined spindle projecting through the dial and carrying a handle, and a swiveled coupling connecting the spindle with the magazine-shaft, substantially as described.

3. The combination, with the magazine-shaft *c*, connected, substantially as herein shown and described, to the spindle *e*, of the handle-bar *e'*, having the projection e^3 thereon, and the obliquely-set indicator-dial *h*, having a series of notches, *h'*, in its periphery, substantially as herein set forth.

400,537. CHEESE-CUTTER. BERNARD BARRY, Schenectady, N. Y. Filed Nov. 13, 1888. Serial No. 290,761. (No model.)

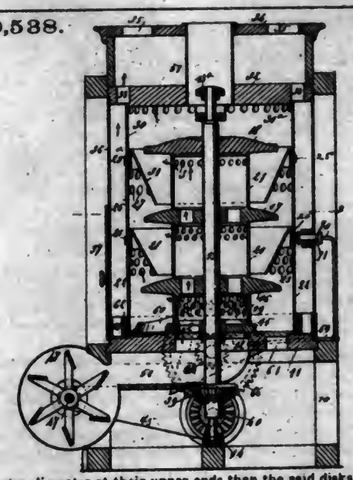


Claim.—As an article of manufacture, the improved cheese-knife formed of the triangular base-flange B, having its outer edge sharpened, and the body or main plate A, provided with the aligned handle C and arranged at right angles to the said flange, its sharpened front edge being vertical and meeting the apex of the flange, as shown and described.

400,538. MIDDLINGS-PURIFIER. GEORGE W. BELL, River Falls, Wis. Filed Feb. 15, 1888. Serial No. 264,096. (No model.)

Claim.—1. A middlings-purifier comprising the frame, the flooring 11, having openings 12, 61, and 65, the ring 15 around the opening 12, the vertical shaft 13, journaled in the frame, passing through said ring, and provided with the vertically-apertured disks 16 17 18, the series of apertured cylinders 19 20 21 between said disks, the apertures increasing in number from the top cylinder downward, a blower delivering upwardly through the ring 15, the outer series of perforated cylinders having separating-rings and apertures also increasing in number from the top to the bottom cylinder, the downwardly and inwardly tapering hoppers supported by said rings and

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of greater diameter at their upper ends than the said disks surrounding casing 36, the cover 32, having openings 33 between the said casing 36 and the top cylinder, 30, upper cover, 34, having apertures 35, and the delivery-tube 51, extending through said covers to deliver upon the disk 18, substantially as set forth.

2. The combination, with a middlings-purifier of the character described, of a crank-shaft, 69, having an upwardly-projecting hammer-arm at one end and an operating-arm, 73, at its opposite end, a plate-spring, 72, bearing on said crank, and a wheel having a pin into the path of which said arm 73 projects, substantially as set forth.

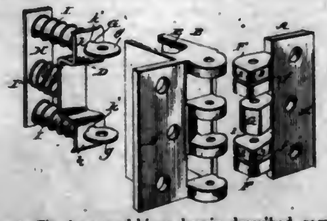
400,539. CRYSTALLIZING-FRAME. ALBERT E. BELLER, Ogden City, Utah. Filed Apr. 14, 1888. Serial No. 270,612. (No model.)



Claim.—1. A crystallized monogram or other like frame consisting of an open frame provided with the stripe *b*, arranged within the frame to support and form the characters of the design, and crystals applied to the frame and to the design thereof, substantially as described.

2. As an improved article of manufacture, a crystal-incased monogram or other like frame consisting of an open frame provided with stripe *b*, arranged to support and form the characters of the design, a fibrous covering for the portions of the frame intended to be incased with crystals, and the crystals applied to the said covered portions, as set forth.

400,540. LOCK-HINGE. BENJAMIN F. BOUGHS, Randolph, Nebr., and WILLIAM CASSNER, Pleasant Hill, Mo., assignors of one-third to Lewis Gates, Garden City, Mo. Filed Nov. 27, 1888. Serial No. 292,043. (No model.)

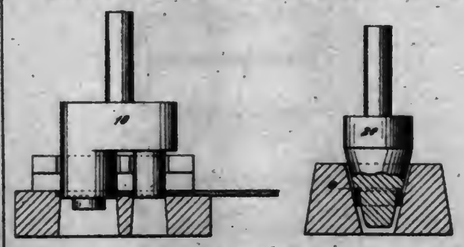


Claim.—1. The improved hinge herein described, comprising a section having a knuckle or knuckles exteriorly non-circular in cross-section, a second section, a pintle connecting such sections, a back plate, a bearing-plate arranged to engage the non-circular knuckles, a spring bearing between said back and bearing plates, and a rod, as G, connected with the pintle, extended through the bearing-plate, and threaded in the back plate, substantially as set forth.

2. In a hinge substantially as described, the combination of the section A, having knuckles F, provided with slots *f*, the section B, having box-like casing E, the back plate and the bearing-plate in such casing, a spring or springs between said plates, the rods G, having perforated heads *g* fitted in slots *f*, such rods being passed through the bearing-plates and connected with the back plate, and the pintle passed through the knuckles of sections A B and through the heads of rods G, substantially as set forth.

3. The combination of the section A, having a knuckle or knuckles exteriorly non-circular in cross-section, the section B, the pintle connecting said sections, the bearing-plate, the back plate, the spring or springs bearing between said bearing and back plates, and the rod or rods G, connected with the pintle, passed through the bearing-plate, and extended between the same and the back plate, substantially as set forth.

400,541. METHOD OF FORMING RINGS. JOSEPH B. BOWDEN, Brooklyn, N. Y. Filed Jan. 14, 1889. Serial No. 296,311. (No model.)



Claim.—1. The herein-described method of forming rings from flat annular blanks, which consists in first forming a ring having a convex outer side and an opposing inwardly-inclined inner side, in then manipulating the ring so that its inner side will be more closely aligned with the axis of the ring, and in finally holding the upper edge of the ring and subjecting it to pressure, substantially as described.

2. The herein-described method of forming rings from flat annular blanks, which consists in striking up the blank to form a flat inwardly-inclined surface on one side and a convex surface on the other side, then further manipulating the blank or ring so that the flat surface shall assume substantially a plane at right angles to its position in the blank, with one edge of the ring shaped, and in then shaping the other edge without enlarging the diameter of the ring, substantially as described.

3. The herein-described method of forming rings from flat annular blanks, which consists in bending the blank and shaping the metal thereof at one step, so that one flat side of the blank is at an inward angle and the opposing side convex, in then further striking up the blank so that one edge of the ring is shaped and the inner periphery substantially in the line of the axis of the blank, and in then striking up the other edge to finish without enlarging the diameter of the ring, substantially as described.

4. The herein-described method of forming solid rings from flat annular blanks, which consists in swaging a flat annular blank at one operation to have a flat face at an angle to the axis of the ring and an opposing convex face, in then further swaging the same until one edge is shaped and the said flat face brought substantially to the line of the axis of the ring, and in then holding the other edge of the ring and subjecting it to pressure, substantially as described.

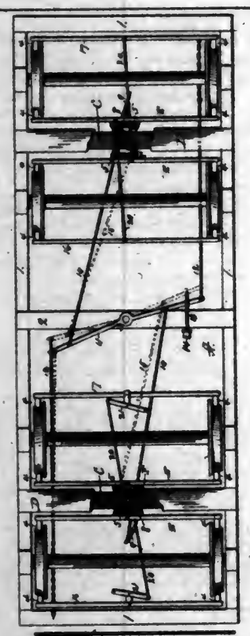
400,542. CAR-BRAKE. RASHLER BOYER, Lebanon, Pa. Filed Feb. 2, 1889. Serial No. 298,495. (No model.)

Claim.—1. The combination of the pivotally-supported rotary elliptical disks, the inner suspended brake-bars arranged between the wheels of the truck, a lever to rotate the disks on their axis, the outer suspended brake-bars arranged to brake against the outer faces of the wheels of the trucks, and connecting-rods from the inner brake-bars to the opposite outer brake-bar, substantially as described.

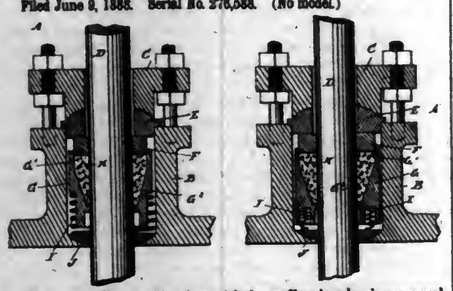
2. The combination, with the rotatable elliptical disk, and means, substantially as described, for turning it on its axis, of inner and outer brake-bars arranged to brake on both sides of the wheels, and rods connecting the inner and outer brake-bars, whereby all the brake-bars move synchronously on and off brakes, substantially as described.



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400,543. STUFFING-BOX. WILLIAM E. BROCKETT, Berlin, Wis. Filed June 9, 1888. Serial No. 276,583. (No model.)



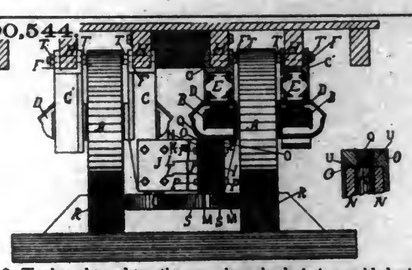
Claim.—1. The combination, with the stuffing-box having a rounding bottom or inner end, of the washer rounded to fit said rounding bottom and to form a ball-joint therewith, and having an aperture through which rod D loosely passes, the spring-seated casing G, closely fitting said rod at its inner end, and having the conical packing-receiving opening, cylindrical at its outer end, as shown at G', the follower F, snugly fitting the rod D and said cylindrical part G', the block E, through which the rod D loosely passes, and having a reduced portion on its lower or inner face snugly fitting the outer end of the stuffing-box, and a rounding outer or upper face, and the gland C, bolted to the stuffing-box and having a concave inner end fitting the rounding face of the block E, substantially as set forth.

2. The combination, with the stuffing-box having its bottom or inner end rounded, of the washer J, rounded on its lower face, provided with pins J' on its upper face, and having a central aperture through which the rod D freely passes, the casing G, apertured at its lower end to snugly fit the rod, apertured on its lower face to receive said pins, and formed with the conical packing-receiving opening cylindrical at its upper end, the spiral springs I, the follower F, snugly fitting the rod D and said cylindrical part of the packing-opening, the block E, through which the rod D loosely passes, provided with a reduced portion on its lower face snugly fitting the outer open end of the stuffing-box, and having a rounding outer or upper face, and the gland bolted to the stuffing-box and having a conical inner end receiving the said rounding face, substantially as set forth.

400,544. RAILWAY AND RAILWAY-VEHICLE. GAY W. BROWN, Los Angeles, Cal. Filed Aug. 1, 1888. Serial No. 281,711. (No model.)

Claim.—1. The broad level-faced wooden rails R R, in combination with equally broad-tread traction carrying-wheels and the pendent guide-wheels running in contact with each other, supported in horizontally-grooved boxing secured on frame C, (represented in Fig. 6,) substantially as described.

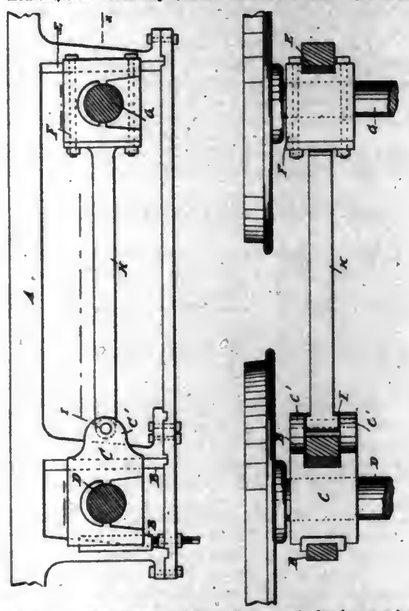
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2. The broad-tread traction carrying-wheels A A, provided with independent axles and trucks, in combination with the rails R R and the pendent guide-wheels running in contact with each other and connected to the car or locomotive by the mechanism, substantially as described.

3. The railway organized as specified, consisting of the combination of the single broad-tread flangeless wheels independently journaled on separate trucks, the pendent flat-faced guide-wheels in contact with each other, the mechanism described, and shown in Figs. 2, 6, and 10, for supporting the guide-wheels and connecting them to the car or locomotive, and a single pair of broad-faced rails, substantially as described.

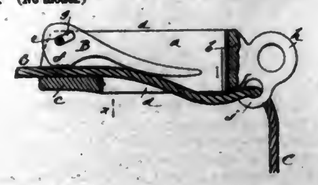
400,545. AXLE-BOX FOR LOCOMOTIVES. RAMSFORD T. CHASE, Houston, Tex. Filed July 7, 1888. Serial No. 279,270. (No model.)



Claim.—1. The combination, with a truck having vertically-sliding axle-boxes and ways therefor, of a vertically-swinging rod rigidly secured at one end to one box and hinged at its opposite end to the other box, substantially as set forth.

2. The combination, with a pedestal, of an axle-box mounted to slide vertically in the said pedestal, a second axle-box mounted with one side in a bearing in the said pedestal, and a connecting-rod secured to the last-named axle-box and pivotally connected with the first-named axle-box, substantially as shown and described.

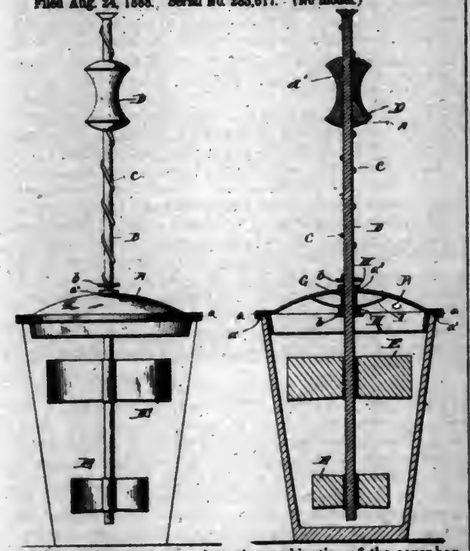
400,546. CLAMP FOR CLOTHES-LINES, TENT-ROPES, &c. STEPHEN W. CONKLIN, Yonkers, N. Y. Filed June 20, 1888. Serial No. 277,618. (No model.)



Claim.—1. The rope-clamp herein shown and described, comprising the side pieces, *a a*, bridge *c* at the front and cross-piece *b* at the rear end, reaching above the bridge *c*, having the open space at the bottom between the said bridge and cross-piece, and formed with the two rings or eyes *h j* at the outer surface of the cross-piece *b*, in combination with the eccentric lever B, pivoted between the side pieces, *a a*, over the bridge *c*, and formed with the incline slot *g*, substantially as described.

2. The rope-clamp composed of the side pieces, *a a*, bridge *c*, and cross-piece *b*, in combination with the eccentric lever B, formed with the upwardly and rearwardly inclined slot *g* and pivoted between the side pieces over the bridge *c*, substantially as described.

400,547. BEVERAGE-MIXER. CHARLES B. CRAFTON, Mason City, Ill., assignor to Otho S. King and William Y. McLemore, same place. Filed Aug. 24, 1888. Serial No. 283,617. (No model.)

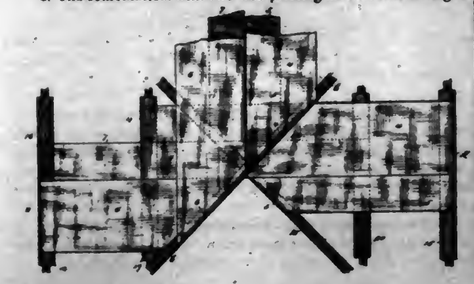


Claim.—In a beverage-mixer, the combination of the cover having a central aperture, the downwardly-convexed web I, having a central aperture registering with the aperture in the cover, the bearing a^3, consisting of the vertical barrel G, arranged in the said registering apertures and provided at its upper and lower ends with flanges H H, which bear respectively against the cover and the web, the vertical rod or shaft mounted in the said barrel and provided with collars *b b*, which bear, respectively, against opposite ends of the barrel, a wire, C, being wound spirally on that portion of the rod or shaft above the said collars, the beater-wings secured to the rod or shaft below the collars, and the spirally-bored knob or handle sliding on the spirally-wound wire on the upper portion of the rod or shaft, substantially as specified.

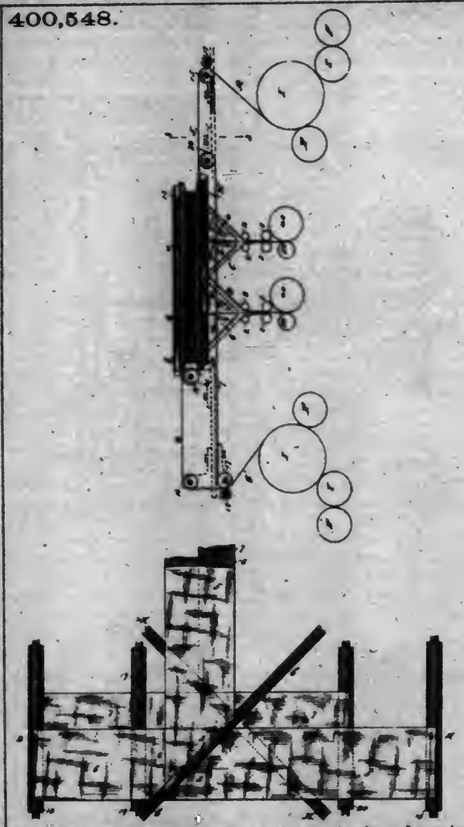
400,548. WEB PRINTING AND DELIVERY MECHANISM. LUTHER C. CROWELL, Brooklyn, assignor to R. Hoe & Co., New York, N. Y. Filed Jan. 24, 1888. Serial No. 261,763. (No model.)

Claim.—1. The combination, with two web-printing mechanisms arranged end to end and each capacitated to perfect a web, of a web turning and associating mechanism consisting of two turning-bars arranged crosswise of each other and in position to receive the perfected webs from the two printing mechanisms and turn and associate them, substantially as described.

2. The combination, with two web-printing mechanisms arranged



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end to end and each capacitated to perfect a web, of a web turning and associating mechanism consisting of two turning-bars, G H, arranged crosswise of each other and in position to receive the perfected webs from the two printing mechanisms and turn and associate them, and two register-rolls, 19 20, located upon opposite sides of the turning-bars, substantially as described.

3. The combination, with two web-printing mechanisms arranged end to end and each capacitated to perfect a web, of a web turning and associating mechanism consisting of two turning-bars arranged crosswise of each other and in position to receive the perfected webs from the two printing mechanisms and turn and associate them, and two longitudinal folders arranged to receive the associated webs, substantially as described.

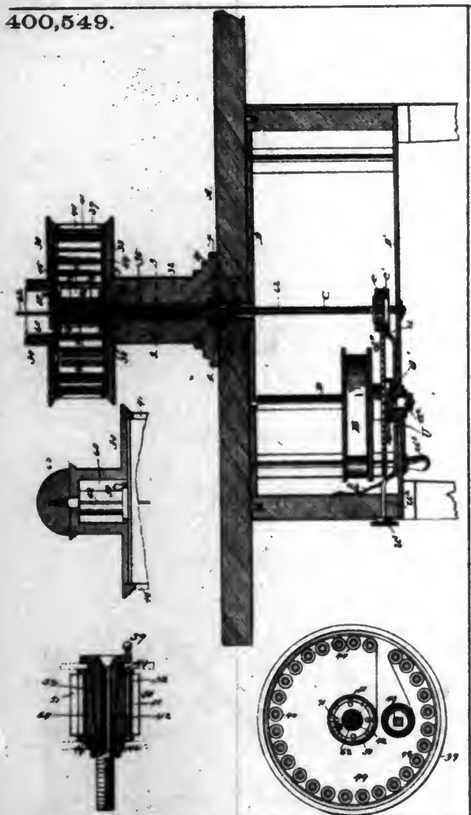
4. The combination, with two web-printing mechanisms arranged end to end and each capacitated to perfect a web, of a web turning and associating mechanism consisting of two turning-bars, G H, arranged crosswise of each other and in position to receive the perfected webs from the two printing mechanisms and turn and associate them, and two register-rolls, 19 20, located upon opposite sides of the turning-bars, and two longitudinal folders arranged to receive the associated webs, substantially as described.

5. The combination, with two web-printing mechanisms arranged end to end and each capacitated to perfect a web, of a web turning and associating mechanism consisting of two turning-bars, G H, arranged crosswise of each other, and a third bar, K, arranged parallel with one of the other bars, and a register-roll, 19 or 20, substantially as described.

400,549. ADVERTISING OR DISPLAY DEVICE. ANDREW DAHLSTROM, Ashton, Mich. Filed Aug. 24, 1888. Serial No. 283,668. (No model.)

Claim.—1. The combination, with the shaft C, connected at its upper end with and adapted to operate the display devices, a gear, *e*, and a notched hub, *e'*, mounted upon the lower end thereof, said gear *e* engaging with the spring-operated gear d^2, whereby the shaft C is revolved, said hub *e'* provided with notches e^2 e^2, arranged in diametrically-opposite edges of said hub, of the spring-actuated sliding plate U, provided with a hand-hold at one end, its opposite end adapted to normally engage either of said notches e^2, substantially as and for the purpose set forth.

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2. The combination, with the shaft C, connected at its lower end with and adapted to be revolved by the spring-actuated gearing, and the tubular shaft 35, connected to the display devices, of the coupling-section 36, connected at its lower end to the upper end of shaft C and at its upper end to the tubular shaft 35, whereby the same revolution of shaft C is communicated to the tubular shaft 35, substantially as and for the purpose set forth.

3. The combination, with the shaft C, means, substantially as shown, for operating said shaft, the tubular shaft 35, connected with the shaft C, said shaft 35 disposed within the column 32 of the display device 30 and provided with a squared recess in its upper end, of the core 42, provided with a central squared hub, 46, fitting the squared recess in the shaft 35, said core disposed centrally with the casing 33 and having one end of the display-ribbon connected thereto and adapted to wind the said tape upon itself, substantially as shown and described.

4. The combination, with the main table or frame, of the display device 30, said device consisting of a base, 31, a central hollow column, 32, projecting upwardly therefrom, an enlarged horizontal casing, 33, formed at the upper end of said column, provided with sight-openings 39 in the circular vertical rim thereof, said case adapted to receive the tape or winding mechanism, the hollow shaft 35, operating in the tubular column, said ribbon devices connected to the shaft 35, said shaft 35 connected to the shaft C, and means for operating the several shafts and ribbon devices, substantially as shown and described.

5. The combination, with the tubular shaft 35, disposed within the column 32, and the casing 33, arranged above said column, of the central core, 42, connected with the upper end of the tubular shaft 35, the spool 43, mounted within the casing 33 and adjacent to the core 42, the rollers 44, arranged within the casing 33, near the circular rim 40 and concentric with the central core and the ribbon, said ribbon connected at one end to the spool 43, passed about the rollers, between them and the vertical rim of the casing, and connected at its other end to the core 42, and means for revolving the said core, substantially as shown and described.

6. The combination, with the display-casing 33, a ribbon-winding spool, 43, mounted therein, guide-rollers 44, disposed in a circle near the vertical rim of the casing, a ribbon wound upon the spool 43 and passing about the rollers 44, said casing provided with a hollow column, 31, and a tubular shaft mounted in said hollow column, of the contractile core 42, said core disposed centrally within said casing and connected to the upper end of said shaft 35, and connected with the free end of the ribbon, and means for revolving the shaft 35 and the core, substantially as and for the purpose set forth.

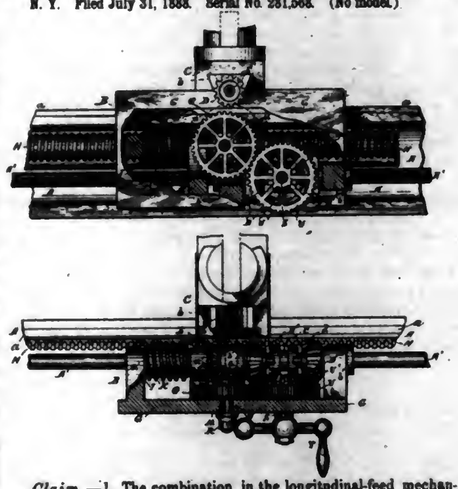
7. The combination, with the tubular shaft 35, the display-casing 39, the ribbon spool or roller 43, the ribbon-guide rollers 44, said rollers 43 and 44 disposed within said casing, of the contractile core 42, disposed centrally of said display-casing, said core formed of segmental sections, said sections adapted to be contracted and expanded, the lower end of said core connected to the tubular shaft 35, and means for operating said shaft, all arranged substantially as and for the purpose hereinbefore described.

8. The combination, with the tubular shaft 35, provided with a screw-threaded portion, the contractile core 42, formed substantially as described, and the casing 33 and cap-piece, 38, said cap-piece 38 provided with a recess, 60, of the conical screw-plug 55, said plug adapted to be screwed at its lower end into the tubular shaft 35, its upper end formed conical and arranged to hold the several sections of the core in concentric circular alignment, said plug adapted to be automatically fed upward by the revolution of the tubular shaft, said plug 55 held from turning by its upper end projecting in the recess 60, said shaft 35 connected with and operated by the shaft C, and means for operating said shaft, substantially as shown and described.

9. The combination, with the contractile core 42, the tubular shaft 35, connected therewith, said core and shaft disposed within the casing 33 and column 31 of the display device, and the ribbon-roller 43 and guide-rollers 44 arranged within said casing 33, said ribbon connected at one end to the roller 43, wound thereon, and passed between the rollers 44 and the casing-wall 40, of the ribbon-fastening device, consisting of a recess, 70, formed in one of the sections 50 of the core 42, a rod passed through the heads 48 and 49 of the core-body and the recess 70, said rod formed with a cam portion, 80, adapted to press the free end of the ribbon against the side of the section, and means for operating said ribbon-moving devices, substantially as hereinbefore described.

10. The combination, with the main frame, the hollow shaft C, the tubular shaft 35, connected with the upper end of said shaft C, the display device disposed above the frame, said device provided with a hollow column surrounding the tubular shaft 35, an enlarged casing adapted to receive the ribbon winding and unwinding devices, and a cap-piece, 30, of the tie-rod 62, said rod passing centrally through the shafts C and 35, the central core of the ribbon-display device, and the cap-piece, said rod screwed into the frame below the base of the table and provided with a squared end entering the cap-piece and provided with a securing-nut, 63, at its upper end, whereby the several parts are securely held together, substantially as shown and described.

400,550. TURNING-LATHE. ROBERT F. DARLING, Seneca Falls, N. Y. Filed July 31, 1888. Serial No. 281,568. (No model.)



Claim.—1. The combination, in the longitudinal-feed mechanism of a lathe, of a short or comparatively short rotary screw, worm, or spiral turning in suitable bearings extending from the carriage, and a long or comparatively long rack engaging the said screw and secured to the frame or bed of the lathe, substantially as and for the purpose specified.

2. The combination, in the longitudinal-feed mechanism of a lathe, of a short or comparatively short screw, worm, or spiral turning in suitable bearings extending from the carriage, a long or comparatively long rack engaging the said screw and secured to the frame or bed of the lathe, and shifting-gear constituting a part of the longitudinal-feed mechanism and arranged to engage alternately a gear or pinion on the shaft or spindle of the said worm and a pinion or gear in the cross-feed mechanism, substantially as and for the purpose specified.

3. In the feed mechanism of a lathe, the hereinbefore-described means for reversing the feed-movement, the said means consisting of the shaft A', the bevel-gears B B', turning loosely on the said shaft and having clutch-engaging teeth, the sliding clutch C', mounted on and turning with the said shaft and arranged between the said gears, the wheel or gear U', engaging the said bevel-gears, an arm for shifting the said clutch, and the apron of the lathe, substantially as and for the purpose specified.

4. A lathe in which the longitudinal feed-movement and the cross-feed movement are produced independently by means of a shifting-gear in continuous engagement with driving-gear constituting a part of the means for producing both the said movements, and alternately in engagement with the gear directly employed for moving the carriage and the gear for moving the tool-block, substantially as and for the purpose specified.

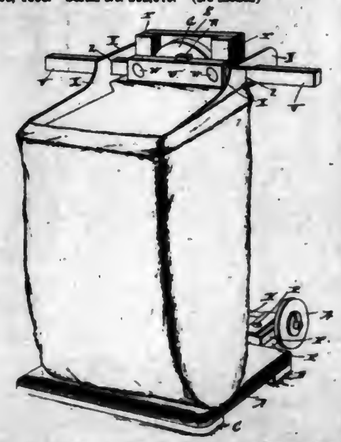
5. A rack made in sections arranged end to end in a line and having an inwardly-curved outer face on which are inclined alternate grooves and ribs, in combination with the frame or bed of a lathe and the carriage-moving mechanism, substantially as and for the purpose specified.

6. A lathe in which the longitudinal-feed gearing and the cross-feed gearing are combined with supplemental-feed gearing for simultaneously operating the longitudinal-feed gear and the cross-feed gear, substantially as and for the purpose specified.

7. The combination, in a lathe, of the wheel D, constituting a part of the cross-feed gearing, the gears H' and I' and their shaft, the gear E', having thereon one or more sets of teeth, *e e*, the latter being in operative engagement with the wheel D through the medium of the gears H' and I', and the longitudinal-feed gearing, substantially as and for the purpose specified.

8. The combination, in a lathe, of the wheel D, constituting a part of the cross-feed gearing, the gears H' and I' and their shifting-shaft F', the gear E', having thereon one or more sets of teeth, *e' e'*, the latter being in operative engagement with the wheel D through the medium of the gears H' and I', and the longitudinal-feed gearing, substantially as and for the purpose specified.

400,551. BAG-HOLDER. GRIFF DE OWENS, Loyalton, Dak. Filed Nov. 23, 1888. Serial No. 292,079. (No model.)

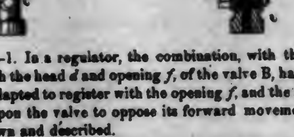


Claim.—1. In a bag-holder, the base or platform A, the standard G, secured thereto, the guide-bar R, secured to the standard, the adjustable cross-head S, having the metallic loop or guide U, which is notched to receive the guide-bar, the horizontal supporting-arms V, for receiving the loop, and the bag-holding arms X, fitted on the said arms V, substantially as described.

2. In a bag-holder, the combination of the standard and cross-head, and arms V, attached to the latter, with the bag-holding arms X, having the ears Y and transverse openings Z at their inner ends to receive the arms V, for the purpose set forth, said bag-holding arms being further provided with the flanges A', projecting outward from their lower edges to engage the mouth of the bag, said flanges being in lower planes than the inner ends of the bag-holding arms, substantially as described.

3. In a bag-holder, the standard G, having the guide-bar R on one side, the cross-head on the opposite side of the standard, and having the cleats T, engaging the side edges thereof, the metallic loop or guide U, notched to receive the guide-bar and bolted on the cleats T, the arms V, secured in the said loop or guide by the same bolts, and the bag-holding arms X, fitted and laterally adjustable on the arms V, substantially as described.

400,552. TELEGRAPH-WIRE CARRIER. ROBERT S. DONALDSON, Wilkinsburg, Pa. Filed Dec. 16, 1887. Renewed Feb. 11, 1889. Serial No. 299,559. (No model.)



Claim.—1. The combination, with the cross-arms of telegraph-poles, of temporary carriers provided each with adjustable sheaves mounted thereon, one at each cross-arm, and the wire placed in said carriers between the sheaves, as described, whereby an old wire may be readily drawn out and at the same time the new wire attached thereto drawn into place in long sections, as described.

2. The combination, with the standard and means for readily attaching the same to the cross-arms, of the sheaves mounted on their pins, respectively, said sheaves being placed opposite one another, so that their grooves will form a space for holding the wire, one of said pins being readily adjustable to separate the sheaves to admit or take out the wire, substantially as described.

3. The combination, with the standard provided with a point for insertion in the cross, of the grooved wheels mounted upon pins secured to the standard, said sheaves being placed so as to form a space between them for the wire, said sheaves being readily adjustable to permit the wire to be taken out or placed between the rollers, substantially as described.

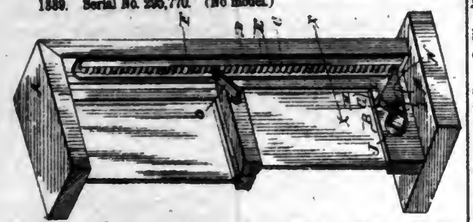
400,553. PRESSURE-REGULATOR. CHARLES DUBOIS, Leadville, Colo. Filed Oct. 20, 1888. Serial No. 288,679. (No model.)

Claim.—1. In a regulator, the combination, with the casing A, provided with the head *d* and opening *f*, of the valve B, having a spiral groove, *g*, adapted to register with the opening *f*, and the spiral spring C, bearing upon the valve to oppose its forward movement, substantially as shown and described.

2. In a regulator, the combination of the casing A, having the partition *a*, chambers *b c*, and aperture *f*, the cap *d*, closing the chamber *c*, the chambered valve B, having the spiral slot *g*, the spring C, abutting against the partition *a* and resting upon the closed end of the valve B, the spindle *l*, and the cap D, substantially as specified.

3. In a regulator, the combination of the casing A, having the partition *a*, chambers *b c*, and aperture *f*, the cap *d*, closing the chamber *c*, the chambered valve B, having the spiral slot *g*, and provided with the packing-ring *j*, the spring C, abutting against the partition *a* and resting upon the closed end of the valve B, the spindle *l*, and the cap D, provided with graduations on its periphery, substantially as specified.

400,554. SASH-FASTENER. WILLIAM F. ELKINS, Comanche, Tex., assignor of one-half to J. R. Thomas, same place. Filed Jan. 8, 1889. Serial No. 295,770. (No model.)

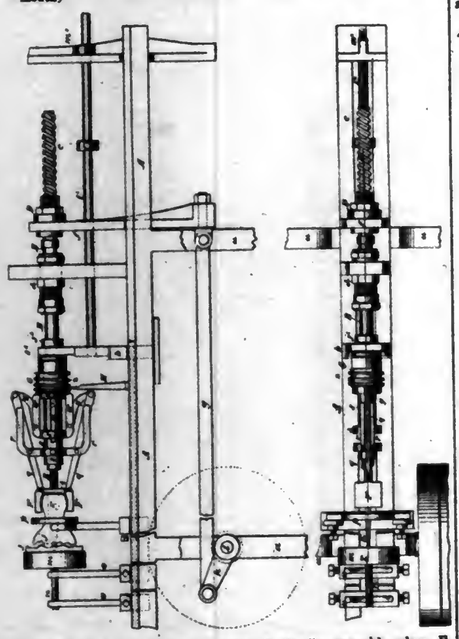


Claim.—1. In a sash-holder, the rack-bar comprising the strip D, having transverse corrugations, and the strip F, having one edge bent over the adjacent edge of the strip D, and its other edge bent past the edge of said strip at right angles, as specified.

2. In a sash-holder, the pawl consisting of a metallic strip bent into substantially triangular form, one of the angles forming the engaging-point, while the other angles form the pivotal and operating ends, as set forth.

3. In a sash-holder, the combination of the rack-bar, the pawl consisting of a metallic strip bent into substantially triangular form, one of the angles engaging the rack-bar, the pivot-screw passed through an eye formed at the upper angle of the pawl, and a handle at the remaining angle of the pawl, a stop-pin inserted through the pawl in rear of the engaging-point, and a spring to hold the pawl normally in engagement with the rack-bar, as set forth.

400,555. MACHINE FOR SHAPING BOTTLE-NECKS. EDWARD H. EVERETT, Newark, Ohio. Filed Mar. 30, 1888. Serial No. 268,959. (No model.)



Claim.—1. A rotating and longitudinally-movable plug, E, adapted to enter a bottle-neck, combined with rotating jaws F, adapted to shape a bottle-neck during rotation, substantially as described.

2. A rotating and longitudinally-movable plug, E, adapted to enter a bottle-neck, combined with rotating and longitudinally-movable shaping-jaws F, as specified.

3. A rotating and longitudinally-movable plug, E, for entering a bottle-neck, combined with rotating and longitudinally-movable jaws F, and with movable supports for a bottle that advance with the plug, as specified.

4. The rotating spindle B, having the plug E, and sleeve *s*, surrounding said spindle, combined with the shaping-jaws F and sleeve G, which is flexibly connected to said jaws, substantially as described.

5. The spindle B, having plug E, sleeve, and supporting-arms *r* on said sleeve, combined with the shaping-jaws F, levers *q*, carrying said jaws and pivoted in the arms *r*, and with the sleeve G and links *y*, substantially as described.

6. The rotating spindle B and rotating opening and closing clamping-jaws F, combined with the bottle-support *o* and the gaging and centering ring *p*, substantially as described.

7. The spindle B, having worms *c* and d^3, combined with the sleeve D, having internal threads that fit said worm *c*, means, substantially as described, for reciprocating said sleeve D, and with the stationary bearing *d*, having internal threads, b^3, that fit the worm d^3, whereby said spindle will be rotated and advanced simultaneously, substantially as described.

8. The spindle B, having worm *c*, reciprocating sleeve D, having internal threads meshing with the worm *c*, and means, substantially as described, for reciprocating said sleeve, combined with the rotating opening and closing jaws F, that are carried by the spindle B, substantially as described.

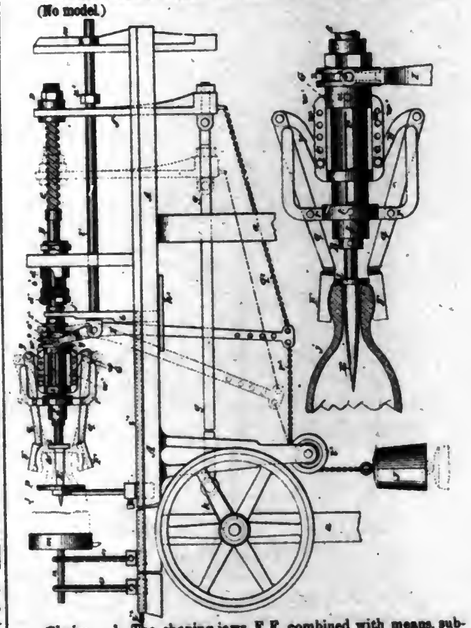
9. The rotating advancing spindle B, combined with the movable bearing *b*, that is actuated during the advance of said spindle, movable supports *o* and *p*, and the rod i^3, connecting said supports with the bearing *b*, substantially as described.

10. The combination of the rotating and advancing spindle B, movable bearing *b*, that is actuated with the advance of the spindle, supports *o* and *p*, connected with the bearing *b*, arm *f*, and rod i^3, substantially as described.

11. The spindle B, means substantially as described, for longitudinally moving and revolving the same, the bottle-supports *o o*, connected to said spindle to move longitudinally together therewith, and plug E on said spindle, combined with the jaws F, carried by said spindle, and means, substantially as described, for opening and closing said jaws while they revolve with said spindle, as specified.

12. The combination, with a rotating and advancing plug, E, adapted to enter a bottle-neck, of opening and closing jaws F, that are adapted to press upon the bottle-neck, as specified.

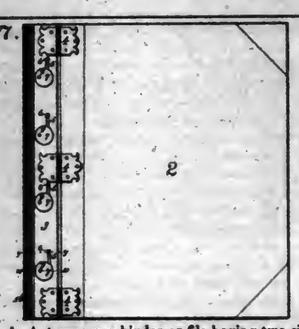
400,556. MACHINE FOR SHAPING BOTTLE-NECKS. EDWARD H. EVERETT, Newark, Ohio. Filed Nov. 9, 1888. Serial No. 290,370. (No model.)



Claim.—1. The shaping-jaws F F, combined with means, substantially as described, for revolving and for opening and closing them, the closing mechanism having a weighted member, I, which will allow the jaws, when closed and in the act of closing, to yield to pressure from within, as specified.

2. The spindle B, opening and closing jaws F, and sleeve G, jointed to said jaws, combined with the lever I, connected with the sleeve G and with the weight J on the lever I, and means, substantially as described, for rotating the jaws F, all arranged to render the jaws yielding to internal pressure when closed and when closing, as specified.

400,557. TEMPORARY-BINDER. TOBY FAIFER, Denver, Colo. Filed Sept. 14, 1888. Serial No. 285,416. (No model.)

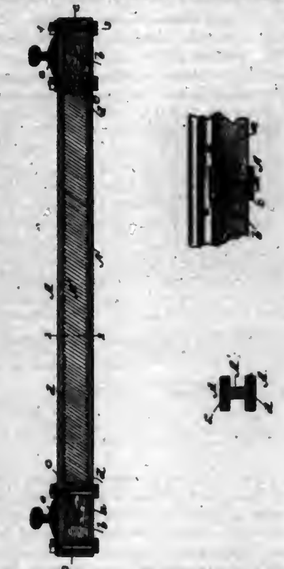


Claim.—1. A temporary binder or file having two sides or covers, one provided with flexible wires extending inwardly, a rigid metal bar hinged to the edge of the other cover or side and having apertures corresponding in location to the location of the wires, and means upon the bar for clamping the free ends of such wires thereupon, substantially as set forth.

2. A temporary binder or file comprising two sides or covers, one somewhat broader than the other and having flexible wires extending from its rear edge toward the narrower side or cover, a rigid metallic bar hinged to the edge of the narrower side or cover and having perforations for such wires to pass through, and means secured upon such bar for locking or clamping thereto the free ends of the wires, substantially as set forth.

3. A temporary binder or file comprising the side or cover 1, with wires 5, the side or cover 2, secured to rigid bar 3 by hinges 4, the metal fastening-disks 7, and the back 10, substantially as set forth.

400,558. RAILROAD-RAIL TIE AND FASTENING. JACOB FRYSINGER, Milan, Ill. Filed June 25, 1888. Serial No. 278,189. (No model.)



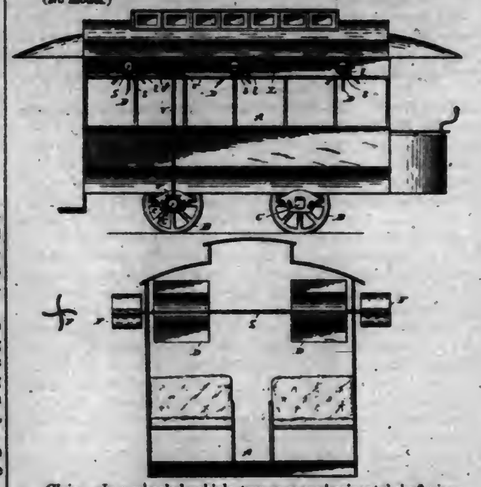
Claim.—1. The railroad-rail tie-fastening consisting of the upper and lower bars and an intermediate bar interposed between and edgewise to the aforesaid bars and endwise to the sleepers, substantially as set forth.

2. The railroad-rail tie consisting of the upper and lower plate-like bars and an intermediate edgewise-disposed plate-like bar let into grooves or channels in the aforesaid bars, substantially as set forth.

3. The railroad-rail tie consistieg of the upper and lower plate-like bars and an intermediate edgewise-disposed plate-like bar let into grooves or channels in the upper and lower bars, the upper and lower bars being arranged one above and let into transverse grooves or recesses in the upper surfaces of the stringers, and the lower one below the stringers, substantially as specified.

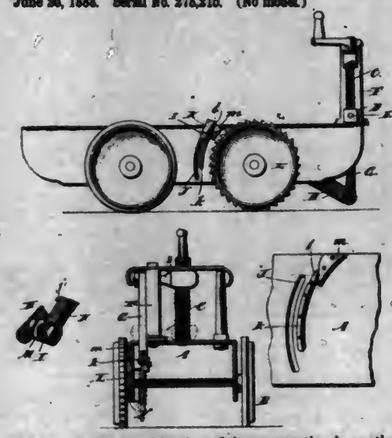
4. The railroad-rail tie comprising the upper and lower plate-like bars and an intermediate edgewise-disposed plate-like bar let into grooves or channels of the upper and lower bars, and the chairs consisting of clamp-plates resting upon the upper bar and held in place by bolts passing through said upper and lower bars, substantially as set forth

400,559. VENTILATING APPARATUS FOR VEHICLES. JOHN J. GERAGHTY, Streator, Ill. Filed June 29, 1888. Serial No. 278,547. (No model.)



Claim.—In a wheeled vehicle, two or more horizontal shafts journaled in bearings near the top thereof and in parallelism with each other, fans keyed upon each of said shafts, a longitudinal shaft, bevel-gears on each of said transverse shafts, and bevel-gears on said longitudinal shaft intermeshing therewith, in combination with a bevel-gear upon one of the axles of the vehicle, a vertical shaft, a bevel-gear at the lower end of said shaft intermeshing with that on the axle, a bevel-gear at the upper end of said vertical shaft, and a bevel-gear upon said longitudinal shaft, intermeshing with that at the upper end of said vertical shaft, for conveying rotary motion from the axle to the longitudinal shaft, and thence to the several fans, substantially as described.

400,560. CAR-STARTER. RUDOLF O. GERDES, Augusta, Ga. Filed June 26, 1888. Serial No. 278,215. (No model.)



Claim.—1. The combination of the car-starting lever, the brake-rod, and connections between the brake-rod and the lever, operated by the brake-rod, as set forth.

2. The combination of the worm-shaft forming the brake-rod, the car-starting lever, and the nut mounted on the worm-shaft and connected to the lever, as set forth.

3. The combination of the worm-shaft, the nut mounted thereon and having an outwardly-projecting arm, the car-starting lever, and the link connecting said arm and lever, as set forth.

4. The combination of the worm-shaft, the slotted standard arranged at one side of the same, the nut mounted on the shaft and having an arm playing in the slotted standard, the link connected to said arm, and the car-starting lever connected to said link, as set forth.

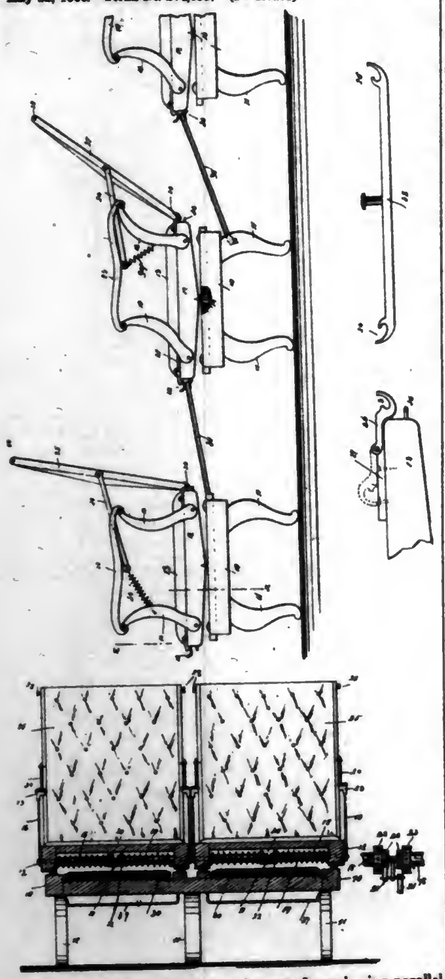
5. The combination of the car-starting lever and devices for oper-

ating the same, the pawl carried by said lever, and the spring connected to said pawl, as set forth.

6. The combination of the car-starting lever and devices for operating the same, the pawl pivoted thereto, and the rib and plates for releasing the pawl from its operative position, as set forth.

7. The combination of the car-starting lever and devices for operating the same, the pawl pivoted to said lever and having a pin on its inner side, the curved rib, pivoted plate at the upper end of the rib, and the rigid plate adjacent to the pivoted plate, the pin on the pawl riding in said rib and plates, as and for the purposes set forth.

400,561. CAR-SEAT. EDWARD B. GOELET, Fort Worth, Tex. Filed May 22, 1888. Serial No. 274,655. (No model.)



Claim.—1. The combination, with a seat-frame having parallel transverse front and rear rock-shafts and oppositely-acting springs connected to and rotating said shafts toward each other, of supports rigidly secured to the ends of said shafts and normally held in an upwardly-projecting position, arm-rests pivotally connecting said supports at their upper ends, and a reversible back pivotally connected to said rests, whereby the back will be yieldingly supported in either of its two positions against the action of one of said spring-controlled shafts, substantially as set forth.

2. The combination, with a seat-frame having parallel transverse rock-shafts, each shaft having a torsion-spring tending to rotate it toward the other, of the front and rear supports rigidly attached at their lower ends to the ends of the said shafts and held normally in an upwardly-projecting yielding position by the force of said springs, the arm-rests pivoted at their ends to said supports, and the reversible seat-back having links pivotally connecting its ends with the said arm-rests, whereby the back may be inclined against the action of one of the said torsion-springs in either of its positions, substantially as set forth.

3. The combination, with the seat-frame having front and rear back-supporting hooks or bearings, parallel front and rear transverse rock-shafts, two coiled torsion-springs on each shaft connected at their outer ends with the seat-frame, the springs on one shaft being coiled oppositely to those on the other to rotate the shafts toward each other, collars loose on the shafts and connected to the inner ends of the springs, and pawl-and-ratchet mechanisms connecting the said shafts and collars, of the supports 16, rigidly connected at their lower ends to the ends of the shafts to rock them against the torsion of one pair of said springs, according to the position of the seat-back, arm-rests pivotally connecting the upper ends of the said supports, and the reversible seat-back having links or arms pivotally connecting its ends to the said arm-rests, substantially as set forth.

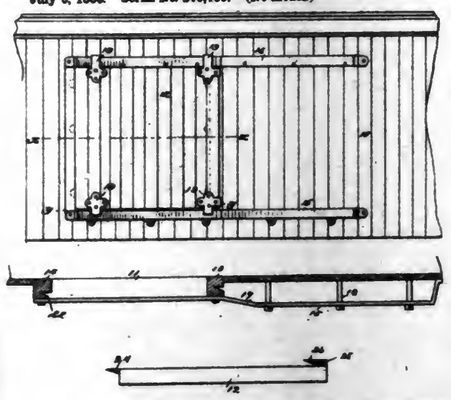
4. The combination, with the seat-frame, front and rear rock-shafts provided with torsion-springs to rotate them toward each other, the supports rigidly secured to the ends of said shafts, and the arm-rests pivoted at their ends to the upper ends of the said supports, of the spring 34, secured at its upper end to the arm-rest, and means for connecting its lower end to either the front or rear support at different heights, substantially as set forth.

5. The combination, with the seat-frame and its reversible back, of the sliding bars mounted on the seat-frame and having hooks at their ends to receive either longitudinal edge of the back, substantially as set forth.

6. The combination, with a seat-frame and its reversible back, of the sliding bars mounted on the seat-frame and having upward-projecting hooks at their opposite ends to receive either longitudinal edge of the back, and each having an intermediate handle projection on its upper side between its ends, substantially as set forth.

7. The combination, with the main support 10, having inwardly bowed or curved springs 33 on the inner faces of its side bars, of the removable rest 30, having recesses in its sides to receive the bowed portions of said springs and be thereby held in place, substantially as set forth.

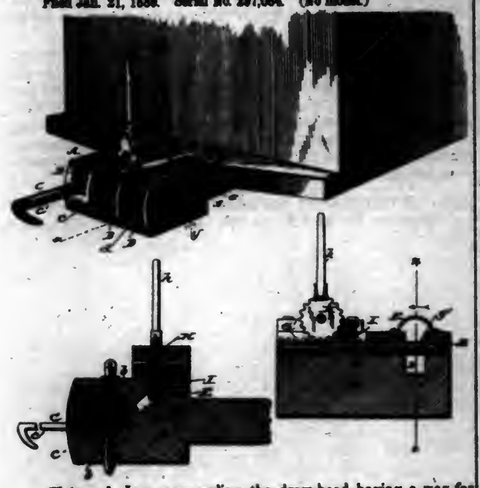
400,562. CAR-DOOR. EDWARD B. GOELET, Fort Worth, Tex. Filed July 6, 1888. Serial No. 279,169. (No model.)



Claim.—1. The combination, with a car having a door-opening, top and bottom tracks, and perpendicular door-posts, one post provided with a series of recesses in its side next to the opening and the other having recesses in its outer side or side nearest the end of the car, of the door sliding on said tracks and having forwardly-projecting cleats on its front edge to enter the recesses in the first-named post, and provided on its inner side at its opposite end with cleats projecting toward its front edge to enter the recesses in second-named strip, substantially as set forth.

2. The combination, with the car having the door-opening, perpendicular post 14 at one side of the opening, provided on its side next to the opening with recesses 21, and having a vertical rabbet forming a shoulder, 22, at the outer corner of its recessed edge intersecting said recesses, the opposite post, 13, projecting beyond the side of the car and having recesses 20 in its outer side, or side next to the end of the car, of the car-door having a vertical groove, 23, and forwardly-projecting cleats 24 on its front edge, to engage the shoulder 22 and recesses 21, respectively, and provided on its opposite end on its inner side with a perpendicular projection, 25, having forwardly-projecting cleats 26 on its side nearest the front edge of the door, to enter the recesses 20, the said recesses and cleats being wedge-shaped to force the door inwardly, substantially as set forth.

400,563. CAR-COUPLING. WILEY M. GERMAN, Winchester, Ill. Filed Jan. 21, 1889. Serial No. 297,064. (No model.)



Claim.—1. In a car-coupling, the draw-head having a way for the coupling-hook formed with an incline up which to direct such hook, and having a transverse horizontal opening or guide for the coupling-pin, and the coupling-pin movable in said guide and provided with a flange or wing arranged in the closed position of the pin to form an extension or continuation of the incline for the coupling-hook, substantially as set forth.

2. The combination of the draw-head having a way for the coupling-hook and a transverse guide or opening for the coupling-pin, the coupling-pin having a rack or series of teeth, and the toothed wheel, substantially as and for the purposes specified.

3. In a car-coupling, the draw-head having a transverse guide or opening for the coupling-pin and formed with an incline, *d*, leading up thereto, and with an incline, *d'*, leading rearwardly and down from the upper end of incline *d*, combined with the coupling-pin, substantially as set forth.

4. The improvement in car-couplings, comprising the draw-head having a way for the coupling-hook formed with an inclined bottom and having a transverse pin-opening, E, formed with a slot-like extension, *e*, and the coupling-pin having a wing or flange, *g*, all substantially as set forth.

5. The improved car-coupling herein described, comprising the draw-head having opening E, formed with extension *e*, the way D, having inclines *d d'*, and a shield or cover, F, and the central link-mortise, the coupling-hook pivoted to said draw-head, the coupling-pin G, having flange or wing *g* and provided with the rack or teeth, and the toothed operating-wheel meshing said teeth, substantially as set forth.

400,564. ROCKING-CHAIR. LEWIS C. GUNN, San Diego, Cal. Filed Apr. 21, 1888. Serial No. 271,396. (No model.)



Claim.—1. The combination, with the chair-base comprising two connected parallel recessed boxes having slots 10 through their upper faces, of the curved rockers 7, mounted on transverse pivots within the said boxes above the bottoms thereof and provided with arms 11 at their ends extending up through said slots, and longitudinally-extending springs 22 22 in the bottoms of said boxes and bearing at their adjacent ends upwardly against the lower faces of the rockers at opposite sides of and below their pivots, substantially as set forth.

2. The combination, with the recessed or slotted chair-base, of the curved rockers pivoted between their ends within said recesses, and having upwardly-projecting arms at their ends passing through said slots and curved thereat to correspond with the arcs described by the ends of the rockers, and springs bearing against the lower faces of the rockers at opposite sides of their pivotal points, substantially as set forth.

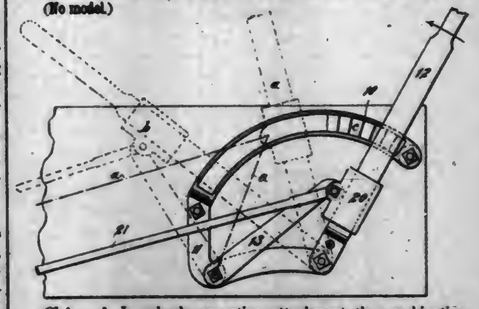
3. In a chair, the curved rocker 7, having upwardly and inwardly projecting arms 11 at its ends, curved at their junction with the rocker, and the vertical stop or brake 16, projecting from the upper face of the rocker in line with the axis or pivotal point, substantially as set forth.

4. The combination, with the chair-base comprising two connected parallel recessed boxes having slots 10 through their upper faces and a central or intermediate recess, 8, having cushions 18, of the rocker 7 within the recessed boxes, and having arms 11 at their ends projecting up through the slots 10 and curved thereat, and a vertical central stop or brake, 16, extending up into the recess 8, the transverse bearings 12, extending through the rockers below their stops or brakes, and the longitudinally-extending springs 19, resting in the bottoms of the recessed boxes and having their ends bent back upon themselves, as shown at 22, and bearing at their free ends against the lower face of the rockers at opposite sides of the bearings 12.

5. The combination, with the boxes 3, having longitudinally-extending recesses or spaces 6, slots 10, and intermediate upper recess, the front and rear walls of which form stops 17, and cushions 18 on said walls, of the rockers 7 within the said recesses 6, and having upwardly-projecting curved arms 11 at their ends extending through the slots 10, and vertical brakes or stops 16 on their upper faces extending up between the cushions 18, and transverse bearings extending through the said rockers under their brakes or stops 16, substantially as set forth.

6. The rocking-chair 24, having the inclined and curved legs 11 and rockers 7, with brake 16, mounted on a base consisting of the boxings 3, connected by cross-bar 2 and formed with slots 10, recess 8, and stops 17, with elastic cushions 18, and having the steel strip 19, with elastic projections 22, covered with soft material 23, located beneath the rocker 7, the brake 16 being located in recess 8 between cushioned stops 17, substantially as described.

400,565. WAGON-BRAKE LEVER. WILLIAM A. HANEY and ENOCH G. HANEY, Media, Kans. Filed Jan. 11, 1889. Serial No. 296,072. (No model.)



Claim.—1. In a brake-operating attachment, the combination, with a rack, of a toothed lever, a slide mounted upon the lever, a pivotally-mounted link that is pivotally connected to the slide, and a rod pivotally connected to the slide and arranged for connection with a brake, substantially as described.

2. In a brake-operating attachment, the combination, with a rack the teeth of which are formed only at the forward edge, of a toothed lever arranged to engage the rack, a spring carried by the lever and arranged to bear upon the rear face of the rack-bar, a slide carried by the lever, a pivotally-mounted link that is pivotally connected to the slide, and a rod pivotally connected to the slide and arranged for connection with a brake, substantially as described.

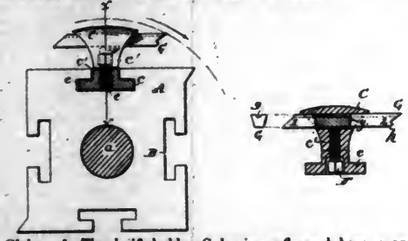
400,566. TANK. HUGH W. HARRY, Dallas, Tex. Filed Dec. 6, 1888. Serial No. 292,797. (No model.)



Claim.—As an improvement in tanks, the combination of the wooden bottom having cross-braces on its under side, the sheet-metal

bottom arranged over the wooden bottom and having an annular flange nailed or secured to said wooden bottom, and the metallic body, the lower end of which is connected to the bottom by nails, while the extreme lower edge of said body is turned under the wooden bottom between the cross-braces of the latter, substantially as set forth.

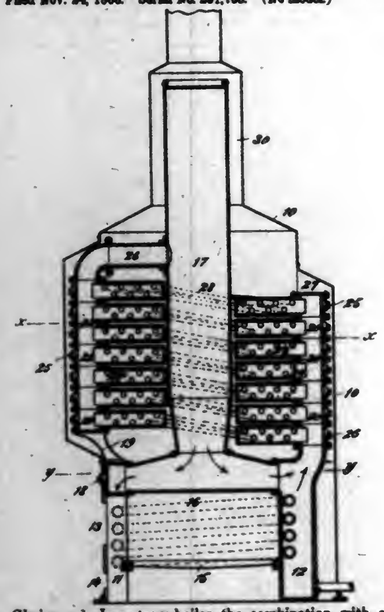
400,567. CUTTER-HEAD. HENRY L. HASKELL, Ludington, Mich. Filed May 21, 1888. Serial No. 274,339. (No model.)



Claim.—1. The knife-holder C, having a flanged base, c, and a head, c', having a transverse knife-receiving slot, and a threaded aperture extending up through the base and head into the knife-slot and enlarged at its lower end, substantially as set forth.

2. The knife-holder C, having a flanged base, c, a central transversely-slotted head, c', provided with a threaded aperture extending upwardly through the base into said slot and enlarged at its lower end, a bolt, F, working in said aperture, with its head in the enlarged lower end thereof, and the set-bolts e, extending through the base from its upper side at opposite sides of the head, substantially as set forth.

400,568. STEAM-BOILER. SAMUEL P. HEDGES, Greenport, N. Y. Filed Nov. 24, 1888. Serial No. 291,763. (No model.)



Claim.—1. In a steam-boiler, the combination, with opposing series of horizontally non-aligning manifolds or headers, of inclined concentric tubes connecting the corresponding manifolds of each series, substantially as shown and described.

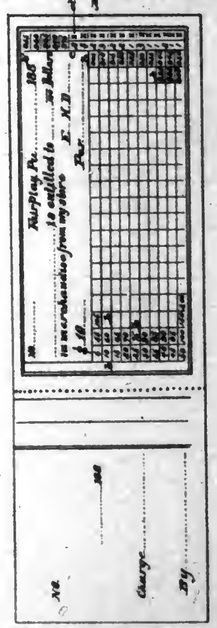
2. In a steam-boiler, the combination, with opposing series of horizontally non-aligning manifolds or headers provided with a series of alternating apertures in the sides, of inclined semicircular tubes having their ends inserted in the equivalent apertures of the corresponding manifolds of each series, substantially as shown and described.

3. In a steam-boiler, the combination, with an essential U-shaped water-leg at the front of the fire-box and an essentially perpendicular water-leg at the rear of the said fire-box, of a series of inclined semicircular tubes connecting the members of the front water-leg with the rear leg, substantially as shown and described.

4. In a steam-boiler, the combination, with a front and rear water-leg and inclined semicircular tubes connecting the said legs, of opposing series of horizontally non-aligning manifolds or headers, inclined tubes uniting the corresponding manifolds, and a connection between one series of manifolds and the rear water-leg, substantially as shown and described.

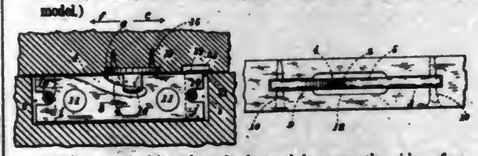
5. In a steam-boiler, the combination, with a front and rear water-leg, an inverted-T-shaped stand-pipe connecting the water-legs at the top, and a series of semicircular inclined tubes uniting the said legs below the stand-pipe, of a series of front and rear horizontally non-aligning manifolds or headers, a series of inclined tubes connecting the corresponding manifolds of each series, and a connection between the rear manifolds and the rear water-leg and between the front manifolds and the stand-pipe, substantially as shown and described.

400,569. CREDIT OR STORE ORDER. CHARLES S. HEMPSTEAD, Fairchance, Pa. Filed Mar. 2, 1888. Serial No. 265,908. (No model.)



Claim.—In credit or store orders having upon the face of them a series of columns of regular progressive amounts, omitting intermediate fractions, the combination with a series of such columns, the last one of which stops short of the full amount of the order, of a supplementary column of intermediate fractions amounting in the aggregate to the balance necessary to complete the full value of the order, and an additional column of symbols arranged opposite or by the side of said supplementary column of intermediate fractions, essentially as herein shown and described, and for the purposes specified.

400,570. COFFIN-FASTENER. EDWARD HOLMES and BRITAIN HOLMES, Buffalo, N. Y. Filed July 25, 1887. Serial No. 245,179. (No model.)

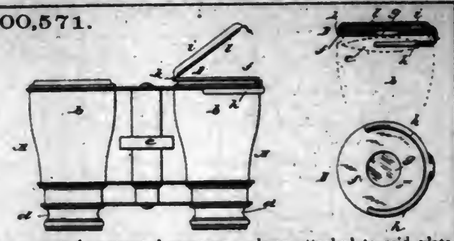


Claim.—A locking-plate, 3, clamped between the sides of an opening in the side of the casket, and having a pointed catch, 6, projecting horizontally in a line with the top of the plate, or substantially so, and a curved opening leading to and under the pointed catch, in combination with a loop-locking portion, 16, secured to the casket-lid, a spring, 19, having its fixed end secured to the inside of a casket-lid having a depression, 23, and the free end of the spring provided with a thumb-piece, and a downwardly-projecting catch, 21, for catching over the end of the plate 3 and locking the casket.

400,571. MIRROR ATTACHMENT FOR TELESCOPIC GLASSES. AUGUST JANSEN, Iron Mountain, Mich. Filed Oct. 19, 1888. Serial No. 288,557. (No model.)

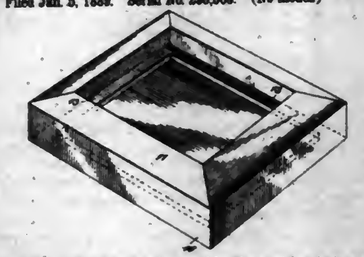
Claim.—1. A reflector or mirror attachment for telescopes, including opera-glasses, consisting of a metal or other suitable plate having a central contracted aperture, a clamp attached to said plate adapted to hold the latter upon the outer end of the telescope, with its contracted aperture in concentric position over or on the outside of the object-lens of the telescope, and a mirror hinged to the one side of said plate for operation, substantially as specified.

400,571.



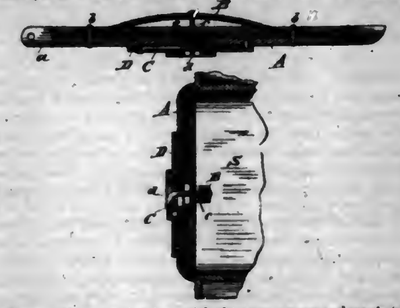
2. In a reflector or mirror attachment for telescopes, including opera-glasses, the removable reflector or mirror attachment D, composed of a metal or other suitable plate, f, adapted to close the outer end of the telescope, and provided with a central aperture, g, an elastic clamp or clip, h h, attached to said plate and adapted to hug the outer tube or case of the telescope, and a reflector or mirror-provided cover hinged to the one side of said plate, essentially as shown and described.

400,572. INSECT-TRAP. JENNIE G. F. JOHNSON, Mount Vernon, N. Y. Filed Jan. 5, 1889. Serial No. 295,503. (No model.)



Claim.—In an insect-trap, the combination, with a bait-receptacle, of a surrounding-trough and a hood which overhangs the bait receptacle, substantially as described.

400,573. OVEN-THERMOMETER. CAMILLA JULIER and JAMES O. ROBINSON, Hanging Rock, Ohio, assignors of one-third to Henry D. Miller, same place. Filed Nov. 23, 1888. Serial No. 291,619. (No model.)



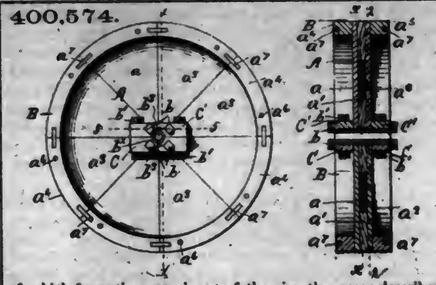
Claim.—The combination, with the stove or oven door A, of the strip B, of more expansible metal than that of said door, attached at or near its opposite ends to the door on its interior, the index-actuating stem c, secured to said strip intermediately of its ends and arranged to slide through the door, and the index C and graduated dial D, both upon the exterior of the door, essentially as shown and described.

400,574. SPLIT BAND-PULLEY. AMOS KEELER, Warsaw, Ind. Filed Oct. 23, 1888. Serial No. 288,982. (No model.)

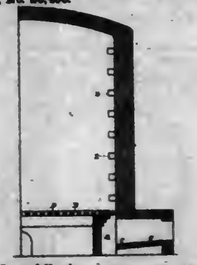
Claim.—1. In a split pulley, the web composed of a number of layers, the two outer layers consisting of a number of triangular-shaped sections, and the inside or center layer of a number of rectangular pieces arranged transversely to the triangular pieces, substantially as and for the purpose set forth.

2. A separable or split pulley the web whereof is composed of a number of layers, the two outer layers consisting of a number of triangular-shaped sections, and the inside layer of a number of rectangular pieces arranged transversely to the triangular parts, the segment rim-pieces secured to the respective sides of said web, the periphery of which forms the central part of the rim, the means described for securing said parts together, the clamping-bars forming the hub, the bolts for securing said bars to the web, the clamping-bolts passing through said bars and locking the two parts forming the pulley together, and the bushing divided longitudinally and provided with a feather or rib on each part, substantially as set forth.

400,574.



400,575. BRICK-KILN. DAVID LARNELS, Fort Wayne, Ind. Filed Nov. 24, 1886. Serial No. 219,339. (No model.) Patented in Canada Oct. 22, 1884, No. 20,408.

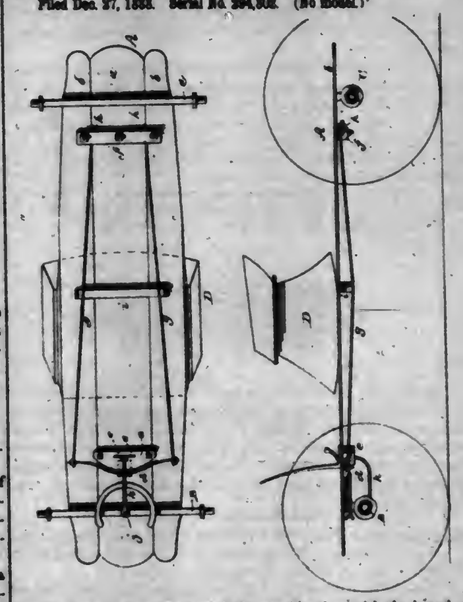


Claim.—1. In a kiln, lugs or supports separated on all sides by intervening spaces projecting into the kiln-chamber from the face of the inside wall sufficiently near one another to prevent the material to be fired from falling against the wall, substantially as set forth.

2. In a kiln, the lugs or supports 2, in combination with the inlets B, substantially as described.

3. In a kiln, the combination of combustion-chambers A, inlets B, and supports 2, substantially as set forth.

400,576. BUCKBOARD. JAMES W. LAWRENCE, New York, N. Y. Filed Dec. 27, 1888. Serial No. 294,802. (No model.)



Claim.—1. In a buckboard, the combination, with the board, of a spring attached to the board near one end, two rods connected with the spring and extending to the opposite end, supports for the

rods secured to the board, and a bridge-piece interposed between the rods and the board, substantially as specified.

2. In a buckboard, the combination of the board A, the convex cleat *c*, secured to the board, the spring *d*, resting upon the cleat *c*, two threaded rods, *g*, connected with the ends of the spring, the cleat *f*, secured to the board A and adapted to receive the ends of the rods *g*, nuts *h*, placed upon the threaded ends of the rods *g* and bearing upon the cleat *f*, and the bridge-piece *i*, attached to the board A at or near its center and bearing upon the rods *g*, substantially as specified.

3. In a buckboard, the combination of the board A, the convex cleat *c*, secured to the board, the spring *d*, resting upon the cleat *c*, two threaded rods, *g*, connected with the ends of the spring, the cleat *f*, secured to the board A and adapted to receive the ends of the rods *g*, nuts *h*, placed upon the threaded ends of the rods *g* and bearing upon the cleat *f*, the bridge-piece *i*, attached to the board A at or near its center and bearing upon the rods *g*, and the brace *k*, connected with the king-bolt and attached to the cleat *c*, substantially as specified.

400,577. MEDICAL COMPOUND.

NOAH LEVERING, Los Angeles, Cal., and MARY E. CURRY, Pacific, Mo. Filed Jan. 12, 1887. Serial No. 224,146. (No specimens.)

Claim.—The herein-described composition of matter to be used as a remedy for consumption in its early stages, coughs, colds, sore throat, and similar afflictions, consisting of honey, *Schinus molle* or pepper-tree berries, alcohol, glycerine, water, and alum, in the proportions specified.

400,578. BRACELET.

ADOLPH LUTHY, New York, N. Y., assignor to Adolph Luthy & Co., same place. Filed Nov. 21, 1888. Serial No. 291,432. (No model.)



Claim.—1. A bracelet comprising a major member of elastic material, constructed to encircle the wrist and to close by its own elasticity, and a minor member connected at both ends telescopically with the opposite ends of the major member, substantially as described, whereby, when the major member is expanded, the minor member serves as a bridge across the gap between its ends.

2. A bracelet comprising a major and a minor member telescopically connected, one of said members being constructed of two bars or wires and the other of a single bar or wire which telescopes between said bars and with stops on the respective members to limit their play.

3. In a bracelet, the combination of a member consisting of two or more elastic wires united by perforated cross-bars at their ends, and another member consisting of a wire sliding through the perforations in said cross-bars, and having on its end a cross-bar having perforations embracing the wires of said other member, whereby the two members are connected telescopically, and the cross-bars serve as stops to limit the expansion of the bracelet.

400,579. FABRIC FOR MACHINE-BELTING, &c.

JOSHUA P. MADDOX, Portland, Me. Filed Mar. 1, 1889. Serial No. 301,594. (No specimens.)

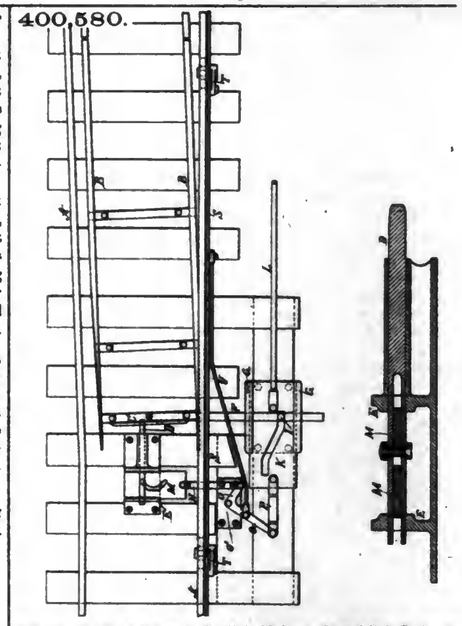


Claim.—The herein-described fabric for machine-belting and for other like purposes, having an inner ply composed of a wire warp and a fibrous weft, and one or more plies of facing material of fibrous material on each side of said inner ply and bound thereto by binders extending from said facing-plies to the said inner ply and back through said facing-plies and interlocking with the weft of said inner ply, substantially as shown.

400,580. LOCK FOR SWITCHES.

ISAAC MAY, Brooklyn, and CHARLES SPIKING and THOMAS SPIKING, New York, N. Y. Filed Jan. 3, 1887. Serial No. 223,167. (No model.)

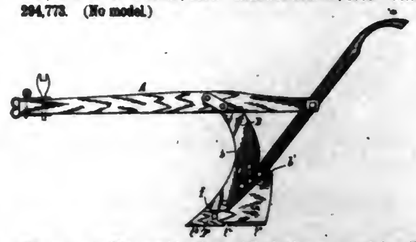
Claim.—The combination, with the track-rail and switch-rail, of the cam-plate K and bar F, for moving the switch-rail, and the stock E and bolt D, the shank of which slides through the stock, the cam-slide M, supported in the stock E and having a mortise with inclined



ends to act upon the bolt, the link N, lever O, and link P, for connecting the plate K to the cam-slide M, substantially as set forth.

400,581. PLOW AND PLOW-POINT.

JOHN W. MCAHULEY, Concord, N. C. Filed Feb. 23, 1888. Renewed Dec. 27, 1888. Serial No. 294,773. (No model.)



Claim.—1. The combination, with the beam A and handles *a*, of curved foot B, having the sharp edge *b* and elbow *b'*, landside F, its front end sharp and flush with the said edge *b*, the front half of its base, f^3, turned in and its rear half, f^4, turned out, its wing G extending up and secured to said foot, share C, having the short perforated wing *c* and long slotted and perforated wing *c'*, movable invertible reversible self-sharpening point D, and movable wing E, substantially as shown and described.

2. The combination, with the beam A and handles *a*, of curved foot B, having the sharp edge *b* and elbow *b'*, landside F, its front end sharp and flush with the said edge *b*, the front half of its base, f^3, turned in and its rear half, f^4, turned out, its wing G extending up and secured to said foot, share C, having the short perforated wing *c* and long slotted and perforated wing *c'*, movable invertible reversible self-sharpening point D, movable wing E, and section H, substantially as shown and described.

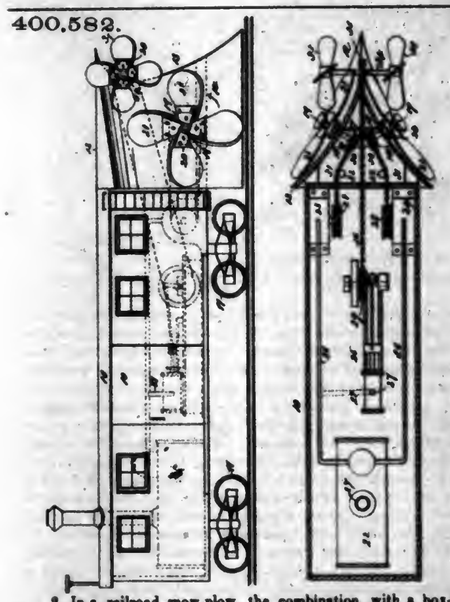
3. The combination, with the beam A and handles *a*, of curved foot B, having the sharp edge *b* and elbow *b'*, landside F, its front end sharp and flush with the said edge *b*, the front half of its base, f^3, turned in and its rear half, f^4, turned out, its wing G extending up and secured to said foot, share C, having the short perforated wings *c* and long slotted and perforated wings *c'*, movable wings E, and sweep I, having the wings *i*, substantially as shown and described.

400,582. RAILROAD SNOW-PLOW.

CHARLES A. MCCARTHY and JOHN P. MORAN, Sault de Ste. Marie, Mich. Filed Oct. 5, 1888. Serial No. 287,313. (No model.)

Claim.—1. In a railroad-snow-plow, the combination, with the body having a vertical wedge-shaped mold-board at its front end, of vertically-rotating snow-wheels on the two faces of said mold-board and the smaller vertically-rotating snow-wheels in front of and above the lower wheels, substantially as set forth.

400,582.



2. In a railroad snow-plow, the combination, with a box-like body and a triangular mold-board secured to the forward end of the same, provided with concave sides and a concave forward cutting-edge, of horizontal shafts journaled in the sides of the mold-board, a hub secured to the outer extremity of each shaft, twisted spaced arms radiating from said hubs, twisted blades detachably attached to the said arms, a boiler and two engines located within the body, said engines being connected with the said boiler, and means, substantially as shown and described, of connecting the several engines with the several shafts, as and for the purpose specified.

3. In a railroad snow-plow, the combination, with a box-like body and a triangular mold-board attached to the forward end of the same, provided with concave sides and a concave cutting-edge, of a snow-wheel provided with twisted blades journaled in the sides of the mold-board at the center, a shaft journaled transversely in the forward upper edge of the said mold-board, small snow-wheels also provided with twisted blades attached to the extremities of the said shaft, and means, substantially as shown and described, for independently rotating the side wheels and the upper shaft carrying the small snow-wheels, as and for the purpose specified.

4. In a railroad snow-plow, the combination, with a box-like body containing a boiler and three independent engines and a triangular mold-board secured to the forward end of the said body, provided with concave sides and a concave forward cutting-edge, of a longitudinal shaft journaled in each side of the mold-board at the center, a hub secured to the outer extremity of each of said shafts, twisted spaced arms projected from the hub, and twisted blades detachably attached to the said arms, a single transverse shaft journaled in the forward end of the mold-board near the top, provided at each extremity with an attached snow-wheel provided with detachable twisted blades, and a connection, substantially as shown and described, between the several engines and the boiler and the several shafts and the several engines, as and for the purpose specified.

400,583. SELVAGE-SHEDDING DEVICE FOR HAND-LOOMS.

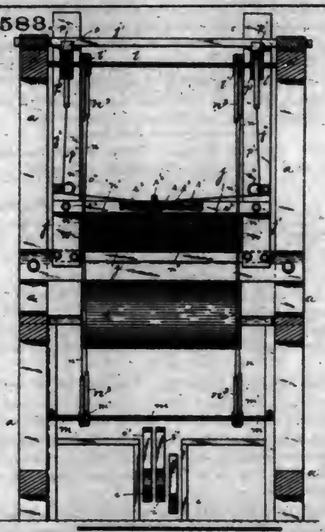
HUGH S. MCKEAN, Allegheny, Pa., assignor to Edward S. Wright, trustee, same place. Filed Oct. 25, 1888. Serial No. 289,066. (No model.)

Claim.—1. The combination, with the lathe, of two wires or cords at each side of the loom for carrying the selvage-threads, a hand-actuated device on the lathe, and connections therefrom to the selvage-thread wires or cords for operating said wires or cords, substantially as and for the purposes set forth.

2. In a hand-loom, the combination, with the lathe, of two wires or cords carrying the selvage-threads on each side of the loom, a slide mounted on the upper part of the lathe, and connections from said slide to said wires carrying the selvage-threads, substantially as and for the purposes set forth.

3. In a hand-loom, the combination, with the lathe *j'*, of the wires or cords *n* for carrying the selvage-threads, the shafts *l m*, on which they are mounted, the pulleys *o'* on the lathe, the slide-rod *r*, and the cords extending from said slide over said pulleys *o'* to shaft *l*, substantially as and for the purposes set forth.

400,583.



400,584. LAMP-EXTINGUISHER.

ALEXANDER E. MCLEOD, Hallock, Minn. Filed Mar. 26, 1888. Serial No. 268,493. (No model.)



Claim.—The combination, with the burner A, provided with the bracket G, of the sleeve C, fitting loosely on the wick-tube and provided with the pins D, the U-shaped plate E, apertured to receive the pins D and having its ends pivoted to the bracket G, and the forked rod I, pivoted on the pins D and extending downward through the top plate of the burner, substantially as herein shown and described.

400,585. METHOD OF PROTECTING DENTAL FILLINGS.

DANIEL C. MCNAUGHTON, Jersey City, N. J. Filed Aug. 3, 1887. Serial No. 246,060. (No model.)



Claim.—The herein-described method of protecting a tooth and arresting decay without destroying the healthy part of the tooth, which consists in lining a band having free ends with a plastic or cement, passing said band about the part of the tooth to be protected, having previously removed any decay, and then drawing the band tightly in position and securing its free ends permanently together, the plastic or cement being interposed between the band and the tooth, substantially as hereinbefore set forth.

400,586. SYRINGE.

DANIEL C. MCNAUGHTON, Jersey City, N. J. Filed Sept. 3, 1888. Serial No. 284,445. (No model.)

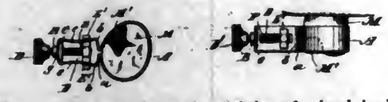


Claim.—1. A syringe having disposed therein a storage bottle or receptacle communicating solely with the exterior of the syringe, and in which a substance may be stored and from which it may be drawn, substantially as and for the purpose set forth.

2. The combination, with a flexible bulb, of a tube extending through the bulb and having a partition dividing the tube into a bottle and a nozzle, the bottle provided with a stopper and the nozzle communicating with the interior of the bulb, substantially as and for the purpose set forth.

3. The combination, with the flexible bulb 4, having the opening 5 for the nozzle, of the nozzle 7, extending through the opening 5, and formed with the opening 8, communicating with the interior of the bulb, and provided with the extension 9, which is attached to the bulb and acts to steady the nozzle under the compression and expansion of the bulb, substantially as and for the purpose set forth.

400,587. DENTAL MATRIX. CHRIST. A. MEISTER, Allentown, Pa. Filed Aug. 15, 1888. Serial No. 282,795. (No model.)

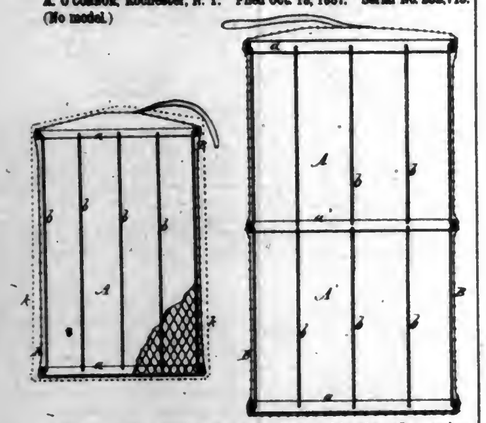


Claim.—1. A matrix for teeth, consisting of a band having a body for engaging a tooth, an integral extension of said band, consisting of slotted inclined side pieces, a cross-head engaged in the slots of said sides, and means for actuating the cross-head, substantially as described.

2. A matrix for teeth, consisting of a band having a body for engaging a tooth, an integral extension of said band, consisting of slotted inclined side pieces, the outer united ends of said extensions being provided with a screw-threaded opening, in combination with a screw-threaded stem having a cross-head swiveled thereto, said cross-head being mounted in the slots of the side pieces aforesaid, substantially as described.

3. A matrix for teeth, comprising a tooth-grasping band having extensions projecting from its adjacent ends, a nut between outer ends of said extensions, a cross-head sliding upon said extensions to force them toward and from each other, and thereby contract or expand the ring, and a screw passing through the nut into engagement with the cross-head, substantially as set forth.

400,588. FISHERMAN'S PAIL. CHARLES F. METHERD and JAMES A. O'CONNOR, Rochester, N. Y. Filed Oct. 18, 1887. Serial No. 252,715. (No model.)



Claim.—1. In a fisherman's pail, the combination of a spring frame consisting of heads and spring-wires connecting them, and a flexible reticulated covering to said frame, the whole forming a receptacle that can be collapsed by turning the upper head axially, as shown and described, and for the purpose specified.

2. In a fisherman's pail, the combination of a spring-frame consisting of heads and spring-wires connecting them, and a flexible reticulated covering to said frame, the heads being constructed with flanges, so that when the device is collapsed said heads will shut together in box form, as herein shown and described.

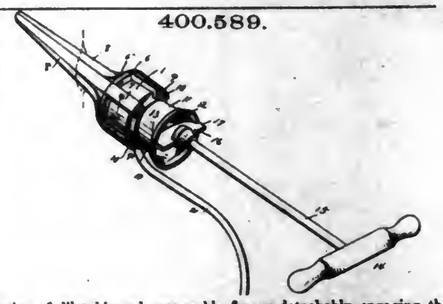
3. In a fisherman's pail, the combination of a spring-frame composed of two or more sections, each consisting of heads and spring-wires connecting them, and each folding independently, and a flexible reticulated covering to said frame, the whole forming a receptacle that can be collapsed by turning each section axially, the whole folding in compact form, as herein shown and described.

4. In a fisherman's pail, the combination of a collapsible spring-frame, a flexible covering inclosing the frame, and a water-proof bag inclosing both the frame and covering, in the manner and for the purpose specified.

400,589. SPECULUM. WILLIAM MOLESWORTH, Brooklyn, N. Y. Filed June 9, 1888. Serial No. 276,583. (No model.)

Claim.—1. The combination, with the dilatable fingers of a speculum, of removable shields, substantially as described.

2. A speculum consisting of a ring and supporting-handle, and a



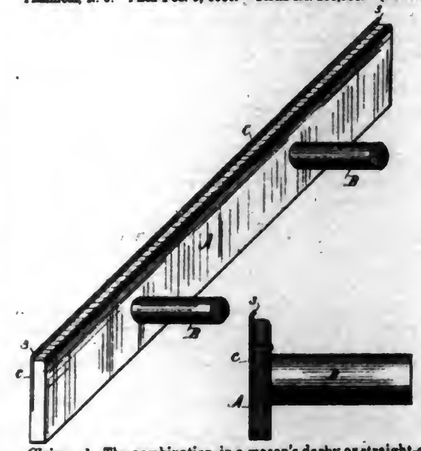
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series of dilatable and removable fingers detachably engaging the ring, in combination with a tube having a screw-threaded connection with the ring and movable therein to operate the fingers, and a handle for screwing and unscrewing the tube and detaching and withdrawing the fingers, substantially as shown and described.

3. A speculum consisting of an internally-screw-threaded ring, 1, having rear projections, 10, lateral flange 5, with slots 6, and a handle for supporting ring 1, and a series of dilatable and detachable fingers, 8, with shanks 7, having holes 22, and slotted lips 9 engaging projections 10, in combination with tube 11, engaging screw-thread of ring 1, and having flange 12 with slots 13, and the detachable handle 14, with rod 13, having at its end a plate, 16, with lugs 17, and a projection, 20, with bent arm 21, substantially as shown and described.

4. In a speculum substantially as herein described, a dilatable and detachable finger, 8, in combination with shield 23, having a rounded surface and outer end, and a sleeve, 24, with which finger 8 is held in engagement, substantially as shown and described.

400,590. STRAIGHT-EDGE OR DARBY. EUGENE MOORE, North Plainfield, N. J. Filed Feb. 9, 1889. Serial No. 299,318. (No model.)



Claim.—1. The combination, in a mason's darby or straight-edge, of the wooden strip A, handles B, fastened to the back thereof, and the metallic strip C, attached upon the surface of the darby and forming one edge thereof, substantially as set forth.

2. The wooden straight-edge A, having the handles B projecting at the back thereof, and the metallic strip C, having one edge bent backwardly to form a rounding surface, and the strip of metal attached to the wooden straight-edge, the whole forming an improved mason's darby, substantially as set forth.

400,591. TELEPHONE-TRANSMITTER. WILLIAM J. MORTON, New York, N. Y. Filed Feb. 17, 1888. Renewed Feb. 7, 1889. Serial No. 299,068. (No model.)

Claim.—1. A telephone containing a fixed electrode having an opening, a movable electrode entering and loosely moving in said opening, an independently-vibrating support carrying said movable electrode, the said electrodes each having a surface disposed substantially in the same plane, and a mass of comminuted conducting material in contact with said surfaces, substantially as described.

2. A telephone containing a fixed electrode having an opening, a movable electrode entering and loosely moving in said opening, an independently-vibrating support carrying said movable electrode, the said electrodes each having a surface disposed substantially in the same plane, a mass of comminuted conducting material in contact with

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said electrodes, and a body of insulating material extending across the interval between said electrodes, but not attached to both electrodes, substantially as described.

3. A telephone containing an inclosing case or ring of insulating material, a plate-electrode supported therein, a diaphragm, an electrode projecting from said diaphragm and entering an opening in said plate-electrode, and contained within said case or ring a loose mass of comminuted conducting material in contact with said electrodes, substantially as described.

4. A telephone containing an inclosing case or ring of insulating material horizontally disposed and having a downwardly-inclined inner periphery, a horizontal plate or partition of conducting material having a central opening and secured at the lower portion of said case, a diaphragm supported below and parallel to said plate, a block of conducting material on the upper side of said diaphragm loosely entering said opening in said plate, and a mass of comminuted conducting material resting upon said block and said plate, substantially as described.

5. A telephone containing an inclosing case or ring of insulating material horizontally disposed and having a downwardly-inclined inner periphery, a horizontal plate or partition of conducting material having a circular central opening and secured at the lower portion of said case, a diaphragm supported below and parallel to said plate, a cylindrical block of conducting material on the upper side of said diaphragm and loosely entering said opening in said plate, a ring of insulating material resting upon said cylinder and said plate, and a mass of comminuted conducting material resting upon said cylinder and said plate, substantially as described.

6. The combination of the ring or case A, carbon plate B, containing a central opening, diaphragm D, carbon cylinder E therein, loose ring F of non-conducting material, and a loose mass, G, of comminuted carbon in contact with said cylinder and said plate, substantially as described.

7. The combination of the ring or case A, carbon plate B, having a central opening, diaphragm D, carbon cylinder E therein, loose ring of non-conducting material, F, a mass, G, of comminuted conducting material in contact with said plate and said cylinder, and cover H, substantially as described.

8. The combination of the box M, hinged door L, having opening K, tube J, secured to said door, cup-shaped receptacle N, supported by said tube and having a central opening communicating with said tube, and the ring or case A, containing carbon plate B, having a central opening, diaphragm D, carbon cylinder E thereon, loose ring F of non-conducting material, and a mass, G, of comminuted conducting material in contact with said plate and cylinder, substantially as described.

400,592. FIN FOR VESSELS. GEORGE W. NAPIER, Los Angeles, Cal. Filed June 16, 1888. Serial No. 277,334. (No model.)

Claim.—1. In combination with the vessel, a fin pivotally secured to the side of the vessel by one edge, an arm pivotally secured to the fin near the other edge thereof, and mechanism for raising and lowering the arm.

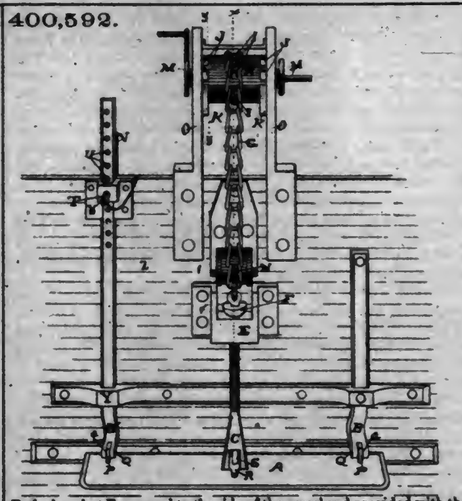
2. In combination with the vessel, the arm B, affixed thereto, the arm B', adjustably attached to the vessel, the fin A, pivotally attached to the arms B B', the rod C, hinged to the fin A, mechanism for raising and lowering the arm B', and mechanism for raising and lowering the rod C.

3. In combination with the vessel, the fin A, the arm B, fixed upon the side of the vessel and pivotally connected with one end of the fin, the arm B', connected with the other end of the fin and adjustably attached to the vessel, the rod C, attached to the fin, and mechanism for raising and lowering the rod C.

4. In combination with the vessel, the arm B, fixed upon the side of the vessel, the arm B', adjustably attached to the vessel, the fin A, pivotally attached near one edge thereof to the arms B B', the arm C, pivotally attached to the fin near the other edge thereof, and mechanism for raising and lowering the arm C.

5. In combination with the vessel, the arms B B', attached to the side of the vessel, the fin A, pivotally attached thereto, the rod C, pivotally attached to the fin and provided at its upper end with the head

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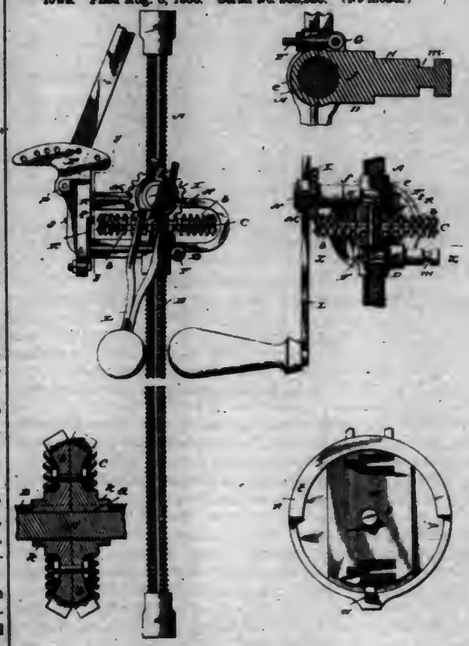


F, the bracket E, secured to the side of the vessel and provided with the hole D, the endless chain connected to said rod C, the drum provided with cogs I, and means for rotating the drum.

6. In combination with the vessel and with each other, the arms B B', attached to the side of the vessel, the fin A, pivotally attached thereto, the point of attachment being near one edge of the fin, the rod C, pivotally attached to the fin near the other edge thereof, the bracket E, embracing the rod C and secured to the side of the vessel, the endless chain passing over the pulley N and connected at one end to the rod C and at the other end to the drum H, provided with cogs I, and mechanism for rotating the drum.

7. In combination with the vessel and with each other, the arms B B', attached to the side of the vessel, the fin pivotally attached thereto, the point of attachment being near one edge of the fin, the rod C, pivotally attached to the fin near the other edge, the bracket E, embracing the rod C and secured to the side of the vessel, the endless chain passing over the pulley N and connected at one end to the rod C and at the other end to the drum H, provided with the cogs I, and at each end with the peripheral notches J, pawls engaging therewith, and mechanism for rotating the drum.

400,593. COAL-DRILLING MACHINE. JOSEPH NOICE, What Cheer, Iowa. Filed Aug. 8, 1888. Serial No. 282,223. (No model.)



Claim.—1. The bracket P, having the fixed disk R, which is provided with a central aperture, and also having a semicircular flange, as *l*, in combination with the fixed clamp-section having a fixed head or plate, E, also perforated, and having its edge adapted to engage the flange of said disk, a bolt for pivotally connecting the said head with the disk, and the pivoted clamping-jaw adapted to co-operate with the rigid jaw in sustaining a drive-gear, substantially as specified.

2. The clamp composed of the rigid jaw *e*, having the internally-threaded portions *g*, separated by an interspace, in combination with the pivoted jaw, also having threaded portions *g*, separated by an interspace, and both jaws having corresponding recesses *i* to form journal-boxes, the sectional gear C, having annular grooves *k*, to enter the said boxes in the clamping-jaws, the said jaws also having journals to receive a beveled pinion, whereby motion may be imparted to the main drive-gear, substantially as specified.

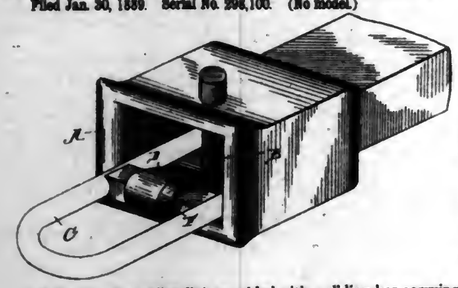
3. The pinion I, having an extension, M, and also having a journal-aperture, said pinion also having one or more apertures traversing the journal-aperture, in combination with the hinge-clamp, each section of which is provided with a journal having a groove, whereby the operating-handle may serve as a means of securing a pinion to either of the journals, substantially as specified.

4. In a coal-drilling machine, the combination, with the hinge-clamp comprising a rigid and a pivoted jaw, said jaws being respectively provided with the threaded portions *g* and the journal-boxes *i*, of the main drive-gear, comprising two separable sections secured together, and having the extensions, as *k*, and the spline *d*, substantially as specified.

5. In a coal-drilling machine, the combination, with a clamp constructed as described and provided with the two journals, of a pinion having an extension provided with apertures to receive a crank-arm, and the journals, also having a groove to receive the said arm, and suitable means for securing the arm to the pinion, substantially as specified.

400,594. CAR-COUPLING. WINFIELD S. PALMER, Glenburn, Pa.

Filed Jan. 30, 1889. Serial No. 298,100. (No model.)



Claim.—1. A coupling-link provided with a sliding bar carrying a supporting-tongue, as set forth.

2. The combination, with the coupling-link, of the transverse sliding bar within the same, having concave ends engaging the sides of the link, and the tongue loosely mounted on said bar and adapted to bear against the floor of the draw-head, as set forth.

3. The combination, with the coupling-link of the transverse bar composed of two sections loosely connected, the supporting-tongue carried by said bar, and the cushion to hold the bar in engagement with the link, as set forth.

4. The bar or shaft E, having the pivoted tongue D, as set forth.

5. The bar or shaft E, having the pivoted tongue D, oval-shaped in outline, as set forth.

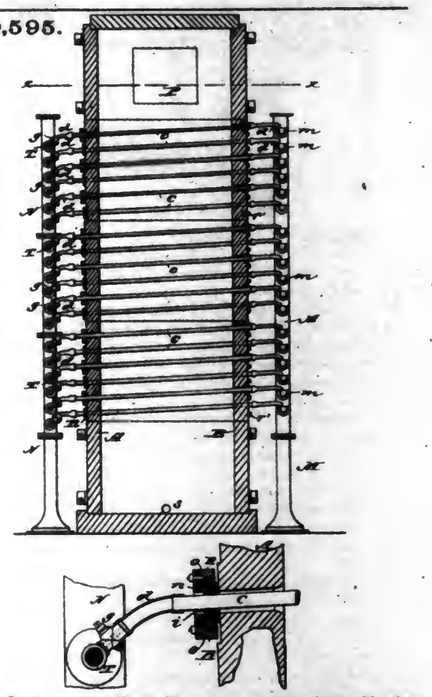
400,595. REFRIGERATING-TOWER. ALFRED R. PECHINEY, Salindres, France, assignor to Weldon's Chlorine Processes Company, (Limited,) Burstow, England. Filed July 14, 1887. Serial No. 244,291. (No model.) Patented in France Apr. 25, 1885, No. 163,507; in England May 18, 1885, No. 6,066; in Belgium May 26, 1885, No. 69,011; in Germany May 31, 1885, No. 34,397, and in Austria-Hungary Aug. 18, 1885 No. 21,753.

Claim.—1. The combination, with the tower, of cooling-tubes extending transversely through the walls thereof, each tube having a separate supply-connection exterior to the outer walls of the tower, whereby any tube may be removed and replaced without interfering with the flow through any other tube, substantially as set forth.

2. The combination, with the tower and the series of cooling-tubes extending transversely through its walls, of a vertical water-supply column outside of the tower, a series of transverse pipes communicating therewith, and separate valved connections leading from a pipe to each tube of the adjacent series, substantially as set forth.

3. The combination, with the tower A B, of the tubes *c*, packing *i*, bar R, and glands *n*, held to the bar R by screws *o*, substantially as described.

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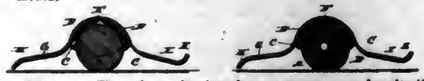


4. In an apparatus for cooling gases or vapors, the combination of the following elements, viz: tower A B, tubes *c c*, column N, pipes T, stop-cocks *g*, and tubes *d*, substantially as described.

5. In an apparatus for cooling gases and vapors, the combination of the following elements, viz: tower A B, tubes *c c*, column N, pipes T, stop-cocks *g*, tubes *d* and *d'*, and column M, supporting gutters *m*, substantially as described.

6. The combination, with the tower, of the transverse cooling-pipes extending therethrough with their delivery or outlet ends higher than their inlet ends, whereby the pipes when supplied will be always completely filled, substantially as set forth.

400,596. PARALLEL-RULER. NIEL S. PHELPS and CHARLES L. ELLER, Eureka, Cal. Filed Oct. 26, 1888. Serial No. 289,570. (No model.)



Claim.—1. The ruler A, having the concavo-convex longitudinal central portion, F, the bearings at the ends of said portion F, the downwardly-curved sides G I, extending in opposite directions from portion F, the said side G having the downwardly-inclined straight edge H, and said side I having the upwardly-curved straight edge K, and the cylindrical roller arranged under the portion F and having journals at its ends mounted in the bearings of the ruler, substantially as described.

2. The ruler A, having the concavo-convex longitudinal central portion, F, and the downwardly-curved sides G I, the former having the downwardly-inclined straight edge H and the latter having the upwardly-curved straight edge K, substantially as described.

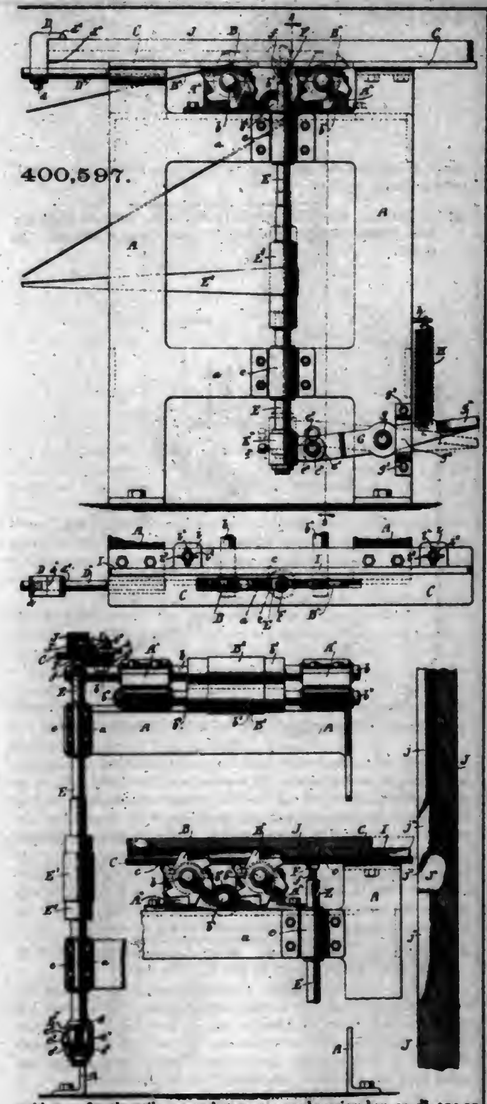
3. The blank rectangular in shape and of suitable length and width, and having the extensions B at its ends provided with the openings D and the salient-angle portions C, the latter and said extensions B being divided by aligned longitudinal slits E, substantially as described.

4. The ruler having the concavo-convex central portion, F, the overlapping end portions, B, having the aligned openings D, and the lips C, the latter being clinched on the overlapping portions B to secure the same together, in combination with the cylindrical roller having its journals engaging the openings B, substantially as described.

400,597. MACHINE FOR GROOVING WINDOW-SASH. FRANCIS V. PHILLIPS, Chicago, Ill., assignor to the Chicago Sash Pulley Company, same place. Filed July 9, 1888. Serial No. 278,361. (No model.)

Claim.—1. In a machine for grooving and recessing window-sash stiles at one operation, the combination of a table provided with a

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guideway for the stile, an end-stop, an overhanging lug, as *d*², one or more rotating groove-cutters in the path of the stile, and a recessing-tool movable into and out of the path of the stile, substantially as and for the purposes specified.

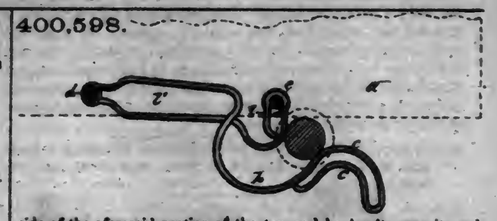
2. In a machine for grooving and recessing window-sash stiles at one operation, the combination of a stile-guide, two grooving-cutters of unequal thickness mounted in line with each other in the path of the stile, and a recessing-cutter movable sidewise with respect to the path of the stile into and out of said path, substantially as described.

3. The combination of a table, revolving groove-cutters B B', a stile-guide adjustably secured to the table, an adjustable end-stop having a projection which overhangs the path of the stile, a recess-cutter supported by a neck which is narrower than the cutter itself and is arranged between the cutters B B', a rotating and lengthwise-movable shaft carrying the recess-cutter at its end, and a foot-lever connected to said shaft for giving lengthwise movement thereto, substantially as specified.

400,598. HOLDER FOR UMBRELLAS OR ANALOGOUS ARTICLES. ANDREW C. PORTER, Utica, N. Y., assignor of one-half to Charles W. Higgins, same place. Filed Dec. 17, 1888. Serial No. 293,796. (No model.)

Claim.—1. In combination with the projecting portion of the top of a counter or stand, a clasp pivoted at one end to the under

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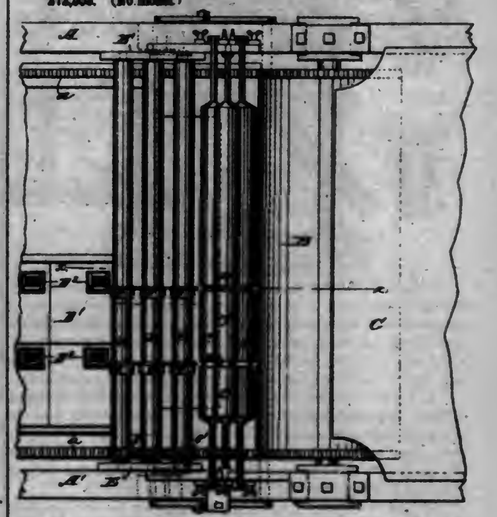


side of the aforesaid portion of the top and having its opposite end adapted to swing outwardly therefrom, a stop for limiting the said movement of the clasp, and an arm on said clasp adapted to grasp between it and the edge of the counter or stand the article to be held, substantially as set forth.

2. In combination with the projecting portion of the top of a counter or stand, a clasp pivoted at one end to the under side of the aforesaid portion of the top, and provided at the opposite end with an arm adapted to grasp the article to be held, and provided between its ends with a transverse slot, and a stop passing through said slot and secured to the aforesaid portion of the top, substantially as described and shown.

3. As a new article of manufacture, the within-described holder A, formed of a continuous piece of spring-wire bent at one end into the elongated loop *l*, thence into the elongated loop *l'* at right angles to the loop *l*, thence into the outward bow, *b*, and thence into the reversed bow *c*, and terminated with the end *d* bent back along the side of the latter bow, substantially as described and shown.

400,599. NUMBERING ATTACHMENT FOR PRINTING-PRESSES. TUNIS ROBERTSON, New York, N. Y. Filed May 2, 1888. Serial No. 272,553. (No model.)



Claim.—1. The combination, in a printing-press, with impression-cylinder, the bed, the numbering-heads, and their operating mechanism, of an auxiliary depressor or actuator in the path of the said head-operating mechanism to actuate it independently of the impression-cylinder, substantially as set forth.

2. The combination, in a printing-press, with the impression-cylinder, the bed, the numbering-heads, and their operating mechanism, of auxiliary depressors or actuators in the path of said head-operating mechanism, and mechanism, substantially as described, for automatically moving one of the said depressors or actuators out of the path of the head-operating mechanism as the bed is moved in one direction, substantially as set forth.

3. In a printing-press, the combination, with numbering-heads, their operating mechanism, and the impression-cylinder, of a series of transverse depressing-rolls journaled in advance of said cylinder, substantially as and for the purposes specified.

4. In a printing-press, the combination, with the numbering-heads, their operating mechanism, and the impression-cylinder, of a series of transverse depressing or actuating rollers to one side of the cylinder in the path of the said head-operating mechanism, vertically-movable bearings for one of said rollers, and a cam for automatically raising said bearings and the roller carried thereby when the numbering-heads are moved away from the cylinder, substantially as set forth.

5. In a printing-press, the combination, with numbering-heads provided with unite-wheels, and a plunger operating the same, of a series of depressing-rolls journaled in advance of the cylinder, and collars upon said rolls engaging the plunger of numbering-heads, one of said rollers being vertically movable, and a cam for automatically raising said roller when the heads are carried away from the cylinder, as and for the purposes specified.

400,600. INSULATING PIPE-COUPLING. FREDERICK C. ROCKWELL, Hartford, Conn. Filed Jan. 26, 1889. Serial No. 297,650. (No model.)

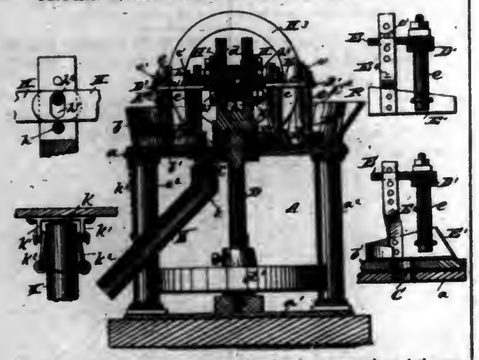


Claim.—1. The herein-described pipe-coupling, consisting of a tubular core of rigid material and an exterior body of insulating material, the ends of the dielectric body being threaded to receive the ends of pipes, as specified.

2. The herein-described pipe-coupling, consisting of a cylindrical metallic core with an exterior body of insulating material compressed around the core, as specified.

3. The herein-described pipe-coupling, consisting of a perforated metallic core, *a'*, a body, *a''*, of insulating material, and an integral insulating-diaphragm, *d*, substantially as specified.

400,601. ORE-CRUSHER. JACOB RODERMOND, New York, N. Y. Filed Mar. 17, 1888. Serial No. 267,495. (No model.)



Claim.—1. The combination, with the ore-receptacle and the vertical shaft bifurcated at its upper end, of the axles H, overlapped at their inner ends and having vertical aligned slots *k'*, the bolt h^3, passed through the said bifurcated end and slots, a second bolt, *h*, below the bolt *k'*, and on which the under sides of the slotted ends of the axles rest, and the crushing-rollers on said axles, substantially as set forth.

2. The combination, with the ore-receptacle, the crushing-rollers, and their operating-shaft, of a horizontal arm, D', projecting from the said shaft, a plate, E, secured to the said arm at an angle thereto, the vertical rod *e*, depending from arm D', and the shovel on the lower end of said rod and having a vertical plate, E^3, extending up through the plate E and secured thereto, substantially as set forth.

3. The combination, with the ore-receptacle, the vertical shaft and the crushing-rollers, of the horizontal arms D', projecting from said shaft between the rollers, the vertical spaced rods *e*, having shovels on their lower ends and extending at their upper ends through the arms D', the slotted plates E, adjustable horizontally on said upper ends, and the apertured vertical plates E^3, extending from the shovels up through the slots in plates E, and the securing-pins *e'*, substantially as set forth.

4. The combination, with a receptacle having an open top and outlet-aperture, a spout therefor, a chute suspended from the bottom of the receptacle, engaging the spout, a vertical shaft journaled in the receptacle, provided with a bifurcated upper end, and crushing-rollers provided with independent axles pivoted in the bifurcated shaft end, of opposing horizontal arms secured to the shaft between the rollers, and adjustable shovels carried by said arms, adapted to follow the rollers, substantially as and for the purpose specified.

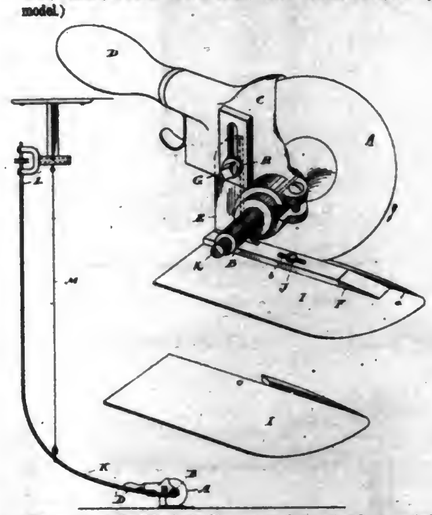
400,602. GAS OR VAPOR BURNER FOR HEATING. OTTO ROTTH, Brooklyn, N. Y. Filed Nov. 7, 1887. Serial No. 254,463. (No model.)

Claim.—In an apparatus for burning gas or hydrocarbon vapor, the combustion plate or burner herein described, consisting of a disk composed of a ring or band and a fagot of parallel fine wires or pieces of metal, through the interstices of which the vapor or gas



passes, and on the end surfaces of which ignition takes place, substantially as herein set forth.

400,603. MACHINE FOR CUTTING CLOTH. RICHARD SCHOFIELD, Paris, Ontario, Canada. Filed Feb. 27, 1888. Serial No. 265,397. (No model.)

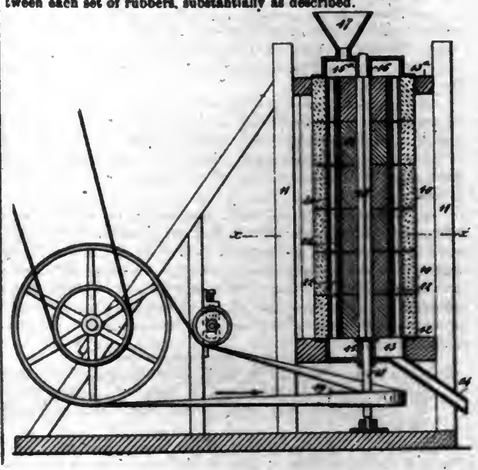


Claim.—1. A flexible shaft, K, connected at one end to a spindle, L, deriving a rotary motion from some suitable motor, and at its other end to a spindle, B, of the disk A, and suitably supported, as described, in combination with the elastic band M, arranged to support the flexible shaft K, substantially as and for the purpose specified.

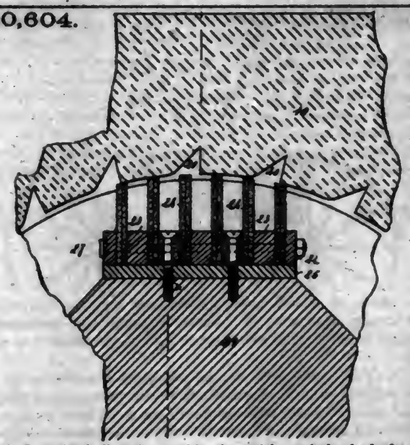
2. The combination, with the foot F and the standard E, of the bracket C, adjustably connected to said standard, the plate I, adjustably connected to said foot and formed with ledge *a*, forming a support for the cloth on the side of the disk opposite that on which the cloth is supported by the said foot, substantially as described.

400,604. RICE-HULLER. HENRY SCHOLFIELD, New York, N. Y. Filed Mar. 12, 1888. Serial No. 266,955. (No model.)

Claim.—1. In a rice-huller, the combination, with a tubular sectional body provided with vertical angular grooves, of a rotary hub within the body, a series of flexible and spaced rubbers, each section being secured in an arc of a circle to the hub and extending the length of one of the body-sections, and a series of guide-plates arranged between each set of rubbers, substantially as described.



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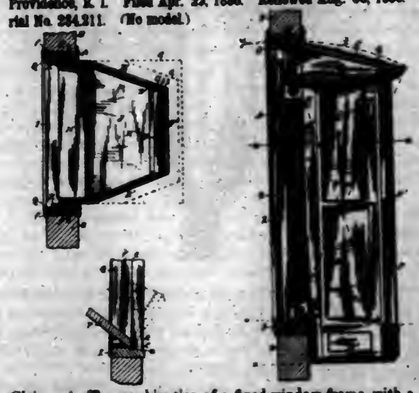


2. In a rice-huller, the combination, with a tubular body formed of a series of stone cylinders having vertical angular grooves, a rotary polygonal hub within the body, a series of flexible and spaced rubbers, each section being secured in an arc of a circle to the several sides of the said hub and extending the length of one of the cylinders, and a series of guide-plates between the several sets of rubbers and extending to within a short distance of the inner wall of the body, substantially as described.

3. The combination, with a body consisting of a series of cylindrically-bored stones the inner walls whereof are provided with a series of angular vertical grooves, of a spindle revolving in said body, a sectional polygonal hub secured to the spindle, a series of rubbers detachable connected to the hub-sections, provided with spaced leather blades, having their ends adapted to the inner contour of the body, deflecting or guide plates intervening the abutting ends of the rubbers, and means, substantially as shown and described, for laterally adjusting the rubbers, as herein set forth.

4. In a rice-huller, the combination, with a hub, of a series of strips, 23, of hard material, blades 24, of leather, inserted between the said strips, the blocks 26, inserted between the said strips and the hub, and screws for securing the whole to the hub, substantially as herein shown and described.

400,605. REMOVABLE BAY-WINDOW. SOLOMON SCHOLFIELD, Providence, R. I. Filed Apr. 22, 1886. Renewed Aug. 30, 1888. Serial No. 284,211. (No model.)



Claim.—1. The combination of a fixed window-frame, with a removable bay-window, comprising a window-light or sash-holding frame, floor, and roof or ceiling in one structure, and having when in its normal position in the window-frame a vertical height greater than the shortest distance between the window-stool and the head-rail of the opening for the bay-window, and being also adapted for a tilting inward movement from its normal position under the head-rail, substantially as described.

2. The combination of a fixed window-frame with a removable bay-window, comprising a window-light or sash-holding frame, floor, and roof or ceiling in one structure, which is adapted for a tilting inward movement from its normal position in the window-frame, the lowest point or extension of the removable bay-window being located below a horizontal plane extending outward from the upper surface of the window-stool, substantially as described.

3. The combination of a fixed window-frame, with a removable bay-window comprising a window-light or sash-holding frame, floor, and roof or ceiling in one structure, and having its extreme outward and downward diagonal measurement in a vertical plane greater than the extreme outward and upward diagonal measurement of the same, the former distance being greater than the distance between the window-stool and the head-rail of the opening for the bay-window, and the latter less than the same, and also being adapted for a tilting inward movement upon a fulcrum from its normal position under the head-rail, substantially as described.

400,606. TENSION DEVICE FOR WIRE FENCES. DWIGHT H. SCOTT, Flora, Dak. Filed June 27, 1888. Serial No. 278,311. (No model.)

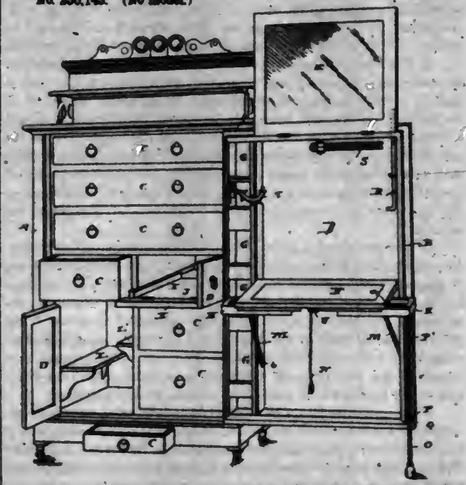


Claim.—1. A wire-tension device consisting of a single piece of wire bent to form an essentially U-shaped body, an outwardly-extending lip integral with the extremity of one member, and an outwardly and oppositely extending arm integral with the other member terminating in a hook at right angles to the arm, substantially as shown and described.

2. As an improved article of manufacture, a wire-tension device comprising two parallel arms of approximately equal lengths connected by an integral bow, the upper end of one arm having an outwardly and oppositely extending arm integral therewith, whereby the bow may be inserted in a suitable wrench and the wire twisted about both of said arms throughout their lengths, substantially as set forth.

3. A wire-tension device, A, consisting in the bow-shaped section a^2, having its ends drawn in or contracted, and the members *a a'*, extending from said point of contraction in parallel lines, the outward-projecting lip *b* at the free end of one arm, and the arm *b'*, extending from the other member and terminating in a hook, B, substantially as set forth.

400,607. COMBINATION FOLDING SECRETARY AND DRESSER. ANDREW SHIELDS, Grand Rapids, Mich. Filed Sept. 19, 1887. Serial No. 250,143. (No model.)

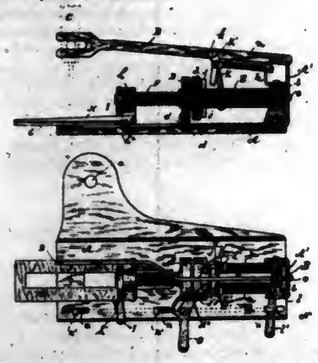


Claim.—1. The combination, with the door B, of the folding leaf F, an eye, U, thereon, a brace to support said leaf in its raised position, and a cord, N, connected with the brace and passing through the eye, substantially as described.

2. In an article of compound furniture, the combination, with a case, A, of the door or portion B, hinged to said case, the mirror E, hinged at its lower edge to the upper edge of said door or portion B, so as to be folded downward flat upon the door and to be turned upward into a plane parallel to or coincident with that of the door, and means for locking the same in open position, substantially as and for the purposes explained.

3. The case A, provided with drawers C and a large recess for the reception of a wash-bowl, the wash-bowl stand consisting of the piece J, provided with cleats I, placed and adapted to slide in the lower portion of said recess, and the hinged piece K, and an independent door, D', hinged at the side of said recess, whereby the opening may be closed, substantially as shown.

400,608. BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES. GEORGE D. SPIELMAN, Cincinnati, Ohio. Filed Oct. 24, 1887. Serial No. 253,170. (No model.)



Claim.—1. The combination of the base-plate, the laterally-adjustable perforated standard, the male and female screws passing through the standard, a cloth-carrier connected to the male screw, a cam secured upon the female screw and engaging a part of the standard, whereby a lateral vibratory movement is imparted to the feed-screws and cloth-carrier when the female screw and its cam are revolved, and means, substantially as shown, to impart an intermittent rotary motion to the cam and female screw, substantially as set forth.

2. The combination of the base-plate, the laterally-adjustable perforated standard carrying lugs, the feed-screws E and F, passing through the standard, a cloth-carrier connected to one of the screws, a wheel mounted upon the other feed-screw, and having a cam on one face engaging the lugs on the standard and projections on the other face, and suitably-actuated pawls engaging such projections.

3. The combination of the base-plate, the perforated standard, the feed-screws E F, arranged to vibrate laterally in said standard, the cloth-clamp connected to the forward end of the screw F, and means suitable for connecting the screw E to the needle-bar, whereby an intermittent rotary motion is imparted to the screw E and a lateral vibratory motion to both screws and the clamp, substantially as specified.

4. The combination of the base-plate and laterally-adjustable perforated standard having lugs projecting from it, the feed-screws E and F, passing through the standard, a cloth-carrier connected to the screw F and screw E, having its forward bearing in said standard, a wheel mounted upon the female screw, and having a cam on one face to engage the lugs on the standard and projections on the other face, suitably-actuated pawls engaging such projections, the pin d^3, projecting from the standard, and the slotted cam-lever O, pivoted on the base-plate and engaging said pin to change the position of the standard.

5. The combination of the base-plate, the laterally-adjustable perforated standard D and stationary standard A', the feed-screws E and F, passing through the standard D, the screw E having a pivotal bearing in the stationary standard and lateral play in its bearing in the adjustable standard D, the cloth-carrier connected to screw F, the vibrating bar pivoted in standard A' and having its opposite end arranged for connection with the needle-bar, and suitable means connected to the vibrating arm to impart an intermittently rotary motion to the feed-screw E, substantially as shown and described.

6. The combination of the base-plate and vibrating and longitudinally-reciprocating feed-screws, a cloth-carrier connected to one of said screws and a wheel mounted upon the other feed-screw, said wheel having projections, a vibrating arm actuated by the needle-bar and pawls depending from said arm and engaging said projections, the pivoted chair, and spring-links connecting said chair and the pawls, said chair having a lateral extension, whereby the chair is turned to bring the pawls alternately into and out of engagement with the projections on the feed-screw wheel, substantially as hereinbefore set forth.

7. In a button-hole attachment, the combination of the vibrating and longitudinally-reciprocating feed, the vibrating bar and its dependent pawls, the pivoted chair, and spring-links connecting the pawls and chair, said chair having a lateral extension, the sliding bar having an upper slotted extension to receive the extension of the chair, said sliding bar having also upwardly-extending lugs x' x', projecting through slots in the base, and the cloth-clamp having a lateral extension to alternately engage said lugs to change the feed from forward to backward movement, and vice versa, substantially as shown and described.

400,609. SIDE CURTAIN FOR BUGGIES. JOSEPH W. THOMAS, Sargent, Nebr. Filed Nov. 19, 1888. Serial No. 291,221. (No model.)

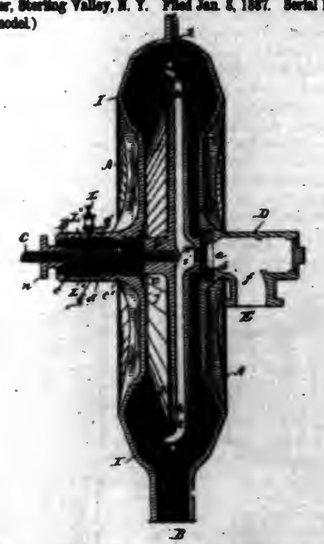


Claim.—1. In side curtains for buggies and other like vehicles, the curtain constructed of independent upper and lower sections adapted for separate or united use, as desired, substantially as specified.

2. In side curtains for buggies and other like vehicles, the curtain constructed of independent upper and lower sections provided with a series of button-holes along their upper and lower margins, and constructed the one to overlap the other when applied to the buggy or vehicle, essentially as shown and described, and for the purpose herein set forth.

3. In side curtains for buggies and other like vehicles, the combination, with the vehicle, of the independent upper and lower curtain-sections, D D', arranged the one to overlap the other, and constructed each with a series of button-holes, *b*, along their upper and lower margins, essentially as specified.

400,610. WATER-MOTOR. FREDERICK W. TUBBS, Jr., Syracuse, N. Y., assignor of two-thirds to James G. Hunter, same place, and John Hunter, Sterling Valley, N. Y. Filed Jan. 5, 1887. Serial No. 223,726. (No model.)



Claim.—1. A case for a water-motor, provided on its interior with an annular inclined plate forming a water passage or duct at one side of the case, and with a peripheral shield the inner edge of which projects toward said plate, so that water thrown on said shield will be directed into said duct, substantially as described.

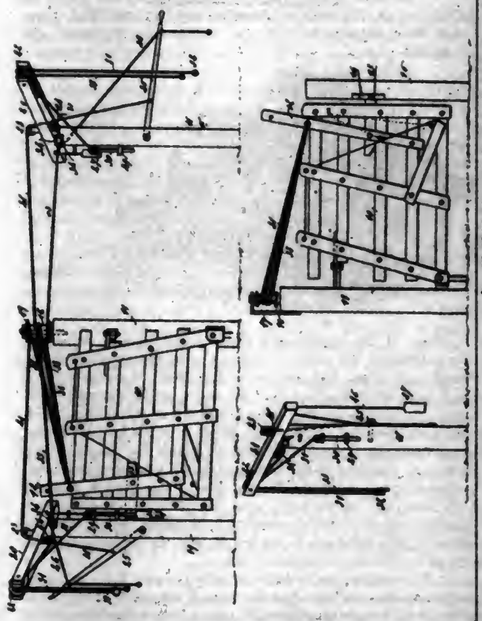
2. In a water-motor, the combination, with the case and rotary hollow hub and radial arms, of an annular ductor-block fitted in the open side of the case between it and the open hub for directing the water thereto and preventing it from entering the portion of the case in which said arms move, substantially as described.

3. In a water-motor, the combination, with the case and rotary hollow radial water-conducting arms, of an annular ductor-block in the case at the inlet sides of the said arms, and an annular shield projecting from the peripheral portion of the interior of the case toward the path of the discharge ends of the aforesaid arms, substantially as and for the purpose set forth.

4. In a water-motor, the combination, with the rotary hollow water-conducting arm, of a discharge nozzle on the free end of said arm and deflected laterally therefrom, a valve in the said nozzle, a lever hinged on the aforesaid arm and carrying the valve, and a spring connected with said lever and arranged to normally sustain the valve in its open position, substantially as described and shown.

5. The combination of the case N, provided with the water-passages 1 1, intermediate port, 2, hub 3, projecting into said port and provided with the screw-threaded socket 4 and opening 9 in the side of the case, the strainer 5, spanning the port 2 and seated upon the hub 3, and the cap 6, having the screw-threaded stem 7 entering the socket 4, and having also the shoulder 8, bearing on the portion of the strainer resting on the hub, substantially as described and shown.

400,611. GATE. THOMAS TYBUS, Mound City, Mo. Filed June 4, 1888. Serial No. 276,015. (No model.)



Claim.—1. The combination, with a gate-post provided with pulleys upon the upper end and a gate having its upper hinge forward of the vertical line of the lower hinge and adapted to open in two directions, of a standard at each side of the gate-post, a lever pivoted to said standards, a rope or chain attached to the levers, passing over the pulleys and secured to opposite sides of the latch-bar, a latch pivotally secured to said bar, a latch-pin vertically supported upon the standards in line of the said latch, and a rope attached to said latch-pin and supported from the standards, by means of which the latch-pin may be raised out of operative contact with the latch, as and for the purpose described.

2. The combination, with a gate-post provided with pulleys upon the upper end, a gate having its upper hinge forward of the vertical line of the lower hinge and adapted to open in two directions, and a latch-bar pivoted to said gate and extending above the same, of a standard at each side of the gate-post, a lever pivoted to each standard, a rope or chain attached to each lever, passing over the pulleys on the gate-post and secured to opposite sides of the latch-bar, a latch pivotally secured to said bar, a latch-pin vertically supported upon the standards in line of the horizontal movement of the said latch, and a rope attached to said latch-pin and supported from the standards, by means of which the latch-pin may be raised out of operative contact with the latch, as and for the purpose specified.

3. The combination, with a gate-post provided with pulleys upon the upper end, a gate having its upper hinge forward of the vertical line of the lower hinge and adapted to open in two directions, and a latch-bar pivoted to said gate, extending above the upper end, of a standard at each side of the gate-post, a counterbalanced lever pivoted to each standard, a rope or chain attached to each lever, passing in opposite directions over the pulleys on the gate-post, and secured to opposite sides of the gate-latch bar, a latch pivotally secured to said bar, a latch-pin vertically supported upon the inner side of each standard in line of the horizontal movement of said latch, and a rope attached to each latch-pin and supported from the standards, by means of which the latch-pin may be raised out of operative contact with the latch, as and for the purpose specified.

400,612. STOVE. FREDERICK VEIL, Allegheny, Pa. Filed Sept. 26, 1888. Serial No. 286,276. (No model.)



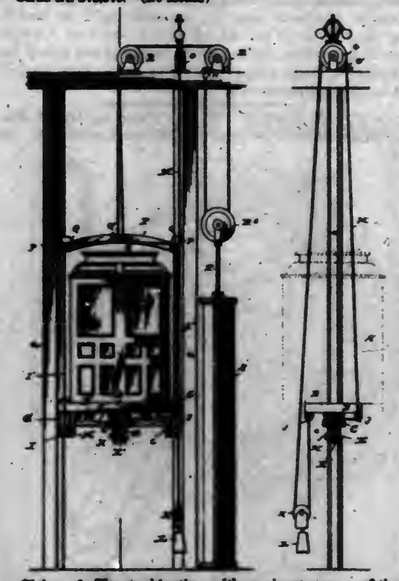
Claim.—1. The combination of an open grate, an upwardly-tapering zigzag flue supported on said grate, and a metallic casing in which said grate and flue are located and which constitutes a closed air-chamber around the zigzag flue, substantially as and for the purpose specified.

2. In a stove, the combination of an open grate, an upwardly-tapering zigzag flue supported thereon, and a metallic casing in which said parts are located, said casing being formed in two sections and having a shelf between them, substantially as and for the purpose specified.

3. In a stove, the combination of an open grate, a flue or uptake leading therefrom, a metallic casing in which said parts are located, and a downdraft space which connects the chamber inclosing the uptake with the ash-pit, substantially as and for the purpose specified.

4. In a stove, the combination of a basket grate, a tapering uptake, and a metallic casing inclosing the same, the grate being suspended within the casing, so as to form a posterior air-flue leading from the casing to the rear of the grate, substantially as and for the purpose specified.

400,618. ELEVATOR. ISAAC H. VEIL, Yonkers, N. Y., assignor of one-half to Hiriam G. W. Bartlett, same place. Filed May 2, 1888. Serial No. 272,573. (No model.)



Claim.—1. The combination, with an elevator-cage, of the brake, a sheave-nut movable upon a screw, connections between the said nut and brake to move and apply the latter as the nut is moved, an endless governor-rope passing around the said sheave-nut, and a governor which may arrest the movements of the rope, substantially as described.

2. The combination, with an elevator-cage, of the brake, an endless governor-rope, a governor to retard the motion of the rope upon an undue increase in the speed thereof, a sheave on the cage normally stationary and around which the rope is wound, but to which it is not secured, whereby the rope is caused to move with the cage when traveling at normal speeds, but turns the sheave when the cage travels too rapidly, and connections between the said sheave and brake, whereby upon the rotation of the former the latter are applied, substantially as described.

3. The combination, with an elevator-cage, of the brake, a sheave-nut, connections between the said nut and the brake, a governor, and a governor-rope extending from the governor to the sheave-nut, which latter forms the sole connection between the rope and the cage, substantially as described.

4. The combination, with an elevator-cage movable between the upright bars *a*, of brakes arranged loosely between the said bars and

the cage, the levers C, fulcrumed to the cage and pivoted at their outer ends to the brakes, and having their inner ends arranged in proximity to a screw-stud, E, a sheave-nut, D, mounted upon the stud and resting upon the inner ends of the levers, a spring which holds the levers against the nut, the governor-rope passing around the sheave-nut, and the elevator-governor, substantially as described.

400,614. COLUMNAR CLOSET. EMMA H. WATSON, Elizabeth, N. J. Filed Oct. 31, 1888. Serial No. 289,610. (No model.)

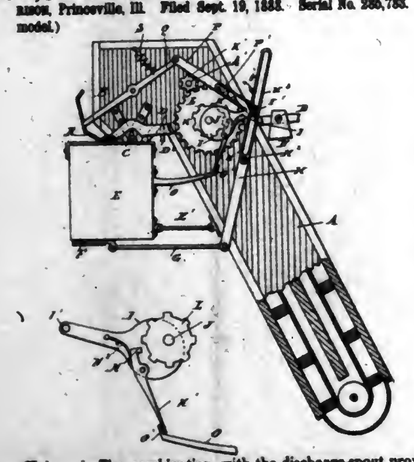


Claim.—1. A columnar closet in the form of an obelisk with an uneven number of sides, one or more of the sides being hinged to form a door, the inner sides of the door and column being provided with a series of pockets to contain flat articles, and the two sides adjacent to the edges of the door being inclined toward one another at their rear edges to facilitate the exposure of the pockets fixed thereon, substantially as herein set forth.

2. A columnar closet in the form of an obelisk having three equal sides, one of the sides being hinged to form a door, and all the inner sides of the column, including the door, being provided with pockets, as and for the purpose set forth.

3. The columnar closet consisting in the hollow obelisk formed with an uneven number of sides, the pyramidal cap E, the head K, separating the interior of the cap and obelisk, the door D, hinged at one side of the obelisk, and the lid F, formed of one side of the cap and having its hinge arranged at a different side from the door D, as and for the purpose set forth.

400,615. GRAIN-METER. VALENTIN WEBER and JAMES R. HARRISON, Princeville, Ill. Filed Sept. 19, 1888. Serial No. 285,783. (No model.)

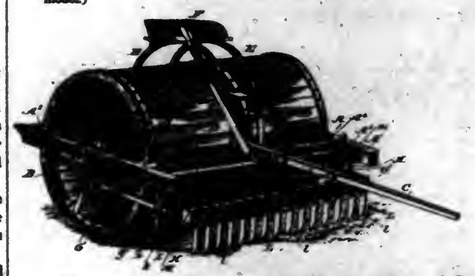


Claim.—1. The combination, with the discharge-spout provided with a gate, the grain-box under the spout and having a gate at its lower end, and the scale-beam supporting the box, of the toothed wheel, a crank-arm mounted on the axle of said wheel, a pawl pivoted to said arm, a spring pressing the pawl into engagement with said toothed wheel, an arm projecting from the grain-box and having a lug to engage the outer end of the pawl, an arm pivoted between its ends and operated by said crank-arm, and connections between the pivoted arm at opposite sides of its pivot and said gates, substantially as set forth.

2. In a tripping device for grain-weighing machines, the combination, with the gate for the discharge-spout, the gate for the grain-box, and a toothed wheel having a rotary motion, of a tripping-pawl adapted to engage the said toothed wheel, an arm secured to the grain-box and having a lug adapted to engage the said tripping-pawl, a crank-arm fulcrumed on the axle of the said toothed wheel and carrying the said tripping-pawl, and slotted arms connected with the said crank-arm and operating, respectively, the gate for the grain-box and the gate for the discharge-spout of the elevator, substantially as shown and described.

3. In a tripping device for grain-weighing machines, the combination, with the gate for the discharge-spout, the gate for the grain-box, and a toothed wheel having a rotary motion, of a tripping-pawl adapted to engage the said toothed wheel, an arm secured to the grain-box and having a lug adapted to engage the said tripping-pawl, a crank-arm fulcrumed on the axle of the said toothed wheel and carrying the said tripping-pawl, a spring held on the said crank-arm and pressing against the said tripping-pawl to throw the latter in contact with the toothed wheel when the said lug disengages the said tripping-pawl, and slotted arms connected with the said crank-arm and operating, respectively, the gate for the grain-box and the gate for the discharge-spout of the elevator, substantially as shown and described.

400,616. HARROW ATTACHMENT FOR LAND-ROLLERS. JAMES W. WEIR, Princeton, Ind. Filed Dec. 7, 1888. Serial No. 292,944. (No model.)

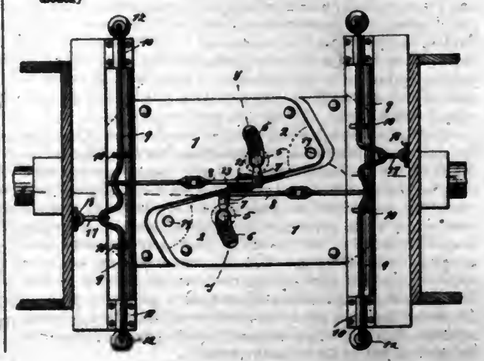


Claim.—1. The combination, with the main frame A, the axle B, journaled therein, the rollers D, mounted on said axle, arched bars E, secured to the frame and extended over the rollers D, and the driver's seat F, mounted on said bars over the rollers, of the harrow attachment G, disposed below the frame in advance of the rollers D, said attachment consisting of the harrow-bar H, provided with depending harrow-teeth, carrier-arms G' G', secured to said bar, extended rearwardly and journaled on the axle B, as shown, a flexible connection, N, secured at one end to the bar, and a bell-crank lever, O, mounted at its lower end on the front beam of the frame, its crank end connected with the flexible connection N, its handle portion extended upward in close proximity to the driver's seat, all arranged substantially as and for the purpose described.

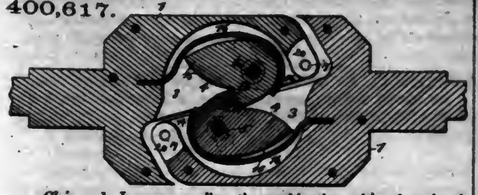
2. The combination, with the frame A, the axle B, the rollers D, mounted thereon, and the adjustable stops K, secured to the frame, as shown, of the harrow attachment G, disposed below the frame and in advance of the rollers, said attachment consisting of a transverse bar, H, having depending harrow-teeth, carrier-arms G', secured to said bar and adapted to rest in the stops *k* and extending upwardly and rearwardly, the upper ends, *g*, of which are journaled upon the axle B, as shown, and a flexible connection between the harrow-bar and the front end of the frame, substantially as and for the purposes described.

3. The herein-described attachment for land-rollers, consisting of the transverse bar H, provided with depending harrow-teeth having curved and sharpened front edges, angle-plate connections I, secured one at each end of said bar to the rear side thereof, and carrier-arms G' G', the lower ends, *g'*, thereof secured to the arms *i* of the plates I, all arranged substantially as and for the purpose hereinbefore described.

400,617. CAR-COUPLING. ISAAC L. WHEDDON and JULIAN S. RAMAW, Chipley, Fla. Filed June 13, 1888. Serial No. 277,155. (No model.)



400,617.



Claim.—1. In a car-coupling, the combination, with a draw-head, of a spring-actuated catch mounted in the draw-head to have a laterally sliding and rotary movement, substantially as described.

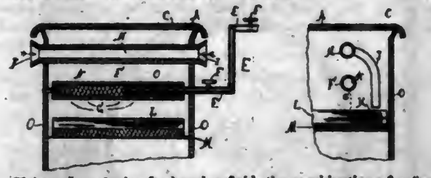
2. In a car-coupling, the combination, with the draw-heads having overlapping portions, of laterally sliding and rotary catches mounted in the said draw-heads, and springs for holding the catches in engagement, substantially as herein shown and described.

3. In a car-coupling, the draw-heads 1, formed with the inclined overlapping portions 2, having recesses 3, the rotary catches 4, mounted on pins 5, having their ends located in inclined slots 6 in the top and bottom of draw-heads 1, and formed with shoulders 13, oval portion 14, and projection 15, the reacting-spring 16, extending over the side of projection 15 and oval portion 14, and the crank-rods 9, with weighted crank-handles 11 at the sides of a car, and rods 8, connecting crank-rods 9 with arms 7 on pins 5, substantially as described.

4. In a car-coupling, the draw-heads 1, formed with recess 20 and hole 19 at their outer ends, and with the overlapping inclined portions 2, having recesses 3, the rotary catches 4, mounted on pins 5, having their ends located in curved slots 6 in the top and bottom of draw-head 1, and formed with shoulder 13, oval portion 14, and projection 15, the reacting-springs 16, extending over the side of projection 15 and oval portion 14, the rods 8, connecting arm 7 on pins 5 with crank-rods 9, and the operating-rod 17, connected with crank-rod 9 and extending to the top of a car, substantially as described.

5. In a car-coupling, the draw-heads 1, formed with the inclined overlapping portions 2, having vertical recesses 22 in their abutting surfaces, recesses 3, with rotary catches 4, mounted on pins 5, having their ends located in inclined slots 6 in the top and bottom of draw-heads 1, and formed with shoulders 13, oval portion 14, and projection 15, the reacting-spring 16, extending over the side of projection 15 and oval portion 14, and the crank-rods 9, with weighted crank-handles 11 at the sides of the car, and rods 8, connecting crank-rods 9 with arms 7 on pins 5, substantially as shown and described.

400,618. DEVICE FOR BURNING FLUIDS. WILLIAM H. WIBGARDNER, Chicago, Ill., assignor to Margaret R. Flagg, same place. Filed Aug. 27, 1887. Serial No. 248,090. (No model.)

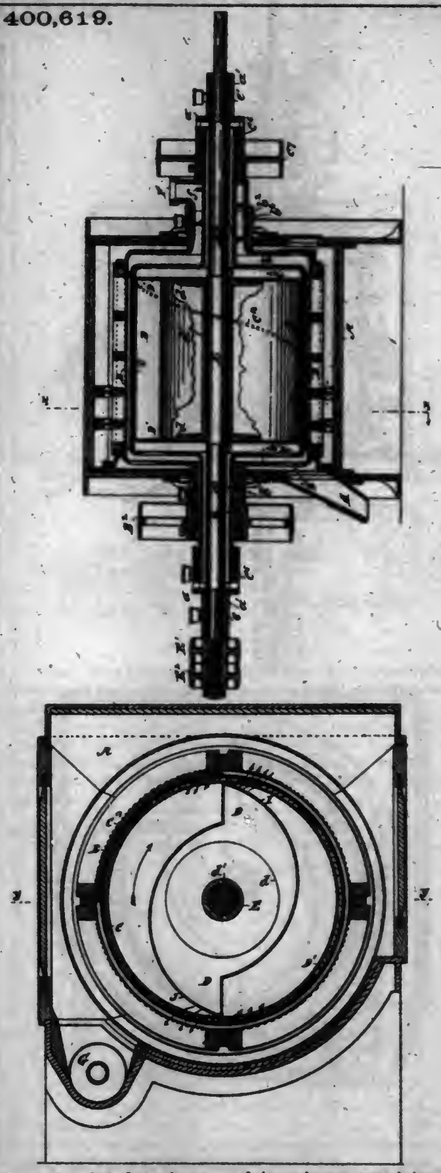


Claim.—In a device for burning fluid, the combination of a furnace with a pan therein, said pan provided with a lining or coating of indestructible material, a deflector above the surface thereof and within said pan, an air-supply pipe extending entirely through and above the furnace and provided with downwardly-curved discharge-pipes which discharge said air against said deflector, a fluid-supply pipe extending across said furnace beneath the air-supply pipe filled with a non-combustible material and provided with discharge-apertures along its lower edge, and a pipe leading from the oil-reservoir and discharging within such discharge-pipe so that the fluid to be consumed drops from the apertures in the discharge-pipe into the pan where it is burned, the heat thereof heating the air as it is supplied, substantially as and for the purpose specified.

400,619. METHOD OF SIFTING GRANULAR MATERIAL. FRIEDRICH G. WINKLER, Zschoppau, Saxony, Germany, assignor to Robert R. Lester, New York, N. Y. Filed Aug. 24, 1887. Serial No. 247,705. (No model.) Patented in Germany Apr. 3, 1886, No. 38,576, July 8, 1886, No. 40,257, and Oct. 22, 1886, No. 39,709.

Claim.—The herein-described method of sifting flour or other granular material through a sieve or bolting-cloth forming the curved wall of a cylindrical drum, which consists in the subjection of all parts of such sieve or bolting-cloth, and hence the subjection of all portions of the granular material contained within the sieve or bolting-cloth, successively to the influence alternately of a relatively-strong current of air moving transversely outward through a prescribed area of the sieve and a relatively-weak current of air moving transversely inward through a larger area of the sieve.

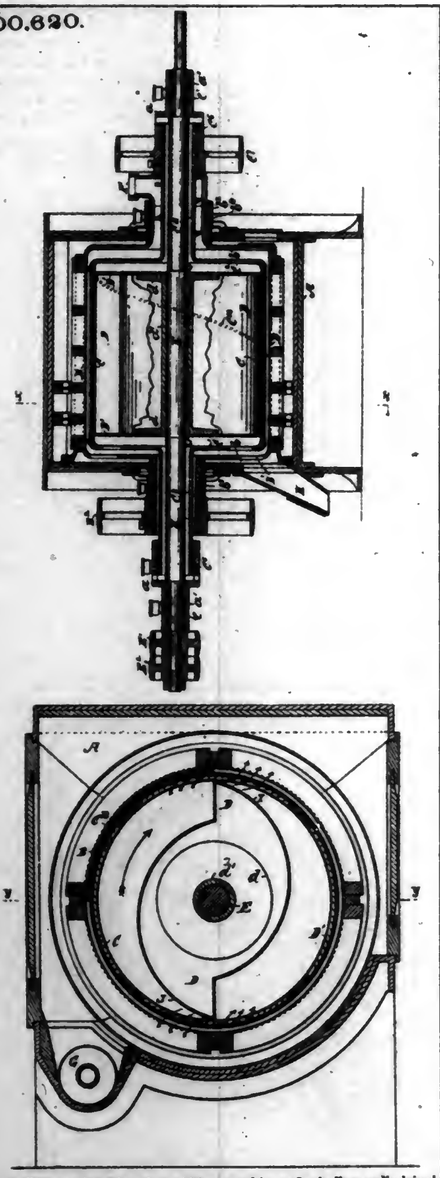
400,619.



400,620. ROTATING WAVE-GENERATING SIFTER. FRIEDRICH G. WINKLER, Zschoppau, Saxony, Germany, assignor to Robert R. Lester, New York, N. Y. Filed Nov. 23, 1888. Serial No. 291,542. (No model.) Patented in Germany July 8, 1886, No. 40,207, and Oct. 22, 1886, No. 39,709; in Sweden Aug. 27, 1887, No. 1,627; in Luxemburg Aug. 30, 1887, No. 883; in Norway Sept. 1, 1887, No. 670; in France Sept. 1, 1887, No. 170,762; in Belgium Sept. 1, 1887, No. 73,745; in England Sept. 1, 1887, No. 11,881; in Finland Sept. 13, 1887, No. 268; in Italy Sept. 30, 1887, No. 18,970; in Portugal Nov. 3, 1887, No. 1,186; in Austria-Hungary Feb. 13, 1888, No. 34,417; in Spain Apr. 30, 1888, No. 12,425; in India May 1, 1888, No. 10, and in Argentine Republic May 30, 1888, No. 654.

Claim.—1. The combination, in a sifting-machine, of a hollow cylindrical sieve, a rotating wave-generator within said sieve, and an annularly-arranged system of deflecting-bars interposed between the path of motion of the wave-generator and the interior surface of the said cylindrical sieve, substantially as set forth.

400,620.



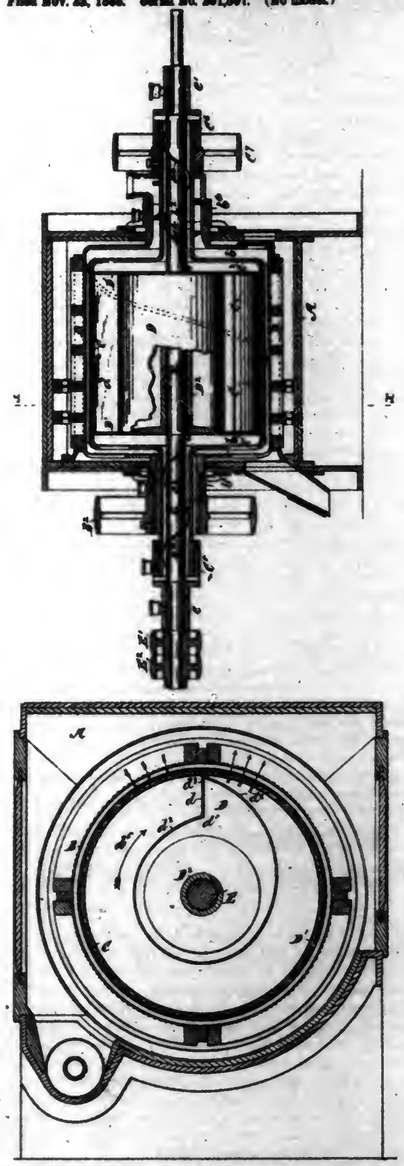
2. The combination, in a sifting-machine, of a hollow cylindrical sieve, a rotating wave-generator within said sieve, and a rotating deflecting-grate composed of an annularly-arranged system of deflecting-bars interposed between the path of motion of the rotating wave-generator and the interior surface of the said cylindrical sieve, substantially as set forth.

3. The combination, in a sifting-machine, of a rotating hollow cylindrical sieve, a rotating wave-generator within said sieve, and an annularly-arranged system of deflecting-bars interposed between the path of motion of the wave-generator and the interior surface of the said cylindrical sieve, substantially as set forth.

4. The combination, in a sifting-machine, of a rotating hollow cylindrical sieve, a rotating wave-generator within said sieve, and a rotating deflecting-grate composed of an annularly-arranged system of deflecting-bars interposed between the path of motion of the wave-generator and the interior surface of the said cylindrical sieve, substantially as set forth.

5. The combination, with a hollow cylindrical sieve, of a rotating wave-generator consisting, essentially, of two parallel disks affixed to a central shaft and of partitions or fans extending longitudinally across the wave-generator from one of said disks to the other, whereby there are established in said generator longitudinal spaces or pockets open only toward the periphery of the wave-generator, substantially as set forth.

400,621. SIFTING-MACHINE. FRIEDRICH G. WIESLER, Bischoppau, Saxony, Germany, assignor to Robert H. Lester, New York, N. Y. Filed Nov. 23, 1888. Serial No. 291,697. (No model.)



Claim.—1. The combination, with a cylindrical sieve, of a single rotating wave-generator for continuously propagating a single wave of air around the entire circumference of said cylindrical sieve, the said generator consisting, essentially, of two parallel disks affixed to a central shaft and of a fan extending inwardly from one side of the periphery of the generator, and extending longitudinally across the generator from one of said disks to the other.

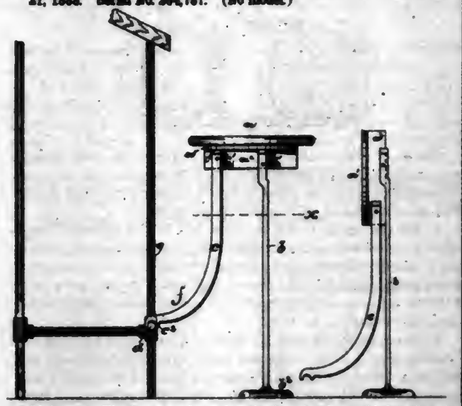
2. In combination with a cylindrical sieve and means for establishing outward and inward currents of air through said sieve, a hollow cylindrical deflecting-grate composed of a system of slats inclined diagonally with relation to the radial lines, which centrally intersect them, respectively, and shaped in cross-section substantially as described, whereby the widths of the outer ends of the spaces between the slats are prevented from exceeding the widths of the inner ends of the said spaces.

3. The combination, as herein set forth, of the hollow hubs C^3 and C^4, of the cylindrical deflecting-grate and the spiral blades c^2 and c^3, affixed to the portion of the fan-shaft E which is surrounded by the said hubs, respectively.

400,622. PROCESS OF DEPHOSPHORIZING IRON ORE. THOMAS F. WITHERBEE, Port Henry, N. Y. Filed Dec. 22, 1887. Serial No. 259,257. (No specimens.)

Claim.—The process of dephosphorizing iron ore, which consists in mechanically separating apatite or phosphorus-holding compounds from iron ore, then dissolving the remaining small percentage of apatite with dilute sulphuric acid, and finally washing the ore with water, substantially as described.

400,623. SEAT. GUSTAVE J. WOLBER, Newark, N. J. Filed Feb. 21, 1888. Serial No. 264,787. (No model.)



Claim.—1. The improved seat herein described, combining therein a seat, *a*, having pivotal bearings, a rear leg, *b*, pivoted on said bearings, and short legs *c c*, extending forward and having on their under side depending fingers c^2 c^2, adapted to hold the legs to said bar when said legs rest on said bar, substantially as and for the purposes set forth.

2. In combination with a seat, *a*, pivotal legs *b* and *c*, having lateral extensions b^2 at their upper extremities, c^2, adapted to engage the under side of the said seat to give greater firmness to said seat, the forward extremities of said legs being adapted to engage the raised fixture *d* and to hold the same, substantially as and for the purposes set forth.

400,624. SATCHEL ATTACHMENT. JOHN A. YARGER, New Hampton, Iowa. Filed Feb. 6, 1887. Serial No. 226,642. (No model.)

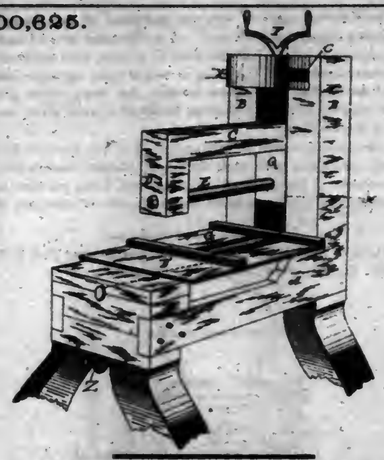


Claim.—The described attachment for satchels, consisting of a base-plate having a loop formed upon one side for the attachment of the strap and a pin on its upper surface adapted to engage with the perforations on the other end of the strap, suitable guiding-flanges on each side, and a hinged cover under spring-tension having ears projecting from its rear part, substantially as described.

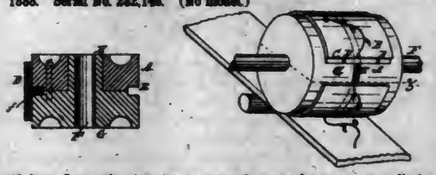
400,625. MACHINE FOR ORNAMENTING WOOD, &c. EDWARD W. ALLISON, Minneapolis, Minn. Filed Aug. 7, 1888. Serial No. 282,145. (No model.)

Claim.—In machines for ornamenting wood, the arm C, provided with the depending guide Q, carrying the ribs K K and the depending portion D, and each depending portion provided with a bearing for the shaft E and the die Y thereon, in combination with bed A and standards B B at the sides of the guide portion Q, with grooves therein to engage the ribs K, the table D', and roller G, projecting through it, the screw I, gears *b c*, and lever F, as and for the purpose specified.

400,625.

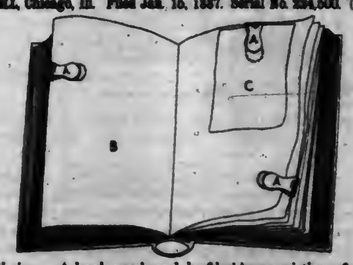


400,626. TWO-PART CYLINDER AND DIE FOR ORNAMENTING WOOD, &c. EDWARD W. ALLISON, Minneapolis, Minn. Filed Aug. 7, 1888. Serial No. 282,146. (No model.)



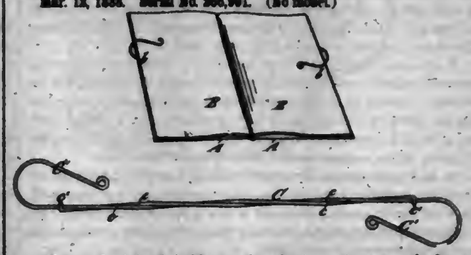
Claim.—In mechanism for ornamenting wood, a two-part cylinder consisting of the part G, provided with the hub H, and the part A, placed on the said hub, and the part G, with its hub H, provided with a continuous bearing for a supporting-shaft, and the periphery of the cylinder provided with an annular groove between said parts, in combination with a segment-die, B, provided with a rib engaging said groove and fastened at one end to the two-part cylinder, as specified and shown.

400,627. BOOK-LEAF OR PAPER HOLDER. EDWARD P. ARNELL, Chicago, Ill. Filed Jan. 16, 1887. Serial No. 224,500. (No model.)



Claim.—A book-mark and leaf-holder consisting of a piece of flat metal bent or folded to form two lips of unequal length, the shorter lip curved upwardly and the longer lip flat, as described.

400,628. BOOK-HOLDER. WILLIAM H. ASH, Brooklyn, N. Y. Filed Mar. 12, 1888. Serial No. 266,991. (No model.)

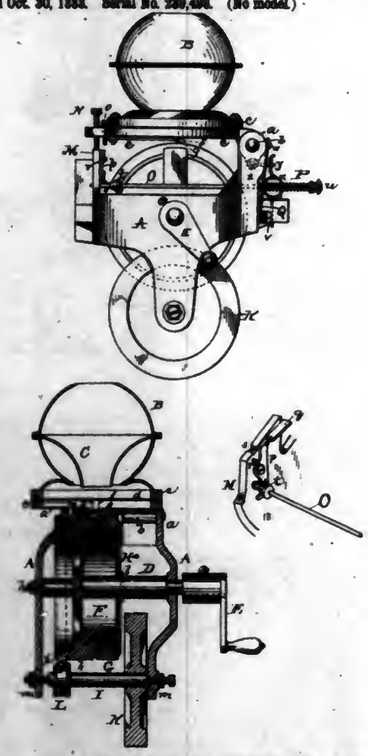


Claim.—1. A book-holder made of wire and composed of two portions having a sliding connection with each other, each of said portions at its outer end being bent into the form of a hook, the connections between the two portions preventing the rotation of the two portions relatively to each other, substantially as specified.

2. A book-holder made of wire and composed of two portions having a sliding connection with each other, the outer ends of each of said portions being bent into the form of a hook, said hooks extending toward each other, but being arranged upon opposite sides of the book-holder, the connections between the two portions preventing the rotation of the two portions relatively to each other, substantially as specified.

3. A book-holder made of wire composed of two portions having a sliding connection with each other, said portions intermediate of their connections being twisted together and being provided at their outer ends with bent portions forming hooks, substantially as specified.

400,629. PHONOGRAPH. CHARLES BATCHELOR, New York, N. Y. Filed Oct. 30, 1888. Serial No. 289,498. (No model.)



Claim.—1. In a phonograph, the combination of a revolving phonogram, a movable reproducer in contact therewith, means for feeding said reproducer forward by the revolution of the phonogram, a catch for holding said reproducer at the end of its movement, a tripping device for said catch, and a spring for returning the reproducer to its original position, substantially as set forth.

2. In a phonograph, the combination of a revolving phonogram, a movable reproducer in contact therewith, means for feeding said reproducer forward by the revolution of the phonogram, a catch for holding said reproducer at the end of its movement, a tripping device for said catch, a spring for returning the reproducer to its original position, and means for raising the reproducer off the record during such return movement, substantially as set forth.

3. In a phonograph, the combination of a revolving phonogram, a movable reproducer in contact therewith, means for feeding said reproducer forward, a spring for returning said reproducer, a guide-plate for the forward motion of the reproducer, and a device operated by hand for raising said reproducer off the record and guide-plate during its return movement, substantially as set forth.

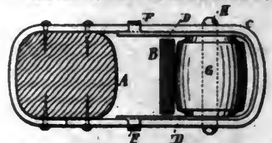
4. In a phonograph, the combination of a revolving phonogram, a movable reproducer whose reproducing-point has a hooked end, means for feeding said reproducer forward by the movement of the phonogram, and means for returning said reproducer to its original position, substantially as set forth.

5. In a phonograph, the combination of a revolving shaft, a shell mounted thereon, a ring placed on said shell and bearing a sound-record, a spiral thread on another portion of said shell, a movable reproducer whose reproducing-point engages said sound-record, and a tooth carried by the reproducer engaging said spiral thread, substantially as set forth.

6. In a phonograph, the combination of a revolving phonogram, a movable reproducer, means for feeding said reproducer forward by the revolution of the phonogram, a catch for holding said reproducer at the end of its movement, a spring for returning said reproducer to its original position, and a sliding rod for tripping said catch, substantially as set forth.

7. In a phonograph, the combination of a revolving shaft, a shell mounted thereon, a ring placed on said shell and bearing a sound-record, a clamp for securing said ring on said shell, a spiral thread on another portion of said shell, a movable reproducer whose reproducing-point engages said sound-record, and a tooth carried by the reproducer engaging said spiral thread, substantially as set forth.

400,630. TRACE-LOOP FOR VEHICLES. OSCAR V. BLAHER, Gillette, N. J. Filed Nov. 6, 1888. Serial No. 290,097. (No model.)

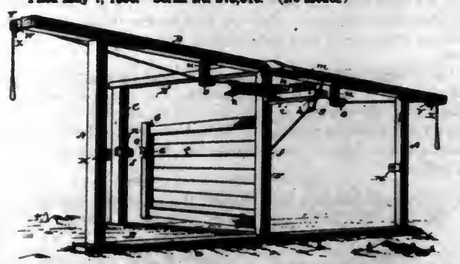


Claim.—1. The combination, with the shaft, of the loop projecting inwardly and nearly horizontally, and a roller within the loop, and a vertical pivot-pin for the roller passing through the loop, and against which the trace passes, substantially as set forth.

2. The combination, with the shaft, of a loop of leather or other flexible material attached to the shaft and projecting inwardly, a metal plate within the loop and bent to a corresponding shape, cross-bars or fastenings for connecting the plate to the leather, a roller, and a vertical axis for the same within the plate, and against which roller the trace passes, substantially as set forth.

3. The combination, with the shaft, of a horizontal and inwardly-projecting loop, a roller within the outer curvature of the loop, said roller being enlarged or bulging in the middle, and a vertical axis passing through the loop and through the roller, substantially as set forth.

400,631. SWINGING GATE. TILDEN R. BRODT, Brodtville, Wis. Filed May 7, 1888. Serial No. 273,016. (No model.)



Claim.—1. In a swinging gate, the combination, with the posts A and cross-beam B, of the post C, the gate having the outer post, G, and the extended inner post, F, which is pivoted in the beam B and in a suitable base, the spring-latch C on the outer post of the gate, a wire, *t*, attached to said latch and extending through the post F, an arm, *i*, extending out from the post F near its top, a lever, *g*, centrally pivoted in the outer end of the arm *i*, pulleys on the arm in the rear of the lever, the brackets *u* on the beam B, having pulleys mounted thereon, pulleys on the ends of the beam B, the ropes, and catches on the posts A and C, substantially as described.

2. The combination of the posts A A and C, having catches H, the cross-beams B B', the gate consisting of posts F and G, connected by boards or wires, the spring-catch *c*, the wire *t*, lever *g*, arm *i*, hood *n*, pulleys *m*, fish-tail piece *z*, brackets *u* and *v*, pulleys *o* and *x*, and ropes or wires for operating the lever *g*, substantially as herein set forth.

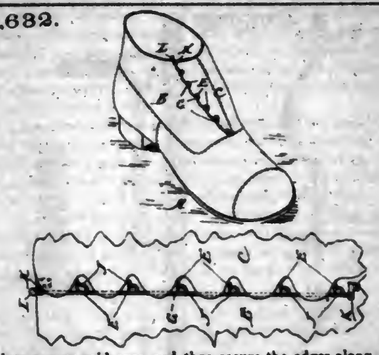
3. The combination, with the posts A and C and the beam B, of the gate-post F, having arm *i* extending therefrom, the lever *g*, centrally pivoted in the end of the arm, its arms being above and below the arm *i*, respectively, the latch on the gate, the flexible connection between the same and the lever *g*, the pulleys on the arm and ends of the beam, and the catches on the posts A and C, substantially as described.

400,632. SHOE. PAUL CASPARY, Chicago, Ill. Filed Dec. 14, 1888. Serial No. 293,645. (No model.)

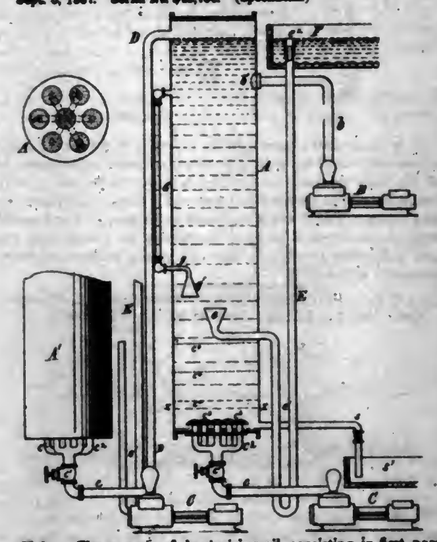
Claim.—1. A shoe having on one of its engaging edges a series of eyes and on the other a movable rod provided with a series of hooks adapted to engage said eyes, and thus secure the edges along their lengths, and keepers or guides in which the rod reciprocates.

2. A shoe having on one of its engaging edges a series of eyes and on the other a movable rod provided with a series of upwardly-turned hooks adapted to engage said eyes, and thus secure the edges along their lengths, and keepers or guides in which the rod reciprocates.

400,632.



400,633. METHOD OF REFINING AND DEODORIZING COAL OIL OR PETROLEUM. FRANCIS M. F. CAZIN, New York, N. Y. Filed Sept. 3, 1887. Serial No. 248,756. (Specimens.)



Claim.—The process of deodorizing oil, consisting in first passing the same in a finely-divided state through water; second, passing the same through an alkaline solution; third, passing the same through a solution of a salt of a heavy metal; fourth, passing the same through a solution of sulphuric acid; fifth, passing the same through an alkaline solution and ultimately washing the same, substantially as herein described.

400,634. APPARATUS FOR REFINING PETROLEUM. FRANCIS M. F. CAZIN, New York, N. Y. Filed Aug. 29, 1887. Renewed Feb. 6, 1889. Serial No. 299,938. (No model.)

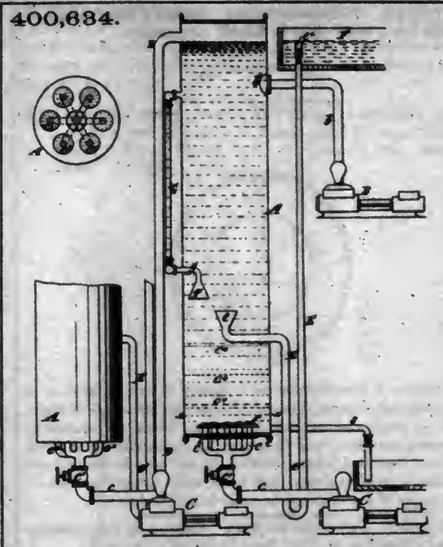
Claim.—1. The combination, with a series of upright vessels provided each with a water-supply pipe and with a water-overflow leading upward from a point between its ends and terminating at a point near its top, of an oil-supply pipe leading to the bottom of the first vessel, an oil-overflow pipe leading from each vessel at a point at about the level of the water-overflow to the bottom of the next vessel in the series, and distributers in the lower part of each vessel, whereby the entering oil is finely divided or diffused prior to its ascent through the water in the vessel, substantially as herein described.

2. The combination, with an upright vessel having a water-supply pipe and an oil-supply pipe leading to its lower part, of a water-overflow pipe leading from a point between the ends of the vessel, first downward and thence upward to a point near the top of the vessel, thus forming a loop to permit the oil entering the pipe with the water to escape back to the vessel by reason of its lighter specific gravity, oil-distributers arranged in the lower part of the vessel, whereby the entering oil is finely divided or diffused prior to rising through the water, and an oil-overflow pipe at about the level of the water-overflow, substantially as herein described.

3. The combination, with an upright vessel having a water-supply pipe, and an oil-supply pipe leading to its lower part and communicating by several branches with its bottom, of oil-distributers covering the outlet ends of said branches, and screens placed one above another in the lower part of the vessel and of gradually-increasing fineness from the bottom up, a water-overflow extending from the vessel between its ends and terminating at a point near the top of the vessel, and an oil-overflow leading from the vessel at about the level of the water-overflow, substantially as herein described.

4. The combination, with the upright vessel A, a water-supply pipe, *b*, leading to its upper part, and an oil-supply pipe, *c*, leading to its lower part, and oil distributers or diffusers in the vessel above the oil-inlet, of the oil-overflow pipe D, the water-overflow pipe E, leading from the lower part of the vessel and of gradually-increasing fineness from the bottom up, a water-overflow extending from the vessel between its ends and terminating at a point near the top of the vessel, and an oil-overflow leading from the vessel at about the level of the water-overflow, substantially as herein described.

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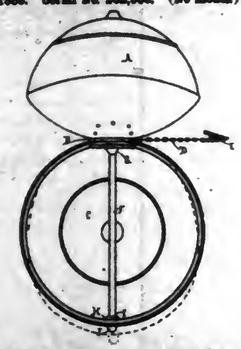
400,635. TEA-KETTLE. CHARLES E. COATS, Chicago, Ill. Filed Feb. 21, 1888. Serial No. 264,769. (No model.)



Claim.—1. In a tea-kettle, a hanger provided with a float which closes the spout-opening, and a steam-exit tube extending downward near one side of the kettle, and an alarm to indicate when the water has receded to a predetermined point, substantially as described.

2. In a tea-kettle, a hanger provided with a float which closes the spout-opening, a steam-exit tube extending downward near one side of the kettle to a point below the spout-opening, and a signaling device to indicate when the water has receded to a certain predetermined point, substantially as described.

400,636. THREAD-PROTECTOR. EDWARD J. COLBY, Chicago, Ill. Filed Feb. 1, 1888. Serial No. 262,692. (No model.)



Claim.—A thread-protector consisting of two hemispheres of spring sheet metal hinged together, a spindle hinged to one of them, a catch for the free end of such spindle, into which it is received by compressing the sides of and thus enlarging the hemisphere to which the spindle is pivoted, a spring-catch, whereby the two hemispheres are locked together opposite their hinge, and a suspending-chain attached to one of the hemispheres, substantially as shown.

400,637. WASHING-MACHINE. SHERMAN M. COLE, Adamson, Iowa. Filed Nov. 10, 1887. Serial No. 254,798. (No model.)



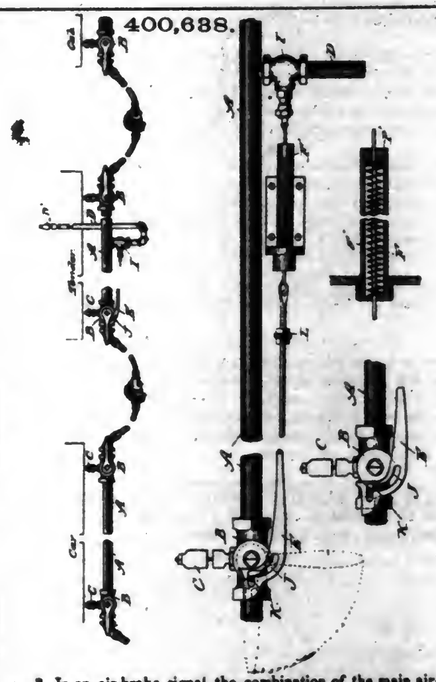
Claim.—In a washing-machine, the combination of the upright frame, the body formed of three radial equidistant wings, a portion of one of which is removable, a wringer-frame hinged to the upright frame and provided with cross-pieces Z and Z', one arranged to engage one of the wings and the other to rest on the seat of the movable wing, and a fastener to secure the wringer-frame to the upright frame when the wringer is in use, all substantially as specified.

400,638. AIR-BRAKE SIGNAL. ALLEN B. COLLINS, Burlington, Iowa. Filed Nov. 23, 1888. Serial No. 291,711. (No model.)

Claim.—1. In an air-brake signal, the combination of the main air-pipe running lengthwise of the train beneath the cars, cocks for closing such pipe, and whistles attached to the cocks and adapted to be blown when the cocks are turned to close the main air-pipe, substantially as described.

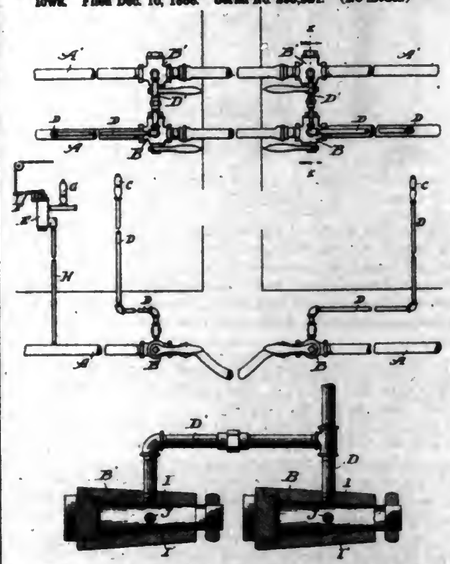
2. In an air-brake signal, the combination of the main air-pipe provided with cocks for closing the same, a branch pipe connecting with the main pipe and provided with a whistle, and a valve for opening and closing the pipe, and a spring-lever connected with the handle of one of the cocks in the main air-pipe and moved thereby to open and close the valve in the branch pipe, substantially as described.

400,638.



3. In an air-brake signal, the combination of the main air-pipe provided with cocks for closing the same, a branch pipe connected with the main air-pipe and provided with a whistle, and a valve whereby the pipe is opened and closed, and a slotted spring-lever attached to the handle of one of the cocks in the main pipe, and moved thereby in one direction to open the valve in the branch pipe, and moved in the other direction by means of a spring to close such valve, substantially as described.

400,639. AIR-BRAKE SIGNAL. ALLEN B. COLLINS, Burlington, Iowa. Filed Dec. 10, 1888. Serial No. 293,221. (No model.)



Claim.—1. In an air-brake signal, the combination of the main air-pipe running lengthwise of the train beneath the cars, cocks for closing such pipe, and whistles located above the roof of the car connected to the cocks by means of tubes and adapted to be blown whenever the cocks are turned to close the main air-pipe, substantially as described.

2. In an air-brake signal, the combination of the signal-pipe and main train-pipe extending lengthwise of the train, cocks for closing such pipes, tubes running from the cocks in the main air-pipe through the car-roof and connected with the cocks in the signal-pipe, and whistles located at the upper end of such tubes and adapted to be blown when the cocks are turned to close the pipes or either of them, substantially as described.

3. In an air-brake signal, the combination of the main air-pipe running lengthwise of the train beneath the cars, cocks for closing the same, a branch pipe leading from one of said cocks up into the tender and provided with a whistle at its upper end and adapted to be blown when the cock is closed, substantially as described.

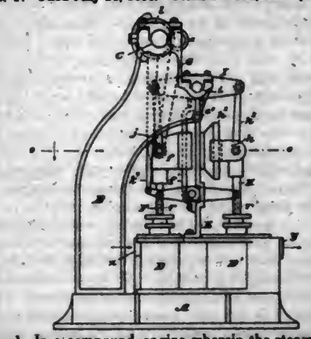
4. In an air-brake signal, the combination of the main air-pipe running lengthwise of the train beneath the cars, valves situated inside the cars and connected with the main air-pipe, and whistles attached to the valves and adapted to be blown when the valves are opened, substantially as described.

400,640. VEHICLE-SEAT LOCK. JAMES H. COREY, Connautville Pa. Filed Sept. 25, 1888. Serial No. 286,367. (No model.)



Claim.—In vehicle-seat locks, the torsion-spring E, having its bearings in the seat-hangers c^2, and provided with the end loops, e, cranks e' e^2, and bail e^3, in combination with the rods D D, having reversed end hooks to connect with the loops e and rails C, substantially as shown and described.

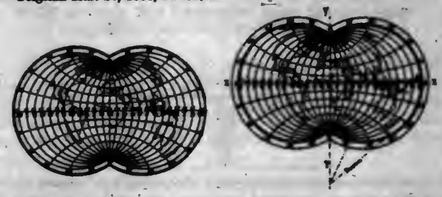
400,641. COMPOUND STEAM-ENGINE. MILES CORYELL, New York, N. Y. Filed July 23, 1888. Serial No. 281,282. (No model.)



Claim.—1. In a compound engine wherein the steam is worked expansively in all the cylinders, the valve-operating mechanism comprising the rock-shaft k, having an arm, k', coupled to the eccentric which actuates the cut-off valves, and two oppositely-arranged arms, m and m', coupled to the respective stems of the cut-off valves, and a rocking lever mounted on shaft k, and having its arms o and o' coupled, respectively, to the stems of the main valves, the arms o being also coupled to the eccentric which actuates the main valves, as set forth.

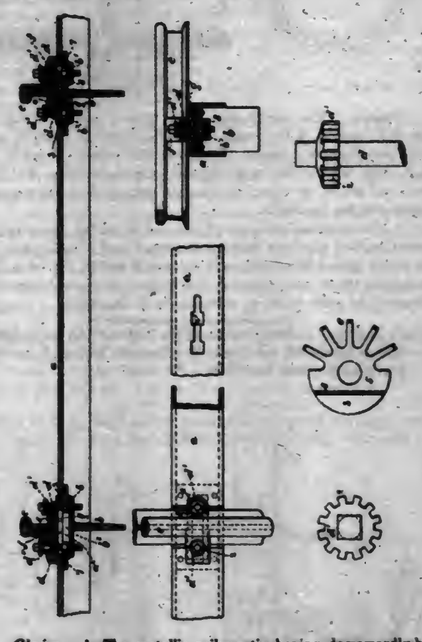
2. The combination, with the bed-plate, the pillars, and the cylinders, of the tie-plate E, mounted on and secured to the cylinders, and connected to the pillars at its upper end, said tie-plate having a tubular part, e, to receive a tie-rod, e', the said rod, and the nuts e^3, substantially as and for the purposes set forth.

400,642. MAP. HENRY R. DE BRAHMONT, Geneva, Switzerland. Filed Oct. 15, 1888. Serial No. 288,194. (No specimens.) Patented in Belgium Mar. 27, 1888, No. 81,202.



Claim.—The map herein specified, representing the earth having a straight equatorial line and a central straight meridian perpendicular to the equator, and extending from the north to the south pole and dividing the representation of one hemisphere from the other, the boundaries of the maps and the meridians being arcs of circles, the meridian-lines being equidistant, or nearly so, at the equator and at the north and south latitude lines, which also are arcs of circles, substantially as set forth.

400,643. METALLIC RAILWAY-TIE AND FASTENING. HENRY L. DE ZEEW, Geneva, assignor to himself, Albert G. Lucas, Utica, and William D. Burrall, Waterloo, N. Y. Filed Aug. 13, 1888. Serial No. 282,433. (No model.)



Claim.—1. The metallic railway-tie having downwardly-bent edges and slotted at a', in combination with the spuds or anchor-plates b, riveted to the tie and provided with pockets at b' beneath the slots of the ties, substantially as set forth.

2. The combination, with a metallic railway-tie having slots at a', of spuds or anchor-plates b, secured to said tie and having pockets b' in their upper faces, and the screw-bolts d, having conical disks or heads d' and a square end to the same, the nuts of the bolts being received and held within the pockets b', substantially as set forth.

3. The combination, with the metallic railway-tie a and the rail c, of the screw-bolts d, the conical disks or heads d' to said bolts, peripheral teeth 2, formed upon the conical disks d', and the washer e, through which the screw-bolt passes, said washer being provided with peripheral teeth 6, which teeth are adapted to be bent over into the teeth 2 to secure and lock the screw-bolt and prevent its turning, substantially as set forth.

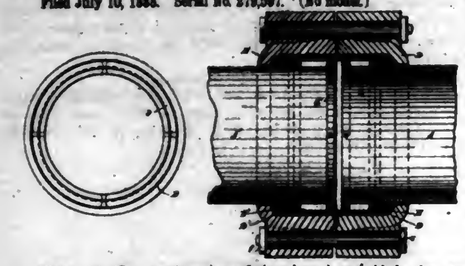
4. The combination, with a metallic railway-tie having slots at a', of spuds or anchor-plates b, secured to said tie and having pockets b' in their upper faces, the screw-bolts d, having conical disks or heads d' and a square end to the same, the nuts of the bolts being received and held within the pockets b', the braces f upon the outer surface of the rail and fitting the contour thereof, the leg 7 upon the brace adapted to pass into the slot a' of the tie, and the screw-bolt d, passing through the brace and adapted to secure the same and the rail to place, substantially as set forth.

5. The combination, with the rail c and the metallic tie a, of the screw-bolts d, conical disks or heads d' to said bolts, the peripheral teeth 2, and the washer e, having a flat portion, 3, to rest upon the tie, and an inclined portion, 5, fitting the inclined web of the rail, and having peripheral teeth 6, which teeth are adapted to be bent into the teeth 2 to lock the bolt-head and prevent it turning, substantially as set forth.

6. The combination, with the metallic rail c and the metallic railway-tie a, of the spuds b, connected to the metallic tie, and the bolts d, for holding the rail to the tie, a corrugated plate of steel, g, between the base of the rail and the top of the metallic tie to form an elastic bearing for the rail, said corrugated plate being notched for the bolts d, which act to hold the plate in position, substantially as set forth.

400,644. PIPE-COUPLING. SOLOMON R. DRESSER, Bradford, Pa.

Filed July 10, 1888. Serial No. 279,597. (No model.)

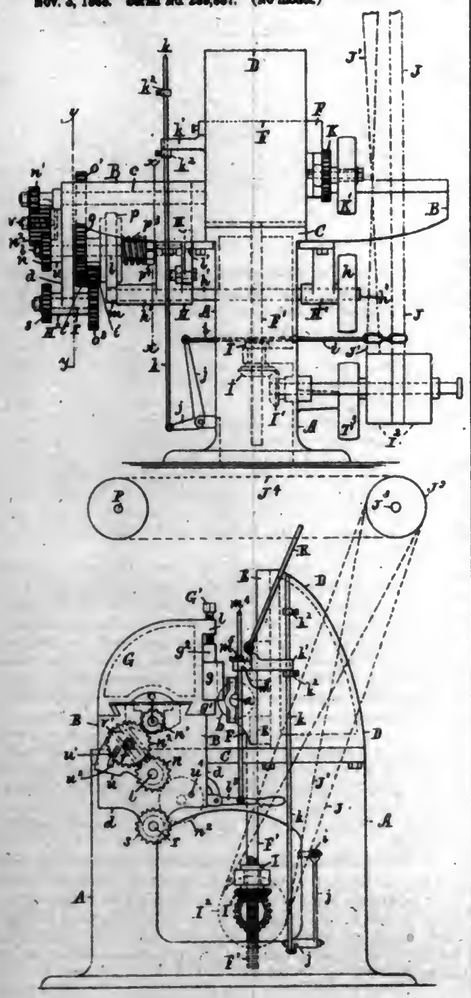


Claim.—1. The combination of the pipes A and A', having detachable retainers on their ends, the coupling-sections B and B', made male and female for gasket H between said sections B and B', the loose rings, the packing-rings between coupling-sections and loose rings, and means for clamping the pipe-sections B and B' together substantially as described.

2. The combination of the pipes A and A', having detachable retainers on their ends, the coupling-sections B and B', made male and female for gasket H between said sections B and B', the loose rings having shoulders and recesses *d'*, the packing-rings, and means for clamping the parts together, substantially as described.

400,645. AUTOMATIC MACHINE FOR CUTTING RACK-TEETH.

ULRICH EBERHARDT and HENRY R. EBERHARDT, Newark, N. J. Filed Nov. 3, 1888. Serial No. 290,857. (No model.)



Claim.—1. In a rack-cutter, the combination, with a cutter-head movable vertically and having the cutters mounted upon a horizontal spindle, of a rack-carriage adjustable to and from the cutter-spindle and movable parallel therewith and adapted to hold the blank with its face vertically before the cutters, as and for the purpose set forth.

2. A rack-cutter comprising a bed having horizontal ways C, a cross-head movable horizontally thereon, vertical guides formed upon the bed, a cutter-head fitted to slide vertically in such guides and provided with a horizontal cutter-spindle, and a rack-carriage movable upon the cross-head parallel with the cutter-spindle and adjustable to and from the same, as and for the purpose set forth.

3. In a rack-cutter, the combination, with a cutter-spindle, of a rack-carriage, a feed-screw having a thread corresponding with the diametral pitch of a spur-wheel, as .5236 of an inch, a shaft, *r*, and a train of gears connected with the said screw and adapted to rotate the shaft $\frac{1}{101}$ of a revolution for each rotation of the screw, and a locking device to hold the said shaft when turned, as and for the purpose set forth.

4. In a rack-cutter, the combination, with a cutter-spindle, a rack-carriage, and a screw for feeding the same carriage parallel with the spindle, of the notched disk N, a catch for locking the same, a shaft rotating with such disk and provided with a gear-wheel, *n*, and two interchangeable trains of gearing connecting the screw with such gear-wheels, the wheels in one train being proportioned to turn the screw for cutting teeth of diametral pitch, and the wheels in the other train being proportioned to turn the screw for cutting teeth of circumferential pitch, substantially as herein set forth.

5. In a rack-cutter, the combination, with a cutter-spindle, of a rack-carriage, a feed-screw for shifting the same, a shaft provided with a locking device to hold the said shaft when turned a complete revolution, and two interchangeable trains of gears adapted for connecting the said shaft and screw, the wheels in one train being proportioned to turn the screw for cutting teeth of diametral pitch, and the wheels in the other train being proportioned to turn the screw for cutting teeth of circumferential pitch, substantially as herein set forth.

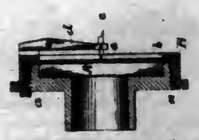
6. In a rack-cutter, the combination, with a rack-carriage and a feed-screw for operating the same, of a rotary spindle provided with a gang of three or more cutters shaped and spaced upon the spindle to form in the rack-blank simultaneously a series of two or more teeth of uniform size and pitch, and feeding mechanism adapted to shift the rack-carriage intermittently in correspondence with the total pitch of the teeth cut by the gang of cutters, substantially as herein set forth.

7. In a rack-cutter having the feed-screw actuated by a friction-driver, the combination, with the feed-screw, of a shaft connected thereto by a suitable gearing, a friction-plate clamped between fast and loose flanges rotated with such shaft, and a spring pressed upon the movable flange, as and for the purpose set forth.

8. In a rack-cutter, the combination, with a cutter-head moving vertically upon a suitable bed and a rack-carriage moving horizontally upon the same, of a counter-shaft arranged over the rack-cutter, a belt-compensating lever pivoted upon the counter-shaft and carrying two guide-pulleys, two guide-pulleys upon the rack-cutter, an endless belt applied to the pulley upon the counter-shaft and to a pulley upon the cutter-head and carried over the several guide-pulleys, as set forth, and a connection from the cutter-head to the lever to move the lever with the cutter-head, as and for the purpose set forth.

9. The combination, with a rack-cutter having a horizontally-moving rack-carriage and a cutter-spindle mounted in a cutter-head, of a counter-shaft arranged over the rack-cutter, a belt connecting a pulley upon the counter-shaft with a pulley upon the cutter-head, a driving-belt applied to fast and loose pulleys upon the counter-shaft to stop and start the same, a shipper applied to such driving-belt, a spring to throw the shipper to its inoperative position, a latch to hold the shipper in its operative position, and a trip-lever connected with the latch and actuated by the rack-carriage to withdraw the latch at the end of the carriage travel, and to thereby stop the machine automatically, as and for the purpose set forth.

400,646. PHONOGRAPH RECORDER AND REPRODUCER. THOMAS A. EDISON, Llewellyn Park, N. J., assignor to the Edison Phonograph Company, of New Jersey. Filed June 7, 1888. Serial No. 276,284. (No model.)



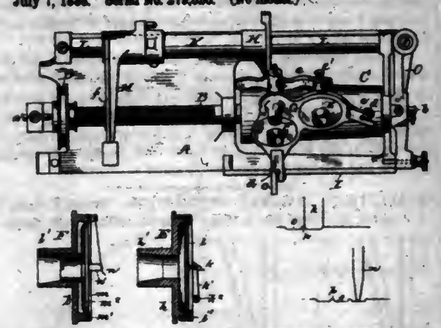
Claim.—1. In a phonograph, the recorder or reproducer having in combination with the recording or reproducing point a diaphragm of glass, substantially as set forth.

2. In a phonograph, the recorder or reproducer having in combination with the recording or reproducing point a diaphragm of microscope-glass, substantially as set forth.

3. In a phonograph, the recorder or reproducer having in combination with the recording or reproducing point a diaphragm of glass clamped between metallic rings with rings of yielding material around the edges of the glass diaphragm, substantially as set forth.

4. In a phonograph, the recorder having in combination a glass diaphragm and a recording-point secured directly thereto by a suitable cement, substantially as set forth.

400,647. PHONOGRAPH. THOMAS A. EDISON, Llewellyn Park, N. J., assignor to the Edison Phonograph Company, of New Jersey. Filed July 7, 1888. Serial No. 279,290. (No model.)



Claim.—1. A phonograph having a reproducing-point narrower than the indentations forming the sound-record, substantially as set forth.

2. The combination, in phonographs, of separate recording and reproducing instruments, the reproducing-point being narrower than the recording-point, substantially as set forth.

3. In a phonograph, the reproducer having its point narrower than the indentations forming the sound-record, in combination with means for adjusting such reproducer laterally across the track of the record, substantially as set forth.

4. In a phonograph, the reproducer having its point narrower than the indentations forming the sound-record, in combination with a phonogram-blank carrier adapted to receive a removable phonogram-blank, substantially as set forth.

5. In a phonograph, the reproducer having its point narrower than the indentations forming the sound-record, and means for adjusting such reproducer laterally across the track of the record, in combination with a phonogram-blank carrier adapted to receive a removable phonogram-blank, substantially as set forth.

400,648. PHONOGRAM-BLANK. THOMAS A. EDISON, Llewellyn Park, N. J. Filed July 30, 1888. Serial No. 281,457. (No model.)

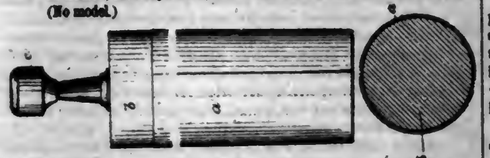
Claim.—1. Phonogram-blanks made of a mixture of a wax with stearic acid, substantially as set forth.

2. Phonogram-blanks made of a mixture of ceresin and stearic acid, substantially as set forth.

3. Phonogram-blanks made of a mixture of ceresin, beeswax, and stearic acid, substantially as set forth.

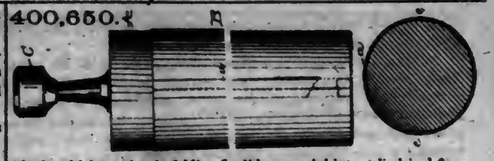
4. Phonogram-blanks made of a mixture of ceresin, beeswax, and stearic acid, in about the proportion, by weight, of one hundred parts of ceresin, twenty-five parts of beeswax, and twenty-five parts of stearic acid, substantially as set forth.

400,649. METHOD OF MAKING PHONOGRAM-BLANKS. THOMAS A. EDISON, Llewellyn Park, N. J. Filed Oct. 11, 1888. Serial No. 287,943. (No model.)



Claim.—The method of making a phonogram-blank, which consists in wrapping a sheet of flexible material upon a tapering cylindrical core, dipping the same into the sound-recording material, which is caused to adhere to its surface, and then turning off the surface of such material into a true cylindrical form, substantially as set forth.

400,650. METHOD OF MAKING PHONOGRAM-BLANKS. THOMAS A. EDISON, Llewellyn Park, N. J. Filed Oct. 17, 1888. Serial No. 288,361. (No model.)



Claim.—1. The method of making a collapsible phonogram-blank, which consists in folding flexible material into cylindrical form, covering the same with sound-recording material, and removing such material on two opposite lines, substantially as set forth.

2. The method of making a phonogram-blank, which consists in folding flexible material into cylindrical shape, with its edges meeting, securing such edges by a thin strip pasted on the outside of the cylinder, and covering said cylinder with sound-recording material, substantially as set forth.

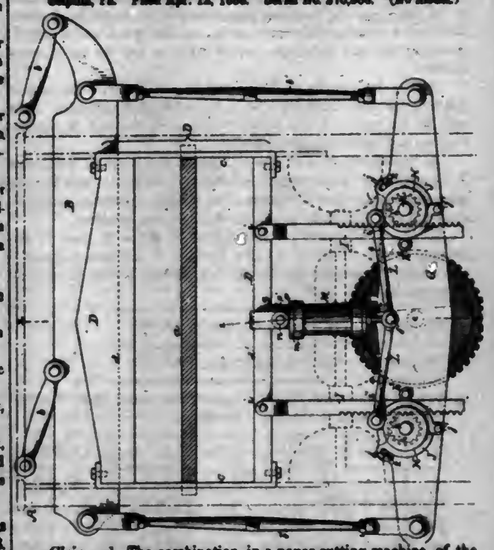
3. The method of making a collapsible phonogram-blank, which consists in wrapping flexible material upon a core, securing it together at its edges, dipping it in sound-recording material, so that the same adheres to its surface, and removing such material on two lines opposite each other, substantially as set forth.

4. The method of making a collapsible phonogram-blank, which consists in wrapping flexible material upon a tapering core, securing it together at its edges, dipping it into sound-recording material which adheres to its surface, turning off such material into cylindrical form, and removing such material on two lines opposite each other, substantially as set forth.

400,651. ILLUMINATING COMPOSITION. TIMOTHY J. FEALY, Boston, Mass. Filed Oct. 23, 1888. Serial No. 288,893. (No specimens.)

Claim.—A composition for illuminating purposes, composed of olive-oil, wax, and salt, in or about the proportions stated.

400,652. PAPER-CUTTING MACHINE. HENRY P. FRISTER, Philadelphia, Pa. Filed Apr. 12, 1888. Serial No. 270,286. (No model.)



Claim.—1. The combination, in a paper-cutting machine, of the paper-clamp D, the cutter-beam, and mechanism, substantially as described, for operating said beam, with depending rack or racks hung to the clamp, devices, substantially as specified, for frictionally holding the rack or racks to the beam, and a cylinder and piston, one of which is connected to the clamp and the other to the said frictional holding devices, substantially as set forth.

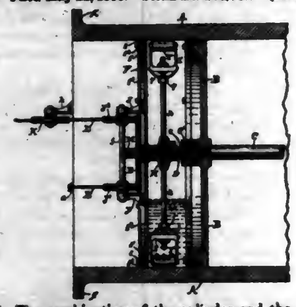
2. The combination, in a paper-cutting machine, of the paper-clamp D, the beam, and mechanism, substantially as described, for operating the same, with pinions and friction-wheels on said beam, racks attached to the clamp and engaging with the said pinions, friction-bands adapted to act upon the band-wheels, a cylinder carried by the clamp D, a piston in said cylinder, and means, substantially as described, for connecting said piston to the friction-bands, all substantially as set forth.

3. The combination, in a paper-cutting machine, of the paper-clamp D, the beam, and mechanism, substantially as described, for operating the same, pinions and friction-wheels on said beam, racks attached to the clamp and engaging with said pinions, friction-bands adapted to act upon the band-wheels, and a cylinder carried by the

clamp D, with links L L, connected together to the piston and to the friction-bands, all substantially as set forth.

4. The combination, in a paper-cutting machine, of the paper-clamping frame, an operating beam therefor, a cylinder, M, pivoted to the frame, a piston therein, mechanism, substantially as described, connected to said piston for frictionally retaining the clamping-frame to the beam, and a relief-valve so seated in the cylinder that it will be operated at a certain point in the stroke of the driving mechanism, substantially as described.

400,653. CYLINDER-LUBRICATOR. ADAM L. FILLMORE, Cincinnati, Ohio. Filed May 22, 1888. Serial No. 274,747. (No model.)



Claim.—1. The combination of the cylinder and the piston B, a diaphragm, F, traveling backward and forward in said cylinder, and a rotating lubricant-distributer located in the space between the said piston and said diaphragm, substantially as and for the purposes specified.

2. The combination of a cylinder, a piston-head, a diaphragm fixed to the piston-rod and traveling therewith and forming a space therewith, and a rotating distributer within the said space, and means for operating the said distributer, substantially as and for the purposes specified.

3. The combination of the cylinder A, the piston B, the stem D, diaphragm F, hub H, sleeve *e*, spokes *h*, lubricators attached to the ends of the spokes *h*, and means for rotating the hub H, substantially as and for the purposes specified.

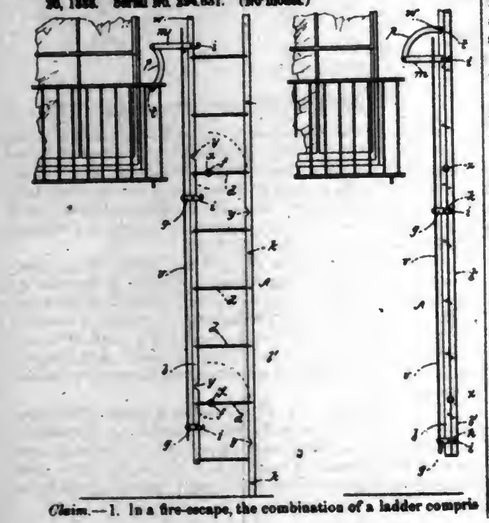
4. The combination of the cylinder A, the piston B, diaphragm F, the stem D, grooved pulley E, provided with sleeve *e*, hub H, lubricators attached to hub H, pulleys J' J², suitably supported, pulley K, and cord L, substantially as and for the purposes specified.

5. The combination of the cylinder A, piston B, stem D, diaphragm F, hub H, spokes *h*, yokes I, rollers I', springs *i* and nuts *i'*, and means for rotating the hub H, substantially as and for the purposes specified.

400,654. WITHDRAWN.

400,655. WITHDRAWN.

400,656. FIRE-ESCAPE. JAMES FLYNN, Boston, Mass. Filed Dec. 26, 1888. Serial No. 294,631. (No model.)

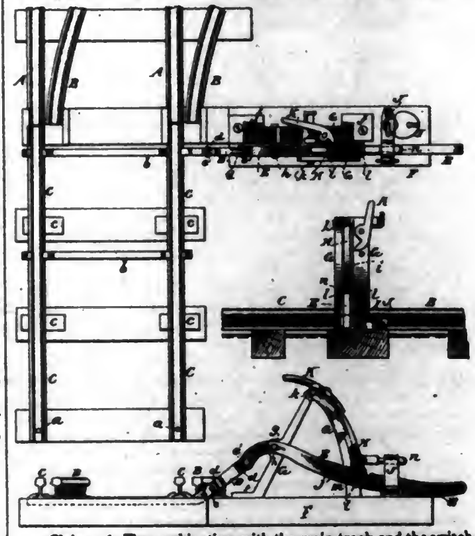


Claim.—1. In a fire-escape, the combination of a ladder compris ing channeled side bars and rungs pivoted therein, levers pivoted to one side bar and provided with hooks for receiving pins on the opposite side bar when the ladder is closed, a vertical rod pivoted to said levers for releasing them from said pins, and a slotted bar pivoted to one of said levers and adapted to receive a pin on a side bar, whereby said rod may be locked, substantially as described.

2. In a fire-escape, a ladder provided with channeled side bars having rungs pivoted therein, sleeves secured to certain rungs at one side of the center thereof for receiving studs in the wall of the building, hooked levers pivoted to a side bar for receiving pins on the opposite bar, a vertical rod pivoted to said levers, and a curved bar pivoted to one of said levers, said bar being provided with a slot for receiving a pin on a side bar, all being arranged to operate substantially as set forth.

3. In a fire-escape, the combination of the ladder A, comprising channeled side irons, *b b'*, and rungs *d*, pivoted therein, the sleeves *f* on said rungs for pivoting the ladder to a building, the levers *g m*, pivoted to the side iron, *b*, and provided with hooks *i*, the pins *k* on the side iron, *b'*, the rod *v*, pivoted to said levers, and the curved bar *p*, pivoted to the lever *m* and provided with the slot *l*, for engaging a pin, *w*, and locking said bar, substantially as described.

400,657. RAILWAY-SWITCH STAND. GEORGE F. GAGE, Huntingdon, Pa. Filed Nov. 9, 1888. Serial No. 290,362. (No model.)



Claim.—1. The combination, with the main track and the switch-rails, of the operating mechanism for said switch-rails, and a safety gravity-lock for the operating-lever of said mechanism, pivoted in a higher plane than said lever, and moving over the lever and engaging and locking the same when it is in the substantially horizontal position, substantially as described.

2. The combination, with the main track and the switch-rails, of the operating mechanism for said switch-rails, the operating-lever of which works through a slotted bracket, and the gravity safety-lock, also working through said slot and pivoted at its upper end, with its lower end embracing the lever, substantially as shown and described.

3. The combination, with the main track and the switch-rails, of the operating mechanism for said switch-rails, and a gravity safety-lock pivoted at its upper end above the lever of the operating mechanism, with its free end riding on said lever, and adapted to engage said lever below the pivot thereof when the lever is in a substantially horizontal position and lock the same, substantially as shown and described, and for the purpose specified.

4. The combination, with the main track and switch-rails and the operating mechanism for said switch-rails, of a safety-lock for the operating-lever and a pivoted catch working at right angles to said safety-lock, substantially as and for the purpose specified.

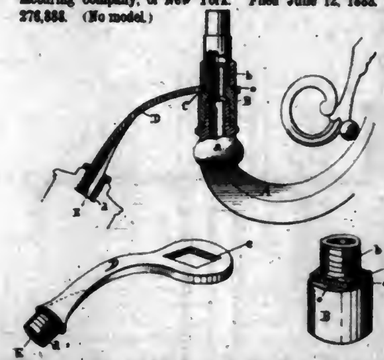
5. The combination, with the main track and the switch-rails, of the operating mechanism for said switch-rails, the gravity safety-lock riding over the lever of said operating mechanism and provided with a handle, n, the lock and hasp I J, for locking said handle, and a pivoted catch working at right angles to the safety-lock, substantially as and for the purpose specified.

6. The combination, with the main and switch rails and the operating mechanism for the switch-rails, the operating-lever of which is formed with a notch, of a gravity safety-lock pivoted to the rear of the pivot of said operating-lever and on a higher plane and moving over and with the same, and formed with a detent to engage said notch and with jaws to embrace the lever, substantially as shown and described.

7. The combination, with the support F and the brackets G, secured thereto and provided with a slot, as described, of the operating-lever pivoted on said bracket and working in the slot thereof, and connected at its end to the mechanism for operating the rails, and the safety-lock pivoted at one end to said bracket and working in the slot thereof over said lever, substantially as described.

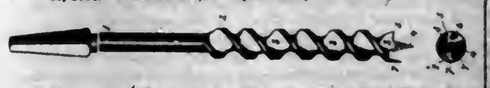
8. The combination, with the switch-rails, the support F, and the bracket G, secured to said support and formed with curved slotted portion, as described, of the operating-lever pivoted to said bracket and the curved safety-lock pivoted at one end to the apex of said bracket and working in said slot over and with the operating-lever, substantially as shown and described.

400,658. ELECTRIC-LAMP ATTACHMENT FOR GAS-FIXTURES. EMIL P. GEHNERT, Brooklyn, N. Y., assignor to the E. P. Gleason Manufacturing Company, of New York. Filed June 12, 1888. Serial No. 276,888. (No model.)



Claim.—A device for attaching electric lamps to gas-fixtures, consisting of the two pieces, a socket, as B, adapted to screw on the nipple of a gas-fixture, said socket having the angular neck C and nipple *b*, and the arm, as D, one end of which is provided with a nipple adapting it to attach a lamp and the other end with an angular opening or eye adapted to fit the neck of said socket, combined and arranged in the manner and for the purpose specified.

400,659. AUGER. FRANK C. GERARD, Seymour, Conn. Filed June 18, 1888. Serial No. 277,414. (No model.)



Claim.—1. An auger or bit having upon one side of the leading-screw a cutting-edge concaved upon its lower side, and upon the other side a cutting-spur sharpened to its base and supported by a floor, 8, cut away at the front, said spur projecting below the plane of the cutting-edge, and the plane of the latter being below the plane of floor 8, substantially as and for the purpose set forth.

2. An auger or bit having upon one side of the leading-screw a cutting-edge, and upon the other side thereof a cutting-spur supported by a floor, 8, cut away at the front, the entire front of said spur being sharpened so that it will cut to the base, as and for the purpose set forth.

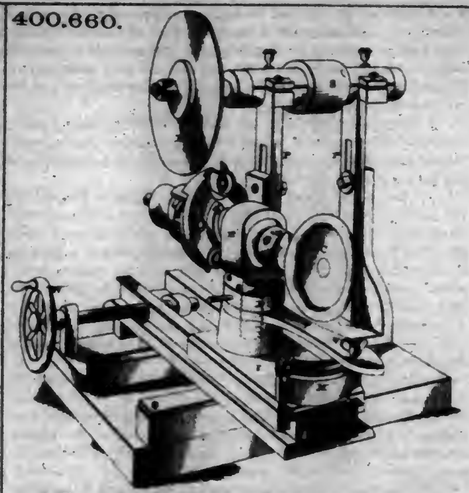
3. An auger or bit having a leading-screw the threads of which are straight upon the upper side and inclined upon the lower side, a cutting-edge forming a continuation of the thread of the screw, and a cutting-spur upon the opposite side, the horizontal plane at the base of the spur being higher than the cutting-edge, as and for the purpose set forth.

4. A double-groove auger or bit having a pod twisted to form a delivery-groove wider than the other groove, a single cutting-edge at the base of the delivery-groove, and a single cutting-spur opposite to the cutting-edge, the plane at the base of the spur being higher than the plane of the cutting-edge, as and for the purpose set forth.

400,660. MACHINE FOR GRINDING SHIMER MOLDING-BITS, &c. HIRAM C. GILBERT, Burlington, Vt. Filed July 5, 1888. Serial No. 279,014. (No model.)

Claim.—1. The combination of a reciprocating carriage, a handle mounted thereon, and an adjusting-block placed upon the handle, the mandrel-frame having its shank to pass through the block, and the mandrel which passes through the frame and upon which the head is placed, substantially as described.

400,660.



2. The combination of a vertically-adjustable emery-wheel, an adjustable mandrel upon which the head is placed, a frame through which the mandrel passes, an adjusting-block by which the frame is adjusted vertically, a handle for turning the frame horizontally around, a locking-screw for holding the handle in any desired position, and a reciprocating carriage, substantially as set forth.

400,661. APPARATUS FOR DETERMINING ELECTRIC OR MAGNETIC FORCES. ADOLPHUS GIFFORD, Richmond, Va. Filed Jan. 24, 1888. Serial No. 261,731. (No model.)



Claim.—1. An instrument for determining the value of magnetic or electric or electro-magnetic forces, comprising a polarized body, a balance, a fulcrum common to both, an adjustable weight on said balance, a register, shifting mechanism for shifting the weight on the balance, and transmitting mechanism for transmitting the movements of the weight to the register, as described, for the purpose specified.

2. An instrument for determining the value of magnetic or electric or electro-magnetic forces, comprising a polarized body, a balance, and a revoluble staff upon which said body and balance are poised, said body being adapted to be rotated independently of the staff and balance, to adjust the same in any position relatively to the balance, substantially as and for the purpose specified.

3. An instrument for determining the value of magnetic or electric or electro-magnetic forces, comprising a polarized body, a balance, a revoluble staff or arbor upon which said body and balance are poised, said body being adapted to be rotated independently of the staff and balance, and a stop to lock the balance and staff against rotation, substantially as and for the purpose specified.

4. An instrument for determining the value of magnetic or electric or electro-magnetic forces, comprising a polarized body, a balance, a revoluble staff or arbor upon which said body and balance are poised, said body being adapted to be rotated independently of the staff and balance, a shifting device for shifting the staff from its bearings, and a stop for locking the balance and staff against rotation when so shifted from its bearings, substantially as and for the purpose specified.

5. An instrument for determining the value of magnetic or electric or electro-magnetic forces, comprising a dial divided into four sections of ninety degrees each, a magnetic needle, a balance, a staff or arbor upon which said balance and needle are poised and which is revoluble in the center of the dial, and a weight or weights adjustable on the balance, substantially as and for the purpose specified.

6. An instrument for determining the value of magnetic or electric or electro-magnetic forces, comprising a dial divided into four parts of ninety degrees each, a magnetic needle, a balance, a staff or arbor upon which said balance and needle are poised and which is revoluble

in the center of the dial, and a weight or weights adjustable on the balance, in combination with a supporting-plate and means, substantially such as described, for supporting the instrument either in a horizontal or vertical north and south and east and west plane, or in a plane at an angle to the north and south line, substantially as and for the purpose specified.

7. The combination, with the staff K, of the bearings *g* and *h*, consisting each of a jewel having a bearing enlarged from a center toward the outside to form a knife-edge bearing, g^3, substantially as and for the purpose specified.

8. The combination of the staff K, having collars or flanges k^4 k^5, the cock G, constituting one of the bearings of said staff, the bridge E^2, through which the other end of the staff projects and upon which the collar k^5 is adapted to bear, and the spring-actuated angle-lever H, constituting the other bearing for said staff, the bearing end of which projects under said bridge of shifting devices for shifting the staff from its bearings, consisting of the spring-actuated angle-lever I, operating on flange k^4 of staff K, and the push-bar L, provided with inclined faces L' L^2, for tilting the levers I H, substantially as and for the purpose specified.

9. The combination, with the revoluble shaft K, the needle D, and balance M, carrying toothed weights N and N', of the pinion *o*, for rotating said weights on the balance, and a shifting device for shifting said pinion into and out of gear with one of the weights, whereby either one or both weights may be rotated on the balance, substantially as and for the purpose specified.

10. The combination, with the staff K, the balance M, rigidly secured thereto, and the needle D, revoluble on said staff, of the crown-wheel C, provided with pins projecting from its upper face, shifting devices for shifting the staff K vertically to bring the needle into the path of said pins, and a stop to lock the staff and balance against rotation, whereby said needle may be rotated on the staff through the medium of the pins on the crown-wheel independently of the staff and balance, substantially as and for the purpose specified.

11. The combination, with the staff K, the balance M, rigidly secured thereto and carrying toothed disk-weights N and N', the needle D, revoluble on staff K, a shifting device for shifting the staff vertically, and a locking device for locking said staff against rotation when shifted, of the arbor O, carrying a pinion, *o*, adapted to mesh with one or both weights, and a train of registering-gearing operated from the worm-thread of the arbor, substantially as and for the purpose specified.

12. The combination, in an instrument of the class described, of a revoluble staff, a balance rigidly connected thereto and carrying a weight or weights adjustable thereon, a shifting device for shifting the weights on the balance, and a train of registering-gearing operating hands indicating units, tens, and hundreds, operated from said shifting device and constructed to rotate the hands in the same direction, forward or backward, substantially as and for the purpose specified.

13. The combination, with the herein-described instrument provided at its southeast and southwest corners with journal-bearings, a supporting-plate for said instrument, and journals pivoted to said plate and fitting into said journal-bearings, of a quadrant adapted to be secured on the line north and south of the instrument, a slide-rest for supporting the north end of said instrument, a pointer adapted to travel along the graduations of the quadrant, with the slide-rest, and a locking device for locking the slide-rest in position on the quadrant, substantially as and for the purpose specified.

14. The combination, with the described instrument provided on its back plate with an axial pin, of a frame adapted to revolve on the axial pin, a spool of insulated wire supported from said frame, and binding-posts for connecting the wire ends with a source of electricity, substantially as and for the purpose specified.

400,662. ART OF DETERMINING THE VALUE OF ELECTRIC, MAGNETIC, OR ELECTRO-MAGNETIC FORCES BY WEIGHT.

ADOLPHUS GUPPERICH, Richmond, Va. Filed Sept. 25, 1888. Serial No. 286,372. (No model.)



Claim.—1. The herein-described mode of determining the value of magnetic, electric, or electro-magnetic forces by weight, which consists in first determining by weight the value of terrestrial magnetism by counterbalancing an equilibrated polarized body as against the influence of such magnetism and utilizing the value obtained as a standard of comparison in weighing other like forces, substantially as and for the purposes specified.

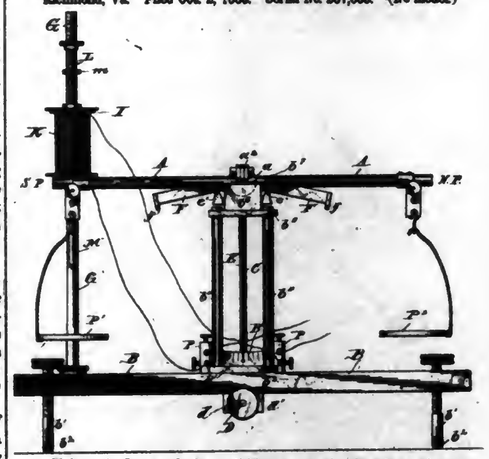
2. The mode of determining the value of magnetic, electric, or electro-magnetic forces, which consists in neutralizing a polarized and equilibrated body against the influence of terrestrial magnetism, subjecting such body to the influence of the force whose value is to be determined, and counterbalancing the power exerted thereby upon said body by a gravital force, as described.

3. The described mode of obtaining standard polarized bodies, which consists in magnetizing equilibrated bodies to a definite power and neutralizing the same as against a definite force of terrestrial magnetism by means of a correspondingly-definite gravital force, substantially as and for the purposes specified.

4. The described mode of obtaining standard polarized bodies, which consists in magnetizing equilibrated bodies to a definite power, placing such bodies in a line due east and west, and neutralizing the same as against a definite power of terrestrial magnetism by means of a correspondingly-definite gravital force, substantially as and for the purposes specified.

400,663. APPARATUS FOR DETERMINING THE VALUE OF ELECTRO-MAGNETIC FORCES BY WEIGHT.

ADOLPHUS GUPPERICH, Richmond, Va. Filed Oct. 2, 1888. Serial No. 287,033. (No model.)



Claim.—1. In a scale for weighing magnetic, electric, or electro-magnetic forces, a magnetized or polarized scale-beam, substantially as and for the purposes specified.

2. In a scale for weighing magnetic, electric, or electro-magnetic forces, a magnetized or polarized beam neutralized as against terrestrial magnetism, substantially as and for the purposes specified.

3. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with a magnetized or polarized scale-beam, of a coil of insulated wire included in an electric circuit and supported in proximity to one of the poles of the beam, substantially as and for the purposes specified.

4. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with a magnetized or polarized scale-beam, of a coil of insulated wire included in an electric circuit and supported in proximity to one of the poles of the beam in the plane of the center of attraction or point of leverage of the forces, substantially as and for the purposes specified.

5. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with a magetized or polarized scale-beam, of a coil of insulated wire included in an electric circuit and supported in proximity to one of the poles of the beam and adjustable relatively to said beam.

6. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with a magnetized or polarized scale-beam, of a coil of insulated wire included in an electric circuit and supported in proximity to one of the poles of the beam in the plane of the center of attraction or point of leverage of the forces and adjustable relatively to said center or point, substantially as and for the purposes specified.

7. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with a magnetized or polarized scale-beam neutralized as against terrestrial magnetism, of a coil of insulated wire included in an electric circuit and supported in proximity to one of the poles of the beam, substantially as and for the purposes specified.

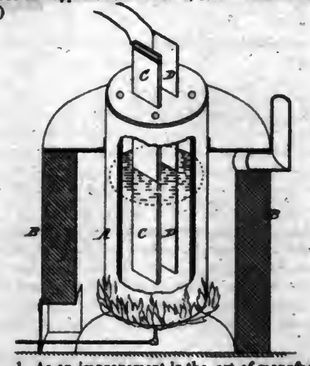
8. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with a magnetized or polarized scale-beam neutralized as against terrestrial magnetism, of a coil of insulated wire included in an electric circuit and supported in close proximity to one of the poles of the beam in the plane of the center of attraction or point of leverage of the forces and adjustable relatively thereto, substantially as and for the purposes specified.

9. In a scale for weighing magnetic, electric, or electro-magnetic forces, a magnetized or polarized scale-beam and a scale-pan suspended from said scale-beam at the center of attraction or point of leverage of the forces, substantially as and for the purposes specified.

10. In a scale for weighing magnetic, electric, or electro-magnetic forces, the combination, with the scale-beam A and the screw-threaded standard G, carrying the adjusting-nut I, of the spool-holder comprising the rod L, bracket-arm L', and guide-rod and bracket M *m*, substantially as and for the purposes specified.

400,664. PROCESS OF REDUCING ALUMINIUM FROM ITS FLUORIDE SALTS BY ELECTROLYSIS.

CHARLES M. HALL, Oberlin, Ohio. Original application filed July 9, 1886, Serial No. 207,601. Divided and this application filed Feb. 2, 1887. Serial No. 226,206. (No model.)

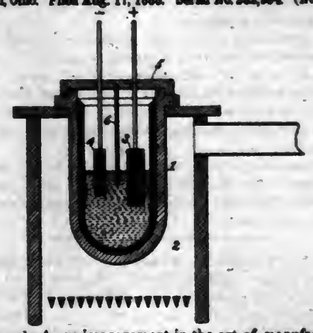


Claim.—1. As an improvement in the art of manufacturing aluminium, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminium and potassium, and then passing an electric current, by means of an anode formed of non-carbonaceous material, through the fused mass, substantially as set forth.

2. As an improvement in the art of manufacturing aluminium, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminium, potassium, and lithium, and then passing an electric current through the fused mass, substantially as set forth.

400,665. MANUFACTURE OF ALUMINIUM.

CHARLES M. HALL, Oberlin, Ohio. Filed Aug. 17, 1888. Serial No. 282,954. (No specimens.)



Claim.—1. As an improvement in the art of manufacturing aluminium, the herein-described method, which consists in fusing a combination of the fluoride of aluminium and the fluoride of an alkaline-earth metal, adding alumina to the bath so formed and passing a current of electricity through the fused mass, substantially as described.

2. As an improvement in the art of manufacturing aluminium, the herein-described method, which consists in fusing a combination of the fluoride of aluminium and the fluoride of calcium, adding alumina to the bath so formed, and then passing a current of electricity through the fused mass, substantially as set forth.

400,666. PROCESS OF ELECTROLYZING CRUDE SALTS OF ALUMINIUM.

CHARLES M. HALL, Oberlin, Ohio. Filed Aug. 17, 1888. Serial No. 282,955. (No specimens.)

Claim.—1. As an improvement in the art of manufacturing aluminium, the method herein described, which consists in fusing a combination of the fluoride of aluminium, the fluoride of calcium, and the fluoride of sodium, adding alumina to the bath so formed, and then passing a current of electricity through the fused mass, substantially as set forth.

2. As an improvement in the art of manufacturing aluminium, the method herein described, which consists in fusing a combination of the fluoride of aluminium, the fluoride of calcium, the fluoride of sodium, and the chloride of calcium, adding alumina to the bath so formed, and then passing a current of electricity through the fused mass, substantially as set forth.

400,667. PROCESS OF ELECTROLYZING FUSED SALTS OF ALUMINIUM.

CHARLES M. HALL, Oberlin, Ohio. Filed Sept. 21, 1888. Serial No. 286,084. (No specimens.)

Claim.—1. As an improvement in the art of manufacturing aluminium or alloys thereof, the herein-described continuous method, consisting in dissolving alumina in a fused bath composed of the fluoride of aluminium and the fluoride of a metal more electro-positive than aluminium, passing an electric current through the fused solution by means of suitable electrodes arranged therein, thereby separating the alumina into its constituent elements, adding from time to time or continuously a fresh supply of alumina to the bath, and removing the aluminium, substantially as set forth.

2. As an improvement in the art of manufacturing aluminium, the herein-described continuous method, consisting in dissolving alumina in a fused bath composed of the fluorides of aluminium, sodium, and calcium, and the chloride of calcium, passing an electric current through the fused solution by means of suitable electrodes arranged therein, thereby separating the alumina into its constituent elements, adding from time to time or continuously a fresh supply of alumina to the bath, and removing the aluminium, substantially as set forth.

400,668. VACUUM-PUMP.

JAMES T. HANDAY, Pittsburg, Pa. Filed Aug. 3, 1887. Serial No. 246,034. (No model.)

Claim.—1. In an apparatus for the production of high vacuums, the combination of a cylinder having a valvular connection with a continuously-operating exhaust-pump and with the vessel to be exhausted, a shell surrounding said cylinder and protecting the same as against the admission of air, except through connection with the vessel to be exhausted, and a suitably-packed piston operating in said cylinder, substantially as set forth.

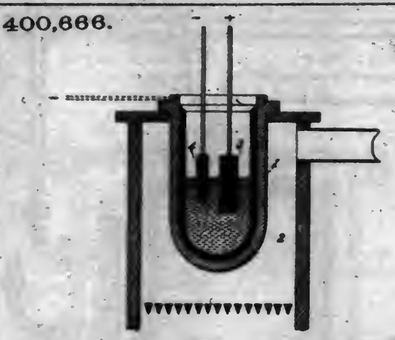
2. In an apparatus for the production of high vacuums, the combination of a cylinder having a valvular connection with a continuously-operating exhaust-pump and with the vessel to be exhausted, a shell surrounding said cylinder and having pipe-connections with a continuously-operating exhaust-pump, and a suitably-packed piston operating in said cylinder, substantially as set forth.

3. In an apparatus for the production of high vacuums, the combination of a cylinder having a valved outlet, a mechanically-operated fluid-piston, a valve-chamber connected thereto and to the vessel to be exhausted, a valve for closing the connection to the cylinder, and a mechanically-operated fluid-piston for operating said valve, substantially as set forth.

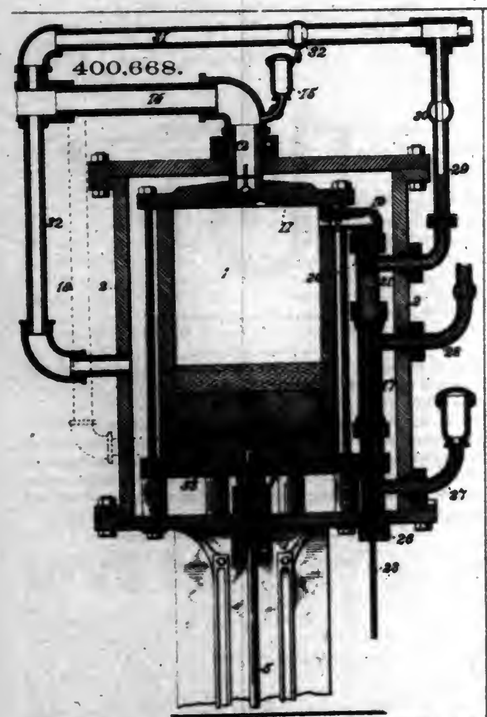
4. In an apparatus for the production of high vacuums, the combination of a cylinder, a piston operating therein, a valve-chamber having a valved connection to said cylinder, and a piston for operating said valve, the several joints, connections, and valves, when in a closed position, having a fluid seal, substantially as set forth.

5. In an apparatus for the production of high vacuums, the combination of a cylinder, the head thereof having a concave inner surface, a valved outlet located at the apex of the concave surface, a valved inlet connecting the cylinder and the vessel to be exhausted, and a mechanically-operated fluid-piston in said cylinder, substantially as set forth.

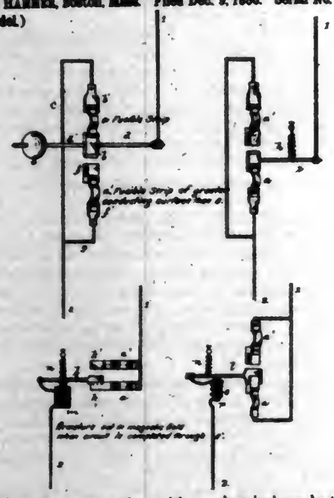
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400,669. SAFETY DEVICE FOR ELECTRIC CIRCUITS. WILLIAM J. HAMMER, Boston, Mass. Filed Dec. 9, 1886. Serial No. 221,067. (No model.)



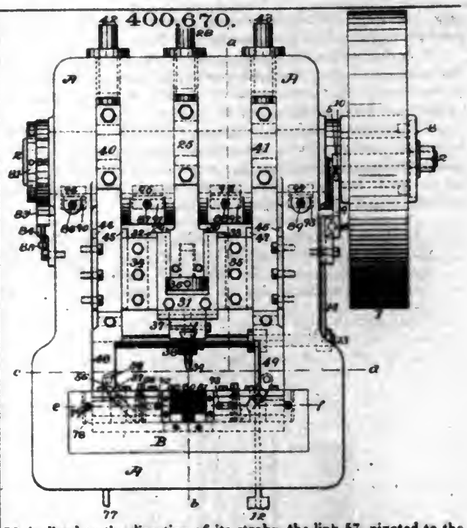
Claim.—1. The combination, with an electrical conductor, of a safety-catch normally in the circuit thereof, a substitute safety-catch of greater conducting capacity, and means for automatically placing the latter in circuit upon the breaking of the former, substantially as set forth.

2. The combination, with an electrical conductor, of a safety-catch normally in the circuit, a switching device suspended by said safety-catch, and a substitute safety-catch of greater conducting capacity provided with suitable terminals situated beneath said switching device, whereby upon the breaking of the normal safety-catch the substitute is switched automatically into circuit, substantially as set forth.

400,670. FORGING-MACHINE. HENRY HAMMOND, New Haven, Conn. Filed Dec. 4, 1888. Serial No. 292,637. (No model.)

Claim.—1. The combination of the pitman 48, provided with a surface, 55, parallel to the direction of its stroke, and with a surface,

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56, inclined to the direction of its stroke, the link 57, pivoted to the pitman opposite to that parallel surface, and the block 63, adapted to slide substantially at right angles to the stroke of the pitman and during one such stroke to be first caused by that inclined surface thus to slide, and then to be held stationary by that parallel surface, and then to be forced by that link to slide still farther, all substantially as described.

2. The combination of the shaft 2, the pitman 25, provided with the head 36, and the gate 31, and the pitman 40, provided with the link 57 and the die-block 63, all constructed and combined substantially as described.

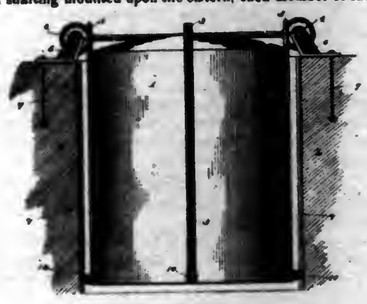
3. The combination of a pulley mounted on a shaft with a bushing between them, and with an elastic cushion between the pulley and the bushing, and a rotating eccentric key between the bushing and the shaft, a shaft carrying the pulley and intermittently revolved thereby, and three pitmen harmoniously worked by cranks on the shaft, all constructed and combined so that the pulley turns freely on the shaft when the key is in one position, and that turning the key into another position locks the shaft to the bushing and transmits the motion of the pulley to the shaft and thence to the pitmen, and that the cushion eases the otherwise sudden shock of the beginning of that transmission, all substantially as described.

4. The combination of the shaft 2, provided with cranks, substantially as described, the pitmen 25, 40, and 41, worked by those cranks, the disk 81, keyed to that shaft and provided with the eccentric surface 82, and the shoe 83, fixed adjacent to that surface, all constructed and combined so that the shoe will tend to stop each revolution of the disk and shaft and each reciprocation of the pitmen, all substantially as described.

5. The combination of the shaft 76, worked by the arm 77 and having the arms 74 and 75, with the cam-rods 70 and 71, reciprocating two opposite die-blocks simultaneously in opposite directions, all substantially as described.

400,671. GASOMETER. WILBERFORCE B. HAMMOND, Boston, Mass. Filed Jan. 18, 1889. Serial No. 296,700. (No model.)

Claim.—1. In a gasometer, the combination, with a cistern, of an inverted holder adapted to rise and fall therein, guides spaced at governing-points about said holder and attached thereto, and connected shafting mounted upon the cistern, each member of said shaft-



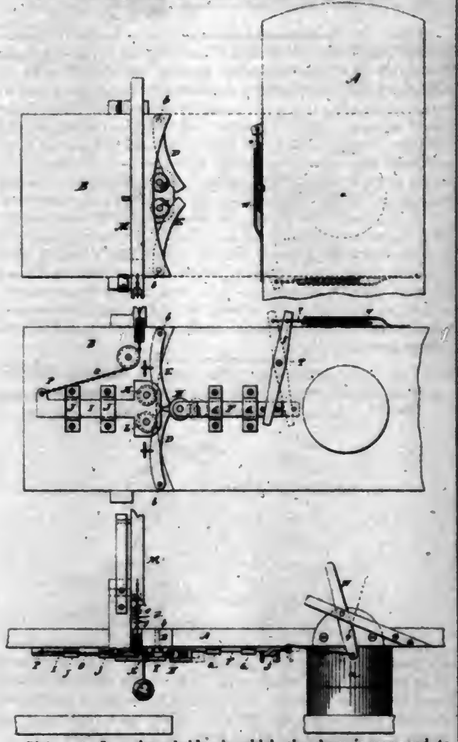
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ing being operated by or geared to one of said guides, whereby a motion of parallel translation of the holder is assured at all periods of its rise and fall, substantially as described.

2. In a gasometer, the combination, with a cistern, of an inverted holder adapted to rise and fall therein, rack-bars spaced at governing-points about said holder and attached thereto, and connected shafting mounted upon the cistern, each member of said shafting being provided with a sprocket-wheel intermeshing with one of the rack-bars, substantially as described.

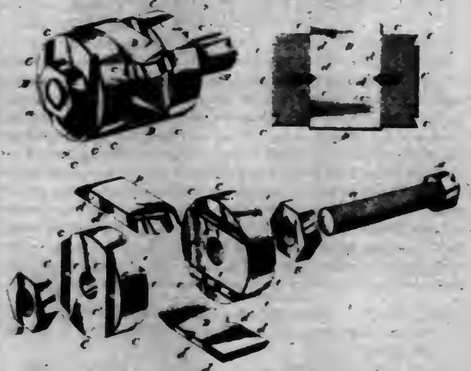
400,672. DRAW-BRIDGE GATE. WILLIAM HANEY, New Haven, Conn. Filed May 21, 1888. Serial No. 274,470. (No model.)



Claim.—1. In a draw-bridge in which the draw is arranged to swing in a horizontal plane, the combination of the levers D E, hung upon pivots beneath the approach to the draw, so as to swing in a horizontal plane, but inclined toward the draw, a longitudinal slide, I, arranged in rear of said levers, and upon which both the said levers are adapted to bear, a gate over the approach with a connection therefrom to said slide I, a longitudinal central slide, F, beneath the draw, so as to form a projection in the plane of the said levers D E, and so as to work upon the inclined surface of one of said levers as the draw opens or closes, a hand-lever hung at a stationary point on the draw, and a connection therefrom to said slide F, substantially as described, and whereby the projection of the said slide F may be forced into or taken from engagement with said levers.

2. In a draw-bridge in which the draw is arranged to rotate in a horizontal plane, the combination therewith of the two levers D E, arranged upon the approach to the draw, hung upon pivots at their outer end and inclined toward the center of the bridge, where the free ends of the lever substantially meet, a projection on the draw arranged to work in a path in the plane of said levers D E as the draw opens or closes, a vertically-moving gate located on the approach to the draw, and a connection from said gate to said levers, substantially as described, and whereby as the bridge swings in either direction it will operate upon one of said levers, according to the direction in which the said bridge swings, and impart a corresponding opening or closing movement to said gate, with a yielding spring in the connection between the gate and said levers, substantially as described.

400,673. CUTTER-HEAD FOR MOLDING-MACHINES. PETER J. HARDY, Tom's River, N. J. Filed Apr. 30, 1887. Renewed Jan. 19, 1889. Serial No. 296,902. (No model.)



Claim.—1. As an improvement in molding-machines, the combination of a journaled spindle, two disks which are placed upon and adapted to be rotated with and to be relatively moved lengthwise of the same, and are provided within their contiguous faces with transverse grooves that have each a projecting stud, and cutters which have notched side edges that are adapted to enter said grooves and to engage with said studs, substantially as and for the purpose specified.

2. As a means for securing a cutter in position within a cutter-head, two disks that are adapted to rotate with a journaled spindle in the same plane and around a common axis, and are provided within their contiguous faces with coinciding grooves that are adapted to engage with the side edges of a cutter, and with pins which are arranged in said grooves and adapted to engage with corresponding notches in said cutter-edges, in combination with said spindle, and with means whereby said disks may be moved toward each other, substantially as and for the purpose set forth.

3. As an improvement in cutter-heads, the combination of two reversible clamping-disks that are provided within each of their faces with grooves for engagement with the side edges of a cutter, each of which grooves may be caused to coincide with one of the grooves of the opposite disk, and is provided with a pin for engagement with a notch in the edge of a cutter that has a position with relation to the longitudinal center of said groove which is different from the like position of either of the other pins of the same disk, substantially as and for the purpose shown and described.

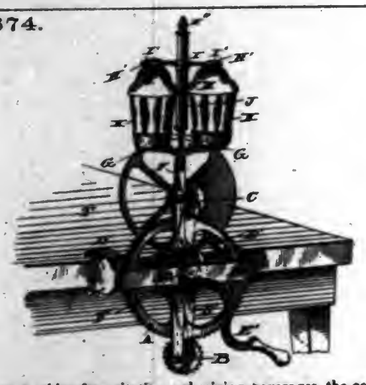
4. In combination with the threaded spindle provided with the nuts, the disks having within each face two or more grooves, and each groove provided with an engaging-pin, and the cutters which have each side edge adapted to fit into either of said grooves and provided with a notch for engagement with said pin, substantially as and for the purpose specified.

400,674. BEVERAGE SHAKING AND MIXING MACHINE. PETER P. HARING, Brenham, Tex. Filed Apr. 26, 1888. Serial No. 271,961. (No model.)

Claim.—1. The combination of the frame provided with arms at right angles thereto and the main drive-wheel journaled therein, gear-wheels journaled at the ends of the arms, provided with wrist-pins and meshing with the drive-wheel, a shaker-bar connected to the wrist-pins of the gear-wheels and having a loop or opening for the insertion of the shaft of the drive-wheel, and the cups or tumbler-holders attached rigidly to the shaker-bar, substantially as and for the purpose set forth.

2. The combination, with the frame, of the shaker-bar, tumbler-holders, covers for the tumblers, and a spring-actuated movable cross-bar provided at its outer ends with rings adapted to engage with the covers, substantially as and for the purpose set forth.

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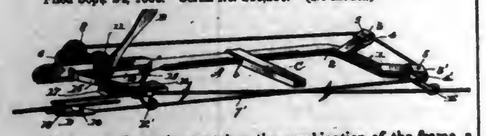
3. In a machine for agitating and mixing beverages, the combination consisting substantially of the following elements: a suitable frame adapted to be fastened upon a table or other support, a main drive-wheel journaled in said frame and provided with a crank or handle for operating it, a pair of gear-wheels or pinions journaled on the ends of the arms of the frame, provided with wrist-pins and meshing with the main wheel, a shaker-bar connected to the wrist-pins of said wheels, a series of tumbler-holders attached to and projecting laterally from the shaker-bar, the tumblers and covers, and a movable spring-actuated top bar connected to and moving with the shaker-bar and adapted to exert downward pressure upon the covers when the same are placed in position upon the tumblers, substantially as set forth.

400,675. WAGON-BRAKE. JOHN W. HARTMAN, Mapleton, and HENRY P. CLAY, Prescott, Kans. Filed Jan. 14, 1889. Serial No. 296,305. (No model.)



Claim.—The stirrup A, having hole a^3 and carrying the spring-pin D in ears a^4 a^5, in combination with brake-bars B B, having the holes b' b^2 b^3, whereby said brake-bars may be adjusted, as and for the purposes set forth.

400,676. COMBINED WIRE STRETCHER, TIGHTENER, AND SPLICER. JAMES P. HAYS and HENRY R. CLEMENS, Wellsville, Kans. Filed Sept. 24, 1888. Serial No. 286,238. (No model.)



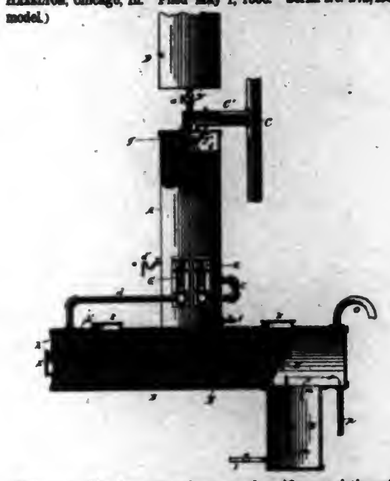
Claim.—1. In a wire-stretcher, the combination of the frame, a shaft, a reel mounted on the shaft, a ratchet-wheel and a lever for operating the reel, arms secured to the frame and forming a bearing for the said shaft, a yoke secured to the arms, and a clamp working in the yoke, substantially as described.

2. In a wire-stretcher, the combination of the frame curved at one end, pulleys secured to the said curved portion, a reel mounted on a shaft at the other end of the frame, a ratchet-wheel and lever for operating the reel, and a clamp or block supported on the frame, substantially as described.

3. In a wire-stretcher, the combination of the frame curved at one end, pulleys secured to the said curved portion, a shaft at the other end of the frame, a reel mounted on the shaft, a rope or chain passing from the reel around the said pulleys, a clamp secured to the rope, a ratchet-wheel and a lever for operating the reel, and a clamp or block supported on the frame, substantially as described.

4. In a wire-stretcher, the combination of the frame curved at one end, pulleys secured to the said curved portion, a reel mounted on a shaft at the other end of the frame, a ratchet-wheel and lever for operating the reel, a clamp or block supported on the frame opposite the reel, and guides secured to the clamp and to the curved portion of the frame, substantially as described.

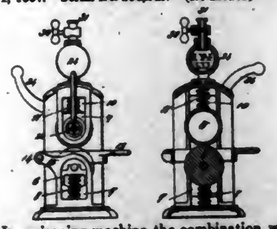
400,677. FEED-WATER HEATER AND PURIFIER. MILTON W. HAMILTON, Chicago, Ill. Filed May 1, 1888. Serial No. 272,435. (No model.)



Claim.—1. The feed-water heater and purifier consisting of heater A, containing wooden blocks *b*, and having branch of engine exhaust-pipe C connected with its top and overflow and blow-off pipes *d f*, respectively, and distributing-cone *g*, feed-water tank D, set above the heater, and having a pipe, D', leading down into the elbow of the pipe C', pump or pumps G', purifying-cylinder B, containing filtering substance H, and provided with distributing-cone *h*, man-holes *k*, and perforated diaphragm F, catch-basin E, provided with partition *l*, and having blow-off pipe *s*, and pipes *o* and *p*, all constructed, arranged, and operated substantially in the manner and for the purpose specified.

2. In a heater and purifier, the combination, with heating-cylinder A, engine exhaust-pipe C, and water-tank D, of branch exhaust-pipe C', connecting the pipe C with cylinder A, and pipe D', leading down from tank D into elbow of pipe C', substantially as herein shown and described, whereby the cold feed-water from the tank D may be operative to condense the steam entering the pipe C', and thereby create and maintain sufficient vacuum to contiuually draw steam from pipe C, as set forth.

400,678. IRONING-MACHINE. GUSTAVUS HEIDEL, St. Louis, Mo., assignor to the National Self-Heating Sad Iron Company, same place. Filed Oct. 1, 1887. Serial No. 251,943. (No model.)



Claim.—In an ironing-machine, the combination, with the frame, of a lower roller supported on springs 8 in each end of the frame, arms 15 on each end of the frame, frame 13, pivoted at 14 to said arms between the rollers, hollow upper roller held by springs in contact with the lower roller, burner for heating the upper roller, supply-pipe, and reservoir, all substantially as and for the purpose set forth.

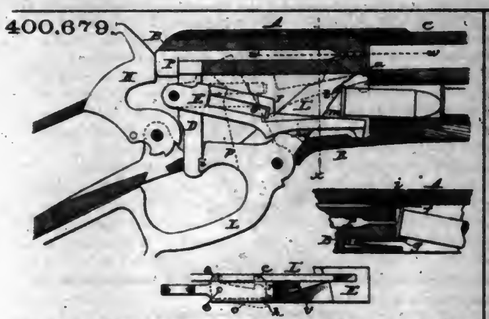
400,679. MAGAZINE-GUN. LEWIS L. HEPBURN, New Haven, Conn. Filed Jan. 12, 1889. Serial No. 296,129. (No model.)

Claim.—1. The combination, in a gun, of the receiver A, having a solid or unbroken wall at its top, with the longitudinal opening I in its side, and the reciprocating breech-block B, of the proper form transversely to fill the cavity between the walls of the receiver and the opening I in its side, substantially as shown and described.

2. The carrier E, having the rocker or dog *c* pivoted therein, said rocker or dog being provided with the shoulders *b* and *c*, constructed as described, and adapted to engage and operate with the lever L', as set forth.

3. In combination with the receiver A, having an opening, I, in its side, and its top wall closed or unbroken, the barrel C, having its

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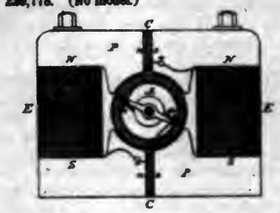


rear end projected backward into the cavity of the receiver, and having a notch or recess, *a*, cut in its under wall only, substantially as and for the purpose set forth.

4. In combination with the pivoted carrier E, the pivoted lever, L, provided with an eccentric, *w*, adapted to come in contact with the under side of the carrier as the lever is moved to open the breech, and elevate the front end of the carrier to a point just above the lower wall of the magazine-tube, and thereby prevent the cartridge from prematurely passing out of the magazine, as set forth.

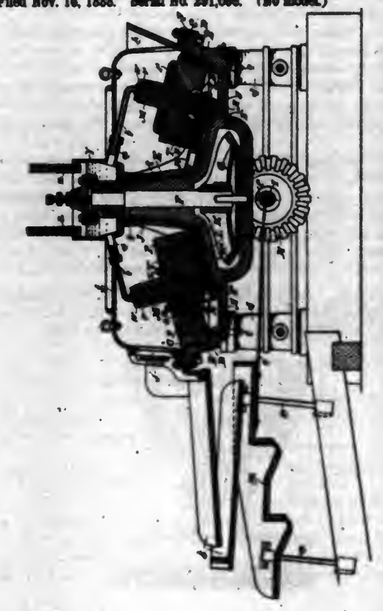
5. The flat-spring ejector *f*, provided with the projection *i*, said projection being provided with a right-angled face at its front and an inclined or beveled face at its rear side, the same being secured in a recess formed in the inner wall of the receiver, substantially as shown and described.

400,680. PREVENTION OF SPARKING IN ELECTRIC MOTORS AND GENERATORS. DANIEL HIGHAM, Philadelphia, Pa., assignor to the Higham Electric Motor Company, same place. Filed Mar. 5, 1887. Serial No. 229,773. (No model.)



Claim.—An electric motor or generator having field-magnet coils on its cores and counter distorting-coils on its pole-pieces, as and for the purpose set forth.

400,681. GRINDING-PAN. PHILIP HINKLE, San Francisco, Cal. Filed Nov. 16, 1888. Serial No. 291,066. (No model.)



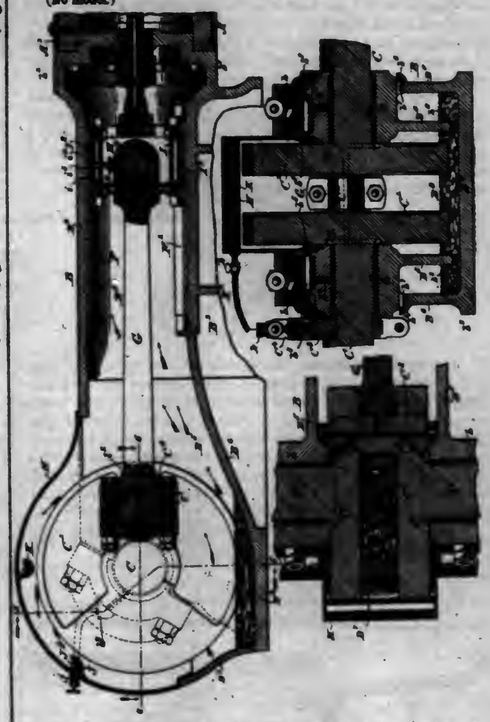
Claim.—1. In a grinding-pan, the inclined bottom, the outwardly-inclined sides, with the correspondingly-shaped ring-die fixed therein by calking, the carrier or driver, the bottom of which is inclined to correspond with the bottom of the pan, and having the radial guide-slots, in combination with guides fitted in said slots, the top plates, the upwardly extending shafts fixed in said guides so as to extend at an inclination outwardly, and the rollers turning upon said shafts, with their peripheries traveling in contact with the ring-die, substantially as herein described.

2. A grinding-pan having the inclined bottom and sides, the correspondingly-inclined die, the rotary carrier having radial slots in its outer periphery, with top plates and guides movable in said slots, said guides having upwardly-projecting cones or hubs, and the inclined shafts M, fixed in said cones or hubs, in combination with rollers fitting said shafts, having upwardly-extending sleeves from the top, and concavities in the bottom fitting the conical hubs of the guides, and the anti-frictional rings T and U, the holding nut and washer at the top of the shaft, substantially as herein described.

3. In a grinding-pan, the inclined bottom and sides, the correspondingly-inclined rollers, the inclined shafts, and the radially-moving guides, in combination with a central rotating reservoir, and pipes connecting said reservoir with the upper ends of the shafts, so as to discharge water through them and beneath the rollers and guides, substantially as herein described.

4. In a grinding-pan, the inclined bottom and sides, the radially-moving guides, the inclined shafts, the grinding-rollers journaled at the corresponding inclination upon said shafts, the conduits, and pipes, whereby water is discharged through the roller-shafts and between the carrier and the pan-bottom, substantially as herein described.

400,682. LUBRICATING DEVICE FOR STEAM-ENGINES. ALBERT L. IDE, Springfield, Ill. Filed Feb. 20, 1888. Serial No. 264,606. (No model.)



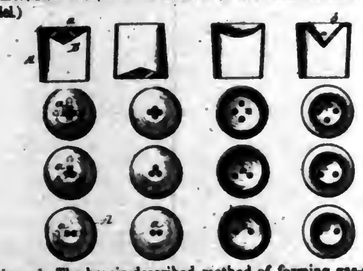
Claim.—1. The combination, with a steam-engine crank-shaft and disk and an engine-frame affording bearings for the shaft and formed to provide an oil tank or basin beneath the disk, the side walls of which rise to a point above the lower edge of the disk, of a detachable cover fitted to the frame and forming with the latter a closed housing surrounding the crank-disk and adjacent parts, a trough or receptacle located upon the inner surface of the cover in position to receive from the same lubricant thrown thereon by the disk, and a pipe attached to the housing communicating with said trough and leading to a bearing-surface to be lubricated, substantially as described.

2. The combination, with a crank-shaft and a crank-disk, of an

oil tank or basin beneath the disk, the side walls of which rise to a point above the lower edge of the disk, a housing or casing provided with an oil-receiving surface arranged in the same plane with the disk, a trough located within the housing in position to receive from the said oil-receiving surface fluid lubricant cast thereupon by the crank-disk, a pipe leading from said trough to a bearing to be lubricated, and a valve in said passage, substantially as described.

3. The combination, with an engine crank-shaft, a crank-disk thereon, and a bearing for the shaft provided with an oil cup or receptacle located in position to receive from the surface of the bearing-lubricant cast upon the same by the disk, of a pipe communicating with said trough or receptacle and discharging into the oil-cup upon the bearing, said oil-cup being provided with an overflow pipe or passage leading into the housing, substantially as described.

400,683. METHOD OF FORMING GAS-OUTLETS. WALTER M. JACKSON, New York, N. Y. Filed Nov. 6, 1888. Serial No. 290,103. (No model.)



Claim.—1. The herein-described method of forming gas-outlets, consisting in forcing the head of a closed sheet-metal pillar or tip into shape and at the same time or subsequently giving the under or inner surface of the head a convex shape, and then making apertures through the latter in such directions that none of the escaping gas shall pass vertically while in the apertures, substantially as set forth.

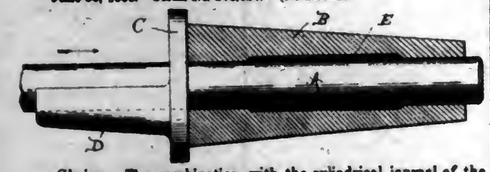
2. The herein-described method of forming gas-outlets, consisting in forcing the head of a closed sheet-metal pillar or tip into shape, then thickening the head or apex of the same by the insertion of a separate piece of material, and finally making apertures through the latter in such directions that none of the escaping gas shall pass vertically while in the apertures, substantially as set forth.

400,684. HORSESHOE. DAVID S. JAFFRAY, Chicago, Ill. Filed May 14, 1888. Serial No. 273,782. (No model.)



Claim.—In combination with the horseshoe A, having the longitudinal recesses A' A' formed therein, the transverse slot a^2 in said horseshoe, forming a key-socket and a U-shaped calk, B, the prongs thereof fitting the recesses A' A' in the shoe, said calk having an opening, b^2, passing through it in line with the opening a^2 of the horseshoe, the top of said opening being contracted by the shoulders b^2, and a key, as C, passing through said opening a^2 b^2, and bearing upon the shoulders b^2 of the slot in the calk, whereby it is prevented from slipping out, substantially as described.

400,685. AXLE-SKEIN. JOHN A. JOHNSON, Madison, Wis. Filed June 30, 1888. Serial No. 278,697. (No model.)



Claim.—The combination, with the cylindrical journal of the metallic axle A, of the skein B, shrunk upon said journal, having the annular chamber E, and provided with the collar C and the inwardly-projecting bolster D, which collar and bolster are integral with the skein, substantially as specified.

400,686. RECEPTACLE FOR PULVERIZED SUBSTANCES. FERDINAND KAMPF, Chemnitz, Germany. Filed Aug. 17, 1888. Serial No. 283,016. (No model.)

Claim.—A receptacle for dry pulverized condiments, having an interior tube extending from the top opening of the receptacle nearly to the bottom of said receptacle, for the purpose of allowing a definite quantity of the condiments to be ejected at one movement, substantially as herein shown and described.

400,686.



400,687. FUSE OR IGNITING DEVICE FOR PROJECTILES. WILLIAM KENNEDY, Brooklyn, N. Y. Filed Jan. 7, 1889. Serial No. 295,617. (No model.)



Claim.—1. An igniting device or fuse for an elongated rifle shell or projectile, consisting of a wheel rotatively mounted in a chamber in the projectile, with its axis of rotation coincident with the axis of rotation of the projectile, and an igniter and arrester, one of which is borne by the projectile and the other by said wheel, said igniter and arrester being arranged in the same circular path, whereby they are brought into contact by the rotation of the wheel relatively to the projectile.

2. The combination, with the body of the projectile, provided with a chambered tip or cap capable of removal, of the wheel rotatively mounted within said cap, its axis of rotation coinciding with that of the projectile, said projectile and wheel being provided, the one with a holder for the igniter and the other with an arrester arranged in the same path with the igniter, whereby the exploding charge is ignited by the rotation of said wheel relatively to the projectile.

3. The combination, with the body of the projectile, provided with a chambered tip or cap capable of removal, of a wheel rotatively mounted within said cap and having on its rim a holder for the igniter, and an arrester carried by the projectile and arranged in the path of the igniter carried by said wheel, whereby the igniter is fired by the rotation of the wheel relatively to the projectile.

4. The combination, with the body of the projectile, provided with a chambered tip or cap capable of removal, of the wheel rotatively mounted within said cap and provided with a holder for the igniter, the arrester carried by the projectile and arranged in the path of the igniter carried by the wheel, and the detent whereby the wheel is held against accidental rotation while the projectile is being manipulated.

5. The combination, with the body of the projectile, provided with a chambered tip or cap, of the wheel rotatively mounted in said cap on a screw-bearing, the axis of rotation of said wheel coinciding with the axis of the projectile, said projectile and wheel being provided, the one with a holder for the igniter and the other with an arrester in the same path with the igniter.

400,688. AUTOMATIC FIRE-EXTINGUISHER. CHARLES W. KRESTNER, Chicago, Ill., assignor of one-half to William E. Smith, same place. Filed Jan. 26, 1889. Serial No. 297,671. (No model.)

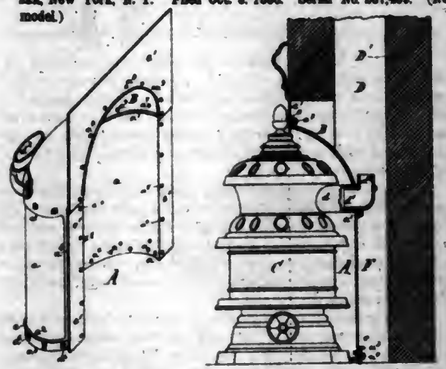


Claim.—1. In an automatic fire-extinguisher, the combination of a nozzle, a yoke projecting beyond the orifice of the nozzle and having retaining-lugs on each of its upright portions, a cap-valve adapted to close the nozzle-orifice, levers adapted to engage the lugs of the yoke-uprights and having short arms bearing on the valve, and a fusible strip connected at its respective ends by arms and links to the upper ends of the levers, substantially as described.

2. In an automatic fire-extinguisher, the combination of a nozzle, a yoke projecting beyond the orifice of the nozzle and having lugs toward each end of its upright portions, a valve adapted to close the nozzle-orifice, levers having projections to engage the lower lugs of the yoke-uprights and having their upper ends extended to bear upon the outer side of the upper lugs and provided with short arms adapted to bear on the valve, and a fusible strip connected at its respective ends by arms and links to the upper ends of the levers, substantially as described.

3. In an automatic sprinkler, a deflector secured over the nozzle-orifice, said deflector comprising a disk slitted radially and having the metal thereof turned down at the edges of the slits at a screw-pitch, whereby to break the water into spray, substantially as described.

400,689. RECESS SUMMER-PIECE FOR STOVES. JOHN H. KEYSER, New York, N. Y. Filed Oct. 3, 1888. Serial No. 287,409. (No model.)



Claim.—1. The summer piece, hood, or cell A for a stove, comprising the cast-iron cap portion B, of arched and concave form, skeleton frame a^3 a^4, bolting-flange c, inner stove-pipe collar, d', and curved sheet-iron body portion a, bolted to the skeleton frame of the cap portion, substantially as described.

2. The summer-piece A for a stove, comprising cap portion B, skeleton frame a^3 a^4, curved body portion a, flange c, inner collar d', and sheet-metal reducible flange or rim c', bolted to the flange c, substantially as and for the purpose described.

3. The summer-piece A, comprising the cast-iron cap portion B, of arched and concave form, skeleton frame a^3 a^4, the curved body portion a, the inner stove-pipe collar, d', cast on the cap portion, the outer upturned collar, d^3, connected to the cast-iron cap portion, the bolting-flange c, and the sheet-metal reducible flange c', substantially as and for the purpose described.

4. The summer-piece A for a stove, comprising the skeleton frame a^3 a^4, cast-iron cap portion B, and body portion a, both made of less horizontal extension than the recess of the fire-place and provided with collars d' d^3, flange c, and reducible sheet-metal flange or rim c', substantially as and for the purpose described.

5. The summer-piece A for a stove, comprising the cast-iron cap portion B and body portion a, and skeleton frame a^3 a^4, said portions B and a being both made of less horizontal extension than the recess of the fire-place and provided with collars d' d^3 and flange c, substantially as and for the purpose described.

6. A summer-piece for a stove, having its curved sheet-metal body portion a provided with reducible flanges which are of metal homogeneous therewith and made in one piece, and applied in combination with an arched cap portion forming an extension of the body portion, substantially as described.

7. A summer-piece for a stove, having its arched cap portion B, its inner collar, and its skeleton frame of homogeneous metal and made in one piece, substantially as described.

400,690. COMBINATION-TOOL. ARDEN D. KENDALL, Miles, Iowa. Filed Dec. 3, 1888. Serial No. 292,463. (No model.)

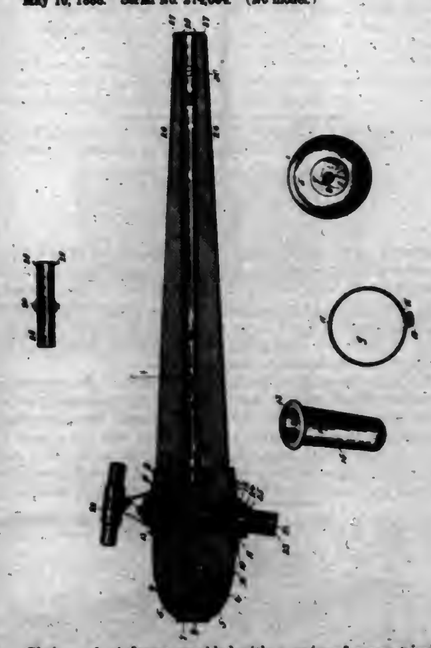
Claim.—The hereinbefore-described combination-tool, composed of the three levers A, B, and C, pivotally connected together, the levers A and B, having the curved jaws D' and D, respectively, the lever A, having the cutting-edge d, and the lever B, having the saw-edge d', and the tack-extractor d^3, and the lever C, having the screw-driver

400,690.



E at one end and the cork-screw F at its other end, substantially as shown.

400,691. FAUCET. WILLIAM W. KENDALL, Leetonia, Ohio. Filed May 16, 1888. Serial No. 274,064. (No model.)



Claim.—1. A faucet provided with a series of concentrically-shouldered annular recesses at its front end, a shouldered metal ring seated in the recesses, and an elastic buffer seated in the shoulders of the ring, and a screw for retaining the buffer in position, substantially as specified.

2. A faucet bored for the reception of a key-seat and provided with a metal clasp having perforations registering with said bore, in combination with a removable seat mounted in the bore and formed with flanges at its upper end adapted to take over said band, and screw-threaded at its lower end and bound in position by suitable nut and washer, substantially as specified.

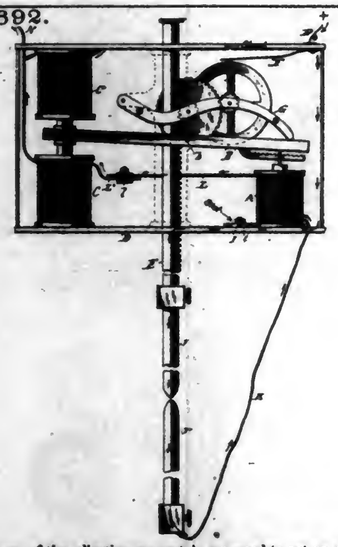
3. The combination, with a wooden faucet having a transverse bore, of a metal seat mounted in the bore and formed with flange at its upper end and screw-threads at its lower end and with nuts for binding the same to position, and of a metal key mounted in the seat and screw-threaded at its lower end and provided with nuts for binding it in position, whereby the key and its seat are adapted for removal and application to a new wooden faucet-body, substantially as specified.

400,692. ARC LAMP. GEORGE M. LANE, Asbury Park, N. J. Filed Dec. 26, 1888. Serial No. 294,575. (No model.)

Claim.—1. In an electric-arc lamp, the combination, with the feed-controlling lever, the magnet C in the main circuit, and the magnet C' in a shunt, the two magnets C and C' acting in opposition to each other for controlling the movements of the said lever, of the adjusting or compensating magnet A, of less force than the feed-controlling magnets, placed in the main circuit with the magnet C, and acting on the said feed-controlling lever in opposition to the said magnet C proportionate to the strength of the current, substantially as and for the purpose described.

2. In an electric-arc lamp, the combination, with the feed-controlling lever and the magnets C and C', for controlling the movements

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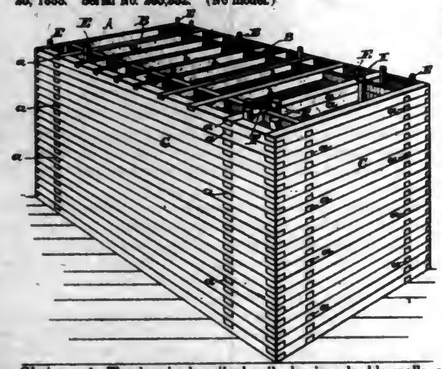


of said lever, of the adjusting-magnet A, arranged to act on said lever in opposition to the magnet C and adjustable to and from the pivotal support of the said lever, substantially as and for the purpose described.

3. In an electric-arc lamp, the combination, of the feed-controlling lever B, the magnets C and C', the arm H, and the magnet A, adjustable on the frame and having its core suspended from the said arm H, substantially as and for the purpose described.

4. The combination of the feed-controlling lever, the magnet C in the main circuit, and the shunt-magnet C', arranged to act in opposition to one another on the same end of the said feed-controlling lever, the compensating magnet A, of less force than the magnet C and in the main circuit therewith, arranged to act on the other end of the said lever in opposition to the magnet C, and having its armature connected and movable with the said lever, substantially as described.

400,698. CRIB. CYRENIUS LAWRENCE, Clyde, Mich. Filed Feb. 25, 1888. Serial No. 265,332. (No model.)



Claim.—1. The herein-described crib, having double walls, a space between said walls open at the top and bottom, and a compartment within the inner walls, having a solid bottom, substantially as shown and described.

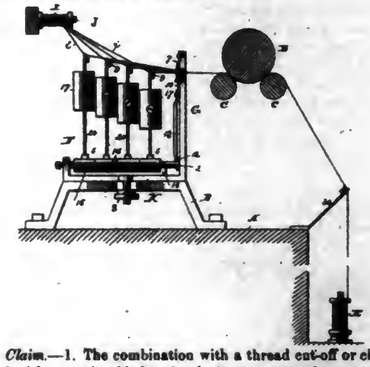
2. A crib having outer and inner walls, B and C, secured to each other by the projecting timbers *a*, a space between said walls open at the top and bottom, and a compartment within the inner walls, B, having a solid bottom, D, substantially as shown and described.

3. The combination, with the cribs having double walls, a space between said walls open at the top and bottom, and a compartment within the inner walls, having a solid bottom, of suitable piles driven between the inner and outer walls of the crib, substantially as shown and described.

4. The combination, with the crib having inner and outer walls, B C, a space between said walls open at the top and bottom, and a compartment within the inner walls, having a solid bottom, of suitable piles, E, driven between said inner and outer walls, the piles at the corners of the compartment being connected by chains F, extending over the timbers *a*, substantially as shown and described.

400,694. STOP-MOTION FOR DOUBLING-MACHINES, &c. ANTHONY A. LEHMANN, Baltimore, Md. Filed Oct. 8, 1887. Serial No. 251,835. (No model.)

Brief.—The object of the invention is to provide improved means for insuring the stoppage of the thread in doubling upon the accidental breakage of one or more of its strands.



Claim.—1. The combination with a thread cut-off or clamp provided with a moving blade, of a shaft, connections between the shaft and blade to move said blade, a weighted arm pivotally mounted on said shaft and having a loop for the thread, and a contact-piece on the shaft adapted to be struck by the weighted arm as it falls, whereby the shaft and blade are moved simultaneously with the fall of the said arm, substantially as described.

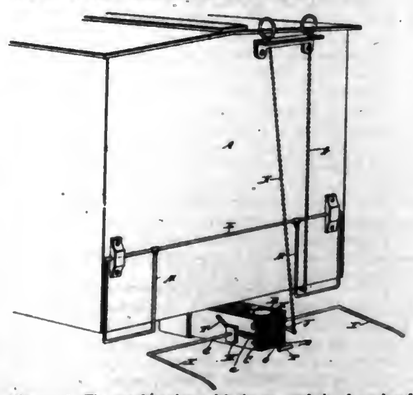
2. The combination, with a thread cut-off or clamp provided with a moving blade, of a shaft, connections between the shaft and blade to move said blade, a plurality of weighted arms pivotally mounted on said shaft, each having a loop for the thread, and a contact-piece on the shaft common to all of the weighted arms, whereby the fall of either or all of the arms will simultaneously move the shaft and blade, substantially as described.

3. The combination, with a thread cut-off or clamp, of a shaft, connections between the shaft and said cut-off or clamp, a weighted arm provided at one end with a loop for the thread and at the opposite end with a sleeve loosely mounted on said shaft, and having a shoulder, 5, and a contact-piece on the shaft in position to be struck by the shoulder on the movement of the weighted arm, whereby the shaft is rocked, substantially as described.

4. The combination, with a thread cut-off or clamp, of a shaft, connections between the shaft and said cut-off or clamp, two or more weighted arms pivotally mounted on said shaft, and a contact-piece on the shaft in position to be struck by the movement of either of said arms, whereby the shaft may be rocked by one of the arms, substantially as described.

5. The combination of a thread cut-off or clamp provided with a reciprocating blade, a shaft having an arm connected to move said blade when it is rocked, a plurality of weighted arms loosely mounted on said shaft and each having a loop for the thread, and a contact-piece common to all of the arms in position to be struck by either of them upon the breakage of the thread, substantially as described.

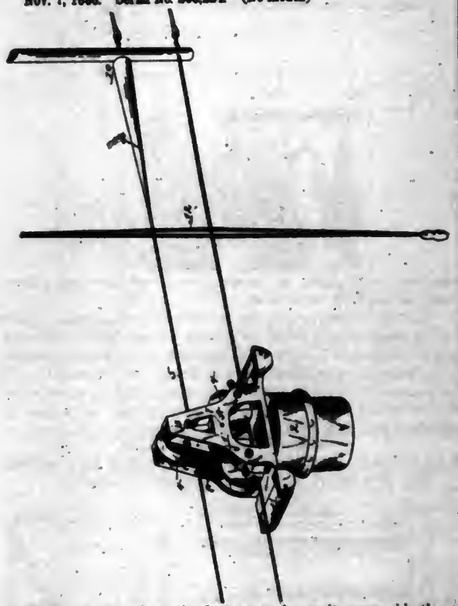
400,695. CAR-COUPLING. GEORGE W. LEWTON, Eldora, Iowa. Filed Jan. 9, 1889. Serial No. 295,830. (No model.)



Claim.—1. The combination, with the car and the draw-head, of the rock-shaft L, mounted on the car and having the loops M at its ends, and the shaft G, mounted in the draw-head and carrying the coupling-link, and provided at its ends with the arms I I, adapted to be engaged by the loops M, as set forth.

2. The combination, with a draw-head having the slot C and recess D in its front end and the inclined slot F in its upper rear portion, of the shaft G, mounted in said slot F, and the coupling-link secured to said shaft and extending forward therefrom through the slot C, and provided at its front end with the cross-head adapted to fall within the recess E, as set forth.

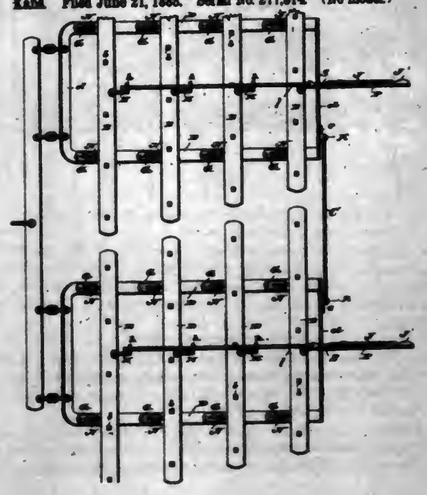
400,696. CASH-CARRIER. DAVID LIPPT, Mansfield, Ohio. Filed Nov. 7, 1888. Serial No. 290,234. (No model.)



Claim.—1. A cash-carrier frame carrying on its upper side three grooved wheels and on its lower side a cash-receptacle, and an idle grooved wheel placed intermediate of the three grooved wheels and adapted to bear against a stop at the end of the track, substantially as specified.

2. A cash-carrier frame carrying on its upper side three grooved wheels for running upon the track, a cash-receptacle secured to its under side, a grooved idle-wheel placed intermediate of the three grooved wheels and adapted to bear against a tapered stop at the end of the track, and two rollers mounted in the base of the frame and adapted to be acted against by a starting-cord, substantially as described.

400,697. HARROW. HENRY L. MACK, Summit, Cloud County, Kans. Filed June 21, 1888. Serial No. 277,814. (No model.)



400,697.



Claim.—In a harrow of the character described, the combination, substantially as set forth, of the continuous rectangular frame, the side bars of which are provided on the upper side with bent plates, the tooth-beams connected therewith by means of eyebolts, the coupling-bar provided at intervals with transverse circular openings and at its rear end having notches in its upper edge, the brackets rigidly secured at their lower forked ends to the tooth-beams and provided at their upper ends with laterally-projecting studs to engage the circular openings in the coupling-bar, the rearmost of said brackets having an extended shank constituting an operating-lever, a spring-pressed pawl pivoted to the lever above the coupling-bar and forked at its free end to straddle said bar, and a connecting-rod composed of two sections adapted to slide one upon the other.

400,698. BUTTER-PACKAGE. CHARLES H. MACOMBER, Atwater, Minn. Filed June 18, 1888. Serial No. 277,402. (No model.)



Claim.—The package herein described, comprising the open-ended sections telescoping together, and the followers fitting in the ends of the package, substantially as described.

400,699. QUILTING ATTACHMENT FOR SEWING-MACHINES. CHARLES MANSEVILLE, Farmer, Tex. Filed Oct. 2, 1888. Serial No. 287,073. (No model.)



Claim.—1. A quilting attachment for sewing-machines, consisting of two side bars, a take-up roll at one end, a stay-rod at or near the central part thereof, a vertically-adjustable guide and tension-roll revoluble between the stay-rod and take-up roll, an independently revoluble pay-off roll for the lining at the opposite end of the side bars, a vertically-adjustable pay-off roll for the top removably mounted in bearings between the side bars adjacent to the stay-rod and between the latter and the lining pay-off roll, and revoluble in its bearings independent of rotation of the lining pay-off roll for adjusting the tension of the top independent of the lining, and a transverse rail on which the side bar travels, substantially as described.

2. A quilting-machine consisting of two side bars, a take-up roll at one end, a stay-rod at or near the central part thereof provided with supporting-wheels, a vertically-adjustable guide and tension-roll revoluble in bearings between the take-up roll and the stay-rod, a vertically-adjustable independently-revoluble pay-off roll for the lining at the opposite end of the side bars, a vertically-adjustable pay-off roll for the top removably mounted in bearings between the side bars adjacent to the stay-rod and between the latter and the lining pay-off roll, and revoluble in its bearings independent of rotation of the lining pay-off roll for adjusting the tension of the top independent of the lining, and a transverse rail on which the supporting-wheels rest and travel, substantially as described.

3. In a quilting-frame attachment for sewing-machines, the combination, with two parallel side bars, having their greatest width and weight at one end, of a vertically-adjustable take-up roll journaled in said side bars, a vertically-adjustable tension and guide roll journaled in brackets depending below the side bars, a stay-rod connecting the said bars at or near their central part and rising to or nearly to their upper edges, a pay-off roll for the top vertically adjustable in brackets rising above the side bars, a pay-off roll for the lining in the other end of the frame, and a rail supporting the frame, the pay-off for the lining and the take-up roll having ratchets and thumb-buttons and the frame being provided with wheels moving on the rail, substantially as described.

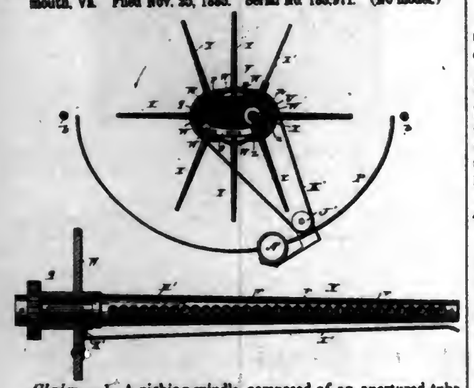
4. In a quilting-frame attachment for sewing-machines, a frame

composed of side bars strengthened by a flange, said bars tapering from a point past their centers to one end, a stay-bar having elbow-braces connecting said bars, a rail clamped upon the work-table of the machine and having a groove and bead, and wheels upon the frame moving upon said bead, all constructed and arranged substantially as described.

5. In a quilting-frame attachment for sewing-machines, the combination, with two parallel bars having one end of greater width and weight, of a guide-roll and a pay-off roll for the top of the quilt journaled upon opposite sides of a substantially central stay-rod rising nearly flush with the upper edges of the said bars, a take-up roll at the wider ends having a ratchet engaging with a spring-pressed pawl on the frame, and a pay-off roll for the lining having a similar ratchet and pawl, the guide-roll and pay-off for the top being adjustable below and above the bars, respectively, substantially as described.

6. In a quilting-frame attachment for sewing-machines, the combination, with a supporting-rail for the frame having suitable attaching-clamps and provided with metallic plates having openings in their projecting ends, and having slots cut from their edges into said openings in a plane inclined to the perpendicular, of legs having headed bolts set in their ends, said bolts being adapted to enter the slots by inclining the legs, substantially as described.

400,700. COTTON-HARVESTER. SAMUEL D. T. MANNING, Portsmouth, Va. Filed Nov. 26, 1885. Serial No. 183,971. (No model.)



Claim.—1. A picking-spindle composed of an apertured tube, and an interior core provided with picking-pins corresponding with said apertures, said picking-pins being of such length that they do not project beyond the exterior surface of the spindle, substantially as set forth.

2. A rotating cage and rotating picking-spindles journaled therein and carried thereby, in combination with fixed toothed rods carried by said cage, each of said rods being located immediately beneath one of said spindles, substantially as set forth.

3. A gathering-box open on one side, a rotating cage located therein, and rotating picking-spindles mounted thereon, in combination with stripping-bars located on said cage beneath said spindles, and stripping-bands arranged between said spindles and bars, substantially as set forth.

4. A rotating spindle which has a double rotary motion on its axis, first in one direction and then the other, and also a bodily movement in an approximately-circular path, in combination with a stripping-bar parallel with said spindle, which is carried around with said spindle, said bar being toothed on one edge and flat on the other, substantially as set forth.

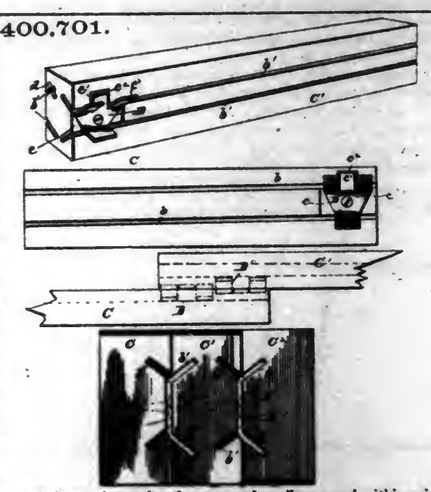
400,701. EXTENSION-TABLE. ELIAS I. MATTESON, Randolph, N. Y. Filed July 7, 1888. Serial No. 279,235. (No model.)

Claim.—1. In an extension-table, the combination, with a series of extension-sections have grooves arranged on an incline relatively to the side edges thereof, and central extension-sections having grooves parallel with their side edges, of runners pivotally secured to the several sections and entering the grooves in the next adjacent sections, substantially as set forth.

2. In an extension-table, the combination, with a series of extension-sections having diverging grooves, the grooves in the end sections being arranged on an incline relatively to the side edges of the sections, and the grooves in the central section being parallel with its side edges, of runners pivoted to the sections and adapted to run in said grooves, substantially as set forth.

3. In an extension-table, the combination, with a series of extension-sections having grooves arranged on an incline relatively to the side edges thereof, and central extension-sections having grooves parallel with their side edges, the said sections being recessed at points

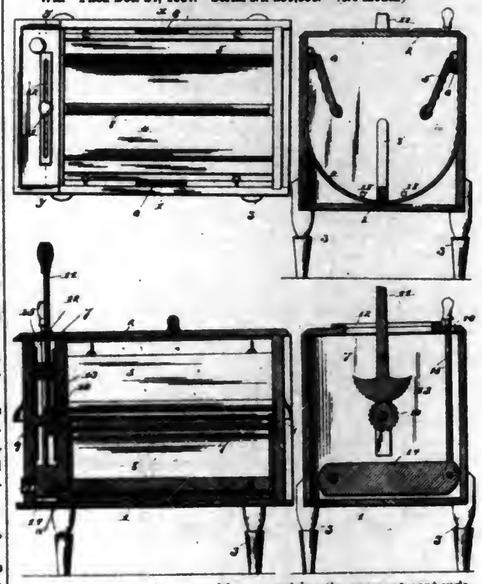
400,701.



near their meeting ends, of runners pivotally secured within said recesses, substantially as set forth.

4. In an extension-table, the combination, with extension-pieces having longitudinal grooves, of runners pivoted to said extension-pieces and adapted to work in said grooves, said runners consisting of a plate having portions at each end thereof bent obliquely to enter the grooves in the sections, and a tongue projecting from one end of the runners and bearing upon the face of the sections to broaden the bearing of said runners on the section, substantially as set forth.

400,702. WASHING-MACHINE. RICHARD HASE, North La Crosse, Wis. Filed Dec. 27, 1887. Serial No. 259,038. (No model.)

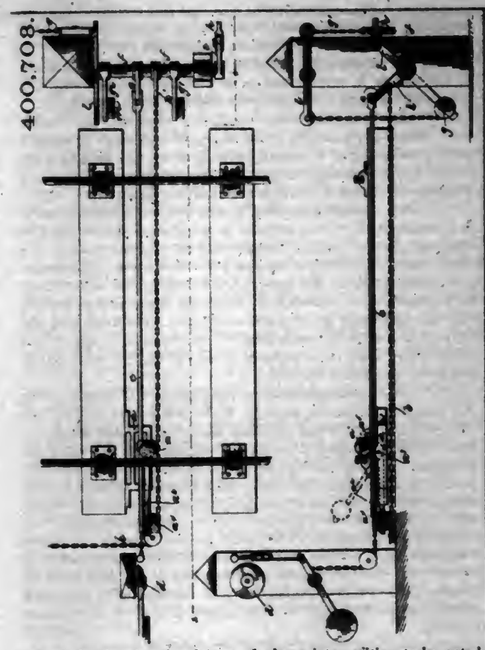


Claim.—The washing-machine comprising the compartment suds-box, the dasher hung therein and geared to an operating handle or lever arranged in its lesser compartment, and the pivoted longitudinally-arranged wings, the under sides of which, as also the opposite surfaces of the suds-box, are corrugated, which wings also stand off from the sides of the suds-box as well as being yielding, substantially as specified.

400,708. AUTOMATIC SIGNAL FOR RAILWAYS. JOSHUA OXLEY, 3 Harleston Cottages, Harleston Green, County of Middlesex, England. Filed Sept. 23, 1887. Serial No. 250,509. (No model.) Patented in England Feb. 26, 1886, No. 2,815.

Claim.—1. In a device for actuating railway alarm-signals, the combination, with the track, of a pivoted rocking lever carrying a globe forming a friction-wheel, and mechanism, substantially as described, for drawing the globe or the lever into position to be acted upon by the wheels of the car.

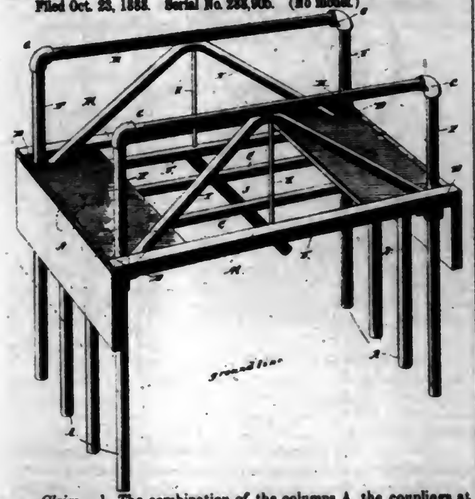
400,703.



2. In a device for actuating railway alarm-signals, the combination of a pivoted rocking lever carrying a globe, the alarm mechanism, substantially as described, actuated thereby, and the arm and lever connected to the operating-lever and adapted to operate a suitable recording-instrument, as set forth.

3. The mechanism for actuating railway alarm-signals and recording-instruments, consisting of a pivoted rocking lever on which is mounted on a horizontal axis a globe, arranged and operating substantially as and for the purpose set forth.

400,704. TRUSS-BRIDGE. JOHN W. PAMLEY, East Randolph, N. Y. Filed Oct. 23, 1888. Serial No. 288,905. (No model.)



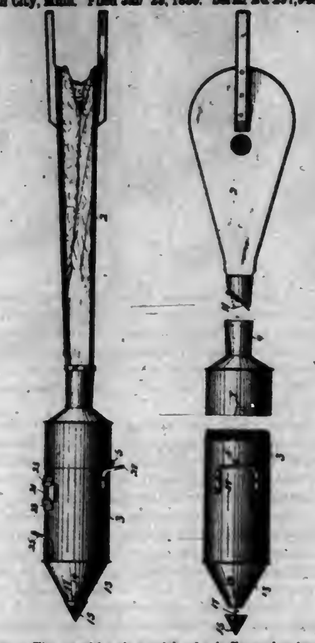
Claim.—1. The combination of the columns A, the couplings at the upper ends of some of the said columns, the elbows at the upper ends of the remaining columns, the tubular beams secured to and between said couplings and elbows, the standards secured to the couplings, the said standards being tubular, the elbows at the upper ends of the standards, and the tubular rails secured to and between said elbows, as set forth.

2. The combination of the tubular columns, the tubular beams secured to and between the upper ends of the columns, the tubular standards projecting upward from the outer columns, the tubular rails secured to and between said standards, the tubular cross-bar arranged beneath the beams at the centers of the same, the tubular braces, and the securing-rods inserted through the rails, the braces, the outer beams, and the ends of the cross-bar, as set forth.

3. In a bridge, the metallic columns A, of any desired number, the standards secured to and above the end columns, the longitudinal metallic beams C, secured to the intermediate columns A, the side longitudinal beams, E, secured to the end columns A, the metallic rails H, secured to the upper ends of the standards secured on the end columns A, and the cross-bar J, suspended from the rails H and arranged transversely across beneath the longitudinal beams, as set forth.

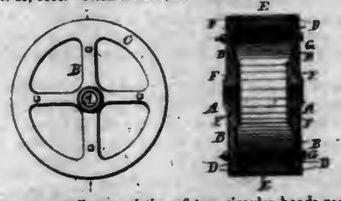
4. In a bridge, the metallic columns A, of any desired number, the standards secured to and above the end columns, the longitudinal metallic beams C, secured to the intermediate columns A, the metallic rails H, secured to the standards secured to the upper ends of the end columns A, and the cross-bar J, suspended from the rails H and arranged transversely across beneath the longitudinal beams C, the side longitudinal beams, E, secured to the end columns A below the rails H, and the braces I, connected to the end columns and bearing under the cross-rails H, as set forth.

400,705. GOPHER-EXTERMINATOR. MARTIN B. PARKER, Sibley Earth City, Minn. Filed Jan 29, 1889. Serial No. 297,943. (No model.)



Claim.—The combination, with the bellows having the inclined end and the valve 11, hinged upon said end, of the combustion-chamber 3, provided with a tube, 9, fitting upon the end of the bellows, and with a conical end, the conical spark-arrester fitting over the end of said combustion-chamber and provided with the fastening-hook 17, the ledges 23 upon the sides of the combustion-chamber, and the door 21, sliding under said ledges, all substantially as described, and for the purpose set forth.

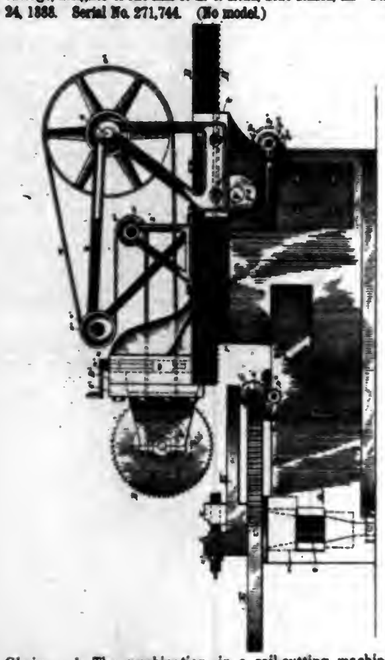
400,706. PULLEY. ROBERT C. PAUL, Cumberland, Md. Filed Nov. 15, 1888. Serial No. 290,963. (No model.)



Claim.—A pulley consisting of two circular heads provided with inwardly-projecting flanges and with hub portions, a series of tenoned staves inserted in said flanges between the heads and forming with the annular portions of the heads the face or periphery of the pulley, and screw rods and nuts for securing the heads and staves in position, substantially as described.

400,707. MACHINE FOR CUTTING RAILS.

THOMAS G. PERKINS, Chicago, assignor of one-half to R. C. Read, Blue Island, Ill. Filed Apr. 24, 1888. Serial No. 271,744. (No model.)



Claim.—1. The combination, in a rail-cutting machine, of a rotary cutter, a horizontally-reciprocating table carrying at one end the rotary cutter, and a stationary turn-table at one end of the machine provided with means for supporting a rail thereon, and serving to permit setting of the supported rail to any angle in the horizontal plane with reference to the vertical plane of the rotary cutter, substantially as described.

2. The combination, in a rail-cutting machine, of a rotary cutter, a horizontally-reciprocating table carrying at one end the rotary cutter, an adjustable stationary support for the rail toward the end of the forward stroke of the reciprocating table, and an angle-indicating attachment, substantially as and for the purpose set forth.

3. The combination, in a rail-cutting machine, of a rotary cutter, a horizontally-reciprocating table carrying at one end the rotary cutter, a stationary turn-table at one end of the machine, and provided with means for supporting a rail thereon, and serving to permit setting of the supported rail to any angle in the horizontal plane with reference to the vertical plane of the rotary cutter, and an angle-indicating attachment geared to the turn-table and operated by the rotation thereof, substantially as described.

4. In a rail-cutting machine, in combination with the bed A, a reciprocating table, B, carrying a saw, D, a rack, B', on the table B, a shaft, q, provided with a cog-wheel, q', in mesh with the rack and with a worm-wheel, q^2, a worm-shaft, p, having its worm in mesh with the wheel q^2, and a driving-shaft, p^2, geared to the shaft p, substantially as described.

5. In a rail-cutting machine, in combination with the bed A, a reciprocating table, B, carrying a saw, D, vertically adjustable on its support, substantially as described.

6. In a rail-cutting machine, in combination with the bed A, a reciprocating table, B, carrying a saw, D, a driving-shaft, o, supported on the bed and connected with the saw-shaft by an endless belt, and a compensator for the endless belt on the table B, substantially as described.

7. In a rail-cutting machine, in combination with the bed A, a reciprocating table, B, carrying a saw, D, on a rotary shaft, o', brackets y on the bed supporting rotary shafts o and o^3, a rotary shaft, o^4, supported on the table B, and an endless belt, m, connecting the shaft o and saw-shaft, and passing over the intermediate shafts, o^3 and o^4, to form a compensator, substantially as described.

8. In a rail-cutting machine, in combination with the bed, a reciprocating table, B, carrying a saw, D, and a turn-table, E, adjacent to the saw, and provided with means for holding the rail to be cut, substantially as described.

9. In a rail-cutting machine, in combination with the bed, a reciprocating table, B, carrying a saw, D, a turn-table, E, adjacent to the saw, and a guard, E', upon the turn-table, provided with a clamp for holding a rail to be cut, substantially as described.

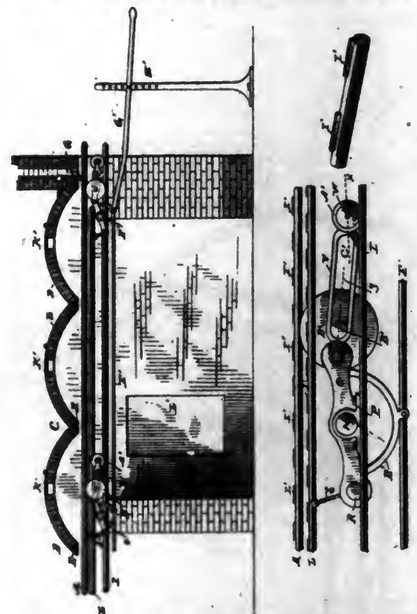
10. In a rail-cutting machine, in combination with the bed, a saw, D, a turn-table, E, having teeth on its periphery, a worm-shaft, i, in mesh with the teeth of the turn-table and carrying a cog-wheel, i', a rotary shaft, i^2, carrying a cog-wheel, i^3, in mesh with the wheel i', and a protractor, G, having a dial-finger, k^3, connected by suitable gearing with the shaft i^2, whereby rotation of the said shaft turns the table E and the dial-finger to indicate upon the protractor the angle to which the table E is turned, substantially as described.

11. In a rail-cutting machine, in combination with the bed, a saw, D, a turn-table, E, having teeth on its periphery, a worm-shaft, i, in mesh with the teeth of the turn-table and carrying a cog-wheel, i', a rotary shaft, i^2, carrying a cog-wheel, i^3, in mesh with the wheel i', a miter-gear, g', and a dial-finger, g^3, a stationary dial, H, surrounding the shaft i^2, a worm-shaft, k, carrying a miter-gear, g, in mesh with the miter-gear g^2, a rotary worm-wheel, k', in mesh with the worm on the shaft k and on an arbor, k^2, carrying a dial-finger, k^3, and a protractor, G, supported adjacent to the dial-finger k^3, substantially as and for the purpose set forth.

12. In a rail-cutting machine, in combination with the bed, a saw, D, a turn-table, E, having teeth on its periphery, a worm-shaft, i, in mesh with the teeth of the turn-table and carrying a cog-wheel, i', a rotary shaft, i^2, carrying a cog-wheel, i^3, in mesh with the wheel i', a miter-gear, g', a cog-wheel, g^6, and a dial-finger, g^3, a stationary minute-dial, H, surrounding the shaft i^2 and having a seconds-dial, H', marked upon it, a shaft, e', carrying a pinion, e^2, in mesh with the wheel g^6 and a cog-wheel, e, an arbor, f, carrying a dial-finger, g^4, for the dial H', and a pinion, f', in mesh with the cog-wheel e, a worm-shaft, k, carrying a miter-gear, g, in mesh with the miter-gear g^2, a rotary worm-wheel, k', in mesh with the worm on the shaft k and on an arbor, k^2, carrying a dial-finger, k^3, and a protractor, G, supported adjacent to the dial-finger k^3, substantially as and for the purpose set forth.

400,708. DEVICE FOR CONVEYING SHEETS OF GLASS THROUGH THE ANNEALING-TUNNEL.

PETER PFEIFER, Durhamville, N. Y. Filed Sept. 29, 1887. Serial No. 251,027. (No model.)



Claim.—1. In a device for conveying sheets of glass through the annealing-tunnel, the combination, with the tunnel, of horizontal bars extending longitudinally therethrough, connected levers pivoted centrally upon said bars, a series of longitudinal conveying-rods supported at their ends by one end of said levers, links, each link being pivoted at one of its ends to the other end of one of the aforesaid levers, a second set of bars, disks carried by the links to support the last-named bars, and devices for rocking the levers, as set forth.

2. In a device for conveying sheets of glass through the annealing-tunnel, the combination, with the tunnel, horizontal bars extending longitudinally through the tunnel, rocking levers pivoted centrally upon the bars, links, each link pivoted to one end of the levers, and the free end of the link resting upon the aforesaid bars, said links having carrying-disks loosely mounted therein, and a series of longitudinal conveying-rods supported by the disks, and devices adapted to operate the levers in unison, as set forth.

3. In a device for conveying sheets of glass through the annealing-arch, the combination of horizontal bars extending longitudinally in the tunnel, rocking levers pivoted on said bars, links connected at one end to the rocking levers and loosely supported on the horizontal bars at the other, horizontal axles supported loosely by said links, disks or wheels mounted upon said axles, a series of longitudinal conveying-rods supported by said disks or wheels, and devices for operating the levers, as set forth.

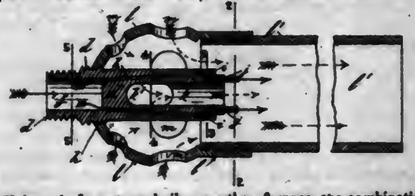
4. In devices for conveying sheets of glass through the annealing tunnel, the combination of the tunnel, horizontal bars extending through the tunnel, cross-shafts pivoted on said longitudinal bars, levers pivoted on each end of said shafts, slotted links pivoted at one end to one end of the levers and resting loosely at the other end on the horizontal bars, a series of horizontal axles supported loosely by said links and adapted to roll therein in the direction of the length of the tunnel, a series of wheels centered upon said axles and a series of longitudinal conveying-rods supported upon said wheels, and devices for operating the levers in unison, as set forth.

5. In a device for conveying sheets of glass through the annealing-tunnel, the combination, with the tunnel, of horizontal bars extending longitudinally therethrough, connected levers centrally pivoted upon said bars, a series of longitudinal conveying-rods support one end of said levers, a series of links, each link being pivoted at one of its ends to the other end of one of the aforesaid levers, the free end of the links resting on the aforesaid bars, a series of horizontal axles supported loosely by said links and adapted to roll thereon in the direction of the length of the tunnel, a series of wheels centered upon said axles, a second series of longitudinal conveying-rods supported upon said wheels, and devices to operate the aforesaid levers in unison, as set forth.

6. In devices for conveying sheets of glass through the annealing-tunnel, the combination, with the tunnel, of horizontal bars extending longitudinally therethrough, connected levers centrally pivoted upon said bars, a series of longitudinal conveying-rods supported by one end of said levers, a series of links, each link being pivoted at one of its ends to the other end of one of the levers, wheels connected to the free end of the links and resting upon the bars, a series of horizontal axles supported loosely by said links and adapted to roll therein in the direction of the length of the tunnel, a series of wheels or disks centered upon said axles, a second series of longitudinal conveying-rods supported upon said wheels, and devices for operating the levers in unison, as set forth.

400,709. SMOKE-PREVENTER FOR FURNACES.

HENRY R. PRESCOTT, St. Louis, Mo., assignor, by direct and mesne assignments, of part interest to Edward B. Roth and William H. Barnett, both of same place. Filed Jan. 21, 1889. Serial No. 296,980. (No model.)



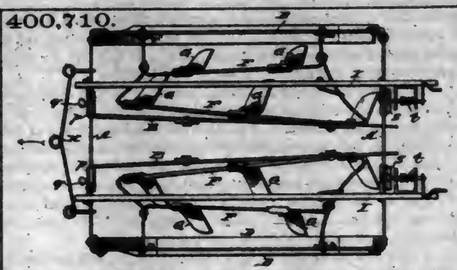
Claim.—1. In a steam-boiler or other furnace, the combination of a nozzle, d, having inlet steam-chamber f, communicating by passages h with annular space i, and outlet annular passage j, and having a central passage, k, receiving air through inlet-openings k', with means for admitting steam to chamber f, substantially as shown, and for the purpose described.

2. In a steam-boiler or other furnace, the combination of a nozzle, d, having inlet steam-chamber f, passages h, annular space i, outlet annular passage j, and central passage, k, having inlet-openings k', hood or casing l, surrounding the nozzle d, and having openings m for receiving air, with means for admitting steam to chamber f, substantially as shown, and for the purpose described.

3. In a steam-boiler or other furnace, the combination of a nozzle, d, having inlet steam-chamber f, passages h, annular space i, outlet annular passage j, and central passage, k, having inlet-passages k', hood or casing l, surrounding the nozzle d, and having extension-pipe e and openings m, with means for admitting steam to chamber f, substantially as shown, and for the purpose described.

400,710. CORN-PLOW.

WILLIAM GUILLEN and FRANCIS A. DAKE, Almena, Kans. Filed Dec. 28, 1888. Serial No. 294,897. (No model.)

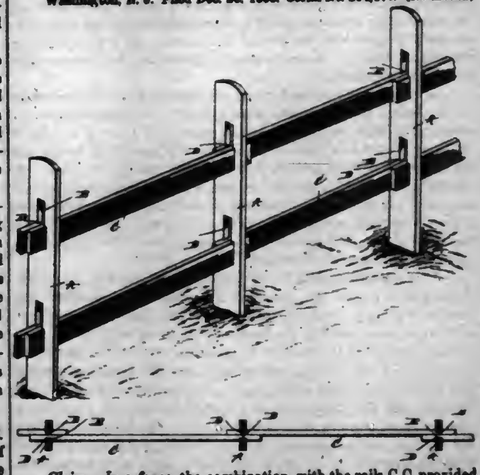


Claim.—1. A plow or cultivator consisting of upwardly-arched end frames, A A', longitudinal side bars, B B, standards C C, runners D, arranged at the lower ends of the standards, the longitudinal guard-blades E E', the blades or shovels G, and the frames F F, placed between and connected to the standards and guard-blades, substantially as shown and described.

2. The combination, with the arched end frames, A A', of the two handles I I, connected thereto, the link-rods r, and the shovels, substantially as shown and described.

400,711. FENCE.

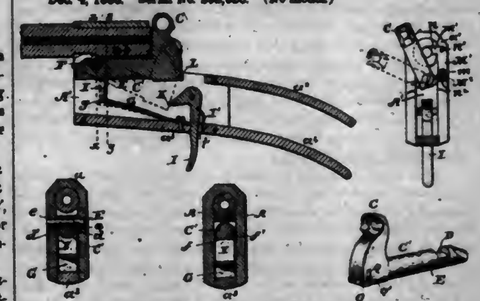
ROBERT J. REIMER, Belvidere, N. J., assignor of one-fourth to Jacob V. Carter, same place, and Joseph B. Cornish, Washington, N. J. Filed Dec. 20, 1888. Serial No. 294,177. (No model.)



Claim.—In a fence, the combination, with the rails C C, provided with transverse grooves D D, equal in depth to half the thickness of a rail, of the posts provided with the vertical openings or slots B B, equal in length to twice the width of a rail and equal in width to the thickness of a rail, all constructed and combined substantially as and for the purpose specified.

400,712. BREECH-LOADING FIRE-ARM.

CHARLES M. RIDER, Newark, Ohio, assignor of one-half to William Baker, same place. Filed Dec. 4, 1888. Serial No. 292,630. (No model.)



Claim.—1. In a breech-loading fire-arm, the combination, with the breech of the barrel, of a combined breech-block and hammer pivoted to permit of a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech, substantially as shown and described.

2. In a breech-loading fire-arm, the combination, with the breech of the barrel, of a combined breech-block and hammer pivoted to permit of a swinging motion in a plane at an angle to the face of the

breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech, and a spring holding said combined breech-block and hammer normally against said face, substantially as shown and described.

3. In a breech-loading fire-arm, the combination, with the breech of the barrel, of a combined breech-block and hammer pivoted to permit of a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech, a spring holding said combined breech-block and hammer normally against said face, and a trigger adapted to engage the breech-block and hammer and hold the same in a cocked position against the tension of the spring, substantially as shown and described.

4. In a breech-loading fire-arm, the combination, with the breech of the barrel, of a combined breech-block and hammer having a shank pivoted to permit said breech-block and hammer to have a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech, substantially as shown and described.

5. In a breech-loading fire-arm, the combination, with the breech of the barrel, of a combined breech-block and hammer having a shank pivoted to permit said breech-block and hammer to have a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech, and a spring holding the breech-block and hammer normally against said face, substantially as shown and described.

6. In a breech-loading fire-arm, the combination, with the breech of the barrel, of a combined breech-block and hammer having a shank pivoted to permit said breech-block and hammer to have a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech, a spring holding said combined breech-block and hammer normally against said face, and a trigger adapted to engage the breech-block and hammer and hold the same in a cocked position against the tension of the spring, substantially as shown and described.

7. In a breech-loading fire-arm, the combination, with the breech-frame and breech of the barrel, of the combined breech-block and hammer having a shank provided with a notch near its forward end, a fulcrum-pin mounted in the frame and engaging with said notch, a mainspring holding the shank in engagement with its fulcrum-pin and the combined breech-block and hammer normally against the face of the breech, and a trigger adapted to engage the breech-block and hammer and hold the same in a cocked position, all constructed, arranged, and operating substantially as shown and described, whereby the breech-block and hammer may have a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech.

8. In a breech-loading fire-arm, the combination, with the breech-frame and the breech of the barrel, of a combined breech-block and hammer having a shank provided with a notch in the upper side of its forward end, having its bottom in two different planes at an angle to each other, a fulcrum-pin mounted in the frame and engaging with said notch, a notch on the under side of the shank having its bottom formed in two different planes at an angle to each other, a mainspring secured in the frame, a link engaging at one end with the mainspring and at its other end with the notch in the under side of the shank, and a trigger adapted to engage the breech-block and hammer and hold it in a cocked position against the tension of the spring, all constructed, arranged, and operating substantially as shown and described, whereby the breech-block and hammer may have a swinging motion in a plane at an angle to the face of the breech and an axial motion which permits it to be turned laterally in a plane substantially parallel with the face of said breech.

9. In a breech-loading fire-arm, the combination, with the breech-frame and breech of the barrel, of the combined breech-block and hammer C, having the shank C', provided on its upper side near its forward end with the notch D, having its bottom formed in two different planes, *d* and *d'*, at an angle to each other, and on its under side with the notch F, having its bottom formed in two different planes, *f f'*, at an angle to each other, the fulcrum-pin E, mounted in the frame and engaging with the notch D, the mainspring G, the link H, engaging at one end with the end of the spring H and at its other end with the notch F, and the trigger I, adapted to engage the combined breech-block and hammer and hold it in a cocked position against the tension of the spring, all constructed, arranged, and operating substantially as shown and described.

10. In a breech-loading fire-arm, the combination, with the breech-frame and the breech of the barrel, of the combined breech-block and hammer C, having the shank C', provided on its upper side near its forward end with the notch D, having its bottom formed in two different planes, *d d'*, at an angle to each other, the fulcrum-pin E, engaging with the notch D and normally resting against the plane *d*, and a spring holding said shank in engagement with its fulcrum-pin and permitting said shank to have an axial movement, whereby, as said combined breech-block and hammer is turned laterally, when the fulcrum-pin engages the plane *d'* the piece will be held in a safety or half-cocked position, substantially as shown and described.

11. In a breech-loading fire-arm, the combination, with the breech-frame and breech of the barrel, of a combined breech-block and hammer, C, having the shank C', provided with a fulcrum-pin mounted in the frame and having a notch, F, on its under side, having its bottom formed in two different planes, *f f'*, at an angle to each other, the spring G, and the link or block H, secured on the end of said spring and having its upper end in engagement with the notch F and normally resting against the plane *f*, said spring permitting the shank to have an axial movement, all constructed, arranged, and operating substantially as shown and described.

12. In a breech-loading fire-arm, the combination, with the breech-frame and breech of the barrel, of a spring extractor-lever pivoted to the frame at one side of the breech and having one end adapted to engage the rim of a shell when inserted in the barrel, and a breech-block pivoted to permit of a lateral movement with relation to the breech and adapted when moved laterally to engage the spring-extractor and operate the same, substantially as shown and described.

13. In a breech-loading fire-arm, the combination, with the extractor-lever M, pivoted to the breech-frame and having one end adapted to engage the rim of a shell and provided with the spring-arm M^2, of the breech-block C, pivoted to permit of a lateral movement with relation to the breech and adapted when turned laterally to engage said spring-arm and lift it against its tension to cause it to operate the extractor when released from the breech-block, substantially as shown and described.

14. In a breech-loading fire-arm, the combination, with the breech of the barrel, the extractor-lever M, pivoted to the breech-frame and having a projecting end, *m'*, normally resting in the recess *n* in the breech of the barrel, and having the spring-arm M^2, of the breech-block C, pivoted to permit of a lateral movement with relation to the breech and provided with the spring-actuated dog *o*, adapted to engage said spring-arm M^2 as the breech-block is turned laterally and operate the extractor, all constructed, arranged, and operated substantially as shown and described.

400,718. DENTAL ARTICULATOR. WILLIE P. SLACK and GEORGE A. SMITH, Lawrence, Mass. Filed Jan. 11, 1889. Serial No. 296,066. (No model.)



Claim.—1. In a dental articulator, the supporting-frame having the holes or sockets 6 6 for the reception of pins or dowels affixed to the lower mold, combined with the pivoted or hinged frame having the holes or sockets 6 6 for the reception of pins or dowels affixed to the upper mold, as set forth.

2. The combination of the lower frame having rods 8 8, the upper frame having sleeves jointed or swiveled to its ends, whereby the upper mold is enabled to rise and fall, said sleeves having orifices fitting loosely on the rods 8 8, whereby the upper mold is enabled to swing laterally, as set forth.

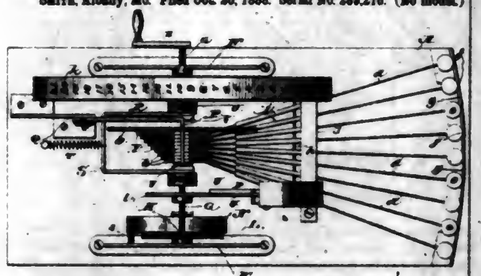
3. The combination of the lower frame having the rods 8 8, the upper frame having sleeves jointed to its ends, (said sleeves embracing the rods 8 8,) and a spring whereby said sleeves are normally held with a yielding pressure against the lower frame, as set forth.

4. The combination of the lower frame having the rods 8 8, the upper frame having a pivotal connection with the lower frame and provided with an ear, *m*, having a tapped socket, and an adjusting-screw engaged with said socket and bearing on a portion of the lower frame, whereby the downward movement of the upper mold may be adjusted, as set forth.

5. The improved dental articulator composed of the supporting-frame *a*, having the rods 8 8 and the detachable pins or dowels 7 7, the upper frame, *b*, having the sleeves *u u*, jointed or pivoted to its ends, said sleeves being adapted to slide and move laterally on the rods 8 8, the detachable pins or dowels on the upper frame, the controlling-spring *i*, and the adjusting screw or stop *s*, all arranged and operating substantially as set forth.

6. The combination of the lower frame, *a*, the lower cast supporting-arm, 4, made in a separate piece from said arm, and a screw, *s*, connecting said arm and frame, as set forth.

400,714. ADDING-MACHINE. JOHN G. SMITH and GEORGE W. SMITH, Albany, Mo. Filed Oct. 26, 1888. Serial No. 289,216. (No model.)



Claim.—1. In an adding-machine, the combination of the spring actuated main shaft, the indicator-wheel carried thereby, the ratchet-wheel rigidly secured thereto, the pawl engaging said wheel to prevent movement of the shaft, a series of trip-levers adapted to disengage the pawl from the ratchet-wheel and to hold it disengaged therefrom for periods of different lengths, and a series of operating-levers adapted to actuate the trip-levers, as set forth.

2. The combination of the main shaft, the indicator-wheel carried thereby, the spring adapted to actuate said shaft, the ratchet-wheel mounted on the main shaft, the pawl engaging the ratchet-wheel, a series of trip-levers loosely mounted on the main shaft and provided at their upper ends with arcs of varying lengths bearing against the pawl and adapted to disengage it from the ratchet-wheel, and a series of operating-levers adapted to actuate said trip-levers, as set forth.

3. The combination of the main shaft, the spring to actuate the same, the indicator-wheel carried thereby, the ratchet-wheel rigidly secured to said shaft, the pawl engaging the ratchet-wheel, the trip-levers loosely mounted on the shaft and adapted to disengage the pawl from the ratchet-wheel, the yoke loosely mounted on the main shaft, the transverse rod connecting said yoke to the lower ends of the trip-levers and engaging the ratchet-wheel, a spring to hold said yoke in its normal position, and a series of operating-levers adapted to actuate the trip-levers, as set forth.

4. The combination of the main shaft having a crank at one end, a volute spring connected by gearing to the other end of the shaft and adapted to actuate the same, the ratchet-wheel rigidly mounted on the shaft, the pawl engaging said ratchet-wheel, a series of trip-levers adapted to disengage the pawl from the ratchet-wheel and thereby control the rotation of the shaft, and a series of operating-levers adapted to actuate the trip-levers, as set forth.

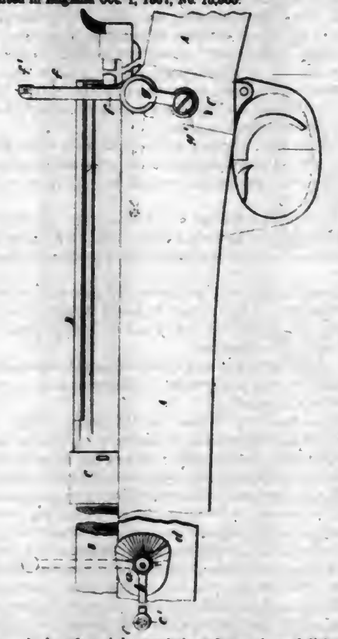
5. The combination of the spring-actuated main shaft, the indicator-wheel carried thereby, the ratchet-wheel rigidly secured thereon, the pawl engaging the ratchet-wheel, the trip-levers loosely mounted on the main shaft and having longitudinal slots in their lower ends, the yoke loosely mounted on the main shaft and having depending arms, the rod secured in said arms, passing through the slots in the trip-levers, and engaging the ratchet-wheel, and the operating-levers connected with the trip-levers to actuate the same, as set forth.

6. The combination of the spring-actuated main shaft, the indicator-wheel carried thereby, the ratchet-wheel secured rigidly thereon, the pawl engaging the ratchet-wheel, the series of trip-levers loosely mounted on the main shaft and having arcs at their upper ends of varying lengths, the said arcs having the stops *x* and bearing against the pawl, the yoke loosely mounted on the main shaft, the rod carried by the yoke, passing through the trip-levers, and engaging the ratchet-wheel, and the operating-levers connected with the trip-levers, as set forth.

7. The combination of the spring-actuated main shaft, the indicator-wheel carried thereby, the ratchet-wheel secured on the shaft, the standard Q, the pawl pivoted thereon and engaging the ratchet-wheel, the trip-levers mounted on the main shaft and bearing against the pawl, the yoke loosely mounted on the shaft and connected with the trip-levers, the spring secured to the yoke to hold it normally lowered, the operating-levers, and the connecting-rods having their lower ends pivoted to the operating-levers and their upper ends pivoted to the trip-levers at about the centers of the same, as set forth.

8. The combination of the main shaft, mechanism for rotating the same, the disk secured on said shaft, having a single notch in its edge and a single tooth projecting from its edge, the standard in front of the main shaft, the disk journaled on said standard and having a series of notches in its edge and a single tooth projecting from its edge, and having a series of recesses in its side, the indicator-plate secured to the edge of the last-mentioned disk, and the spring secured to the standard and provided with a pin engaging one of the recesses in the side of the disk, as set forth.

400,715. SIGHT FOR FIRE-ARMS. JOSEPH J. SPEED, Waltham Cross, England. Filed Jan. 7, 1889. Serial No. 295,640. (No model.) Patented in England Oct. 1, 1887, No. 13,335.

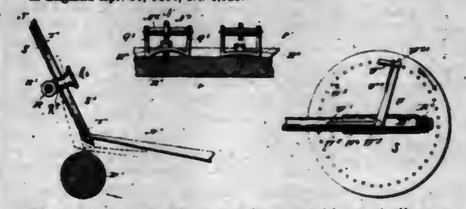


Claim.—1. In a fore sight consisting of a graduated disk mounted at the side of the gun, and a sight-supporting bar pivoted in said disk and having an indicator registering with the graduations on said disk, substantially as described.

2. The combination, with a fire-arm, of a fore sight consisting of an arm carrying a suitable sight adjustably pivoted with respect to a graduated scale or dial, substantially as described, and a rear sight consisting of a pivoted arm having a peep-hole, and a spring to sustain said arm in a fixed position, substantially as described.

3. The combination, with a fire-arm, of a fore sight consisting of a dial, *a*, and a pivoted arm, *b*, registering therewith and carrying a suitable sight, a rear sight carried by an arm, *f*, and a spring, *g*, for supporting said arm in elevated position, substantially as described.

400,716. TYPE-WRITING MACHINE. CHARLES SPIRO, New York, N. Y. Filed Apr. 15, 1887. Serial No. 234,905. (No model.) Patented in England Apr. 30, 1887, No. 6,325.



Claim.—1. A bracket for a type-bar, comprising a yielding convex base provided with upwardly-projecting sides, substantially as specified.

2. The combination, with the type-bar having lateral pivots or bearings, of a support consisting of a yielding convex base provided with projecting sides, perforated for the reception of the pivots, and an attaching device passing through the base into a suitable table or foundation, substantially as specified.

3. The combination of a suitable foundation having a groove the front and rear walls of which are parallel and curved on circles having a common center, with a type-bar having lateral pivots, and with a type-bar-supporting bracket having a convex base of a width agreeing with that of the groove in the foundation, and having projecting

sides adapted to receive the type-bar pivots, and a fastening device passing through the convex base of the bracket and into the foundation, substantially as specified.

4. In combination with the platen and type-bars of a type-writing machine, an inclined tilting rotatable ink-disk, with its edge arranged in the path of the free end of the type-bars, and a disk-tilting spring, substantially as specified.

5. The combination, with the platen and type-bars of a type-writing machine, of a flanged rotatable and tilting inking-disk arranged to project into the path of the type, substantially as specified.

6. The combination, with the pawl and rack of the feed mechanism of the carriage, of a pawl-carrying lever, a double bail, a series of key-levers suitably notched and arranged above the bail, and suitable devices for directly connecting the double bail with the pawl-carrying lever, substantially as specified.

7. An inking-plate provided with an outwardly-flared flange, in combination with printing-characters constructed and arranged, substantially as specified, to come into contact with said flange with their faces parallel to it.

8. An inking-disk provided with a flange and centrally pivoted at a point to present the flange in a plane substantially agreeing with that of the face of the type when inked thereby, substantially as specified.

9. The combination, with the key-levers K and with the type-bars connected therewith, of the carriage D, having the rack I, the double bail L, having the arm L^3, the pawl J and its pivoted lever, and the rod L^4, substantially as specified.

10. The plate P, provided with a series of parallel circular grooves, and perforated between the grooves for the passage of connecting-rods, substantially as specified.

11. The combination, with the plate P, having circular annular grooves and intermediately-arranged apertures, of type-bar brackets arranged within the grooves, type-bars mounted therein, and connecting-rods passing through the apertures, substantially as specified.

12. The combination of the bracket R, a sleeve mounted thereon, an inking-disk mounted on the sleeve and projecting into the path of the type, and an inking-disk-returning device, substantially as described, for bringing the disk to its normal position after having been depressed by a type, substantially as and for the purpose specified.

13. The combination, with the bracket, the sleeve pivotally mounted thereon, and the disk pivotally mounted on the sleeve, of disk-rotating mechanism, substantially as described, mounted on the sleeve, substantially as specified.

14. The combination of the bracket, the sleeve mounted thereon, the inking-disk mounted on the sleeve, and a pawl-carrying lever mounted on the sleeve, and having a projecting arm and stops arranged on the bracket in the path of the arm, substantially as and for the purpose specified.

400,717. THERMOMETER-CASE. CHARLES J. TAGLIABUE, Brooklyn, N. Y. Filed Dec. 13, 1888. Serial No. 293,436. (No model.)



Claim.—1. A case for thermometers, provided at each of its ends with an elastic pad having a portion extending into the case, a portion extending beyond the case, and a flange engaging the edge of the case, substantially as described.

2. A case for thermometers, provided at each of its ends with an elastic pad having a portion extending into the case, a portion extending beyond the case, and a flange engaging the edge of the case, said flanges being of such width as to form an elastic rest for the case when the case falls lengthwise, substantially as described.

3. A case for thermometers, provided at each of its ends with an elastic pad having a portion extending beyond the case, a hollow portion provided with a slide and spring extending into the case, and a flange engaging the edge of the case, substantially as described.

400,718. STEAM-TRAP. WALTER A. TAYLOR, New Orleans, La., assignor to Taylor Brothers, same place. Filed Oct. 23, 1888. Serial No. 288,969. (No model.)

Claim.—1. In a steam-trap, the combination, with a condensed-water vessel having a discharge located outside thereof below the water-level, a weighted float in the vessel having a stem rising through the top thereof, a lever pivoted above and outside the casing and connected with the float-stem, and an external rigid rod connecting the lever to the stem, of the external valve for moving the valve in unison with any movement of the lever, and a lever-stop, bracket, and guide rising from a support on the top of the vessel and adjustable lengthwise in a vertical plane on said support to enable the water to be carried at different levels above the discharge-valve, substantially as described.

2. In a steam-trap, the combination, with a condensed-water vessel having an external discharge-valve, a lever pivoted above the vessel and connected with the float, and an external rigid connection between the lever and the valve-stem which moves the valve in unison with any movement of the lever, of a supporting-bracket rising from the top of the vessel, a stop-bracket and guide for the lever, having a stem movable lengthwise in a vertical plane in the supporting-bracket, and means for rigidly locking the stem and supporting-bracket together, substantially as described.

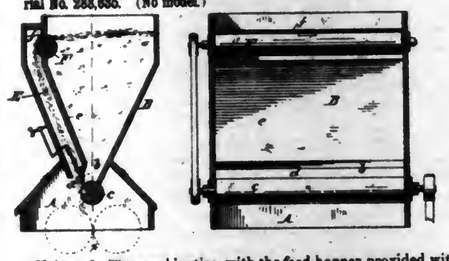
400,719. MEDICINE-SPOON REGISTER. HOWARD W. WELLS, Poughkeepsie, N. Y., assignor of one-half to John G. Collingwood, same place. Filed May 9, 1888. Serial No. 273,350. (No model.)



Claim.—1. A medicine-spoon in combination with a time and dose register, consisting of a revolving time-dial and a pointer or index-hand to indicate the dose, all constructed upon a clamp-shaped base-plate, so as to be independently movable, as and for the purpose described.

2. A clamp-plate adapted to engage with a spoon-handle, a revolving dial marked with hours or portions thereof and pivoted on the clamp-plate, so that any hour-mark may be brought opposite a mark on the clamp-plate, together with an index-hand or dose-indicator moving independently upon the revolving dial, in combination with a spoon, for the purpose of indicating the time for giving medicine and the character of the dose, substantially as described.

400,720. FEED-REGULATOR. JOHN B. WHEATLEY, Detroit, Mich., assignor to August Heine, Silver Creek, N. Y. Filed Oct. 20, 1888. Serial No. 288,635. (No model.)



Claim.—1. The combination, with the feed-hopper provided with a discharge-opening, of a partition forming an overflow-passage communicating with the upper end of the feed-hopper and a distributing-roller whereby the material is uniformly discharged from the upper end of the feed-hopper into the overflow-passage, substantially as set forth.

2. The combination, with a feed-hopper provided with a discharge-opening, of a partition arranged within the hopper and forming an overflow-passage on one side of the hopper, an opening arranged near the upper end of said partition between the hopper and overflow-passage, and a distributing device arranged in said opening, substantially as set forth.

400,721. SHIRT-WAIST. EDWARD W. WHEELER, Chicago, Ill., assignor to A. L. Singer & Co., same place. Filed Oct. 27, 1887. Serial No. 253,501. (No model.)

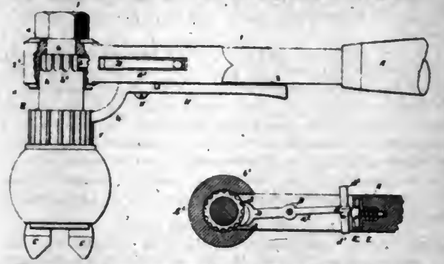
Claim.—The combination, in a waist, of a cloth body, A, extending below the waist-line, a waistband sewed to the outer surface of the cloth body, said waist being provided with eyelets extending through said band and cloth body, buttons for said waist provided

400,721.



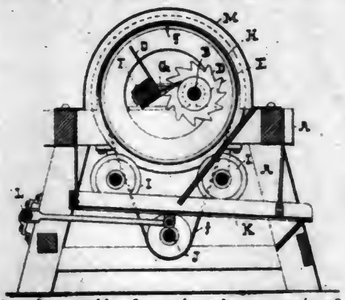
with shanks extending through said eyelets, a fastening device for securing the button-shanks upon the interior of the garment, and a strip, G, secured at its upper edge to the garment inside the latter and forming a flap to cover the fastenings for the button-shanks, whereby the body of the person is protected from contact with the button-shanks, substantially as described.

400,722. RATCHET-WRENCH. WILLIAM H. WHITMORE, Cleveland, Ohio. Filed June 23, 1888. Serial No. 277,939. (No model.)



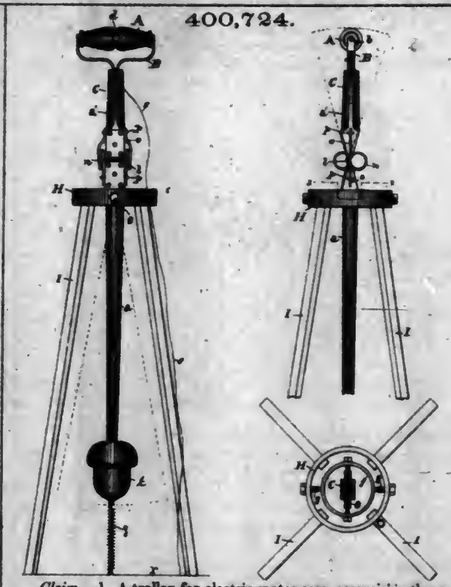
Claim.—In a ratchet-wrench, the combination, with a lever, a spindle journaled therein, and pawl mounted on the lever and engaging the spindle for operating the latter, of a sleeve mounted on the spindle for compressing the jaws of the latter, and a dog mounted on the lever and adapted to engage the sleeve for moving the latter up or down, substantially as set forth.

400,723. TOBACCO-CUTTER. JOHN B. ADT, Baltimore, Md. Filed Oct. 4, 1888. Serial No. 287,210. (No model.)



Claim.—In a machine for cutting tobacco, a series of revoluble saws, combined with a fixed comb placed at an angle with reference to a line drawn from the center of the said saws through the base or support for the said comb, a deflecting device which consists of a plate which extends from the upper surface of the said comb and falls back at an angle from the vertical, and an inclosing revoluble cylindrical sieve, substantially as and for the purpose specified.

400,724. TROLLEY FOR ELECTRICAL RAILWAYS. DAVID A. ASHLEE, Richmond, Va. Filed Apr. 12, 1888. Serial No. 270,420. (No model.)



Claim.—1. A trolley for electric-motor cars, comprising the combination of a standard, I, provided at its top with a gimbal-ring, a staff mounted on a pivot in said gimbal-ring with its lower end free, so as to have a swinging movement in all directions, and a cylinder on the upper end of the staff.

2. A trolley for electric-motor cars, comprising the combination of a staff made in two sections which are united by a spring-joint, a supporting-pivot attached to the lower section, and a cylinder on the upper end of the top section.

3. A trolley for electric-motor cars, comprising the combination of a staff made in two sections, which are united by a joint or hinge, a supporting-pivot attached to the lower section, a spring at the said joint or hinge to retain the top section upright, and a cylinder on the upper end of the top section.

4. A trolley for electric-motor cars, comprising the combination of a staff made in two sections which are united by a spring-joint, a gimbal-ring supporting the said staff, and a cylinder on the upper end of the top section.

5. A trolley for electric-motor cars, comprising the combination of a gimbal-ring, a staff mounted on a pivot in said gimbal, so as to have a swinging movement in all directions, a cylinder on the upper end of the staff, and a weight attached to the bottom of the staff.

6. A trolley for electric-motor cars, comprising the combination of a gimbal-ring, a staff mounted on a pivot in said gimbal, so as to have a swinging movement in all directions, a cylinder on the upper end of the staff, a weight attached to the bottom of the staff, and a spring connecting the lower end of the weighted staff with the car-top.

400,725. TROLLEY FOR ELECTRIC RAILWAYS. DAVID A. ASHLEE, Richmond, Va. Filed July 27, 1888. Serial No. 281,902. (No model.)

Claim.—1. A trolley-cylinder, A, for electric-motor cars having a circumferential groove, *c*, around its greatest diameter, and provided with a tapered side which has disconnected spirals leading up to the said circumferential groove, for the purpose set forth.

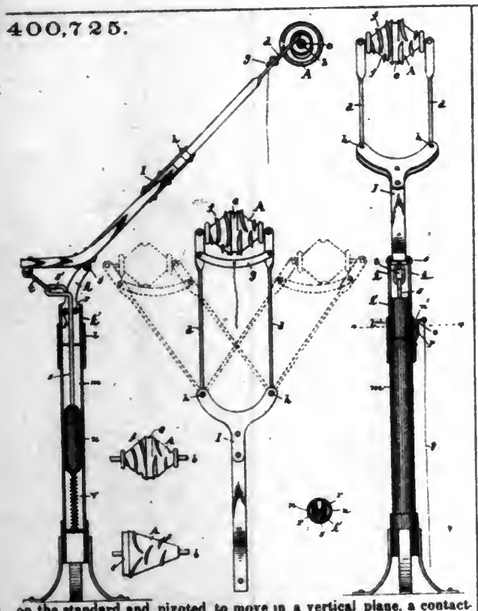
2. A trolley-cylinder, A, for electric-motor cars, having a greater diameter at the center than at the end and tapered from said center toward the end, and provided at the center with a groove, *c*, which extends all around, and on the tapered side with segment grooves or ridges *f*, which are disconnected from each other, but which lead up to the said center groove, for the purpose set forth.

3. The combination of a trolley-staff, I, pivoted to move in a vertical plane, arms *d*, connected by pivots *h* to the trolley-staff, so as to swing laterally, and a contact-cylinder mounted to revolve in bearings at the ends of said pivoted arms, as set forth.

4. The combination of a standard, a trolley-staff, I, mounted on the standard and pivoted so as to move in a vertical plane, arms *d*, connected by pivots *h* to the trolley-staff, so as to swing laterally, a contact-cylinder mounted to revolve in bearings at the ends of said pivoted arms, and a weight pulling down on the trolley-staff, as set forth.

5. The combination of a tubular standard, a trolley-staff mounted

400,725.



on the standard and pivoted to move in a vertical plane, a contact-cylinder, a weight in the tubular standard, and means for suspending the said weight to the trolley-staff.

6. The combination of a tubular standard, a trolley staff mounted on the standard and pivoted to move in a vertical plane, a contact-cylinder, a rod passing from the top down into the tubular standard, and provided at its upper end with a laterally-projecting loop, a link, *t*, connecting the trolley-staff and said loop, and a weight suspended from the rod in the tubular standard.

7. The combination of a tube-socket provided with a spring having a pin or lug, *p*, a pivot-arm attached to a section, *l'*, which occupies said socket and may be turned therein, a trolley-staff, I, on the pivot-arm and capable of turning in a vertical plane, and a contact-cylinder.

8. The combination of a tubular standard, a tube-socket on top of the standard, pivot-arm having a tube-section which may turn in the tube-socket, a trolley-staff mounted on said pivot-arm, a contact-cylinder, a rod passing from the top down into the tubular standard and provided at its upper end with a laterally-projecting loop, a link, *t*, connecting the trolley-staff and said loop, and a weight suspended from the rod in the tubular standard.

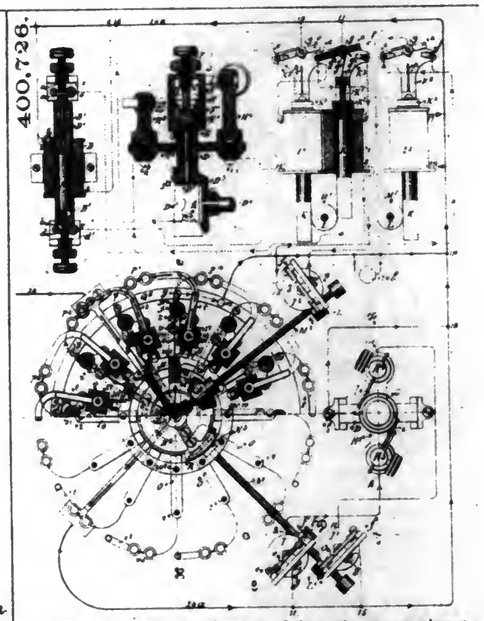
400,726. **METHOD OF REGULATING ELECTRIC CURRENTS.** JOSEPH W. BALET, New York, N. Y., assignor of one-half to Robert Dunlap and Luke F. Comma, same place. Filed Jan. 21, 1888. Renewed Mar. 9, 1889. Serial No. 302,743. (No model.)

Claim.—1. The method of regulating electric currents automatically, which consists in conveying the main current or a portion of the main current into one or more storage-batteries, so as to absorb the surplus energy of the main current when the main current is too strong to do the work, and adding the current of as many storage-batteries to the main current as may be necessary to supply the deficiency of electrical energy in the main circuit when the main current is too weak to do the work, substantially as specified.

2. The method of regulating electric currents automatically, which consists in conveying the main current or a portion of the main current into storage-batteries, so as to absorb the surplus energy of the main current when the main current is too strong to do the work, and cutting out the fully-charged storage-batteries from the charging-current by causing the circuit of the charged batteries to open and disconnecting the storage-batteries from the main circuit when the main current corresponds to the work to be done, substantially as specified.

3. The method of regulating electric currents automatically, which consists in conveying the main current or a portion of the main current into storage-batteries, so as to absorb the surplus energy of the main current when the main current is too strong to do the work, and cutting out the fully-charged storage-batteries only from the charging-current by causing the circuit of the charged batteries only to open when a charging-current will flow through them, and disconnecting the storage-batteries from the main circuit when the main current corresponds to the work to be done, and adding the current of the storage-batteries to the main current as may be necessary to

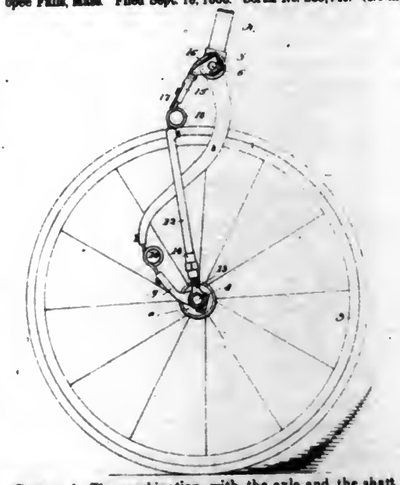
400,726.



supplement the deficiency of energy of the main current when the main current is insufficient for the work to be done, substantially as specified.

4. The method of regulating electric currents automatically, which consists in conveying the main current or a portion of the main current into storage-batteries, so as to absorb the surplus energy of the main current when the main current is too strong to do the work, and disconnecting the storage-batteries from the main circuit when the current in the main circuit corresponds with the work, and adding the current of as many storage-batteries as may be necessary to the main current to supply the deficiency of energy of the main current when the main current is too weak to do the work, substantially as described.

400,727. **SPRING-FORK FOR BICYCLES.** LEON BAUDREAU, Chicopee Falls, Mass. Filed Sept. 18, 1888. Serial No. 285,746. (No model.)



Claim.—1. The combination, with the axle and the shaft above and parallel thereto, of two sets of curved or angular arms, each intermediately jointed and connected by their ends to the said shaft and axle, arranged in relation to each other to form in substance a figure 8, and a spring applied to exert a pressure between said angular arms to maintain them in their relations described and to yield under pressure applied substantially in the direction of their lengths, substantially as described.

2. The combination, with the axle and the shaft above and parallel thereto, of two sets of curved or angular arms, each consisting of two members united by a coil-spring, and the said so-formed angular arms connected by their ends to the shaft and axle, and arranged in relation to each other to form in substance a figure 8, and a coil surrounding said shaft loosely and connected by its ends to the upper members of each of said arms, substantially as set forth.

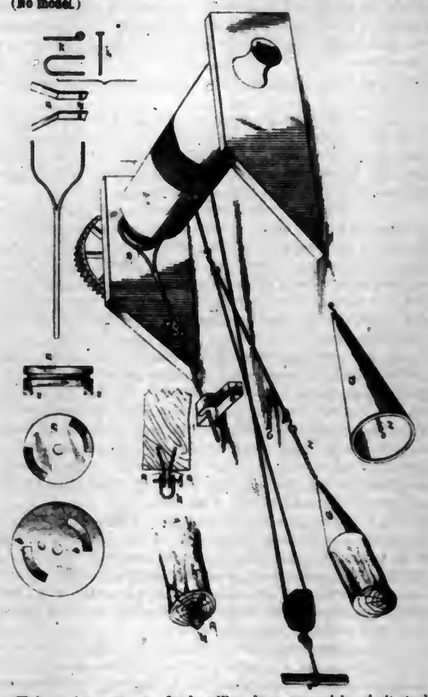
3. Spring-fork devices for bicycles and similar vehicles, consisting of the axle 4, the shaft 6, parallel with said axle, a support for said shaft, substantially as described, the fork-legs 8, hung on said shaft, the arms 9, secured on said axle, the springs 10, uniting said legs and arms, the posts 12, connected to the axle, the arms 15, secured on said shaft, the springs 18, uniting said posts and arms 15, and the springs 16, having an engagement with said legs and the arms 15, combined and operating substantially as set forth.

4. Spring-fork devices for bicycles and similar vehicles, consisting of the axle 4, the shaft 6, parallel with said axle, a support for said shaft, substantially as described, the fork-legs 8, hung on said shaft, the arms 9, secured on said axle, the springs 10, uniting said legs and arms, the posts 12, the arms 13 on said axle, the nuts 14, uniting arms 13 and said posts, the arms 15, secured on said shaft, the springs 18, uniting said posts and arms 15, and the springs 16, having an engagement with said legs and said arms 15, combined and operating substantially as set forth.

5. Spring-fork devices for bicycles and similar vehicles, consisting of the axle 4, the shaft 6, parallel with said axle, a support for said shaft, substantially as described, the legs 8, hung on said shaft and curving first toward one side of said axle and then in the opposite direction and terminating above and to one side of said axle, the arms 9, secured on said axle, the springs 10, uniting said legs and arms, the posts 12, connected to the axle, the arms 15, secured on said shaft, the springs 18, uniting said posts and arms 15, and the springs 16, having an engagement with said legs and the arms 15, combined and operating substantially as set forth.

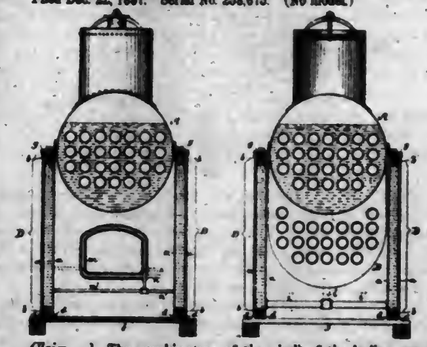
6. Spring-fork devices for bicycles and similar vehicles, consisting of the axle 4, the shaft 6, parallel with said axle, a support for said shaft, substantially as described, the fork-legs 8, hung on said shaft, the arms 9, secured on said axle, the springs 10, uniting said legs and arms, the posts 12, connected to the axle and crossing said legs 8, the arms 15, secured on said shaft, the springs 18, uniting said posts and arms 15, and the springs 16, having an engagement with said legs and the arms 15, combined and operating substantially as set forth.

400,728. **DEVICE FOR HANDLING LOGS AND TIMBER.** WILLIAM RAFFERT, New Orleans, La. Filed Nov. 26, 1887. Serial No. 256,169. (No model.)



Claim.—An apparatus for handling logs, comprising bolts to be driven into the end of a log, a clevis attached to the said bolts, a cone for the end of the log, and a chain, all adapted to be used in connection with a winding-drum, substantially as specified.

400,729. **STEAM-BOILER.** WILLIAM T. BATE, Conshohocken, Pa. Filed Dec. 22, 1887. Serial No. 258,675. (No model.)

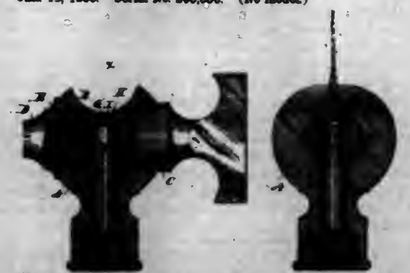


Claim.—1. The combination of the shell of the boiler, comprising the tubed cylindrical barrel and tubed depending leg at the rear, with opposite water-chambered cheek-pieces extending forward from the depending leg of the boiler and forming the sides of the fire-box, each cheek-piece being a self-contained independent structure outside of and forming a joint with the barrel and leg of the boiler, all substantially as specified.

2. The combination of the shell of the boiler, comprising the tubed cylindrical barrel and tubed depending leg, with the fire-box casing having a front plate conforming to the shape of the cylindrical barrel, a back plate conforming to the shape of the depending leg, and opposite water-chambered cheek-pieces extending forward from said depending leg and forming the sides of the fire-box, each cheek-piece being a self-contained independent structure outside of and forming a joint with the barrel and leg of the boiler, all substantially as specified.

3. The within-described water-chambered cheek-piece for the fire-box of a steam-boiler, the same consisting of a jointless rectangular frame forming the top, bottom, and ends of said cheek-piece, and opposite side plates secured to said frame, so as to form therewith a hollow rectangular slab, all substantially as specified.

400,730. **SPRAY-NOZZLE.** JOHN BEAN, Los Gatos, Cal. Filed Jan. 19, 1888. Serial No. 260,358. (No model.)



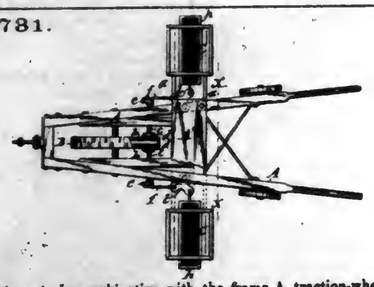
Claim.—1. In a spray-nozzle, the combination, with the body thereof having a passage through it, of a plug rotatably fitted thereto across the said passage, a transverse passage extending partly through the said plug, and a concavo-convex partition extending across the passage in the plug, and having a slot therein.

2. In a spray-nozzle, the combination, with the body thereof having a longitudinal passage, a transverse passage intersecting it, and a concave mouth, of a plug rotatably fitted to the transverse passage, and having a passage partly through it, and a concavo-convex partition across the said passage and near one end thereof, with the convex side toward the farthest termination of the passage in the plug, substantially as described.

400,731. **FERTILIZER-DISTRIBUTER.** JULIUS BENDER, Manlius, N. Y., assignor to Ann Jennett Bender, same place. Filed July 14, 1888. Serial No. 279,977. (No model.)



400,781.

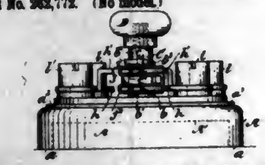


Claim.—1. In combination with the frame A, traction-wheel B, and hopper C, the reciprocating sieve *a* under the hopper, the gear *b*, rotating with the traction-wheel, the counter-shafts *c*, pinion *d* on one end of said shaft, meshing with the aforesaid gear, the crank *e* on the opposite end of said shaft, and the pitman *f*, transmitting motion from the said crank to the sieve, as set forth.

2. In combination with the frame A and traction-wheel B, the hoppers C C, carried on opposite sides of said frame, the reciprocating sieves *a a* under said hoppers, the gears *b b* on opposite sides of the traction-wheel, the counter-shafts *c c*, pinions *d d* on one end of said shafts, meshing, respectively, with the two gears aforesaid, cranks *e e* on the opposite end of the shafts, and two two-armed levers, *l l*, each connected with one of the cranks and one of the sieves, substantially as described and shown.

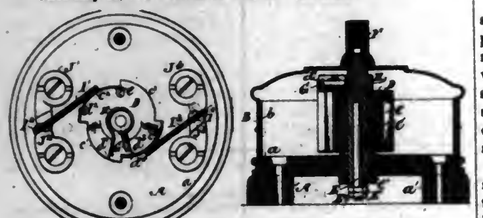
3. In combination with the frame A and traction-wheel B, the arms *a a*, extending laterally from opposite sides of the frame, the hoppers C C, connected to said arms adjustably longitudinally thereon, the sieves *a a*, arranged movably horizontally under the hoppers, gears *b b* on opposite sides of the traction-wheel, counter-shafts *c c*, parallel with the axle of said traction-wheel, pinions *d d* on one end of the counter-shafts, meshing with the gears, cranks *e e* on the opposite end of the counter-shafts, two two-armed levers, *l l*, pivoted to the frame and each having one of its arms connected with one of the sieves, and pitmen *f f*, connecting the said levers with the cranks, substantially as described and shown.

400,732. ELECTRIC SWITCH. SIGMUND BERGMANN, New York, N. Y., assignor to Bergmann & Company, of New York. Filed Feb. 2, 1888. Serial No. 262,772. (No model.)



Claim.—In an electric switch, the combination, with a base, of a shaft, a cross-bar of insulating material mounted on the shaft, two fixed electrical conductors mounted on the base, two other fixed electrical conductors mounted on the base approximately opposite the conductors first named, and contact-pieces on each end of said cross-bar comprising each three U-shaped portions and each adapted to contact with both sides of its two adjacent conductors, substantially as specified.

400,738. SWITCH FOR ELECTRIC CIRCUITS. SIGMUND BERGMANN, New York, N. Y., assignor to Bergmann & Company, of New York. Filed May 18, 1888. Serial No. 274,262. (No model.)



Claim.—1. In a switch, the combination of a rotary part or wheel, a shaft around which the rotary part or wheel turns, a radial projection on the shaft, and a spring connected to the shaft, establishing a connection between the shaft and the rotary part or wheel, substantially as specified.

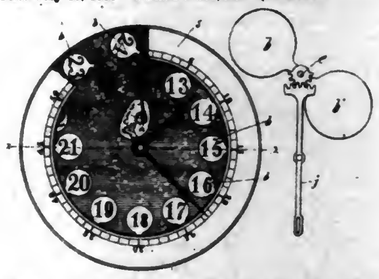
2. In a switch, the combination of a rotary part or wheel, an axle or support upon which the rotary part or wheel may turn, a shaft capable of turning relatively to the axle or support of the rotary part or wheel, a radial projection on the shaft, and a spring secured to the rotary shaft, establishing a connection between the said rotary shaft and the rotary part or wheel, substantially as specified.

3. In a switch, the combination, with a rotary part or wheel provided with tangential segment-surfaces, certain of which are of insulating material and the others of which are faced with conducting material, of a rotary shaft around which the rotary part or wheel turns, a pin radial from said shaft, and a spring fastened to the rotary shaft and extending outwardly therefrom between projections extending from the rotary part or wheel, substantially as specified.

4. In a switch, the combination of a rotary part or wheel, a rotary shaft around which the rotary part or wheel can turn, and provided with upwardly-extending projections, a pin extending radially from this shaft between the said projections of the rotary part or wheel, and a spring, also connected with the shaft and extending between the said projections, substantially as specified.

5. In a switch, the combination, with a rotary part or wheel, of a rotary shaft around which the rotary part or wheel can turn, and having a pin extending radially therefrom, a spring connected to said shaft, a hand-piece for imparting motion to the shaft and the rotary part, and having a screw-threaded connection with said shaft, and brushes contacting with the rotary part or wheel, substantially as specified.

400,734. TIME-PIECE DIAL. CHARLES BICKFORD, Boston, Mass. Filed July 19, 1888. Serial No. 280,425. (No model.)



Claim.—1. In a time-piece, the combination of a plate or dial, *a*, a series of twelve figure or ordinal plates, each independent of the others, pivoted to swing in a plane parallel with the dial on pivots which are arranged concentrically with relation to the center of the dial, and a motor operated by the time-movement of the time-piece and operating said plates successively, whereby each plate is moved independently into its operative position once in every twelve hours and out of its operative position during the succeeding twelve hours, as set forth.

2. In a time-piece, the combination of the plate or dial *a*, a series of figure or ordinal plates pivoted to swing in a plane parallel with the dial, a rack-segment, *c*, revolved with the hour-hand of the time-piece, and intermediate devices, whereby edgewise motion is imparted successively to said plates from said segment, as set forth.

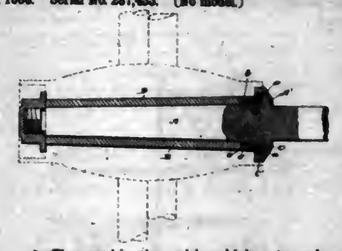
3. In a time-piece, the combination of a plate or dial, *a*, a series of figure or ordinal plates pivoted to swing in a plane parallel with the dial, a rack-segment revolved with the hour-hand of the time-piece, intermediate devices which impart edgewise motion from said segment to said plates, whereby said plates are moved successively to and from their operative positions, and a ring or cover outside of the dial, whereby said plates are concealed when in their inoperative positions, as set forth.

4. In a time-piece, the combination of a plate or dial having a series of fixed ordinals, a series of ordinal plates or movable ordinals pivoted to swing in a plane parallel with the dial, a rack-segment revolved by the hour-hand of the time-piece, intermediate devices which impart edgewise motion successively to said plates from said segment, whereby said plates are alternately swung over the corresponding fixed ordinals and away from the same, and a ring or cover outside of the dial, whereby said plates are concealed when moved away from the fixed ordinals, as set forth.

5. In a time-piece, the combination of a series of arbors, *e*, ordinal-plates or ordinals secured to said arbors, a rack-segment affixed to the hour-hand thimble of the time-piece, a series of pinions mounted in fixed bearings and arranged to be engaged successively by said segment, eccentric-pins on said pinions and on the hubs of the ordinal-plates, and radial levers pivoted between their ends and engaged at their ends with said pins, as set forth.

6. In a time-piece, the combination of a transparent or translucent plate or dial, *a*, a series of movable ordinals mounted to swing in a plane parallel with the dial, and an opaque ring or shield arranged to conceal the said ordinals when they are moved away from their operative positions, as set forth.

400,735. AXLE-BOX. WILLIAM P. BLAKE, Cleveland, Ohio. Filed Oct. 6, 1888. Serial No. 287,433. (No model.)



Claim.—1. The combination, with vehicle-axle and axle-box, the latter having a detachable thimble, substantially as indicated, of axle-collar having an annular chamber in the outer face thereof for receiving the end of such detachable collar, substantially as set forth.

2. The combination, with vehicle axle and collar, the latter having an annular chamber in the outer face thereof, of axle-box having a detachable thimble screwed into the inner end of the box, such thimble having an enlarged head adapted to fit into the chamber of the axle-collar, substantially as set forth.

3. The combination, with vehicle axle and collar, the latter having an annular chamber in the outer face thereof concentric with the axis of the axle, of axle-box having an enlarged end or head adapted to fit into such annular chamber, substantially as set forth.

400,736. WATER-FILTER. JAMES V. BLAKE and F. CORTES WILSON, Chicago, Ill.; said Blake assignor to said Wilson. Filed Jan. 14, 1889. Serial No. 296,309. (No model.)



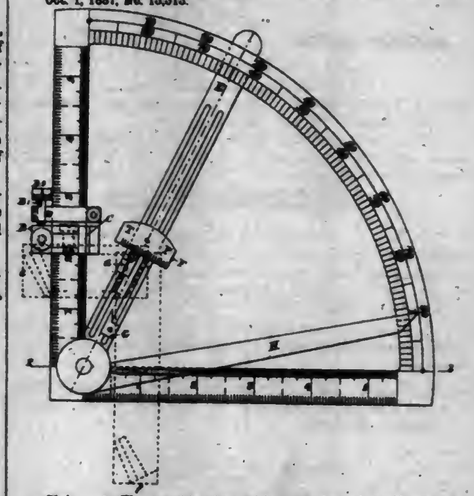
Claim.—1. In combination with the casing, the inner annular partition provided with apertures at or near its lower edge, the outer lower annular partition, the pan resting upon the inner partition and having the neck or extension with perforated bottom extending down within the inner partition, the perforated nozzle in an opening from the pan into the pan-extension, and suitable outlets from the lower portion of the space around the outer partition, substantially as and for the purpose shown.

2. In combination with the pan having the central opening in its bottom, and the extension on the pan having a perforated bottom, the filter-casing having its bottom provided with apertures near its outer edge, the central annular partition supported on such bottom extending up around the pan-extension to the pan-bottom, and provided around its lower edge with apertures, the outer partition extending up around the inner partition to a point below the pan-bottom, a perforated nozzle in the central opening in the pan-bottom, and suitable filter-packing in the pan-extension, and the chambers formed between the two partitions and the outer partition and casing-wall, substantially as and for the purpose set forth.

3. In a filter, in combination with the casing having its bottom provided with exit-apertures near its outer edge, the inner annular partition extending upward from the casing-bottom, and near such bottom provided with apertures, the outer partition extending up from the casing-bottom, but lower than the inner partition, the pan having its bottom resting upon the top of the inner partition and provided with the extension with perforated bottom surrounded by the inner partition, the straining-nozzle through which the water flows from the pan into the pan-extension, the sponge within the nozzle, a body of sand within the pan-extension, and the charcoal packing within the annular chambers between the two partitions and the casing, substantially as and for the purpose described.

4. In combination with the casing having its bottom perforated near its outer edge, the outer partition, and the inner partition made higher than the other and provided with apertures near its lower edge, the pan having its bottom supported upon the top of the inner partition and provided with the central extension with perforated bottom, the straining-nozzle in the passage from the pan into the pan-extension, a sponge within such nozzle, a layer of gravel on the bottom of the pan-extension, and a body of sand within such extension above the gravel, a layer of gravel on the casing-bottom, the charcoal packing or filling within the two chambers between the outer and inner partitions and between the outer partition and the casing, and a layer of gravel on top of such filling, extending down to a point below the level of the top of the outer partition, substantially as and for the purpose specified.

400,787. APPARATUS FOR PLOTTING ANGLES FOR BEVEL-GEAR. JOSEPH A. BOORMAN, Leeds, County of York, England. Filed Aug. 25, 1888. Serial No. 283,303. (No model.) Patented in England Oct. 1, 1887, No. 13,313.



Claim.—1. The combination, with a graduated quadrant, of a slide movable upon one arm of the same, a graduated arm hinged to the slide and extending at right angles to the side upon which the slide is located, and an adjustable slide upon said arm, for the purpose set forth.

2. An instrument for ascertaining the correct angles of bevel and miter wheels and the angle of a line passing through a point at given distances from vertical and horizontal planes, comprising a graduated quadrant, a radial arm pivoted to the quadrant capable of adjustment around the axis of the same and adapted to be clamped in the desired adjustment, and a transverse adjustable slide upon the radial arm, for the purpose set forth.

3. The combination of a graduated quadrant, an adjustable slide upon one arm of the same, a graduated arm hinged to the slide and provided with an adjustable slide, a radial arm pivoted to the axis of the quadrant and capable of adjustment around the same, a transverse reversible and adjustable slide upon the radial arm, and indices for the same, for the purpose set forth.

4. An instrument for ascertaining the correct angles of bevel and miter wheels and the angle of a line passing through a point at given distances from vertical and horizontal planes, comprising a graduated quadrant and an adjustable arm pivoted to the same at its axis and adapted to be clamped at the desired angle, an adjustable transverse slide upon this arm, and a radial index or arm loosely pivoted to the axis of the quadrant, all arranged for the purpose set forth.

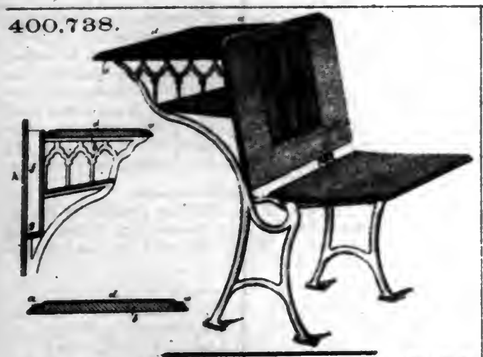
5. An anglegraph comprising a graduated quadrant, a slide upon an arm of the same provided with a graduated arm, an adjustable radial arm pivoted to the axis of the quadrant and adapted to be clamped at the desired ascertained angle, a transverse reversible and adjustable slide upon the radial arm, a pair of indices upon the radial arm, and an index mounted upon the axis to freely turn upon the same, for the purpose set forth.

400,788. SCHOOL-DESK. ANNA M. BENADUM, Philadelphia, Pa. Filed Dec. 14, 1888. Serial No. 293,553. (No model.)

Claim.—1. The combination, in a school-desk top, of the outer border or frame, the panel within the same, and the rubber covering having a surface higher than the surface of the frame and having its edges confined between the panel and said frame, all substantially as specified.

2. A school-desk having a slate-well with closed internal casing, and an open front with cross-slats forming the front of the well, substantially as specified.

400,738.



400,739. THREAD. LUCIUS BRIGGS, Glasgo, Conn. Filed Oct. 22, 1888. Serial No. 288,843. (Specimens.)

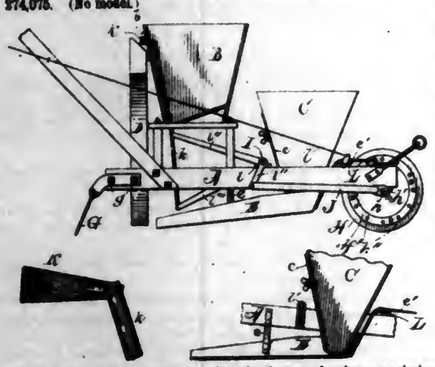
Brief.—The object of the invention is to produce a thread for use in crochet-work, &c., which will give to the fabric a peculiar beaded or twilled appearance.



Claim.—1. A new article of manufacture consisting of a cabled thread made of two threads of like number doubled and twisted together and two threads of a finer number doubled and twisted together, the two kinds of doubled and twisted thread being twisted together or cabled, as described.

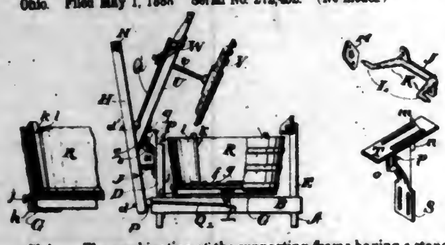
2. A cabled thread consisting of three or more doubled and twisted threads one of which is of finer number than the others, as described.

400,740. CORN-PLANTER AND FERTILIZER-DISTRIBUTER. JOHN B. BROADWELL, Alpharetta, Ga. Filed May 16, 1888. Serial No. 274,075. (No model.)



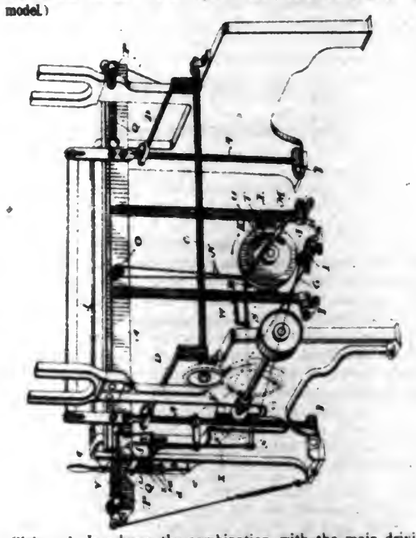
Claim.—In a planter, the seed-distributing mechanism, consisting of the wheel H, its shaft A, provided with cranks A' at each end, the connecting-rods J, rock-shafts I, having cranks i'' and arms i''', rods k, and the pivoted seed-cups K, the hopper B, provided with the holes b, having adjustable covers b', and the curved chutes D, for depositing the seed in the furrow, all arranged and operating substantially as shown and described.

400,741. WASHING-MACHINE. BENJAMIN BROBST, Columbus, Ohio. Filed May 1, 1888. Serial No. 272,452. (No model.)



Claim.—The combination of the supporting-frame having a standard, as D, the hinge-piece S, secured to said standard, hinge-piece T, pivotally secured to piece S, said piece T having a downwardly-projected wing, n, having therein a circular slot, O, and the cross-bar U, substantially as described, and for the purpose set forth.

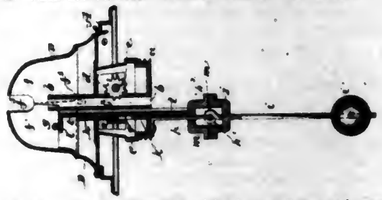
400,742. SHUTTLE-MOTION FOR LOOMS. JOSEPH L. BROOK, Simcoe, Ontario, Canada. Filed May 21, 1888. Serial No. 274,575. (No model.)



Claim.—1. In a loom, the combination, with the main driving-shaft, a pulley having a flattened portion, as shown, and provided with a fixed projecting stud on its face, a pivoted lever extended across the face of said pulley, and the pickers connected by cords to said lever, of a friction-pinion revolving in contact with said pulley and connected with the main driving-shaft, substantially as and for the purpose specified.

2. The lay A, the weighted and flattened friction-pulley K, journaled on a stud fixed to the lay, the friction-pulley J, the main driving-shaft, connections between said pulley J and said shaft, the longitudinally-movable rod S, the stud U, extending from the face of the pulley K, and a pin, R, extending from the opposite side of the pulley K and passing the rod S, combined with the lever X, connected to the rod S, the bail *f*, fixed to the lay, the wedge-shaped plate Y, pivoted in the frame of the machine and extended through said bail, the pickers, the pivoted lever L, extending across the face of the pulley K, and the cords N, connecting said lever L to the pickers, substantially as and for the purpose specified.

400,743. LAMP-EXTINGUISHER. CHARLES M. BROWN, Chicago, Ill. Filed Oct. 11, 1888. Serial No. 287,903. (No model.)



Claim.—1. The combination, with a burner-frame and a cone made in two sections, one section thereof being pivoted to the other section, of a sliding plate for operating the pivoted section of the cone, substantially as set forth.

2. The combination, with a burner-frame, of a cone made in two sections, one section pivoted on the other, a sliding plate to operate the pivoted section, a block on the sliding plate, and a rod attached to a fixed arm by a universal joint, said rod carrying a block at one end and a weight at the other, substantially as set forth.

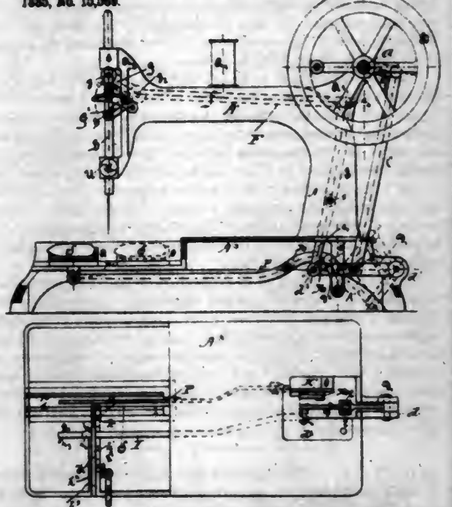
3. The combination, with a burner-frame, of a cone made in two sections, one section pivoted on the other, a sliding plate to operate the pivoted section, a guide-plate for the sliding plate, a lip at one end of the sliding plate and a block at the other end, a fixed arm, a rod pivoted to the fixed arm by a universal joint, and a block at one end of said rod and a weight at the other end, substantially as set forth.

4. The combination, with a burner-frame, of a cone made in two sections, one section pivoted to the other, a rod fixed to the pivoted section, a sliding plate having a lip to engage said fixed rod, and a block at the lower end of said rod, fixed arm, a rod connected to the fixed arm by a universal joint, a weight at the lower end of said pivoted rod, and a block at the upper end thereof, the blocks on the

sliding plate and pivoted rod being made cup-shaped to receive the universal joint, and having annular flanges at their meeting faces, substantially as set forth.

5. The combination, with a burner-frame, of a cone made in two sections, one section pivoted to the other, a rod fixed to the pivoted section, a sliding plate to engage said fixed rod, and a pivoted lever attached at one end to the sliding plate, whereby the pivoted section may be made to turn and close the opening in the burner, substantially as set forth.

400,744. SEWING-MACHINE. EWALD BRÜCKER, Siegler, near Troisdorf, Germany. Filed Mar. 2, 1886. Serial No. 194,613. (Model.) Patented in Germany Sept. 30, 1885, No. 47,993, and in England Dec. 18, 1885, No. 15,569.



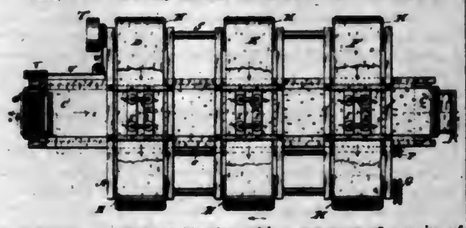
Claim.—1. The combination, in a sewing-machine, of the main or power shaft, a crank thereon, a pitman connected to said crank, a pair of toggle-arms connected at their middle joint to said pitman, a feed reciprocating bar connected to the free end of one of said toggle-arms, a shuttle-bar, a swinging arm, to which said shuttle-bar is pivotally attached, and a crank or lever connected to said swinging arm and to the free end of said toggle-arm, whereby, when said crank is rotated, said shuttle and feed reciprocating bar will be moved alternately in the same direction, substantially as set forth.

2. The combination, in a sewing-machine, of the main or power shaft, a crank thereon, a pitman connected to said crank, toggle-arms connected to said pitman at their middle joint, a lever fulcrumed on the machine-frame and connected to one of said toggles, a needle-bar-actuating arm pivotally connected to said lever, a vertically-moving needle-bar, and a pair of toggles coupling said needle-bar and arm, substantially as described.

3. In a sewing-machine, the combination, with the horizontally-reciprocating needle-bar-actuating arm, of a pair of toggles, one of which is pivotally connected to the machine-head and the other to the needle-bar, and a pivot passing through the lower member of said toggles and having a forked end which embraces and slides upon the presser-bar, substantially as described.

400,745. WITHDRAWN.

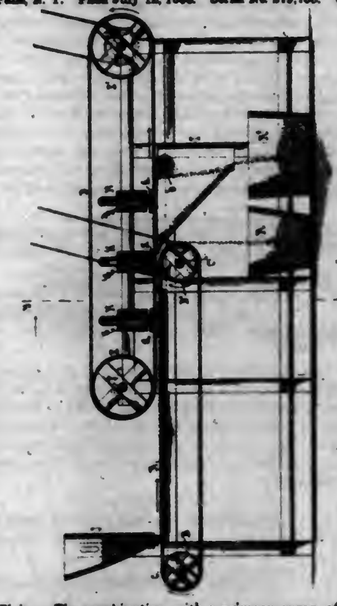
400,746. MAGNETIC SEPARATOR. GORDON COWLING, Glens Falls, N. Y. Filed July 12, 1888. Serial No. 279,754. (No model.)



Claim.—1. The combination, with a conveyer, of a series of aprons to operate transversely to the conveyer and at different distances from the same, a magnetized plate secured in proximity to each of the aprons, and suitable driving mechanism for actuating the aprons, substantially as set forth.

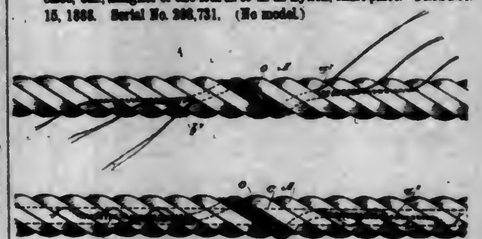
2. The combination, with a conveyer, of a series of aprons to operate transversely to the conveyer and at different distances from the same, a magnetized plate secured in proximity to each of the aprons, a scraper or brush made to act on each of the aprons, a separate receptacle under each of the aprons, and suitable mechanism for actuating the aprons, substantially as set forth.

400,747. MAGNETIC SEPARATOR. GORDON COWLING, Glens Falls, N. Y. Filed July 12, 1888. Serial No. 279,755. (No model.)



Claim.—The combination, with a primary apron, of a secondary apron situated over and made to extend in the same direction as the primary apron, a magnetized plate secured in proximity to the secondary apron, and suitable driving mechanism for actuating the aprons, substantially as described.

400,748. ART OF SPLICING CABLES. JOHN COLLINS, San Francisco, Cal., assignor of one-fourth to H. H. Lynch, same place. Filed Dec. 15, 1888. Serial No. 293,731. (No model.)



Claim.—1. In the art of splicing cables, the method of treating and disposing of the strand ends or tucks, which consists in dividing them back to their union with the cable, cutting off even with the surface of the cable one of the divisions of each tuck, laying up the remaining divisions so as to form a splice-strand occupying the vacant score of the cable, unlaying the projecting ends of said last-named divisions into individual wires, and finally laying said unlaid ends in a flattened condition into the cable under the strands and against the soft core of the cable, substantially as described.

2. In the art of splicing cables, the method of treating and disposing of the strand ends or tucks, which consists in dividing them back to their union with the cable, cutting off even with the surface of the cable one of the divisions of each tuck, laying up the remaining divisions so as to form a splice-strand occupying the vacant score of the cable, tucking said divisions under adjacent strands, unlaying their projecting ends back to said strands into individual wires, and finally laying said unlaid ends in a flattened condition into the cable under the strands and against the soft core of the cable, substantially as described.

3. In the art of splicing cables, the method of treating and disposing of the strand ends or tucks, which consists in dividing them back to their union with the cable, cutting off even with the surface of the cable one of the divisions of each tuck, laying up the remaining divisions so as to form a splice-strand occupying the vacant score of the cable, unlaying the ends of said last-named divisions into individual wires, and finally tucking and laying under different strands of the cable the different wires of the said divisions and carrying them around and against the soft core of the cable, whereby said wires are nipped by all the strands of the cable, substantially as described.

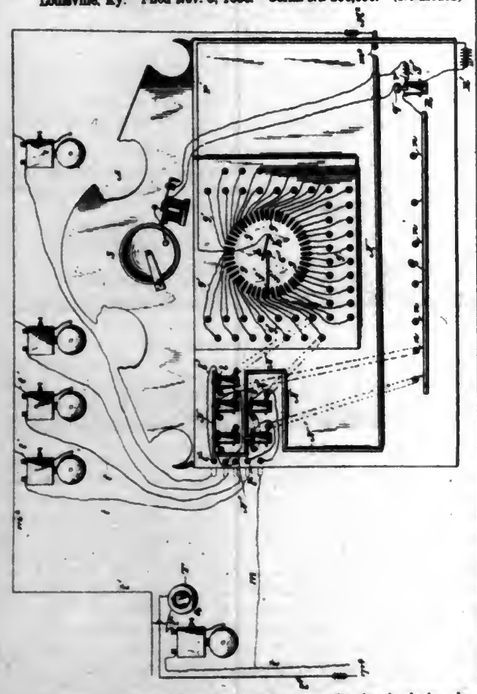
4. In the art of splicing cables, the method of treating and disposing of the strand ends or tucks, which consists in dividing them back to their union with the cable, cutting off even with the surface of the cable one of the divisions of each tuck, laying up the remaining divisions so as to form a splice-strand occupying the vacant score of the cable, tucking said divisions under adjacent strands of the cable, unlaying the projecting ends of said last-named divisions into individual wires, tucking different ones of said wires under succeeding strands, and finally laying in all of said wires under different strands of the cable against and around the soft core thereof, whereby said wires are nipped by all the strands of the cable, substantially as described.

400,749. DOUBLE-ACTING SWIVEL. MATTHIAS COLLIER, Freeport, Pa. Filed June 1, 1888. Serial No. 275,789. (No model.)



Claim.—In a double swivel, the combination of a hollow body provided with orifices at each end of less diameter than the hollow itself, with two end pieces whose shanks play loosely in said orifices, and whose interior ends are enlarged, so as to nearly fill the hollow in the central body, the said exterior ends being provided with rings or other suitable means for connecting them with ropes, chains, &c., substantially as described.

400,750. ALARM SYSTEM. CHARLES A. COX and JOSEPH F. COX, Louisville, Ky. Filed Nov. 5, 1888. Serial No. 290,059. (No model.)



Claim.—1. The combination, in an automatic circuit-closing device, of a hinged door or frame conjointly provided with the following elements: a time-piece having a contact-arm located at the rear of said door and adapted for circuit-connection and rotating correspondent with an hour-hand, rear contact-plates, *g*, portion *c*, having contacts connected with plates *g*, portion *d*, having alarm circuit-contacts, and coupling devices to connect the contacts of portions *c d*, substantially as set forth.

2. The combination, in an automatic circuit-closing device, of a time-piece, two series of contacts respectively corresponding with divisions of time and alarms, an electro-magnet having a circuit-closing armature, alarm-circuit controlled by said armature, and a bell directly included therein, couplers to close the primary circuit through any desired magnet or magnets, an arm actuated by the time-piece and adapted for primary circuit-connections, and a series of plates connected to said time-contacts, substantially as set forth.

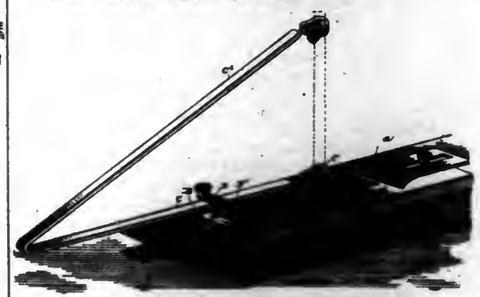
3. The combination, in an automatic circuit-closing device, of a hinged door or frame, a time-piece carried thereby, contact-arm *f*, and plates *g*, portion *c*, having contacts connected with said plates, portion *d*, having contacts *e*, an electro-magnet for each pair of contacts *e*, an armature for each electro-magnet controlling the room circuit-connections, and coupling devices for connecting the contacts of portion *c d*, substantially as set forth.

4. The combination, in an automatic circuit-closing device, of a time-piece carried thereby, contact-arm *f*, and plates *g*, portion *c*, having contacts connected with said plates, portion *d*, having contacts *e*, electro-magnets connected to the latter and each having an armature, and alarm circuit-connections controlled by said armatures and including metallic strips N N', arranged as and for the purpose specified.

5. The combination, with an electro-magnet, of a clamp or collar secured thereto and having ears, a vertical armature pivoted in said ears, a malleable-metal extension depending from said armature below its pivotal connection, and a weight permanently secured to said extension, substantially as set forth.

6. The combination, in an automatic circuit-closing device, of a time-piece, two series of contacts respectively corresponding with divisions of time and alarms, an electro-magnet having a circuit-closing armature and adapted to control an alarm-circuit, couplers to close the primary circuit through any desired magnet or magnets, an arm actuated by the time-piece and adapted for primary circuit-connections, a series of plates connected to said time-contacts, and a shunt-circuit and circuit-closing device included therein to complete an alarm-circuit independent of the time-piece, substantially as set forth.

400,751. TUCK CREASING AND MARKING ATTACHMENT FOR SEWING-MACHINES. ALICE A. CRAWFORD, Austin, Tex. Filed May 2, 1888. Serial No. 272,601. (No model.)



Claim.—1. In a tuck creaser and marker, the combination, with a creasing-blade arranged on the bed-plate of a sewing-machine, and the needle-bar and supporting-arm attached thereto, of a block adjustably secured upon said arm and provided with a groove to receive the creasing-blade and with a chalk or crayon holder, substantially as set forth.

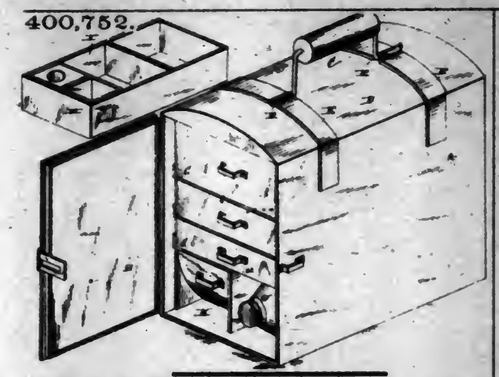
2. The combination, with an arm attached to the needle-bar of a sewing-machine, of a block provided with a holder for a marker and with spring-jaws clasping said arm, the said jaws being provided with a pinching-screw, whereby the block may be adjustably secured upon said arm, substantially as set forth.

3. The combination, with a tuck-line-indicating device, of a support therefor, consisting of the V-shaped rod having means at its free ends for connecting it to the needle-bar of a sewing-machine, substantially as set forth.

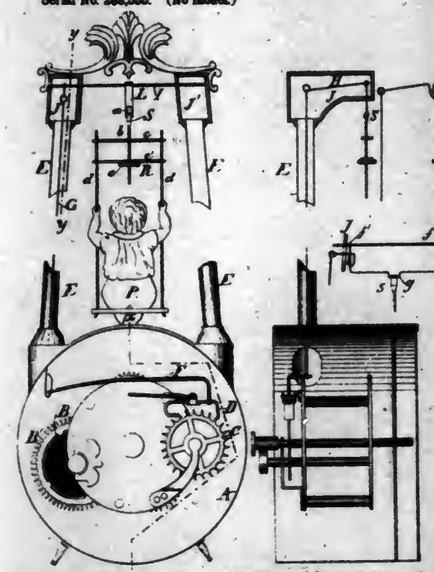
400,752. DINNER-PAIL. PERRY L. CROSSMAN, Granby, Mo. Filed Aug. 6, 1888. Serial No. 282,043. (No model.)

Claim.—The dinner-pail consisting of the case having a series of compartment-ledges, a series of boxes or drawers supported upon said ledges, and the bottom compartments for holding a butter-dish and a bottle, said case having integral with itself an arched top or cover having applied to and depending from its under side the knife and fork holding brackets having the curved approximately horizontal portion, substantially as set forth.

400,752.

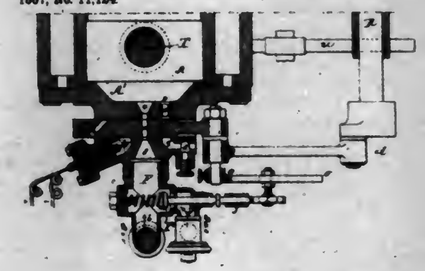


400,753. CLOCK. WALTER D. DAVIES, Brooklyn, N. Y., assignor to the Ansonia Clock Company, Ansonia, Conn. Filed Oct. 19, 1888. Serial No. 288,536. (No model.)



Claim.—In a clock, the combination, with an escapement, of an arm receiving motion from the verge thereof, a case for the clock-movement, a post or pillar extending upwardly above the said case, a bell-crank lever, a rod extending upwardly through said pillar or post and connected to said arm and to one of the arms of said bell-crank lever for transmitting motion to the latter, and a pendulum suspended from the other arm of said bell-crank lever above the clock-case, substantially as specified.

400,754. MOTIVE-POWER ENGINE. EDOUARD D. DESOUTTEVILLE and LEON F. C. MALANDIN, Fontaine-le-Bourg, France. Filed Oct. 12, 1886. Serial No. 216,012. (No model.) Patented in Germany May 4, 1884, No. 33,915, and May 2, 1886, No. 37,420; in France Feb. 4, 1885, No. 160,367; in England Jan. 1, 1886, No. 11; in Belgium May 4, 1886, No. 72,974; in Italy June 10, 1887, No. 21,342, and in Spain July 13, 1887, No. 11,124.



Claim.—1. A gas-engine provided with a slide-valve having a small outlet from the igniting-chamber to the atmosphere when the said chamber is opened to the cylinder, in combination with an inclosing-cover for the slide, and containing said igniting-chamber, substantially as set forth.

2. The combination of the gas-valve of a gas-engine and a compressing-cylinder and piston operated by a moving part of the engine, with a tappet operated with the slide to act on the gas-valve under the control of the compressing-cylinder and piston, substantially as described.

3. The combination of the cylinder of a gas-engine and its slide having a passage, *a*, with passages *p q* in the cylinder-head and cover, and a regulating-plug for the escape of the air in starting the engine.

400,755. ASBESTUS PACKING. JOHN B. DEEDS, Terre Haute, Ind., assignor to Robert H. Catlin, same place. Filed Mar. 23, 1888. Serial No. 268,294. (No specimens.)

Claim.—In an article for packing, strips or lengths of asbestus or mineral wool when twisted, spun, or plaited into shape, and having incorporated therewith a paste composed of plumbago or described equivalent, oil, and rosin, substantially as described.

400,756. METHOD OF TREATING ASBESTUS. JOHN B. DEEDS, Terre Haute, Ind., assignor to Robert H. Catlin, same place. Filed Dec. 13, 1888. Serial No. 293,495. (No specimens.)

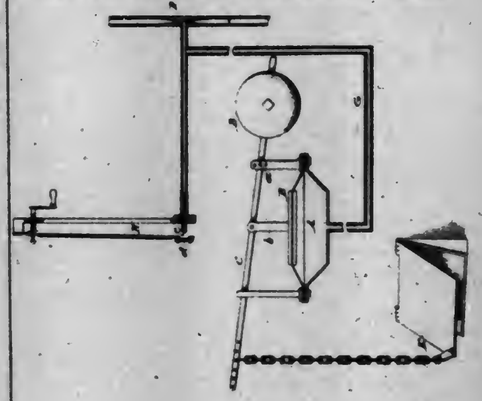
Claim.—The method herein described of treating asbestus or mineral wool, the same consisting in combining therewith, in proper quantity, a thin paste composed of plumbago, oil, and rosin, subjecting the mass to the action of heat, and then allowing the same to cool, as set forth.

400,757. BURDEN-CARRIER. ROBERT H. DIXEY, New Orleans, La. Filed Nov. 22, 1888. Serial No. 291,613. (No model.)



Claim.—As an improved article of manufacture, the burden-carrier described, consisting, essentially, of the two longitudinal bars A, the hinge-bar *b*, secured near the lower ends thereof, the braces arranged at opposite ends of the hinge-bar, the hinged shelf adapted to rest upon the braces and fold upon the longitudinal bars, the curvilinear rods or bars connecting the longitudinal bars, the arm-loops secured to said longitudinal bars, and the adjusting-rope connecting the hinged shelf with one of the curved transverse rods, substantially as specified.

400,758. TEMPERATURE-REGULATOR. LUCIEN F. EASTON, La Crosse, Wis. Filed Dec. 26, 1888. Serial No. 294,610. (No model.)

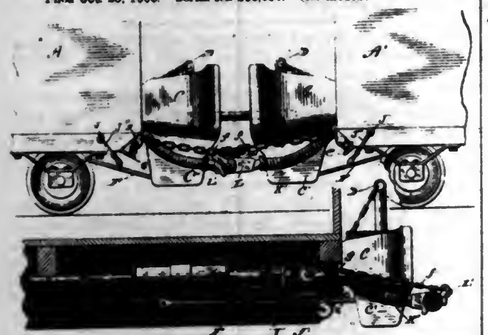


Claim.—1. The combination of a valve, damper, or analogous device, an expansible and contractible chamber having a movable part arranged to actuate said valve, damper, or device, a pumping apparatus communicating with the chamber, and a thermally-controlled valve serving to open and close communication between the pump and the external atmosphere at a point between the pump and the chamber, substantially as and for the purpose specified.

2. The combination of a valve, damper, or analogous device, an expansible and contractible chamber having a movable part arranged to actuate said valve, damper, or other device, an exhausting apparatus serving to exhaust air from the chamber, and a thermally-controlled air-inlet serving to admit air to the chamber or to the exhaust system at any point.

3. The combination of chamber A, movable wall B, lever C, weight D, valve or damper E, aspirator F, pipe G, provided with inlet *e*, and thermostat H, provided with valve *d*, said parts being constructed and arranged to operate substantially as set forth.

400,759. PIPE-COUPLING. RICHARD J. EDWARDS, Galena, Ill. Filed Oct. 23, 1888. Serial No. 288,957. (No model.)



Claim.—1. The combination of the cars, transverse crank-shafts journaled upon the cars, conducting-pipes upon the cars provided with flexible hose-sections, pipe-couplings on the ends of these flexible sections, these couplings being provided with interlocking lugs and upwardly-extending arms, and chains connecting the upwardly-extending arms with the respective crank-shafts on the cars, whereby the couplings may be uncoupled, whether the cars be in motion or at rest, substantially as described.

2. The combination, with the cars provided with draw-bars and draw-heads, of the coupling devices, multiple crank-shafts journaled on the cars and adapted to operate the uncoupling devices, the air-pipes provided with the flexible sections, the pipe-couplings provided with interlocking lugs and arms, chains connecting these arms with the cranks on the respective crank-shafts, valves in the air-pipes, arms on the stems of these valves, these arms being adapted to be operated by cranks on the crank-shafts, whereby by a single movement of one of the crank-shafts the coupling devices may be uncoupled, the pipe-couplings uncoupled, and the valves in the air-pipes closed, substantially as described.

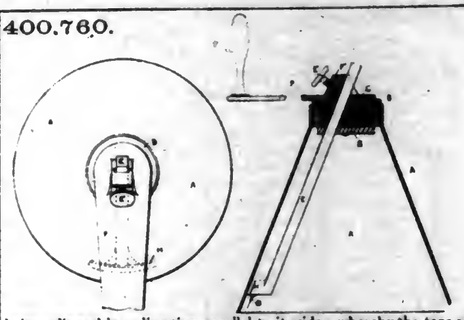
3. The combination, with the cars, of the multiple crank-shafts journaled in the cars and provided with operating-handles, the air-pipes provided with stop-cocks, arms on the stems of these cocks, these arms being adapted to be operated by the cranks of the crank-shafts, flexible hose-sections on the ends of the air-pipes, coupling-sections on the ends of these flexible sections, these coupling-sections being provided with interlocking lugs and rigid arms, and the chain for connecting these rigid arms with the respective crank-shafts, whereby the said stop-cocks may be closed and the hose-sections detached at one operation, substantially as described.

400,760. CAN-OPENING DEVICE. THOMAS ELCOATE, Norton, Stockton-on-Tees, County of Durham, England. Filed Feb. 6, 1889. Serial No. 298,863. (No model.)

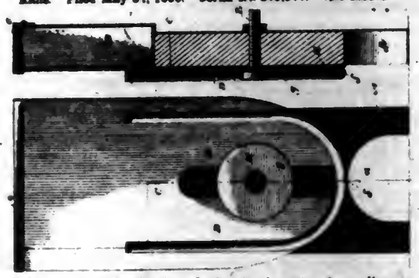
Claim.—1. The combination, with a loose cover for protecting the contents of a can after it has been opened, of the rotatable radial arm E, mounted centrally on the interior of said cover and provided with a downwardly-projecting cutter, D, adapted to pierce the top of the can when the loose cover is laid or pressed thereon, and a suitable crank-handle, F, on the exterior of the cover, adapted to rotate the arm E, whereby the top of the can may be removed or cut off by the rotation of said handle, substantially as set forth.

2. A can-opener having a loose shell or cover, A, with sloping or tapering sides adapted to receive the top of the can it is desired to open, and having a knife-carrying arm, E, mounted obliquely in a rotatable head or boss, C, on the interior of said cover A, and capable of being adjusted in a direction parallel to its sides, whereby the tops of sealed cans of different sizes may be removed or cut off, substantially as set forth.

400,760.



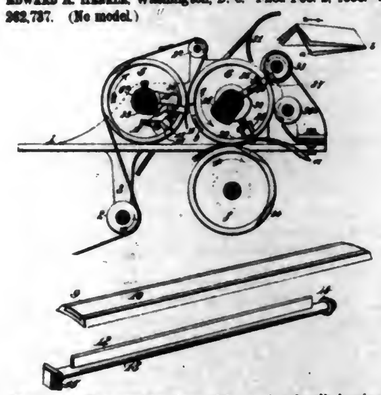
400,761. LUBRICATOR. LAWRENCE M. FLEISCHMANN, Wichita, Kans. Filed May 31, 1888. Serial No. 275,577. (No model.)



Claim.—1. A lubricating device having the depending vertical flange slotted longitudinally, and the tube leading from the lubricant-holder and looped downwardly and across a slot of the flange and provided with an aperture at its lowest point, substantially as specified.

2. A lubricating device having the depending vertical flange slotted longitudinally, and the tube leading from the lubricant-holder and provided with an aperture at its lowest point, substantially as specified.

400,762. PAPER-FOLDING MACHINE. JOSEPH C. FOWLER and EDWARD A. HENKLE, Washington, D. C. Filed Feb. 2, 1888. Serial No. 262,737. (No model.)



Claim.—1. The combination, with a pair of rolls having surface contact and provided with cutting mechanism operating upon the tangent line, of grippers pivotally mounted at the ends of one of said rolls, cams rigid on supports which underlie the ends of said grippers, whereby their other extremities are brought down upon the margins of the sheet just after the cut is made, and a similar pair of grippers upon the other roll which seize the end of the web, both pairs of grippers acting after the cut is made, whereby the two parts are positively separated, substantially as described.

2. The combination, with a pair of rolls having surface contact and provided with cutting mechanism acting upon the tangent line, of a pair of pivotally-mounted grippers mounted on and rotating with each of said rolls, cams rigidly mounted upon suitable supports and timed to act upon one pair of said grippers to cause them to seize the margins of the web, one pair of grippers seizing the sheet at its center and the other pair just beyond the line of cut, whereby the cut portion

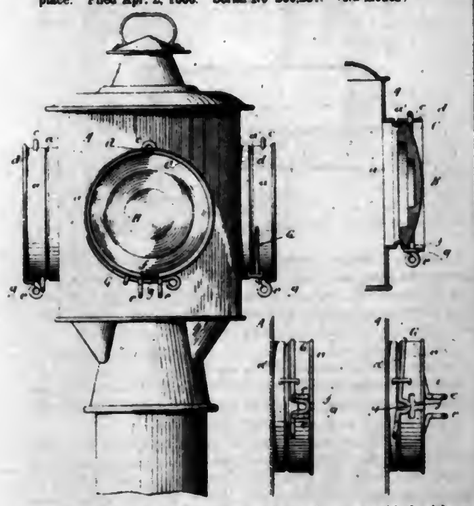
is carried in one direction and the end of the web in the other, substantially as described.

3. The combination, with two rolls having surface contact and with a third roll having contact with the second of said rolls, of web-severing mechanism acting upon the line of contact of the two first-named rolls, a pair of grippers pivotally mounted near the ends of the first roll and actuated by cams to engage the margins of the web immediately after it is cut, grippers pivotally mounted near the ends of the second roll and operated by cams to seize the center of the cut sheet, and a third pair of grippers separated from the second pair by a suitable arc and actuated by cams to seize the center of the centrally-folded sheet, substantially as described.

4. The combination, with a pair of rolls geared to revolve in unison and having their peripheries cut away to leave marginal contacting portions, of severing mechanism acting on the tangent line of said rolls, grippers pivoted on brackets at the ends of the first roll, cams throwing said grippers down upon the margins of said roll, two independent grippers pivoted at each end of the second roll and having independent cams which actuate the same, a third roll having contact with the second roll, and a roll running upon the same above said third roll, substantially as described.

5. The combination, with a pair of rolls geared to revolve in unison, of severing mechanism acting upon the line of contact, grippers pivotally mounted near the ends of the first roll and having cams which engage their ends with the edges of the web an instant after the cut, a second pair of grippers mounted upon the second roll and having cams which engage them with the center of the cut sheet, a third roll beneath the second roll, between which the folded edge is drawn by said grippers, a third pair of grippers pivoted near the ends of the second roll and actuated by separate cams to seize the center of the folded sheet, a fourth folding-roll running in contact with the second roll, and a creasing-roll having one or more creasing-collars running in grooves in the said second roll, substantially as described.

400,763. LENS-FASTENING FOR LAMPS. JOHN S. GALL, Rochester, N. Y., assignor to the Steam Gauge and Lantern Company, same place. Filed Apr. 2, 1888. Serial No. 269,231. (No model.)



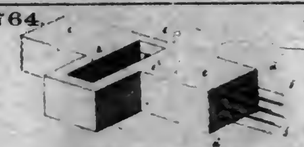
Claim.—1. The combination, with the frame provided with an internal shoulder and with an undercut notch, of a lens resting against said shoulder, and an elastic bow bearing against the lens and engaging with its ends in said undercut notch, substantially as set forth.

2. The combination, with the frame provided with an internal shoulder and having on opposite sides an opening, *d*, and an undercut notch, *f*, of a lens, and an elastic bow provided with an ear, *c*, which engages in the opening *d*, and having its ends engaging in said undercut notch *f*, substantially as set forth.

3. The combination, with the frame provided with an internal shoulder and having on opposite sides an opening, *d*, and an undercut notch, *f*, of a lens, an elastic bow provided with an ear, *c*, which engages in the opening *d*, and having its ends engaging in said undercut notch, *f*, and a spring-catch, G, secured to the frame and engaging between the ends of the bow, substantially as set forth.

400,764. UNDERGROUND CONDUIT. PATRICK R. GREENE, Brooklyn, N. Y., assignor two-thirds to Peter Byrne, Jersey City, N. J., and John Claffy, Brooklyn, N. Y. Filed Sept. 15, 1888. Serial No. 285,467. (No model.)

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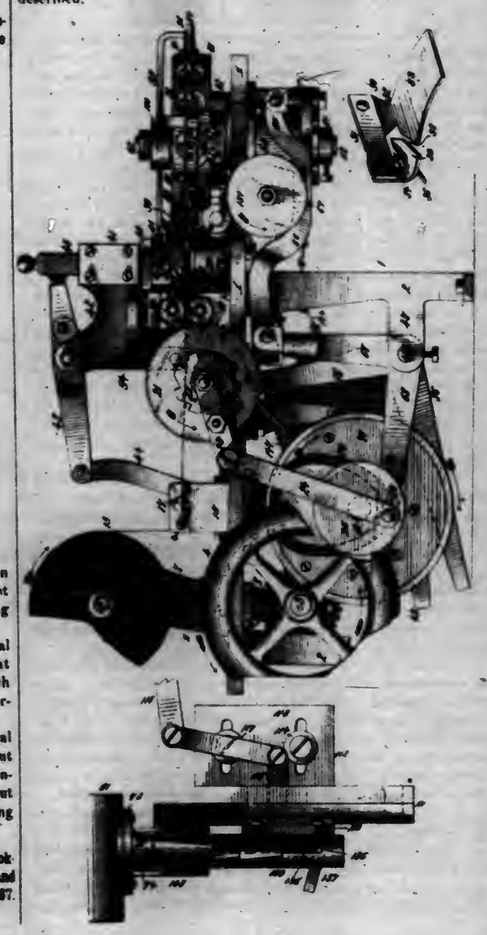


Claim.—As an improved article of manufacture, a conduit-section composed of cement and having a laterally-arranged well or manhole formed integral therewith to form a T in cross-section, and a series of longitudinal tubular perforations extending from the well the entire length of the section, and also having the inner wall of the well provided with an opening, *e*, the whole being adapted when placed in a street to have the well extending outwardly from the curb, substantially as specified.

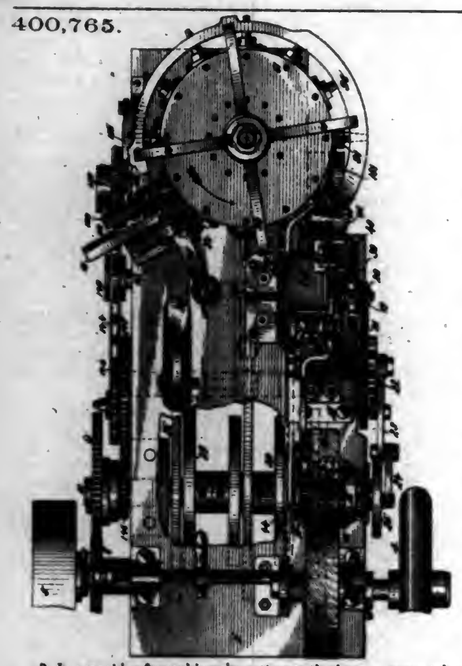
400,765. MACHINE FOR MAKING CIGARETTE MOUTH-PIECES OR PAPER TUBES. GEORGE M. GRENWOLD, New Haven, Conn., and ROBERT W. THURMAN and RICHARD H. WRIGHT, Lynchburg, Va., assignors to the Lone Jack Cigarette Company, Lynchburg, Va. Filed Aug. 4, 1887. Serial No. 246,138. (No model.)

Claim.—1. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a cutting mechanism, substantially as described, rollers for feeding the paper strip, a paste-roller for applying an adhesive substance to one edge of a blank cut from said strip, and a presser-foot for pressing the edge of the blank into contact with the paste-roller, substantially as described.

2. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a die-block, a vertically-reciprocating cutter-head, rollers for feeding a paper strip to the cutting mechanism, a paste-roller for applying an adhesive substance to one edge of a blank cut from the paper strip, and a presser-foot carried by the cutter-head to force the blank into contact with said paste-roller, substantially as described.



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3. In a machine for making cigarette mouth-pieces or paper tubes, the combination of mechanism, substantially as described, for feeding a paper strip, a die-block, a vertically-reciprocating cutter-head having knives for cutting a blank from the paper strip, a rotary mandrel provided with means, substantially as described, for grasping one corner of the blank at its forward end, a roller for applying an adhesive substance to the rear edge of the blank, and a presser-foot for forcing the blank into contact with said roller, substantially as described.

4. In a machine for making cigarette mouth-pieces or paper tubes the combination, with a rotary mandrel-carrier, of a series of rotary mandrels mounted in said carrier, a receptacle for melted wax or paraffine, an absorbent material so placed in said receptacle as to come in contact successively with the cigarette mouth-pieces or tubes carried by said mandrels as the carrier rotates, and means for keeping the wax or paraffine in a melted condition, substantially as described.

5. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a rotary mandrel-carrier, a pawl-and-ratchet mechanism provided with lever-connections for actuating said carrier from a cam-shaft, a series of mandrels mounted in said carrier and provided with pinions, a gear loosely surrounding the carrier-shaft and meshing with said pinions, a pawl-and-ratchet mechanism for driving said gear, and lever-connections for actuating said pawl-and-ratchet mechanism from the cam-shaft with which the mandrel-carrier is connected, all substantially as described.

6. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a rotary mandrel-carrier, a series of rotary mandrels mounted in said carrier and each provided with a longitudinal slot, a gripping dog or latch pivoted in said slot and a spring located beneath the rear end of said latch, a vertically-reciprocating cutter-head provided with knives for forming blanks to be fed to said mandrels, and a lever connected by a link with the cutter-head lever and adapted to bear on the rear end of the mandrel latch or dog and thereby raise its forward end to engage a blank, substantially as described.

7. In a machine for making cigarette mouth-pieces or paper tubes, the combination, with a rotary mandrel-carrier and a series of rotary mandrels mounted therein and each provided with a longitudinal slot, a pivoted dog, and spring, of a reciprocating tubular pull-off or receiver formed in two telescopic parts having a yielding connection, substantially as described, and provided with a spring for raising the mandrel latch or dog, and spring-hooks for withdrawing a finished tube or mouth-piece from the mandrel, substantially as described.

8. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a rotary mandrel-carrier, a series of rotary mandrels mounted in said carrier, a reciprocating pull-off or receiver for taking the finished mouth-pieces from said mandrels, a slotted guideway for the pull-off, an arm passed through the slot in said guideway and attached to the pull-off, and lever-connections for actuating said arm from a cam-shaft with which the mandrels and mandrel-carrier are connected, all substantially as described.

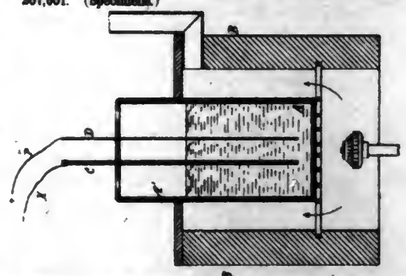
9. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a rotary mandrel-carrier, a series of rotary mandrels mounted therein, a reciprocating pull-off or receiver having a longitudinal slot, and an ejector-rod for entering said slot at intervals and removing the mouth-pieces or tubes collected in the pull-off or receiver, substantially as described.

10. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a rotary mandrel-carrier, a series of rotary mandrels, a slotted pull-off or receiver for taking finished mouth-pieces from said mandrels, an ejector-rod carried by a spring-depressed lever a cam for raising said lever, and means for actuating said cam from the shaft that actuates the mandrels, mandrel-carrier, and pull-off, substantially as described.

11. In a machine for making cigarette mouth-pieces or paper tubes, the combination, with a mandrel and mandrel-carrier, of a reciprocating tubular pull-off formed in two telescopic parts provided with means for releasing a mouth-piece or tube engaged on the mandrel and for withdrawing the same, substantially as described.

12. In a machine for making cigarette mouth-pieces or paper tubes, the combination of a rotary mandrel-carrier, a series of rotary mandrels mounted in said carrier and provided with means, substantially as described, for gripping a paper blank, rollers for feeding a paper strip, mechanism, as set forth, for cutting a blank from said strip, a lever actuated from the cutting mechanism to cause the mandrel-gripping device to seize a blank, pressure devices for winding the blanks on the rotary mandrels, means for coating the tips of the mouth-pieces with paraffine or like material, a pull-off for withdrawing the finished mouth-pieces from the mandrels, and an ejector for removing said mouth-pieces from the pull-off, all substantially as described.

400,766. PROCESS OF REDUCING ALUMINIUM BY ELECTROLYSIS. CHARLES M. HALL, Oberlin, Ohio. Filed July 9, 1886. Serial No. 207,601. (Specimens.)

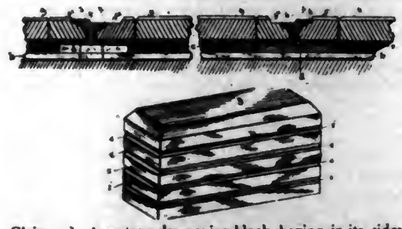


Claim.—1. As an improvement in the art of manufacturing aluminium, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminium and a metal more electro-positive than aluminium, and then passing an electric current through the fused mass, substantially as set forth.

2. As an improvement in the art of manufacturing aluminium, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminium and sodium, and then passing an electric current, by means of a carbonaceous anode, through the fused mass, substantially as set forth.

3. As an improvement in the art of manufacturing aluminium, the herein-described process, which consists in dissolving alumina in a fused bath composed of the fluorides of aluminium, sodium, and lithium, and then passing an electric current, by means of a carbonaceous anode, through the fused mass, substantially as set forth.

400,767. STREET-PAVEMENT. HENRY S. HALLWOOD, Columbus, Ohio. Filed Nov. 16, 1888. Serial No. 291,083. (No model.)

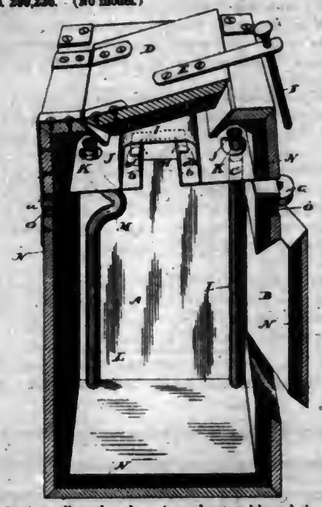


Claim.—1. A rectangular paving-block having in its sides continuous horizontal grooves or corrugations encircling said blocks and the upper edges beveled, substantially as and for the purpose described.

2. The combination, in a street-pavement, of the street-railway rails *f*, the adjoining paving-blocks *f'*, so set as to have their beveled top upon a higher level than the top of the rail, the blocks *f*[3] having one half of their surface depressed in line with the surface of the bearing-flange of the track and the other half having their tops upon a higher level than the top of the rail and the inner ends or sides adjoining said rails conforming to the shape of the web and flanges of the rail, but with an opening between them alongside the flange and the web of the rail wherein pitch is poured, substantially as described.

3. In a street-pavement and railway-track, the combination of the layer of boards *b*, planks *d* laid thereon, railway-track rails *f*, secured to said planks and boards, as described, and the layer of gravel, sand, or broken stone, *c*, upon said planks and boards, with the paving blocks or bricks resting upon said layer *c*, substantially as described.

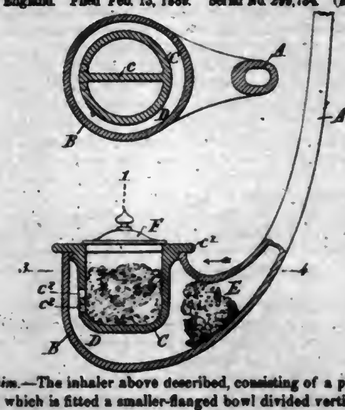
400,768. REFRIGERATOR PACKING-BOX. PHILIP HOMMEIER and JACOB BALL, Waterloo, Ontario, Canada, assignors of one-third to John Nichol, same place. Filed Dec. 15, 1887. Renewed Feb. 8, 1889. Serial No. 299,236. (No model.)



Claim.—1. A cooling-chamber, A, and a top hinged thereto and formed with ice-chamber C, having an opening, H, protected by the walls *b*, having flanges *d*, in combination with the perforated shield I over said opening outside the walls *b*, substantially as and for the purpose specified.

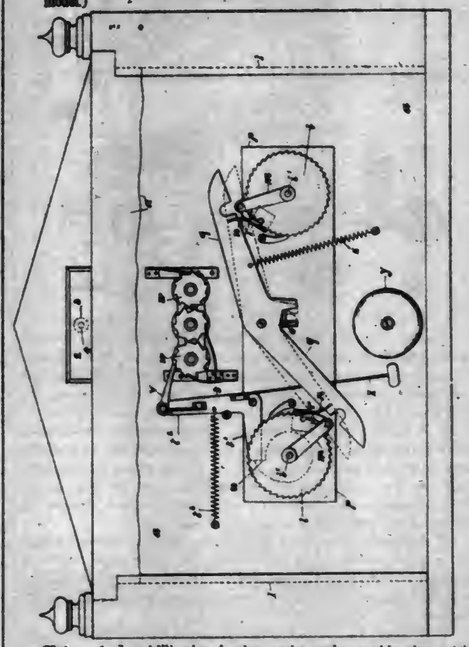
2. The combination, with the chamber A and the hinged top formed with an ice-chamber, C, provided with openings J and an opening, H, protected by the walls *b* and flanges *d*, of the perforated shield I over the opening H outside the walls *b*; the pipes K, communicating with the openings J, the pipe L, and the flexible pipe M, connecting one of the pipes K with the pipe L, substantially as shown and described.

400,769. INHALER. JOSEPH S. HOOKER, Hastings, County of Sussex, England. Filed Feb. 13, 1889. Serial No. 299,734. (No model.)



Claim.—The inhaler above described, consisting of a pipe in the bowl of which is fitted a smaller-flanged bowl divided vertically into two compartments for the reception of the chemical substances to be inhaled, such compartments being pierced with holes for the discharge of the vaporous chemical substances into a mixing-chamber contained within the outer bowl, and closed against the stem of the pipe by a plug of moistened sponge, as and for the purpose above set forth.

400,770. GAME-COUNTER. JOHN HOPE, Liverpool, County of Lancaster, England. Filed Oct. 16, 1888. Serial No. 288,201. (No model.)



Claim.—1. In a billiard and other register, the combination, with a dial provided with numerals, a main working-pointer for registering the state of the game, a single ratchet-wheel mounted on said pointer, and a pawl-lever and pawl by which said wheel is actuated, of a hand-actuated pointer mounted on the same arbor as the main working-pointer and connected with said pawl-lever, whereby the increments of score are added and the said main working-pointer operated, substantially as described.

2. The combination, with the pointer-spindle *i'* of an apparatus for marking the scores made in playing the game of billiards and other like games, of a cam, *u*, lever *t*, secondary counter *w*, gong *y*, and gong-striker *x*, said lever being adapted to be operated by the said cam and to actuate the said counter and gong, as set forth.

3. In a billiard or other game marker, the combination of the spindle *i'*, the actuating-head *k*, pointer *i*, pawl-lever *m*, pawl *n*, ratchet-wheel *l*, hollow shaft *h'*, pointer *h*, a numeral-dial, *c*, and the cam *u*, lever *t*, gong *y*, striker *x*, pawl *v*, and counter *w*, as set forth.

4. The combination, with the actuating pawl-levers *m*, of a lever, *g*, and key *o*, said lever being adapted to engage and interlock with the said pawl-levers *m* and operated by the key *o*, substantially as and for the purposes set forth.

5. In a billiard or other game marker, the combination of the spindles *i' i'*, actuating-heads *k k*, pointers *i i*, pawl-levers *m m*, pawls *n n*, ratchet-wheels *l l*, hollow shafts *h' h'*, pointers *h h*, cam *u*, lever *t*, gong *y*, striker *x*, pawl *v*, counter *w*, and a locking-lever, *g*, and key *o*, substantially as and for the purposes set forth.

400,771. DENTAL RUBBER-DAM CLAMP. JAMES W. IVORY, Philadelphia, Pa. Filed Sept. 13, 1888. Serial No. 285,305. (Model.)

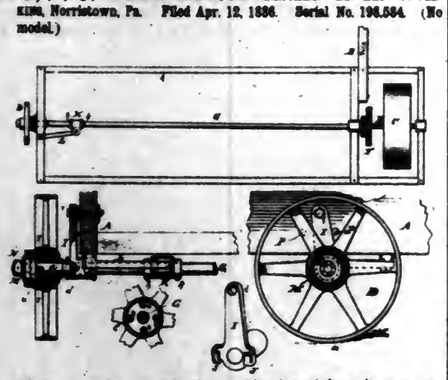


Claim.—1. A dental clamp consisting of two jaws having spring-connections on opposite sides thereof and provided with recesses adjacent to and upon both sides of said jaws, substantially as and for the purpose set forth.

2. A dental clamp consisting of jaws having spring-connections,

the latter being elliptical in front and having lower portions swelled forwardly, as at *a*, substantially as and for the purpose set forth.

400,772. RUNNING-GEAR FOR VEHICLES. EDWARD W. JENKINS, Norristown, Pa. Filed Apr. 12, 1886. Serial No. 198,584. (No model.)



Claim.—1. In a vehicle, the combination of the pole, two supporting-wheels for the vehicle geared together, a clutch for connecting and disconnecting the two wheels with respect to each other, and a mechanical connection between the pole and clutch, whereby the shifting of the latter is caused by lateral pressure upon the pole.

2. A vehicle-frame and two supporting-wheels, in combination with separate shafts for said wheels, gearing connecting said shafts, and a clutch to connect or disconnect one of said wheels with its shaft, a pole for the vehicle, and a connection between the pole and the clutch, whereby upon turning the vehicle the clutch is actuated to disconnect the outer wheel.

3. A vehicle-frame and two supporting-wheels of different diameters, in combination with a pole close to the larger wheel, shafts for said wheels, and gearing connecting the shafts and a grain-platform between said supporting-wheels, substantially as and for the purpose specified.

4. A vehicle-frame and two supporting-wheels of different diameters, in combination with two parallel shafts for said wheels, and gearing connecting the shafts, the larger wheel being fixed to its shaft, and a clutch between the smaller of said wheels and its shaft for connecting or disconnecting that wheel with its shaft.

5. A vehicle-frame, a pole attached thereto near one wheel, and two supporting-wheels, in combination with supporting-shafts and a ratchet-clutch connecting one of said wheels with its shaft, whereby the wheel farthest from the pole is free to rotate faster than the wheel next to the pole, but not slower, substantially as and for the purpose specified.

6. In a vehicle, the combination of two supporting-wheels of different diameters, a pole attached to the frame near one wheel, separate shafts upon which the wheels are mounted, the wheel near the pole being fixed to its shaft, gearing connecting the shafts, and a ratchet-clutch connecting the other wheel to its shaft, whereby the wheel farthest from the pole is free to rotate faster than the wheel next to the pole, but not slower.

7. The combination of frame A, master-wheel C and its gear E, intermediate spur-wheel, *f*, shaft G, having pinion H and clutch-head M, fixed bearing *g* and loose bearing I for said shaft, grain-wheel D, having spring-clutch N and loosely supported on shaft G, and link L, connected to the frame and shaft G, substantially as and for the purpose specified.

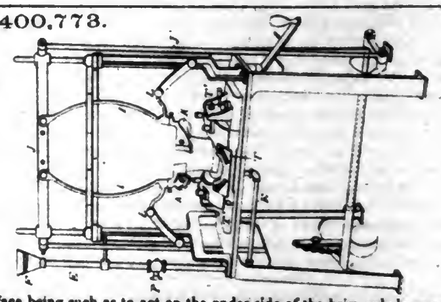
8. In a harvester, the combination of the frame, the main and grain wheels, of different diameters, mounted on separate axles, a pole attached to the frame near the main wheel, gearing connecting the main wheel with the grain-wheel, and a clutch connecting the grain-wheel with its immediate driver, whereby the grain-wheel is driven from the main wheel and is at the same time free to rotate faster but not slower than the main wheel.

400,773. BOTTOM BOARD FOR HATS. CHARLES E. KRATOR, Brooklyn, N. Y., assignor to the Palmud Hat Machine Company, same place. Filed Feb. 2, 1887. Serial No. 226,253. (No model.)

Claim.—1. A hollow bottom board of elastic material having as a unitary part a solid central portion, substantially as described.

2. A hollow bottom board having as a unitary part a solid central portion and an outlet or inlet for a fluid, substantially as described

3. The within-described bottom board for a hat-brim-curling machine, said bottom board having as a unitary part a solid central portion, and around it a surface flexible throughout and conforming to the general shape of the brim with its dip and roll, said flexible surface being such as to act on the under side of the brim only in pressing, all substantially as specified.



4. The within-described bottom board for a hat-brim-curling machine, said bottom board constituting a self-contained structure independent of and detachable from the machine, and having as a unitary part a solid central portion and around this a flexible upper surface conforming to the general shape of the brim of the hat, all substantially as specified.

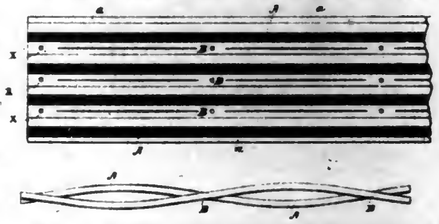
5. The combination of the flexible bottom board of a hat-brim-curling machine with wedge-pieces to support and give shape to the side edges of the bottom board, substantially as described.

6. The combination of the flexible bottom board of a hat-brim-curling machine with movable wedge-pieces to support and give shape to the side edges of the bottom board, all substantially as described.

7. The combination of the bottom board having a solid center, and a hollow rim with movable wedge-pieces to support and give shape to the flexible side edges of the bottom board, substantially as described.

8. The combination of the flexible bottom board of a hat-brim-curling machine with pressers and side-edge curlers and movable wedge-pieces to support and give shape to the flexible side edges of the bottom board, substantially as described.

400,774. METALLIC LATHING. ISRAEL KINNEY, Windsor, Ontario, Canada. Filed Dec. 3, 1887. Serial No. 256,906. (No model.)



Claim.—1. Metallic lathing formed of sheet metal having longitudinal corrugations A and slitted longitudinally throughout between said corrugations, excepting at points in transverse zones, whereby bands B are left for holding the strips thus formed together, portions of said strips being alternately raised and depressed, as herein shown.

2. Metallic lathing constructed of longitudinally-corrugated strips secured together, as shown, by transverse bands, portions of each longitudinally-corrugated strip being raised or depressed, the raised portion of one strip being opposite the depressed portion of the adjacent strips, whereby the mortar is deflected by the sides of the corrugations in the depressed portions behind the raised portions, as set forth.

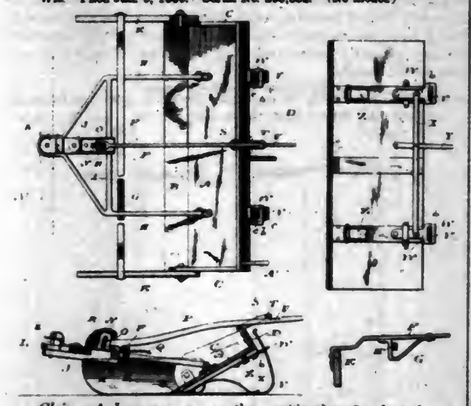
3. Metallic lathing constructed, substantially as described, of longitudinally-corrugated flanged strips secured parallel to each other, portions of each strip throughout being alternately raised and depressed, the raised portions of one strip being opposite the depressed portions of the adjacent strips, whereby the corrugations and flanges of the depressed portions of each strip deflect the mortar behind the raised portions of the adjacent strips to effectually key the same.

4. Metallic lathing constructed of longitudinally-corrugated strips secured together, as described, and having their portions between securing-points alternately raised and depressed, as hereinbefore explained.

5. Metallic lathing constructed of longitudinally-corrugated strips secured in the proper relative positions to each other, substantially as shown, said longitudinal strips being bowed alternately in the plane of their length, as shown and described.

6. Metallic lathing consisting of long parallel longitudinally-corrugated strips, each of said strips having alternate longitudinally-corrugated portions raised and depressed, the adjacent portions of the strips being bent oppositely, as described.

400,775. SNOW-SCRAPER. GERHARD J. KOPMEIER, Milwaukee, Wis. Filed Jan. 9, 1889. Serial No. 295,852. (No model.)



Claim.—1. In a snow-scraper, the combination of a pivoted scraping-board, a tongueless draft-frame shackled thereto, and a doubletree or analogous device detachably connected to said draft-frame, substantially as set forth.

2. In a snow-scraper, the combination of a pivoted spring-supported scraping-board, a draft-frame shackled thereto, and a doubletree or analogous device detachably connected to the draft-frame, substantially as set forth.

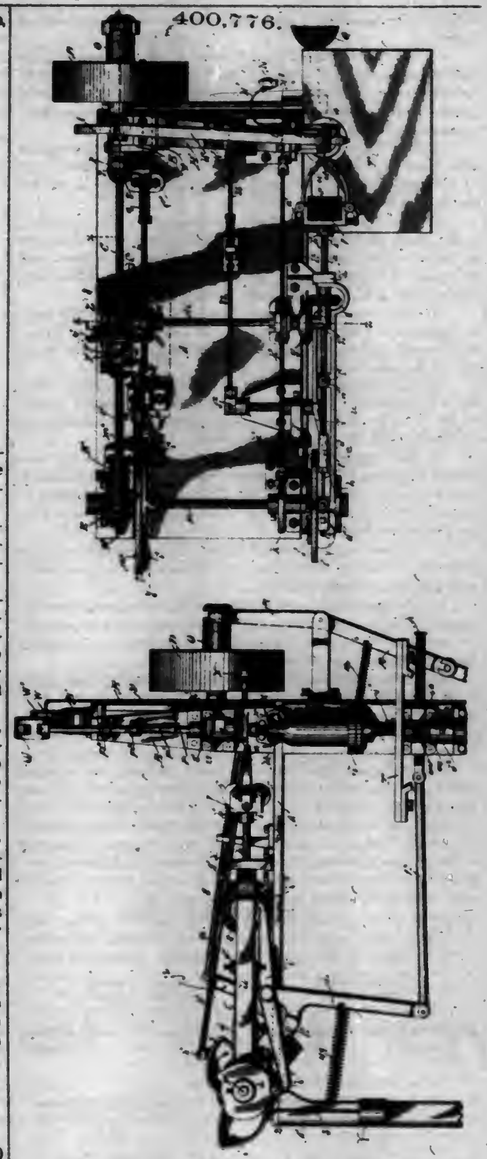
3. In a snow-scraper, the combination of the main runners, a cross-brace uniting the same and provided with depending loops, a scraping-board pivoted to the runners, a draft-frame shackled to the scraping-board and supported by said loops, a standard on the draft-frame, a rearwardly-extended lever fulcrumed on said cross-brace and loosely connected to the standard, and a latch pivoted to said scraping-board to engage the lever, substantially as set forth.

4. In a snow-scraper, the combination of a pivoted scraping-board, runners hinged to the under side of the same and having upwardly-extended free ends provided with notches, slotted plates pivoted to said scraping-board to engage said free ends of the runners, a strap connecting the pivoted plates, and a lever for actuating the strap, substantially as set forth.

5. In a snow-scraper, the combination of a pivoted scraping-board, runners hinged to the under side of the same and having upwardly-extended free ends provided with notches, pivotally-adjustable slotted plates secured to the scraping-board to engage said free ends of the hinged runners, and springs secured to said scraping-board to exert their force against the same and rest upon said runners, substantially as set forth.

6. A snow-scraper comprising a pair of main runners, a cross-brace uniting the same and provided with depending loops, a scraping-board pivoted to the main runners and provided with hinged runners having upwardly-extended and notched free ends, pivotally-adjustable slotted plates secured to the scraping-board to engage said free ends of the hinged runners, a draft-frame shackled to said scraping-board and supported by said loops on the cross-brace, a standard on the draft-frame, a rearwardly-extended lever fulcrumed on said cross-brace and loosely connected to the standard, and a latch pivoted to the scraping-board to engage the lever, substantially as set forth.

400,776. MACHINE FOR CORKING AND WIRING CORKS TO BOTTLES. HENRY LA CASSE, Syracuse, assignor to Sol Wile, Rochester, N. Y. Filed July 30, 1888. Serial No. 281,361. (No model.)



Claim.—1. The combination of a compressor for compressing the cork, a wire-carrier having jaws for applying the wire to the cork and bottle, a plunger for forcing the cork into the bottle, and connected mechanism for actuating the several devices in their due order, substantially as and for the purpose set forth.

2. The combination of the compressor, plunger, wire-carrier having jaws, and hammer N, and connected mechanism for actuating the several devices in their due order, substantially as and for the purpose set forth.

3. The combination of the compressor, plunger, wire-carrier having jaws, bottle-support, and jaws M M, for grasping the neck of the bottle, and connected mechanism for actuating the several devices in their due order, substantially as and for the purpose set forth.

4. The combination of the plunger, wire-carrier and its jaws, jaws M M, for holding the two strands of wire together while the bottle is revolved to twist them onto the cork, the rotating bottle-support J, and connected mechanism for actuating the several devices in their due order, substantially as and for the purpose set forth.

5. The combination of the bottle-support, wire-carrier having jaws, jaws M M, and hammer N, for cutting off the wire after it has been twisted onto the cork, and connected mechanism for actuating the several devices in their due order, substantially as and for the purpose set forth.

6. The rotating wire-carrier I, having jaws *a a*, and shaft *b*, sliding endwise in the pivoted hanger U and oscillating on the hub U', journaled on the shaft F, substantially as and for the purpose set forth.

7. The wire-carrier I, provided with jaws *a a*, and shaft *b*, adapted to move endwise in a hanger, U, and to oscillate on the hub U', in combination with the elbow-bearing Z', the gears *g g'*, and the pivoted actuating-shaft H, all substantially as and for the purpose set forth.

8. The wire-carrier I, having jaws *a a*, and shaft *b*, mounted in the hanger U to oscillate therewith, in combination with the cam *h* on the shaft F and the pivoted lever V, substantially as and for the purpose set forth.

9. The hanger U, provided with the hub U', journaled on the shaft F, and the projecting bearing *d'*, in combination with the rods *f f'*, sliding bearing *d*, carrying the shaft *b* of the wire-carrier, the cam *i*, for impelling the bearing *d* and shaft forward, and the cord 3 and

weight Y, for retracting it, substantially as and for the purpose set forth.

10. The combination of the wire-carrier I and its jaws with the shaft *b*, elbow-bearing Z', gears *g g'*, shaft H, sleeve *o*, slotted post X', swiveled bearing Z, gears G G', and collar H^3, setting in a cut-out in the bearing Z, for rotating the wire-carrier and permitting it to oscillate, substantially as and for the purpose set forth.

11. The bottle-support J, having screw-shaft J', in combination with the collar J^3, pinion 44, clutch 45, and rack K, operated by rod L^2, connected to lever L, actuated by cam *j*, substantially as and for the purpose set forth.

12. The combination, with the bottle-support J and its shaft J', of the loosely-mounted pinion 44, actuated by the forward movement of the rack K to engage the clutch 45 and revolve the support J, and disengaged from the clutch by the rearward movement of the rack, substantially as and for the purpose set forth.

13. The compressor S', mounted movably in the bracket-support S, composed of a semi-tubular section and a pivoted section, in combination with the rod *s* and its actuating-cam *u*, substantially as and for the purpose set forth.

14. The bracket-support S, provided with the curved slot or recess 29, in combination with the vertically-moving compressor S', hinged on pin 21 to the compressor-rod *s* and its actuating mechanism, substantially as and for the purpose set forth.

15. The combination, with the bracket-support S, of the compressor S', having a hinged section or segment, the pivoted locking-lever K', having the projecting end 27 in the path of the finger P', carried by the plunger P, and the finger P', substantially as and for the purpose set forth.

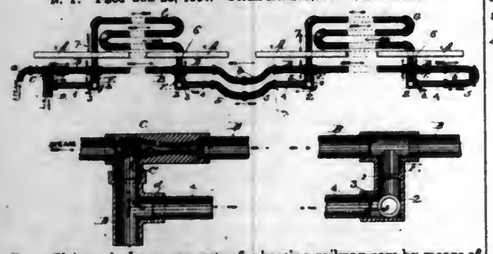
16. The combination, with the plunger P, of the vertically-movable compressor S', having the bulb or swell 52 near its exit, substantially as and for the purpose set forth.

17. The combination, with the hammer N, having spring-shank N', secured to pinion N^3, of the rack N^2, rod k^2, lever *k'*, having stud 38, the cam *k*, having notches 39 and 40, and the spring 41, substantially as and for the purpose set forth.

18. The combination of the jaws M M, mounted on the shafts M' M', gears 32, crank M^2, rod 33, eccentric-lever j^3, the cam *j*, for actuating the lever j^3, and a spring on the rod 33 for restoring the jaws M M to their normal position, substantially as and for the purpose set forth.

19. The combination of the wire-carrier I, having jaws, the main shaft C, and intermediate mechanism for operating the jaws, with the gear G, having notches 14, the lever H', having pawl-hook 15, a clutch, *p'*, and the pivoted lever F', carried by the sliding section of the clutch *p'* to force the pawl of lever H' from engaging the notches in gear G, and the spring 51, for forcing the lever H' toward the gear for stopping the wire-carrier in its normal position after twisting the wire, substantially as and for the purpose set forth.

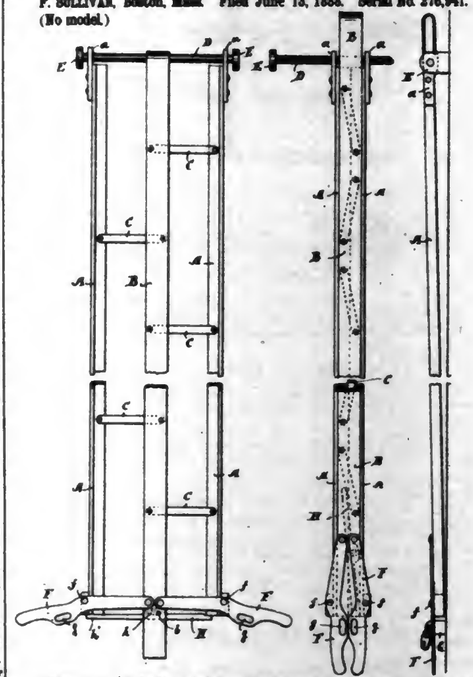
400,777. APPARATUS FOR HEATING RAILWAY-CARS. JOHN LOFTUS, Albany, assignor of one-half to John Greenalch, East Albany N. Y. Filed Oct. 25, 1887. Serial No. 253,308. (No model.)



Claim.—1. In an apparatus for heating railway-cars by means of mixed steam and air, the combination of a steam-injector that is connected with a steam-supply, and is provided with an air-inlet, a conducting-pipe for conveying the commingled steam and air from said injector directly to the rearmost end of the train without passing the same through the radiators, said conducting-pipe being provided on each car with branch fittings which do not break the continuity of the opening through said pipe nor divert the direct current of steam and air into the radiators, said branch fittings having just below their T-heads a perforated diaphragm, and at their lower end a triple elbow, a lower system of pipes which is connected at the rearmost end of the train to said conducting-pipe, and by which the steam and air is returned toward the foremost end of the train and into the injector, the direct continuity of said lower system of pipes being broken between the branch fittings under each car, and lateral pipes leading from the lower end of each branch fitting and connecting with the radiators within the cars, as and for the purpose herein specified.

2. The valveless branch fitting E, consisting of a body-piece having at its upper end a T-head and at its lower end a triple elbow, the single branch of the latter ranging in line with the T-head, and the oppositely-located lateral branches thereof ranging at right angles to said T-head, said body-piece having within it and just below the opening through said T-head a perforated diaphragm, as and for the purpose herein specified.

400,778. FOLDING LADDER. FRANK W. LOWE and CORNELIUS F. SULLIVAN, Boston, Mass. Filed June 13, 1888. Serial No. 276,941. (No model.)

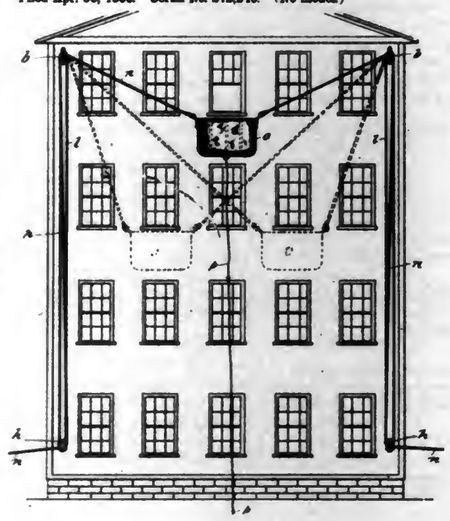


Claim.—1. A folding ladder consisting of two side angle-irons and a central flat bar with rounds on each side of same, said rounds being pivoted at their inner ends to the central flat bar and at their outer ends to the side angle-irons, substantially as shown and described.

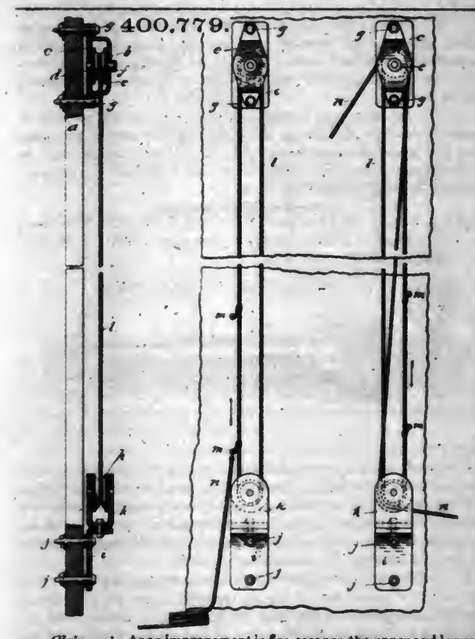
2. The side angle-irons, A, central flat bar, B, and rounds C, in combination with operating-levers F, substantially as set forth.

3. The side angle-irons, A, central flat bar, B, and rounds C, in combination with operating-levers F and spacer-bar H, substantially as shown and described.

400,779. FIRE-ESCAPE. CHARLES A. LOCK, Manchester, N. H. Filed Apr. 30, 1888. Serial No. 272,246. (No model.)



400,779.



Claim.—1. As an improvement in fire-escapes, the upper and lower sheaves and pulleys attached to the front wall of a building, the two endless ropes or chains passed each around an upper and lower pulley, and the car or vehicle having chains or cables designed to be connected to said endless ropes or chains at their outer ends, substantially as described, whereby said car or vehicle can be raised or moved to the desired point between said endless ropes or chains, as stated.

2. A building having its outer wall provided with a sheave or pulley at or near the roof or top and a similar sheave or pulley at or near the ground, and an endless rope or chain passing over said pulleys the bearing for the lower pulley being swiveled in its support, as set forth.

3. The herein-described improvement in fire-escapes, consisting of the upper and lower sheaves and pulleys attached to the outer wall of a building near the ends thereof, the endless ropes or chains passed over the respective upper and lower pulleys and having hooks or attaching devices, the car or vehicle, and the chains or cables secured thereto and designed to be connected at their outer ends to said hooks or attaching devices, substantially as described.

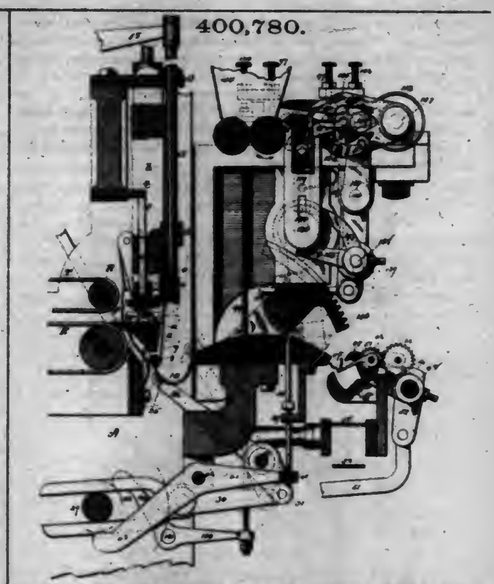
400,780. CIGARETTE-MACHINE. FRANK J. LUDINGTON, Waterbury, Conn. Filed Aug. 27, 1888. Serial No. 283,535. (No model.)

Claim.—1. In a machine for making cigarettes, the combination of a feeding device to deliver a predetermined quantity of tobacco, a stationary cutter below and a vertically-reciprocating slide above carrying a corresponding cutter, and between which cutters the tobacco is so delivered, the presser *f*, yieldingly supported in said slide, springs between said slide and presser, and a spring-latch also between said slide and presser, with a shoulder, *r*, adapted to engage said latch as the slide commences its ascent, and a stationary shoulder, *t*, in the path of said latch as it ascends with the slide, substantially as described, and whereby said latch is tripped as the slide approaches its upward position.

2. In a machine for making cigarettes, the combination of a feeding device to deliver a predetermined quantity of tobacco, a stationary cutter, *a*, over which the tobacco so delivered passes, and a corresponding reciprocating cutter, *c*, above, with the sliding cleaner 2, arranged in rear of said cutter *a*, so as to move forward over the edge of the cutter at predetermined times, and mechanism for imparting such sliding movement to said cleaner, substantially as and for the purposes described.

3. In a cigarette-machine, the combination of the rolling-table 6, the flexible apron 7, attached by its forward end to the outer edge of the said table, a bar, 8, at the rear of the table, to which the other end of the apron is attached, swinging levers 9, carrying said bar 8, guard 25, arranged to double the apron over the tobacco as the apron is drawn forward over the table, levers 26, carrying said guard 25, mechanism for imparting swinging movement to said bar and guard, nippers 37, working through openings in the table and apron and adapted to grasp the inner edge of the wrapper and hold it upon the apron, so that as the tobacco is rolled by said apron and guard over the table

400,780.



the said wrapper will be wound around the tobacco, with two pairs of cutters, 47 49, arranged forward of the bed, to which the rolled cigarette is delivered, substantially as described, said cutters being adapted to clip the ends of the cigarette.

4. In a machine for making cigarettes, the combination of the rolling-table 6, the apron attached by its forward end to the forward edge of the table, the said apron adapted to receive the requisite quantity of tobacco for a cigarette at the rear edge of the table, mechanism, substantially such as described, to double said apron over the tobacco and roll it over the table to its forward edge, nippers 37, working through openings in the table and apron to grasp the inner edge of the wrapper, fingers 45, forward of the table and arranged to receive the rolled cigarette as it is delivered from the apron, with two pairs of cutters, 47 49, arranged distant from each other corresponding to the length required for the cigarette, with mechanism, substantially such as described, to turn said fingers 45 downward to deliver the cigarette to the said cutters, substantially as described.

5. In a machine for making cigarettes, the combination of the rolling-table and feeding and rolling mechanism, a carrier at the forward edge of the table moving in a path parallel with the table and adapted to receive the cigarettes as they fall from the apron, and a hopper, 66, to which the cigarettes are delivered from said carrier, the bottom of the said hopper being inclined to a mouth, 67, the said mouth corresponding in width substantially to the diameter of a cigarette and forming a conductor for the discharge of the cigarettes, substantially as described.

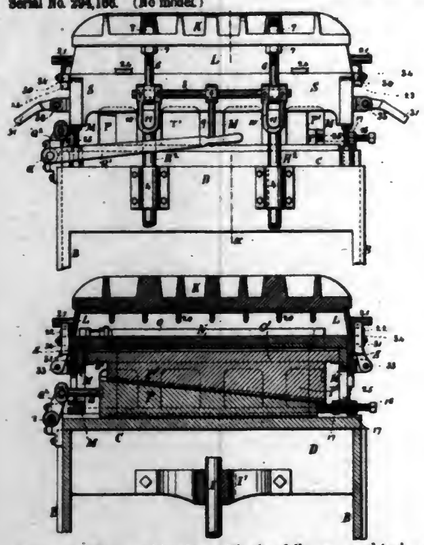
6. In a machine for making cigarettes, the combination of the rolling-table, a feeding and rolling mechanism, a carrier at the forward edge of the table moving in a path parallel with the table and adapted to receive the cigarettes as they fall from the apron, a hopper, 66, the bottom of the said hopper inclined to a mouth, 67, a carriage below said hopper and movable in a path at right angles thereto, the said carriage constructed with a series of vertical partitions, 68, forming a corresponding series of parallel pockets, 71, with mechanism, substantially such as described, to impart step-by-step movement to said carriage, and whereby the said pockets are successively brought beneath the mouth of the hopper, substantially as described.

7. A receiver for cigarettes, consisting of a series of vertical partitions, 68, forming a corresponding series of pockets, 71, the said pockets open at the top and one end, combined with a removable front, 84, constructed with fingers 85, projecting from its lower edge, the said fingers corresponding to and adapted to form false bottoms for the said pockets, substantially as described.

8. In a machine for making cigarettes, the combination, with mechanism adapted to deliver the requisite quantity of tobacco and roll the same into its wrapper, of a spool carrying the paper from which the wrapper is to be taken, the axis of said spool being parallel with the path in which the cigarette is rolled, two pairs of nippers, 92 93, arranged above and at one side of said rolling devices, a pair of fingers, 117 118, hung upon a shaft parallel with the run of the paper and with the path of the rolling cigarette, the said shaft being midway between the nippers holding the paper and the table over which the cigarette is rolled, mechanism, substantially such as

described, to impart to said shaft a longitudinal reciprocating movement, a pair of blades, 105 106, arranged to cut the paper, with mechanism, substantially such as described, to impart rotative movement to said shaft, substantially as described.

400,781. SAND-MOLDING MACHINE. JOHN N. MATLOCK, Brooklyn, N. Y., assignor to himself, and Thomas Hilton Williams and Samuel Ducenbury Tompkins, both of Jersey City, N. J. Filed Dec. 20, 1888. Serial No. 294,166. (No model.)



Claim.—1. The combination, with the follower, sand-bed, patterns, and flask, of the flask-rest S and screws for adjusting the flask-rest to vary the sand-joint between two parts of the mold, substantially as set forth.

2. The combination, with the patterns, of a sand-bed having openings corresponding to the outline of the patterns, a pattern-bed to which the patterns are connected, wedges P beneath the pattern-bed and connected with the same, a grooved top plate, C, the wedges P, having ribs that fit the grooves in the top plate, a frame, M, around the pattern-bed and supporting the sand-bed, mechanism, substantially as specified, for giving an end motion to the wedges P, and a stop for limiting the movement of said wedges, substantially as set forth.

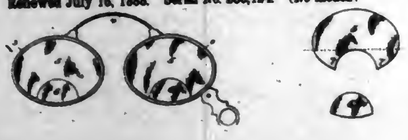
3. The combination, with the flask, of the flask-rest and means for adjusting the same vertically, a sand-bed within the flask-rest, patterns occupying openings in the sand-bed, a pattern-bed with which the patterns are connected, the plate C and the wedges acting between the same and the pattern-bed, the rock-shaft Q, lever Q', and connection to the wedges P, for raising or lowering the patterns, the stripping-plates T, and connections from the same to the bed C, substantially as set forth.

4. The combination, with the press, the frame for the same, the sand-bed, and the flask, of a follower, side rods, H', to which the follower is hinged at one side, rods H^2, having hook-shaped ends, the rods 6, rock-shaft 8, passing through eyes on the rods, the lever-handle 9, and the loops 10, connected to said rock-shaft, whereby the follower is connected to or disconnected from the rods H^2 by the movement of the lever 9, substantially as set forth.

400,782. METHOD OF TREATING SISAL, &c. ALPHEUS W. MOUTCORREY, New York, N. Y. Filed Apr. 13, 1888. Serial No. 270,605. (No specimens.)

Claim.—The method, substantially as herein described, of cleaning sisal and analogous fibers and preparing the same for spinning after the ultimate fibers have been separated from each other and the preliminary cleaning effected, which consists in combing or hatcheling said fibers to remove the remaining foreign adhering matter before oil has been applied thereto and of subsequently oiling said fiber.

400,783. SPECTACLE-LENS. AUGUST MORCK, Jr., Warren, Pa., assignor of one-half to Fred. Morck, same place. Filed Sept. 10, 1887. Renewed July 16, 1888. Serial No. 280,124. (No model.)



Claim.—1. The combination, with a far-vision lens having its lower edge cut out centrally in semicircular form, of a near-vision lens shaped to fit said central semicircular opening in the far-vision lens, and secured therein by suitable adhesive substance, substantially as set forth.

2. A far-vision lens having its lower edge cut out centrally in semicircular form, and having the surface on both sides of the opening thus made extended to the lower rim of the inclosing-frame, in combination with a near-vision lens shaped to fit said central semicircular opening, substantially as set forth.

400,784. AXLE-LUBRICATOR. OTTO F. MULHAUPT, Shreveport, La., assignor to J. Henry Shepherd, same place. Filed Jan. 24, 1889. Serial No. 297,371. (No model.)

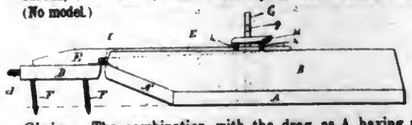


Claim.—1. In an axle-lubricator, a spindle provided with a longitudinal groove the upper and lower walls of which meet the surface of the spindle with a gradual curve, the lower portion of said groove being undercut to provide an oil-containing channel, said groove being connected by one or more perforations with an oil-chamber, substantially as shown, and for the purpose set forth.

2. In an axle-lubricator for carriages or wagons, the combination of a hollow spindle, an oil cup or chamber connected therewith, a longitudinal groove in the front or leading side of the spindle, the lower edge of said groove being undercut to provide an oil-containing channel, and openings connecting the groove with the bore of the spindle, whereby the lubricant is distributed over the major portion of the surface of the spindle and axle-box, substantially as shown.

3. In an axle-lubricator for carriages and wagons, a spindle bored longitudinally to provide an oil-chamber, C, a longitudinal groove, D, in the front side of the spindle, and perforations e, connecting said groove with the oil-chamber, the longitudinal groove being undercut at its lower portion to provide an oil-channel, the exterior edges of said groove being curved, substantially as shown.

400,785. COMBINED HARROW AND DRAG. GEORGE W. MULLENNIX, Yates Centre, Kans. Filed Sept. 5, 1888. Serial No. 284,650. (No model.)



Claim.—The combination, with the drag, as A, having an inclined forward end, and sides, as B, of a harrow, as D, hinged to the forward upper end of the drag, teeth F, a long lever, as E, rigidly secured to the upper side of the harrow and extending back over the drag, and a vertically-arranged rack-bar, as G, having rectangular teeth, as *g*, on its side, between which the end of the lever is adapted to be placed, substantially as described.

400,786. PROCESS OF PREPARING COTTON-SEED FOR PLANTING. GEORGE W. NEWELL, Mapleville, assignor of one-half to Arthur Arrington, Louisburg, N. C. Filed July 16, 1887. Serial No. 244,531. (No specimens.)

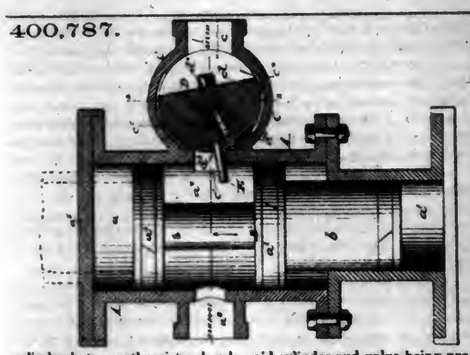
Claim.—1. The hereinabefore-described process of preparing cotton-seed for planting, destroying the adherent fibrous matter, which consists in placing the cotton-seed in the condition in which it comes from the gin into a suitable vessel, or into suitable vessels, then pouring upon it a quantity of the sulphuric acid of commerce to cover it about two-thirds, adding a quantity of water equal to about one-half the quantity of acid, thus covering the seed, then stirring and allowing to remain for a few minutes, and then removing and soaking, substantially as set forth.

2. The process of preparing cotton-seed for planting, which consists in treating the seed with a solution composed of about two parts of sulphuric acid of commerce and about one part of water.

400,787. STEAM-PUMP. SAMUEL J. PARKER, Rochester, N. Y., assignor to Elisa J. Parker, same place. Filed June 8, 1888. Serial No. 276,435. (No model.)

Claim.—1. The cylinder and the transverse cylindrical valve-chest at its side, in combination with the double-headed piston in the cylinder, and the oscillating and longitudinally-reciprocating valve mounted in the valve-chamber and having the arm extended into the

400,787.



cylinder between the piston-heads, said cylinder and valve being provided with ports, substantially as shown, for admitting steam to and from the ends of the valve-chamber and the ends of the cylinder, whereby the operative parts are all brought within and protected by the cylinder and valve-chamber.

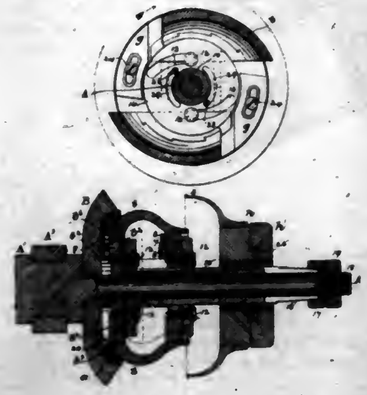
2. In a steam-pump, a cylinder having the central exhaust-ports, a double-headed piston therein, a valve-chamber lying transversely against the side of the cylinder, a rocking and reciprocating valve mounted in said chamber and provided with an arm extending into the cylinder between the piston-heads, and also provided with steam-ports leading to its ends, a single exhaust-port in its face, and two independent live-steam ports around its ends, all operating in connection with corresponding ports in the cylinder and valve-chamber, as shown.

3. In a steam-pump, the steam-cylinder and the pump-cylinder a', forming a continuation thereof at one end, in combination with the piston having one end fitted to the steam-cylinder and the other end projected in the form of a piston into the pump-cylinder, the transverse valve-chamber opening into the steam-cylinder, and the rocking and reciprocating valve provided with the arm or tappet, said moving parts being wholly inclosed within the cylinder and valve-chamber.

4. The cylinder provided with the ports a^6 and a^7 and the central exhaust-port, and the transverse cylindrical valve-chamber located at the side of the cylinder and communicating centrally therewith, in combination with the double-headed piston in the cylinder, and the oscillating and longitudinally-reciprocating valve mounted in the valve-chamber and provided with the arm extending directly into the cylinder between the piston-heads, said valve provided with the ports leading from the steam-inlet to its ends, with the live-steam ports d^7 d^8 and the exhaust-port d^6.

5. The steam-cylinder provided with the central exhaust-port, a^5, and the cylindrical valve-chamber located transversely at the side of the cylinder and communicating therewith by an opening, c', in combination with the double-headed piston mounted in the cylinder, and the oscillating and reciprocating valve mounted in the valve-chamber and provided with the operating-arm extended through the opening c' into the cylinder, said valve and cylinder provided with ports, substantially as described, and said opening c' adapted to permit the movement of the valve-operating arm therein, both longitudinally and transversely of the cylinder.

400,788. ROTARY CUTTER FOR TRIMMING-MACHINES. MERTON D. PHELAN, Wollaston, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed June 13, 1888. Serial No. 276,969. (No model.)

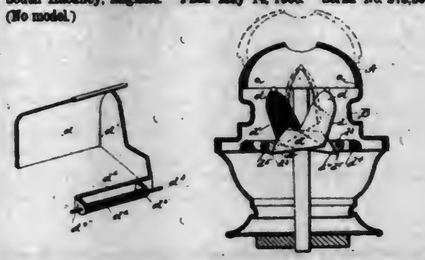


Claim.—1. In a heel-trimming tool, a chambered tread-guard and expansible cutter, combined with a rand or counter guard, the said parts being adjustable relatively toward and from each other in the direction of the length of the cutter-shaft to expose different portions of the blades of the cutter, according to the style of the heel, substantially as described.

2. The combination, with a cup-shaped counter-guard and a chambered tread-guard, of a cutter-shaft and an expansible cutter connected thereto between the said counter-guard and tread-guard and made adjustable with relation to the said counter and tread guards in the direction of the length of the cutter-shaft, to operate substantially as described.

3. The chambered or dished tread-guard, cutter-shaft, and cutter thereon made adjustable longitudinally in the direction of the length of the said shaft within the chambered end of the tread-guard, combined with means, substantially as described, to expand the cutter and to enable its blades to substantially fill the chambered portion of the tread-guard inclosing the said blades, substantially as described.

400,789. LAMP-EXTINGUISHER. CHARLES E. POPPLEWAITE, South Hackney, England. Filed May 14, 1888. Serial No. 273,896. (No model.)



Claim.—1. The automatic extinguisher consisting of the pivoted shutters provided with pins, and the detachable weighted dome to rest upon said pins, and the springs, substantially as described, whereby, when the dome is in place, it serves by its weight upon the pins to hold the shutters open against the action of the springs, as set forth.

2. The extinguishing mechanism for single-burner flat-wick oil-lamps, consisting of the combination of the shutters d with pins d^7, arms d', and bars d^2, the springs d^3, and the pins d^5, and the movable weight supported on the pins d^7, substantially as described.

3. The extinguishing mechanism for single-burner flat-wick oil-lamps, consisting of the combination of the shutters d with arms d' and bars d^2, the springs d^3, the pins d^5, the levers e, with bars e', pins d^7, projection e, and the lever F, and movable weight supported on the pins d^7, substantially as described.

4. The extinguishing mechanism of duplex flat-wick oil-lamps, consisting of the shutters d, with arms d' and bars d^2, the springs d^3, the pins d^5, the levers e, with bars e', pins d^7, and projections e^3, the frame g', and movable weight supported on the pins d^7, substantially as described.

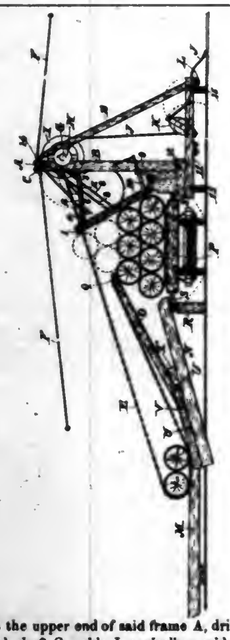
400,790. LOG-LOADING MACHINE. GEORGE W. PRATT and JAMES P. HARSON, Oshkosh, Wis. Filed Apr. 23, 1888. Serial No. 271,560. (No model.)

Claim.—1. In a log-loading machine, the combination, with the vertical frame, the thereto-attached log-loading chains, and the mechanism for winding and operating the said chains, of one or more log-stops adjustably connected to said frame and adjustable bars for moving and retaining said stops at any desired angle for stopping the logs parallel to each other when being elevated and loaded by the action of said chains, substantially as and for the purpose specified.

2. In a log-loading machine, the combination of a frame mounted upon a supporting-base and provided with retaining-braces, horizontal rotating shaft G, secured in journal-bearings at the upper end of said frame, a driving-pulley rigidly affixed centrally upon said shaft G and provided with an encircling cable communicating with the moving power, chain-retaining spools H H, affixed to the respective ends of said shaft G, two chains, E, secured, respectively, at one end to the respective spools H H and at their other ends to the ends of the movable log-supporting skids O, stationary skids N, provided with retaining-ways for the reception of the lower ends of said movable skids O, and two log stops or bars, I, adjustably connected at their respective ends to the vertical frame A and adapted to stop the logs in their proper places as they are being loaded or piled together, substantially as and for the purpose specified.

3. A log-loading machine comprising a vertically-arranged frame, A, pivoted at its lower end upon a movable base, 11, base 11, base-supporting runners 15 15, frame-supporting braces 13, pivoted at their lower ends to said base 11 and connected at their upper ends to the upper end of said frame, horizontally-arranged shaft G, secured

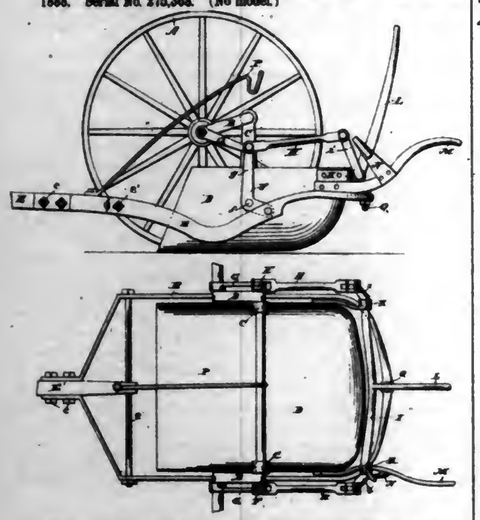
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in journal-bearings at the upper end of said frame A, driving-pulley I, rigidly affixed to said shaft G, cable J, encircling said pulley I and communicating therefrom with the moving power, chain-retaining spools H H, affixed to the respective ends of said shaft G, and two chains, E, secured, respectively, at one end to said spools H and at the other end to the log-supporting skids O, all substantially as and for the purpose specified.

4. In a log-loading machine, the combination, with the vertical frame provided with mechanism for operating the log-loading chains E, of the log stops or bars 1, adjustably connected at their lower ends with said frame, ratchet-bars 3, pivoted at one end to the upper ends of said stops 1, and ratchet-engaging pins or stops 5, upon which the teeth of said ratchet-levers are adapted to engage as said log-stops are adjusted, substantially as and for the purpose specified.

400,791. WHEEL-SCRAPER. TIMOTHY REBHOLS, Troy, Ohio, assignor of one-half to Wm. G. Rebhols, same place. Filed May 23, 1888. Serial No. 275,368. (No model.)



Claim.—1. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon, and the frame or hounds connected to the scraper-bowl, of a rod or shaft journaled on the rear of the scraper-bowl, and having the cranked ends connected to the cranked ends of the axle, and the handle for rotating said shaft, whereby the scraper-bowl may be raised or lowered, substantially as described.

2. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon, and the frame or hounds connected to the scraper-bowl, of a rod or shaft journaled on the rear of the scraper-bowl, having its cranked ends connected to the cranked ends of the axle, and the catch engaging the cranked ends of the shaft for holding the bowl in elevated position, substantially as described.

3. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon, the frame or hounds, and the bell-crank levers connecting said scraper-bowl and frame, of a lever connected to the cranked axle and bell-crank levers, respectively, for moving the same and raising or lowering the scraper-bowl, substantially as described.

4. In a wheel-scraper, the combination, with the cranked axle the scraper-bowl hung thereon, the frame or hounds, and the bell-crank levers connecting said frame and scraper-bowl, of a lever pivoting on the rear of the scraper-bowl, and a connection between the cranked end of the axle and bell-crank levers, and levers pivoted to the rear of the bowl, as set forth.

5. In a wheel-scraper, the combination, with the cranked axle the scraper-bowl hung thereon, and the lever for raising and lowering said scraper-bowl, of the frame or hounds extending entirely around the bowl, and serving as a stop for limiting the tilting of the same, substantially as described.

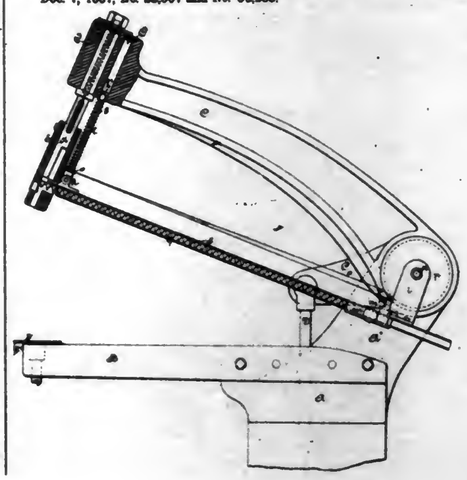
6. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon by the standards having the downward extensions, and the frame or hounds, of levers carried by the lower ends of the standards and connected to the frame or hounds, and a lever connected to said first-mentioned levers and to the cranked axle for raising and lowering the scraper-bowl, substantially as described.

7. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon, the frame or hounds, the bell-crank levers connecting the bowl and frame or hounds, the lever pivoted to the rear of the scraper-bowl, and the connection between said lever and the cranked end of the axle and bell-crank levers, of a handle, also connected to the rear of the scraper-bowl, and serving to tilt or dump the same independently of the raising and lowering mechanism.

8. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon, the frame or hounds passing around the same, and the bell-crank levers uniting the frame and scraper-bowl, of the lever pivoting on the rear of the scraper-bowl, and connected to the cranked end of the axle and bell-crank levers for raising and lowering, the dumping-handle rigidly connected to said scraper-bowl, and the lock for holding the same in elevated position while being dumped, substantially as described.

9. In a wheel-scraper, the combination, with the cranked axle, the scraper-bowl hung thereon, the frame or hounds passing around the same, and the raising and lowering lever, of an adjusting-block on said frame or hounds for varying the angle at which the scraper-bowl shall operate, substantially as described.

400,792. MACHINE FOR MAKING JOINT-FASTENINGS. CARL T. RENUS, Dresden, Saxony, Germany, assignor to Jean Scherbel, same place. Filed Oct. 30, 1888. Serial No. 289,531. (No model.) Patented in Germany Apr. 30, 1887, No. 41,313, and May 10, 1887, No. 42,444; in England May 28, 1887, No. 7,807; in Belgium July 14, 1887, No. 78,308; in France July 15, 1887, No. 184,818, and in Austria-Hungary Dec. 7, 1887, No. 22,307 and No. 58,233.



Claim.—1. In a machine for cutting off and hammering on sheet-metal cramps to effect connections between sheets of material, the combination of a die, movable upward and downward and having its face plain or recessed, with a sleeve, E, sliding on the die against the reaction of a spiral spring, and consisting of a trough-shaped piece, *b*, and the covering-plates *b'* and *b²*, the latter having a recess, *c*, for the entrance of the sheet-metal strip into the sleeve E, and with a flat anvil, B, supplied with a matrix, *q*, or with a beam-like anvil, B', having the shape of an inverted V, all substantially as set forth.

2. In such a machine, the combination of the covering-plate *b²* with a guiding-bolt, *c'*, passed through it and adjusting the position of the sheet-metal strip, substantially as and for the purpose specified.

3. In such a machine, the combination of a bolt, *c*, passed through the piece *b* of the sleeve E and sliding in the slot *f''* of the die *a*, with a rod, *f*, on the head of which acts the spring *g*, situated in the hollow fixing-pin *a'* of the die *a*, and pushing forward the sleeve E, substantially as set forth.

4. In such a machine, the matrix *q*, with a concentric groove, *q'*, in its face, substantially as shown, and for the purpose specified.

5. In such a machine, the combination of the sleeve E with a feed-channel, *k*, guiding the sheet-metal strip, and attached to the lever-head C', carrying the die *a*, by means of a rod, *l*, with a head, *l'* held in a hole of the lever-head and surrounded by a spiral spring, *o*, and hinged by a hinge, *k*, to the groove *k*, substantially as set forth, and for the purpose described.

6. In such a machine, the combination of the feed-channel *k*, with a feeder, *m m'*, communicating, by means of the cord *n*, led around the disk *o* on the rod *l*, with a drum, *p*, containing a watch-spring, and situated on the axis *x* of the lever C, carrying the die, substantially as and for the purpose set forth.

400,793. MEDICAL COMPOUND. ANDRE ROSSETS, Pattonville, Tex. Filed Nov. 17, 1888. Serial No. 291,135. (No specimens.)

Claim.—The herein-described medical compound, consisting of the extracts of eucalyptus, lady's-slipper, gentian, balmony, and the oil of sassafras, in substantially the proportions specified.

400,794. BLANK-HEADING DIE. CHARLES D. ROGERS, Providence, R. I., assignor to the American Screw Company, same place. Filed July 5, 1888. Serial No. 279,052. (No model.)



Claim.—1. The improved die hereinbefore described, having guide-ribs in its head-forming cavity, substantially as and for the purpose set forth.

2. A die in which the heads of blanks or nails are formed, having guide-ribs arranged to laterally support the wire or stock *w* and centralize it while being subjected to the action of the heading-hammer, substantially as hereinbefore described

3. A die of the class described having the head-forming cavity provided with a series of ribs for guiding the wire or stock laterally, and adapted to be impressed into the head of the blank during the heading operation.

4. The combination, in a machine for making headed blanks or nails, of actuated dies, substantially as hereinbefore described, having a head-forming cavity provided with guide-ribs, for the purpose specified.

400,795. SPARK-COIL. FRANCIS H. ROOT, Chicago, Ill., assignor to the Root Electric Gas Lighting Company, of Illinois. Filed Apr. 19, 1888. Serial No. 271,245. (No model.)

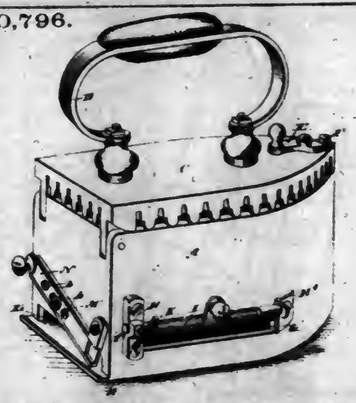


Claim.—1. As an improvement in the manufacture of spark-coils, a core consisting of pliable metal strips laid together flatwise, and a winding which is wound to provide gaps or notches, such as set forth, whereby the core may be readily bent and brought substantially within the radius of a circle.

2. A spark-coil consisting of a core formed of pliable metal strips laid together flatwise, and a winding which is wound to provide gaps or notches, such as set forth, the whole being substantially within the radius of a circle.

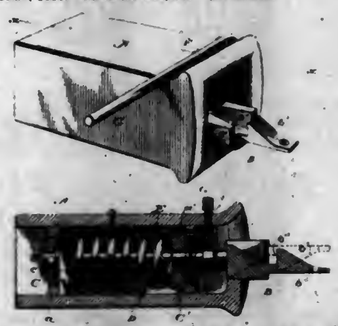
400,796. SAD-IRON. ALBERT ROSA, Milwaukee, Wis., assignor to Jennie A. Zinn, same place. Filed Feb. 14, 1887. Serial No. 227,533. (No model.)

400,796.



Claim.—A hollow sad-iron having its body portion provided with a cover of such construction that a draft-space and openings are left between said shell and cover when the latter is in its normal position, longitudinal openings in the sides of the shell near its base, plates or dampers journaled in bearings on said shell, and set-screws arranged to impinge against the journals of said plates or dampers, substantially as described.

400,797. CAR-COUPLING. DAVID H. ROYER, Millmont, Pa. Filed June 27, 1888. Serial No. 278,366. (No model.)



Claim.—1. The herein-described draw-bar, having the beveled hook b^3, the converging side walls, b^4, and the flat bearing-faces at the front ends of said walls to serve as buffers and limit the motion of the heads as they are advanced toward each other.

2. In combination with the draw-head, the plate C, the vertically-movable plate C', the draw-head revoluble about its longitudinal axis, and the spring E, acting to urge the draw-bar downward.

3. In a car-coupling, the draw-head, the two plates C C', movable horizontally therein, the plate C' being also adapted for vertical motion, the spring between said plates, and the draw-bar having its forward end provided with a hook and its rear end arranged to rotate in and slide through the two plates provided with pins or fastenings *c c'*.

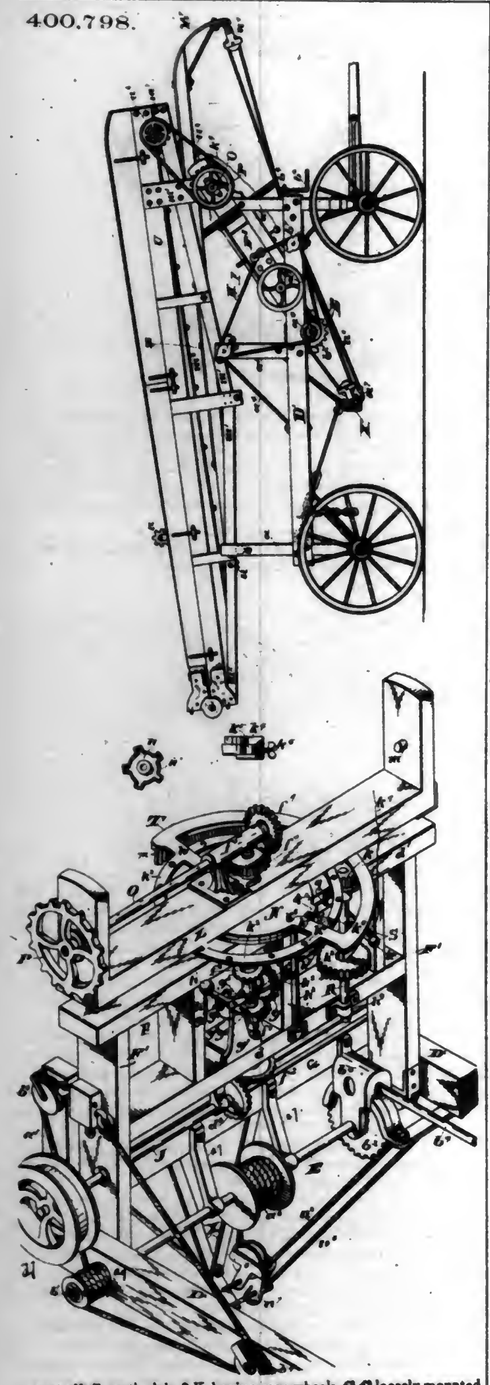
400,798. STRAW-STACKER. ALLEN A. RUSSELL, Indianapolis, Ind., assignor to Russell & Company, Massillon, Ohio. Filed June 6, 1888. Serial No. 276,268. (No model.)

Claim.—1. A stacker supporting and carrying truck comprising the carrying-wheels B, axles A, a bolster, C, pivotally secured to the front axle, standards *a*, secured to the rear axle, standards *a'*, secured to the bolster, sills D', secured to the standards *a a'* at a point above the said bolster and rear axle, as shown, and vertical posts a^3, rigidly secured to the sills D as a support for the folding frame F, substantially as described, and for the purpose set forth.

2. The combination, with the supporting-frame, of a cross-shaft, E, extending through the said frame, having spools on the ends thereof, a vertical post secured to said frame, a folding frame, F, pivotally secured about said shaft, a pulley secured at the upper portion of said vertical post, a similar pulley secured to the supporting-frame, a cable wound about the spools on the ends of the said cross-shaft and placed about the pulleys on the supporting-frame and the vertical post, and the ends secured to the frame F, a worm-wheel secured on the cross-shaft, and a worm and a shaft by which the shaft E may be rotated to either raise or lower the frame F and the front end of the stacker, substantially as described, and for the purpose set forth.

3. The combination, with the frame F, actuating-shaft J, gear-

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wheels d^3 f^3, vertical shaft K, having gear-wheels f^3 f^5 loosely mounted thereon, having inwardly-projecting clutch-teeth, as f g^3, a sliding clutch to engage therewith, gear-wheels f^3 f^4, shaft O, sprocket-wheels P and m^7, chain n^3, wheel g, shaft Q, worm k^7, worm-wheel k^8, shaft R, pinion k, segment T, ring k^9, having perforations k^{10}, pins p, and a gear-shipper, these parts operating jointly, as shown and described, to continuously rotate the endless apron and to oscillate the carrier-frame about its pivotal connection with the supporting-frame, substantially as set forth.

4. The combination, with a stacker-supporting frame, of a cross-shaft, E, extending through said frame, having on its outer ends spools having a toothed connection with collars b, rigidly secured to said shaft, and having teeth on their outer face to engage similar teeth on the inner face of said spool, and a nut by which said spool may be held in engagement with the said collar or released therefrom, substantially as described.

5. The combination, with a supporting-frame and a depending frame, X, of a cross-shaft, E, extending through said frame, supported in journal-boxes, as a^2, a folding frame, F, supported on the inner ends of said journal-boxes, collars b, rigidly secured to said shaft, spools a^9, loosely mounted upon the ends of said shaft and adapted to be fixed to and turn in unison with the collars b, cables connecting said spools with the frame F, a spool, a^6, mounted on shaft E, a hoisting-rope, n^6, secured to said spool and to free end of lever W, a worm-wheel, b^2, mounted on shaft E, a worm, b^3, and crank-shaft b^4, whereby the shaft E may be rotated, the frame F raised to a vertical position, the lever W drawn down, and the stacker raised, substantially as set forth.

6. The combination, in a straw-stacker, of a supporting-frame having side sills, as D, a cross-shaft, E, supported on said sills and having collars b rigidly mounted thereon, said collars adapted for fixed engagement with spools a^9, loosely mounted on said shaft, cables adapted to wind on and off said spools, the ends of said cables secured to a folding frame, F, a worm-wheel, b^2, a worm, b^3, and a shaft, b^4, to actuate said worm, substantially as described, and for the purpose set forth.

7. In an oscillating straw-stacker, a supporting-frame, F, circular way M, bolster L, pivotally secured thereto, a table, N, secured to said bolster and resting on said way, a segment, T, a gear-trip, k^9, and an adjustable stop operated by the oscillations of said table N to oscillate said gear-trip to change the direction of oscillation of the stacker-frame, substantially as described.

8. The combination of the shaft Q, hanger k^5, journal-box k^4, pivotally secured in said hanger, a worm-wheel, k^8, worm k^7, a sliding journal-box, k^3, and a gear-shipping lever, S, whereby said shaft may be oscillated to engage and disengage the said worm with the wheel, substantially as described, and for the purpose set forth.

9. The combination of a gear-shaft mounted in movable journals and having mounted thereon a gear to engage a co-operative gear, a gear-shipping lever, and a flexible connection extending from said lever to the operator on the stack, whereby the gears may be engaged or disengaged to start or stop the oscillatory movement of the stacker-frame, substantially as described, and for the purpose set forth.

10. The combination of a stacker-frame, as Z, pivotally secured to a supporting-frame, as F, of a lever, W, the rear end of which is secured to the said frame, the front portion resting on a bearing that coincides with the pivotal connection of the frame Z, the front end projected forwardly and downwardly, and a flexible connection with a winding-spool, whereby the rear portion of the stacker-frame Z may be raised or lowered, substantially as described, and for the purpose set forth.

11. The combination of the circular way M, turn-table N, loop k^4, shoe k^5, and thumb-screw k^6, substantially as described, and for the purpose set forth.

400,799. IRONING-BOARD. JOHN M. SEBOLD, Philadelphia, Pa., assignor of one-half to William Schreiner, same place. Filed July 7, 1888. Serial No. 279,283. (No model.)



Claim.—1. The clamp C, with a nose and heel, and the tightening-lever E, having a spirally-curved and serrated edge, e, said parts being combined substantially as described.

2. An ironing-board having ears on the under side thereof, a forked clamp pivoted in said ears and having two noses adapted to engage a supporting-ledge and provided with a heel, and a rotary lever with a head having inclined and serrated contact-face, said parts being combined substantially as described.

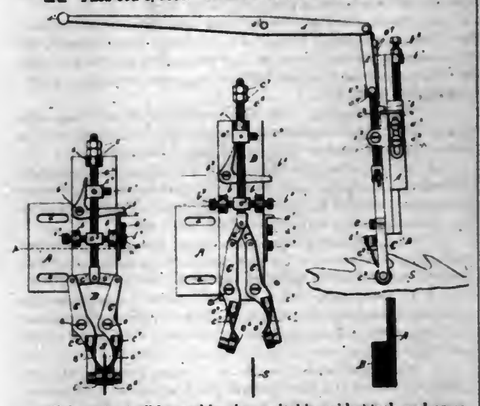
400,800. PRUNING-KNIFE. LOUIS H. SNOLDER, Cleveland, Ohio. Filed Sept. 10, 1888. Serial No. 285,066. (No model.)

Claim.—A cutter-blade having a handle provided with a piece at either side, which is highest at its center and inclines toward each extremity, whereby a swell is formed centrally in the handle, in combination with wire wrapping about the shank and piece to form the covering of the handle, substantially as set forth.

400,800.



400,801. SAW-GUIDE. CHARLES W. SLEEPER, Island Pond, and RUSSELL M. WOODARD, Norton, Vt.; said Sleeper assignor to said Woodard. Filed Oct. 3, 1888. Serial No. 287,597. (No model.)

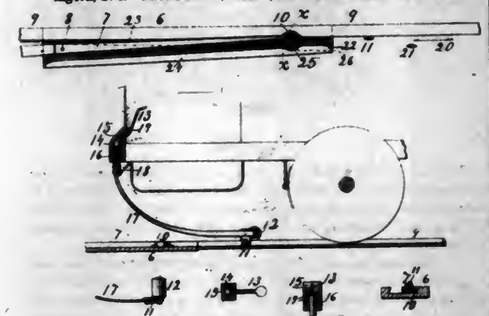


Claim.—1. A slide working in a suitable guide-block and carrying two movable guide-fingers to grasp the saw, combined with a rod, c^3, connected to the guide-fingers by two links, c' c', which form a toggle-joint between the extremities of the said guide-fingers and act to open and close the same, and with means, substantially as described, to raise and lower the slide and to raise and lower the rod c^3 independently of the slide, substantially as described and for the purpose set forth.

2. The slide B, the guide-fingers, and the rod c^3, combined with the latch b^3, to prevent the rod c^3 from moving while lowering the slide, and with the stop a', to trip the said latch and allow the rod to move when the slide reaches its lower position, substantially as described, and for the purpose set forth.

3. The slide, the guide-fingers, and the rod c^3, combined with the adjusting-screws b^3, to adjust the guide-fingers to line with the saw, and with the stop-screw b^4, to adjust the height of the slide, substantially as described, and for the purpose set forth.

400,802. AUTOMATIC SWITCH. WILLIAM X. STEVENS, Washington, D. C. Filed Nov. 17, 1888. Serial No. 291,100. (No model.)



Claim.—1. The combination of a railway-frog and a switch-tongue pivoted thereon and having a portion of its side edges slanted under, the edge of the rail portion of the frog also being slanted under beside the tongue, the said two slanting sides forming an aperture which in cross-section is wedge-shaped, with the base of the wedge downward, and which in horizontal section is wedge-shaped, with the base of the wedge toward the point of the said tongue, substantially as shown and described.

2. A railway-switch tongue having a portion of its side edges slanted under near its point, substantially as shown and described, whereby the under side of the point of the tongue is made a more obtuse wedge than the body of the tongue is.

3. The combination of the wedge 11, the wheel 12, journaled thereto, and the drag-bar 17, adapted to be hung to a car, substantially as shown and described.

4. The combination of a switch-operating wedge, a wheel journaled thereon to roll on the track, and an elastic connection between the wedge and the car, substantially as shown and described, whereby the rocking of the car is compensated for and the wheel is maintained upon the track.

5. The combination of a switch-operating wedge hung upon a car and adapted to travel beside the rail, a device, substantially as described, upon the car for turning the wedge to the right and left, and a laterally-elastic connection between the said device and wedge, whereby the wedge is elastically pressed to the side of the rail, as set forth.

6. The combination of a rail or frog having a notch in its side adapted to admit an operating-wedge, a switch-tongue located beside the said notch and pivoted to swing, a wedge carried upon a car, and a spring-connection between the wedge and the car, whereby the wedge is pressed upon the rail in a direction to engage the said notch, substantially as shown and described.

400,803. PICK. HIRAM C. STOUFFER, Mineral Ridge, Ohio, assignor of one-half to Edward Hunt, same place. Filed Sept. 3, 1888. Serial No. 284,406. (No model.)



Claim.—1. A socket part for pick-handles, having its solid outer end provided with openings g g on each side of a central screw-threaded hole, f, in combination with the handle, and one or more wedges, h, driven into the latter through said openings, substantially as described.

2. A socket part for pick-handles, having its solid outer end provided with openings g g on each side of a central screw-threaded hole, f, and having flat end bearing parts, d d, each having a projecting pin, e, in combination with the handle, one or more wedges, h, driven into the latter through said openings, the pick-head having the holes i i, and the fastening screw-bolt therefor, substantially as described.

3. The combination, in a pick, of a metallic socket part for receiving the handle, having a central screw-threaded opening and openings on each side thereof, in combination with one or more wedges driven into the handle through said openings, the pick-head, and the screw-bolt for securing the head upon the socket part over the said openings and their wedges, substantially as described.

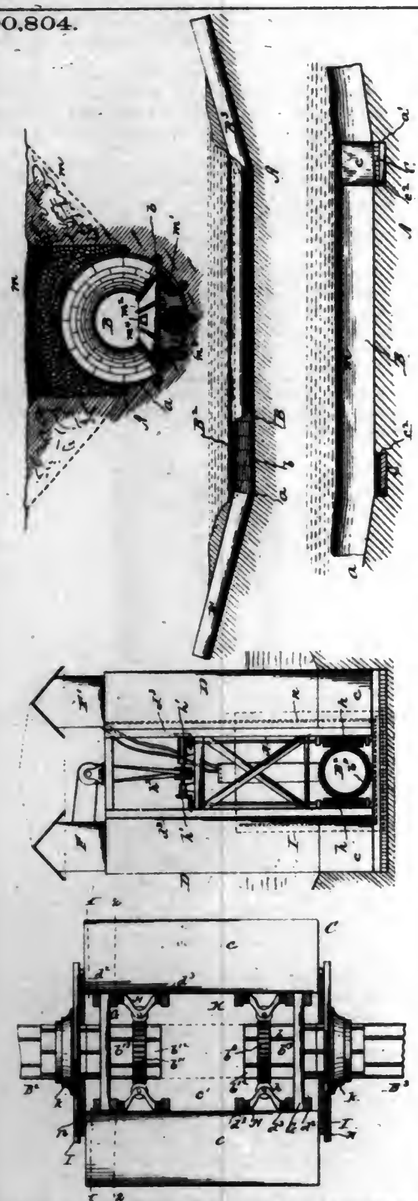
4. The pick-socket part having its outer end recessed at e and provided with a solid part between said recess and the socket, having a central screw-threaded opening, f, and an opening, g, on each side of said central opening, the said openings terminating in the socket and in the recess, combined with the handle secured over the inner ends of said openings, the wedges h, driven through said openings g into the handle, the pick-head secured in the socket-recess over the butt-ends of said wedges, and the fastening-screw, as shown and described.

400,804. SUB-RIVER TUNNEL. ANDREW W. STRAUB, Philadelphia, Pa. Filed Jan. 28, 1888. Serial No. 262,213. (No model.)

Claim.—1. A sub-river tunnel composed of a series of long sections separated from each other by short sections which are secured at each end with one of the long sections, and an anchorage of broken material and cement upon the top and at the sides of the tunnel-sections, and the top surface of the anchorage being approximately flush with the river-bed, substantially as set forth.

2. In combination with a sub-river channel or way, a section of a tunnel having longitudinal peripheral ribs in said way, caissons at

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columns and gates, and a tunnel resting on said flooring between said boxes and passing through said gates, substantially as set forth.

7. A metal tunnel-section having removable bulk-heads and interior stay-rods to retain the form of the section while building the section and floating and sinking it to position at the bottom of the river, substantially as set forth.

8. In combination with a sub-river channel or way, a section of a tunnel, removable caissons at the ends of said tunnel-section, and power appliances upon said caissons in gear with the tunnel-section, substantially as set forth.

9. A tunnel-section having end and middle removable bulk-heads, stuffing-boxes on the end bulk-heads, and air and water pipes passing through said end heads, substantially as set forth.

10. The combination, with sub-river tunnel-sections, the caisson-foundation C, uprights D D, and gates or ends I, having openings for the passage of the tunnel-sections, and packing between said uprights and the gates or sides and between the latter and the tunnel-sections, substantially as set forth.

11. The combination, with tunnel-sections B^3 B^3, of a removable caisson having removable ends I, through which said tunnel-sections pass, and slides or frames G H, substantially as set forth.

12. A tunnel-section having exterior longitudinal ribs, removable end bulk-heads, stuffing-boxes on the end bulk-heads, air and water pipes passing through said end heads, and outside gear-wheels at or near the ends of the section, substantially as set forth.

13. The combination of a caisson having frames H and power appliances, and a sub-river tunnel-section having outside gear-wheels connected to said power appliances, as and for the purpose set forth.

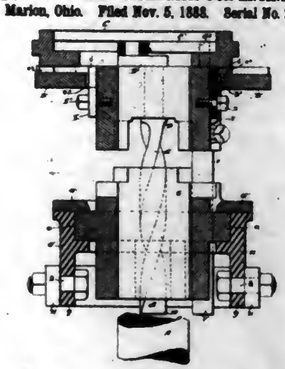
14. In combination with a sub-river channel, a tunnel-section, removable caissons for said section, and power appliances on the caissons in gear with the tunnel-section for lowering the latter to and for rotating it in the subway, substantially as set forth.

15. The combination of foundation C, having open ends, and side columns or towers, D, and the gates or ends I, substantially as set forth.

16. In combination with a sub-river channel, tunnel-sections, and removable caissons located at the opposing ends of successive tunnel-sections, substantially as set forth.

17. In combination with a sub-river channel, tunnel-sections separated from each other, so as to leave a space between their ends, and removable caissons joining said ends, substantially as and for the purpose set forth.

400,805. REVERSING MECHANISM FOR ENGINES. JOHN W. STRINGER, Marion, Ohio. Filed Nov. 5, 1888. Serial No. 289,989. (No model.)



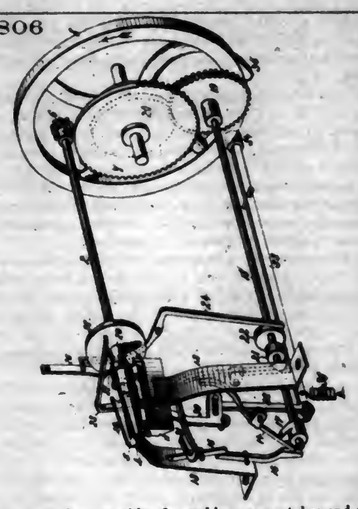
Claim.—1. The combination, with shifting eccentric disk for reversing the engine, of crank and connecting-link for shifting such eccentric disk, the position of link and crank past their dead-centers being utilized in locking the eccentric disk in its working position, substantially as set forth.

2. The combination, with shifting eccentric disk and crank and link for operating the same, the position of the link and crank past their dead-centers being utilized in locking the eccentric disk in its working position, of crank-shaft having spiral flutings or grooves, and a sliding block for engaging and rotating such shaft by reciprocations of the block, the parts being arranged substantially as set forth.

3. The combination, with a hub mounted on the engine-shaft and provided with ways and a sliding eccentric disk mounted on said ways, of crank and connecting-link for shifting such eccentric disk, the position of link and crank past their dead-centers being utilized in locking the eccentric disk in its working position, substantially as set forth.

400,806. MACHINE FOR MAKING MOUTH-PIECES OR HOLDERS FOR CIGARS, CIGARETTES, &c. ROBERT W. THURMAN, Lynchburg, Va., assignor to the Lone Jack Cigarette Company, same place. Filed Mar. 28, 1887. Serial No. 232,634. (No model.)

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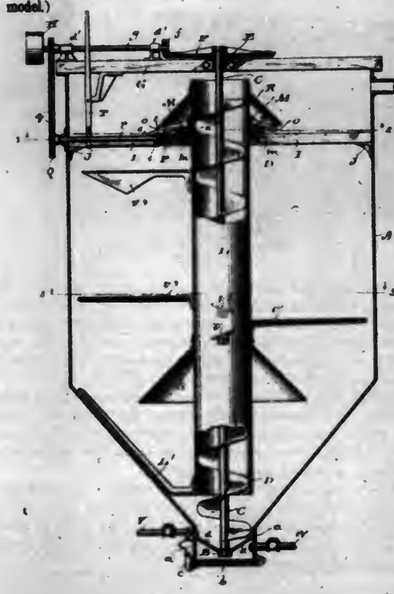
Claim.—1. In a machine for making paper tubes and mouth-pieces for cigarettes, the combination, with a rotary mandrel having a longitudinal groove, of a swinging spring gripping-finger pivoted intermediate its ends in said groove, and a device, substantially as described, for acting on the tail end of the finger to swing it, for the purposes set forth.

2. The combination, with a rotary mandrel having a longitudinal groove, of a swinging spring gripping-finger pivoted intermediate its ends in said groove, a swinging lever for acting on the tail end of the finger to swing the latter, and a rotary cam for actuating the lever, substantially as described.

3. The combination of a rotary mandrel having a longitudinal groove, a swinging spring-actuated gripping-finger pivoted in said groove, a device, substantially as described, for acting on the tail end of the finger to swing it, and an ejector slidable on the mandrel, substantially as described.

4. The combination, with a rotary mandrel provided with a gripping-finger for holding a paper blank, of a roller and a pressure-bar located on opposite sides of said mandrel and each supported in normal contact therewith by a spring-standard, and cam-actuated levers for acting on said spring-standards to remove said roller and pressure-bar from contact with the mandrel, substantially as described.

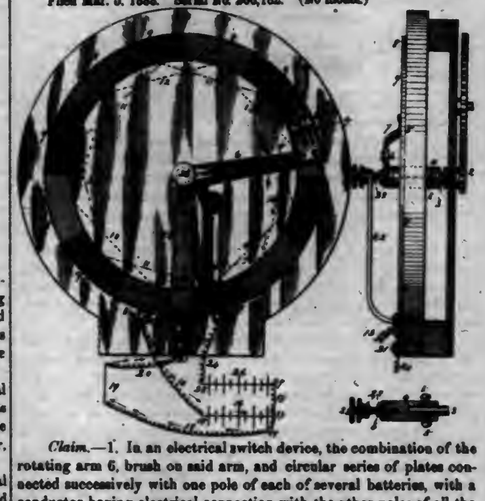
400,807. APPARATUS FOR MALTING GRAIN. PETER G. TORPER, Milwaukee, Wis. Filed June 5, 1888. Serial No. 276,458. (No model.)



Claim.—1. The combination, with the tank, of a spiral conveyer supported therein, and means for revolving the same, a tube surrounding said conveyer provided with conveyer-arms, and means for revolving said tube, substantially as described.

2. The combination, with the tank, of a spiral conveyer supported therein, and means for revolving the same, a tube surrounding said conveyer and means for revolving it, deflecting-hoods carried by said tube, and a plowing-arm projecting from said tube between the hoods, substantially as described.

400,808. SWITCH DEVICE FOR ELECTRIC CURRENTS. JOSEPH A. TURNER, St. Louis, Mo., assignor to Charles R. Turner, same place. Filed Mar. 5, 1888. Serial No. 266,182. (No model.)



Claim.—1. In an electrical switch device, the combination of the rotating arm 6, brush on said arm, and circular series of plates connected successively with one pole of each of several batteries, with a conductor having electrical connection with the other poles of all the batteries, and an adjustable pivotal contact, 23, completing the circuit between said conductor and rotating arm, all substantially as and for the purpose described.

2. Two or more plates or series of plates arranged in a circle, each series of plates in electric connection together and with one pole of a galvanic battery and insulated from the plates of the other series, and a revolving arm in connection with the opposite poles of all the batteries to that with which the said plates are in connection, and having a brush carried by the revolution of the arm into and out of contact with the plates, for the purpose set forth.

3. The combination, with a disk having an annular series of closely-related insulated plates, electric batteries, each having one pole connected to one or to alternate ones of said plates, of a hand pivoted centrally in relation to the series of plates rotated by clock-work, adapted to contact with the plates successively, and having electrical connection with the remaining poles of all the batteries.

4. In a switch for electric batteries, the combination, with the frame or support and clock-work 2, mounted thereon, of shaft 3, rotated by clock-work 2, insulating-sleeve 4, carried by said shaft, arm 6, mounted on the sleeve and carrying brush 7, insulated plates 8 9, with which said brush is adapted to contact successively, connections between said plates and one pole of each of several batteries successively, arm 22, carrying screw 23, making pivotal electrical contact with arm 6, and electrical connection between the arm 22 and the other poles of all the batteries, as herein shown.

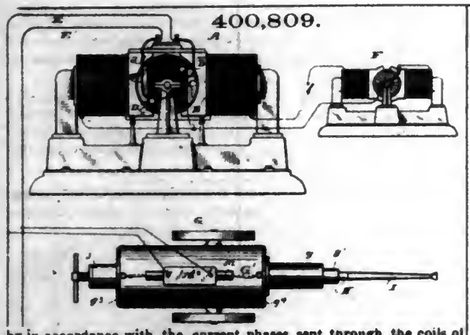
400,809. ALTERNATING-CURRENT ELECTRIC RECIPROCATING ENGINE. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Sept. 13, 1888. Serial No. 285,294. (No model.)

Claim.—1. In a system of electro-magnetic reciprocating engines, a source of electricity giving defined phases of current in a closed circuit, engines having motor-coils placed in said circuit and energized by the said defined currents, and a magnetic piston or plunger placed under the influence of the said coils, substantially as described.

2. A reciprocating electric-engine system comprising an engine having two or more motor-coils and a magnetic piston adapted for reciprocation within said coils, an electric generator adapted to produce rising and falling defined electric impulses, and circuit-connections between the motor-coils and generator, whereby electric impulses are supplied to the motor-coils in alternation, substantially as described.

3. An electro-magnetic reciprocating engine comprising a solenoid or solenoids composed of one or more coils and in circuit with a source of electricity giving defined phases of current, and a magnetic piston under the influence of the coils and arranged to be reciprocated there-

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by in accordance with the current phases sent through the coils of the engine, substantially as described.

4. An electro-magnetic reciprocating engine comprising a coil or coils in circuit with a source of alternating or defined electric currents, a piston arranged to move longitudinally within the said coil or coils under the influence of the phases of the supply-current, and a tool holding piston-rod attached to the piston, substantially as described

5. An electro-magnetic reciprocating engine comprising an actuating coil or coils in circuit with a source of alternating or intermittent currents, a non-magnetic lining or tube within the coil or coils, and a piston adapted to be reciprocated within the interior tube under the influence of alternating phases of current circulating in the motor-coils, substantially as described.

6. An electro-magnetic reciprocating engine comprising a motor coil or coils in circuit with a source of alternating or defined electric currents, and an iron plunger adapted to be reciprocated within the coil or coils under the influence of the alternating currents, the mass of said plunger being laminated or subdivided, substantially as described.

7. In an electro-magnetic reciprocating engine, a motor-helix in circuit with a source of alternating or defined electric currents, a plunger attached to the tool-holding devices adapted to be reciprocated within the helix under the influence of and in accordance with the phases of current circulating therein, a series of terminals extending from the coils of the helix, and a movable contact for adjusting the length of the stroke of the plunger by cutting out a greater or less portion of the motor-helix, substantially as described.

8. In an electro-magnetic reciprocating engine, a motor-helix in circuit with a source of alternating or defined electric currents, a piston attached to the tool-holding devices and adapted to be reciprocated within the helix under the influence of and in accordance with defined currents circulating therein, a series of terminals extending from the coils of the helix, and movable contacts for cutting out a greater or less portion of the motor-helix, whereby the length of the stroke may be adjusted and whereby also the operative position of the plunger may be determined, substantially as described.

9. In a reciprocating electric engine, the combination of motor-coils in circuit with a source of defined electric currents, a piston arranged within said coils and actuated alternately thereby, and a circuit-changing device arranged and operating to connect the supply-circuit alternately with the said coils at the zero-point between the current phases, substantially as described.

10. In a reciprocating electro-magnetic engine, the combination of motor-coils, a piston moving within said coils under the influence of current flowing therethrough in alternation, a circuit-closing plunger, a solenoid for imparting reciprocating motion thereto, said solenoid being of less length than the plunger, and two sets of main and auxiliary contacts at opposite ends of the path of the circuit-closing plunger, said sets of main and auxiliary contacts being electrically connected to the outer terminals of the motor-coils, respectively, substantially as described.

11. In a reciprocating electro-magnetic engine, the combination, with motor-coils and a magnetically-actuated piston arranged to be moved back and forth within said coils by the influence of currents circulating in said coils in alternation, of a reciprocating circuit-changing device comprising a solenoid, an iron plunger therefor of a length exceeding that of the solenoid, main contacts located at opposite ends of the path of the plunger and electrically connected to the motor-coils, respectively, and auxiliary contacts located between the inner extremities of the main contacts and the solenoid, but separated therefrom, whereby the extremity of either end of the plunger will be out of contact with one of the main contacts when in its opposite position, substantially as described.

12. In a reciprocating electro-magnetic engine, the combination, with motor-coils and a magnetically-actuated piston moving within said coils, of a circuit-changing device for directing the supply-current through said coils in alternation, comprising a solenoid, a reciprocating plunger, contacts representing the motor-coils and located in the path of the plunger, and an adjustable resistance for regulating the speed of the circuit-changing device, substantially as described.

13. In a reciprocating electro-magnetic engine, the combination of a source of intermittent or defined current, motor-coils, and a piston arranged to be reciprocated within said coils by the passage of said currents therethrough in alternation, and a circuit-changing device comprising a solenoid in circuit with said intermittent currents and having a reciprocating plunger arranged to close the main circuit upon the motor-coils in alternation, said plunger and piston operating simultaneously and completing their respective movements during each phase of current, substantially as described.

14. In a reciprocating electro-magnetic engine, the combination of motor-coils, a piston moving in said coils, and a circuit-changing device comprising a solenoid, a reciprocating plunger therefor, and tubular contacts arranged to receive the ends of the plunger, the diameter of said tubes being adjusted to retard the free escape of air and form an air-cushion to absorb the momentum of the plunger, substantially as described.

15. In a reciprocating electro-magnetic engine, the combination, with a motor coil or coils and a magnetically-actuated piston moving in said coils under the influence of currents flowing therethrough, of an inductional transformer in circuit therewith for producing defined currents of alternating polarity, an electro-dynamic motor mechanically connected to circuit-changing devices in said transformer for controlling the flow of the primary current therethrough, and means for regulating the speed of the motor and thereby controlling the action of the transformer, substantially as described.

16. In a reciprocating electro-magnetic engine, the combination, with a motor coil or coils and a magnetically-actuated piston moving in said coils under the influence of currents flowing therethrough, of a source of continuous current, an inductional transformer for producing defined currents of alternating polarity, an electro-dynamic motor mechanically connected to circuit-changing devices in said transformer for controlling the flow of the primary current therethrough, and an adjustable resistance for regulating the speed of the motor and thereby controlling the action of the transformer, substantially as described.

17. The combination, with an electro-magnetic reciprocating engine, of a source of continuous current, an inductional transformer comprising primary and secondary coils, a commutator the sections of which are connected to the continuations of the coils of the primary circuit, rotatably-mounted commutator-brushes in circuit with the source of continuous current, and an electro-dynamic motor connected to and acting to rotate the brushes upon the commutator to distribute the primary current and render the secondary coils active, substantially as described.

400,810. UNDERGROUND CONDUIT. WILLIAM WALTER, Philadelphia, Pa. Filed Mar. 22, 1888. Serial No. 268,127. (No model.)



Claim.—1. In an underground conduit, a frame consisting of sections, each section having upsights with side and central connecting-bars, and top segmental bars sustained on said side and central bars by short uprights, said frame being adapted to sustain on said top segmental bars the ground surface, and on its uprights suitable pipes, substantially as described.

2. An underground conduit consisting of sections having uprights and cross-bars, as described, the flooring 13, connecting said sections, a base with side gutters, sewers under said side gutters, and separate pipes leading from the street-surface and side gutters to said sewers, substantially as and for the purpose set forth.

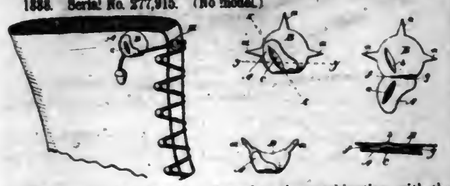
3. In an underground conduit, the combination of sections having top curved or segmental bars, 7, and short uprights 8, supporting said bars, timbers resting on said bars and having the tracks 22 secured thereto, rollers 24, journaled in uprights 8, and the cable 23, substantially as and for the purpose set forth.

400,811. HOLDBACK. GEORGE T. WILSON and JOHN D. HOUSH, Lowville, N. Y. Filed Jan. 4, 1889. Serial No. 295,406. (No model.)



Claim.—The combination, with the chambered body formed with hollow standard and the spring secured at one end within said body, of the hook having a vertical portion in said hollow standard, and a heel pivoted within said body and formed with the flat sides *l* and *m*, bearing on said spring, substantially as shown and described, and for the purpose specified.

400,812. SHOE-FASTENING. STEPHEN WILSON, Jr., Philadelphia, Pa., assignor of one-half to H. C. Conkle, same place. Filed June 23, 1888. Serial No. 277,915. (No model.)



Claim.—1. In a shoe-lace fastening, the combination, with the base rigidly secured to the shoe, of the tongue bent into proximity therewith, forming a V-shaped opening inclined away from the tongue-opening of the shoe and adapted to hold the lacing, whereby a pull on the latter will tend to force it farther down into the V-shaped opening, substantially as set forth.

2. In a shoe-lace fastening, the combination, with the base secured to the shoe and the tongue bent over into proximity therewith, forming the V-shaped opening, of the projection on the tongue and the corresponding recess in the base inclined away from the tongue-opening of the shoe, whereby a pull on the lacing held between the tongue and base will tend to force the same farther down between the tongue and base, substantially as described.

3. In a shoe-lace fastening, the combination, with the base secured to the shoe and the tongue lying in proximity therewith, of the inclined longitudinally-corrugated projection on the tongue and the corresponding recess in the base for retaining the lacing in position, substantially as described.

4. The combination, with a shoe having lacing hooks or studs and a fastening for the lacing on the side of the opening opposite and level with the top lacing-stud, whereby the lacing at the top will be supported on each side at substantially the same level, of a hook on the tongue of the shoe engaging said top lacing intermediate its two supports for preventing the displacement of the tongue, substantially as described.

400,813. WEATHER-STRIP. HENRY O. WOY, Green City, Mo. Filed Mar. 1, 1888. Serial No. 265,788. (No model.)



Claim.—The frame A, having the grooved sill B, in combination with the weather-strip C, provided with a projection, *e'*, and an extension, *f*, whose terminal axes *f'* *f²* are pivotally secured in slots in the sides of the frame, which normally lies flush with the frame, and the door D, having the plate I, provided with a projecting lug, *j*, whereby the arc-like oscillation of said lug operates the weather-strip in either direction, respectively, to engage and disengage the strip by reason of the projection *e'*, for the purpose set forth.

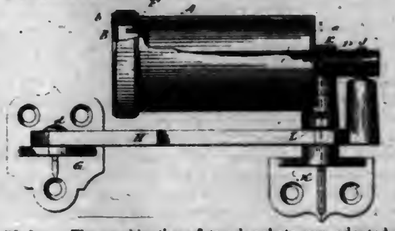
400,814. LATCH. BERTON L. WRIGHT, Bridgeport, Conn., assignor to Samuel A. Burnes, same place. Filed Dec. 26, 1888. Serial No. 294,620. (No model.)



Claim.—1. The combination, with a cup-shaped bolt having lugs, of a sheet-metal case having slots engaged by said lugs, and a spring acting to force the bolt outward.

2. A cylindrical bolt-case formed from a blank of sheet metal having an enlargement at the center and projections at its opposite ends, said blank being doubled upon itself, so that the enlargement forms the closed inner end of the case and the inner ends of the slots, the projections forming a flange, 4, at the outer end of the case and the outer ends of the slots.

400,815. DOOR-CHECK. GRANVILLE W. WRIGHT, New Haven, Conn., assignor to Sargent & Company, same place. Filed Jan. 14, 1889. Serial No. 296,234. (No model.)



Claim.—The combination of two brackets, one adapted to be attached to the door and the other to the frame of the door, an arm hung to one of the brackets and so as to swing in a horizontal plane, the said arm constructed with a longitudinal slot vertically through it, the other bracket carrying a pivot which extends through said slot in the arm, a cylinder hung upon said pivot of the said other bracket, a piston in said cylinder, and a rod extending from the piston through the head of the cylinder and hung upon a pivot upon the free end of the said arm, substantially as and for the purpose described.

400,816. RAILWAY-SWITCH STAND. CHARLES ALKINS, Muskegon, Mich., assignor to Henrietta Alkins, same place. Filed Apr. 28 1888. Serial No. 272,200. (No model.)



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Claim.—1. In a railway-switch stand, a compound lever for the purpose described, comprising, in combination, a pivotally-supported hand-lever and a separately-pivoted lever engaged by said hand-lever and provided with an arm, E, adapted to carry a weight, substantially as set forth.

2. The combination, substantially as hereinbefore set forth, of the hand-lever B and the lever C, carrying a weighted arm, and gear connected with said hand-lever, for the purpose described.

3. The combination, substantially as hereinbefore set forth, with the hand-lever, of the lever C, for the purpose set forth, provided with one or more sockets adapted to receive a bar or arm, for the purpose described.

4. A railway-switch stand comprising a compound lever having as one of its elements the vibratory lever C, carrying a weighted arm, and as an another element the separately-pivoted hand-lever B, pivoted above said weighted lever, and gear connected with the same, a rotary signal-rod arranged alongside the switch-stand, and a connection between the said compound lever and rotary signal-rod, whereby the latter can be operated by operating the hand-lever or controlled and set by the weighted arm of the lower lever, said members combined for operation substantially as described.

400,817. AXLE. EDWARD M. ALLEN, Stafford, Md., assignor to Sallie E. Allen, same place. Filed June 14, 1888. Serial No. 277,135. (No model.)



Claim.—1. An axle comprising the connection-blocks, the upper and lower shafts secured rigidly to such connection-blocks and detachable therefrom, and the spindles, substantially as set forth.

2. An improved axle, substantially as described, comprising the connection-blocks, the spindles, the upper and lower shafts connected with the said blocks, and the braces extended between said shafts, substantially as set forth.

3. The combination of the connection-blocks having bores fitted to receive the stems of the spindles, the upper and lower shafts connected with said blocks, the spindles having stems fitted to the bores of the connection-blocks, and the fastening-keys, substantially as set forth.

4. The combination of the connection-block having a bore for the spindle-stem and an extension at the inner end of said bore fitted to receive the fastening-key, the spindle, and the fastening-key, substantially as set forth.

5. The combination, in an axle, of a spindle having a stem and a connection-block having a socket fitted to receive said stem, and provided at the outer end of said socket with a collar or flange, substantially as set forth.

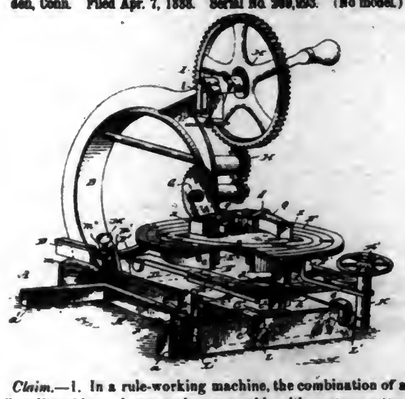
6. An axle comprising the connection-blocks having threaded sockets in their inner faces near their upper and lower ends, and the upper and lower shafts or sections having their ends threaded to enter said sockets, substantially as set forth.

7. An axle having upper and lower shafts or sections and provided thereon with removable wear-sleeves, substantially as set forth.

8. The combination of the connection-blocks having threaded sockets in their inner faces and screws intersecting said sockets, and the shafts or sections having their ends threaded to enter the sockets of the connecting-blocks, substantially as set forth.

9. An axle consisting of the connection-blocks having bores or sockets for the spindle-stems, and provided in their inner faces with sockets for the upper and lower shafts, the spindles having their stems fitted to the bores of the connection-blocks, fastenings whereby to secure the stems in said blocks, the shafts having their ends fitted to the sockets of the blocks, and fastenings for securing said shafts in their sockets, substantially as set forth.

400,818. RULE-WORKING MACHINE. RICHARD ATWATER, Meriden, Conn. Filed Apr. 7, 1888. Serial No. 269,893. (No model.)



Claim.—1. In a rule-working machine, the combination of a vertically-adjustable work-supporting turn-table with a rotary cutter supported above it, substantially as described.

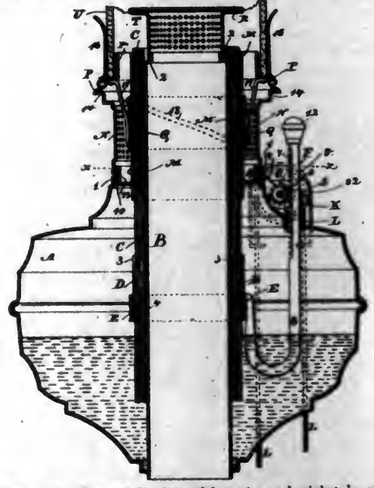
2. The combination of a laterally and vertically adjustable turn-table with a rotary cutter supported above it, substantially as described.

3. The combination, with tracks D, of the carriage E, having turn-table F and the rotary cutter supported above it, substantially as described.

4. The combination, with the base and standard A B of a rule-cutting machine, of the rule-bending rolls I I', the roll I being operated by the main driving-shaft of the cutting mechanism, the lower rolls, I', being adjustable toward and from the upper roll, substantially as described.

5. In a rule-working machine, a turn-table having suitable guide-lines and indexes marked thereon and means for securing the gage-blocks thereto, in combination with a cutter supported above said table and means for feeding the table under the cutter, whereby the work is carried thereto, substantially as described.

400,819. ARGAND LAMP. LEWIS J. ATWOOD, Waterbury, Conn. assignor to the Plume & Atwood Manufacturing Company, same place. Filed Jan. 6, 1888. Serial No. 259,990. (No model.)



Claim.—1. The combination, with an Argand wick-tube and central air-tube and reservoir, of a wick-holder having a screw-thread upon the same, a screw-ring into which the wick-holder screws, and a rod connected with the screw-ring and passing up through the upper part of the reservoir, substantially as set forth.

2. The combination, with the wick-holder and reservoir, and wick-raiser having rack-teeth upon it, of the shaft and pinion gearing into the wick-raiser, a ring, 1, surrounding the rim 10 of the reservoir, and bearing-arms 9, extending out from the ring to receive the wick-raiser shaft 8, substantially as set forth.

3. The combination, with an Argand wick-tube, of a reservoir and a central sheet-metal air-tube, said air-tube at its upper end be-

ing contracted circumferentially and formed with a two-part right-angle bend of greater width than the thickness of the metal of the air-tube, thereby forming an annular offset or shoulder, 2, and a cavity between the end of the wick and the air-tube, also of greater width than the thickness of the metal of the air-tube to receive overflowing oil and prevent it passing down inside the air-tube, substantially as specified.

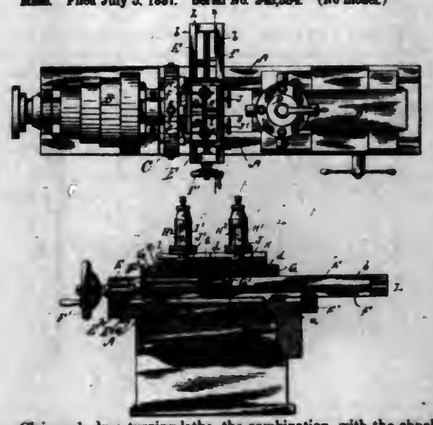
4. The combination, with the reservoir, air-tube, and Argand wick, of the wick-tube around the wick, having screw-threads in the upper portion thereof, a chimney-holder, a sleeve around the wick-tube adapted to fit upon the screw-threads thereof, and connections from the sleeve to the chimney-holder, substantially as set forth.

5. The combination, with the Argand wick-tube and chimney-holder, of a base, 13, resting upon the upper end of the reservoir, and an air-distributer above the same, the chimney-holder resting upon the upper end of the air-distributer when the lamp is in use, a sleeve around the wick-tube having inclines for lifting the chimney-holder by a rotary movement, and connections from the sleeve to the chimney-holder, substantially as set forth.

6. The combination, with the air-tube B and an offset, 2, of greater width than the thickness of the metal of the air-tube and forming an annular shoulder at the upper edge of the same, of a foraminous skirt closed at the upper end and forming an air-regulator, and adapted to rest upon the annular shoulder, a space consequent upon the offset and of greater width than the thickness of the walls of the foraminous skirt being formed between the said skirt and the wick, substantially as set forth.

7. The combination, with the wick raiser or holder, the rack and pinion, and pinion-shaft, of a spool upon the pinion-shaft and a cord passing around the same, a guide or strap, 22, surrounding the spool and serving to prevent the cord slipping off, and hanging-eyes connected to said guide or strap and through which the cord passes, the ends of said cord hanging down, so that the wick-raiser can be actuated by pulling upon the cord, substantially as specified.

400,820. METAL-TURNING LATHE. JOHN R. BACK, Worcester, Mass. Filed July 5, 1887. Serial No. 243,334. (No model.)



Claim.—1. In a turning-lathe, the combination, with the chucking mechanism, substantially as described, for holding the work to be operated upon, of a carriage capable of a sliding motion transversely to the axis of the chucking mechanism, sliding blocks carrying tool-posts and mounted in ways upon said carriage, said ways being parallel with the axis of the chucking mechanism, and actuating-screws journaled in said carriage and engaging nuts upon said sliding blocks, whereby each of said blocks, with its tool-post, can be moved toward or away from the chucking mechanism independently, substantially as described.

2. In a turning-lathe, the combination, with rotating chucking mechanism for holding the work to be operated upon, of a saddle placed at right angles to the axis of the rotating chuck, a screw journaled in said saddle, a sliding block or carriage actuated by said screw and sliding in ways on said saddle transversely to the axis of the rotating chucking mechanism and carrying the tool-holding blocks, and a pair of tool-holding blocks, each having an independent sliding motion parallel with the axis of the rotating chucking mechanism through actuating-screws, substantially as described.

3. In a turning-lathe, the combination, with a saddle resting on the ways of the lathe, of a screw journaled in said saddle, a sliding block sliding in ways on said saddle and detachably connected with said screw, and a pair of tool-holding blocks having a sliding motion in ways on said sliding block and at right angles thereto, substantially as described.

4. In a turning-lathe, the combination, with a rotating chucking mechanism for holding the work to be turned, of a pair of tool-holding blocks having an independent sliding motion parallel with the axis of the rotating chucking mechanism, a sliding block supporting said tool-holding blocks and having a sliding motion at right angles with the axis of the rotating chucking mechanism, and a saddle supporting said sliding block and resting on the ways of the lathe, said saddle extending over said ways, so as to allow the tool-holding blocks to be moved away from the work, substantially as described.

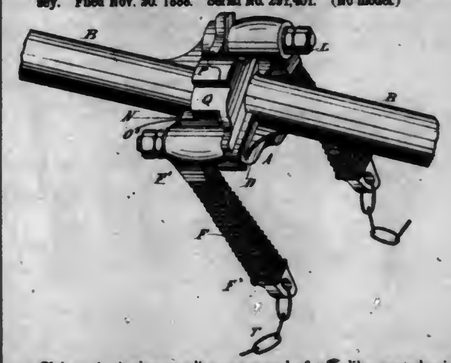
400,821. MUFFLER FOR SIGNAL-BELLS. EDWARD T. BATES, Brightwood, D. C., assignor of one-half to Melville Lindsay, same place. Filed July 13, 1888. Serial No. 279,805. (No model.)



Claim.—1. As a new article of manufacture, a hollow flexible muffler conforming in its configuration to that of a bell-hammer, adapted to cover said hammer and to be retained in position by adhesion.

2. As a new article of manufacture, a hollow and elastic muffler having the configuration of a bell-hammer, contracted at one end and adapted to be retained in position by its own elasticity, substantially as described.

400,822. PIPE-COUPLING. JAMES C. BAYLES, New York, N. Y., assignor to The Safety Car Heating and Lighting Company, of New Jersey. Filed Nov. 20, 1888. Serial No. 291,401. (No model.)



Claim.—1. A pipe-coupling composed of two like parts having vertical meeting faces and provided with a port or passage the axis of which is horizontally angular to the plane of said faces, each part provided with a locking-lever adapted to engage with a flange on the opposite part, said levers adapted to move in planes parallel to the meeting faces of said coupler.

2. A pipe-coupling composed of two like parts, a locking-lever on each part adapted to engage with a flange on the part opposite to that to which it is attached, said levers moving in planes parallel to the meeting faces of the coupler, and an adjustable spring on each part adapted to bear upon the outer side of the head of the lever and to force said lever toward the body of the coupling to which it is attached.

3. A pipe-coupling composed of two like parts, a locking-lever on each of said parts, two springs in the head of each of said locking-levers adapted to exercise their pressure in opposite directions, and means for regulating the tension of one of said springs in each part.

4. A pipe-coupling composed of two like parts, and each part provided with a locking-lever having a plane of movement parallel to the meeting faces of said coupler and adapted to engage a flange on the part opposite to that to which it is attached, a spring so located on each part as to bear upon the outer side of the head of the lever, and a device for adjusting the pressure of said spring, whereby said lever may be adjusted to exert a locking-pressure independent of the force exerted in making the coupling.

5. The combination, with two railway-cars, of a pipe-coupling and its connecting hose or pipes arranged horizontally between said cars, the plane of the meeting faces of said coupling being vertical and in the median line of said cars, and the axis of the port or passage through said coupling and its connecting-hose horizontally angular to the plane of the said meeting faces and substantially straight and diagonally across the space intervening between said cars.

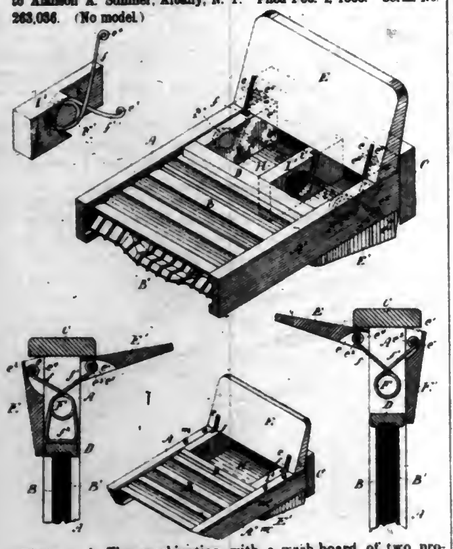
6. The combination, with the heating system of two railway-cars,

of a pipe-coupling composed of two parts of identical construction, the meeting faces of which are in the median line of said cars, and provided with locking-levers located in planes parallel to said meeting faces.

7. A pipe-coupling composed of two like parts, a locking-lever on each part, a spring bearing upon the outer side of the head of each of said locking-levers, said locking-levers pivoted in a transverse line to the plane of the meeting faces of said cars, and each lever provided with a projecting cam portion adapted to engage a flange on the part opposite to that to which it is attached.

8. A pipe-coupling composed of two like parts, a locking-lever on each part, said locking-lever being pivoted in a transverse line to the plane of the meeting faces of the parts, and each provided with a projecting cam portion adapted to engage a flange on the part opposite to that to which it is attached.

400,823. WASH-BOARD. SOLON BINGHAM, Conklingville, assignor to Alanson A. Sumner, Albany, N. Y. Filed Feb. 4, 1888. Serial No. 263,036. (No model.)



Claim.—1. The combination, with a wash-board, of two protectors, springs pivotally attached to the protectors at or near the outer ends thereof, and said springs held in blocks supported in position contiguous to but independent of the side frames of the board within an opening between the crown-piece and cross bar thereof, substantially as and for the purposes set forth.

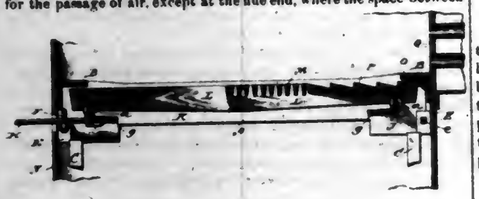
2. The combination of a wash-board with studs or cushions in the side frames thereof, protectors pivoted to the extremities of springs, and removable blocks adapted to receive and hold said springs in position within an opening between the crown-piece and supporting cross-bar of the board, substantially as shown and described.

400,824. FURNACE-GRATE FOR PORTABLE ENGINES. STEPHEN E. BURKE, Edon, Ohio. Filed Oct. 15, 1887. Serial No. 252,469. (No model.)

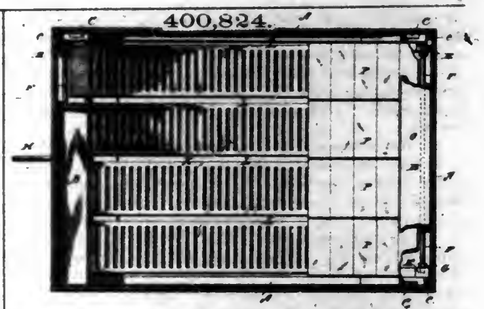
Claim.—1. The grate-bar frame having bars formed with bosses on their inner faces, in which are formed angular cavities, in combination with spreading rods having angular ends fitting in said cavities, substantially as described.

2. The combination, with the fire-box having a flue-sheet at one end thereof, of the grate-bars provided at the end of the box next to the flue-sheet with a rake for drawing the ashes away from the flue-sheet, and thus preventing the banking up of ashes and cinders against the flue-sheet, substantially as described.

3. In an engine furnace-grate, the grate-bar composed of longitudinal bars connected together, and having openings between them for the passage of air, except at the flue end, where the space between



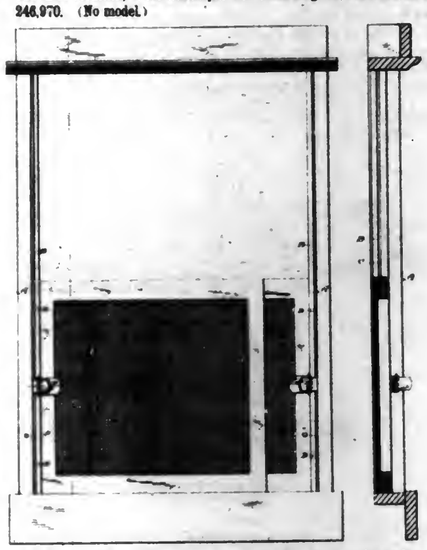
400,824.



the longitudinal bars is closed to break the passage of air, and provided with a rake to draw ashes away from the flue-sheet, substantially as described.

4. A furnace-grate composed of a series of grate-bars constructed of longitudinal bars connected together, and having openings between them for the passage of air, except at the flue end, where the space between said longitudinal bars is closed to break the passage of air, and provided with rake-teeth, substantially as and for the purposes set forth.

400,825. EXTENSION WINDOW-SCREEN. JAMES H. BURT and SELVA E. HOLMAN, West Randolph, Vt. Filed Aug. 15, 1887. Serial No. 246,970. (No model.)



Claim.—1. The combination of the window-frame, the strips applied to the inner sides thereof, each one having a groove, C, in its inner side, and a groove, O, in its edge, the screen-frames provided with pins or projections to catch in the grooves C, and catches to catch in the grooves O, substantially as shown.

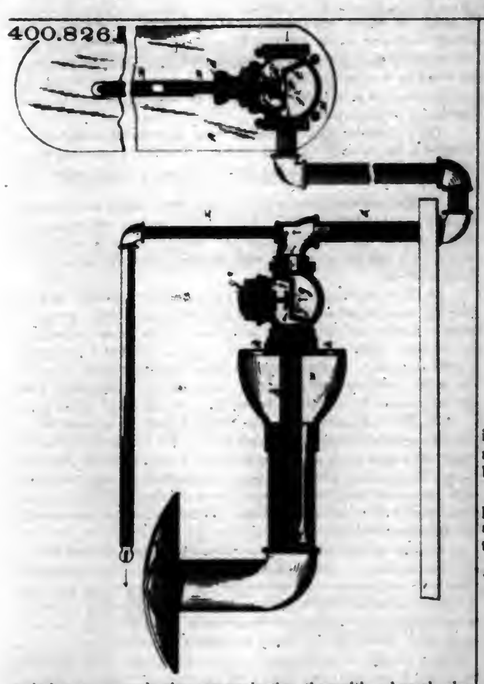
2. The combination of the window-frame, the strips B, secured to the inner sides thereof and provided with grooves C O, the expansible window-screen provided with pins or projections D, and the spring-catches P, consisting of stationary plates secured to the screen-frames, and spring-actuated plates pivoted upon the stationary plates, and having their outer ends bent so as to catch in the grooves O, substantially as described.

400,826. AUTOMATIC HEAT-REGULATING DEVICE. NATHAN C. BUTLER and FRANK D. ROSENBERGER, Leipsic, Ohio. Filed May 7, 1888. Serial No. 273,069. (No model.)

Claim.—1. In an automatic heat-regulating device, the combination of a main burner, a supply-pipe communicating therewith, a branch pipe communicating with the supply-pipe, a supplemental burner located adjacent to the main burner and communicating with the branch pipe, a gravity-valve in the main pipe between the branch pipe and main burner opening toward the burner, and a globe-valve in the supply-pipe having a permanently-open perforation in the diaphragm, substantially as described.

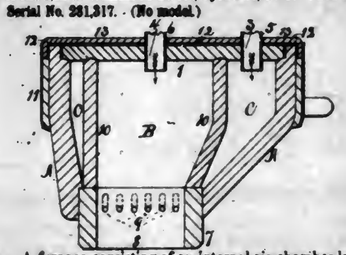
2. In an automatic heat-regulating device, the combination of a

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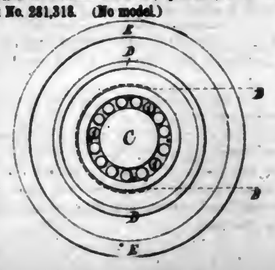
main burner, a supply-pipe communicating therewith, a branch pipe communicating with the supply-pipe, a supplemental burner located adjacent to the main burner and communicating with the branch pipe, a gravity-valve in the main pipe between the branch pipe and main burner opening toward the burner, a globe-valve in the supply-pipe having a permanently-open perforation in the diaphragm, and a thermostat connected to said valve, substantially as described.

400,827. GAS-FURNACE. ROBERT CARTWRIGHT, Rochester, assignor of one-half to William A. Sweet, Syracuse, N. Y. Filed July 28, 1888. Serial No. 281,317. (No model.)

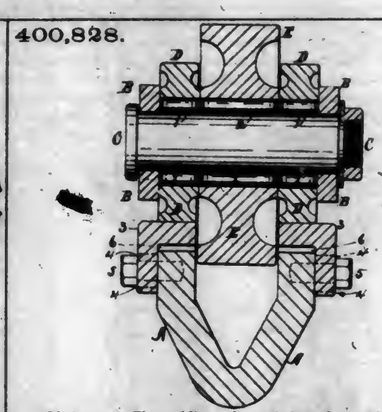


Claim.—A furnace consisting of an internal air-chamber inclosed within a frusto-conical shell, an outer shell separated therefrom creating a gas-chamber between them, and a mixing-chamber having a direct connection to the air-chamber, and ducts connecting the gas-chamber to the mixing-chamber, a top inclosing the upper ends of the gas and air chambers, an air-inlet pipe opening into the air-chamber, a gas-inlet pipe opening into the gas-chamber, and means for clamping the upper end of the gas-chamber and the top together and for supporting the same, substantially as described.

400,828. WELDING-ROLL. ROBERT CARTWRIGHT, Rochester, assignor of one-half to William A. Sweet, Syracuse, N. Y. Filed July 28, 1888. Serial No. 281,318. (No model.)



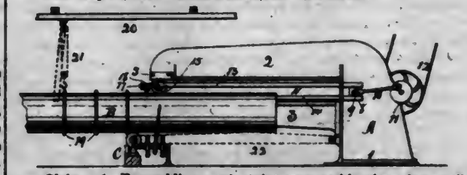
400,828.



Claim.—1. The welding-roll consisting of a welding-roller and independent supporting-rolls, all mounted upon independent friction-roll bearings, which are themselves mounted upon one arbor, in combination with a trackway for the supporting-rolls.

2. A welding-roll consisting of a welding-roller, independent supporting-rollers, all mounted upon friction-bearings bearing upon an arbor loose in its bearings, and a trackway mounted adjustably upon the main frame of the machine and carrying the supporting-rollers.

400,829. MACHINE FOR WELDING PIPES. ROBERT CARTWRIGHT, Rochester, assignor of one-half to William A. Sweet, Syracuse, N. Y. Filed July 28, 1888. Serial No. 281,319. (No model.)



Claim.—1. For welding a tube-joint, the combination of two rollers, one internal and the other external, mounted upon a reciprocating frame, with an internal heating-furnace and an external heating-furnace mounted upon the same frame, substantially as described.

2. For the continuous and simultaneous heating and welding of a pipe joint, the combination of the heating-furnaces mounted upon a reciprocating frame and located within and outside of the pipe of the welding-rolls, mounted upon the same frame, substantially as described.

3. A reciprocating frame upon which heating-furnaces and welding-rolls are mounted contiguous to each other, in combination with a crank having a pitman-rod connected to the frame, substantially as described.

4. A reciprocating frame carrying welding-rolls and heating-furnaces contiguous to each other, in combination with the rolls and furnaces, substantially as described.

5. A reciprocating frame carrying welding-rolls, in combination with heating-furnaces mounted upon the frame, substantially as described.

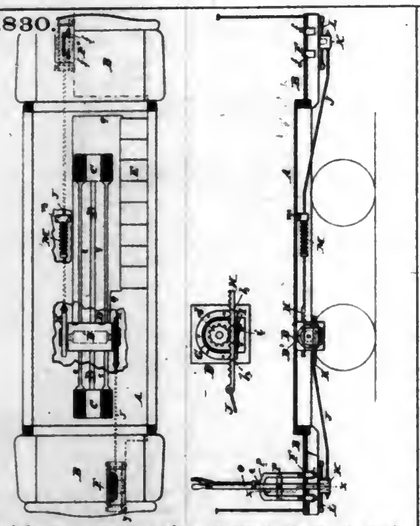
400,830. ELECTRIC CAR. GEORGE H. CONDICT and VICTOR ANDREE, Philadelphia, Pa., assignors to The Electric Car Company of America, same place. Filed June 20, 1888. Serial No. 277,670. (No model.)

Claim.—1. The combination of a car having a platform, an electric motor to propel the car, a current-regulator to control the current passing to the motor arranged under the body of the car, a positive mechanical device for operating said regulator and extending to the platform, and an operating-lever and fulcrum detachably supported by said platform and having a positive detachable connection with the regulator-operating device, whereby the operating-lever may be readily removed without disturbing the other parts.

2. The combination of a car having a platform, an electric motor to propel the car, a current-regulator to control the current passing to the motor arranged under the body of the car, a positive mechanical device for operating said regulator and extending to the platform, an operating-lever detachably supported by said platform having a positive detachable connection with the regulator-operating device, whereby the operating-lever may be readily removed without disturbing the other parts, and a spring independent of the lever to normally move the regulator to reduce or cut off the current.

3. The combination of a car having a platform, an electric motor

400,830.



to propel the car, a current-regulator to control the current passing to the motor arranged under the body of the car, a positive mechanical device for operating said regulator and extending to the platform, an operating-lever rack and detent detachably supported by said platform having a positive detachable connection with the regulator-operating device, whereby the operating-lever may be readily removed without disturbing the other parts, and a spring independent of the lever to normally move the regulator to reduce or cut off the current.

4. The combination of a car, an electric motor to propel said car, a rotary current-regulator under the car having a transverse axis, and a sliding mechanical mechanism extending to the front of the car and connecting with said regulator by a rack and pinion to rotate it.

5. The combination of a car, an electric motor to propel said car, a rotary-barrel current-regulator under the car, a mechanical mechanism extending to the front of the car to rotate said regulator, and a spring to oppose the rotation of the barrel in one direction and rotate the barrel in the opposite direction to reduce or shut off the current.

6. The combination of a car, an electric motor to propel said car, a rotary-barrel current-regulator under the car, a mechanical mechanism extending to the front of the car to rotate said regulator, a spring to oppose the rotation of the barrel in one direction and rotate the barrel in the opposite direction to reduce or shut off the current, and a locking device to lock the barrel in two or more positions of rotation.

7. The combination, in an electrically-propelled car, of a regulator for the current flowing to the motor, a detachable hand-lever mechanism detachably supported upon the car-platform to move it in one direction, and a spring to move it in the opposite direction to reduce or cut off the current.

8. The combination of a regulator for the current flowing over an electric circuit, a detachable hand-lever mechanism to move it in one direction, a connection between the hand-lever and regulator, a spring acting on the connection and independent of the lever to move it in the opposite direction to operate the regulator to reduce or cut off the current, and a locking device to lock the lever of the regulator in two or more positions to vary the current passing to the circuit.

9. The combination of a car having a platform, an electric motor to propel the car, a current-regulator to control the current passing to the motor arranged under the body of the car, a positive mechanical device for operating said regulator and extending to the platform, an operating-lever detachably supported by said platform having a positive detachable connection with the regulator-operating device, whereby the operating-lever may be readily removed without disturbing the other parts, and a snap-lock between the movable part of the regulator and the frame supporting it to insure the movable part stopping positively at fixed places.

10. The combination of a car, an electric motor to propel said car, a rotary-barrel current-regulator under the car, a mechanical mechanism extending to the front of the car to rotate said regulator, a series of depressions in the regulator-barrel-operating mechanism, and a spring-lock to snap into said depressions to hold the barrel in given positions.

11. The combination of a car, an electric motor to propel said car, a rotary-barrel current-regulator under the car, a mechanical mechanism extending to the front of the car to rotate said regulator, a spring to oppose the rotation of the barrel in one direction and rotate the barrel in the opposite direction to reduce or shut off the current, a locking device to lock the barrel in two or more positions of rotation, a series of depressions in the regulator-barrel-operating mechanism, and a spring-lock to snap into said depressions to hold the barrel in given positions.

12. The combination of a barrel regulator or switch, a spur-wheel secured to the rotating barrel, a sliding rack meshing with said spur-wheel and moving transversely to the barrel, and a lever to move said rack.

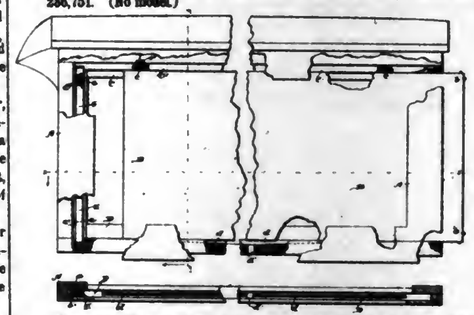
13. The combination of a barrel regulator or switch, a spur-wheel secured to the rotating barrel, a sliding rack meshing with said spur-wheel and moving transversely to the barrel, a lever to move said rack, and a locking device to hold said rack and barrel in two or more positions.

14. The combination of a car having a platform at each end, an electric motor to propel the car, a regulator located under the car, a positive mechanical mechanism to operate the regulator extending to and below each platform of the car, and a detachable operating-handle movable to or from each platform extending from above to below the platform and detachably but positively connectible with the mechanism for operating the regulator at either end of the car.

15. The combination of a car having a platform at each end, a current-regulator for the motor arranged on the car, a rod extending from said regulator to each end of the car to a point below the platforms, an operating-lever-frame support arranged upon each platform, a lever-support detachably connectible to either platform, and an operating-lever carried by the frame and detachably connected with the rod over which it is placed.

16. The combination of a car having a platform at each end, a current-regulator for the motor arranged on the car, a rod extending from said regulator to each end of the car to a point below the platforms, an operating-lever-frame support arranged upon each platform, a lever-support for detachable connection to either platform, an operating-lever carried by the frame and detachably connected with the rod over which it is placed, and a spring acting upon said regulator to cause it to move in opposition to one movement of the lever to move the regulator to reduce or cut off the current to the motor.

400,831. ADVERTISING-PANEL FOR DELIVERY-WAGONS. EDGER A. CULVER, Cleveland, Ohio. Filed Sept. 29, 1888. Serial No. 286,751. (No model.)



Claim.—1. The combination, in a delivery-wagon the side frame of which is provided with upper and lower grooves open at one end, a strip located within the upper groove, and springs for imparting a downward pressure on said strip, of a panel constructed to be removably secured within said grooves, the spring-actuated strip being arranged to press against the upper edge of the panel, substantially as set forth.

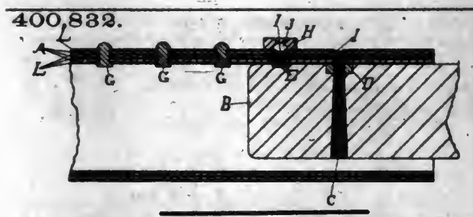
2. The combination, in a delivery-wagon the side frames of which are provided with upper, lower, and an end groove, and strips located in the upper groove and the end groove, and springs tending to force said strips outwardly from the grooves, of a panel constructed to be removably secured within said grooves, said strips being arranged to press against the end and upper edge of the panel, and latches for locking the panel in place, substantially as set forth.

400,832. ASPHALT-COATED SHEET-METAL PIPE. JOHN P. CULVER, Los Angeles, Cal. Filed Dec. 14, 1888. Serial No. 293,584. (No model.)

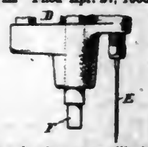
Claim.—1. A pipe comprising a convolute sheet of metal coated with a cementing substance and having its free edge secured by rivets passing through the several layers of metal and cementing substance.

2. A pipe comprising a convolute sheet of metal coated throughout its entire length with a protective cement, and provided with rivet-holes therein, passing through the free edge and the several layers of the metal and cement, and rivets of metal cast within the rivet-holes, as described.

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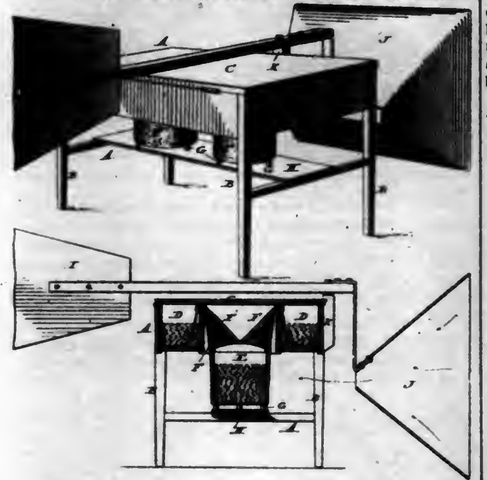


400,833. FEED MECHANISM FOR SEWING-MACHINES. JOHN W. DEWEES, Philadelphia, Pa., assignor to The Union Special Sewing Machine Company, Chicago, Ill. Filed Apr. 27, 1888. Serial No. 272,040 (No model.)



Claim.—In a feed device having an oscillating feed-frame composed of vertical and horizontal arms pivoted together, the combination, with said arms, of a pair of eccentrics mounted upon a driving-shaft, the first of said eccentrics engaging directly with said horizontal arm, a bifurcated frame pivoted upon an axis parallel to the driving-shaft and having in one of its bifurcations a curved slot, a link adjustably secured in said slot and connected with said vertical arm, and a second link and strap connecting the other bifurcation with the second eccentric, substantially as set forth.

400,834. MILK-COOLER. FRANCIS A. DODGE and ISRAEL A. DODGE, Brady, Tex. Filed Oct. 18, 1888. Serial No. 288,496. (No model.)



Claim.—1. In a milk-cooler, the combination, with a body having two water-troughs side by side, but separated from each other, substantially as shown, of cans or vessels and jackets surrounding the cans and extending into the water-troughs.

2. In a milk-cooler, the combination, with the frame or body having two water-troughs arranged side by side, but separated from one another, of the jacketed cans located between the troughs, and having their jackets extending into the latter.

3. In a milk-cooler, the combination, with the frame or body having the two troughs arranged substantially as shown, of the jacketed cans located between and below the troughs, and having their jackets extending into the latter.

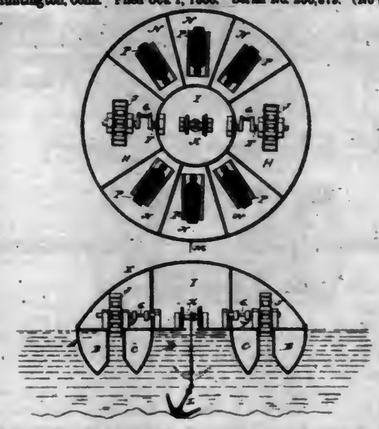
4. In a milk-cooler, the combination, with the body or frame A, having troughs D D, of jacketed cans E, board H, and pins G, secured to the board and supporting the cans.

5. In a milk-cooling apparatus, the combination, with the body or frame provided with water-troughs, of the jacketed cans having the upper ends of their jackets extending into the troughs, and an air-collecting device arranged, substantially as shown and described, to collect and direct the air against the exposed jackets.

400,835. PROCESS OF TREATING RICE. ENOCH V. DOWLSON, Baltimore, Md. Filed July 27, 1888. Serial No. 281,234. (No specimens.)

Claim.—The herein-described process for treating rice, consisting of first removing from rice in its usual marketable condition the covering of cellular tissue, then subjecting the grain to the action of moisture and heat to thoroughly develop the soluble starch, dextrine, and sugar without destroying the identity of the grains, then hardening or toughening the outside of the grain by cold applications, passing them through rolls or mill, and then drying, as set forth.

400,836. REVOLVING MARINE BATTERY. LOCKWOOD DURAND, Huntington, Conn. Filed Oct. 1, 1888. Serial No. 286,879. (No model.)



Claim.—The herein-described circular battery, consisting of two concentric ring-shaped hulls, B C, connected, but so as to leave a space between the said two rings, combined with a central anchor, and mechanism, substantially such as described, at the center for raising and lowering said anchor, with propelling-wheels arranged in the space between the said rings, substantially as described.

400,837. CULTIVATOR. HORACE G. EMERSON, Rockford, Ill., assignor to Henry H. Palmer and Samuel D. Palmer, same place. Filed May 26, 1888. Serial No. 275,132. (No model.)



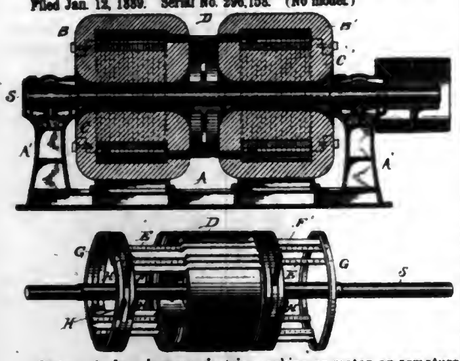
Claim.—1. In a garden-cultivator, the combination, with a carrying-wheel, a handle, side bars connecting the wheel and the handle, and a support bolted between said side bars, of a shovel-standard journaled in said support near one end, a segment-ratchet secured to the support near its opposite end, and a handle connecting the standard and segment-ratchet so as to adjust the shovel, substantially as set forth.

2. In a garden-cultivator, the combination, with a handle and supporting-wheel, side bars connecting the handle and supporting-wheel, and provided with curved inner ends, of bars rigidly secured to the said handle and pivoted with their outer ends to the intermediate portions of said side bars, and provided at their opposite ends with overlapping portions which frictionally engage the curved ends of the side bars, substantially as set forth.

3. In a garden-cultivator, the combination, with a handle, and side

bars connecting the handle and supporting-wheel, of bars pivotally connecting the handle with the side bars, and having their ends formed to embrace and adjust the handle upon the upturned ends of the side bars, substantially as set forth.

400,838. DYNAMO-ELECTRIC MACHINE. JUSTUS B. ENTZ, New York, N. Y., assignor to Thomas Alva Edison, Llewellyn Park, N. J. Filed Jan. 12, 1889. Serial No. 296,158. (No model.)



Claim.—1. In a dynamo-electric machine or motor, an armature carrying independent insulated conductors, and alternate supporting-strips to which are attached collecting-rings, forming terminals for the said conductors, substantially as and for the purpose set forth.

2. In a dynamo-electric machine or motor, an armature consisting of a core in the form of a pulley, conducting and supporting strips attached thereto, and collecting-rings secured to the supporting-strips and forming terminals for the conducting-strips, the said supporting-strips extending beyond the pulley's edge, and being bent to receive the rings, substantially as and for the purpose set forth.

3. In a dynamo-electric machine or motor, the combination, with an annular field-magnet composed of an inner core and a surrounding shell joined to the core at one end and approaching the core at the other end, such approaching ends forming the annular pole-pieces of the magnet, the field-winding placed upon the core and leaving a surrounding space between it and the shell, and an annular armature entering the field of force between the poles and extending over the field-magnet winding, substantially as set forth.

4. In a dynamo-electric machine or motor, the combination, with an annular field-magnet composed of an inner core and a surrounding shell joined to the core at one end and approaching the core at the other end, such approaching ends forming the annular pole-pieces of the magnet, of the field-winding placed upon the core and leaving a surrounding space between it and the shell, an annular armature composed of an iron core, and conductors supported by the core entering the field of force between the poles, the conductors extending beyond such field over the magnet-winding, and collecting-rings connected with such conductors and surrounding the said winding, substantially as set forth.

5. In a dynamo-electric machine or motor, a pair of field-magnets presenting a pair of annular fields of force opposite each other, a pair of helices beyond the fields of force, and an armature made up of magnetic and non-magnetic portions, the arrangement being such that the magnetic portions of the armatures enter the fields and the non-magnetic portions continue beyond and surround the helices, substantially as and for the purpose set forth.

6. An armature consisting of an iron pulley supporting conducting-strips, in combination with a pair of field-magnets presenting annular fields around opposite edges of the pulley, the central portion of the pulley being exposed, substantially as set forth.

7. The combination, with a pair of annular field-magnets supported on a suitable base, of an armature and its shaft, the latter passing through the annular magnets and being supported in independent bearings, substantially as and for the purpose set forth.

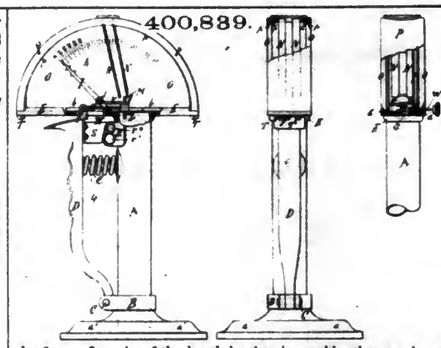
8. A field-magnet constructed in two annular parts, secured together at one end, the inner annulus being circumferentially grooved about its center to admit a helix without obstruction to outside parts, substantially as and for the purpose set forth.

9. A field-magnet constructed in two annular parts secured together at one end and forming an annular yoke at the other, the inner annulus being circumferentially grooved to admit a helix without obstruction to outside parts, substantially as and for the purpose set forth.

400,839. COIN-OPERATED GRIP-TESTING MACHINE. PERCIVAL EVERITT, London, England. Filed Sept. 14, 1888. Serial No. 285,392. (No model.)

Claim.—1. A coin-operated machine for testing and indicating

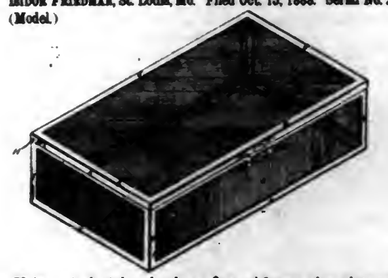
400,889.



the force of a grip of the hand, having, in combination, a coin-receiving and releasing mechanism, a hollow post serving as a hand-support, and also as a coin-receptacle, an inclined grip-lever pivoted to the base of such post, and an indicating finger and dial, the pivoted grip-lever causing the release of the coin, and also actuating said finger.

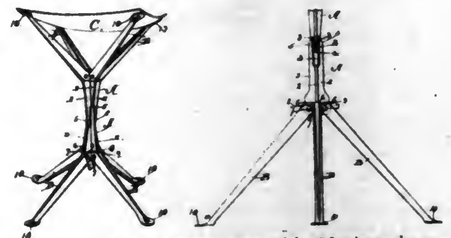
2. In a coin-operated machine for testing and indicating the force of the grip of the hand, the combination, with the grip-lever, of a stationary post to support the hand, a bent arm, K, coin rest or support, arm G, and an indicating-hand, substantially as shown and described.

400,840. GLASS CIGAR-BOX WITH METAL OR OTHER FRAME. ISIDOR FRIEDMAN, St. Louis, Mo. Filed Oct. 15, 1888. Serial No. 288,069. (Model.)



Claim.—A cigar-box having a flanged frame, glass plate set in the frame, and a ventilator consisting of an apertured extension of said frame, a registering aperture in the glass plate, a sliding plate having apertures to correspond with the apertures of said extension and provided with a knob, and bolts or rivets on said plate projecting through elongated slots in said extension, substantially as and for the purpose set forth.

400,841. SECTIONAL CAMP-STOOL. CARL F. GLOCKER, Albany, N. Y., assignor to Henry Lang, same place. Filed June 27, 1888. Serial No. 278,370. (No model.)

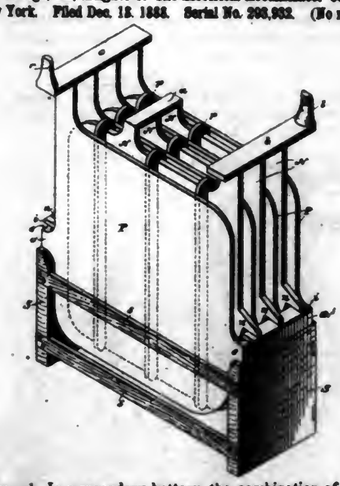


Claim.—1. In a camp-stool or other article of furniture, the combination of two separable sections which have substantially the same form and are adapted to be interlocked, one on top of the other, by means of a V-shaped notch and a corresponding edge formed in the central post of each section, said central post for each section having a cruciform cross-sectional area and each rib of said central post being provided with a shoulder, 6, and a series of channel-form arms, which are separately pivoted to the ribs of said central post, each of said arms being provided at its upper end with a shoulder, 9, that is adapted to engage with the shoulder of the rib to which said arm is pivoted, as and for the purpose herein specified.

2. In a camp-stool, the combination of two separable sections of substantially the same form, each section being provided with a central post having in one end a V-shaped notch, whereby the two sections can be interlocked together by fixing one on the top of the other,

each of said sections having a series of swinging arms pivoted to its central post, and a flexible seat-piece for the uppermost section, as and for the purpose herein specified.

400,842. SECONDARY BATTERY. WILLIAM W. GIBBON, Haverford College, Pa., assignor to The Electrical Accumulator Company, of New York. Filed Dec. 13, 1888. Serial No. 293,932. (No model.)



Claim.—1. In a secondary battery, the combination of two elements or electrodes, one being independently removable with respect to the other, and each composed of a series of plates electrically united, an inclosing-cell therefor, an electrolytic liquid, and means for supporting both elements above the bottom of the cell, consisting of fixed points located on opposite sides of both elements between the upper and lower edges, and points of support located at opposite sides of the interior of the inclosing-cell, substantially as described.

2. In a secondary battery, the combination of two elements or electrodes, an inclosing-cell therefor, an electrolytic liquid, and means for supporting both said electrodes above the bottom of the cell, consisting of projections located on opposite sides at or near the central vertical distance thereof and taking against fixed supports within the cell, substantially as described.

3. In a secondary battery, the combination of two elements or electrodes, each consisting of a series of plates, an inclosing-cell therefor, an electrolytic liquid, a series of projections on one element located on opposite edges between the upper and lower edges united by a mechanical connection to maintain a fixed distance between the plates, a series of projections on the other element similarly located and resting upon said mechanical connection, and means for supporting said elements upon said projections free from contact with the bottom of the cell, substantially as described.

4. In a secondary battery, the combination of two elements or electrodes, each composed of a series of plates, an inclosing-cell therefor, a suitable battery-fluid, a series of projections on opposite sides of both elements near the central vertical distance thereof, strips of conducting material uniting the plates of one element at or near said projections and at a point on the upper edge thereof, strips of conducting material uniting the plates of the second element at points on the upper edge thereof, insulated supports on opposite sides of the inclosing-cell, near its central vertical distance, upon which the projections of the first element rest in position to form a rest for the projections of the second element, and strips of insulated material separating one element from the other, substantially as described.

5. In a secondary-battery, the combination of two elements or electrodes, each composed of a series of plates, an inclosing-cell therefor, a suitable battery-fluid, strips of conducting material uniting the plates of one element at one or more points between the upper and lower edges, also at or near the upper edge, strips uniting the plates of the second element at or near the upper edge, a series of projections on the edges of the second element, insulating-supports upon which the central strips of the first element rest, the projections of the second element resting thereon, and strips of insulating material separating one element from the other, substantially as described.

6. The combination, in a secondary battery, of two elements, each consisting of a series of plates having fixed points of supports between their upper and lower edges, and a support, rest, or frame consisting of two slabs of insulating material located on opposite sides of the cell and held in position with respect to each other by one or more strips, substantially as described.

7. The combination, in an electrical connection, of two sections of conducting material, one section being the complementary part of the other, a series of parallel grooves in the surface of each section, the grooves of one registering with the grooves of the other, and a nut for uniting the two sections mechanically and electrically, substantially as described.

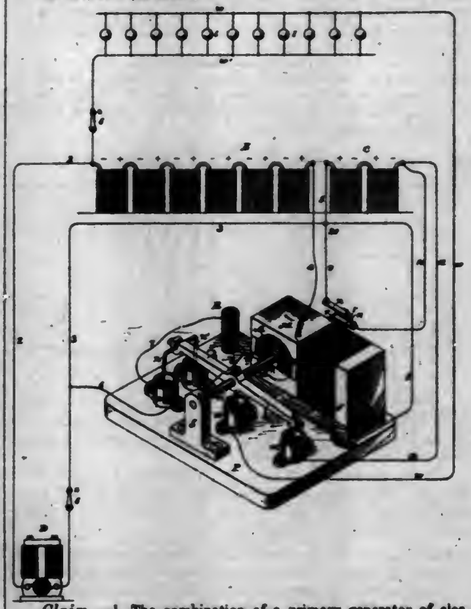
8. The combination of two complementary sections of conducting material having a series of parallel grooves united to form a male screw, and a nut having a female screw for mechanically and electrically uniting the two sections, substantially as and for the purpose described.

9. In an electrical connection, the combination of a battery-terminal carrying a screw-thread, a second terminal carrying a similar screw-thread, and a nut having a corresponding thread for mechanically and electrically uniting both terminals, substantially as described.

10. An electrical connector for batteries, consisting of two sections of conducting material having the form of a cone divided on the plane of its major axis with a helical groove in its curved surface forming a male screw, and a nut having a female screw for uniting the two sections mechanically and electrically combined with a battery-terminal connected to each section, substantially as described.

11. The combination of two sections of conducting material, each forming the terminal of a battery, and each provided with a threaded surface combined with a nut having a threaded contact-surface for mechanically and electrically uniting the two said sections.

400,843. DISTRIBUTION OF ELECTRICITY BY SECONDARY BATTERIES. WILLIAM W. GIBBON, Haverford College, assignor to the Electro Dynamic Company, Philadelphia, Pa. Filed Jan. 12, 1889. Serial No. 296,163. (No model.)



Claim.—1. The combination of a primary generator of electricity, a charging-circuit, a secondary battery, a working-circuit containing a series of translating devices, a compensating resistance to be inserted and withdrawn with respect to the working-circuit between the battery and translating devices, a switch or circuit-changer for inserting and withdrawing said resistance, and an electro-magnet located in a branch circuit between the dynamo and battery and between the battery and translating devices to control said switch.

2. The combination of a dynamo-electric machine, a charging-circuit, a secondary battery, a working-circuit containing a series of translating devices, a compensating resistance consisting of one or more electrolytic cells to be inserted and withdrawn with respect to the working-circuit between the battery and translating devices, a switch or circuit-changer for inserting and withdrawing said resistance, and an electro-magnet located in a branch circuit between the dynamo and battery and between the battery and translating devices operating to control said switch, substantially as described.

3. The combination of a dynamo-electric machine, a charging-circuit, a secondary battery, a working-circuit containing lamps in parallel circuit, a compensating resistance consisting of one or more electrolytic cells yielding a counter electro-motive force with respect to the battery, a switch or circuit-changer for inserting and withdraw-

ing said resistance, and an electro-magnet located in a branch circuit between the dynamo and battery and between the battery and lamps operating to control said switch, substantially as described.

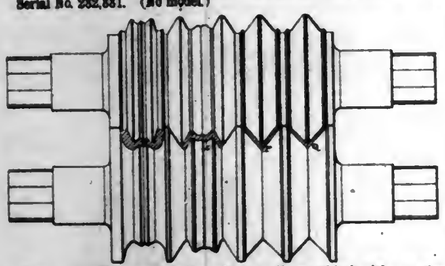
4. The combination of a primary generator of electricity, a charging-circuit, a secondary battery, a working-circuit containing a series of lamps in multiple arc with the battery, a compensating resistance, a switch or circuit-changer for inserting and withdrawing said resistance with respect to the working-circuit, and a polarized electro-magnet located in a branch circuit between the dynamo and battery and between the battery and lamps operating to control said switch or circuit-changer, substantially as described.

5. The combination of a primary generator of electricity, a secondary battery connected therewith, a working-circuit connected with the secondary battery and containing translating devices, one or more electrolytic cells located between the battery and translating devices, and a switch for varying the position of such cells with respect to the working-circuit, substantially as described.

6. The combination of a primary generator of electricity, a secondary battery connected therewith, a working-circuit connected with the secondary battery and containing translating devices—such as lamps—and one or more cells of secondary battery located in circuit between the battery and translating devices yielding a counter electro-motive force with respect to said battery, substantially as described.

7. The combination of a primary generator of electricity, a secondary battery connected therewith, a working-circuit connected with the secondary battery containing translating devices, a suitable device yielding a counter electro-motive force to be inserted and withdrawn with respect to the working-circuit at a point between said battery and translating devices, and a switch for varying the position of such counter electro-motive-force device with respect to the working-circuit, substantially as described.

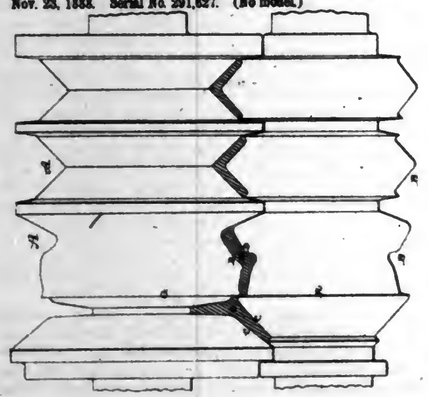
400,844. ROLLING-MILL. JOSEPH GUEST, Pittsburg, Pa., assignor of one-half to Ferdinand Protzman, Sr., Sidney M. Youngs, Fred R. Youngs, and Ralph W. Carroll, all of same place. Filed Aug. 16, 1888. Serial No. 282,881. (No model.)



Claim.—1. The combination of two rolls provided with a series of W or M shaped grooves, through which the metal is successively passed, so as to first break down the metal, and then form it into angle-iron, substantially as shown.

2. The combination of two rolls provided with a series of W or M shaped grooves for breaking down the metal and forming it into angle-iron, and cutters for separating the two halves of the double angle-iron, substantially as set forth.

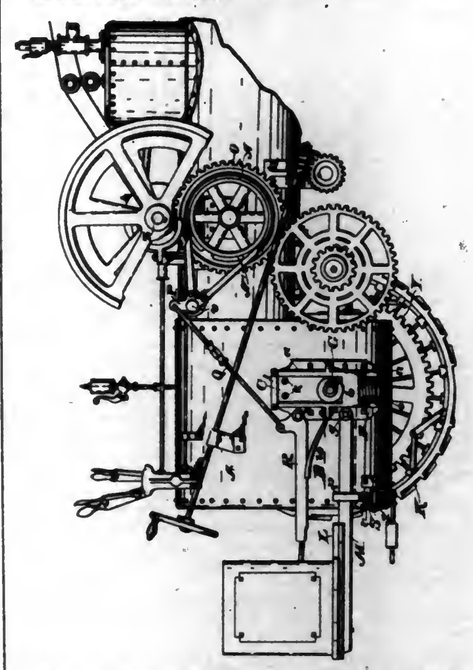
400,845. ROLLS FOR ROLLING METAL. JOSEPH GUEST, Pittsburg, Pa., assignor of one-half to Ferdinand Protzman, Sr., Sidney M. Youngs, Fred. R. Youngs, and Ralph W. Carroll, all of same place. Filed Nov. 23, 1888. Serial No. 291,627. (No model.)



Claim.—1. The combination of the two rolls provided with the two grooves C D, which are separated from each other by the cutter G, for separating the rails at the top of the flange, the grooves being so shaped that both the flanged and the head and web portions are changed in shape at the same time that the rail is being divided, substantially as shown.

2. The combination of two rolls provided with the two grooves C D, which are separated from each other by the cutter G, and separate grooves for finishing each one of the two parts of the rail, substantially as described.

400,846. TRACTION-ENGINE. CHARLES O. HEGGEM, Massillon, Ohio, assignor to Russell & Company, same place. Filed June 6, 1888. Serial No. 276,373. (No model.)



Claim.—1. The combination, in a portable engine, of a spindle-supporting frame, C, having projecting side portions, *a*, a bottom portion, *b*, having a perforation, *d*, spindle G, a spindle-frame having a downwardly-projected portion, H, a spiral spring, F, secured about said portion, and an upwardly-projected portion adapted for lateral adjustment, and means for securing said portion in desired adjustment, substantially as described, and for the purpose set forth.

2. The combination, in a portable engine, of a spindle-supporting frame, C, and a spindle-frame, E, loosely secured to said frame C and adapted for vertical vibration and lateral adjustment, substantially as described, and for the purpose set forth.

3. In a portable engine, the combination of the spindle G, and a spindle-supporting frame having an upwardly-projected portion, E, and a downwardly-projecting portion, H, substantially as described, and for the purpose set forth.

4. The combination, in a portable engine, of the U-shaped foot-board support, the ends thereof pivotally secured to the sides of the fire-box, and supporting-springs, substantially as described, and for the purpose set forth.

5. In a portable engine, in combination with a U-shaped foot-board support pivotally secured to the fire-box portion of the boiler, a spring supporting-bracket, *f*, spring *e*, and loop *h*, substantially as described, and for the purpose set forth.

6. In a portable engine, a brake composed, essentially, of a brake-wheel, N', secured to the gear-wheel O, a flexible shoe, N, pivotally secured at both ends to a lever, P, stud *v*, adjustable link Q, foot-lever R, and a spring, *w*, fixed at one end to the engine and bearing with its free end against the under side of the lever R, substantially as set forth.

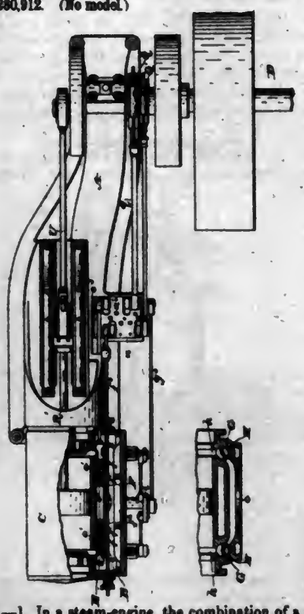
7. A steam-engine having an axle and an adjusting device in connection therewith to regulate the inclination of the axle, substantially as set forth.

8. A steam-engine having a vertically-yielding axle and an adjusting device in connection with the axle to regulate the inclination of the same, substantially as set forth.

9. In a portable steam-engine, the combination, with the spindle-supporting frame C, of a spindle-frame, E, vertically movable in said frame C and provided with a recess, *g*, a block, *h*, fitting in said recess, and a set-screw, *k*, for separating the upper ends of said frames, substantially as set forth.

10. In a portable engine, the combination of the pivoted foot-board support, the fixed spring supporting-bracket, the loop embracing branches of the said foot-board support and provided with a stem working in an aperture of the spring-support, and a spring encircling the said stem and engaging, respectively, with its ends the loop and the spring-support, substantially as set forth.

400,847. STEAM-ENGINE. CHARLES O. HEGGEM, Massillon, Ohio, assignor to Russell & Company, same place. Filed July 24, 1888. Serial No. 280,912. (No model.)



Claim.—1. In a steam-engine, the combination of a slide-valve for steam admission and a cut-off valve seated on the slide-valve and provided with a hollowed-out face in normal communication with the interior of the steam-chest to retain steam between the valves, substantially as described, and for the purpose set forth.

2. In a steam-engine, the combination of a slide-valve for steam admission, having its inner face cut under to admit steam from the steam-chest, and a cut-off valve seated on the slide-valve, substantially as described, and for the purpose set forth.

3. In a steam-engine, the combination of a slide-valve for steam admission, having its inner face cut under to admit steam, and a cut-off valve seated on the slide-valve and having its face hollowed out to retain steam between the valves, substantially as described, and for the purpose set forth.

4. In a steam-engine, the combination, with a slide-valve of the gridiron form, of a cut-off of the gridiron form seated on the slide-valve and having the faces of its bars hollowed out and in normal communication with the interior of the steam-chest to receive and retain steam for the purpose of balancing the valves, substantially as described, and for the purpose set forth.

5. In a steam-engine, the combination, with the steam-admission and steam-cut-off valves, of a pair of rocking exhaust-valves, operating-arms secured to their shafts, a vibrating plate or arm connected with their operating-arms, and means for vibrating the plate or arm, substantially as described, and for the purpose set forth.

6. In a steam-engine, the combination, with the main shaft and the steam-controlling valves, of a box-like portion of the supporting-frame intermediate of the main shaft and cylinder, movable bearings seated in said box-like portion, a pair of rock shafts journaled in the movable bearings, a pair of wedges in engagement with the bearings, and means for operating the wedges to take up wear, substantially as described, and for the purpose set forth.

7. In a steam-engine, the combination, with the main shaft and valves for controlling the admission of steam, of a box-like supporting-frame intermediate of the main shaft and valves, a cover to the said box-like portion, the cover provided with a depending central web having inclined sides, movable bearings on opposite sides of the web, rock-shafts journaled in the bearings, arms secured to the rock-shaft and extending upward through openings in the cover, inclined face blocks inserted between the web and bearings, and means for operating the inclined face blocks, substantially as described, and for the purpose set forth.

8. In combination, the main shaft, the three steam-controlling valves, the intermediate rock-shafts provided with arms—one with three arms and the other with two—connections between the main shaft and one arm of each shaft, and connections between the other arms and the valves, substantially as described, and for the purpose set forth.

400,848. JOINT FOR FIRE-POT LININGS. STEPHEN D. HORTON, Peekskill, N. Y., assignor to Horton & Mabie, same place. Filed Nov. 19, 1888. Serial No. 291,215. (No model.)



Claim.—1. A joint for fire-pot linings, formed by a female section and a male section, the female section having a top and front wall on its face adapted to engage the top and front faces of the end of the male section, substantially as set forth.

2. A joint for fire-pot linings, formed by two meeting sections, one of the sections having a recess adapted to receive the end of the other section and engage the top and front thereof, and with a projection at the bottom of the recess, the other section having a recess in its end to receive said projection and lock the first-named section against vertical displacement, substantially as set forth.

400,849. GRAIN-METER. GEORGE R. HOWLAND, Pontiac, Ill. Filed June 16, 1888. Serial No. 277,336. (No model.)



Claim.—1. The combination, in a grain-meter, with an intermittent revolving cylindrical grain-measure divided into two compartments, each of which is provided with openings, and studs secured to and projecting from the end of said measure, of a pneumatic brake consisting of a bellows, as described, which is struck and compressed by one of said studs when said measure approaches the position where the openings of said compartments will receive and discharge grain, as set forth.

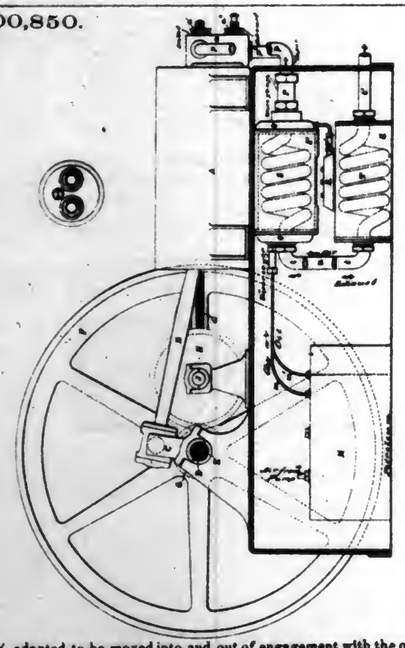
2. The combination, in a grain-meter, with an intermittent revolving cylindrical grain-measure divided longitudinally and centrally into two compartments, and studs projecting from the ends of said cylindrical measure, of an oscillating beam pivoted in suitable manner parallel to the plane of the adjacent end of the measure, so that studs will alternately strike the shorter end thereof, and a stop or check having a serrated edge pivoted contiguous and parallel with the other end of the measure and engaged alternately by the studs on the same, as and for the purpose set forth.

3. In a grain-meter, the combination of a revolving cylindrical measure having studs projecting from its end or head, a pivoted weighted beam having an arm in position to be struck by the said studs, and a pneumatic brake having a serrated stop or check-surface with which projections on the cylinder engage, substantially as described.

400,850. HYDROCARBURETED-AIR ENGINE. JOHN J. B. HUBBS, Camberwell, County of Surrey, England. Filed Mar. 8, 1887. Serial No. 230,068. (No model.) Patented in England Sept. 4, 1886, No. 11,269; in Germany Feb. 23, 1887, No. 21,510; in France Mar. 3, 1887, No. 181,939; in Belgium Mar. 5, 1887, No. 76,589; in Canada May 20, 1887, No. 44,230; in India Aug. 27, 1887, No. 158; in Italy Feb. 25, 1888, No. 3; in Spain May 10, 1888, No. 7,905, and in Ceylon May 24, 1888.

Claim.—1. The combination, in a hydrocarbureted-air engine, of the exhaust-valve of the motor-cylinder, the rod Q, and intermediate lever, *v*, for actuating said valve at or near the end of the outstroke of said rod, and a pressure-reliever comprising the rocking lever *w*, one end of which takes under the said intermediate lever, and a movable body or sleeve, *x*, on the rod Q, said body having a projecting part,

400,850.



as *x'*, adapted to be moved into and out of engagement with the other arm of lever *w*, substantially as set forth.

2. In a hydrocarbureted-air engine, the combination, with the reservoir M, containing compressed air and liquid hydrocarbon, of a mechanical vaporizer, N, pipes *m m*, which lead the air and liquid hydrocarbon, respectively, to said vaporizer, and a vapor-chamber connected with the vaporizer N, said chamber being provided with appliances for utilizing the heat of the waste gases for heating its contents, and also with a lamp for heating the contents of said chamber before the engine is started, as set forth.

3. The vapor-chamber Q, provided with an exteriorly-arranged jacket, S', open at its lower side to receive the heated gases from a lamp or like exterior heater, and also provided with an internally-arranged conduit for the passage of the waste gases from the engine, substantially as set forth.

4. In a hydrocarbureted-air engine, the combination, with the reservoir M, for containing compressed air and liquid hydrocarbon, the mechanical vaporizer, and the pipes for leading the air and liquid hydrocarbon to said vaporizer, of the vapor-chamber connected with said vaporizer, the air-chamber U, connected with said vapor-chamber, and conduits for the heated gases, arranged within said vapor and air chambers, said conduits being connected to form a continuous passage for said gases, substantially as set forth.

5. The combination, with the main shaft D and the auxiliary shaft D', aligned therewith, of the internal gear-wheel, d^7, loose on shaft D' and provided with one member of a double clutch, the gear-wheel d^4, fixed on shaft D, the pinion-shaft D^4, the pinions d^5 and d^6 on said shaft, meshing, respectively, with wheels d^3 and d^7, the member of the double clutch on shaft D, and the sliding member of said clutch on shaft D', substantially as set forth, whereby shaft D' may be driven in either direction by the shaft D.

400,851. PHONOGRAPH-DOLL. WILLIAM W. JACQUES, Newton, Mass., assignor to the Edison Phonograph Toy Manufacturing Company, of Maine. Filed Nov. 30, 1888. Serial No. 292,949. (No model.)

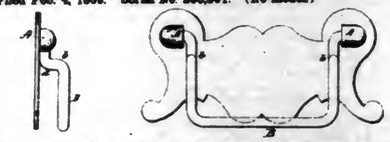


Claim.—1. The combination of a phonograph and a doll provided with a body containing and carrying said phonograph, and a closed hollow space in communication with the diaphragm and within the doll.

2. The combination of a phonograph and a doll provided with a body carrying said phonograph, and a closed hollow head to act as a resonator.

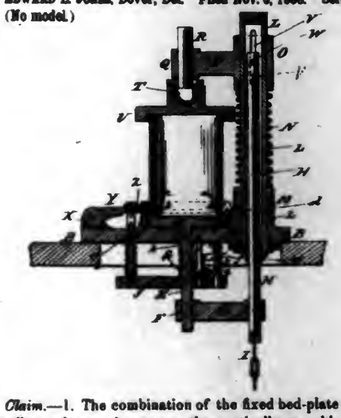
3. The combination, within the body of a doll, of a phonograph supported thereby, and a globular resonating-chamber divided into two portions by a perforated conical partition, substantially as described.

400,852. DRAWER-PULL. AUGUSTUS H. JOHNS, Meriden, Conn. Filed Feb. 4, 1889. Serial No. 298,591. (No model.)



Claim.—In a drawer-pull in which the handle is of U shape, the two legs terminating in pivots turned to the right and left and hung in sockets to the drawer-front, and so as to swing in said sockets, the handle constructed with stops *d* below the pivots, the body of the handle from said stops thrown forward out of the plane of the said stops and pivots, but substantially parallel therewith, and substantially as described.

400,853. MACHINE FOR APPLYING HEADS TO TIN CANS. EDWARD L. JOHNS, Dover, Del. Filed Nov. 6, 1888. Serial No. 290,104. (No model.)



Claim.—1. The combination of the fixed bed-plate having a central collar and central aperture, the vertically-movable bottom plate having a rod inserted loosely through the aperture in the bed-plate, the spring-actuated hinged segments overlapping the rim of the collar, the spider-plate connected to the free ends of the segments by jointed connecting-rods, the springs encircling said rods, the spring and collar upon the rod of the movable bottom plate, and the arm having a sleeve or socket at its outer end through which said rod is loosely inserted and adapted to exert upward pressure on the under side of the spider-plate, substantially as and for the purpose set forth.

2. The combination of the hinged segments, jointed rods secured in and projecting downwardly from the free ends of the same, the springs encircling said rods, the bed-plate through which said rods are loosely inserted, the spider-plate in which their lower ends are fastened, and the described mechanism for raising and lowering said plate, substantially as and for the purpose set forth.

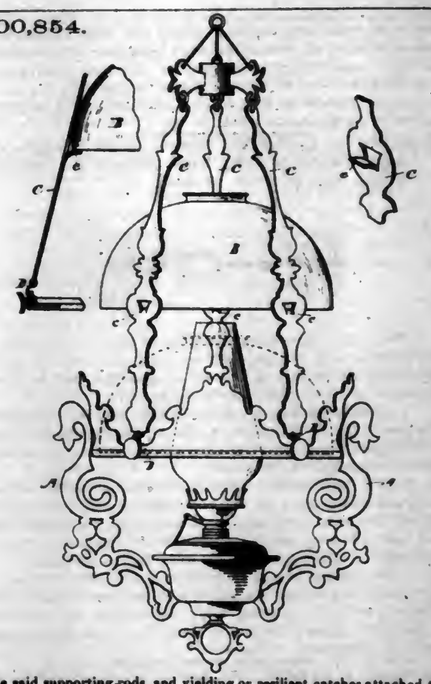
3. The combination of the bed-plate having a central collar and central aperture, the movable bottom plate and its downwardly-projecting rod having a flanged collar, and the described tripping mechanism, whereby the plate is lowered suddenly within the encircling collar of the bed-plate after it has been pushed up flush or even with the top thereof, substantially as and for the purpose set forth.

4. The combination of the tubular slotted standard, the spring encircling the same, the movable rod within said standard, the pin or bolt inserted transversely through the upper end of the inside rod and projecting through the slots in the tubular standard, the collar sliding upon said standard and fastened to the projecting ends of the transverse bolt or pin, the arm projecting from said collar and having a sleeve at its outer end, the rod inserted adjustably through said sleeve, and the plate connected to the lower end of said rod by a universal joint, substantially as and for the purpose set forth.

400,854. LAMP-SHADE HOLDER. JOSEPH KEITH, Ballard Vale, Mass. Filed Sept. 21, 1888. Serial No. 286,019. (No model.)

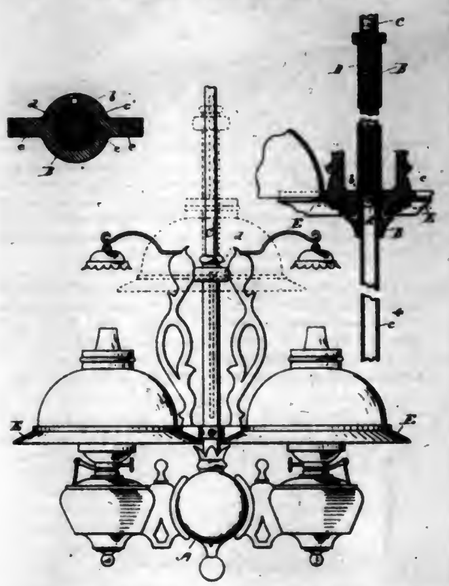
Claim.—In a suspension-lamp, the combination of a plurality of supporting-rods, a lamp-shade adapted to be raised and lowered within

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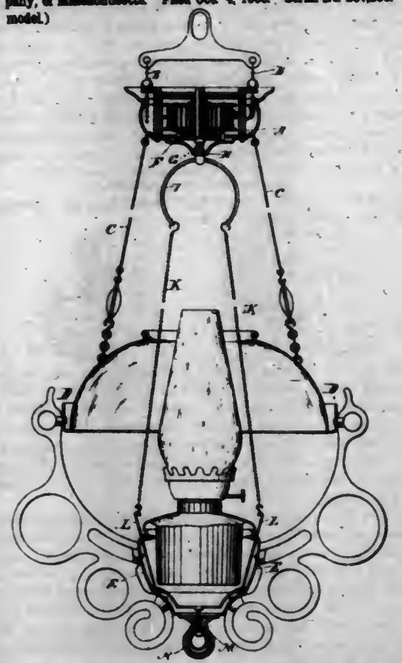
the said supporting-rods, and yielding or resilient catches attached to the supporting rods and adapted to spring inwardly against and engage directly with the shade to support it in an elevated position, all substantially as set forth.

400,855. LAMP-SHADE SUPPORT. JOSEPH KEITH, Ballard Vale, Mass. Filed Sept. 21, 1888. Serial No. 286,020. (No model.)



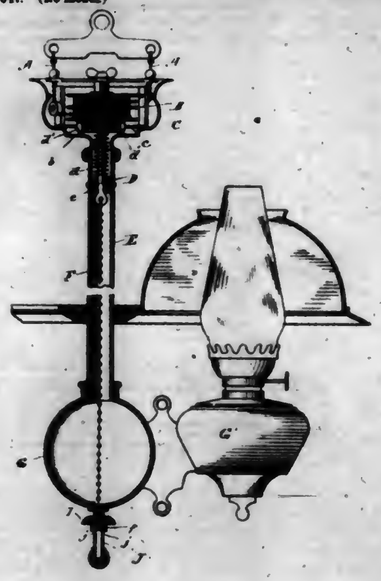
Claim.—In a chandelier, the improvement in shade elevating and supporting devices herein described, consisting of the standard C, provided with the vertical slot *c* and the upper horizontal slot, *c'*, and the sleeve B, having the lamp-shade holders attached, said sleeve being provided with a stud, *b*, adapted to enter the said slots, whereby the shade-holder and shades may be raised, lowered, and secured in position, all substantially as set forth.

400,856. SUSPENSION-LAMP. JOSEPH KEITH, Ballard Vale, Mass., assignor to himself and the Craighead & Kintz Manufacturing Company, of Massachusetts. Filed Oct. 4, 1888. Serial No. 287,208. (No model.)



Claim.—In a suspension-lamp of the character described, the combination, with the mechanism which controls the motion of the raising and lowering drum, of a hollow lamp-fount-cup support, K, a stirrup, L, located and vertically movable therein and having its upper portions passing through the upper portion of the lamp-fount-cup support, a finger-grasp, N, attached to the lower part of the stirrup, and connections K, extending upwardly from the upper ends of the said stirrup and attached to the extremities of a cross-bar, I, connected with the drum-controlling latch, all substantially as set forth.

400,857. EXTENSION-CHANDELIER. JOSEPH KEITH, Ballard Vale, Mass., assignor to himself and the Craighead & Kintz Manufacturing Company, of Massachusetts. Filed Oct. 24, 1888. Serial No. 289,047. (No model.)



Claim.—In an extension-chandelier, the combination of the supporting-chains A A, winding-drum B, provided with notches *b* on its under side, the drum-case C, provided with the internally-located perforated plate *c*, the catch-piece D, having a fork, *d'*, arranged to work vertically through the perforations in the said plate to engage with the said notches, the coiled spring *d*, supporting said catch-piece, the shell E, hub G, shell J, provided with the vertical slots *j j*, finger-slide I, surrounding the said shell J and provided with a pin, *f*, and the chain F, connected at its upper end to the said catch-piece and at its lower end to the said pin, whereby the catch-piece may be operated to check or release the drum as the elevation, depression, or suspension of the fixture may require, all substantially as set forth.

400,858. LOCK. FRANK KRUPP, New Orleans, La. Filed Sept. 22, 1888. Serial No. 286,107. (Model.)

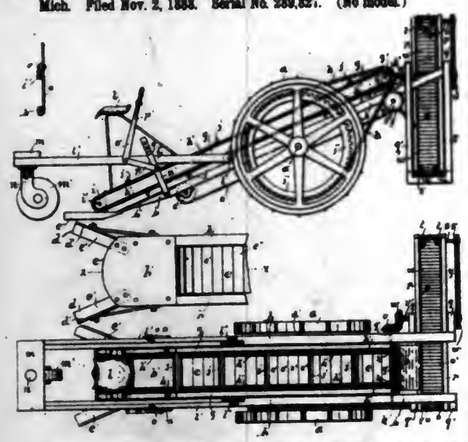


Claim.—1. In a tumbler-lock, the combination, with the lock-bolt having a recess and provided with an opening having a shoulder arranged above and in rear of a notch or pocket lying behind the stump on the bolt, of an independent latch-plate having a stud or pin lying in said notch and projecting beyond the outer face of the bolt, a latch-tumbler provided with a shoulder lying behind said pin or stud, and a lock-spindle having a cam slotted to receive the key, substantially as described.

2. In a tumbler-lock, the combination, with a series of ordinary tumblers, and with a lock-bolt having a stump, of an independent latch-plate lying in a recess behind the said bolt and provided with a pin or stud projecting through a shouldered opening in the bolt and normally lying behind the stump, a latch-tumbler adjacent to the bolt having a shoulder lying behind and a point resting upon said pin or stud, a lock-spindle having a cam which lifts and retracts the independent latch-plate, and a key which raises the latch-tumbler, substantially as described.

3. In a tumbler-lock, the combination, with a lock-bolt having a stump and guided and supported by a post, 6, on the case, of a series of ordinary slotted tumblers, 7, a latch-plate, 28, sliding upon said post and having a pin or stud, 30, projecting through a notch, 32, forming part of an opening, 31, in the bolt, said opening having shoulders 33 and 40, a latch-tumbler, 36, having a point, 37, and a shoulder, 38, lying behind the stud 30, a lock-spindle, 12, having a slotted cam, 14, limited in rotation by lugs 17 on the case, and provided with a bearing, 18, lying in a shell, 22, having a notched flange, 23, an auxiliary key having a single projection, 39, lying partly in the slot in the cam 14, and a primary key having shoulders 41, acting on the ordinary tumblers and having a notch, 25, which receives the flange 23, substantially as described.

400,859. DITCHING-MACHINE. JOSEPH LALONDE, Brooxville, Mich. Filed Nov. 2, 1888. Serial No. 289,827. (No model.)



Claim.—The combination, in a ditching-machine, of the side pieces, *b*, supported at an incline by the axle *a'* and driving-wheels *a*, and provided on their front ends with a shovel-blade, *b'*, and the endless apron *c*, in rear of the shovel-blade, and devices, as described, for imparting a rearward movement to the upper run of the apron, with the levers *f*, with their rear ends pivoted at *f'* to the side pieces, *b*, and provided on their front ends with a cross-piece, *m*, the wheel *m'*, having a caster-bearing, *n*, secured to the said cross-piece, and the regulating-pieces *n'*, with their lower ends secured to the side pieces, *b*, and provided with the gage-stops *o* above the levers *f*, substantially as and for the purpose set forth.

400,860. HAND-STAMP. EDWIN W. LEHMAN, Philadelphia, Pa., assignor of one-half to David C. Walker, Edgewater, N. J. Filed Jan. 11, 1888. Serial No. 260,414. (No model.)



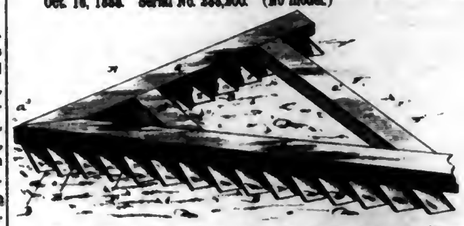
Claim.—1. A hand-stamp having a head with an opening to receive type and a lip to engage with one side thereof, and a laterally-movable washer having a lip adapted for engagement with the opposite side of the type, substantially as described.

2. A hand-stamp having a head with a shoulder and a lip at one side thereof, and a sliding washer with an elongated opening and lip, which is opposite to the lip of the head and engages with the shoulder thereof, substantially as described.

3. In a hand-stamp, a collar receiving the pin or screw of the head, and a stem connected with said collar, forming a shoulder at the base thereof, in combination with a rubber handle partly encircling said stem and resting against said shoulder, the remaining portion of the handle being clear of the stem, substantially as described.

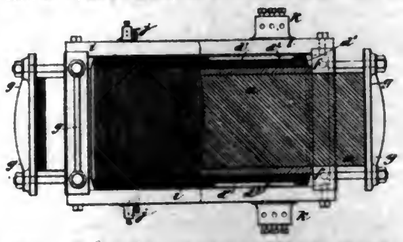
4. In a hand-stamp, the combination of the head A, with opening 1, having the lip 2 at one side thereof, and the shoulder 3, the washer B, with lip 4, extending below said shoulder, and type with inclined sides embraced by said lips 2 and 4, and right-angular adjacent sides, substantially as described.

400,861. HARROW. PHILANDER C. LOVELAND, Fairfield, Ill., assignor of one-half to John A. Moffitt and W. P. Bunch, same place. Filed Oct. 16, 1888. Serial No. 288,200. (No model.)



Claim.—In a harrow, the combination of the triangular frame A, having the rearwardly-divergent side bars, *a a*, the parallelogram-shaped teeth B B, affixed to the side bars and having their horizontal lower edges in the same plane, each succeeding tooth being inclined inward more than the preceding tooth, whereby the lower edges of all the teeth converge toward a common center on the line of draft in rear of the harrow, substantially as specified.

400,862. SECONDARY GENERATOR FOR THE CONVERSION OF ELECTRICAL ENERGY BY INDUCTION. WILLIAM LOWRIE and CHAS J. HALL, London, County of Middlesex, England. Filed May 24, 1887. Serial No. 239,366. (No model.) Patented in England Aug. 23, 1886, No. 10,765; in France May 28, 1887, No. 183,676; in Belgium May 28, 1887, No. 77,639, and in Italy Dec. 31, 1887, XXI, 22,594, XLIV, 398.



Claim.—1. A secondary generator or induction apparatus comprising one or more unit pairs of straight magnetic cores, each core being separately built up of flat thin plates square or rectangular in shape without re-entering angles, and having centrally mounted thereon superposed primary and secondary coils, a pair of the said straight cores being subsequently magnetically and mechanically united close to the

coils by bending and alternately overlapping the extended ends of the several plates and clamping them together in the form of an elongated link, substantially as and for the purpose described.

2. In a secondary generator, the combination of a magnetic core composed of thin flat plates in the shape of a solid square or rectangle with strips rounded upon their outer edges adapted to stiffen the said core-plates and to receive coils wound thereon, the ends of the said strips being cut away close to the coils, substantially as and for the purpose described.

3. In a secondary generator, the combination of two or more laminated magnetic cores, forming a complete magnetic circuit with flattened sides, on each of which are mounted superposed primary and secondary straight-wound coils, the junctions of the core ends being effected by bending, overlapping, and clamping the plates of the said cores, substantially as described.

4. In a secondary generator, the combination of two straight magnetic cores, each core composed of thin flat plates of square or rectangular form without re-entering angles, having mounted upon the central part of each core superposed primary and secondary coils, each end of each core being magnetically joined to the corresponding end of the other core, close to the said coils, in the form of a link with straight sides, substantially as and for the purpose set forth.

5. In combination, two or more magnetic cores of square or rectangular shaped plates without re-entering angles, superposed primary and secondary coils on central part of each core, alternately-lapped ends of protruding component core-plates close to coils, with the corresponding plates in adjoining core or cores in magnetically-continuous layers, and clamping devices at the junction of said plate ends, substantially as and for the purpose set forth.

6. Two or more laminated iron cores of square or rectangular shape without re-entering angles, and having superposed coils wound or mounted thereon, combined with distance pieces or blocks adapted to receive the end portions of the cores, and clamping devices to clamp the blocks and cores together in their relative positions, substantially as described.

7. In combination, two or more magnetic cores of square or rectangular shaped plates without re-entering angles, primary and secondary coils centrally mounted thereon, a frame or frames adapted to receive the said cores, and bolts, nuts, and plates adapted to clamp together the several plate ends in closed magnetic circuits without perforating the said ends, substantially as and for the purpose described.

400,863. REFRIGERATING AND VENTILATING CAR. CHRISTIAN R. LUCAS and ALBERT A. WOOD, Atlanta, Ga. Filed July 10, 1888. Serial No. 279,600. (No model.)



Claim.—1. The combination, in a refrigerating and ventilating car, of an ice-receptacle formed in the end of the car, the chambers on either side of said receptacle containing flues made by vertical partitions placed at right angles to the sides of the car, said flues being separated into upper and lower parts by horizontal partitions, the inner flues connecting with the ice-chamber, the interior of the car, and with the outer flues by openings in the partitions separating them, respectively, and the said outer flues connecting with the exterior of the car, substantially as set forth.

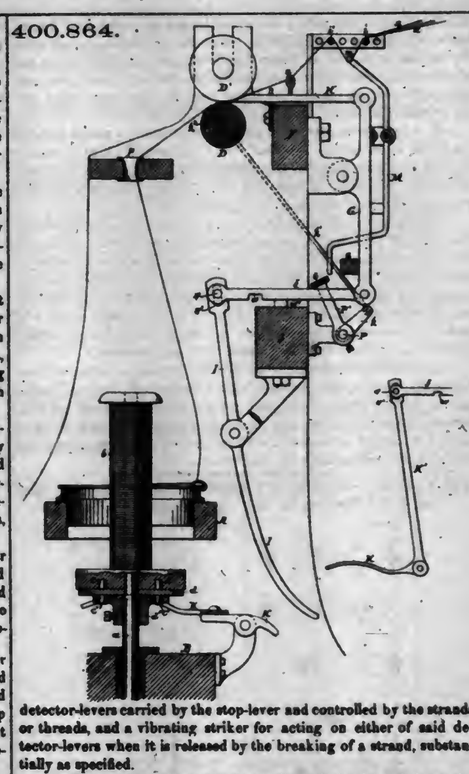
2. In a refrigerating and ventilating car, the chambers on either side of an ice-chamber formed in the car, containing flues formed by vertical partitions placed at right angles to the sides of the car, and horizontal partitions separating them into upper and lower flues, the inner flues connecting with the ice-chamber, the interior of the car, and with the outer flues by openings in the partitions separating them, respectively, the outer flues connecting with the exterior of the car by suitable openings, in combination with the valves for closing the openings in the partitions between said flues, and the mechanism for operating said valves, substantially as set forth.

400,864. STOP-MOTION DEVICE FOR SPINNING AND TWISTING MACHINES. WILLIAM LORD, Philadelphia, Pa. Filed Dec. 20, 1888. Serial No. 294,136. (No model.)

Brief.—The object of the invention is to provide simple, cheap, and effective means whereby, on the breaking of a strand, there will be a stoppage of the feeding devices and of the bobbin.

Claim.—1. The combination, in a spinning or twisting machine, of the feed-rolls and the drive-disk on the spindle with a separator-bar for the feed-rolls, a lifting-lever for the drive-disk, a stop-lever, connections between the same and the separator-bar and lifting-lever,

400,864.



detector-levers carried by the stop-lever and controlled by the strands or threads, and a vibrating striker for acting on either of said detector-levers when it is released by the breaking of a strand, substantially as specified.

2. The combination of the feed-rolls and the drive-disk on the spindle, the stop-lever, its detector-levers, the feed-roll separator-bar, the vibrating striker for acting on the detector-levers, a lifting-lever for acting on the drive-disk, an intermediate lever acting on said lifting-lever, and connections between the stop-lever and intermediate lever and between the stop-lever and separator-bar, substantially as specified.

3. The combination of the feed-rolls, the drive-disk on the spindle, the stop-lever, its detector-levers, the feed-roll separator-bar, the lifting-lever for the drive-disk, the vibrating striker-bar for acting on the detector-levers, a connection between the stop-lever and separator-bar, and a connection between said stop-lever and the lifting-bar, said connection having a notched link for engaging with a retainer-bar when the link is in its retracted position, substantially as specified.

4. The combination of the feed-rolls, the drive-disk on the spindle, the stop-lever, its detector-levers, the vibrating striker for the latter, a lifting-lever for the drive-disk, connections between the stop-lever and lifting-lever, and a wedge-shaped feed-roll separator-bar hung to the stop-lever, all substantially as specified.

400,865. FASTENER FOR GLOVES. GEORGE W. MANDRILL, Gloversville, N. Y., assignor to Eugene Pringle, same place, and Madison D. Shipman and Charles E. Bradt, De Kalb, Ill. Filed Nov. 21, 1888. Serial No. 291,425. (No model.)



Claim.—1. In a ball-and-socket glove-fastening, a socket member consisting of an eyelet provided with a downward-curved top, and a tube formed below the same having slits in the lower end, which slits do not sever the continuity thereof, and an elastic washer, the slotted end of the tube being adapted to extend through the glove and be upset against said washer on the under side of the glove, as set forth.

2. In a ball-and-socket glove-fastening, a socket member consisting

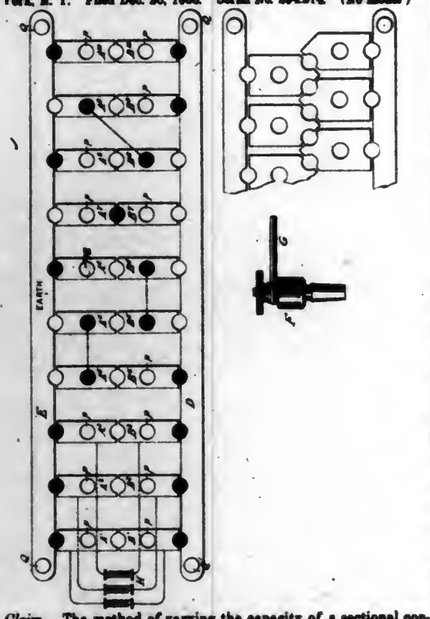
of an eyelet provided with a downward-turned top, and a tube formed below the same having slits at the lower end, which slits do not sever the continuity thereof, an elastic washer against which the lower end of said tube is upset on the under side of the glove, and an ornamental downwardly-flanged top or cap fitting over the top flange of the eyelet, as set forth.

3. A ball-and-socket glove-fastening comprising a socket member consisting of an eyelet provided with a downwardly-turned flanged top and a lower slitted end, an apertured and slitted washer against which the said lower tubular end of the eyelet is upset, and a stud adapted to engage said parts, as set forth.

4. A ball-and-socket glove-fastening comprising a socket member consisting of an eyelet provided with a downwardly-curved flanged top and a lower slitted tubular end, a centrally-apertured radially-slotted washer having the ends of its separated parts struck down to engage the struck-up ends of the slitted parts of the lower tubular end of the eyelet, an ornamental cap or covering arranged over said eyelet, and a stud constructed of two sections united by flanges formed in each to provide a shoulder, substantially as described.

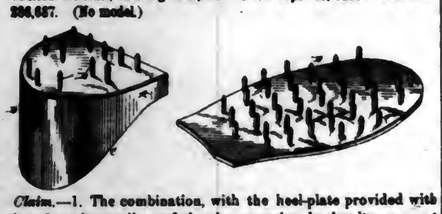
5. A ball-and-socket glove-fastening comprising a socket member consisting of an eyelet provided with a downwardly-curved flanged top and a lower slitted tubular end, and a centrally-apertured radially-slotted washer having the ends of its separated parts struck down to engage the struck-up ends of the slitted parts of the lower tubular end of the eyelet, substantially as specified.

400,866. ELECTRIC CONDENSER. WILLIAM MARSHALL, New York, N. Y. Filed Dec. 20, 1888. Serial No. 294,214. (No model.)



Claim.—The method of varying the capacity of a sectional condenser, which consists in grouping two or more sections in series to reduce the individual capacity of the sections and combining the group thus formed in multiple arc with one or more individual sections.

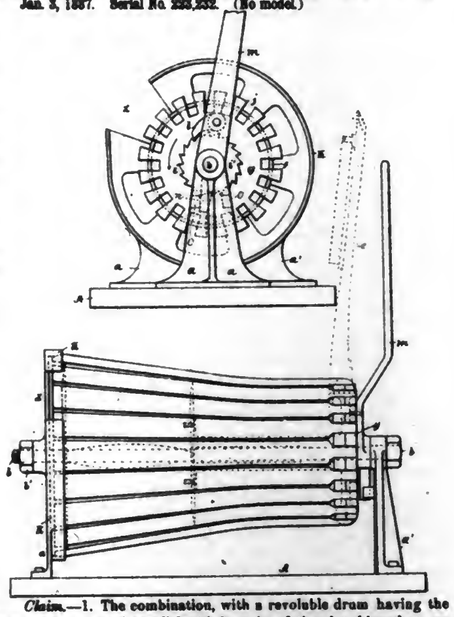
400,867. SOLE AND HEEL PLATE FOR BOOTS OR SHOES. GEORGE MEYERS, Sterling Run, Pa. Filed Sept. 26, 1888. Serial No. 286,657. (No model.)



Claim.—1. The combination, with the heel-plate provided with a series of teeth or spikes, of the rim or casing having its rear part extending upward a greater distance than the front portion thereof, and also provided with a conoidal perforation or hole, substantially as set forth.

2. The combination, with a boot or shoe, of the heel-plate provided with a series of teeth or spikes having enlarged upper ends terminating in a point, the rim or casing having its rear part extending upward a greater distance than the front portion thereof, and also provided with a conoidal perforation or hole, and the sole-plate provided with a series of teeth or spikes having enlarged upper ends terminating in a point, substantially as set forth.

400,868. CIGAR-MOLD. FREDERICK C. MILLER, Newport, Ky. Filed Jan. 3, 1887. Serial No. 223,232. (No model.)



Claim.—1. The combination, with a revoluble drum having the lower cups arranged parallel with its axis, of the slats hinged at one end to said drum, so as to project over the lower cups parallel therewith, and the upper cups secured to said slats, substantially as set forth.

2. The combination, with a revoluble drum having the lower cups arranged parallel with its axis and a disk having connection with said drum, so as to revolve therewith, of the slats of greater length than said cups hinged to said disk, so as to project over the lower cups parallel therewith, and the upper cups carried by said slats, substantially as set forth.

3. The combination, with a frusto-conical drum having the lower cups arranged parallel with its axis, of the hinged slats of greater length than said cups projecting over the lower cups, and the upper cups carried by said slats, substantially as set forth.

4. The combination, with a revoluble drum having the lower cups and the slats hinged at one end and carrying the upper cups, and a band partially surrounding said drum and embracing said slats near their free extremities, substantially as set forth.

5. The combination, with the rotary drum having the lower cups, of the slats carrying the upper cups and hinged at one end, and the stationary band or flange projecting over the free extremities of said slats and formed in part concentric with the drum, substantially as set forth.

6. The combination, with the drum having the lower cups, of the slats hinged at one end and carrying the upper cups, and the stationary band or flange projecting over the free ends of said slats, said band or flange being in part concentric with the drum and in part tangential thereto, substantially as set forth.

7. The combination, with the drum having the lower cups, of the slats carrying the upper cups, said slats being of greater length than said cups, the disk to which said slats are hinged, and the connection *h* between said disk and drum, substantially as set forth.

8. The combination, with the revoluble drum having the lower cups, of the hinged slats carrying the upper cups, and the disk connected to the drum and having the radial notches for the reception of the ends of said slats, substantially as set forth.

9. The combination, with the revoluble drum having the lower cups, of the hinged slats carrying upper cups, said slats having perforations *e'*, the flange *h''*, carried by the drum and having the notches in its periphery and the annular grooves in its outer face, the wire *f*, passed through said perforations and occupying said groove, and the disk *i*, having notches and an annular groove corresponding to the flange *h''*, substantially as and for the purposes set forth.

10. The combination, with a rotary drum having a number of flat surfaces and the lower cups arranged in said flat surfaces, of a hinged slat carrying a plurality of upper cups, substantially as set forth.

11. The combination, with the revoluble drum *c*, having the lower cups, of the hinged slats carrying the upper cups, the disk *g*, carried by the drum and to which said slats are hinged, and the sleeve *h*, connecting the disk with the drum, substantially as set forth.

400,869. COMBINED SOLDER AND FLUX. EDWIN NORTON and JOHN G. HODGSON, Chicago, Ill., assignors to said Edwin Norton and Oliver W. Norton, same place. Filed Apr. 5, 1886. Serial No. 197,779. (No model.)

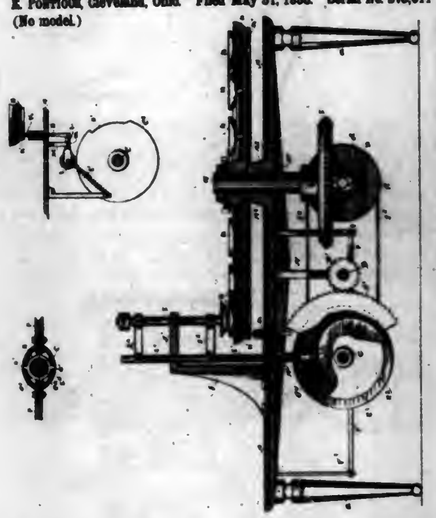


Claim.—1. Wire-solder provided with an outside groove or channel, a flux in said groove or channel, said groove or channel being closed or partially closed about said flux, substantially as specified.

2. Wire-solder provided with an outside dovetail-shaped groove or channel formed in the body of the wire for containing flux, substantially as specified.

3. Flexible solder-wire provided with a continuous longitudinal bore containing flux, whereby the flux is retained in place therein, substantially as specified.

400,870. MACHINE FOR MAKING BIRD-TARGETS. MARSHAL E. PORTEOUS, Cleveland, Ohio. Filed May 31, 1888. Serial No. 275,611 (No model.)

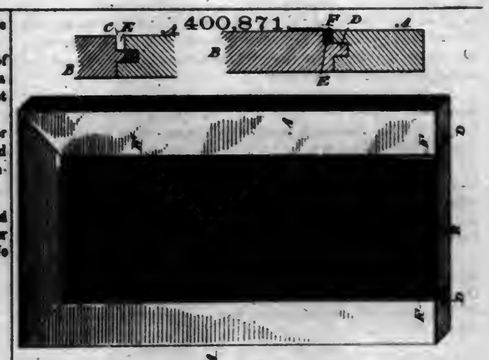


Claim.—1. The combination, with a table carrying a series of molds and gearing for imparting a rotary motion to said table, of a shaft, a clutch thereon, driving mechanism connected with the loose sliding section of the clutch for actuating the table-gearing, and devices for automatically opening and closing the clutch to intermittingly rotate the table, substantially as set forth.

2. The combination, with a table, gearing for rotating the same, molds, friction-clutch, motion-transmitting devices connecting the table-gearing and sliding section of the clutch, and a lever for sliding one section of the clutch, of a spring for actuating the lever in one direction and a cam for moving the lever in the opposite direction, the parts being timed to intermittingly rotate the table the distance from one mold to another, substantially as set forth.

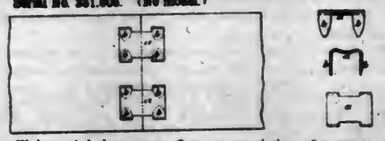
3. In a bird-target machine, the combination, with a rotary table carrying molds, a constantly rotating shaft having a clutch thereon and power-transmitting devices actuated by the loose section of the clutch for rotating the table, of a plunger actuated by the constantly-rotating shaft, and a dog for locking the table against movement, also actuated by said shaft, substantially as set forth.

400,871. TOP FOR DESKS. WILLIAM H. PORTER, Washington, D. C. Filed July 7, 1888. Serial No. 279,300. (No model.)



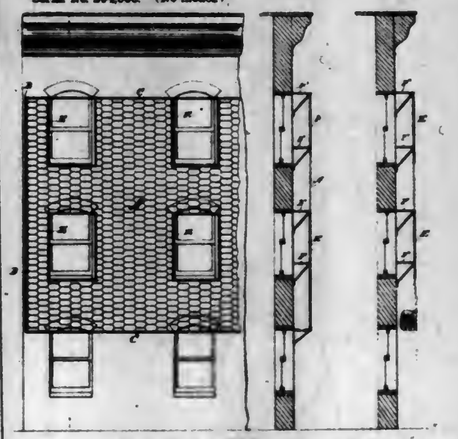
Claim.—In the manufacture of a desk-top, the combination of the grooved frame A and the panel B, tongued all around its edges, the wood being cut away on the upper side, as described, so that when the panel is in position in the frame a rib-recess will be left between the frame and panel for fastening the cloth cover in place, substantially as set forth.

400,872. JOINT FOR STRAPS. CARL T. RENUS, Dresden, Saxony, Germany, assignor to Jean Schertel, same place. Filed July 31, 1888. Serial No. 281,608. (No model.)



Claim.—A belt or strap fastener consisting of a cramp of sheet metal in the shape of a slightly-downward curved sheet-metal strip, *a*, with four sharp-pointed teeth, *b*, at the corners, a wide space being left between the two teeth on each side, substantially as and for the purpose specified.

400,873. FIRE-ESCAPE. CHARLES O. ROSE, Rochester, N. Y., assignor of one-half to John Heisler, same place. Filed Dec. 27, 1888. Serial No. 294,808. (No model.)



Claim.—1. The herein-described fire-escape, consisting of a strong netting of large mesh secured to a building substantially parallel with the wall thereof, and extending around one or more of the windows, the meshes serving as hand and foot holds, as set forth.

2. In a fire-escape, the combination, with the supporting-brackets permanently secured to the building, of the strong netting of large mesh secured thereto, extending substantially parallel with a wall of the building and around one or more of the windows, the meshes serving as hand and foot holds, as set forth.

3. In a fire-escape, the combination, with the frame, of the strong netting of large mesh secured to the frame and means for securing the latter at top and bottom permanently to the side of a building substantially parallel with the wall thereof and in proximity to one or more of the windows, the meshes serving as hand and foot holds, as set forth.

4. In a fire-escape, the combination, with the strong netting of

large, mesh secured to a building substantially parallel with the wall thereof, having openings coinciding with the windows and extending around one or more of them, of the meshes serving as hand and foot holds, substantially as described.

5. In a fire-escape, the combination, with the strong netting of large mesh adapted to be secured to a building having openings coinciding with the windows in the latter, of frames around said openings, substantially as described.

6. In a fire-escape, the combination, with the strong netting of large mesh adapted to be secured to a building, having openings coinciding with the windows in the latter, of the frame in said openings and the brackets securing them to the building, substantially as described.

7. In a fire-escape, the combination, with the building, of the strong wire-netting secured thereto substantially parallel with the wall thereof and extending around one or more of the windows, the bottoms of the meshes being horizontal and formed of two or more strands of twisted wire, forming hand and foot holds, substantially as described.

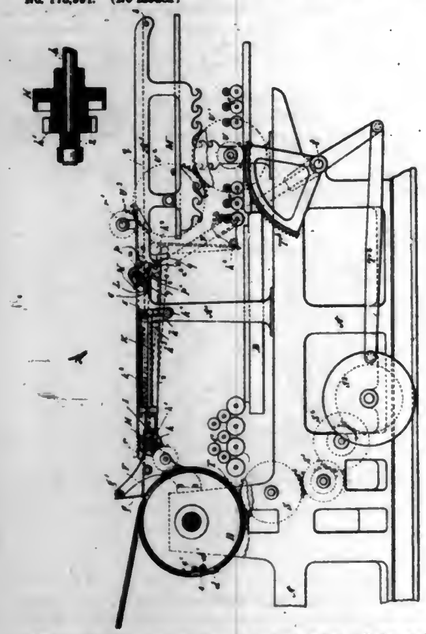
400,874. NEEDLE-BEAM FOR BRIDGES. EDWIN E. RUSTON, Mountain Spring, Tex. Filed Nov. 22, 1888. Serial No. 291,595. (No model.)



Claim.—1. The combination, with the needle-beams A, of the castings C, the caps B, the supports E and D', and the cables, substantially as described.

2. The combination, with the needle-beams A, of the supports E and D', the caps B, and the cables G and H, substantially as described.

400,875. SHEET-DELIVERY APPARATUS FOR PRINTING-MACHINES. WALTER SCOTT, Plainfield, N. J. Filed Oct. 5, 1885. Serial No. 178,991. (No model.)



Claim.—1. The combination, with the impression-cylinder making two revolutions to each impression, of sheet-strippers upon which the advancing ends of the sheets are passed, endless belts and pulleys to convey the sheets along from the strippers, gripper-fingers to seize the sheet, a cross-bar carrying the grippers, mechanism for giving motion to the cross-bar, and a table upon which the sheet is laid as delivered, substantially as set forth.

2. The combination, with the impression-cylinder and its grippers, of lifting-fingers and their shaft upon the impression-cylinder, stationary sheet-strippers, endless belts and their pulleys, grippers, a cross-bar carrying such grippers, and mechanism, substantially as set forth, for moving the grippers, substantially as set forth.

3. The combination, with the impression-cylinder and grippers of sheet-strippers over which the printed sheet passes, endless belts and pulleys for conveying the sheets, a frictional driving mechanism, substantially as specified, for the belts, and a frictional brake for stopping the pulleys and belts, the grippers, and their actuating mechanism, substantially as set forth.

4. The combination, with the impression-cylinder, the sheet-strippers, and the belts and actuating mechanism, of the racks, the cross-bar N, the gripper-fingers, a spring to close the same, an arm and stop to open the grippers, a latch to hold the grippers open, and a stop to act upon the latch and allow the grippers to close, substantially as set forth.

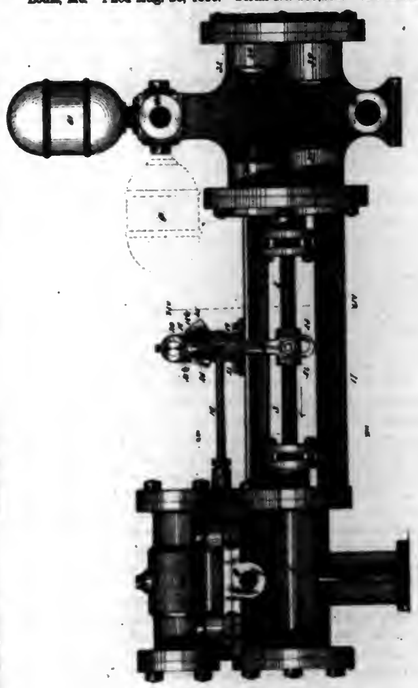
5. The combination, with the impression-cylinder and its grippers, of sheet-strippers, endless conveying-belts, grippers, a cross-shaft for the same, racks at the ends of the cross-shaft, and pinions for moving said racks, substantially as set forth.

400,876. LAST. ELDRED W. STEAD, Stoke Newington, County of Middlesex, assignor to Ralph Lees, Crewe, County of Chester, England. Filed Nov. 15, 1888. Serial No. 290,944. (No model.) Patented in England Aug. 8, 1887. No. 10,855.



Claim.—A damp-boot drier consisting of a hollow hot-water-containing last formed of heat-conducting material integral with the hollow leg, the instep, the upper, and the sole shaped to fit the interior of the sole, upper, and leg of a boot, and the hollow leg formed at its top with an upwardly-projecting handle, and a transverse diaphragm containing a stoppered filling-aperture, substantially as shown and described.

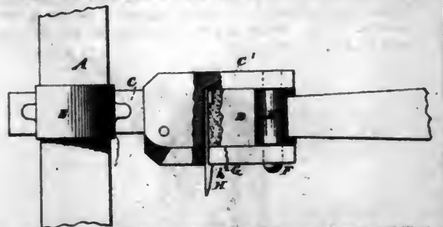
400,877. STEAM PUMPING-ENGINE. FRANK STEINMANN, St. Louis, Mo. Filed Aug. 20, 1888. Serial No. 283,206. (No model.)



Claim.—1. The combination of the main cylinder provided with a piston and receiving-ports, 4 and 5, and exhaust-ports 6, an auxiliary cylinder located over the main cylinder and having ports 14 15 communicating therewith, an auxiliary piston connected to the valve of the main cylinder, an auxiliary valve for controlling the ports of said auxiliary cylinder, having the exhaust-ports 14½ extending therethrough, adapted to place the exhaust 6 and the ports 14 15 in communication, and mechanism connecting the rod of the main piston to the stem of the auxiliary valve, substantially as and for the purpose set forth.

2. The combination of the main cylinder provided with a piston and receiving and exhaust ports, an auxiliary cylinder located over the main cylinder, an auxiliary piston, a valve for controlling the ports of the main cylinder connected to said auxiliary piston, an auxiliary valve for controlling the ports of the auxiliary cylinder, and a connection between the valve-stem and piston-rod of the main cylinder, consisting of a pivoted arm to which said stem is connected and which is provided with lugs and a slot, a lever connected to said piston-rod, a standard to which said arm and lever are connected, and a pin on the standard fitting in a slot in said arm, substantially as and for the purpose set forth.

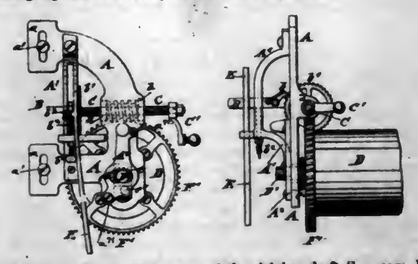
400,878. THILL-COUPLING. DAVID K. STOUT, Bloomingdale, Mich., assignor of one-half to Albert Taylor, same place. Filed June 20, 1888. Serial No. 277,666. (No model.)



Claim.—A thill-coupling consisting of the eye E on the thill, the head C, carrying the fixed pivot F in its rabbet c', a hinged side latch, G, having pivot-hole g and shoulders g^2, a spring, H, having shoulders h^2, and the cross-barred yoke B C, as shown and described.

400,879. OPERATING MECHANISM FOR THE CLOTH-BEAMS OF LOOMS. CHARLES STRAUBMANN, Jersey City, N. J. Filed June 19, 1884. Renewed Jan. 8, 1889. Serial No. 296,905. (No model.)

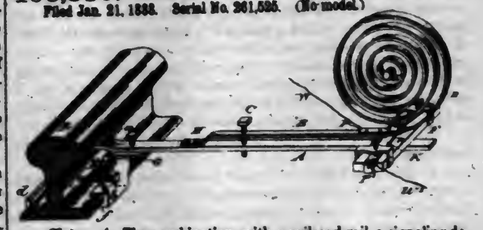
Brief.—A cam on a shaft operated from the driving-shaft acts on a lever, which through a rod gives reciprocatory motion to a lever carrying a spring-actuated pawl, which acts on a ratchet on a worm-shaft, which in turn operates a worm-gear fast on the shaft of the cloth-beam. By a set-screw the throw of the pawl-carrying lever can be adjusted. The shaft of the cloth-beam at one end plays in a journal-block, which is adjusted in a vertical slot of the bracket by means of an auxiliary plate provided with a transverse slot and an inwardly-extending lug and fastened by suitable fastening-screws.



Claim.—1. The combination of the driving-shaft S, a cam, E', intermediate gear-wheels, an oscillating lever-rod, E^3, a vertically-reciprocating rod, E, operated by said cam and having a heel or shoulder, b^3, an oscillating lever, B, a supporting-bracket, A, having a slotted guide-piece, A', and set-screw b^4, for the lever B, a pawl, b, on the oscillating lever B, a shaft, C, having a ratchet-wheel, b', and worm F, and a cloth-beam, D, having a worm-wheel, F', substantially as set forth.

2. The combination of a supporting bracket-plate, A, having a guide-opening, an auxiliary face-plate, A^3, pivoted to the bracket-plate A, said face-plate having a transverse slot, c^4, and a projecting lug, c', a cloth-beam, D, having a shaft, D', a journal-bearing, c, for said shaft guided in said opening and supported by the lug c', and a fastening-screw, a^{12}, for removably retaining said auxiliary plate in position, substantially as set forth.

400,880. RAILWAY-SIGNAL. SAMUEL T. STREET, Deposit, N. Y. Filed Jan. 21, 1888. Serial No. 261,535. (No model.)

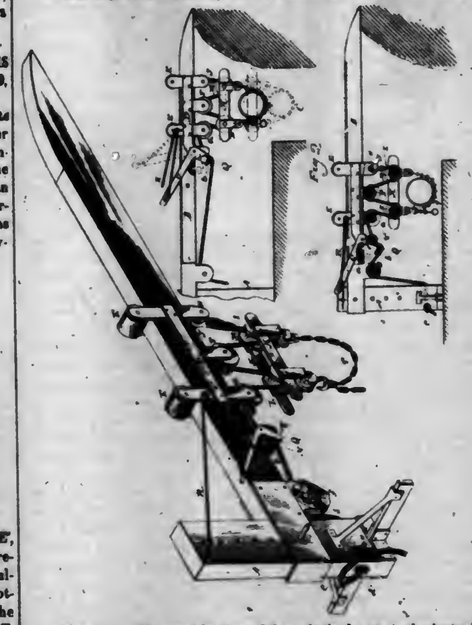


Claim.—1. The combination, with a railroad-rail, a signaling device, and an electric circuit, of a lever mounted to have contact with said rail, a block of non-conducting material mounted upon said lever at its free end, contact-springs secured to said block, and a spring-arm mounted upon the lever in advance of the block of non-conducting material and adapted to vibrate between the contact-springs carried by said block, substantially as set forth.

2. The combination, with a railroad-rail, a signaling device, and an electric circuit, of a lever mounted to have contact with said rail, a block of non-conducting material mounted upon said lever at its free end, contact-springs secured to said block and overlapping at their free ends, and a spring-arm carrying a coiled spring mounted upon the lever in advance of the block of non-conducting material and passing between the overlapping ends of the spring-contacts, substantially as set forth.

3. The combination, with a railroad-rail, a signaling apparatus, and an electric circuit, of a lever mounted to have contact with the rail, a block of non-conducting material carried by the lever at its free end, contact-springs secured to said block, devices secured to the block for regulating the tension of said contact-springs, and a spring-arm mounted upon the lever in advance of the block of non-conducting material and passing between the contact-springs carried by said block, substantially as set forth.

400,881. PIPE-LAYING APPARATUS. DANIEL A. STREETER, Waterbury, Conn. Filed Aug. 27, 1888. Serial No. 283,573. (No model.)

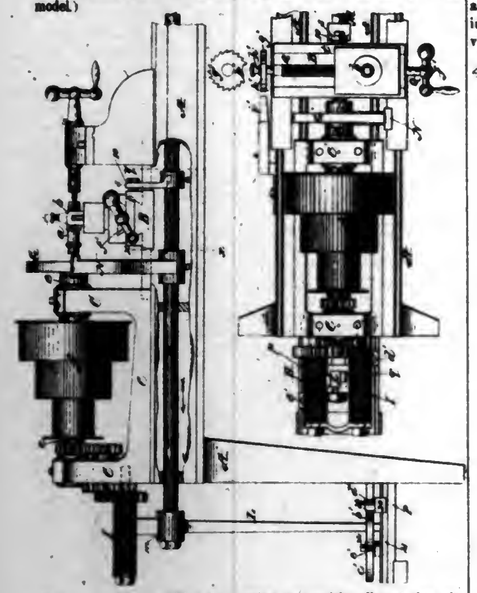


Claim.—1. The combination of the principal post A, the beam B, extending horizontally therefrom, the post provided with a suitable base for its vertical support, a carriage, D, hung upon said beam and adapted to travel thereon, the carriage provided with pulleys F G below the beam, with a cradle, K, carrying pulleys L M, and a rope attached by one end to said carriage and running down around the pulley M on the cradle, up over the pulley F of the carriage, down around the pulley L of the cradle, thence up over the pulley G of the carriage, the said cradle provided with means for supporting the pipe, substantially as and for the purpose described.

2. The combination of the post A, the beam B, extending horizontally therefrom, carriage D, supported and so as to run upon said beam, the carriage carrying pulleys F G below the beam, the cradle K below said carriage, a rope attached by one end to the carriage and running around pulleys in the cradle and over the said pulleys in the carriage, the carriage constructed with an opening in rear of the pulleys, through which the rope runs, and a brake-lever carrying a finger adjacent to said opening in the carriage and adapted to operate as a brake upon the rope, substantially as and for the purpose described.

3. The combination of the post A, the beam B, extending horizontally therefrom, a carriage arranged to travel upon the beam, a cradle below the carriage, a rope by which said cradle is suspended to said carriage, a lever, O P, hung upon said carriage, a beam constructed with one or more notches, *a*, and the lever provided with corresponding studs, *b*, substantially as and for the purpose described.

400,882. MACHINE FOR CUTTING SCREW-TAPS. GEORGE W. TOWER, Boston, Mass. Filed Aug. 22, 1888. Serial No. 283,457. (No model.)



Claim.—1. In a machine for cutting taps with relieved threads, the combination, with the head and tail centers for supporting the work and a slide-rest or tool-carriage, of the reciprocating rock-shaft M, connected with the tool-carriage and provided with means for transversely operating the tool-slide to cause the tool to move toward or from the work, a pattern-wheel or face-plate, G, having a cam-shaped periphery, and a lever secured to the reciprocating rock-shaft and bearing upon the pattern-wheel, whereby the shaft M as it is moved longitudinally is rocked to cause the tool to advance and recede to cut a relieved thread on the top, substantially as set forth.

2. In a machine for cutting taps with relieved threads, the combination, with the head and tail centers for supporting the work and a slide-rest or tool-carriage, of the reciprocating rock-shaft M, provided with a crank-arm, *a*, connected with the tool-slide *t* of the carriage, whereby the tool is caused to advance and recede as the shaft is rocked, the pattern-wheel or face-plate G, having a cam-shaped periphery, the lever N, secured to the rock-shaft and bearing on the pattern-wheel, whereby the shaft is rocked to operate the tool-slide transversely, the feed and return screws H I, geared to the live-spindle, and the lever L, connected with the rock-shaft M and provided with the half-nuts *p q*, the said lever L being vibrated to cause the half-nuts to alternately engage with the feed and return screws, whereby the tool-carriage is reciprocated, all operating substantially as described.

3. In a machine for cutting taps with relieved threads, the combination, with the reciprocating tool-carriage B, its operating rock-shaft M, the lever N, and pattern-wheel G, of the tool-slide *t* and the transverse feed-screw Q, for operating the same, provided with a ratchet-wheel, *g'*, having a blank or toothless portion, *k'*, and the stationary pawl *i'*, whereby the tool is advanced and its motion automatically arrested when the thread on the tap has been cut to the desired depth, substantially as set forth.

4. In a machine for cutting taps with relieved threads, the combination of the head and tail centers for supporting the work, a slide-rest or tool-carriage, the reciprocating rock-shaft M, connected with the tool-carriage and provided with means for transversely operating the tool-slide to cause the tool to move toward or from the work, a pattern-wheel or face-plate, G, having a cam-shaped periphery, a lever, N, secured to the reciprocating rock-shaft and bearing upon the pattern-wheel, the feed and return screws H I, the lever L, connected with the rock-shaft M, and having the half-nuts *p q* at its upper end and provided at its lower end with the springs *b' c'*, the guide-plate *w*, and the rolls *d' d'*, with which the springs are alternately brought into contact, all operating substantially in the manner and for the purpose set forth.

5. In a machine for cutting taps with relieved threads, the combination, with the reciprocating rock-shaft M, connected with the tool-carriage, and the lever N, attached to said rock-shaft and carrying the half-nuts *p q*, of the feed and return screws H I, having threads with a carrying-face at right angles to the axial line of the screw and tapering from the bottom toward the top on the opposite side or face, and having a flat top and bottom, whereby the half-nuts *p q* are held in constant engagement with the said feed and return screws and prevented from slipping thereon, substantially as described.

400,883. WATER-MOTOR. FREDERICK W. TUBBS, Jr., Syracuse, N. Y., assignor of two-thirds to James C. Hunter, same place, and John Hunter, Sterling Valley, N. Y. Original application filed Jan. 8, 1887, Serial No. 223,728. Divided and this application filed Sept. 21, 1887. Serial No. 250,272. (No model.)



Claim.—1. In an improved water-motor, the combination of the case provided with a water-inlet in one side thereof, a shaft extending through the case central of the water-inlet, and a hub having in the side facing the inlet an annular port around the shaft and hollow radial arms extending therefrom, said shaft being journaled in boxes projecting from the sides of the case and provided with metal sleeves adjustable axially to maintain water-tight joints between the hub and the case, substantially as described.

2. In a water-motor, the case provided with a water-inlet in the center of one side, a shaft extending through the case central of the water-inlet, and a hub mounted on said shaft and provided with an induction-port at the side facing the inlet in the case, and hollow radial arms extending from said port, in combination with an annular anti-friction bearing between the face of the hub at the induction-port and the case at its water-inlet, and the adjustable collar bearing on the opposite end of the hub, whereby the joint between the hub and case at the water-inlet is kept tight, substantially as described.

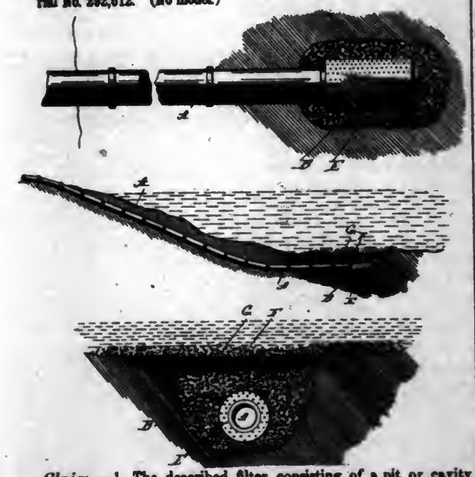
3. In a water-motor, the case having a central water-inlet at one side, the shaft extending therethrough, and the wheel having hollow hub and radial arms extending therefrom with nozzles on their free ends and deflected laterally from the inlet side of in the case, combination with the annular inclined water-shield extending from the opposite side of the case, and the shield depending peripherally from the case and having a V-shaped lip and water-escape openings, substantially as described.

4. In combination with the case having journal-boxes projecting from opposite sides thereof and the driving-shaft extending through said boxes, and the wheel secured to said shaft, a longitudinally-adjustable bushing secured in one of the journal-boxes and bearing against a loose collar on one side of the wheel-hub, a longitudinally-adjustable bushing in the other journal-box, and a collar affixed to the shaft at the inner end of said latter bushing, all constructed and combined to adjust the wheel within the case, substantially as described and shown.

5. The within-described centrifugal governing-valve on the nozzle N, the water-conducting arms A, consisting of the valves *r*, pivoted lever R, and an adjustable spring, S, all substantially as and for the purpose set forth.

6. The water-shield *k*, provided with the V-shaped lip *k'*, depending peripherally from the annular case A of the water-motor, and provided with the water-escape openings k^3, substantially as and for the purpose set forth.

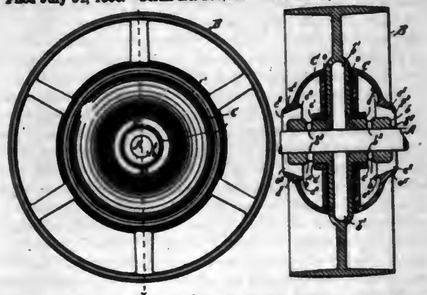
400,884. FILTER. ALFRED WILBUR, Allegheny, assignor of one-half to Benjamin H. Lightfoot, Pittsburg, Pa. Filed Dec. 4, 1888. Serial No. 292,612. (No model.)



Claim.—1. The described filter, consisting of a pit or cavity formed in the river-bed, a line of pipe extending from said pit to a connection upon the shore, as a suitable pump, a strainer upon the end of said pipe located within the pit or cavity, filtering material surrounding said strainer, and a covering of clay across the top of said pit or cavity, substantially as described.

2. The described filter, consisting of a pit or cavity formed in the river-bed, a line of pipe extending from said pit to a connection upon the shore, as a suitable pump, a strainer upon the end of said pipe located within the pit or cavity, filtering material surrounding said strainer, a covering of clay across the top of said pit or cavity, and a covering material above the clay for protecting the same, substantially as described.

400,885. LUBRICATOR FOR LOOSE PULLEYS. CHARLES W. WILDER, Fitchburg, assignor, by direct and mesne assignments, to Thomas C. Entwistle, Lowell, and William H. Rankin, Lawrence, Mass. Filed July 31, 1886. Serial No. 209,611. (No model.)



Claim.—1. An oil-chamber provided at one end with an opening adapted to receive and fit the hub of a loose pulley and at the other end with an opening larger than said hub and adapted to extend beyond the outer end of said hub, as and for the purpose specified.

2. An oil-chamber circular in cross-section and provided at one end with a central opening adapted to receive and fit the hub of a loose pulley and at the other end with another central opening larger than said hub and adapted to extend beyond the end of said hub, as and for the purpose specified.

3. An oil-chamber provided at one end with a central opening adapted to receive and fit the hub of a loose pulley and at the other end with another central opening larger than said hub, the outer end of said last-named opening being adapted to extend beyond the end of said hub, said chamber being provided on the inner surface of its outer end with an annular groove surrounding said outer opening, as and for the purpose specified.

4. The combination of a loose pulley provided with a hub and an oil-chamber provided at one end with an opening to receive and fit said hub, the other end of said chamber extending beyond the end of said hub and having a central opening larger than said hub, said hub being provided with one or more oil-passages leading from the eye of said hub to the outside of the same within said chamber, as and for the purpose specified.

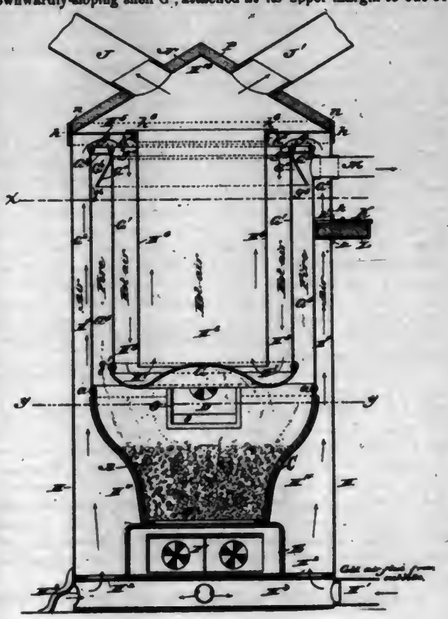
5. The combination of a loose pulley provided with a hub and an oil-chamber provided at one end with an opening to receive and fit said hub, the other end of said chamber extending beyond the end of said hub and having a central opening larger than said hub, said hub being provided with one or more oil-passages leading from the eye of said hub to the outside of the same within said chamber, and provided also with an external annular groove connecting the outer ends of said oil-passages, as and for the purpose specified.

6. The combination of a loose pulley provided with a hub and an oil-chamber provided at one end with an opening to receive and fit said hub, the other end of said chamber extending beyond the end of said hub and having a central opening larger than said hub and flaring inwardly and having an annular groove about said last-named opening, said hub provided with one or more oil-passages leading from the eye of said hub to the outside of the same within said chamber, as and for the purpose specified.

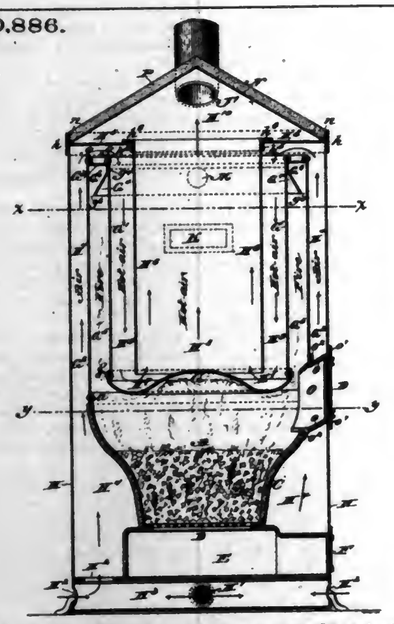
400,886. HOT-AIR FURNACE. ALFRED WILLIAMS, Philadelphia, Pa. Filed Apr. 12, 1888. Serial No. 270,475. (No model.)

Claim.—1. In a heating-furnace provided with fire-pot and contained fire-space and an annular combustion-chamber communicating with said fire-space and rising above the crown-sheet G, the smoke-flue M, leading from the upper part of said annular combustion-chamber at one side thereof, and the shelf G^4, surrounding and contained within the said annular chamber beneath the exit of said smoke-flue, there being a crevice, g^6, extending around the said annular chamber between the free edge of said shelf and the opposite wall and adapted to cause the products of combustion to ascend vertically into the space above said shelf and be thence drawn laterally into said smoke-flue M, substantially as described.

2. In combination with the fire-pot C, fire-space A, crown-sheet G, and annular combustion-chamber G^3, the smoke-flue M, opening from the upper part of said chamber G^3 at one side thereof, and the downwardly-sloping shelf G^4, attached at its upper margin to one of



400,886.



the walls of said annular combustion-chamber beneath said smoke-flue and extending around within the same, there being the crevice g^4 around the free margin of said downwardly-sloped shelf, the whole constructed substantially as and for the purposes described.

3. An air-heating furnace consisting of fire-pot C and its attachments, fire-space A, transverse imperforate crown-sheet G, and annular combustion-chamber G^2, surrounding and extending above the level of said crown-sheet, with smoke-flue M leading from one side of said annular combustion-chamber at the upper part thereof, in combination with an annular air-casing surrounding said furnace, having air-inlets beneath said casing closed above, and extended inwardly over said annular combustion-chamber G^2 and downwardly within the inner walls thereof, forming the annular inward passage H^7 between the lower free margin of H^6 and the upper surface of the crown-sheet G, and the central upward air-passage, H^6, said casing adapted to convey a current of air to be heated upward and inward over the top of said combustion-chamber G^2, thence downward within the same, and thence inward beneath the free margin of wall H^6, and finally upward in a central column of highly-heated air, the products of combustion being carried off from the upper part of said combustion-chamber G^2 at one side thereof, substantially as described.

4. In combination with the furnace A C, imperforate crown-sheet G, attached to the inner wall, G', of annular combustion-chamber G^2, said combustion-chamber surrounding and rising above the level of said crown-sheet, open beneath into fire-space A, closed above by the wall G^3, and having external wall, G^4, attached to fire-pot C, the smoke-flue M, leading from the upper part of said annular combustion-chamber G^2 at one side thereof, and an air-guiding casing consisting of external vertical wall, H, surrounding said furnace and provided with air-inlets H^3 H^3 beneath, closed transverse top H^5, attached to the upper part of wall H and extended inwardly over and within the annular combustion-chamber G^2, inner vertical wall, H^6, attached to and depending from the inner margin of H^5 and terminating beneath in a free margin, leaving annular space H^7 continuously extending around and over said crown-sheet G, and central vertical air-passage, H^6, the whole constructed to operate substantially as and for the purposes herein shown and described.

5. In combination with the air-distributing chamber H^{10} above the level of a heating-furnace, and provided with one or more hot-air exits, J J', the upward central air-passage, H^6, opening centrally into H^{10}, annular downward air-passage H^9, leading at its lower part, H^7, into H^8, transverse passage inward over annular combustion-chamber G^2 and beneath plate H^9 into the upper part of passage H^9, annular upward air-passage H^4, external to furnace A C G^2, and leading from inlets H^3 H^3 beneath to passage into H^9 above, said passages separated from each other by continuous annular walls and leading into each other through continuous annular passages from said inlets H^3 to said distribution-chamber H^{10}, substantially as and for the purposes described.

6. In a furnace for heating buildings by hot air conveyed through passages thereof, the furnace proper having ash-pit, fire-pot, entrance for fuel, and the fire-space A, and over said fire-space, relatively near the same, the transverse crown-sheet G, formed entire and imperforate, and the annular combustion-chamber G^2, connecting the outer margin of said crown-sheet with the wall of said fire-pot, and rising above the level of and surrounding said crown-sheet, and having smoke-flue M leading from the upper part of said annular combustion-chamber G^2, in combination with said furnace, an annular air-casing consisting of outer wall, H, external to said furnace, extending above the level of said annular casing and pierced by said smoke-flue M, having external air-inlet, H^3, beneath, and transverse top H^5, continuing said casing H over and within the vertical inner line of said annular combustion-chamber, and downward inner wall, H^6, continuing said casing H H^5 downward within said annular combustion-chamber G^2, having annular space H^9 between said wall H^6 and said combustion-chamber G^2, and central passage, H^8, over the center of said crown-sheet G, separated from said fire-space A thereby, and the inward passage H^7, connecting the lower part of annular air-space H^7 with lower part of central passage, H^8, said passage H^9 forming a central air-passage upward, together with one or more air-distributing pipes, J, above the level of the said furnace, substantially as described.

7. In combination with a stove or furnace having transverse crown-sheet over and relatively near the fire-space A, said crown-sheet formed entire without opening or perforation therein, and an annular combustion-chamber surrounding said crown-sheet above the level of the same and attached by its inner wall to the periphery thereof and by its outer wall to the upper part of the fire-pot C, closed above at G^3 and having smoke-flue M leading from said annular combustion-chamber G^2, the annular wall H^6, extending downward within the inner walls of said annular combustion-chamber, having vertical downward passage H^9 between said wall H^6 and said chamber G^2, and an air-inlet external to its upper part over said combustion-chamber, said wall H^6 extending downward near to and above said crown-sheet G and leaving annular passage H^7, together with the central upward air-passage, H^8, receiving a current of air through the said passage H^7 from said downward passage H^9, the whole constructed to operate substantially as described.

8. The combination of stove or furnace A C D E, solid imperforate crown-sheet G, annular combustion-chamber G^2, surrounding said crown-sheet and extending above the level of the same, smoke-flue M, leading from said annular combustion-chamber, with the annular wall H^6, extending downward within the inner wall, G', of said combustion-chamber and forming an annular downward passage, H^9, open above externally and terminating beneath in a free margin, leaving annular space H^7 between the upper surface of said crown-sheet G and said free margin, said space H^7 continuous around and within the periphery of said crown-sheet, and internal ascending passage, H^8, connected therewith and extending above the upper surface of said furnace, substantially as described.

9. In combination with a heating-furnace having ash-pit, fire-pot, and a fire-space, A, and above and relatively near said fire-space, a transverse crown-sheet, G, attached by its periphery to the inner wall, G', of the annular combustion-chamber G^2, the outer wall, G^3, supported by said fire-pot, said combustion-chamber closed above by transverse wall G^3, and having smoke-flue M leading therefrom, and beneath said smoke-flue the annular shelf G^4, extended around within said chamber G^2, there being a crevice, g^4, the air-casing surrounding said furnace and consisting of external annular wall, H, having inlets H^3, inturned top H^5, forming transverse passage over and within the inner wall, G', of annular combustion-chamber G^2, downwardly-turned inner wall, H^6, forming downward passage H^9, there being an inward passage, H^7, between the lower margin of H^5 and the upper surface of G, and ascending cylindrical passage H^8 within the wall H^6 and connected with passage H^9 through space H^7, chamber H^{10} above and connected with H^8, cover N, and one or more hot-air-distributing pipes, J J', substantially as and for the purposes herein set forth.

10. In a portable metallic hot-air furnace for heating buildings, the furnace proper, having fire-space A, crown-sheet G, relatively near said fire-space and attached to inner wall of combustion-chamber, annular combustion-chamber G^2, and air-casing consisting of outer wall, H, inturned top H^5, connected therewith, and inner wall, H^6, depending therefrom, having ascending cold-air passage H^4 surrounding the outer wall of said furnace, having inlets H^3 beneath, transverse air-passage inward over the top of annular combustion-chamber G^2, downward air-passage H^9, inward passage H^7, ascending central passage, H^8, chamber H^{10} above the same, distributing-pipes J J', and metallic cover N, together with the supplemental non-conducting cover P, adapted to prevent escape of heat from said chamber H^{10} before distribution thereof, substantially as described.

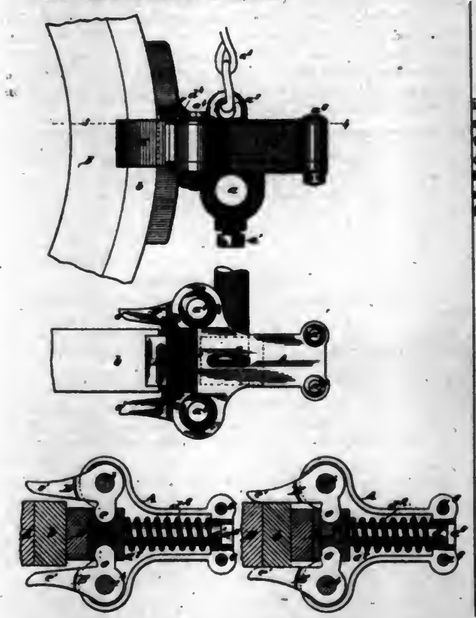
11. In a hot-air furnace, in combination with a fire-space, A, and annular combustion-chamber G^2, and an imperforate crown-sheet, G, within said annular chamber G^2, closing the space within the inner walls, G', thereof and relatively near the fire-space A, the double annular casing H H^5 H^6, there being transverse passages beneath H^5 and H^6, forming continuous annular passages H^4 upward, transverse passage beneath H^5 inward, H^9 downward, H^7 inward, and central cylindrical upward passage, H^8, said passages continuous and adapted to convey currents of air in contact with more and more highly-heated parts of said furnace from fire-pot C to center of crown-sheet G as said currents of air advance along the surfaces of said furnace, together with smoke-flue M, leading from the upper part of said annular combustion-chamber G^2 and receiving the products of combustion at the lowest temperature from contact with the coolest currents of air in their ascent through passage H^4, substantially as described.

12. In a hot-air furnace, an annular combustion-chamber, G^2, supported by its outer wall, G^3, upon the margins of fire-pot C, having annular top G^5, attached hermetically to outer wall, G^3, and to inner wall, G', imperforate crown-sheet G, attached hermetically to lower margin of said inner wall, G', and supported thereby, in combination with a double annular air-casing consisting of vertical outer wall, H, provided with air-inlets H^3 beneath, having annular top H^5, hermetically attached to and supported by said wall H and hermetically attached to and supporting inner annular wall, H^6, said wall H^6 terminating in a free margin near to and above said crown-sheet G, leaving space H^7 and internal upward passage, H^8, the said furnace and said air-casing independent of each other and each self-supporting, substantially as described.

13. In a stove or furnace, the fire-pot C, annular combustion-chamber G^2, solid imperforated crown-sheet G, attached to inner wall of the combustion-chamber, internal annular casing, H^6, downward annular passage H^9 between said casing H^6 and the inner wall of said chamber G^2, open above to receive the currents of air to be heated, there being a continuous annular passage, H^7, connected externally with the lower part of downward air-passage H^9 and internally with the lower part of upward central air-passage, H^8, together with smoke-flue M, leading from said annular combustion-chamber G^2, substantially as and for the purposes set forth.

14. In combination with the fire-pot C, fire-space A, annular combustion-chamber G^2, smoke-flue M, leading therefrom, outer air-casing, H, inwardly-extended transverse top H^5, having joint h^3, and downwardly-extended inner wall, H^6, having joint h^3, there being a space H^7, beneath wall H^6, connecting the downward passage H^9 and upward central passage, H^8, the solid imperforate crown-sheet G, extended over and relatively near the fire-space A, hermetically attached to the lower margin of inner wall, G', of annular combustion-chamber G^2, said crown-sheet having an upward convexity in the center thereof beneath said central passage, H^8, and an annular concavity in its upper surface beneath the free margin of said annular wall H^6, substantially as described.

400,887. VEHICLE-BRAKE. ARTHUR H. WILSON, St. Louis, Mo., assignor of one-half to Gustav F. Vogel, same place. Filed Dec. 17, 1888. Serial No. 293,908. (No model.)

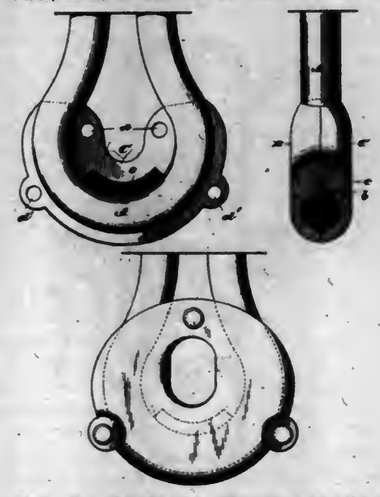


Claim.—1. In a brake, the combination of a pair of pivoted grips, a brake shoe or block, and a lever or beam, all so arranged and combined that the brake lever or beam and the part or parts rigidly attached thereto may be moved forward after the shoe or block is brought into contact with the periphery of the wheel, so as to cause the jaws of the grips to clasp the rim of the wheel, for the purposes set forth.

2. In a brake, the combination of a pair of pivoted grips each provided with a jaw and a lever-arm or analogous part, a brake shoe or block, and a brake lever or beam, all so connected together, arranged, and combined that the brake lever or beam and the parts or part rigidly attached thereto may be moved forward after the shoe or block is brought into contact with the periphery of the wheel, and so move the lever-arms of the grips as to cause the jaws thereof to grip the rim of the wheel, for the purposes set forth.

3. In a brake, the combination of a pair of pivoted grips each having a lever-arm or analogous part and a jaw, a brake-shoe or brake-block, a lever or brake-beam, and a spring, all so arranged and combined that pressure may be transmitted to the shoe or block through said spring, and the brake lever or beam and attached parts or part moved forward, so as to bring pressure upon the lever-arms of said grips and cause the jaws thereof to close upon the rim of the wheel, for the purposes described.

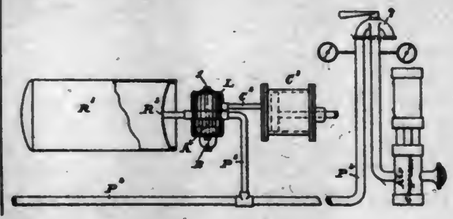
400,888. WEAR-PLATE FOR BUOY-EYES. ALBERT L. WOODWORTH, Norfolk, Va. Filed Nov. 3, 1888. Serial No. 290,314. (No model.)



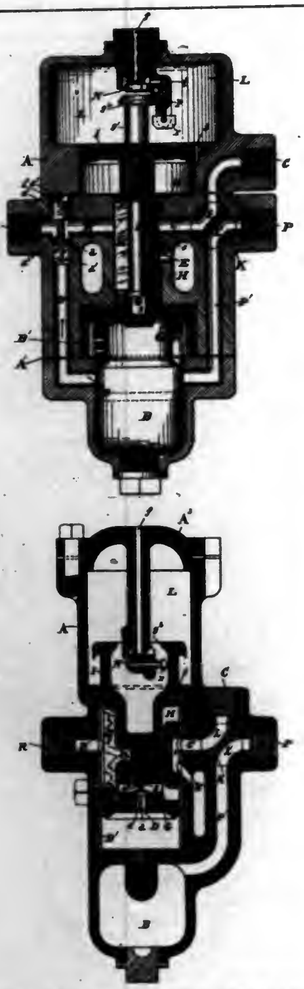
Claim.—In combination with a buoy-eye, castings B and C, having recesses curved to correspond with the contour of the eye, corresponding recess and projection, b and c, immediately above the center of said curved recesses, and perforations d and d' at opposite sides of the curved recesses, through which bolts or rivets pass for securing the wear-plates upon the eye, so as to be immovable upon each other and upon the buoy-eye, substantially as shown, and for the purpose set forth.

REISSUES.

10,993. FLUID-PRESSURE BRAKE. GEORGE A. BOYDEN, Baltimore, Md., assignor of one-half to Charles R. Mann, same place. Filed Jan. 11, 1883. Serial No. 260,436. Original No. 280,286, dated June 26, 1883.



10,993.



Claim.—1. In a fluid-pressure brake, the combination of a single line of train-pipe, an air-reservoir on the car, a brake-cylinder, a valve moved both ways by air-pressure to open and close communication between the said reservoir and brake-cylinder, and a passage from the train-pipe to the same end of the brake-cylinder which communicates with the air-reservoir, which passage is opened and closed by varying the pressure in the train-pipe.

2. In a fluid-pressure brake, the combination of a single line of train-pipe, an air-reservoir on the car, a brake-cylinder, a valve moved both ways by air-pressure to open and close communication between the said reservoir and brake-cylinder, a passage through which air passes from the train-pipe to the brake-cylinder, and a check-valve which allows air to pass one way only in said passage.

3. In a fluid-pressure brake, the combination of an air-compressing apparatus, a single line of train-pipe, a cock to control the compressed air in the train-pipe, an air-reservoir on the car, a brake-cylinder, a valve moved both ways by air-pressure to open and close communication between the said reservoir and brake-cylinder, a passage through which air passes from the train-pipe to the brake-cylinder, and a check-valve which allows air to pass one way only in said passage.

4. In a fluid-pressure brake, the combination of a single line of train-pipe, an air-reservoir on the car, a brake-cylinder, a valve-casing provided with a passage to admit air from the train-pipe to the same end of the brake-cylinder which communicates with the air-reservoir, which passage is opened and closed by varying the pressure in the train-pipe, and a valve moved both ways by air-pressure to open and close communication between the said reservoir and cylinder.

5. In a fluid-pressure brake, the combination of the single line of train-pipe, a brake-cylinder, an air-reservoir on the car, valve mechanism to open and close connection between said cylinder and reservoir, a chamber for air to resist the movement one way of the shifting parts of the valve mechanism, and an exhaust-valve separate from the shifting parts of said valve mechanism which discharges the resisting air.

6. In a fluid-pressure brake, the combination of the single line of train-pipe, an air-reservoir on the car, a brake-cylinder, a valve moved both ways by air-pressure to open and close communication between the said reservoir and brake-cylinder, a chamber for air to resist the movement one way of the shifting parts of the valve mechanism, and a passage which opens one way only to allow fluid-pressure from the train-pipe to enter the brake-cylinder while the brakes are applied, as set forth.

7. In a fluid-pressure brake, the combination of a brake-cylinder, an air-reservoir on the car, valve mechanism to open and close connection between the said cylinder and reservoir, a chamber for air to resist the movement of the shifting parts of the valve mechanism in that direction which the air-pressure in the train-pipe would force them, air-compressing apparatus on the locomotive, and a single line of train-pipe to connect directly between the air-compressing apparatus and the said appliances on the car, whereby the usual main air-reservoir on or near the locomotive is dispensed with, as set forth.

8. In fluid-pressure brakes, the combination of the single line of train-pipe, the brake-applying devices on the car, valve mechanism which opens and closes communication with the brake-applying devices, and an exhaust-valve to discharge air that is in immediate resistance to the shifting parts of said valve mechanism, whereby the movement of the latter is quickened.

PHOTO LITH. NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

COMMISSIONER'S DECISIONS.

EX PARTE TAINTER.

Decided March 25, 1889.

1. DIVISION—PROCESS AND PRODUCT—RE-EXAMINATION OF EX PARTE BLYTHE, (C. D., 1885, p. 82.)

While there is no express provision of the statute limiting or controlling the discretion of the Commissioner in embracing more than one invention in the same Letters Patent, and the courts would not for that reason declare such a patent void, the statute does prohibit the introduction into reissue patents of new matter or other invention than that covered by the original patent. The Supreme Court has held that under this prohibition no new matter could be introduced; that process and apparatus are separate and distinct inventions, and that when a patent for one has issued, although the other was distinctly shown, a reissue for both could not be maintained. (*Burr* v. *Duryee*, 1 Wall., 531; *James* v. *Campbell*, 104 U. S., 356; *Powder Co.* v. *Powder Works*, 98 U. S., 126; *Heald* v. *Rice*, 104 U. S., 737.)

2. The opposite conclusion has been reached in regard to process and product when both were new and the process could produce no other product and the product could be made by no other process. This conclusion is based upon the premise that such process and product contribute one single invention. It must be deemed settled by the highest authority that such processes and products are not separate and distinct but unitary inventions, and that the process and product may be regarded and claimed as parts of such invention, much as different elements in a combination may be separately claimed. This conclusion finds satisfactory support in the nature of the invention itself, as well as in the character of legal property residing in it.

3. This conclusion excludes all other cases of process and product, such as when either process or product is not new, or when the product can be made by some other process or the process will produce some other product.

4. The novelty of the tablet in the present case doubted, but not determined; but the novelty and patentability of the process denied. The question of division in such case, being a preliminary one, must be settled first, and consequently the action of the examiner in requiring division is affirmed for this reason, and not upon the general proposition.

ON petition.

GRAPHOPHONIC TABLETS.

Application of Charles Sumner Tainter filed November 14, 1887, No. 255,082.

Mr. Anthony Pollok for the applicant.

HALL, *Commissioner:*

This application contains the following claims:

1. A tablet for graphophonic records, having a recording-surface consisting, essentially, of ozokerite wax, substantially as described.

2. A tablet for graphophones, comprising a foundation of paper or other suitable material, having a surface coating of concentrated or boiled ozokerite wax, substantially as described.

3. The method of preparing a tablet for use in graphophones by boiling crude ozokerite wax until it loses from ten to thirty per cent. of its weight, and then applying the same to a suitable base or foundation, substantially as described.

Claims 1 and 2 cover a graphophone-tablet as an improved article of manufacture. Claim 3 is for an improvement in the art by which the tablet is made. Applicant claims that both the process or method and the product are new, and that the art cannot be executed without producing the article, and that the article cannot be produced except by the art.

In the first action of the Office the question of division was overlooked by the examiner, and all the claims were rejected for want of invention. In the second letter the oversight was corrected and division required, on the ground that an article and the process of making it could not be included in the same patent. Second action was waived and applicant has appealed from the requirement of division to the Commissioner. It may therefore be said that the requirement of division is based upon the proposition that the art and the product constitute two separate and distinct inventions, which cannot be embraced in one set of Letters Patent, and also upon a declaration that neither of the two alleged inventions is new. The applicant has appealed from the requirement of division to the Commissioner, and relies upon the authority of *ex parte Blythe*, (C. D. 1885, 82.) The examiner, recognizing the fact that in *ex parte Herr* this particular question of division was not passed upon, and also recognizing the authority of *ex parte Blythe*, compares the latter with the authorities upon which it was founded, and gives a construction to it with the following conclusion: That joinder of process and product have been permitted and are allowable in the following cases only: (1.) When both are new, and the product is new not merely as an improvement upon something of the same kind, but absolutely new as being the first of its kind and a new departure in the arts. (2.) To justify such joinder in a single patent the process and product must bear such relation to each other that no other known process will make the particular product and the product can be made by no other process.

Among other cases he quotes from *Merrill* v. *Yeomans*, (5 O. G., 267:)

A patentee who has invented a new process in the arts whereby an article of manufacture is produced, *new in kind* and not before known, may separately claim and patent both the art and the manufacture. He cannot properly combine them in one claim.

Also, *Rubber Company* v. *Goodyear*, (9 Wall., 788:)

Processes and their results *are wholly disconnected and independent facts.* Such is the sound and necessary construction of the statute.

The question of division in almost every conceivable form has come before me, and I have attempted to dispose of it upon certain accepted and recognized principles. (*Ex parte Herr*, C. D., 1887, 105; *ex parte Sartell*, 42 O. G., 295; *ex parte Simonds*, 44 O. G., 445; *ex parte La Borde*, 44 O. G., 700; *ex parte Gillette*, 44 O. G., 819; *ex parte Willcox and Borton*, 45 O. G., 455.)

The case before me presents the question of joinder of process and its product, or method and article of manufacture, in one set of Letters Patent. I might perhaps dispose of it upon the authority of *ex parte Blythe* (C. D., 1885, 82) and *ex parte Young* (*Ib.*, 108) and allow the question to rest there; but it is somewhat singular that while both of these cases have had their controlling influence on this particular question it was involved in neither. In each the question presented was that of division as between process and apparatus, and only as *obiter dicta* can either be accepted as authority upon the present question. As to process and apparatus they are directly opposed to each other, and in their *obiter* reasoning the Young decision goes much further and is much more indefinite than the Blythe decision. The reasoning in the decision in *ex parte Young*, which permits two inventions, process and apparatus, to be included in one patent, would necessarily admit the new product as the third, while the Blythe decision, distinctly recognizing the four statutory divisions of art, also recognizes two specific classes of process and product as constituting unitary inventions which lie partly in two of the separate divisions. In consequence there exists uncertainty as to which decision is the controlling authority and the extent or limitation of its application. In addition, an impression prevails that in some of the later decisions of the present Commissioner, cited above, there are suggestions and opinions which either directly or by analogy overrule or very much shake the ruling in *ex parte Blythe* and *ex parte Young*. I find myself therefore not only justified but required to attempt a re-examination of the question, with the view, if possible, of definitely settling and giving permanence and harmony to the practice in relation to it.

I believe a careful examination of the decisions of the present Commissioner will fail to disclose even a *dictum* which, when properly considered, can be said to bear upon this question, except as subject for mere inference or argument.

Shall all inventions of process and product be joined in one application? If not, shall any such be joined; and, if so, what shall be the limitation? So far as it may be accepted, *ex parte Young* declares that the proper rule will admit of all cases. *Ex parte Blythe* says that is too broad—

> There are perhaps only two cases in which claims to a process (or mode or method) and to a product can properly be included in one patent, and these are: (1) when the product is entirely new, and hence the procedure also; or, (2) where the exercise of the procedure would produce no other result, and where the result (the product) could be produced by no other procedure, (process, mode, method.) In such cases, of course, the invention is unitary, and, being incapable of division, not only may, but must, be included in one patent. If there were two patents upon such an invention, one with a claim to the process and the other with a claim to the product, (hitherto unknown as produced by *any* procedure, or incapable of being made in any way other than by the process, subject of the first patent,) there would be two patents for the same thing.

The last proposition is a very broad one, in view of the fact that separate patents and separate reissue patents have been issued for processes and products, respectively, and have been sustained by the courts. It is not stated that divisional applications may not issue for the process and the product. We have the direct authority of *Plummer* v. *Sargent* (120 U. S., 442) for supporting two patents, for process and product, which constitute one invention, and when the product could be made by no other process. On the other hand, there is the Mosler Safe decision, (127 U. S., 354,) in which it is held that a patent upon an article of manufacture barred a patent upon a contemporaneous application for the mechanical procedure or method by which alone the article could be made. The question as to the validity of either patent was not raised in *Plummer* v. *Sargent* upon the ground that there were two patents for the same invention, or that one patent would bar the other. The Mosler Safe case is a later one, but there is no necessary conflict. In the latter the product or article was such that its process was disclosed in its structure; in the former it was not. It could not be known how the latter product was made except by absolutely ascertaining what process had been employed, although the Tucker bronze could be made by no other process than the Tucker process.

It is not pretended that a new process and an old product, or an old process and a new product, can be prosecuted together. In each case one of the elements or facts lacks novelty and the invention consists of the new process or new product only. Then what class of processes and products constitute unitary inventions? According to *ex parte Blythe* they are limited to *two* classes. It is there distinctly stated:

> Suppose there be invented something in an art, or, as it is ordinarily called, a "process," also the machine for carrying out the process, and also the manufacture or article which is produced in the operation of the process by the machine. There can be no doubt but that the statute calls for three patents for these three things. It makes no difference whether they are invented simultaneously or successively, by one man or by three. Their independence remains the same.

In this supposed case the process, product, and machine were all new, and yet the decision holds that each is a separate distinct invention, found and defined in a distinct statutory class, and must be patented separately. This gives the general rule, viz: All processes and their products which are respectively new and patentable must be applied for and patented separately. Out of this must be excepted only two cases. What are they? I am forced by the language employed to give it a construction: first, when the product is entirely new, and hence the procedure also, *or* where the exercise of the procedure would produce no other result; *and, second*, when (the product being entirely new) the result (product) could be produced by no other procedure, (process, &c.)

The two exceptional cases divide by the word *and*, rather than by the word *or*. Otherwise the first exception embraces cases where the process and product are simply new, which is *a felo de se*, in view of the general rule first stated above. The first excepted class must be construed to mean a case where the product is entirely new, or new in kind, and *hence* its process is new—that is, the process is new *because* the product is new. To illustrate, take the angle-irons in the *Mosler Safe Company* v. *Mosler*: To cut and bend iron in any form or shape was old; but when, as a consequence of the manufacture, the result assumed a specific shape which was novel and useful, then the specific process was new—new because what it had accomplished was new and the process inhered in the product. It was impossible to see the product, understanding its form and construction, without at the same time perceiving, as part of its structure, the process by which it was made, just as you can see a self-luminous body in its own light.

I am not able to discover any distinction between the second excepted case in *ex parte Blythe* and the first, unless the first was intended to cover mechanical methods and the last processes proper. If this be correct, then *Plummer* v. *Sargent* presents an illustration of the last exception. It involved reissued patents for what is known as the "Tucker bronze." The original patent covered claims for the "process of ornamenting iron in imitation of bronze by the application of oil and heat, as described," and also for "the new manufacture, consisting of iron ornamented in imitation of bronze by the application of oil and heat." It was reissued in two patents, for the process and the product, respectively. The question was whether the defendant infringed in consequence of making a very similar article, but one which was easily distinguished, so that the product could not be said to be the same as Tucker bronze, unless it could be shown that it was made by the identical Tucker process. The Court says:

> Although there are two patents, one for a process and the other for a product, *there is in fact but one invention*; and it may be assumed that the new article of manufacture, called Tucker bronze, is a product which results from the use of the process described in the patent, and not one which may be produced in any other way, so that, whatever likeness may appear between the product of the process described in the patent and the article made by the defendants, their identity is not established unless it is shown that they are made by the same process.

Now, what possible distinction with reference to the *oneness* of process and product exists between the two excepted classes and the general classes, according to *ex parte Blythe*? It is difficult to arrange or classify processes and products with regard to such supposed distinctions. There are processes or methods which do not result in any patentable product. Bell's method of transmitting articulate speech is a notable illustration. There are methods which are mere functions of machines which give form or structure to patentable products or articles; but such methods are but functions of machines and not patentable. There are processes which so inhere in the product that a patent on the product leaves nothing in the process that is patentable. (*Mosler Safe case*, 127 U. S., 354.)

The Goodyear process and product furnish illustration of a case when both process and product were new. As far as then, or now, known, the process could result in no other product and the product could be made by no other process. It is true, to assert of such a product that it can be made by no other process is to declare a limitation upon what is possible and to prescribe a limit to the inventive faculties, yet the patent law requires a practical application, and it necessarily follows that it is proper to assert that to be impossible which is at the time beyond the range of human knowledge to accomplish. So it must be said that Goodyear's process would produce no other product and that his product could be produced by no other process. When a new process shall be discovered which will produce that identical product the proposition will cease to be true. It is also true that the Goodyear product, made by his process, may be said to be different from the same product if made by a new and different process, if the product can depend for existence or identity upon the process by which it is made; but the law does not recognize patentable distinctions between products which possess no appreciable difference in qualities and characteristics, and when the only difference consists in a reference to the method or process by which they are produced or made. (*Ex parte Ackerson*, C. D., 1869, 74; *ex parte Truesdale*, C. D., 1870, 123; *ex parte Sellers*, C. D., 1872, 197; *ex parte Mayall*, C. D., 1873, 134: *ex parte Lupton*, C. D., 1874, 40; *ex parte Cobb*, C. D., 1874, 60; *ex parte Arkell*, C. D., 1877, 73; *Draper* v. *Hudson*, 1 Holmes, 208; *Cochrane* v. *Badische Anilin Co.*, 27 O. G., 813; 111 U. S., 293.)

It does not follow that a claim to a product is void because there may be some reference therein to its process, or that a patentee may not limit his claim to the product made by a specific process. It is required that the product shall be described and claimed by definite qualities or characteristics, other than by any reference to its process, for, as above stated, when the product possesses no such qualities and is incapable of distinction except by reference to its process, it is not patentable and the invention exists in the process alone. (*Ex parte Burrage*, Mason, Commissioner, MS. Dec., 1853, Vol. I, p. 93.)

> A patent may sometimes be rightly granted for a product, but never where the only means for describing that product is by a reference to the process by which it is obtained. In such cases the patent should be granted only for the process.

There are also processes which produce more than one product, when possibly neither could be produced by any other process. I had before me recently a case involving a process of treatment of crude oil, which produced two distinct products—a refined deodorized oil and a deposit of useful pigment for paint. It is not impossible that another distinct process could produce the refined oil and a third distinct process the pigment; yet it must be conceded that if the first process could alone produce the two products and neither of the latter could be produced by any other process, the process and the two products would constitute one invention, under the statement of the court in *Plummer* v. *Sargent*.

There are also other procedures, especially mechanical methods and their products or articles, which may be both entirely new, and yet the product or article be capable of production by various other methods, which may suggest themselves at once upon inspection of the product of article. Upon what, if any, line shall a definite distinction be drawn between these various classes or kinds of processes and their products? When shall a process and its product be said to constitute one invention? Or must all processes and all products be held to be separate inventions and be embraced in separate patents? Undoubtedly the question is one of greatest difficulty, unless it be determined arbitrarily, without reference to principles or authorities.

A process and its product are different things or facts. One is a producer, the other the thing produced. One produces the other, executes itself, and as an active agent or instrumentality ceases to exist at the instant the umbilicus of relation is severed and the product is delivered complete from the forces which give it existence. The former is called an art, the latter a machine, manufacture, or composition. Strong reasons can be urged to establish the proposition that process and product are, in the very nature of things, distinct inventions, and therefore not to be covered by the same patent. In the classification of

the arts in the Office, to which great weight is attached in *ex parte Herr* as being an important feature of the American system, the art or process and its product are generally found in different classes of invention and divisions of the Office. The same danger of mistakes on the part of the Office in overlooking references when examining such applications necessarily exists.

However serious and important these considerations, there are others which seem more controlling and conclusive. It is no longer an open question that under our system it was never intended that two or more distinct and separate inventions should be claimed and receive examination in the same application. However much difficulty there might be in ascertaining and determining whether the invention be a single invention, when it has been determined it must be applied for alone, and cannot be joined with other separate and distinct inventions. The only instance in which there has ever been recognized the slightest departure from this practice is in the matter of reissues, where by the statute of July 3, 1832, section 13, it was provided that "improvements" could be subsequently incorporated in a patent by certificate. By the act of March 3, 1837, section 5, it was provided that the improvements could be covered—be separate reissue patents—when a reissue was ordered. This continued to be the law until July 8, 1870, section 3, when this provision was repealed and the introduction of any new matter in the reissue patents was prohibited.

It has been definitely settled by the Supreme Court that under this prohibition no new matter can be introduced. However closely allied or dependent upon each other the process and the apparatus by which it is executed may be, that Court has held them to be separate and distinct inventions, and that when a patent has issued for one, although the other was distinctly shown, a reissue for both could not be sustained. (*Burr* v. *Duryee*, 1 Wall., 531; *James* v. *Campbell*, 104 U. S., 356; *Powder Co.* v. *Powder Works*, 98 U. S., 126; *Heald* v. *Rice*, 104 U. S., 737.)

If, now, process and product are also separate and distinct inventions, it must follow that when a patent has issued for a process, but which also showed the product, a reissue which covered both process and product could not be maintained as to the latter. This is so, not only because it is true that but one single invention can properly be embraced in an original patent, but especially because a reissue must be limited to corrections relative to the single identical invention originally claimed, and cannot embrace claims for another and independent invention. It is largely in the discretion of the Commissioner of Patents to determine whether more than one invention may be embraced in the original Letters Patent; but to introduce a new or second invention in a reissue patent is expressly forbidden by statute.

What are the decisions of the courts in this respect as to process or product? The adjudications upon the Goodyear patents are instructive and bear directly upon this question. The original patent was issued in 1844 and contained a claim for the process. In *Goodyear* v. *The Central R. R. of N. J.*, (1 Fisher, 626,) decided in 1853, it became necessary, in order to sustain the action, to hold that the claim for the process covered the product also, and a sale or use of the composition, except when purchased from licensees under the patent, infringed the process claim. Judge Grier held:

> The product and the process constitute one discovery, the monopoly of which is secured to the inventor or discoverer as a consideration or compensation for making it known to the public. * * *
>
> Now, what is this india-rubber, cured "substantially as herein described?"
>
> It is clearly not merely an improved method or process of producing an old and well-known composition or material, but it is a new product, fabric, manufacture, or composition of matter, having qualities possessed by no other known material. This is what is described and claimed in the patent—a new product as well as a new process.
>
> The product and process being both new and proper subjects of a patent, the patentee has a right to prohibit the sale or use of the composition, unless when purchased from persons licensed by him to use the process and vend the product. If precedent be needed for this doctrine, the case of *Hancock* v. *Sommerville*, in the English court of common pleas, tried in June, 1851, will be found directly in point.

This decision, which probably grew out of a judicial anxiety to save a patent for a "great and useful discovery," will probably be questioned so far as it held that a claim for a process will cover the product. It was doubted in *Goodyear* v. *Wait*, (3 Fisher, 242,) and it shows a dependence upon English precedents, which are not always applicable to cases arising under the American patent statutes.

It appears that the question was so doubtful that the patentee was unwilling to trust the patent, and in 1849 it was reissued "for a new and useful improvement in the processes for the manufacture of india-rubber." It was extended in 1858, and in 1860 was surrendered and reissued in two patents, one for the process and the other for the product.

In *Goodyear* v. *Wait*, *supra*, it was held that in a patent for process and product, both new, a claim for one does not exclude a claim for the other:

> Our conclusion of this point is that the original patent was properly surrendered in order to amend the claim, and that the reissue of two patents is unobjectionable.

Subsequently the suit of *Rubber Co.* v. *Goodyear* was instituted in the United States Circuit Court for Rhode Island, involving the validity of these reissued patents. It was contended by defendant that both reissue patents were invalid for two reasons: (1) because they were broader than the claims of the surrendered patent; (2) because one was for a process and the other for the product of that process. The court below held the first objection fatal to the process claim, but sustained the product claim. No appeal was taken from the decision holding the process claim invalid. In the Supreme Court the second objection was considered. Evidently the question was whether separate reissue patents could be sustained for process and product. The decision and its language must be construed with reference to the case involved. The Court said by way of introduction:

> But liberality rather than strictness should prevail where the fate of the patent is involved, and the question to be decided is whether the inventor shall hold or lose the fruits of his genius and his labors. * * * [*Corning* v. *Burden*, 15 Howard, 269; *Battin* v. *Taggert*, 17 Id., 74.]
>
> Patentable subjects, as defined by the patent law [act of 1836, sec. 6,] are "any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement on any art, machine, manufacture, or composition of matter." A machine may be new, and the product or manufacture proceeding from it may be old. In that case the former would be patentable and the latter not. The machine may be substantially old and the product new. In that event the latter, and not the former, would be patentable. Both may be new or both may be old. In the former case both would be patentable; in the latter, neither. The same remarks apply to processes and their results. Patentability may exist as to either, neither, or both, according to the fact of novelty, or the opposite. The patentability, or the issuing of a patent as to one, in no wise affects the rights of the inventor or discoverer in respect to the other. They are wholly disconnected and independent facts. Such is the sound and necessary construction of the statute.

It is impossible to make a proper application of this language of the Court to the case before it, except upon the hypothesis that the Court held that the process and product were one invention, but different and distinct parts of that invention, and that separate reissue patents for these respective parts (the statute authorized reissues for parts) of the invention were valid. It cannot be supposed that the Court would recognize as valid a reissue for a separate and distinct invention from that covered by the original patent, and yet it will be observed that the claim for the process was the only claim in the original patent. The reissue patents covered, respectively, the process and the product; the reissue process patent was declared invalid, and the reissue patent for the product alone sustained. So that if the process and product are distinct and separate inventions, the case presents an instance in which, after the original invention covered by the original patent had been eliminated, the reissue patent for a separate and distinct invention was upheld.

It is not necessary to a full and proper application of the above language of the Court that they should be understood as holding that the process and product were distinct and different inventions. "They are wholly disconnected and independent *facts*," and such an invention is so far capable of division upon the line dividing those facts that separate reissue patents will be held valid, when—

> Liberality rather than strictness should prevail where the fate of the patent is involved, and the question to be decided is whether the inventor shall hold or lose the fruits of his genius and his labors.

Thus it appears in the history of the adjudications upon the Goodyear patent that in the first adjudication the court ("considerably embarrassed in making it, and from which he would have been relieved if there had been a claim for the product or substance," *Goodyear* v. *Wait*) held that a claim for a process covered the product, in order to save the patent, and in the last and final adjudication the Supreme Court, in order to save the invention, held that a reissue patent for the product was valid, though the original patent was for the process alone, the reissue for which was invalid and could not be enforced. See *Goodyear* v. *Providence Rubber Co.*, (2 Fisher, 499,) where it was held that under section 5 of act of March 3, 1837, separate reissue patents for separate and distinct parts of the things patented were authorized. (*Penn Salt Co.* v. *Gugenheim*, 3 Fisher, 423.) Three reissue patents for product and process were issued upon an original patent for the product alone.

> The amended patent of 11th of April, 1867, (the reissue,) in which *ex major cautela* the improvement had been unnecessarily split into distinct patents, may be treated as one patent with three distinct claims.

Jones v. *Sewall*, (6 Fisher, 343.) Four original patents were issued covering the process of canning corn and the product. Speaking of the second patent, CLIFFORD, *J.*, says:

> Necessarily the details of the process are somewhat fully given in the specification describing the patented product; but the claim of the first patent does not extend to the process, which shows that the Patent Office committed no error in granting the second patent, as it does not include anything patented in the first patent. (*Goodyear* v. *Providence Rubber Co.*, 2 Cliff., 371; *Ib.*, 9 Wall., 788; *Seymour* v. *Osborne*, 11 Wall., 559.)

Both parties agree that it is competent for the Commissioner to grant a patent for the product and one for the process, and it is obvious that the patent under consideration is for the process, which is not included in the prior patent.

In *Seymour* v. *Osborne*, (11 Wall., 544,) cited above, the Court says:

> Reissued Letters Patent must, by the express words of the section authorizing the same, *be for the same invention*, and consequently where it appears on a comparison of the two instruments, as matter of law, that the reissued patent is not for the same invention as that embraced and secured in the original patent, the reissued patent is invalid, as that state of facts shows that the Commissioner, in granting the new patent, exceeded his jurisdiction.

In *Merrill* v. *Yeomans* (94 U. S., 568) MILLER, *J.*, says:

> If the patentee is also entitled to a patent for the product of this distillation and has failed, as we think he has, to obtain it, the law affords him a remedy, by a surrender and reissue.

This conclusion can only be true upon the premise that the process and the product constitute one invention.

In *Anilin et al.* v. *Higgin et al.* (14 O. G., 414; C. D., 1878, 335) the suit was upon reissued patent with claims for both process and product, issued upon an original patent with a claim for the process alone. The defense was that the reissued patent was unauthorized. WHEELER, *J.*

> Nothing is seen to show that the original (patent) was not valid for what it claimed. There was nothing defective or insufficient about the specification of the invention. If the statute, by specification, meant that and no more, then on the patents themselves it would appear that there was no ground for the reissue; but the word seems to be used in a broader sense and to be intended to cover specification of the claim as well. In that sense there was a defective specification of the invention as patented, and the patent was inoperative and invalid *for that part* of the invention not covered by the claim. *The invention specified in each was precisely the same.* The original did not cover the whole of it, and so was inoperative as to part. The reissues do cover the whole. They seem to fall exactly within the intention of the statute in this particular. (*Seymour* v. *Osborne*, 11 Wall., 516.)

Cochrane v. *Badische Anilin Co.*, (111 U. S., 293:)

> We have not deemed it necessary to consider more particularly the question whether the reissue patent (product, original patent for process alone) is or is not for a different invention. It certainly is, *unless* the product claimed in the reissue is precisely that product, and no other, which the process described in the original patent produces.

The case of *Kelleher* v. *Darling* (14 O. G., 673) seems at variance with the foregoing authorities. The original patent was for a shoe made of several parts and by a peculiar seam. It contained no description of the method by which it was made whatever, but was reissued with a description of the process and claims covering both the shoe as an article or product and also claim 4 for a method or process. CLIFFORD, *J.*, held that the new description and claim 4 were new matter, citing *Seymour* v. *Osborne*, and added:

> Beyond doubt the invention described in the original patent, though composed of the several parts therein described, is, in legal contemplation, a new and useful manufacture, and it is equally clear that the process of making an article of manufacture is a different invention from that of the product. Both may be included in the same patent, but the required description is as essential and indispensable in the one case as in the other.

The decision was undoubtedly correct; but the suggestion that the process and product were different inventions was unnecessary, and is in conflict with the cases cited. The article or product and mechanical method presented a case like the Mosler Safe case, where after patent for the product there is no patentable process left. See the cases of *McKay* v. *Dibert* (C. D., 1881, 238) and *McKay* v. *Jackman*, (C. D., 1882, 303,) where finally the claims for the process and the article were held invalid, the invention being covered by the patent for the machine.

Powder Co. v. *Powder Works*, (98 U. S., 126:)

> In another case arising on the original patent of Goodyear, reported in 2 Wall., Jr., 356, Mr. Justice Grier used this expression:

"The process and the product constitute one discovery." The product in Goodyear's invention was the direct result of the process. They were parts of one invention, and, except in imagination, could no more be separated from each other than the two sides of a sheet of paper, or than a shadow from the body that produces it.

This expression, not necessary to the case, and probably *obiter*, yet shows how clearly and definitely was lodged in the mind of the eminent judge who wrote the opinion the judicial conception of process and product as one invention.

In *James* v. *Campbell* (104 U. S., 356) the relations between process and apparatus and process and product were distinctly considered and determined. The original patent contained claims for the letter-stamping apparatus. In the reissued patent there were introduced some new and additional features relating to the stamping apparatus, and also a claim for the process of stamping, carried out by the apparatus. After holding that the reissue patent was invalid for the introduction of new parts to the apparatus, it was said:

The third addition in the reissued patent to the invention described in the original is that of the *process* of stamping letters with a post-mark and canceling the postage-stamp at one and the same blow or operation of the instrument, in the manner and by the means described and set forth. Leaving out of view the history of the art prior to the invention claimed by the patentee, what possible pretense can there be for contending that the general process was part of the invention which formed the subject of the original patent? Suppose it be true that Norton was the first inventor of this process, was that process the invention which he sought to secure in the original patent? A patent for a process and a patent for an implement or a machine are very different things. (*Powder Company* v. *Powder Works*, 98 U. S., 126.) Where a new process produces a new substance the invention of the process is the same as the invention of the substance, and a patent for the one may be reissued so as to include both, as was done in the case of Goodyear's vulcanized rubber patent; but a process and a machine for applying the process are not necessarily one and the same invention. They are generally distinct and different. [There may be many machines for applying the same process.] The process or act of making a post-mark and canceling a postage-stamp by a single blow or operation, as a subject of invention, is a totally different thing in the patent law from a stamp constructed for performing that process. The claim of the process in the present case, however, is not so broad as this. It is for the process or act of stamping letters with a post-mark and canceling the postage-stamp at one and the same blow or operation of the instrument, *in the manner and by the means described and set forth*. Perhaps this claim amounts to no more than a claim to the exclusive use of the patented instrument or device. If it is anything more, it is for a different invention from that described in the original patent. If it is not for anything more, the question is brought back to the instrument or device itself, which forms the subject of the patent, and which has been already considered.

Tucker v. *Burditt* (4 Bann. & Ard., 569) simply holds that where separate patents for process and product are issued the Commissioner did not so far exceed his jurisdiction as to render the patents invalid. The process and product were similar to those involved in *Plummer* v. *Sargent:*

In respect to the issue of two patents a large discretion is left to the Commissioner; the matter is specially made discretionary with him in the existing law, (Rev. Stats., sec. 4916,) and such was the construction of the earlier statute, (*Bennett* v. *Fowler*, 8 Wall., 445,) and especially in the case of a new article made by a new process the reissue of separate patents has been pronounced valid. (*Goodyear* v. *Providence Rubber Co.*, 2 Cliff., 351; 9 Wall., 788.)

When properly understood, the case of *McKay* v. *Dibert* does not conflict with the general proposition. It involved original patents for a process of making a shoe and the shoe as an article. The inventor originally filed an application containing claims for both, and the Commissioner of Patents required him to divide and file separate applications for the process and the product, which was done, and the separate patents issued, but on separate dates. The machine patent expired earlier than the other. During the life of the latter patent and after the expiration of the former suit was brought against the defendants for infringing the process and product patents by using the machine, which, it was claimed, had become public property. The Court said:

As long as separate patents for a machine and the process and the product are allowable they represent distinct inventions, (*Kelcher* v. *Darling*, 14 O. G., 673,) and each one may live without interference or molestation its whole life without regard to the death of the others.

The decision related to the distinction between a machine or apparatus as one invention and the process and product as unitedly or separately constituting the other; but, as said before, as between the process and the product the case more properly falls within the Mosler Safe decisions. (127 U. S., 354.)

The cases of *United Nickel Co.* v. *American Nickel Plating Works* (4 Bann. & Ard., 74) and *United Nickel Co.* v. *California Electrical Works* (25 Fed. Rep., 475) do not, as sometimes supposed, militate against the idea that a process and product may constitute one invention. They simply settle the fact that when a patentee has a patent for a solution (composition) of nickel, which is necessarily employed to carry out a process for nickel-plating for which he has another patent, he does not confer upon a licensee or assignee of his process patent the right to use the solution or composition secured by the former patent. In other words, the patentee or assignee of a process must secure the composition and material, as well as the means of executing the process, from those persons who control, own, or sell them, and if they are secured by other patents the consent of such other patentees must be obtained. These cases may possibly be applicable as between the respective assignees of process and product claims in a patent for both.

With this review of the authorities before me I cannot escape the conclusion that it is settled by the highest authority that a new process which produces a distinct and new product, the product being incapable of production by any other process and the process incapable of producing any other product, and such product constitute a single invention. This conclusion finds satisfactory support in the nature of the invention itself, as well as in the character of the legal property residing in it.

(1.) The procedure, whether mechanical (that is, by the physical force of man's hands or his tools or machinery) or natural (that is, by natural forces, chemical, electrical, &c.,) must have material to operate upon. No process or method creates anything originally. It finds matter or material in one form, shape, or combination of elemental parts, and resolves it into some other form, shape, or arrangement of elements, the latter being called the article or product. When an invention has been made by which these forces can be applied to matter in one form in such a manner that it is resolved into some other new and useful form, we have presented an invention that has a beginning, a progressive intermediate stage or status, and a terminal conclusion. At the outset the material to be changed or metamorphosed goes into the permeating embrace and submits to the all-pervading influence of the forces which appertain to it. From this beginning, along the entire path or course of the process, this condition continues. The process, or presence and effect of the forces, can no more be separated or disassociated from the matter operated on than heat can be disassociated from the iron or other body that retains it, or than the light of a self-luminous body can be separated from the body that emits it. During the progression, from beginning to conclusion, this oneness of matter and operative force, spirit and body, continues; but a point is reached when the transformation is finished and completed; the forces cease to operate, because they have accomplished their totality, and there is no more material to be operated upon by them. It is at this precise instant that the invention is also completed. The product—the changed material—remains, and its existence may continue for years; but it came into being and existed, perfectly complete, as the last expiring influence of the forces operated upon it. Its existence began at the inception of the process and continued during the travail of the entire journey to the end. It involved force and matter, neither of which could exist in the desired state and under the required conditions without the other. The conception which thus unites and employs the two is necessarily one single invention, though, in mental conception, the material and the force may be separately thought of, described, and claimed. In operation they are one and indivisible.

(2.) So, also, when the nature of the property which exists in inventions is considered with reference to legal definitions and relations, the same conclusion will be reached.

It is well known that the property in a thing is something else than the thing itself. It is undoubtedly true that the thing patented is the marketable and vendible thing, whether it be product or process, or both. The right or property secured by a patent is the right to make, sell, and use the thing patented. In the case of a mere process—such as Bell's method of transmitting articulate speech—the right is to exercise, (make,) sell, and use the process. The product of any producing process is that which possesses the principal utility. The patent property possesses value because the patented thing possesses utility and will be demanded and used by the people. The utility of the process is secondary, and depends upon that of the product. The process is valuable, and will find purchasers and users commercially, because it produces a product which finds users and purchasers; but where the process is incapable of producing any other product and the product cannot be made by any other process, what property is vested by the respective separate patents for the process and the product? Or, if a single patent issues for both and the patentee assigns the claim for the process to A and that for the product to B, what is the property conveyed to each? A is authorized to exercise, (make,) use, and vend the process; B to make, use, and vend the product. The rights conveyed are incapable of enjoyment in a legal sense. A must in some manner secure a license or consent from B to carry out the process and make B's product, and B, in order to make his own product, must obtain A's license or consent to use the latter's process. It is said, however, that this is precisely like the case of a patentee of a new combination that contains an element for which another patentee has an earlier patent. The combination cannot be used without the consent of the patentee of the element, and the element cannot be used in its relation in the combination without the consent of the patentee for the combination. (*United Nickel Co.* v. *California Electrical Works*, 25 Fed. Rep., 475.) The same thing may be said of the relations between an apparatus and the process it was made to execute. Separate patents issue for each. The owner of the machine will be unable to use it unless he can get the consent or license of the owner of the process. These results arise from the statute, the purpose of which is to give to the patentee a monopoly which prohibits another from making, using, or vending the subject of the patent, whether the use required be that of ordinary use and consumption or employment as a part or element in some new invention; but as between process and apparatus it cannot be said that the process can be executed by no other apparatus. It is believed no instance of a patentable process can be cited of which it can be said that it can be executed only by the one apparatus first discovered. We know changes and improvements and entirely new apparatus are readily developed, so that the patentee or assignee of an apparatus takes it with the knowledge that possibly the next week a new apparatus may be made, and that the process cannot be used by him or any other inventor of the apparatus except by consent of the owner of the process. So the owner of the process, having parted with the apparatus, is not wholly remediless. He may invent or buy a new apparatus for his process. The relation between process and product, however, is different. The relation is that the process can make no other product and the product can be made by no other process. Separate patents divide the invention into such two parts that each absolutely embargoes the other. Not so in the case of process and apparatus, for while the owner of the process may not use the apparatus without its owner's consent, he *is* at liberty to invent or purchase another new or different apparatus and use that; but as between process and product of the character involved this cannot be done. Each is absolutely dependent upon the other, and if neither will give consent each is barred and the public is deprived of the use and benefit of the invention. If the patent or claim for the process should belong to A and that for the product to B, before A can enjoy his own property he must obtain an interest in B's property, and *vice versa*. If B grants to A the right to make and vend his product, he only secures that which, by the terms of his own patent, is his own property by right, and *vice versa*. In other words, such a division presents a case where there appears to be, but is not, an actual property vested by either patent.

It is legally impossible to grant an absolute right in a process alone when that process can make but one product, and so of the product. If separate patents issue and the process and product come to belong to different persons, an infringement of one would be an infringement of both. Must separate suits be brought, or may both owners unite as complainants? It cannot be denied that these relations and the issue of different patents will tend to create confusion and uncertainty of rights, and will not only complicate business affairs, but may be the means of misleading or defrauding the public.

While it is true that the question determining what inventions may or may not be embraced in a single application is one largely of discretion in the Commis-

sioner, with which the courts do not interfere, it should always be exercised to guard and protect the public as far as possible, while granting to the applicant the full measure of his rights. As frequently stated, the courts would, no doubt, as they have always done, sustain and enforce separate patents for process and product. It may also be said to be discretionary with the Commissioner to so issue them, and that the convenience and certainty of action in the Office, aided by its classification, would be increased, and thereby greater benefits extended to the applicants and patentees. But if it be true that the particular process and product constitute one invention, it is impossible lawfully to deny an applicant's right to embrace them both in the same application and secure them in a single set of Letters Patent. If he elects to prosecute them separately, he should be permitted to do so; but where he joins them he cannot be required to divide them.

The conclusion reached is that a process and its product of the character and relation stated constitute a single entire invention. This of course excludes all other cases of process and product—such as where either process or product is not new, or where the product can be made by some other process, or the process will make some other product.

In the present case I have grave doubts whether there is any patentable novelty in the tablet as claimed in the first and second claims. Similar tablets have heretofore been made, the only difference being that in this ozokerite is employed; but there is no discovery or invention shown in selecting and substituting one substance for another under these circumstances; but without absolutely determining the question of novelty with reference to the article claimed, I concur with the examiner in holding that the method claim, 3, is without novelty. Indeed, it seems to possess no character of a method. The article is a tablet of paper or other material with ozokerite spread over and upon it. The method consists in taking such a paper tablet and spreading the ozokerite upon it. It is true claim 2 speaks of boiling the ozokerite as one of the steps; but clearly the application of boiling water relates solely to the treatment of the ozokerite, and not the tablet.

The question of division is a preliminary one, and must be settled before final action on the merits. When the question depends upon novelty, the latter question must be settled first, which is an exception to the general and wholesome practice. Whenever division is required in such cases, the examiner should advise the applicant generally as to the state of the art and such other matters as will enable him in making division to make an advised election which of the inventions he will prosecute, and not induce him to file a new application which the Office believes presents no patentable matter.

The action of the examiner requiring division is affirmed.

DECISIONS OF THE U. S. COURTS.

U. S. Circuit Court—Eastern Judicial District of Missouri, Eastern Division.

TAFT *v.* STEPHENS LITHOGRAPHING AND ENGRAVING COMPANY.

Decided March 20, 1889.

JURISDICTION.

The circuit courts have jurisdiction of suits brought to recover penalties imposed by the copyright-laws of the United States.

ON PLEA to jurisdiction.

Mr. W. E. Fisse for the plaintiff.

Mr. Paul Bakewell for the defendant.

THAYER, *D. J.:*

This is a *qui tam* action brought to recover certain penalties imposed by section 4963 Revised Statutes of the United States for violations of the law relating to copyright.

Defendant's attorney contends that the jurisdiction to recover penalties of such character is vested in the United States district court, and not in the circuit court. He has accordingly filed a plea to the jurisdiction. By section 9 of the judiciary act of 1789 United States district courts were given jurisdiction of—

all suits for penalties and forfeitures incurred under the laws of the United States.

This clause has ever since continued in force and reappears in the Revised Statutes of the United States as subdivision 3 of section 563.

Suits to recover penalties imposed by the laws of the United States must accordingly be brought in the United States district court unless jurisdiction to recover a particular penalty is vested in the circuit court by the statute imposing the penalty. It is claimed by plaintiff's attorney that jurisdiction of suits to recover penalties imposed by section 4963 is vested in the United States circuit court by the ninth clause of section 629 Revised Statutes of the United States, which gives that court jurisdiction of—

all suits at law or in equity arising under the patent and copyright laws of the United States.

If the claim was based solely on the phraseology of the ninth clause of section 629, we should be disposed to overrule it and to hold that the suits therein referred to and over which the circuit court is given jurisdiction are ordinary civil suits at law and in equity to recover damages for, or to restrain infringements of, patents and copyrights, and that the clause does not confer jurisdiction upon this court over suits of a penal character—that is, of suits brought to recover penalties imposed by the patent and copyright laws. It must be borne in mind, however, that the ninth clause of section 629 is based on sections 55 and 106 of "An act to consolidate and amend the statutes relating to patents and copyrights," approved July 8, 1870. (U. S. Statutes at Large, vol. 16, pp. 206 and 215.) We infer that the revisers, in drafting the ninth clause of section 629, did not intend to disturb the jurisdiction then vested in the United States circuit court by the two sections of the act last alluded to. By reference to the act of July 8, 1870, it will be seen that section 106 provides that—

all actions, suits, controversies, and cases arising under the copyright laws of the United States shall be originally cognizable as well in equity as at law, whether civil or penal in their nature, by the circuit courts of the United States or any district court having the jurisdiction of a circuit court.

Prior to that enactment Congress had expressly authorized certain other penalties imposed by the copyright laws to be sued for in the circuit as well as in the district courts of the United States. (*Vide* vol. 14 U. S. Stat. at Large, 395, sec. 1 act of February 18, 1867.)

In view of section 106 of the act of July 8, 1870, we think it clear that Congress intended thereby to give the United States circuit courts jurisdiction of suits brought to recover penalties imposed by the copyright laws of the United States, and that it retains such jurisdiction since the revision of the laws of the United States by virtue of clause 9 of section 629, (*supra.*)

The reference made in section 106 of the act of July 8, 1870, to suits of a penal as well as of a civil nature makes it certain that *qui tam* actions arising under the copyright laws were within the contemplation of Congress when that section was enacted, and that jurisdiction of such suits was intended to be conferred on the circuit court.

The plea to the jurisdiction is accordingly overruled.

THE
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OF THE
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[BY AUTHORITY OF CONGRESS.]

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Notice to the Patrons of the Patent Office.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., March 23, 1889.

Attention is called to Rule 9 of the Rules of Practice, requiring that a separate letter should accompany each subject of inquiry or application, and that assignments, final fees, and orders for copies or abstracts must be sent in separate letters. A strict observance of the provisions of this rule would prevent confusion and delay, and would result in expediting the business, and it is urged that proper attention should be given to this matter.

BENTON J. HALL,
Commissioner.

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; but notice is hereby given such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Indexes to Foreign Patents.

The following indexes to foreign patents have been translated, compiled, and published under the authority of the Commissioner of Patents, and may be obtained as a Patent Office publication at the prices given below:

INDEX TO FRENCH PATENTS, 1791 to 1876, inclusive, (subject-matter, one volume, 935 pages, bound in cloth $10 00

INDEX TO ITALIAN PATENTS, 1848 to May 1, 1882, (subject-matter,) one volume, 130 pages—

Bound half-turkey	2 50
Bound in cloth	1 25
Paper covers	1 00

Issue of April 9, 1889.

Patents	436	No. 400,889 to No. 401,324, inclusive.
Designs	42	No. 19,005 to No. 19,046, inclusive.
Trade-Marks	25	No. 16,463 to No. 16,487, inclusive.
Labels	4	No. 5,864 to No. 5,867, inclusive.
Reissues	None.	
Total issue	507	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama			Nebraska	1	
Arizona Territory	2		Nevada		
Arkansas			New Hampshire	1	1
California	13	1	New Jersey	36	2
Colorado	5		New Mexico Terri'y		
Connecticut	17	1	New York	98	6
Dakota Territory	2		North Carolina		
Delaware			Ohio	32	2
District of Columbia	1		Oregon		
Florida	1		Pennsylvania	51	3
Georgia	3		Rhode Island	6	
Illinois	34	1	South Carolina	1	
Indian Territory			Tennessee	1	
Indiana	14	1	Texas	8	1
Iowa	9		Utah Territory		
Kansas	6		Vermont	2	
Kentucky	5		Virginia	3	
Louisiana	1		Washington Terri'y		
Maine	1		West Virginia		
Maryland	1		Wisconsin	6	
Massachusetts	48	2	Wyoming Terri'y		
Michigan	8	1	U. S. Army		
Minnesota	8		U. S. Navy		
Mississippi	3				
Missouri	8		Total to citizens of the United States	438	22
Montana Territory	2				

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Australia	1		Germany	8	1
Austria-Hungary	2		India		
Barbadoes			Hawaii	2	
Belgium			Mexico	1	
Brazil			Netherlands		
Canada	2		Russia	1	
Canary Islands			Scotland		
Colombia, U. S. of			Sweden		
Cuba			Switzerland	1	
Denmark			Victoria		
Ecuador					
England	19	4	Total to citizens of foreign countries	40	7
France	3	2			

DESIGNS.

19,005.—BOX-STOVE.—*Henry Clay Bascom*, Lansingburg, N. Y. Application filed February 28, 1888. Serial No. 265,600. Term of patent 14 years.

19,006.—PIPE-COLLAR AND FLUE-STOPPER.—*James I. Flanagen*, Philadelphia, Pa. Application filed December 3, 1888. Serial No. 292,535. Term of patent 7 years.

19,007 to 19,015, inclusive.—CARPET.—*James L. Folsom*, Brooklyn, N. Y., assignor to *The Hartford Carpet Company*, Hartford, Conn. Applications filed March 7, 1889. Serial Nos. 302,339 to 302,346, inclusive, and 302,348. Term of patents 3½ years.

19,016.—PIPE-COLLAR AND FLUE-STOPPER.—*Zachary T. Hall*, Philadelphia, Pa. Application filed March 9, 1889. Serial No. 302,654. Term of patent 14 years.

19,017 to 19,025, inclusive.—CARPET.—*Henry Horan*, East Orange, N. J., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed March 8, 1889. Serial Nos. 302,566 to 302,574, inclusive. Term of patents 3½ years.

19,026 to 19,028, inclusive.—CARPET.—*Henry Hunt*, Greenville, N. J., assignor to *The Hartford Carpet Company*, Hartford, Conn. Applications filed March 7, 1889. Serial Nos. 302,333 to 302,335, inclusive. Term of patents 3½ years.

19,029.—SCISSORS.—*Henry Herbert Howard*, New York, N. Y. Application filed March 8, 1889. Serial No. 302,535. Term of patent 14 years.

19,030.—COUPLING FOR ELECTRICAL CONDUCTORS.—*John Ellwood Lee*, Conshohocken, Pa., assignor to *The J. Ellwood Lee Company*, same place. Application filed March 14, 1889. Serial No. 303,323. Term of patent 14 years.

19,031 to 19,039, inclusive.—OIL-CLOTH.—*Charles T. Meyer* and *Victor E. Meyer*, Bergen, N. J., assignors to *Edward C. Sampson*, New York, N. Y. Applications filed March 14, 1889. Serial Nos. 303,328 to 303,336, inclusive. Term of patents 3½ years.

19,040 to 19,042, inclusive.—CARPET.—*Edward Poole*, Brooklyn, N. Y., assignor to *The Lowell Manufacturing Company*, Lowell, Mass. Applications filed February 27, 1889. Serial Nos. 301,410, 301,411, and 301,414. Term of pateuts 3½ years.

19,043.—PIPE-COLLAR AND FLUE-STOPPER.—*Joseph B. Rohrman*, Philadelphia, Pa. Application filed February 7, 1889. Serial No. 299,058. Term of patent 3½ years.

19,044.—T-SQUARE.—*Edward G. Soltmann*, New York, N. Y. Application filed January 29, 1889. Serial No. 298,022. Term of patent 14 years.

19,045.—BRUSH OR MIRROR BACK AND HANDLE.—*William M. Welling*, New York, N. Y. Application filed February 23, 1889. Serial No. 300,948. Term of patent 7 years.

19,046.—PICTURE-HOOK.—*William Alex. Williamson*, Newark, N. J. Application filed March 11, 1889. Serial No. 302,905. Term of patent 14 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,463.—BELTING, HOSE, PACKING, AND OTHER RUBBER GOODS FORMING PARTS OF MACHINERY.—*Boston Belting Company*, Boston, Mass. Application filed February 14, 1889. Used since January, 1864.
"The word 'IMPERIAL.'"

16,464.—BELTING, HOSE, PACKING, AND OTHER RUBBER GOODS FORMING PARTS OF MACHINERY.—*Boston Belting Company*, Boston, Mass. Application filed February 14, 1889. Used since January, 1864.
"The word 'EXCELSIOR.'"

16,465.—DRESS-SHIELDS.—*Charles Boulenger*, Paris, France. Application filed February 26, 1889. Used since October 19, 1888.
"The representation of a lady seated in a swing with the words 'WITH' and 'WITHOUT' under her right and left arms, respectively, and the representation of a dress-shield with ornamental scroll-work."

16,466.—CREAM FOR THE ACCELERATION OF THE MAMMARY GROWTH. *John A. Chard*, Jersey City, N. J. Application filed February 1, 1889. Used since September 15, 1888.
"The name 'MLLE. GOLDSCHMIDT'S' in script letters, accompanied by the words 'CRÈME D'ELEGANCE.'"

16,467.—UNDERWEAR FOR MEN AND WOMEN, AND APRONS.—*Joseph P. Cooper & Son*, Philadelphia, Pa. Application filed February 26, 1889. Used since February 20, 1889.
"The words 'BELMONT MANUFACTURING CO.,' arranged in the shape of an oval inclosing the picture of a bell."

16,468.—SOPORIFIC PREPARATION.—*Farbenfabriken, vormals Fr. Bayer & Co.*, Elberfeld, Prussia, Germany. Application filed March 9, 1889. Used since March, 1888.
"The words 'SULFONAL BAYER.'"

16,469.—DRESS SHIELDS AND PROTECTORS.—*Pierre Paul Guillaume, Fils Aîné*, Paris, France. Application filed January 14, 1889. Used since December, 1886.
"The word-symbol 'G F A K'ALLISTA.'"

16,470.—SALVE.—*Alfred F. Humphrey*, Canton, Conn. Application filed February 8, 1889. Used since 1835.
"The fac-simile signature of 'C. G. GRISWOLD.'"

16,471.—MEDICAL COMPOUND FOR PURIFYING THE BLOOD.—*Charles Rufus King*, Lampasas, Tex. Application filed March 8, 1889. Used since September, 1888.
"The words 'ROYAL GERMETUER.'"

16,472.—PETROLEUM-JELLY FOR MEDICINAL AND TOILET PURPOSES. *Lehn & Fink*, New York, N. Y. Application filed March 5, 1889. Used since January 1, 1888.
"The word 'BLANCOLINE.'"

16,473.—GAME.—*Moses Lyman*, Waverly, N. Y. Application filed February 28, 1889. Used since January, 1889.
"The words 'PIGS IN CLOVER.'"

16,474.—SHIRTS.—*D. McCarthy & Sons*, Syracuse, N. Y. Application filed January 2, 1889. Used since August 15, 1888.
"The representation of a lizard grasped by a hand."

16,475.—EYE-HEALING WATER.—*Thomas McGuire*, Brooklyn, N. Y. Application filed March 15, 1889. Used since February 10, 1889.
"The words 'WATER OF LIGHT.'"

16,476.—BOOTS AND SHOES.—*Pingree & Smith*, Detroit, Mich. Application filed February 25, 1889. Used since September 1, 1888.
"The representation of an outstretched skin or hide, back of which is a calf flanked on either side by a goat and a kangaroo."

16,477.—ELECTRICAL, TELEGRAPHIC, AND TELEPHONIC APPARATUS OR INSTRUMENTS.—*The Phonopore Syndicate, (Limited,)* London, England. Application filed December 19, 1888. Used since June 18, 1886.
"The word 'PHONOPORE.'"

16,478.—CUTLERY AND PLATE.—*Joseph Rodgers & Sons, (Limited,)* Sheffield, England. Application filed February 18, 1889. Used since December, 1883.
"The word 'RODGERSINE.'"

16,479.—MEDICINE FOR THE LIVER, STOMACH, AND KIDNEYS, AND LINIMENT, WORM-REMOVER, AND SALVE.—*Herman Schindhelm*, Philadelphia, Pa. Application filed February 2, 1889. Used since July, 1887.
"The word 'TA-HA.'"

16,480.—BANJOS.—*Samuel Swaim Stewart*, Philadelphia, Pa. Application filed February 27, 1889. Used since February 20, 1889.
"The letters 'S. S. S.'"

16,481.—BAKING-POWDER.—*Josephine Elizabeth Titsworth*, New York, N. Y. Application filed February 27, 1889. Used since January 1, 1889.
"The word 'SILVER-BELL.'"

16,482.—SPOOL COTTON AND THREAD.—*Tootal Broadhurst Lee Company, (Limited,)* Manchester and London, England. Application filed October 12, 1888. Used since August 12, 1886.
"The words 'LEE' and 'BEST SIX CORD.'"

16,483.—MEN'S AND BOYS' HATS.—*Ward, Goldthwaite & Co.*, Chicago, Ill. Application filed February 23, 1889. Used since January 2, 1889.
"The words 'PRIDE OF AMERICA.'"

16,484.—CANNED SALMON.—*Western Alaska Packing Company*, San Francisco, Cal. Application filed February 23, 1889. Used since December 26, 1888.
"The word 'WALRUS' and the pictorial representation of a walrus's head."

16,485.—PREPARATION FOR TREATMENT OF THE FEET.—*Edward Payson Weston*, New York, N. Y. Application filed February 23, 1889. Used since September 14, 1888.
"A full-length picture of the registrant and the words 'WESTON'S FOOT-CURE.'"

16,486.—RUM.—*Henry White & Co.*, London, England. Application filed February 25, 1889. Used since January 1, 1871.
"The words 'RED HEART.'"

16,487.—ICE-CREAM FREEZERS.—*The White Mountain Freezer Company*, Nashua, N. H. Application filed February 13, 1889. Used since 1878.
"The word 'MOUNTAIN.'"

LABELS.

5,864.—Title: "DR. COLE'S TONIC AND BLOOD PURIFIER."—*Drs. P. C. Cole & Son*, South Solon, Ohio. Application filed March 13, 1889.

5,865.—Title: "DR. COLE'S PILLS."—*Drs. P. C. Cole & Son*, South Solon, Ohio. Application filed March 13, 1889.

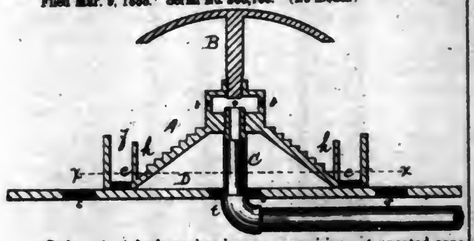
5,866.—Title: "THE RUSSIAN PREVENTIVE OF CONTAGIOUS DISEASES."—*Henry L. Jackson*, Buffalo, N. Y. Application filed March 7, 1889.

5,867.—Title: "CATARRH AND ASTHMA BALL" (FOR A CATARRH REMEDY.)—*Frank S. Newby*, Indianapolis, Ind. Application filed January 26, 1889.

PATENTS

GRANTED APRIL 9, 1889.

400,889. HYDROCARBON-BURNER. JAMES AKIN, Dayton, Ohio. Filed Mar. 9, 1888. Serial No. 266,769. (No model.)

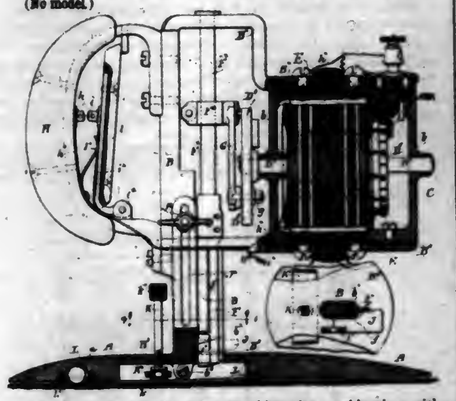


Claim.—1. A hydrocarbon-burner comprising a truncated cone having a series of concentric ledges with a rim at its base, a chamber at the top with eduction-orifices, and an orifice beneath for the introduction of an induction-pipe, substantially as set forth.

2. A hydrocarbon-burner comprising a truncated cone with a series of ledges and induction-pipe connection at the top, rim *h* at the base, and rim *f*, with a series of air-orifices between said rims, substantially as set forth.

3. A hydrocarbon-burner comprising a truncated cone having a series of concentric ledges, with rim *h* at its base and chambered at the top, with orifice for an induction-pipe and eduction-orifices, and the reflector B, attached to the top, substantially as set forth.

400,890. REGULATION OF ELECTRIC MOTORS. FOREST BAIN, Chicago, Ill., assignor, by mesne assignments, to the Electric Cutting Machine Company, same place. Filed Apr. 6, 1888. Serial No. 269,780. (No model.)



Claim.—1. In a cloth-cutting machine, the combination, with a reciprocating knife and a motor connected with and actuating the same, of a handle for controlling the movement of the machine, resistance-coils for regulating the flow of current to the motor, and an automatically-acting switch or contact device located in position to be acted upon by the operator in grasping the handle of the machine, and operating to throw the said resistance-coils into and out of circuit with the magnet and armature coils of the motor, substantially as described.

2. The combination, with the frame of a cloth-cutting machine, of a reciprocating cutter thereon, a motor for actuating the cutter, a handle attached to said frame for controlling the movement of the machine, a switch-bar movably connected with the handle, a resistance-coil, contact-points upon the switch-bar and handle, and conductors connecting said contact-points with the resistance-coil and with the field and armature coils of a motor, substantially as described.

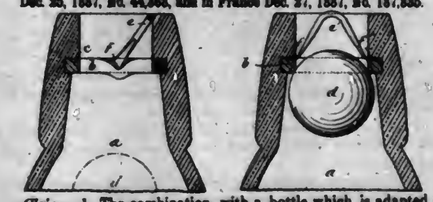
400,891. BUCKLE. DANIEL B. BAKER, Rising Sun, Ohio. Filed July 18, 1888. Serial No. 280,261. (No model.)



Claim.—1. A buckle provided with the swinging keeper G, arranged transversely across one end of the buckle, for the purpose specified.

2. In a buckle, the combination, with the stationary tongue or stud, of the swinging keeper G, arranged transversely across one end of the buckle in advance of the stationary stud, substantially as specified.

400,892. MEANS FOR FACILITATING THE OPENING OF INTERNALLY-STOPPERED BOTTLES. HENRY BARRETT and JOHN J. VARLEY, London, England. Filed Dec. 17, 1888. Serial No. 293,784. (No model.) Patented in England Nov. 2, 1887, No. 14,941; in Germany Dec. 25, 1887, No. 44,268, and in France Dec. 27, 1887, No. 187,835.



Claim.—1. The combination, with a bottle which is adapted to be closed by means of a stopper held against an elastic seating in the neck by the pressure of gas contained in the bottle, of a bow-shaped loop or lever whose terminal or end is inserted between the upper shoulder of the recess in which the said seating is located and the seating itself, such terminal or end being flattened or cam-shaped, substantially as and for the purpose set forth.

2. The combination, with a bottle having an elastic seating located in its neck, of a loop or lever, *e*, having flattened ends bent outward and adapted, when the lever is turned over from one side of the mouth toward the other side, to compress or displace the ring, substantially as and for the purpose described.

3. Levers or loops *e*, adapted for compressing the elastic rings in internally-stoppered bottles, made, as set forth, in the form of a bow and having the ends turned outward from each other and made flat or cam-shaped, substantially as and for the purposes described.

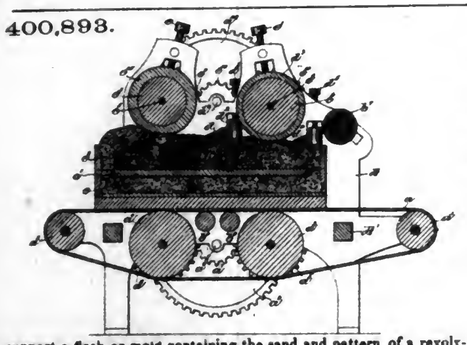
400,893. SAND-MOLDING MACHINE. WILLIAM R. BIRD, Boston, Mass. Filed Sept. 3, 1888. Serial No. 284,290. (No model.)

Claim.—1. In a sand-molding machine, the combination, with a bed to support a flask or mold containing the sand and pattern, of a revolving presser having a yielding surface, the said bed and presser being made movable one with relation to the other, whereby the surface of the sand is acted upon in a direction transverse to the axis of the presser, substantially as described.

2. In a sand-molding machine, the combination, with a bed to support a flask or mold containing the sand and pattern, of a revolving presser having a yielding surface, a leveler, and a second presser, the said bed, pressers, and leveler being made movable one with relation to the other, to operate substantially as described.

3. In a sand-molding machine, the combination, with a bed to

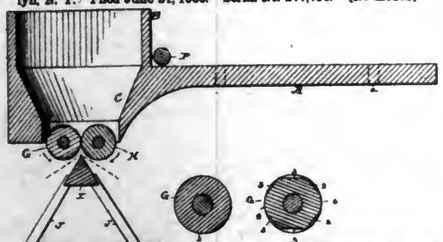
400,893.



support a flask or mold containing the sand and pattern, of a revolving presser having a yielding surface, a leveler, and a second presser, a second leveler, and a brush, the said parts being made movable one with relation to the other, as described, whereby the surface of the sand is acted upon in a direction transverse to the axis of the revolving presser, substantially as described.

4. In a sand-molding machine, a traveling bed to support a flask or mold containing the sand and pattern, combined with a revolving presser having a yielding surface to act on the surface of the sand in a direction transverse to the axis of the presser, substantially as described.

400,894. HAIR-PLUCKING MACHINE. JOHN H. BRIERLEY, Brooklyn, N. Y. Filed June 21, 1888. Serial No. 277,750. (No model.)



Claim.—1. In a machine for plucking hair from skins, the combination, with a pair of plucking-rollers, of a suction-creating or air-exhausting device for raising the hair.

2. In a machine for plucking hair from skins, the combination of a pair of plucking-rollers, an air-inlet, and a suction-creating or air-exhausting device.

3. In a machine for plucking hair from skins, the combination of a pair of plucking-rollers constructed to form an air-inlet and a suction-creating or air-exhausting device.

4. In a machine for plucking hair from skins, the combination of a pair of plucking-rollers, one of said rollers being flattened or cut away, and a suction-creating or air-exhausting device.

5. In a machine for plucking hair from skins, the combination of a pair of plucking-rollers constructed to have at all times an air opening or inlet between their peripheries and a suction-creating or air-exhausting device.

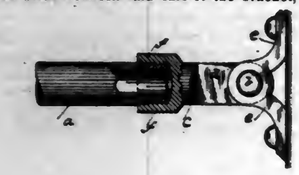
6. In a machine for plucking hair from skins, the combination of a ridge-piece and a pair of plucking-rollers.

7. In a machine for plucking hair from skins, the combination of a ridge-piece, a pair of plucking-rollers, an air-inlet, and a suction-creating or air-exhausting device.

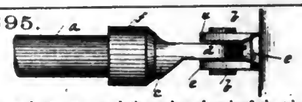
8. In a machine for plucking hair from skins, the combination of the plucking-rollers G H, the air-chamber C, the pipe E, and the fan F.

400,895. AWNING-CLEVIS. WILLIAM M. BROWN, Ingram Station, Pa. Filed Aug. 17, 1888. Serial No. 282,956. (No model.)

Claim.—The combination of a rigid bracket, *c*, securely fixed to a wall or other structure and having the parallel spaced ears, a clevis having a threaded socket, *f*, at one end and its other end reduced in thickness and fitted between said ears of the bracket, a pivot-bolt

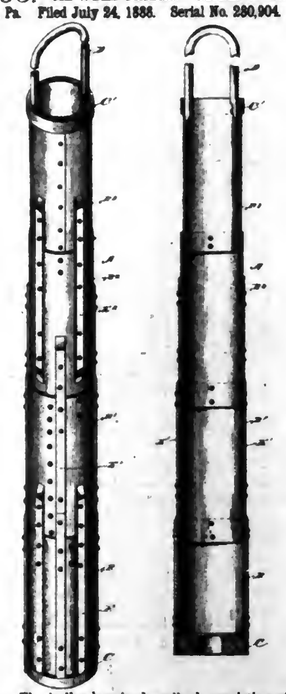


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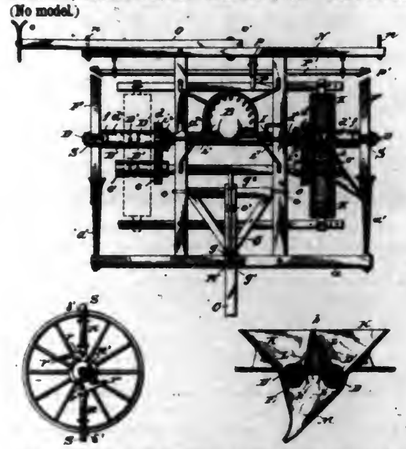
passing through the ears and the reduced end of the clevis, said clevis adapted to turn on the bolt, and a tubular frame-section, *a*, screwed into the threaded socket, substantially as described.

400,896. OIL-WELL BAILER. THOMAS A. BURKELLOW, Washington, Pa. Filed July 24, 1888. Serial No. 280,904. (No model.)



Claim.—The bailer herein described, consisting of the cylindrical metallic sections B, B', B², and B³, fitting, respectively, in each other the edges of the lower sections overlapping those of the upper sections, the thick metallic hoops C and C' on the top and bottom edges of the bailer, and the series of vertically-arranged guards E, E', and E², of a thickness equal to the thickness of the hoops, their upper ends being beveled and projecting beyond the overlapping edges of the sections, substantially as described.

400,897. CORN-PLANTER AND DRILL COMBINED. ANDREW J. CALLAWAY, Chestnut Hill, Ind. Filed Dec. 9, 1887. Serial No. 258,395. (No model.)



Claim.—1. In a seed-planter, a frame having an axle provided with seed-delivering cylinders loosely mounted thereon, formed with

a clutch and provided with wheels having toothed clutches to coact with those of the cylinders, and spiral springs between said cylinders and the frame of the planter, in combination with a lever, I, pivoted to said frame and connected by means of rods to said cylinders.

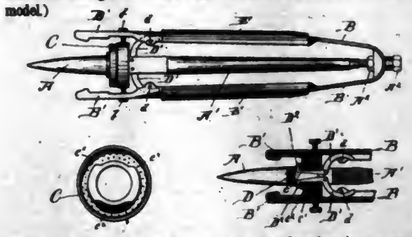
2. In a seed-planter, the axle D and shaft E, provided with cylinders connected by cog-wheels and bearing hollows disposed in circumferential rows, the double box K, fitting over said cylinders and provided with a chute extending downward and to one side, in combination with the beveled wheels F, the tongue C, the lever G, and the grooved runners *a'*, extending in front of the wheels and under the chute on the box K, substantially as described.

3. The combination, with the rotatable cylinders *d d'*, having the circumferential seed-hollows D', in combination with the hopper K, having the inclined dividing partition *k*, terminating in the joint seed-chute M, the guards *l'*, mounted over the cylinders, and the brushes L, projecting from the partition in contact with the cylinders, substantially as and for the purpose specified.

4. In a seed-planter, the driving-wheels provided with the sliding arms R, having curved faces S, and provided with cams *r*, having arms *r'*, substantially as described.

5. In a seed-planter, the driving-wheels provided with the sliding arms R, provided with curved faces S, projecting over the faces of said wheels, and recesses for the reception of said projecting faces, in combination with the cams *r*, as described.

400,898. TOOL FOR FORMING BOTTLE-NECKS. WILLIAM A. CASWELL, Chicago, Ill. Filed May 15, 1888. Serial No. 273,978. (No model.)

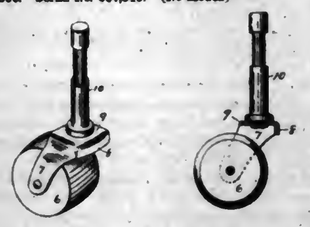


Claim.—1. The combination, in a tool for forming bottle-necks, of the exterior clamping-jaws, the interior spindle, and the loose washer-mold, the latter being provided with fine perforations or holes to permit the glass to come into close contact with the surface of the mold, substantially as specified.

2. In a tool for forming bottle-necks, the combination, with the interior spindle and exterior clamping-jaws, of projectible points in the spindle for forming an internal groove, and a loose washer-mold fitted to revolve with the bottle, substantially as specified.

3. In a tool for forming bottle-necks having external clamping-jaws and an internal spindle, the combination of said parts with the loose molding-washer, and the projectible points for forming the internal groove, said points being operated by the clamping-jaws, substantially as specified.

400,899. CASTER. GEORGE D. CLARK, Plainville, Conn. Filed Oct. 8, 1888. Serial No. 287,513. (No model.)

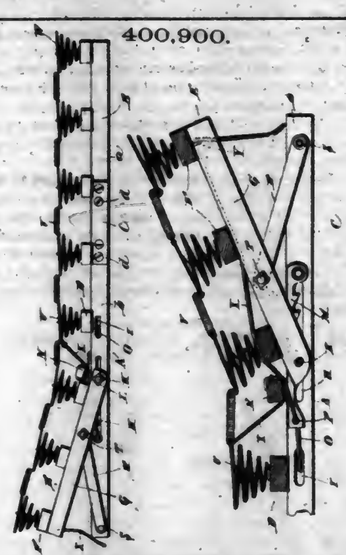


Claim.—The herein-described caster-frame, consisting of the bridge 9, the horns or arms 7 at each end thereof, and the flange 8, bent at an angle to said bridge in the same general direction as the horns, all formed integral with seamless corners at both ends and one side of said flange at its junction with the horns and bridge, substantially as described, and for the purpose specified.

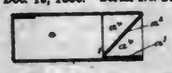
400,900. SPRING BED-BOTTOM. JULIUS M. DAVIS, Columbia, Tenn. Filed June 12, 1888. Serial No. 276,848. (No model.)

Claim.—In a spring bed-bottom, the frame comprising the longitudinal and transverse bars, each of which is formed of separable members or sections arranged end to end, and the cleats overlapping the meeting ends of said separable members or sections and secured to and connecting the same, substantially as described.

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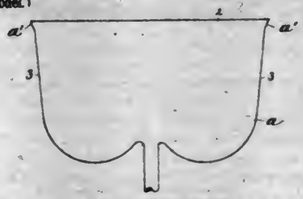
400,901. LID FOR RECEPTACLES. CHARLES W. ELLIOTT, Boston, Mass. Filed Dec. 19, 1888. Serial No. 294,052. (Model.)



Claim.—1. The combination of a receptacle, *a*, with a spring-controlled lid, a^2, having one or more lips, a^3, the lid a^2 being secured in place with one end within the receptacle *a*, substantially as and for the purpose set forth.

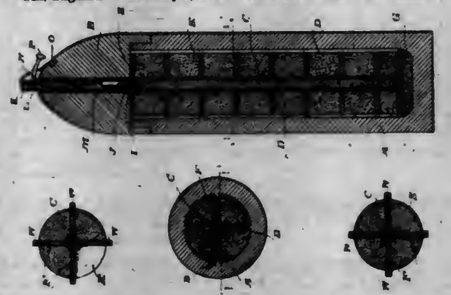
2. The herein-described combination of receptacle *a* and spring-controlled lid a^2, the lid having a let-off, a^4, projecting from that surface which is toward the chamber of the receptacle when the lid is closed, substantially as and for the purpose set forth.

400,902. HOE-BLANK. HENRY G. ELY, St. Johnsbury, Vt., executor of George B. Ely, deceased. Filed Aug. 7, 1888. Serial No. 282,186. (No model.)



Claim.—A hoe-blank having a finished form otherwise than the projecting portions *a'* at the points of intersection of the sides of the plate with the edge thereof.

400,903. HIGH-EXPLOSIVE SHELL. STEPHEN H. EMMES, London, England. Filed July 2, 1888. Serial No. 278,725. (No model.)



Claim.—1. In a shell for high-explosives, the combination, substantially as hereinbefore specified, of a hollow cylindrical shell-body having internal longitudinal ribs, a charge-holder comprising transverse diaphragms notched to coact with said ribs, and radial webs be-

tween said diaphragms coinciding with the ribs for preventing internal friction, in the manner set forth.

2. In a shell for high-explosives, the combination, with an axial bursting-tube and its charge, of a detonator in front of said charge, a flexible time-fuse attached to said detonator, and an inwardly-yielding striking-tube, through which said time-fuse extends, arranged in front of said detonator and protruding at the nose of the shell, substantially as hereinbefore specified.

3. In a shell for high-explosives, the combination, with an axial bursting-tube and its charge, of an anvil-plunger in front of the latter, a detonator in front of said plunger having a flexible time-fuse attached thereto, a striking-tube through which the time-fuse extends, provided with a cross-pin to limit its intrusion in advance of contact, an external detonator to which said time-fuse is connected, and an inertia-actuated firing-hammer pivoted on said cross-pin, substantially as hereinbefore specified.

400,904. HAIR-CURLER. FERDINAND FAUST, Brooklyn, N. Y.

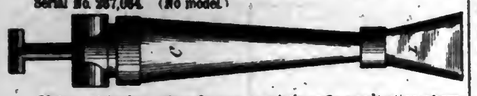
Filed Feb. 10, 1888. Serial No. 263,654. (No model.)



Claim.—1. The combination, in a hair-curling device, consisting of a clamp having its upper and lower parts provided with tongues C C in the center of an opening at the end of such parts, and the edges of the lower part turned up, and a rolling stick provided with the slot *a*, all substantially as set forth.

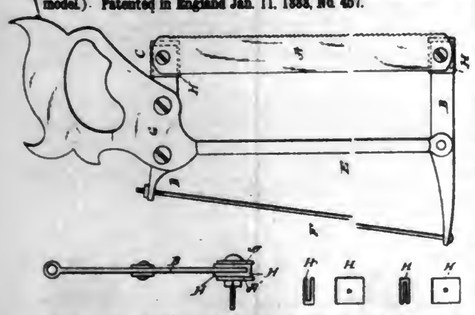
2. A clamp having its upper and lower parts provided with tongues C C in the center of and opening at the end of such parts and the edges of the lower part turned up, all substantially as shown, for the purpose aforesaid.

400,905. HYDROCARBON-BURNER. ARCHIBALD F. FLETCHER, Brooklyn, N.Y., assignor of two-thirds to Valentine Clemson, New York, N. Y., and John Victor Carraher, Washington, D. C. Filed Mar. 13, 1888. Serial No. 267,064. (No model.)



Claim.—A hydrocarbon-furnace consisting of a combustion-chamber, a burner for heavy hydrocarbons entering said combustion-chamber and provided with an inner and outer passage concentric with each other, a supply-pipe for furnishing hydrocarbon to one of said passages, a supply-pipe for furnishing superheated steam or air to the other of said passages, a superheating-coil located within the combustion-chamber, and pressure-chambers intermediate between said coil and burner, and said coil and supply-pipe, substantially as described.

400,906. SAW FOR CUTTING TENONS. THOMAS FORSAITH, Adelaide, South Australia. Filed Mar. 1, 1888. Serial No. 265,883. (No model.) Patented in England Jan. 11, 1888, No. 457.



Claim.—The adjusting-clips H, in combination with the front and back pieces, B and D, the main bar E, the straining-rod F, the fastening-screws C, and the saw-blades, substantially as shown and described.

400,907. WHEEL. JOSEPH FRENIER, La Porte, Ind. Filed Aug. 7, 1888. Serial No. 282,191. (No model.)

Claim.—1. The combination, with a metallic wheel hub-box having a flange and being screw-threaded, of the spoke-holder having a screw-threaded hub and provided with an annular flange and a concentric ring connected by ribs, both the flange and ring having holes radially in line for inserting and holding the spoke ends, substantially as set forth.



2. The combination, with a metallic wheel hub-box screw-threaded and provided with a rigid flange having a circular sharp-edged side projection, of the spoke-holder screwed upon such hub-box and provided with an annular flange and a concentric ring connected by ribs, both the flange and ring having holes radially in line for inserting and holding the metal spokes notched at their inner ends for engaging the sharp-edged side projection of the hub-box, substantially as set forth.

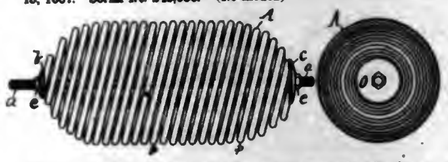
400,908. PAIL-COVER. GUSTAV FUCHS, New York, N. Y. Filed Jan. 4, 1889. Serial No. 295,395. (No model.)



Claim.—1. The combination of the ring B, having an outer annular groove to receive the upper edge of a receptacle, and a horizontal part, E, with a plate, D, secured to the inner edge of the ring B, the plate D, having an opening, F, and with the oscillatory segment or plate G, pivoted on the plate D and adapted to cover the opening F, substantially as described.

2. The combination of the pail or receptacle A, having the cover H, with the ring B, having an outer annular groove to receive the upper edge of the receptacle, and a horizontal part, E, and with the plate D, secured to the inner edge of the ring B, and the oscillatory segment or plate G, pivoted on the plate D, the plate D having an opening to be covered by the segment G, substantially as described.

400,909. FUEL-MAGAZINE. JEREMIAH D. GREENE and JAMES C. TREMAN, Troy, N. Y., assignors to James Lacey, same place. Filed Aug. 15, 1887. Serial No. 246,936. (No model.)



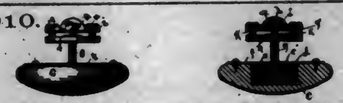
Claim.—1. In a hydrocarbon-burner, a magazine having oval ends, and a central bolt having its ends screw-threaded, concave caps provided with flanges and fitting said oval ends, and nuts fitting the ends of said central bolt, whereby the magazine may be compressed or elongated, as and for the purposes set forth.

2. In a hydrocarbon-burner, a magazine formed of coiled wire and having oval ends, a central bolt having screw-threaded ends passing through said magazine, concave caps provided with flanges and fitting said oval ends, and nuts fitting the ends of said screw-threaded bolt, substantially as and for the purposes set forth.

3. In a hydrocarbon-burner, the combination of a magazine having a central bolt with projecting ends, with a trough adapted to receive and hold centrally said magazine, said trough provided with longitudinal supporting-ribs, whereby such trough and magazine may be placed on a grate or plate and remain upright, substantially as and for the purposes set forth.

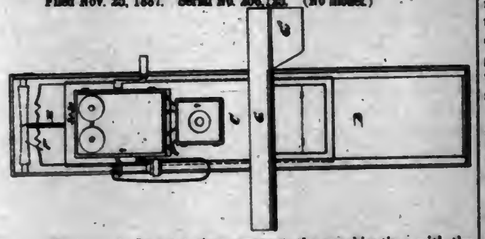
4. In a hydrocarbon-burner, the combination of the magazine, the containing-trough, and the case having ribs at intervals on front and back longitudinally arranged inside of said case, whereby the said trough is kept in a central and horizontal position, substantially as set forth.

400,910. TRUSS. ABEL C. HAINES, Columbus, Ohio. Filed Mar. 23, 1888. Serial No. 268,197. (No model.)



Claim.—In an abdominal support, the combination of the pad, its spring-actuated bolt *g*, pivoted to plate *h* and having head *g'*, clamping-plate *i*, detachably connected, as described, with plate A, and the rounded and angular grooved adjustable bearing-piece *l* with the body-band *a*, having one of its sides half-rounded in form and its remaining side angular, substantially as and for the purpose specified.

400,911. TELEPHONE-SUPPORT. PHILO R. HALL, Detroit, Mich. Filed Nov. 25, 1887. Serial No. 256,125. (No model.)

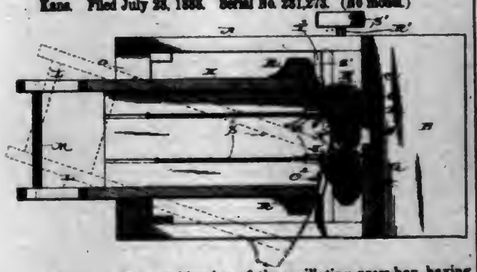


Claim.—1. In a telephone-support, the combination, with the frame B, of the supporting-board C, sliding vertically within said frame and having attached thereto the signaling apparatus, transmitter, and battery-box, the shelf G on the battery-box, the hinged leaf G' at the front and to one side of said shelf, and the counterpoise D, situated in a space in said frame B and connected to the upper end of the supporting-board by the chain E, said frame B, with all the other appliances attached, made portable and adapted to be fastened against the wall of a room, substantially as described.

2. The combination, with the supporting-board having the signaling apparatus, transmitter, and battery-box attached thereto, of the shelf having the hinged leaf and located on the top of said battery-box, the chain E and weight D, and the chain or flexible cable H, for permitting the vertical movement of the parts without breaking the connection with the telephone-line, all operating in the frame B, said frame B, with all the other appliances attached, made portable and adapted to be fastened against the wall of a room, substantially as described.

3. The combination, with the frame B, having a space for the reception of the weight and chain, the weight and chain within said space, and a space for the reception of the supporting-board, and the supporting-board sliding therein, of the shelf G and flexible cable H, said frame B, with all the other appliances attached, made portable and adapted to be fastened against the wall of a room, substantially as described.

400,912. BALING-PRESS. WILLIAM H. HEWITT, Osage Mission, Kans. Filed July 28, 1888. Serial No. 281,273. (No model.)



Claim.—1. The combination of the oscillating press-box having an open mouth, the drums journaled in fixed supports at points opposite the mouth of the press-box and geared together so as to vibrate simultaneously in the same direction, and the straps provided with teeth or spurs, connecting said drums, respectively, to opposite sides of the mouth of the press-box and adapted each to coil and uncoil alternately thereon, whereby the mouth of the press-box is oscillated, substantially as specified.

2. The combination of the oscillating press-box having an open mouth, the vibrating drums journaled in fixed supports beyond the mouth of the press-box and geared together to revolve simultaneously in the same direction, the straps coiled on the said drums and connected, respectively, to opposite sides of the mouth of the press-box, and the slats or cleats secured to the straps and provided with spurs or teeth, substantially as specified.

3. The combination, in a baling-press, of the oscillating press-box having an open mouth, the gate at the rear end of the press-box, the vibrating drums arranged opposite the mouth of the press-box in proximity to each other and geared together to revolve simultaneously in the same direction, the said direction being reversed alternately, and the straps connecting the drums, respectively, to opposite sides of the mouth of the press-box and coiled on the drums, whereby as the latter are vibrated the press-box is oscillated.

4. In a baling-press, the combination of the shaft K', having the loose gear-wheels T', the clutches feathered on the said shaft and adapted to alternately engage their respective gear-wheels, the revolvable shafts G, having drums at the upper ends and having their lower ends geared together and provided with gears I^3, engaging the gear-wheels T', the pivoted press-box adapted to oscillate and having its mouth presented to the drums, the straps connecting opposite sides of the mouth of the press-box to the drums, the levers connected to the clutches and adapted to move them longitudinally on the shaft to engage the gear-wheels T', and connections, substantially as described, to the press-box and the levers to operate the latter, substantially as specified.

5. The combination of the reciprocating bar K', having the cam-slots, the pinion engaging the rack on said bar and having the weighted arm, the clutch-levers engaging the cam-slots, and the oscillating press-box, having the stop-plates to engage and operate the bar K' alternately, substantially as described.

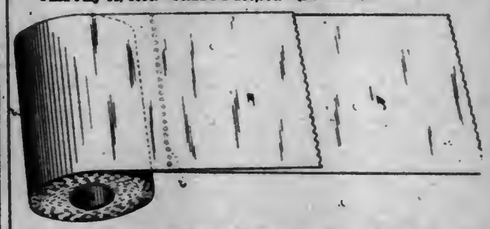
6. The combination of the oscillating press-box, the drums arranged at the mouth thereof, straps connecting said drums to opposite sides of the mouth of the press-box, gearing for rotating the drums simultaneously in the same direction, the power-shaft, the clutch members mounted on the shaft and adapted to alternately engage the said gearing, the clutch-levers connected to the clutch members, the reciprocating bar K', having the cam-slots engaged by the clutch-levers and provided by the arm M', and the stops secured to the press-box and adapted to engage said arm, for the purpose set forth, substantially as described.

7. The combination, in a baling-press, of the oscillating press-box, the stop-plates secured thereto and adjustable laterally thereon, and the reciprocating bar having the arm engaged by the stop-plates, for the purpose set forth, substantially as described.

8. The combination of the oscillating press-box having the vertical longitudinal slots in its upper sides and the guides in its lower side near its mouth, the drums arranged opposite the mouth of the press-box, the straps connecting said drums to opposite sides of the mouth of the press-box, the reels or spools, and the cords or wires thereon directed by the guides and passed upward and rearward through the press-box, and the slots therein, substantially as described.

9. The combination of the oscillating press-box open at its front and rear ends, the vibrating drums arranged opposite the mouth of the press-box and adapted to rotate simultaneously in the same direction, the straps connecting said drums to opposite sides of the mouth of the press-box, and the gate pivoted in the rear end of the press-box, substantially as described.

400,913. TOILET-PAPER ROLL. OLIVER H. HIGBEE, Chicago, Ill. Filed July 13, 1888. Serial No. 280,200. (No model.)

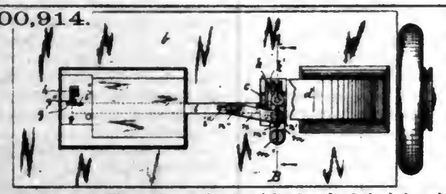


Claim.—A roll or bundle of paper consisting of two or more lengths of paper each weakened transversely at intervals, wound together with the lines of weakness of one length between those of the adjoining length, whereby upon drawing upon the end of one of the lengths to detach a sheet therefrom the end of the adjoining length will be brought into position to be grasped for the next operation, substantially as described.

400,914. SEWING-MACHINE FOR FINISHING BUTTON-HOLE PIECES. GEORGE S. HILL, Lynn, assignor, by direct and mesne assignments, to John Reece, Boston, Mass. Filed Apr. 8, 1887. Serial No. 234,112. (No model.)

Brief.—A reciprocating bar has an end projecting upward through a hole in the throat-plate just in front of the needle-hole. The button-hole piece of a shoe is fed to the needle so that the cords from one button-hole to the next are engaged by a notch in the end of the reciprocating bar, thus gathering them in line to be stitched down by the vibrating needle-bar.

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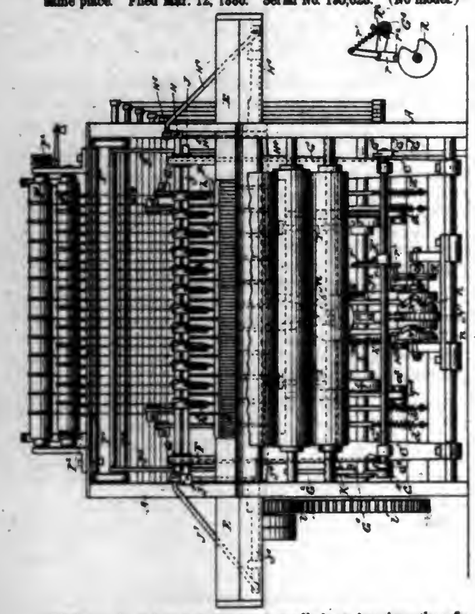
Claim.—1. The reciprocating bar *i*, having the forked thread-guide *i'* in its outer end projecting upwardly through the needle-plate, combined with the vertically-reciprocating needle *e* and needle-plate *g* with its perforation for the thread-guide for the purpose of alternately carrying the loose threads, as described, to opposite sides of the stitches being made, for the purpose set forth.

2. The rotary shaft *c* and its grooved cam *k k'*, combined with the reciprocating bar *i* and its forked thread-guide *i'*, and the intermediate connecting mechanism, consisting of the connecting-rod *n*, lever *m*, pivoted to plate *b* and having tooth or projection *l*, engaging in the groove *k'* of said cam *k*, as and for the purpose set forth.

3. The rotary shaft *c* and its grooved cam *k k'*, the rock-lever *m* and its tooth or projection *l*, and the bar *i* with its forked thread-guide *i'*, combined with the connecting-rod *n*, its studs or pins *n' n''* and slots *i''* and *m'* in the bar *i* and lever *m*, respectively, for the purpose of regulating the amount of throw on bar *i*, as herein set forth and described.

400,915. LAPPET-LOOM.

GEORGE H. HODGES and THOMAS LONERGAN, Canton, Mass.; said Lonergan assignor to Thomas D. Lonergan, same place. Filed Mar. 12, 1886. Serial No. 195,023. (No model.)



Claim.—1. A lay, one or more needle-bars, bearings therefor, and ways on the lay in which said bearings may move vertically, the roller K, located as described upon one of the swords of the lay, a cam-lever, G^2, located as described with respect to said roller K, whereby said lever may be raised during a portion of the forward movement of said lay and allowed to fall during the backward movement of said lay, and connections, substantially as described, between said cam-lever and said bearings, whereby each movement of the lever shall cause a corresponding movement of the bearings, all as and for the purposes set forth.

2. A lay, one or more needle-bars, bearings therefor, and ways on the lay in which said bearings may move vertically, the roller K, located as described upon one of the swords of the lay, a cam-lever, G^2, located as described with respect to said roller K, whereby said lever may be raised during a portion of the forward movement of said lay and allowed to fall during the backward movement of said lay, and connections, substantially as described, between said cam-lever and said bearings, whereby each movement of the lever shall cause a corresponding movement of its bearings, in combination with a stop located to receive the mechanism above described for operating the needle-bar bearings during the backward movement of the lay and limit the downward movement of said bearings, all as and for the purposes set forth.

3. The lay, a needle-bar, bearings therefor in which said needle-bar may be moved longitudinally and ways on the lay in which said bearings may be moved vertically, means, substantially as above described, whereby there is given to said needle-bar a vertical reciprocating movement during each oscillation of the lay, a grooved pattern-wheel, means, substantially as described, whereby said pattern-wheel is rotated step by step, treadles H^3 J^3, cams H' J', located as described with respect to said treadles, an oscillating lever supported on said lay and connected with said treadles in substantially the manner described, and means, substantially as described, whereby one end of said lever is connected with said needle-bar, the other end of said lever being located in the groove of said pattern-wheel, all as set forth.

4. In combination with the needle-bar, the bearings therefor, the lay C, the ways thereon for said bearings, roller K, attached to one of the swords of said lay, cam-lever G^2, pivoted upon the frame, rocker-arm G^4, link G^5, rock-shaft G^3, connections, substantially as above described, between said rock-shaft and the bearings, whereby the oscillating motion of the lay imparts an intermittent vertically-reciprocating movement to the bearings and needle-bar, all as set forth.

5. In combination with the needle-bar, the bearings therefor, the lay C, the ways thereon for said bearings, roller K, attached to one of the swords of the said lay, cam-lever G^2, mounted upon the frame, rocker-arm G^4, link G^5, rock-shaft G^3, arms G^2, and connections, substantially as above described, between said arms and the bearings, whereby the oscillating motion of the lay imparts an intermittent vertically-reciprocating motion to the needle-bar and a stop, G^6, the lower surface, G^7, of one of said arms G^2 being adapted to engage intermittently with said stop G^6, as and for the purposes set forth.

6. The needle-bar and mechanism, substantially as described, for giving it a vertically-reciprocating motion, in combination with the rotating notched wheel R and mechanism, substantially as above described, whereby said needle-bar is periodically held from its downward movement, all substantially as described.

7. A lay, one or more needle-bars mounted thereon, the rock-shaft G^3, means, substantially as above described, whereby said rock-shaft is oscillated, and means, substantially as described, whereby each oscillation of the said rock-shaft imparts a vertically-reciprocating motion to said needle bar or bars, the rocker-arm R', mounted upon said rock-shaft, the lever *r*, having pin r^2, and the spring *r'*, constructed and connected to said rocker-arm substantially in the manner described, in combination with the notched wheel R and mechanism, substantially as above described, whereby said notched wheel is rotated step by step, as and for the purposes set forth.

8. In combination with a needle-bar and means, substantially as above described, whereby said needle-bar is reciprocated vertically, the grooved pattern-wheel N and means, substantially as above described, whereby it is rotated intermittingly, the cam-shaft, cams H' J', located upon the cam-shaft, the treadles H^3 J^3, located beneath and operated by said cams, the drum M, the springs and straps connecting said treadles with said drum, the oscillating lever H^2, connected with said drum, as described, the lower end of said lever being located in the groove of said pattern-wheel, and devices, substantially as described, whereby the upper end of the lever is connected with said needle-bar, all as and for the purposes set forth.

9. The combination, with the lay and reed, of the needle-bars H J, each provided with a set of thread-carrying needles, and mechanism, substantially as above described, whereby said bars are reciprocated vertically and horizontally, the needles *j* on one bar lying nearer the reed than those, *k*, of the other bar, the points of the said needles *k* being above the line of the threads passing from the needles *j* to the fabric when the bars are moving laterally, and the thread-guides k^3 k^4, said guides k^3, belonging to said needles *k*, being located directly above said needles *k*, all substantially as and for the purposes set forth.

10. In combination, a lay, one or more needle-bars, H J, mounted thereon, and mechanism, substantially as above described, whereby they are given a vertical reciprocating movement with respect to the lay, the guard-carrying bar T, provided with auxiliary guards *t* and mounted upon uprights, the treadles T^4 and their cams and cam-shaft, and means of connection, substantially as described, whereby each movement of the treadle is imparted to the bar, as and for the purposes set forth.

11. The pattern-wheel N, provided with its ratchet N', in combination with the pawl V^4, its latch V', and the pin V, the lever V^3, and cam J', all substantially as and for the purposes set forth.

12. The pattern-wheel above described, made in two parts, in combination with one or more washers located between the parts of said pattern-wheel, as and for the purposes set forth.

13. In combination with the lay, needles, and tension mechanism of a lappet-loom, the take-up mechanism above described, consisting of the bars p^4 p^5, the levers p^7, connected at one end to and operated by the lay, and the take-up bar p^8, lying between the bars p^4 p^5 and carried by the other ends of such levers, whereby at each forward movement of the lay the otherwise slack thread is drawn tight over the said bars p^4 p^5, as and for the purposes set forth.

14. The cam shaft L, the cams H' J', mounted thereon, a pair of treadles H^3 J^3, actuated by said cams, the lay, a wheel, N, axled to the lay, the strap *m'*, passing over and attached to said wheel, springs *j'*, forming an elastic connection between said strap and said treadles, a lever, J^3, attached to said wheel, a grooved pattern-wheel, N, one end of said lever being located in the groove thereof, a needle-bar, J, and means, substantially as described, whereby said needle-bar is connected to said lever, all adapted for the purposes set forth.

15. The lay, the needle-bar J, mounted upon the lay in substantially the manner described, in combination with the pivoted connecting-rod J^6, upright J^5, attached to said needle-bar, slide J^6, located and free to move in straps upon the lay, and the brace J^7, rigidly connected at one end to the outer end of said slide and at the other end with the upper end of said upright J^5, and means, substantially as described, whereby said rod J^6 is reciprocated laterally, as set forth.

400,916. CURRENT-COLLECTING DEVICE FOR ELECTRIC RAILWAYS.

RUDOLPH M. HUNTER, Philadelphia, Pa. Original application filed Nov. 8, 1888, Serial No. 290,302. Divided and this application filed Dec. 13, 1888. Serial No. 293,455. (No model.)



Claim.—1. The combination of a flexible suspended conductor of circular cross-section, supports therefor at intervals in its length, a traveling vehicle, a grooved collector-wheel located below said conductor, and in the groove of which the conductor is received and guided against lateral displacement, and a support for said grooved collector-wheel hinged to the vehicle on a transverse axis.

2. The combination of a flexible suspended conductor of circular cross-section, supports therefor at intervals in its length, a traveling vehicle, a grooved collector-wheel located below said conductor, and in the groove of which the conductor is received and guided against lateral displacement, a support for said grooved collector-wheel hinged to the vehicle on a transverse axis, and a spring acting on said support to press the wheel against the under surface of the conductor.

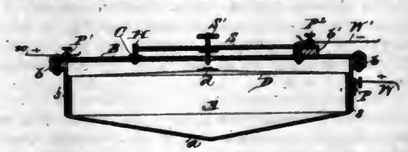
3. The combination of a flexible suspended conductor of circular cross-section, supports therefor at intervals in its length, a traveling vehicle, a grooved collector-wheel located below said conductor, and in the groove of which the conductor is received and guided against lateral displacement, and a pivoted spring-support for said grooved collector-wheel.

4. In an electric railway, a suspended conductor free to rise and fall, in combination with a traveling electrically-propelled vehicle, an upwardly-extending pivoted collector having a collecting-wheel running upon the under side of the conductor, and a spring to press the collector-wheel up against the conductor, whereby the collector-wheel and conductor both rise and fall to accommodate themselves to each other and maintain a constant contact.

5. In an electric railway, a flexible suspended conductor, in combination with a traveling electrically-propelled vehicle, an upwardly-extending pivoted collector having a collecting-wheel running upon the under side of the conductor, a spring to press the collector-wheel up against the conductor, whereby the collector-wheel and conductor both rise and fall to accommodate themselves to each other and maintain a constant contact, and means to adjust the tension of the spring.

400,917. THERMAL CIRCUIT-CLOSER FOR FIRE-ALARMS.

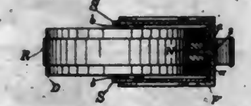
ARMAND C. IWANOWSKI, Moscow, Russia. Filed Feb. 23, 1888. Renewed Mar. 9, 1889. Serial No. 302,746. (No model.)



Claim.—The combination, with the receptacle A, its diaphragm D, provided with a contact, *d*, and binding-post P, of the cross-bar B, provided with an anvil, C, and binding-post P', said cross-bar being insulated from the receptacle A, the spring-actuated hammer H, and binding-post P^3, insulated from the cross-bar and the contact-screw S', substantially as and for purposes specified.

400,918. SPRING SASH-BALANCE.

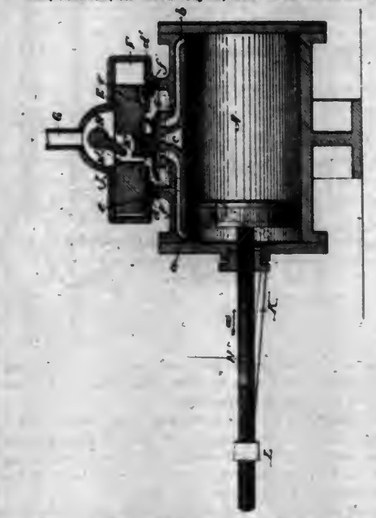
WALTER S. JENNINGS, Rochester, N. Y., assignor, by mesne assignments, to Adelbert Cronise, same place. Filed Sept. 4, 1888. Serial No. 284,542. (No model.)



Claim.—In a spring sash-balance, the adjustable opposing brakes S S, fitted to press toward each other against the opposite sides of the interposed drum, substantially as shown and described.

400,919. VALVE FOR STEAM-ENGINES.

SAMUEL M. KEPLINGER, Franklin, Pa. Filed May 21, 1888. Serial No. 274,496. (No model.)



Claim.—1. The combination, with a steam-cylinder and a slide-valve operating over the usual ports of the steam-cylinder, of an auxiliary piston loosely connected with the said slide-valve and an auxiliary cylinder receiving the auxiliary piston, and having ports connecting its ends directly with the steam-chest and other ports connecting it with the exhaust, and a rocking finger loosely connected to said auxiliary piston to give it an initial movement, which traps live steam from the steam-chest in that end of its cylinder toward which said auxiliary piston is moving to cushion the piston, and lets in live steam at the other end of the said cylinder to finish the stroke of the auxiliary piston and the slide-valve, substantially as described.

2. The combination, with a steam-cylinder and a slide-valve operating over its ports, of an auxiliary piston loosely connected with the slide-valve and having an exhaust-channel in each end, and an auxiliary cylinder for said piston provided with channels leading from the live-steam chest to each of its ends, and also provided with channels extending to the exhaust-port of the cylinder and adapted to register with the exhaust-channels of the auxiliary piston, and an initial motor for the auxiliary piston—such as a finger rocked from the main piston-rod—which moves the auxiliary piston a distance sufficient to put one or the other of its channels in communication with the exhaust and to open the live-steam channel in the auxiliary cylinder at the opposite end to let in live steam from the steam-chest, which live steam, acting upon the auxiliary piston, moves it to close the exhaust, and thereby entrap some live steam at the leading end to cushion the piston, and completes the stroke of the auxiliary piston, and through it finishes the stroke of the slide-valve, substantially as described.

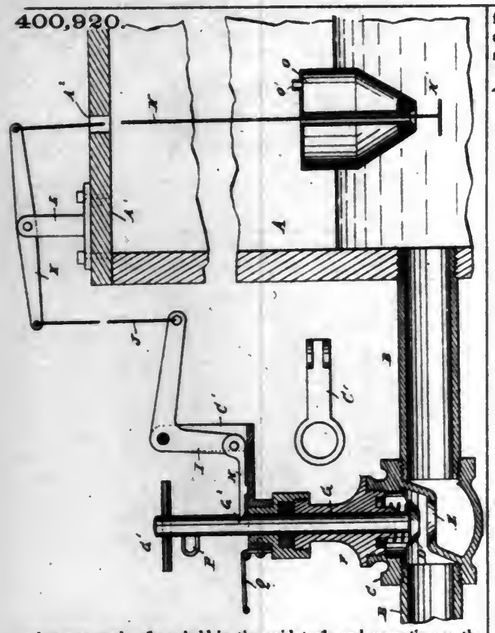
400,920. CUT-OFF VALVE FOR TANKS.

NATHANIEL W. KROONE, Washington, Pa. Filed July 11, 1888. Serial No. 279,630. (No model.)

Claim.—1. The combination, with an oil-tank and a pipe-line connected with the said oil-tank, of a valve located in the said pipe-line, a spring pressing against the said valve, a bolt engaging the stem of the said valve, and a float operating on the said bolt to withdraw it whenever the oil in the tank reaches a low level, substantially as shown and described.

2. The combination, with an oil-tank and a pipe-line connected with the said tank, of a valve located in the said pipe-line, a spring pressing against the said valve, a valve-stem supporting the said valve and provided with a notch, a bolt engaging the notch of the said

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valve-stem, and a float held in the said tank and operating on the said bolt to withdraw it whenever the oil in the tank reaches a low level, substantially as shown and described.

3. The combination, with a valve located in the pipe-line, of a spring pressing against the said valve, a bolt adapted to engage the stem of the said valve, and a float located in the oil-tank and operating on the said bolt to withdraw it whenever the oil in the tank reaches a low level, substantially as shown and described.

4. The combination, with a float held in the oil-tank, of a rod on which the said float is guided loosely, a cross-arm secured on the lower end of the said rod, a lever connected with the said rod, a bell-crank lever connected with the said lever, a bolt pivotally connected with the said bell-crank lever, a valve-stem having a notch engaged by the said bolt, a valve secured on the said valve-stem and adapted to open and close the pipe-line, and a spring pressing the said valve downward on its seat in the pipe-line, substantially as shown and described.

5. The combination, with a float held in the oil-tank, of a rod on which the said float is guided loosely, a cross-arm secured on the lower end of the said rod, a lever connected with the said rod, a bell-crank lever connected with the said lever, a bolt pivotally connected with the said bell-crank lever, a valve-stem having a notch engaged by the said bolt, a valve secured on the said valve-stem and adapted to open and close the pipe-line, a spring pressing the said valve downward on its seat in the pipe-line, and a lock for locking the said valve-stem in place, substantially as shown and described.

400,921. ARTIFICIAL TOOTH. CHARLES H. LAND, Detroit, Mich. Filed Mar. 14, 1888. Serial No. 267,132. (No model.)



Claim.—1. In a tooth-filling appliance, an anchoring-post, in combination with a porcelain head molded thereon, substantially as set forth.

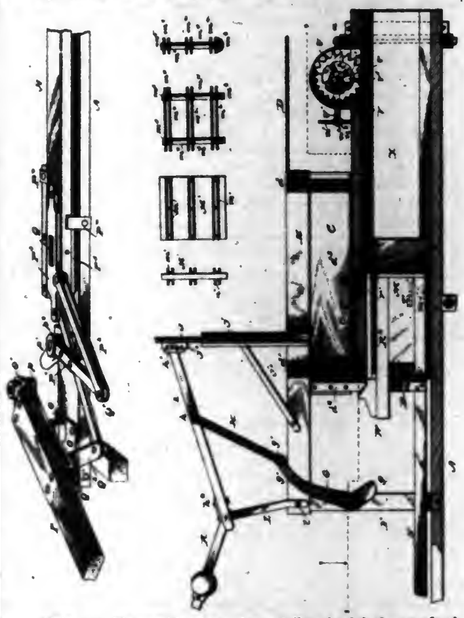
2. In a tooth-filling appliance, a porcelain-headed screw, in combination with a tubular anchoring device provided with a tubular stem, substantially as set forth.

3. In a tooth-filling appliance, a screw consisting of a metal screw-threaded shank, in combination with a porcelain head molded thereon, substantially as set forth.

4. The combination, with an anchoring device embedded in a cavity, of a porcelain section fitted upon the tooth, and a porcelain-headed anchoring-post for locking the porcelain section to the tooth, substantially as set forth.

5. The combination of the anchoring device, embedded as set forth, the plate D', an intervening protecting substance to exclude the fluids of the mouth, the matrix, and the porcelain section, said section engaged in place by a porcelain-headed screw, substantially as described.

400,922. BALING-PRESS. JOHN LA DOW, Denver, Colo. Filed Sept. 8, 1888. Serial No. 284,867. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of the follower, the pitman secured thereto, the sweep, the jointed arms Q' Q^2, pivotally connected therewith and forced inward by the sweep to push the pitman forward, the link P^3, pivoted to the pitman, the bell-crank lever P', jointed to the link and with which the sweep engages to return the pitman, and the rollers Q^3 and p on the sweep.

2. The combination, substantially as hereinbefore set forth, of the follower, the pitman secured thereto, the sweep, the casting on which it is mounted, the jointed levers for forcing the pitman forward, the bell-crank, jointed levers for returning the pitman, and the rollers on the under side of the sweep at its inner end operating upon said levers.

3. The combination, substantially as hereinbefore set forth, of the compressing-chamber, the reciprocating follower, the condensing-chamber, the vertically-reciprocating feed-board, the trip-lever having a projecting end or nose, g, at its lower end, connections between the trip-lever and the feed-board, and the block W, having an inclined upper surface mounted on the rear end of the follower, which engages with the trip-lever.

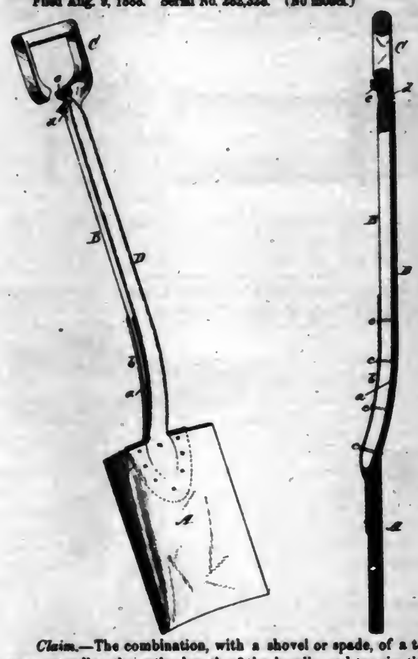
4. The combination, substantially as hereinbefore set forth, of the side casing of the compressing-chamber, the hollow folder, the bolt extending through the folder and secured to the casing, and the spring incased within the folder and bearing against the bolt and the folder.

5. The combination, substantially as hereinbefore set forth, of the main frame, the compressing-chamber, the reciprocating follower, the folder having a lower beveled side, the guideways at the ends in which it moves vertically, the spring attached to the frame for forcing the folder down, and the beam secured to the top of the plunger against which the lower beveled side of the folder bears.

6. The combination, substantially as hereinbefore set forth, of the compressing-chamber and a partition-follower consisting of the combination of the flat rods, the bars on which they are mounted, the spacing-thimbles, and devices for securing the rods and thimbles on the bars.

7. The combination, substantially as hereinbefore set forth, of the baling-chamber, the compressing-chamber, the plunger which reciprocates within the compressing-chamber, the condensing-chamber located above the compressing-chamber, the folder below the condensing-chamber and above the compressing-chamber, the pitman-arm connected to the plunger, the vertically-reciprocating feed-board, the guideways in which it moves, the uprights F, secured to the main frame, the jointed levers L and I, flexibly connected to the uprights F and the upper end of the feed-board, a weighted arm, K, secured to said levers, the pivoted bell-crank trip-lever G, pivoted to the uprights F, the hinged arm H, connecting the upper end of the lever G with the arm I, and the block W, carried by the plunger, with which the lower end or nose, g, of the bell-crank lever G engages.

400,923. SPADE OR SHOVEL. JAMES A. LITTLE, Cartersburg, Ind. Filed Aug. 9, 1888. Serial No. 282,338. (No model.)

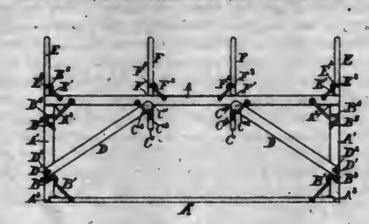


Claim.—The combination, with a shovel or spade, of a tension-strap extending the entire length of the handle, and terminating in a screw-bolt which extends obliquely through the same, and a nut engaging with the bolt, whereby the necessary tension of the strap may be had, substantially as and for the purpose set forth.

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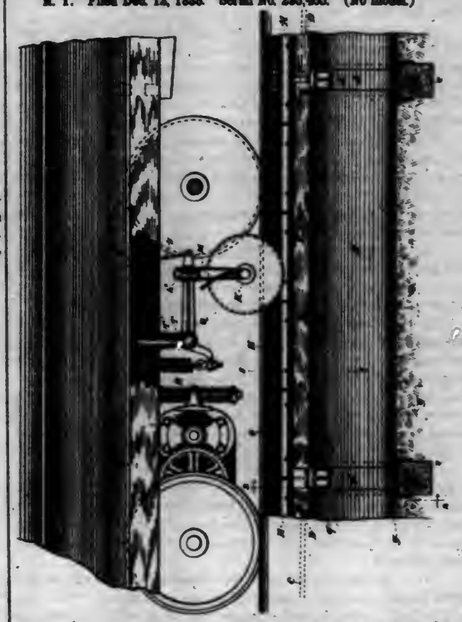
400,925. BOOK-CASE. RICHARD W. LOVERING, Poplar Grove, Ill. Filed Dec. 17, 1888. Serial No. 293,539. (No model.)



Claim.—1. As a new article of manufacture, a book-case consisting, essentially, of an upper shelf, A, the folding end pieces, A', hinged thereto, a lower shelf, A^4, connected with said end pieces, the auxiliary folding end pieces, E, hinged to the shelf A, the lower folding partitions, C, jointed to the lower side and the upper partitions, F, jointed to the upper side of said shelf A, substantially as described, and for the purpose specified.

2. The herein-described book-case, consisting of the upper and lower shelves, A A^4, the end pieces and auxiliary end pieces, A' E, the upper and lower folding partitions, F C, the braces D, and the hooks, eyes, and hinges securing said parts together, in the manner shown, and for the purpose set forth.

400,926. ELECTRIC RAILWAY. ROBERT LUNDELL, New York, N. Y. Filed Dec. 12, 1888. Serial No. 293,605. (No model.)



Claim.—1. The combination, with an open-slot conduit, of an insulated line-conductor laid therein, in the upper part thereof, and a service-conductor arranged in said conduit, subdivided into sections, and said sections supported from said insulated line-conductor.

2. In an electric railway of the described class, a service-conductor divided into short sections mechanically separated from one another, in combination with springs for pressing up the sections and rigid vertical guides for each section adapted to prevent lateral displacement thereof in its up-and-down movement.

3. In an electric railway of the described class, a service-conductor divided into short sections mechanically separated from one another, in combination with elastic supports therefor, consisting each of a vertical plunger attached to one of the sections, a socket which the plunger may rise and fall, and a spring for pressing the plunger up.

4. In an electric railway of the described class, a service-conductor divided into short sections mechanically separated from one another, in combination with two elastic supports for each section constructed to engage its opposite end portions through the medium of horizontal pivots, whereby the section may be depressed at one end before being depressed at the other.

5. In an electric railway of the described class, a service-conductor

divided into short sections mechanically separated from one another, in combination with elastic circuit-closing supports for the sections, consisting each of a plunger attached to the section at its upper portion and arranged with its lower end normally just above a contact-surface in connection with the line-conductor, a vertical socket in which said plunger may move up and down, and a spring for pressing it up.

6. In an electric railway of the described class, the combination, with the line-conductor inclosed in insulation with its upper surface exposed at intervals, of a succession of vertical plungers arranged with their lower ends adjacent to said exposed surfaces, respectively, springs for pressing said plungers up to prevent normal contact of their ends with said surfaces, insulated sockets in which said plungers may move up and down, and the service-conductor divided into sections and mounted on said plungers.

7. In an electric railway of the described class, the combination, with the line-conductor, of an insulating and supporting casing therefor, consisting of an insulating-sheath surrounding the line-conductor and a supporting-bar of strong material to which said sheath is fastened,

8. In an electric railway of the described class, the combination, with the line-conductor, of an insulating and supporting casing therefor, consisting of an exterior shell of rigid material and an insulating sheath or filling within said shell surrounding the line-conductor.

9. In an electric railway of the described class, the combination with the line-conductor, of an insulating and supporting casing therefor, consisting of an exterior shell made in two parts, the one a metal plate of U-shape in cross-section and the other a channel-bar closing the open side of said U-shaped plate and fixed thereto, and an insulating sheath or filling surrounding the line-conductor and inclosed within said shell.

10. In an electric railway of the described class, the combination, with the line-conductor and its insulating-casing made in sections of convenient length, of means for connecting together the ends of adjoining sections, consisting of conducting fish-plates arranged to lap over the adjacent end portions of the line-conductor, and a hood embracing the end portions of the two sections of casing.

11. In an electric railway of the described class, the combination, with the line-conductor and its insulating-casing, of a plug of insulating material inserted in said casing and formed with a socket extending to and exposing the surface of the line-conductor, and a plunger in said socket adapted, when pressed down, to make contact at its lower end with said conductor.

12. In an electric railway of the described class, the combination, with the line-conductor and its insulating-casing, of a plunger-shell fixed to said casing and insulated thereby from the line-conductor, a plunger in said shell, and a spring for pressing up said plunger.

13. In an electric railway of the described class, the combination, with the line-conductor and its insulating-casing, of a circuit-closing plunger movable up and down and arranged, when pressed down, to make circuit-connection with the line-conductor, a plunger-shell fixed to said casing and having a neck through which the plunger projects upwardly, and a thimble fixed on said plunger and having an annular flange extending downward and embracing the top of said neck.

14. In an electric railway of the described class, a current-collector for the motor-car, consisting of a conducting-disk, and two insulating-disks on opposite sides thereof and of larger diameter to form flanges projecting beyond the periphery thereof, fastened together to form a wheel, and a bearing in which said wheel is rotatively mounted.

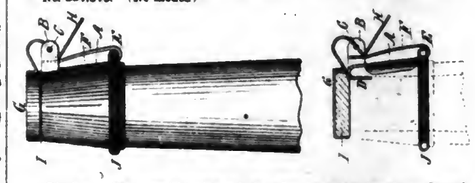
15. In an electric railway of the described class, a current-collector for the motor-car, consisting of the combination, with a collector-wheel having a conducting-journal, of a conducting-bearing for said journal, a bearing-frame carrying said bearing, an insulation interposed between said bearing and said frame, and an electric conductor joined to said bearing.

16. In an electric railway of the described class, the combination, with the motor-car, of a collector-wheel, its bearing-frame, a lever extending longitudinally of the car and to which said frame is swiveled on a vertical axis, and a swiveled connection between said lever and the car-body, arranged also on a vertical axis, whereby the collector-wheel is adapted to travel in an open slot and to adjust itself to changes of direction in said slot.

17. In an electric railway of the described class, the combination, with the motor-car, of a collector-wheel, its bearing-frame, a lever extending longitudinally of the car and to which said wheel is swiveled on a vertical axis, a vertically-swiveled part to which said lever is fulcrumed, whereby the collector-wheel is adapted to travel in an open slot and to adjust itself to changes of direction in said slot, and a spring acting against said lever in such direction as to impart a downward tension to said wheel.

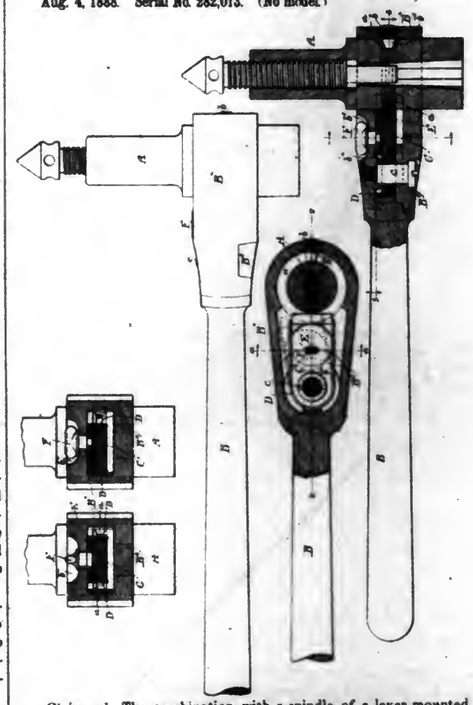
18. In an electric railway, the combination, with an open-slot conduit and a conductor laid therein beneath the slot, of a motor-car and a collector-wheel carried by said car and traveling in said slot, with its periphery riding upon and in conductive contact with said conductor and mounted to turn in a bearing above said slot, whereby the wheel may be lifted out of the slot at will.

400,927. BOTTLE-STOPPER. SOLOMON MARKS, Cincinnati, Ohio, assignor to Rachel B. Hyams, same place. Filed Jan. 28, 1889. Serial No. 297,873. (No model.)



Claim.—The combination of the plate A, carrying jaws B and spring F, cap G, having cushion I, lever H, secured to the cap and pivoted to the jaws, and ring J, as and for the purpose set forth.

400,928. DRILL-BRACE. THOMAS C. MASSEY, Chicago, Ill. Filed Aug. 4, 1888. Serial No. 282,013. (No model.)

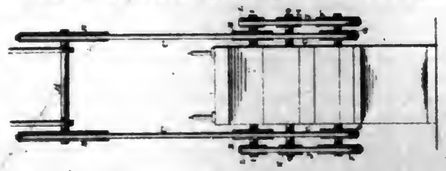


Claim.—1. The combination, with a spindle, of a lever mounted to turn about said spindle, a single pawl mounted upon said lever, said spindle and the free end of the pawl being provided with engaging wedge-shaped surfaces, springs located at opposite sides of said pawl, and a revolving cam-plate acting to hold either of said springs out of engagement with the said pawl, substantially as described.

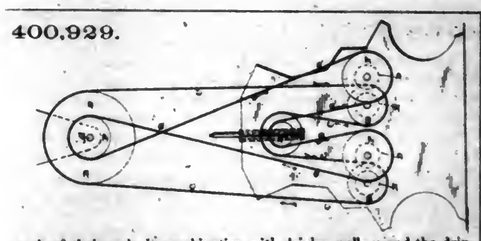
2. The combination, with a spindle provided with a circumferential groove, of a lever adapted to turn about said spindle, a spring-pawl upon the said lever engaged with said groove, and a screw secured in said lever and engaged at its inner end with said groove, substantially as described.

400,929. REDUCTION ROLLER-MILL. MILES MASTERS, Bureau, Ill. Filed Nov. 21, 1887. Serial No. 255,800. (No model.)

Claim.—1. In a roller-mill, the rolls provided with pulleys upon



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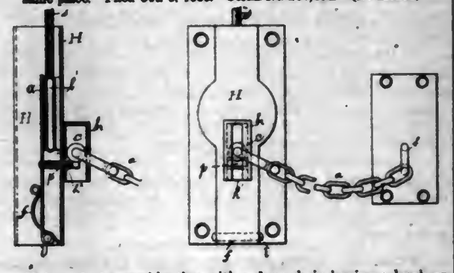
each of their ends, in combination with driving-pulleys and the driving-belts which are applied to the roll-pulleys from above, whereby all of the rolls are driven with an upward pull simultaneously or alike from each end, substantially as shown.

2. The combination of the driving-shaft provided with pulleys and located above the plane of the rolls, and suitable driving-belts extending from the pulleys, with the grinding-rolls provided with pulleys upon each of their ends, and around which the driving-belts pass, and a counter-shaft which extends through the frame and is provided with pulleys upon each of its ends, and around which the driving-belts also pass, whereby the rolls are driven from each end alike from above, substantially as described.

3. The combination of the driving-shaft A, provided with a driving-pulley, B, the two driving-belts, with the grinding-rolls, each provided at each end with a pulley, and a counter-shaft which extends through or above the frame and is provided with pulleys at each end, and around which both of the belts pass, substantially as set forth.

4. The combination of the driving-shaft provided with driving-pulleys, the two driving-belts, reducing-rolls provided with driving-pulleys at each end, a counter-shaft which extends through or above the frame and is provided with pulleys at each end, and around which pulleys the two belts pass, and adjusting devices for the counter-shaft, whereby the pulleys upon the ends of the counter-shaft can be adjusted freely, so as to tighten the two driving-belts, substantially as specified.

400,930. DOOR-CHAIN AND UNCOUPLING DEVICE THEREFOR. HERMANN MAUL, Dresden, Saxony, Germany, assignor to MAX ROST, same place. Filed Oct. 3, 1888. Serial No. 287,484. (No model.)



Claim.—1. In combination with a door-chain having a knob on its detachable end, a casing slotted to receive said knob, a movable shelf or bracket for retaining said knob in said casing, and pneumatic device arranged to move said shelf from a distance, in order to set free said knob and chain, substantially as set forth.

2. A compressible ball, *g*, tube *r*, and expansible cushion *b'*, in combination with a pivoted plate, *a'*, arranged in proximity to said cushion, a shelf or bracket carried by said plate, a spring bearing against the rear of said plate, a casing, which contains said plate and cushion, and is provided in front with a supplemental vertically-slotted casing entered from the rear by said shelf, and a door-chain provided with a knob which enters said slotted supplemental casing from below and rests therein on said shelf or bracket until released, as set forth.

400,931. MANUFACTURE OF BARS OR ROUNDS OF STEEL OR IRON. SIDNEY MCCLOUD, Chicago, Ill. Filed Dec. 22, 1888. Serial No. 294,391. (No model.)



Claim.—1. As a new article of manufacture, a bar or round of steel or iron, comprising multiple layers superposed from the same plate or plates by bending the metal of said plate or plates upon itself, substantially as described.

2. As a new article of manufacture, a bar or round of iron or steel, comprising multiple layers formed by winding a sheet or plate (one or more) of metal upon itself, substantially as described.

3. As a new article of manufacture, a bar or round of steel or iron having the grain of the metal extending in the direction of its length, said bar or round being formed from a plate (one or more) coiled or wound upon itself, substantially as described.

4. As a new article of manufacture, a bar or round of steel or iron formed from a plate (one or more) wound spirally upon itself, substantially as described.

400,932. WHEELED HARROW. DANIEL R. MCSHERRY and HORACE G. SWOPE, Dayton, Ohio, assignors to D. R. McSherry & Co., same place. Filed Jan. 24, 1889. Serial No. 297,490. (No model.)



Claim.—1. In combination with the beam A and the rearwardly-extending drag-bars provided with harrow-teeth, the wheels or runners supporting said beam, and an adjustable seat standard or support mounted upon said beam, whereby the teeth may be raised out of the soil or caused to enter therein, according as the standard is moved forward or backward.

2. In combination with the frame A, supported upon wheels or runners and having the rearwardly-extending drag-bars and teeth, the adjustable seat-standard provided with a seat, and means for locking the said standard in its adjusted positions.

3. In combination with beam A and wheels or runners B, bar C, projecting from the beam A, a seat-standard, D, provided with a seat, E, means for securing the seat-standard to the bar C, and drag-bars provided with harrow-teeth and extending rearwardly from the bar A, as shown.

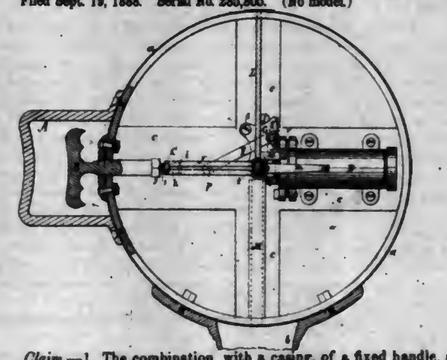
4. In a harrow, the combination, with a frame and its wheels or runners, of a series of drag-bars extending rearwardly of the wheels (or runners) and provided with harrow-teeth, and a seat-standard adjustably secured to the frame in advance of the wheels, (or runners,) as and for the purpose set forth.

5. In a harrow, the combination, with a main frame and its wheels or runners, of the elastic or yielding drag-bars G, projecting in rear of the main frame and provided with harrow-teeth K and an adjustable seat-support, in advance of the bearing-point of the wheels or runners.

6. In combination with beam A and drag-bars G, the clips I, provided with arms *a b*, to clasp the front and rear faces of the beam, and provided also with an inclined bottom, *c*, and a bolt, H, passing through the beam, drag-bar, and clip.

7. The clip I, comprising arms *a b*, to clasp the front and rear faces of the beam, an inclined bottom, *c*, and side flanges, *d d*, provided with lugs i.

400,933. COIN-OPERATED HAND-POWER-TESTING MACHINE. ALBERT C. MEADY, Somerville, and CHARLES B. BOSWORTH, Everett, assignors to the Crosby Steam Gage and Valve Company, Boston, Mass. Filed Sept. 19, 1888. Serial No. 285,805. (No model.)



Claim.—1. The combination, with a casing, of a fixed handle, a movable handle supported in the casing within the fixed handle, a rod adjustably connected to the shank of the movable handle and having in it a notch, *l*, reductions *s s'*, an abutment, *o*, and fixed to it a piston, a cylinder secured to the casing to receive the piston, a spring operated by the piston-rod and handle, and an automatic locking device arranged to hold said rod from movement, substantially as shown and set forth.

2. The combination, with a casing provided with a chute, M, and stop I, of a handle fixed thereto, a rod provided with a handle, piston provided with the notch *l*, and the reductions *n n'*, and abutment *o*, a cylinder secured within the casing and provided with heads, a spring arranged within the cylinder and operated by the rod and piston, a dog pivoted in the casing, grooved, and provided with a tooth, *l*, spring *m*, and screw *i*, substantially as shown and set forth.

3. The combination, with a casing, of a handle fixed thereto, a rod mounted therein and provided with a piston and handle, a cylinder to receive said piston, a spring arranged within the cylinder to resist the movement of said piston in a direction toward the center of the case, a link pivoted to the rod and connected to a toothed sector, the said sector, a pinion, H, with which it engages, the arbor *t*, and index *w*, substantially as shown and set forth.

4. The combination, with a casing, of a handle fixed thereto, a rod provided with a handle and piston supported in said casing and in a cylinder secured thereto, the said cylinder, a spring arranged therein, as shown, the link F, pivoted to the rod and connected to the toothed sector G, the said sector, the pinion H, its arbor *t*, and index-hand *w*, provided with the pin 4, the auxiliary hand *x*, its pivot, the friction-spring *z*, glass plate *y*, and button *b'*, substantially as shown and set forth.

5. The combination, with a casing provided with the chute M and stop I, of a handle fixed thereto, a rod provided with a handle and piston having a notch, *l*, and reductions *n n'*, and abutment *o*, and supported in the frame and in a cylinder, the said cylinder, a spring arranged therein for the purpose described, and operated by said rod, a dog grooved, as shown, and provided with a tooth, *k*, adjusting-screw *i*, and spring *m*, and pivoted within the frame, the guide-tube L, the link F, pivoted to the rod, provided with a slot, and connected to a toothed sector, the said sector, the pinion H, with which it engages, the pinion-arbor *t*, index-hand *w*, provided with pin 4, the auxiliary hand, and the mechanism applied to the glass plate for supporting it in position, all arranged with a case, substantially as shown and set forth.

6. The rod C, provided with the notch *l*, reductions *n n'*, and abutment *o*, handle, and piston, in combination with the cylinder and spring arranged therewith, as shown, the grooved dog provided with a tooth, an adjusting-screw, and a spring, and pivoted within the casing, the link F, the toothed sector G, engaging the pinion H, its arbor and hand, the auxiliary hand and mechanism for holding it, the button by which it can be turned back to starting-point, the casing and the handle fixed thereto, the stop I, the chute M, and the guide-tube L, all being arranged within a casing, *a*, substantially as shown and set forth.

7. The dog J, provided with the groove *k*, to receive the coin to unlock the dog, as described, and the tooth *l*, adjusting-screw *i*, and the spring *m*, said dog pivoted within the frame, in combination with the rod C, provided with the notch, reductions, abutment, piston, and handle, the latter adjustably connected to the rod, the cylinder and spring arranged about the rod and piston, essentially as shown, the link F, the toothed sector and the engaging pinion, its arbor and index-hand, and mechanism connected therewith by which it can be moved, the casing *c*, provided with the stop I, chute M, and guide-tube L, all being arranged with the casing and supported in the case, having a handle fixed thereto and to the frame, substantially as shown and set forth.

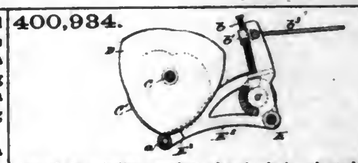
8. The combination, with a casing provided with a stop, I, of a rod, C, mounted therein and having a notch, *l*, reductions *n n'*, abutment *o*, and a piston, as shown, a cylinder secured to the casing to receive the piston, a spring operated by said rod and piston, a dog pivoted within the casing and provided with a groove, an adjusting-screw, spring, and a tooth to operate with said rod, as described, a link, F, pivoted to the rod and to a sector, the said sector, and the mechanism connected therewith to operate the index and registering hands, and the tube L, all being arranged in a case and to operate with a coin deposited in the dog, substantially as shown and set forth.

9. The combination, with a casing, of a handle fixed thereto, a rod mounted in the casing, movable therein, and provided with a handle, a spring operated by said rod, a link pivoted to the rod and to a toothed sector, the said sector pivoted to the casing, a pinion engaging said sector secured to an arbor supported in the casing, the said arbor, and the mechanism connected thereto for indicating on the dial the pressure applied to the handle and rod, substantially as shown and set forth.

10. The combination of the rod C, mounted in the frame, the spring operated thereby, the toothed sector G, pivoted to the frame, the link F, connecting the rod and sector, the pinion H, engaging the sector, the arbor *t*, and mechanism connected therewith for indicating the pressure applied to the rod, substantially as shown and set forth.

400,984. RING-SPINNING FRAME. JOHN T. MEATH, Taunton, Mass. Filed Dec. 3, 1887. Serial No. 256,891. (No model.)

Brief.—The invention has for its object to improve the construc



tion of the winding motion, whereby it is adapted for warp or for weft, and of the frame to permit the easy adjustment or removal of the spindle-driving drum.

Claim.—1. The lifter or builder-rail and the bifurcated quadrant-lever having stud-receiving openings therein, a quadrant-screw, nut, and pulley thereon, and intermediate connections between it and the said rail to raise the latter and permit it to descend, combined with two cams side by side, as C' and D, in line with and adapted to actuate the bifurcated quadrant-lever, either of which cams may be made to act upon one of the bifurcations of said lever by means of a stud placed in the opening therein to move the said rail for either the warp or weft wind, substantially as described.

2. The rail B, the shaft C, the two cams C' and D, fixed side by side thereon for warp and weft wind, respectively, and the bifurcated quadrant-lever having a screw, a nut, and a pulley, and a removable stud, *a*, which may be adjusted to be acted upon by either of the said cams, combined with the screw-threaded draw-bar b^3, adapted to be attached to the quadrant-nut either directly or through a chain or flexible connection, and with the rod c', the stud, and intermediate connections between the said rod and the rail, substantially as and for the purpose described.

3. The combination, with the lifting-rod, of the rock-shaft c^4, having the ears 18 19, and cross-bar 20 of the arm c^5 connected thereto, and having its inner end extended under and engaging the said shaft, substantially as described.

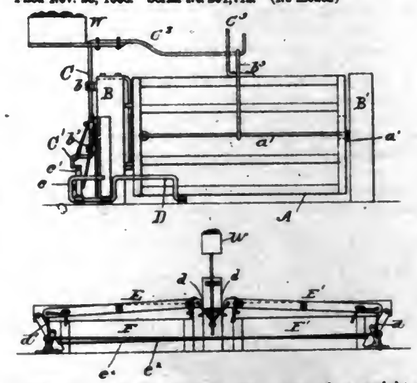
4. The rod c' and rock-shaft having the ears 13 and 14, and cross-bar 15 to connect them, combined with the arm c^5, having the foot and connected to the said rock-shaft, substantially as described.

5. The combination, with the intermediate stand, G, of a spinning-frame, the said stand being open at its center, and the drum, of the independent bearing therefor transversely adjustable by means of the slotted and removable bar *h*, to which it is removably attached by the bolt 31, whereby the drum may be lowered to the floor, substantially as described.

6. The combination, with the intermediate stand, G, of a spinning-frame open at its center, and the drum, of the independent removable bearing consisting of the parts 25, 28, and 30, adjustably bolted together and supported by the cross-bar *h*, removably attached to said stand, whereby the drum may be lowered to the floor, and with the detachable legs *m*, substantially as described.

7. The combination, with the stand G, having conical seats therein, of the cross-bar *h*, provided with bosses adapted to fit into the said seats to enable the cross-bar and stand to be readily assembled, the bearing adjustable upon the cross-bar, and the bolts 36, substantially as described.

400,985. AUTOMATIC GATE. WILLIAM H. MILLER, Enon, Ohio. Filed Nov. 23, 1888. Serial No. 291,712. (No model.)



Claim.—1. The combination, with a gate, of an upright shaft supported in a bearing in which it is adapted to turn and also move in a vertical direction, arms extending in opposite directions from said shaft in the same plane with the gate, a weight on said shaft, wheel-irons on either side of said gate, connections, substantially as described, from said wheel-irons to the rear extending arm, said connections having a flexible portion which extends downwardly and rearwardly to connect with the said arm, and a connection from the forwardly-extending arm to said gate, substantially as specified.

2. The combination, with the gate, of an upright shaft having oppositely-extending arms connected, respectively, to the said gate and to pivoted fingers on opposite sides thereof, as described, and the wheel-irons adapted to engage and move said fingers when turned toward the gate and to be disengaged from said fingers when turned from the gate, substantially as specified.

3. The combination, with the gate and the loop-connecting piece attached thereto, of the upright shaft having the forwardly-extending arm extending through said loop, the latch on the said gate connected to said arm, and wheel-irons on either side of said gate connected to said upright shaft, substantially as described, so that an inward movement of either of said wheel-irons will cause the said shaft to turn upon its axis and move vertically in its bearings, substantially as and for the purpose set forth.

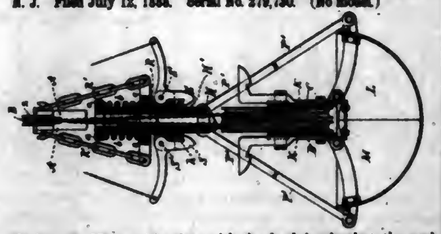
4. The combination, with the gate, the upright shaft and its oppositely-extending arms, as described, of the wheel-irons, each having a finger adapted to be moved by it connected to the said upright shaft, the pivoted stops to engage said wheel-irons when turned toward said gate, and connections from the respective wheel-irons to the stops of the other wheel-irons, substantially as and for the purpose set forth.

5. The combination, with the gate having the loop-connecting piece attached thereto, of the upright shaft journaled in suitable bearings, in which it is adapted to move longitudinally, provided with oppositely-extending arms, one of which passes through said loop-connection and is connected to the latch on said gate, the pivoted operating-levers forming the connection between wheel-irons on the opposite sides of the said gate and the other extended arm, and means, substantially as described, for holding each of said wheel-irons in a downward position when turned toward said gate until the opposite wheel-iron is turned in the opposite direction, substantially as specified.

6. The combination, with the gate, of the vertical shaft having the oppositely-extended arms, the loop-connection and latch on the said gate connected to one of said arms, and the pivoted levers connected to the other of said arms, the wheel-irons having fingers connected to said operating-levers, pivoted stops adapted to engage said wheel-irons and connections from each of said wheel-irons to the pivoted stop of the other wheel-iron, substantially as and for the purpose set forth.

7. The combination, with the gate, of the upright shaft having the oppositely-extended arms, a connection from one of said arms to the gate and also to the latch of said gate, supporting-frames on each side of said gate having operating-levers pivoted thereto, wheel-irons having pivoted fingers connected to said operating-levers, pivoted stops on the said supporting-frames to engage said wheel-irons, and connections, substantially as described, from each wheel-iron to the pivoted stop of the other wheel-iron, substantially as specified.

400,936. DREDGING-BUCKET. CHARLES A. MOREE, Bloomfield N. J. Filed July 12, 1888. Serial No. 279,790. (No model.)



Claim.—1. The combination, with the dredging-bucket, the conical flange, the runner, and the latches, of suspending chains or links, and a spring intervening between the latches and the suspending device, substantially as and for the purposes set forth.

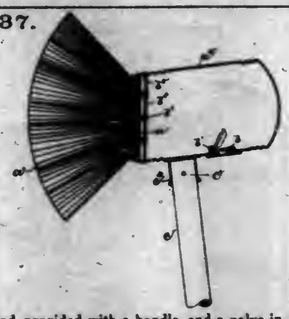
2. The combination, with the dredging-bucket and the conical flange upon the head-block thereof, of a tubular runner, through which the hoisting-chain of the bucket passes, latches pivoted upon the said runner, a follower around the runner, links for suspending the same, a spring around the tubular runner, and a flange connected with said tubular runner and acting against the end of the spring, substantially as set forth.

400,937. FOUNTAIN WINDOW-CLEANER. HENRY W. MUNCH, Somerville, Mass. Filed May 14, 1888. Serial No. 273,798. (No model.)

Claim.—1. The combination, with a brush composed of a perforated head and bristles attached thereto, of a receptacle or reservoir secured to the said head and provided with a handle, and an automatically-operated valve, substantially as described.

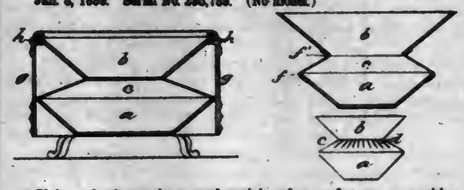
2. The combination, with a brush composed of a perforated head and bristles attached thereto, of a receptacle or reservoir secured to

400,937.



said head and provided with a handle, and a valve in said reservoir intermediate of the said handle and end of the reservoir, whereby the latter may be filled by dipping it into a pail, substantially as described.

400,938. CUSPIDOR. DANIEL H. MURPHY, Hartford, Conn. Filed Jan. 6, 1888. Serial No. 295,789. (No model.)

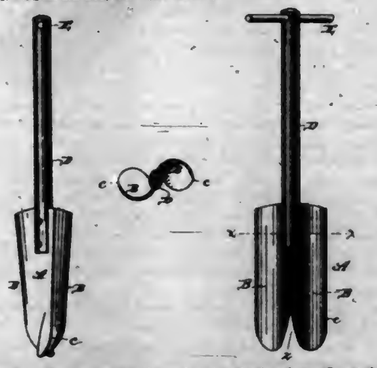


Claim.—1. As an improved article of manufacture, a cuspidor formed of paper, having a base, *a*, shield *b*, and a flexible cover, *c*, joining the base and shield, with flexible seams at the joints, substantially as specified.

2. As an improved article of manufacture, a cuspidor formed of paper, having a base, *a*, shield *b*, and a cover, *c*, joining the base and shield, with flexible seams at the joints, said cover being slitted to render it flexible, substantially as specified.

3. In combination, in a cuspidor, a shell, *g*, with an overturned top and an inward-projecting flange below the top, and an inner receptacle having a base, *a*, a shield, *b*, and a flexible cover, *c*, joining the base and shield, substantially as specified.

400,939. POST-HOLE AUGER. NELSON NEWMAN, Springfield, Ill., assignor of one-half to George A. Sanders, same place. Filed July 25, 1888. Serial No. 280,973. (No model.)

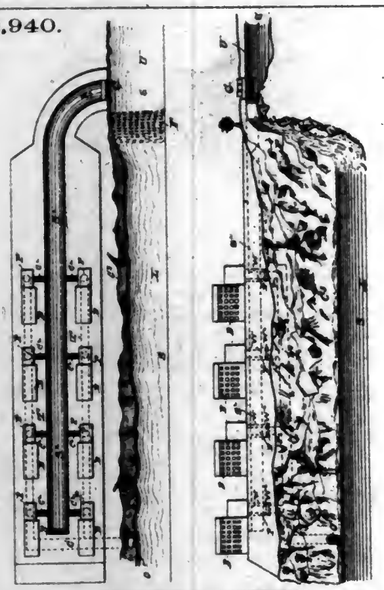


Claim.—The auger-head made of a single piece of metal and having the oppositely-inclined blades B, concavo-convex in cross-section, said blades being further provided with the separated rounded lower ends and with the sharpened cutting-edges C, substantially as described.

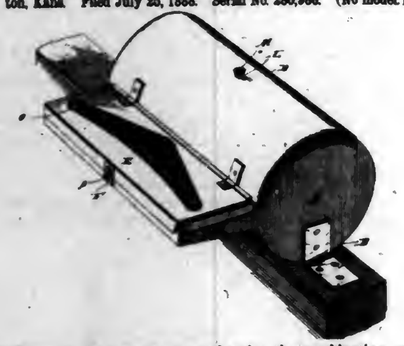
400,940. SYSTEM FOR UTILIZING WATER-POWER. WILLIAM ORR, Troy, N. Y. Filed Jan. 15, 1889. Serial No. 296,498. (No model.)

Claim.—The system for utilizing water-power herein described, consisting of a sluiceway arranged to receive water from the elevated level of a stream or pond, a tunnel-form tail-race having a lower level than the sluiceway, a series of wheel-pits containing turbine wheels having their stand-pipes connected with and so as to receive water from said sluiceway, and each provided with a vertical discharge or draft pipe connecting the discharge from the wheels with the tunnel-form raceway, substantially as and for the purposes set forth.

400,940.



400,941. SPONGE-CUP AND SEALER. JAMES C. PARKER, Woodston, Kans. Filed July 25, 1888. Serial No. 280,966. (No model.)



Claim.—1. In a sponge-cup and sealer, the combination, with a receptacle containing a moistened absorbent material, of the movable perforated spring-actuated cover, covering an opening in the receptacle and arranged adjacent to the said absorbent material, and adapted, when depressed, to compress the absorbent material and force the moisture therein through the perforations, the envelope or other article to be moistened being arranged over the perforations on the outer side of the cover, substantially as specified.

2. In a sponge-cup and sealer, the combination, with a suitable reservoir, of the adjoining receptacle provided with a movable cover having an opening, N, therein, covered by a screen, O, and the absorbent material H in the reservoir extending into the receptacle under the said opening, substantially as specified.

3. In a sponge-cup and sealer, the combination, with the reservoir, of the adjoining receptacle having a movable cover provided with an opening, N, the draining-plate located in the receptacle slightly above the bottom of the same, and the absorbent material in the reservoir, having an extension which rests on the said draining-plate, substantially as specified.

4. In a sponge-cup and sealer, the combination, with the reservoir, of the receptacle having its bottom inclined toward the reservoir, the inclined draining-plate J, the movable cover on the receptacle, and the absorbent material in the reservoir extending over the draining-plate, substantially as specified.

5. In a sponge-cup and sealer, the combination, with the reservoir, of the receptacle having its bottom inclined toward the reservoir, the draining-plate located above the bottom of the receptacle and inclined toward the front of the same, the said plate being corrugated or fluted, for the purpose specified, and removed from the front of the receptacle to form a slot, K, the cover on the receptacle, and the absorbent material, arranged as and for the purpose specified.

6. In a sponge-cup and sealer, the combination, with the reservoir and the adjoining receptacle having a sponge or absorbent arranged therein, of the sliding cover fitting on the open front side on the reservoir and the swinging cover hinged to the front edge of the sliding cover and fitting over the receptacle, substantially as specified.

7. In a sponge-cup and sealer, the combination, with the reservoir and the adjoining receptacle, of the sliding cover D, fitting over the opening in the reservoir and provided with an aperture having a stopper, and the swinging cover hinged to the front edge of the sliding cover and provided with an opening, N, substantially as specified.

8. In a sponge-cup and sealer, the combination, with the reservoir and the adjoining receptacle and the absorbent material arranged therein, of the sliding cover on the reservoir, the swinging cover hinged to the front edge of the sliding cover and provided with a slotted catch, F, fitting over a stud on the receptacle, and the spring-flange on the front edge of the sliding cover extending under the swinging cover and adapted to hold the same normally raised, substantially as specified.

400,942. WAGON-BRAKE. PHILIP PILON, Hinesburg, Vt. Filed Jan. 2, 1889. Serial No. 295,250. (No model.)



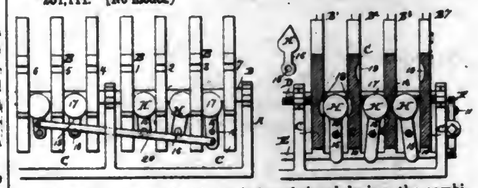
Claim.—1. The combination, with the running-gear and the plates M, secured upon the ends of the bolsters, of the levers supported by the running-gear and carrying the brake-shoes, the supplemental reach connected to said levers, the secondary bolsters secured to the supplemental reach, and the plates J, secured to said secondary bolsters and sliding on the plates M, as set forth.

2. In a wagon-brake of the character described, the combination of the plate M, having the dovetailed ribs on its side edges, the plate J, having ribs on its under side engaging said dovetailed ribs, and the anti-friction rollers arranged between the said plates, as set forth.

3. In a wagon-brake of the character described, the combination of the plate M, having the ribs L and the stops N, the plate J, having ribs on its under side engaging the ribs L and stops N, and rollers arranged between the said plates, as specified.

4. The combination, with the running-gear, of the levers mounted thereon and carrying the brake-shoes, the sliding supplemental reach H, mounted on the running-gear, the cross bars G G, secured to said supplemental reach, and the rods F, connecting said cross-bars with the levers, as set forth.

400,943. INTERLOCKING DEVICE FOR RAILROAD-SWITCHES. HOBART B. POTTER, Hillburn, N. Y. Filed Sept. 30, 1887. Serial No. 251,111. (No model.)



Claim.—1. In interlocking switch and signal devices, the combination, with two switch or signal operating levers, each having a recess located in different positions with respect to each other, of a pivoted locking-piece adapted to said recesses and to be locked and unlocked therefrom by the movement of one of the levers, substantially as described.

2. In interlocking switch and signal devices, the combination with three adjacent levers, of a pivoted locking-piece mounted between each of the levers and engaging one of the levers and adapted to be locked thereto and unlocked by the movement of each of the other levers, substantially as described.

3. In interlocking switch and signal devices, the combination, with three adjacent levers, of a pivoted locking-piece mounted between each of the levers, one locking-piece engaging with one lever and the other locking-piece engaging with either of the other two levers, whereby the movement of one lever will lock the locking-piece to one lever and unlock the other locking-piece from the other lever, substantially as described.

4. In interlocking switch and signal devices, the combination, with two or more levers, each having one or more recesses therein, and their respective pivoted locking-pieces adapted to said recesses, of a rod, 20, connecting two locking-pieces together, whereby the movement of one locking-piece to free one lever will prevent the other locking-piece from moving to free the other lever, substantially as described.

5. The combination of the levers B^5 and B^7, each provided, respectively, with a recess, as 18 19, and a locking-piece adapted to engage with one recess in one lever in one position of the levers and with the other recess in the other lever when the position of the levers is changed, substantially as described.

6. The combination of the levers B^5 and B^7, each provided, respectively, with a spherical recess, as 18 19, and a locking-piece provided with a spherical-shaped head adapted to engage with the recesses in said levers, substantially as described.

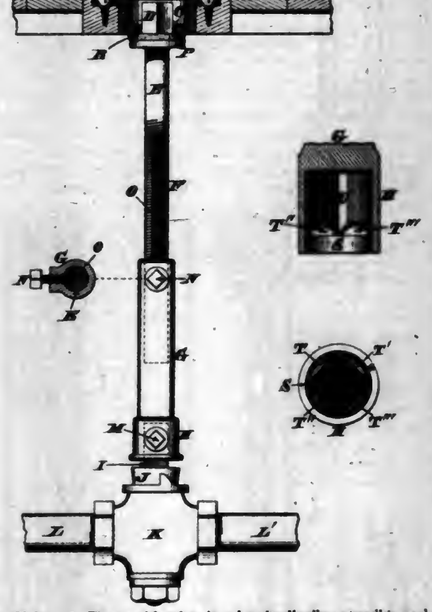
7. The combination of the levers B^5 and B^7, each provided, respectively, with a spherical recess, as 18 19, and a pivoted locking piece provided with a spherical-shaped head adapted to be vibrated to engage with the recesses in said levers, substantially as described.

8. The combination, with two or more switch or signal operating levers having enlargements C, formed therewith, of a pivoted locking-piece contacting with the enlargement of one lever and adapted to be locked thereto and unlocked therefrom by the movement of another lever, substantially as described.

9. The combination, with switch or signal operating levers, as B^5 B^7, having enlargements formed therewith upon the side of their fulcra opposite the operating or long arm of the levers, each of said enlargements having recesses therein, of a pivoted locking-piece adapted to said recesses and to be locked therein and unlocked therefrom by the movement of one of the levers, substantially as described.

10. The combination, with a plurality of interlocking switch or signal levers each having a notch and their respective locking-pieces adapted to recesses in the levers, of a movable bar provided with tongues for engagement with the notches of levers, whereby all the levers may be either simultaneously locked or unlocked independent of the locking-pieces, substantially as described.

400,944. FLOOR-KEY FOR COCKS. JAMES POWELL, Cincinnati Ohio. Filed Jan. 21, 1887. Serial No. 225,028. (No model.)



Claim.—1. The combination, in a longitudinally-extensible cock-key, of the nut-section G, having a socket, H, and clamp-screw N, and the screw-threaded section E F, engaged with said nut-section G, this section E F being provided with a turning device at its outer end, and having a longitudinal groove, O, that admits the point of said screw N, as described.

2. A cock-key provided with a socket whose outer end has a cylindrical bore, S, terminating with four concaves, T T' T'' T''', where the inner end of said bore joins the square chamber U, as herein described.

400,945. RETAIL-CASE AND SUPPORT FOR STORES. GEORGE W. PYLE, Geneva, Ind. Filed Sept. 12, 1888. Serial No. 285,214. (No model.)

400,945.



Claim.—1. In a retail case for stores, the combination of a top or counter having a recess or opening therein, a slide or cover to close said opening, a holder or compartment thereunder, and a revolving base for carrying said holders.

2. In a retail-case for stores, the combination of the top or counter having a recess or opening therein, a slide or cover therefor, serving the double purpose of closing the opening in the top and the upper end of one of the holders at the same time, a series of holders or combinations, and a revolving base, substantially as described.

3. In a retail-case for stores, the combination of a circular case, A, top A', having an opening, G, cover H, holder E, shaft C, extending above the top, shelf J, and arms K, substantially as and for the purposes described.

400,946. LAST. JOHN REBECK, Gladstone Terrace, Wellingborough Road, Rushden, Higham Ferrers, County of Northampton, England. Filed Sept. 24, 1888. Serial No. 286,268. (No model.) Patented in England Jan. 9, 1888, No. 337.



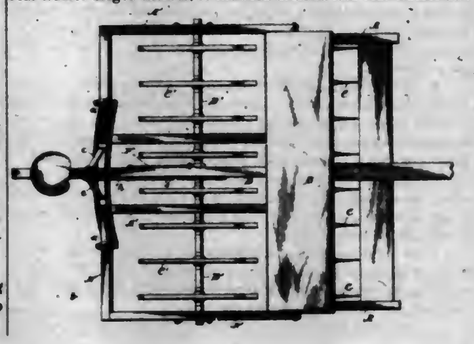
Claim.—1. In combination with a last which has a recess in its bottom, a spiked plate set entirely into said recess, the edge of said plate being cut away, as at b', for the purpose set forth.

2. In combination with a last recessed in its bottom, a spiked plate set into said recess with downwardly-projecting spikes, the bottom of the last being provided with perforations, through which the points of said spikes protrude, said last being constructed in removable sections, exposing the spiked plate in the center, in order that the upper part of the last and the spiked plate may be removed before removing the bottom section of the last, substantially as set forth.

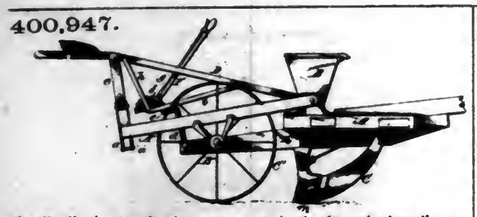
400,947. GRAIN-DRILL. JOHN W. RHODES, Havana, Ill. Filed Oct. 9, 1888. Serial No. 287,686. (No model.)

Claim.—1. In a grain-drill, the combination, with the runner-frame, of the rear frames hinged thereto, the axles journaled in the hinged frames, the press-wheels mounted thereon, and the distributing-bar pivotally connected at its opposite ends to the rock-arms, said arms being pivoted to the ends of the rear frames, substantially as and for the purpose specified.

2. In a grain-drill, the combination, with the front frame and the rear frames hinged thereto, of the rock-arms on said rear frames and



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the distributing-bar for the seat-support, having its ends pivotally connected to the free ends of said rock-arms, substantially as and for the purpose specified.

3. In a grain-drill, the combination, with the front frame and the rear frames hinged thereto, of the seat-beam pivoted to the seed-box on the pivot of the rear frames, substantially as shown and described.

4. In a grain-drill, the combination, with the front frame and the rear frames hinged thereto, of the seat-beam pivoted on the pivot of the rear frames and the rigid seat-supports connected to the seat-beam near its rear end and to the rear frames, substantially as described.

5. A runner for grain-drills, having the front portion only of its shank extended to the bottom of the runner, substantially as and for the purpose specified.

6. In a grain drill, the combination, with the axles and wheels, of the front frame having its main beam extended to the rear of said axles, substantially as and for the purpose specified.

400,948. FASTENING FOR GLOVES. WILLIAM S. RICHARDSON, Boston, Mass. Filed July 30, 1888. Serial No. 281,468. (No model.)

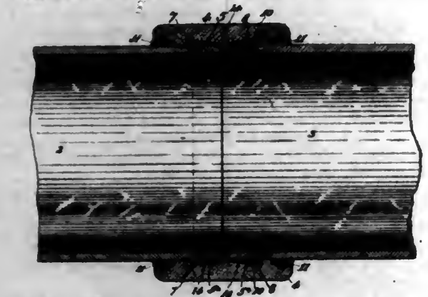


Claim.—1. In a fastening for gloves and other articles, the member having the socket *b*, held at the apex of a conical piece, b^3, the conical piece b^3, collet b^4, cap b^5, and eyelet C, substantially as described.

2. The combination of the cap b^5, the collet b^4, the cone-piece b^3, and socket *b*, held at the apex of the cone, substantially as described.

3. The combination of the cap b^5, the collet b^4, the cone-piece b^3, the socket *b*, held at its apex, and the eyelet C, with a ball member, A, substantially as described.

400,949. PIPE-COUPLING. GEORGE N. RILEY, Braddock, Pa. Filed Sept. 8, 1887. Serial No. 249,074. (No model.)



Claim.—1. In a pipe-coupling, a pipe having an encircling sleeve or socket provided with a calking-recess and inclosed movable catch adapted to grip and hold the end of the opposite pipe during the insertion of the calking or packing, substantially as and for the purposes described.

2. In a pipe-coupling, the combination, with the pipes, of an encircling sleeve having calking-recesses at its opposite ends, and inclosed movable spring-catches adapted to grip the ends of the pipes when inserted in the sleeve and hold the same during the application of the calking or packing, substantially as and for the purposes specified.

3. In a pipe-coupling, the combination of a pipe having a catch-notch, an encircling sleeve provided with a catch-recess which is enlarged at its end, and an interposed spring-catch, substantially as and for the purposes specified.

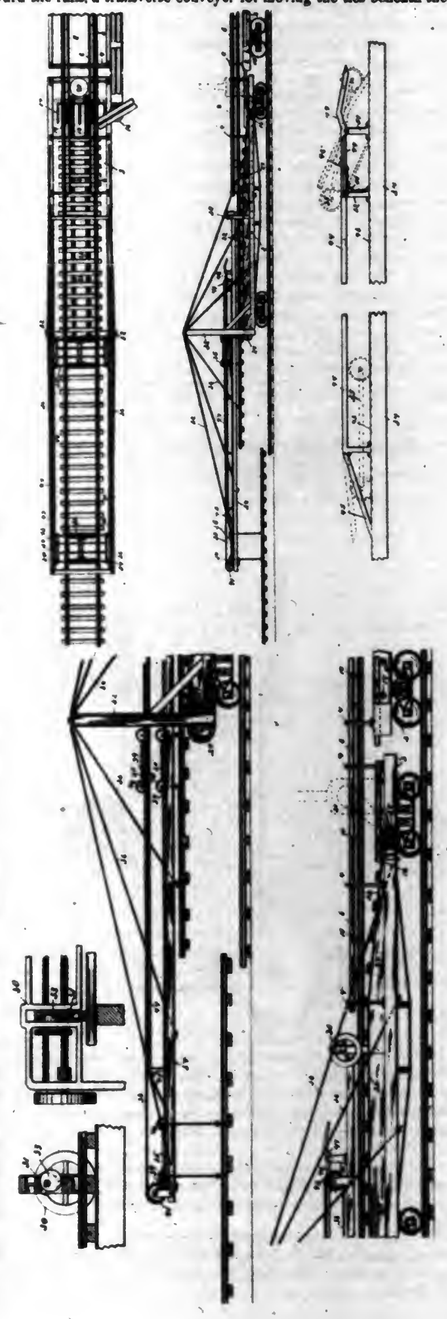
4. In a pipe-coupling, the combination of a pipe having a catch-notch with inclined bottom, an encircling sleeve provided with a catch-recess enlarged at its end, and an interposed spring-catch, substantially as and for the purposes specified

5. In a pipe-coupling, the combination of pipes having a catch-notch, a sleeve having a catch-recess, and an interposed catch having its hook end rounded, substantially as and for the purposes specified.

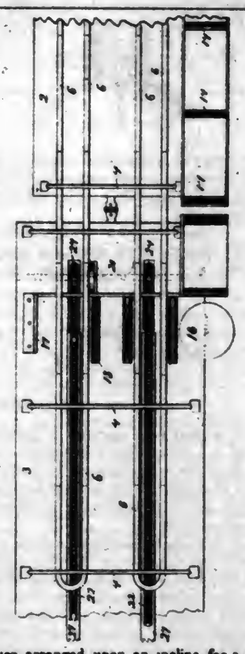
400,950. TRACK-LAYER. SOLOMON W. ROBERTS and EDWARD P. CALDWELL, Minneapolis, Minn. Filed Mar. 5, 1888. Serial No. 266,242. (No model.)

Claim.—1. The combination, in a track-layer, of carriers for moving forward the rails at the required gage for the track, means for introducing the ties beneath the rails, and a conveyer for moving forward the ties and bringing them against the under surfaces of the rails, substantially as described.

2. The combination, in a track-layer, of carriers for moving forward the rails, a transverse conveyer for moving the ties beneath the



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rails, and a conveyer arranged upon an incline for a portion of its length and adapted to carry the ties against the under surface of the rails, and then to move forward the ties and rails together, during which latter operation they may be spiked together.

3. The combination, in a track-layer, of a car or platform, a conveyer traveling longitudinally on said platform, upon which the cross-ties are distributed and by which they are carried forward, and suitable carriers delivering the rails at the required gage upon the cross-ties while said ties are upon the conveyer, substantially as described

4. The combination, in a track-layer, of a car or platform, a conveyer traveling longitudinally of said platform, upon which the cross-ties are distributed and by which they are carried forward, suitable carriers delivering the rails at the required gage upon the cross-ties while the said ties are on the conveyer, and a spiker for fastening the rails to the cross-ties as they are brought in contact, as described.

5. The combination, in a track-layer, of a car, a conveyer traveling longitudinally of said car for distributing the ties, carriers delivering the rails upon said ties while said ties are upon the conveyer, the projecting or overhanging frame secured to the car and provided with a track or tramway, and a truck traveling on said track and adapted to receive the completed sections from the conveyer and deliver them upon the road-bed, substantially as described.

6. The combination, in a track-layer, of a car, a frame supported upon said car and projecting longitudinally in front thereof, trucks arranged to travel on said frame, a suitable track, 43, on which the trucks are drawn in one direction, and the stationary track 44, arranged over said track 43, and provided with switches 45 and 47 for transferring the trucks from one track to the other, substantially as described.

7. The combination, in a track-layer, of the track 43, the track 44, arranged above said track 43, and provided with the switches 45 and 47, the driving-chain 38, and the carriage 35, arranged to be moved forward on the lower track and to be returned upon the upper track, substantially as described.

8. The combination, in a track-layer, with the track 43 and the track 44, arranged above the track 43, of the carriage 35, arranged to travel on either of said tracks, and the driving-chain 38, connected to said carriage, substantially as described.

9. The combination, with the track 43, of the track 44, arranged above said track 43, the switch 45, pivoted in line with the track 44 and adapted to rest on said track 43, the carriage 35, arranged to travel over said tracks, the endless driving-chain 38, the sprockets 41, and the connecting-chain 39 between said chain 38 and said carriage and adapted to pass around said sprockets, for the purpose set forth.

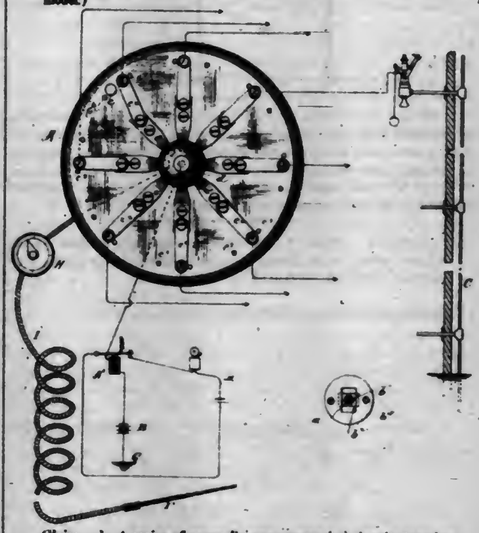
10. The combination, with the tracks 43 and 44, arranged one above the other, of the automatic switches 45 and 47, arranged at the ends of said upper track, the carriage and the endless driving-chain connected therewith, whereby said carriage may be moved over said tracks and automatically transferred from one to the other, substantially as described.

11. The combination, with the car 2, of the tracks 6, extending over said car, and the carriages 8, arranged to travel on said tracks and provided with the grippers 10, adapted to hold the rails, substantially as described.

12. The combination, with the car 2, of the tracks 6, extending for ward and back over said car and provided with the curved portion connecting its forward ends, and the carriage 8, arranged to travel on said tracks and provided with the grippers 10, adapted to hold the rails, substantially as described.

13. The combination, in a track-layer, with the cars 2 and 3, of the tracks 6, extending forward over said car 2, and provided with the carriages 8, adapted to support and carry the rails, of the conveyer 22, arranged upon said car 3, and adapted to move forward the cross-ties and distribute them beneath the rails as they are moved forward by the carriages 8, a spiker, 30, arranged upon the car 3 and adapted to spike the rails and ties together, the projecting frame 34, supported upon the forward end of said car 3, and the carriages 35, arranged upon said frame and adapted to take the completed sections of track from said conveyer-frame 2 and move them forward and deposit them upon the road-bed, substantially as described.

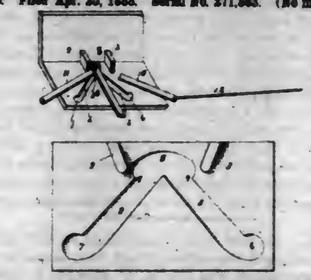
400,951. ELECTRIC-CIRCUIT-TESTING DEVICE. MINER ROBINSON, Newton, Mass. Filed June 11, 1888. Serial No. 276,709. (No model.)



Claim.—1. A series of normally-open grounded circuits terminating at a testing-board, gas-igniting apparatus in said circuits, a series of manually-operated switches on said board for connecting the circuits with a generator, a sparking-coil between the circuits and the generator, and a local bell-circuit adapted to be closed by the sparking-coil, as set forth.

2. The base or board A, having central post, *a*, the knob *d*, strips c' and c^2, and contacts *c*, for the purpose set forth.

400,952. AUTOMATIC GATE. JOHN C. ROCK, near West Liberty, Ohio. Filed Apr. 26, 1888. Serial No. 271,863. (No model.)

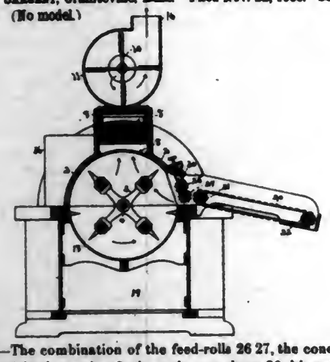


Claim.—1. The combination, with a gate, of the hinge-plate having the V-shaped guide-slot (formed with the oval recess 8 at its apex, the rounded ends of which project beyond corners 9) and also provided with fulcrums 2 and 3, levers 10 and 11, pivoted to the gate-

pintle, and rods 12, connecting said levers to the wheel-irons, all substantially as shown and described.

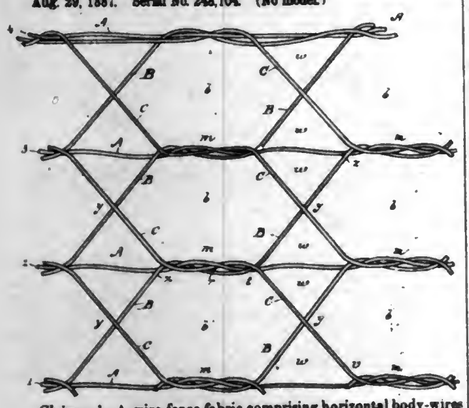
2. The combination of the gate having an upper hinge-plate forming a brace for the stay-rods, a spring-latch, and the sleeve 23, surrounding the latch-bolt, for supporting the gate when closed, with the lower hinge-plate having the V-shaped guide-slot (formed with the oval recess 8 at its apex, the rounded ends of which project beyond corners 9) and also provided with fulcrums 2 and 3, levers 10 and 11, pivoted to the gate-pintle, and rods 12, connecting said levers to the wheel-irons, all substantially as shown and described.

400,953. CONE-DUSTER FOR FIBROUS SUBSTANCES. FREDERICK G. SARGENT, Graniteville, Mass. Filed Nov. 22, 1888. Serial No. 291,585. (No model.)



Claim.—The combination of the feed-rolls 26 27, the cone-duster 3, provided with the casing 2, the valve or door 30, hinged to the casing above the feed-rolls, the screen 8 above the cone-duster, its inclosure 9, and the suction-fan connected with said inclosure and adapted to create a current of air from said valve 30 through said screen and inclosure, substantially as described.

400,954. WIRE-FENCE FABRIC. BENJAMIN SCARLES, Clinton, Mass., assignor to the Clinton Wire Cloth Company, same place. Filed Aug. 29, 1887. Serial No. 248,104. (No model.)



Claim.—1. A wire-fence fabric comprising horizontal body-wires and diagonal crossing filling-wires, forming alternately a vertical series of hexagonal meshes and a vertical series of triangular meshes, the joint between said wires being formed by an interbraiding of the filling-wires with one of the body-wires, substantially as described.

2. A wire-fence fabric comprising horizontal body-wires and diagonal crossing filling-wires, forming alternately a vertical series of hexagonal meshes and a vertical series of triangular meshes, the joint between said wires being formed by an interbraiding of the filling-wires with one of the body-wires, said fabric having a selvage composed of the outer horizontal body-wire interbraided with the filling-wires, which respectively extend along said body-wire a distance equal to the space between two hexagonal meshes, substantially as described.

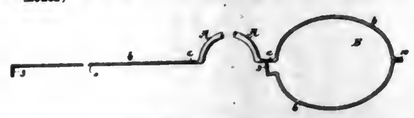
400,955. PROCESS OF SECURING RIGID SOCKETS IN RUBBER PIPES. AUGUSTUS D. SCHLESINGER, College Point, assignor to the India Rubber Comb Company, New York, N. Y. Filed Jan. 31, 1888. Serial No. 262,518. (No model.)

Claim.—The process of securing sockets in necks and pipes herein described, which process consists in inserting a hard-rubber socket, B, in an unvulcanized neck or pipe, A, having a flange, a, and



in then, by one operation, vulcanizing the unvulcanized rubber around and on top of the socket, thereby intimately uniting them, and forming said rubber neck or pipe into a holder and washer for the socket, substantially as specified.

400,956. SPECTACLE OR EYEGLASS FRAME. JAMES E. SEARING, New York, N. Y. Filed Aug. 19, 1886. Serial No. 211,300. (No model.)



Claim.—1. A blank for a spectacle or eyeglass frame of a single piece from end to end, provided with grooves extending from each end toward the center of the blank and adapted to be formed into lens-containing rims, and the central ungrooved portion adapted to form the bridge-piece and terminating in perforated enlargements, substantially as described.

2. A blank for a spectacle or eyeglass frame of a single piece from end to end, provided with grooves extending from each end toward the center of the blank, which ends are adapted to be doubled each upon itself and formed into lens-containing rims, and the central portion of the blank adapted to form the bridge-piece and terminating in perforated enlargements, substantially as described.

3. A blank for a spectacle or eyeglass frame of a single piece from end to end, provided with grooves extending from each end toward the center of the blank and adapted to be formed into lens-containing rims, and the extremity of each end provided with means adapting it to be secured to the body of the blank at or near the central portion, and the central ungrooved portion adapted to form the bridge-piece and terminating in flattened enlargements, with which said ends engage, substantially as described.

4. A spectacle or eyeglass frame consisting of lens-containing rims provided with grooves extending from each end toward the center of the frame, and a bridge-piece terminating in perforated enlargements, said rims each having a side projection formed therewith, the whole being made from a single piece of metal continuous from end to end, substantially as described.

5. A spectacle or eyeglass frame consisting of lens-containing rims and a bridge-piece made from a single piece of metal continuous from end to end, and having perforated enlargements upon opposite sides of the bridge-piece, each of said ends being secured to the body of the frame by being passed through the perforations in said enlargements, substantially as described.

6. A spectacle or eyeglass frame consisting of lens-containing rims and a bridge-piece terminating in perforated enlargements, said rims each having a side projection formed therewith, the whole being made from a single piece of metal continuous from end to end, and each of said ends being secured to the body of the frame by engagement with said perforated enlargements, substantially as described.

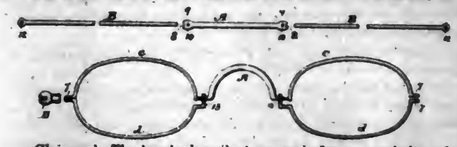
7. A spectacle or eyeglass frame consisting of lens-containing rims and a bridge-piece made from a single piece of metal having free ends detachably secured to the body of the frame at the base of the bridge-piece, substantially as described.

8. A spectacle or eyeglass frame made of a single piece of metal having a bridge-piece and two lens-containing rims, said rims being formed by curving each of the ends of the blank from which the frame is made back upon itself, and which are adjustably connected to the body of the frame at the base of the bridge-piece, so as to be capable of varying the size of the rims within small limits, substantially as described.

9. A spectacle-frame made from a single piece of metal having lens-containing rims and a bridge-piece, said rims carrying projecting attaching ends formed therewith, and temple-joint pieces formed separately therefrom and adapted to be secured to said attaching ends, substantially as described.

10. A spectacle-frame made from a single piece of metal having lens-containing rims and a bridge-piece, said rims being each provided with an attaching end formed continuous therewith by doubling the metal upon itself and adapted to receive and secure a temple-joint piece, and the end of each rim terminating in a stud adjustably secured to the frame at the base of the bridge-piece by a thumb-nut, substantially as described.

400,957. SPECTACLE-FRAME. JAMES E. SEARING, Mount Vernon, N. Y. Filed Dec. 27, 1888. Serial No. 294,796. (No model.)



Claim.—1. The herein-described spectacle-frame, consisting of a nose-piece and closed lens-containing rims formed independent of each other, one end of each rim being permanently secured to the nose-piece and the other end detachably secured to the nose-piece.

2. The herein-described frame, consisting of a nose-piece and lens-containing rims formed independent of each other, one end of each rim being permanently secured to the nose-piece and the nose-piece having a perforation for detachably securing the other end of the rim.

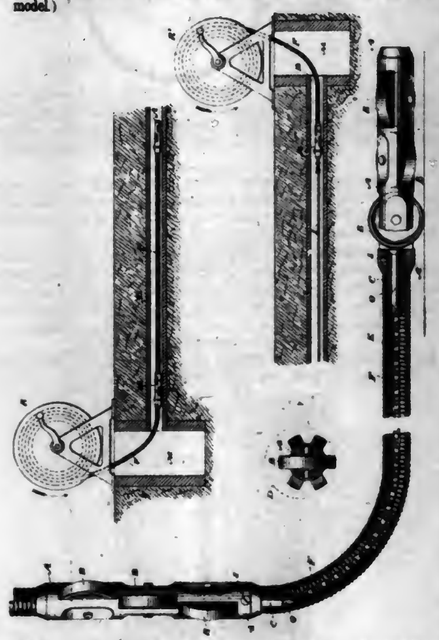
3. The herein-described spectacle-frame, consisting of a nose-piece and lens-containing rims formed independent of each other and secured together, the said rims each being formed of two pieces secured together at one end, one of the opposite ends of the rims having ends detachably secured to the nose-piece.

4. A blank for a spectacle-frame, the same consisting of a nose-piece having perforated and flattened enlarged ends, and lens-containing rims each having an end permanently attached to the nose-piece and another end provided with a pin or stud for detachable engagement with the perforation in the nose-piece, substantially as described.

5. A blank for a spectacle-frame, the same consisting of a nose-piece having perforated and slotted ends and lens-containing rims each having an end provided with a pin or stud for detachable engagement with the perforation in the nose-piece, substantially as described.

6. A blank for a spectacle-frame, the same consisting of a nose piece having perforated enlarged ends, and lens-containing rims formed of two pieces having ends 7 for securing them together and attachment of joint-pieces, and one of the opposite ends of the rims having a pin or stud for detachable engagement with the perforation in the end of the nose-piece, substantially as described.

400,958. LEADING-IN APPARATUS FOR CONDUITS. JOHN A. SEELY, Brooklyn, N. Y. Filed Feb. 2, 1889. Serial No. 298,509. (No model.)



Claim.—1. In a leading-in apparatus for conduits, the combination of two or more anti-friction devices constructed substantially as described, and a flexible mechanical connection uniting said devices, said connection being capable of limited expansion and contraction, whereby the distance between any two such devices is maintained substantially unchanged under the action of a power applied to push or to pull the apparatus through a conduit.

2. In a leading-in apparatus for conduits, the combination of two or more anti-friction devices constructed substantially as described, a flexible mechanical connection uniting said devices capable of limited expansion and contraction, and a supplemental mechanical connection between said devices capable of contraction only, whereby the distance between any two such devices is maintained substantially unchanged under the action of a force applied to push or to pull said apparatus through the conduit.

3. In a leading-in apparatus for conduits, the combination of two or more anti-friction devices composed of wheels or rollers united by a flexible connection composed of a helically-disposed wire or strip, substantially as described.

4. In a leading-in apparatus for conduits, the combination of two or more anti-friction devices united by a flexible mechanical connection consisting of a helically-disposed wire or strip and a chain, substantially as described.

5. In a leading-in apparatus for conduits, two or more anti-friction devices, each composed of a support or bearing-piece and two or more wheels or rolls, the plane of rotation of such wheels or rolls being parallel with the line of movement of translation, but forming an angle with respect to each other, in combination with a mechanical connection uniting said devices, substantially as described.

6. In a leading-in apparatus for conduits, two or more anti-friction devices, each composed of a support or bearing-piece and two or more wheels or rolls, the plane of rotation of each of such wheels or rolls being parallel with the line of movement of translation and forming an angle with respect to each other, in combination with a flexible connection mechanically uniting successive devices, substantially as described.

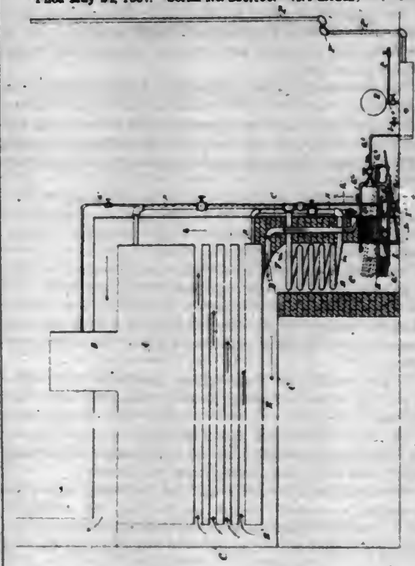
7. In a leading-in apparatus for conduits, the combination of a cylindrical section or bearing-piece and three wheels or rolls pivoted on the line of its major axis, the bearings being separated from each other a distance slightly greater than the diameter of a wheel or roll, substantially as described.

8. In a leading-in apparatus for conduits, the combination of two or more cylindrical sections or bearing-pieces, wheels or rolls pivoted on the line of their major axes, and a flexible connection uniting successive or adjacent sections, substantially as described.

9. In a leading-in apparatus for conduits, the combination of two or more cylindrical sections of metal, wheels or rolls pivoted on the line of their major axes, and a flexible connection mechanically uniting each pair of sections into one continuous cylinder of extended length, said connection consisting of a helically-disposed resilient wire or strip, substantially as described.

10. In a leading-in apparatus for conduits, the combination of a series of cylindrical sections of metal, wheels or rolls pivoted on the line of their major axes, and flexible connections mechanically uniting successive sections into one continuous cylinder of substantially uniform diameter and extended length, said connections consisting of a helically-disposed resilient wire or strip and a chain terminating in a swivel-joint, substantially as described.

400,959. HYDROCARBON APPARATUS. JAMES F. SEERY, New York, N. Y., assignor to the Empire Hydro Carbon Company, of New York. Filed May 24, 1887. Serial No. 239,196. (No model.)



Claim.—1. In combination with the fire-box of a furnace, a vapor-burner located therein, and a pivoted coil of pipes forming a superheater for steam surrounding the burner, and means whereby said coil may be raised above the said burner at will, substantially as and for the purpose set forth.

2. In combination with a furnace having a hydrocarbon-burner, a superheating-coil surrounding the burner and being pivotally connected to its supply and exit pipes, a lever connected at one end to the coil-pipe, and a fulcrum for said lever, the free end of the lever being made to extend outward and adapted for prehension, as and for the purpose set forth.

3. The combination, in a furnace provided with a fire-box having an arched top forming a deflecting-plate, of a steam-generating coil placed below said arch, a vapor-burner, and a superheating-coil surrounding the burner, substantially as and for the purposes set forth.

4. In combination with the fire-box of a furnace having a suitable burner and an arched or curved deflecting-plate, a draft-pipe opening into the fire-box above the deflecting-plate, a steam-generating coil placed below the deflecting-plate and above a burner, and a superheating-coil surrounding the burner, substantially as described.

5. In combination with the fire-box of a furnace, a hydrocarbon-burner, a steam-superheating coil, a mixing-chamber, pipe for supplying oil to said mixing-chamber, an air-pipe leading from the fire-box above the burner and connected to the mixing-chamber, and a steam-pipe connected to the superheating-coil and mixing-chamber, forming an injector, all substantially as shown and described.

400,960. REVERSE-LINK FOR STEAM-ENGINES. JOHN R. SNYDER and JAMES DEETS, Agency, Mo. Filed Nov. 3, 1888. Serial No. 289,922. (No model.)



Claim.—1. The combination, with a reverse-link for steam-engines, of an adjustable facing therefor, bolts projecting outwardly from the facing, and screws projecting through the adjacent side of the link, said bolts and screws being adapted for the adjustment of the facing, substantially as set forth.

2. The combination, with a reverse-link for steam-engines, of an adjustable facing, screws for adjusting the latter, and bolts for retaining the same against further play, whereby the facing is held rigid in adjusted position, substantially as set forth.

3. The combination, with a reverse-link for steam-engines, of an adjustable facing provided with contracted ends adapted to slide in grooves in the ends of the link and screws for adjusting said facing, substantially as set forth.

4. The combination, with a reverse-link for steam-engines, of an adjustable facing, bolts having their heads countersunk in the latter, said bolts projecting through the adjacent upright portion of the link and provided on their ends with nuts, and adjusting-screws passing through said upright portion and bearing against the facing, substantially as set forth.

5. The combination, with a reverse-link for steam-engines, of a facing secured thereto by screws having their heads countersunk in said facing, the latter being adjustable for the insertion of packing, substantially as and for the purpose set forth.

6. In a reverse-link for steam-engines, the combination, with the hanger provided at one end with a transverse elongated recess, of a sectional bearing-block for the reception of a pivot pin or bolt for connecting the hanger with the lever-crank and screws for adjusting the outer section of the block against said pin or bolt, substantially as set forth.

7. In a reverse-link for steam-engines, the combination, with a hanger provided at one end with a transverse elongated recess, of a bearing-block comprising two sections provided upon their opposing faces with oppositely-disposed approximately-semicircular grooves, forming a bearing, and screws in the end of the hanger for adjusting the outer section of the block, substantially as set forth.

8. The combination, with a reverse-link for steam-engines and lugs projecting from one side thereof and provided with rectangular recesses, of bearing-blocks disposed in the latter and comprising two sections provided upon their opposing faces with oppositely-disposed approximately-semicircular grooves, forming bearings, screws bearing against the backs of the outer blocks and adapted to adjust the same inwardly, and jam-nuts upon the screws for locking them in adjusted position, substantially as set forth.

9. The combination, with a reverse-link for steam-engines, composed of two sections bolted together, the inwardly-projecting ends of one section being grooved upon their interior faces, of an adjustable facing provided with contracted ends adapted to slide in said grooves and screws for adjusting the facing, substantially as set forth.

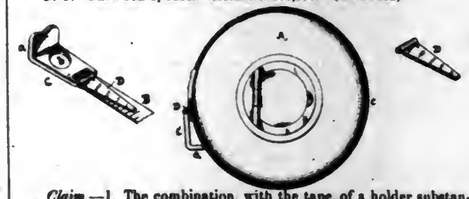
10. In a reverse-link for steam-engines, the combination, with the link-saddle provided with a conical pin and the lever-crank provided with a bifurcated end, of a hanger provided at one end with a conical bearing for the reception of said pin and at the other end with an elongated recess carrying a sectional adjustable bearing-block embraced by the bifurcated end of the lever-crank, and a bolt passing through the latter and said block, substantially as set forth.

11. The combination, with a reverse-link for steam-engines, of a sliding block provided with a shoulder upon one side and with a conical bearing through the same and the shoulder, and a corresponding pin adapted to be seated in said bearing and connecting the link-block with the valve-rod, substantially as set forth.

12. In a reverse-link for steam-engines, and with the link-saddle provided with a conical pin having a reduced screw-threaded outer end, a hanger provided with a bearing corresponding to and embracing said pin and retained thereon by a binding-nut and a securing-nut, substantially as shown and described.

13. In a reverse-link for steam-engines, the combination, with the link-block provided with a conical bearing, of a corresponding pin seated therein and provided with perforations in its larger end for adjusting it and a reduced outer screw-threaded end, said pin being screwed through a screw-threaded perforation in the valve-rod, and a nut applied upon the projecting end, substantially as set forth.

400,961. TAPE-MEASURE. EDWARD G. SOLTMANN, New York, N. Y. Filed Oct. 9, 1888. Serial No. 287,635. (No model.)



Claim.—1. The combination, with the tape, of a holder substantially equal in width to the tape, and having at its outer end a rigid stop projecting at right angles therefrom, said stop being approximately of the same width as the body of the holder, substantially as described.

2. The combination, with the tape, of a holder having at its outer end a projecting stop provided with a recessed upper edge, said holder being so located that the recess receives the bead of the casing when the tape is wound up, substantially as described.

3. In a tape-measure, the combination of a metallic tape, a holder, and the flexible metallic strap G, uniting the holder and the tape and embracing the latter, the opposite arms of said strap gradually tapering to a point, whereby the resistance to bending of the triple thickness of metal is gradually decreased, substantially as set forth.

400,962. CALF-FEEDER. WILLIAM I. SPENCER, Clinton, Iowa. Filed July 13, 1888. Serial No. 279,851. (No model.)



Claim.—1. In a calf-feeder, a trough or pail, in combination with a nipple formed of flexible tubing and a perforated arched nipple-receiving plate, forming a milk-passage, for securing the same to the bottom of said trough or pail, substantially as specified.

2. The pail 1, having the bottom 2, in combination with the tube 3, bifurcated, as at 11, the nipple-plate 4, arched and perforated, as

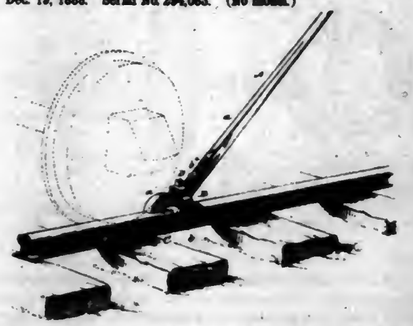
at 9 and 10, and formed with the ears 5, perforated, as at 6, and the screws 8, substantially as specified.

400,963. COFFIN-PLATE. JOHN H. SPICER, Harrisburg, Pa. Filed May 10, 1888. Serial No. 273,467. (No model.)



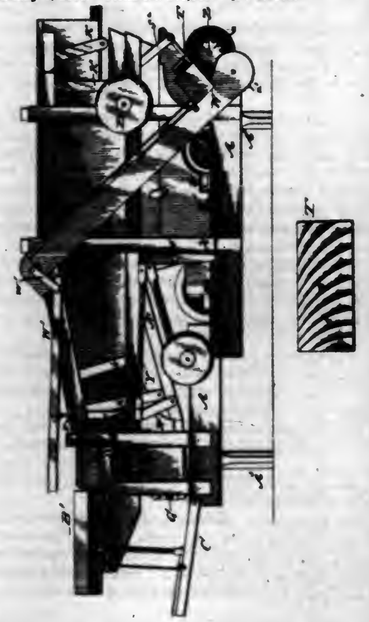
Claim.—As an improved article of manufacture, the herein-described coffin-plate, consisting of the central block, A, the fabric having affixed thereon an inscription or design stretched over said block and secured to the under face thereof near the edge, the strips or molding B, covered with fabric, and the strip C, secured to the bottom of said block and to the bottom of all of said strips, with an air-space, *a*, between said strip C and the bottom of the central block, substantially as shown, and for the purpose specified.

400,964. PINCH-BAR. SPENCER H. ST. JOHN, Chicago, Ill. Filed Dec. 19, 1888. Serial No. 294,063. (No model.)



Claim.—The combination of a bar, removable fulcrum-piece wholly external thereto, and a clevis fitting upon said bar, having downwardly-projecting arms adapted to embrace the rail, substantially as described.

400,965. GRAIN-SEPARATOR. HERMAN STOKER, Potosi, Wis. Filed May 9, 1888. Serial No. 273,365. (No model.)





Claim.—1. The combination, with the grain-table N and the screens P P', of the shaft O', the rock-arms O, the fan R, the shoe provided with the grooved plate S, grooved bed S', screen P², and means for oscillating the shaft, substantially as described.

2. The combination, with the grooved grain-table N, of the links N', the screens P and P', the shaft O', the rock-arms O and *o*, the links *p*, the shoe provided with the inclined grooved plate S under screen P', the grooved plate S', receiving the tailings from screen P', and means for oscillating the shaft O', substantially as described.

3. The combination of the shaft O', the rock-arm *o'*, the grain-spout V, bell-crank lever V', attached to the spout, rod *v*, connecting the lever and the rock-arms, the tailings-spout W', the hangers *w'*, supporting the rear end thereof, the lever X, supporting the front end of the spout, and the rod Y, connecting the lever X with the rock-arm *o'*, substantially as described.

400,966. COMBINED TOBACCO-TAMP AND PIPE-STEM CLEANER. JOSEPH STRACHAN, Brooklyn, N. Y. Filed June 9, 1888. Serial No. 276,602. (No model.)



Claim.—1. A combined tobacco-tamp and pipe-stem cleaner, consisting of a hollow casing having a longitudinal slot formed therein, a tamp-button at one end of the casing of greater diameter than the casing, and a wire pipe-stem cleaner sliding within the casing, the tamp-button being connected to the pipe-stem cleaner, substantially as shown and described.

2. A combined tobacco-tamp and pipe-stem cleaner, consisting of a hollow slotted casing, a pipe-stem cleaner fitting within the casing, and a tamp-button passing through the slot of the casing and pivoted to the stem-cleaner so as to assume two positions, in one sliding freely in the slot and forming a handle for moving the pipe-stem cleaner within the casing and in the other held at the end of the slot and adapted to be used as a tamp, substantially as shown and described.

3. A combined tobacco-tamp and pipe-stem cleaner, consisting of a hollow cylindrical slotted casing, a wire pipe-stem cleaner held in a plunger sliding within the casing, and a disk-shaped tamp-button passing through the slot of the casing and pivoted to the plunger so as to assume two positions thereon at right angles to each other, in one sliding freely in the slot and forming a handle for moving the pipe-stem cleaner within the casing and in the other held at the end of the slot and adapted to be used as a tamp, substantially as shown and described.

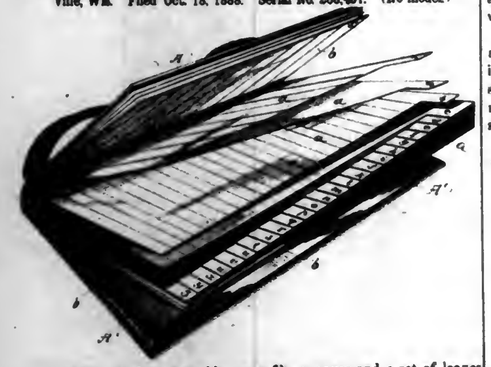
4. A combined tobacco-tamp and pipe-stem cleaner, consisting of the hollow casing *a*, having the slot *a'* and notches a^3 a^3 formed therein, the looped wire stem-cleaner *c*, carried by the plunger *b*, and the disk-shaped tamp-button *d*, projecting through the slot of the

casing and pivoted to the plunger c, substantially as shown and described.

400,967. OINTMENT. CAROLINE V. SUTHERLAND, Lathrop, Cal. Filed Oct. 19, 1888. Serial No. 288,598. (No specimens.)

Claim.—The herein-described medical compound, as a salve, consisting of an extract from wormwood stalks and leaves; rosin-weed, stalks, and leaves; yarrow stalks, leaves, and flowers; thorn-apple stalks and leaves; Australian blue gum twigs and leaves; plantain stalks and leaves, with beeswax, fresh hogs lard and camphor, in the proportions specified.

400,968. PORTABLE SCRAP-FILE. CLARENCE W. TAYLOR, Janesville, Wis. Filed Oct. 18, 1888. Serial No. 288,437. (No model.)



Claim.—1. In a portable scrap-file, a cover and a set of leaves which are joined in pairs at one end to form pockets, each open at the side and one end, the leaves being adapted to receive written memoranda, substantially as set forth.

2. In a scrap-file, a cover and a set of leaves which are secured together in pairs at one end to form pockets, open at the side and one end, and indexed on their edges, substantially as set forth.

3. In a scrap-file, a cover, a single pocket open at the side only formed adjacent to one lid of the cover, and a series of pockets open at the side and one end, the said pockets being formed of ruled leaves joined in pairs at one end, substantially as set forth.

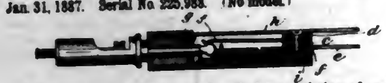
4. In a scrap-file, a cover, a series of blank leaves, and a series of pockets, each open at the side and one end, substantially as set forth.

5. In a scrap-file, a cover, a series of leaves, a series of pockets, each open at the side and one end, and a pocket closed at both ends, substantially as set forth.

6. In a scrap-file, the combination, with a body consisting of a series of pockets, each open at the side and one end, of a cover removably secured to said body, substantially as set forth.

7. The combination, with a body secured together by rivets having sockets in their ends, of a cover and the spring-clasps having end projections to enter the sockets in the rivets, substantially as set forth.

400,969. SPRING-JACK SWITCH. HARRY B. THAYER, New York, N. Y., assignor to the Western Electric Company, Chicago, Ill. Filed Jan. 31, 1887. Serial No. 225,983. (No model.)



Claim.—1. A strip of spring-jack switches consisting of a supporting-base of insulating material, in combination with the springs of the different spring-jacks placed with corresponding springs in the same plane, the springs of each of the different spring-jacks being placed in parallel planes one above the other, the separating-pieces *e f*, and bushing *i* around the screw of each spring-jack for insulating the springs *e f* of the different spring-jacks, substantially as shown and described.

2. The combination, with the insulated springs of a spring-jack switch placed in parallel planes one above the other, of a socket or test-piece, *a*, provided with a slot, and the upper or test spring resting in said slot, substantially as shown and described.

3. The combination, in a spring-jack switch, of three springs or contact-pieces placed in different parallel planes one above the other, the upper one of said springs being connected with the test piece or socket of the switch and the central spring normally resting against a point of the lower spring, and a plug which, when inserted, lifts the central spring from its normal contact with the lower spring and forms connection therewith, while the test-piece is at the same time connected with the shank of the plug.

400,970. ROPE OR CABLE. COLIN M. THOMPSON, Brooklyn, N. Y. Filed Feb. 10, 1885. Serial No. 155,505. (No model.)

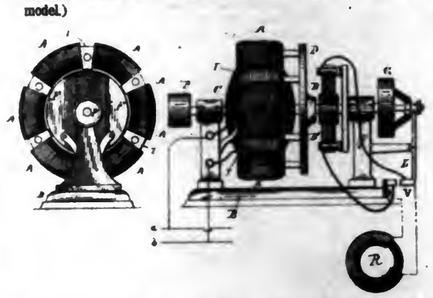
Brief.—The object of the invention is to produce an improved cable for use in connection with cable railways and in transmitting power generally.



Claim.—1. A cable consisting of a non-extensible slightly-elastic and flexible core, a wrapper of rubber surrounding said core, and an external wrapper of large wire spirally arranged about said resilient wrapper, substantially as described.

2. A cable composed of a core formed of hemp or other slightly-elastic material inclosed by small wire, a wrapper of rubber surrounding said core, and an external wrapper inclosing said rubber wrapper, said external wrapper formed of large wire spirally arranged with regard to the longitudinal axis of the cable, as and for the purpose specified.

400,971. ALTERNATING-CURRENT ELECTRIC MOTOR. ELIHU THOMSON, Lynn, Mass. Filed July 30, 1888. Serial No. 281,433. (No model.)



Claim.—1. In an alternating-current electric motor in which the reaction between an alternating field and currents induced by such field in a closed-circuit armature is employed as the motive force, a ring or endless structure of iron, I, carrying coils A, operated on closed local circuit.

2. In an alternating-current electric motor having an alternating field and a closed-circuit conductor, the reaction between which and the field produces motive effects, an external ring, I, carrying coils A on locally-closed circuit, and an internal electro-magnet, F, carrying coils C, connected to an alternating source, as and for the purpose described.

3. In an alternating-current electric motor, an alternating-current field-coil, C, fixed in position, as described, and wound over a suitable core, F, and a revoluble ring-magnet, I, carrying the coils which form the circuit for the induced currents by whose reaction the ring is revolved.

4. In an alternating-current electric motor having a closed electric circuit for induced currents, by the reaction of which on an inducing alternating field the motor is operated, a laminated external ring-magnet, in combination with a laminated internal magnet formed, as shown and described, with a central reduced portion for the coils and enlarged polar portions conforming to the circular internal line of the outer ring-magnet, both said magnets being wound with suitable coils, one set of which is closed on itself.

5. In an alternating-current electric motor having a closed armature-circuit, as described, forming the path of induced currents by whose reaction motion is produced, means for varying the resistance to such induced currents for the purpose of regulating the speed or power of the motor.

6. In an alternating-current electric motor, the combination, with the closed circuit for the induced currents, of means for varying the resistance to the induced currents and a speed-governor for adjusting the devices which vary the resistance.

7. The combination, substantially as described, of the speed-governor, a double flange disk or clutch, S, connected therewith, a roll, H, and a screw and worm wheel, T X, the worm-wheel X carrying an arm, J, which supports the device for producing variations in the resistance to the alternating currents.

8. The combination, substantially as described, of the circular-shaped core I, carrying coils A, an internal inducing alternating field-magnet, F C, and a commutator, K, for closing the circuit of coils A in the same plane, when, by reason of rotation of the shaft with the motor, such plane is parallel with the plane of the coils C.

400,972. INDUCTION-COIL AND SELF-INDUCTIVE APPARATUS. ELIHU THOMSON, Lynn, Mass. Filed Oct. 15, 1888. Serial No. 288,161. (No model.)



Claim.—1. In an electro-magnet having a closed magnetic circuit threading its coils, a laminated core-piece having a notch or gap for application of the coils closed by a driven laminated plug or stopper whose laminations are parallel to and in magnetic connection with those of the body of the core and form a butt-joint with the same, as and for the purpose described.

2. A horseshoe electro-magnet having coils placed upon the legs of the horseshoe and a core-piece for said magnet made up of a bundle or pile of plates of general U form, in combination with a laminated plug or stopper driven or forced into the gap between the legs of the horseshoe, with its laminations parallel to and in direct magnetic contact with those of the core to form a closure of the magnetic circuit threading the coils, as and for the purpose described.

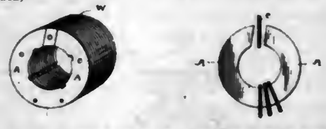
3. The combination, with the laminated magnet-core having a gap or notch, of a closing-piece for the magnetic circuit consisting of a tapered laminated plug or stopper forced or driven tightly into the gap or notch, with its laminæ parallel to and forming magnetic contact with the ends of the laminæ for the core by butt-joints.

4. In an induction or self-inductive coil, a magnetic circuit threading the coil or coils and composed of a number of discontinuous plates or laminæ of iron piled up together and insulated flatwise, in combination with a magnetic circuit-closing plug or block composed of iron laminæ of a width adapted to fit tightly into the gap in the continuity of the first-named plates and driven or forced tightly into place in the socket formed by the gap, the laminations of both sets of plates being in substantially the same plane.

5. An induction or self-inductive coil constructed of a laminated core in U shape, coils slipped over the limbs of the laminated core, and a magnetic circuit-closing plug or stopper driven or forced into the socket formed by the notch or opening between the legs of the core, as and for the purpose described.

6. An electro-magnet having an endless core formed in two parts, one of which is the greater portion of said core, while the other consists of a plug or stopper driven into place in an opening or gap between the ends of the larger piece, said plug and gap being accurately fitted to one another, so that the plug when driven in place will be tightly held, and will form a complete closure of the endless magnetic circuit for the core.

400,973. ARMATURE FOR DYNAMO-ELECTRIC MACHINES. ELIHU THOMSON, Lynn, Mass. Filed Oct. 15, 1888. Serial No. 288,162. (No model.)



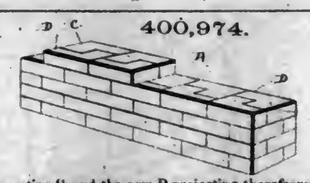
Claim.—1. In a ring-armature for dynamo-electric machines or motors, a laminated core having a notch or gap at one side for the insertion of the coils closed magnetically by a laminated plug or bundle fitted tightly into the notch or gap to complete or restore the magnetic circuit after application of the coils, in combination with suitable fastening devices for holding said plug against displacement by revolution of the armature.

2. In a ring-armature, a laminated ring-core having a notch or gap at one side filled by a laminated plug fitted tightly therein with the ends of its laminæ abutting against and closing the magnetic circuits for the laminæ of the body of the core, in combination with coils applied over said plug, and binding-rings of wire for holding the coils and plug in place.

3. In a ring-armature, a laminated ring-core having a gap or notch at one side closed by a tightly-fitting plug or bundle of plates abutting against the ends of the plates of the body of the core, so as to close the magnetic circuits of the latter and form practically a uniform continuous laminated ring-armature, as and for the purpose described.

400,974. BRICK. THEODORE THOER, St. Clair, Pa. Filed Oct. 22, 1888. Serial No. 288,746. (No model.)

Claim.—As a new article of manufacture, the rectangular brick A, having the rectangular recess B in one corner, the said recess being equal in length to one-half the length of the brick, and equal in width to one-half the width of the brick, thereby forming the approximately-

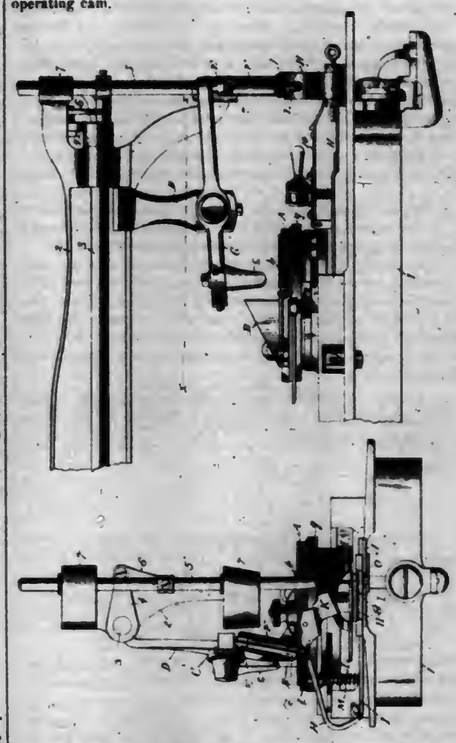


400,974.

square portion C, and the arm D projecting therefrom at right angles, substantially as described.

400,975. BUTTON-HOLE CUTTER FOR SEWING-MACHINES. ADELBERT L. TRAVER, Philmont, N. Y., assignor of one-half to James Aken, same place. Filed July 6, 1887. Serial No. 243,564. (No model.)

Brief.—A slotted plate moves with the vibrations of the clamp. To an arm of this plate is pivoted the cutter-carrying arm. This cutter-carrying arm is depressed by a lever pivoted to the frame of the machine. The lever is operated by a cam mounted upon the clamp-operating cam.



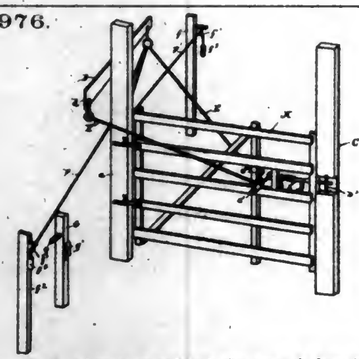
Claim.—1. The combination, in a button-hole machine, and with the cloth-holder thereof, of the traveling plate J, having a slot for the cutter, the arm I, moving therewith, the cam 9, for moving said arm and plate, the cutting-lever H, attached to said arm, the cutter-blade connected with the said lever, with the wedge-cam R, mounted on said cam 9, and intermediate connections for depressing said lever by said wedge-cam, substantially as described.

2. The combination, in a button-hole machine, and with the cloth-holder thereof, of the traveling cloth-plate J, having a slot for the cutter, the arm I, attached thereto, the cam 9, for moving said arm and plate, the cutting-lever H, pivoted to the arm I, the cutter-blade connected with the said lever, the link F, the lever C, and the cam R moving with said cam 9 and operating the cutting-lever H, substantially as described.

3. The combination, in a button-hole machine, and with the cloth-holder thereof, of the cam 9, the traveling cloth-plate J, having a slot for the cutter, the arm I, attached thereto, the slide 11, connected with the cam 9, the cutting-lever H, pivotally connected to said arm I, the cutter-blade connected with the said lever, the link F, the lever C, supported by the arm 2, and the wedge-shaped cam B, mounted on the cam 9 and operating the cutting-lever H, substantially as described.

400,976. GATE. JAMES H. TUDOR, Lexington, Ky. Filed Sept. 26, 1888. Serial No. 286,474. (No model.)

400,976.



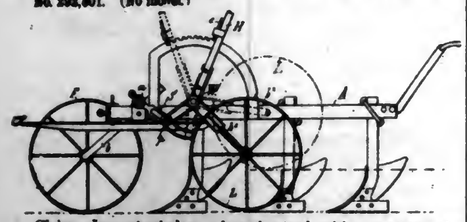
Claim.—1. As an improvement in swinging gates, the lever having the friction-rollers projecting therefrom and working in a circular groove or recess of the post to which said lever is pivoted, in combination with the gate, to which said lever is connected, substantially as shown and described.

2. The combination, with the swinging gate and the post to which said gate is secured, of the lever fulcrumed on said post near its upper end and having a weighted end, the ropes or chains connecting said lever to the gate, and the spring-held latch-rod, to the inner end of which one of said ropes or chains is connected, substantially as set forth.

3. The combination, with the swinging gate having the hooked arm, of the retaining-post having a stud or pin and the bent spring secured to said post, substantially as shown and described.

4. The herein-described improved gate, comprising the post having a circular groove, the swinging gate having the spring-held latch-rod and the hooked arm, the lever having a weighted end and provided with friction-rollers working in said circular groove, the ropes or chains, the latching-post having the pivoted arm, and the retaining-post having a stud or pin and a bent spring, substantially as shown and described.

400,977. ADJUSTING DEVICE FOR WHEEL-PLOWS. AUGUST J. VENTZKI, Graudenz, Prussia, Germany. Filed Dec. 6, 1888. Serial No. 292,801. (No model.)



Claim.—In a wheel-plow, a lowering and raising apparatus for furrow-wheel and land-wheel, characterized by the arrangement of a slotted lever, S, curved at one end concentric to the segment B of the hand-lever H, but straight or curved not concentric to the segment B at the other end, the fixed axle *a* of said slotted lever being also the pivot for the furrow-wheel F, while the pivot of land-wheel L is at the same time the fulcrum of the hand-lever H, substantially as herein shown and described.

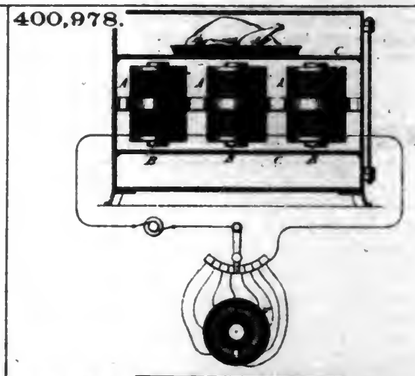
400,978. ELECTRIC HEATING APPARATUS. HENRY P. WATTS, Sandusky, Ohio. Filed Nov. 22, 1888. Serial No. 291,563. (No model.)

Claim.—1. In an electric heating apparatus, a coil or coils in which alternating currents flow, said coil or coils having magnetic cores, in combination with a metallic plate or plates arranged adjacent to the said cores, whereby the flow of said alternating currents will cause the heating of said plates.

2. In an electric oven, a coil or coils having magnetic cores, in combination with the metallic wall or walls of said oven, the said cores extending into close proximity to said wall or walls, whereby the flow of alternating currents in the coils will cause the walls of the oven to become heated.



400,978.



400,979. DIE FOR UPSETTING EYE-BARS. WILLIAM R. WEBSTER, Philadelphia, Pa. Filed Jan. 12, 1888. Serial No. 296,157. (No model.)



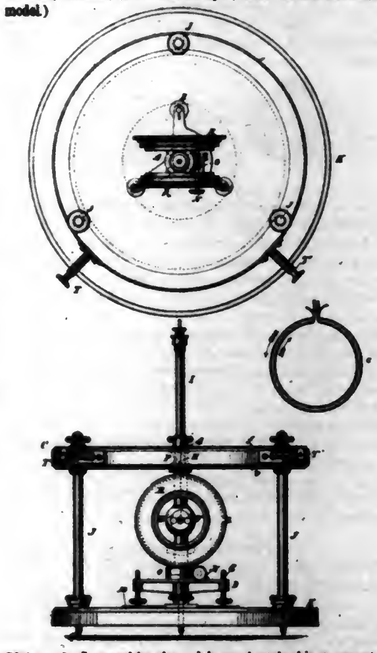
Claim.—1. In dies for forming eye-bars substantially as specified, a central longitudinal projection recessed or cut away in that part of the die-surface which rests upon the end of the finished eye, all substantially as and for the purpose specified.

2. In dies for forming eye-bars substantially as specified, a sliding die having a central longitudinal projection cut away at its end, which rests on the end of the eye, in combination with a plunger formed with or secured on said end of the die, all substantially as and for the purpose specified.

3. In dies for forming eye-bars substantially as specified, a central longitudinal projection formed with a groove along its apex, substantially as and for the purpose specified.

4. In dies for forging eye-bars substantially as specified, a central longitudinal projection formed with a groove along its apex and cut away in that part which rests on the end of the finished eye, all substantially as and for the purpose specified.

400,980. STANDARD TANGENT-GALVANOMETER. EDWARD WESTON, Newark, N. J. Filed May 3, 1888. Serial No. 272,634. (No model.)



Claim.—1. In combination with an electrical instrument contain-

ing a vibrating index-mirror, a curved surface extending around said mirror and concentric with the axis of vibration thereof, and a scale upon said surface for showing the angular deflections of said mirror, substantially as described.

2. In combination with an electrical instrument containing a vibrating index-mirror, a curved surface extending around said mirror and concentric with the axis of vibration thereof, and a scale upon said surface for showing the deflections of said mirror, the zero-point of said scale being marked at a point on said surface distant forty-five degrees in arc from the point at which a radius from the mirror-center drawn perpendicular to the face meets said surface when no current traverses the instrument, substantially as described.

3. In combination with an electrical instrument containing a vibrating index-mirror, a curved surface extending around said mirror and concentric with the axis of vibration thereof, and a scale upon said surface for showing the deflections of said mirror, the said scale having two zero-points marked, respectively, at points on said surface distant forty-five degrees in arc and at each side of the point at which a radius from the mirror-center drawn perpendicular to the mirror-face meets said surface when no current traverses the instrument, substantially as described.

4. In combination with an electrical instrument containing a vibrating index-mirror, a curved surface extending around said mirror and concentric with the axis of vibration thereof, and a scale upon said surface for showing the deflections of said mirror, the said scales having two zero-points marked, respectively, at points on said surface distant forty-five degrees in arc and at each side of the point at which a radius from the mirror-center drawn perpendicular to the mirror-face meets said surface when no current traverses the instrument, and the said scale being laid off in regular successive divisions from each of said zero-points toward the other, substantially as described.

5. In combination with an electrical instrument containing a vibrating index-mirror, a wall extending around said mirror and having its inner periphery curved and concentric with the axis of vibration of said mirror, a scale on said periphery for showing the angular deflections of said mirror, and a sight-opening in said wall in line with said mirror, substantially as described.

6. In combination with an electrical instrument containing a vibrating index-mirror, a wall extending around said mirror and having its inner periphery concentric with the axis of vibration of said mirror, a scale on said periphery for showing the angular deflections of said mirror, and a sight-opening in said wall in line with said mirror, the position of said opening in said wall being such that a line of sight drawn from said opening to said mirror shall make an incident angle of forty-five degrees with the reflecting-surface when no current traverses the instrument, substantially as described.

7. In combination with an electrical instrument containing a vibrating index-mirror, a wall extending around said mirror and having its inner periphery concentric with the axis of vibration of said mirror, a scale on said periphery for showing the angular deflections of said mirror, and two sight-openings in said wall and in line with said mirror, the positions of said openings in said wall being such that lines of sight drawn from said openings to said mirror shall make equal incident angle with the reflecting-surface when no current traverses the instrument, substantially as described.

8. In an electrical instrument, a vibrating index-mirror and a scale-chamber inclosing said mirror, substantially as described.

9. The combination of an electrical instrument containing a standard, a vibrating index-mirror supported thereby, an independently-supported scale-chamber inclosing said mirror and surrounding said standard, and means—such as screws—for vertically adjusting said standard in said chamber, substantially as described.

10. In an electrical instrument, a base, a circular scale-chamber supported thereon, a central hollow standard resting on said base and passing through said scale-chamber, and an index-mirror supported in said standard and inclosed in said scale-chamber, substantially as described.

11. In an electrical instrument, a base, a circular scale-chamber supported thereon, a central hollow standard resting on said base and passing through said scale-chamber, an index-mirror supported in said standard and inclosed in said scale-chamber, universal-joint connections between said standard and the top and bottom walls of said chamber, means—such as screws—for leveling said base and chamber, and means—such as screws G—for leveling said standard upon said base, substantially as described.

12. In an electrical instrument, a central hollow standard, a vibrating index-mirror supported therein, an independently-supported scale-chamber inclosing said mirror, (through which chamber said standard passes,) and means—such as a tangent-screw and toothed segment—for rotating said standard on its axis within said chamber, substantially as described.

13. In a galvanometer, a central hollow standard, a vibrating index-mirror supported therein, an independently-supported chamber having side, top, and bottom walls inclosing said mirror, (through which chamber said standard passes,) and universal-joint connections between said standard and the top and bottom plates or walls of said chamber, substantially as described.

14. A galvanometer-coil containing an annular spool or bobbin and two encircling conductors located, respectively, upon the periphery and upon one face of said spool, substantially as described.

15. A galvanometer-coil containing an annular spool or bobbin having two encircling grooves or channels formed, respectively, in its periphery and in one face, and conductors located in said grooves, substantially as described.

16. A galvanometer-coil containing an annular spool or bobbin and two conductors forming loops of different diameters, located, respectively, upon the periphery and upon one face of said spool, substantially as described.

17. In a galvanometer, a coil containing two separate conductors of unequal lengths, but each making the same number of loops or turns, substantially as described.

18. In a galvanometer, a coil containing two separate conductors forming loops, respectively, of different diameters, substantially as described.

19. In a galvanometer, a coil containing two separate conductors each making the same number of loops or turns, but relatively varying in electrical resistance, substantially as described.

20. In a galvanometer, a coil having its leading-out terminals disposed in a line radial to the coil-center and in the horizontal plane of vibration of the magnet-needle, substantially as described.

21. The combination, with a galvanometer containing a vibrating index-mirror and a central hollow standard, A, of the collars *c* and Q, scale-chamber C, having upper plate, *f*, and lower plate, *b*, and the flexible disk *e*, interposed between said collar Q and plate *b*, substantially as described.

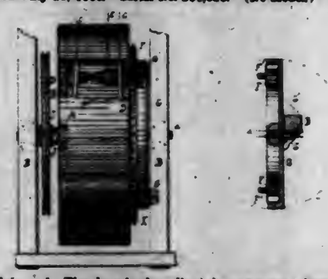
22. The combination, in a galvanometer, of a magnet-needle and two rings supported in parallel planes on opposite sides thereof with their centers in line with and equidistant from the center of the needle, and two conducting-coils supported concentrically by each of said rings, one conductor being on the face of the ring adjacent to the needle and the other conductor being on the periphery of said ring, the diameters of said coil being relatively such that the circumferences of both coils will lie in the periphery of a cone having its apex at the needle-center, substantially as described.

23. The combination of the standard A, index-mirror H, chamber C, containing the rim C', top plate, *f*, and bottom plate, *b*, the said plates *f* and *b* encircling said standard, respectively, above and below the position of the mirror therein, and a scale on the inner periphery of rim C', substantially as described.

24. The combination, with a galvanometer containing the standard A and index-mirror H, of the base K and curved wall C', having a scale on its inner periphery and supports upon said base for said wall, substantially as described.

25. The combination, with a galvanometer having the central standard, A, and tripod-base B, of the base K, scale-chamber C, supported on said base and surrounding said standard, and the centering-plate M on said base K, substantially as described.

400,981. DRIVING-GEARING. JOHN C. WHITTOAN, Stockton, Cal. Filed July 26, 1888. Serial No. 281,023. (No model.)

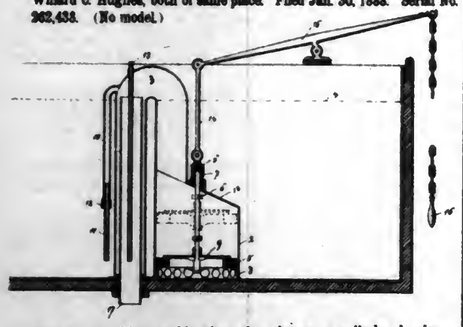


Claim.—1. The herein-described improvement in machine driving-gearing, comprising the beams B, the wheel A and its axle *a*, the internal gear-wheel, G, having the lugs G' G', the spur-pinions F F, the shafts F' F' and their boxes D, the spur gear-wheels H H, and the V-faced pulley I, with the spur-pinions J upon its hub intermeshing with the spur gear-wheels H.

2. As an improvement in driving-gearing, the main driving-wheel A, having the journal-bearings of its axle *a* in boxes secured to the beams B B, in combination with the transverse shafts F' F', having their journal-bearing in boxes D, secured to the spokes of the wheel A, such shafts F' F' having at their ends suitable gear-wheels intermeshing at one end with a large gear-wheel on the end of the axle

a, and at the other end intermeshing with a pinion on the end of the hub of a suitable driving-pulley upon the end of the axle *a*, the whole operating substantially as and for the purpose specified.

400,982. CISTERN-VALVE FOR WATER-CLOSETS. JOSEPH WICKS, Utica, N. Y., assignor of two-thirds to George H. Hughes and Willard C. Hughes, both of same place. Filed Jan. 30, 1888. Serial No. 262,433. (No model.)

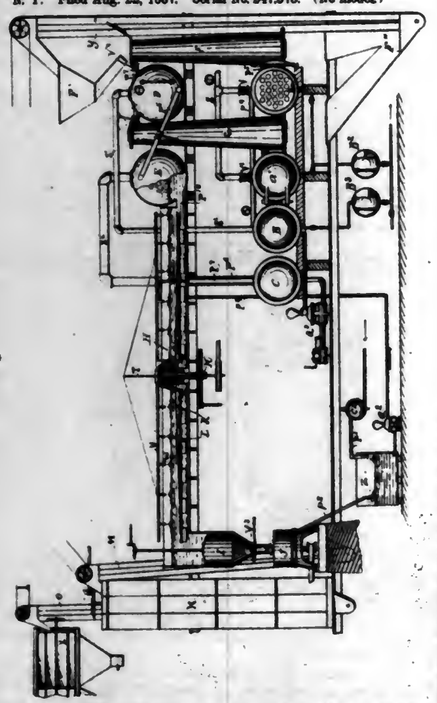


Claim.—1. The combination of a cistern, a cylinder having a plunger adapted to move therein, said plunger having a valve, a siphon connected with the cylinder, and a vent or air tube extending down the longer arm of the siphon to a point above the bottom of the cistern, substantially as set forth.

2. A cylinder having an inclined top, in combination with a siphon provided with an air-vent, 13, extending to a point above the bottom of the cistern, and having a pipe, 17, extending up into it, substantially as described.

3. A cylinder with an inclined top, in combination with a siphon provided with a vent-pipe, 13, extending to a point above the bottom of the cistern, a downwardly-extending pipe, 10, entering said siphon near its highest point, and a pipe, 17, extending up into said siphon, substantially as described.

400,983. APPARATUS FOR THE MANUFACTURE OF SALT. HORACE WILLIAMS, JOHN L. ALBERGER, and LOUIS R. ALBERGER, Buffalo N. Y. Filed Aug. 22, 1887. Serial No. 247,573. (No model.)



Claim.—1. The combination of the gravel-box F with the closed evaporators D and E, the open grainer H, the pipes P, the shaft [illegible] stantially as described.

2. The combination of the grainer H with the pipes P, the rotating arms R, having scrapers L, the shaft K, the shaft T, and the agitator-arms U, provided with flippers W, in the manner as and for the purpose described.

3. The dam, in combination with the grainer H, the pipes P, and the inlet and exit pipes P^{10} and P^9, in the manner as and for the purpose described.

4. The dam, in combination with the grainer H, the flippers W, the arms U, and means for supporting and rotating them, in the manner as and for the purpose described.

5. The combination of the tubular heaters A B, the gravel-box F, the evaporators D and E, the grainer H, and the heater C with the pump A^2 and connecting-pipes, in the manner as and for the purpose described.

6. The combination of the grainer H with the agitator-arms U, the pendent parts *b c d*, and the shaft T, in the manner as and for the purpose described.

7. The combination of the heaters A A' with the gravel-boxes F G, the heater B, the pump A^2, and connecting-pipes, in the manner as and for the purpose described.

8. The combination, in a grainer, of a series of arms provided with scrapers submerged in the brine, a series of agitator-arms above the brine, provided with flippers, and shafts T and K, in the manner as and for the purpose described.

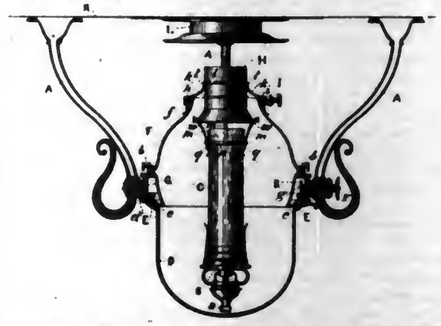
9. The combination of the grainer H with the suction-pipe P^8, the jacket-pipe P^6, inclosing it, the heater C, and the pump A^2, together with means for returning the brine through the apparatus to the grainer, in the manner as and for the purpose described.

10. The combination of the pump A^2, the grainer H, and the pipe P^4 with the pipe P^8, the heater C, pump A^2, and connecting-pipes, and means for conveying the brine through the apparatus to the grainer, in the manner as and for the purpose described.

11. The combination of the grainer H with the inlet-pipe P^{10}, the exit-pipe P^9, the pipes P, the dam, the rotating arms having scrapers, and the agitating-arms provided with flippers, in the manner as and for the purpose described.

12. The combination of the heaters A A', the gravel-boxes F G, evaporators D and E, grainer H, heating-pipes P, suction-pipe P^8, and heaters B and C with the pump A^2 and connecting-pipes, in the manner as and for the purpose described.

400,984. LAMP FIXTURE AND VENTILATOR FOR RAILWAY-CARS. JOHN WILLIAMS, Jersey City, N. J., and EDWARD J. FROST and WILLIAM DAWSON, Philadelphia, Pa. Filed June 5, 1885. Serial No. 167,774. (No model.)



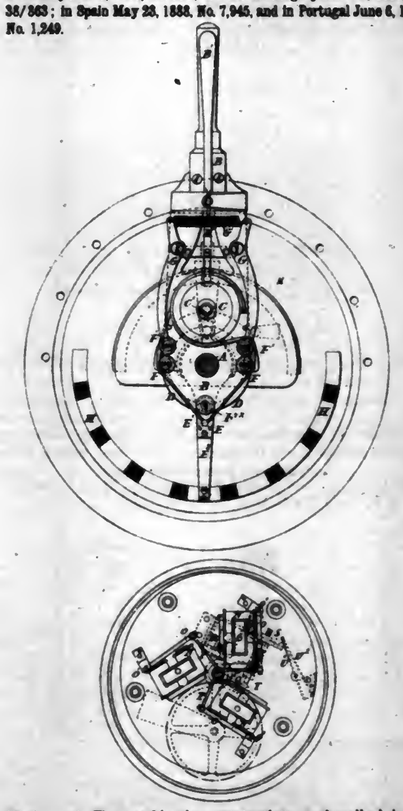
Claim.—1. The combination, with the burner and its chimney, of the inclosing bell-glass and the inclosing dome-shaped reflecting-shade, the edges of which meet together, so as to form an unobstructed space around said burner and chimney, the supporting ring or frame surrounding the joint of said shade and glass, and a perforated support in the upper contracted open end of said shade surrounding and supporting the upper end of said chimney and admitting air to feed the burner, substantially as described.

2. The combination, with the burner and its chimney, of the dome-shaped reflecting-shade having a contracted upper open end, the perforated clamp-ring fitted to said shade and securely supporting a separable chimney-piece therein, and a spring-clamp connection of said chimney-piece supporting the upper end of said chimney, substantially as described.

3. The chimney-piece supporting-ring consisting of the annular ring fitted around the reflecting-shade, the perforated extension or fingers fitted to support said chimney-piece, and the movable clamp-segment of said supporting-ring and its adjusting clamp-screw I, substantially as described.

4. The combination of the chimney, the separable chimney-piece fitted above it, and the double-ring clamp-connection between said chimney and chimney-piece, consisting of a ring secured to the lower end of said chimney-piece and connected by fingers with a second ring grasping the upper end of said chimney by interposed springs, substantially as described.

400,985. TELEGRAPH APPARATUS FOR SHIPS. JAMES B. WILLER, Portsmouth, County of Hants, England. Filed Feb. 7, 1888. Serial No. 263,256. (No model.) Patented in England Jan. 16, 1887, No. 800; in France Dec. 7, 1887, No. 187,446; in Belgium Dec. 8, 1887, No. 79,839; in Germany Dec. 21, 1887, No. 45,392; in Italy Dec. 31, 1887, No. 22,756; in Norway Feb. 6, 1888, No. 884; in Austria-Hungary Mar. 29, 1888, No. 38/363; in Spain May 23, 1888, No. 7,945, and in Portugal June 6, 1888, No. 1,249.



Claim.—1. The combination, substantially as described, in an electric-telegraph transmitter, of a contact-making arm, a series of contacts over which it travels and to any one of which it may be moved, an electric signaling-circuit in which the arm and contacts are included, a movable handle whose movement is to be signaled, yieldingly coupled with said arm and by which the arm may be moved to any of said circuit-completing contacts, and a speed-controller connected with the contact-arm and regulating the speed of its forward movement as it follows the handle independently of the movement of the handle, whereby whether the handle be moved rapidly or slowly good contacts are obtained, as described, and a locking-bolt for holding the handle in any desired position.

2. The combination, substantially as described, of a transmitter which when operated by the movement of a handle transmits currents in succession through three line-wires, an electric telegraph-receiver consisting of three electro-magnets symmetrically arranged around a circle and each included in one of said wires, armatures to these magnets, a central axis with eccentric-pin, connecting-rods passing from the armatures to the eccentric-pin, and gear connecting the central axis with an axis on which is an index or pointer showing the signals upon a dial, as herein set forth, the return-wire, and the arc on the transmitter to which the return-wire is connected.

3. The combination of a transmitter having a contact-maker, a series of contacts, a handle yieldingly connected with the contact-maker, and a speed-controller connected with the contact-maker, for the purpose described, line-wires connected with said contacts, a receiver having an electro-magnet in each of said line-wires, and an indicator operated by said magnets, as set forth, and a return-conductor with which all of said wires are connected after passing through their magnets, returning to the contact-maker of the transmitter, and circuit making and breaking devices for opening and closing the circuit of the return-conductor.

4. The combination of a transmitter having a contact-maker, a series of contacts, a handle yieldingly connected with the contact-maker, and a speed-controller connected with the contact-maker, for the purpose described, line-wires connected with said contacts, a receiver having an electro-magnet in each of said line-wires, and an indicator operated by said magnets, as set forth, a return-conductor with which all of said line-wires are connected after passing through their magnets, returning to the contact-maker of the transmitter, a magnet, R, in said conductor, contacts $U' U^2$, included in a sub-circuit operated by said magnet R, and signal-bells in said sub-circuit at the transmitter and receiver.

5. The combination, substantially as described, in an electric-telegraph transmitter, of a contact-making arm, a series of contacts over which it travels and to any one of which it may be moved, an electric signaling-circuit in which the arm and contacts are included, a movable handle pivotally connected with the contact-making arm, the pulleys on the arm, the chains secured to the arm and passing over the pulleys, the spring-actuated drum to which the chains or cords are connected, the fly-wheel, gearing between the fly-wheel and the contact-making arm, the pivoted levers G, the spring connecting them at their upper end, and the pulleys on their lower ends, over which the chains pass which connect the contact-making arm with the operating-handle.

400,986. FEED-REGULATOR FOR ROLLER-MILLS. JOSEPH W. WILSON, Brookville, Kans. Filed Mar. 16, 1888. Serial No. 267,390. (No model.)



Claim.—1. In a feed-regulator, a vibrating shoe, in combination with a rake having teeth with parallel sides, forming spaces of equal width from top to bottom of the teeth, substantially as and for the purpose set forth.

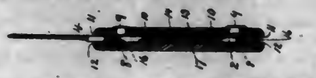
2. In a feed-regulator, the combination of the vibrating shoe, a hinged rake having teeth with parallel sides forming spaces of uniform width, and a spring acting on the rake, substantially as and for the purpose set forth.

3. In a feed-regulator, the combination of the vibrating shoe, a hinged rake having teeth with parallel sides, a spring, and a pin on the spring bearing against the rake, substantially as and for the purpose set forth.

4. In a feed-regulator, the combination of the vibrating shoe, a hinged rake, a spring, and an adjustable pin passing through the spring and bearing against the rake, substantially as and for the purpose set forth.

5. In a feed-regulator, the combination of the vibrating shoe, a hopper, a rake hinged to the hopper by a strip, 6, and adjustable on said strip, a spring, and a pin made adjustable by nuts 13, by which it is secured to said spring, substantially as and for the purpose set forth.

400,987. POCKET-KNIFE. ARTHUR WILSIN, New York, N. Y. Filed Sept. 10, 1888. Serial No. 285,086. (No model.)



Claim.—1. A pocket-knife comprising a handle, a blade with the usual shouldered heel to engage the back-spring when the blade is fully opened and be locked thereby, and a back-spring of the full regular length and with the usual straight end, but differing from the ordinary back-spring in having its inner edge formed with a projection bearing against the heel portion of the blade when closed on the edge adjacent to the knife-edge and forward of the pivotal point of the blade, for the purpose of holding the blade normally partially open or projected, in combination with a locking device engaging the blade when fully closed and holding its portion in rear of its pivotal point out of contact with the knife-spring, substantially as shown and described.

2. In a pocket-knife, a spring in back of the blades, of the full regular length and with the usual straight end, but differing from the ordinary back-spring in having its inner edge formed with a projection adapted to bear against the heel portion of the blade when closed on the edge adjacent to the knife-edge and forward of the pivotal point of the blade, substantially as shown and described.

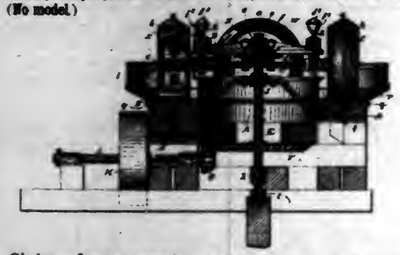
3. A pocket-knife constructed with a spring in back of the blades, with the usual straight end, having its inner edge formed with a pro-

jection bearing against the pivotal portion of the knife-blade on the edge adjacent to the knife-edge and forward of the pivotal point of the blade, in combination with a spring-actuated locking device for the same blade mounted on the knife-handle and extending into a recess in the knife-blade, substantially as shown and described.

4. A pocket-knife constructed with a spring in back of the blades, with the usual straight end, having its inner edge formed with a projection bearing against the pivotal portion of the knife-blade on the edge adjacent to the knife-edge and forward of the pivotal point of the blade, in combination with a locking device for the same blade mounted on the knife-handle and extending into a recess in the knife-blade, substantially as shown and described.

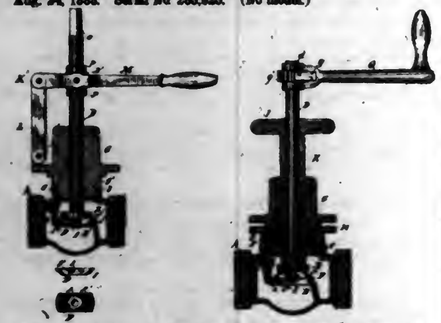
5. In a pocket-knife, a spring-arm formed at its free outer end with a knob projecting through the covering, and with a lateral extension projecting through the linings and engaging the knife-blade and locking it in its closed position from the side opposite to the one on which the knob is located, substantially as shown and described.

400,988. ORE-CRUSHER AND METAL-SEPARATOR. JACOB C. WIXWELL, Medford, Mass., assignor to the Wixwell Electric Mining Machinery Company, Portland, Me. Filed Sept. 30, 1887. Serial No. 251,086. (No model.)



Claim.—In an ore-crusher and metal-separator made substantially as described, the combination of the bed A, plates B, rolls C, with the curb I, provided with one or more openings fitted with screws, with the insulated plate or plates *s*, electric excitant, and connections therewith, substantially as and for the purpose hereinbefore set forth.

400,989. VALVE-RESEATING TOOL. PLINY J. WRIGHT, Minneapolis, Minn., assignor of one-half to Clara E. Sampson, same place. Filed Aug. 24, 1888. Serial No. 283,035. (No model.)



Claim.—1. In a valve-reseating device, the combination, with a revoluble shaft, of a file connected to the lower end of said shaft at right angles to its axis, of a size to cover at any one time only a part of the surface to be dressed, whereby the file is rendered self-clearing, substantially as described.

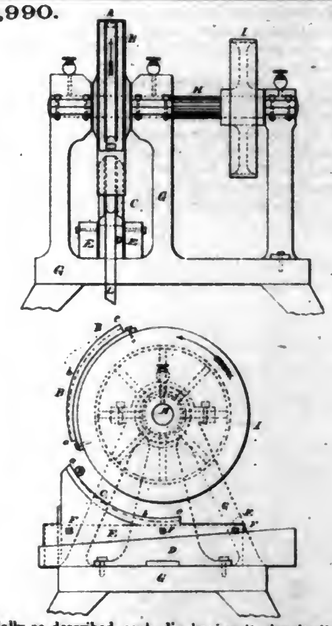
2. In a valve-reseating device, the combination, with a revoluble shaft, of a cutter detachably connected thereto, having a flat file-surface on its under side and inclined file-surfaces on its ends, substantially as described, whereby the tool is adaptable to dressing both flat and conical valve-seats.

3. The combination, with the shaft D, of the cutter F, having flat and inclined file-surfaces *f' f''*, the centering-guide G, the bushing H, the screw K *j*, and the ratchet-crank Q *q q'*, substantially as described.

400,990. MACHINE FOR MAKING STEEL BALLS. WILLIAM H. WRIGHT, Buffalo, N. Y. Filed Aug. 3, 1886. Serial No. 209,027. (No model.)

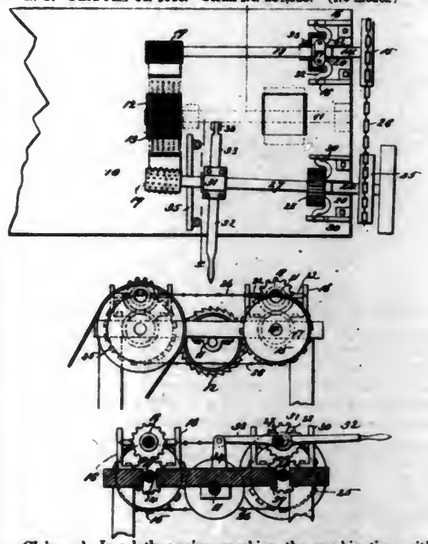
Claim.—In a machine for making balls or other similar articles, the combination of a longitudinally outwardly-curved grooved die having curved edges Q, and mounted on a disk secured to the shaft of the machine, with a longitudinally inwardly-curved grooved die having similar curved edges Q and mounted on the bed of the machine,

400,990.



substantially as described, each die having its longitudinal groove gradually enlarging and its edges curved, for the purposes set forth.

400,991. LATH-SAWING MACHINE. DAVID S. ABBOTT, Olean, N. Y. Filed July 31, 1888. Serial No. 281,525. (No model.)



Claim.—1. In a lath-sawing machine, the combination with a lower feed-shaft provided with a cogged pinion and hangers at each side of said shaft, of an upper parallel feed-shaft, a box supporting said upper shaft, provided with arms pivoted in said hangers, and a cog-wheel recessed to receive the body of said box, meshing with the cog of the lower shaft, substantially as shown and described.

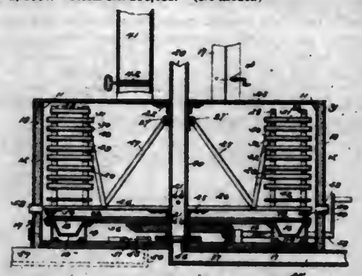
2. In a lath-sawing machine, the combination, with a lower feed-shaft provided with a cogged wheel, vertical hangers at each side of the said shaft at its forward end, and a second parallel and upper shaft, of a box supporting the forward end of the upper shaft, provided with arms pivoted in the hangers, a recessed cog-wheel inclosing the body of the box, meshing with the cog of the lower shaft, a pivoted box supporting the inner end of the upper shaft, and a handle attached to said box, substantially as shown and described, whereby the upper shaft may be vertically adjusted without separating the cogs, as set forth.

3. In a lath-sawing machine, the combination, with a feed-shaft and hangers at each side of the same, of a box supporting the shaft, provided with oppositely-projected arms pivoted in the hangers, and a cogged wheel secured upon said shaft, recessed to receive the body of the box, substantially as shown and described.

400,992. LINIMENT. JULIA A. AGNARD, Lodi, Cal. Filed Nov. 30, 1888. Serial No. 292,346. (No specimens.)

Claim.—The herein-described medical compound as a liniment, consisting of chloroform, ether, laudanum, gum-camphor, tincture arnica, tincture cayenne, beef-gall, fresh butter, alcohol, and water, in the proportions specified.

400,993. FRUIT-DRIER. FREDERICK ALTMAN, San José, Cal. Filed Dec. 2, 1887. Serial No. 256,783. (No model.)



Claim.—1. In a fruit-drier, a drying-chamber having a ventilating-flue with a regulating-damper located at its top, a central vertical air-pipe extending from top to bottom of the drying-chamber and having apertures opening into the drying-chamber, the upper end of the central vertical air-pipe having an air-discharge outlet, an air-supply pipe having a regulating-valve and connecting with the lower end of the central vertical air-pipe, a furnace at one side of the drying-chamber, with a circular hot-air flue located in the drying-chamber, and a rotary fruit-tray rack located above the circular hot-air flue, substantially as described.

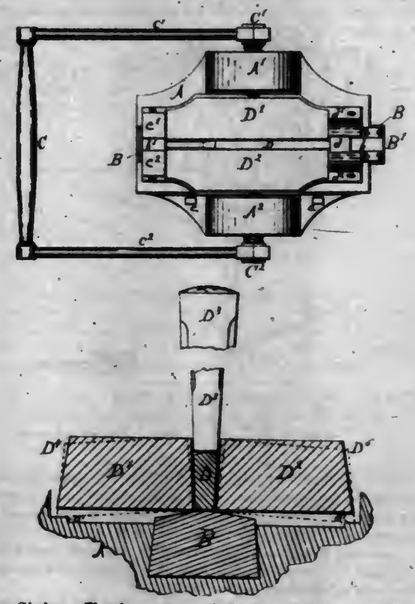
2. In a fruit-drier, a drying-chamber having a ventilating-flue with a regulating-damper located at its top, a central vertical air-pipe extending from top to bottom of the drying-chamber and having apertures opening into the drying-chamber, the upper end of the central vertical air-pipe having an air-discharge outlet, an air-supply pipe having a regulating-valve and connecting with the lower end of central vertical air-pipe, a pit, and carbonic-acid discharge-pipe located in the bottom of the drying-chamber, and having a regulating-valve with means for operating the same, a furnace located at one side of the drying-chamber, with a circular hot-air flue located in the drying-chamber, and rotary fruit-tray rack located above the circular hot-air flue, substantially as described.

3. In a fruit-drier, a drying-chamber with air-supply openings in its walls, a central hollow shaft, 20, having air-supply apertures opening into the drying-chamber and an air-supply pipe at its lower end, a rotary frame mounted on the shaft 20 and having at its periphery fruit-tray racks, a furnace with a circular hot-air flue extending beneath the fruit-tray racks, and perforated plates extending between the hot-air flue and the fruit-tray racks, substantially as shown and described.

4. A fruit-drier consisting of a drying-chamber having air-supply openings 58 in its walls, a rotary vertical hollow shaft, 20, with air-supply perforations 21, an air-supply pipe, 20', at its lower end, and a valve, 56, with operating rod and handle 57, radial arms 26, secured to and braced on the shaft 20, and having at their outer ends casters 59, resting on a circular track, 60, and standards 28, with horizontal wires 29, forming racks for supporting fruit-trays, a ventilator-chimney, 41, with damper 42 at the top of the drying-chamber, a pit, 50, at the bottom of the drying-chamber, with door or valve 51, having operating rod and handle 53, and discharge-conduit 54, a furnace, 15, located adjacent to the drying-chamber, with a hot-air flue, 16, extending beneath fruit-tray racks and terminating in a stack, 17, with valve 40, located above the furnace 15, perforated plates 33, mounted at the bottom of the fruit-tray racks above the flue 16, and a mechanism, substantially as described, for rotating the shaft 20 and fruit-tray racks, substantially as shown and described.

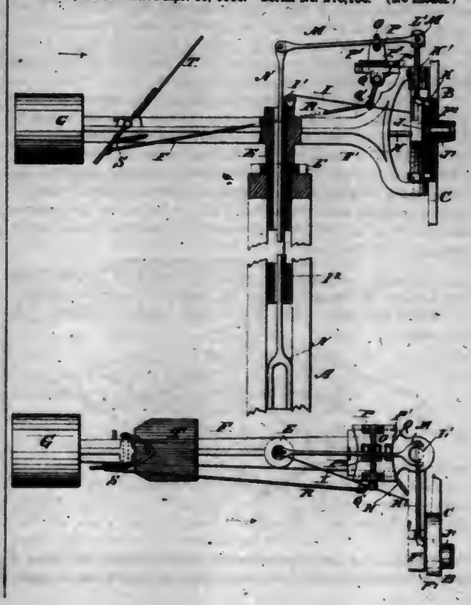
5. A fruit-drying apparatus consisting of a drying-chamber having an air-escape chimney and damper at its top, an opening in its bottom, with a pit, valve, and conduit, a rotary circular open-work frame located in the drying-chamber, supporting a series of fruit-trays, and mounted on a vertical rotary hollow shaft having perforations for the admission of air, a damper at its lower end, and an air-pipe, a circular heating-flue extending beneath the series of drying-pans and connecting at one end to a furnace located at one side of the drying-chamber and at the other to a chimney located above the furnace and adjacent thereto, and a mechanism for rotating the hollow shaft and circular fruit-tray frame, substantially as described.

400,994. FITTING COMMUTATOR-BARS. FERDINAND BAILLEY, Schenectady, N. Y. Filed May 24, 1888. Serial No. 274,983. (No model.)

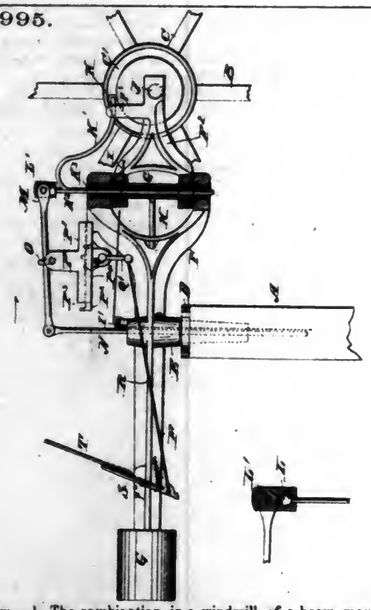


Claim.—That improvement in the art of finishing commutator-bars that have already been formed approximately, whether by the action of a drop-press or any other means producing substantially similar results, which consists in placing the blanks in a die the bottom and sides of which are constructed of the exact shape and dimensions which the finished bar is to have, and then hammering the upper exposed edge of the bar to reduce said bar to the right breadth, and at the same time to straighten the bar and also secure a hardened surface on the edge (so hammered) of the bar, substantially as described.

400,995. WINDMILL. EDGAR C. BEEBE and RILEY STONER, Glen Elder, Kans. Filed Apr. 10, 1888. Serial No. 270,180. (No model.)



400,995.



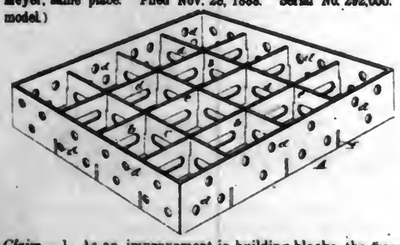
Claim.—1. The combination, in a windmill, of a beam mounted to swing in the horizontal plane, a bracket, a tubular pivot connecting the beam and bracket, a wind-wheel mounted on the bracket, a reciprocating yoke having a shank guided in the bore of the said pivot, operating mechanism, substantially as described, connecting the yoke and wind-wheel, a pitman, and connections between the same and the yoke, substantially as described.

2. The combination, in a windmill, of a hollow standard, a beam journaled on the standard, a bracket connected by a swing-joint to the beam, a wind-wheel mounted to turn on the bracket, an eccentric groove on the body of the wind-wheel, a reciprocating yoke carrying an arm provided with an anti-friction bearing adapted to travel in the eccentric groove, a lever fulcrumed on the beam, a universal joint connecting the yoke and lever, and a main pitman working in the hollow standard and beam-journal and in operative connection with the said lever, substantially as described.

3. The combination, in a windmill, of a standard, a horizontally-turning beam, a wind-wheel mounted to turn thereon, a pitman, a rocking lever in operative connection with the same, operating-connections, substantially as described, between the wind-wheel and rocking lever, a sliding carriage having a rocking bearing mounted upon it and through which bearing said rocking lever freely passes, a governor-vane, and connections, substantially as described, between said vane and the carriage, substantially as set forth.

4. In a windmill, the combination, with a beam adapted to swing in the horizontal plane, a wind-wheel mounted on the beam, a pitman, and a rocking lever in operative connection both with the wind-wheel and pitman, of a fulcrum for the rocking lever supported on an adjustable carriage provided with gear-teeth, a carriage-guide on the wind-beam, a rocking gear in engagement with the teeth of the carriage, a movable wind-pressed wing on the beam, and connections substantially as set forth, between the said wing and the rocking gear, substantially as described.

400,996. **FRAME FOR BUILDING-BLOCKS OR PAVING-TILES.** BENJAMIN W. BELDEN, St. Louis, Mo., assignor of one-half to Gustave J. Meyer, same place. Filed Nov. 28, 1888. Serial No. 292,055. (No model.)

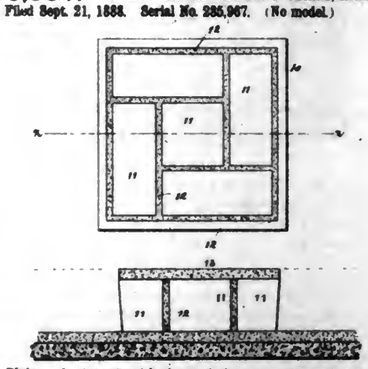


Claim.—1. As an improvement in building-blocks, the frame A, formed of thin strips of non-corrosive material, said frame consisting of an outer shell or casing, and parallel strips arranged at right angles to each other provided with apertures, said strips forming communicating compartments adapted to receive the plastic material, substantially as and for the purpose described.

2. As an improvement in building-blocks, the frame A, formed of suitable thin strips of non-corrosive material, said frame consisting of an outer shell and inner strips arranged parallel to and crossing each other at right angles, the walls of said shells and the strips provided with horizontally-arranged apertures and vertically-arranged slits, whereby said strips and shell may be interlocked, thereby forming compartments communicating with each other, said compartments adapted to receive the plastic material, substantially as and for the purpose described.

3. As a new article of manufacture, a block for building or paving purposes consisting of the frame A, formed of thin apertured strips arranged parallel and at right angles to each other and interlocked, as described, and a plastic composition disposed within said compartments and through the apertures in the walls thereof, all arranged substantially as shown, and for the purpose specified.

400,997. **PAVING-BLOCK.** ROBERT B. BERRIE, Lexington, Mo. Filed Sept. 21, 1888. Serial No. 285,967. (No model.)



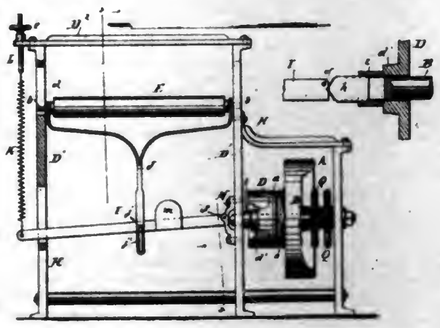
Claim.—1. A paving-block consisting of a series of bricks grouped to form a rectangle, having the spaces between the said bricks filled with a cement grouting, the top covered with a cement mortar and the sides with a coat of coal-tar, with the exception of the top, substantially as shown and described.

2. A paving-block consisting of a series of porous bricks arranged to form a predetermined shape, and the spaces between the same filled with a cement grouting, and the top of the said bricks covered with a cement mortar, substantially as shown and described.

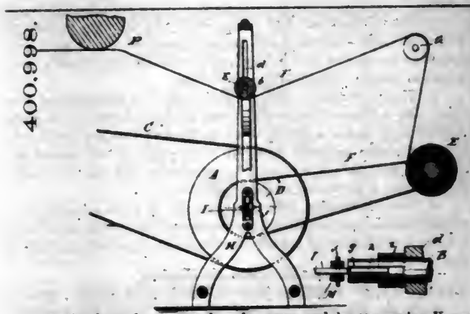
3. A paving-block consisting of a series of porous bricks arranged to form a predetermined shape, having the spaces between the same filled with a cement grouting, a cement mortar covering the upper faces of the bricks, and the said block being provided with a coat of coal-tar upon all sides with the exception of the top, substantially as shown and described.

400,998. **AUTOMATIC CLUTCH AND TENSION MACHINE.** JEREMIAH C. BILL, Willimantic, Conn. Filed June 8, 1888. Serial No. 276,489. (No model.)

Claim.—1. The automatic clutch and tension machine comprising pulleys A D, adapted to be clutched together, a tension weight or roller, E, supported on a lever, I, and intermediate mechanism placed between the lever I and pulley D, whereby vertical movement of the lever I will impart horizontal movement to the pulley D, substantially as described.

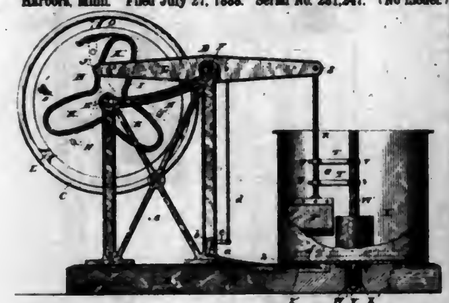


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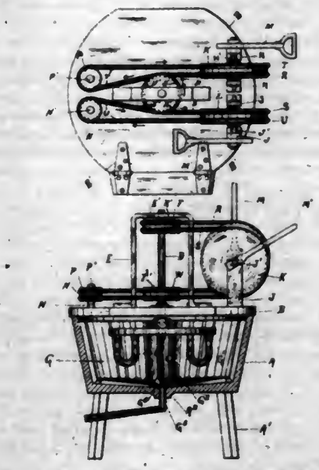
2. The lever I, supported at its outer end by the spring K and pivoted at its opposite end at *f*, in combination with the roller E, frame J, pulleys A D, plate Â, and ring *i*, the plate Â impinging against the end of the lever I below its pivot *f*, substantially as described.

400,999. **MEAT-CHOPPING MACHINE.** FRANK BLOOMQUIST, Two Harbors, Minn. Filed July 27, 1888. Serial No. 281,347. (No model.)



Claim.—In the herein-described meat-chopping machine, the combination of the frame, the trefoil wheel journaled thereto, the working-beam, also journaled to said frame, a pin secured to said working-beam and traveling in said trefoil, a bell-crank lever pivoted at the base of the frame, a rod connecting the bell-crank lever and the working-beam, a spring-pawl connected to said bell-crank lever and engaging the ratchet around the lower periphery of the meat-receptacle, a jointed rod connected to said working-beam and provided with a reciprocating knife, the upright shaft and guides, and a seat located beneath the floor of the meat-receptacle, all arranged and adapted to operate in the manner and for the purpose substantially as described.

401,000. **WASHING-MACHINE.** CARL BRANDTNER, Reading, Pa. Filed May 21, 1888. Serial No. 274,538. (No model.)



Claim.—1. The combination, with the main shaft provided with pulleys F and W, of drivers secured to independent shafts, idlers P and N, and a flexible driving-connection between said drivers and pulleys, whereby the simultaneous movement of said drivers in opposite directions is adapted to co-operate in rotating said main shaft, substantially as set forth.

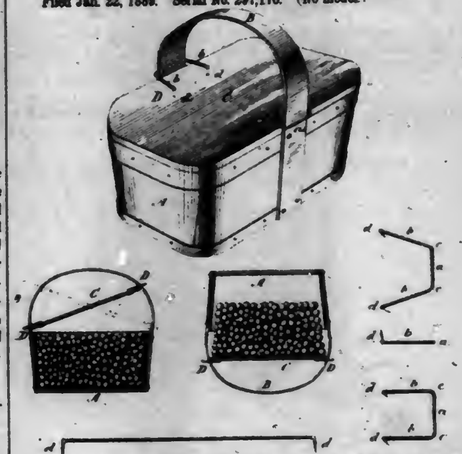
2. The combination, with the main shaft provided with pulleys F and W, of drivers secured to independent shafts supported at right angles to said main shaft, idlers P and N, and separate ropes R and S and T and U, having one end of each fastened to said drivers and the opposite ends to said pulleys F and G, respectively, whereby the simultaneous movement of said drivers in opposite directions is adapted to co-operate in positively rotating said main shaft, substantially as set forth.

401,001. **FEED-BAG.** WILLIAM M. BROOKE, New York, N. Y., assignor of one-half to James J. Ebert, same place. Filed Oct. 27, 1888. Serial No. 289,273. (No model.)



Claim.—The herein-described feed-bag, consisting of the body 10, provided with the pocket 12, the apertured bottom 13, the grommets 14, near the top edge of the bag, the ropes 15 and 16, secured in the grommets, the rings 17, to which the ropes 15 and 16 are secured, and the ropes 18 and 19, secured to the rings 17, as specified.

401,002. **FRUIT-BASKET-COVER FASTENING.** FRANK BURNS, Westfield, N. Y., assignor of one-half to Elijah W. Holt, same place. Filed Jan. 22, 1889. Serial No. 297,170. (No model.)



Claim.—1. The combination, with a covered fruit-basket having a handle arched over its top, of a cover-fastening consisting of two staples driven into the cover on opposite sides, and each embracing the handle, whereby the cover is held in place on top of the basket, and it may be raised to inspect the contents thereof, and the lateral spreading of the basket is prevented.

2. The combination, with a covered fruit-basket having a handle arched over its top, of a cover-fastening consisting of a staple applied to the top of the cover, with its ends bent down and driven into the cover, and its middle portion bent to embrace the handle.

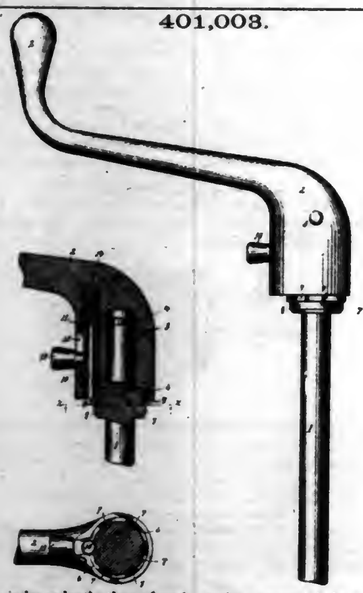
3. The combination, with a covered fruit-basket having a flat handle arched over its top, of a cover-fastening consisting of two staples driven into the cover on opposite sides thereof, each staple formed with a straight middle portion, *a*, extending outside of the handle, side portions, *b b*, extending thence inwardly over the cover and confining the edges of the handle between them, and turned-down sharpened end portions, *d d*, driven into the cover, whereby the endwise displacement of the cover is prevented.

401,003. **BRAKE-HANDLE.** SAMUEL A. BURR, Bridgeport, Conn. Filed Feb. 4, 1889. Serial No. 298,553. (No model.)

Claim.—1. In combination, a brake-staff having an enlargement provided with notches at its outer edge, said notches terminating abruptly in a flange, 8, a handle secured to said staff, but free to rotate thereon, and a bolt socketed in said handle and adapted to engage said notches, as and for the purpose set forth.

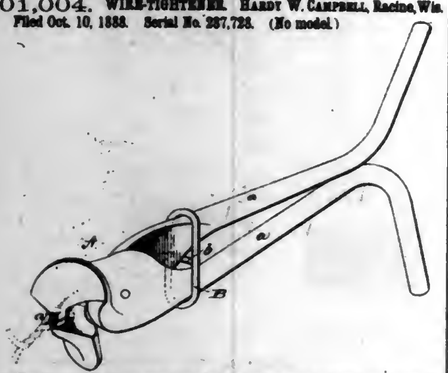
2. The brake-staff having an enlargement with notches 9 and flange 8, in combination with a handle secured to said staff, but free

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to rotate independently thereof, and a spring-actuated bolt socketed in said handle and adapted to engage said notches, said bolt being provided with a finger-piece for convenience in operation.

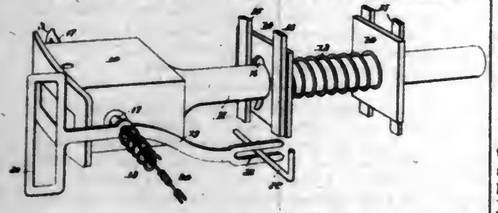
401,004. WIRE-TIGHTENER. HARDY W. CAMPBELL, Racine, Wis. Filed Oct. 10, 1888. Serial No. 287,723. (No model.)



Claim.—1. The herein-described device for twisting or tightening wire, consisting of a pair of levers bent at their upper ends and having the auger-bit-shaped jaws, and a projection upon the inner edge of each of said jaws adapting them to receive and retain the wire, substantially as described and shown.

2. The herein-described device for twisting or tightening wire, consisting of a pair of levers bent at their upper ends and having the auger-bit-shaped jaws, and a projection upon the inner edge of each of said jaws adapting them to receive and retain the wire, in combination with the ring B, substantially as described.

401,005. CAR-COUPLING. MANUEL M. CARMONA Y VALLE, Mexico, Mexico. Filed Dec. 1, 1888. Serial No. 292,581. (No model.)



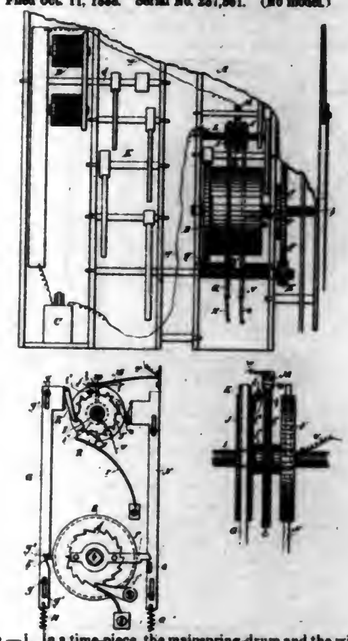
Claim.—1. The combination, with a draw-head, of a coupling-pin, a spring arranged in connection with the pin, and a coupling-link pivotally connected to the pin, substantially as described.

2. The combination, with a draw-head, of a coupling-pin formed with a forwardly-extending and inwardly-inclined arm, a spring arranged in connection with the pin, and a coupling-link pivotally connected to the pin, substantially as described.

3. The combination, with a draw-head, of a coupling-pin provided with a forwardly-extending arm, auxiliary draw-bars through which the pin passes, a saddle by which the draw-bars are connected, a lever pivotally mounted upon the coupling-pin, a link carried by the lever, and springs arranged in connection with the lever and coupling-pin, substantially as described.

4. The combination, with a coupling-pin, of a link pivotally connected thereto, auxiliary draw-bars through which the pin passes, and a follower-plate through which the draw-bars pass, substantially as described.

401,006. ELECTRIC SELF-WINDING TIME-PIECE. MANUEL CARRANZA, Guatemala, Guatemala, and José M. TINOCO, San Francisco, Cal. Filed Oct. 11, 1888. Serial No. 287,861. (No model.)



Claim.—1. In a time-piece, the mainspring-drum and the winding-arbor, the electric motor connected with the winding-arbor, and an electric circuit, including the motor, in combination with the separable contacts forming the poles or electrodes of the circuit, a rotary wheel carrying one of the contacts, and a mechanism for operating the wheel, consisting of a ratchet-wheel having a lug, a fixed pin on the rotary wheel with which the lug of the ratchet-wheel is adapted to come in contact, a vertically-movable bar having a pawl for engaging and turning the ratchet-wheel, and the lug on the mainspring-drum for operating the movable bar, substantially as herein described.

2. In a time-piece, the mainspring-drum, the winding-arbor, and the holding ratchet-wheel thereon, an electric motor connected with the winding-arbor, and an electric circuit, including the motor, in combination with the separable contacts forming the poles or electrodes of the circuit, the rotary wheel carrying one of the contacts and having a fixed pin, the mechanism for moving the wheel to bring the contacts together and close the circuit, consisting of a ratchet-wheel, J, having a lug adapted to come in contact with the pin of the rotary wheel, the vertically-movable bar G, having the pawl engaging the teeth of the ratchet-wheel, and the lug on the mainspring-drum for operating the bar, and the mechanism for returning the rotary wheel to position and opening the circuit, consisting of the second ratchet-wheel, J', connected with the ratchet-wheel J, the vertically-movable bar N, having an arm, Q, and a pawl for engaging the ratchet-wheel J' and reversing both ratchet-wheels, and the arm P, secured to the holding-ratchet of the winding-arbor and adapted to engage and operate arm Q of the vertically-movable bar N, substantially as herein described.

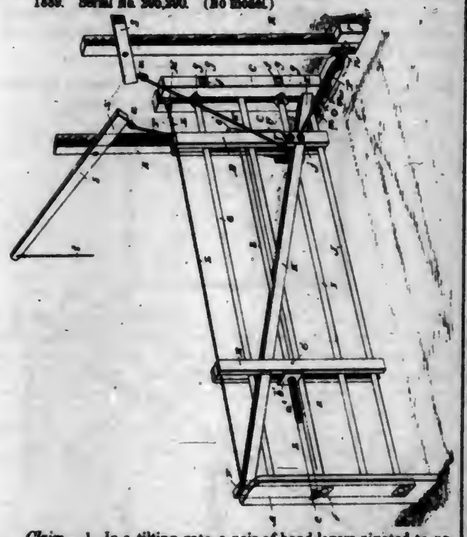
401,007. FASTENING FOR SHOES. PAUL CASPARY, Chicago, Ill. Filed Jan. 29, 1889. Serial No. 297,960. (No model.)

Claim.—A fastening for shoes, consisting of a continuous wire bent into substantially a V form, with a coil outside of or exterior to its meeting angle and comprising two arms or members, one of which is provided with hooks and the other with eyes, substantially as shown and described.

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401,008. GATE. CLARK CHIDESTER, Decatur, Ind. Filed Jan. 3, 1889. Serial No. 295,290. (No model.)

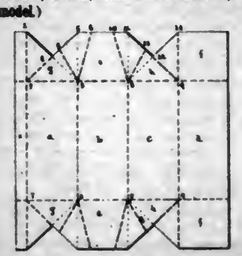


Claim.—1. In a tilting gate, a pair of hand-levers pivoted to upright standards, a bell-crank lever pivoted to the gate and consisting of a rod bent to form a yoke and extending on either side of the gate, and a spring-actuated bolt engaged by said yoke and operated thereby, in the manner and for the purpose described.

2. In a tilting gate, the combination of a pair of hand-levers pivoted to upright standards erected on either side of the gate, a bell-crank lever consisting of a U-shaped portion and a pair of short arms located on either side of the gate, a pair of rods connecting the hand-levers and the short arms of the bell-crank lever, and a spring-actuated bolt engaged by the U-shaped portion of said bell-crank lever and operated thereby, all arranged and adapted to operate as set forth.

3. In a tilting gate, a bell-crank lever pivoted to the gate and consisting of a U-shaped portion and a pair of short arms extending on either side of the gate, in combination with a pair of hand-levers, a spring-actuated bolt, a projection upon the end of said bolt engaging the U-shaped portion of the bell-crank lever, and a slot in said bolt engaged by a pin which limits the play of the bolt, substantially as described.

401,009. PAPER BOX. DWIGHT S. CLARK, Cambridge, assignor to William H. Forbes, Boston, Mass. Filed Dec. 29, 1888. Serial No. 294,943. (No model.)



Claim.—1. A blank for an angular paper box, scored or indented for folding, so as to form the sides *a b c d*, and the pasting-strip *x*, the back and front flaps, *e* and *f*, and the side flaps, *g* and *h*, the last two being notched, as shown, and subdivided by the lines 7 2 and 3 4 in one, and 9 12 and 8 13 in the other, substantially as shown and described.

2. A blank for a rectangular paper box, scored or indented for folding, and consisting of four fields for the sides, a pasting-strip to unite the first and last sides, and four connected flaps at each end for closing the box, each set of four having a front flap to cover the whole cross-section of the box, a back flap having converging edges, and two notched side flaps, each divided by scored or indented lines into two triangular and one irregular four-sided figure, substantially as shown and described.

3. An angular paper box consisting of the sides *a*, *b*, *c*, and *d*, united to form a four-sided prism, and closed by ends constructed of the side flaps, *g* and *h*, folded upon themselves, the front flap, *f*, and the back flap, *e*, inserted between the front and side flaps, substantially as described.

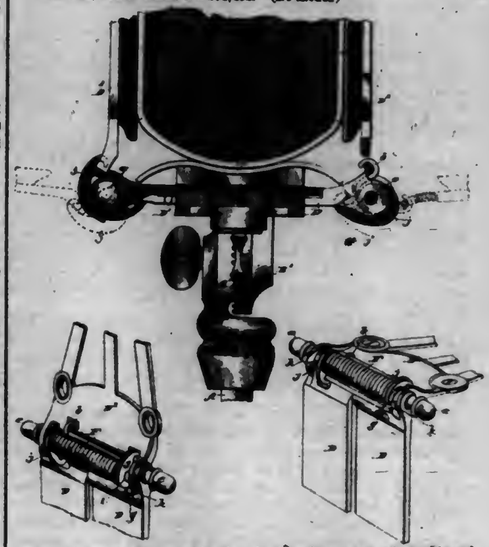
4. An angular paper box consisting of the sides *a*, *b*, *c*, and *d*, united to form a four-sided prism, and closed by ends consisting, first, of the triangular fields 7 4 3 and 9 13 8, then the triangular fields 7 2 1 and 9 12 14, then the four-sided figures 3 4 5 6 and 8 13 11 10, then the pointed flap *e*, and upon that the square front flap, *f*, substantially as described.

5. In the closed end of an angular paper box, the side flaps, *g* and *h*, notched by cutting through the lines 1 2 2 5 and 11 12 12 14, and subdivided each by indented lines into three fields folding on each other, in combination with the pointed entering flap *e* and the rectangular flap *f*, covering the whole end of the box, substantially as described.

401,010. PROCESS OF TOUGHENING FORGED ARTICLES OF STEEL. JOHN COFFIN, Johnstown, Pa., assignor to The Cambria Iron Company, same place. Filed Feb. 8, 1888. Serial No. 263,327. (No specimens.)

Claim.—The within-described process of toughening steel articles that have been forged, consisting in first forging the article, then immediately subjecting it to the cooling action of a bath of water or other cooling mixture or medium to partially cool its mass, and finally removing the article from the bath while it has sufficient contained heat in its body to show after diffusion a low red color in the dark.

401,011. BOOK-SUPPORT. JAMES W. COULTAS, Clinton, Ill. Filed Nov. 21, 1888. Serial No. 291,482. (No model.)



Claim.—1. The combination, in a book-support, of two hinged plates jointed together about a fixed axial line, a spiral spring arranged parallel and adjacent to that line and having one end attached to one hinged plate and the other end to the other hinged plate, and link-bars connected loosely to the opposite ends of the spring and opposite hinged plates, whereby the axis of the spring is thrown away from the axis of the hinge when the latter is opened and the hinge locked in open position, substantially as shown and described.

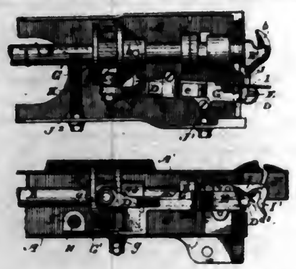
2. The combination, in a book-support, of two pairs of hinges, each having one leaf formed in two different planes and arranged to lap together reciprocally, and a clamp for fastening the same together, consisting of an upper plate, which forms a rest for the back of the book, a subjacent frame-plate, and set-screws holding the two together, substantially as shown and described.

401,012. CORN-HUSKING IMPLEMENT. JOHN L. CULBERSON, Hendrysburg, Ohio, assignor of two-thirds to Robert Boyd and Alexander Pryor, same place. Filed Nov. 16, 1888. Serial No. 291,018. (No model.)



Claim.—The corn-husker herein described, consisting of the main portion A, having a slot, as a^3, in its rear end, with obliquely-inclined end walls, its rear end being bent to form a ring, as a, and its forward end being bent up and serrated, of a series of upwardly-extending teeth, as b^3, on the portion A near its serrated end, an arm, as D, pivoted in the said slot, having a curved forward end with a serrated edge, and the spring E, secured to the outer end of portion A and impinging against the rear end of the arm, substantially as described.

401,013. BAND-SECURING MECHANISM FOR GRAIN-BINDERS. JOHN S. DAVIS, Cleveland, assignor to the Davis Platform Binder Company, Rockport, Ohio. Filed Nov. 2, 1887. Serial No. 254,034. (No model.)



Claim.—1. The combination of the knotter, the reciprocating cord-holder and the laterally-moving guide-bracket in which it is mounted, a spring to press the bracket away from the knotter, an adjustable stop to limit its outward movement, and a fixed stop to limit its movement toward the knotter, substantially as and for the purpose hereinbefore set forth.

2. The combination of the guiding-horn I', the bar D, reciprocating across the recess under the horn, and the spring-actuated bar E, which follows the bar D partly across the recess, holding the cord end until it is freshly gripped between the bar D and the horn.

3. The combination of the guiding-horn I', the bar D, reciprocating across the recess under the horn and inclined at its front end to ride under the cord, the hooks or clamping-abutment d' d^3 on the upper surface of the bar, and the spring-actuated bar E, against the end of which the abutment bears to clamp the cord, substantially as set forth.

4. The combination of the guideway and its fixed horn I with the reciprocating bar D, inclined and rounded at its front end and formed with projecting hooks or abutments on its upper side and a recess or throat on its lower side, substantially as hereinbefore set forth.

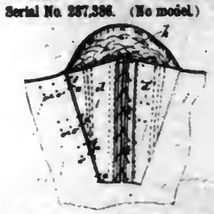
5. The combination of the bar D, inclined and formed with a clamping hooked projection on its front end, the clear groove d, dividing said hook into two separate parts, the spring-actuated bar E, formed with a tongue, E', on its front end that slips into the groove, and having the shoulders at each side of the tongue shaped to fit into clamping-hooks on the bar D, substantially as hereinbefore set forth.

6. The combination of the knotter, a laterally-moving guideway, a cord-holder consisting of bars D and E mounted therein, the horn I', and shear i^3, mounted on the guideway, which is adapted to be drawn toward the knotter by the cord held in the grasp of the holder with a spring, H, which urges the holder away from the knotter, and means by which its force may be adjusted, substantially as and for the purpose hereinbefore set forth.

401,014. INSULATING AND COATING COMPOUND. ANTOINE DE FIGANIÈRE, Philadelphia, Pa.; Gibson Peacock, committee of said de Figanière (lunatic.) Filed Aug. 12, 1886. Renewed Nov. 10, 1888. Serial No. 290,473. (No specimens.)

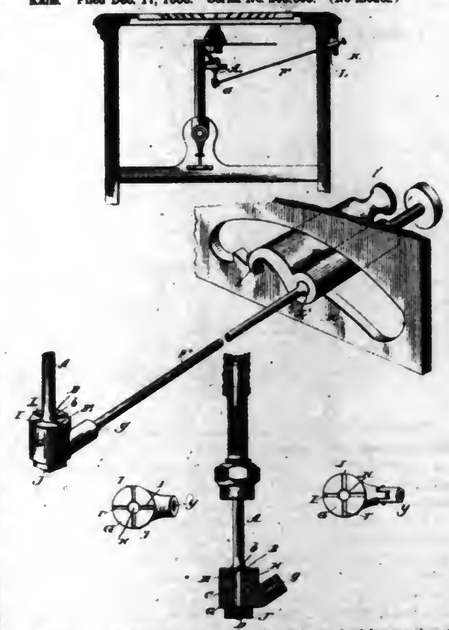
Claim.—The hard, fusible insulating and coating composition of matter herein described, consisting of pulverized coal, lime, and coal-tar pitch, in about the proportions specified.

401,015. CORSET. FANNIE E. DENKEL, Glen Ullin, Dak. Filed Oct. 6, 1888. Serial No. 287,386. (No model.)



Claim.—The combination, with a corset and its bust-section, of double flaps disposed inside the bust-section and secured thereto, and a series of rows of lacing-holes diverging or radiating from a common point at the base of the bust-section upwardly to the top thereof, whereby the bust of the corset is given more or less prominence, substantially as set forth.

401,016. GASOLINE-STOVE. WILLIAM P. DURHAM, Belleville, Kans. Filed Dec. 17, 1888. Serial No. 293,893. (No model.)



Claim.—1. A gasoline-stove valve-shaft formed with a portion, C, and an opening, b, combined with the lever-connecting piece having an opening fitted to receive portion C, and provided in its face with a groove or grooves registering with opening b, and the pin E, fitting in said grooves and opening, substantially as set forth.

2. In a gasoline-stove, the combination of the rack K, the valve shaft, the lever whereby to turn said shaft, and the pawl pivoted on the lever arranged to engage the rack, and having a handle-like portion extended adjacent to the handle of the lever, substantially as set forth.

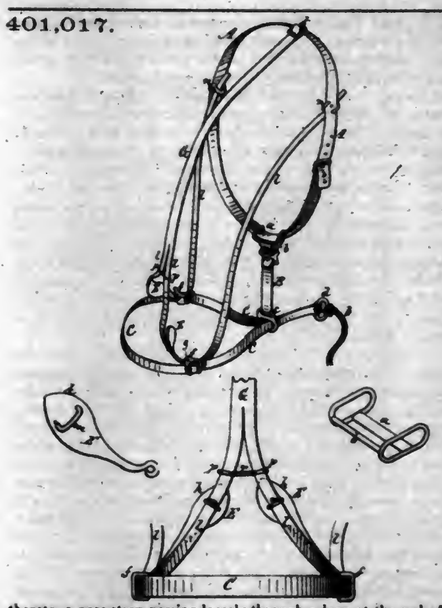
3. The improvement in gasoline-stoves herein described, consisting of the valve-shaft having shoulder B, opening b, non-circular portion C, and threaded part D, the connection-piece G, having socket g, opening H, and grooves I, and having opening H formed to receive portion C of the shaft, the nut-securing piece G on such portion, the pin E, fitted in groove I and opening b, the pawl L, pivoted on the lever-arm near its outer end and having a handle portion, l', and the rack arranged for engagement by said pawl, substantially as set forth.

401,017. HALTER. JAMES DUNN, Brockport, N. Y. Filed July 28, 1888. Serial No. 281,260. (No model.)

Claim.—1. In a halter, the combination of a neck-strap, a hanger attached thereto, a nose-strap passing loosely through a loop at the end of the hanger, and a front strap attached to the top of the neck-strap, thence extending down to the nose-strap, and thence passing up again at the lower ends to the sides of the neck-strap and attached thereto, as herein shown and described.

2. In a halter, the combination of a neck-strap, a hanger attached

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thereto, a nose-strap passing loosely through a loop at the end of the hanger, a front strap attached to the top of the neck-strap, extending down to the nose-strap, branched at the lower end, the branches extending through loops attached to the nose-strap, and extending upward and attached to the neck-strap, and pads pivoted to the nose-strap and connected with the branches of the front strap and bearing against the nose, as herein shown and described.

401,018. FRICTIONAL GEARING. GEORGE F. EVANS, Somerville, Mass. Filed July 26, 1888. Serial No. 281,064. (No model.)



Claim.—1. The device for transmitting motion between two lines of shafting not parallel, substantially as described, composed of two shafts, two beveled frictional gears mounted on their adjacent ends, and a loose endless band encircling one of said gears and adapted to pass between and be gripped by said gears, as specified.

2. In frictional gearing by which motion is transmitted between two shafts not in parallelism, the combination, with two beveled frictional gears and their supporting-shafts, of a loose endless band encircling one gear and adapted to be gripped by both, and means for adjusting one of said gears to control the pressure upon the band, substantially as and for the purposes herein set forth.

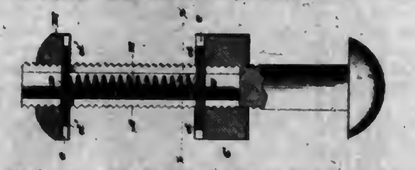
3. In frictional gearing of the class described, the combination, with two beveled gears, one of which is flanged, and the shafts upon which they are mounted, of the loose endless band encircling one of said gears and gripped by the adjacent surfaces of the latter, and adjusting mechanism by which the gears are caused to approach or separate, substantially as described.

4. In a device for transmitting motion between shafts not in parallelism, the shaft 2, its frictional beveled gear 4, the shaft 3, having endwise motion, and the frictional gears 5 10, oppositely disposed thereon and positioned diametrically of said gear 4, combined with two endless bands which loosely encircle said gears 5 10 and co-operate with the gear 4, substantially as set forth and stated.

5. In frictional gearing of the class described, the mechanism for transmitting motion and for reversing the motion transmitted, as described, composed of a shaft which carries a frictional gear provided with a re-entering active surface, a shaft having endwise movement carrying a gear formed with two reversely-conical surfaces, and two adjustable endless bands which operate independently upon said conical surfaces and are gripped between the latter and the re-entering surface of the co-operating gear, substantially as herein set forth.

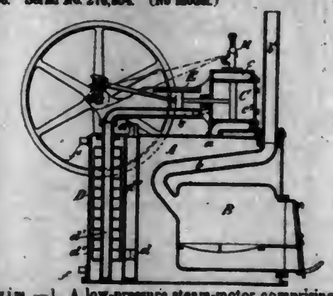
6. In mechanism for transmitting motion from one shaft to another not parallel with the first, a shaft provided with a beveled frictional gear, and a second shaft furnished with conical gears oppositely disposed thereon, combined with two endless bands loosely encircling said conical gears and gripped between said gears and the beveled gear upon diametrically-opposite portions of the latter to render the driven shaft revoluble in either direction, as herein specified.

401,019. NUT-LOCK. LEWIS W. EVANS, Upper Tygart, Ky. Filed Nov. 30, 1887. Serial No. 256,570. (No model.)



Claim.—The combination, with a bolt, A, having the end opposite the head hollow and slotted, nuts C and E, provided with recesses, plates D and D', adapted to engage with said recesses, and a spring, B, located within the hollow portion of the bolt to bear upon said plates, substantially as shown, and for the purpose set forth.

401,020. LOW-PRESSURE STEAM-MOTOR. RICHARD K. EVANS, Whiston Grange, Rotherham, County of York, England. Filed June 12, 1888. Serial No. 276,854. (No model.)



Claim.—1. A low-pressure steam-motor comprising a boiler, a surface-condenser secured to the boiler, a steam-engine secured on top of the boiler and condenser and having its steam and exhaust apertures connected directly with said boiler and condenser, respectively, an air-pump driven by said engine and forcing the condensed water into the upper part of the condenser-jacket, and a feed-water pipe provided with an automatic regulator and connecting the upper part of said condenser-jacket with the boiler, whereby the steam is caused to go through a constantly-recurring cycle of changes within the motor, substantially as set forth.

2. In a low-pressure steam-motor, the combination, with a boiler, of a steam-jacketed cylinder and connection, valve-chest, guides, bearings, and exhaust-passage cast in one, an upright surface-condenser, an air pump with a delivery-pipe, p, to upper part of condenser, a feed-pipe, S, from top of condenser to steam-space of boiler, automatic feed-regulating float t, suspended lever and weight w, and valve v, all arranged substantially as herein described.

3. In a low-pressure steam-motor, the combination, with a boiler carrying on its top a steam-jacketed cylinder fitted and cast in one with the piston-rod guides and crank-shaft bearings, and an upright condenser arranged as specified, of steam-pipe with regulating and equilibrium valves placed in the steam-jacket of the cylinder, and a governor actuating the latter, all arranged as set forth.

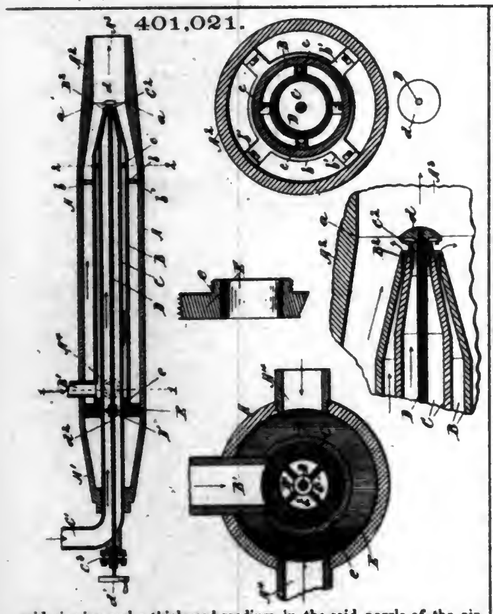
401,021. HYDROCARBON-BURNER. ERNEST W. FELLOWES, South Chicago, Ill., assignor to Ernest T. Fellowes, New York, N. Y. Filed Mar. 26, 1888. Serial No. 268,578. (No model.)

Claim.—1. In a hydrocarbon-burner, the combination of the partition E, screw-threaded on its periphery and having an aperture therein, the sections of pipe A A', having their ends internally screw-threaded and meeting upon said partition, a screw-threaded boss surrounding the aperture in said partition, the steam pipe B, screwed upon said boss, and the oil-pipe fitted hermetically within the said aperture and located concentrically within the pipe B, as set forth.

2. In a hydrocarbon-burner, the combination, with the perforated partition having peripheral screw-threads, of the cylindrical section of pipe A, having its ends interiorly and exteriorly screw-threaded respectively, the conical section A^3, screwed upon one end of section A, and the other end of section A and an interiorly-threaded section, A', having their ends meeting upon said partition, the oil-pipe passing through said partition, a screw-threaded boss on said partition surrounding said oil-pipe, and the steam-pipe screwed upon said boss, as set forth.

3. In a hydrocarbon-burner, the combination, with the concentrically-arranged air, steam, and oil pipes, of a converging nozzle on

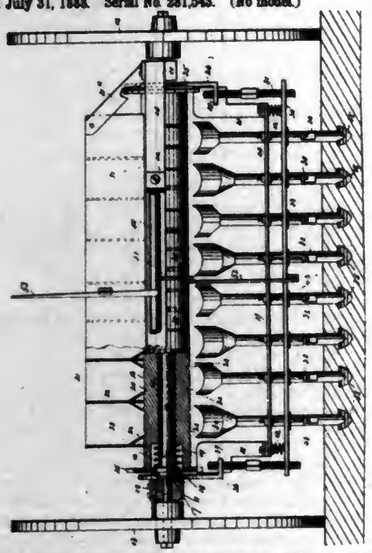
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said air-pipe and a thickened medium in the said nozzle of the air-pipe, located even with the outlets of the steam and oil pipes, substantially as set forth.

4. In a hydrocarbon-burner, the combination, with the steam and oil pipes arranged concentrically one within the other, of a stuffing-box on the end of the oil-pipe, a rod passing through said stuffing-box and oil-pipe, and having a screw-threaded portion and carrying the shield *d* at one end, a screw-threaded nut on said rod, having screw-threaded sockets, screws d^5, passing through the oil-pipe into said sockets, and the partition E, arranged over the heads of said screws d^5, for retaining them in place, as set forth.

401,022. GRAIN-DRILL. CHARLES J. FENDEL, Butte City, Mont. Filed July 31, 1888. Serial No. 281,543. (No model.)



Claim.—1. In a grain-drill, the combination, with a cylinder provided with a fixed number of circumferentially-grouped pockets arranged a set distance apart, and a sleeve passing longitudinally through said cylinder having teeth produced in the extremities, of an axle passing through said sleeve, a spring-actuated clutch-section splined upon said axle engaging the toothed surface of the sleeve, drive-wheels secured to the axle of as many times greater diameter than said cylinder as the desired distance between the seed when dropped is times greater than the distance between the pockets, brackets pivoted to the bearings of the said axle engaging the movable clutch-section, and drills supported from said brackets beneath the several groups of pockets, substantially as shown and described.

2. In a grain-drill, the combination, with a cylinder provided with a number of circumferentially-grouped pockets arranged a set distance apart, a sleeve longitudinally fitted in said cylinder having toothed extremities, a hopper supported above the cylinder, partitions dividing said hopper into a series of chambers, embracing two of said groups of pockets, said chambers having inclined bottoms, and toothed wheels secured to the extremities of said cylinder, of an axle passing through the sleeve of the cylinder, a spring-actuated clutch splined upon said axle, brackets journaled in the bearings of the axle, a lip engaging said clutch, a platform adjustably suspended from said brackets, drills alternately secured in said platform, and a spring-actuated frame engaging the toothed wheels of the cylinder and adjustably attached to the dropping mechanism of the drill, substantially as shown and described.

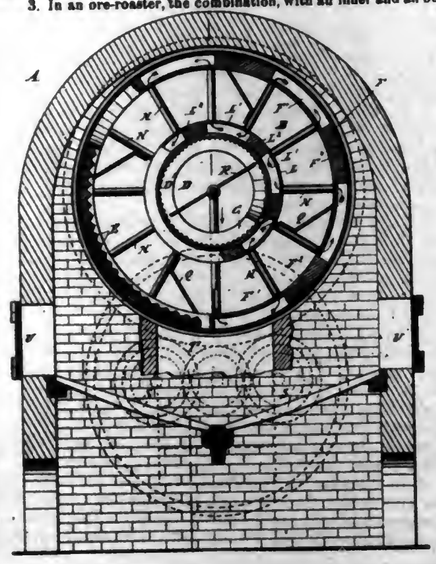
3. In a grain-drill, the combination, with a cylinder provided with a number of circumferentially-grouped pockets arranged a set distance apart, a sleeve longitudinally fitted in said cylinder having toothed extremities, a hopper supported above the cylinder, partitions dividing said hopper into a series of chambers embracing two of said groups of pockets, said chambers having inclined bottoms, and toothed wheels secured to the extremities of said cylinder, of an axle passing through the sleeve of the cylinder, a spring-actuated clutch-section splined upon said axle, brackets journaled in the bearings of the axle having a lip engaging said clutch, a platform adjustably suspended from said brackets, drills alternately secured in said platform, a spring-actuated frame engaging the toothed wheels of the cylinder and adjustably attached to the dropping mechanism of the drill, a frame supported upon the axle surrounding the cylinder, arms projected from said frame, a rock-shaft journaled in said arms, a connection between said rock-shaft and drill-carrying frame, and a lever projected from said rock-shaft, substantially as shown and described, whereby the drill-carrying frame may be elevated or depressed, as desired.

401,023. ORE-ROASTER. CHARLES J. FENDEL, Anaconda, Mont. Filed Oct. 11, 1888. Serial No. 287,790. (No model.)

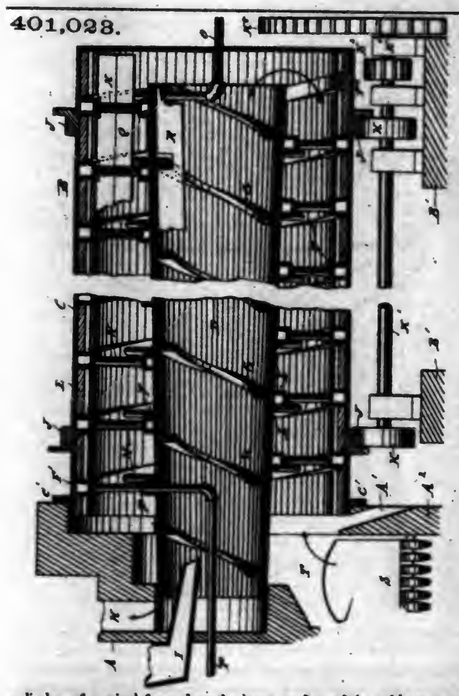
Claim.—1. The combination, in an ore-roaster, with the outer cylinder and the inner cylinder extending therethrough, of the tubes connecting said cylinders, and series of imperforate passages on both cylinders, the tubes alternately connecting the forward end of a passage on one cylinder with the rear end of a passage on the other cylinder and the forward end of the latter passage with the rear end of the next passage on the first-named cylinder, whereby a continuous serpentine passage is formed, substantially as set forth.

2. In an ore-roaster, the combination, with an inner and an outer cylinder, of a spiral formed on the inner surface of the said outer cylinder and made of alternate hollow and solid sections, a second spiral formed on the outer surface of the inner cylinder and also made of hollow and solid sections, and hollow spokes connecting the hollow sections of one spiral with the hollow sections of the other spiral, substantially as shown and described.

3. In an ore-roaster, the combination, with an inner and an outer



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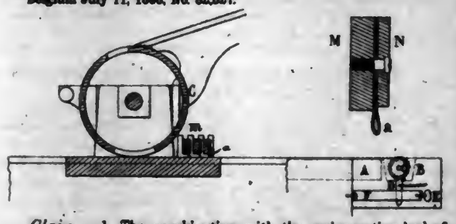


cylinder, of a spiral formed on the inner surface of the said outer cylinder and made of alternate hollow and solid sections, a second spiral formed on the outer surface of the inner cylinder and also made of hollow and solid sections, hollow spokes connecting the hollow sections of one spiral with the hollow sections of the other spiral, a water-supply pipe leading to one of the outermost spokes, and a discharge-pipe leading from the last hollow section of one of the spirals to the outside of the roaster, substantially as shown and described.

401,024. YELLOW DYE. EUGEN FRANK, Elberfeld, Prussia, Germany, assignor to the Farbenfabriken, vormals Fr. Bayer & Co., same place. Filed July 15, 1884. Serial No. 137,789. (Specimens.) Patented in Germany June 14, 1884, No. 31,658, and in England July 1, 1884, No. 9,008.

Claim.—The coloring-matter herein described, which is produced by the action of tetrazo-ditolyl upon salicylic acid, and which is a brown-red powder, forming a yellow solution when dissolved in hot soap-water, and which forms a brown coloring-matter with alkali and with concentrated sulphuric acid produces a dark violet color and dyes unmordanted cotton a yellow color fast to soap solution and sunlight, substantially as described.

401,025. DAMPING APPARATUS FOR LITHOGRAPHIC AND ZINCOGRAPHIC PRESSES. ALBERT GENET, Paris, France, assignor to Jules Michaud, same place. Filed May 26, 1888. Serial No. 275,345. (No model.) Patented in France Apr. 4, 1887, No. 182,680; in Germany Apr. 19, 1888, No. 44,859; in England May 7, 1888, No. 6,781, and in Belgium July 11, 1888, No. 82,567.

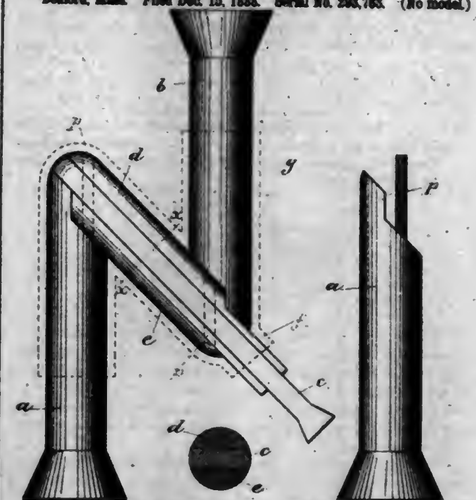


Claim.—1. The combination, with the reciprocating bed of a lithographic or zincographic press, of a rectilinear damper fixed to the frame of the press and composed of flexible material, a dampingtable attached to said bed, and a water-supply roller, also attached to said bed, whereby as the bed reciprocates the roller and table will be passed in contact with the fixed damper, substantially as described.

2. The combination, with the reciprocating bed of a lithographic or zincographic press, of a fixed damper composed of flexible material and a water-supply roller attached to said bed, whereby as the bed reciprocates the roller is caused to travel under and come into contact with the damper, substantially as set forth.

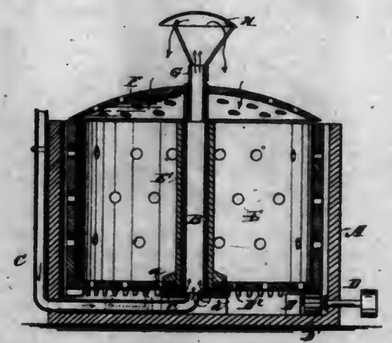
3. The combination, with the damper or dampers *a*, of the roller C, which is caused to rotate in a trough, B, containing water, and is carried by the traveling bed of the machine, so as to automatically supply the dampers *a* with the necessary amount of water for damping the stones or plates of lithographic or zincographic printing-presses, the amount of water being capable of being regulated at will by varying the extent of rotation of such roller, substantially as specified.

401,026. CORE FOR CASTING S-TRAPS. JOHN I. GIFFORD, New Bedford, Mass. Filed Dec. 15, 1888. Serial No. 293,763. (No model.)



Claim.—A metallic core for casting an S-trap, consisting of the end sections, *a* and *b*, provided with pins *p*, passing through the central part of the core to hold it in position, said central portion being divided longitudinally into the sections *c*, *d*, and *e*, all as shown and described.

401,027. DYEING-VAT. JAMES W. GREAVES, Providence, R. I., assignor of one-half to William R. Arnold, same place. Filed May 25, 1888. Serial No. 275,102. (No model.)



Claim.—1. The vat A, central pipe, B, held in the vat, and the perforated basket E, placed upon the said pipe B and of less depth than the length of the pipe, in combination with the steam-pressure pipe C, entering the vat, and the pipe B, substantially as described.

2. The vat A and perforated revolving basket E, placed therein, in combination with a steam-pressure pipe, C, and vertical pipe B, perforated spreader F, placed over the basket, and the spreader H, held above the top of the pipe B, substantially as described.

401,028. BOSOM-FORM. JACOB W. GREBER, Chillicothe, Mo. Filed Oct. 30, 1888. Serial No. 289,544. (No model.)

Claim.—1. In a breast-form and suction-cup, the combination of a compressible spring-frame, substantially as described, constructed to rebound when forcibly compressed and released, and an elastic rub-

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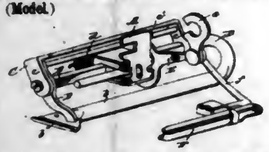


ber cup inclosing said frame capable of holding itself in place by suction against the part to which it is applied, for the purpose described

2. A bosom-form and suction-cup consisting of an elastic rubber cup having a series of integral stiffening-braces, substantially as described, said braces extending along one face of the cup from a point near its open end to the apex thereof, for the purpose specified.

3. A bosom-form and suction-cup consisting of an elastic cup made of a single thickness of rubber and stiffening-braces extending radially from the open end of the cup toward the apex thereof, said braces being composed of inner wire springs and integral ribs inclosing the springs, substantially as and for the purpose described.

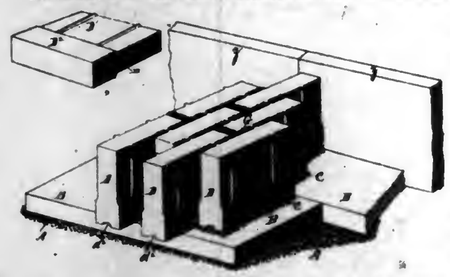
401,029. **TUCK CREASER OR MARKER FOR SEWING-MACHINES.** JOHN M. GRIMM, Bergen Point, N. J., assignor to The Singer Manufacturing Company of New Jersey. Filed Nov. 8, 1888. Serial No. 290,273. (Model.)



Claim.—1. In a tuck creasing or marking attachment for sewing-machines, the combination, with a rigid rocking bar extending lengthwise of the attachment and oscillating at right angles to its length and means for supporting and operating said bar, of a rigid creasing-arm, a spring forming a yielding connection between said arm and rocking bar, and a lower creasing lip or device co-operating with said creasing-arm.

2. In a tuck creaser or marker, the combination, with the supporting-bar B, having a return-bend provided at its forward end with a creasing-lip, of the rocking bar C, pivoted on said bar B and oscillating at right angles to its length, the rigid arm or lever D, the spring-rod *d*, connecting said rocking bar with the said arm or lever, and the operating-lever E.

401,030. **PAVEMENT AND PAVING-BRICK.** DAVID HARGER, Des Moines, Iowa. Filed Dec. 21, 1888. Serial No. 294,279. (No model.)



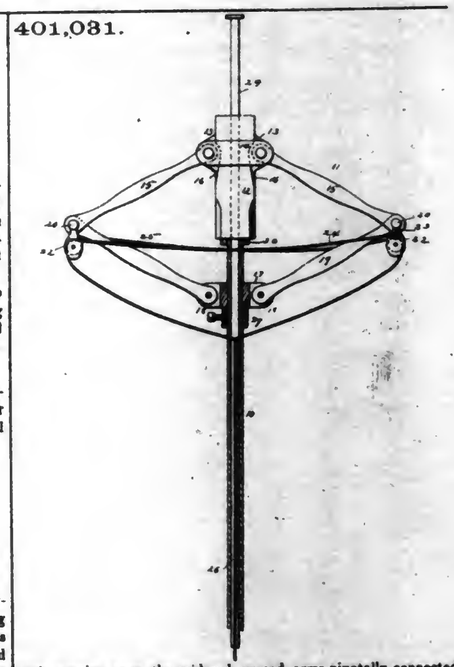
Claim.—A pavement or roadway consisting of a foundation of sand or the like, a tile or brick laid upon said sand, a second layer of sand, and a brick or block set upon said second layer in an upright position, said brick or block having a longitudinal groove in its bottom and an enlarged base projecting on each side, a reduced upper portion being provided with vertical projections or ribs on each side of the brick for equalizing the spaces between the bricks or blocks when set, said spaces being filled with sand or like material, as set forth.

401,031. **DRIVE APPARATUS FOR PILES, &c.** THOMAS J. HARRIMAN, New Paris, Ind. Filed July 14, 1888. Serial No. 279,939. (No model.)

Claim.—1. The combination, with a tube, post, pile, or similar article and a perpendicular guide, of a hammer reciprocating upon said guide, spaced arms pivoted to opposite sides of said hammer, a single arm pivotally connected between the extremities of the upper or spaced arms, a reciprocating guide bar or cap pivoted to the lower ends of the said single arms, and means, substantially as shown and described, for extending the pivoted arms, whereby the hammer is reciprocated upon the guide-rod, as and for the purpose specified.

2. The combination, with a perpendicular guide-rod, of a hammer

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reciprocating upon the said rod, spaced arms pivotally connected to opposite sides of said hammer, single lower arms pivoted between the outer extremities of the spaced arms, a guide bar or cap pivoted to the lower ends of the single arms, and means, substantially as shown and described, for contracting and extending the arms, as and for the purpose specified.

3. The combination, with a perpendicular guide-rod, of a hammer reciprocating upon said rod, spaced arms pivoted to opposite sides of said hammer, lower single arms pivoted between the outer extremities of the said spaced arms, a guide bar or cap pivoted to the lower ends of the said single arms, blocks and eyes secured to the pivotal connection of the upper and lower arms upon opposite sides at opposite ends, and a rope or chain secured to said eyes and passing over said blocks, substantially as shown and described, and for the purpose specified.

4. The combination, with a tube, post, or pile and a perpendicular guide-rod, of a hammer reciprocating upon said guide-rod, spaced arms pivoted to opposite sides of said hammer, lower single arms pivoted between said spaced arms, a sliding block or cap connecting the lower extremities of the single arms, blocks and eyes secured, respectively, to the pivotal connection of the arms upon opposite sides at opposite ends, ropes secured to said eyes passing over said blocks, and means, substantially as shown and described, for clamping the said pile, post, or tube, as and for the purpose specified.

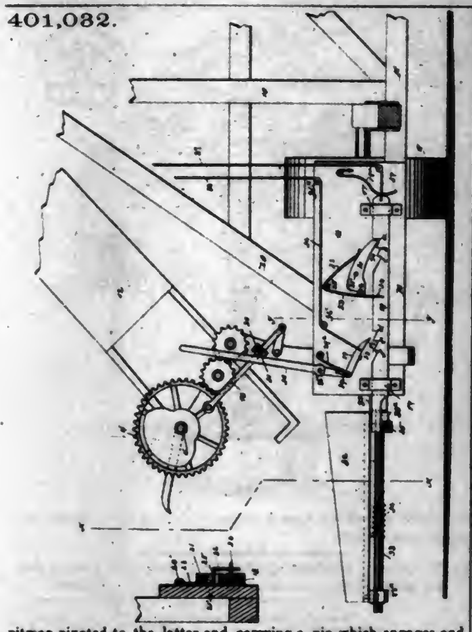
5. The combination, with a reciprocating hammer, spaced arms pivoted to opposite sides of said hammer, and single arms pivoted between said spaced arms, of a cap uniting the said single or lower arms, a perpendicular guide-rod secured to said cap, adapted to pass through the hammer, and means, substantially as shown and described, for securing a post, pile, or tube to said cap, and for reciprocating the hammer, as and for the purpose specified.

401,032. **BUNDLE-CARRIER.** FRED HECKMANN, Philothea, Ohio. Filed Aug. 23, 1888. Serial No. 283,576. (No model.)

Claim.—1. The combination, with the tilting bundle-carrier and a latch secured to the under side of the same, of a sliding bar adapted to engage said latch, provided with two groups of notches in its upper edge, a pawl engaging one group of notches, a spring pressing on one end of said pawl and engaging its other end when the pawl is tilted upward, a dog engaging the other group of notches, and a pivoted lever for operating said dog, substantially as shown and described.

2. The combination, with the tilting bundle-carrier and a latch secured to the under side of the same, of a sliding bar adapted to engage said latch, provided with two groups of notches in its upper edge, a pawl engaging one group of notches, a spring pressing on one end of said pawl and engaging its other end when the pawl is tilted upward, a dog engaging the other group of notches, and a pivoted lever for operating said dog, the knotter-shaft and its gear, and the

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pitman pivoted to the latter and carrying a pin which engages and trips the aforesaid lever, substantially as shown and described.

3. The combination, with a tilting bundle-carrier and a spring-actuated latch secured to the under side of the same, of a sliding bar engaging said latch and provided with an inner and outer group of notches in the upper edge, a pawl engaging the inner group of notches and provided with a shoulder at the outer end, a spring bearing upon the said pawl and provided at its outer end with a horizontal projection to engage the said shoulder, a pin attached to the bar and engaging the outer end of the said spring, a dog pivoted above and engaging the outer group of notches, and means connected with the binder, substantially as shown and described, for operating the said dog, as and for the purpose specified.

4. The combination, with a tilting bundle-carrier, a latch secured to the under side of the same, and a horizontal sliding bar on the harvester engaging with the said latch and provided with an inner and an outer group of notches in the upper edge, the inner group being lower than the outer, of a pawl pivoted above the inner group of notches provided with a shoulder at the outer end, a spring, its upper end bearing upon the upper surface of the inner end of the pawl, passing downward to the outer end of the pawl, and provided with a horizontal projection adapted to engage the shoulder of the pawl, a pin in the bar bearing against the inner surface of the lower end of the spring, a lever pivoted above the outer group of notches, a spring-dog pivoted to the extremity of the said lever, and a sleeve carrying a forwardly-extending pin engaging the said lever, which sleeve is attached to the pitman connecting the needle and knotter shafts of the binder, substantially as and for the purpose specified.

5. The combination, with the knotter-shaft, of a binder, the needle-shaft, the pitman-connection between the two shafts, a sleeve adjustably mounted upon the pitman carrying a forwardly-extending pin, a tilting bundle-carrier below the binding mechanism, and a (spring-actuated) latch secured to the under face of the said carrier, of a sliding bar engaging the latch of the carrier and provided with an outer and inner group of notches in the upper edge, a pawl pivoted above the inner group of notches, a lever fulcrumed above the outer group of notches, a dog pivoted to the lower end of the said lever, and means, substantially as shown and described, for elevating the pawl out of engagement with the inner group of notches, as and for the purpose specified.

401,033. **TIME-STAMP.** BENJAMIN B. HILL, Philadelphia, Pa. Filed Feb. 16, 1887. Serial No. 227,812. (No model.)

Claim.—1. The combination, with the fixed inscription-plate of a hand-stamp and a handle connected with said plate for pressing the same upon the paper, of multiple time-indicating printing-disks, wheel-work connecting them together and moving them simultaneously, and a shaft attached to one of the wheels provided with a knob for turning the same, substantially as described.

2. The combination, with the fixed inscription-plate and the handle

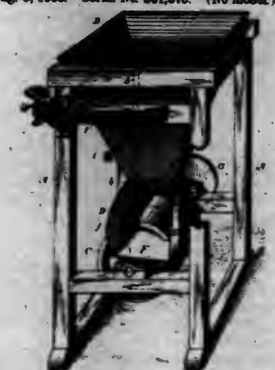
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of a hand-stamp constructed to be pressed downward on the upper surface of the paper to be impressed, of multiple time-indicating printing-disks, wheel-work connecting said printing-disks to cause them to move simultaneously, a cover for said wheel-work, and a shaft extending through said cover and connected with said wheel-work, and having on its upper end means, as the milled head Q, for turning said shaft, substantially as described.

3. The combination, with the fixed inscription-plate and handle of a hand-stamp, of multiple time-indicating printing-disks, wheel-work connecting them together, a back plate covering said wheel-work and carrying the handle of the stamp, and a shaft attached to one of the wheels rising through the back plate and handle and provided with a knob for turning the same, substantially as described.

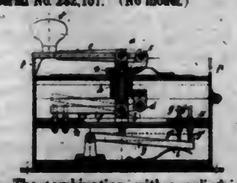
401,034. **ORE-FEEDER.** GEORGE JOHNSTON, San Francisco, Cal. Filed Aug. 3, 1888. Serial No. 281,875. (No model.)



Claim.—1. In an ore-feeder, the combination of the hopper, the horizontal rotary cylinder mounted under the mouth of the hopper, with its axis parallel to the side thereof and to the flow of the material, the fixed scraper or feed flange extending from one side of the hopper over the cylinder to its forward end and at an angle with the plane of its axis, the fixed guide-flange extending from the other side of the hopper over the cylinder to its forward end and at an angle with the plane of its axis, and the discharge-plate between the projecting ends of the two flanges and at the end of the cylinder, substantially as herein described.

2. In an ore-feeder, the combination of the hopper, the horizontal rotary cylinder mounted under the mouth of the hopper with its axis parallel to the side thereof and to the flow of the material, said cylinder having a recessed end, the fixed scraper or feed flange extending from one side of the hopper over the cylinder to its forward end and at an angle with the plane of its axis, the fixed guide-flange extending from the other side of the hopper over the cylinder to its forward end and at an angle with the plane of its axis, and the discharge-plate between the projecting ends of the two flanges and at the end of the cylinder, said discharge-plate having a lip extending into the recessed end of the cylinder and forming a close joint, substantially as described.

401,035. **ELECTRICAL NIGHT-SIGNALING APPARATUS.** EMIL KAMELOWSKY, Berlin, Germany, assignor to the Berliner Maschinenbau-Actien-Gesellschaft, vormals L. Schwartzkopff, same place. Filed Aug. 7, 1888. Serial No. 282,161. (No model.)



Claim.—1. The combination, with a cylindrical casing having a notched rim, a sleeve revoluble centrally in the casing, a spindle vertically adjustable and revoluble in the sleeve, a lever fulcrumed on the

sleeve and pivoted to the spindle, having a nose adapted to the notched rim of the casing, and concentrically-arranged groups of contact-springs in the casing in electrical connection with a main circuit-wire, and with opposite groups of electric lamps in electrical connection with a dynamo or electric battery, of a contact-lever fulcrumed on and pivoted to the opposite ends, respectively, of the sleeve and spindle and adapted to enter the groups of contact-springs, substantially as shown and described, whereby as the spindle is raised, rotated, and lowered the lamps are switched into and out of the circuit, and during such rotation the contact-lever is held clear of the contact-springs, as herein set forth.

2. The combination, with a cylindrical casing having a notched rim, a sleeve revoluble centrally in the casing, a spindle vertically adjustable and revoluble in the sleeve, a lever fulcrumed on the sleeve and pivoted to the spindle, having a nose adapted to the notched rim of the casing, concentrically-arranged groups of contact-springs in the casing, one having downwardly-projecting extensions in electrical connection with a main circuit-wire and with opposite groups of electric lamps in electric connection with a dynamo or electric battery, and a contact-lever fulcrumed on and pivoted to the opposite ends, respectively, of the sleeve and spindle and adapted to enter the groups of contact-springs, of an auxiliary spring-pressed contact-lever fulcrumed at the base of the casing and adapted to enter the lower extensions of one of the groups of contact-springs as the contact-lever carried by the sleeve and spindle is raised, substantially as shown and described, whereby, as the lamps are switched into and out of the circuit and the main contact-lever held clear of the contact-springs, a constant current is maintained, as herein set forth.

401,036. HINGE. WILLIAM S. LARIMER, Glen Eden, Ohio. Filed July 27, 1888. Serial No. 281,177. (No model.)



Claim.—1. A hinge consisting of two securing-plates provided with lugs, the lugs of one plate being square and those of the other plate having convex sides, and an intermediate supporting-piece provided with concave recesses on one side and with convex lugs on the opposite side, substantially as described.

2. A hinge consisting of the securing-plate 1, with lugs 10, having pintle-holes 14 and convex sides 11, the securing-plate 2, having square lugs 12, with pintle-holes 14, and the concave edge 15, adjacent thereto, and the intermediate rotary supporting-piece, 4, having the plane face 5 extending throughout its length, the concave recesses 6, in which are located lugs 10, the lugs 7, with convex sides 8, the lugs 12, located between lugs 7, and the piece 4, having pintle-holes 14, and pivoted to plates 1 and 2 by removable pins 13, substantially as shown and described.

3. In a hinge, the combination of the plate 1, provided with the lugs 10, having apertures 14 and convex sides 11, and the plate 2, having concave edge 15, and provided with the square lugs 12, having apertures 14, substantially as herein shown and described.

401,087. WORK-BOX. CHRISTIAN LATSCHAR, New Brunswick, N. J. Filed Apr. 26, 1888. Serial No. 271,971. (No model.)

Claim.—1. The improved work-box herein shown and described, combining a spindle, a revolving plate having a series of hinged triangular tablets thereon, and a spool-holder provided with spool-spindles, the said tablets inclosing said spool-holder, substantially as and for the purposes set forth.

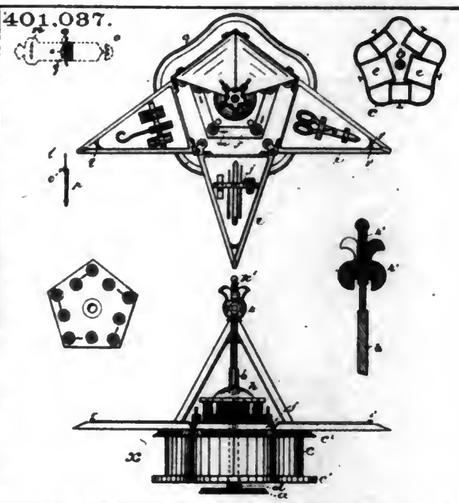
2. The improved work-box herein shown and described, combining therein a revolving or rotary case, *c*, a spindle, a spool-holder arranged on said spindle, and a series of tablets hinged to said case *c* and adapted to be turned against said spindle to inclose the spool-holders, substantially as set forth.

3. The improved work-box for ladies, providing a series of revolving tablets having yarn-holding arms at their outer extremities and tool-receptacles *j*, said parts being arranged and adapted to operate substantially as and for the purposes set forth.

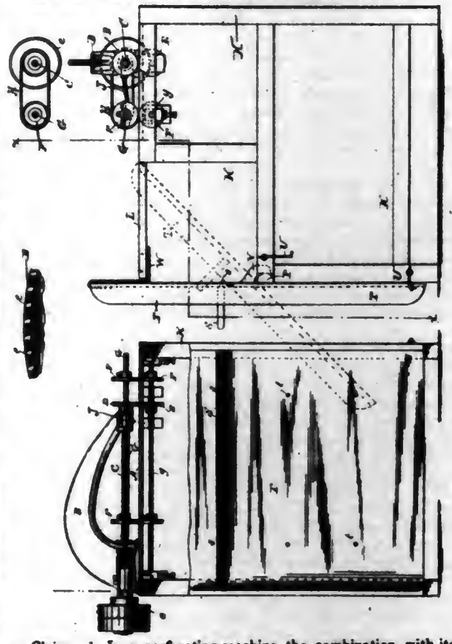
4. The improved work-box for ladies, combining therein a series of hinged tablets arranged upon a plate, c^2, a spindle, and open tool-receptacles formed on the inner or upper sides of said tablets and adapted to receive the tools and hold them in a concealed position when said tablets are closed against the spindle, substantially as set forth.

5. The improved work-box for ladies, combining a spindle and a series of triangular tablets hinged to open and close against said spindle, and a catch sliding on said spindle and adapted to hold the extremities of said tablets against said spindle, substantially as and for the purposes set forth.

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401,038. PERFORATING-MACHINE. STEPHEN D. LAYMAN, Boston, Mass. Filed Jan. 13, 1887. Serial No. 224,233. (No model.)



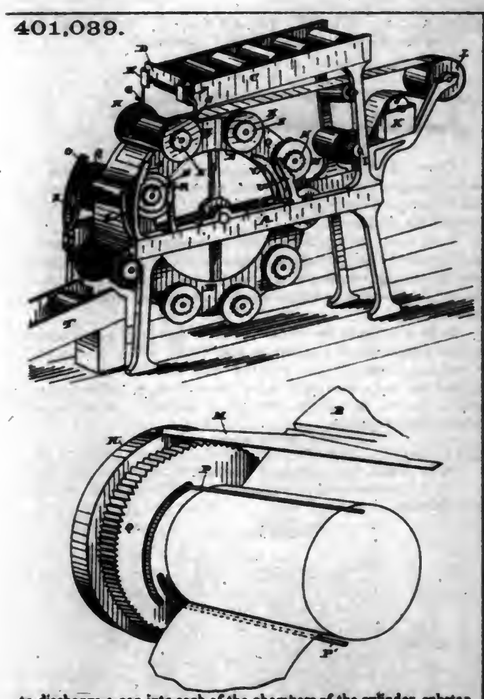
Claim.—1. In a perforating-machine, the combination, with its frame, the bed, and the perforating and feed mechanism, of the table supported by and rocking on the frame, and the detachable leaf L, supported by said table, substantially as and for the purpose specified.

2. In a perforating-machine, the combination, with its frame, the bed, and the perforating and feed mechanism, of the table T, catch V on said table, engaging a cross-bar, P, on said frame, the bracket W on the under side of said table, and the detachable leaf L, supported by said bracket, substantially as shown and described.

401,039. MACHINE FOR LABELING CANS. WILLARD LEE, Los Gatos, Cal. Filed May 3, 1888. Serial No. 273,220. (No model.)

Claim.—1. In a machine for labeling cans, a rotary cylinder having chambers upon its periphery, a chute from which the cans are delivered successively into said chambers, in combination with a vertically-sliding gate controlling the mouth of the chute, arms connected with said gate, and lugs or projections by which the gate is opened

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to discharge a can into each of the chambers of the cylinder, substantially as herein described.

2. The rotary cylinder having chambers upon its periphery, a chute having a gate operated periodically by the rotation of the cylinder, so as to deliver cans into the chambers, in combination with a paste-roller and direction roller or rollers, whereby the labels are delivered upon the periphery of the cylinder and across the can-receiving chambers, substantially as herein described.

3. The rotary cylinder having semi-cylindrical chambers upon its periphery into which the cans are delivered automatically during its rotation, a mechanism, substantially as described, for applying the paste to one side of the label-band and delivering it across the chambers of the cylinder, so that the cans are placed upon the label-band, in combination with the rotary disks, cutters M, and gear-wheels N and racks O, by which the cutters are moved, so as to sever the labels, substantially as herein described.

4. The rotary cylinder having chambers upon its periphery across which the continuous label-band is carried after paste has been applied to one side, and means, substantially as specified, for depositing cans upon that portion of the label which lies across the chamber, a cutter, and mechanism, substantially as set forth, for operating the same, whereby the labels are severed after the can has been placed upon them, in combination with the rods P and P', gear-wheels Q, and stationary racks R and S, with which said gear-wheels engage, so as to cause the rods to move over the ends of the label and paste it upon the can, substantially as herein described.

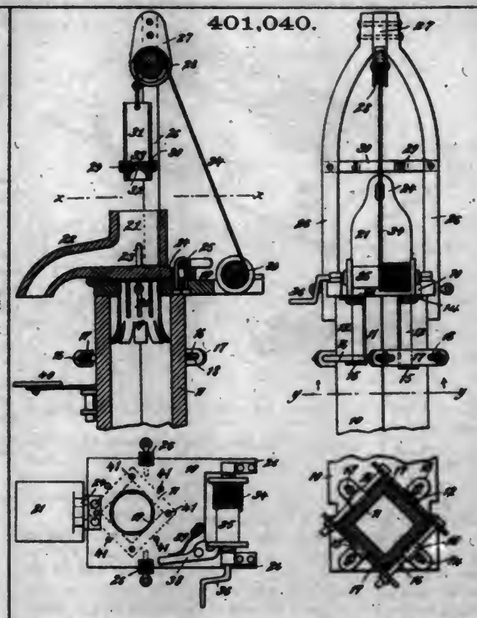
5. The rotary cylinder chambered upon its periphery to receive cans from a constant source of supply, means, substantially as described for supplying paste to the label-band and guiding it across the chambers in the cylinder, so that the cans when delivered to the same will rest upon the labels, in combination with disks carrying cutters, a mechanism, substantially as set forth, for rotating said disks and cutters so as to sever the labels, and rods extending transversely across the cylinder, and having their ends connected with gears by which the rods are moved alternately, so as to press the ends of the labels down upon the cans, substantially as herein described.

6. The rotary cylinder with the chambers containing cans, the means for applying the labels thereto during the rotation of the cylinder, in combination with the fixed racks U and V, which engage the gear-wheels Q and N, and return the cutters and rods to the proper position for again cutting and applying a label before the cylinder completes its rotation, substantially as herein described.

401,040. ATTACHMENT FOR WELL-CURBS. JOHN T. LEGGER, Columbia, Miss. Filed Nov. 3, 1888. Serial No. 289,809. (No model.)

Claim.—1. The combination, with the curb-plate 10, having a vertical opening, of the upwardly and forwardly swinging trunk 21, hinged on its lower side to the upper side of the curb-plate, and a fastening in rear of said hinge for securing the trunk to the curb-plate, substantially as set forth.

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2. The combination, with a well-curb and an apertured curb-plate attached thereto, of a guide-cylinder secured to the curb-plate, extending downward within the curb, and a trunk provided with a delivery-spout hinged at one side of the said curb-plate, substantially as and for the purpose specified.

3. The combination, with a well-curb and an apertured curb-plate secured thereto and provided with a staple, of a guide-cylinder attached to the curb-plate, extending downward within the curb, and a trunk pivoted upon one side of the curb-plate, provided with a delivery-spout, and having an apertured projection to receive said staple, substantially as set forth.

4. The combination, with a well-curb and a curb-plate, of hinged strap-plates having the upper member adjustably secured to the curb-plate, binding-plates clamping the lower member of the strap-plates, and rods connecting the binding-plates, substantially as shown and described.

5. The combination, with a well-curb and a curb-plate provided with a well-opening and having a series of apertures arranged around said opening, of hinged strap-plates having the lower member securely attached to the well-curb, and bolts passing through the upper member and through the registering aperture in the curb-plate, substantially as shown and described.

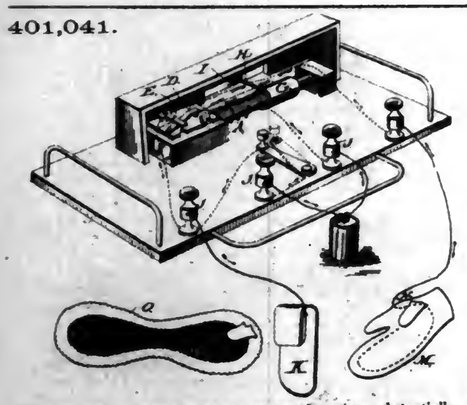
6. The combination, with a well-curb, an apertured curb-plate attached to the same, a guide-cylinder attached to the said curb-plate, extending downward within the curb, and provided with an outwardly-flaring lower end, of a trunk provided with a delivery-spout hinged at one side of the curb-plate, a vertical pin secured within the body of the trunk, a well-bucket provided with a valve in the bottom, and means, substantially as shown and described, for raising and lowering the well-bucket, as and for the purpose specified.

7. The combination, with a well-curb, a curb-plate secured thereto, a guide-cylinder provided with a series of longitudinal slots at the upper end, and an outwardly-flaring lower end, hinged to the curb-plate and extending downward within the curb, of a trunk provided with a delivery-spout hinged at one side of the curb-plate, a vertical pin secured within the body of the trunk, arms extending upward from the curb-plate, a drum pivoted at one side of the curb-plate and provided with a spring-actuated pawl, a pulley located at the upper end of the said arms, a well-bucket provided with a valve in the bottom, and a rope connecting the drum and well-bucket passing over the said pulley, all combined for operation substantially as set forth.

401,041. ELECTRO-MEDICAL APPARATUS. JOHN J. LEWIN, San Francisco, Cal. Filed May 26, 1887. Serial No. 239,709. (No model.)

Claim.—1. In an electro-medical apparatus, the core composed of fine parallel wires extending horizontally and having the ends upturned, in combination with the insulated wire wound around said

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core from end to end and upon the upturned portion, substantially as described.

2. In an electro-medical apparatus, the horizontal core of an electro-magnet having one end upturned and the exterior insulated wire wound from end to end, in combination with the sliding sleeve inclosing the horizontal portion, the pin projecting therefrom, and the slide or plate by which it is moved, substantially as described.

3. In an electro-medical apparatus, an electro-magnet consisting of the parallel soft-iron wires having one end turned up at right angles with the body of the magnet, the horizontal and upturned end being wound with coils of insulated conducting-wire, and the supporting blocks or standards in which the ends of the coil are fixed, in combination with the vertically-moving armature, the inclined spring-arm to which it is attached, and the horizontally-moving arm or lever swinging above said spring, so as to adjust its vibrations, substantially as described.

4. In an electro-medical apparatus, the horizontally-supported electro-magnet composed of parallel wires having the upturned end and the regulating-sleeve sliding upon the horizontal portion, in combination with the armature vibrating vertically above the upturned end of the magnet, having the inclined spring-arm by which it is supported, and the horizontally-swinging arm by which the current is communicated to the spring, said arm acting to regulate the movement of the armature, substantially as described.

5. In combination with an electro-medical apparatus, the conducting-wires having the ends connected with broad flat metallic hooks, substantially as herein described.

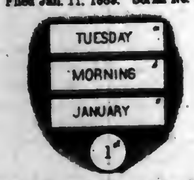
6. In an electro-medical apparatus, the electro-magnet and armature constructed as shown, in combination with the electrodes composed of the hook-shaped pieces of metal, substantially as described.

7. The electro-magneto apparatus with its connecting-wires, hook-shaped electrodes, and the gloves and pads to which the wires may be connected, so that the current may be passed through the person of the operator and to the patient, substantially as described.

401,042. COMPOSITION FOR WATERPROOFING AND PREPARING SHEATHING AND BUILDING PAPER. GEORGE MANAHAN and HENRY GADE, New York, N. Y. Filed Aug. 17, 1888. Serial No. 283,004. (Specimens.)

Claim.—The within-described composition of matter to be used on paper for sheathing and building purposes, consisting of glue, amber mineral oil, rosin-oil, eucalyptus-oil, and a drier, in or about the proportions specified.

401,043. EDUCATIONAL APPARATUS. ABRAHAM I. MANNING, Philadelphia, Pa. Filed Jan. 11, 1889. Serial No. 296,061. (No model.)



Claim.—The blocks or cards herein described, one set, rectangular in shape, having marked thereon the names of the months; a second set, similar in shape, having marked thereon the names of the days of the week; a third set, similar in shape, having marked thereon the names of the different parts of the day, and a fourth set, of circular or disk-shaped blocks or cards, smaller in area than the other blocks or cards, and having numbers marked thereon indicating the days of the month.

401,044. NUT-LOCK. BENJAMIN MARSHALL, San Francisco, Cal. Filed Nov. 30, 1888. Serial No. 292,326. (No model.)

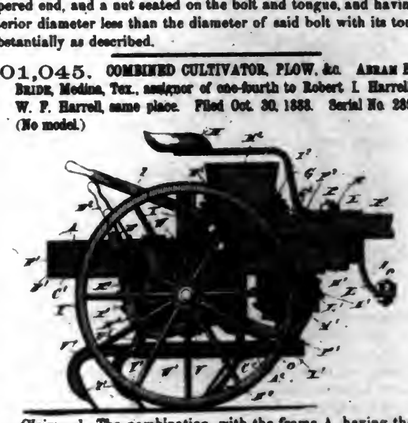


Claim.—1. A bolt for locking a nut thereon, having a spring or resilient tongue, the free end of which is toward the head of the bolt, and its place of junction with said bolt is toward the end of the bolt, substantially as described.

2. In a nut-lock, the combination of a bolt having a correspondingly-threaded spring or resilient tongue joined to or formed with it near its end, the free end of said tongue being toward the head of the bolt, and a nut seated upon said bolt and spring, substantially as described.

3. In a nut-lock, the combination of a bolt having a spring or resilient tongue joined to or formed with it near its end, the free end of said tongue being toward the head of the bolt, said bolt having a tapered end, and a nut seated on the bolt and tongue, and having an interior diameter less than the diameter of said bolt with its tongue, substantially as described.

401,045. COMBINED CULTIVATOR, PLOW, &c. ABRAM B. MCBRIDE, Medina, Tex., assignor of one-fourth to Robert I. Harrell and W. P. Harrell, same place. Filed Oct. 30, 1888. Serial No. 289,529. (No model.)



Claim.—1. The combination, with the frame A, having the supporting-wheels, and a supplementary detachable and removable frame carrying the implements and adapted to bear against the lower side of frame A, and the devices to detachably secure said frame to the frame A, whereby the machine is adapted for using various cultivating and cutting devices, substantially as described.

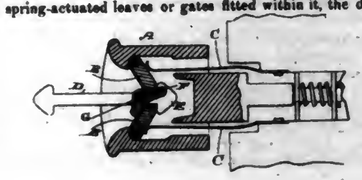
2. The combination, with the frame A, having the supporting-wheels, and a supplementary detachable and removable frame carrying the implements and adapted to bear against the lower side of frame A, said supplementary frame being provided with the vertical right-angular brackets adapted to engage the sides and rear end of the frame A, and the bolts to secure the said supplementary frame to the frame A, whereby the machine is adapted for using various cultivating and cutting devices, substantially as described.

3. The combination, with the main frame A, having the driving or supporting wheels, of the frame B', detachably secured thereto, and having the depending brackets, the rock-shafts journaled in said brackets, and having the ratchet-wheels and the rock-arms, the plow-beams pivotally bolted to the lower ends of the rock-arms, the double-ended pawl or detent to engage said ratchet-wheels and having the operating-lever, and the lever secured to one of the rock-shafts, substantially as described.

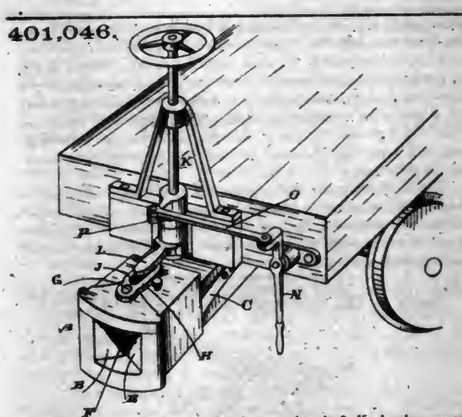
401,046. CAR-COUPLING. CHARLES A. MCDOUGALL, Alameda, Cal. Filed Oct. 20, 1888. Serial No. 288,704. (No model.)

Claim.—1. The vertically-fulcrumed leaves or gates B, fitted within the chamber of the draw-head, and springs by which they are closed, so as to retain the head of the draw-bar, in combination with the double-acting cam fixed upon the vertical shaft between the hinged gates, the vertical shaft K, and the intermediate crank-arms, whereby the cam-shaft is turned, substantially as herein described.

2. The chambered draw-head having the vertically-fulcrumed and spring-actuated leaves or gates fitted within it, the double cam

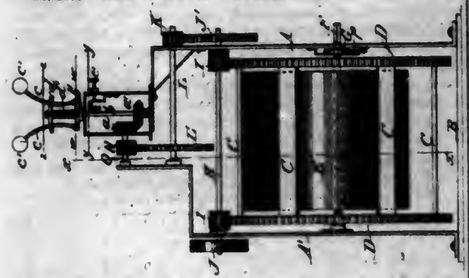


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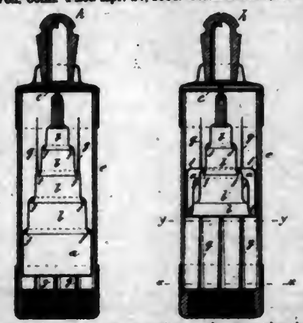
fixed to the shaft between the leaves, the shaft K, having crank-arms connecting with a similar arm from the cam-shaft, and a second crank-arm, P, fixed to the shaft K and connected by a rod with a hand-lever, N, substantially as herein described.

401,047. SPRING-MOTOR. ADAM MEAHL, Cairo, Ky. Filed June 21, 1888. Serial No. 277,766. (No model.)



Claim.—In a spring-motor, the combination of the spring C, the mechanism for winding the same, the gearing for conveying motion to the spindle *b*, the flanged collar *b'*, movably attached to said spindle, the arms *c c*, attached to its outer edge, the cross-piece *d*, attached to the top of the spindle and having the arms *c c* passing through its ends, and the spring between the cross-piece and flanged collar, all arranged substantially as set forth.

401,048. GAS-PRESSURE REGULATOR. WILLIAM H. METCALF, New Haven, Conn. Filed Apr. 27, 1888. Serial No. 272,026. (No model.)

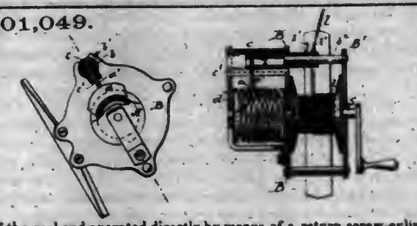


Claim.—In a gas-pressure regulator, the combination, with the valve case or shell having diminishing area upwardly, of the graduated valve, consisting of the cup, and a series of short telescopic tubes fitted to suspend one by the other and connected by the upper tube with a support, substantially as described.

401,049. LINE-GUIDE FOR FISHING-REELS. CHRISTIAN E. MOLLER, Hoboken, N. J., and CHARLES RAETTIG, New York, N. Y. Filed Oct. 20, 1888. Serial No. 289,447. (No model.)

Claim.—1. In a fishing-reel, the combination of a tubular line-guide, *b*, having a follower, *a*, and pins *b' b'*, protruding through the left side of the reel-frame B and guided at one end by the upper stay-rod, b^3, over which it passes, and at the other by a slotted tube, *c*, supported by a bracket or casing, *d'*, mounted upon the outer left side

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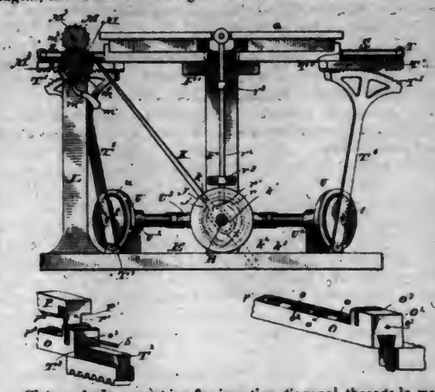


of the reel and operated directly by means of a return screw-cylinder, A, mounted on the spool-shaft *a*, with the fishing-line *l*, as and for the purposes herein shown and set forth.

2. In a fishing-reel, the combination, of a tubular line-guide, *b*, having a follower, *a*, and pins *b' b'*, protruding through the left side of the reel-frame B and guided at one end by the upper stay-rod, b^3, over which it passes, and at the other by a slotted tube, *c*, supported by a bracket or casing, *d'*, mounted upon the outer left side of the reel and operated by the aid of a return screw-cylinder, A, arranged at the left side of the reel with the line *l*, as and for the purposes herein shown and described.

401,050. MACHINE FOR INSERTING DIAGONAL STRIPS IN WEAVING CANE-WORK, &c. HENRY B. MORRIS, Hornellsville, assignor to the Morris Weaving Company, Geneva, N. Y. Filed Nov. 22, 1888. Serial No. 291,655. (No model.)

Brief.—The objects of the invention are to provide improved means for separating the threads in the woven fabric, so that diagonal threads may be inserted, means for inserting the diagonal threads, means for holding the ends of said threads during the return of the inserting-needle, means for cutting the diagonal threads to the proper lengths, and means for feeding the fabric to the separators.



Claim.—1. In a machine for inserting diagonal threads in warp fabrics, the combination, substantially as hereinbefore set forth, of the separators for opening a diagonal passage in the fabric, means for actuating the separators, the needle which carries the diagonal thread through said passage, and means for actuating the needle.

2. In a machine for inserting diagonal threads in warp fabrics, the combination, substantially as hereinbefore set forth, of the separators for opening a diagonal passage in the fabric between the warp and weft threads, means for actuating the separators, the needle which carries the diagonal thread through said passage, means for actuating the needle, and devices for holding the end of the diagonal thread during the backward movement of the needle.

3. In a machine for inserting diagonal threads in warp fabrics, the combination, substantially as hereinbefore set forth, of the separators for opening a diagonal passage in the fabric between the warp and weft threads, means for actuating the separators, the needle which carries the diagonal thread through said passage, means for actuating the needle, and devices for severing the diagonal thread inserted from the thread carried by the needle.

4. The combination, substantially as hereinbefore set forth, of the separators for opening a diagonal passage in the fabric between the warp and weft threads, means for actuating the separators, the needle which carries the diagonal thread through said passage, means for actuating the needle, the feed-rollers for carrying the fabric through the machine, and means for actuating them.

5. The combination, substantially as hereinbefore set forth, of the upper and lower dies formed with a longitudinal groove or race, means for raising and lowering the upper die relatively to the lower die, the feed-rollers for carrying the fabric through the dies, the needle, and means for reciprocating the needle in the longitudinal groove or race.

6. The combination, substantially as hereinbefore set forth, of the main frame, the upper and lower feed-rollers geared to revolve synchronously and formed with projecting pins and recesses corresponding with the interstices in the fabric, and means for actuating the feed-rollers.

7. The combination, substantially as hereinbefore set forth, of the main frame, the upper and lower dies, the main driving-shaft, connections between the driving-shaft and the upper dies, whereby they are raised and lowered relatively to the lower dies, the feed-rollers, connections between the main driving-shaft and the feed-rollers for actuating them, the needle, the needle-carrying frame, and connections between the needle-carrying frame and the main driving-shaft.

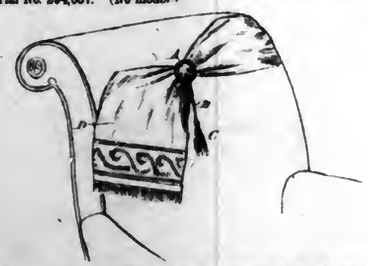
8. The combination, substantially as hereinbefore set forth, of the main frame, the upper and lower dies, the main driving-shaft, the frame to which the upper dies are secured, the vertical rods secured to the die-supporting frame, the cams on the driving-shaft with which the vertical rods engage, the upper and lower feed-rollers geared to revolve synchronously, the feed-roll-actuating rod, and the cam on the driving-shaft with which said rod engages.

9. The combination, substantially as hereinbefore set forth, of the lower die formed with alternate projections and recesses and longitudinal grooves, the upper die formed with alternate projections and longitudinal grooves, the recessed block on the outer end of the lower die, and the blade or plate on the upper die adapted to enter said recess, said block and plate being perforated for the purpose specified.

10. The combination, substantially as hereinbefore set forth, of the lower die, the upper die, the needle-carrying-frame, the needle, the bell-crank lever pivoted to the lower die and projecting beneath it, a clamping device on the lower front portion of the lever, and a lug or projection on the front end of the lever engaging with a lug or projection on the upper die, for the purpose specified.

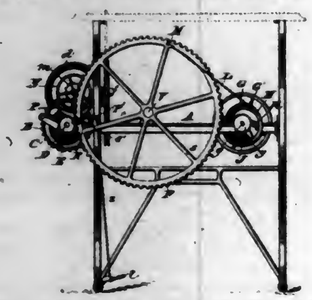
11. The combination, substantially as hereinbefore set forth, of the separators, the clamping devices, and the needle formed with a horizontal central opening, and tapered, split, and provided with forwardly-projecting teeth at its front end.

401,051. LOOP-TIE FOR DECORATIVE SCARFS OR SIMILAR ARTICLES. JOSEPHINE MÜLLER, New York, N. Y. Filed Dec. 26, 1888. Serial No. 294,657. (No model.)



Claim.—As an article of manufacture, the tie for decorative scarfs, consisting of the broad ornamental loop A and the relatively-long cord B, attached thereto at one end, and having the ornamental appendage C attached to its free end, as shown and described.

401,052. SPRING-MOTOR. CHARLES NICHOLSON, Philadelphia, Pa., assignor to the Nicholson Storage Power and Spring Motor Company, Washington, D. C. Filed Feb. 4, 1887. Serial No. 226,497. (No model.)



Claim.—1. In a spring-motor, the combination of a motor-spring and an equalizing-spring with a wheel connected to the motor-spring and a chain and cam connecting the equalizing-spring with the rim of the wheel, substantially as described.

2. In a spring-motor, the combination of a volute motor-spring connected with a gear-wheel and a volute equalizing-spring, a cam of suitable pitch connected with the equalizing-spring, and a chain connecting the cam with the rim of the wheel, substantially as described.

3. In a spring-motor, the combination of a volute motor-spring and a similar equalizing-spring with a driving-wheel connected to the motor-spring, and a chain and cam connecting the equalizing-spring with a stud in the radius of the wheel, which radius in the revolution of the wheel crosses the line of the chain, whereby the equalizing-spring will alternately oppose and assist the motor-spring, substantially as described.

4. In a spring-motor, the combination of a friction-wheel and a friction brake-shoe with a wheel driven by a motor, and spurs upon said wheel for actuating the brake-shoe automatically when the motor arrives at the limits of its run in storing and yielding power, substantially as described.

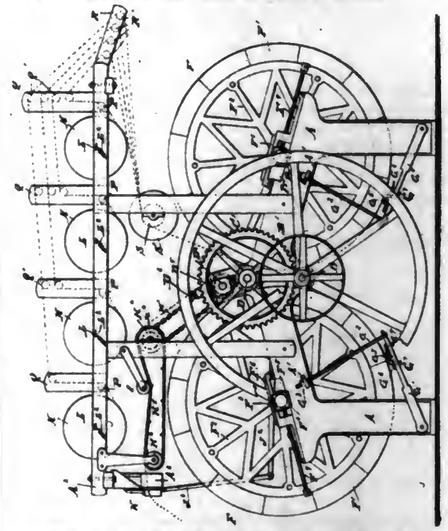
401,053. LACE-PIN FASTENING. MILTON E. OPPENHEIMER, New York, N. Y. Filed Jan. 31, 1888. Serial No. 262,532. (No model.)



Claim.—1. In a lace-pin, the combination, with a sleeve provided with a longitudinal slot and a transverse slot at the end of the said longitudinal slot, of a longitudinally-slotted tube fitting in the sleeve and provided with a stop at the end of the slot, a collar abutting against the sleeve, and a handle projecting from the collar, substantially as described.

2. In a lace-pin, the combination, with the body A and the sleeve E, secured to the body and provided with the longitudinal slot F and the transverse slot K, of the tube G, provided with the slot J, the stop L, the shoulder H, and the handle I, substantially as described.

401,054. LACE-PAPER MACHINE. GIUSEPPE PAGI, New York, N. Y. Filed Dec. 3, 1886. Serial No. 220,978. (No model.)



Claim.—1. In a lace-paper machine, the combination of a pattern-wheel with two wheels having wooden rims, means, as described, for holding the said wheels in frictional contact with the said pattern-wheel, and a roller having an elastic rim and held on top of the said pattern-wheel, substantially as shown and described.

2. In a lace-paper machine, the combination, with the gearing of the pattern-wheel, of an endless belt driven from said gearing, a paper-cutting device located at the end of the said endless belt, and means, as described, for operating the said cutting device from the said gearing, substantially as set forth.

3. In a lace-paper machine, the combination, with the pattern-wheel D and wheel F, having a wooden periphery and working in contact with said pattern wheel, of a scraper having a series of blades arranged obliquely to the axis of said wheel F, as and for the purpose specified.

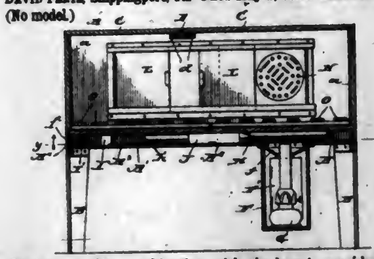
4. In a lace-paper machine, the combination, with the wheels F, having wooden rims, of the files or scrapers G^3, held in contact with the periphery of the said wooden rims, the pivoted box G^4, supporting the said scrapers or files G^3, the hinged frame G', supporting the said box G^4, the screw-rod G^5, supporting the free end of the said hinged frame G', and the nuts G^6, for adjusting the said rods G^5, substantially as shown and described.

5. In a lace-paper machine, the combination, with the pattern-wheel D', of the wheel F, having a wooden rim, the shaft F^2, supporting the said wheel F, the box F^3, in which the said shaft F^2 is mounted, the main frame A, forming, in connection with the hinged covers F^4, inclined slots F^5, the said covers F^4, hinged on the said frame A, and the screw-rods F^7, screwing in the said hinged covers F^4 and against the boxes F^3, so as to adjust the said wheel F in relation to the pattern-wheel D', substantially as shown and described.

6. In a lace-paper machine, the combination, with the wheel F, having a wooden rim, of the scrapers G^3, acting on the periphery of the said wooden rim, the box G^4, supporting the said scrapers G^3, and the set-screws G^4, for adjusting the said scrapers vertically in the said box G^4, substantially as shown and described.

7. In a lace-paper machine, the combination, with a wheel, F, having a wooden rim, of the scrapers G^3, acting on the periphery of the said wooden rim, the box G^4, supporting the said scrapers G^3, the set-screws G^4, for adjusting the said scrapers G^3 in the said box G^4, the pivoted frame G', supporting the said box G^4, the set-screws G^7, for adjusting the said box G^4 on said frame G', the rods G^5, connected with the said frame G', and the nuts G^6, for adjusting the said rods G^5 on the main frame in relation to the wooden rim of the said wheel, substantially as shown and described.

401,055. COMBINED BREAD-RAISER AND KITCHEN-SAFE. DAVID PEFFER, Shippingport, Pa. Filed May 2, 1888. Serial No. 272,569. (No model.)



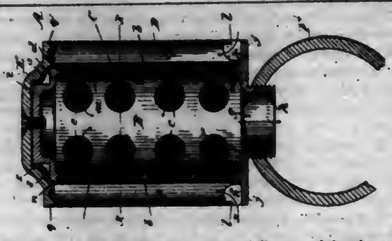
Claim.—1. The combination, with the box A, provided with a double hollow bottom, of a lamp-chamber in communication with said hollow bottom, a plate, as H, united to one member of said hollow bottom, forming a chamber open at one end and formed with an opening for the admission of heat from the lamp-chamber, and baffle-pieces located between the chamber formed by the plate H and the heat-escape opening, substantially as shown and described.

2. The combination, with the box A, formed with a double hollow bottom, of a lamp-chamber, F, in communication with said hollow bottom, the plate H, having apertures h, and secured to one member of said bottom, forming a heat-distributing chamber, baffles I I I', and support J, located between the forked end A" of the plate H, substantially as shown and described.

401,056. PROCESS OF EXTRACTING COPPER FROM COPPER PYRITES. JOSEF PERINO, Charlottenburg, near Berlin, Germany. Filed Mar. 3, 1888. Serial No. 266,054. (No model.) Patented in Germany Jan. 28, 1888, No. 44,498; in Norway Feb. 10, 1888, No. 794; in Sweden Feb. 10, 1888, No. 1,496; in England Feb. 10, 1888, No. 2,019; in Luxemburg Feb. 10, 1888, No. 367; in France Feb. 13, 1888, No. 188,606; in Belgium Feb. 13, 1888, No. 80,635; in Italy Mar. 31, 1888, No. 23,074 and No. 398; in Portugal Apr. 12, 1888, No. 1,237; in Spain May 14, 1888, No. 7,901, and in Austria-Hungary Oct. 20, 1888, No. 18,314 and No. 32,839.

Claim.—The herein-described process of obtaining copper from copper pyrites, consisting in heating the copper pyrites mixed with nitric salts of iron to a temperature of about 200° centigrade, whereby sulphate is produced, lixiviating the mass with water, and finally precipitating the copper, as set forth.

401,057. FILTERING APPARATUS. BENJAMIN F. PERKINS, Holyoke, Mass. Filed Nov. 20, 1888. Serial No. 291,400. (No model.)



Claim.—1. In a filter, in combination, a body comprising open-work sides formed by intersecting ribs, a closed top and an opening through its bottom, a strainer-shell fitting upon and surrounding the open-work sides of said body, a casing of larger diameter than said strainer-shell resting on said lugs, whereby a chamber is formed between the said casing and shell, an opening at the lower edge of said shell leading to said chamber, and means for closing the top of said chamber, substantially as described.

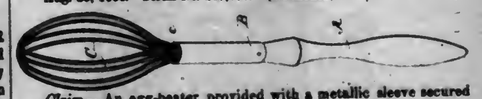
2. In a filter, in combination, a body comprising open-work sides formed by intersecting ribs, a closed top, an opening through its bottom, and the outlying ledge *j*, provided with the lugs *k*, a strainer-shell fitting upon and surrounding the open-work sides of said body, a casing of larger diameter than said strainer-shell resting on said lugs, whereby a chamber is formed between the said casing and shell, an opening at the lower edge of said shell leading to said chamber, and means for closing the top of said chamber, substantially as and for the purpose described.

3. In a filter, in combination, a body comprising open-work sides formed by intersecting ribs, a closed top, an opening through its bottom, and the outlying ledge *j*, provided with the lugs *k*, a strainer-shell fitting upon and surrounding the open-work sides of said body, a casing of larger diameter than said strainer-shell resting on said lugs, and a cover bearing against the upper ends of said strainer-shell and casing for confining same in their positions and closing the top of the chamber which is formed between the casing and strainer-shell, substantially as and for the purpose described.

4. In a filter, in combination, a body comprising open-work sides formed by intersecting ribs, a closed top externally provided with a polygonal projection, an opening through its bottom surrounded by an externally-screw-threaded boss and having the outlying stepped lugs *k*, a strainer-shell fitting upon and surrounding the open-work sides of said body, a casing of larger diameter than said strainer-shell resting on said lugs, a cover bearing against the upper ends of said strainer-shell and casing for confining same in place for covering the chamber which is formed between the casing and strainer-shell and covering the top of said body, and a screw passing through the said cover and into the top of said body.

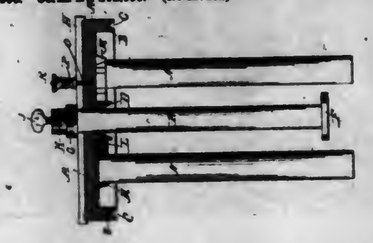
5. In a filtering apparatus, the combination, with a filter-tank provided with a supplemental box, G, having an outlet-opening, and a series of pipes, F, in said tank leading and open to said box G, of a series of strainer-filters each comprising a body having open-work sides, a closed top and an opening through its bottom leading to the passage of its carrying-pipe F, a strainer-shell fitting upon and surrounding said open-work sides of the body, a casing of larger diameter than said strainer-shell supported to surround same, forming the chamber *p*, and the lower opening leading thereto, and a lid for closing the top of said chamber, and a body of granulated filtering material or materials in said tank enveloping said series of filters, substantially as and for the purpose described.

401,058. EGG-BEATER. CHRISTIAN F. PFAU, Quincy, Ill. Filed Aug. 25, 1888. Serial No. 283,750. (No model.)



Claim.—An egg-beater provided with a metallic sleeve secured to a suitable handle, a thimble having longitudinal peripheral grooves, and the wires bent into loops and their ends secured between the sleeve and thimble in the grooves of the latter, the wires at their apices bearing from within outward on the adjacent ones and being free to move on each other, substantially as described.

401,059. GALVANIC BATTERY. JAMES H. PHALAN, New Haven, assignor to the Electrical Supply Company, Ansonia, Conn. Filed Dec. 7, 1888. Serial No. 292,953. (No model.)



Claim.—1. In a battery, the combination of a jar-cover with contractible element-securing devices and means whereby such devices are both contracted to secure the elements and secured to the cover.

2. In a battery, the combination of a jar-cover with contractible element-securing clamps and devices whereby such clamps are simultaneously contracted to secure the elements and themselves secured to the cover.

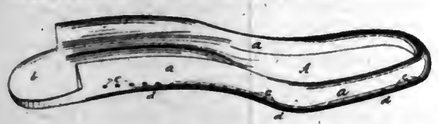
3. In a battery, the combination of a series of element-clamps, each provided with a lateral elongation, and a series of staples to straddle such elongations, and whereby such clamps are both contracted and secured to the cover.

4. In a battery, the combination of a jar-cover with a series of element-clamps arranged in a circle upon such cover, each clamp having a lateral elongation, and a series of staples which straddle such elongations, and are then driven into the cover so as to simultaneously contract such clamps and secure the whole system to the cover.

5. In a battery, the combination of a series of connected element-clamps, each provided with a lateral projection and with a body of substantially the same diameter as the element, and a series of staples which straddle the projections, and when driven contract the clamps, and thus secure the element.

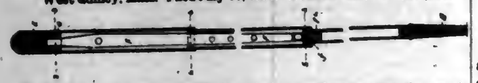
6. In a battery, the combination of a jar-cover with a series of element-securing devices, each having a continuous outline consisting of a body substantially the diameter of the element and a contractible lateral projection.

401,060. BOOT OR SHOE. BENJAMIN A. PILLOW, Richmond, Va. Filed Mar. 21, 1888. Serial No. 268,026. (No model.)



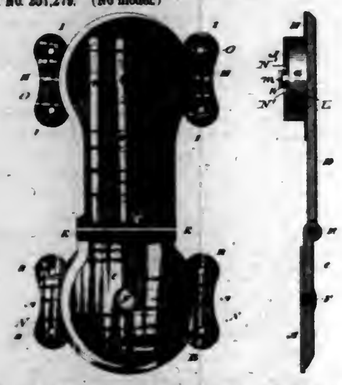
Claim.—A boot or shoe composed of an upper, outer sole, an insole and lining, and a molded middle sole secured between the inner and outer sole and upper and lining, and composed of a blank cut approximately to the size and shape of the sole of the foot of the wearer, but slightly larger than the same, except at the heel, which is cut away, and having the extended edges beveled and turned up and molded to the shape of the foot, as described, for the purposes specified.

401,061. WALKING-STICK. PAUL PILOW and JOSEPH PLOUDRE, West Quincy, Mass. Filed July 16, 1888. Serial No. 280,116. (No model.)



Claim.—A walking-stick in tubular sections telescoping each other, in combination with a fife inserted in and crossing the joints of said sections, and with rests E F² of the sections for the opposite ends of the fife, substantially as described, for the purpose specified.

401,062. TRUNK-LOCK. HENRY B. PLUMB, Terryville, Conn., assignor to the Eagle Lock Company, same place. Filed Oct. 3, 1887. Serial No. 251,279. (No model.)



Claim.—In a trunk-lock, the combination, with a carrying-plate having two ears extending horizontally from opposite points on its edge and perforated for its attachment to a trunk, of a hasp consisting of a hinged and a pivoted part, the latter being pivoted to the center of the carrying-plate and shaped to bear solely upon the central portion thereof, whereby the pivoted part of the hasp does not touch the ears of the rivets by which the carrying-plate is secured to the trunk, a cylindrical case inclosing locking mechanism carried by the free end of the hinged part of the hasp, and a keeper having a recess to receive the said case and horizontally-extending ears for its attachment to the trunk, substantially as set forth.

401,063. FLUX-FEEDING APPARATUS FOR BLAST-FURNACES. NATHANIEL A. PRATT, Atlanta, Ga., assignor to the Pratt Steel Company, Birmingham, Ala. Filed June 2, 1888. Serial No. 275,940. (No model.)



Claim.—1. The combination, with a furnace having tuyeres, of a blower-cylinder, a blast-main, a bustle-pipe provided with nozzles, a flux-feeding apparatus for discharging pulverized flux into said blast-main, and an air-engine connected to and operated by compressed air from said blower-cylinder and operating to drive said flux-feeding apparatus, substantially as described.

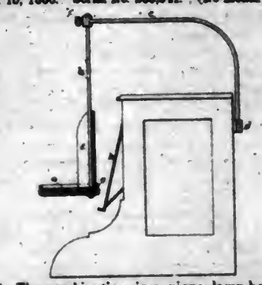
2. The combination, with a furnace having tuyeres, of a blower-cylinder, a blast-main, a bustle-pipe provided with nozzles, a flux-hopper, a discharge-valve and its casing beneath said hopper and communicating with said blast-main, and an air-engine operated by compressed air from said blower-cylinder and operating said valve, substantially as described.

3. The combination, with a furnace having tuyeres, of a blower-cylinder, a blast-main, a bustle-pipe provided with nozzles, a flux-hopper, a discharge-valve beneath said hopper and communicating with said blast-main, an air-engine, a piston within the same connected to said valve, and pipes which connect said engine with said blower-cylinder, substantially as described.

4. The combination, with a furnace having tuyeres, of a blower-cylinder, a blast-main, a bustle-pipe provided with nozzles, a flux-hopper formed with an outlet-port, a valve-casing below said outlet-port, feed-channels which open into said blast-main, a reciprocating valve within said casing having ports or recesses which alternately register with said outlet-port and with said feed-channels, an air-engine, a piston within the same having its rod connected to said reciprocating valve, and pipes which connect said engine and blower-cylinder, substantially as described.

5. The combination, with the furnace 1, having tuyeres 2, of the blower-cylinder 5, provided with the air-inlet valves 10 and the piston 6, the vertical chamber 7, having inlet-valves 9, the curved pipes 8, the blast-main 4, the annular blast or bustle pipe 3, provided with nozzles 3ª, the flux-hopper 11, provided with the outlet-port 12, the valve-casing 13, the feed-channels 14, the valve 15, formed with ports or recesses 16, the air-engine 19, the piston 18, connected to said valve 15 by the rod 17, and the pipes 21, provided with stop-cocks 22 and connected with said engine 19 and blower-cylinder 5, substantially as described.

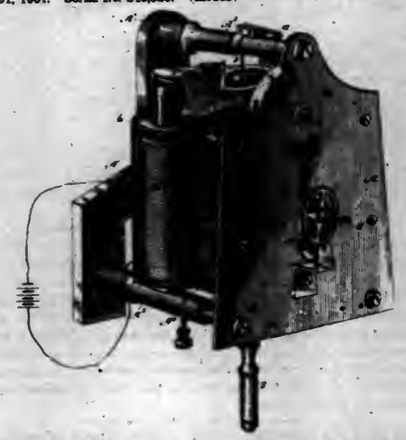
401,064. PIANO LAMP-HOLDER. LEWIS PRAY, Portland, Me. Filed Sept. 15, 1888. Serial No. 285,541. (No model.)

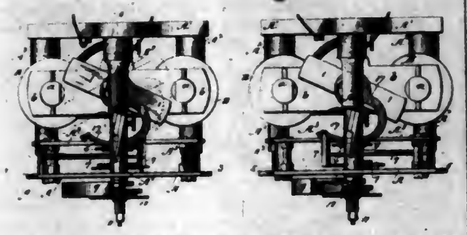


Claim.—1. The combination, in a piano lamp-holder, of a disk, *a*, having a rim around the top and a groove inside of said rim, with a shade, *c*, inserted in said groove, all substantially as set forth.

2. The combination, in a piano lamp-holder, of the disk *a*, rod *b*, secured to one side of the disk *a*, a set-screw coupling, *f*, through which the rod passes, a curved rod, *e*, attached to said coupling *f*, and a socket, *d*, fastened to the back of piano, and serving as a bearing for the rod *e*, all substantially as set forth.

401,065. ELECTRIC WINDING FOR TORSION-PENDULUM CLOCKS. HEINRICH RABE, Hanau, Germany, assignor to the Hanauer Electrische Uhren Fabrik Steinheuer Rabe, same place. Filed Aug. 31, 1887. Serial No. 248,329. (Model.)





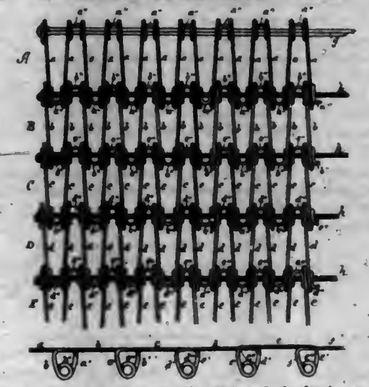
Claim.—1. In an electrical clock-winding apparatus, the combination, with the dial-work shaft, of electro-magnets forming part of an electric circuit, a pivoted swinging spring-retracted armature, an arm attached to and moving with the latter, a pivoted lever connected with the aforesaid shaft, and one part of which has a non-conducting portion and projects into the path traversed by the armature-arm, a weight connected with the pivoted lever, and conductors connecting the winding mechanism and magnetic coils with a battery, substantially as shown and described, whereby when the weight shall have run down the projecting portion of the lever comes in contact with the armature-arm, thus completing the electrical circuit, so that the armature turns and carries the lever back to its starting position, and also raises the weight, as specified.

2. In an electrical clock-winding apparatus, the combination, substantially as shown and described, with a swinging arm forming part of an electro-magnetic circuit, of a pivoted vibrating lever having a conducting and non-conducting portion which engages the aforesaid arm and alternately makes and breaks the circuit at the limits of movement of said lever, a weight, and a clock-work mechanism, with both of which said lever is connected, whereby the said weight is raised when the lever is returned to its starting position, as specified.

3. In an electrical clock-winding apparatus, the combination, with the electro-magnets forming part of an electrical circuit, a spring-retracted armature pivoted between their poles and having an arm attached, the segmental rack-lever and a weight, both fixed on the same rotatable axis, and said lever having a laterally-projecting portion, to which a non-conducting piece is secured, the dial-work shaft, and a pinion mounted loose on the same and meshing with the aforesaid lever, escape mechanism, the pendulum, and a piece connecting said escape mechanism with the pendulum-rod, substantially as shown and described, whereby the pendulum is vibrated until the weight has descended, when an electric circuit is formed by contact of the rack-lever and armature-arm, thus causing the armature to swing and carry the lever and weight back to their starting-place and break the circuit, so that the armature resumes its normal position and the weight begins to fall again, as specified.

4. In an electrical clock-winding apparatus, the combination, with the two electro-magnets arranged vertically parallel and forming part of an electric circuit, of a bar-armature fixed horizontally on a vertical shaft between their poles, a retracting-spring coiled about the said shaft and serving to hold the armature normally out of alignment with the magnetic poles, the vertically-swinging segmental rack-lever, and a weight fixed on the same horizontal axis, the said lever having a lateral portion provided with a non-conducting piece, an escape mechanism, a pendulum, dial-shaft, means for connecting the shaft and pendulum with the lever, and a curved arm attached to the armature and extending normally around the pendulum-rod, so that its free end is in position to engage the lateral portion of the rack-lever when thrown over by the weight reaching the limit of its downward movement, substantially as shown and described.

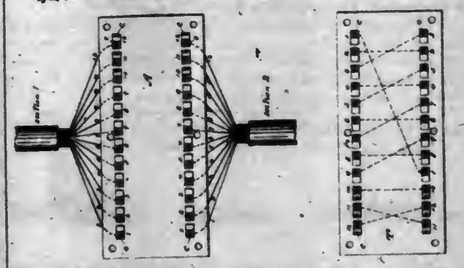
401,066. METALLIC MAT. ABBOTT M. REEVES, Indianapolis, Ind. Filed Dec. 3, 1888. Serial No. 292,490. (No model.)



Claim.—1. A mat composed of strips of wire having each horizontal portions, downward extensions, and bends or coils, as set forth.

2. A mat composed of strips of wire having each horizontal portions, downward extensions, and bends or coils, and rods securing the strips together by passing through the coils, as set forth.

401,067. CIRCUIT-CONNECTING DEVICE. JOHN C. REILLY, Brooklyn, N. Y. Filed Feb. 13, 1889. Serial No. 299,783. (No model.)



Claim.—1. A connecting device for multiplex circuits, consisting of a plate fitted with two groups of contacts forming the terminals of the respective circuits to be connected, in combination with a second plate removably attached thereto and similarly fitted with two groups of contacts registering with the contacts of the first plate and

having circuit-connections between the contacts of one row and those of the other row.

2. A connecting device for multiplex circuits, consisting of two plates adapted to be adjustably clamped together, each of their adjacent faces being fitted with corresponding contacts in two groups, one plate having permanent terminals for the circuits to be connected and the other plate having the required connections.

3. In a connecting device for multiplex circuits, a plate having two groups of contacts constituting the terminals of the circuits to be connected, both groups arranged in regular order, in combination with a circuit-transposing plate having two groups of registering contacts and wires or strips constituting the connections for said circuits and arranged in irregular order, in accordance with the scheme of transposition required, and means for bringing the corresponding contacts of the two plates together.

401,068. SAFETY-GUARD FOR RAILWAY-CARS. GEORGE W. REMINGTON, Exeter, R. I., assignor of one-half to Thomas G. Hunt, same place. Filed Aug. 21, 1888. Serial No. 283,326. (No model.)



Claim.—1. The safety-guard hereinbefore described, consisting of hangers or supports secured to the car, the guard *a*, journaled in said hangers, and the spring-actuated catch arranged to hold the guard in a vertical or normal position.

2. The combination, with a car, of the pivotally-mounted guard *a* and the spring-connected latches *b*, adapted to retain the guard in position, all constructed, arranged, and operating substantially as shown and described, and for the purpose set forth.

3. In a safety attachment of the class hereinbefore described, the combination therewith of the pivotally-mounted guard *a*, having its upper portion cut away, as at a^4, substantially as shown and described, and for the purpose set forth.

4. The combination, with a railroad-car, of the pivotally-mounted spring-locking guard *a*, mounted in front of the car-wheels, and a flexible guard, a^3, attached to the forward end of the car, substantially as shown and described.

401,069. HEEL-PROTECTOR. FRANCIS H. RICHARDS, Hartford, Conn., assignor to the American Heel Protector Company, Newark, N. J. Filed July 11, 1887. Renewed Sept. 25, 1888. Serial No. 286,387. (No model.)



Claim.—1. The improved heel-protector herein described, it consisting of a bar having the cross-sectional form of an inverted arch or channel-bar and provided on its under side with wear-plugs and on one edge with placing-braces, substantially as described.

2. The improved heel-protector herein described, it consisting of a curved bar having the cross-sectional form of an inverted arch or channel-bar, said bar being provided with wear-plugs and having openings therein between said plugs, substantially as described.

3. The improved heel-protector herein described, it consisting of the curved bar B, of a cross-sectional form, substantially as described, said bar being connected at its ends by a bar, 6, and provided with wear-plugs and placing-braces, substantially as described.

4. The improved heel-protector herein described, it consisting of the bar B, having the cross-sectional form of an inverted arch or channel-bar and the hollow wear-plugs 4, depending from the under side of said bar, the openings through said plugs connecting with the interior of said bar, all substantially as described.

401,070. GLOVE-FASTENING. WILLIAM S. RICHARDSON, Boston, Mass. Filed July 30, 1888. Serial No. 281,467. (No model.)



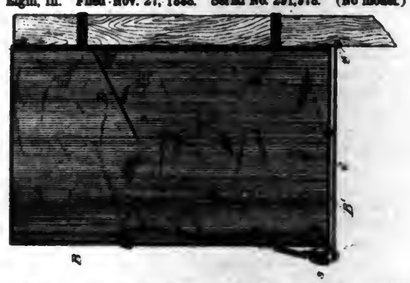
Claim.—1. In the herein-described fastening for gloves and other articles, the ball member, comprising a ball, post, or stud, having, or having attached to it, a conical base, a collet and cap, within which said base is contained, and a flanged eyelet adapted to fasten the capped ball to the material by turning its flange upon the conical base of the ball, substantially as described.

2. In a fastening for gloves and other articles, the socket member having the tubular sleeve *f*, the shoulder f', integral therewith, and the curved sides f^3, having the opening f^4 and the slit or slits f^5, substantially as described.

3. The combination, in a fastening device for gloves and other articles, of the ball *b*, base *c*, collet *d*, cap *e*, and an eyelet, with the socket member of the fastening having the opening of less diameter than the greatest diameter of the ball and flaring or enlarged sides of less diameter than the bore of the eyelet, substantially as described.

4. In the herein-described fastening for gloves and other articles, the combination of the collet, the cap, the conical base, and the ball member held at the apex of the conical base, substantially as described.

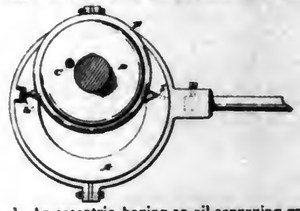
401,071. RECEPTACLE FOR BUNDLES. LEONARD M. ROSE, Elgin, Ill. Filed Nov. 27, 1888. Serial No. 291,978. (No model.)



Claim.—1. In combination, a laundry-receptacle, A, containing a downwardly-inclined guard, D, extending from the rear thereof part way across the receptacle, separating the latter into an upper and a lower compartment and affording a passage between them toward the front side of the receptacle, an opening in the front side of the receptacle above the said passage, a self-closing door, B, hinged at the lower side of the opening to open inward and thereby close the passage, a door, B', in the lower part of the receptacle, and means, substantially as described, for locking the door B', substantially as and for the purpose set forth.

2. In combination, a laundry-receptacle, A, containing a downwardly-inclined guard, D, extending from the rear thereof part way across the receptacle, separating the latter into an upper and a lower compartment and affording a passage between them toward the front side of the receptacle, an opening in the front side of the receptacle above the said passage, a door, B, hinged at the lower side of the opening to open inward and thereby close the said passage, a spring, C, maintaining the said door normally in the position of closing the opening, and a door, B', in the lower part of the receptacle, and means, substantially as described, for locking the door B', substantially as and for the purpose set forth.

401,072. ECCENTRIC-OILER. JOSEPH ROSBONG and ISAIAH ROSBONG, Canton, Ohio, assignors of one-third to John J. Rosbong, same place. Filed Oct. 22, 1888. Serial No. 288,857. (No model.)



Claim.—1. An eccentric having an oil-conveying groove on one side and provided with oilways leading therefrom through said eccentric to its periphery, substantially as described.

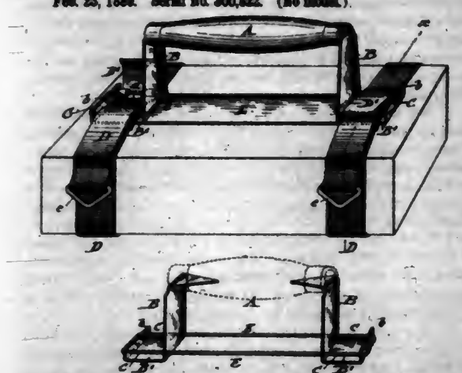
2. The combination, with an eccentric having oilways, of a disk having an annular oil-conveying groove, substantially as described.

3. The combination, with an eccentric having oilways leading to its periphery, of a disk having an oil-groove upon its inner face located against the face of the eccentric having the oilways, substantially as described.

4. The combination, with an oil-conveying disk, of an eccentric having oilways communicating with an oil-groove in the disk and with the periphery of the eccentric, said disk being mounted centrally on the power-shaft, substantially as described.

5. The combination, with the eccentric A, having oilways *b'*, of the oil-conveying disk B, connected by said oilways with the periphery *a* of the eccentric, a non-rotatable plate, D, located in the disk, and the oil-supply pipe C, substantially as described.

401,073. SHAWL-STRAP. MAX RUBER, New York, N. Y. Filed Feb. 23, 1888. Serial No. 300,822. (No model.)



Claim.—1. The combination, in a shawl-strap, of upright stays, a handle connecting said stays, outwardly bent and flanged parts at the lower ends of the stays, wire links connecting the flanges and stays, straps attached to one side of the wire links, and clamping-levers hinged to the other side of the wire links, substantially as set forth.

2. In a shawl-strap, the combination of upright shanks or stays, a handle connecting said stays, outwardly-bent parts at the lower ends of the stays, having flanges at the outer ends, wire links connecting said stays and flanges, a longitudinal bar connecting said stays, straps attached to one side of the wire link, and clamping-levers pivoted to the other side of the wire links, substantially as set forth.

3. The combination of upright shanks or stays having outwardly bent and flanged parts at their lower ends, a handle connecting the upper end of said stays, wire links connecting the stays and flanges, clamping-levers hinged to one side of said wire links, and straps attached to the other side of the wire links, and provided with stop devices at the outer ends for preventing the straps from being withdrawn from the clamping devices, substantially as set forth.

401,074. STEM WINDING AND SETTING WATCH. EDWARD SMITH, Peoria, Ill. Filed July 17, 1888. Serial No. 280,170. (No model.)



Claim.—1. In stem winding and setting mechanism, the stem consisting of the part W, having at its inner end the lateral V-shaped notches, and the part *c*, having corresponding spring-catches with V-shaped ends adapted to automatically engage said notches when the parts are pressed together end to end and to automatically disengage when the parts are forcibly drawn apart, whereby a strong pull upon the crown leaves the movement with a portion of the stem mounted therein free from the parts within the pendant.

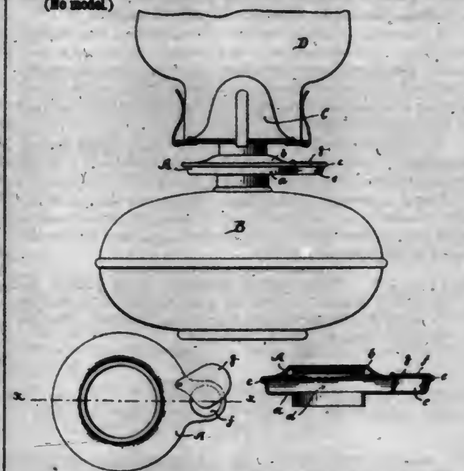
2. The combination, with the pendant, of the sleeve F, fixed therein and having the inward projection *m* at its own outer end, the stem-bearing K, having a limited sliding movement in said sleeve, the divergently-curved springs J, formed integrally with said bearing and engaging said projection, and the stem rotating without sliding in said bearing, substantially as and for the purpose set forth.

3. In stem winding and setting mechanism, the combination, with the watch-pendant, of a sleeve fixed therein and internally contracted at its upper or outer end, a sliding stem-bearing closely fitting said sleeve, provided at its upper end with opposite divergent springs whose free ends fall within and without said contracted sleeve end as the bearing slides back and forth in the sleeve, and a stem having a rotary but not a sliding motion in said bearing.

4. In stem winding and setting mechanism, the combination, with the pivoted yoke and the winding and hands-setting train mounted thereon, of a spring fixed at each end and at its middle engaging an arm of said yoke, and a detachable portion of the stem sliding in the movement and engaging the middle of said spring at all times, whereby the sliding of the stem in either direction may impart positive motion to said yoke, substantially as set forth.

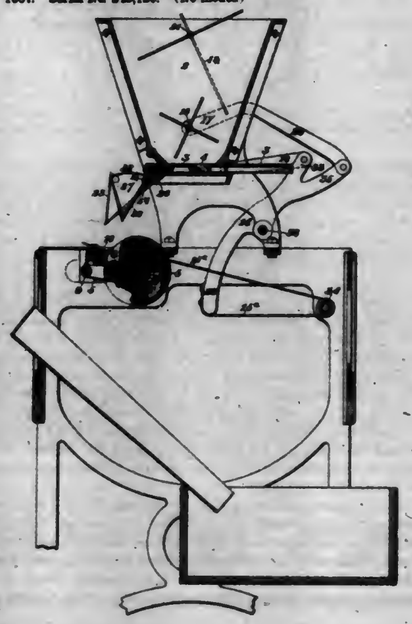
5. The combination of the stem c C, the slide-bearing K, surrounding and sliding with said stem, the sleeve F, inclosing said bearing and secured in the pendant, the internal annular projection, *m*, upon said sleeve, the divergent springs J, projecting from said bearing and resisting its sliding in said sleeve, the collar *e g*, fixed to the stem c C, and the spring S, engaging an arm of the yoke N and engaged by said collar, substantially as set forth.

401,075. ATTACHMENT AND OIL-FILLER FOR LAMPS. JOHN G. DELEKER, Boston, Mass. Filed Mar. 23, 1888. Serial No. 268,279. (No model.)



Claim.—A combined safety attachment and oil-filler for lamps, consisting of a shallow hollow casing having its lower end formed to fit into the body of the lamp and its upper end formed to receive the burner, and provided with a lip or trough and cover, substantially as shown, and for the purposes described.

401,076. CIGAR-BUNCHING MACHINE. STEPHEN A. SHEPARD, Allegheny, assignor to Lang & Shepard, Pittsburg, Pa. Filed July 1, 1887. Serial No. 243,139. (No model.)



Claim.—1. In a cigar-bunching machine, the combination of a hopper, a discharge mechanism therefor, a bunching-cylinder, a bunching-apron, a rock-lever for actuating the discharge device, and straps which connect the cylinder and lever and are reversely wrapped around the cylinder, substantially as and for the purposes specified.

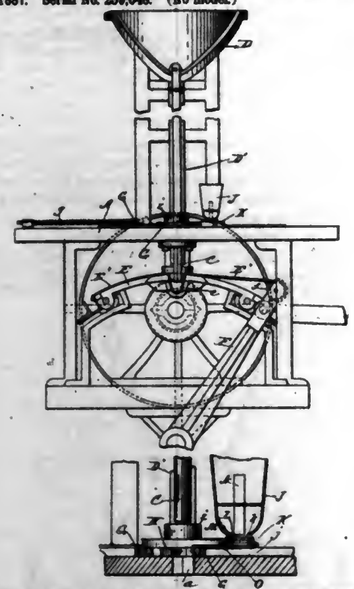
2. In a cigar-bunching machine, the combination of a hopper, a discharge mechanism therefor, a rock-lever connected to and actuating the discharge mechanism, a chute having a delivery-gate and means for actuating the same from the discharge mechanism, and a bunching-cylinder connected with and actuated from the rock-lever, substantially as and for the purposes specified.

3. In a cigar-bunching machine, the combination, with the hopper having a reciprocating discharge-bottom, a rock-lever connected to and actuating the same, two reversely-moving agitators arranged above the bottom and operated by said lever, and a chute having a delivery-gate and means for actuating the same from the reciprocating bottom, substantially as and for the purposes specified.

4. In a cigar-bunching machine, the combination, with the hopper having a discharge-bottom, of two reversely-moving agitators or shafts in said hopper, a chute or receptacle into which the tobacco is delivered in measured quantities, a valve or gate in said chute, and a pivoted lever actuated by the discharge-bottom, substantially as and for the purposes specified.

5. In a cigar-bunching machine, the combination, with the hopper having reversely-moving agitators located therein and a moving discharge-bottom, of a chute or receptacle into which the tobacco is discharged in measured quantities, a valve in said chute, a pivoted lever actuated by the moving bottom of the hopper, and a bunching-apron located beneath the discharge end of said chute, substantially as and for the purposes specified.

401,077. CIGAR-MAKING MACHINE. JAMES R. SMITH, New York, N. Y., assignor, by direct and mesne assignments, of two-thirds to Adolph Moceeis and Benjamin Lichtenstein, same place. Filed Dec. 27, 1887. Serial No. 259,048. (No model.)



Claim.—1. In a cigar-bunching machine, the combination of a main table having a vertical opening therein, a rolling-table located below the main table and provided with a cavity in line with said vertical opening, a hopper fixed to the main table at one side of the opening therein and elevated a short distance above the same, a reciprocating carriage provided with a cut-off operating on the main table and having an open mold adapted to slide beneath said hopper, and a vertically-reciprocating plunger adapted to pass through said open mold and the opening in the main table to carry the contents of the mold to the cavity in the rolling-table, substantially as and for the purpose described.

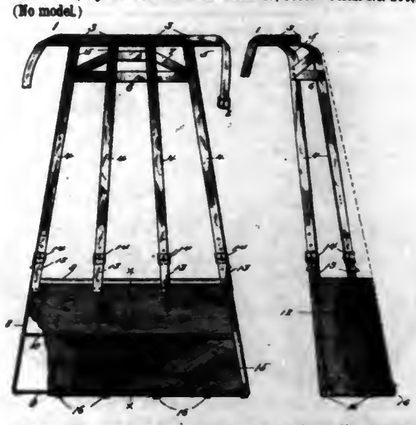
2. In a cigar-bunching machine, the combination of a main table having an opening therein, a cigar-rolling table located below said main table and having a cavity in the same vertical line with the opening in said main table, an apron connected to the rolling table, a hopper fixed to the main table at one side of the opening therein, a reciprocating carriage on the main table provided with a cut-off, and an open mold fixed to said carriage and adapted to alternately align with the discharge-orifice of the hopper and the opening in the main table, adjustable valves located in the bottom of said hopper for varying the area of the discharge-orifice thereof, a vertically-reciprocating plunger adapted to pass through said vertical opening and the open mold, and a rocking arm carrying the bunching-roller, substantially as described.

3. In a cigar-bunching machine, the combination of a main table having an opening therein, a cigar-rolling table having a cavity therein, an apron connected to said rolling-table, a rocking-arm carrying the bunching-roller and adapted to take the filler and bight in the apron out of the cavity in said rolling-table, a hopper fixed to the main table at one side of the vertical opening therein, a reciprocating carriage operating on the main table having a cut-off and an open mold secured thereto, regulating-valves located in the bottom of the hopper for varying the area of the discharge-orifice thereof, an agitator operating in the hopper above its discharge-orifice, and a reciprocating plunger adapted to pass through the opening in the table and the open mold, substantially as and for the purpose described.

4. In a cigar-bunching machine, the combination of a main table having an opening therein, a cigar-rolling table located below the same and having a cavity therein, a hopper fixed to the main table at one side of the vertical opening in said table, the endwise-adjustable valves located in the bottom of the hopper across the discharge-orifice therein and adapted to vary the area of the same, a reciprocating carriage having a cut-off and operating on the main table, an open mold fixed to the carriage, and a reciprocating plunger operating through the opening and the mold, substantially as and for the purpose described.

5. In a cigar-bunching machine, the combination of the main table having an opening therein, a cigar-rolling table having a cavity therein, a hopper fixed to the main table at one side of the vertical opening therein, endwise-adjustable valves located in the bottom of the hopper, a laterally-adjustable valve located above the endwise-movable valve and adapted to be moved transversely across the discharge-orifice in the hopper to vary the width thereof, a reciprocating carriage having a cut-off, an open mold fixed to said carriage, and a vertically-reciprocating plunger operating in the mold and vertical opening, substantially as and for the purpose described.

401,078. SKIRT-PROTECTOR. WILLIAM F. SMITH and ALBERT B. CATTERALL, Syracuse, N. Y. Filed Jan. 15, 1889. Serial No. 296,440. (No model.)



Claim.—The combination, with a series of depending tapes, of a protector-frame formed of steel ribs and bent to conform to the shape of the dress and having an outer covering of cambric and an inner facing of rubber, the lower end of the frame being provided with a series of dress receiving and securing clamps, and the upper end of the protector being provided with a series of short tapes having buckles for connection with the depending tapes, substantially as specified.

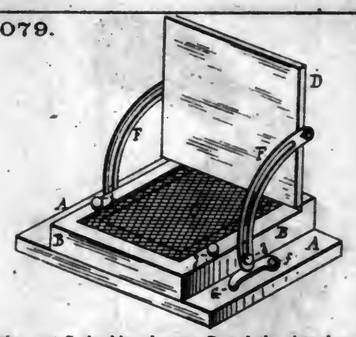
401,079. WAGON-SEAT. ROSCOE G. STONE, Warwick, R. I., assignor of one-half to Maynard L. Stone, same place. Filed Jan. 12, 1889. Serial No. 296,153. (No model.)

Claim.—1. A wagon-seat having a cover hinged thereto and provided with slotted guide-bars of quadrant shape movable on side pins of the seat-frame, so that said cover may be used interchangeably as a seat and a seat-back, substantially as described.

2. The combination of a wagon-seat, a cover hinged thereto and provided with quadrant-shaped slotted guide-bars which are movable on side pins of the seat-frame, and a spring adapted to automatically close said covers, substantially as shown.

3. The combination of the seat-frame B, having the pins *b*, the

401,079.



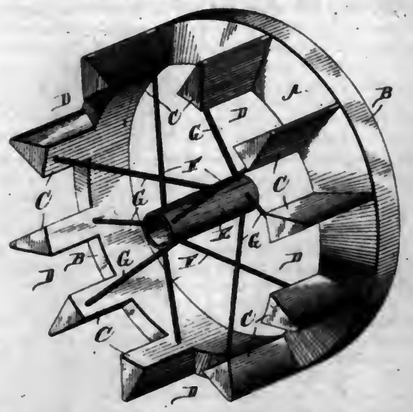
wire-netting seat C, the hinged cover D, and the slotted quadrant-shaped guide-bars fastened to said cover D, substantially as specified.

4. The combination of the seat-frame B, having the pins *b*, the wire-netting seat C, the hinged cover D, the spring *d*, and the slotted quadrant-shaped guide-bars F, fastened to said cover D, substantially as specified.

5. The combination of a wagon-seat, a back hinged thereto and having curved slotted guide-bars movable on side pins of the seat-frame, a slotted base-board, and a movable stop adapted to swing under the foot of the guide-bar to support the seat-back, substantially as described.

6. A wagon-seat consisting of a frame, B, a wire-netting, C, stretched thereon, and a cover, D, hinged to said frame, substantially as shown.

401,080. WHEEL. WILEY H. STROUD, Waxahachie, Tex. Filed Dec. 11, 1888. Serial No. 293,234. (No model.)



Claim.—1. In a wheel for the purpose named, the combination of the rim provided with a peripheral outwardly-tapered rib, B, and the lateral independent wedge-shaped ears or projections arranged on the side of the said rib with their outer edges flush with the outer edge of the rib, substantially as specified.

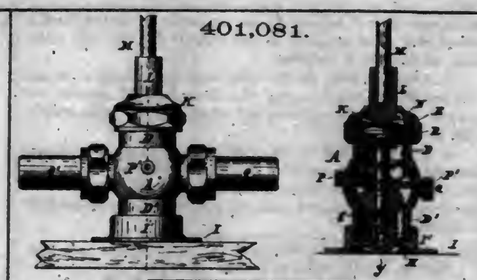
2. In a wheel for the purpose named, the combination of the rim provided with a tapered peripheral rib having laterally-extending wedge-shaped ears or projections C C, the hub, and the outer and inner series of spokes extending from the hub, respectively, to opposite ends of the said ears or projections, substantially as specified.

3. In a wheel for the purpose named, the combination, with the rim provided with laterally-extending independent ears or projections, of the hub and the outer and inner series of spokes, F and G, inclined in opposite directions and attached at their outer ends to alternate ears or projections, substantially as specified.

401,081. HOPPER-VALVE. CHRISTIAN STURM, Buffalo, N. Y. Filed Dec. 14, 1888. Serial No. 293,542. (No model.)

Claim.—As an improved article of manufacture, a hopper-valve consisting, essentially, of a body having cylinders D D', a valve-seat located centrally in said body, a cap and a bottom piece to close said cylinders, the former having a passage for the push-button L, and a valve consisting of a stem having a curved top, E, a cup-shaped piston secured underneath said head by a nut, and an elastic valve proper located in the egress side of the cylinders, whereby the initial pressure of the liquid passing through the valve acting upon said piston will close the valve proper, as and for the purpose set forth.

401,081.



401,082. LAWN-TENNIS NET. FREDERICK W. TAYLOR, Philadelphia, Pa. Filed Dec. 20, 1887. Serial No. 258,486. (No model.)

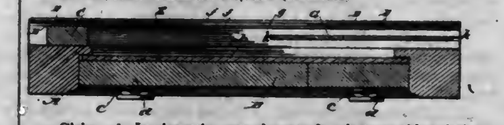


Claim.—1. In a lawn-tennis net, the combination, with a reticulated body having an upper sight-tape, of a centrally re-enforced portion joined to said sight-tape, substantially as set forth.

2. In a lawn-tennis net, the combination, with a reticulated body having upper and lower sight-tapes, of a centrally re-enforced portion joined to said sight-tapes, substantially as set forth.

3. In a lawn-tennis net, the combination of a reticulated body having its upper, middle, and lower portions of greater strength than the adjacent portions, and two sight-strips, one of which is attached to the upper and the other to the lower extremity of the body, substantially as set forth.

401,083. VIGNETTING ATTACHMENT FOR PHOTOGRAPHIC-PRINTING FRAMES. JOSEPH R. TEWKESBURY, Fort Madison, Iowa. Filed Nov. 27, 1888. Serial No. 291,965. (No model.)



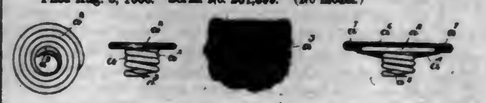
Claim.—1. In vignetting attachments for photographic-printing frames, the combination, with the printing-frame A, of the attached mask-carrying frame C, closed on its sides over the printing-frame, but provided with opposite side slots, *h h*, at its lower end, substantially as specified.

2. In vignetting attachments for printing-frames, the combination, with the printing-frames A, of the attached mask-carrying frame C, closed on its sides over the printing-frame, but provided with opposite side slots, *h h*, at its lower end, and the adjustable and flexible vignetting-mask G, having opposite arm-like projections, *i i*, on its sides adapted to slide within said slots as guides and to provide for the adjustment of the mask G in various directions, essentially as described.

3. In vignetting attachments for photographic-printing frames, the combination, with the printing-frame, of the attached frame C, the masks D D, of card-board or other suitable thin material, secured to said frame C, and having enlarged openings *f* in them, and the loose mask E, adjustable in various directions between the masks D D, and provided with a suitably-shaped smaller aperture, *g*, substantially as specified.

4. In vignetting attachments for photographic-printing frames, the combination, with the printing-frame, of the attached frame C, the masks D D, secured to said frame C, and having enlarged openings *f* in them, the loose mask E, adjustable in various directions between the masks D D, and provided with a suitably-shaped smaller aperture, *g*, and the adjustable and flexible cut-off vignetting-mask G, all of said masks being constructed of card-board or other suitable thin material and being arranged in relation to each other and to the printing-frame, essentially as shown and described.

401,084. BUTTON. GEORGE H. THOMAS, Chicopee Falls, Mass. Filed Aug. 3, 1888. Serial No. 281,899. (No model.)



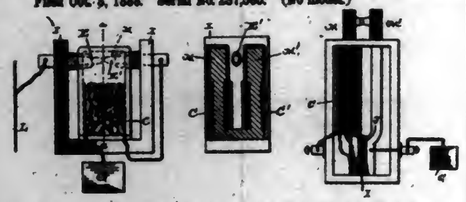
Claim.—1. As an improved article of manufacture, a button

having the head a^3, formed of wire, the worm or tubular shank a, formed by a close spiral coil of wire integral with the wire of the head, substantially as described.

2. A button having the flat coiled head a^3 and shank a, the said head and shank being formed of wire in one piece, as specified, and a cap or covering secured to the flat coiled head by a collet, substantially as described.

3. A button having the flat coiled head a^3 and shank a, the said head and shank being formed of wire in one piece, the end a^5 of the wire being pointed and bent to a position in line with the axis of the shank, but slightly removed from the last coil thereof, substantially as described.

401,085. LIGHTNING-ARRESTER. ELIHU THOMSON, Lynn, Mass. Filed Oct. 9, 1888. Serial No. 287,565. (No model.)



Claim.—1. In an arc-rupturing device, a shield of insulating material located between the surfaces of the electrodes and adjacent conducting-surfaces of the device by which the arc is disrupted, as and for the purpose described.

2. An arc-rupturing device having its exposed surfaces adjacent to surfaces of the arcing electrodes or bodies shielded with insulating material.

3. The combination, with electrodes liable to abnormal arcing, of an arc-dispelling magnet and a shield of insulating material between opposed surfaces of the magnet and electrodes, as and for the purpose described.

4. In an arc-rupturing device, a magnet whose poles are covered with insulating-shields.

5. In an arc-rupturing device, an intercepting-shield of solid insulator between the poles of an arc-rupturing magnet and the arcing-electrodes.

6. In an arc-rupturing device, magnet portions shielded by an insulating-covering, in combination with shielded electrodes having an exposed metal portion wholly within the space between the magnet-poles.

7. In an arc-rupturing device, a divided magnet whose portions are electrically insulated, but free for the passage of magnetism from one to the other, the poles of which magnet each bear one of a pair of electrodes connected, respectively, to the parts of an electric circuit, substantially as described.

401,086. HINGE. JAMES A. TURNER, Evanston, Ill. Filed Dec. 9, 1887. Serial No. 257,204. (Model.)



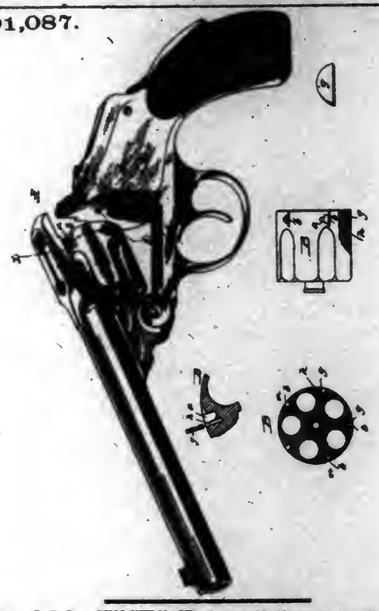
Claim.—The herein-described hinge, consisting of the leaves B C, adapted for attachment to the parts to be joined, knuckles *b c*, formed on said leaves, pivots passing through said knuckles, a link, as D, connecting the two leaves, said link being bent at right angles near its ends to form flat faces or shoulders located in position to rest in contact with the adjacent flat faces of the leaves when the leaves are folded together or parallel with each other, and having knuckles formed upon the ends of the bent portions of the link to engage the pivots E E', substantially as described.

401,087. REVOLVING FIRE-ARM. DANIEL B. WESSON, Springfield, Mass. Filed Jan. 31, 1889. Serial No. 298,277. (No model.)

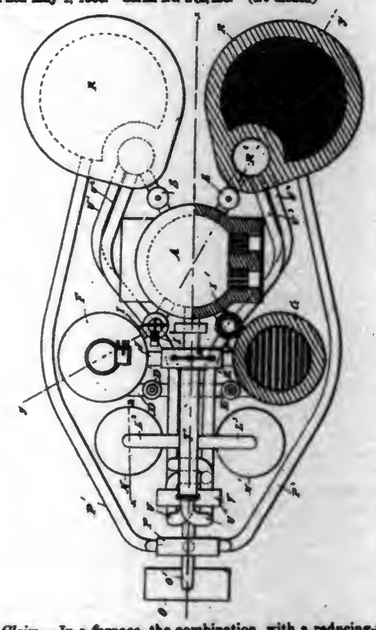
Claim.—1. A cylinder for revolving fire-arms, provided with peripheral catch-notches having the abutment-wall of each thereof formed of a block of suitable material harder than that from which the cylinder proper is formed and let into a recess therein and there rigidly secured, substantially as and for the purpose described.

2. In a revolving fire-arm, the combination, with the stock or frame provided with a cylinder-catch, of the cylinder provided with peripheral catch-notches having the abutment-wall of each thereof formed of a block of suitable material harder than that from which the cylinder proper is formed and let into a recess therein and there rigidly secured, substantially as and for the purpose described.

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401,088. ZINC-FURNACE. GUSTAF M. WESTMAN, New York, N. Y. Filed May 1, 1888. Serial No. 272,428. (No model.)

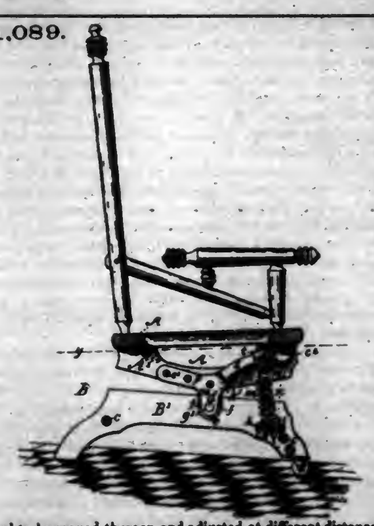


Claim.—In a furnace, the combination, with a reducing-furnace, of regenerators connected alternately with the reducing-furnace, condensers, each connected by two or more pipes with the said reducing-furnace, coolers connected with the said condensers, and a blast-engine connected with the said coolers and the said regenerators, substantially as shown and described.

401,089. OSCILLATING CHAIR. CHARLES R. WHITTLESEY, New Haven, assignor of one-half to Charles Lee, Bridgeport, Conn. Filed Nov. 15, 1888. Serial No. 290,972. (No model.)

Claim.—1. The combination, with the stationary and tilting parts of an oscillating chair, of a spring pivotally attached to one of the parts, a guide, track, or lever-arm attached to the other part in a line the points of which are at different distances from the center of oscillation, and an attachment for connecting the spring to the lever-bar,

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adapted to be moved thereon and adjusted at different distances from the center to vary the force of the action of the spring.

2. The combination, with the stationary and tilting parts of an oscillating chair, of a spring pivotally attached or hinged to one of the parts, a curved lever-arm attached to the other part arranged in a line the points of which are at different distances from the center of oscillation, and having its curve formed in the arc of a circle approximately concentric to the pivotal center of the spring when the chair is in normal position, and a sliding part fitted upon the lever-bar and connected to the spring and adapted to be moved along the arm to vary the leverage of the action of the spring on the chair.

3. The combination, with the stationary and tilting parts of an oscillating chair, of a spring pivotally attached or hinged to the base thereof, a lever-arm attached to the tilting part and arranged in a line the points of which are at different distances from the center of oscillation, an attachment fitting upon the lever-arm and adapted to slide thereon and having the spring connected to it, and means for securing the sliding attachment to the arm at different distances from the center of oscillation to vary the leverage of the action of the springs on the oscillation of the chair.

4. The combination, with the stationary and tilting parts of an oscillating chair, of a spiral spring pivotally connected or hinged at one end to the base of the chair, a curved arm attached to the tilting part as a lever from the center of oscillation, a part fitted upon the arm and adapted to slide thereon and connected with the upper end of the spring, and a set-screw for securing the said part to the arm at different distances from the center of oscillation, as specified.

5. The combination of the base B, having the side frames B', the tilting part A, having the side frames A', each hinged to the side frames of the base, with the axis below the surface of the frames of the base, the lever-arms S, attached to the side frames of the tilting part, the springs *m*, pivotally attached to the base at the lower ends, the sliding attachments *t*, fitted to slide upon the lever-arms, with the upper ends of the springs connected to them, and set-screws for securing the sliding attachments upon the lever-arms at different distances from the center of oscillation, substantially in the manner and for the purpose specified.

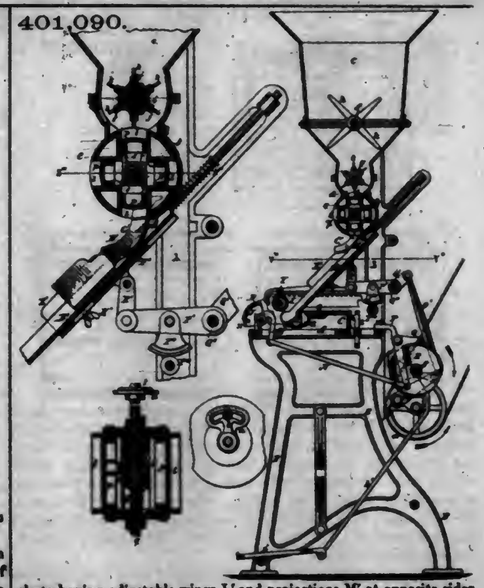
401,090. CIGAR-BUNCHING MACHINE. JOHN R. WILLIAMS, Newark, N. J., assignor to the John R. Williams Company, New York, N. Y. Filed July 19, 1888. Serial No. 280,409. (No model.)

Claim.—1. In a cigar-bunching machine, the inclined chute secured to a casting or frame, inclined guide-rods for controlling the movement of the chute, and mechanism for moving the said chute and frame on said rods from the driving-shaft, combined with a rolling-table, apron, and reciprocating roller, the elevated hopper for scrap-tobacco, and feed mechanism, substantially as and for the purposes set forth.

2. In a cigar-bunching machine, the chute having adjustable wings at its lower end and connected with the frame or casting, the inclined guide-rods for said frame, and mechanism, substantially as described, for imparting an inclined sliding movement to the chute, combined with the rolling-table, apron, reciprocating roller, and hopper for scrap-tobacco, substantially as and for the purposes set forth.

3. The rolling-table having at its front end a recess and plate, G, combined with the reciprocating roller and the chute secured to a frame and having an inclined sliding movement, the lower end of the

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chute having adjustable wings L' and projections M' at opposite sides extending below the chute, substantially as and for the purposes set forth.

4. In a cigar-bunching machine, the rotary cylinder *c*, containing the recesses *l*, the confining-plate *z* for said cylinder, and the hinged door A', which when open operates as a chute for the tobacco, combined with the chute B', for conveying the charges of tobacco measured in said recesses to the rolling-table, the elevated hopper for containing the tobacco in bulk, and mechanism for rotating the said cylinder and for opening and closing said door, substantially as shown and described.

5. In a cigar-bunching machine, the cylinder *c*, containing recesses *l*, the platens *p*, having racks *s*, pinion *r*, meshing with said racks, shaft *q*, and confining-plate *z*, having door A', combined with the chute for conveying the tobacco from said recesses to the rolling-table, an elevated hopper for the tobacco in bulk, and mechanism for rotating the said cylinder and for opening and closing said door, substantially as set forth.

6. In a cigar-bunching machine, the cylinder *c*, containing recesses and platens *p*, the confining-plate *z*, and the pivoted door A', operating in conjunction therewith and provided with lateral projections D', combined with the sliding chute and frame connected therewith, the sides of said frame forming cams for opening and closing door A', and an elevated hopper for feeding charges of tobacco to said recesses, substantially as set forth.

7. In a cigar-bunching machine, the cylinder *c*, containing recesses *l*, the platens *p*, having racks *s*, pinion *r*, meshing with said racks, shaft *q*, having index-finger *t*, and index-plate *u*, combined with the confining-plate *z*, provided with a pivoted door, A', the chute for conveying the charges of tobacco to the rolling-apron, and the elevated hopper for feeding the tobacco to said recesses, substantially as set forth.

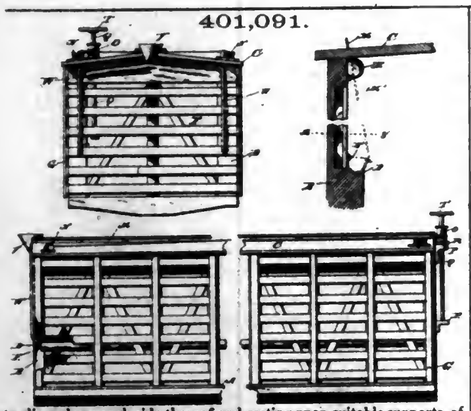
8. In a cigar-bunching machine, the elevated hopper for the tobacco in bulk, a charge-receptacle below said hopper, a door connected with said receptacle to confine or permit the escape of the charges of tobacco therefrom, mechanism, substantially as described, for opening and closing said door, and the bunch-rolling mechanism, combined with the chute leading from the charge-receptacle to the rolling mechanism, and the blades J' J', secured at the upper end of the chute, said blades converging toward each other at their outer ends and constituting walls to direct or distribute the charges of tobacco on said chute, substantially as and for the purposes specified.

9. In a cigar-bunching machine, the elevated hopper having a reduced lower end, combined with the horizontal shaft *g* in said lower end and having the collar *i*, provided with the recesses *j*, and radial blades *k*, of flexible material, the receptacle below said hopper for measuring the charges of tobacco, and having a hinged door, A', mechanism, substantially as described, for operating said door, and a chute for conveying the charges of tobacco from said receptacle to the rolling mechanism, substantially as set forth.

401,091. STOCK-CAR. JOHN R. WILSON, Farmville, Va. Filed Oct. 17, 1888. Serial No. 288,277. (No model.)

Claim.—1. The combination, with the car and the troughs ex-

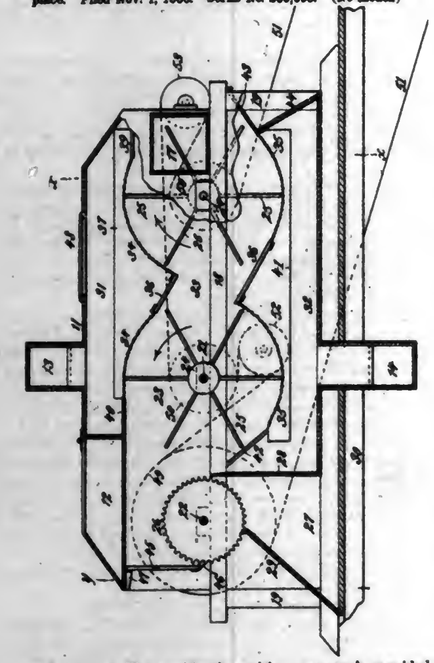
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tending along each side thereof and resting upon suitable supports, of guides hinged to the outer edges of the troughs, respectively, and sliding in ways in the car-walls, a funnel fixed without the car above the plane of the troughs, pipes leading from said funnel to points slightly above the ends of the troughs and terminating in open ends substantially parallel to the troughs, respectively, cords secured to the inner edges of the troughs and passing vertically through the car-roof, and means for drawing all said cords simultaneously upward, substantially as set forth.

2. The combination, in a stock-car, of the trough E, the grooved posts B, the rollers H, working in the grooves in the posts, the links I, connecting the rollers and the outer edge of the trough, the cords M, and means for drawing the cords upward simultaneously, whereby the trough may be raised to the top of the car and be at the same time partially inverted.

401,092. SEED-COTTON CLEANER. WILLIAM M. WILSON, Friar's Point, Miss., assignor of one-half to William Henry Dickerson, same place. Filed Nov. 1, 1888. Serial No. 289,695. (No model.)



Claim.—1. The combination, with a receptacle provided with longitudinal spaced screens dividing the receptacle into three compartments, a supply-tube entering the central compartment near the front end thereof, and exhaust-tubes connecting with the upper and lower compartments, of a series of rotary beaters in the central compartment, and a delivery-cylinder adjacent to the discharge end of said compartment, substantially as shown and described.

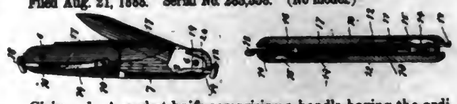
2. The combination, with a receptacle provided with longitudinal spaced screens dividing the receptacle into three compartments, a supply-tube entering the central compartment near the front end thereof at a right angle, and exhaust-tubes connected with the upper and lower compartments, of shafts within the central compartment, provided with beaters, said shafts capable of revolving in opposite directions, means, substantially as shown, for revolving said shafts, as described, and a delivery-cylinder having a roughened periphery journaled in the main frame and adjacent to the discharge end of the central compartment, all combined to operate substantially as shown and described.

3. The combination, with a receptacle provided with longitudinal spaced screens dividing the same into three compartments, a supply-tube entering the central compartment near the front end thereof, and exhaust-tubes connected with the lower and upper compartments, of a series of beaters journaled in the central compartment, a delivery-cylinder journaled in the main frame at the rear or discharge end of the central compartment, and a gravity air-valve pivoted at the rear of the cylinder in the outlet of the receptacle, substantially as shown and described.

4. The combination, with a receptacle provided with longitudinal spaced screens dividing the receptacle into three compartments, a supply-tube entering the central compartment near the front end thereof at a right angle thereto, and exhaust-tubes connecting with the upper and lower compartments, of shafts provided with arms journaled in the central compartment, capable of revolving in opposite directions, means, substantially as shown, for revolving said shafts, a corrugated delivery-cylinder journaled in the main frame at the discharge end of said compartment, and a gravity air-valve pivoted at the rear of the cylinder in the outlet of the receptacle, substantially as shown and described.

5. The combination, with a receptacle provided with longitudinal spaced screens dividing the receptacle into three compartments, a supply-tube entering the central compartment near the front end thereof, and exhaust tubes connected with the upper and lower compartments, of oppositely-revolving shafts journaled transversely in the central compartment, hubs attached to said shafts, and beater-arms projecting from the hubs, alternately flaring in opposite directions, means for operating said shafts, as described, a roughened delivery-cylinder journaled in the main frame at the discharge end of the said compartment, and a gravity air-valve pivoted at the rear of the cylinder and in the outlet of the receptacle, all combined substantially as shown and described.

401,093. POCKET-KNIFE. ARTHUR WILSIN, New York, N. Y. Filed Aug. 21, 1888. Serial No. 283,358. (No model.)



Claim.—1. A pocket-knife comprising a handle having the ordinary back-spring, a blade normally held partially projected or open by said spring, and having the usual shouldered heel to engage the spring when the blade is fully opened and be locked thereby, and a lock or catch to engage the blade when fully closed, substantially as set forth.

2. The combination, with the knife-handle and the ordinary back-spring held therein, of a blade having a projection on the inner edge of its pivotal portion in front of the pivot and bearing against the said spring when the blade is closed, and a lock or catch to hold the blade fully closed, as set forth.

3. A pocket-knife constructed with a blade having its pivotal portion formed with a projection bearing against the knife-spring, in combination with a spring-actuated locking device mounted on the knife-handle and extending between and clamped by the knife-spring and the butt of the pivotal portion of the blade, substantially as shown and described.

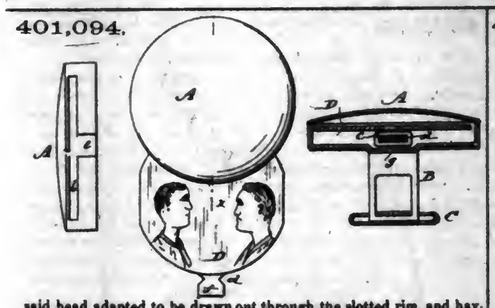
4. A pocket-knife constructed with a blade having its pivotal portion formed with a projection bearing against the knife-spring, in combination with a locking device mounted on the knife-handle and extending between and clamped by the knife-spring and the butt of the pivotal portion of the blade, substantially as shown and described.

5. A pocket-knife constructed with blade 2, having its pivotal portion 1 formed with a projection, 3, bearing against knife-spring 7, a receding part, 4, adjacent thereto, with a heel, 5, in combination with spring-arm 9, laterally movable in a recess, 11, in the knife-handle, having at its outer end the tip 13, and a pin, 8, extending through opening 8' in the plate 10, and between knife-spring 7 and receding part 4 of the pivotal portion 1 of knife-blade, substantially as shown and described.

401,094. CAMPAIGN-BUTTON. LEON WESTERDORF and AUGUST REYNOUD, New York, N. Y. Filed Aug. 1, 1888. Serial No. 281,629. (No model.)

Claim.—1. The campaign-button herein described, consisting of a hollow head having a slotted rim, and with a portrait-slide within

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said head adapted to be drawn out through the slotted rim, and having a spring operating to draw the slide within the button, substantially as shown and described.

2. The combination of the hollow button or button-head A, having a slot in its rim, the portrait-slide D, arranged to pass in and out of said button through said slot, the draw-bar or pull-piece *d*, attached to said slide and projecting beyond the rim of the button, and a spring closing the slide within the button, essentially as shown and described.

401,095. LIGHTNING-CONDUCTOR FOR WIRE FENCES. FREMONT E. WOOD, Yucca, Ariz. Filed Nov. 23, 1888. Serial No. 292,058. (No model.)



Claim.—1. In a lightning-conductor for wire fences, the combination of a sectional conductor and clamping-sockets formed of two sections, each section being provided with a longitudinal groove and an aperture at right angles to the groove, substantially as described.

2. In a lightning-conductor, the combination of the sectional conductor, sectional sockets in which the ends of the sectional conductor are secured, and a connecting or binding wire for connecting the ends of the sectional conductor with the strands of a wire fence, substantially as described.

3. A sectional socket consisting of a socket-section, 10, formed with a central groove and ribs 12 and 12ª, and a socket-section, 13, formed with ribs 15 and 15ª, and a means, substantially as described, for connecting the sockets, as and for the purpose stated.

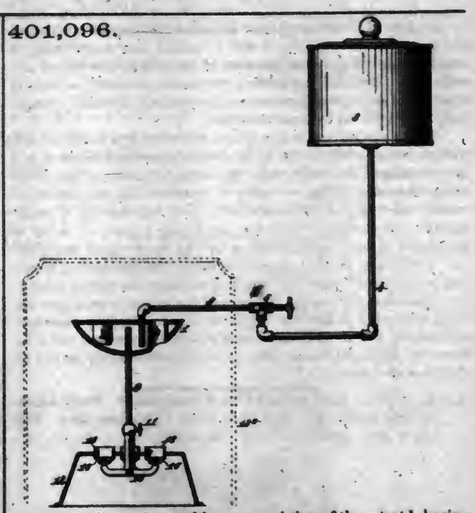
4. In a lightning-conductor, the combination, with rods 20, of socket-sections 10 and 13, screws 2, a binding-wire, 21, and set-screws, as 22 and 23, substantially as described.

401,096. HEATER FOR STOVES AND OTHER PURPOSES. SAMUEL H. ALTICE, HENRY P. ROBERTS, and CUNNINGHAM REED, Jamestown, N. Y.; said Roberts assignor to said Altice and Reed. Filed May 3, 1888. Serial No. 272,662. (No model.)

Claim.—1. The open air-supply pan 12, having a perforated top wall and adapted to set within a stove, and the air-chamber 13, open at the top, supported by and rising above said top wall, and in communication at its base with the interior of the air-supply pan, in combination with the burner projecting into the air-chamber, the retort, the vapor-conducting tube, and the oil-supply pipe, substantially as described.

2. An oil vaporizer and burner consisting of the retort 1, having flues 2 extending entirely through it, the oil-supply tube 4, the vapor-conducting tube 9, communicating with the retort, descending therefrom, and provided with a burner at its lower end, the open air-supply pan 12, adapted to set within a stove and having a perforated top wall, and the air-chamber 13, open at the top, supported by and rising above said top wall surrounding the burner, and in communication at its base with the interior of the air-supply pan, substantially as described.

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3. An oil vaporizer and burner consisting of the retort 1, having flues 2 extending therethrough, the oil-supply pipe 4, the vapor-conducting tube 9, leading down from the retort and provided at its lower end with a series of burner-tips, the air-supply pan 12, adapted to set within a stove and having a series of openings in its top wall, and a series of air-chambers, 13, supported in said openings and each one rising above the top wall surrounding a burner and provided with openings 15 at its lower end, placing it in communication with the interior of the air-supply pan, substantially as described.

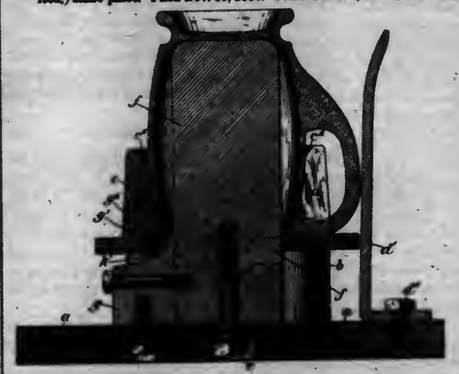
401,097. BRICKS, &c., INCRUSTED WITH METAL. JAMES C. ANDERSON, Highland Park, Ill. Filed Nov. 30, 1888. Serial No. 292,309. (Specimens.)

Claim.—As a new article of manufacture, a brick or tile having a metallic incrustation formed integral with the same without an intermediate vitrifiable material.

401,098. METHOD OF INCRUSTING BRICK. JAMES C. ANDERSON, Highland Park, Ill. Filed Nov. 30, 1888. Serial No. 292,308. (No specimens.)

Claim.—An improvement in the art of manufacturing bricks, blocks, and tiles, which consists in applying finely divided or comminuted metals to the bricks, blocks, or tiles while the same are in a green or unburned state, and in then burning said articles to the pottery point to fuse the metal and cause it to form an incrustation or envelope of metal integral with the main body of the article.

401,099. APPARATUS FOR SHAPING GLASSWARE. JOSEPH ANDERSON, Pittsburg, Pa., assignor to the O'Hara Glass Company, (Limited,) same place. Filed Nov. 19, 1887. Serial No. 255,581. (No model.)



Claim.—1. A former for shaping glass articles, which consists in a central guide die or post and an outer matrix into the cavity of which the article is inserted, said matrix being of less width than the original diameter of the article to be shaped and being contracted in diameter from the outside inwardly, whereby a compressing and shaping action on the article is obtained, substantially as and for the purposes described.

2. A former for shaping glass articles, which consists in a matrix into the cavity of which the article is inserted, said matrix being of less width than the original diameter of the article to be shaped and being contracted in diameter from the outside inwardly, whereby a compressing and shaping action on the article is obtained, substantially as and for the purposes described.

3. In a former for shaping glass articles having a handle or projection, a matrix into the cavity of which the article is inserted, said matrix being of less width than the original diameter of the article to be shaped and being contracted in diameter from the outside inwardly, the cavity of the matrix being slotted at the side to permit passage of the handle or projection and having a guide, *d'*, situate at the rear of the slot, substantially as and for the purposes described.

4. A former for shaping glass articles, which consists in a matrix into the cavity of which the article is inserted, said matrix being of less width than the original diameter of the article to be shaped and being contracted in diameter from the outside inwardly, whereby a compressing and shaping action on the article is obtained, and a lip-former or die at the base of the said matrix, substantially as and for the purposes described.

401,100. CORNER-IRON FOR WAGON-BOXES. PETER ANDERSEN, Fort Wayne, Ind., assignor to Henry G. Olds, same place. Filed July 6, 1888. Serial No. 279,189. (No model.)



Claim.—1. An iron wagon-box corner combining in one piece an exterior rib constituting the outer corner of the box, a single thin connecting septum or web, and diverging interior flanges fitting the interior corner of the box and forming by these three parts mitered recesses for receiving and holding the wooden side and end of the box, substantially as shown and described.

2. A set of corner-irons for a solid wagon-box corner, comprising an upright corner of iron having an exterior rib forming the outer corner of the box, a connecting septum or web, and diverging interior flanges fitting the inner corner of the box and forming by these three parts mitered recesses for receiving and holding the wooden side and end of the box, and a top piece fitting the upper and inner edge of the box and bolted thereto, substantially as described.

3. A set of corner-irons for a solid wagon-box corner, comprising, in combination, the upright corner-iron I and the top piece, T, constructed and combined substantially as described.

4. A corner-iron for the rear end of a wagon-box having a hinged end-gate, combining in one piece an exterior rib forming the outer corner of the box, a recess to receive the end of the wooden side of the box, a catch to hold the latch of the end-gate, and an inner flange fitting against and fastened to the rear corner-post of the box, substantially as described.

5. The corner-iron I', substantially as described.

6. A corner-iron for a wagon or buggy seat, combining in one piece an exterior rib forming the outer corner of the seat, a single thin connecting septum or web, and diverging interior flanges fitting the interior corner of the seat and forming by these three parts mitered recesses for receiving the ends of the back and side of the seat, the said parts being combined in planes and angles corresponding to the planes and angles of the back, sides, and bottom of the seat, substantially as described.

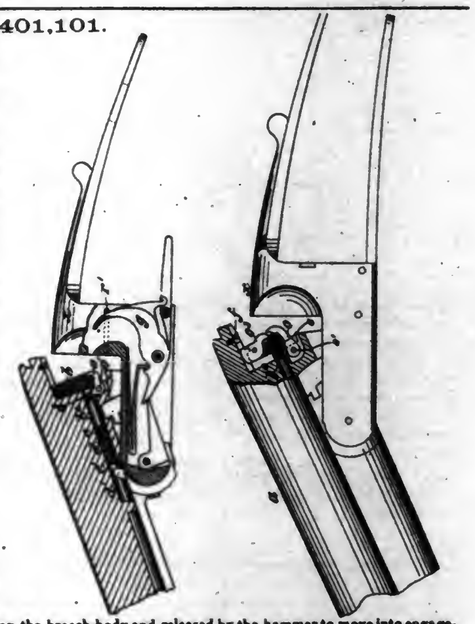
401,101. BREECH-LOADING FIRE-ARM. WILLIAM ARMOS, Birmingham, County of Warwick, England. Filed Aug. 3, 1888. Serial No. 282,195. (No model.) Patented in England Dec. 9, 1886, No. 16,138.

Claim.—1. The combination, with a drop-down barrel, a breech-body, and a lift for the ejecting mechanism, of an extractor-ejector, a retaining-catch therefor on the breech end of the barrel, a rod moved lengthwise of the extractor-ejector by the lift, and a spring acting on the extractor-ejector and compressed when the rod is moved by the lift, substantially as described.

2. The combination, with a drop-down barrel, a breech-body, and a lift for the ejecting mechanism, of an extractor-ejector comprising a head and a tubular shank or sleeve extending therefrom, a lengthwise-movable rod located in the shank and having a head at its inner end to be acted on by the lift, a spring between the shank and the head of the rod, and a retaining-catch pivoted on the breech end of the barrel, substantially as described.

3. The combination, with a drop-down barrel, a breech-body, and an extractor-ejector, of a movable dog on the extractor-ejector to engage and hold an unfired cartridge, a hammer and a plunger arranged

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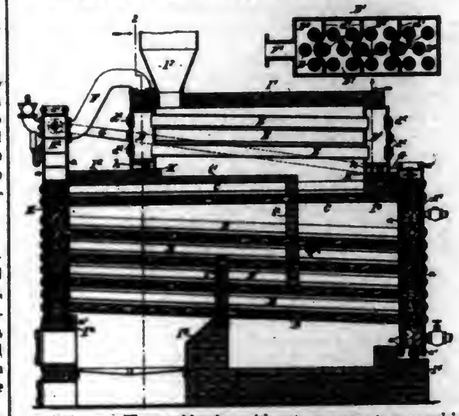


on the breech-body and released by the hammer to move into engagement with the dog for disengaging the latter from the cartridge when the barrel is dropped, substantially as described.

4. The combination, with a drop-down barrel, a breech-body, and an extractor-ejector, of a dog pivoted on the extractor-ejector to engage and hold an unfired cartridge, a plunger on the breech-body, and a hammer which holds the plunger retracted while cocked and releases such plunger when uncocked and permits the latter to advance and engage the dog, substantially as described.

5. The combination of a drop-down barrel, a breech-body, and an extractor-ejector, of a dog pivoted on the extractor-ejector and having a lip to engage and hold an unfired cartridge, a plunger on the breech-body having a lateral leg, a spring for advancing the plunger to engage the dog, and a hammer which holds the plunger retracted when cocked, substantially as described.

401,102. STEAM-GENERATOR. MICHAEL C. ARMOUR, Chicago, Ill. Filed May 7, 1888. Serial No. 273,011. (No model.)



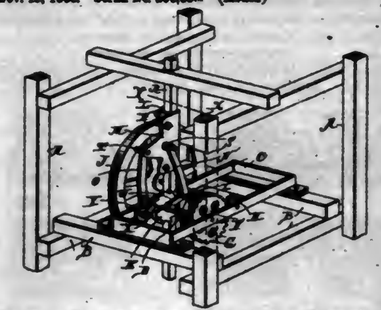
Claim.—1. The combination, with a steam-generator comprising two water-heads arranged at opposite ends of the generator and extending the full width of the same, a series of inclined water-tubes located between and connected at their opposite ends to said water-heads, and a second series of horizontal water-tubes located above the same, one of said water-heads being extended above the horizontal water-tubes to form a separating-chamber, of a plurality of separate steam-headers arranged at opposite ends of the boiler, and steam-heating pipes connecting said headers with each other and one of said headers with the top of said separating-chamber, one of said

headers being provided with an opening forming the steam-exit of the boiler, substantially as described.

2. The combination, with a steam-generator provided with a steam-space or separating-chamber, of steam-headers D D', divided into a series of chambers or compartments by transverse partitions, steam pipes or tubes E E E, connecting said headers, and a pipe or passage connecting one of the headers with the steam-space of the generator, substantially as described.

3. The combination, with a steam-generator comprising two water-heads and intermediate water-tubes connected therewith, two steam-headers, D and D', and a plurality of steam-heating pipes, E E E, communicating with the said headers, and a pipe connecting said headers and steam-heating pipes with the steam-generator, of transverse girders located over the water-tubes of the boiler and sustaining said steam-headers D and D', substantially as described.

401,103. DEVICE FOR CONVERTING MOTION. CHARLES R. ARMSTRONG, Nevada, Iowa, assignor to Jay A. King, same place. Filed Nov. 15, 1888. Serial No. 290,890. (Model.)

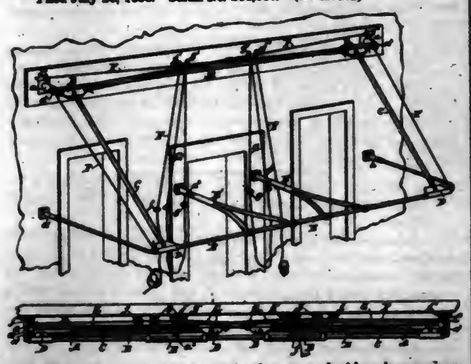


Claim.—1. The combination of the main shaft, the ratchet-wheel mounted thereon, the plates W, extending from said shaft and having notches in their edges, the pawls pivoted to said plates and engaging the ratchet-wheels, and the springs having one end bearing upon the pawls and the other end engaging one of the notches in the plates W, as set forth.

2. The combination, with the reciprocating rod, of the L-shaped clamping-plates fitting around the same and provided with perforated ears, the securing-bolts passed through said ears, the pitmen pivoted to one of said clamping-plates, the main shaft, the ratchet-wheel on the said shaft, and the pawls operated by the pitmen and engaging said ratchet-wheel, as set forth.

3. The combination of the reciprocating rod, the main shaft, the ratchet-wheel mounted thereon, the clamping-plates L M, fitting around the reciprocating rod, the plate L, having the pairs of ears P, and the plate M, having the perforated ears Q and the projection R, the securing-bolts passed through the ears P Q to bind the clamping-plates around the reciprocating rod, the stud S, projecting laterally from the end of the projection R, the stud T, projecting from the plate M in a direction opposite to the stud S, the pitmen pivoted to said studs, and the pawls operated by said pitmen and engaging the ratchet-wheel, as set forth.

401,104. AWNING-FRAME. CHARLES M. ASHBY, De Smet, Dak. Filed July 26, 1888. Serial No. 281,117. (No model.)

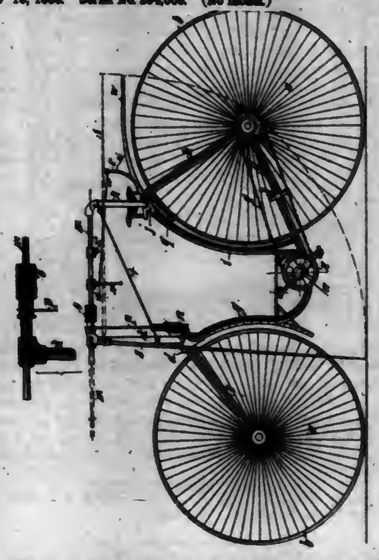


Claim.—1. An awning-frame having on each side a brace pivotally secured at one end to its pivoted or hinged bow or projecting part and at the other end to a runner or sleeve movable on the rear or guide rod, and having suitable cords to operate it, whereby it can be let down and locked in position or raised and folded, substantially as described.

2. The awning-frame composed of the guide-rod A, secured upon projecting standards, the bow or projecting part E, hinged to like standards, and the brace-rods C, one on each side, pivoted at one end to the bow and at the other to runners on the rod A, substantially as and for the purposes set forth.

3. The guide-rod A, secured at a distance from the face of the building, the bow E, hinged to standards, the brace-rods C, pivoted at one end to the bow and at the other movable on the rod A, and the cords F and G, the whole combined and operating in the manner set forth.

401,105. BICYCLE. DÉSIRÉ A. BAZE, Paris, France. Filed Dec. 18, 1888. Serial No. 294,006. (No model.)



Claim.—1. The combination, in a bicycle, of an upper frame, *k*, having on one side a slide, *m*, to provide for opening it, a cross-head, *d*, and a lower frame, *g h i*, connected in front with the cross-head *d*, and connected with the upper frame, *m*, at the rear thereof, substantially as and for the purpose herein set forth.

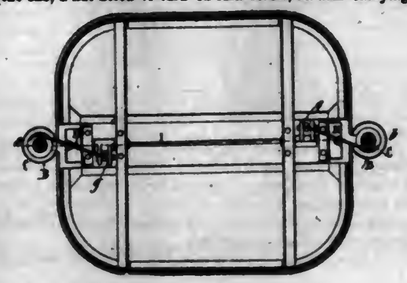
2. The combination, with a frame, *k*, and the cross-head *d*, of the fork *c*, provided with a rod or pivot passing through it, the pulley *n* on the upper end of the said rod or pivot, the collars *o* on the sides of the frame *k*, and the cords *p*, connecting said collars with the said pulley, all substantially as herein set forth.

3. The combination, with an upper frame, *k*, of the tail-bar *w*, arranged over the hind wheel and provided with pegs *w'*, for hanging of baggage, substantially as herein specified.

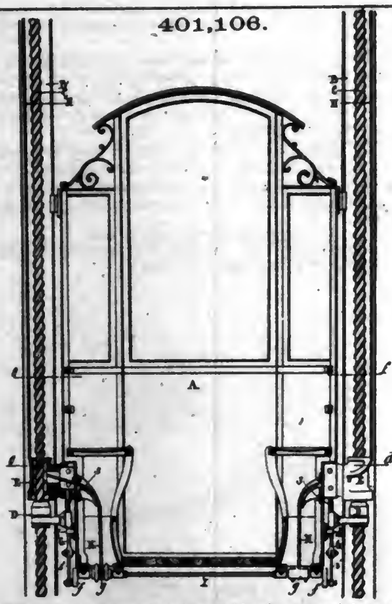
4. The combination, with the frame *m*, of the supporting-legs *z*, pivoted to said frame near the front thereof, and a spring, *t*, adapted to spring said legs out into a horizontal position at the sides of the frame, substantially as specified.

401,106. SAFETY DEVICE FOR ELEVATORS. PIER G. RACKNAM, Paris, France. Filed Feb. 14, 1888. Serial No. 263,903. (No model.) Patented in France May 18, 1883, No. 160,662.

Claim.—The combination, with an elevator-cab and a hoisting-rope therefor, of a stationary upright screw, a socket secured fixedly to the cab, a nut fitted to turn on said screw, an arm carrying said

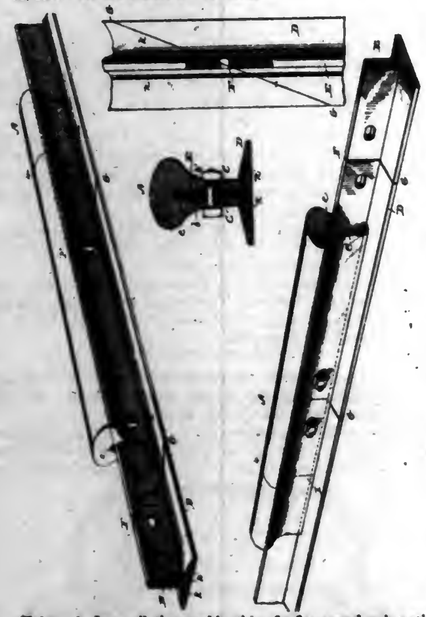


401,106.



nut and attached to the cab to be capable of an up-and-down movement thereon, a friction-brake one member of which is on said socket and the other on said nut, a horizontal shaft carried by the cab, a lever-arm on said shaft connected with the hoisting-rope, a crank on said shaft, and a rod connecting said crank with the said arm which carries the nut, substantially as described, whereby the nut is prevented from descending on the screw on the breaking of the hoisting-rope, as herein set forth.

401,107. RAIL. RICHARD DE S. BAGOT, Columbia, S. C. Filed Dec. 15, 1888. Serial No. 293,678. (No model.)



Claim.—1. In a rail, the combination of a flange and web section constituting the base and a grooved ball fitted thereto by means of webs integral with the ball and concave in the wake of the bolts projecting from each side of the ball clamping the base-section, and having a space, *c*, between the top of the web-section and the bottom of the groove, substantially as described.

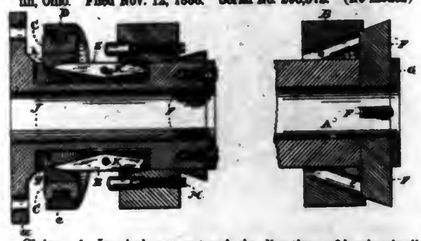
2. In a rail, the combination of a flange and web section constituting a base having diagonally-cut ends for forming the joints, and a grooved ball with projecting webs or jaws fitting over the base-section, whereby, when a joint is formed, the sections are secured together and an unbroken base-section is provided for the support of the ball.

3. In a rail, the combination of a flange and web section constituting a base having a groove on each side of the web and a grooved ball fitting over the base, and having webs or jaws concave in the wake of the bolts, the extremities of which fit into the grooves on each side of the base-section, and having a space, *c*, between the top of the base-section and the bottom of the groove in the ball, as described.

4. As a new article of manufacture, a ball for a rail having a central groove and two downwardly-projecting webs or jaws integral with the ball, concave in the wake of the bolts, and adapted to be fitted over the web of a flange and web section, the groove being of sufficient depth to leave a space, *c*, when applied to the base-section, substantially as described.

5. In a rail, the combination of a flange and web section constituting the base and a grooved ball fitted thereto by means of webs integral with the ball, concave in the wake of the bolt projecting from each side of the ball and clamping the base-section.

401,108. SCREW-CUTTING DIE-HEAD. WILLIAM J. BAKER, Tiffin, Ohio. Filed Nov. 12, 1888. Serial No. 290,572. (No model.)



Claim.—1. In a bolt-cutter head, the dies thereof having inclined circular enlargements opposite their thread-cutting ends in co-operative engagement with the grooved ring B, movably fitted and arranged to encircle the barrel of said cutter-head, substantially as and for the purpose set forth.

2. The combination, with a bolt-cutter head and the ring B, having inclined grooves with enlarged circular terminals fitting to correspondingly-shaped dies or cutters movable therein, of a sleeve, C, with a shifter, D, for moving said ring upon the barrel of the head, and the levers E E, pivotally arranged within cavities of said barrel for locking said ring, substantially in the manner and for the purpose described.

3. The combination, with the locking mechanism of a bolt-cutter head, the barrel A, provided with cavities, and pivoted levers E E, swinging therein, of the springs J, arranged for conjoint action in connection with the sleeve C and die-ring B, in the manner and for the purpose substantially as set forth.

4. In a bolt-cutter head, the arrangement of the barrel A, ring B, and levers E E, in combination with the springs J and N, the adjusting-screws M, connecting-screws I, and set-screws O, constructed substantially in the manner described, for the purpose set forth.

5. In a bolt-cutter head, the sleeve C, having in connection a wedge, *h*, for raising the levers E, located between the said sleeve and the die-ring B, arranged to encircle the barrel A and slide thereon, constructed and arranged in the manner and for the purpose substantially as described.

401,109. PRESERVING FRUIT. WILLIAM R. BAKER, Pasadena, Cal. Filed July 28, 1888. Serial No. 281,305. (Specimens.)

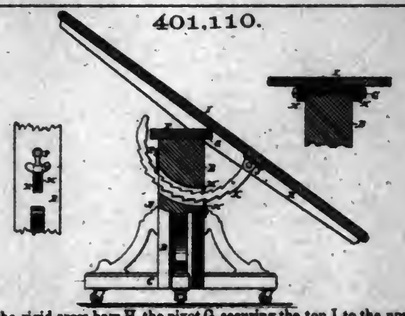
Claim.—The process of curing or drying fruit, consisting in first subjecting it in a confined space to the fumes of the herein-described mixture, composed of sulphur, willow charcoal, saltpeter, allspice, coffee, and alum, and then exposing the same to the action of a drying agent, substantially as specified.

401,110. TABLE OR STAND FOR EXHIBITING CLOAKS, &c. WILLIAM BARDSLEY, Kearney, N. J. Filed May 14, 1887. Serial No. 238,206. (No model.)

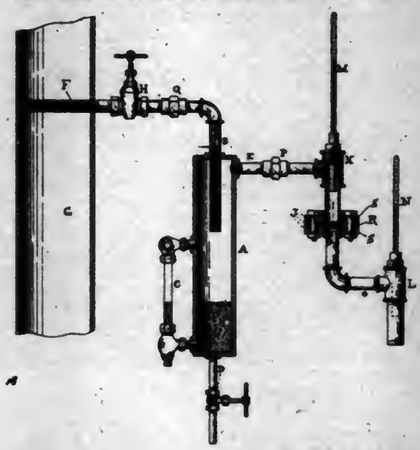
Claim.—1. The table hereinbefore described, consisting of the stand and the top I, the latter being pivotally secured to the upper end of the former and being provided with the loosely-pivoted segmental rack having teeth on its lower and upper edges and passing through the slot M in the stand, combined with the rigid plate N at one end of said slot and below said rack and the swinging dog P at the other end of said slot and above said rack, the teeth on the opposite sides of the segmental rack having their inclined or longer faces parallel with each other, substantially as for the purposes set forth.

2. The table hereinbefore described, consisting of the post B and base C, extending laterally therefrom, combined with the top I, having the rigid cross-bars H, the pivot G, securing the top I to the upper end of the said post and passing through said cross-bars, the loosely-swinging segmental rack K, secured to the under side of the top and having teeth upon its upper and lower edges, said teeth being reversely inclined, the slot M, cut in the post B, the supplemental plate N, secured to the face of said post in position to engage the rack, and the locking-dog P, pivotally secured to the opposite face of said post and adapted to swing freely in either direction transversely to the path of the rack and to engage the upper edge of said segmental rack, substantially as and for the purposes set forth.

401,110.



401,111. STEAM-CALORIMETER. GEORGE H. BARRUS, Reading, Mass. Filed Nov. 30, 1888. Serial No. 292,264. (No model.)



Claim.—1. In a steam-calorimeter, a drip-chamber for the deposit and measurement of most of the entrained water contained in the wet steam tested, combined with a heat-measurer in which the balance of the moisture is measured, in the manner and for the purposes set forth.

2. In a steam-calorimeter, the combination of two thermometer-chambers with their respective thermometers, one subjected to the steam of initial pressure, the other to the escaping steam of atmospheric pressure, the second chamber being open to the atmosphere, and means for wire-drawing the steam interposed between the two thermometer-chambers, in the manner and for the purposes set forth.

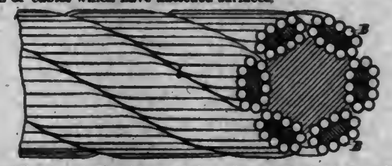
3. In a steam-calorimeter, the combination of two thermometer-chambers with their respective thermometers, one subjected to the steam of initial pressure, the other to the escaping steam of atmospheric pressure, the second chamber being open to the atmosphere, means for wire-drawing the steam interposed between the two thermometer chambers, and an insulating device for intercepting the transfer of heat along the walls of the pipe to the wire-drawn steam, in the manner and for the purposes set forth.

4. In a steam-calorimeter, the combination of means for wire-drawing the steam and a thermometer-chamber (which is open to the atmosphere) with its thermometer for showing the temperature of the escaping steam, in the manner and for the purposes set forth.

5. In a steam-calorimeter, the combination of means for wire-drawing the steam, a thermometer-chamber (which is open to the atmosphere) with its thermometer for showing the temperature of the escaping steam, and an insulating device for intercepting the transfer of heat along the walls of the pipe to the wire-drawn steam, in the manner and for the purposes set forth.

401,112. WIRE CABLE. TELFORD C. BATCHELOR, 8 Barons Court Road, West Kensington, County of Middlesex, and ARTHUR LATCH, Biddick Hall, South Shields, County of Durham, England. Filed Nov. 26, 1888. Serial No. 292,093. (Specimens.) Patented in England Aug. 25, 1888, No. 12,285; in France Sept. 1, 1888, No. 192,723, and in Belgium Sept. 3, 1888, No. 83,110.

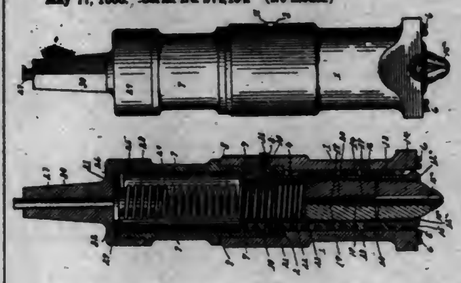
Brief.—The object of the invention is to improve the construction of cables which have flattened surfaces.



Claim.—1. A cable consisting of a series of substantially flattened strands laid together and each strand comprising a single-wire core, A, formed with substantially flat sides, and a series of wires, B, covering the wire core.

2. In wire-cable strands, the combination of an inner wire of shape other than round and of ordinary wires on the outside, which substantially conform to the contour of the inner wire and constitute a strand having one or more substantially flattened sides, substantially as described.

401,113. NAIL-EXTRACTOR. LEOPOLD BAUMEISTER, Bridgeport, Conn., assignor of one-half to David F. Crofut and George H. Crofut. Filed May 17, 1888. Serial No. 274,134. (No model.)



Claim.—1. A nail-extractor consisting, essentially, of a shell, a sliding jaw-carrier within the shell, jaws within the carrier projecting below the same, and provided at their extremities with inwardly-turned edges adapted to undercut the head of the nail, a spring acting to throw said jaws downward, a spring acting to open the jaws when raised, and means for turning the jaw-carrier and jaws backward to cut away the wood from under the head of a nail and for raising them straight outward to draw the nail.

2. In combination, the shell, the sliding jaw-carrier, jaws within the carrier projecting below the same, and provided at their extremities with inwardly-turned edges adapted to undercut the head of the nail, a spring acting to throw the jaws downward, a spring acting to open the jaws when raised, and means whereby the jaw-carrier and jaws may be rotated to cut the wood from under the head of a nail.

3. In combination, the shell, the sliding jaw-carrier, pivoted and oscillating jaws within the carrier, a spring acting to throw the jaws downward, a spring acting to oscillate upon their pivots and to open the jaws when raised, a rotatory barrel having a screw-thread engagement with the jaw-carrier, whereby the jaw-carrier and jaws may be raised to extract a nail, and a spring connecting and adapted to relatively rotate said carrier and barrel.

4. The combination, with the shell and the barrel adapted to rotate independently thereof, of the sliding jaw-carrier provided with projecting cutting ends, jaws pivoted within but separately from said carrier, provided with projecting cutting ends and having longitudinal movement independently thereof, springs 17 and 22, for respectively protruding the jaws and for opening them, and means for rotating and for raising the jaw-carrier and jaws.

5. The combination, with the shell, the barrel rotating independently thereof, the jaws, and the jaw-carrier having slot 20 in one side thereof, of screw-pin 18, engaging the jaws and lying in said slot, springs 17 and 22, and means, substantially as described, for rotating the jaw-carrier and jaws and for raising them straight upward in the shell, as and for the purpose set forth.

6. The combination, with the shell, the barrel rotating independently thereof, and the jaw-carrier having incline 12ª, of the jaws projecting below said carrier, provided at their extremities with inwardly-turned edges adapted to undercut the head of the nail and having inclines 10ª, engaging the incline on the jaw-carrier, spring 22, act-

ing to force said jaws downward, so that they are closed by the inclines, and spring 17, acting to open the jaws when pressed upward.

7. The shell having lug 4, and the jaw-carrier having threads 13 and groove 14, engaging said lug, in combination with the jaws within the carrier projecting below the same, and provided at their extremities with inwardly-turned edges adapted to undercut the head of the nail, springs to hold said jaws downward and to open them when raised, and the barrel having threads 9, engaging the threads upon the jaw-carrier, as and for the purpose set forth.

8. The shell having lugs 4 and 5, and the jaw-carrier having grooves 14 and 15, engaging said lugs, and screw-threads 13, in combination with the jaws, springs 17 and 22, and the barrel having screw-threads engaging the threads upon the jaw-carrier, as and for the purpose set forth.

9. The shell having opening 3 and lug 4, and the jaw-carrier having groove 14, engaging said lug, and screw-threads 13, in combination with the barrel having screw-threads engaging the threads upon the jaw-carrier, spring 24, connecting and adapted to relatively rotate the barrel and jaw-carrier, a groove, 10, and a key engaging opening 3 and groove 10, whereby the barrel and shell are locked together, leaving the barrel free to rotate.

10. The shell having lug 4, and the jaw-carrier having a groove, 14, engaging said lug, screw-threads 13, and incline 12^b, in combination with the jaws projecting below said carrier, provided at their extremities with inwardly-turned edges adapted to undercut the head of the nail, and having inclines 10^b, engaging incline 12^b, spring 22, acting to force the jaws downward, so that they are closed by said inclines, spring 17, acting to open the jaws when raised away from the incline, and the barrel having threads engaging the threads upon the jaw-carrier, whereby the jaw-carrier and jaws are raised together when the barrel is rotated forward.

11. The shell having lugs 4 and 5, the jaw-carrier having grooves 14 and 15, engaging said lugs, screw-threads 13, and inclines 10^b, in combination with the jaws having inclines engaging the jaw-carrier, springs 17 and 22, and the barrel having threads engaging threads upon the jaw-carrier, whereby, when the barrel is rotated in one direction, the shell, jaw-carrier, and jaws are carried with it, and when rotated in the opposite direction the jaw-carrier and jaws are drawn upward into the shell and barrel.

12. The combination, with the shell, jaws, and jaw-carrier having screw-threads 13, of the barrel having threads engaging threads 13, cap 29, spring 22, acting to force the jaws downward in the jaw-carrier, and spring 24, connected to the jaw-carrier and to the cap, whereby, when the barrel is rotated to raise the jaw-carrier, spring 24 is twisted, and when the barrel is released said spring will act to throw the jaw-carrier outward to its normal position.

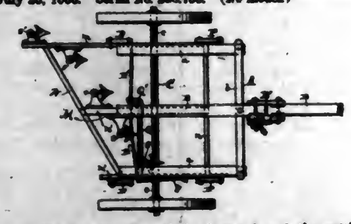
13. The combination, with the shell, the jaw-carrier having threads 13, the barrel having threads engaging threads 13, and the cap, of spring 24, connected to the cap and to the jaw-carrier, whereby, when said barrel is rotated to raise the jaw-carrier, said spring is twisted, and when the barrel is released the spring will act to throw the jaw-carrier downward.

14. The shell, jaw-carrier, barrel, and cap threaded to engage the barrel and having a pin, 32, in combination with plate 26, having a rod projecting upward through the cap and notches engaging said pin, and spring 24, connected to said cap and to the jaw-carrier, whereby, when said rod is pressed inward, the plate is disengaged from the pin and the cap may be turned downward to place without twisting the spring.

15. The combination, with the shell, jaw-carrier, and jaws, of the barrel, cap 29, springs 22 and 24, and pin 21, passing through the jaw-carrier, against which said springs bear, substantially as described.

16. The combination, in a nail-extractor, of the shell 1, the sliding jaw-carrier in the same, the rotatory barrel 7, having a screw engagement with the jaw-carrier, spring 24, connecting and adapted to relatively rotate the barrel and carrier, and the grasping-jaws within the latter, substantially as described.

401,114. CULTIVATOR. BENJAMIN F. BERGER, South Bend, Ind. Filed July 23, 1888. Serial No. 280,753. (No model.)

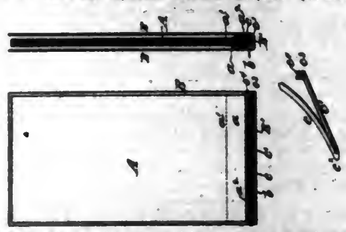


Claim.—1. The combination of the frame A and the cultivator-gang suspended therefrom by links, substantially as described, with a sectional tongue and the lock-hinge joint thereof, composed of plates R H, and J, and bolts *f* and G, all substantially as set forth.

2. The combination, in a cultivator of the character described, of the rectangular carrying-frame A, having tongue-section B, and the tongue-section D, adjustably connected to part B by an adjusting locking-hinge, with the frame M and the cultivator-gang attached to said frame, the chain R', crank-rod Q, lever *g*, and cranked axle C, all substantially as and for the purpose specified.

3. The herein-described locking-hinge joint, consisting of the plate E, the opposite plate, H, having racks I I on its outer face and the spring-plate J, having racks L L, the bolt *f* and bolt G, and hand-nut *g*, all constructed and adapted to operate substantially as described.

401,115. MEMORANDUM-BOOK. MARCELLUS F. BERRY, Brooklyn, N. Y. Filed Jan. 16, 1888. Serial No. 260,823. (No model.)

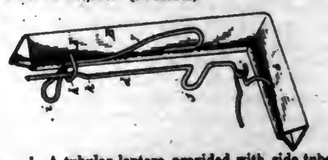


Claim.—1. The combination, with a book-cover and a needle or strip of metal extending parallel with the line of fold of the cover and within the same, of a book having extending lengthwise at the back of the leaves and outside thereof a pocket or loop receiving the needle or strip, whereby the book is detachably secured in its cover, substantially as herein described.

2. The combination, with a book-cover, of a strip of metal folded upon itself and having one member or leg forming a needle, and the other member or leg being permanently secured in the back of the cover and having a catch or fastening for the engagement of the free end of the needle, and a book having at the back and outside of its leaves a pocket or loop receiving the needle, whereby the book is detachably secured in its cover, substantially as herein described.

3. The combination, with a book-cover and a book having at the back of the leaves outside thereof a pocket or loop, as a^3, of the device for securing the book in the cover, consisting of a needle, as *c*, entering said pocket or loop, and a base-piece or stock, as *c'*, from one end of which the needle springs, and having at the opposite end a fastening or catch for the free end of the needle, and a strip of fabric, *b*, attached to the back of the cover, and serving to secure and conceal the base-piece or stock *c'* in the cover, substantially as herein described.

401,116. TUBULAR LANTERN. LEWIS F. BEITH, New York, N. Y., assignor of two-thirds to The R. E. Dietz Company, same place, and the Steam Gauge and Lantern Company, Rochester, N. Y. Filed Aug. 4, 1887. Serial No. 246,108. (No model.)



Claim.—1. A tubular lantern provided with side tubes of triangular cross-section, each arranged with its flat back outwardly and with one edge toward the burner, substantially as set forth.

2. The combination, with the tubular-lantern frame having its side tubes provided with guide-loops *h*, of a lifting globe-frame provided with side wires, *d*, passing through said loops, and having a thumb-piece, *j*, formed on one of said side wires below the guide-loop, through which it passes, substantially as set forth.

3. The combination, with the tubular-lantern frame provided with a guide-loop, *h*, of a lifting globe-frame provided with a side wire, *d*, passing through said loop, and having a thumb-piece, *j*, below said loop, and a spring-catch, I, arranged in said loop, and provided above the latter with a thumb-piece, *i*, substantially as set forth.

401,117. HARVESTER-CUTTER. JOHN A. BLAIR, Philadelphia, Pa. Filed Sept. 8, 1888. Serial No. 284,856. (No model.)

Claim.—1. A cutter-bar with lugs and tongues thereon, knives with recesses, the walls of which embrace the lugs, and a locking bar or cap with slots to engage the tongues, each knife having a flange at its back, and the locking-bar having a series of faces at its back,

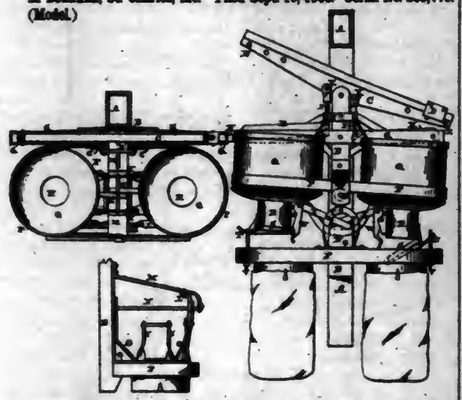


401,117.

said series of flanges and faces being in parallel vertical planes inclined to the edges of the cutter-bar, said parts being combined substantially as described.

2. A cutter-bar in combination with knives, and a locking-bar for said knives, each knife having a vertical flange, and the said locking-bar having on its back a series of faces, said flanges and faces being parallel with each other and inclined to the edges of the cutter-bar, substantially as described.

401,118. AUTOMATIC GRAIN-WEIGHING MACHINE. HENRY H. BOSSERT, St. Charles, Mo. Filed Sept. 19, 1888. Serial No. 285,770. (Model.)



Claim.—1. In an automatic weighing-machine, the combination of a suitable supporting-frame, a frame pivoted at its center to the supporting-frame, hoppers secured to its ends, a scale-beam pivoted at its center, connecting-rods which connect the frame and the beam upon opposite sides of their centers, and a rolling or sliding weight placed upon the scale-beam, whereby, when the beam is tilted by the weight of the grain in one of the hoppers, the weight will slide to that end of the beam, and vice versa when tilted by the grain in the opposite hopper, substantially as described.

2. The combination of the supporting-frame, the pivoted frame having a hopper at each end, a scale-beam pivoted at its center, a rolling or sliding weight placed thereon, two levers pivoted to the supporting-frame at their outer ends, and their inner ends to the scale-beam at opposite sides of its center, and the pivoted frame connected to the centers of the levers at opposite sides of its center, all combined to operate in the manner substantially as set forth.

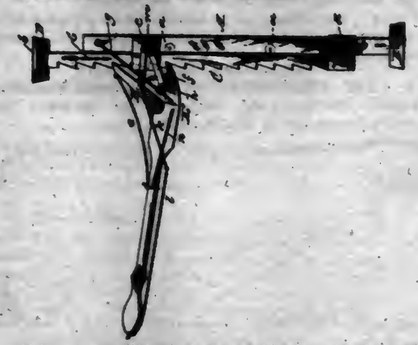
3. The combination of the supporting-frame, the pivoted frame provided with hoppers at each end, the levers pivoted at their outer ends to the supporting-frame, connecting-rods which connect the pivoted frame at opposite sides of its center to the levers, connecting-rods which connect the inner ends of the levers with the scale-beam upon opposite sides of its center, the scale-beam pivoted at its center above the pivoted frame, and the sliding weight, the beam being provided with a device for limiting the movement of the weight, for the purpose specified.

4. The combination of the supporting-frame, a frame pivoted at its center to the supporting-frame, hoppers secured to opposite ends of the pivoted frame, a pivoted scale-beam connected therewith, a weight placed thereon, doors pivoted to the outer edges of the lower ends of the hoppers, outwardly-extending arms secured to the doors, the horizontal base secured to the supporting-frame, and upwardly-extending connections secured to the base and engaging the outer ends of the arms that are secured to the doors, all combined to operate in the manner substantially as described.

5. The combination of the scale-beam, a weight placed thereon, the pivoted frame connected to the beam, the hoppers having an opening in their bottoms, the doors hinged thereto and having an arm connected to the base, vertical latches pivoted to the lower ends of the hoppers, levers pivoted at their outer ends to the upper ends of the latches and at their inner ends pivoted upon the base, whereby, when the beam is raised, the doors are closed and the latches made to engage therewith and lock them in a closed position, and which, when the beam is lowered by the weight of the grain, allow the doors to open, substantially as described.

6. The combination of the scale-beam having a weight, the pivoted frame having an arm extending downward below its pivotal point, the base, a vertical lever pivoted to the base at its lower end, and a bifurcated rod pivoted at its outer end to the upper end of the lever, the bifurcated ends of the rod engaging a wheel of the register, and the register, whereby, when the frame is tilted, the register is operated, substantially as shown.

401,119. LIFTING-JACK. JAMES A. BOUK, Nevada, Mo. Filed Dec. 22, 1888. Serial No. 294,944. (No model.)



Claim.—1. In a lifting-jack, the combination, with the standard A, having guide-yoke *c* and pivoted support B, of the toothed rack-bar C, having guide-yoke *d* and pivoted support D, and the lever E for operating the rack-bar C, substantially as and for the purpose set forth.

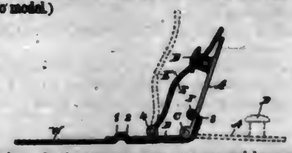
2. The standard A, rack-bar C, and lever E, with pawl F, in combination with the pivoted arms *h i*, rods *g k*, and the cords or chains *e l*, substantially as and for the purpose described.

401,120. MANUFACTURE OF INCANDESCENT-LAMP FILAMENTS. THEREE D. BOTTOME, Newark, N. J., assignor to John B. Tibbits, Hoosick, N. Y. Filed Sept. 30, 1887. Serial No. 251,057. (No specimens.)

Claim.—1. The process of manufacturing filaments, consisting in saturating a carbon filament with a tungsten compound and reducing such compound to metal tungsten, substantially as herein described.

2. An incandescent filament composed of metallic tungsten and carbon in varying proportions, for the purpose as herein described.

401,121. GARMENT-SUPPORTER. PETER J. BOYLE, Boston, and GEORGE H. GATES, Athol, Mass. Filed Oct. 27, 1888. Serial No. 289,333. (No model.)



Claim.—1. A garment-supporter comprising a pair of metal plates hinged together, a headed stud upon the lower plate, and a loop hinged at one end to the other plate to engage the stud, said loop provided with an enlarged opening for the passage of the head of the stud, having its lower end contracted and of less breadth than the head of the stud, for the purpose set forth.

2. A garment-supporter comprising a pair of plates hinged together, a stud and a loop on the plates to grasp the garment to be held, and an elastic webbing secured to and stretched between the plates, substantially as described.

3. A garment-supporter comprising a pair of plates hinged together, a headed stud on one plate, a loop hinged to the other plate, having an enlarged opening to receive the head of the stud, the lower end of said opening being of less breadth than the head of the stud, and an elastic webbing secured to both plates to yieldingly hold the stud in the contracted end of the loop, for the purpose set forth.

4. A garment-supporter comprising an elastic webbing to support the same, a pair of plates hinged together and each provided with one or more transverse slots, the webbing passing through and confined in the slot of the upper plate and along the under sides of the plates to the slot in the lower plate, through which its looped end extends, a pin or the like inserted in said looped end on the outer side of the plate, whereby the webbing is secured in the slot, and a stud on the lower plate and a loop to engage the stud hinged to the upper plate, substantially as described.

5. In a garment-supporter, a plate having a transverse slot, in combination with an elastic webbing secured to the plate, the end por-

tion of the webbing being doubled and passed through the slot, with the extremity of the webbing between the body of the same and the plate, and a length of wire shorter than the width of webbing located in the loop on the outer side of the plate, the combined diameter of the wire and thickness of the two lengths of webbing being greater than the width of the slot, whereby the webbing is removably and securely fastened to the plate in the manner substantially as described.

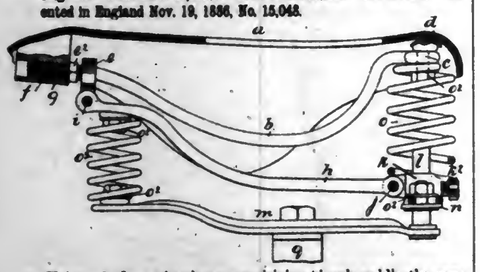
401,122. WHITEWASH. DAVIS BRIBOLARI, Madisonville, Tex.

Filed Jan. 3, 1889. Serial No. 295,310. (No specimens.)

Claim.—A whitewash-paint composed of the cactus-plant, lime, eggs, and water thoroughly intermingled and in about the quantities substantially as described.

401,123. VELOCIPEDE-SADDLE. JOHN B. BROOKS, Birmingham, England.

Filed Dec. 20, 1887. Serial No. 258,510. (No model.) Patented in England Nov. 19, 1886, No. 15,048.



Claim.—1. In a tricycle or rear-driving bicycle saddle, the combination, with the seat of a saddle, of three coiled springs, *o o*^{3}, and two curved framing or extension bars, *b*, which latter proceed from front to rear of the under side of the seat of a saddle, with their back ends separated and connected to the under side of the saddle-seat by hanging pins, while their fore parts, which are screwed for tensioning, pass through and take within brackets *e g*, respectively, secured on the front under side of the saddle-seat, substantially as described and set forth.

2. The combination, with the seat of a tricycle or rear-driving bicycle-saddle and base-plate *m*, of an adjustable bracket, *k*, fixed pillar *l*, and bracket-affixing screw *k*^{2}, for the purpose substantially as set forth.

3. The combination, with a bicycle-saddle, *a*, extension-bars *b b*, bracket-plate *n*, and clip *l*, of two rear-disposed coiled springs, *o*, substantially as set forth.

4. The combination, with the back supporting-springs of velocipede-saddles, of an adjustable bracket-plate, *n*, working upon a pillar or upright, *l*, substantially as set forth.

5. The combination, with an adjustable bracket, *k*, with fixed peg *l*, of a bracket-plate, *n*, substantially as set forth.

6. The combination, with the seat of a saddle, *a*, extension-bars *b*, coiled springs *o*, and base-plate *m*, with adjusting means *k l*, of a stay, *h*, jointedly connected at its ends to brackets *k* and *e*, respectively, as set forth.

401,124. BRUSH-CYLINDER FOR COTTON-GINS. ISRAEL F BROWN, New London, Conn.

Filed June 7, 1888. Serial No. 276,306. (No model.)



Claim.—1. The combination, with a bristle-holder for cotton-gins, consisting of a long piece of wood having a flange or lip, B, made integral with it and extending outward from one of its outer edges, of bristles arranged to lie directly against such flange or lip from their inner ends to a point near their outer ends and normally supported and stiffened by it, substantially as set forth.

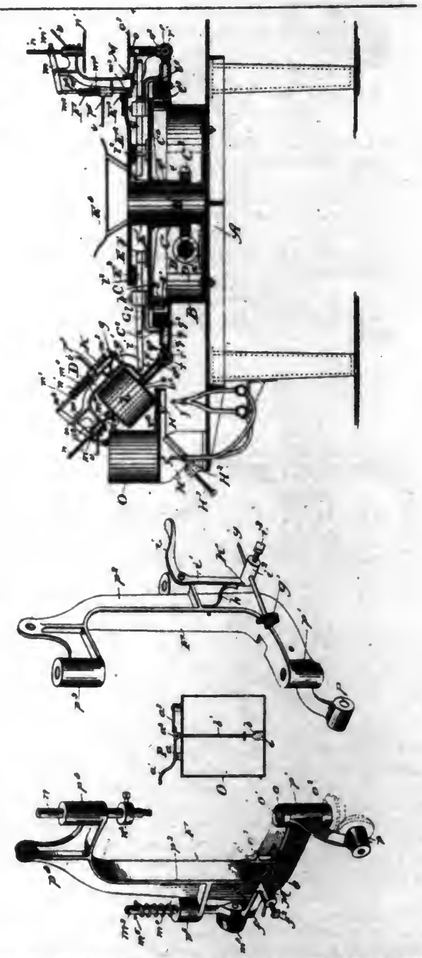
2. The combination, with a bristle-holder for cotton-gins, consisting of a long strip of wood having a flange or lip, B, made integral with it extending outward from one of its outer edges and having its inner edge beveled and laterally grooved, of bristles located in the lateral grooves in the flange or lip of the holder and supported from their inner ends to a point near their outer ends, substantially as set forth.

401,125. CAN-SOLDERING MACHINE. KATIE BROWN, Chicago, Ill., administratrix of James Brown, deceased, assignor to the said Katie Brown, (in her personal capacity.)

Filed Nov. 27, 1888. Serial No. 291,946. (No model.)

Claim.—1. In a can-soldering machine, the combination, with a stationary support, of an annular rack, *t*^{4}, cam E^3, and rotatory support C upon the stationary support, pivotal can-carriers F upon the rotatory

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support, having revoluble supports *o*^{3} for the cans and pinions *q*^{3}, connected with the supports *o*^{3} and in mesh with the rack *t*^{4}, sustaining-rods G, pivotally secured toward one end to the carriers and toward the opposite end permanently engaging the cam E^3, means, substantially as described, for revolving the support C, whereby the cam E^3 shall cause the rods G to reciprocate and thereby oscillate the can-carriers, and the rack *t*^{4} shall cause the pinions *q*^{3} to rotate and thereby revolve the supports *o*^{3}, clamps upon the frames F, operating to hold the cans upon the supports *o*^{3}, and a solder-trough, H, in the path of the carriers F, near the limit of their outward oscillation, substantially as and for the purpose set forth.

2. In a can-soldering machine, the combination, with a stationary support, of an annular rack, *t*^{4}, cam E^3, and rotatory support C upon the stationary support, brackets *c*^{3} upon the support C, carrying rotatory shafts *q*', each having toward one end a pinion, *q*^{3}, in mesh with the rack *t*^{4}, and toward its opposite end a miter gear-wheel, *q*^{2}, and rotatory shafts *r*, having miter gear-wheels *r*', in mesh with the wheels *q*^{2}, can-carriers F, pivotally supported on the shafts *r* and provided with sleeves *p*', containing rotatory shafts, each carrying toward one end a miter gear-wheel, *o*^{2}, in mesh with the wheel *r*', and at its opposite end a can-support, *o*^{3}, sustaining-rods G, pivotally secured toward one end to the carrier-frame and toward the opposite end permanently engaging the cam E^3, means, substantially as described, for revolving the support C, whereby the cam E^3 shall cause the rods G to reciprocate and thereby oscillate the can-carriers, and the rack *t*^{4} shall cause the support *o*^{3} to rotate, clamps upon the carriers F, operating to hold the cans upon the supports *o*^{3}, and a solder-trough, H, in the path of the carriers F, near the limit of their outward oscillation, substantially as and for the purpose set forth.

3. In a can-soldering machine, the combination, with a stationary support, rotatory support, can-carriers, and solder-trough, of a solder-reservoir having a normally-closed discharge valve automatically

opened at intervals by the revolving parts of the machine, substantially as described.

4. In a can-soldering machine, the combination, with a stationary support, rotatory support, can-carriers, and solder-trough, of a gage, I, substantially as and for the purpose set forth.

5. In a can-soldering machine, the combination, with a stationary support, of a rotatory support, C, pivotal can-carriers F upon the support C, provided with revoluble supports *o*^{3} for the cans, means, substantially as described, for rotating the support C, a rack, *t*^{4}, and cam E^3 on the stationary support, reciprocal sustaining-rods G upon the rotatory support, pivotally secured toward one end to the can-carriers and toward the other end engaging with the cam E^3, pinions *q*^{3} upon the support C, connected with the supports *o*^{3} and in mesh with the rack *t*^{4}, whereby when the support C is rotated the carriers F are caused to oscillate and the supports *o*^{3} to revolve, a solder-trough in the path of the carriers F near the limit of their outward oscillation, and a horizontal curved perforated pipe, L, communicating with an air-supply and adjacent to the path of the carriers F, near the limit of their inward oscillation, substantially as and for the purpose set forth.

6. In a can-soldering machine, the combination, with a stationary support, solder-trough, and rotatory support, of can-carriers F, each provided with a wiper, *g*', substantially as and for the purpose set forth.

7. In a can-soldering machine in which the cans to be soldered are carried by a revolving support, *o*^{3}, on an oscillatory frame, F, whereby they are revolved and oscillated into and out of a solder bath, the combination, with the frame F, of reciprocating wiping mechanism K upon said frame, substantially as and for the purpose set forth.

8. In a can-soldering machine, the combination, with a stationary support, rotatory support C upon the stationary support, oscillatory can-carriers F upon the support C, provided with revoluble supports *o*^{3} for the cans, and clamps operating to hold the cans on the supports *o*^{3} to revolve with the latter, and the mechanism for actuating the support C, carriers F, and supports *o*^{3}, of wiping mechanism K, secured upon each can-carrier, having a projecting part, *i*, and a part, *i*', supporting a wiper, *g*', and a cam, E^4, upon the stationary support, in the path of the projecting part *i*, whereby, when the support C is rotated, the engagement of the projecting part *i* with the cam E^4 advances the wiper *g*', substantially as and for the purpose set forth.

9. In a can-soldering machine, the combination, with a stationary support, solder-trough, and rotatory support C, of can-carriers F upon the support C, each comprising a frame provided with a sleeve, *p*^{3}, and a support, *p*', a revoluble holder, *o*^{3}, on the support *p*', a holder, *n*', upon a rod, *n*, extending through the sleeve *p*^{3}, a lever, *m*, fulcrumed upon the frame and pivotally secured toward one end to the rod *n* and toward its opposite end to a rod, *m*^{3}, carrying a projection, *m*^{2}, a cam, E^2, upon the stationary support in the path of the projection *m*^{2}, spring mechanism tending to force the holder *n*' downward, and loosening mechanism M, fulcrumed upon the can-carrier frame and extending toward one end underneath the rod *m*^{3} and at its opposite end toward the holder *o*^{3}, whereby, when the support C is rotated, the engagement of the projections *m*^{2} with the cam E^2 forces each projection *m*^{2}, rod *m*^{3}, and adjacent end of the loosening mechanism M down and raises the opposite end of the loosening mechanism and raises the holder *n*' against the resistance of the spring, the resilience of which latter forces the holder *n*' down when the projection *m*^{2} is freed from engagement with the cam E^2, substantially as and for the purpose set forth.

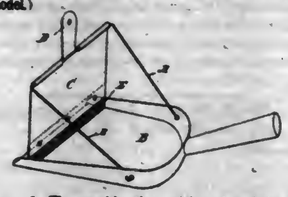
10. In a can-soldering machine, the combination, with a stationary support, solder-trough, and rotatory support C, of can-carriers F and one or more projections, *v*, upon the support C, and a solder-reservoir, O, having a discharge-valve, *b*, normally closed and connected with an arm, *a*^{2}, of a pivotal lever, an arm, *a*', of which latter extends into the path of the projection *v*, whereby, as the support C rotates, the engagement of the projections *v* with the arm *a*' temporarily opens the valve *b*, substantially as and for the purpose set forth.

11. In a can-soldering machine, the combination, with a stationary support, solder-trough, and rotatory support C, of can-carriers F upon the support C, having one or more projections, *v*, and a solder-reservoir, O, having a discharge-valve, *b*, rod *b*', connected with the valve *b* and projecting above the solder-reservoir, a pivotal lever, P, having an arm, *a*^{4}, pivotally connected with the rod *b*', and an arm, *a*', extending into the path of the projection *v*, and spring mechanism retaining the valve *b* normally closed, whereby, as the support C rotates, the engagement of the projections *v* with the arm *a*' temporarily opens the valves *b*, substantially as and for the purpose set forth.

12. In a can-soldering machine, the combination, with a stationary support, solder-trough, rotatory support, and pivotal can-carriers F, of a cam, E^2, on the stationary support and reciprocal sustaining-rods G upon the rotatory support, pivotally secured toward one end to the can-carriers and provided with projections P, engaging with the cam E^2, whereby, when the support C rotates, the cam E^2 causes the rods G to reciprocate and thereby to oscillate the can-carriers, substantially as and for the purpose set forth.

401,126. COMBINED SINK SHOVEL AND CLEANER. PHILIP C. BROWN, Brooklyn, N. Y.

Filed May 18, 1888. Serial No. 274,337. (No model.)

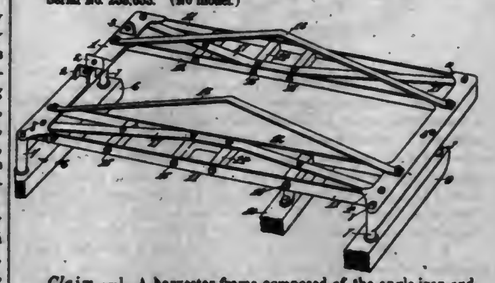


Claim.—1. The combination, with a shovel, (or scoop,) of arms hinged to the rear part of the flange thereof and allowed a vertical swinging movement, and a cleaner pivoted on the outer ends of said arms above the shovel and adapted to swing thereon, substantially as described.

2. The combination, with a shovel, (or scoop,) of arms, as A, hinged to the rear sides of the shovel and united at their outer ends, a cleaner, as C, pivoted to the connecting-piece of said arms, and a thumb-piece, as D, and scraper, as E, secured on the upper and lower edges, respectively, of said cleaner, substantially as described.

401,127. HARVESTER-FRAME. ROBERT BROWN, Miamisburg, Ohio, assignor to Hoover & Gamble, same place.

Filed Apr. 4, 1887. Serial No. 233,633. (No model.)



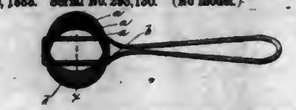
Claim.—1. A harvester-frame composed of the angle-iron end plates, 1 and 5, having their horizontal flanges turned inward, the compound side rails consisting of parallel members braced and united by sleeves 14 and bolts 15, the ends of said side rails underlying the horizontal and abutting against the vertical flanges of the end rails, the arched braces 16, and the lateral braces 17, substantially as described.

2. The combination, with a harvester-frame having gear-segments 19 centrally mounted thereon, of pinions on the axle meshing with said segments, an arm, 22, having a hook embracing the lower side of a sleeve surrounding the axle, said arm having a projection, 23, connected by a rod, 24, to the frame, a crank-shaft having bearing in the arm 32, and a spring-actuated sleeve, 43, on the end of the arm 32, extending from said arm 22, a miter-gear, 33, carried by said crank-shaft, a miter-gear, 34, rigid with a pinion, 36, both journaled on the arm 22, with the gear 36 meshing with the crest of a gear, 37, on the axle, and the gear 34, meshing with miter-gear 33, the spring-actuated locking-sleeve 43 being provided with a bayonet-slot with which a pin on the crank-shaft engages, substantially as described.

3. The combination, with the crank-arm 32, having lug 44, of the shaft 28, the lock-sleeve 43, having bayonet-slot 46 and notches engaging with lugs 44, the stop-pin 47 on shaft 28, and the spring 45, substantially as described.

401,128. SEEDER. JOSEPH W. CALEF, North Easton, assignor, by mesne assignments, to Allen G. Lovell, trustee, Boston, Mass.

Filed Dec. 10, 1888. Serial No. 293,130. (No model.)

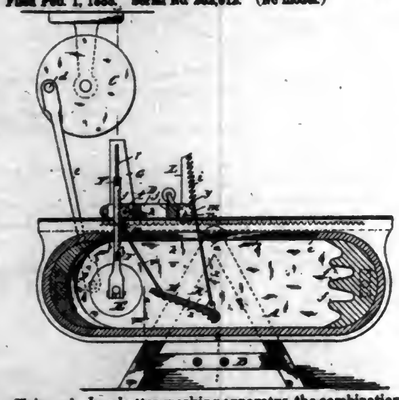


Claim.—1. A raisin-seeder composed of a handle or holder and a series of elastic ribs secured to said holder and adapted to yield laterally, said ribs being separated by spaces which permit the ribs to separate, but are of less width than the thickness of a raisin-seed, whereby the ribs are adapted to first yield or open and permit the passage of a seed between them and to then close and prevent the withdrawal of the seed, as set forth.

2. A raisin-seeder composed of a spirally bent or coiled wire and a handle or holder secured to said wire and formed to inclose portions of the coils, the remaining portions projecting from said holder and constituting elastic convex ribs, which are separated by spaces narrower than the thickness of a raisin-seed, as set forth.

3. In a raisin-seeder, the combination of the spiral wire, the handle formed to receive said wire, and the curved plate *d*, secured to said handle and covering portions of the coils of the wire, the remaining portions of said coils projecting from the plate *d* and constituting elastic convex ribs, as set forth.

401,129. BUTTER-WORKER. HENRY I. CARVER, Ludlow, Mass. Filed Feb. 1, 1888. Serial No. 262,612. (No model.)



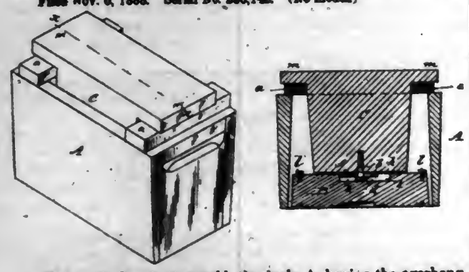
Claim.—1. In a butter-working apparatus, the combination, with a receptacle or body, A, provided with intermediately-disposed trunnions *a a*, by which it is hung in bearings of a suitable support, and provided at its opposite inner ends with the horizontally and vertically arranged series of ribs *f f* and *g g*, of a revolving crank-pin, *d*, carried by a suitably-arranged shaft, and a connecting-rod extending between and secured to said crank-pin and one end portion of said receptacle-body, substantially as and for the purpose described.

2. The combination, with a body or receptacle provided with a longitudinally-arranged rack-bar, of a horizontal sliding frame, D, having mounted therein a pinion meshing with said rack, the vertical frame F, vertically movable and guided on and supported by said sliding frame, and a horizontal roller, E, carried by said vertical frame, substantially as and for the purpose described.

3. The combination, with a body or receptacle provided with a longitudinally-arranged rack-bar, of a sliding frame, D, having mounted thereon a pinion, *m*, meshing with said rack-bar and provided with a pinion, *t*, the vertical frame F, supported and guided in said sliding frame D, provided with the rack-teeth *s*, and a horizontal roller, E, carried by said vertical frame F, substantially as and for the purpose described.

4. The combination, with a body or receptacle provided with a longitudinally-arranged rack-bar, of a sliding frame, D, provided with the hooked standard L, and having mounted thereon a pinion, *m*, meshing with said rack-bar, and a frame, K, comprising the transversely ribbed or serrated board H, the supporting-arms *v v*, pivoted to said sliding frame, and the bail *x*, adapted to engage the hooks *i* of said standards, substantially as and for the purpose described.

401,130. BUTTER-MOLD. HENRY I. CARVER, Ludlow, Mass. Filed Nov. 6, 1888. Serial No. 290,142. (No model.)



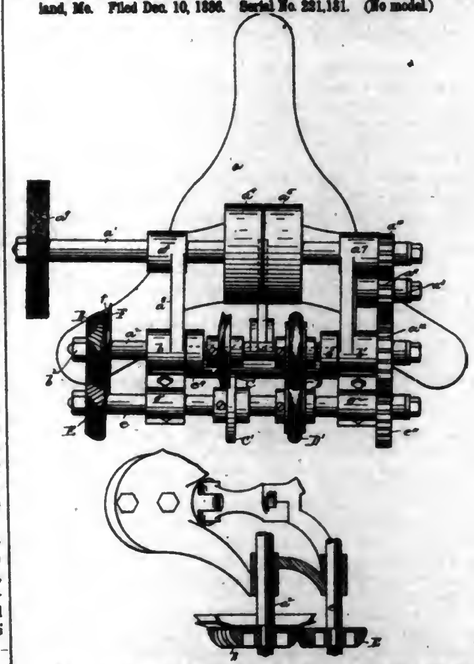
Claim.—1. In a butter-mold, the body A, having the overhanging cleats *a a*, combined with the print-block B and the forcing-block C, swiveled the one to the other, said forcing-block having at its inner end a length greater than the width of the mold-chamber, substantially as and for the purpose described.

2. In a butter-mold, the body having the overhanging cleats *a a*, combined with the print-block B, having the adjustable stops *l* at its top end portions in the lines of said overhanging cleats, and the forcing-block C, provided with the screw-pin *b*, perpendicularly adjustable on the inner end of said forcing-block and having a swiveling engagement with the said print-block, substantially as and for the purpose described.

3. In a butter-mold, the body having the overhanging cleats *a a* and the print-block having the channel and bifurcated metal plate lying over and having its legs terminating at a short distance from one end of said channel, combined with the forcing-block having the headed stud on its under side and capable of a detachable engagement with the said print-block, all substantially as shown, and for the purpose described.

4. In a butter-mold, the body A, having the overhanging cleats *a a*, combined with the print-block B, having the adjustable stops *l*, and provided with the channel and bifurcated metal plate lying over and having its legs terminating at a short distance from one end of said channel, the forcing-block C, having at its inner end a length greater than the width of the mold-chamber and having the headed and perpendicularly-adjustable screw-pin and capable of a detachable engagement with the said print-block, all substantially as shown and described.

401,131. HEEL-BURNISHING MACHINE. JAMES W. CARVER, Lynn, Mass., assignor to the National Heeling Machine Company, Portland, Me. Filed Dec. 10, 1886. Serial No. 221,131. (No model.)



Claim.—1. In a burnishing-machine, the combination, with the shafts a^9 and *e* and their connecting-gears a^{10} a^{11}, of the burnishing-roll B, secured to the said shaft a^9 and provided with the rest F, and the burnishing-roll E, secured to the said shaft *e*, and being below and in advance of the said burnishing-roll B, and thereby adapted to serve as a roll-rest as well as a burnisher, substantially as set forth.

2. The combination, in a burnishing-machine, of the burnishing-roll B, having ribs or projections *f'* extending diagonally across the same in one direction, and the rest-roll E, having the ribs or projections f^5 extending across the same in a direction opposite to that of the ribs or projections *f'* of the roll B, substantially as described.

3. In a burnishing-machine, the combination, with the rotary burnishing-roll B, having a burnishing-surface shaped transversely to approximate the shape of the surface of a trimmed heel, of the rotary burnishing-roll E, adapted to serve as a roll-rest, and having a transverse burnishing-surface struck upon a smaller arc than that of the transverse surface of the roll B, substantially as set forth.

4. In a burnishing-machine, the combination, with the shaft a^9, having the burnishing-roll B and the beading-roll C, of the shaft *e*, having the burnishing rest-roll E and the rotary rest C', to co-operate with the said beading-roll, substantially as set forth.

5. In a burnishing-machine, the combination, with the shaft a^9, having the burnishing-roll B and the wax-roll D, of the shaft *e*, having the burnishing rest-roll E and the rotary heel-rest D', to co-operate with the said wax-roll D, substantially as set forth.

6. In a burnishing-machine, the combination, with the shaft a^9, having the burnishing-roll B, and provided also with a wax-holding device, consisting of the sleeve or hub d^2 d^4, having the flange or collar d', the flange or collar d^3, and nut d^2, of the shaft *e*, having the burnishing rest-roll E and the roll-rest D', substantially as set forth.

7. In a burnishing-machine, the combination, with the shaft a^9, having the burnishing-roll B, and provided also with a wax-holding device, consisting of two collars, d^7 d^8, one of which is adjustable or movable relative to the other, and both of which are provided with inwardly-extending pins or projections d^6, of the shaft *e*, having the burnishing rest-roll E and the roll-rest D', to co-operate with the wax-roll, substantially as set forth.

8. In a burnishing-machine, the combination, with the shaft a^9 and the burnishing-roll B, carried thereby, of the shaft *e*, having the burnishing rest-roll E, and the adjustable hanger e^3, in which the said shaft *e* is journaled, substantially as set forth.

9. The combination of the head *a*, supporting the shaft a^9, the burnisher-roll B, carried thereby, the hanger e^3, suspended from the shaft a^9, the shaft *e*, carried thereby, the slotted link e^4, and the clamping-nut e^{13}, substantially as described.

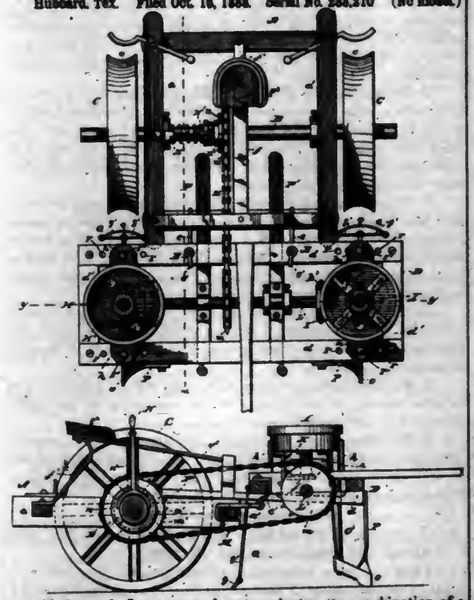
10. In a burnishing-machine, the combination, with the shaft a^9, provided with the burnishing-roll B and the beading-roll C, of the shaft *e*, provided with the burnishing-roll E and roll-rest C', and the adjustable hanger e^3, in which the said shaft *e* is journaled, substantially as set forth.

11. In a burnishing-machine, the combination, with the shaft a^9, provided with the burnishing-roll B and the wax-roll D, of the shaft *e*, having the burnishing-roll E and the rest D', and the adjustable hanger e^3, in which the said shaft *e* is journaled, substantially as set forth.

12. The combination, in a burnishing-machine, of the head *a*, the pulley-shaft *a'*, having the gear a^{10}, the shaft a^9, connected with the gear a^{10} by the intermediate gear, a^{11}, and supporting the burnishing-wheel B, the beading-roll C, and waxing-roll D, with the shaft *e*, connected with the gear-wheel a^{12} by the gear e^{11}, and the rests E C' D', carried thereby, substantially as and for the purposes described.

13. The combination, in a burnishing-machine, of the shaft *a'*, supporting the brush a^8, the shafts a^9 *e*, arranged to run at a slower rate of speed than the shaft *a'*, and supporting, respectively, the burnishing-roll B and rest-roll E, with said burnishing-roll and rest-roll, substantially as described.

401,132. CORN AND COTTON PLANTER. THOMAS J. CATHEY, Hubbard, Tex. Filed Oct. 16, 1888. Serial No. 288,210. (No model.)



Claim.—1. In a corn and cotton planter, the combination of a main carrying-frame in which the axle is journaled, an adjustable frame hinged thereto and carrying two hoppers or receptacles, levers for elevating the adjustable frame, a rotary disk located in one of said hoppers, a rotary sweep located in the other hopper, vertical shafts to which said sweep and disk are secured, an endwise-movable shaft common to both of said vertical shafts and adapted to be geared at will with either of the same, and a sprocket-chain passing over sprocket-wheels fixed on the axle and the shaft for rotating the latter, substantially as described.

2. In a corn and cotton planter, the combination of the two hoppers, one having a rotary planting-disk and the other a rotary sweep, the depending straps secured to the hoppers and each having a step or bearing, the vertical shafts stepped in said bearings and having the disk and sweep secured thereto, and the shaft adapted to be geared with either of said vertical shafts, substantially as described.

3. In a corn and cotton planter, the combination of a main carrying-frame having the axle journaled therein, an adjustable frame jointed thereto, the two hoppers each mounted on standards which are bolted to said adjustable frame to detachably secure said hoppers to the adjustable frame and adapt them to be adjusted laterally thereon, the depending straps secured to said hoppers, the vertical shafts mounted in the straps and hoppers and one having a rotary planting-disk and the other a rotary sweep, a shaft having bevel gear-wheels keyed thereto and adapted to mesh with similar wheels on the vertical shafts, the seed-tubes secured to the hoppers and having braces bolted to the adjustable frames, the drags suspended from said adjustable frame, and mechanism intermediate of the axle and the shaft for rotating the latter, substantially as described.

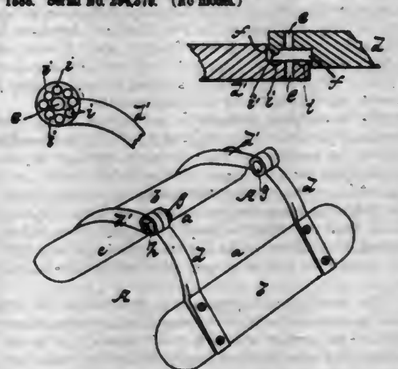
401,133. GUARD FOR BARBED-WIRE FENCES. MERRITT R. CHAPPELL, Battle Creek, Iowa. Filed July 3, 1888. Serial No. 278,367 (No model.)



Claim.—1. A guard T-shaped in transverse section and adapted to be suspended from the fence-wire, substantially as described.

2. The guard comprising the slat B, the slat C, secured to the lower edge thereof and projecting beyond opposite sides of the same, and the link pivotally connected to the guard and adapted to be engaged with the fence-wire, substantially as described.

401,134. HARNESS-SADDLE. JOHN W. CLARK, Jackson, Miss., assignor of one-half to Lynn H. Kirkland, same place. Filed Dec. 22, 1888. Serial No. 294,379. (No model.)

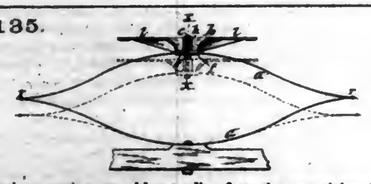


Claim.—In a harness-saddle, the arms *a a'*, provided with the pads *b b'* and central perforations, *c c*, and depressions *i* on the inner face thereof, the arms *d d*, having a corresponding central opening and provided with the pin adapted to engage one of the depressions, whereby the twin sections are held in position, and the bolt *g* and nut *h*, for securing the meeting ends of the arms together, as shown and described.

401,135. VEHICLE-SPRING. EDWARD CLUTT, Nyack, N. Y. Filed Dec. 3, 1888. Serial No. 292,994. (No model.)

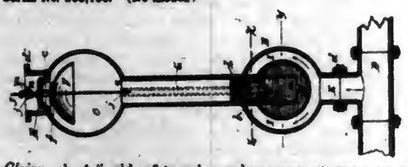
Claim.—The combination of the graduated elliptic spring, consisting of the leaves *a a*, having their end portions curved reverse from the central portion and lying contiguous to each other and rigidly united thereat, and the saddle *b*, formed with the spring-bearing *c*, longitudinal flanges *f f* on said bearing, the eye *h* at the center,

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longitudinal supporting-arms *l l*, extending from the central bearing, *c*, and the bolt or rivet *c*, passing through said eye and spring, substantially as described and shown.

401,136. LIQUID SAFETY-VALVE FOR GAS-DISTRIBUTING PIPES. JAMES C. CONROY, Pittsburg, Pa., assignor of one-half to the Union Water Meter Company, Worcester, Mass. Filed Jan. 2, 1889. Serial No. 295,153. (No model.)



Claim.—1. A liquid safety-valve and escapement apparatus comprising the tubular standard provided at its lower end with a chambered bulb having an inlet and gas passages and forming a liquid-containing pocket about the end of the tube, and having at its upper end a chambered bulb or enlargment joining flush with said tube and furnished with an exit-passage, and provided with attaching flanges or bosses at the inlet and exit for connecting said apparatus with a main and a discharge pipe, substantially as and for the purpose set forth.

2. The combination, with the tubular standard provided with the lower chambered bulb having inlet and gas passages arranged to form a pocket for liquid for sealing the end of the tube, and the upper chambered bulb having an exit-passage, of the shield disposed within said upper chamber above the tube, substantially as and for the purpose set forth.

3. The combination, substantially as described, of the tubular standard provided with upper and lower chambered bulbs, gas inlet and exit passages, and liquid seal for the lower end of said tube, a gage-glass for denoting the level of liquid within the tube, and the inverted-cup-shaped shield suspended within the upper chamber, for the purposes set forth.

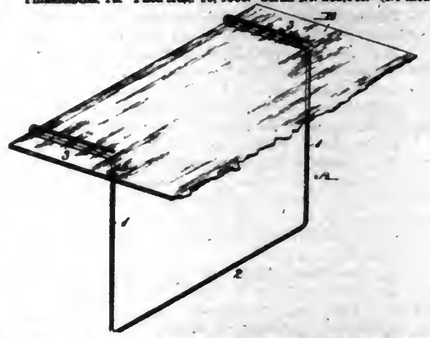
4. The combination, substantially as described, of the tubular standard provided with the lower chambered bulb having inlet and gas passages adapted for containing a liquid to form a seal or liquid-valve at the lower extremity of the tube, the upper chambered bulb provided with the exit or escapement passage, and a movable shield suspended within said upper chamber over the tube and having at its top a disk or surface filled at its top to close or partially close said exit-passage, substantially as and for the purpose set forth.

5. The combination, substantially as described, of the tubular standard provided with a lower chambered bulb or enlargement, having inlet and gas passages and fitted for containing liquid to seal the lower end of the tube, the upper chambered bulb having an exit-passage with a valve-seat about said passage, a movable shield suspended within said upper chamber over the end of the tube and having its top fitted for closing outward to said valve-seat, and an adjusting-stop, *m*, for arresting the upward movement of said shield at a given position in relation to said valve-seat, for the purpose set forth.

6. The combination, substantially as described, of the tubular standard provided with a lower chambered bulb or enlargement having inlet and gas passages and fitted for containing liquid to seal the lower end of the tube, the upper chambered bulb having an exit-passage with a valve-seat about said passage, a puppet-valve closing inward against said seat, a movable shield connected with said valve and suspended within said upper chamber over the end of the tube and fitted for closing outward to said valve-seat, and an adjusting-stop for arresting the upward movement of said puppet-valve and shield at a given position in relation to the seat, for the purpose set forth.

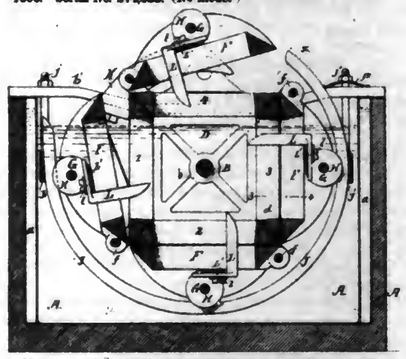
7. The combination, with a gas-distributing pipe or main, of the tubular standard provided with the lower chambered bulb having inlet-passages disposed for maintaining a liquid seal at the lower end of the tube, a chamber at the upper end of said tube, into and from which said sealing-liquid can flow, an escapement or exit opening at the top of said upper chamber, a shield disposed within, between the tube and escapement-opening, and an indicator or gage-gears fixed on the side of said tubular standard, all arranged for operation, substantially as and for the purpose set forth.

401,137. LIGHT-HOLDER FOR HOT-BEDS. WILLIAM DE CAUX, Philadelphia, Pa. Filed Aug. 16, 1888. Serial No. 282,840. (No model.)



Claim.—A glass or light holder consisting of the legs 1, foot 2, and loops 3, said foot being connected with the base of the legs and said loops with the top thereof, substantially as described.

401,138. APPARATUS FOR HARDENING SAW OR OTHER STEEL BLADES. THOMAS S. DIBSTON, Philadelphia, Pa. Filed May 18, 1888. Serial No. 274,322. (No model.)



Claim.—1. The combination of the tank containing hardening-liquid, a drum provided with stationary and movable grids, with cams encircling a portion of the drum and acting to clamp the movable grids to the drum while said grids are in the hardening-liquid, and cams for raising the movable grids when they emerge from the liquid, substantially as described.

2. The combination of the tank, the drum formed of a series of grids with a series of grids pivoted thereto, cams encircling a portion of the drum and acting to close the jaws formed by said grids, and fixed cams with which projections on the pivoted grids engage to open said jaws when they reach a position above the liquid in the tank, all substantially as specified.

3. The combination of the drum and means for rotating the same, said drum having a series of grids forming jaws adapted to be opened and closed automatically, with a cleaning-block and a treadle connected thereto to raise said block, so that a hardened blade may be passed from the grids under the cleaning-block when the jaws release said blade, substantially as and for the purpose set forth.

4. The combination of the tank and a drum carrying a series of jaws with a cam encircling a portion of said drum for closing the jaws, said cam having a yielding support at one or both of its ends, substantially as specified.

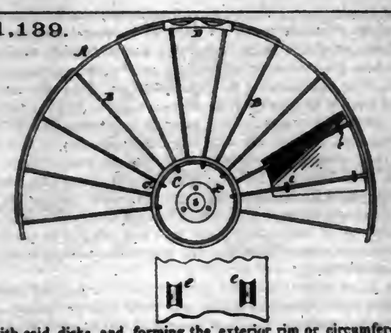
5. The combination of the movable grids with an adjustable stop or stops secured to one of said grids for supporting the saw-blade, substantially as described.

6. The combination of the tank, a drum composed of a series of grids, a series of grids or frames pivoted thereto, with rollers carried by each movable grid, and an annular cam acting upon said rollers to clamp the grids together, substantially as described.

401,139. WIND-WHEEL. WILLIAM BOKER, Newark, N. J. Filed Mar. 30, 1887. Serial No. 233,000. (No model.)

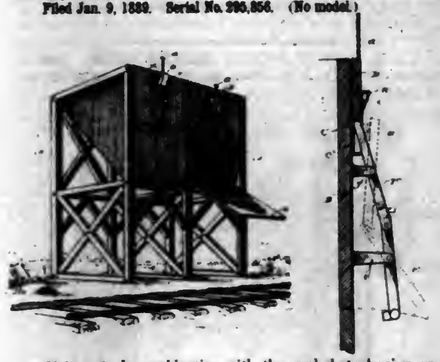
Claim.—1. In a wheel such as described, the combination of disks C, having a series of perforations near their peripheries, spoke-wires inserted through said perforations and bent up and over the peripheries of said disks, and metallic bands or rings, as C', fitting over the ends of the spoke-wires and the peripheries of the disks in line with said disks and forming the exterior rim or circumference thereof when in place, as set forth.

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2. In a wheel such as described, the combination of disks C and spoke-wires B, a screw-shaft on which the disks are mounted, a nut or nuts on the shaft for adjusting one of said disks, and a fixed collar against which the other disk is held, as set forth.

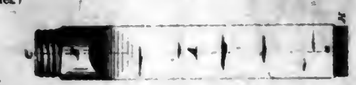
401,140. COAL-CHUTE INDICATOR. JOSEPH ELDER, Peoria, Ill. Filed Jan. 9, 1889. Serial No. 296,856. (No model.)



Claim.—1. In combination with the coal-chute having an outwardly-opening door, an indicator comprising a stationary signal, a gravitating shutter to cover the same, and trip devices, substantially as shown, arranged at one end in the path of the ordinary door and acting at the opposite end to sustain the door.

2. In combination with the coal-chute having the outwardly-opening door, the indicator-frame C, the gravitating shutter D, provided with the incline *d*, and the connected levers E F, arranged the former in position to be acted upon by the opening door and the latter in position to engage the shutter.

401,141. ENVELOPE AND STAMP MOISTENER. ABRAHAM J. ELIAS, Buffalo, N. Y. Filed Jan. 2, 1889. Serial No. 295,147. (No model.)



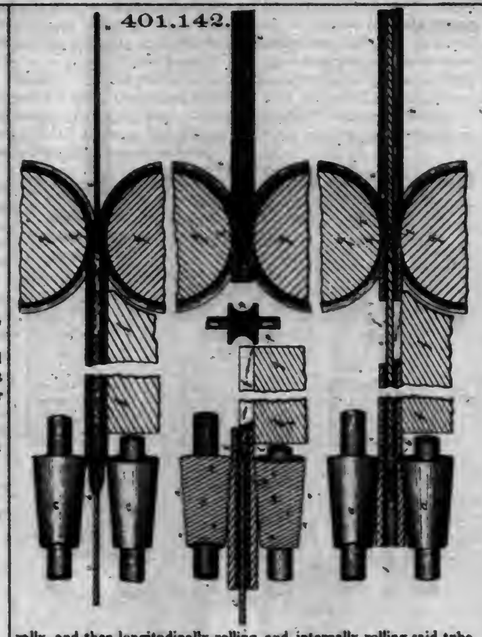
Claim.—As an improved article of manufacture, an envelope and stamp moistener consisting, essentially, of a flat thin tube, A, having on its upper end a circular enlargement, B, provided with a screw-cap, C, said tube having on its lower end an inwardly-projecting neck or stricture, *a*, and being fitted with a flat wick of woven fabric reaching to within a short distance of the circular enlargement, the whole being constructed and combined in the manner as and for the purpose set forth.

401,142. METHOD OF MAKING METAL TUBING. JOHN H. FLAGLER, New York, N. Y. Filed Dec. 17, 1887. Serial No. 258,161. (No model.)

Claim.—1. The method of making tubing which consists in spirally rolling and reducing a hollow ingot or blank to draw out the metal into a tube and arrange the fibers of the same spirally, and then longitudinally rolling said tube over a mandrel to further decrease the thickness of the walls of the same, substantially as and for the purposes set forth.

2. The method herein described of making tubing, which consists in spirally rolling and reducing a hollow ingot or blank to draw out the metal into a tube and arrange the exterior fibers thereof spirally, and then longitudinally rolling and internally rolling said tube to further draw out the metal and to arrange the interior fibers thereof spirally, substantially as and for the purposes set forth.

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3. The method of making tubes which consists in spirally rolling a hollow ingot or blank to draw it out into a tube and arrange the fibers of the same spirally, and then rolling said tube longitudinally over a rotating mandrel to decrease the thickness of walls of said tube and give the desired finish to the same, substantially as and for the purpose set forth.

4. The method of making tubes which consists in spirally rolling a hollow ingot or blank to draw it out into a tube, and then rolling said tube longitudinally over a rotating conical mandrel of larger diameter than that of the interior of said tube to increase the diameter of the same and decrease the thickness of its walls, substantially as and for the purpose set forth.

5. The method of making tubes which consists in spirally rolling a hollow ingot or blank, and thereby drawing it out and forming spiral ribs on the surface thereof, and then rolling said tube longitudinally over a mandrel, and thereby smoothing and elongating said tube, substantially as and for the purpose set forth.

401,143. APPARATUS FOR THE MANUFACTURE OF METAL TUBING. JOHN H. FLAGLER, New York, N. Y. Filed Dec. 17, 1887. Serial No. 258,162. (No model.)

Claim.—1. In apparatus for the manufacture of metal tubing, a set of diagonally-acting converging rolls with an interposed mandrel, in combination with a set of direct-acting concave rolls and an interposed rotating mandrel, said second set being in line with said first set and adapted to receive the blank therefrom, substantially as and for the purposes set forth.

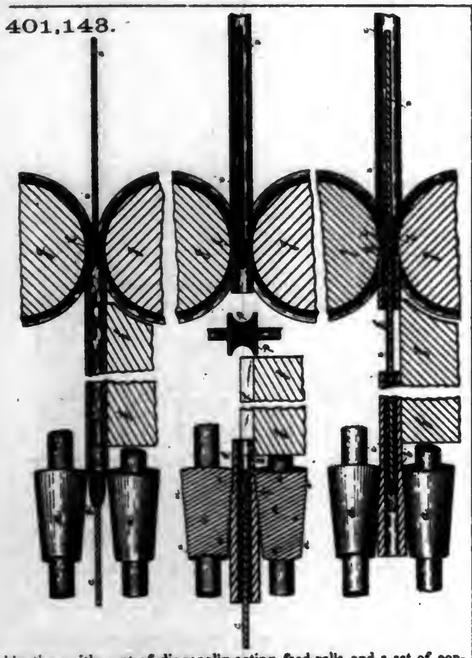
2. In apparatus for the manufacture of metal tubing, the combination, with a set of diagonally-acting spirally-grooved converging rolls having an interposed mandrel, of a set of direct-acting concave rolls having an interposed rotating mandrel, said second set being in line with said first set and adapted to receive the blank therefrom, substantially as and for the purposes set forth.

3. In apparatus for the manufacture of metal tubing, the combination of a set of diagonally-acting converging rolls provided with an interposed mandrel, a set of direct-acting concave rolls in line therewith, and a rotating mandrel interposed between said second set and of larger cross-section than the internal diameter of the tube fed thereto and having a tapering forward end slightly concave in longitudinal section, substantially as and for the purposes set forth.

4. In apparatus for the manufacture of metal tubing, the combination, with a set of diagonally-acting converging rolls and a set of direct-acting concave rolls having an interposed mandrel, of a pair of concave feed-rolls in the line of feed between said sets of rolls and adapted to feed the blank to said concave rolls, substantially as and for the purposes set forth.

5. In apparatus for the manufacture of metal tubing, the com-

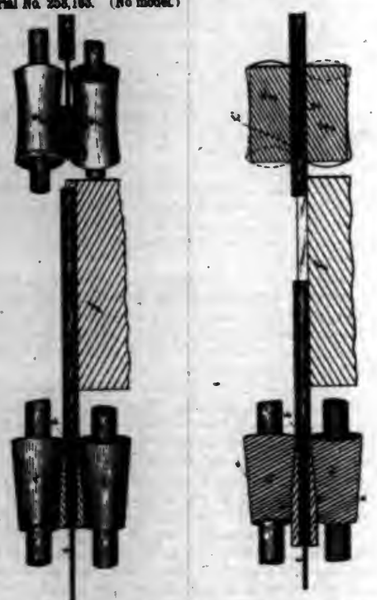
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bination, with a set of diagonally-acting feed-rolls and a set of concave rolls having an interposed mandrel, of a pair of feed-rolls, said feed-rolls being transversely adjustable, so as to engage with the blank and feed it into the concave rolls, substantially as and for the purposes set forth.

6. In continuous rolling-mills for the manufacture of tubing, the combination, with a pair of concave drawing-rolls, of a pair of feeding-rolls mounted in line therewith, a transversely-moving slide or slides carrying one or both said feed-rolls, and lever mechanism to draw said rolls together, substantially as and for the purposes set forth.

401,144. APPARATUS FOR THE MANUFACTURE OF METAL TUBING. JOHN H. FLAGLER, New York, N. Y. Filed Dec. 17, 1887. Serial No. 258,163. (No model.)



Claim.—1. In an apparatus for the manufacture of tubing, the combination of a set of diagonally-acting converging rolls, with a set of concave cross-rolls having an interposed mandrel between them, said latter set of rolls being in line with and adapted to receive the blank from the first set, substantially as and for the purpose set forth.

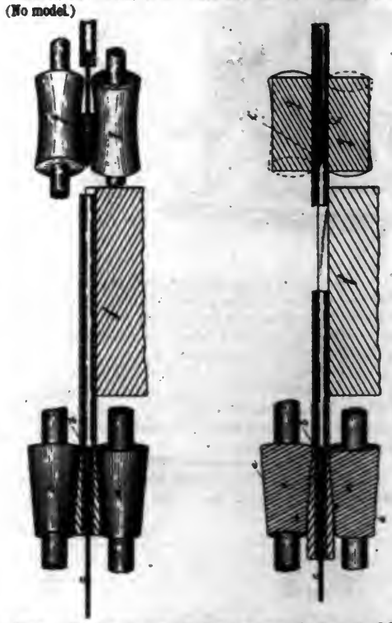
2. In an apparatus for the manufacture of tubing, the combination of a set of diagonally-acting converging rolls, with a set of concave cross-rolls having a rotating mandrel interposed between them, said latter set being in line with and adapted to receive the blank from the first set, substantially as and for the purpose set forth.

3. In an apparatus for the manufacture of tubing, the combination of a set of diagonally-acting converging rolls, with a set of concave cross-rolls having a portion of its pass gradually reducing in area, the latter set of rolls being in line with and adapted to receive the blank or tube coming from the first set, substantially as and for the purposes set forth.

4. In an apparatus for the manufacture of tubing, the combination of a set of diagonally-acting rolls, with a set of concave cross-rolls having a mandrel interposed between them and having the space between the surface of the mandrel and the working-faces of the rolls gradually decreasing in size, the second set of rolls being in line with and adapted to receive the blank coming from the first set, substantially as and for the purpose set forth.

5. In an apparatus for the manufacture of tubing, the combination of two or more concave cross-rolls, the pass formed by which gradually decreases in area throughout a portion thereof and remains constant during the remaining portion, substantially as and for the purpose set forth.

401,145. ART OF FORMING SEAMLESS TUBING. JOHN H. FLAGLER, New York, N. Y. Filed Dec. 17, 1887. Serial No. 258,164. (No model.)



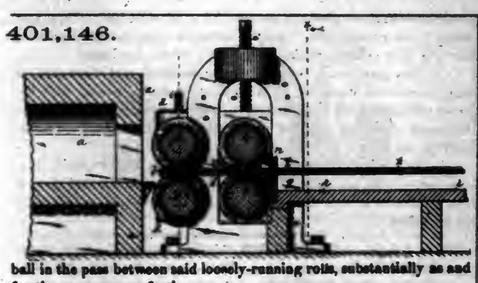
Claim.—The herein-described improvement in the art of forming seamless metal tubing, consisting in first spirally rolling and reducing a hollow ingot or blank to draw out the metal into a tube and arrange the fibers thereof spirally, and then cross-rolling said tube over a mandrel to further draw out the metal of the same, preserve the exterior spiral fibers, and arrange the interior fibers spirally, and also imparting a true cylindrical form to the tube, and straighten the same, substantially as and for the purpose set forth.

401,146. APPARATUS FOR WELDING TUBING. JOHN H. FLAGLER, New York, N. Y. Filed July 6, 1888. Serial No. 279,161. (No model.)

Claim.—1. In tube-welding apparatus, the combination, with the welding-furnace and power-driven tube-welding rolls, of a set of concave forming and lapping rolls mounted loosely in bearings between the furnace and the welding-rolls, and adapted to form the tube and lap the edges to be welded prior to its entrance into the welding-rolls, substantially as and for the purposes set forth.

2. In tube-welding apparatus, the combination, with a welding-furnace and power-driven tube-welding rolls, of a set of loosely-running rolls between the furnace and welding-rolls, and a mandrel or

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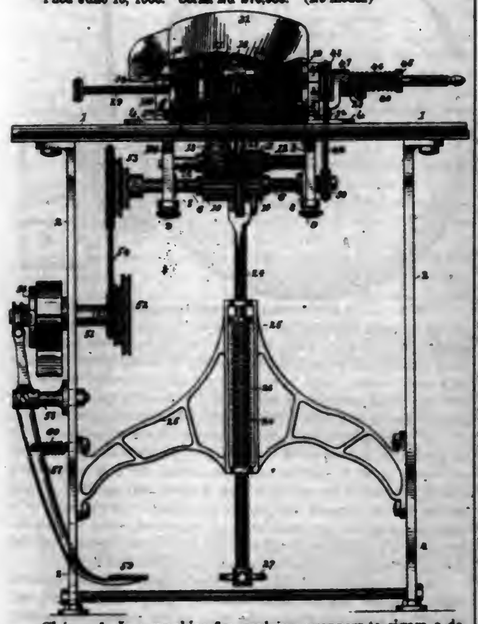
ball in the pass between said loosely-running rolls, substantially as and for the purposes set forth.

3. In tube-welding apparatus, the combination, with a welding-furnace and power-driven tube-welding rolls, of loosely-mounted rolls located between the furnace and welding-rolls, and springs governing the pressure of said loosely-running rolls, substantially as and for the purposes set forth.

4. In tube-welding apparatus, the combination, with tube-welding rolls, of a sizing or finishing ball located back of the same and in the line of the passage of the tube from said welding-rolls, substantially as and for the purposes set forth.

5. In apparatus for welding tubes, the combination, with the tube-welding rolls c c, of the bracket *p* and the sizing or finishing ball *n*, supported by said bracket, substantially as and for the purposes set forth.

401,147. MACHINE FOR WRAPPING CIGARS. SIMON J. FLATOW, New York, N. Y., assignor of one-half to Louis Sieber, same place. Filed June 13, 1888. Serial No. 276,939. (No model.)



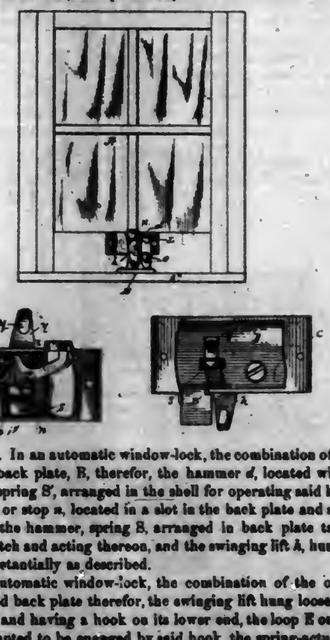
Claim.—1. In a machine for applying wrappers to cigars, a device for forming the head portion of the cigar, constructed as herein shown and described—that is, comprising a plate or surface having a longitudinal concavity open at its top throughout its entire length and running to a point, the latter being cut away or open at one side, as described, to permit the tip or "ball" of the operator's finger to be inserted laterally into the point of the concavity, for the object herein stated.

2. In a machine for wrapping cigars, the combination of the longitudinally-adjustable carriages, each comprising parallel side plates and rollers fitted between the same, of the narrow endless belt passing over said rollers between the side plates of the carriages, and the stationary guideways or rods upon which the carriages can slide, substantially as herein set forth.

3. In a machine for applying wrappers to cigar-bunches, the combination of the inclined longitudinally-arched plate, the inclined end plate having a concave depression and a tip-forming plate or surface having a concave tapering cavity made open at the top and end, and the ledge at the end of said cavity with the endless traveling apron, and the operating and guide rollers, substantially as herein set forth.

4. In a machine for applying wrappers to cigar-bunches, the combination of the longitudinally-adjustable carriages having guide-rollers and the endless belt passing over the same, with the fixed and pivoted frames having guideways for said adjustable carriages, and the screw-shafts on said fixed and pivoted frames for moving the carriages, as and for the purpose set forth.

401,148. COMBINATION ALARM-LOCK FOR WINDOWS. JAMES B. FINCH, Newark, N. J., assignor of one-half, by mesne assignments, to Thomas W. Harris, Henry R. Kilmly, and Hugo S. Mack. Filed Feb. 23, 1888. Serial No. 265,042. (No model.)



Claim.—1. In an automatic window-lock, the combination of the outer shell, C, back plate, B, therefor, the hammer *d*, located within said shell, flat spring S', arranged in the shell for operating said hammer, the catch or stop *n*, located in a slot in the back plate and serving to support the hammer, spring S, arranged in back plate transverse to the catch and acting thereon, and the swinging lift A, hung in the shell C, substantially as described.

2. In an automatic window-lock, the combination of the outer shell, the slotted back plate therefor, the swinging lift hung loosely in the outer shell and having a hook on its lower end, the loop E on the window-sill adapted to be engaged by said hook, the spring-actuated hammer located within the outer shell, and the catch or stop in the slotted back plate for temporarily supporting said hammer, substantially as described.

3. The combination of the outer shell, C, having projection B', formed to receive a percussion-cap, O, the slotted back plate, B, of the shell, the oscillating lift A, having hook *h*", lugs U U, on which it hangs in shell C, and projection 2, the hammer *d*, located within the shell, so as to be capable of falling upon cap O, its actuating-spring likewise situated within shell C, the stop *n* in the slotted back plate having shoulder V, and the spring S, fixed in the back plate transverse to said stop and acting thereon, substantially as described.

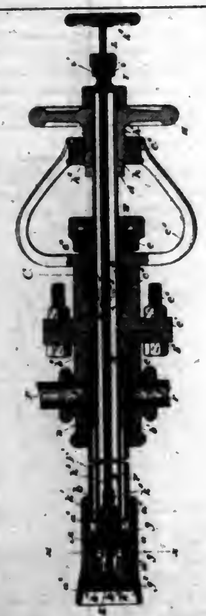
4. The combination of the outer shell, C, the spring-actuated hammer within the same, the stop or catch *n* for supporting said hammer, the spring S, transverse to the catch and serving to keep it in place, the swinging lift A, hung in the outer shell, and the loop E on the window-sill, substantially as described.

401,149. HYDROCARBON-BURNER. WILLIAM L. FISHER, Flint, Mich., assignor to the Fisher Oil Burner Company, same place. Filed May 16, 1888. Serial No. 274,085. (No model.)

Claim.—In a vapor-burner, the combination, with an outer casing having a portion of its inner wall inclined outwardly to form a valve-seat and a portion outside of said valve-seat at a different angle forming a dash, of a steam-valve and an oil-valve within said casing and within the dash, one of said valves adapted to engage the valve-seat of said casing, the oil and steam passages adjacent to the point of discharge both inclining outwardly, and the inner passage having a greater angle of inclination, whereby the two passages are made to approach each other.



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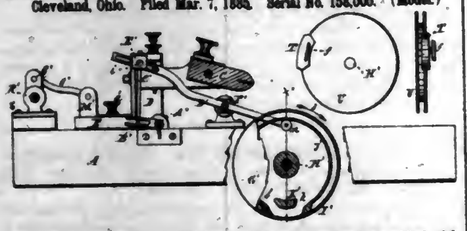
401,150. TACKLE-BLOCK. GEORGE A. FORD, Cleveland, Ohio. Filed June 21, 1888. Serial No. 277,718. (No model.)



Claim.—1. A sheet-metal casing for tackle-blocks, consisting of two sections, approximately halves, joined together rigidly in a plane lengthwise the sheave-axle and approximately lengthwise the tackle-block, each having a flanged slot for the sheave, substantially as set forth.

2. In a tackle-block, the combination, with a sheet-metal casing made up of two sections, approximately halves, joined together on a plane lengthwise the sheave-axle and lengthwise or approximately lengthwise the tackle-block, of an internal metallic strap extending around the inner wall of the casing and riveted to sections of the casing, substantially as set forth.

401,151. PAPER-RULING MACHINE. JONATHAN C. FORMAN, Cleveland, Ohio. Filed Mar. 7, 1888. Serial No. 156,005. (Model.)



Claim.—1. In a paper-ruling machine, the rocker I, provided with an arm in which is secured a face-plate, S, arranged in relation to and in combination with the drum U and cams thereon, and spring for operating said rocker, pen-beam C, and arms L and K, substantially as described, and for the purpose set forth.

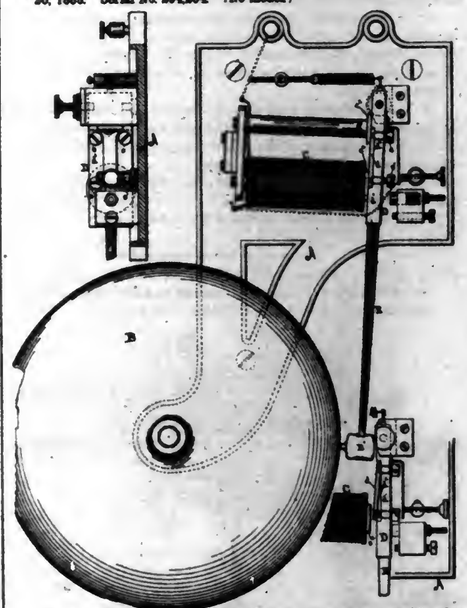
2. In a paper-ruling machine, the combination of a rock-shaft arranged in the rear of the pen-beam and having at each end thereof an arm whereby the ends of the shaft are attached by suitable connecting rods or links to the sliding standards of the pen-beam, respectively, for moving simultaneously and oppositely both ends of the pen-beam, for the purpose specified, and the pen-beam *c*, substantially as hereinbefore set forth.

3. The combination of the rocker I, the arms K and L, and pen-beam C, the conical core P, and its set-screw *c*, for the adjustment of the arm K in relation to the lifting-arm L of the pen-beam.

4. In a paper-ruling machine, the combination, with the pen-beam and its movable standards, of the transverse shaft provided with devices, substantially as described, at its ends connected with and simultaneously imparting opposite movements to said standards, substantially as set forth.

5. In a paper-ruling machine, the closed cam G' and lever D', having one end thereof adapted to run on the course of the said cam, in combination with the connecting-rod and the gate A", substantially as described.

401,152. ARMATURE FOR ELECTRO-MAGNETS. JOHN GEARY, Philadelphia, Pa., assignor to J. Elliott Shaw, same place. Filed Dec. 20, 1888. Serial No. 294,204. (No model.)



Claim.—1. In an armature for electro-magnets, the combination of one or more light sections and a heavy section held in operative relation by a hinge or other device in such manner that portions of each section will be opposite the surface of attraction of the poles of a single magnet, said light sections being influenced before the heavier section, traveling in advance of and drawing the said heavier section into the field of attraction, substantially as shown and described.

2. In an armature for electro-magnets, the combination of one or more light sections and a heavy section, each of said sections being set loosely in the face of its contiguous section, and held in operative relation therewith by screws in such manner that portions of each section will be opposite the surface of attraction of the poles of a single magnet, said light sections being influenced before the heavier section, and traveling in advance of and drawing said section into the field of attraction, substantially as shown and described.

3. An armature for electro-magnets, composed of two or more sections secured together in such manner that portions of each section will be opposite the same poles of an electro-magnet, each section being successively influenced by the magnetic attraction and drawing its attached section into the field of attraction, for the purpose described.

4. In an armature for electro-magnets, the combination of light section *d*, set loosely in recess d^2 in the face of heavy section d', said light section being first influenced by the magnetic attraction, traveling in advance of the heavier section, and operating to draw said heavier section into the field of attraction of a single magnet, C, through the medium of diamagnetic screws *c c'*, substantially as shown and described.

401,153. ELECTRIC GAS-LIGHTING BURNER. JOHN GEARY, Philadelphia, Pa., assignor to J. Elliott Shaw, same place. Filed Feb. 5, 1889. Serial No. 298,721. (No model.)

Claim.—1. In an electric gas-lighting burner, the combination, with the magnets thereof, of an armature pivoted thereon two cam-levers riding on shoulders and operating to impart rotary motion to the gas-cock, as and for the purpose set forth.

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2. In an electric gas-lighting burner, the combination, with the magnets thereof, of an armature pivoted at its center, and having pivoted on one of its edges two cam-levers riding on the ends of adjusting-screws in the bed-plate and imparting rotary motion to the gas-cock, as and for the purpose set forth.

3. In an electric gas-lighting burner, the combination, with the magnets, the movable electrode, and the gas-cock thereof, of an armature pivoted below the plane of its lower surface, in order to secure a movement of the same in the direction of a radial curve, as and for the purpose set forth.

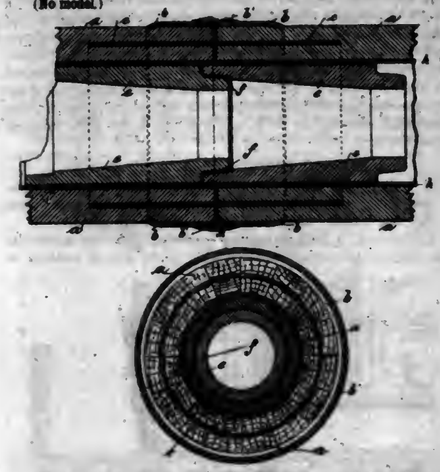
4. In an electric gas-lighting burner, the combination, with the movable electrode-rod D, sliding in the flange b^3 on the burner-tube B, of the adjustable slide d', sliding on said tube and secured to said rod by screw d^3, preventing the same from turning, and serving to admit of changing the tension of the spiral spring *d*, encircling rod D, and sustained between said flange and slide, as and for the purpose set forth.

5. In an electric gas-lighting burner, the combination, with the magnets thereof, of an armature, E, provided with trunnions *e e'* below the plane of its lower surface, said trunnions being secured on the screw e^2, and bolt e^3, passing into the burner-tube, as and for the purpose set forth.

6. In an electric gas-lighting burner, the combination, with the magnets thereof, of an armature, E, having pivoted on the edge thereof on screws *f f'* the cam-levers F F', provided with the cam portions f^2 f^2 in their under edges, and the rounded ends f^4 f^4, engaging with the gas-cock, said levers at their cam portions resting and riding on the ends of the adjusting-screws *g g'* in the bed-plate G when the armature is actuated and communicating rotary motion to said gas-cock, as and for the purpose set forth.

7. In an electric gas-lighting burner, the combination, with the magnets thereof, of the armature E, having the trunnions *e e'*, pivoted on the screw and bolt e^2 e^3 below the plane of the lower edge of said armature, the latter having pivoted on its edge on screws *f f'* the cam-levers F F', provided with the cam portions or notches f^2 f^2, for engagement with the ends of the adjusting-screws *g g'* in the bed-plate G, the outer ends, f^4 f^4, of said levers engaging with the gas-cock H in the burner-tube and transmitting rotary motion to said gas-cock, as and for the purpose set forth.

401,154. TUBE OR CONDUIT. GEORGE H. GILLETTE and KING C. GILLETTE, New York, N. Y. Filed Jan. 17, 1889. Serial No. 296,637. (No model.)



Claim.—1. A tube or casing for a conduit, consisting of a series of sections formed of compressed wooden strips having grooved or slitted ends, as described, suitable retaining-bands, and connecting-sleeves, said section being disposed end to end and the said sleeves extending into the adjoining slits or grooves of the several connecting sections.

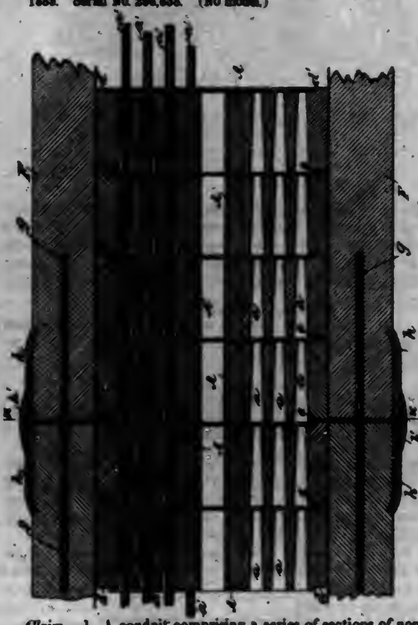
2. A tube or conduit consisting of a series of sections formed of compressed wooden strips, as described, suitable retaining-bands, and an inner tube or core, said sections being disposed end to end and united one to another.

3. A tube or conduit consisting of a series of sections formed of compressed wooden strips having grooved or slitted ends, as described, suitable retaining-bands, connecting-sleeves, and an inner tube or core, said sections being disposed end to end and said sleeves extended into the adjoining slits or grooves of the several connecting sections.

4. A tube or conduit consisting of a series of sections formed of compressed wooden strips, as described, suitable retaining-bands, and an inner core composed of a series of short cylinders of insulating material, as glass, provided with connecting longitudinal openings, said sections being disposed end to end and united one to another.

5. A tube or conduit consisting of a series of sections formed of compressed wooden strips, as described, suitable retaining-bands, an inner core composed of short cylinders of insulating material, as glass, provided with one or more connecting longitudinal openings, and washers or packings interposed between said cylinders, said sections being disposed end to end and united one to another.

401,155. CONDUIT FOR ELECTRICAL CONDUCTORS. GEORGE H. GILLETTE and KING C. GILLETTE, New York, N. Y. Filed Jan. 17, 1889. Serial No. 296,638. (No model.)



Claim.—1. A conduit comprising a series of sections of non-conducting material, as glass, provided with contracting longitudinal openings, said sections being arranged and secured one after another with the corresponding openings in line, whereby one or more continuous ducts with bearings at intervals are formed, substantially as set forth.

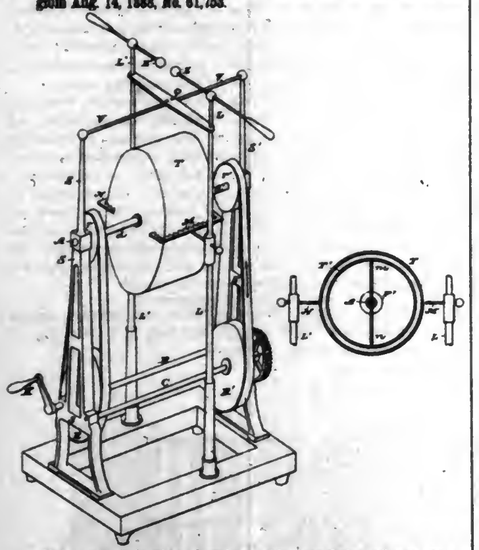
2. A conduit comprising a series of sections of non-conducting material, as glass, provided with tapering longitudinal openings, said sections being arranged and secured one after another with the larger ends of the opening in the succeeding sections adjacent to the smaller ends of the openings in the immediately preceding sections, substantially as and for the purposes set forth.

3. A conduit comprising a series of sections of non-conducting material, as glass, and intermediary washers or packings, said sections being provided with contracting longitudinal openings and secured one after another with the corresponding openings in line, substantially as and for the purposes set forth.

4. A conduit comprising a series of inner sections of non-conducting material, as glass, and an outer covering or casing, said sections being provided with contracting longitudinal openings arranged one after another with the corresponding openings in line, substantially as and for the purposes set forth.

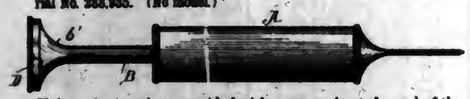
5. A conduit consisting of a series of sections of non-conducting material, as glass, intermediary packings or washers, and a compressed outer wooden casing, said sections being provided with contracted longitudinal openings and secured within said casing with the corresponding openings in line, substantially as described.

401,156. STATIC-INDUCTION MACHINE. HERMANN GLASER, Vienna, Austria-Hungary. Filed Dec. 28, 1887. Serial No. 259,271. (No model.) Patented in England Aug. 29, 1887, No. 11,718; in Austria-Hungary Jan. 15, 1888, No. 317,118 and No. 64,906; and in Belgium Aug. 14, 1888, No. 81,753.



Claim.—An induction electric machine consisting of two rotary drums of idioelectrical material arranged one within the other and hermetically closed against the entrance of air without frictional materials or brushes, the two drums rotating in opposite directions, substantially as herein described, and shown on the accompanying drawings.

401,157. SYRINGE. JAMES H. GLASCOCK, Sherman, Tex., assignor of one-half to John C. May, Lexington, Ky. Filed Oct. 23, 1888. Serial No. 288,935. (No model.)



Claim.—1. A syringe provided with a reservoir at the end of the piston-rod outside of the syringe-barrel, said reservoir communicating through the piston-rod with a fibrous piston-head and adapted to contain a suitable liquid, whereby said piston-head is kept continually moistened, substantially as and for the purpose described.

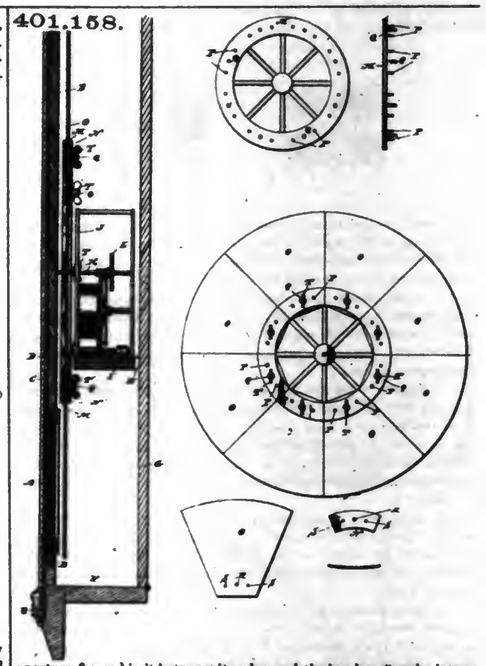
2. A syringe provided with a piston-rod having its inner end perforated and its outer end enlarged and provided with a cap, and a fibrous piston-head surrounding the perforations of the piston-rod, substantially as described.

401,158. ADVERTISING DEVICE. CHARLES D. GOODWIN and WILLIAM M. CHASE, New Haven, Conn. Filed Aug. 13, 1888. Serial No. 282,596. (No model.)

Claim.—1. In an advertising device, the combination, with a flat panel displaying a picture upon its outer face and having a single



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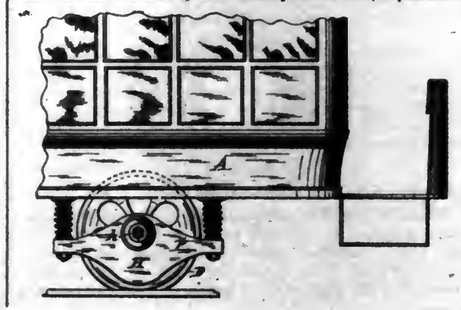
aperture formed in it between its edge and the border of such picture, of a frame of molding for such panel, a case located behind the frame, which is adapted to be supported in an upright position, a clock-movement located in the case, and a single imperforate flat or disk-shaped wheel for displaying the advertisements interposed between the back of the panel and the said movement, an arbor of the strike-train whereof is forwardly extended for the purpose of supporting and intermittently rotating the said wheel, substantially as set forth.

2. In an advertising device, the combination, with a panel having an aperture in it, of a clock-movement located behind the panel, and a flat or disk-shaped card-wheel located directly back of the panel connected with the clock-movement, so as to be supported and intermittently rotated thereby, and composed of a wheel-plate, sector-shaped cards having their inner and narrower ends applied to the rim of such plate, and retaining-segments placed upon such ends of the cards and secured to the plate, substantially as set forth.

3. In an advertising device, the combination, with a panel having an aperture in it, of a clock-movement located behind the panel, and a flat or disk-shaped card-wheel located directly behind the panel connected with such clock-movement, so as to be supported and intermittently actuated thereby, and composed of a wheel-plate, sector-shaped cards having their inner and narrower ends applied to the rim of the plate, retaining-segments placed upon such ends of the cards, and pins and studs for securing the cards and segments to the plate, substantially as set forth.

401,159. BEARING FOR STREET-CARS. DAVID G. GRANT, Syracuse, N. Y., assignor of one-half to Marion A. Andrews, same place. Filed Jan. 7, 1889. Serial No. 295,654. (No model.)

Claim.—1. A car-axle bearing consisting of a vertical annular track carried eccentrically and rotatably on the axle, a pedestal se-



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cured to the car-body and provided with an endless track, and a plurality of anti-friction rollers provided with bearings traveling on the two tracks, substantially as set forth and shown.

2. A car-axle bearing consisting of a vertical annular track carried eccentrically and rotatably on the axle, a pedestal secured to the car-body and carrying an endless track a portion whereof is concentric with the lower portion of the aforesaid annular track, and anti-friction rollers provided with bearings on the endless track of the pedestal and mounted on the lower portion of the annular track carried on the axle, as aforesaid.

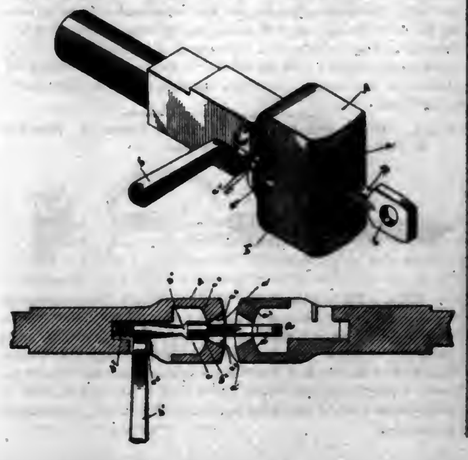
3. A car-axle bearing consisting of a ring suspended vertically from the axle and riding eccentrically and rotatably thereon, a pedestal secured to the car-body and having affixed to it an endless track a portion whereof is concentric with the lower portion of the suspended ring, and the remainder of said track being eccentric in relation to the aforesaid ring, and rollers adapted to travel independently of each other and provided with bearings in the aforesaid track and upon the inner side of the lower portion of the suspended ring, substantially as set forth.

4. A car-axle bearing consisting of a ring suspended vertically from the axle and riding eccentrically and rotatably thereon, a pedestal secured to the car-body and formed with a housing inclosing the aforesaid ring, endless tracks on the inner sides of the said housing and having their main portions concentric with the lower portion of the ring, and the remainder of the said tracks of the form of arches beneath the axle, and rollers adapted to travel independently of each other, and provided with bearings in the aforesaid tracks and on the inner side of the lower portion of the ring, substantially as described and shown.

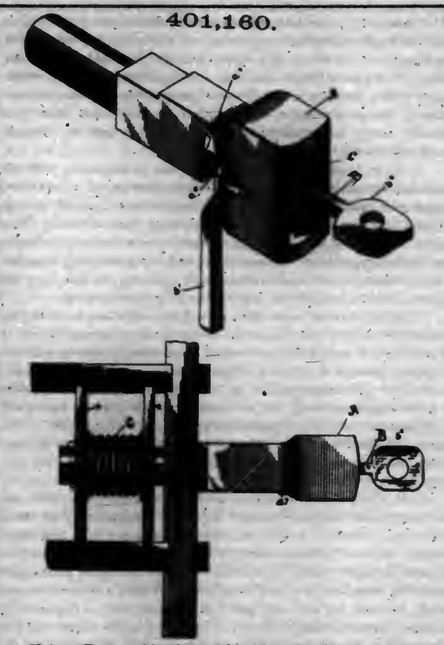
5. In an anti-friction axle-bearing, the combination, with the stationary track and movable track parallel therewith and rollers interposed between said tracks and adapted to rotate independently of each other, of supplemental rollers of larger diameters than the aforesaid rollers and pivoted to the ends thereof and concentric therewith, substantially as and for the purpose set forth.

6. The combination, with the car-body and axle, of the ring *r*, hung on the axle, the pedestal P, connected to the car-body and formed with the housing H, inclosing the aforesaid ring, and formed also with segmental tracks *a a*, concentric with the lower portion of the ring, and with the arching tracks *a' a'* beneath the axle, the journals *c c c*, traveling in the tracks *a a'*, the rollers *b b b*, mounted on the central portions of said journals and traveling on the inner side of the lower portion of the ring *r*, the supplemental rollers *c c c*, mounted on the aforesaid journals at opposite ends of the rollers *b b b* and of greater diameter than the latter rollers, and the set-screw *k*, passing through the housing H from the outer side thereof and in line with the axle, substantially as described and shown.

401,160. CAR-COUPLING. ROBERT I. HAMPTON, Athens, Ga. Filed July 25, 1888. Serial No. 281,013. (No model.)

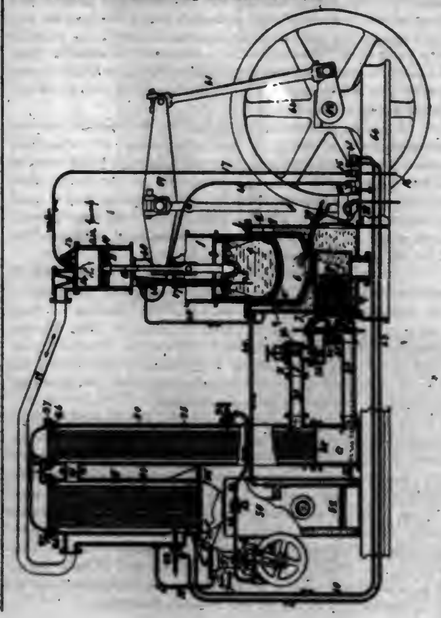


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Claim.—The combination, with a draw-head having an oblong mouth with inclined sides leading into a larger interior opening provided with the lug or shoulder forming a seat, of the coupling-link provided with the weighted lever designed to rest against the lug or shoulder when in an uncoupled position, and to drop and turn the coupling-link to bring it to the position of coupling, substantially as described.

401,161. INTERNAL-COMBUSTION THERMO-DYNAMIC MOTOR. JAMES HARGREAVES, Farnworth, County of Lancaster, England. Filed Mar. 20, 1888. Serial No. 268,294. (No model.) Patented in England July 26, 1882, No. 3,540, and Apr. 15, 1887, No. 5,485; in France Feb. 6, 1883, No. 153,536, and Dec. 5, 1887, No. 187,491; in Belgium Feb. 7, 1883, No. 60,385, and Dec. 6, 1887, No. 79,287; in Italy Mar. 31, 1883, No. 15,195, and Nov. 30, 1887, No. 22,711; in Spain Apr. 12, 1888, No. 12,296, and in Canada Aug. 23, 1888, No. 29,736.



Claim.—1. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, a heating-chamber with which the supply-passage communicates, an air pump, 10, communicating with the heating-chamber, and a water-supply which discharges into the working-cylinder, of the air-pump, whereby the air is mingled with water or aqueous vapor prior to its delivery to the heating-chamber, substantially as and for the purposes described.

2. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a saturating chamber or vessel communicating with the air-supply passage, through which chamber or vessel the air-supply passes, said saturating chamber or vessel being provided with a steam or water supply, whereby the air is charged with aqueous vapor, and a superheating-chamber through which the air and aqueous vapor pass and wherein they are superheated, substantially as and for the purposes described.

3. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage having the valves 34 and 26, of a saturating chamber or vessel communicating with the air-supply passage, through which chamber or vessel the air-supply passes, said saturating chamber or vessel being provided with a steam or water supply, whereby the air is charged with aqueous vapor, and a regenerator-chamber communicating with the exhaust-port of the engine and also interposed in the air-supply passage between the saturator and the combustion-chamber, substantially as and for the purposes described.

4. In an internal-combustion motor, the combination, with the main piston, an air-pump operated therefrom, and an air-duct and a combustion-chamber having an air-supply passage, of a saturating chamber or vessel communicating with the air-supply passage and the air-duct, through which chamber or vessel the air-supply passes, said saturating chamber or vessel being provided with a steam or water supply, whereby the air is charged with aqueous vapor, a regenerator-chamber communicating with the exhaust-port of the engine and also interposed in the air-supply passage between the saturator and the combustion-chamber, and valves controlling the passage from the saturator to the generator, and also controlling the passage from the regenerator to the delivery end of the exhaust.

5. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a saturating chamber or vessel communicating with the air-supply passage, through which chamber or vessel the air-supply passes, said saturating chamber or vessel being provided with a steam or water supply, whereby the air is charged with aqueous vapor, and a flue or flues extending through the saturating-chamber and forming a passage-way for the exhaust from the motor-cylinder, whereby the exhaust is used for heating the said saturating-chamber, substantially as and for the purposes described.

6. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a saturating chamber or vessel communicating with the air-supply passage, and through which chamber or vessel separately pass the air and the products of combustion, said saturating chamber or vessel being provided with a water-supply, whereby the air is charged with aqueous vapor, and a pump, 41, connected with the water-supply and adapted to spray the water into and saturate the air in the saturating chamber or vessel, substantially as described.

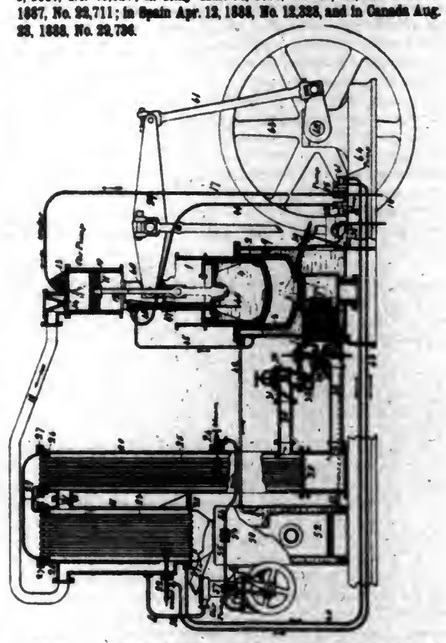
7. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a saturating chamber or vessel communicating therewith, through which chamber or vessel the air-supply passes, a water-jacket for the motor, which water-jacket is connected with the saturating-chamber, and a pump also connected therewith, whereby a circulation of the water through the jacket and the saturating-chamber is maintained, substantially as and for the purposes described.

8. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a chamber or vessel communicating therewith, through which chamber or vessel the air-supply passes, a water-jacket for the motor, a boiler, 50, communicating with the water-jacket and with the said chamber or vessel, and an air-pump whose engine is connected with the boiler, the delivery-pipe of said air-pump communicating with the air-supply, substantially as and for the purposes described.

9. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a saturating-chamber, 18, communicating with the said air-supply passage, through which chamber the air-supply passes, said saturating-chamber being provided with a water-supply, whereby the air is charged with aqueous vapor, a second saturating-chamber, 20, interposed between the chamber 18 and the air-supply passage and provided with a steam-supply pipe, and a passage leading from the exhaust of the said combustion-chamber through said saturating-chambers, whereby the air and aqueous vapor passing through the saturating-chambers are heated, substantially as and for the purposes described.

10. In an internal-combustion motor, the combination, with the combustion-chamber having an air-supply passage, of a saturating chamber or vessel, 18, communicating therewith, through which chamber or vessel the air-supply passes, and a water-supply pump having its inlet and discharge ports communicating with said saturating-chamber, whereby a continuous circulation of water into and from said saturating-chamber is maintained, substantially as and for the purposes described.

401,162. PROCESS OF OBTAINING MOTION FROM HEAT PRODUCED BY LIQUID OR GASEOUS FUEL. JAMES HARGREAVES, Farnworth, County of Lancaster, England. Filed Apr. 4, 1888. Serial No. 269,532. (No model.) Patented in England July 26, 1883, No. 3,540, and Apr. 15, 1887, No. 5,485; in France Feb. 6, 1883, No. 153,536, and Dec. 5, 1887, No. 187,401; in Belgium Feb. 7, 1883, No. 60,335, and Dec. 6, 1887, No. 79,827; in Italy Mar. 31, 1883, No. 15,185, and Nov. 30, 1887, No. 22,711; in Spain Apr. 12, 1884, No. 12,328, and in Canada Aug. 23, 1888, No. 23,736.



Claim.—1. The method hereinbefore described of treating the air which is supplied to the combustion-chamber of an internal-combustion motor, which consists in mingling aqueous vapor with the air, heating the same until the air is saturated with aqueous vapor, then mingling the saturated air with steam and superheating the same preparatory to bringing the air into contact with the liquid or gaseous fuel in the combustion-chamber, substantially as and for the purposes described.

2. The method hereinbefore described of treating the air which is supplied to the combustion-chamber of an internal-combustion motor, which consists in saturating air with water under pressure, mixing the thus saturated air with steam, superheating the resulting product and raising the same to a high degree of heat prior to bringing the same into contact with the other fuel, and thereafter utilizing the products of combustion for heating the water and air, substantially as described.

401,163. SHEARS. WALTER P. HATCH, Pullman, Ill. Filed Nov. 30, 1888. Serial No. 292,310. (No model.)



Claim.—The combination of the blades A and B, the blade B being countersunk adjacent its pivot-hole, a single screw-bolt, C, for pivotally connecting said blades, the nut E upon said screw-bolt, and a washer, D, of rubber, said washer D being located within the countersunk seat of the blade B and bearing against the inner face of the nut E, whereby the screw-bolt C and the nut E are held in fixed relation to the blade B during the operation of the shears, substantially as described.

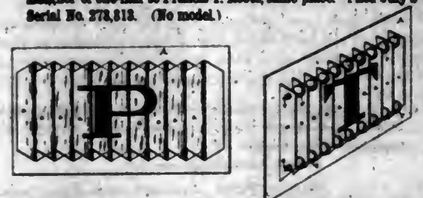
401,164. METHOD OF PREPARING DESIGNS FOR ADVERTISING-CARDS. THEODORE P. HEINEMANN, Connersville, Ind., assignor of one-half to Francis T. Roots, same place. Filed July 2, 1888. Serial No. 278,812. (No model.)



Claim.—1. The hereinbefore-described method of forming variable signs, which consists in first crimping the strip or blank to the form of the proposed sign, then folding the outwardly-projecting ribs down, first upon one side, then upon the other, and while so folded forming upon each side of the slats the design.

2. The method of forming designs for signs, consisting of the following steps: first crimping the strip or blank to the form of the proposed sign; second, folding the outwardly-projecting ribs down first in one direction and then in the other, and while so folded forming the designs upon them, and, third, folding the ribs to the reverse side and forming the third character upon the spaces between the ribs, substantially as hereinbefore set forth.

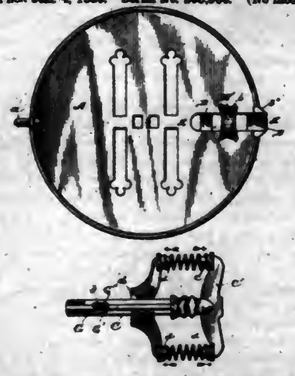
401,165. METHOD OF PRODUCING VARIABLE SIGNS AND ADVERTISING-CARDS. THEODORE P. HEINEMANN, Connersville, Ind. assignor of one-half to Francis T. Roots, same place. Filed July 2, 1888. Serial No. 278,813. (No model.)



Claim.—1. The method of preparing slatted variable signs by first in so forming the required designs or characters upon both sides of a strip or sheet of metal or other suitable material that the character will appear regular when the slats are turned at a right angle, then severing or partially severing the said sheet to form slats.

2. The method of preparing slatted fronts for variable signs, which consists of the following steps: first, in forming one of the required designs or characters regularly upon one side of a plate of sheet metal or other suitable material; second, in so forming the second designs or characters required upon the opposite side of the plate that they will appear regular when said plate is severed into slats and the slats turned at a right angle; third, in partially severing the said plate to form slats and turning said slats at a right angle to the plate, substantially as shown and described.

401,166. STOVE-PIPE DAMPER. FREDERICK W. HOSMER, Freeport, Ill. Filed Jan. 4, 1889. Serial No. 295,396. (No model.)



Claim.—1. The combination, with a damper-blade provided with a socket having an internal lug, *b*, of a shank adapted to enter said socket, and having a suitable head or enlargement, a slide moving on said shank, and a spring interposed between said slide and the head or enlargement of the shank, and adapted to press the slide away from said head or enlargement, the end of the shank opposite said head or enlargement being formed with a longitudinal groove or depression extending inward from the end of the shank, but having its inner end closed and turned outward toward the end of the shank, said groove throughout its entire length being adapted to permit the passage of the internal lug, *b*, of the socket in the blade, substantially as and for the purpose set forth.

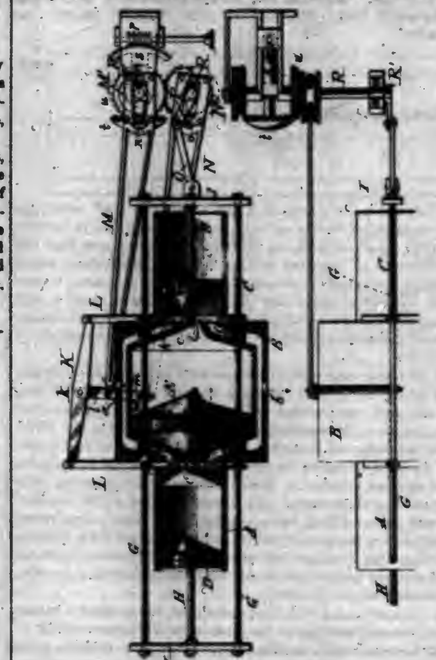
2. The combination, with a damper-blade having an outwardly-conical boss at one point in its margin, of a shank adapted to pass axially through said cone and provided with means for engagement of the blade, a slide moving on said shank and having an internally-conical surface corresponding with the external cone on the boss of the blade, and a spring interposed between said slide and a suitable head or enlargement on the shank, and adapted to press said slide toward the boss on the blade, substantially as and for the purpose set forth.

3. The combination, with the damper-blade and a shank adapted to engage therewith and provided with a suitable head or enlargement, of a slide moving on said shank and provided with arms extending in opposite directions therefrom, and a spring interposed between the end of each of said arms and the head or enlargement on the shank, and adapted to press said slide away from said enlargement, and at the same time to form a non-heating surface to be grasped in operating the damper, substantially as and for the purpose set forth.

4. The combination, with the blade A and the shank C, adapted to engage said blade, and provided with a head, C', of the slide D, moving on the shank, and the springs S S, interposed between the ends of the arms of the slide and the corresponding ends of the arms of the head, and adapted to press the slide away from the head, and at the same time to form non-heating surfaces adapted to be grasped in operating the damper, substantially as and for the purpose set forth.

5. The combination, with the blade A and shank C, adapted to engage therewith, and having a head, C', provided with bosses *c*, of the slide D, provided with the bosses *d*, and the springs S, interposed between the slide and head, and held in place by the bosses *c d*, substantially as and for the purpose set forth.

401,167. COMPOUND STEAM-ENGINE. CARLOS HOLLY, Lockport, N. Y. Filed Dec. 10, 1885. Serial No. 185,310. (No model.)



Claim.—1. As a compound steam-engine, a double-acting cylinder, in combination with two single-acting cylinders arranged on the ends of the double-acting cylinder and provided with simultaneously-moving pistons which are connected by means of piston-rods joined at their ends by cross-pieces, said piston-rods passing through the double-acting but outside of the single-acting cylinders, the middle piston being secured to the rods and the end pistons being connected by rods with said cross-pieces, substantially as described.

2. In a compound steam-engine, the combination of a low-pressure cylinder, two high-pressure cylinders placed on the ends of the low-pressure cylinder, the adjacent heads of said cylinders having each a steam-port and ingress and exhaust passages, arranged substantially as shown, and all of said cylinders being provided with simultaneously-moving pistons which are connected by means of piston-rods joined at their ends by cross-pieces, and passing through the double-acting

but outside the single-acting cylinders, the middle piston being secured to the rods and the end pistons connected with the cross-pieces, and valves situated between the heads of the cylinders, each of said valves having two openings, and arranged to operate substantially as specified and shown.

3. In a compound steam-engine, a double-acting cylinder, in combination with two single-acting cylinders arranged on the ends of the double-acting cylinder, a piston within each cylinder, and a frame for enabling the pistons to have a simultaneous movement without the use of a piston-rod common to the three pistons, said frame consisting of a cross-piece at the outer end of each single-acting cylinder and rods connecting the pistons with said cross-pieces, substantially as described.

4. In a compound steam-engine, the combination of a low-pressure cylinder, two high-pressure cylinders placed on the ends of the low-pressure, the adjacent heads of said cylinders having each a single port, and being likewise provided with ingress and exhaust passages, and valves situated between the heads of the cylinders, each of said valves having two openings, one to admit steam to the high-pressure cylinders and the other for allowing steam to pass from the high-pressure to the low-pressure cylinders, and also from the low-pressure to the exhaust, all arranged and operated substantially as described.

5. In a compound steam-engine, a central low-pressure double-acting cylinder, in combination with two contiguous single-acting high-pressure cylinders, said cylinders being provided with pistons having port-closing projections, and all connected together and having a simultaneous movement in the same direction, as and for the purpose specified.

6. The combination of cylinder B, its piston E, cylinders A and C, their pistons D and F, the piston-rods G G and H H, and the cross-pieces I I, substantially as set forth.

401,168. MACHINE FOR IMPARTING MOTION. JOHN J. ITEN, Davenport, Iowa. Filed Sept. 18, 1888. Serial No. 285,754. (No model.)



Claim.—1. In combination with a journaled shaft carrying a fixed ratchet-wheel having one or more notches in its side, two crank-arms hung upon said shaft, one provided with an engaging pawl and the other with an engaging arm for imparting intermittent partial rotation to said wheel, an actuating-rod connected at one end to each of said crank-arms, one of said connections riding in a slot in said rod, and the opposite end of said rod attached to driving mechanism for imparting to the opposite end reciprocal motion, substantially as described.

2. In combination with a journaled shaft carrying a fixed ratchet-wheel having one or more notches in its side, two crank-arms hung upon said shaft, one provided with an engaging-pawl and the other an engaging arm for imparting intermittent movements to said wheel, and an actuating-rod connected at one end to each of said crank-arms, one of said connections riding in a slot in said rod, the opposite end of said rod attached to driving mechanism for imparting to its other end to-and-fro motion, and a sprocket-wheel rigidly attached upon said shaft, a sliding frame carrying two or more pulleys seated in a slideway in the main frame, an endless sprocket-chain with one or more catches upon its outer surface surrounding said pulleys and sprocket-wheel, and mechanism for adjusting said frame in its slideway, substantially as described.

3. In combination with a journaled shaft, mechanism for imparting to it intermittent partial rotations, a sprocket-wheel rigidly attached upon said shaft, a sliding frame seated in a slideway in the main frame, carrying two or more pulleys, an endless sprocket-chain, with one or more catches in its outer surface surrounding said pulleys and sprocket-wheel, and mechanism for adjusting said frame in its slideway, substantially as described.

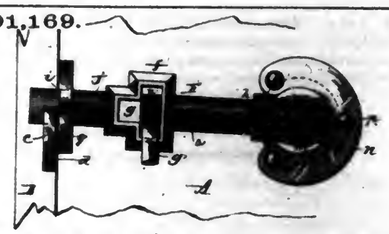
401,169. LATCH. ORIEN A. JEFFERS, Lansing, Mich. Filed Dec. 27, 1888. Serial No. 294,791. (No model.)

Claim.—1. In a latch, the combination, with a turning plate having a socket therein, of a sliding latch-bolt, one end of which rests loosely within said socket, substantially as set forth.

2. In a latch, the combination, with a turning plate having a socket therein, of a sliding latch-bolt, one end of which rests loosely within said socket, and means for operating and locking the bolt, substantially as set forth.

3. In a latch, the combination, with a turning plate having a socket therein, of a latch-bolt loosely mounted in the socket of the

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turning plate, and a lever, the said bolt having a shoulder adapted when the latch-bolt is in one position to rest over and in a position to be engaged by the lever, substantially as set forth.

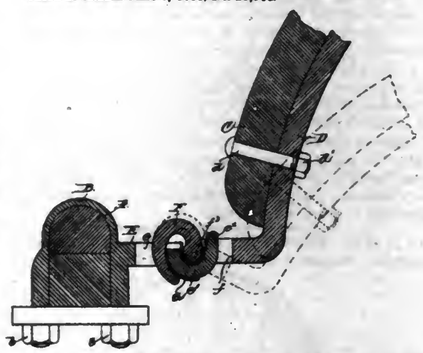
4. In a latch, the combination, with a turning socket and rim to hold the latter in place, and a slide-bolt, the latter having a rib thereon, of a keeper having a notch therein adapted to receive said rib in order to lock the latch, substantially as set forth.

5. In a latch, the combination, with a turning socket and a rim to hold the latter in place, of a bolt having a T-shaped slot and a rib, a keeper having a notch to receive the rib, and a thumb-lever for operating the latch-bolt, substantially as set forth.

6. In a latch, the combination, with a turning socket having an offset thereon, and a rim having a corresponding offset to receive said turning socket, of a latch-bolt adapted to slide in the socket, said bolt having a T-shaped slot, a rib, and a flattened end, a keeper having a notch to receive the rib, a thumb-lever, and a slotted handle, substantially as set forth.

7. In a latch, the combination, with a longitudinally-sliding latch-bolt having a T-shaped slot therein, of a lever passing through said slot, substantially as set forth.

401,170. THILL-COUPLING. CHARLES R. JOHNS, Hatley, Quebec, Canada. Filed Aug. 3, 1888. Serial No. 281,861. (No model.) Patented in Canada June 9, 1888, No. 29,311.



Claim.—1. A thill-coupling composed, essentially, of a coupling-iron provided with an upward, backward, and downwardly curved hook, substantially as specified, and a second coupling-iron having a bar and slot or opening to permit the said curved hook to pass in front of and over the bar, through the slot, and under said bar to lock the couplings, in the manner and for the purpose specified.

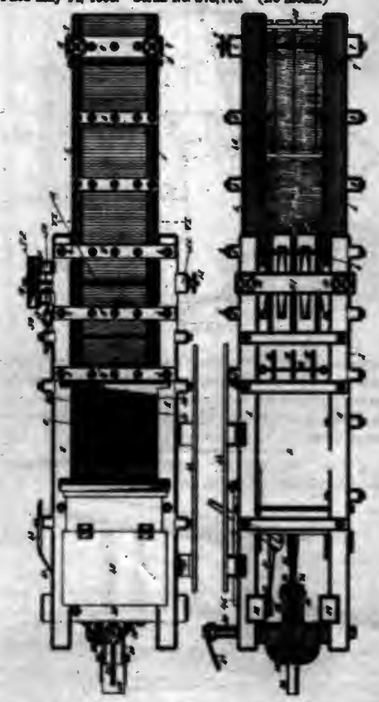
2. A thill-coupling composed, essentially, of a primary loop portion having a bar, a slot or opening, and a forward and upwardly turned lip, and a thill-iron provided with a secondary loop portion having a slot or opening and a backward and downwardly curved hook, substantially as and for the purpose described.

3. The combination, with the primary loop portion having the slot or opening and bar, as specified, of a thill-iron provided with a backward and downwardly curved hook, and a washer provided with the wings g, the main portion g', and the lip g^2, the said lip passing over the bar, substantially as and for the purpose set forth.

4. The combination, with the primary loop portion having a slot, a bar, and the upturned lip, substantially as specified, and the thill-iron provided with the secondary loop portion having the slot and curved hook, as specified, of the shaped and hardened washer G, having the wings g, the main body portion g', and the lip g^2, substantially as and for the purpose specified.

5. A thill-coupling composed, essentially, of a thill-iron provided with a backward and downwardly curved hook, and a bar adapted to be secured to an axle and to permit the hook to pass over and under the same and to prevent lateral movement of said hook when engaged therewith.

401,171. BALING-PRESS. WILLIAM J. H. KAPPE, Quincy, Ill. Filed May 14, 1888. Serial No. 273,773. (No model.)



Claim.—1. A baling-press having a traverser provided with guide-plates, and guide-strips for said plates in the compression-chamber extended into the receiving-chamber, the part extended into the receiving-chamber being beveled, substantially as and for the purpose described.

2. The combination, in a baling-press, of a traverser, a connecting-rod secured to said traverser and pivoted in slotted links, a cam-lever pivoted to said slotted links, a shaft upon which said cam-lever is pivoted, a crank swiveled to said shaft and embracing the cam-lever, and a horse-power arm connected with said crank.

3. The combination, in a baling-press, as hereinbefore set forth, of the vertical shaft 30, attached to the fore part of the press, a double crank, 35, swiveled to said shaft and having shoulders, as described, a cam-lever, 33, also swiveled to said shaft, having projecting shoulders 37 39 and embraced by said double crank, a horse-power arm, 36, secured to said double crank, a slotted link, 34, pivotally affixed to said cam-lever, a connecting-rod, 24, pivoted in a slot in said link, and a traverser, as 19, connected with said rod.

4. The combination, in a baling-press, of slotted links, a connecting-rod, as 24, pivoted in the slot of said links, a traverser, as 19, secured to said connecting-rod, a power-supply connection pivotally secured to said links, and anti-friction rollers mounted upon the outer end of said connecting-rod.

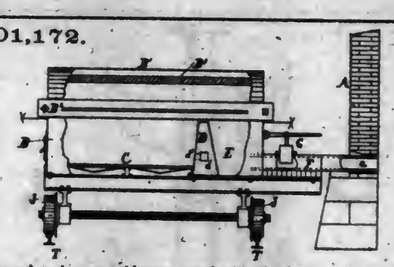
5. The combination, in a baling-press, of a traverser, a connecting-rod for said traverser pivotally secured in slotted links 34, as described, a double cam-lever pivotally secured to said slotted links, power-connections for actuating said double cam-lever, and anti-friction rollers mounted upon the outer end of said connecting-rod, for the purpose described.

6. The combination, in a baling-press, as hereinbefore set forth, of the vertical shaft 30, attached to the end of the press, a crank swiveled to said shaft and having shoulders, as described, a cam-lever, also swiveled to said shaft, having projecting shoulders 37 39 and embraced by said crank, a link pivotally affixed to said cam-lever, a connecting-rod, 24, pivoted in said link, a traverser, 19, secured to said connecting-rod, and anti-friction rollers 48, mounted upon the outer end of said connecting-rod, for the purpose described.

401,172. FURNACE FOR BRICK-KILNS. CHARLES M. KEEP, Erie, Pa. Filed Aug. 31, 1888. Serial No. 284,224. (No model.)

Claim.—1. A brick-kiln plant comprising a number of kilns having each a series of flues opening through its walls, and a portable furnace having a series of flues corresponding with the kiln-flues and

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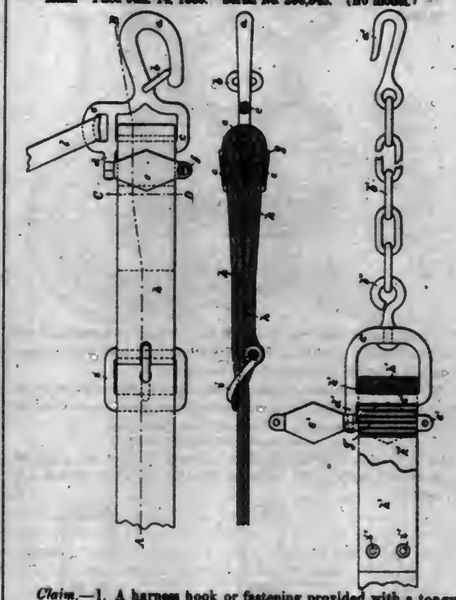


arranged to be separably connected with the latter, substantially as and for the purpose described.

2. An improved portable furnace for brick-kilns of the kind herein described, provided with a hollow bridge-wall opening into the fire-chamber, an air-chamber above the fire-chamber, and with pipes connecting the air-chamber with the bridge-wall, whereby the air is heated and then fed directly into the fire-chamber of the furnace, substantially as and for the purpose set forth.

3. In a furnace substantially as shown, the combination, with the arched roof B, of the fixed base-plate B^2, the movable base-plates b', and the springs b between said plates.

401,173. HOOK FOR HARNESS. DANIEL E. KENDRICK, Boston, Mass. Filed Jan. 14, 1889. Serial No. 296,343. (No model.)



Claim.—1. A harness hook or fastening provided with a tongue adapted to lie between the two parts of the chafing-leather and harness-strap, substantially as described, combined with two clamps pivotally connected to each other and to said harness hook or fastening and adapted to clasp the bight or loop of said strap, and means for drawing and holding said clamps together, for the purpose herein specified and set forth.

2. The harness hook or fastening, substantially as herein described, having a tongue, and two pivoted clamps pivoted to said hook, and a clamp-tightening screw, in combination with the harness-strap and its chafing-leather, substantially as set forth.

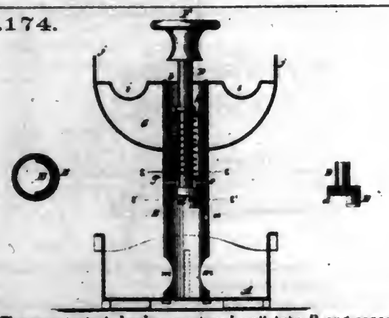
3. The herein-described harness hook or fastening, consisting of the hook a, dog b, frame c, pivot d, clamps $c\,c$, screw f, and tongue g, all constructed and arranged to operate substantially as specified.

4. A harness hook or fastening of the class herein described, combined with the two clamps $c\,c$, pivoted thereto, and the pressure-adjusting screw f, all substantially as and for the purpose specified.

401,174. CIGAR CUTTER AND SUPPORT. PHILIP KERN, Yonkers, N. Y. Filed June 1, 1888. Serial No. 275,714. (No model.)

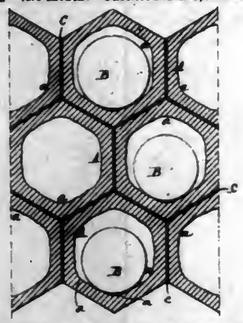
Claim.—1. The single tube B, having opening m at its lower end, a cutter within said tube, rod D, carrying said cutter, and knob F on said rod, combined with the head G, carried at the upper end of said tube and having cigar-recesses i, the head G serving to limit the movement of the knob F, substantially as described.

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2. The receptacle A, having apertured wall, tube B, and concave cutter E within said tube, rod D, carrying the cutter E, and knob F on said rod, combined with the cigar-rest G on the tube B, and the apertured lug *f* on said head, said lug being above the aperture in the wall of the receptacle A, the head G serving to limit the movement of the knob F, substantially as described.

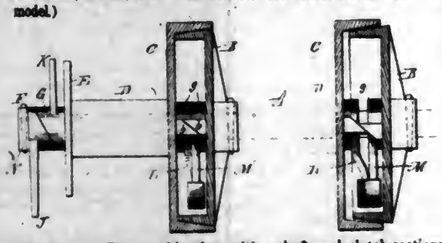
401,175. WINE-BIN. GEORGE KING, East Haddon, County of Northampton, assignor of two-thirds to William Arthur Smith, Weedon, and George King, Jr., East Haddon, England. Filed Jan. 19, 1888. Serial No. 261,244. (No model.) Patented in England Nov. 23, 1886, No. 15,296.



Claim.—1. A wine-bin consisting of a number of hexagonal cells of brick or other suitable material piled together, such cells adapted to contain a bottle, substantially as described.

2. A hexagonal cell adapted to contain a bottle and having its interior surface provided with slightly-hollowed grooves *a* in line with each angle of the hexagon, substantially as described.

401,176. FRICTION-CLUTCH. GEORGE W. KING and HENRY M. BARNHART, Marion, Ohio. Filed Dec. 24, 1888. Serial No. 294,482. (No model.)



Claim.—1. The combination, with a shaft and clutch-sections thereon, of hubs located between the sections and carrying gravity-weights and inclines for separating said sections, substantially as set forth.

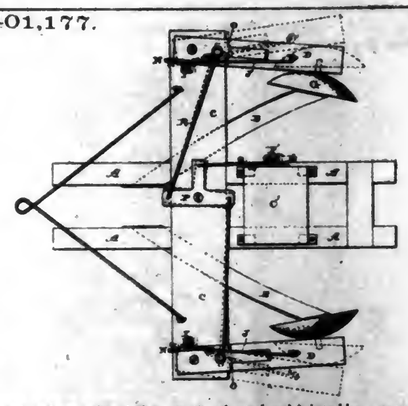
2. In a clutch, the combination, with a shaft and clutch-sections thereon, of hubs located on said shaft and carrying inclines and weights for forcing the clutch-sections apart, and cams for forcing the clutch-sections together, substantially as set forth.

3. In a clutch, the combination, with a shaft, a clutch-section fixed thereon, a clutch-section loosely mounted thereon, and a drum secured to the loose section, of hubs loosely mounted on the shaft between the clutch-sections and carrying inclines and weights for separating the clutch-sections, and cams for holding the clutch-sections together, substantially as set forth.

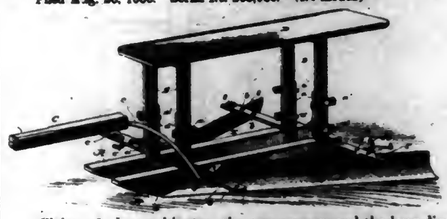
401,177. CULTIVATOR FOR LISTED CORN. HARLIN R. KING, Jackson, Kans. Filed Oct. 18, 1888. Serial No. 288,511. (No model.)

Claim.—In a corn-cultivator, the combination of the runners, the board or frame placed thereon, the pivoted and jointed bars connected to opposite ends of the board, the disks connected to the bars, levers for operating the bars and disks vertically, levers for moving the bars and disks laterally, and cutters which extend from opposite sides of the runners, substantially as shown.

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401,178. CULTIVATOR. FRANK W. KIRKBRIDE, Stratton, Nebr. Filed Aug. 28, 1888. Serial No. 283,980. (No model.)



Claim.—1. In a cultivator, the two runners and the long divergent blades or scrapers located outside of the respective runners, in combination with the blades G, secured to and extending below the runners to prevent lateral movement of the machine.

2. In a cultivator, the arched cross-bars B, having the outwardly-turned ends, the runners secured to said bars and adjustable vertically in relation thereto, and the oblique scrapers secured to the ends of the cross-bars, as shown.

3. The arched cross-bars with the outwardly-turned ends and the oblique scrapers rigidly attached thereto, in combination with the two runners having the upright arms, the clip-bolts securing said arms to the cross-bars, and the blades G, secured to and adjustable vertically upon the runners.

4. In a cultivator, the two runners, the arched cross-bars connecting said runners and extended upward at their ends, and the oblique blades or scrapers bolted to said extended ends and adapted for transposition, as described, whereby they may be caused to throw the earth inward or outward, as occasion may require.

401,179. SEAT FOR VEHICLES. JAMES LEA, Fernleigh, New Road, Bromsgrove, County of Worcester, England. Filed Aug. 8, 1888. Serial No. 282,294. (No model.) Patented in England May 15, 1888, No. 7,202.

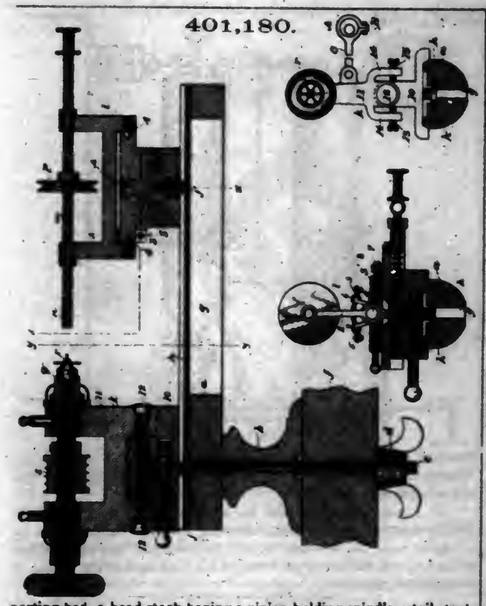


Claim.—As a new article of manufacture, a foot stool or seat consisting of the base-plate H, the secondary plate K, and the top plate, N, all of substantially uniform dimensions and arranged horizontally one above the other, a series of springs secured to and distributed about the under side of the base-plate adjacent to the edges or corners thereof, and two series of springs located, respectively, between and secured to and distributed about the edges or corners of the base and secondary plates, and the secondary and top plates, substantially as and for the purposes described.

401,180. PINION-FACING MACHINE. WILLIAM B. LEARNED and LEONIDAS MURRAY, Boston, Mass., assignors of one-half to The E. Howard Watch and Clock Company, same place. Filed May 6, 1887. Serial No. 237,396. (No model.)

Claim.—1. In a pinion-facing machine, the combination of a supporting-bed, a head-stock having a pinion-holding spindle, a tail-stock having a laterally-movable portion, a spindle journaled in said movable portion, and thereby adapted to reciprocate laterally, and a facing-shell supported by said spindle and having an independent rocking movement thereon, as set forth.

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2. In a pinion-facing machine, the combination of a supporting-bed, a tail-stock having a spindle, a facing-shell supported by said spindle and having a rocking or oscillating motion thereon, and a head-stock having a laterally-movable portion, and a pinion-holding spindle journaled in said movable portion, and thereby adapted to reciprocate laterally, as set forth.

3. A lathe-stock composed of a base, a frame pivoted to said base, and a spindle journaled in said frame, combined with power-driven devices, as an eccentric, A, and connecting-rod C, whereby a continuous rapid rocking or oscillating motion may be automatically imparted to said frame and spindle, as set forth.

4. In a pinion-facing machine, the combination of a spindle having a grooved pulley, a facing-shell supported by said spindle and adapted to rock, a cord engaged with said pulley, and power-driven devices, as a crank-wheel, *w*, and rod *v*, for reciprocating said cord and jarring or rocking the facing-shell, as set forth.

401,181. HANDLE FOR TABLE-CUTLERY. WILLIAM W. LEE, Northampton, Mass. Filed Sept. 7, 1888. Serial No. 284,834. (No model.)



Claim.—The compound handle above described, made up of the shells *a* and *b*, the inner shell, *a*, being of metal and connected to the tang of the instrument, and the outer shell, *b*, being of plastic material and molded upon the inner shell, *a*, all as and for the purpose specified.

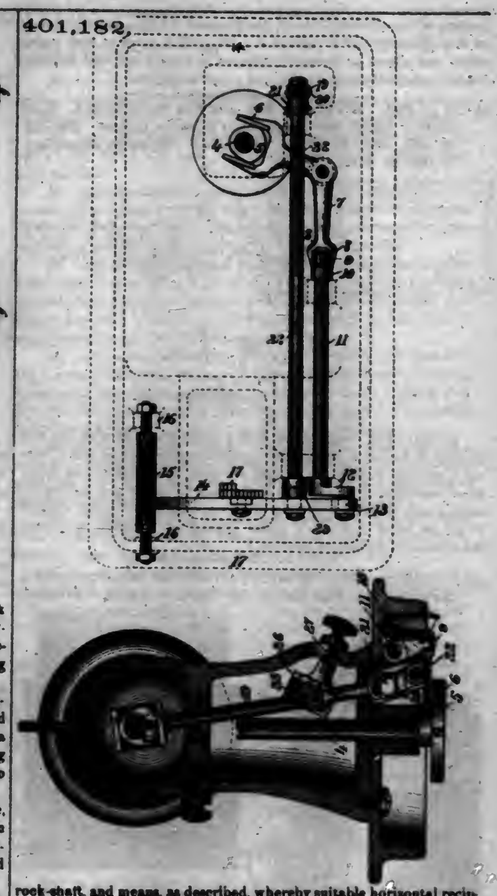
401,182. FEEDING MECHANISM FOR SEWING-MACHINES. FRANCIS T. LEILICH, Bridgeport, Conn. Filed Jan. 25, 1889. Serial No. 297,547. (No model.)

Claim.—1. In a feeding mechanism for sewing-machines, the combination, with the feed-bar slotted and forked at one end, as shown, of a link fulcrumed to the bed and upon which the other end of said bar is supported, a horizontally-extended and cranked rock-shaft engaging the forked end of the bar, whereby the appropriate vertical movement is imparted thereto, the feed-driving rock-shaft engaging the slot in the bar, the cam-actuated bell-crank lever, whereby the feed-lifting rock-shaft is actuated, and the vibratory lever connected to the main shaft, whereby the feed-driving shaft is operated, substantially as set forth.

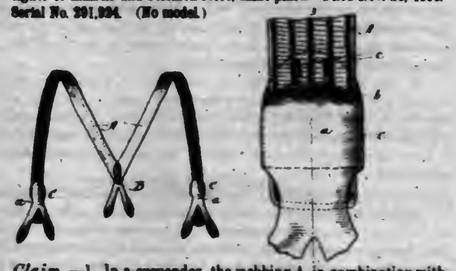
2. In a feeding mechanism for sewing-machines, the combination, with the vertical shaft and the cam secured thereon, of the horizontally-vibrating bell-cranked lever actuated as to one end by said cam, the feed-lifting rock-shaft engaged and actuated by the outer end of said bell-crank lever, the feed-bar operated vertically by said lifting rock-shaft, and means, as described, whereby suitable horizontal reciprocation is imparted to said feed-bar, substantially as and for the purpose specified.

3. In a feeding mechanism for sewing-machines, the combination, with the main shaft and the cam arranged thereon, of the reciprocating connection whose upper end embraces the cam, and whose lower end is forked and engages the wrist of the crank on the feed-driving rock-shaft, a slide-block on the connection, and a grooved block in which the slide-block travels, the slotted arm of the machine, and an adjustable binding device, as a screw, whereby said block may be held in adjusted position, substantially as set forth.

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401,183. SUSPENDERS. HYMAN LIEBENTHAL, Chicago, Ill., assignor to himself and Solomon Price, same place. Filed Nov. 26, 1888. Serial No. 291,934. (No model.)

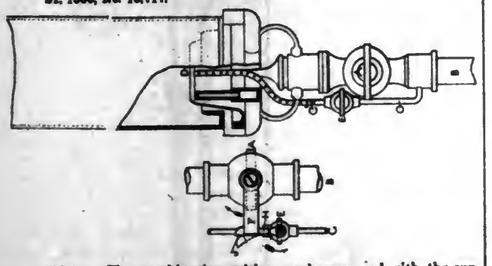


Claim.—1. In a suspender, the webbing A, in combination with straps C, each strap C consisting of a piece, *a*, and a piece, *b*, sewed together at their edges, and a fastener or hook, *c*, secured to the inner face of one of the pieces *a* or *b* near its upper edge, substantially as specified.

2. In a suspender, the webbing A, in combination with straps C, each strap C consisting of a piece, *a*, which is made from a single piece of material, and a piece, *b*, corresponding in form to the upper

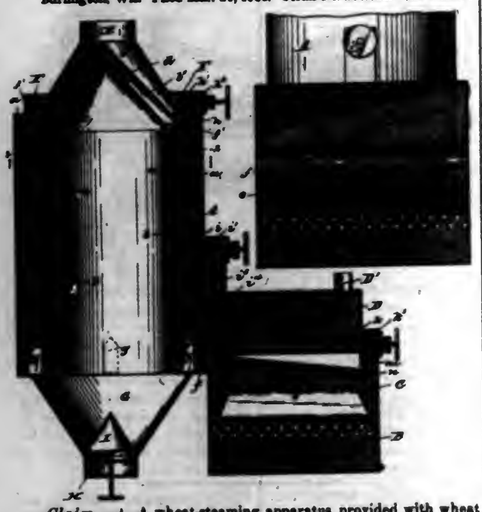
portion of the piece *a*, the two pieces *a* and *b* being sewed together at their side edges and capable of being pulled apart at their upper edges, and a hook or fastener, *c*, adapted to engage and hold the webbing A, substantially as and for the purpose specified.

401,184. APPARATUS FOR LIGHTING GAS-BURNERS. ALEXANDER A. LISTER, Camberwell, County of Surrey, England. Filed Jan 12, 1888. Serial No. 260,516. (No model.) Patented in England Aug. 21, 1886, No. 10,717.



Claim.—The combination, with a gas-burner and with the supply-pipe B, having a tap, A, of the supplementary igniting-pipe C, having a separate cock or tap, E, and provided with interlocking mechanism consisting of the arm H on the plug of tap E, and having the catch J and the arm F on plug of tap A, said arm F being adapted to rest on top of arm H, and under catch J, as described, to prevent the premature turning of the tap A.

401,185. WHEAT-STEAMING APPARATUS. GEORGE LITTLEFIELD, Burlington, Wis. Filed Mar. 29, 1888. Serial No. 268,892. (No model.)



Claim.—1. A wheat-steaming apparatus provided with wheat and steam chambers, combined with a boiler and a water-tank, the latter being in communication with one of the said steam-chambers to enable the water therein to be heated prior to being supplied to the said boiler, substantially as set forth.

2. The combination, with the receptacle A, having the steam-chambers *a* and *b*, the interposed wheat-chamber *c*, and the steam pipe or chamber F, of the boiler C, the water-tank D, communicating with said boiler and with one of said steam-chambers, and the valve *i'*, for controlling admission of steam to said water-tank, substantially as set forth.

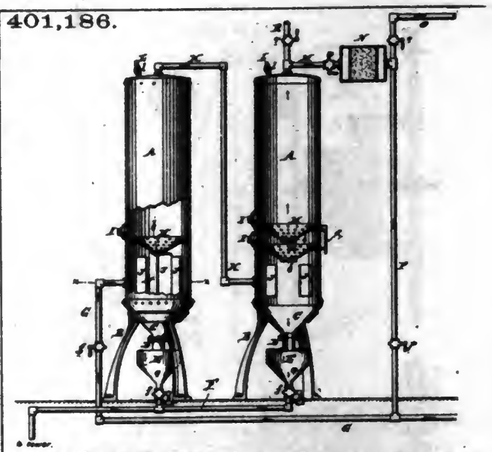
401,186. WATER-PURIFYING APPARATUS. JOHN B. LOVE, Philadelphia, Pa. Filed May 1, 1888. Serial No. 272,433. (No model.)

Claim.—1. In combination, a water-supply main, settling-purifiers having conical bottoms, collecting-chambers below said purifiers communicating with said purifiers by tubular necks, perforated diaphragms, pipe-connection between the supply-main and purifier below the diaphragms, and a valved blow-off pipe from the dirt-collecting chamber.

2. The combination of a street water-main, settling-purifiers having conical bottoms, collecting-chambers below said purifiers communicating with said purifiers by a tubular neck, a filter proper, pipe-connections for causing water to pass successively through the purifiers and filter to the house, and an auxiliary valved pipe leading directly from the purifiers to the house to convey water which does not pass through the filter.

3. A water-settling purifier having a conical bottom, and a collecting-chamber below it communicating with its conical bottom by a tubular neck, and in which the collecting-chamber also has a conical bottom, in combination with a valved blow-off pipe at the bottom of the collecting-chamber.

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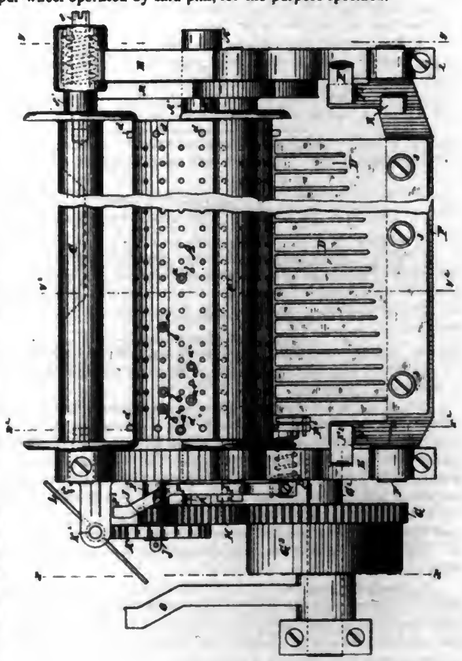


401,187. AUTOMATIC MUSICAL INSTRUMENT. THOMAS A. MACAULAY, New York, N. Y. Filed July 24, 1886. Serial No. 208,915. (No model.)

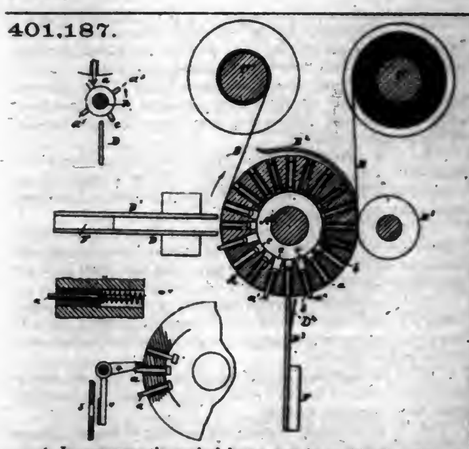
Claim.—1. In an automatic musical instrument controlled by a perforated sheet, a cylinder having movable pins, said pins being held in operative position by gravity alone to operate a sounding device, for the purpose specified.

2. In an automatic musical instrument controlled by a perforated sheet, a cylinder having movable pins, said pins being held in operative position by gravity alone, in combination with means, as A, to operate sounding devices, for the purpose specified.

3. In an automatic musical instrument, in combination, the cylinder having movable pins controlled by a perforated sheet and a spur-wheel operated by said pins, for the purpose specified.



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4. In an automatic musical instrument, in combination, the cylinder having pins controlled by a perforated sheet and a device having multiple projections adapted to be operated by said pins, for the purpose specified.

5. In combination, the cylinder having pins and the spur-wheels C, operated by said pins, for the purpose specified.

6. In combination, the cylinder having pins and a device having multiple projections adapted to be operated by said pins, for the purpose specified.

7. In an automatic musical instrument, a movable perforated sheet, suitable devices for moving said sheet, and a device having multiple projections operated by devices controlled by said sheet, said multiple projections adapted to operate sounding devices.

8. In an automatic musical instrument controlled by a perforated sheet, a cylinder having holes, adjustable bushes fitted into said holes and provided with pins adapted to move outward and inward in said bushes, whereby the extent of movement of the pins is varied, for the purpose specified.

9. In an automatic musical instrument, a cylinder having holes, bushes open at both ends fitted into said holes, and pins having heads or collars loosely fitted in said bushes, for the purpose specified.

10. In an automatic musical instrument controlled by a perforated sheet, a cylinder having holes, bushes fitted into said holes and provided with pins adapted to move outward and inward in the respective bushes, and having heads or collars playing between the bushes and the inner ends of the holes of the cylinder to limit the movement of the pins, for the purpose specified.

11. In an automatic musical instrument, in combination with a cylinder having movable pins controlled by a perforated sheet, a spur-wheel operated by said pins and a sounding device operated by said spur-wheel, for the purpose specified.

12. In an automatic musical instrument, the combination of movable pins in a cylinder controlled by a perforated sheet, a sounding device, as D, and an intermediate rotary device for operating said sounding device.

13. In an automatic musical instrument, the combination of movable pins in a cylinder controlled by a perforated sheet, a sounding device, and an intermediate device for operating said sounding device.

14. In an automatic musical instrument, the combination of a cylinder having pins, a sounding device, and an intermediate rotary device, as A, having projections for operating said sounding device, for the purpose specified.

15. In an automatic musical instrument, the combination of a cylinder having pins, a sounding device, and an intermediate device, as A, having projections, as a^3, for operating said sounding device, for the purpose specified.

16. In an automatic musical instrument, the following elements in combination: a sounding device, as D, a spur-wheel for operating said sounding device, and an automatic device, as A, provided with means to operate said spur-wheel, for the purpose specified.

17. In an automatic musical instrument, the following elements in combination: a sounding device, a rotary device having means to operate said sounding device, and an automatic rotating device, as A, provided with projections adapted to operate said rotary device, for the purpose specified.

18. In an automatic musical instrument, the following elements in combination: a sounding device, as D, a rotary device, as A, having projections, as a^4, adapted to operate said sounding device, and a rotary device having projections for operating said rotary device A, for the purpose specified.

19. In an automatic musical instrument, a movable pin-cylinder having lines of holes arranged in quincuncial order, for the purpose specified.

20. In an automatic musical instrument, a movable pin-cylinder having lines of holes arranged in quincuncial order and a perforated sheet adapted for use with said cylinder, for the purpose specified.

21. In an automatic musical instrument, the combination of the clip P^4, the spring, the lever P^7, and the operating-pin, for the purpose specified.

22. In an automatic musical instrument, the combination of a movable pin-cylinder provided with a stop-pin, a perforated sheet provided with holes registering with said stop-pin for releasing the same, and means, as a lever, for stopping the instrument thereby.

23. In an automatic musical instrument, in combination, a perforated sheet having holes, a cylinder having movable pins controlled by said sheet and a lever or equivalent device operated by said pins, and a fan-wheel or other similar device controlled by said lever to stop the instrument, for the purpose specified.

24. In an automatic musical instrument, a perforated sheet having a line of holes, as *c*, adapted to engage feeding devices, a hole or holes, as c^6, intermediate between said holes, and one or more stop-pins, the feed-engaging holes being adapted to permit the passage over them of the said pin or pins to stop the instrument.

25. In an automatic musical instrument, the combination of a cylinder provided with fixed registering pins, one or more movable stop-pins, and a perforated sheet provided with sets of perforations adapted to the several sets of pins, for the purpose specified.

26. A perforated sheet for automatic musical instruments having one or more holes registering with a stop device and adapted to release the same, whereby the instrument is caused to stop.

27. In an automatic musical instrument, the combination of a perforated flexible sheet, a cylinder having fixed pins registering with said perforations, a wheel, as M, deriving its movement from said cylinder, and a take-up roller, as C, for taking up the flexible sheet.

28. In an automatic musical instrument, in combination with a pin-cylinder, a comb-plate movable away from its operative position, for the purpose specified.

29. In an automatic musical instrument, the combination of the arm R with the comb-plate F, the arm F^2, and the lug F^3, for the purpose specified.

30. In an automatic musical instrument, the combination of the comb-plate F, the arm F^2, and the lug F^3, for the purpose specified.

31. In an automatic musical instrument, in combination with a pin-cylinder two or more comb-plates placed one over the other and provided with corresponding teeth tuned in unison, whereby two or more sounds of the same pitch are produced in succession to represent one note and prolong the same.

32. In an automatic musical instrument, a comb-plate fixed in bearings and adapted to be brought out of and into operative position, for the purpose specified.

33. In an automatic musical instrument, a cylinder having movable pins, a perforated sheet, two or more rows of sounding devices placed one above the other, and devices to operate said sounding devices controlled by said perforated sheet, for the purpose specified.

34. In an automatic musical instrument, a perforated sheet, a cylinder having pins adapted to engage in said perforations, and a roller pressing said sheet against said cylinder, for the purpose specified.

35. In an automatic musical instrument, a cylinder having pins and a guard placed over said cylinder, for the purpose specified.

36. In an automatic musical instrument, a pin-cylinder having a guard fixed in an inclined position over said cylinder, for the purpose specified.

37. A perforated sheet for automatic musical instruments having two lines of equidistant holes and a series of lines of holes unequally distant located between said lines of equidistant holes, for the purpose specified.

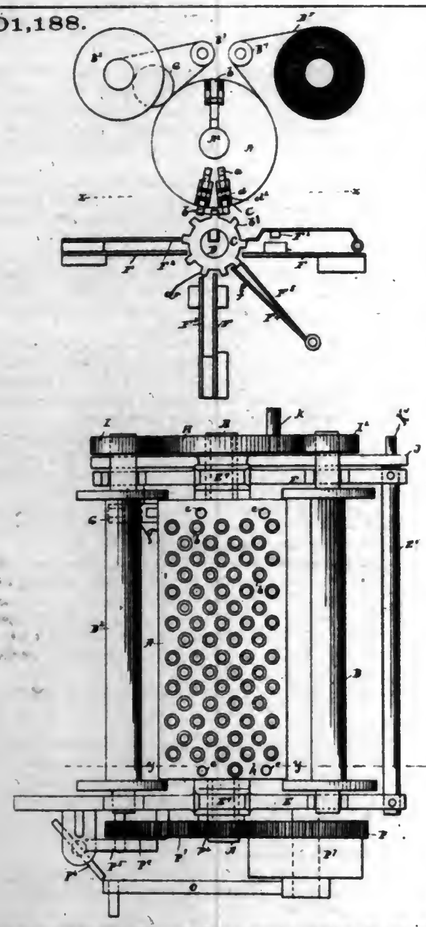
401,188. AUTOMATIC MUSICAL INSTRUMENT. THOMAS A. MACAULAY, New York, N. Y. Filed Dec. 20, 1887. Serial No. 258,460. (No model.)

Claim.—1. In a musical instrument, a picking device and means to operate the same, said picking device provided with multiple projections moving in substantially the same planes and adapted to be brought in simultaneous or nearly simultaneous engagement with two or more sounding devices and set them in vibration.

2. In a musical instrument, a device, as C, and means to operate the same, said device provided with means, as c^5 c^5, moving in substantially the same plane, adapted to be brought into simultaneous or or nearly simultaneous engagement with two or more sounding devices to set them in vibration.

3. In a musical instrument, a spur-wheel, as C, and means to operate the same, having devices, as c^5 c^5, moving in substantially the same plane, adapted to be brought in simultaneous or nearly simul-

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taneous engagement with two or more sound-producing devices and set them in vibration.

4. In an automatic musical instrument, in combination, movable pins in a cylinder controlled by a perforated sheet, a device, as C, operated by said pins, having means, as c^3 c^3, adapted to be brought in simultaneous or nearly simultaneous engagement with two or more sounding devices, for the purpose specified.

5. In a musical instrument, the combination of a spur-wheel, as C, and means to operate the same, and two or more sounding devices arranged in different radial lines in relation to the axis of the spur-wheel, the different projections of the said spur-wheel being adapted to actuate the said sounding devices simultaneously, or nearly so, for the purpose specified.

6. In an automatic musical instrument, a movable perforated sheet, operating devices controlled by said sheet, and a picker having multiple projections operated by said sheet-controlled devices, and two or more sounding devices operated by said multiple projections, for the purpose specified.

7. In an automatic musical instrument having a flexible sheet, a sheet-roller, and take-up roller provided with pulleys, adjustable bearings for said rollers, a wheel for operating said roller-pulleys, and a device adapted to disengage either of said pulleys from said wheel, for the purpose specified.

8. In an automatic musical instrument having a perforated flexible sheet, sheet-roller, and a take-up roller having pulleys, slotted bearing-brackets containing said rollers, a driving-wheel for operating said roller-pulleys, and a lever arranged to disengage either of said rollers from said driving-wheel, for the purpose specified.

9. In an automatic musical instrument, the combination of the driving-wheel H, the pulleys I I^3, the slotted brackets, and the levers J, for the purpose specified.

10. In an automatic musical instrument controlled by a perforated sheet, a pin-cylinder supported in movable bearings and adapted to be raised out of operative position, for the purpose specified.

11. In an automatic musical instrument, a pin-cylinder, a hinged frame supporting said cylinder, and a stopping device, as E^7, for limiting the position of said frame, for the purpose specified.

12. In an automatic musical instrument controlled by a perforated sheet, a pin-cylinder and sheet-rollers supported in a hinged frame adapted to raise said cylinder and rollers out of operative position, for the purpose specified.

13. In an automatic musical instrument, a pin-cylinder, a spur-wheel shaft, a hinged frame in which said cylinder is supported, and a device to fix the operative positions of said cylinder and said spur-wheel shaft, for the purpose specified.

14. In an automatic musical instrument, in combination, a pin-cylinder and spur-wheel shaft, one being movable from the other, and devices by which the relative positions of said spur-wheel shaft and pin-cylinder are fixed when brought into operative position.

15. In an automatic musical instrument, a pin-cylinder, a motor-wheel, a hinged frame in which said cylinder is supported, and a device to fix the operative position of said cylinder and motor-wheel, for the purpose specified.

16. In an automatic musical instrument, a movable pin-cylinder having pin-holes and an axle having a hole connecting with said pin-holes, for the purpose specified.

17. In an automatic musical instrument, a sliding pin-cylinder having an axle provided with a hole through its entire length, for the purpose specified.

18. In an automatic musical instrument, a sheet-roller having two perforated sheets, two pin-cylinders controlled by said sheets of perforations, and two take-up rollers for taking up said sheets, for the purpose specified.

19. In an automatic musical instrument, two perforated sheets containing parts of the same piece of music, pins in two cylinders controlled by said sheets, and devices operated by said pins adapted to operate sounding devices, for the purpose specified.

20. In a musical instrument, the combination of the shaft D, the spur-wheels C, the washers D^2, the screw D^4, and the nuts D^5, for the purpose specified.

21. In a musical instrument, the combination of the shaft D, the spur-wheels C, the washers D^2, and means to secure said spur-wheels and washers on said shaft, for the purpose specified.

22. In an automatic musical instrument, in combination, the shaft D, the washers D^2, and a picking device, and means to secure said picking device and washers on said shaft, for the purpose specified.

23. In a musical instrument, a shaft, as D, having a series of spur-wheels, as C, a comb-plate, as F, and adjusting-bushes, as D^4 D^5, to adjust the positions of said spur-wheels to said comb-plate, for the purpose specified.

24. In a musical instrument, in combination, a shaft having a groove, a series of spur-wheels adapted to rotate on said shaft, and a series of washers having projections adapted to enter the grooves in said shaft.

25. In a musical instrument, in combination, a shaft having a series of rotating spur-wheels, a series of fixed washers alternating with said spur-wheels, and a series of cloth or other similar washers interposed between said spur-wheels and said washers, for the purpose specified.

26. In a musical instrument, in combination, a shaft having a series of spur-wheels and an alternating series of non-rotary separating devices, for the purpose specified.

27. In a musical instrument, a pin-cylinder, a shaft having spur-wheels, as C, and adjustable devices whereby said spur-wheels are adjusted to said pin-cylinder, for the purpose specified.

28. In a musical instrument, a shaft having spur-wheels, a comb-plate operated by said spur-wheels, and devices by which said spur-wheels are adjusted to said comb-plate, for the purpose specified.

29. In an automatic musical instrument, a pin-cylinder having an adjustable bush, said bush being split longitudinally, for the purpose specified.

30. In an automatic musical instrument, a sliding pin having a head or collar, a stopping device for said pin, and a sound-deadening washer, for the purpose specified.

31. In a musical instrument, in combination, the comb-tooth F^2, with the comb-tooth F, the spur-wheel C, and means to operate the same, for the purpose specified.

32. In a musical instrument, in combination, the comb-tooth F^2, arranged to escape action of the picking device C, and the comb F, arranged to be set in vibration by the said picking device, for the purpose specified.

33. In a musical instrument, a comb-tooth, as F^2, arranged to escape the action of its picking device, and the comb-tooth F, arranged to be set in vibration by said picking device, for the purpose specified.

34. In an automatic musical instrument, the combination of a pin-cylinder, a perforated sheet, a spur-wheel, as C, a lever, as F^4, and a spring, as F^5, and a stop-pin, as *f*, for the purpose specified.

35. In a musical instrument controlled by a perforated sheet, the combination of the spur-wheel C, the lever F^4, the spring F^5, and the stop-pin *f*, for the purpose specified.

36. In an automatic musical instrument, a spur-wheel and means to operate it, controlled by a perforated sheet, and a damper operated by a projection on said spur-wheel, said damper held from contact with the sounding device by said projection, for the purpose specified.

37. In an automatic musical instrument, a cylinder having pins, a spur-wheel, as C, operated by said pins, and a damper operated by said spur-wheel, for the purpose specified.

38. In an automatic musical instrument, a comb-tooth-picking device operated by a rotating device having pins, and a damper operated by said picking device, for the purpose specified.

39. In an automatic musical instrument, a spur-wheel and means to operate it, a damper consisting of a lever operated by a projection on said spur-wheel, and a sounding device controlled by said damper, for the purpose specified.

40. In an automatic musical instrument, a flexible sheet having perforations, a cylinder having pins engaging said perforations, an elastic roller pressing said sheet against said cylinder, and a take-up roller, for the purpose specified.

41. In an automatic musical instrument, a flexible sheet having perforations, a cylinder provided with pins engaging said perforations, a roller pressing said sheet against said cylinder, and a take-up roller, said pressure-roller located between said cylinder and said take-up roller, for the purpose specified.

42. In an automatic musical instrument, in combination, a roller having a perforated sheet, a guide-roller, as B^3, one or more, a cylinder having pins engaging in said perforations, and a take-up roller for taking up said sheet, for the purpose specified.

43. In an automatic musical instrument, a flexible sheet having perforations, a cylinder provided with pins engaging said perforations, a roller pressing said sheet against said cylinder, and a take-up roller, for the purpose specified.

44. In a musical instrument, a series of spur-wheels, a shaft and frictional devices, and means to adjust the same, said frictional devices applied to the faces of said spur-wheels, for the purpose specified.

45. A perforated sheet for automatic musical instruments, having lines of holes along its edges, and a blank space at one or both ends of said sheet for some distance between said lines of holes, for the purpose specified.

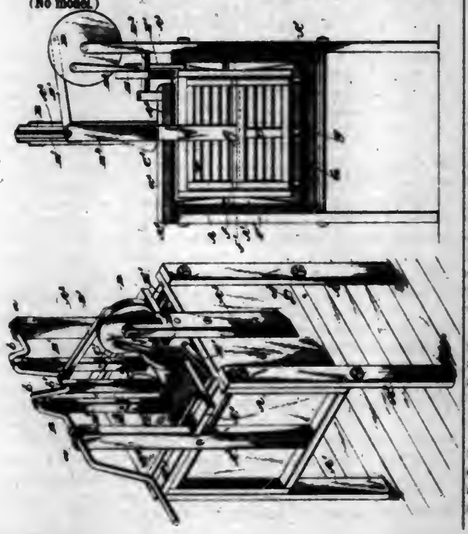
46. A music-sheet roller having two perforated sheets containing different parts of the same piece of music adapted for simultaneous use in automatic musical instruments, for the purpose specified.

47. A duplex perforated sheet adapted for simultaneous use in automatic musical instruments having different parts of the same piece of music on each sheet, for the purpose specified.

401,189. MEDICATED FELT. ANTHONY F. MACHOLD, Philadelphia, Pa. Filed Oct. 25, 1888. Serial No. 289,068. (No specimens.)

Claim.—The herein-described composition of matter, consisting of lamb's wool, dog's hair, and oil of the juniper-berry, in the proportions specified.

401,190. WASHING-MACHINE. SOLOMON MANTLE, JOHN MANTLE, and CHARLES MANTLE, Penfield, Ill. Filed Oct. 4, 1888. Serial No. 287,141. (No model.)

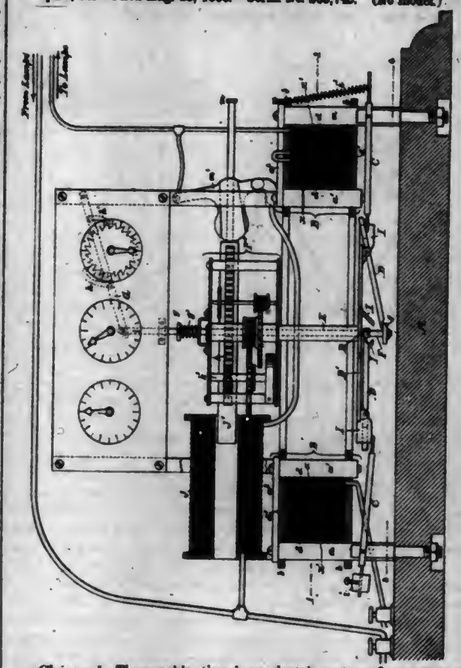


Claim.—1. In a washing-machine, the combination of the washing-box having uprights, the crank-shaft, the vertically-reciprocating pounders attached to the crank-shaft, the semi-rotary disk-wheels connected to the crank-shaft and to each other by pitmen, and the side oscillating rubbers connected to one of said disk-wheels by pitmen, substantially as described.

2. In a washing-machine, the combination, with the pounders and rubbers, of the crank-shaft and disk-wheels, one of which is mounted at right angles to the other, and pitmen connecting the crank-shaft to the upper disk, the disks to each other, and the rubbers to the lower disk, substantially as described.

3. In a washing-machine, the combination of a washing-box having uprights, the crank-shaft having depending pitmen with mortised ends, vertically-reciprocating pounders having posts with upper-tenoned ends adapted to fit into the mortised ends of the depending pitman and forming a hinged joint therewith, the reversely-situated semi-rotary disk-wheels connected to the crank-shaft and to each other by pitmen, the oscillating ribbed rubbers having gudgeons working in curved slots in stripe mounted in the washing-box, and the pitmen connecting said rubbers with one of the disk-wheels, substantially as described.

401,191. ELECTRIC METER. ALBERT H. MARWARDS, Philadelphia, Pa. Filed Aug. 25, 1888. Serial No. 283,745. (No model.)



Claim.—1. The combination, in an electric meter, of a compound magnet energized by the main or lighting current, and a series of register-operating armatures controlled by said magnet and offering a graduated resistance to the attracting power thereof, the retracting device of each armature being independent of those of the other armatures, substantially as specified.

2. The combination, in an electric meter, of a compound magnet energized by the main or lighting current, a series of armatures controlled by said magnet and offering a graduated resistance to the attracting power thereof, and a moving disk or plate carrying elements of the registering apparatus, whereby said elements are carried past the successive armatures, so as to be acted upon by those armatures which are attracted by the magnet, substantially as specified.

3. The combination, in an electric meter, of a compound magnet energized by the main or lighting current, a series of register-operating armatures controlled by said magnet and offering a graduated resistance to the attracting power thereof, and a traversing tripper for acting upon the armatures in succession and moving them away from the attracting-pole of the magnet, all substantially as specified.

4. The combination, in an electric meter, of a compound magnet energized by the main or lighting current, a series of armatures controlled by said magnet and offering a graduated resistance to the attracting power thereof, and a traversing carrier forming part of the registering mechanism and having elements which coact with the

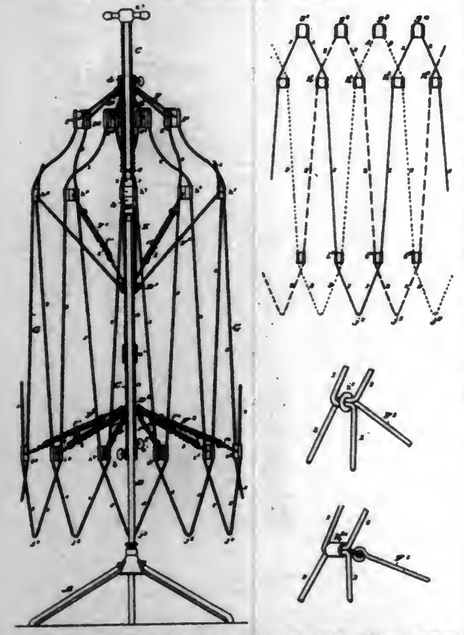
armatures and are so arranged in respect thereto that each of said elements will be acted upon in succession before the first is again acted upon, all substantially as specified.

5. The combination of a compound magnet energized by the main or lighting current, a series of armatures controlled by said magnet and offering a graduated resistance to the attracting power thereof, the ratchet-lever of a registering device, a rod connected to said lever, one or more actuating-levers acted on by the armatures and acting upon said rod to operate the register, a spring for restoring the rod, and a rotated carrier for the actuating-levers, all substantially as specified.

6. The combination of a compound magnet, a series of register-operating armatures governed thereby and offering a graduated resistance to the attracting power thereof, and a double-coil wrapping for said magnet interposed in the main or lighting circuit, whereby the coils may be used either in series or multiple arc, all substantially as specified.

7. The combination of the clock-work mechanism of an electric meter, a solenoid-coil having a core geared to the spring-shaft of said clock-work mechanism, and a switch whereby the coil is thrown into and out of circuit by the movement of the core, all substantially as specified.

401,192. DRESS-FORM. ALBERT McDOWELL, New York, N. Y. Filed Aug. 1, 1887. Serial No. 245,585. (No model.)



Claim.—1. In a dress-form, the combination, with a support therefor, of the expansible rib structure formed of three overlapping zigzag structures of wire or the like connected together at their points of crossing and connected to the distending braces of said support at said crossing-points.

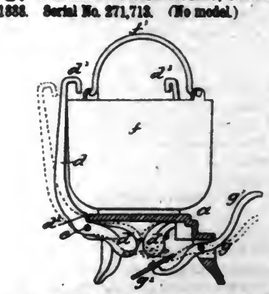
2. The combination, with a standard, a runner, and a rib structure of a dress-form, of an extensible brace composed of two members having eyes or loops formed at their ends, through which the bodies of said members pass, respectively, and one or both of said members corrugated laterally, as and for the purposes set forth.

3. In a dress-form, the combination of the expansible rib structure G, the standard C, provided with right and left screws *c c*, the nut-runners D' D^2 on said screws, the braces F' F^2, connecting said runners, respectively, with the rib structure at the points described, the runner D, the braces F, connecting said runner with the rib structure at the waist, the set-collar over the runner D, and the spring E under runner D, substantially as set forth.

4. In a dress-form, the combination, with a standard and runners thereon, of an expansible rib structure composed of three sets of wires, 1 2 3, which cross each other, and which have laterally-bent portions that lie side by side at the points $1'$ 1^2 1^3 1^4, where said wires cross, and wire expanding-braces hinged to said rib structure at said crossing-points and connecting it with said runners, as set forth.

5. In a dress-form, the combination, with the rib structure, the braces F' and F^2, the runner-nuts D' and D^2, all connected and arranged substantially as set forth, of the upright B, the set-collar *b* thereon, and the tubular standard C, constructed of two parts, provided with right and left screws, as described, and said parts joined together end to end by a sleeve, c^x, as set forth.

401,198. POT-REST. JOSEPH McLEAN, Rockville, Conn. Filed Apr. 24, 1888. Serial No. 271,713. (No model.)



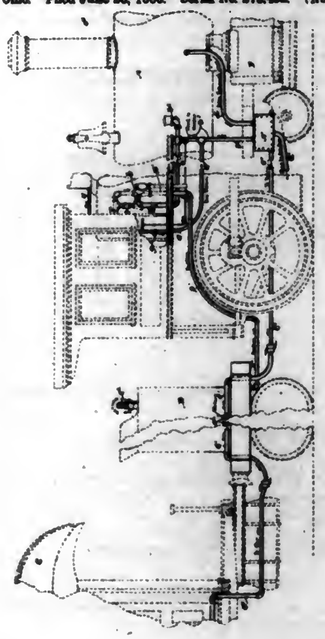
Claim.—1. In combination with a pot-supporting base, the upright arms pivoted to the base on several sides, and having the inturned hooked upper ends and the inward-extending lower ends overlying the inner end of the trip-lever, and the trip-lever with one end located outside the base and the other underlying the inner ends of the several hooked arms, all substantially as described.

2. In a pot-holder, in combination with the base *a*, the plural number of hooked arms *d*, pivoted to the base on several sides, with the inturned lower ends weighted and bent or curved inward, whereby the hooked ends are held normally inward, and the trip-lever *g*, pivoted to the base, with one end extending beyond the base and the other underlying the inner ends of the several arms *d*, all substantially as described.

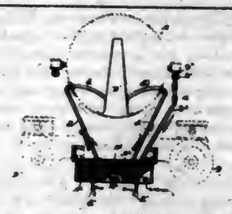
3. In a pot rest or support, in combination with a base, *a*, having suitable feet, *b*, the upright arms *d*, pivoted thereto, each arm having a stop, d^3, and inturned hook d^5 on its upper end, and an inward-extending weighted end, d', and a lever, *g*, pivoted to the base, and with its inner end adapted to engage the lower ends of the arms, all substantially as described.

4. In a pot rest or support, in combination with a base, *a*, the upright hooked arms *d*, pivoted to the base and having inward-extending lower ends, and the lever *g*, pivoted to the base and bearing on its inner end the loose disk g^4, underlying the ends of the arms, all substantially as described.

401,194. CAR-HEATER. JOHN T. MEAD and JOHN THOMSON, Cleveland, Ohio. Filed June 23, 1888. Serial No. 278,402. (No model.)



401,194.



Claim.—1. In car-heater, the combination, with motor for supplying feed-water to the boiler, of heater arranged to receive the overflow feed-water, pipes for conducting the water from the heater through the train and returning the water to the supply-tank of the tender, and pipes connecting the heater with the exhaust of the engine, substantially as set forth.

2. The combination, with heater located under the boiler, such heater having a heating-coil and two steam-compartments, of pipes connecting the said compartments of the heater, respectively, with the exhaust and with the ash-pan of the engine, the said heating-coil being connected in the train-pipe, substantially as set forth.

401,195. PRINTER'S PRESS-POINT. JACOB W. MEISE, Harrisburg, Pa. Filed July 17, 1888. Serial No. 280,187. (No model.)



Claim.—In combination with a piece of press-furniture having a recess in its upper face and a vertical opening leading from the bottom of said recess, a metal socket seated in said opening and provided with a head and internal threads, a press-point having a pointed upper end, a threaded lower end to engage the threads of the socket, and an intermediate angular nut or collar adapted to rest upon the bottom of the recess when the point is level with the face of the type, in the form substantially as described.

401,196. MAIL-POUCH. CHARLES W. MILLER, Clifton, Ariz., assignor of one-half to Charles Royce, same place. Filed July 21, 1888. Serial No. 280,595. (No model.)



Claim.—1. In a mail-pouch, the combination of a plate secured at one side of the mouth for a portion of the length of the plate, and provided with a series of locking-lugs, with a locking-plate mounted at the opposite side of said pouch and secured thereto for a portion of its length, and adapted to receive said lugs, substantially as specified.

2. In a mail-pouch, the combination of a locking-plate secured at one side of the mouth of the pouch for a portion of the length of the plate, and provided with lugs, with a locking-plate secured to the opposite side of the pouch for a portion of its length, and provided with spring-actuated locking-bolt having openings adapted to receive said lugs, substantially as specified.

3. In a mail-pouch, the combination of a plate having inwardly-projecting locking-lugs with a spring-pressed slotted guard-plate secured to the pouch under the lugs, substantially as specified.

4. In a mail-pouch, a plate having locking-lugs connected for a portion of its length to the pouch, in combination with a locking-plate secured for a portion of its length to the opposite side of the pouch, and provided with a locking-bolt for the reception of lugs, and an interposed hinge, the ends of which are connected to said plate, substantially as specified.

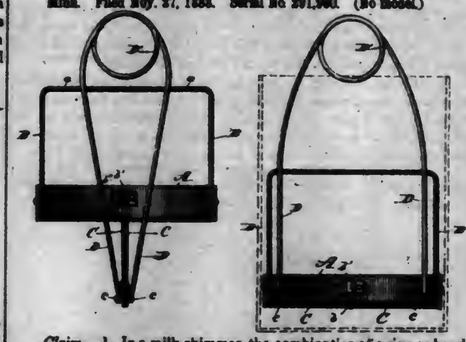
5. In a mail-pouch, the combination of opposite plates adapted to lock and secured to the pouch for a portion of their length with an interposed spring-hinge adapted to spring the plates apart when said plates are not locked, substantially as specified.

6. In a mail-pouch, the combination of two opposite plates adapted to lock with a spring-hinge secured to and mounted intermediate said plates, and formed with a central coil adapted to take into recesses formed in the ends of said plates when the same are closed and locked, substantially as specified.

7. The combination, with the pouch 1, of the plate 2, having the lugs 5 and connected to the pouch for a portion of its length, and of the plate 3, having the openings 13 and 15, the interposed inwardly-folding hinges 19, and the bolt-plate 11, perforated, as at 12, and having the interposed spring 14, substantially as specified.

8. The combination, with the pouch 1, having openings 8, of the plate 2, having the end recesses, 4, and the lugs 5, and of the locking-plate 3, having the openings 13, and locking-bolt 11, having openings 12, the spring 14, for actuating said bolt-plate, and of the spring-hinges 19, having the coils 20 and 21, and the stiffening-plate 24, perforated, as at 25, substantially as specified.

401,197. MILK-SKIMMER. ALBERT T. MILLS, Lac Qui Parle, Minn. Filed Nov. 27, 1888. Serial No. 291,960. (No model.)



Claim.—1. In a milk-skimmer, the combination of a ring or band, A, a transverse rod, *b*, extended across the bottom of this band and provided with upturned ends *b'*, clips *b''*, for securing or clamping these upturned ends *b'* against the interior of the said band, semicircular bottom plates, C C, pivoted upon the transverse rod *b*, the curved edges of these plates being adapted to fit within the said band A, and operating-rods pivoted to the said hinged bottom plates, substantially as and for the purpose herein set forth.

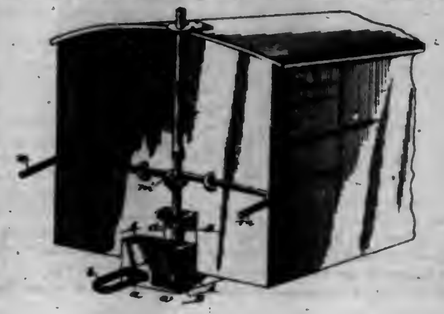
2. The combination of a rim or band provided with a suitable bail, a transverse rod secured to this rim, two semicircular bottom plates, C C, pivoted upon this rod, and the spring-actuating operating-rods, the normal tendency of these rods being to press inward, substantially as described.

3. The combination of a circular rim or band, a bail, B, secured to the rim and provided with slots *a a*, a stationary rod, *b*, secured to the said rim, two semicircular bottom plates pivoted upon this rod, spring-actuated rods D, attached to the said bottom plates and passing through the slots *a a* in the bail, and a spring connected to these rods to press their lower ends inwardly, substantially as described.

4. In a milk-skimmer, the combination of a ring or band, a pivotal rod attached thereto, bottom plates pivotally attached to this rod, vertical operating-rods pivotally attached to these bottom plates, and a spring interposed between the upper ends of the said operating-rods and formed integral with the same, substantially as described.

401,198. CAR-COUPLING. JOEL I. MOSHEIMER, Fowlton, Kans. Filed Sept. 26, 1888. Serial No. 286,423. (No model.)

Claim.—1. In a car-coupling, the combination, with the draw-bar and the coupling-pin, of the impact-block, the vertical lever C, pivoted at its upper end and engaging with the said impact-block at its lower end, and the pin-supporting bar adapted to be engaged by



401,198.



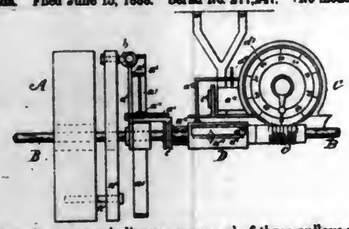
the said lever C, and having its front end extended and adapted to engage directly with the said coupling-pin, substantially as and for the purpose described.

2. In a car-coupling, the combination, with the draw-bar, the impact-block, and the lever C, of the bar F, the spring G, the bar H, arranged parallel with the bar F and adapted to be engaged by the lever C, and the spring J, substantially as described.

3. In a car-coupling, the combination, with the draw-bar, the impact-block, the lever C, and the spring G, of the bar H, having its front end reduced and provided with the projection A^2, the spring K, having its front end extended within the path of the lever C, and the spring J, substantially as and for the purpose described.

4. In a car-coupling, the combination of the draw-bar having the chamber D, the partition E, dividing the chamber into two compartments, the bar F and the spring G in one compartment, the bar H and the spring J in the other compartment, the spring K on bar H, the impact-block, and the lever C, substantially as described.

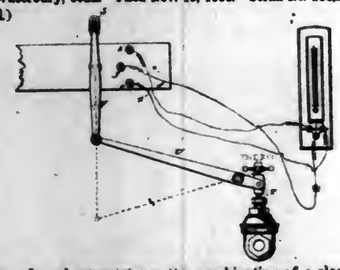
401,199. POWER-INDICATOR. EMERY NIXON, Toronto, Ontario, Canada. Filed June 15, 1888. Serial No. 277,247. (No model.)



Claim.—1. A power-indicator composed of three pulleys of about equal diameter, the first pulley, A, being the driven pulley from the factory-pulley and being loose on the shaft B, and the second pulley, a^3, having two driving-bolts, one of them, a', projecting sidewise and between two arms of the first pulley, from which it receives its motion, the other bolt, b, projecting from the other side, and going behind the outer end of an arm, a^4, journaled on the hub of the third pulley, a^2, the outer end of said arm bearing upon the rear end of a compression-spring, a^5, secured on the circumference of the third pulley, which is rigidly secured on the shaft B, the vibrations of which compression-spring are utilized to operate a rack, a^7, pinion a^8, spindle a^9, lower pinion, a^{10}, and rack with tongue a^{11}, which racks and pinions aforesaid operate a pointer, a^{14}, denoting upon a graduated scale the pressure in pounds on the surface of the first driven pulley, substantially as shown and described.

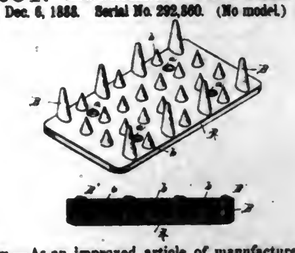
2. In a power-indicator composed of three pulleys of about equal diameter, the pulleys A and a^3, loose on the shaft B, the pulley a^2, rigidly secured on the said shaft, the driving-bolts a' and b in pulley a^3, the arm a^4, journaled in the hub of pulley a^2, and compression-spring a^5, secured on the circumference of pulley a^2, the rack a^7, pinion a^8, spindle a^9, lower pinion, a^{10}, and rack with tongue a^{11}, all combined and operating as set forth.

401,200. ELECTRIC VALVE-CONTROLLER. WILLIAM E. NORRIS, Waterbury, Conn. Filed Nov. 19, 1888. Serial No. 291,269. (No model.)



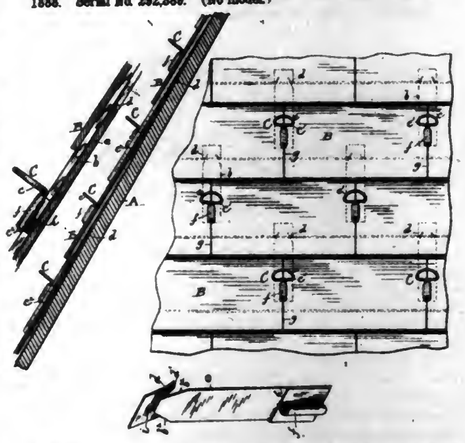
Claim.—In a heat-regulator, the combination of a clock-work, an arm revolved thereby, connections from the said arm to the valve or damper of the heating apparatus, a magnet, a lever one arm of which forms the armature for said magnet, the other arm provided with a dog, and the rapidly-revolving part of the clock-work provided with a finger revolving in a path corresponding to the said dog of the armature-lever and adapted to engage therewith when the circuit is broken or disengage therefrom when the circuit is closed, a wheel in connection with said clock-work and adapted to revolve therewith, the said wheel constructed with notches in its periphery at opposite points, the said points corresponding to the extreme positions of the said arm, and the armature-lever constructed with a finger adapted to engage said notches when the circuit is open, but adapted to ride upon the periphery of said wheel between the said notches, two spring-contacts in connection with one line of the electric circuit, but arranged upon opposite sides of a revolving arbor in said clock-work, the said revolving arbor carrying an arm which is adapted to engage said contacts at predetermined points in its revolution and make connection with the magnet through the frame at either of said points, as the case may be, the said magnet having one end of its wire in connection with the frame of the clock-work and the other end in connection with the other line of the electric circuit, substantially as described.

401,201. BELT-FASTENER. JOHN B. NORTON, Philadelphia, Pa. Filed Dec. 6, 1888. Serial No. 292,860. (No model.)



Claim.—As an improved article of manufacture, the herein-described belt-fastener, consisting of a rectangular metallic plate having rivet-apertures a, arranged as described, and provided on opposite sides with a row of flattened clinchable teeth separated from one another by short conical non-clinchable teeth, and with intermediate rows of short conical non-clinchable teeth intersecting or breaking joints with the side rows of alternate long and short teeth, substantially as and for the purpose set forth.

401,202. SNOW-GUARD. THOMAS O'GARA, Worcester, Mass., assignor of one-half to Orlando W. Norcross, same place. Filed Dec. 1, 1888. Serial No. 292,389. (No model.)

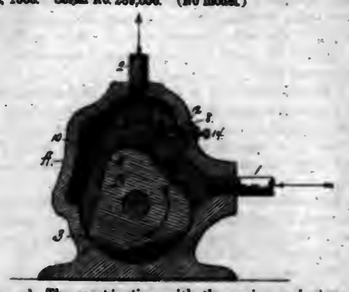


Claim.—1. A snow-guard consisting of a strip of sheet metal having holding-ears at its upper end projecting back of its under surface, adapted to catch and hold over the upper edge of the bottom slate, and also provided with a suitable bracket or snow-stop at its lower end, the sheet-metal strip being adapted to be passed up under the edges of two abutting slates, with the aforesaid snow-stop projecting up through the joint between them above the surface thereof, substantially as set forth.

2. A snow-guard comprising, in combination, the sheet-metal strip b, having its upper end cut to produce the ears d d, projecting back to form hooks adapted to catch and hold over the upper edge of the bottom slate, and said upper end of the main strip bent forward for the purpose specified, said strip also being provided at its lower end with a longitudinal socket, and the wire part c bent to form a holding-loop or snow-stop, and straight ends at about right angles thereto adapted to be inserted into the aforesaid socket to hold said wire part in position, substantially as set forth.

3. The sheet-metal strip b, having the ears d d, projecting back from its upper end, and a longitudinal holding-socket upon the face of its lower end, in combination with the wire part c, bent in such manner as to form a snow-stop and to be inserted into the holding-socket aforesaid, substantially as and for the purpose set forth.

401,203. ROTARY PUMP. JAMES H. PARKER, Utica, N. Y. Filed Oct. 24, 1888. Serial No. 289,056. (No model.)



Claim.—1. The combination, with the casing and piston of a rotary pump, of the abutment C, pivotally mounted in the casing over the piston, and formed with an arm terminating in a head to set with its end face against the casing, and a downward-extending part to rest on the piston, and an arm, 10, formed to rest on the piston opposite to the abutment-head, substantially as described, and for the purpose specified.

2. The combination, with the casing formed with an abutment bearing-surface having a packing-seat and provided with an adjustable packing arranged in said seat, and the rotary piston, of an abutment, C, pivotally mounted in the casing over the piston, and formed with a head arranged to set with its face end against the abutment bearing-surface of the casing, and said head having a downward-extending arm, 9, and having an arm, 10, to rest on the surface of the piston, substantially as described, and for the purpose specified.

3. In a rotary pump, an abutment pivotally mounted in the casing over the piston, and formed with an arm terminating in a head arranged to bear with its end surface against the surface of the casing and to rest with its lower end on the surface of the piston, and an arm formed to bear on the piston, said arm having its end extended to project partly across the water-course, substantially as described, and for the purpose set forth.

401,204. IGNITING APPARATUS FOR GAS-ENGINES. LEWIS C. PARKER and BEAUMONT PARKER, Kansas City, Mo. Filed Dec. 3, 1888. Serial No. 292,505. (No model.)



Claim.—1. As an improvement in gas-engines, the combination with the inlet pipe or chamber, of the exhaust-chamber and its valve, the ignition-chamber applied to one side of the inlet pipe or chamber, around and outside the inlet-arm of which is applied a plate or disk, and between which and a second plate is interposed asbestus covering, together with means for fastening in place the same, substantially as set forth.

2. As an improvement in gas-engines, the combination, with the valved inlet pipe or chamber having connection with an exhaust-chamber connected to the power-cylinder, of the ignition-chamber applied to one side of the inlet pipe or chamber, and having a valve provided with a port, the apertured shield overhanging the ignition-tube, and the heating medium disposed below the ignition-tube and having its flame within said shield, substantially as set forth.

3. The combination, with the inlet pipe or chamber, of the plate or disk secured thereto, the interposed asbestus, the arm or shield having an asbestus covering, and the securing-bolts, substantially as described.

401,205. HEATING STREET-CARS. WILLIAM H. PATTON, Pueblo, Colo. Filed Nov. 12, 1887. Renewed Mar. 5, 1889. Serial No. 302,018. (No model.)

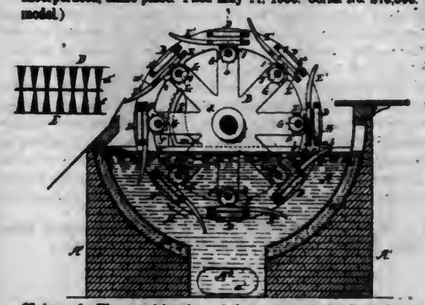
Claim.—The combination, with a gas-engine mounted upon a wheeled frame and having a surrounding water-jacket, of the pipe

401,205.



E, leading from said water-jacket to and through the cars to be heated, a tank, C', into which the returning end of said pipe discharges, a second tank above the gas-machine, into which the water from the tank C' is forced, and a pipe leading from said second tank into the surrounding water-jacket, whereby a continuous circulation is effected, substantially as herein described.

401,206. HARDENING APPARATUS FOR SAW-BLADES, &c. SAMUEL T. PAUL, Philadelphia, Pa., assignor to Henry Disston & Sons, Incorporated, same place. Filed May 11, 1888. Serial No. 273,506. (No model.)

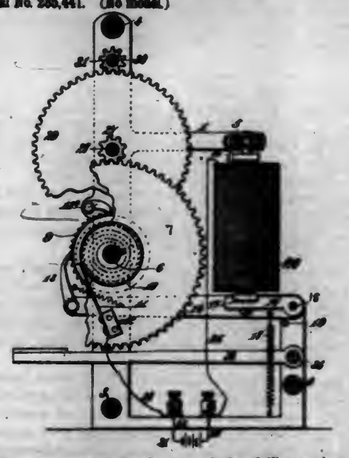


Claim.—1. The combination of the tank and the drum having a series of grids with movable frames, with devices acting upon said movable frames to clamp the saw-blank or other blade between the grid and frame, substantially as described.

2. The combination of the tank, the rotatable drum mounted in bearings thereon and having a series of grids, with movable frames opposite said grids, and cams adapted to clamp said movable frames to the grids, substantially as described.

3. The combination of the drum formed of a series of grids, a series of frames opposite the series of grids, and a cam-shaft with cams thereon, with pinions on the end of each cam-shaft, and racks with which the pinions engage to move the frames toward or from the grids, substantially as and for the purpose described.

401,207. COMBINED MECHANICAL AND ELECTRO-MAGNETIC MOTOR. CHARLES A. RANDALL, London, England. Filed Sept. 15, 1888. Serial No. 285,441. (No model.)



Claim.—1. A motor for driving a lathe, drill, or other machine, consisting of a train of gearing having a drive-wheel to connect with and operate the lathe or other machine, a motive power for supplying the force to actuate the train of gearing, a ratchet-wheel for rewinding the motive power, a pawl-carrier having its pawl arranged to

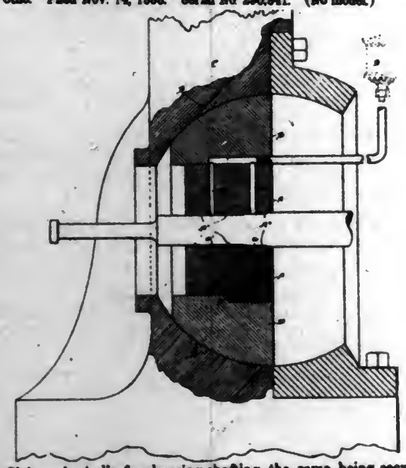
engage the ratchet-wheel, an electro-magnet, an armature-lever, an electric circuit, a revolving circuit-closing wheel having an annular row of alternating make-and-break contact-points, and a contact-finger in the circuit alternately acting on said annular row of alternating make-and-break contact-points to vitalize the electro-magnet at intervals, substantially as described.

2. A motor for driving a lathe, drill, or other machine, consisting of a train of wheels, one of which is provided with a lateral stud, a drive-wheel revolved by said train and having means to connect with and operate the lathe or other machine, a motive power for actuating the train of wheels, electro-magnetic mechanism, substantially as described, operating at intervals to rewind the motive power, a governor for controlling the speed of the drive-wheel, and a lever operating the governor and having a pin to engage and hold the aforesaid lateral stud, substantially as described.

3. A motor for driving a lathe, drill, or other machine, consisting of a train of gearing having a drive-wheel to connect with and operate the lathe or other machine, a motive power for actuating the train of gearing, an electric circuit, an electro-magnet in the circuit, pawl-and-ratchet mechanism, an armature-lever, a revolving circuit-closing wheel having an annular row of alternating make-and-break contact-points, and a contact-finger in the circuit acting alternately on said annular row of make-and-break points to vitalize the magnet at intervals and rewind the motive power the extent to which it unwound while the circuit was broken, substantially as described.

4. The combination, in a motor, of a train of gearing, a motive power for actuating the same, the ratchet-wheels, the pawl-carrier, the armature-lever, the electro-magnet, the circuit, the revolving circuit-closing wheel having an annular row of alternating make-and-break contact-points, and the contact-finger acting alternately on the said annular row of make-and-break points to energize the magnet at intervals and rewind the motive power, substantially as described.

401,208. DIE FOR DRAWING SHAFTING. JOSEPH RAPP, Akron, Ohio. Filed Nov. 14, 1888. Serial No. 290,841. (No model.)



Claim.—1. A die for drawing shafting, the same being secured to a ring having a spherical bearing in the housing, substantially as shown, whereby the die may turn universally to bring itself in alignment with the engaging shafting, substantially as set forth.

2. The combination, with the die for drawing shafting, of a band or ring embracing such die, the periphery of the band or ring being spherical and engaging a corresponding spherical seat in the supporting-housing, substantially as set forth.

3. A die for drawing shafting, the same being loosely mounted, whereby it may turn universally to bring itself in alignment with the engaging shafting, and provided with receiving and finishing bores of unequal diameter, with an annular groove separating these bores, and with suitable holes connecting such annular groove with the lubricating device, substantially as set forth.

4. A die secured to a ring having a ball-and-socket bearing and provided with receiving and finishing bores of unequal diameter, an annular recess between the bores for lubricating, an annular groove midway of the finishing-bore for lubricating, and with suitable holes connecting such recess and groove with an oiler, substantially as set forth.

401,209. SLIDE-VALVE. HARRY C. REAGAN, Philadelphia, Pa. Filed Jan. 26, 1888. Serial No. 297,635. (No model.)



Claim.—1. The combination, in a slide-valve, of the main steam-inlet passages and supplemental inlet-passages, and the exhaust-chamber, with a valve for controlling said supplementary inlet-passages, substantially as described.

2. The combination, in a slide-valve, of the passages F F', supplemental passages *f f'*, and a passage, *e*, with a valve, G, having on its stem a pinion meshing with a stationary rack, so that on the reciprocation of the main valve said valve G will be oscillated to open one or other of the ports *f f'* to the steam, substantially as and for the purpose set forth.

3. The combination, in a steam-valve, of the exhaust-chamber *f'* and a steam-passage with a pipe connecting said exhaust and steam passages, and a check-valve in said pipe to allow for the escape of steam from the exhaust to the steam-passage, but check any escape of steam from the steam-passage into the exhaust, substantially as set forth.

4. The combination of the slide-valve and its steam-passages with the valve-seat having grooves so situated as to be uncovered by one or other of the steam-passages, whereby the lubricant in said grooves will be atomized, as and for the purpose set forth.

5. The combination, in a slide-valve, of the reservoirs J J, outlets *j j'*, and grooves J' J', substantially as described.

6. The combination, in a slide-valve, of the valve G, having an indicator-hand, *i*, with a dial on the said slide-valve, substantially as and for the purpose described.

401,210. BOOK AND BOOK-COVER. ISABELLA REED, New York, N. Y. Filed Aug. 17, 1887. Serial No. 247,151. (No model.)



Claim.—A book-cover having designated spaces for an address, postage, or other indicated purpose, with words of direction and information placed thereon, said cover being permanently bound with a book and serving also as a mailing-cover instead of a wrapper, substantially as described.

401,211. SHEET-METAL VESSEL. HENRY S. REYNOLDS, Brooklyn, N. Y. Filed July 9, 1888. Serial No. 279,474. (No model.)

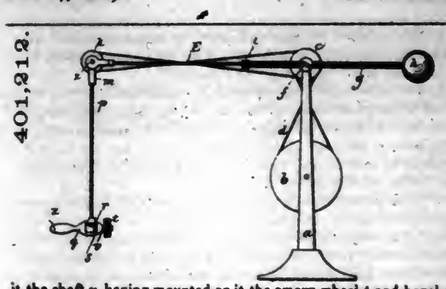


Claim.—The body A, having the flange *i*, foot B, having the flange *o*, and the bottom C, having the dished bottom *c*, the sides *p*, rising therefrom, and the outturned flange *r* at the upper edge of the sides, and the flange *e* beneath the flanges of the body and foot, the said flanges *r* and *o* embracing the flanges of the body and foot above the dished bottom, and thus uniting the body and foot and securing the bottom in place, substantially as described.

401,212. GRINDING-MACHINE. WILLIAM S. ROBBINS, New Bedford, Mass. Filed July 20, 1888. Serial No. 280,878. (No model.)

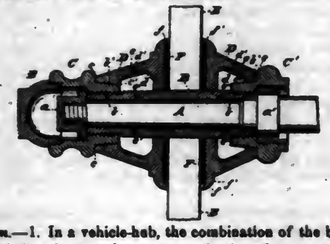
Claim.—In a grinding-machine, the combination of the standard *a*, band-wheels *b* and *c*, pivoted tube *g*, rod *e*, provided with fork *x*, the shaft *n*, provided with band-wheel *k*, and bevel-gear meshing with bevel-gear on rod *p* and pivoting the fork *x* and yoke *m* together, the rod *p*, journaled in yoke *m* and box *q* and provided with bevel-gears *o* and *r*, the box *q*, provided with handle *z*, having journaled in





it the shaft *v*, having mounted on it the emery-wheel *t*, and bevel-gear *s*, all as shown and described.

401,213. WHEEL-HUB. EDWARD C. ROBERTS, Abingdon, Va. Filed July 28, 1888. Serial No. 281,396. (No model.)

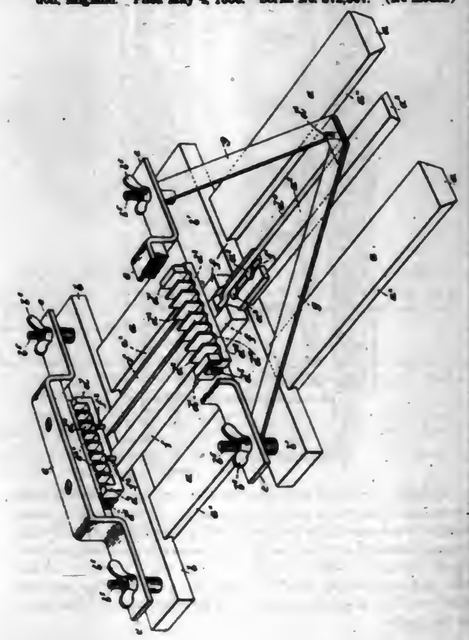


Claim.—1. In a vehicle-hub, the combination of the box having the threaded ends, the clamping-nuts having the transversely-beveled portion, the bearing-rings, and the washer, substantially as specified.

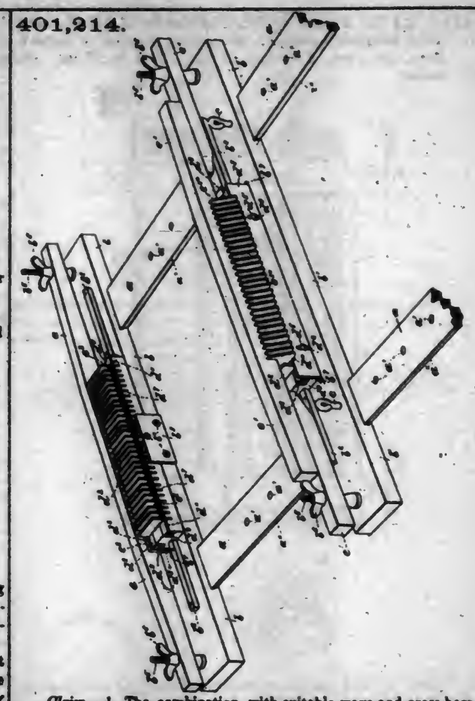
2. In a vehicle-hub, the combination, with the box threaded at its ends, of the clamping-nut C, having the beveled portion, the shoulder *c*, and the rearwardly-projecting portion, the nut C, having the beveled portion, the annular shoulder, and the threaded outer end, the cap E, the bearing-rings having the oil-chamber, the flared opening and the flange, and the rubber washers, substantially as specified.

3. A wheel-hub consisting of the box threaded at its ends, the clamping-nuts having the threaded and beveled inwardly-projecting portion, the cap E, engaging a threaded portion of the nut C, the bearing-rings having the annular recess *d*, the flared opening and the flange, and the rubber washer, substantially as specified.

401,214. PLAITING APPARATUS. CORNELIS F. A. ROELL, London, England. Filed May 4, 1888. Serial No. 272,867. (No model.)



401,214.



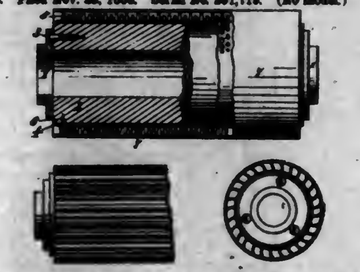
Claim.—1. The combination, with suitable ways and cross-bars, of the lower comb-bars, each lower comb-bar having a series of comb-plates, and the upper comb-bars, each upper comb-bar having a series of comb-plates, substantially as described.

2. The combination, with suitable ways, of the cross-bars sliding thereon, the lower comb-bars secured to the cross-bars, the uprights secured to the ends of the cross-bars, the upper comb-bars through which the uprights project, and the fly-nuts by which the upper comb-bars are secured, substantially as described.

3. The combination, with suitable ways and cross-bars, of the lower comb-bars, each lower comb-bar having a series of comb-plates, the adjustable plates for regulating the depth of work between the comb-plates, and the upper comb-bars, each upper comb-bar having a series of comb-plates, substantially as described.

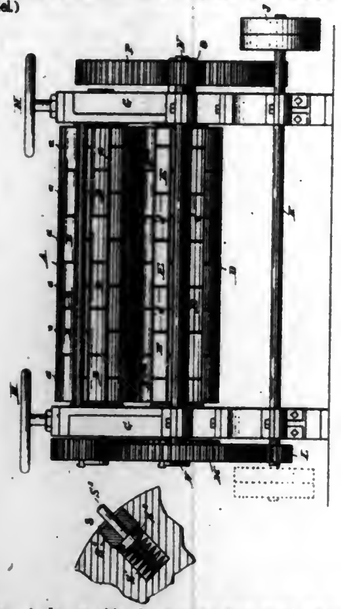
4. The combination, with suitable ways and cross-bars, of the lower comb-bars, each lower comb-bar having a series of comb-plates, the guide-bars, the upper comb-bars, each upper comb-bar having comb-plates, the links connected to the traversing cross-bar, and the rod connected to the lower traversing comb-bar and to the links, substantially as described.

401,215. SAND-PAPER DEVICE. SIMON ROSS, Jr., Linwood, Ohio. Filed Nov. 22, 1888. Serial No. 291,719. (No model.)



Claim.—As an improved article of manufacture, the herein-described sandpapering device, consisting of a drum provided with a tubular covering-band fixed thereto and formed integral with a series of inherently-elastic soft-rubber projections extending radially from the surface of the band, separated to provide intervening air-circulating spaces and yieldingly holding and driving a sand-paper band by frictional contact therewith to permit the free circulation of air between the adjacent surfaces of the soft-rubber projections and the sand-paper band, substantially as described.

401,216. ROLLER-DIE FOR STAMPING SHEET METAL. LOSELEY L. SAGENDORPH, Cincinnati, Ohio, assignor of one-half to Harlan P. Lloyd, same place. Filed June 15, 1888. Serial No. 277,251. (No model.)

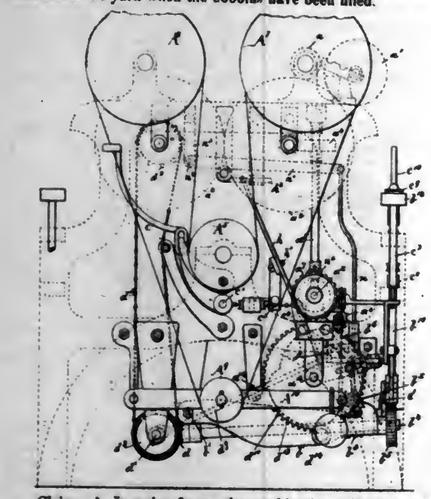


Claim.—1. In a machine for stamping sheet metal, the two roller-dies adapted to mesh, and journaled in suitable sliding blocks in the end frames, in combination with the gears I, keyed to the spindles of said dies, and the spring-gages S in one of said roller-dies, and suitable mechanism for rotating said dies, substantially as set forth.

2. In a machine for stamping sheet metal, having two roller-dies, the spring-gages located in one of said dies and consisting of the spring S', pin S^2, having the flanged head S^3, and stop S^4, substantially as set forth.

401,217. RING-SPINNING FRAME. WILLIAM H. SALTMARSH and CHARLES A. BOSARDUS, Chicopee Falls, Mass. Filed Sept. 14, 1888. Serial No. 285,415. (No model.)

Brief.—The object of the invention is to provide a ring-frame with means whereby the ring-rail may be automatically lowered to wind down the yarn when the bobbins have been filled.



Claim.—1. In a ring-frame, the combination, with the building-lever, chain-hub, and pick-shaft, of the reversing-shaft, connecting gearing between the reversing-shaft and pick-shaft and between the pick-shaft and chain-hub, and with means to actuate the said reversing-shaft to operate the pick-shaft, substantially as described.

2. The builder-lever, the pick-shaft, its attached ratchet and pawl p, combined with the lever d^9, and the connection between the said lever and pawl, substantially as described.

3. The belt-shipper rod, the lever to engage and hold the said rod, the leg-lever n, connected thereto and having a projection, 3, and the lever d^9, having the finger or projection 4, combined with the locking-lever f, and with means to move it to release the lever d^9, and means to actuate said lever at the completion of the winding-down motion, substantially as described.

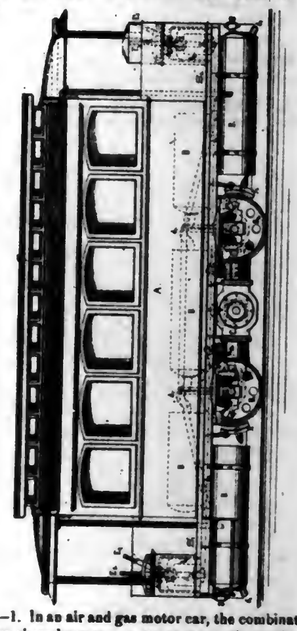
4. The builder-lever, the pick-shaft, the reversing-shaft, the gearing between it and the pick-shaft, means to rotate the reversing-shaft, the lever d^9, a spring to effect the engagement of the said gearing, a latch to hold the said lever d^9, and a tripping device, as c', for the said latch, combined with the ring-rail, lifting-rod, and with means between the builder-lever and lifting-rod to lift the lifting-rod, whereby as the lifting-rod makes its greatest upstroke the said latch is actuated to release the said lever and cause the reversing-shaft to rotate the pick-shaft, substantially as described.

5. The builder-lever, the pick-shaft, the sliding reversing-shaft, its actuating-spring, the gear between the said shafts, and means to rotate the said reversing-shaft, combined with the lever d^9 and the latch e to hold the said lever in position to disengage the gears between the reversing and pick shafts, substantially as described.

6. The builder-lever, the pick-shaft, the sliding reversing-shaft, its engaging spring, the gear between the said shafts, and means to rotate the said reversing-shaft, combined with the lever d^9 and with the locking device f to engage the said lever and lock it in position to keep the gears between the reversing and pick shafts in engagement while the reversing-shaft actuates the pick-shaft, substantially as described.

7. The builder-lever, means to move it, the pick-shaft having the worm and the beveled gear, the chain-hub having the worm-gear, the chain, the rock-shaft to which it is connected, and the lifting-rod and ring-rail, and the ratchet-wheel and pawl to move the pick-shaft intermittingly, combined with the reversing-shaft, its gear d^8, and means to rotate the said shaft, and means to automatically stop the rotation of the spindles as soon as the ring-rail reaches its lowest position after starting to wind the yarn down over the yarn load preparatory to doffing the bobbins, substantially as described.

401,218. AIR AND GAS LOCOMOTIVE. ALBERT SCHMID, ROBERT SIEGFRIED, and JOHN C. BECKFELD, Allegheny, Pa., said Siegfried assignor to said Schmid. Filed Dec. 14, 1888. Serial No. 293,569. (No model.)



Claim.—1. In an air and gas motor car, the combination of tanks for containing air under pressure, one or more other tanks for containing gas under pressure, a combustion-chamber with which said tanks communicate and in which the air and gas burn continuously, an interposed mixing-chamber, an engine driven by the products of combustion, and a controlling-lever upon each end of the car for governing the flow of the products of combustion from the combustion-chamber to the engine.

2. In an air and gas motor car, the combination of a double-compound single-acting reversible engine, tanks for containing air and gas under pressure, a combustion-chamber in which the mingled air and gas are consumed, pipes leading from the combustion-chamber to the respective ends of the car, and levers for controlling the flow of the products of combustion through said pipes to the engine located on the car.

3. In an air and gas motor car, the combination of a double-compound single-acting engine, tanks for containing air and gas under pressure, a combustion-chamber in wich the mingled air and gas are consumed, pipes leading from the combustion-chamber to the respective ends of the car, levers for controlling the flow of the products of combustion through said pipes to the engine located on the car, brakes applied to the wheels of the car, cylinders having their pistons connected with the brake-levers, pipes communicating with the combustion-chamber and leading from the respective platforms to said brake-cylinders, and levers located upon the respective platforms for controlling the flow of the products of combustion from said combustion-chamber through said pipes.

4. In an air and gas motor car, the combination of a double-compound single-acting engine, tanks for containing air and gas under pressure, a combustion-chamber in which the mingled air and gas are consumed, pipes leading from the combustion-chamber to the respective ends of the car, levers for controlling the flow of the products of combustion through said pipes to the engine located on the car, a reversing-gear on the engine, and levers located upon the respective platforms for operating the reversing-gear.

5. In an air and gas motor car, the combination of an engine, tanks for containing air and gas under pressure, a combustion chamber in which the mingled air and gas are consumed, pipes leading from the combustion-chamber to the respective ends of the car, and levers for controlling the flow of the products of combustion through said pipes to the engine located on the car.

6. In a double-compound single-acting engine, two high-pressure cylinders and two low-pressure cylinders located upon opposite sides of the driven crank-shaft, in combination with a vehicle carrying the engine and apparatus for supplying the products of combustion to said engine.

7. In a double-compound single-acting engine, two high-pressure cylinders and two low-pressure cylinders located upon opposite sides of the driven crank-shaft, in combination with a vehicle carrying the engine and apparatus for supplying the products of combustion to said engine, and valves intervening between the high-pressure and low-pressure cylinders, whereby the latter are used automatically as high-pressure cylinders in case the valves of the small cylinder are in such a position as not to admit gases to their respective cylinders.

401,219. POCKET-BOOK. ERNST SCHNUPP, East New York, assignor to Well & Livingston, New York, N. Y. Filed Feb. 28, 1889. Serial No. 301,454. (No model.)

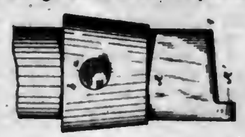


Claim.—The combination, with the jaws, of a bag or body secured below the jaws and gussets or flaps extending above said jaws when the bag is open and folding between the same when the jaws are closed, substantially as described.

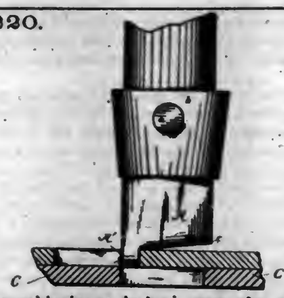
401,220. PUNCH. FREDERICK H. SKIDEL, Easton, Pa., assignor of one-half to Henry C. Barnet and Frank Traumbiter, same place. Filed Jan. 2, 1888. Serial No. 295,167. (No model.)

Claim.—1. The punch having at lower corner edge of its inclined shear cutting-edge a, combined guide projection and cutter having a central beveled and pointed cutting-edge, substantially as shown and described, and for the purposes set forth.

2. The punch having a central beveled and pointed inclined shear

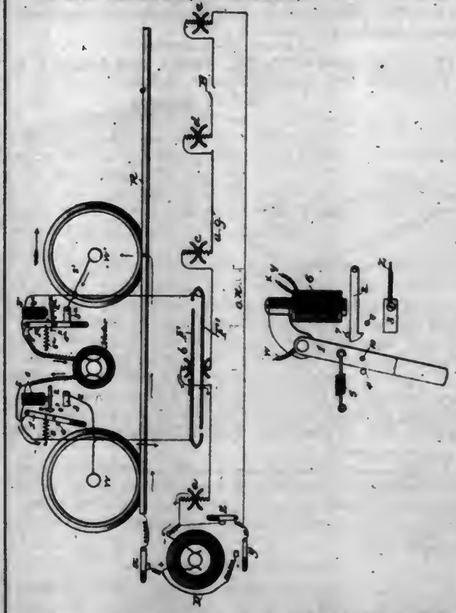


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cutting-edge, and having at the lower corner edge of said cutter a combined guide projection and cutter having a central beveled and pointed cutting-edge, substantially as set forth.

401,221. ELECTRIC RAILWAY. SIDNEY H. SHORT, Denver, Colo., assignor to the United States Electric Company, same place. Filed Feb. 17, 1887. Serial No. 227,960. (No model.)



Claim.—1. In combination with the main and return conductor of a series electric railway, a generator therefor, and a current-collector, movable connections from the terminals of the generator to connect one of the said terminals with the main and return conductors of the railway, and the other terminal of the generator with a rail, as R, connections from said rail to the motor, and interposed switches on the car between said rail and motor, with connections between said switches and the motor on the car, and between said switches and the current-collector, substantially as described.

2. In combination with a car and electric motor carried thereby, connections between said motor and the rail and between said motor and the current-collector, with interposed switches on the car between the rail and the motor, a generator, a rail in connection therewith, and conductors arranged in parallel, substantially as described.

3. In combination with the car, a motor carried thereby, connections from said motor to the rail and to the current-collector, an interposed switch, a main conductor in connection with one terminal of the generator, a return-wire, O H, switches y z, for changing the connection of the said return-wire from one terminal to the other of said generator, and a switch, x, for connecting the rail with the generator, substantially as described.

4. In combination with a generator, the conductors x g O H in connection with one terminal, a rail, R, in connection with the other terminal, a motor on the car, a connection between the rail and the motor and a connection between the motor and the current-collector, a spring-actuated switch on the car between one terminal of the motor and the rail, an electro-magnet adapted to release said switch, and thus automatically short-circuit the motor, a second switch between

the other terminal of the motor and the rail, and connections from said rail to said motor through the said switch, and connections from the other terminal of said motor to the current-collector, substantially as described.

5. In combination with the generator, conductors arranged in parallel in connection with one terminal, a rail in connection with the other terminal, electrical connections from the rail to the motor on the car, an interposed switch-blade for making or breaking this connection, a connection between the motor and the current-collector, an electro-magnet interposed, and an armature automatically operated by the passage of the current through the electric magnet to break the connection from the rail to the motor, substantially as described.

6. In combination with the system of electrical railway described, a switch consisting of an electro-magnet interposed between the motor and the current-collector, a pivoted lever, 1, a contact-block, 3, electrically connected to the rail, and the pivoted armature 2, adapted to engage with the lever 1, substantially as described.

7. In combination with the main and return conductor of a series electric railway, a generator therefor, and a current-collector, movable connections from the terminals of the generator to connect one of said terminals with the main and return conductor of the railway and the other terminal of the generator with a rail, as R, and connections from the rail to the motor and from the motor to the current-collector, substantially as described.

401,222. GAME APPARATUS. HENRY L. SMITH, Brooklyn, N. Y.

Filed July 28, 1888. Serial No. 281,299. (No model.)

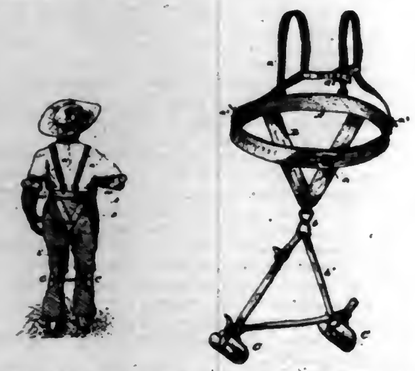


Claim.—1. In a game apparatus, the combination, with a board or table laid out to represent a ball-field and provided with raised sides, of an elastic cushion having a curved outer surface and representing a batter and a number of pins or pegs representing fielders.

2. A game apparatus comprising a board or table laid out to represent a ball-field and provided with raised sides an elastic cushion representing the batter, and projections extending laterally from the sides of the field and toward the "diamond," substantially as and for the purpose specified.

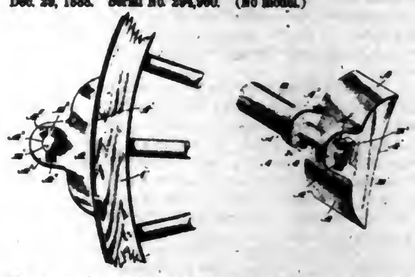
3. A game apparatus comprising a board or table laid out to represent a ball-field and provided with raised sides, an elastic cushion representing the batter, and a bridge provided with arches extending across the rear portion of the field, substantially as and for the purpose specified.

401,223. BRACE FOR BACK AND LEGS. JOSEPH H. SMITH, Kaufman, Tex. Filed Jan. 22, 1889. Serial No. 297,122. (No model.)



Claim.—In a back and leg brace, the combination of the belt A, the straps *a' a'*, secured to the belt A, the straps B B, secured to the belt A and extending downward V-shaped, the links at the lower ends of the straps B B, the strap *b'*, the pads C, attached to the lower ends of the strap *b'*, and the necessary buckles to secure and adjust the device to the body of the wearer, substantially as described and shown.

401,224. BRAKE FOR VEHICLES. THOMAS S. SMITH, Washington, D. C., assignor of one-half to Henry Copperthite, same place. Filed Dec. 29, 1888. Serial No. 294,960. (No model.)



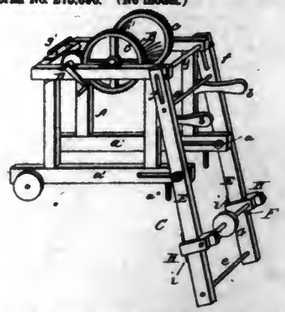
Claim.—1. In combination with the brake-bar having a suitable shank or stem, the brake-block having an opening to receive such stem, and a lug on the stem engaging a portion of the block, so as to hold it in place on the stem, substantially as and for the purpose specified.

2. In combination with the brake-block having the opening for reception of a supporting-stem, the brake-bar having a stem extending through such opening, and a shoulder and lug at opposite ends of the opening to hold the block in place on the stem, substantially as and for the purpose shown.

3. In combination with the brake-block having the shank-receiving opening with an offset at one side, the brake-bar having a stem or shank to enter the opening in the brake-block, and having the shoulder and the lug to engage the block at opposite ends of the opening, with the lug so situated as to be out of line with the offset from the opening when the block is in operative position, substantially as and for the purpose set forth.

4. In combination with the brake-bar having the brake-block-supporting shank and the shoulder and lug at opposite ends of such shank, the brake-block having the shank-receiving opening with an offset so situated as to be out of line with the lug on the shank when the block is in operative position, and a lug or shoulder on the block to engage the lug on the stem, so as to limit the rotation or tilting of the block, substantially as and for the purpose described.

401,225. APPARATUS FOR LAYING ELECTRICAL CONDUCTORS. WALTER F. SMITH, Philadelphia, Pa., assignor to the United Electric Improvement Company, Gloucester City, N. J. Filed June 1, 1888. Serial No. 275,696. (No model.)



Claim.—1. The combination, with the portable winch or windlass frame A, having elongated longitudinally-slotted base-bars *a'*, of the supplementary detachable and adjustable frame E, carrying the pulley G, and secured to said base-bars by bolts a^3, substantially as described.

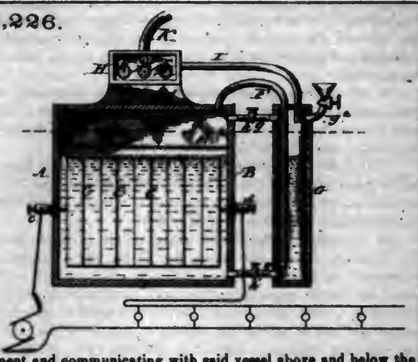
2. The combination, with the portable winch or windlass frame A, of the supplementary adjustable and detachable frame E E, the adjustable stirrups H, secured to the frame E E, the pulley G, and the pulley-shaft F, mounted in said stirrups, substantially as set forth.

3. The combination, with the horizontal winch or windlass frame having longitudinally-slotted base-bars and transverse tie-bar *g*, of the supplementary pulley-frame C and bolts a^2 a^3, substantially as set forth.

401,226. ELECTRIC METER. WALTER F. SMITH, Philadelphia, Pa., assignor to the United Electric Improvement Company, Gloucester City, N. J. Filed Aug. 22, 1888. Serial No. 283,431. (No model.)

Claim.—1. In an electric meter, the combination, with a vessel adapted to contain a fluid-conductor, electrodes contained in said vessel, and a gas-measuring instrument in communication therewith, of an auxiliary receptacle interposed between said vessel and measuring-

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instrument and communicating with said vessel above and below the fluid-level thereof, substantially as and for the purpose described.

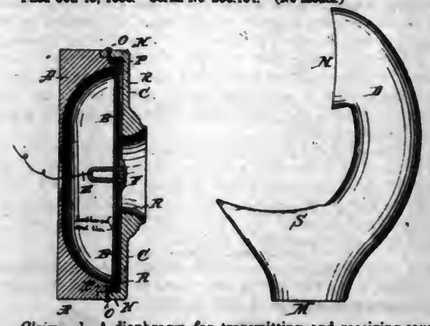
2. In an electric meter, the combination of a closed vessel containing electrodes and adapted to contain a fluid-conductor, a foraminated partition arranged in said vessel above the fluid-level, and a gas-measuring instrument in communication with said vessel by a pipe opening into the vessel above said partition, substantially as described.

3. In an electric meter, the combination, with a vessel containing electrodes composed of sections of iron nickel-coated and a solution of caustic potash, of a gas-measuring instrument in communication with said vessel, substantially as described.

4. In an electric meter, the combination, with a vessel adapted to contain a fluid-conductor, of electrodes contained in said vessel and composed of sections of iron coated with nickel and a gas-measuring instrument in communication with said vessel, substantially as described.

5. In an electric meter, the combination, with a vessel containing electrodes composed of sections of iron and a solution of caustic potash, of a gas-measuring instrument in communication with said vessel, substantially as described.

401,227. MECHANICAL TELEPHONE. GEORGE THOMAS, New York, N. Y., assignor of one-third to Joseph H. Simpson, same place. Filed Oct. 15, 1888. Serial No. 288,137. (No model.)



Claim.—1. A diaphragm for transmitting and receiving sound, composed of leatheroid and tin, substantially as described.

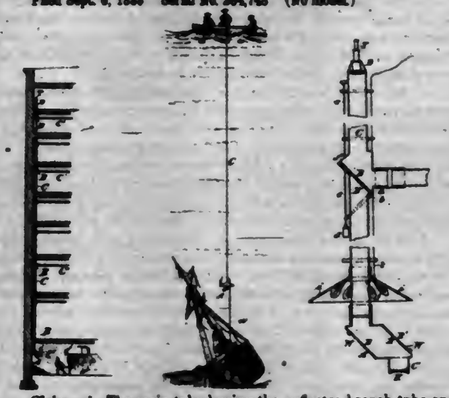
2. A combined mouth and ear attachment made rigid in one piece and adapted to be detachably attached to a telephone, and consisting of two communicating chambers, the opening of one of which, when in use, is applied to the mouth simultaneously with placing the ear at the opening of the other, substantially as described.

401,228. WASHING-MACHINE. FREDRICH W. TIEMANN, Fort Wayne, Ind. Filed Mar. 27, 1888. Serial No. 268,606. (No model.)



Claim.—In a washing-machine, the combination, with a supporting-frame having seats or bearings, of a rectangular frame having journals engaging therewith, and a barrel pivotally mounted within said frame and provided with bolts projecting through curved slots formed in half-disks mounted on said rectangular frame, thumb-nuts being turned upon the bolts to lock the barrel, substantially as described.

401,229. OPTICAL DEVICE FOR THE OBSERVATION OF LOCALITIES BY REFLECTION. HOWARD A. TRAFF, Brooklyn, N. Y. Filed Sept. 6, 1888. Serial No. 284,748. (No model.)



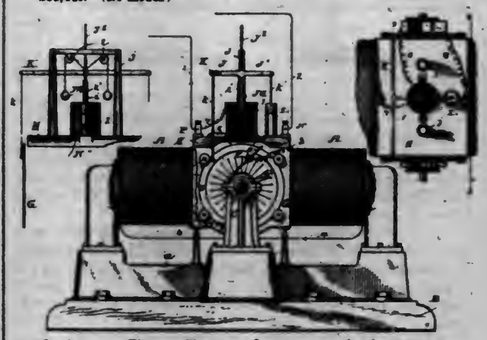
Claim.—1. The main tube having the reflector branch tube and reducing-lens at one end and a telescope at the other, combined with means for producing illumination adjacent to said reflector, substantially as set forth.

2. The main tube having an eye-piece at one end and the reflector at the other end, combined with a branch leading from said reflector, provided with a double-concave lens, substantially as set forth.

3. The main tube having a telescope at one end and the reflector at the other end, combined with a branch leading from said reflector and having a double-concave lens, substantially as set forth.

4. The main tube having a branch tube extending therefrom, combined with the weighted movable reflector at the union of the tubes, the reflector being at equal angles with the axial lines of the tubes, substantially as set forth.

401,230. REGULATOR FOR DYNAMO-ELECTRIC MACHINES. CHARLES J. VAN DEPOELE, Chicago, Ill. Filed Aug. 22, 1888. Serial No. 283,446. (No model.)



Claim.—1. The combination of a generator having two armatures within its field of force, one supplying the main working-circuit, the other being in circuit with and supplying current to the field-magnet coils of the generator, and a motor for automatically adjusting the commutator-brushes of both armatures and arranged to raise or lower said commutator-brushes, and thereby increase or diminish the output of the armature supplying the field-magnet circuit, according to the rise or fall of potential in the main circuit, and prevent sparking in the brushes of the main armature, substantially as described.

2. The combination of a generator having two armatures, one of which is included in the main working-circuit, the other in circuit with the field-magnets of the generator, and a motor for adjusting the commutator-brushes of both armatures, comprising a solenoid included in the main circuit and arranged to lower or raise the said commutator-brushes, according to the rise or fall of potential arising from increased or diminished demand for current in the main circuit, substantially as described.

3. In combination with the field-magnets of an electric generator, two armatures, one in the main circuit and the other acting as an

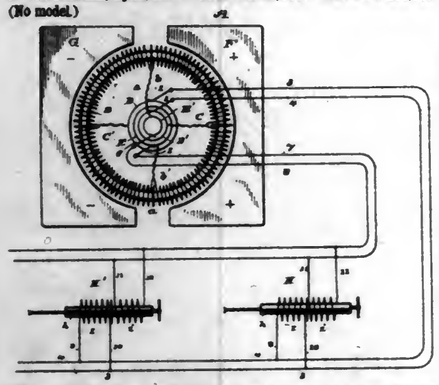
exciter and in circuit with the field-magnets of the generator, and a motor for adjusting the brushes of both armatures, comprising a solenoid or solenoids included in the main circuit and a plunger or plungers influenced thereby and arranged to lower or raise the commutator-brushes according to the flow of current in the main circuit, substantially as described.

4. The combination, with the field-magnets of an electric generator, of two armatures, the mumutator-brushes of both of which are rotatively mounted, and a motor actuated by the main current and arranged to shift all the brushes at once, according to the flow of current in the main circuit, substantially as described.

5. In an electric generator, the combination, with suitable supports thereon, of movable commutator-brush-carrying frames, a solenoid included in the main circuit, an iron plunger for said solenoid, a frame secured to and extending from said plunger and connected to the brush-carrying frame, a guiding-frame extending over the plunger, and counter-weights suspended from said guiding-frame and arranged to raise the plunger and its connections when less than the predetermined current is passing in the solenoid, substantially as described.

6. In an electric generator, the combination, with suitable supports thereon, of movable commutator-brush-carrying frames, solenoids adapted to be put in circuit with the coils of the field-magnets and having iron plungers mechanically connected to the movable frames to move said frames in the desired direction, a solenoid included in the main circuit and having an iron plunger, and circuit-connections extending from the commutator-brush-actuating solenoids and into the path of the plunger of the solenoid in the main circuit, whereby one or the other of said solenoids will be actuated in accordance with the increase or decrease of demand for current in the main circuit, substantially as set forth.

401,231. RECIPROCATING ELECTRIC-ENGINE SYSTEM. CHAS. J. VAN DEPOELE, Lynn, Mass. Filed Jan. 21, 1889. Serial No. 296,981. (No model.)



Claim.—1. An electro-magnetic reciprocating engine system, comprising a generator adapted to produce independent current phases, a reciprocating electro-magnetic engine having two or more motor-coils, and independent circuits extending between the coil or coils and the generator, substantially as described.

2. An electro-magnetic reciprocating engine having two or more sets of motor-coils and a movable core adapted to be reciprocated by the alternate action of said coils thereon, a generator producing two or more independent currents, and separate closed supply-circuits for supplying motive currents to the said motor-coils, substantially as described.

3. In an electro-magnetic reciprocating engine system, a reciprocating engine comprising two or more motor-coils, a generator adapted to produce current of different phases corresponding to the desired speed of reciprocation, and separate circuit-connections between the generator and the said motor-coils for energizing the same in alternation to produce reciprocatory movement of the piston, substantially as described.

4. In a reciprocating electric-engine system, an electric generator for producing defined electric impulses, comprising an armature divided into four or more parts, each connected to a separate insulated collector, a reciprocating electric engine or engines each having a plurality of motor-coils, and separate supply-conductors extending between the separate portions of the generating-armature and connecting the same with the motor-coils of the engine.

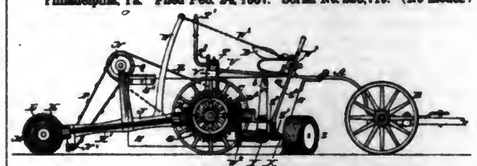
5. In a reciprocating electric-engine system, an electric generator for producing defined electric impulses, comprising an armature divided into four or more parts, each connected to a separate insulated collector-ring, a suitable field of force within which said armature may be rotated, a reciprocating electric engine or engines each having a plurality of motor-coils, and separate supply-conductors extending between the separate portions of the generating-armature and connecting the same with the motor-coils of the engine, substantially as described.

6. An electro-magnetic reciprocating engine comprising motor-coils, an iron core adapted to be reciprocated therein, and a magnetic cylinder enveloping the coil or coils, the mass of said cylinder being subdivided, substantially as described.

7. An electro-magnetic reciprocating engine having motor-coils and a movable core adapted to be reciprocated therein, and iron heads at each end of the coil or coils, the mass of the iron in said heads being subdivided, substantially as described.

8. In a reciprocating electric-engine system, an electric generator for producing defined electric impulses, comprising a magnetic core, a primary coil thereon, a secondary in inductive relation to the primary, an electric engine or engines, and separate supply-conductors extending between different portions of the secondary coils of the generator and coil or coils of the electric engine or engines, and means for supplying continuous current to different parts of the primary coils, comprising a rotating circuit-making device and means for adjusting and determining the rate of movement thereof, substantially as described.

401,232. STREET-SWEEPING MACHINE. CHARLES WHELER, Philadelphia, Pa. Filed Feb. 24, 1887. Serial No. 228,719. (No model.)



Claim.—1. A street-sweeping machine consisting of a truck with a rising-and-falling frame pivotally mounted on its rear axle, a rotary brush and an endless apron journaled on said frame and operated by the rotation of the hind wheels of the truck, and a side brush having a tumble-joint-shaft coupling and gearing by which it is operated from the axles of one of the hind wheels of the truck, substantially as described.

2. A street-sweeping machine consisting of a truck with a rising-and-falling frame pivotally mounted on its rear axle, a rotary brush and an endless apron journaled on said frame and operated by the rotation of the hind wheels of the truck, an adjustable box supported on said truck, a rotary shaft and chain, the latter connected to an arm of the rising-and-falling frame, and a side brush rotated by gearing connected with a bevel-wheel on the axle of one of the hind wheels of the truck, said parts being combined substantially as and for the purpose set forth.

3. In a street-sweeping machine, the gear-wheel G, mounted on one of the axles of the running-gear, in combination with the bevel-wheel W^2, the sectional rotary shaft X, having gimbal-joint Y and a brush, the gearing W^4, connecting the shaft X with bevel-wheel W^2, and the arm Z^2, hinged to the truck A and provided with collar Z' and lever Z^3, all substantially as described.

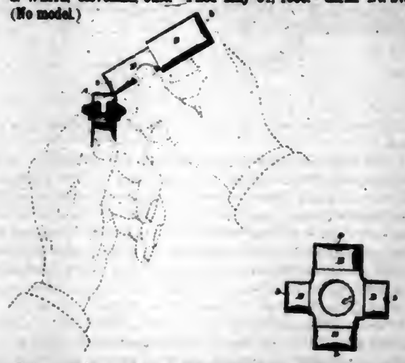
401,233. TOILET OR WRAPPING PAPER ROLL. SETH WHEELER, Albany, N. Y. Filed July 24, 1888. Serial No. 280,914. (No model.) Patented in Canada Sept. 13, 1888, No. 29,856.



Claim.—1. A roll of paper having all its incisions or perforations in the same plane, with the cut edges tending outward, substantially as described, whereby the roll is adapted to permit the introduction of a suspensory device through the incisions from the interior outwardly.

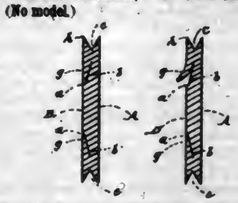
2. As a new manufacture, a roll of paper having all its incisions or perforations in the same plane, with the cut edges tending outward, and provided with a suspensory device introduced from the interior of the roll and passing outwardly through the incisions, substantially as described.

401,234. FORMER FOR RESTORING RENT WICK-TUBES. JOHN S. WHITE, Cleveland, Ohio. Filed May 31, 1888. Serial No. 275,603. (No model.)



Claim.—A former for restoring wick-tubes of lamps or lanterns, said former being adapted to fit snugly inside the wick-tube, the former having a thin edge at the end thereof, substantially as set forth.

401,235. CHANNELED SHOE-SOLE. GEORGE B. WIGGIN, South New Market, and JONATHAN BARTLETT, Epping, N. H., assignors of one-half to John W. Hoard, Providence, R. I. Filed May 7, 1888. Serial No. 273,065. (No model.)



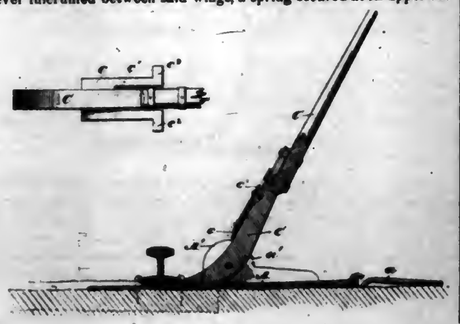
Claim.—1. The described shoe-sole having in its edge an angular groove, both edges of which are in the same plane at right angles to the surfaces of the sole, and also having a flap on the surface cut outward toward such edge, and whereby the stitches may lie within the groove and be concealed under the flap.

2. A shoe-sole having a cut one part of which extends from the surface of the sole downward at right angles to the same, and the remainder of the cut extending toward the edge of the sole, and also having a V-shaped channel in said edge, all substantially as shown, and for the purposes described.

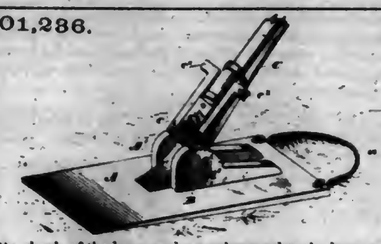
401,236. TRACK-LIFTER. JAMES D. WILTROUT, Hyde, Colo. Filed Nov. 1, 1888. Serial No. 289,738. (No model.)

Claim.—1. The combination, substantially as described, of the shoe provided with wings having toothed segments on their upper edges, a lever fulcrumed between said wings, and a spring-pawl secured to the shank of the lever to engage the teeth of the segments.

2. The combination, substantially as described, of the shoe provided with wings having toothed segments on their upper edges, a lever fulcrumed between said wings, a spring secured at its upper end



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to the shank of the lever, and a pawl secured to the lower end of the spring.

3. The combination, substantially as described, of the shoe provided with wings having toothed segments on their upper edges, a lever fulcrumed between said wings, a spring secured at its upper end to the shank of the lever, and a V-shaped pawl secured at its lower end to the lower end of the spring and provided at its upper end with footholds extending outwardly from the lever.

401,237. VELOCIPEDE. CHARLES R. W. WOODWARD, Chicopee Falls, assignor to the Overman Wheel Company, Boston, Mass. Filed June 8, 1888. Serial No. 276,473. (No model.)



Claim.—1. In a cycle, the combination, with a main frame, of a rear-wheel frame provided with a forward extension, a crank-shaft forming a pivotal connection between the two frames, and a spring connected with the main frame and the said extension, which extends forward under the main frame, substantially as set forth.

2. In a cycle, the combination, with a main frame, of a rear-wheel frame provided with an extension located in the same horizontal plane with it, a crank-shaft forming a pivotal connection between the two frames, and a spring positively connecting the main frame and the extension and extended under the weight of the rider, substantially as set forth.

3. In a cycle, the combination, with a main frame, of a crank-shaft carried thereby, a rocking sleeve mounted on such shaft, a rear-wheel frame having a forward extension connected with such sleeve, and a spring connecting such extension and the main frame of the vehicle, substantially as set forth.

4. In a cycle, the combination, with the main frame thereof, of a crank-shaft carried thereby, a rear-wheel frame pivotally and adjustably connected to such shaft, and a spring connecting the forward end of such frame with the main frame of the vehicle, substantially as set forth.

5. In a cycle, the combination, with the main frame thereof, of a crank-shaft carried thereby, a rocking sleeve mounted on such shaft and provided with depending clamping-lugs, a rear-wheel frame having a forward extension passing between such lugs, which are clamped upon it, and a spring connecting the forward end of the extension with the main frame of the vehicle, substantially as set forth.

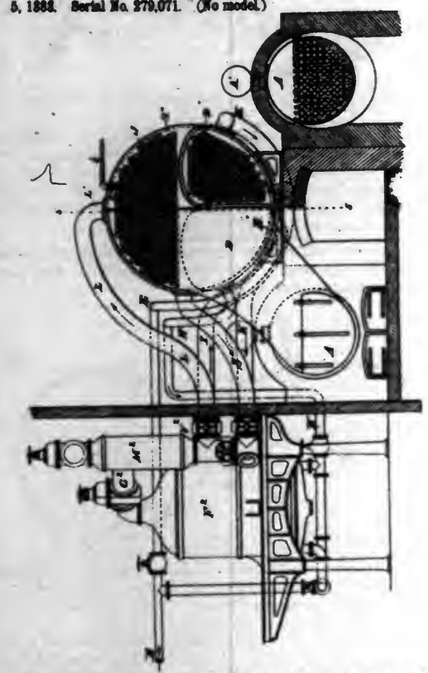
6. In a cycle, the combination, with the main frame thereof, of a crank-shaft carried thereby, a rocking sleeve mounted on such shaft, a rear-wheel frame provided with a tubular forward extension connected with such sleeve, a spring connecting such extension with the main frame of the vehicle, and a threaded rod mounted in the extension and provided at its forward end with adjusting-nuts and at its inner end with a pin passing through limiting-slots in the extension and connected with the said sleeve, substantially as set forth.

7. In a cycle, the combination, with a main frame having an upright provided at its lower end with a fork each arm whereof carries a ball-bearing case, of a crank-shaft carrying a grooved sleeve for each of such cases, a rocking sleeve located between such grooved sleeves, a rear-wheel frame provided with a forward extension connected with such rocking sleeve, and a spring connecting such extension with the main frame of the vehicle, substantially as set forth.

8. In a cycle, the combination, with the main frame having an upright provided at its lower end with a fork each arm whereof carries a ball-bearing case, of a crank-shaft passing through such cases and carrying two grooved and coned sleeves to co-operate with them, a rocking sleeve having flaring ends mounted on the axle between the

said sleeves, the coned ends whereof enter its flaring ends in the formation of raceways for anti-friction balls, a rear-wheel frame having a forward extension connected with such rocking sleeve, and a spring connecting the said extension with the main frame of the vehicle, substantially as set forth.

401,288. APPARATUS FOR EVAPORATING SACCHARINE OR OTHER LIQUIDS. ALEXANDER YOUNG, Honolulu, Hawaii. Filed July 5, 1883. Serial No. 279,071. (No model.)



Claim.—1. The combination, with the cells of a multiple-effect evaporating or vacuum pan, of a steam-generator and two (or more) superheaters arranged to be traversed in succession by the products of combustion, and pipes connecting the respective cells of the pan to the superheaters, whereby the exhaust steam or vapor from one cell is passed through one superheater and then conducted to another cell for heating the latter, and the several connections relatively arranged to pass the exhaust-vapors of higher pressure through the superheater acted upon by the hottest gases and the exhaust-vapors of lower pressure through a superheater acted upon by the gases after their temperature has become reduced, substantially as specified.

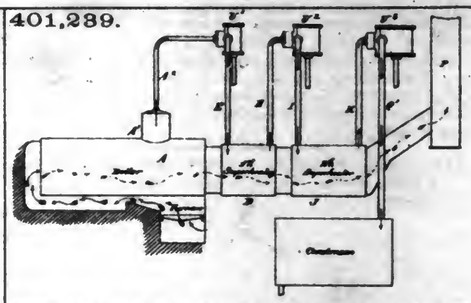
2. The combination, with the cells of a multiple-effect evaporating or vacuum pan and the vacuum-pump thereof, of a steam-generator and two (or more) superheaters arranged to be traversed in succession by the products of combustion, and exhaust-pipes connecting the respective cells to the corresponding superheaters and the latter to the heating-surfaces of the next successive cells, whereby the cells are connected in series and the vapors exhausted from each cell are superheated and used for heating the next successive cell, substantially as specified.

3. The combination, with an evaporating or vacuum pan, of a superheater, a pipe conveying steam to said superheater, a pipe conveying air to said superheater, and a pipe leading from said superheater to said evaporating-pan, whereby the latter may be heated by superheated steam or superheated air, or a mixture of both, substantially as specified.

401,239. SUPERHEATING STEAM-GENERATOR. ALEXANDER YOUNG, Honolulu, Hawaii. Original application filed July 5, 1883, Serial No. 279,071. Divided and this application filed Dec. 12, 1888. Serial No. 293,384. (No model.)

Claim.—1. The combination, with a steam-boiler and its furnace, of two or more superheaters arranged to be traversed by the products of combustion after they have traversed the boiler, and pipes or conduits adapted to return spent steam or vapor to said superheaters to be reheated, arranged to conduct the steam or vapor of the highest temperature to that superheater or portion of the superheater which is acted on by the hottest gases and to conduct the steam or vapor of the lowest temperature to that superheater or portion of the superheater which is acted on by the gases when their temperature has been reduced.

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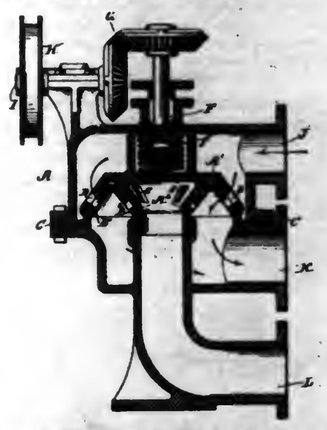


2. The combination, with a steam-boiler and its furnace, of two or more superheaters arranged to be traversed by the products of combustion after they have traversed the boiler, and pipes or conduits adapted to return spent steam or vapor to said superheaters to be reheated, arranged to conduct the steam or vapor of the highest temperature to that superheater which is being traversed by the hottest gases and to conduct the steam or vapor of the lowest temperature to that superheater which is being traversed by the gases the temperature of which has been last reduced before passing to the stack.

3. The combination, with a multiple-expansion engine, of a steam-boiler and its furnace, and two or more superheaters arranged to be traversed successively by the products of combustion after they have traversed the boiler, a steam-pipe conducting live steam from the boiler to the first cylinder, a pipe conveying the exhaust-steam from this cylinder to the superheater which is traversed by the hottest gases, a pipe conveying the reheated steam from this superheater to the second cylinder, a pipe conveying the exhaust-steam from this cylinder to a superheater which is traversed by the gases after they have passed the first superheater, and a pipe conveying the reheated steam from this superheater to the third cylinder.

4. The combination, with a boiler, of a superheater divided into compartments, a smoke box or passage for conducting the products of combustion from the boiler to one of said compartments, a smoke-box for conducting the products of combustion emerging from one of said compartments to the other compartment in order that they may return in the opposite direction through the latter and the stack, arranged to receive the products of combustion after they issue from said second compartment, and pipes for conveying steam to and from said compartments, arranged to conduct the steam or vapor of the highest temperature to that compartment which is first traversed by the gases and the steam or vapor of the lowest temperature to that compartment which is last traversed by the gases before they pass to the stack.

401,240. VALVE. LEONARD ATWOOD, Philadelphia, Pa. Filed Jan. 5, 1889. Serial No. 295,492. (No model.)



Claim.—1. A three-way valve provided with pressure and exhaust portions, each in the form of a frustum of a cone, the exhaust being a reverse from that of the pressure and valve seat corresponding with said valve, with which said valve forms a water-tight joint, but upon which it is capable of rotating, and ports in the pressure and exhaust portions of the valve and the corresponding seat portions, the position of the ports being such that when the ports of either portion of the valve are open the ports in the other portion are closed.

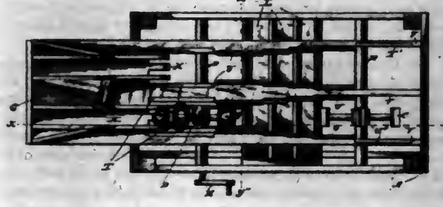
2. A three-way valve provided with pressure and exhaust portions, each in the form of a frustum of a cone, the exhaust being a reverse cone from that of the pressure and valve-seat corresponding with said valve with which said valve forms a water-tight joint, but upon which it is capable of rotating, and quadrilateral ports in the pressure and exhaust portions of the valve and the corresponding seat portions, the position of the ports being such that when the ports of either portion of the valve are open the ports in the other portion are closed.

3. In combination, a three-way valve provided with pressure and exhaust portions, each in the form of a frustum of a cone, the exhaust being a reverse cone from that of the pressure and valve seat corresponding with said valve, with which said valve forms a water-tight joint, but upon which it is capable of rotating, and ports in the pressure and exhaust portions of the valve and the corresponding seat portions, a valve-stem, and a spring surrounding said valve-stem.

4. In combination, a three-way valve provided with pressure and exhaust portions, each in the form of a frustum of a cone, the exhaust being a reverse cone from that of the pressure and valve seat corresponding with said valve, with which said valve forms a water-tight joint, but upon which it is capable of rotating, ports in the pressure and exhaust portions of the valve and the corresponding seat portions, a valve-stem, and means, substantially as described, to operate said valve-stem and rotate said valve upon its seat.

5. In combination, a three-way valve provided with pressure and exhaust portions, each in the form of a frustum of a cone, the exhaust portion being a reverse cone from that of the pressure and valve seat corresponding with said valve, with which said valve forms a water-tight joint, but upon which it is capable of rotating, ports in the pressure and exhaust portions of the valve and the corresponding seat portions, a valve-stem, and bevel-gear, whereby, when the bevel-gear is operated, the valve is rotated on its seat.

401,241. ORANGE-GRADER. ALFRED AYER, Lake Weir, Fla. Filed Apr. 30, 1888. Serial No. 272,339. (No model.)



Claim.—1. In an orange-grader, the combination, with a suitable frame, a hopper, G, mounted thereon, and an inclined chute, H, of an endless chain belt mounted in the vertical plane of said chute, the expanding rings mounted upon the links of said belt and each provided with a fork adapted to pass through slots in said chute and lift fruit therefrom, and guiding-surfaces adapted to act upon two opposite sides of said rings fully expanding and contracting each ring while it is making each complete circuit.

2. In an orange-grader, the combination of an endless open-link belt, expansible segmental rings mounted, respectively, in the links of said belt, arms projecting from two opposite segments of each ring, and guides adapted to carry said arms outward as the link passes along one horizontal portion of the chain's path and to press them inward as it passes along the other horizontal portion of said path, substantially as and for the purpose set forth.

3. In an orange-grader, the combination of the revoluble sprocket-wheels C, carrying the chain D, the expansible sizing-rings Y, mounted upon the respective links of said chain, the ring-arms moving in guides adapted to force them alternately outward and inward, and the transverse chutes lying below one fold of said chain, substantially as set forth.

4. In an orange-grader, an expansible grading-ring composed of radially-movable segments, the alternate segments being each provided with ways oblique to the segments' line of motion, and each intermediate segment being provided upon its opposite sides with rigid sliding arms lying, respectively, in the ways of the two adjacent segments, all combined with mechanism for operating two opposite segments, substantially as and for the purpose set forth.

5. In an orange-grader, an endless traveling belt provided with openings larger than the fruit to be graded, expansible rings mounted in said openings, a chute adapted to convey fruit to said belt, a series of forks carried by said belt and adapted to transfer fruit from said chute to each passing ring, and means for expanding said rings from their smallest to their largest limit, substantially as set forth.

6. In an orange-grader, the combination, with two radially-moving segments, N, forming opposite sides of an expansible grading-ring and each provided with rigid arms Q, oppositely inclined to the segments' line of motion, of the opposite segments, M, forming the other two sides of the ring and each provided with ways to receive an arm, Q, from each of the segments N, substantially as set forth, whereby radial motion of the segments N causes a corresponding motion of the segments M and expands the ring symmetrically.

401,242. MIDDLINGS-PURIFIER. HIRAM A. BARNARD, Moline, Ill., assignor to the Barnard & Leas Manufacturing Company, same place. Filed Aug. 17, 1888. Serial No. 211,134. (No model.)



Claim.—1. In a middlings-purifier, a reciprocating screen-shoe composed of a lower half connected with the mechanism for longitudinally vibrating the shoe and an upper half mounted upon, supported by, and moving with the lower half, in combination with mechanism, substantially as described, for imparting a transverse motion to the upper half independent of its longitudinal reciprocation by and with the lower half, the two halves being inseparably connected, substantially in the manner and for the purpose specified.

2. In a middlings-purifier, a reciprocating screen-shoe composed of a lower half connected with the mechanism for longitudinally vibrating the shoe, having slots or bars extending from end to end and immovably secured therein, and an upper half carrying a sieve and mounted upon, supported by, and moving longitudinally with the lower half, in combination with mechanism for imparting an independent transverse motion to said upper half, all substantially as and for the purpose specified.

3. In a middlings-purifier, the combination of a screen-shoe, D, composed of two frames, *d d'*, the upper frame, *d*, having a screen secured to its bottom and supported upon and moving with the lower frame, *d'*, and the lower frame having longitudinal strips rigidly secured therein and sustaining the screen on the upper frame, with mechanism for imparting a longitudinal movement to the shoe, and mechanism for imparting a transverse movement to frame *d* independent of its movement with frame *d'*, all substantially as and for the purpose described.

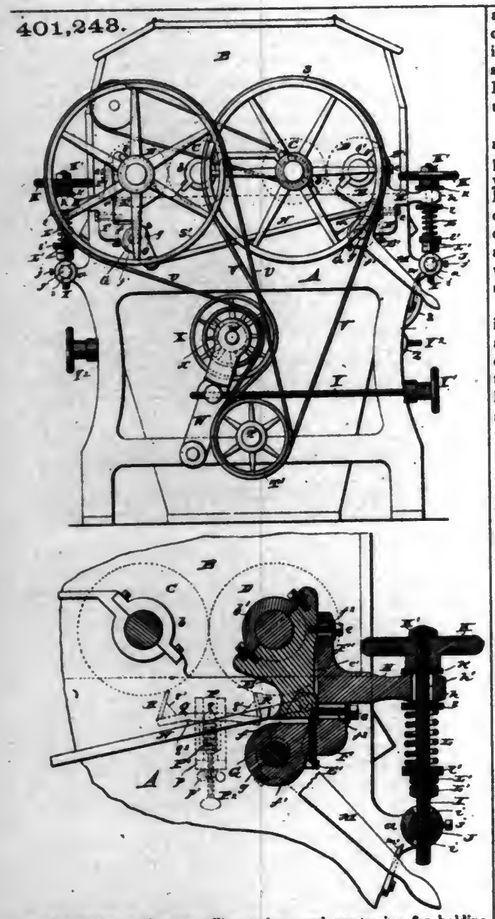
4. The combination of the rectangular lower frame, *d'*, having the bars d^2, carrying cleaning-strips d^4, standing upward from said bars, the chute *f*, rising from its head or front end rail, and the transverse bar *f'*, with the reciprocating upper frame, *d*, shorter and wider than the lower frame, having the bolting-cloth stretched over its lower side and resting between the said chute and bar *f'*, the links d^3, supporting-frame *d'* upon the main frame, the pitman-rods E, heads *e*, shaft C, and fan-shaft by which it is rotated, and the eccentric-disks *c'* on said shaft for reciprocating the rods E and frames *d' d* longitudinally, and mechanism for reciprocating frame *d* laterally, all substantially as specified.

5. The combination of the frames *d d'*, the mechanism to longitudinally reciprocate the two frames simultaneously, with the countershaft, shaft C, and belt by which it is rotated, and a worm, g^4, on said shaft, the longitudinal shaft I, the worm-wheel *i*, and eccentrics j^3 thereon, the pivoted lever J, having the lower bifurcated arms, *j*, embracing said eccentrics, cords K, and strips *k*, all constructed substantially as and for the purpose described.

401,243. ROLLER-MILL. HIRAM A. BARNARD, Moline, Ill., assignor to the Barnard & Leas Manufacturing Company, same place. Filed May 26, 1887. Serial No. 239,465. (No model.)

Claim.—1. In a roller-mill, the combination of the rigid roll and the yielding roll, with the swinging arms supporting the yielding roll, the springs controlling said arms mounted on swinging supports, the transverse shaft G, journaled in the main frame below and parallel with the yielding roll and having cams formed on its ends upon which the swinging arms are supported, and the lever to oscillate the shaft and thereby shift both arms simultaneously to throw the yielding roll away from the rigid roll without disturbing the alignment of the rolls

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or the tension of the controlling-springs, and mechanism for holding the yielding roll up to the rigid roll when in operative position, substantially as specified.

2. In a four-roller mill, the combination of the rigid rolls with the yielding rolls, the swinging arms supporting the latter, the adjustable springs controlling said arms mounted on swinging supports, the two shafts G G, journaled in the main frame below the yielding roll, having cams *g* on their ends, upon which said arms are mounted, the series of connected levers for simultaneously oscillating shafts G G, to adjust the yielding rolls to or from the rigid rolls without disturbing the tension of the springs, and mechanism for holding the yielding rolls up to the rigid rolls when in operation, substantially as specified.

3. In a four-roller mill, the combination of a counter-shaft journaled in the main frame and receiving motion from the main driving-belt at one side of the machine, pulleys on the other end of said shaft at the opposite side of the machine, pulleys on the shafts of two of the rolls, and belts of unequal length diverging from the pulleys on said counter-shaft to said other pulleys, with a tightening device mounted on the main frame, having two pulleys of unequal diameters adapted to be brought, respectively and simultaneously, against the slack sides of said driving-belts, all substantially as and for the purpose specified.

4. In a roller-mill, the combination of the crushing-rolls and the main frame provided with vertical guides and horizontal brackets *p* on the inner faces of its sides with a rectangular frame, Q, carrying suitable roll-cleaning devices and having lugs *q* on its ends moving in the guides on the main frame, the springs loosely supporting the frame, and the bolts F^3, carrying the springs, whereby the frame can be adjusted, all constructed and arranged to operate substantially in the manner and for the purpose described.

5. In a roller-mill, the combination of the rigid rolls, the yielding rolls, the upright movable arms F, bearing the yielding rolls, the springs engaging said arms mounted on swinging supports, the transverse shafts G G, journaled in the main frame below the yielding rolls, having cams *g* on their ends, forming the pivotal supports of said arms, and the connected levers for oscillating said shafts simultaneously to shift arms F and throw the yielding rolls into or out of grinding position without disturbing the adjustment of the controlling-springs, with the screw-rods and their adjusting-nuts engaging arms F and projections of the main frame for regulating the grinding adjustment of the rolls, substantially as specified.

6. In a roller-mill, the combination of the rigid and yielding rolls and the independent movable arms F with the vertically-adjustable pillow-blocks mounted on arms F, forming the journal-bearings of the yielding rolls, the springs L, for regulating the adjustment of the arms F, mounted on swinging supports, the transverse shafts G G, having on their ends cams *g*, forming the pivotal supports of arms F, and the connected levers to oscillate said shaft to simultaneously shift the arms F to throw the yielding rolls into or out of grinding position without disturbing the tension of the springs, all constructed and arranged substantially in the manner and for the purpose described.

7. The combination of the swinging arms F, carrying the yielding rolls, the adjustable swinging screw-rods I, and adjustable nuts and springs L thereon controlling arms F for regulating the grinding operation of the rolls, with the transverse shafts G, having cams *g* on their ends, upon which arms F are mounted, and the levers for oscillating said shafts to shift arms F without disturbing the tension of springs L, all constructed and arranged substantially as and for the purpose described.

8. The combination of the adjustable angular arms F and the rod I and its nuts and springs for regulating and adjusting the arms, substantially as described, with the angular pillow-blocks E, mounted on said arms, the adjusting-bolts E' and retaining-bolts *e* for said pillow-blocks, and the rolls mounted on the pillow-blocks, all constructed and arranged to operate substantially in the manner as and for the purpose described.

9. The combination of the roll-supporting pivoted swinging arms F F, having outstanding slotted pieces H H, with the journal-nuts mounted on the main frame, the threaded rods I I, adjustably engaged at their lower ends in said nuts and playing freely through openings in pieces H H, the adjusting-nuts and jam-nuts on rods I above pieces H, and the springs L and nuts L' on said rods between nuts J and pieces H, whereby the arms F can be adjusted without disturbing the springs, all constructed and arranged to operate substantially in the manner and for the purpose described.

10. In a four-roller mill, the combination of the rigid roll, the pivoted swinging arms F, having each an outstanding piece, H, the pillow-blocks E and the yielding roll mounted in said blocks, and the shaft G, journaled in the main frame below the yielding roll and having cams *g g* on its ends, forming the pivotal supports of arms F, with the rods I, springs L, and nuts L' thereon, and the journal-nuts J, K and K', engaging piece H, whereby the arms F can be adjusted without disturbing the springs, substantially as and for the purpose specified.

11. In a roller-mill, the combination of the fast rolls having equal-sized pulleys on their shafts at one side of the mill and the slow rolls having equal-sized pulleys on their shafts at the opposite side of the mill with the counter-shaft having pulleys on its opposite ends driven by the main belt, that also drives the fast rolls, and driving the slow rolls by different belts of unequal length, and a belt-tightener composed of a bifurcated bracket pivoted on the main frame and carrying two pulleys on one shaft adapted to simultaneously tension these belts, and suitable tension devices for the main belt, substantially as and for the purpose specified.

12. The combination, in a four-roller mill having fast and slow rolls and a counter-shaft, T, having single pulley *t* at one end and double pulleys T' T' at the other, of the main belt U, driving the fast rolls and counter-shaft at one side of the mill, and the belts V *v*, driving the slow rolls from pulleys T' T' at the opposite side of the mill, with the belt-tightening devices for belts V *v*, consisting of an arm, W, pivoted to the main frame and operated by an adjustable horizontal screw-rod, Y, and bearing in its upper bifurcated end the large pulley X and small pulley *x*, mounted upon the same shaft, engaging, respectively, the belts V *v*, and the similar arm Z, bearing one pulley and its operating devices for tightening belt U, all substantially as and for the purpose described.

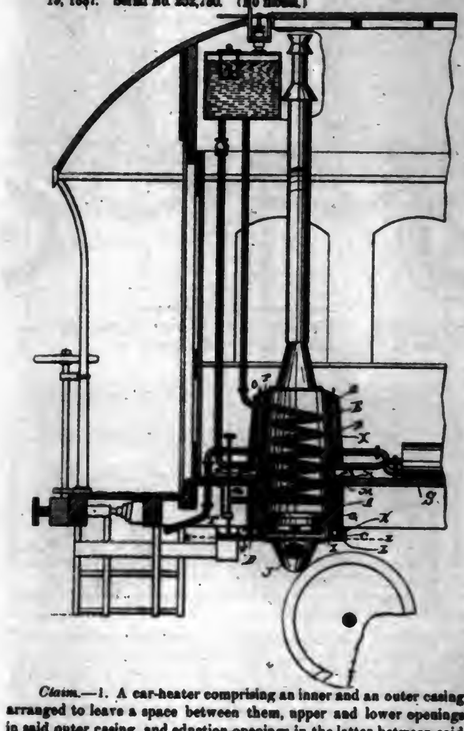
401,244. SPLICING DEVICE. JOHN C. BASEL, Galveston, Tex. Filed Oct. 15, 1888. Serial No. 288,165. (No model.)



Claim.—1. The combination, with the adjacent ends of two wires bent so as to interlock, of a casing, as A, surrounding said ends and having its ends bent in, as at B, substantially as described.

2. The combination, with the casing A, of the wires *a a*, entering the casing at the opposite sides of the respective ends and bent in opposite directions, so as to interlock within the casing, said casing being bent down, as at B, at each end, substantially as described.

401,245. APPARATUS FOR HEATING RAILWAY-CARS. GEORGE H. BENJAMIN, New York, N. Y., assignor, by mesne assignments, to The Safety Car Heating and Lighting Company, of New Jersey. Filed Oct 19, 1887. Serial No. 252,780. (No model.)



Claim.—1. A car-heater comprising an inner and an outer casing arranged to leave a space between them, upper and lower openings in said outer casing, and eduction-openings in the latter between said upper and lower openings, and a fire-pot secured to the inner casing, substantially as described.

2. A car-heater comprising an inner and an outer casing arranged to leave a space between them, said casings projecting below the car-floor, a perforated base-ring on the outer casing for supporting the heater, said outer casing also having upper and lower draft-openings, and a fire-pot within the inner casing.

3. A car-heater comprising an inner and an outer casing arranged to leave an air-space between them, said casings projecting below the car-floor, a perforated base ring on the outer casing, a fire-pot arranged within the inner casing, and a draft-rieg for closing the lower openings in the outer casing.

4. A car-heater comprising an inner and an outer casing projecting below the car-floor and having upper and lower openings, as described, a base-ring having perforations communicating with the space between the casings and supporting the casings, the perforated ring to which the inner casing is secured, and the damper-ring for opening and closing the lower openings.

5. A car-heater comprising an inner and an outer casing having upper and lower openings and arranged to leave a space between them, said casings projecting below the car-floor, a base-ring having openings communicating with the space between the casing, the perforated base-ring to which the inner casing is secured, the fire-pot, the perforated damper-ring to close the lower openings, and mechanism, substantially as described, for operating said damper-ring from within the car.

6. A car-heater comprising two casings arranged to leave a space between them and projecting below the car-floor, said outer casing having upper and lower openings, as described, a damper-ring, and means, substantially as described, for operating it to close the lower openings, the fire-pot, the ash-chute arranged under the latter, and means, substantially as described, for operating the latter from a point within the car, substantially as described.

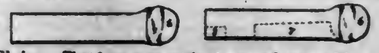
401,246. RUBBER BOOT OR SHOE. ERSKINE F. BICKFORD, Malden, Mass., assignor to the Boston Rubber Shoe Company, same place. Filed Jan. 14, 1888. Serial No. 296,282. (No model.)

Claim.—In a rubber boot or shoe, or a boot or shoe whose sole is of rubber, the combination, with the rubber outer or main sole, B, of the inner leather sole, D, provided with a row of perforations, as D', and the intermediate sole, C, of felt or similar porous substance, said inner sole being permanently attached to the intermediate sole, and said intermediate sole being attached to the rubber outer sole, substantially as and for the purpose set forth.

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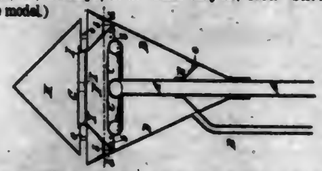


401,247. MANUFACTURE OF KEY-BLANKS. CHARLES M. BURGESS, New Britain, Conn., assignor to the Russell & Erwin Manufacturing Company, same place. Filed Feb. 16, 1889. Serial No. 300,150. (No model.)



Claim.—That improvement in the manufacture of keys which consists in heading the stock at one end, cutting out portions of said headed blank to give the general contour of a key, then swaging it into the form of the desired key, and then removing the surplus metal, substantially as described, and for the purpose specified.

401,248. TRAP FOR EXHAUST-STEAM PIPES. THOMAS BURKHARD, Jr., Brooklyn, N. Y. Filed May 22, 1888. Serial No. 274,717. (No model.)



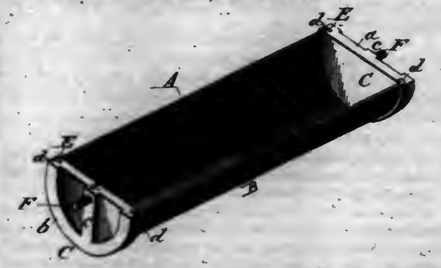
Claim.—1. In a trap for exhaust-steam pipes, the combination, with a funnel-shaped casing forming a chamber, of an exhaust-pipe extending into said chamber and to near the top thereof, a perforated head upon the upper end of said exhaust-pipe, an inverted funnel having its lower portion extending into the interior of the casing and contacting at its lower end with the inner wall of the casing, and a diaphragm surmounting said inverted funnel, substantially as specified.

2. In a trap for exhaust-steam pipes, the combination, with a casing, of an upwardly-extending exhaust-pipe, a circular and tubular head thereon, a perforated diaphragm at the upper end of the casing, whereby a compartment is formed below the diaphragm, and a compartment above the diaphragm, a space open to the atmosphere being provided between said compartments, substantially as specified.

3. In a trap for exhaust-steam, the combination, with a casing, of an upwardly-extending exhaust-pipe, a perforated head thereon, a perforated diaphragm at the upper end of the casing, and a top supported above said casing, so that a space will be left between the two, the diameter of the said top at its lower end being less than that of the casing at its upper end, substantially as specified.

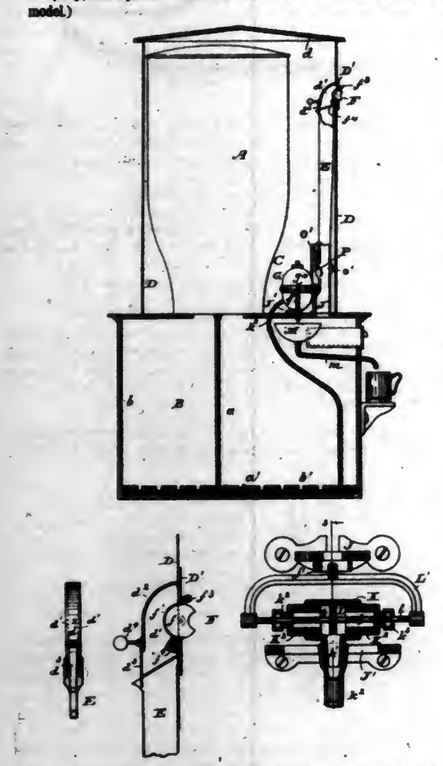
4. The combination, with an exhaust-pipe, A, terminating in a perforated head, C, casing D, discharge-pipe B, inverted funnel F, having perforations *b*, and the perforated diaphragm G, of the top H and supports therefor, substantially as described and set forth.

401,249. FEED-TROUGH. GEORGE D. BURTON, Boston, Mass. Filed Mar. 21, 1888. Serial No. 267,992. (No model.)



Claim.—As an improved article of manufacture, a feed-trough consisting of a body-piece having inwardly-extending flanges at its ends, and head-pieces having right-angled recesses to receive the ends of the body-piece, substantially as described, whereby a perfectly tight and secure connection is formed without the employment of bolts, rivets, or other analogous fastening devices.

401,250. LIQUID-VENDING APPARATUS. ALBERT M. BUTZ and OLE PEDERSON, Chicago, Ill., assignors to the Butz Drinking Fountain Company, same place. Filed Dec. 26, 1888. Serial No. 294,614. (No model.)

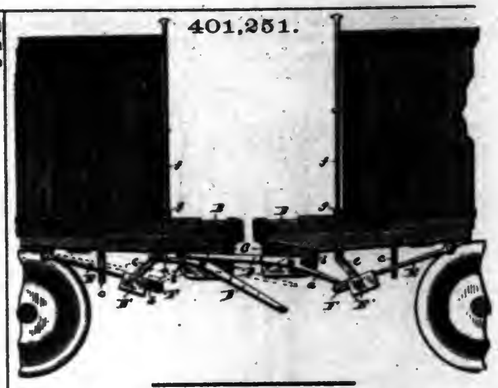


Claim.—1. The combination of the vibrating vessels, and the rock-shaft by which they are supported, with means by which the vessels are alternately filled at their highest and discharged at their lowest elevations, the notched segment, also supported by the rock-shaft, the coin-chute, and the latch pivoted between its walls and engaging the notches in the segment, substantially as and for the purpose hereinbefore set forth.

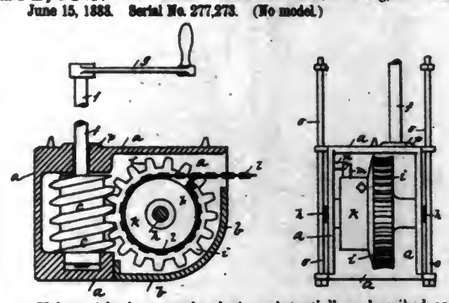
2. The combination of the liquid-carrying mechanism, the coin-chute, the latch pivoted between the walls of the coin-chute and engaging the liquid-carrying mechanism with one of its ends, while the other projects into the chute, with a roller, also pivoted between the walls of the chute and projecting slightly into it, substantially as and for the purpose hereinbefore set forth.

3. The combination of the casing having a coin-slot, the gate pivoted in the slot, closed at its inner but open at its outer edge, and adapted to receive and contain but a single coin, means for holding the gate in a position to normally close the slot, the coin-chute within the casing, and the yielding gate d^3, all arranged substantially as hereinbefore set forth.

4. The combination of the casing having a slot therein, the coin-chute terminating below the slot and having its upper end inclined and formed with flaring edges, the projecting lugs d^7 d^7, and the weighted gate d^3, pivoted between them, substantially as and for the purpose hereinbefore set forth.

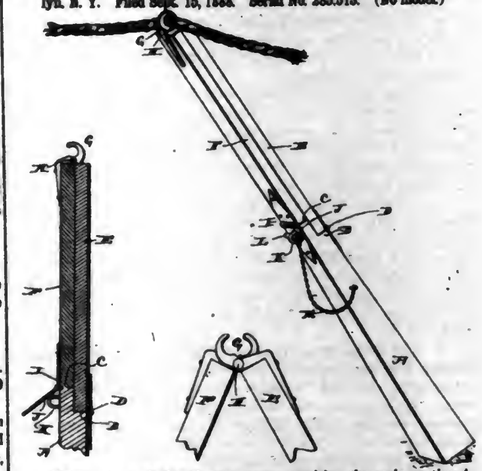
401,251. 

401,252. CAR-BRAKE. HARRY H. COFFIN, Pittsburg, Pa. Filed June 15, 1888. Serial No. 277,273. (No model.)



Claim.—A brake-operating device substantially as described, consisting of an inclosing case or shell, *a*, having a curved apron, *b*, forming one of the sides thereof and leaving an opening for the passage of the brake-lever chain, a worm-screw, *c*, carried by a shaft, *f*, and housed within said case, a fixed shaft, *h*, a gear-wheel fitted loosely on said shaft and having a drum, a projection, *m*, fixed to the periphery *n* on the interior of the case or shell and arranged in the path of the projection *m* to limit the drum to a single complete rotation on its axis, and a chain connected to the drum and passing through the opening in the case between the apron *b* and one side of the drum, as and for the purpose described.

401,253. CLOTHES-LINE SUPPORT. JONATHAN T. CRANE, Brooklyn, N. Y. Filed Sept. 15, 1888. Serial No. 285,513. (No model.)



Claim.—1. A clothes-line support comprising the main section A, the section E, hinged thereto, the section F, adapted to be locked to the section A, and the hooks pivoted together and connecting the sections E F, as set forth.

2. The combination of the section A, the section E, hinged thereto, the section F, connected to the section E by hooks which are adapted to clasp the clothes-line, the hinge secured to the section F and having a slotted leaf, the staple secured to the section A and projecting through the slotted leaf of the hinge, and the locking-pin attached to the section A and adapted to be inserted through said staple, as set forth.

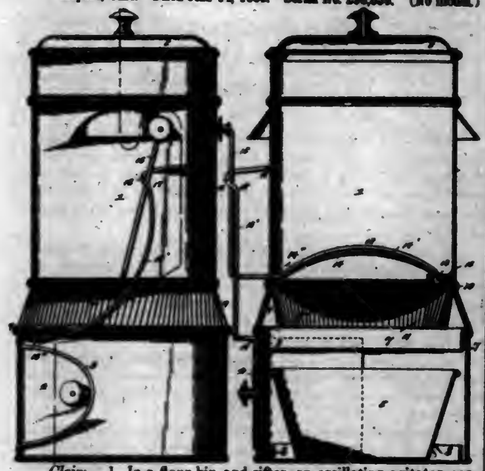
3. The combination of the section A, the section E, hinged thereto, the section F, adapted to be locked to the section A, and the hooks G, pivoted together and having their shanks bent around the ends of the sections E F and secured to the outer sides of the same, as specified.

401,251. CAR-COUPLING. GEORGE W. CAMPBELL, El Paso, Tex., assignor of one-tenth to John P. Pryor, same place. Filed Jan. 26, 1889. Serial No. 297,635. (No model.)

Claim.—1. The combination of a draw-head and draw-bar, an inclined coupling-link pivoted in the mouth of the said draw-head, and provided with an extension, *a*, and an upwardly-extending shoulder, *b*, and means for engaging the said extension, substantially as described.

2. The combination, with a draw-bar and draw-head, of an inclined coupling bar or link, D, pivoted in the mouth of the draw-head and provided with an upwardly-extending shoulder, *b*, and a rearward extension, *a*, and a pivoted weighted lever and its pawl, substantially as described.

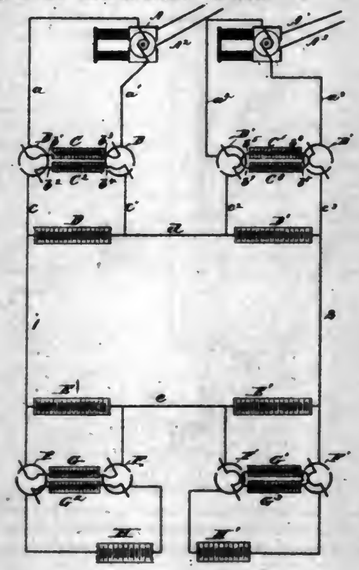
401,254. FLOUR BIN AND SIFTER. THOMAS F. CRARY, Midlothian, Ohio. Filed Jan. 14, 1889. Serial No. 296,330. (No model.)



Claim.—1. In a flour bin and sifter, an oscillating agitator consisting of the curved laterally-spaced arms having an eye or loop at one end, and a crank-handle at the opposite end of the arms from said eye or loop, in combination with a shell or case through which the crank-handle is passed to provide a support for one end of said agitator, and a short trunnion or stud fixed to said case and fitted in the eye or loop of said agitator to support the opposite end of the agitator, substantially as described.

2. In a flour bin and sifter, the combination, with a shell or case, a sieve, and an agitator having an extended crank-handle, of a curved guard fixed in an inclined position exteriorly on the case and having one end thereof inclined toward the shell, as described, and a notch or recess contiguous to said inclined end, substantially as described.

401,255. SYSTEM OF TRANSMITTING AND DISTRIBUTING ELECTRICITY. STANLEY G. G. CURRIE, Philadelphia, Pa., assignor to the United Electric Improvement Company, Gloucester City, N. J. Filed Aug. 23, 1888. Serial No. 283,518. (No model.)



Claim.—1. The herein-described method of distributing and transmitting electricity, which consists in producing two or more currents of low electro-motive force, transferring such currents at intervals of time to reservoirs disconnected from the generator-circuits, again transferring such currents to reservoirs connected with a main line, and finally combining the said currents to form a current of high electro-motive force, and conveying the said current over said main line, substantially as described.

2. The herein-described method of transmitting and distributing electricity, which consists in conveying a current of high electro-motive force over a main line, then converting said current to one or more currents of lower electro-motive force, then transferring such currents to reservoirs, and finally transferring said currents at intervals to distributing-reservoirs disconnected from the main line, substantially as described.

3. The method of transmitting and distributing electricity, consisting in dividing a current of high electro-motive force between several sets of secondary batteries, then transferring current from such sets of batteries individually to two other sets of similar batteries at alternate intervals, and during such intervals transferring current to distributing-batteries electrically isolated from the main conductor, substantially as described.

4. The method of transmitting and distributing electricity, consisting in conveying currents of high electro-motive force to points of consumption by main conductors, and there dividing said current and reducing its electro-motive force and transferring it to distributing-batteries at alternate intervals of time, substantially as described.

5. The method of distributing and transmitting electricity, consisting in producing two or more currents of low electro-motive force, transferring such currents at intervals of time to reservoirs disconnected from the generator-circuits, again transferring such currents to reservoirs connected with a main line and combining the said currents to form a current of high electro-motive force, then conveying said current of high electro-motive force over the main line and dividing it into currents of lower electro-motive force, then transferring such currents to reservoirs connected to the main line, and finally transferring said currents at intervals to distributing-reservoirs disconnected from the main line, substantially as described.

401,256. DROPPER-SPOUT. SYLVESTER P. DENISON, Brooklyn, assignor of one-half to Holbrook Cushman, New York, N. Y. Filed Nov. 3, 1887. Serial No. 254,940. (No model.)



Claim.—1. A dropper-spout which consists of a movable tube furnished with suitable packing and slotted at its lower extremity and passing through the base of a cylinder provided with a spring and in its base with vent-holes, said tube having attached to its lower end a plate and pliant washer and at the other end a drip-cup capable of being rotated, substantially as described, and for the purposes set forth.

2. A dropper-spout which consists of a movable tube furnished with suitable packing and slotted at its lower extremity and passing through the base of a cylinder provided with a spring and in its base with vent-holes, said tube having attached to its lower end a plate and pliant washer and at the other end a drip-cup capable of being rotated and notched at its edge, in combination with a permanent upright sliding in said notch, substantially as described, and for the purposes set forth.

401,257. BRAKE-SHOE ATTACHMENT FOR RAILWAY-CARS. GUSTAV A. DIEDEL, New York, N. Y. Filed Nov. 13, 1888. Serial No. 290,677. (No model.)

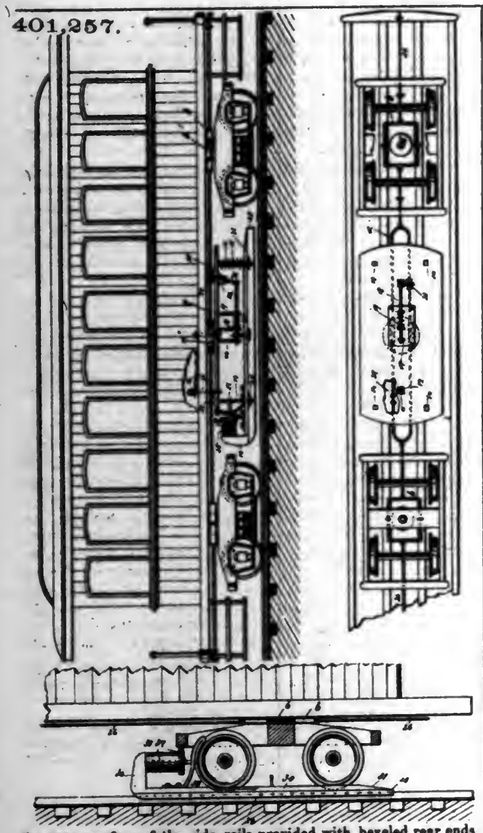
Claim.—1. The combination, with a railway-car and a turn-table pivoted beneath the same, of a brake-shoe suspended from said table and means, substantially as described, for releasing said shoe, as and for the purpose specified.

2. The combination, with a railway-car and a turn-table pivoted beneath the same, of a brake-shoe detachably suspended from the turn-table, having the side rails longitudinally grooved and provided with a track upon the upper surface, substantially as shown and described.

3. The combination, with a railway-car and a turn-table pivoted beneath the same, of a brake-shoe detachably suspended from the turn-table, having the side rails longitudinally grooved, a track integral with the upper surface of the said side bars provided with one beveled end, and means, substantially as described, for releasing the brake-shoe, as and for the purpose specified.

4. The combination, with a railway-car and a turn-table pivoted beneath the same, of a brake-shoe suspended from the turn-table, having the side rails thereof longitudinally grooved, a track integral with

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the upper surface of the side rails provided with beveled rear ends, buffers attached to the forward ends of said tracks, and means, substantially as described, for releasing the brake-shoe, as and for the purpose specified.

5. The combination, with a railway-car and a turn-table pivoted beneath the same, of a brake-shoe suspended from the turn-table, having the under face of the side rails longitudinally grooved, a track integral with the upper surface of the side rails provided with beveled rear ends, cushioned buffers attached to the forward ends of the rails, and means, substantially as described, for retaining the turn-table in a fixed position and releasing the shoe from the table, as and for the purpose specified.

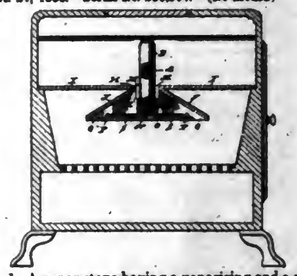
6. The combination, with a railway-car, a turn-table pivoted beneath the same, a draw-rod held to slide above the table, hangers attached to the table, a releasing-bar carried by said hangers, and a trip-lever pivoted to said bar and engaging the draw-rod, of a brake-shoe suspended from the releasing-bar, having the under face of the side bars longitudinally grooved, a track integral with the upper surface of the side bars provided with a beveled rear end, and buffers secured to the forward end of the tracks, substantially as shown and described.

7. The combination, with a railway-car, a turn-table pivoted beneath the same, a draw-rod held to slide above the table, hangers attached to said table, a releasing-bar sliding in said hangers, a trip-lever pivoted to the releasing-bar and actuated from the draw-rod, and guide-bars projected from the turn-table, of a brake-shoe suspended from the releasing-bar, provided with apertures to receive the said guide-bars, and side bars having a bottom longitudinal groove, a track integral with the upper surface of the side bars provided with a beveled rear end, and cushioned buffers secured to the forward end of the tracks, substantially as shown and described.

8. A brake-shoe for railway-cars, consisting of connected side bars spaced to the gage of a railroad-track and having a longitudinal bottom groove to receive the rails, a track integral with the upper surface of the side bars, and buffers secured to the shoe-tracks near the rear end, substantially as described.

9. A brake-shoe of the character described, having cushioned buffers on its upper side for the car-wheels to strike, substantially as set forth.

401,258. VAPOR-STOVE. CHARLES S. DRAKE, San Rafael, Cal. Filed Sept. 27, 1888. Serial No. 286,597. (No model.)



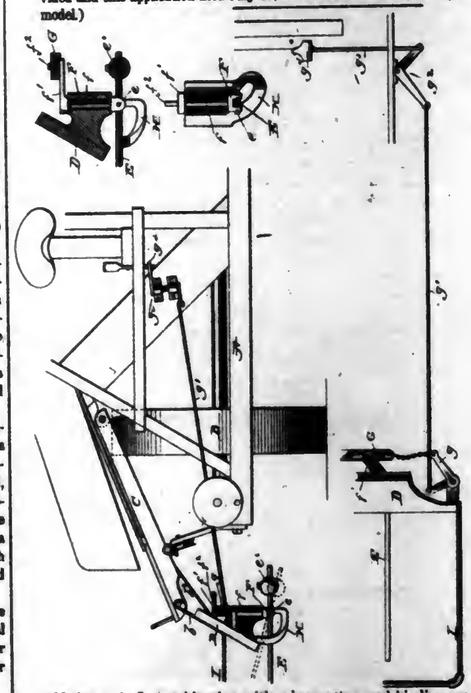
Claim.—1. A vapor-stove having a vaporizing and a vapor chamber formed of a pipe or conduit and a box with which the pipe is combined, and having a central longitudinal slot and inclined side walls converging toward such slot to deflect the draft to a point over the vapor-chamber and below the vaporizing-chamber, substantially as set forth.

2. A vapor-stove having a vaporizing and a vapor chamber formed of a pipe or conduit and a box with which the pipe is combined, and having a central longitudinal slot, and a trough receiving the vapor-chamber and located directly under such slot, over which the vaporizing-chamber extends, substantially as set forth.

3. A vapor-stove having a vaporizing and a vapor chamber formed of a pipe or conduit and a box with which the pipe is combined, and having a central longitudinal slot, and supports located at the opposite ends of such slot for supporting the pipe in position, substantially as set forth.

4. A vapor-stove having a vaporizing and a vapor chamber formed of a pipe or conduit and a box with which such pipe is combined, having a central longitudinal slot, a trough located under such slot and running parallel therewith, inclined side walls, draft-openings formed in the bottom of the box, and means for supporting the pipe in place therein, substantially as set forth.

401,259. SHEAF-CARRIER FOR HARVESTERS. LUCIEN W. ELLIS, Anamosa, Iowa, assignor to William Deering & Company, of Illinois. Original application filed Nov. 20, 1885, Serial No. 183,395. Divided and this application filed July 18, 1888. Serial No. 280,258. (No model.)



Claim.—1. In combination with a harvesting and binding machine, a series of laterally-projecting sheaf-receiving fingers individually connected thereto by vertical and also by horizontal axes.

2. In a sheaf-carrier, the upright crank-shafts F, in combination with the series of sheaf-receiving fingers connected thereto by horizontal axes, the bar G, connecting said shafts, and the inclined cams or tracks H to control the vertical movement of the teeth.

3. A sheaf-carrier composed of a series of vertically and horizontally swinging teeth, each combined with an inclined track or cam, H, and a counter-weight, e^3, to lift them clear of the ground when relieved from the weight of the sheaves.

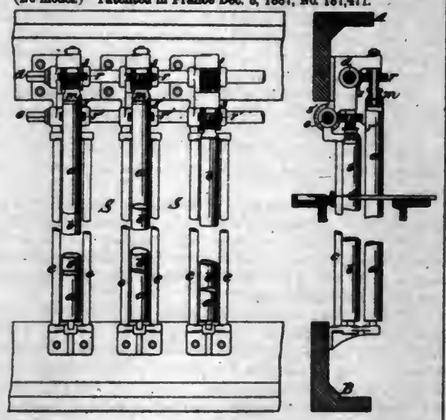
4. In combination with a grain harvesting and binding machine, a series of sheaf-receiving fingers projecting normally in a lateral direction therefrom, a series of upright shafts to which the respective fingers are connected by horizontal pivots, a bar connecting the upright shafts, and operating devices extending from said bar to a point adjacent to the driver's seat.

5. In a sheaf-carrier, a series of fingers each secured to its supporting-bar by means of a joint turning upon two axes.

6. In a sheaf-carrier, sheaf-supporting fingers independently pivoted to a supporting-bar by means of double joints.

7. In a sheaf-carrier, a series of fingers independently pivoted to a supporting-bar by means of double joints, in combination with trip mechanism.

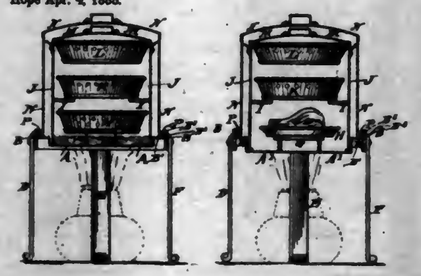
401,260. FRAME FOR EMBROIDERING-MACHINES. JAKOB FREY, Bruggen, near St. Gallo, assignor to John Jacob Rieter & Company, Winterthur, Switzerland. Filed June 28, 1888. Serial No. 278,417. (No model.) Patented in France Dec. 8, 1887, No. 187,471.



Claim.—1. In an embroidery-machine, the combination, with a frame, of two rows of upright rollers journaled therein, the rollers of one row being immediately behind those of the other row, said rollers being arranged in pairs, whereby material to be embroidered will be passed from one of the rollers of one pair to and over one of the rollers of another pair, and interposed guides by which all the pieces of material being embroidered are presented to the needles in substantially the same vertical plane, substantially as specified.

2. In an embroidery-machine, the combination, with a frame, of two rows of upright rollers carried thereby, the rollers of one row being arranged directly behind those of the other row, two horizontal shafts, gearing between said rollers and said shafts, whereby the rollers are rotated, and stretching devices for stretching the material being embroidered simultaneously and all parts and independently in a given part, substantially as specified.

401,261. PORTABLE COOKING APPARATUS. HENRY FRICKER, London, England. Filed Dec. 27, 1887. Serial No. 258,076. (No model.) Patented in England Nov. 16, 1887, No. 15,734; in France Dec. 20, 1887, No. 187,724; in Belgium Dec. 21, 1887, No. 80,012, and in Cape of Good Hope Apr. 4, 1888.



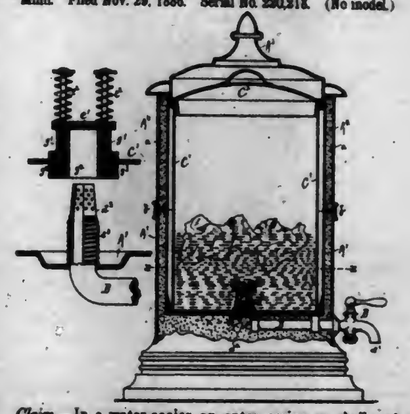
Claim.—A portable cooking apparatus consisting of the ring mounted on supporting-legs, the dished tray having a lateral flange, and a projecting bead above the flange removably supported on the ring, the dish-containing cylinder detachably resting on the bottom wall of the tray and provided with an opening and closing door in its vertical side wall and having inwardly-projecting dish-supports and a removable closely-fitting cover, and the imperforate closed cylindrical casing detachably resting on the lateral flange of the tray, above the bottom wall of the latter, and inclosing and entirely covering the dish-containing cylinder, substantially as described.

401,262. RENEWABLE PACKING-RING. HENRY R. FRISBIE, Mansfield, Ohio. Filed Apr. 11, 1888. Serial No. 270,317. (No model.)



Claim.—A packing-ring consisting of two metallic concentric rings, one within the other, and the intermediate connecting-arms, $x\,x$, with openings between them, and of a yielding packing substance interposed between said rings surrounding and interlocking said arms, and having exposed bearing-surfaces at opposite ends thereof, substantially as set forth.

401,263. WATER-COOLER. WILLIAM H. FRUEH, Minneapolis, Minn. Filed Nov. 29, 1886. Serial No. 220,218. (No model.)



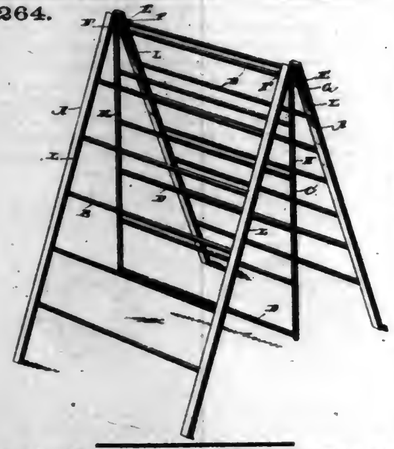
Claim.—In a water-cooler, an outer casing or shell and a discharge-pipe extending outward beneath the bottom of the compartment formed by the casing, said pipe having a vertical open-mouthed branch extending through said bottom, in combination with a removable water-reservoir which is inserted into said compartment, and which rests on the bottom of said compartment, said reservoir having an opening in its lower end which passes over said vertical branch, and a self-closing valve carried by said water-reservoir for said opening, which valve is opened by being displaced upwardly by said vertical branch when said reservoir is placed in said compartment, and which automatically closes said opening when the reservoir is removed from the compartment, substantially as set forth.

401,264. CLOTHES-DRIER. CHARLES D. FULLER, Minneapolis, Minn. Filed Jan. 4, 1888. Serial No. 259,776. (No model.)

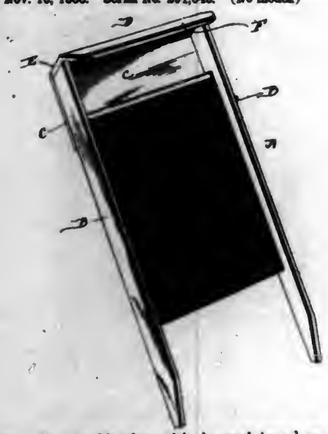
Claim.—In a clothes-drier, the two side frames, A, resting at their lower ends on the floor, combined with the central frame, C, said central frame being shorter than the side frames, so as not to reach to the floor, and the hinge or coupling connecting the side and central frames together at their upper ends, said hinge comprising the end rings, F, to embrace the bars of the side frames, and the central ring, G, to embrace one of the bars of the central frame, as set forth.



401,264.

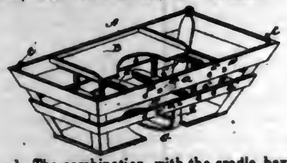


401,265. WASH-BOARD. GEORGE P. FULLER, Kalamazoo, Mich. Filed Nov. 16, 1888. Serial No. 291,046. (No model.)



Claim.—The combination, with the wash-board provided with side bars, B B, having their upper ends beveled upward toward their front edges, and the head-board secured to the rear edges of the side bars, of the combined cap-bar and protector D, comprising the integral similar parts, E F, arranged at an angle to each other, the part E being secured to the upper beveled ends of the side bars, whereby the part F projects forwardly beyond the front edges of the side bars and forms a protector, substantially as and for the purpose specified.

401,266. BABY-JUMPER. ALBERT W. GRAY, Mazomanie, Wis. Filed Aug. 18, 1888. Serial No. 283,079. (No model.)



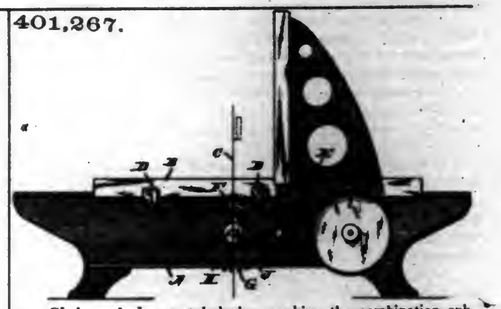
Claim.—1. The combination, with the cradle having openings formed in the sides thereof, of the arms for engaging the said openings, substantially as and for the purpose specified.

2. The combination of the cradle having openings formed in the sides thereof, arms for engaging the said openings, and a table provided with flanged guides for engaging the said arms, substantially as described.

3. The combination, with the cradle, the coil-spring, and means for attaching the spring to the cradle, of a plate secured between the coils of the spring, a pulley, and a rope secured to the said plate and passing over the pulley to the floor, substantially as described.

401,267. METAL-PLANING MACHINE. GEORGE A. GRAY, Covington, Ky., assignor to the G. A. Gray Company, Cincinnati, Ohio. Filed Jan. 17, 1889. Serial No. 296,846. (No model.)

401,267.



Claim.—1. In a metal-planing machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, and a bull-wheel and an oscillating tumbler having a common axis.

2. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a bull-wheel, a tubular shaft therefor supported by the bed, a tumbler-shaft journaled axially in the bore of the bull-wheel shaft, and a tumbler on said tumbler-shaft.

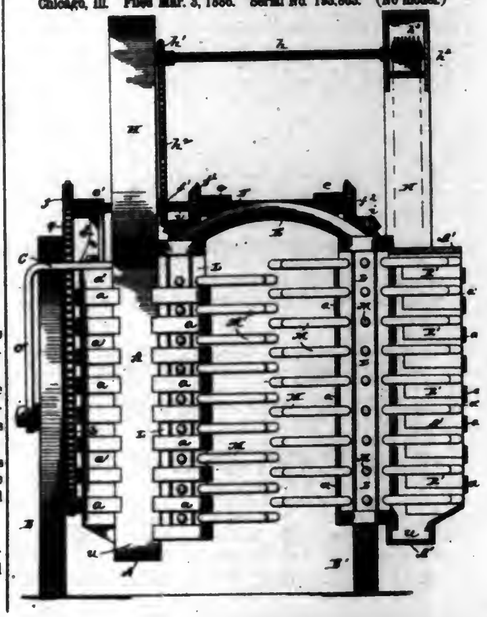
3. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a bull-wheel shaft mounted in bearings in the bed of the planer and adjustable endwise therein, and a bull-wheel and tumbler carried thereby upon an axis common to both.

4. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a tubular bull-shaft supported by the bed of the planer, and a bull-wheel at the center of length of said shaft and a tumbler at each end of said shaft, said bull-wheel and both said tumblers having an axis in common.

5. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a tubular bull-wheel shaft supported in bearings in the bed of the planer and adjustable endwise therein, a bull-wheel thereon, a tumbler-shaft axially disposed in the bore of the bull-wheel shaft, and a tumbler secured to each end of the tumbler shaft.

6. In a planing-machine, the combination, substantially as set forth, of a table provided with a rack, dogs on the table edge, a bull-wheel shaft, a bull-wheel thereon, a tumbler at each side of the planer adapted to receive a belt-shifting connection alternatively, the axis of oscillation of said tumblers coinciding with the axis of said bull-wheel, and a shaft uniting said tumblers and serving to impart oscillatory motion from one tumbler to the other.

401,268. MACHINE FOR PICKING COTTON. THOMAS J. GRAY, Chicago, Ill. Filed Mar. 3, 1886. Serial No. 193,863. (No model.)



Claim.—1. In a cotton-harvesting machine, the combination of horizontally-traveling endless belts or aprons carrying a series of rotating picker-stems, pinions located upon said stems, racks on the frame engaged by the pinions and imparting opposite rotations to the stem, and guides located in position on the frame to receive ends of the picker-stems and prevent their rotation while turning corners, substantially as set forth.

2. In a cotton-harvesting machine, the combination, with a traveling endless belt composed of a series of bars or slats secured at their ends in a pair of drive-chains, said chains having eyes or openings to receive the ends of the slats, of picker-stems mounted in said slats, pinions on the inner ends of the stems, rack-bars on the frame for rotating the picker-stems, and guides on the frame, through which lugs on the pinions pass to prevent their rotation while turning corners, substantially as set forth.

3. In a cotton-harvester, the combination, with a housing composed of a series of separated bars extending longitudinally of the machine, of a canvas or sheet-metal apron or lining covering the spaces between the bars, upright shafts carrying sprocket or pulley wheels, chains mounted on said wheels, vertical slats secured to the chains, and rotating picker-stems mounted in the slats, substantially as set forth.

4. The combination, with the frame-sections A A' and the bridge E, connecting the same, of the triangular frame C, in which the axle of the carrying-wheel B is supported, and the connected shafts D D', connected to the adjacent housing, substantially as set forth.

5. The combination, with housings, vertical shafts arranged therein, one behind the other, the sprocket-wheels secured on said shafts, the upper and lower drive-chains mounted on the sprocket-wheels, the upper chains having sockets on their lower faces and the lower chains sockets on their upper faces, the slats or bars secured in said sockets, picker-stems mounted in the slats, racks on the frame and pinions on the stems for rotating the picker-stems, the guides located at the ends of the housings, and lugs on the pinions for controlling the direction of movement of the slats and picker-stems, substantially as set forth.

6. In a cotton-harvesting machine, the combination, with a traveling endless belt and a series of picker-stems carried therein, said pickers having lugs on their inner ends, in combination with guides in the interior of the frame for throwing the stems downward, and wipers affixed in close proximity to the stems for removing the cotton from the stems while in this position, substantially as set forth.

7. The combination, with the frame-sections carrying the hollow elevator-frames, of the partitions forming conduits or channels *u*, communicating at the bottom with the interior of the sections and at the top with the hollow frames, and the elevators adapted to move through the conduits, substantially as set forth.

8. The combination, with a housing, an endless belt or apron therein, and picker-stems mounted in the apron and provided with flattened inner ends, of stationary guides adapted to receive the flattened ends of the picker-stems as the latter pass around the shafts, substantially as set forth.

9. The combination, with an endless belt or apron mounted on vertical shafts, picker-stems mounted therein and provided with pinions, and the rack-bars, one of which is arranged obliquely, as shown, of the stationary guides located between the rack-bars and adapted to direct the stems from the rack-bar on one side of the shaft to the rack-bars on the other side of said shafts, substantially as set forth.

10. The combination, with an endless apron and oscillating flat circular bearings pivotally mounted in the apron, of picker-stems journaled in said oscillating bearings, and devices for rotating the picker-stems, substantially as set forth.

11. The combination, with the shafts I and J and sprocket-wheels mounted thereon, of endless chains engaging the sprocket-wheels, slats secured to the chains, the picker-stems mounted in the slats, pinions secured on the picker-stems and provided with the elongated lugs, and racks on the frame in position to be engaged by the pinions, of the stationary guides having grooves with which the elongated lugs engage while the stems are turning the corners, substantially as set forth.

12. The combination, with shafts I J, an endless belt or apron mounted thereon, oscillating and rotating picker-stems mounted in said belt or apron, said pickers having pinions thereon and lugs on the pinions, of rack-bars and stationary guides having inclined cam-grooves adapted to receive the lugs on the pinions, and thereby oscillate the stems as they pass through the grooves, substantially as set forth.

401,269. PROCESS OF PRODUCTION OF MATERIAL AS SUBSTITUTE FOR INDIA-RUBBER, &c. FREDERICK GREENING, Uxbridge, County of Middlesex, England, assignor to himself and John Frost, same place. Filed June 23, 1887. Serial No. 242,786. (No specimens.) Patented in England June 26, 1886, No. 8,442; in France June 15, 1887, No. 184,947, and in Belgium June 20, 1887, No. 77,879.

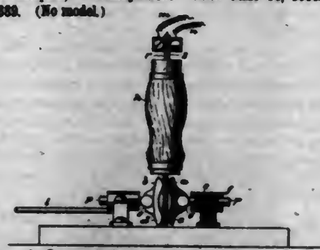
Claim.—1. The herein-described process of producing from fibrous substance a soluble base, consisting in steeping or saturating the said fibrous substance in a mixture of sulphuric acid and nitrate of potash, washing the converted fiber, then subjecting the same to a bath of liquid carbonic acid or carbonic-acid gas, and then drying the converted fiber, substantially as described.

2. The process of treating fibrous substances, consisting of steeping or saturating said substances with a mixture of sulphuric acid and nitrate of potash, washing the converted fiber, then subjecting the same to a bath of liquid carbonic acid or carbonic-acid gas, then subjecting the same to an acid bath, then drying the converted fiber, and then treating the same with a suitable solvent, as herein described.

3. The process of treating fibrous substances, consisting of subjecting the same to a mixture of sulphuric acid and nitrate of potash, washing the converted fiber, subjecting the same to a bath of liquid carbonic acid or carbonic-acid gas, then drying the converted fiber, and then treating the same with a solvent composed of a mixture of methylated alcohol, rosin, or colophony, gum benzoin or benjamin, and castor-oil, substantially as described.

4. The process of treating fibrous substances with a heated mixture of sulphuric acid and nitrate of potash, then freeing the converted fiber from excess of the mixture, washing it with water, partially drying it, subjecting it to a bath of liquid carbonic acid or of carbonic-acid gas, then drying it, then treating it with a distillate composed of a mixture of methylated alcohol, rosin, or colophony, gum benzoin or benjamin, castor-oil, and light hydrocarbon, substantially as herein set forth.

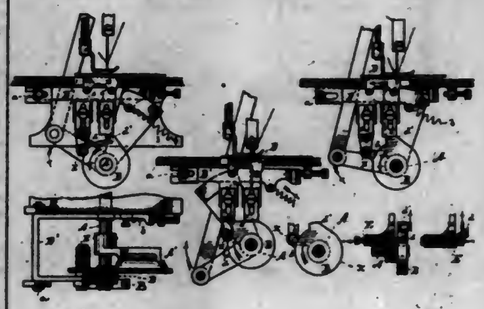
401,270. SWITCH OR CIRCUIT-CHANGER. WILLIAM W. GRISCOM, Haverford College, Pa., assignor to the Electro Dynamic Company of Philadelphia, Pennsylvania. Filed June 30, 1888. Serial No. 278,682. (No model.)



Claim.—1. In a switch or circuit-changer, two pieces of conducting material respectively pivoted at corresponding points intermediate their terminals or points of contact to reciprocating bearings and normally held in contact at two points, in combination with a plug or wedge consisting of two strips or conductors insulated from each other and adapted to successively separate said two contact-points by a continuous advance movement, substantially as described.

2. The combination, in a switch or circuit-changer, of two pieces of conducting material respectively pivoted at points midway between their extremities to reciprocating bearings and normally held in contact at two points by spring-pressure, with a plug or wedge consisting of two strips or conductors insulated from each other and adapted to successively separate said two contact-points by a continuous advance movement.

401,271. FEEDING DEVICE FOR SEWING-MACHINES. LUDWIG GUNDELACH, Leipsic, Saxony, Germany. Filed May 31, 1888. Serial No. 275,590. (No model.)



Claim.—The combination of feed-plate D and pivoted frame D', that supports said plate and has projections *d'*, with movable spring-pin E and with an oscillating cam, B, having two noses, *d d'*, the nose *d* being beveled and adapted to engage pin E, while the nose *d'* is adapted to engage projection *d'*, and with the spring *b*, substantially as specified.

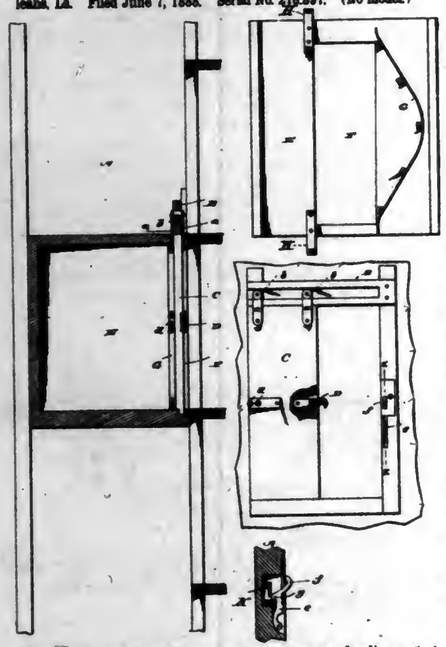
401,272. SIDE SPRING FOR VEHICLES. GEORGE B. HAMLIN, Providence, R. I. Filed June 4, 1888. Serial No. 276,092. (No model.)



Claim.—1. In a vehicle-spring, the combination, with a main leaf or bar, of a series of auxiliary semi-elliptical springs secured to said bar, the ends of said springs being coupled together in substantially the same horizontal plane, as and for the purposes set forth.

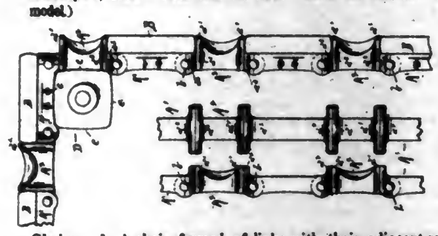
2. In a vehicle-spring, the combination, with a main leaf or spring bar, of a series of secondary springs secured at their centers to said bar, their adjacent ends being coupled together, and the extremities of the two outer springs secured to the axle or bolster supported thereby, substantially as and for the purpose set forth.

401,273. ELEVATOR-HATCHWAY. HENRY G. HESTER, New Orleans, La. Filed June 7, 1888. Serial No. 276,397. (No model.)



Claim.—In a device for operating doors at the landings of elevator-wells, the combination, with the car having the curved flange G, arranged as shown, of the shoes H, arranged at the opening of the car on the side opposite the said flange, and one directly opposite each end of the said flange, the sliding door carrying the pivoted latch and the friction-rollers *d* about midway of its length to be engaged by the said flange, and the lock arranged at the door of the landing to receive the pivoted latch, whereby the said latch may be disengaged by one of the shoes on the car pressing upon the said lock-lever as the adjacent end of the flange enters the rollers, substantially as specified.

401,274. CHAIN FOR STOCK-CAR PARTITIONS. BORN C. HICKS, Minneapolis, Minn. Filed Jan. 12, 1889. Serial No. 296,755. (No model.)

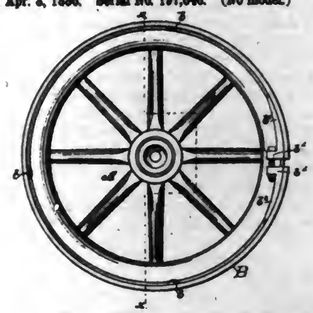


Claim.—1. A chain formed of links with their adjacent ends coupled together and curved on one side, and with stops on their other sides, whereby it is flexible in one direction and rigid in the other, substantially as and for the purpose set forth.

2. A chain formed of links with their adjacent ends coupled together and curved on one side, and with stops d' d^3 d^5 on their other sides, whereby it is flexible in one direction and rigid in the other, substantially as and for the purpose set forth.

3. A chain formed of links coupled by their ends, in combination with a carrier-sheave over which said chain is adapted to be drawn, and having sides corresponding to the length of said links, said sides and links being curved in segments of circles whose radii are in excess of the radius of said sheave, whereby a sheave of small diameter may be employed to carry a chain having long links, substantially as and for the purpose set forth.

401,275. WAGON-TIRE. ALBERT H. HOPKINS, Crookston, Minn. Filed Apr. 3, 1888. Serial No. 197,646. (No model.)



Claim.—The combination, with the wheel, of the supplementary tire, composed of the bar B, bent to embrace the rim of the wheel and having pairs of lugs at intervals to embrace the sides of the said rim, the re-enforcing stripe b^3, secured to the proximate ends of the bar B and embracing the sides of the said rim, and having their ends provided with lugs b', which extend radially inward and bear on the sides of the rim to brace the ends of the bar B, and the bolts, one on each side of the rim, passing through the said lugs b', substantially as and for the purpose described.

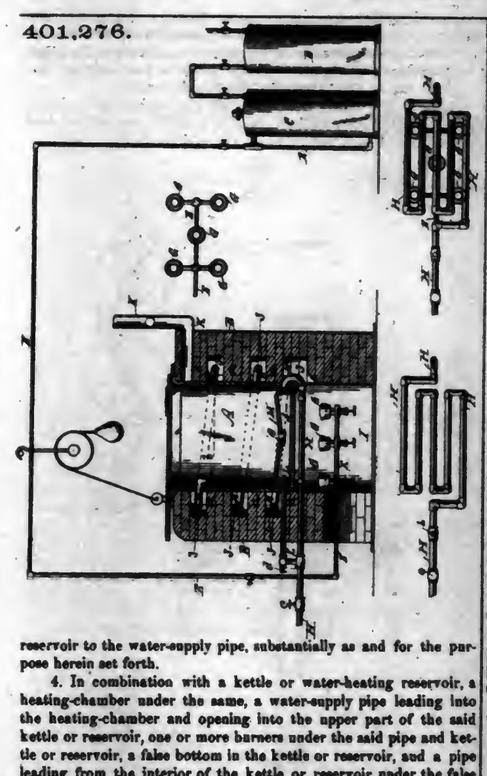
401,276. PROCESSING APPARATUS. JOHN S. HULL and THOMAS A. HAND, Baltimore, Md. Filed Nov. 27, 1888. Serial No. 292,041. (No model.)

Claim.—1. A vertical furnace having a spiral flue formed in the masonry, in combination with a vessel for containing water suspended in the furnace and surrounded by said flue, a heating-chamber below the vessel, and a supply-pipe passing through the heating-chamber, encircling the vessel in the path of the flue, and communicating with the upper part thereof, substantially as described.

2. A vertical furnace having a spiral flue formed in the masonry, in combination with a vessel containing water suspended in the furnace and surrounded by said flue, a heating-chamber below the vessel, and a supply and circulating pipe communicating with the vessel at the lower end thereof, passing through the heating-chamber, encircling the vessel in the path of the flue, and again communicating with the vessel near the upper end thereof, substantially as described.

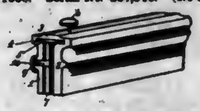
3. In combination with a kettle or water-heating reservoir, a heating-chamber under the same, a water-supply pipe leading into the heating-chamber and opening into the upper part of the said kettle or reservoir, one or more burners under the said pipe and kettle or reservoir, and a pipe leading from the bottom of the kettle or reservoir to the water-supply pipe, substantially as and for the purpose herein set forth.

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4. In combination with a kettle or water-heating reservoir, a heating-chamber under the same, a water-supply pipe leading into the heating-chamber and opening into the upper part of the said kettle or reservoir, one or more burners under the said pipe and kettle or reservoir, a false bottom in the kettle or reservoir, and a pipe leading from the interior of the kettle or reservoir under the false bottom out and into the said water-supply pipe, substantially as and for the purpose herein set forth.

401,277. SAW-JOINTER. WESLEY A. HUSTER, Idaho Springs, Colo. Filed Oct. 5, 1888. Serial No. 287,316. (No model.)



Claim.—1. A saw-jointer adapted to be grasped in the hand and reciprocated over the edge of a saw, consisting of the side pieces or frames fixed relatively to each other, connectors or clamps uniting them and adapted to hold a file, an intermediate sliding gage or guide-piece, ways for it to slide or move upon, and means for adjusting it, substantially as set forth.

2. A saw-jointer consisting of side pieces, 1 2, clamps 3, with set-screws 6, sliding piece 7, having guide rods or arms, and the adjusting-screws 9, substantially as set forth.

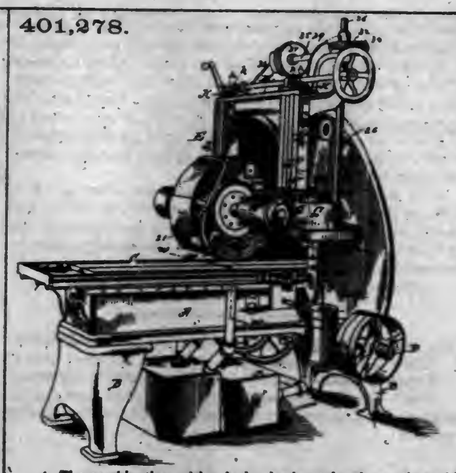
401,278. SURFACE GRINDING MACHINE. ELWIN R. HYDE and RICHARD C. HORNER, Springfield, Mass. Filed Mar. 23, 1888. Serial No. 268,244. (No model.)

Claim.—1. In a surface-grinding machine, the combination, with a table and suitably-supported horizontal guideways, of the slides guided in said horizontal ways, carrying a rotatable grinding-wheel, a face-plate having a crank-pin, and a pitman-rod between said face-plate and said slide, for the purpose set forth.

2. The combination, with a bed, a longitudinally-reciprocating table thereon, and suitably-supported horizontal guideways, of the slides guided in said horizontal ways, carrying a rotatable grinding-wheel, a face-plate having a crank-pin, and a pitman-rod between said face-plate and said slide, substantially as and for the purpose described.

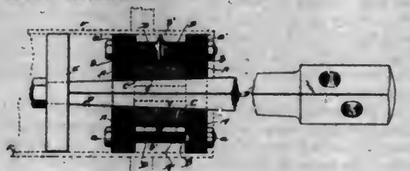
3. The combination, with a bed, a horizontal reciprocating table thereon, the uprights, and horizontal guideways thereon, of slides 12 12, movable in said guideways and carrying a rotatable grinding-wheel, the shaft 35, provided with the worm-screw 34, a shaft, 26, having a worm-wheel engaged by said worm-screw, and a gear, 25, a face-plate, 17, having a shaft, 18, and a gear, 24, engaging said gear 25 and provided with a crank-pin, and a pitman-rod, 15, connecting said crank-pin and one of said slides, substantially as and for the purpose described.

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4. The combination, with a bed, a horizontal reciprocating table thereon, the uprights E E, and the screw-shafts K K, of the vertically-movable slide-blocks G G, engaging said screw-shafts having horizontal guideways, the slides 12 12, movable therein and carrying a rotatable grinding-wheel, the shaft 35, provided with the worm-screw 34, a vertical shaft, 26, having a spline-groove, a gear, 25, and a feathered worm-wheel confined against axial movement and engaged by said worm-screw, a bracket carried by one of said slide-blocks G, in which the lower end of said shaft 26 bears, the shaft 18, bearing in said bracket, provided with the gear 24, and the face-plate 17, having the crank-pin, and the pitman-rod connecting said crank-pin and one of said slides 12, substantially as and for the purpose described.

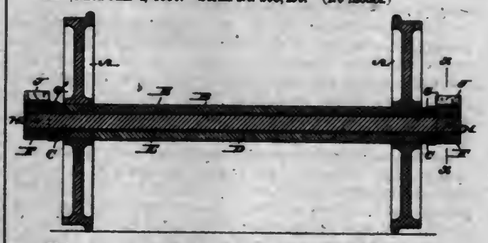
401,279. TUBE-CUTTER. JOHN E. JERROLD, Sr., Erie, Pa., and HARRY H. BARCLAY, Cleveland, Ohio. Filed Nov. 5, 1888. Serial No. 289,905. (No model.)



Claim.—1. The combination of a pair of rings having recesses therein, cutter-rollers, the trunnions of which rest in said recesses, a sectional driver located between the rings and engaging the cutter-rollers and provided with an angular socket, and bolts connecting the rings and locking the parts in position, of a tapering mandrel having a cross-section corresponding in shape to the angular socket in the driver, substantially as set forth.

2. The combination, with a pair of rings having recesses therein, cutter-rollers, the trunnions of which rest in said recesses, springs located within the recesses outside of the roller-trunnions and bearing against said trunnions, a sectional driver located between the rings and engaging the cutter-rollers, and provided with an angular socket, and bolts connecting the rings and locking the parts in position, of a tapering mandrel having a cross-section corresponding in shape to the angular socket in the driver, substantially as set forth.

401,280. CAR-WHEEL AXLE. GEORGE W. JONES, Philadelphia, Pa. Filed Jan. 4, 1889. Serial No. 295,459. (No model.)



Claim.—1. A car-wheel axle consisting of a hollow axle carrying the wheels, a spindle passing through said axle, forming a bearing

therefor, and conical caps connected with the ends of the spindle and forming bearings for the ends of the axle, said ends also being conical, the parts being combined and serving for the purpose described.

2. A car-wheel axle consisting of a hollow axle having conical ends, a spindle passing through said axle, forming a bearing therefor, oil-ducts in said spindle for lubricating the axle, and caps secured to the spindle and having conical ends, with which the conical ends of the axle are in contact, said conical ends forming bearings, substantially as described.

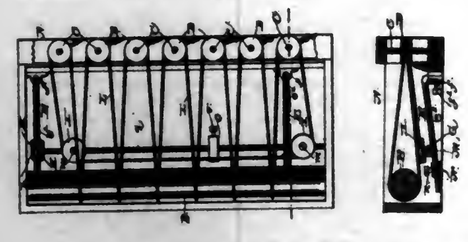
3. In a car-axle, the combination, with the hollow axle, of a spindle on which said axle rotates, caps carried by the spindle and forming end bearings for the axle, and axle-boxes secured to the spindle and caps, preventing the same from turning, substantially in the manner described.

4. The conical caps G, with shoulders G', as described.

401,281. TENSION-REGULATOR FOR SPINDLE-DRIVING BANDS.

PATRICK L. KENNEY, Pittsfield, Mass., assignor of one-half to Louis C. Werner, same place. Filed Jan. 3, 1889. Serial No. 295,280. (No model.)

Brief.—The invention consists in the improved devices for maintaining a uniform tension upon the band employed to drive a number of spindles.



Claim.—1. The combination, with the cylinder or drum, the whirls, and the band passing around the same, of the bracket provided with a supporting-arm which inclines downwardly from the whirls, and the swinging arm bearing at its free end on the said supporting-arm and provided with idler-pulleys around which the band extends, whereby as the band slackens the swinging arm slides along the supporting-arm away from the whirls, substantially as and for the purpose specified.

2. The combination, with the cylinder or drum, the whirls, and the band passing around the same, of the brackets provided with downwardly-inclined supporting-arms d' d', the removable collar fitting on one of the arms, the swinging arm pivoted to the said collar and bearing on the other supporting-arm, and the idler-whirls secured to the swinging arms and having the band passing therearound, substantially as specified.

3. The combination, with the cylinder, the whirls, and the band extending around the same, of the castings provided with sockets, the brackets provided with vertical arms mounted in the said sockets and having downwardly-inclined arms d' d', the swinging arm provided at one end with a collar which fits on one of the inclined arms d' and bearing at its free end on the other inclined arm, and the adjustable idler-whirls provided with collars which fit on the swinging arm, substantially as specified.

4. The combination, with the cylinder, the whirls, and the band extending around the same, of the brackets having arms d' d', the collar H, mounted on one of the arms, the swinging arm bearing at one end on one of the arms d' and provided at the other end with an eye, K, the adjusting-bolt fitting in the said eye engaging a threaded aperture in the side of the collar, the conical washer arranged between the head of the bolt and the eye, and the idler-pulleys arranged on the swinging arm, substantially as specified.

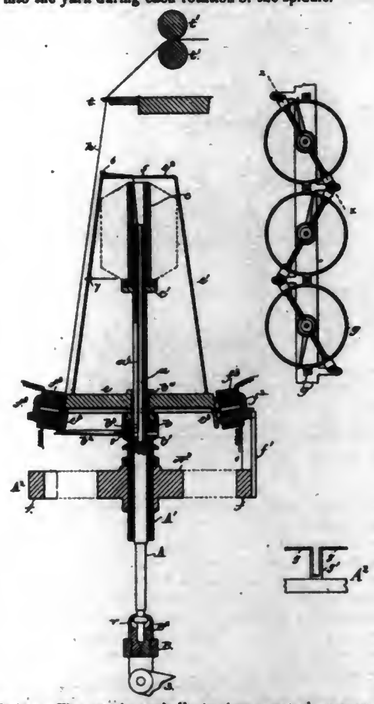
5. The combination, with the cylinder, the whirls, and the band passing around the same, of the bracket provided with a downwardly-inclined arm, d', the swinging arm bearing at its free end on the said arm and provided with idler-pulleys around which the said band passes, and the weight mounted on the swinging arm and provided with a set-screw to clamp it in the desired position, substantially as specified.

6. The combination, with the cylinder, the whirls, and the band passing around the same, of the bracket provided with an inclined supporting-arm, the swinging arm bearing at its free end on the supporting-arm, the adjustable collars M M, arranged on the arm and provided with the vertical bolts m, which fit in threaded apertures in the collars and bear against the arm, and the idler-pulleys mounted on the said bolts and having the band passed therearound, substantially as specified.

401,282. SPINNING, DOUBLING, AND TWISTING MACHINE.

ERNEST KIENEL, Tumovar, Austria-Hungary, and EDWARD R. CLAUSEN, Hartford, Conn., assignors to George Draper & Sons, Hopedale, Mass. Filed Jan. 24, 1888. Serial No. 297,363. (No model.)

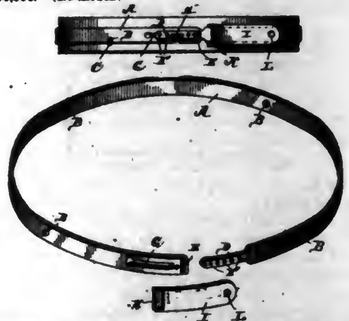
Brief.—The object of the invention is to improve the construction of spinning and twisting machines in which two turns of twist are put into the yarn during each rotation of the spindle.



Claim.—The rotating spindle having a central passage, a, the twisting device rotating in unison with the spindle, and the spool or bobbin, combined with the delivery-yoke and with a magnet to check the rotation of the said delivery-yoke with the spindle, substantially as described.

401,283. TABLE-COVER FASTENER.

EDMUND B. KNAPP and HENRY L. THOMPSON, San Jacinto, Cal. Filed June 8, 1888. Serial No. 276,538. (No model.)



Claim.—1. In a fastener for table-top covers, the combination, with the flat band having its meeting ends secured together, of the detachable covering flap or plate provided with a transverse slot fitting over the said band and covering the joint between the meeting ends of the band, substantially as specified.

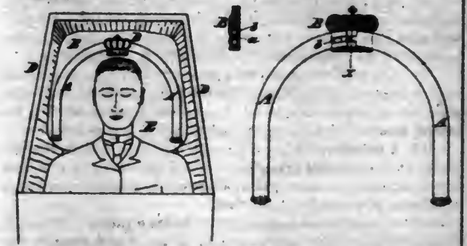
2. The fastener for table-top covers, consisting of a band having a longitudinal slot, G, and a vertical slot, E, in one end, the tongue on the opposite end passing through the vertical slot and a having a series of apertures registering with the slot G, and the staple passing through the apertures and the slot G and engaging the table-top, substantially as specified.

3. In a fastener for table-top covers, the metallic band having slots E and G therein, the apertured tongue passing through the slot

E and having its apertures aligned with the slot G, and the staple engaging the aligned apertures and slot, combined with the covering flap or plate having a vertical slot to receive the band and an aperture to receive a screw, substantially as specified.

401,284. FRAME FOR THE PILLOWS OF COFFINS.

CYRUS KRAMER, Leeper, Pa. Filed Mar. 22, 1888. Serial No. 268,040. (No model.)



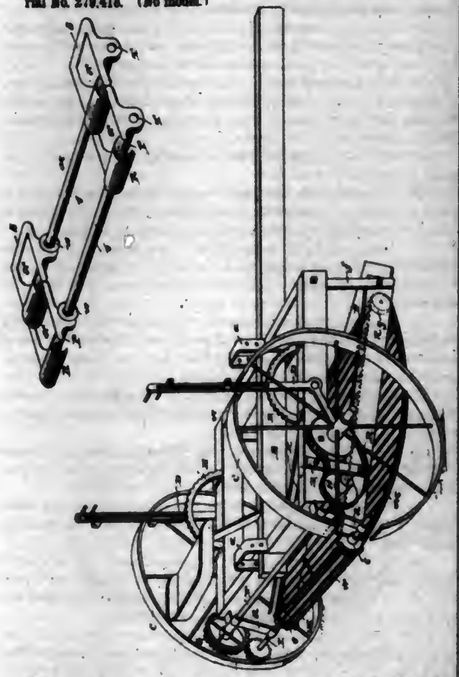
Claim.—1. The combination, with a pillow, of a frame consisting of an arc having its sides prolonged substantially parallel with each other and open at their ends, substantially as herein described.

2. A frame for a pillow, composed of two flexibly and contractibly adjustable sections united by a sleeve which conceals the joint, substantially as herein described.

3. A frame for a pillow, formed as an arc with its sides prolonged and provided with perforated flanges, whereby it may be sewed to a pillow, for the purpose set forth.

401,285. POTATO-DIGGER.

JOHN W. LOREE, Fenwick, assignor of one-half to D. W. Loree, Ridgeway, Mich. Filed July 9, 1888. Serial No. 279,418. (No model.)



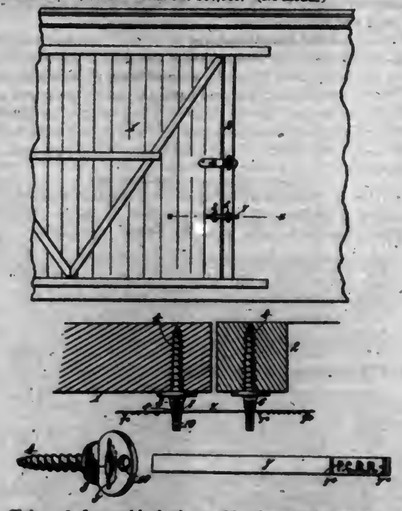
Claim.—1. In a machine for digging potatoes and the like, the combination, with the main frame, of the central vertical loops, the draft-beam placed therein, the plow-frame depending from the main frame on hangers, the endless elevator, the supporting-wheels journaled on angular levers, the gearing and drive belts, the segmental racks, and the spring-dog in the said hand-levers, substantially as specified.

2. The combination, with the main frame having the vertical loops, as described, of the angular levers D, pivoted to the said frame and carrying spindles at their lower branches, the supporting-wheels having fixed pulleys or gears and arranged on the spindles of the angular levers, the segmental racks on the main frame, an endless elevator, and the shaft I, receiving the endless elevator, the shaft F, and the intermeshing gears on the respective shafts, substantially as specified.

3. The endless elevator composed of the links having cross-bars at one end and hooks at the opposite ends and eyes between the hooks and cross-bars, and the transverse rods having shoulders near their opposite ends and adapted to enter the eyes in the links, the whole designed to serve in a machine for digging potatoes or peanuts, substantially as specified.

401,286. SEAL-LOCK.

WASHINGTON I. LUDLOW, Cleveland, Ohio. Filed Oct. 9, 1888. Serial No. 287,665. (No model.)

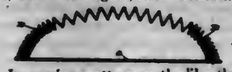


Claim.—1. In a seal-lock, the combination of a slotted plate rigidly secured to a door-casing, and a similar but independent slotted plate rigidly secured to and movable with an opening and closing door, with a thin straight metallic strip passing through the slots of the plates and having its projecting ends embossed or stamped with letters or other designs, substantially as described.

2. In a seal-lock, the combination, with plates having slots of greater length upon one side than upon the other, of a thin metallic seal-slip inserted in said slots and having its projecting ends embossed with suitable characters, substantially as described.

401,287. SPRING MATTRESS, PILLOW, &c.

ANDREW J. LITTLE, Hillsborough, Ohio. Filed Aug. 20, 1888. Serial No. 283,285. (No model.)

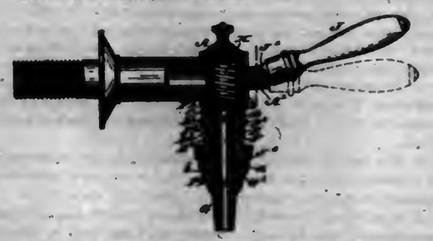


Claim.—1. In a spring-mattress or the like, the combination, with the spring D, having the closely-coiled end portions and the intervening integral portion formed of expanded coils, of the base a, connected to the outer ends of the closely-coiled portions, substantially as specified.

2. In a spring-mattress, the combination, with the springs D, having the closely-coiled end portions and the intervening portions formed of integral expanded coils, of the base a, connected to the outer ends of the closely-coiled portions, and the pad b, provided with eyelet-holes and covering said springs, substantially as specified.

401,288. SELF-CLOSING FAUCET.

KARL MAIER, Philadelphia, Pa., assignor of one-third to Louis Frik, same place. Filed Sept. 12, 1888. Serial No. 285,261. (No model.)



Claim.—1. A self-closing faucet consisting of a shell with a chamber, a thimble and sleeve connected to the shell, a tube within said thimble and sleeve having perforations affording communication between the chamber and the interior of the tube, and side vents opening the interior of the tube to the atmosphere, a spring within the tube bearing against the head of the tube, and a nozzle connected to the

tube, the said vents coinciding with the lower edge of the said sleeve when the faucet is closed, substantially as described.

2. A self-closing faucet having a shell with a chamber, a sliding tube projecting from said shell and having side vents and a bore, the latter communicating with the said chamber when the upper closed end of said tube is raised from its seat, a spring in said chamber bearing against said tube, and a nozzle secured to the said tube below the said vents, the said vents being uncovered when the cock is closed, said parts being combined substantially as described.

3. A self-closing faucet consisting of the shell A, with chamber B therein, the thimble D, secured to shell A, the collar E, secured to said thimble, the sliding tube F, having a closed head, F', with side openings, F^2, below said head, said head having a seat on the top of said thimble D, the spring H in said chamber B bearing against said sliding tube, the nozzle G, secured to said tube F, and the pivoted handle J, with link J^3 and annulus J^3, said parts being combined substantially as described.

401,289. SECONDARY BATTERY. WILLIAM MAIN, Brooklyn, N. Y., assignor to the River and Rail Electric Light Company, of West Virginia. Filed Jan. 10, 1889. Serial No. 295,956. (No model.)



Claim.—1. A secondary battery the hydrogen pole-piece whereof is composed in whole or in part of zinc and wherein mercury is present either in solution or as a constituent of the hydrogen pole-piece, the plates of which battery are in close proximity and horizontally placed, one or more of the hydrogen-plates being immediately below an oxygen element, said horizontal disposition facilitating the even distribution of precipitated metal upon the hydrogen-plates and preventing the accretion upon the hydrogen-plate of short-circuiting formations, substantially as described.

2. A secondary battery whereof the active material of the hydrogen pole-piece consists of mercury electrolytically combined with zinc, the electrolytic formation being more or less built up during charge and broken down during discharge, the plates whereof are in close proximity and horizontally placed, said horizontal disposition facilitating and promoting the even distribution of the electrolytic formation upon the hydrogen-plates and preventing the accretion thereon of short-circuiting formations, substantially as described.

3. A secondary-battery cell containing but a single pair of elements, the hydrogen element being composed in whole or in part of zinc and lying upon the bottom of the cell, mercury being present either in solution or as a constituent of the hydrogen element, the oxygen element being supported immediately above the hydrogen element in a position substantially parallel therewith and in close proximity thereto, the horizontal disposition of the elements facilitating the even distribution of precipitated metal upon the hydrogen element and preventing the accretion thereon of short-circuiting formations, substantially as described.

4. A secondary battery-cell containing but a single pair of elements, the hydrogen element being composed in whole or in part of zinc, mercury being present either in solution or as a constituent of the hydrogen element, the oxygen element being of lead and supported immediately above the hydrogen element in a position substantially parallel therewith and in close proximity thereto, the horizontal disposition of the elements facilitating the even distribution of precipitated metal upon the hydrogen element and preventing the accretion thereon of short-circuiting formations, substantially as described.

5. As a pair of elements for a secondary battery, amalgamated zinc constituting the hydrogen element and a laminated perforated plate constituting the oxygen element, substantially as described.

6. As a pair of elements for a secondary battery, amalgamated zinc constituting the hydrogen element and a laminated perforated lead plate constituting the oxygen element, substantially as described.

7. As a pair of elements for a secondary battery, a horizontal mass of amalgamated zinc constituting the hydrogen element and a laminated perforated plate constituting the oxygen element, substantially as described.

8. As a pair of elements for a secondary battery, a horizontal mass of amalgamated zinc constituting the hydrogen element and a laminated perforated lead plate constituting the oxygen element, substantially as described.

9. As a pair of elements for a secondary battery, amalgamated zinc constituting the hydrogen element and a laminated perforated plate having one or more layers of carbon between the laminæ constituting the oxygen element, substantially as described.

10. As a pair of elements for a secondary battery, amalgamated zinc constituting the hydrogen element and a laminated perforated lead plate having one or more layers of carbon between the laminæ constituting the oxygen element, substantially as described.

11. As a pair of elements for a secondary battery, amalgamated zinc constituting the hydrogen element and a laminated perforated plate having one or more layers of powdered graphite between the laminæ constituting the oxygen element, substantially as described.

12. A secondary-battery cell having a pair of elements, one consisting of amalgamated granulated zinc and the other of a pole-piece supported above the same and at all points substantially equidistant therefrom, substantially as described.

13. A secondary or storage battery having a pair of horizontally-disposed elements, the active material of one of said elements consisting of an electrolytically-formed layer of zinc and mercury formed upon a substratum of zinc granules, substantially as described.

14. A secondary-battery cell having two elements, one consisting of granulated zinc lying in the bottom of the cell and the other of a pole-piece supported above the same and being at all points substantially equidistant from the other element, substantially as set forth.

15. A secondary-battery cell adapted to contain two horizontally-placed pole-pieces, one of said pole-pieces consisting of granulated material lying in the bottom of the cell and the other of a laminated plate or plates suspended above the same, substantially as set forth.

16. In a secondary battery, a hydrogen pole-piece made up of granulated material horizontally placed and held in position by a perforated plate placed over it, substantially as set forth.

17. In a secondary battery, a hydrogen pole-piece made up of amalgamated granulated zinc horizontally placed and held in place by a perforated zinc plate, substantially as set forth.

18. In a secondary battery, the combination of insulating-block F, serving to prevent contact between the conductor and the oxygen element, and corner-piece G, upon which the block F rests, substantially as described.

19. The cell A, provided with supporting corner-pieces for the plate, substantially as set forth.

20. A battery-plate made up of several metallic laminæ, one or more of which is coated with finely-divided material conductive of electricity and inactive in the battery, substantially as described.

21. A compound plate for secondary batteries, made up of laminæ fastened together and having one or one layers of conductive material inactive in the battery held between the laminæ, substantially as described.

22. A compound plate for secondary batteries, made up of laminæ fastened together and provided with perforations and having one or more layers of conductive material inactive in the battery held between the laminæ, substantially as described.

23. In a secondary battery, a perforated plate made up of laminæ fastened together and having one or more layers of carbon held between them, substantially as described.

24. A compound plate for secondary batteries, made up of laminæ fastened together and having one or more layers of carbon held between them, substantially as described.

25. In a secondary battery, a compound plate one or more of the layers of which are coated with finely-divided carbon, substantially as set forth

26. In a secondary battery, a compound plate one or more of the layers of which are coated with graphite, substantially as set forth.

27. A battery-plate made up of alternate layers of oxidized lead and finely-divided carbon, substantially as set forth.

28. A battery-plate made up of layers one or more of which are coated with graphite in a state of fine subdivision, substantially as set forth.

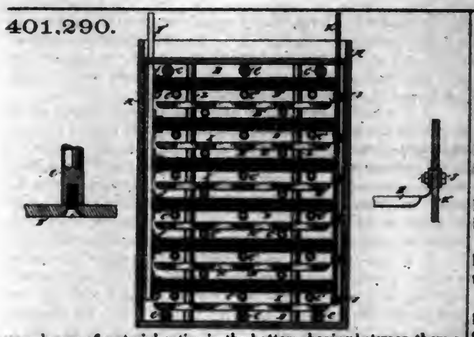
29. A secondary or storage battery element made up of pieces of material intended to be active in the battery in metallic state, said pieces being coated with finely-divided carbon and fastened or suitably associated together to form the element, substantially as described.

30. A secondary or storage battery element made up of pieces of lead in metallic state, said pieces being coated upon their surfaces with graphite and suitably fastened or associated together to form the element, substantially as described.

401,290. SECONDARY BATTERY. WILLIAM MAIN, Brooklyn, N. Y., assignor to the River and Rail Electric Light Company, of West Virginia. Filed Jan. 10, 1889. Serial No. 295,959. (No model.)

Claim.—1. In a laminated secondary-battery element, two or more layers of material active in the battery, having between them a layer of carbonized cloth or other fabric, substantially as described.

401,290.



2. In a secondary-battery element, two or more layers of material active in the battery, having between them a layer of cloth or other fabric carbonized at a high degree of heat, substantially as described.

3. In a secondary-battery element, two or more layers of material active in the battery, having between them a layer of carbonized fabric, the compound plate so formed being perforated, substantially as described.

4. In a secondary-battery element, two or more layers of material active in the battery, having between them a layer of carbonized cotton cloth, substantially as described.

5. In a battery-cell, a frame-work for supporting the elements, consisting of two plates connected by rods of insulating material, in combination with oxygen and hydrogen elements supported thereon, substantially as described.

6. In a secondary-battery cell, a set of negative elements electrically connected to each other, a set of positive elements connected to each other, and a rack removable from the cell for supporting the elements, substantially as described.

7. In a battery-cell, a set of negative elements, a set of positive elements, and a rack formed of vertical plates of insulating material connected by rods for supporting the elements, also of insulating material adapted to receive the set of negative elements on one side and the set of positive elements on the other side thereof, substantially as described.

8. The combination, in a battery-cell, of a removable element-supporting rack and a set of elements of like name in the form of horizontal plates connected together so that they can be removed as a unit from the rack, substantially as described.

9. In a battery-cell, a rack consisting of two plates suitably connected to each other and provided with glass rods or tubes supporting the plates and elements resting upon said rods, substantially as described.

10. The combination of the cell A, a rack formed of plates B, connected by rods C and supporting-rods C', of insulating material, and oxygen and hydrogen elements D E, substantially as set forth.

11. A secondary battery having as an element a horizontal copper tray containing granulated electro-positive material, substantially as described.

12. In a secondary battery containing mercury, a plate or tray serving as a support made of rolled copper, substantially as described.

13. A secondary-battery element consisting of a copper tray or plate and amalgamated zinc supported thereby.

14. A secondary-battery element consisting of an amalgamated copper plate or tray supporting granulated material, substantially as described.

15. A secondary-battery element consisting of a perforated tray the perforations of the tray having upwardly-projecting rims or edges and the tray containing amalgamated zinc, substantially as described

16. As a pair of elements for a secondary battery, a lead plate constituting the oxygen element and a copper plate supporting amalgamated zinc constituting the hydrogen element, substantially as described.

17. A secondary battery in which the elements are horizontally arranged, the oxygen elements being of lead and alternating with hydrogen elements of amalgamated zinc, substantially as described.

18. A secondary battery in which the oxygen elements are of lead horizontally placed and alternating with trays supporting amalgamated zinc, substantially as described.

19. A secondary battery in which the oxygen elements are of lead horizontally placed and alternating with copper trays containing amalgamated zinc, substantially as described.

20. A secondary battery in which the oxygen elements are of lead horizontally placed and alternating with perforated copper trays containing amalgamated zinc, substantially as described.

21. As a pair of elements for a secondary battery, a horizontal lead plate constituting the oxygen element and amalgamated zinc constituting the hydrogen element.

22. As a pair of elements for a secondary battery, a horizontal lead plate constituting the oxygen element and amalgamated granulated zinc constituting the hydrogen element.

23. As a pair of elements for a secondary battery, a horizontal lead plate constituting the oxygen element and a copper tray containing granulated zinc constituting the hydrogen element.

24. As a pair of elements for a secondary battery, a horizontal lead plate constituting the oxygen element and a copper tray containing amalgamated granulated zinc as the hydrogen element.

25. As a pair of elements in a secondary battery, a horizontal lead plate constituting the oxygen element and a perforated copper tray containing granulated zinc constituting the hydrogen element.

26. As a pair of secondary-battery elements, a horizontal lead plate constituting the oxygen element and a perforated copper tray containing amalgamated granulated zinc constituting the hydrogen element.

27. In a secondary battery, an element consisting of a perforated copper plate or tray serving as a support for the active material, the perforations having upwardly-projecting rims or edges, substantially as described.

28. In a secondary battery, an element consisting of amalgamated zinc and a metallic plate or tray serving as a support for the same, substantially as described.

29. In a secondary battery, an element consisting of finely-divided zinc and a horizontal metallic plate or tray serving as a support for the same, substantially as described.

30. In a secondary battery, an element consisting of amalgamated zinc and a horizontal metallic plate or tray serving as a support for the same, substantially as described.

31. In a secondary battery, an element consisting of amalgamated zinc placed in a horizontal layer upon a supporting-plate or tray of conducting material electrically connected with one of the binding-posts of the battery-cell, substantially as described.

32. In a secondary battery, a series of oxygen and hydrogen elements placed vertically one above the other in a single cell, the hydrogen elements consisting of metallic plates or trays containing amalgamated zinc, substantially as described.

33. In a secondary battery, a series of oxygen and hydrogen elements placed vertically one above the other in a single cell, the hydrogen elements consisting of metallic plates or trays containing finely-divided zinc, substantially as described.

34. In a secondary battery, a series of oxygen and hydrogen elements placed vertically one above the other in a single cell, the hydrogen elements consisting of copper plates or trays containing finely-divided zinc, substantially as described.

35. In a secondary battery, a series of oxygen and hydrogen elements placed vertically one above the other in a single cell, the hydrogen elements consisting of copper plates or trays containing amalgamated zinc, substantially as described.

36. In a secondary battery, a series of oxygen and hydrogen elements placed vertically one above the other in a single cell, the hydrogen elements consisting of perforated copper plates or trays containing amalgamated zinc, substantially as described.

37. A secondary-battery element consisting of a plate or tray of material substantially inert in the electrolyte and having a mass of finely-divided metal conformed thereto and solidified thereon in the presence of mercury, substantially as described.

38. A secondary-battery element consisting of a horizontal plate or tray of material substantially inert in the electrolyte and having a mass of zinc conformed thereto and solidified thereon in the presence of mercury, substantially as described.

401,291. PROCESS OF PREPARING ELECTRODES FOR SECONDARY BATTERIES. WILLIAM MAIN, Brooklyn, N. Y., assignor to the River and Rail Electric Light Company, of West Virginia. Filed Jan. 10, 1889. Serial No. 295,960. (No model.)



Claim.—1. The process of preparing a secondary-battery pole-piece, which consists in subjecting a layer of granulated zinc to the action of an electrical current in an electrolyte and in the presence of mercury, thus causing a spongy formation of the zinc and mercury upon the granules of said layer, substantially as described.

2. The process of preparing a secondary-battery pole-piece, which consists in immersing a layer of granulated zinc in a bath containing a solution of zinc and in the presence of mercury passing an electrical

current through the bath and the layer of zinc, thus forming a spongy deposit of zinc and mercury upon the granules of said layer, substantially as described.

3. The process of forming a secondary-battery pole-piece, which consists in immersing a layer of granulated zinc in a bath containing a solution of zinc and in the presence of mercury passing an electrical current through said battery and said layer of granulated zinc, thereby causing a deposit on the granules thereof of spongy mercury and zinc, and mechanically mixing said granules and said spongy deposit, substantially as set forth.

4. The process of preparing a secondary-battery pole-piece, which consists in subjecting a layer of granulated zinc to the action of an electrical current in an electrolyte in the presence of mercury, thereby procuring a spongy electrolytic formation upon the granules of said layer, and mechanically mixing said granules and said spongy formation, substantially as described.

5. The process of forming up a compound plate for a secondary battery, which consists in coating one or more laminæ with carbon or equivalent material conductive of electricity and inactive in the battery, uniting the laminæ together, and subjecting the compound plate thus formed to the action of a current until the metal of the laminæ becomes wholly or partially oxidized, substantially as described.

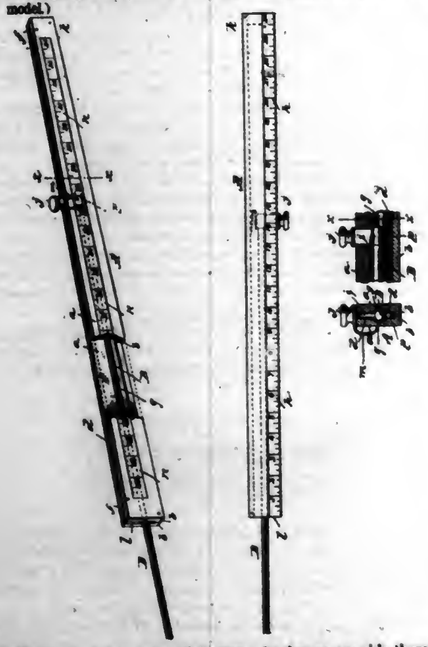
6. The process of forming up a compound plate for a secondary battery, which consists in covering the laminæ of the plates with finely-divided carbon, uniting the laminæ together, and subjecting the compound plate that is thus formed to the action of a current until the metal of the laminæ becomes wholly or partially oxidized, substantially as described.

7. The process of forming up a compound plate for a secondary battery, which consists in covering the laminæ of the plates with finely-divided graphite, uniting the laminæ together, and subjecting the compound plate that is thus formed to the action of a current until the metal of the laminæ becomes wholly or partially oxidized, substantially as described.

8. The process of forming a secondary-battery plate, which consists in placing finely-divided material upon a proper support and subjecting it to the action of a current in an electrolytic bath in the presence of mercury until it becomes solidified into a coherent mass, substantially as described.

9. The process of forming a secondary-battery plate, which consists in placing finely-divided zinc upon a proper support and subjecting it to the action of a current in an electrolytic bath in the presence of mercury until it becomes solidified into a coherent mass, substantially as described.

401,292. **EXTENSIBLE MEASURING-STICK.** CHARLES M. MUNFORD, Springfield, Mass. Filed Jan. 26, 1889. Serial No. 297,672. (No model.)

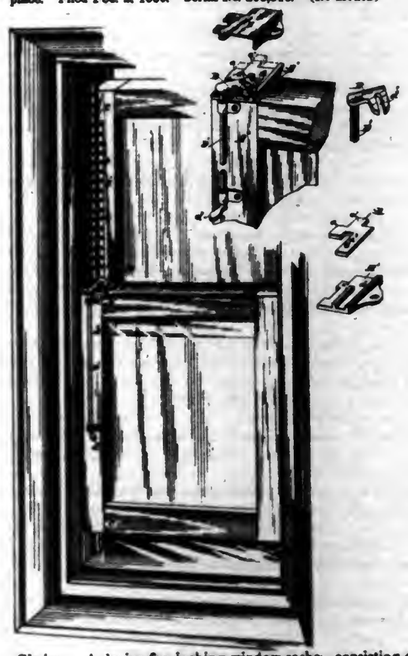


Claim.—1. A measuring-stick proper having on one side thereof a scale to indicate the length and subdivisions of the length thereof, and having therein a longitudinal channel, *d*, provided with the grooves *g g* in the opposing walls thereof, and the end abutments, *f f*, combined with an extension-bar movable in said grooves *g g*, provided with the neck *i*, projecting through said channel *d*, and having a head, *j*, substantially as and for the purpose described.

2. A measuring-stick proper having on one side thereof a scale to indicate the length and subdivisions of the length thereof, and having therein a longitudinal channel, *d*, provided with the grooves *g g* in the opposing walls thereof, and the end abutments, *f f*, combined with an extension-bar movable in said grooves *g g*, provided with the neck *i*, projecting through said channel *d*, and having a head, *j*, and a pointer, *m*, adapted to measure with a scale, *n*, which is also made on said measuring-stick, substantially as and for the purpose described.

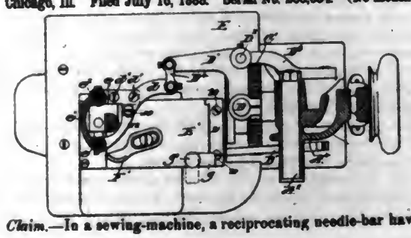
3. A measuring-stick proper composed of a pair of side strips, *a a*, each provided at one edge with a rib, *b*, said strips being secured together and forming the channel *d*, and the blocks *f f* between the ends of said side strips, and the grooves *g g*, formed in the inner end walls of said strips, combined with the extension-bar B, movable in said grooves *g*, provided with the neck *i* and head *j*, and a friction-spring secured on said extension-bar, movable therewith and bearing by its free end upon the bottom of said channel, substantially as and for the purpose described.

401,293. **SASH-FASTENER.** WILLIAM H. MURPHY, Cleveland, Ohio, assignor to himself, William Kanitzer, and Matthias Laven, same place. Filed Feb. 2, 1889. Serial No. 298,516. (No model.)



Claim.—A device for locking window-sashes, consisting of recesses in the parting-strip which separates the sashes of a window, recesses in the stile of the upper sash of the window, a guide-plate, a sliding bolt adapted to enter the recesses in the parting-sash strip and the stile of the upper window-sash, and an arm for throwing the sliding bolt, all arranged substantially as described.

401,294. **NEEDLE-VIBRATING MECHANISM FOR SEWING-MACHINES.** LORENZ MUTHER, Chicago, and RUSSEL G. WOODWARD, Waukegan, assignors to The Union Special Sewing Machine Company, Chicago, Ill. Filed July 16, 1888. Serial No. 280,084. (No model.)



Claim.—In a sewing-machine, a reciprocating needle-bar having an eye-pointed needle, a pivoted needle-guide, *c'*, an arm, *d*, pivotally attached thereto, an elbow-lever, D', and a link-connection between it and the arm *d*, and a link, 12, intermediate said arm and needle-guide, combined with a cam to vibrate the said elbow-lever and reciprocate the needle-guide laterally, and with the gears C C' to operate the cam, substantially as described.

401,295. **VELOCIPEDE.** MALCOLM A. NORTON, Hartford, Conn. Filed Dec. 20, 1888. Serial No. 294,169. (No model.)



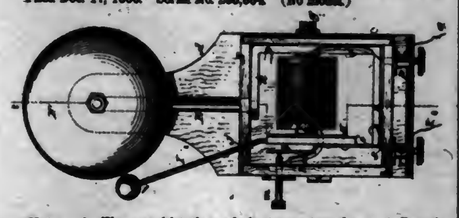
Claim.—1. A velocipede-frame consisting of the central section, 1, provided with the adjustable saddle-support 21 and the adjustable bracket 32 at or near its upper and lower ends, respectively, the V-shaped sections 2 and 3, fixed to the central section by the clamps 4 and 5 between those ends, and the reach 6, fixed to the central section, 1, between the clamps 4 and 5 by the clamp 7, all substantially as described.

2. The combination of the velocipede-fork 8, each side of which consists of the sub-bifurcations 9 and 10, with the spring 13, supporting one pair of those sub-bifurcations, and a corresponding spring supporting the other pair thereof, and with the axle of a velocipede-wheel supporting those springs, all substantially as described.

3. The combination of the axle-sections 23 and 24, longitudinally adjustable together and fixed at their outer ends to opposite sections of a velocipede-frame, the hub 27, provided with the ball-bearing boxes 28, revolving on those axle-sections and between those frame-sections, and two series of balls turning in bearings between those ball-bearing boxes and those frame-sections, respectively, all substantially as described.

4. The combination of the shaft 36, provided with the hubs 40 and 41, the ball-bearing boxes 42 and 43, inclosed within those hubs and one or both of them adjustable therein, the bushings 45 and 48, fixed in opposite ends of the bracket 32, and two series of balls turning in bearings between those ball-bearing boxes and those bushings, respectively, all substantially as described.

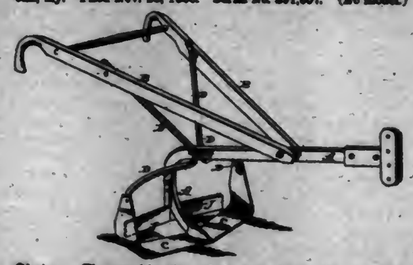
401,296. **ELECTRICAL CALL-BELL.** JOSEPH G. HOYER, New York, N. Y., assignor to the New Haven Clock Company, same place. Filed Dec. 17, 1888. Serial No. 293,894. (No model.)



Claim.—1. The combination of the open box-frame A B, yoke D, standard E, bell F, single magnet G, single screw *g*, that passes through the frame B and yoke D and into the magnet G, said screw thereby holding said parts B D G together and establishing a metallic connection between the core of the magnet and the yoke, armature H, perpendicular to the single magnet, spring *i*, clapper I on the armature-spring *i*, screw *m*, for engagement with the spring *i*, conductor *n*, connecting the screw *m* with one terminal of the magnet, conductor *o*, post *p*, connected with the magnet by the conductor *o*, post *r*, and conductor *s*, connecting the post *r* with the yoke D, all arranged substantially as herein shown and described.

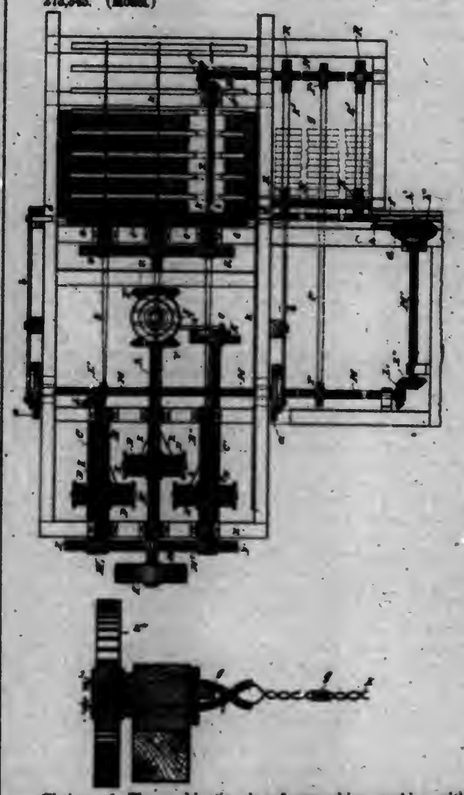
2. The open box-frame B and removable back A, combined with the yoke D, L-shaped standard E, and bell F, the standard being screwed into the yoke D before the back A is applied to the frame B, so that the standard cannot be separated from the yoke while the back A is in position, substantially as described.

401,297. **AGRICULTURAL IMPLEMENT.** ROBERT OWEN, Paducah, Ky. Filed Nov. 23, 1888. Serial No. 291,657. (No model.)



Claim.—The combination of the bent beam, the cutter having upturned ends and secured at its center to the lower end of the beam, the braces D, bolted to the beam at or near their centers and having their ends secured to the ends of the cutter and to the handles, and the handles supported at their rear ends by the braces, substantially as shown.

401,298. **FENCE-MAKING MACHINE.** ARTHUR A. PARKER and JOHN F. LANDERS, Jersey City, N. J. Filed May 9, 1888. Serial No. 273,343. (Model.)



Claim.—1. The combination, in a fence-making machine, with a supporting-frame, a revoluble main shaft journaled in said frame, a spur-wheel and pulley mounted upon one end of said shaft without said frame, and a bevel cog-wheel mounted upon the other end of said main shaft within said frame, of parallel auxiliary shafts mounted in bearings upon said frame above said main shaft, a train of spur-wheels mounted upon said auxiliary shafts meshing together, and one of them meshing into the spur-wheel upon said main shaft, spools mounted upon said auxiliary shafts, upon which wire may be wound, to be conducted through conduits in the inner ends of said auxiliary shafts, another auxiliary shaft journaled in bearings upon said frame, a spur-wheel upon one end of such shaft without said frame and meshing into the spur-wheel on said main shaft, a disk-wheel having an eccentric groove in its face, mounted upon the other end of said shaft within the said frame and connected to a segmental spur-wheel

by a connecting-bar, said connecting-bar, said segmental spur-wheel mounted upon a shaft journaled in said frame and connected, as aforesaid, with said disk-wheel, whereby facility is afforded to oscillate said segmental wheel, another segmental wheel attached to an oscillating shaft and meshing into said first-mentioned segmental wheel, said oscillating shaft mounted upon a cross-shaft and carrying upon its upper end a beveled gear-wheel, meshing into the wheel upon the inner end of said main shaft, said bevel-wheel supported by said oscillating shaft and said cross-shaft, said cross-shaft being journaled in the center of said main shaft, and in a short shaft journaled in said frame opposite said main shaft, a bevel-wheel mounted upon one end of said short shaft and meshing into the bevel-wheel upon said oscillating shaft, a spur-wheel mounted upon the other end of said short shaft and meshing into an intermediate spur-wheel mounted upon a shaft secured in said frame, a train of spur-wheels mounted upon parallel shafts meshing together, and one of them meshing into said intermediate wheel, a series of parallel shafts journaled in bearings on said frame and upon which the wheels of said train are mounted, the said parallel shafts having conduits through which the wires from said spools are conducted to twisting-fingers, and a pair of helically-bent twisting-fingers mounted upon the end of each of said shafts and composed of tubes through which said wires pass to afford facility for twisting the same, all substantially as and for the purpose set forth.

2. The combination, in a fence-making machine, with a supporting-frame, a revoluble main shaft journaled in said frame, a spur-wheel mounted upon one end of said shaft without said frame, and a bevel-wheel mounted upon the other end of said main shaft within said frame, of an auxiliary shaft journaled in bearings on said frame, a spur-wheel mounted upon one end of said shaft without said frame and meshing into the spur-wheel upon said main shaft, a disk-wheel having an eccentric groove in its face, mounted upon the other end of said shaft within said frame, a connecting-bar connecting said disk-wheel and a segmental spur-wheel, a shaft journaled in said frame, whereon said segmental wheel is mounted, the construction and arrangement of said disk-wheel, said connecting-bar, and said segmental wheel being such as to afford facility for oscillating said segmental wheel, another segmental spur-wheel mounted upon the lower end of an oscillating shaft and meshing into the first-named segmental wheel, said oscillating shaft carrying said segmental wheel and moving upon a cross-shaft journaled in the center of said main shaft by one end, and by the other end in the center of a short shaft journaled in said frame opposite to and concentric with the said main shaft, so that the periphery of the segmental wheel upon said oscillating shaft and the oscillating motion of said shaft shall be concentric with said main shaft, a bevel-wheel mounted upon the upper end of said oscillating shaft, meshing into the bevel-wheel on the end of said main shaft and actuated thereby, a bevel-wheel mounted upon the end of said short shaft and meshing into the bevel-wheel upon said oscillating shaft, the said three bevel-wheels, said oscillating shaft, said two segmental wheels and the connecting-bar being so arranged and combined that although the main shaft and the bevel-wheel mounted upon it is in continual rotation in one direction, and the bevel-wheel on the oscillating shaft is also in continuous rotation, the rotary motion is only communicated by the bevel-wheel on said oscillating shaft to the bevel-wheel on the short shaft, as said wheel is carried one way by the motion of said oscillating shaft, and when moving the other way this bevel-wheel on the oscillating shaft rolls over the wheel on the short shaft and imparts no motion to it, thus an intermittent motion is produced and the said wheel on the said short shaft, the said short shaft, and all the mechanism propelled by them are periodically still and periodically in motion at regular intervals, substantially as and for the purpose set forth.

3. The combination, in a fence-making machine, with a supporting-frame, a revoluble main shaft journaled in bearings in said frame, a spur-wheel mounted upon said main shaft without said frame, an auxiliary shaft also journaled in bearings in said frame, a spur-wheel mounted upon one end of said auxiliary shaft without said frame and meshing into the spur-wheel upon said main shaft, and a bevel-wheel mounted upon the other end of said auxiliary shaft within said frame, of a cross-shaft journaled in bearings upon said frame at right angles to said auxiliary shaft, a bevel-wheel mounted upon said cross-shaft and meshing into the bevel-wheel upon the end of said auxiliary shaft, two disk-wheels mounted upon said cross-shaft, each having an eccentric groove in its face, an oscillating frame reaching over the upper part of said machine, pivoted by its lower part to the lower part of said supporting-frame, connecting-bars pivotally attached to said oscillating frame, and by means of friction-rollers working in the eccentric grooves of said disk-wheels, connecting them with said oscillating frame, and downwardly-projecting fingers attached to the upper part of said frame, and constructed and arranged to push pickets out of said machine when the same have been properly placed to receive wire to be twisted upon them, substantially as and for the purpose set forth.

4. The combination, in a fence-making machine, with a revoluble main shaft journaled in bearings upon the supporting-frame of said machine, a spur-wheel mounted upon said main shaft, an auxiliary shaft journaled in bearings in said frame, parallel to the said main shaft, a spur-wheel mounted upon one end of said auxiliary shaft without said frame and meshing into the spur-wheel upon said main shaft, and a bevel-wheel mounted upon the other end of said auxiliary shaft within said frame, of a cross-shaft journaled in said frame at right angles to said auxiliary shaft, a bevel-wheel mounted upon said cross-shaft and meshing into the bevel-wheel upon said auxiliary shaft, another bevel-wheel mounted upon the end of said cross-shaft, an inclined shaft also mounted in bearings in said frame, and extending upward diagonally above the upper part of said machine, a bevel-wheel mounted upon the lower end of said inclined shaft and meshing into the bevel-wheel on the end of said cross-shaft, a disk-wheel upon the upper end of said inclined shaft, an eccentric groove in the face of said disk-wheel, a slide moving in a groove in the top of said machine and propelled by a connecting-bar, coupling it to the eccentric of said disk-wheel, so that facility is afforded for pushing pickets into said machine, substantially as hereinbefore specified, a pulley mounted upon the said cross-shaft, another cross-shaft journaled in the frame of said machine parallel to the first-named cross-shaft, a pulley mounted upon said last-named cross-shaft and connected by a belt with the pulley on said first-named cross-shaft, a bevel-wheel mounted on the end of said last-named cross-shaft, an auxiliary shaft journaled in said frame at right angles to the cross-shaft, a bevel-wheel on one end of said auxiliary shaft meshing into the bevel-wheel on the said cross-shaft, a pulley on the other end of said auxiliary shaft, and three other pulleys arranged on proper bearings on the frame of said machine, a belt running over the said pulleys, and so arranged that it will be in proper position to engage and carry a picket into said machine, and springs arranged to press said picket down upon said belt as it passes into said machine, substantially as and for the purpose set forth.

5. In a fence-making machine, the combination, with the revolving main shaft A, journaled in bearings on the frame of said machine, the bevel-wheel V, mounted upon said main shaft, the shaft C', mounted upon said frame, as specified, and connected with said main shaft by means of a gear-wheel on each shaft meshing together, and an eccentric wheel upon said shaft C', of the short shaft S', journaled, as specified, in the main shaft A, and the short shaft T', the oscillating shaft S', mounted upon said shaft S', the bevel-wheel S, mounted upon said oscillating shaft S' and meshing into said wheel V, the bevel-wheel T, mounted upon the said shaft T' and meshing into the wheel S, the segmental wheel $S^{\times}$, mounted upon the lower end of said oscillating shaft S', the shaft T^{4}, journaled in said frame, as specified, the segmental wheel $T^{\times}$, mounted thereon, and meshing with the segmental wheel $S^{\times}$, the bar $K^{\times}$, connecting said segmental wheel and said eccentric wheel upon said shaft C', the shaft T', journaled in the frame of said machine and having the axis coincident with the said main shaft, and a train of wheels connecting said shaft T' with the twisting-heads of the machine, and all so constructed and arranged that, by means of said mechanism, when the said main shaft is continuously turned in one direction an intermittent rotary motion will be imparted to the said twisting-heads, substantially as and for the purpose set forth.

6. In a fence-making machine, the tubular helically-bent twisting-fingers i, mounted upon revoluble shafts journaled in the frame of said machine, and constructed and arranged substantially as and for the purpose set forth.

7. In a fence-making machine, the combination, with the supporting-frame X, the main shaft A, journaled in said frame, the pulley E, the spur-wheel G, and the bevel-wheel V, all mounted on said main shaft A, the shafts B B' B'', also journaled in said frame, the wheels H H' H'', mounted upon said shafts B B' B'', and the spools D, mounted upon the same shafts, of the said shafts, the shaft C, journaled in said frame, the spur-wheel I', mounted upon said shaft C and meshing into the wheel G, the disk-wheel K, mounted upon the same shaft C, the segmental wheel $T^{\times}$, mounted upon the shaft T^{4}, the bar $K^{\times}$, connecting the disk-wheel K and the segmental wheel $T^{\times}$, the shaft T^{4}, mounted in bearings in said frame and carrying the segmental wheel $T^{\times}$, the segmental wheel $S^{\times}$, mounted upon the lower end of the oscillating shaft S', mounted on the cross-shaft S'', the cross-shaft S'', journaled in the main shaft A, and the short shaft T'', the bevel-wheel S, mounted upon the oscillating shaft S' and meshing into the wheel V, the bevel-wheel T, mounted on the shaft T' and meshing into the bevel-wheel S, the shaft T'', journaled in said frame opposite to and concentric with said main shaft A, the spur-wheel T', mounted upon said shaft T'', the wheel $U^{\times}$, mounted upon a bearing secured to the frame of said machine and meshing into the wheels U' and T', the spur-wheels U U' U'', meshing together and mounted on short shafts journaled in the frame of said machine, the said shafts, and the twisting-fingers i, mounted thereon, all substantially as and for the purpose set forth.

8. In a fence-making machine, the combination, with the frame X thereof, the main shaft A, journaled on said frame, the spur-wheel G, mounted upon said main shaft, the auxiliary shaft C, also journaled in said machine, the spur-wheel I, mounted upon said shaft C and meshing into the wheel G upon said main shaft, and the bevel-wheel L, mounted upon said shaft C, of the shaft M, journaled on said frame X at right angles to said shaft C, the bevel-wheel L', mounted upon said shaft M and meshing into the bevel-wheel L upon said shaft C, the disk-wheels *a* and *a*, having eccentric grooves in their faces, the oscillating frame *c d*, pivoted to said supporting-frame X and reaching over the top of said machine, the downwardly-projecting fingers *e*, fastened to the upper part of said oscillating frame *c d*, the bars *b*, connecting the said oscillating frame *c d* with the eccentric grooves of the disk-wheels *a*, the bevel-wheel L'', mounted upon the cross-shaft M, the inclined shaft M', journaled on said supporting-frame, the bevel-wheel L''', mounted upon said shaft M' and meshing into the bevel-wheel L'' upon the shaft M, the disk-wheel O, mounted upon said shaft M', the eccentric groove *h'* in the face of said wheel O, the pin and friction-roller *h''*, moving in said eccentric grooves, the slide *h*, moving in a groove in the top of said machine, the bar *f*, connecting said slide with said eccentric grooves, the pulley P upon the shaft M, connected to the pulley P' by the belt $P^{\times}$, the shafts N and N, journaled in said supporting-frame, the pulleys P' R R R and R, mounted upon said shafts N and N, the belts $R^{\times}$, connecting the pulleys R, the bevel-wheel $O^{\times}$, mounted upon the shaft N, the shaft Z, journaled in bearings on said frame, the bevel-wheel O', mounted upon said shaft Z and meshing into the bevel-wheel $O^{\times}$ on the shaft N, the pulley Z', mounted upon said shaft Z, the pulleys Z' Z'' $Z^{\times}$, mounted on bearing fastened in said frame, the belt *s*, connecting said pulleys Z' Z'' Z''' $Z^{\times}$, and the springs *s'*, fastened upon the said machine above said wheels Z'' and $Z^{\times}$ to afford facility for drawing a picket into said machine, all substantially as and for the purpose set forth.

9. In a fence-making machine, the combination, with the supporting-frame X, the main shaft A, journaled in said frame, the pulley E, the spur-wheel G, and the bevel-wheel V, all mounted on said main shaft A, the shafts B B' B'', also journaled in said frame, the wheels H H' H'', mounted upon said shafts B B' B'', the spools D, upon which wire may be wound, mounted upon the same shafts, the shaft C, journaled in said frame, the spur-wheel I', mounted upon said shaft C and meshing into the wheel G, the disk-wheel K, mounted upon the shaft C, the segmental wheel $T^{\times}$, mounted upon the shaft T^{4}, the bar $K^{\times}$, connecting the disk-wheel K and the segmental wheel $T^{\times}$, the shaft T^{4}, mounted in bearings in said frame, the segmental wheel $S^{\times}$, mounted upon the lower end of the oscillating shaft S', the oscillating shaft S', mounted on the cross-shaft S'', the shaft S'', journaled in the main shaft A, and the short shaft T'', the bevel-wheel S, mounted upon the oscillating shaft S' and meshing into the wheel V, the bevel-wheel T, mounted upon the shaft T'' and meshing into the bevel-wheel S, the short shaft T'', journaled in the said frame opposite to and concentric with said main shaft A, the spur-wheel T', mounted upon said shaft T'', the wheel $U^{\times}$, mounted upon a bearing secured to the frame of said machine and meshing into the wheels U' and T', the spur-wheels U U' U'', meshing together and mounted on short shafts journaled in the frame of said machine, the said shafts, and twisting-fingers mounted thereon, of the shaft C, journaled in the frame of said machine, the spur-wheel I, mounted upon said shaft C and meshing into the wheel G upon said main shaft, the bevel-wheel L, mounted upon said shaft C, the shaft M, journaled in said frame X at right angles to said shaft C, the bevel-wheel L', mounted upon said shaft M and meshing into the wheel L upon the shaft C, the disk-wheels *a* and *a*, having eccentric grooves in their faces, the oscillating frame *c d*, pivoted to said supporting-frame X and reaching over the top of said machine, the downwardly-projecting fingers *e*, fastened to the upper part of said oscillating frame, the bars *b*, connecting the eccentric grooves of the said disk-wheels *a* with said oscillating frame, the bevel-wheel L'', mounted upon the cross-shaft M, the inclined shaft M', journaled on said supporting-frame, the bevel-wheel L''', mounted upon said shaft M' and meshing into the bevel-wheel L'' upon the shaft M, the disk-wheel Q, mounted upon said shaft M', the eccentric groove *h'* in the face of said wheel Q, the pin and friction-roller *h''*, moving in said eccentric groove, the slide *h*, moving in a groove in the top of said machine, the bar *f*, connecting said slide and said eccentric groove, the pulley P upon the shaft M, connected to the pulley P' by the belt $P^{\times}$, the shafts N and N, journaled in said supporting-frame, the pulleys P R R R and R, mounted upon said shafts N and N, the belts $R^{\times}$, connecting the pulleys R, the bevel-wheel $O^{\times}$, mounted upon the shaft N, the shaft Z, journaled in bearings in said frame, the bevel-wheel O', mounted upon said shaft Z and meshing into the bevel-wheel $O^{\times}$ on the shaft N, the pulley Z' mounted upon said shaft Z, the pulleys Z' Z'' $Z^{\times}$, mounted on bearings fastened on said supporting-frame, the belt *s*, connecting said pulleys Z' Z'' Z''' $Z^{\times}$, and the springs *s'*, fastened upon said machine above said wheels Z'' $Z^{\times}$, all in one machine, substantially as and for the purpose set forth.

401,299. PRESSURE-BAR FOR PLANING-MACHINES. George W. Fassel, Cincinnati, Ohio. Filed Nov. 26, 1887. Serial No. 256,232. (No model.)

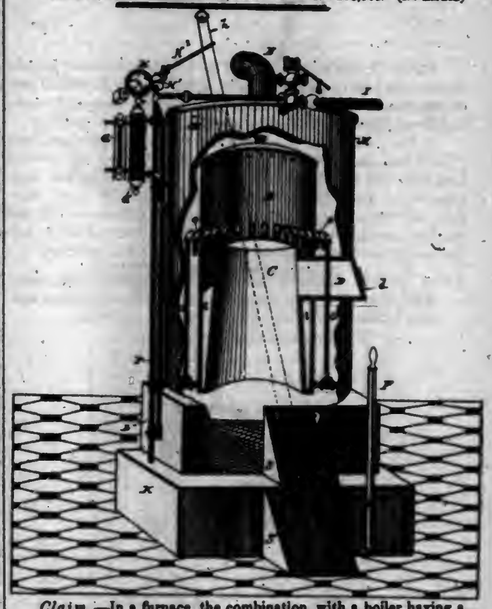


Claim.—1. A pressure-bar for planing-machines, provided with an inclosed channel or channels open at one end to receive and at the other end to discharge chips, shavings, and like substances, substantially as described.

2. A pressure-bar for planing-machines, having an unbroken lower edge and a channel or channels for receiving and discharging chips, shavings, and like substances, substantially as described.

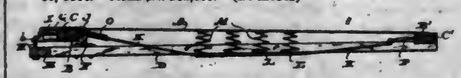
3. The combination, with a pressure-bar for planing-machines, of an elastic plate attached thereto, and an open channel or channels communicating with the space between such plate and the pressure-bar for the escape of chips, shavings, and like materials, substantially as described.

401,300. BOILER FOR HEATING PURPOSES. Isaac K Potts, Columbus, Ohio. Filed Nov. 22, 1888. Serial No. 291,563. (No model.)



Claim.—In a furnace, the combination, with a boiler having a cone-shaped magazine and tubes in direct contact with the gases, of an exterior metallic jacket having a non-conducting lining, the boiler-tubes being interposed directly between the boiler and jacket, as and for the purpose set forth.

401,301. WOVEN-WIRE MATTRESS. Rudolph Perus, Milwaukee, Wis., assignor of one-half to Fred Kunkel, same place. Filed Aug. 13, 1888. Serial No. 282,605. (No model.)



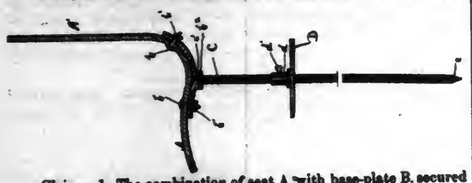
Claim.—1. In a woven-wire mattress, the woven-wire section and side rails, in combination with castings rigidly secured to the side rails, links pivoted at their inner ends to the castings for engagement with a cross-bar of said woven-wire section, and vertically-arranged set-screws passed through said side rails to engage the outer ends of the links, substantially as set forth.

2. In a woven-wire mattress, the woven-wire section and side rails, in combination with pivotally-adjustable links connected to the side rails to engage a cross-bar of said woven-wire section, screws passed through the cross-bar to have their bearings in the ends of the links, and nuts arranged on the screws between the inner side of said cross-bar and adjacent ends of said links, substantially as set forth.

3. In a woven-wire mattress, the woven-wire section and side rails, in combination with castings rigidly secured to the side rails, links pivoted at their inner ends to the castings for engagement with a cross-bar of said woven-wire section, set-screws passed through said side rails to engage the outer ends of the links, other screws passed through the cross-bar to have their bearings in both ends of said links, and nuts arranged on the latter screws to bear against the inner side of said cross-bar, substantially as set forth.

4. In a woven-wire mattress, the woven-wire section and side rails, in combination with castings rigidly secured to the side rails links pivoted at their inner ends to the castings for engagement with a cross-bar of said woven-wire section, vertically-arranged set-screws passed through said side rails to engage the outer ends of the links, a frame having a yielding connection with said cross-bars, and spiral springs arranged on the frame to impinge against the woven-wire section, substantially as set forth.

401,802. **HUNTER'S PORTABLE STOOL.** EDWARD G. PURDY, Michigan City, Ind. Filed Sept. 3, 1888. Serial No. 284,488. (No model.)



Claim.—1. The combination of seat A, with base-plate B, secured thereto, standard C, secured to said base-plate, and adjustable supporting-disk D, having hub *d* and set-screw *d'*, for securing the same in different positions to said standard C, substantially as specified

2. The combination of veneer-board seat A, having integral back A', with base-plate B, threaded bolts *b*, passing through said seat and base-plate, and furnished with thumb-nut *b'*, for securing said base-plate to said seat, standard C, secured at its upper end to said base-plate, and flat supporting-disk D, having hub *d* and set-screw *d'*, said standard passing through said hub, and said hub being fixed in position on the standard by said set-screw, substantially as specified.

401,803. **TRANSPARENT PICTURE.** WILLIAM READ, Jr., Boston, Mass., assignor, by mesne assignments, to Sarah Farrington Read, same place. Filed Jan. 23, 1888. Serial No. 261,591. (No model.)



Claim.—1. As an article of manufacture, a flexible transparent picture composed of superposed sheets, respectively, of gelatine and paper united by a transparent cement, the paper sheet having a print or picture thereon and being embossed in imitation of canvas on the front side, as set forth.

2. As an article of manufacture, a flexible transparent picture composed of superposed sheets, respectively, of paper having a print or picture and gelatine united by a transparent cement, the gelatine being protected from atmospheric action by a water-proof coating applied to the back of said gelatine sheet, as set forth.

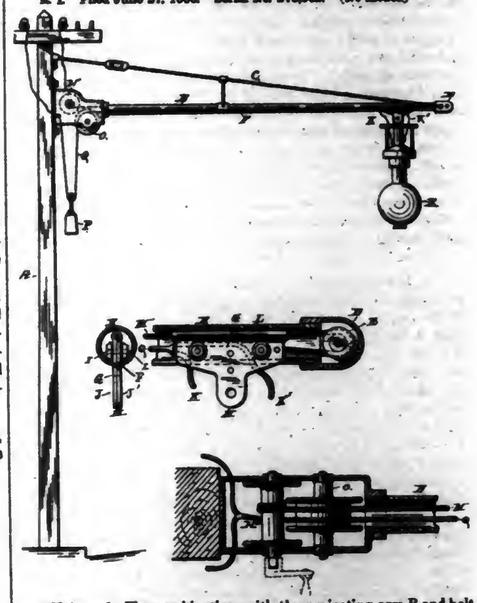
3. The improved transparent picture sheet composed of superposed layers of paper and gelatine united by a transparent cement, the gelatine being protected from atmospheric action by a water-proof coating applied to its exposed surface, as set forth.

4. The improved flexible transparent picture composed of the front gelatine sheet, *a*, having a transparent water-proof coating on its outer surface, the back gelatine sheet, *a'*, and the interposed print *b*, secured to said sheets by transparent cement, as set forth.

5. The improved picture composed of a print, front and back gelatine sheets, *a a'*, to which the print is secured by a transparent cement, the front gelatine sheet having a transparent water-proof coating on its outer surface, the back gelatine sheet or sheets, *c*, having color laid upon them coinciding with the print, and the metal frame interposed between the sheets *a'* and *c* and forming a space, *s*, therebetween, as set forth.

6. The improved picture composed of a print, front and back gelatine sheets, *a a'*, to which the print is secured by a transparent cement, the front gelatine sheet having a transparent water-proof coating on its outer surface, the back gelatine sheet or sheets, *c*, having color laid upon them coinciding with the print, the metal frame interposed between the sheets *a'* and *c* and forming a space, *s*, therebetween, and a marginal binding securing all of said parts together, as set forth.

401,804. **DEVICE FOR SUPPORTING AND OPERATING ELECTRIC LIGHTS.** CHARLES W. RUSSELL and JOHN I. DRAKE, Providence, R. I. Filed June 27, 1888. Serial No. 278,262. (No model.)



Claim.—1. The combination, with the projecting arm B and belt M, of the carrier G, having a sleeve, L, for the passage of the belt.

2. The combination, with the projecting arm B and belt M, of the carrier G, having a sleeve, L, for the passage of the belt, and ways for the passage of the conducting-wires, as set forth.

3. The combination, with the hollow slotted projecting arm B of the belt M, supported on pulleys therein, and a carrier, G, having the sleeve L for the passage of the belt, and the inclined pulleys for riding in the arm B, as set forth.

401,805. **SNAP-HOOK.** JAMES R. RYAN, Sault Ste. Marie, Mich. Filed Aug. 2, 1888. Serial No. 281,906. (No model.)



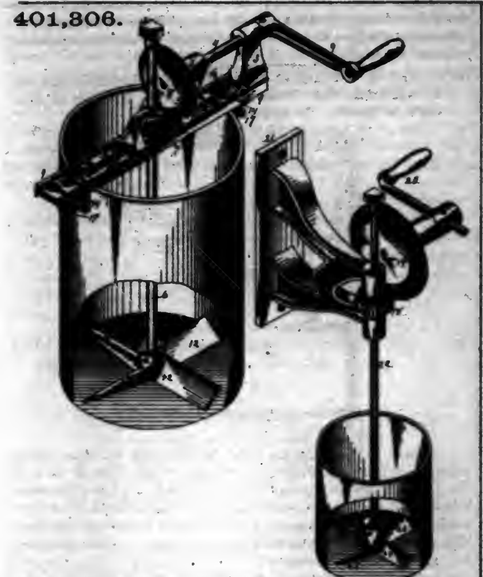
Claim.—As an improved article of manufacture, a snap-hook consisting of a single piece of wire to form the hook A, shank B, loop C, coils D D, and latch E, substantially as described.

401,806. **PAINT-MIXER.** GEORGE W. SCHOCK and WILLIAM H. WARNEROVER, South Bend, Ind. Filed May 3, 1888. Serial No. 272,707. (No model.)

Claim.—1. The combination, with a shaft carrying the mixing-blades and a receptacle to receive the blades, the said shaft having a free vertically-sliding adjusting movement, of a support to prevent the lateral displacement of the shaft and means for rotating the shaft, substantially as set forth.

2. The combination, with a shaft carrying the mixing-blades and a receptacle to receive the blades, the said shaft being provided with

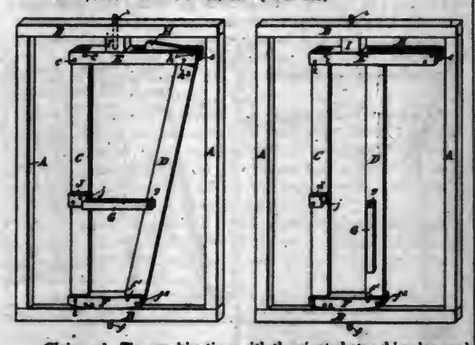
401,806.



a longitudinal groove, of a support to prevent the lateral displacement of the shaft, a pinion through which the shaft may freely slide during its rotary movement, the pinion having a feather loosely engaging the longitudinal groove in the shaft, and driving-gear in engagement with the pinion, substantially as set forth.

3. The combination, with the shaft carrying the mixing-blades and a receptacle to receive the blades, of a support for the shaft-driving mechanism, the said support being provided with clamping-arms having a sliding movement toward and away from the vertical axis of the support, set-screws to hold the arms in the desired adjustment, and set-screws seated in the arms and adapted to impinge against the sides of the receptacle to prevent the support from shifting, substantially as set forth.

401,807. **STANCHION.** WALTER SCOTT, Hoosick Falls, N. Y. Filed Feb. 13, 1888. Serial No. 263,914. (No model.)



Claim.—1. The combination, with the pivoted stanchion-bar and a prop adapted to hold the said bar open against the action of a spring and to be swung downward by the animal to permit the spring to close said bar, of a locking device operated by the movement of the pivoted bar to hold the animal in the stanchion, substantially as and for the purpose specified.

2. The combination, with the elongated bar E, latch H, pivoted in the slot *e* and resting on the top of the pivoted bar D, of the prop G, and spring K, substantially as and for the purpose specified.

401,808. **NIPPERS.** SILAS E. SELLEW, Cold Spring, N. Y. Filed Aug. 13, 1888. Serial No. 283,092. (No model.)

Claim.—The pliers consisting of the casing or head, the apertured disks having, in addition to their registering wire-receiving apertures, a concaved notch or recess at each of their upper and lower ends, the pivoted handles having at their ends projections which engage with the lower end notches or recesses of the disks, and the

401,808.



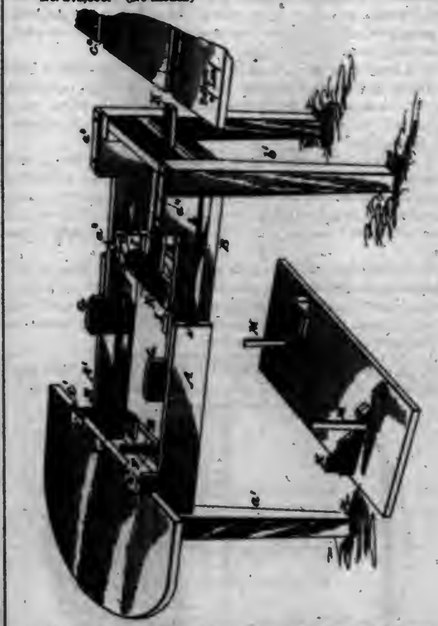
gage having a bent arm pivoted to said casing or head, to the outer end of which arm is secured an upright on which fits a second arm registering with any one of the wire-receiving apertures of the disks and which aforesaid or bent arm is provided with an elongated slot receiving a projection on one of the handles, substantially as specified.

401,809. **KEY-LEVELING DEVICE FOR PIANOS.** CHARLES H. SMITH, Atlanta, Ga. Filed Mar. 12, 1888. Serial No. 267,043. (No model.)



Claim.—In the key of a musical instrument, the combination of the tongue *a* and the screw E, substantially as shown and described, and for the purpose specified.

401,810. **EXTENSION-TABLE.** ERNST H. W. STAHLHUTH and HENRY W. STAHLHUTH, Cincinnati, Ohio. Filed Apr. 27, 1888. Serial No. 272,039. (No model.)



Claim.—1. An extension-table having two dovetailed tenons, a^3, on one of its two sections, a correspondingly-grooved leaf, C', with the lip *c'*, a leaf, C^2, with subjacent hooks D, standards E, and riser G, arranged as shown and described, for the purpose set forth.

2. In extension-tables, the lever K and movable wedges I, the latter flexibly connected with one end of the T-head of said lever, in combination with wedges H H and leaf C^2, as and for the purpose specified.

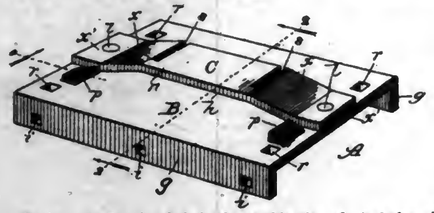
401,811. **PREPARING SOLUBLE COCOA.** HEINRICH STOLLWERCK, Cologne-on-the-Rhine, Prussia, Germany, assignor to Gebr. Stollwerck, same place. Filed Sept. 26, 1887. Renewed Oct. 11, 1888. Serial No. 287,208. (No model.)

Claim.—1. The method set forth of preparing cocoa in solid plates or pieces readily soluble in boiling water, said method consisting in impregnating the powdered cocoa with a solvent of the fatty matter

therein contained, and then pressing it in suitable molds, whereby the finished pieces are inclosed in an envelope of the hardened cocoa-butter, substantially as described.

2. The method set forth of preparing cocoa in solid plates or pieces readily soluble in boiling water, said method consisting in first impregnating the powdered cocoa with an alcoholic solvent, and then pressing the same in suitable heated molds, substantially as described.

401,812. SWITCH-RAIL CHAIR. AXEL A. STROM, Austin, assignor to the Strom Manufacturing Company, Chicago, Ill. Filed Nov. 23, 1888. Serial No. 291,641. (No model.)



Claim.—1. In a head-chair, the combination of a bed-plate, B, and a cross-bar, C, having slots *s*, and bent toward its opposite ends, thereby producing end portions, *x'*, and an intermediate housing, and secured to the bed-plate, substantially as described.

2. In a head-chair, the combination of a bed-plate, B, and a cross-bar, C, having slots *s*, and bent obliquely from near the opposite outer sides of the slots, and having horizontal end portions, *x'*, and an intermediate housing, *h*, and secured to the bed-plate, substantially as described.

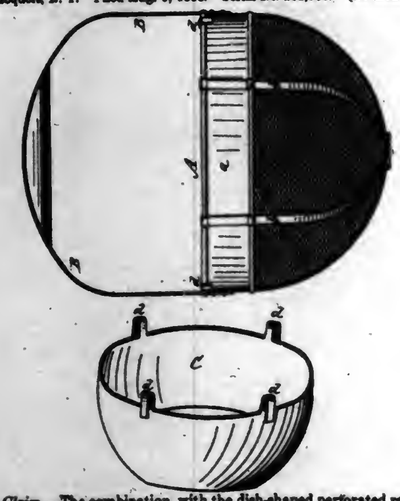
3. A head-chair comprising, in combination, a bed-plate, A, and a cross-bar, C, formed of a slotted bar, *n*, having a flange, *m*, extending at opposite ends short of the ends of the said bar, and the cross-bar being bent toward its ends and secured thereat to the bed-plate, substantially as described.

4. A head-chair comprising, in combination, a bed-plate, A, and a cross-bar, C, formed of a slotted bar, *n*, having a flange, *m*, beveled at opposite ends toward the surface of the bar *n*, the cross-bar being bent toward its ends and secured thereat to the bed-plate, substantially as described.

5. A head-chair comprising, in combination, a bed-plate, A, and a cross-bar, C, formed of a slotted bar, *n*, having a flange, *m*, beveled at opposite ends toward the surface of the bar *n*, the cross-bar being bent toward its ends to conform to the surface of the bed-plate and welded and riveted thereto toward its bent ends, substantially as described.

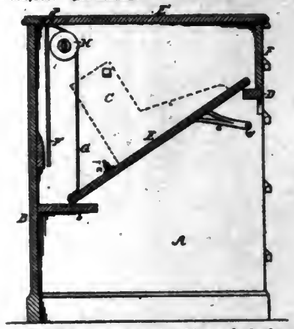
6. A head-chair comprising, in combination, a bed-plate, A, having lateral perforated flanges *g* and struck-up stops *p*, and a cross-bar, C, having slots *s*, and bent toward its opposite ends, thereby producing the end portions, *x'*, and an intermediate housing, *h*, and secured to the bed-plate, substantially as described.

401,813. POISONOUS-POWDER DUSTER. GEORGE B. TITUS, Irondequoit, N. Y. Filed Aug. 9, 1888. Serial No. 282,383. (No model.)



Claim.—The combination, with the dish-shaped perforated receptacle A, provided with the handle B, of the removable shield C, constructed with imperforate sides and an open bottom, and provided with hooks *d d*, by which it is suspended and held in the receptacle, as herein set forth.

401,814. DESK OR CABINET. WILLIAM H. TRAVIS, Philadelphia, Pa., assignor to James Densmore, Brooklyn, N. Y. Filed Apr. 20, 1888. Serial No. 162,803. (No model.)



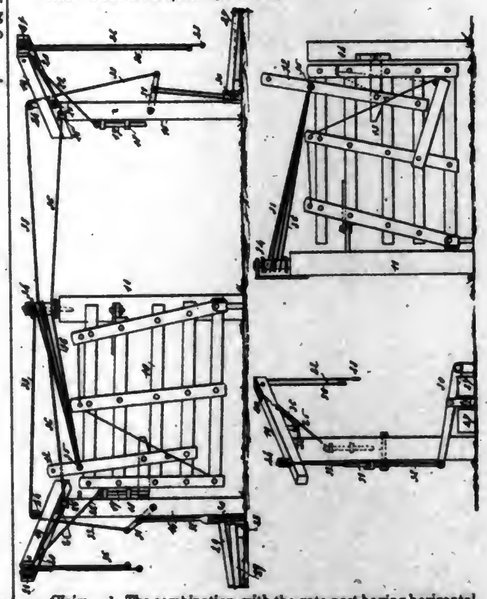
Claim.—1. The herein-described table or desk for type-writing purposes, said table having a movable top, which, when down, is at the proper height for use as an ordinary desk, and below the top a hinged shelf, which, when elevated, is at the proper height for a type-writing machine, and connecting devices between the top and shelf, whereby the moving of one out of position brings the other into position, all substantially as set forth.

2. The herein-described table or desk for type-writing purposes, said table having a movable top, which, when down, is at the proper height for use as an ordinary desk, and below the top a hinged shelf, which, when elevated, is at the proper height for a type-writing machine, the said shelf being hinged near its front, substantially as described, whereby the front edge of said shelf is moved forward toward the front of the desk as it is elevated, as and for the purpose described.

3. The herein-described table or desk for type-writing purposes, said table having a vertically-sliding folding top, which, when horizontal, is at the proper height for use as an ordinary desk, and below the top a hinged shelf, which, when elevated, is at the proper height for a type-writing machine, and chains, straps, or cords connecting the sliding top and hinged shelf, all substantially as specified.

4. The combination of the side and rear frames of a desk and cross-strips D with hinged shelf E and movable top E', having a flap, F, as described.

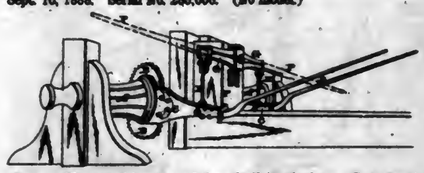
401,815. GATE. THOMAS TYSON, Mound City, Mo. Filed June 4, 1888. Serial No. 276,016. (No model.)



Claim.—1. The combination, with the gate-post having horizontal pulleys on its upper end and a gate pivoted to swing in opposite directions and having a latch and lever therefor, of standards 15 16 at opposite sides of the gate-post, having pulleys 24 on their upper ends, spaced inclined planes near each standard, a lever, 29, pivoted between each pair of said inclined planes parallel with the roadway, a second lever, 30, pivoted at right angles to each lever 29, and pivotally connected with said levers 29 at their adjacent or inner ends, levers 31, pivoted to the posts 15 16, rods 32, connecting levers 30 31, and a rope or chain leading from the latch-lever in opposite directions around the pulleys 34, thence over the pulleys 24 and down to the levers 31, substantially as set forth.

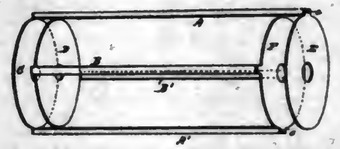
2. The combination, with the gate having a latch and side standards, 15 16, having cross-beams 19, extending toward the roadway, of the vertically-sliding latch-pin 17 on each post to engage the gate-latch, and ropes or chains leading from the upper end of said pins outward over pulleys on the outer ends of beams 19 and downwardly therefrom within reach of a pedestrian or driver, substantially as set forth.

401,816. WINDLASS. ADOLPH VOSS, Gloucester, Mass. Filed Sept. 10, 1888. Serial No. 285,006. (No model.)



Claim.—The combination of the windlass, the levers C, connected therewith and provided with dogs O, the lever G, placed at an angle to the levers C and connected thereto, and the hand-levers P, which are applied to the ends of the levers C G, substantially as shown and described.

401,817. DYNAMO OR MAGNETO ELECTRIC MACHINE. EDWARD WESTON, Newark, N. J., assignor to the United States Electric Lighting Company, New York, N. Y. Filed May 31, 1881. Serial No. 34,506. (No model.)



Claim.—1. In an armature whose core is longitudinally wound with a continuous conducting coil or coils, substantially in the manner stated, a coil composed of longitudinal conducting-bars, combined with cross connecting disks or plates, substantially as hereinbefore set forth.

2. An armature-coil composed of longitudinal bars or strips, combined with cross connecting disks which at one end of the armature connect the two bars of one set and at the other end of the armature connect the terminal bar of one set with the initial bar of the next succeeding set, the latter disks being connected up with the commutator, substantially as hereinbefore set forth.

3. In a revolving armature, a conducting-coil whose longitudinal portions are united at the end or ends of the armature by a disk or plate connection, substantially as and for the purposes hereinbefore set forth.

4. The combination, in a revolving armature, of longitudinal conductors with end connecting-disks, substantially as hereinbefore set forth.

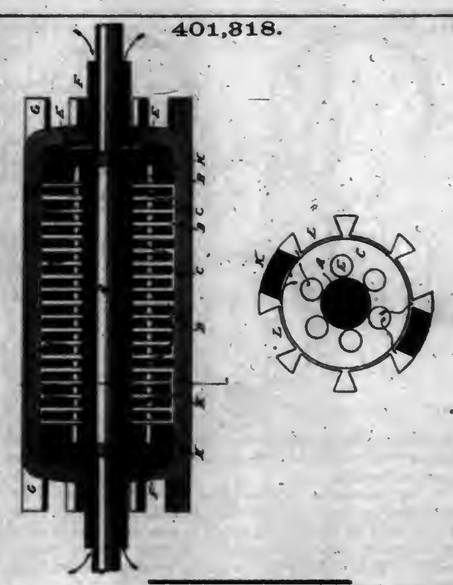
401,818. DYNAMO-ELECTRIC MACHINE. EDWARD WESTON, Newark, N. J., assignor to the United States Electric Lighting Company, New York, N. Y. Filed Oct. 24, 1882. Serial No. 75,068. (No model.)

Claim.—1. The combination, with the armature-core of a dynamo-electric machine, of conductors raised from the body of the core, so as to leave air-spaces between the core and the conductors, as set forth.

2. The combination, with the armature-core of a dynamo-electric machine, of conductors or coils and means for supporting each of the same so disposed that the said conductors are separated from the body of the core, a space being left entirely around them, as set forth.

3. The combination, with an armature-core having air-passages E E and spaces D D, of conductors or coils and means for supporting the same so disposed that the said conductors or coils are separated from the body of the core, as and for the purpose set forth.

401,818.



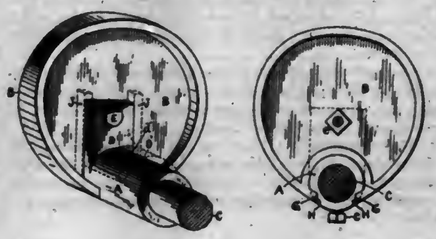
401,819. DOOR-SPRING. JOHN H. WILLIAMS, Waterloo, Iowa. Filed Dec. 26, 1888. Serial No. 294,579. (No model.)



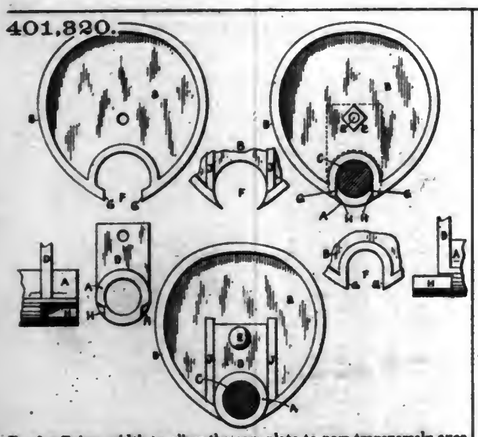
Claim.—In a door-closer, the combination of a bracket having a bearing therein, a drum-carrying frame swiveled in the bracket, a drum mounted in the frame, a ribbon, cord, or the like wound upon the drum, and a spring attached to the drum and frame, all substantially as set forth.

401,820. CAM. ALVIN D. WOODMANSEE, Natick, R. I. Filed Feb. 18, 1889. Serial No. 300,347. (No model.)

Claim.—1. The combination, with the hollow hub or sleeve of a cam, of a detachable cam-plate provided with a peripherical opening,



401,820.



F, of sufficient width to allow the cam-plate to pass transversely over a shaft to which the hub is to be attached, substantially as and for the purposes specified.

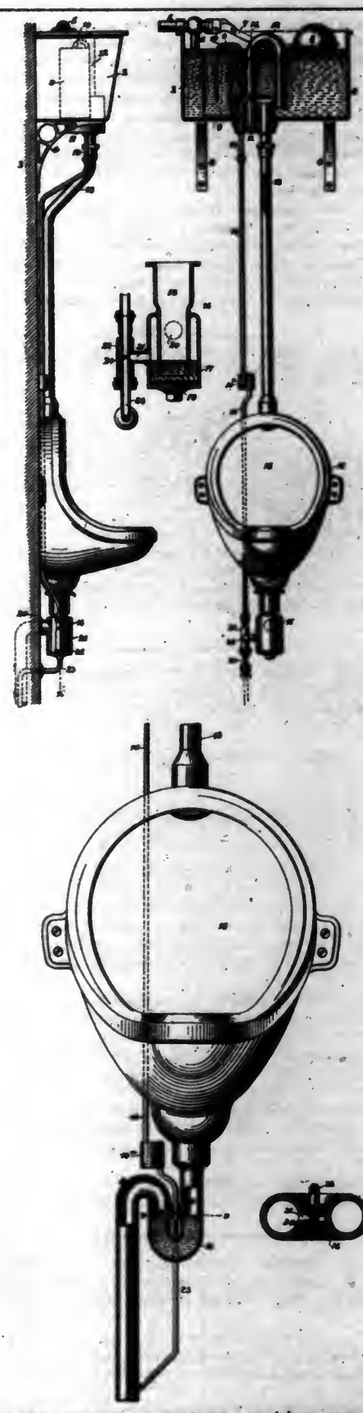
2. The combination, with the hollow hub or sleeve of a cam, of a detachable cam-plate provided with a peripherical opening, F, of sufficient width to allow the cam-plate to pass transversely over a shaft to which the hub is to be attached, the said cam-plate having shoulders or stops G G, and the hub having shoulders or stops H H, substantially as set forth.

3. The combination, with the hollow hub or sleeve of a cam having an arm, D, and shoulders H H, of a cam-plate detachably secured to said arm and having a peripherical opening, F, and shoulders G G to engage the shoulders H H, substantially as and for the purposes specified.

4. The combination, with the hub A, having the arm D and shoulders H H, of the cam-plate B, having the peripherical opening, F, shoulders G G, and ribs J J, substantially as and for the purposes specified.

401,821. APPARATUS FOR FLUSHING URINALS, &c. STRETTELL H. WRIGHT, Birkenhead, County of Chester, England, assignor to the Meyer-Sniffen Company, (Limited,) New York, N. Y. Filed Aug. 3, 1888. Serial No. 282,345. (No model.) Patented in England Jan. 26, 1887, No. 1,223; in France Nov. 10, 1887, No. 186,900, and in Belgium Nov. 12, 1887, No. 79,534.

401,821.



Claim.—1. The combination of a cistern, a urinal, a flushing-siphon, and a part-bore draw-pipe connecting with the urinal-outlet and with the flushing-siphon, substantially as described.

2. The combination of a cistern provided with two siphons communicating with each other, a urinal, and a part-bore draw-pipe connecting with the urinal-outlet and with the siphons, substantially as described.

3. The combination of a cistern provided with communicating siphons 10 and 12, the bend of the former being arranged below that of the latter, a urinal, and a draw-pipe connecting with the urinal-outlet and with the siphons, substantially as described.

4. The combination of a cistern provided with communicating siphons 10 and 12, the siphon 10 having a smaller bore above the point of connection with the siphon 12, a urinal, and a draw-pipe connecting with the urinal-outlet and with the siphons, substantially as described.

5. The combination of a cistern, two siphons connecting with each other, a well for one of the siphons, a urinal, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

6. The combination of a cistern, a flushing-siphon, a ball-cock, a urinal, and a part-bore draw-pipe connecting with the urinal-outlet and with the flushing-siphon, substantially as described.

7. The combination of a cistern, two siphons connecting with each other, a ball-cock, a well for one of said siphons, a urinal, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

8. The combination of a cistern, two siphons communicating with each other, a well for one of said siphons and a trap for the other, a supply-cock, a urinal, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

9. The combination of a cistern, two siphons communicating with each other, a well for one of said siphons and a trap for the other, a supply-cock, a pan or basin, a trap beneath the same, and a draw-pipe connecting with the urinal and with the siphons, substantially as described.

10. The combination of a cistern, two siphons communicating with each other, a well for one of said siphons and a trap for the other, a supply-cock, a draw-pipe, a pan or basin, and a trap beneath the same having two outlets, one to the draw-pipe and the other to the waste-pipe, substantially as described.

11. The combination of a cistern, two siphons communicating with each other, a well for one and a trap for the other, a supply-cock, a pan or basin, a trap beneath the same, and a part-bore-exhausting apparatus consisting of a draw-pipe, a surrounding chamber, and an inlet from the chamber to the draw-pipe.

12. The combination of a cistern, two siphons, 10 and 12, therein connecting with each other, a well for the siphon 10, a draw-pipe, and a supply-cock to the cistern, substantially as described.

13. The combination of a cistern, two siphons, 10 and 12, the shorter leg of the latter extending below that of the former, a well for the short leg of the siphon 10, a trap for the long leg of the siphon 12, a draw-pipe, and a supply-cock to the cistern, substantially as set forth.

14. The combination of a cistern, a flushing-siphon, a draw-pipe connected therewith, a urinal, a trap beneath the same, a waste-pipe from the trap, and a passage-way from the trap to the draw-pipe, substantially as described.

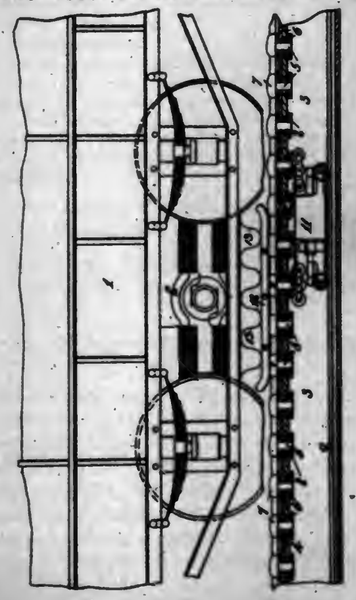
401,822. APPARATUS FOR THE APPLICATION OF ELECTRICITY TO PROPEL VEHICLES. FRANK WYNER, Westminster, County of Middlesex, England. Filed June 6, 1887. Serial No. 240,412. (No model.) Patented in England July 15, 1886, No. 9,215; in Germany Jan. 27, 1887, No. 41,326; in France Mar. 9, 1887, No. 182,077; in Belgium Sept. 2, 1887, No. 78,757, and in New South Wales Oct. 4, 1887, No. 226.

Claim.—1. In apparatus for the application of electricity to propel cars or vehicles, the combination, with a pipe or covered channel, of stationary insulated contact studs or rivets having parts 7, exposed in the road along which cars or vehicles are to be electrically propelled, and parts exposed in said channel, said contact studs or rivets being so arranged that said exposed parts 7 are short and frequent in the direction of said road but not in close proximity, substantially as herein described, for the purpose set forth.

2. In apparatus for the application of electricity to propel cars or vehicles, the combination of a covered channel, stationary insulated contact studs or rivets having parts exposed in said channel, and contact parts 7, exposed in the road along which cars or vehicles are to be propelled, and metallic connections between said contact studs or rivets and said contact parts 7, said exposed parts 7 being made short and frequent in the direction of said road but not in close proximity, substantially as herein described, for the purpose set forth.

3. In apparatus for the application of electricity to propel cars or vehicles, the combination of a covered channel, stationary insulated contact studs or rivets arranged at frequent intervals apart and having parts exposed in said channel, metallic contact bars or plates 7, exposed in and arranged transversely to the road along which cars or vehicles are to be propelled, said exposed bars or plates 7 being made short and frequent in the direction of said road but not in close proximity, and metallic connections between said contact studs or rivets and said contact bars or plates 7, substantially as herein described, for the purpose set forth.

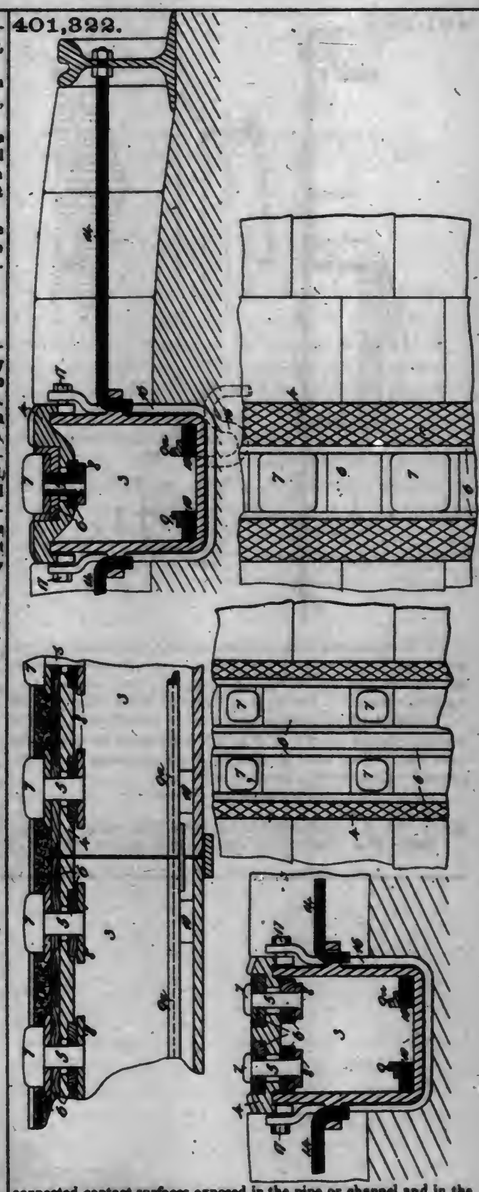
4. Apparatus for the application of electricity to propel cars or vehicles, comprising pipe or channel 3, contacts 5 5, with electrically-



connected contact-surfaces exposed in the pipe or channel and in the road on which the cars or vehicles are to be propelled, insulating material 6, strap-clips 19 and 20, rails or conductors 9 and 9*, and insulating-supports 10, all substantially as herein described, for the purpose specified.

5. In apparatus for the application of electricity to propel cars or vehicles, the combination of lengths of pipe or channel 3, with removable cover 4, straps 16, and screws 17, said straps 16 adapted to hold said cover 4 in place and to close the joint between adjacent lengths of pipe or channel, substantially as herein described.

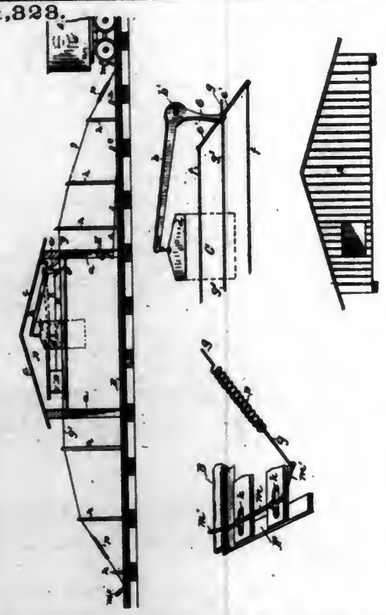
401,822.



401,823. RAILROAD-CROSSING SIGNAL. JACOB H. YOUNG, Lancaster, N. Y. Filed Oct. 26, 1888. Serial No. 288,139. (No model.)

Claim.—1. In combination with a railroad-crossing signal-stand, *a a*, having a roofed box, A *c*, the flag-arm *b*, pivoted at *b'*, with the flag C *d* depending from the outer end, the rod *e* of the arm *b*, having the cross-piece *e'*, the cables or wires *g g'*, connected to the rod *e* and attached to the bent levers *m m' m''*, adapted to be operated by wheels of passing trains, throwing the flag up or down, substantially as specified.

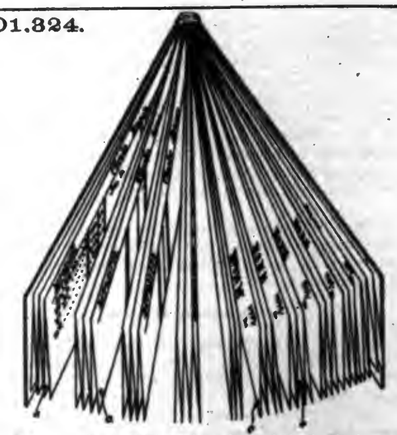
401,823.



2. In combination with a railroad-crossing signal-stand, *a a*, having the box A *c*, the flag-arm *b*, pivoted at *b'*, with the flag C *d* depending from the outer end, the rod *e*, forming part of the arm *b*, and having the cross-piece *e'*, with wires *g'*, connected to the rod *e*, and rods *f f*, connected to the cross-piece and to the slides D, the wires *g g'*, connected to bent levers *m m' m''* at both extremes of the wires at the track side, adapted to be operated by wheels of passing trains, substantially as and for the purpose specified.

401,824. POCKET-CHECK AND FORM BOOK. EUGENE FANNING, Newton, Mass. Filed Dec. 31, 1888. Serial No. 295,072. (No model.)

401,824.



Claim.—1. In a check-book, a sheet of check blanks or forms folded alternately back and forth, the printed blank forms of checks all facing one way when folded, but alternately in opposite directions when the sheet is spread out, substantially as described.

2. A sheet of printed forms folded back and forth similarly to the folds of a paper fan and printed on each side of the sheet on the alternate folds, a vacant fold of one side occupying the back of a printed form on the other, and attached within the covers of a book by the edge of one of the outer folds, all the printed forms on the sheet facing when so folded and attached in one uniform direction, substantially as described.

3. The combination of a block of printed forms in blank, constructed of a sheet folded back and forth, having the printed-form faces all in one direction when folded, and printed account-blanks having a number of spaces or lines suited to the number of forms in the blocks and bound within covers in book form, substantially as described.

4. The combination of book-covers, printed blank forms of account attached therein, a sheet of bank-check or other similar printed forms in blank folded back and forth, each alternate fold bearing upon the back of the alternate vacant space of the other side a check-form printed in blank, the forms all facing when so folded and attached in a uniform direction the account-forms, substantially as described.

PHOTO-LITH NORRIS PETERS WASHINGTON D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

THE MORLEY SEWING MACHINE COMPANY *et al. v.* LANCASTER.

Decided February 4, 1889.

1. MORLEY—MACHINES FOR SEWING BUTTONS ON FABRICS, &c.

Letters Patent No. 236,350, granted January 4, 1881, to Joseph H. Morley, for a machine for sewing buttons on fabrics, &c., is entitled to receive a liberal construction in view of the fact that the inventor was a pioneer in the construction of an automatic button-sewing machine, and is not to be limited to the particular devices or instrumentalities described by him, used in the three main elements of his machine, which combine together to make it up.

2. INFRINGEMENT.

As thus construed the patent is infringed by defendant's machine manufactured under Letters Patent No. 268,369, granted November 28, 1882, to Joseph Mathison, for a machine for sewing on buttons, the means employed in which are substantially equivalents of those used in the Morley machine.

3. EQUIVALENTS.

The mechanical devices used by the defendant are known substitutes or equivalents for those employed in the Morley machine to effect the same results, and this is the proper meaning of the term "known equivalents," in reference to a pioneer machine, such as that of Morley.

4. USE OF PATENTED PROCESSES BY A SUBSEQUENT INVENTOR.

A person who subsequently discovers a new mode of carrying out a patented process is not entitled to use the process without the consent of the patentee.

5. IMPROVEMENT ON PIONEER MACHINES.

Where an invention is one of a primary character and the mechanical functions performed by the machines are as a whole entirely new all subsequent machines which employ substantially the same means to accomplish the same results are infringements, although the subsequent machines may contain improvements in the separate mechanisms which go to make up the machine.

APPEAL from the Circuit Court of the United States for the District of Massachusetts.

Mr. B. F. Thurston for the appellant.

Mr. J. E. Maynadier and *Mr. George E. Smith* for the appellee.

Mr. Justice BLATCHFORD delivered the opinion of the Court.

This is a suit in equity, brought November 6, 1882, in the Circuit Court of the United States for the District of Massachusetts, by the Morley Sewing Machine Company and the Morley Button Sewing Machine Company against Charles B. Lancaster, for the alleged infringement of Letters Patent No. 236,350, granted January 4, 1881, to James H. Morley, E. S. Fay, and Henry E. Wilkins, on the invention of said Morley, on an application filed June 23, 1880, for an improvement in machines for sewing buttons on fabrics. The machine of the defendant is constructed in accordance with the description contained in Letters Patent No. 268,369, granted November 28, 1882, to Joseph Mathison, William D. Allen, and C. B. Lancaster, on the invention of said Mathison, for improvements in machines for securing buttons to material, on an application filed August 1, 1882.

The specification of the Morley patent says:

My invention consists in mechanism for automatically sewing shank-buttons onto fabrics, shoes, &c.; and the objects of my invention are to form a double-threaded stitch on the top side of the material being sewed upon transversely to the direction of feed, and on the reverse side of the material two parallel lines of stitches at right angles to the first-named ones, to make alternately long and short stitches, and to so feed buttons to be sewed by said machines as to present them at the proper time and in the proper place to be operated upon.

The specification then describes, by reference to 21 figures of drawings, the mechanical means used by the patentee to perform the mechanical operations described. The specification then proceeds:

Having thus described the machine and constructions set forth in the drawings, I wish it to be understood that the same is only one of different mechanisms which I have contemplated, and which may be effectually employed for carrying out the main feature of my invention—to wit the automatic mechanical sewing of buttons to a fabric. Thus different means may be adopted for carrying the thread through the eye of the button into the fabric—as, for instance, passing the hooked needle through said eye to a position to seize the thread from the straight needle, or form a suitable carrier and then draw the loop down through the fabric to be secured beneath by a shuttle or needle thread, or the eye-pointed needle may be used in connection with a loop-spreader and shuttle for carrying a thread through the loop, a single thread or two threads being used. It will further be understood that wires may be sometimes substituted for threads and that other feed mechanisms may be employed, the needles moving with but not controlling the fabric, as in the construction described.

There are 18 claims in the patent, only 4 of which are relied upon by the plaintiffs, namely, claims 1, 2, 8, and 13, which are as follows:

1. The combination, in a machine for sewing shank-buttons to fabrics, of button-feeding mechanism, appliances for passing a thread through the eye of the buttons and locking the loop to the fabric, and feeding mechanism, substantially as set forth.

2. The combination, in a machine for sewing shank-buttons to fabrics, of a needle and operating mechanism, appliances for bringing the buttons successively to positions to permit the needle to pass through the eye of each button, and means for locking the loop of thread carried by the needle to secure the button to the fabric, substantially as set forth.

8. The combination, in a machine for sewing buttons to fabrics, of button feeding and sewing appliances, substantially as set forth, and feeding appliances and operating mechanism whereby the feeding devices are moved alternately different distances to alternate short button-stitches with long stitches between the buttons, as specified.

13. The combination, with button-sewing appliances, of a trough, appliances for carrying the buttons successively from the trough to the sewing devices, and mechanism for operating said appliances and sewing devices, as set forth.

The defendant's machine is known as the Lancaster machine.

The Morley machine contains and is made up of 3 main groups of instrumentalities: (1) mechanism for holding the buttons in mass, and delivering them separately, in proper position, over the fabric, so that they

may be attached to it by the sewing and stitching mechanism; (2) the stitching mechanism; (3) the mechanism for feeding the fabric along, so as to space the stitches and consequently the buttons when sewed on.

In the button-feeding mechanism there is a hopper containing the buttons in mass. The principal use of the machine is to sew buttons onto the uppers of buttoned boots, and the button designed to be used is one having a round ball affixed to a shank, which terminates in an eye. On the bottom of the hopper is a hopper-valve, which picks out the buttons one by one and delivers them into an inclined trough. This trough has a V-shaped groove along its bottom, midway between its sides, and the buttons enter the upper part of the trough with their shanks in all directions, and it becomes necessary to turn them over, so that the eyes will lie in the groove while the bodies of the buttons occupy the trough. The contrivance for accomplishing this consists of a flexible, corrugated strip of metal, lying over the top of the trough, and oscillated by proper machinery, which, by contact with the bodies of the buttons, will roll them over so that their eyes will lie in the groove. After the buttons are thus arranged, they slide down the trough, being aided to do so by a jarring motion imparted to the latter. When they arrive at its lower end, which is bent so as to be nearly vertical, they lie with their heads toward the front of the machine, that is, the side farthest from the driving-pulley. In one modification of the machine, the buttons are held in the trough by a button-wheel, which is mounted on a vertical axis, and is provided with pockets, each capable of receiving a button, and admits of being intermittently revolved at proper times. This button-wheel is used (1) to close the bottom of the trough; (2) to receive buttons into its pockets; and (3) by its own revolution, to turn the buttons around, so that their eyes will lie toward the front of the machine. In order to prevent the buttons from falling out of the pockets, the button-wheel rests upon a stationary table, which closes the bottoms of all of the pockets but one. When a button arrives over the notch in the table, it has been turned around, on a vertical axis, 180 degrees; but, as a plane passing through its eye is then vertical, it must be turned on a horizontal axis through 90 degrees, so that its eye may lie flat, in order that the needle, which ascends from beneath, may pass through the eye. Therefore, when a button arrives over the notch in the table, a plunger or punch descends into the pocket and drives the button into a button-carrier, which lies at that time immediately under the notch, and under the pocket into which the punch enters. When the button enters the carrier, a plane passing through its eye is still vertical, and the carrier therefore turns around on a horizontal axis 90 degrees, to bring the eye of the button into such a position that it can be entered by the needle; and, as the carrier turns, it retracts, so as to bring the eye into such a position that a plane passing through it will be horizontal, and the needle will readily enter it. The patent describes a modified form of the contrivances for bringing the button into a position for the needle to enter its eye, in which modification the button-wheel is dispensed with, and a light spring is applied to the bottom of the trough, to hold up the column of buttons, such spring operating as a spring-gate, opened at proper intervals by mechanism, and shutting itself automatically. This mechanism, which also receives the button and turns it around 90 degrees on a horizontal axis, and transfers it to the place where it is to be sewed, is a sort of spring-nippers, one of the jaws of which is split so as to receive the shank of the button.

The above contrivances constitute what is called in claim 1, "button-feeding mechanism;" in claim 2, "appliances for bringing the buttons successively to positions to permit the needle to pass through the eye of each button;" in claim 8, "button-feeding appliances;" and, in claim 13, "a trough, appliances for carrying the buttons successively from the trough to the sewing devices, and mechanism for operating said appliances."

In the Morley patent there is a contrivance for feeding the fabric so as to space the stitches, and consequently to space the buttons. The needles, while inserted in the fabric, move in the direction of the feed, carrying the fabric with them. The motion of the needles or feed is derived from revolving cams, and the two needles swing like an inverted pendulum. This kind of feed was well known in machines for sewing leather, prior to the date of the Morley patent. This feeding contrivance is what is called in claim 1, "feeding mechanism," and in claim 8, "feeding devices."

The Morley patent describes its stitch as being made by means of two needles, one eye-pointed, like the Howe needle, and the other a hooked or crochet needle, such as is used in machines for sewing leather. These needles are set at an inclination to each other, across the line of the seam, and enter the fabric from beneath, and, when they get above it, cross each other. The eye-pointed needle pierces the fabric and carries a bight of thread up above it, and then retreats a little to form a loop by causing the thread to expand away from the needle. During this time, the hooked needle has also penetrated the fabric from beneath, and, when the loop is formed, passes between the eye-pointed needle and the thread, and, as both needles descend, the hook catches the thread supplied by the eye-pointed needle, and carries a bight of thread across the fabric and down through it to the under side, thus forming the transverse stitches on the button side of the fabric, the eye-pointed needle being described as passing through the eye of the button, although it is stated that instead the hooked needle may pass through such eye. The passage of the needle through the eye, after it has passed through the fabric, holds the button upon the fabric. When the eye-pointed needle retracts and forms a loop above the eye of the button, a loop-spreader is employed to spread the loop, and a shuttle, carrying either one thread or two threads, is passed through the loop, the eye-pointed needle, in its retraction, carrying, by means of the loop, the thread or threads furnished by the shuttle, and the stitch being the ordinary lock-stitch. The stitch described in the Morley patent as made by eye-pointed and hooked needles, both operating from the lower side of the fabric, and making transverse stitches on its upper side and longitudinal stitches on its lower side, is a stitch known prior to the date of the Morley patent.

In the Lancaster machine there are found combined

together the same three main groups of instrumentalities above set forth as being found in the Morley patent. There is in the Lancaster machine a hopper containing the buttons in mass, and an inclined surface which supports a column of the buttons, the buttons lying with their shanks up and their bodies down. This hopper is provided with a reciprocating brush, which sweeps over the buttons and rolls them over so that their shanks, pointing upward, will fall into one or another of slits in a metal plate which covers the inclined flat surface. These slits all converge into a single slit, so that the buttons slide down the various slits and ultimately lie in a single column in the single slit, with their shanks upward, upon an inclined plane surface. This single slit, and the plane surface which it covers, are twisted at the end, in such a manner that a plane passing through the slit is nearly horizontal, and the surface which is in contact with the head of the button is nearly vertical. Consequently, when the buttons reach the bottom, they lie in such a position that a plane passing through the eye of the lowermost button is horizontal, or nearly so. The column of buttons is held up by a light spring, and this spring-gate is opened by the button itself, because the so-called "trough" holding the column of buttons vibrates sidewise, and a thread which passes through the eye of the lowermost button prevents that button from vibrating with the contrivance, and the button is pulled out by the thread, and, in being pulled out, overcomes the resistance of the spring. The eye of the lowermost button in the column lies directly under the needle, so that the needle enters it while it is still in the column. The contrivance containing the column then vibrates sidewise, so as to get out of the way of the needle in a subsequent feeding operation. The spring in the Lancaster machine, which holds up the column of buttons, was a common device in screw blank and eyelet machinery, to hold up a column of blanks and permit them to be removed one by one.

In the Lancaster machine there is a contrivance for feeding the fabric so as to space the stitches, and consequently to space the buttons, and the machine feeds by means of a single needle which reciprocates in a straight line, and, while it is inserted in the fabric, moves in the direction of the feed, carrying the fabric with it, the motion of the needle or feed being derived from revolving cams. The expert for the defendant says that he finds no substantial difference between the mechanism which feeds the fabric in the two machines.

As to the stitching mechanism of the Lancaster machine, the needle is on the upper side of the fabric, and descends through it. It is an ordinary crochet-needle, provided with a cast-off, both the needle and the cast-off being like those described in the Morley patent, and the same which had been used for many years in sewing leather. The machine is also provided with a thread-carrier beneath the fabric, like that used in machines for sewing leather. The eye of the button in the Lancaster machine makes a part of the stitch, and the stitch cannot be made unless a button is supplied at every alternate perforation of the needle. It is therefore necessary that the machine should have some contrivance for carrying some of the loops of the thread over the bodies of the buttons, so that the loop may be locked by the eye of the button. In making the stitch, the needle first passes down through the eye of the button, carrying its hook below the fabric. The thread-carrier beneath the fabric then puts a loop of thread into the hook, and the hook rises, pulling a loop of thread through the fabric and through the eye of the button. The needle then descends again, sliding through such loop and piercing the fabric, and leaving the loop on top of the fabric. The thread-carrier then again puts the thread into the hook of the needle, and the needle rises again, carrying another bight of the thread through the fabric and through the loop on top of the fabric, thus locking that loop. As the needle rises, a contrivance seizes both parts of the loop carried up through the second hole made by the needle, opens it wide and passes it over the body of the button, and the part of the loop which is over the button is then pulled down through the fabric, and consequently around the shank of the button, thus locking the stitch. A succession of these operations forms the stitch, and sews a row of buttons on the fabric, each alternate loop of the stitch being locked by the button itself. If the buttons were removed from the stitch, there would remain a succession of loops, and consequently no seam.

In the operation of the Lancaster machine, after the needle has passed through the eye of the button, the end of the so-called "trough" and the needle move together, while the needle is making its feeding motion. The so-called "trough" then stands still until the needle has ascended and pulled a loop of thread through the eye, and has again pierced the fabric. When the needle has got into the fabric the second time the button is pulled out of the end of the trough by the retreat of the trough toward the rear of the machine, and is so pulled out because at that time the fabric is standing still and the button is held to it by the loop of thread which is passed through the eye of the button. After the button is thus pulled out of the end of the trough, the trough stands still for a while, while a loop is passed over the body of the button, as above described, and the trough then returns again, so as to hold the eye of a second button in the path of the descending needle, the button being thus released, not by the motion of the fabric, but by the motion of the trough which carries the column of buttons.

It satisfactorily appears that the Morley machine was the first one which accomplished the result of automatically separating buttons which have a shank from a mass of the same, conveying them in order to a position where they can be selected by the machine, one after another, and, by sewing mechanism, coupled with suitable mechanism for feeding the fabric be sewed thereto at prescribed suitable distances apart from each other. The machine performs automatically these three functions of selecting, sewing, and spacing. The problem to be performed was to select from a mass of buttons, furnished with heads and with wire eyes projecting therefrom, single buttons, and to present them in succession to the needle of a sewing mechanism, so that the needle could pass through the eye and secure it to the fabric. Machinery existed before for selecting from a mass wood-screw blanks, horse-nails, and pins, and delivering them to other machinery; but, in such constructions,

the shank of the article being heavier than its head, the tendency was for the articles to arrange themselves in the way with the shanks downward, the heads being supported on the top surface of the way. With such buttons as are used in the two machines in controversy, as the heads are much heavier than the shanks and the eyes combined, the buttons will not naturally arrange themselves with their shanks downward. It is therefore necessary to have some means for turning each button into such a position that a plane passing through its eye shall be perpendicular to a plane passing through the long axis of the sewing-needle, so as to insure the passage of the needle through the eye. No machine existing prior to Morley's is shown to have accomplished that operation.

The substance of the defense in the case is that there are certain specific differences between the button-feeding mechanisms in the two machines, and also certain specific differences between their sewing mechanisms; and hence that there is no infringement. This was the view taken by the circuit court in its opinion, (23 Fed Rep., 344.)

Morley, having been the first person who succeeded in producing an automatic machine for sewing buttons of the kind in question upon fabrics, is entitled to a liberal construction of the claims of his patent. He was not a mere improver upon a prior machine which was capable of accomplishing the same general result; in which case, his claims would properly receive a narrower interpretation. This principle is well settled in the patent law, both in this country and in England. Where an invention is one of a primary character, and the mechanical functions performed by the machine are, as a whole, entirely new, all subsequent machines which employ substantially the same means to accomplish the same result are infringements, although the subsequent machine may contain improvements in the separate mechanisms which go to make up the machine.

In *McCormick* v. *Talcott*, (20 How., 402, 405,) the inquiry was, whether McCormick was the first person who invented, in a reaping-machine, the apparatus called a "divider," performing the required functions, or whether he had merely improved an existing apparatus, by a combination of mechanical devices which performed the same functions in a better manner. This Court, speaking by Mr. Justice Grier, said:

> If he [the patentee] be the original inventor of the device or machine called the "divider," he will have a right to treat as infringers all who make dividers operating on the same principle, and performing the same functions by analogus means or equivalent combinations, even though the infringing machine may be an improvement of the original, and patentable as such. But if the invention claimed be itself but an improvement on a known machine by a mere change of form or combination of parts, the patentee cannot treat another as an infringer who has improved the original machine by use of a different form or combination, performing the same functions. The inventor of the first improvement cannot invoke the doctrine of equivalents to suppress all other improvements which are not mere colorable invasions of the first.

So, also, in *Railway Co.* v. *Sayles*, (97 U. S., 554, 556,) this Court, speaking by Mr. Justice BRADLEY, said, in regard to brakes for eight-wheeled railroad-cars:

> Like almost all other inventions, that of double brakes came when, in the progress of mechanical improvement, it was needed; and being sought by many minds, it is not wonderful that it was developed in different and independent forms, all original, and yet all bearing a somewhat general resemblance to each other. In such cases, if one inventor precedes all the rest, and strikes out something which includes and underlies all that they produce, he acquires a monopoly, and subjects them to tribute. But if the advance toward the thing desired is gradual, and proceeds step by step, so that no one can claim the complete whole, then each is entitled only to the specific form of device which he produces, and every other inventor is entitled to his own specific form, so long as it differs from those of his competitors, and does not include theirs. These general principles are so obvious, that they need no argument or illustration to support them.

The same view was directly applied in *Clough* v. *Barker*, (106 U. S., 166, 177,) to the Clough patent for an improvement in gas-burners. The first claim of that patent was for—

> the bat-wing burner, perforated at the base, in combination with the surrounding tube, substantially as described.

The second claim read thus:

> In combination with the bat-wing burner, perforated at the base, and surrounding-tube, the tubular valve for regulating the supply of external gas to the burner, substantially as described.

It appeared that in no prior structure had a valve arrangement been applied to regulate the flow of gas in such a combination as that covered by the first claim of the patent. It was, therefore, held, that the patentee was entitled to the benefit of the doctrine of equivalents, as applied to the combination covered by the second claim. In the defendant's burner, the regulation was made by a tubular valve on the outside of the perforations, instead of on the inside, as in the patent, but performing its work by being screwed up or down, as in the patent. This Court said:

> Although in the Clough structure the burner and surrounding tube revolve together in adjusting their position in reference to that of the tubular valve, so as to let in or turn off the supply of gas through the perforations, and although in the Clough structure the flame revolves by the revolution of the burner, and although in the defendant's burners the revolution of the surrounding tube regulated the supply of gas through such perforations, and neither the burner nor the flame revolved, the defendant's valve arrangement must be held to have been an equivalent for that of Clough to the full extent to which that of Clough goes, involving, perhaps, patentable improvements, but still tributary or subject to the patent of Clough. It is true that that patent describes the tubular valve as being inside of the burner-tube. But Clough was the first person who applied a valve regulation of any kind to the combination to which he applied it, and the first person who made such combination; and he is entitled, under decisions heretofore made by this Court, to hold as infringements all valve regulations, applied to such a combination, which perform the same office in substantially the same way as, and were known equivalents for, his form of valve regulation. See, also, *Duff* v. *Sterling Pump Co.*, (107 U. S., 636, 639.)

The same doctrine was applied by this Court in *Consolidated Valve Co.* v. *Crosby Valve Co.*, (113 U. S., 157,) to the Richardson patent, the claim of which was—

> A safety-valve with the circular or annular flange or lip ee, constructed in the manner, or substantially in the manner, shown, so as to operate as and for the purpose herein described.

It appeared that Richardson was the first person who made a safety-valve which, while it automatically relieved the pressure of steam in the boiler, did not, in effecting that result, reduce the pressure to such an extent as to make the use of the relieving apparatus practically impossible, because of the expenditure of time and fuel necessary to bring up the steam again to the proper working standard; and that his valve was the first which had a strictured orifice leading from the huddling-chamber to the open air, to retard the escape of the steam, and to enable the valve to open with increasing power against the action of the spring, and to close suddenly, with small loss of pressure in the boiler. It was held, that that claim covered a valve in which were combined an initial area, an additional area, a huddling-chamber beneath the additional area, and a strictured orifice such as that above mentioned, the orifice being proportioned to the strength of the spring. It was also held, that, under the claim of a second patent, namely—

> the combination of the surface beyond the seat of the safety-valve, with the means herein described for regulating or adjusting the area of the passage for the escape of steam, substantially as and for the purpose described—

the patentee was entitled to cover the combination, with the surface of the huddling-chamber and the strictured orifice, of a screw-ring to be moved up or down to obstruct such orifice more or less, in the manner described. It was further held, that both of the patents were infringed by a valve which produced the same effects in operation by the means described in Richardson's claims, although the valve proper was an annulus, and the extended surface was a disk inside of the annulus, the Richardson valve proper being a disk and the extended surface an annulus surrounding the disk; and although the valve proper of the defendant had two ground joints, and only the steam which passed through one of them passed through the stricture, while, in the Richardson valve, all the steam which passed into the air passed through the stricture; and although in the defendant's valve the huddling-chamber was at the center, instead of at the circumference, and was in the seat of the valve, under the head, instead of in the head, and the stricture was at the circumference of the seat of the valve, instead of being at the circumference of the head. These conclusions were based on the fact, stated in the opinion of the Court, that no prior structure was known or recognized as producing any such result as that produced by Richardson's apparatus; that the prior structures never effected the kind of result attained by his apparatus, because they lacked the thing which gave success; and that, taught by Richardson, and by the use of his apparatus, it was not difficult for skilled mechanics to take the prior structures and so arrange and use them as to produce more or less of the beneficial results first made known by him. The doctrine thus applicable to a machine patent is of a kindred character with that applied, in this country and in England, to a patent for a process.

In *Tilghman* v. *Proctor*, (102 U. S., 707,) the claim of Tilghman's patent was for—

> The manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure.

In the opinion of this Court, delivered by Mr. Justice Bradley, the claim was sustained as a claim for a process, irrespective of the particular mode or form of apparatus for carrying it into effect, inasmuch as the patent described a practical and useful mode of carrying it into effect. It was said in the opinion, (p. 721:)

> Had the process been known and used before, and not been Tilghman's invention, he could not then have claimed anything more than the particular apparatus described in his patent; but being the inventor of the process, as we are satisfied was the fact, he was entitled to claim it in the manner he did.

It was also held that, in such a case, a person who subsequently discovers a new mode of carrying out the patented process is not entitled to use the process without the consent of the patentee.

Reference was made in the opinion in that case to the decision in *Neilson* v. *Harford*, (1 Webster Pat. Cas., 295,) which related to Neilson's patent for the process of applying a blast of heated air to anthracite coal in a smelting-furnace, by forcing such blast through a vessel situated between the blowing apparatus and the furnace, and heated to a red heat, the form of the heated vessel being stated by the patent to be immaterial. On this question this Court said:

> That a hot blast is better than a cold blast for smelting iron in a furnace, was the principle or scientific fact discovered by Neilson; and yet, being nothing but a principle, he could not have a patent for that. But having invented and practically exemplified a process for utilizing this principle, namely, that of heating the blast in a receptacle between the blowing apparatus and the furnace, he was entitled to a patent for that process, although he did not distinctly point out all the forms of apparatus by which the process might be applied, having, nevertheless, pointed out a particular apparatus for that purpose, and having thus shown that the process could be practically and usefully applied. Another person might invent a better apparatus for applying this process than that pointed out by Neilson, and might obtain a patent for such improved apparatus; but he could not use the process without a license from Neilson. His improved apparatus would, in this respect, stand in a relation to the process analogous to that which an improvement on a patented machine bears to the machine itself.

In regard to the case of *Neilson* v. *Harford*, this Court, speaking by Chief Justice Taney, in *O'Reilly* v. *Morse*, (15 How., 62, 115, 116,) said, in reference to the opinion of the court of exchequer in that case, delivered by Baron Parke:

> We see nothing in this opinion differing in any degree from the familiar principles of law applicable to patent cases. Neilson claimed no particular mode of constructing the receptacle, or of heating it. He pointed out the manner in which it might be done; but admitted that it might also be done in a variety of ways, and at a higher or lower temperature, and that all of them would produce the effect in a greater or less degree, provided the air was heated by passing through a heated receptacle. And hence it seems that the court at first doubted whether it was a patent for anything more than the discovery that hot air would promote the ignition of fuel better than cold. And if this had been the construction, the court, it appears, would have held his patent to be void, because the discovery of a principle in natural philosophy or physical science is not patentable. But after much consideration, it was finally decided that this principle must be regarded as well known, and that the plaintiff had invented a mechanical mode of applying it to furnaces; and that his invention consisted in interposing a heated receptacle between the blower and the furnace, and by this means heating the air after it left the blower, and before it was thrown into the fire. Whoever, therefore, used this method of throwing hot air into the furnace used the process he had invented, and thereby infringed his patent; although the form of the receptacle or the mechanical arrangements for heating it might be different from those described by the patentee. For, whatever form was adopted for the receptacle, or whatever mechanical arrangements were made for heating it, the effect would be produced in a greater or less degree, if the heated receptacle was placed between the blower and the furnace, and the current of air passed through it. Undoubtedly, the principle that hot air will promote the ignition of fuel better than cold, was embodied in this machine. But the patent was not supported because this principle was embodied in it. He would have been equally entitled to a patent if he had invented an improvement in the mechanical arrangements of the blowing apparatus, or in the furnace, while a cold current of air was still used. But his patent was supported because he had invented a mechanical apparatus by which a current of hot air, instead of cold, could be thrown in. And this new method was protected by his patent. The interposition of a heated receptacle, in any form, was the novelty he invented.

This Court also said, in *Tilghman* v. *Proctor*, (p. 728:)

> If the mode of applying the process is not obvious, then a description of a particular mode by which it may be applied is sufficient. There is, then, a description of the process and of one practical mode in which it may be applied. Perhaps the process is susceptible of being applied in many modes and by the use of many forms of apparatus. The inventor is not bound to describe them all, in order to secure to himself the exclusive right to the process, if he is really its inventor or discoverer. But he must describe some particular mode, or some apparatus, by which the process can be applied with at least some beneficial result, in order to show that it is capable of being exhibited and performed in actual experience.

The English doctrine is to the same effect. In the case of *Curtis* v. *Platt*, before Vice-Chancellor Wood, in 1863, reported in a note to *Adie* v. *Clark*, (3 Ch. Div., 134,) the Vice-Chancellor said, (p. 136,) in regard to a patent for an improvement in spinning-mules:

> When the thing is wholly novel, and one which has never been achieved before, the machine itself which is invented necessarily contains a great amount of novelty in all its parts; and one looks very narrowly and very jealously upon any other machines for effecting the same object, to see whether or not they are merely colorable contrivances for evading that which has been before done. When the object itself is one which is not new, but the means only are new, one is not inclined to say that a person who invents a particular means of doing something that has been known to all the world long before has a right to extend very largely the interpretation of those means which he has adopted for carrying it into effect.

In the same case, on appeal before the Lord Chancellor, (Lord Westbury,) (p. 138,) the views of Vice-Chancellor Wood were concurred in.

In *Badische Anilin und Soda Fabrik* v. *Levinstein*, (24 Ch. Div., 156, 171,) in regard to a patent for im-

provements in the production of coloring-matters for dyeing and printing, Mr. Justice Pearson said:

Where a patent is taken out for a process for arriving at a known result, (I mean, a result known before the patent is taken out for the process *simpliciter*,) any other person may take out a patent for another process, or may use another process without taking out a patent, without any infringement of the process first taken out. But when a patent is taken out for a new result not known before, and there is one process described in the patent which is effectual for the purpose of arriving at that new result at the time when the patent is taken out, the patentee is entitled to protection against all other processes for the same result; and no person can, without infringing upon his patent, adopt simply a different process for arriving at the same result.

As authority for this view, he cites the cases of *Jupe* v. *Pratt*, (1 Webster Pat. Cas., 146;) *Household Co.* v. *Neilson*, (Id. 685,) and *Curtis* v. *Platt*, (*ubi sup.*, and Goodeve Pat. Cas., 102.) He decided in favor of the plaintiff.

On appeal to the court of appeal, (29 Ch. Div., 366,) the decree was reversed, Lord Justices Bowen and Fry being in favor of a reversal, and Lord Justice Baggallay against it. On further appeal to the House of Lords, (12 App. Cas., 710,) the decision of the court of appeal was reversed, and the decision of Mr. Justice Pearson was restored, Lord Halsbury, (Lord Chancellor,) Lord Herschell, and Lord Macnaghten sitting in the case and concurring. In the judgment given by Lord Herschell it is stated that all the judges of all the courts were agreed on the question of infringement.

A recent and instructive case is that of *Proctor* v. *Bennis*, (36 Ch. Div., 740,) in regard to a patent for self-acting mechanism for supplying fuel at intervals to, and distributing it over the surface of, a fire. The court of first instance held the patent to be valid and to have been infringed. In the court of appeal, Lords Justices Cotton, Bowen, and Fry unanimously affirmed the decision, and held that a patent for a combination of known mechanical contrivances, producing a new result, was infringed by a machine producing the same result by a combination of mechanical equivalents of such contrivances, with some alterations and omissions, which did not prevent the new machine from being one which took the substance and essence of the patented invention; but that, where the result was old, and the novelty consisted only of improvements in a known machine for producing a known result, the patentee must be tied down strictly to the mode which he had described of effecting the improvements.

Lord Justice Cotton, after referring to the case of *Curtis* v. *Platt*, (3 Ch. Div., 135, note,) said, (p. 757:)

Where there is no novelty in the result, and where the machine is not a new one, but the claim is only for improvements in a known machine for producing a known result, the patentee must be tied down strictly to the invention which he claims, and the mode which he points out of effecting the improvement. But here the throwing coal on to the furnace by the intermittent radial action of a flap or door was new. Nothing of the kind had been done before. It is true, there had previously been imperfect machines for feeding furnaces automatically, but that had not, previously to this machine, been done by an intermittent radial action of a flap or door, as is done by the plaintiff. In my opinion, therefore, the opinions expressed by the judges with reference to mere improvements in an old machine for an old purpose cannot apply to a case like this, where there was not only novelty in the machine, but novelty in the result to be produced by that machine.

Lord Justice Bowen said, (p. 764:)

Now, I think it goes to the root of this case to remember that this is, as was described by one of the counsel, really a pioneer invention: and it is by the light of that, as it seems to me, that we ought to consider the question whether there have been variations, or omissions, and additions, which prevent the machine which is complained of from being an infringement of the plaintiff's. With regard to the variations, I take precisely the same view that the Lord Justice Cotton has taken; and I will not travel over the ground again. With regard to the additions and omissions, it is obvious that additions may be an improvement, and that omissions may be an improvement; but the mere fact that there is an addition, or the mere fact that there is an omission, does not enable you to take the substance of the plaintiff's patent. The question is not whether the addition is material, or whether the omission is material, but whether what has been taken is the substance and essence of the invention. That seems to me to be the true test, as propounded by the House of Lords in *Clark* v. *Adie*, (2 App. Cas., 315, 320.)

Lord Justice Fry said, (p. 766:)

The pith and substance of the plaintiff's invention is, in my judgment, putting coals upon a fire by an intermittent radial action, an invention which, it may be remarked, reproduces with great exactitude the action of the human arm in placing coals upon a fire.

Also, (p. 768:)

In the present case, we have these broad features of likeness, that in both machines the motion is a radial motion, in both machines it is an intermittent motion, in both machines it is of course produced by means of a radius, in both machines that radius is moved in one direction by tappets, and the same radius is moved in the opposite direction by a spring. All those broad features of the machines are in common; but there is this difference, that in the plaintiff's machine a shaft is impelled by the tappets and by the spring, whereas in the defendant's machine the radius itself is impelled by the tappets and the spring. It follows that the radius in the plaintiff's is attached to the shaft, whereas the radius in the defendant's works on a pin. That is the broad distinction between them. The result, however, appears to me to be substantially the same; by substituting the pin for the shaft as the center on which the radius acts, and by impelling the radius itself instead of impelling the shaft fixed to the radius, you have produced in substance precisely the same radial action by the same means. You drive your radius in one direction by tappets, and you drive it in the other direction by the spring, and you produce the same result, namely, the feeding of coal by a radial motion made intermittent in one direction by the operation of the tappets, and in the other direction by the spring. I think, therefore, that we have a new combination for a new object, and that the gist of that combination has been taken by the defendant, and that, consequently, there is an infringement.

Applying these views to the case in hand, Morley having been the first inventor of an automatic button-sewing machine, by uniting in one organization mechanism for feeding buttons from a mass, and delivering them one by one to sewing mechanism and to the fabric to which they are to be secured, and sewing mechanism for passing a thread through the eye of the button, and securing it to the fabric, and feeding mechanism for moving the fabric the required distances to space the buttons, another machine is an infringement, in which such three sets of mechanism are combined, provided each mechanism, individually considered, is a proper equivalent for the corresponding mechanism in the Morley patent; and it makes no difference that, in the infringing machine, the button-feeding mechanism is more simple, and the sewing mechanism and the mechanism for feeding the fabric are different in mechanical construction, so long as they perform each the same function as the corresponding mechanism in the Morley machine, in substantially the same way, and are combined to produce the same result.

The view taken on the part of the defendant, in regard to the question of infringement, is that, inasmuch as the Lancaster machine uses different devices in its mechanisms which correspond to those referred to in the first, second, eighth, and thirteenth claims of the patent, those claims are to be limited to the special devices described in the patent, which make up such combinations, although both machines contain the same main group of instrumentalities which, when combined, make up the machine. But, in a pioneer patent, such as that of Morley, with the 4 claims in question such as they are, the special devices set forth by Morley are not necessary constituents of the claims. The main operative features of both machines are the same. In each there is a receptacle for shank-buttons in a mass; in each the mass of buttons passes in order into a conveyer-way; and in each the buttons conveyed to the sewing mechanism are presented successively with their shanks in a horizontal position, so as to allow of the passage of the needle through the eye. In the Morley machine, the buttons are carried along the raceway with their shanks downward, and are turned over by proper devices, so that the needle can enter the eye. In the Lancaster machine, the buttons travel along the raceway with their shanks upward, and the twisted shape of the raceway causes the buttons to be presented properly in succession to the needle. The only difference is, that in the Morley machine there is an active operating device for turning the buttons, in the shape of a button-wheel which receives them, and shuts off the column, and takes one at a time out of the raceway; while in the Lancaster machine there is a passive device for accomplishing the same result of turning the buttons, and there is no button-wheel, but there is a spring-gate at the end of the raceway, which shuts off the column and, with the addition of other devices, allows one button at a time to be withdrawn from the raceway. But in the Morley patent a modification is described, whereby the button-wheel is dispensed with, and a spring-gate, as in the Lancaster machine, is employed, and an active device is used to open the spring-gate and discharge the button, while in the Lancaster machine an active instrumentality is used to effect the same result, in combination with the sidewise movement of the raceway and in connection with the fact that the needle enters the eye of the button and passes a thread through it.

As to the mechanism for feeding the fabric, it is substantially the same in the two machines, for in each the needle operates to feed the fabric, while inserted in it, and it makes no difference that in the Morley machine the two needles swing like an inverted pendulum, while in the Lancaster machine the single needle swings in a straight line.

The principal difference relied on by the defendant is in regard to the sewing or stitching mechanism, based upon the difference in the kind of stitch used in the two machines for fastening the button to the fabric. The two stitches are, indeed, different, specifically considered. Morley uses the chain-stitch. In the Lancaster machine, the stitch is made by looping the thread upon itself, and putting the bight of the loop around the shank of the button, so as to prevent the loop from pulling out, as it would otherwise do. The Morley patent, however, is not for any particular kind of stitch, or for any particular kind of mechanism for making such stich. When the form of the stitch is changed, the instrumentalities for making it must change. Morley says, in his specification, that different means for making a stitch may be employed, as well as other feed mechanisms.

The contention of the defendant, in regard to the sewing mechanism, rests upon the proposition, that the convolution or concatenation of thread which makes up the stitch in the Lancaster machine is different from that which is found in the Morley machine. In each machine, however, the buttons are spaced at the proper distances apart by the feeding mechanism which moves the fabric along, and the feeding device is moved alternately different distances, to alternate short stitches with long stitches between the buttons. In each machine, the button is taken possession of by the sewing mechanism, and the needle in each enters the eye of the button. In the Lancaster machine, however, the thread is so looped as to embrace also the shank of the button, and thus, if the button were not present in the Lancaster machine, the lock-stitch would not be formed, but merely a succession of loops, which could be pulled out of the fabric. But this convolution or concatenation of the thread to form the fastening of the stitch, and the particular device which forms such convolution or concatenation, are not made, by the Morley patent, elements which enter into the claims in question. Those claims are not for a result or effect, irrespective of the means by which the effect is accomplished. It is open to a subsequent inventor to accomplish the same result, if he can, by substantially different means. The effect of the rule before laid down is merely to require that, in determining whether the means employed in the Lancaster machine are substantially the same means as those employed in the Morley machine, the Morley patent is to receive a liberal construction, in view of the fact that he was a pioneer in the construction of an automatic button-sewing machine, and that his patent, especially in view of the character and terms of the four claims in question, is not to be limited to the particular devices or instrumentalities described by him, used in the three main elements of his machine, which, combined together, make it up. This is the principle applied by this Court in *Consolidated Valve Co.* v. *Crosby Valve Co.*, (113 U. S., 157.)

In all three of the main mechanisms used in the Lancaster machine, the means employed in it are substantially equivalents of those employed in the Morley machine. There is in each a hopper containing the mass of buttons, and an inclined conveyer-way leading from the hopper to the sewing mechanism. The only question in regard to the button-feeding mechanism is, whether the means employed in the Lancaster machine for turning the buttons so that the eyes will come into the path of the needle, are within the means employed for the same purpose in the Morley machine. In the Morley machine there is a flexible, corrugated strip of metal, which is oscillated to and fro, and operates to roll the buttons over, so that their shanks will occupy a groove at the bottom of the trough. In the Lancaster machine, the reciprocating brush which sweeps over the bottom of the hopper in which the buttons lie in a mass, operates in an equivalent way with the corrugated strip of the Morley machine, and causes the shanks, which stand upward, of the buttons which have been rolled over by its action, to enter slits in a metal plate, which converge in the single conveyer-way. The only difference is that, in the Morley machine, the shanks are caused to lie in one direction at one time in their path, and in the Lancaster machine the same result is accomplished by equivalent devices at another time.

As to the instrumentalities employed in the two machines for bringing the buttons one by one so that their eyes will stand in a horizontal position, ready to receive the needle, the buttons in the Morley machine pass down the conveyer-way with their eyes pointing

downward, and occupying the groove, and from the conveyer-way they enter one by one into a button-wheel, which, by revolving, turns them 180 degrees, and they are then received into a carrier which further turns them 90 degrees, so as to get the eye into a horizontal plane. In the Lancaster machine, it is not necessary to turn the buttons more than 90 degrees, because they have been so rolled over by the brush in the hopper that their eyes point upward and enter the slits, and the conveyer-way is twisted and so turns the button that its eye will occupy a horizontal plane, ready to receive the needle. Then the needle, entering the eye of the button, pulls the button out of the conveyer, and the latter moves out of the way, leaving the button in the possession of the sewing mechanism. These instrumentalities are the equivalents of each other, the differences being merely formal, active instrumentalities being employed in one case to turn the buttons, and in the other that end being accomplished by the twisting of the conveyer-way. To employ a curved path to change the plane occupied by a body passing along that path was well known in mechanics, and is a device shown in the Morley patent for turning the buttons from a nearly vertical position to a horizontal position, by a corresponding variation in the inclination of the conveyer-way. The only difference in the particular devices in the two machines in this respect results from the fact that in the Morley machine the buttons pass from the hopper with their shanks downward, while in the Lancaster machine they pass with their shanks upward. From this it results that, while the means employed in the two machines are substantially the same, to effect the same result, active agents can be used in the one case, while passive agents are used in the other, to effect the same turning of the button. Indeed, in the modified form of construction suggested in the Morley specification, there is a spring-gate for holding the buttons up, while in the Lancaster machine there is a similar spring, the only difference being that in the Morley machine the spring-gate is opened by a special device, while in the Lancaster machine the button itself opens the spring when the button-holding contrivance moves out of the way. In that modification of the Morley arrangement, as the specification states, the button-wheel and the plunger are dispensed with, and it is not necessary to turn the button 180 degrees on a vertical axis. So, in this respect, the only difference between the two machines is, that in the Morley machine the spring-gate is opened by an active device, while in the Lancaster machine the conveyer-way is moved sidewise by an active device, leaving the button behind, which opens the spring-gate because the needle has entered the eye of the button.

In regard to the sewing mechanism in the two machines, a sewing-needle with thread is employed in each to fasten the buttons to the fabric. In each, the thread is continuous, and follows the fabric as that is moved along by the mechanism which feeds it. The Morley machine employs the common stitch. In the Lancaster machine there is a peculiar stitch, in which a loop is drawn around the shank of the button and thus the stitch is locked against being drawn out; but, notwithstanding the new convolution or concatenation of thread used in the Lancaster machine to secure the shank of the button to the fabric, the sewing mechanism of that machine is a substantial equivalent for the corresponding mechanism of the Morley patent. The invention of Morley in that respect did not consist in the peculiarity of the stitch, but in the combination of the needle, and the mechanism for operating it, with a button having a shank and an eye, the eye being held in a horizontal plane in the path of the needle, so that the thread carried by the needle could secure the button to the fabric. It is immaterial, in so securing the button, whether or not a loop is passed over the head of the button. The defendant's device and arrangement may be an improvement, and the subject of a patent, but nevertheless the use of it involves the plaintiff's invention.

It may be true that the defendant's peculiar form of stitch was unknown before; and it may also be true that his arrangement for carrying the buttons with their eyes upward, and turning the eyes into a horizontal plane by the twisting of the conveyer-way, was not before known. Of course, they were not before known in a machine for automatically sewing buttons to a fabric, because Morley's machine was the first to do that. But still, the defendant employs for the above purposes known devices, which, in mechanics, were recognized as proper substitutes for the devices used by Morley to effect the same results. Thus, in the Lancaster machine, the brush for rolling over the buttons is the obvious equivalent of the corrugated plate in the Morley machine. The mode of operation used in the Lancaster machine for rolling over the buttons so that their shanks shall point in a particular direction before entering the main conveyer-way is the same mode of operation found in the Morley machine, where the corrugated plate rolls the buttons over during their passage to the grooved conveyer-way, so that their shanks shall all point in the same direction. In the Lancaster machine the action resulting from the twisted way is a mechanical equivalent for the button-wheel, the punch, and the carrier used in the Morley machine to turn the eye into the proper plane for the needle to enter it; and the specific difference in the devices in this respect becomes less when the modification described in the Morley patent is used, so that in each of the two machines the button is turned only 90 degrees on a horizontal axis, and in each of them a spring-gate is employed, opened in the one case by an active device, while in the other case an active device moves the conveyer away from the particular button which is being held by the needle. In this sense the mechanical devices used by the defend .nt are known substitutes or equivalents for those employed in the Morley machine to effect the same result; and this is the proper meaning of the term "known equivalent," in reference to a pioneer machine such as that of Morley. Otherwise, a difference in the particular devices used to accomplish a particular result in such a machine would always enable a defendant to escape the charge of infringement, provided such devices were new with the defendant in such a machine, because, as no machine for accomplishing the result existed before that of the plaintiff, the particular device alleged to avoid infringement could not have existed or been known in such a machine prior to the plaintiffs' invention.

It results from these views that the decree of the circuit court must be reversed, and the case be remanded to that court with a direction to enter a decree in favor of the plaintiffs, sustaining the validity of claims 1, 2, 8, and 13 of the plaintiffs' patent, and adjudging that those claims have been infringed by the defendant, and ordering a reference to a master to take an account of profits and damages in respect to such infringement, and awarding to the plaintiffs a perpetual injunction in respect to the four claims above mentioned; and to take such further proceedings as shall be according to law and not inconsistent with this opinion.

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OF THE
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[BY AUTHORITY OF CONGRESS.]

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Indexes to Patents on Electricity.

Appendix No. 2 to the index to patents relating to electricity, covering the period of time from July 1, 1882, to June 30, 1883, has been issued, and is now for sale. These indexes, arranged alphabetically, numerically, and by classes, are completed to June 30, 1883, and comprise the following volumes:

Vol. 1. Index to patents relating to electricity granted by the United States prior to June 30, 1881, with an appendix, July 1, 1881, to June 30, 1882. One volume, 250 pages. In paper covers, $3; bound, $5.

Vol. 2. Appendix No. 2, July 1, 1882, to June 30, 1883. One volume, 50 pages. In paper covers, $1.50.

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Vol. 4. Appendix No. 4, July 1, 1884, to June 30, 1885. One volume, 60 pages. In paper covers, $1.50.

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Notice.

UNITED STATES PATENT OFFICE,
Washington, D. C., April 13, 1888.

To expedite the distribution of the mail in this Office, and to insure the prompt and certain delivery of communications to the divisions and officials having charge of the matters to which they relate, attorneys and correspondents are respectfully requested to enter upon the upper left-hand corner of amendments and other communications, if known to them, the number of the room and the name of the examiner or designation of the division to which the communication should be sent.

BENTON J. HALL,
Commissioner of Patents.

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Issue of April 16, 1889.

Patents	403	No. 401,325 to No. 401,727,	inclusive.
Designs	6	No. 19,047 to No. 19,052,	inclusive.
Trade-Marks	15	No. 16,488 to No. 16,502,	inclusive.
Labels	8	No. 5,868 to No. 5,875,	inclusive.
Reissue	2	No. 10,994 to No. 10,995,	inclusive.
Total issue	434		

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Denmark	3	....	Victoria	1	....
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Finland	....	....	Total to citizens of foreign countries	41	2
France	1	....			

DESIGNS.

19,047.—ASH-RECEIVER, &c.—*Joseph E. Dallon*, Brooklyn, N. Y. Application filed January 28, 1889. Serial No. 297,832. Term of patent 3½ years.

19,048.—RACKET.—*Charles A. Davis*, Washington, D. C. Application filed March 18, 1889. Serial No. 303,783. Term of patent 14 years.

19,049.—MIRROR OR BRUSH BACK.—*Charles Kunze*, Newark, N. J., assignor to *P. Wiederer & Brother*, New York, N. Y. Application filed February 26, 1889. Serial No. 301,261. Term of patent 3½ years.

19,050.—CANTEEN.—*Charles W. Ledig*, Philadelphia, Pa. Application filed January 5, 1889. Serial No. 295,568. Term of patent 3½ years.

19,051.—RUG.—*Thomas E. Meagher*, Philadelphia, Pa. Application filed March 21, 1889. Serial No. 304,173. Term of patent 3½ years.

19,052.—BOTTLE.—*Erskine J. S. Van Houten*, Nyack, N. Y. Application filed October 17, 1888. Serial No. 288,397. Term of patent 7 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,488.—EMMENAGOGUE.—*Chichester Chemical Co.*, Philadelphia, Pa. Application filed January 24, 1889. Used since October 20, 1887.

"The words 'DIAMOND BRAND.'"

16,489.—CIGARETTES OR CHEROOTS.—*Consolidated Cigarette Company*, New York, N. Y. Application filed March 5, 1889. Used since November 1, 1888.

"The word 'CONSOLS.'"

16,490.—SOAP.—*Curtis Davis & Co.*, Boston, Mass. Application filed February 28, 1889. Used since February 13, 1889.

"The words 'CUI BONO.'"

16,491.—HUNGARIAN WINES.—*The Willman Cossenas Company*, New York, N. Y. Application filed December 20, 1888. Used since November 13, 1888.

"A green-colored strip with the wreath-encircled Hungarian coat of arms and the words 'ROYAL HUNGARIAN MODEL WINE-CELLAR AT BUDAPEST,' in the Hungarian, German, French, and English languages, along the said strip."

16,492.—MEN'S OVERALLS.—*Dittenhoefer, Haas & Co.*, Portland, Oreg. Application filed March 5, 1889. Used since 1881.

"The word 'IRON-CLAD.'"

16,493.—TOILET PERFUMES, WATERS, POWDERS, AND SOAPS.—*The Doussan French Perfumery Company*, New Orleans, La. Application filed February 4, 1889. Used since September 1, 1888.

"The representation of a circular stone window inclosing a cliff surrounded by water, &c., and a light-house on top of it and a cobweb across the face of the window, and the words 'DELICATE AS A COBWEB, LASTING AS THE HILLS,' on the stones which form the window."

16,494.—WATCHES.—*Julien Gallet & Co.*, New York, N. Y. Application filed February 28, 1889. Used since May 22, 1888.

"The word 'PATRIOT.'"

16,495.—ARTICLES OF JEWELRY AND ORNAMENTATION FOR PERSONAL WEAR.—*Hammond Turner & Sons*, Snow Hill, Birmingham, county of Warwick, England. Application filed June 7, 1888. Used since February 8, 1866.

"The representation of a lion."

16,496.—LEATHER GLOVES.—*Sinclair T. Hunting*, New York, N. Y. Application filed March 2, 1889. Used since February, 1886.

"The word 'RICHELIEU.'"

16,497.—WHISKY.—*Max Klein*, Allegheny, Pa. Application filed December 24, 1888. Used since 1877.

"The words 'SILVER AGE.'"

16,498.—SHEATHING-PAPER.—*Margaret E. Manahan*, New York, N. Y. Application filed February 27, 1889. Used since September 7, 1885.

"The words 'PARCHMENT SHEATHING.'"

16,499.—WEEKLY PERIODICALS.—*Perry Mason & Co.*, Boston, Mass. Application filed March 8, 1889. Used since April 16, 1827.

"The words 'YOUTH'S COMPANION.'"

16,500.—MEDICAL REMEDIES FOR EXTERNAL USE.—*F. O. Robertson*, Janesville, Wis. Application filed August 30, 1888. Used since 1871.

"The representation of a cactus-plant and a photograph of the registrant."

16,501.—GRANULAR EFFERVESCENT MEDICINE.—*Henry K. Wampole & Co.*, Philadelphia, Pa. Application filed February 27, 1889. Used since October 19, 1888.

"The word 'BROMO-PYRINE.'"

16,502.—BOOTS AND SHOES.—*Waukenphast & Co.*, London, England. Application filed September 7, 1888. Used since February 23, 1869.

"The name 'WAUKEN-PHAST.'"

LABELS.

5,868.—Title: "BIRD'S INFALLIBLE ORIENTAL LOTION."—*Samuel M. Bird*, Philadelphia, Pa. Application filed March 20, 1889.

5,869.—Title: "DR COLE'S NERVE PILLS."—*Drs. P. C. Cole & Son*, South Solon, Ohio. Application filed March 18, 1889.

5,870.—Title: "DR COLE'S KIDNEY PILLS."—*Drs. P. C. Cole & Son*, South Solon, Ohio. Application filed March 18, 1889.

5,871.—Title: "MELILOTUS LOTION."—*Thomas H. Field*, Chicago, Ill. Application filed March 20, 1889.

5,872.—Title: "SUPERIORE BAKING POWDER."—*F. L. Hooper & Co.*, Baltimore, Md. Application filed March 21, 1889.

5,873.—Title: "INDIAN BLOOD CURE." (FOR A MEDICAL COMPOUND.)—*F. P. Mayes* and *Green Abbey*, Weatherford, Tex. Application filed March 18, 1889.

5,874.—Title: "SHEPARD'S COMPOUND" (FOR A MEDICINE.)—*A. P. Shepard*, Lapeer, Mich. Application filed March 20, 1889.

5,875.—Title: "THE GREAT KENTUCKY TONIC BOURBON BITTERS."—*Jesse B. Shumaker*, Bridgewater, Pa. Application filed March 20, 1889.

DISCLAIMERS.

252,002.—*Camille A. Faure*, Paris, France. IMPROVEMENT IN POLARIZATION OR SECONDARY ELECTRIC BATTERIES. Patent dated January 3, 1882. Disclaimer filed April 9, 1889, by the assignee, *The Electrical Accumulator Company*, New York, N. Y.

Enters its disclaimer to—

"From the first claim of said Letters Patent No. 252,002, any electrode of a secondary battery coated with an active layer of absorptive substance, to which the active layer is wholly applied otherwise than in the form of a paint, paste, or cement practically insoluble in the electrolytic liquid."

Also, to the following words on the first page of said Letters Patent, to wit:

"in the form of a deposit by galvanic action or chemical precipitation, or otherwise."

Also, to the following words on the second page of said Letters Patent after the words "lead plates," to wit:

"in any suitable way."

Also, to the following words, also on the second page of said Letters Patent, to wit:

"The plates *a* can be coated with an active porous layer in any suitable way."

263,067.—*Marshall J. Allen*, New York, N. Y., and *William E. Bradley*, Frankfort, Ky. IMPROVEMENT IN PROCESS OF MAKING WHISKY. Patent dated August 22, 1882. Disclaimer filed April 5, 1889, by the *Frankfort Whisky Process Company*, assignee.

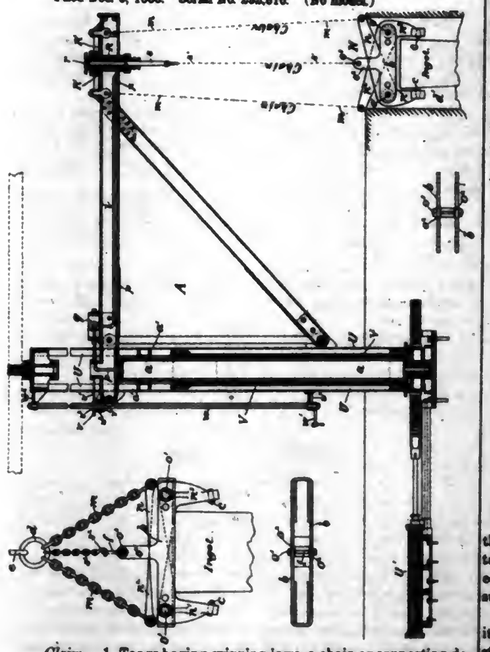
Enters its disclaimer—

"To the first claim of said Letters Patent and to any process as covered by the second claim, in which the coarse waste particles are not removed before distillation, and in which the fine particles are not returned with the spent beer and mixed with fresh material."

PATENTS

GRANTED APRIL 16, 1889.

401,325. MILL APPLIANCE. HENRY AIKEN, Homestead, Pa. Filed Dec. 6, 1888. Serial No. 293,816. (No model.)



Claim.—1. Tongs having gripping-jaws, a chain or supporting device by which the tongs may be suspended without exerting a closing action on the jaws, and a second supporting device—such as chains—connected with the jaws and acting thereon to close the same when the tongs are suspended therefrom, substantially as and for the purposes described.

2. Tongs having gripping-jaws, a chain or supporting device by which the tongs may be suspended without exerting a closing action on the jaws, a second supporting device—such as chains—connected with the jaws and acting thereon to close the same when the tongs are suspended therefrom, a crane from which the tongs are suspended, and power devices on the crane connected with the tongs, whereby the weight of the tongs may be shifted from one of said supporting devices to the other to cause the tongs to open or close, substantially as and for the purposes described.

3. Tongs having arms forming jaws and levers, a cross bar or frame connecting the jaws, and a lifting device connected with the cross bar or frame, substantially as and for the purposes described.

4. As an improvement in ingot-tongs, the combination of a crane having a cylinder at the outer end of the jib, a pipe conveying motive fluid from the motive-fluid supply of the crane to the cylinder, and tongs which are connected with and operated by the moving parts of said cylinder, substantially as and for the purposes described.

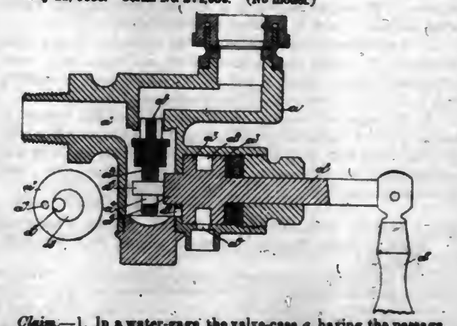
5. As an improvement in devices for transporting ingots and like articles, the combination of a crane having a lifting-cylinder and plunger, fluid-power connection between the crane-plunger and the lifting-cylinder, and a valve operated by a vertical shaft, to which the valve is connected by a traveling connection, substantially as and for the purposes described.

6. Tongs having pivotally-movable jaws and a cross-frame in which the jaws are pivoted, said cross-frame being constructed to afford for the jaws a number of pivots more or less remote from the center to permit the relative positions of the jaws to be varied, substantially as and for the purposes described.

7. Tongs having jaws pivoted on separated pivots, substantially as and for the purposes described.

8. Tongs having pivotally-movable jaws and a cross bar or frame constituted of separated side pieces or bars, between which the jaws are pivoted, substantially as described.

401,326. WATER-GAGE. JOHN G. BLOUNT, Boston, Mass. Filed May 22, 1888. Serial No. 274,639. (No model.)



Claim.—1. In a water-gage, the valve-case *a*, having the passage through it formed with but one communicating port, the valve to control said port, combined with the link a^3, loosely connected thereto, eccentric-stud a^2, engaging therewith, and the rotatable valve-stem a^5, substantially as described.

2. In a water-gage, the valve-case *a*, having the passage through it, and the movable valve, as a^3, within said case, and the rotatable stem a^5, combined with a hub partially rotated by the stem, having a port or passage through it and controlling a port into the chamber formed within the valve-case to serve as a blow-off, substantially as described.

3. In a water-gage, the valve-case *a*, having the entire passage through it formed with but one connecting port or orifice, and the valve, as a^3, combined with a rotatable stem, the eccentric-stud thereon, and the slotted link loosely connecting said valve and stem, by which the valve a^3 may be moved positively toward or from its seat, and may also be held at an intermediate position to serve as a check-valve, and the hand-piece a^{10}, by which the said stem is semi-oscillated, substantially as described.

4. In a water-gage, the valve-case *a*, having a passage through it, a valve controlling said passage, combined with a slotted link, a^3, loosely connected with the said valve, and the stem for moving the link, substantially as described.

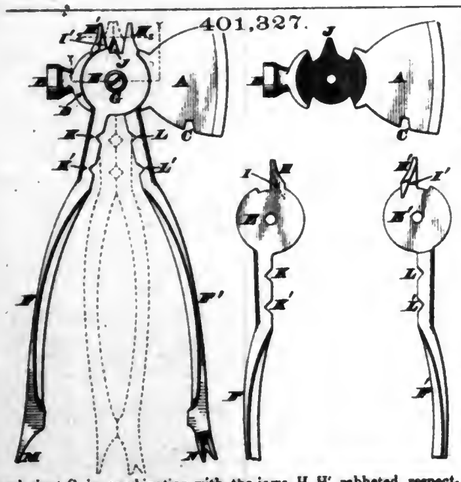
5. In a water-gage, the valve-case *a*, having the passage through it, and a single connecting-port therein, the valve a^3 for said port, and the blow-off passage or port, combined with the oscillating valve-stem for simultaneously moving the valve a^3 and for controlling the blow-off port or passage, substantially as described.

401,327. COMBINATION-TOOL. ANDREW J. BRYANT, Winton Place, assignor of one-half to Thomas E. Spivey, Cincinnati, Ohio. Filed Sept. 13, 1888. Serial No. 285,267. (No model.)

Claim.—1. A combination-tool consisting of the hatchet A, having a pair of levers, F F', pivoted thereto at G, which handles terminate with jaws H H', as herein described.

2. The hatchet A, having a cutter-bit, J, a pair of levers, F F',

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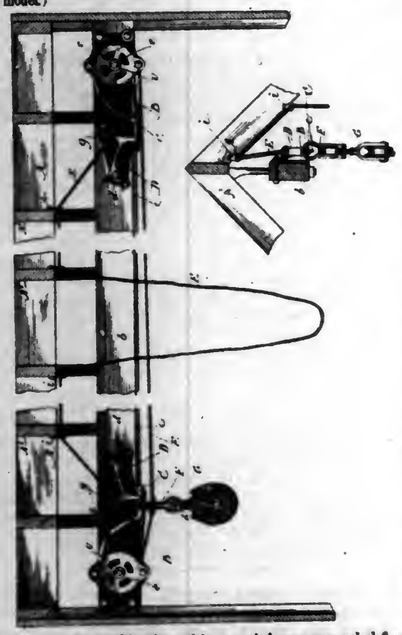
and pivot G, in combination with the jaws H H', rabbeted, respectively, at I I', as herein described.

3. A combination-tool consisting of the hatchet A, having a pair of levers, F F', pivoted thereto at G, the inner faces of said handles being notched, as at K L, for the purpose described.

4. A combination-tool consisting of the hatchet A, having a pair of levers, F F', pivoted thereto at G, one of said levers, as F, terminating with a screw-driver, M, and the other lever, as F', terminating with a claw, N, for the purpose described.

5. An improved combination-tool consisting of the hatchet A, having a poll, B, cutter-bit J, and sockets D D', which sockets receive the joint-plates E E', of levers F F', said handles being provided with rabbeted jaws H I H' I', and being pivoted to said hatchet by a bolt, G', as herein described.

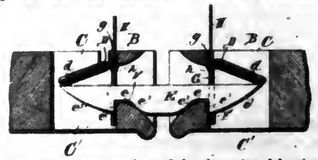
401,328. PULLEY-CHANGING DEVICE. ABNER J. BURBANK and EUGENE L. CHURCH, Harvard, Ill. Filed Dec. 10, 1888. Serial No. 293,210. (No model.)



Claim.—1. In combination with a track-beam suspended from the frame of the roof, the plates B, one of which is attached to each end of such beam, each plate being provided with a sheave, *s*, and an arm, C, and a wire track, *c*, connecting said plates, spring-stops D, and the endless rope E, extending around the sheaves and held up by supports above the plates and provided with a long loop, whereby the clevis F and its pulley are adapted to be moved from one end of the building to the other, substantially as described.

2. In combination with the endless rope E, mounted upon bearings above the sheaves *s*, as described, the said sheaves, the plates B, and their arms C, the wire track *c*, connecting said arms, and the spring-stops D, pivoted to plates B, adapted to be confined or released by operating said rope as required, substantially as described.

401,329. CAR-COUPLING. FRANK J. CASE and JAMES F. PRESTON, Arrington, Kans. Filed June 30, 1888. Serial No. 278,616. (No model.)

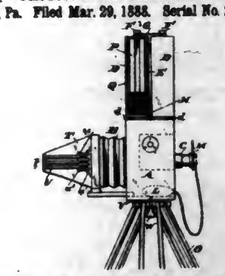


Claim.—1. The combination of the draw-head having the shoulder F and the recess *g*, the link engaging the shoulder F, and the frame G, seated in the recess *g* and having its upper cross-bar bearing on the upper edge of the link, the said frame G being arranged entirely within the draw-head, as set forth.

2. The combination of the draw-head having a shoulder, F, the link engaging said shoulder, the frame G, arranged within the draw-head and engaging the link, and the shaft D, mounted in the draw-head in rear of said frame G and having its crank-arm *d* resting on the upper edge of the link, as specified.

3. In a car-coupler, the combination of the recessed draw-head provided with the slots C C', the link-bar E, and the transverse shaft D, provided with the central lever-arm, *d*, and crank-handles *d'* outside of its bearings.

401,330. PHOTOGRAPHING-INSTRUMENT. GEORGE A. COOKE, Philadelphia, Pa. Filed Mar. 29, 1888. Serial No. 268,837. (No model.)



Claim.—1. A carrying-case for a camera, consisting of an inclosing-frame in which the camera is secured, in combination with removable door or cover upon opposite sides thereof corresponding to the front and rear of the camera, so as to expose both ends of the camera without removing it from the inclosing-frame, a plate-holding compartment carried by one of said doors or covers, and a handle for carrying the case.

2. A portable photographic apparatus consisting of a main case in which the camera is formed or secured, having means of attachment for use to a tripod or other support, in combination with an auxiliary box or case to contain the photographic sensitized plates or holders hinged at its upper edge to said main case and capable of being folded upon the top of the main case, exposing the focusing-plate of the camera according as to whether the camera is to be carried or used.

3. In a portable photographic apparatus, a main case provided with means of attachment for use to a tripod or other support and having compartments within it to receive the photographing-shutter and stop-sights, in combination with a camera secured in said main case, and a movable compartment for the plates or holders attached to said main case.

4. In a portable photographic apparatus, the combination of a case or box-frame independent of the camera and having means of support upon a tripod, two covers or doors for opposite sides of said frame to expose the front and rear of the camera, a collapsible camera secured within said box-frame, and a collapsible focusing shade or screen secured to the rear of the camera.

5. In a portable photographic apparatus, a main case provided with means of attachment to a tripod or other stand, in combination with a camera secured therein, having a collapsible focusing shade or screen, consisting of the double-jointed side pieces, U u, and cross-pieces U', and the textile or flexible covering T.

6. In a portable photographic apparatus, the main case A, having doors or covers and means of attachment to a tripod or other support for use, in combination with a camera, B, formed or secured

within said main case A, having a lens, C, secured to the removable and reversible board R, whereby said lens C may be turned into the camera when it is not in use.

7. In a portable photographic apparatus, the main case A, having doors or covers and means of attachment to a tripod or other support for use, in combination with a camera, B, formed or secured within said main case A, having a lens, C, secured to the removable and reversible board R, whereby said lens C may be turned into the camera when it is not in use, and compartments K and J within said main frame A.

8. In a portable photographic apparatus, the main case A, having doors or covers and means of attachment to a tripod or other support for use, in combination with a camera, B, formed or secured within said main case A, having a lens, C, secured to the removable and reversible board R, whereby said lens C may be turned into the camera when it is not in use, compartments K and J within said main frame A, and movable compartments for the photographing plate-holder formed on the door or covers of the case A.

9. The combination of a box-frame having its opposite ends open, a collapsible camera secured within said frame and having its lens at one of the open ends and its focusing-plate at the other open end and extensible from said frame, and a plate-holding compartment secured to said frame and arranged above it when photographing and having no communication with the camera proper.

10. The combination of a box-frame having its opposite ends open, a collapsible camera secured within said frame and having its lens at one of the open ends and its focusing-plate at the other open end, a removable plate holding said lens, so that it may be turned into the camera when not in use, a plate-holding compartment secured to said frame and arranged above it when photographing, and a handle for carrying said apparatus arranged at its top.

11. A camera-case consisting of a frame independent of the camera proper, provided with means for attachment to a tripod and having two of its diametrically-opposite sides open, in combination with two doors or lids adapted to close said open ends or sides and a carrying-handle secured to the upper part of the case between the doors or lids and on the opposite side with reference to the means for attachment to the tripod.

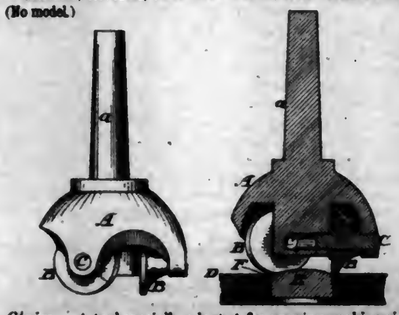
12. A combined camera and plate-holder case consisting of the camera-compartment A, having a handle, in combination with the two plate-holder compartments D D, having doors E and hinged to the compartment A.

13. A combined camera and plate-holder case consisting of the camera-compartment A, having a handle and plate V, in combination with the two plate-holder compartments D D, having doors E and hinged to the compartment A and provided with feet F F, and a rubber band, G, to snap over said feet to hold the case open or closed.

14. The combination of a box-frame open at opposite ends and provided on two of its sides at right angles to each other with plates V V', for securing it to a tripod, doors or covers for said open ends of the box-frame, and a collapsible camera having a rectangular focusing-plate longer in one direction than the other and secured within said box-frame, so that its sides or edges are parallel with the box frame sides.

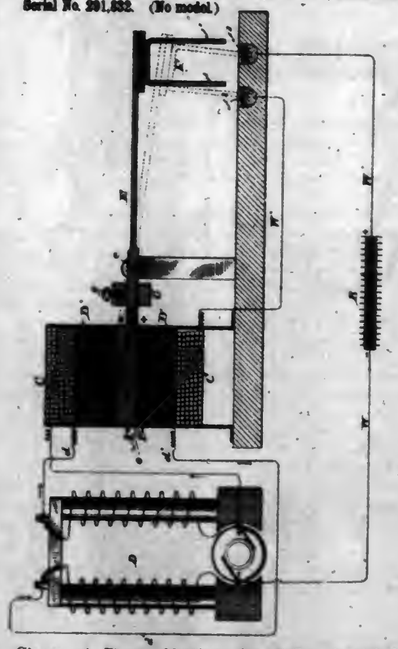
15. A camera made collapsible having an independent plate holding compartment secured to it when in use, but above and forward of the plate-holding part of the camera, but having no communication with the camera proper, whereby plates may be taken from the compartment by hand and inserted in place in the camera and in which the focusing plate or glass is exposed when the apparatus is in its normal position and condition for photographing, and inclosing-covers on front and back to inclose and protect the camera when being transported.

401,331. TOOL FOR CONSTRUCTING VAULT-LIGHTS. HARRY A. CROSSLEY, Cleveland, Ohio. Filed Aug. 17, 1888. Serial No. 270,967. (No model.)



Claim.—A tool specially adapted for pressing packing-rings in vault-lights, consisting of a chambered hemispherical head, A, having a spindle, *a*, and side openings, and provided with compressing-rollers B, substantially as shown and described.

401,332. AUTOMATIC CUT-OUT FOR SECONDARY BATTERIES. STANLEY G. G. CURRIE, Philadelphia, Pa., assignor to the United Electric Improvement Company, Gloucester City, N. J. Filed Nov. 26, 1888. Serial No. 291,832. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, of a dynamo-electric machine, an accumulator, and an energizing-coil, all in the main circuit, a second energizing-coil (in a separate or branch circuit) adjacent to and parallel with the main-circuit coil, a permanent magnet within said coils, a soft-iron armature, also within said coils, and a circuit-controller or switch in the main circuit controlled by said armature.

2. The combination, substantially as hereinbefore set forth, of a shunt-wound dynamo, an accumulator, and an energizing-coil, all in the main circuit, a second energizing-coil (in a constantly-closed field-circuit) coincident with the main-circuit coil, an armature vibrating within both coils, a permanent magnet actuating the armature, and the main-circuit switch controlled by said armature.

3. The combination, substantially as hereinbefore set forth, of a dynamo, an accumulator, and an energizing-coil of coarse wire, all in the main circuit, a second energizing-coil of fine wire, (in a separate or branch circuit,) a permanent magnet and an armature both inclosed by the coils, and the main-circuit switch controlled by the armature.

4. The combination, substantially as hereinbefore set forth, of the main-circuit coil, the branch-circuit coil coincident therewith, the permanent magnet and the soft-iron armature both inclosed by the coils, and the main-circuit switch controlled by the armature.

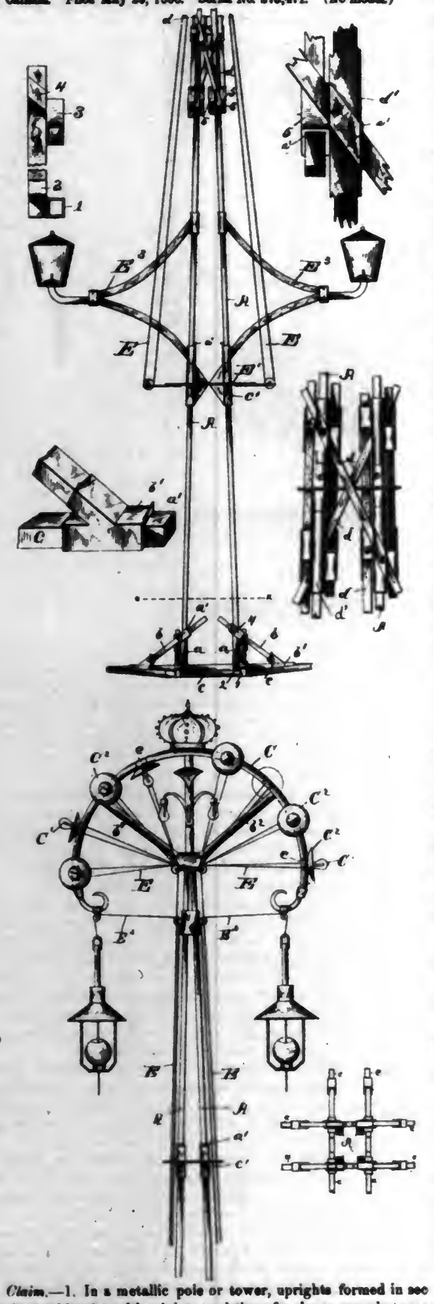
5. The combination, substantially as hereinbefore set forth, of the main-circuit coil, the concentric coacting branch-circuit coil, the permanent magnet inclosed therein, the armature vibratable laterally relatively to the permanent magnet, and the interposed diamagnetic plate which prevents the adhesion of the magnet and armature.

6. The combination, substantially as hereinbefore set forth, of the coacting concentric coils, the permanent magnet therein, the armature vibratable within the coils, the arm, pivot, and counterpoise of the armature, and the circuit-controller carried by said arm.

7. The automatic circuit-controller hereinbefore described, consisting of the combination of a dynamo, an accumulator, and an energizing-coil, all in the main circuit, a second energizing-coil, (in a separate or branch circuit,) concentric and coacting with the main coil, a permanent magnet within said coils, an armature vibratable therein, an arm on which said armature is mounted, a pivot on which said armature rocks, a counterpoise normally holding said magnet and armature together, and a switch controlling the main circuit, also mounted on said arm and controlled by the vibrations of the armature, substantially as hereinbefore set forth.

8. The combination, substantially as hereinbefore set forth, of the energizing-coil, its fixed permanent magnet-core, and its movable soft iron armature, normally similarly polarized and vibratable laterally within the coil.

401,333. POLE OR TOWER. JOHN W. DAVY, Kingston, Ontario Canada. Filed May 29, 1888. Serial No. 275,471. (No model.)



Claim.—1. In a metallic pole or tower, uprights formed in sections, in combination with a joint consisting of a sleeve or socket open at each end, into which the adjoining ends of two sections are inserted, and wedges driven into the socket or sleeve between its inner surface and the outer faces of the sections, thereby removably and rigidly clamping the sections together to form a continuous piece, substantially as set forth.

2. The combination, with a pole or tower, of a base or anchor consisting of horizontal transverse bars secured to the lower end of the tower or pole and projecting laterally beyond the same, inclined braces secured to said bars and to the tower or pole, and sleeves provided with sockets, whereby said bars, braces, and tower or pole are secured together, substantially as described.

3. The combination, with a pole or tower, of a suitable anchor secured to the lower end of the same and adapted to be buried a suitable distance below the surface of the ground, and vertically-adjustable lamps or burners carried by said pole or tower a suitable distance above the surface of ground by adjustable sleeves and brackets, substantially as described.

4. The herein-described upwardly-tapering light-tower, consisting of three or more uprights formed in sections detachably jointed together by means of suitable sleeves or sockets, cross-braces, and wedges for removably clamping the upright sections in said sleeves, links, or sockets, substantially as described.

5. A light-tower composed of uprights formed in sections and suitably connected and jointed together, in combination with an anchor or base for the same, a crown supported by the top of the tower, lamps or burners adjustably supported by said crown, and ropes or chains connected with the lamps and by which the same are adjusted, said ropes extending downwardly to or near the ground, substantially as described.

6. A light-tower tapering upwardly and consisting of uprights formed in interchangeable sections removably clamped together and supporting a crown upon which the lights are carried, and an anchor or base for the tower composed of interchangeable parts removably clamped together, as set forth.

7. A light-tower tapering upwardly and consisting of uprights formed in sections removably clamped together by means of sockets connected in sets, and wedges by which said sections are clamped in the sockets, whereby the height of the tower can be increased or diminished, substantially as described.

8. A stationary upwardly-tapering light-tower comprising uprights suitably secured together, in combination with an anchor for the same buried a suitable distance beneath the surface of the ground, and comprising a number of horizontal beams equal to the number of uprights, each beam connecting, secured directly to, and extending beyond the lower ends of two or more uprights, and inclined braces secured to each upright and to the horizontal beams directly secured to the lower end of the same, substantially as described.

9. The herein-described light-tower, composed of uprights formed in sections and provided with a suitable anchor or base and a light-supporting crown, and the herein-described joint and brace between a set of upright sections consisting of sleeves provided with inclined sockets, inclined brace-rods removably clamped in said sockets and extending diagonally from each upright to the next adjoining uprights and from a section above the joint to a section below a joint, and wedges for clamping the rods and uprights in the sleeves and sockets, substantially as described.

10. The combination, with a light-tower, of a crown supported by the top of the tower and provided with a segmental supporting-rod, and lamps or burners provided with reflectors and carried by sleeves loosely mounted on the supporting-rod, and means whereby the lamps can be turned in the desired direction, substantially as described.

11. In a light-tower provided with a crown, lamps or burners provided with reflectors and adjustably mounted on said crown, and ropes or chains extending to or near the ground, whereby each lamp can be independently adjusted from the ground to throw a light in any direction, substantially as described.

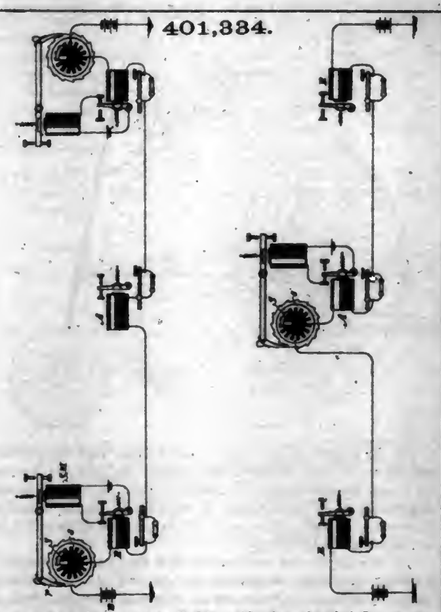
12. A light-tower the various parts and sections of which are clamped and removably secured together by means of sleeves and wedges, thereby dispensing with the use of nails, bolts, &c., substantially as described.

401,334. TELEGRAPHY. PATRICK B. DELANY, New York, N. Y. Filed Nov. 10, 1888. Serial No. 290,444. (No model.)

Claim.—1. The combination, substantially as set forth, of a line, a battery at each end thereof, with which the line is normally connected, transmitting and receiving devices at each end of the line, and line-opening devices at each end of the line, said devices consisting of separable contacts included in the line, one of which is disconnected or insulated from the other and from earth when the contacts are separated, and contact-separating devices controlled by the relay, which momentarily separate said contacts and leave the line open or disconnected from earth and battery for a brief period after each interruption of the main circuit.

2. The combination, substantially as set forth, of a line, a battery, transmitting devices at one end thereof, a receiving-relay in the line at a point removed from the transmitting-station, line-opening devices at said relay, said devices consisting of separable contacts in the line-circuit, which while separated leave the line broken or open, and con-

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tact-separating devices controlled by said relay, that briefly separate the contacts, and thereby open the line upon the movement of the relay when the circuit is opened at the transmitter.

3. The combination, substantially as set forth, of a line, terminal and way stations connected in the line, a battery, transmitting devices at one end thereof, a receiving-relay in the line at a point removed from the transmitting-station, line-opening devices at said relay, said devices consisting of separable contacts in the line-circuit, which while separated leave the line broken or open, and contact-separating devices controlled by said relay, that briefly separate the contacts, and thereby open the line upon the movement of the relay when the circuit is opened at the transmitter.

4. The combination, substantially as set forth, with a line, a battery at each end thereof, with which the line is normally connected, and electro-magnetic receiving devices and transmitting-keys connected directly in the line, of a series of contacts connected with the battery at each terminal station, said contacts being separated by intervening insulated spaces, a trailer or contact-maker actuated by the electro-magnetic receiving devices to pass from one battery-contact across the intervening space, thereby opening the line to the next battery-contact each time the circuit is opened at a transmitter, and electro-magnetic receiving devices connected in the line at intermediate or way stations.

5. The combination, substantially as set forth, of a line having terminal and way or intermediate stations, a battery with which the line is normally connected, transmitting and receiving devices at each end of the line, and line-opening devices at each end of the line, said devices consisting of separable contacts included in the line, one of which is disconnected or insulated from the other and from earth when the contacts are separated, and contact-separating devices controlled by the relay, which momentarily separate said contacts and leave the line open or disconnected from earth and battery for a brief period after each interruption of the circuit.

6. The combination, substantially as set forth, with a relay, of a rotating trailer or contact-maker, a series of segments or contacts over which the trailer rotates, the said segments being separated by intervening insulation, trailer-rotating devices controlled by the relay, an electric circuit including the relay-coil, the rotating contact, and the circle of segments traversed thereby, and a source of electric energy, whereby, upon the movement of the relay-armature, the rotating contact is moved from one segment across the intervening insulation to the next segment and the circuit thereby momentarily opened.

401,335. HAND-STAMP. ISAAC R. DODSON, Danville, Va. Filed Apr. 17, 1888. Serial No. 270,900. (No model.)

Claim.—1. In a hand-stamp, the combination of the type-roller, the spring for returning the same to its initial position, and an adjustable stop for limiting the rotation of the roller, whereby the initial position of the latter may be adjusted, substantially as specified.

2. In a hand-stamp, the side plates provided with a series of apertures, N, combined with a roller, F, mounted between the plates, having a stud or pin, L, and provided with a spring to return it to its initial position, and the adjustable stop fitting in one of the apertures N in the path of the stud or pin, substantially as and for the purpose specified.

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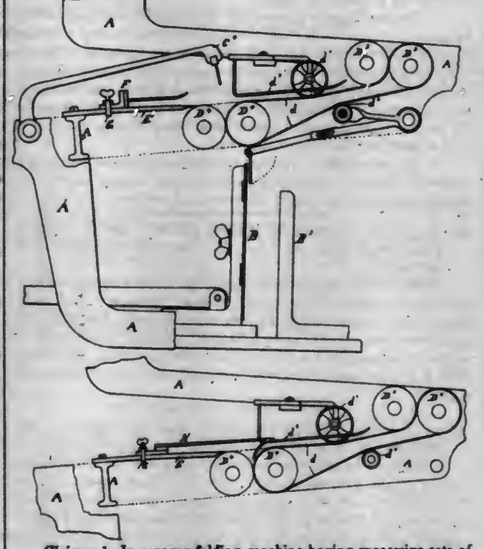


3. In a hand-stamp, the side plates provided with a series of apertures, N, combined with the roller provided with a spring to return it to its initial position and having a series of apertures, K, in one end, the adjustable stud or pin arranged in one of the apertures K, and the adjustable stop M, fitting in one of the apertures N in the path of the stud or pin, substantially as specified.

4. In a hand-stamp, the combination, with the side plates having the radial slots O O P therein, of the roller F, mounted between the said plates, the rods *r r s*, arranged in the slots O O P, respectively, and having eyes or rings on their ends, the springs T T, attached at their upper ends to the rods *r r*, the springs *t t*, connecting the ends of the rod *s* to the ends of the rods *r r*, and the rollers R R and S, mounted on the rods *r r* and *s*, respectively, substantially as specified.

5. In a hand-stamp, the combination, with the side plates having the roller F mounted therebetween and provided with slots arranged radially to the said roller, of the inking-rollers R R, mounted in the said slots and connected by springs T T to the roller F, and the roller S, arranged between and in contact with the rollers R and connected to the latter by springs *t t*, substantially as specified.

401,336. PAPER-FOLDING MACHINE. WELLINGTON DOWNER, Erie, Pa. Filed Jan. 11, 1888. Renewed Feb. 23, 1889. Serial No. 301,502. (No model.)

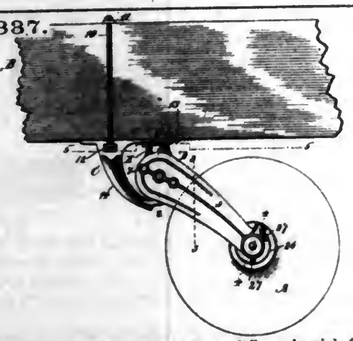


Claim.—1. In a paper-folding machine having successive sets of folding-rollers set parallel to each other, the combination, with the second set of said successive sets of parallel rollers, of the detachable deflectors H, interchangeable with the detachable upper guards, F, substantially as and for the purposes set forth.

2. In a paper-folding machine, the combination, with the folding-rollers D^3 D^3 and D^4 D^4, arranged parallel to each other and successively, and the packing-box B B', in position to receive papers from the rollers D^4 D^4, of the detachable deflectors H, made interchangeable with the detachable upper guards, F.

401,337. COLTER ATTACHMENT FOR PLOWS. WILLIAM J EDWARDS, Chicago, Ill. Filed Mar. 20, 1888. Serial No. 267,899. (No model.)

401,337.



Claim.—1. The combination, substantially as hereinbefore set forth, of the rotary hub E, provided with oppositely-arranged toothed faces, the vertical pivot 1, arranged as a stationary portion of a bracket and providing an axis about which the hub is arranged to turn, and the colter-yoke carrying a colter-blade and having toothed portions which engage with the toothed faces of the hub, for the purpose described.

2. The combination, substantially as hereinbefore set forth, of the rotary hub E, fitted to turn upon a vertical pivot and provided with oppositely-arranged toothed faces, the colter-yoke carrying a colter-blade and having toothed portions which engage with the toothed faces of the hub, and one or more bolts, 7, engaging the colter-yoke and extending through one or more curved slots, 9, that are formed through opposite sides of the hub, for the purpose described.

3. The combination, substantially as hereinbefore set forth, of the colter-yoke carrying a colter-blade and having toothed portions, as described, and the rotary head E, fitted to turn about a vertical pivot and having at opposite sides the circular toothed face portions 4, and projecting journals 2, arranged centrally with relation to said circular toothed portions, the colter-yoke being hung upon said journals and held with its teeth in engagement with the teeth of the hub, for the purpose described.

4. The combination, substantially as hereinbefore set forth, of the bracket C, adapted to fit against a plow-beam and having a vertical pivot, 1, rigid therewith and extending from the lower end of its arm 14 to its top portion, 13, the hub E, fitted to turn about said pivot and provided with oppositely-arranged toothed faces, and the colter-yoke carrying a colter-blade and having toothed portions engaging the toothed faces of the hub, said bracket being directly attached to a plow-beam, for the purpose described.

5. The colter-yoke having the inner opposing faces of its two sides or division formed to diverge from their upper toward their lower edges, substantially as and for the purpose described.

401,338. PROCESS OF MAKING BATTERY-ZINCS. HIRAM G. FARR, Boston, Mass. Filed Apr. 27, 1888. Serial No. 272,063. (No specimens.)

Claim.—That improvement in the art of constructing battery-zincs which consists in melting zinc, adding tin and mercury to the molten mass, casting or shaping the same in molds, submitting the blanks thus cast or formed to heat until a portion of the mercury exudes or appears on the surface, and then submitting said blanks while hot to the action of a weak acid solution, substantially as described.

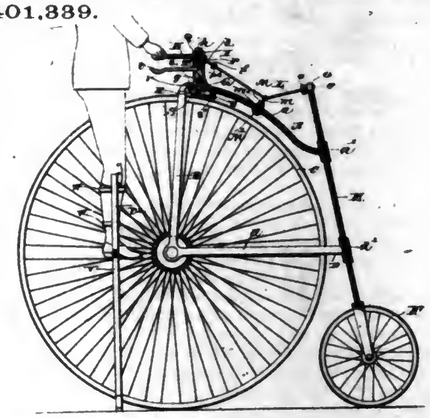
401,339. BICYCLE. RICHARD H. FLETCHER, Socorro, N. Mex. Filed Nov. 26, 1888. Serial No. 292,106. (No model.)

Claim.—1. In a bicycle, the combination, with the frame having the main wheel mounted therein, of the steering-rod mounted on the frame, and provided at its lower end with a steering-wheel and at its upper end with a cross-bar, the steering-handles attached to a revolving head, and the steering-lines connecting the handle with the corresponding arms of the said cross-bar, substantially as specified.

2. In a bicycle, the combination, with the frame having the backbone a, bifurcated at its rear end to form the forks B B and terminating at its front end in a sleeve, and the brace-rod terminating at its front end in a sleeve, and having the extremities of its bifurcated rear end fixed to the lower ends of the forks, and the main wheel mounted between the said forks, of the steering-rod mounted in the said sleeves and having a steering-wheel mounted on its lower end, and the handles connected to a revoluble head and connected to the said steering-rod, substantially as specified.

3. In a bicycle, the combination, with the frame A, having the main wheel mounted thereon, and the steering-rod provided at its lower end with a steering-wheel and having a cross-bar, *c*, at its upper

401,339.



end, of the handles K K, secured to a revoluble head, the guide-bar secured to the frame of the bicycle between the head and the cross-bar *c*, and the steering-lines connected at their front and rear ends, respectively, to the cross-bar and the handles, and passing at intermediate points through guide-eyes on the extremities of the said guide-bar, substantially as specified.

4. In a bicycle, the combination, with the frame provided with a backbone, *a*, the main wheel mounted on the said frame, and the steering-rod mounted on the frame and provided with a steering-wheel and a cross-bar, *c*, of the clip G, adjustably mounted on the backbone and provided with a vertical spindle, the head mounted on the said spindle, and the handles K K, attached to the head and connected to the arms of the cross-bar *c* by the steering-lines L N, substantially as and for the purpose specified.

5. In a bicycle, the combination, with the frame having a backbone, *a*, the main wheel mounted in the frame, and the steering-rod mounted on the frame and provided with a steering-wheel and a cross-bar, *c*, of the guide-bar M, provided at its center with a clip, M', adjustably mounted on the backbone and provided at its ends with the guide-eyes *m m*, the handles attached at their adjacent ends to a revoluble head in rear of the said guide-bar, and the steering-lines connecting the handles to the arms of the cross-bar *c*, and passing at intermediate points through the guide-eyes *m m*, substantially as specified.

6. In a bicycle, the combination, with the frame having the main wheel mounted thereon, and the steering-rod provided with a cross-bar, *c*, and having the steering-wheel mounted on its lower end, of the handles K K, connected to a revoluble head which is mounted on the frame, the steering-lines connected at their front ends to the arms of the cross-bar *c*, the loops P P, connected at their rear closed ends to the handles, the transverse bars *p'*, secured to the rear ends of the steering-lines and provided with eyes p^3 p^3, fitting over the free ends of the said loops, and the adjusting-nuts engaging the threaded extremities of the loops, whereby the steering-lines may be tightened, substantially as and for the purpose specified.

7. In a bicycle, the combination, with the frame having the main wheel mounted thereon, and the steering-rod provided with a cross-bar, *c*, and having a steering-wheel on its lower end, of the clips O O on the arms of the cross-bar, the steering-lines engaged at their front ends in the said clips, the handles K K, connected to a revoluble head, the clips Q on the said handles, the loops P, engaged at their rear ends in the clips Q, the transverse bars *p'*, extending through eyes on the rear ends of the steering-lines and provided with eyes p^3 p^3, which fit on the free ends of the loops, and the adjusting-nuts engaging the threaded extremities of the loops and bearing against the eyes p^3, substantially as and for the purpose specified.

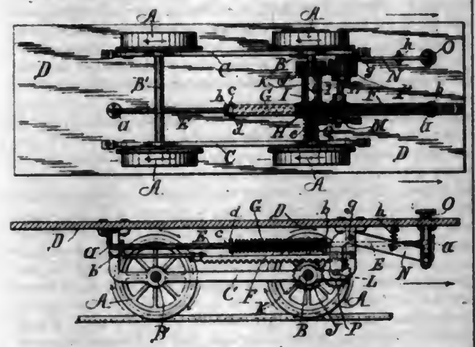
8. In a bicycle, the combination, with the frame having the main wheel mounted thereon, and the steering-rod provided with a steering-wheel, of the handles K K, attached to a revoluble head and connected to the steering-rod, the brake-shoe pivoted at its rear end to the frame of the bicycle and adapted to bear at its free end on the main wheel, and the brake-lever mounted on the revoluble head and provided with a curved loop which engages hooks on the said free end of the shoe, substantially as specified.

9. In a bicycle, the combination, with a frame having forwardly-inclined forks, the main wheel mounted between the lower ends of the forks, and the steering-rod mounted on the front of the frame and provided with a steering-wheel, of the head mounted on the frame in front of the forks, and the handles connected to the steering-rod, substantially as specified.

10. In a bicycle, the combination, with the frame, the main wheel,

and the steering-rod provided with a steering-wheel, of the revoluble head mounted on the frame and provided with handles K K, which are connected to the steering-rod, the bifurcated brake-shoe S, having the rear ends of its arms pivoted to the frame and provided at its free end with the hooks *s' s'*, and the brake-lever having the arms *t t*, pivoted to opposite sides of the revoluble head and terminating at their front ends in the curved loop U, which engages the hooks *s' s'* on the brake-shoe, substantially as and for the purpose specified.

401,340. COMBINED CAR STARTER AND BRAKE. SILAS B. FYLER, East Syracuse, N. Y. Filed Jan. 12, 1889. Serial No. 296,132. (No model.)



Claim.—1. In a combined car starter and brake, a horizontally-disposed rack-bar movably mounted on a carrying-rod attached to the car-bottom and adapted to longitudinal movement thereon, a recoil-spring upon said rod, a pinion loosely mounted on the car-axle and meshing in the rack-face of the rack-bar, a keyed pinion upon the opposite end of the car-axle, said respective pinions having an integral serrated sleeve portion adapted to engage one with the other and forming a ratchet-clutch, a shaft journaled at one end in a bearing upon the car and its opposite end in a movable operating-bar pivoted at its rear portion to the car and at its front end to a vertical manipulating-rod, a pinion keyed to one end of the aforenamed shaft adapted to be thrown into and out of engagement with the keyed pinion on the car-axle, and a pinion keyed to the opposite end of the shaft and adapted to be thrown into and out of engagement with the rack-face of the horizontal rack-bar, all combined and operating together substantially as described, and for the purposes specified.

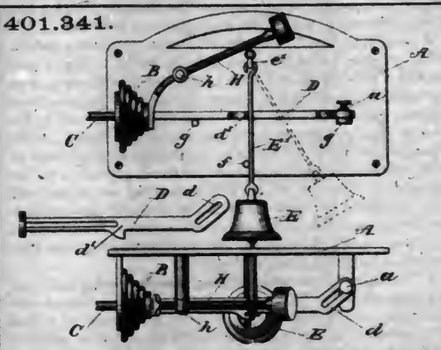
2. In a combined car starter and brake, a horizontal carrying-rod with vertical hangers connected to the car-bottom, a recoil-spring coiled upon said rod part way of its length, a horizontal rack-bar having cogs on its lower face suspended at either end from the carrying-rod by vertical hangers adapted to move longitudinally thereon, carrying the rack-bar forward or rearward longitudinally, a fixed collar on the carrying-rod abutting against the recoil-spring, a loose pinion upon the car-axle adapted to engage with the lower or rack face of the rack-bar, and a keyed pinion at the opposite end of the aforesaid axle, each of said pinions having a sleeve portion serrated at its end, the two combined forming a ratchet-clutch and adapted to be held in engagement one with the other by a coiled spring upon the car-axle bearing against the loose pinion, a supplemental shaft journaled at one end in a stationary hanger and at the other in an angular operating-bar pivotally connected to the car, a keyed pinion upon the supplemental shaft adjacent to the operating-bar, adapted by the movement of said bar to be thrown in and out of engagement with the keyed pinion on the car-axle, and a keyed pinion at the opposite end of said shaft adapted to be thrown in and out of engagement with the under rack-face of the horizontal rack-bar, all combined and operating together substantially as described and shown.

401,341. PNEUMATIC BELL. ROBERT P. GARBER, Norristown, Pa. Filed Dec. 18, 1888. Serial No. 294,020. (No model.)

Claim.—1. The combination, in a pneumatic bell, of the frame A, with a suspended bell, E, having a rod, E', supported by hook *e'*, attached to said frame, bellows B, attached to frame A, and having a pushing-rod, D, with a slant and shoulder on its side adapted to move back and forth with the motions of said bellows, and air-pipe, *c*, leading to said bellows, and the rod E' of said bell adapted to engage and disengage itself from the rod D, whereby a jingling of the bell E takes place, substantially as and for the purposes set forth.

2. The combination, in a pneumatic bell, of the air-conveying pipe *c*, the frame A, with supported bellows B, and a suspended bell with its rod E', and an actuating-arm, D, adapted to move back and forth, attached to said bellows, said arm D having a projection, *d'*, on

401,341.

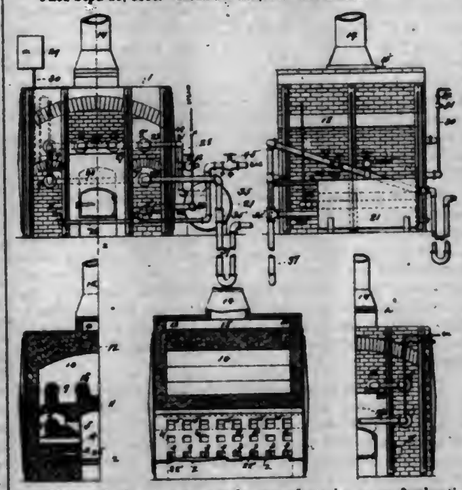


its side, with a slant and shoulder adapted by the movement of said arm to engage and disengage the bell-rod E', and the collapsing-lever H, pivoted to the frame A by the pivot *h*, and having a weight on one end and at the other adapted to engage the bellows B to collapse the same, substantially as and for the purposes set forth.

3. The combination, in a pneumatic bell, of the air-conveying pipe *c*, the frame A, with the suspended bell E, and a supported bellows, B, carrying an actuating-arm, D, with a projecting part adapted by the movement of said arm to engage and disengage the rod E' of said bell, said arm also having a diagonal slot, *d*, to give lateral motion to it when engaging pin *a*, the pin *a*, supported by the stud *g*, and passing through said slot, and the stud *g*, supported on said frame A, substantially as and for the purposes set forth.

4. The combination, in a pneumatic bell, of the air-conveying pipe *c*, a frame carrying a suspended bell, E, and bellows B therefor, which is provided with an actuating-arm, D, said arm formed with a projection, *d'*, on its side with a slant and shoulder, and an inclined end, *d*, to give lateral motion to it when engaging the pin *a*, said pin *a* and the studs *f* and *g* each secured to the frame, and the collapsing-lever H, pivoted intermediate of its length on the stud *h*, the outer long arm being weighted and the inner and shorter arm engaging the actuating-rod D to collapse the bellows and restore the parts to their normal position, substantially as set forth.

401,342. APPARATUS FOR THE MANUFACTURE OF GAS. CHARLES M. GEARING, Pittsburg, Pa., assignor to Thomas Liggett, Charles M. Clarke, Robert S. Fraser, and Alex. M. Neeper, all of same place. Filed Sept. 25, 1888. Serial No. 286,337. (No model.)



Claim.—1. In an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, a furnace combined with a series of retorts having suitable connections, one or more of the series being used as superheaters, the others as gas-generators, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheating and first gas-generating retort, and a condenser connected between said injector and first superheating-retort for the purpose of injecting air through said retorts, extracting the steam therefrom by means of said condenser before the same reaches said first superheat-

ing-retort to bring the same to a proper condition to combine with said hydrocarbon and form a gas, substantially as described.

2. In an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, a furnace combined with a series of retorts having suitable connections, one or more of the series being used as superheaters, the others as gas-generators, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheater and the first gas-generating retort, a condenser connected between said injector and the first superheating-retort, and a washer connected to the last gas-generating retort for the purpose of injecting air through said retorts, extracting the steam therefrom by means of said condenser before the same reaches the first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon and form and purify a gas, substantially as described.

3. In an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, a furnace combined with a series of retorts having suitable connections, all packed with fragments of a heat-conducting non-fusible refractory material, one or more of said series being used as superheaters, the others as gas-generating retorts, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheating and the first gas-generating retort, and a condenser connected between said injector and the said first superheating-retort for the purpose of injecting air through said retorts, extracting the steam therefrom by means of said condenser before the same reaches said first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon and form a gas, substantially as described.

4. In an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, a furnace combined with a series of retorts having suitable connections, all packed with fragments of a heat-conducting non-fusible refractory material, one or more of said series being used as superheating, the others as gas-generating retorts, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheating and the first gas-generating retort, a condenser connected between said injector and the first superheating-retort, and a washer connected to the last gas-generating retort for the purpose of injecting air through said retorts, extracting the steam therefrom before the same reaches said first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon to form and purify a gas, substantially as described.

5. A furnace in an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, having an arched fire-box, an arched chamber containing a retort on both sides thereof, each of said chambers connecting thereto by two series of ports at different levels, the ports of the upper series being inclined upward on the bottom and having in their arches two series of ports diverging from each other and from a vertical line, and a third chamber the floor of which is formed of the arches of the fire-box and said chambers on both sides thereof, the roof thereof being formed of an arch sprung across the top of the furnace and having ports at its front and rear ends connecting with a flue extending longitudinally on top of the same, having a damper for the purpose of preventing the flames and heat from playing directly upon the retorts contained therein and evenly distributing the same, substantially as described.

6. In an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, a combined condenser and washer having a water-vessel provided with an inlet, an outlet provided with a water seal, a gas-inlet with opening below the water-level and a gas-outlet above the same, a condensing-coil fixed therein below the water-level and having an inlet for air and steam and an outlet provided with a water seal, through which is drained condensation from the condensing-coil, and a connection to conduct the moist air therefrom, substantially as and for the purposes described.

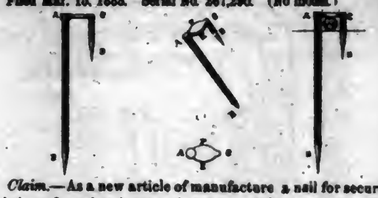
7. A furnace in an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, having an arched fire-box, an arched chamber containing a retort on both sides thereof, each of said chambers connecting thereto by two series of ports at different levels, the ports of the upper series being inclined upward on the bottom and having in their arches two series of ports diverging from each other and from a vertical line, a third chamber the floor of which is formed of the arches of the fire-box and said chambers on both sides thereof, the roof thereof being formed of an arch sprung across the top of the furnace and having ports at its front and rear ends connecting with a flue extending longitudinally on top of the same, having a damper for the purpose of preventing the flames and heat from playing directly upon the retorts contained therein and evenly distributing the same, combined with a series of retorts having suitable connections, one or more of the series being used as superheaters, the others as gas-generators, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheater and the first gas-generating retort, a condenser connected between said injector and the first superheating-retort, and a washer connected to the last gas-generating retort for the purpose of injecting air through said retorts, extracting the steam therefrom by means of said condenser before the same reaches said first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon and form a gas, substantially as described.

8. A furnace in an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, having an arched fire-box, an arched chamber containing a retort on both sides thereof, each of said chambers connecting thereto by two series of ports at different levels, the ports of the upper series being inclined upward on the bottom and having in their arches two series of ports diverging from each other and from a vertical line, a third chamber the floor of which is formed of the arches of the fire-box and said chambers on both sides thereof, the roof thereof being formed of an arch sprung across the top of the furnace and having ports at its front and rear ends connecting with a flue extending longitudinally on top of the same, having a damper for the purpose of preventing the flames and heat from playing directly upon the retorts contained therein and evenly distributing the same, combined with a series of retorts having suitable connections, one or more of the series being used as superheaters, the others as gas-generators, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheating and first gas-generating retort, and a condenser connected between said injector and first superheating-retort for the purpose of injecting air through said retorts, extracting the steam therefrom by means of said condenser before the same reaches said first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon and form a gas, substantially as described.

9. A furnace in an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, having an arched fire-box, an arched chamber containing a retort on both sides thereof, each of said chambers connecting thereto by two series of ports at different levels, the ports of the upper series being inclined upward on the bottom and having in their arches two series of ports diverging from each other and from a vertical line, a third chamber the floor of which is formed of the arches of the fire-box and said chambers on both sides thereof, the roof thereof being formed of an arch sprung across the top of the furnace and having ports at its front and rear ends connecting with a flue extending longitudinally on top of the same, having a damper for the purpose of preventing the flames and heat from playing directly upon the retorts contained therein and evenly distributing the same, combined with a series of retorts having suitable connections, all packed with fragments of a heat-conducting non-fusible refractory material, one or more of said series being used as superheaters, the others as gas-generators, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheating and first gas-generating retort, and a condenser connected between said injector and the said first superheating-retort for the purpose of injecting air through said retorts, extracting the steam therefrom by means of said condenser before the same reaches said first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon and form a gas, substantially as described.

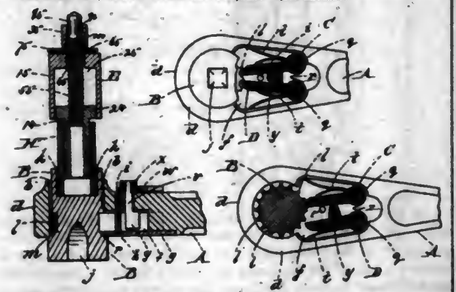
10. A furnace in an apparatus for manufacturing gases for heating and illuminating purposes from a liquid hydrocarbon and air, having an arched fire-box, an arched chamber containing a retort on both sides thereof, each of said chambers connecting thereto by two series of ports at different levels, the ports of the upper series being inclined upward on the bottom and having in their arches two series of ports diverging from each other and from a vertical line, a third chamber the floor of which is formed of the arches of the fire-box and said chambers on both sides thereof, the roof thereof being formed of an arch sprung across the top of the furnace and having ports at its front and rear ends connecting with a flue extending longitudinally on top of the same, having a damper for the purpose of preventing the flames and heat from playing directly upon the retorts contained therein and evenly distributing the same, combined with a series of retorts having suitable connections, all packed with fragments of a heat-conducting non-fusible refractory material, one or more of said series being used as superheating, the other as gas-generating, retorts, an injector operated by steam, an elevated receptacle for said hydrocarbon having a pipe connecting between the last superheating and the first gas-generating retort, a condenser connected between said injector and the first superheating-retort, and a washer connected to the last gas-generating retort for the purpose of injecting air through said retorts, extracting the steam therefrom before the same reaches said first superheating-retort to bring the same to a proper condition to combine with said hydrocarbon to form and purify a gas, substantially as described.

401,843. ELECTRIC-WIRE NAIL. CHARLES A. GILDEMEYER, Haddonfield, N. J., assignor of one-half to Madison Rush, Philadelphia, Pa. Filed Mar. 15, 1888. Serial No. 267,290. (No model.)



Claim.—As a new article of manufacture a nail for securing wire, consisting of a pointed rod, a shorter parallel pointed rod, a thin flattened connecting-bar broader than the pointed rods arranged with the plane of its surface substantially at right angles to said rods, and a nail-head substantially in line with the longer rod.

401,844. RATCHET-DRILL. HUMPHREY M. GLENN, Boston, Mass. Filed Nov. 30, 1888. Serial No. 292,225. (No model.)



Claim.—1. In a drill-ratchet, the combination of a body, a corrugated ratchet-block fitted to rotate therein and provided with a socket, two spring-actuated pawls loosely disposed in said body in engagement with said ratchet, a cam-rod for alternately disengaging said pawls, a feed mechanism, and a pipe adapted to enter said socket and receive said feed mechanism, substantially as described.

2. In a drill-ratchet, the combination of a handle provided with a ratchet-block socket, a chamber opening therein, a corrugated ratchet-block fitted to revolve in said socket, two pawls disposed in said chamber, springs for holding said pawls in engagement with the corrugations of said block, a socket in said block, a pipe adapted to enter said socket and receive a feed mechanism, and a plate for closing said chamber, the forward end of said plate projecting into a groove in the ratchet-block, substantially as and for the purpose set forth.

3. In a drill-ratchet, the feed mechanism E, comprising the cylinder 15, screw-bolt 55, bearing 85, and nut 14, in combination with the pipe H, ratchet-block B, provided with the socket *k*, and adjunctive mechanism for actuating said block, substantially as set forth.

4. In a drill-ratchet, the feed mechanism E, comprising the cylinder 15, provided with the cap 35, the screw-bolt 55, secured in said cap, the bearing 85, provided with cone-shaped ends and fitted to rotate in said cap and the head of said bolt, the pipe H, and the nut 14, all being combined and arranged to operate substantially as described.

5. In a drill-ratchet, the feed mechanism E, in combination with pipe H, the ratchet-block B, having the socket *k* for receiving the nut 14 of said feed, and adjunctive mechanism for actuating said ratchet, substantially as described.

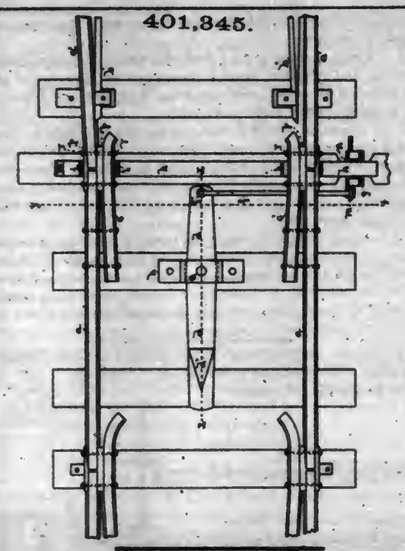
6. In a drill-ratchet, the feed mechanism E, provided with the nut 14, having the head 24, in combination with the pipe H, adapted to receive the body of said nut and engage the head thereof, the ratchet-block B, provided with the socket *k* for receiving said pipe, and adjunctive mechanism for actuating said ratchet, substantially as set forth.

401,845. RAILROAD-SWITCH. EDWIN GORDON, Hyde Park, Mass. Filed July 2, 1888. Serial No. 278,330. (No model.)

Claim.—The lever *d*, pivot *e*, rod *f*, pin *f'*, pivot *m*, link *g*, pin *o*, bar *h*, and bar *m'*, in combination with the continuous rails *a a'*, fixed point-rails *b b'*, guard-rails *c c*, blocks *p p*, and bolts *r r*, substantially as and for the purpose above described.



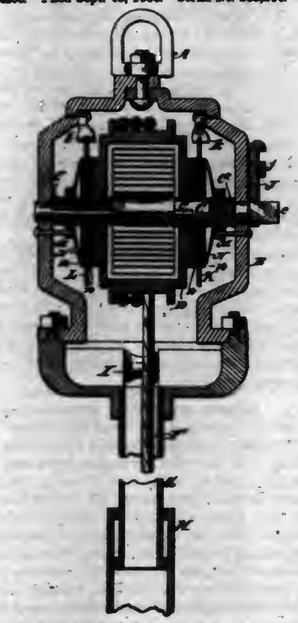
401,845.



401,846. METHOD OF FINISHING RAILROAD-SPIKES. HOWARD GREER, Lake View, Ill. Filed Jan. 17, 1889. Serial No. 296,690. (No model.)

Claim.—The method of finishing spikes, which consists in grinding the point on one or both sides, heating it by the grinding operation, and tempering or hardening the point so heated, and at the same heat, by subjecting it to the action of a suitable tempering or hardening fluid or liquid, substantially as described.

401,847. EXTENSION-FIXTURE FOR LAMPS, &c. LEWIS F. GRISWOLD, Meriden, Conn., assignor to The Charles Parker Company, same place. Filed Sept. 13, 1888. Serial No. 285,296. (No model.)



Claim.—1. In a suspension device, the combination of a spring which counterbalances the suspended article midway between its highest and lowest elevation, a drum turned by said spring, and two friction brakes or stops, one resisting upward motion and the other resisting downward motion, substantially as set forth.

2. The combination of a shaft, a drum movable endwise thereon, friction-brakes on each side of it, with which it is brought in contact alternatively by such endwise motion in either direction, a suspend-

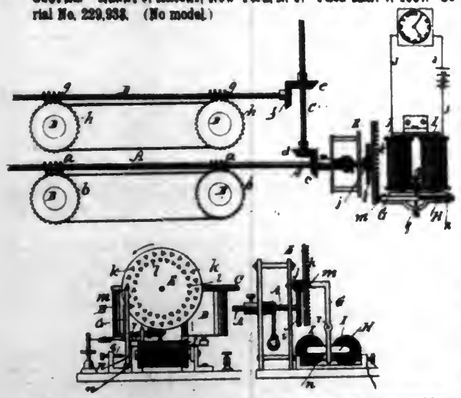
ing-cord wound on said drum, and a spring actuating the latter, substantially as set forth.

3. A spring-actuated drum, a shaft with which it has screw-thread connection, and frictional devices alternatively on each side of said drum arranged for contact with said drum, in whichever direction the latter is moved, substantially as set forth.

4. In combination with a shaft having screw-threads, a spring-actuated drum movably mounted thereon and having screw-threads to engage therewith, brake-disks arranged on each side of said drum and having peripheral teeth facing in opposite directions, pawls engaging said teeth, and springs forcing said brake-disks toward said drum, substantially as set forth.

5. In combination with a shaft and spring-drum movable endwise thereon, a suspension-cord winding on said drum, a pair of friction brakes arranged to resist, respectively, upward motion only and downward motion only, and the locking-key J, arranged to make contact with one of the faces of the prismatic end of said shaft, or to free the same at will, substantially as set forth.

401,348. ATTACHMENT FOR ELECTRO-MAGNETIC THERMOSCOPES. HENRY J. HAIGHT, New York, N. Y. Filed Mar. 7, 1887. Serial No. 229,938. (No model.)

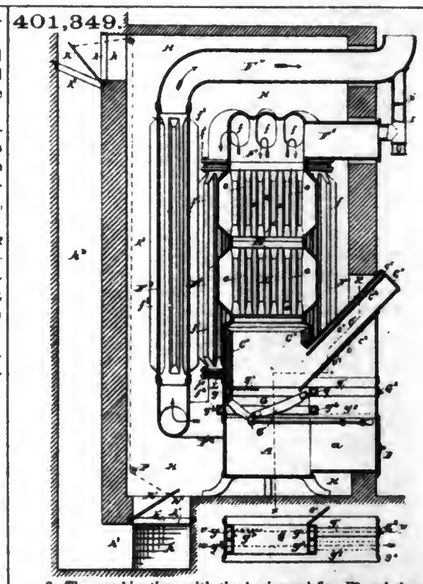


Claim.—1. In an electro-magnetic thermoscope, the combination of a mechanically-turned driving-shaft, tablet-rollers actuated directly by the said driving-shaft, an escapement-wheel geared to the driving-shaft, an escapement or pallet lever controlled by an electro-magnet, a clock, and a clock-time-transmitting circuit, including the coil of the said electro-magnet, for the purpose herein specified.

2. The combination of a mechanically-turned driving-shaft, an escapement-wheel geared to the driving-shaft, an escapement or pallet lever controlled by an electro-magnet, a clock, a clock-time-transmitting circuit, including the coil of the said electro-magnet, an additional shaft or shafts turned by the driving-shaft, and one or more sets of tablet-rollers driven by the said additional shaft or shafts, for the purpose herein specified.

3. The combination of a mechanically-turned driving-shaft, tablet-rollers actuated by the said shaft, an escapement-wheel geared to the driving-shaft and provided with two concentric rows of alternately-arranged triangular escapement-teeth, and a vibrating escapement or pallet lever having a triangular pallet projection engaging with the said escapement-teeth and actuated by an electro-magnet in the circuit of an electro-magnetic clock-time transmitter, substantially as and for the purpose herein set forth.

401,349. HEATING APPARATUS. HERMANN HEIM, Ober-Döbling, near Vienna, Austria-Hungary. Filed Aug. 14, 1886. Serial No. 210,899. (No model.) Patented in Germany June 26, 1886, No. 41,674; in France July 1, 1886, No. 177,131; in Belgium July 1, 1886, No. 73,684; in England July 1, 1886, No. 8,643; in Italy Sept. 30, 1886, XX, 20,168, XL, 33, and in Austria-Hungary Jan. 24, 1887, No. 25,668 and No. 66,239.



Claim.—1. In a heater, a grate-section having air-flues formed in its walls at points above and below the grate, respectively, the flue above the grate having a multiplicity of air-ports to divide the body of air admitted above the grate, and a single air-delivery port for the flue below the grate, whereby the air passing through said flue is delivered in a body below said grate, substantially as and for the purpose specified.

2. In a heater, a grate-section having air-flues formed in its walls at points above and below the grate and completely encompassing said grate, the upper flue being unobstructed and provided with perforations extending along the back and partly along the sides of the flue, the lower flue being obstructed by a partition at a point where said flue returns upon itself and provided at that point with an outlet leading under the grate, substantially as and for the purposes specified.

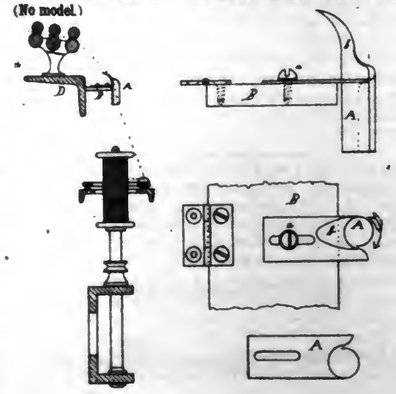
3. The combination, with the horizontal flue F^2 and the vertical flues F' F^3, connected therewith, said flue F^2 having a horizontal extension, F^4, of the furnace-section F, provided with branch flues *f*, to which the flues F' are connected, and with a flue, F^5, connected with the flue F^4, said branches and connection between flues F^4 F^5 constituting the supports for the system of pipes F' F^2 F^3 F^4, substantially as and for the purposes specified.

4. The combination, with the section F, of the furnace provided with branches *f* and draft-flue F^6, of the diving-flues F', the horizontal flue F^2, the draft-flue F^6 F^4, connected together and suspended from said branches *f* of section F, as described, and the valved flue I, connecting the flues F^5 F^6 and serving to support the free end of said flue F, substantially as and for the purposes specified.

5. The combination, with the branches *f* of the furnace-section F, the branches f^2 of the flue F^5, and the flue F^4, provided with bolt-flanges and stepped seats f^4 f^5, respectively, projecting from said flanges, of the flues F' and F^6, similarly provided with bolt-flanges and stepped seats, the upper flue-seats fitting onto the corresponding seats of the branches *f* and flue F^4, and the lower seats of said flues F' F^6 fitting into the corresponding seats of the branches f^3 of flue F^6, substantially as and for the purposes specified.

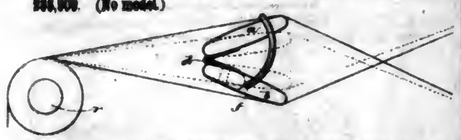
6. The combination of the following elements: the furnace, the hot-air chamber H, the cold-air flue *h'*, in communication with said chamber through a valved passage, $h^\times$, in the floor thereof, the vertical flue h^3, in communication with said cold-air flue and with the hot-air chamber through the valved passage $h^\times$ and through a passage, *h*, near the roof of said chamber, and the valve K, arranged to close either the vertical flue or said passage *h*, substantially as and for the purposes specified.

401,350. GUIDE-TUBE FOR SPINNING-FRAMES, &c. SAMUEL HENDERSON, Millville, N. J. Filed Dec. 17, 1888. Serial No. 293,906. (No model.)



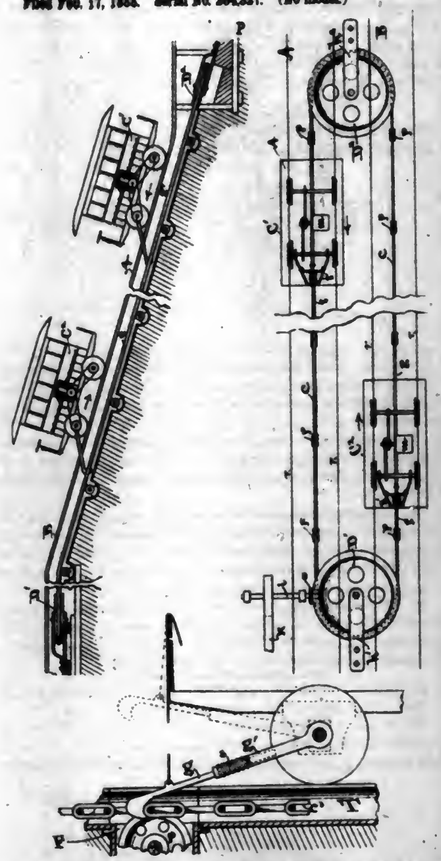
Claim.—In a yarn-guide for spinning or twisting machines, the combination, with the guide-board B, of a yarn-guide consisting of a tube, A, having a lip, *b*, and a lap-opening, as shown and described.

401,351. LEASE-ROD FOR LOOMS. CHARLES H. HOBBS and TIMOTHY P. WHELAN, Slatersville, R. I. Filed Oct. 23, 1888. Serial No. 288,909. (No model.)



Claim.—The two bars hinged together at their edges to form a lease-rod and a spring to normally separate the said bars to act upon the warp-threads, substantially as described.

401,352. STREET-RAILWAY. LEWIS M. HOBBS, Cincinnati, Ohio. Filed Feb. 17, 1888. Serial No. 264,337. (No model.)



Claim.—1. In a tram or rail way system, in combination with cars or motors provided with independent means of propulsion, an endless normally-idle cable carried in a surface-slotted conduit or conduits in or parallel with the trackway, fixed carrying-pulleys arranged in the terminal bights of the cable, and means for temporarily connecting the cars or motors to said cable through the surface slot of the conduit, substantially as set forth.

2. In a tram or rail way system, in combination with cars or motors provided with independent means of propulsion, an endless normally-idle cable carried over a gradient or other section of said railway in a surface-slotted conduit or conduits in or parallel with the trackways, fixed pulleys arranged at the terminus of such railway-section in the bights of the cable, and means for connecting cars or motors to such cable through the surface slot of the conduit while passing over said section of the railway, substantially as set forth.

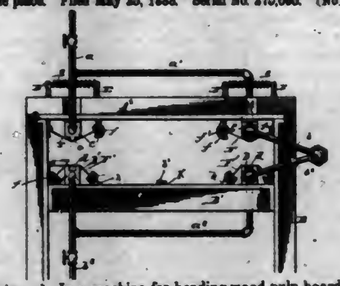
3. In a tram or rail way, in combination with cars or motors provided with independent means of propulsion, an endless normally-idle cable arranged upon a section of the railway and carried around fixed carrying-pulleys at the termini of such section, a surface-slotted conduit inclosing the cable between said pulleys, power-connections for the temporary application of power to one or both of said terminal carrying-pulleys to drive the cable, and means carried by the cars or motors to connect with said cable temporarily while passing over said section, substantially as set forth.

4. In a double-track tram or rail way system operating cars provided with independent means of propulsion in opposite directions over said tracks, the combination, with such cars so provided, of an idler-cable carried in opposite directions in surface-slotted conduits in or parallel with the trackways, respectively, and means for connecting said cars with said cable through the slot, whereby the cars moving in one direction may impart motion through the medium of said cable to cars moving in the opposite direction, substantially as set forth.

5. In a tram or rail way system, the combination, with the trackway, of a cable-conduit having a surface slot, a cable having engaging-stops thereon carried in said conduit, cars or motors provided with independent means of propulsion traveling said railway, and adjustable engaging devices carried by said cars for connecting to or disconnecting from said cable at will to give power thereto or receive power therefrom, substantially as set forth.

6. In a street-railway, in combination with a section of double trackway upon which cars move in opposite directions, a surface-slotted cable-conduit arranged at or parallel with the trackway, a horizontal carrying-pulley at each terminus of such trackway-section, and an endless normally-idle cable passed around said pulleys and through said conduits in opposite directions, and means carried upon the cars for temporarily attaching to said cable at either track upon reaching said section of trackway and while passing the same, and for disconnecting from the same upon reaching the terminus of said section, substantially as set forth.

401,353. WOOD-PULP-BOARD-BENDING MACHINE. CHARLES B. JAMMON, Mansfield, Ohio, assignor to the Bodine Roofing Company, same place. Filed May 25, 1888. Serial No. 275,095. (No model.)



Claim.—1. In a machine for bending wood-pulp board, the combination, with the dies, of the interposed flexible sheets and yielding holders therefor on opposite sides of dies for keeping the sheets under tension, substantially as described.

2. The combination of fixed and movable hollow dies, interposed flexible sheets between which the material operated upon is pressed into the dies, and yielding holders for said sheets for keeping them under tension, substantially as described.

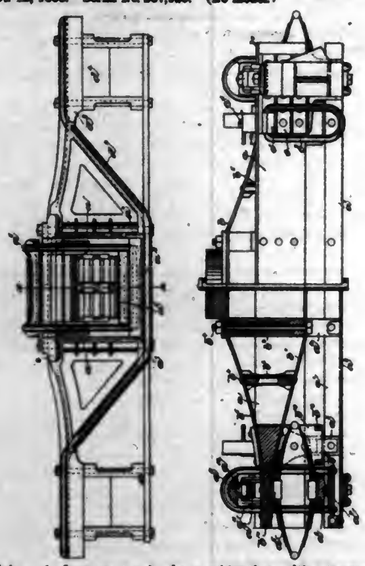
3. The combination of the fixed and movable hollow dies, the flexible sheets held under tension between said dies, yielding holders for said sheets, and means, substantially as described, for maintaining the tension on said flexible sheets during the operation of bending the material operated upon.

4. The combination of the fixed and movable dies C C' and D D', the steam-pipes *a* and *a'*, supplying and connecting the fixed dies, the flexible pipe connecting the fixed and movable dies for supplying steam to the latter, the pipe a^3, connecting the movable dies, and the exhaust b^3, all substantially as and for the purpose described.

5. The combination, with the fixed hollow dies, of the movable hollow dies, the steam-pipes connecting said fixed and movable dies and permitting their relative movement toward and away from each other, the frame or support for the movable dies, and the toggle-links connected in pairs to opposite sides of said support for upholding and moving it, those upon the same side being connected to move together, substantially as described.

6. In a machine for molding pulp board, the combination, with the movable frame or table supporting the movable dies, of the parallel hollow dies on said frame, and the toggle-links for upholding and moving said frame, connected in pairs to opposite sides thereof, those upon the same side being connected to move together and all connected to a common shaft or motor for simultaneous movement, substantially as described.

401,354. CAR-TRUCK. LUTHER K. JEWETT, Boston, Mass. Filed Oct. 12, 1888. Serial No. 287,925. (No model.)



Claim.—1. In a car-truck, the combination, with a transom, of a metallic bolster composed of top and bottom separated by posts or studs, the said top being concaved or curved downward on opposite sides of the bolster center to prevent upward buckling of the bolster under excessive loads, substantially as described.

2. In a car-truck, the combination, with a metallic transom having independent sides *a*, of arch-bar-sustaining blocks having each an arm, *c*, secured to the said sides to leave free space between the said arms and the bottom of the transom, substantially as and for the purpose specified.

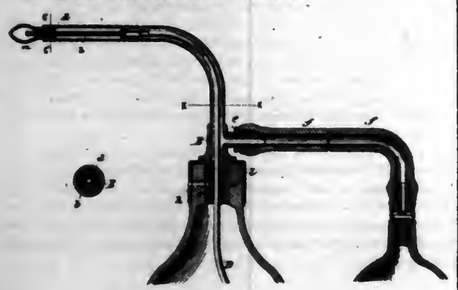
3. In a car-truck, the combination, with a metallic transom having independent sides *a*, of arch-bar-sustaining blocks having each an arm, *c*, and provided with a lug, *c'*, to support a link, as c^3, and a lock to secure said link on said lug, substantially as described.

4. In a car-truck, a metallic transom and a metallic bolster adapted to swing in said transom, and composed of a top plate, *b*, and bottom plate, *b'*, combined with castings b^{10}, inserted between the said plates at their opposite ends and secured thereto and provided with chafe-irons, forming an integral part of the said castings, substantially as and for the purpose specified.

5. In a car-truck, a metallic transom and a bolster vertically movable in said transom, arch-bar-sustaining blocks secured to said transom and provided with projections or ribs, combined with clips having ribs or projections to co-operate with the ribs or projections on the arch-bar-sustaining blocks, substantially as and for the purpose specified.

6. In a car-truck, a metallic transom and a metallic bolster adapted to swing in said transom, and composed of a top plate, *b*, and bottom plate, *b'*, combined with castings b^{10}, inserted between the said plates at their opposite ends, and secured thereto and provided with chafe-irons, forming an integral part of the said castings, and tie-bars to join the chafe-irons of the said castings, substantially as described.

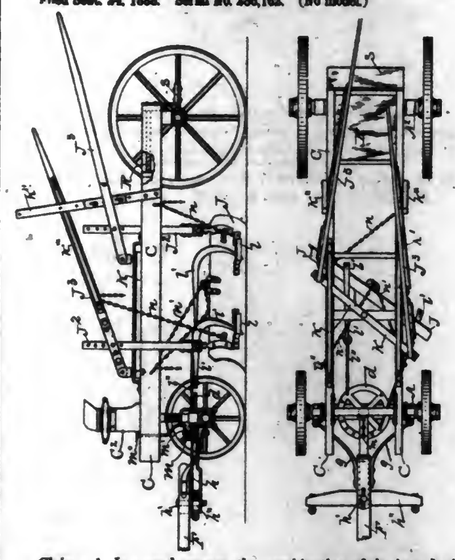
401,355. ATOMIZER. GEORGE KNEUPER, New York, N. Y. Filed Feb. 2, 1889. Serial No. 298,502. (No model.)



Claim.—1. The liquid-vessel A and its air-tube B, provided with the opening *g*, said opening being adapted to be closed and unclosed, in combination with the pipe *f* and bulb E, substantially as described.

2. The liquid-vessel A, having a flexible neck, *j*, combined with a rigid cap, *l*, around and overlapping said neck, and with the tube B, that enters said neck, substantially as described.

401,356. ROAD-SCRAPER. HENRY C. LAFKHARTHEA, Star, Iowa. Filed Sept. 24, 1888. Serial No. 286,162. (No model.)



Claim.—1. In a road-scraper, the combination of the bars A, pin *K'*, doubletree *K''*, a pole having a slot, a circular plate, *d*, and a bolt, *d'*, with the front axle and bolster of a four-wheeled carriage, for the purpose stated.

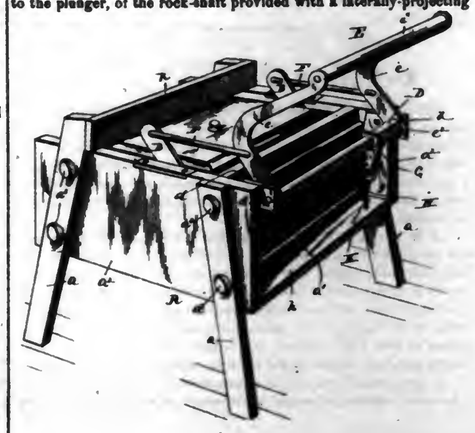
2. A road-scraper having drag-bars at its opposite ends adjustably connected with a circular perforated plate pivoted to the center of the axle of a carriage, to operate in the manner set forth, for the purposes stated.

3. A scraper having loops *l* on its back, drag-bars having rear ends adapted to enter said loops and to fit against the back of the scraper, and a circular plate pivoted to the axle of a carriage and adjustably connected with the drag-bars by means of links, to operate in the manner set forth, for the purposes stated.

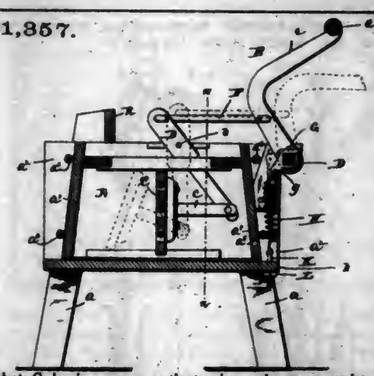
4. The combination of the perforated plate *d*, pivoted to the carriage-axle, the perforated bars *k*, fixed to the same axle, and the locking device composed of the pin *m*, lever *m'*, and treadle *m''*, substantially as shown and described, for the purposes stated.

401,357. WASHING-MACHINE. JOHN O. LEFFINGWELL, Nevada, Iowa. Filed Aug. 4, 1888. Serial No. 281,995. (No model.)

Claim.—In a washing-machine, the combination, with the tub, the plunger arranged therein, and the operating-levers B B, connected to the plunger, of the rock-shaft provided with a laterally-projecting

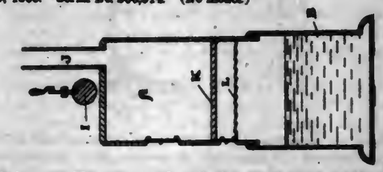


401,357.



bracket, G, having an eye, *g*, the tension-spring connected to the said bracket, for the purpose specified, and the hand-lever comprising the curved or angle arms *e e*, connected, respectively, to the levers B B, and provided with squared eyes e^4, fitting on the squared portion of the rock-shaft, and the hand-bar connected to the free ends of the hand-levers, substantially as specified.

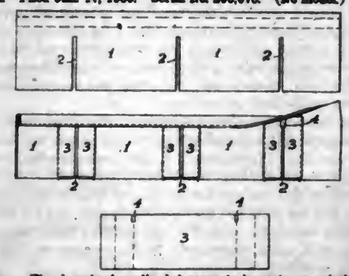
401,358. SAFETY SELF-EXTINGUISHING CAR-HEATING STOVE. WILLIAM J. LOCKE and ISAAC THAYER, San Francisco, Cal. Filed Sept. 25, 1888. Serial No. 286,314. (No model.)



Claim.—1. The car-stove described, consisting, essentially, of the water-chamber, the fire-chamber arranged above the same and adapted to move therein and having the pivoted lattice-work beneath the fire-grate, the guide-frame C, secured to the water-tank and looped over the fire-chamber, the springs encircling the guide-frame and secured at one end to the fire-chamber and at the other end to the water-chamber, the bracket-arm, and the weighted connection having a ball-and-socket joint for connecting the fire-chamber with the bracket, substantially as specified.

2. In a car-stove, the combination of the water-chamber, the fire-chamber arranged above the same and adapted to move therein, the guide-frame C, secured to the water-chamber, the springs encircling the guide-frame and secured at one end to the fire-chamber and at the other end to the water-chamber, the bracket-arm, and the weighted connection having a ball-and-socket joint for connecting the fire-chamber with the bracket, substantially as specified.

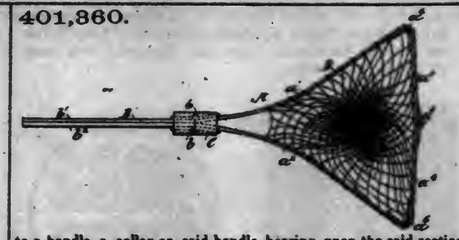
401,359. BUTTON-HOLE STRIP. HENRY W. LYON, Bridgeport, Conn. Filed Jan. 17, 1889. Serial No. 296,670. (No model.)



Claim.—The herein-described button-hole strip, consisting of a body-strip having cut therein button-holes, one end of the latter intersecting the inner edge of said strip, in combination with the edge-binders having notches in one side abutting against the closed ends of the button-holes, the ends of said binders being doubled and secured to said strip, and the outer edge of the latter being folded down across the closed ends of the button-holes and then secured to the strip, substantially as set forth.

401,360. FISHERMAN'S NET. JAMES P. MARSTERS, Brooklyn N. Y. Filed Sept. 15, 1888. Serial No. 285,483. (No model.)

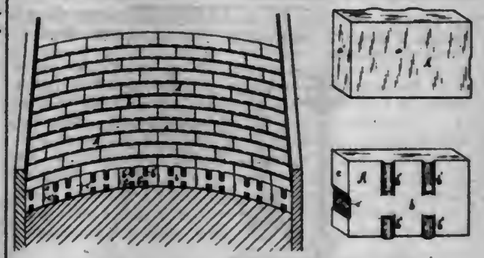
Claim.—1. A net-frame having resilient diverging sections hinged



to a handle, a collar on said handle bearing upon the said sections, and two flexible sections hinged to the outer ends of the diverging sections and hinged together at their inner ends, substantially as specified.

2. The combination, with the handle and the resilient diverging arms hinged thereto, of the slide adapted to vary the resilience of the diverging sections, and the two flexible sections hinged to the outer ends of the diverging sections and hinged together at their inner ends, the said sections being deflected outwardly, substantially as specified.

401,361. PAVING-BLOCK. WILLIAM MCREYNOLDS and JOHN W. MCREYNOLDS, Cleveland, Ohio. Filed Feb. 9, 1889. Serial No. 299,322. (No specimens.)



Claim.—1. In a pavement, the combination of two paving-blocks laid on their longitudinal edges, each of said blocks having one plane longitudinal face and provided on its opposite longitudinal face with two projections located in different vertical planes, said projections of less vertical length than the vertical height of the face on which they are located, the longitudinal plane face of one block and the longitudinal face that is provided with projections of the adjacent block located in proximity to each other, whereby an interstice is formed between adjacent faces of the two blocks, a portion of said interstice being located in the same vertical plane with each of said projections, substantially as set forth.

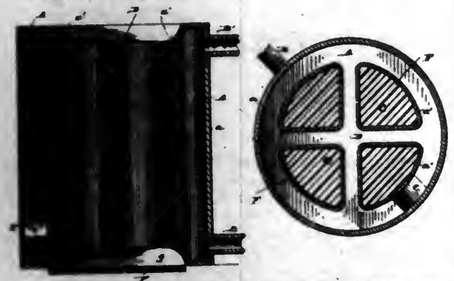
2. In a pavement, the combination of two paving-blocks laid on their longitudinal edges, each of said blocks having one plane face and provided on its opposite longitudinal face with two lugs located transversely to the length of the face from which they project, said lugs located in different vertical planes, said projections of less vertical length than the vertical height of the face on which they are located, the longitudinal plane face of one block and the longitudinal face that is provided with projections of the adjacent block located in proximity to each other, whereby an interstice is formed between adjacent faces of the two blocks, a portion of said interstice being located in the same vertical plane with each of said projections, substantially as set forth.

3. In a pavement, the combination of two paving-blocks laid on their longitudinal edges, each of said blocks having one plane face and provided on its opposite longitudinal face with two lugs located in different vertical planes, said projections of less vertical height than the vertical height of the face on which they are located, said block further provided on one of its end faces with a transverse recess extending across said end, the longitudinal plane face of one block and the longitudinal face that is provided with projections of the adjacent block located in proximity to each other, whereby an interstice is formed between adjacent faces of the two blocks, a portion of said interstice being located in the same vertical plane with each of said projections, substantially as set forth.

4. A paving-block provided on its longitudinal face with transverse lugs located near the opposite edges of said face and having a smooth face portion formed intermediate of them, said lugs of segmental form in cross-section, said block further provided on one of its end faces with a transverse recess extending across said end, the greater part of the body of said recess located below the transverse center of said block, substantially as set forth.

401,862. HOT-WATER HEATER.

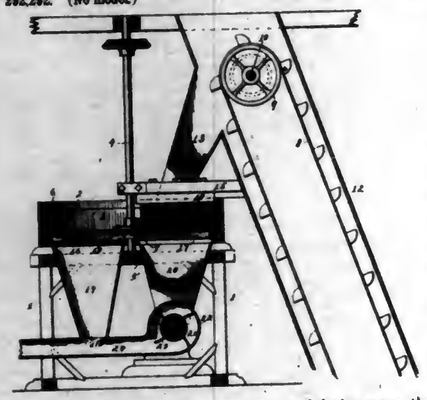
EDWIN MEDDEN and JOHN URQUHART, Sr., Seneca Falls, N. Y., assignors of one-half to Frank Walter and Charles R. Wessell, both of same place. Filed Apr. 5, 1888. Serial No. 269,743. (No model.)



Claim.—In a hot-water heater, the combination, with an exterior continuous water-compartment provided with inlet and outlet pipes, of interior diametrical water-compartments connected therewith and provided with concave or contracted lower ends, for the purpose described, said exterior and interior compartments forming complete fire-chambers, as and for the purpose set forth, and a grate disposed under the heater, substantially as described.

401,863. MACHINE FOR GRANULATING AND DRYING SUGAR.

LOUIS A. MOREL, Jr., Jeanerette, La. Filed Nov. 30, 1888. Serial No. 292,292. (No model.)



Claim.—1. In a machine for granulating and drying sugar, the combination of a horizontal fixed receptacle having an opening in its bottom, a rotary sieve operating in said receptacle, a fixed brush arranged above and in contact with the sieve, a sweep intermediate the sieve and bottom of the receptacle and fixed to the sieve-carrying shaft, and an air-blower arranged immediately below said receptacle to receive and dry the sugar after it leaves the sieve, substantially as and for the purpose described.

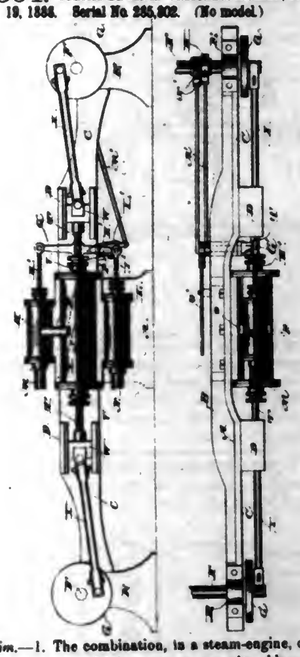
2. In a machine for granulating and drying sugar, the combination of a receptacle having an opening in its bottom, a rotary sieve, an air-blower below said receptacle, a conduit communicating with the blower, and a chute intermediate the receptacle and conduit for discharging the sugar in the conduit in the path of the blast or current generated by the blower, substantially as described.

3. In a machine for granulating and drying sugar, the combination of a receptacle having an opening in its bottom, a rotary sieve operating in said receptacle, a stationary brush arranged in contact with the sieve, a sweep fixed to and rotating with the sieve to force the sugar between the sieve and bottom of the receptacle into the opening in the latter, an air-blower beneath the receptacle, a conduit communicating with said blower, and a chute intermediate the receptacle and conduit, substantially as described.

4. In a machine for granulating and drying sugar, the combination of the following elements, to wit: a stationary receptacle having the openings in its bottom and a valve-plate for closing one of said openings, a rotary sieve carried by a shaft, the stiff brush fixed above the sieve, an elevator having an inclined discharge-chute terminating immediately above the sieve, a rotary blower, a conduit communicating with said blower, and the chutes depending from the receptacle, one of said chutes communicating with the blower-shell and the other with the conduit, all arranged and adapted for service substantially as described.

401,864. STEAM-ENGINE.

MATTHIAS MULLER, Trenton, Ill. Filed Sept. 19, 1888. Serial No. 285,802. (No model.)



Claim.—1. The combination, in a steam-engine, of the cylinder having the exhaust and inlet ports on opposite sides communicating with its center and with its end, the steam-chest on one side of the cylinder, the exhaust-steam chamber on the opposite side thereof, the cut-off valve in the steam-chest, adapted to alternately register with the end and center steam-ports, the exhaust-valve in the exhaust-chamber, adapted to alternately register with the end and center exhaust-ports, and the lever Y, having its ends connected to the said valves, and means, substantially as specified, to operate the said lever, whereby the valves will be moved simultaneously in opposite directions, substantially as described.

2. The combination, in an engine, of the cylinder having the end and center steam and exhaust ports on opposite sides, the steam-chest on one side of the cylinder, the exhaust-steam chamber on the opposite side thereof, the cut-off and exhaust valves, the lever Y, having its ends connected to the said valves in the steam and exhaust chambers, respectively, and provided with the pin or stud K', the slotted link fulcrumed on said pin or stud, and the eccentric-rods connected to opposite ends of the said link, substantially as described.

3. In a steam-engine, the cylinder having the steam and exhaust ports or channels, each communicating with its center and ends, the steam and exhaust chambers, the cut-off and exhaust valves therein, respectively, the pistons in the cylinder having the piston-rods extending through opposite ends thereof, the independent crank-shafts, the pitman connecting the latter to the pistons, and connections, substantially as described, between the crank-shafts and the cut-off and exhaust valves, substantially as set forth.

4. In a steam-engine, the combination of the cylinder having the inlet steam-ports O P, communicating with its center and ends, respectively, and the exhaust-ports R S, also communicating, respectively, with its center and ends, the pistons in the cylinder, the steam-chest, the cut-off valve therein, having the port B', adapted to register alternately with the ports O P, the exhaust-chamber, and the exhaust-valve therein, having the ports E' F', adapted to register alternately with the ports R and S, respectively, for the purpose set forth, substantially as described.

401,865. ARTIFICIAL FUEL.

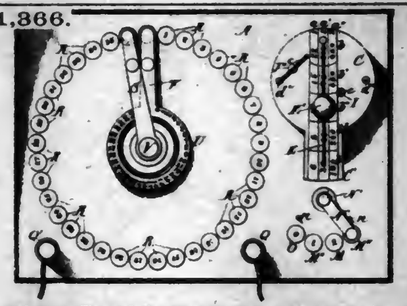
ALEXANDER K. MURRAY and CLARA M. MURRAY, Bradford, Pa. Filed Mar. 6, 1888. Serial No. 266,872. (No specimens.)

Claim.—In a fuel compound, the combination of crude petroleum, hay, straw, (or the specified equivalents,) and a hardening-mixture—such as water-lime or plaster-of-paris and water—with an illuminating coloring-matter, in the proportions substantially as set forth.

401,866. THERAPEUTIC ATTACHMENT FOR GALVANIC BATTERIES.

CHAUNCEY V. CHOCKE, Chicago, Ill., assignor to the McIntosh Battery and Optical Company, same place. Filed May 17, 1886. Serial No. 202,463. (No model.)

401,866.



Claim.—1. The rod E, adjustable weight E', verge-shaft *e*, and verge *f*, in combination with the verge-wheel F and a motive power for driving such wheel, strips *k k' k''*, pins *l*, strip *l'*, and pin *l''*, for making and breaking the contact at regular intervals, substantially as specified.

2. The rod E, adjustable weight E', verge-shaft *e*, and verge *f*, in combination with the verge-wheel F, pins *l*, strips *k*, and wire L, for making and breaking the circuit of the wire L, substantially as and for the purpose specified.

3. The rod E, adjustable weight E', verge-shaft *e*, and verge *f*, in combination with the verge-wheel F, strip *l'*, strip *k'*, and wire L', for making and breaking the circuit of the wire L', substantially as and for the purpose specified.

4. The rod E, adjustable weight E', verge-shaft *e*, and verge *f*, in combination with the verge-wheel F, pin *l''*, strip *k''*, and wire L'', for making and breaking the circuit of the wire L'', substantially as and for the purpose specified.

5. The rod E, adjustable weight E', verge-shaft *e*, verge *f*, and verge-wheel F, in combination with the support K, wires L L' L'', strips *k k' k''*, pins *l*, strip *l'*, and pin *l''*, for making and breaking the circuits of the wires, substantially as and for the purpose specified.

6. The rod E, adjustable weight E', shaft *e*, verge *f*, and verge-wheel F, in combination with the support K, wires L L' L'', strips *k k' k''*, pins *l*, strip *l'*, pin *l''*, buttons *m m' m''*, and switch-lever N, for selecting the wire and making and breaking the circuit thereof, substantially as and for the purpose specified.

7. The combination, with a weighted rod and a rock-shaft, of a graduated scale, circuit-wires, and a switch-lever for throwing into circuit any one of several contact-springs having different rates of rupture, substantially as specified.

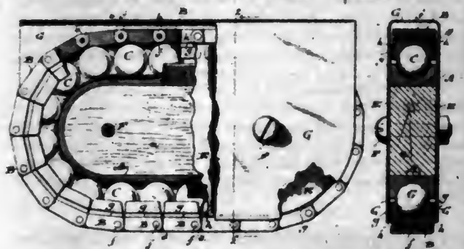
8. The combination, with a rheotome, of a weighted vibratory rod, E, having an adjustable weight, E', and a scale over which said rod and weight vibrate, said scale indicating the several variations in the make and break of the circuit selected in accordance with the adjustment of the weight, substantially as described.

9. The rod E, adjustable weight E', shaft *e*, verge *f*, verge-wheel F, and a motive power therefor, support K, wires L L' L'', strips *k k' k''*, pins *l*, strip *l'*, and pin *l''*, in combination with the buttons M M' M'', switch-lever N, and a graduated scale coacting with the weight of the vibrating rod for selecting and indicating the circuit and denoting upon said scale the breaks thereof with relation to the adjustable weight E', substantially as specified.

10. A series of buttons arranged in a circle, in combination with the levers S T and indicator U, mounted upon the central pivot carrying said levers S and T, for selecting and determining the cells in use, substantially as specified.

401,867. VEHICLE-RUNNER.

CHARLES L. PIERCE, Milwaukee, Wis. Filed Aug. 3, 1888. Serial No. 281,853. (No model.)



Claim.—The combination of a central stationary bearing, a moving track or runner consisting of a series of sliding blocks surrounding said bearing, and a series of loose independent balls or rolls confined between the central bearing and the moving track.

401,868. LIFTING-JACK.

WILLIAM M. PIPER, Allegheny, Pa. Filed July 24, 1888. Serial No. 280,574. (No model.)



Claim.—1. The combination, with a bottom piece and vertically-movable top piece, the distance between said pieces being greatest at their central point and decreasing toward their ends, of interposed wedges and a screw-shaft having right and left threads which engage the said wedges, substantially as and for the purposes described.

2. The combination, with a bottom piece and a vertically-movable top piece, the distance between said pieces decreasing from the central point toward the ends, of interposed wedges and a screw-shaft having right and left threads which engage the said wedges, said bottom piece having inclined sunken ways in which said wedges travel, substantially as and for the purposes described.

3. The combination, with a bottom piece and a vertically-movable top piece, of interposed wedges, a screw-shaft having right and left threads which engage the said wedges, and said top piece having vertical guide-flanges which fit against the bottom piece, substantially as and for the purposes described.

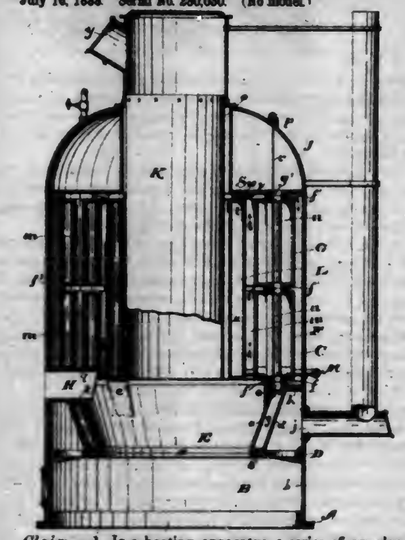
4. The combination, with a bottom piece and a vertically-movable top piece, of interposed wedges, a screw-shaft having right and left threads which engage the said wedges, and said top piece having vertical guide-flanges which fit against the bottom piece, and which are provided with vertical elongated slots through which the screw shaft passes, substantially as and for the purposes described.

5. The combination, with a bottom piece and a vertically-movable top piece, of interposed wedges, a screw-shaft having right and left threads which engage the said wedges, and projections on the said wedges which fit in inclined guides on the top piece, whereby the motion of the wedges is caused to impart a simultaneous vertical and lateral motion to the top piece, substantially as and for the purposes described.

6. The combination, with a bottom piece and a vertically-movable top piece, of interposed wedges and a screw-shaft having right and left threads which engage the said wedges, said top piece having vertical guide-flanges fitting in corresponding guide-recesses in the bottom piece, substantially as and for the purposes described.

401,869. BOILER.

EMANUEL W. POORMAN, Canton, Ohio. Filed July 16, 1888. Serial No. 280,080. (No model.)



Claim.—1. In a heating apparatus, a series of annular hollow water-sections placed one upon another, spaced apart and having a series of communicating apertures, a cylinder, L, and a passage for the water between the said annular water-sections and the cylinder L, substantially as set forth.

2. In a heating apparatus, a series of annular tubular water-sec-

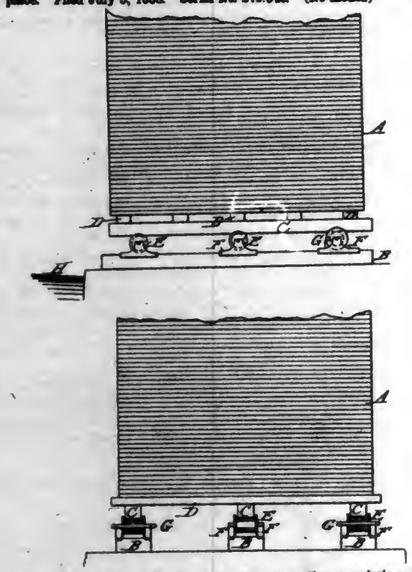
tions placed one upon another and spaced apart by spacing-necks formed about a series of communicating apertures, and a bottom section, as E, having outwardly and upwardly inclined walls *c d*, a flange, *h*, and a series of perforations forming a communication between the tube *g* and the inner portion of the adjacent section, substantially as described, and for the purpose set forth.

3. The combination, in a heating apparatus, of the tubular conical fire-box E, a series of annular tubular sections placed in vertical order and spaced apart to form flues between said sections, a series of vertical corresponding flues centrally located in said sections, a dome supported by and having apertures communicating with said sections, and a depending hollow cylinder communicating with said dome, substantially as described, and for the purpose set forth.

4. The combination, in a heating apparatus, of the tubular section E, having the outwardly and upwardly inclined walls *c d*, sections F and G, dome J, depending cylinder L, and fuel-magazine K, substantially as described, and for the purpose set forth.

401,370. DEVICE FOR LAUNCHING LUMBER-PILES.

HARRISON ROSE, Muskegon, Mich., assignor of one-half to Edwin Rich, same place. Filed July 5, 1883. Serial No. 279,040. (No model.)



Claim.—1. A device for launching lumber-piles, consisting of a series of inclined rollers adapted to support the lumber-pile, and means, consisting of a bar, for locking and unlocking certain of these rollers, so that the lumber-pile may be caused to move when desired, substantially as described.

2. In a device for launching lumber-piles, the inclined bed, the series of rollers located thereon, certain of which are grooved and held by a locking-bar so as not to rotate, and a lumber-supporting frame arranged upon the rollers, substantially as described.

3. In a device for launching lumber-piles, the combination of the beams B B B, each carrying a series of rollers, E E E, journaled in brackets F F F, the beams C C, carried by the rollers, and the transverse beams D D, located on the beams C, substantially as described.

4. In a device for launching lumber-piles, the combination of the beams B, carrying rollers E, journaled in brackets F, the rearmost roller adapted to be locked against rotation by the bar G, the timbers C C, and the transverse timbers D D, substantially as described.

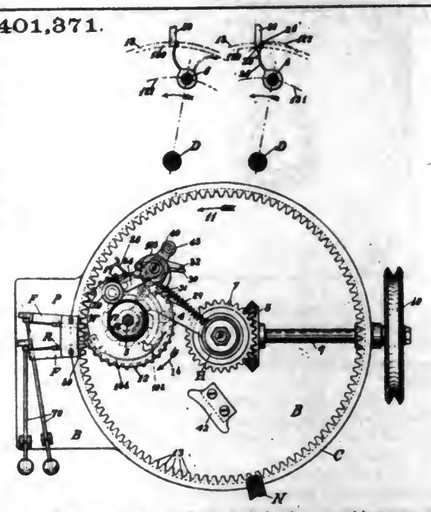
401,371. MECHANICAL MOVEMENT.

FRANCIS H. RICHARDS, Springfield, Mass., assignor to Darien W. Dodson, Wilkes-Barré, Pa. Filed Nov. 15, 1886. Renewed May 2, 1888. Serial No. 273,531. (No model.)

Claim.—1. The combination of a frictionally-mounted wheel having an orbital movement, a detent apparatus carried with said wheel and acting to restrain the axial rotation thereof, said apparatus having a starting-arm, substantially as described, and a latch adapted to be interposed in the path of said arm to unset said apparatus and thereby allow the starting of said wheel, all substantially as described.

2. The combination of a revolving shaft having an orbital movement, a wheel frictionally mounted on said shaft and having thereon a stop, a stop-arm carried by said wheel and acting against the stop thereof to restrain the axial rotation thereof, and mechanism operating to unset and reset said arm, all substantially as described.

401,371.



3. The combination, with a shaft having an orbital movement and having a starting-arm, of a latch adapted to be interposed in the path of said arm, said latch being normally held back in a state of tension, and constructed and arranged to have, on being released, a free and instantaneous movement in said path, all substantially as described.

4. The combination of a shaft having an orbital movement and having thereon the starting-arm, and a latch having a movement crosswise to said orbital movement and adapted to be interposed in the path of and to engage with said arm, the arm being constructed to push back the latch, and the latch to turn the arm and shaft, substantially as described.

5. The combination of the reciprocating latch 50, having thereon the spring-catch operating to hold back said latch, and a tripping-rod operating in connection with an incline to unhook said catch, all arranged and operating substantially as shown and described.

6. The combination of the reciprocating latch, a spring-catch for holding back said latch, and vertically-movable tripping-rod operating in connection with an incline to unhook said catch, the upper end of said rod having a movement in crosswise directions, all substantially as and for the purpose described.

7. The combination of a reciprocating latch having a longitudinal and a lateral movement, and a tripping-rod also having a longitudinal and a lateral movement, the longitudinal movement of the one being crosswise to the longitudinal movement of the other, substantially as and for the purpose described.

8. The combination, with the frame, as F, having a bearing for a reciprocating latch, incline 66, and notch 58, of a reciprocating latch having spring 56 and hook 57, and tripping-rod 60, all operating substantially as described.

9. The combination, in a mechanical movement of the class described, of a shaft having an orbital motion about an axis, and having thereon a starting-arm and a resetting-arm, a latch mechanism acting on said arm to turn said shaft in one direction, and a resetting-cam acting on said resetting-arm to afterward turn said shaft in the reverse direction during said orbital motion, substantially as described.

10. The combination, with a shaft having an orbital movement and adapted to have a turning movement about its own axis during its orbital movement, of a starting-arm fixed on said shaft and having the two points 26′ and 26″, and a latch interposable in the path of the first point and taking its bearing in a concavity between the two points, substantially as and for the purpose described

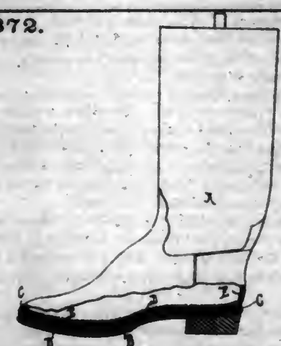
11. The combination, with a revolving shaft having the notched flange 15, of wheel W, frictionally mounted thereon and carrying a hooked lever, and a detent apparatus operating to restrain the rotary movement of said wheel and having cam 105, said apparatus and cam being operated to release the wheel and to permit the engagement of the hook with said flange, all substantially as and for the purpose described.

401,372. PROTECTIVE SOLE FOR RUBBER FOOT-WEAR.

TIMOTHY REGAN, New York, assignor of one-half to William V. Ross, Brooklyn, N. Y. Filed May 11, 1888. Serial No. 273,545. (No model.)

Claim.—As an improved article of manufacture, a rubber boot having a sole comprising a superposed layer of felt, an interposed sheet of metal, and an under layer composed of two sheets of rubber,

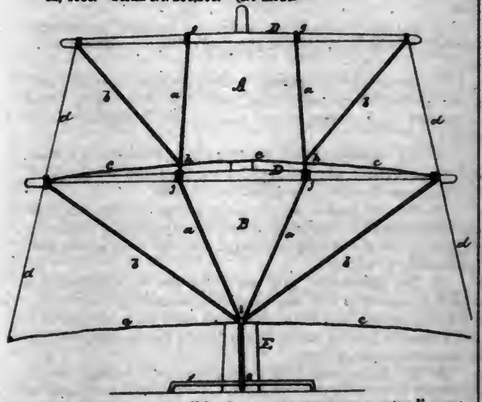
401,372.



the upper layer being soft and the lower hard, substantially as described.

401,373. SHIP'S SAIL.

JOHN ROBERTS, Boston, Mass. Filed Jan. 12, 1888. Serial No. 296,209. (No model.)

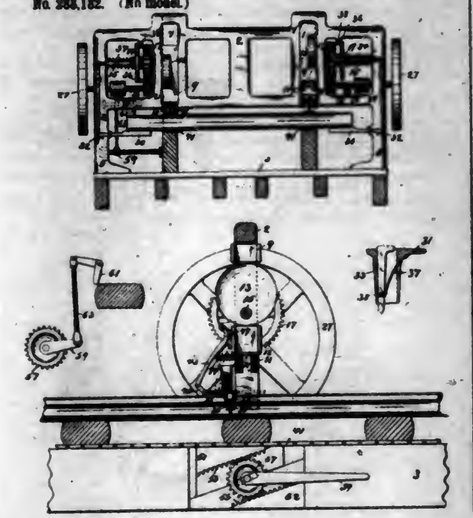


Claim.—1. A ship's sail having one or more ropes extending vertically midway across the same, secured to the sail and to the yards or gaff and boom, substantially as described.

2. A ship's sail having one or more ropes extending vertically midway across the same, secured to said sail and to the yards or gaff and boom, and a rope also secured to the sail extending from the top outer corner of the sail to the foot of the vertical rope, substantially as described.

401,374. RAIL-SPIKING MACHINE.

SOLOMON W. ROBERTS and EDWARD P. CALDWELL, Minneapolis, Minn. Filed Oct. 15, 1883. Serial No. 288,182. (No model.)



Claim.—1. The combination, in a machine of the class described, with the sliding plate 31, provided with the spike-holders 33, of the reciprocating plunger 9, provided with the drivers 11, adapted to enter said spike-holders and push the spikes through said holders, substantially as described.

2. The combination, in a machine of the class described, with the sliding plate 31, of the depending spike-holders 33, secured upon said plate and adapted to receive spikes from a suitable receptacle, the springs 35 and 37, arranged upon the inner side of the said spike-holders, the reciprocating plunger 9, provided with the drivers 11, adapted to enter said spike-holders, and the driving-shaft 15, provided with the eccentric 13, engaging said plunger, whereby said shaft is rotated and said plunger is raised and lowered, all substantially as described.

3. The combination, in a machine of the class described, with the reciprocating plunger 9, provided with the spike-drivers 11, of the driving-shaft 15, provided with the eccentric 13, engaging said plunger, the clutch mechanism upon said shaft, and the releasing-treadle 30, adapted to be engaged by a moving tie releasing said clutch mechanism when the tie passes beneath the plunger, for the purpose specified.

4. The combination, in a machine of the class described, with the reciprocating plunger 9, of the laterally-adjustable spike-drivers 11, secured upon the bottom of said plunger and adapted to be moved from or toward each other, substantially as described.

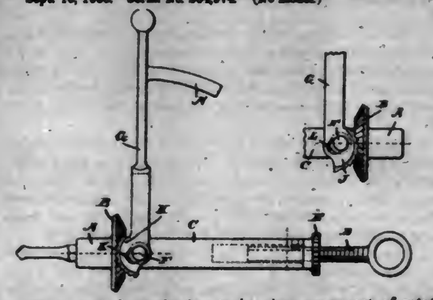
5. The combination, in a machine of the class described, with the sliding plate 31, provided with the spike-holders, of the vertically-reciprocating plunger provided with the spike-drivers 11, and the inclined support 51, arranged beneath said plunger, substantially as described.

6. The combination, in a machine of the class described, with the sliding plate 31, provided with the spike-holders 33, of the vertically-reciprocating plunger 9, provided with the spike-drivers 11, the block 52, provided with the inclined upper surface, the block 51, provided with the inclined lower surface resting upon said block 52, and means for moving said block 51 upon said block 52, for the purpose specified.

7. The combination, in a machine of the class described, with the sliding plate 31, provided with the spike-holders 33, of the vertically-reciprocating plunger 9, provided with the spike-drivers 11, the block 52, provided with the inclined upper surface, the block 51, provided with the inclined lower surface resting upon said block 52, the rack-bars 53 and 55, upon said blocks, a pinion, 57, engaging said rack-bar, the bell-cranked lever 61, adapted to be engaged by a moving tie, the lever 59, connected with said pinion, and the rod 63, connecting said bell-crank lever with said lever 59, all substantially as described.

401,375. RATCHET-DRILL.

WINFIELD S. ROGERS and WILLIS C. JOURS, Cincinnati, Ohio, assignors to P. G. March, same place. Filed Sept. 10, 1888. Serial No. 284,974. (No model.)



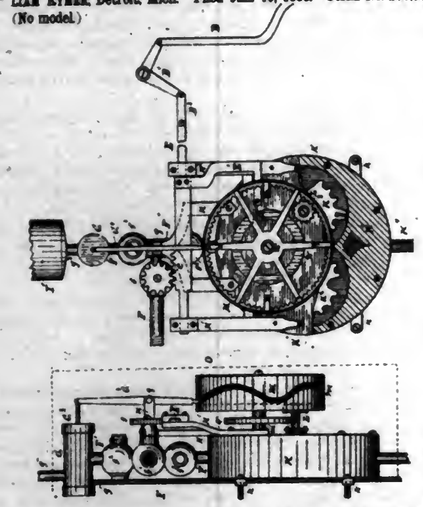
Claim.—1. In mechanism to be given movement of rotation through the medium of an oscillating lever, the combination, substantially as set forth, of a rotatory disk having a bevel-face provided with ratchet-form teeth, a pair of trunnions or pivots arranged with their axes in the plane of and at right angles to the axis of rotation of said disk, a bifurcated lever fitted to oscillate on said pivots and engage the same by diagonally-slotted pivot-bearings, and segments at the pivot portions of said lever provided with ratchet-form teeth adapted to engage the teeth of said disk upon opposite sides of its axis.

2. In a ratchet-drill, the combination, substantially as set forth, of stock C, provided with trunnions F, drill-socket A, journaled axially in the front end thereof, bevel-disk B upon the drill-socket and provided upon its bevel-face with ratchet-form teeth, bifurcated hand-lever G, engaging said trunnions by slot-bearings K and L, and segments H and J upon said hand-lever and provided with ratchet-form teeth adapted to engage the teeth of disk B.

3. In a ratchet-drill, the combination, substantially as set forth, of a stock, a drill-socket journaled axially therein, a hand-lever connected with said stock by a pivot of oscillation having its axis at right

angles to the axis of said stock, means for transmitting motion from said hand-lever to said drill-socket, a pawl projecting from said hand-lever in the direction of its motion of oscillation, and feed mechanism connected with said stock and provided with a feed-ratchet arranged with its axis coincident with the axis of the stock and in position to have its teeth engaged by said pawl.

401,376. AUTOMATIC RAILWAY-ALARM APPARATUS. WILLIAM RYNER, Detroit, Mich. Filed Jan. 10, 1888. Serial No. 260,335. (No model.)



Claim.—1. The combination, with a whistle and a piston-cylinder in connection with the whistle, of a piston within the cylinder to control the blast in pipes leading from a common power-supply to the piston-cylinder and to the whistle, whereby the piston is actuated by the same power that blows the whistle, the valve in the supply-pipe, and a reciprocating bar connected with the valve for operating it and having an irregular intermittent movement, substantially as set forth.

2. The combination, with a whistle and a piston-cylinder in connection with the whistle, of a piston within the cylinder to control the blast of the whistle, a rotary mechanism in connection with the piston to determine the length of the blast, and an actuating medium common to both rotary mechanism and whistle, substantially as set forth.

3. The combination, with a whistle and a piston-cylinder in connection therewith provided with an inlet-opening, of a piston within the cylinder to control the blast, a rotary mechanism for operating the piston, and a valve to admit the whistle-actuating medium to the cylinder and to the piston-actuating mechanism, substantially as set forth.

4. The combination, with a whistle and a piston-cylinder in connection therewith provided with an inlet-opening, of a piston within the cylinder to control the blast, a rotary mechanism to operate the piston, a valve to control the admission of the whistle-actuating medium to both the cylinder and the rotary mechanism, and means for operating the valve intermittently, substantially as set forth.

5. The combination, with a whistle, of a piston-cylinder, an inlet-pipe, and connecting-pipe F, said inlet-pipe provided with a controlling-valve and said connecting-pipe with a regulating-valve, the piston-cylinder and the whistle being each connected with a common power-supply, substantially as described.

6. In combination, a piston-cylinder, a piston, a rotary mechanism to operate the piston, a pipe connecting the piston-cylinder and rotary mechanism, a supply-pipe in connection with the connecting-pipe, and a valve in the supply-pipe to control the admission of the whistle-actuating medium to both cylinder and rotary mechanism, substantially as set forth.

7. The combination of the piston-cylinder and rotary mechanism united by a connecting-pipe, an inlet-pipe communicating with said connecting-pipe, a controlling-valve located in the inlet-pipe, and valves f^2 f^3, located in the connecting-pipe, substantially as described.

8. The combination of a whistle, a cylinder, a power-conducting supply-pipe connecting said cylinder with the whistle, a piston within the cylinder to control the whistle, and a rotatable cam to control the movements of the piston, substantially as set forth.

9. The combination, with the piston and its cylinder, of a rotatable cam-cylinder to control said piston and a locking device to dog said cam-cylinder, substantially as described.

10. The combination of the whistle, a cylinder in connection therewith, a piston within the cylinder to control the blast, a lever to control the operation of the piston, and rotary mechanism to actuate said lever, substantially as set forth.

11. In combination, a whistle, a cylinder in connection therewith, a piston within the cylinder to control the whistle, a supply-pipe in communication with the whistle, a supply-pipe in communication with the cylinder, the pipes from the whistle and cylinder each leading to a common power-supply, a valve in the supply-pipe, a reciprocating bar to operate the valve, and a fixed tripping device for the purpose of operating the said bar, substantially as set forth.

12. In combination, the whistle, the cylinder in connection therewith, the piston to control the whistle, the inlet-pipe in connection with the cylinder, the valve provided with a pinion, and a reciprocating rack-bar meshing with the pinion to operate the valve, substantially as set forth.

13. In combination, the cylinder, the piston, the inlet-pipe, the controlling-valve, the bar C, to operate the valve, and a fixed tripping device for the purpose of operating said bar, substantially as set forth.

14. In combination, a rotary mechanism, a pipe to admit the actuating medium to the rotary mechanism, a cylinder provided with a cam and driven by the rotary mechanism, a cylinder, and a piston in the cylinder, the said piston driven by the cam, substantially as set forth.

15. In a whistle-actuating mechanism, a rotatable cam-cylinder having in combination therewith a locking device, substantially as set forth.

16. The combination, with the rotary mechanism, of an inlet-pipe, a cam-cylinder driven by said rotary mechanism, and a locking device to regulate the movement of said cam-cylinder, substantially as set forth.

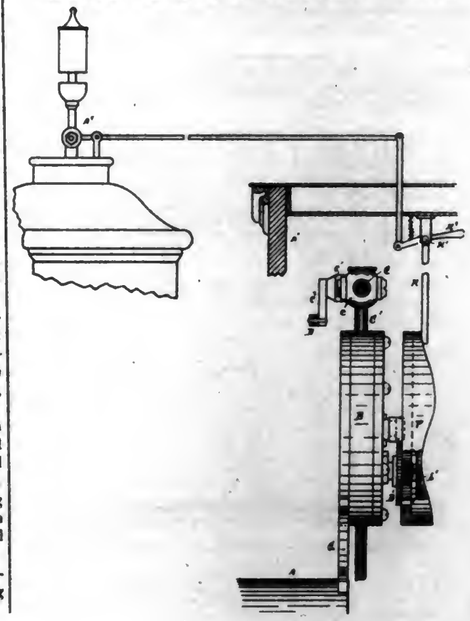
17. The combination, with the piston and its cylinder, of a rotatable cam-cylinder to operate the piston, a locking-disk, and a locking-arm to engage the disk, substantially as set forth.

18. The combination, with the piston and its cylinder, of a rotatable cam-cylinder to operate the piston, a locking-disk, a reciprocating bar, E, and a locking-arm engaged with the reciprocating bar, substantially as set forth.

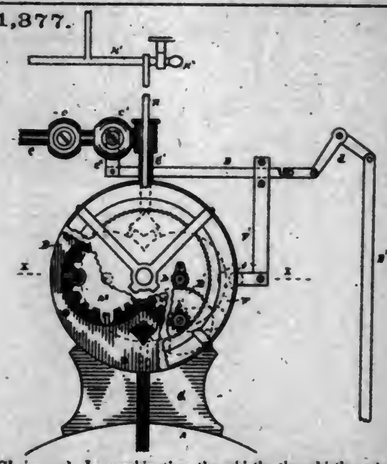
19. The combination, with the piston and its cylinder and a whistle in connection with said cylinder, of the inlet-pipe, controlling-valve, reciprocatory bar E, to operate the valve, reciprocating rod D and a retracting-spring, and stationary means for operating said rod D, substantially as set forth.

20. The combination, with a locomotive, of a movable bar, C, connected with a reciprocatory bar, E, and valve f', located in an inlet-pipe to control the admission of steam to a locomotive-whistle, substantially as described.

401,377. WHISTLE-ACTUATING MECHANISM. WILLIAM RYNER, Detroit, Mich. Filed Oct. 29, 1888. Serial No. 289,375. (No model.)



401,377.



Claim.—1. In combination, the whistle, the whistle-actuating lever, a movable cam to operate the lever, a power-supply pipe to communicate power to drive the cam, said pipe provided with a controlling-valve, and automatic tripping mechanism to throw the said valve, substantially as set forth.

2. In combination, the whistle, the whistle-actuating lever, a movable cam to operate the lever, a power-supply pipe to communicate power to drive the cam, said pipe provided with a controlling-valve, and a reciprocatory tripping-bar to throw said valve, substantially as set forth.

3. In combination, the whistle, the whistle-actuating lever, a movable cam to operate the lever, a power-supply pipe provided with a controlling-valve to communicate power to drive the cam, and tripping mechanism to throw said valve, substantially as set forth.

4. In combination, the whistle, the whistle-actuating lever, a rotary cam, rotary mechanism to actuate the cam, and a power-supply pipe communicating with the rotary mechanism provided with a controlling-valve, substantially as set forth.

5. In combination, the whistle, the whistle-actuating lever, a rotary cam, rotary mechanism to operate said cam, a power-supply pipe communicating with said rotary mechanism, said pipe provided with a controlling-valve, and a reciprocatory bar engaged with said valve, substantially as set forth.

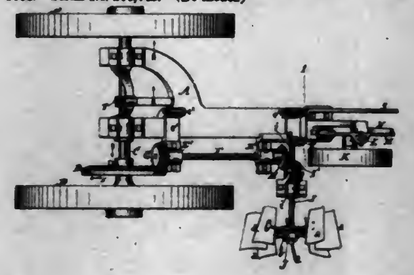
6. In combination, a whistle, an actuating-lever, a rotary mechanism, a cylinder provided with a cam driven by said rotary mechanism to actuate said lever, and an inlet-pipe to admit the power-supply to the rotary mechanism, said pipe provided with a controlling-valve, substantially as set forth.

7. In combination, the whistle, the rotary cam, a lever connecting the whistle with said cam, rotary mechanism to drive said cam, and an inlet-pipe communicating with the rotary mechanism, said pipe provided with a regulating-valve and a controlling-valve, substantially as set forth.

8. In combination, the whistle, the rotary cam, a whistle-actuating lever connecting the whistle with said rotary cam, and a locking device, substantially as set forth.

9. In combination, a rotary mechanism provided with a supply-pipe and controlling-valve, a rotatable cam geared with rotary mechanism, a locking device to hold the cam, a whistle, and a whistle-actuating lever connecting the rotary cam and whistle, substantially as set forth.

401,878. WEEDING-MACHINE. AMBROSE L. SADDLEMYER, Knox, N. Y., assignor of one-half to Alvinus Gray, same place. Filed Mar. 29, 1888. Serial No. 268,743. (No model.)

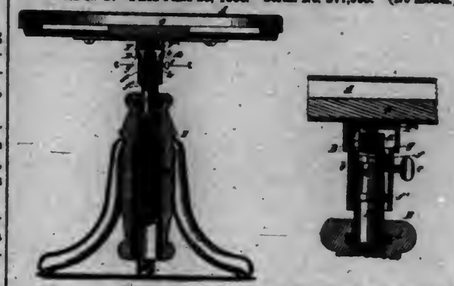


Claim.—1. The combination, with the longitudinal shaft F, inclined forwardly and downwardly and actuated by gears, pinion H, secured to said shaft, shaft I, provided with gear I', set at an angle with shaft F and inclining outwardly and upwardly, of the adjustably-secured hub *b* on shaft I, and the series of blades or cutters *a a*, arranged relatively oblique to the direction of the axis of hub *b*, with their cutting-edges inclined relatively inwardly and toward shaft I, substantially as and for the purposes set forth.

2. The combination, with the gear D, revolved by the drive-wheel, shaft F, provided with pinions G and H, of the shaft I, provided with pinion I', and set at an angle to the inclined shaft F and inclined upwardly and outwardly from the axis of pinion I', and the series of cutters or blades connected with the central hub, *b*, adjustably secured to shaft I and having their cutting-edges made from one side edge to the other inclined in relation to the axis of said shaft, substantially as and for the purposes set forth.

3. The combination, with the frame A, mounted on drive-wheels, and the gear mechanism described, of the hinged brackets having within them the bearings E E', the supplemental bearings *e*, and the shaft of the revolving hoe, substantially as and for the purposes set forth.

401,879. STORE STOOL OR CHAIR. JACOB S. SAMMONS, New York, N. Y. Filed June 23, 1888. Serial No. 277,996. (No model.)

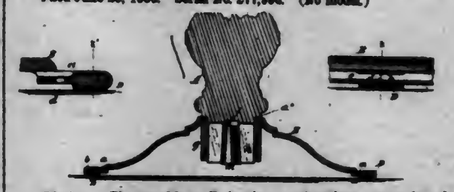


Claim.—1. The screw-rod E, having bearing *d* at its upper end and the notch *h* on its side, combined with the socket *b*, having pin *c*, and with the movable bearing F, spring G, and swivel-seat A, secured to socket *b*, substantially as described.

2. The screw-rod E, having oil-cup D, bearing *d* in said oil-cup, and notch *h*, combined with the socket *b*, pin *c*, movable bearing F, and spring G, within the socket *b*, all arranged substantially as described.

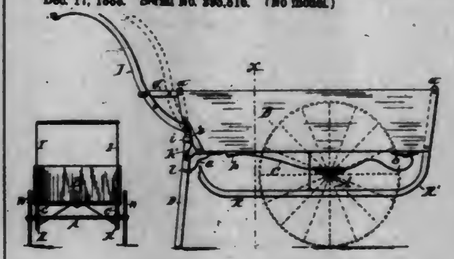
3. The pedestal B, having nut *a* and packing *i*, screw-rod E, bearing *d*, and notch *h* on said rod E, in combination with the seat A, socket *b*, pin *c*, movable bearing F, and spring G, all arranged for operation, substantially as herein shown and described.

401,880. STORE-STOOL. JACOB S. SAMMONS, New York, N. Y. Filed June 23, 1888. Serial No. 277,996. (No model.)



Claim.—The stool-base B, having perforations *a* near its edge, combined with the binding-strips D, that are lapped over the edge of the base near said perforations, the ends of said binding-strips being secured by fastenings that pass through said perforations, substantially as described.

401,881. HAND-CART. AUGUST SCHUBERT, Oneida, N. Y. Filed Dec. 17, 1888. Serial No. 293,816. (No model.)



Claim.—1. The combination of the runners curved upward at both ends and integral with the posts *a a*, the sides and ends of the body attached to said posts, springs detachably connected to the body, an axle attached to said springs, and wheels mounted on said axle, substantially as described and shown.

2. In combination with the body B and axle A, shoes attached to the body, and the longitudinal springs C C, secured intermediate of their ends to the axle and having their ends removably inserted into the aforesaid shoes, substantially as set forth.

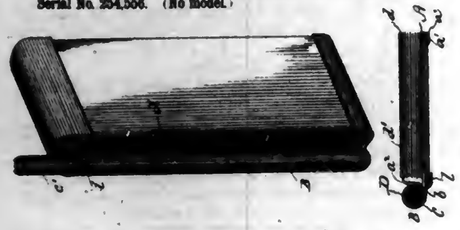
3. In combination with the body B and axle A, the shoe *b*, secured to the body near one end thereof and provided with the recess *b'*, the shoe *c*, secured to the body near the opposite end thereof and consisting of the base-plate *c'*, formed with the loop *d*, and the side springs, C, having one end inserted into the recess *b'* of the shoe *b* and the opposite end curved upward and backward and passing through the loop *d* and detachably confined therein, as set forth.

4. In combination with the body B and axle A, the shoe *b*, secured to the body near one end thereof and provided with the recess *b'*, the shoe *c*, secured to the body near the opposite end thereof and consisting of the base-plate *c'*, formed with the loop *d*, transverse slot *c''*, and side slots, *d'*, the side springs, C, having one end inserted into the recess *b'* and the opposite end curved upward and backward and terminated with the hook *f* and passing through the loop *d* and hooked into the slot *c''*, and the key *e*, inserted into the slots *d'*, substantially as described and shown.

5. In combination with the body, the handles I, hinged thereon and perforated at different points in their length, and the stays *g*, hinged on the body and perforated at intervals of their lengths, and bolts or pins passing through the perforations of the stays and handles, substantially as described and shown.

6. In combination with the cart-body, the bracket *h*, formed with ears *h' h'*, the leg D, hinged on said ears, the sleeve *i*, sliding on the bracket and over the upper end of the leg, and the catch *n*, secured to the body and adapted to engage said leg below its hinge, substantially as described and shown.

401,382. CARBON-PAPER ATTACHMENT FOR RECEIPT OR NOTE BOOKS. HORACE C. SEELY, Philadelphia, Pa. Filed Nov. 7, 1887. Serial No. 254,566. (No model.)



Claim.—1. In combination with a book or pad, the attachable and detachable plate A, having fastening-clips, a cylinder, B, a roller, C, having handle *c'*, mounted on said cylinder, and a roll of carbonized paper on said roller, substantially as set forth.

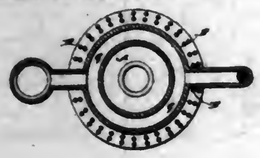
2. A plate, A, having fastening-clips *a' l*, slotted cylinder B, a roller, C, having handle *c'*, mounted on said cylinder, and a roll of carbonized paper on said roller, substantially as set forth.

3. A plate, A, having integral fastening-clips *a' l* and slotted cylinder B', and roller C, having handle *c'*, mounted on said cylinder, substantially as set forth.

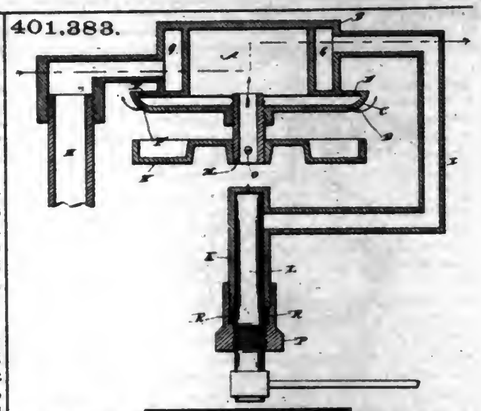
4. A plate, A, having fastening-clips *a' l*, slotted cylinder B, one end of which projects beyond the adjacent end of said plate, and roller C, having handle *c'*, mounted on said cylinder, substantially as set forth.

401,383. VAPOR-BURNER. CHARLES H. SHULTS, St. Joseph, Mo. Filed May 16, 1887. Serial No. 238,342. (No model.)

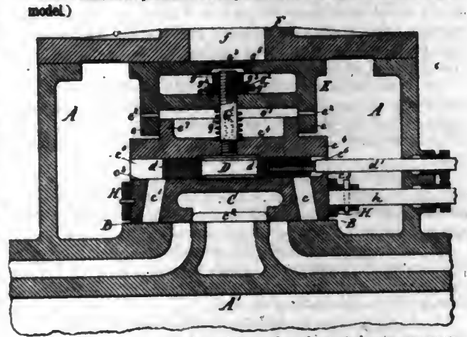
Claim.—The burner A, having the annular vaporizing-chamber G on its outer side and closed at the top, the lower side of the burner being extended laterally at the bottom beyond the outer side of the vaporizing-chamber to form a hollow projecting portion or offset, C, said offset or hollow portion being provided with the openings E in its upper side, which openings are inclined inwardly, and the mixing-tube entering the bottom of the burner, as set forth.



401,383.



401,384. BALANCED SLIDE AND CUT-OFF VALVE. WILLIAM SIMPKIN, Richmond, Va., assignor to the Richmond Locomotive and Machine Works, same place. Filed Sept. 14, 1888. Serial No. 285,376. (No model.)



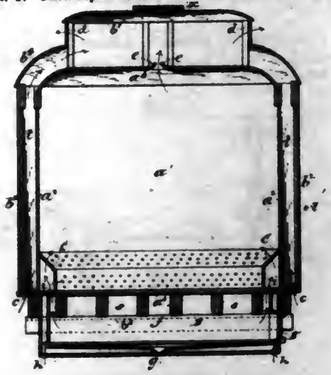
Claim.—1. In combination with a valve-chest, A, having an opening, *f*, in its cover, the slide-valve C, having supply and exhaust ports, rimmed pressure-plate c^4 c^5, balance-plate E, having aperture e^3, closing-plug e^2, diaphragm e', and rim *e*, bolt G, nut *g*, spring *g'*, and cut-off valve D, substantially as and for the purpose set forth.

2. The combination, with a valve-chest, A, of the described main slide-valve C, pressure-plate c^4, the balance-plate E, and the bolt G, having spring *g'*, the nut *g*, having shoulder g^3, the washer g^5, having dowel-pin g^4, and set-screw g^2, substantially as and for the purpose set forth.

3. The combination, with a valve-chest, A, of the described slide-valve C, the described balance-plate E, having aperture e^3, closing-plug e^2, and the described bolt G, having nut g^3, substantially as and for the purpose set forth.

4. In combination with a valve-chest, A, of the slide-valve C, having supply and exhaust ports, rimmed pressure-plates c^4 c^5, balance-plate E, having diaphragm e' and perforated rim e e^3, bolt G, nut *g*, spring *g'*, and cut-off valve D, substantially as described.

401,385. REFRIGERATOR-CAR. WILLIAM H. H. SIBUM, Brooklyn, N. Y. Filed Sept. 19, 1888. Serial No. 285,790. (No model.)

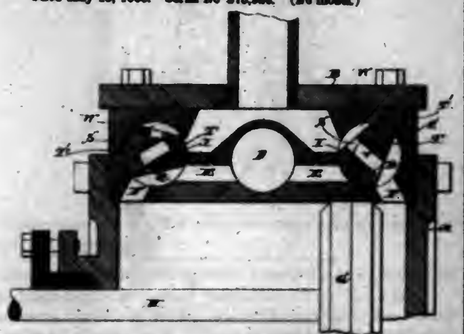


401,385.



Claim.—In a refrigerator-car, the combination, with the car-body, comprising double side and end walls secured to stanchions and a double roof, of vertical air-passages formed by the stanchions and double side and end walls and the double walls of the roof, said passages opening to the outside atmosphere at the bottom of the car and having an outlet through the roof, a floor for the car, consisting of two courses, an ice-box arranged beneath the floor and having air communication between said courses and through openings in the upper course with the interior of the car, deflectors over said openings, and hinged valves in the inner wall of the roof, substantially as specified.

401,386. STEAM-ENGINE. CHARLES A. SMITH, Dresden, N. Y. Filed May 15, 1888. Serial No. 273,926. (No model.)



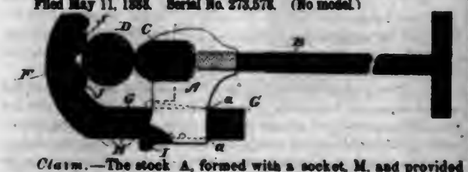
Claim.—1. The combination, in a steam-engine, of the cylinder having the exhaust-opening D, the channels E, and ports F, with the steam-chest having the recesses C, communicating with the said ports and channels and with the interior of the chest, and the oscillating valves arranged in the recesses C and having the channels S R, for the purpose set forth, substantially as described.

2. The combination, in a steam-engine, of the cylinder having the steam-chest, the recesses C and the inlet and exhaust ports communicating therewith, and the oscillating valves I, arranged in the recesses C and having the converging channels W R on opposite sides, and the transverse channels S, connecting the same, substantially as described.

3. The combination, in a steam-engine, of the cylinder having the steam-chest, the recesses C and the inlet and exhaust ports communicating therewith, the oscillating valves I, arranged in the recesses C and having the converging channels W R on opposite sides, and the transverse channels S, connecting the same, and the arms X, attached to the valves, and the link connecting said arms, whereby the valves are caused to operate in unison, substantially as described.

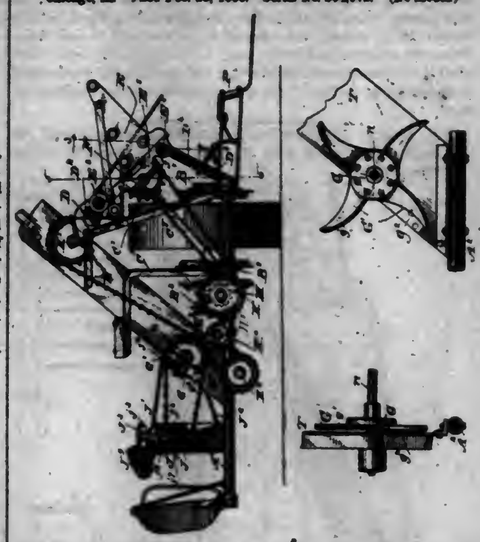
4. In a steam-engine, the combination of the valves I, having the central longitudinal bores, the transverse channels S, and the conveying-channels W R on opposite sides, communicating with channels S, the valves T, arranged in the bores of valves I and having the transverse channels V, means, substantially as set forth, to oscillate the valves I, the governor and connections between the same, and the valves T, substantially as described.

401,387. PIPE-CUTTER. VERNON R. STEVENS, Bridgeport, Conn. Filed May 11, 1888. Serial No. 273,578. (No model.)



Claim.—The stock A, formed with a socket, M, and provided with the block C and adjustable handle B, and formed with the passage E, the outer wall thereof being parallel with the handle B, and provided with a pin, I, the opposite wall being inclined, in combination with the curved jaw F G, provided with rotating cutters J and formed with a series of sockets, H, the block C being provided with a rotating cutter, D, substantially as described.

401,388. CORN-HARVESTING MACHINE. JOHN F. STEWARD, Chicago, Ill. Filed Feb. 23, 1888. Serial No. 264,972. (No model.)



Claim.—1. In a corn-harvester, in combination with conveying mechanism which includes an endless belt operating transversely with respect to the stalks, a case in which such endless belt travels and into which it is adapted to convey the stalks, the rear or head end of such case being armed with a metal edge at the entrance of the case, and a cutter fixed on the shaft of such endless belt and operating past such metal edge at the entrance of the case to sever the portion of the heads of the stalks which protrude beyond such cutter to permit them to enter the case, substantially as set forth.

2. In a corn-harvester, in combination with conveying mechanism which includes an endless belt operating transversely with respect to the stalks, and a case in which such belt travels and into which it is adapted to carry the stalks, such case having its rear or head end formed of thin metal plate or sheet, a cutter fixed on the shaft of the driving-roll of such conveyer rearward of the rear or head end of the case and operating past the edge thereof and co-operating with said edge to sever the protruding portion of the heads of the stalks to permit the stalks to enter the case, substantially as set forth.

3. In combination with the main frame and the binder-frame sustained and movable back and forward thereon, the main frame having slide-bearings for the binder-frame, which comprises the gear standard or bracket and has slide-bars, which are held in such gearing standard or bracket and extend rearward therefrom and adapted to fit to the slide-bearings both in front and in rear of said standard, substantially as set forth.

4. In combination with the binder-frame and the main frame which sustains it, the binder main driving-shaft having a bearing in the binder rear gearing-standard and projecting rearward therefrom, and two similar driving-wheels on said shaft, one located forward of the gear-standard and the other rearward of the same, substantially as and for the purpose set forth.

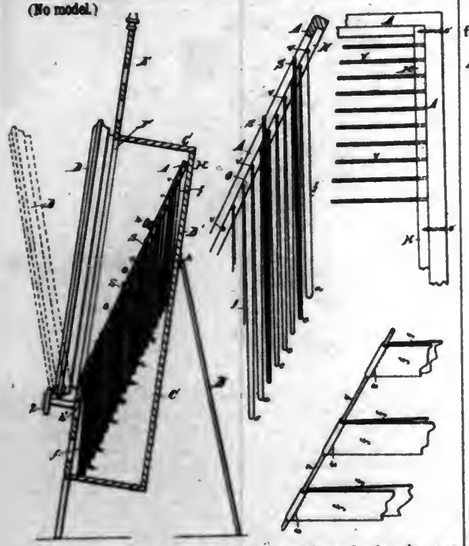
5. In combination with the main frame and the binder-frame sustained thereon, the binder main driving-shaft having a bearing in the binder rear gearing standard or bracket, the main frame having a bearing for a driving-wheel in line with said shaft-bearing, and two similar driving-wheels, each adapted to be journaled in said main-frame wheel-bearing and both located on said shaft, one in front of the binder rear gearing-standard and one in rear of same, substantially as set forth.

6. In combination with the main frame and the binder-frame sustained and movable back and forward thereon, the binder main driving-shaft having a bearing in the binder rear gearing standard or bracket and extended both forward and rearward of said bearing and adapted to receive and slide through a driving-wheel, the main frame having a bearing for a driving-wheel located in line with said binder-frame shaft-bearing, and a driving-wheel journaled therein and apertured through its hub to fit said shaft both forward and rearward of its bearing in the rear binder gearing-standard, substantially as set forth.

7. In combination with the main frame and the binder-frame sustained and movable back and forward thereon, the binder main driving-shaft having a bearing in the binder rear gearing standard or bracket and extended rearward of said bearing, the main frame hav-

ing a bearing for a drive-wheel in line with said bearing on the binder rear gearing-standard, said shaft, both forward and rearward of its said bearing, being adapted to slide through a driving-wheel, and two similar driving-wheels, each adapted to be journaled in said main-frame wheel-bearing and having their hubs apertured to receive said shaft and located thereon, one forward and the other rearward of said shaft-bearing in the binder rear gearing-standard, substantially as set forth.

401,389. COMBINED EASEL AND SHEET-MUSIC CABINET. OSCAR STODDARD, Detroit, Mich. Filed Apr. 11, 1888. Serial No. 270,355 (No model.)



Claim.—1. In combination with the easel-frame having the open front, the case mounted on the back of said easel-frame, and the frame located in said case and having a series of supporting-rods, said rods having attached thereto the strip of textile fabric or flexible material forming the pockets for the sheet-music, as and for the purpose specified.

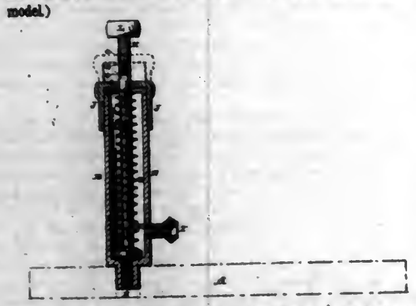
2. In combination with the easel-frame having the open front, the case mounted on the back thereof, the leg hinged to said case, the frame located in said case having its lower end hinged to the easel-frame, the series of rods attached to the frame A, and the flexible material mounted on said rods and doubled, so as to form the series of pockets *a*, substantially as and for the purposes specified.

3. In combination with the easel-frame having the opening F, the case C, attached to the back face of the easel-frame and communicating with the opening thereof, and having pockets for sheet-music located therein, as and for the purposes specified.

401,390. SHOE-BLACKING. CHARLES D. ST. PIERRE, Brooklyn, N. Y. Filed Oct. 6, 1888. Serial No. 287,400. (Specimens.)

Claim.—A boot and shoe blacking or polish composed of ivory-black, sugar, linseed-tea, sweet-oil, Diamond black dye, oil of vitriol, whisky, wormwood-tea, extract of nux vomica, vinegar, and alum, in substantially the proportions hereinbefore described.

401,391. REGULATING-VALVE FOR DENTAL VULCANIZERS. LEVI STOCK, Hart, Mich. Filed May 17, 1888. Serial No. 274,228. (No model.)



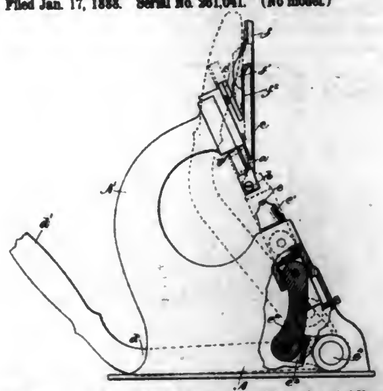
Claim.—The combination, with a vulcanizer, of a cylinder provided with a valve-seat and a blow-off pipe, the valve, the graduated valve-stem, a spring applied to the valve-stem, and an adjustable cap, by means of which the pressure of the spring is regulated to correspond to the graduations on the stem, substantially as shown and described.

401,392. RULER. NICOLAI VERMEHREN, Copenhagen, Denmark. Filed Dec. 11, 1888. Serial No. 293,276. (No model.) Patented in Norway Nov. 16, 1887, No. 582, and in Sweden Dec. 9, 1887, No. 1,165.



Claim.—A ruler consisting of a right-angled plate or disk, M, furnished on both sides with narrower plates, H and H'.

401,393. BUTTON-SETTING MACHINE. JOHN H. VINTON, Boston, Mass., assignor to the Peninsular Novelty Company, Grand Rapids, Mich. Filed Jan. 17, 1888. Serial No. 261,041. (No model.)



Claim.—1. In a button-setting machine, the rigidly-attached driver *a* and yielding carrier *b*, arranged to automatically present a single fastening having a button attached thereto beneath the driver, combined with the anvil movable in a straight line toward the driver, as set forth.

2. In a button-setting machine, the button-setting devices mounted in the face of a stationary frame-work which is inclined rearwardly from the operator, and a substantially-vertical attached chute, substantially as described.

3. In a button-setting machine, the button-setting devices, combined with a rearwardly-extended hand-lever movable upward in the arc of a circle to effect the upward movement of the movable member of the button-setting devices, substantially as described.

4. In a button-setting machine, the driver and carrier, combined with the anvil movable toward the driver in a straight line, the rearwardly-extended toggle-jointed levers, and bent hand-lever, the said lever having an upward and forward movement, substantially as described.

5. In a button-setting machine, the raceway and detachable tube and its yielding connection between the said detachable tube and the raceway, substantially as described.

401,394. CHARGING APPARATUS FOR BLAST-FURNACES. EDWARD WALSH, Jr., St. Louis, Mo. Filed May 26, 1888. Serial No. 275,206. (No model.)

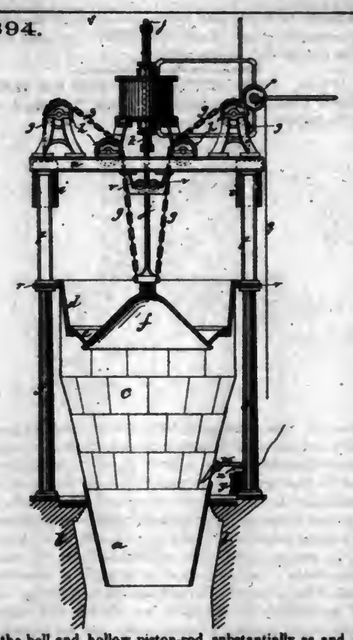
Claim.—1. The combination, with a blast-furnace, of a feed-bell provided with a suspension-rod having key-slots, and a cylinder arranged over the feed-bell and having a tubular piston-rod through which the suspension-rod of the bell passes, substantially as and for the purposes described.

2. The combination, with a blast-furnace, of a feed-bell provided with a suspension-rod having key-slots, a cylinder arranged over the feed-bell, having a tubular piston-rod through which the suspension-rod of the bell passes, and counter-weights connected directly to the bell, substantially as and for the purposes described.

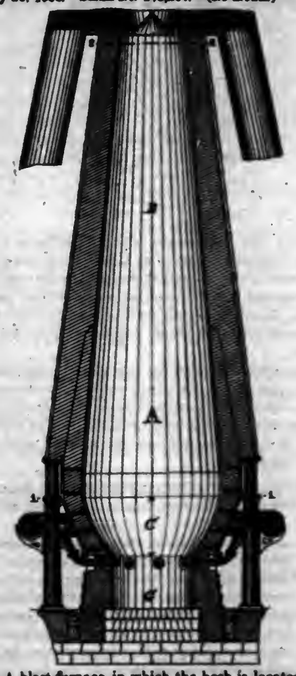
3. The combination, with a blast-furnace, of a feed-bell provided with a suspension-rod having key-slots, a cylinder arranged over the feed-bell and having a tubular piston-rod through which the suspension-rod of the bell passes, and guide-rollers for preserving the relation of the bell and hollow piston-rod, substantially as and for the purposes described.

4. The combination, with a blast-furnace, of a feed-bell provided with a suspension-rod having key-slots, a cylinder arranged over the bell and having a tubular piston-rod through which the suspension-rod of the bell passes, counter-weights connected directly to the bell on opposite sides of the stem, and guide-rollers for preserving the relation of the bell and hollow piston-rod, substantially as and for the purposes described.

401,394.



401,395. BLAST-FURNACE. EDWARD WALSH, Jr., St. Louis, Mo. Filed May 26, 1888. Serial No. 275,207. (No model.)

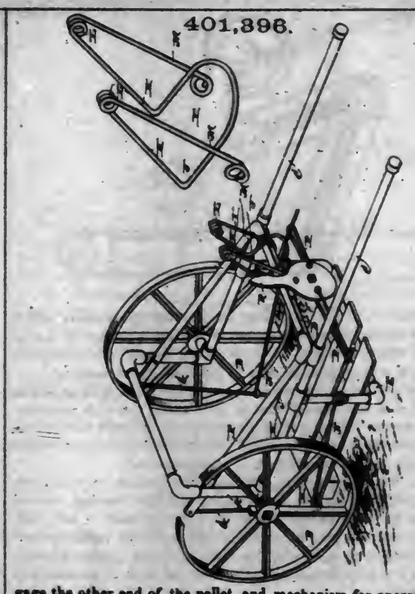


Claim.—A blast-furnace in which the bosh is located well down within the zone of fusion, and in which the sectional area of the upper limit of its bosh is substantially three times it hearth-area and substantially five to seven times the area of its tunnel-head, substantially as shown, and for the purposes specified.

401,396. BRICK-TRUCK. JOHN W. WEBBER, Fort Worth, Tex. Filed Dec. 31, 1888. Serial No. 296,095. (No model.)

Claim.—1. A truck for carrying bricks, provided with a depending frame to support one end of the pallet and supporting-arms to engage the other end of the pallet, and mechanism for operating said arms, as set forth.

401,396.



2. A truck comprising the crank-axle and the handles extended therefrom, the supporting-frame depending from the handles, the levers fulcrumed on the axle, and the supporting-arms carried by said levers, as set forth.

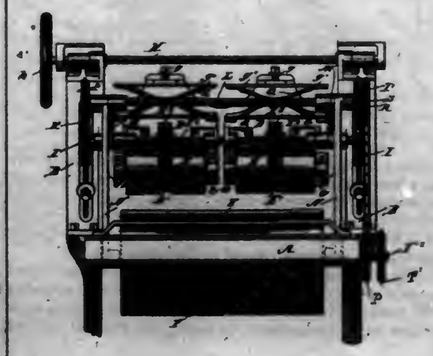
3. The combination, with the axle, the handles extending therefrom, and the cross-bar connecting the handles, of the supporting-frame depending from the handles, the levers fulcrumed on the axle, the supporting-arms carried by said levers, and the spring-latch mounted on the cross-bar between the handles and engaging said lever, as set forth.

4. In a truck, the combination, with the main frame, of the U-shaped frame depending therefrom, the supporting-arms supported by the main frame, the horizontal vibrating levers mounted on the arms of the U-shaped frame and having their rear ends connected to the supporting-arms, and mechanism for operating said levers, as set forth.

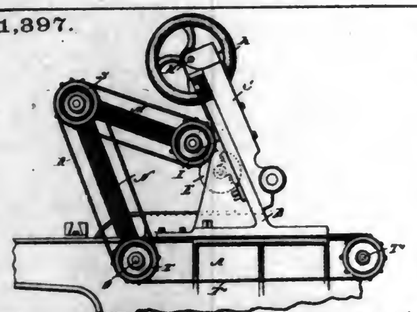
5. The combination, with the main frame, the arms G G, and the levers having their rear ends connected to said arms, of the crank-disk and the pitmen extending between the front ends of the levers and diametrically opposite points of the crank-disk, as set forth.

6. The combination, with the lever F and the cross-bar G, of the spring-latch mounted on the cross-bar and engaging the lever, the said spring-latch consisting of a single spring-wire bent to form the U-shaped locking portion J, the arms K K, extending upward from said locking portion, the coils L L at the upper ends of said arms, and the branches M M, depending from the coils and secured to the cross-bar, as set forth.

401,397. WOOD-PLANING MACHINE. GEORGE F. WETHERELL and RICHARD B. JOHNS, Chicago, Ill., assignors of one-third to Ransom Richards, same place. Filed Sept. 27, 1887. Serial No. 250,906. (No model.)



401,897.



Claim.—1. In a wood-planing machine, the combination, with a positively-driven endless carrier-belt or feed-table formed of slats or lags and with a vertically-movable presser roll or rolls, of suitable gearing for driving said roll or rolls, substantially as described.

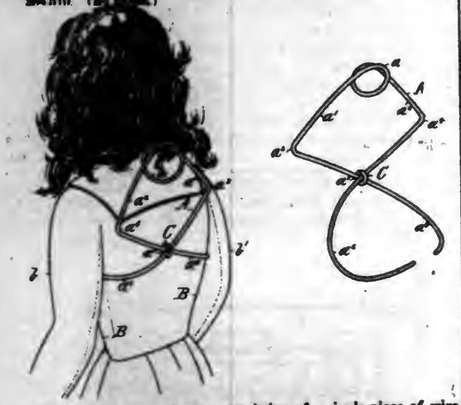
2. In a wood-planing machine, the combination, with an endless carrier-belt or feed-table formed of slats or lags and with vertically-movable presser-rolls, of suitable gearing for driving said rolls, extending between the shafts of said rolls and the drive-shaft of the endless carrier-belt or feed-table, substantially as described.

3. In a wood-planing machine, the combination, with the vertically-movable presser-rolls and vertically-movable housings, wherein said rolls are sustained, of cog-wheels upon the shaft of said rolls, vertically-movable gear-wheels for driving said rolls, vertically-movable shafts carrying said gear-wheels and journaled upon the movable housings, and suitable gearing for driving said shaft, all substantially as described.

4. In a wood-planing machine, the combination, with vertically-movable presser-rolls, of cog-wheels for said rolls, gear-wheels engaging with said cog-wheels, shafts for said gear-wheels extending across said presser-rolls, vertically-movable housings wherein said shafts and said presser-rolls are mounted, a transverse shaft in gear with the shafts of said gear-wheels, and a driving-shaft in gear with said transverse shaft, substantially as described.

5. In a wood-planing machine, the combination, with vertically-movable presser-rolls and housings wherein said rolls are mounted, of the gear-wheels for driving said rolls, provided with shafts journaled in said housings, sprocket-wheels upon said shafts, a transverse shaft mounted upon movable arms and provided with sprocket-wheels, belts leading from said transverse shaft to the shafts on the housings, a slatted carrier-belt, and suitable gearing extending between said transverse shaft and the shaft that drives the carrier-belt, substantially as described.

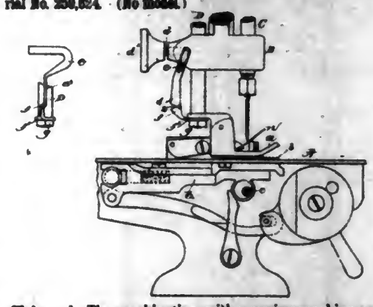
401,898. SPRING-HANGER. ALBERT WHITE, Lowell, Mass., assignor to Joseph L. Pinder, same place. Filed Feb. 18, 1888. Serial No. 264,510. (No model.)



Claim.—1. A spring-hanger consisting of a single piece of wire having a bend adapted to engage a hook, nail, or other support, and having arms extending laterally outward from said bend, then laterally inward across each other, and having their free ends bent forward in curves to form jaws having concave inner faces to grasp the object to be suspended by said hanger, as and for the purpose specified.

2. The combination of the spring-hanger having a bend adapted to engage a hook, nail, or other support, and having arms extending laterally outward from said bend, then laterally inward across each other below said first-named bend, and having their free ends provided with forwardly-extending jaws having concave inner faces, and a ring or clasp surrounding both of said arms where they cross each other loosely, as and for the purpose specified.

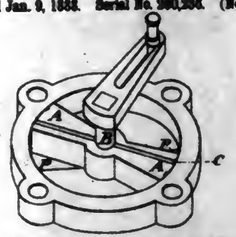
401,899. THREAD-CUTTING MECHANISM FOR SEWING-MACHINES. CHARLES F. WILCOX, Ipswich, Mass. Filed Jan. 3, 1888. Serial No. 259,624. (No model.)



Claim.—1. The combination, with a sewing-machine presser-bar, of a cutter or blade rigidly attached thereto, and thus vertically movable therewith as the said bar is lifted slightly at each stitch by the action of the feed against the presser-foot, and a stationary cutter or blade contiguous to the said movable cutter or blade, said cutters or blades serving to operate with a shearing effect to sever threads which may be inserted between their ends, substantially as set forth.

2. In a sewing-machine, the combination, with the head B and the cutting-blade d', having a shank, c, by which it is secured to the said head, of the presser-bar D, and the blade f, having a shank or plate, f', by which it is attached to the said bar, said blades being contiguous to and parallel with each other, and one or both of them having inclined ends to form a V-shaped notch into which the thread to be severed may be inserted, substantially as set forth.

401,400. VALVE FOR ENGINES. JOHN H. WILLIAMS, Urbana, Ohio. Filed Jan. 9, 1888. Serial No. 260,236. (No model.)



Claim.—1. The combination, with an oscillating valve and its steam-chest, composed in part of an annular body and a cap-plate, of a steam-cylinder having a boss fashioned to form the remainder of said chest and provided with port-mouths, at diametrical points, of substantially the shape and slightly smaller than the arms of said valve, and constructed with ports proper whose area is not less than that of said mouths.

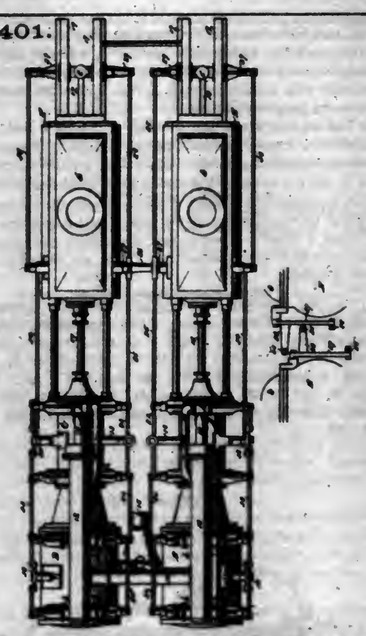
2. The combination, with the steam-chest composed of an annular body, a cap-plate, and the cylinder-boss, of two steam-pipes which connect with the boss at diametrical points of the chest and communicate with the chest through openings in the boss, an oscillating valve whose shaft is mounted in said boss, and said plate and cylinder-ports within said chest.

401,401. DIRECT-ACTING DUPLEX ENGINE. CHARLES C. WORTHINGTON, Irvington, N. Y. Filed Sept. 24, 1888. Serial No. 286,163. (No model.)

Claim.—1. The combination, with a steam-cylinder and piston, of separate induction and exhaust ports for each end of the cylinder and two oscillating valves, one for controlling the induction and exhaust of the steam to and from each end of the cylinder, said valves moving synchronously and being so timed and connected that the opening of the exhaust-port at one end of the cylinder commences immediately upon the closing of the exhaust-port at the other end of the cylinder, substantially as described.

2. The combination, with a steam-cylinder and piston, of separate induction and exhaust ports for each end of the cylinder and two oscillating valves, one for controlling the induction and exhaust of the steam to and from each end of the cylinder, said valves moving synchronously and being so timed and connected that the opening of the induction-port at one end of the cylinder commences immediately upon the closing of the induction-port at the other end of the cylinder, substantially as described.

401,401.



3. The combination, with a steam-cylinder and piston, of separate induction and exhaust ports for each end of the cylinder and two oscillating valves, one for controlling the induction and exhaust of steam to and from each end of the cylinder, said valves moving synchronously and being so timed and connected that the exhaust-port for one end of the cylinder and the induction-port for the other end of the cylinder are opened simultaneously, substantially as described.

4. The combination, with the steam-cylinders and pistons of a duplex engine, of an oscillating valve for controlling the induction and exhaust of the steam to and from each end of the cylinders of the two sides of the engine, rods 23, connecting with two valves of each cylinder, so as to cause them to move synchronously and in the same direction and without lost motion, and connections between one of the valves of each side of the engine and the piston-rod of the other side of the engine, substantially as described.

5. The combination, with a steam-cylinder and piston, of separate induction and exhaust ports for each end of the cylinder, two oscillating valves, one for controlling the induction and exhaust port for each end of the cylinder, ports 2 3, located in the valve-chests and connecting the induction and exhaust ports, and adjustable valves 39, controlling said ports, substantially as described.

6. The combination, with the main steam-cylinders, pistons, and piston-rods of a duplex engine, of induction and exhaust valves and cut-off valves, a cross-head carried by the piston-rod of each engine, a rod, 36, connected to one end of the cross-head of each engine to operate the cut-off of that engine, and a rod, 26, connected to the other end of the cross-head to operate the induction and exhaust of the other engine, substantially as described.

7. The combination, with a steam-cylinder and piston, of an induction and exhaust valve and a cut-off valve for each end of the cylinder, and connections for operating the cut-off valves from one side of the cylinder and for operating the induction and exhaust valves from the other side of the cylinder, substantially as described.

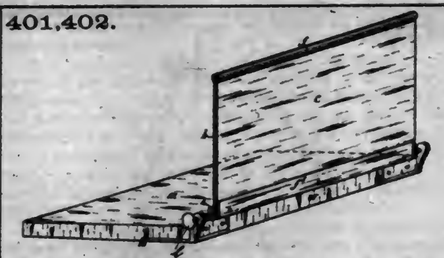
8. The combination, with a steam-cylinder and piston, the cylinder being provided with separate induction and exhaust ports at each end, of two independent valve-chests, A, located at the ends of the cylinder and detachably connected thereto, each chest containing an oscillating valve for controlling the induction and exhaust of the steam to and from that end of the cylinder, substantially as described.

401,402. APPARATUS FOR COPYING WRITINGS. FRANZ A. C. SAHR, Ingolstadt, assignor to Huber & Lorenz, Halle-on-the-Saale, Prussia, Germany. Filed May 1, 1885. Serial No. 164,200. (No model.) Patented in Germany Jan. 8, 1881, No. 14,775.

Claim.—1. A manifold-copying apparatus comprising a stone or plate to receive the matter to be copied and a transfer-plate having an elastic front face and a backing of inelastic flexible material, substantially as described.

2. In a manifold-copying apparatus, the combination, with an impression stone or plate, of a transfer sheet or plate having an elastic front face and inelastic flexible backing, and side rails constituting a frame, substantially as described.

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3. In a manifold-copying apparatus, the combination of the stone a with the sheet-metal piece w, the bearings k k', and the impression-plate c, pivoted in said bearings, said plate having an elastic front face and an inelastic flexible backing, substantially as described.

401,403. MACHINE FOR MAKING BASKETS. ISAAC J. W. ADAMS, Laurel, Del. Filed Nov. 2, 1888. Serial No. 289,790. (No model.)



Claim.—1. A sectional form for making baskets or carriers, comprising semicircular metallic plates registering to form rings of varying diameter, provided on their inner faces with hoop-receiving spaces, semicircular spaced hinged ribs, to the inner faces of which said plates are secured, and connecting bars or bolts securing the semicircular ribs of each section together, substantially as set forth.

2. A form for making baskets or carriers, comprising the two hinged sections each composed of semicircular metallic plates having inward-projecting hoop-retaining projections or lugs and registering at their ends to form rings of varying internal diameter, the semicircular spaced ribs, on the inner faces of which are the said metallic plates, the bolts or bars securing the ribs of each section together, and a fastening to secure the two hinged sections together, said fastenings and the hinges lying within the peripheries of the ribs to present an unbroken surface and allow of the rotation of the form, substantially as set forth.

3. A basket-machine comprising a stationary frame having a series of ribs provided with semicircular recesses in their upper edges, anti-friction rollers journaled therein, and the curved guiding-plates, and a rotary two-part hinged form having semicircular spaced connected ribs resting on said rollers, the internal diameters of the ribs varying according to the shape of the basket or carrier, and provided with semicircular hoop-retaining metallic plates, substantially as set forth.

401,404. WELL-BORER. BENJAMIN ANDREWS, New Orleans, La. Filed Aug. 26, 1888. Serial No. 283,815. (No model.)

Claim.—1. In a well-boring apparatus, the combination of the well-tube, the boring-head journaled thereto, and the water-tube connected with said boring-head and constructed to fit snugly therein, whereby water forced down said water-tube will be prevented from passing up between the same and the boring-head, all substantially as and for the purposes specified.

2. The combination, in a well-boring apparatus, of the well-tube, the boring-head journaled thereto, the turning-stem detachably connected with said head, and the center cutter or bit supported on said turning-stem, substantially as set forth.

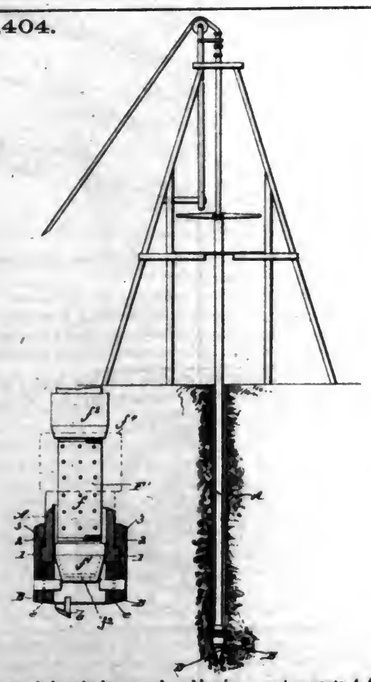
3. The combination, in a well-boring apparatus, of the well-tube, the boring-head journaled thereon, and the turning-stem made tubular or having a passage formed through it for the water and provided with a check-valve, substantially as set forth.

4. In a well-boring apparatus, the combination of the well-tube, the boring-head journaled thereon and provided with inwardly-extended studs or projections, and the turning-stem having at its lower end slots arranged to receive said studs or projections, substantially as set forth.

5. In a well-boring apparatus, the combination, with the well-tube and the boring-head journaled on the well-tube, of the studs projected into the bore of said head for engagement by the turning-stem, and fragile fastenings for said studs, substantially as set forth.

6. In a well-boring apparatus, the well-tube having the boring-

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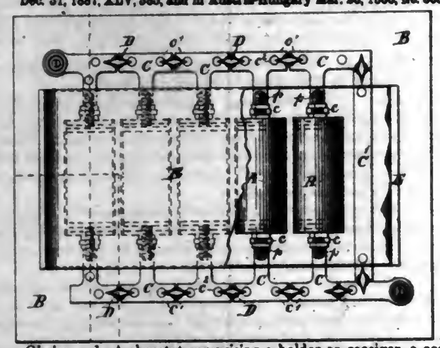


head journaled on its lower end, and having a vent or vents, 4, formed through it, substantially as described, and for the purposes specified.

7. The well-tube and the boring-head journaled on the lower end thereof and provided with inwardly-projected studs, combined with the turning-stem, having slots made L shape and engaged with said studs, substantially as set forth.

8. The improvement in well-boring apparatus, substantially as herein described, consisting of the well-tube, the boring-head journaled thereon, the studs projected into the bore of said well-tube, fragile fastenings for said studs, the turning-stem fitted at its lower end tightly in the well-tube and provided at such end with slots constructed to engage the studs, and the center cutter or bit supported on said turning-stem, substantially as set forth.

401,405. RHEOSTAT. NICHOLAS BENARDOS, St. Petersburg, Russia. Filed Jan. 7, 1888. Renewed Mar. 9, 1889. Serial No. 302,745. (No model.) Patented in England Dec. 21, 1887, No. 17,585; in Belgium Dec. 19, 1887, No. 79,974; in France Dec. 19, 1887, No. 187,683; in Italy Dec. 31, 1887, XLV, 385, and in Austria-Hungary Mar. 26, 1888, No. 805

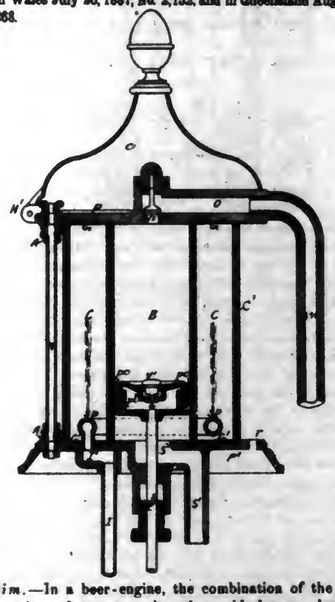


Claim.—1. A rheostat comprising a holder or receiver, a conductive material capable of being compressed or compacted, and an adjustable metallic follower or piston arranged to operate upon said material, in combination with a support for the rheostat, consisting of a metallic band, bar, or strap of T shape, provided with a bearing for the piston-rod in its vertical branch, and with recesses in the outer edges of the horizontal branch or branches, substantially as described, for the purposes set forth.

2. A rheostat comprising a holder or receiver of non-conductive material, a compressible conductive material contained in said cylinder, and a metallic piston or pistons arranged to operate upon said material, in combination with a support for the rheostat in electrical connection with the compressible conductive material, said support consisting of a band or bar of T shape, the horizontal arms whereof are provided with a notch or recess in their outer ends, substantially as and for the purposes specified.

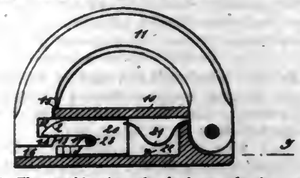
3. The combination, with a plurality of rheostats, each comprising a holder or receiver of non-conductive material, a compressible conductive material contained in said holder, a piston or pistons arranged to operate upon said material, and a T-shaped metallic support, the foot or horizontal arms of which are provided in their outer ends with a notch or recess, of the pins D, the connecting band or strap C', and a suitable supporting-bar, upon which said rheostats are arranged side by side, substantially as shown and described, for the purposes specified.

401,406. CONSTRUCTION OF BEER-ENGINES. JAMES A. BIGELOW, Melbourne, Victoria, assignor to John Hyam Nathan, Sydney, New South Wales. Filed July 16, 1887. Serial No. 244,543. (No model.) Patented in Victoria June 20, 1884, No. 3,743, and Apr. 29, 1887, No. 5,043; in New Zealand Nov. 21, 1884, No. 1,303; in South Australia Apr. 29, 1887, No. 800; in England May 31, 1887, No. 7,904; in New South Wales July 20, 1887, No. 2,132, and in Queensland Aug. 26, 1887, No. 263.



Claim.—In a beer-engine, the combination of the following elements: a base-plate, a pump-barrel on said plate, a valved plunger and its rod working upwardly in the pump-barrel and base-plate, a cylinder surrounding the pump-barrel and forming a chamber therebetween, a circular spray-pipe in said chamber, an inlet-pipe communicating with the spray-pipe, an outlet-pipe leading from the base of the chamber, a cap-plate centrally apertured over the pump-barrel and fitted thereat with a valve, and having openings over said chamber provided with detachable covers, adjustable connections between the base and cap plates, an outlet-pipe leading from the valved aperture in the cap-plate and provided with a delivery-tap, valved pipes connecting the pump-barrel with liquor-receptacles, and a foot-lever for operating the plunger-rod, all constructed, arranged, and adapted to operate as herein shown and described.

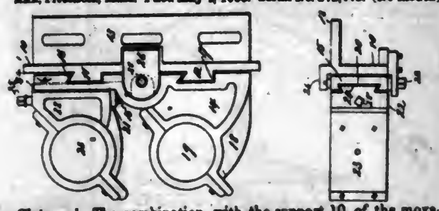
401,407. PADLOCK. GRANT BRAMBEL, Lake Park, Minn. Filed Mar. 26, 1888. Serial No. 268,478. (No model.)



Claim.—1. The combination of a lock-case having an open end and its upper wall cut away at said open end, a pivoted shackle having its recessed free end entering the lock-case through the cut-away portion, with its outer surface flush with end of the case and extending into the said case a distance less than the depth thereof, to leave a space between the lower wall of the case and the shackle for the insertion of a key, and a series of sliding and spring-actuated tumblers in said case and engaging the recess of the shackle, substantially as described.

2. The combination of the lock-case 10, having an open end and its upper wall cut away at said end, the shackle 11, pivoted to the case and provided with the recess 12 and shoulder 15, the tumblers 20, provided with the slots 17, the transverse pins 23, and the springs 21, substantially as herein shown and described.

401,408. ADJUSTABLE BOX FOR SHAFTS. EDWARD H. BRIDGMAN, Pittsfield, Mass. Filed May 4, 1888. Serial No. 272,773. (No model.)



Claim.—1. The combination, with the support 10, of the movable frame, upper and lower shaft-boxes carried by said frame, and screws for vertically adjusting the upper box and for adjusting both boxes laterally, as shown and described.

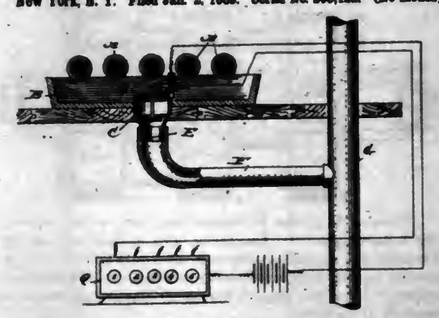
2. The combination, with the support 10, of the frame which is laterally adjustable thereon, a screw for adjusting the said frame, and boxes attached to the latter for carrying slitter-shafts, as shown and described, whereby the latter may be adjusted with the boxes, as specified.

3. The combination, with the support 10, having dovetail projections upon its face, of a frame carrying an upper and lower box, said frame being provided with dovetailed recesses adapted to receive the projections of the bracket, and a screw, substantially as shown and described, for adjusting such box-frame, as and for the purpose specified.

4. The combination, with a body-bracket provided with essentially dovetail projections upon one face and horizontally-projecting ears between said projections, of a frame carrying a lower and upper box, provided with a central horizontal lug, and a set-screw passing through said ears and the frame-lug, substantially as shown and described.

5. The combination, with a body-bracket provided with essentially dovetail projections upon one face and horizontal aligning ears extending outward between said projections, a frame carrying a box at its lower end, provided upon the inner face with horizontal dovetail recesses, a vertical dovetail recess in the upper end, and a leg between said recesses, and a set-screw passing through the ears of the bracket and the leg of the frame, of a second box-carrying frame provided upon the inner face with a dovetail projection adapted to enter the upper dovetail recess of the lower box-frame, and means, substantially as shown and described, for vertically adjusting the upper box in the said lower box-frame, as and for the purpose specified.

401,409. LEAK-DETECTOR FOR PIPES. ANDREW H. BROWN, New York, N. Y. Filed Jan. 2, 1889. Serial No. 295,122. (No model.)



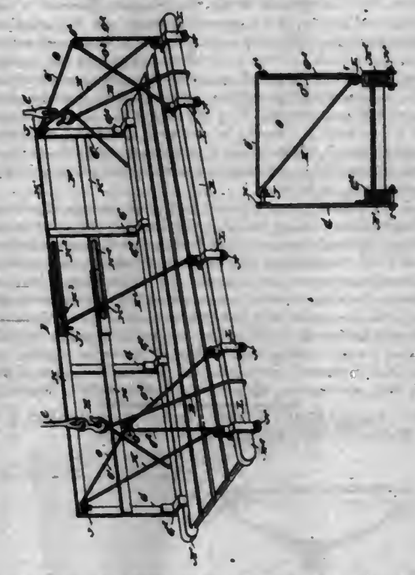
Claim.—1. A leak-detector for pipes, comprising a head into which passes the leak-water, a valve held in the said head and opened by the accumulated leak-water, and an annunciator connected with the said valve and actuated when the latter opens, substantially as shown and described.

2. A leak-detector for pipes, comprising a drip-pan over which pass the various pipes, a head held in the said drip-pan and connected with a pipe, a valve held close in the said head until a sufficient amount of water accumulates in the said head, and a lever supporting the said valve and weighted to hold it on its seat in the head, substantially as shown and described.

3. A leak-detector for pipes, comprising a drip-pan over which the various pipes pass, a head held in the said drip-pan and connected with a waste-pipe, a valve held closed in the said head until a sufficient amount of leak-water accumulates in the said head, a lever supporting the said valve and weighted to hold it on its seat in the head, a contact-point held on the said lever, a screw held above the said contact-point, and an annunciator connected with the said contact-point and the said screw to establish an electric current when the said valve is opened, substantially as shown and described.

4. The combination, with a drip-pan, a head held in the said drip-pan, and a waste-pipe connected with the said head, of a valve held on its seat in the said head, a lever pivotally connected with the said valve and weighted to hold the valve closed, a saddle in which the free end of the said lever plays, a screw screwing in the said saddle, wires leading from the said screw in the said lever, and an annunciator connected with the said wires and actuated when the said valve opens and throws the free end of the said lever in contact with the said screw to establish an electric current, substantially as shown and described.

401,410. SAFETY-SCAFFOLD. JOHN CARMICHAEL, Brooklyn, N. Y. Filed Oct. 6, 1888. Serial No. 287,419. (No model.)



Claim.—1. In a safety-scaffold, the combination, with a scaffold-ladder, of a railing made in two parts adapted to slide over each other, and also to be clamped to one of the longitudinal beams of the scaffold-ladder, substantially as shown and described.

2. In a safety-scaffold, the combination, with a scaffold-ladder, of a railing made in two parts, each comprising vertical posts clamped to one of the longitudinal beams of the scaffold-ladder, and longitudinal rails secured on the said posts and mounted to slide over each other, being provided for this purpose with slots and bolts, substantially as shown and described.

3. In a safety-scaffold, the combination, with a scaffold-ladder, of a railing made in two parts adapted to slide over each other, and also adapted to be clamped to one of the longitudinal beams of the scaffold-ladder, and end railings connected with the ends of the said railing and clamped to the other longitudinal beam of the said scaffold-ladder, substantially as shown and described.

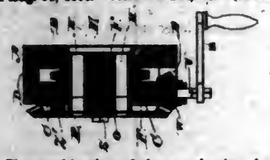
4. In a safety-scaffold, the combination, with a scaffold-ladder, of a railing made in two parts adapted to slide over each other, and also adapted to be clamped to one of the longitudinal beams of the scaffold-ladder, and braces connected with the said railing and clamped to the other longitudinal beam of the said scaffold-ladder, substantially as shown and described.

5. In a safety-scaffold, the combination, with a scaffold-ladder, of a railing made in two parts adapted to slide over each other, and also adapted to be clamped to one of the longitudinal beams of the scaffold-ladder, and braces connected with the said railing and clamped to the other longitudinal beam of the said scaffold-ladder, and end railings connected with the ends of the said railing and adapted to be

clamped to the longitudinal beam of the said scaffold-ladder, substantially as shown and described.

6. In a safety-scaffold, the combination, with a scaffold-ladder, of a railing made in two parts adapted to slide over each other, and also adapted to be clamped to one of the longitudinal beams of the scaffold-ladder, braces connected with the said railing and clamped to the other longitudinal beam of the said scaffold-ladder, and railings connected with the ends of the said railing and adapted to be clamped to the longitudinal beam of the said scaffold-ladder, and braces connected with the said end railings and clamped to the other longitudinal beam of the said scaffold-ladder, substantially as shown and described.

401,411. WIRE-TWISTING MACHINE. DANIEL T. CLARK, Leslie, Mich. Filed Aug. 31, 1888. Serial No. 284,261. (No model.)



Claim.—1. The combination of the case having the openings in its sides, the twisting-heads having the trunnions journaled in said openings and having the transverse openings and the peripheral sprocket-teeth, the endless chain connecting the twisting-heads and engaging the teeth thereof, the block bearing against the rear trunnion of one of the twisting-heads, the gear-wheel R on the outer side of said blocks, said block and gear-wheel having openings coincident with those of the head, the strap U on one edge of the case, the crank-shaft V, journaled in a bearing in said strap and having the pinion engaging wheel R, and the flange Z' on the rear side of the case, concentric with the block, and bearing against the inner side of the wheel R, substantially as described.

2. The combination of the case having the openings in its sides, the twisting-heads having the projecting trunnions journaled in said openings, said heads being provided, further, with the transverse openings and with the peripheral sprocket-teeth, the endless chain connecting the said twisting-heads and adapted to rotate the same in the same direction, the block bearing against one of the twisting-heads and having the openings coinciding with those of said head, the gear-wheel R, bearing against said block and having similar openings, the bolts clamping the said twisting-head, block, and gear-wheel together, the crank-shaft journaled in one side of the case, and the pinion on said crank-shaft and engaging the gear-wheel, substantially as described.

401,412. SHAFT-SUPPORT. EDWARD CLARK, New York, N. Y. Filed Dec. 31, 1888. Serial No. 296,050. (No model.)



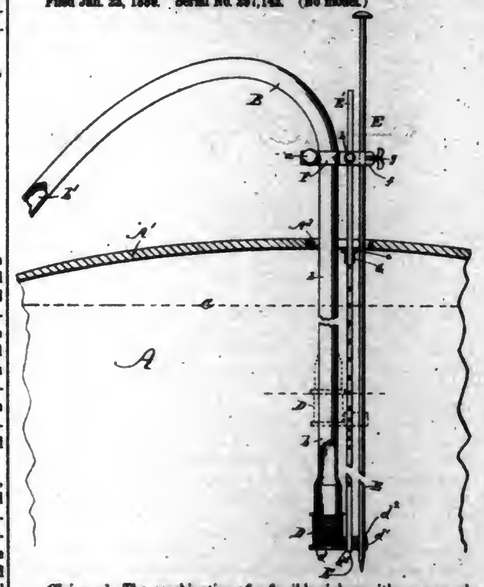
Claim.—1. A shaft-support comprising a beam secured to the front end of the vehicle and projecting under the shafts, a stiff plate pivoted at one end to the top of the said beam and engaging with its free end the under side of the transverse beam of the shafts, and a screw-rod screwing vertically in the outer end of the said beam and supporting at its upper end the free end of the said pivoted stiff plate, substantially as shown and described.

2. A shaft-support comprising a beam secured to the front end of the vehicle and projecting under the shafts, a pivot formed on the top of the said beam near its front end, a stiff plate hung with one end on the said pivot and engaging with its free end the under side of the transverse beam of the shafts, a nut held in the outer end of the said beam, and a screw-rod screwing vertically in the said nut and supporting at its upper end the free end of the said pivoted stiff plate, substantially as shown and described.

3. The combination, with the shafts pivoted to the vehicle and provided with a transverse beam, of a longitudinal beam secured to the front end of the vehicle and projecting under the said transverse beam, a stiff plate pivoted at one end to the top of the said longitudinal beam and engaging with its free end the under side of the said transverse beam of the shafts, and a screw-rod screwing vertically in the outer end of the said longitudinal beam and supporting at its upper end the free end of the said pivoted stiff plate, substantially as shown and described.

4. The combination, with the shafts pivoted to the vehicle and provided with a transverse beam, of a longitudinal beam secured to the front end of the vehicle and projecting under the said transverse beam, a stiff plate pivoted at one end to the top of said longitudinal beam and engaging with its free end the under side of the said transverse beams of the shaft, a screw-rod screwing vertically in the outer end of the said longitudinal beam and supporting at its upper end the free end of the said pivoted stiff plate, and an upwardly-extending projection formed on the free end of the said stiff plate and engaging the front edge of the said transverse beam of the shafts, substantially as shown and described.

401,413. MEASURING-SIPHON. JAMES M. CLARK, Louisville, Ky. Filed Jan. 22, 1889. Serial No. 297,142. (No model.)



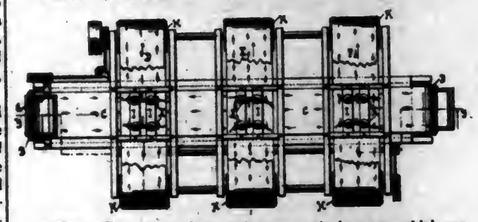
Claim.—1. The combination of a flexible siphon with a gage-rod and a supporting-rod adjustably secured to said siphon, as herein shown, and for the purposes set forth.

2. In combination with a siphon, a supporting-rod, E, an adjustable clamp, F, and a bottom guide-lug, d', as and for the purpose herein set forth.

3. In combination with a siphon, a supporting-rod, E, an adjustable clamp, F, a gage-rod, E', and guide-lug d', as herein shown and set forth.

4. In combination with a siphon, a supporting-rod, E, a gage-rod, E', an adjustable clamp, F, and a wire cage, D, provided with an extension-lug, d', as and for the purposes herein set forth.

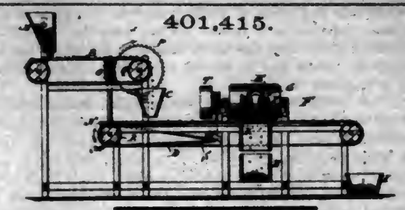
401,414. PROCESS OF TREATING MAGNETIC IRON ORE. GORDON CONKLING, Glens Falls, N. Y. Filed July 31, 1888. Serial No. 281,495. (No model.)



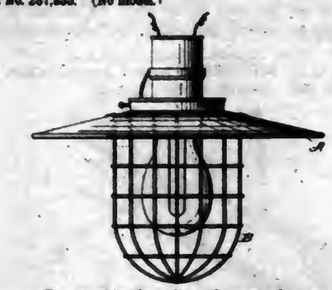
Claim.—The process for treating magnetic iron ore, which consists in exposing the ore after having been crushed to the action of a succession of magnets of graduated intensity in relation to the mass exposed to their action, and finally collecting the iron particles attracted by the several magnets in separate heaps or receptacles, substantially as described.

401,415. MAGNETIC SEPARATOR. GORDON CONKLING, Glens Falls, N. Y. Filed Aug. 9, 1888. Serial No. 282,305. (No model.)

Claim.—The combination, with the carrying-conveyer D, the movable diaphragm E, and the magnet F, of the feed-conveyer B, which moves at a different velocity from that of the carrying-conveyer, and mechanism, substantially as described, for moving the feed and carrying conveyer each at the required velocity.



401,416. COMBINED LAMP SHADE OR REFLECTOR AND GUARD. CHARLES A. COOLEY, Montreal, Quebec, Canada. Filed Oct. 11, 1888. Serial No. 287,835. (No model.)



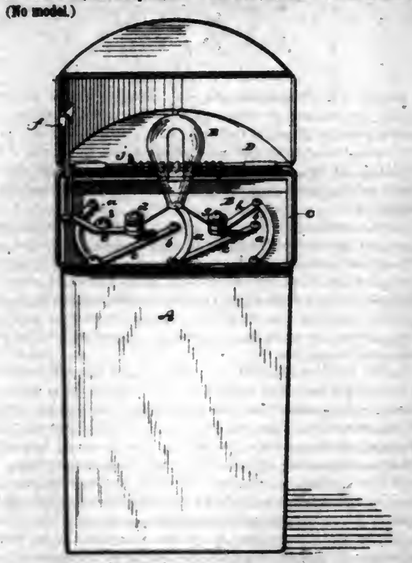
Claim.—1. The combination of a reflector and a guard for the light or lamp, the guard being rigidly secured to the reflector, as described.

2. As a new article of manufacture, a reflector or shade rigidly secured to a cage or guard, the whole being provided with attaching devices for securing it to a lamp.

3. A lamp reflector or shade having an opening large enough to admit a lamp, in combination with a guard for said lamp rigidly secured to the reflector, as set forth.

4. A lamp reflector or shade having an opening large enough to admit a lamp, in combination with a guard for said lamp rigidly secured to the reflector directly in front of the opening in said reflector.

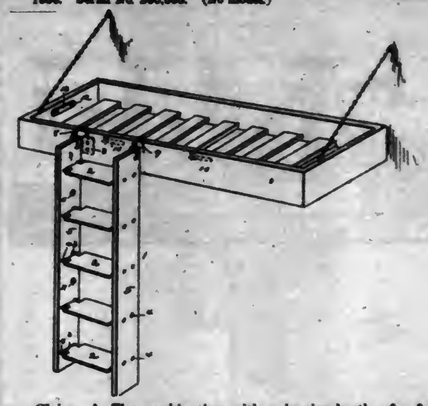
401,417. ELECTRIC LANTERN. CHARLES W. COX and THOMAS R. VAN DYKE, Philadelphia, Pa. Filed Oct. 27, 1888. Serial No. 289,305. (No model.)



Claim.—1. In an electric lantern, the combination of the opaque casing A, the battery B, the lamp E, and the switch-arm e, adapted to be pressed down by the cover of the casing, thereby breaking the circuit, substantially as specified.

2. The combination, with the casing A, provided with the spring cover D, of the battery B, having posts $d\,g$, the lamp E, connected with the posts $d\,g$, the spring switch-arm e, and the arm f, carried by the cover D, substantially as specified.

401,418. LADDER AND GUARD FOR SLEEPING-CAR BERTHS. SIMON COLLIER and CARVER C. BROWN, Alexandria, La. Filed July 24, 1888. Serial No. 280,805. (No model.)



Claim.—1. The combination, with a sleeping-berth, of a folding ladder and detachable guard for the edge of the berth, substantially as shown and described.

2. The combination, with a sleeping-berth, of a folding ladder and jointed connection by means of which the ladder may be swung in and out of and suspended from the berth, substantially as shown and described.

3. The combination, with the berth 6, having pivoted arm 13, with perforated end 12 at the end of the berth and pivoted pins 10 at the side of the berth, of the folding ladder 1, having steps 2, with their ends hinged to the uprights 5 by means of folded ends 3 engaging staples 4, and one of the uprights 5 having holes 11 and connected by a chain, 7, with the inside of berth 6, and the other upright having a hook, 9, substantially as shown and described.

4. The combination, with a sleeping-berth, of a ladder having folding steps and uprights and a chain connecting one of the uprights with the inside of the berth, and a hook on the other upright adapted to engage the edge of the berth, substantially as shown and described.

401,419. HANDLE. LEVI M. DEVORE, Prospect, Ill. Filed Jan. 8, 1889. Serial No. 295,792. (No model.)



Claim.—1. In a handle of the class described, the combination, with a spiral coil and an integrally-formed rod lying within the same, of a suitable boss adapted to receive the free end of the spiral, and an elongated bearing attached to the boss and receiving and supporting the free end of said rod, substantially as and for the purpose set forth.

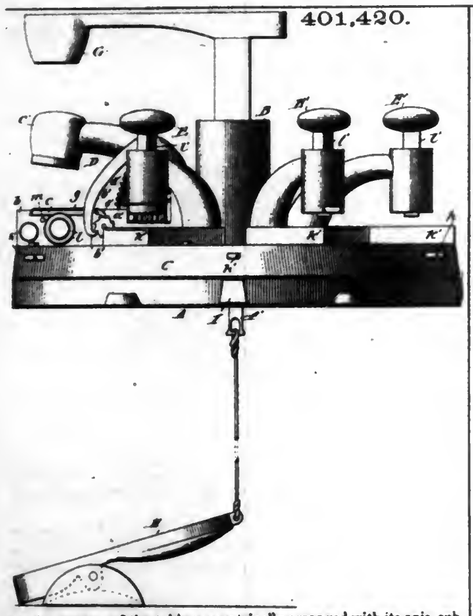
2. The combination of the boss A' and the clasps $a\,a'\,a''\,a'''$, formed integrally therewith and making up a socket, the coil B', abutting against the boss A', and the rod B, seated in the socket and having its end E' bent to prevent withdrawal of the rod from the socket, substantially as and for the purpose set forth.

401,420. COMBINATION COUPON-TICKET STAMP AND PUNCH. WILSON M. DUNAWAY, Dolphus, Kans. Filed May 22, 1888. Serial No. 274,782. (No model.)

Claim.—1. A combined ticket stamp and punch consisting, essentially, in the stationary base A, revolable table mounted thereon, a vertically-reciprocating-hammer or striker above said table, a ticket-stamp, and a series of punches, each having a separate and independent bed-piece detachably secured to the upper side of the revolable table, said punches and stamp being arranged to allow of their being brought under the hammer or striker, substantially as set forth.

2. The combination, with the stationary base having a tubular bearing, a circular revolable base on said bearing, the vertically-reciprocating hammer having an operating-rod extending down through the tubular bearing, a spring throwing said rod upward, and a treadle connected with the lower end of the rod, of the stamping device and

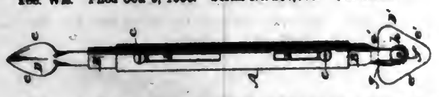
401,420.



punches on top of the table concentrically arranged with its axis, substantially as set forth.

3. The combination, with the stationary base having a catch, I, projecting at its inner end above the face thereof, and the vertically-reciprocating hammer, of the circular revoluble table having a stamping device and radial punches concentrically arranged with its axis, and provided with a series of concentric notches, *i*, substantially as set forth.

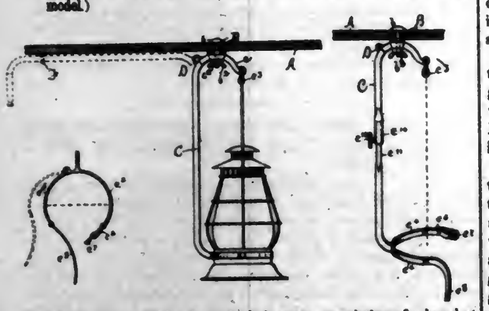
401,421. KNIFE FOR PRINTERS' USE. LOUIS J. DUS, Milwaukee, Wis. Filed Oct. 9, 1888. Serial No. 287,678. (No model.)



Claim.—1. The combination, with the knife-handle, of extensible blade-holders at opposite ends thereof, a stationary double-edged cutting-blade attached to one of said holders, and a rotatably-adjustable blade having a greater number of cutting-edges attached to the other of said holders, substantially as specified.

2. The combination of the longitudinally-slotted tubular handle A, the extensible blade-holders B B at opposite ends thereof, the cutting-blade D, having two opposite cutting-edges, *e e*, attached to the one of said holders, the rotatably-adjustable cutting-blade D′, pivoted to the other of said holders, the ratchet *h*, and the spring-pawl *g*, essentially as shown and described.

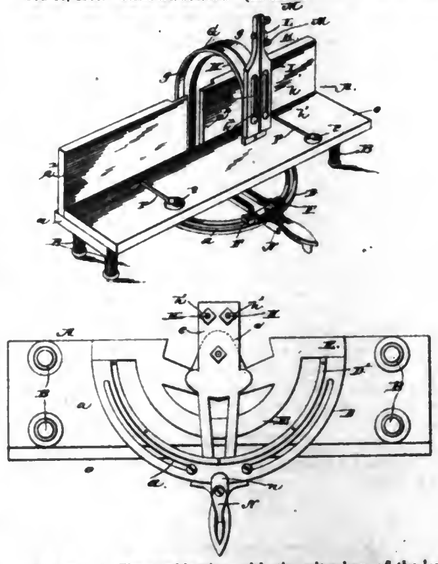
401,422. LAMP-HOLDER FOR VEHICLES. CHARLES L. ELLICOTT, Baltimore County, Md. Filed Nov. 27, 1888. Serial No. 292,011. (No model.)



Claim.—1. A holder for vehicle-lanterns, consisting of a bracket suspended from the under side of the floor of a vehicle and having a laterally-extending arm at its top, the end of which is provided with a snap-hook in position to engage the bail of the lantern when in a perpendicular position, and provided on its lower end with a laterally-extending fork in position to partially encircle the base of the lantern when suspended in a vertical position from the snap-hook, in combination with a strap and buckle secured to the ends of the fork, whereby the lantern may be securely held within the fork, substantially as described.

2. A holder for vehicle-lanterns, consisting of a bracket suspended from the under side of the floor of a vehicle and having a laterally-extending arm at its top, the end of which is provided with a snap-hook in position to engage the bail of the lantern when it is in a perpendicular position, said bracket being provided with a hinge to permit its being raised to a horizontal position when not in use, and having on its lower end a laterally-extending fork semicircular in shape in position to engage and partially encircle the base of the lantern, in combination with a strap and buckle, one secured to one end of the fork and the other to the other end thereof, whereby the lantern may be securely held within the fork, substantially as described.

401,423. MITER-BOX. WILLIAM H. ENGLEHARD, Espy, Pa. Filed Oct. 10, 1888. Serial No. 287,754. (No model.)



Claim.—1. The combination, with the miter-box, of the lever mounted thereon and provided with suitable locking devices, the arched saw-guides affixed at their rear ends to the heel of the lever, and the clamp comprising the arms affixed to the front ends of the said guides and connected by an adjusting-bolt, L, whereby the extremities of the guides may be relatively adjusted, substantially as specified.

2. The combination, with the miter-box, of the lever mounted thereon and provided with suitable locking devices, the arched saw-guides affixed to the heel of the lever and provided at their extremities with the set-screws *k′ k′*, the vertical slotted arms K K, mounted on the said set-screws, the adjusting-bolt L, connecting the upper ends of the arms, and the set-screws M M, engaging transverse apertures in the upper end of one of the arms and bearing against the other arm, substantially as specified.

3. The combination, with the miter-box, of the lever mounted thereon and provided with suitable locking devices, the arched saw-guides provided at their rear ends with apertures *h h*, which register with transverse slots in the heel of the said lever, the adjusting-bolts H H, engaging the apertures and the slot, and the clamp I, connecting the free extremities of the guides, substantially as specified.

4. The combination, with the miter-box, of the lever mounted thereon and provided at its heel with the transverse groove g^3 and the transverse slot *h′*, the saw-guides provided at their rear ends with the ribs *g′ g′*, fitting in the groove g^3, and the apertures *h h*, registering with the slot *h′*, the adjusting-bolts H H, engaging the registering slot and apertures, and the clamp connecting the free ends of the said guides and comprising the arms K K, affixed, respectively, to the guides and connected by an adjusting-bolt, L, whereby they are relatively adjustable, substantially as specified.

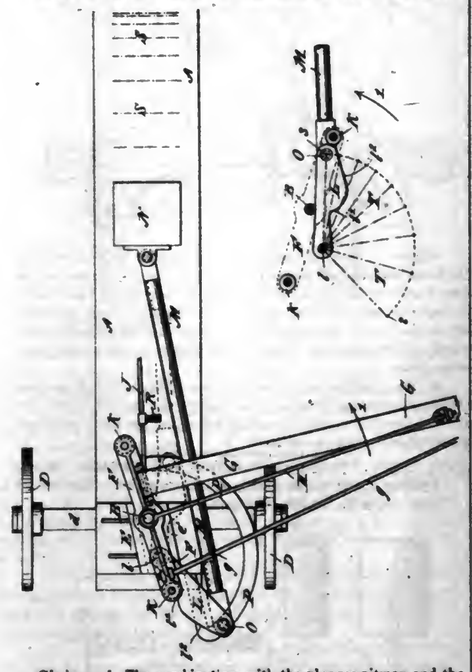
5. The combination, with the miter-box, of the semicircular guide arranged under the base-plate thereof, the lever C, mounted on the box and bearing at its free end on the said guide, the cam-lever mounted on the said lever and provided with a lip, *n*, engaging under the semi-

circular guide, and the arched saw-guides affixed to the heel of the lever C, substantially as specified.

6. The combination, with the miter-box, of the semicircular slotted guide D, the lever C, mounted on the box and provided with the arched saw-guides G G, the cam-lever N, mounted on the lever C and adapted to engage the guide D, and the adjusting-bolts F F, arranged in the slot of the guide D and adapted to be adjusted on opposite sides of the lever C, substantially as and for the purpose specified.

7. The combination, with the miter-box, having its bottom provided with transverse slots P P, and the lever C, mounted on the box and provided with the saw-guides G, of the bevel-plates Q Q, provided at their lower edges with apertures *q q*, adapted to register with the slots P P, and the adjusting-bolts R R, engaging the registering apertures and slots to clamp the said plates in the desired position, substantially as and for the purpose specified.

401,424. POWER MECHANISM FOR BALING-PRESSES. GEORGE EKTEL, Quincy, Ill. Filed Oct. 15, 1888. Serial No. 288,065. (No model.)



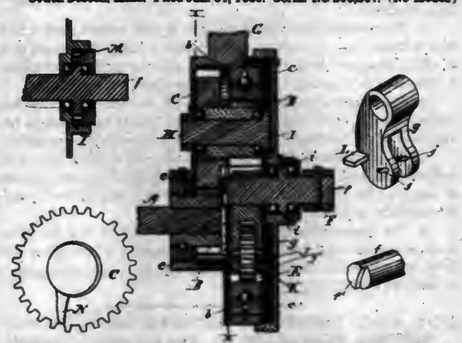
Claim.—1. The combination, with the plunger-pitman and the sweep having two rollers or bearing-points on its head, of a knuckle or link pivoted at one end to the press-frame at a point between the sweep-head pivot and the range of travel of the rollers or bearing-points of the sweep-head and pivoted at its other end to the plunger-pitman, so as to give two effective rearwardly-pushing strokes of the plunger for each complete turn of the sweep, said knuckle having an outer face formed with a curve or incline where the sweep-head first strikes it to give a quick initial movement to the plunger and assure its gradually-decreasing speed as the plunger is completing its rearward effective pushing stroke, substantially as herein set forth.

2. The combination, with the plunger-pitman and the sweep having a bearing point or roller on its head and a knuckle or link pivoted at one end to the press-frame at a point between the sweep-head pivot and the range of travel of the sweep-head bearing point or roller and pivoted at its other end to the pitman, of a spring arranged to be struck and put in tension by the pitman to assure rebound of the plunger after the sweep-head bearing point or roller slips past the end of the knuckle, substantially as herein set forth.

3. The combination, with the bed or frame A and the front truck, *d* D D, of the press, of a yoke, C, connected to the axle, a plate, *e*, on the frame and resting on the yoke, a vertical shaft, B, on the frame and passing through the parts *e* C as a king-bolt, a sweep-head, F, on said shaft, a sleeve, I, and pin *b* on the shaft, and a knuckle, L, pivoted at *l* to the press-frame and adapted for engagement by the sweep-head, substantially as shown and described.

4. The combination, with the press-frame, of a bracket, E, having base *e* and ledge *e′*, a shaft, B, and pin *b*, a knuckle, L, pivoted on a pin, *l*, between the parts *e e′* and connected at its outer end to the plunger-pitman, a sweep having a head, F, fulcrumed on the shaft B and having rollers K K, a sleeve, I, on said shaft, a track, P, on the press-frame, and a roller, *o*, next the joint of the knuckle and pitman, substantially as herein set forth.

401,425. GEARING FOR BICYCLES. WILLIAM J. FITZPATRICK, South Boston, Mass. Filed Jan. 31, 1889. Serial No. 298,207. (No model.)



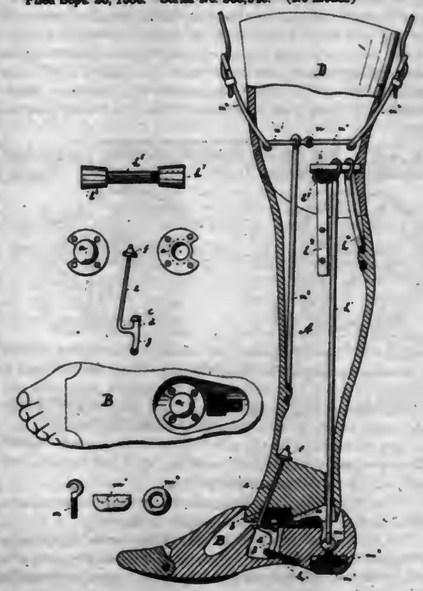
Claim.—1. In combination, the internal driving-gear, D, the pedal-arm and its shaft, an arm, *g*, also attached to and operated by said shaft, a pawl-gear, J, having its bearings in slots in the said arm *g* and meshing with the driving-gear, and a locking-pin, L, attached to the said arm and adapted to enter the tooth of the pawl-gear to lock the same.

2. In combination, the internal driving-gear, D, the pedal-arm and its shaft, an arm, *g*, also attached to and operated by said shaft, a pawl-gear, J, having its bearings in slots in the said arm *g* and meshing with the driving-gear, a locking-pin, L, attached to the said arm and adapted to enter the tooth of the pawl-gear to lock the same, and stops K K, located upon an adjacent portion of the fork or non-revolving part of the device and adapted to engage with a portion of the arm *g* to stop its motion and that of its connected parts, as described.

3. In combination, the pedal-arm-returning mechanism herein described, consisting of the pedal-arm F, with its shaft *f*, having an arc-shaped projection, *f′*, formed thereon, and the gear C, having the projection N, adapted to strike against the said projection *f′* to return the pedal-arm to its upper position.

4. In combination with the fork G, the cover-plate I, adapted to be attached thereto, the said plate being provided with stops K K, for the purpose set forth, and also with a box, *i*, to form a bearing for the pedal-arm shaft.

401,426. ARTIFICIAL LEG. CHANCY A. FERRIS, New York, N. Y. Filed Sept. 20, 1888. Serial No. 285,846. (No model.)



Claim.—1. The combination of leg A and foot B, with the bulged plate *a* forming a ball on one side and a socket on the other, and with a ball engaging the socket of said plate, and with a socket for receiving the ball of said plate, substantially as specified.

2. The combination of leg A and foot B, with bulged plate *a*, and with a forked bar provided with ball *c*, and with spring *k*, substantially as specified.

3. The combination of leg A and foot B, with bulged plate *a*, and with a forked bar, one arm of which carries a ball, *c*, the second arm of which is connected to a fixed support, and the third arm of which is connected to a spring, *k*, substantially as specified.

4. The combination of leg A and thigh D, with bolt A^3, having conical head A^3 at one end, and with conical nut A^7, that receives the other end of the bolt, and with the braces A^5, substantially as specified.

5. The combination of leg A and foot B, with the heel-tendon *k'*, and with the hook *m* connected therewith, and with the grooved plate *m'* engaging the hook, and with gasket m^2 within said grooved plate, substantially as specified.

6. The combination of leg A, foot B, and thigh D, with the pivot *n* traversing the thigh, and with the equalizing-bar *n'* turning on said pivot and adapted to be connected to the shoulder-strap, substantially as specified.

401,427. COMPOSITION OF MATTER FOR THE PRODUCTION OF ARTIFICIAL SCHOOL-SLATES, &c. HUGO GALLINOWSKY, Rochester, N. Y., assignor of one-half to Henry L. Becker, same place. Filed Jan. 30, 1889. Serial No. 298,069. (No specimens.)

Claim.—The composition of matter herein described, consisting of muriatic acid, water, burnt magnesia, white bone-ash, mineral flour, and pumice-stone flour, in proportions substantially as named, and for the purposes specified.

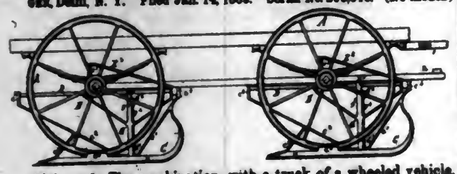
401,428. PROCESS OF DETERMINING THE CENTER OF ATTRACTION IN POLARIZED BODIES. ADOLPHUS GIFFERICH, Richmond, Va. Filed Jan. 19, 1889. Serial No. 296,821. (No model.)



Claim.—1. The mode or process of determining the center of attraction or point of leverage in a polarized body, which consists in neutralizing such body against the influence of terrestrial magnetism, loading the poles of the body with a substance capable of being attracted and held thereby, removing the load from one of the poles, weighing such load, and suspending an equal weight from said pole at a point where it will equilibrate the load at the opposite pole, as described, for the purposes specified.

2. In the art of determining the center of attraction or point of leverage in a polarized bar or beam, the herein-described process of neutralizing such body as against the influence of terrestrial magnetism, which consists in magnetizing or polarizing an equilibrated bar or beam and maintaining such bar or beam in a state of equilibrium as against the force of terrestrial magnetism by a weight suspended from one of the links thereof, substantially as and for the purposes specified.

401,429. RUNNER FOR WHEELED VEHICLES. JAMES B. GRAHAM, Delhi, N. Y. Filed Jan. 14, 1889. Serial No. 296,316. (No model.)



Claim.—1. The combination, with a truck of a wheeled vehicle, of the horizontally-hinged and longitudinally-sliding runners hung to the axle-tree, whereby said vehicle can be mounted upon said runners, as a sleigh, and also dismounted from said runners and remounted upon wheels, as a carriage, substantially as described.

2. In combination with the axle B of a vehicle, a spring-support E E^2 E^3 e^4 e^5, clamp F, sliding and revolving rod D, and runner C, substantially as and for the purpose described.

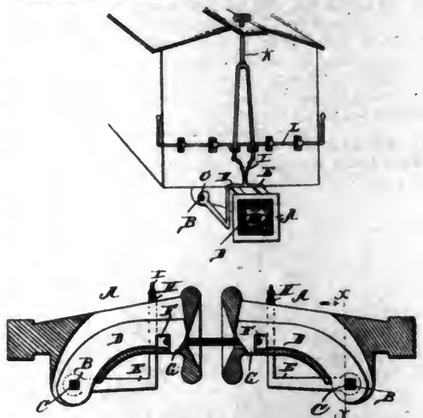
3. The combination of a folding and sliding runner C, wheel-axle B, frame I, and spring-bolt G^3, substantially as described.

4. The combination of a sliding and folding runner, C, having a spring-support upon the axle B of a vehicle, the swinging brace G, having a spring-bolt, G', and notches e^4 e^5 in the runner, substantially as and for the purpose described.

5. The combination of the swinging brace G, spring-bolt G', rods g^4 g^5, bell-crank lever G^2, levers i^7, links i^8, and sliding block i^9, substantially as and for the purpose described.

6. In combination with the bearing E and brace G, the spring e^5, substantially as and for the purpose described.

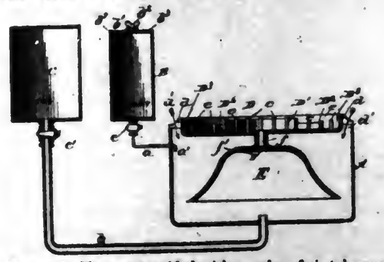
401,430. CAR-COUPLING. DAVID U. GRAVELINE, Chicago, Ill. Filed Jan. 9, 1889. Serial No. 296,820. (No model.)



Claim.—1. In a car-coupling, the combination of the draw-head, the pivot-bolt inserted transversely through the rear portion of the draw-head and having angular portions the uncoupling-yoke having its rear ends secured to the outer angular portions of the pivot-bolt, the coupling-hook having its rear end secured to the central angular portion of the pivot-bolt, and the link adapted to engage said hook, as set forth.

2. The combination of the draw-head, the pivot-bolt mounted therein, the coupling-hook and uncoupling-yoke secured thereto, the rod K, connected to the uncoupling-yoke, and the crank-shaft connected to said rod K, as set forth.

401,431. HYDROCARBON-BURNER FOR FURNACES. GRAVES GRIFFITH and THEODORE L. MILLER, Blanchard, Iowa. Filed Oct. 10, 1888. Serial No. 287,753. (No model.)



Claim.—1. The pan provided with a series of air-tubes and having a series of concentric rings of varying height, forming annular chambers, in which said air-conducting tubes are distributed, and means for supplying oil to the inner chamber, as shown and described.

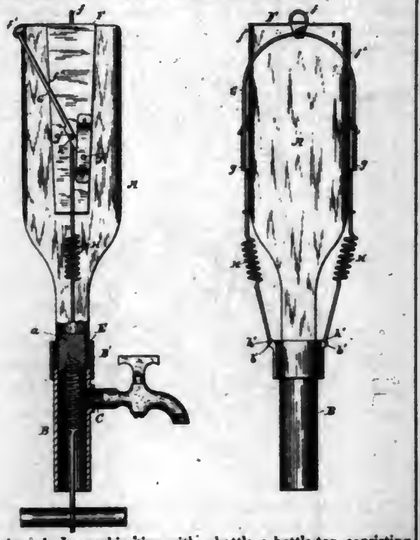
2. The pan having a series of concentric rings forming annular chambers, which are of varying height, and a series of air-conducting tubes distributed in said chambers, their upper ends projecting above the top edges of the chambers in which they are respectively located, and means for supplying oil to the inner chamber of the series, as shown and described.

3. The combination, with the pan for receiving and holding oil and the oil and water tank A, above which said pan is located, of the bell-shaped chamber E, arranged in said tank and connected with the pan, as shown and described.

4. The combination of the pan having a series of concentric rings of varying height, forming annular chambers, the series of air-tubes interspersed throughout said sub-chambers and opening through the bottom of the pan, and the conical or bell-shaped chamber depending from the bottom of the pan and communicating therewith through a tube or neck, substantially as specified.

5. The combination, with the receptacle A and connecting oil-tank and water-tank, of the pan having a series of concentric rings of varying height, forming annular oil-chambers, and the conical or bell-shaped chamber depending from the bottom of the pan and communicating therewith, the pipes connecting said water and oil tanks together being provided with cocks, while the discharging end of the water-supply pipe is turned down to submerge it below the water-level in said receptacle, substantially as specified.

401,432. BOTTLE-TAP. ELIAS H. GRISWOLD, Baker City, Oreg. Filed Oct. 15, 1887. Serial No. 252,451. (No model.)



Claim.—1. In combination with a bottle, a bottle-tap consisting of an open-ended tube secured upon the neck of the bottle, and a faucet communicating therewith at one side and midway the length of the tube, the bore of such tube being substantially equal in diameter to that of the neck of the bottle, as set forth.

2. In combination with a bottle, a bottle-tap provided with an open-ended tube of substantially the same bore as the neck of the bottle, having one end enlarged by a supplemental tube to fit over the said neck, and a faucet communicating with said chamber at one side and midway the length of the tube, in combination with a spring-fastening which serves to secure the tap in position on the bottle, as set forth.

3. In combination with the tap, the bent plate embracing the bottom and sides of the bottle, the bail pivoted thereto, and the springs connecting the tap with the bail, and means for holding the bail in a locked position, as set forth.

4. The combination, with a bottle, of a tap consisting of the faucet and the tube having an enlarged end fitting over the bottle, the packing-ring, the springs with hooked ends, the bail having perforations to receive the hooks, the plate to which the bail is pivoted formed with a loop by which to suspend the bottle, and a hook to secure the bail, as set forth.

5. A bottle-tap-attaching device consisting of a bent plate to embrace the bottom of the bottle, a bail pivoted thereto, and a pair of coiled springs having hooked ends, one of which engages with said bail and the tap, and means for securing the bail in a locked position, as set forth.

401,433. FIRE-LADDER. LEVI HARRIS, Kalamazoo, Mich. Filed Dec. 6, 1887. Serial No. 257,125. (No model.)

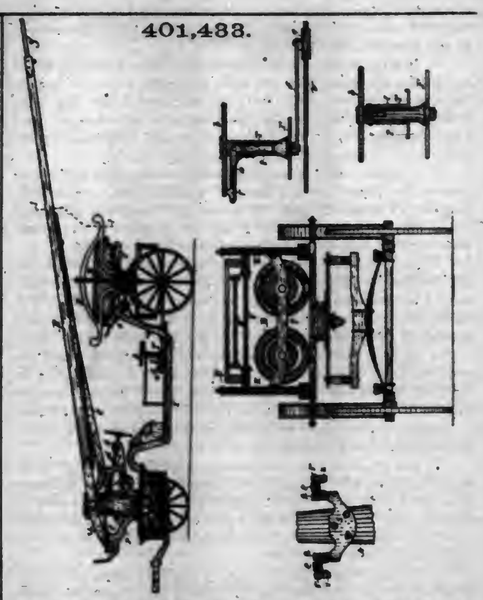
Claim.—1. In combination, a ladder-support, a ladder fulcrumed at its base to said support and having the end extensions beyond said fulcrum, and springs exerting a downward leverage on said end extensions to assist in raising the ladder, substantially as set forth.

2. In combination, a ladder-support, a ladder fulcrumed at its base to said support and having the end extensions, a two-part lever having the angled end, one part sliding within the other, said lever at the angled end having a pivotal support, the other end being pivoted to the end extension of the ladder, and a spring attached to the angled end of said lever and exerting a downward leverage on the lever to assist in raising the ladder, substantially as set forth.

3. In combination, a ladder-support, a ladder fulcrumed to said support and having the end extensions beyond the fulcrum, a pivoted lifting-lever, a screw for operating said lever, and a spring or springs exerting a downward leverage on the end extensions of the ladder to assist the lifting-lever and screw in raising the ladder, substantially as set forth.

4. In combination, a ladder-support, a ladder fulcrumed to said

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support at its base and having the end extensions beyond the fulcrum, a lifting-lever pivoted to a support, a screw for operating said lever, levers made in two parts, one part sliding within the other and having the angled ends, said ends pivoted to a support, the other ends being pivoted to the end extensions of the ladder, and the springs exerting a downward leverage on said extensions to assist the lifting-lever and screws in raising the ladder, substantially as set forth.

5. In combination, a truck having the revoluble pillar mounted thereon, a ladder having the end extensions and being pivoted to said pillar back of said extensions, a transverse bar attached to said pillar and provided with an elbow end each side of the pillar, levers capable of lengthening and shortening and being pivoted at one end to the elbow ends of said bar and having the angled ends, the other end of these levers being pivoted to the end extensions of the ladder, and the springs attached to the angled ends of the two-part levers and to the elbow ends of the transverse bar, said springs and their levers exerting a downward leverage on the end extensions of the ladder to assist in raising said ladder, substantially as set forth.

6. In a tiller for a truck, the combination of the tiller-wheel, a pivoted foot-lever, and a spring-actuated dog pivoted to said lever in position to engage the tiller-wheel and lock the tiller in its normal position, substantially as set forth.

7. The combination of the truck-body, the transverse support, the hollow standard mounted upon said support, the tiller-wheel and its vertical shaft, the latter being revoluble in said support, the vibratory arm attached to the wheel-shaft, the forked lever, a sliding collar thereon, to which collar the end of the vibratory lever is pivoted, and the wheeled axle to which the forked lever is attached, substantially as set forth.

401,434. PROCESS OF TANNING. JAMES W. HITT, Lisle, assignor to Theodore L. Corwin, Marathon, N. Y. Filed Jan. 14, 1889. Serial No. 296,329. (No specimens.)

Claim.—The improved mode of tanning heretofore described, which consists in submitting the depilated hides to a mixture of saltpeter, alum, and Glauber's salt in admixture with a bark-liquor, in the proportion and manner and during the time substantially as set forth.

401,435. PEN-HOLDER. LOUIS M. HOPKINS, Chicago, Ill. Filed Aug. 13, 1888. Serial No. 282,540. (No model.)



Claim.—1. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen and a spiral plug secured within the open end of said stem, said plug being sufficiently less in diameter than the interior of said stem to afford space for the admission of the pen between them, substantially as set forth.

2. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen and a spiral plug of sufficiently less diameter than the interior of said stem to afford space for the admis-

sion of the pen between them, removably secured within the open end of said stem, substantially as set forth.

3. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen and a spiral plug formed of springy material and secured within the open end thereof, said plug being sufficiently less in diameter than the interior of said stem to afford space between them for the admission of the pen, substantially as set forth.

4. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a longitudinally-compressible plug secured within the open end thereof, said plug being sufficiently less in diameter than the interior of said stem to afford space between them for the admission of the pen, substantially as set forth.

5. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a longitudinally-compressible spiral plug secured within the open end thereof, said plug being sufficiently less in diameter than the interior of the stem to afford space between them for the admission of the pen, substantially as set forth.

6. In a pen holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug situated within the open end thereof, said plug being sufficiently less in diameter than the interior of the stem to afford space between them for the admission of the pen, and having its inner end secured so as to prevent its accidental displacement, substantially as set forth.

7. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug situated within the open end thereof, said plug being sufficiently less in diameter than the interior of the stem to afford space between them for the admission of the pen, and having one of its convolutions enlarged or bent outward, substantially as set forth.

8. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug situated within the open end thereof, said plug being sufficiently less in diameter than the interior of the stem to afford space between them for the admission of the pen, and having its innermost convolution enlarged or bent outward, substantially as set forth.

9. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug situated within the open end thereof, said plug being sufficiently less in diameter than the interior of the stem to afford space between them for the admission of the pen, and said stem having upon its interior a shoulder for engaging said plug and preventing its accidental displacement, substantially as set forth.

10. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug situated within the open end thereof, said plug being sufficiently less in diameter than the interior of said stem to afford space between them for the admission of the pen, and said stem having upon its interior shoulders for engaging said plug and preventing its accidental displacement in either direction, substantially as set forth.

11. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug sufficiently less in diameter than the interior of the stem within which it is situated to afford between them necessary space for the admission of the pen, and having one of its convolutions enlarged or bent outward, said stem having upon its interior a shoulder for engaging said enlarged or bent convolution and preventing displacement of the plug, substantially as set forth.

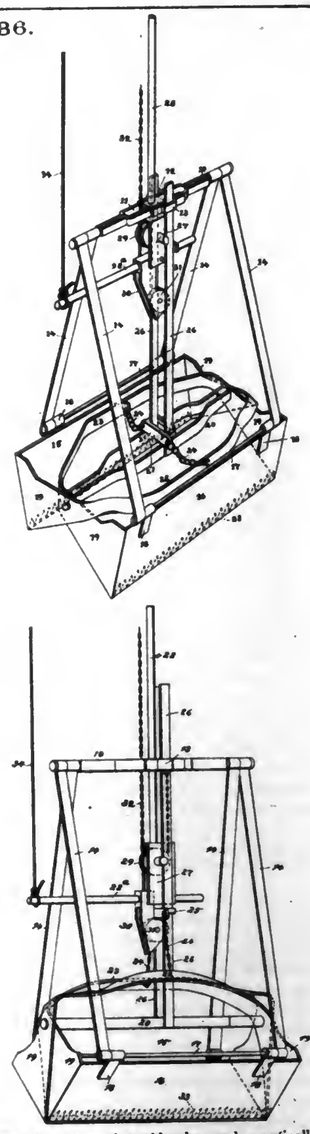
12. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug of less diameter than the interior of the stem secured within the open end thereof, the internal surface of said stem and external surface of said plug converging inward, substantially as and for the purpose set forth.

13. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug secured within the open end thereof, said plug being tapered inward or from the open end of the stem, substantially as set forth.

14. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and a spiral plug slightly less in diameter than the interior of said stem secured within the open end thereof and protruding slightly therefrom, the outer convolution of said plug being enlarged or bent outward, substantially as and for the purpose set forth.

15. In a pen-holder, the combination of a hollow stem open at one end for the admission of the pen, and an inward tapering spiral plug secured within the open end thereof and protruding slightly therefrom, the outer convolution of said plug being enlarged or bent outward, substantially as set forth.

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401,486. DREDGING-BUCKET. REBIE HOSFORD, Lebanon, Ind. Filed Sept. 26, 1888. Serial No. 286,432. (No model.)

Claim.—1. The combination, with a frame and shovels pivoted to said frame and to each other, of yokes oppositely curved, secured to the shovels, a link connecting said yokes, and a vertically-reciprocating latch engaging said link, substantially as shown and described.

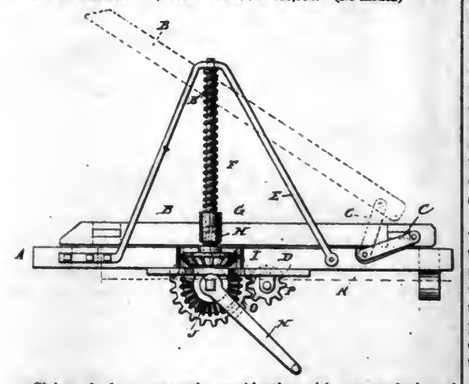
2. The combination, with a frame and shovels pivoted to said frame and to each other, of yokes oppositely curved, secured to the shovels, a link connecting said yokes, a vertically-reciprocating carriage, a latch pivoted in the carriage, engaging the link, and means, substantially as described, for manipulating said carriage, as and for the purpose specified.

3. The combination, with a frame, shovels pivoted to said frame and to each other, and yokes oppositely secured to the shovels, of a link connecting the yokes, a vertically-reciprocating carriage provided with a grooved pulley, a counterbalanced latch pivoted in the carriage, and a chain attached to the frame, passing over the carriage-pulley and upward beyond the frame, substantially as shown and described.

4. The combination, with a frame, shovels pivoted to said frame and to each other, yokes oppositely secured to the shovels, and a link connecting said yokes, of a vertically-reciprocating carriage provided with a pulley, a latch pivoted in said carriage, engaging said link, a trip-bar extending an unequal distance each side of the latch, and a chain attached to the frame, passing over the carriage-pulley and upward beyond the said frame, substantially as shown and described.

5. The combination, with a frame consisting of an apertured head and downwardly-extending oppositely-disposed arms, shovels pivoted to said arms and to each other, oppositely-curved yokes secured to said shovels, a link connecting said yokes, and vertical guide-rods secured to base-bar 20, of a carriage sliding upon said guide-rods, containing a grooved pulley, a manipulating-rod integral with the top of the carriage, a latch pivoted in the lower end of the same, a trip-bar extending an unequal distance from the sides of the latch, a chain attached to the frame, passing over the carriage-pulley and upward beyond the frame, and means, substantially as described, for manipulating the trip-bar, as and for the purpose specified.

401,487. DUMPING-WAGON. WILLIAM JACHMANN, New York, N. Y. Filed Nov. 12, 1888. Serial No. 290,557. (No model.)



Claim.—1. In a wagon, the combination, with a wagon-body and a wagon-bed pivotally connected at its rear end to the said wagon-body, of two nuts connected with each other by a rod, on which rests the front end of the said wagon-bed, upright screws held to turn in suitable bearings on the said wagon-body, and on which screw said nuts, and a turning mechanism located under the wagon-body for imparting a simultaneous rotary motion to the said screws, substantially as shown and described.

2. In a wagon, a wagon-bed, a wagon-body, and links for connecting the rear ends of the said wagon-bed with the wagon-body, in combination with a transversely-extending rod, on which rests the front end of the wagon-bed, nuts secured on the outer ends of the said transversely-extending rod, upright screws held to turn in suitable bearings on the wagon-body and screwing in the said nuts, a transversely-extending shaft mounted to rotate in suitable bearings on the wagon-body and connected by gear-wheels with the said upright screws, and a crank-arm for turning the said shaft, substantially as shown and described.

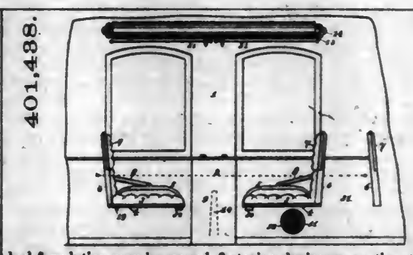
3. In a wagon, a wagon-bed, a wagon-body, and links for connecting the rear ends of the said wagon-bed with the said wagon-body, in combination with a transversely-extending rod, on which rests the front end of the wagon-bed, nuts secured on the outer ends of the said transversely-extending rod, upright screws held to turn in suitable bearings on the wagon-body and screwing in the said nuts, a transversely-extending shaft mounted to rotate in suitable bearings on the wagon-body and connected by gear-wheels with said upright screws, and a second shaft mounted to turn in suitable bearings on the under side of the said wagon-body and geared with the said first-named shaft, substantially as shown and described.

4. In a wagon, a wagon-bed, a wagon-body, and links for connecting the rear ends of the said wagon-bed with the said wagon-body, in combination with a transversely-extending rod, on which rests the front end of the wagon-bed, nuts secured on the outer ends of the said transversely-extending rod, upright screws held to turn in suitable bearings on the wagon-body and screwing in the said nuts, a transversely-extending shaft mounted to rotate in suitable bearings on the wagon-body and connected by gear-wheels with said upright screws, a second shaft mounted to turn in suitable bearings on the under side of the said wagon-body and geared with the said first-named shaft, and a crank-arm for turning the said second shaft, substantially as shown and described.

401,488. COMBINED SLEEPING AND DAY CAR. HENRY M. JONES, Denver, Colo. Filed Mar. 31, 1888. Serial No. 269,195. (No model.)

Claim.—1. The combination of the seats of a section, the seats being pivoted at or near their rear edges in the seat-frame and adapted to fold up against the seat-backs, a mattress or bed-foundation secured to a roller journaled under one seat, and upon which the mattress or

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bed-foundation may be wound, fastening devices upon the other end thereof, and coacting fastening devices secured beneath the other seat, substantially as set forth.

2. The combination, in a car-seat, of a seat portion, 3, pivoted at or near one edge in the seat-frame, and a back having its base or foundation vertically divided through a portion of its width, such division dividing the cushioned front or front proper thereof into two parts, one permanently or rigidly secured to such base or foundation and the other part, 7, being secured thereto by single hinges at the top of the back, whereby the part 7 may be turned outwardly and over upon the top of the back to extend it upwardly, substantially as set forth.

3. The combination of a roller pivotally secured or journaled upon the side of the car, a mattress or bed-foundation secured at one side thereto and provided with hooks upon or near its ends, arms or rods pivotally secured to the side of the car—one at either end of the mattress or bed-foundation—and adapted to be turned outwardly from the side of the car to support the mattress or bed-foundation, rods 22, pivoted to and in use depending from the ceiling to support such rods or arms, and diagonal braces 23, also pivoted to and depending from the ceiling to steady the same, substantially as described.

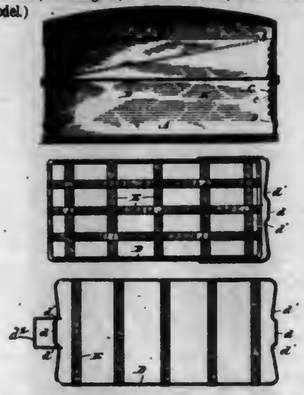
4. The combination, with the rolling mattress or bed-foundation, of side and end wings secured thereto along one edge and adapted to be folded and rolled therewith, and provided with fastening devices along or near the opposite edges, whereby they may be secured in position to surround and form the walls of a berth, substantially as set forth.

5. The combination, with the seats of a section, of half-gates hinged to the side framings of the seat, a half-gate on either side, and adapted to be closed to form a solid front frame for the lower berth, substantially as set forth.

6. The combination of the upper rolling mattress, 13, provided with hooks 17, supporting-rods 21 therefor pivoted each at one end to the side of the car, the brace-rods 22 and 23, pivoted at one end to the ceiling and depending therefrom to support and brace the rods 21, and the catches 24, for holding the brace-rods, when not in use, against the ceiling or roof, substantially as set forth.

7. The combination, with the upper rolling mattress, 13, of end wings, 15, and side wing, 16, each secured thereto along one edge and provided along their opposite edges with fastening devices 18, substantially as set forth.

401,489. FOLLOWER FOR TRUNKS OR PACKING-BOXES. KING I. KARO, Washington, D. C. Filed Oct. 2, 1888. Serial No. 286,993. (No model.)



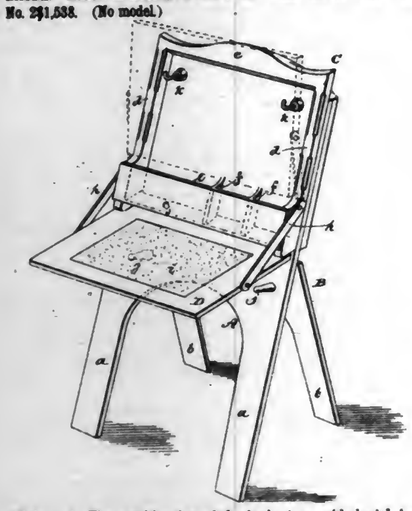
Claim.—1. The combination, with a trunk or packing-box provided with series of ratchet-notches on its inner walls, of a follower, the end of the follower adjacent to one of the series of ratchet-notches having a horizontally-yielding movement for engaging and disengaging said notches, substantially as set forth.

2. The combination, with a trunk or packing-box provided with series of ratchet-notches on its opposite inner walls, the upper walls of the notches being concave, of a follower having a horizontally yielding end adapted to engage the concave walls of the notches, substantially as set forth.

3. The herein-described follower, consisting of a frame formed of wire having strips of webbing stretched across it, and a dog pivoted on one end of the frame, in combination with a series of ratchet-notches secured to the inner wall of a trunk or box, substantially as set forth.

4. The herein-described follower, consisting of a frame formed of wire having portions of its end bent inwardly, a dog loosely mounted on one end of the frame, and transverse strips of webbing stretched across the frame, in combination with a series of ratchet-notches secured to the inner wall of a trunk or box, substantially as set forth.

401,440. COMBINED WRITING-DESK, DRAWING-BOARD, AND EASEL. HENRY L. KEITH, Stockton, Cal. Filed July 31, 1888. Serial No. 281,538. (No model.)



Claim.—1. The combination of the body A, provided with board C, secured to its front face, the board B, hinged to the back of the body, and the board D, pivotally connected to the body by straps *h*, and having its rear edge, when lowered into a horizontal position, resting under the lower end of the board C, substantially as described.

2. The combination, with the body A, provided with the legs *a*, of the hinged board B, having legs *b*, the cross-piece *c*, side pieces, *d*, the boards *e f g*, the straps *h*, and the board D, substantially as specified.

3. The combination, with the body A, provided with the legs *a*, of the hinged board B, having legs *b*, the cross-piece *c*, side pieces, *d*, the boards *e f g*, the straps *h*, the board D, and the pins *j*, inserted in the body A, substantially as specified.

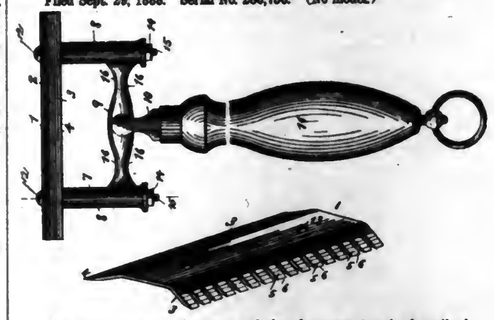
401,441. METHOD OF MOUNTING PORTRAITS. PHILIP G. KRAMER, Jr., Detroit, Mich., assignor of one-half to Caspar H. Schulte, same place. Filed Apr. 19, 1888. Serial No. 271,206. (No model.)



Claim.—1. The herein-described method of mounting pictures, which consists in first tinting the portrait, then applying liquid cement over the card surrounding the portrait, and then sprinkling on said cemented surface a covering of flaked hematite and flaked metallic bronze, as and for the purposes specified.

2. The method of finishing portraits, which method consists in first tinting or coloring the portrait, then coating the untinted portion or front surface of the picture with cement, and then sprinkling on the cemented surface a coating of flaked hematite, as and for the purposes specified.

401,442. SCRAPER. ETIENNE L. LEVEQUE, New York, N. Y. Filed Sept. 29, 1888. Serial No. 286,756. (No model.)



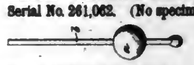
Claim.—1. A wood-scraper of the character herein described, constructed with a blade having a central horizontal portion and edge portions abruptly inclined at an angle to the central horizontal portion, one of which edge portions has a beveled scraping-edge and the other a scraping-edge formed with short teeth, substantially as shown and described.

2. In a scraper, the combination, with frame 7, having tubular arms 8, of the blade 1 and the bolts 12, substantially as shown and described.

3. A scraper consisting of the blade 1, formed with the central horizontal portion, 2, and the inclined portions 3, one of which has the beveled scraping-edge 4 and the other the scraping-teeth 5, with beveled edges 6, the metallic frame 7, consisting of tubular arms 8, connected by cross-bar 9, having depressions 16, bolts 12, passing through holes 13 in blade 1 and tubular arms 8, and secured by nuts 14, engaging the ends of bolts 12, and the handle 11, secured to frame 7, substantially as shown and described.

4. In a scraper, as herein described, the blade 1, formed with a central horizontal portion, 2, and edge portions 3, abruptly inclined at an angle to the central horizontal portion, 2, one of said portions, 3, having the beveled scraping-edge 4 and the other the short scraping-teeth 5, with beveled edge 6, substantially as shown and described.

401,443. MATCH. FREDERICK LEIBE, New York, N. Y. Filed Jan. 17, 1888. Serial No. 261,062. (No specimens.)



Claim.—As a new article of manufacture, a match provided with a globule or ball of sealing-wax attached directly to the stem or body thereof, substantially as set forth.

401,444. INCANDESCENT LAMP. HERMANN LEMP and MERLE J. WIGHTMAN, Hartford, Conn., assignors to The Schuyler Electric Company, of Connecticut. Filed Sept. 14, 1886. Serial No. 213,484. (No model.)

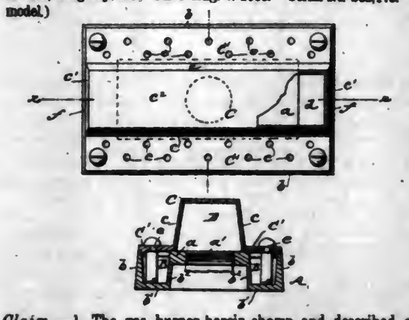


Claim.—1. A leading-in wire for an incandescent electric lamp and a conductor flattened through the portion within the glass of the globe, the flattened portion having rounded edges, substantially as and for the purpose described.

2. In an incandescent electric lamp, a sheet-metal entering-conductor consisting of a thin metal plate within the lamp and formed with longitudinal corrugations, as and for the purpose set forth.

3. The herein-described method of constructing electric incandescent lamps, which consists in forming a sheet-metal blank with two legs or bifurcations separated from one another, sealing the said bifurcated portions of the blank and dividing the blank longitudinally on a line passing between the two legs or bifurcations to make a separate insulated support for attachment to the ends of the incandescent conductor.

401,445. GAS-BURNER FOR HEATING PURPOSES. PHILLIP LEISER, Ridgway, Pa. Filed Aug. 7, 1888. Serial No. 282,173. (No model.)

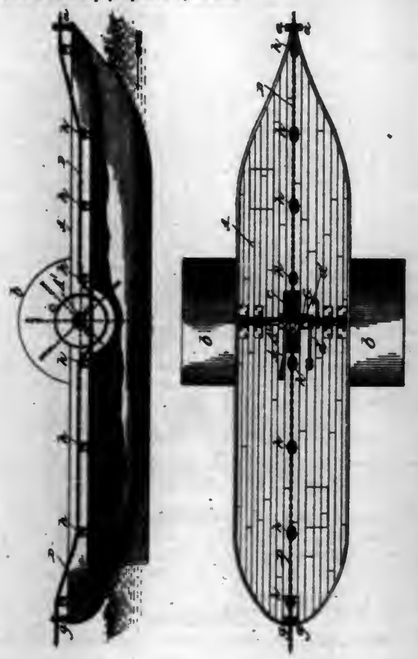


Claim.—1. The gas-burner herein shown and described, constructed to form a top chamber to which the gas is first applied, an end passage leading from said top chamber downward, and side chambers or channels on a lower level than the top chamber and communicating therewith through said end passage, said side chambers being covered by perforated plates, substantially as described.

2. A gas-burner consisting in the raised bottom *a*, having a surrounding channel, B, around its sides and ends, the top of the channel being open, and the raised bottomless cap-plate C, resting at its lower longitudinal edges on the side edges of the bottom *a* and with its end walls, *c'*, on the outer end walls, *f f*, of the chamber B to form the end passages, *d d*, and formed with the perforated side plates, C' C', forming covers for the side of the channel B, the chamber D, formed by said cap-plate, being provided with a gas-inlet, substantially as set forth.

401,446. CURRENT-PROPELLER FOR VESSELS. ERNST LOTES, Spokane Falls, Wash. Filed July 24, 1888. Serial No. 280,935. (No model.)

Brief.—The current strikes against paddle-wheels, which set in motion a shaft bearing a sprocket-wheel. The sprocket-wheel is brought into contact with a chain anchored along the river-bed, and the vessel is thereby propelled up stream.

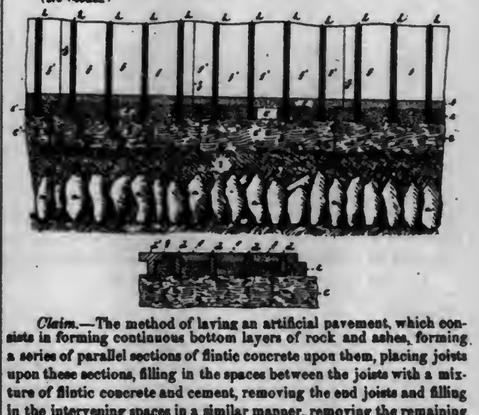


Claim.—1. The boat, substantially as described, provided with a main wheel and with guide-rolls by which to direct the chain into contact with said wheel, the upper surface of the rolls adjacent to the said main wheel being arranged above the lower surface of the main wheel, whereby the chain passed over such guide-rolls and under the main wheel will be held firmly in contact with such main wheel and the chain passed over said guide-rolls and under the main wheel, substantially as set forth.

2. An improved boat, substantially as described, provided with a shaft suitably journaled and having a wheel or wheels arranged to be turned by the current, a main wheel carried by and loose with reference to said shaft, a clutch by which to key the said wheel to such shaft, and guides located on said boat by which to direct an anchored chain into contact with said main wheel, substantially as set forth.

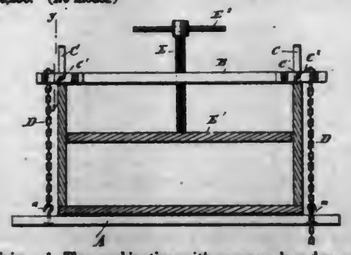
3. The combination, in a boat, substantially as described, of the boat hull or body, the shaft journaled thereto and bearing the undershot side wheels at its ends, the main wheel C, loose on such shaft, the clutch by which such wheel may be keyed on the shaft, the brake consisting of disk D' on the shaft, the pawl *f*, and the vertical and horizontal guide-rollers, and the chain guided by said rollers and engaging the main wheel, substantially as set forth.

401,447. METHOD OF LAYING ARTIFICIAL PAVEMENT. JOHN W. MACKNIGHT, New York, N. Y. Filed Jan. 2, 1889. Serial No. 295,197. (No model.)



Claim.—The method of laying an artificial pavement, which consists in forming continuous bottom layers of rock and ashes, forming a series of parallel sections of flintic concrete upon them, placing joists upon these sections, filling in the spaces between the joists with a mixture of flintic concrete and cement, removing the end joists and filling in the intervening spaces in a similar manner, removing the remaining joists, and filling in the grooves with a yielding mixture, substantially as specified.

401,448. PORTABLE TOBACCO-PRESS. IRVING A. MCKIBLEY, Cicero, N. Y. Filed Apr. 12, 1888. Renewed Jan. 31, 1889. Serial No. 298,253. (No model.)



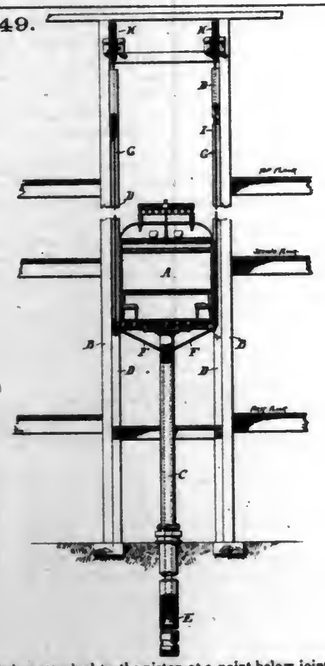
Claim.—1. The combination, with an upper board provided with rests, a screw passing through said upper board, and a follower engaging the lower end of said screw, of a bottom board and a detachable link-connection between the ends of the said upper and lower boards, substantially as and for the purpose herein set forth.

2. The combination, with an upper board provided with adjustable essentially U-shaped rests, a screw passing centrally through said board, having a hand-hold at the upper end, and a plate or follower engaging the lower end of the screw, of a bottom board having eyes attached at the ends and a chain secured to the ends of the upper board and detachably engaged with said eyes, substantially as and for the purpose herein set forth.

401,449. ELEVATOR. WILLIAM H. MILLIKEN, Philadelphia, Pa. Filed Nov. 22, 1888. Serial No. 291,557. (No model.)

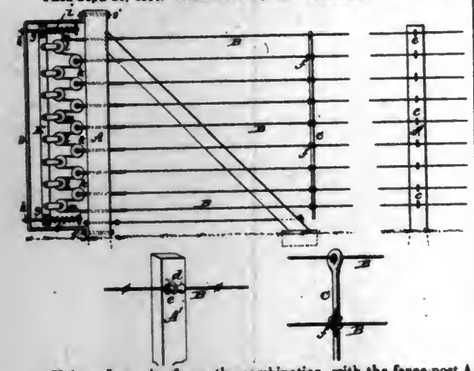
Claim.—In an elevator system having a car and an actuating-piston attached to the bottom thereof, the combination, with said piston, of a counterbalance-weight and a rope supporting the same,

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said rope being attached to the piston at a point below joint with the car, substantially as set forth.

401,450. WIRE FENCE. WILLIAM H. MITCHELL, Horse Cave, Ky. Filed Sept. 29, 1888. Serial No. 286,767. (No model.)



Claim.—In a wire fence, the combination, with the fence-post A and wires B B, of the outer fixed bar or casing, D, the loose bar E, arranged between said post and said outer bar, adjustable spring-tension devices applied to said bars D and E, the sheaves or pulleys *k l*, connected, respectively, with the bar E and ends of the wires B B, and the flexible connection or rope *m*, arranged to pass around said pulleys and connected at its ends with the upper and lower wires of the fence, substantially as and for the purposes specified.

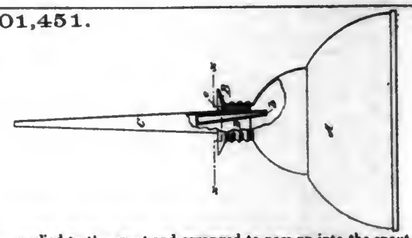
401,451. OIL-CAN. HENRY MULLER, New York, N. Y. Filed Feb. 15, 1889. Serial No. 299,957. (No model.)

Claim.—1. In an oil-can, the combination, with the spout and drip pan or cup of a can, of a tube applied to the spout arranged to pass up into the spout and down into the can, and provided with a combined drip-aperture and air-vent intermediately of its length and above the drip pan or cup, substantially as specified.

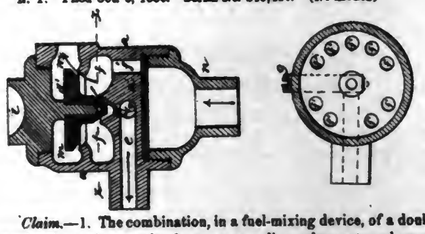
2. In an oil-can, the combination, with the body of the can and its drip pan or cup and spout, of a tube closed at its top, but open below, applied to the spout of the can and arranged to pass up into the spout and down into the can, and provided with a combined drip-aperture and air-vent intermediately of its length and above the drip pan or cup, essentially as specified.

3. The combination, with the body of the can and its drip pan or cup B and spout C, of the tapering tube D, closed at its top, but open below, applied to the spout and arranged to pass up into the spout and down into the can, and provided with a combined drip-aperture and air-vent, *c*, intermediately of its length and passing through it and the spout above the drip pan or cup, substantially as shown and described.

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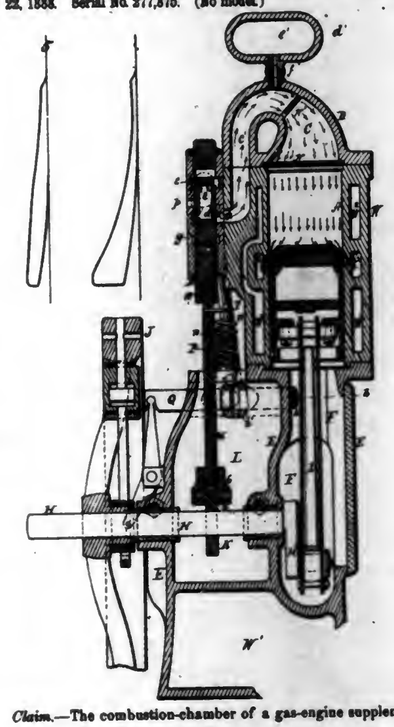
401,452. FUEL-MIXING DEVICE FOR GAS-ENGINES. LEWIS H. HASH, Brooklyn, assignor to the National Meter Company, New York, N. Y. Filed Oct. 6, 1886. Serial No. 215,417. (No model.)



Claim.—1. The combination, in a fuel-mixing device, of a double-seated valve and a case having corresponding valve-seats and supply-passages, with the adjustable plug *g* and the adjustable cup *n*, substantially as herein set forth.

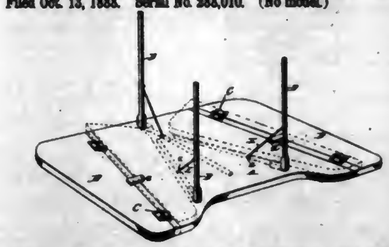
2. The fuel-mixing device herein described, consisting of the case *a*, having a bottom plate, *a'*, provided with the passages *e*, *e'*, and *f'*, and a central valve-seat, a chamber formed by said bottom plate and an upper valve-seat, the passage *m*, and a double-seated lift-valve operating in the passage *m* and in said chamber, and constructed substantially as herein set forth.

401,453. GAS-ENGINE. LEWIS H. NASH, South Norwalk, Conn., assignor to the National Meter Company, New York, N. Y. Filed June 22, 1888. Serial No. 277,875. (No model.)



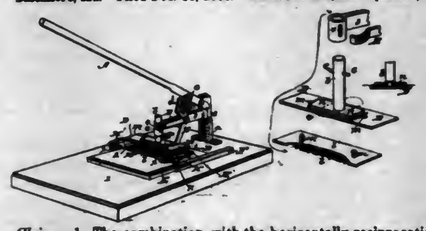
Claim.—The combustion-chamber of a gas-engine supplemented with an external-valved communicating chamber placed between the charge-supplying port and the combustion-chamber for relieving the pressure in said chamber in starting the engine, in combination with a piston compressing the charge upon its back-stroke, as described.

401,454. TRIMMING-BOARD. FRANCIS NATHAN, New York, N. Y. Filed Oct. 13, 1888. Serial No. 288,010. (No model.)



Claim.—The combination, in a trimming board or table, of a central portion having its front narrower than its rear, leaves hinged thereto having their front edges wider than their rear edges, a hinged leg attached to the center of the front, and two rear legs hinged to fold at an angle to the sides, substantially as and for the purpose specified.

401,455. HAND PRINTING-MACHINE. WILLIAM O. NELSON, Baltimore, Md. Filed Feb. 18, 1888. Serial No. 264,455. (Model.)



Claim.—1. The combination, with the horizontally-reciprocating platen, and an inking-pad attached to it, of the bed-plate or type-carrier reciprocating in a vertical guide over the platen, pivoted levers connected with said platen and bed-plate, and the main or hand lever, which is connected with and vibrates the first-mentioned levers, substantially as shown and described, so that when the hand-lever is elevated to its limit the bed-plate descends and is forcibly pressed on the inking-pad and when the lever is depressed to its limit the bed-plate is forcibly pressed on the surface to be printed, as set forth.

2. The combination, with the vertically-reciprocating type-carrier and horizontally-reciprocating platen, and slotted pivoted levers for operating them, of a vibrating hand-lever having lateral pins which work in the slots of the other levers, as shown and described.

3. The combination of the following parts: the vertically-reciprocating bed-plate, the horizontally-reciprocating platen, and operating-levers, pivoted as described, and having angular slots in their upper arms, which extend in opposite directions from their pivot, and a hand-lever having lateral pins that work in the slots of the other levers, as shown and described.

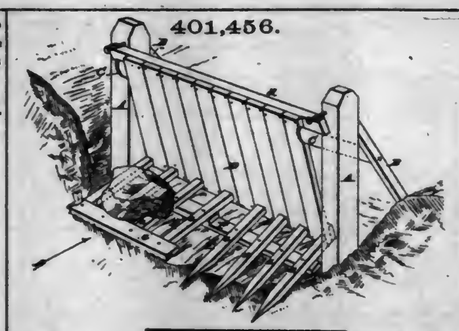
4. The combination of the pivoted hand-lever, the standard, a tubular guide, H, fixed in position, the bed-plate and its stem working in the guide and made of such length as to project above it when the bed-plate is down, and a pivoted elbow-lever connecting the hand-lever with the bed-plate and serving to elevate and depress the latter, all as shown and described.

5. The combination, with the vertically-reciprocating type-carrier and the horizontally-reciprocating platen, of stops or guards which project forward and backward on the platen from a point intermediate of the inking and printing positions of the type-carrier, so as to arrest the downward movement of the type-carrier in both positions, as specified.

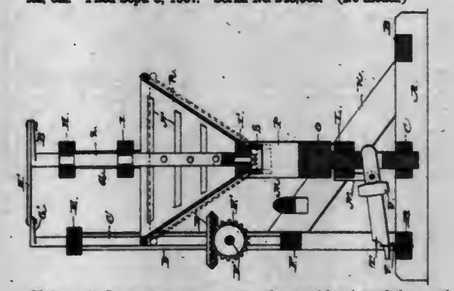
401,456. WATER-GATE. THOMAS A. NEWCOMER, Cleveland, Tenn. Filed Feb. 25, 1888. Renewed Mar. 12, 1889. Serial No. 303,062. (No model.)

Claim.—The inclined spilling composed of stakes *a*, having their lower ends secured at the bottom of the stream and their upper ends connected by a stringer, F, and terminating at the vertical line of the gate to form a stop or abutment for the latter, in combination with the water-gate D, having a horizontal axis, the posts A A, braces B B, and stripe C C, carrying the axis of the gate, substantially as shown and described.

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401,457. ORE-CONCENTRATOR. JOHN H. PENDERTON, Los Angeles, Cal. Filed Sept. 5, 1887. Serial No. 248,865. (No model.)



Claim.—1. In an ore-concentrator, the combination of the vertically-movable hopper having the discharge-opening in its lower end, the agitator secured against vertical movement, and the stationary valve attached to the agitator and normally closing the discharge-opening of the hopper, substantially as described.

2. In an ore-concentrator, the combination of the vertically-movable conical hopper having the discharge-opening, the agitator arranged in the hopper and adapted to rotate therein, said agitator being secured against vertical movement, and the conical valve swiveled to the lower end of the agitator and adapted to close the discharge-opening in the hopper in the normal position of the latter, and means for moving the hopper and agitator, substantially as described.

3. In an ore-concentrator, the combination of the vertical frame-work provided with the guide-bars, a standard playing in said guide-bars, a hopper secured to said standard, the valve stationary against vertical movement for closing the lower end of the hopper, an agitator connected to said valve, and counterbalancing devices for effecting the vertical movement of the hopper and its standard to open its lower end, substantially as described.

4. In an ore-concentrator, the combination of the vertical frame-work provided with the guide-bars, a standard playing in said guide-bars, a hopper secured to said standard, a stationary valve at the lower end of said hopper, a balance beam or lever, T, pivoted, as described, to elevate said hopper, cords connected to said yoke-frame and passing over sheaves in the main frame, and weights connected to said cords, substantially as described.

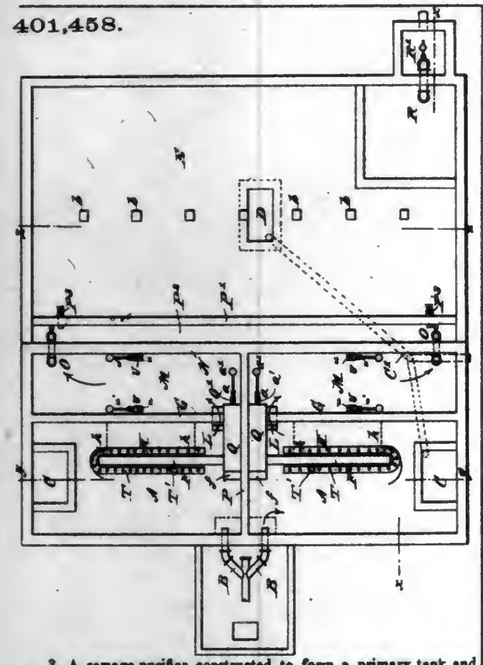
5. In an ore-concentrator, the combination of the vertically-movable conical hopper having the discharge-opening, and the conical valve adapted to close the said discharge-opening in the normal position of the hopper, and the agitator within the hopper, both the valve and the agitator being held against vertical movement, as set forth.

401,458. SEWAGE-PURIFIER. JAMES J. POWERS, New York, N. Y. Filed Oct. 26, 1888. Serial No. 289,170. (No model.)

Claim.—1. The tanks A and M and connecting-passage L, in combination with the lime-receiver Q, pipe Q', connecting said receiver with a water supply or head, a float-valve fitted in said supply-pipe within the tank M, and a siphon for intermittently emptying the tank M, the float-valve being adapted to be opened and closed at intervals by the rise and fall of sewage in tank M, whereby a given quantity of lime may be automatically supplied at intervals to a given quantity of sewage, substantially as described.

2. The tank M, chemical-receptacles U, located within said tank, and pipes *u*, connecting the receptacles U with a water supply or head, in combination with a siphon, O, for intermittently emptying the tank M, and float-valves *u'*, fitted in the pipes *u* within the tank M, substantially as and for the purposes set forth.

401,458.

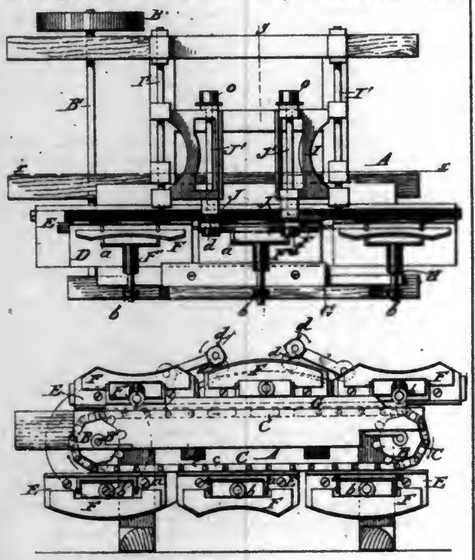


3. A sewage-purifier constructed to form a primary tank and settling or disinfecting tank M, in combination with perforated tubes H and pipes T', lime-injector Q, water-supply pipe Q', closed by a float-valve, and chemical-injectors located in the tank M and provided with float-valves, substantially as described.

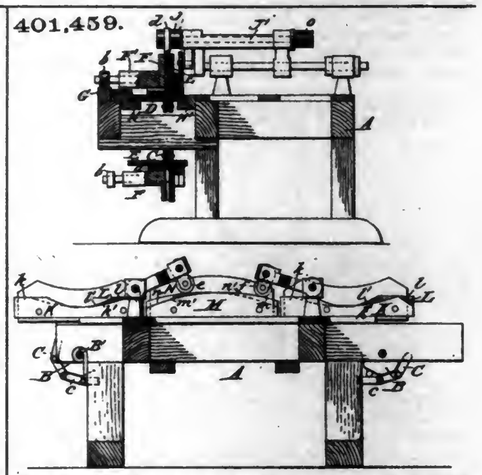
401,459. SELF-FEEDING MACHINE FOR SHAPING IRREGULAR FORMS. WILLIAM REID, West Hebron, N. Y., and GEORGE M. REID, Rutland, Vt., assignors to William Reid, West Hebron, N. Y. Filed June 28, 1888. Serial No. 278,474. (No model.)

Claim.—1. In a machine for dressing irregular forms or articles, the combination, with the main frame provided with gibbed ways, of an endless chain running in said ways and carrying automatically-operating clamps, the reversely-rotating cutters beneath which the clamps pass, and the pairs of forms or patterns carried by the clamps, substantially as described.

2. In a machine for dressing irregular forms or articles, two oppositely-rotating cutters, an endless chain carrying the automatically-operating clamps, constructed substantially as described, for holding



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the articles to be dressed, and the patterns arranged in pairs on the clamps, so that the cutters may act by turns upon the article to avoid splitting it, substantially as described.

3. In a machine for dressing irregular forms or articles, the combination of the reversely-rotating cutters, the rocking frames therefor having rollers, the feeding mechanism, the automatically-operating clamps carried thereby for holding the articles to be dressed, and patterns or forms likewise carried by the feeding mechanism and moving beneath the rollers on the cutter-frames, all substantially as described.

4. In a machine for dressing irregular forms or articles, the combination of the rotating cutters, the rocker-frames supporting the same, the endless feeding-bed carrying clamps for the articles to be dressed, and consisting of a plate secured to said bed, a rigid jaw thereon, and also a hinged jaw, and suitable patterns on the clamps which co-operate with rollers on the cutter-frames to cause the cutters to act properly on the articles to be dressed, substantially as described.

5. In a machine for dressing irregular forms or articles, the combination, with the main frame having a horizontal bar upon the same and a conveying chain or belt, of a clamp for holding the article to be dressed, consisting of a flat plate secured to the chain, a rigid jaw on said plate, and a movable jaw pivoted to the plate and carrying a projecting arm that rides upon the horizontal bar, substantially as described.

6. In a machine for dressing irregular forms or articles, the combination, with the dressing mechanism and an endless conveying-chain, of clamps for the articles to be dressed, consisting of a flat plate secured to one of the chain-links, a plate rigid thereon forming one jaw, and a movable plate pivoted thereon forming the other jaw, said movable jaw having an arm, and a bar or surface on the main machine-frame on which said arm is adapted to move for the purpose of automatically closing the clamp, substantially as described.

7. In a machine for dressing irregular forms or articles, the combination, with a conveying-chain, C, consisting of links *c* and the sprocket-wheels B B, of a series of clamps carried by said chain, consisting each of a plate, D, a rigid plate, E, secured thereto and forming one of the jaws, a pivoted plate, F, forming the other jaw, and having an outwardly-extending arm, F', furnished with a roller, *b*, and a horizontal bar, as G, on the main frame of the machine, upon which said roller *b* travels, substantially as and for the purpose described.

8. In a machine for dressing irregular forms or articles, the combination of the main frame of the machine, the frames I I, carried on shafts I' I', journaled in the upper portion of said main frame, said frames carrying shafts J' J', having the reversely-rotating cutters J J thereon, and the feeding mechanism for conveying the articles to be dressed to the action of said cutters, the self-operating clamps on said mechanism, and the patterns likewise carried thereby, all substantially as described.

9. In a machine for dressing irregular forms or articles, the combination, with the cutting or dressing devices, of an endless chain and a series of clamps consisting each of a plate secured to one of the chain-links, a rigid plate carried thereby, and a movable plate likewise carried thereby, said plates forming the jaws of the clamp, and said jaws of each alternate clamp being convexed on its upper edge, while the jaws of the remaining clamps are concaved on the upper edge, substantially as and for the purpose described.

10. In a machine for dressing irregular forms or articles, the combination of the cutters, their frames having rollers, a clamping device, and forms or patterns upon the upper edges of which said rollers travel, said patterns consisting of vertical plates whose upper edges are straight for a portion of their length and curved throughout the remainder, and said patterns being relatively arranged so that their dissimilar portions may be opposite, substantially as described.

11. In a machine for dressing irregular forms or articles, a pair of patterns, M N, said pattern M having its upper edge straight at *m* and curved at *m'*, and said pattern N having its upper edge straight at *n* and curved at *n'*, the dissimilar portions of the two patterns being located opposite each other, in combination with cutter-frames having rollers that travel on the upper edges of the patterns, substantially as described.

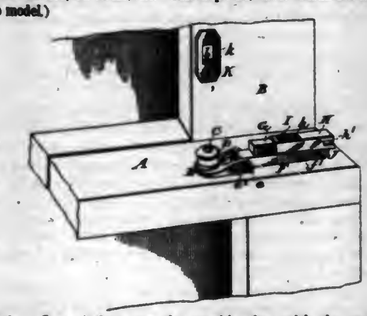
12. In a machine for dressing irregular forms or articles, the combination of the cutters, their frames having small rollers, an endless feed-chain carrying suitable clamping devices which are alternately convex and concave, and patterns arranged in connection with said clamping devices, said patterns for the convex clamps consisting of a pair of plates whose upper edges are partially straight and partially convexly curved, and said patterns for the concave clamps consisting of a pair of plates whose upper edges are partially straight and partially concavely curved, all substantially as described.

13. In a machine for dressing irregular forms or articles, the combination of an endless series of clamps which are alternately convex and concave, as described, with a double series of patterns arranged in connection with said clamps, the patterns with the convex clamps having their upper edges straight for a certain distance and convexly curved throughout the remainder, and relatively located so that the curved portion of the one shall be opposite the straight portion of the other, and the patterns with the concave clamps having their upper edges straight for a portion of their length and concavely curved throughout the remainder, and relatively located so that the curved portion of the one shall be opposite the straight portion of the other, substantially as described.

14. In a machine for dressing irregular forms or articles, the combination of an endless chain, C, having link *c*, the sprocket-wheels B, the endless series of clamps carried by said endless chain, and the parallel series of patterns constructed as described and arranged in connection with the clamps, as specified, and the reversely-rotating cutters carried in frames having small rollers that travel on the upper edges of the patterns, substantially as described.

15. In a machine for dressing irregular forms or articles, a series of clamping devices that are alternately convex and concave, in combination with a series of patterns, the patterns for the concave clamps consisting of a pair of plates whose upper edges are partially straight and partially concavely curved, and the patterns for the convex clamps consisting of a pair of plates whose upper edges are partially straight and partially convexly curved, said patterns of both kinds of clamps being so arranged with relation to each other that their dissimilar portions shall be opposite each other, substantially as described.

401,460. FASTENER FOR MEETING-RAILS OF SASHES. RICHARD A. REESE, St. Louis, Mo. Filed Sept. 24, 1888. Serial No. 286,177. (No model.)



Claim.—In sash-fasteners, the combination, with the upper rail of lower sash carrying a pivot, C, and the side rail of upper sash carrying the undercut socket L, of the three jointed pieces E F G, and the flanged plate H, slotted at A A' A', the piece E being swiveled on pivot C and the piece F being provided with side projections, *f'*, as and for the purpose described.

401,461. TONGUE-SUPPORT. BARNUM REEVE, Waco, Nebr. Filed Feb. 12, 1889. Serial No. 299,574. (No model.)

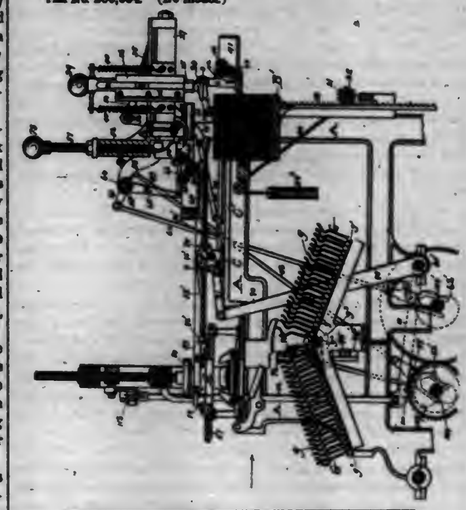
Claim.—1. The combination of the springs A, having the arms B C, arranged at right angles to each other, said arms C being secured on the tongue, with the bolts E, secured to the mud-board and attached to the upper ends of arms B, substantially as described.

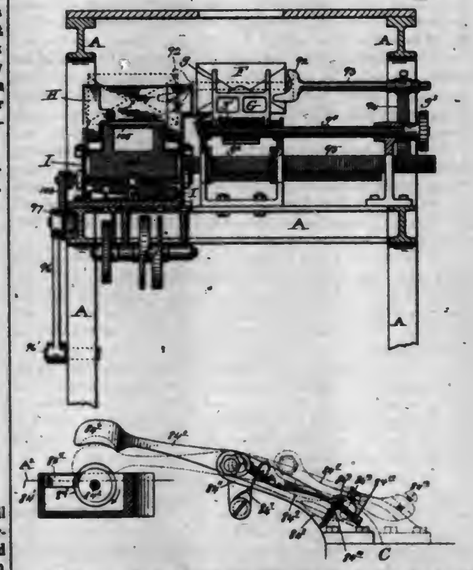
401,461.



2. The tongue-support, comprising the coiled springs A, having the arms B C, arranged at right angles to each other, and the eye-bolts E, connected to the upper ends of arms B and adapted to be secured to the mud-board, substantially as described.

401,462. ENVELOPE-MACHINE. ADRIAN A. REBOTAN, Worcester, Mass., assignor to Wade H. Hill, same place. Filed June 30, 1886. Serial No. 206,634. (No model.)





Claim.—1. In an envelope-machine, the gum-box 41 and its rolls located in front of and below the top of the pile of blanks, the gummer 20, having vertical movements imparted to it through the flange 35, and horizontal movements through suitable connections with carriage C, said carriage and flange 35, means, essentially as shown, for feeding up the pile of blanks, and feet, substantially as described, independent of the gummer and picker mechanism, operatively connected with carriage C, for holding the top blank in position while its front and back flaps are being gummed, in combination with the picker 50, hav-

ing vertical reciprocating movements, and arranged to descend upon the back flap of the top blank to gum the same, then lift it a short distance and hold it until it is removed therefrom preparatory to being drawn forward, the gum-roll 59, having horizontal reciprocating movements under the picker to gum the bottom thereof when elevated, and the gum-box 69 and its rolls, located back of and above the pile of blanks, substantially as set forth.

2. The picker 50 and means, substantially as described, for operating the same up and down, in combination with the gum-roll 59, having hubs 70 70 of irregular shape in cross-section, said hubs being reversed in shape, and the roll mounted in suitable bearings on sliding carriages, having means, substantially as described, for imparting forward and back reciprocating movements thereto, the gum-box 69, having one or more rolls, stationary curved fingers 71 71, so arranged that when the roll 59 moves forward and back, as aforesaid, its hubs 70 70 will come in contact with and travel over the surface thereof, and thus cause irregular rotary motions to be imparted to said roll 59, substantially as and for the purpose set forth.

3. In an envelope-machine, a blank-conveyer comprising, in combination, a sliding carriage having continuous forward and back reciprocating movements imparted to it between the back-flap gumming and the folding mechanism, a hinged gripping-finger upon the front end of said carriage, arranged to grip the back edge of the blanks between its front end and the top front end of the carriage, when said finger is forced down upon said carriage, and the means described for operating the finger and carriage to produce the results herein specified.

4. In an envelope-machine, the carriage C, provided with the hooks 82 82', and with means, substantially as described, for imparting forward and back reciprocating movements thereto, in combination with the gripping-finger 74 and mechanism for operating the same, substantially as and for the purpose set forth.

5. In an envelope-machine, the blank-gripping and back-feeding mechanism, constructed and arranged to operate as described, in combination with the hooks on the carriage or conveyer of said mechanism for feeding the blanks back from the picker and depositing the same under the plunger, and the movable and rigid guide-stops arranged, respectively, back of and in front of said plunger, and adapted to adjust and hold each blank in position preparatory to its being forced down into the folder-box, substantially as set forth.

6. In an envelope-machine, the combination of the creasing-die A^3 and plunger 84 with adjustable stationary stops arranged in front of the creasing-die opening, movable stops arranged at the back side thereof, and means, substantially as described, for imparting forward and back reciprocating movements to said movable stops, substantially as and for the purpose set forth.

7. In an envelope-machine, a gum-roll arranged at one side of the creasing-die under one of the side flaps of the blank when the latter is in position under the plunger, and means, substantially as described, for imparting a slow rotary movement to said gum-roll in a box containing gum or other suitable adhesive substance, in combination with a compressing-head arranged over said roll, and means, substantially as described, connected with the mechanism for conveying the blanks to the folding mechanism, whereby said head is moved down upon the end of the blank to bring the latter in contact with the gum-roll at each forward movement of said conveying mechanism, substantially as and for the purpose set forth.

8. The picker or distributing roll having horisontal reciprocating movements imparted to it in the manner described, and the picker having vertical reciprocating movements, in combination with the blank conveyer or carriage provided with the gripping-finger, and mechanism for operating said carriage and finger, substantially as shown and specified.

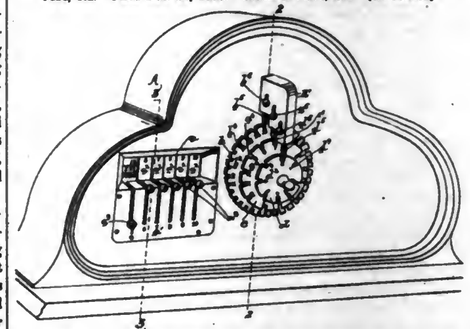
9. The combination of the creasing-die A^3, provided with the adjustable stationary stops 90 90, arranged in front of its opening, with the sliding carriage or conveyer C, provided with the hooks 82', whereby the envelope-blanks are pushed over said stops 90 90 and deposited back of the same under the plunger, and their backward movements thereby controlled, substantially as and for the purpose set forth.

10. The combination of the head 92 and means, substantially as described, for imparting horisontal reciprocating movements thereto crosswise of the drying-chain between the fingers thereof, with said chain and means, substantially as described, for operating the same, whereby the envelopes are pushed laterally from between said fingers, substantially as shown and specified.

11. The combination of the head 92 and means, substantially as described, for imparting forward and back reciprocating movements thereto crosswise of the drying-chain between the fingers thereof to push the envelopes therefrom, with an envelope-receiver interposed between the point of discharging the envelopes from the drying-chain and the counting-box, said receiver having a supporting-plate which is moved forward and back by suitable means to catch the envelopes when delivered from the chain and to discharge the same therefrom into the counting-box, substantially as shown and specified.

12. The reciprocating head 92, having the finger 92' arranged to travel forward and back horizontally crosswise of the drying-chain between the fingers thereof, in combination with said drying-chain, substantially as shown, and for the purpose set forth.

401,468. CALCULATING-MACHINE. EUGENE M. ROSENTHAL, San José, Cal. Filed Dec. 22, 1888. Serial No. 294,388. (No model.)



Claim.—1. In a calculating-machine, independent and separately-rotatable dial-plates provided with suitable numbers previously calculated, said plates being located one behind the other and having suitable openings, d^2, so that the numbers may be seen through said openings, in combination with independent slides on the faces of the case for exposing and concealing the numbers on the dials, substantially as described.

2. In a calculating-machine, and in combination with a case having a sight-aperture in its face, independent and separately-rotatable dial-plates within said case and having a series of numbers thereon adapted by the movement of said plates to be brought into position behind the sight-aperture of the case, said plates having openings through which the numbers on the plates may be seen through the sight-aperture, and vertical slides for exposing and concealing the numbers, substantially as herein described.

3. In a calculating-machine, and in combination with a case having a sight-aperture in its face, the independent and separately-rotatable dial-plates within the case, having the concentric series of previously-calculated numbers upon them, adapted to be brought into position behind the sight-aperture of the case, said plates having openings through which the numbers can be seen, and the independent slides a^3 on the face of the case and controlling its sight-aperture for exposing and concealing the different numbers of the concentric series on the dial-plates, substantially as herein described.

4. In a calculating-machine, the case A, having a sight-aperture in its face, in combination with the independent dial-plates within the case and having the previously-calculated numbers thereon and openings through which they may be seen, the concentric sleeves passing through the face of the case and each carrying a dial-plate, the separate thumb-wheels on the outer ends of the sleeves, whereby the dial-plates may be separately moved, and the independent slides a^3, controlling different portions of the sight-aperture and exposing and concealing the different numbers on the dial-plates, substantially as herein described.

5. In a calculating-machine, the case A, having a sight-aperture in its face, in combination with the independent dial-plates within the case and having the previously-calculated numbers upon them and openings by which the figures on the dial-plates may be seen through the sight-aperture, the concentric sleeves passing through the face of the case and each carrying a dial-plate, the independent thumb-wheels on the outer end of the sleeves, each thumb-wheel having notches, and the vertically-moving spring-actuated pawls over the thumb-wheels engaging the notches therein and controlling said wheels, substantially as herein described.

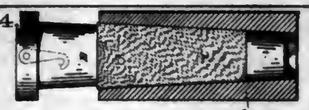
6. A calculating-machine consisting of the combination of the case A, having a sight-aperture, *a*, in its face, the independent dial-plates within the case and having the numbers thereon and openings through which the numbers may be seen through the sight-aperture, the concentric sleeves carrying the dial-plates, the notched and independent thumb-wheels on the outer ends of the sleeves for rotating the dial-plates, the pawls controlling the thumb-wheels, and the independent separate slides a^3, controlling the sight-aperture and exposing and concealing the numbers on the dial-plates, all arranged and adapted to operate substantially as herein described.

401,464. ART OF MANUFACTURING CORN-COB PIPES. AUGUST RUTH, St. Louis, Mo. Filed Aug. 15, 1888. Serial No. 282,770. (No model.)

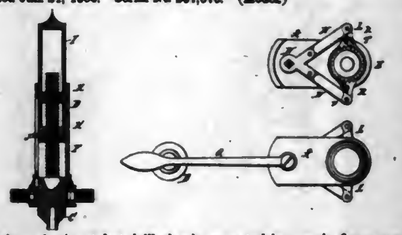
Claim.—1. The improvement in the art of manufacturing corn-cob pipes, consisting in treating the corn-cob to render it pliable, then compressing it, and subsequently boring it to form a pipe-bowl.

2. The improvement in the art of manufacturing corn-cob pipes, consisting in, first, boiling a corn-cob to render it pliable; second, compressing it in a mold, and subsequently boring the compressed cob to form the pipe-bowl.

401,464.



401,465. RATCHET-DRILL. THEODORE N. SCOTT, Brooklyn, N. Y. Filed Jan. 21, 1889. Serial No. 297,070. (Model.)



Claim.—1. A ratchet-drill chuck mounted in a main frame provided with a holding-handle, in combination with independent movable arms bearing pawls and projecting at each side of the drill-chuck, said arms being connected to an operating-hub having a handle secured thereto, substantially as shown and described.

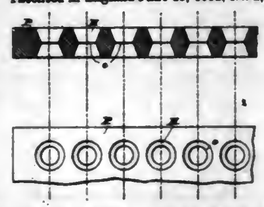
2. The combination, with the drill-chuck bearing a ratchet-wheel, as set forth, of rings encircling said chuck and having projecting arms whereon are pivoted pawls, the extremities of said arms being connected to an operating hub, cam, or shaft, substantially as shown and described.

3. The combination with the main frame and the drill-chuck provided with a screw-threaded stem, of a detachable shell mounted upon the main frame and containing the feeding-tube, substantially as shown and described.

4. The combination, with the feeding-tube having an internal screw-thread wherein the stem of the drill-chuck engages, and an outwardly-projecting pin or screw, of the surrounding shell having a slot through which said pin or screw projects, and a catch for detachably securing said shell to the main frame, substantially as shown and described.

5. A ratchet-drill consisting of a main frame provided with a holding-handle, a drill-chuck whereon is located a ratchet, rings encircling the drill-chuck and bearing arms whereon spring-pawls are pivoted, a hub to which the arms are connected by links, said hub having an operating-handle, a removable shell held to the main frame by a bayonet-catch or its equivalent, and a feeding-tube sliding in said shell, the interior of the feeding-tube being threaded and engaging with the screw-threaded stem of the drill-chuck, the whole combined and arranged to operate substantially as shown and described.

401,466. SECONDARY BATTERY. JOHN S. SELLON, Hatton Gardens, County of Middlesex, England, assignor to The Electrical Accumulator Company, of New York. Filed Apr. 19, 1887. Serial No. 235,425. (No model.) Patented in England June 15, 1882, No. 2,818.



Claim.—In a secondary battery, a plate or support of conducting material containing a series of uniform holes or perforations separated and surrounded by walls or partitions having a double-bevel cross-section so arranged that the areas at the surfaces are substantially equal, but greater than the area at an intermediate plane, in combination with an active material located within such holes or perforations in the form of a series of equal truncated cones or pyramids united at their apices, substantially as described.

401,467. HAY RAKE AND LOADER. JOHN E. SHINN, Bridgman, Mich. Filed Apr. 16, 1888. Serial No. 270,812. (No model.)

Claim.—1. The combination, in a hay rake and loader, of the elevator-frame having the standards E F at its rear end, the rear axle, I, having the driving-wheels, one of which is provided with a gear-wheel, M, the endless elevator arranged in the elevator-frame and having one of its rollers provided with the gear-wheel X outside of the standard E, the wheel D', journaled to the standard E on the outside and meshing with the wheel X, and the lever to raise the said standard, thereby to throw said wheel D' into engagement with the wheel M to revolve the endless elevator, substantially as described.

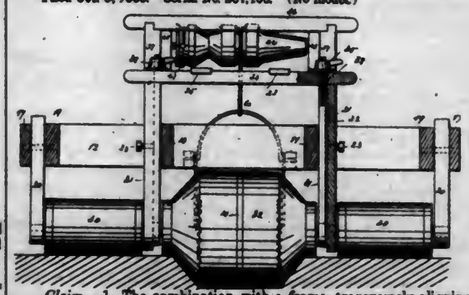
2. The combination, in a hay rake and loader, of the elevator-frame having the standards E F at its rear end, the axle I, from which said frame is suspended by the said standards, the standard E having the vertical slot in its upper end and being thereby adapted to move vertically about the axle, the supporting-wheels journaled to the axle, one of said wheels being provided with the wheel M, the endless elevator having one of its rollers provided with the gear-wheel X, the gear-wheel D', journaled on standard E and engaging wheel X, the lever to raise the standard E and cause wheel D' to engage wheel M, and the plate or key adapted to enter between the upper end of the slot in standard E and the axle I, substantially as described.

3. The combination, in a hay rake and loader, of the rear axle having the supporting-wheels, one of which is provided with gear-wheel M, the elevating-frame having its rear end suspended from the said axle and adapted on one side to be raised and lowered, the endless elevator in the said frame, and the gears to operate the said elevator journaled in the elevator-frame and adapted to engage the wheel M when the elevator-frame is raised and to be disengaged when lowered, substantially as described.

4. The combination of the elevator-frame, the rear axle, I, having the supporting-wheels, one of which has the wheel N, the conveyer arranged at the front end of the elevator and having the operating-pulley G^3, the plate U^3, pivoted to one side of the frame, the geared wheels V^3 and X^3, mounted on the said plate, one of said wheels being adapted to engage the wheel N, the pulley W^3, secured to the wheel V^3, and the endless belt Y^3, connecting said pulley to the pulley G^3, substantially as described.

5. The combination, in a hay rake and loader, of the endless elevator, the rake at the rear end thereof, the revolving shaft X', having the radial arms or teeth arranged between the rake teeth or tines, and the fender-bar A^3, having the pivoted arms B^3 and bearing on the teeth of the revolving shaft in succession, substantially as described.

401,468. CULTIVATOR. HARRISON STAGG, near Valencia, Kans. Filed Oct. 3, 1888. Serial No. 287,108. (No model.)



Claim.—1. The combination, with a frame, transversely-aligning standards secured thereto, and ridge-rollers journaled between the outer and intermediate standards, of bearings held to vertically slide in the contiguous faces of the intermediate standards, and an extensible furrow-roller journaled in said sliding standards, as and for the purpose specified.

2. The combination, with a frame and transversely-aligning standards secured thereto between the outer and intermediate standards,

of bearings held to vertically slide in the contiguous faces of the intermediate standards and an extensible and removable furrow-roller journaled in said sliding bearings, drag-plows detachably pivoted to the frame, a rotary drum connected with the said plow, and a lever connected with said drum, substantially as shown and described.

3. The combination, with a frame and transversely-aligning standards secured thereto between the outer and intermediate standards, of bearings held to vertically slide in the contiguous faces of the intermediate standards and an extensible and removable furrow-roller journaled in said sliding bearings, drag-plows detachably pivoted to the frame and consisting of parallel beams, vertical blades adjustably attached to said beams, triangular shares horizontally extending from the bottom of the blades, and vertical scrapers attached to the face of the blades contiguous to the shares, and means, substantially as shown and described, for elevating the said drag-plows, as and for the purpose specified.

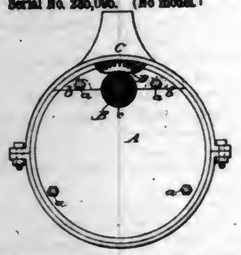
4. In a cultivator, a frame consisting of longitudinal central beams, 10 and 11, the rear transverse beam, 12, the spaced side beams, 17 and 19, the front beam, 13, diagonal brace-beams 18, connecting the side and center beams, vertically and downwardly projecting standards attached to the side beams, 17 and 19, and similar horizontally-aligning standards, 21, secured to the outer faces of the central longitudinal beams, 10 and 11, all combined for operation substantially as shown and described.

5. The combination, with the frame and the horizontally-aligned ridge-rollers journaled thereto, of the separate and independent vertically-adjustable furrow-roller between the ridge-rollers, substantially as set forth.

6. The combination, with the frame and the horizontally-aligned ridge-rollers journaled thereon, of an extensible vertically-adjustable separate and independent furrow-roller between the inner ends of said ridge-rollers, substantially as set forth.

7. In a cultivator, a furrow-roller consisting of two sections, 37 38, the inner end of one section having its inner end reduced or rabbeted to form a tongue, 40, and a recess, 39, in the inner end of the outer section, receiving said tongue, and the intermediate ring fitting on said tongue, the outer faces or peripheries of said sections and ring being flush to present an unbroken surface, substantially as set forth.

401,469. HAND-CAR. VIRGIL A. STASKER, Haines City, Fla. Filed Sept. 10, 1888. Serial No. 285,095. (No model.)



Claim.—1. The combination, in a motor for vehicles, of the lever *g*, connecting-rod *f*, internally-toothed ring or band C, pinion D, and disks A A, all substantially as set forth.

2. The combination, in a motor for vehicles, of the internally-toothed ring or band C, pinion D, and eccentrically-mounted disks A A, all substantially as set forth.

401,470. TRUCK. EDWIN F. STRANGE, Taunton, Mass., assignor of one-half to Elias W. Strange, same place. Filed July 11, 1888. Serial No. 279,633. (No model.)

Claim.—1. A truck-axle formed with an integral cast-metal center having tubes *a a*, united by a bar or bars, *b*, with the insertible journals *c c*, removably secured in said tubes, substantially as specified.

2. A truck-axle formed with the integral cast-metal center having tubes *a a* for the reception of journals *c c*, and the lugs *s*, formed at each end to support the springs, substantially as specified.

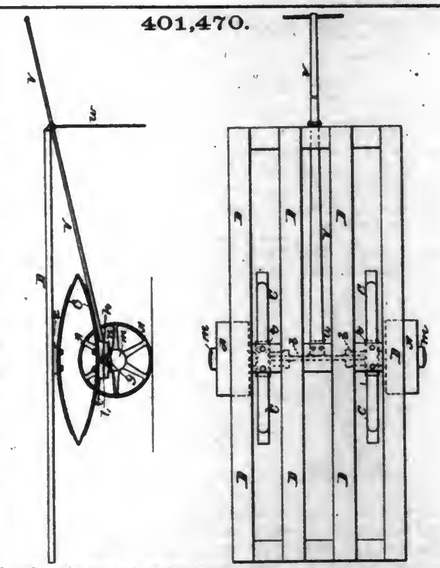
3. A truck-axle formed with the integral cast-metal center having tubes *a a*, to receive journals *c c*, and a lug, *u*, for connection of the draft-bar, substantially as specified.

4. A truck-axle consisting of a unitary cast-metal center having lug *u* for the draft-bar, lugs *s* for the springs, and tubes *a* for the journals *c*, and said journals therein arranged, all substantially as specified.

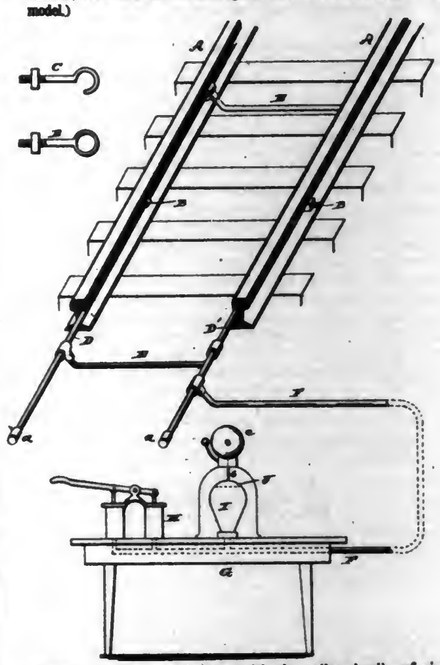
5. The combination, with the cast-metal center of a truck-axle having tubes *a*, of the cylindrical journals *c*, secured in said tubes by set-screws *d*, and formed to be reversed for double duty, as specified.

6. The combination, with wheels A, having metal hubs provided with oil-passages *k*, and the supporting-journals, of boxes *g*, insertible in and removable from said hubs and formed with a chamber or recess, *i*, and perforations *j*, leading from said recess *i* to the journals, substantially as specified.

401,470.



401,471. PNEUMATIC ALARM FOR RAILWAYS. THEODORE TAYLOR, Cedarville, Cal. Filed Aug. 27, 1888. Serial No. 283,919. (No model.)



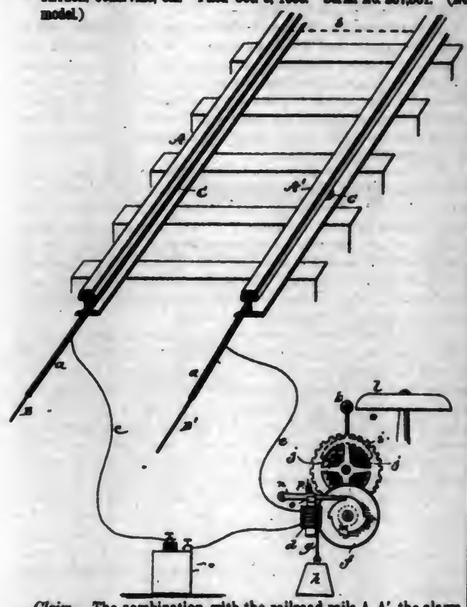
Claim.—1. The combination, with the railroad-rails, of pipes secured to the several rails parallel therewith, a pump for filling the pipes with compressed air or for exhausting the air therefrom, as the case may be, and a signal or indicator operated by the breaking of a rail and the pipe connected therewith.

2. The combination, with the railroad-rails, of pipes secured to the rails parallel therewith, an air-pump for charging the pipes with compressed air, a flexible bulb held expanded by the compressed air in the pipe, and a signal actuated by the collapse of the bulb caused by the breaking of a rail and the pipe connected therewith, substantially as set forth.

3. The combination, with the alarm, of a compressible bulb, a weight supported thereby and holding the alarm locked until the air escapes from the bulb, substantially as set forth.

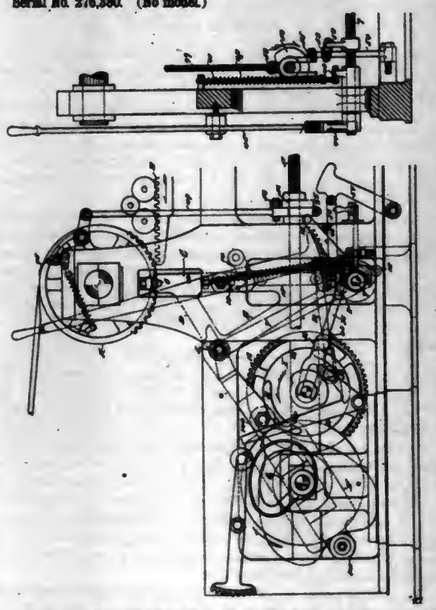
4. In a pneumatic railway-track alarm, the combination, with the pipes D D', extending along the track-rails A, of the flexible bulb I, the weight J, and the alarm-bell *c*, substantially as specified.

401,472. ELECTRIC RAILWAY-TRACK ALARM. THEODORE TAYLOR, Cedarville, Cal. Filed Oct. 6, 1888. Serial No. 287,501. (No model.)



Claim.—The combination, with the railroad-rails A A', the alarm apparatus, and an electric generator, of the insulated electric conductor B B', extending alongside and between the rails, and the hooks C, which pass through said rails and secure the conductors to the side thereof, all as shown and described.

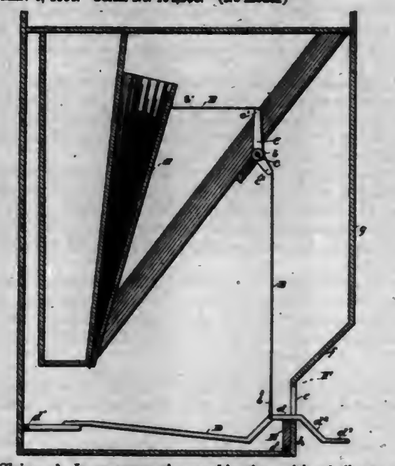
401,473. STOP MECHANISM FOR CYLINDER PRINTING-MACHINES. STEPHEN D. TUCKER, New York, N. Y. Filed June 7, 1888. Serial No. 276,360. (No model.)



Claim.—1. The combination, with the cylinder and its stop mechanism, of the rock-shaft 9, for automatically throwing the stop mechanism into and out of operation, and having a rocking motion beyond the points necessary to connect and disconnect the stop mechanism, and a clutch mechanism for connecting and disconnecting the shaft, one member of which is normally held beyond the limit of the movement of the other part when the two are disconnected, substantially as described.

2. The combination, with the cylinder and its gear A, of the catch-lever, the cam-bar for operating the lever, the coupling-bar, rock-shaft 9 and cam 10, for operating the cam-bar, the clutch upon the shaft 9, and connections, substantially such as described, for rocking the shaft 9 at each alternate reciprocation of the bed, the arm 40, secured to the shaft, the spring 42, acting upon the arm 40 to hold the shaft in either position to which it is rocked, and the stops 43, for limiting the movement of the shaft, which are arranged to permit the shaft to be rocked in either direction slightly beyond the position which will permit the two members of the clutch to engage, substantially as described.

401,474. ORGAN. ORMUS G. WHITNEY, Cleveland, Ohio. Filed Mar. 6, 1886. Serial No. 194,288. (No model.)



Claim.—1. In an organ, the combination, with a bellows and a pedal having a free swinging forward extremity, of a rocking lever having its upper arm longer than its lower arm, a connection between said long upper arm and the bellows, and a connection between said short lower arm and said pedal, substantially as set forth.

2. In an organ, the combination, with a bellows and a pedal having its rear extremity pivoted within the case and its forward extremity projecting from the latter, of a rocking lever having its upper arm longer than its lower arm, a connection between said long upper arm and the bellows, and a connection between said short lower arm and the pedal at a point on the latter intermediate of its pivotal rear extremity and its free swinging forward extremity, substantially as set forth.

3. In an organ, the combination, with a bellows and a pedal, of a band connecting said two parts, and a two-arm rocking lever over the arms of which said band passes intermediate of the pedal and bellows, said rocking lever having its upper arm of greater length than its lower arm, substantially as set forth.

4. In an organ, a pedal having the double-crank formation, for the purpose and substantially as set forth.

5. The combination, with the front wall of an organ-case, having slot *e*, of a pedal, D, having a double-crank formation, the horizontal section *d* of which fits in said slot and works therein, substantially as set forth.

6. The combination, with an organ-case having its front wall provided with a pedal-slot and a pedal hinged within said case and working in said slot, of an automatic mouse-guard which covers that portion of the slot not filled by the pedal when the latter is at rest, substantially as set forth.

7. The combination, with a pedal and an organ-case having slot, of a spring-pressed mouse-guard for said slot, substantially as set forth.

8. The combination, with pedal D and organ-case provided with slot *e*, of guard E and spring e^4, substantially as set forth.

9. An organ-case having its front wall below the key-board formed with the recess F in its lower portion, said recess extending to the plane of the lower side of the organ-case floor, substantially as set forth.

10. An organ-case having its front wall located below the key-board formed with the vertical section *f*, the inwardly-inclined sec-

tion *g*, extending below the latter, and the vertical section *h*, extending below said inclined section, substantially as set forth.

401,475. HEATING ATTACHMENT FOR LAMPS. JOHN W. ZINN, Hawthorne, Fla. Filed July 12, 1888. Serial No. 279,776. (No model.)



Claim.—1. A heating attachment for lamps, consisting, essentially, of a base adapted to encircle the lamp-chimney and be supported thereon, and a series of arms or uprights hinged to the base and extending above the chimney-top, substantially as shown and described.

2. The combination, with the base adapted to encircle the lamp-chimney and be supported thereon, of a series of arms hinged to the base and extended above the lamp-chimney, each provided with a stop projection at the lower end for limiting the downward movement of the said arms, substantially as described.

3. The combination, with the base adapted to encircle the lamp and be supported thereon, of a series of arms hinged to the lower edge of the base and extended above the lamp-chimney, said arms provided with catches adapted to engage the upper edges of the base, whereby said arms are held in a raised position, substantially as shown and described.

4. The combination, with the base adapted to encircle a lamp-chimney, of arms hinged to said base and divided at their upper ends, the said divided portions being bent in opposite directions, forming hooks for suspending the device from the top of the chimney, and supports for a vessel, substantially as described.

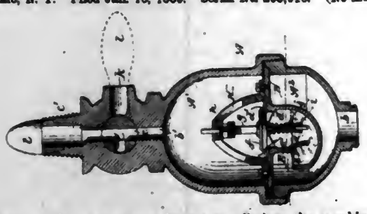
401,476. PICKING-THIMBLE FOR MUSICAL INSTRUMENTS. NORMAN E. BARNES, Bay Shore, N. Y. Filed Sept. 27, 1888. Serial No. 286,561. (No model.)



Claim.—1. A picking-thimble for stringed musical instruments, formed with a tubular portion to fit over the end of a finger, a projection inclined downward over one end of the tubular portion and having an interior surface adapted to rest against the end of the finger, with a bent rounded point projecting lengthwise with the tubular portion, substantially as described.

2. A picking-thimble for stringed musical instruments, consisting of the split tubular portion 2, adapted to be slipped over the end of a finger, and having the inclined concave projection 3, with the rounded point 4, beat in the direction of the length of the tubular portion 2, substantially as shown and described.

401,477. CYLINDER RELIEF-VALVE. ALEXANDER M. BARNUM, Buffalo, N. Y. Filed Jan. 10, 1889. Serial No. 296,910. (No model.)



Claim.—1. In a steam-trap for steam-cylinders, the combination, with a casing having an inlet-passage communicating with the steam-cylinder and with a discharge-opening, of an automatic valve arranged in said discharge-opening and closed against its seat by the pressure of the steam in the cylinder, a spring whereby said valve is opened when the steam-pressure is removed therefrom, and an air-trap receiving the water of condensation passing through said discharge, and whereby the exterior atmosphere is excluded from the steam-cylinder, substantially as set forth.

2. In a steam-trap for steam-cylinders, the combination, with a casing communicating with the steam-cylinder and provided with a discharge-opening, of a diaphragm arranged within said casing and having a central opening, an automatic valve applied to said opening and closed against the same by the pressure of the steam in the cylinder, a spring whereby said valve is lifted from its seat to clear said opening when the valve is relieved from the steam-pressure, and an air-trap attached to the under side of said diaphragm and receiving the water of condensation passing through the opening in the diaphragm, substantially as set forth.

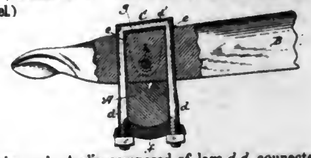
3. In a steam-trap for steam-cylinders, the combination, with a casing having inlet and discharge passages, of a diaphragm, D, arranged in said casing and having an opening, *d*, a valve *f*, adapted to close said opening and provided with a stem, *g*, a bridge-tree, H, secured to the upper side of the diaphragm in which said stem is guided, a spring, *j*, bearing against the under side of said valve, and the air-trap E, attached to the under side of said diaphragm below the opening *d*, substantially as set forth.

4. In a steam-trap for steam-cylinders, the combination, with a casing having inlet and discharge passages and composed of two parts, A′ A², united by a screw-thread, of a diaphragm, D, arranged in said casing clamped between the parts A′ A², and having an opening, *d*, a valve, *f*, adapted to close said opening and provided with a stem, *g*, a bridge-tree, H, secured to the upper side of the diaphragm in which said stem is guided, a spring, *j*, bearing against the under side of said valve, and the air-trap E, attached to the under side of said diaphragm below the opening *d*, substantially as set forth.

5. In a steam-trap for steam-cylinders, the combination, with a casing having an inlet-passage communicating with the steam-cylinder and with a discharge-opening, of a stop-cock arranged in said inlet-passage, an automatic valve arranged in said discharge-opening and closed against its seat by the pressure of the steam in the cylinder, a spring whereby said valve is opened when the steam-pressure is removed therefrom, and an air-trap receiving the water of condensation passing through said discharge, and whereby the exterior atmosphere is excluded from the steam-cylinder, substantially as set forth.

6. In a steam-trap for steam-cylinders, the combination, with the casing A, having an inlet-passage, *b*′, and discharge-passage *b*, of the three-way cock C, arranged in the inlet-passage *b*′, and having a discharge-nozzle, *k*, the diaphragm D, having the opening *d*, the automatic valve *f*, closing said opening, and the spring *j*, substantially as set forth.

401,478. WAGON-CLIP. JAMES R. BAYNES and CHARLES A. HENNICKE, Buffalo, N. Y. Filed Dec. 18, 1888. Serial No. 293,966. (No model.)



Claim.—1. A clip composed of legs *d d*, connected by a cross-bar, *d*′, a tie-bar, *f*, and a curved strengthening-plate, *g*, arranged at right angles to the cross-bar *d*′, substantially as set forth.

2. The combination, with a side bar and a bolster or axle, of a clip, C, connecting said parts and consisting of legs *d d*, connected by a cross-bar, *d*′, and passing through openings in the side bar and straddling the bolster or axle, a tie-bar, *f*, and a strengthening-plate, *g*, embracing and clamping the side bar, and arranged at right angles to the connecting-bar *d*′, substantially as set forth.

3. The combination, with a side bar and a bolster or axle, of a clip, C, connecting said parts and consisting of legs *d d*, connected by a cross-bar, *d*′, and passing through openings in the side bar and straddling the bolster or axle, a tie-bar, *f*, a strengthening-plate, *g*, embracing the side bar and arranged at right angles to the connecting-bar *d*′, and a horizontal fastening rivet or bolt, A, passing through the end portions of the plate *g* and through the side bar, substantially as set forth.

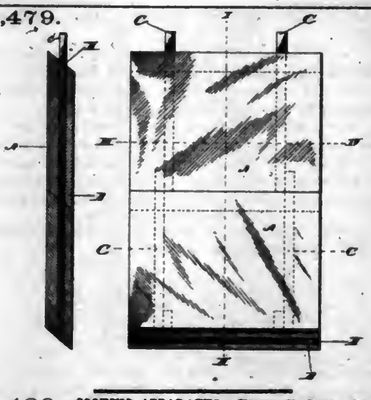
401,479. FLOORING-BLOCK. WILHELM BÜELLING, Berlin, Germany. Filed Oct. 8, 1887. Serial No. 251,851. (No specimens.) Patented in Germany Feb. 19, 1886, No. 36,471, and in England June 2, 1887, No. 7,966.

Claim.—1. A flooring-block formed of an upper plate, an under plate, intervening cross-battens, and a filling of pitch or asphalt between the said plates, substantially as and for the purposes described.

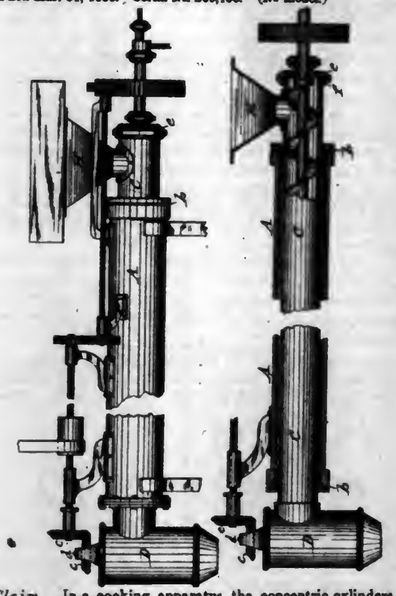
2. The flooring-blocks, each of which consists of an upper plate, A, and under plate, B, and cross-battens C, and a filling of pitch or asphalt between the plates, said plates being formed so that plates in one block overlap corresponding plates in an adjoining block, substantially as set forth and described.

3. A flooring-block consisting of upper and under plates, A and B, battens C, extending beyond the edge of plate A, and a filling of pitch or asphalt between the plates, substantially as described.

401,479.

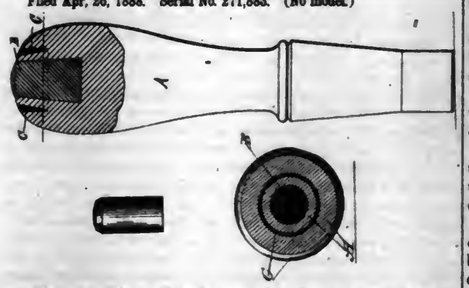


401,480. COOKING APPARATUS. HENRY H. BOSES, Syracuse, N. Y., assignor to the Hemingway Manufacturing Company, same place. Filed Mar. 31, 1888. Serial No. 269,153. (No model.)



Claim.—In a cooking apparatus, the concentric cylinders, arranged one within the other, the ends of the inner cylinder projecting through the heads of the outer cylinder, the interposed packed joints at each end of the outer cylinder, and the screw-threaded cap on one end of the inner cylinder, in combination with the screw-shafts and beveled gearing by which the same are operated, whereby the free expansion and contraction of the respective cylinders are provided for, substantially as and for the purpose set forth.

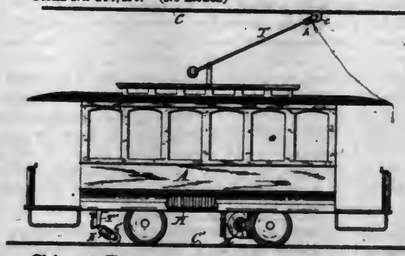
401,481. TOOL-HANDLE. GEORGE CARLISLE, Attleborough, Mass. Filed Apr. 26, 1888. Serial No. 271,883. (No model.)



Claim.—1. The tip B, of horn or other durable material, having greater cross-section at its base than at its top, combined with a handle, A, and binding ring or collar C, said tip being nearly concealed within said handle and rigidly secured therein by compression of a portion of the encompassing material of the handle.

2. In a tool-handle, the described tip composed of horn or other durable material and having a plane base of greater cross-section than the top of the tip, combined with a handle, A, of greater diameter than the tip, said tip being, as shown and described, nearly concealed in said handle and rigidly secured therein by compression of a portion of the immediately-surrounding material of the handle.

401,482. ELECTRIC-HEATING APPARATUS FOR RAILWAY SYSTEMS. MARK W. DEWEY, Syracuse, N. Y., assignor of two-thirds to Emil Lean and Charles H. Duell, same place. Filed Jan. 25, 1889. Serial No. 297,490. (No model.)



Claim.—1. The combination, with an electrically-propelled vehicle receiving its current from stationary supply-conductors along the path of the vehicle, and a conductor on the vehicle having its terminals connected with movable contacts on said stationary conductors, of an electric-heating device carried on the vehicle in contact with or in proximity to one of said stationary conductors, for the purpose set forth.

2. The combination, with an electrically-propelled vehicle receiving a continuous current from stationary supply-conductors along the path of the vehicle and a conductor on the vehicle having its terminals connected with movable contacts on said stationary conductors, of a continuity-preserving-current pole-changer operated by the electric motor propelling the vehicle and in circuit with said motor, a portion of the vehicle-conductor having its current therein alternated by the pole-changer, a transformer having its primary coil in circuit with the portion of the conductor wherein the current is alternated and its secondary coil in circuit with a heating device, and a device for cutting out or in the said heating device, as set forth.

3. In combination with an electrically-propelled vehicle receiving a continuous current from stationary supply-conductors along the path of the vehicle and a conductor on the vehicle having its terminals connected with movable contacts on said stationary conductor, two or more suitable electric-heating devices in series and a shunt containing a making and breaking device around each of said heating devices, as set forth.

4. In combination with an electrically-propelled vehicle, the supply-conductor on the vehicle, an electric-heating device connected with said supply-conductor, and a direct low-resistance shunt-path for the current around said heating device containing a circuit maker and breaker.

5. The combination, with an electrically-propelled vehicle and the supply-conductors and motor thereon, of a continuity-preserving-current pole-changer operated by the electric motor propelling the vehicle and in circuit with said motor, a portion of the vehicle-conductor having its current therein alternated by the pole-changer, a transformer having its primary coil in circuit with the portion of the conductor wherein the current is alternated and its secondary coil in circuit with a heating device, and a device for cutting out or in the said heating device, as set forth.

6. The combination of a movable vehicle, a stationary electric conductor along the path of said vehicle, and a suitable heating device supported on the vehicle in contact with or in close proximity to said stationary conductor.

7. The combination, with a movable contact or trolley of an electrically-propelled vehicle, of an electric-heating device on said movable contact or trolley, for the purpose of heating the same.

8. The combination, with a movable contact or trolley of an electrically-propelled vehicle, of a suitable heating device carried by said trolley in contact with or in proximity to a stationary supply-conductor, as set forth.

9. An electric-heating device consisting of a thin strip of metal coiled or formed spirally, a divided core of metal within the said heating device, means for connecting and disconnecting the parts of the core to shunt the heating device, and a suitable shield or case enveloping said device, as set forth.

10. The combination, with a vehicle, stationary electric supply-

conductors along the path of said vehicle, a source of continuous current connected thereto, and a conductor on the vehicle having its terminals connected with movable contacts on said stationary supply-conductors, of a continuity-preserving-current pole-changer and an electric motor for operating the same both upon the vehicle and in circuit with the vehicle-conductor, a portion of the vehicle-conductor having its current therein alternated by the pole-changer, a transformer having its primary coil in circuit with a portion of the conductor wherein the current is alternated and its secondary coil in circuit with a heating device, and means for cutting out the said heating device, as set forth.

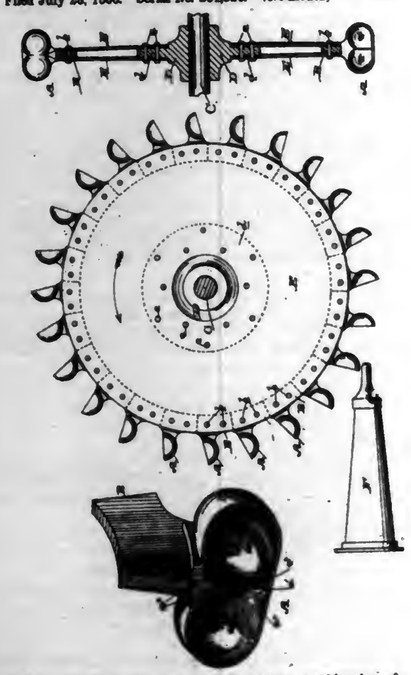
11. The combination, with an electrically-propelled vehicle receiving a continuous current from stationary supply-conductors along the path of the vehicle and a conductor on the vehicle having its terminals connected with movable contacts on said stationary conductors, of a continuity-preserving-current pole-changer operated by the electric motor propelling the vehicle and in circuit with said motor, a portion of the vehicle-conductor having its current therein alternated by the pole-changer, a transformer having its primary coil in circuit with the portion of the conductor wherein the current is alternated and its secondary coil in circuit with a heating device, means for cutting out the said heating device, and suitable means also on the vehicle for throwing the motor out of gear with the driving-axle of the vehicle, so that the motor may operate the pole-changer when the vehicle is at rest, as set forth.

401,483. CRIMSON DYE. THEODOR DIEHL, Mannheim, Germany, assignor to G. C. Zimmer, same place. Filed Oct. 6, 1888. Serial No. 287,396. (No specimens.)

Claim.—1. The process of obtaining a compound that yields coloring-matter when subjected to the action of phenols, amines, or other sulpho or carbon acids, which consists in combining one molecule of beta-phenylnaphthylamine monosulpho-acid with one molecule of a tetrazo salt, substantially as herein set forth.

2. The process of obtaining coloring-matter that dies unmordanted cotton directly, which consists in first combining one molecule of beta-phenylnaphthylamine monosulpho-acid with one molecule of a tetrazo salt and afterward subjecting the obtained product of said combination to the action of phenols, amines, or other sulpho or carbon acids, substantially as herein set forth.

401,484. WATER-WHEEL. WILLIS G. DODD, San Francisco, Cal. Filed July 28, 1888. Serial No. 281,326. (No model.)

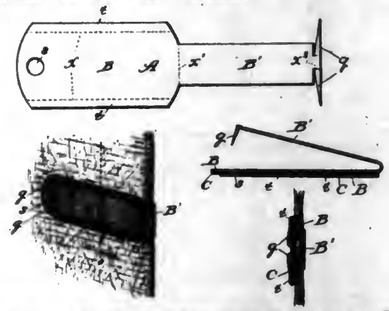


Claim.—1. A water-wheel consisting of the combination of a hub having a central encircling flange, annular separated disks secured to the flange of the hub, and buckets formed with two pockets side by side, having hemispherically-concaved faces separated by a central division-wall for receiving and splitting the stream, said buckets having flanges secured between the outer edges of the disks, substantially as described.

2. A water-wheel consisting of the combination of a hub having a central encircling flange, annular separated disks secured to the flange of the hub, and buckets having flanges secured between the outer edges of the disks, substantially as herein described.

3. A water-wheel consisting of the combination of a hub having a central encircling flange, annular separated disks secured to the flange of the hub, and buckets with flanges seated and secured between the outer edges of the disks, said flanges abutting against each other and forming a continuous ring, substantially as herein described.

401,485. TAG. CHARLES O. DOWST, Waukegan, Ill. Filed Sept. 28, 1888. Serial No. 286,634. (No model.)

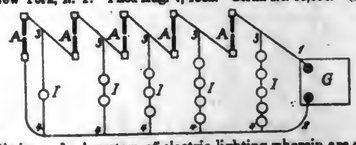


Claim.—1. In a tag, the combination of the body portion B and a strip of cloth, C, on one side of the body portion and secured thereon by the bent edges *t*, substantially as described.

2. A tag comprising, in combination, a body portion, B, having an opening, *s*, a strip of cloth, C, secured on the body portion, and a bent extension, B', having a fastener, *q*, at one end adapted to pass through the opening *s*, substantially as described.

3. A tag comprising, in combination, a body portion, B, having an opening, *s*, a strip of cloth, C, on one side of the body portion and secured thereon by the bent edges *t* thereof, and a bent extension, B', having a fastener, *q*, at one end adapted to pass through the opening *s*, substantially as described.

401,486. SYSTEM OF ELECTRIC LIGHTING. THOMAS A. EDISON, Menlo Park, N. J., assignor to the Edison Electric Light Company, New York, N. Y. Filed Aug. 7, 1882. Serial No. 68,658. (No model.)



Claim.—1. A system of electric lighting wherein are combined arc lamps arranged in series and incandescing electric lamps connected with the arc-lamp circuit and shunting one or more of the arc lamps, the shunt circuit or circuits being taken around less than the total number of arc lamps in circuit, substantially as set forth.

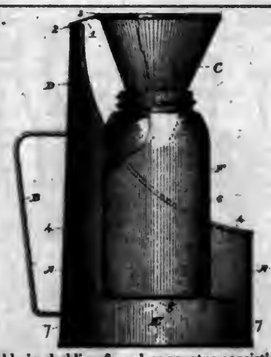
2. In a system of electric lighting, the combination of a circuit containing arc lamps arranged in series with a number of cross or multiple-arc circuits taken from different points between the arc lamps and incandescent electric lamps located in said independent cross-circuits and adjusted by number and capacity for the different electromotive forces existing at said several cross-circuits, substantially as set forth.

401,487. JAR-HOLDING-FUNNEL APPARATUS. MOLLIE ELLIS, Bardstown, Ky. Filed June 11, 1888. Serial No. 276,676. (No model.)

Claim.—1. A portable jar-holding-funnel apparatus consisting of the cup having at the back a handle and a standard fastened to said cup, leaving sufficient open space in front of said handle and standard above the front retaining-wall of the cup to expose the jar below the shoulder, and the movable funnel loosely connected in use with the said cup through said standard, substantially as described.

2. A portable jar-holding-funnel apparatus consisting of the cup having at the back a handle and a standard fastened to said cup, leaving sufficient open space in front of said handle and standard to expose the jar below the shoulder, and the movable funnel loosely connected in use with said cup through said standard, said apparatus being provided with a portion extending beyond the jar below the bottom of the funnel for catching any overflow, and with wings spread out on both sides of said handle partially around the jar, substantially as described.

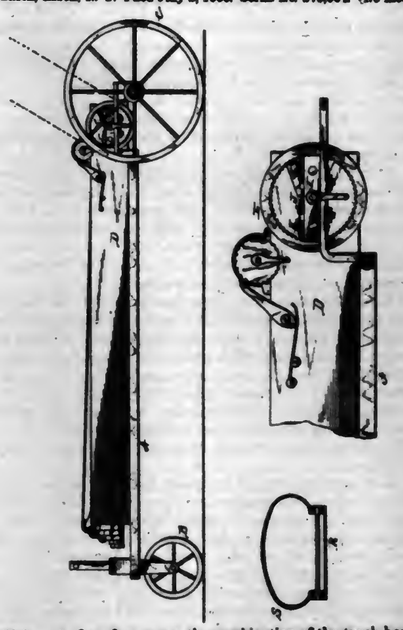
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3. A portable jar-holding-funnel apparatus consisting of the cup having at the back an upright extension, forming a standard broad at the base and diminishing in width upward, with sloping edges, which merge into and make a continuation of the top edge of the front of the cup, the handle fastened behind the said upright extension, and the movable funnel loosely connected with the top thereof, substantially as described.

4. The combination, with the jar-holding-funnel apparatus composed of the cup having at the back a handle and a standard fastened to said cup, leaving sufficient open space in front of said handle and standard above the front retaining-wall of the cup to expose the jar below the shoulder, and the movable funnel loosely connected with the cup through said standard, of the removable false bottom having underlying supports which rest on the bottom of the cup and a hole in said false bottom, substantially as described.

401,488. FIRE-ESCAPE LADDER AND TRUCK. AUGUSTUS FREDERICK, Essex, N. Y. Filed July 2, 1888. Serial No. 278,804. (No model.)

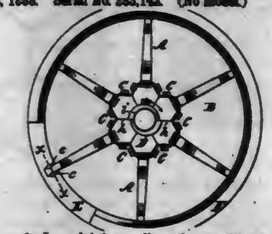


Claim.—1. In a fire-escape, the combination of the truck having two wheels at its front end and a single central wheel at its rear end, the nest of extensible ladders disposed within said truck, the internally-toothed wheel secured to the end of the lower one of said ladders, the crank-shaft having a gear-wheel, and the intermediate gear-wheels located within said internally-toothed wheel, substantially as described.

2. The combination, with the truck, of the nest of ladders herein described, the internally-toothed wheel secured to the end of the lower one of said ladders, the crank-shaft having a gear-wheel, and the intermediate gear-wheels located within said internally-toothed wheel, all constructed and arranged substantially as described.

3. As an improvement in fire-escapes, the ladder having a fire-proof shield or tube secured to the outer side thereof, and the flat shield attached to the inner side of said ladder, substantially as described.

401,489. PULLEY. HENRY J. GILBERT, Saginaw, Mich. Filed Aug. 18, 1888. Serial No. 283,142. (No model.)

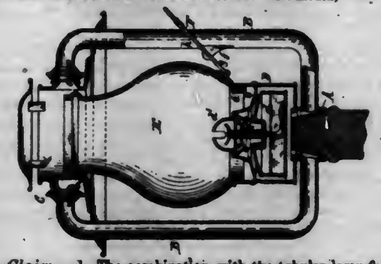


Claim.—1. In a driving-pulley, the combination, with the rim provided with openings for the spoke-tenons, of the spokes having their outer ends beveled relatively to a line through the axis of the pulley to permit their ready adjustment in said rim, substantially as described.

2. In a driving-pulley, the combination, with the rim provided with tapering bores or openings for the spoke-tenons, of the spokes, having their outer ends beveled relatively to a line through the axis of the pulley, and having their tenons provided on their sides with tapering grooves, and wedges adapted to be driven in the openings formed by said grooves and the sides of the bores, substantially as and for the purpose described.

3. In a separable pulley, the combination, with the two-part rim E, provided on its inner surface near each of its two joints with the inclined bores *d*, connected by the grooves *e*, of the metal keys or tie-bars *f*, shaped to conform to said bores and grooves and arranged to be secured therein, substantially as and for the purpose described.

401,490. TUBULAR LANTERN. ELIAS C. GLASIER, Rochester, N. Y., assignor to the Steam Gauge and Lantern Company, same place. Filed June 13, 1887. Serial No. 241,150. (No model.)



Claim.—1. The combination, with the tubular lamp-frame and the globe made vertically movable therein, of a spring lifting-lever pivoted to one of the side tubes and springing over the convex side of the tube to lock the globe in its raised position, substantially as set forth.

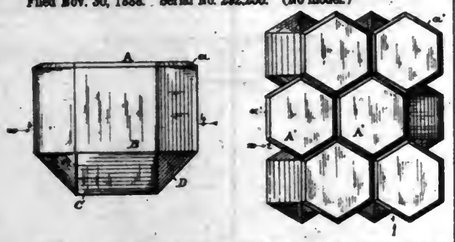
2. The combination, with the tubular lamp-frame, of a removable air-chamber, D, containing the oil-pot and burner, a loose vertically-movable globe, E, resting on said air-chamber, a guide-link pivoted to the tubular frame, and a globe-supporting hook hung to the inner end of the guide-link and extending under the bottom edge of the globe and upwardly on the inner side thereof, said hook entering within the rim of the air-chamber when the globe is seated thereon, substantially as set forth.

401,491. NECKTIE-FASTENER. WILLIAM H. GLENN, Boston, Mass. Filed Jan. 17, 1889. Serial No. 296,627. (No model.)



Claim.—The holder B, comprising the body *b*, provided with the ears *d*, horizontal portions *f*, groove *i*, and hooks *l*, and an attaching-pin on said body for securing it to the necktie, substantially as described.

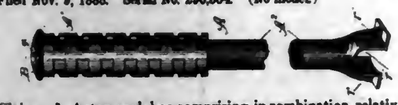
401,492. PAVING-BLOCK. GEORGE M. GRAHAM, Cleveland, Ohio. Filed Nov. 30, 1888. Serial No. 292,255. (No model.)



Claim.—1. As a new article of building material, blocks of artificial stone with two opposite sides analogously formed and the other two inversely, the horizontal and vertical profiles of said sides having extensions and depressions of hexagonal prismoids, the face side thereof being grooved to resemble said prismoids, substantially as shown, and for the purpose described.

2. An artificial-stone block consisting of a prismoid having six square vertical sides, a flat face with broken edges, and an under side beveled to an edge of opposite corners, substantially as shown, and for the purpose described.

401,493. STOP-COCK BOX. PHILIP H. GUNDERMANN, Chicago, Ill. Filed Nov. 9, 1888. Serial No. 290,354. (No model.)



Claim.—1. A stop-cock box comprising, in combination, relatively-extensible sections A′ and A^2, the upper section, A′, having on its inner surface one or more longitudinal grooves, *t*, annular grooves *s*, communicating with the grooves *t*, and sockets *s′*, extending upward from the annular grooves, and the lower section, A^2, extending into the section A′, and having one or more plugs, *p*, on its outer surface, to enter the grooves *t* and *s* and sockets *s′*, substantially as and for the purpose set forth.

2. A stop-cock box comprising, in combination, relatively-extensible sections A′ and A^2, the upper section, A′, having on its inner surface one or more longitudinal grooves, *t*, annular grooves *s*, communicating with the grooves *t*, and sockets *s′*, extending upward from the annular grooves, and having a head, B, integral with the section A′, and provided with an opening, a removable cover, *q*, for the opening, having a lip, *q′*, and a latch, q^2, to engage with the under side of the head B, respectively, at opposite sides of the opening, and the lower section, A^2, extending into the section A′, and having one or more lugs, *p*, on its outer surface, to enter the grooves *t* and *s* and sockets *s′*, substantially as and for the purpose set forth.

401,494. DEVICE FOR EXTINGUISHING FIRES IN PASSENGER-CARS. SAMUEL H. HARRINGTON, Columbus, Ohio. Filed Feb. 19, 1887. Serial No. 228,274. (No model.)

Claim.—1. The combination of a water-tank having an opening leading into a car-heater closed by a valve, mechanism adapted to open said tank-valve, a compressed-air motor actuating the valve-opening mechanism, a pipe leading from the air-brake system to said motor, a valve closing said pipe or conduit, and a tripping rod or device adapted to open said valve in the event of the derailment of the train, all substantially as and for the purpose specified.

2. The combination of a water-tank having an opening leading into a car-heater closed by a valve, mechanism adapted to open said tank-valve, a compressed-air motor actuating the valve-opening mechanism, a pipe leading from the air-brake system to said motor, a valve closing said pipe or conduit, a reservoir situated between the air-brake system and the said valve, having a valve arranged, as specified, to prevent the exhaustion of the air when the brakes are set, and a tripping rod or device adapted to open said valve in the event of the derailment of the train, all substantially as and for the purpose specified.

3. The combination of a water-tank having an opening leading into a car-heater closed by a valve, mechanism adapted to open said tank-valve, a compressed-air motor actuating the valve-opening mechanism and having an opening situated so as to permit the free egress of the air when its movement is completed, a pipe leading from the air-brake system to said motor, a valve closing said pipe or conduit, and a tripping rod or device adapted to open said valve in the event of the derailment of the train, all substantially as and for the purpose specified.

4. The combination of a water-tank having an opening leading into a car-heater closed by a valve, mechanism adapted to open said tank-valve, a compressed-air motor actuating the valve-opening mechanism, and having an opening situated so as to permit the free egress of the air when its movement is completed, a pipe leading from the air-brake system to said motor, a valve closing said pipe or conduit, a reservoir situated between the air-brake system and the said valve, having a valve arranged as specified, to prevent the exhaustion of the air when the brakes are set, and a tripping rod or device adapted to open said valve in the event of the derailment of the train, all substantially as and for the purpose specified.

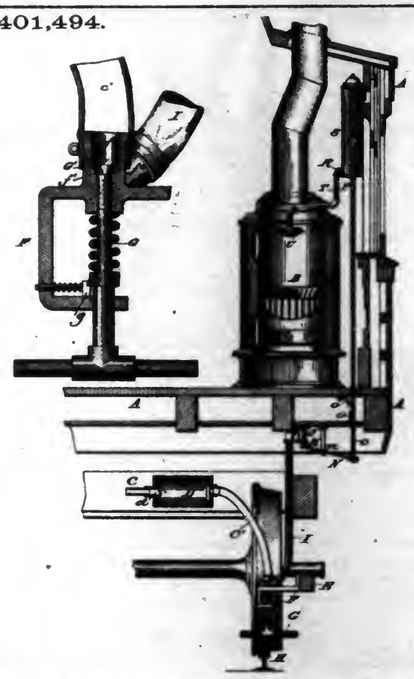
5. In a fire-extinguishing apparatus for railway-cars, the combination of the air-brake system with a conduit leading to a compressed-air motor and closed by a valve, a tripping-arm resting on a bracket secured to the equalizing-bar of the car-truck and arranged to open said valve in case of derailment, a water-tank closed by a valve, and mechanism connecting the motor and the valve of the water-tank, substantially as and for the purpose specified.

6. In a fire-extinguishing apparatus for railway-cars, the combination of the air-brake system with a conduit leading to a compressed-air motor and closed by a valve, said conduit being provided with a reservoir having a valve which permits air to pass from it only in a direction away from the brake system, a tripping-arm resting on a bracket secured to the equalizing-bar of the car-truck and arranged in case of derailment to open the valve which closes the conduit, a water-tank closed by a valve, and mechanism connecting the motor and the valve of the water-tank, substantially as and for the purpose specified.

7. In combination with a conduit leading from the air-brake system, a valve closing the same, a tripping-arm arranged to open said valve in case of derailment, a cylinder connected to said conduit and secured to the car-body and having an opening in its lower side, a piston moving in said cylinder, a water-tank connected with a car-heater by a conduit closed by a valve, and mechanism connecting said valve and said piston, substantially as specified, so that the operation of the tripping-rod first opens the valve of the water-tank, and then allows the air to escape from the air-brake system.

8. In combination with a conduit leading from the air-brake system, a reservoir situated in said conduit having a valve which permits the air to pass from it only in the direction away from the air-brake system, a valve closing the same, a tripping-arm arranged to open said valve in case of derailment, a cylinder connected to said conduit and secured to the car-body and having an opening in its lower side, a piston moving in said cylinder, a water-tank connected with a car-heater by a conduit closed by a valve, and mechanism connecting said valve and said piston, substantially as specified, so that the operation of the tripping-rod first opens the valve of the water-tank, and then allows the air to escape from the air-brake system.

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anism, and having an opening situated so as to permit the free egress of the air when its movement is completed, a pipe leading from the air-brake system to said motor, a valve closing said pipe or conduit, a reservoir situated between the air-brake system and the said valve, having a valve arranged as specified, to prevent the exhaustion of the air when the brakes are set, and a tripping rod or device adapted to open said valve in the event of the derailment of the train, all substantially as and for the purpose specified.

5. In a fire-extinguishing apparatus for railway-cars, the combination of the air-brake system with a conduit leading to a compressed-air motor and closed by a valve, a tripping-arm resting on a bracket secured to the equalizing-bar of the car-truck and arranged to open said valve in case of derailment, a water-tank closed by a valve, and mechanism connecting the motor and the valve of the water-tank, substantially as and for the purpose specified.

6. In a fire-extinguishing apparatus for railway-cars, the combination of the air-brake system with a conduit leading to a compressed-air motor and closed by a valve, said conduit being provided with a reservoir having a valve which permits air to pass from it only in a direction away from the brake system, a tripping-arm resting on a bracket secured to the equalizing-bar of the car-truck and arranged in case of derailment to open the valve which closes the conduit, a water-tank closed by a valve, and mechanism connecting the motor and the valve of the water-tank, substantially as and for the purpose specified.

7. In combination with a conduit leading from the air-brake system, a valve closing the same, a tripping-arm arranged to open said valve in case of derailment, a cylinder connected to said conduit and secured to the car-body and having an opening in its lower side, a piston moving in said cylinder, a water-tank connected with a car-heater by a conduit closed by a valve, and mechanism connecting said valve and said piston, substantially as specified, so that the operation of the tripping-rod first opens the valve of the water-tank, and then allows the air to escape from the air-brake system.

8. In combination with a conduit leading from the air-brake system, a reservoir situated in said conduit having a valve which permits the air to pass from it only in the direction away from the air-brake system, a valve closing the same, a tripping-arm arranged to open said valve in case of derailment, a cylinder connected to said conduit and secured to the car-body and having an opening in its lower side, a piston moving in said cylinder, a water-tank connected with a car-heater by a conduit closed by a valve, and mechanism connecting said valve and said piston, substantially as specified, so that the operation of the tripping-rod first opens the valve of the water-tank, and then allows the air to escape from the air-brake system.

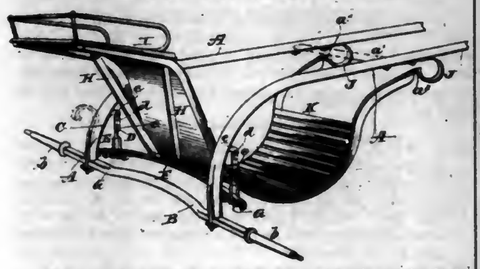
9. In combination with a conduit leading from the air-brake system, a valve closing the same, a tripping-arm arranged to open said valve in case of derailment, a cylinder, J, connected with the conduit aforesaid, an opening, K, formed in said cylinder, a piston, L, working in the cylinder, a water-tank, a conduit leading from said tank, a valve, R, closing said conduit, and actuating-rods M N O P, connecting the piston L and valve R.

10. In combination with a conduit leading from the air-brake system, a valve closing the same, a tripping-arm arranged to open said valve in case of derailment, a cylinder, J, connected with the conduit aforesaid, a piston, L, working in the cylinder, a water-tank, a conduit leading from said tank, a valve closing said conduit, a piston-rod, M, a hinged lever, N, secured at one end to rod M, a connecting-rod, O, secured to the other end of lever N, and having detents *o* secured upon it, a valve-actuating rod, P, secured to the free end of rod O, and a pawl, *o′*, placed to engage the detents *o* of rod O and prevent it from falling and closing the valve after being raised.

11. In combination with the air-brake system of a railway-car, a conduit, C, leading from the brake system, a bracket, F, forming the support for a derailment-trip, the tube *f*, formed on said bracket, connecting with conduit C and containing a valve-seat, the branch tube f^3, situated on said bracket below the valve-seat, the conduit I, connected with tube f^3, a valve, G′, and the tripping-rod G, supported in bracket F, and having its head *g* contracted or slotted, so as to trip the valve and leave the passage $f\,f^3$ freely open in case of accident.

12. In combination with the air-brake system of a railway-car, a reservoir, D, having valve *d* connected with the brake system, a conduit, C, leading from the reservoir D, a bracket, F, forming the support for a derailment-trip, the tube *f*, formed on said bracket, connecting with conduit C and containing a valve-seat, the branch tube f^3, situated on said bracket below the valve-seat, the conduit I, connected with tube f^3, a valve, G′, and the tripping-rod G, supported in bracket F, and having its head *g* contracted or slotted, so as to trip the valve and leave the passage $f\,f^3$ freely open in case of accident.

401,495. VEHICLE-SPRING. GEORGE E. HARRIS, Lawrenceville, Pa. Filed Jan. 12, 1889. Serial No. 296,120. (No model.)



Claim.—1. In a two-wheel vehicle, the combination, with a body and an axle, of a spring attached to the body and supports for the ends of the springs, the said supports being adjustable toward and away from the center of the spring, substantially as set forth.

2. In a two-wheel vehicle, the combination, with a body and a carrying-frame composed of an axle and shafts secured thereto, of loops suspended from said frame and forming supports for the free ends of the spring, the said loops being adjustable toward and away from the center of the spring, substantially as set forth.

3. In a vehicle, the combination, with a body and a carrying-frame composed of an axle, and shafts secured thereto, of a spring secured at its center to the body and provided at each end with a series of notches and swinging loops suspended from the carrying-frame and supporting the ends of the spring, the said loops being adjustable toward and away from the ends of the spring, substantially as set forth.

4. In a vehicle, the combination, with the shafts and shaft-irons secured thereto, of a stirrup adjustably secured to the latter and a spring adjustably connected with the stirrup, substantially as set forth.

5. The combination, with a body and a carrying frame composed of an axle and shafts secured thereto, of vertically-adjustable loops suspended from said carrying-frame and supporting the spring, the said loops being adjustable toward and away from the center of said spring, substantially as set forth.

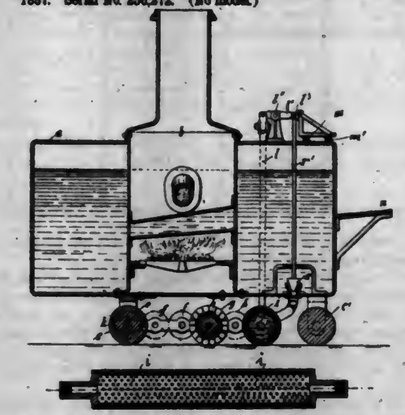
6. In a vehicle, the combination, with the shafts, of curved shaft-irons secured thereto, perforated plates attached to the shaft-irons so as to oscillate, stirrups adjustably connected to said plates, and a spring adjustably attached to the stirrups, substantially as set forth.

7. The combination, with a body and a semi-elliptic spring secured thereto and provided at each end with a series of bearings, of suspended loops supporting the ends of the spring and adjustable toward and away from the center thereof, substantially as set forth.

8. In a vehicle, the combination, with a body and a carrying-frame composed of an axle and shafts, of springs connecting the front end of the body to the shafts, a semi-elliptic spring secured to the under side of the body, and loops suspended from the carrying-frame and supporting the ends of the semi-elliptic spring, the said loops adapted to be adjusted toward and away from the center of the spring, substantially as set forth.

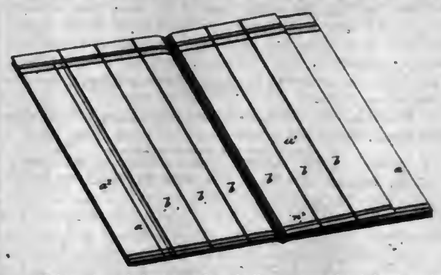
9. In a vehicle, the combination, with the shafts, of stirrups supported thereby, a spring supported by said stirrups, notched plates on said spring to receive the stirrups, spring-jacks or body-supports secured to said spring, and a body supported at one end on said spring-jacks or body-supports and at the other end by the shafts or cross-bars, substantially as set forth.

401,496. MACHINE FOR MELTING SNOW AND CLEANING STREETS. AUGUSTIN HENTSCHEL, Berlin, Germany. Filed Nov. 26, 1887. Serial No. 256,272. (No model.)



Claim.—In a machine for melting snow and cleaning streets, the combination of tank *a*, furnace *b*, located thereto, water-delivery roller *i*, composed of a perforated cylinder wrapped with jute, manila, or other textile material, *q*, connected with said tank, and helical scraper *g*, substantially as described.

401,497. LEDGER OR SIMILAR ACCOUNT-BOOK. JOHN W. HORNE, Boston, Mass. Filed Mar. 1, 1886. Serial No. 193,643. (Model.)



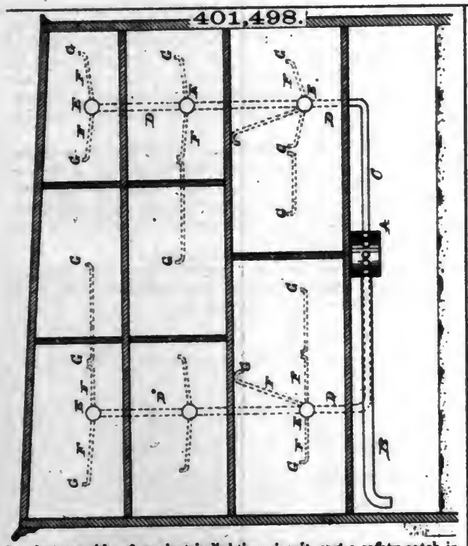
Claim.—1. A ledger or other similar account-book having alternating full or wide and narrow leaves, all of which are complete or integral with the parts thereof which are bound in at the back of the book, the narrow leaves being interposed between the full or wide leaves throughout the book, substantially as set forth.

2. A ledger or other similar account-book having alternating full or wide and narrow leaves, all of which are complete or integral with the parts thereof, which are bound into the back of the book, the narrow leaves being interposed between the full or wide leaves throughout the book, one page of each full leaf being provided with a name-entry space or margin which is outside of or beyond the edge of the adjacent narrow leaf or leaves, and the remainder of the page-space of the full leaves and also the pages of the narrow leaves being divided by rulings into monthly sections, substantially as set forth.

401,498. WIRING STRUCTURES FOR ELECTRIC LIGHTING. EDWARD H. JOHNSON and EDWIN T. GREENFIELD, New York, N. Y. Filed Sept. 21, 1888. Serial No. 285,907. (No model.)

Claim.—1. In house-wiring for electric light, the combination of a pipe of insulating material, a pair of wires insulated from each other and placed in close proximity to each other within said pipe, and each

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forming one side of an electric-lighting circuit, and a safety-catch interpolated in said circuit, substantially as set forth.

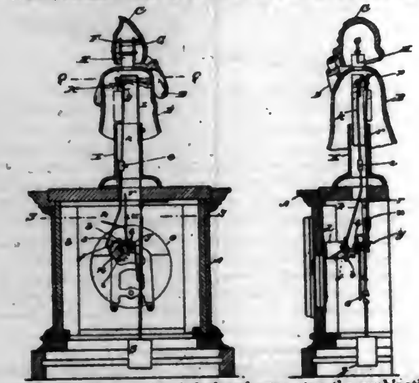
2. In house-wiring for electric light, the combination, with the building or structure, of a system of insulating-pipes extending throughout the same, and comprising main and branch pipes, a pair of wires in each pipe, insulated from each other and placed in close proximity to each other, and each forming one side of an electric-lighting circuit, and safety-catches interpolated in the circuit, substantially as set forth.

3. In house-wiring for electric light, the combination of a pipe of insulating material, a pair of insulated wires twisted together within said pipe, each wire forming one side of an electric-lighting circuit, and a safety-catch interpolated in said circuit, substantially as set forth.

4. In house-wiring for electric light, the combination, with the building or structure, of a system of pipes extending throughout the structure, comprising main pipes, branch pipes extending from said main pipes continuously to all points where outlets are required, junction-boxes connecting the branch pipes to the main pipes, a pair of wires placed loosely in each pipe, such wires being placed in close proximity to each other and insulated from each other, and each forming one side of the electric-lighting circuit, and safety-catches in the junction-boxes connecting the wires of main and branch circuits, substantially as set forth.

5. The fishing-wire having, in combination, a core of wire and a flexible wire coiled spirally on said core, substantially as set forth.

401,499. CLOCK. ARTHUR JUNGHANS, Schramberg, Würtemberg, Prussia, Germany. Filed Feb. 16, 1888. Serial No. 264,846. (No model.)



Claim.—1. In a combined clock and automaton, the combination, with clock mechanism, of a rotative drum provided with a groove in its periphery, a figure or image having one or more movable parts, and a pivoted rod one end of which engages with the drum, the other end of the rod having connection, substantially as described, with a movable part of the image, substantially as and for the purposes set forth.

2. The combination, with clock mechanism, of an image having a movable part provided with a dependent rod, *r*, loosely connected at its upper end with such movable part, the lower end of the rod being bent and adapted to engage with a wire fixed to a shaft which is actuated by the pendulum and said fixed wire, substantially as set forth and described.

3. The combination, with clock mechanism, of a notched cam on a rotary shaft, a fixed pin with a rock-shaft placed loosely thereon, a bent wire fixed to said rock-shaft and in position to engage with said cam, an image having a movable part provided with a pendent rod, *r*, a bent rod, *u*, fixed to said rock-shaft and being in position to engage said pendent rod, and a wire, *y*, fixed to shaft *f*, substantially as and for the purposes described.

4. The combination, with clock mechanism, of a rotary drum provided with a groove, *c*, an image having a movable arm, D, fastened to a shaft, *a*, provided with a bent arm, *g*, and a pivoted rod, *k*, one end of which is adapted to engage with arm *g*, the other end of the rod being in position to engage with the drum in the groove *c*, substantially as and for the purposes described.

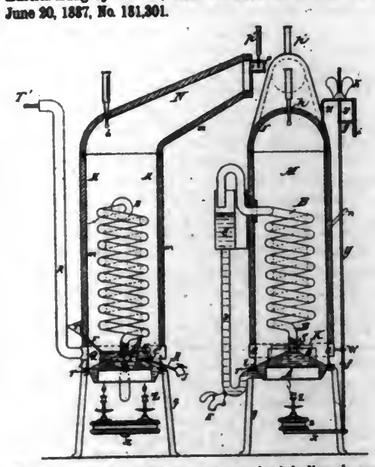
401,500. MEDICAL COMPOUND. FRIEDRICH KRÖGER, Mühlheim, near Frankfort-on-the-Main, Germany, assignor to A. Leonhardt & Co., same place. Filed Nov. 2, 1888. Serial No. 290,378. (No specimens.)

Claim.—The medical compound herein described, having the formula $C_2H_5CH(SO_2C_2H_5)_2$, and having the properties of being almost insoluble in water, hardly soluble in hot water, being without smell, having a slight bitter taste, crystallizing in thin long white needles, melting at 133° Celsius, (uncorrected,) being soluble without decomposing in hot acids and alkalies, and being not acted upon by permanganate of potassium.

401,501. MEDICAL COMPOUND. FRIEDRICH KRÖGER, Mühlheim, near Frankfort-on-the-Main, Germany, assignor to A. Leonhardt & Co., same place. Filed Nov. 10, 1888. Serial No. 290,472. (No specimens.)

Claim.—The medical compound herein described, having the formula $(CH_3)_2C(SO_2CH_3)_2$, and the properties of being easier soluble in water than sulphonal, crystallizing in large white rhombic scales or plates, its melting-point being 119° to 120° centigrade, (uncorrected,) being turned at this temperature directly from the crystal form into the liquid one.

401,502. INHALING APPARATUS. EDUARD KRELL, Güstrow, Mecklenburg-Schwerin, Germany. Filed Mar. 2, 1887. Serial No. 229,406. (No model.) Patented in Germany June 16, 1886, No. 38,641; in England Feb. 8, 1887, No. 1,957; in Belgium Feb. 15, 1887, No. 76,122; in Italy May 7, 1887, No. 21,140; in Denmark May 31, 1887, No. 47; in Austria-Hungary June 11, 1887, No. 10,338 and No. 5,484, and in France June 20, 1887, No. 181,301.

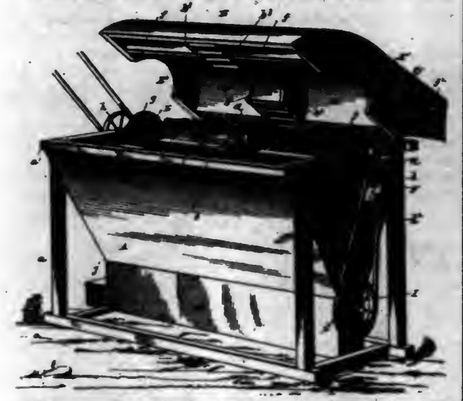


Claim.—1. In a portable apparatus for inhaling damp or warm moist air of a certain and unvarying temperature, the combination, with the water-containing boiler A, for heating the water, and evaporating-vessel G, of the serpentine pipe B, the cold-water reservoir C, and the pipe D, substantially as set forth.

2. In a portable apparatus for inhaling damp or warm air of certain and unvarying temperature, the combination, with the water-evaporating vessel G and boiler A, of the serpentine pipe B, cold-water reservoir C, and pipe D, and the lamp-regulating device consisting of the guided rod Y, provided with a screw-thread, *v*, arm *x*, and fixed stop *f*, substantially as described.

3. In a portable apparatus for inhaling damp or warm air of a certain and unvarying temperature, the combination, with the serpentine pipe B, cold-water reservoir C, and pipe D, of the ring Q, having opening S, and provided with pipe R, for introducing cold air into the inhaling apparatus, substantially as described.

401,503. DUST-COLLECTOR. NELSON LEDOU and ALBERT H. WEEKS, Lockport, N. Y.; said Weeks assignor to said Ledou. Filed Mar. 5, 1887. Renewed Feb. 2, 1888. Serial No. 263,513. (No model.)



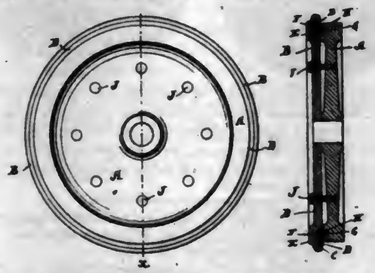
Claim.—1. The herein-described dust-collector, consisting of the V-shaped chamber or receptacle, the still-air chamber having openings in its side walls, the continuous valve and the inclosing box or casing therefor, the deflectors, the shaft having fans, the cover provided with trunks, the screen-covered openings, the circular slatted jackets, and the gearing and driving wheels, the whole arranged to operate substantially as shown and described, and for the purpose specified.

2. The combination, with the chamber or receptacle and the cover having openings at the ends, of the still-air chamber having openings in its side walls, the deflectors, the circular slatted jackets, and the fans, substantially as shown and described.

3. The combination, with the chamber or receptacle provided with openings at the ends and the cover, of the circular jackets secured therein having slatted and closed portions, the operating-fans inclosed in said jackets, and the still-air chamber having openings in its side walls, substantially as shown and described.

4. The combination, with the chamber or receptacle provided with openings at the ends, the cover, the circular jackets, and the fans, of the still-air chamber having openings in its sides and the deflectors arranged one a short distance from the other, substantially as shown, and for the purpose described.

401,504. CAR-WHEEL. HORACE W. LIBBEY, Boston, Mass. Filed Aug. 8, 1888. Serial No. 282,220. (No model.)



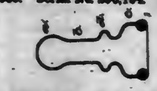
Claim.—1. A car-wheel made in two parts bolted together, with a loose ring in the flange, which projects below the tread of the wheel and is held in position by means of friction-rollers, substantially as and for the purposes set forth.

2. A car-wheel consisting of the tread portion A and flange portion B, bolted together, in combination with the loose ring D and friction-rollers E H, substantially as and for the purposes set forth.

3. In a car-wheel, the tread portion A, provided on its inner face with radial recesses G and friction-rollers H, in combination with the flange portion B, provided on its inner face with a circular recess, C, and radial recesses E, friction-rollers F, and a loose ring, D, substantially as and for the purposes set forth.

4. In a car-wheel, a loose ring mounted in the flange of the wheel so that when it comes into contact with the rail the ring is free to rotate independently of the wheel, substantially as shown and described.

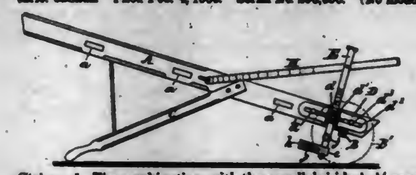
401,505. NURSING-NIPPLE. REUBEN LOCKWOOD, Boston, Mass. Filed Jan. 12, 1889. Serial No. 296,164. (No model.)



Claim.—1. The herein-described india-rubber nipple, it having a body, as *b*, a base, *c*, to embrace the bottle, a contracted waist, *f*, and an independent enlargement or ring intermediate the delivery end of the nipple and the contracted waist *f*, the said waist constituting a free bending-point between the base *c*, which fits the neck of the bottle, and the said guard, substantially as described.

2. An india-rubber nipple having a neck, a base, and an independent enlargement made as a hollow ring and located between the said base and delivery end of the nipple, to operate substantially as described.

401,506. HAND-TRUCK. DAVID M. MACPHERSON, Lancaster, Ontario, Canada. Filed Feb. 4, 1888. Serial No. 298,660. (No model.)

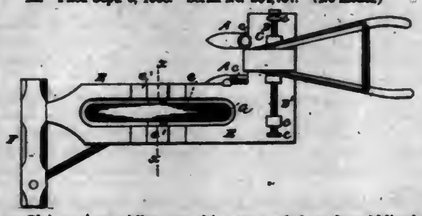


Claim.—1. The combination, with the parallel skids A A', secured to an axle, B, having wheels B', and provided with handles C C', supporting the skids inclinedly, of the jaws E E, toggle-bars *g g'*, and spring side bars, H H', as set forth, for the purposes described.

2. The combination, with the skids A A', of the jaws E E, toggle-bars *g g'*, boxes *e e*, and spirally-coiled spring *j*, as set forth.

3. The combination, with the skids A A', provided with cheek-plates D, of the jaws E E, spring side bars, H H', toggle-bars *g g'*, and spirally-coiled spring *j*, as set forth.

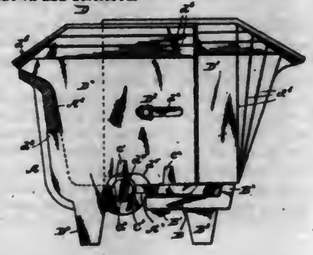
401,507. COTTON-CULTIVATOR. JOHN MARION, Bayou La Chute, La. Filed Sept. 6, 1888. Serial No. 284,737. (No model.)



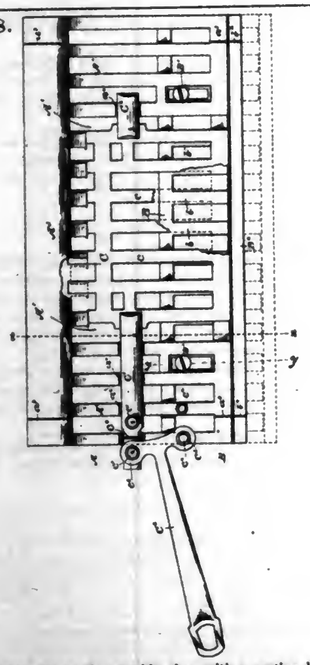
Claim.—A straddle-row cultivator consisting of a middle slotted main beam, E, provided with a draft-beam at the left of the front end and a plow-standard beam at the right of the rear end, two standards carrying shovel-plows on the right, and one supporting-standard on the left, all substantially as shown and described.

401,508. STOVE-GRATE. WILLIAM C. METTNER, Chicago, Ill. Filed May 16, 1887. Serial No. 238,207. (No model.)

Claim.—1. In a stove-grate, the combination, with a section having an upright part to form the front of the fire-pot and a horizontal part to form the bottom thereof, of a horizontally-adjustable section overlapping the first-named section and end walls composed of adjustable overlapping plates set between the ribs of said sections, substantially as shown and described.



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2. In a stove-grate, the combination, with a section having an upright part to form the front of the fire-pot and a horizontal part to form the bottom thereof, of a horizontally-adjustable section overlapping the first-named section and end walls composed of adjustable overlapping plates set between the ribs of said sections, said second section having legs to support the rear of the grate and the front plates of said end walls being each provided with a supporting-leg and a hip or its equivalent, by which it engages said first-named section and supports the latter, all substantially as shown and described.

3. In a stove-grate, a section, A, having an opening, A', and recesses a^2 in the ribs A^2 at each end of said opening A', a dump, C, lying in said opening and having its journals resting in the recesses a^2, the ends of the section A being provided with breaking-grooves to facilitate the breaking away of the outermost ribs, A^2, substantially as shown and described.

4. In a stove-grate, the combination, with a section, A, having the transverse ribs A^2, of end walls, D, having a hip and leg at the front side and seated between said ribs and supporting the front of the section A, while the rear of said section is provided with supports, as legs B^3, independent of said end walls, substantially as shown and described.

5. In a stove-grate, the combination, with a section, A, having the transverse ribs A^2, of end walls, D, having a hip and leg at the front side and seated between said ribs and supporting the front of the section A, while the rear of said section has applied to its lower side a section, B, from which depend legs whereon the rear of the grate is supported, substantially as shown and described.

401,509. MACHINE FOR BENDING RIBS OR FRAMES OF SHIPS. JOHN S. MITCHELL, Milford, assignor to himself, and Charles Coupland Seymour, Conn. Filed June 5, 1888. Serial No. 276,118. (No model.)

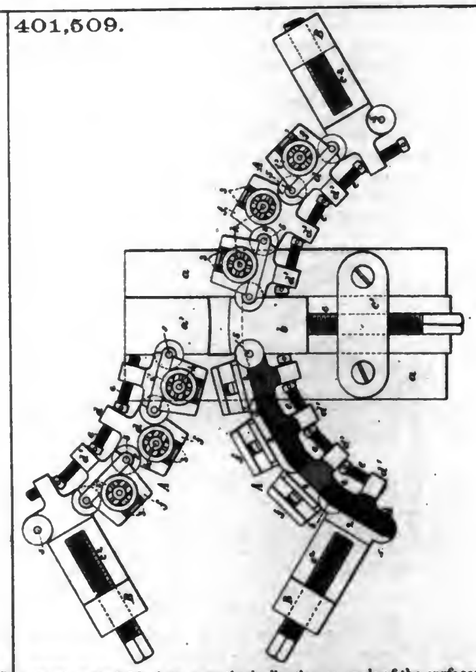
Claim.—1. The range or chain of formers composed of blocks hinged together and the clamping devices at the ends of such chain for holding the rib or other article to be bent, in combination with adjusting-screws, forming stops for determining the curvature to which the chain may be swung in bending the article, substantially as specified.

2. The combination, with the clamp *a' b*, of the range of hinged former-blocks composing the bending-chain, the clamp at the outer end of such chain, and the adjusting-screws passing through flanges on the former-blocks, substantially as set forth.

3. The combination, with the bed plate or frame and a stationary head and sliding head connected therewith for holding the article to be bent, of a range of hinged former-blocks secured to one of the heads, each block having a flat or nearly flat face and grooved in the center of the face, substantially as set forth.

4. The combination, with clamps *a' b*, for holding the article to be bent, of a range of hinged former-blocks and an adjustable leaf, *f'*,

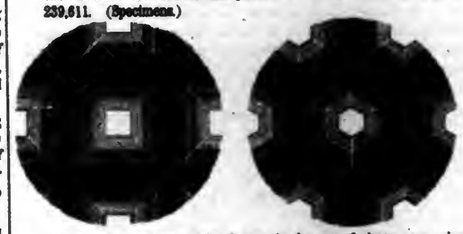
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applied to each block to vary the inclination or angle of the surfaces against which the article is bent, substantially as set forth.

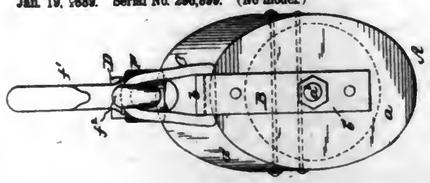
5. The combination, with the horizontal frame and stationary head and a sliding head and adjusting-screw, of formers composed of grooved blocks hinged together and having slightly-curved working-surfaces, a flange to each block, an adjusting-screw passing through the same, toothed sector-frames upon the side of each block, swinging levers pivoted to the blocks *d* at each side of the central groove and having threaded stems on their outer ends, and the toothed blocks *i* and wheels *i'*, for securing the hinged leaves at any desired angle, substantially as set forth.

401,510. TRANSLUCENT FILM FOR USE IN THE ART OF PHOTO-ENGRAVING. CARL A. MÜLLER, New York, N. Y., assignor of one-fourth to Otto Bühler, same place. Filed May 28, 1887. Serial No. 239,611. (Specimens.)



Claim.—A translucent film for use in the art of photo-engraving, provided with a number of small grain-figures, each figure being composed of a series of bands of different shades representing different tints or tones, each band having the same shade throughout its area, and the area of one band being equal to the area of each of the other bands, substantially as described.

401,511. SNATCH-BLOCK. BENJAMIN H. NAVES, Philadelphia, Pa., assignor to Francis Shubert and John C. Cottingham, same place. Filed Jan. 19, 1889. Serial No. 296,899. (No model.)



Claim.—1. A snatch-block having fixed strap D secured to and forming a part of one of its cheeks and a vertically-movable cross-head at the top of said strap, having a hook-shaped free end, substantially as set forth.

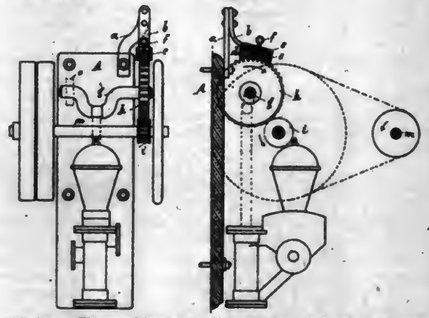
2. A snatch-block having a strap, D, provided at its lower end with a circular sheave-pin opening, and having at its upper end a separate sliding cross-head, F, with swivel-hook *f'* and hook-shaped free end f^3, substantially as set forth.

3. A snatch-block having opening *x*, a link, C, the strap D, and a separate sliding cross-head, F, on strap D, said cross-head having a hook-shaped free end for link C, substantially as set forth.

4. In a snatch-block, the link C, combined with a vertically-moving cross head, F, separate from but secured to a strap, D, substantially as set forth.

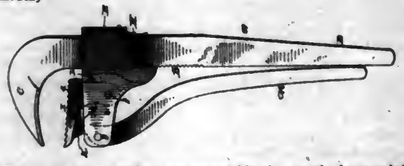
5. A snatch-block having a fixed strap, D, provided at its upper portion with a slot or opening, *d'*, a cross-head, F, having a hook-shaped free end, f^3, an opposite end, *f*, terminating in an enlargement, f^4, and said end *f* engaging with said slot *d'*, substantially as set forth.

401,512. GEARING FOR PUMPS. EMIL H. C. OEHLMANN, Berlin, Germany. Filed Oct. 10, 1888. Serial No. 287,707. (No model.) Patented in Belgium Oct. 15, 1888, No. 83,363; in France Nov. 9, 1888, No. 193,179; in Germany Dec. 10, 1888, No. 46,457, and in Italy Dec. 27, 1888, No. 24,230.



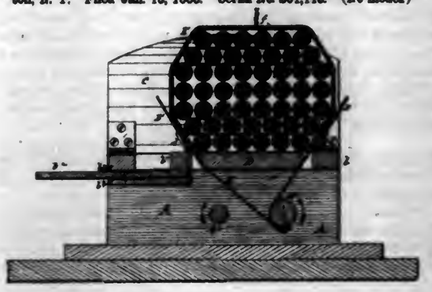
Claim.—The combination, with a driving-shaft, of a pinion on said driving-shaft, a crank-shaft, a cog-wheel on said crank-shaft meshing with said pinion, a spring-actuated brake resting on the teeth of said cog-wheel, and a connecting-rod connecting the crank-shaft with a pump-piston, substantially as set forth.

401,513. WRENCH. CHARLES POMEROY, New York, N. Y., as signor, by mesne assignments, to the Vulcan Manufacturing Company. Filed Feb. 13, 1885. Renewed May 9, 1887. Serial No. 237,588. (No model.)



Claim.—A wrench wherein are combined a toothed wrench-bar carrying the fixed jaw, a head sliding on such bar and having a bearing spring and teeth engaging the teeth of the bar, a jaw pivoted in the sliding head, a spring throwing the pivoted jaw back, and a cam-lever pivoted on the sliding head and acting to throw the pivoted jaw forward, substantially as set forth.

401,514. CIGAR-BUNDLING MACHINE. ALONZO E. PYE, Kingston, N. Y. Filed Jan. 18, 1888. Serial No. 261,118. (No model.)



Claim.—1. The combination, with a supporting-frame, having a back and horns, of a filling-piece between said horns, a loop-shaped belt extending around the filling-piece and provided with a longitudinal opening or slot, a roller to which the ends of the belt are attached, and means for winding the belt on the roller, substantially as set forth.

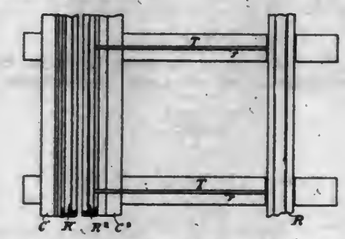
2. The combination, with a supporting-frame, having a back, a fixed horn, an adjustable horn, and an interchangeable filling-piece between said horns, of a loop-shaped belt passing around the filling-piece, a roller to which the ends of the belt are attached, and mechanism for winding the belt on said roller, substantially as set forth.

3. The combination of a supporting-frame, having a back hinged to said frame, horns also hinged to the frame, stops for retaining the horns in raised position, a filling-piece between the horns, said filling-piece having rounded-off ends, a loop-shaped belt provided with a longitudinal opening or slot, a winding-roller to which the ends of the belt are attached, and mechanism for winding the belt on said roller, substantially as set forth.

4. The combination of a supporting-frame, a hinged back, a hinged horn applied to a fixed piece of the frame, a second horn hinged to a laterally-adjustable piece of said frame, and an interchangeable filling-piece between said horns, substantially as set forth.

5. In a cigar-bundling block, the combination, with a filling-piece, of a loop-shaped belt having a longitudinal opening or slot, said belt passing around the filling-piece, a roller to which the ends of the belt are attached, and means for winding the belt around said roller, so as to compress the bundle of cigars placed in said belt preparatory to tying the same, substantially as set forth.

401,515. UNDERGROUND CONDUIT FOR ELECTRICAL RAILWAYS. FRED. H. REED, Jersey City, N. J. Filed Oct. 6, 1886. Serial No. 215,472. (No model.)



Claim.—1. The combination of the rail portions R' and R^2, supported continuously throughout their length, forming together a single tread with a slot in the middle thereof and constituting a track-rail, one or more electrical conductors suitably insulated therefrom, and means for completing the circuit from the same to a passing vehicle, substantially as described.

2. The combination of the flanged rail portion R' and R^2, forming together a single tread, with a slot intermediate thereof having its orifice above the level of the way, as shown and described, one or more electrical conductors insulated therefrom, and means extending into said slot for completing the circuit.

3. A track-rail having a single tread with a slot in the middle thereof, rendering the same reversible, and a conduit thereunder, as and for the purpose described.

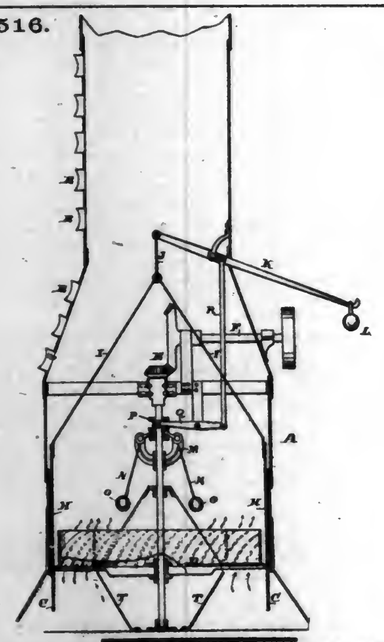
4. The combination of the following devices forming a combined conduit and rail for an electrical railway, to wit: two conduit-walls continuous throughout, forming the conduit proper, in which one or more conductors are arranged for conveying the current, and a ribbed rail above the level of the way, with a slot in the middle thereof, forming two parts, R' R^2, each secured to and supported by one of said conduit-walls and forming together a single tread for a wheel adapted to travel thereupon.

401,516. CHIMNEY OR STACK PROPELLER AND GOVERNOR. JAMES A. ROBB, San José, Cal. Filed Apr. 14, 1888. Serial No. 270,647. (No model.)

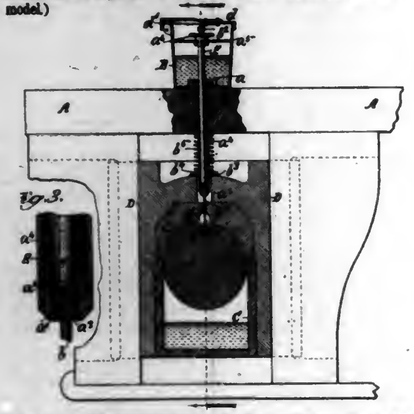
Claim.—1. The combination, with the vertical chimney, of the lenses fixed in the side thereof and concentrating the rays of the sun on the inner side of the stack away from the sun, whereby the upward draft in the stack is increased, substantially as herein described.

2. The wheel journaled to rotate within the vertical shaft or chimney, which has openings at the bottom through which air is admitted to drive said wheel, the interior cone, T, for directing the current of air through the wheel, in combination with a vertically-moving damper for opening and closing the air-supply passages, a governor driven by the wheel, and mechanism, substantially as specified, whereby the governor is connected with the suspending-arms of the damper so as to open and close it, substantially as herein described.

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401,517. OILING DEVICE FOR LOCOMOTIVE-AXLES. THOMAS J. ROGERS, Chicago, Ill. Filed Feb. 2, 1888. Serial No. 298,469. (No model.)



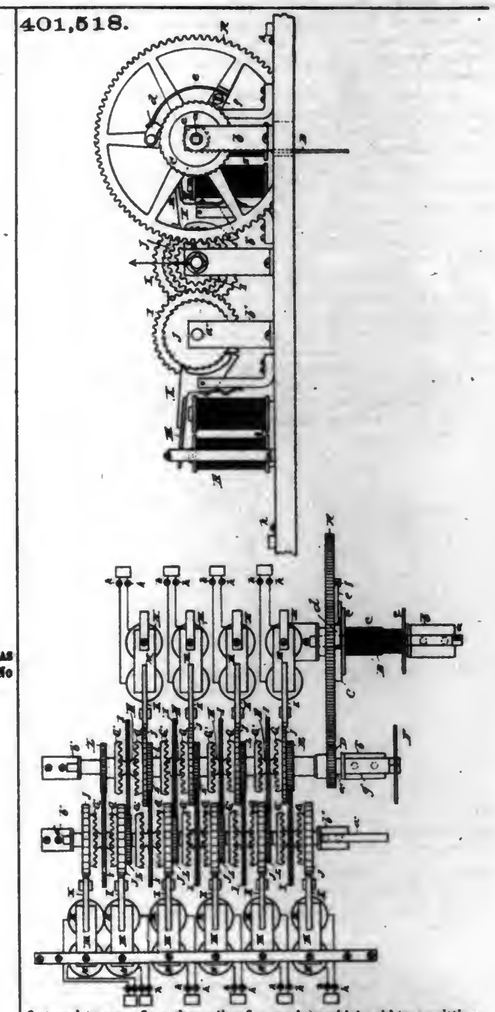
Claim.—1. The combination, with the axle-frame, of an oil-cup rigidly mounted thereon, an oil-conducting tube leading from the bottom of the cup to and resting on the brass, a second tube starting from the inside of said cup at a point above the oil-line and extending down inside of and stopping short of the lower end of the oil-tube, the plug inserted in the lower end of said oil-tube and provided with a concave seat and a contracted oil-passage, and the wire inserted in the inner tube and having the lower end resting on the axle, substantially as and for the purpose set forth.

2. The combination, with the oil-cup, of the bridge arranged inside thereof, the adjustable tube having a threaded engagement with said bridge and extending down inside of the oil-conducting tube, and the wire inserted in the adjustable tube and having the lower end resting on the axle, the upper end projecting above said tube inside of the cup, substantially as and for the purpose set forth.

401,518. REGISTER. HENRY S. ROSE, New York, N. Y. Original application filed Nov. 2, 1888, Serial No. 289,791. Divided and this application filed Jan. 31, 1889. Serial No. 297,071. (No model.)

Claim.—1. A system of gear-wheels in a registering apparatus, which consists of a pair of gears mounted loosely on a shaft, an intermediate transmitting gear-wheel carrying a loose or running pinion which engages both said gears, an escape-wheel rigidly secured to one or both of said pair of gears, and a small gear-wheel securely

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fastened to one of another pair of gears, into which said transmitting-wheel meshes, the whole arranged and adapted to receive through either or both of said gears a given amount of motion and to transmit it unaltered by means of said intermediate transmitting gear and pinion, substantially as shown and described.

2. A mechanical registering system which consists of a series of escapements operated from a corresponding series of reporting-stands, an adding-machine composed of a series of systems of gear-wheels and provided with an escape-wheel for each of said escapements, and with a resultant-wheel which receives and sums up the motions given to all of said escapements, and a pointer or other suitable device for registering the amount of said motions, substantially as shown, and for the purposes specified.

3. A mechanical registering system which consists of a series of escapements simultaneously operated from a corresponding series of reporting-stands, an adding-machine composed of a series of systems of gear-wheels and provided with an escape-wheel for each of said escapements, and with a resultant-wheel which receives and sums up the motions given to all of said escapements, and a pointer or other suitable device for registering the amounts of said motion, substantially as shown, and for the purpose specified.

401,519. DATING DEVICE FOR HAND-STAMPS. LOUIS K. SCOTFORD, Chicago, Ill. Filed Aug. 18, 1887. Serial No. 246,615. (No model.)

Claim.—1. The combination, with a type-band, of a support sustaining the band at the point of printing, and a plurality of supporting-rollers for the band, two of which engage the face of the band, one at each side of the said support, said rollers, which engage the

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face of the band, being provided with teeth or projections adapted to engage the spaces between the projecting types upon the band, substantially as described.

2. The combination, with the frame and the revolving die-plate of a self-inking hand-stamp, of a flexible type-band, a support for the band at the point of printing, and a plurality of rollers for sustaining the band mounted upon the die-plate within the space inclosed by the frame, two of which rollers are adapted to engage the printing-face of the band, one at each side of the said support, said two rollers, which engage the face of the band, being provided with projections or teeth engaging the spaces between the projecting types upon the band, substantially as described.

3. The combination, with a type-band, a support for the same at the point of printing, and a plurality of guides or supports for the band embracing two wheels or rollers provided with cogs or teeth engaging spaces between the projecting types of the band, and a notched or cogged wheel engaging both of said cogged wheels or rollers, substantially as described.

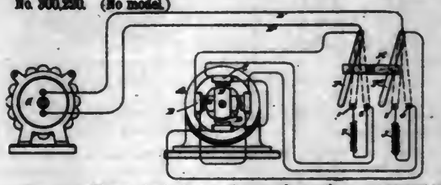
4. The combination, with a type-band and a support for the band at the point of printing, of two supporting-rollers, J J, provided with teeth engaging the spaces between the projecting types of the band, and three supporting-rollers, I K K, engaging the back or rear surface of the band, substantially as described.

5. The combination, with the frame of a dating apparatus, a type-band, and a support for the band at the point of printing, of two rollers, J J, provided with teeth or projections engaging the spaces between the projecting types of the band, supporting-rollers I K K, a shaft, D, for said roller I, and a toothed actuating-wheel mounted upon said shaft D and engaged with said rollers J J, substantially as described.

6. The combination, with the frame of a dating apparatus and a type-band, of a plurality of supports for the band embracing the roller adapted to engage the printing-face of the band, said roller consisting of two disks, and cross-bars attached to and between the same, one of said disks being provided with peripheral cogs, and a toothed actuating-wheel mounted upon the frame and engaging with the cogged disk, substantially as described.

7. The combination, with a dating-device frame and wheels or rollers for supporting a band provided with projections or teeth engaging the space between projecting types upon the band, of a rubber type-band and means for connecting the ends of the band, consisting of integral projections or lugs cast upon the ends of the band, and a metal clasp having prongs engaging the said projections or lugs, substantially as described.

401,520. METHOD OF OPERATING ELECTRO-MAGNETIC MOTORS. NIKOLA TESLA, New York, N. Y. Filed Feb. 18, 1889. Serial No. 300,220. (No model.)



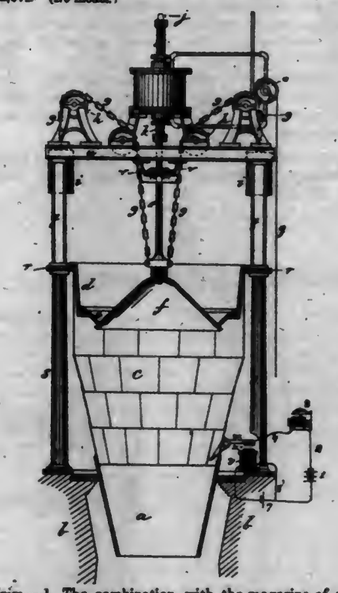
Claim.—1. The method of operating an alternating-current motor herein described by first progressively shifting or rotating its poles or points of greatest attraction and then, when the motor has attained a given speed, alternating the said poles, as described.

2. The method of operating an electro-magnetic motor herein described, which consists in passing through independent energizing-circuits of the motor alternating currents differing in phase and then, when the motor has attained a given speed, alternating currents coinciding in phase, as described.

3. The method of operating an electro-magnetic motor herein described, which consists in starting the motor by passing alternating currents differing in phase through independent energizing-circuits and then, when the motor has attained a given speed, joining the energizing-circuits in series and passing an alternating current through the same.

4. The method of operating a synchronizing-motor, which consists in passing an alternating current through independent energizing-circuits of the motor and introducing into such circuits a resistance and self-induction coil, whereby a difference of phase between the currents in the circuits will be obtained, and then, when the speed of the motor synchronizes with that of the generator, withdrawing the resistance and self-induction coil, as set forth.

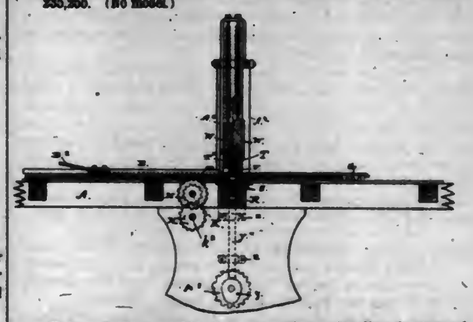
401,521. INDICATING DEVICE FOR CHARGING FURNACES. EDWARD WALSH, Jr., St. Louis, Mo. Filed Aug. 16, 1888. Serial No. 282,871. (No model.)



Claim.—1. The combination, with the magazine of a blast-furnace, of an open alarm-circuit and a lever controlled by the charge in the magazine and adapted to automatically close the alarm-circuit, substantially as and for the purposes set forth.

2. In an indicating device for furnaces, the combination, with the magazine, of a pivoted lever, one arm of which projects into the magazine and is operated upon by the material therein, an electro-magnet operating upon the other arm of the lever, and an electric alarm-circuit in which the electro-magnet is located, substantially as and for the purposes described.

401,522. MACHINE FOR FORMING SHEET-METAL LATHING. JOHN WEICHHART, San Francisco, Cal. Filed Apr. 18, 1887. Serial No. 235,255. (No model.)



Claim.—1. In a machine for corrugating or bending sheet metal, the combination of a fixed die, R, having a groove, a bar, S, lying in and forming the bottom of said groove, and means, substantially as described, for elevating said bar by positive mechanical action, a reciprocating die, T, a yielding presser-bar, U, and mechanism, substantially as described, adapted to move said bar and reciprocate said die with respect to each other, as set forth.

2. In a machine for corrugating or bending sheet metal, the combination of a sliding carriage, feed mechanism by which said carriage is moved intermittently step by step, a stationary die having a groove, a vertically-movable bar forming the bottom of said groove, and means, substantially as described, for elevating said bar by positive

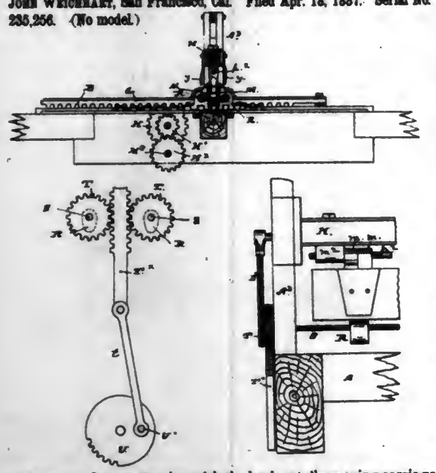
mechanical action, a reciprocating die, a spring presser-bar adapted to coact with said die to produce crimps or corrugations in the metal, and mechanism adapted to reciprocate said movable die and move said vertically-acting bar with respect to each other and between the intervals in the feed of the carriage, as set forth.

3. The combination, with the sliding carriage B, of the stationary grooved die or former R, having the faces R' R^2 and the movable bar S between them, the reciprocating die T, composed of two parts or sections, one of which is set to act in advance of the other, the spring presser-bar U, and mechanism, substantially as described, adapted to move the carriage step by step and to actuate the movable die and the bar with respect to each other between the movements of the carriage, as set forth.

4. The combination of a suitable frame or bed, the sliding carriage B, pawl-and-ratchet feed G H I J J^x K K', cross-heads W W, cranks M P X and connecting-rods, the bar y^x, cam *y*, and connecting-gears, substantially as described.

401,523. MACHINE FOR FORMING SHEET-METAL LATHING.

JOHN WEICHHART, San Francisco, Cal. Filed Apr. 13, 1887. Serial No. 235,256. (No model.)



Claim.—1. In combination with the horizontally-moving carriage adapted to present and feed a sheet of metal step by step, the crimping-jaws M M, movable cross-head N, the cranks and connecting-rods, and the cams and actuating mechanism consisting of the gears T T, double rack T^x, connecting-rod *t*, and crank-disk U, substantially as described.

2. In a machine for crimping metal for the manufacture of corrugated metal lathing, the hinged jaws placed for operation, as described, over a traveling work-holding bed or carriage, and having vertical movement to engage with and to clear the work, the cams R R, rotary crank-disk U, gears T T, reciprocating rack T^x, and connecting-rod *t*, as a means for pressing the jaws together against the rack, substantially as described.

3. The herein-described machine for crimping sheet metal, consisting of a suitable bed or frame, A A, traveling carriage B, having intermittent movement at spaced intervals, the feeding mechanism, and means for operating the same, consisting of a ratchet, a pawl working thereon, pivoted arm, a connecting-rod attached to said arm at one end and to a crank at the other on the continuously-rotating shaft D, cross-head N, carrying hinged crimping-jaws, the actuating-crank T^x, connecting-rod D^2, the cam-shafts, cams, gears, racks, and crank-disk U, constructed and combined for operation as set forth.

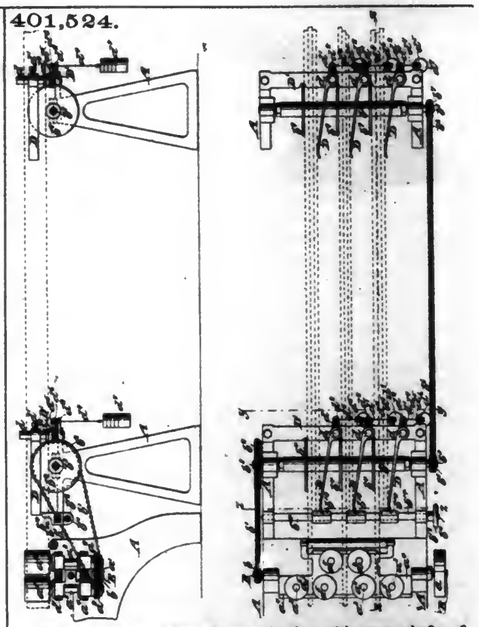
401,524. FEEDING DEVICE FOR PLANING-MACHINES.

JAMES F. WELCH, Brooklyn, and ERNST F. AUTENRIETH, New York, assignors to the Glen Cove Machine Company, (Limited,) Green Point, Brooklyn, N. Y. Filed Nov. 27, 1888. Serial No. 291,961. (No model.)

Claim.—1. In a planing-machine, the combination, with rotary shafts, of feeding-disks mounted on said shafts so as to rotate in vertical planes and having their faces contacting with the board to be fed, and yielding pressers independent of said disks operating to force the board into contact with the disks, substantially as specified.

2. In a planing-machine, the combination, with rotary shafts, of feeding-disks mounted on said shafts so as to rotate in vertical planes and having their faces contacting with the board to be fed, yielding pressers adapted to maintain a number of boards in contact with each other and one of said boards in contact with the feeding-disks, and a stop for preventing a forward movement of any of the boards except the one in contact with the feeding-disks, substantially as specified.

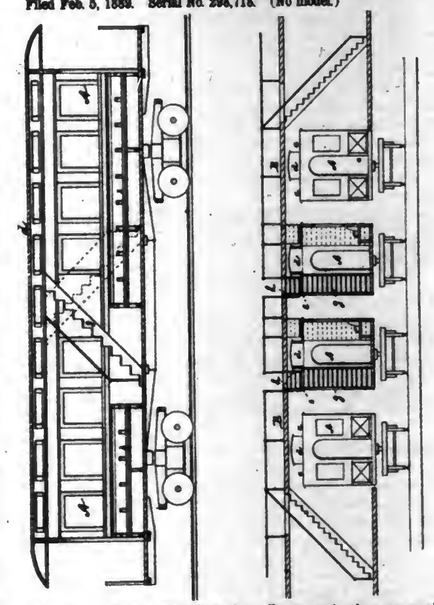
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3. In a planing-machine, the combination, with rotary shafts, of feeding-disks mounted on said shafts so as to rotate in vertical planes and having their faces contacting with the board to be fed, yielding pressers adapted to maintain a number of boards in contact with each other and one of said boards in contact with the feeding-disks, and an adjustable stop for preventing a forward movement of any of the boards except the one in contact with the feeding-disks, substantially as specified.

401,525. RAILWAY-CAR.

ERNEST WEHGMANN, New York, N. Y. Filed Feb. 5, 1889. Serial No. 298,718. (No model.)

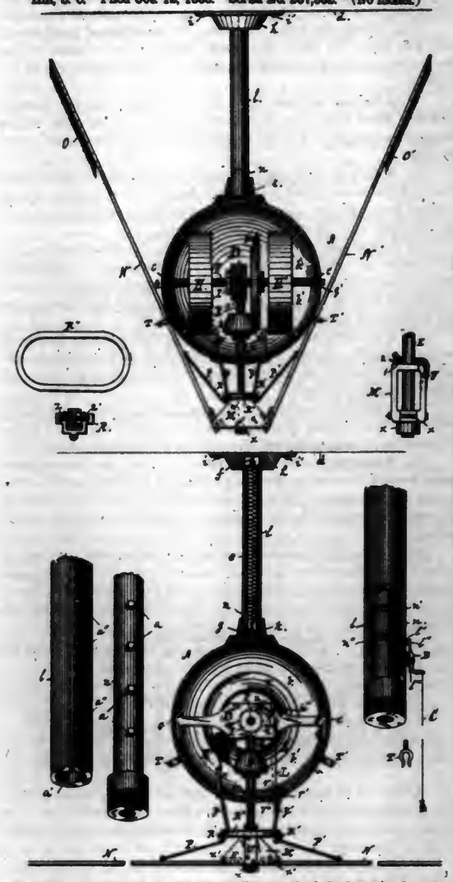


Claim.—1. The combination of a railway-car having an opening in the roof with a door for closing said opening, and with a staircase leading from the roof to the interior of the car, the staircase being supported upon the car-floor and facing toward one of the ends of the car, substantially as specified.

2. The combination of a railway-car having a pair of openings in its roof with two pairs of staircases leading from said openings to the interior of the car, the staircases facing in opposite directions and being located at opposite sides of the aisle, substantially as specified.

401,526. SUSPENSION FLY-FAN.

WILLIAM C. WHITNER, Rock Hill, S. C. Filed Oct. 12, 1888. Serial No. 287,882. (No model.)



Claim.—1. The combination, with a vertical shaft to the fans provided with a sleeve mounted on the shaft, of the elliptical-shaped track concentric with the shaft and the links connected with the fans and provided with travelers operating on the track, whereby a wave-like motion is imparted to the fans.

2. The combination, with a vertical shaft and the fans provided with a sleeve mounted on the shaft, of the flanged horizontal elliptical track and the travelers connected by links to the fans and provided with double anti-friction rollers operating on the inside and on the outside of the said flanged track.

3. The combination, with the sphere provided with spring-catches T T', vertical shaft E, provided with collar *x*, loose sleeve M, fan-arms N N', having slotted ends, and the pivots *x' x''*, whereby said ends are secured to the sleeve, of the endless track R'' and the travelers R R' and links P P', all arranged for operation substantially as described.

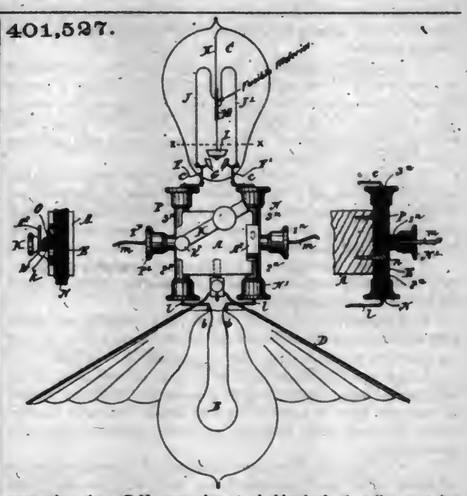
401,527. CUT-OUT FOR INCANDESCENT ELECTRIC LAMPS.

EDWIN R. WHITNEY, St. Johnsbury, Vt. Filed July 21, 1888. Serial No. 280,675. (No model.)

Claim.—1. In combination with an incandescent electric lamp, an independent glass lamp-bulb, contact-pieces, and carbons of a higher resistance than that of the filament in the lamp proper, inclosed in such independent bulb, connections of carbons and contact-pieces with main wires, a wire inclosed in and suspended from top of said independent bulb, a fusible strip forming part of such wire, to which said carbons are connected, and a drop-plug carried by said wire and adapted when dropped to rest on said contact-pieces and form a circuit through them, all as herein set forth, and for the purpose described.

2. In an incandescent electric lamp, the combination, with the main wires *m m* and connecting-strips *l l*, of the three-armed insulated

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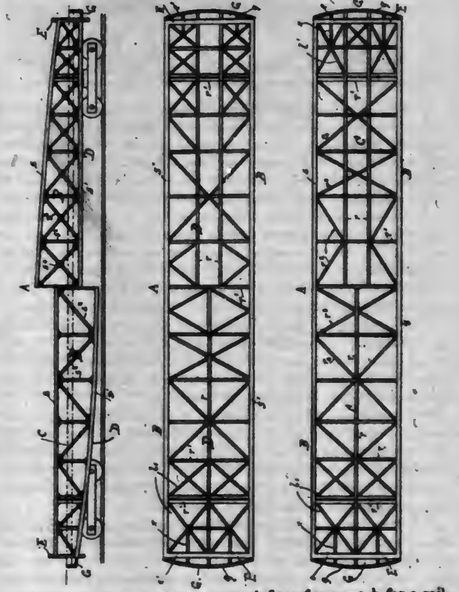


connecting-pieces P N, secured to the holder-body A, split to receive said strips *l l*, and the strips *c c*, connected, respectively, to terminals *b b* and F F', and the screwed sleeves P' N', for securing the several parts firmly in place, as set forth.

3. In an incandescent electric lamp, the combination, with the main wires *m m* and connecting-pieces P N, of stud k^2, communicating with connecting-piece P, coiled spring k^3, latch O, in contact with connecting-piece N, and key K, all carried by holder-body A, as shown and described.

401,528. RAILWAY-CAR.

MAX A. ZORCHER, Phœnixville, Pa. Filed May 25, 1888. Serial No. 275,121. (No model.)



Claim.—1. A statically-constructed floor frame-work for a railway-car, consisting of two or more vertical longitudinal girders, all of the individual members and details of which are rigid and non-adjustable, each having a top and bottom chord and web members throughout, said parts being integrally connected together at or near their tops and bottoms by longitudinal lateral tie-trusses of similar constructions, substantially as described.

2. A statically-constructed floor frame-work for a railway-car, consisting of two or more vertical longitudinal girders connected together at or near their tops and bottoms by longitudinal trusses adapted to resist lateral strains, in combination with one or more transverse vibration or tie trusses, having its greatest permissible depth at each location, and all of said trusses integrally connected

together in such manner as to be rigid and non-adjustable, substantially as described.

3. A statically-constructed railway-car floor-frame consisting of the combination of the rigid non-adjustable side trusses, B, having top and bottom chords and web members throughout, and one or more transverse tie or vibration trusses or girders, r', similarly constructed, both of said sets of girders having common struts and connecting members s^3, substantially as described.

4. A statically-constructed car-floor frame consisting of side, top, and bottom girders, all of the members and details of which are continuous, rigid, and non-adjustable, the whole being so arranged that the longitudinal top truss or trusses form the support of the car-floor, substantially as described.

5. A trussed floor-frame for a railway-car, consisting of substantially vertical longitudinal trusses having inclined top chords on which the floor rests, substantially as described.

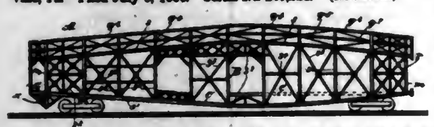
6. A trussed floor-frame for a railway-car, consisting of substantially vertical longitudinal exterior and interior trusses having inclined top chords on which the floor rests, substantially as described.

7. A trussed floor-frame for a railway-car, consisting of substantially vertical longitudinal trusses the top chords of which are inclined to carry the floor, in combination with lateral transverse bracing-trusses, the whole being integrally connected together, substantially as described.

8. A railway-car floor-frame consisting of longitudinal girders or trusses united by a longitudinal top truss or girder and lateral transverse bracing or tie trusses or girders, all of said trusses being constructed and connected together to resist strains in all directions, substantially as described.

9. A railway-car floor-frame consisting of longitudinal girders or trusses united by a longitudinal bottom truss or girder and lateral transverse bracing or tie trusses or girders, all of said trusses being constructed and connected together to resist strains in all directions, substantially as described.

401,529. RAILWAY-CAR FRAME. MAX A. ZORCHER, Phœnixville, Pa. Filed July 6, 1888. Serial No. 279,221. (No model.)



Claim.—1. A railway-car frame having two or more longitudinal trusses or girders extending throughout the length of the car, having increased depth at or near the center of the car, and connected together at or near their upper and lower chords by trussed girders adapted to resist lateral strains, the whole being joined together to form a statically-trussed frame, substantially as shown and described.

2. A railway-car frame consisting of two or more longitudinal supporting trusses or girders having increased depth at or near the center of the car, connected at or near the top and bottom by longitudinal trusses or girders, with one or more intermediate cross or tie trusses or bracing uniting said longitudinal trusses, so as to form a solid or statically-constructed structure, substantially as described.

3. A railway-car frame consisting of an external skeleton body having vertical longitudinal trusses of increased center depth, with one or more vertical transverse statically-constructed overhead roof-trusses having rigid and non-adjustable web members throughout their entire length, substantially as described.

4. A railway-car frame consisting of an external skeleton body having vertical longitudinal trusses of increased depth between the truck-supports, with one or more interior transverse vibration-trusses and one or more vertical transverse statically-constructed overhead roof-trusses having rigid and non-adjustable web members throughout their entire length, substantially as described.

5. A railway-car frame consisting of an external skeleton body whose vertical longitudinal trusses are of increased depth between the truck-supports, with one or more interior longitudinal trusses and one or more vertical transverse statically-constructed overhead roof-trusses having rigid and non-adjustable web members throughout their whole length, substantially as described.

6. A railway-car frame consisting of an external skeleton body, with vertical longitudinal trusses of increased depth between the truck-supports, and one or more interior longitudinal trusses, and one or more interior transverse vibration-trusses, and one or more vertical transverse statically-constructed overhead roof-trusses having rigid and non-adjustable web members throughout their whole length, substantially as described.

7. A railway-car frame having four or more longitudinal external members, any of which may be of irregular shape, with diagonal and normal members connecting the sides of said frame to said longitudinal members, and diagonal and normal members connecting the top and bottom of such frame to said longitudinal members, substantially as described.

8. A railway-car frame having normal and diagonal braces in its side faces, the latter of variable depth, in combination with diagonal and normal braces in its top and bottom faces, and knee-braces between the sides and top and bottom faces, substantially as described.

9. A railway-car frame consisting of trussed lateral top, bottom, and side faces, the latter of variable depth, in combination with a trussed-roof-supporting frame or auxiliary body, substantially as described.

10. A railway-car frame consisting of trussed lateral top, bottom, and side faces, the latter of variable depth, in combination with a trussed-floor-supporting frame or auxiliary body, substantially as described.

11. A railway-car frame consisting of trussed lateral top, bottom, and side faces, the latter of variable depth, in combination with a trussed floor, and also a trussed-roof-supporting frame forming each an auxiliary body, substantially as described.

12. A statically-constructed railway-car frame wherein any or all exterior or interior faces are each constructed of two or more statically-constructed trusses integrally connected together for each face, so as to form one truss of variable depth and having openings for windows or doors, substantially as described.

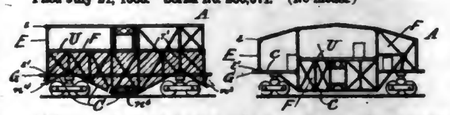
13. A statically-constructed railway-car frame having longitudinal girders with a diminished depth at their ends, in combination with top and bottom chords, the arrangement being such as to resist collision strains more evenly.

14. A statically-constructed railway-car frame containing two or more statically-trussed floor-frames, each integrally connected therewith and each constituting the floor-support, substantially as described.

15. A statically-constructed railway-car frame containing one or more trussed floor-frames integrally connected therewith, each constituting a floor-support and any or all inclined in any one or various directions to assist in the discharge of the load, substantially as described.

16. A statically-constructed railway-car frame containing one or more trussed floor-frames integrally connected therewith, having longitudinal trusses, their greatest depth being at or near the center of the car, while the top chords of the floor-girders which sustain the floor are inclined, substantially as described.

401,530. RAILWAY-CAR. MAX A. ZORCHER, Phœnixville, Pa. Filed July 21, 1888. Serial No. 280,671. (No model.)



Claim.—1. A hopper-bottom railway-car body or frame consisting of statically-trussed side, end, and bottom faces and one or more transverse interior girders, all rigidly connected together, substantially as described.

2. A hopper-bottom railway-car body or frame statically constructed and having one or more transverse and longitudinal interior trusses, substantially as described.

3. A hopper-bottom railway-car body statically constructed, having corrugated metal-plate wall and floor linings to retain the load, substantially as described.

4. A hopper-bottom railway-car body or frame whose sides and ends and floor and interior girders consist each of a statically-constructed truss of a corrugated plate-web, substantially as described.

5. A hopper-bottom railway-car body or frame statically constructed, having one or more interior trusses, any of which in connection with any of the exterior sides and ends form the support for an overhead floor to carry load, substantially as described.

6. A hopper-bottom railway-car body or frame statically constructed whose exterior faces, any or all, are inclined, substantially as shown and described.

7. A hopper-bottom railway-car body or frame statically constructed, and having one or more interior girders whose exterior faces, any or all, are inclined, substantially as described.

8. A hopper-bottom railway-car body or frame externally and internally statically constructed, any of whose exterior girders are inclined, the various girders also forming an overhead-floor support to carry load, substantially as described.

9. A hopper-bottom railway-car body or frame statically constructed, any of the chords of the longitudinal sustaining-girders of which are securely held in place by knee-braces, substantially as described.

10. A hopper-bottom railway-car body or frame externally and internally statically constructed with an overhead floor and one or more variously placed and constructed and operated doors, substantially as described.

11. An externally and internally statically-constructed railway-car body or frame whose central compartment is of hopper-bottom construction, and suitable truss-work extending therefrom to transfer said loads to the trucks and to resist impacts, substantially as shown and described.

12. An externally and internally statically-constructed railway-car body or frame whose end compartments are of hopper-bottom construction, and suitable truss-work connecting these two compartments, substantially as shown and described.

13. An externally and internally statically-constructed hopper-bottom car body or frame of maximum permissible car-height, any or all of its girders also forming the support for one or more upper floors, each to carry load, substantially as described.

14. A multiple-deck car having a statically-constructed framework and a pipe or raceway extending downward to enable the filling of the lower compartment and the discharging of the upper, substantially as described.

15. A statically externally and internally constructed compartment-car having a hopper-bottom compartment centrally located and single and multiple deck compartments on either side, substantially as described.

16. A statically externally and internally constructed compartment-car having a hopper-bottom compartment over each truck, and centrally located a single or multiple deck compartment connecting the two, substantially as described.

17. A composite multiple-deck railway-car externally and internally statically constructed, having a central compartment partly extending downward between the two trucks, of the greatest permissible dimensions, able to carry maximum loads, substantially as described.

18. A hopper-bottom railway-car frame or body statically constructed, whose longitudinal girders have a bottom chord, r'', substantially as shown and described.

19. A railway-car body or frame consisting of statically-constructed trusses, any or all of which have latticed webs, to which are secured corrugated or buckle plates or sheets adapted to act as linings, and thereby increase the strength of the structure, substantially as described.

20. A railway-car body or frame consisting of statically-constructed trusses combined with corrugated plate and latticed webs, the whole being joined together in such manner as to withstand strains in all directions, substantially as described.

21. A hopper-bottom railway-car body or frame having an externally-trussed body with statically-constructed side girders, said side girders being inclined, substantially as described.

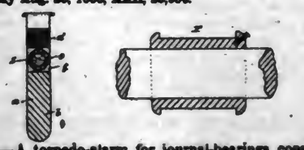
22. A statically-constructed hopper-bottom railway-car body or frame having one or more acting double slide-doors, in combination with a lever and connecting mechanism for operating the same, substantially as described.

23. A statically-constructed railway-car body or frame having one or more continuous transversely-located stiffening-frames, Z, the whole being so arranged as to give great strength against collisions and accidents due to derailment, substantially as described.

24. A statically-constructed hopper-bottom railway-car body or frame having one or more double-acting sliding doors provided with a lever and connecting mechanism, substantially as described, for operating the same.

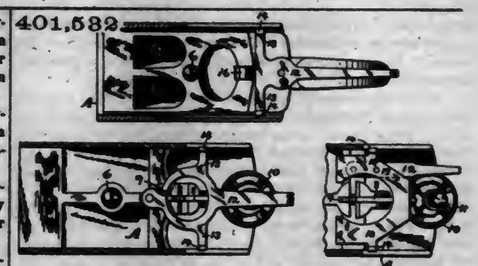
25. A statically-constructed car-body having all of its exterior faces trussed except the top face, and having one or more transverse girders, r', and knee-brace s', extending from r' upward, the whole being designed and arranged to operate substantially as described.

401,531. ALARM. CHRISTIAN ANDERSEN, Copenhagen, Denmark. Filed Oct. 1, 1888. Serial No. 286,904. (No model.) Patented in Norway Aug. 23, 1888, No. 1,081; in France Aug. 23, 1888, No. 190,560; in Belgium Aug. 23, 1888, No. 82,985; in England Aug. 23, 1888, No. 12,184 and in Italy Aug. 23, 1888, XXII, 23,950.



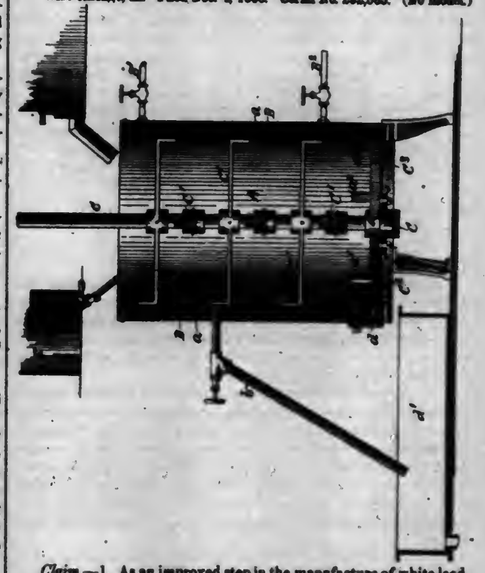
Claim.—A torpedo-alarm for journal-bearings, consisting of a tubular shell closed at the bottom and open at the top, an explosive within said shell, ingredients of an ignition compound within said shell, and an envelope separating said ingredients, said envelope being composed of a material which melts at a comparatively low temperature and permits said ingredients to unite and ignite for setting off the explosive, substantially as described.

401,532. BENCH-PLANE. FRANK M. BAILEY, New Britain, Conn., assignor to the Stanley Rule and Level Company, same place. Filed Dec. 3, 1888. Serial No. 292,540. (No model.)



Claim.—In a bench-plane, the combination of the cutting-bit, a laterally-adjusting lever, the laterally-projecting arms and upwardly-projecting lugs moving laterally with said lever and adapted to engage the outer edges of the cutting-bit, substantially as described, and for the purpose specified.

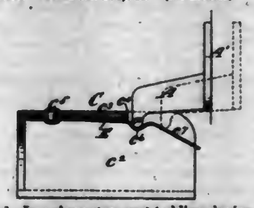
401,533. PROCESS OF MAKING WHITE LEAD. JOHN BALDWIN, Chicago, Ill. Filed Dec. 4, 1888. Serial No. 292,535. (No model.)



Claim.—1. As an improved step in the manufacture of white lead, the method herein described, which consists in grinding the lead with water in the usual manner and transferring the pulp from the mill to a vessel adapted for subjecting the pulp to the action of indirect steam heat, and then adding the oil gradually while the pulp is in a heated condition, substantially as set forth.

2. As an improved step in the manufacture of white lead, the method herein described, which consists in grinding the lead with water in the usual manner and transferring the pulp from the mill to a vessel adapted for subjecting the pulp to the action of indirect steam heat and keeping the mass agitated, next adding the oil gradually while the pulp is in a heated condition, then drawing off the water expelled, and finally disposing of the lead in the usual manner, as set forth.

401,534. DOOR-CHECK. WARREN S. BARLOW, Paterson, N. J.; Chloe H. Barlow executrix of said Warren S. Barlow, deceased. Filed Jan. 20, 1888. Serial No. 261,343. (No model.)

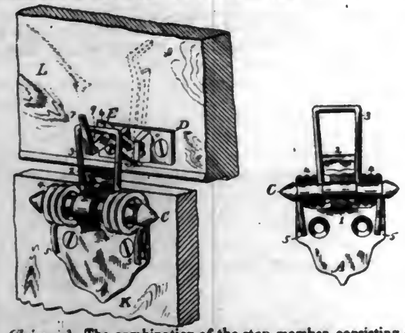


Claim.—1. In a door-stop and holding device, the combination, with a member consisting of an arm, as A, having a tooth or downward projection, a, of the member C, consisting of a box or frame having sides or cheeks c^2, and the top terminating inward of the ends

of the sides or cheeks, and a spring-supported holding device arranged between and shielded by the sides or cheeks c^3, and having a recess, c^4, for engagement of the tooth or projection a, substantially as herein described.

2. In a door-stop and holding device, the combination, with the member A, of the member C, consisting of a box or frame having sides or cheeks c^3, and the top terminating inward of the ends of the sides or cheeks to form a stop, c^4, and the holding device consisting of a spring, E, arranged between and protected by the sides or cheeks, the spring being inserted under the top and secured thereto, and having a recess, c^4, for the engagement of said member A, and forward of the recess an inclined tongue, c^7, on which the member acts to depress the spring, the recess c^4 being entirely forward of the stop c^4, and having an inclined rear wall, serving to arrest the member A by the latter striking it before it can strike said stop, substantially as herein described.

401,535. DOOR-CHECK. MILTON H. BASSETT, New Britain, Conn. Filed Nov. 10, 1886. Serial No. 218,446. (Model.)



Claim.—1. The combination of the stop member, consisting of a pivoted stop and a supporting-frame for said stop, and a buffing member, consisting of an arm-supporting base, a tripping device, and a buffer-arm of wire in the form of a loop, having the cross-bar at its outer end and the reverse spring-coils at its inner end, substantially as described, and for the purpose specified.

2. The combination of the stop member and a buffing member, consisting of an arm-supporting base, a tripping device, a buffer-arm of wire projecting therefrom in the form of a loop with a cross-bar at its outer end and having the series of reverse spring-coils at its inner end, the supporting-bar of a diameter to fill the spring-coils at two separate points for properly supporting the buffer-arm, while other coils are wholly out of contact with said bar when the buffer is in its normal position, substantially as described, and for the purpose specified.

3. The combination of an arm-supporting base, a buffing-arm in the form of a loop with a cross-bar at its outer end which projects from said arm-supporting base, a tripping device separate from the cross-bar of said buffing-arm, and a stop member acting in connection with said tripping device and buffing-arm, substantially as described, and for the purpose specified.

4. The combination of an arm-supporting base, a buffer-arm of wire in the form of a loop with a cross-bar at its outer end and the series of reverse spring-coils at its inner end, the supporting-bar within said reverse spring-coils, a pivoted stop adapted to act against the cross-bar of said buffer-arm, and a tripping device for throwing upward the pivoted stop, substantially as described, and for the purpose specified.

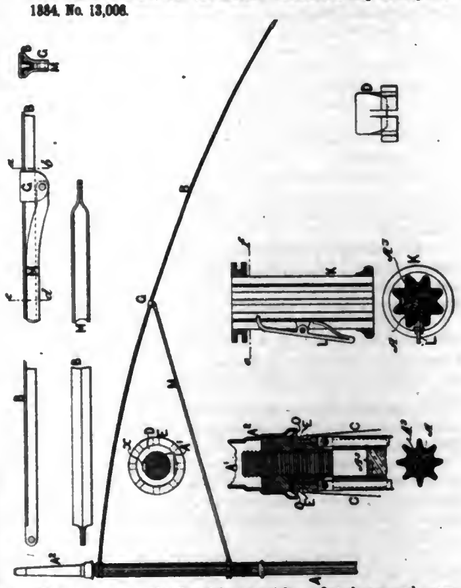
5. The combination of an arm-supporting base, a buffer-arm in the form of a loop with a cross-bar at its outer end, a tripping device connected with said arm-supporting base and separated from the cross-bar of said buffer-arm, and the pivoted stop in the form of a single bar, whereby the entire stop may pass bodily through said buffer-arm, substantially as described, and for the purpose specified.

6. In a door-check, the combination of a buffer-arm in the form of a loop, with the pivoted stop E, having the stop-shoulder 6 on its upper side and the lug 9 projecting from said shoulder at its outer end, with the under face, 7, for being hit by a tripping device, substantially as described, and for the purpose specified.

7. The combination of a buffing member and a pivoted stop adapted to swing freely in its supporting-frame, and having a lug at its outer end adapted to engage said buffing member for limiting the upward movement of said pivoted stop when thrown upward by a tripping device, substantially as described, and for the purpose specified.

8. The combination of an arm-supporting base and a buffer-arm in the form of a loop with a pivoted stop and its supporting-frame, said stop and the lugs of its supporting-frame being formed and adapted for mounting in relation to the opening within said buffer-arm substantially as described, whereby said stop and lugs may bodily enter the said opening, as specified.

401,536. UMBRELLA-FRAME. WILLIAM W. BOX, Crayford, County of Kent, assignor to Emil Weidlich, Holloway, England. Filed Jan. 8, 1888. Serial No. 259,906. (No model.) Patented in England Sept. 28, 1884. No. 13,006.



Claim.—1. An umbrella-stick comprising a fluted core and a correspondingly-fluted sheath fitted on said core, substantially as and for the purposes specified.

2. An umbrella-stick comprising a core of some light material, a sheathing fitted around said core, and a screw-threaded end plug, A', substantially as and for the purposes specified.

3. In an umbrella, a tubular stick having the plug A', in combination with the shoe or ferrule A^2, substantially as and for the purposes specified.

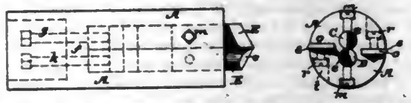
4. In an umbrella, a fluted stick provided with a depression between two ribs of the fluting, with stop notches or holes, in combination with a correspondingly-fluted runner, and a spring-catch pivoted between two ribs of the fluting and projecting through an aperture in the runner to engage the stop-notches on the stick, substantially as and for the purposes specified.

5. The fluted tubular stick A, having plug A', in combination with the shoe A^2 and top notch, D, substantially as described and shown.

6. The combination, with an umbrella-stick the ferrule end whereof is screw-threaded exteriorly for a portion of its length, said screw-threaded portion being provided with a flat locking-face, the top notch, D, loosely mounted on said threaded end, and the key x, engaging the top notch and said flat face on the threaded portions of the stick to lock said parts against rotation, of the collar E, mounted and held against rotation on the top notch and provided with a peripheral groove, and the shoe or ferrule A^2, screwed onto the threaded end of the stick, substantially as and for the purposes specified.

7. The umbrella-frame consisting of the fluted tubular stick A with screwed plug A', in combination with the top notch, D, grooved collar E, shoe A^2, ribs B, stretchers M, and fluted runner K, with spring-catch L, substantially as described and shown.

401,537. DRILLING-TOOL. ALEXANDER B. BROWN, Cleveland, Ohio. Filed Jan. 2, 1889. Serial No. 295,228. (No model.)



Claim.—1. A drilling-tool comprising two or more separate cutters, the operative edges of which exactly meet (at their inner ends) at a point which lies in the axis of motion of the tool, all substantially as and for the purpose set forth.

2. In a drilling-tool of the kind shown and described, the combination, with the tool-stock A, having formed therein suitable seats or receptacles for the same, of two tool pieces or cutters, E E, each formed of a semi-cylindrical piece of steel having its working ends beveled or tapered in two directions, substantially as and for the purposes hereinbefore set forth.

3. In combination with the tool-stock A, two or more cutters or tool-pieces having their working ends projected beyond said tool-stock, and means for adjusting said pieces endwise and also securely clamping them in place laterally, all substantially as and for the purposes hereinbefore set forth.

401,538. CAST-METAL BRACE-CHAIR FOR GIRDER-RAILS. WILLIAM M. BROWN, Johnstown, Pa., assignor to The Johnson Steel Street Rail Company, of Kentucky. Filed Feb. 15, 1888. Serial No. 264,124. (No model.)

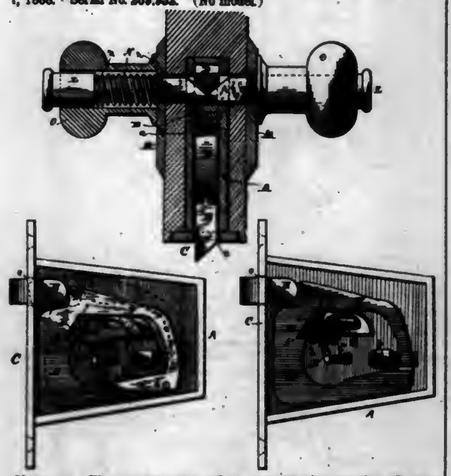


Claim.—A rail-chair for girder-rails, provided with a filler making a splice-bar fit with the rail and formed with a feather, as f, in combination with a vertical key, as K', whereby the chair is adapted to be secured to the rail without bolts or other similar fastenings, substantially as and for the purposes set forth.

401,539. CONCRETE PAVEMENT AND FLOOR. PRESTON M. BRUNER, St. Louis, Mo. Filed Nov. 24, 1888. Serial No. 291,773. (No specimens.)

Claim.—A concrete pavement, &c., having a temporary facing composed of some quick-setting material that may be removed from the pavement after the latter has become hardened.

401,540. LATCH AND LOCK COMBINED. JOHN A. CAMPBELL, Ellis, Kans., assignor to himself and F. J. Best, same place. Filed Apr. 7, 1888. Serial No. 269,932. (No model.)



Claim.—1. The combination of the gravitating tumbler D, pivoted at its lower inner corner and having a latch-head at its upper outer corner and shouldered on its interior edge, substantially as described, with an adjustable locking-tumbler within the gravitating tumbler adapted to engage the shoulder thereof to lock the same, and a spindle for oscillating the gravital tumbler, substantially as specified.

2. The combination of the pivoted tumbler D, with a knob-spindle having a beveled end engaging said tumbler and adapted to oscillate the tumbler when pushed inward, and the spring for retracting said spindle, substantially as described.

3. In a lock, the combination of the pivoted tumbler D and movable tumbler G, located inside said tumbler, with a sliding knob-spindle, L, engaging tumbler D, and the spring controlling said spindle, all substantially as and for the purpose described.

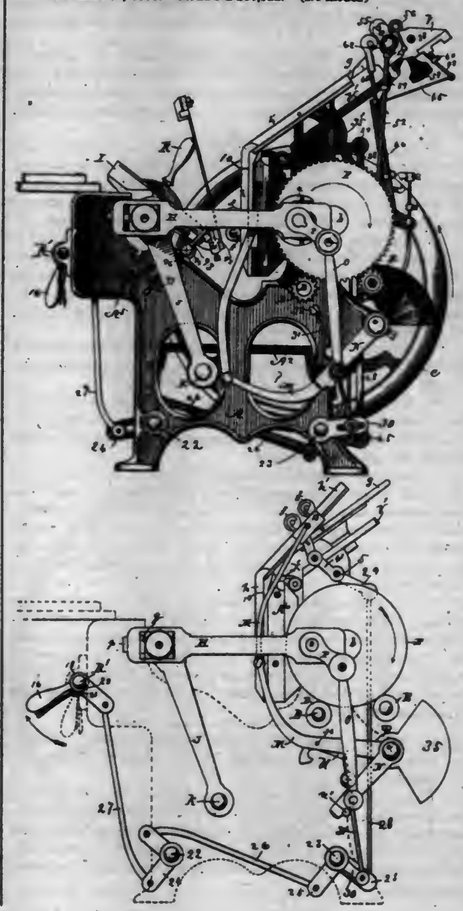
4. The combination of the pivoted weighted tumbler D and its latch-head with the slotted sliding tumbler G, and the spring-plate J, mounted on and adapted to lock said tumbler G, all constructed and arranged substantially as described.

5. In a lock, the combination of the casing having lug F, the pivoted tumbler D, latch-head E, and the slotted tumbler G, mounted on lug F, and its spring-plate J, with the knob-plates M M, the spring-controlled knob-spindles L L, and knobs O, all constructed and arranged to operate substantially in the manner and for the purpose described.

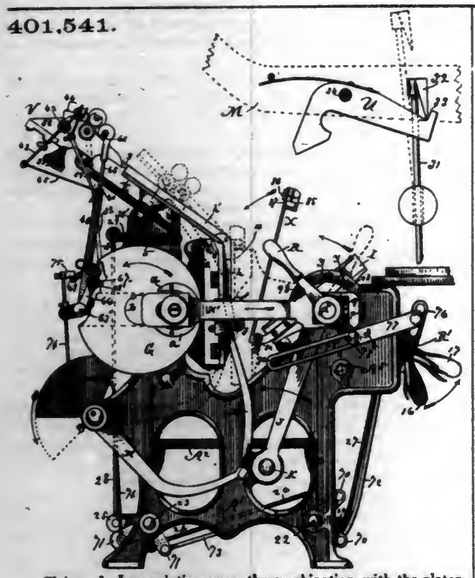
6. The combination of the casing having a lug, b, and the pivoted hollow tumbler D therein, with the knob-spindles L L, having flattened and beveled inner ends bearing against the lug b and engaging tumbler D when pushed inward, and the springs controlling said spindles, all substantially as and for the purpose described.

7. The combination of the casing having a lug, F, and a tumbler, D, pivoted at its lower inner corner in the casing and having a latch at its upper outer corner and shouldered on its interior near said latch, with the sliding toothed locking-tumbler G, mounted on lug F, and the spring-plate J on lug F, adapted to lock tumbler G, and the spindles for oscillating tumbler D, all substantially as specified.

401,541. PRINTING-PRESS. ALTON B. CARTY, Frederick, Md. Filed Mar. 17, 1888. Serial No. 267,522. (No model.)



401,541.



Claim.—1. In a printing-press, the combination, with the platen, of a frisket-frame pivoted at its lower edge to the platen and provided with an arm at one side, and a spring-operated rod and a tripper, all arranged so that when the platen returns the spring returns the grippers and the rod until arrested by the latter striking the tripper, as herein set forth.

2. In printing-presses, the roller-ways consisting of a vertical or form portion adjustable to or from the form by set-screws, and an inclined or plate portion hinged to the vertical or lower portion and supported in position by hinged arms operated by levers, as herein set forth.

3. In printing-presses, the combination of an auxiliary arm loosely connected to the shaft of the form-roller-operating arms by a spring-latch, U, and stud or pin *u'*, and a rod, 31, provided with a detent, 32, by which said form-roller-operating arms may be disengaged from the auxiliary arm, as and for the purposes herein set forth.

4. In printing-presses, the plate-roller mechanism consisting of two vertical oscillating arms, 46, rigidly secured to shaft 63 and provided with guide-lugs 60 for rod of plate-roller, said shaft 63 carrying upon one end a loosely-connected arm, 66, adapted to engage with cam-wheel G, and a stud or pin, 68, in combination with spring-hook 69, pivoted to one arm, 46, as herein set forth.

5. In combination with the plate-roller mechanism above claimed, the detent 75, rod 74, bell-crank levers 70 and 71, connecting-rods 72 and 73, and handled lever 17, as herein set forth.

6. In a printing-press, the system of levers 16, 24, 25, and 29 and their connecting-rods 26, 27, and 28, and pivoted roller-ways adjacent to the ink-disk, whereby the roller-ways may be elevated above the ink-disk, as herein set forth.

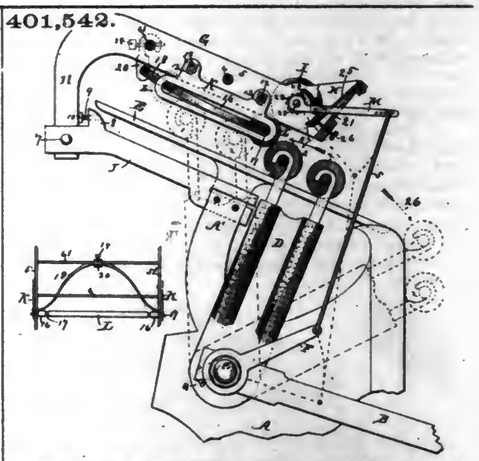
7. In a printing-press, the combination of arm 30, shaft 23, rod 31, detent 32, and spring-hook U, pivotally connected to one of the form-roller-operating arms, and auxiliary arm N, loosely secured to shaft *e*, balance-weight 35, and the system of levers 16, 24, 25, and 29 and their connecting-rods 26, 27, and 28, whereby the roller-ways are elevated and the form-rollers carried up and rested therein, as herein set forth.

8. In a printing-press, two handled levers, 16 17, connected by spring-pawls to shaft R', arm 76 of shaft R', rigidly secured thereto, platen-lever R, secured to eccentric pin *d'* of platen-shaft, and slotted bar 77, whereby the roller-ways may be elevated, the form-rollers rested thereon, the plate-roller rested above the ink-disk, and the impression taken off, all simultaneously and by one movement of lever R, as herein set forth.

401,542. INK-FOUNTAIN FOR PRINTING-PRESSES. ALTON B. CAREY, Frederick, Md. Filed May 21, 1888. Serial No. 274,506. (No model.)

Claim.—1. In a printing-press inking device, the combination of the form-rollers and the fountain-roller with an intermediate transfer-roller and a spring bearing laterally against the transfer-roller, whereby the latter is held with a yielding pressure against the fountain-roller and removed therefrom by the contact of the traversing form-rollers as set forth.

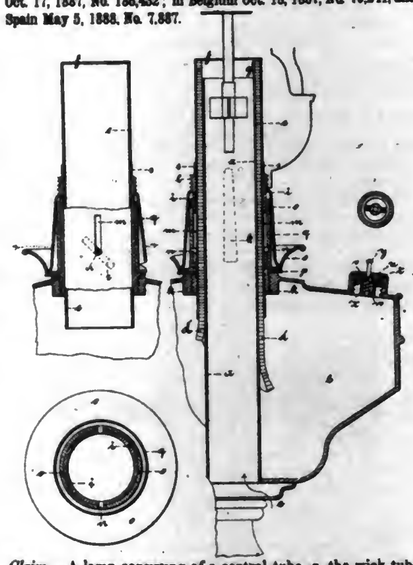
401,542.



2. In a printing-press inking device, a transfer-roller, in combination with its supporting-plates K, adjustable and having the slotted ways 14, whereby the parallelism of the roller-ways with the inking-disk of the device can be preserved, as set forth.

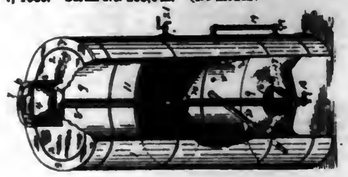
3. The combination of a pivotal-supported ink-fountain for printing-presses, as herein set forth, with ratchet-wheel 22, spring-pawl 24, lever M, rod 5, arm F, and rock-shaft C of a printing-press, as and for the purposes herein set forth.

401,543. OIL-LAMP WITH ANNULAR BURNER. ARTHUR CAUTIUS, Tilsit, Prussia, Germany. Filed Jan. 10, 1888. Serial No. 260,270. (No model.) Patented in England Oct. 8, 1887, No. 13,664; in France Oct. 17, 1887, No. 186,432; in Belgium Oct. 18, 1887, No. 79,241, and in Spain May 5, 1888, No. 7,887.



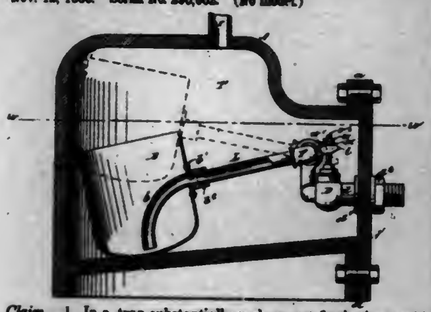
Claim.—A lamp consisting of a central tube, *a*, the wick-tube *c*, provided with projecting pins, the tube *i*, encircling the tube *c* and slotted, as described, the tube *o*, having inclined slots engaging with the pins of the tube, the cap *q* and disk *p*, and the hand-disk *o'* for rotating the tube *o*, substantially as described.

401,544. OIL-FILTER. ALBERT G. DARRAGH, Allegheny, Pa. Filed Jan. 7, 1889. Serial No. 295,642. (No model.)



Claim.—In a combined filter and reservoir, the combination of a shell, a receiver containing a funnel with a strainer and having a short pipe-section projecting from its base, a stand-pipe extending from said receiver into a funnel, provided with a strainer at the base of the filter, a guide supporting said funnel, a wash-cock at the bottom of the filter, and a filter-disk forming the bottom of the reservoir and separating said reservoir from the water-chamber, all substantially as and for the purposes set forth.

401,545. STEAM-TRAP. GEORGE ISHAM, Jersey City, N. J. Filed Nov. 12, 1888. Serial No. 290,602. (No model.)



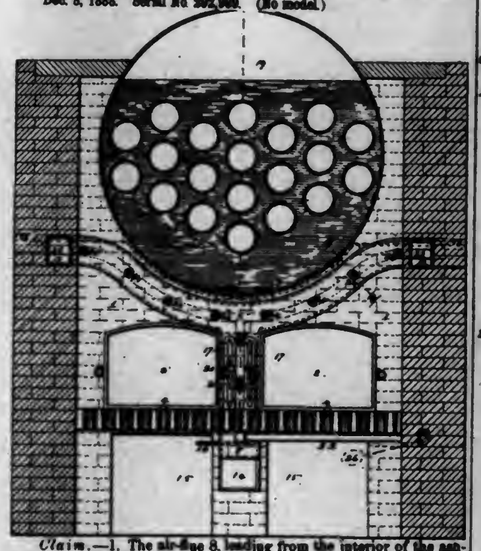
Claim.—1. In a trap substantially such as set forth, the combination, in the inclosed chamber T, of the open float B, drain-pipe *b*, hollow lever L, and hollow fulcrum F, with the discharge-valve D, interposed in the discharge-passage and operated by the short arm *l* of the lever L, substantially in the manner and for the purpose described.

2. In a trap substantially such as designated, the combination of the closed chamber T, open float B, hollow lever L, having the hollow fulcrum F, communicating with the discharge-passage, and the short arm *l*, for raising the valve-disk *v* from its seat *v'*, and the valve D, interposed in the discharge-passage and provided with the retractile spring v^3, for closing the valve, substantially in the manner and for the purpose described.

3. In a trap substantially such as described, the combination of the closed chamber T, open bucket B, hollow lever L, short arm *l*, hollow fulcrum F, passage d^2, valve-disk *v*, stem v^2, retractile spring v^3, valve-seat *v'*, and discharge-passage *d*, the whole arranged and operating substantially in the manner and for the purpose described.

4. In a trap substantially such as set forth, the combination, in the closed chamber T, of the open bucket B, drain-pipe *b*, hollow lever L, hollow fulcrum F, and short arm *l*, with the discharge-valve D, interposed in the discharge-passage and formed with the retractile spring v^3 and adjustable shoulder M upon the valve-stem v^2, substantially in the manner and for the purpose set forth.

401,546. FURNACE. MICHAEL A. FOSTER, St. Louis, Mo. Filed Dec. 8, 1888. Serial No. 292,969. (No model.)



Claim.—1. The air-flue 8, leading from the interior of the ash-pit up the front of the fire-chamber and having side branches, 9, and having nozzles discharging into the fire-chamber.

2. The grate-bearing bar having a flange for support of the ends of the grate-bars, an aperture for the passage of an air-flue reaching from the interior of the ash-pit in front of the fire-chamber and having nozzles discharging from the flue into the fire-chamber.

3. The combination, with a grate-bearing bar and an air-flue extending from beneath the fire in front of the fire-chamber and discharging therein, of brackets adjustably attached to the flue and resting on the bearing-bar, substantially as and for the purpose set forth.

4. The air-flue opening beneath the fire within the ash-pit, extending upwardly in front of the fire-chamber and having nozzles discharging into the fire-chamber, and a steam-pipe having steam-nozzles within the air-nozzles forming injectors, by which the air is mixed with the steam and injected into the fire-chamber, substantially as set forth.

5. The air-flue extending from beneath the fire and upward in front of the fire-chamber and having side branches, the upright pipe and branches having nozzles discharging into the fire-chamber, and a steam-pipe extending through said flue and its branches and having steam-nozzles within the said air-nozzles and forming with such nozzles injectors forcing air mixed with steam into the fire-chamber.

6. The combination, with a boiler-furnace, of the upright flue 8 branch flues 9, and longitudinal flues 12, with valves 13 and 16 to govern the air-supply, and discharge-nozzles extending from the flue to the fire-chamber, and a steam-pipe passing through the upright and branch pipes and having nozzles within the nozzles of the air-flues 8 and 9, substantially as and for the purpose set forth.

7. The combination, with the vertical air-heating flue in the front of a fire-chamber having nozzles discharging into said chamber, and a port, 14, opening into the ash-pit, and a steam-pipe within said flue having steam-jet nozzles within the air-discharge nozzles, substantially as and for the purpose set forth.

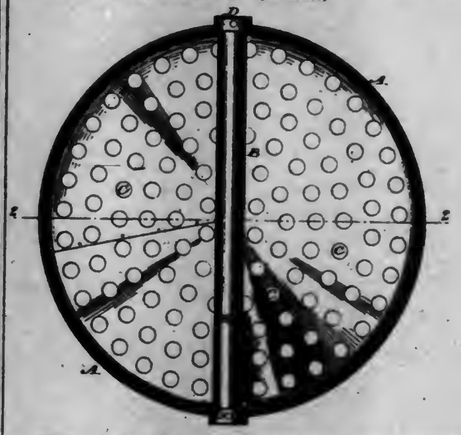
8. The combination, with the furnace-wall, of a vertical flue in said wall having nozzles projecting through said wall into the furnace, a grate-bearing bar let into said wall and having an aperture for the passage of the flue and grooves or channels 6, and the grate-bars 4, having hooks resting in said groove, substantially as set forth.

401,547. TURF-FIBER SURGICAL DRESSING. VICTOR FRANCKEN and JOSEPH PIERRAY, Liege, Belgium. Filed Sept. 4, 1888. Serial No. 284,550. (Specimens.)



Claim.—The disintegrated fibrous product from peat herein described.

401,548. SIFTER. JOHN H. FREDERICK, Lock Haven, Pa. Filed Jan. 17, 1889. Serial No. 296,623. (No model.)



Claim.—A sifter whose sides are composed of a single perforated annular band of sheet metal, combined with a perforated sheet-metal

disk slitted and overlapped, so as to form a circular convex bottom, the disk and annular band being joined by infolding together at X, substantially as set forth.

401,549. SURGEON'S KNIFE. HENRY E. GENRIS, Philadelphia, Pa. Filed Sept. 15, 1888. Serial No. 285,490. (Model.)



Claim.—1. A knife-handle consisting of two separate parts and a fastening device with lips adapted to embrace the outer sides of the said parts at their ends, substantially as and for the purpose set forth.

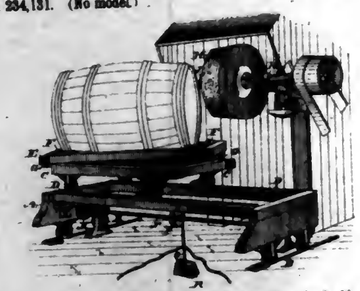
2. In a knife, substantially as described, a fastening formed with a tongue for engagement with a recess in the blade and with lips for clasping or embracing the sides of the handle, as stated.

3. In a knife formed of detachable parts, substantially as described, a blade having recesses in opposite sides of its heel, and a fastening device provided with a tongue which engages with either recess in closed or open position of the blade and lips which embrace the detachable sides of the handle, thus keeping the members of the knife intact, the parts being combined as stated.

4. In a knife formed of detachable parts, consisting of a separable handle, a blade, and a fastening device, the pivot-pins 1 3 and stop-pin 2, connected with one part of the handle, said parts of the handle being held intact by the fastening device, all combined substantially as described

5. The fastening C, having a heel, C', which is adapted to press against the blade and open the same, substantially as described.

401,550. APPARATUS FOR SHAVING BARRELS, &c. WILLIAM GIBSON and ROBERT RAY, Philadelphia, Pa. Filed Apr. 8, 1887. Serial No. 234,131. (No model.)

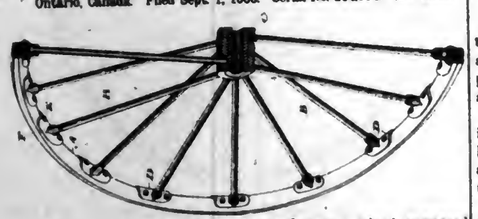


Claim.—1. In a barrel-grinding device, the shaft N, suitably mounted on standards adapted to be secured to a floor, in combination with the pinions M and pulley P, mounted on said shaft, the weighted cord Q, secured to said pulley, the truck A, having racks L on its under face, the track B, the truck C on truck A and adapted to move at right angles to track B, the cradle E, pivoted to the truck C, and a grinding-wheel, with means, substantially as described, for operating the same, substantially as described.

2. In a barrel-grinding device, a truck having means for automatically moving the same, a second truck mounted on the first truck and adapted to move thereon at right angles to the direction of movement of the first truck, a cradle centrally pivoted to said second truck and provided with the wheels G, and the rollers F, the latter journaled in said cradle at the ends thereof and having the barrel to be operated on resting thereon, substantially as described.

3. In an apparatus for grinding barrels, &c., the truck A, having a rack connected therewith, in combination with a pinion mounted on the floor, a pulley on the pinion-shaft, and a weighted cord connected with said pulley, substantially as described.

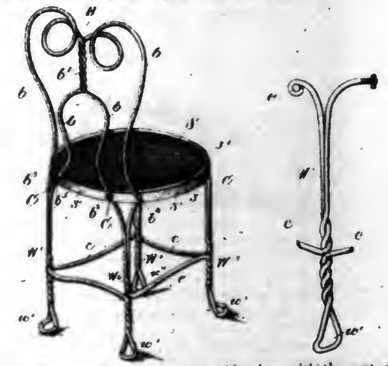
401,551. WHEEL. ALEXANDER GILLIES, West Toronto Junction, Ontario, Canada. Filed Sept. 1, 1888. Serial No. 284,354. (No model.)



Claim.—1. As a new article of manufacture, a wheel composed of the hub C, formed of two concentric tubes, a metal tubular frame, A, and tubular spokes B, the latter being screwed into the outer tube of the hub C, and connected at their opposite ends to the rim A by means of the clips D, substantially as and for the purpose specified.

2. The wheel described, consisting of a tubular metal frame or felly, A, the clips D, shaped to fit said felly and provided with screw-threaded sockets, the tire shaped to fit the felly, the hub, and the tubular spokes B, screwed directly into said hub at one end, and at the other end into said socket, substantially as shown and described

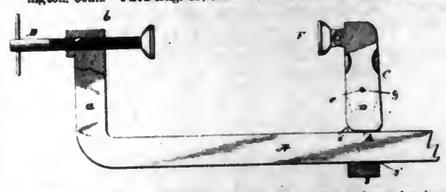
401,552. IRON CHAIR. ALEXANDER M. GJESTVANG, Christiania, Norway. Filed Sept. 28, 1888. Serial No. 286,641. (No model.) Patented in Norway May 5, 1888, No. 398; in France May 17, 1888, No. 190,639, and in England Aug. 24, 1888, No. 12,230.



Claim.—1. In a chair, the combination, with the seat, of legs composed of doubled wires twisted together to form a foot and braced by connecting one branch of each leg-wire with a branch of another leg-wire, so that both branches of a wire form the lower portion of a leg, while one of said branches will form a cross-brace for a pair of legs, the terminals of said wires being connected to the seat, substantially as and for the purposes specified.

2. In a chair, the combination, with the seat, of legs composed of a doubled wire twisted together to form a foot, one branch of such wire being connected by twisting it with one branch of another leg-wire above the twisted foot portion, the terminals of said wires being connected to the seat, substantially as and for the purposes specified.

401,553. WOOD-WORKING CLAMP. ERNEST F. GODFREY, Southington, Conn. Filed Aug. 15, 1888. Serial No. 282,766. (No model.)



Claim.—1. The combination, in a wood-working clamp having a straight smooth-edged bar, A, terminating on one end in an arm having a clamping-screw, of the yoke C, provided with parallel arms *d d*, and a transverse connecting portion beveled to afford a biting angle, *s*, and a pivotal jaw, D, provided at its lower end with a front rounded portion and a rear flat gripping portion, substantially as specified.

2. The combination, with the bar A, having an arm at one end provided with a clamping-screw, of an adjustable arm consisting of the yoke C, having an acute angular biting portion, *s*, formed on it, and a gripping-jaw pivoted to said yoke and adapted to impinge directly upon the upper edge of said bar A, as specified.

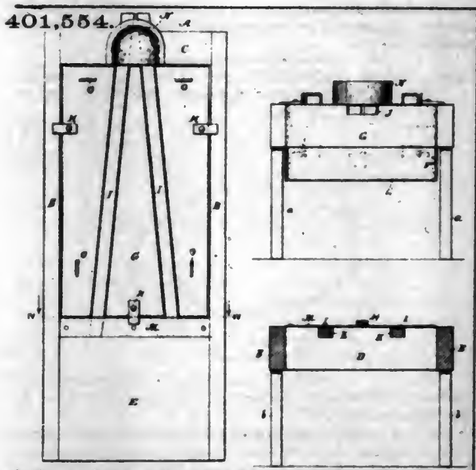
401,554. CORPSE-DRESSING TABLE. CASPER GREEN, Dublin, Ind. Filed July 28, 1888. Serial No. 281,284. (No model.)

Claim.—1. A table having an opening in its top, slide-bars extending lengthwise of said opening and supported by the table, and a lowering support below said bars, said bars being adapted to support a corpse when the lowering support is lowered, substantially as and for the purpose set forth.

2. A table having an opening in its top, removable bars extending across said opening and supported by the table, and a support below the bars for supporting a corpse when said bars are removed and adapted to be moved away from said bars, substantially as and for the purpose set forth.

3. A table having an opening in its top, removable bars supported by the table across its opening, a head-rest above the upper ends of

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the bars and supported by the table, and a support below the bars for supporting a corpse independently of said bars and adapted to be moved away from said bars, substantially as and for the purpose set forth.

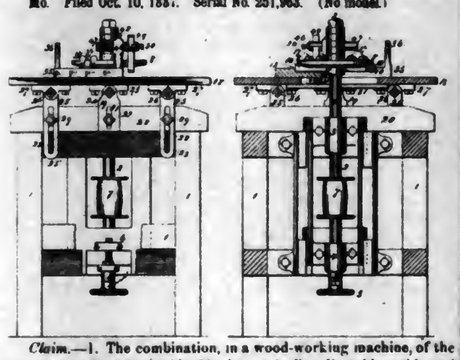
4. A table having an opening, bars I, extending lengthwise of said opening and angularly with respect to each other, and a recessed block above the meeting ends of said bars to afford a rest for the head, as set forth.

5. A table having an opening, removable bars extending lengthwise of said opening, a movable portion occupying said opening, and fixed supports extending from side to side of and below the table, whereon the movable portion is adapted to be lowered, and means for supporting the movable portion in said opening, substantially as set forth.

6. A table having an opening, bars I, extending lengthwise of said opening and supported by the table, and a board, G, fitting in said opening and provided with grooves for receiving said bars, said board being adapted to be lowered below the table, substantially as set forth.

7. A table having an opening, a movable board having buttons for supporting it in said opening by engagement with the sides of the table, corpse-supporting bars above the said board, and means for supporting the board when lowered, as set forth.

401,555. PANEL-RAISING MACHINE. JOHN GREEN, St. Louis, Mo. Filed Oct. 10, 1887. Serial No. 251,963. (No model.)



Claim.—1. The combination, in a wood-working machine, of the transversely-adjustable guide 35, the vertically-adjustable guide and chip-breaker 41, and the adjustable bar 32, all constructed and connected substantially as set forth.

2. The combination, with the main frame and table, of the brackets 27, secured to said table, the links or supports 26, hinged to said brackets, having slots, and bolts passing through said slots and securing said supports to the main frame, as set forth.

3. The combination, with the table and the cross-bars 20, of supports hinged to each corner of said table and having vertical slots therein, bolts passing through said slots and securing said supports to the cross-bars 20, recesses in said cross-bars, slotted standards set in said recesses and hinged to the table, and bolts passing through the slots in said standards and into said cross-bars 20, as set forth.

4. In a wood-working machine, the combination, with the table and the rotary cutter-head, of the combined guide-bar and chip-breaker 41, having the upwardly-projecting ends 42, adjustably secured to the table and adjustable to and from the cutter-head and adapted to serve as a side guide for the material, substantially as described.

5. The combination, with the guide-pieces 35 35 and the rotary cutter-head, of the combined guide-bar and chip-breaker 41, arranged between the ends of and having slot-and-screw connection with said guide-pieces 35 35, whereby said guide-bar and chip-breaker 41 is adjustable to and from the cutter-head, substantially as set forth.

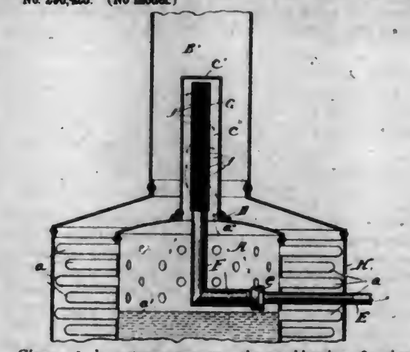
6. The combination, with the cutter-head and the guide-pieces 35 35, of posts secured to said guide-pieces, and the guide-bar and chip-breaker 41, having extensions 42, adjustably secured to said posts, substantially as set forth.

7. In a wood-working machine, the combination of the bar 32, adapted to support the stuff, vertically-adjustable screws upon which said bar is mounted, springs adapted to bear upon the stuff above said bar, and supports for holding said springs, substantially as set forth

8. In a wood-working machine, the combination, with the guide-pieces 35 35 and the bars 31, of standards carried by said pieces, a bar, 32, adjustably supported on said bars 31 and adapted to support the stuff, and springs adjustably secured to said standards and adapted to rest upon the stuff, substantially as set forth.

9. The combination, with the cutter-head, the table, and the guide 35 35, having slot-and-screw connection with said table, of the combined guide-bar and chip-breaker 41, having the vertical slot-and-screw connection with said guide 35 35, whereby said guide-bar and chip-breaker 41 is adjustable vertically and longitudinally to and from the cutter-head, as set forth.

401,556. SEPARATOR. CHARLES HALLETT, Chicago, Ill., assignor to Francis Carll Hallett, River Head, N. Y. Filed Jan. 15, 1889. Serial No. 296,425. (No model.)



Claim.—1. In a steam-separator, the combination of a pipe having one end thereof closed, perforations in the pipe, and metal cloth wound one or more times around the perforated pipe in close contact therewith, whereby steam entering the perforated pipe must pass through the meshes of the cloth, all substantially as described.

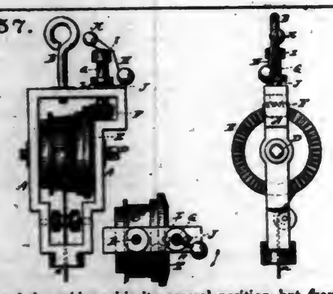
2. In a separator for steam-generating boilers, a pipe having perforations therein placed in the steam collector or dome of said boiler formed by a tubular extension thereon of less diameter than said boiler, in combination with a metal wrapping having small perforations therein wound around the perforations in said pipe, and a steam-outlet pipe passing from said dome or collector through the furnace of said boiler, whereby steam generated in said boiler passing through said separator in leaving said boiler by said steam-outlet pipe shall pass through the furnace of said boiler above the fire-box thereof, all substantially as described.

3. In a steam-separator, a pipe having perforations therein placed within a steam-generating boiler above the water-line thereof, in combination with metal cloth wrapped around the pipe and over the perforations therein, and a steam-outlet pipe passing from and a continuation of the perforated pipe and extending through the furnace surrounding the boiler above the fire-pot therein, all substantially as described.

401,557. SUSPENSION DEVICE FOR LAMPS. WILLIAM E. HAMMOND and JOSEPH G. MERRIAM, Meriden, Conn., assignors to Edward Miller & Company, same place. Filed Oct. 15, 1888. Serial No. 288,125. (No model.)

Claim.—1. In a suspension device, the combination of a frame, an axle, a spring-actuated drum arranged thereon, a shaft in connection with the drum, but so as to receive a revolution from the drum more rapid than that of the drum, and a pawl hung to said shaft and so as to partake of its revolution, the said pawl adapted to swing toward and from its center of revolution, with one or more stationary stops

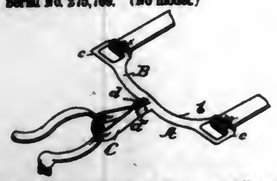
401,557.



in the path of the said pawl in its normal position, but from which stop the said pawl will swing under centrifugal force imparted to it through the shaft which carries it, substantially as described.

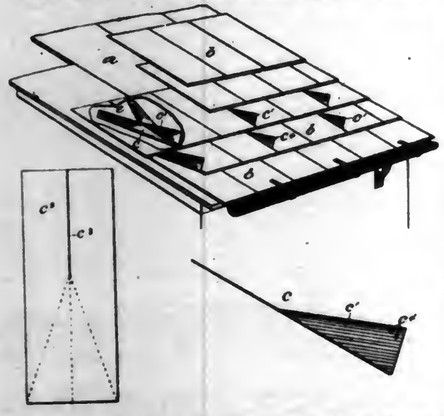
2. In a suspension device, the combination of a frame, a stationary axle therein, a spring-actuated drum on said axle, a gear-wheel on said drum revolving therewith, a vertical shaft carrying a pinion, and so that said vertical shaft receives a revolution from the drum, but more rapid than that of the drum, a pawl hung to said shaft so as to swing in a vertical plane, but so as to revolve with said shaft in a horizontal plane, and one or more stationary stops on the frame in the path of the pawl when in its normal position, substantially as described, and whereby under the rapid revolution of the shaft carrying the pawl the centrifugal force imparted to the pawl will cause it to fly outward and assume a path outside of said stop, substantially as described.

401,558. OVERDRAW CHECK-SPREADER. SAMUEL R. HARSH, Wabash, Ind., assignor of one-half to John M. Harter, same place. Filed June 1, 1888. Serial No. 275,709. (No model.)



Claim.—A checkrein-spreader consisting, essentially, of a single continuous integral bar provided with rigid loops on its ends, and in the same plane a pair of parallel ears formed integral with said bar and extending rearwardly from the central portion of the rear edge of the bar, the inner faces of said ears being smooth and located a distance apart, and the edge of the bar between the same forming a square shoulder, the flexible loop composed of a single piece of flexible material having its ends squared and located between said ears and bearing against said shoulder, and a pin passing through the ears and said ends, substantially as set forth.

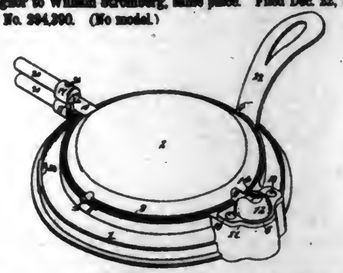
401,559. SNOW AND ICE GUARD. SAMUEL R. HAWTHORNE, Middlebury, Vt. Filed Nov. 30, 1888. Serial No. 292,344. (No model.)



Claim.—1. The improved snow-guard consisting of the sheet-metal forked base with the integral rib projecting upward from the base at the line of union of the legs, all substantially as described.

2. In combination with the roof *a* of a building, the slates *b*, and the snow-guard consisting of the forked sheet-metal base with the integral triangular rib projecting upward from the base, all substantially as described.

401,560. WAFFLE-IRON. EDWARD HOTHEIMER, St. Louis, Mo., assignor to William Stromberg, same place. Filed Dec. 22, 1888. Serial No. 294,200. (No model.)



Claim.—1. In a waffle-iron attachment, a ball-and-socket universal-bearing bed on which the pan is turned, substantially as and for the purpose set forth.

2. In a waffle-iron attachment, the combination of the sectional ball and sectional socket bed-plate forming the universal-movement bearing on which the pan is turned, substantially as and for the purpose set forth.

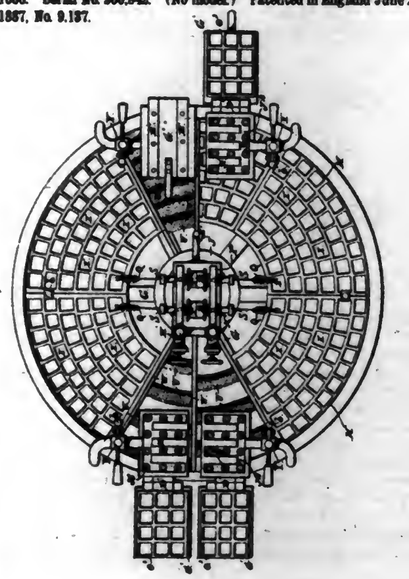
3. In a waffle-iron attachment, the combination of the sectional ball, the globular core 10, the concave bed-section of the socket bed-plate in which said ball works in a universal movement, and the concave cap of the socket-bed, substantially as and for the purpose set forth.

4. In a waffle-iron attachment, the combination of the sectional ball, the globular core 10, the concave bed-socket plate in which said ball is seated, and the concave cap that surmounts the ball provided with a curvilinear slot, 14, substantially as and for the purpose set forth.

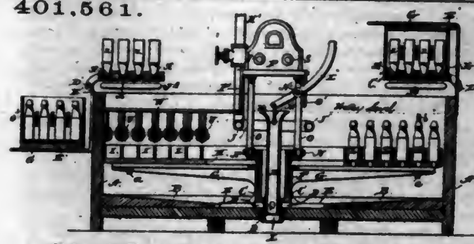
5. In a waffle-iron attachment, the combination of the sectional ball, the globular core 10, the socket bed-plate in which said ball works, the concave cap-plate that surmounts said ball, provided with the curvilinear slot 14, the sectional combined pan and cover, and the sectional neck 9, the sections of which each relatively connect its section of the combined pan and cover with the corresponding section of the ball, substantially as and for the purpose set forth.

6. In a waffle-iron attachment, the combination of the sectional ball, the globular core 10, the socket bed-plate and cover within which said ball works, the sectional combined pan and cover, the sectional handle by which the waffle-iron is operated, and the projecting lugs 24, that couple the sections of the handle together, substantially as and for the purpose set forth.

401,561. BOTTLE WASHING AND BRUSHING MACHINE. CHARLES B. INMAN, Leeds, County of York, England. Filed Mar. 10, 1888. Serial No. 266,542. (No model.) Patented in England June 28, 1887, No. 9,137.



401,561.



Claim.—1. The combination of a vat, pipes for supplying the same with water, a stand-pipe opening through the vat-bottom, an overflow-tube in the stand-pipe having its upper end opening at the water-level, radial arms journaled on the stand-pipe, bottle-carrying boxes supported by and moving around with the radial arms, and suspended brushes between which the bottles are carried by the bottle-boxes, substantially as described.

2. The combination of a vat, pipes for supplying the same with water, a stand-pipe having lateral water-passages and opening through the vat-bottom, a vertically-movable overflow-tube having a valve at its lower end to open and close the lateral water-passage in the stand-pipe, radial arms journaled on the stand-pipe to travel in a circular path, bottle-carrying boxes on the radial arms, and cleaning-brushes between which the bottles are carried by the bottle-boxes, substantially as described.

3. The combination, with a vat for washing bottles having an orifice in its bottom, of a stand-pipe, C, opening through the vat-bottom, having lateral orifices D and provided with the bore L, the rising-and-falling overflow-tube M, having its lower end adapted to said bore, and a pivoted swinging lever, L', connected with the tube for raising and lowering it in a vertical plane, substantially as described.

4. The combination, with a vat, of a central stand-pipe, C, a flanged ring, N, on the pipe, standards O, carried by the ring or frame P on the uprights, the rotary brushes Q on the frame, the supports W, connected with said frame, the brushes U, suspended from the supports, and traveling bottle-boxes for moving the bottles between the suspended brushes, substantially as described.

5. The combination, with a vat, of a stand-pipe, C, rotary arms journaled on the pipe and having bottle-boxes moving therewith, and the overflow-tube M, located in the stand-pipe and having its upper end arranged to carry off the matter floating on the surface of the water in the vat, substantially as described.

6. The combination, with the vat, of the covers C', hinged thereto, the rinsing-nozzles X, the hinged brackets E', for supporting the bottle-boxes O^3, and pipes Y, for supplying the rinsing-nozzles with water, substantially as described.

7. The combination, with a vat and traveling bottle-carrying boxes therein, of the cell-case A^3, the horizontally-sliding plate B^3 in the said case, and means for raising and lowering the cell-case, substantially as described.

8. The combination, with the vat, of the stand-pipe C, the rotary sleeve F, carrying the box-supporting arms G, the flanged ring N on the upper end of the stand-pipe, standards O, secured to the flanged ring, and the frame P, mounted on the standards and carrying the revolving brushes Q, substantially as described.

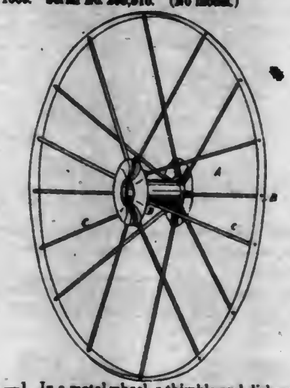
9. The combination, with the vat, of the stand-pipe C, the traveling arms G, carrying the bottle-holding boxes H, the flanged ring on the stand-pipe above the traveling arms, the standards O, secured to the flanged ring and provided with the hangers P', the bars W, supported at their inner ends by the hangers, and the suspended brushes U, hung from the bars, substantially as described.

401,562. PLOW. STEPHEN KAUBLE, Clay City, Ill. Filed Jan. 16, 1889. Serial No. 296,488. (No model.)



Claim.—As an improvement in plows, the landside having upwardly-projecting apertured ears, and the plow-point and cutter integral with or secured to said landside, in combination with the standard having a flange or seat, the mold-board, and the long and short handles, substantially as set forth.

401,563. METAL WHEEL. ALPHEUS KEEFE, Toledo, Ohio. Filed Jan. 3, 1889. Serial No. 295,816. (No model.)

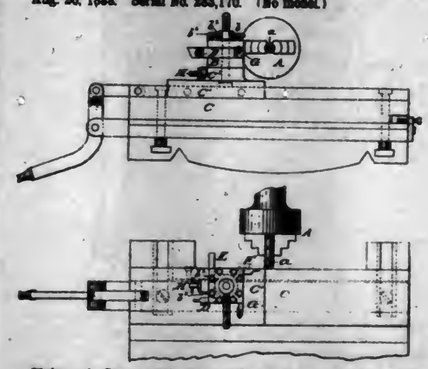


Claim.—1. In a metal wheel, a thimble and disks upon each end thereof, having arched bearings upon which the bent portions of the spokes engage, in combination with lugs upon the disks adapted to be bent upon the spokes, as and for the purpose set forth.

2. In a metal wheel, disks formed with radial channels terminating in a curved shoulder, the channels being adapted to be closed by bending a portion of the projecting metal which forms the same, in combination with bent spokes resting within the channels and engaging the shoulder, as and for the purpose set forth.

3. A metal wheel comprising a box having radial flanges, and disks formed with U-shaped bearings, a portion of which are of a depth to overlap the bearing, in combination with spokes held within the bearings by the overlapping portions and the radial flanges of the box, as and for the purpose set forth.

401,564. LATHE-TURRET. CHARLES I. KING, Madison, Wis. Filed Aug. 20, 1888. Serial No. 283,170. (No model.)



Claim.—1. The combination, with a lathe-turret, of a tool having its working-point in a line parallel with and out of the radius of the turret.

2. A lathe-turret provided with tangentially-arranged tool-seats.

3. A lathe-turret provided with lateral grooves for tool-seats, and set-screws threaded through the top ledges of the grooves.

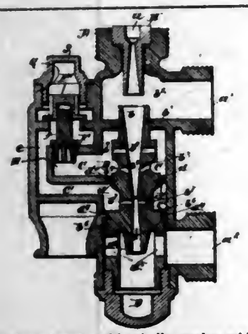
4. The combination, with a lathe-turret provided with a tool-seat, of a tool having its rear end inclined, and an adjusting-screw having its end projected into bearing upon the inclined end of the tool and movable in a direction transverse to the length of the tool.

5. The combination, with a rotatable lathe-turret, its stationary support, and tools so arranged in the turret as to impose tangential pressure upon the turret, of a spring-actuated pin radially mounted in the stationary support of the turret, and having its inner end tapered to enter and fill a suitable hole provided in the turret.

401,565. STEAM-INJECTOR. ALBERT LAMBERT, Wadsworth Ohio. Filed Sept. 12, 1888. Serial No. 285,222. (Model.)

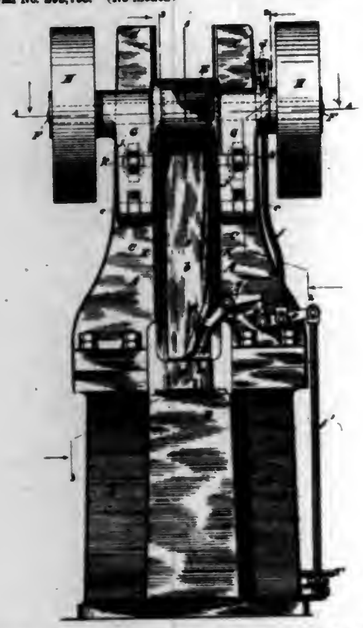
Claim.—In an injector, the combination of the casing having the upper and lower overflow-chambers, *c c'*, the overflow arm or branch formed at one side of said casing, the passage-ways E *e*, leading from said overflow-chambers, the lower valve, F, having a projecting spin-

401,565.



die, and the upper valve wherein said spindle works, said valve being seated over the respective openings of the passage-ways E *e*, substantially as set forth.

401,566. DROP-HAMMER. FRANK M. LEAVITT, Brooklyn, N. Y., assignor to the E. W. Bliss Company, same place. Filed Dec. 6, 1888. Serial No. 292,793. (No model.)



Claim.—1. The combination, with the hammer and its lifting mechanism, of a wedging incline arranged in connection therewith to act by the ascent of the hammer to its highest position to disengage said lifting mechanism.

2. The combination, with the hammer and its lifting mechanism, of a wedging incline and a coacting part arranged to be displaced by said incline upon the ascent of the hammer and connected to the lifting mechanism, so that upon being so displaced it throws the latter out of action.

3. The combination, with the hammer and revolving friction-rollers for lifting it, of a movable bearing-frame carrying one of said rollers, and a wedging incline arranged in connection with the hammer and said bearing-frame and adapted upon the ascent of the hammer to displace said bearing-frame and move its roller out of action.

4. The combination, with the hammer and revolving friction-rollers for lifting it, of a pivoted lever-frame carrying one of said rollers, and a wedging incline arranged in connection with the hammer and said lever-frame and adapted upon the ascent of the hammer to force said lever-frame outwardly and move its roller out of contact with the hammer.

5. The combination, with the hammer and its lifting mechanism and supporting-frame, of reciprocally-wedging surfaces carried, respectively, by the hammer and frame and arranged to be wedged together by the ascent of the hammer to its highest position and thereby to hold the hammer suspended.

6. The combination, with the hammer and its lifting mechanism and supporting-frame, of reciprocally-wedging parts carried, respectively, by the hammer and frame and arranged to be wedged together by the ascent of the hammer to its highest position, and a spring against which one of said parts is seated, so that it yields to the wedging action of the other of said parts.

7. The combination, with the hammer and its lifting mechanism and supporting-frame, of reciprocally-wedging parts carried, respectively, by the hammer and frame and arranged to be wedged together by the ascent of the hammer to its highest position and thereby to hold the hammer suspended, and a releasing mechanism for retracting one of said parts from the other in order to drop the hammer.

8. The combination, with a vertically-moving hammer and its lifting mechanism and supporting frame, of a wedging incline and a friction-shoe, the one connected to the hammer and the other arranged relatively thereto to be wedged against it by the ascent of the hammer to its highest position, whereby the hammer is held suspended by their frictional contact.

9. The combination, with the hammer and its lifting mechanism and supporting-frame, of a frictional projection carried by the hammer and opposite frictional parts carried by the frame and between which said projection enters, said frictional projection and parts constructed to reciprocally wedge together as the hammer ascends to its highest position and thereby to hold the hammer suspended, and a releasing mechanism for retracting said parts from frictional engagement to drop the hammer.

10. In a drop-hammer, the combination, with the hammer and revolving friction-rollers for lifting it, of springs arranged to press said rollers together with a force sufficient to give the requisite tractive adhesion to lift the hammer between them.

11. In a drop-hammer, the combination, with the supporting-frame, the hammer, and revolving friction-rollers for lifting it, of a lever-frame in which one of said rollers has its bearings pivoted to said frame and movable toward and from the opposite roller, and a spring acting against said frame and pressing its roller against the opposite roller with a force sufficient to give the requisite tractive adhesion to lift the hammer between them.

12. The combination, with the supporting-frame, the hammer, and revolving friction-rollers for lifting it, of two lever-frames carrying the respective friction-rollers pivoted to the supporting-frame and movable toward and from each other, and springs acting against said lever-frames for pressing the rollers together.

13. The combination, with the supporting-frame, the hammer, and revolving friction-rollers for lifting it, of two lever-frames carrying the respective friction-rollers pivoted to the supporting-frame and movable toward and from each other, and springs arranged each to react in opposite directions against the opposite lever-frame for pressing the rollers together.

14. The combination, with the supporting-frame, the hammer, and revolving friction-rollers for lifting it, of two lever-frames carrying the respective friction-rollers pivoted to the supporting-frame and movable toward and from each other, springs acting against said lever-frames for pressing the rollers together, and the hammer arranged relatively to said lever-frames, as described, so that in its ascent its momentum is utilized to force them apart and disengage said rollers from the hammer.

15. The combination, with the supporting-frame, the hammer, and revolving friction-rollers for lifting it, of two lever-frames carrying the respective friction-rollers pivoted to the supporting-frame and movable toward and from each other, springs acting against said lever-frames for pressing the rollers together, and reciprocal opposite wedging inclines in connection with said hammer and lever-frames respectively constructed to come into engagement during the ascent of the hammer and thereby to force said levers and rollers apart.

16. The combination of the hammer formed with opposite wedging inclines, its frictional lifting-rollers, lever-frames carrying said rollers and arranged to be thrust apart by said inclines upon the ascent of the hammer to its highest position, and springs acting against said lever-frames for pressing the rollers together.

17. The combination of the hammer formed with opposite wedging inclines, its frictional lifting-rollers, lever-frames carrying said rollers, and friction-shoes borne by said lever-frames and arranged to bear against said inclines and to be thrust apart thereby upon the ascent of the hammer to its highest position, and springs acting against said lever-frames for pressing the rollers together.

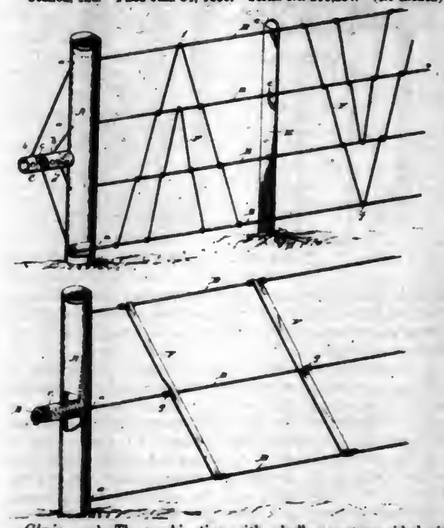
18. The combination, with the supporting-frame, the hammer, and revolving friction-rollers for lifting it, of two lever-frames carrying the respective friction-rollers pivoted to the supporting-frame and movable toward and from each other, and springs acting against said lever-frames for pressing the rollers together, and a releasing mechanism consisting of toggle-links acting, upon being straightened, to force said frames apart.

19. The combination, with the hammer, revolving friction-rollers for lifting it, springs for forcing said rollers together, and a releasing mechanism for pressing said rollers apart, of a catch for holding said releasing mechanism in order to prevent the re-engagement of the rollers during the fall of the hammer, and a projection on the hammer arranged to displace said catch on the striking of the hammer, whereby it is immediately relifted.

20. The combination, with opposite revolving friction-rollers, of the hammer-body projecting between them and constructed with detachable plates on its opposite sides to receive the tractive bearing of said rollers.

21. The combination, with opposite revolving friction-rollers, of the hammer-body projecting between them and constructed with vertical dovetailed recesses on its opposite sides, and plates fastened in said recesses to receive the tractive bearing of said rollers.

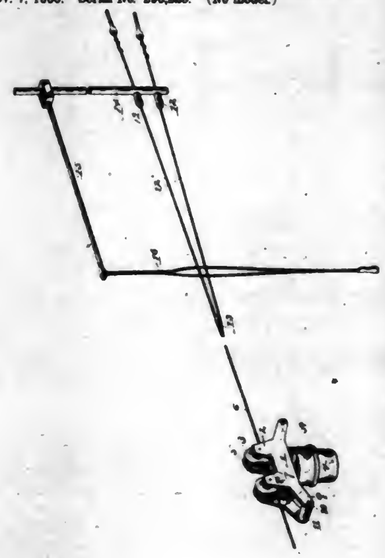
401,567. WIRE FENCE. JOSEPH N. LEHMAN and NEAL LEHMAN, Goshen, Ind. Filed Jan. 31, 1889. Serial No. 298,237. (No model.)



Claim.—1. The combination, with a hollow post provided with openings, as shown, and the lateral tube projecting from said post, of the longitudinal wires passed through said openings and engaging means on said tube, substantially as shown and described.

2. The combination, with the hollow post and the tube projecting laterally therefrom, of the longitudinal wires passed into said post and into the tube and engaging turning devices on the said tube, substantially as shown and described.

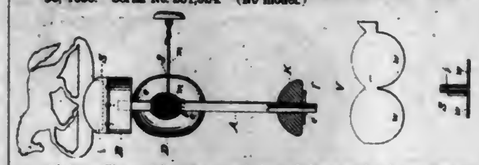
401,568. CASH-CARRIER. DAVID LIPPY, Mansfield, Ohio. Filed Nov. 7, 1888. Serial No. 290,223. (No model.)



Claim.—1. In a cash-carrier apparatus, the combination, with the track having its diverging arms 12 passed through and supported near the lower end of the arm 14, and provided with separate bumpers on the diverging arms of the track, which bear against the lower end of the arm 14, of the cash-car comprising the frame provided with wheels mounted on the track, and provided, also, with flexible rollers 11, forming bumpers on the cash-car for engaging the bumpers on the diverging arms of the track, substantially as specified.

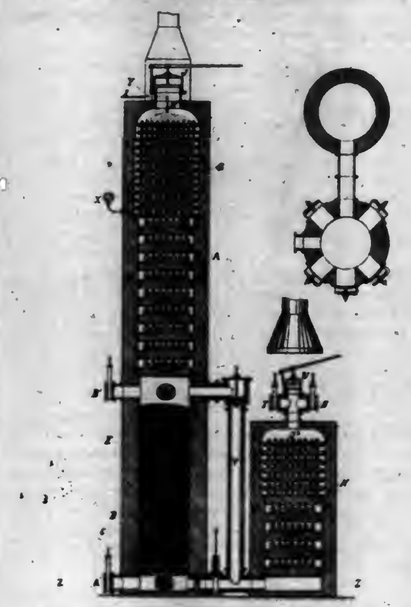
2. In a cash-carrier apparatus, the combination, with the track having its diverging arms passed through and supported in the arm 14, and provided with bumpers 12 12, bearing against said arm 14, of the starting-rope 16, suspended from the arm 15, and the carrier mounted on the track, whereby the bumpers 12 12 will prevent the carrier from being driven against the depending arm 14, substantially as specified.

401,569. TOY. DAVID W. LOSE, Springfield, Ohio. Filed July 26, 1888. Serial No. 281,324. (No model.)



Claim.—The twirling toy consisting of the stem having at its one end the block, upon which is secured the socket having parallel sides and lateral wings, the metallic ellipsoidal shell having bearings for the stem and a lateral opening, and the cord wound around said stem and extending through said opening, substantially as set forth.

401,570. APPARATUS FOR THE MANUFACTURE OF GAS. THADDEUS S. C. LOWE, Norristown, Pa., assignor to the Guarantee Trust and Safe Deposit Company, trustees, of Pennsylvania. Filed Nov. 12, 1884. Serial No. 147,764. (No model.)



Claim.—1. In an apparatus for making water-gas, a generator comprising in one casing or stack a steam-generator, a superheater, and a decomposing-chamber, to wit: a casing or stack lined with fire-bricks or other refractory materials containing a fuel or decomposing chamber, a mass of fire-bricks or other refractory materials loosely piled immediately above said fuel-chamber, a mass of metal in bars or pieces loosely piled above said last-mentioned refractory materials, a spraying-nozzle or atomizer, a damper or valve at or near its top, and a fuel-supply door, substantially as set forth.

2. In an apparatus for making water-gas, a heat-restorer consisting of a lined casing containing fire-bricks, metal bars or other refractory materials loosely piled in the lower part thereof, and above these a mass of metal in bars or pieces loosely piled, an air-inlet, one or more gas-outlets, and a flue connecting said casing with the gas-generator, substantially as set forth.

3. In an apparatus for making water-gas, the gas-generator A, containing the fuel or decomposing chamber D, the fire-bricks or other refractory materials F, piled loosely above said chamber, the metal bars G, piled loosely above the refractory materials F, a water-inlet, H, top valve, J, and fuel-charging door K, in combination with a heat-restorer consisting of the lined casing N, containing loosely-piled fire-bricks or other refractory materials O', and the loosely-piled bars or pieces of metal O², and provided with a top valve, U, air-inlet T, and gas-outlet S, said generator and heat-restorer being connected by a fine, all substantially as set forth.

401,571. CLOTHES-POUNDER. LEWIS H. MARTIN, Leavenworth, Kans. Filed June 6, 1888. Serial No. 276,192. (No model.)



Claim.—In a clothes-pounder, the combination of the casing having a handle, hoods attached to the outside of the casing, tubes secured to the casing beneath the hoods, valves at the lower ends of the tubes, disks located within the casing and supported by the tubes, said disk having an air-space surrounding it between its edge and the inner side of the casing, and the spider or valve support, substantially as and for the purpose set forth.

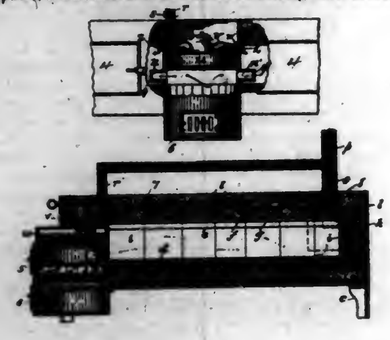
401,572. SHIRT. HORACE W. MESSER, Berlin, Ontario, Canada. Filed Dec. 24, 1888. Serial No. 294,471. (Model.)



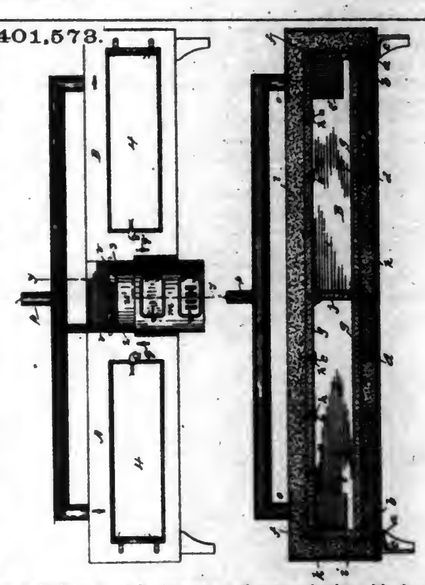
Claim.—A shirt open at the back and provided with the under yoke, and back yokes independent of the under yoke, and having its neckband formed in two separate independent parts, one part permanently connected to the under yoke and bridging the space between the ends of the part of the neckband attached to the back yokes and the other to the back yokes, independent of the under yoke, substantially as shown and described.

401,573. PORTABLE OVEN. JOSEPH MIDDLEBY, Gibson, Kans. Filed Feb. 8, 1888. Serial No. 263,249. (No model.)

Claim.—1. An oven combined with a heating device communicating with the oven and adapted to supply heat thereto, dampers for cutting off the supply of heat to the oven, a pipe or exit-port connected with the heater, and dampers connected with said pipe or exit-port to cut off direct communication between the heater and outside atmosphere, and a boiler or similar device for holding water connected



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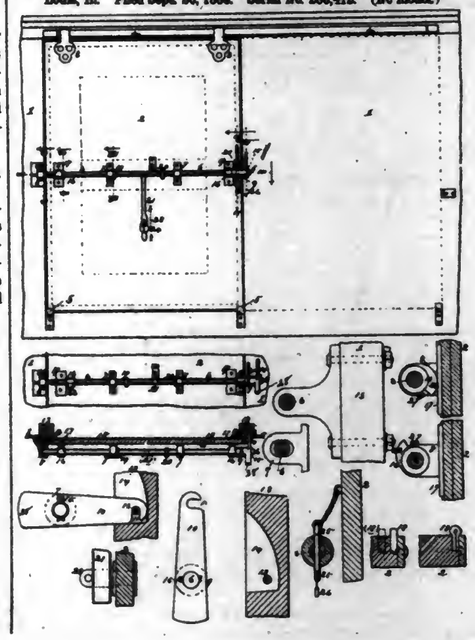


with the heater and having means of communication with the oven independent of the heating device, and dampers or similar devices for shutting off communication between the boiler and the oven, substantially as described.

2. The combination, with the dual or double portable oven, of the heating apparatus intermediate of and communicating with both ovens, the boiler secured on said heating apparatus for holding water, the rotary disks 2 3, and the angular pipes secured to said disks and opening into said oven, substantially as described.

3. The combination, with the dual or double portable oven herein described, consisting of a skeleton metallic frame and brick or tiling supported by said frame, of the heating apparatus located in front of and communicating with both ovens, the side flues, *n n'*, extending from said heating apparatus into said ovens and having dampers, the rear exit-pipes secured to said ovens, and the dampers therefor, substantially as described.

401,574. CAR-DOOR FASTENING. PETER H. MURPHY, East St. Louis, Ill. Filed Sept. 26, 1888. Serial No. 286,412. (No model.)



Claim.—1. The combination, with a car-door, of a shaft having bearings at each side of the door and having a cam bearing against the door, for the purpose set forth.

2. The combination, with a car-door, of a shaft having a cam bearing against the door and supported in a fixed box, and a detachable box connected to the car-body at opposite sides of the door, for the purpose set forth.

3. The combination, with a car-door, of a shaft extending across the door having bearing in boxes attached to the car-body at opposite sides of the door, a cam on the shaft adapted to bear against the outer side of the door, and a box connecting the shaft to the door, substantially as set forth.

4. The combination, with a sliding car-door, of a shaft having bearing in boxes attached to the car-door and to the car-body each side of the door, and carrying a cam adapted to press the door inward by the rotary motion of the shaft, and a handle upon the shaft by which the shaft is turned and also held in position, substantially as set forth.

5. The combination, with a sliding car-door, of a cam-shaft extending across the door having cam bearing against the door and turning in boxes supported on the car-body at opposite sides of the door, substantially as and for the purpose set forth.

6. The combination, with a sliding car-door, of a cam-shaft having cam bearing against raised plates 17 upon the door and turning in boxes attached to the door and to the body of the car each side of the door, said shaft being capable of endwise motion upon the door to carry a cam, as 16, out of line with a bearing-plate, 17, substantially as and for the purpose set forth.

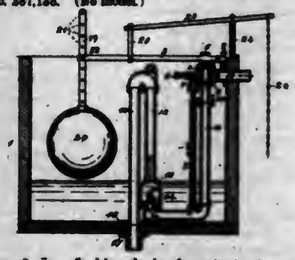
7. The combination, with a sliding car-door, of bearing-boxes fixed to the door and the car-body at one side of the door and a detachable box at the opposite side of the door, a cam-shaft turning in said boxes and having a cam bearing upon the outer side of the door in a given position of the shaft, the shaft and one of the boxes being traversed in such position by a perforation adapted to receive a locking-pin, substantially as and for the purpose set forth.

8. The combination, with a sliding car-door, of the cam-shaft having a cam bearing against the outer side of the door, boxes fixed to the door in which the shaft has rotary and endwise bearing, collars upon the shaft limiting its endwise movement on the door, a box fixed to the car-body at one side of the door adapted to receive the end of the shaft in closing the door, and a box, as 9, turning freely on the shaft and having a projection adapted to engage the car-body, substantially as and for the purpose set forth.

9. The combination, with a sliding car-door, of a shaft having bearing in boxes fixed to the car-door and to the car-body at one side of the door, and a box at the other side of the door turning upon the shaft and attachable to the car-body, the shaft having endwise movement in the fixed boxes independently of the movement of the door, cams on the shaft adapted to bear upon plates projecting from the face of the door, the said plates, handle upon the shaft acting by gravity to hold the shaft in a locking position, and stripe 18, forming a tight joint when the door is in locked position, substantially as and for the purpose set forth.

10. The combination, with a sliding car-door, of a shaft having bearing in boxes connected to the car-body at each side of the car-door, cams upon the shaft adapted to force the door inward against the car-body, a handle on the shaft, and a lug, 23, extending from the face of the door and passing through an orifice in the handle when the handle is depressed, substantially as and for the purpose set forth.

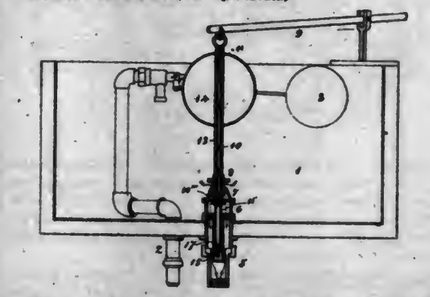
401,575. FLUSHING DEVICE FOR URINALS. RICHARD MURPHY and CHARLES W. ATKINSON, Cincinnati, Ohio. Filed Oct. 4, 1888. Serial No. 287,138. (No model.)



Claim.—1. In a flushing device for urinals, the combination of the automatic and the manual means for discharging water from the tank, consisting substantially of the following elements, to wit: a ball-cock, 2, having a plunger, 5, which is guided by lugs 4, and port 6, which operates at regulatable intervals of time to admit for a short space of time a spurt of water through main supply-pipe 11 into the siphon 12, for the purpose specified, a lever, 23, for manual operation of said ball-cock, a siphon, 12, the siphon-jet 15, a by-pass, 7, through which passes the normal supply, and a set-screw, 8, for controlling the flow into said by-pass, and a stem, 19, provided with perforations 21, as and for the purposes set forth.

2. In a flushing device for urinals, water-closets, &c., a siphon having its longer arm passing through and secured to the tank-floor and having upon the shorter arm an enlarged mouth-piece which is provided at its upper end with a small orifice for the purposes set forth, said enlarged mouth-piece also carrying a perforated cross-bar which receives the siphon-jet of the main supply-pipe, and a chambered projection in the U-shaped coupling for receiving jets of water from the siphon-jet, as and for the purpose set forth.

401,576. FLUSHING DEVICE FOR WATER-CLOSETS, &c. RICHARD MURPHY and CHARLES W. ATKINSON, Cincinnati, Ohio. Filed Oct. 31, 1888. Serial No. 289,503. (No model.)



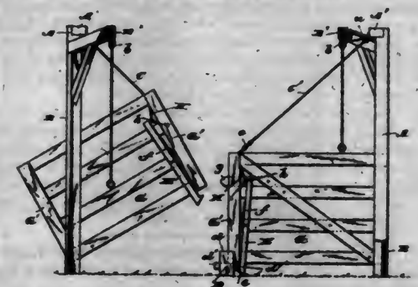
Claim.—1. In a flushing device for water-closets, the combination, with auxiliary float 14 and a submerged flush-passage, 5, of the following elements, to wit: the open-crowned valve proper, 7, the auxiliary valve 8, constituting a cap thereto, and which it normally closes, and a sleeve, 13, which surrounds the stem 10 of the valve proper and connects said cap to said float.

2. In a flushing device for water-closets, the combination of the following elements, to wit: the open-crowned valve proper, 7, having the tubular stem 10, the operating-lever 9, the dash-pot 17, the submerged stand-pipe 6, the flush-pipe or nozzle 5, which communicates therewith and constitutes the seat of the said open-crowned valve proper, 7, whose tubular stem 10 carries the said operating-lever 9 and contains the ports 11 11' and the regulatable port 12, the auxiliary valve 8, with its float 14, and the sleeve 13, which surrounds said stem and which connects the said valve with its said float.

3. In a flushing device for water-closets, the combination, with the automatically-operated auxiliary valve 8, of the open-crowned valve proper, 7, and a rubber seat, 10''', constituting a double seat to said auxiliary valve.

4. In a flushing device for water-closets, the combination of the following elements, to wit: the submerged overflow consisting of the stand-pipe 6, extending through and secured to the tank-floor, and to whose lower end is secured the flushing-nozzle 5, having the automatic auxiliary float 14, the auxiliary valve 8, and the sheath 13, having the manually-operated lever 9, stem 10, and valve proper, 7, and a dash-pot, 17, containing a fluid and having the hollow plunger 10', said plunger being provided with channeled set-screw 15, which allows the fluid to flow from dash-pot into plunger when valve proper descends, and vice versa when valve proper ascends, for the purposes set forth.

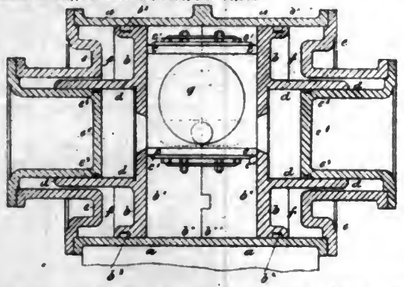
401,577. TILTING GATE. MILFORD A. NELSON, La Monte, Mo. Filed Feb. 14, 1888. Serial No. 263,822. (No model.)



Claim.—In combination with a pivoted gate provided with operating-cords, a pivoted spring-latch bar, E, having a staple or guide, A, near its upper end, a cord rigidly attached at one end to the gate, passed from thence through the staple attached to the upper end of the latch-bar and through the gate and connected to the operating-

cords C and C', and a block, D, having a projection, *d'*, with which the lower end of the latch-bar engages, the parts being organized substantially as shown, and for the purpose set forth.

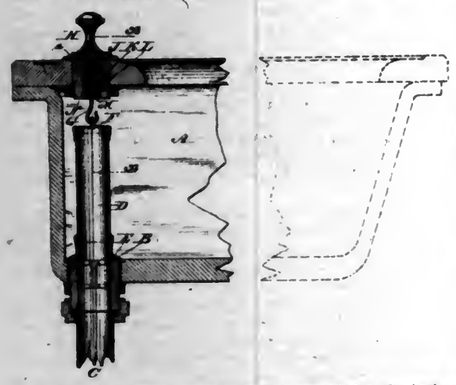
401,578. MOTOR-ENGINE. GEORGE W. NEWALL, Manor Park, County of Essex, and JAMES F. BLYTH, Sydenham, County of Kent, England. Filed May 7, 1888. Serial No. 273,084. (No model.) Patented in Belgium Mar. 13, 1888, No. 81,006.



Claim.—1. In a motive-power engine driven by steam or other fluid, a crank-shaft formed with inlet and outlet ports operating with an inner circular piston and an outer circular piston having corresponding ports, said inner piston and outer piston being contained and working one within and at right angles to the other and all within one outer circular cylinder, substantially as set forth.

2. A crank-shaft, *g*, provided with ports for passage of fluid, rotating within a correspondingly-ported circular opening in an inner circular piston working within an outer circular cylinder, the one circular piston working at right angles to the other circular piston, and all within one outer circular cylinder, arranged and operating substantially as set forth.

401,579. BASIN OR BATH WASTE AND OVERFLOW. WILLIAM H. NEWELL, Philadelphia, Pa. Filed Jan. 11, 1888. Serial No. 260,403. (No model.)

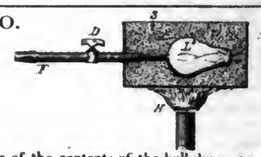


Claim.—1. An operating device for a stand-pipe of a bath or basin waste or overflow, consisting of a detachable guide with horizontal flange at its upper portion and screw-threaded lower end, and having on its interior wall an inclined shoulder and a horizontal projecting pin, a handle with inclined lower edge and shoulder bearing on the inclined shoulder of the guide, and a vertical depending pin, the hook G, with shank-screw, and the screw *a* in the side of the handle and with point below the shank-screw, said parts being combined substantially as and for the purpose set forth.

2. In a device of the character described, a stand-pipe forming a valve, a rotary plug connected with said stand-pipe and having an inclined under face and a vertical pin projecting therefrom, a hollow guide having an inclined shoulder on which the inclined under face of said rotary plug bears, and a horizontal pin projecting across the path of said vertical pin, said pins being within said plug and guide, said parts being combined substantially as described.

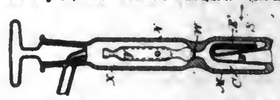
401,580. METHOD OF EXHAUSTING ELECTRIC-LAMP BULBS. JAMES W PACKARD, New York, N. Y. Filed Apr. 6, 1888. Serial No. 269,810. (No model.)

Claim.—A method of producing a vacuum in the bulb of an incandescent light, which consists, first, in the partial exhaustion by a mechanical pump of the vapors and gases in the bulb, while at the same time the bulb is subjected to heat; second, in the completion of



the exhaustion of the contents of the bulb by a mercury-pump, substantially as described.

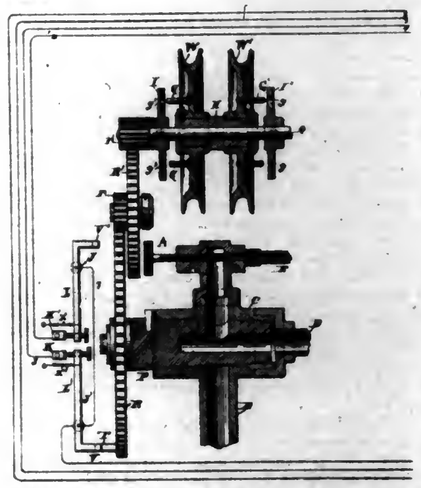
401,581. MERCURY AIR-PUMP. JAMES W. PACKARD, New York, N. Y. Filed May 19, 1888. Serial No. 274,437. (No model.)



Claim.—1. In a mercury-pump, the combination of the siphon-chamber, the siphon in said chamber sealed by a quantity of mercury, a valve-chamber above the siphon-chamber, and a floating valve seated within said valve-chamber, substantially as described.

2. In a mercury-pump, the combination, with the valve-chamber, a valve seated in said chamber, the siphon-chamber below said valve-chamber, the siphon within the siphon-chamber, and the vacuum-bulb below the siphon, the valve-chamber, siphon-chamber, siphon, and vacuum-bulb all made in one piece, substantially as described.

401,582. VALVE-ACTUATING APPARATUS. JAMES W. PACKARD, New York, N. Y. Filed Sept. 11, 1888. Serial No. 285,125. (No model.)



Claim.—1. The combination, with a two-way cock which connects an air-tight chamber alternately with the atmosphere and with a vacuum-pump, of an electrical switch, a pressure-gage connected with the electrical switch and operated by the varying pressures in the air-tight chamber, a magnet excited by the currents controlled by the said switch, the continuously-revolving pulley, and the clutch which intermittently connects the revolving pulley with the two-way cock and is controlled by the magnet, substantially as described.

2. The combination, with a two-way cock which connects an air-tight chamber alternately with the atmosphere and with a vacuum-pump, of an electrical switch, a pressure-gage connected with the electrical switch and operated by the varying pressures in said air-tight chamber, opposing magnets alternately excited by currents under control of the said switch, continuously and oppositely revolving pulley-wheels, and clutches operated by the opposing magnets which throw the two-way cock alternately into gear with one or the other of the oppositely-revolving pulley-wheels, substantially as described.

3. The combination, with a two-way cock which connects an air-tight chamber alternately with the atmosphere and with a vacuum-pump, of an electrical switch, a pressure-gage connected with the electrical switch and operated by the varying pressures in said air-tight chamber, opposing magnets alternately excited by currents under control of said switch, continuously and oppositely revolving pulley-wheels, and clutches operated by the opposing magnets which throw the two-way cock alternately into gear with one or the other of the oppositely-revolving pulley-wheels, together with a spring which

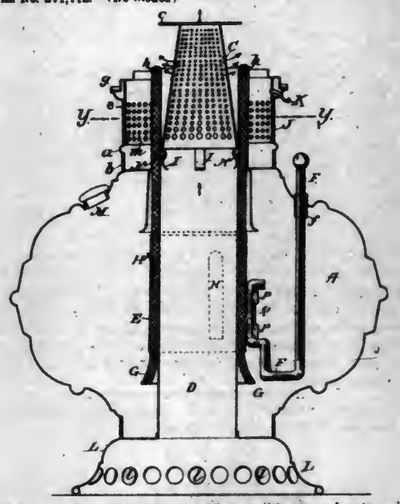
normally holds the clutch in its central position out of gear with both the revolving pulley-wheels, substantially as described.

4. The combination, with an intermittently-operated valve, of a continuously-revolving pulley, an electrically-controlled clutch for intermittently connecting the valve with the continuously-revolving pulley, an automatically-controlled electrical switch, a relay, a second switch operated by the relay to open and close the circuits which control the clutch, and a circuit-breaker in each of said circuits, which circuit-breaker is positively operated by the movement of the valve itself, substantially as described.

5. The combination, with a pressure-gage, of a vibrating arm or indicator for the same, suitable contact-pieces against which the arm strikes, one or more electrical circuits which have the said contact-points and the vibrating arm for terminals, together with a double relay controlled by said circuits, and a positively-controlled vibrating armature for said double relay, which armature can remain at rest only at one or the other extremity of its arc of vibration, substantially as described.

6. In an electrical apparatus for controlling intermittent motion, the combination of an intermittently revolving or reciprocating element, a continuously-moving element, a system of magnets which throw the said intermittently-moving element into gear with the continuously-moving element, the electrical circuit which excites the magnet, the automatically-operated switch which closes the circuit, and the circuit-breaker in the circuit which is positively operated by the intermittently revolving or reciprocating element, substantially as described.

401,583. LAMP. DEXTER W. PARKER, Meriden, Conn., assignor to The Charles Parker Company, same place. Filed Apr. 24, 1888. Serial No. 271,712. (No model.)



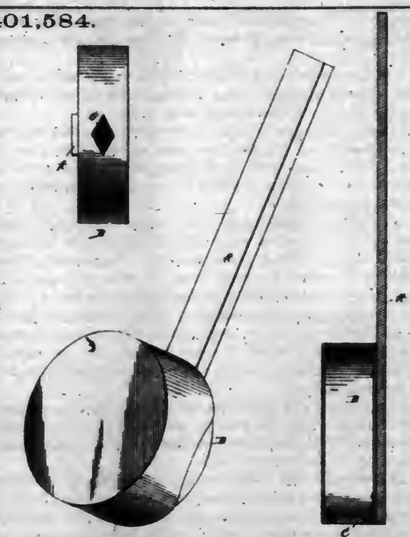
Claim.—1. In combination with the usual inner and outer wick-tubes of an Argand-burner lamp and a suitable wind-guard or air-distributer for supplying the outer draft, the non-adjustable but removable perforated air-distributer, (for supplying the inner draft to the tubular flame,) and means which opperate to hold said air-distributer and the inner wick-tube in a given relative position against casual misplacement, all substantially in the manner and for the purposes hereinbefore set forth.

2. In combination with the inner and outer wick-tubes of an Argand burner and suitable means for supplying air to the outside tubular flame, a removable perforated air-distributer having its lower portion arranged interiorly of the upper portion of the inner wick-tube, an annular seat or support, N, formed in said inner wick-tube, and spring-catches at the base of said perforated air-distributer, which engage with said annular seat N, all in the manner and for the purposes hereinbefore described.

3. The combination, with the inner and outer wick-tubes of an Argand burner and a suitable air-distributer for supplying the outer draft to the flame, of a removable perforated air-distributer for supplying the inner draft, having its perforations graduated either as to size or as to number, so as to supply the air in greater volume at the vicinity of its base than at the vicinity of its upper portion, substantially in the manner and for the purpose hereinbefore set forth.

401,584. HAND-SEEDER. TRUMAN B. PARRY, Manatee, Fla. Filed Jan. 4, 1889. Serial No. 295,402. (No model.)

401,584.



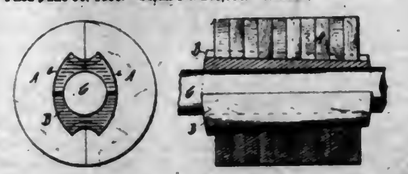
Claim.—The improved hand-planter herein described and shown, comprising a handle and a hopper secured to the lower end of the handle, and consisting of two semi-cylindrical boxes provided with discharge-openings in their sides and one moving upon the other, as specified.

401,585. SHOE. CHARLES H. PEABBALL, Brooklyn, N. Y. Filed Nov. 14, 1888. Serial No. 290,784. (No model.)



Claim.—In a shoe, the combination, with two side flaps, *b d*, having disconnected lower ends, and horizontal button-holes in one of said flaps to engage buttons on the other, of the button *i* on the shoe proper, and of a vertical button-hole, *j*, in one of the flaps to engage said button *i*, as specified.

401,586. SPLIT PULLEY. JAMES M. POLLARD, Washington, D. C. Filed June 30, 1888. Serial No. 278,630. (Model.)



Claim.—1. In a split pulley, the two-part rim and two-part bushing provided with interlocking ribs and grooves adapted to draw and lock the half-rims together as they are forced endwise upon the bushing, substantially as and for the purpose specified.

2. A split or separable pulley consisting of two duplicate portions constituting the rim and two duplicate portions constituting the hub

or bushing, and having inclined or wedge surfaces whereby it is made self fastening and tightening by the act of forcing the parts together, as set forth.

3. A split or separable pulley having interior doubly-inclined mortises, and a separable bushing having exterior doubly-inclined surfaces and bored to fit over or upon a shaft, as set forth.

4. In a split or separable pulley, the two-part rim and the wooden bushing adapted to hold the rim parts together, having the grain of its wood at right angles to the shaft-opening in the bushing and to the plane of division of the rim into its two parts, substantially as and for the purpose shown.

5. In a split or separable pulley, the two-part bushing with each part having a doubly-inclined wedge shape, being tapered uniformly from end to end, and having on its inner side a longitudinal groove to partially inclose a shaft, and on its outer side being grooved, dovetailed, or channeled longitudinally, in combination with the two half-rims having their inner sides shaped to fit the bushing, so that as the rim and bushing are moved longitudinally with reference to each other the parts of the rim will be drawn together and the parts of the bushing will be forced toward each other, substantially as and for the purpose specified.

6. In a two-part split pulley, the two parts of the rim each having a dovetailed or equivalent undercut mortise, in combination with a two-part split bushing shaped exteriorly to fit said mortise, substantially as set forth and described.

7. In a two-part split pulley having a dovetailed or equivalent undercut wedge-shaped mortise in each part, a two-part split bushing shaped exteriorly to fit said mortise and bored to fit over or upon a shaft, the construction being such that when the bushing and other parts of the pulley are being put together the bushing draws and holds the two parts of the rim forcibly together and the rim draws and holds the two parts of the bushing firmly upon the shaft, as shown and described.

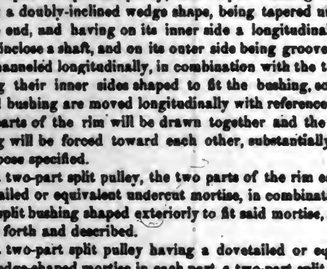
8. In a split or separable pulley, in combination with the two halves of the pulley-rim, formed of layers of wood glued and pressed together, the grain of the alternate layers crossing each other and having undercut wedge-shaped mortises in each half, a separable bushing formed of wood and having the longitudinal fibers or grain crossing the bore at a right angle thereto, whereby the tensile strength of the wood of the bushing is available for drawing the two parts of the rim together or toward each other, and the tensile strength of a part of the wood composing the rim is available for drawing the two parts of the bushing toward each other, as shown and described.

9. A split or separable pulley made in two equal or like halves united and held together solely by a split or separable bushing.

10. A split or separable bushing made in two equal and like halves, in combination with a rim, also made in two equal and like halves, the bushing forming the sole connection between the two halves of the rim, and the rim forming the sole connection between the two parts of the bushing, as set forth.

11. In a split pulley, in combination with the tapering bushing divided longitudinally into two parts, each part provided on its outer side with a longitudinal groove or channel diminishing in width toward the smaller end of the bushing, the pulley-rim divided into two parts on a longitudinal plane at right angles to the plane of division of the bushing, each part rim being provided on its inner side with ribs to engage the opposite sides of the grooves in the outer sides of the bushing, substantially as and for the purpose described.

401,587. SELF-LOCKING PRESS FOR BUNDLE-WRAPPING. EDWARD R. FORTER, Cincinnati, Ohio. Filed Sept. 13, 1888. Serial No. 285,329. (No model.)



Claim.—1. In a self-locking press for bundle-wrapping, the combination of two pairs of plates or followers, 12 25, members carrying said plates or followers and adapted to slide one on the other, and a lock for holding said members in any position to which they are set, substantially as set forth.

2. In a self-locking press for bundle-wrapping, the combination of the mutually-dependent members 1 5, the plates or followers 12 25, carried thereby, the springs 21, for forcing said members apart, and a lock for holding said members in any position to which they may be set, substantially as set forth.

3. In a self-locking press for bundle-wrapping, the combination of the plates or followers 12 25, the members 1 5, sliding one upon the other, a rack, 11, attached to one of the members, springs 21, for forcing said members apart, and a pawl or trigger upon the other member for engagement with said rack, so as to lock or hold said members in any position to which they may be set, as set forth.

4. In a self-locking press for bundle-wrapping, the combination of the member or sliding plate 5 with the other member or standard, 1, the plate or follower 12, attached to the standard, the plate or follower 25, attached to the sliding plate, springs 19, for forcing said standard and sliding plate apart, rack 11 upon the sliding plate, a pawl or trigger, 8, upon the standard for engagement with said rack, a spring, 9, for automatic engagement of said pawl with said rack, and a pin, 24, projecting into a groove, 23, in the sliding plate for preventing separation of the sliding plate and standard by the springs 19, as set forth.

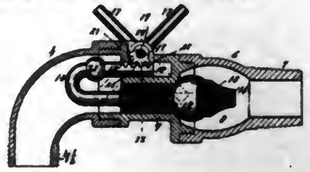
5. The self-locking press for bundle-wrapping, consisting of the two similar disconnected halves, each half consisting substantially of a channeled standard, 1, a sliding plate, 5, capable of sliding in channel of said standard and carrying a rack, 11, a pawl or trigger, 8, upon the standard adapted to automatically engage with said rack, the springs 21, for projecting said sliding plate upward upon disengagement of said pawl and said rack, and the plates or followers 12 and 25, attached to the standard and the sliding plate, respectively, for the purposes set forth.

6. A self-locking press for bundle-wrapping, consisting of the two similar disconnected halves, each half having the sliding plate 5, adapted for sliding in a channel or excavation, 2, of the standard 1, having its outer surface flush with the surface of the standard, for the purpose specified, and provided with tongues 4 4, which engage in grooves in the sides of said excavation, a rack, 11, and the grooves 23, in which engages the pin 24, for limiting the upward motion of said sliding plate, as set forth.

7. A self-locking press for bundle-wrapping, consisting of the two similar disconnected halves, each half having, in combination, the following elements, to wit: the channeled standard 1, having a hole, 6, lugs 7 7, and a pawl or trigger, 8, fulcruming upon said lugs and whose point 10 lies in said hole, a spring, 9, whose office is to keep said trigger in engagement with rack 11 of the sliding plate 5, grooves 3 3, the pin 24, and the detachable plate or follower 12, secured to the lower standard, as set forth.

8. In a self-locking press, the combination of the standard, a leg, 15, secured to said plate, two similar rods, 19, shrunk into holes 20 in said plate, the sliding plate 5, whose dimensions correspond to the dimensions of excavation or channel 2 of the standard, and which slides in said excavation, having the tongues 4 4, which engage with said grooves 3 3, rack 11, groove 23, into which projects the pin 24, the two similar orifices 18, which receive springs 21, that surround said rods 19, a detachable plate, 25, secured to the upper end of the sliding plate, and the block 27, all substantially as described, and for the purposes set forth.

401,588. COCK OR FAUCET. FRANK B. RAY, Kansas City, Mo. Filed June 28, 1888. Serial No. 278,481. (No model.)



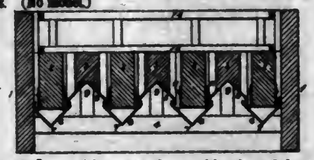
Claim.—1. In a cock or faucet, the combination of the body having a water-passage and a chamber located over the water-passage, a valve-stem fitting in said passage, and a return-bend inclosed by the outer section of the body and extending into the chamber above the passage, a valve operated by the stem to control the flow of water through said passage, and means for moving the stem to operate the valve, substantially as and for the purpose set forth.

2. In a cock or faucet, the combination of the body having a water-passage and a chamber located over the passage, a stem having guide-wings fitting in said passage and having a return-bend fitting in said chamber and inclosed by the outer section of the body, a valve secured to the stem to control the flow of water through said passage, and means for engaging the stem to open and close the valve, said valve fitting upon an extension, 13, of the stem and secured to the said stem, substantially as and for the purpose set forth.

3. In a faucet, the combination of the section 9, having a water-passage through it and the chamber 16 therein, a U-shaped valve-stem having its legs fitting in said chamber and water-passage, means for reciprocating said stem, a valve on each of the legs of said stem, said valves being adapted to close said chamber and water-passage alternately, and a removable nozzle secured to said section 9, completely inclosing said valve-stem.

4. In a faucet, the combination, with the valve-chamber having a valve, 12, therein, the section 9, connected with said chamber and having the water-passage and chamber 16, and a U-shaped valve-stem having its legs inserted in said passage and chamber 16, adapted to unseat valve 12, of a valve, 23, on one leg of said stem adapted to close the chamber 16, and a nozzle or section secured to section 9 and completely inclosing said valve-stem, substantially as set forth.

401,589. REFRIGERATOR ICE-HOLDER AND WATER-ESCAPE. ULRICH REUTER, Kansas City, Mo. Filed July 27, 1888. Serial No. 281,172. (No model.)



Claim.—1. In a refrigerator, the combination of the box, a series of ice-supporting bars placed crosswise of said box, troughs, one attached to and arranged under each alternate bar, and water-sheds, one attached to and arranged under each intervening bar and projecting over said troughs, substantially as and for the purposes set forth.

2. In a refrigerator, the combination, with the box, of a series of ice-supporting bars placed within the box, troughs, one arranged directly under each alternate bar, straps 11, attached to each alternate bar and to the inside of the trough below, and water-sheds, one attached to and arranged under each intervening bar and projecting below the edges of said troughs, and a conducting-trough into which the said troughs drain, substantially as set forth.

3. In a refrigerator, the combination, with the box, of the cleats 4 and 5 in said box, the ice-supporting bars 2, supported upon cleat 5, troughs beneath said bars and attached thereto and resting upon cleat 4, the ice-supporting bars 3, water-sheds beneath said bars and attached thereto, the standards 9, resting upon one of said cleats and supporting said bars 3 at one end, and the extensions 10, attached to said bars 3 and resting upon the other cleat, substantially as set forth.

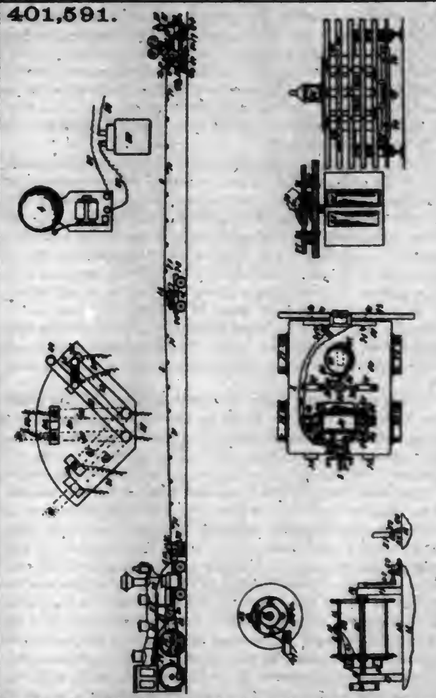
4. In a refrigerator, the combination, with the box, of the bars 2 3, arranged alternately across said box, the bars 3, having longitudinal grooves, the troughs 6, arranged below the bars 2, the straps 11, attached to bars 2 and to the inside of said troughs, water-sheds fitted in said longitudinal grooves and projecting downwardly beyond the edges of said troughs, the cleat 4, having notches in which said troughs rest, the cleat 5, upon which said bars rest, and the standards 9, substantially as set forth.

401,590. CURTAIN-POLE SOCKET. HENRY REUBEL, New York, N. Y. Filed Dec. 3, 1888. Serial No. 292,962. (No model.)



Claim.—A socket for curtain-poles, consisting of a bracket recessed at the upper part, a spring-catch applied on the inside of said bracket and extending at its free end through an opening of the bracket, and a tubular sheath or band having an aperture that is engaged by the projecting end of the spring-catch, substantially as set forth.

401,591. ELECTRIC-ALARM ADVANCE CAR. HARRY RIBSENBERG, St. Louis, Mo. Filed Dec. 1, 1888. Serial No. 292,305. (No model.)



Claim.—1. In a rail-train alarm to prevent collisions, &c., the combination of the advance pilot alarm-car 2, driven by a dynamo that is run by an endless belt or chain connection with the drive-wheel gearing of the locomotive, the cable 3, through which the current from the dynamo is transmitted to said pilot-car, the intermediate cable-supporting car, 12, and the reel on said car to which said cable is attached, substantially as and for the purpose set forth.

2. In a rail-train alarm to prevent collisions, &c., the combination of the advance pilot alarm-car, the cable 3, that connects said car to the locomotive, the said car propelled by the current generated by a dynamo on the locomotive, the means of driving said dynamo by the running-gears of the locomotive, the insulated wires that convey the current from the dynamo to the switch-board 30, the said switch-board, the insulated wires that convey the current from the switch-board to the cable, through said cable, and transmit it to the motor 27 on the pilot-car, substantially as and for the purpose set forth.

3. In a railway-train alarm to prevent collisions, &c., the combination of the advance pilot alarm-car driven sufficiently in advance of the locomotive to give timely warning for the arrest of the train before meeting obstructions on the track, the said car driven by the current generated by a dynamo on the locomotive that is operated by the running-gears of said locomotive, the insulated wires and insulating-cable *via* which said current is conveyed to the motor on the pilot-car, through which the current passes to drive said car, the said motor, the pulley-belt or chain-gearing that communicates motion from the axle of said motor to the rear axle of the pilot-car, on which its rear wheels have tight bearings, the revolving pedestal 74, surmounted by alarm-disks, the pulleys, respectively, on the foot of said pedestal and on the rotary fore axle of the car, and the belt or chain gearing that transmits its motion from said axle to said pedestal and turns the same, substantially as and for the purpose set forth.

4. In a railway-train alarm to prevent collisions, &c., the combination of the advance pilot alarm-car driven by the motor on said car that is operated by the current from a dynamo on and worked by the running-gear of the locomotive, the belt-pulley gearing that transmits motion from the axle of the motor to the drive-axle of said car, the revolving pedestal surmounted by alarm-disks, the rotary front axle of the pilot-car, the pulleys on the foot of said pedestal and on said rotary front axle, the twisted belt or chain gearing that transmits power from one pulley to the other to drive the revolving pedestal, the alarm-gong 81, the pedestal on which said gong is mounted, the spring trip-hammer 83, and the stud 84, that projects from the side of the revolving pedestal and trips said hammer, substantially as and for the purpose set forth

5. In a railway-train alarm to prevent collisions, &c., the combination of the electric alarm-bell, the battery, the insulated wires and cable on the line of circuit, the advance pilot alarm-car with which said circuit communicates, the dash of rubber or other non-conductive material, the commutation-plates 90 and 92, the screw-bolts 91, that couple said plates, the pendent impulsive metallic detector-bars 97, the bolts 98 on which said bars work with loose bearings, said bolts screwed at their upper ends beneath the dash, the spiral resectionary springs on said bolts, and the metal studs that surmount and are integral with said detector-bars, and which studs, when said bars are pressed upward by the pilot-car running over an obstruction, come in contact with the forward commutation-plates on the dash, close the circuit, and consequently ring the alarm-bell in the engineer's cab, substantially as and for the purpose set forth.

6. In a railway-train alarm to prevent collisions, &c., the combination of the electric alarm-bell, the battery, the insulated wires and

cable on the line of circuit, the advance pilot alarm-car with which said circuit communicates, the dash of rubber or other non-conducting material, the coupled commutator-plates 90 92, the foot vertically-impulsive bar, 97, and the series of horizontally-impulsive bars 93, adapted to form electrical connection with the alarm-bell in the engineer's cab when the pilot-car collides with or runs over an obstruction, whereby the engineer is warned of any danger, substantially as and for the purpose set forth.

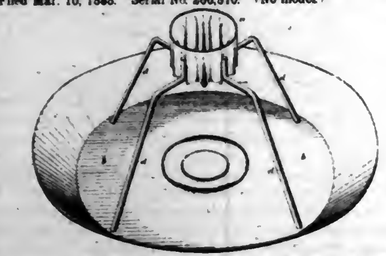
7. In a railway-train alarm to prevent collisions, &c., the combination of the advance pilot alarm-car driven by the current generated by a dynamo on the locomotive, the insulated wires and insulating-cable that carry said current, the cable-supporting car 12, the reel on said car that supports the intervening stretch of cable, and to which it is secured, the insulated wires 29, that convey the current from the dynamo to the switch-board, the said switch-board, the switching-arms 47, the stations arranged on said switch-board for switching the current, respectively, to the pilot-car 48, to the cable-supporting car 12, to wind the reel, or to the ground-circuit for the exhaust 54, and the insulated wires that carry said current from said station to their said operative and exhaust points, substantially as and for the purpose set forth.

8. In a railway-train alarm to prevent collisions, &c., the combination of the pilot alarm-car driven by the current generated by a dynamo on the locomotive, the insulated wires and insulating-cable that convey said current, the intermediate cable-supporting car, the reel on said car to which said cable is secured, the switch-wires from and to said cable immediately in front of its attachment to the reel, the positive and negative concentric rings 32, with which said wires connect, the rubber or other insulating disk-head, 33, of the reel, to which said rings are secured, the brushes 37, the rubber base 38, on which said brushes are secured, the electric motor on said car, the insulated wires which transmit the current between said brushes and said motor, the pulleys on the axle of the motor and that of the reel, and the endless band or chain that transmits motion from the motor-pulley to the reel-pulley, all arranged so that when the current is switched at the switch-board to said motor to turn the reel, wind the cable around it, and simultaneously retrograde the advance pilot-car to the cable-supporting car and the latter to the locomotive, substantially as and for the purpose set forth.

9. In a railway-train alarm to prevent collisions, &c., the combination of the advance pilot-car, the cable-supporting car, the cable between the locomotive and said cars, the reel 14 on the latter car, to which said cable is secured, the crank-handle 57, to wind said reel, the hook 58, to hold said handle captive when inoperative, and the rubber buffer-heads 73 on the locomotive, the cable-supporting car and the advance pilot-car, and the belay-pin-handled screws that secure the cable respectively to the locomotive at its rear end and to the pilot-car at its forward end, substantially as and for the purpose set forth.

10. In a railway-train alarm to prevent collisions, &c., the combination of the electric energy-producing dynamo driven by the locomotive, the insulated wires conducting said energy to the switch-board in the cab, the said switch-board, the switching-arms 47, the pilot alarm-car, the motor on said car, the insulated wires that conduct electric energy to the motor on said pilot-car, the cable that insulates said wires, the intervening car that supports said cable, the electric motor on said car, the insulating rubber dash of the pilot-car, the series of horizontally-impulsive bars, the vertically-impulsive bar, the insulated wires that connect with the battery and alarm-bell in the engineer's cab, the said battery and alarm-bell arranged, when obstructions are met along the track, to give the alarm in the engineer's cab, substantially as described, and for the purpose set forth.

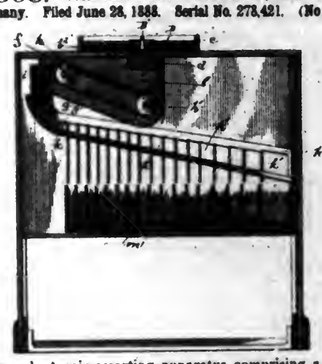
401,592. CANDLESTICK. ANTHONY ROKLOFF, Philadelphia, Pa. Filed Mar. 10, 1888. Serial No. 266,870. (No model.)



Claim.—1. The combination of the base of the candlestick, the legs projecting upward therefrom, and an elevated candle-holder mounted upon said legs, and consisting of a rigid tube having internal vertical ribs gradually flattened toward their upper ends, so as to form a flaring mouth for the holder, all substantially as specified.

2. The combination of the base of the candlestick, having indentations therein, with the elevated candle-holding tube having internal vertical ribs and supporting-legs therefor inclined outward from the tube to the base, and having their lower and outermost ends secured in the indentations in the base, thereby serving as rigid supports for the said candle-holding tube, all substantially as specified.

401,593. COIN-ASSORTER. JOSEF ROSSY, Saar Louis, Prussia, Germany. Filed June 28, 1888. Serial No. 278,421. (No model.)



Claim.—1. A coin-assorting apparatus comprising a horizontal rotatory coin-receiving table, an inclined channel extending from the periphery of said table, an arm to guide the coin on the table into said channel, and an inclined and angularly-placed sorting-bar upon the upper end of which the coin from said channel is discharged, said bar being provided with a series of different-sized apertures and separate compartments beneath the apertures.

2. In a cash-receptacle, the combination, with a receiver, of a rotatory receiving-table provided with a stationary annular flange around its outer edge extending above its upper face and having a discharge-opening and channel, and a guide-piece on the upper face of said table tapering toward said discharge-opening in the annular flange.

3. In a cash-receptacle, the combination of a rotatory receiving-table mounted upon a vertical spindle, an annular flange provided with a discharge-opening and forming an edge around and extending above the upper face of the table, a driving-shaft, and gearing connecting the shaft and spindle, whereby the table can be rotated.

4. A coin-assorter comprising a horizontal rotatory coin-receiving table mounted upon a vertical spindle, a discharge-channel to receive the coin from the table, and a stationary arm extending over the table and adapted to guide the coin toward the periphery of the table into said channel, substantially as described.

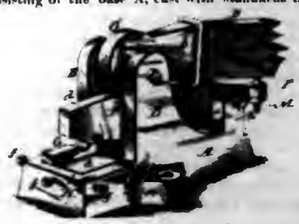
5. A coin-assorter comprising a rotatory coin-receiving table, a conveyer upon which the coin from the table is discharged, a sorting-bar upon which the conveyer discharges the coin, and a receiver located beneath the sorting-bar, substantially as described.

6. In a coin-assorter, a rotatory receiving-table mounted upon a vertical spindle and provided with a guide, a belt-conveyer upon which the money from the table is discharged, in combination with a horizontal shaft provided with a handle, a pulley mounted on the shaft on which the conveyer is mounted, and gearing connecting the shaft and vertical spindle, whereby the conveyer and table are simultaneously operated, substantially as described.

7. In a cash-receptacle, the combination, with the rotatory receiving-table and the belt-conveyer upon which the money from the table is discharged, of the driving-shaft connected with and simultaneously operating the conveyer and table.

401,594. COMBINED PUNCH, SHEARS, AND SAW-GUMMER. JAMES SCROFIELD, Petoskey, Mich. Filed Sept. 17, 1888. Serial No. 285,563. (No model.)

Claim.—1. The combination, with a set of reversible and detachable tools, of a frame to which the tools may be interchangeably connected, consisting of the base A, cast with standards B E, and seat



401,594.



H, and ears *a*, and the cam-lever C, pivoted to the standard B, substantially as and for the purpose set forth.

2. The combination, with the frame constructed substantially as described and provided with a cam-lever, of the reversible blade F, detachably connected to the frame, substantially as and for the purpose set forth.

401,595. CULTIVATOR. JAMES SHOOLBRED, Eastover, S. C. Filed Dec. 6, 1888. Serial No. 292,808. (No model.)

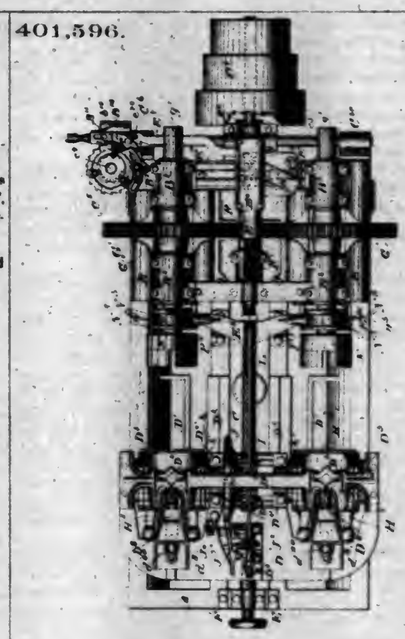


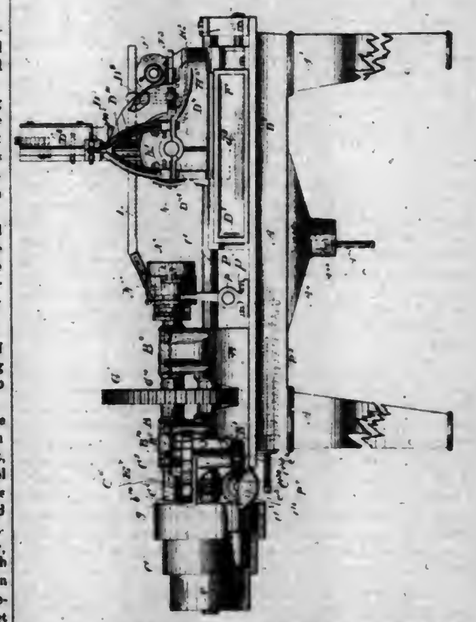
Claim.—1. In combination, the frame having teeth and a draft-beam swiveled to said frame and carrying the handle-bars, the said beam being adjustable to horizontally change the line of draft, and holding devices for said beam, substantially as described.

2. In combination, the frame composed of a series of bars having teeth, said bars being pivoted at their forward ends, the adjustable bars at their rear ends, whereby the said bars may be spread apart or set close together, and a draft-beam pivoted to one of said bars and having movement in a horizontal plane, and holding means therefor, substantially as described, whereby the toothed bars may be drawn longitudinally or laterally, as desired.

3. In combination with the beam, a tooth having a flattened lower portion or blade with a cutting-edge in a vertical plane, the angular and bent shank for said blade adapted to a socket in the beam, whereby the blade may be adjusted into the line of draft or across the same and the inclination of said vertical cutting-edge may be varied, substantially as described.

401,596. MACHINE FOR CUTTING THE SCREW-THREADS ON BOLTS. JOHAN M. SIMPSON, Chicago, Ill., assignor to William Deering & Company, same place. Filed Apr. 26, 1888. Serial No. 271,992. (No model.)





Claim.—1. In a bolt-cutting machine, in combination with the main driving-shaft and the cutter-head, and the train of mechanism which communicates rotary motion to the cutter-head from the shaft, a slide-bar connected to the cutter-head having slide-bearings parallel with the axis of said head, a bar having slide-bearings at right angles to those of the first-mentioned bar, a plate having slide-bearings, and a block adapted to travel in said bearings, one secured to the first-mentioned slide-bar and the other secured to the second-named bar, the said plate being adjustable in its securement to the bar to which it is fastened to change the direction of its slide-bearings, and a train of mechanism from the main driving-shaft to the second-named slide-bar, whereby it is actuated in its slide-bearings, substantially as set forth.

2. In a bolt-cutting machine, in combination with the driving-shaft and the revolving bolt-cutter head, and the train whereby said shaft communicates rotary motion to the cutter-head, the rack-bar E^7 and connections from it to the cutter-head, the wheel C^8 and the train of gear whereby the main driving-shaft rotates it, said wheel engaging the rack-bar E^7, the lever C^{30}, pivoted on the frame and engaging said bar, a cam on said lever, and a trip-block on the wheel C^8 in position to engage the cam and actuate thereby the lever to disengage the rack-bar from the wheel, substantially as set forth.

3. In combination, substantially as set forth, the revolving and longitudinally-movable cutter-head and connections therefrom to the rack-bar E^7, whereby the longitudinal movement of said rack-bar longitudinally actuates the cutter-head, the wheel C^8, engaging the rack-bar, the lever C^9, pivoted on the frame and connected to the rack-bar, the trip E^{31} on the wheel C^8, and the cam C^{30}, secured to the levers C^9 and adjustable thereon to expose a greater or less portion of its face to the action of the trip, substantially as set forth.

4. In combination, substantially as set forth, the bar E^7, wheel C^8, lever C^9, and cam C^{30}, secured to said lever, the wheel C^8, having one or more trip-blocks adjustably and removably attached thereto in the same circle, whereby the bar E^7 may be disengaged from the wheel as frequently and at such intervals as desired in each revolution of the wheel by varying the number and position of said trip-blocks.

5. In combination, substantially as set forth, the bar E^7, wheel C^8, lever C^9, cam C^{30}, adjustably secured thereon, and the trip-blocks E^{31}, adjustably and removably secured to the wheel C^{30}, whereby a greater or less number may be employed at once, the cam C^{30} being adjustable to expose a greater or less portion to the action of the trip-blocks, whereby the bar E^7 may be disengaged from the wheel C^8 as

frequently and at such intervals and held out of engagement as long as desired, and the point of re-engagement determined at will.

6. In combination with the longitudinally-movable cutter-head, the wheel O^3, and the rack-bar E^7, engaged by it, and connections from said rack-bar to the cutter-head, the cam and trip mechanism which disengages said wheel and bar, and the spring P^2 and the connections therefrom to the cutter-head, whereby said spring reverses said cutter-head and the bar E^7, substantially as set forth.

7. In a bolt-cutting machine, the cutter-head, the bolt-feed tube, and the bolt-carrying head, the bolt-carrying head having journal-bearings at right angles to its cavity and revoluble in said bearings, the cutter having its axis, and the feed-tube having its longitudinal axtent in the plane of rotation of the bolt-cavity and at an angle to each other, substantially as set forth.

8. In a bolt-cutting machine, in combination with the cutter-head, the bolt-feed tube, the bolt-carrying head, and the clamp-cam, the cutter-head and feed-tube being both located in a plane at right angles to the revolution of the bolt-carrying head and at an angle to each other, said head having a bolt-cavity transverse with respect to its axis and the train which revolves the carrying-head, whereby the bolt-cavity is alternately in line with the feed-tube and with the cutter-head, and clamping mechanism adjacent to the bolt-cavity in the carrying-head and having a portion protruding from said head, and the clamping-cam fixed with respect to the bearings of the bolt-carrying head and located adjacent to the path in which the protruding portion of the clamping mechanism is carried by the revolution of said head and at the point in said path which is reached by said portion, where the bolt-cavity is in line with the cutter-head, substantially as set forth.

9. In a bolt-cutting machine, in combination, the cutter-head, the bolt-carrying head, and the bolt-feed tube, the bolt-carrying head being journaled in horizontal bearings and having the bolt-cavity at right angles to such bearings, and the cutter-head and feed-tube being both located in a plane also at right angles to said bearings, the feed-tube being vertical and at an angle to the cutter-head and the train which revolves the bolt-carrying head, whereby the bolt-cavity is vertical twice in each revolution and in the interval is in line with the cutter-head, substantially as set forth.

10. In a bolt-cutting machine, in combination with the cutter-head, the bolt-feed tube, the clamping-cam, and the bolt-carrying head, the bolt-carrying head being journaled in horizontal bearings and having the bolt-cavity at right angles to said bearings, and bolt-clamping mechanism in said head adjacent to such cavity and protruding from the bolt-carrying head, the cutter-head and feed-tube being also located in a plane at right angles to the bearings of the bolt-carrying head, the feed-tube being vertical and at an angle to the cutter-head, the train which revolves the cutter-head, whereby the bolt-cavity twice in each is vertical and thereby in line with the feed-tube and in one of the intervals is in line with the cutter-head, and the clamping-cam fixed with respect to the bearings of the bolt-carrying head and located adjacent to the path of the protruding part of the clamping mechanism and at the point in said path reached by said protruding part when the bolt-cavity is in line with the cutter-head, substantially as set forth.

11. In a bolt-cutting machine, in combination with the cutter-head, the bolt-carrying head having journal-bearings transverse to the axis of the cutter-head, and a bolt-cavity transverse to said journal-bearings, the bolt-feed tube located in the plane of rotation of the bolt-cavity and at an angle to the cutter-head, and the train which revolves the bolt-carrying head, whereby the bolt-cavity is alternately in line with the cutter-head and with the bolt-feed tube, a clutch-wheel in said train, and the tripping mechanism which disengages the clutch and locks the bolt-carrying head, said tripping and locking mechanism being located and timed to engage the wheel when the bolt-cavity is in line with the cutter-head, whereby the bolt-carrying head is held stationary at that position, substantially as set forth.

12. In a bolt-cutting machine, the cutter-head and its advancing and retracting mechanism, the bolt-carrying head journaled transversely to the line of advance and retreat of the cutter-head, and the train which revolves the cutter-head in said bearings, comprising a clutch-wheel, tripping mechanism which actuates the clutch-wheel to force it into engagement, and a connecting-rod from the cutter-head to the tripping mechanism, whereby the retreat of the cutter-head actuates the tripping mechanism to cause it to engage the clutch-wheel with the remainder of the bolt-carrying-head-driving train, substantially as set forth.

13. In combination with the cutter-head, the mechanism which retracts it, the bar connected to and longitudinally actuated by said retracting mechanism, the wheel J^3, engaged and actuated by said bar in its retreating movement, the shifting-lever J^3, actuated by said wheel, the bolt-carrying head journaled transversely to the line of advance and retreat of the cutter-head, and the clutch-wheel J in the train which rotates the bolt-carrying head actuated by the lever J^3 out of engagement with the remainder of the bolt-carrying-head-driving train, substantially as set forth.

14. In combination, substantially as set forth, the bolt-carrying head, its actuating clutch-wheel J, the lever J^3, pivoted on the bearings of the clutch-wheel and having one end engaging the hub and the other resting upon the rim of said wheel, a spring tending to actuate the lever to disengage the clutch-wheel, said clutch-wheel rim having the notch j^{31}, adapted to receive the arm of the lever J^3, which rests upon said rim, whereby said rim detains the lever in position to hold the clutch-wheel in engagement with the train, and said notch allows it to be forced by the spring out of such engagement, by engaging the lever-arm, and locks the said clutch-wheel and bolt-carrying head stationary.

15. In combination with the bar L, the wheel J^5, having its ratchet engaged by said bar and having the cam J^{51}, the lever J^3, contacting the cam, and the clutch-wheel J, engaged by the lever and having the rim J^4, serving as a delay-surface for the same, substantially as set forth.

16. In combination with the cutter-head and its advancing mechanism and the adjustable mechanism which controls the duration of the advance movement, the bar L, connected to and actuated by the cutter-head-advancing mechanism, the wheel J^5, having a ratchet over which the bar L advances and adapted to be engaged by said bar in its retreat, the cam J^{51}, which actuates the clutch-shifting mechanism adjustably secured on said wheel J^5, whereby the instant of engagement of said clutch may be made to coincide with the completion of the retreating movement of the cutter-head, substantially as set forth.

17. In a bolt-cutting machine, in combination with the cutter-head having a part (as the collar N^2) whose retraction opens the jaws, the retracting mechanism having as a part of it the pin N^7, engaging said collar, whereby the retracting movement of the retracting mechanism first retracts the collar and opens the jaws, substantially as set forth.

18. In a bolt-cutting machine, in combination with the cutter-head having a part (as the collar N^2) whose retraction opens the jaws, the retracting mechanism having as a part of it the pin N^7, engaging said collar, and the cam projection N^8, engaging the pin to disengage it from said collar before the limit of the retracting movement is reached, substantially as set forth.

19. In a bolt-cutting machine, in combination with the cutter-head having a part (as the collar N^2) whose retraction opens the jaws, the retracting mechanism having as a part of it the pin N^7, engaging said collar, the cam projection N^8, engaging the pin to disengage it from said collar before the limit of the retracting movement is reached, said cutter-head having beside the collar N^2 other means of engagement with the retracting mechanism, as the flange N^9, and a suitable stop to arrest the collar N^2 after the disengagement of the pin while the retracting mechanism further retracts the cutter-head, whereby the jaws are closed during the last part of the retracting movement, substantially as set forth.

20. In combination with the bar L, the wheel J^5, having the cam J^{50}, the lever J^3, actuated by said cam, the clutch-wheel J, actuated by the lever and having the cam projection j^{31}, the spring J^6, engaging and tending to reverse the wheel J^5, the plunger D^{21} and the connections by which the cam projection j^{31} actuates it, whereby the ratchet-wheel J^5 is released from the bar L after the clutch is engaged, and the spring J^6 is allowed to restore said wheel to its initial position, substantially as set forth.

21. In combination with the plunger D^{21}, the cam D^{25}, having the notch d^{24} to receive and form a seat for the foot of the plunger, the form of said notch being angular, as described, whereby one side of it is stopped against the plunger while the other side stops the plunger, substantially as set forth.

22. In combination with the bolt-feed tube and the transverse slides D^{23} and D^{23} therein, the mouth of each slide having a larger and smaller portion, the larger portion of each mouth being in line with the smaller portion of the other, and the bar which reciprocates said slides transversely to bring the larger and smaller portions of each mouth alternately into the bolt-channel of the bolt-feed tube, substantially as set forth.

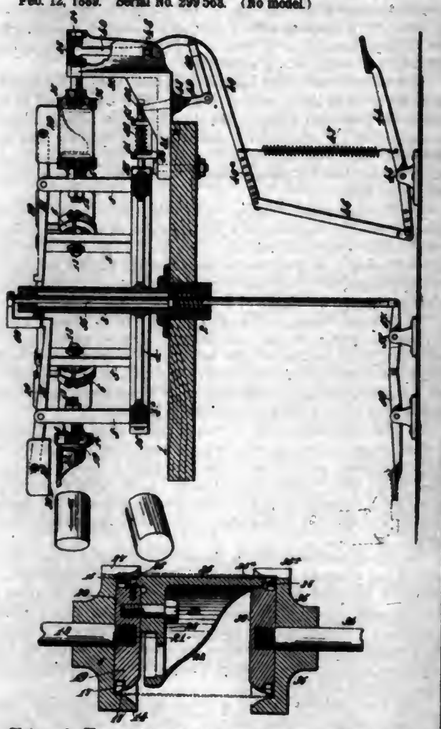
23. In combination with the bolt-feed tube, the transverse slides D^{23} and D^{23} therein, having their mouths comprising larger and smaller portions arranged, respectively, substantially as described, the slide-bar D^{24}, having the oblique slots which engage the slides D^{23} D^{23}, (as at their necks d^{23},) the rock-shaft having the lever-arms M' M^3, and the bolt-carrying head having the cam projection A^{29}, which engages the arm M' and causes the arm M^3 to actuate the bar D^{24} and the spring D^{25} to reverse the movement of the said bar, substantially as set forth.

24. In combination with the bolt-carrying head having the bolt-clamps and the levers which actuate them protruding from the head, the cam D^5, contacted by said levers and having its cam-faces converging toward the bolt-carrying head and adjustable toward and from said head, substantially as set forth.

25. In a bolt-carrying head, in combination with the body, the clamp-blocks H^4, having similar concavities on their proximate faces, diminishing from the receiving end toward the middle, and the plates H^9, having the bolt-emerging aperture formed by the notches A^{31} on their proximate edges, said plates being laterally adjustable to vary the size of the aperture formed by the notches, and the adjusting-screws A^{40}, to limit adjustably the separation of the clamp-blocks H^4, whereby the aperture between them may be adjusted to correspond with the bolt-emerging aperture, substantially as set forth.

26. In the bolt-carrying head, in combination with the body, the clamp-blocks H^4, having the outer portion of their cavities H^{41} enlarging toward the outer end, and the plates H^9, having the bolt-emerging apertore formed by the notches A^{31} in their proximate edges lapping over and partially closing the opening between the said clamp-blocks, substantially as and for the purpose set forth.

401,597. MECHANISM FOR FORMING AND SIZING SHEET-METAL VESSELS. ALEXANDER SLATEMAN, Baltimore, Md., assignor to himself, Augustus E. Clarson, and John O'Ferrall, same place. Filed Feb. 12, 1889. Serial No. 299,563. (No model.)



Claim.—1. The combination of a rotating support having a standard carrying a bolt, a guide-nut fixed on the bolt, a sectional expansible die mounted on the bolt and having a cup-shaped recess containing the guide-nut, a can-body former rigidly secured to the guide-nut in the recess of the die, a lengthwise-movable mandrel arranged on a stationary support, a sectional expansible sizing-die mounted on the mandrel and having a cup-shaped recess, a guide-nut located in the recess of the sizing-die and fixed to the mandrel, a pivoted vibrating lever connected with the mandrel, and a treadle connected with the vibrating lever to move the mandrel and retract the sizing-die and its inclosed guide-nut from the end of the can carried by the body-former, substantially as described.

2. The combination of a revolving support having a series of standards, a tubular arbor carrying the support, a bolt projecting from each standard, a sectional expansible die arranged on each bolt and having a cup-shaped recess, a guide-nut located in the recess of each die and mounted on a bolt, a cylindrical body-former rigidly secured to each nut in the recesses of the expansible dies, a lever pivoted on each standard and having a clamp at one end, a vertically-movable rod extending through the tubular arbor and having a lug at its upper end to act successively on the other ends of the clamp-carrying levers, a treadle connected with the rod for depressing it, a mandrel having a guide-nut, a sectional expansible sizing-die having a cup-shaped recess containing the guide-nut on the mandrel, a pivoted vibrating lever connected with the mandrel, and a treadle connected with the vibrating lever for moving the mandrel and retracting the sizing-die and its guide-nut from the end of the can carried by the body-former, substantially as described.

3. In a machine for sizing the bodies of sheet-metal cans, the combination, with a rotating support provided at intervals with standards, of a sizing-die mounted on each of said standards, a body-former projecting radially from the outer face of each sizing-die, a clamp carried by a lever pivoted on each standard and adapted to descend upon the top of the body-former to hold the meeting edges of the can-body, a reciprocating sizing-die co-operating successively with the revolving sizing-dies, a reciprocating lug lifting the clamp-lever successively and operated by a foot-lever upon one side of the table carrying the support, a foot-lever upon the opposite side of said table operating the lever which retracts the reciprocating sizing-die, a stop-bar retracted by a device connected to the latter lever, and a spring connecting said lever and its foot-lever and throwing the reciprocating sizing-die into engagement, substantially as described.

4. In a machine for sizing the bodies of sheet-metal cans, the combination, with a sizing-die having a marginal sizing-flange, of a cleft ring arranged within said flange, a guide-nut having the form of a frustum of a cone, the base of which overlies said ring and is provided with a boss or projection lying within but not in contact with said ring, and a bolt lying loosely in a cavity in the die and tapped into said guide-nut, substantially as described.

5. In a machine for sizing the bodies of sheet-metal cans, the combination, with a sizing-die having a marginal flange, of a cleft compressible ring lying within said flange and having a peripheral face which expands constantly toward the flat face of the die at the foot of the outwardly-flaring inner face of the marginal flange, a guide-nut having a boss lying within but out of contact with said ring and provided with a frustrum-shaped portion partly overlying the peripheral face of said ring, the expanding face of said nut forming a guide to the expanding face of the ring, and a bolt passing through the die from the rear and entering the guide-nut, substantially as described.

6. In a machine for sizing the bodies of sheet-metal cans, the combination, with a sizing-die consisting of two similar adjustable semicircular parts each having a marginal flange and provided with lugs connected by bolts and nuts, of a cleft compressible ring lying within said flanges, a guide-nut having the shape of the frustum of a cone, the expanding face of which forms a guide to the expanding face of the ring, and a body-former composed of a cylindrical shell having its flat end mounted upon the flat outer face of the guide-nut, substantially as described.

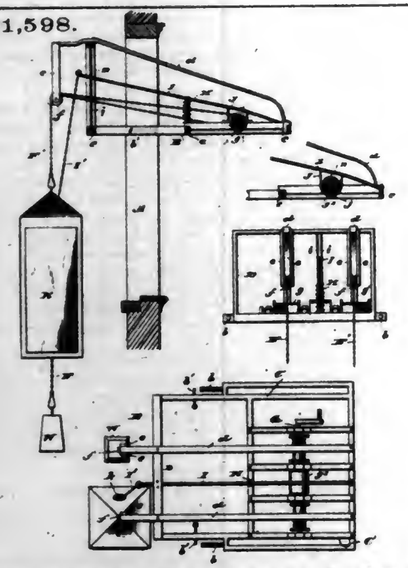
8. In a machine for sizing the bodies of sheet-metal cans, the combination, with a circular sizing-die having a marginal flange projecting at right angles to the flat face of said die and having an interior contracting surface, of a cleft compressible ring having an expanding peripheral face lying within said flange and having contact with the base thereof, a guide-nut having the form of the frustum of a cone, the expanding face partly overlying the peripheral face of the ring, a body-former consisting of a cylindrical shell, its end mounted on the flat face of the guide-nut, the top of said shell provided with a raised strip lying in the plane of the bottom of a notch cut in the flange of the die as deep as the inner face of said flange at its base, and a clamp mounted on a lever pivoted on a support above said die, said clamp having a straight edge adapted to engage the surface of said strip, substantially as described.

9. In a machine for sizing and forming the bodies of sheet-metal cans, the combination, with a circular sizing-die formed in two adjustable parts and having a cleft compressible ring lying within the contracting surface of said die, said ring having an expanding peripheral face engaging said surface, a guide-nut having an expanding face which partly overlies said ring, a body-former mounted on said nut and provided with a raised strip on its top, the projecting end thereof lying in a notch in the guide-nut, a rotating support carrying said parts, a clamp having a straight edge resting upon said strip, a lever carrying the clamp, a reciprocating sizing-die carried by a mandrel and having a cleft ring and guiding-nut, a stop-bar holding the revolving support, a lever retracting the mandrel and stop-bar, a lever upon the opposite side of the revolving support raising the clamp, and a spring throwing the reciprocating sizing-die into engagement, substantially as described.

401,598. FIRE-ESCAPE. SAMUEL H. SPRAGUE, Beloit, Kans. Filed Jan. 17, 1889. Serial No. 296,599. (No model.)

Claim.—1. The combination, in a fire-escape, of a suitable frame, B, having a shaft journaled therein, projecting bars *d d*, carrying

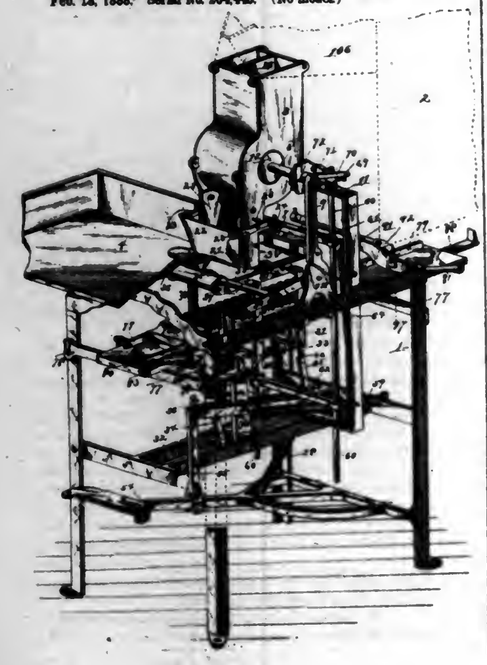
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pulleys *f f*, a brake-bar, l, secured to the inner side of said frame and provided with a spring, H, guide-bars *i i* therefor, flexible connections F and F', wound in different directions upon the shaft and provided at their ends with a cage and weight, and a flexible connection, I', extending from the projecting end of the brake-lever into the cage, so that the descent of the case can be regulated, the parts being organized substantially as shown, and for the purpose set forth.

2. The combination, substantially as described, of the frame, the chain-drums fixed on a shaft journaled therein and provided with car-chains, the brake-drum fixed to the same shaft and provided with peripheral recesses, the brake-bar overhanging the brake-drum and provided with a pull-rope, and a band secured to the brake-bar to encircle the brake-drum and provided with a lug to engage the recesses in the drum.

401,599. CIGAR-MAKING MACHINE. WILLIAM M. STEHLE, Pittsburg, assignor of one-half to John Bowman, Allegheny, Pa. Filed Feb. 13, 1888. Serial No. 264,445. (No model.)



Claim.—1. The combination of a feed-hopper the sides of which are extended downward to form a chute, a shaft journaled in bearings upon the rear side of said extensions, three arms upon said shaft, one of which is adapted to be operated automatically, and a door secured to the other arms, the lower end of which engages with said chute, substantially as set forth.

2. The combination of a feed-hopper, a feed-roller therein provided with recesses and having an adjustable head, a vertical slide above the roller, two rods secured to said slide and projecting through one side of the hopper, a vertical bar secured to the outer ends of the rods, and a screw through the bar and the side of the hopper, substantially as set forth.

3. The combination of a frame, two uprights secured thereto carrying a cross-piece, a feed-hopper having a lug upon its rear portion, a set-screw projecting through the lug into the cross-piece, a shaft journaled in the upper ends of the uprights extending through the feed-hopper, and a feed-roller upon the shaft, substantially as set forth.

4. The combination of a frame, a swinging cigar-rolling table therein, two slotted legs secured to the sides of the frame, two supports pivotally secured to the legs at one end and to the uprights at the other end, a bunching-roller journaled at its ends in the supports, and an apron secured at its ends to the table and passed over the bunching-roller, substantially as set forth.

5. The combination, with a cigar-rolling table, of a bunching-roller above the table, an apron passing over the roller and secured at its ends to the table, two blocks at the rear end of the table, the inner faces of which are concaved, the rear block being narrower than the other one, a guide yieldingly secured at the top of the narrower block, and a vertically-moving plunger passing between the blocks, substantially as set forth.

6. The combination of a cigar-rolling table, a pair of blocks secured to its rear end, the inner faces of which are concaved and act as guides, one of which is narrower than the other one, a guide secured to the narrower block, a wing secured to one end of the guide, a vertically-moving plunger, and a stop against which the wing is caused to strike, substantially as set forth.

7. The combination, with a swinging cigar-rolling table, of a pair of blocks secured at its rear end, the inner faces of which are concaved and act as guides, and one end of each of which is provided with a sharp cutting-edge, an apron on the table, a bunching-roller, and a vertically-moving plunger, one end of which passes close to the cutting-edge of the blocks, substantially as set forth.

8. The combination, with a swinging cigar-rolling table, of a pair of blocks secured at its rear end, the inner faces of which are concaved and act as guides, and one end of each of which is inclined and provided with a sharp cutting-edge, an apron on the table, a bunching-roller, and a vertically-moving plunger passing between the blocks with one end near the cutting-edge of the blocks, substantially as set forth.

9. The combination, with a frame, of a swinging cigar-rolling table, a pair of blocks at the rear end of the table, the inner faces of which are concaved and act as guides, one end of each of which is provided with a sharp cutting-edge, an apron on the table, a bunching-roller, a vertically-moving plunger passing between the blocks, and a scraper secured at one end to the frame and having its free end projecting over the ends of the blocks provided with the cutting-edges, substantially as set forth.

10. The combination, with a frame, of a bunching-roller, arms of unequal length pivotally secured within the frame, a swinging cigar-rolling table pivotally secured upon said arms, and means for connecting the arms, whereby one end of the table approaches nearer the bunching-roller than the other one as the table moves forward and back below the bunching-roller, and an apron on the table, substantially as set forth.

11. The combination, with a frame, of three arms, a lever, and a cigar-rolling table, the table being pivotally secured to the upper ends of two of the arms and the lever being pivotally secured at the middle of one of the said arms and connected at its ends with the other two arms, a bunching-roller above the table, and an apron upon the table, substantially as set forth.

12. The combination, with a frame, of two forked arms, a cigar-rolling table pivoted to the upper or forked ends of said arms, a pair of parallel brace-pieces across the frame of the machine, a lever pivotally secured at its middle to one of the arms and at one end to the lower end of the other arm, and an additional arm pivotally secured at its upper end to the lever and at its lower end between the braces in front of the pivotal point of the lower end of one of the forked arms, substantially as set forth.

13. The combination, with a frame, of arms pivotally secured thereto, a cigar-rolling table pivotally secured to the upper ends of the arms, a treadle, a lever secured near the lower end of one of the arms, and a link secured to the treadle and to the end of the lever, substantially as set forth.

14. The combination, with a frame, of arms pivotally secured thereto, a cigar-rolling table pivotally secured to the upper ends of the arms, a treadle and lever pivotally secured near the lower end of one of the arms, having a bolt at the rear of the arm, and a link for connecting the lever and the treadle, substantially as set forth.

15. The combination, with the main frame, of a vertical frame secured thereto, two rods adapted to slide within the frame, two cross-pieces secured to the rods, a plunger secured to the upper cross-piece, a latch pivoted at its lower end to the main frame, having a pin at that end and a shoulder at its upper end, a treadle, and a spring secured to the pin and to the treadle, substantially as set forth.

16. The combination, with the main frame, of a vertical frame secured thereto, two rods adapted to slide within the frame, two cross-pieces secured to the rods, a plunger secured to the upper cross-piece, a latch pivoted at its lower end to the main frame having a shoulder at its upper end adapted to engage with the lower cross-piece, a lever, the rear end of which engages with the lower cross-piece, and a bolt near the end of the lever adapted to engage with the face of the latch, substantially as set forth.

17. The combination, with a frame, of two vertically-sliding rods, a cross-piece near their lower ends, a latch having a shoulder at its upper end adapted to engage with cross-piece, and a lever, the rear end of which is rounded upon its upper edge and adapted to engage with the cross-piece and latch, the length of the lever between its pivotal point and its rear end being a trifle greater than the distance between the cross-piece when secured upon the shoulder of the latch and the pivotal point of the lever, substantially as set forth.

18. The combination, with a main frame, of two vertically-sliding rods, a cross-piece secured near their lower ends, a latch having a shoulder at its upper end adapted to engage with the cross-piece and pivotally secured at its lower end to the main frame of the machine, an arm pivotally secured to the machine, a lever pivotally secured to the lower end of the arm, the rear end of which is adapted to engage with the cross-piece, and a bolt upon the lever at the rear of the point at which the lever is pivoted to the arm, said bolt being adapted to engage with the rear face of the arm as the rear end of the lever is moved out of engagement with the cross-piece, substantially as set forth.

19. The combination, with a frame, of an arm having a table secured upon its upper end, a lever pivotally secured near the lower end of the arm, a treadle, a link for connecting the end of the lever with the treadle, and two springs, one of which is secured to the main frame and the arm and the other one to the treadle and to the frame, substantially as set forth.

20. The combination, with the main frame, of a vertical frame therein, a feed-hopper upon the frame in front of the vertical frame, a bracket upon the rear side of the hopper, the legs of which are adjustably secured to the top of the vertical frame, and a feed-roller within the feed-hopper having pockets in its periphery, the cutting-edges of which pockets engage with the lower edge of the front wall of the hopper, substantially as set forth.

21. The combination, with a frame, of a platform, a guide secured to one side of the platform and a lever secured to the other side of the platform, a clamp pivotally secured to an arm and to the lever, a latch-lever secured to the lever having a notch near one end, a spring secured to the clamp and to the lever, and a hook secured to the opposite end of the latch-lever and to the spring, substantially as set forth.

22. The combination, with a frame, of a platform secured thereto having lugs upon one of its sides, a spring-actuated lever and an arm pivotally secured to the lugs, a clamp pivotally secured to the inner ends of the lever and the arm, a guide upon the opposite side of the platform, and a stop-pin secured to the rear ends of the platform, against which the arm engages, substantially as set forth.

23. The combination, with a frame, of a platform secured thereto, a reciprocating pawl pivotally secured above the platform, having a lug or projection upon its pivoted end, and a set-screw in the frame, one end of which engages with the lug of the pawl, substantially as set forth.

24. The combination, with a frame, of a platform secured thereto, a feed-hopper above the platform, a swinging cigar-rolling table between the bottom of the hopper and the top of the platform, two brackets adjustably secured to the rear portion of the frame of the machine, a rock-shaft journaled in the brackets connected with and operated by the table, an arm upon the shaft, and a pawl upon the end of the arm above the platform, substantially as set forth.

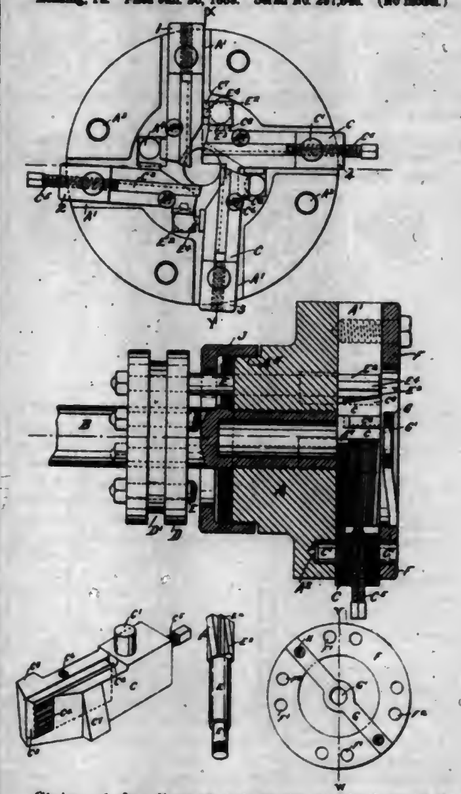
25. The combination, with a frame, of a swinging cigar-rolling table, a platform, a shaft adjustably secured above the platform, two arms upon the shaft, a pawl at the lower end of one of the arms, and a connecting-rod secured to the end of the other arm and to the table-operating mechanism, substantially as set forth.

26. The combination, in a cigar-making machine, of a supply-hopper secured at the rear of the same, the bottom of which is vertically movable, a shaft across the upper and lower ends of the hopper, each of which is provided with a spur-wheel, and a chain through the bottom of the hopper and over said wheels, substantially as set forth.

27. The combination, in a cigar-making machine, of a supply-hopper having a vertically-movable bottom, shafts across the upper and lower ends of the hopper, each having a spur-wheel near its middle and the lower one having a ratchet-wheel at one end, a chain passing through the bottom of the hopper and around the spur-wheels, and a lever carrying a pawl for operating the ratchet-wheel, substantially as set forth.

28. The combination of a frame, a swinging table therein, a pair of blocks at the rear end of the table, a movable guide secured to the rear block, and a stop secured to the frame and adapted to engage with the guide when the table is drawn forward, substantially as set forth.

401,600. SCREW-CUTTING MACHINE. JAMES H. STEINBERGER, Reading, Pa. Filed Jan. 26, 1889. Serial No. 297,848. (No model.)



Claim.—1. In a die stock or head, the combination, with the movably-secured cutter-holders, of separate bars passing through the head and having ends engaging said holders, and means for simultaneously operating said bars, all substantially as set forth.

2. In a die stock or head, the combination, with the pivoted cutter-holders, of separate bars passing through the head, the front end of each bar engaging opposite sides of two adjacent holders, and means for simultaneously operating said bars, all substantially as set forth.

3. In a die stock or head, the combination, with the movably-secured cutter-holders, of separate bars connected to a sliding sleeve and passing through the head, the free ends of said bars engaging said holders, and all adapted to operate substantially as set forth.

4. In a die stock or head, pivoted cutter-holders, each having a beveled side, in combination with axial bars passing through said die-head, and each having a beveled surface engaging the beveled side of a holder, and means for simultaneously operating said bars, substantially as and for the purpose set forth.

5. In a die stock or head, pivoted cutter-holders having oppositely-beveled sides, substantially as described, in combination with axial bars passing through said die-head and having correspondingly-beveled surfaces, each of which engages a beveled side of a holder, and means for simultaneously operating said bars, substantially as and for the purpose set forth.

6. In a die stock or head, the cutter-holders with inclined slots C^3, pivoted to said head by trunnions, and the rectangular longitudinally-grooved cutters adjustably secured in said slots, substantially as described, in combination with means for oscillating said holders, substantially as and for the purpose set forth.

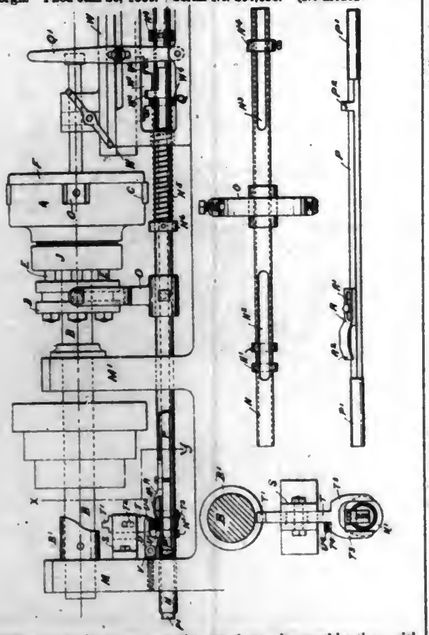
7. In a die stock or head, the cutter-holders with trunnions C', pivoted to the head and provided with cutters and adjusting-screws, in combination with a retaining-ring secured to the head and having bearings for said trunnions, all substantially as set forth.

8. In a die stock or head, the combination, with cutter-holders secured thereto and a retaining-ring, of a guard, G, with central opening, removably secured to said ring, substantially as and for the purpose set forth.

9. In a die stock or head, the combination, with the adjustable cutter-holders secured thereto, and a sliding sleeve and connected mechanism for operating said holders, of a stop for said sleeve, adjustably secured to the head, substantially as and for the purpose set forth.

10. In a die stock or head, the combination, with the adjustable cutter-holders secured thereto, and a sliding sleeve and mechanism, substantially as described, for operating said holders, of a nut, J, adapted to serve as a stop for said sleeve, substantially as and for the purpose set forth.

401,601. SCREW-CUTTING MACHINE. JAMES H. STERNBERGH and ROBERT PEMBERTON, Reading, Pa.; said Pemberton assignor to said Sternbergh. Filed Jan. 26, 1889. Serial No. 297,653. (No model.)



Claim.—1. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a sleeve-operating rod, a lever engaged by said sleeve-rod, and a lever-rod moving with the carriage and arranged to throw said lever into engagement with the machine-spindle, substantially as and for the purpose set forth.

2. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, tail-carriage, and cam on the machine-spindle, of a sleeve-operating rod, a pivoted lever engaged by said sleeve-rod, and a lever-rod and connected mechanism, substantially as described, arranged to throw said lever into engagement with said cam, all substantially as and for the purpose set forth.

3. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a sleeve-operating rod, a lever engaged by said sleeve-rod, a lever-rod arranged to throw said lever into engagement with the machine-mandrel, and a stop-latch, also operated by said lever-rod, all substantially as and for the purpose set forth.

4. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of the sleeve-operating rod and pivoted lever, a lever-rod arranged to throw said lever into engagement with the machine-spindle, a stop-latch operated by said lever-rod, and a spring arranged to move said sleeve-rod, all substantially as and for the purpose set forth.

5. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a slotted tubular sleeve-operating rod with collars N', a pivoted lever engaging said collars, a lever-rod within said tubular rod provided with an adjustable lifter and attached to the carriage, and a cam on the machine-spindle, all arranged and adapted to operate substantially as set forth.

6. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a slotted tubular sleeve-operating rod with collars N', a pivoted lever engaging said collars, a lever-rod within said tubular rod provided with an adjustable lifter and attached to the carriage, a cam on the machine-spindle, a spring arranged to move said sleeve-rod, and a stop-latch, all adapted to operate substantially as set forth.

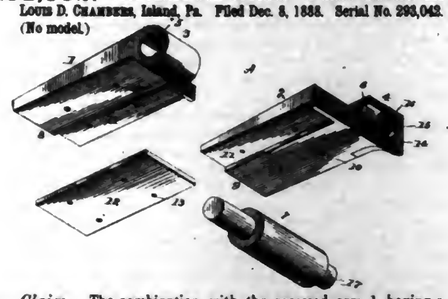
7. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, and tail-carriage, of a sleeve-operating rod with lever-collars N' and carriage-collar N^4, a pivoted lever, a lever-rod provided with an adjustable lifter and attached to the carriage, and a cam on the machine-spindle, all arranged and adapted to operate substantially as set forth.

8. In a screw-cutting machine, the combination, with the die-head, sliding sleeve, sleeve-operating rod, and tail-carriage, of a spring adapted to press said carriage and rod in opposite directions, all arranged substantially as and for the purpose set forth.

9. In a screw-cutting machine, the combination, with the die-head, tail-stock, and carriage, of a spring located in said tail-stock and adapted to retract said carriage, substantially as set forth.

10. In a screw-cutting machine substantially as described, the combination, with the sleeve-operating rod, the lever engaging said rod, and the lever-rod attached to the carriage, of a lifter adjustably secured to said lever-rod and provided with a spring, all adapted to operate substantially as set forth.

401,602. STOP-PLATE FOR BUGGIES. R. HAYS STEWART and LOUIS D. CHAMBERS, Island, Pa. Filed Dec. 8, 1888. Serial No. 293,042. (No model.)



Claim.—The combination, with the recessed arm 1, having a shoulder and an open bearing on the same end, and the roller 7, provided with shouldered ends, of the recessed arm 2, provided with the shoulder 4, having its opening provided with an internally-disposed spring-pressed washer bearing against the end 17 of the roller 7, substantially as specified.

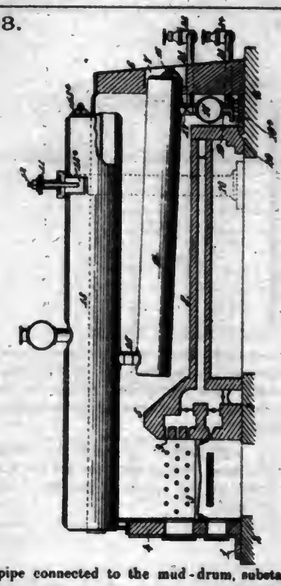
401,603. STEAM-BOILER. WILLIAM W. SUTCLIFFE, New Orleans, La. Filed Dec. 27, 1888. Serial No. 294,739. (No model.)

Claim.—1. The combination, with an inclosing furnace structure having a rear wall provided with a through-orifice, of a flue-boiler, an underhanging boiler connected at its forward end only with the flue-boiler, inclined downward in a rearward direction, and having its rear extremity extended back of the flue-boiler into the orifice in the rear furnace-wall and there provided with a man-hole accessible through said orifice, and a mud-drum located under and connected with the rear end of the underhanging boiler and adapted to slide or move on a supporting-base, substantially as described.

2. The combination, with an inclosing furnace structure having a fire-box, a bridge-wall, and a rear wall provided with a through-orifice, of a flue-boiler, an overhanging boiler connected at its forward end only with the flue-boiler behind the bridge-wall and having its rear extremity extended beyond the rear end of the flue-boiler into the orifice in the rear furnace-wall, and a mud-drum located under and connected with the rear end of the underhanging boiler and provided with a leg or shank loosely sustained by a supporting-base to permit the mud-drum to slide, substantially as described.

3. The combination, with an inclosing furnace structure having a rear wall provided with a through-orifice, of a flue-boiler supported at its front end by the front furnace-wall, supporting-columns having a beam or girder provided with pendent bolts by which the rear end of the flue-boiler is suspended, an underhanging boiler connected at its front end with the flue-boiler, and having its rear end extended beyond the rear end of the flue-boiler, and provided with a man-hole accessible through the orifice in the rear end of the underhanging boiler, and having a leg or shank resting on a supporting-base, and a feed-water pipe connected to the mud-drum, substantially as described.

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4. The combination, with an inclosing furnace structure having a rear wall provided with through-orifices, of a series of flue-boilers resting at their front ends on the front furnace-wall and suspended at their rear ends, a series of underhanging boilers connected at their front ends only with the flue-boilers and having their rear ends extended beyond the rear ends of the flue-boilers, and each provided with a man-hole accessible through one of the orifices in the rear furnace-wall, a mud-drum located transversely under the rear ends of the underhanging boilers and having connections therewith and provided with legs or shanks loosely sustained by a supporting-base, and a feed-water pipe connected to the mud-drum, substantially as described.

5. The combination, with an inclosing furnace structure having a rear wall provided with through-orifices, of flue-boilers, underhanging boilers connected, respectively, at their front ends only with the flue-boilers, inclining downward in a rearward direction, and having their rear ends extended back of the rear ends of the flue-boilers and provided with man-holes accessible through the orifices in the rear furnace-wall, a mud-drum located transversely under and connected with the rear ends of the underhanging boilers and provided with a leg or shank loosely sustained by a supporting-base, a feed-water pipe communicating with the upper portion of the mud-drum, and a blow-off pipe communicating with the lower portion of the mud-drum, substantially as described.

6. The combination, with a furnace structure, of a main boiler, an underhanging boiler connected at its front end to the main boiler and having its rear extremity extended beyond the rear end of the main boiler and provided with a man-hole, a mud-drum located under and connected with the rear end of the underhanging boiler, a rolling expansion support for the mud-drum, and a feed-water pipe communicating with the upper portion of the mud-drum, substantially as described.

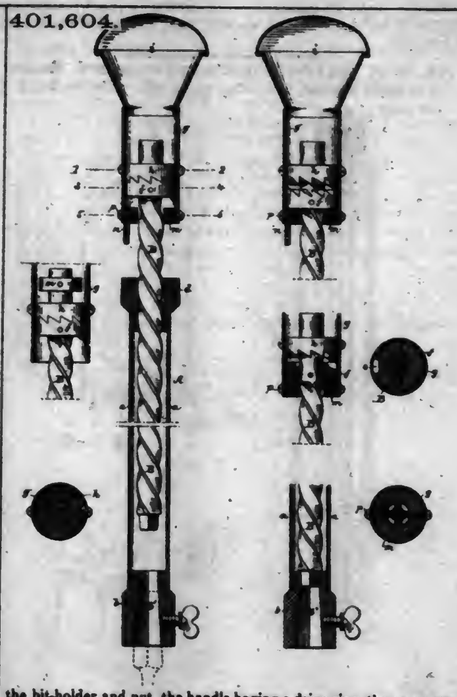
7. The combination of a furnace structure, a main boiler resting on the front furnace-wall, the columns having a girder provided with pendent bolts by which the rear end of the main boiler is suspended, an underhanging boiler connected at its front end with the main boiler, a mud-drum located under and connected with the rear end of the underhanging boiler, and a rolling expansion support for the mud-drum, substantially as described.

8. The combination of a furnace structure, a main boiler, the columns having a girder provided with pendent bolts by which the rear end of the main boiler is suspended, an underhanging boiler connected at its front end with the main boiler, a mud-drum located under and connected with the rear end of the underhanging boiler, a rolling expansion support for the mud-drum, and a feed-water pipe communicating with the lower portion of the mud-drum, substantially as described.

401,604. BRACE. GILBERT T. SUTTERLEY, Philadelphia, Pa. Filed Nov. 12, 1888. Serial No. 290,577. (No model.)

Claim.—1. The combination of the shank of the brace having

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the bit-holder and nut, the handle having a drive-ring, the screw-stem having a driving-collar for engagement with said ring, and a stop-ring for limiting the longitudinal movement of the handle on the stem, all substantially as specified.

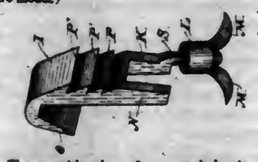
2. The combination of the shank having a bit-holder and nut, the screw-stem engaging with the nut and having a driving-collar at the upper end, and the handle having an internal drive-ring and stop-ring, one above and the other below the driving-collar on the stem, all substantially as specified.

3. The combination of the shank having a bit-holder and nut, the screw-stem engaging with said nut, a driving-collar, a drive-ring and a stop-ring, and the handle comprising the hollow spun head, and a tube containing and inclosing said rings and collar, all substantially as specified.

4. The combination of the shank of the implement having a bit-holder and nut, with the screw-stem engaging with said nut and having its lower end formed for engagement with an opening in the bit-holder, all substantially as specified.

5. The combination of the shank having a bit-holder and nut, the screw-stem engaging with the nut and having a driving-collar, and the loose handle having a drive-ring and stop-ring, and a locking-bolt for securing the handle to the driving-collar independently of the drive-ring, all substantially as specified.

401,605. PIPE-GRIPPING ATTACHMENT FOR WRENCHES. CHARLES H. THOMAS, Hancock, Wis. Filed Dec. 14, 1888. Serial No. 293,606. (No model.)

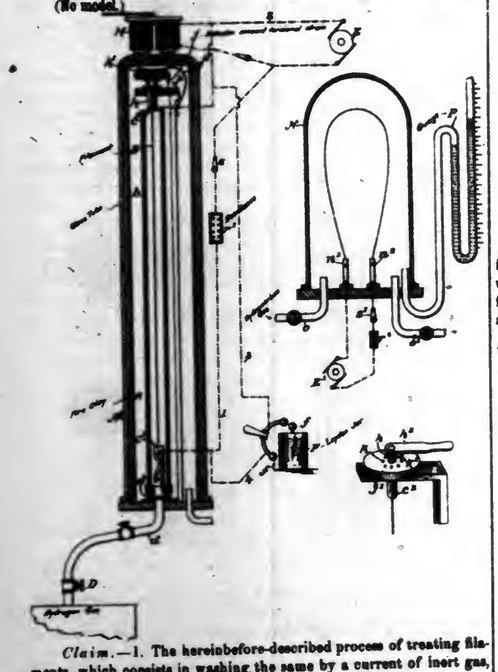


Claim.—1. The combination of a wrench having a shank, B, a fixed jaw, D, and traveling jaw E, with a removable plate, I, said plate being provided with a hook, O, downwardly-turned teeth P P' P'', a long screw-threaded tang, K, and a short tang, N, and a thumb-nut, L, turning on the screw-threaded tang K against shank B, all substantially as and for the purpose described.

2. The combination of a wrench having a shank, B, a fixed jaw, D, a head, C, and a traveling jaw, E, with a removable plate, I, having a hook, O, a series of downwardly-projecting teeth, P P' P'', a long screw-threaded tang, K, a short tang, N, and a shoulder, S, and a thumb-nut, L, the inner tooth, P, being the shortest one and each

outer tooth being longer than the next inner tooth, all substantially as described.

401,606. MANUFACTURE OF CARBON FILAMENTS. EDWARD P. THOMPSON, Elizabeth, N. J. Filed Feb. 4, 1887. Serial No. 226,585. (No model.)



Claim.—1. The hereinbefore-described process of treating filaments, which consists in washing the same by a current of inert gas, heating the filament while being so washed, and in sending a static charge to said filament while being so washed.

2. The hereinbefore-described process of treating filaments, which consists in removing the loose particles of carbon from the filament by a static charge of electricity and in building up the filament by a deposit of carbon upon the filament, substantially as described.

3. The hereinbefore-described process of treating filaments, which consists in washing the filament by an inert gas, heating the filament to incandescence while being so washed, throwing off the loose particles by one or more static charges, and in subsequently building up the filament by a deposit of carbon.

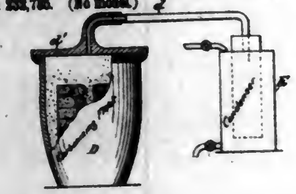
4. The hereinbefore-described process of treating filaments, which consists in washing them with gas while incandescent, subsequently placing them under torsion, and breaking them while under torsion

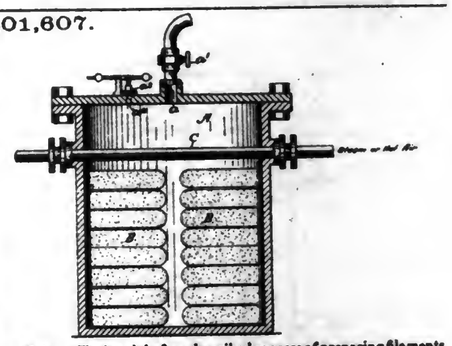
5. The hereinbefore-described process of treating filaments, which consists in washing them with gas while incandescent, subsequently placing them under torsion, and in heating them by an increased current until they break.

6. In an apparatus for treating filaments for incandescent electric lamps, the combination, with an inclosing-case, of clamps for supporting the filament, a revolving support for one of the clamps, an armature carried thereby, and an electro-magnet outside of said case for revolving the armature.

7. In an apparatus for treating filaments for incandescent electric lamps, the combination, with an inclosing-case, of clamps for supporting the filament, a revolving support for one of the clamps, an armature carried thereby, an electro-magnet outside of said case for revolving the armature, and a spring acting in opposition to the longitudinal pull of said electro-magnet.

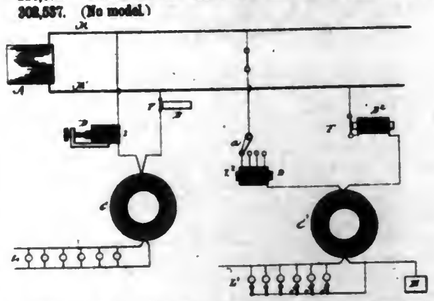
401,607. MANUFACTURE OF INCANDESCING CARBON FILAMENTS. EDWARD P. THOMPSON, Elizabeth, N. J. Filed Mar. 28, 1887. Serial No. 232,795. (No model.)





Claim.—The hereinbefore-described process of preparing filaments for incandescent electric lamps, which consists in winding the filaments upon carbon blocks, displacing the occluded gases in the blocks and filaments, filling the pores of the blocks and filaments with an inert fluid, and carbonizing the filaments.

401,608. DISTRIBUTION OF ELECTRIC CURRENTS. ELIHU THOMSON, Lynn, Mass. Original application filed Dec. 6, 1886, Serial No. 220,850. Divided and this application filed Mar. 8, 1889. Serial No. 302,537. (No model.)



Claim.—1. The combination, in a system of electric distribution, of a main or principal circuit, a local or independent circuit, interposed apparatus for transforming the electric energy in the main into electric energy in the local without contact between the circuits, a fusible plug or safety-strip in the connection from the main to said apparatus, and means, as described, for rupturing an arc at the fusible plug, as and for the purpose described.

2. The combination, in a system of electric distribution, of a main or principal circuit, local independent circuits, induction apparatus interposed between the local circuits and the main, and fed in multiple arc from the latter, fusible plugs or safety-strips in the multiple-arc connection, and arc-rupturing devices for said strips or plugs, as and for the purpose described.

3. In an alternating or rapidly-varying current system in which induction-coils are used, the combination of primaries fed in multiple from the mains, secondary circuits feeding local lighting or other devices, a fusible plug in the primary circuit, and means of rupturing an arc thereat, as described.

4. The combination, with a safety strip or fuse in a system of electric distribution, of an arc-rupturing device, substantially as described.

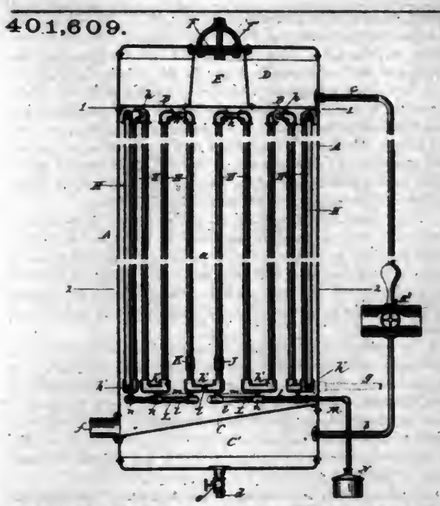
5. The combination, with a safety strip or wire fusible by excess of current, of a magnet whose pole or poles are in proximity to said strip or wire.

401,609. APPARATUS FOR TREATING VEGETABLE SUBSTANCES. JOHN D. TOMPKINS, Brainard, assignor to the Tompkins Paper Stock Company, Albany, N. Y. Filed Feb. 9, 1888. Serial No. 263,502. (No model.)

Claim.—1. In apparatus for making paper-stock, the combination, with a digester, of a circular series of vertically-arranged pipes extending the entire length of the digesting-chamber and arranged in pairs a short distance from the interior walls thereof, the neighboring pipes of the several pairs being connected at their lower ends by couplings, and the pairs at their upper ends, as described, a plug in one of the lower couplings, and the live-steam inlet and bent pipes connected with the adjoining pipes, separated by the plug *i*, substantially as described.

2. The combination, with the digesting-chamber, of the circular series of pipes connected above in pairs, the couplings *k'*, connecting the neighboring pipes of the adjoining pairs below, the plug *i* in one

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of the couplings *k'*, the inlet and bent pipes J K, a circular condensed-steam pipe connected with the couplings *k'*, and a pipe, M, connected with said condensed-steam pipe for carrying off the water of condensation.

401,610. APPARATUS FOR TREATING VEGETABLE SUBSTANCES. JOHN D. TOMPKINS, Brainard, assignor to the Tompkins Paper Stock Company, Albany, N. Y. Filed Feb. 9, 1888. Serial No. 263,503. (No model.)

Claim.—1, In an apparatus for treating vegetable substances for making paper-stock, the combination, with the digesting-vessel and a liquor-circulating pump, of a series of perforated chambered rings which are at intervals apart within the upper portion of the digesting-chamber and neighboring the wall of the same, and a corresponding series of branch pipes leading from a main pipe connecting with the inlet of the pump to said perforated rings, and a main circulating-pipe which leads from or is connected with the outlet of the pump and the lower end of the digester, substantially as and for the purposes set forth.

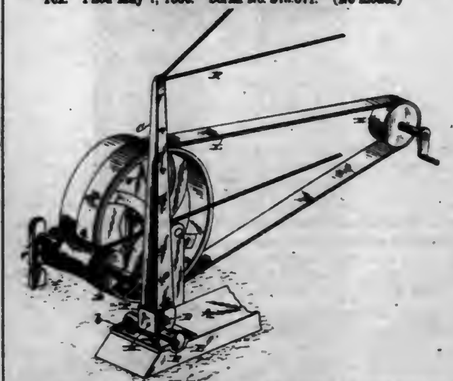
2. The combination, with the digesting-vessel and the two systems of liquor-circulating pipes, of a single pump having at its inlet a two-way valve and at its outlet a similar valve, these valves being operated at will and effecting within the digesting-chamber alternating upward and downward circulation of the cooking-liquor through the body of the material being treated, substantially as and for the purposes set forth.

3. The combination, with the digesting-vessel and a single pump, of two systems of liquor-circulating pipes, one connecting with the upper portion of the digesting-vessel and the other with the lower portion of the same, a two-way valve between each system of said pipes and the pump and which can be operated at will, and a heating-coil between the said pump and one of the two-way valves, whereby the pump, revolving in one direction, will force the water continuously through the heating-coil in one direction to be introduced into the digesting-vessel from below or from above and the reverse at will, substantially as and for the purposes set forth.

4. The combination, with the digesting-vessel and a single pump operating between the two main pipes, which connect, respectively, with the opposite ends of the said vessel, of the two-way valves L L', respectively, between said main pipes and the pump, and pipes N and M, substantially as and for the purposes and operations set forth.

5. The combination, with the digesting-vessel and the coiled pipe contained within the steam heating-drum, of the two sets of liquid-circulating pipes connected each with an opposite end of the said vessel, a single pump between said coiled pipe and one of said sets of pipes, the two-way valve L_1 connecting both sets of pipes with the inlet of the pump, and the two-way valve L', connecting said two sets of pipes with the coiled pipe, all substantially as and for the purposes set forth.

401,611. FOOT FOR SAND-LEVERS. CHARLES VEHE, Denison, Tex. Filed May 7, 1888. Serial No. 273,071. (No model.)



Claim.—In a foot or casting for sand-levers, the combination of the semi-cylindrical bearing having an aperture formed in its center, a cylindrical body working in the said bearing and having a square intermediate portion adapted to fit in the said aperture, upward-extending wings made integral with the body and forming a socket, and a lever fitting in the said socket, substantially as described.

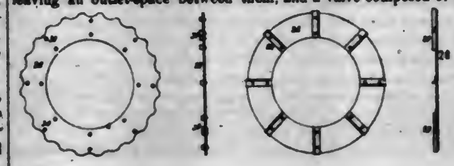
401,612. APPARATUS FOR MOLDING AND REFINING SUGAR. HUGH W. WALKER and THOMAS L. PATTERSON, Greenock, County of Renfrew, Scotland. Filed Feb. 4, 1888. Serial No. 263,011. (No model.) Patented in England Mar. 24, 1887, No. 4,307; in France Dec. 31, 1887, No. 187,910; in Belgium Dec. 31, 1887, No. 80,143; in Germany Jan. 9, 1888, No. 44,747; in Canada Mar. 1, 1888, No. 26,505, and in Austria-Hungary May 13, 1888, No. 3,062 and No. 13,025.

Claim.—1. Apparatus for molding and refining sugar, comprising, in combination, a driving-shaft, a mold in the form of a truncated cone and carried by the shaft, with an imperforate circumferential shell, an annular cover which is carried by the shell and through the center of which the mold can be charged, the mold having a circumferential outlet closed when charging and open when draining or drying, and a central cover and inner shell, substantially as set forth.

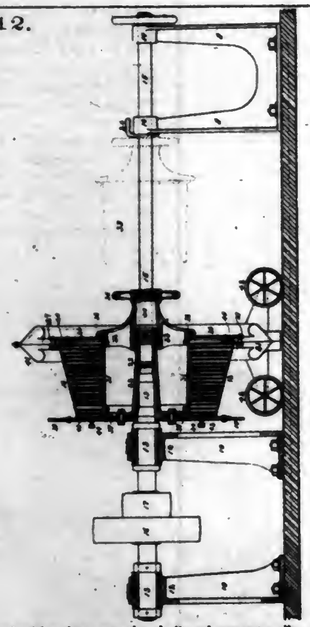
2. The combination of a rotary mold having an imperforate shell with a number of flat annular plates at right angles to the axis of the mold and having distance projections to keep them apart, and having passages between their outer edges and the inner face of the shell for the escape of the sirup, substantially as set forth.

3. The combination of a rotary sugar-mold having an imperforate circumferential shell and dividing-plates, leaving spaces between the edges of the plates and the shell, with an annular cover having an outlet between it and the edge of the shell and a valve in the said outlet, substantially as herein set forth.

4. A rotary sugar-mold having an imperforate shell and cover, leaving an outlet-space between them, and a valve composed of an

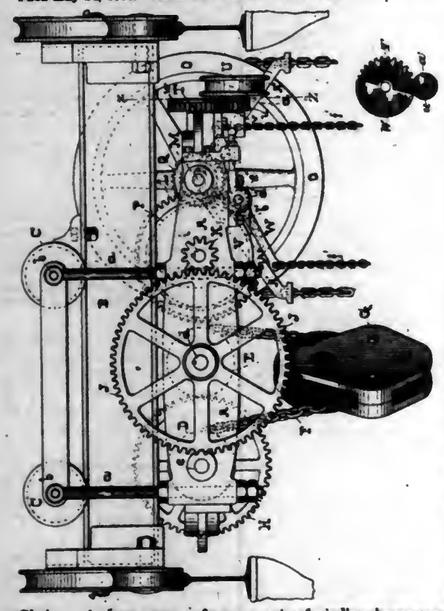


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annular lip of rubber between the shell and cover to allow the escape of liquid when the machine is in operation, substantially is set forth.

401,613. TRAVELING CRANE. JOHN WALKER, Cleveland, Ohio. Filed May 24, 1888. Serial No. 274,940. (No model.)



Claim.—1. In a crane, a frame, a pair of winding-drums connected by a lifting-chain arranged to wind or unwind at different speeds, and gearing to effect this movement, the said drums having chain-grooves of different pitches, whereby the pulley-block suspended by the said chain maintains a central position during the lifting and lowering operations, substantially as and for the purpose specified.

2. In a crane, a frame, a pair of winding-drums of a common diameter having chain-grooves of different pitches, as described, combined with gearing whereby the said drums are revolved at different speeds, and a lifting-chain the ends of which are connected to the said drums, substantially as and for the purpose specified.

3. In a crane, a longitudinally-moving hoisting-shaft and sleeves in which the said shaft is confined endwise, and which are adapted to have a longitudinal motion only in the frame carrying the same, whereby the bearings or journals of the said shaft are protected from the action of dust, substantially as and for the purpose specified.

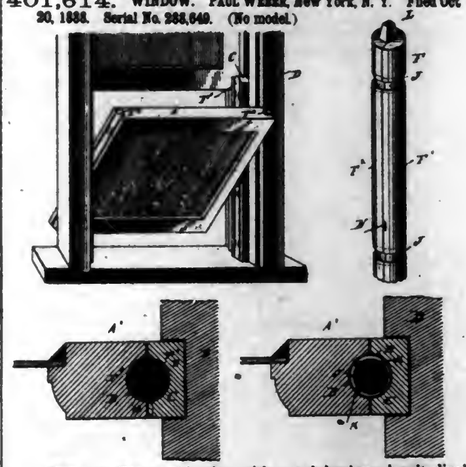
4. In a crane, a longitudinally-moving hoisting-shaft and sleeves in which the said shaft is confined endwise, and which are adapted to have a longitudinal motion only in the frame carrying the same, combined with a crank the pin of which rests in a groove in the said sleeve, whereby the said sleeve and its contained shaft may be moved endwise to change the speed of the hoisting mechanism or to detach the same, substantially as and for the purpose specified.

5. In a crane, a hoisting-shaft, a sleeve on the said shaft carrying a claw, and a crank adapted to move the said sleeve and shaft in an endwise direction to change the speed of the hoisting mechanism or detach the same, combined with a shaft carrying wards which in one position lock the said claw and in another release the same, and thereby allow of the endwise motion aforesaid, substantially as and for the purpose specified.

6. In a crane, a hoisting-shaft, a sleeve on the said shaft carrying a claw, and a crank adapted to move the said sleeve and shaft in an endwise direction to change the speed of the hoisting mechanism or detach the same, combined with a shaft carrying wards, by means of which the said claw may be locked and unlocked, and a brake-shoe adapted to control the rotation of a shaft comprised in the hoisting mechanism, whereby in the unlocking of the said claw the brake is applied, substantially as and for the purpose specified.

7. In a crane, the combination of the crank-shaft S, carrying the gear T, having the semicircular flange *w*, the shaft *v*, carrying the pinion *u*, with the flange *d'* and the chain-pulley U, substantially as and for the purpose specified.

401,614. WINDOW. PAUL WEBER, New York, N. Y. Filed Oct 20, 1888. Serial No. 288,649. (No model.)



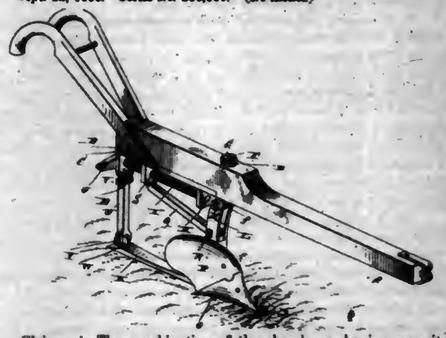
Claim.—1. The combination, with a sash having a longitudinal semicircular groove in the outer edge of each side bar, of sliding rails in the window-frame having longitudinal semicircular grooves in the edge adjacent to the side edges of the sash, and a split key-rod mounted to turn in said grooves, substantially as set forth.

2. The combination, with a sash having a longitudinal groove in the outer edge of each side bar, of sliding rails in the window-frame, each having a longitudinal semicircular groove in that edge adjacent to the side edge of the sash, a split key-rod in the two adjacent grooves of the sash and rail, and guide-pins projecting from said grooves into the grooves in the key-rod, substantially as set forth.

3. The combination, with a sash having a longitudinal semicircular groove in the outer edge of each side bar, of sliding rails in the window-frame, each having a longitudinal semicircular groove in that edge adjacent to an edge of the sash, a key-rod composed of two semi-cylindrical sections in each pair of grooves at each side of the sash, pins passing from the grooves in the sash and sliding rail into grooves in the semi-cylindrical sections of the key-rod, and a pin or pivot on each key-rod section in the sash, which pins can pass into grooves in the key-rod sections in the grooves of the sliding rails, substantially as set forth.

4. The combination, with sliding rails and a sash having longitudinal grooves in each side edge, between which rails the sash can swing, of a split key-rod composed of two semi cylindrical sections, which key-rod is placed in grooves formed in the sash and rails, each key-rod being provided at its upper ends with a head countersunk in the top of the sash, substantially as set forth.

401,615. PLOW. JOSEPH W. WEBSTER, Little Rock, S. C. Filed Sept. 22, 1888. Serial No. 286,066. (No model.)

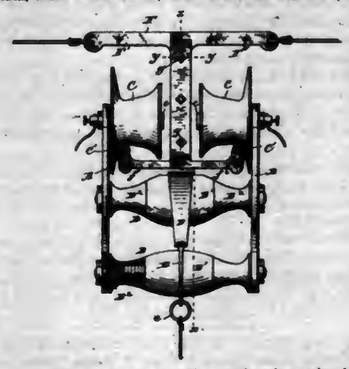


Claim.—1. The combination of the plow-beam having upon its rear end an under-cut, the metallic plate having downwardly-bent rear portion, said portion being provided with a smooth bore and terminating in a reduced bifurcated part, the perforated lug or shoulder depending from said metallic plate, the adjusting-screw having reduced smooth ends, the rear end thereof being provided with a handle, the bolt having flat lower end, the standard-bar pivotally secured to the flat-headed bolt, the arm pivoted to the standard and having a screw-threaded perforation in its upper end, through which the adjusting-screw passes, the pivoted rear arm, the shoe pivotally secured at each of its ends to the rear arm and lower end of the standard-bar, respectively, and the plowshare, substantially as set forth.

2. The combination, with the standard provided with a series of perforations and having an upper bifurcated portion and formed or provided with a lower bearing-surface or breast-piece, said bearing-surface having its inner edge provided with a triangular-shaped notch, of the plowshare secured to said bearing-surface or breast-piece and formed or provided on its inner edge with a shoulder adapted to fit in said triangular-shaped notch, and the mold-board, substantially as set forth.

3. The combination, with the plow, of the standard provided with a series of perforations and having upper bifurcated portion and formed or provided with a lower bearing-surface or breast-piece, said bearing-surface having its lower inner edge provided with a triangular-shaped notch, the plowshare formed or provided on its inner edge with a notch, and on its upper edge with a recess, and the mold-board provided on its lower edge with a curved lug or projection adapted to fit in the recess of the plowshare, substantially as set forth.

401,616. SYSTEM OF ELECTRIC LOCOMOTION. FRANK WHEELER, Meriden, Conn. Filed Jan. 14, 1889. Serial No. 296,301. (No model.)



Claim.—1. The combination, with two electric conducting-wires, of a trolley having its contact-rollers supported from the outside of said wires, substantially as described.

2. The combination, with two electric conducting-wires, of supports therefor, the arms of said supports extending from the center outward, and a trolley having its contact-rollers supported from the outside of said wires, substantially as described.

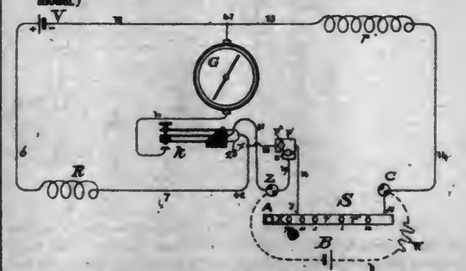
3. A trolley having a frame carrying inwardly-projecting axles for the contact-rollers and two braces connecting the sides of the frame and consisting of insulating-blocks with metallic end thimbles, substantially as described.

4. In combination with two electric conducting-wires and the supporting-brackets therefor, a trolley having an arch-shaped guide for guiding the said trolley when passing a conductor-bracket, substantially as described.

5. In combination with a two-wheeled trolley and a draft-cord for connecting it with a car, an intermediate connection between the cord and the trolley-frame extending to the front or rear of the said frame for steadying the trolley while being drawn in either direction, substantially as described.

6. A bracket for electric conducting-wires, consisting of two metallic pieces connected by bolts or rivets passing through enlarged holes therein and through insulating material, the said metallic pieces being rabbeted to partially receive the insulating material, substantially as described.

401,617. ELECTRICAL MEASUREMENT APPARATUS. ANTHONY C. WHITE, Boston, Mass. Filed Nov. 21, 1888. Serial No. 291,446. (No model.)



Claim.—1. An ammeter consisting of the combination, in a single instrument, of a direct-reading voltmeter and an adjustable shunt therefor having a series of resistances arranged in geometrical progression in the ratio of ten, and provided with circuit-changers for introducing any of the said resistances into circuit at will, the said shunt being connected or adapted to be connected across the voltmeter-terminals, whereby the reading of the voltmeter may be caused to indicate also the current strength in ampères, substantially as hereinbefore described.

2. The combination, in an electrical measurement apparatus, of a direct-reading voltmeter consisting of a test-circuit, a galvanometer in a bridge thereof dividing the said circuit into two divisions, a standard battery and fixed resistance in one division, and in the other a variable resistance, and terminals for connection of a generator or circuit to be tested in such manner that its current will pass through the galvanometer in a direction opposing that of the standard battery, and means for closing the circuit of both generator and galvanometer when a test is to be made, with an adjustable shunt connecting the said terminals of the generator or circuit to be tested and containing a series of resistances, either of which may at will be introduced, the said resistances being, respectively, unity and values in decreasing and increasing geometrical progression therefrom in the ratio of ten, whereby the reading of the voltmeter may be caused to indicate also the strength of current, substantially as herein specified.

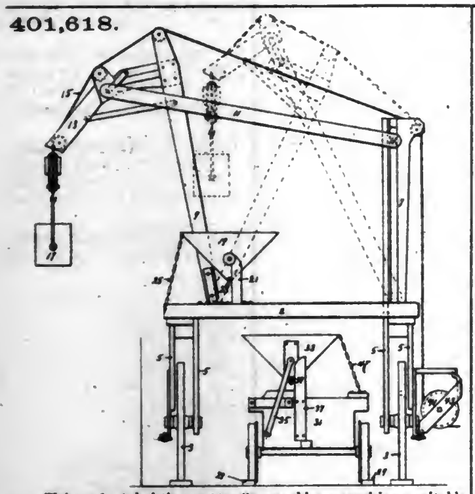
3. The combination, substantially as hereinbefore described, of a direct-acting voltmeter adapted for the measurement of low electromotive forces, an ammeter attachment therefor, whereby the readings of the voltmeter may be caused to indicate the value of the current strength also in direct terms, the said ammeter attachment comprising a resistance or series of resistances with a value of unity, or unity multiplied or divided by ten or powers of ten, shunting the said voltmeter, and a supplementary voltmeter attachment formed, as described herein, and connected with the ammeter, whereby high and low electro-motive forces may be measured with the same instrument.

4. In an electrical measurement apparatus, the combination of two independent resistances in series with one another, one of which is small and the other comparatively great, and the sum of which shall equal ten or some larger number in geometrical series therewith having ten for its ratio, and terminals for the attachment of a generator or appliance to be tested, with a direct-reading voltmeter looped round the smaller resistance, substantially as described.

5. In an electrical measurement apparatus, the combination of a direct-reading voltmeter, an adjustable shunt therefor containing a series of resistances in geometrical progression with the number ten for a ratio, an additional circuit-terminal electrically connected with the said shunt-circuit, and a high resistance included between the said shunt and the said extra terminal, the said high resistance having such a value that when added to a determined one of the shunt-resistances the sum shall be one thousand ohms, or a greater or less number in the same geometrical progression and having the same ratio.

401,618. HOISTING AND LOADING MACHINE. DAVID S. WHITE, Minneapolis, Minn. Filed May 3, 1887. Serial No. 236,930. (No model.)

401,618.



Claim.—1. A hoisting and loading machine comprising a suitable carriage constructed with depending standards having a clear space between them adapted to permit a car to be passed beneath the carriage, standards fixed upon said carriage, a receptacle pivoted in said standards and adapted to dump its contents into a car beneath said carriage, and a hoisting apparatus mounted on said carriage and adapted to raise material and deposit it in said receptacle, substantially as described.

2. The combination, in a machine of the class described, of a suitable carriage constructed with depending standards having a clear space between them adapted to permit a car to be passed beneath the carriage, standards fixed upon said carriage, and a receptacle pivoted in said standards and adapted to dump its contents into a car beneath the carriage, substantially as described.

3. The combination, with a suitable carriage constructed with depending standards and adapted to permit a car to be passed beneath it and between said standards, of standards fixed upon said carriage, a receptacle, 19, pivoted in said standards and arranged to dump its contents into a car beneath said carriage, a hoisting-bucket, and a hoisting apparatus adapted to raise said bucket and carry it over said receptacle 19, substantially as described.

4. The combination, with the carriage 2, constructed with depending standards and adapted to permit a car to be passed beneath said carriage and between said standards, of the standards 21, mounted thereon, and a receptacle, 19, pivoted in said standards and adapted to dump its contents into a car beneath said carriage, substantially as described.

5. The combination, with a suitable carriage constructed to permit a car to be passed beneath it, of a box or receptacle pivoted in standards upon said carriage and provided with stops 23, that strike against the standards and limit the movement of the box in one direction, and a locking device adapted to hold said box in its filling position.

6. The combination, in a machine of the class described, with the carriage provided with depending standards at each side and having a clear space between said standards, through which a car may be passed, and supporting-wheels mounted upon axles in said standards, of a hoisting apparatus mounted on said carriage and adapted to overhang one side of the carriage, and a receptacle mounted upon said carriage and adapted to receive material from said hoisting apparatus and to hold it and to be dumped at will to deposit said material in a car beneath said carriage.

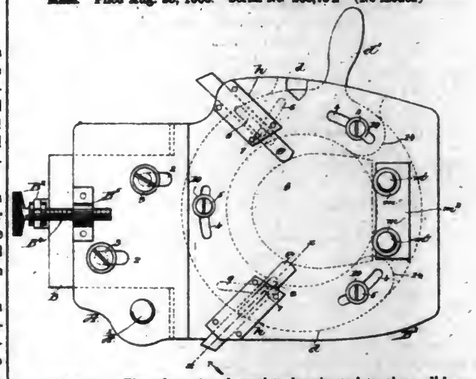
7. The combination, with the carriage 2, constructed to permit a car to be passed beneath it, of the standards 21, having the offset portions at their upper ends, the hopper-shaped receptacle 19, pivoted in said offset portions of said standards and provided with the stops 23, adapted to encounter said standards when the box is in filling position, and a securing device for holding said receptacle in such position.

8. The combination, with a carriage constructed to permit a car to be passed beneath it, of a standard, as 7, secured to the carriage near one side thereof, a movable block adapted to overhang the opposite side of the carriage, a support secured upon the carriage and constructed to permit said block to be drawn back to a position over the carriage, a hoisting-bucket, a hoisting rope or chain passing over sheaves on said movable block and over a sheave on said standard, standards 21 on said carriage, and a receptacle pivoted in said standards and adapted to receive material from said bucket and to dump its contents into a car beneath the carriage.

9. A hoisting and loading machine comprising a carriage constructed with depending wheeled standards having a clear space between them adapted to permit a car to be passed longitudinally beneath the carriage, a fixed standard, as 7, secured upon the carriage, a hoisting apparatus mounted and supported upon said carriage and provided with a movable block adapted to overhang one side of the carriage, a hoisting-bucket and a rope or chain passing from said bucket over said movable block and over a sheave on said standard, a receptacle on said carriage between said standard and the opposite side of the carriage, and a car adapted to pass beneath said carriage and receive material from said receptacle, substantially as described.

10. A hoisting and loading apparatus comprising a suitable carriage constructed to permit a car to be passed beneath it, a hoisting mechanism on said carriage adapted to raise material and carry it to a point over said carriage, standards fixed upon said carriage, a hopper pivoted in said standards and adapted to receive material from said hoisting mechanism and dump it beneath said carriage, and a car adapted to pass beneath said carriage and receive material from said receptacle, substantially as described.

401,619. TOP-LIFT CARRIER FOR HEELING-MACHINES. HENRY W. WEBSTER, Boston, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed Aug. 25, 1888. Serial No. 283,734. (No model.)



Claim.—1. The plate A, adapted to be pivoted to the nail-box, and the connected plate B', combined with sliding fingers to act against the edges of the top lift, and with the adjusting-plate to move the said fingers longitudinally, substantially as described.

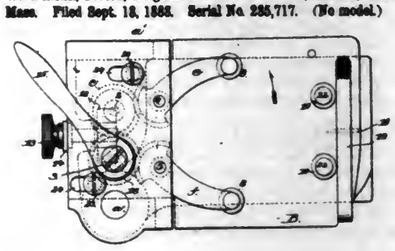
2. The plate A, adapted to be pivoted to the nail-box, and the connected plate B', combined with sliding fingers to act against the edges of the top lift, and with the adjusting-plate to move the said fingers longitudinally, and with the stops for the breast end of the heel, substantially as described.

3. The nail-box, the pivoted plate A, the plate B', carried by the said pivoted plate, means, substantially as described, to adjust the plate B' longitudinally, and the guides *h*, combined with the sliding fingers and the adjusting-plate to actuate them, substantially as described.

4. The nail-box, the pivoted plate A, combined with the top-lift plate B', fitted to slide in the plate A, and with a screw to adjust the plate B longitudinally with relation to the pivoted plate A, substantially as described.

5. The nail-box, the plate A, pivoted to it, and the plate B and screw to adjust it longitudinally with relation to the said pivoted plate, substantially as described, combined with the breast-gage attached to the top-lift plate for the breast of the top lift and movable in unison with the said plate B, substantially as described.

401,620. TOP-LIFT HOLDER FOR HEELING-MACHINES. HENRY W. WEBSTER, Boston, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed Sept. 18, 1888. Serial No. 285,717. (No model.)



401,620.

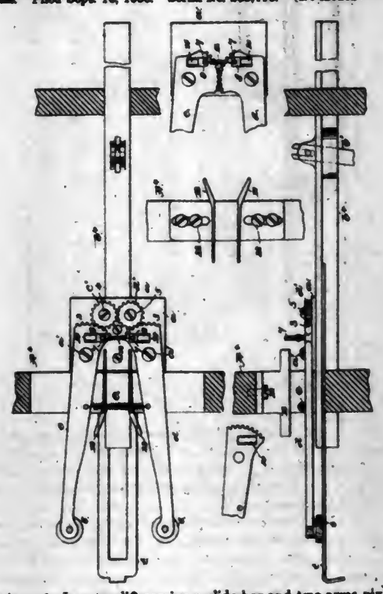


Claim.—1. The top-lift or swinging plate and plate *a'*, and arms having teeth, and gears engaging the said teeth, combined with a friction device to retain the said arms in adjusted position, substantially as described.

2. The top-lift plate B, the plate *a'*, nail-box, pivot *a*, and gears *c d* and arms *e f*, combined with gages, as 10, on the plate B, to act against the breast of the heel, substantially as described.

3. The nail-box and the top-lift plate above it adapted to swing about a pivot, combined with the horizontally-arranged latch pivoted upon and movable with the plate B about the said pivot, substantially as described.

401,621. TOP-LIFT HOLDER FOR HEELING-MACHINES. HENRY W. WEBSTER, Boston, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed Sept. 18, 1888. Serial No. 285,718. (No model.)



Claim.—1. In a top-lift carrier, a slide-bar and two arms pivoted thereon and provided with gear-teeth and geared together, substantially as described, combined with arm-spreading devices to turn the said arms, the said teeth insuring the movement of the said arms together in opposite directions positively for like distances, substantially as described.

2. The pivoted arms *c d*, provided with teeth and geared together, the spring *e*, and the sliding spring-connected studs 7, combined with the arm-spreading devices, co-operating with the said studs to effect the opening of the jaws as they are being retracted, substantially as described.

3. In a heel-nailing machine, the pivoted arms having teeth, as 2 3, combined with the gears *c d*, engaging the said teeth and engaged each with the other, substantially as described.

401,622. INSECT-DESTROYING SYRINGE. FREDERICK L. ZITSCHER, New York, N. Y. Filed Feb. 6, 1889. Serial No. 299,887. (No model.)



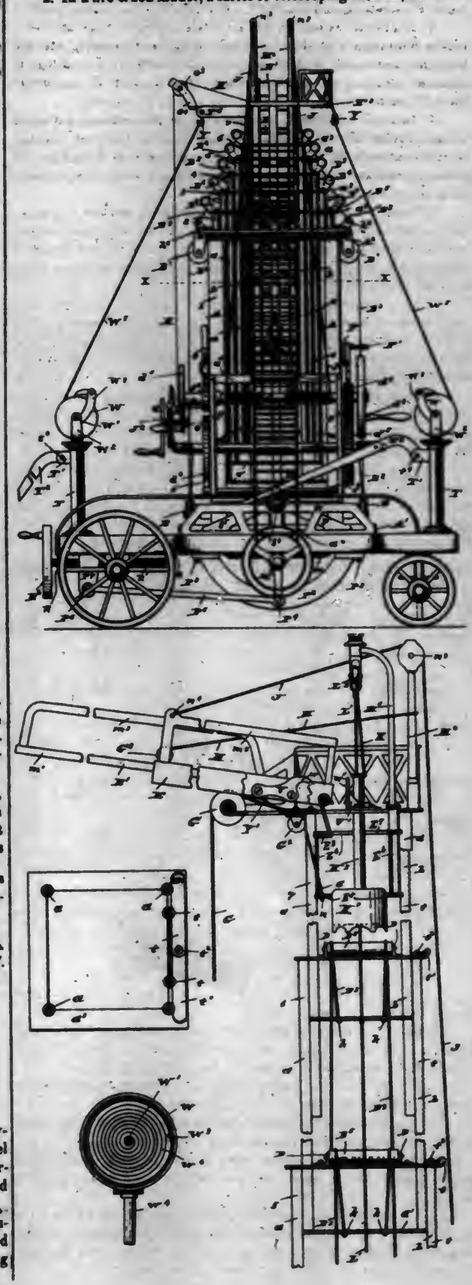
Claim.—1. The combination, with a sheet-metal screw-cap having a supply-opening in its top part, of a syringe on said cap, the barrel of which communicates with the opening in the cap, and a nozzle arranged at right angles to the barrel of the syringe at the delivery end of the same, substantially as set forth.

2. The combination, with a receptacle for insect-destroying solution, of a screw-cap for closing said vessel, a syringe-barrel arranged on the top of the cap, said barrel communicating through an opening in the cap with the interior of the vessel, a piston guided in said barrel and provided with a piston-rod having a ring-shaped handle, and a nozzle arranged at right angles to the barrel at the delivery end of the same, substantially as set forth.

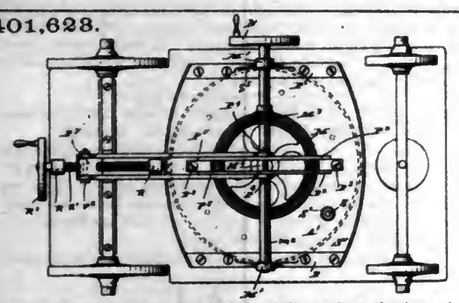
401,623. FIRE-TRUCK LADDER. CHARLES ALBERT, Cincinnati, Ohio. Filed Feb. 13, 1888. Serial No. 264,474. (No model.)

Claim.—1. In a fire-truck ladder, a series of telescoping sections, the lower section being attached to a movable platform, rollers B^3, cross-pieces B^4, ropes and winding mechanism, substantially as set forth, for elevating said sections, and mechanism for revolving said sections, consisting of shaft M^2 and gear-wheels M and M^3, and suitably supported, substantially as set forth.

2. In a fire-truck ladder, a series of telescoping sections, the lower



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section being attached to the platform of the truck, mechanism, substantially as set forth, for raising and lowering said sections, and mechanism for inclining said sections, consisting of arms P^3 P^3, rods P^5 P^5, block P^7, screw R, and wheel R^2, substantially as set forth.

3. In a fire-truck ladder, a series of telescoping sections, and mechanism, substantially as described, for raising and lowering said sections, in combination with revolving corner-posts, as T, and legs T^3, pivotally attached to said posts T and revolving with them, substantially as set forth.

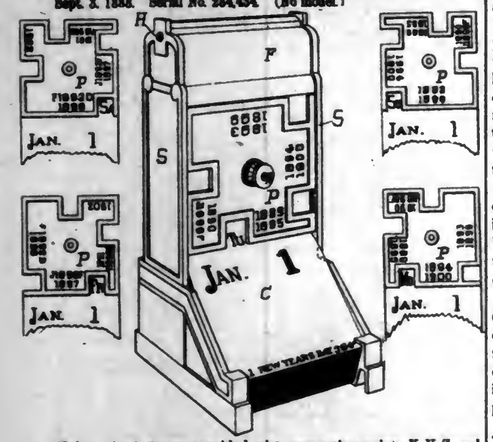
4. In a fire-truck ladder, a series of telescoping sections, and mechanism, substantially as set forth, for raising and lowering said sections, in combination with guide-ropes, as W^3, and drums W, said drums W automatically winding up the guide-ropes when the sections are being lowered, substantially as set forth.

5. In a fire-truck ladder, a series of telescoping sections, and mechanism, substantially as described, for raising and lowering said sections, each of said sections having a ladder notched at *t*, in combination with plates, as *t'*, pivoted on the top plates of each section, substantially as set forth.

6. In a fire-truck ladder, a series of telescoping sections, and mechanism for raising and lowering said sections, said sections being united at the top by top plates, a^2, having cross-rods B^4, and rollers B^5, and bottom plates, *a'*, and ropes B^3, substantially as set forth.

7. In a fire-truck ladder, a series of telescoping sections, and mechanism, substantially as described, for raising and lowering said sections, in combination with auxiliary ladders E E', ladder E, having pulley G^2, and rope H, suitably connected at one end to ladder E' and at the other end to uprights H^2, substantially as set forth.

401,624. CALENDAR. SAMUEL W. BALCH, Yonkers, N. Y. Filed Sept. 3, 1888. Serial No. 284,434. (No model.)



Claim.—1. A frame provided with supporting-points X Y Z and a pocket in its upper portion, in combination with a calendar bound in book form, substantially as and for the purpose set forth.

2. In a calendar, the combination of a frame and movable plate having notches in its edge, for the purpose set forth.

3. The combination of the side frames, S S, the supporting-points X Y Z, and hinged front F, substantially as described.

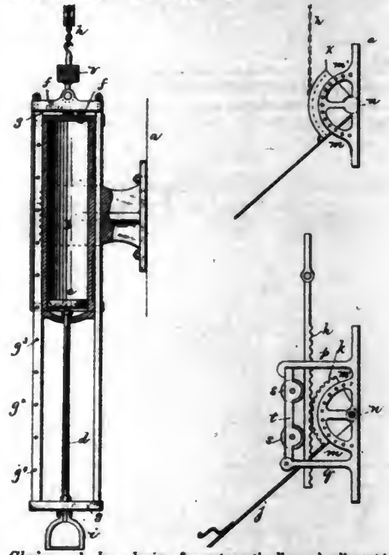
4. The combination of the book C, the supports X Y Z, the hinged front F, and a pocket, substantially as and for the purpose set forth.

5. In a calendar, the combination of a page having all the days of the week, a month, and a day of the month printed upon it with an adjustable plate to designate on which day of the week the date falls and the year for which it is correct, as set forth.

6. A calendar bound together in book form having the days printed on both sides of each leaf and arranged so that successive days will appear on the corresponding sides of successive leaves, substantially as described.

7. A calendar in which all the days of the week are repeated with each day of the month and arranged so that successive days of the week appear in the same relative position with successive days of the month, for the purpose set forth.

401,625. DEVICE FOR OPERATING DAMPERS FOR FIRE-PLACES, &c. AXEL V. BAY, Nakskov, Denmark. Filed Jan. 30, 1888. Serial No. 262,311. (No model.)



Claim.—1. In a device for automatically and adjustably operating dampers for fire-places, &c., the combination of a cylinder having an inlet-valve and an outlet at one end, and a piston sliding in the cylinder and having its rod connected to the damper, as shown, and for the purpose specified.

2. In a device for automatically and adjustably operating dampers for fire-places, &c., the combination of a cylinder having an inlet-valve and an outlet-cock at the upper end and having a perforated lower head, a frame having rods traveling in ways in the sides of the cylinder and having the lower end provided with a stirrup, the piston-rod and piston in the cylinder, the lower end of the rod being secured to the lower end of the frame, and the damper-operating chain having weights and secured to the upper end of the frame, as shown, and for the purpose specified.

3. In a device for automatically and adjustably operating dampers for fire-places, &c., the combination of the cylinder *b*, having the inlet-valve *f* and cock *f'*, the piston *c*, having the rod *d*, the frame having the end pieces, *g*, and side pieces, *g'* and g^3, the piece g^3 having the perforations g^4 and pin g^5, the stirrup *i*, and the damper-operating chain *h*, having the weights *v*, as shown, and for the purpose specified.

4. In a device for automatically and adjustably operating dampers for fire-places, &c., the combination of the damper *j*, having pivotal rod *n* and cogged segments *k*, sector-shaped guides *m*, having perforations and stop-pins *m'*, the operating-rod having the rack-bar *k'*, engaging the cogged segment, the bracket *g*, the hinged piece *t*, having the guide-rollers *s*, and the hinged hook *p*, as shown, and for the purpose specified

401,626. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J. assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed July 2, 1888. Serial No. 278,737. (No model.)

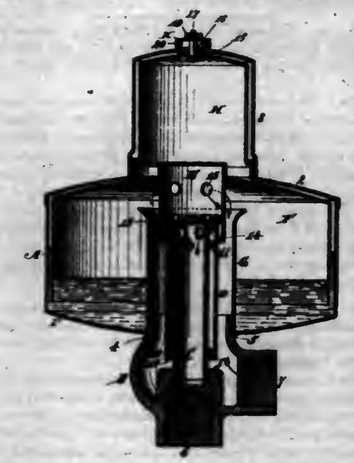


Claim.—1. In a gas-governor or gas-regulating burner, the combination, with the regulator-shell having a tubular perforated stem

closed at its upper end and provided with a guide, of a cup or annular chamber surrounding said stem near its lower end, and a flaring or conical float-valve surrounding the stem above said cup and provided with an internal perforated tube to control the gas-openings in said stem, substantially as described.

2. In a gas-governor or gas-regulating burner, the combination of the two-part shell 1 and 2, having tabular perforated stem 7, cup 9, having opening 11, the adjusting-screw 6, the float-valve 13, having a perforated tube, 14, and the gas-passages 10 and 21, substantially as described.

401,627. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Jan. 16, 1889. Serial No. 296,516. (No model.)



Claim.—1. In a gas-governor, the combination of a central governor inlet-tube having a closed top and lateral gas-exits and provided with a valve-seat, a balanced gas-valve surrounding said governor inlet-tube, a gas-chamber attached to the balanced valve and provided with lateral gas-exits, a bell-shaped float attached to said gas-chamber and dipping in a liquid contained in the governor-casing, an air-valve located in the upper part of said casing, and a tube surrounding the balanced gas-valve and communicating with the governor-outlet, substantially as described.

2. In a gas-governor, the combination, with a governor-casing containing a liquid and a balanced gas-valve having a float that dips into said liquid, of an air-valve having a float suspended within the upper part of the governor-casing and provided with a perforated cap on the outside of said casing, substantially as described.

3. In a gas-governor, the combination of the casing A, the fitting B, having an inlet and an outlet, the governor inlet-tube C, having lateral gas-exits and upper and lower valve-seats, the tubular balanced gas-valve D, having a gas-chamber, E, provided with lateral gas-exits, the float F, connected with said valve, the tube G, surrounding the tubular gas-valve, and an air-valve located in the upper part of the governor-casing, substantially as described.

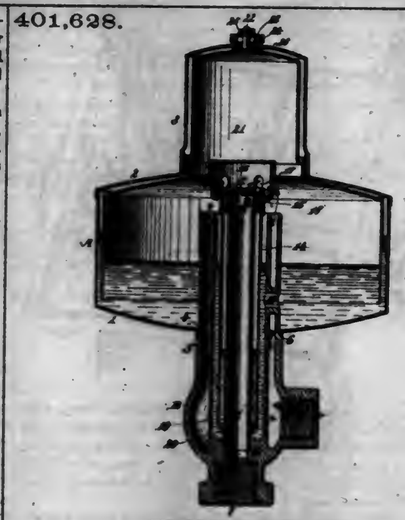
4. In a gas-governor, the combination, with the casing having an air-opening, 16, in its upper part, the gas-valve, and the gas-valve float, of the bell-shaped float H, having a stem, 17, passed through air-opening 16, the valve-washer 18, located on the float-stem beneath said opening, and the perforated cap K, secured to the stem above the air-opening, substantially as described.

401,628. GAS-GOVERNOR. HAROLD J. BELL, Gloucester City, N. J., assignor to the Welsbach Incandescent Gas Light Company, of New Jersey. Filed Jan. 16, 1889. Serial No. 296,517. (No model.)

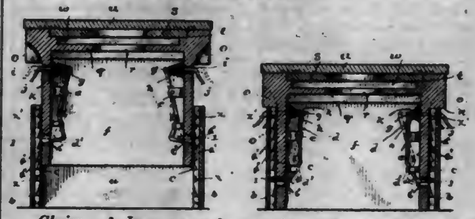
Claim.—1. In a gas-governor, the combination, with the governor-casing having an air-valve in its upper part, of a gas-fitting having an inlet and an outlet and provided with concentric tubes projecting vertically into the governor-casing and connected by a short horizontal tube, a gas-inlet tube supported centrally in said fitting and provided with a closed top and lateral gas-passages, and a tubular balanced valve surrounding the gas-inlet tube and provided with a perforated gas-chamber and a bell-shaped float, substantially as described.

2. In a gas-governor, the combination, with the casing A, inlet-tube 11, tubular valve 14, and bell-shaped float 18, of the fitting B, having an inlet and an outlet, and provided with the concentric tubes 5 and 10, connected by a tube, 19, substantially as described.

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401,629. COMMODE. JOHN A. BELL, Naperville, Ill. Filed Dec. 21, 1888. Serial No. 294,251. (No model.)



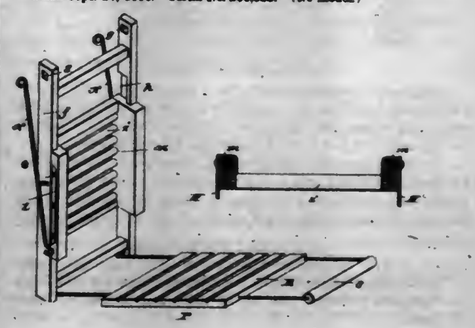
Claim.—1. In a commode, a stationary base provided with ratchet-bars, in combination with a vertically-movable seat provided with spring-pawls having cross-bars upon their lower extremities and catches upon the opposite ends of said bars, arranged in the manner and for the purpose described.

2. In a commode, a stationary base having ratchet-bars upon its interior, in combination with a sliding seat portion provided with spring-actuated pawls having cross-bars upon their lower extremities, and pulls for releasing said pawls, substantially as described.

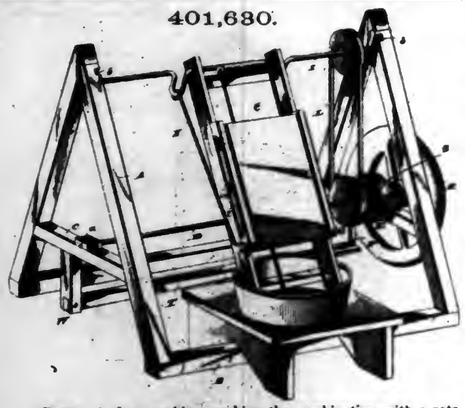
3. In a commode, a stationary base portion provided with ratchet-bars upon opposite sides thereof, in combination with an inner sliding seat-section having a pair of levers pivoted thereto and pivoted to each other, the free end of one of said levers engaging the ratchets of the base portion, substantially as described.

4. In a commode, a stationary base portion provided with ratchets, in combination with a sliding seat-section having a pair of levers pivoted thereto and also pivoted to each other, one of said levers acting as a pawl to engage said ratchets, and the other being provided with a pull for releasing said pawl, in the manner and for the purpose set forth.

401,630. WASHING-MACHINE. WILLIAM F. BELTON, Greenville, Pa.; Jesse C. Belton administrator of said William F. Belton, deceased. Filed Sept. 27, 1888. Serial No. 286,525. (No model.)



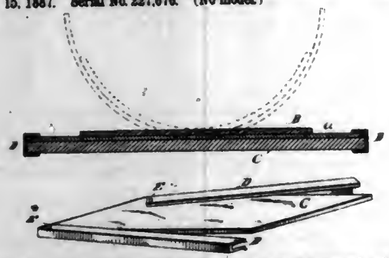
401,630.



Claim.—1. In a washing-machine, the combination, with a rotative crank-shaft, of a frame journaled thereon, a reciprocating roller or rubber-frame supported on the said main frame, pitmen connecting the cranks of the said shaft with the reciprocating frame, and a hinged clamping-frame adapted to turn upon the said reciprocating frame, substantially as specified.

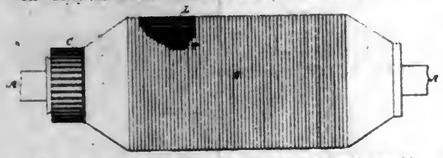
2. In a washing-machine, the combination, with a rotative crank-shaft, a frame journaled thereon, a reciprocating frame supported on the main frame and having friction-rollers and grooves to prevent lateral displacement, the hinged corrugated frame having a handle, and pitmen connecting the cranks of the said shaft with the reciprocating or rubbing frame, substantially as specified.

401,631. FORMING CURVED ELECTROTYPES. GILBERT H. BENEDICT, Ellenville, and PATRICK M. FURLONG, Troy, N. Y. Filed Feb. 15, 1887. Serial No. 227,676. (No model.)



Claim.—The combination of a curved elastic plate and a flat bed provided with hinged and movable clamps for holding said elastic plate in a flat position upon said bed while a matrix-bed is being formed thereon, an impression taken, the form removed from the matrix, and the same fully perfected for its use in the electrotype-vat before being allowed to resume its curved form, substantially as set forth and described.

401,632. DYNAMO-ARMATURE. CARL O. C. BILLBERG, Philadelphia, assignor to Thomas H. Dallett and George A. Dallett, Thornbury, Pa. Filed Oct. 1, 1888. Serial No. 286,816. (No model.)



Claim.—1. An armature-core for a dynamo-electric machine or electric motor, having an iron core with polar projections or teeth and a divided iron sheath around the outside of the armature throughout the length or part of the length of the polar projections.

2. An armature for a dynamo-electric machine or electric motor, having a divided iron core with polar projections and a divided iron sheath composed of iron wire wrapped around the armature circumferentially throughout the length or part of the length of the polar projections.

401,633. ALIZARINE-BLUE GREEN. RENÉ BOHN, Ludwigshafen on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik Mannheim, Germany. Filed Oct. 13, 1888. Serial No. 288,430. (Specimens.)

Claim.—As a new product, the coloring-matter or dye-stuff (alizarine-blue green) hereinbefore described, and having the following characteristics: With much boiling water it forms a blackish-purple solution, which, by the addition of a very large quantity of water, assumes a blue-green color; in concentrated or rectified sulphuric acid it dissolves with a bright red or crimson color; in fuming sulphuric acid containing about twenty-three per cent. of free anhydride it forms a blue-green solution; with caustic alkalies it forms bright-green solutions which are not precipitated by adding thereto a large excess of these solvents; its bisulphite-of-sodium compound is particularly useful for printing cotton fabrics, the shades produced being of a considerably greener hue than the corresponding shades of alizarine-blue; the colors produced with the aid of chrome, nickel, or zinc mordants are partly distinguished by their bright blue-green tint.

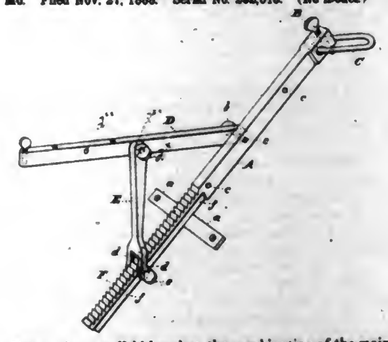
401,634. CARBAZOL-YELLOW. RENÉ BOHN, Ludwigshafen-on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik, Mannheim, Germany. Filed Oct. 18, 1888. Serial No. 288,433. (Specimens.)

Claim.—As a new product, the yellow coloring-matter or dye-stuff hereinbefore described, which results from the combination of one molecule of tetrazo-carbazol with two molecules of salicylic acid; and which has the following properties: In its uncombined state it forms a powder of a dark bluish-green color which is insoluble in water, but dissolves in concentrated sulphuric acid with a bright bluish-purple color; its sodium salt when dried forms a powder of a brown color, and in its alkaline solution it imparts to cotton a bright and intense yellow color without the aid of mordants; it dyes wool and other animal fiber a bright and fast yellow either in a neutral or acidified bath.

401,635. ALIZARINE-GREEN SULPHO-ACID. RENÉ BOHN, Ludwigshafen-on-the-Rhine, Bavaria, assignor to the Badische Anilin and Soda Fabrik, Mannheim, Germany. Filed Oct. 31, 1888. Serial No. 289,677. (Specimens.)

Claim.—As a new product, the coloring-matter or dye-stuff (alizarine-green sulpho-acid) which is produced by the action of moderately-strong fuming sulphuric acid at an elevated temperature upon alizarine-green, and the chemical constitution and general behavior of which correspond to those of a true and stable sulphonated derivation of alizarine-green having the following characteristics: In its solid state it has the appearance of a crystalline powder consisting of small needle-shaped crystals possessing a metallic luster; its aqueous solution has a bluish-green color, which changes into red upon the addition of mineral acids; alkaline carbonates produce blue saline compounds, while with caustic alkalies it forms green alkaline salts which are not precipitated from their aqueous solutions by adding thereto an excess of caustic alkali; its solution in concentrated sulphuric acid has a dingy-brown color, and its solution in fuming sulphuric acid containing about twenty-three per cent. of free anhydride has a grass-green color; upon chrome-mordanted wool it produces green shades.

401,636. SCAFFOLD-BRACKET. EVERETT A. BRACE, Moberly, Mo. Filed Nov. 27, 1888. Serial No. 292,013. (No model.)



Claim.—In a scaffold-bracket, the combination of the main beam having the rack and the groove, the lateral projections on said beam, the fastening at its upper end, the adjustable pivoted base-beam, and the adjustable brace having the bifurcated end and the projection to engage in the groove of the main beam, substantially as specified.

401,637. HAND-MOTOR. CHARLES E. BRONWELL, Helena, Ark. Filed June 19, 1888. Serial No. 277,005. (No model.)

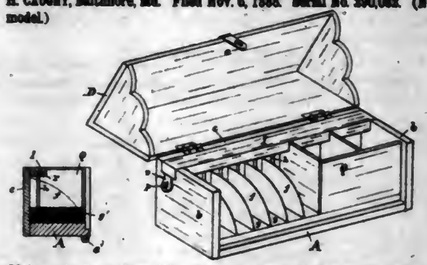
Claim.—A motor consisting of the portable frame-work A, having at one end the standards B, the crank-shaft C, supported thereby and carrying the beveled wheel D, the vertical shaft F, having the beveled wheel E attached to its upper end and at its lower end the beveled wheel G, combined with the shaft I, having beveled wheel H

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and worm J, the worm-wheel K, meshing with said worm, the gear-wheel M, the shaft N, and its pinion and wheel, the pinion O, and shaft P, the clutch Q, link R, and lever S, all substantially as and for the purposes set forth.

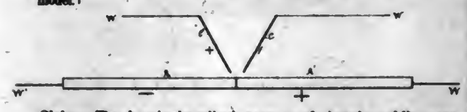
401,638. TICKET-BOX FOR STREET-RAILWAY CARS. SAMUEL H. CAUGHY, Baltimore, Md. Filed Nov. 6, 1888. Serial No. 290,062. (No model.)



Claim.—1. In a fare-ticket box, the combination, with the box provided with partitions *f*, forming spaces *g*, with pins *h*, of the bar I, inclosing the upper ends of the pins, said bar being hinged at one end of the box and adapted to be locked at the other, as set forth.

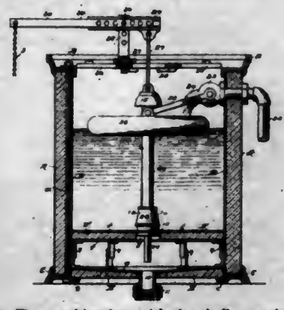
2. The combination, in a fare-ticket box, of the transverse partitions *f*, having intervening spaces *g*, the pins *h*, located in said spaces and extending above the upper edges of the partitions, and the longitudinal locking-bar I, hinged to the box at one end and provided at the other end with fastening devices, the under side of the locking-bar being provided with a recess adapted to set over the upper ends of the pins, whereby the tickets impaled on said pins may be held in security, substantially as specified.

401,639. PROCESS OF ELECTRIC WELDING. CHARLES L. COFFIN, Detroit, Mich. Filed Sept. 18, 1888. Serial No. 285,741. (No model.)



Claim.—The herein-described process of electric welding, consisting in submitting the joint to be welded simultaneously to the action of manifold arcs instead of a single arc, substantially as and for the purposes set forth.

401,640. TANK FOR WATER-CLOSETS. PATRICK CONNOLLY, Brooklyn, N. Y., assignor to Martin Dease, same place. Filed May 29, 1885. Serial No. 167,044. (No model.)



Claim.—1. The combination, with the shell or casing A, having the metal lining D and the bottom E, of the frames B C, the former of said frames being arranged to fit over the upper end of the casing A, and the latter to fit over the bottom end of said casing, and also to support the bottom E, substantially as described.

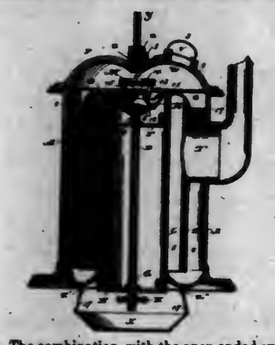
2. The combination, with the shell or casing A, having the metal lining D and the bottom E, of the frames B C, the former of said frames being arranged to fit over the upper end of the casing A and the latter to fit over the bottom end of said casing, and also to support the bottom E, and the tie-rods *a*, for holding the frames B C together, substantially as described.

3. The combination, with the lever 50 and the standard 28, of the adjustable plate 35, whereby the position of the lever can be varied, substantially as described.

4. The combination, with the tank and the outlet-valve 25, located in the tank, of the operating-lever 50, fulcrumed on top of the tank and having the adjustable arm 30, whereby the position of the chain or rod 31 can be varied, substantially as described.

5. The combination, with the outlet-valve 25, of the operating-lever made in two parts, 29 30, the standard 28, and the adjustable plate 35, whereby the position of the lever and the length of its long arm can be varied, substantially as described.

401,641. GAS OR OIL STOVE. BENJAMIN G. DEVOE and THOMPSON A. DULL, Lima, Ohio. Filed Nov. 13, 1887. Serial No. 255,533. (No model.)



Claim.—1. The combination, with the open-ended cylinder C, having base R, of the cylinder B, having a hood to fit over the top of cylinder C, and the cylinder A, fitting on base R, as and for the purpose set forth.

2. The combination of air-cylinder C, drip-pan K, and the pipe D, and means whereby the same may be raised or lowered to regulate the amount of air admitted to the fire, as and for the purpose set forth.

3. In an oil-stove, the combination, with the oil-pipe Y, of the air-valve L and mixer M, as and for the purpose set forth.

4. The combination, with cylinders A B C and burner or mixer M, of the adjustable top or dome P and pipe Y, as and for the purpose set forth.

5. The stove having the dome P, provided with the air-passage, in combination with the drip-pipe Y and mixer M, located within the stove and beneath the pipe, as and for the purpose set forth.

401,642. BELTING. ROBERT DICK, Greenhead, Glasgow, County of Lanark, Scotland. Filed July 9, 1887. Serial No. 243,901. (No model.) Patented in England Oct. 14, 1885, No. 12,253, and June 25, 1887, No. 9,043.



Claim.—1. A solid round band or rope composed of flat webs of canvas or other fabric impregnated with a gutta-percha solution and rolled upon itself, substantially as set forth.

2. A composite solid round band or rope composed of alternate layers of canvas and gutta-percha compound rolled upon itself, substantially as set forth.

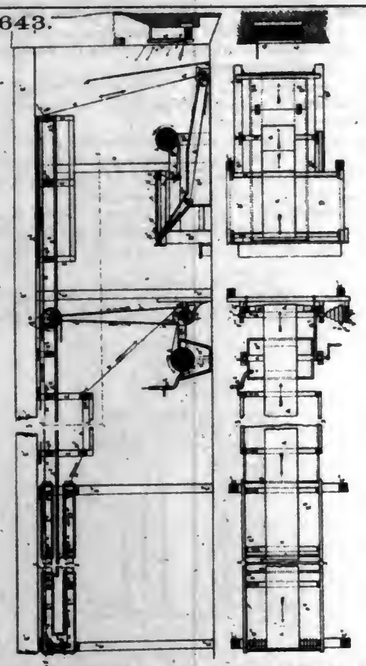
3. A composite solid round band or rope composed of alternate rolls of canvas or gutta-percha compound with a layer of cloth on the outer surface, as and for the purpose set forth.

401,643. METHOD OF MAKING FLAT BELTS. ROBERT DICK, Greenhead, Glasgow, County of Lanark, Scotland. Filed July 9, 1887. Serial No. 243,902. (No model.) Patented in England Oct. 14, 1885, No. 12,254, and June 25, 1887, No. 9,043.

Claim.—1. The herein-described method of preparing flat belts or bands, said method consisting in impregnating a web of canvas or other fabric with a gutta-percha solution, then partially heating it, folding the web into a belt or band of the desired width, heating the folded web, and passing it between pressure-rolls, substantially as set forth.

2. The herein-described method of making composite flat belts or bands by first impregnating webs or canvas or other fabric with a solution of gutta-percha, then subjecting the impregnated webs to

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heat, then folding the webs into belts or bands of the desired width, and then applying to the belts or bands thus impregnated and folded elastic layers or sheets of gutta-percha compound, substantially as set forth.

401,644. GRAIN-BINDER. WALTER W. EASTMAN and HERBERT R. POTTER, Milford, Iowa. Filed Oct. 18, 1888. Serial No. 288,499. (No model.)



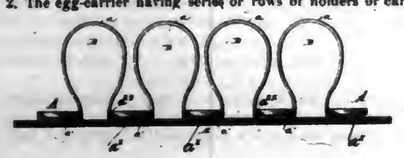
Claim.—1. The combination of the supporting-bars L, the beams Q, connecting the same, the upper beam Q being secured to the harvester-frame and the lower beam being secured to the binder-frame, the movable deck mounted on the bars L, mechanism for reciprocating said deck, and the strip S, secured to the bars L and projecting up over the upper edge of the deck, as set forth.

2. The combination of the bars L, the beams Q, connecting the same, one of said beams being secured to the harvester-frame and the other one being secured to the binder-frame, the longitudinally-slotted strips K, secured on the bars L, the movable deck, the studs depending from the deck and engaging the slots in said strips K, the crank-shaft mounted on the bars L, the [illegible] between connecting said shaft with the under side of the deck, and mechanism for rotating said shaft, as specified.

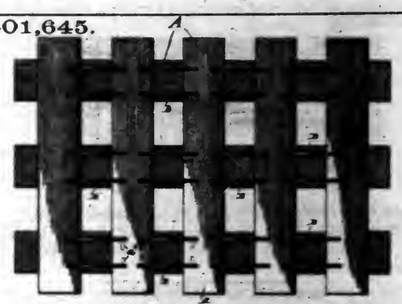
401,645. EGG-CARRIER. CHARLES F. A. EDDY, Greenfield, Mass. Filed Feb. 9, 1889. Serial No. 299,256. (No model.)

Claim.—1. The egg-carrier consisting of the reticulated frame or base, and the holders or carriers proper extended outward into arms, said arms having lateral extensions which are interposed between the crossing-pieces of the frame or base, substantially as set forth.

2. The egg-carrier having series or rows of holders or carriers



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proper, each consisting of two continuous wires formed into loops having outward-extended arms provided with lateral extensions, substantially as set forth.

401,646. INCANDESCING ELECTRIC LAMP. THOMAS A. EDISON, Menlo Park, N. J., assignor to the Edison Electric Light Company, New York, N. Y. Filed Aug. 7, 1882. Serial No. 68,617. (No model.)



Claim.—An exhausted and sealed incandescent electric lamp provided with a tube or vessel containing a gas-absorbing material—such as charcoal—such tube or vessel being connected with the exhausted chamber of the lamp and embedded in the base of the lamp, substantially as set forth.

401,647. VALVE. ROBERT FOSTER, Indianapolis, Ind., assignor to Frank R. Jennings, Walter B. Harris, and James A. Dixon, all of same place. Filed Sept. 22, 1888. Serial No. 286,114. (No model.)



Claim.—1. The combination, with the shell and seat, of a valve connected to its stem by a swivel-joint and formed with a central perforation, and a supplemental valve on the lower end of said stem which has its seat in said perforation, an aperture for the passage of the gas being provided leading from the interior of the main valve to the space in said shell on the discharge side of the seat, substantially as set forth.

2. The combination of the shell, the seat therein, the main valve secured to its stem by a swivel connection and formed with a central perforation, a supplemental valve at the lower end of said stem arranged to have its seat in said perforation, and a spring interposed between said valve and stem, substantially as set forth.

401,648. FARM-GATE. CALVIN M. GITT, Stanberry, Mo. Filed Dec. 28, 1888. Serial No. 294,883. (No model.)



Claim.—1. The combination, with the gate mounted on a pin at its inner lower end, of the connection, as the wires G, interposed between the front portion of the gate and the gate-post, and the lever J, pivoted to the gate and extending obliquely, and adjustably connected with the gate at its upper end and having the said connection engaged therewith, substantially as and for the purpose described.

2. The combination of the gate mounted on a pin at its inner lower end, the posts B and B', the plates C, connecting the upper ends of the posts, the wires G, the clevis adjustably connected with the plates C and supporting the inner ends of the wires, the latch-bar having the wires G connected therewith, the stirrup I, engaged with the said wires and adjustable on the gate, and the oblique lever J, weighted at its upper end and adjustable on the gate and having engagement with the said wires, substantially as described.

401,649. HOLDER FOR THE HAIR. JOHN I. HACKETT, Rochester, N. Y. Filed Oct. 18, 1888. Serial No. 288,489. (No model.)



Claim.—1. A holder for the hair, consisting of a spring bent substantially to the form of a circle and having its ends turned to extend within the circle, substantially as shown.

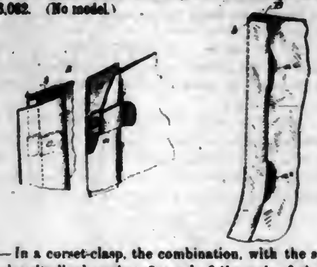
2. A device for fastening or holding the hair, comprising a spring bent to substantially a circular form and to the form of a spiral, with inwardly-turned ends, substantially as shown and described.

3. A fastening device for the hair, consisting of a spring bent substantially to the form of a circle, having its ends made to overlap each other and turned inwardly, substantially as shown.

4. A holder for the hair, consisting of a spring bent substantially to a circular form and having its ends turned inwardly, in combination with a head or ornament secured to said spring, substantially as described and shown.

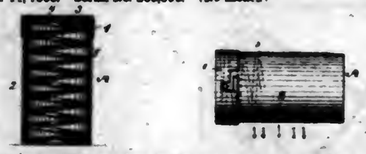
5. A device for holding the hair, consisting of a spring substantially of a circular form, in combination with a head or ornament secured to said spring, and a bow of ribbon held between said spring and head, substantially as shown and described.

401,650. CORSET-CLASP. JOSEPH H. HAVILAND, Jackson, Mich., assignor to William F. McGee, same place. Filed Aug. 18, 1888. Serial No. 283,062. (No model.)



Claim.—In a corset-clasp, the combination, with the steel A, inclosed in a longitudinal pocket formed of the web of the corset at one of the meeting edges thereof, and the curved lips *a*, secured to the outer edges of the steel A, standing therefrom over the adjacent portion of the outer side of the corset-web, and provided with the bends or bulges *a'*, of the steel B, inclosed in the longitudinal pocket *b*, formed on the meeting edge of the corset opposite that on which is formed the pocket inclosing the steel A, and provided with openings a^3 at its inner edge, opposite the lips *a*, for the reception of said lips, which openings are made by leaving unstitched portions of said inner edge, substantially as specified.

401,651. DREDGE-BOX. JAMES W. IVORY, Philadelphia, Pa. Filed Jan. 11, 1888. Serial No. 260,390. (No model.)



Claim.—1. A dredge-box having an opening in its lid and perforations in its side, an inside coil-spring, and a washer closing said opening in the lid, said parts being combined substantially as described.

2. A dredge-box having a body with side perforations, a lid with an opening, a movable washer covering said opening, and a coiled spring within said box, said parts being combined substantially as described.

3. A dredge-box having side perforations, a lid, and an interior coil which is operated from said lid, said parts being combined substantially as described.

401,652. HYDRANT. JOHN KAISER, Seneca Falls, N. Y. Filed Nov. 17, 1888. Serial No. 291,128. (No model.)



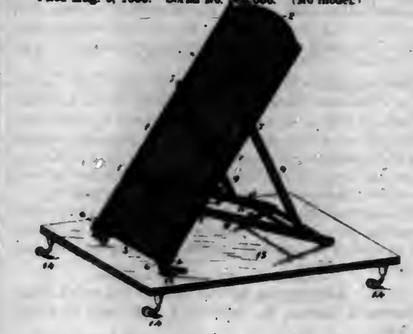
Claim.—1. In a hydrant, the combination, with the tubular body having the drainage-ports 5 and a valve-seat and the hollow valve in said body having the circumferential flanges 15, completely filling said body, and perforations between said flanges, of a loose packing-band having its ends overlapping located between said flanges over said perforations, as set forth.

2. In a hydrant, the combination, with the tubular body having the drainage-ports 5 and a valve-seat and the hollow valve B, having the circumferential flanges 15, and perforations between said flanges, of a loose packing-band located between said flanges and secured at one end to said valve, as set forth.

3. In a hydrant, the combination, with the tubular body having the drainage-ports 5 and the valve-seat and the hollow valve B, having circumferential flanges 15, and perforations between said flanges, of a loose packing-band located between said flanges and coiled around said valve more than once, as set forth.

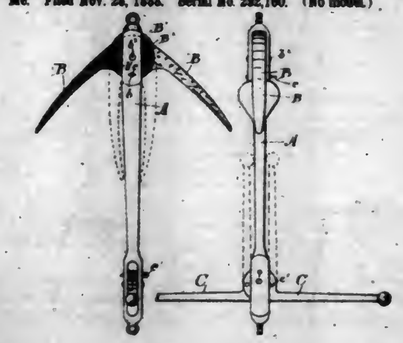
4. In a hydrant, the combination, with the tubular body having a valve-seat and the drainage-ports 5, and the hollow valve B, having the circumferential flanges 15, and perforations between said flanges, of a loose packing-band completely filling the space between said flanges and coiled around said valve more than once and having one end secured thereto, as set forth.

401,653. DISPLAY-RACK. ROBERT KAUFMANN, Cincinnati, Ohio. Filed Aug. 6, 1888. Serial No. [illegible]. (No model.)



Claim.—The display-rack consisting of the stiles 1 1, connected by arch 2 and rundle 3, the latter being journaled in the stiles, the fabric 5, secured at top to the arch and wound at bottom on the rundle, the pins 6, for securing the rundle, the prop 8, having notches 10, and prop 9, having cross-piece 11, which rests in the notches, said props being hinged, as at 7, substantially as herein explained.

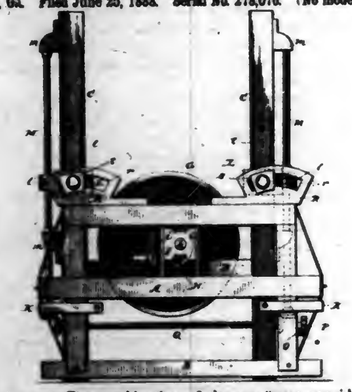
401,654. FOLDING ANCHOR. THOMAS S. LAUGHLIN, Portland, Me. Filed Nov. 28, 1888. Serial No. 292,160. (No model.)



Claim.—1. The herein-described folding anchor having the independent arms and stock pivoted to the shank by means of a rule-joint, holes through said joint-sections, located to coincide with corresponding holes in the shank for the admission of a pin when the parts are opened, and holes located to coincide in like manner when the parts are closed, combined with a pin adapted to enter said holes to retain said parts in an open or closed position, substantially as described.

2. The herein-described folding anchor having the two independent arms pivoted to the shank by means of a rule-joint, holes through said joint, located to register with holes in the shank for the admission of a pin to retain said arms when open, and registering holes in said joint and shank to admit a pin for retaining said arms in a closed position, substantially as described.

401,655. **STONE-SAWING MACHINE.** JAMES W. MALOY, Marietta, Ga. Filed June 25, 1888. Serial No. 278,076. (No model.)

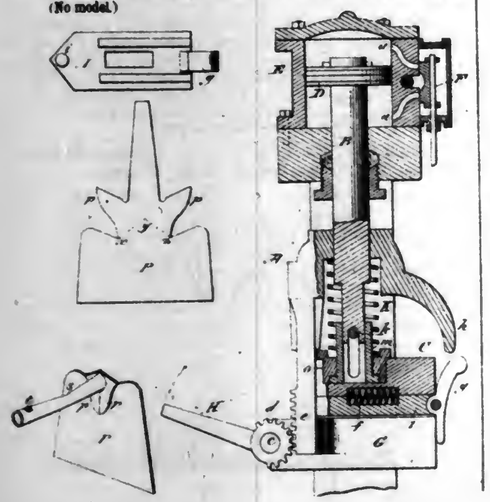


Claim.—1. The combination of the saw-frame provided with vertical guideways, a stationary frame upon which it is supported, a shaft provided with a crank or wrist pin, and a slide mounted upon the said crank-pin and moving between the said ways, whereby upon the rotation of the shaft the frame is reciprocated, substantially as described.

2. The combination of the saw-frame provided with vertical guideways, a stationary frame, the blocks upon which the saw-frame is supported and slides as it is reciprocated movable vertically upon the stationary frame, a shaft provided with a crank-pin, a slide mounted upon the said crank-pin and movable between the ways on the saw-frame, and mechanism driven from the said shaft for moving vertically the saw-frame-supporting blocks, substantially as described.

3. The combination, with the stationary frame, of a reciprocating saw-frame provided with segmental slots, and tilting bearing-blocks S, carried by the stationary frame and fitting the said slots, substantially as described.

401,656. **MACHINE FOR MAKING HOES AND SHOVELS.** HENRY E. MARCHAND, Pittsburg, Pa. Filed Oct. 9, 1883. Serial No. 108,533. (No model.)



Claim.—1. In a metal pressing and shaping machine, the combination of the anvil G, the self-adjusting die C, the sliding former I, and the folding device H, substantially as described.

2. In a metal shaping and pressing machine, the combination of an anvil, a yielding die, a sliding former adapted to be moved along the pressing-face of said die, a pivoted folding device, and suitable operating mechanism, substantially as described.

3. In a metal pressing and shaping machine, the combination of an anvil, a yielding die, a sliding former adapted to be moved along the face of said die, a pivoted folding device, a vertically-movable frame provided with suitable shaping devices and having means for operating the folder and former, and a piston for actuating the frame and die, substantially as described.

4. In a metal pressing and shaping machine, the combination of an anvil having bearings for a rock-shaft, a folding device carried by said rock-shaft, a yielding die, a sliding former adapted to move along the face of the die, said former being provided with a pointed end and carrying a vertical mandrel, a vertically-movable frame having a vertical mandrel and shaping devices and provided with means for operating the folder and the sliding former, a steam-cylinder, and a piston for actuating the frame and die, substantially as described.

5. In a metal pressing and shaping machine, the combination of the die C, the sliding former I, and the anvil G, the faces of said die and anvil being inclined at any suitable angle, substantially as described.

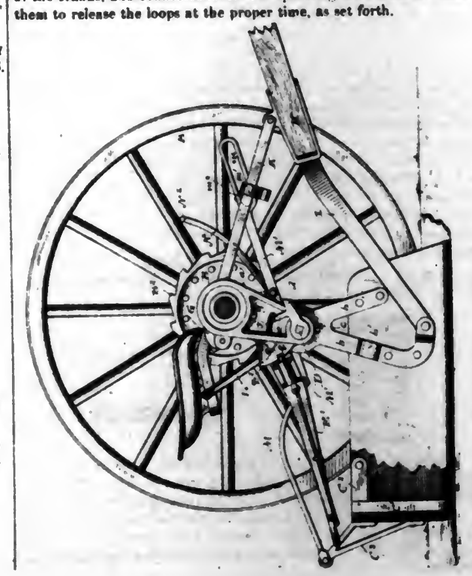
401,657. **METHOD OF MAKING SOLUBLE BONBONS.** LEONHARD OBERNDORFER, Würzburg, Bavaria, Germany, assignor to A. Grossenbach & Company, Milwaukee, Wis. Filed July 16, 1888. Serial No. 280,066. (No specimens.) Patented in Germany Sept. 12, 1885, No. 34,973.

Claim.—The hereinbefore-described method of making soluble bonbons, consisting of moistening the powdered sugar and other ingredients with slightly-diluted alcohol, and subjecting the mass to a very slight pressure in metal forms heated sufficiently to cause the contents next to the heated metallic surfaces to melt slightly and form a thin sugar-glazing over the powdered interior of the bonbons, substantially as set forth.

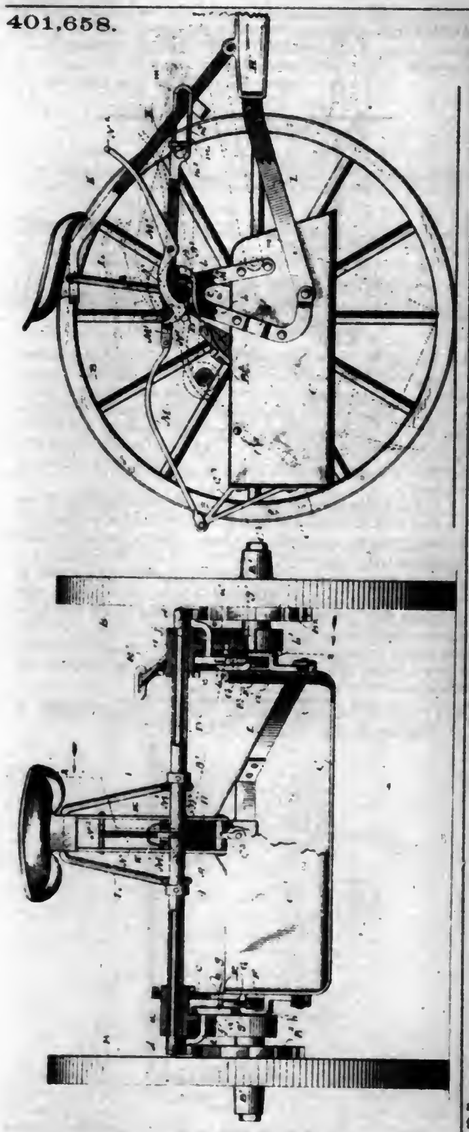
401,658. **WHEELED SCRAPER.** FRANK A. RATHBUN, Beloit, assignor to the Rathbun Manufacturing Company, Milwaukee, Wis. Filed June 21, 1888. Serial No. 277,802. (No model.)

Claim.—1. In an earth-scraper, the combination, with the wheels and the hubs thereof, the latter having toothed peripheries, of a hollow axle the journals whereof are cranked thereto, a scoop hung from the outer hubs of the cranks, a rock-shaft running through the hollow axle, pawls carried by said rock-shaft for engaging the teeth of the hubs, and a lever and connections for operating the rock-shaft, substantially as described.

2. The combination, with the hollow cranked axle of a scraper and its suspending-straps, the latter hung from the outer hubs of the axle-cranks, of a prong and latch carried by each of the inner hubs of the cranks, and connected levers for operating the latches to cause them to release the loops at the proper time, as set forth.



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3. The combination, with the scoop, cranked axle, and wheels having toothed hubs, of straps for suspending the scoop to the axle, a prong and latch for engagement with a loop in each suspending-strap, a rock-shaft extending across the machine, and pawls carried by said rock-shaft, and means for operating the said rock-shaft and latch, substantially as described.

4. In a scraper, the combination, with the cranked axle and the rock-shaft running through it, of levers pivoted each to a crank-arm of the axle, pawls carried by the rock-shaft, one at each end, a toothed hub on each of the wheels, and connections between each of said pawls and the lever adjacent to it, whereby both pawls may be lifted or dropped by a movement of one of the said levers, substantially as described.

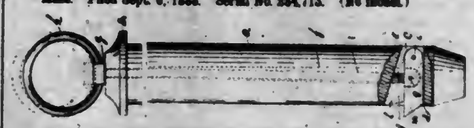
5. The combination, with the wheels and their toothed hubs, of a hollow axle cranked to its journals, a rock-shaft and pawls carried thereby, one on each end, a lever pivoted to each crank-arm, an arm extending from each pawl through a slot in the adjacent crank-arm, and another slot in the adjacent lever at substantially a right angle to the slot in the crank-arm, and means for locking one of said levers, substantially as described.

6. The combination, with the cranked axle, of the scoop hung therefrom and a standard pivoted on the axle, a seat pivoted on the standard, and a strut secured to the seat at one end and hinged to the tongue at the other end, and means for locking the axle in its raised position, substantially as described.

7. The combination, with the axle and tongue, of the toggle-support for the seat, and a bar connecting the axle with the foot-rest and serving to limit the forward movement of the axle when the machine is scraping, substantially as described.

8. The combination, with the cranked axle and toggled seat-supports, of the bar M, pin m^3, latch-lever N, the scoop and its door, ball I, and tongue H, substantially as described.

401,659. **COUPLING-PIN.** FRANK I. REMINGTON, New Bedford, Mass. Filed Sept. 6, 1888. Serial No. 284,713. (No model.)



Claim.—A coupling-pin consisting of the pin *a*, having head *s*, transverse slot *e*, longitudinal opening *f*, tapering toward the head of the pin, the latch *m*, having one end rounded and the other chamfered, and provided with the recess *r* and pivoted in slot *e*, and the rod *g*, provided with ring *h*, extending from the head of the pin through the opening *f* to the latch *m*, where it is pivoted in the recess *r*, all as shown and described.

401,660. **BOX-COVER.** WILLIAM SCHARFWEBER, Chicago, Ill., assignor of two-thirds to Henry H. Mann and Richard J. Elliott, same place. Filed July 2, 1888. Serial No. 278,801. (No model.)



Claim.—1. A box with a groove in its walls, in combination with a cover fitted thereinto and containing a wedge-shaped piece and a filling-piece divided into sections, as and for the purpose stated.

2. A box provided with a groove in its inside walls, in combination with a cover fitted into said groove and composed of a central wedge-shaped portion and two filling portions divided into sections, as and for the purpose set forth.

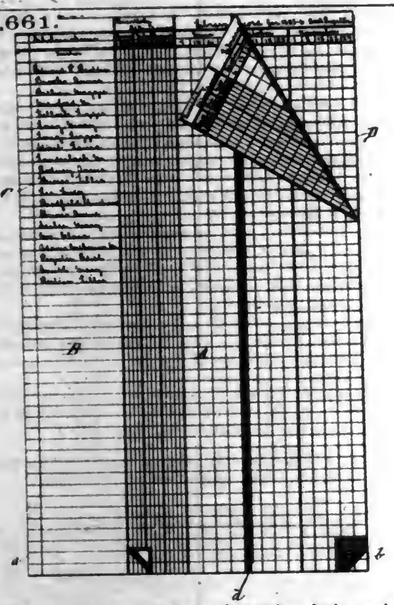
3. A box with a groove in its inside walls, in combination with a cover fitted thereinto containing a wedge-shaped portion and a filling portion, so arranged that the grain of the wood in the filling portion will run crosswise of the grain in the wedge-shaped portion, as and for the purpose stated.

4. A box with a groove in its walls, in combination with a cover fitted thereinto and composed of a wedge-shaped piece and two filling-pieces divided into sections, and so arranged that the grain of the wood in the filling-pieces shall run crosswise of the grain in the wedge-shaped piece, as and for the purpose set forth.

401,661. **RECORD.** HORACE C. SEELY, Philadelphia, Pa., assignor of one-half to James Arnold, same place. Filed June 10, 1886. Renewed July 2, 1888. Serial No. 278,881. (No specimens.)

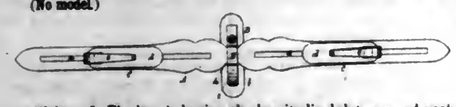
Claim.—In a record or register, the combination, with a main sheet adapted and designed to receive a list of names or other entries, of a series of supplemental folded sheets attached or fastened to the main sheet near the outer edge thereof and adapted, and designed to

401,661.



be successively turned over and to receive entries referring to the list on the main sheet, substantially as shown and described.

401,662. SHEET-MUSIC SUPPORT FOR PIANO-FORTES. EVERETT J. SNOW, Penobscot, Me. Filed June 23, 1887. Serial No. 242,252. (No model.)



Claim.—1. The bar A, having the longitudinal slots *a a* and neck *h*, in combination with the spring-clips C C, located in said slots, and the spring-clip B, located at the neck, as set forth.

2. The bar A, having the longitudinal slots *a a* and the neck *h*, in combination with the clips C C, consisting of the slides *d d*, having the tongues *f f*, the plates *g g*, and the springs *e e*, and the clip B, consisting of the piece of wood *b* and the spring *c*, the clips C C being located at the slots *a a* and the clip B at the neck *h*, as set forth.

401,663. COFFIN-FASTENER. WILLIAM A. SPARKS, Rochester, N. Y., assignor to the Stein Manufacturing Company, same place. Filed Nov. 4, 1886. Serial No. 217,935. (No model.)

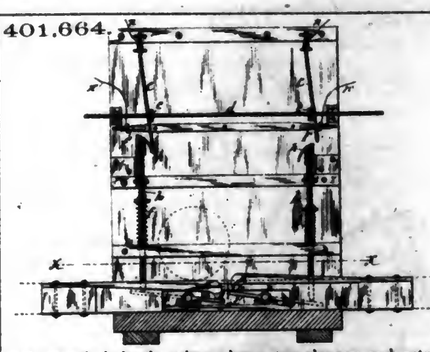


Claim.—1. The combination, with the interlocking members of a concealed lid-fastener for burial-caskets, of a locking-spring for automatically securing the aforesaid interlocking members in their locked position, the said spring having a finger-piece projecting underneath the overlapping edge of the lid, whereby the lid may be released from the casket, substantially as and for the purpose set forth.

2. The combination, with the inclined interlocking hook of a concealed coffin-lid fastener, of a flat locking-spring secured to the lid, having a recess back of its free end and a laterally-projecting finger-piece extending outward near the marginal edge of the under side of the lid, a plate secured to the casket-body provided with a slot or recess for engaging the inclined interlocking hook, and a locking device consisting of a pin or lug secured to the upper edge of the casket to engage the spring, all substantially as and for the purpose set forth.

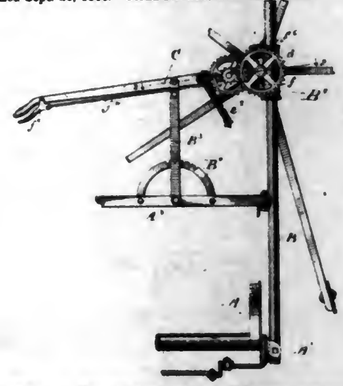
401,664. RAILWAY TRACK-INSTRUMENT. GEORGE C. STEERSBERG, Syracuse, N. Y. Filed Aug. 8, 1888. Serial No. 282,266. (No model.)

Claim.—1. A railway track-instrument comprising two primary levers lying in opposite directions along the side of the track-rail to be successively depressed by the car-wheels passing over said lever, supplemental levers operating independently of each other and actuated respectively by the primary levers, two plungers each actuated by one of the supplemental levers, movable electrodes carried in opposite direction from each other by the plungers, stationary electrodes in the path of the movable electrodes, a push-bar transmitting motion from the first actuated electrode to the second electrode and throwing the latter out of the path of the plunger, and electric conductors extended from the respective electrodes, substantially as described and shown.



2. The within-described track-instrument consisting of the levers *a a*, lying with their free ends toward each other and in proximity to and higher than the track-rail, the two two-armed levers *l l*, each having one arm under the free end of one of the levers *a*, the plungers *b b*, resting on the second arm of the respective levers *l l*, and provided at their upper ends with the beveled heads *h h*, the metallic spring-rods *c c*, having their free ends over the said heads, the slide *d*, having the collars *e e* between the said spring-rods, metallic contacts *f' f'* in the path of the spring-rods, and electric conductors extended from the aforesaid spring-rods and contacts, substantially as described and shown.

401,665. HARVESTER-REEL. JOHN F. STEWARD, Chicago, Ill. Filed Sept. 29, 1888. Serial No. 286,724. (No model.)

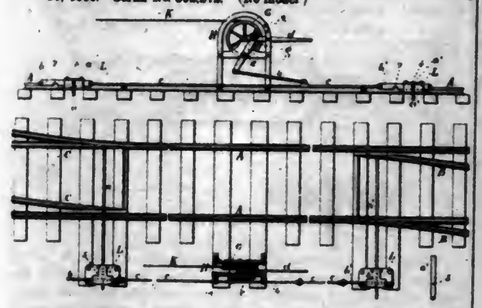


Claim.—1. The reel-post and the sliding reel-sustaining bracket thereon, in combination with the adjusting-lever pivoted to the bracket, the pawl pivoted to the bracket at a point eccentric to the lever-pivot and curved in a line substantially concentric with said lever-pivot, and the latch-controlling rod mounted on the lever and arranged to slide on the curved portion of the pawl, whereby said rod is enabled to adjust itself to suit the variable angle between the lever and bracket.

2. The reel-post, the sliding bracket thereon, and the reel-shaft mounted in said bracket and provided with the driving-gear, in combination with a bracket-adjusting lever pivoted thereto concentric with the reel-shaft, and a driving-gear mounted on said lever and engaging the gear on the reel-shaft, whereby the lever is enabled to sustain the driving-gear and to adjust the reel without disturbing the operative relation of said gears.

3. The reel-post and the sliding bracket thereon, the reel-shaft mounted in the bracket and provided with the gear *d*, the adjusting-lever pivoted to the bracket concentric to the reel-shaft, the concentric gears d^2 and d^3, mounted on the lever in rear of the reel-post, the pinion E', also mounted on the lever, the universal joint connected to said pinion, and the driving-shaft connected to said joint, whereby the driving-shaft is permitted to stand in rear of the reel-shaft, as and for the purposes described, and the adjustment of the reel permitted without disturbing the operative relation of the gears.

401,666. INTERLOCKING SIGNAL APPARATUS FOR RAILWAY-SWITCHES. FRANK H. TREACY, Poughkeepsie, N. Y., assignor to the Palmer Torpedo Railway Signal Company, Plainfield, N. J. Filed Nov. 30, 1888. Serial No. 292,272. (No model.)

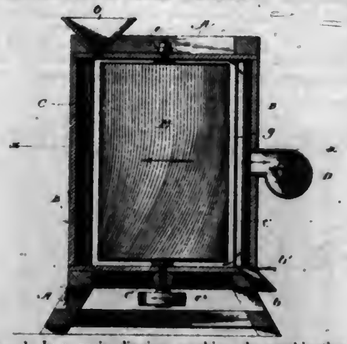


Claim.—1. The combination, with the lever *d* and connection for a railway-signal, of the lever *e*, notched bars, and connection *c* and *4* from one notched bar to the lever *e*, substantially as set forth.

2. The combination, with the bars *a* and *b*, notched and crossing each other, of the cast block L, having T-shaped flanges and slots of varying depth at right angles to each other for receiving and supporting the bars *a b*, and a removable retaining-cover, substantially as set forth.

3. The combination, with the signal-lever *d*, wheel G, and connection from the same for a railway-signal, of the lever *e*, frame H, upon which the lever *e* is pivoted, the crank-pin *g* from the lever *d* and within the slot in the lever *e*, the notched switch-bar *a*, the notched bar *b*, and the connection from the bar *b* to the lever *e*, and the slotted block L, within which the respective bars *a* and *b* are received and cross each other at right angles, substantially as set forth.

401,667. GRAIN-CLIPPING MACHINE. ROSIA W. WELCH, Baltimore, Md., assignor of one-half to John M. Knight, same place. Filed July 31, 1888. Serial No. 281,535. (No model.)



Claim.—1. In a grain-clipping machine, the combination of an external vertical cylinder, and an internal rotary cylinder having on its surface a series of ribs, the upper ends of which extend vertically, while the lower ends are curved forward in the direction of rotation

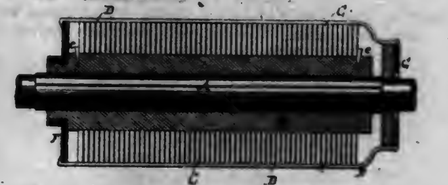
2. In a grain-clipping machine, the combination of the following elements: a stationary external casing, an internal perforate cylinder, an exhaust-fan communicating with the space between said cylinder and casing, and an internal vertical rotary cylinder provided with ribbed plates, each rib extending from the upper end of the cylinder downward in a vertical direction about one-third of its length, and trending thence forward in the direction of rotation to the lower end of the cylinder.

401,668. DYNAMO-ELECTRIC MACHINE. EDWARD WESTON, Newark, N. J., assignor to the United States Electric Lighting Company, New York, N. Y. Filed Sept. 22, 1882. Serial No. 72,475. (No model.)



Claim.—In a dynamo-electric machine, the combination, with the shaft, of a cylinder or hub of insulating material secured thereon iron plates or rings strung over said hub, and plates or sheets of insulating material interposed between said rings, these parts being constructed and combined in substantially the manner set forth for the reception of the coils.

401,669. DYNAMO-ELECTRIC MACHINE. EDWARD WESTON, Newark, N. J., assignor to the United States Electric Lighting Company, New York, N. Y. Original application filed Sept. 22, 1882, Serial No. 72,475. Divided and this application filed Nov. 14, 1882. Serial No. 76,757. (No model.)

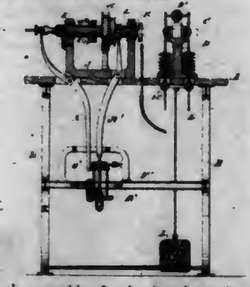


Claim.—1. A core for electrical generators operating by inductive action, composed of alternate sections, plates, or disks of magnetic and insulating materials, in combination with insulated coils wound thereon, as set forth.

2. A core for electrical generators operating by inductive action, composed of iron plates, sections, or disks, with interposed plates or sections of insulating material, in combination with insulated coils wound thereon at right angles to the planes or lines of the insulating sections, as set forth.

3. A core for electrical generators operating by inductive action, composed of iron sections, plates, or disks, with interposed plates or sections of insulating material, in combination with means for binding and holding the same together and insulated coils wound thereon at right angles to the planes or lines of the insulating sections, as set forth.

401,670. MACHINE FOR MAKING VIALS. CHARLES A. WISCHERT and RICHARD GABRIELSKY, Brooklyn, N. Y.; Lizzie F. Wischert administratrix of said Charles A. Wischert, deceased. Filed June 18, 1888. Serial No. 277,469. (No model.)



Claim.—1. In a machine for shaping glass tubes, the combination of a support for holding the heated glass tube and separable dies adapted to shape the tube and having spiral reciprocation thereon.

2. In a machine for shaping glass tubes, the combination of a support for holding the heated tube and intermittingly-closing dies adapted to receive the tube and shape the same and having spirally-reciprocating motion upon the tube

3. In a machine for shaping glass tubes, the combination of a support for holding the tube and separable opening and closing dies for shaping the tube, which are carried upon a spirally-reciprocating support, whereby the dies are longitudinally reciprocated and at the same time gradually closed on the tube.

4. In a machine for shaping glass tubes, the combination of a tube-holding support, separable automatically-closing and spirally-reciprocating dies adapted to shape the tube, and a support for the heated end of the tube arranged within the dies and supporting the heated end of the tube as it is being shaped by the dies.

5. In a machine for shaping glass tubes, the combination of opening and closing spirally-reciprocating shaping-dies and an internal support for holding the heated end of the tube while it is being properly operated upon by the dies.

6. In combination, the tube-shaping dies mounted upon the levers S and within the spirally-reciprocating cylinder L, the lever A', operated by the said cylinder, the ratchet B' and cam G', and the lever X, provided with the wedge W, arranged substantially as and for the purpose set forth.

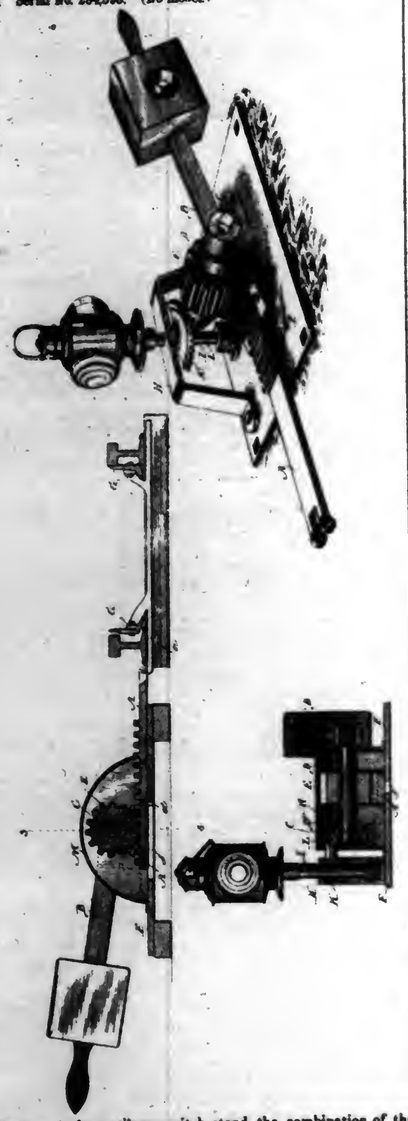
7. In combination, the screw-threaded-die-carrying cylinder L, the collar M, the spring-drum N, longitudinally movable on the said

cylinder, and the eccentric connection P P', with the driving-shaft Q, all arranged substantially as and for the purpose set forth.

8. In combination, the spirally-reciprocating cylinder L, the dies R and levers S, the spring-levers U, the support V, and the die-closing wedge W, all arranged substantially as and for the purpose set forth.

9. In combination, the reciprocating die-carrying cylinder L, the wedge W and lever X, the collar Z and lever A', the ratchet-wheel B' and ratchets D' E', and the cam G', all arranged substantially as and for the purpose set forth.

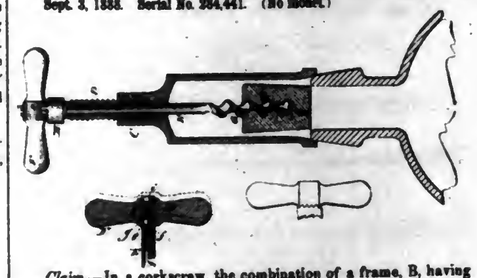
401,671. **RAILWAY-SWITCH STAND.** CHARLES ALKINS, Muskegon, Mich., assignor to Henrietta Alkins, same place. Filed Sept. 5, 1888. Serial No. 284,593. (No model.)



Claim.—1. In a railway-switch stand, the combination of the sliding rack-bar, a cog engaging the same, and a stop device arranged for determining the extent of throw on the part of the rack-bar and consisting of a lug on the rack-bar engaging in a slot in the base of the stand, substantially as set forth.

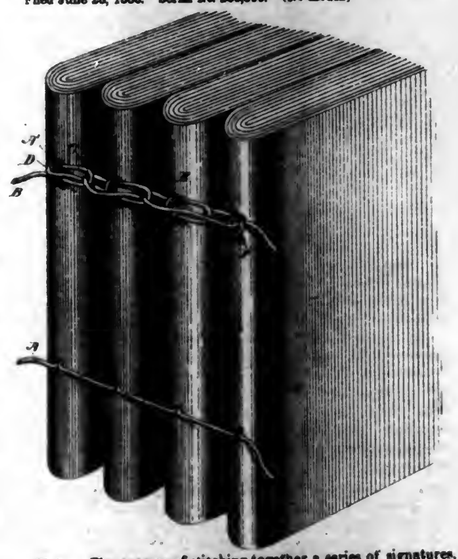
2. In a railway-switch stand, the combination of the sliding rack-bar which is to connect with the switch, the cog for operating the rack-bar, and the lever connected with the cog, said rack-bar being provided with a stud which extends into a channel in the base-plate of the switch-stand, substantially as and for the purpose described.

401,672. **CORKSCREW.** SETHOUR L. ALVORD and EDWARD E. BROWN, West Winsted, Conn.; said Brown assignor to said Alvord. Filed Sept. 3, 1888. Serial No. 284,441. (No model.)



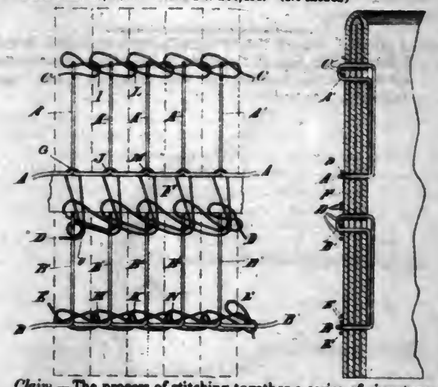
Claim.—In a corkscrew, the combination of a frame, B, having a socket, A, at its lower end, adapted to rest upon the neck of the bottle, and having a neck, C, at its upper end, the said neck internally screw-threaded with a left-hand thread, a tubular sleeve, D, through said neck and correspondingly left-hand screw-threaded, the spindle E, corresponding in diameter to the internal diameter of the sleeve D, but of a length greater than the length of said sleeve D, the lower end of the said spindle terminating in a right-hand-threaded corkscrew, G, as an integral part thereof, a handle, F, upon the upper end of said spindle, the spindle extending through the handle, a portion, *f*, of the spindle within the handle made of angular shape, and a corresponding portion of the opening through the handle made of corresponding angular shape, the portion of the spindle above said angular shape *f* within the handle being of cylindrical shape, the upper end of the spindle constructed with a head, *i*, a spring, *m*, in the handle below and so as to yieldingly bear against the head *i*, and so that said handle may engage the angular portion of the spindle and impart its rotation thereto, or, disengaged from such angular portion, may have a rotation of its own independent of the spindle, the upper end of the left-hand screw-threaded sleeve and the corresponding surface of the handle constructed of irregular shape, whereby contact between the handle and the said sleeve causes the said sleeve to partake of the rotation of the handle, all substantially as described.

401,673. **METHOD OF BOOK-STITCHING.** HORACE L. ARNOLD, Hartford, Conn., assignor to Robert S. Woodruff, trustee, Trenton, N. J. Filed June 23, 1886. Serial No. 206,399. (No model.)



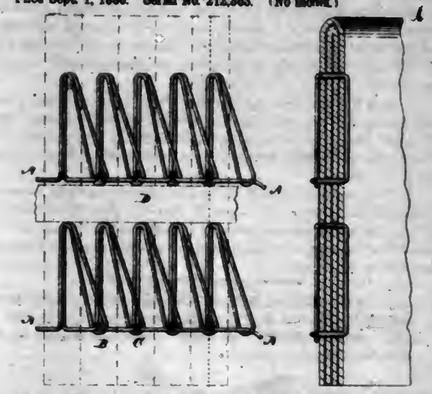
Claim.—The process of stitching together a series of signatures, which consists in carrying a loop of one thread through the back of one signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying a loop of another thread through the end of the first loop outside of the signature, and then carrying another loop of the first thread through the back of another signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying another loop of the second thread through the first loop of that thread and through the end of the second loop of the first thread, and then repeating the operation, if necessary, till all the signatures in the series are stitched together, all substantially as described.

401,674. **METHOD OF STITCHING BOOKS.** HORACE L. ARNOLD, Hartford, Conn., assignor to Robert S. Woodruff, trustee, Trenton, N. J. Filed June 23, 1886. Serial No. 206,400. (No model.)



Claim.—The process of stitching together a series of signatures, which consists of forming a portion of a thread into a loop and extending that loop lengthwise along the back of a signature, and then carrying a loop of a second thread through the back of that signature from the outside thereof, and then bringing it out through the same back at another place adjacent to the first loop, and also carrying a loop of a third thread through the end of the first loop of the first thread, and then through the back of the signature at a third place, and then bringing it out through the same back at a fourth place, and then carrying a loop of a fourth thread through the end of the first loop of the third thread outside of the signature, and then carrying a second loop of the first thread through the first loop of the second thread and through the first loop of the first thread, and thence laterally to the back of a second signature, and thence lengthwise of the back of that signature, and then repeating the operation until all the signatures in the series are stitched together, all substantially as described.

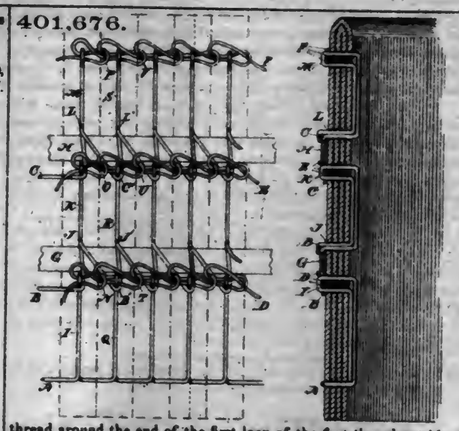
401,675. **METHOD OF STITCHING BOOKS.** HORACE L. ARNOLD, Hartford, Conn., assignor to Robert S. Woodruff, trustee, Trenton, N. J. Filed Sept. 1, 1886. Serial No. 212,363. (No model.)



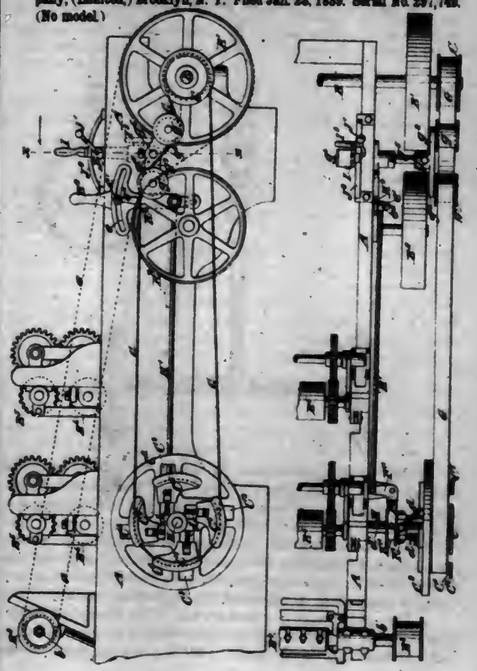
Claim.—The method of stitching together a series of signatures, which consists in carrying a loop of a thread through the back of one signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying another loop of that thread through the first loop thereof and then through the back of another signature from the outside, and then bringing it out through the same back in another place, and then repeating the operation, if necessary, until all the signatures in the series are stitched together, all substantially as described.

401,676. **METHOD OF STITCHING BOOKS.** HORACE L. ARNOLD, Hartford, Conn., assignor to Robert S. Woodruff, trustee, Trenton, N. J. Filed Sept. 1, 1886. Serial No. 212,364. (No model.)

Claim.—The process of stitching together a series of signatures, which consists in carrying a loop of one thread through the back of one signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying a loop of a second thread around the end of the first loop of the first thread outside of the signature and thence through the back of the first signature from the outside thereof at a third place, and then bringing it out from the same back at a fourth place, and then carrying a loop of a third thread through the end of the first loop of the first thread outside of the signature and over the second thread, and also carrying a loop of a fourth thread through the end of the first loop of the second thread outside of the signature, and then carrying a second loop of the first thread through the back of another signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying a second loop of the second thread around the end of the second loop of the first thread outside of the signature and thence through the back of that signature from the outside thereof at a third place, and then bringing it out through the same back at a fourth place, and then carrying a second loop of the third thread through the first loop of that thread and through the end of the second loop of the first thread and over the second thread, and also carrying a second loop of the fourth thread through the first loop of that thread, and then through the end of the second loop of the second thread, and then repeating the operation, if necessary, until all of the signatures in the series are stitched together, all substantially as described.



401,677. **BELT-TIGHTENER FOR PLANING-MACHINES.** ERNST F. AUTENRIETH, New York, assignor to the Glen Cove Machine Company, (Limited,) Brooklyn, N. Y. Filed Jan. 28, 1889. Serial No. 297,749. (No model.)

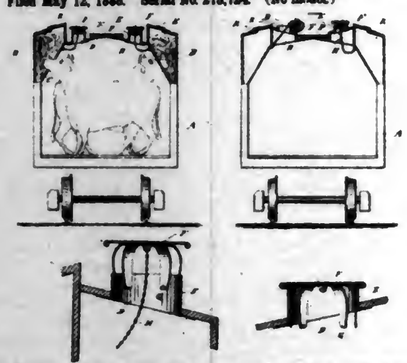


Claim.—1. The combination, with pulleys, of a belt passing about said pulleys, a belt-tightener, a rock-shaft upon which said belt-tightener is mounted, a worm-wheel on said rock-shaft, a worm engaging said worm-wheel, and a lever mounted upon the rock-shaft in which said worm is journaled, substantially as and for the purpose specified.

2. The combination, with pulleys, of a belt passing about said pulleys, a belt-tightener, a rock-shaft upon which said belt-tightener is mounted, a lever for operating said rock-shaft, and a main frame, said main frame and lever, the one being provided with a binding surface and the other with a cam, constituting a lock adapted to bear upon said binding-surface to lock the lever in a position into which it has been adjusted, substantially as specified.

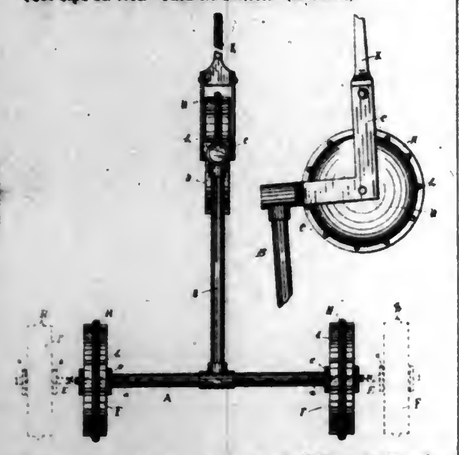
3. The combination, with pulleys, of a belt passed about said pulleys, a belt-tightener, a rock-shaft upon which said belt-tightener is mounted, a lever for operating said rock-shaft, and a main frame, said main frame and lever, the one being provided with a binding-surface and the other with a weighted cam adapted to bear upon said binding-surface to automatically lock the lever in a position into which it has been adjusted, substantially as specified.

401,678. CAR FOR LIVE STOCK. HUGH BAIRD, Brooklyn, N. Y. Filed May 12, 1888. Serial No. 273,734. (No model.)



Claim.—A cattle-car constructed, as described, with elevated hay-rack in the roof, elevated ventilation-ducts contiguous thereto, and movable caps to protect said ducts and permit observation of the interior through the same, as explained.

401,679. LAND-MARKER. WILLIAM H. BOGGS, Covington, Ohio. Filed Sept. 20, 1888. Serial No. 285,886. (No model.)



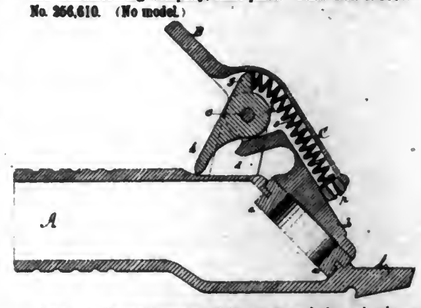
Claim.—1. In a land-marker, the wheels F F and D, formed or provided with a central circumferential flange in which are equidistant perforations, in combination with removable marking-pins *h h*, all substantially as and for the purpose specified.

2. In a land-marker, the combination of a hollow axle with two arms adjustably secured in the opposite ends of said axle and the marker-wheels on the outer extremities of said arms, constructed and arranged substantially as described, for the purpose specified.

3. The combination, in a land-marker, of the forward or central marking-wheel, journaled in an L-shaped bracket pivotally attached to the forward end of the frame, with the rear marking-wheels mounted on adjustable arms, all substantially as and for the purpose set forth.

4. The within-described land-marker, consisting of hollow axle A, adjustable arms E E, marking-wheels F F, set-screws *a a*, T-joint and bar B, L-joint, bracket C, and handle or tongue K, all constructed and arranged to operate substantially in the manner as and for the purpose described.

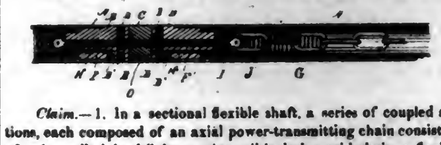
401,680. VALVE FOR PNEUMATIC PIPES OR TUBES. EDWARD S. BOYNTON, New York, N. Y., assignor to the Campbell Printing Press and Manufacturing Company, same place. Filed Dec. 1, 1887. Serial No. 256,610. (No model.)



Claim.—1. In combination with an external pivoted valve, a compressive helical spring inclosed within a tubular guide formed upon or attached to the valve, substantially as and for the purposes set forth.

2. In combination with an external pivoted valve, a self-closing device consisting of a compressive helical spring held within a tubular guide formed upon or attached to said valve between one end of said guide and a stop at the pivotal point of the valve, substantially as and for the purposes set forth.

401,681. FLEXIBLE POWER-SHAFT. OSCAR J. BROWN, Black River Falls, Wis. Filed July 17, 1888. Serial No. 280,187. (No model.)



Claim.—1. In a sectional flexible shaft, a series of coupled sections, each composed of an axial power-transmitting chain consisting of universally-joined links, a wire coil inclosing said chain, a flexible sleeve enveloping said coil, metallic blocks secured to both said sleeve and coil in the ends thereof, and rods attached to and rotating with the end links, respectively, of said chain and passing axially through said blocks.

2. In a flexible shaft, the combination, with two stationary sections having a rotary rod projecting axially from their adjacent ends, of a block interposed between said ends, engaging both said rods and rotating therewith, whereby power may be transmitted from one section to the other.

3. The combination, with the power-transmitting chain J and its inclosing-sleeve A G, of the blocks B, provided with the oil-ducts H and the packing-chambers O, closing the ends of said sleeves, and the rods F F', connected to said chain and projecting through said blocks substantially as set forth.

401,682. ELECTRO-THERAPEUTIC SPECTACLES. CASPAR BRUNI, Schlossgasse No. 6/2, Haidhausen, Munich, Germany. Filed Feb. 14, 1888. Serial No. 264,031. (No model.) Patented in England Oct. 27, 1885, No. 12,921.



Claim.—1. As an improvement in devices for imparting electricity to the human body, a pair of spectacles comprising the copper frame-work embodying the side arms having openings or perforations in their end portions and the nose or bridge piece, in combination with the plates of zinc secured in and corresponding to said openings and the strip of zinc secured to the under side of the nose-piece, substantially as set forth.

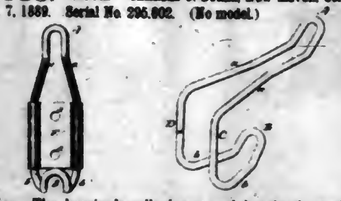
2. As an improvement in devices for imparting electricity to the human body, the spectacle-frame formed of copper and comprising the rims, connecting nose-piece, and side arms flattened at their end portions and formed with an opening or aperture in said flattened portions, in combination with the zinc plates secured in and corresponding to said openings and the zinc strip secured to the under side of the nose-piece and corresponding in curvature thereto, substantially as set forth.

3. In spectacles of the class described, the combination, with the side arms formed of copper and provided with a flattened portion having an opening or aperture, of a zinc plate set in the said opening, substantially as and for the purpose set forth.

4. In spectacles of the class described, a nose-piece formed of copper and comprised in the frame and carrying a zinc plate secured thereto, substantially as and for the purpose set forth.

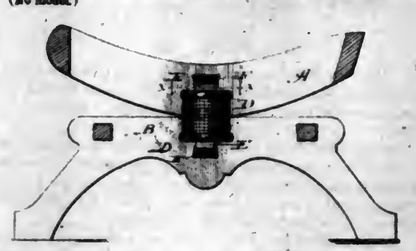
5. In devices for imparting electricity to the human body, the combination, with a spectacle-frame formed of copper and carrying zinc plates or strips secured thereto, of a coating, as at *f*, of lacquer, varnish, or the like, substantially as and for the purpose set forth.

401,683. HOOK. CHARLES O. BURLL, New Haven, Conn. Filed Jan. 7, 1889. Serial No. 295,902. (No model.)



Claim.—The herein-described coat and hat hook, made from a single piece of wire bent to form two parallel uprights, D C, the said uprights turned outward at their upper ends to form two converging branches, *a a*, the said branches coming together at their outer end, and turned upward to form the hook A, the lower ends of the uprights turned outward, forming two converging branches, *b b*, united at their outer ends and turned upward to form the coat-hook B, combined with a sheet-metal base, E, its two ends closed around the respective uprights C D, and so as to form a web-like connection between the said two uprights, and pierced between the said uprights as a means for securing the hook, substantially as described.

401,684. SPRING ATTACHMENT FOR ROCKING-CHAIRS. WILLIAM I. BUNKER, Chicago, Ill. Filed Mar. 12, 1888. Serial No. 267,051. (No model.)

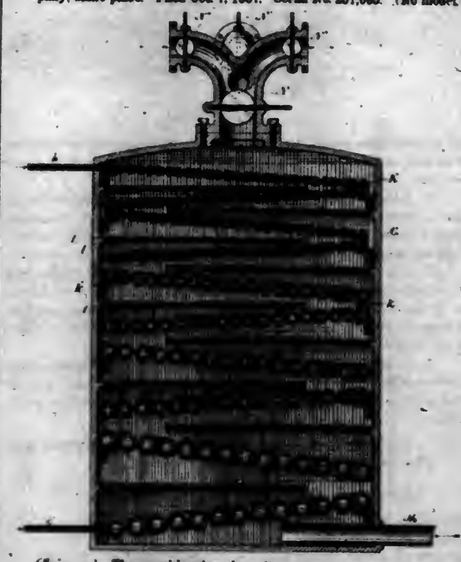


Claim.—1. In a platform rocking-chair, recessed rockers and base-rails, in combination with coiled-spring attachments arranged vertically at the side of the rockers and base-rails at or near the center of oscillation of the chair-seat and provided with projections or attaching portions extending from their ends sidewise, said projections or attaching portions being arranged to enter the recesses in the rockers and base-rails when drawn apart against the drawing tension of the spring and to be held and locked in such recesses when released, substantially as described.

2. In a platform rocking-chair, a rocker and base-rail, one of which is provided with a recess, in combination with a coiled-spring attachment arranged vertically at or near the center of oscillation of the chair-seat, and provided with a projection or attaching portion extending from its end sidewise, said projection or attaching portion being arranged to enter the recess in the recessed rocker or base-rail when drawn out against the drawing tension of the spring and to be held and locked in such recess when released, substantially as described.

3. In a platform rocking-chair, the combination of a base-rail having a recess in its side extending partially through the rail, a rocker having a recess in its side extending partially through the rocker, and a coiled spring having its ends formed into shape to fit the recesses in the rocker and base-rail and connecting them together by engagement therewith at the side of the spring, substantially as described.

401,685. HEATING SYSTEM. WILLIAM W. CANFIELD, New York, N. Y., assignor, by mesne assignments, to the National Heating Company, same place. Filed Oct. 7, 1887. Serial No. 251,685. (No model.)



Claim.—1. The combination, in a hot-water or steam heater, of a casing, as G, having air ingress and egress openings in its top and bottom, respectively, a radiator consisting of separate sections, each of said sections being composed of a series of communicating hollow pipes or bars, said sections communicating at alternate sides of the casing, and diaphragms, as L, arranged alternately and between said sections at equal distances therefrom, whereby air in passing from the bottom to the top of the casing is compelled to pass around the diaphragms and in contact with the entire surface of each of the pipes or bars of the separate sections, substantially as shown and described.

2. The combination, in a steam or hot-water heater, of a casing, as G, having air ingress and egress openings at its bottom and top, respectively, a radiator consisting of separate sections composed of a series of hollow pipes or bars, said sections communicating at alternate sides of the casing, and diaphragms, as L, arranged between said sections, the pipes or bars of which the sections of the radiator are composed increasing in size from the top to the bottom, substantially as shown and described.

3. A radiator consisting of separate sections of hollow pipes or bars, said sections being arranged in planes one above the other, and the pipes of said sections increasing in size from the top to the bottom, substantially as shown and described.

4. The combination, with a hot-air casing, as G, of a radiator consisting of separate sections composed of a series of hollow pipes or bars arranged one above the other, the pipes of which said sections are composed increasing in size from the top to the bottom, substantially as shown and described.

5. In a hot-water or steam heater, the combination, with a casing, as G, having air ingress and egress openings in its bottom and top, respectively, of a radiator consisting of separate sections composed of a series of communicating hollow pipes or bars, said sections being arranged in inclined or oblique planes one above the other, and communicating at alternate sides, and the diaphragms, as L, arranged alternately between said sections at equal distances therefrom, substantially as shown and described.

6. A hot-water or steam radiator consisting of separate sections of hollow pipes or bars, said sections being arranged in planes one above the other, the pipes of said sections increasing in size from the top to the bottom, and the egress opening for the steam or hot water being smaller than the pipes or bars of the lower section of the radiator, substantially as shown and described.

401,686. SUPPORT FOR SPINNING-SPINDLES. EDGAR J. CARROLL, Worcester, assignor to George Draper & Sons, Hopedale, Mass. Filed Aug. 22, 1887. Serial No. 247,557. (No model.)

Brief.—The invention has for its object to improve the supports for spindles, whereby the latter may be run at greater speed with less gyration.

Claim.—1. The combination, with a sleeve-whirl spindle and a case or support having therein a rigid bolster-bearing for the spindle,

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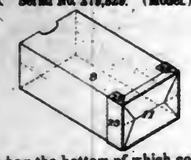
of a detachable cup or nut, constituting a step-case, and an oil-reservoir and containing a loose step for the spindle, substantially as described.

2. A sleeve-whirl spindle, a bolster-case, and rigid bolster therein, and a chambered cup or nut at the lower end of the case, combined with a loosely-held step to support the pintle of the spindle, and with locking means to restrain the rotation of the step with the spindle.

3. A sleeve-whirl spindle, a bolster case or support, a bolster held rigidly therein in vertical position by means of adjusting or set screws, as *d*, and a cup or nut, combined with a loosely-held step, and with means to restrain the rotation of the step with the spindle, substantially as described.

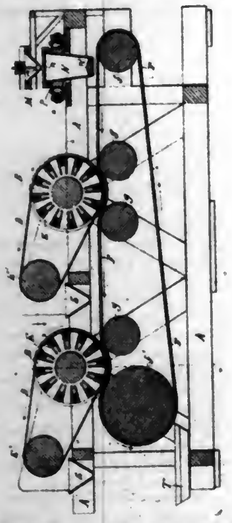
4. A spindle and a bolster-case containing a rigid bolster-bearing, combined with a detachable cup or nut containing a loose step for the spindle-support in said cup or nut, to operate substantially as described.

401,687. PAPER BAG. EDWARD E. CLAUSEN, Hartford, Conn. Filed July 13, 1888. Serial No. 279,829. (Model.)



Claim.—A paper bag the bottom of which consists of a separate rectangular piece of paper larger in all its dimensions than the cross-section of the bag, and the borders of which rectangular piece of paper are pasted to unequal extents to the lower borders of the sides of the bag, and the corners of which rectangular piece of paper are folded over and pasted to sides of the body of the bag, substantially as described in the foregoing specification, and shown in Figs. 9, 12, 28, 32, 48, and 49 of the accompanying drawings.

401,688. MAGNETIC ORE-SEPARATOR. CHANDLER C. COATS, Newark, N. J. Filed July 18, 1888. Serial No. 280,271. (No model.)



Claim.—1. The combination of the magnet-wheel of an ore-separator and a belt passing around it, with a traveling feed-belt, substantially as described.

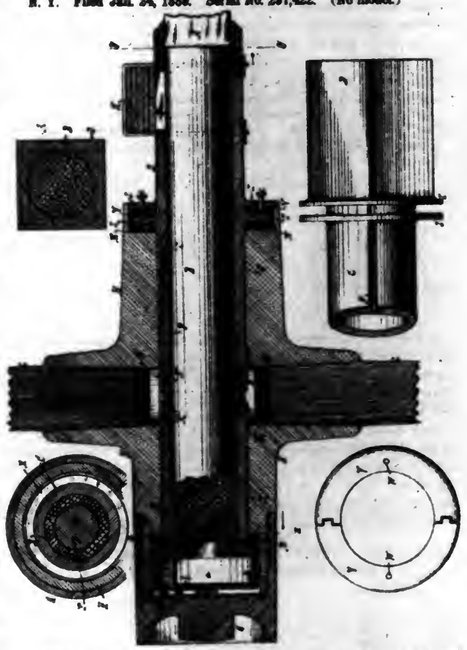
2. The combination of the magnet-wheel of an ore-separator and a belt passing around it, with a feed-belt traveling in a curved path around a portion of the circumference of the magnet-wheel and adjacent thereto.

3. The combination of the magnet-wheel and its belt with a traveling feed-belt and disks to keep the feed-belt in proper relation to the magnet-wheel.

4. The combination of the magnet-wheel of an ore-separator with a traveling feed-belt having on its face, near each edge, a rib or strip, as and for the purpose set forth.

5. The combination of the magnet-wheel of an ore-separator with a traveling feed-belt having on its face, near each edge, a rib or strips, and rotary disks to bear on the ribs or strips to keep the belt in proper relation to the wheel.

401,689. VEHICLE HUB AND AXLE. JOHAN R. COLE, New York, N. Y. Filed Jan. 24, 1888. Serial No. 297,422. (No model.)



Claim.—1. The combination, with an axle, a hub or wheel, and a spring-seat, K, supported by the axle, of a sleeve secured to said axle and extended back beneath said spring-seat, substantially as described.

2. The combination, with an axle and a hub or wheel, of a sleeve, C, secured to the axle and provided at a point between the axle and the inner end of the hub with collars I I, and the rotary collar V, made in two parts and held between the collars I I by the projecting inner end of the hub, substantially as described.

3. The combination, with an axle and a sleeve secured to said axle and provided with grooves F and X, of a hub having a lubricating-chamber, N, communicating with said grooves and located between the spokes and said sleeve, substantially as described.

4. The combination, with an axle, of a hub provided with a lubricating-chamber, N, located between the spokes and the axle, and with a cushion, U, to prevent escape of the lubricant and to secure a firm seat for the spokes, substantially as described.

5. The combination, with an axle and a hub or wheel, of a retaining-nut, E, for said hub, said nut being provided with a lubricant-chamber, *a*, and with a supply-opening, Y, and outlet Z for said chamber, and said axle having a channel, F, for leading the lubricant to the hub, substantially as described.

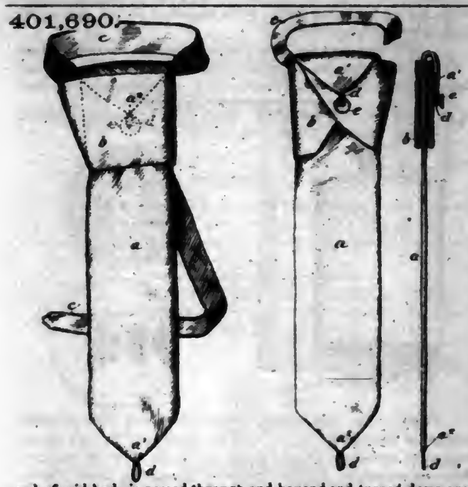
6. The combination, with an axle and a hub or wheel, of a sleeve for said axle, a nut, E, for retaining the hub in place, and a key, P, for locking the nut, the sleeve, and the axle, substantially as described.

7. The combination, with an axle and a hub or wheel, of a sleeve for said axle, a nut, E, for retaining the hub in place, and a key P, for locking the nut, the sleeve, and the axle, said nut being provided with washers or cushions *b* for the key, substantially as described.

401,690. NECKSCARF. LOUIS COLE, Chicago, Ill. Filed Jan. 12, 1889. Serial No. 296,215. (No model.)

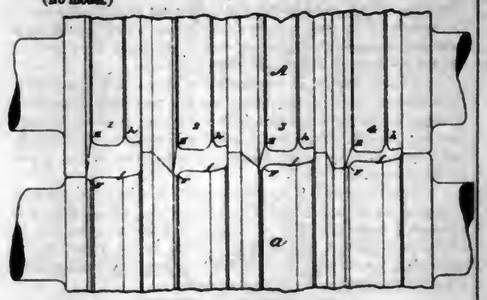
Claim.—In a scarf, an independent knot, *b*, provided with neck-band, in combination with an independent removable body, *a*, whereof each of its front and back sides and each of its ends are finished so as to be reversible face for face and end for end, and of which the upper

401,690.



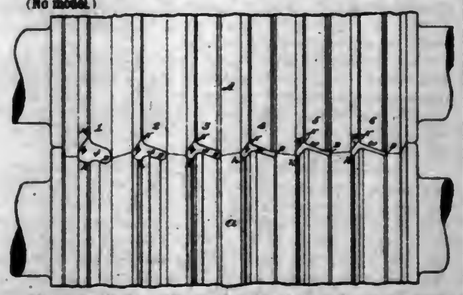
end of said body is passed through and beyond and turned down over the upper back edge of said knot and fastened to the back side thereof, substantially as specified.

401,691. ROLLS FOR ROLLING THREE-FLANGED SLOT-RAILS. FREDERICK COLLEY, Johnstown, Pa., assignor to The Johnson Steel Street Rail Company, of Kentucky. Filed Nov. 16, 1888. Serial No. 290,966. (No model.)



Claim.—Rolls for rolling three-flanged slot-rails, provided with passes having conformations substantially of the forms described, for the purposes set forth.

401,692. ROLLS FOR ROLLING BULB-WEBBED SLOT-RAILS. FREDERICK COLLEY, Johnstown, Pa., assignor to The Johnson Steel Street Rail Company, of Kentucky. Filed Nov. 16, 1888. Serial No. 290,967. (No model.)

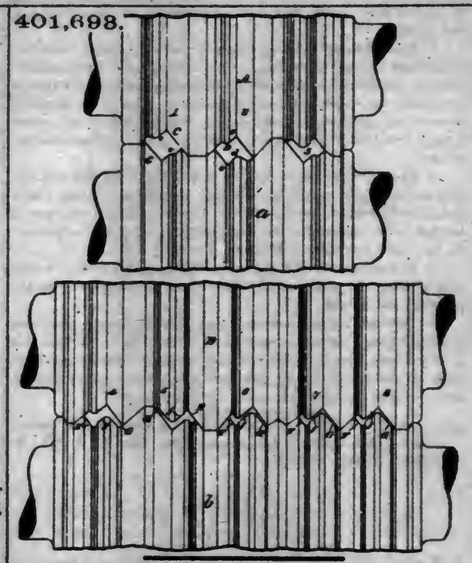


Claim.—Rolls for rolling bulb-webbed slot-rails, provided with passes having conformations substantially of the forms described, for the purposes set forth.

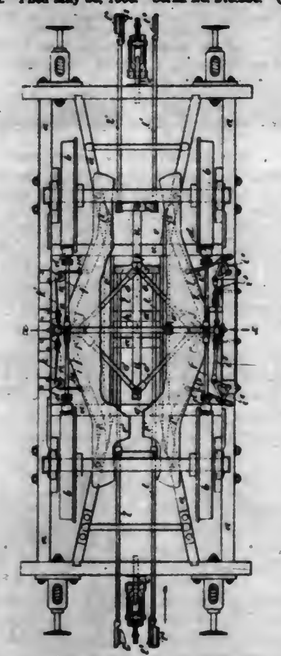
401,693. ROLLS FOR ROLLING Z-SHAPED SLOT-RAILS. FREDERICK COLLEY, Johnstown, Pa., assignor to The Johnson Steel Street Rail Company, of Kentucky. Filed Nov. 16, 1888. Serial No. 290,968. (No model.)

Claim.—Rolls for rolling Z-shaped slot-rails provided with passes having conformations substantially of the forms described, for the purposes set forth.

401,698.



401,694. BRAKE APPARATUS FOR RAILWAY-VEHICLES. THOMAS COWBURN, Modling, and FLORIAN TRITSCHERT, Vienna, Austria-Hungary, assignors of one-half to Arthur Charles Bonsall, Wyldewoods, England. Filed May 28, 1888. Serial No. 275,322. (No model.)



Claim.—1. In continuous-brake apparatus for railway-vehicles, a lever or levers having inwardly-curved ends pivoted centrally and beneath the vehicle, and connected with the brake-blocks, as set forth, either arm respectively of the lever being similarly and equally acted upon, and whereby, when moved upon such central pivot or fulcrum, its motion will be transmitted through its connections (according to the direction in which the vehicle is traveling) to the brakes.

2. The combination, with a pivoted lever or levers, i, pivoted beneath the vehicle and arranged in connection with the brake-blocks, of a series of bars jointed together in the form of a parallelogram or half-parallelogram, the lateral angles or angle of which are or is adapted to bear upon the pivoted levers or lever, while the other angles are respectively connected with rods extending through the end of

the vehicle most remote therefrom, substantially as and for the purpose specified.

3. In continuous-brake apparatus for railway-vehicles, a series of bars jointed together in the form of a parallelogram or half-parallelogram, in combination with push-rods extending through the ends of the vehicle and respectively connected with the angle of the parallelogram or half-parallelogram most remote from the end of the vehicle through which they extend, substantially as and for the purpose described.

4. The improved means for uniting the ends of the adjacent connecting brake-rods, consisting of the two bars, the one having a solid part, f^3, and the other having a recess, f^4, into which said solid part is adapted to fit, combined with a hinged cap, f^4, adapted to close over the bars after they have been united.

5. In combination with a fixed guide-bar, *y*, and lever, *i*, a half-parallelogram, *o o'*, connected to rods *l l'*, the combination being and operating as set forth.

6. The described improved continuous-brake apparatus, consisting of the following elements in combination, namely: brake-blocks *d*, rods *f*, lever-arms *g*, arm *u*, shaft *h*, lever-bars *i*, having inwardly-bent ends, ropes or chains *k k'*, or their described equivalents, arm *l*, guide-pulleys *n n*, bars *o o'*, cross-bar *s*, rods *t t'*, and cross-bar *s'*.

401,695. JETTY. WILLIAM M. DOUGLAS, Galveston, Tex., assignor of one-third to Charles L. Benske, same place. Filed May 3, 1888. Serial No. 272,647. (No model.)



Claim.—The combination, in a jetty or similar structure, of a core or hearting of clay, piling along the sides of the core, and a stone envelope upon the sides of the core, substantially as set forth.

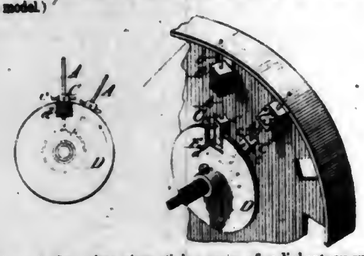
401,696. LAWN-MOWER. FRANK ENOS, Jr., Norwich, Conn. Filed Sept. 24, 1888. Serial No. 286,294. (No model.)



Claim.—1. In combination with a rotary cutter having spiral knives, a yielding shearing-blade parallel or approximately parallel with the axis of said rotary cutter and pressing against its knives, substantially as set forth, and for the purpose specified.

2. In combination with a rotary cutter having spiral knives, a shearing-blade substantially parallel with the axis of said cutter and pressing against its knives, said blade being formed of sheet metal, arranged as described, so that the cutting-edge may yield to follow the cutting-edge of said rotary cutter, substantially as and for the object specified.

401,697. TIME-PIECE DIAL. MARTIN V. B. SYBRIDGE, Boston, Mass., assignor of two-thirds to John Swann, New York, N. Y., and Henry B. Waite, West Newton, Mass. Filed June 20, 1888. Serial No. 277,634. (No model.)



Claim.—1. In a time-piece dial, a series of radial rotary spindles carrying turnstiles, in combination with a single notched disk or plate and a projecting pin or arm thereon, substantially as described.

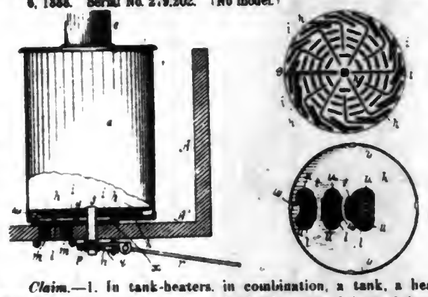
2. In a time-piece dial, the combination of a series of radial rotary spindles having turnstiles thereon, a disk secured to the hour-hand sleeve and having a single notch in its periphery, and a projecting arm or pin upon the disk, substantially as described.

3. In combination with one or more radial spindles of a time-piece dial, said spindles being provided with projecting pins thereon, a notched disk and a pin or arm projecting from said disk, substantially as described.

4. In a time-piece dial, the combination of a series of radial rotary spindles carrying turnstiles, a disk secured to the hour-hand sleeve having a notched flange, and a projecting pin or arm on the disk, substantially as described.

5. In a time-piece dial, the combination, with a series of radial rotary spindles carrying turnstiles, of the disk D, notched at *d*, and the pin or arm E, projecting from the disk, substantially as described.

401,698. TANK-HEATER. FRANK FUHR, Decatur, Ill. Filed July 6, 1888. Serial No. 279,202. (No model.)



Claim.—1. In tank-heaters, in combination, a tank, a heater secured to the bottom of the tank, the heater and the tank having coincident openings, a grate in the heater having ribs on its under surface, and a shaft for the grate extending through the heater and the tank, as and for the purpose set forth.

2. In tank-heaters, in combination, a tank, a heater secured to the bottom of the tank, the heater and the tank having coincident openings, a grate in the heater having deflected ribs on its under surface, and means for rotating the grate, as and for the purpose set forth.

3. In tank-heaters, in combination, a tank, a heater having a portion of its bottom depressed and secured to the bottom of the tank, coinciding vents in the depression of the bottom of the heater and in the bottom of the tank, a grate in the heater, a shaft for the grate extending through the heater and through the tank, and a lever to actuate the shaft, as and for the purpose set forth.

4. In tank-heaters, in combination, a tank, a heater secured to the bottom of the tank, the heater and the tank having coincident openings, a grate in the heater, a shaft for the grate extending through the heater and the tank, a ratchet-wheel on the lower end of the shaft, and a lever carrying a pawl adapted to actuate the ratchet, as and for the purpose set forth.

5. In tank-heaters, in combination, a tank, a heater in the tank secured to the bottom thereof, the heater and tank having coincident openings, a removable lid for the heater, a smoke-stack fixed to the lid and provided with handles, a grate in the heater, a shaft for the grate extended through the heater and the tank, and means below the tank for rotating the shaft, as set forth.

401,699. PROCESS OF MAKING SODA. FREDERICK H. GOSSAGE, Widnes, County of Lancaster, England, assignor of one-half to Thomas Train Mathiesen, same place. Filed Dec. 4, 1888. Serial No. 292,652. (No specimens.) Patented in England Mar. 2, 1888, No. 3,218.

Claim.—1. The improvement in the manufacture of sulphide of sodium or sulphide of potassium which consists in adding to a mixture of sulphate of soda or sulphate of potash and carbonaceous matter a quantity of sodium or common salt, in about the proportion of eight parts, by weight, of such salt to every twenty parts, by weight, of the sulphate during reduction.

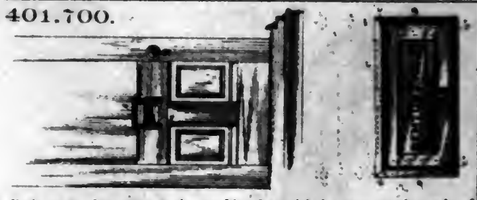
2. In the manufacture of sulphide of sodium or sulphide of potassium, adding to a mixture of sulphate of soda or sulphate of potash and carbonaceous matter a quantity of sodium or common salt, in about the proportion of eight parts, by weight, of such salt to every twenty parts, by weight, of the sulphate during reduction, the mixture after cooling then being lixiviated.

3. In the manufacture of sulphide of sodium or sulphide of potassium, adding to a mixture of sulphate of soda or sulphate of potash and carbonaceous matter a quantity of sodium or common salt, in about the proportion of eight parts by weight, of such salt to every twenty parts, by weight, of the sulphate during reduction, the mixture after cooling then being lixiviated, and after this, in order to obtain bicarbonate of soda, mixing with the sulphide a solution of a corresponding chloride or sulphate, the whole then being subjected to the action of carbonic-acid gas.

401,700. NAME AND LETTER-DROP PLATE. WILLIAM GRAHAM, Cleveland, Ohio. Filed June 30, 1888. Serial No. 278,067. (No model.)

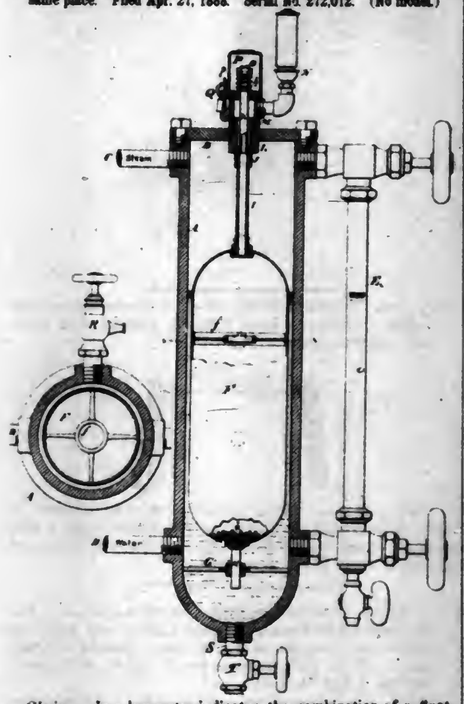
Claim.—A door provided with an opening for the introduction of mail, a name-plate, C, having beveled edges *c*, stops c', limiting the downward movement of the plate, recesses c^3, matching with shoulders in the keepers, and projections c^2 on the back of the plate to

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limit upward movement, in combination with keepers at the ends of the plates C, having dovetail grooves *d*, shoulders d', flat portion d^4, with cut-away portion d^5 and screw-holes d^6, all adapted to parts of the name-plate, substantially as set forth.

401,701. LOW-WATER INDICATOR FOR STEAM-BOILERS. PHILIP J. GRAU, Philadelphia, Pa., assignor to Jeremiah G. Donoghue, same place. Filed Apr. 27, 1888. Serial No. 272,012. (No model.)



Claim.—In a low-water indicator, the combination of a float-chamber, a head therefor, a valve-seat and whistle carried thereby, a float, a valve-stem extending from the top of the float and connected to said head, and a valve on said stem adapted to work with the valve-seat, whereby the float, valve, and all of their appendages may be simultaneously removed with the removal of the head.

401,702. SHUTTLE-BOX-PATTERN MECHANISM FOR LOOMS FOR WEAVING FABRICS HAVING END BORDERS. FRANK HERDIS, Philadelphia, Pa. Filed Jan. 24, 1889. Serial No. 297,391. (No model.)

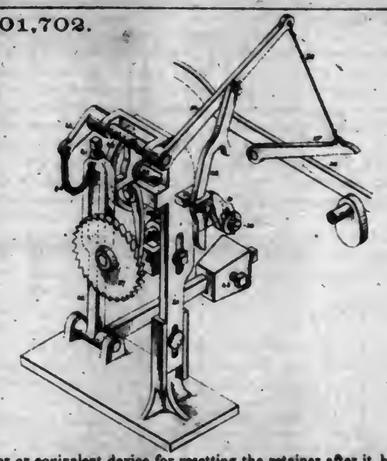
Brief.—An improvement on the devices presented in Letters Patent No. 399,613, dated March 12, 1889.

Claim.—1. The combination of the drop-box-chain-operating rod and its arm, a retainer for holding said arm out of operative position, a tripper for said retainer, a weighted lever or equivalent resetting device for said retainer, a connection between the resetting device and the retainer, a cam for governing the action of said resetting device, and means for operating the tripper and cam, substantially as specified.

2. The combination of the drop-box-chain-operating rod and its arm movable into and out of operative position, a rock-shaft having a lever connected to said arm and provided with a retainer for holding the arm in inoperative position, a tripper for said retainer, a weighted lever connected to an arm on the rock-shaft, a cam for acting on said weighted lever, and means for operating the tripper and cam, substantially as specified.

3. The combination of the drop-box-chain-operating rod and its arm movable into and out of operative position, a retainer for holding said arm in inoperative position, a tripper for said retainer, a weighted

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lever or equivalent device for resetting the retainer after it has been tripped, a connection between the resetting device and the retainer, a cam for governing the operation of said resetting device, a set-screw on the resetting device for engaging with said governing-cam, and means for actuating the tripper and cam, substantially as specified.

401,703. SPINDLE FOR SPINNING-MACHINES. JAMES HOGG and ALFRED H. ROBINSON, Lawrence, Mass. Filed Jan. 5, 1888. Serial No. 259,836. (No model.)



Claim.—A lifter plate or rail, a spindle-support, *b*, secured to the plate or rail and provided with an inclined frictional seat for the bobbin-carrying tube, a spindle provided at its upper end with an inclined shoulder or offset and having a screw-threaded connection with and vertically adjustable in said support *b*, a bobbin-carrying tube provided at its upper end with a plug, *k*, of anti-friction metal, and having a hole formed therein, said plug resting on the inclined shoulder or offset of said spindle, the bobbin-carrying tube being also provided with a base, *i*, conforming to the inclined frictional seat on support *b*, and a check-nut, *f*, on the lower end of the spindle, adapted to be screwed up against the lower face of the support *b*, all combined, arranged, and operating substantially as set forth.

401,704. APPARATUS FOR DELIVERING LIQUIDS. SYLVESTER JENKINS, Lansdale, Pa., assignor of one-half to William R. Dean, Jr., same place. Filed Aug. 31, 1888. Serial No. 284,233. (No model.)

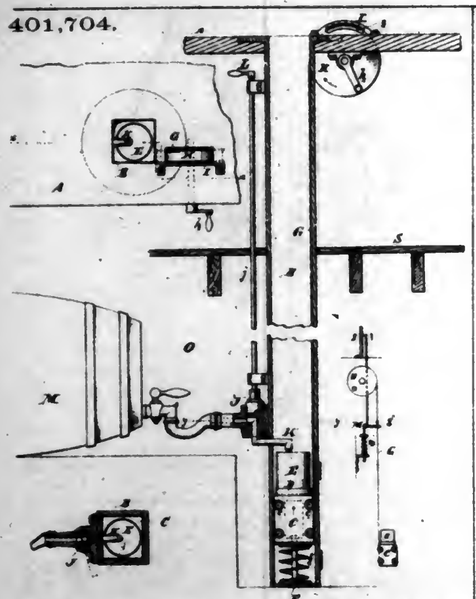
Claim.—1. The combination, with an elevator-shaft or guideway extending from one room to another, of a carriage movable therein, provided with a hollow bottom, a spring secured to said bottom, a downwardly-extending stem or support secured to said spring and adapted to be received into said hollow bottom as the receptacle descends, when the weight of the carriage is increased, and power devices to raise and lower said carriage in the guideway.

2. The combination, with an elevator-shaft or guideway extending from one room to another, of a carriage movable therein, provided with a hollow bottom, a spring secured to said bottom, a downwardly-extending stem or support secured to said spring and adapted to be received into said hollow bottom as the receptacle descends, when the weight of the carriage is increased, and power devices to raise and lower said carriage in the guideway, a measuring device, and a connection between said measuring device and the carriage.

3. The combination, with an elevator-shaft or guideway extending from one room to another, of a carriage movable therein, provided with a hollow bottom and having anti-friction rollers on its sides, a spring secured to said bottom, a downwardly-extending stem or support secured to said spring and adapted to be received into said hollow bottom as the receptacle descends, when the weight of the carriage is increased, and power devices to raise and lower said carriage in the guideway.

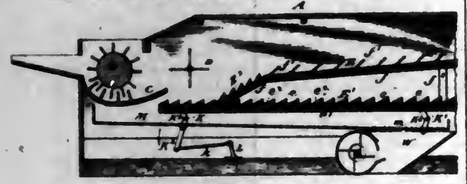
4. The apparatus comprising an elevator-shaft or guideway ex-

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tending from an upper to a lower room, a receptacle movable in said elevator-shaft, a liquor-reservoir at the lower part of said elevator-shaft, a spigot or valve connecting with said reservoir, said spigot adapted to be laterally moved into and out of said shaft and to be opened or closed by said movement, and a substantially vertical torsional rod connected with said valve and extending upward substantially to the top of said elevator-shaft.

401,705. THRASHING-MACHINE. WILLIAM KING, St. James, Minn. Filed July 25, 1888. Serial No. 280,963. (No model.)



Claim.—In a thrashing-machine, the shaker consisting of the angularly and transversely slatted floors E' E² and the longitudinally-slatted carrier E, rigidly mounted thereon, the floor E' being horizontal and the floor E² and carrier E inclined, as shown, the shaker E extending over the floor E' and being provided with rearwardly-inclined pins *f'*, combined with the shafts K K', arms K² K³, mounted on said shafts, a crank, and a connecting-rod, substantially as set forth.

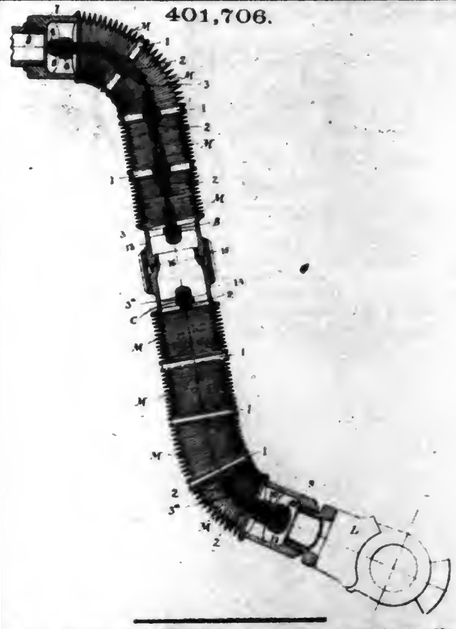
401,706. FLEXIBLE PIPING FOR AIR-BRAKES. DIMIRÉ M. LEGAT, Paris, France. Filed Sept. 14, 1888. Serial No. 285,406. (No model.) Patented in Germany May 17, 1887, No. 41,626; in France July 6, 1888, No. 191,635; in Belgium Aug. 10, 1888, No. 82,852; in England Aug. 13, 1888, No. 11,648, and in Italy Aug. 23, 1888, XLVII, 223.

Claim.—1. In a flexible piping, the combination of a set of membranes, M, a set of rings, 1, tubes 2, secured severally to the bore of each ring, and a wire rope extending through said tubes and serving to prevent expansion of the membranes, substantially as shown and described.

2. In a flexible piping, the combination of a set of membranes made substantially as shown and described, a series of rings, 1, interposed between each two adjacent membranes, and provided with bosses, as set forth, a series of tubes, 2, severally secured to said bosses, and wire rope extending centrally through the series of membranes, rings, and tubes, and fastened at its extremities, substantially as shown and described, and for the purposes set forth.

3. In a flexible piping having a set of membranes, M, the combination, with such membranes, of a wire rope extending through the same, a perforated boss, 10, through which the separated strands at the ends of the wire are passed, and a nut serving to fasten such ends to the boss, all substantially as shown and described.

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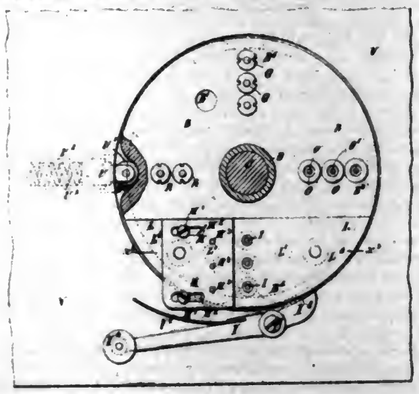
401,707. BARREL-COVER. GEORGE W. LINDSEY, Baltimore, Md., assignor of one-third to Joseph B. Budding, York, Pa. Filed Nov. 6, 1888. Serial No. 290,100. (No model.)



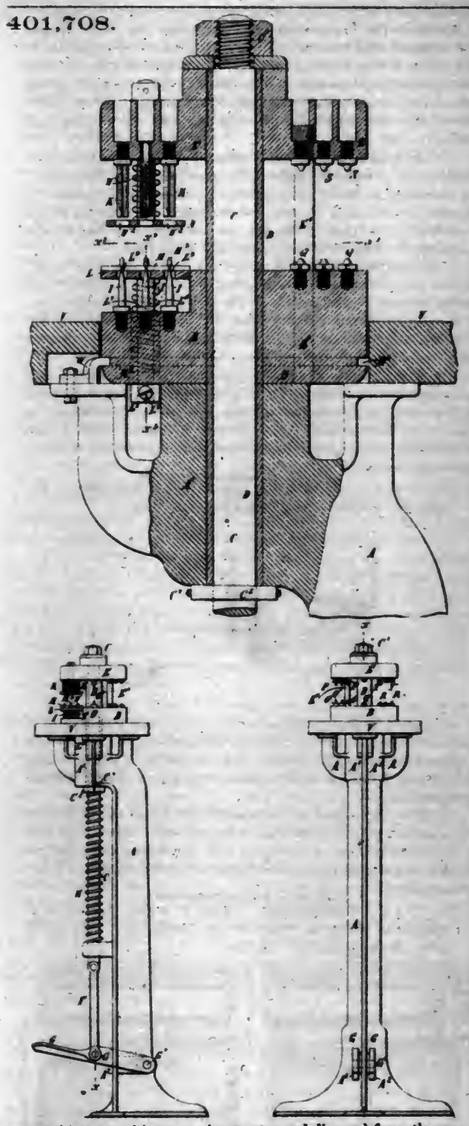
Claim.—A cover made in two sections which are connected by hinges, and one section provided on its under side with clips to take astride of the barrel-rim, and also provided with fastening-hooks whose ends may be driven into the barrel-staves.

401,708. RIVETING-MACHINE. HIRAM S. MAXIM, London, England, assignor to the Maxim Gun Company, (Limited,) same place. Filed Aug. 24, 1888. Serial No. 283,632. (No model.) Patented in England Aug. 20, 1886, No. 10,686; in France May 27, 1887, No. 183,853, and in Italy Aug. 8, 1887, No. 22,144.

Claim.—1. In an eyeleting or riveting machine, the combination, with one or more upwardly-projecting conical punches, each adapted to receive an eyelet, and a perforated spring-seated plate through which the punches extend, of a corresponding die or dies movable toward the punches and adapted to receive the punches and the eyelets thereon, whereby the punches will perforate the cloth or other



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material interposed between the punches and dies and force the eyelets therein, as set forth.

2. In an eyeleting or riveting machine, the combination, with a series of punches with conical ends adapted to receive eyelets upon them, a spring-seated perforated plate through which the punches extend, and corresponding dies for operating conjointly with the punches to perforate the cloth or other material and insert the eyelets therein, of a series of anvils or devices for riveting or clinching the eyelets previously inserted in the cloth by the punches, all of said devices being connected to simultaneously-moving supports, whereby the insertion of eyelets and the riveting of others are performed by one operation, as set forth.

3. In an eyeleting or riveting machine, the combination of two rotating disks or heads provided, respectively, with studs or punches and corresponding dies and also with clinching or riveting devices, one of said disks being movable toward and away from the other, as set forth.

4. In an eyleting or riveting machine, the combination, with the disks or heads, one movable toward and away from the other, of studs or punches set in one of the disks, and dies in the other, and spring-seated plates with perforations through which the studs and dies project, as and for the purpose set forth.

5. In an eyleting-machine, the combination, with a perforating stud or punch, of a tubular die slit longitudinally and into which the stud projects when the machine is operated, as set forth.

6. In an eyeleting or riveting machine, the combination of a series of dies, a disk or head below the same, perforating studs or punches fixed therein, a spring-seated plate with perforations therein through which the studs project, and means, substantially as described, for locking or retaining the said plate when forced down against the force of the springs, as set forth.

7. The combination, with the movable heads or disks B E, of the anvils O, and the spring-seated rods or pins O', working in the same and set in one of said heads, and the dies P, with projecting pins or studs P' fixed to the other head, as set forth.

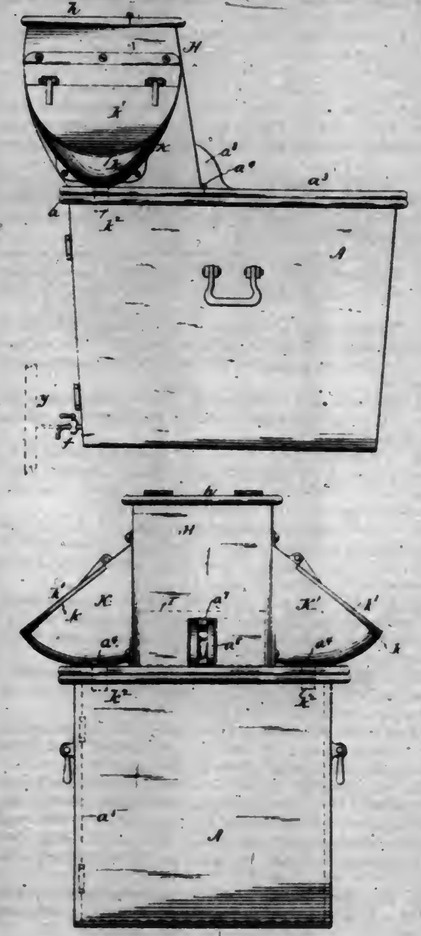
8. The combination, with the rotating disks or heads B E, provided with perforating and riveting or clinching devices, of the rod or shaft G, secured to head E, and passing through the head B, the lever G, connected to rod C for raising and lowering the same, and the spring H, surrounding the rod and acting to raise it when depressed, as described.

9. The combination, with the series of punches, of a gage-plate, M, adjustable with respect to the same and provided with studs or pins M², adapted to be passed through the clinched or riveted eyelets in the material, and to so determine the points at which the next perforations are to be made, as set forth.

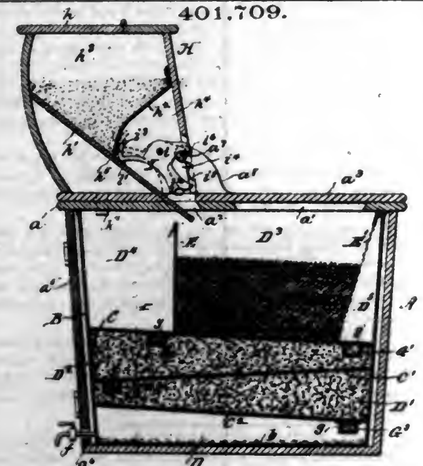
401,709. FECULENT-MATTER RECEIVER. OSCAR D. MCCLELLAN, Philadelphia, Pa., assignor, by mesne assignments, to the Sanitary and Fertilizer Company of the United States, same place. Filed Dec. 26, 1888. Serial No. 294,713. (No model.)

Claim.—1. A feculent-matter receiver having perforated deposit-chamber D⁴, in combination with a series of reversely-inclined filtering-chambers having perforations at the lower or terminal parts of their inclinations, substantially as set forth.

2. A feculent-matter receiver having deposit-chamber D⁴, hav-



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ing a perforated front side, E', a chamber, D³, in front of chamber D³, in combination with a series of filtering-chambers, substantially as set forth.

3. The receiver B, having perforated deposit-chamber D³, in combination with a series of reversely-inclined filtering-chambers, each having a perforated pocket at their exit or terminal end, and an outlet-chamber below the filtering-chambers, substantially as set forth.

4. A feculent-matter receiver having deposit-chamber D³, provided with a perforated side, E', and a chamber, D³, in front of side E', in combination with a series of filtering-chambers and an outlet-chamber below said filtering-chambers, substantially as set forth.

5. A feculent-matter receiver having deposit-chamber D³, in combination with a series of filtering-chambers and precipitant pockets or receptacles located in said filtering-chambers, substantially as set forth.

6. A feculent-matter receiver having separate deposit-chambers, located one in front of the other, a series of reversely-inclined filtering-chambers located below said deposit-chambers, and an outlet therefor, substantially as set forth.

7. In a feculent-matter receiver, the combination of separate chambers D³ D⁴, the pockets G G', filtering-chambers D² D', having pockets G² G², and an outlet for said filtering-chambers, substantially as set forth.

8. The combination of chambers D³ D⁴, intervening partition, E, inclined partitions C, C', and C², having pockets G G' G² G², and outlet for the chambers bounded by said partitions C C' C², substantially as set forth.

9. The combination of chambers D³ D⁴ D⁴, reversely-inclined partitions C C' C², having pockets G G' G² G², and chamber D, substantially as set forth.

10. In a feculent-matter receiver, the perforated pockets G G', containing alum, and chambers D² D', located one above the other, containing a charge of pulverized coke or equivalent material, and having perforated pockets G¹ G², substantially as set forth.

11. In combination with perforated chamber D³, the chambers D² D', containing a filtering compound, perforated pockets G² G² in said chambers D² D', a supply of alum in said pockets G² G², and an outlet-chamber, D, substantially as set forth.

12. In combination with perforated chamber D³, the chambers D² D', containing a filtering compound, perforated pockets G². G² in said chambers D² D', an outlet-chamber, D, a supply of alum in said pockets G² G², and chamber D, substantially as set forth.

13. In combination with perforated chamber D³, the reversely-inclined partitions C C' C², having perforated pockets G' G² G², and side flanges, c, substantially as set forth.

14. In combination with receiver-casing A, having seat-opening a', lid a^3, and passage-way a^2 back of said seat-opening, of receptacle H, having incline h', extending through the passage-way a^2, valve I, pivoted within receptacle H near the bottom of incline h', and having two oppositely-located seating-edges facing and having alternate contact with incline h', and mechanism interposed between seat-lid a^3 and valve I for effecting the alternate contact of the valve-seating edges with said incline as the seat is raised and lowered, substantially as set forth.

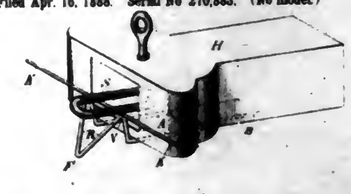
15. In combination with receiver-casing A, having seat-opening a', lid a^3, and passage-way a^2 back of said seat-opening, of receptacle H, having incline h', extending through passage-way a^2 and divided into communicating chambers h^3 h^4, valve I, pivoted within chamber h^4 near the bottom of incline h', and having two oppositely-located seating-edges for alternate contact with incline h', and a recess, i^4, having ends i^5 and i^6, and bracket a^6 on seat-lid a^3, having pin a^7 for alternate contact with ends i^5 i^6 as the seat is raised and lowered, substantially as set forth.

16. In combination with the receiver A, of a perforated deposit-chamber, D³, a separate chamber, D⁴, back of chamber D³ and having perforated pocket G', a receptacle, H, located above chamber D⁴, separate receptacles K K', secured to receptacle H and having outlet-pipes leading into chamber D⁴, and a series of filtering-chambers located below chambers D³ D⁴, substantially as set forth.

17. In combination with a receiver, A, having seat-lid a^3, a perforated deposit-chamber, D³, a chamber, D⁴, back of chamber D³ and having perforated outlet-pocket G', one or more separate receptacles, K K', communicating with chamber D³, and a series of filtering-chambers below chambers D³ D⁴, substantially as and for the purpose set forth.

18. In a receiver, A, having a seat-lid, a^3, the combination of a deposit-chamber, a series of filtering-chambers, a separate chamber back of said deposit-chamber, a supply-receptacle, H, containing an absorbing compound and having charging devices actuated by said seat-lid to eject a charge of said compound into said deposit-chamber, substantially as set forth.

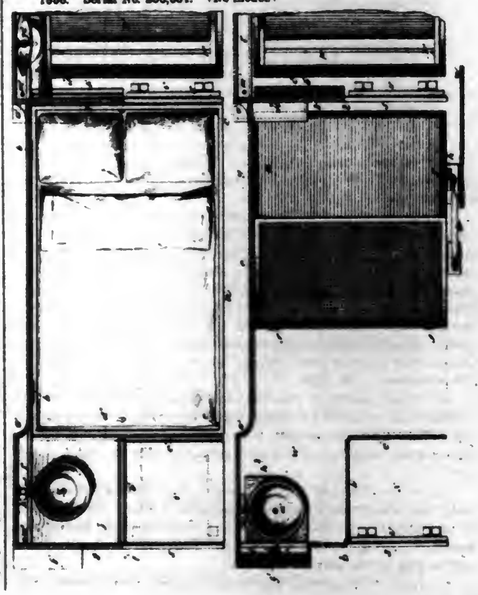
401,710. CAR-COUPLING. ALLEN W. MCKENZIE, Helena, Wis. Filed Apr. 16, 1888. Serial No. 270,883. (No model.)



Claim.—1. The combination, in a car-coupling device, of a hinged swinging device or coupler, A, having a deflecting point or outward end, R, horizontal link-rest and handles K K, and attaching-strip B, substantially as shown and described, and for the use and purpose specified.

2. The combination, in a car-coupling device, of a hinged swinging device or coupler A, having a deflecting point or outward end, R, horizontal link-rest, and handles K K, and the attaching yoke or swing C, substantially as shown and described, and for the use and purpose specified.

401,711. SLEEPING-CAR. THOMAS W. MOORE, Plainfield, N. J., assignor to Thomas W. Moore, Jr., Los Angeles, Cal. Filed Oct. 22, 1888. Serial No. 288,851. (No model.)



Claim.—1. In a berth-section of a sleeping car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other by the folding partition b', located between them and connected to said stationary partition, with the entrance to the rear closet from the end and rear part of the lower berth, substantially as described.

2. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other by the folding partition b', located between them and connected to said stationary partition, with the entrance to the rear closet from the end and rear part of the lower berth, in combination with the jointed lower berth folding backward from said entrance, substantially as described.

3. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, and the front closet separated from the lower berth by the folding partition b' d, jointed together and connected to said stationary partition, substantially as described.

4. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, and the front closet separated from the lower berth by the folding partition b' d, jointed together and connected to said stationary partition, in combination with the folding basin-stand for the front closet, located over the rear closet and the folding stand in said front closet, substantially as described.

5. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, the front closet separated from the lower berth, and the rear closet separated from the upper berth up to the basin-stand of the front closet by the folding partition b', d and d', jointed together and connected to said stationary partition, substantially as described.

6. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, and the front closet separated from the lower berth by the folding partition b' d, jointed together and connected to the stationary partition, in combination with the basin-shelf in the rear closet folding into the recess of the stationary partition clear of the folding partition when folded, substantially as described.

7. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, and the front closet separated from the lower berth by the folding partition b' d, jointed together and connected to the stationary partition, in combination with the basin-shelf of the front closet, located over the rear closet, substantially as described.

8. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, and the front closet separated from the lower berth by the folding partition b' d, jointed together and connected to the stationary partition, in combination with the basin-shelf in the rear closet folding into the recess of the stationary partition clear of the folding partition, and the basin-shelf of the front closet located over the rear closet, substantially as described.

9. In a berth-section of a sleeping-car having upper and lower berths, a private closet for each berth thereof, located between one end of the berths and the stationary partition at the end of the section and separated from each other, and the front closet separated from the lower berth by the folding partition b' d, jointed together and connected to said stationary partition, in combination with the lower berth having the folding sections d e and being supported on the pivot-joint g to fold up and form a seat-back at the opposite end of the berth-section, substantially as described.

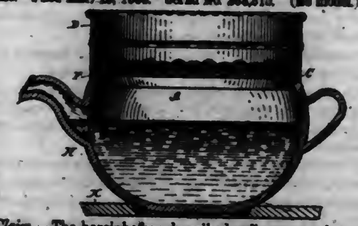
10. In a berth-section of a sleeping-car, the lower berth having the folding sections d e and being supported on the pivots g to fold up against the stationary partition s and form a seat-back, substantially as described.

11. In a berth-section of a sleeping-car having upper and lower berths, the lower berth having the folding sections d e, and the seat i, jointed to the lower side of section d and having jointed legs and arms, and said section supported on pivots g to fold up against partition s and form a back to the seat i, substantially as described.

12. The combination of the clothes-holding web p with the folding bed consisting of section d, supported on pivots g to fold upright thereon and having section e jointed to one end to fold over on it, said web being attached to the downwardly-folding end of section d and to the lower end of section e to form a clothes-sack, substantially as described.

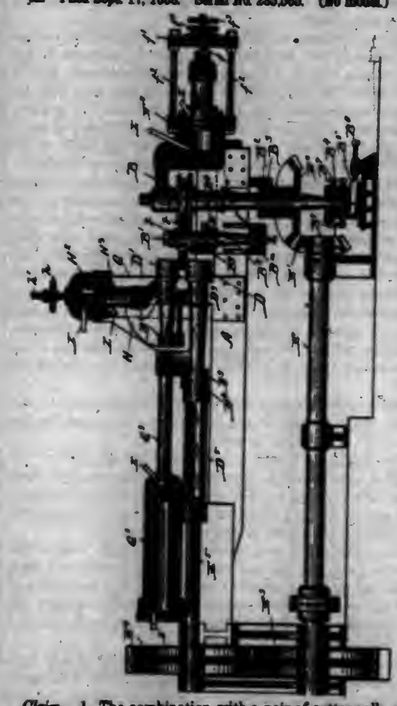
13. In a berth-section of a sleeping-car, the combination of the clothes-holding web p with the lower berth having the folding sections d e and supported on pivots g, and with the stationary partition s, said berth being arranged to fold up against said partition for a seat-back, substantially as described.

401,712. COLANDER-STEAMER. GEORGE L. MOTTER, Rich Hill, Mo. Filed Mar. 10, 1888. Serial No. 266,815. (No model.)



Claim.—The hereinbefore-described culinary vessel, consisting of the cylindrical vessel having the narrow flange projecting laterally and inwardly from its lower edge, the tapering or beveled flange projecting downwardly and inwardly from said narrow flange, and the removable perforated bottom turned or struck up round its edge, whereby it may rest on said flanges when used as a colander, or be inverted and rest on the lateral flange only when used as a steamer, substantially as described.

401,718. TIRE-ROLLING MACHINE. JAMES MURTON, Maywood, Ill. Filed Sept. 17, 1888. Serial No. 285,566. (No model.)



Claim.—1. The combination, with a pair of cutter-rolls, of a pair of edging-rolls, substantially as specified.

2. The combination, with a pair of horizontal or edging rolls, D D', said roll D' being journaled in a vertically-movable slide, of a hydraulic cylinder and piston for operating said vertically-movable slide, an exterior vertical roll, and an inside movable pressure-roll mounted on a separate slide from said edging-rolls, substantially as specified.

3. The combination, with stationary exterior cutter-roll, B, of inside movable pressure cutter-roll, B', a slide upon which it is mounted, and a fixed stop on the frame of the machine limiting the movement of said slide, substantially as specified.

4. The combination, with cutter-rolls B B', of slide F, hydraulic

cylinder F^4, piston F^5, connected to said slide, and adjustable stop *f* on the frame of the machine, limiting the movement of said slide to prevent the cutter-flanges of said rolls from meeting, substantially as specified.

5. The combination, with an exterior stationary roll and its shaft, of inner movable roll and its shaft, a slide upon which said pressure-roll is mounted, a hydraulic cylinder and piston, and a connection between said slide and piston passing astride of said stationary roll or its shaft, substantially as specified.

6. The combination, with exterior vertical fixed roll, B, of inside pressure-roll, a movable slide on which said pressure-roll is mounted, two edging-rolls and two exterior vertical pressure-rolls, C C, and a main slide, as G, upon which said edging-rolls and said exterior pressure-rolls are all mounted, substantially as specified.

7. The combination, with edging-rolls D D′, of a movable main slide, G, carrying both said rolls, substantially as specified.

8. The combination, with edging-rolls D D′, of a movable main slide, G, carrying both said rolls, and a supplemental vertical slide mounted upon said main slide and in which one of said edging-rolls is journaled, substantially as specified.

9. The combination, with edging-rolls D D′ and a movable main slide, G, carrying both said rolls, and a supplemental vertical slide mounted upon said main slide and in which one of said edging-rolls is journaled, of a hydraulic cylinder and piston mounted on said main slide for operating said supplemental slide, substantially as specified.

10. The combination, with edging-rolls D D′, of a movable main slide, G, carrying both said rolls, and exterior vertical rolls, C C, mounted on said main slide G, substantially as specified.

11. The combination, with main slide G, of supplemental vertical slide H, mounted on said main slide, edging-roll D, journaled on said main slide, edging-roll D′, journaled on said supplemental slide, a hydraulic cylinder and piston carried by said main slide for operating said supplemental slide, exterior vertical rolls, C C, mounted on said main slide, and a fixed exterior roll opposing said rolls C C, substantially as specified.

12. The combination, with main slide G, of supplemental vertical slide H, mounted on said main slide, edging-roll D, journaled on said main slide, edging-roll D′, journaled on said supplemental slide, a hydraulic cylinder, H^3, and piston H^5, carried by said main slide, for operating said supplemental slide, exterior vertical rolls, C C, mounted on said main slide, a fixed exterior roll opposing said rolls C C, and a hydraulic cylinder, G^3, and piston G^5, mounted on the frame of the machine, for operating said main slide G, substantially as specified.

13. The combination, with main slide G, of supplemental vertical slide H, mounted on said main slide, edging-roll D, journaled on said main slide, edging-roll D′, journaled on said supplemental slide, a hydraulic cylinder, H^3, and piston H^5, carried by said main slide, for operating said supplemental slide, exterior vertical rolls, C C, mounted on said main slide, a fixed exterior roll opposing said rolls C C, a hydraulic cylinder, G^3, and piston G^5, mounted on the frame of the machine, for operating said main slide G, an inside vertical pressure-roll, a separate horizontal slide upon which it is mounted, and a hydraulic cylinder, F^3, and piston F^5 at the opposite end of the machine from said hydraulic cylinder and piston G^3 G^5, substantially as specified.

14. The combination, with main slide G, of edging-rolls D D′, carried thereby, shaft D^4, shaft E^3, and sliding sleeve D^5, connecting said shafts D^4 and E^3, substantially as specified.

15. The combination, with a stationary vertically-driven roll-shaft, B^3, of a horizontal slide carrying an inside pressure-roll shaft, a horizontal slide carrying exterior pressure-rolls, and hydraulic cylinders and pistons mounted on opposite sides of said stationary roll-shaft for operating said slides, substantially as specified.

16. The combination, with a stationary vertically-driven roll-shaft, B^3, of a horizontal slide carrying an inside pressure-roll shaft, a horizontal slide carrying exterior pressure-rolls, and hydraulic cylinders and pistons mounted on opposite sides of said stationary roll-shaft for operating said slides, and a pair of edging-rolls mounted upon said slide G, substantially as specified.

17. The combination, with edging-rolls D D′, of a movable main slide carrying both said edging-rolls, a stationary exterior roll, a movable or pressure inside roll opposing said stationary exterior roll, and an independent slide, upon which said inside pressure-roll is mounted, substantially as specified.

18. The combination, with a stationary exterior roll, of an inside pressure or movable roll, a horizontal slide, F, upon which it is mounted, a main slide, G, a supplemental slide, H, mounted on said main slide, edging-roll D, mounted on said main slide G, and edging-roll D′, mounted in said supplemental slide H, substantially as specified.

19. The combination, with a stationary exterior roll, of an inside pressure or movable roll, a horizontal slide, F, upon which it is mounted, a main slide, G, a supplemental slide, H, mounted on said main slide, edging-roll D, mounted on said main slide G, edging-roll D′, mounted in said supplemental slide H, and hydraulic cylinders and pistons at opposite ends of the machine, for operating said horizontal slides F and G, substantially as specified.

20. The combination, with a stationary exterior roll, of an inside pressure or movable roll, a horizontal slide, F, upon which it is mounted, a main slide, G, a supplemental slide, H, mounted on said main slide, edging-roll D, mounted on said main slide G, edging-roll D′, mounted in said supplemental slide H, and a hydraulic cylinder and piston mounted in said slide G, for operating said supplemental slide H, substantially as specified.

21. The combination, with a stationary exterior roll, of an inside pressure or movable roll, a horizontal slide, F, upon which it is mounted, a main slide, G, a supplemental slide, H, mounted on said main slide, edging-roll D, mounted on said main slide G, edging-roll D′, mounted on said supplemental slide H, a hydraulic cylinder, H^3, and piston H^5 on said main slide G, for operating said supplemental slide H, and hydraulic cylinders F^4 G^3 and pistons F^5 G^5 at opposite ends of the machine, for operating said horizontal slides F and G, substantially as specified.

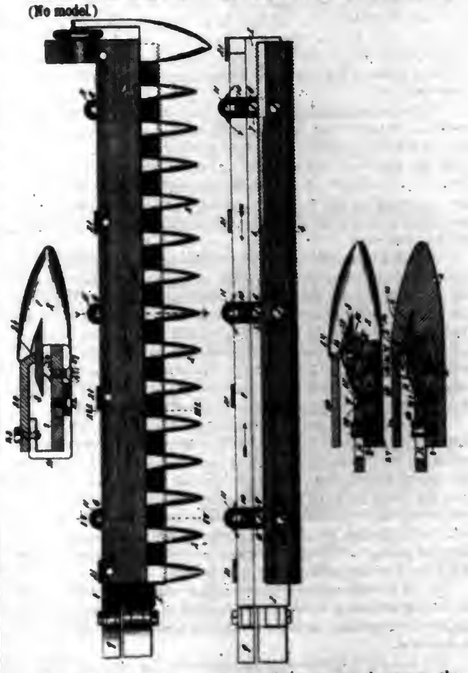
22. In a tire-rolling mill, the combination of horizontal edging-roll D, vertically-movable or pressure edging-roll D′, and a stop to limit the downward movement of said edging-roll D′, substantially as specified.

23. In a tire-rolling mill, the combination, with a horizontal edging-roll, D, of vertically-movable edging-roll D′, a vertically-movable slide upon which it is journaled, a hydraulic cylinder and piston for operating said slide, and a stop for limiting its movement, substantially as specified.

24. The combination, in a tire-rolling mill, of an exterior vertical stationary roll, an inside movable pressure-roll, a hydraulic cylinder and piston for operating it, and a stop for limiting its movement, substantially as specified.

25. The combination, in a tire-rolling mill, of an exterior vertical stationary roll, an inside movable pressure-roll, a hydraulic cylinder and piston for operating it, and a stop for limiting its movement, a horizontal edging-roll, D, a movable edging-roll, D′, a hydraulic cylinder and piston for operating it, and a stop for limiting its movement, substantially as specified.

401,714. CUTTER-BAR FOR REAPERS AND MOWERS. JOHN I. MURRAY, St. Louis, Mo. Filed June 2, 1888. Serial No. 275,846. (No model.)



Claim.—1. In a cutting apparatus for reapers and mowers, the combination of the finger-bar, guard-fingers secured to the bar, arms pivoted to the bar, a knife pivoted to the forward ends of the arms, and a reciprocating bar pivoted to the rear ends of the arms, and by which the knife is operated, substantially as and for the purpose set forth.

2. In a cutting apparatus for reapers and mowers, the combination of the finger-bar, guard-fingers secured to the bar, a single reciprocating knife extending lengthwise of the cutting apparatus, and operating-bar parallel with and connected with said knife, and mechanism for imparting the necessary motions to said knife from said operating-bar, substantially as set forth.

3. In a cutting apparatus for reapers and mowers, the combination of the finger-bar, guard-fingers secured to the bar, arms pivoted to the bar, a knife pivoted to the arms, and a reciprocating bar pivoted to the arms for operating the arms, the connection between the knife and arms being made by means of studs 13 and screws 5, having enlarged heads 14, substantially as and for the purpose set forth.

4. In a cutting apparatus for reapers and mowers, the combination of the finger-bar, guard-fingers secured to the bar, arms pivoted to the bar, a knife pivoted to the forward ends of the arms, and a bar pivoted to the rear ends of the arms to operate the knife, the arms being connected with the finger-bar by means of screws 7, having enlarged heads 16 and shoulders 17, substantially as and for the purpose set forth.

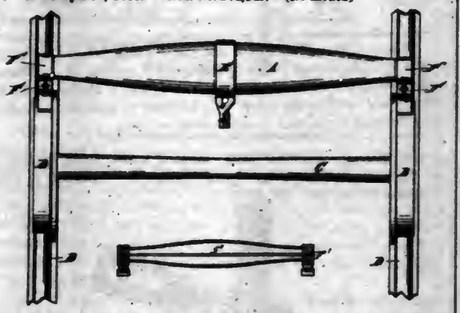
5. In a cutting apparatus for reapers and mowers, the combination of the finger-bar, guard-fingers secured to the bar, a knife, means for operating the knife, and a cap-plate, 20, having flanges 24 fitting between the guard-fingers and the tongue-and-groove connection with the upper rear extensions of the guard-fingers, substantially as and for the purpose set forth.

6. In a cutting apparatus for reapers and mowers, the combination of the finger-bar, guard-fingers secured to the bar, a knife, means for operating the knife, the main plate 20, U-shaped straps 21, connecting plate 20 and the finger-bar at the rear, screws 22, passing through the finger-bar and straps, and bolts 23, passing through the upper ends of straps 21 and the rear end of the plate 20, substantially as and for the purpose set forth.

401,715. TANNING PROCESS. ERIK OLLESTAD, St. Paul, Minn., assignor of one-half to Andrew Jenson, same place. Filed Mar. 2, 1888. Serial No. 265,955. (No specimens.)

Claim.—As an improvement in the art of tanning, the process described, which consists in treating the hides with a solution composed, essentially, of water-tanning extracts, blue vitriol, alum, bichromate of potash, and sulphuric acid, as set forth.

401,716. BRAKE-BEAM. WILLIAM A. PRIOR, Detroit, Mich. Filed Apr. 19, 1888. Serial No. 271,149. (No model.)



Claim.—1. A brake-beam made of metal in two parts, A' A^3, said parts united by embracing-straps and having upon the interior re-enforcing blocks, said beam being in the form of a flattened tube of greater sectional dimensions along its middle portion than at its extremities, substantially as and for the purposes described.

2. The combination, with a hollow brake-beam, of a brake-head cast with a socket and an interior fillet, into which the end of the brake-beam projects, and which serves the purpose of a support for the end of the brake-beam, substantially as described.

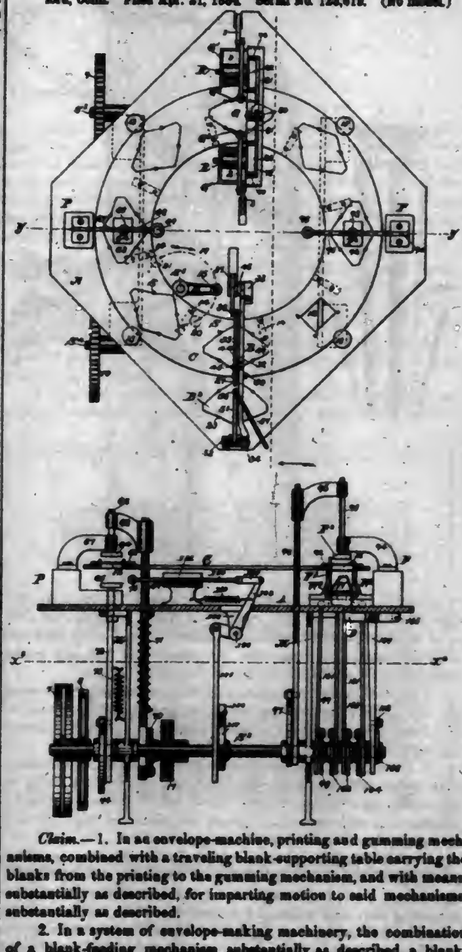
3. The combination, with a hollow brake-beam, of brake-heads cast with sockets to receive the ends of the brake-beam, and with a single longitudinal bolt, *f*′, extending from end to end of the beam, whereby said heads and beam are fastened together, substantially as described.

4. The combination of interior re-enforcing blocks with a hollow brake-beam made in two parts united along the front and rear of the beam, the meeting edges of said parts being provided with flanges a' a^3, substantially as described.

401,717. FLANNEL SHIRT. FRANK D. REMSHAW, Long Pine Nebr. Filed Jan. 5, 1889. Serial No. 295,881. (No model.)

Claim.—A shirt provided with a neck-band, composed of an outer layer of worsted, an inner layer of muslin, and buckram or the like between said layers, and a collar attached to said neck-band and composed of two layers of worsted, and layers of buckram or the like between the worsted layers, substantially as set forth.

401,718. ENVELOPE-MACHINE. FRANCIS H. RICHARDS, Springfield, Mass., assignor of one-half to The Pratt & Whitney Company, Hartford, Conn. Filed Apr. 21, 1884. Serial No. 128,619. (No model.)



Claim.—1. In an envelope-machine, printing and gumming mechanisms, combined with a traveling blank-supporting table carrying the blanks from the printing to the gumming mechanism, and with means, substantially as described, for imparting motion to said mechanisms, substantially as described.

2. In a system of envelope-making machinery, the combination of a blank-feeding mechanism, substantially as described, a blank-printing mechanism, substantially as described, a blank-gumming mechanism, substantially as described, and a blank-folding mechan-

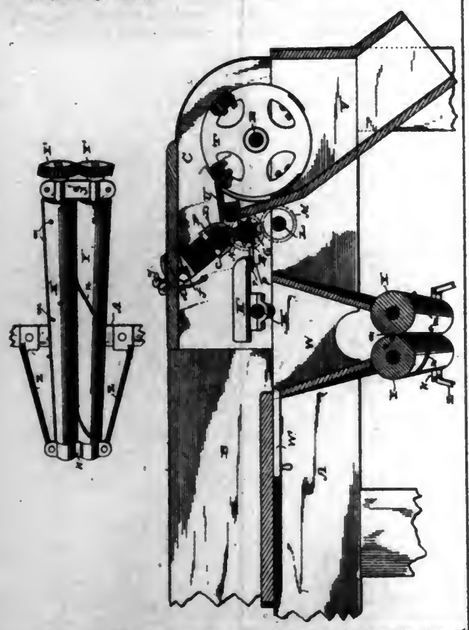
lem, substantially as described, all located in a circuit in the order described, and a blank-carrier operating to receive blanks from the blank-feeding mechanism and convey them first to the blank-printing mechanism, then to the blank-gumming mechanism, and finally to the blank-folding mechanism, substantially as set forth.

3. In a system of envelope-making machinery, the combination of a blank-feeding mechanism, substantially as described, a blank-printing mechanism, substantially as described, a blank-gumming mechanism, substantially as described, and a blank-folding mechanism, substantially as described, all located, in the order described, in a circular circuit, and a circular blank-carrier operating to receive blanks from the blank-feeding mechanism and convey them first to the blank-printing mechanism or mechanisms, then to the blank-gumming mechanism, and then to the blank-folding mechanism, substantially as set forth.

4. In an envelope-machine, the traveling blank-carrier and gumming apparatuses situated on opposite sides of said carrier and arranged to operate on the blanks on said carrier, all substantially as described.

5. In an envelope-machine, the traveling blank-carrier and gumming apparatuses situated on opposite sides of said carrier and arranged to operate simultaneously on the same envelope-blank on said carrier, all substantially as described.

401,719. COMBINED FEED-CUTTER AND CORN-HUSKER. AUGUST ROSENTHAL, Milwaukee, Wis. Filed Oct. 29, 1888. Serial No. 289,399. (No model.)



Claim.—1. In a stalk-cutter and corn-husker, the combination of the cutter-box provided with longitudinal guides, a crank-shaft journaled to said cutter-box, and a plate loosely clipped to the shaft and provided with lateral projections for engagement with said guides, substantially as set forth.

2. In a stalk-cutter and corn-husker, the combination of a cutter box having its sides provided with slots, a crank-shaft journaled to said cutter-box, and a plate loosely clipped to the shaft and having projections that engage said slots, substantially as set forth.

3. A stalk-cutter and corn-husker comprising a cutter-box, shear-plate, cutter-head, and feed-rollers, in combination with a tilting reciprocating plate arranged in the rear of said feed-rollers, a chute depending from said cutter-box beneath the plate, and husking-rollers arranged below the chute, substantially as set forth.

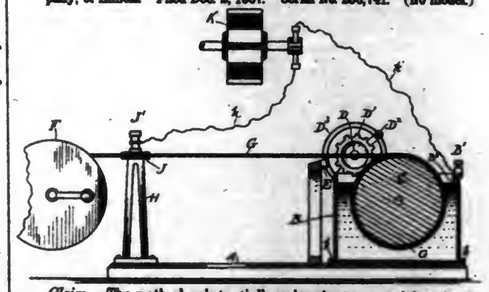
4. A stalk-cutter and corn-husker comprising a cutter-box, shear-plate, cutter-head, and feed-rollers, in combination with a tilting reciprocating plate arranged in the rear of said feed-rollers, a chute depending from said cutter-box beneath the plate, and inclined and tapered rollers arranged parallel to each other below the chute, one of these rollers being provided with a series of pins spirally arranged thereon and the other with a spiral groove to engage said pins, substantially as set forth.

401,720. CARRIAGE-CURTAIN FASTENER. SAMUEL P. SCOTT, Hillsborough, Ohio, assignor to the Star Manufacturing Company, same place. Filed Jan. 10, 1889. Serial No. 295,940. (No model.)



Claim.—As an improved article of manufacture, the herein-described four-part carriage-curtain fastening, consisting of a base-piece having a central bore enlarged at its outer end and a projecting flange around said bore, a head-piece having a central bore enlarged at its inner end to receive the flange of the base-piece, and having pairs of diametrically-opposite notches in its outer face at the end of the bore, with a coiled spring inclosed between the head and base in the enlargements of the bores thereof, and a pin passing through said head, spring, and base and rigidly secured to the base only, and having a pair of diametrically-opposite ears on its outer end adapted to engage the notches of the head and lie flush with the surface thereof when locked, all substantially as and for the purpose specified.

401,721. METHOD OF TEMPERING SPIRAL SPRINGS. FREDERICK SEDGWICK, Chicago, Ill., assignor to the American Spring Company, of Illinois. Filed Dec. 2, 1887. Serial No. 256,741. (No model.)



Claim.—The method, substantially as herein shown and described, in the manufacture of coiled springs, which consists in simultaneously heating the steel wire or strip to redness or a ductile condition, winding and chilling the same upon a former or mandrel, and afterward drawing the temper in any well-known way.

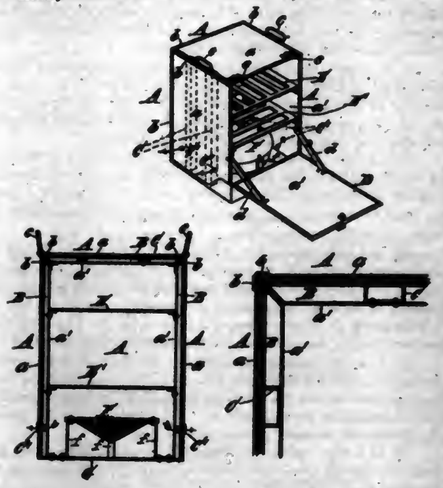
401,722. LIFTING-JACK. AXEL A. STROM, Austin, assignor to the Strom Manufacturing Company, Chicago, Ill. Filed Dec. 20, 1888. Serial No. 294,188. (No model.)



Claim.—1. In a lifting-jack, the combination, with the standard lifting-bar, and operating-lever, of a clutch for raising the lifting-bar or holding it in raised position, and comprising a collar on the bar provided with one or more reduced bearings near the center of its inner side, and a bearing-plate for each reduced bearing having a recess formed in its back transversely of the plate and fitting upon the reduced bearing, whereby the bearing-plate is pivotally supported between the collar and lifting-bar, substantially as and for the purpose set forth.

2. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a clutch for raising the lifting-bar or holding it in raised position, and comprising a collar supported on the bar and provided near the center of its inner side with one or more reduced grooved bearings, each having a rounded bar in the groove, and a bearing-plate for each reduced bearing having a recess formed in its back transversely of the plate and fitting over the rounded bar, whereby the bearing-plate is pivotally supported between the collar and lifting-bar, substantially as and for the purpose set forth.

401,728. OVEN FOR VAPOR OR GAS STOVES. JOSEPH STUBERS, Cincinnati, Ohio. Filed Nov. 4, 1887. Serial No. 254,274. (No model.)



Claim.—1. In a bake-oven for vapor or gas stoves, the walls A, each composed of two sheets, one of asbestus or other suitable non-conducting material on the outside, and the other of metal on the inside, the latter being turned or flared outwardly at its ends and sides to form a frame for receiving the said sheet of asbestus, and then a part of said flared ends and sides lapped over the edges of said asbestus sheeting to hold it in position and at the same time furnish a protecting seam or binding on the corners of the oven, substantially as herein set forth.

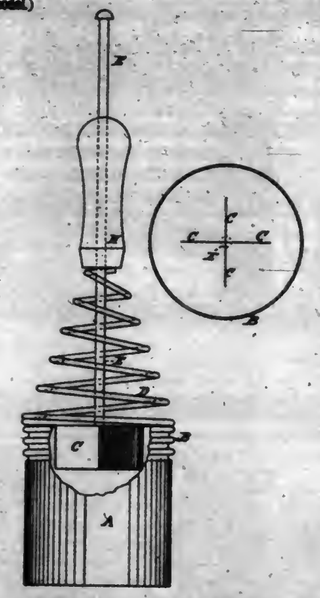
2. In a bake-oven for vapor or gas stoves, the walls A, each composed of two sheets, one of asbestus or other suitable non-conducting material on the outside, and the other of metal on the inside, the latter being turned or flared outwardly on the ends of the sides next the door, and the ends of the door being likewise turned or flared outwardly, the flared ends being lapped over the edge of the adjacent asbestus sheeting, substantially as and for the purposes specified.

3. In a bake-oven, an exterior wall of asbestus or other non-conducting substance and an inner wall of sheet metal, these two walls inclosing an air-space between them, the edges of the inner metal wall crossing the air space and lapping around the outer edges of the outer wall, substantially as and for the purposes specified.

4. In a bake-oven, an exterior wall of asbestus or other non-conducting substance and an inner wall of sheet metal, these two walls inclosing an air-space between them, the edges of the inner metal wall crossing the air-space and lapping around the outer edges of the outer wall, and braces or stops for holding apart the central portions of the said outer and inner walls, substantially as and for the purposes specified.

5. In a bake-oven, the door composed of two sheets, one of asbestus or other suitable non-conducting material on the outside, and the other of metal on the inside, an air-space being present between the outside and inside sheets, the ends of said metal sheet lapping over the edges of the adjacent asbestus sheet, substantially as and for the purposes specified.

401,724. DEVICE FOR AGITATING LIQUIDS. ROBERT S. WILLIAMS, Merchantville, N. J. Filed Jan. 15, 1889. Serial No. 296,432. (No model.)

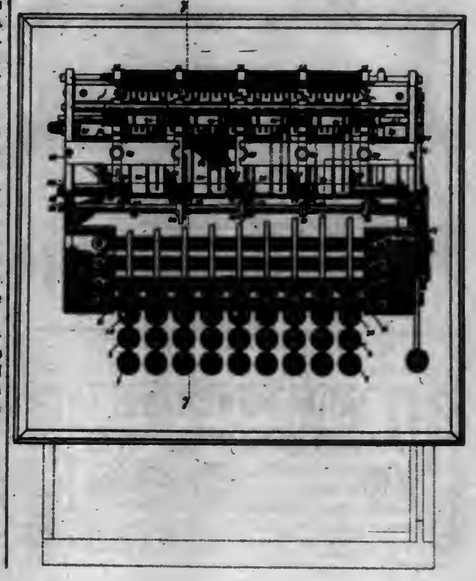


Claim.—The liquid-agitating device described, consisting of a receptacle, A, having a tightly-fitting cap or cover, said cap or cover carrying upon its upper surface a spring, D, and a standard, E, and on its lower surface blades or breakers, in combination with a handle, H, secured to the upper end of the spring and provided with a bore for reciprocating upon said standard, substantially as shown and described.

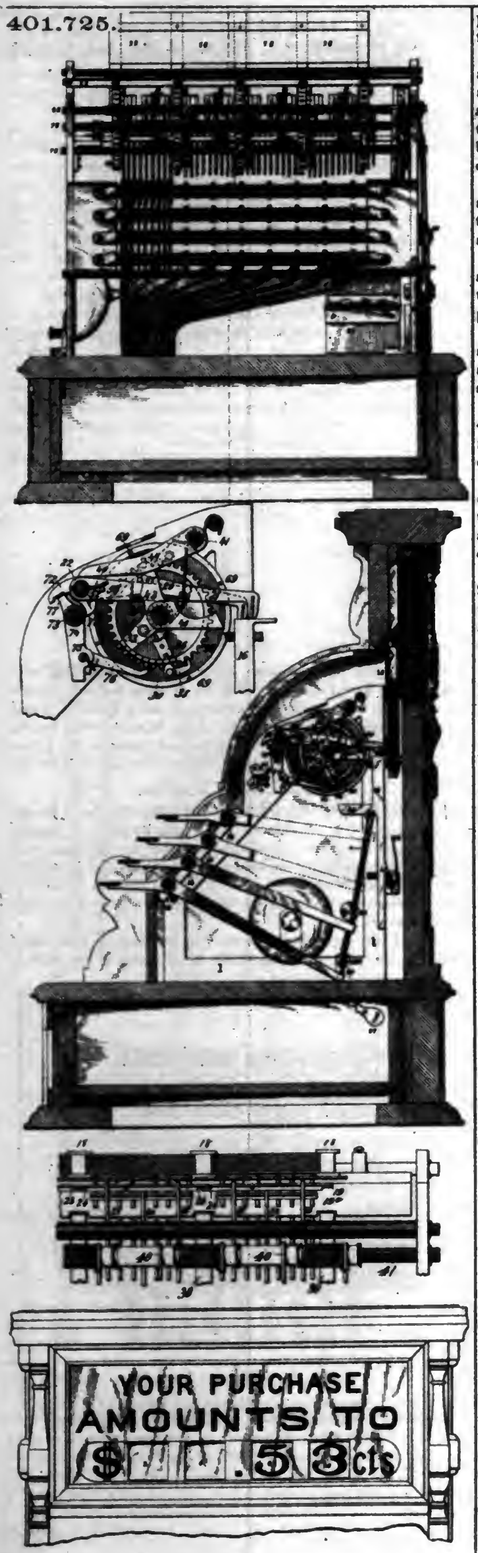
401,725. CASH INDICATOR AND REGISTER. WILLIAM W. WYTHE, Chautauqua, N. Y. Filed July 3, 1888. Serial No. 278,912. (Model.)

Claim.—1. In a cash register and indicator, the combination of the coiled springs 39 with the money-drawer D by means of the bent lever 60 63, connecting-rod 65, arm 66, sleeves 52, and pins 92, by means of which the closing of the drawer winds up the springs, substantially as described.

2. In a cash register and indicator, the combination of the coiled springs 39 with the registering-wheels 32 by means of the notched



401,725.



plates 36 and locking-pawls 38, whereby the wheels 32 are carried forward when the springs are released, substantially as described.

3. In a cash register and indicator, a curved arm, 34, constructed as the segment of a hollow cylinder or tube cut obliquely to its axis and bearing upon one edge nine notches or steps supported by radial arms 33 35, proceeding from a sleeve, 32ᵃ, which turns loosely upon the shaft 31, in combination with a registering-wheel, 32, and arms 49, by means of which the registering-wheel may be stopped at varying distances.

4. In a cash register and indicator, the combination of the curved arm 34 and spring 39 with an arm, 49, connected with a key-lever, so that when the key is depressed the arm 49 acts as a stop on the curved arm 34, substantially as described.

5. In a cash register and indicator, the combination of the curved arm 34 with the wheels 32 by means of the pawl 38 and plate 36, so that upon the release of the springs the wheel and pawl act as one piece, substantially as described.

6. In a cash register and indicator, the combination of the notched arms 43 with the pins 44 and arms 40, by means of which the curved arms 34 are held in position and the springs retained in tension, substantially as described.

7. In a cash register and indicator, the combination of the arms 46 with the pins 44 and arms 40, by means of which the arms 43 are released by the backward movement of the shaft 31 consequent upon opening the drawer, substantially as described.

8. In a cash register and indicator, the combination of two or more series of keys with the arms 43 and quadrants 34 by means of the rods 16, bars 19ᵃ, arms 20, and pins 48, so that the depression of any key of a series disengages the arm 43 and releases the spring 39 corresponding to that series, substantially as specified.

9. In a cash register and indicator, the combination of the pins 92 and shaft 31 with the locking-pawls 38 by means of the notched plate 36, so that by the rotation of the said shaft backward the pawls are lifted from the teeth of the wheels 32 and move independently of them, substantially as described.

10. In a cash register and indicator, the sleeve 74, with lugs 77 and jointed pawls 75 76, in combination with the notched arms 72, lugs 70, and pins 69, so arranged that when the pins 69 engage with the lugs 70 the arms 72 are raised sufficiently to release the lugs 77 and the pawls 75 76 are retracted one tooth on the wheels 32, preparatory to their action on the wheels, substantially as described.

11. In a cash register and indicator, the shaft 79, with a series of lugs, 80, arranged upon it, so that upon the rotation of the shaft the lugs press against the retracted pawls 75 76 and push them forward in succession the space of one tooth on the wheels 32, moving the wheels that distance, substantially as described.

12. In a cash register and indicator, the combination of the bellows 81, rack 89, pinion 90, shaft 79, pawls 76, and wheels 32, by means of which the speed of the carrying mechanism is controlled, substantially as described.

13. In a cash register and indicator, the combination of the shaft 79, lugs 80, and pawls 75 76 with the bellows 81 in such a way that the motion of the wheels 32 by the jointed pawls 76 can only take place when the other mechanism is at rest, substantially as described.

14. In a cash register and indicator, the combination of the retaining-pawls 26 with the bellows 81 by means of the arm 91, so that the rods 16 are kept up until all other motions of the mechanism have ceased, substantially as described.

15. In a cash register and indicator, the combination of the sleeves 32ᵃ, arms 35 43, pins 44, arm 20, and pin 48, by means of which the mechanism is locked until a key is depressed and the shaft 31 is rotated, substantially as described.

16. In a cash register and indicator, the locking-pawl 38, so arranged, in combination with the plate 36, pin 92, shaft 31, arm 66, connecting-rod 65, bent lever 60 63, and drawer D, that the pawl engages with the registering-wheel at the moment the drawer is opened, and remains engaged until the movement of the wheel is completed and the drawer is closed.

17. In a cash register and indicator, the combination of the curved arm 34, the sleeve 32ᵃ, the arms 33 and 35, the plate 36, the pawl 38, engaging with the toothed wheel 32, and the coiled spring 39, substantially as and for the purpose described.

18. The combination of two or more series of vertical sliding rods, 16, carrying the figured indicating-slides, the stops 49, engaging with the notches on the curved arms 34, connecting-rod *a*, and the key-levers 8 9 10 11, substantially as and for the purpose described.

19. In a cash register and indicator, the combination of the retaining-pawls 26 on the shaft 27, engaging with the tooth 25 on the sliding rods 16, and the arm 91, substantially as and for the purpose specified.

20. In a cash register and indicator, a series of figured plates provided with the arms *b* at different positions on the plate, and the guiding-arms *c d*, substantially as and for the purpose described.

21. In a cash register and indicator, the combination of the bar 19, carrying the zero-plate, the arms 20 21, journaled on the shaft 22, and the lugs 23 and 24, substantially as and for the purpose described.

22. In a cash register and indicator, the combination of the arm 35, the locking-pins 44 on the arm 40, the pins 48 on the arm 20, the bar 19ᵃ, and the sliding rods 16, substantially as and for the purpose described.

23. In a cash register and indicator, the combination of the pins 52 on the shaft 22, the pins 53 on the arm 21, the arms 54 and 55, pivoted on the frame, the rod 56, and hook 57, engaging with the notch 58, substantially as and for the purpose described.

24. In a cash register and indicator, the combination of the spring 59, the arm 60, and the roller 61, the connecting-rod 65, the arm 66, the shaft 31, and the arm 41, by means of which the drawer is thrown open and the shaft 31 revolved, substantially as and for the purpose specified.

25. In a cash register and indicator, the combination of the pins 69 on the wheel 30, the lug 70, the notched arm 72, the lug 77, the arm 75, sleeve 74, and pawl 76, substantially as and for the purpose specified.

26. In a cash register and indicator, the combination of the lugs 80 on the shaft 79, the pinion 90, the rack 89, the bellows 81, arm 82, pin 83, slot 84, lug 85, and hook 86, substantially as and for the purpose specified.

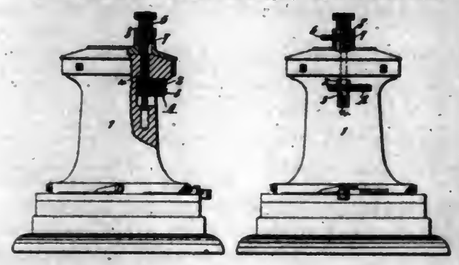
27. In a cash register and indicator, the combination of the pin 92, inserted on the shaft 31, the lug 93, pawl 38, sleeve 32ᵃ, and spring 39, substantially as and for the purpose specified.

28. In a cash register and indicator, the key-levers 8 9 10 11, in combination with the connecting-rods A and rod 16, with its lug 49, by means of which the indicating-slides are raised, and at the same time the registering-wheels are stopped in the proper position, substantially as described.

401,726. **CAR-COUPLING.** JOHN C. BRYANT, Charity, Tenn., assignor of two-thirds to James N. Bryant, same place, and John M. Sullivan, Flat Creek, Tenn. Filed Dec. 27, 1887. Serial No. 259,161. (No model.)

Claim.—In a car-coupling, the combination of the draw-head *b*, having the recess *l*, the flaring opening *n*, provided with a removable plate, *m*, with the clutches *k*, the cranks *e*, having crank-shafts *i*, the springs *k*, the chains *f* and *o*, the rods *c* and *d*, and pin *g*, having a conical-shaped head at each end, all constructed, arranged, and operating substantially as shown and described, and for the purpose set forth.

401,727. **COMBINED DRUM AND GRIPPER.** HORATIO FLETCHER, Newcastle-upon-Tyne, County of Northumberland, England. Filed Apr. 30, 1888. Serial No. 273,262. (No model.) Patented in England June 23, 1887, No. 8,948, and Nov. 18, 1887, No. 15,570; in France Mar. 27, 1888, No. 189,621; in Belgium Mar. 27, 1888, No. 81,196; in Italy Mar. 31, 1888, XLVI, 47, and in Austria-Hungary July 5, 1888, No. 13,186.



Claim.—1. In winding machinery, the combination of a winding-barrel, a gripping device comprising a fixed and a movable jaw, both applied to and extending outwardly from the circumference of said barrel, and a rod located within and extending to one end of said barrel for actuating said movable jaw, substantially as herein described, for the purpose set forth.

2. In winding machinery, the combination of a winding-barrel having a slot or guide, a hole extending lengthwise therein, and a bearing for a rod, a gripping device comprising a jaw fixed to said barrel, and a movable jaw arranged to work in said slot or guide, and a rod or bolt located in said hole and adapted to cause said movable jaw to approach or recede from said fixed jaw, said rod being arranged to act against said bearing, substantially as herein described, for the purpose set forth.

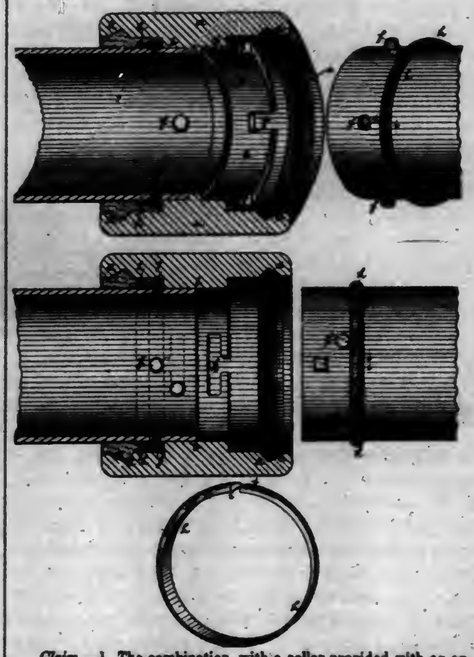
3. In winding machinery, the combination of a winding-barrel, a gripping device comprising a fixed and a movable jaw applied to and extending outward from the circumference of said barrel, and a screw-threaded rod adapted to engage with and actuate said movable jaw, said rod being located within and extending outward from one end of said barrel, against which it has a bearing, substantially as herein described, for the purpose set forth.

4. In winding machinery, the combination of a winding-barrel formed with a slot or guide, a gripping device comprising a jaw, 2, fixed to said barrel, a jaw, 3, movable within said slot or guide, a screw-threaded bolt, 4, arranged within and extending outward from one end of said barrel and adapted to operate said jaw 3, and a bearing at one end of said barrel and against which said rod acts, substantially as hereinbefore described, for the purpose specified.

5. The combination, with a winding-barrel, of a gripper comprising a fixed jaw, 2, a movable jaw, 3, a screw-threaded bolt, 4, adapted to move said jaw 3 nearer to or farther from the fixed jaw 2, a tubular extension, 8, with slot or cam-groove 7, a sleeve, 5, encircling said screw-threaded bolt, and a pin or projection, 6, secured to said sleeve and adapted to work in said slot or cam-groove 7, substantially as hereinabove described, for the purpose specified.

REISSUES.

10,994. **TUBE-COUPLING.** GEORGE N. RILEY, Braddock, Pa. Filed Mar. 21, 1888. Serial No. 304,069. Original No. 374,557, dated Dec. 6, 1887.



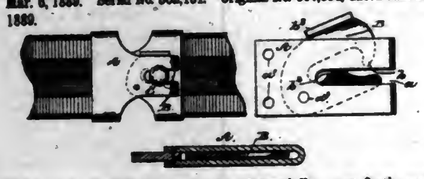
Claim.—1. The combination, with a collar provided with an annular inwardly-flaring calking-recess at the end thereof, of a section of tubing having lugs thereon and a loose ring fitting against said lugs and within the calking-recess, substantially as and for the purposes set forth.

2. In tube-couplings, the combination, with a collar provided with annular inwardly-flaring calking-recesses at the ends, of the tubing having lugs thereon and a loose ring fitting against said lugs and within the calking-recesses, substantially as and for the purposes set forth.

3. In tube-couplings, the combination, with a coupling-collar having annular inwardly-flaring calking-recesses at the ends, of the tubing having lugs thereon and a loose ring fitting against the lugs and within the calking-recesses, said loose ring having a curved or beveled face corresponding in shape to the inwardly-flaring calking-recesses, substantially as and for the purposes set forth.

4. In tube-couplings, the combination, with a coupling-collar having annular inwardly-flaring calking-recesses at the ends and tube-sections adapted to engage therewith by suitable locking devices, of lugs on the tubing and loose rings fitting against said lugs within the calking-recesses, substantially as and for the purposes set forth.

10,995. CLASP. FREDERICK R. SPOONER, Brooklyn, N. Y. Filed Mar. 6, 1889. Serial No. 302,181. Original No. 307,094, dated Jan. 29, 1889.



Claim.—1. A clasp for garments, substantially as set forth, comprising two parts consisting of a slotted plate and a cam-slotted latch pivoted to said plate and adapted to be operated by the stud eye or shank which it secures.

2. A clasp adapted to be operated by a stud, substantially as set forth, comprising a stationary slotted plate with an unattached bent-over end and a cam-slotted latch pivoted thereto, and whose bent-over end incloses the front part of said latch.

3. A clasp adapted to be operated by and secure a stud eye or shank, substantially as set forth, consisting of a plate constructed of a piece of doubled sheet metal having a slot therein for the reception of the stud eye or shank, and a cam-slotted latch pivoted to said plate and inclosed thereby.

4. A clasp adapted to be operated by and secure a stud eye or shank, comprising a doubled sheet-metal plate having a slot therein and a latch pivoted thereto having an operating-guard, a hooked end, and a slot with a cam projection.

5. A clasp substantially as described, comprising a slotted plate and a latch pivoted thereto having an open slot with a cam projection, in combination with an adjacently-situated stud for operating and engaging said latch.

6. A clasp adapted to be operated by a stud, substantially as set forth, comprising a slotted plate with a bent-over unattached end, and a cam-slotted latch pivoted thereto having an overhanging hooked end provided with a front-curved edge.

7. A clasp comprising a slotted plate, a latch having an open slot, with a cam projection pivoted to said plate below the slot thereof, and an adjacently-situated stud or its equivalent adapted to engage the slots in said plate and latch and close said latch independent of spring action, substantially as described.

8. A corset-fastening having studs or equivalents on one steel thereof and slotted plates secured to the opposite steel in alignment with the said studs, each plate having a cam-slotted latch pivoted thereto and operating through said slotted plate, adapted to be actuated by and secure said studs, substantially as described.

9. A clasp comprising a doubled sheet-metal plate provided with a slot in its doubled portion for the entrance of a stud or analogous device, and a locking-latch mounted in said plate and inclosed thereby, substantially as described.

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DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

OPINION OF THE ATTORNEY-GENERAL OF THE UNITED STATES

Upon the construction of the articles of the International Convention for the Protection of Industrial Property in relation to Caveats.

LEGISLATION FOR THE ENFORCEMENT OF THE TREATY NECESSARY.

This treaty is a reciprocal one. Each party to it covenants to grant in the future to the subjects and citizens of the other parties certain special rights in consideration of the granting of like special rights to its subjects and citizens. It is a contract operative in the future infraterritorially. It is therefore not self-executing, but requires legislation to render it effective for the modification of existing laws.

DEPARTMENT OF JUSTICE,
Washington, D. C., April 5, 1889.

SIR: Your predecessor, by his letter of the 15th of January, 1889, requested the opinion of the Attorney-General on the following state of facts:

Section 4902 of the Revised Statutes grants the right to file caveats preliminary to applications for patents for inventions and establishes the legal effect that shall be given to them. It also provides—

Any *citizen of the United States* who makes any new invention or discovery, and desires further time to mature the same, may * * * file in the Patent Office a caveat.

It further provides—

An alien shall have the privilege herein granted if he has resided in the United States one year next preceding the filing of his caveat and has made oath of his intention to become a citizen.

By the first of these clauses the grant of the right is limited to citizens. By the second it is enlarged to include one class of aliens. The grant as a whole entitles only citizens and aliens who have been residents 1 year and have legally declared their intention to become citizens to file caveats.

It is claimed by Ferdinand Bourquin, a Swiss citizen, that the second article of a Convention entered into between the United States and certain other nations, of which the Swiss Confederation was one, proclaimed on the 7th day of June, 1887, (U. S. Statutes of 1887 and 1888, treaties, 37,) extends the grant of section 4902 Revised Statutes to all subjects and citizens of the parties to the Convention. That article provides:

The subjects or citizens of each of the contracting States shall enjoy, in all the other States of the Union, so far as concerns patents for inventions, trade or commercial marks, and the commercial name, the advantages that the respective laws thereof at present accord, or shall afterward accord to subjects or citizens. In consequence they shall have the same protection as these latter, and the same legal recourse against all infringements of their rights, under reserve of complying with the formalities and conditions imposed upon subjects or citizens by the domestic legislation of each State.

Congress has passed no law for the execution of this article, nor did the House of Representatives in any way consider or assent to the treaty.

Section 4902 is a part of the system of laws of the United States *concerning* patents for inventions. If, therefore, the article above quoted has become and is self-executing as an infraterritorial law, by virtue of the making and proclamation of the treaty by the President, by and with the advice and consent of the Senate, the claim made by Ferdinand Bourquin is valid. By the second clause of the second section of the second article of the Constitution the power to make treaties, by and with the advice and consent of the Senate, is vested in the President. By the second clause of the sixth article of the Constitution "all treaties made, or which shall be made, under the authority of the United States shall be the supreme law of the land." By the eighth clause of the eighth section of the first article the whole legislative power over the subject of patents is committed to Congress. It is found among the powers to borrow money: to coin money; to declare war; to raise and support armies; to constitute judicial tribunals; to regulate commerce, &c. It is due to the credit of the United States that the provisions concerning the treaty-making power of the President and the legislative power of Congress shall, if possible, be so construed and executed as to give full and proper effect to each and insure harmony in their exercise.

In the case of *Foster* v. *Neilson* (2 Peters, 314) Chief Justice Marshall, delivering the opinion of the Court, in discussing the effect of the Constitution on treaties as laws, declared:

A treaty is, in its nature, a contract between two nations, not a legislative act. It does not generally effect of itself the object to be accomplished, especially so far as its operation is infraterritorial, but is carried into execution by the sovereign power of the respective parties to the instrument.

In the United States a different principle is established. Our Constitution declares a treaty to be the law of the land. It is consequently to be regarded in courts of justice as equivalent to an act of the legislature whenever it operates of itself without the aid of any legislative provision. *But when the terms of the stipulation import a contract, when either of the parties engaged to perform a particular act, the treaty addresses itself to the political, not the judicial department; and the legislature must execute the contract before it can become a rule for the court.*

The principle thus stated has been generally accepted as a true interpretation of the constitutional provisions relating to the subject of treaties. It establishes that there is a class of treaties which, without legislation, do not become self-executing as a rule of municipal law. A statement is given of such provisions of treaties as come within this class; as "when the terms of the stipulation import a contract, when either of the parties engages to perform a particular act." But the decision does not enumerate or define the limitations of the whole class. In the treaty-making power conferred on the President the implication exists that the power is to be exercised by him

subject to the limitation of the Constitution. If, in time of peace, he should provide by the stipulations of a treaty for the quartering of soldiers in any house without the consent of the owner, such a stipulation would be simply void, because forbidden by the Constitution to every department of the Government. But where the Government of the United States has power under the Constitution over a subject, although that power may be vested by the Constitution exclusively in Congress, it has been claimed that in the making of treaties, such power may be exercised by the President, by and with the advice and consent of the Senate, without the co-operation of the House of Representatives or act of Congress. Issue was joined on this proposition in 1796 between the President and Senate in the affirmative, and the House of Representatives in the negative, concerning certain provisions of the Jay treaty with Great Britain. The treaty, at the end of the disagreement, remained intact, but the House of Representatives—

passed resolutions disclaiming the power to interfere in making treaties, but asserting their right, whenever stipulations were made on subjects committed to Congress by the Constitution, to deliberate on the expediency of carrying them into effect; and in legislating on several treaties then before them they struck out the words, "that provision ought to be made by law," and substituted words which declared merely the expediency of passing the necessary laws. (Sargeant's Constitutional Law, 411; Story on the Constitution, section 1841.)

In the session of 1815 and 1816 a like disagreement arose concerning a commercial treaty made in the July preceding "between the United States and Great Britain, by which it was agreed to abolish the discriminating duties on British vessels and cargoes." This disagreement was terminated with no decisive results.

The treaty between the United States and the King of the Hawaiian Islands, signed January 30, 1875, which provided for commercial reciprocity between the nations, and involved the exercise of one of the powers submitted to Congress by the Constitution, provided in its fifth article that it should not be ratified "until a law to carry it into operation should be passed by the Congress of the United States of America." (19 U. S. Stats., 627.) In execution of this treaty Congress, on the 15th of August, 1876 (19 U. S. Stats., 200) passed an act in accordance with the provisions of the treaty. The treaty by its terms, however, was clearly a contract by which, in consideration of certain special commercial privileges granted on the one part, certain other like privileges were granted on the other. Such special privileges granted in consideration of others received, the Supreme Court of the United States in the case of *Bartram* v. *Robertson* (122 U. S., 120) ruled, constitute a contract, FIELD, J., delivering the opinion (speaking of the treaty with Denmark as compared with that of the Hawaiian Islands) declaring:

Those stipulations, even if conceded to be self-executing, by the way of a proviso or exception to the general law imposing the duties, do not cover concessions like those made to the Hawaiian Islands for a valuable consideration. They were pledges of two contracting parties, the United States and the King of Denmark, to each other; that, in the imposition of duties on goods imported into one of the countries which were the product or manufacture of the other, there should be no discrimination against them in favor of goods of like character imported from any other country. They imposed an obligation on both countries to avoid hostile legislation in that respect. But they were not intended to interfere with *special arrangements with other countries founded upon a concession of special privileges.* (See, also, *Whitney* v. *Robertson*, 124 U. S., 192.)

If the treaty-making power, in all treaties whose execution required the exercise of powers committed to Congress, should uniformly provide in the treaties for their proper submission to Congress before they should be effective, consequences might be avoided which may jeopardize the credit of the nation. Under the British constitution, with reference to this subject the jurisdiction of Parliament is thus stated in 1 Todds Parliamentary Government in England, page 610:

The constitutional power appertaining to Parliament in respect to treaties is limited. It does not require their formal sanction or ratification by Parliament as a condition to their validity. The proper jurisdiction of Parliament in such matters may be thus defined: First, it is right to give or withhold its sanction to those parts of a treaty that require a legislative enactment to give it force and effect, as, for example, when it provides for an alteration in the criminal or municipal law, or proposes to change existing tariffs or commercial regulations. * * * If a treaty requires legislative action in order to carry it out, it should be subjected to the fullest discussion in Parliament, and especially in the House of Commons, with a view to enable the Government to promote effectually the important interests at stake in their proposed alterations in the foreign policy of the nation.

It is not necessary to the decision of the question submitted to me in the matter under consideration to determine whether all the provisions of treaties, whose execution requires the exercise of powers submitted to Congress, must be so submitted before they become law to the courts and executive departments, for the treaty under consideration is a reciprocal one—each party to it covenants to grant in the future to the subjects and citizens of the other parties certain special rights in consideration of the granting of like special rights to its subjects or citizens. It is a contract operative in the future infraterritorially. It is therefore not self-executing, but requires legislation to render it effective for the modification of existing laws.

Very respectfully,

W. H. H. MILLER,
Attorney-General.

The Secretary of the Interior.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

BROWN *v.* THE DISTRICT OF COLUMBIA.

Decided March 11, 1889.

1. BALLARD AND WADDELL—STREET-PAVEMENTS.

Letters Patent No. 94,062, granted August 24, 1869, to Ballard and Waddell, for an improvement in street-pavements, and Letters Patent No. 94,063, granted same date to the same parties, for an improved mode of cutting blocks for street-pavement, *Held* void for want of patentable novelty.

2. COWING—STREET-PAVEMENTS.

Letters Patent No. 101,590, granted to Turner Cowing April 5, 1870, for a new mode of constructing wood pavement for streets, cannot be regarded as possessing patentable novelty.

APPEAL from the Supreme Court of the District of Columbia.

STATEMENT OF THE CASE.

Tallmadge E. Brown filed his bill in the Supreme Court of the District of Columbia on the 14th day of April, 1880, counting upon three patents alleged to have been infringed by the respondent, namely: Patent No. 101,590, issued to Turner Cowing April 5, 1870, for "a new mode of constructing wood pavements for streets."

The specification and claim are as follows:

The nature of my invention consists in providing and arranging blocks of a peculiar shape, in manner to form wedge-shaped crevices for the reception of earth or gravel, and wherein such earth and gravel will be returned to act as a key to bind and confine the blocks in their place.

Figure 1 represents a section of road paved with the blocks, complete. Fig. 2 represents the straight side of a block, with the inclined side at E. Fig. 3 represents the top of a block, and also the section of the base D. Fig. 4 represents the straight side of a block, which is set next to the inclined side of the adjoining block.

In Fig. 1 letters A represent the top of the block; B, the side; and E the crevice and gravel. The blocks should, of course, be placed so that the gravel spaces may extend lengthwise across the direction of the street or road, so that, besides wedging and holding the blocks securely, they may furnish a better foothold for animals drawing heavy loads.

In the drawing, the front edge of the pavement, as shown, represents the side next the curb, or a section parallel to the curb.

It is obvious that the wedge-shaped crevices may also be formed by setting the above-described blocks so that two vertical sides and two inclined sides come together alternately, as shown in Fig. 5; and it is equally obvious that two blocks having their vertical sides together may be replaced by a single block, having two inclined faces, as shown in Fig. 6, without any material change of plan, and with a considerable saving of labor and expense in the construction.

To construct my pavement, prepare the roadway by grading it to the proper form, and ramming solid; then set the blocks as shown in Fig. 1, confining them permanently between the curbs of walks; then fill and ram the crevices with earth and gravel.

I do not claim a wood pavement composed of wedge-shaped blocks when the blocks are laid alternately on the larger and smaller ends so as to form a continuous surface of wood; but—

What I do claim, and desire to secure by Letters Patent of the United States, is—

A wood pavement composed of blocks, each side having a single plane surface, and one or more of the sides being inclined, and the blocks being so laid on their larger ends as to form wedge-shaped grooves or spaces to receive concrete or other suitable filling, substantially as set forth.

Patent No. 94,062, issued to William W. Ballard and Buren B. Waddell August 24, 1869, for "improvements in street-pavements," of which the following are the specification and claims:

Figure 1 is a perspective view of a section of pavement embracing our improvement. Fig. 2 is a perspective view of a piece of timber from which the block is cut, and showing the cuts made by the saw; and Fig. 3 is a perspective view of two of the blocks laid alongside of each other.

To more clearly illustrate our invention, we will proceed to describe the construction, &c., referring by letters to the drawings.

A represents the bed of the street, which is made slightly arched, the ends of the arch resting against the curbs B B. Strips C are laid upon said arch at right angles to the curb, and at convenient distances apart. Upon said strip is laid a flooring, composed of boards of any desired dimensions, and the blocks are then laid on this flooring in rows, and so as to break joints. These blocks are of a wedge shape, and are so laid as that their bases shall touch, forming a continuous arch across the street, and leaving V-shaped spaces between the rows. These spaces are filled with concrete, or its equivalent, and the whole surface tarred over, if thought necessary. The gutters are formed by inclining the bed slightly upward at the curb, and splitting the ends of the blocks off, to fit against the curb and the last one of the street-blocks.

The peculiarity of the blocks used in this pavement is that they are wedge-shaped, and having both sides at acute angles with the base, and the grain running parallel with one and oblique to the other of these sides.

A more perfect description of these blocks and the manner of producing them is given in another pending application, now on file in the United States Patent Office, entitled "A method of cutting blocks for street-pavements," prepared and executed by us on the 29th day of September, 1869.

The advantages of blocks having both sides beveled, with the grain running, as described, over the ordinary wedge-shaped block, are, first and most important, that only one corner of the base is at all likely to become broken off by transportation and rough handling, whereas in the ordinary block both corners are liable to such accidents. Another advantage of the relation of grain to the sides of the block is, that the V-shaped spaces have one perfectly smooth side, and consequently less opportunity is afforded to the gravel in the filling to jam, and leave the lower portion of the space loosely or entirely unfilled. This is believed to be a difficulty in pavements constructed of wedge-shaped blocks having the grain running vertically, and thereby exposing the end of the fiber on both the beveled sides of the blocks.

A pavement constructed of our improved blocks can be laid at a less cost than any other wedge-shaped pavement, owing to the cheapness of the blocks.

It has always been desirable to build pavements of wedge-shaped blocks, as they make a stronger and more durable pavement, and are more easily laid; but so far it has been impracticable, owing to the expense of producing the blocks caused by the waste in material and extra sawing.

Having described the construction and advantages of our improved pavement, what we claim as new, and desire to secure by Letters Patent, is—

1. As an article of manufacture, wedge-shaped blocks having the grain running parallel to one and oblique to the other of their beveled sides, and produced substantially in the manner referred to.

2. A wooden street-pavement constructed, substantially as hereinbefore described, of wedge-shaped blocks, with the grain running and produced in the manner and for the purpose set forth.

Patent No. 94,063, issued to said Ballard and Waddell, August 24, 1869, for "an improved mode of cutting blocks for street-pavement," of which the specification and claim are as follows:

Figure 1 represents the lumber, as the blocks are being cut off, in order to give the ends of the blocks the proper angle or bevel. Fig. 2 represents the blocks after being cut off, as above described, before splitting. Fig. 3 represents the blocks in the act of being split on a saw-table, showing the rest or guide necessary to cut them in the proper direction. Fig. 4 represents the blocks finished and placed in the pavement.

Our invention consists in a novel method of cutting and splitting blocks for wood pavement, in such a manner that two cuts, or rather one cut and one splitting, will produce two finished blocks with level top and bottom, and two sides beveled, one being with the grain and the other slightly oblique to the grain, without more waste of timber than is occasioned by the saws.

We take a piece of lumber four and a half feet long, twelve inches wide, and seven inches thick. This is placed under the saws, as shown in Fig. 1, in an inclined position, so that the first cut will produce blocks with two sides inclined, the top and bottom level, or in parallel planes. The first cut produces nine blocks, such as shown in Fig. 2, out of a piece of lumber as described above; each such block will then be twelve inches long, six inches high with the fiber, and seven inches wide across the fiber. These blocks are then split, as indicated in dotted lines, Fig. 2, slightly oblique to the fiber, as seen also in Fig. 3, being brought toward the splitting-saw in an inclined position, inclined in contradistinction to a position level at top and bottom, in such a manner that the line of the cut will form the other two beveled sides of two blocks, each of which has the top and bottom level, or in parallel planes, and the sides beveled, as shown in Fig. 4, and, moreover, has the grain running in the direction of one of the beveled sides, as clearly shown in Figs. 2 and 3. These blocks will then be twelve inches long, six inches high, three inches wide at the top, and four inches wide at the base.

The figures of feet and inches we have, of course, used only as an illustration, as different dimensions of lumber may be used; but those given will do for an ordinary street-block.

The two great advantages of this method are economy of lumber and of labor and time, the only loss of lumber being the small pieces cut off at each end to start the bevel; each two cuts, or rather one cut and one splitting, produces two complete blocks ready for use.

Having thus described our invention, what we desire to secure by Letters Patent is—

The herein-described method of cutting blocks for wooden pavement, so as to form by two cuts, or one cut and one splitting, two finished blocks with the top and bottom level, or in parallel planes, and the sides beveled, one side being inclined with the fiber, and without waste of material, substantially as set forth.

The defendant pleaded the statute of limitations, whereupon the complainant amended, and the defendant subsequently demurred, and, the demurrer being overruled, the defendant, after interposing another plea of want of notice, answered, denying that it had, in any way, violated the rights of the complainant, and, among other things, averring that all the substantial claims of complainant's alleged patents were covered by previous patents granted to Nicholson, De Golyer, Miller and Mason, Stone, Cranford, and others; and that wooden pavements, in all substantial particulars identical with those claimed by complainant, had been laid and used for more than two years before the patents were applied for, in Chicago, New York, Boston, &c., and that the alleged patents are null and void because the alleged invention is neither new nor useful.

Replication was filed and proofs taken. It appeared that Patent No. 101,590 was originally granted to Cowing, whose first application was made in November, 1865, and rejected December 27 of that year, whereupon it was amended and renewed in 1869, but the decision was that the application had been abandoned. It was afterward entertained, and was twice amended in 1870, and the patent was finally issued April 5, 1870. In the original application Cowing said as in the patent as issued:

The nature of my invention consists in providing and arranging blocks of a peculiar shape in manner to form wedge-shaped crevices for the reception of earth or gravel, and wherein such earth or gravel will be retained to act as a key to bind and confine the blocks in their place.

The amended claim of May, 1869, was:

The above-described wood pavement, constructed of rectangular blocks, having each a wedge-shaped piece cut from one of its four vertical sides to form a corresponding space for filling, and placed and filled in, substantially as set forth.

The amended claims of February 22, 1870, were:

1. A wood pavement consisting of blocks having one or more inclined sides, forming between them wedge-shaped spaces or crevices, which are filled with earth, gravel, or other suitable material, substantially as herein described.

2. In wood pavement, wedge-shaped spaces or crevices for the reception of earth, gravel, or other filling to act as a key to bind and confine the blocks in their places, substantially as described.

3. A wood-pavement block having one or more oblique or inclined sides, so as to form, when set, wedge-shaped spaces or crevices to receive earth, gravel, or other filling, substantially as set forth.

4. In wood pavement, in combination with wedge-shaped crevices above, formed by the peculiar shape of the blocks, for receiving gravel or other filling, a continuous base beneath, formed by the complete fitting together of the same blocks at the bottom, substantially as specified.

On the 31st of March, 1868, a patent was issued to Miller and Mason, of Chicago, Illinois, for "certain new and useful improvements in wood pavements," in which the claim is—

A pavement constructed of wedge-shaped blocks A, when laid so as to break joints with those of the opposite rows, in combination with a concrete filling, and in further combination with a continuous wood foundation, and so laid as to form continuous rows across the street.

It is said in the specification of that patent:

The blocks A are to be cut from plank, and are of the usual size, having the fiber vertical. The blocks of our pavement, however, differ from all other blocks in use for pavements, in having both sides beveled from top to bottom, as shown by the end view of the blocks in the drawings. The blocks thus prepared are placed in the board or plank foundation B in transverse rows. Each block may be secured to the foundation by a nail or spike, as shown at *a*. It will be observed that in consequence of the peculiar shape of the blocks those in the several rows touch each other at the bottom, but are some distance apart at the top, forming between the rows wedge-shaped channels. These channels are to be filled with concrete, or gravel and coal-tar, or other suitable substance, furnishing the necessary foothold for horses.

* * * * * * *

The blocks can be cut with less waste of material by cutting them from timber, and splitting the timber blocks with the proper bevel. This makes a strong pavement, and as the blocks have a broad base they will not cut or break the foundation when very heavily-loaded teams are driven over it.

August 20, 1867, Letters Patent were reissued to Samuel Nicholson, of Boston, for "a new and useful improved wooden pavement," the original letters having been issued August 8, 1854, and new letters issued dated December 1, 1863. The claims of the second reissue are:

1. Placing a continuous foundation or support, as above described, directly upon the roadway, then arranging thereon a series of blocks having parallel sides endwise in rows, so as to leave a continuous narrow groove or channel-way between each row, and then filling said grooves or channel-ways with broken stone, gravel and tar, or other light materials.

2. The formation of a pavement by laying a foundation directly upon the roadway, substantially as described, and then employing two sets of blocks; one, a principal set of blocks that shall form the wooden surface of the pavement when completed, and an auxiliary set of blocks or strips of board which shall form no part of the surface of the pavement, but determine the width of the groove between the principal blocks, and also the filling of said groove, when so formed, between the principal blocks, with broken stone, gravel and tar, or other light material.

3. Placing a continuous foundation or support, as above described, directly upon the roadway, and then arranging thereon a series of blocks having parallel sides endwise in a checkered manner, so as to leave a series of checkered spaces or cavities between said blocks, and then filling said checkered cavities with broken stone, gravel and tar, or other light material.

4. The formation of a pavement by laying a foundation directly upon the roadway, substantially as above described, and then employing two sets of blocks, viz., one a principal set of blocks that shall form the wooden surface of the pavement, and an auxiliary set of blocks that shall form no part of the wooden surface of the pavement, but determine the dimensions of the tessellated cavities between the principal blocks, and then filling said tessellated cavities with broken stone, gravel and tar, or other light material.

February 28, 1824, English Letters Patent were granted to A. H. Chambers for "improvements in preparing and paving horse and carriage ways," in which the nature of the invention is said to—

consist in an arrangement of conical-formed stones, or other hard mineral or silicious substances of the said form, placed on their natural bases, cemented together at their lower extremities, and having their remaining interstices filled with loose materials insoluble in water.

He describes pyramidal stones, "cut in the form represented in the drawing, and placed with their large end or natural base downward," to be grouted at their bases by a good strong cement; the upper part of the interstices that will then be left vacant to be filled "with finely-broken flints, patent English pozzolana powdered, or any other similar substance, not soluble in water."

Fig. 3 represents the stones in that form which I consider the best calculated to effect the required resistance to downward pressure, the size of which should be eight inches square at the apex, twelve inches square at the base, and ten inches high.

He explains that while stones of the shape described are the best adapted for the purpose of the pavement or carriage-way, yet to save expense use may be made for all ordinary pavements of stones as usually prepared for pavers, but taking care "always to lay their natural bases or largest end downwards, which is the exact reverse of the mode adopted by paviours;" "the upper part of the intermediate spaces or interstices aforesaid filled with powdered or finely-broken matter, not soluble in water, as aforesaid."

June 14, 1825, English Letters Patent were granted to John Lindsay for—

certain improvements in the construction or formation of the horse and carriage ways of streets, turnpike, and other roads, and an improvement or addition to wheels to be used thereon.

He says, referring to a pavement "with the common or usual sized paving-stones," that—

The method of arranging or laying them is as follows: Instead of laying them with their broadest ends upward, I lay them with the broadest ends downward, and, as each stone is made of a wedge form, this leaves a considerable space open between the stones. These I close with smaller stones of a wedge form, which, being carefully placed and well rammed down, after a sufficient quantity of fine gravel or grout has been worked between them, will make a pavement nearly as substantial as a solid sheet of granite.

In 1839, English Letters Patent were issued to Richard Hodgson for "improvements in the forms or shapes of materials and substances used for building and paving and in their combinations for such purposes," in which he describes an invention consisting in forming and shaping materials and substances according to a new section of the cube obtained by dividing the cube into eight equal prisms or parts, &c., the shapes and forms described, with their combinations, being "applicable generally to materials and substances employed in building and paving, whether of stone, iron, bricks, or wood." The shapes in the case of stone, marble, &c., are "to be formed by sawing or cutting the same out of the full size of the cube and leaving them entire in their relative dimensions, so as to be ready to be placed together either horizontally, vertically, or obliquely, as the case may require," while for "wood paving a peculiar disposition of the materials or blocks thus shaped, and, if necessary, pegged or doweled, will be required," &c. The blocks may be packed up together in the workshop in masses, so as to be laid down more speedily on the ground, where they must be fastened together with pegs or with any bituminous compound usually employed for similar purposes. They must be placed nearly vertically, as the tree grows, and according to the traffic the depth or substance of the wood pavement must be increased or diminished. They may in most cases be laid across the street from side to side, but, when necessary, in a diagonal line.

Defendant introduced various Letters Patent, to wit: For improvement in "the machine for resawing boards and other timber," (issued to Crosby, 1841;) for "improvements in saw-mills, for curved and bevel sawing, but which may also be used for rectilinear sawing," (issued to Normand, 1854;) for "a new and improved mode of sawing stone or marble into tapering and other forms," (issued to McBird, 1856;) for "an adjustable table for reciprocating saws," "whereby the proper bevel may be imparted to the ribs of vessels and other objects with accuracy and facility," (issued to Hinchman, 1863;) for "improvement in the manufacture of siding," (issued to Millengar, 1864;) for "an improved saw-mill," "so as to cut ship-timbers and other irregular forms," (issued to Wright and Molyneux, 1865;) and also extracts from a volume entitled "Turning and Mechanical Manipulation," by Charles Holtzapffel, London, 1847.

These extracts treat of cutting, by means of guides, rectangular pieces from the end of a long bar, and rhomboidal pieces of any angle and magnitude; the sawing of small pieces into regular and irregular polygons of any particular angles and numbers of sides; the cutting of miters, &c.; the sawing beveled edges and oblique prisms or those in which the angular variations are in the vertical plane, rhomboids, or squares.

When the pieces are parallel in one direction and beveled in the other, they may be cut out without any waste beyond that arising from the passage of the saw.

Figure 743 shows a method of cutting blocks at one cut for each piece, into rhombuses, which are shown separately at *a*, which blocks can be afterward divided into two, so as to make triangular-shaped blocks such as are shown at *c*.

At the hearing in special term the bill was dismissed, and the decree being affirmed in general term, the complainant has prosecuted his appeal to this court.

The opinion of Judge Cox at special term was adopted by the court in general term, (Cartter, C. J., Hagner and James, JJ.,) and from it it appears that it was held that no case of actionable infringement was made out as to No. 94,063, and that Nos. 94,062 and 101,590 were void for want of patentable novelty. (*Brown* v. *District of Columbia*, 3 Mackey, 502.)

Mr. C. C. Cole, *Mr. A. S. Worthington*, and *Mr. William E. Mason* for the appellants.

Mr. H. E. Davis for the appellee.

Mr. Chief Justice FULLER delivered the opinion of the Court:

Was a wood pavement "composed of blocks, each side having a single plain surface and one or more of the sides being inclined, and the blocks being so laid on their larger ends as to form wedge-shaped grooves or spaces to receive concrete or other suitable filling," patentable April 5, 1870, in view of the state of the art?

Chambers had, in 1824, described a pavement of pyramidal stones, twelve inches square at the base, eight inches square at the apex, and ten inches high, placed with their larger end downward, and the interstices filled with loose materials insoluble in water.

Lindsay's invention, in 1825, comprised stones made of a wedge-shaped form, laid with their broadest ends downward, leaving a considerable space between them to be closed with smaller wedge-formed stones, with fine gravel or grout worked between them.

Nicholson's pavement was composed of blocks of wood laid in rows across the street, with spaces obtained by interposing narrow wooden strips between the blocks, to be filled with concrete or other suitable filling.

Cowing disclaimed "a wood pavement composed of wedge-shaped blocks when the blocks are laid alternately on larger and smaller ends, so as to form a continuous surface of wood," but claimed the arrangement of the blocks so as to leave wedge-shaped spaces to receive filling to act as a key to bind the blocks together. But reference to these prior patents clearly shows that the formation of wedge-shaped spaces to receive concrete or other filling by laying blocks with one or more inclined sides with their larger ends downward, the filling acting as a key, and the use of wooden blocks in that way, were well known at the time of the alleged invention under consideration.

The blocks of the Lindsay patent are of the same shape as those of Cowing, but are of stone, while the latter are of wood, but this was nothing more than the substitution of one material for another without involving a new mode of construction, or developing anything substantially new in the resulting pavement. (*Hotchkiss* v. *Greenwood*, 11 How., 248; *Hicks* v. *Kelsey*, 18 Wall., 670; *Smith* v. *Goodyear Dental Vulcanite Co.*, 93 U. S., 486; *Phillips* v. *Detroit*, 111 U. S., 604.)

The filling under Lindsay's patent was with small stones, fine gravel, or grout, while Cowing names a filling of earth, gravel, or some other similar substance, but Nicholson used broken stone, gravel and tar, or other light material, being the same filling for the same purpose and with substantially the same result, while the material of the Nicholson block was the same as that of Cowing.

It is argued that gravel and similar substances cannot be forced into the stone blocks of the Chambers and Lindsay patents, and that in ramming gravel between wooden blocks it of necessity indents the blocks, and the filling must adhere much more firmly than would be the case if they were stone. There is nothing said about this by Cowing in his specification, but he is entitled, if this is an advantage directly following from the alleged invention as described, to the benefit of it, whether he perceived it or not. (*Stow* v. *Chicago*, 104 U. S., 547, 550.) The same effect, however, would be obtained in ramming filling between the blocks of any wooden pavement, and the same liability of the filling "to extend laterally into the fiber of the wood and seat itself therein" is found in the Nicholson pavement.

In the Chambers patent the blocks had four inclined sides, which would make the filled space run lengthwise as well as crosswise. In the Cowing patent the crevices run lengthwise "across the direction of the street or road."

As Cowing's combination simply embraces blocks of the same shape and material, and similar filling, applied in substantially the same way and producing substantially the same results as in the prior patents referred to, it cannot be regarded as possessing patentable novelty.

The first claim of Patent No. 94,062 covers, as an article of manufacture—

wedge-shaped blocks having the grain running parallel to one and oblique to the other of their beveled sides, and produced substantially in the manner referred to.

The second is—

a wooden street-pavement constructed, substantially as hereinbefore described, of wedge-shaped blocks with the grain running and produced in the manner and for the purposes set forth.

The original application of Ballard was filed June 15, 1869, and rejected by Examiner Spear upon the ground that the claim was essentially the same as that in No. 94,063, which was for a mode of cutting blocks. It was then amended and again rejected, the examiner saying:

It is admitted that there is no difference between the blocks of applicant and those of Miller and Mason in configuration, nor is any difference claimed of functions. These blocks and those of the patent referred to, once laid, would be indistinguishable, serving, under the same conditions, precisely the same purposes and wearing equally as long. The difference lies in the mode of cutting, by which not a different block is produced, but the same block is cut with a minimum of waste of material.

From this decision an appeal was taken to the Examiners-in-Chief, who affirmed the ruling, holding that—

the trouble with the present application appears to be that the specification and claim merely set forth and embrace a paving-block and the use thereof, having a certain form and being so cut that the grain will run in certain angles with the sides, or parallel thereto, and without any reference to the mode and manner of manufacturing. Blocks having all the peculiarities set forth may be manufactured without resorting to the method by which it seems the ones described in the application were made; and it does not follow, therefore, that the block described and claimed is the new article of manufacture produced by the

new invention, nor is it at all material whether the grain runs as set forth or the blocks have the precise form described. Therefore these peculiarities are not the patentable features of the invention; they merely result from the invention.

The application was then renewed by Ballard and Waddell with the result before us, but it is plain that the patent was granted for novelty in the method of making the block and not in the block itself, nor in a wooden street-pavement so constructed. It is not denied that the Ballard block is identical in shape with those set forth in the Cowing, Chambers, Lindsay, and Miller and Mason patents, but it is claimed that a difference exists between it and that of Miller and Mason in the arrangement of the grain, namely, running parallel with one and oblique to the other of its beveled sides.

We can discover nothing materially different in the practical result of having the grain run in this way, and no material difference is disclosed by the evidence.

The specification asserts that the gravel in the filling is not so liable to jam and leave the lower portion of the space loosely or entirely unfilled, where the blocks have one perfectly smooth side, and that "only one corner of the base is at all likely to become broken off by transportation and rough handling, whereas in the ordinary block both corners are liable to such accidents;" but, as appears from the evidence, "if the blocks are cut with the grain in the manner described in said patent, although one side is not so likely to break off as the other, yet the side that has the grain oblique to it is twice as likely to be broken off as the blocks made in the ordinary way, that is, with the grain vertical," and "the effect of the smooth side of one block, if there were such an alleged advantage in said side, would be fully recompensed by the additional roughness of the other side;" and it would seem that the durability of the block is less where the grain is inclined than where it is vertical. It is fully shown in an elaborate report upon wood paving, quoted from in the evidence, and which, it is testified, agrees with general experience, that vertical-fiber blocks have far greater power of resistance than blocks with fibers horizontal, and with fibers at various degrees of inclination.

The manner of laying the blocks is substantially the same as in prior pavements.

The process of making the block is given in Patent No. 94,063, the claim of which is—

The herein-described method of cutting blocks for wooden pavement, so as to form by two cuts, or one cut and one splitting, two finished blocks with top and bottom level, or in parallel planes, and the sides beveled, one side being inclined with the fiber, and without waste of material, substantially as set forth.

From what we have said it will be perceived that this claim and the first claim of Patent No. 94,062 must be considered together. The manner of producing these blocks is described as cutting them from lumber by means of guides so as to cut the blocks of certain bevels, by which a block is produced having two of its sides inclined and with the grain running parallel to one and oblique to the other of the beveled sides; but the essential features of the apparatus described in this patent appear in many of the defendant's exhibits. Instead of having a table parallel with the shaft of the saw or at right angles with the saw itself, the patent in question uses a rest or guide in presenting the material to the saws, but the use of such guides is shown in Holtzapffel's "Turning and Mechanical Manipulation," and Crosby's patent and others.

The prior existence of the method of cutting blocks without waste by severing a large block by a cross cut from a long stick and then dividing that block into two similar blocks by a splitting cut is satisfactorily established, as also the same result reached in the same way in the treatment of stone. In the case of the Ballard block, the splitting cut is made in a direction parallel with the grain; but that is because the object of having the grain run in a particular way controls the action of the mechanic, who makes the cut as he desires the fiber to run.

Complainant's expert admits that the patentee in the McBird patent, by the first cut he makes, produces a block of rhomboidal form, and, by a second oblique cut, divides his block into two equal wedge-shaped blocks, produced without waste of material; and the difference he points out between that and the Ballard and Waddell patent is, so far as the cutting operation is concerned, that in the former the cut which divides the rhomboid into two wedge-shaped blocks is made across the grain, while in the latter it is made in the general direction of the grain.

To cut the block so as to get the grain in a particular way, and so as to avoid waste, requires simple mechanical skill, without involving invention. The result is that none of these claims can be sustained, and the decree of the court below is affirmed.

Supreme Court of the United States.

BÉNÉ *et al.* *v.* JEANTET.

Decided March 5, 1889.

1. BÉNÉ—PROCESS OF REFINING AND BLEACHING HAIR.
   Reissued Letters Patent No. 8,637, granted March 25, 1879, to John Béné, for an improvement in the process of refining and bleaching hair, *Held*, except as to the second claim, not full and clear enough to give one skilled in chemistry such an idea of the particular kinds and character of the chemicals or combination of chemicals, with the relative proportions of each, as would enable him to use the invention without having to resort to experiments of his own to discover the ingredients.
2. CONSTRUCTION AND LIMITATION OF PATENT.
   The patent limited to the second claim is to be construed as one for a process of refining hair by treating it in a bath composed of a solution of chlorine salt dissolved in an excess of muriatic acid, and the claims are to be limited accordingly.
3. INFRINGEMENT.
   Thus limited and construed the patent is not infringed, and the allegation that the product cannot be produced except by treating the hair in a bath composed of chlorine salt dissolved in an excess of muriatic acid, or a solution of their (chemical) equivalents, is not established.

APPEAL from the Circuit Court of the United States for the Southern District of New York.

Mr. Samuel George Smith for the appellant.
Mr. William P. S. Melvin for the appellee.

Mr. Justice LAMAR delivered the opinion of the Court.

This is a suit in equity, brought in the Circuit Court of the United States for the Southern District of New York, by John Béné and Adolph Grünberg against Emile Jeantet, praying an injunction, accounting, and damages for an alleged infringement of Reissued Letters Patent No. 8,637, granted to Béné March 25, 1879, on an application filed March 4, 1879, for an improvement in the process of refining and bleaching hair.

Counsel for complainant stated in the record that no claim is made in this suit for the bleaching of hair except so far as the bleaching may result incidentally from the process of refining; and the only issue presented by the pleadings, therefore, relates to the question of infringement so far as the process of refining hair is concerned, there being no issue raised as to the validity of the patent in any respect.

The nature and object of the invention are set forth in the specification as follows:

This invention relates to the treatment of all kinds of coarse hair, which, in its natural state, has little commercial value, and is entirely unfit for toilet uses and purposes.
The said treatment serves, mainly, to refine the hair or reduce the diameter of the hairs, and to render them more pliable and glossy; but it also serves to partially bleach the hair or lighten its color or tint, and fit it to pass through any of the ordinary dyeing processes, whereby it may be given any shade or color desired or possible.
In carrying out my invention, for the purpose of producing from the coarse, harsh hair above mentioned a soft, pliable hair of fine texture, I treat the said coarse hair to a bath composed of such chemicals or chemical substances as will dissolve away a portion of the surface of each hair, and thus reduce its diameter.
I find that a solution of a chlorine salt dissolved in an excess of muriatic acid serves my purpose as a bath for this refining treatment. * * *
I claim as my invention—
1. The method of refining all grades of coarse hair, which consists in subjecting it to the action of chemicals, whereby the surface of each hair is corroded or dissolved away and its diameter reduced, substantially as set forth.
2. The method of refining coarse hair, which consists in subjecting it to the action of a bath composed of muriatic acid, in which is dissolved a chlorine salt, substantially as set forth.
3. The method of refining and bleaching all kinds and grades of coarse hair, which consists, first, in bathing and manipulating the same in a chemical bath composed of acid and a chlorine salt, and then in a bleaching-bath composed of acids and bichromate of potash, substantially as and for the purposes set forth.
4. The method of refining and bleaching all kinds and grades of coarse hair, which consists, first, in bathing and manipulating the same in a bath composed of acid and a chlorine salt, which refines the hair; second, subjecting the refined hair to a bath composed of acids and bichromate of potash; and, third, subjecting the hair thus refined and bleached to the proper shade to a fixing-bath composed of warm water, solution of muriate of tin, bisulphite of soda, and muriatic acid, which sets the color, substantially as set forth.
5. The method of refining and treating hair, which consists in first passing it through a refining-bath composed of an acid and a chlorine salt; then, if desired or necessary, through bleaching and fixing baths, as above described, and finally treating the hair so refined to a bath composed of water and ammonia, to remove all of its impurities, substantially as specified.
6. As a new article of commerce and manufacture, hair of fine texture produced from any grade of coarse hair, either animal or human, by the method of refining, substantially as herein described.

The court below held that were it not for the latter part of this description the specification would fail to comply with the statute, and would be void for uncertainty. It therefore limited the patentee to his second claim, and accordingly ruled that under this specification—

the patent is to be construed as one for a process of refining hair by treating it in a bath composed of a solution of chlorine salt dissolved in an excess of muriatic acid, and the claims are to be limited accordingly.

The court further found from the evidence produced in the case that the alleged infringement, the sole issue presented by the pleadings, had not been proven, and, therefore, dismissed the bill without prejudice to the right of the complainants to bring an action at law if they were so advised. An appeal from this decree brings the case here.

Under section 4888 Rev. Stat. the specification must describe the invention and the manner and process of—

making, constructing, compounding, and using it in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains * * * to make, construct, compound, and use the same.

Tested by this requirement, the patent in suit cannot receive the broad construction for which complainants contend. Except as applicable to the second claim, the specification is not full and clear enough to give one skilled in chemistry such an idea of the particular kinds and character of the chemicals, or combination of chemicals, with the relative proportions of each, as would enable him to use the invention without having to resort to experiments of his own to discover those ingredients. The broad construction claimed for this patent as a pioneer and foundation invention in the art of refining hair cannot extend the rights of the patentee beyond the compositions of matter and processes which, as stated in the patent, embody his real invention. It is true, as appears upon the pleadings, that the appellant Béné was the first discoverer of a process of refining hair, and his patent, therefore, is entitled, within the limits just indicated, to a liberal construction. If, therefore, it was proved that the hair dealt in by the defendant was refined by substantially the same chemical action as that set forth in the second claim, the fact of infringement was established, and the complainants were entitled to the decree prayed for.

Upon the trial no direct testimony was offered by plaintiffs to show that the articles dealt in by the defendant were treated or refined by the patented process. The only fact upon which the plaintiffs relied was the correspondence of the articles proved to have been sold by defendant, in respect of smoothness, luster, and pliability, with the hair produced according to the patented process; which correspondence, it was contended, showed that both products resulted from the same method or equivalent method of preparation; and it was further insisted that the court was bound from that fact to conclude that refined hair, like that in question, could not be produced except by treating it in a bath composed of a solution of chlorine salt dissolved in an excess of muriatic acid, or a solution of their (chemical) equivalents. To support this contention the plaintiff introduced an expert, Nathaniel S. Keith, who states that, while he had never attended any lectures on the subject of chemistry, he had pursued his studies in the chemical laboratory of his father, a practicing physician and a manufacturing chemist. He had given hair special consideration during three or four years past, and had made experiments upon the processes of refining and bleaching hair with reference to this suit and another legal controversy. In his testimony he asserts, substantially, that the defendant's article cannot be produced, except by a treatment in a solution of chlorine salt and muriatic acid, or their (chemical) equivalents. In response to the question—

What other substance is there, if any, except chlorine and its compounds, which will corrode or dissolve away the surface of the hair so as to reduce the size or diameter without essentially destroying the hair?

He answers—

I have no knowledge of any other.

Again—

My opinion is, that any method under which, by the action of chemicals, the surface of hair is dissolved or corroded away so as to reduce its diameter, comes within the province, or falls within one or more of the claims, of the said patent.

To repel this contention the defendant called as an expert witness one Charles Marchand, who stated that he had been engaged in chemical studies for twenty-four years, having graduated at a school of arts and manufactures in Paris in 1871, from which time his business had been that of a manufacturing chemist, to which, after he came to this country in 1878, he added the occupation of analytical chemist. He testifies that in his studies and business he has had much to do with bleaching and refining human hair, and other hair; has known for many years oxidizing agencies for bleaching or refining hair; first saw hair reduced in diameter by the use of chemicals twelve years ago in Paris by a chemist; and that he had made a number of experiments in the treatment of hair by subjecting it to a refining process entirely different from that described in the patent; and in corroboration of his testimony he produced several samples of refined hair, which he stated he had refined by the use of different chemicals from those mentioned in the patent. The first was treated by a chlorine gas solution in pure water, and then by a solution of peroxide of hydrogen. The second was a solution of permanganate of potash in water with sulphuric acid and muriatic acid in proper proportions. The third was a solution of sulphurous acid in water, and also a solution of permanganate of potash. The fourth was treated by one of the same methods. Another specimen was treated by a concentration of peroxide of hydrogen.

To break the force of this testimony, Keith was recalled, and, upon many points, contradicted Marchand's statements. He testified that he had made experiments according to the methods described by Marchand, and found them failures, and the hair subjected to them worthless and unrefined. The testimony of these two witnesses is conflicting. But the testimony of Marchand relates to facts declared to be within his knowledge and experience; while that of Keith is largely the assertion of a theory and a presentation of arguments to show that the facts testified to by Marchand cannot exist. The experiments which Keith said he had made according to Marchand's formula, and which failed to produce refined hair, were, as he admitted, his first experiments for that purpose; while those made by Marchand were the results of twelve years of practice, and attested themselves by the specimens produced.

We think the complainants did not make out a case of infringement. There is not a preponderance of evidence in their favor. The decree of the circuit court is therefore affirmed.

U. S. Circuit Court—Northern District of New York.

SARGENT *et al. v.* JENKINS *et al.*

Decided March 21, 1889.

INJUNCTION.

Motion for injunction to enjoin defendants from manufacturing wash-boards which infringe the patent to Gorham (No. 228,338, dated January 8, 1880) granted. (Sargent *et al. v.* Burgess, 46 O. G., 693, referred to.)

WALLACE, *J.*:

The wash-boards which the defendants are manufacturing embody the invention specified in the first and second claims of the patent to Gorham, and the motion for a preliminary injunction should be granted unless there is a serious question of the novelty of the subject-matter of those claims.

The essential feature of the wash-board of those claims is a protector, (to shield the operator from getting wet,) which yields to pressure and returns to its normal position automatically when the pressure is removed. In the second claim the spring is the device which gives the elastic or resilient quality to the protector; but the patentee states that he is not to be confined to any specific form of device, and consequently the first claim should be interpreted broadly to include any wash-board having a protector, whether with or without a spring, which is so constructed as to bend or yield to pressure and return when the pressure is removed.

If the patent to Frike describes a wash-board having a protector that possesses this function and yields to pressure and returns automatically on its pivot by gravity, the first claim is anticipated, and, as the substitution of the spring for the weight would not involve invention, the second claim would also be invalid. The protector of the Frike patent, however, is not of that character. There is no suggestion in the specification that it is to return to its position by gravity, or by any instrumentality except by the hand of the operator. It is designed exclusively for a wash-board having a double face, and is constructed so as to afford a broad surface to support the operator (and protect him from getting wet) until he desires to use the other side of the wash-board, when by tilting it over he can transfer it for use upon that side. It belongs to the second class of protectors referred to in Gorham's patent as not embodying his invention.

The Frike patent was before the Supreme Court in the suit upon the complainants' patent against Burgess, and is referred to in the opinion. In the opinion the Court say that but for the yielding or resilient function of Gorham's protector it would be questionable whether his patent would be valid.

It is fairly to be assumed that the Supreme Court did not consider the Frike patent an anticipation of either of the claims of the Gorham patent, and that the Court were of the opinion that the patent to Gorham was a valid one.

The motion for an injunction is granted.

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Changes in Classification.

(ORDER No. 543.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., April 16, 1889.

It is directed that in Division III the title of Class 148, "Metal Tempering, Annealing, and Cementation," be changed to *Annealing and Tempering.*

Under Class 148, the following sub-classes are hereby abolished:

9. Tempering and annealing—
11. Compositions,
3. Metals generally,
4. Sheet and plate metal,
5. Wheels and tires,
6. Wire and springs.

And the following sub-classes are hereby established:

Annealing apparatus—
Boxes and pots,
Clamps,
Muffles,
Ovens,
Ovens, rotary hearths,
Pits,
Wire and springs.
Annealing processes—
Drawing temper,
Gas,
Toughening.
Cementation and case-hardening compounds—
Gaseous,
Liquids.
Glass-annealing, flattening-tables—
Hearths,
Leers,
Leers, grids,
Muffles,
Processes.
Hardening apparatus—
Bands and wire,
Clamps.
Hardening processes—
Solutions,
Molten metal.

Under Class 75, the following sub-classes are abolished:

Metallurgy—
Leers,
Leers, grids.

And the following sub-classes are established:

Converters, fixed—
Furnace,
Runways,
Sectional,
Tuyeres and bottoms.
Spelter, processes—
Retorts,
Stacks.

The title of sub-class "Revolving Roasters" is changed to *Roasters, Revolving Cylinders.*

ROBERT J. FISHER,
Assistant Commissioner.

47 O G—4—i

Issue of April 23, 1889.

Patents	397—No.	401,728 to No. 402,124, inclusive.
Designs	8—No.	19,033 to No. 19,060, inclusive.
Trade-Marks	29—No.	16,503 to No. 16,531, inclusive.
Labels	18—No.	5,876 to No. 5,893, inclusive.
Reissues	2—No.	10,996 to No. 10,997, inclusive.
Total issue	454	

TO CITIZENS OF THE UNITED STATES.

States.	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	1	Nebraska	2	1
Arizona Territory			Nevada		
Arkansas	4		New Hampshire	3	
California	11	1	New Jersey	15	1
Colorado	3	1	New Mexico Terr'y.		
Connecticut	10		New York	67	14
Dakota Territory	3		North Carolina	1	
Delaware	1		Ohio	20	2
District of Columbia	3		Oregon	2	
Florida	1	1	Pennsylvania	40	3
Georgia	3		Rhode Island	7	1
Idaho Territory	1		South Carolina		
Illinois	24	1	Tennessee	2	
Indiana	13		Texas	5	1
Iowa	6		Utah Territory		1
Kansas	12	1	Vermont	3	
Kentucky	7	2	Virginia	2	
Louisiana	5	5	Washington Terr'y.		
Maine	1		West Virginia	2	
Maryland	9	1	Wisconsin	8	1
Massachusetts	44	4	Wyoming Terr'y.		
Michigan	9		U. S. Army		
Minnesota	5		U. S. Navy		
Mississippi					
Missouri	10	2	Total to citizens of the United States	377	45
Montana Territory					

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Australia			Germany	6	1
Austria-Hungary			India		
Barbadoes			Hawaii		
Belgium			Mexico		
Brazil			Netherlands		
Canada	4		Russia		
Canary Islands			Scotland	1	
Colombia, U. S. of			Sweden		
Cuba	1		Switzerland	1	
Denmark			Victoria		
Ecuador					
England	11		Total to citizens of foreign countries	28	2
France	4	1			

DESIGNS.

19,033.—ORNAMENTATION OF GLASSWARE.—*William C. Anderson*, Toledo, Ohio, assignor to *The W. L. Libbey & Son Company*, same place. Application filed January 21, 1889. Serial No. 297,100. Term of patent 7 years.

19,034.—WINDOW-GLASS.—*William Buttler*, Fostoria, Ohio, assignor to *The Buttler Art Glass Company*, same place. Application filed March 30, 1889. Serial No. 305,456. Term of patent 7 years.

19,055.—BUILDING-BRICK.—*William H. Fish*, Columbus, Ohio. Application filed November 28, 1888. Serial No. 292,183. Term of patent 14 years.

19,056.—AX.—*William C. Kelly*, Louisville, Ky. Application filed February 19, 1889. Serial No. 300,491. Term of patent 14 years.

19,057 and 19,058.—KNITTED FABRIC.—*George D. Kinsey*, Brooklyn, N. Y., assignor to *The Australian Knitting Company*, Paterson, N. J. Applications filed March 7, 1889. Serial Nos. 302,338 and 302,337. Term of patents 7 years.

19,059.—BRETZEL OR CRACKER.—*Eugene H. Sandt*, Allentown, Pa. Application filed March 30, 1889. Serial No. 305,467. Term of patent 7 years.

19,060.—STRENGTH-TESTER CASING.—*Gustav Soeding*, Philadelphia, Pa. Application filed March 18, 1889. Serial No. 303,782. Term of patent 14 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,503.—MEDICINAL LOTION.—*Theodore Angelo*, New York, N. Y. Application filed March 13, 1889. Used since January 7, 1889.
"The word 'BENZOINOL.'"

16,504.—WHISKY.—*Belmont Distillery Company*, Louisville, Ky. Application filed October 29, 1888. Used since November, 1880.
"The representation of a bell having a scroll containing the word 'BELMONT' arranged across the top thereof."

16,505.—KNITTED SHIRTS, DRAWERS, OVERSHIRTS, BLOUSES, AND JACKETS.—*Suits Condé*, Oswego, N. Y. Application filed February 18, 1889. Used since January 1, 1881.
"The letters 'S. C.'"

16,506.—TIMOTHY-SEEDS.—*Conklin & Mersereau*, Binghamton, N. Y. Application filed February 27, 1889. Used since March 1, 1884.
"The representation of a star arranged within a shield."

16,507.—WHISKY.—*Joseph Cornibé*, New Orleans, La. Application filed January 23, 1889. Used since November, 1884.
"The figure of Justice."

16,508.—WHIPS.—*Henry S. Cushman*, Milford, Mass. Application filed March 13, 1889. Used since August 1, 1888.
"The word 'PARADOX.'"

16,509.—SIRUPS AND ROCK-CANDY.—*Dryden & Palmer*, Baltimore, Md. Application filed March 13, 1889. Used since March 1, 1880.
"The word 'CHESAPEAKE.'"

16,510.—HAIR-RESTORATIVE.—*Julius Falke*, St. Louis, Mo. Application filed March 27, 1889. Used since December, 1886.
"The figures, words, and letters '3 K-K-K 3 HAIR RESTORATIVE' and the picture of a bird inscribed 'THE FALKE LEADS THEM ALL.'"

16,511.—HAY ELEVATORS OR CARRIERS.—*Manlas G. Grosscup*, Milwaukee, Wis. Application filed February 19, 1889. Used since July 1, 1886.
"The word 'JUMBO.'"

16,512.—[Withdrawn.]

16,513.—CIGARS, CIGARETTES, AND CHEROOTS.—*L. Kahner & Co.*, New York, N. Y. Application filed March 5, 1889. Used since December 1, 1868.
"The word 'METROPOLIS' and the representation of a bird's-eye view of Manhattan Island."

16,514.—ANTI-SUDORIFIC POWDER.—*Naum Khasan*, New York, N. Y. Application filed February 26, 1889. Used since January 1, 1889.
"The figure of a woman downward to the waist, with the hands upon the top of the head, and the word-symbols 'KHASAN'S SANTIN.'"

16,515.—CORSETS.—*H. C. F. Koch & Co.*, New York, N. Y. Application filed March 13, 1889. Used since February 9, 1889.
"The word 'ELAINE.'"

16,516.—PERFUMERY.—*Ladd & Coffin*, New York, N. Y. Application filed March 16, 1889. Used since October 1, 1887.
"A combination of the letters and character 'L & C.'"

16,517.—SHIRTINGS, SHEETINGS, GINGHAMS, TICKINGS, CHEVIOTS, AND PRINTS.—*Lewis Bros. & Co.*, New York, N. Y. Application filed March 2, 1889. Used since February 12, 1889.
"The word 'NANTUCK.'"

16,518.—ANTISEPTIC POWDER.—*Nelson A. Lloyd* and *Curtis G. Lloyd*, Cincinnati, Ohio. Application filed May 19, 1888. Used since November, 1887.
"The word 'ASEPSIN.'"

16,519.—BLEACHED, COLORED, AND PRINTED COTTON FABRICS.—*Miller, Kaster & Co.*, New York, N. Y. Application filed March 13, 1889. Used since July 15, 1888.
"The words 'SANS PAREIL.'"

16,520.—BONE FERTILIZERS.—*H. S. Miller & Co.*, Newark, N. J., and Baltimore, Md. Application filed August 4, 1888. Used since December 15, 1887.
"A circular band or figure inclosing a white ground, on which latter appear words printed in letters contrasting with said ground and circular figure or band, the said band and words being printed in red and blue and contrasting with one another."

16,521.—RUBBER-STONES FOR CLEANING AND POLISHING.—*Joseph J. Murphy* and *John W. Mosier*, Louisville, Ky., and Chicago, Ill. Application filed March 14, 1889. Used since June 2, 1887.
"The word 'EUREKA.'"

16,522.—PIPES, CIGAR AND CIGARETTE HOLDERS, AND CIGARETTE-PAPER.—*Quentin & Co.*, Paris, France. Application filed August 20, 1888. Used since January, 1888.
"A representation of the sun together with the letters 'J' and 'G.'"

16,523.—ALCOHOLIC LIQUORS.—*Harry Rab* and *Gustavus Rab*, Denver, Colo. Application filed December 8, 1888. Used since November 1, 1885.
"The representation of a windmill."

16,524.—IMPREGNATED CANVAS, LINEN, AND CLOTH FOR ROOFING.—*F. Reddaway & Co.*, Hamburg, Germany. Application filed March 11, 1889. Used since January 1, 1869.
"The word 'ANTI-ELEMENTUM' and a scroll having the picture of a house upon it."

16,525.—ORANGES, LEMONS, AND PRODUCTS OF THE CITRUS FAMILY.—*Henry S. Sanford*, Sanford, Fla. Application filed March 9, 1889. Used since 1880.
"The word 'BELAIR.'"

16,526.—AERATED TONIC BEVERAGE.—*Clara H. Schmidt* and *Walter B. Starbird*, Stockton, Cal. Application filed March 9, 1889. Used since October 1, 1888.
"The word 'ORANGINE' and the fac-simile signature 'SCHMIDT & Co.'"

16,527.—LAUNDRY AND TOILET SOAP.—*Schultz & Co.*, Zanesville, Ohio. Application filed March 11, 1889. Used since January 30, 1889.
"The word 'DUCK.'"

16,528.—OUTER GARMENTS.—*Forrest F. Tebbetts*, Providence, R. I. Application filed March 18, 1889. Used since September 15, 1888.
"The representation of a bear."

16,529.—PETROLEUM LUBRICATING-OIL.—*Vacuum Oil Company*, Rochester, N. Y. Application filed March 11, 1889. Used since December 1, 1888.
"The word 'ZETA.'"

16,530.—HARNESS AND HORSE-BLANKETS.—*J. Newton Van Ness & Co.*, New York, N. Y. Application filed February 19, 1889. Used since February 1, 1889.
"The representation of a horseshoe and an equestrian scene within the same."

16,531.—PERFUMES, PERFUMED WATERS, AND BAY-RUM, ALSO SOAPS, POWDERS, AND COSMETICS.—*John Wanamaker*, Philadelphia, Pa. Application filed June 25, 1888. Used since January 1, 1881.
"The words 'THE QUEEN MARY.'"

LABELS.

5,876.—Title: "ANGIER'S PETROLEUM PASTILLES" (FOR A MEDICINE.) *Angier Chemical Company*, Newton and Boston, Mass. Application filed April 1, 1889.

5,877.—Title: "GERMAN FRESH ROASTED COFFEE."—*The Consolidated Coffee Company*, Omaha, Nebr. Application filed March 30, 1889.

5,878.—Title: "THE COTTON OIL PRODUCT CO'S COTTON SEED LARD—A VEGETABLE LARD."—*The Cotton Oil Product Company*, New York, N. Y. Application filed March 26, 1889.

5,879.—Title: "VIBRATING" (FOR WIND MUSICAL INSTRUMENTS.)—*Henry J. Distin*, Philadelphia, Pa. Application filed April 1, 1889.

5,880.—Title: "HOG CHOLERA CURE AND PREVENTIVE AND INSECT DESTROYER."—*J. M. Ellerd*, Lindale, Tex. Application filed February 27, 1889.

5,881.—Title: "ACACINE THE PERFECT EMULSIFIER" (FOR MEDICINES.)—*James G. Flint*, Fort Scott, Kans. Application filed March 8, 1889.

5,882.—Title: "HEILNER'S SURE CURE FOR MALARIA."—*Abraham M. Heilner*, New York, N. Y. Application filed March 28, 1889.

5,883.—Title: "KIRTLEY'S FIRE BALL" (FOR A FIRE EXTINGUISHER.) *William F. Kirtley*, Quincy, Ill. Application filed March 18, 1889.

5,884.—Title: "COCOANUT TAFFY" (FOR BISCUITS.)—*Justin J. Langlés*, New Orleans, La. Application filed March 14, 1889.

5,885.—Title: "PEOPLES MIXED" (FOR BISCUIT.)—*Justin J. Langlés*, New Orleans, La. Application filed March 28, 1889.

5,886.—Title: "RICH LUNCH" (FOR BISCUITS.)—*Justin J. Langlés*, New Orleans, La. Application filed March 28, 1889.

5,887.—Title: "DESSERT MIXED" (FOR BISCUITS.)—*Justin J. Langlés*, New Orleans, La. Application filed March 28, 1889.

5,888.—Title: "CONSOLS" (FOR CIGARS AND CIGARETTES.)—*The Consolidated Cigarette Company*, New York, N. Y. Application filed March 26, 1889. (Trade-Mark Registered.)

5,889.—Title: "WHITE WAINSCOTING" (FOR A VARNISH.)—*Theodore T. Lines*, Philadelphia, Pa. Application filed March 27, 1889.

5,890.—Title: "OWEN'S PINK MIXTURE" (FOR MEDICAL COMPOUND.) *J. H. Owen* and *R. H. Wilhoyte*, Sheffield, Ala. Application filed January 22, 1889.

5,891.—Title: "PAIN EXTERMINATOR" (FOR A LINIMENT.)—*William L. Robinson*, East Somerville, Mass. Application filed March 28, 1889.

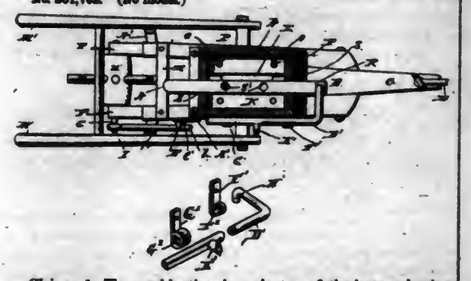
5,892.—Title: "ALL HEALING SALVE."—*William L. Robinson*, East Somerville, Mass. Application filed March 28, 1889.

5,893.—Title: "WHITTAKER'S COUGH SYRUP."—*James Whittaker*, Silver City, Utah Ter. Application filed March 1, 1889.

PATENTS

GRANTED APRIL 23, 1889.

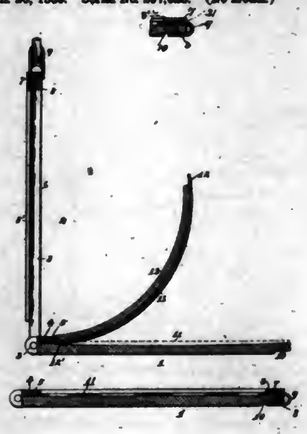
401,728. CORN AND COTTON PLANTER. JOHN J. ARMSTRONG and ANDREW S. LOWREY, Weimar, Tex. Filed Aug. 2, 1888. Serial No. 281,782. (No model.)



Claims.—1. The combination, in a planter, of the hopper having the plates F G on one side at its front and rear ends, respectively, said plates being provided, respectively, with cylindrical and rectangular guides or bearings F^2 G^2, the seed-slide arranged in the hopper and extending longitudinally through openings in the front and rear sides thereof, the reciprocating yoke having its front portion circular in cross-section and its rear portion rectangular in cross-section, said front and rear portions being arranged, respectively, in the cylindrical and rectangular guides or bearings, and said yoke being further provided at its front ends with the arm to engage the seed-slide and provided at its center with the stud E, the driving-shaft having the crank, and the rod Z, connected to the crank and detachably connected to the stud E, substantially as described.

2. In a planter, the combination, with the hopper and the seed-slide therein having one end projecting from one end of the hopper, of the reciprocating yoke D, having its rear portion angular in cross-section and its front portion cylindrical in cross-section and having an arm at one end to engage the opening in the projecting end of the seed-slide, the angular and cylindrical bearings G F, for the respective parts of the yoke, whereby the latter may be unshipped from or attached to the seed-slide, and the mechanism to reciprocate the yoke, substantially as described.

401,729. MATRIX-PLATE FOR CURVED ELECTROTYPES. GILBERT H. BENEDICT, Ellsworth, and PATRICK M. PURDOM, Albany, N. Y. Filed Jan. 26, 1889. Serial No. 297,635. (No model.)



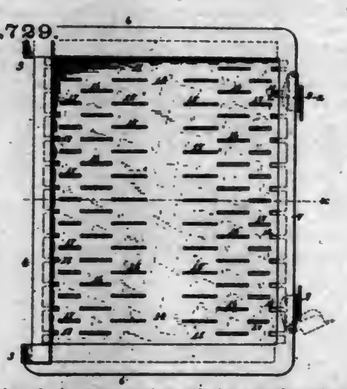
Claim.—1. The combination, with a curved matrix-plate, of a clamping-frame having guards for the retention of the matrix-plate, substantially as described.

2. The combination, with a curved matrix-plate, of a clamping-frame having guards for the retention of the matrix-plate, and a clamping-screw for tightening the matrix-plate, substantially as described.

3. The combination, with a curved matrix-plate, of a clamping-frame having guards for the retention of the matrix-plate, and a clamping-screw for tightening the matrix-plate, and a gage for the proper adjustment of the matrix-plate, substantially as described.

4. The combination, with a curved matrix-plate, of a clamping-frame having guards for the retention of the matrix-plate, and a clamping-screw for tightening the matrix-plate, and a gage for the proper adjustment of the matrix-plate, and a stop for the proper adjustment of the clamping-frame, substantially as described.

401,729.



Claim.—1. An apparatus for producing curved matrices for electrotype-plates, consisting, essentially, of a curved elastic matrix-plate having its mass reduced from the middle toward the edges in the direction of the curvature, and a clamping-frame for flattening the matrix-plate, provided with guards for the retention of the matrix material, substantially as described.

2. An elastic matrix-plate for the production of electrotype-plates for cylinder-presses, having a set curvature corresponding to the curvature of the printing-cylinder of the press, and having its mass reduced from the middle line to the edges in the direction of the curvature, substantially as described.

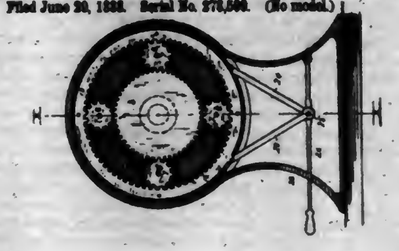
3. A matrix-support for the production of electrotype-plates for cylinder-presses, consisting of a plate of spring metal bent to a definite set curvature, and having its mass gradually reduced from the middle toward the edges in the direction of the curvature, whereby the matrix-plate may be flattened out without buckling to receive the matrix material and to recurve to its original shape when released, substantially as described.

4. A matrix-support for the production of curved electrotype-plates for cylinder-presses, consisting of a plate of spring metal bent to a definite set curvature and having its mass reduced step by step from the middle toward the edges in the direction of the curvature, substantially as described.

5. A matrix-support for the production of curved electrotype-plates for cylinder-presses, consisting of a plate of spring metal having parallel series of slots from near the middle to the edges in the direction of the curvature, substantially as described.

6. A matrix-support for the production of curved electrotype-plates, consisting of a plate of spring metal having its mass reduced from the middle toward the edges in the direction of curvature by a series of perforations, substantially as described.

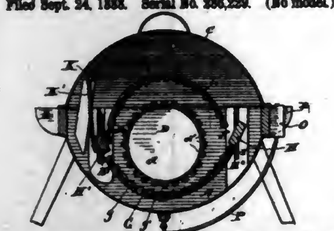
401,730. VALVE-GEAR. ELIJAH B. BENHAM, Providence, R. I. Filed June 20, 1888. Serial No. 278,069. (No model.)



Claim.—1. A shaft and a sleeve thereon, each provided with a gear, the rotatable walls 8 and 9, one or more pinions, 6, and one or more pinions, 10, supported and capable of an independent rotation on pintles 7, which are extended between and supported in said walls 8 and 9, the said pinions respectively meshing with said shaft and sleeve-gears, combined with the internal gears, 12 and 15, normally immovable, having their teeth in engagement with said pinions, and means, substantially as described, for securing a partial rotation of said internal gears in reverse directions, substantially as described.

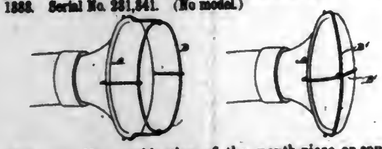
2. The crank-shaft E and sleeve-valve F, each provided with a gear, 3 and 5, the standard 11, having the circular rim 19 and the ratcheted edge 28, the walls 8 and 9, rotatable on said rim 19, two series of pinions, 6 and 10, supported and capable of an independent rotation on pintles 7, which are extended between and supported on said walls 8 and 9, the said pinions meshing with said gears 3 and 5, combined with the internal gears, 12 and 15, normally immovable, having their teeth in engagement with said pinions, the handle-lever 26 by its inner end pivoted to said standard and capable of engagement by its handle end with said ratcheted face 28, and the link-levers 18 and 20, each pivoted by one end to the said handle-lever and by their other ends pivoted to the said internal gears, 12 and 15, respectively, all substantially as and for the purpose described.

401,731. WASHING-MACHINE. HENRY BROADWELL, Blue Mound, Kans. Filed Sept. 24, 1888. Serial No. 286,229. (No model.)



Claim.—The combination, with the semi-cylindrical casing or tub A, the top C, the rotary cylindrical rubber D, mounted in the casing, the vertical guides H^3, springs I, secured in said guides, and the vertical guides H^2, of the lower concave wash-board, G, having an end cross-bar, H, provided with projecting pins *h*, mounted in the guides H^2 and engaging with the springs I, and the end cross-bar H′, provided with projecting pins *h′*, mounted in the guides H^2, the spring K′, secured to the casing and connected with the cross-bar H′, and the upper concave wash-board, L, the springs M, connecting one end of the said concave L with the concave G, and the springs *m*, secured to the casing and attached to the other end of the concave L, all constructed, arranged, and operated substantially as shown and described.

401,732. MOUTH-PIECE GUARD FOR PHONOGRAPHS OR TELEPHONES. WILLARD L. CANDEE, Brooklyn, N. Y. Filed Aug. 3, 1888. Serial No. 281,841. (No model.)



Claim.—1. The combination of the mouth-piece or sound-conveying tube or chamber of a phonograph, telephone, or the like, and an open-work or skeleton guard arranged in front thereof, substantially as and for the purpose set forth.

2. The combination of the mouth-piece or sound-conveying tube or chamber of a telephone, phonograph, or the like, and a skeleton wire frame or guard arranged in front thereof, substantially as and for the purpose set forth.

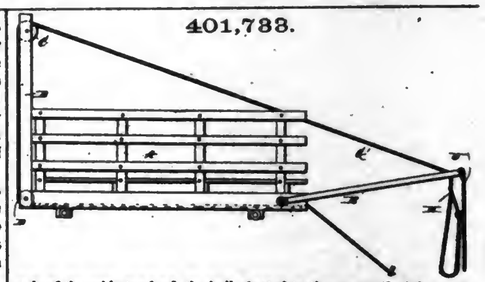
401,733. HAY AND GRAIN RACK. GEORGE CARR, Charles City, Iowa. Filed Jan. 26, 1889. Serial No. 297,639. (No model.)

Claim.—1. The combination, with the rack, of the lifting-bail pivoted to the rear end of the same, and the operating-rope passing forward over the rack and across the front end of the same and then rearwardly beneath the rack, whereby, as the rack is drawn forward, the bail will be raised, as set forth.

2. The combination, with the rack, of the standard erected at the front end of the same, the pulleys C D, journaled in the upper and lower ends of the standard, the lifting-bail pivoted to the rear ends of the rack, and the rope passing from the said bail over the pulley C and under the pulley D and thence rearward beneath the rack, as set forth.

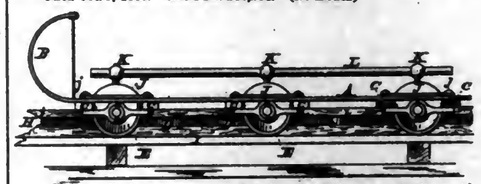
3. The combination, with the rack, of the standard erected at the front end of the same, the rollers C D, journaled in the upper and lower

401,733.



ends of the said standard, the bail pivoted to the rear end of the rack and having an eye at its center, the rope passing through said eye over the pulley C and under the pulley D and thence rearward beneath the rack, the hook secured to the end of said rope, and the rope J, secured to the bail, as specified.

401,734. TOBOGGAN. GEORGE H. CHADEAYNE, Buffalo, N. Y. Filed Oct. 5, 1888. Serial No. 287,361. (No model.)



Claim.—1. A toboggan consisting, essentially, of a platform, A, having the dash B, and a series of battens, C, each set of said battens being provided with outside bearings, D, having track-wheels E, and two spiders, F, having vertical spindles fitted with guard-wheels G, engaging a central rail having grooves on opposite sides, said outside bearings being provided with caps J, having eyes K fitted with the hand-rails L, the whole being constructed and combined in the manner as and for the object stated.

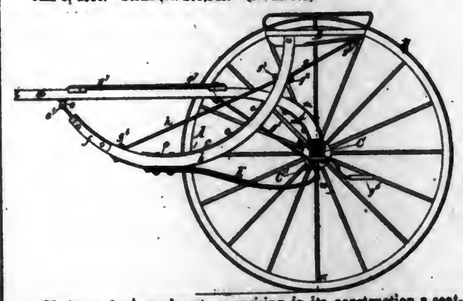
2. In toboggans, the combination, with the platform, of the battens having the bearings for the track-wheels, and the spiders with the bearings for the guide-wheels, as described, said bearings being provided with wheels, as stated, and the whole arranged to operate with suitable tracks, as and for the purpose set forth.

3. In toboggans, the track-wheel bearings having wheels, as shown, in combination with caps having eyes provided with hand-rails, as and for the purpose stated.

4. In toboggans, a bearing for the guard-wheels, consisting of an X-shaped frame having at the intersection of the radiating members a boss provided with a pendent stud fitted with a horizontally-revolving guard-wheel, G, in combination with the battens and the platform, as and for the object set forth.

5. In toboggans, the combination, with the platform and battens, of a combined wheel-bearing and cap, consisting of a frame, D, having the wheel E journaled upon a bolt, and a cap-piece, J, provided with upwardly-projecting member K, adapted to receive the hand-rail L, said cap-piece being secured upon the platform and the wheel-bearing below the same, in a manner as and for the purpose set forth.

401,735. ROAD-CART. MORRIS L. CLEVELAND, Delhi, N. Y. Filed Jan. 5, 1889. Serial No. 296,545. (No model.)



Claim.—1. A road-cart comprising in its construction a seat-body, A, formed of segmental side bars united by flooring-boards and braced, as at *a*, and arranged forward of the axle and connected at its front end to the thills by joint-connections which do not slide and to the axle by longitudinal flat springs fastened directly to the body A forward of the center of the length of said body, and a driver's

seat on a vertical line, *x x*, with the axle, substantially as and for the purpose described.

2. A road-cart comprising a body having segmental side bars, *b*, united by flooring-boards *c*, braced by rods *a*, and provided with metal thill-connection straps *f*, a seat, B, mounted on said side bars and braced by rods *g* in line with the brace-rods *a*, said seat being centrally over the axle, thills, *d d*, rigidly connected to the road-cart axle D and having hinging eye-connections *e*, to which straps *f* of the body-bows are hinged, as at *e′*, and longitudinal flat springs attached directly to the under side of the body at a point forward of the longitudinal center of the body, substantially as and for the purpose described.

401,736. MARINE VELOCIPEDE. SETH CURLIS, Union City, Tenn., assignor to the Seth Curlis Marine Velocipede Company, same place. Filed Apr. 9, 1888. Serial No. 270,023. (No model.)

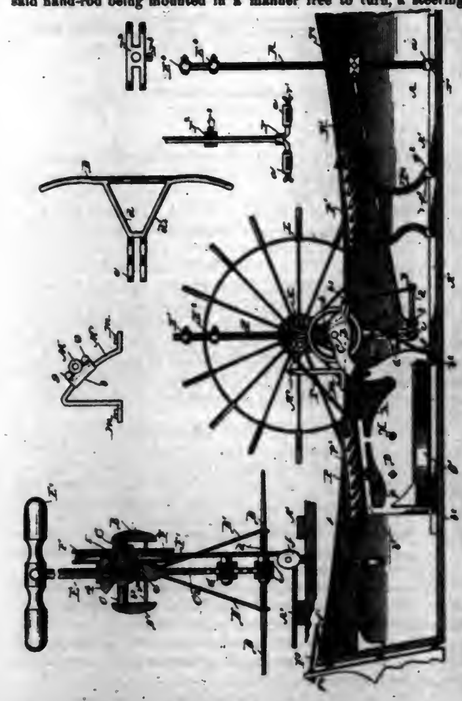
Claim.—1. In a marine velocipede or similar apparatus, the combination, with suitable mechanism for imparting movement to the propeller or paddle wheels and suitable steering mechanism, of a single main hand-rod consisting of a single bar pivotally sustained with respect to the mechanism for propelling the boat and connected directly with the steering mechanism, whereby said single hand-rod serves to effect both the movement of the driving mechanism and of the steering mechanism, substantially as described.

2. In a marine velocipede or similar apparatus, the combination, with a driving-lever for imparting movement through suitable intermediate mechanism to the propeller or paddle wheels, said driving-lever having a socket in its upper end, of a main hand-rod having its lower end fitted within the socket of the driving-lever, and suitable steering mechanism connected with said hand-rod, whereby said hand-rod serves to effect both the movement of the driving-lever and of the steering mechanism, substantially as described.

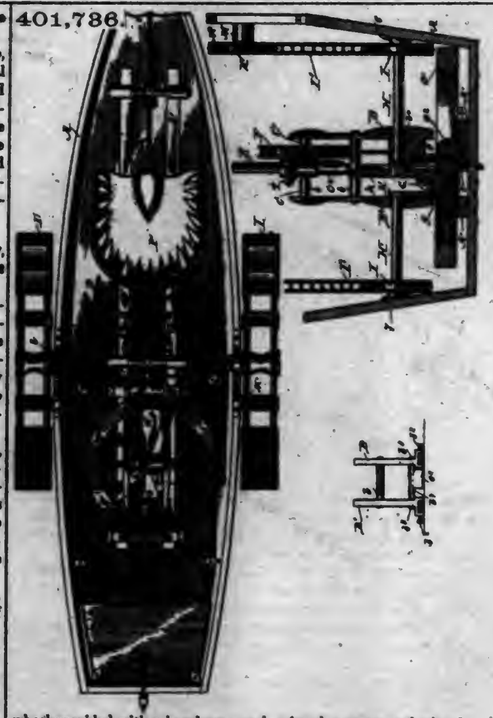
3. In a marine velocipede or similar apparatus, the combination, with the driving-lever C^3, of a hand-rod, E, mounted upon the end of said driving-lever in a manner free to turn, a steering-wheel, F, gear-wheels 4 and 5, and suitable connections from said gear-wheel to the rudder, substantially as described.

4. In a marine velocipede or similar apparatus, the combination, with the driving-lever C^3, of a suitable hand-rod, E, mounted in a manner free to turn, a steering-wheel, F, journaled upon the trunnion or shaft of said driving-lever, suitable gear-wheels connecting said hand-rod with the steering-wheel, and suitable ropes leading from said steering-wheel to the rudder, substantially as described.

5. In a marine velocipede or similar apparatus, the combination, with the driving-lever C^3, of a hand-rod for moving said driving-lever, said hand-rod being mounted in a manner free to turn, a steering-



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wheel provided with a bevel-gear, and a bevel-gear upon the hand-rod, and suitable connections leading from said steering-wheel to the rudder, substantially as described.

6. In a marine velocipede or similar apparatus, the combination, with the hull, of suitable stringers or supports, A′, attached thereto, the operating mechanism, and a main frame for sustaining said operating mechanism, said main frame being movably mounted upon said stringers and within said hull, and suitable means for adjusting said main frame in the direction of the length of the hull, substantially as described.

7. In a marine velocipede or similar apparatus, the combination, with the sides B and B′, of the main frame for supporting the driving-lever and operating mechanism, said main frame having rails b^4, extending lengthwise of the boat, of the operator's seat P, adjustably mounted upon said rails, whereby said seat can be moved in the direction of the length of the boat, substantially as described.

8. In a marine velocipede or similar apparatus, the combination, with the paddle-wheels, of the brackets M′, having the curved bearing portions, and the vertically-movable journal-blocks M for the shafts of said wheels, said journal-blocks being adjustably mounted upon the curved portions of said brackets, substantially as described.

9. In a marine velocipede or similar apparatus, the combination, with the main frame, of a driving-lever, C^3, sustained within said main frame, a suitable hand-rod and treadle connected with said driving-lever, a main shaft and shaft-wheel sustained within said main frame that supports the driving-lever, a pitman for imparting motion to said main shaft from the driving-lever, and suitable mechanism leading from said shaft-wheel to the paddle-wheels or propeller-wheel, substantially as described.

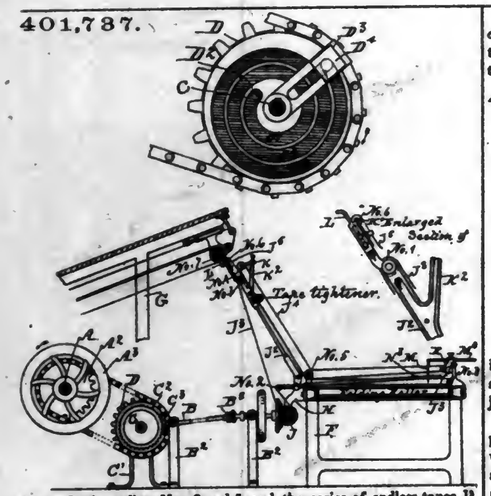
401,737. PAPER-FOLDING ATTACHMENT FOR PRINTING-PRESSES. TALBOT C. DEXTER, Des Moines, Iowa. Filed May 31, 1884. Serial No. 133,431. (No model.)

Claim.—1. A loose wheel, D, having a spiral or convolute groove in its side face, a shaft, C, a slotted arm, D^3, and a pin or stud, D^4, in combination with the driving-shafts A and C and sheet carrying and folding mechanism, to operate in the manner set forth, for the purposes specified.

2. The hinged frame J^3, the tape shaft or roller No. 1, the shaft J, carrying driver-pulleys, the adjustable roller No. 2, the rollers Nos. 3 and 5, and series of endless tapes J^2 and J^4, and operating mechanism arranged and combined to operate in the manner set forth in conveying sheets from the press to the folding mechanism.

3. The adjustable arms L, the adjustable arms K, carrying a roller, No. 4, and a series of endless tapes, in combination with the hinged

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frame J^3, the rollers Nos. 3 and 5, and the series of endless tapes J^3, to aid in carrying a sheet from a printing-press to a folding-machine.

4. The adjustable shaft No. 6, carrying a series of short endless tapes, in combination with the hinged frame J^3, the roller No. 1, and the endless tapes J^3 and J^4, the shaft No. 7, and a series of sheet-delivering tapes, combined with said shaft No. 7, as illustrated in Fig. 1, to convey sheets to the folding-machine.

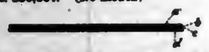
5. A frame consisting of two parallel arms or side pieces hinged to the frame of a paper-folding machine and connected at their outer ends by means of a roller journaled thereto, a series of sheet-carrying tapes stretched over said roller carried by said hinged side pieces, and also stretched over rollers journaled to the machine-frame, and an adjustable roller connected with the same machine-frame, arranged and combined relative to each other and the sheet-delivery mechanism of a printing-press to operate in the manner set forth, for the purposes stated.

6. In a paper-folding machine, an adjustable gage supporting rigid slats, in combination with sheet-carrying tapes for the purpose of lifting the advancing sheets relative to the tapes, in the manner set forth.

7. The gage M, having slots N and N^2, and supporting-slats N^3, the adjustable arms M^2, and the adjustable bar P, in combination with a series of endless tapes, J^3, substantially as shown and described, to operate in the manner set forth, for the purposes stated.

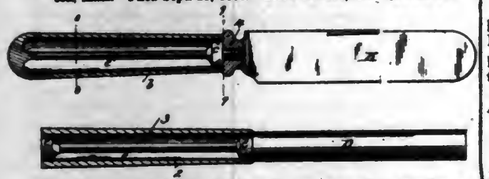
8. The gage M M^2, carrying slats N^3, the arms M^2, and the adjustable bar P, arranged and combined as and for the purposes stated.

401,738. MATRIX FOR STEREOTYPE-PLATES. GEORGE EASTWOOD, Kingston-upon-Hull, County of York, England. Filed Jan. 5, 1888. Serial No. 259,857. (No model.)



Claim.—A mold or matrix for stereotype-plates, having a facing and a backing, the facing being composed of sheets of tissue-paper or other like thin paper united together by means of a mixture of glycerine, a starchy material, and gum, the said facing containing at the time of use only sufficient moisture to render the paper slightly soft, and the backing being composed of one or more dry sheets of soft paper capable of receiving and retaining an impression, all substantially as set forth.

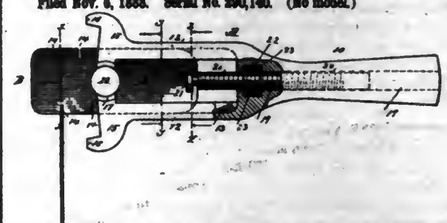
401,739. TABLE-CUTLERY. FREDRICK C. FISCHER, Northampton, Mass. Filed Sept. 26, 1888. Serial No. 286,311. (No model.)



Claim.—1. A hollow knife-handle consisting of a metallic tube and two metal plugs united by a bar, *c*, which said tube incloses and to which it is solidly united, one of said plugs having an extension beyond the end of said tube, from which to form a blade, substantially as set forth.

2. A hollow metallic handle consisting of a tube and the plugs *c c*, one thereof having a tang, 4, thereon, inserted within and closing the ends of said tube, said plugs being united by a bar, *c*, integral therewith, substantially as set forth.

401,740. SAW-SET. FREDERICK C. FISCHER, Northampton, Mass. Filed Nov. 6, 1888. Serial No. 290,140. (No model.)



Claim.—1. A saw-set consisting of a holder and slide-frame having a laterally-extended abutment-nose at one end, combined with a set-plate having one or more slots, 14, in its edge, longitudinally adjustable on said slide-frame, for the purpose described.

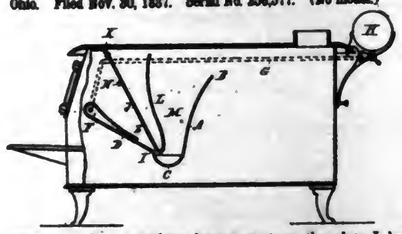
2. The combination, with the holder-frame comprising the legs 12, provided with the slideways 13, the abutment-noses 16, and the bridge-web, of the set-plate having one or more slots, 14, longitudinally movable in said ways, and the set-screw 18 through said bridge-web for a bearing against the set-plate, substantially as described.

3. The combination, with the holder-frame having longitudinal slideways, of the edge-slotted set-plate B and a screw-rod, substantially as described, engaging said set-plate and having a screw engagement in the holder-frame, substantially as and for the purpose described.

4. The combination, with the holder-frame provided with the longitudinal bore 20, the aperture 22, and having longitudinal slideways, and a laterally-extended abutment-nose, 16, of the edge-slotted set-plate, the screw-rod playing endwise in said handle-bore and having a non-rotatable connection with said set-plate, and the nut 23 in said aperture engaging the said screw-rod, substantially as and for the purpose described.

5. The combination, with the holder-frame provided with the longitudinal bore 20, the aperture 22, and having longitudinal slideways and a laterally-extended abutment-nose, of the edge-slotted set-plate having the rectangular socket 25, the screw-rod playing endwise in said handle-bore and having the squared button 21 engaging said rectangular socket, and the nut 23 in said aperture engaging the said screw-rod, all substantially as described and shown, and for the purpose specified.

401,741. PETROLEUM-BURNER. CALEB V. FLEETWOOD, Cleves, Ohio. Filed Nov. 30, 1887. Serial No. 256,577. (No model.)



Claim.—1. In a petroleum burner or stove, the plate J, bent at L, and hinged at its upper end to the inside of the stove and forming the front of the combustion-chamber, in combination with the rod N, having an eccentric, *n*, upon it, and the plate D, bent to form the chamber F, having the opening E, and the oil-inlet pipe, whereby the oil-supply and the draft, which enter the combustion-chamber simultaneously and through the same aperture, can be regulated at will.

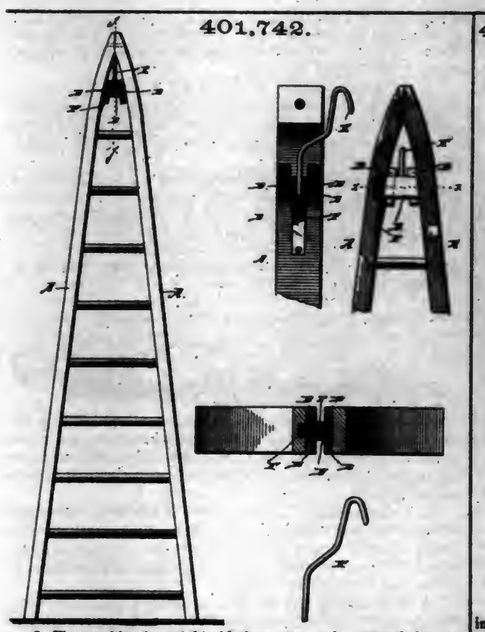
2. In a petroleum burner or stove, the combustion-chamber composed of the rear upwardly-curved back, the trough C, the angle-point I, and plate D, bent to form the chamber F, having opening E, and the plate J, having a shield or plate next to the combustion-chamber, and the oil-supply pipe, all combined, as and for the purposes set forth.

401,742. LADDER-HOOK. JAMES B. FOOTE, Delancy, N. Y., assignor of one-half to Gordon B. Maxwell, same place. Filed Jan. 28, 1889. Serial No. 297,966. (No model.)

Claim.—1. The combination, with the side bars of the ladder having their upper ends secured together in contact, of the hook removably fitted between the same, as set forth.

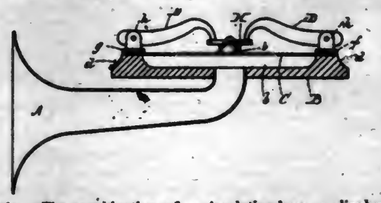
2. The combination, with the side bars, of the guides secured thereto and the sliding block engaging the guides and carrying the hook, as set forth.

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3. The combination of the side bars, the guides secured thereto, the sliding block having its ends engaging the guides and carrying the hook, and the spring secured to one of the side bars and bearing against the under side of the sliding block, as set forth.

401,743. TELEPHONE-TRANSMITTER. WEBSTER GILBERT, St. John, New Brunswick, Canada, assignor to James Straton, same place. Filed Jan. 26, 1889. Serial No. 297,556. (No model.)



Claim.—The combination of an insulating-base, a diaphragm, separate arc-shaped metallic plates secured to said base, and provided with upright ears disposed in pairs, an insulating-cushion on the center of said diaphragm, a carbon disk on said cushion, carbon electrodes pivoted at their outer ends in said ears, in conductive contact therewith, and resting at their inner ends on said disk, and electric connections for said arc-shaped plates.

401,744. SECONDARY BATTERY. WILLIAM W. GIBSON, Haverford College, Pa., assignor to The Electrical Accumulator Company, of New York. Filed Feb. 1, 1889. Serial No. 298,236. (No model.)

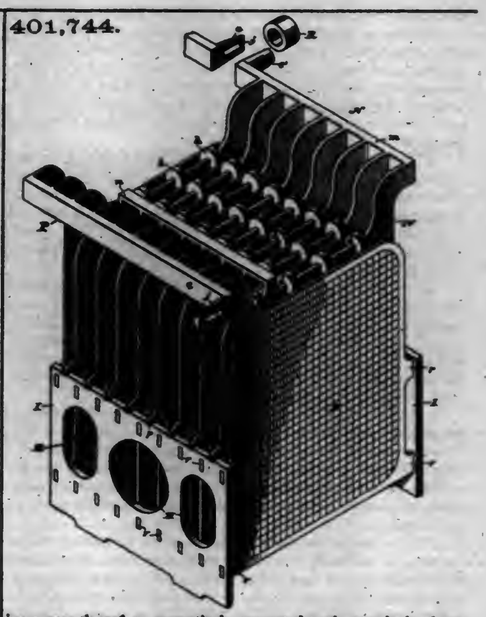
Claim.—1. In a secondary battery, the combination of two elements or electrodes, an inclosing-cell therefor, an electrolytic liquid, and means for supporting both electrodes, consisting of boards or strips of insulating material mechanically connecting and fixed to the plates of one element at points upon opposite edges, forming a support, substantially as described.

2. In a secondary battery, the combination of two elements or electrodes, an inclosing-cell therefor, an electrolytic liquid, boards or strips of insulating material to which the plates of one element are fastened, and a series of projections on the second element resting upon said strip, whereby both elements are supported free from contact with the cell-bottom, substantially as described.

3. In a secondary battery, the combination of two elements or electrodes, an inclosing-cell therefor, an electrolytic liquid, and boards or strips of insulating material to which the opposite edges of the plates of one element are respectively riveted, forming a support for the projections on the second element, whereby both elements are supported free from contact with the cell-bottom.

4. An electrical connector for batteries, consisting of two sections of conducting material, each forming part of a cone or cylinder having a smooth surface, respectively connected to the terminals of two battery-elements, and a clamp or ring for uniting the two sections mechanically.

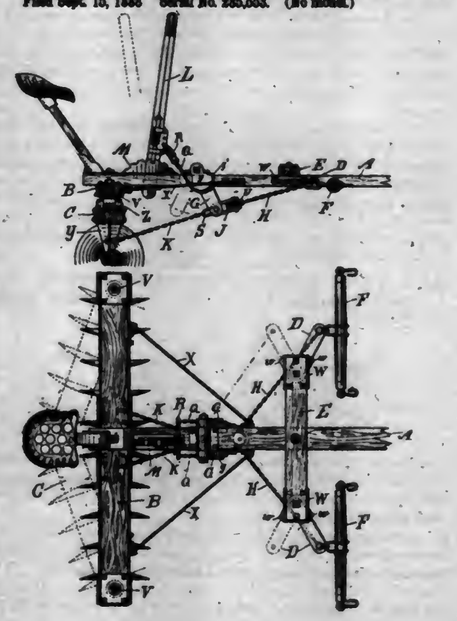
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5. An electrical connector for batteries, consisting of two sections of conducting material, each forming part of a cone or cylinder having a smooth curved surface, said sections being respectively connected to two battery-elements, and a ring having an interior wall conforming to said curved surface for uniting the two sections mechanically and electrically, substantially as described.

6. An electrical connector for uniting two cells of battery, consisting of two complementary sections of conducting material connected, respectively, to two battery-elements and suited to form a cone or cylinder having a smooth surface, guides upon the meeting surfaces to produce accurate registry, and a suitable device for clamping or holding the sections together.

401,745. DISK HARROW. ROBERT W. HARDIE, Albany, N. Y. Filed Sept. 15, 1888. Serial No. 285,553. (No model.)



Claim.—1. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of whiffletrees movable forward and backward together independently of a doubletree, draft-equalizing mechanism movable bodily forward and backward in the line of draft, and draft-connections flexibly uniting said equalizing mechanism with the free ends of the cutter-gangs, substantially as shown and described.

2. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of whiffletrees movable forward and backward together independently of a doubletree, draft-equalizing mechanism movable bodily forward and backward in the line of draft by means of a swinging arm pivoted to the pole, and draft-connections flexibly uniting said swinging arm with the free ends of the cutter-gangs, substantially as shown and described.

3. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of whiffletrees movable forward and backward together independently of a doubletree, flexible connections uniting said whiffletrees and engaging with a pulley flexibly attached to a swinging arm pivoted to a pole, and draft-connections flexibly uniting said swinging arm with the free ends of the cutter-gangs, substantially as shown and described.

4. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of whiffletrees mounted upon pivoted arms movable together forward and backward on their pivots, draft-equalizing mechanism movable bodily forward and backward in the line of draft, and draft-connections flexibly uniting said equalizing mechanism with the free ends of the cutter-gangs, substantially as shown and described.

5. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of whiffletrees mounted upon pivoted arms movable together forward and backward on their pivots, draft-equalizing mechanism movable bodily forward and backward in the line of draft, draft-connections flexibly uniting said equalizing mechanism with the free ends of the cutter-gangs, a lever pivoted to a pole, and flexible connections uniting said lever and draft-equalizing mechanism, substantially as shown and described.

6. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of whiffletrees mounted upon pivoted arms movable together forward and backward on their pivots, draft-equalizing mechanism movable bodily forward and backward in the line of draft by means of a swinging arm attached to a pole, draft-connections flexibly uniting said swinging arm with the free ends of the cutter-gangs, a lever pivoted to a pole, and flexible connections uniting said lever and swinging arm, substantially as shown and described.

7. In a disk harrow, the combination, with a main frame and cutter-gangs pivoted thereto, of a swinging arm pivoted to a pole and provided with a sector, flexible draft-connections uniting said swinging arm with the free ends of the cutter-gangs, a lever pivoted to the pole, and flexible connections attached to said lever and engaging the edge of said sector, substantially as shown and described.

8. The combination, with a pole, of whiffletrees mounted upon pivoted arms, draft-equalizing mechanism movable bodily forward and backward in the line of draft, an adjusting-lever pivoted to the pole, a locking device connected therewith, and flexible connections uniting said lever and equalizing mechanism, substantially as shown and described.

9. The combination, with a pole, of whiffletrees mounted upon pivoted arms and movable together backward and forward in a horizontal plane, draft-equalizing mechanism consisting of flexible connections uniting said whiffletrees, engaging with a pulley flexibly attached to a swinging arm pivoted to a pole, an adjusting-lever attached to said pole and having a locking device connected therewith, and adjustable connections uniting said lever and swinging arm, substantially as shown and described.

401,746. COMBINED BUTTON-HOOK AND BRACELET. ALICE JOHNSTONE, Avondale, N. J. Filed Jan. 14, 1889. Serial No. 296,253. (No model.)



Claim.—1. A bracelet consisting of a body portion and a detachable buttoner portion, the body portion having bearings or connections for the attachment of the ends of the detachable portion, substantially as set forth.

2. A bracelet formed of a body portion and a detachable hook portion, the latter forming an integral part of the bracelet and wholly removable from the body portion, substantially as described.

3. A combined bracelet and button-hook, the body portion of the bracelet terminating in enlargements which form part of the securing means, and the removable button-hook portion having ends adapted to engage with said enlargements to complete the securing means, substantially as described.

4. A bracelet consisting of a body and a buttoner portion, the body portion of the bracelet formed of springy material and terminating in connections, and the removable buttoner portion having ends adapted to detachably engage with said connections, substantially as described.

5. A bracelet consisting of a body portion and a detachable buttoner portion, the body portion having bearings for the attachment of the detachable portion, and a chain for connecting the buttoner and bracelet portion together, substantially as set forth.

401,747. RIVET. ALBERT KIRK, Canton, Ohio. Filed Feb. 25, 1889. Serial No. 301,025. (No model.)

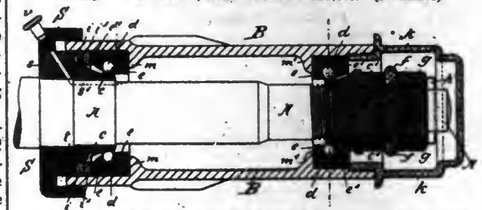


Claim.—1. A rivet having an outside portion of soft iron, embracing a portion of flat hardened steel extending from the central portion of the rivet to the outside, a portion of the said steel having been removed before hardening, substantially as described, and for the purpose set forth.

2. A rivet having an outside portion of soft iron, embracing a portion of flat steel extending from the central to the outside portion, having one head formed by upsetting the iron and steel, the other formed of the soft iron over the end of the steel, substantially as described, and for the purpose set forth.

3. A rivet, preferably of soft iron, having a groove extending from the central portion to the outside, and a hardened-steel plate driven in said groove, substantially as described, and for the purpose set forth.

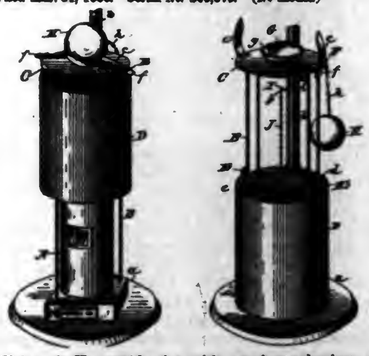
401,748. BALL-BEARING. HERMANN KUHATH, Dresden, Saxony, Germany. Filed Dec. 17, 1888. Serial No. 293,573. (No model.)



Claim.—1. In adjustable ball-bearings for carriage-axles, the combination of the rings *e e' e d'*, cones *c c'*, axle-spindle A, washer *f*, lock-nut *g*, and box B, with cap *k*, substantially and for the purpose as described.

2. In adjustable ball-bearings for carriage-axles, the combination of the spindle A, butting-ring 8, cones *c c'*, rings *e e' e d'*, leather washers *i i'*, soft-metal washer *f*, lock-nut *g*, balls *d*, axle-box B, and cap *k*, substantially and for the purpose as described.

401,749. RAILWAY-CAR HEATER. ROLAND M. LA RUE, Connersville, Ind., assignor of one-half to William Newkirk, same place. Filed Mar. 31, 1888. Serial No. 269,079. (No model.)

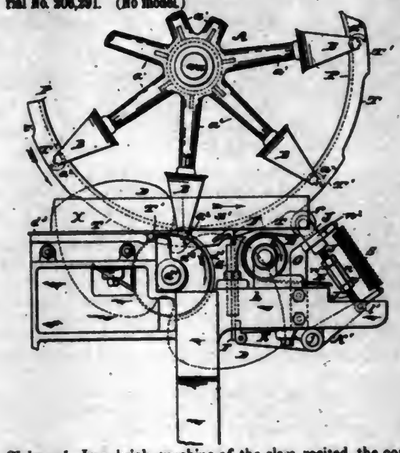


Claim.—1. The combination, with a car-heater having a movable hood with holds on its sides and perforations in its head for guide-rods, of a cap on top of the rods above the elevated hood having a slotted cap thereon, and hinged lever-arms at its edges registering with the holds on the hood and with the slots in the cup, and a weight within the cup holding the ends of the arms, as set forth.

2. The combination, with a movable hood with holds on its sides and perforations in its head for a stove-pipe and guide-rods, of detents on the guide-rods passing through the perforations of the head, and a cap on top of the rods having hinged lever-arms at its edges and a cup in its center having slots in its sides, the outer ends of the arms taking into the holds on the hood and the inner ends resting in the slots of the cup, and a weight on the arms in the cup, as set forth.

3. The combination, with a car-heater having a drop-hood and stationary guide-rods securing the heater to the floor, a stove-pipe and said rods extending up through the head of the cover above the elevated hood, of a cap on top of the rods with curved hinged lever-arms on its sides, a cup in the center of the cap having slots in its upper side, holds on the sides of the upper end of the hood, and a damper in said pipe automatically opened and closed by the movement of the hood, said lever-arms registering with the holds on the hood and slots in the cup and their ends held in the cup by a weighted ball, as set forth.

401,750. WIRE CUT-OFF BRICK-MACHINE. ELIZABETH S. LESOR, Philadelphia, Pa., (administratrix of Sanford W. Lesor, deceased,) assignor to Cyrus Chambers, Jr., same place. Filed June 26, 1886. Serial No. 206,291. (No model.)



Claim.—1. In a brick-machine of the class recited, the combination, with the continuously-moving belt E and the rotating cut-off device arranged with relation thereto, substantially as shown and described, of the plate for supporting and retarding the advancing end of the bar of clay while a brick-length is being severed therefrom, said plate being located between the point of severance and delivery beyond said belt, substantially as described.

2. In a brick-machine of the class mentioned, the combination, with the rotating cut-off devices, of the supporting-plate located with relation to the point of severance of the clay bar, as shown and described, together with mechanism, such as shown and described, for bringing and retaining the plate in position to support the end of said bar and for moving the same away from such supporting position out of the path of the cut-off wires, substantially as and for the purpose set forth.

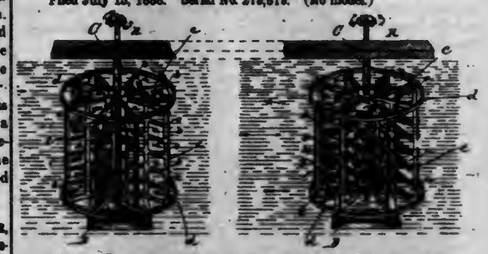
3. In a brick-machine of the class mentioned, the combination, with the rotating cut-off devices, of the vertically-sliding plate located relatively to the point of severance of the clay bar, as shown and described, the rock-lever, the rod, the bracket, the spring, and the disk having the elevations and depressions, all constructed and adapted to operate substantially as and for the purpose set forth.

4. In a brick-machine of the class mentioned, the combination, with the rotating cut-off devices, of the belt for carrying the clay bar, the off-bearing-belt with its surface below the said carrying-belt, the supporting-plate located with reference to the point of final severance of the clay bar, as shown, together with the mechanism for elevating, depressing, and retaining said plate, all constructed and adapted to operate substantially as and for the purpose set forth.

5. In a brick-machine of the class mentioned, the combination, with the rotating cut-off devices, of the vertically-sliding plate located relatively to the point of severance of the clay bar, as shown and described, the rock-lever, the rod, with means for adjusting its length, the bracket, the spring, and the disk having the elevations and depressions, all constructed and adapted to operate substantially as and for the purpose set forth.

6. In a brick-machine of the class mentioned, the combination, with the rotating cut-off devices, of the sliding plate located with relation to the point of complete severance of the clay bar, as shown, the rock-lever, the rod, the disk having the elevations and depressions, and means for holding the free end of said rod in contact with the disk by a yielding force, substantially as and for the purpose set forth.

401,751. WATER-WHEEL. FREDERICK LE BEAU, Buffalo, N. Y. Filed July 13, 1888. Serial No. 279,819. (No model.)



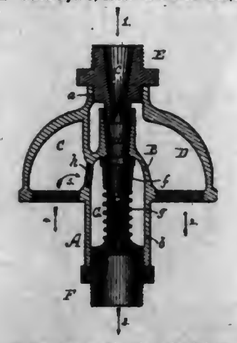
Claim.—In a water-wheel, A, the vertical shaft C, its upper end working through a suitable bearing and having a gear-wheel thereon, its lower end working in a bearing in the base-piece B, the frames *c c c*, radiating from the said shaft, divided by a vertical strip and longitudinal strips into a series of valve-openings covered by flap-valves *a a a*, attached to the top of valve-openings at *b*, the flaps on one side of the shaft opening on one side of the frame, and the flaps on the other side of shaft opening on opposite side of frame, the outer end of the frames being secured to circular rings or hoops *d d*, substantially as described.

401,752. PAVEMENT FOR STREETS OR ROADS. MORDICAI LEVI, Charleston, W. Va. Filed Nov. 19, 1888. Serial No. 291,284. (No model.)



Claim.—A pavement consisting of a first or bottom layer of comminuted stone, of a second layer composed of asphalt and any suitable comminuted material, of a third layer of sand, and of a fourth or surface layer of any suitable material, substantially as described.

401,753. INJECTOR. LEVI W. LOMBARD and WILLIAM CONNOR, Boston, Mass. Filed Apr. 2, 1888. Serial No. 269,356. (Model.)



Claim.—1. In general combination, the injector composed of the tubular body A, the partition B, with the combining-cone *d*, the supply and overflow chambers D C, the aperture *h*, the relief-chamber G, the discharge-cone *e*, located therein, and the relief-valve *f*, with its spring *g*, as and for purposes set forth.

2. In an injector provided with a relief-chamber constantly open to the external air, a discharge-cone, *e*, located therein, the relief-valve *f*, movable upon said cone and adapted to engage with the outlet-mouth of the combining-cone, in combination with a discharge-cone, *c*, and the steam-cone *c*, aligned therewith, projecting within and partially inclosed by said combining-cone, for purposes stated.

401,754. RAILWAY-GATE. ALEXANDER J. MCDONALD, Chicago, Ill. Filed May 14, 1888. Serial No. 273,781. (No model.)



Claim.—A railway-gate arm consisting of a tubular metallic body provided with one or more longitudinal strengthening-ribs projected radially from the body, and angle-irons whose flanges are secured, respectively, to the body and the rib, substantially as described.

401,755. RAIL-BRAKE. MOSES A. MICHAELS, Allegheny, assignor of one-half to John T. Moore, Pittsburg, Pa. Original application filed May 15, 1888, Serial No. 273,951. Divided and this application filed July 10, 1888. Serial No. 279,514. (No model.)

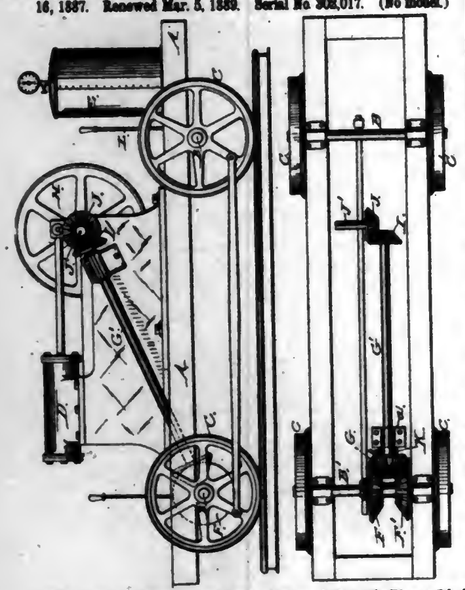


Claim.—1. In a rail-brake, the combination, with the truck-sill, of two parallel journaled brake-shafts having crank-arms arranged between the wheels of the truck in line therewith and adapted to grip the track-rail, substantially as and for the purposes specified.

2. The combination, in a rail-brake, of two parallel journaled brake-shafts provided with pinions, and a bevel skew-gearing, substantially as and for the purposes specified.

3. The combination, with a truck one of whose sills has an offset or bracket arranged between the wheels, of two parallel brake-shafts journaled on said bracket of the side sill, and mechanism for rotating the parallel journaled brake-shafts, substantially as and for the purposes specified.

401,756. MOTOR. WILLIAM H. PATTON, Pueblo, Colo. Filed Nov. 16, 1887. Renewed Mar. 5, 1889. Serial No. 302,017. (No model.)

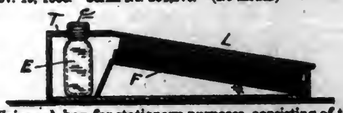


Claim.—1. The frame A of a car-truck, and the axle B', provided with the sliding bevel-gears F F', in combination with the bevel-gears G and I, mounted on a flexible shaft, G', the bevel-gear J, mounted on the shaft J', and a motive power for operating the same, substantially as and for the purpose herein described.

2. The axle B', provided with the sliding bevel-gears F F', in combination with the bevel-gears G and I, mounted on a flexible shaft supported in proper bearings, and provided with a close collar held in place by means of a thumb screw and adapted to hold the bevel-gear G up to its work, substantially as herein set forth.

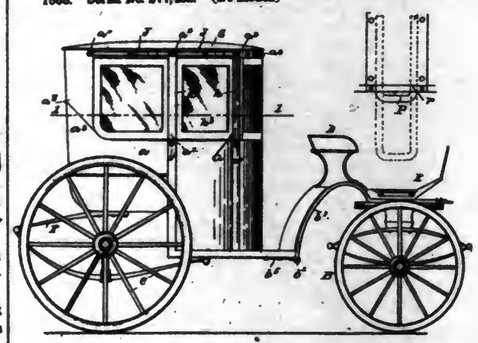
3. The flexible shaft G', supported in proper bearings, provided with the bevel-gears G and I, in combination with the collar K, secured to the said shaft between the bearing and gear G, substantially as and for the purpose set forth.

401,757. DESK-BOX. ALLEN W. PHILLIPS, Providence, R. I. Filed Nov. 19, 1888. Serial No. 291,276. (No model.)



Claim.—A box for stationery purposes, consisting of the inclined lid L, the flat portion T, and the inclined false bottom F, combined with the ink-receptacle E, substantially as described, for the purpose specified.

401,758. CAR. CHARLES A. READE, Chicago, Ill. Filed June 18, 1888. Serial No. 277,402. (No model.)



Claim.—1. In a covered vehicle, the fixed front panel which extends from the level of the floor of the vehicle to a point about midway in its height, in combination with a sash arranged to telescope into the panel, substantially as described.

2. In combination, in the body of a covered vehicle, doors, the position of which is substantially upon the sides of the vehicle, a floor-platform extending to the front of the vehicle, a bayed front wall extending from the floor-platform to the roof to form a recessed interior to the vehicle forward of the doors of the full height of the vehicle, and seats therein adapted to be removed or folded out of the way to permit of said recess being used when the seats are unoccupied, as specified.

3. In a cab-body, the combination of window-sashes in the sides of the vehicle, socket-receptacles into which they telescope, sectional doors, a roof to the vehicle of flexible material, and sectional standards to support the roof, the upper portions of the standards adapted to be loosened from the lower portions and carried to the rear with the roof-covering, as specified.

4. In a cab-body, the combination of window-sashes in the sides of the vehicle, socket-receptacles into which they telescope, a roof to the vehicle of flexible material, and sectional standards to support the roof, the upper portions of the standards being provided with socket ends and adapted to be loosened from the lower portions and carried to the rear with the roof-covering, as specified.

5. In combination with a vehicle, a vehicle-door which opens and closes with a sliding swinging motion determined by suitable guides upon the one side thereof and upon the other side by a hinge or hinges which swing the door outwardly and then inwardly, substantially as shown.

6. A vehicle and a guide-casting, K, in combination with a vehicle-door, a guiding-arm, H', and a hinge, H², all operating together, substantially as and for the purpose specified.

7. In combination with a vehicle-seat, parallel rack-standards O², casting o, arranged to slide upon the standards, hinges which unite the seat to the castings, and a bolt, o', projecting from the seat and adapted when the seat is lowered to enter the apertures in the standards O² to sustain the seat in position, substantially as specified.

8. In a vehicle, a standard provided with apertures to form a rack, in combination with a seat adjustable in height, an arm pivoted to the seat, and a casting movably secured to the rack through which the lower end of the arm operates and engages in the apertures of a rack, the said arm being retained in the casting in such manner as to be limited in its motion, as specified.

9. A convertible four-wheeled cab having that portion of the frame-work of its front running-gear which attaches directly to the body of the vehicle of identical or equivalent shape with the similar portion of a shaft used by two-wheeled cabs, the said running-gear and the said shafts being readily interchangeable and the vehicle thus made convertible, as specified.

10. In a cab interchangeably convertible from a two into a four wheeled vehicle, a rear elevated driving-seat, the stand of which is detachably connected to the body of the cab, for the purpose specified.

11. In a package-support for vehicles, the combination of a U-shaped continuous bar of angle-iron with guides secured to the vehicle in which the legs of the angle-bar may slide and the bar be supported when extended beyond the edge of the vehicle, as specified.

12. An elevated rear driving-seat to a cab, the base of which is inclined upwardly and to the rear and a latch-rod attached in bearings thereto, in combination with a seat-support similarly inclined, and with a rack-bar, N⁹, adapted to co-operate with it and secure the seat in any adjusted position, as and for the purpose specified.

401,759. WATCH-MAKER'S STAKING-TOOL. JOHN C. ROGERS-LEAN, Worcester, Mass. Filed Oct. 31, 1887. Serial No. 253,234. (No model.)



Claim.—1. In a tool for watchmakers' use, the supporting-stand adapted to be held in a vise and having the end to be embraced by the jaws of the vise provided with a slot forming two elastic portions at each side of the slot, substantially as described, and for the purpose specified.

2. In a tool for watchmakers' use, a supporting-stand for maintaining a rest for the work, a rest for the work, a barrel for a vertically-moving plunger, said barrel having an external screw-thread, a sleeve provided with an internal screw-thread, and a screw-threaded plug entering said sleeve and arranged to force the plunger downward in said barrel, substantially as described.

3. In a tool for watchmakers' use, having a supporting-stand and a vertically-moving plunger, the stamp D, said stamp being provided with a series of openings substantially semicircular in form, as and for the purpose set forth.

4. In a tool for watchmakers' use, the stand A, provided with a slot, *d*, and holes *b* and *c*, and a tubular barrel to receive a sliding plunger, substantially as described.

5. The combination of stand A, barrel *d'*, screw-threaded sleeve F, and plug G, having a socket, *m*, substantially as described.

6. The combination of the supporting-stand A, provided with rests for the work and a barrel, *d'*, screw-threaded sleeve F, and plug G, provided with a central socket, *m*, to receive a plunger or tool, H, said tool being flattened on its side, together with means by which the rotation of the tool is prevented, substantially as described.

401,760. STOPPER-RECEIVER FOR BOTTLES. AXEL T. SOHER, Salem, Mass. Filed Mar. 7, 1888. Serial No. 266,644. (No model.)

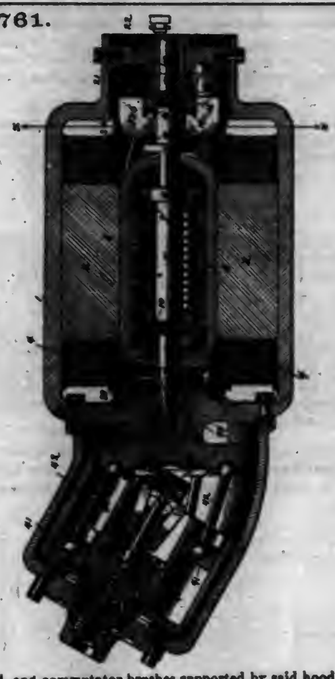


Claim.—The bottle a, having neck *a'* and projecting shoulder a^2 at the junction of the neck and body of the bottle, in combination with the spring-clasp *c* and its cup *c'*, supported on the said shoulder or projection a^2 of the bottle, substantially as set forth and described.

401,761. COMBINED MOTOR AND ELECTRIC GENERATOR. JAMES F. SHAWHAN, Dayton, Ohio, assignor of one-half to James W. Carpenter, same place. Filed Mar. 23, 1888. Serial No. 268,268. (No model.)

Claim.—1. In an electric generator, a frame supporting the field-magnets and provided with a contracted hood extending from one end thereof, and an armature-shaft, one end of which is supported in the frame and the other in the hood, a commutator arranged within

401,761.



the hood, and commutator-brushes supported by said hood, substantially as described.

2. In an electric generator, a supporting-frame carrying the field-magnets and provided with a hood extending from one end thereof, a cross-bar arranged in said hood, and an armature-shaft, one end of which is supported in said cross-bar and the other is supported in the frame, substantially as described.

3. In an electric generator, a frame supporting the field-magnets and having a hood extending from one end thereof inclosing the commutator and brushes, and a casing surrounding the exposed portions of the armature between the field-magnets and the frame, substantially as described.

4. In an electric generator, a frame supporting the field-magnets and having a hood projecting from one side thereof, a disk of insulating material closing the end of said hood, and casings extending between the field-magnets and the frame, whereby the armature and commutator and brushes are completely protected from exposure, substantially as described.

5. In an electric generator, an armature-shaft, a commutator supported thereon, and screw-nuts for holding said commutator in position, one of the nuts being provided with a recess for the reception of oil, substantially as set forth.

6. In an electric generator, a frame supporting the field-magnets, a hood projecting from said frame, and having a cross-bar supporting the armature-shaft, a commutator upon said armature-shaft, a disk of insulating material closing said hood, and commutator-brushes supported in said disk and arranged parallel to said shaft to make contact with the commutator-sections at right angles to the shaft, substantially as described.

7. In an electric generator, a frame supporting the field-magnets, a hood extending therefrom, a disk of insulating material secured in said hood, sleeves secured to said insulating material, and commutator-brushes in said sleeves and arranged parallel with the armature-shaft, substantially as described.

8. In a combined electric generator and motor therefor, a frame supporting the field-magnets, provided with a hood inclosing the commutator and brushes therefor, a casing between the field-magnets and frame inclosing the exposed portions of the armature, and a casing secured to the other end of the frame inclosing the motor connected to the armature-shaft, whereby all the operative parts of the generator and motor are protected from exposure, substantially as described.

9. In an electric generator, a frame supporting the field-magnets, casings arranged between the field-magnets and frame, and a hood inclosing the commutator and brushes, whereby the operative parts of the generator are protected from exposure while the field-magnets are exposed to the air, substantially as described.

10. In an electric generator, the combination, with an armature

shaft carrying a commutator, of a disk of insulating material, casings attached to said disk, commutator-brushes sliding in said casings, springs secured to the disk and bearing upon the end of said brushes, and adjusting-screws in the ends of the springs, substantially as described.

401,762. COPYING APPARATUS. GEORGE H. SMITH, London, County of Middlesex, England. Filed Aug. 13, 1888. Serial No. 282,637. (No model.) Patented in England May 14, 1888, No. 7,149.

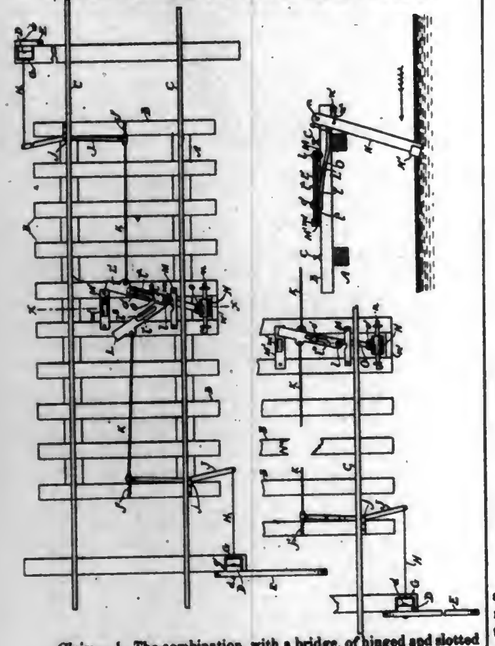


Claim.—1. The hereinbefore-described composition of matter to be used for a slab or pad for taking manifold copies of writing or other analogous matter, consisting of china-clay, starch, glycerine, and water.

2. The combination, with a back plate of absorbent material, of a composition consisting of china-clay, starch, glycerine, and water mounted on said plate, substantially as and for the purpose set forth.

3. The combination, with a retaining-tray, of a layer of absorbent material in the tray, and a composition consisting of china-clay, starch, glycerine, and water above the said absorbent material, substantially as and for the purpose set forth.

401,763. DANGER-SIGNAL FOR RAILWAY-BRIDGES. JAMES W. STEELE, Topeka, Kans., assignor of one-half to Andrew McNally, Chicago, Ill. Filed June 1, 1888. Serial No. 275,745. (No model.)



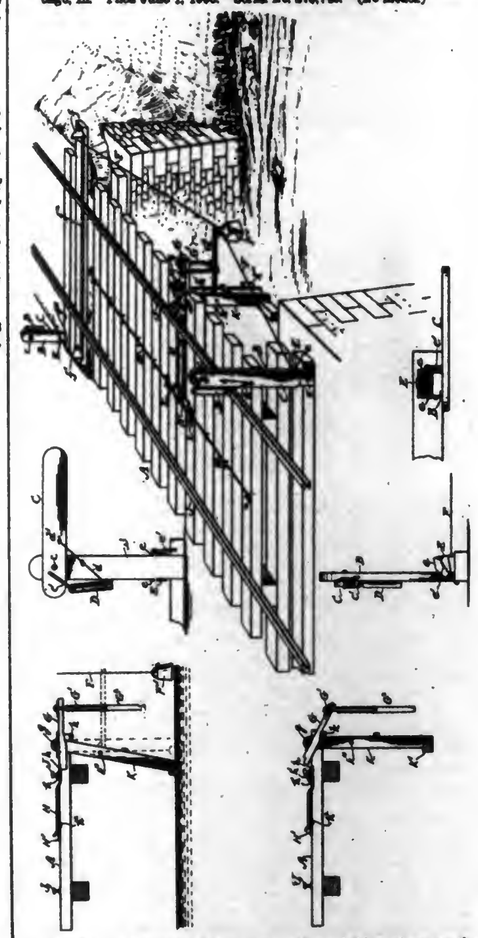
Claim.—1. The combination, with a bridge, of hinged and slotted jaws normally held together by a pin or stud in operative connection with a float-trigger, rods, cords, or strips K K, attached to said jaws, respectively, and to the ends of the bridge, springs for holding said cords under resilient tension, and signals at or near the ends of said bridge in operative connection with said springs, whereby the severing one or both of said cords will permit the springs to recoil and operate the signals, substantially as shown and described.

2. The combination, with a railway-bridge, of automatic semaphores or signals arranged, respectively, at or near the ends of the bridge, the slotted jaws L L', wires, rods, or strips for connecting the same with said automatic signals, and a float-trigger having a rod, O, and stud o', substantially as shown and described.

3. The combination, with a railway-bridge, of automatic semaphores or signals arranged, respectively, at or near the ends of the bridge, slotted jaws L L', a float-trigger for releasing said jaws, and rods or strips of a fusible or inflammable material for connecting said jaws with said automatic signals, substantially as shown and described.

4. In a danger-signal for railway-bridges, the hinged jaws L L' in operative connection with automatic signals at or near the ends of the bridge, a pin, o', for normally holding said jaws together, a suspended float-trigger in operative connection with said pin, and means—such as the cleat n' and spring n^3—for preventing the swinging of said frame by the action of the wind, substantially as shown and described.

401,764. DANGER-SIGNAL FOR RAILWAY-BRIDGES. JAMES W. STEELE, Topeka, Kans., assignor of one-half to Andrew McNally, Chicago, Ill. Filed June 1, 1888. Serial No. 275,746. (No model.)



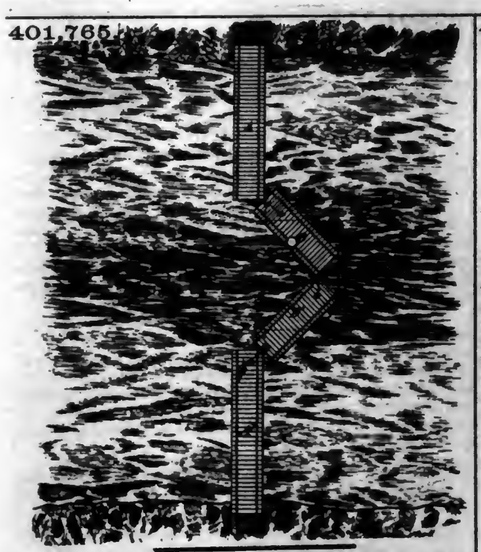
Claim.—1. The combination, with a railway-bridge, of automatic signals at or near the ends thereof, a wire or cable for connecting the releasing mechanism of said signals, a float-trigger, a weight attached to said cable at or near the middle of the bridge, w pivoted bar in operative connection with said trigger for normally sustaining said weight, a secondary pivoted bar for sustaining said weight-supporting bar, a tripping-plate for normally holding said secondary bar, springs attached to said tripping-plate, and rods, cords, or strips of fusible or inflammable material attached to the ends of the bridge for holding said springs under resilient tension, whereby a fire or dangerous rise of water may release said weight and actuate said signals, substantially as shown and described.

2. The combination, with a bridge, of the tripping-plate H, springs L L', rods, cords, or strips M M', for holding said springs under resilient tension, bars G G^2, the latter being suspended from the former, float-trigger K, weight F', and cable F, in operative connection with automatic signals at or near the ends of the bridge, substantially as shown and described.

401,765. PONTOON-BRIDGE. SYLVESTER H. STEWART, Philadelphia, Pa. Filed Jan. 19, 1889. Serial No. 296,926. (No model.)

Claim.—A bridge with a floating draw constructed of two floating leaves, one connected to each causeway in such manner as to swing freely, and of such length relatively to the open water-way as when closed to have the form of a V, substantially as and for the purpose described.

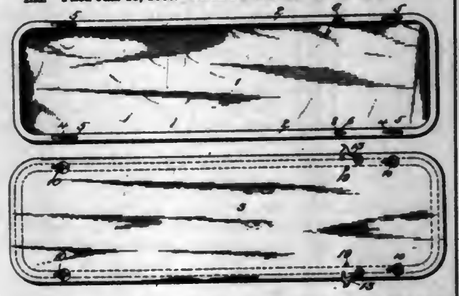
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401,766. DETERGENT. FRANCIS C. TAYLOR, New York, N. Y., assignor of two-thirds to Robert C. Campbell, Philadelphia, Pa., and William K. Peck, Grand Rapids, Mich. Filed Aug. 6, 1888. Serial No. 282,060. (No specimens.)

Claim.—The herein-described composition of matter adapted for softening hardened printing-inks and the skins thereof, consisting of balsam of copaiba, glycerine, crude petroleum, and oil of sandal-wood, combined together substantially in the proportions specified.

401,767. COFFIN-FASTENER. CHARLES R. TEMPLE, Terre Haute, Ind. Filed Jan. 15, 1889. Serial No. 296,422. (No model.)



Claim.—1. A coffin or casket provided near one end in each of its sides with a socket and at the opposite end with a transverse recess, one of the walls of which is undercut, in combination with a lid provided near one end with opposite lugs adapted to enter the sockets and at its opposite end with a pivoted hook adapted to take in the recesses and bind against one of the walls thereof, substantially as specified.

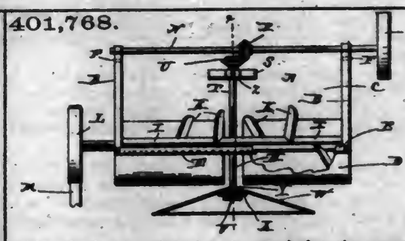
2. A coffin or casket provided near one end at each of its sides with inclined sockets and at the opposite end with a transverse recess, one of the walls of which is undercut for a portion of its length, in combination with a lid having horn-shaped lugs adapted to enter the sockets and having pivoted hooks adapted to enter the recesses, the hooks being formed on a taper and undercut at its inner edge, whereby a forcing and drawing action takes place when the hooks enter the recesses, substantially as specified.

3. The casket 1, having the walls 2, formed with the sockets 4, having grooves 5, and the opposite recesses 6, provided with transverse bars 8 and undercut, as at 7, in combination with the lid 3, having the lugs 10, secured thereto by means of the perforated plates 11 and adapted to enter the sockets, and having the hooks 13, provided with the eye 14 and secured to the lid by the screw 15, and having the hook end 16, tapered and undercut as at 17, substantially as specified.

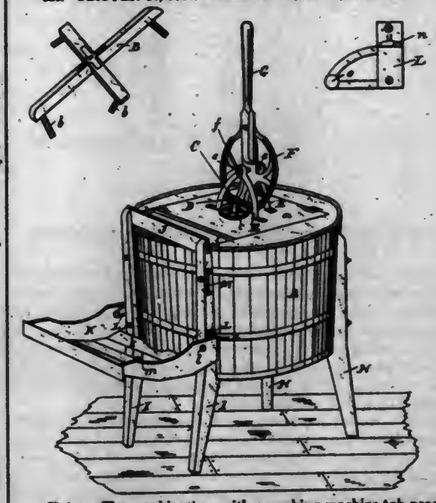
401,768. MANURE-DISTRIBUTER. JAMES A. TISHER, Gordon La. Filed Nov. 13, 1888. Serial No. 290,668. (No model.)

Claim.—The manure-distributing attachment for wagons, comprising the hopper adapted to be attached to the rear end of the wagon-body and having the semi-cylindrical bottom provided with the discharge-opening, the shaft I, journaled in the walls of the hopper above the bottom thereof, and having the stirring-arms K and the pulley L at one end, the shaft N, journaled in the upper side of the hopper and having the pulley O, the vertical shaft T, journaled in bearings S in the hopper and extending down through the discharge-opening thereof, the mitered gears P U, connecting the shafts N T, the distributing device detachably secured to the lower end of shaft T, and the endless belts to connect the pulleys O L to the hubs of the rear wagon-wheels, substantially as described.

401,768.

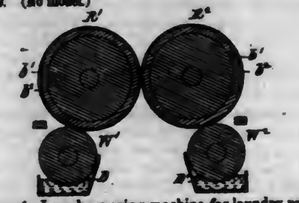


401,769. WASHING-MACHINE. THOMAS WALDRON, Sheldon, Mo. Filed June 17, 1887. Serial No. 241,642. (No model.)



Claim.—The combination, with a washing-machine tub provided with legs, of the projecting brackets L, secured to the legs of the tub and provided with the stops s on their inner ends, and with the pivots o, projecting horizontally from the projecting outer ends of the said brackets some distance from the said stops, and the clothes-rack having its sides pivoted on the said pivots, with the inner ends of its sides resting against the under sides of the stops, said clothes-rack being adapted to fold upwardly over the center of the said pivots and to rest against the side of the tub when not in use, substantially as set forth.

401,770. DAMPENING-MACHINE. MEMO R. WENDELL, Troy, and THOMAS S. WILDE, Albany, N. Y. Filed Nov. 17, 1883. Serial No. 112,079. (No model.)



Claim.—1. In a dampening-machine for laundry purposes, a pair of rollers each having a non-absorbent elastic body or periphery covered by a thin textile fabric and arranged to run in contact with each other, in combination with separated water-supply rollers, substantially as specified.

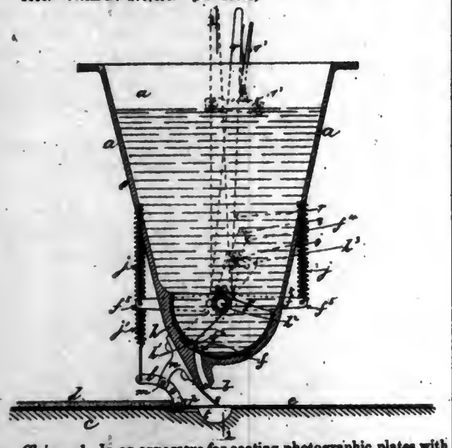
2. The combination of the rollers R' R^2, each having the rubber body or periphery b' and thin textile covering b^2, and arranged to run

in contact with each other, the separated water-supply rollers W' W³, the troughs D', connecting-troughs D³, supply-pipe I, overflow-nipple n, and discharge-pipe o, substantially as specified.

3. The combination, with the rollers R' R³, arranged to run in contact with each other, having the non-absorbent elastic bodies or peripheries b' and thin textile covering b³, of the adjustable bearings J', the water-supply rollers W' W³, the adjustable bearings J³ J⁴, and the troughs D' D³, substantially as specified.

4. The combination, with the two dampening-rollers R' R³, each having a rubber body or periphery, b', and thin textile covering b³, running in contact with each other, of the supply-rollers W' W³, each running in contact with one of the rollers R' R³, and a suitable frame-work, substantially as specified.

401,771. APPARATUS FOR COATING PHOTOGRAPHIC PLATES WITH EMULSION. ROBERT R. M. BAIN, St. Louis, Mo. Filed Jan. 5, 1888. Serial No. 260,490. (No model.)



Claim.—1. In an apparatus for coating photographic plates with emulsion, the combination of a tank having an outlet-passage, a cylindrical-shaped valve pivoted axially and having arms connected by springs to said tank, a spring connecting one of said arms to a lever fixed on a shaft mounted in bearings and having an arm, whereby, when the plate to be coated is brought into contact with the lever, the valve is opened and the emulsion is permitted to flow, substantially as shown, and for the purpose described.

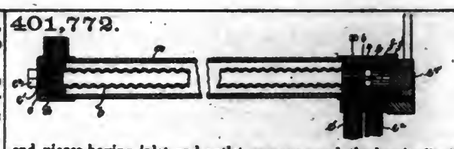
2. In an apparatus for coating photographic plates with emulsion, the combination of a tank having an outlet-passage, a cylindrical-shaped valve pivoted axially and having arms connected by springs to said tank, a spring connecting one of said arms to a lever fixed on a shaft mounted in bearings and having an arm, with a hand-lever having a ratchet or clicking device, whereby, when the plate to be coated is brought into contact with the lever, the valve is opened and the emulsion is permitted to flow, substantially as shown, and for the purpose described.

3. In an apparatus for coating photographic plates with emulsion, the combination of a tank having an outlet-passage, a cylindrical-shaped valve pivoted axially and concentrically, with an adjustable portion formed on its edge with notches, said valve having arms connected by springs to said tank, and an arm having a projecting stud or pin, a spring connecting one of said arms to a lever fixed on a shaft mounted in bearings and having an arm, a slotted arm fixed on the pivot of the adjustable portion of the valve and adjustably confined to the arm having the stud or pin, with a hand-lever having a ratchet or clicking device, whereby, when the plate to be coated is brought into contact with the lever, the valve is opened and the emulsion is permitted to flow, substantially as shown, and for the purpose described.

4. In an apparatus for automatically coating photographic plates with emulsion, the combination of a tank for holding the emulsion, an outlet-passage in the said tank for the escape of the emulsion, a flexible apron for directing the emulsion onto the plate to be coated, a valve for opening and closing said outlet-passage, and mechanism for operating said valve, substantially as described, whereby, when the plate to be coated is brought into contact with the lever, the valve is opened and the emulsion is permitted to flow, substantially as described.

401,772. STEAM-TRAP. CHARLES F. REISHAW, Boston, Mass. Filed July 20, 1888. Serial No. 280,630. (No model.)

Claim.—1. In a steam-trap, the external elongated case, a, and

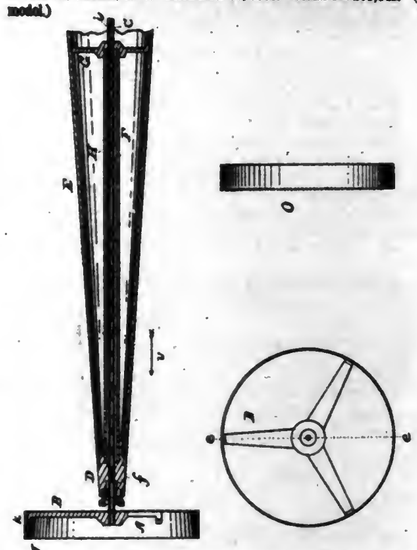


end pieces having inlet and outlet passages, and the longitudinally-expansible tube b, combined with a valve moved by said tube b, the rotatable plug f, and the valve-seat within it, substantially as described.

2. In a steam-trap, the external case, a, and longitudinally-expansible tube b, held adjustably within it, and the valve moved by said tube, combined with the end piece c, having the outlet-passages c' c², and the plug-valve f, contained in said end piece, it having the ports 2 3 and the valve-seat formed within it between said ports, substantially as described.

3. In a steam-trap, the external case, a, adapted to be placed beneath a car-seat and made substantially as long as the said seat to serve as a radiating and discharge pipe, and the end pieces connected with said case having inlet and outlet passages, the expansible tube held in said case, and the valve controlled by the longitudinal expansion of said tube, combined with the rotatable plug controlling the outlet-passages, and the valve-seat formed within said plug, substantially as described.

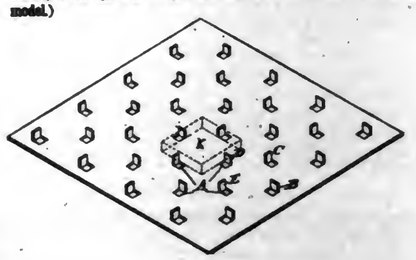
401,773. NET-CUTTING ATTACHMENT FOR TORPEDOES. SETH A. BROWN, Buffalo, N. Y. Filed Dec. 17, 1888. Serial No. 293,843. (No model.)



Claim.—1. In a torpedo, the combination therewith of an annular cutter secured in a supporting-frame mounted at the head of the torpedo upon a shaft set in bearings within the torpedo, and extending from the front toward the rear, and a suitable means for giving it a rotary motion, substantially as described.

2. In a torpedo, the combination therewith of a tube, F, passing longitudinally through the explosion-chamber H, and the shaft C, passing through the tube and having at its forward end an annular cutter, and at its rear end a means for giving it a cutting motion, substantially as described.

401,774. CARAMEL-HOLDER. GEORGE W. CRANE and ERNEST E. CRANE, St. Joseph, Mo. Filed July 13, 1888. Serial No. 279,885. (No model.)



Claim.—1. A caramel-holder consisting of a sheet having fingers B, C, D, and E stamped out therefrom, forming apartments for the articles to be packed, substantially as described.

2. A caramel-holder consisting of a sheet having upright fingers B, C, D, and E stamped therefrom, forming apartments for the articles to be packed, substantially as described.

401,775. CAR-COUPLING. JOHN CONE, New Haven, Conn. Filed Aug. 14, 1888. Serial No. 282,711. (No model.)



Claim.—1. In a car-coupler of the Janney type, a draw-head pivotally secured to the draw-bar outside of the framing of the car, and a swinging hook secured to one of the lateral extensions of the head, in combination with a locking device, substantially as described.

2. In a car-coupler of the Janney type, a draw-bar having upper and lower projecting jaws at its front end, a draw-head having seats or recesses to receive said jaws, and a pin for securing said parts, in combination with a swinging hook secured to one of the lateral extensions of the head, and a locking device, substantially as described.

3. In a vertical-hook coupler, the combination of a draw-bar, a head made in two detached sections and pivotally secured to the bar, a hook having a shoulder on its rear arm, a latch having two arms, and a pin provided with a projection for tripping said latch, substantially as described.

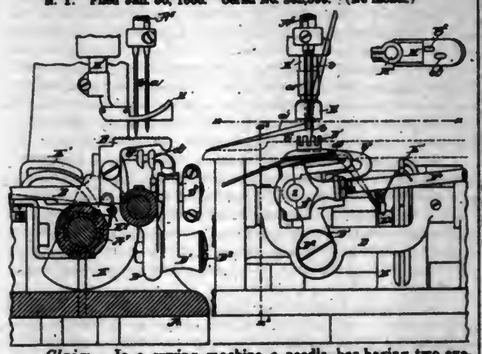
4. In a car-coupler having a swinging hook, a snow or ice guard constructed to cover the joint of the hook, substantially as described.

5. In a car-coupler having a swinging hook, a swinging snow or ice guard supported by a pin in the draw-head and constructed to cover the joint of the hook when the hook is in locked position, substantially as described.

6. In a vertical-hook coupler, a draw-bar, a draw-head secured thereto by a bolt and forming a laterally-swinging joint, a rotary hook, and a latch for locking the hook, in combination with a snow-guard for the joint between the hook and the draw-head, substantially as described.

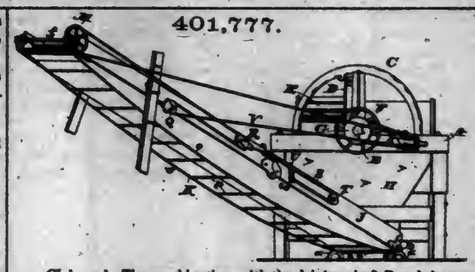
7. In a vertical-hook coupler, the combination of a draw-bar having upper and lower jaws or extensions on its front end, a draw-head made in two separate sections, each having a rounded extension on its rear end, the upper section having a vertical projection on said extension and the lower section having a recess corresponding therewith, a rotary hook, and a latch, substantially as described.

401,776. SEWING-MACHINE. JOHN W. DEWEES, Philadelphia, Pa., assignor to The Union Special Sewing Machine Company, New York, N. Y. Filed Jan. 30, 1888. Serial No. 262,309. (No model.)



Claim.—In a sewing-machine, a needle-bar having two eye-pointed needles set in different vertical planes, both in the direction of the width and length of the machine, combined with two loopers arranged one behind the other in the direction of the feed of the material, and with a looper-carrier, each looper co-operating with one of the said needles in the formation of parallel seams, substantially as described.

401,777. DRIVING MECHANISM FOR ENDLESS CARRIERS. JOSEPH DIEM, Canton, Ohio. Filed July 9, 1888. Serial No. 279,477. (No model.)



Claim.—1. The combination, with the driving-shaft B and sheave G, of sheaves N and sheave-holders O, terminating in shanks r, having extending bearing portions s, about which the sheaves may swing, substantially as set forth.

2. In combination, the sheave G, sheaves N, arranged at one side of the sheave G, sheave-holders O, having bearing portions s, and a clasp, P, having oppositely-projected fingers u, by which said holders and sheaves are spaced apart, one above the other and free to swing vertically, substantially as set forth.

3. The combination of the sheaves G and N, sheaves M and Q on the carrier-frame, endless rope V, movable sheave R, and a take-up device in connection with the movable sheave R, for adjusting the endless rope V to different positions of the carrier, substantially as set forth.

401,778. CULTIVATOR. JOSIAH DODDS, Appleton City, Mo. Filed Aug. 6, 1888. Serial No. 282,111. (No model.)



Claim.—1. In a cultivator, a main frame provided with ground-wheels and with a doubletree to permit the connection of two draft-animals thereto, two drag bars or beams connected to the frame by suspending devices and free to move longitudinally in relation to each other and to the frame, and two singletrees connected one with each beam, substantially as described.

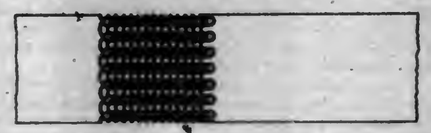
2. In a cultivator, the main or draft frame provided with supporting-wheels and with means for the connection of two draft-animals thereto, the pendent arms or links attached to said frame, the two independent drag bars or beams connected to the respective links by joints which admit of their rear ends swinging vertically and laterally, the singletrees connected to the forward ends of the respective beams, and adjustable devices, substantially as shown, connecting the beams with the frame and regulating the elevation of their rear ends.

3. In a cultivator, a wheeled frame provided with a draft device, a drag-bar connected to said frame by devices which permit free longitudinal motion in relation thereto, and a distinct and independent draft device connected with said beam, as described, whereby the power required for the propulsion of the beam may be applied to each independently of the other.

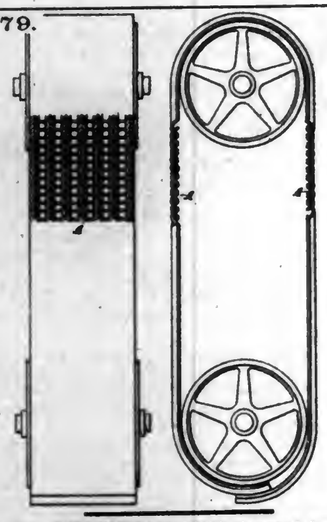
4. In combination with the wheeled frame, the drag-bar, the rock-shaft provided with the sector-plates, the suspending device connecting one of said plates with the beam, the chain extended rearward from the other of said plates, and a fastening device for the last-named chain, substantially as described.

401,779. BELTING FOR MACHINERY. WILLIAM C. EDGE, Newark, N. J. Filed Jan. 21, 1888. Serial No. 266,978. (Model.)

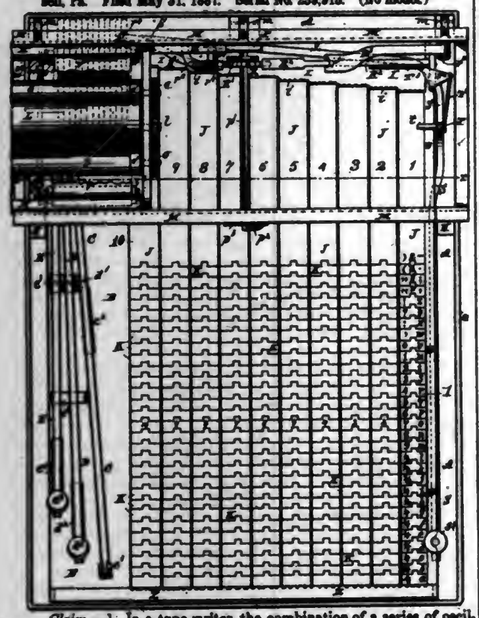
Claim.—As an improved article of manufacture, a driving-belt for machinery, the same consisting of a strip of knitted wire having a practically smooth or flush side for contact with the pulleys, and ribs on the reverse side, substantially as described.



401,779.



401,780. TYPE-WRITING MACHINE. LEBBEUS G. GARRETT, Biscoll, Pa. Filed May 31, 1887. Serial No. 239,913. (No model.)



Claim.—1. In a type-writer, the combination of a series of oscillating type-carriers, a series of keys connected, substantially as described, to and operating the said type-carriers to bring the type into line, and a rocking plate upon which the said type-carriers and keys are mounted and by which the type-carriers are elevated to make the impression, substantially as described.

2. In a type-writer, the combination of a series of oscillating type-carriers and a series of keys, each composed of a number of sections hinged together, connected, substantially as described, to and operating the said type-carriers to bring one or more of the type into line at once, substantially as described.

3. In a type-writer, the combination of a series of oscillating type-carriers, a series of keys, each composed of a number of sections hinged together, and connected, substantially as described, to and operating the said type-carriers to bring one or more type into line, and springs for returning the type-carriers and keys to their normal position, substantially as described.

4. In a type-writer, the combination of a series of oscillating type-carriers, a series of keys, each composed of sections hinged together, substantially as described, and connected, substantially as described, to and operating the said type-carriers to bring the type into line, a rocking plate upon which the said type carriers and keys are mounted and by which the type-carriers are elevated to make the impression, and springs for returning the type-carriers, keys, and rocking plate to their normal position, substantially as herein set forth.

5. In a type-writer, the combination, with a frame and a paper-carriage thereon, of a series of oscillating type-carriers, a series of keys connected, substantially as described, to and operating the type-carriers to bring the type into line and having their inner ends of varying lengths, a pivoted spacing-plate having a series of shoulders, and intermediate mechanism, substantially as described, between the spacing-plate and the paper-carriage for operating the same, substantially as herein shown and described.

6. In a type-writer, the combination, with a frame and a paper-carriage thereon, of a series of oscillating type-carriers, a series of keys, each composed of hinged sections connected to and operating the said type-carriers to bring the type into line and having their inner ends of varying lengths, a rocking plate upon which the said type-carriers and keys are mounted and by which the type-carriers are elevated to make the impression, springs for returning the type-carriers, keys, and rocking plate, a pivoted spacing-plate having a series of shoulders, a pawl on the spacing-plate, and mechanism, substantially as described, operated by the pawl to shift the paper-carriage, substantially as herein specified.

7. In a type-writer, the combination of a frame, a paper-carriage thereon a rocking plate, B, fulcrumed on the frame, a shaft, 1^a, held in bearings on the plate B, a series of keys, as 1 to 10, supported independently by a series of hollow shafts from said shaft 1^a, a series of type-carrying sectors, as 3^b to 12^b, connected to the key-shafts to be rocked by or from the keys to carry the type into line for print, springs retracting the rocking plate, the type-carrying sectors and the keys, and an impression roller or platen on the paper-carriage opposite the type on the adjusted sectors, substantially as shown and described.

8. In a type-writer, the combination of a suitable frame, a paper-carriage thereon, a rocking plate, B, fulcrumed on the frame, springs F and stops for said plate, a shaft, 1^a, on the plate B, a series of keys, as 1 to 10, supported independently from said shaft and having rear stems of varying lengths, a series of type-carrying sectors, as 3^b to 12^b, connected to the respective key-shafts to be rocked by or from the keys to bring the type into line for print, springs G, retracting the sectors and keys, an impression roller or platen on the carriage opposite the type on the adjusted sectors, a spacing-plate, I, having a series of shoulders, *i*, normally overlapping the keys, and said plate I fitted to the frame so as to yield to let the ends of the keys pass the shoulders, a stop, I', for the plate I, a pawl, R^3, connected to the plate I, a shaft, *p'*, a ratchet-wheel, R, thereon, actuated by the pawl R^3, and a pinion, P, engaging a rack on the paper-carriage, substantially as described, for the purposes set forth.

9. In a type-writer, the combination of a frame, a paper-carriage thereon, a rocking plate, B, fulcrumed to the frame, a shaft, 1^a, on the plate B, retracting-springs and stops for said plate, a series of keys, as 1 to 10, supported independently from the shaft 1^a and having rear stems of varying lengths, a series of type-carrying sectors, as 3^b to 12^b, connected to the respective key-shafts, an impression roller or platen on the carriage, a spacing-plate, I, having a series of shoulders, *i*, normally overlapping the keys, a pawl, R^3, connected to the plate I, a shaft, *p'*, a ratchet-wheel, R, thereon, actuated by the pawl, a pinion, P, engaging a rack on the carriage, a spring, E', connected to the frame and to the shaft *p'* and adapted to be put in tension as the carriage is shifted by the pawl, a retaining-pawl, R^4, having a hook-head, *r*, engaging the ratchet-wheel to lock the carriage when shifted by the pawl and pinion, the pin r^2, for engaging the head of the pawl to disengage it from the ratchet-wheel, and a lever for raising the said pawl, substantially as described, for the purposes set forth.

10. In a type-writer, the combination, with a frame, a paper-carriage thereon, a rack-and-pinion device adapted to shift the carriage, and a pawl, R^3, connected to a pivoted spacing-plate operated by the keys for actuating the pawl, substantially as specified, of a lever, S, fulcrumed to the key-board support and having an arm, T, the elbow-lever T^2, pivoted to the frame, the rod T', pivoted to the arm T and elbow lever T^2, and the rod T^3, pivoted to the elbow-lever and to the pawl R^3, substantially as herein set forth.

11. In a type-writer, the combination, with a frame, a paper-carriage thereon, a rack-and-pinion device adapted to operate the carriage, a pawl, R^3, connected to a pivoted spacing-plate operated by keys for actuating the pawl, a ratchet-wheel, R, a spring, R', on the ratchet-shaft, and a retaining-pawl, R^4, for the ratchet and carriage, of a lever, S, fulcrumed to the key-board support and having an arm, T, the elbow-lever T^2, pivoted to the frame, the rod T', pivoted to the arm T and to the elbow-lever, and the rod T^3, pivoted to the elbow-lever and to the pawl R^3, said lever S extended to the detent-pawl R^4, substantially as shown and described, whereby as the lever is depressed at s^4 both pawls R^3 R^4 will be disengaged from the ratchet-wheel R to allow the spring R' to automatically retract the carriage, as herein set forth.

12. In a type-writer, the combination, with a frame, a paper-carriage, N, sliding thereon, a paper-roller in the said carriage, a pinion on the end of the paper-roller, a lever, S, having an arm, T, carrying a pin, *t*, a ratchet-and-pinion device, *p'* R P, adapted to feed the carriage, a spring, R', adapted to retract the carriage, a feeding-pawl, R^3, connected to a pivoted spacing-plate operated from the type-keys, and a retaining-pawl, R^4, substantially as shown and described, whereby as the lever S is depressed at s^4 the pawls R^3 R^4 will be disengaged from the ratchet-wheel R to allow the spring to retract the carriage, and the pin *t* of the arm T will be set to engage a pinion on a paper-roller of the retracted carriage, and when the lever S is released the carriage-rollers will be actuated by the pin *t* to shift the paper for the next line of printing, as herein set forth.

13. In a type-writer, the combination, with the frame, a sliding carriage thereon, paper holding and feeding rollers mounted in the said carriage, and pinions on the ends of the rollers and meshing with each other, of the lever S, provided with the arm T, having an inwardly-projecting pin, *t*, and a spring for returning the lever to its normal position, substantially as described, whereby when the lever is depressed the arm will be swung forward with its pin between the teeth of the pinion of one of the feed-rollers, ready to move the said roller by the action of its spring when released, as set forth.

14. In a type-writer, the combination of a series of keys forming a key-board, a rocking plate pivoted to the frame and to which the keys may be depressed, said keys being connected independently to a series of oscillating type-carriers adjustable by depressing the keys to bring the type into line for print, and springs retracting the type-carriers and keys, and said keys having inner parts or stems varying in length, a pivoted spacing-plate having a series of shoulders normally overlapping the keys, a pawl connected to the spacing-plate, and mechanism, substantially as specified, operated by the pawl for shifting the paper-carriage, a stop, b^3, for the rocking plate, and a stop, I', fixed to said plate and adapted, when the plate is rocked by pressure on said bar, to operate the pawl for feeding the paper-carriage to space words apart and, without operating the type-carriers, to adjust the type into line for print, substantially as shown and described.

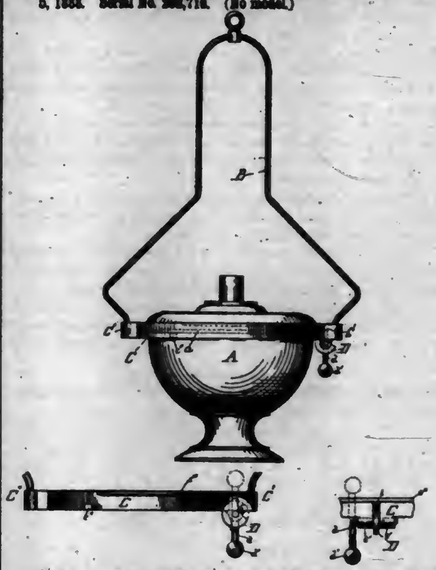
15. In a type-writer, the combination of a series of keys forming a key-board and connected to independent type-carriers, and adapted, when depressed, to operate the carriers to bring the type on them into line for print, and said keys having characters produced on them corresponding to those on the carriers, in combination with one or more special type-carriers bearing capitals and other special characters, and a lever and one or more special keys and pins arranged to couple the special carriers to the shaft of the first key and simultaneously uncouple said key from the type-carrier to which it is normally connected, and said first key bearing characters like those on the type-carriers connected to the key-board keys, and also bearing characters corresponding with or indicating those on the special type-carriers, which may be coupled to it, substantially as described, for the purposes set forth.

16. In a type-writer, the combination, with a frame, a rocking plate, B, fulcrumed thereon, a series of keys, as 2 to 10, supported independently from a shaft, 1^a, held to the plate B, a series of type-carriers, as 4^b to 12^b, inclusive, fixed to shafts on which the keys 2 to 10, respectively, are supported, and said type-carriers having a series of like characters corresponding with the characters of the keys to which they are normally connected, a key, 1, fixed to the shaft 1^b, type-carriers 3^b 2^b 1^b, mounted loosely on said shaft 1^a, and the carrier 3^b, having a series of characters corresponding with those of the carriers 4^b to 12^b, and adapted for connection with a key, 1, which is held to the common shaft 1^a, a spring-actuated lever, C, fulcrumed on the plate B, and having a pin, *c*, normally entering the carrier 3^b and coupling it to the key 1, and said lever C having a lug, C', and spring-actuated keys D E, fulcrumed on the plate B, and provided, respectively, with coupling-pins *d e*, entering type-carriers 2^b 1^b, and adapted, when the keys D E are depressed, to engage the pins *d e* with the shaft 1^a, to couple the carriers 2^b 1^b, respectively, to said shaft and to simultaneously uncouple the carrier 3^b from the shaft, substantially as shown and described, whereby either of the carriers 2^b 1^b, having capitals or other special characters, may be operated at will from the key 1 of the key-board, and said key 1 also bearing characters corresponding with or indicating those on the carriers 2^b 1^b, all operating as and for the purposes set forth.

17. In a type-writer, the combination, with a frame, a rocking plate fulcrumed thereto and supporting a key-board, and a series of reciprocating type-carriers adapted to be adjusted by operating the keys and to be lifted to make an impression by tilting the rocking plate, substantially as specified, of a pair of inking-ribbon rollers, V' V^2, journaled on the frame, a ribbon, V, on the rollers and next the type, ratchet-wheels w' w^2 on the shafts of the rollers V' V^2, and pawls W' W^2, engaging the ratchets and connected to a rod, W, held to the rocking plate, substantially as shown and described, whereby as the rocking plate is tilted the pawls W' W^2 will shift the inking-ribbon, as and for the purpose set forth.

18. In a type-writer, the combination, with the operating-rollers V' V^2, provided with ratchet-wheels w' w^2, pitched in the same direction, and the rocking plate B, of the elastic pawls W' W^2, having their teeth pitched in opposite directions and secured to the elastic arm W, which is secured to the rocking plate B, substantially as herein shown and described.

401,781. SUSPENSION DEVICE. WILLIAM C. HOMAN, Meriden, Conn., assignor to Edward Miller & Company, same place. Filed Dec. 5, 1888. Serial No. 292,716. (No model.)



Claim.—1. In a ring for the support of a lamp or similar article, the combination of an interiorly-projecting lug or lugs and a rotary cam-shaped disk also normally projecting into said ring, substantially as described.

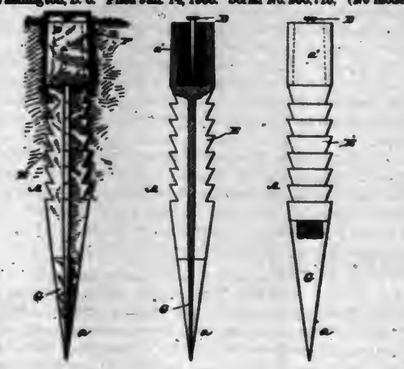
2. In a ring for the support of a lamp or other article, the combination of an interiorly-projecting lug or lugs, a rotary cam-shaped disk also normally projecting into said ring, and an interiorly-projecting flange in a plane above that of said lugs and said disk, substantially as described.

3. In a ring for the support of a lamp or similar article, the combination of an interiorly-projecting lug or lugs and a cam-shaped disk also normally projecting into said ring and capable of rotation in a vertical plane, substantially as described.

4. In a ring for the support of a lamp or similar article, the combination of an interiorly-projecting lug or lugs, a rotary cam-shaped disk also normally projecting into said ring, and an axle on which said disk is secured, one end of which is bent to form a lever or thumb-piece, substantially as described.

5. In a ring for the support of a lamp or similar article, the combination of lugs *c'*, slotted ear C, bearing *c'*, disk D, lever *d*, and weight *d'*, substantially as described.

401,782. SURVEYOR'S CORNER-STAKE. JOHN H. HOWLETT, Washington, D. C. Filed Jan. 14, 1888. Serial No. 260,715. (No model.)



Claim.—1. A surveyor's stake consisting of a metallic body provided with a head filled with an imperishable substance adapted to receive and retain a nail at any point within its limits, substantially as set forth.

2. A surveyor's stake consisting of a metallic body provided with a head filled with soft metal exposed on its upper surface to receive and retain a nail, substantially as set forth.

3. A surveyor's stake consisting of a metallic body provided with exterior longitudinal grooves, and further provided with a head filled with soft metal exposed at its upper surface to receive and retain a nail, substantially as set forth.

4. A surveyor's stake consisting of a metallic body provided with peripheral grooves extending laterally thereto and having a head filled with an imperishable substance adapted to receive and retain a nail at any point within its limits, substantially as set forth.

5. A surveyor's stake consisting of a metallic body provided with exterior longitudinal grooves and provided with a laterally-extending grooves and having a head filled with soft metal to receive and retain a nail, substantially as set forth.

6. A surveyor's stake having a filled head, the filling in the head being larger at the base than at the top and exposed at the top to receive and retain a nail, substantially as set forth.

7. A surveyor's stake provided with a head filled with an imperishable substance to receive a nail, in combination with a cap to protect the filling and nail in the head, substantially as set forth.

8. A surveyor's stake consisting of a metallic body provided with a steel point and having a head filled with soft metal, the soft-metal filling being exposed to receive and retain a nail, substantially as set forth.

401,788. BURNER FOR GAS-STOVES. LAZARD KAHN, Hamilton, Ohio. Filed May 31, 1888. Serial No. 275,594. (No model.)



Claim.—1. In a gas-burner, a closed receiver having an annular series of jet-holes at its top and a vertical air-tube leading downwardly from within said series of jet-holes, said air-tube being open to the atmosphere at its lower end, and having at its base a series of jet-holes, placing the interior of the tube in communication with the interior of the receiver, whereby flames are produced at said upper jet-holes and supplied by a column of air rising through said air-tube and heated by flames at said lower jet-holes, substantially as set forth.

2. In a gas-burner, the combination, substantially as set forth, of a receiver, a pipe in communication therewith for the supply of gas and air, and an air-tube vertically through said receiver within said series of jet-holes and enlarged from its base upward and provided with jet-holes at its base leading from within the receiver to within the air-tube.

3. In a gas-burner, the combination, substantially as set forth, of a receiver, a pipe in communication therewith for the supply of gas and air, a continuous bead formed in the top of said receiver having a series of jet-holes leading vertically through the top of the bead, a series of jet-holes in said bead and having also outside said first series of jet-holes and leading upward and outwardly from the receiver, and prongs disposed within the receiver and joining the metal of said bead.

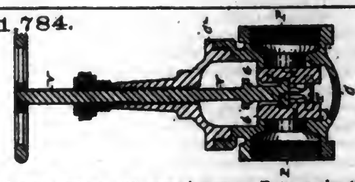
4. In a gas-burner, the combination, substantially as set forth, of a receiver, a pipe in communication therewith for the supply of gas and air, a bead formed at the top thereof and provided with a vertical series of jet-holes and with an outer series of jet-holes upwardly and outwardly inclined, and a second bead formed at the top of the receiver around said first-mentioned bead and provided with a series of jet-holes upwardly and inwardly inclined.

5. In a gas-burner, the combination, substantially as set forth, of a receiver having a series of jet-holes in its top, a pipe in communication therewith for the supply of gas and air, and a circle of prongs projecting downward from the top of the receiver to near the bottom thereof.

6. In a gas-burner, the combination, substantially as set forth, of a receiver having a series of jet-holes in its top, a pipe in communication therewith for the supply of gas and air, a tube reaching vertically through the receiver and disposed within said series of holes and having jet-holes in its base leading from the receiver to the tube, and a series of prongs disposed within the receiver between the outer wall thereof and said tube.

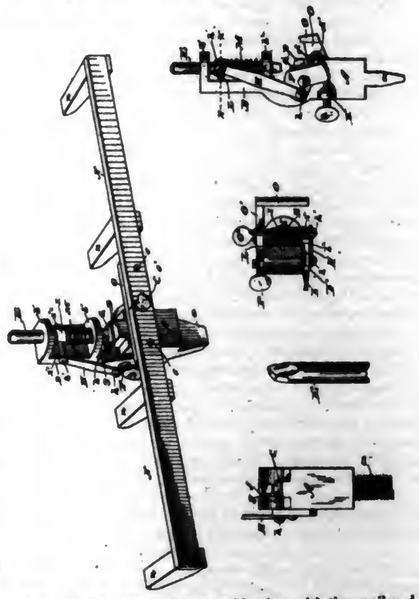
401,784. STRAIGHT-WAY VALVE. WARREN T. KELLOGG, Lansingburg, N. Y. Filed Jan. 7, 1888. Serial No. 260,068. (No model.)

Claim.—The combination, with the valve-casing C, formed with interior wedging-surfaces, W^2, and the reciprocating valve-stem V, formed with a boss, B, on its lower end, of the valve-gates G, having



beveled inner surfaces and central recesses, R, to receive the end of the valve-stem, and bearings *b* in their lower portions, and the wedges W', pivotally mounted in the bearings *b* between the gates with their free ends upward, substantially as and for the purpose specified.

401,785. SAW-SET. EVERETT H. KITCHEN, Jamestown, N. Y. Filed Aug. 15, 1888. Serial No. 282,780. (No model.)



Claim.—1. In a saw-set, the combination, with the anvil and the brackets in which the punch takes its bearings, of the pivoted gage and the arm pivotally connected to the punch between the brackets at one end and to the gage at the opposite end, whereby the gage is retracted as the punch descends, substantially as described.

2. In a saw-set, the combination, with the anvil and the reciprocatory punch, of the gage, connections, substantially as described, between the gage and punch, whereby the gage is withdrawn as the punch descends and is projected again as the punch ascends, and a spring for holding said gage in engagement with the anvil, as and for the purpose set forth.

3. In a saw-set, the combination, with the anvil, the reciprocatory punch, and the spring for returning it to normal position, of the segmental plate carrying the pivotal gage, a connection between said plate and punch whereby the gage is withdrawn as the punch descends, and the spring for holding the gage depressed, substantially as described.

4. In a saw-set, the combination, with the base carrying the anvil, the standard having the brackets for guiding the punch, and the straight surface on said standard, of the punch, and the straight surface on the same engaging the straight surface on the standard to hold the punch in alignment, substantially as described.

5. In a saw-set, the combination, with the base carrying the anvil and the standard having the two brackets and the straight surface intermediate said brackets, of the punch moving in bearings in the brackets, and the collar secured to the punch having the straight surface engaging the straight surface on the standard for holding the punch in alignment, substantially as described.

6. In a saw-set, the combination, with the base carrying the anvil, the standard having the two brackets with the intermediate straight surface and the pivoted gage, of the punch moving in bearings in the brackets, the collar connected to the punch having the straight surface engaging the straight surface on the standard, the arm extending from one side of said collar, and the rod connecting said arm and pivoted gage, substantially as and for the purpose specified.

7. In a saw-set, the combination, with the base carrying the anvil and the reciprocating punch co-operating with said anvil, of the table or saw-support pivoted to the side of the base, and the set-screw engaging said support to adjust the inclination of the same, substantially as described.

8. In a saw-set, the combination, with the base carrying the anvil, of a table or support for the saw formed of the two frames united to a central base by the pins, and the single set-screw engaging the end of both frames, substantially as described.

9. In a saw-set, the combination, with the base carrying the hardened anvil made integral therewith, of the standard extending up from one side of the base and supporting the reciprocatory plunger for co-operating with the anvil, substantially as described.

10. In a saw-set, the combination, with the base carrying the anvil, the segmental plate carrying the short shaft on which the movable gage is mounted, and the coil-spring surrounding the shaft and engaging the gage and segmental plate, respectively, of the punch, the collar surrounding the punch, having the straight surface projection and connected to the punch by the screw, the short arm on the collar, and the single link or rod connecting said arm and the segmental plate, substantially as described.

11. In a saw-set, the combination, with the reciprocating punch and segmental plate carrying the movable gage, of a collar surrounding the punch and connected to the segmental plate, said collar having a screw-threaded aperture through the same from side to side, and a screw passing through said aperture and a corresponding aperture in the punch to unite the two, substantially as described.

401,786. IRONING-TABLE. JASON A. KIMBALL, Grand Ledge, Mich. Filed Aug. 23, 1888. Serial No. 284,007. (No model.)



Claim.—1. The combination, with an ironing-board, a main inclined standard pivoted to one end of the board, and an upright standard, of a brace pivoted to the under side of the opposite end of the board to allow its free end a vertical movement, said brace being adapted to rest on the inclined standard and removably hold the free end of the board in position, and a cord or rope to limit the movement of the brace, substantially as described.

2. The combination of an ironing-board, a main inclined standard hinged to the board, an upright short standard hinged to the main standard, a brace to support the free end of the board provided with a string or cord to limit its downward movement, a cross-piece of the upright standard provided with a pin, and a horizontal brace hinged to a cross-piece of the main standard and provided at its free end with an aperture to receive said pin, substantially as described.

3. In an ironing-board, the combination of a main inclined standard pivoted to the board, an upright standard pivoted to the inclined standard, a brace hinged to the board and limited in its play by a cord attached to its free end, and a notch or depression in said inclined standard, within which the outer end of said brace rests, substantially as described.

401,787. SURGICAL APPLICATOR. ELMER LEE, St. Louis, Mo. Filed Sept. 28, 1888. Serial No. 286,655. (No model.)

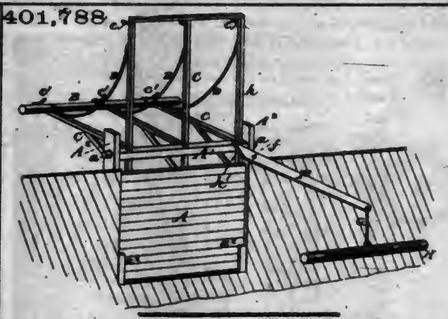


Claim.—In a surgical applicator, the combination of a tube open at one end and a rod having a rounded end or knob working freely in said tube, with a funnel or receptacle carried by and opening into the tube, substantially as shown, and for the purpose described.

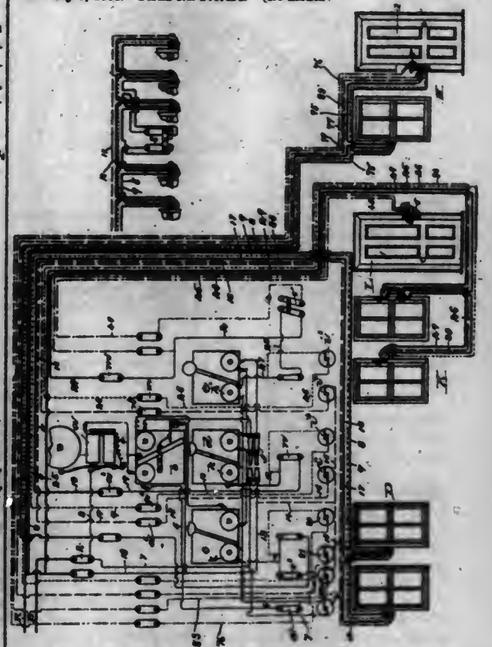
401,788. WATER-GATE. WILLIAM T. MCCLOSKEY, Westport, Pa. Filed June 18, 1888. Serial No. 277,443. (No model.)

Claim.—1. The combination, with a pivoted water-gate, of the frame C, carrying rolling or sliding weights, which change position to hold the gate open or closed, as described.

2. The combination, with a water-gate having the pivoted bar A', of the lever F, automatically operated by a float connected therewith by a rod, G, as and for the purpose set forth.



401,789. BURGLAR-ALARM AND TESTING SYSTEM. FRANK H. NUTTER, Malden, assignor to Herbert L. Slade, Chelsea, Mass. Filed July 9, 1888. Serial No. 279,431. (No model.)



Claim.—1. In a burglar-alarm system, the battery-wires and several pairs of independent loops leading therefrom, each pair of loops being normally open respectively at opposite sides of the battery, and provided with a testing press-button, combined with one member of a circuit-changing device included in each loop, whereby each independent pair of loops offers a closed path for the current when the members of the circuit-changing devices are brought in contact, and the indicating-signal included in one of the loops of each pair between its testing press-button and the battery, substantially as described.

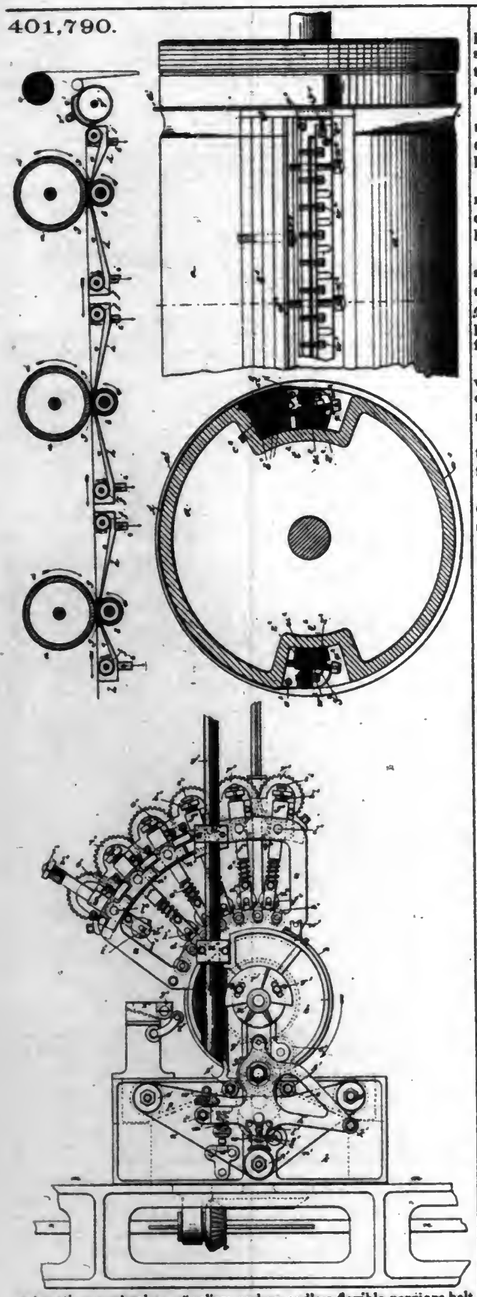
2. In a burglar-alarm system, the battery-wires and several pairs of independent loops leading therefrom, each pair of loops being normally open respectively at opposite sides of the battery, and provided with a testing press-button and circuit-closing devices, one of the members of which is connected in each loop, combined with the independent loop or wire 76 83 and the circuit-changing device included therein, and the switch, as 82, included in said independent loop or wire, substantially as and for the purpose set forth.

3. In a burglar-alarm system, the battery-wires and several pairs of independent loops leading therefrom, each pair of loops being normally open respectively at opposite sides of the battery, and provided with a testing press-button, combined with one member of a circuit-closing device for each loop, substantially as described.

401,790. PRINTING-MACHINE. JOHN W. OSBORNE, Washington D. C., assignor to William H. Forbes, Boston, Mass. Filed May 1, 1882. Serial No. 60,065. (No model.)

Claim.—1. The combination, substantially as described, with a case having an open side for the feeding-belt and provided with air-

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exhausting mechanism, of rollers and an endless flexible pervious belt mounted on said rollers.

2. The combination, substantially as described, of the endless pervious belt and its rollers with the case provided at one end with the supporting-tongues and with air-exhausting mechanism.

3. The combination, substantially as described, of a pervious surface or support, means for moving said surface, and means for applying atmospheric pressure to the same, with the case having its projecting end provided with supporting-tongues.

4. The combination, substantially as described, with an intermittent feeder, of two or more pairs of form and impression cylinders having their several printing surfaces or forms located to print simultaneously, and means for continuously revolving said cylinders.

5. The combination, substantially as described, with two or more pairs of form and impression cylinders having their several printing surfaces or forms located to print simultaneously, and meaus for continuously revolving said cylinders, of intermittent feeders located, respectively, in front of the first pair and between the pairs of cylinders.

6. The combination, substantially as described, of the perforated revolving feed-roller, as q^3, provided with flange s^3 and stationary case, as t^6, partially inclosing said roller and provided with air-exhausting mechanism, with the inclined adjustable guide-roller, as c^4.

7. The combination, substantially as described, of the perforated revolving feed-roller, as q^3, provided with flange s^3, and stationary case, as t^6, partially inclosing said roller, and provided with air-exhausting mechanism, with the inclined guide-roller, as c^4.

8. In a printing-machine, the combination, substantially as described, of the driving-pulley g', connected by gearing with the form-cylinder shaft, the free pulley l' in the arm K', held against the pulley g' by the spring m', the belt n', passing between the two and over the pulleys o' on the exhaust-belt rollers, and the depressing-cam r' on the form-cylinder shaft, substantially as and for the purpose described.

9. In a printing-press, the wheels, as r^6, geared together and provided with cam-surfaces s^6, in combination with the vibrating shaft l^6, carrying the anti-friction rollers t^6, the forked bars j^6, and the form-roller riders, substantially as and for the purpose described.

10. In a printing-press, the vibrating shaft l^6, in combination with the pieces n^6, keyed thereon, the screws o^6, the forked bars j^6, and the form-roller riders, substantially as and for the purpose described.

11. In a printing-press, the roller-frame z, carrying the form-rollers, their riders, and devices for vibrating the same, and provided with sliding bearings u^6, in combination with the guide-posts v^6, substantially as and for the purpose described.

12. In a printing-press, the false bearer c', in combination with the form-cylinder and the form-roller trucks, substantially as and for the purpose described.

13. In a printing-press having one or more form-cylinders adapted for the reception of flexible forms, the straining-bars w^3, provided with nippers, in combination with the segments v^6 and the straining-screws x^3, substantially as and for the purpose described.

14. In a printing-machine having one or more cylinders adapted for the reception of flexible forms, the straining-bars w^6, provided with nippers, in combination with the segments v^3, the straining-screws x^3, the adjusting-screws y^6, and the releasing-screws z^6, substantially as and for the purpose described.

15. In a printing-press, the combination, substantially as described, of a form-cylinder adapted to carry flexible forms with the movable pieces b^3 and the interchangeable lip-piece d^3, as set forth.

16. In a printing-press, a form-cylinder adapted for flexible forms, in combination with a straining-bar provided with clamps and adjustable in all directions, and mechanism, substantially as described, for adjusting the straining-bar in all directions on the cylinder.

17. In a printing-press, a form-cylinder having gaps in its surface, as described, a straining-bar adjustable in all directions in each gap, a flexible form, and mechanism, substantially as described, by which the straining-bar may be adjusted in all directions in the gap, all combined substantially as described.

18. In a printing-press having a form-cylinder adapted for printing in the lithographic manner, the projecting rib d', in combination with the form and with apparatus for damping the same, substantially as and for the purpose set forth.

401,791. CIRCULAR-KNITTING MACHINE. WILLIAM H. PEPPER and ALBERT T. L. DAVIS, Lake Village, N. H. Filed June 5, 1885. Serial No. 167,763. (No model.)

Claim.—1. The combination of the cap A, dial B, dial-needles w, thread-guide 1, drawing-in cam C, lever D, lever-arm E, slide G, pattern-chain J, and means, substantially as described, for actuating the said slide from the pattern-chain, substantially as and for the purpose herein specified.

2. The combination of the cap A, dial B, dial-needles w, two thread-guides, 1 2, movable drawing-in cam C, lever D, lever-arm E, slide G, pattern-chain J, means, substantially as described, for actuating the said slide from the pattern-chain, and stationary drawing-in cam C', substantially as and for the purpose herein specified.

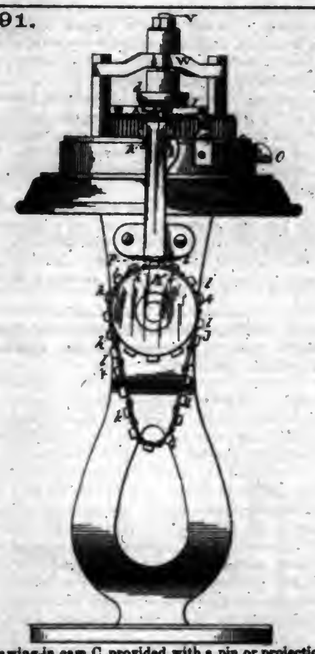
3. The combination of the cap A, drawing-in cam C, pivoted to the said cap and provided with a pin or projection, o, and a cam-ring, T, substantially as and for the purpose herein specified.

4. The combination of the cap A, dial B, dial-needles w, thread-guide 1, drawing-in cam C, provided with a pin or projection, o, and a cam-ring, T, substantially as and for the purpose herein specified.

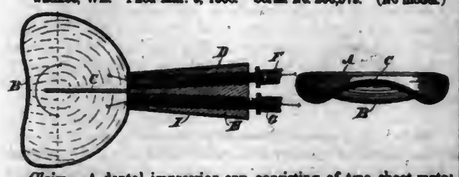
5. The combination of the cap A, drawing-in cam C, provided with a pin or projection, o, cam-ring T, slide G, a device connecting the cam and slide, pattern mechanism, and means, as described, intermediate between the slide and pattern mechanism, substantially as and for the purpose herein specified.

6. The combination of the cap A, dial B, dial-needles w, thread-guide 1, drawing-in cam C, provided with a pin or projection, o, camring T, slide G, a device connecting the cam and slide, pattern mechanism, and means, as described, intermediate between the slide and pattern mechanism, substantially as and for the purpose herein specified.

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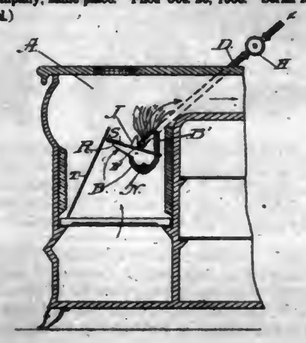


401,792. DENTAL IMPRESSION-CUP. JULIUS SCHEFFLER, Milwaukee, Wis. Filed Mar. 8, 1888. Serial No. 266,579. (No model.)



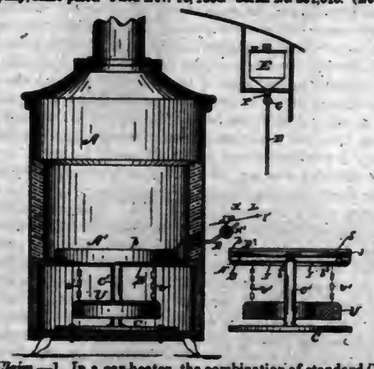
Claim.—A dental impression-cup consisting of two sheet-metal water-holding chambers, the outer one being so formed as to encircle the jaw and teeth, and the inner one being so formed as to encircle the tongue within the jaw and teeth, the two chambers being connected at their inner ends by water-conveying pipes, and being otherwise unconnected and located so far from each other that the teeth of the upper and of the lower jaw may come together from above and below in the space between said chambers, the outer chamber having a water-receiving and a water-discharging duct leading into and from said outer chamber, one on each side of a vertical partition in said outer chamber, substantially as described.

401,793. OIL-BURNER FOR STOVES. HENRY SCHREINER, Philadelphia, Pa., assignor to the American Patent Safety Heater Manufacturing Company, same place. Filed Oct. 26, 1888. Serial No. 289,171. (No model.)



Claim.—In a stove of the kind described, the combination, with a burner-trough having an elevated back, B', partitions E, and bridges J, of the foraminous plate S and burner-pipe D', supported on the bridges above the foraminous plate, and an imperforate plate, T, resting upon the grate of the stove at the front edge thereof at its lower end and against plate S at the top.

401,794. CAR-HEATER. HENRY SCHREINER, Philadelphia, Pa., assignor to the American Patent Safety Heater Manufacturing Company, same place. Filed Nov. 16, 1888. Serial No. 291,015. (No model.)



Claim.—1. In a car-heater, the combination of standard C, a circular burner pivoted thereon, and a circular weight surrounding said standard and suspended from said burner, substantially as described.

2. A burner for burning oil, consisting of a suitable support, a trough pivoted upon said support and having a high outer side, b, and a lower inner side, b', a series of segmental foraminous plates, S, laid over the trough upon its lower side, and a burner-pipe, D', placed over the foraminous plates inside the higher outer wall of the burner, as set forth.

3. The combination of a circular trough having a layer of ashes or sand, bridges or partitions at suitable intervals, a pivot on which the trough is supported, and a circular burner-pipe supported on the bridges in the trough, as set forth.

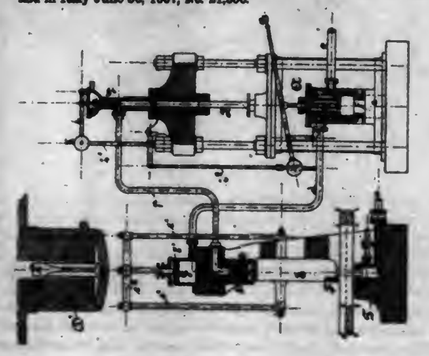
4. The combination of a circular burner having a trough, as described, a burner-pipe supported upon said trough, a supply-pipe connected to the burner-pipe, and a pivot or support on which the whole is pivoted, as set forth.

5. The combination, with a suitable support, of a circular burner pivoted thereupon and a circular weight suspended from the burner, as set forth.

6. The combination, with a heater and supply-pipe, of a needle-valve in said supply-pipe, a weighted wheel on the stem of the needle-valve, having ratchet-teeth on its rim, a gravity-dog engaging said teeth, and a wedge for automatically raising said dog, as set forth.

7. The combination, with the feed-pipe of an oil-heater, of a needle-valve, a weighted wheel on the stem of said valve, having ratchet-teeth over a portion of its circumference, a hinged gravity-dog having teeth for engagement with the ratchet-teeth, and a wedge mounted on rollers for operating the dog, as set forth.

401,795. PUNCHING, SHEARING, AND SUCH LIKE MACHINE. CASPAR SCHUMACHER, REINER DAELEN, and MORITZ ROTER, Kalk, Prussia, Germany. Filed May 19, 1888. Serial No. 274,412. (No model.) Patented in Germany May 21, 1886, No. 37,917, and May 25, 1886, No. 38,347; in Austria-Hungary June 23, 1887, No. 24,929 and No. 2,540, and in Italy June 30, 1887, No. 21,850.



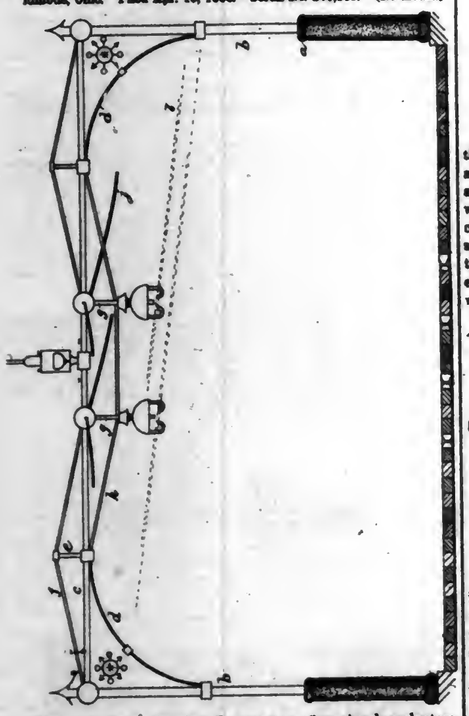
Claim.—1. In punching, shearing, and such like machines worked by steam and water power, the combination of a punching, shearing, or such like machine with a steam-cylinder, A, with a distributing-valve, *b*, hydraulic cylinder C, and piston-rod B, the piston-rod B being fastened to a piston in the steam-cylinder A, hand-lever *a*, hydraulic cylinder D, attached to the head of the punching-machine, the said hydraulic cylinder having an automatic throttle piston-valve, *l*, and pipe *p*, substantially and for the purpose as described.

2. In punching, shearing, and such like machines worked by steam and water power, the combination of a punching, shearing, or such like machine with a steam-cylinder, A, with a distributing-valve, *b*, hydraulic cylinder C, and piston-rod B, the piston-rod B being fastened to a piston in the steam-cylinder A, hand-lever *a*, hydraulic cylinder D, attached to the head of the punching-machine, the said hydraulic cylinder having an automatic throttle piston-valve, *l*, steam-cylinder G, rods *d' d'*, and cross-head d^3, fastened to the piston *g'*, filling-valve *g*, having its lever *i* attached to the hand-lever *a* by a rod, i^3, and pipes *p d*, substantially and for the purpose as described.

3. In punching, shearing, and such like machines worked by steam and water power, the combination of a punching, shearing, or such like machine with a steam-cylinder, A, with a distributing-valve, *b*, hydraulic cylinder C, and piston-rod B, the piston-rod B being fastened to a piston in the steam-cylinder A, hand-lever *a*, hydraulic cylinder D, attached to the head of the punching-machine, the said hydraulic cylinder having an automatic throttle piston-valve, *l*, and pipe *p*, with hydraulic buffer or buffers T, piston or pistons *m*, non-return valve *p'*, and pipes *n* and *o*, substantially and for the purpose as described.

4. In punching, shearing, and such like machines worked by steam and water power, the combination of a punching, shearing, or such like machine with a steam-cylinder, A, with a distributing-valve, *b*, hydraulic cylinder C, and piston-rod B, the piston-rod B being fastened to a piston in the steam-cylinder A, hand-lever *a*, hydraulic cylinder D, attached to the head of the punching-machine, the said hydraulic cylinder having an automatic throttle piston-valve, *l*, steam-cylinder G, rods *d' d'*, and cross-head d^3, fastened to the piston *g'*, filling-valve *g*, having its lever *i* attached to the hand-lever *a* by a rod, i^3, and pipes *p d*, with hydraulic buffer or buffers T, piston or pistons *m*, non-return valve *p'*, and pipes *n* and *o*, substantially and for the purpose as described.

401,796. **ELECTRIC-RAILWAY SYSTEM.** SIDNEY H. SHORT, Columbus, Ohio. Filed Apr. 10, 1888. Serial No. 270,185. (No model.)

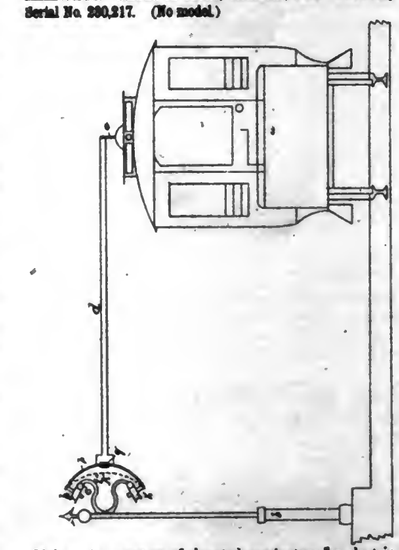


Claim.—1. In an electric-railway system of overhead conductors, the combination of elevated supports located at intervals along the railway, insulated hangers suspended from the supports, cables connecting and secured to the said supports, a second set of hangers suspended from the cables, electrical conductors supported upon the said hangers, and a current-collector located upon the conductors and connected with the electric car of the system.

2. In an electric-railway system of overhead conductors, the combination of two posts, a chord connecting the upper portions of the posts, tie-rods connecting the chord and posts, insulated hangers supported upon the chord and ties, cables supported upon the chord, a second set of insulated hangers suspended from the cables, and conductors supported upon the hangers.

3. The combination of three fixed supports not located in the same straight line, but substantially in the same horizontal plane, cables connecting every two supports, tie-wires connecting one of the cables with the remaining two, and insulated electrical conductors suspended from that cable which is held by tie-wires to the remaining two cables.

401,797. **SYSTEM OF ELEVATED CONDUCTORS FOR ELECTRIC RAILWAYS.** SIDNEY H. SHORT, Columbus, Ohio. Filed July 17, 1888. Serial No. 280,217. (No model.)



Claim.—In a system of elevated conductors for electric railways the combination of one conductor above the other in a vertical plane and parallel to the railway, metallic wheels thereon and standing at an angle to the vertical, the planes of the wheels forming an angle which points toward the railway, a spring in two insulated portions connecting the said wheels, and two electrical conductors under tension and connected, respectively, to the said two portions of the spring, the other ends of the last-named conductors being connected to an electric car, and the direction of tension being such as to force the wheels against the conductors upon which the same are mounted.

401,798. **SEESAW.** FREDERICK SPENCER, Sterling, Ill. Filed July 27, 1888. Serial No. 281,234. (No model.)

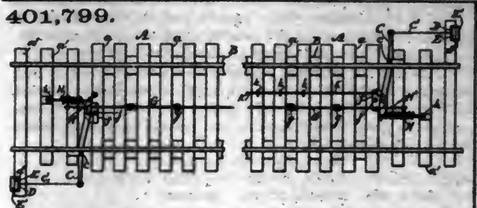


Claim.—The combination of the boards C, centrally gashed and interlocked, as shown, and provided with beveled crowns and upwardly-extending posts D D, the board E, provided with transverse ribs F and holes G G, and the bushing H, provided with opening J, substantially as shown, and for the purpose described.

401,799. **DANGER-SIGNAL FOR RAILWAY-BRIDGES.** JAMES W. STEELE, Topeka, Kans., assignor of one-half to Andrew McNally, Chicago, Ill. Filed Dec. 14, 1888. Serial No. 293,509. (No model.)

Claim.—1. The combination, with a railway-bridge and danger-signal, of a coiled, crimped, or bent wire, rod, or strip for holding said signal in a normal position, said wire, rod, or strip being composed of a material capable of being annealed by heat, substantially as shown and described.

401,799.



2. The combination, with a railway-bridge and the tripping mechanism of a danger-signal, of a tempered metallic wire, rod, or strip having a series of coils, bends, or crimps therein, whereby the heat caused by the burning of the bridge will permit said wire to stretch and release the signal, substantially as shown and described.

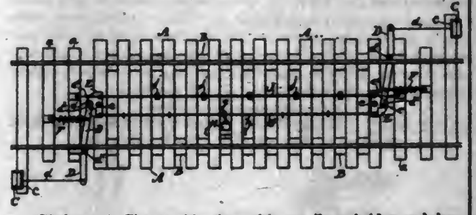
3. The combination, with a railway-bridge, of a semaphore, means—such as the spring H—in operative connection with said semaphore for unlocking and releasing it, and a tempered wire, rod, or strip having coils, crimps, or bends therein and attached to said bridge and spring, respectively, for normally holding the latter in an expanded position, substantially as shown and described.

4. The combination, with a railway-bridge, of a semaphore, means—such as a spring—in operative connection with said semaphore for unlocking it, a tripping mechanism for normally holding said spring in an expanded position, a tempered wire, rod, or strip having a series of bends, coils, or crimps therein, attached to said tripping mechanism and to the bridge, respectively, and a secondary spring attached to said tripper for actuating the same upon the annealing of the coils, crimps, or bends in said rod, substantially as shown and described.

5. The combination, with a railway-bridge, of a semaphore, a spring in operative connection with said semaphore for unlocking it, a pivoted tripping device—such as the plate J—for normally holding said spring in an expanded position, wires, rods, or strips K G, attached to said tripping device upon opposite sides of its pivotal point, the former being straight and the latter provided with coils, crimps, or bends *g*, substantially as shown and described.

6. The combination, with a railway-bridge, of a semaphore arranged at a distance therefrom, a tripper for locking it in a normal position, lever C and spring H, for operating said tripper, pivoted plate J, stud c^3, flange *j'*, and wires K G, the latter having a series of coils therein, whereby the burning or carrying away of the bridge may permit the plate J to rotate and thus actuate the signal, substantially as shown and described.

401,800. **DANGER-SIGNAL FOR RAILWAY-BRIDGES.** JAMES W. STEELE, Topeka, Kans., assignor of one-half to Andrew McNally, Chicago, Ill. Filed Dec. 14, 1888. Serial No. 293,600. (No model.)

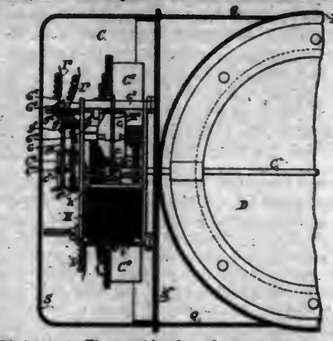


Claim.—1. The combination, with a railway-bridge and danger-signals, of the trippers E E, constructed and arranged as described, and in operative connection with the signals, connecting-wire G, springs c^3 c^3, held normally under tension by means of said connecting-wire, a swinging float suspended beneath the bridge and connected directly to the wire G, and independent springs for actuating the signals upon the movement of said trippers, substantially as shown and described.

2. The combination, with a railway-bridge and danger-signals, of the trippers for holding said signals in a normal position, wire G, having a swinging float connected therewith and suspended beneath the bridge, and a coiled, crimped, or bent wire, J, composed of a material capable of being annealed by heat, substantially as shown and described.

3. The combination, with a railway-bridge and danger-signals, of the trippers E E, for holding said signals in a normal position, wire G, having a swinging float connected therewith and suspended beneath the bridge, springs c^3 c^3, and wire J, having a series of coils, crimps, or bends therein, substantially as described.

401,801. **COMMUTATING DEVICE.** DAVID W. THOMPSON, Englewood, Ill. Filed May 29, 1888. Serial No. 275,496. (No model.)



Claim.—1. The combination of a commutator consisting of a cylindric metal body having insulating-sections extending radially outward beyond the cylindric surface of the body, and brushes bearing upon said commutator, substantially as described.

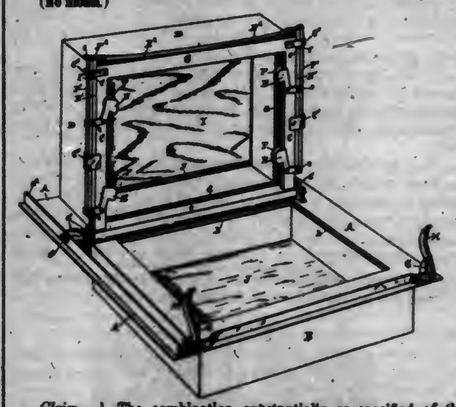
2. The combination of a commutator consisting of a cylindric metal body having insulating-sections extending radially outward beyond the cylindric surface of the body, and brushes resting at their free ends against the commutator, said brushes consisting of wires provided with spiral coils, whereby the brushes may bend or yield to allow the passage of their free ends over said projecting insulating-sections, substantially as described.

3. The combination of a cylindric commutator provided with insulating sections in its cylindric surface, and brushes bearing thereon provided with transverse parts or bends between their points of support and their ends which are in contact with the commutator, whereby the parts of the brushes which bear upon the commutator may be adjusted relatively to the insulating-sections, substantially as described.

4. The combination of a commutator consisting of a cylindric metal body provided with projecting insulating-sections and having circumferential grooves, and wire brushes, the free ends of which engage said grooves, substantially as described.

5. The combination, with the frame, of the motor and the revolving cylindric distributer provided with insulating-sections extending radially outward beyond the surface thereof, brushes resting at their free ends against the distributer, and parts supporting the brushes having rotative connection with the frame of the motor, whereby the brushes may be adjusted to give greater or less pressure upon the commutator, substantially as described.

401,802. **ATTACHMENT FOR PHOTOGRAPHIC CAMERAS.** OTTO D. TROUTROT, Lockland, Ohio. Filed June 11, 1888. Serial No. 276,742. (No model.)



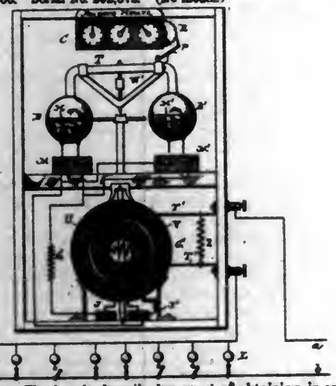
Claim.—1. The combination, substantially as specified, of the two frames hinged together, the two receptacles, one secured to each frame, two sets of spring-pressed catches on the upper frame to retain the plates in the upper receptacle, and cam projections upon the lower frame to alternately actuate each set of catches as the upper frame is opened or closed down upon the lower one, whereby the plates are successively released and permitted to drop into the lower receptacle, when the frames are closed and the following plates successively placed in position to receive an impression when the frame is raised.

2. The combination, substantially as specified, of the frame A, the box B, secured underneath said frame, the frame $C c^3$, the box D, secured above said frame, the hinge for uniting the two frames, the pivoted latches E and F upon opposite sides of said frame, the rods E' F', coupled to the latches, the springs F^2 and F^3, exerting an outward pressure upon said rods, the guides C', for the rods, the cam projections G in the path of said rods E', and the cam projections H in the path of the rods F', for the purpose of automatically releasing the impressed plates as the upper frame is closed and automatically placing a fresh plate in position to be acted upon as the frame is raised.

3. In a camera attachment, the combination of an upper receptacle for the fresh plates and a lower receptacle for the image-impressed plates, the hinge uniting the two receptacles, the hinge-shaft extending out and formed to receive a key, whereby the upper receptacle may be changed from a horizontal to a vertical position without opening the camera or dark box inclosing the receptacles, plate-holders J, to fit the receptacles to protect and shield the plates and hold them separated for the reception of one set of the holder and plate retaining latches, two sets of spring-actuated latches, and cam projections for each set, combined and operating substantially as hereinbefore set forth.

4. The combination of the hinged frames A C, having hinged flanges $a c^3$, provided with pins $a^3 c^3$, and spring-latches $b^3 b^3$ $d^3 d^3$, with the receptacles B D, provided with perforated plates $b' b'$ and $d' d'$, whereby the receptacles are detachably connected to their respective frames, substantially as shown and described.

401,808. ELECTRIC METER. ELIHU THOMSON, Lynn, Mass. Filed Dec. 7, 1888. Serial No. 292,872. (No model.)



Claim.—1. The herein-described method of obtaining, in an electric translating device, actions or effects in direct proportion to the current flowing in another circuit or portion of the circuit, consisting in admitting current to said translating device in proportion to the square root of the current in such circuit.

2. The herein-described method of obtaining, in an electric meter operated by heating effects of an electric current, indications in direct proportion to the currents to be measured, consisting in admitting current to the meter in proportion to the square roots of such currents.

3. In an electric translating device in which actions or effects are the direct result of the flow of electric current, the herein-described method of obtaining an action or effect in direct proportion to the flow of current on another circuit or portion of the circuit, consisting in admitting current to the translating device in proportion to the square root of the current on such other circuit or portion of circuit.

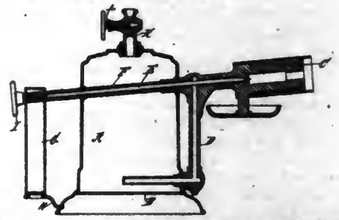
401,804. METALLIC MOLD. NATHAN WASHBURN, Boston, Mass. Filed Dec. 21, 1888. Serial No. 294,248. (No model.)



Claim.—1. A metallic mold for the production of steel car-wheels, consisting of a metallic top plate, a metallic bottom plate, and a metallic rim detachably connected together, the said top and bottom plates being provided near their circumference with annular layers b b' of non-metallic refractory material, whereby the molten steel poured into the mold retains its heat and is prevented from setting, substantially as described.

2. The combination, with a metallic mold for the production of steel car-wheels, consisting of a metallic top plate and a metallic bottom plate, each provided with an annular groove at its outer edge or circumference and a metallic rim, of a layer of non-heat-conducting material in said groove, a second layer, b^3, of non-metallic material near the center of the mold, and a sand or non-metallic core, the top and bottom plates being detachable from the rim, substantially as and for the purpose specified.

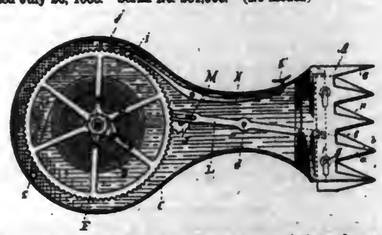
401,805. TORCH. HENRY WELLINGTON, Brooklyn, N. Y. Filed May 1, 1888. Serial No. 272,416. (No model.)



Claim.—1. In a torch of the character herein set forth, the valve-stem and its casing located above the usual oil-level, extending across but not communicating with the oil-chamber, and the handle of the torch connected with the valve-stem casing and with the base of the torch, substantially as and for the purposes set forth.

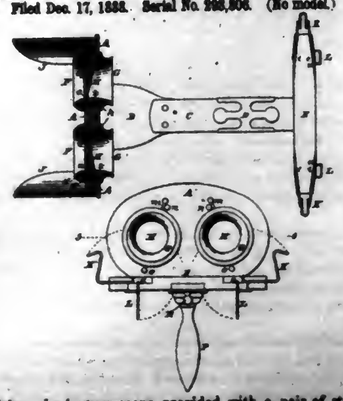
2. In a torch of the character herein set forth, the combination, with the shell provided with an air-valve, of the valve-stem casing extending through the top of the oil-chamber, but not communicating with the interior thereof, and being above the usual oil-level, said casing being threaded upon its outer end to receive the threaded valve-stem, and the burner connected with the valve-stem casing, arranged substantially as shown and described.

401,806. ANIMAL-SHEARS. ALBERT A. WHITE, Vassar, Mich. Filed July 26, 1888. Serial No. 281,068. (No model.)



Claim.—An animal-shearing instrument consisting of a casing, the shaft E, journaled therein, the gear-wheel on said shaft, the spring actuating said gear-wheel, the lever pivoted between its ends in said casing, the stationary cutting-plate, the vibratory cutting-plate working on guides on the stationary plate, the pinion J, and a limited loose connection between the shaft of said pinion and one end of said lever and between the other end of the lever and the vibratory cutting-plate, substantially as and for the purpose specified.

401,807. STEREOSCOPE. HAWLEY G. WHITE, North Bennington, Vt. Filed Dec. 17, 1888. Serial No. 293,806. (No model.)



Claim.—1. A stereoscope provided with a pair of stereoscopic lenses, each of which is mounted in an annular eye-piece which is fitted to and adapted to revolve in a circular opening in the lens-holder about an axis coincident with the axis of the eye of the observer, substantially as described, and for the purposes set forth.

2. The combination of lens-holder A and lenses H H, mounted in revolvable annular eye-pieces F G F G, with guiding-pins n o n o, and adjusting-pins m m, substantially as described, and for the purposes set forth.

3. The combination of the lens-holder A, provided with the two reversible stereoscopic lenses H H, mounted on the longitudinally-adjustable shaft B C, with the view-holder E, provided with the supports K K and L L, for supporting either a telescopic or a single view, substantially as described and set forth.

401,808. SHOE-FASTENING. JOSEPH G. WHITTIER and WILLIAM R. E. HERRON, Attica, Ind. Filed July 7, 1888. Serial No. 279,236. (No model.)

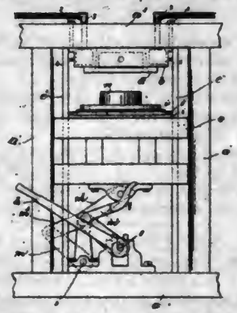


Claim.—1. As an improved article of manufacture, the fastener for overshoes, consisting of a clip-plate adapted to be secured to the shoe and a clasp-plate hinged to the clip-plate and having an upwardly-turned flange at its sides and outer end, and a series of slots shaped to receive a button attached to the shoe, substantially as set forth.

2. The combination, with the clip-plate having a sliding engagement with a button-shank, of a clasp-plate provided with a flanged rim bent integrally thereon and a series of slots or perforations cut in the clasp-plate that interlock with a stud or button shank, substantially as set forth.

3. The combination, with the slotted clip-plate having a sliding engagement with a button-shank, of a flanged clasp-plate perforated or notched at spaced intervals and a stud or button which is adapted to be secured to a shoe, substantially as set forth.

401,809. MACHINE FOR MOLDING HATS. THOMAS P. WILKINSON, Milford, Mass. Filed Jan. 31, 1889. Serial No. 298,204. (No model.)

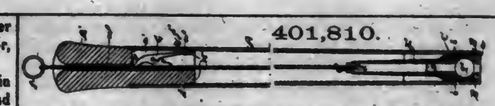


Claim.—1. In a machine for pressing hats, an outer crown-mold and an independent brim-mold, and the hollowed or chambered holder therefor, combined with the removable inner crown-mold support therefor, and the independent rim or guide i^3, and means, substantially as described, for moving vertically the said support, as set forth.

3. In a machine for pressing hats, the outer crown-mold and independent brim-mold, the support or holder therefor, and fastenings, as set-screws, for securing the said outer crown-mold in position, combined with the inner crown-mold and vertically-movable support therefor, substantially as described.

3. In a machine for pressing hats, the outer crown-mold and independent brim-mold, the support or holder therefor, combined with the inner crown-mold, the rim or guide i^3, and support for said mold and rim or guide, substantially as described.

401,810. TORPEDO-STAFF. HARRIS P. YOUNG, Lowell, Mass., assignor of one-half to Joseph L. Finder, same place. Filed Aug. 2, 1888. Serial No. 281,768. (No model.)

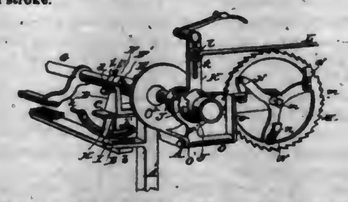


Claim.—1. The combination of the body or barrel provided with a recess in one end to receive a torpedo, one or more springs arranged in said recess to retain a torpedo therein, a striker, a spring to force said striker into said recess, a cord attached to said striker and provided with a knot or enlargement, a catch to engage said knot or enlargement to hold said striker out of said recess, and a spring to hold said catch in engagement with said knot or enlargement, as and for the purpose specified.

2. The combination of the body or barrel provided with a recess in one end to receive a torpedo, one or more springs arranged in said recess to retain a torpedo therein, a striker, a spring to force said striker into said recess, a cord attached to said striker and provided with a knot or enlargement, a catch to engage said knot or enlargement to hold said striker out of said recess, a spring to hold said catch in engagement with said knot or enlargement, and a stud projecting from said catch through an opening with which said body or barrel is provided to release said catch, as and for the purpose specified.

401,811. DOFFER-CLEANER FOR CARDING-MACHINES. GEORGE BERG, Indianapolis, Ind., assignor to George Merritt and Worth Merritt, same place. Filed Mar. 16, 1888. Serial No. 267,422. (No model.)

Brief.—The doffer-cleaner is brought into action at intervals by means of step-by-step mechanism and a clutch on the cleaner-shaft, and the cleaner engages the clothing on the doffer only on its downward stroke.



Claim.—1. In a doffer-cleaner, the combination of the framing provided with a box or strap for the circle-block, the circle-block having off its center a bearing for the cleaner-shaft, the cleaner-shaft provided with a cleaner and journaled in said bearing, and means for oscillating the cleaner-shaft, the said shaft and the circle-block being provided with projections or portions arranged to contact as the shaft is oscillated, whereby the oscillation of the shaft will effect the desired adjustment of the circle-block, substantially as set forth.

2. The combination of the framing, the box or strap supported by said framing, the circle-block journaled in said box or strap and provided off its center with a journal-bearing, an arm connected with said circle-block and supporting projections, the shaft journaled in the bearings of the circle-block, an arm connected with such shaft and arranged to operate between the projections of the arm of the circle-block, and the cleaner, substantially as set forth.

3. The combination of the framing, a shaft having a cleaner, the arm for oscillating such shaft, a clutch-section whereby said arm may be keyed to such shaft, a shifter-piece whereby to communicate motion to said clutch-section, a tripper whereby to engage and operate said shifter-piece, and operating means for said tripper, substantially as set forth.

4. The combination of the shaft provided with a cleaner, bearings in which said shaft is journaled, a clutch-section fixed on such shaft, a clutch-section loose with reference to the shaft and movable into and out of engagement with the fixed clutch-section, a shifter-piece having a fork engaging the movable clutch-section, and an arm by which the said shifter-piece may be operated, a toothed wheel having a projecting portion or portions arranged to engage the said shifter-piece, a pawl engaging the toothed wheel, the arm K, and oscillating means therefor, substantially as set forth.

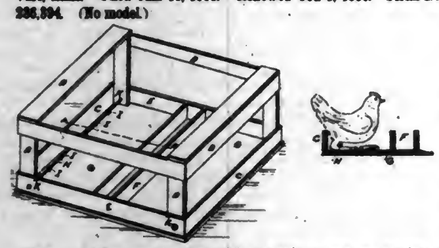
5. The combination, with the shaft having the cleaner-bar, bearings for said shaft, and the clutch having a movable section, of the shifter-piece having one arm arranged to operate the loose clutch-section, a toothed wheel having a number of projecting portions whereby to engage the shifter-piece, such portions being movable, whereby they may be set into and out of position to engage the shifter-piece, the arm K, and oscillating means therefor, and the pawl engaging the toothed wheel, substantially as and for the purpose specified.

6. The combination of the framing, the shaft having a cleaner, the clutch-section fixed on the shaft, the clutch-section loose on the shaft and having an arm by which the said clutch-section may be rocked, oscillating means for said arm, a shifter-piece having a fork

engaging the loose clutch-section, and an arm by which the shifter-piece may be rocked, a toothed wheel having projections arranged to engage the arm of the shifter-piece, and a pawl supported on the arm of the loose clutch-section and engaging the toothed wheel, substantially as set forth.

7. In a doffer-cleaner, the combination of the framing having a box or strap, the circle-block turning therein and having a bearing off its center, the shaft journaled in said bearing and having a cleaner, such shaft and circle-block being provided with projections or portions arranged to contact as the shaft is rocked, the clutch-section fixed on said shaft, the clutch-section loose on the shaft and provided with an arm, means for oscillating said arm, a shifter-piece engaging the loose clutch-section, and means for operating said shifter-piece, substantially as set forth.

401,812. **POULTRY-CARRIER.** GEORGE M. BERROWER, Cherry Vale, Kans. Filed Jan. 18, 1888. Renewed Oct. 1, 1888. Serial No. 286,594. (No model.)

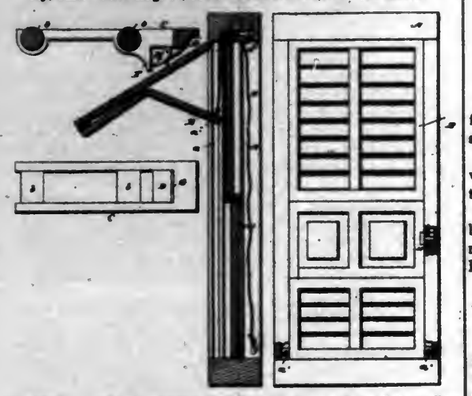


Claim.—1. The combination, with a poultry coop or carrier, of a series of eyes or staples, I, and a wire, cord, or rod, H, passing through the same, for securing the legs of the fowls, substantially as and for the purpose described.

2. The combination, with a poultry coop or carrier, of the eyes or staples I and the wire, cord, or rod H, for securing the legs of the fowls, and a board or strip, C, arranged immediately in rear of the eyes, to hold the joints of the fowls against dislodgment, substantially as and for the purpose described.

3. A poultry coop or carrier having the eyes I and wire, cord, or rod H, and a strip, C, on one side and trough F on the other, substantially as and for the purpose described.

401,818. **SHUTTER.** SAMUEL I. BLOOM and EDDY M. BLOOM, Findlay, Ohio. Filed Aug. 27, 1888. Serial No. 283,876. (No model.)



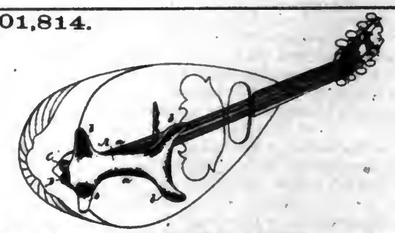
Claim.—The combination, with a window-casing, of the roller brackets secured in the upper portion thereof and bearing the rollers *b b*, and having the abutment F, the pivoted pawl D, the spring G, pressing thereon, the hinged sectional blind carrying frictional rollers traveling in ways in the casing, and the operating-rope secured to the lower section of the blind and passing over the bracket into the room, substantially as specified.

401,814. **ARM-REST FOR MUSICAL INSTRUMENTS.** JOSEPH BOHNARD, Chicago, Ill. Filed Mar. 15, 1888. Serial No. 267,204. (No model.)

Claim.—1. The combination, with a musical instrument of the class described, of an arm-rest hollowed in the direction of its length to conform to the player's arm, and standing at an angle to the top of the instrument corresponding to the natural angle of the arm, as shown and described.

2. The combination, with a musical instrument of the class described, of an arm-rest A, pivotally connected thereto, and an adjusting-screw, D, substantially as described.

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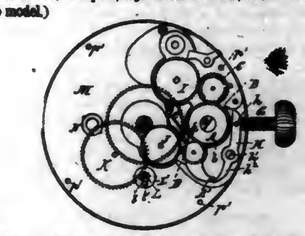
3. The combination, with a musical instrument of the class described, of an arm-rest attached to the side thereof and extending over its top at an angle thereto corresponding to the natural angle of the player's arm, and adjustable to and from the instrument, substantially as and for the purpose described.

4. An arm-rest adapted for application to a musical instrument of the class described for supporting the hand employed in picking the strings, said rest being of a height to elevate and position the hand of the player over the sound-board and to determine the extent to which his fingers can drop toward the strings, substantially as and for the purpose set forth.

5. An adjustable arm-rest adapted for application to a musical instrument of the class described in position to support the hand employed in picking the strings, substantially as and for the purpose set forth.

6. The combination, with a musical instrument of the class described, of an arm-rest adapted and arranged to support and position the hand of the player over the sound-bound and to determine the extent to which his fingers can drop toward the strings, substantially as and for the purpose set forth.

401,815. **STEM WINDING AND SETTING WATCH.** CASPER BORNHEIMER, Newport, Ky. Filed Nov. 23, 1887. Serial No. 256,230. (No model.)



Claim.—1. The combination of the plate M, having openings N N', fourth-wheel K, and detachable seconds-hand arbor and pinion, substantially as and for the purposes set forth.

2. The combination of plate M, having openings N N', fourth-wheel K, cap L', pinion L, and arbor *l*, swiveled in cap L', substantially as and for the purposes specified.

3. The combination of plate M, having openings N N', with rabbeted edges, and openings *p' p' p' p'*, seconds-wheel K, cap L', with rabbeted edges, pinion L, arbor *l*, swiveled in cap L', and dial-plate P, having four posts, *p*, substantially as and for the purposes specified

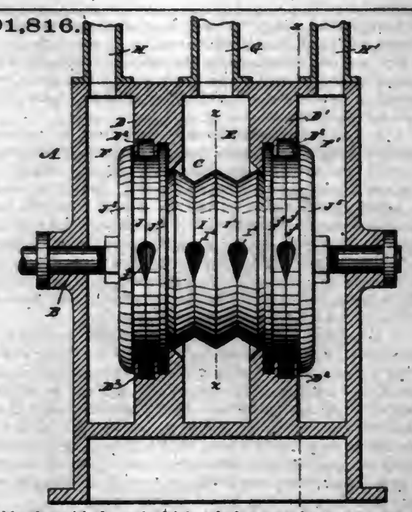
401,816. **ROTARY ENGINE.** MARCELLUS A. BUFORD, Thompson's Station, Tenn. Filed Aug. 14, 1888. Serial No. 282,710. (No model.)

Claim.—1. In a rotary engine, the combination, with a casing provided with a steam-inlet chamber and steam-exhaust chambers, of a main driving-shaft mounted to rotate in the said casing, and a wheel secured on the said shaft in the said casing and provided with central disks having inlet-openings in their peripheries, and exhaust-disks secured to the central disks and provided with outlet-openings discharging into the said exhaust-chambers, substantially as shown and described.

2. In a rotary engine, the combination, with the casing A, provided with the walls D and D', forming the chambers F and F', of the main driving-shaft B, mounted to rotate in the said casing, the wheel C, secured on the said driving-shaft and provided with the disks I I', each having the spokes I^3 and inlet-openings I^2 in its periphery, said wheel being also provided with the exhaust-disks J and J', having spokes J^2 and exhaust-disks J^3, registering with channels formed in the walls D and D', substantially as shown and described.

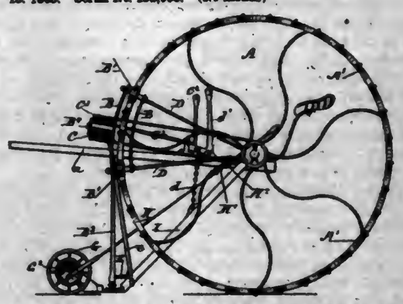
3. In a rotary engine, a casing, partition-walls formed in the said casing and provided with channels leading into the outer chambers formed by the said partition-walls, an inlet-pipe leading to the central chamber formed by the said partition-walls, and exhaust-pipes leading from the outlet-chambers formed by the said partition-walls, in

401,816.



combination with the main driving-shaft mounted to rotate centrally in the said casing, the disks I and I', secured on the said main driving-shaft between the said partition-walls, each disk being provided with spokes and inlet-openings extending from the periphery through the said spokes, and exhaust-disks secured on the said main driving-shaft and abutting against the outer faces of the said disks I and I', said exhaust-disks being fitted in the said partition-walls D and D' and provided with spokes and exhaust-openings in the periphery, said openings registering alternately with the channels in the partition-walls, substantially as shown and described.

401,817. **MOWER.** PHILIPP C. CLOSE, Augusta, Ga. Filed Jan. 15, 1886. Serial No. 152,965. (No model.)



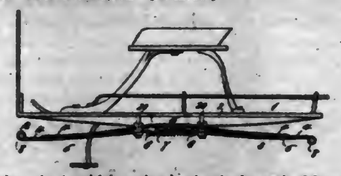
Claim.—1. In combination with the driving-wheel A, having corrugations upon one side, and the beam B, provided with rollers bearing thereon, the tubular connecting-rod B^3, integral with said beam and having inserted into its lower end a vertical pin, B^7, having a cylindrical socket, B^8, a horizontal cylindrical pin inclosed in said socket, and a pin projecting upward from the cutter-bar and entering a socket in said cylindrical pin, substantially as and for the purpose described.

2. In a harvester, the oscillating beam B and connecting-rod B^3, rigidly attached thereto and having its lower ends provided with a tubular sleeve, the stem B^7 therein carrying the horizontal cylindrical socket B^8, and the cylindrical pin B^9 within the latter, in combination with a pin, *b*, entering a socket in said pin B^9 and secured to the cutter-bar B^2, substantially as and for the purpose described

3. In a harvester, the oscillating beam B and pivot B^4 thereon, the eccentric C upon said pivot in front of said beam and provided with a handle, the band C^2 upon said eccentric, and the frame C^4, to which said band is attached, the brace *c*, and the bent spring E, having its middle portion secured to the lower end of said brace, in combination with the cylindrical socket B^8, having the stem B^7 within the socketed rod B^3 of the beam B, the horizontal pin B^4 within the socket B^8, and the vertical pin *b*, received into the pin B^9 and projecting from the cutter-bar, substantially as described.

4. In combination with the finger-bar, a raising and lowering device therefor, consisting of a disk, G^3, within the wheel G, a stud-pin, *g*, on the inner side of said disk carrying the shoe and cutter-bar attachments, and the arm *g'*, located on the outer side of the disk, a lever, H, provided with a rack, and a pin, H^3, attached to the main frame, substantially as and for the purpose described.

401,818. **VEHICLE-SPRING.** ALBERT E. COOK, Knowlton, Quebec, Canada, assignor to George W. Vasco, same place. Filed Dec. 1, 1888. Serial No. 292,331. (No model.)



Claim.—1. A vehicle-spring having its lower leaf formed in two parts, with a spring connecting the inner ends, substantially as described.

2. A vehicle-spring having its lower leaf formed in two parts, with their inner ends connected by a spring having longitudinal end-wise tension, substantially as described.

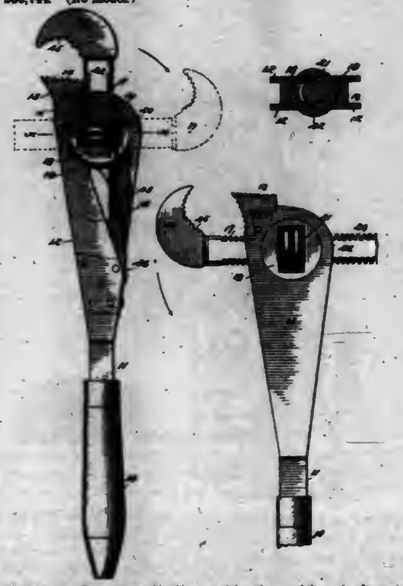
3. In a vehicle-spring, the combination, with a rocker-shaped bearing, of a vehicle-spring having its lower leaf formed in two parts, with their inner ends connected by a spring, substantially as described.

4. In a vehicle-spring, the combination, with a rocker-shaped bearing having clips with blocks formed with passage-ways, of a vehicle-spring extending through the passage-ways, and having its lower leaf formed in two parts connected at their inner ends by a spring, substantially as described.

5. A vehicle-spring, 3, formed of the leaves 4 and the bottom short leaves, 5, having their inner ends connected by a coiled spring, 7, substantially as described.

6. The combination, with rocker-shaped bearing-bar 2, having clips 20, with blocks 16, having passage-way 18, of the spring 3, extending through passage-way 18 and formed of the leaves 4 and the bottom short leaves, 5, connected at their inner ends by coiled spring 7, substantially as described.

401,819. **WRENCH.** SIDNEY COOK, Orlando, Fla., assignor of one-half to Ezra P. Sperry, same place. Filed Sept. 20, 1888. Serial No. 286,744. (No model.)

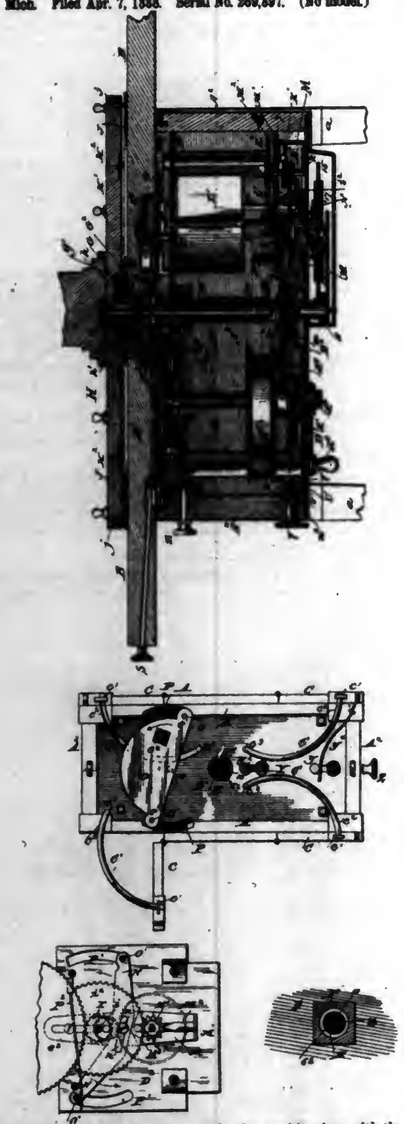


Claim.—1. In a wrench, the combination, with a body open at the top and sides and provided with a fixed jaw having teeth on its upper and outer faces, of a revolving carrier in the body and a movable jaw detachably and adjustably secured in the said carrier, substantially as described, whereby provision is made for causing the movable jaw to work with either toothed face of the fixed jaw, as set forth.

2. In a wrench, the combination, with an open body provided with a fixed jaw having teeth on its upper and outer faces, of a carrier fitted to revolve in the body and provided with apertures intersecting each other at right angles, a nut fitting in one of the aper-

tures of the carrier, a movable jaw having a screw-threaded shank and passing through the carrier and nut, and a spring secured to the body and engaging the carrier, substantially as herein shown and described.

401,820. SELF-WAITING TABLE. ANDREW DAHLSTROM, Ashton, Mich. Filed Apr. 7, 1888. Serial No. 269,897. (No model.)



Claim.—1. In a self-waiting table, the combination, with the main table-body projections 1 formed thereon, of the extensions C, the rods C', one end of said rods secured to the extensions C, the other end having a stop projection and adapted to fold into the main frame when extensions are closed in, the spring-actuated catch 2, adapted to be engaged and held by the projection 1 upon the main body of the table, substantially as described and shown.

2. In a self-waiting table, essentially as described, the combination, with the shaft E, the hub G, mounted on said shaft, a ratchet-disk, g', formed on said hub, of the revolving table H, and a pawl, h', secured centrally to the table and adapted to be engaged by the ratchet-disk, substantially as shown and described.

3. In a self-waiting table, the combination, with the main frame and table, spring-actuated gearing supported therein and adapted to operate the table, a box-like frame centrally pivoted to the under side of the table-top, and a pawl, R, pivotally secured at one end in the said box, provided with a depending lip, r, of the pivoted plate O, provided with a slot, O^2, said plate arranged to engage the lip r of the pawl, and rods depending from the plate O and connected with a releasing device connected to the spring-gearing, said device being operated by movement of the plate O and pawl R, substantially as shown and described.

4. In a self-waiting table, the combination, with the operating-gears, of a slide-plate, M, having a projecting finger, M^3, adapted to be moved into or out of engagement with the gears, whereby the movement thereof may be stopped, a pivoted plate, O, mounted in the table-frame and connected with the plate M, a box-like frame centrally pivoted to the under side of the table-top, and a pawl, R, pivotally secured at one end in the said box, provided with a depending lip, r, adapted to normally engage the plate O and thereby hold said finger M^3 in engagement with the gearing, and means, substantially as shown and described, for operating the box-like frame and pawl, as and for the purposes hereinbefore described.

5. In a self-waiting table, the combination, with the shaft K, the spur-wheel K', and the intermediate gearing, of the sliding plate M, having a rearwardly-projecting finger adapted to engage the spur-wheel K', and a shoulder, M^3, a cross-bar, N, mounted on said plate, arranged to bear against the said shoulder, a pivoted plate, O, connected with the bar N, a box-like frame centrally pivoted upon the under side of the table-top, a pawl, R, pivotally secured at one end in the said box, provided with a projecting finger, r, adapted to engage the plate O, and means, substantially as shown, for operating the pawl R and plate O, as described, for the purpose set forth.

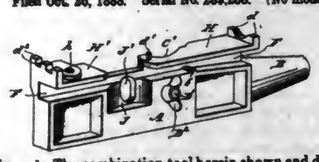
6. The combination, with the plate O, centrally pivoted upon the frame D', said plate provided with depending rods, a plate, M, connected to said rods, said plate provided with a projecting finger for arresting the movement of the operating-gearing devices, and a shoulder, M^3, a cross-bar, N, mounted on said plate, arranged to engage the said shoulder, and upwardly-projecting arms connecting said bar N with the plate O, said plate provided with an opening, O^3, of the swinging box Q, having a hinged pawl, R, having a beveled projection, r, adapted to enter the opening O^3, and means, substantially as shown and described, for swinging said box, whereby the plate O is swung on its pivot and the bar N caused to operate the plate M, as and for the purpose set forth.

7. In a self-waiting table, the combination, with the main frame, spring-actuated gearing supported therein, the plate O, centrally pivoted on the frame D', having an opening, O^2, a releasing device, substantially as shown, connected with spring-gearing and with the plate O, the swinging box Q, centrally pivoted upon the under side of the table-top, and a pawl, R, hinged at one end in said box, provided with a downwardly-projecting finger, r, engaging the opening O^2 in plate O, of the pull-rod S, mounted in the table-top, its outer end extending beyond the table-rim and its inner end connected to the swinging box, substantially as and for the purpose described.

8. In a self-waiting table, the combination, with the table-top B, provided with a central hub, W, a recess, f^2, formed in said hub, a circular groove, F', surrounding the hub, of a spring-actuated sliding plate, Y, having an upwardly-projecting hub, y^2, fitting normally in the recess f^2, and means, substantially as shown, for withdrawing the projecting hub from the recess f^2, as and for the purpose described.

9. In a self-waiting table, substantially as described, the combination, with the plate U, having a projecting finger, u, at one end adapted to enter the cog-pinion c, and an upturned portion, u', having a screw-threaded opening, u^2, at its opposite end, of the thumb-screw V, having a screw-shank adapted to enter the screw-opening, an annular groove, v, engaged by the studs v', and the thumb-screw body passed through the side A^2 of the frame, substantially as and for the purpose specified.

401,821. COMBINATION-TOOL. SAMUEL I. HEINOLD, Anderson, Ind. Filed Oct. 26, 1888. Serial No. 289,233. (No model.)



Claim.—1. The combination-tool herein shown and described, the same consisting of a main body, A, hammer, file-holding groove F, gage projections, and an eye, D, adapted for holding a handle and for dressing the drag-teeth, as set forth.

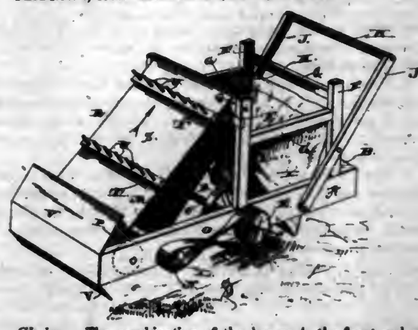
2. The main body A, formed with spaced flanges H H' and aperture J', in combination with the gage-eye D, substantially as described.

3. The main body A, formed with flanges H H' and fulcrum f, the flange H' being provided with the threaded opening h, in combination with a screw, D', substantially as described.

4. The body A, formed with recess J, flanges H H', and slot J', in combination with the eye D, having threaded shank D', and the nut D^2, substantially as described.

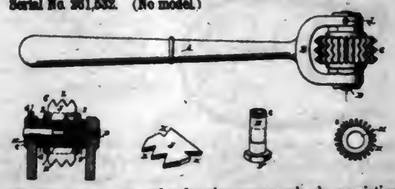
5. The body A, formed with the concave C', socket C^2, and aperture C, in combination with the handle E, eye D, having threaded shank D', and the nut D^2, substantially as described.

401,822. LAWN-RAKE. JOSHUA B. DETWEILER, Goshen, Ind. Filed Nov. 7, 1888. Serial No. 290,192. (No model.)



Claim.—The combination of the beams A, the front and rear standards F, erected thereon, the hooks H on the standards, the bags suspended on said hooks, the handles secured to the rear standards and the beams A, the roller Q in the front standards, the rotating axle, the roller M, the belt connecting the axle with the roller M, the endless rake moving over the rollers Q and M, and the shield secured to the front ends of the beams, as set forth.

401,823. INSTRUMENT FOR CUTTING OR GRINDING EMERY-WHEELS. WILLIAM DIEHL, Philadelphia, Pa. Filed Jan. 21, 1888. Serial No. 261,532. (No model.)



Claim.—1. A cutter for dressing emery-wheels, consisting of a central hub provided with transverse slots, in combination with cutting-teeth having dovetailed ends, clamping-disks provided with flanged edges adapted to fit over the dovetailed ends of the cutting-teeth, means, substantially as described, to draw said clamping-disks toward each other, and thereby to draw said cutting-teeth downward into the transverse slots of the hub toward the center thereof, shaft D, loosely journaled in said hub, and handle to which said shaft is secured, whereby the hub with its cutting-teeth is free to rotate on said shaft.

2. A cutter for dressing emery-wheels, consisting of a central hub provided with transverse slots and having its edges cut away or slightly beveled, in combination with cutting-teeth having dovetailed ends, clamping-disks provided with flanged edges adapted to fit over the dovetailed ends of the cutting-teeth and cut-away or beveled edges of the central hub, means, substantially as described, to draw said clamping-disks toward each other and thereby to draw said cutting-teeth downward into the transverse slots of the hub toward the center thereof, shaft D, loosely journaled in said hub, and handle to which said shaft is secured, whereby the hub with its cutting-teeth is free to rotate on said shaft.

3. In a cutter for dressing emery-wheels, a central hub, H, having transverse slots A, in combination with cutting-teeth J, having dovetailed ends K, clamping-disks I I, adapted to fit over the dovetailed ends K, means to draw said disks toward each other to clamp the teeth, shaft D, loosely journaled in hub H, and handle A B, to which said shaft is secured, whereby said hub with its cutting-teeth is free to rotate upon the shaft.

4. In a cutter for dressing emery-wheels, a central hub, H, having transverse oblique slots A, in combination with cutting-teeth J, having dovetailed ends K, clamping-disks I I, adapted to fit over the dovetailed ends K, means to draw said disks toward each other to clamp the teeth, shaft D, loosely journaled in hub H, and handle A B, to which said shaft is secured, whereby said hub with its cutting-teeth is free to rotate upon the shaft.

5. In a cutter for dressing emery-wheels, a central hub, H, having transverse slots A, in combination with cutting-teeth J, having dovetailed ends K, clamping-disks I I, adapted to fit over the dovetailed ends K, means to draw said disks toward each other to clamp the teeth, consisting of the bolt E, having head F, and the nut G, shaft D, loosely journaled in hub H, and handle A B, to which said shaft is secured, whereby said hub with its cutting-teeth is free to rotate upon the shaft.

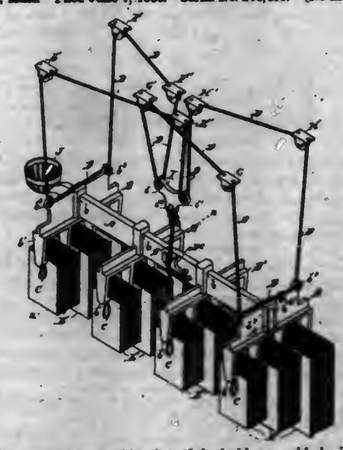
6. In a cutter for dressing emery-wheels, a central hub having beveled or tapering edges and provided with transverse slots, in combination with cutting-teeth adapted to fit into said slots having dovetailed edges, means, substantially as described, to hold said teeth in place upon the hub, and handle A B, provided with a fixed shaft, D, upon which the hub is journaled and free to rotate.

401,824. WINDLASS FOR CLOTHES-LINES. HENRY FOOTE, Jersey City, N. J. Filed Sept. 27, 1888. Serial No. 286,541. (No model.)



Claim.—A windlass for clothes-lines, with suitable means for turning and attachment, and being composed of a standard, D, having a rectangular elbow, E, in one of its sides, and a sheave, A, having firmly attached to one side of it a cog-wheel, B, both said sheave and cog-wheel being rigidly fixed upon and turning either backward or forward, with a shaft, P, working loosely in said standard at a point above the rectangular elbow thereof, said cog-wheel B engaging with a smaller cog-wheel, C, in the same vertical plane, and rigidly fixed upon and turning either backward or forward, with a long shaft, P', loosely set at one side in the standard D and at the other side in the rectangular elbow E, all substantially as described.

401,825. HOLDER FOR PAPER BAGS. HERBERT R. GAGE, Lowell, Mass. Filed June 7, 1888. Serial No. 276,409. (No model.)



Claim.—1. The combination of the holder provided with hangers having oppositely-arranged recesses, and spring-skewers adapted to be compressed, to be placed between said hangers and by their expansion to enter said recesses, and to be thereby held in place, as and for the purpose specified.

2. The combination of the holder provided with hangers having oppositely-arranged recesses, and skewers formed of spring-wire, each of said skewers having a loop between its ends and being adapted by the compression of said loop to have its ends drawn toward each other to enter between a pair of hangers and by the expansion of said loop to force its ends into said recesses, as and for the purpose specified.

3. The combination of the holder, the yoke, one or more cords connecting the corners of said holder to said yoke and passing over pulleys between each each corner and said yoke, the diagonally-opposite corners of said holder being connected to the same end of said yoke, and another cord attached to said yoke to draw the same downward to raise said holder, and when secured to maintain said holder in a raised position, whereby depressing one side, end, or corner of said holder will have a tendency to depress to an equal amount

the other side, end, or corner of the same, as and for the purpose specified.

401,826. THILL-COUPLING. FRANK GANDY, Freeport, Ohio. Filed Dec. 26, 1888. Serial No. 294,659. (No model.)

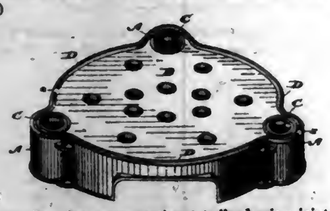


Claim.—1. The combination, with an axle-clip provided with forwardly-extending arms, of a block mounted between said arms, a spring arranged in connection with the block, a stud carried by one of the arms, the opposite arm being apertured, and a thill head or eye arranged to engage the stud, substantially as described.

2. The combination, with an axle-clip provided with forwardly-extending arms, of a block mounted between said arms, a spring arranged in connection with the block, a stud carried by one of the arms, a recessed aperture formed in the opposite arm, and a thill head or eye provided with a lug or projection which may be brought into register with the recess of the apertured arm, substantially as described.

3. In a thill-coupling, the combination, with a clip formed with forwardly-extending arms, one of which is provided with a stud, 15, and formed with a recess, 16, while the other is formed with an aperture, 17, and a recess, 18, of a block mounted between the arms and supported by a pin, 21, a spring, 22, mounted in a recess formed in the clip behind the block, and a thill-head formed with a projection, 27, said head being adapted to engage the stud and enter the recess 16, substantially as described.

401,827. SECTIONAL FURNACE-JOINT. EDWARD GURNEY, Toronto, Ontario, Canada. Filed May 21, 1888. Serial No. 274,564. (No model.)



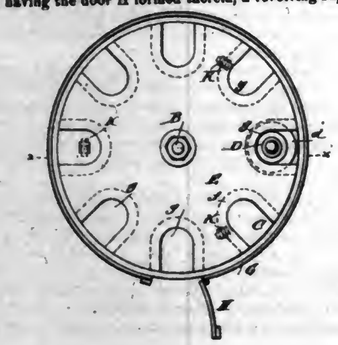
Claim.—In a hot-water sectional boiler having joints formed around its water-legs by compressible metal rings C, the combination of a softer and easier compressible packing, D, placed on the section and extending above the top surfaces of the rings C, substantially as and for the purpose specified.

401,828. PROCESS OF PREPARING SULPHATE OF SILVER. FREDERICK GUTEKUNST, San Francisco, Cal. Filed Feb. 11, 1889. Serial No. 299,504. (No specimens.)

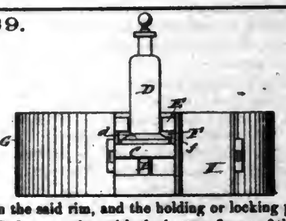
Claim.—In the process of refining silver bullion, the preparation of crystals of sulphate of silver by diluting the hot solution of sulphate of silver in sulphuric acid, by means of a steam-jet, to such concentration that on cooling the crystals will separate as a monosulphate.

401,829. BOTTLE-STAND. CHARLES K. HALL, New Orleans, La. Filed Aug. 15, 1888. Serial No. 282,794. (No model.)

Claim.—1. The bottle-stand herein shown and described, composed of the base A and rim G, attached thereto and surrounding the same, and having the door H formed therein, a revolving support, C,



401,829.

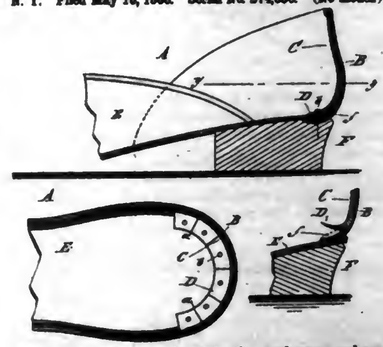


placed within the said rim, and the holding or locking plate E above the support C, for engaging with the bottom flange of the bottle, substantially as set forth.

2. The bottom board, A, provided with stud B and surrounding rim G, having door H, in combination with the support C, intermediate board, F, and plate E, formed with spaces *g* to receive the bottles, the boards C E F being placed loosely upon the stud B to revolve thereon, substantially as described.

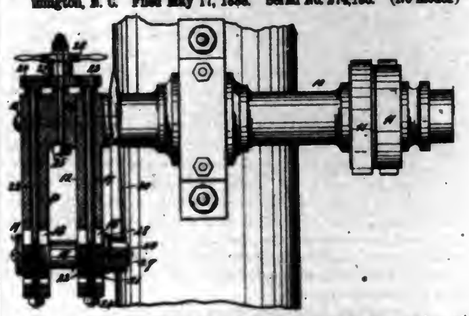
3. The bottom board or base, A, the surrounding rim G, secured to the base, and the door H, formed in the rim, and the central bolt, B, in combination with the horizontal support C, held by the bolt, the rollers K, placed beneath the support, and the holding-boards E F, substantially as described.

401,830. SHOE OR SLIPPER. JAMES HAHAN, Jr., New York, N. Y. Filed May 16, 1888. Serial No. 274,090. (No model.)



Claim.—As an improved article of manufacture, a shoe or slipper having a counter, C, bare upon its inner surface and split at its lower edge to form the narrow inner flap, D, and the narrow lower flap, *f*, secured at the heel of the shoe, substantially as described.

401,831. CUT-OFF-VALVE GEAR. ANDREW L. HARRISON, Wilmington, N. C. Filed May 17, 1888. Serial No. 274,188. (No model.)



Claim.—1. The combination, with the rock-shaft of an engine, of parallel spaced arms secured to one end of said rock-shaft, provided with aligning and straight rectangular slots near their lower ends, an eccentric-pin sliding in said slots, a nut also sliding in the slots below the said pin, rods projected downward through the arms and the pins and engaging the nuts, and a means, substantially as shown and described, for manipulating said rods, whereby provision is made for changing the lead of the valves, and also the lift or throw of the said valves, as set forth.

2. The combination, with the rock-shaft of an engine and spaced arms secured at one end, provided with an aligning rectangular slot and a vertical bore extending longitudinally from end to end, of an eccentric-pin sliding in said slots, a nut also sliding in the slots below the pin, rods threaded at their lower ends and projected through the bore of the arms and engaging said nuts, pinions attached to the upper end of said rods, and a hand-wheel journaled in the rock-shaft

above the pinion and provided with a gear-wheel meshing with the same, as and for the purpose specified.

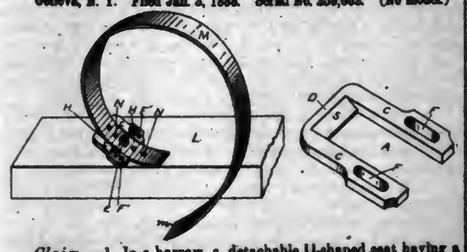
3. The combination, with the rock-shaft of an engine and spaced arms secured at one end, provided with an aligning rectangular slot and a vertical bore extending longitudinally from end to end, of an eccentric-pin sliding in said slots, a nut also sliding in the slots below the pin, rods threaded at their lower ends and projected through the bore of the arms and engaging said nuts, pinions attached to the upper end of said rods, a hand-wheel journaled in the rock-shaft above the pinions and provided with a gear-wheel meshing with said pinions, and means, substantially as described, for locking the eccentric-pin in a fixed position, as and for the purpose specified.

401,832. HANDLE. JACOB B. HARTMAN, Wooster, Ohio. Filed Aug. 23, 1888. Serial No. 283,332. (No model.)



Claim.—The combination, with the rail of a sash or blind provided with parallel mortises B B, of a plate secured to said rail and formed with perforations which register with the mortises B B, and a handle consisting of a handle proper, E, and parallel arms, which latter are provided at their ends with stops which cannot pass through the perforations in the plate after said plate is secured, substantially as set forth.

401,833. SPRING-TOOTH HARROW. EDWARD W. HERENDEEN, Geneva, N. Y. Filed Jan. 3, 1888. Serial No. 259,662. (No model.)

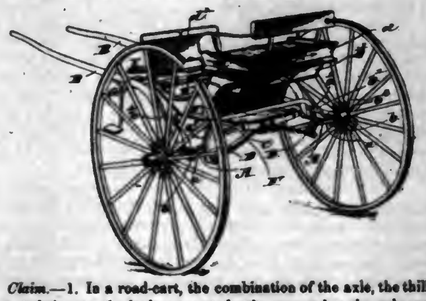


Claim.—1. In a harrow, a detachable U-shaped seat having a bearing portion, S, and perforated arms C C, in combination with fastening-bolts, whereby the seat is adjustable, substantially as and for the purposes described.

2. In a harrow, a tooth provided with a series of holes, in combination with the frame-bolts and a detachable U-shaped seat having a bearing portion, S, and arms C C, substantially as described.

3. A harrow provided with a curved spring-tooth and a detachable U-shaped seat, each independently attached to the harrow, substantially as and for the purposes described.

401,834. ROAD-CART. JOHN G. HESS, Westminster, Md. Filed Oct. 31, 1888. Serial No. 289,619. (No model.)



Claim.—1. In a road-cart, the combination of the axle, the thills connected thereto, the body connected at its rear end to the axle, and the cross-bar G between the thills, passing over the floor of the body in rear of the splash-board, and connected to the body, substantially as specified.

2. In a road-cart, the combination of the axle having the thills attached thereto, the body connected to the axle and having a transverse spring-bar, H, in rear of the splash-board, the cross-bar G, connecting the thills and passing over the said spring-bar; the wear-plate on the upper side of the cross-bar provided with a vertical tapered flange, *k'*, the whiffletree arranged on the upper side of the cross-bar and provided on its under side with a depending tapered flange, *l'*, fitting within the flange *k'*, and the bolt passing through registering perforations in the whiffletree, cross-bar, and spring-bar, substantially as and for the purpose specified.

3. In a road-cart, the combination, with the axle, of the thills and draft-straps *b* and inclined brace-straps *b'*, secured to the rear ends of the thills and arranged at their rear ends respectively below and above the axle, and the bolts connecting the rear ends of the said straps on opposite sides of the axle, said bolts bearing against the axle, substantially as specified.

4. In a road-cart, the combination, with a cranked axle provided with the upward offset *a* and the thills connected to the straight portion of the axle on opposite sides of the offset, of the semi-elliptical spring arranged within and below the offset and connected at its ends to the shoulders *a'* of the offset, and the body having its main portion arranged forward of the axle and its seat directly above the same, and provided with a cross-brace, F, arranged parallel with and bearing on the said spring, and the horizontal arms E, connecting the cross-brace with the rear portion of the body, substantially as specified.

5. In a road-cart, the combination, with a cranked axle provided with the offset *a* and the shoulders *a' a'* on opposite sides of the offset, and the thills attached at their rear ends to the straight portion of the axle beyond the shoulders, of the spring C, arranged within and below the said offset and provided at its ends with swinging loops D D, passing over the axle and engaging the shoulders *a' a'*, the body provided with rearwardly-extending arms E E, the cross-brace F, connecting the rear ends of the said arms and secured to the center of the said spring, and the cross-bar G between the thills, connected to the front of the body, substantially as specified.

6. In a road-cart, the combination, with the cranked axle and the thills affixed to the axle, of the spring C, provided at its ends with swinging loops D D, passing over the axle, and the body provided at its rear end with a cross-brace, F, arranged parallel with and bearing on and affixed to the said spring, said cross-brace and said spring being arranged within and below the cranked portion of the axle, and said body being connected at its front end to the cross-bar G of the thills by a yielding or spring connection, substantially as specified.

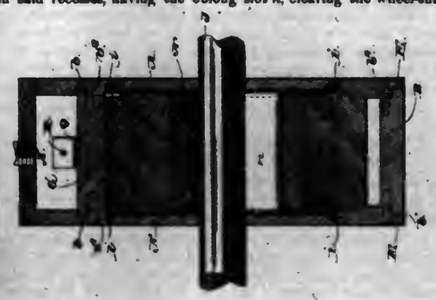
7. In a road-cart, the axle, the thills, the body, the transverse spring-bar H, secured to the floor of the body in rear of the splash-board, the cross-bar G, connecting the thills and passing over the said spring-bar, and the whiffletree connected to the top of the cross-bar and extended at its ends beyond the side of the body, whereby the spring-bar, cross-bar, and whiffletree are all connected to the floor of the body and are arranged in rear and close to the bottom of the splash-board, as set forth.

8. In a road-cart, the thills, the axle, the body, the cross-bar G, connecting the thills and extending across the bottom of the body in rear of the dash-board, said cross-bar having a spring or yielding connection with the body, and the whiffletree connected to the cross-bar and arranged within the body and extended at its ends beyond the sides of the body, as specified.

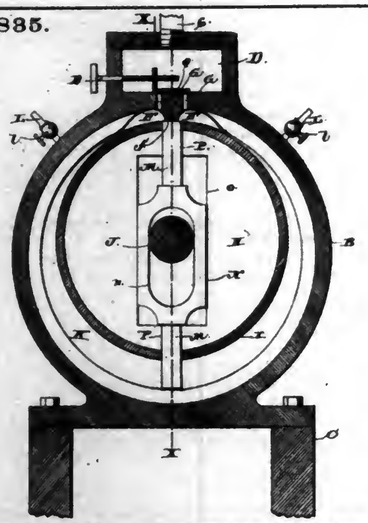
9. In a road-cart, the cranked axle, the spring C, arranged below the cranked portion of the axle and connected to the same, the cross-bar F, arranged parallel with the spring and connected to the top thereof, and also arranged within the crank of the axle, and the arms E, connected to the cross-bar F and arranged at right angles thereto and extended forward and connected to the body, as set forth.

401,835. ROTARY ENGINE. JOHN F. HIMES, Sr., San Antonio, Tex. Filed Sept. 11, 1888. Serial No. 285,115. (No model.)

Claim.—In a rotary engine, the cylinder having the ports G, the wall or offset *f* between them and the recesses F on opposite sides of said offset, the steam-chest, the valve I, the screw R, to move the same over either or both of the ports, and the independent valved escape-ports, in combination with the wheel mounted eccentrically in the cylinder and having the guide-recesses O in its heads, the block N in said recesses, having the oblong slot *n*, clearing the wheel-shaft,

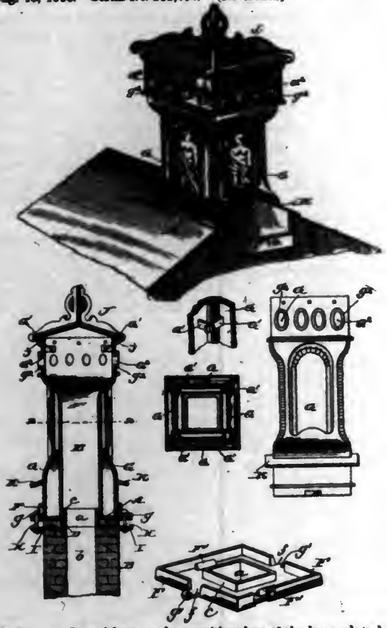


401,835.



and the radial pistons M, secured to opposite ends of the block and working through openings in the periphery of the wheel, substantially as described.

401,836. CHIMNEY. JOSEPH A. RODEL, Cumberland, Md. Filed Aug. 13, 1888. Serial No. 282,757. (No model.)



Claim.—1. In a chimney, the combination of the base-plate having flanges F, short ribs F', and lateral lugs *g'*, and having the flange F recessed at *f* in line with lugs *g'*, the side plates, G, two of which have lugs *g* fitted to rest in recesses *f* and over lugs *g'*, and the other two side plates being fitted at their lower ends between the flange F and the short ribs F', the cap or top and fastenings, substantially as set forth.

2. The base-plate and the casing seated thereon, and having two of its side plates provided at their lower ends with laterally-projected lugs, combined with the anchor-rods, whereby to connect said lugs with plates anchored in the chimney-wall, and the said anchored plates, all substantially as and for the purposes specified.

3. The combination, in a chimney-top, of the base-plate having lateral perforated lugs *g'*, and an edge flange, F, formed in line with lugs *g'*, with openings or recesses *f*, the casing having lateral lugs *g*, extended through openings *f* and over the lugs *g'*, and the anchor-rods passed through lugs *g g'* and secured, substantially as and for the purposes specified.

4. The improved chimney-top consisting of the base-plate A, having openings *a*, tubes C D, lugs *g'*, and flange F, recessed at *f*, the tube E, fitted at its lower end on tube C, the casing having plates G, provided with lugs *g*, extended through recesses *f*, and also having interlocking hook-like lugs G', the cap or top, and the anchor-rods, all substantially as and for the purposes specified.

401,837. WITHDRAWN.

401,838. SUPPOSITORY-MACHINE. WAYNE J. HULL, Alexandria, Dak. Filed Sept. 27, 1888. Serial No. 286,550. (No model.)



Claim.—1. The combination, with a tube and a plunger, of a rotary circular mold journaled at the inner end of the tube and having peripheral recesses to successively register with the inner end of the tube, substantially as set forth.

2. In a machine of the character described, the sectional peripherally-recessed mold formed of disks held face to face and each having a circular series of registering recesses in their adjacent faces forming said mold-recesses, and means for holding the disks together, substantially as set forth.

3. In a machine of the character described, a rotary peripherally-recessed mold formed of interchangeable disks held face to face and each having a circular series of recesses in the outer edge of both sides, the recesses on one side or face being of a different size from those on the opposite side, and the like recesses of each disk being similarly spaced to register, and means for holding the disks together with either set of recesses in register, substantially as set forth.

4. The combination, with a ring, a tube communicating with the interior thereof, and a plunger in the tube, of a circular rotary mold fitting in the said ring and having a series of peripheral recesses to successively register with the tube, substantially as set forth.

5. In a machine of the character described, the sectional peripherally-grooved mold consisting of the disk 12, having a central spindle, 17, projecting at both sides and threaded at its ends, pins 18, projecting from both faces of the disk, a second centrally-apertured disk, 13, having apertures in both faces to register with said pins, a knob or its stated equivalent, 25, on one end of the spindle and having apertures to receive the adjacent pins 18, a nut holding the said knob in position, and a nut on the opposite end of the spindle binding the two disks together, the said disks having a series of alternating semicircular recesses in opposite sides thereof.

6. The combination, with a frame, a tube attached thereto, and a plunger loosely held in said tube, of disks capable of side contact and rotation in the frame, said disks having pins and pin-apertures and being provided with a series of grouped semi-conical recesses produced in opposite sides of their periphery and extending toward their center, and means, substantially as described, for rotating the disks, as and for the purpose specified.

7. The combination, with a frame, a tube attached thereto, and a plunger loosely held in said tube, of disks capable of face-contact with each other and rotation in the frame, said disks being provided with a series of semi-conical recesses produced in opposite sides of their periphery and extending toward their center, pins formed upon the face of one disk adapted to enter apertures in the face of the other disk, a spindle passing through the disks provided with a detachable lock-nut at one end and a handle at the other end, all combined to operate substantially as shown and described.

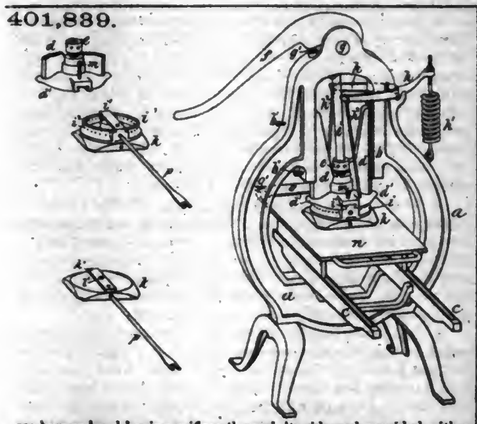
8. The combination, with a frame, a tube attached thereto, and a plunger loosely held in said tube, of interchangeable disk-sections capable of rotating in the frame and provided with a series of semi-conical recesses produced alternately on opposite sides thereof, and means, substantially as shown and described, for securing the disks in contact and rotating the same, substantially as shown and described.

401,839. HAND PRINTING-PRESS. JULIUS KUHNE, Yonkers, N. Y. Filed Jan. 21, 1888. Serial No. 261,503. (No model.)

Claim.—1. The combination, with the plunger of a printing-press, of a hollow gas-burner head detachably secured thereto, said plunger having gas-passages opening into the hollow head, and said hollow head having orifices in its sides, through which the gas escapes, and when ignited impinges against the bottom of the plunger.

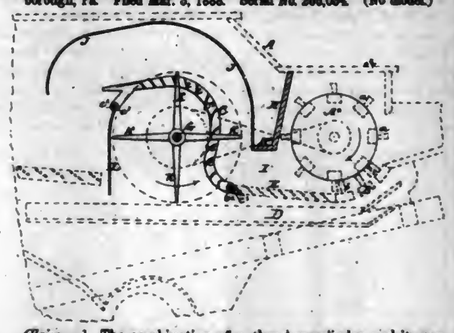
2. In a printing-press, in combination, a plunger having a circular head and a dovetail groove in the under side thereof, a hollow gas-burner head having orifices through its side and provided with a central dovetail rib adapted to fit in the groove of the plunger-head and a dovetail on its under side, and a die-head provided with a dovetail rib adapted to fit in the groove at the under side of the gas-burner head.

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3. In a printing-press, in combination, a plunger having a circular head, with a dovetail groove formed partly through the under side thereof, a gas-pipe secured thereto, and passages from the pipe extending through the bottom at either side of the groove, a hollow gas-burner head provided with orifices through its side and having a central rib dividing it into two chambers and projecting above it in the form of a dovetail to fit the groove in the plunger-head, a die-head provided with a dovetail rib adapted to fit in a groove in the under side of the gas-burner head, a die secured to the die-head by means of a central screw, and a locking-screw passing through the plunger-head and the gas-burner head into the die-head.

401,840. THRASHING-MACHINE. FRANK P. LANDIS, Waynesborough, Pa. Filed Mar. 3, 1888. Serial No. 266,084. (No model.)



Claim.—1. The combination of a thrasher-cylinder and its concave with a stationary abruptly-rising curved grate having a series of transverse webs arranged one above the other and retained obliquely to and in the path of the grain projected in the rear of said cylinder, and revolving fingers passing through slots in said grate to elevate straw above it, substantially as described.

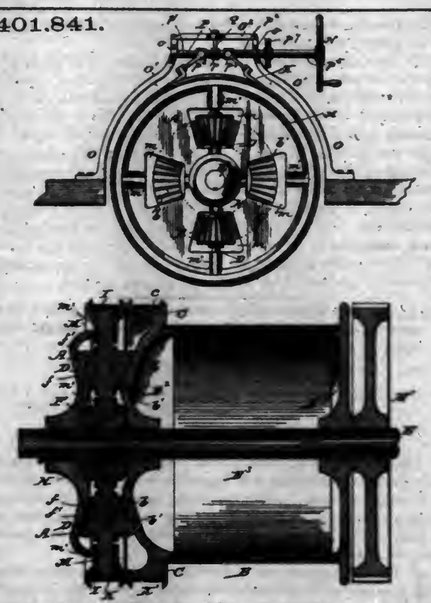
2. The combination of a thrasher-cylinder and its concave, an abruptly-rising curved grate in the rear of said cylinder, and revolving fingers passing through slots in said grate, with a correspondingly-curved deflector above said grate and fingers, substantially as and for the purpose described.

3. The combination of a thrasher-cylinder and its concave, an abruptly-rising curved grate having transverse webs, and revolving fingers passing through the slots in said grate, with a pendent partition between said cylinder and grate, and a correspondingly-curved deflector above said grate, substantially as and for the purpose described.

401,841. HOISTING-MACHINE. TIMOTHY W. LEMIEUX, Duluth, Minn. Filed Oct. 12, 1888. Serial No. 287,961. (No model.)

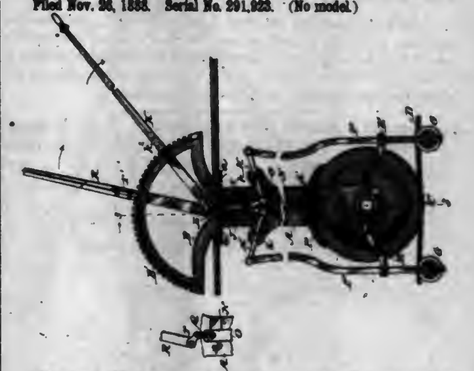
Claim.—1. In a hoisting-machine, the combination, with the power-shaft, a drum loosely mounted thereon provided with a head having an annular brake-seat and a cogged surface on its outer face, and a disk having a cogged inner face fixedly secured upon the power-shaft, of a pulley loosely mounted on the said shaft between the drum-head and the fixed disk, said pulley provided with an annular brake-seat, cog-gears journaled in the web of the pulley M, adapted to engage the cogged surfaces of the drum-head and fixed disk, and brake mechanism, substantially as shown and described, for alternately braking the drum-head and loose pulley, as and for the purpose described.

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2. The combination, with the shaft E, the drum B, and pulley M, loosely mounted on said shaft, said drum provided with a band-brake wheel, C, said pulley M provided with band-brake seat I', and the band-brakes K K', of the frame O, the screw-shafts P P, journaled in said frame, said shaft provided with right and left hand screw-sections p' p^3, sliding boxes p^3 p^4, mounted on said screw-sections p' p^3, the sliding boxes p^3, connected to the ends of the band-brake K', the boxes p^4 being connected to the ends of the band-brake K', the pulley P, provided with a hand-wheel, N, and a gear-wheel, p^5, engaging a similar wheel, p^6, on shaft P', whereby the band-brakes may be alternately engaged and disengaged from operation with their respective hand-wheels, and means for revolving said drum B and the pulley M, substantially as shown and described.

401,842. CABLE-GRIP. TIMOTHY W. LEMIEUX, Duluth, Minn. Filed Nov. 26, 1888. Serial No. 291,923. (No model.)

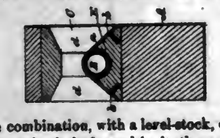


Claim.—1. The combination, with the standard A, adapted for connection with the car-body at its upper end, its lower end bifurcated, a central slot, N, formed in the standard and communicating with the bifurcated portion, and a sheave, C, journaled in the lower end of said bifurcated portion, said sheave adapted for frictional contact with the cable on its lower face, of the vertically-adjustable brake adapted to engage the upper face of the sheave C, said brake consisting of the shoe P and the sliding arm O, fitting and operating in the slot N in the standard, a lever, R, connected to said arm O at its upper end for operating it, and means, substantially as shown, for

raising the cable into contact with the sheave C, substantially as and for the purpose described.

2. The combination, with the standard A, adapted for connection with the car-body at its upper end, its lower end bifurcated, a central slot, N, formed therein communicating at its lower end with the bifurcated portion, and a sheave, C, journaled in the lower end of said bifurcated portion, said wheel having an annular groove or seat to receive the cable and beveled flange to receive the brake-shoe, said wheel adapted for frictional contact with the cable, of the vertically-adjustable brake, said brake consisting of the shoe P, having beveled faces adapted to engage the flanges of the wheel C, and an upwardly-extending arm, O, fitting and sliding in the slot N in the standard, the lever R, connected to the upper end of said arm for operating it, and means, substantially as shown, for raising the cable into contact with the sheave C, substantially as and for the purpose specified.

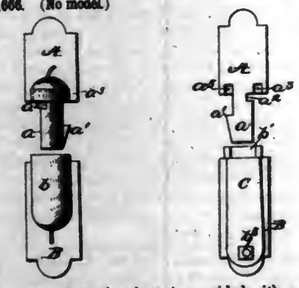
401,848. SPIRIT-LEVEL. EVAN LEWIS and FREDERICK ARESTRONG, Kingston, Pa. Filed Jan. 9, 1889. Serial No. 295,897. (No model.)



Claim.—1. The combination, with a level-stock, of a rectangular frame having a rectangular hole formed in it through its sides that are beveled toward the inner edges of the frame, a spirit-tube located in a longitudinal groove of the frame, and two straps that bear on the body of the spirit-tube and are secured near their ends to the frame, substantially as set forth.

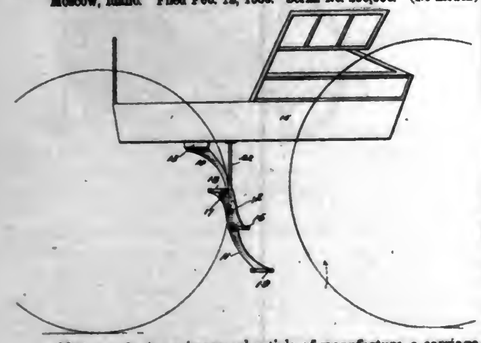
2. The combination, with a level-stock and a rectangular frame which is embedded in the stock and having a rectangular hole with beveled sides and a longitudinal groove formed in it, of a spirit-tube, a slightly-yielding bedding-piece, two bands, and screws to secure the bands in place, substantially as set forth.

401,844. CLASP. ORELOW C. MANN, Delhi, N. Y., assignor of one-half to George E. Marvine, same place. Filed June 11, 1888. Serial No. 276,666. (No model.)



Claim.—In a clasp, the plate A, provided with a half-rounded projection, *a*, having a hook, *a'*, and recess *a²*, formed thereon, the plate B, having a socket, *b*, corresponding to the said projection *a*, for receiving the same, and the spring C, secured to the plate B, for locking the parts together, as shown and described.

401,845. FOLDING STEP FOR VEHICLES. MATTIE M. MARSH, Moscow, Idaho. Filed Feb. 12, 1889. Serial No. 299,806. (No model.)



Claim.—1. As an improved article of manufacture, a carriage-step comprising an upper section and a lower section pivoted thereto, each section being provided with an outwardly-extending tread-plate at each extremity, substantially as shown and described.

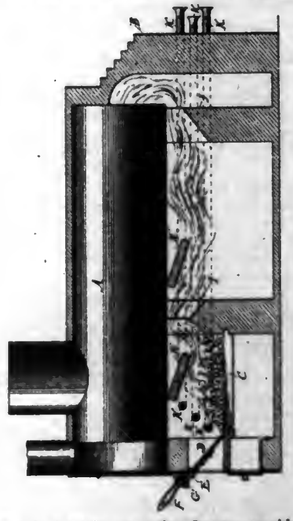
2. As an improved article of manufacture, a folding carriage-step comprising two sections pivoted one to the other, the upper section provided with a tread-plate at each extremity extending at a right angle outward from one face, and a lug or shoulder integral with one edge between said tread-plates, the lower section being provided at each extremity with an outwardly-projecting tread-plate, the upper tread-plate of the lower section, when the step is unfolded to its full extent, being adapted to rest upon the shoulder of the upper section, and the lower tread-plate to extend beyond and below the similar plate of the upper section, substantially as shown and described.

3. As an improved article of manufacture, a folding step for vehicles, comprising an upper and a lower section pivotally connected, each provided at the extremities with a tread-plate extending at a right angle from the outer face, and a brace-rod attached to the pivot-pin of the sections and provided with a spring adapted for engagement with the lower section when said section is folded up parallel with the upper section, substantially as shown and described.

4. In a folding step for vehicles, the combination, with an upper section having the upper end bent outward at a right angle upon itself and horizontally inward to form an upper tread-plate, and a lower extremity bent outward at a right angle to form a lower tread-plate, and a lug integral with the forward edge between the upper and lower tread-plates, of a lower or drop section pivoted to the upper section having the extremities bent at a right angle outward to form a tread-plate, the uppermost of which plates is provided with a recess to receive the forward edge of the upper section immediately below the lug thereon, substantially as shown and described.

5. In a folding step for vehicles, the combination, with an upper section having the upper end bent outward at a right angle upon itself and horizontally inward to form an upper tread-plate, and the lower extremity bent outward at a right angle to form a lower tread-plate, and a lug integral with the forward end between the upper and lower tread-plates, of a lower or drop section pivoted to the upper section having the extremities bent at a right angle outward to form a tread-plate, the uppermost of which plates is provided with a recess to receive the forward edge of the upper section immediately below the lug thereon, a brace-rod attached to the pivot-pin of the step-sections, and a spring coiled upon the said rod capable of engaging with the lower or drop section, substantially as shown and described.

401,846. SMOKE-CONSUMER. CORNELIUS MCGIVERN, Chicago, Ill. Filed Jan. 19, 1889. Serial No. 296,928. (No model.)



Claim.—1. A smoke-consuming furnace provided with flues entering the rear of the furnace and opening above the fuel near the front of the fire-chamber for feeding heated air to the fire, an inclined door, as shown, for feeding additional air, and deflectors placed at an angle to the surface of the grate for directing the air against the surface of the fire, substantially as described.

2. A smoke-consuming furnace provided with flues for feeding heated air to the fire, an inclined door, as shown, for feeding additional air, and deflectors for directing the air against the surface of the fire, substantially as described.

3. In a smoke-consuming furnace, two or more flues for feeding heated air to the fire, placed one above another, entering the rear of the furnace and opening above the fire at the front end of the fire-chamber, each flue opening at a point nearer the rear of the furnace than the one below it, whereby heated air is fed to the different parts of the flame in succession, substantially as described.

4. A smoke-consuming furnace provided with an inclined door for feeding air to the fire, two or more flues for feeding heated air, placed one above another, entering the rear of the furnace and opening above the fuel near the front of the fire-chamber, each flue opening above the fire at a point nearer the rear of the furnace than the one below it, and deflectors for directing the air against the surface of the fire, substantially as described.

401,847. VEHICLE-BODY. LAFAYETTE A. MELBURN, Denver, Colo. Filed Feb. 8, 1889. Serial No. 299,113. (No model.)



Claim.—1. A vehicle-body having its panels formed at their meeting ends with dovetail grooves and ribs, combined with fastening-pins engaging both said panels at their juncture, substantially as set forth.

2. A vehicle-body comprising the panels and the sills secured thereto, the said sills having their ends or corners separated from the corners of the panels, substantially as set forth.

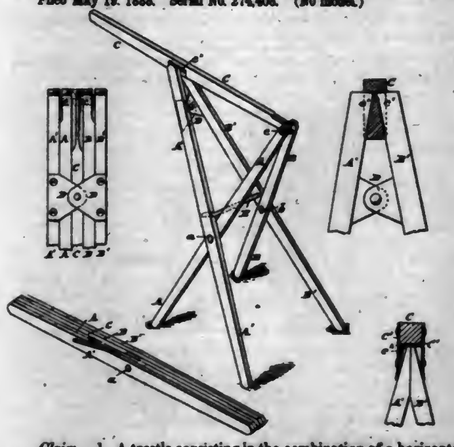
3. The combination, in a vehicle-body, of the panels and the sills secured thereto, a recess or opening being formed between the corners of the sills and the panels, substantially as set forth.

4. A vehicle-body comprising panels, the sills separated at their corners from the corners of the panels, and the fastening-screws passed from the inner side through the sills into the panels, substantially as set forth.

5. A vehicle-body having its panels provided in their inner sides with dovetail or undercut grooves, and having its seat-posts fitted to said grooves, substantially as set forth.

6. The improved vehicle-body herein described, consisting of the panels having their meeting ends formed with dovetail grooves and ribs, and having pins driven partially in each of the panels at their joints, and each panels having dovetail grooves fitted to receive the seat-posts, the seat-posts fitted in said grooves, and the sills secured to the inner sides of the panels, recesses being formed between the joints of the sill and of the panels, substantially as set forth.

401,848. FOLDING TRESTLE. JOHN T. MILLER, Chicago, Ill. Filed May 19, 1888. Serial No. 274,408. (No model.)



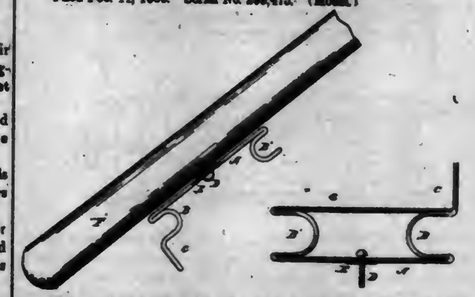
Claim.—1. A trestle consisting in the combination of a horizontal top bar, C, and four legs or standards, A A' B B', pivoted together in pairs at or near their mid-length by pivots *a b*, the legs A' B' being pivoted together at or near their upper ends by pivot D, the axis of which is at right angles to the axis of the pivots *a b*, and the corresponding legs A B being arranged adjacent to each other and between the corresponding legs A' B', the parts being adapted to fold together into a compact form, in the manner and for the purpose set forth.

2. A trestle consisting of four legs or standards, A A' B B', pivoted together in pairs at or near their mid-length by pivots *a b*, the legs A' B' being pivoted together at or near their upper ends by pivot D, the axis of which is at right angles to the axis of the pivots *a b*, in combination with the horizontal top bar, C, pivotally secured between the upper ends of the legs or standards, whereby the trestle parts are permanently connected together and adapted to fold into a compact form, substantially as herein described, and for the purpose set forth.

3. The combination of the legs or standards A A' B B', pivoted together in pairs and connected together by hinge D, with the corresponding legs A B arranged adjacent to each other and between the corresponding legs A' B', top bar, C, having a recess, essentially as described, for receiving the upper ends of the legs A' B', and pivot-bolt *c*, substantially as described, and for the purpose set forth.

4. The combination of the legs or standards A A' B B', pivoted together in pairs and connected together by hinge D, with the corresponding legs A B arranged adjacent to each other and between the corresponding legs A' B', top bar, C, having a recess, essentially as described, for receiving the upper ends of the legs A' B', pivot-bolt *c*, connecting the end of bar C with the tops of the legs A B, and strut or brace E, substantially as described, and for the purpose set forth.

401,849. FISHING-REEL. GEORGE FADDOCK, Brooklyn, N. Y. Filed Feb. 11, 1889. Serial No. 299,473. (Model.)



Claim.—1. A reel of the character described, constructed of a central strip perforated for the reception of a securing-screw and having at each end a curved arm, one of said arms being projected to form an operating-handle, substantially as set forth.

2. A reel of the charater described, consisting of a strip adapted to be secured to the rod and provided at each end with a curved arm, one of said arms extended to and secured at the other arm, substantially as and for the purpose described.

401,850. STUMP-EXTRACTOR. JAMES A. PARIS and JAMES H. DILDAY, Gibson, Tenn. Filed Dec. 18, 1888. Serial No. 294,091. (No model.)



Claim.—1. In a stump-extractor, the combination of the standards pivoted together at their upper ends, the braces pivoted to one pair of standards and detachably engaging the other pairs, the lifting-lever fulcrumed on the pivot-bolt of the standards, the grappling-hooks suspended from the lifting-lever, and mechanism for operating the said lever, as set forth.

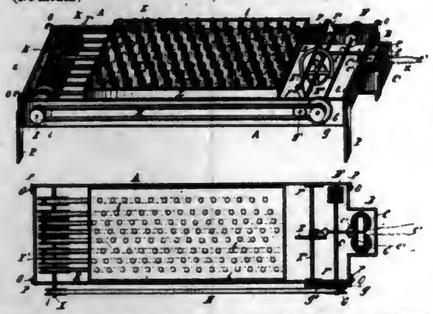
2. The combination of the standards, the lifting-lever fulcrumed at the upper ends of the standards, the grappling-hooks suspended from said lever, the windlass journaled upon the standards, the rope

secured to the lifting-lever and adapted to wind on the windlass, the ratchet-wheel on the end of the windlass, the gravity-pawl pivoted below the ratchet-wheel and engaging the same, and the operating-lever pivoted above the ratchet-wheel and provided with a loop engaging said wheel, as specified.

3. The standards pivoted together at their upper ends, the lifting-lever fulcrumed on the pivot-bolt of the standards, and the grappling-hooks suspended from the lifting-lever, as set forth.

4. The standards pivoted together at their upper ends, the lifting-lever fulcrumed on the pivot-bolt of the standards, and the grappling-hooks suspended from the lifting-lever, the windlass *a*, connected with the short arm of the lifting-lever by rope *b*, and the windlass J, connected to the long arm of said lever by rope I, as set forth.

401,851. DISTRIBUTER FOR EXPLOSIVE BOMBS. HORACE W. PARSONS, Wamego, Kans. Filed Aug. 17, 1888. Serial No. 283,054. (No model.)



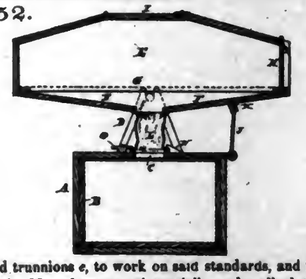
Claim.—1. The combination, in a device for distributing bombs, with a supporting-frame by which all the various parts of said device may be lifted, series of tubes suitable for receiving bombs fastened upon said frame, and slides capable of being moved so as to close and open the lower ends of such tubes, as specified, of a revoluble shaft journaled in said frame, spools mounted upon said shaft and connected with said slides, so as to move the same when turned, as hereinbefore described, and mechanism, substantially as specified, for turning said shaft, and spools to move said slides, all substantially as and for the purpose set forth.

2. The combination, in a device for distributing bombs adapted to be attached to balloons and other appliances capable of lifting and carrying the same, with a supporting-frame by which the distributer may be lifted and carried, tubes set upright upon said frame and arranged for carrying bombs, slides arranged to move under said tubes to open and close the bottom thereof, and mechanism, substantially as specified, for moving said slides, of an escapement to control the movement of said slides, comprising a shaft journaled in said frame, a toothed wheel mounted upon said shaft, a pinion also mounted upon said shaft to connect it with the said moving mechanism, another shaft journaled in said frame parallel to said last-named shaft, an oscillating anchor mounted upon such shaft, a lever pivoted upon said frame and connecting an armature with said anchor, an electro-magnet working said armature and said lever to oscillate said anchor, and electric conductors by which said magnet may be connected with a battery, all substantially as and for the purpose set forth.

3. The combination with the frame A A, having legs P, ears O, and recess B, the box L within said frame, and the series of tubes *l* within said box, open at both ends and adapted to receive and carry bombs, as specified, of the shaft I, journaled in said frame, the spools I′ and pulley i, mounted upon said shaft, the flexible slides *k*, working under said tubes *l* and adapted to be wound upon the spools I′, the shaft D, journaled in said frame, the spool D′, the spur-wheel S, and the pulley G, mounted upon said shaft D, the band H, connecting the pulley i and the pulley G, the shaft E′, journaled in said frame, the spur-wheel *g*′, mounted upon said shaft E″ and meshing into the spur-wheel *g*, the toothed wheel E, also mounted upon said shaft E″, the anchor E, mounted upon the shaft F and engaging the wheel E′, the shaft F, mounted in the brackets F′, the lever C, actuating the said anchor E and connecting the said anchor with the armature *c*′, the electro-magnet C, placed within the recess B of said frame and provided with connecting-wires *c*′ *c*′, the armature *c*′, working upon said magnet, the cord *d*′, wound upon the spool D′, and the weight *d*, attached to said cord, all substantially as and for the purpose set forth.

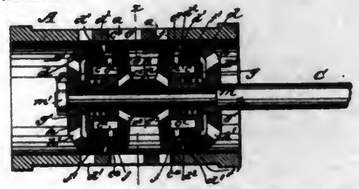
401,852. ASH-SIFTER. GEORGE M. PIERCE, Philadelphia, Pa. Filed Sept. 9, 1887. Serial No. 249,311. (No model.)

Claim.—1. The combination of receptacle A, having opening C and standards D, with sifter-compartment E, having screen G, inlet-door I, and trunnions *e*, to work on said standards, and flexible tube L, having rim M, and means, substantially as described, to secure the rim to the receptacle.



2. The combination of receptacle A, having opening C and standards D, removable drawer B for said receptacle, with sifter-compartment E, having screen G, inlet-door I, inclined bottom F, with outlets *f*, and trunnions *e*, to work on said standards, and flexible tube L, having rim M, and means, substantially as described, to secure the rim to the receptacle A.

401,853. VALVE FOR STEAM-ENGINES. WALTER S. PHELPS, St. Catalina, Guantanamo, Cuba. Filed Sept. 21, 1888. Serial No. 285,969. (No model.)



Claim.—1. A piston-valve for steam-engines, having passages through it from end to end and formed with two valve-seats, in combination with a valve held to said two seats by a spring, substantially as and for the purposes set forth.

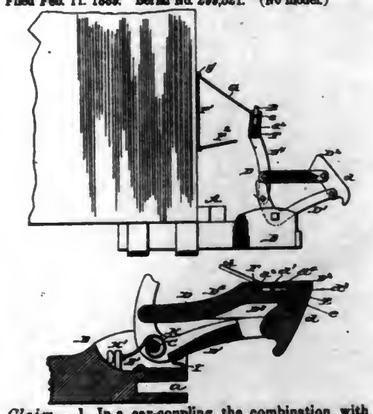
2. A piston-valve for steam-engines, having passages c^3 K, in combination with the interposed valve *g*, held by spring *g*′, substantially as described.

3. A piston-valve for steam-engines, having passages c^3 K, and side passages, c^4 c^4 d^3, in combination with the valve *g*, held by spring *g*′, substantially as and for the purposes set forth.

4. The plate *b*, formed with flange *c* and rim *c*′, and formed with passages c^3 and c^4, in combination with the ring *d*, packing-rings *f*, valve *g*, and spring *g*′, substantially as described.

5. In a valve, the ring *d*, formed with the passages c^4, flange *d*′, and recesses d^3, substantially as described.

401,854. CAR-COUPLING. JONAS POFFENBARGER, York, Nebr. Filed Feb. 11, 1889. Serial No. 299,521. (No model.)



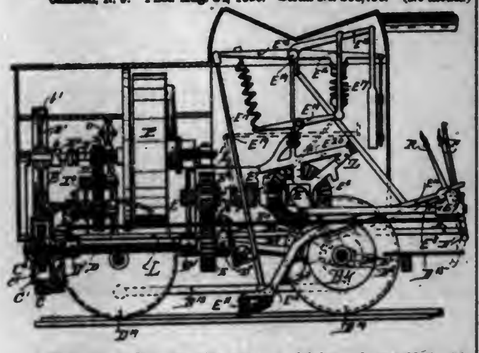
Claim.—1. In a car-coupling, the combination, with bumpers having transverse stationary rods, of a locking-hook formed with the main part, the pivoted head having the curved lower end, the locking-lever having a spring-bolt at its forward end, and the pivoted connecting-arms, substantially as set forth.

2. The combination of the bumpers having the transverse stationary rods, the locking-hooks formed each with the main part, the pivoted head having the curved lower end, the locking-lever having the spring-actuated bolt in its forward end, and the pivoted connecting-arms and levers for unlocking and raising said hooks.

3. The combination of bumpers having the transverse rods, the locking-hooks formed each with the main part, the pivoted head, the locking-lever having the spring-actuated bolt in its forward end, and the pivoted connecting-arms, levers for unlocking and raising said hooks, and the draw-springs having the tension-adjusting screws, substantially as set forth.

4. The combination, with the hooks, of the springs arranged beneath the same to break the jar of the falling hooks.

401,855. MOTOR FOR STREET-RAILWAYS. BENJAMIN C. POLE, Camden, N. J. Filed Aug. 24, 1886. Serial No. 211,756. (No model.)



Claim.—1. In a traction-motor, a driving-axle provided with flanged driving-wheels keyed thereto, with sliding pinions and fixed central collar, combined with a removable arm provided with a removable intermediate shaft which is provided with a universal coupling connecting it with the driving-shaft of the motor, said driving-shaft having an elastic connection with the operating mechanism, substantially as and for the purposes described.

2. In a traction-motor, a driving-axle provided with flanged driving-wheels keyed thereto, with sliding pinions and fixed central collar, combined with a removable arm provided with a removable intermediate shaft which is provided with a universal coupling connecting it with the driving-shaft of the motor, which shaft has an elastic connection with the differential wheels provided with escapement devices, whereby the speed of the motor may be changed, substantially as and for the purposes set forth.

3. In a traction-motor, a driving-axle provided with flanged driving-wheels keyed thereto, with sliding pinions and fixed central collar, combined with a removable arm provided with a removable intermediate shaft which is provided with a universal coupling connecting it with the driving-shaft of the motor, which shaft has an elastic connection with the differential wheels provided with friction and escapement devices, whereby the speed of the motor may be changed, substantially as described, for the purposes set forth.

4. In a traction-motor, the carrying-wheels and auxiliary traction devices other than said carrying-wheels, in combination with the differential wheels provided with the escapement-pawl, substantially as and for the purposes described.

5. In a traction-motor, the combination, with the feet and driving-wheels, of the elastic escapement-wheel C, the shaft D, and device adapted to operate either the foot mechanism or the driving-wheel mechanism, substantially as and for the purposes set forth.

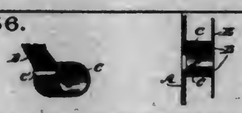
6. In combination with a driving-shaft, a wheel provided with a fixed arm, a yoke within said arm and loose on said shaft, a ratchet-wheel keyed to said shaft and provided with a pawl, and an elastic connection between said fixed arm and said yoke, for the purposes specified.

7. In a traction-motor, the operating-shaft provided with an elastic connection and escapement, C, and the differential wheels provided with escapement devices, whereby the speed of the motor may be changed, substantially as and for the purposes set forth.

8. In a traction-engine, a universal joint, D^9, having a central opening for the end of a shaft, and the shaft D^9, provided with arms D^{10} D^{11}, connected by a link, D^{12}, substantially as and for the purposes set forth.

401,856. INKING-RIBBON SPOOL FOR TYPE-WRITING MACHINES. HARVEY RAY, Mobile, Ala. Filed June 8, 1887. Serial No. 240,632. (No model.)

Claim.—1. An inking-ribbon bobbin provided with a clamp on its outer surface, and with an inwardly-extending projection on its inner surface, substantially as described.

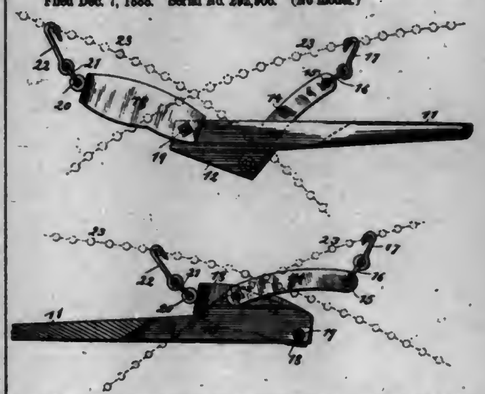


2. The inking-ribbon bobbin C, formed of a plate bent into cylindrical form and provided at one end with an inbent lip, *c*, and at the other end with a ribbon-clamp, *c*′, substantially as shown and described.

3. The inking-ribbon bobbin C, provided at one end with an inbent lip, *c*, and at its other end with a clamp, *c*′, combined with an inking-ribbon, D, held at one end by the clamp *c*′, and wound upon the bobbin, substantially as herein set forth.

4. The combination, in an inking-ribbon spool for a type-writer, of a side part, A, having a hub, B, slotted at *b*, a bobbin, C, fitted to said hub and having a tongue, *c*, entering said slot and adapted to hold the end of the inking-ribbon, and an opposite side part, E, having a hub, F, fitting the hub B of part A, substantially as described, for the purposes set forth.

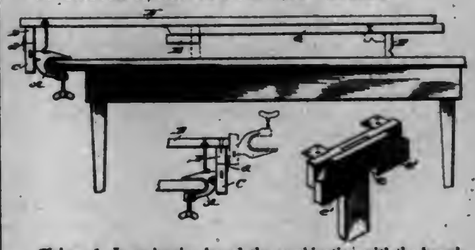
401,857. LOAD-BINDER. THOMAS A. ROGERS, Bloomdale, Ohio. Filed Dec. 7, 1888. Serial No. 292,906. (No model.)



Claim.—1. In a load-binder, the combination, with the head 10, having a handle portion, 11, a curved arm pivoted at the inner lower edge of the head, and a grab-hook linked in the outer extremity of said arm, of an essentially U-shaped or clip-like arm pivoted to the outer extremity of the head, near the upper edge thereof, and a grab-hook swiveled to the body portion of the U-shaped arm, substantially as shown and described.

2. In a load-binder, the combination, with a longitudinally-slotted head, 10, provided with one straight and one inclined longitudinal edge, a curved arm, 14, pivoted in the slot near the lower end of the inclined edge, and a grab-hook linked in the outer end of said arm, of the essentially U-shaped or clip-like arm 18, pivoted upon the outer end of head, near the straight edge, and a grab-hook swiveled in the vertical wall of the arm 18, said inclined edge of the head adapted to engage the vertical wall of the clip 18 when the binder is in its locked position, all arranged substantially as and for the purpose described.

401,858. IRONING-BOARD. ALBERT T. SCANLAND, Dunn Loring, Va. Filed June 16, 1888. Serial No. 277,396. (No model.)



Claim.—1. In an ironing-board, the combination, with the board proper, of a clamp at one end thereof, whereby to secure it to a table or like support, a leg, G, hinged at one end to such board, and prop hinged to leg G and arranged near the hinged and free ends of such leg, such props being independent, whereby one or the other may be set into operative position, substantially as set forth.

2. In an ironing-board, the combination, with the board proper,

of the leg G, hinged at one end to such board, and the prop E, notched or recessed between its ends at *e*, hinged at the base of such recess to the leg, and provided at its ends with portions *d d*, arranged, when such prop is adjusted to operative position, to extend upon opposite sides of the leg G and bear directly against the under side of the board, substantially as set forth.

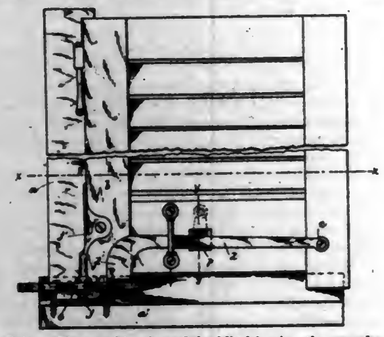
3. The improved ironing-board herein described, consisting of the board proper provided with strip D, the board C, hinged to strip D and provided with the clamps, and the leg hinged to the board proper and provided with the props, substantially as and for the purposes specified.

401,859. SWEAT-PAD FASTENER. LAWRENCE H. SCRUGGS, Huntsville, Ala. Filed June 12, 1888. Serial No. 276,868. (No model.)



Claim.—The herein-described sweat-pad fastener, consisting of a hook adapted to be hinged to a sweat-pad and to clasp the fore roll of a collar and having the end of the hook bent back upon itself over the outer face of the hook, the extremity of the bent portion being turned or curved outward to provide a handle, *a'*, the bent portion of the hook extending over the face thereof a sufficient distance so that when the hames are applied the handle *a'* will be outside of the hames, whereby the hook may be released from the fore roll without removing the hames or unbuckling the collar, as set forth.

401,860. SHUTTER-FASTENER. CHARLES J. SEYMOUR, Brookline, Mass. Filed June 4, 1888. Serial No. 276,008. (No model.)



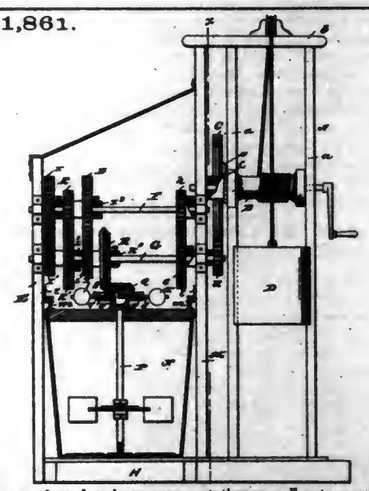
Claim.—The combination of the blind having the angular plate secured thereto, the pintle projecting from said plate, the latch pivoted at one end to the front of the blind and provided at its other end with a downwardly-projecting wedge-shaped tenon, the fixed plate below the blind provided with the series of tenon-fitting slots, the sides of which are beveled outwardly and having the pintle-receiving socket, the handle *r*, projecting from said latch through an aperture of said blind, and the button designed to bear on said handle, substantially as shown and described.

401,861. MOTOR FOR OPERATING CHURNS. EDWIN N. SHAFER and JOHN D. KING, Kiowa, Kans. Filed Nov. 19, 1888. Serial No. 291,201. (No model.)

Claim.—1. In a churn-operating mechanism, the combination of an upright frame, a weight arranged to travel thereon, a drum journaled therein, a rope connecting the weight with the drum, gearing for rotating a dasher-shaft, and a governor arranged upon the said shaft, whereby both the movements of the shaft and the falling of the weight may be controlled, substantially as specified.

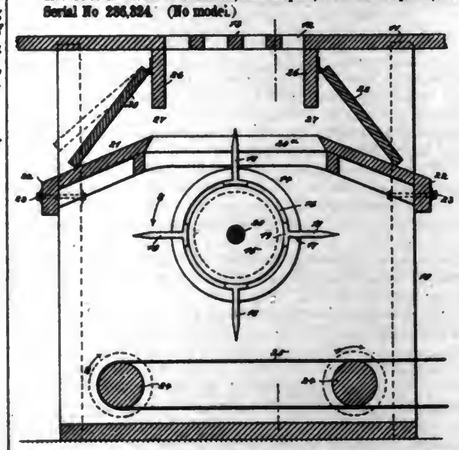
2. In a churn-operating mechanism, the combination of a vertical rotative shaft having a beveled gear at its upper end for rotating the same, a governing device arranged upon the under side of the gear and consisting of two pivoted brake-shoes, two pivoted weighted arms or levers, and rods adjustably connecting one end of each of the respective shoes with the respective weighted arms, whereby said

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shoes are adapted to bear upon a stationary collar to regulate the speed of the gearing, substantially as specified.

401,862. MACHINE FOR PULVERIZING CLAY AND EXTRACTING STONE. JOHN W. SHAFFER, Philadelphia, Pa. Filed Sept. 25, 1888. Serial No. 286,324. (No model.)



Claim.—1. In a pulverizer, the combination, with a casing having an opening in its top and downwardly-projecting partitions 26 at each end of the casing-opening, of a toothed cylinder journaled in the casing, an adjustable grating above the cylinder and having its ends at the termination of the grating inclined downwardly, and gates hinged to the said partitions and having their lower free ends resting on the inclined ends of the grating, substantially as described.

2. In a pulverizer, the combination, with a casing, 10, provided with the grated opening 12 13 in its top and with the downwardly-projecting partitions 26, of the grating 20 21, the gates 28, pivoted to the partitions 26 and having their free ends resting on the said grating, the toothed cylinder 14, journaled in the casing below the grating, with its teeth projecting through said grating, and the apron 25 below the cylinder, substantially as herein shown and described.

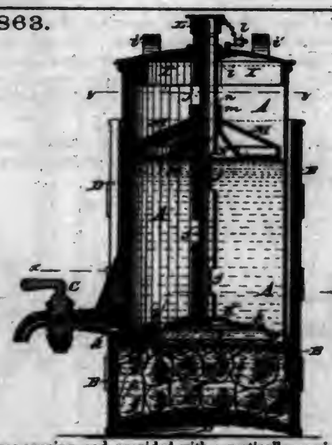
3. A pulverizing-cylinder consisting of the series of disks 15, each provided with the annular groove 16 and the radial grooves 17, and the teeth 18, having T-shaped heads 19, substantially as herein shown and described.

401,868. MILK-CAN. AGNES W. H. SMITH, Beaver Dam, Wis. Filed May 8, 1888. Serial No. 273,168. (No model.)

Claim.—1. The combination, with the can and its top, having a central opening, of a dasher having a central aperture, a tube registering with said aperture and having side apertures extending above the line reached by the milk, and having an opening above the top of the can, substantially as set forth.

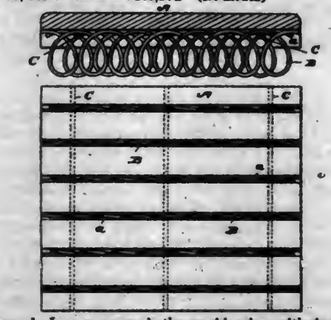
2. The combination, with a milk-vessel having an apertured cover, of a dasher having a hollow handle, open at its ends, fitted through

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said cover-opening, and provided with a vertically-ranging series of side apertures, and a float fitted around the dasher-handle and provided with an enlarged gas-chamber at its under side adapted to register with one of said apertures, substantially as herein set forth.

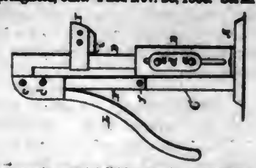
401,864. CURRY-COMB. OSCAR SMITH, Winona, Minn. Filed Feb. 25, 1888. Serial No. 265,274. (No model.)



Claim.—1. In a curry-comb, the combination, with the body having its face provided with grooves extending its entire length or width, of wires coiled and secured in the said grooves, substantially as specified.

2. A curry-comb consisting of a back having its face provided with parallel grooves, and a series of coils of wire arranged in rows in the said grooves and having the coils of one row arranged in a plane between the loops or coils of the adjacent row, substantially as specified.

401,865. LIFTING-JACK. ADDISON J. SOUDERS, Brimfield, assignor to Delos Hart, Springfield, Ohio. Filed Nov. 20, 1888. Serial No. 291,519. (No model.)



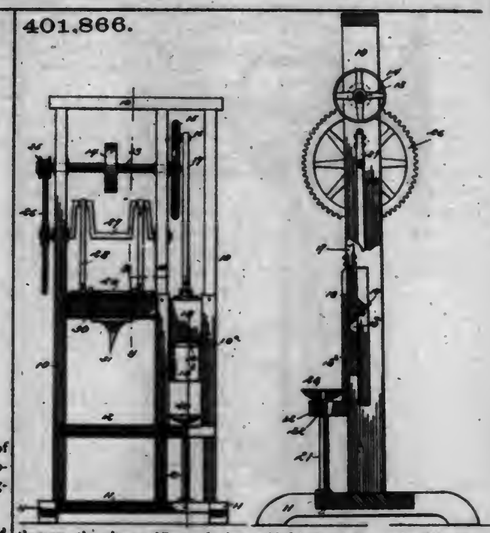
Claim.—The herein-described lifting-jack, consisting of the base A, slotted post B, lifting-bar D, having holes *e* in its front edge and united with the post B by rivets *a* and washer *d*, and bearing the jaw I, having the projection *i*, and the lever L, pivoted to the upper end of the bar D and united with the post B and brace C by the link F and rivet *f*, all constructed and arranged substantially as shown.

401,866. COMBINED BLOCK BARKING AND SPLITTING MACHINE. OTIS W. STEARNS, Johnson, Vt. Filed June 2, 1888. Serial No. 275,900. (No model.)

Claim.—1. The combination, in a block barking and splitting machine, of a reciprocating slide, a bark-cutter projecting at an incline through said slide to plane off the bark from the blocks, and a reciprocating cross-head carrying a splitting-knife, both operated from the one main shaft at different speeds, substantially as described.

2. The combination, with the main shaft 13, the fly-wheel 15

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thereon, the pitman 17, cranked to said fly-wheel, the pinion 25, carried by the shaft 13, and the vertically-reciprocating slide 18, of the gear-wheel 26, the cranked shaft 27, on which the gear-wheel 26 is keyed, and the reciprocating cross-head 30, carrying a splitter-knife and connected with shaft 27, substantially as shown and described.

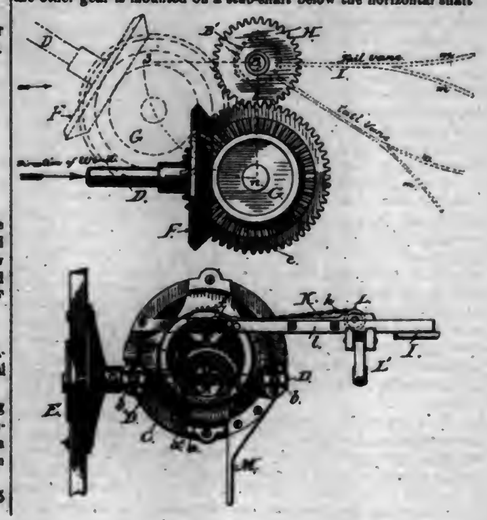
3. A barking and splitting machine comprising the frame, a main shaft journaled therein, a vertical slide, 18, operated from said shaft and having an inclined knife or bit, 19, projecting beyond its working-face to plane the bark off the blocks, a table below and in front of the said slide, and a vertically-reciprocating splitter, also operated from said main shaft, substantially as set forth.

4. The combination, with the frame and the vertically-reciprocating bark-planing cutter, of the post 21, stepped at its lower end to rock toward and from the frame and cutter, and the table on the upper end of the post, substantially as set forth.

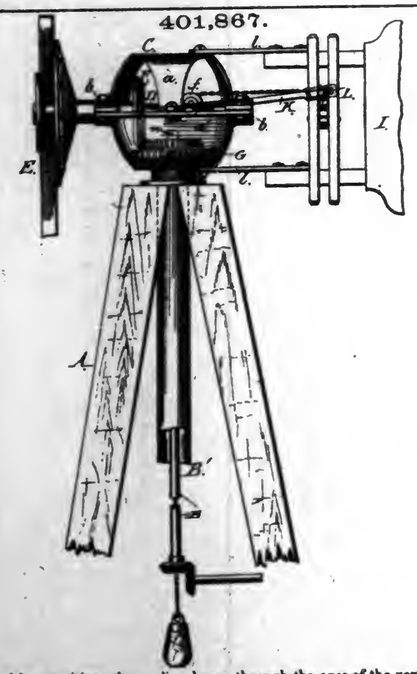
5. The combination, with the shaft 13 and the reciprocating slide 18, operated from said shaft, of the cranked shaft 27, also operated from shaft 13 through pinion 25 and gear-wheel 26, the connecting-rods 28, the rod 29, and the cross-head 30, carrying a splitting-knife, 31, substantially as described.

401,867. WINDMILL. GEORGE P. THURSTON, San Francisco, Cal. Filed Dec. 5, 1888. Serial No. 292,736. (No model.)

Claim.—1. In a windmill, the combination, with the horizontal wheel-shaft, the vertical turning-post, and the power-shaft having a gear-wheel at its top, of suitable gearing located to one side of the power-shaft, one of said gears being on the horizontal shaft, while the other gear is mounted on a stub-shaft below the horizontal shaft



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and in a position where a line drawn through the axes of the vertical and stub shafts will be at right angles with the wheel-shaft, substantially as herein described.

2. In a windmill, the vertical turning-post, a power-shaft having a gear at its top, a wind-wheel having its shaft journaled to one side of said post, a gear on said wheel-shaft, and a double-faced gear journaled on a vertical stub-shaft whose axis is in line with the power-shaft, said double gear having one of its faces engaged by the gear on the wheel-shaft, while its other or spur face engages the gear on the power-shaft at its side portion, whereby, when the wind-wheel falls out of the wind, the double gear traverses that portion of the gear between its side and front portion, substantially as and for the purpose described.

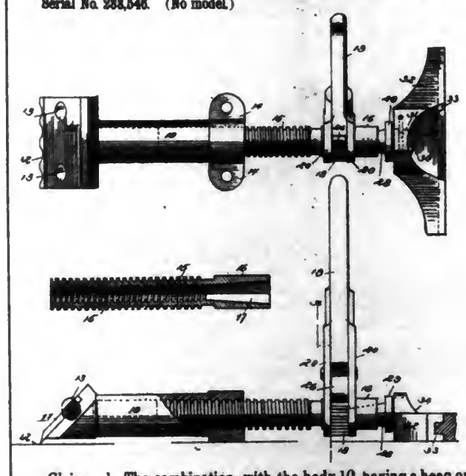
3. In a windmill, a wheel-shaft with a wind-wheel and gear-wheel thereon, a tail-vane, a vertical power-shaft having a gear-wheel at its top, and a double-face gear on a stub-shaft at one side of said power-shaft, said double gear being engaged by the gears on the wheel-shaft and power-shaft and being adapted to move around the circumference of the gear on the power-shaft a distance approximating one-quarter thereof, whereby the windmill is held into the wind, substantially as herein described.

4. In a windmill, the combination of a vertical power-shaft having a gear-wheel at its top, a horizontal wheel-shaft at one side of said power-shaft and carrying a wheel and beveled gear, a gear-wheel intermediate the gears on the power-shaft and horizontal shaft and traversing the gear on the power-shaft, a frame movable with the turning-post, in which the gears and shaft are mounted, said frame having a turning-post located at one side of its center, and a tail-vane, substantially as described.

5. In a windmill, the vertical turning-post, the two-part frame, with its journal-boxes, a wind-wheel having its horizontal shaft journaled in said boxes at one side of the center of the turning-post and having a beveled gear-wheel keyed to it, a vertical power-shaft journaled to turn within the post and having a spur-gear keyed to its upper end, in combination with an independent loosely-turning gear or idler at one side of the vertical power-shaft, one part of said gear having spur-teeth to engage with the gear upon the vertical power-shaft and the other beveled teeth to engage with the gear upon the wind-wheel shaft, said idler being journaled in a plane passing vertically through the axis of the wind-wheel shaft and to one side of and at right angles to the vertical power-shaft, substantially as herein described.

6. In a windmill, a two-part frame having a turning-post, a vertical power-shaft extending through said post at one side of the center, with a spur-gear wheel secured to the upper end of said power-shaft, a horizontal wind-wheel shaft journaled in boxes upon the frame at one side of the vertical power-shaft and having a beveled gear-wheel secured to it, a loosely-turning independent gear or idler having beveled and spur teeth to engage, respectively, with the beveled gear of the wind-wheel shaft and the spur-gear of the vertical power-shaft, in combination with the tail-vane loosely hinged to a turning-post, and a chain or cord attached thereto passing over guide-pulleys and down through the central vertical hollow shaft, substantially as described.

401,868. FLOORING-JACK. HERMAN F. TOWNSEND, Plainfield, Vt., and CHARLES T. WINSLOW, Woodsville, N. H. Filed Oct. 19, 1888. Serial No. 288,546. (No model.)



Claim.—1. The combination, with the body 10, having a head or base at its outer end and a screw-threaded bore extending inwardly from its inner end, of the screw-threaded spindle 15, entering said bore and having a socket, 17, in its outer end, a removable headed plug, 28, inserted in said socket, a block turning freely on said plug, and the operating-lever connected to the spindle, substantially as set forth.

2. The combination, with the body 10, having a screw-threaded bore extending inwardly from its inner end, of the tubular spindle 15, provided with a ratchet-lever and having exterior and interior threads extending from its inner end to a point near its outer end, a socket, 17, in said outer end, and a detachable headed plug inserted in said socket and provided with a freely-turning head, substantially as set forth.

3. The combination, with an interiorly-threaded body, a toothed plate attached at one end of the body, and a threaded spindle screwed into the said body, of a ratchet-wheel fast upon the spindle, a lever pivoted upon the spindle, a V-dog pivoted in the lever, a tapering headed plug inserted in one end of the spindle, and a clamping-block detachably secured to the said plug, substantially as shown and described.

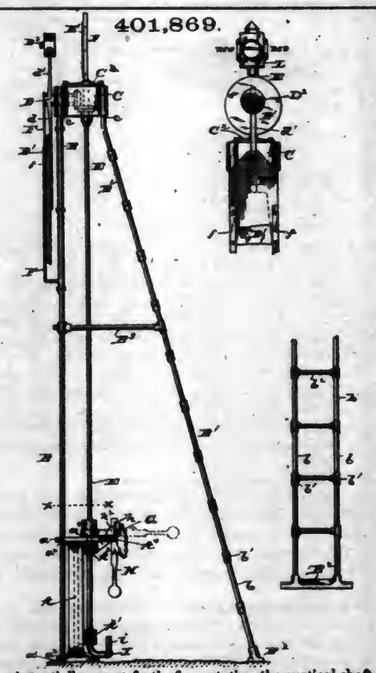
4. The combination, with an interiorly-threaded body, a toothed plate detachably secured at one end of the same, and a threaded tubular spindle screwed into the said body, of a ratchet-wheel fast upon the spindle, a lever pivoted upon the spindle, a spring-actuated notched head-block held in the lever, a pivoted V-dog engaging the ratchet-wheel and head-block, a headed plug held in one end of the spindle, and a clamping-block detachably attached to said plug, substantially as shown and described.

401,869. SWITCH-SIGNAL. KIRTLAND H. WADE, Chicago, Ill. Filed May 10, 1888. Serial No. 273,417. (No model.)

Claim.—1. The combination, with a switch and a vertical crank-shaft for operating said switch, of a column having bearings in which said shaft is journaled, a housing secured to the top of said column, having vertical and horizontal bearings and a removable top, a bevel-gear and target secured to the vertical shaft, a shaft journaled in the horizontal bearing of the housing and provided at its ends with a semaphore-arm and bevel-gear, a U-shaped screen secured to the column below the housing, and a lever for rotating the vertical shaft, substantially as and for the purposes described.

2. A skeleton semaphore switch-stand consisting of a base having vertical bearings, uprights secured to said base and provided at top with a housing having vertical and horizontal bearings, a vertical crank-shaft journaled in the bearings of the base and housing and provided within the housing with a bevel-gear, a shaft journaled in the horizontal bearing of the housing and provided at its ends with a bevel-gear and semaphore-arm, a U-shaped screen having one leg secured to the uprights below the housing and the upper end of its other leg supported by the outer end of the horizontal shaft, and

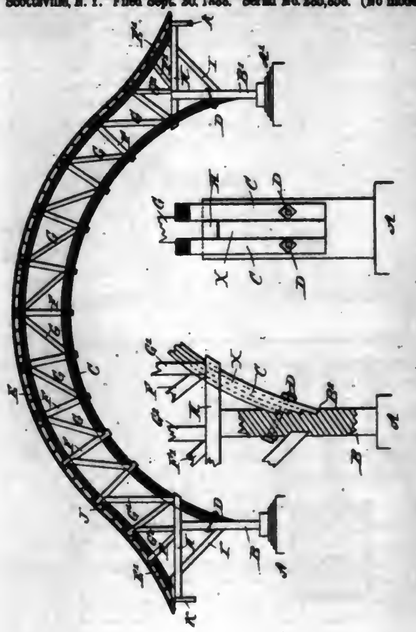
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means, substantially as set forth, for rotating the vertical shaft, substantially as and for the purposes described.

3. A semaphore switch-stand consisting of a base having vertical apertures, vertical tubular uprights secured at their lower ends within said apertures, a housing having apertures for the reception of the upper ends of said uprights, and inclined tubular uprights secured at their lower ends to an anchor and at their upper ends within apertures of the housing, said inclined uprights being constructed of short sections of tubing connected by T-couplings arranged in pairs and short lengths of tubing secured at their ends within the stems of the T-couplings of a pair, substantially as and for the purposes described.

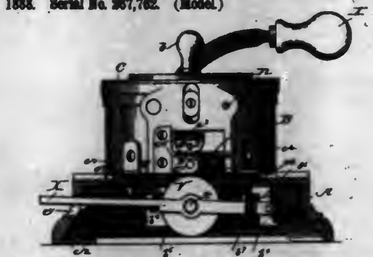
401,870. TRUSS FOR BUILDINGS OR BRIDGES. JOHN T. WELLS, Scottsville, N. Y. Filed Sept. 20, 1888. Serial No. 285,558. (No model.)



Claim.—1. The combination, with an inner arch and main posts supporting the same, of an outer arch held concentric to the inner arch and curved outwardly at its lower ends, radial posts secured to the said two arches, and braces held between the said radial posts and arches, substantially as shown and described.

2. The combination, with main posts and horizontal beams supported on the said posts, of an inner arch secured with its ends on the said posts, and an outer arch held concentric to the inner arch and fastened to the same by radial posts, the ends of the said outer arch being supported on the said horizontal beams, and the vertical bars G' G^2 extending from the upper faces of the inner ends of the horizontal beams and fastened to the lower faces of the radial posts at their upper ends, substantially as shown and described

401,871. CHECK-PROTECTOR. EDWIN O. ABBOTT, Chicago, Ill., assignor to the Abbott Machine Company, same place. Filed Mar. 19, 1888. Serial No. 267,762. (Model.)



Claim.—1. In a check-protector, the combination of a punch and oscillating lever for operating the punch, and a vertically-sliding block, G, interposed between the lever and the punch, substantially as described.

2. In a check-protector, the tenon-shaped block g, having the cap c^3, and screw c^3, provided with a seat for the end of a spring, in combination with the slotted shell B and spring c^4, substantially as described.

3. In a check-protector, the combination of a movable cylinder, reciprocating punches carried thereby, a stop-pin, and the casing having a slot, said pin and slot adapted to be brought into engagement with each other upon the movement of a punch, substantially as described.

4. In a feeding device for a check-protector, the combination of a stationary feed-roll, a rotatable shaft fixed at one end and movable at the opposite end, a feed-roll mounted on the movable end of the shaft, and a lever engaging with the shaft for moving it to carry the feed-rolls from contact, substantially as described.

5. In a feeding device for a check-protector, the combination of a stationary feed-roll, a rotatable shaft mounted at one end in fixed bearings, a feed-roll mounted upon the opposite end of the shaft, a lever carrying the latter end of the shaft, whereby to move it to carry its feed-roll from the stationary feed-roll, and a spring for normally holding the feed-rolls in contact, substantially as described.

6. In a check-protector, the combination, with the feed-rolls, of two ratchet-wheels mounted to rotate together and having teeth oppositely arranged, a plate provided with a projection and carrying an operating-pawl engaging with one of the said wheels, and a stop-pawl independent of the said plate, normally engaging with the other of the said wheels and arranged in position to be engaged by the projection of the said plate as it moves the pawl backward and to be disengaged by the said projection after the operating-pawl and the ratchet-wheel have partly completed their forward movements, whereby the said stop-pawl is away from its ratchet-wheel at the commencement of the forward movement of the wheel, and is held away therefrom until the point of a ratchet-tooth has passed the point of the stop-pawl, but is permitted to engage with the wheel before it completes it forward movement, substantially as set forth.

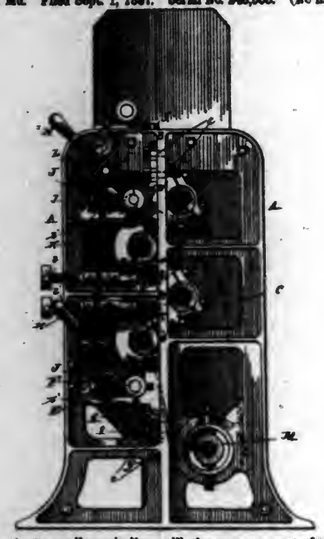
7. In a check-protector, the combination, with the feed-rolls, of two ratchet-wheels mounted to rotate together and having teeth oppositely-arranged, a plate mounted between the ratchet-wheels and provided with a projection and carrying an operating-pawl engaging with one of the said wheels, and a stop-pawl normally engaging with the other of the said wheels and provided with a projecting lip arranged in position to be engaged by the projection of the said plate as it moves the operating-pawl backward and to be disengaged by the said projection after the operating-pawl and the ratchet-wheel have partly completed their forward movements, substantially as set forth.

8. In a check-protector, the combination, with the feed-rolls, of the shaft T, carrying one of the said rolls, the ratchet-wheels b^3 and b^3, carried by the said shaft and having their teeth oppositely arranged, the plate a^3, pivotally supported on the shaft and having the

projection b^3 and the feed-pawl b', and the stop-pawls b^3 and b^7, for the ratchet-wheels, the latter being arranged in position to be engaged by the projection b^3 on the plate a^3 when the latter is moved to carry the feed-pawl into its backward position, substantially as set forth.

9. In a check-protector, the combination of the shell B, having stop or bracket p, the shaft H, having dog K, spring m, arm a^7, connecting-link a^8, plate a^9, having projection b^3, and crank I, having the leg o, and the rod n, all constructed, arranged, and operating substantially as shown and described, and for the purpose set forth.

401,872. GRINDING-MILL. JAMES B. ALLFREE, Indianapolis, Ind., assignor of one-half to Robert Shriver and Harrison Swartzwelder, Cumberland, Md. Filed Sept. 1, 1887. Serial No. 248,555. (No model.)



Claim.—1. In a roller grinding-mill, the arrangement of two fixed and two adjustable rolls in combination with deflecting shelves or chutes, the rolls being arranged, as shown and described, relatively to each other, to secure three reductions, as hereinbefore set forth.

2. In combination with the casing A, provided with a rib, B, the angle-brackets E, adjustably connected to said rib, and adjusting-screws g, substantially as set forth.

3. The angle-brackets E, adapted to be secured to the casing, as described, and formed with an opening, J, therein, in combination with the sliding block A, throw-out shaft F, spring i, and roller-bearings G, substantially as and for the purpose hereinbefore set forth.

4. The roller-bearing G, pivotally connected with the eccentric end of the throw-out shaft F, in combination with the brackets E, blocks A, and spring i, substantially as and for the purpose set forth.

5. In combination with the adjustable roll D', roller-bearing G, bracket E, and throw-out shaft F, formed with eccentric d, the lever H, substantially as and for the purpose set forth.

6. The combination and arrangement of the roller-bearing G, bracket E, throw-out shaft F, formed with eccentric d, lever H, and link L, substantially as and for the purpose set forth.

7. The combination, with the two adjustable rollers, brackets E, and roller-bearing G, connected with the frame of the machine, of the two throw-out shafts F, levers H, and the adjustable connecting-rod K, substantially as and for the purpose set forth.

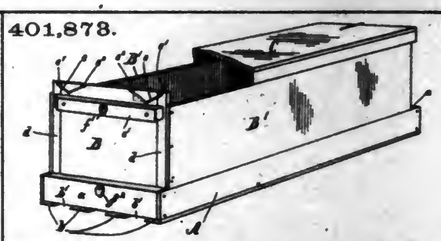
8. The deflecting shelves or chutes N' N'', pivoted at their lower ends and connected and held in position at their upper ends to the extensions O by means of turn-buttons P, substantially as and for the purpose set forth.

401,873. KNOCKDOWN CASE FOR EGGS, &c. WILSON M. BAKER, Urbana, Ohio. Filed Feb. 14, 1889. Serial No. 299,892. (No model.)

Claim.—1. The combination, with the base portion provided with end pieces having grooves or slots therein, of the end boards having cross-pieces adapted to fit in said slots, and an upper cleat at the upper end, side boards having upright pieces secured thereto adapted to join to said end boards, and means for connecting said upright strips to said end boards, substantially as specified.

2. The combination, with the base portion consisting of a rectangular box having end boards connected thereto, of the side boards provided with upright strips secured at right angles thereto and

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adapted to join said end pieces, and a cover to fit over said end pieces and upright strips, substantially as specified.

3. The combination, with the base portion consisting of a rectangular box and end pieces connected to the inside of said box, of side boards adapted to be inserted in said base portion and join the said end pieces, and a fastening-loop on said end boards to engage in the notches in said end pieces, substantially as specified.

4. The combination, in an egg-case having end pieces notched on either side at the top, of a cover provided with longitudinal strips arranged to come opposite the partitions in the egg-case filler, the said longitudinal strips being extended at each side of said cover and adapted to rest in the notches in the end boards, substantially as specified.

401,874. MACHINE FOR JOINTING STAVES. ABIA M. BENSON, Cleveland, Ohio. Filed June 23, 1888. Serial No. 278,420. (No model.)

Claim.—1. In a stave-jointing machine, the combination, with a stave-rest and a clamping-arm, of a pivotal spring-pressed support in which said clamping-arm is pivotally supported, substantially as set forth.

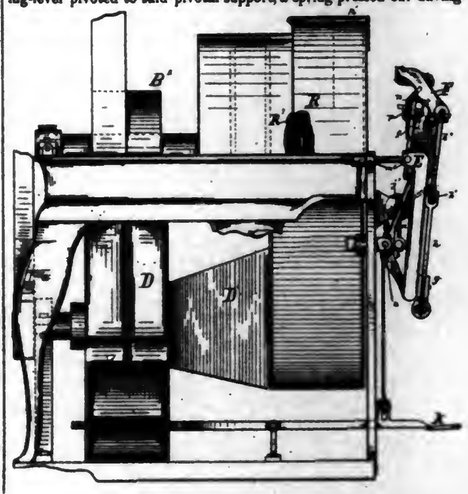
2. In a stave-jointing machine, the combination, with a stave-rest and a movable support, of a spring-pressed clamping-arm pivotally engaging with said movable support, substantially as set forth.

3. In a stave-jointing machine, the combination of a stave-rest, a swinging spring-pressed support, a clamping-arm pivotally engaging with said support, and toggle-joint-actuating mechanism connected with said clamping-arm, substantially as set forth.

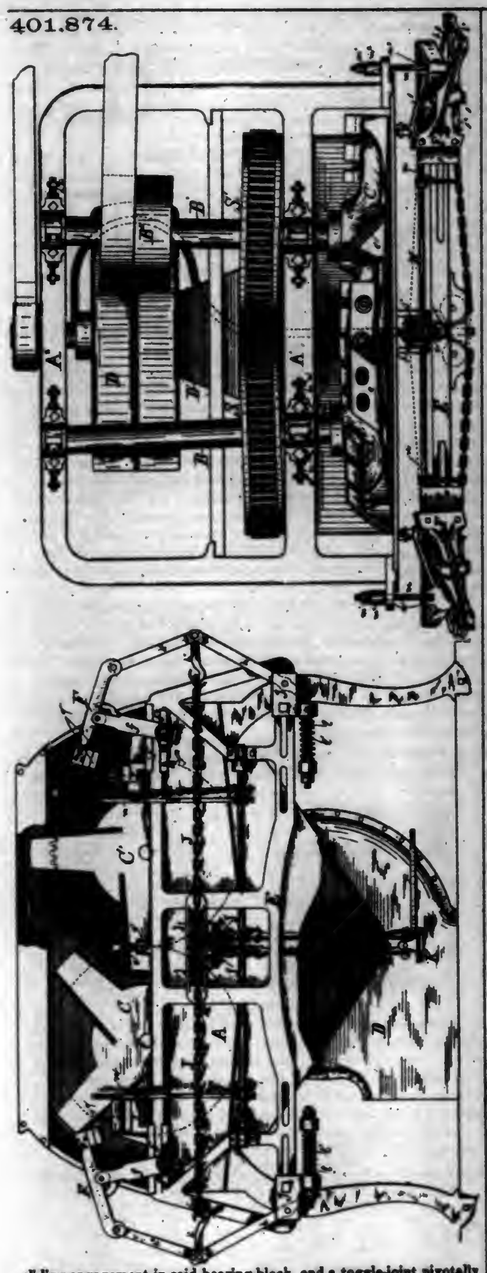
4. In a stave-jointing machine, the combination of a stave-rest, a movable support, a clamping-arm connected with said support, a toggle-joint to one arm of which said clamping-arm is pivotally secured, and a spring-pressed rod pivotally engaging with the opposite arm of said toggle-joint, substantially as set forth.

5. In a stave-jointing machine, the combination of a bearing-block adjustable longitudinally of the machine, a clamping-arm, toggle-joint mechanism pivotally engaging with said clamping-arm, and having pivotal supporting engagement with said bearing-block, actuating mechanism engaging with said toggle-joint mechanism and adapted to straighten the same, and automatic spring mechanism engaging with said toggle-joint, whereby the latter is thrown out of right-line position, substantially as set forth.

6. In a stave-jointing machine, the combination of a swinging table provided at its upper portion with a pivotal clamping-arm support and at its lower portion with a bearing-block, said support and bearing-block each adjustable longitudinally of the machine, a clamping-lever pivoted to said pivotal support, a spring-pressed bar having



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sliding engagement in said bearing-block, and a toggle-joint pivotally connected with said clamping-arm, said bearing-block, and said spring-pressed rod, substantially as set forth.

7. In a stave-jointing machine, the combination, with a frame provided with openings and a swinging table, E, of rods m, movably secured at one extremity to said table and loosely fitting in the openings in said frame, said rods provided on their opposite extremities with nuts, substantially as set forth.

8. In a stave-jointing machine, the combination, with frame A, provided with lugs m^3, said lugs provided with openings, and a swinging table, E, of rods m, movably secured at one extremity to said table and loosely fitting in said openings in the lugs, the opposite extremity of said rods being provided with nuts m', and with flexible washers m^3 intermediate of said lugs and nuts, substantially as set forth.

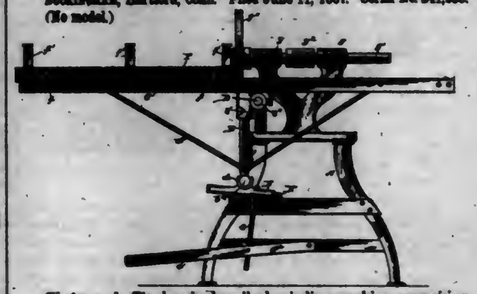
9. In a stave-jointing machine, the combination, with stave-jointing mechanism, and a hopper inclosing the lower portion of the same, of an exhaust-fan connected with said hopper and located substantially in the same horizontal plane therewith, substantially as set forth.

10. In a stave-jointing machine, the combination of cutter heads and knives, a tight-box inclosing the upper portion of said cutter heads and knives, a hopper inclosing the lower portion of the same, and an exhaust-fan connected with said hopper, substantially as set forth.

11. In a stave-jointing machine, the combination of cutter heads and knives, a box and a V-shaped hopper connected together and respectively inclosing the upper and lower portions of said cutter heads and knives, and an exhaust-fan connected with said hopper, substantially as set forth.

12. In a stave-jointing machine, the combination, with stave-jointing mechanism journaled in the machine-frame, and a hopper inclosing a portion of said jointing mechanism, of an exhaust-fan connected with said hopper and located in a plane below the journaling-point of said jointing mechanism, substantially as set forth.

401,875. GRINDING AND SHARPENING MACHINERY. HIRAM BUCKINGHAM, Hartford, Conn. Filed June 11, 1887. Serial No. 241,066. (No model.)



Claim.—1. The herein-described grinding-machine, comprising the stand or table, the longitudinally-tilting table, the central supporting bar or arm, the sliding table designed to move on said tilting table and having rollers on either side, the horizontally-disposed sliding shaft to which said supporting bar or arm is connected, and the emery-wheel, substantially as shown and described.

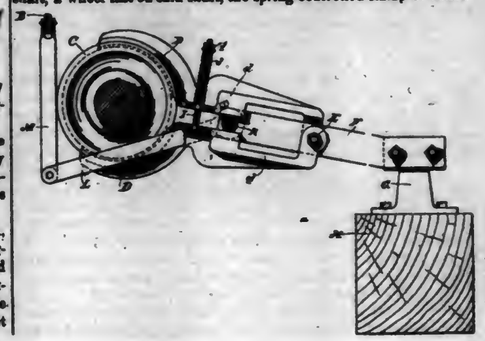
2. The combination, with the stand or table having the bracket provided with journal-boxes, of the longitudinally-tilting table, the horizontally-disposed sliding shaft, the sliding table designed to move on said tilting table and having overhanging clamps, and the emery-wheel, substantially as shown and described.

3. The combination, with the stand or table and the stationary plate secured thereto, of the sliding plate having a cylinder, the spring-held finger or rod, the foot-lever, the central supporting arm or bar having a cylindrical end, the tilting table, the sliding table having rollers and clamps, and the emery-wheel, all arranged substantially as shown and described.

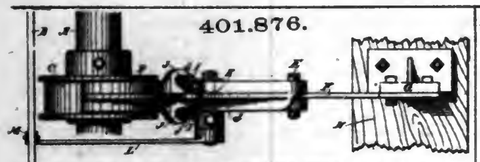
4. The combination, with the stand or table having the bracket supporting the journal-boxes, of the horizontally-disposed sliding shaft, the tilting table, the central supporting bar or arm secured thereto, the collar or sleeve secured on said bar or arm and to a collar on said shaft, the ball-and-socket-like connection, and the supporting V-shaped bar, substantially as shown and described.

401,876. SAW-MILL SET-WORKS. WILLIAM A. CAMPBELL, Portland, Oreg. Filed Sept. 11, 1888. Serial No. 285,139. (No model.)

Claim.—In saw-mill set-works and in combination with the set-shaft, a wheel fast on said shaft, the spring-controlled clamp or brake

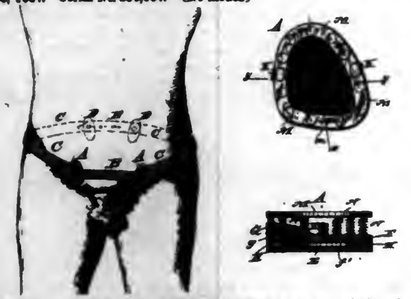


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applied thereto and consisting of opposing hinged jaws with shanks, and the means for relieving the clamp or brake, consisting of the rock-cam or eccentric seated between the jaw-shanks, the lever connected with the cam or eccentric, and a connection of the lever with the disengaging-lever of the set-works, substantially as described.

401,877. TRUSS. ALEXANDER DALLAS, Bayonne, N. J. Filed Nov. 23, 1887. Serial No. 256,337. (No model.)



Claim.—1. A truss-pad having a pressing-face provided with a recess or cavity opening to the lower edge or margin of the pad and extending upward along the line of the inguinal canal when the pad is applied to avoid pressure on the spermatic vessels, while the face of the pad at both sides of and above said recess bears on the ruptured parts, substantially as described, for the purposes set forth.

2. A truss-pad having a pressing-face provided with a recess or cavity opening to the lower edge or margin of the pad and extending upward along the line of the inguinal canal when the pad is applied to avoid pressure on the spermatic vessels, while the face of the pad at both sides of and above said recess bears on the ruptured parts and the lower edge of the pad inclined to fit the flesh fold between the abdomen and leg, substantially as described, for the purposes set forth.

3. A truss-pad having a pressing-face provided with a recess or cavity opening to the lower edge or margin of the pad and extending upward along the line of the inguinal canal when the pad is applied to avoid pressure on the spermatic vessels, while the face of the pad at both sides of and above said recess bears on the ruptured parts, and the general pressing-face of the pad concaved transversely of said recess or cavity, and the lower edge of the pad inclined to fit the flesh fold between the abdomen and leg, substantially as described, for the purposes set forth.

4. A truss-pad having a pressing-face provided with a recess or cavity opening to the lower edge or margin of the pad and extending upward along the line of the inguinal canal when the pad is applied to avoid pressure on the spermatic vessels, while the face of the pad at both sides of and above said recess bears on the ruptured parts, in combination with a back plate adapted for attachment of fastening strape or belts, and springs interposed between said strap-plate and presser-plate, substantially as described, for the purposes set forth.

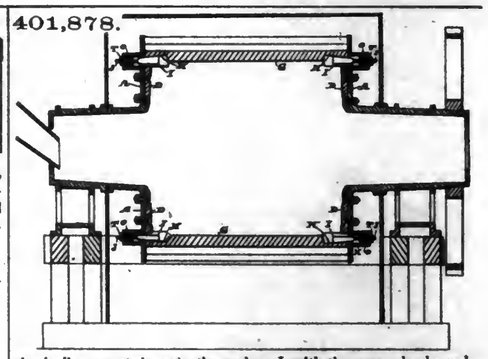
401,878. ROTARY PULVERIZER. MILES R. DODGE, San Francisco, Cal., assignor to Parke & Lacey, same place. Filed May 23, 1888. Serial No. 274,819. (No model.)

Claim.—1. A rotary pulverizer comprising a polygonal drum having channeled heads and having its sides composed of parallel bars, the ends of which are fitted in said channels, locking-bars parallel with and adjacent to the side bars and having inclines at their ends, wedges fitting said inclines, and screw-shanks and nuts by which said wedges are drawn out and locked, substantially as described.

2. A rotary pulverizer comprising a polygonal drum having channeled heads, parallel bars forming the sides of said drum, locking-bars G, lying parallel with and adjacent to each of the sides and having inclines at their ends, wedges acting upon said inclines, screw-shanks and nuts by which the wedges are drawn out and locked, and the elastic springs or buffers upon which the pressure is exerted and by which the wedges are automatically adjusted, substantially as and for the purpose described.

3. In a rotary pulverizer, a rotary drum having its sides composed of bars lying parallel with each other, the locking-bars G, with

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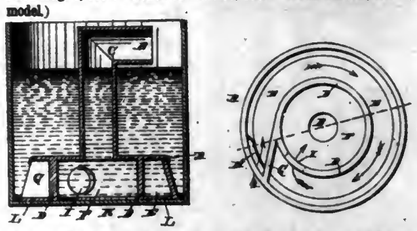


the inclines at their ends, the wedges I, with the screw-shanks and nuts, and the elastic springs or buffers O, in combination with the exterior plates or washers, P, having outer sides chambered to receive the said nuts, the nut-locking plates V, and the guard-plates W, substantially as herein described.

4. The locking-bars G, having the inclined surfaces at their ends, the wedges I, pressing upon said inclines and having the screw-shank J, by which they are operated, in combination with the cylindrical extension from the head of the rotary drum, into which the wedges are drawn, the keys or lugs M on the extensions, the springs O, and the exterior plate or washer with the corresponding keyways or channels by which the washer is prevented from turning upon the cylinder, substantially as herein described.

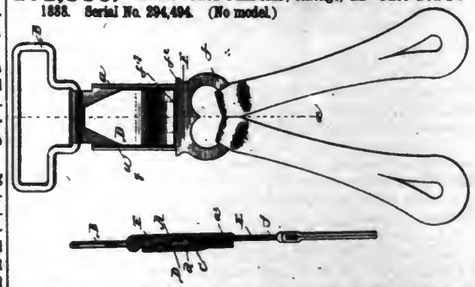
5. A rotary pulverizer comprising the polygonal drum, the parallel bars forming the sides thereof, wedge-shaped locking-bars having screw-shanks adjacent to said side bars, the cylindrical extension K, through which the screw-shank of the wedge-shaped bars passes, the springs O, the exterior washers or plates, P, the nuts resting against said plates, and the arms Q upon said washers or plates and engaging lugs or grooves, whereby the washers are prevented from turning, substantially as herein described.

401,879. WASH-BOILER. WILLIAM W. FORD, Elmira, N. Y. Filed Aug. 6, 1887. Renewed Mar. 27, 1889. Serial No. 305,045. (No model.)



Claim.—The herein-described wash-boiler, having a cylindrical body, the circular casing A within said body, which casing has the central chamber, F, with its floor removed, and the circular passage or channel E, surrounding the said chamber, the incline partition G, between the opening H in the outer wall of the passage E and the opening I in the inner wall thereof, and the pipe B, rising from the roof of the casing around a central opening therein and discharging water back into the body of the boiler.

401,880. CLASP. PAUL FRANTZEN, Chicago, Ill. Filed Dec. 24, 1888. Serial No. 294,494. (No model.)



Claim.—A buckle or clasp one member whereof comprises a plate, A, having at its sides the flanges *a*, and having at its lower or outer end a shoulder, *a'*, in combination with a retaining-plate, D, pivoted to and extending between the flanges *a* to form the back of the buckle or clasp, and having its free end extending over the shoulder *a'*, a spring, E, at the upper end of the said retaining-plate, and a member, F, consisting of a plate of a size to fit between the flanges *a*, and having an eye or seat at a distance from its free end to engage with the shoulder *a'* of the member A, substantially as described.

401,881. FLEXIBLE SHAFT. THOMAS GARE, Stockport, County of Chester, England. Filed May 1, 1888. Renewed Feb. 25, 1889. Serial No. 301,165. (No model.) Patented in England Nov. 3, 1887, No. 14,895.



Claim.—A flexible shaft consisting of a metal bar of flat section coiled on its edge or narrower side, the coils of which internally are close to and externally a little apart from each other, substantially as and for the purpose specified.

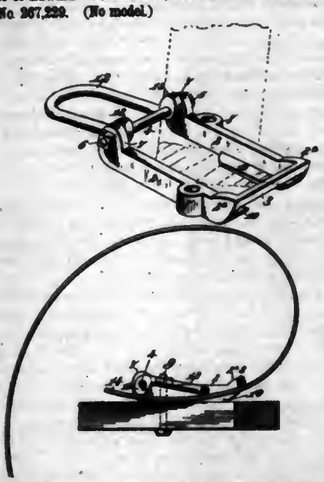
401,882. ELECTRIC BELT. CHARLES H. GRIMLEY, New York, N. Y. Filed Feb. 5, 1889. Serial No. 298,734. (No model.)



Claim.—1. As an improved article of manufacture, a therapeutic electric belt consisting, essentially, of a webbing belt having punctures arranged in pairs, a positive and a negative electrode respectively provided with a puncture to match those of the web and arranged to overlap one another, an interposed cloth strip for the electrodes, eyelets securing the interposed strip and electrodes to the web, and a flap, F, of suitable material, as specified.

2. A therapeutic electric belt having a series of disconnected batteries composed of a positive and a negative electrode overlapping one another, and an interposed cloth strip, all secured to the web, substantially as specified.

401,888. TOOTH-HOLDER. JOHN W. HARNER, Shippensburg, Pa., assignor to Edward W. Herendeen, Geneva, N. Y. Filed Mar. 15, 1888. Serial No. 267,229. (No model.)

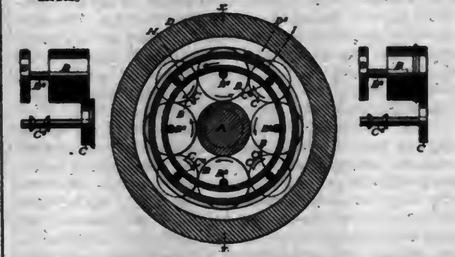


Claim.—1. The combination, with the spring-tooth and the tooth-bar of a cultivator, of the shoe comprising side bars, 2, a cross-bar, 3, at one end thereof, between which and the tooth-bar the spring-tooth passes, a spindle, 4, at the other end of the side bars, and a cam-lever journaled on said spindle to bind against the tooth and clamp it to the tooth-bar, substantially as described.

2. In a harrow, plow, or cultivator, the combination, with a shoe composed of parallel side bars connected at one end by an integral bar and at the other by a spindle, of a yoke having cams turning upon said spindle and a spring-tooth lying between said bars and beneath the cams, substantially as described.

3. In a harrow, plow, or cultivator, the combination, with a shoe composed of parallel side bars connected at both ends and having internal flanges upon their lower edges, of cams mounted upon the spindle connecting one end of said bars, and having a yoke-lever operating them, and a spring-tooth lying between the side bars of the shoe, upon the flanges, and beneath the cams, substantially as described.

401,884. ROLLER-BEARING. REUBEN W. HENT, San Francisco, Cal. Original application filed Apr. 16, 1887, Serial No. 235,040. Divided and this application filed Aug. 3, 1888. Serial No. 281,880. (No model.)



Claim.—1. In a roller-bearing, the combination, with a series of bearing-rollers and a series of separating-rollers bearing only on the bearing-rollers, of a ring bearing at its periphery on journals of the separating-rollers and at its inner side on journals of the bearing-rollers, substantially as set forth.

2. In a roller-bearing, the combination, with the series of bearing-rollers B, having journals B^3, and the series of rollers C, bearing only on the rollers B and having journals C^3, of the ring H, bearing at its periphery on the journals C^3 and at its inner side on the journals B^3 substantially as shown and described, and for the purposes set forth.

3. In a roller-bearing, the combination, with a series of bearing-rollers, a series of separating-rollers bearing on the bearing-rollers only, and a ring bearing at its inner side on journals of the separating-rollers, of a smaller ring bearing at its periphery on said journals and at its inner side on journals of the bearing-rollers, substantially as set forth.

4. In a roller-bearing, the combination, with the series of rollers B, bearing on and projecting beyond the sleeve A' and the sleeves D', and having journals B^3, the series of rollers C, bearing only on the rollers B at their projections and having journals C^3, and the ring I, bearing at its inner side on the journals C^3, of the ring H, bearing at its periphery on the journals C^3 and at its inner side on the journals B^3, substantially as shown and described, and for the purposes set forth.

5. In a roller-bearing, the combination of a series of bearing-rollers bearing on the central journal and the bearing-casing, and having journals bearing on the inner side of a ring, and a series of separating-rollers bearing on the bearing-rollers only and having journals bearing on the periphery of said ring and on the inner side of a larger ring, all constructed and arranged substantially as set forth.

6. In a roller-bearing, the combination of the series of rollers B, bearing on and projecting beyond the sleeve A' and the sleeves D', and having journals B^3, bearing on the inner side of the ring H, and the series of rollers C, bearing only on the rollers B at their projections, and having journals C^3, bearing on the periphery of the ring H and on the inner side of the ring I, all constructed and arranged substantially as shown and described, and for the purposes set forth.

7. In a roller-bearing, the combination, with two rings of different diameters, of a series of bearing-rollers bearing on the central journal and the bearing-casing, and having journals bearing on the inner side of the smaller ring, and a series of separating-rollers keeping the bearing-rollers separate from each other and bearing on the bearing-rollers only, and having journals bearing on the periphery of said smaller ring and on the inner side of the larger ring, all constructed and arranged substantially as and for the purposes set forth.

8. In a roller-bearing, the combination, with the rings H and I, of the series of rollers B, bearing on and projecting beyond the sleeve A' and the sleeves D', and having journals B^3, bearing on the inner side of the ring H, and the series of rollers C, bearing only on the rollers B at their projections, and keeping the latter rollers separate from each other, and having journals C^3, bearing on the periphery of the ring H and on the inner side of the ring I, all constructed and arranged substantially as shown and described, and for the purposes set forth.

9. In a roller-bearing, the combination, between the shaft and casing, of a sleeve upon the shaft and sleeves within the casing, two rings of different diameters, a series of bearing-rollers bearing on and projecting beyond said sleeves and having journals bearing on the inner side of the smaller ring, and a series of separating-rollers bearing only on the bearing-rollers at their projections, each separating-roller on and between two bearing-rollers to keep the latter rollers separate from each other, and having journals bearing on the periphery of said smaller ring and on the inner side of the larger ring, keep-

ing the separating-rollers from contact with the casing, all constructed, arranged, and operating substantially as and for the purposes set forth.

10. In a roller-bearing, the combination, between the shaft A and casing D, of the sleeve A′ and the sleeves D′, having their outer ends in the planes of the ends of the sleeve A′, the rings H and I, the series of rollers B, bearing on and projecting beyond the sleeves and having journals B^3, bearing on the inner side of the ring H, and the series of rollers C, bearing only on the rollers B at their projections, each roller C on and between two rollers, B, to keep the latter rollers separate from each other, and having journals C^3, bearing on the periphery of the ring H and on the inner side of the ring I, keeping the rollers C from contact with the casing, all constructed, arranged, and operating substantially as and for the purposes set forth.

11. A roller-bearing comprising the central journal, the bearing-casing, two rings of different diameters, a series of bearing-rollers bearing only portions of their lengths on the central journal and the bearing-casing and having journals bearing on the inner side of the smaller ring, a series of separating-rollers keeping the bearing-rollers separate from each other and bearing only on the portions of the bearing-rollers not bearing on the central journal and bearing-casing, each separating-roller on and between two bearing-rollers, and having journals bearing on the periphery of said smaller ring and on the inner side of the larger ring, keeping the separating-rollers from contact with the casing, all constructed, arranged, combined, and adapted to operate substantially as shown and described, and for the purposes set forth.

12. A roller-bearing comprising the shaft A, the sleeve A′, the casing D, the sleeves D′, having their outer ends in the planes of the ends of the sleeve A′, the series of rollers B, bearing on and projecting beyond the sleeves and having journals B^3, bearing on the inner side of the ring H, the series of rollers C, keeping the rollers B separate from each other, and bearing only on the rollers B at their projections beyond the sleeves, each roller C on and between two rollers, B, and having journals C^3, bearing on the periphery of the ring H and on the inner side of the ring I, the said ring H interposed between and bearing on the journals C^3 at its periphery and the journals B^3 at its inner side, and the said ring I bearing at its inner side on the journals C^3 and keeping the rollers C from contact with the casing, all constructed, arranged, combined, and adapted to operate substantially as shown and described, and for the purposes set forth.

401,885. THILL-COUPLING. JAMES A. HIBSON, Des Moines, Iowa.

Filed Mar. 19, 1888. Serial No. 267,773. (No model.)



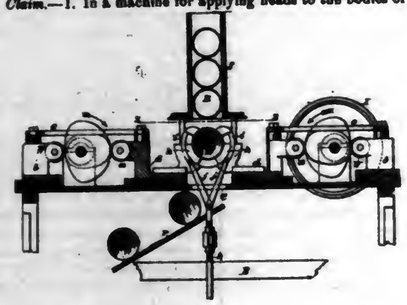
Claim.—1. An axle-clip having an integral socket, B, composed of parallel sides C, that have coinciding perforations *d*, an integral thill-iron support, *f*, and an integral projection, *h*, for retaining a rubber cushion or block in the rear portion of the socket, substantially as shown and described.

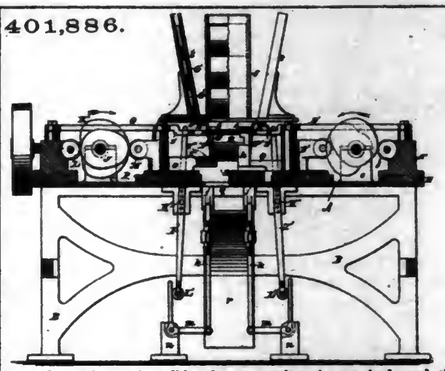
2. An improved thill-coupling composed of an axle-clip having an integral joint-socket and an integral thill-iron rest at the front end and bottom of said socket, a rubber cushion or elastic block fitted in the rear end of the socket, a thill-iron having an enlarged circular end and eccentric, and a perforation corresponding in size and shape with perforations in the parallel sides of the socket, and a key-bolt, constructed and combined in the manner set forth.

401,886. MACHINE FOR APPLYING HEADS TO TIN-CAN BODIES. WILLIAM HIPPERLING, New York, N. Y., assignor to Stephen A. Ginna, Plainfield, N. J., and Richard A. Donaldson, Brooklyn, N. Y.

Filed Nov. 30, 1888. Serial No. 292,237. (No model.)

Claim.—1. In a machine for applying heads to the bodies of tin





cans, the reciprocating slides for supporting the can-body and the reciprocating slides carrying former-heads for embracing the can-body on opposite sides, combined with the reciprocating former-jaws for shaping said body, the plates for moving the can-heads upon the opposite ends of said body, and mechanism, substantially as described, for moving said plates toward and from the ends of the can-body, substantially as and for the purposes set forth.

2. In a machine for applying heads to the bodies of tin cans, the reciprocating slides for supporting the can-body and the reciprocating slides carrying former-heads for embracing the can-body on opposite sides, combined with the reciprocating former-jaws for shaping said body, the plates for moving the can-heads upon the opposite ends of said body, and mechanism, substantially as described, for moving said plates toward and from the ends of the can-body, the chute for feeding the can-bodies, and the chutes on either side thereof for the can-heads, substantially as set forth.

3. In a machine for applying heads to the bodies of tin cans, the reciprocating slides for supporting the can-body and the reciprocating slides carrying former-heads for embracing the can-body on opposite sides, combined with the reciprocating former-jaws for shaping said body, arranged in guiding-grooves in said former-heads, the links connecting said jaws, mechanism, substantially as described, for moving said links vertically, the hinged plates for moving the can-heads upon the opposite ends of said body, mechanism, substantially as described, for moving said plates toward and from the ends of the can-body, and cam mechanism arranged to have a simultaneous movement for acting upon said slides, substantially as and for the purposes described.

4. In a machine for applying the heads to the bodies of tin cans, the reciprocating slides N O, the latter to support the can-body, the reciprocating slides *b d*, the latter carrying former-heads for embracing the opposite sides of said body, rods connecting the slides N O and *b d*, respectively, cams between said slides for imparting a reciprocating movement thereto in opposite directions toward and from the center of the machine, the plates F, hinged to the slides O and connected with the sliding rods D′ for moving the can-heads upon the opposite ends of said body, and the reciprocating former-jaws *i*, for shaping the can-body previous to the action of said plates F′, substantially as and for the purposes set forth.

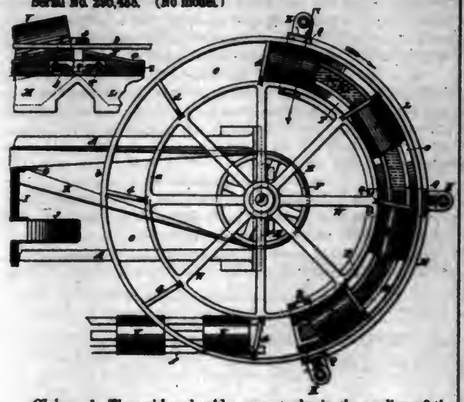
5. In a machine for applying heads to the bodies of tin cans, the reciprocating slides for supporting the can-body, the reciprocating slides carrying former-heads for embracing the opposite sides of said body and the reciprocating former-jaws, the plates F′, hinged to the said supporting-slides for moving the can-heads upon opposite ends of said body, the reciprocating rods D′, pivoted to said plates, and intermediate mechanism, substantially as set forth, between the reciprocating rods D′ and the links connecting the former-jaws, whereby the motion of the former may be communicated to the latter, substantially as and for the purposes set forth.

6. In a machine for applying heads to the bodies of tin cans, the oppositely-reciprocating slides for supporting the can-body, the oppositely-reciprocating slides carrying former-heads for embracing the opposite sides of said body, and the reciprocating former-jaws for shaping said body, combined with the slides A′ B′, rods D′, connecting said slides, cams *w x*, for reciprocating said slides, and the plates F′, pivoted to the inner ends of said rods D′ and hinged to the said supporting-slides for moving the can-heads upon the opposite ends of said body, substantially as and for the purposes set forth.

7. In a machine for applying heads to the bodies of tin cans, the reciprocating slides for supporting the can-body and the reciprocating slides carrying former-heads for embracing the opposite sides of said body, combined with the plates hinged to the said supporting-slides for moving the can-heads upon the opposite ends of said body, and mechanism, substantially as described, for moving said plates toward and from the can-body, substantially as and for the purposes set forth.

401,887. MACHINE FOR SOLDERING TIN CANS. WILLIAM HIPPERLING, New York, N. Y., assignor to Stephen A. Ginna, Plainfield, N. J., and Richard A. Donaldson, Brooklyn, N. Y.

Filed Jan. 5, 1888. Serial No. 295,488. (No model.)

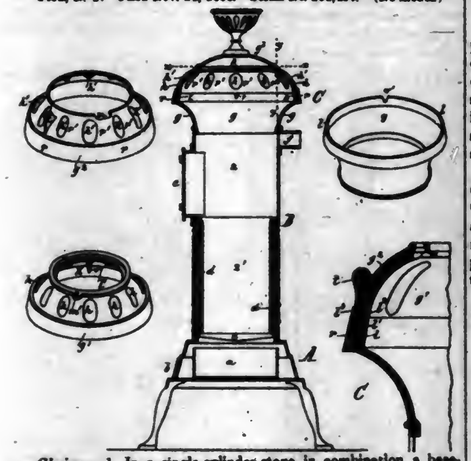


Claim.—1. The acid and solder receptacles in the outline of the arc of a circle, and the bars O P, arranged upon said receptacles, to receive and operate as a tramway for the can-bodies, combined with the wheel W, having at the end of its spokes the rim *a*, the rim *b*, and the bars *d*, connecting said rims and forming spaces to receive the can-bodies over said tramway, substantially as set forth.

2. The acid and solder receptacles L M in the outline of the arc of a circle, combined with the segmental bars O P, secured by angle-plates Q, having elongated slots S to receive the bolts securing said bars, combined with the wheel W, having rims connected by bars, forming spaces to receive the can-bodies, and adapted to move them through the acid and solder baths, substantially as set forth.

401,888. SINGLE-CYLINDER STOVE. JOHN H. KETNER, New York, N. Y.

Filed Nov. 21, 1888. Serial No. 291,467. (No model.)



Claim.—1. In a single-cylinder stove, in combination, a base-section, A, of ordinary suitable construction, a single cylinder, B, having a feed-opening, draft-passage to the chimney-flue, a fire-chamber and a grate, and an enlarged dome-shaped top section forming a gas-chamber above the said draft-passage, provided with air vent or entrance perforations *h h′* in its bulged portion, through which air is allowed to enter and pass unobstructedly down to the burning coal on the grate through the chamber formed by the said cylinder and top section, and at the same time the flame can be seen, whether the eye is on a plane with or above the perforations, substantially as and for the purpose described.

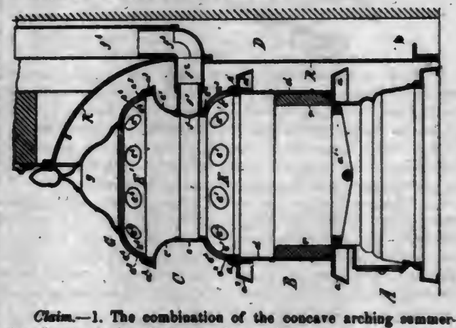
2. In a single-cylinder stove, in combination, an ordinary suitable base-section, A, a single cylinder, B, having a feed-supply opening, draft-passage to the chimney, a fire-chamber and a grate, and an enlarged dome-shaped top section, C, above the draft-passage which spans the horizontal area of the cylinder which it surmounts and overhangs, and is provided with air-vents or entrance-passages *h h′*, through which, while air is entering, the flame is exposed to a sidewise as well as a downward view, substantially as described.

3. In a single-cylinder stove, in combination, an ordinary suitable base-section, A, a cylinder, B, having a feed-supply opening, a draft-passage to the chimney, a fire-chamber and a grate, and an enlarged dome-shaped top section, C, comprising a movable perforated air-vent ring, g^4, having a skirting, *r*, and a stationary air-vent ring, *g′*, substantially as and for the purpose described.

4. In a single-cylinder stove, in combination, an ordinary suitable base-section, A, a cylinder, B, having a feed-supply opening, a draft-passage to the chimney, a fire-chamber and a grate, and an enlarged dome-shaped top section, C, above the draft-passage, comprising the base portion *g*, bulged stationary perforated air vent ring *g′*, and the bulged movable perforated air-vent ring g^4, said rings having overhanging skirtings as encircling peripheries, and their openings adapted for exposing the flame to view while air is entering through them, substantially as and for the purpose described.

5. The combination of the imperforated ring-base portion *g*, a perforated stationary air-vent ring portion, *g′*, and a perforated movable air-vent ring portion, g^4, the ring *g′* being provided with a projection, *w′*, and the ring g^4 with a slot, *m*, and the ring *g′* provided with a tapering projection, *v*, and the base-rim portion *g* having an opening, *v′*, substantially as and for the purpose described.

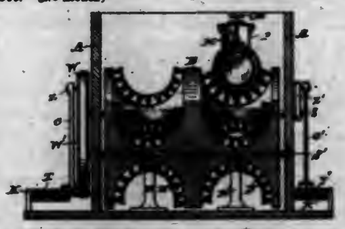
401,889. STOVE. JOHN H. KETNER, New York, N. Y. Filed Nov. 23, 1888. Serial No. 291,690. (No model.)



Claim.—1. The combination of the concave arching summer-piece B and a single-cylinder fire-place coal-stove having only a direct-draft exit, *f*, and formed of sections A B C, sections B and C being each provided with a stationary perforated draft-ring and with a sliding perforated downdraft register-ring, said rings being respectively below and above the draft-exit *f″* of the stove and all around sections B and C, and throwing light upon the curved surface of the said summer-piece and into the room, substantially as described.

2. A single-cylinder fire-place coal-stove, having only a direct-draft exit, *f*, and formed of sections A, B, and C, the sections B and C being provided each with a stationary perforated downdraft-ring and with a sliding perforated downdraft register-ring, said rings being respectively below and above the draft-exit *f″* of the stove, and exposing the flame of both sections B and C, substantially as and for the purpose described.

401,890. MACHINE FOR BLACKING AND POLISHING SHOES. ARTHUR KITSON, Philadelphia, Pa. Filed Sept. 21, 1887. Serial No. 250,302. (No model.)



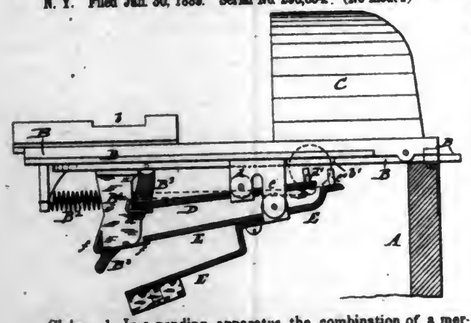
Claim.—1. In combination with a rotary grooved blacking-brush, a perforated blacking-receiver curved to fit the groove of the brush, substantially as described.

2. In combination with a rotary grooved blacking-brush, a perforated blacking-receiver curved to fit the groove of the brush, said perforations being covered with an absorbent material, and a supply-vessel connected to said receiver, substantially as described.

3. In a machine for blacking and polishing boots and shoes, the combination, with two circular double-grooved brushes, of means for simultaneously revolving them, and a blacking-supply for applying blacking to each of the two brushes at one end of the machine, substantially as described.

4. In a machine for blacking and polishing boots, the combination, with two shafts, each having upon it two grooved brushes, one shaft being arranged slightly above the plane of the other, of a blacking-supply, and a foot-rest arranged between each pair of grooved brushes, whereby the toe of the boot will be operated upon by one brush and the heel by the other brush, and whereby the boot, after being blackened by one pair of brushes may be polished by the other pair, substantially as described.

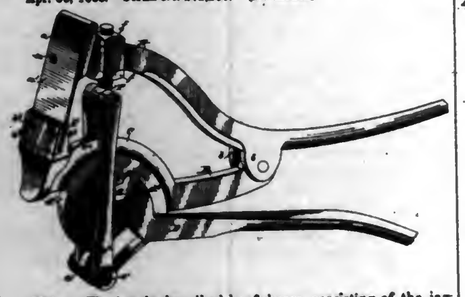
401,891. VENDING APPARATUS. WILLIAM LANE, Brooklyn, N. Y. Filed Jan. 30, 1889. Serial No. 298,054. (No model.)



Claim.—1. In a vending apparatus, the combination of a merchandise-delivery slide having a slot for dropping the coin, a primary locking-lever, a locking-bar on said delivery-side having a stop or keeper for the primary locking-lever, an auxiliary weighted locking-lever, a stop or keeper on the locking-bar for the latter, and a fixed incline above the front end of the auxiliary locking-lever adjoining the bottom opening of the coin-chute, substantially as set forth.

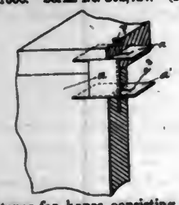
2. The combination, in a vending apparatus, of a merchandise-delivery slide having a slot for the passage of the coin, a coin-chute above said slot, a fulcrumed and weighted locking-lever, a locking-bar attached to the delivery-slide and provided with a stop or keeper for said locking-lever, and a fixed incline arranged vertically above the front end of the locking-lever and adjoining the bottom opening of the coin-chute, substantially as set forth.

401,892. HOOF-SHEARS. JOSEPH P. LEE, Wyalusing, Pa. Filed Apr. 30, 1888. Serial No. 272,280. (No model.)



Claim.—The herein-described hoof-shears, consisting of the jaw or arm A, carrying a knife at one end, the jaw or arm B, pivotally secured at its inner end to said jaw or arm A at about the center thereof, and having a curved groove or recess and a block at its outer end, the slotted cam or eccentric working in said groove or recess and having a rearwardly-extending handle, the pitmen connected to said cam or eccentric, and the adjusting-bolt secured to the jaw-handle A, and to which said pitmen are connected, substantially as set forth.

401,893. BOX-FASTENER. JOHN L. LILIENTHAL, San Francisco, Cal. Filed Dec. 5, 1888. Serial No. 292,727. (No model.)

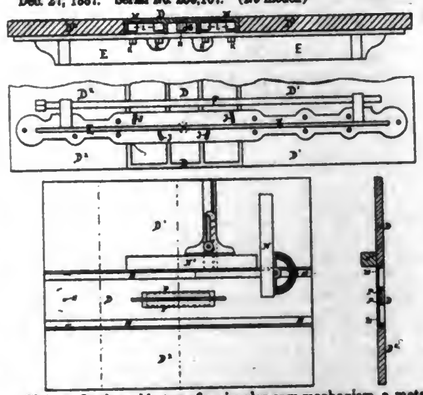


Claim.—1. A fastener for boxes, consisting of a strip, *a*, having integral therewith plates *a'*, overturned in parallel planes at right angles to said strip, each plate provided with an opening adapted to receive a fastening-pin, *p*, as and for the purposes indicated, substantially as described.

2. The combination, with the conjoining edges of the walls of a package, of plates *a'*, inserted therein, said plates being overturned at right angles to a strip, *a*, integral therewith, and secured in place by a pin, *p*, passing bodily into the material of the package and through openings of said plates, substantially as described.

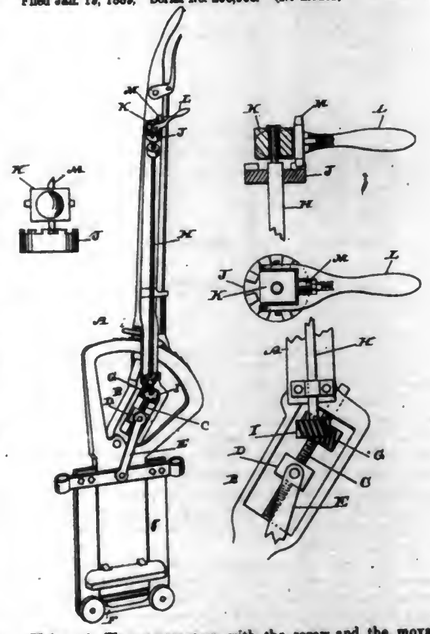
3. A fastener for boxes, consisting of plates *a'*, overturned at right angles to an integral connecting-strip, *a*, said plates being wider than the connecting-strip, each provided with slitted openings, the edges of which are adapted to be forced downwardly by a pin, *p*, when driven against said slits, as and for the purposes indicated, substantially as described.

401,894. TABLE-TOP FOR CIRCULAR SAWS. IRVING G. MARSTON, Boston, Mass., assignor to I. G. Marston & Co., same place. Filed Dec. 27, 1887. Serial No. 259,167. (No model.)



Claim.—In the table-top of a circular-saw mechanism, a metallic center piece extending the length of the table having a slot for the saw, and grooves for guides to present the work to the saw, the same being adapted to adjust the grooves on a line with the saw by means of a pivot and set-screws, as described.

401,895. CABLE-GRIP. SAMUEL F. McDILL, San Francisco, Cal. Filed Jan. 19, 1889. Serial No. 296,908. (No model.)



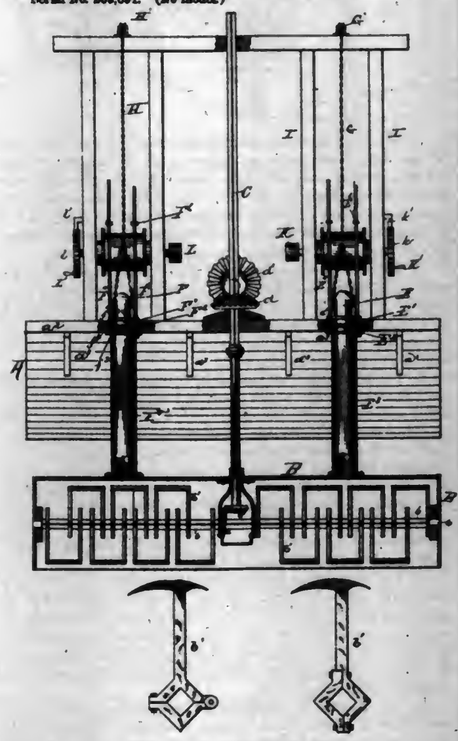
Claim.—1. The combination, with the screw and the movable nut whereby the grip-jaws are adjusted, of the shaft journaled upon the side of the grip-lever, the means for turning said shaft, a pinion upon the lower end of the shaft, and a corresponding pinion upon the screw-shaft, whereby the latter may be turned, substantially as described.

2. The grip-lever having the movable nut connected with the grip-jaw, the screw passing through said nut, a pinion upon the screw-shank, a shaft journaled upon the side of the grip-lever, and a corresponding pinion engaging the one upon the screw-shank, and a pawl-and-ratchet mechanism upon the upper end of the lever-shaft, whereby the latter may be turned, substantially as described.

3. The shaft journaled upon the side of the grip-lever, a screw-shank journaled in the lower part of the grip-lever and connected with the gripping-jaws, pinions upon the screw-shank and the lever-shaft engaging with each other, and a double ratchet fixed upon the upper end of the lever-shaft, in combination with a double-acting pawl and handle, substantially as herein described.

4. The pinion-shaft journaled upon the side of the lever, having the double-toothed ratchet-wheel fixed to its upper end, a swivel-head turning upon the upper end of the shaft above the ratchet, and a handle pivoted to said swivel-head and having the pawls projecting upon opposite sides thereof, so as to be engaged with the ratchet-wheel upon either side of the vertical shaft, and a spring whereby the handle is retained in either position, substantially as described.

401,896. HYDRAULIC DREDGING-MACHINE. JOHN McFARLANE, Washington, D. C., assignor, by direct and mesne assignments, of part to George J. Bessler and Henry Wex, same place. Filed Apr. 6, 1888. Serial No. 269,891. (No model.)



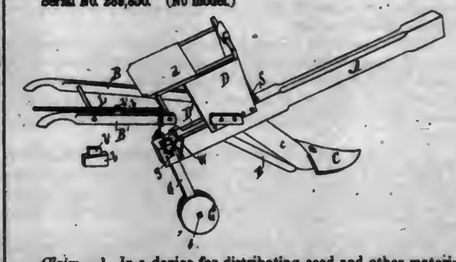
Claim.—1. In a hydraulic dredge, a box or case, telescopic suction-pipes leading therefrom, and a shaft journaled horizontally within said box or case, in combination with alternating cutters bolted to said shaft and adapted to rotate in a vertical plane, each of said cutters having its center beyond the axis of rotation of the shaft, as and for the purposes set forth.

2. In a dredging-machine, the combination, with a vertically-movable box, a shaft journaled horizontally therein, and cutters on said shaft, of telescopic suction-pipes, each of the sections of which is provided with a projection, guiding and controlling rods on either side of each of said pipes, one of which rods is bolted to the projection of the intermediate section of the pipe and passes through the projection on the upper section thereof, and the other of which rods is secured to the projection on the bottom section of the pipe and passes through the projection on the intermediate section thereof, all substantially as and for the purposes set forth.

3. In a dredging-machine, a vertically-movable box or case, a shaft journaled horizontally therein, and alternating cutters secured on either side of said shaft, the blades of which are curved in the arcs of circles whose centers fall without the axis of rotation of said shaft, in combination with telescopic suction-pipes each of the sections of which is formed with a projection at its upper end, guiding and controlling rods on opposite sides of said suction-pipes, and respectively secured to different sections thereof, means for raising and lowering the box or case, and means for operating the shaft carrying the cutters, all substantially as and for the purposes set forth.

4. In a dredging-machine, a cutter the extremity of the shank of which is formed with projections extending obliquely in opposite directions, and one of which has a perforated lip, and a correspondingly-shaped piece hinged to one of said projections, whereby a rectangular opening will be formed, as shown, and also having a perforated lip, and a bolt passing through said lips, for the purpose set forth, in combination with a horizontal shaft passing through the rectangular opening of the cutter.

401,897. SEED-PLANTER. JACK MITCHELL, Dade, Ky., assignor of one-half to Albert W. Dreyfoos, same place. Filed Nov. 2, 1888. Serial No. 289,850. (No model.)



Claim.—1. In a device for distributing seed and other material, provided with a hopper attached upwardly upon a draft-beam, the lever-arm L, pivotally resting upon the pin *b'* of an obliquely-faced post, *b*, uprising from one of the handles of the machine, said lever having pivoted thereto a hasp, H, meshing with a bell-crank lever, W adjusted to impinge against an outward shoulder of a horizontally-reciprocating slide, whereby the aperture of said slide will be projected into and maintained within the hopper until released from pressure of said lever, as and for the purpose indicated, substantially as described.

2. In a seed-planter having a hopper provided with opposite apertures for passage of an orificed reciprocating slide, the combination therewith of the following elements: the bell-crank lever W, linked to the lever L, adjusted to swing upon the pin *b'* of an obliquely-faced post, *b*, uprising from a handle of the device, obliquely-inclined chute E, and follower-wheels G', having their inner faces obliquely inclined from periphery to hub, said coverers being journaled at the lower end of the common beam in alignment with a forward plowshare, as and for the purpose indicated, substantially as described.

401,898. PROCESS OF MAKING GAS-INCANDESCENTS. LEONARD PAGET, New York, N. Y., assignor of one-half to Charles J. Kintner, same place. Filed Mar. 30, 1889. Serial No. 305,436. (No specimens.)

Claim.—1. The within-described process of preparing an incandescent, which consists in causing an incandescing substance to penetrate the pores of a non-friable base or support, substantially as described.

2. The within-described process of preparing an incandescent, which consists in causing an incandescing substance to penetrate the pores of a non-friable base or support and continuing this process until a coating of the desired thickness is had upon the exterior surface of the support, substantially as described.

3. The described process of preparing an incandescent, which consists in heating a metallic base or support in a solution containing an incandescing substance to the required temperature and for the necessary time to cause the expanded pores of the metal to absorb the desired quantity of the incandescing substance, substantially as described.

4. The described process of producing an incandescent, which consists in electrically heating a metallic base or support in an alcoholic solution containing an incandescing substance, substantially as described.

5. The described process of producing an incandescent, consisting in electrically heating a metallic base or support while immersed in an alcoholic solution containing a salt that will produce a highly-refractory substance, as oxide of magnesium, substantially as described.

6. The described process of producing an incandescent, consisting in electrically heating a metallic base or support therefor in a so-

lution of alcohol and a salt that will produce a refractory substance, and continuing this action until the surface pores of the base or support are filled and a coating of the desired thickness is formed about said base or support, substantially as described.

401,899. GAS-INCANDESCENT. LEONARD PAGET, New York, N. Y., assignor of one-half to Charles J. Kintner, same place. Filed Mar. 30, 1882. Serial No. 305,437. (No specimens.)

Claim.—1. As a new article of manufacture, an incandescent consisting of a non-friable base or support having an incandescing substance embedded in its pores, whereby integrality of connection exists between the base or support and the incandescing substance, substantially as described.

2. As a new article of manufacture, an incandescent consisting of a non-friable base or support holding an incandescing substance in its surface pores and an exterior coating of said incandescing material attached to the embedded material and to the surface of the base or support, substantially as described.

3. As a new article of manufacture, an incandescent consisting of a metallic base or support having a coating of an incandescing material which penetrates the surface pores of the base or support, substantially as described.

4. As a new article of manufacture, an incandescent consisting of a metallic base or support having a coating of an incandescing material of highly-refractory nature, which penetrates the surface pores of the base or support and forms also a coating about the exterior surface, the two being thus integrally united, substantially as described.

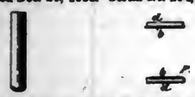
5. As a new article of manufacture, an incandescent consisting of a metallic wire base or support coated with an incandescing material which penetrates the surface pores of the wire and thus becomes integrally attached to said base or support, substantially as described.

6. As a new article of manufacture, an incandescent consisting of a non-friable base or support having magnesium oxide embedded in its surface pores, substantially as described.

7. As a new article of manufacture, an incandescent consisting of a non-friable base or support having magnesium oxide embedded in its surface pores and also a coating of said oxide on the surface of said base or support, substantially as described.

8. As a new article of manufacture, an incandescent consisting of a metallic base or support having magnesium oxide embedded in its surface pores and covering also the entire surface of the base or support, substantially as described.

401,900. PLATING STOCK FOR JEWELRY. JOHN S. PALMER, Providence, R. I. Filed Dec. 26, 1888. Serial No. 294,629. (No model.)



Claim.—The described improvement in the art of making plated metal shells or thimbles for use in the manufacture of jewelry, consisting in forming suitable-sized disks of the precious metal, in forming separate disks of nearly the same size of a baser metal, then soldering each of such precious disks to one of the baser ones, and then converting such plated disks into shells, all substantially as set forth.

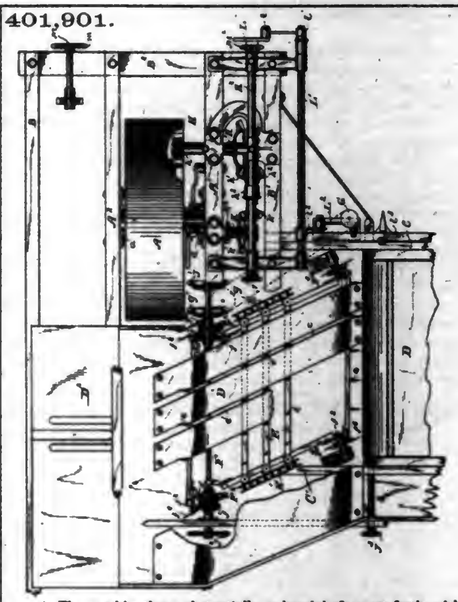
401,901. HARVESTER-BINDER. HENRY R. PRIDMORE, Chicago Ill., assignor to the McCormick Harvesting Machine Company, same place. Filed June 6, 1885. Serial No. 167,906. (No model.)

Claim.—1. The combination, substantially as hereinbefore set forth, of the main wheel, the finger-bar practically abreast the axle on which said main wheel turns, the platform, the diagonal elevator trending rearwardly from the delivery end of the platform, the binding table or receptacle parallel with the plane of the main wheel, and the binding devices operating upon the gavel at right angles to said line.

2. The combination, substantially as hereinbefore set forth, of the elevator-frame trending diagonally to the rear from the end of the platform, the sprocket-wheels arranged at the head and foot of said elevator, the chains connecting said wheels, and the rake-bars universally jointed to links of said chains.

3. The combination, substantially as hereinbefore set forth, of the diagonal elevator-frame, the through-shaft at one end thereof, the bevel-pinions on said shaft, the blocks or brasses encircling the shaft in proximity to said gears and secured to the frame, oblique bearings on said brasses, the sprocket-wheels mounted on said bearings and having face-teeth which mesh with the bevel-pinions, the sprocket-wheels at the opposite end of the elevator-frame turning upon oblique bearings, the chains connecting the sprocket-wheels at the top of the elevator with the corresponding wheels at the foot, and the rake-bars universally jointed to links of said chains.

401,901.



4. The combination, substantially as hereinbefore set forth, with the main wheel and its axle, the finger-bar practically abreast of said axle, the platform arranged in the rear of the axle, the oblique elevator trending rearwardly, and the binding mechanism outside of the plane of said wheel, of the driving-gearing located on the grain side of the main wheel and in advance of the oblique tilting axis between the axle of the main wheel and the axle of the grain-wheels.

5. The combination, substantially as hereinbefore set forth, of the main wheel, the prime pinion engaging with said main wheel in advance of its axle, the counter-shaft driven by the prime-pinion shaft, the diagonal elevator, the through-shaft at the head of said elevator, the sprocket-wheel at the front end thereof, and the sprocket-wheel at the rear end of the counter-shaft.

6. The combination, substantially as hereinbefore set forth, of the main wheel, the prime pinion engaging with said wheel in advance of the main axle, the counter-shaft driven by the prime-pinion shaft, the sprocket-wheel at the rear end of the counter-shaft, the elevator-shaft and its sprocket-wheel, the wrist-wheel at the front end of the counter-shaft beyond the front tie-beam to communicate motion to the cutter-bar, the sprocket-wheel on the counter-shaft adjacent to said wrist-wheel, the driving-shaft for the binder parallel with said counter-shaft outside of the main wheel, and the sprocket-wheel on said binder-driving shaft, whereby it may be driven from the sprocket-wheel at the front of the counter-shaft.

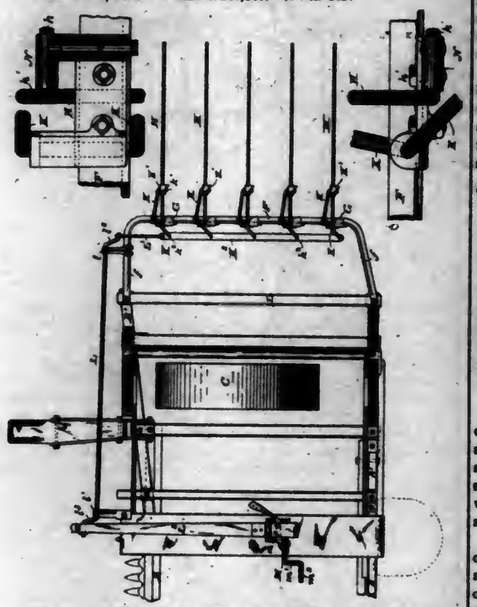
7. The combination, substantially as hereinbefore set forth, of the main wheel, the prime pinion engaging therewith in advance of the main axle, the counter-shaft driven by the prime-pinion shaft, the sprocket-wheel at the rear end of the counter-shaft, the wrist-wheel and sprocket-wheel at the front end of said counter-shaft, the reel-driving shaft and its sprocket-wheel, and the bevel-gears connecting said shaft to the counter-shaft.

8. The combination, substantially as hereinbefore set forth, of the main wheel, the prime pinion engaging therewith in advance of the main axle, the counter-shaft driven by the prime-pinion shaft, the sprocket-wheel at the rear of the counter-shaft, the diagonal elevator, the through-shaft at the head of said elevator, sprocket-wheels at front and rear of said through-shaft, the platform-apron, and a sprocket-wheel at the rear end of the gudgeon of the inner roller of said platform-apron, whereby motion may be communicated by chains from the counter-shaft to the elevator-shaft and from the elevator-shaft to the platform-apron.

9. In a grain-binder in which the gear and cam wheel is operated from the constantly-driven packer-shaft by means of two intermediate idle-gears, the combination, substantially as hereinbefore described, with the first idle-gear, of a driver alongside thereof, a tripping-clutch engaging the driver with the idle-gear, and a trip-latch whereby said clutch is disengaged from the idle-gear.

10. The combination, substantially as hereinbefore set forth, of a pinion fixed to the end of the constantly-driven packer-shaft, the loose pinion engaging therewith and having driving-lugs on its face, the second loose pinion alongside the other on the same axle and having a driving-dog to engage with said lugs, and the hooked trip-latch.

401,902. SHEAF-CARRIER. HENRY R. PRIDMORE, Chicago, Ill., assignor to the McCormick Harvesting Machine Company, same place. Filed Oct. 4, 1888. Serial No. 287,165. (No model.)



Claim.—1. The combination, substantially as hereinbefore set forth, with the carrier-frame bar, of a series of curved fingers projecting transversely therefrom, horizontal journals upon the inner ends of said fingers set at an angle to the length thereof, bearings upon the frame-bar receiving said journals and adapted to permit them to swing in a horizontal direction, a series of bell-crank levers mounted one to the side of each of said fingers and having one arm connected therewith, and a common operating-rod for each of said levers, whereby the fingers may be simultaneously swung to the rear and rocked upon their journals to drop their outer ends.

2. The combination, substantially as hereinbefore set forth, with the carrier-frame bar, of a series of curved fingers having an inner straight portion and horizontal journals at their inner ends set at an angle to the length of said fingers, bearings upon said frame-bar receiving said journals and adapted to permit them to swing horizontally therein, a series of bell-crank levers mounted in bearings one in advance of each of said fingers, a sleeve playing upon the inner straight portion of each finger and pivoted to the outer arm of each lever, and an operating-rod connected to the inner arms of said levers.

3. The combination, substantially as hereinbefore set forth, of the carrier-frame bar, the horizontal quadrant-bearings mounted thereon, the carrier-fingers having horizontal journals playing in said bearings and rocking therein, the vertical bearings on said frame-bar, the bell-crank levers mounted therein, the sleeves upon the fingers pivoted to the outer arms of said levers, the operating-rod connected to the inner arms of said levers, and a lever upon the harvester, whereby said rod is controlled.

401,903. PROCESS OF MANUFACTURING IRON AND STEEL. JACOB REESE, Pittsburg, assignor to the Bessemer Steel Company, (Limited,) Philadelphia, Pa. Filed June 27, 1878.

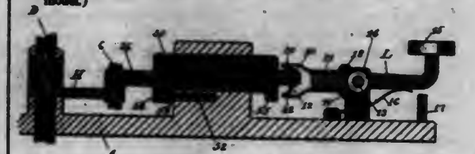
Claim.—1. The process herein described for dephosphorizing in the manufacture of ingot iron and steel, which consists in decarburizing and desiliconizing the metal in a Bessemer converter and immediately conveying it into an open hearth for the purpose of keeping it in a fluid state by the use of other fuel than that contained in the metal, and therein dephosphorizing it by the action of a basic bath and recarburizing and deoxodizing by the use of a manganesic carbide of iron, and further refining it by the action of the basic bath, substantially as herein set forth.

2. In the manufacture of ingot iron and steel, the process herein described, which consists in decarburizing and desiliconizing the metal in a Bessemer converter, and then transferring it while in a molten condition to a converting-furnace, and therein maintaining its fluid condition by means of heat obtained by the use of fuel extraneous to the metal, and subjecting it to the action of a basic bath, substantially as hereinbefore described.

3. In the manufacture of ingot iron and steel, the process of first decarburizing and desiliconizing the metal in a Bessemer converter, then running the molten metal into an open hearth having a calcareous lining, and then exposing it under the influence of additional heat obtained by the use of extraneous fuel to the action of a basic bath for the purpose of dephosphorizing the metal, substantially as hereinbefore described.

4. In the manufacture of ingot iron and steel, the process hereinbefore described of first desiliconizing the metal in a Bessemer converter, then transferring the molten metal to a converting-furnace, and exposing it therein to the action of basic reagents under the influence of additional heat for the purpose of dephosphorizing it, substantially as described.

401,904. MECHANICAL MOVEMENT. FRANCIS H. RICHARDS, Springfield, Mass., assignor to Darius W. Dodson, Wilkes-Barré, Pa. Filed Mar. 30, 1887. Renewed May 21, 1888. Serial No. 272,585. (No model.)

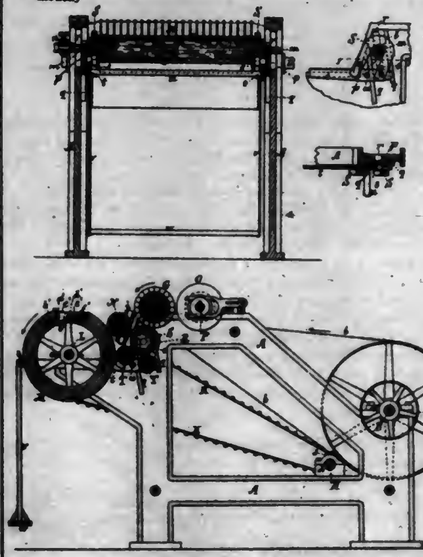


Claim.—1. The combination, in a latch mechanism of the class described, of a reciprocating latch, a tripping-bar, and four catches arranged in two engaging pairs, two of said catches being on the latch and two of them operatively connected to said bar, and those on one said part being constructed and arranged to be successively engaged with and disengaged from those on the other said part, substantially as described, and for the purpose specified.

2. The combination, in a latch mechanism of the class described, of a reciprocating latch, fixed oppositely-disposed catches on said latch, a tripping-bar, and oppositely-disposed spring-catches on said bar, one of said spring-catches being constructed and arranged to engage sooner than the other with the corresponding fixed catch, substantially as described, and for the purpose specified.

3. The combination, in a latch mechanism of the class described, of the latch having fixed catches 10 12, lever L, having the projecting end 21, and the spring-catches 20 22, carried on said lever, all constructed to operate substantially as described.

401,905. MACHINERY FOR SHAVING OR DRESSING GREEN HIDES OR SKINS. JOHN ROON, Salem, Mass., assignor to Reed & Vaughan, same place. Filed July 27, 1888. Serial No. 281,183. (No model.)



Claim.—1. In a machine for shaving or dressing hides or skins, the yielding bed, substantially as described, its body being hollow and filled with an elastic substance or with a fluid under pressure, as set

forth, said bed being supported in slides arranged in the frame and operated or moved therein by the levers *t* and the treadle *w*, connected therewith, in combination with the cutter-cylinder and grinding-wheel arranged and provided with mechanism, essentially as explained, for operating said cylinder and wheel, as set forth.

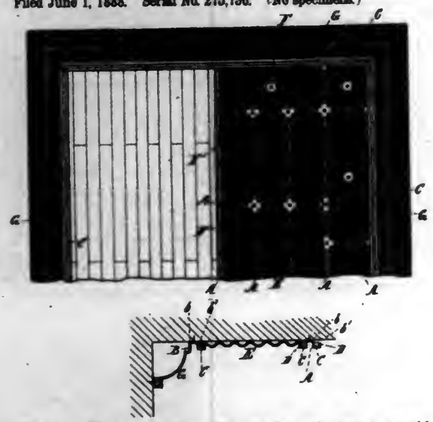
2. The yielding bed, substantially as described, its body being hollow and filled with an elastic substance or with a fluid under pressure, essentially as set forth, said bed being supported in slides in the frame and having yokes S arranged on it, as shown, for supporting the bed-sustaining rolls T T, the whole being operated or moved by the levers *t* and the treadle *w*, connected therewith, combined with the drum M, provided with the clamping mechanism, the cutter-cylinder, and grinding-wheel arranged and provided with mechanism, essentially as explained, for operating said drum, cylinder, and wheel, as set forth.

3. The yielding bed formed with a hollow body and filled with an elastic substance or with a fluid under pressure, as set forth, said bed being supported in slides arranged in the frame and having mechanism for moving it toward the cutter-cylinder, as shown, in combination with the corrugated roll N and the cutter-cylinder and grinding-wheel arranged and provided with mechanism, essentially as explained, for operating said cylinder and wheel, as set forth.

4. The yielding bed formed with a hollow body and filled with an elastic substance or with a fluid under pressure, as set forth, said bed being supported and having mechanism for moving it toward the cutter-cylinder, as shown, in combination with the corrugated roll N, the drum M, provided with the clamping mechanism, and the cutter-cylinder and grinding-wheel arranged and provided with mechanism, essentially as explained, for operating said drum-cylinder and wheel, as set forth.

401,906. METALLIC CEILING. LOUGLEY L. SAGENDORPH, Cincinnati, Ohio, assignor of one-half to Charles N. Harder, Philmont, N. Y.

Filed June 1, 1888. Serial No. 275,736. (No specimens.)



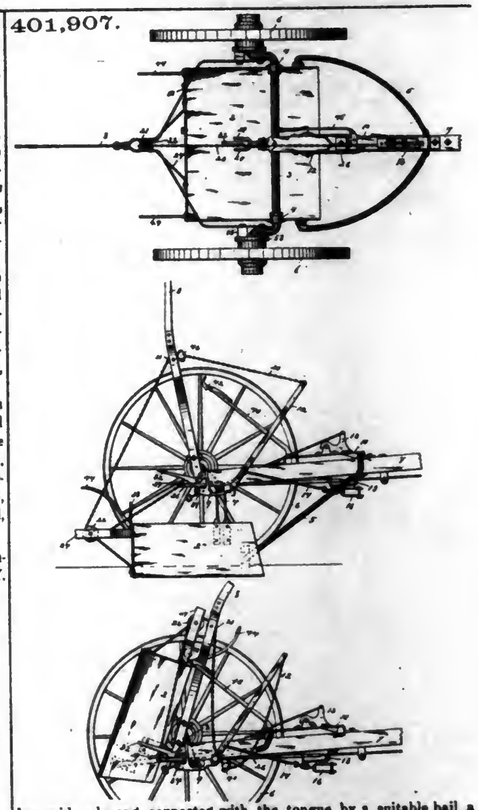
Claim.—The combination of the sheets and cleat A, provided with the ridge B, having flat top *b*, flanges C, and upturned edges D, and cornice G, having ridge B, and flange C, with upturned edge D, substantially as and for the purposes specified.

401,907. WHEELED SCRAPER. CHARLES H. SAWYER, Minneapolis, Minn., assignor of one-half to H. A. Smith, same place.

Filed June 18, 1888. Serial No. 277,491. (No model.)

Claim.—1. In a machine of the class described, the combination with the cranked axle, of the pan or shovel 2, suspended from said axle, a bail, 5, securing the front of the pan to the tongue, and a snitable casting securing the axle to the tongue, and a slot, 9, in said casting, which receives the axle, allowing it to slide in said slot, in the manner and for the purpose substantially as described.

2. In a machine of the class described, the combination, with the crank-axle, of a lever secured to said axle, a pan suspended below said axle and connected with the tongue by a suitable bail, a snatch-bar located beneath said tongue, a lever, 12, pivoted upon the tongue and connected with the draft-bar, and the chain 20, connecting the end of said lever 12 and the snatch-bar and passing over the lever 8 and connected with the end of the pan, substantially in the manner and for the purpose as described.



3. In a machine of the class described, the combination, with the crank-axle, of a lever operating said axle, a pan suspended below said axle and connected with the tongue by a suitable bail, a snatch-bar located beneath said tongue, a lever, 12, pivoted upon the tongue and connected with the draft-bar, a chain connecting the end of the lever 12 with the snatch-bar, and a block or stop secured to the chain and arranged to be brought in contact with the operating-lever and draw it downward and raise the pan, substantially as described.

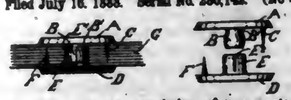
4. In a machine of the class described, the combination, with the tongue, of the snatch-bar located beneath the said tongue, the lever 32, pivoted on the said tongue, and a latch, 30, pivoted in said lever and engaging said snatch-bar, in the manner and for the purpose substantially as described.

5. In a machine of the class described, the combination, with the cranked axle, of a pan suspended from said axle, a lever for operating said axle, and a chain, 20, operating to draw the lever and pan together by the draft on the snatch-bar, substantially as described.

6. In a machine of the class described, the combination, with the draft bar or evener, of the lever 12, pivoted to the tongue and connected with the said evener, the snatch-bar sliding on said tongue, a locking device located on said tongue and engaging said snatch-bar, and a chain connecting the end of the snatch-bar with the lever 12, in order that as the said lever is thrown forward the snatch-bar will be drawn back and brought in engagement with the locking device, in the manner and for the purpose substantially as described.

401,908. SEPARABLE BUTTON. GUSTAVUS A. SCHLICHTER, Reading, Pa.

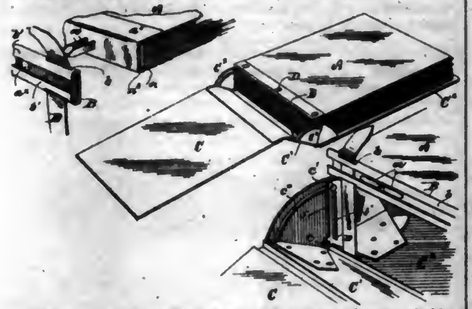
Filed July 16, 1888. Serial No. 280,142. (No model.)



Claim.—A button or badge consisting of two parts with engaging shanks, substantially as described, each of said parts having a pin projecting from its inner face parallel with the shank, for the purpose set forth.

401,909. PAD-BOOK. JOHN R. SCHOMACKER, Springfield, Ohio, assignor to the Book Metal Company, same place.

Filed Mar. 17, 1888. Serial No. 267,560. (Model.)



Claim.—1. A pad-book composed of a series of section-holders hinged together independently of the case or cover and provided with detachable pads, substantially as and for the purpose set forth.

2. The combination, with the case or covers, of flexible binding-strips and the removable section-holders having the folded edges, as described, and openings through which said binding-strips are adapted to pass, substantially as and for the purpose set forth.

3. The combination, in a pad-book, of the removable section-holders joined together by the flexible strips, and the detachable pads secured to said section-holders, substantially as set forth.

4. The combination, in a pad-book, of a series of pads each provided with a metallic plate secured to one end thereof and having flexible projecting points or cleats adapted to pass through a section-holding device and be clinched thereto, substantially as and for the purpose set forth.

5. The combination, in a pad-book, of the section-holders having the folded edges and arranged in series, of the flexible strips, as described, and the detachable pads, each having the metallic plate and projecting points or cleats, said points or cleats being adapted to pass through openings in said section-holders and be clinched thereto, substantially as and for the purpose set forth.

6. The combination, in a pad-book, with the cover formed of three parts, the bottom and end portions of which are hinged together by pivoted sectors, one of which is provided with a slotted opening and the other with a stationary pin or stud adapted to move in said slot, of a series of section-holders secured to said cover adapted to turn independent thereof, and detachable pads connected to said section-holders, substantially as and for the purpose set forth.

7. The combination, with the section-holders having a metallic plate with projecting flexible points or cleats, said plate being first covered with a strip of cloth glued or otherwise firmly secured to the end of said pad, of a binding-strip passed around said cloth-covered plate and the ends thereof glued or otherwise secured to the top and bottom of said pad, substantially as and for the purpose set forth.

8. The combination, with a hinged cover, as described, of the flexible binding-strips secured at the lower end to said cover, the removable section-holders having folded edges with openings therein through which said binding-strips are adapted to pass, a series of pads each provided with a metallic plate having projecting flexible points or cleats, and openings in said section-holders through which said cleats are adapted to pass and be clinched for the purpose of holding said pads in position on said section-holders, substantially as and for the purpose set forth

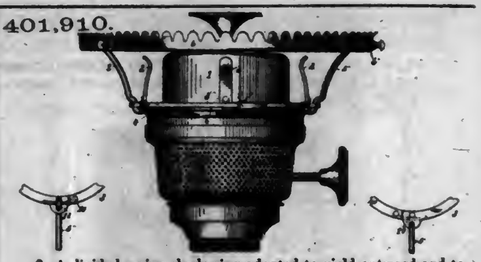
9. The combination, with a case or cover, of the series of section-holders and their attached pads, said section-holders being extended beyond the sides of said pads and adapted to rest against a flange or projection to keep the same in line, as set forth.

10. The combination, with the covers of a book or case, of a hinge formed of pivoted sectors, one of which is provided with a stud adapted to operate in a slotted opening in the other, substantially as and for the purpose set forth.

401,910. SHADE-HOLDER. GEORGE H. SOMERS, Bridgeport, Conn., assignor to The Bridgeport Brass Company, of Connecticut.

Filed Sept. 15, 1888. Serial No. 285,473. (No model.)

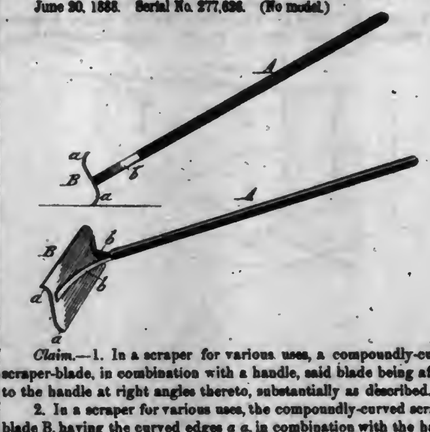
Claim.—1. A divided spring shade-ring adapted to yield outward and to contract in a horizontal plane, whereby it is retained in position on burners of varying size, one end of said ring having a guide and the other end constructed to slide freely therein, so that both of said ends are held against springing in any direction except away from each other.



2. A divided spring shade-ring adapted to yield outward and to contract and having shade-arms, the ends of which pass twice through the ring, forming loops 11 on the under side, one end of said ring having a guide-rod, 10, constructed to engage one of said loops on the other end, whereby both ends are held against movement except toward or from each other in the horizontal plane.

401,911. SCRAPER. ARCHIBALD STEWART, Keota, Iowa.

Filed June 30, 1888. Serial No. 277,636. (No model.)



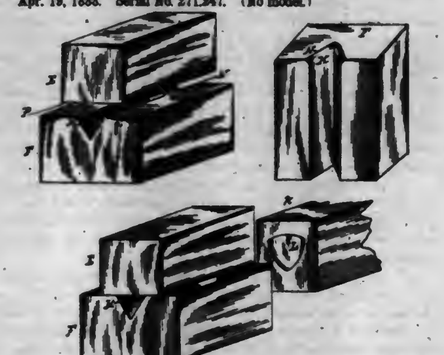
Claim.—1. In a scraper for various uses, a compoundly-curved scraper-blade, in combination with a handle, said blade being affixed to the handle at right angles thereto, substantially as described.

2. In a scraper for various uses, the compoundly-curved scraper-blade B, having the curved edges *a a*, in combination with the handle A and the braces *b b*, substantially as described.

3. In a scraper for various uses, the combination of the handle A, the compoundly-curved scraper-blade, and the braces for securing said blade to the handle at right angles thereto, all the parts being arranged so that the said device may serve as a pulling scraper or as a pushing scraper, substantially as described.

401,912. GRIPPING-DIE. WILLIAM TAYLOR, Allegheny, Pa.

Filed Apr. 19, 1888. Serial No. 271,247. (No model.)



Claim.—1. In a wire-nail machine, a pair of gripping-dies constructed to have or present by the junction of said dies a receiving-cavity all of whose transverse sections are substantially equal triangles, and the faces of which triangular cavity extend to and intersect exposed faces of the dies, whereby the said faces of the cavity are accessible, substantially as set forth.

2. In a wire-nail machine, a pair of gripping-dies constructed to have or present by the junction of said dies a wire-receiving cavity all of whose transverse sections are substantially equal triangles, said cavity having three substantially equal faces or walls, and the two

dies being separable on a plane which coincides with the line of intersection of two of the said faces or walls, substantially as set forth.

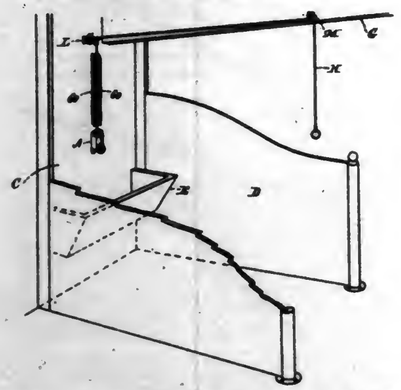
401,918. METAL CAN, BOX, OR OTHER RECEPTACLE. Gustavus A. Warner, New York, N. Y. Filed Feb. 25, 1889. Serial No. 301,094. (No model.)



Claim.—1. A metal can, box, or receptacle having around its perimeter a projection on the margins or corners of which are incisions, substantially as specified.

2. A metal can, box, or receptacle having around its perimeter a projection on the margins or corners of which are incisions, and a tongue upon said projection, substantially as specified.

401,914. ANIMAL-RELEASING DEVICE. Gilbert A. Watenhouse, Quincy, Mass. Filed Oct. 27, 1888. Serial No. 289,260. (Model.)



Claim.—1. In an animal-releasing device, the combination of a hollow body provided with a slot for receiving a detachable bar, a bar provided with a wedge-shaped inwardly-projecting portion and a retaining-stud on its side, a coiled spring disposed in said body and detachably securing the bar therein, and a lever pivoted to said bar and adapted to overcome the pressure of said spring, whereby the bar may be released from the body, substantially as set forth.

2. In an animal-releasing device, the combination of a hollow body provided with a slot for receiving a releasing-bar, a bar adapted to be disposed in said body and provided with an inwardly-projecting wedge, a retaining-stud, and a central opening for receiving a releasing-cord, a spring disposed in said body for detachably securing the bar therein, a lever pivoted to said bar and provided with openings for the releasing-cord and a beveled portion to engage the wedge on said bar, and a releasing-cord disposed in the openings in said bar and lever, whereby the bar may be released from said body when the cord is pulled, substantially as described.

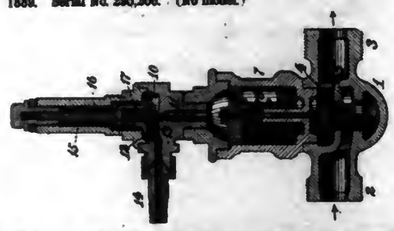
3. In an animal-releasing device, the hollow body A, having the slot *d*, in combination with the spring *i*, provided with the projection *l*, and the bar B, provided with the stud 15, said bar being fitted to enter said body and be detachably secured therein by said spring, substantially as set forth.

4. In an animal-releasing device, the combination of the body A, provided with the slot *d*, the bar B, adapted to enter said slot, and provided with the wedge portion *z* and stud 15, the spring *i*, having the projection *l*, for engaging said bar and detachably securing it in said body, and the lever K, provided with the beveled edge 55, whereby the pressure of said spring may be overcome and the bar released, substantially as described.

5. In an animal-releasing device, the bar B, provided with the hole *x*, wedge *z*, and a stud, 15, in combination with the body A, provided with the slot *d*, for receiving said bar, the spring *i*, for detachably securing the bar within said body, the lever K, pivoted to said bar and provided with the opening 35 and eye 45, and the cord H, disposed in said bar and lever, substantially as and for the purpose described.

6. In an animal-releasing device, the combination of the body A, provided with the slot *d*, the bar B, adapted to be disposed in said body and provided with the extension *g*, ring F, opening *x*, wedge *z*, and retaining-stud 15, the spring *i*, disposed in said body and acting torsionally to secure the bar therein, the lever K, pivoted to said bar and provided with the opening 35, eye 45, and beveled portion 55, the cord H, disposed in the opening in said bar and lever, and the spring-clamps L M, for detachably supporting said cord, all being arranged substantially as described.

401,915. AUTOMATIC PUMP-GOVERNOR FOR BRAKE MECHANISMS. George Westinghouse, Jr., Pittsburg, Pa. Filed Jan. 2, 1889. Serial No. 295,906. (No model.)



Claim.—1. The combination of a valve-body having supply and delivery connections, an unbalanced regulating-valve controlling communication between said connections and having its opening movement in the direction of delivery, a piston positively connected to the regulating-valve and working in a chamber secured to the valve-body, a spring exerting pressure upon said piston conjointly with the unbalanced supply-pressure on the regulating-valve, a movable abutment working in a chamber having a connection communicating with a brake-pipe, an air-pressure valve connected to said abutment and controlling an air-supply port leading from the chamber thereof to the piston-chamber, a spring exerting pressure on said abutment in opposite direction to the brake-pipe pressure thereon, and an exhaust-port leading out of the piston-chamber, substantially as set forth.

2. The combination of a valve-body having supply and delivery connections, an unbalanced regulating-valve controlling communication between said connections and having its opening movement in the direction of delivery, a piston positively connected to the regulating-valve and working in a chamber secured to the valve-body, a spring exerting pressure upon said piston conjointly with the unbalanced supply-pressure on the regulating-valve, two movable abutments working in chambers having connections communicating, respectively, with a brake-pipe and with a main air-reservoir, two air-pressure valves each connected to one of said abutments and controlling an air-supply port leading from the chamber thereof to the piston-chamber, springs exerting pressure on the abutments in opposite direction to the brake-pipe and reservoir-pressure thereon, and an exhaust-port leading out of the piston-chamber, substantially as set forth.

401,916. ENGINEER'S BRAKE-VALVE. George Westinghouse, Jr., and Frank Moore, Pittsburg, Pa. Filed Jan. 2, 1889. Serial No. 295,912. (No model.)



Claim.—1. In an engineer's brake-valve, the combination of a movable abutment and a connected discharge-valve controlling the exhaust of air from a brake-pipe, said abutment being adapted to open the discharge-valve by a disturbance of equilibrium of pressure on its opposite sides, and to close and maintain the closure of the discharge-valve in and by the restoration of such equilibrium, substantially as set forth.

2. In an engineer's brake-valve, the combination of a discharge-valve controlling the exhaust of air from a brake-pipe, a movable abutment connected to the discharge-valve, and a regulating-valve controlling ports by which, respectively, an equilibrium of pressure is established and a difference of pressure is effected on opposite sides of the abutment to maintain the closure and effect the opening and closure of the charge-valve, substantially as set forth.

3. In an engineer's brake-valve, the combination of a movable abutment fitted to work in a chamber communicating with a brake-pipe connection on one side of the abutment, a discharge-valve connected to said abutment and controlling a pipe leading from the brake-pipe connection to the atmosphere, a supply-port for establishing equilibrium of brake-pipe pressure in the chamber on opposite sides of the abutment, an exhaust-port for relieving pressure in the chamber on the side of the abutment opposite that which is in communication with the brake-pipe connection, and a regulating-valve controlling said supply and exhaust ports, substantially as set forth.

4. In an engineer's brake-valve, the combination of a valve casing or chamber, a main air-reservoir connection and a brake-pipe connection leading thereinto, a direct supply-port formed in a valve-seat in the chamber and adapted to establish direct communication between said connections, a movable abutment fitted to work in a chamber in the casing communicating on one side of the abutment with the brake-pipe connection, a discharge-valve connected to said abutment and controlling a passage from the brake-pipe connection to the atmosphere, an equalizing supply-port leading from the abutment-chamber to the valve-seat on the side of the abutment opposite to that which is open to the brake-pipe connection, and a regulating-valve working on the valve-seat and controlling the direct supply and equalizing ports, substantially as set forth.

5. In an engineer's brake-valve, the combination of a valve casing or chamber, a main air-reservoir connection, and a brake-pipe connection leading thereinto, a direct supply-port formed in a valve-seat in the chamber and adapted to establish direct communication between said connections, a loaded valve governing an extra pressure-port leading from the valve-seat to the brake-pipe connection, a movable abutment fitted to work in a chamber in the casing communicating on one side of the abutment with the brake-pipe connection, a discharge-valve connected to said abutment and controlling a passage from the brake-pipe connection to the atmosphere, a primary and a secondary equalizing-port, each leading from the abutment-chamber to the valve-seat on the side of the abutment opposite to that which is open to the brake-pipe connection, and a regulating-valve working on the valve-seat and controlling the several port-openings therein, substantially as set forth.

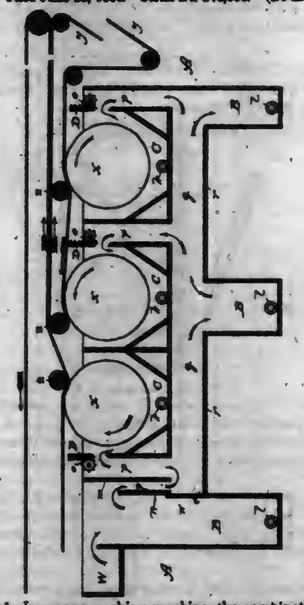
6. In an engineer's brake-valve, the combination of a valve casing or chamber, a main air-reservoir connection and a brake-pipe connection leading thereinto, a direct supply-port formed in a valve-seat in the chamber and adapted to establish direct communication between said connections, a movable abutment fitted to work in a chamber communicating on one side of the abutment with the brake-pipe connection, a discharge-valve connected to said abutment and controlling a passage from the brake-pipe connection to the atmosphere, an equalizing supply-port leading from the abutment-chamber to the valve-seat on the side of the abutment opposite to that which is open to the brake-pipe connection, an exhaust-port leading from the valve-seat to the atmosphere, and a regulating-valve working on the valve-seat and controlling the several port-openings therein, substantially as set forth.

7. In an engineer's brake-valve, the combination of a valve-casing or chamber, a main air-reservoir connection and a brake-pipe connection leading thereinto, a direct supply-port formed in a valve-seat in the chamber and adapted to establish direct communication between said connections, a direct exhaust-passage leading from the valve-seat to the atmosphere, and a regulating-valve working on the valve-seat and controlling the direct supply-passage and having a recess or cavity adapted to establish communication between the brake-pipe connection and the direct exhaust-passage, substantially as set forth.

8. In an engineer's brake-valve, the combination of a valve casing or chamber, a main air-reservoir connection and a brake-pipe connection leading thereinto, a direct supply-port formed in a valve-seat in the chamber and adapted to establish direct communication between said connections, a direct exhaust-passage leading from the valve-seat to the atmosphere, a discharge-valve controlling an independent exhaust-passage from the brake-pipe connection, a movable abutment connected to the discharge-valve, and a regulating-valve controlling ports by which, respectively, an equilibrium of pressure is established and a difference of pressure is effected on opposite sides of the abutment, and also controlling communication between the direct supply-port and the brake-pipe connection and between the brake connection and the direct exhaust-passage, substantially as set forth.

9. In an engineer's brake-valve, the combination of a movable abutment fitted to work in a chamber communicating with a brake-pipe connection on one side of the abutment, a supplemental reservoir communicating with said chamber on the other side of the abutment, a discharge-valve connected to said abutment and controlling a pipe leading from the brake-pipe connection to the atmosphere, a supply-port for establishing equilibrium of brake-pipe pressure in the chamber on opposite sides of the abutment, an exhaust-port for relieving pressure in the chamber on the side of the abutment opposite that which is in communication with the brake-pipe connection, and a regulating-valve controlling said supply and exhaust ports, substantially as set forth.

401,917. PAPER-MAKING MACHINERY. Samuel Wilmot, Lockport, Ill. Filed June 25, 1888. Serial No. 278,006. (No model.)



Claim.—1. In a paper-making machine, the combination of the pulp-reservoir W, cylinders X, separate cylinder-vats C, provided with controllable outlets *k*, conduits leading to said vats, and gates D, whereby one vat may be filled or emptied independently of the other or others, substantially as described.

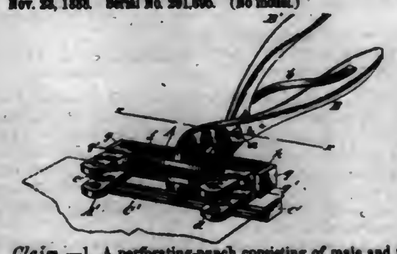
2. In a paper making machine, the combination of a vat, A, cylinders X, separate cylinder-vats C, provided with controllable outlets *k*, supported within the vat A above its floor and forming a passage, *g*, passages *p*, and gates D, substantially as described.

3. In a paper-making machine, the combination of cylinders X and independent cylinder-vats C, having inlet-gates D and controllable outlets *k*, the side walls of the vats, converging toward said outlets, substantially as described.

4. In a paper-making machine, the combination of the pulp-reservoir W, cylinders X, cylinder-vats C, and suitable conduits leading from the pulp-reservoir to the cylinder-vats provided with traps or settling-boxes, substantially as described.

5. In a paper-making machine, the combination of a pulp-reservoir, a vat, A, cylinders X, cylinder-vats C, provided with controllable outlets *k*, supported within the vat A above its floor and forming a passage, *g*, passages *p*, partitions *m* and *n*, gates D and *a'*, and traps or settling-boxes B, having controllable outlets *l*, substantially as described.

401,918. PUNCH. William H. Woglom, Brooklyn, N. Y. Filed Nov. 23, 1888. Serial No. 291,895. (No model.)



Claim.—1. A perforating-punch consisting of male and female punching-jaws A A', having handles B B', crossed and pivoted together, the punching-jaws branched laterally and the respective branches formed with two punches and dies, and one of the jaws provided with guiding projections *g g*, projecting from it past the other jaw, and formed with perpendicular faces engaging opposite guiding-faces on the other jaw, whereby the lateral displacement of the jaws is prevented.

2. A perforating-punch consisting of male and female punching-jaws A A', having handles B B', crossed and pivoted together, the punching-jaws branched laterally and the respective branches formed with two punches and dies, and one of the jaws formed with two aligned grooves crossing its branches in a direction parallel with the pivotal axis, and a side guide, C, consisting of a plate adjustable longitudinally in said grooves, and a set-screw for fastening said plate to the jaw.

401,919. COFFEE OR TEA POT. GALE W. ADAMS, Candor, N. Y., assignor of one-half to Frank J. Horton, same place. Filed Feb. 5, 1889. Serial No. 298,738. (No model.)

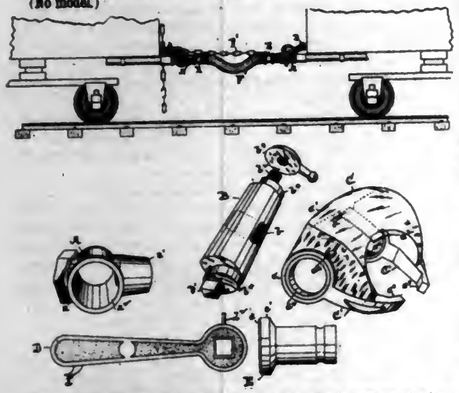


Claim.—1. In a coffee or tea pot, an interior cylinder, B, of slightly less diameter than the diameter of the pot, with a packing-ring connected with the said cylinder B, and a vent through the wall of the said cylinder below the line of the packing, substantially as described.

2. In a coffee or tea pot, an interior cylinder, B, a packing-ring on the outer circumference of said cylinder, forming a steam-tight chamber below the same between the walls of the cylinder and the coffee-pot, and a condenser in the top of said cylinder, substantially as described.

3. In combination with a coffee or tea pot, a cylinder, B, having a perforated bottom, a packing-ring around the outer circumference thereof, a safety-vent through the wall of the cylinder below the packing-ring, a condenser in the top of said cylinder, and a cover, substantially as described.

401,920. STEAM-PIPE COUPLING FOR RAILWAY-CARS. LORIN ALDRICH, Indian Orchard, Mass. Filed Feb. 7, 1888. Serial No. 263,317. (No model.)



Claim.—1. The pipe-coupling herein described, composed of two members, one of said members comprising a plug-cock for closing the passage through the coupling, the plug of said cock having at or near each end portions which are eccentric to its axial center, and two clamping-jaws for engaging the second member, said jaws at their rear ends being swiveled upon said eccentric portions of said plug, substantially as described, whereby rotation of said plug will impart a bodily movement to said jaws.

2. The pipe-coupling herein described, composed of two members, one of said members consisting of shell A, having transverse chamber a^2, plug B, having orifice b therein seated in said chamber, jaws C, mounted upon said plug upon each side of shell A and operating-lever D, and the other of said members consisting of tubular head E, having peripheral flange e' thereon, substantially as set forth.

3. The pipe-coupling herein described, composed of two members, one of said members consisting of shell A, having annular bearing-face a' and chamber a^2, plug B, having orifice b and eccentric portions b^4, frame C, having journals c and jaws C', and the second member consisting of head E, having annular bearing-face e and flange e', substantially as and for the purpose set forth.

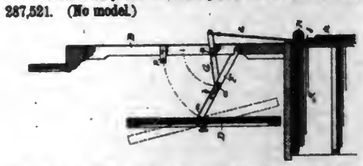
4. The pipe-coupling herein described, one member of which consists of the plug-cock A B, the plug of which is provided with the eccentric portions b^4, frame C, carrying jaws C' and having journals c to receive said eccentric portions of the plug, a lever fitted at one end to said plug; and a stop projecting from said frame C into the path of movement of said lever, and the second member of which consists of head E, arranged and operating substantially as described.

5. In a pipe-coupling, a first member consisting of plug-cock A B, and jaws C', having both a rocking and reciprocating movement upon said cock, said jaws having at their outer ends the inclined surfaces c^3, and a second member consisting of head E, having flange e' thereon, the rear face of which is inclined to correspond with the inclination of said surfaces c^3 of jaws C', arranged and operating substantially in the manner and for the purpose described.

6. In a pipe-coupling, a first member consisting of shell A, plug B, having eccentrics b^4 at each end thereof, frame C, carrying jaws C', said frame having journals c to receive said eccentrics b^4, and having stops c' c^4 and spring c^5, and lever D, having stop d^3 thereon, and a second member consisting of head E, having flange e' thereon, substantially as described.

7. As a means of connecting the ends of the steam-heating pipes of two adjoining cars with the ends of a short flexible pipe extending between the cars, the coupling herein described, composed of a first member adapted to be secured to the ends of the pipes on the cars, and a second member adapted to be secured to the ends of the intermediate pipe, said first member consisting of shell A, plug B, having eccentrics b^4, frame C, mounted upon said eccentrics and carrying jaws C', said frame having stops c^3 c^4, and lever D, having lug d' and stop d^3 thereon, and said second member being composed of tubular head E, having flange e', in combination with a chain or similar device connected at one end to one of the cars and detachably secured at its opposite end to the lever D on the adjoining car, said chain being of less length than the intermediate pipe, whereby said lever will be automatically operated by a movement of the cars away from each other, substantially in the manner and for the purpose set forth.

401,921. HANGER FOR MIRRORS OF BUREAUS. JOSEPH R. ANDERSON, Philadelphia, Pa., assignor of two-thirds to Franklin B. Reeves and Charles Henry Reeves, same place. Filed Oct. 8, 1888. Serial No. 287,521. (No model.)



Claim.—1. The combination of the frame of a bureau or like article of furniture, a mirror adapted to said frame, and a hanging device consisting of arms pivoted to the mirror and to the frame and levers pivoted to said arms and to the frame having longitudinal play at one set of pivots, all substantially as specified.

2. The combination of the frame of a bureau or like article of furniture, the mirror adapted to said frame, the hanger-arms pivoted to the mirror and to the lower portion of the frame, levers pivoted to said arms and to the lower portion of the frame, and one or more springs acting on said levers and serving to counterbalance the weight of the mirror, all substantially as specified.

3. The combination of the frame of a bureau or like article of furniture, the mirror adapted to said frame, the hanger-arms pivoted to the mirror and to the frame, levers pivoted to said arms and to the frame and having longitudinal play on the latter pivots, and one or more counterbalance-springs acting on the levers, all substantially as specified.

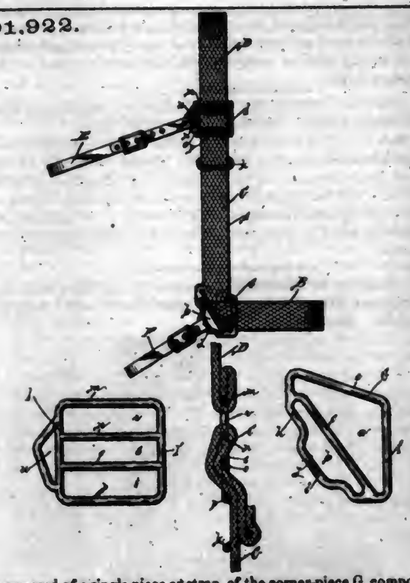
4. The combination of the frame of a bureau or like article of furniture, a mirror adapted to said frame, pivoted hanging devices at the opposite ends of the mirror, cord or chains connected to said hanging devices, a winding-drum for said cords or chains, and one or more springs acting on said drum and serving to wind up the cords or chains thereon, substantially as specified.

5. The combination of the frame of a bureau or like article of furniture, the mirror adapted to said frame, the hanger-arms pivoted to the mirror and to the frame, levers hung to said arms and to the frame, and catches whereby the arms are held in their upright or normal position, all substantially as specified.

401,922. HALTER. EDWARD BARNARD, Rome, N. Y. Filed Oct. 4, 1888. Serial No. 287,209. (No model.)

Claim.—1. The combination, with a halter having crown, cheek, nose, chin, and throat pieces, with the cheek-strap C and nose-strap

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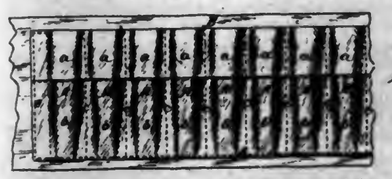
B, composed of a single piece or strap, of the corner-piece G, composed of its inclosing sides, and the diagonal cross-bar c, forming the slots a and b between the cross-bar c and the inclosing sides of the corner-piece, substantially as and for the purpose set forth.

2. The combination, with the herein-described halter, of the corner-piece G, having the cross-bar c extending diagonally across the corner-piece, the sides e and f meeting at an angle with their adjacent extremities opposite to the bar c and forming the triangular slot e, interposed between said sides e and f and the cross-bar c, the side i, substantially parallel to the cross-bar, forming the slot b, interposed between the side i and the cross-bar c, and having the enlargement d formed by a depression in the side i, substantially as and for the purpose set forth.

3. The combination, with a halter having crown, cheek, and nose straps formed of a continuous piece or strap, of the corner-piece G, composed of its inclosing sides, and the diagonal cross-bar c, forming the slots a and b between the cross-bar c and the inclosing sides of the corner-piece, and means for adjustably connecting the crown-strap and cheek-strap, substantially as and for the purpose set forth.

4. The combination, with a halter having crown, cheek, and nose straps formed of a continuous piece or strap, of the corner-piece G, composed of its inclosing sides, and the diagonal cross-bar c, forming the slots a and b between the cross-bar c and the inclosing sides of the corner-piece, with a buckle or loop, I, formed with a series of slots for adjustably connecting together the extremities of the halter-strap, substantially as and for the purpose set forth.

401,923. POCKET FOR CARTRIDGES. GEORGE BARNARD, Chicago, Ill. Filed Feb. 7, 1889. Serial No. 299,047. (No model.)

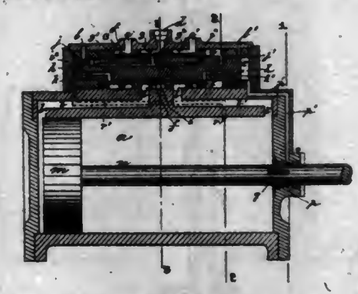


Claim.—1. A cartridge-holding pocket consisting of an upper yielding portion and a lower non-yielding portion, and having both portions fluted and united at the side edges to a backing, substantially as and for the purposes specified.

2. A cartridge-holding pocket consisting of an upper yielding portion and a lower non-yielding portion, and having both portions fluted and united at the side edges to a backing, with the non-yielding portion closed at the end, substantially as and for the purposes specified.

3. A cartridge-holder consisting of a number of pockets, A, having a yielding upper portion, a, and a non-yielding lower portion, b, and a backing-strip, B, for receiving and retaining cartridges of different sizes, substantially as specified.

401,924. VALVE FOR STEAM-ENGINES. GUSTAV A. BARTH, St. Louis, Mo., assignor to Pierre Chouteau, same place. Filed Feb. 2, 1889. Serial No. 298,473. (No model.)



Claim.—1. In a steam or other motive power engine, the combination of a cylinder having inlet and exhaust ports and passages, a steam-chest having inlet and exhaust ports and containing a slide or distribution valve provided with an auxiliary valve having passages opening from and into the steam-chest, a piston fitted within a cylinder, and a piston-rod having a groove or passage, with separate relief-passages opening from the cylinder into the steam-chest, substantially as shown, and for the purpose described.

2. In a steam or other motive power engine, the combination of a cylinder having combined inlet and exhaust ports and passages, a steam-chest having inlet and exhaust ports and containing a slide or distribution valve, an auxiliary valve fitted in and projecting through the distribution-valve into the recessed ends of the steam-chest, said auxiliary valve having a passage opening from the main inlet-passage of the distribution-valve into the steam-chest behind each end of the distribution-valve and relief-passages opening, respectively, from the steam-chest behind the corresponding ends of the distribution-valve through outlet-ports in the recessed ends of the steam chest into the external air, (or exhaust,) a piston fitted within the cylinder and having a rod passing through the cylinder-cover, said rod having a longitudinal groove or passage, with separate relief-passages opening from the cylinder into the steam-chest behind the respective ends of the auxiliary valve, all operating to hold and reverse the distribution-valve, and so control the admission and exhaust of steam or other motive fluid to and from each side of the piston alternately, substantially as shown and described.

3. The combination of a cylinder, a, having inlet and exhaust ports and passages b b', steam-chest c, having inlet-port d, exhaust-ports e e', and outlet relief-passages l l', a slide or distribution valve, f, located in steam-chest c and formed with circumferential grooves or passages g g' g^2, an auxiliary valve, h, having steam-passages i i' i^2 and relief or exhaust passages j k and j' k', a piston, m, fitted within the cylinder a and provided with a rod, n, passing through a stuffing-box, o, in the cylinder-cover and having a longitudinal groove or passage, q, with separate relief-passages, p p' and r r', substantially as shown, and for the purpose described.

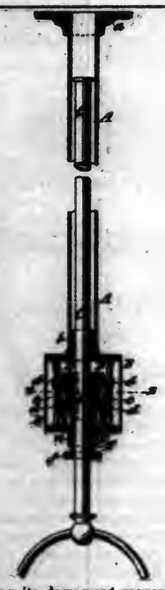
4. The combination of the cylinder a, steam-chest c, distribution-valve f, auxiliary valve h, and piston-rod n, passing through stuffing-box o in cylinder-cover, all being provided with openings and passages, substantially as set forth, the said auxiliary valve h having its respective end portions of different diameters and adapted to slide longitudinally and steam-tight within the correspondingly-recessed ends of the steam-chest c, with the piston m, substantially as shown, and for the purpose described.

401,925. EXTENSION LIGHT-FIXTURE. GEORGE W. BAYLEY, Brooklyn, N. Y. Filed Sept. 13, 1888. Serial No. 285,269. (No model.)

Claim.—In an extension light-fixture, the combination, with a fixed part, of an extensible part, a cylindrical case or shell on the fixed part, guide-rods within said shell extending at a downward incline and secured at their upper and lower ends to the top and bottom of the case or shell, brakes having faces adjacent to the extensible part and provided with lugs or projections, through which said guide-rods loosely extend, and elastic cushions upon the lower ends of said brakes, said brakes being moved to clamp the movable part of the fixture by



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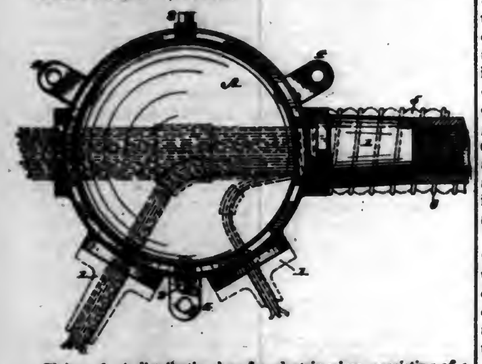
said movable part during its downward movement, substantially as specified.

401,926. PIPE-WRENCH. LEWIS J. BERRENDAHL, Pendleton, Oreg. Filed Dec. 27, 1888. Serial No. 294,811. (No model.)



Claim.—In a pipe-wrench, a rein or handle having an enlarged integral formation at one end, comprising V-shaped gripe with an intersecting space, and pairs of lugs with openings between them arranged in rear of said gripe, a chain connected to and mounted between one pair of said lugs, and a revoluble hooked rod mounted in said handle in rear of the other pair of lugs and adapted to be engaged by the links of the said chain, substantially as described.

401,927. BOX FOR THE DISTRIBUTION OF ELECTRIC WIRES. DAVID ROGERS, Jr., Philadelphia, Pa., assignor to the Electric Cable Construction and Maintenance Company, same place. Filed Nov. 26, 1888. Serial No. 291,982. (No model.)



Claim.—1. A distributing-box for electric wires, consisting of a metallic box with screw-cap and provided with side openings of uniform diameter, nipples for said openings, plugs on opposite sides of said box, and ears at the back thereof, said parts being combined substantially as described.

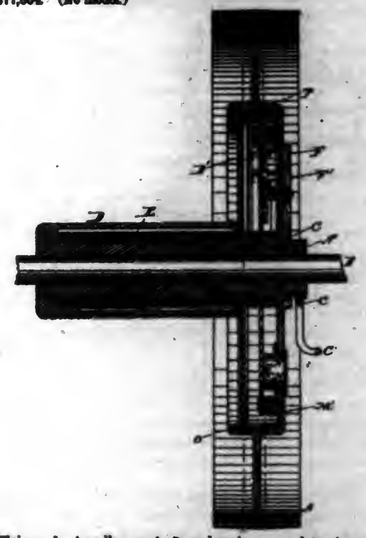
2. A distributing-box for electric wires, consisting of a metallic box with screw-cap and provided with side openings and nipples therefor, and having plugs on opposite sides, substantially as and for the purpose set forth.

401,928. INSECTICIDE. MELVIN B. CHURCH, Grand Rapids, Mich. Filed Apr. 1, 1887. Serial No. 233,267. (No specimens.)

Claim.—1. As a new article of manufacture, the insecticide hereinbefore described, being an impalpable powder containing an intimate mixture of gypsum and paris-green, in the proportions set forth.

2. As a new article of manufacture, the insecticide hereinbefore described, being an impalpable powder consisting of an intimate and uniform mixture of gypsum, paris-green, and flour, in the proportions set forth.

401,929. POWER-METER. FRANK M. CLARK, Tilton, N. H., and FREDERICK R. LOW, Chelsea, Mass. Filed June 22, 1888. Serial No. 277,864. (No model.)



Claim.—1. A pulley, a shaft, and an interposed torsion-spring, in combination with each other, and in further combination with a registering mechanism integral therewith, and an actuating mechanism driven from a stationary gear concentric with said shaft and with two cams severally fastened to said shaft or pulley and automatically separated at their ends, according to the torsion of the spring, and with an automatic clutch connected with said stationary gear and adapted to engage with and drive the registering mechanism, all substantially as and for the purpose described.

2. The combination of a driving-pulley, a driven shaft, and a torsion-spring between them, one end of which is fast to the driving member of the train, and the other end of which is fast to the driven member of the train, and an actuating-rim mounted concentrically around the center of revolution of said mechanism revolved with it, and also constantly and differentially revolved relatively to it around the common center, according to the speed of revolution of the said mechanism, and a registering-rim mounted concentrically around the same center of revolution, revolved with it, and intermittingly and differentially revolved in relation to it in each revolution through an angular distance corresponding to the moment of stress of the torsion-spring between the driving and the driven member of the mechanism, and an intermittently-actuated clutch which connects the actuating and registering rims in their revolution for an angular distance corresponding to the moment of stress of said torsion-spring, substantially as and for the purpose described.

3. In combination with a driving-pulley and a driven shaft connected together by a torsion-spring, a pair of cams concentric with the center of revolution of said shaft and pulley, one of which pair of cams is in fixed relation with the driving and the other of which pair of cams is in fixed relation with the driven member of the mechanism, and an automatic tripping-clutch actuated by said cams, and a registering-rim, substantially as and for the purpose described.

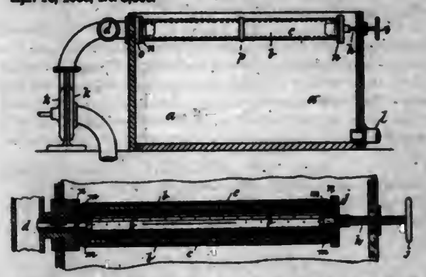
4. A power-register containing a torsion-spring interposed between the driving and driven members of a power-transmitting mechanism, a pair of cams, one of which is in fixed relation with the driving mechanism and the other of which is in fixed relation with the driven mechanism, the distance of which cams from each other measures the

stress of the torsion-spring, an actuating-rim independently and continuously revolved relatively to and differentially from the said driving and driven mechanisms, an automatic clutch carried by said actuating-rim and thrown into and out of engagement by said cams for a greater or less proportion of each revolution, according to their separation, and a registering-rim actuated by said clutch independently, differentially, and intermittently revolved for a fraction of a revolution, according to the stress of the torsion-spring, all in combination with each other, substantially as described.

5. The combination of a transmitting-dynamometer, a train of gearing actuated by the revolution thereof and moved at a proportional speed, a registering-rim independent of said train of gearing, but automatically engaged with it and moved by it at intervals, which correspond in angular distance with and are proportional to the strain between the driving and driven members of said dynamometer, and a counter which records the revolutions of said registering-rim, substantially as described.

6. The combination of the transmitting-dynamometer, one member of which drives an actuating-pawl, with said actuating-pawl moved at a proportional speed, and with a registering-rim moved by said actuating-pawl and engaged therewith automatically at intervals and for periods which correspond in angular distance with and are proportional to the strain between the driving and the driven members of the dynamometer, and a counter which registers the revolutions of the registering-rim, substantially as described.

401,930. FILTERING APPARATUS. ROBERT COOPER, HERBERT F. CLAYTON, and GEORGE H. HOLDROYD, Huddersfield, England. Filed July 5, 1888. Serial No. 278,144. (No model.) Patented in England Apr. 18, 1888, No. 5,906.



Claim.—1. In a filtering apparatus, one or more perforated tubes, each tube having an exterior covering composed of a filtering medium turned inward over the ends, combined with a tapering nozzle adapted to enter and support one end of the tube, and a tapering plug adapted to enter and support its other end, as and for the purposes described.

2. The combination, in a filtering apparatus, of perforated tubes having rounded or beaded ends, a filtering-cloth wrapped externally on such tubes and having its ends turned inward over such beaded ends and projecting into the tubes, and nozzles and plugs severally projecting into opposite ends of the tubes and holding the tubes to place, all substantially as and for the purposes set forth.

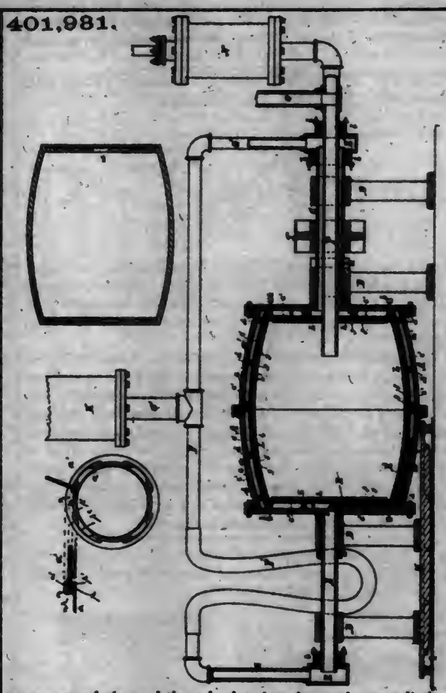
3. In a filtering apparatus, perforated tubes covered externally with filtering-cloth turned at its ends inside said tubes, combined with and supported by tapering plugs and nozzles inserted in the tube end, and elastic packing-rings placed between the ends of the tubes and the said plugs or nozzles to form tight joints and to prevent the cutting of the filtering material, substantially in the manner described.

401,931. MECHANISM FOR THE MANUFACTURE OF BARRELS. WILLIAM H. CRAM, North Windham, Me. Filed July 26, 1888. Serial No. 280,187. (No model.)

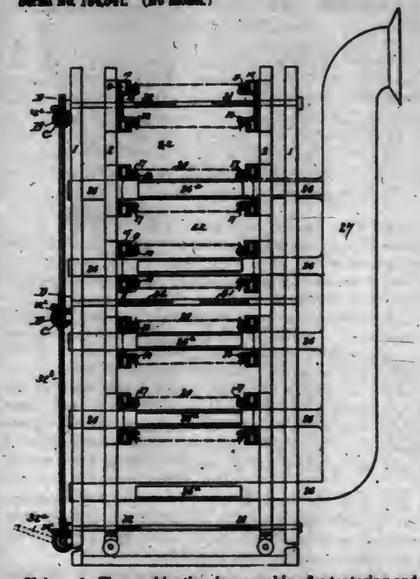
Claim.—1. The mechanism, substantially as described, consisting in the perforated mold and its surrounding case, each made in section separable, and arranged as represented, the tubular shafts projecting from the said case and supported on bearings in standards, the air-exhaust boxes at the outer ends of such shafts, the air-exhaust pump and its pipes leading from such boxes, the railway and carriage for supporting the standards of one of such tubular shafts, the air-pressure pump and pipe, and the pulp-charging pipe, all being arranged to operate essentially as set forth.

2. The combination of the water-discharge pipe with the mechanism, substantially as described, for pressing a barrel in one piece from paper or wood pulp, as explained, such mechanism consisting of the perforated mold and its surrounding case, each made in sections separable, and arranged as represented, the tubular shafts projecting from the said case and supported in bearings on standards, the air-exhaust boxes at the outer ends of such shafts, the air-exhaust pump and its pipes leading from such boxes, the railway and carriage for supporting the standards of one of such tubular shafts, the air-pressure pump and pipe and the pulp-charging pipe, such water-discharge pipe being applied to one of the tubular shafts and extended therefrom down within the space between the next adjacent heads of the case and the mold, as specified.

401,981.



401,982. MACHINE FOR TENTERING AND DRYING FABRICS. FRED. CRAVEN, Brighouse, County of York, England. Filed Dec. 3, 1888. Serial No. 184,541. (No model.)

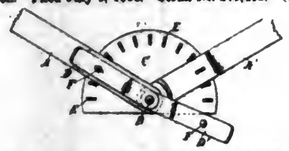


Claim.—1. The combination, in a machine for tentering and drying fabrics, of side frames, a main exhaust-pipe having a series of branch pipes, 26, closed at their outer ends and having elongated slits or air-entrance ways, 26*, steam-pipes 24, and the endless chain 9, having hackle-pins 17, with projecting partition slide-piece 18, all for the purpose and substantially as set forth.

2. In machines for tentering and drying fabrics, the outer frame, the inner adjustable frames, 2, the expansible rollers 3, the chains 9,

supporting-slides 13, having projecting partition-pieces 18, and hackle or tentering pins 17, for the purpose and substantially as set forth herein.

401,933. **FRACTURE APPARATUS.** WILLIAM H. DE CAMP, Grand Rapids, Mich. Filed July 9, 1888. Serial No. 279,463. (No model.)

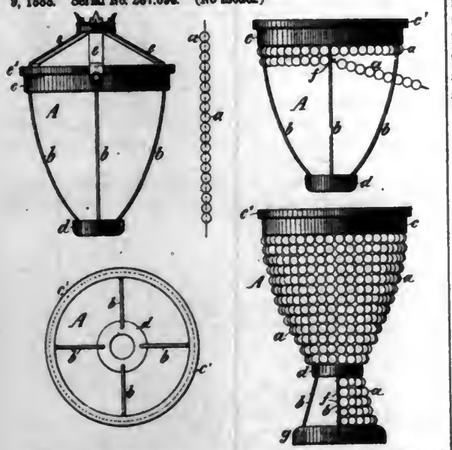


Claim.—1. In combination with surgeons' splints, connecting-bars having a joint, and a disk with its center coincident with the axis of said joint, said bars and disk having openings equidistant from said axis, and stop-pins engaging with said openings, substantially as described.

2. In combination with surgeons' splints, connecting-bars having a joint, auxiliary bars having a similar joint and attached to said connecting-bars, said bars embracing a disk with its axis coincident with that of the said hinges, said bars and disk provided with openings, and stop-pins engaging with said openings, substantially as described.

3. In combination with surgeons' splints, the combination of jointed bars having openings for a stop-pin, a disk with center coincident with the joint of said bars and having corresponding openings for said stop-pin, and a stop-pin attached to a flexible spring pivoted at the center of said disk, substantially as described.

401,934. **GLOBE OR SHADE FOR LAMPS OR LANTERNS.** PAUL R. DE F. D'HUBY, Clapham Rise, County of Surrey, England. Filed Oct. 9, 1888. Serial No. 287,698. (No model.)



Claim.—1. A globe, shade, glass, lamp, or lantern for the electric or other light, consisting of a strong frame or foundation covered with chains of threaded translucent beads or crystals, substantially as herein shown and described.

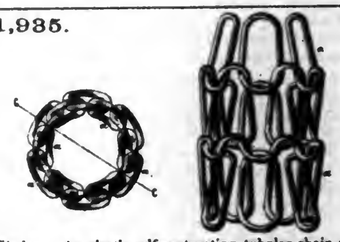
2. A globe, shade, glass, lamp, or lantern for the electric or other light, consisting of a strong frame or foundation and supplemental frames covered with chains of threaded translucent beads or crystals fixed thereto, substantially as herein shown and described.

3. In the manufacture of globes, shades, glasses, lamps, or lanterns for the electric or other light, the combination of a strong frame or foundation with chains of threaded translucent beads or crystals fixed thereto by means of fine binding-wires, and the electroplating process over the metallic parts, substantially as herein shown and described.

4. In a shade for lamps, &c., the combination, with a suitable frame having projections, of a string containing a number of translucent beads, crystals, or equivalent articles wound upon said frame and having the string engaged by said projections.

5. In a shade for lamps, &c., the combination of a suitable frame, a string containing a number of translucent beads or equivalent articles mounted on a stiff core and applied to said frame with the desired bending or curving of said core between parts of the frame, and securing wires by which the said core is bound to the parts of the frame where it crosses the same, substantially as set forth.

401,935. **CHAIN.** WILLIAM C. EDER, Newark, N. J. Filed Jan. 17, 1889. Serial No. 296,652. (No model.)



Claim.—An elastic self-contracting tubular chain composed of elongated links *a a*, that are arranged in spiral order, each link interlocking at each end with two other links and each link being fastened to the links interlocking with it near one end, but free to slide on the links with which it interlocks near the other end, substantially as described.

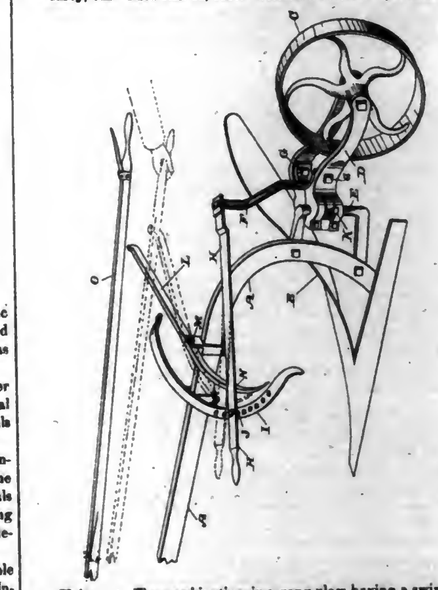
401,936. **ELECTRIC CONDUCTOR.** THOMAS EGLESTON, New York, N. Y., assignor to the Plume & Atwood Manufacturing Company, Waterbury, Conn. Filed June 16, 1885. Serial No. 168,906. (No specimens.)



Claim.—1. A wire or conductor having applied directly to its surface an insulating-covering of fibrous material impregnated with a liquid fireproofing material consisting of a hydrated silicate of an alkali or alkaline earth and a binding material, the impregnated fibrous material forming of itself the insulating-covering for the wire or conductor, substantially as herein described.

2. A wire or conductor having applied directly to its surface an insulating-covering of fibrous material impregnated with a liquid fireproofing material consisting of a hydrated silicate of an alkali or alkaline earth and a binding material, the impregnated fibrous material forming of itself the insulating-covering for the wire or conductor, and also having applied to it an external waterproofing material as a protector to the insulating material, substantially as herein described.

401,937. **GANG-PLOW ATTACHMENT.** EDWARD H. FARMER, Gilroy, Cal. Filed Jan. 11, 1889. Serial No. 296,063. (No model.)

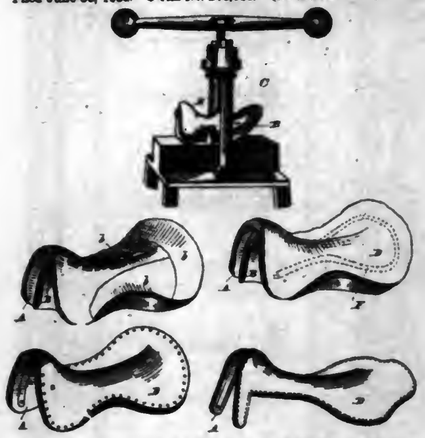


Claim.—1. The combination, in a gang-plow having a swivel rear wheel, of the fork D, the post E, secured to the plow-beam and forming the axis about which the fork turns, the standard F, secured to the fork and connected with the lever N, and the holding-rack, substantially as described.

2. The combination, with a gang-plow and the rear swivel-wheel thereof, of a mechanism whereby the swivel-wheel may be temporarily locked and prevented from turning and released so as to turn freely, and a lever for tripping the locking devices, substantially as described.

3. A gang of plows having the rear wheel swiveled thereto, a lever connected with a swivel-wheel frame, and a rack and locking mechanism for arresting the motion of the swivel-wheel, in combination with a second lever fulcrumed upon the plow-beam, one end extending beneath the swivel-wheel lever and the other beneath the lever O, so as to be actuated thereby, substantially as described.

401,938. **PROCESS OF FORMING FLEXIBLE SADDLE-TREES.** JOHN M. FINK, Louisville, Ky., assignor to Fink & Feldhaus, same place. Filed June 30, 1888. Serial No. 278,618. (No model.)



Claim.—The improved process of forming flexible saddle-trees of layers of leather or other flexible material, consisting in first moistening the layers, then building the saddle-tree from said moistened flexible layers, filling in at proper places with strips *b* to give it the desired shape, placing the cover upon the portion thus formed, then subjecting the tree to pressure between suitable dies, and finally trimming the edges of the layers and strips to the desired shape and size, substantially as specified.

401,939. **FOLDING CARRIAGE.** JOHN F. FLAD, Philadelphia, Pa. Filed Feb. 7, 1889. Serial No. 298,979. (No model.)



Claim.—1. A folding body having axles which are pivoted to said body, and provided with arms which are fitted on rods or guides attached to the body, substantially as described.

2. In a folding carriage, the arms 3, connected with the pivoted axle, the guides 5, attached to the body, said arms adapted to slide on said guides, and the catch 6, engaging with either of said arms, the parts being combined and operating substantially as described.

3. In a folding carriage, the sockets 9 and catch 10, connected with the body thereof, in combination with the handle of the carriage fitted to said sockets and engaged by said catch, substantially as described.

4. In a folding carriage, the springs thereof formed with journals which are mounted on the body thereof, and provided with arms which are connected with rods or guides connected with said body, substantially as described.

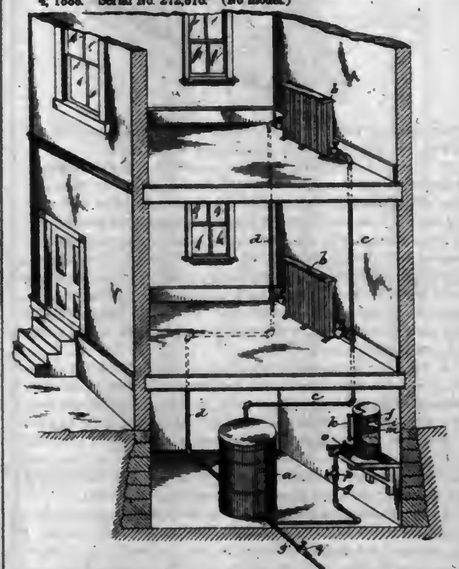
5. A folding carriage having a folding body, a handle and wheels removably connected with said body, folding axles pivoted to said body, arms attached to the axle and engaging with the body, and hooks secured to the body for hanging the wheels and handle thereon, said parts being combined substantially as described.

6. In a folding carriage, a sectional hinged body in combination with a spring-frame having its upper ends bent and forming journals having bearings in the sections of said body, substantially as described.

7. In a folding carriage, a sectional hinged body in combination with a spring-frame having its upper ends bent and forming journals having bearings in the sections of said body, and axles pivotally connected to the said frame, substantially as described.

8. A folding carriage consisting of a hinged sectional body with flexible sides, spring-frame with upper ends bent inwardly forming journals having bearings in the under side of the body, arms rising from the spring-frame and having loops at their upper ends, and rods secured to the sides of the sections of the body and having looped ends forming stops, said parts being combined substantially as and for the purpose set forth.

401,940. **HEATING APPARATUS.** EUGENE N. GATES, Fitchburg, Mass., assignor of one-half to H. F. Cogswell, same place. Filed May 4, 1888. Serial No. 272,810. (No model.)



Claim.—1. The combination, with a water heating and circulating system, of a chamber connected at its lower portion with said system and partly filled with the water of the system, a body of air which is compressed by the water-pressure, and a safety-valve whereby water may be released from the system when the pressure on the air exceeds a predetermined degree, as set forth.

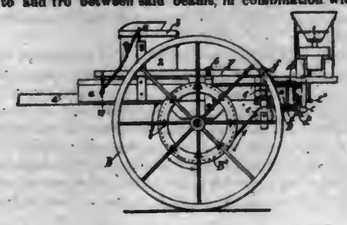
2. The combination, with a water heating and circulating system, of a chamber connected at its lower portion with said system and partly filled with the water of the system, a body of air which is compressed by the water-pressure, and a mobile diaphragm interposed between the air and water in said chamber, as set forth.

3. The combination, with a water heating and circulating system, of a chamber connected at its lower portion with said system and partly filled with the water of said system, a body of air in said chamber supporting the pressure of the water, and a diaphragm of oil supported by the water in the chamber, as and for the purpose specified.

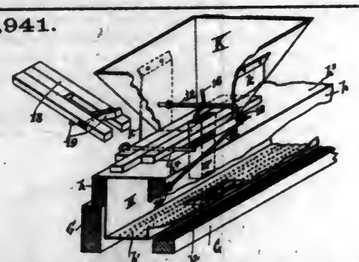
4. The combination, with a water heating and circulating system, of a water-supply pipe, *g'*, connected directly with said system and provided with a shut-off cock, *g*, an air-chamber, *f*, a pipe, *g*, connecting the chamber *f* with the said system, and a shut-off cock, *p*, in the pipe *g*, whereby the air-chamber may be shut off from the water heating and circulating system without interfering with the supply of water thereto by the supply-pipe *g'*.

401,941. **INSECT-POWDER DUSTER.** CHARLES B. GLOVER, Houston, Tex., assignor of one-half to William Owen Ellis, same place. Filed June 25, 1888. Serial No. 278,197. (No model.)

Claim.—1. A device for spreading insect-exterminating powder or distributing other material over a field, mounted on wheels, having on rearward extensions of the truck-frame a transverse sifting-box provided with a foraminous bottom, said box having side cleats resting upon beams, extending crosswise of the truck, and adapted to move to and fro between said beams, in combination with hoppers



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having eduction-spouts passing through ports in the top of the box into and within the sifter-box, substantially as described.

2. In a device for spreading material over a field, mounted upon a propellable truck, to one traction-wheel of which is attached a pulley, B^2, adapted to turn with said wheel, in combination with revoluble shaft C, journaled between beams a^2 a^3, crossing the truck-frame, said shaft having at its rear end a disk-wheel, *c*, provided with an extension-stud, c^2, said wheel B^2 and shaft C geared to rotate at right angles to each other by operative band L, which band intermediately of said shaft and wheel takes onto the grooved peripheries of guide-pulleys d^2 d^3, journaled between upper and lower flanges *d d* of a metal plate, D, connected to the rear end of one side of the truck-frame, substantially as described.

3. In a device for spreading material over a field, having at one of its sides a lever, F, pivoted about midway of its length at 6 to a post uprising from the side of the truck, the forward end of said lever taking onto a fastening device, 10, and having pivoted to its rear end a vertical bar, E', within the lower hooked end of which is journaled a pulley, *e*, all in combination with the gearing of the machine, said gear adapted to be tightened by depression of said lever and released from tension by elevation thereof, substantially as described.

4. In a device for spreading material over a field, the sifter-box H, adjusted to reciprocatingly move transversely across the rear of a propellable truck-frame, said frame having hoppers K, having eduction-spouts extending through port-holes at the top of said box, and having within the mouth of each hopper oscillating stirrer-arms radiating from rods 12, extending within and across each hopper, one end of each rod 12 reaching through one side of each hopper and having a terminal hook, 13, in combination with wire 14, one end of which takes into said hook 13 and the opposite end firmly adjusted to a side, A, of the sifter-box H, whereby, as said box has motion imparted thereto, the stirrer-arms 16 will agitate the contents of each hopper, as and for the purpose intended, substantially as described.

5. In a device for spreading material over a field, having rearwardly of a propellable truck a sifter, H, movable transversely on said truck, provided with feed-hoppers K, the trap-cover shown and described, consisting of a bifurcated strip, 18, having pivoted within its forked opening a tongue, 19, in combination with said hoppers K and sifter H, as and for the purpose intended, substantially as described.

6. In a machine for distributing material over a field, provided with a sifter-box, H, the rotatable disk *c*, having a forward hub, c', extended upon the rear end of a rotatable shaft, C, in combination with pitman-rod 20, one end of which is pivoted to a stud, c^2, extending outwardly from the disk *c* and eccentric from the center of said disk, the opposite end of said pitman being attached to the bottom of the sifter-box H, whereby, when the shaft C is rotated, said box will be reciprocatingly moved transversely across the truck-frame, substantially as described.

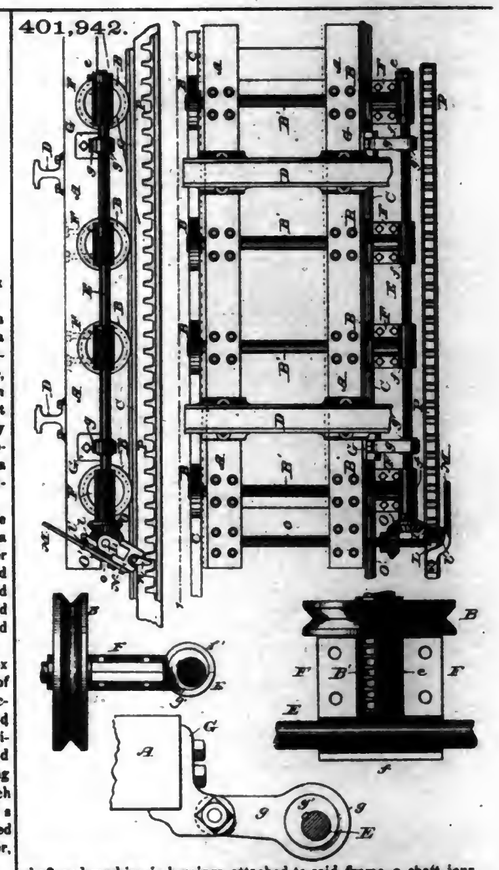
401,942. OFFSET MECHANISM FOR SAW-MILL CARRIAGES. WILLIAM GOWEN, WARREN, Wis. Filed Oct. 5, 1886. Serial No. 215,461. (No model.)

Claim.—1. The combination, in a saw-mill carriage, of a log-frame movable laterally upon its supporting-axles, one set of boxes connected with said log-frame, another set of boxes connected with its axles, a shaft supported lengthwise of said carriage in one set of boxes, eccentrics fixed upon said shaft and working in the other set of boxes, and means for turning the eccentric-shaft, whereby said frame is moved lengthwise of said axles, substantially as and for the purposes set forth.

2. The combination, in a saw-mill carriage, of a log-frame movable laterally upon its supporting-axles, a shaft journaled lengthwise of said carriage in cross-boxes mounted upon said axles, eccentrics fixed upon said shaft, straps or links hinged to said log-frame and working with the peripheries of said eccentrics, and means for turning said eccentric-shaft, substantially as and for the purposes set forth.

3. The combination, in a saw-mill carriage, of a log-frame movable laterally upon its supporting-axles, of a shaft supported in suitable bearings lengthwise of the carriage, eccentrics fixed upon said

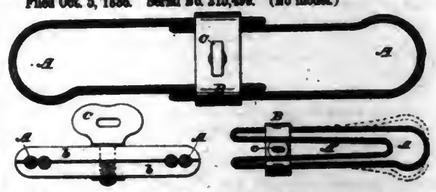
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shaft and working in bearings attached to said frame, a shaft journaled transversely to the carriage and geared with the eccentric-shaft, and an arm or lever attached to said transverse shaft, substantially as and for the purposes set forth.

4. The combination, in a saw-mill carriage, of a log-frame movable laterally upon its supporting-axles, eccentrics mounted upon a shaft set lengthwise of said carriage and working in bearings attached to said frame, a transverse shaft geared with said eccentric-shaft, and an arm mounted upon said transverse shaft and working in the direction of the travel of the carriage, and a rack or rail to actuate said eccentrics and move said log-frame lengthwise of its axles, substantially as and for the purposes set forth.

401,943. GARMENT-HANGER. WILLIAM GOWEN, WARREN, Wis. Filed Oct. 5, 1886. Serial No. 215,499. (No model.)

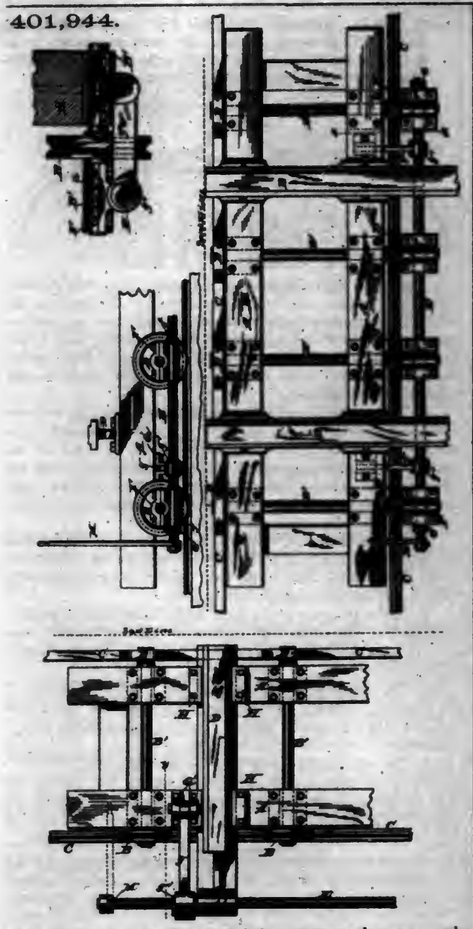


Claim.—The combination, in a garment-hanger, of a central supporting-clamp composed of two sections, a screw connecting said sections, and two arms held between the sections of said clamp and longitudinally adjustable therein, substantially as and for the purposes set forth.

401,944. OFFSETTING DEVICE FOR SAW-MILL CARRIAGES. WILLIAM GOWEN, WARREN, Wis. Filed Dec. 27, 1886. Serial No. 222,607. (No model.)

Claim.—The combination, in a saw-mill carriage, with a guiding-track, of a log-supporting frame, and its wheels and axles having a fixed position transversely to said track, cross-boxes mounted upon

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said axles and restrained from endwise movement thereon, a rock-shaft journaled lengthwise of said carriage in said cross-boxes and connected with said log-supporting frame, and a lever connected with said rock-shaft and arranged to turn the same and to move said log-supporting frame transversely with reference to the track upon which the carriage travels, substantially as and for the purposes set forth.

401,945. OFFSETTING DEVICE FOR SAW-MILL CARRIAGES. WILLIAM GOWEN, WARREN, Wis. Filed Jan. 18, 1887. Serial No. 224,704. (No model.)

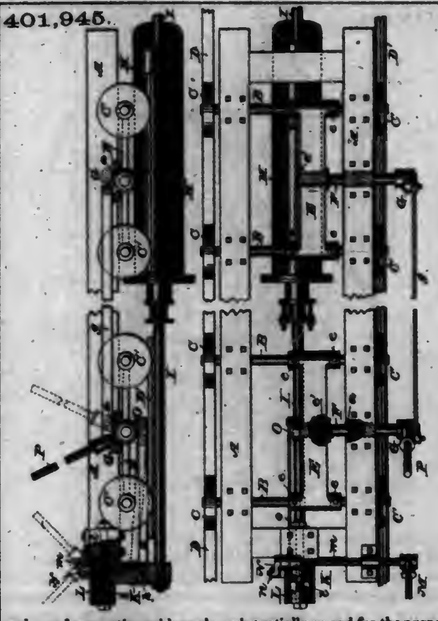
Claim.—1. The combination, in a saw-mill, with a carriage having a log-supporting frame laterally movable upon its axles, of a yoke mounted and laterally immovable upon its axles, offsetting mechanism connecting said frame and yoke, a crank connected with and arranged to operate said offsetting mechanism, and a carriage-feeding piston having a sliding connection with said frame and connected with said crank, substantially as and for the purposes set forth.

2. The combination, in a saw-mill, of a carriage having a log-supporting frame laterally movable upon its wheels and axles, offsetting mechanism connecting said frame with said axles and wheels, a carriage-feeding piston having a sliding connection with said frame, and a detachable connection with said offsetting mechanism, substantially as and for the purposes set forth.

3. The combination, in a saw-mill, with a carriage having a log-supporting frame laterally movable on its wheels and axles, of a yoke mounted upon two or more of said axles and laterally immovable thereon, and a screw-shaft connecting said frame and yoke and arranged to shift said frame laterally upon its axles, substantially as and for the purposes set forth.

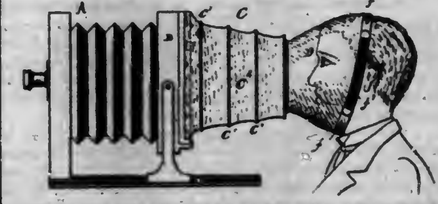
4. The combination, in a saw-mill, with a carriage having a log-supporting frame laterally movable on its wheels and axles, of yokes, each mounted upon two or more of said axles and laterally immovable thereon, screw-shafts connecting said yokes with the log-frame,

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and a rod connecting said cranks, substantially as and for the purposes set forth.

401,946. PHOTOGRAPHIC CAMERA. ROBERT HACKH, New York, N. Y. Filed Sept. 6, 1886. Serial No. 214,715. (No model.)



Claim.—1. A focusing-cloth attachment for photographic cameras, formed of a folding body and of a folding hood or head-piece applied to said body and provided with straps for attaching it to the head, substantially as set forth.

2. The combination, in a photographic camera, with a focusing-frame, of a focusing-cloth attachment composed of a folding body and a cap or head-piece adapted to turn on said body, substantially as set forth.

3. In a photographic camera, the combination, with a focusing-frame, of a folding body formed of wire frames of diminishing size and a connecting-fabric, and a ring-shaped guide-frame connected to the outermost wire frame, and a cap or head-piece connected to said guide-frame and provided with straps for attachment to the head, substantially as set forth.

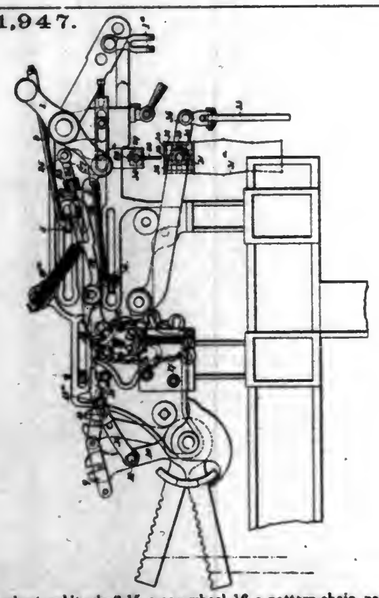
401,947. SHEDDING MECHANISM FOR LOOMS. CHARLES HAMLO, CHARLES R. LUMBROSO, and THEOPHILUS HANSON, Bradford, County of York, England. Filed May 8, 1888. Serial No. 273,942. (No model.) Patented in England June 1, 1887, No. 7,917.

Brief.—The pattern-chain and its described connections act to shift the needle-carrying bar laterally, and in this way the needles may be presented to any one of several series of holes provided in the pattern-cards, thus effecting a reduction in the number of cards required in the formation of any particular pattern.

Claim.—1. In a pattern mechanism for looms, the combination, with a heald-lever, 10, of a pawl, 11^a, operated thereby, shaft 15, star-wheel 14, cog-wheel 16, a pattern-chain, 17, a spring, 18, bearing on said chain, a pivoted lever, 19, supporting the spring 18, pattern-pins, a rock-shaft, 25, connections therefrom to the pattern-pins, and connections from the said rock-shaft to the pivoted lever 19, substantially as described.

2. In combination with a heald-lever and arm, 11, a pawl, 11^a, adjustably secured to said arm, means for effecting said adjustment,

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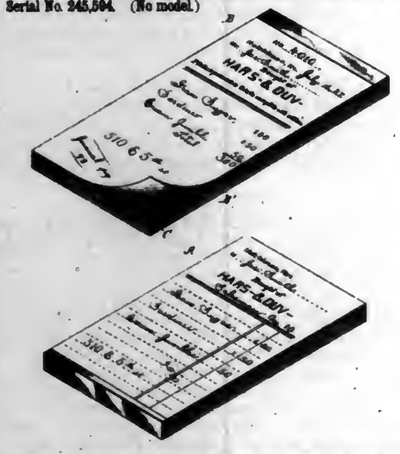


a star-wheel and its shaft 15, a cog-wheel, 16, a pattern-chain, pattern-pins, and connections between the pattern chain and pins, consisting of a pivoted lever, 19, in connection with the pattern-chain at one end, and a rock-shaft, 25, in connection with the pivoted lever 19, and a connection between the shaft 25 and the pattern-pins, consisting of the arms 27 and bar 29, substantially as described.

3. The combination, with the card-barrel, of the pattern-pins 28, a swinging frame carrying said pins, a pattern-chain, and connections therefrom to the pins, consisting of the spring 18, operated by the pattern-chain, and a shaft, 25, rocked by the movement of the spring 18, and intermediate connections, substantially as described, between said spring and shaft, the swinging frame carrying the pins being mounted on the shaft 25, substantially as described.

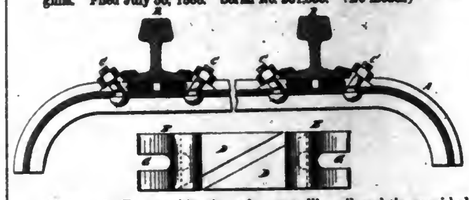
4. The combination, with a heald-lever, of the arm 11 and its attached adjustable pawl 11^a, star-wheel 14, cog-wheel 16, tappet-chain 17, blade-spring 18, pivoted and slotted lever 19, rod 22, arm 24, shaft 25, pendent arms 27, pivoted bar 29, pattern-pins 28, and barrel 31, substantially as described, and for the purposes set forth.

401,948. COMBINED RECORD AND SALES BOOK. JOHN P. HARSHA and CLAUDE DUVAL, Hutchinson, Kans. Filed July 29, 1887. Serial No. 245,594. (No model.)



Claim.—The combination of the tab or scratch-ticket book A, as described, with an auxiliary co-operative book that is numbered for purposes of identification and comprising a series of leaves detachably bound together at one end or side, and a carbon sheet detachably located between contiguous leaves of said auxiliary book, as set forth.

401,949. METALLIC RAILROAD-TIE. ARTHUR J. HARTFORD, New York, N. Y., assignor, by direct and mesne assignments, to the A. J. Hartford Steel Railway Tie Manufacturing Company, of West Virginia. Filed July 30, 1888. Serial No. 281,355. (No model.)



Claim.—1. The combination of a metallic railroad-tie provided with two rail-holding clips adjustable laterally of the length of the rail, thereby adjusting the rail upon the tie, and two screws, one engaging with each of said rail-holding clips, and serving, by the rotation upon the screw-thread, to draw said clips laterally tightly against the said rail, as well as to hold the clip vertically against the rail, substantially as described.

2. The combination of a metallic railroad-tie provided with two rail-holding clips adjustable laterally of the length of the rail, and a rail held within said clips, thereby adjusting the rail upon the tie, and two screws, one engaging with each of said rail-holding clips, and serving, by the rotation upon the screw-thread, to draw said clips laterally tightly against the said rail, as well as to hold the clip vertically against the rail, substantially as described.

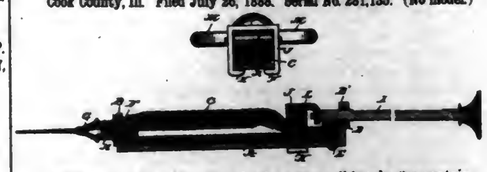
3. The combination of the rail R, the metallic tie A, the clips D D, the bolts C C, and slots G G, whereby the rail can be laterally adjusted upon the tie, while at the same time it is locked in position when so adjusted, substantially as described.

4. The combination of the tie A, having longitudinal channel B, the clips D D, each capable of longitudinal adjustment in said channel, and bolts, as C C, for locking said clips when adjusted, substantially as described.

5. The combination of the tie A, having longitudinal channel B, the clips D D, resting in said longitudinal channel and having slots G G, the bolts C C, passing through the tie and through the slots G, and the rail R, substantially as described.

6. The combination of the tie A, having longitudinal channel B, the clips D D, resting in said longitudinal channel and having slots G G, the bolts C C, having their heads at an angle to the axis of the bolts, and passing through the tie and through the slots G, and the rail R, substantially as described.

401,950. HYPODERMIC SYRINGE. HERMANN HAUSMANN, Chicago, assignor of two-thirds to Sola B. Dunn and James C. McComb, Cook County, Ill. Filed July 26, 1888. Serial No. 281,135. (No model.)



Claim.—1. In a syringe, an elastic compressible tube for containing the injecting-fluid, in combination with mechanism for compressing said tube, substantially as described.

2. In a syringe, a compressible tube for containing the fluid, in combination with a reciprocating roller for compressing said tube, substantially as described.

3. In a syringe, a compressible tube for containing the fluid, in combination with a reciprocating carriage, a roller mounted therein and compressing said tube, and a piston-rod for reciprocating said carriage, substantially as described.

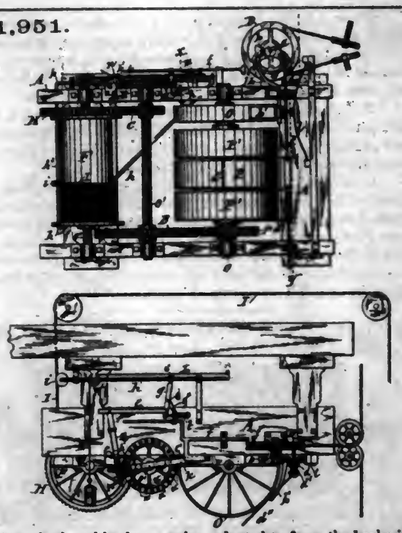
4. In a syringe, the frame-plate provided with the upturned ends, a compressible tube rigidly secured at one end to said plate, a nipple working through one end of said frame, upon which the opposite end of said tube is sleeved, the angular carriage, a sliding connection between said carriage and frame, a roller mounted in said carriage for compressing said tube, and a piston-rod working loosely through the other upturned end of said frame and secured to said carriage, substantially as described.

5. In a syringe, a compressible tube for containing the liquid, composed of elastic material and having a wrapping or covering of textile fabric, in combination with a reciprocating roller for compressing said tube, substantially as described.

401,951. BELT-SHIPPER FOR ELEVATORS. EDGAR W. HOUSER, Syracuse, N. Y. Filed Jan. 30, 1888. Serial No. 262,096. (No model.)

Claim.—1. In combination with the hoisting mechanism, belt-

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shipping wheel, and brake, a spring adapted to force the brake into its operative position, a lever adapted to force the brake out of its operative position, and a cam turning with the belt-shipping wheel and actuating the brake-lever in opposition to the aforesaid spring, substantially as described and shown.

2. The combination, with the hoisting mechanism, belt-shipper, brake, and hoisting-cable, of a spring adapted to force the brake into operative position, a cam operating in unison with the belt-shipper and adapted to hold the brake out of operative position, a wheel moving in unison with the hoisting mechanism and provided with a series of catches, a push-bar adapted to engage said catches, and a rod arranged to transmit motion from the aforesaid wheel to the belt-shipper, substantially as set forth.

3. In combination with the hoisting mechanism, hoisting-cable I, and belt-shipping wheel D, the frame *h*, arranged movably at right angles to the travel of the cable and formed with the shaft *h'* parallel with the axis of the cable-drum, the roller *i*, pivoted to and adapted to slide longitudinally on the shaft *h'*, a weight or spring forcing the frame *h* toward the cable, the wheel *u*, moving in unison with the hoisting mechanism and provided with a series of catches, levers actuated by the frame *h* and adapted to throw the push-bar out of engagement with the wheel *u*, and a rod transmitting motion from the push-bar to the belt-shipping wheel, as set forth.

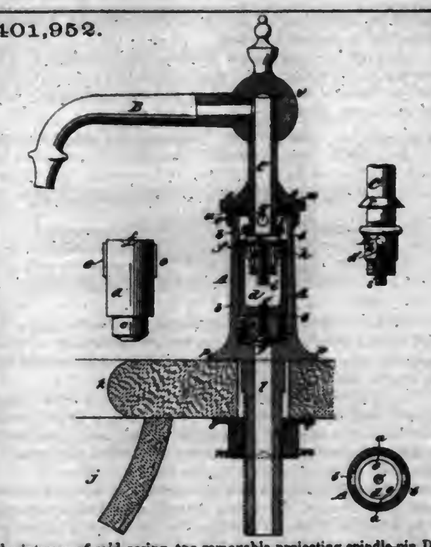
4. In combination with the hoisting mechanism, hoisting-cable, belt-shipping wheel D, and brake, a spring adapted to force the brake into its operative position, the cam *a*, rigidly attached to said wheel, the brake-lever *b*, pivoted to the stationary frame and having one end engaging said cam and its opposite end connected with the brake, the wheel *u*, moving with the hoisting mechanism and provided with a series of catches, a push-bar adapted to engage said catches, a spring pressing the push-bar into engagement with the catches, cams arranged to throw the push-bar out of said engagement at the ends of the strokes, the frame *h*, arranged movably at a right angle to the travel of the cable and formed with the shaft *h'*, parallel with the axis of the cable-drum, the roller *i*, pivoted to the shaft *h'* and adapted to slide longitudinally thereon, a weight or spring forcing the frame *h* toward the cable, the collar *v*, attached to the frame *h*, the lever *g*, held in engagement with said collar, the lever *n*, actuated by the lever *g* and provided with the catch *n'*, adapted to support the free end of the push-bar *h'*, and the rod *f*, transmitting motion from the push-bar to the shipping-wheel D, substantially as described and shown.

401,952. BASIN-FAUCET. BERNARD JOHNSON, New York, N. Y. Filed June 28, 1888. Serial No. 278,411. (No model.)

Claim.—1. In a swing basin-faucet, the combination, with the discharge-tube spindle and the plunger-valve, of the removable transverse projecting spindle-pin for closing the valve, an adjusting-nut and thread on said spindle for regulating the distance of said pin from the end of the spindle, and a clamp-screw for securing the pin when adjusted, substantially as described.

2. In a swing basin-faucet, the combination, with the cylindrical valve-casing A, having guide-grooves *a* and water-ways *b*, the elastic valve *c*, and the plunger *d*, to which it is attached, the latter having wings *e* to enter the said guide-grooves *a*, and having a notch, *f*, in one side only of its rim, of the discharge-tube B and the spindle C thereof, the latter having an opening, *g*, connecting its interior with

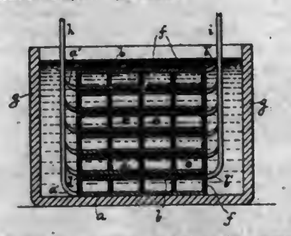
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the interior of said casing, the removable projecting spindle-pin D to ride around the rim of the plunger and enter the notch *f* thereof, the adjusting-nut *h*, for regulating the distance of said pin D from the end of the spindle, and clamp-screw *i*, for securing the pin when adjusted, substantially as described.

3. In a faucet, the combination, with a hollow spindle, of a discharge-tube and a joining-globe, with which said spindle and discharge-tube are connected by means of screw-threads, the discharge-tube when in place acting as a stop to prevent the rotation of the spindle within the joining-globe, substantially as specified.

401,953. SECONDARY BATTERY. WILLIAM P. KOOKOGEY, Brooklyn, N. Y., assignor to the Kookogey Electric Company. Filed Jan. 28, 1889. Serial No. 297,801. (No model.)



Claim.—1. A storage-battery consisting of a receptacle for containing the electrolyte and a series of pairs of positive and negative plates placed horizontally therein, each pair consisting of a positive and a negative plate placed together with insulating material between them, and the positive plate of each of these pairs being placed on top, substantially as and for the purpose described.

2. In a storage-battery, the combination of a positive plate, a negative plate, and a grid or net-work of low-conducting material placed between them and dividing each of them into isolated sections, substantially as and for the purpose described.

3. A storage-battery consisting of a receptacle containing the electrolyte, a series of pairs of positive and negative plates placed horizontally therein, each pair consisting of a positive and a negative plate placed together with insulating material between them, and the positive plate of each pair being placed on top, and a grid or net-work of low-conducting material placed between the successive pairs and dividing the exposed surfaces of the plates into isolated sections, substantially as and for the purpose described.

4. A storage-battery consisting of a receptacle for containing the electrolyte and a series of pairs of positive and negative plates placed horizontally therein, each pair consisting of a positive and a negative plate placed together with insulating material between them, substantially as and for the purpose described.

5. A storage-battery consisting of a receptacle for containing the electrolyte and a series of pairs of positive and negative plates, each pair consisting of a positive and a negative plate placed together with insulating material between them, and the several pairs being laid horizontally and resting by gravity upon strips of insulating or low-

conducting material placed between the successive pairs, substantially as and for the purpose described.

6. A storage-battery plate consisting (before reduction) of two sheets of lead in contact with a sheet of insulating material which lies between them and insulates them from each other, substantially as and for the purpose described.

401,954. PUMP-BUCKET. CHARLES LA DOW, Albany, N. Y. Filed Nov. 7, 1887. Serial No. 254,456. (No model.)



Claim.—1. A bucket or cup comprising a bottom or base or support and side walls composed of a series of superimposed vertically-separable layers of metal resting successively upon each other and upon the bottom, substantially as described.

2. A bucket or cup whose walls are composed of a series of superimposed vertically-separable layers of metal, with a bottom or base provided with or attached to a suitable support, said layers resting successively upon each other and upon the bottom, substantially as described.

3. A bucket constructed and composed of a series of superimposed layers of metal, which form the walls, and which are separable in the direction of the axis of the bucket, and a base or bottom provided with means for attaching it to a rod or chain and serving as a support for the walls, substantially as and for the purpose described.

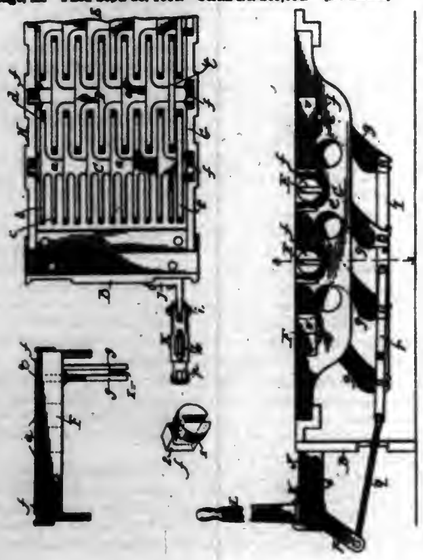
4. A bucket constructed and composed of a series of superimposed layers of metal, which form the walls, and which are separable in the direction of the axis of the bucket, and which are laterally expansible, and a base or bottom provided with means for attaching it to a rod or chain and serving as a support for the walls, substantially as and for the purpose described.

5. A bucket comprising a bottom or base provided with means for attaching it to a rod or chain and side walls composed of a series of superimposed layers of metal which overlap so as to be capable of lateral expansion, said layers being also separable in the direction of the axis of the bucket, substantially as and for the purpose described.

6. A pump-bucket whose walls are composed of a series of metal coils, the lower coil being connected with and supported by a socket adapted to be connected to a pump rod or chain, substantially as and for the purpose described.

7. A pump-bucket formed of superimposed coils of metal which gradually diminish in diameter toward the bottom, the lower coils forming a socket for the reception of a pump rod or chain, substantially as shown and described.

401,955. GRATE FOR FURNACES. WILLIAM H. LANHAM, Chicago, Ill. Filed Sept. 20, 1888. Serial No. 286,061. (No model.)

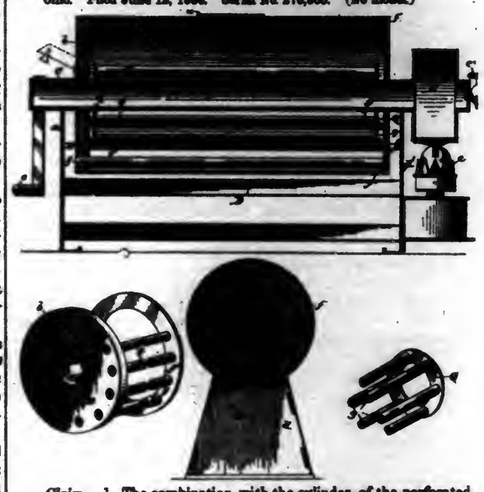


Claim.—1. The combination of the bracket J, provided with a notch, *j*, head K, provided with a socket to receive a lever, a sliding bolt located in the head K and provided with a socket, *l*, the end walls of which are inclined, as shown, and the lever L, formed with the notch *k*, substantially as and for the purpose specified.

2. In combination with the head K, having a socket, *l*, a sliding bolt located in the head and having a socket, *l*, the end walls of which are inclined, as shown, and a lever, L, provided with a notch, *k*, substantially as and for the purpose specified.

3. In a furnace, a series of grate-sections, each consisting of a series of finger-bars supported by a bar, F, in combination with a frame having circular recesses, as *e*, in the sides thereof, in which the bars F are supported, and guides *f*, one on each end of each bar F, said guides having slots in them open at their under side to receive the supporting-bars and allow the same to project below them, substantially as and for the purposes specified.

401,956. WASHING-MACHINE. WILLIAM S. LAMEY, Lithopolis, Ohio. Filed June 12, 1888. Serial No. 276,805. (No model.)



Claim.—1. The combination, with the cylinder, of the perforated steam-pipe passing through the cylinder and journaled at its ends and the steam-generating drum mounted wholly and entirely on one end of the said steam-pipe and communicating therewith, the said drum and pipe revolving together, substantially as hereinbefore set forth.

2. In a washing-machine, the combination of the cylinder having a door in its side, the heads closing the ends of the cylinder, one head having a door, the ring, as *f'*, and the rubbing-bars having their ends fitted in the head and in the ring *f'* at the end of the cylinder opposite the said head, substantially as described.

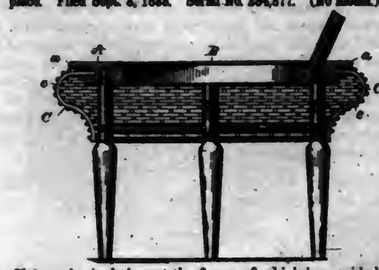
3. The herein shown and described washing-machine, composed of the stand, the cylinder having rubbing-bars which are supported at their ends in the cylinder-heads, the perforated steam-pipe passing through the cylinder and having its ends journaled in the stand, and the steam-generating drum mounted wholly on the steam-pipe and communicating therewith and revolving with the cylinder and steam-pipe, substantially as and for the purpose described.

401,957. HAME-TUG. LOUIS LATIL, Baton Rouge, La. Filed Oct. 8, 1888. Serial No. 287,490. (No model.)



Claim.—The herein-described hame-tug having the body portion provided with the pivoted hook a^2, and the loop B, made integral with said body portion, and the integral inwardly-bent cross-bar a^3, provided with the hinged tongue a^4, whereby when the trace is in position the upper surface of the sides of the buckle will be in the same plane with the under face of the rear portion of the trace, substantially as specified.

401,958. REED OR RATTAN CHAIR, &c. HENRY T. LEAVIS, Wakefield, Mass., assignor to the Wakefield Rattan Company, same place. Filed Sept. 8, 1888. Serial No. 284,877. (No model.)

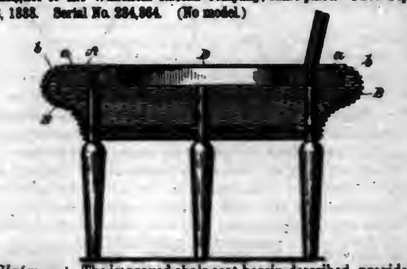


Claim.—1. A chair-seat the frame of which is provided with an outwardly-extending projection and a border or curtain attached thereto below said projection, substantially as described.

2. A chair-seat the frame of which is provided with an outwardly-extending projection and a woven reed or rattan border or curtain the base or warp strands of which are attached to said seat-frame beneath said projection, substantially as described.

3. A chair-seat the frame of which is provided with an outwardly-extending projection, a woven rattan border or curtain the base or warp strands of which are attached to said seat-frame beneath said projection, and a securing-strip for the same, substantially as described.

401,959. REED CHAIR, &c. JOHN LEHMAN, Wakefield, Mass., assignor to the Wakefield Rattan Company, same place. Filed Sept. 8, 1888. Serial No. 284,964. (No model.)

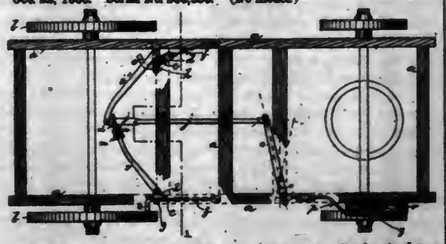


Claim.—1. The improved chair-seat herein described, provided with a woven border or curtain, the warp-pieces of which are secured to the seat-supporting frame below the upper surface of the same, the whole of said border or curtain being below the upper face of the seat-frame.

2. The herein-described chair-seat, provided with a woven border or curtain, the warp-pieces of which are secured to the seat-supporting frame below the upper surface of the same, and a securing-piece for said warp-pieces, the whole of said border or curtain being below the upper face of the seat-frame.

3. The combination, with a seat and its supporting-frame provided with a rabbet on the outer edge of the same, of a border or curtain, the warp-strands of which are secured to said frame and at an angle to the vertical wall of said notch, the whole of said border or curtain being below the upper surface of the seat-frame, substantially as described.

401,960. VEHICLE-BRAKE. JOHN W. MARTIN, St. Louis, Mo., assignor to the St. Louis Dead Lock Brake Company, of Illinois. Filed Oct. 22, 1888. Serial No. 288,830. (No model.)



Claim.—1. In a wagon-brake, the combination of a hooked bar having a longitudinal slot and pivoted to a lever hinged to the wagon-bed, and a chain connecting the hooked bar to the wagon-bed, with mechanism for moving the said lever in the direction of the wheels, substantially as described.

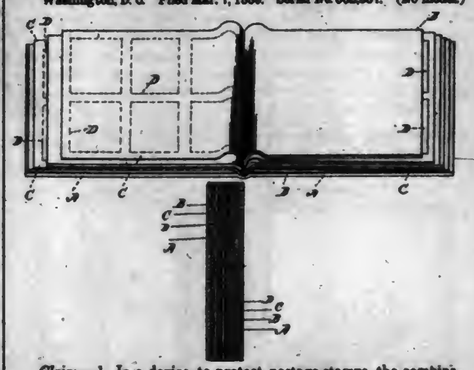
2. In a wagon-brake, the combination of hooked bars having longitudinal slots and pivoted to levers hinged to the bed, and chains connecting the hooked bars to the wagon-bed, with mechanism for moving the said levers in the direction of the wheels, substantially as shown, and for the purpose described.

3. In a wagon-brake, the combination of hooked bars having longitudinal slots and pivoted to levers hinged to the wagon-bed, chains connecting the hooked bars to the wagon-bed, and arms fulcrumed to the said levers and inclined transversely beneath the wagon-bed, with mechanism for vibrating said arms, substantially as shown, and for the purpose described.

4. In a wagon-brake, the combination of hooked bars having longitudinal slots and pivoted to levers hinged to the wagon-bed, chains connecting the hooked bars to the wagon-bed, arms fulcrumed to the said levers and inclined transversely beneath the wagon-bed, and a rod coupled to said arms, one of which is slotted and provided with a spring device for rendering it adjustable endwise with said rod, with means for moving the rod longitudinally beneath the wagon-bed, substantially as shown, and for the purpose described.

5. In a wagon-brake, the combination of the hooked bar *c*, having longitudinal slot *d* and pivoted lever *h*, chain *f*, arm *i'*, and rod *j*, with mechanism for moving said rod longitudinally beneath the wagon-bed *a*, substantially as described.

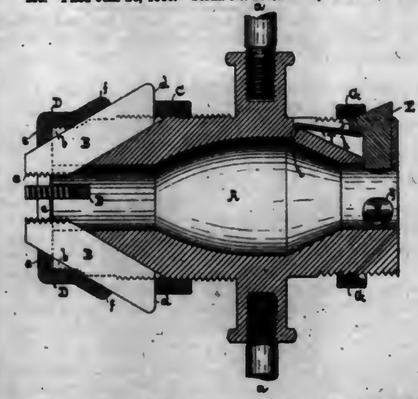
401,961. DEVICE FOR PROTECTING POSTAGE-STAMPS. HIRAM R. MCCALMONT, Warren, Pa., assignor of one-half to William J. Johnston, Washington, D. C. Filed Mar. 7, 1888. Serial No. 302,357. (No model.)



Claim.—1. In a device to protect postage-stamps, the combination, with a thin sheet of tissue paper, thin fabric, or their equivalents, to which the stamps are to be gummed, of one or more sheets of thicker absorbent paper or material, arranged substantially as and for the purpose described.

2. As a new article of manufacture, a stamp-protector consisting of a series of sheets of tissue-paper, thin fabric, or their equivalents, to which the stamps are to be gummed, and interposed alternately between a series of sheets of blotting-paper and a pair of inclosing-covers of pasteboard, wood, or other suitable substance, all combined or arranged substantially as and for the purpose described.

401,962. THREAD-CUTTING DIE. JOHN E. MCCANNA, Baltimore, Md. Filed Jan. 26, 1889. Serial No. 297,607. (No model.)



Claim.—1. In a thread-cutting tool, the stock provided with angularly-placed slots and threading-cutters seated in said slots, com-

bined with a cap having an angular face adapted to fit against the outer surface of the said cutters, substantially as and for the purpose specified.

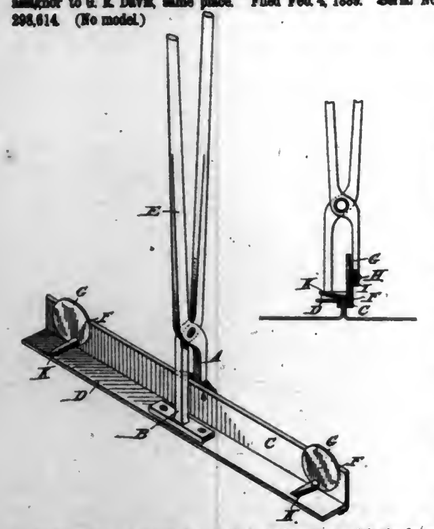
2. In a thread-cutting tool, the stock thereof provided with a series of angularly-placed thread-cutting blades seated in slots, combined with a cap having an angular face which bears against the said blades and an adjusting-nut to clamp the same, substantially as and for the purpose specified.

3. In a thread-cutting tool, the stock thereof having a series of centering-bolts with inclined outer ends, combined with a nut with an inclined inner face which fits over the said ends and springs to hold the said bolts out and against the said nut, substantially as and for the purpose specified.

4. In combination with the stock A, having the radially-placed holes *g*, the bolts E, having the projections *j*, springs F, and nut G, screwed on the outside of the said stock, substantially as and for the purpose specified.

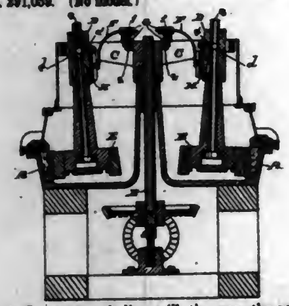
5. In a thread-cutting tool, the stock exteriorly threaded and provided with angularly-placed slots, combined with a cap having an angular inner face, screwed on the stock, and threading-cutters seated in the slots in the stock, with their outer inclined edges in contact with the inner face of the cap and their threading ends projecting through the cap, substantially as and for the purpose specified.

401,963. ROOFING-TONGS. ROBERT B. MCCONNELL, Paducah, Ky., assignor to S. R. Davis, same place. Filed Feb. 4, 1889. Serial No. 298,614. (No model.)



Claim.—In a gripping device, the combination, with the lower blade having circular recesses formed therein and gage-plates having an eccentric projection adjustably secured therein, of an upper blade adapted to engage said lower blade, substantially as shown and described.

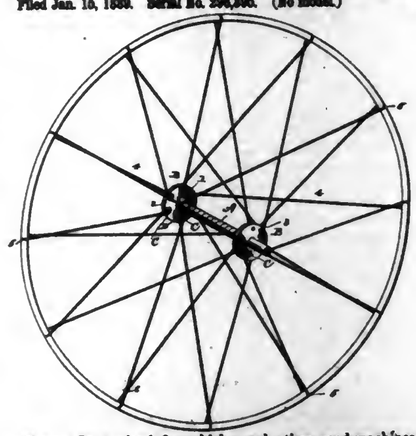
401,964. ORE-GRINDING MILL. JOSEPH MCKENZIE, El Dorado Co., assignor to De Witt C. Morgan, same place. Filed Nov. 16, 1888. Serial No. 291,069. (No model.)



Claim.—1. In an ore grinding mill, the pan, the rotating driver having the pivoted hangers and the series of centrifugally-swinging rollers suspended from said hangers, in combination with springs secured by one end to the driver and having a wearing-knob on the other and the wearing-plates secured to the pivoted hangers and having grooved faces in which the wearing-knobs of the springs are fitted and play, substantially as herein described.

2. In an ore-grinding mill, the pan, the rotating driver having the pivoted hangers, and the series of centrifugally-swinging rollers suspended from said hangers, in combination with the springs acting to throw the rollers outwardly, the grooved and slotted castings on the driver to which the inner ends of the springs are fitted, and the bolts adjustably securing said ends to the castings, the grooved wearing-plates secured to the pivoted hangers, and the wearing-knobs on the outer ends of the springs fitted to and playing in the grooved wearing-plates, substantially as herein described.

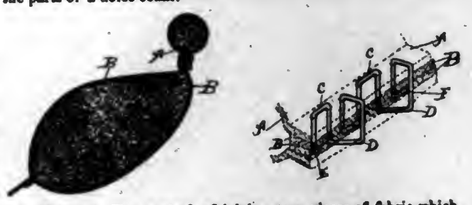
401,965. VEHICLE-WHEEL. JOHN HIPP, Jr., New Castle, Ind. Filed Jan. 16, 1889. Serial No. 296,895. (No model.)



Claim.—In a wheel for vehicles and other road-machines, the combination of the axle carrying a stationary and an adjustable hub, studs on the said hubs, a tire having transverse grooves or channels in its periphery, a continuous wire passing around the studs and resting in the grooves or channels in the tire, strengthening-wires at the points where the wires cross each other near the tire, and a jam-nut on the axle for adjusting the said wires, substantially as described.

401,966. METHOD OF SEWING. ANDREW ORTMAYER, Chicago, Ill., assignor to A. Ortmayer & Son, same place. Filed Jan. 2, 1889. Serial No. 295,945. (No model.)

Brief.—This method is particularly applicable to sewing together the parts of a horse-collar.



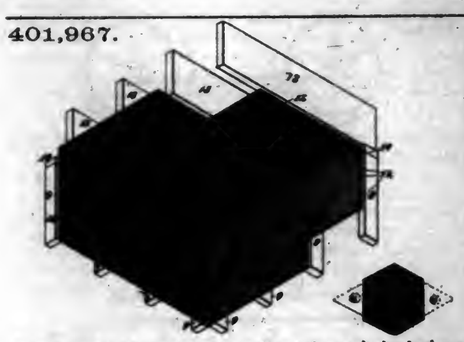
Claim.—1. The method of joining two pieces of fabric which consists in placing the edges of one piece within the edges of the other in passing a thread or thong first through all the thicknesses of fabric to be joined, then carrying it along substantially parallel to the edges of the fabrics and passing it again through all the thicknesses, then carrying it obliquely to the edges of the outer piece, then through the thicknesses of the inner piece, then back and through all the thicknesses, as before, and so on, alternately, whereby the fabrics are firmly bound together, substantially as described.

2. The method of joining the rim of a horse-collar to the shoulder thereof, which consists in placing the edges of the shoulder within the edges of the rim, then passing a thread or thong through all the thicknesses of rim and shoulder, carrying it along substantially parallel to the rim, and again passing it through all the thicknesses, then carrying it obliquely to the edges of the rim, passing it through the thicknesses of the shoulder only, carrying it obliquely back and passing it through all the thicknesses, as before, and so on in alternation, whereby the rim and shoulder are held firmly together and the edges of the former prevented from being torn, substantially as described.

401,967. FIRE-PROOF PLASTER-CLOTH FOR CEILINGS AND WALLS. ALFRED J. PARR, St. Louis, Mo. Filed Feb. 27, 1889. Serial No. 301,379. (No specimens.)

Claim.—1. In fire-proof plaster-blocks for ceilings and walls, &c.,

401,967.



the combination of the plaster layer 8, and the enveloping burlap or other fiber layers and folds that entirely inclose it, substantially as described, and for the purpose set forth.

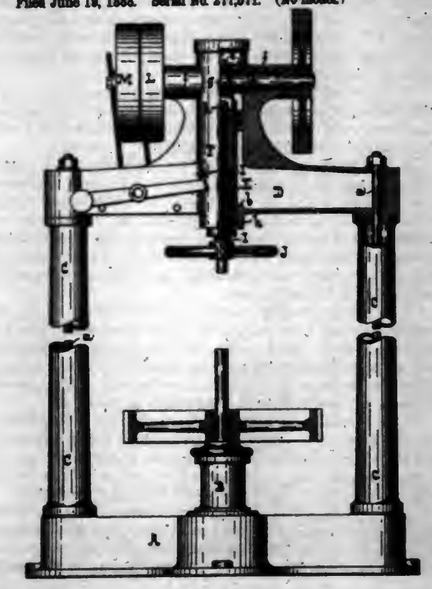
2. In fire-proof plaster-blocks for ceilings and walls, &c., the combination of a layer of plaster constructed in accordance with the formula specified and the envelope of burlap or other fiber on which said layer of plaster rests and extensions of which fold over both sides and ends of said plaster layer and are arranged to hold it from disintegration, substantially as described, and for the purpose set forth.

3. In fire-proof plaster-blocks for ceilings, walls, &c., the combination of the enveloping layers of burlap or other fiber and the intervening layer of plaster, composed of quicklime, plaster-of-paris, sand, pulverized coke, and glue, as herein specified, the burlap being folded entirely around the plaster and its meshes filled therewith, substantially as described, and for the purpose set forth.

4. In fire-proof plaster-blocks for ceilings, walls, &c., the combination of the plaster layer 8, constructed in accordance with the formula herein specified, the burlap or other fibrous cover that entirely envelops said layer and holds it from disintegration, the burlap on one side across the middle of said block being scored and the block bent along said line until each half is at a right angle to the other, substantially as described, and for the purpose set forth.

5. In fire-proof plaster-blocks for ceilings, walls, &c., the burlap envelope-blank cut in approximate form to that of the letter-envelope, the central oblong portion of which blank fits within the mold in which the blank is pressed, the plaster layer 8, composed of quicklime, plaster-of-paris, sand, pulverized coke, and glue, as herein specified, the angle flaps 16 and 17 of said burlap or other fiber cloth being folded over said plaster-envelope to entirely inclose the same and hold it from disintegration, substantially as described, and for the purpose set forth.

401,968. MACHINE FOR DRIVING MANDRELS, KEYS, &c. JOHN RICHARDS, San Francisco, Cal., and JOHN WALKER, Cleveland, Ohio. Filed June 19, 1888. Serial No. 277,571. (No model.)



Claim.—1. In a machine for driving mandrels, &c., a reciprocating ram having a head which is rigidly connected thereto by means of a threaded bar, and a hand-wheel to turn the said bar, substantially as and for the purpose specified.

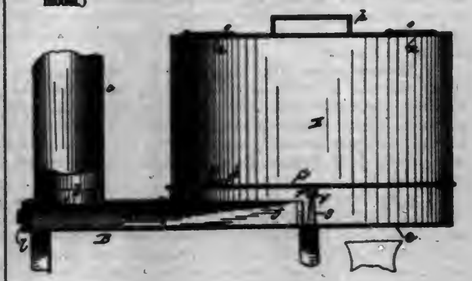
2. In a machine for driving mandrels, &c., a reciprocating ram having a head rigidly connected thereto by means of a threaded bar, and means whereby the said bar may be turned to feed down the said head independently of the reciprocating motion of the said ram, substantially as and for the purpose specified.

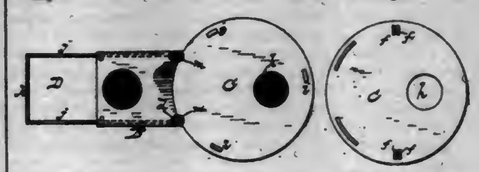
3. In a machine for driving mandrels, &c., the combination of a sleeve, a ram confined within the said sleeve and adapted to have a reciprocating motion therein, a driving-shaft extending through the said sleeve, which is provided with bearings to support the said shaft, an eccentric formed in the said shaft, and means, substantially as described, to connect the eccentric with the ram, a ram-head united with the ram by means of a screw carrying a hand-wheel, and an anvil-block situated under the said ram-head, substantially as and for the purpose specified.

4. In a machine for driving mandrels, &c., the combination of a frame carrying a sleeve with laterally-placed bearings, a ram adapted to slide in the said sleeve, a ram-head connected to the ram by means of a threaded bar having means whereby it may be turned in the said ram, a driving-shaft supported in the said lateral bearings on the sleeve extending through the sleeve and provided with an eccentric, a laterally-sliding box to communicate motion from the eccentric to the ram, and means to effect the revolution of the said driving-shaft, substantially as and for the purpose specified.

5. In a machine for driving mandrels, the combination of a ram adapted to have a reciprocating motion within a sleeve, a ram-head connected to the ram by means of a screw carrying a hand-wheel, and an anvil-block fitted with removable reducers situated under the said ram-head, substantially as and for the purpose specified.

401,969. OVEN AND FLAT-IRON HEATER. SYLVANUS K. ROBINSON, Newark, N. J. Filed Jan. 30, 1889. Serial No. 298,107. (No model.)





Claim.—1. A portable stove having a rear extension forming a flue and provided with a sliding support or shelf, for the purpose set forth.

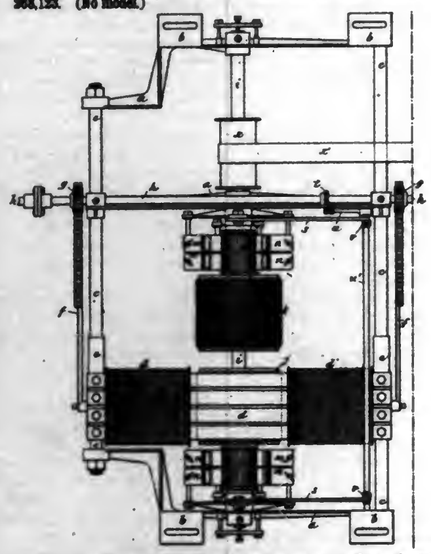
2. The stove provided with the rear extension forming a horizontal flue, a sliding support therein provided with end stops to limit the extension of the support when drawn out, as and for the purpose set forth.

3. In a portable stove, the same provided with the lugs *g* on its inner face or wall, adapted to engage lugs *f f* on the stove-plate, as and for the purpose set forth.

4. The oven provided with the fastening-lugs *q* on its wall and the lugs *i* on the stove-plate, in combination with the lugs *g* on the inner wall of the stove-body, and the lugs *f f* on the stove-plate, the whole adapted to operate as and for the purpose set forth.

5. The within-described portable stove, consisting of the body constructed with a rear extension forming a horizontal flue, a sliding frame or shelf within this flue having stop-lugs, the inner wall of the body provided with the lugs, the removable plate having lugs on its under side and fastening-lugs on its upper face, said plate adapted to serve the double purpose of a plate for said stove and a bottom for the oven, which latter is provided with the openings in the top having lids, a handle for removing it, and fastening-lugs on its wall to engage the lugs on the plate, all as and for the purposes set forth.

401,970. ELECTRIC MOTOR FOR TRAMWAY-VEHICLES. WILLIAM D. SANDWELL, London, England. Filed Mar. 22, 1888. Serial No. 268,123. (No model.)



Claim.—1. The combination, with a tram-car, of an electric motor operatively connected therewith, consisting of field-magnets and two armatures, the said magnets and armatures being movable the one with relation to the other, whereby a movement of magnets or armatures reverses the direction of rotation of the armatures, substantially as described.

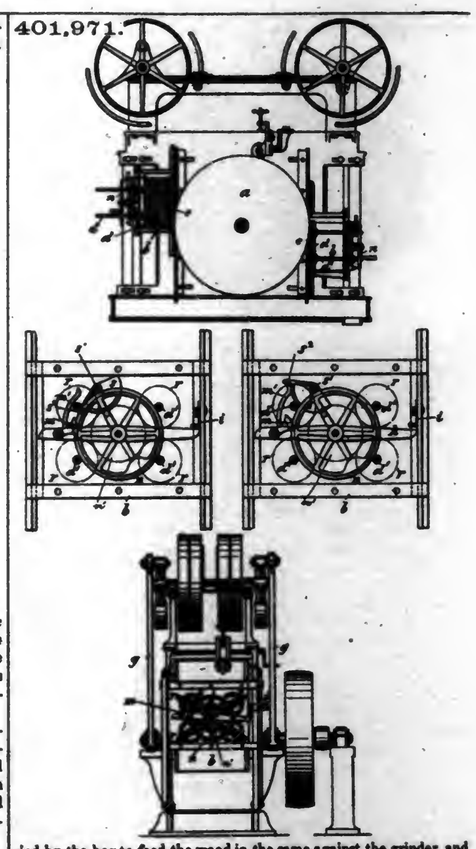
2. The combination, with a tram-car, of an electric motor operatively connected therewith, consisting of two armatures and field-magnets movable with relation thereto, a commutator for each of said armatures, movable brushes for said commutators, and a connection between said brushes and said magnets, whereby a movement of said magnets reverses the direction of rotation of said armatures, substantially as described.

3. In an electric motor, the combination, with two revoluble armatures, each provided with a commutator and movable brushes for said commutator, of the movable field-magnets, a shaft and connections between the same and said movable field-magnets, and connections between said shaft and said movable commutator-brushes, whereby a movement of said shaft effects a movement of said field-magnets and commutator-brushes, substantially as described.

4. In an electric motor, the combination, with two revoluble armatures, each provided with a commutator and movable brushes for said commutators, of movable field-magnets provided with rack-bars, a shaft provided with pinions engaging said rack-bars, a rock-shaft provided with a segment and connected with said movable brushes, and a pinion on said shaft engaging said segment, substantially as described.

5. In an electric motor having field-magnets and two armatures, said field-magnets and armatures being the one movable in relation to the other, combined with two commutators, each having two sets of brushes, one set adapted to move the motor in one direction and the other set in the opposite direction, said brushes being movable into and out of position, substantially as described.

401,971. APPARATUS FOR GRINDING WOOD. FRIEDRICH H. SCHMIDT, Schindler's Werk, near Bochau, Saxony, Germany. Filed July 23, 1888. Serial No. 281,330. (No model.)



Claim.—1. In a wood-grinding machine, the combination of a grinding-box, into which the wood to be ground is placed, a feed-plate in the box to feed the wood against the grinder, gearing to force in the feed-plate, and a pitman connected to the grinding-box to reciprocate the same, and thereby operate the gearing to move the feed-plate inwardly, substantially as described.

2. In a wood-reducing machine, the combination of a reciprocating grinding-box adapted to receive the wood to be ground, means for reciprocating the same, a feed-plate in the box to feed the wood against the grinder, gearing to move the plate, and a stationary stop adapted to be engaged by and operate said gearing as the box reciprocates, substantially as described.

3. In a wood-reducing machine, the combination of a reciprocating grinding-box to receive the wood to be ground, gearing carried by the box to feed the wood in the same against the grinder, and a lever to operate said gearing moving with the box and adapted to engage and be rocked by a stationary part as the box reciprocates, and thereby actuate the gearing, substantially as described.

4. In a wood-grinding machine, the combination of a reciprocating grinding-box adapted to receive the wood to be ground, a pressure-plate in the box to feed the wood against the grindstone, gearing to move the pressure-plate, a stationary stop, and a lever moving with the grinding-box to be rocked by the stop as the box reciprocates, and thereby operate the gearing to feed the wood, substantially as described.

5. In a wood-grinding machine, the combination of a reciprocating grinding-box adapted to receive the wood to be ground, a pitman to reciprocate the same, and a pressure-plate in the box to feed the wood against the grindstone, substantially as described.

6. In a wood-grinding machine, the combination of a reciprocating grinding-box to receive the wood to be ground, a pressure-plate in the box to feed the wood against the grindstone, a ratchet-wheel carried by the box, gearing connecting the pressure-plate and ratchet-wheel to operate the plate to feed when the wheel is turned, an adjustable stop, and a lever moving with the box and provided with a pawl to rotate the ratchet-wheel when the lever is rocked by said stop as the box reciprocates.

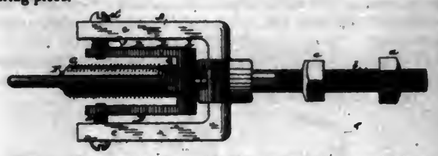
7. In a wood-grinding machine, a grinding-box to receive the wood to be ground, a pressure-plate to feed the wood against the grindstone, one or more rods to force in the plate, gearing to operate the rods, and a weighted pivoted segment adapted to disconnect the gearing from its driving-power and stop the feed when the rods have forced the plates in a certain distance, substantially as described.

8. In a wood-grinding machine, the combination of the grinding-box adapted to receive the wood to be ground, a pressure-plate movable in the box to feed the wood against the grinding-stone, gearing to move the plate, and a pivoted lever or segment to stop the feed when the wood in the box is exhausted, substantially as described.

9. In a wood-grinding machine, the combination of a reciprocating grinding-box to receive the wood to be ground, a pressure-plate movable in the box to feed the wood against the grindstone, one or more rods secured to the plate to move the same, gearing to operate the rods, a ratchet-wheel to operate the gearing, a lever provided with a pawl to rotate the ratchet-wheel when the lever is rocked, means to intermittingly rock the lever as the box reciprocates, and a pivoted lever or segment to automatically throw the lever-pawl from engagement with the ratchet-wheel and stop the feed when all the wood in the box is exhausted.

401,972. TEMPLE FOR GUIDING THE EDGES OF FABRICS. JOSEPH J. SCHOLFIELD, Providence, R. I. Filed Jan. 28, 1889. Serial No. 297,813. (No model.)

Brief.—A pivoted temple-frame contains a guide-roller, a frictional bearing-piece for the running edge of the web, and a spring, the spring being adapted to hold the temple-frame in the proper oblique position to draw the edge of the web outward until the pressure exerted by the same is overcome by the friction of the web against the bearing-piece.



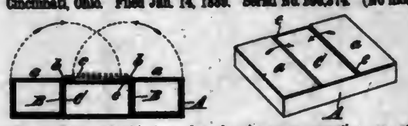
Claim.—The combination, with the pivoted frame and its support, of the guide-roller, the frictional bearing-piece, the spring, and the limiting-stop to the movement of the pivoted frame, substantially as described.

401,973. HARNESS. ADAM SCHUSCK, Celina, Ohio. Filed Jan. 30, 1889. Serial No. 298,106. (No model.)



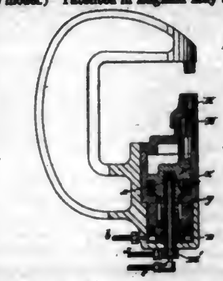
Claim.—In a harness-pad, the flat leather strip or filling C, the coarse textile material or bagging D enveloping the same, the facing-strip E, surrounding the filling and the bagging, the edges of which meet on the center line on the outside, and the facing-strip secured to the other parts by two rows of stitching, substantially as described.

401,974. DISPLAY-BOX. HARRISON D. SMITH and FRED A. SMITH, Cincinnati, Ohio. Filed Jan. 14, 1889. Serial No. 296,374. (No model.)



Claim.—In a display-box for chewing-gum, candies, or other goods, the combination, with the body or box proper, A, divided into end compartments, B, and intermediate blind compartment, C, or its described equivalent, of the plane-faced lids *a a*, hinged at their inner edges to the said blind compartment on its opposite edges, whereby said lids are adapted to be turned or opened inwardly within the compass of the box and rest flatly upon said blind compartment, which forms a foundation therefor to support them safely and entirely out of the way of contact, substantially as herein set forth.

401,975. HYDRAULIC MACHINE FOR RIVETING. HUGH SMITH, Glasgow, County of Lanark, Scotland. Filed Aug. 22, 1887. Serial No. 247,587. (No model.) Patented in England May 26, 1887, No. 7,651.



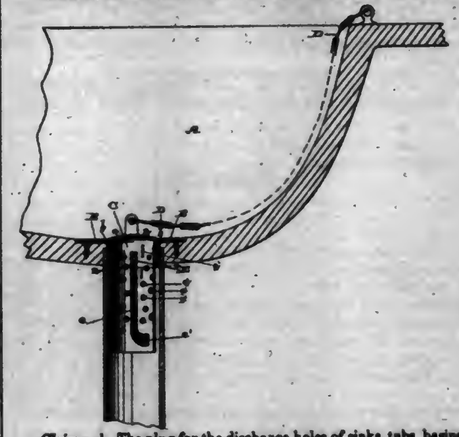
Claim.—1. In a hydraulic riveting-machine, the combination, with the plate-closing snap and the rivet-closing snap, of the traveling plate-closing and rivet-closing cylinders opening in opposite directions and having their heads abutting, and stationary and traveling plungers in said cylinders, respectively, the traveling plunger being adapted to impart pressure to the one and the cylinders to the other of said snaps, substantially as set forth.

2. In a hydraulic riveting-machine, the combination, with the plate-closing snap and the rivet-closing snap, of the traveling plate-closing and rivet-closing cylinders, of equal diameters, and the said cylinders having their heads abutting, stationary and traveling plungers in said cylinders, respectively, the said cylinders and traveling plunger being adapted to impart pressure to the plate-closing snap and the rivet-closing snap, respectively, and an auxiliary ram for forcing said cylinders forward, substantially as set forth.

3. The combination, with the plate-closing and rivet-closing snaps adapted to close toward each other and the cylinders and plungers for operating them, of a duct leading from the back of the one plunger to the front of the other plunger, whereby the back-pressure in one cylinder will decrease the forward pressure of the other plunger, as set forth.

4. The combination, with the plate-closing snap and the rivet-closing snap, of traveling cylinders, stationary and traveling plungers in said cylinders for causing pressure upon said snaps, the stationary cylinder N, snap L, and plunger O, for imparting pressure to said snap L, as set forth.

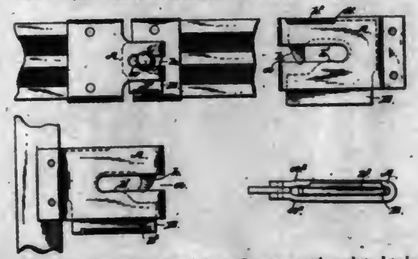
401,976. PLUG FOR SINKS, TUBS, &c. WILLIAM R. SMITH, San Francisco, Cal. Filed Jan. 16, 1889. Serial No. 296,533. (No model.)



Claim.—1. The plug for the discharge-holes of sinks, tubs, basins, and other vessels, consisting of the sliding hollow or tubular piece having a closed top, an open bottom, and apertures in its sides, in combination with the means for holding the plug in position to permit the escape of the water through its apertures, consisting of a fixed pin or stud in the discharge-hole, and a slot in the side of the plug, in which the fixed pin or stud fits, said slot having a curved lower end, with which the pin or stud engages, substantially as described.

2. The plug for the discharge-holes of sinks, tubs, basins, and other vessels, consisting of the sliding hollow or tubular piece having a closed top, an open bottom, and apertures in its sides, and having also in its side an elongated slot terminating below in a portion curved to one side, in combination with the protecting-plate B of the discharge-hole, having a fixed pin or stud entering the elongated slot of the plug and engaging its curved lower portion to hold the plug up, substantially as described.

401,977. CLASP. FREDERICK B. SPOONER, Brooklyn, N. Y. Filed Jan. 17, 1889. Serial No. 296,642. (No model.)



Claim.—1. A clasp consisting of a supporting-plate having an automatically-operating latch loosely and inseparably mounted thereon and unattached thereto, adapted for use with a stud or analogous device, substantially as described.

2. A clasp consisting of a bent sheet-metal slotted supporting-plate having an unattached sliding latch mounted therein, adapted to engage a stud or analogous device, substantially as described.

3. A clasp consisting of a slotted supporting-plate having a cam-slotted latch loosely mounted therein, adapted for use with a stud or analogous device, substantially as described.

4. A clasp consisting of a doubled slotted plate and a latch having a slot with a cam projection loosely mounted in said plate for use in connection with a stud or analogous device, as set forth.

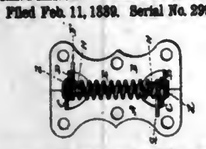
5. A clasp consisting of a slotted supporting-plate, and a cam-slotted latch loosely mounted therein, having a guard with a bent edge for use with a stud or analogous device, substantially as described.

6. A clasp consisting of a slotted supporting-plate constructed from a single strip of sheet metal having the two opposing parts thereof slightly bent outward, and a latch having a cam-slot loosely and inseparably mounted in said plate for use in connection with a stud or analogous device, as set forth.

7. A clasp consisting of a slotted plate with an upper recessed edge, and a cam-slotted latch having an upper projecting guard adapted to engage with the top recess of said plate for use with a stud or analogous device, as set forth.

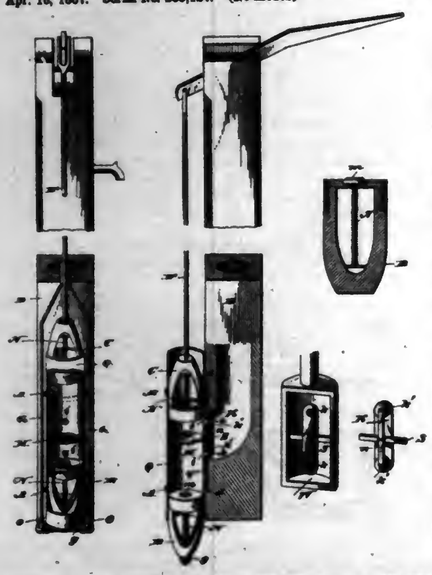
8. A corset-fastening comprising a corset steel or busk with a series of studs thereon, and a slotted plate attached to an opposite steel or busk, in which an automatically-operating latch is loosely mounted to freely slide therethrough and adapted to engage and secure a stud on the oppositely-situated steel or busk, substantially as described.

401,978. SPRING-HINGE. JAMES SPRUCE and ASA M. COMSTOCK, Waterbury, Conn. Filed Feb. 11, 1889. Serial No. 299,386. (No model.)



Claim.—In a spring-hinge composed of the leaves A B, having corresponding ears projecting therefrom, and so that the ears of the one part will stand, respectively, the one inside and the other outside of the ears of the other part, a pintle through each pair of ears, the pintle interlocked with the inside ear of each part, the pintle extending through the outside ear of the other part and upon which the said outside ear may turn, and a spiral spring arranged axially between the said inside ears, the spring surrounding the respective pintles, and the ends of the spring at the said pintles turned outward to bear upon the leaf with which the pintle is interlocked, substantially as and for the purpose described.

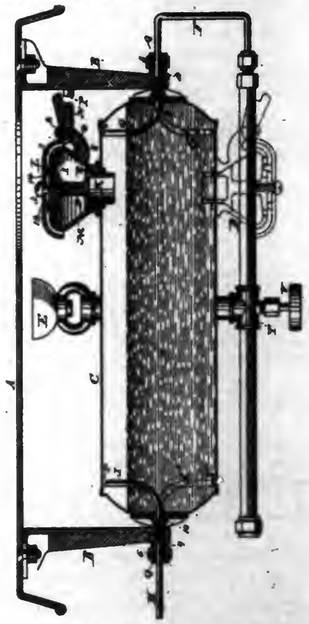
401,979. PUMP. GEORGE W. STAFFORD, Postville, Iowa. Filed Apr. 16, 1887. Serial No. 235,127. (No model.)



Claim.—1. In a pump of the character described, the combination of the pump-stock or tube provided at its lower end with a water-chamber, an open-ended cylinder rigidly secured to said stock to close the open side of said chamber and provided with two openings, *i*, communicating therewith, an imperforate diaphragm secured within the cylinder between said openings, a pump-rod carrying two valved pistons, one for each chamber of the cylinder, and a single plate-spring arranged within the water-chamber of the pump-stock and provided at each end with a valve to close the openings *i* of the cylinder, substantially as described.

2. In combination with a pump-stock or tube having a water-chamber at its lower end, an open-ended cylinder provided at one side with a block provided with projecting edges which fit snugly within the open side of said water-chamber, a diaphragm secured centrally within the cylinder, a discharge-opening above and below the diaphragm leading to the water-chamber, a single spring within the water-chamber provided at each end with a valve to close said discharge-openings, and valved pistons arranged one in each end of the cylinder and connected with a single pump-rod, substantially as described.

401,980. RESERVOIR FOR HOLDING LIQUIDS UNDER PRESSURE. WILLIAM H. THAYER, Melrose, Mass. Filed May 31, 1888. Serial No. 275,575. (No model.)



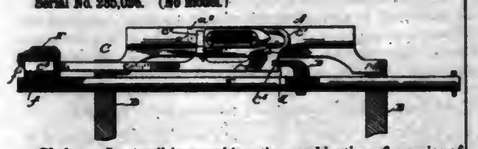
Claim.—1. A pivoted liquid-holding reservoir having an inlet or filling orifice, an outlet or discharge orifice, and an inlet for compressed air, all of which are located near together or upon the same side of the reservoir, which is capable of adjustment by turning upon its pivots, whereby the said orifices will be raised above the level of the liquid contained in the reservoir when it is turned into proper position for filling, and said orifices will be lowered beneath the liquid and sealed therewith when the reservoir is turned into position for discharging the same, substantially as described, and for the purpose specified.

2. A rotatory reservoir for holding and distributing liquids under pressure, provided with hollow journals having a pipe extending from each into the reservoir, to serve, respectively, as an inlet for compressed air and an outlet for liquid, and both of said pipes terminating near the periphery of the reservoir upon the same side thereof as the filling-orifice.

3. A pivoted liquid-holding reservoir having a filling-orifice at one side and suitable pipes for the ingress of compressed air and the egress of the contained liquid, a valve for closing said filling-orifice, a plate connected with said valve, a suitable support for the reservoir having a catch thereon, and a latch pivoted to the reservoir and engaging the catch at one end when the valve is open and the plate at the other when the valve is closed, substantially as described.

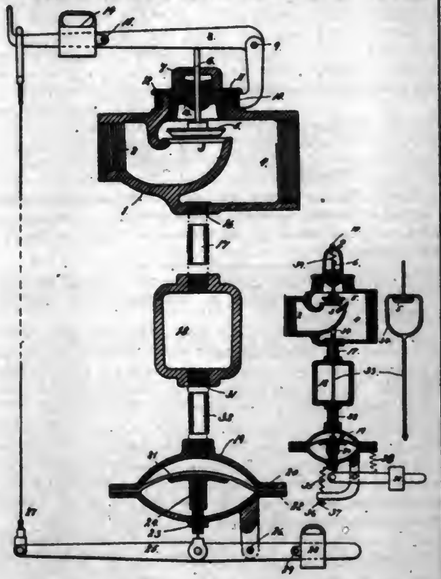
4. A pivoted liquid-holding reservoir having a filling-orifice, an inlet for compressed air and an outlet for oil, all located upon the same side thereof, combined with a hydrocarbon-oil-burning stove, in the manner and for the purpose substantially as described.

401,981. SHUTTLE-CARRIER FOR QUILTING-MACHINES. JOS. THOMAS and GEORGE CRETER, New York, N. Y. Filed Sept. 10, 1888. Serial No. 285,096. (No model.)



Claim.—In a quilting-machine, the combination of a series of races, a series of shuttle-carriers each having a lug on its sides, a notch at one end and a shoulder at the other, and a shuttle-driving bar having a curved shoulder entering the said notch and a hinged clamp to engage the shoulder, substantially as described.

401,982. VALVE FOR REDUCING AND REGULATING PRESSURE OF FLUIDS. WILLIAM P. THOMPSON and ROBERT P. THOMPSON, Philadelphia, Pa. Filed Jan. 29, 1889. Serial No. 297,951. (No model.)



Claim.—1. The combination of a valve opening outwardly from a high-pressure pipe to a low-pressure pipe with a loaded lever and an adjustable weight, or the desired equivalent thereof, combined with a diaphragm in fluid communication with the low-pressure pipe and connected to the valve with a rod arranged to close, but not to open, the valve, and with a lever and an adjustable weight, or their described equivalent, arranged to counteract the fluid-pressure on the diaphragm and increase the pressure required in the low-pressure pipe required to cause closure of the valve, substantially as set forth.

2. In an apparatus for reducing fluid-pressure from a high pressure and adjustably regulating such low pressure, and limiting automatically the reduction of the high-pressure supply in such operation, the combination of a valve opening outwardly from a high-pressure pipe to a low-pressure pipe, and closed by a loaded lever having a fulcrum arranged to rotate about the axis of said valve, with a water-chamber screwed to the low-pressure pipe, and a connected bowl and diaphragm located below the valve-chamber, and all in the same axial line therewith, and a second adjustable loaded lever bearing upwardly against the diaphragm and arranged to receive downward motion from the diaphragm, and connected by a link transmitting a closing motion through the valve-lever, substantially as and for the purpose set forth.

401,983. CUT-OFF VALVE. JOHN J. TOMLIN, Oswego, N. Y., assignor to Thomson Kingsford, same place. Filed Jan. 30, 1889. Serial No. 298,055. (No model.)

Claim.—1. A slide-valve provided with an exhaust-port arranged at right angles to the line of travel of the valve, and with steam-ports disposed diagonally to said line of travel, in combination with a valve-seat provided with correspondingly-arranged exhaust and steam ports, as set forth.

2. A slide-valve provided with an exhaust-port arranged at right angles to the line of travel of the valve, and with steam-ports disposed diagonally to said line of travel, in combination with a valve-seat provided with correspondingly-arranged exhaust and steam ports, a valve-support arranged movably at right angles to the travel of the valve, and a governor-stem connected to said valve-support parallel with the plane of said valve, substantially as set forth.

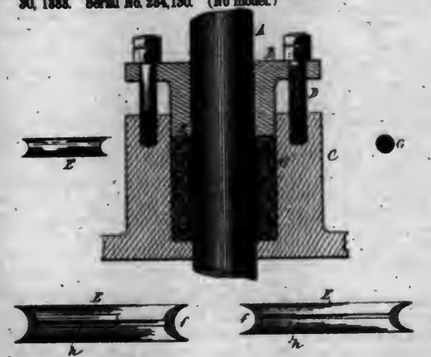
3. The combination of the valve-seat A, provided with the exhaust-port *a*, ports *a' a'* at opposite sides of and parallel with the said exhaust-port, steam-passages *b b*, extending from the ports *a' a'* to opposite ends of the cylinder, and steam-ports *c c*, intersecting said passages, and the valve V, formed hollow and with steam-inlets to the interior thereof, and with the exhaust-port *d* in cage D over said port, and steam-ports *f f* at opposite sides of said cage, substantially as described and shown.

4. The valve V, formed hollow and with steam-inlets to its interior, the exhaust-port *d* at right angles to the line of travel of the valve, the cage D, over said port, and steam-ports *f f*, disposed diagonally in relation to the line of travel of the valve, in combination with the valve-seat A, provided with the exhaust-port *a*, likewise at right angles to the line of travel of the valve, ports *a' a'* at opposite sides of and parallel with the port *a*, the steam-passages *b b*, extending from the ports *a' a'* to opposite ends of the cylinder, steam-ports *c c*, disposed diagonally and correspondingly with the steam-ports of the valve and intersecting the steam-passages *b b*, the slide *h*, supporting the valve, and the governor-stem *l*, connected with said slide, substantially as described and shown.

5. The combination of the slide-valve V, provided with the eyes *i i*, elongated in directions parallel with the plane of the valve, the valve-stem C, passing through said eyes, nuts *n n* on the valve-stem, washers *e e* on the ends of the valve, the slide *h*, supporting the valve, and the governor-stem *l*, connected with said slide at right angles to the line of travel and parallel with the plane of the valve, substantially as described and shown.

6. The combination of the hollow slide-valve provided with steam-inlets to its interior, and with eyes *i i*, elongated in directions parallel with the plane of the valve, the valve-stem passing through said eyes, the sleeve *l*, surrounding the valve-stem inside of the valve and terminating flush with the end faces of the valve, the washers *e e* on the said faces and on the ends of the sleeve, the nuts *n n* on the valve-stem, the slide *h*, supporting the valve, and the governor-stem *l*, connected to said slide at right angles to the line of travel and parallel with the plane of the valve, substantially as described and shown.

401,984. ROD-PACKING. SIVERT UNSTAD, Aurora, Ill. Filed Aug. 30, 1888. Serial No. 284,130. (No model.)



Claim.—1. The metal packing-rings E of crescent form in cross-section, and having an annular groove, A, made centrally of its inner and convex side, combined with a stuffing-box and gland extending beyond the periphery of said rings, all as and for the purposes described

2. In combination, the metal rings described, crescent shape in cross-section and provided with the annular groove A at the crest of their convex inner sides, and the packing-rings having a cylindrical cross-section conforming substantially to the cross-section of the groove *f*, and whereby the packing shall project materially beyond the outer edges of the rings.

401,985. FOUNTAIN-PEN. WILLIAM VAN DENARK, Phelps, N. Y. Filed Feb. 3, 1888. Serial No. 262,915. (No model.)



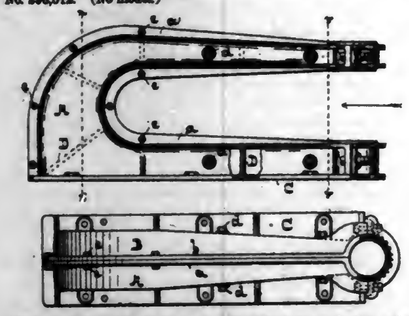
Claim.—1. The combination, in a fountain-pen, of the overflow ink-chamber H, placed on the under side of the pen, for the purpose of receiving the surplus ink and returning it to the reservoir, with the pen-chamber B and reservoir A, as described.

2. The pen D, provided with the lip I, extending across the under side of the pen and firmly secured thereto, as described.

3. The feeding-plug E F G, with its channels for conducting the ink to the pen and overflow-chamber, in combination with the overflow-chamber H and pen-chamber B, as described.

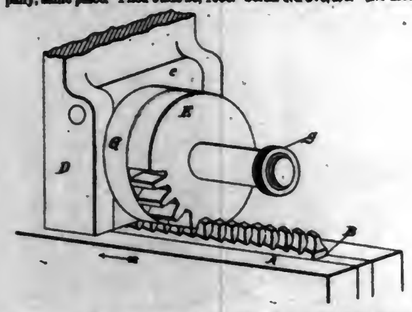
4. A fountain-pen comprehending in its construction the overflow-chamber H, constructed to receive the surplus ink and return it to the reservoir, pen D, provided with the lip I, extending across the under side of the pen, and the feeding-plug E F G, with its channels for conducting the ink to pen and overflow-chamber, all arranged, in combination with the pen-chamber B and reservoir A, substantially as described.

401,986. SHEAVE-SUPPORTING FRAME FOR CABLE RAILWAYS. JOHN WALKER, Cleveland, Ohio. Filed Feb. 2, 1888. Serial No. 263,512. (No model.)



Claim.—A frame for the purpose described, formed of two dished sections having flanges, which are bolted together, and provided with interior strengthening ribs or brackets, substantially as and for the purpose specified.

401,987. MACHINE FOR CUTTING GEARS. JOHN S. WATERMAN, Providence, R. I., assignor to The Brown & Sharpe Manufacturing Company, same place. Filed June 28, 1888. Serial No. 278,490. (No model.)

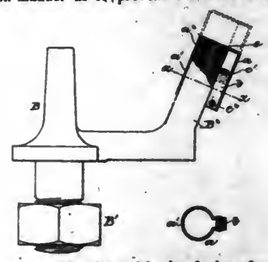


Claim.—1. The combination of a holder for a gear-blank, in which holder the blank shall be adjustable to successive positions, and a traveling bed carrying a progressively-cutting broaching-tool for cutting the spaces between adjacent teeth, the said holder and the said broaching-tool being arranged to be movable relatively toward or from one another, substantially as described.

2. The combination of a holder for a gear-blank, in which holder the blank shall be adjustable to successive positions a traveling bed carrying a progressively-cutting broaching-tool for cutting the spaces between adjacent teeth, the said holder and the said broaching-tool being arranged to be movable relatively toward or from one another, and a tooth-spacing mechanism for fixing the successive adjustments of the blank to the broaching-tool, substantially as described.

401,988. SUPPORT FOR SPINNING-SPINDLES. FRANKLIN H. WHEAT, Lowell, assignor to George Draper & Sons, Hopedale, Mass. Filed Feb. 14, 1888. Serial No. 299,865. (No model.)

Brief.—The invention has for its object to provide the oil-feeder of a spindle-support with a cap or cover, which shall be secured thereto in such manner as to prevent the same becoming detached and lost.



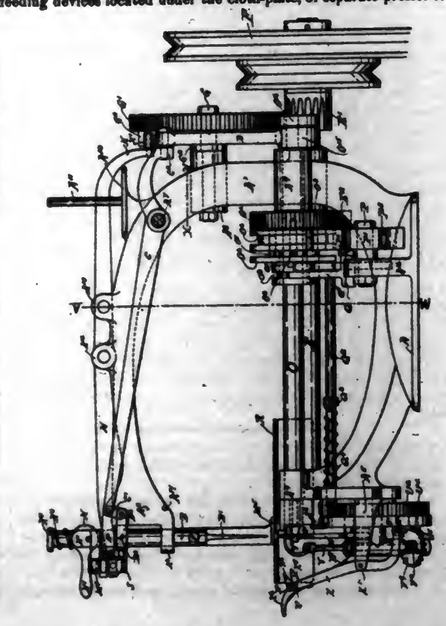
Claim.—The combination, with the feeder of a bolster support or bearing, of a sliding cap having an oil-hole, and a pin-and-slot connection to connect the said cap and feeder loosely, as and for the purposes described.

401,989. SEWING-MACHINE. GEORGE A. XANDER, Hamburg, and JOHN G. XANDER, Reading, Pa. Filed Sept. 5, 1888. Serial No. 284,665. (No model.)

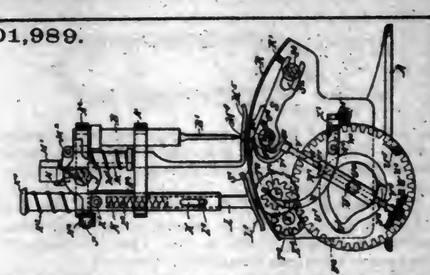
Brief.—This mechanism makes three stitches through the material, the same being looped together. The thread is cut and two of the loops pulled through the other, and the thread at the same time is tightened. The material is then moved along and another series of three stitches made at a little distance from the first series.

Claim.—1. In a sewing-machine having a single reciprocating needle, the combination, with two separate feeding devices located under the cloth-plate, with their feeding-surfaces projecting through the same, of separate presser-feet located above said feeding devices and mechanism, substantially as described, for raising said presser-feet alternately, substantially as and for the purpose set forth.

2. In a sewing-machine, the combination, with the two separate feeding devices located under the cloth-plate, of separate presser-feet



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located above said devices, a rocker-bar with opposite arms engaging said presser-feet, substantially as described, mechanism for vibrating said rocker-arm, and a lever adapted to operate one of said presser-feet independently, all arranged substantially as set forth.

3. In a sewing-machine, the combination, with the two separate feeding devices located under the cloth-plate, of separate presser-bars K and M, located above said feeding devices, said bar K consisting of two parts, one of which has a limited movement in the other and is depressed therein by a spring, separate springs K^4 and M^3, adapted to raise the bar K and to depress the bar M, and mechanism, as rocker-bar J, for simultaneously raising one presser-bar and depressing the other, substantially as set forth.

4. In a sewing-machine, the combination, with a presser-bar and a rotating shaft, E, with cog-wheel E^3, of a feeding device located under said bar, and consisting of a plate loosely supported on said shaft and provided with a stud, T, and a combined cog and feed wheel removably supported on said stud and engaging the wheel E^3, said plate being adjustably fastened to the machine, all substantially as and for the purpose set forth.

5. In a sewing-machine, the spacing-feed T^2 and the presser-foot mechanism, both operated by a continuously-rotating shaft, E, and connected mechanism, substantially as described, in combination with a stitch-feed, S', a needle, and a looper, all operated by a shaft, O, and connected mechanism, substantially as described, said shaft O being intermittently rotated by said shaft E, substantially as and for the purpose set forth.

6. In a sewing-machine, the combination, with a continuously-rotating main shaft and a spacing-feed, T^2, and presser-bars K and M, operated thereby, as set forth, of a counter-shaft, O, carrying a feed, S', and a rotary looper, a needle-bar, operated by said counter-shaft, as set forth, and mechanism, as wheels O^2, O', and P', and clutch O^3, for regularly engaging and disengaging said counter-shaft, all substantially as and for the purpose set forth.

7. In a sewing-machine, the combination with a reciprocating needle, a rotary looper, and a feeding device, of a draw-hook, W, pivoted below said looper and having a curved hook end, substantially as set forth, and mechanism for vibrating the same, whereby a loop formed on said looper is drawn through a later-formed loop, substantially as set forth.

8. In a sewing-machine, the combination, with a reciprocating needle, a rotary looper, a feeding device, and a draw-hook, of an oscillating take-up hook, V', located below said looper, and mechanism for operating the same, substantially as described, whereby a stitch formed by said machine is tightened, substantially as and for the purpose set forth.

9. In a sewing-machine, the combination, with a reciprocating needle, a rotary looper, a feeding device, a take-up hook, V', and mechanism for operating said parts, substantially as described, of a thread-cutter pivoted below said looper and means, substantially as described, for vibrating the same in an approximately-vertical plane, whereby the thread is cut while held taut by said take-up hook, substantially as set forth.

10. In a sewing-machine, the combination of a reciprocating needle, a rotary looper, a feeding device, a draw-hook, W, a take-up hook, V', and a vibrating cutter, all arranged and operated substantially as set forth.

11. In a sewing-machine, the combination of a needle, the looper, the stitch-feed S', the draw-hook, the take-up hook, and the cutter, with a separate feed, T^3, to regulate the space between stitches, and mechanism for operating the same, all arranged substantially as and for the purpose set forth.

12. In a sewing-machine, the combination of a needle, the looper, the stitch-feed S', the draw-hook, and the take-up hook, with a separate feed, T^3, to regulate the space between stitches, and mechanism for operating the same, all arranged substantially as and for the purpose set forth.

13. In a sewing-machine, the combination, with the needle, the looper, and the stitch-feed, of the rotating cam-disk U' and the draw-hook W, pivoted to the machine and operated by said cam, substantially in the manner and for the purpose set forth.

14. In a sewing-machine, the combination, with a reciprocating needle, a rotary looper, and a feeding device, all operated by an intermittently-rotating shaft, substantially as described, and with a draw-hook, W, of the take-up hook and mechanism arranged to operate it while said needle, looper, and feeding device are at rest, substantially as and for the purpose set forth.

15. In a sewing-machine, the rotating disk U', with teeth U^4, in combination with the take-up hook V', its shaft V, pinion V^3, spring V^2, stop V^4, and bearing U^3, all arranged substantially as set forth.

16. The combination, with a needle, a looper, and a feeding device, of the draw-hook W, the take-up hook V', the thread-cutter, and the rotating cam-disk U', engaging said draw-hook, take-up hook, and thread-cutter, substantially as described, and all arranged to operate substantially in the manner set forth.

17. In a sewing-machine, the combination, with the presser-bars K and M, the feeds T^2 and S', and the rocker-bar J, engaging said presser-bars, of a pivoted lever, H, connected to said rocker-bar and operated by a cam, G^2 G^4, substantially as and for the purpose set forth.

18. In a sewing-machine, the combination, with the two separate feeding devices located under the cloth-plate, of separate presser-bars K and M, located above said feeding devices, said bar K consisting of two parts, one of which has a limited movement in the other and is depressed therein by a spring, a separate spring adapted to depress the bar M, and a rocker-bar mechanism, substantially as described, for simultaneously raising one presser-bar and depressing the other, substantially as set forth.

401,990. TYPE-WRITING MACHINE. GEORGE W. N. YOST, New York, N. Y., assignor, by mesne assignments, to the American Writing Machine Company, of New York. Filed June 28, 1880. Serial No. 12,604. (Model.)



Claim.—1. The stationary indicator *i'*, in combination with the rotating and longitudinally-moving platen S and the lever *w*, constructed substantially as described, whereby the operator is enabled to supply an omission or make a correction in the printing, substantially as set forth.

2. The rotating bar *t*, having a shoulder, *u*, in which is pivoted the lever *w*, having a spring tension laterally, in combination with the ratchet-wheel *l* and platen S, substantially as set forth.

3. In a type-writing machine, a plate or disk for indicating when the end of the line has been nearly reached, in combination with an arm which may be adjusted to throw the disk at the proper time, substantially as set forth.

4. In a type-writing machine, a disk or indicator hung behind a casing of a different color, in combination with an adjustable arm which is attached to the paper-carriage frame and which will throw the indicator from behind the disk when the end of the line to be printed has been nearly reached, substantially as set forth.

5. The indicator *i*, hung behind the casing *h* by means of the arm *j*, in combination with the adjustable arm *g*, substantially as set forth.

6. The indicator *i*, of a light color, hung behind the casing *h* of darker color, by means of the arm *j*, having a flange, *k*, upon its upper edge, in combination with the adjustable arm *g*, substantially as specified.

7. The frame L, having a spring tension toward the left and mounted upon the guide-rail K, in combination with the paper-carriage frame O, hinged to frame L, platen S, bars W, and a means of revolving the platen, substantially as shown and described.

8. The paper-carriage frame composed of two cylindrical rods with end bars, P, and provided with the adjustable spring-bars W, as described, and the guide-wire F', in combination with the cylindrical platen S, substantially as and for the purpose set forth.

9. The arm *g*, having a check, *f*, and loosely pivoted to the adjustable sleeve *d*, in combination with the disk or indicator *i*, hung behind a casing by the arm *j*, having a flange, *k*, upon its upper end, substantially as set forth.

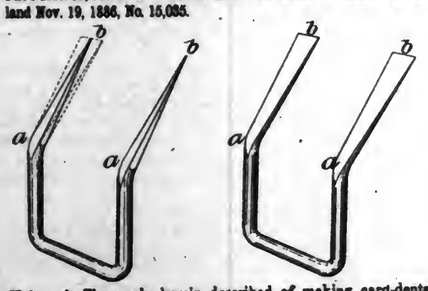
10. The pivoted space-regulator *p*, having a spring tension and provided with the faces *r s*, in combination with the lever *n*, dog *m*, ratchet *l*, and platen S, substantially as specified.

11. The combination of the lever *n*, extending in front and down toward the key-board and having pivoted on its upper end the dog *m*, having curved branches, with bar *t*, loosely mounted on the platen-axle, and lever *w*, substantially as and for the purpose described.

12. As a paper-table for a type-writer, the spring-bars W, adjustable upon the rod N, and having their lower ends curved under the platen S and their upper ends curved upward and toward the rear thereof, in combination with cylindrical platen S, substantially as specified.

401,991. MODE OF MAKING CARD-TEETH.

George Ashworth and Elijah Ashworth, Manchester, County of Lancaster, England. Filed Mar. 15, 1887. Serial No. 231,005. (No model.) Patented in England Nov. 19, 1886, No. 15,035.

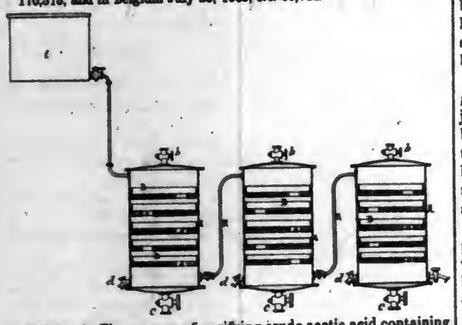


Claim.—1. The mode herein described of making card-dents, said mode consisting in first flattening the wire at the points which form the back and front of the dent-points, then removing the metal at the sides, and thereby producing card-teeth the wires of which are tapered from about the bend to the points, all substantially as set forth.

2. The mode herein described of making wire cards, said mode consisting in first flattening the parts of the wires forming the dent-points at the back and front, then inserting the flattened dents in the foundation, and finally grinding the dents at the sides, to produce tapering points, substantially as set forth.

401,992. PROCESS OF PURIFYING ACETIC ACID.

Ivar A. F. Bang and Marie C. A. Ruffin, Paris, France. Filed Dec. 19, 1888. Serial No. 294,105. (No specimens.) Patented in France July 25, 1885, No. 170,313, and in Belgium July 25, 1885, No. 69,711.



Claim.—1. The process of purifying crude acetic acid containing pyroligneous matter, which process consists in bringing such acid in a liquid state into intimate contact with a carbon compound, such as specified, which will not mix with the acid, whereby the said impurities are dissolved, and then separating the acid from the purifying agent and the impurities which it has absorbed, substantially as described.

2. In the process of purifying acetic acid containing pyroligneous matter, the improvement consisting in bringing the same while in a liquid state into contact with a hydrocarbon of the benzine series, whereby the said impurities are dissolved, substantially as described.

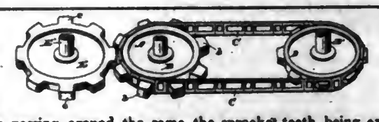
3. The process of purifying crude acetic acid by first blowing air through the same and thereby forming resinous compounds, distilling off the acid, and completing the purification by bringing the acid into intimate contact with a carbon compound (such as herein specified) which will not mix with the acid, substantially as described.

401,993. GEARING.

Milton R. Benedict, Perry, N. Y. Filed July 9, 1888. Serial No. 279,443. (No model.)

Claim.—1. The combination, with the sprocket-wheel and the

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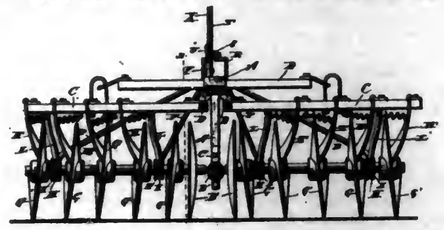
chain passing around the same, the sprocket-teeth being extended beyond the chain between them, of the gear having teeth projecting between and engaging with each of the carrying-teeth on the sprocket, substantially as described.

2. The combination, with the gear-wheel, of the sprocket-wheel and chain, the carrying-teeth on the sprocket having a broad operating-surface and extending beyond the chain a sufficient distance for the engagement of the gear, substantially as described.

3. The combination, with the sprocket-wheel having the extended carrying-teeth and the chain, of the gear-wheel having its teeth circumferentially extended to engage those on the sprocket-wheel without any lost motion, substantially as described.

401,994. DISK HARROW AND CULTIVATOR.

Edward C. Boyer, Dayton, Ohio. Filed Dec. 23, 1888. Serial No. 294,880. (No model.)



Claim.—1. The combination, with the tongue and gang-beams, the former being provided with a horizontal bolt or rod, of plates D, secured to the inner ends of the gang-beams and provided with horizontal slots for the passage of the said bolt, whereby the beams will have a limited vibratory movement, but will be prevented from lifting at their inner ends, substantially as set forth.

2. The combination of a tongue and gang-beams, a horizontal stationary bolt secured to the under side of the said tongue near its rear end, and lugs carried by the gang-beams at their inner ends and provided with horizontal slots for the passage of the said bolt, substantially as described.

3. The combination of a tongue, bearings secured upon the under side of the said tongue, a horizontal bolt secured removably in these bearings and provided with a head or nut, gang-beams provided with lugs at their inner ends, these lugs being provided with horizontal slots for the passage of the said horizontal bolt, and washers upon this bolt between the said lugs, substantially as described.

4. In a disk harrow, the combination of a tongue, the vibrating gang-beams loosely attached to the tongue, independent gang-shafts journaled in bearings attached to the said vibrating beams, this shaft being provided with pulverizing-disks, a hanger, A', depending from the said tongue and provided with a divided spherical socket at its lower end, and a ball loosely confined in this socket and adapted to receive the end-thrusts of the said vibrating gang-shafts, substantially as herein set forth.

5. The combination of the tongue and gang-beams, lugs or plates provided with horizontal slots, and a horizontal stationary bolt whereby the gang-beams will be allowed a limited lateral vibratory movement, but will not be permitted to rise at their inner ends, substantially as described.

6. The combination, with the drag axles or shafts provided with a series of spiral cutters or disks, of the concavo-convex disks or wheels secured to their adjacent ends, substantially as and for the purposes set forth.

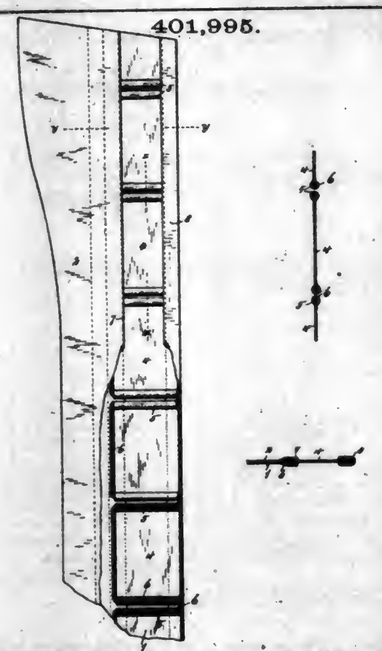
401,995. METHOD OF MAKING BUTTON-HOLE STRIPS.

Morris P. Bray, Ansonia, Conn., assignor of one-half to Chauncey L. Olmstead, West Brookfield, and Albert D. Nason, Springfield, Mass. Filed Aug. 9, 1888. Serial No. 282,334. (No model.)

Claim.—1. The method of making button-holes in garments, which consists in forming pockets at the opposite edges of stay-pieces, then passing a cord backward and forward through said pockets, and finally stitching a binding at one edge of the stay-pieces and stitching the opposite edges to the garment, substantially as described.

2. The method of making button-holes, which consists in forming pockets at the opposite edges or ends of stay-pieces, then passing a continuous cord backward and forward through said pockets and from one stay-piece to another at the front or outer edges thereof, thus looping the cord around the front or outer ends of the button-holes formed by the stay-pieces, then stitching the inner edges of the

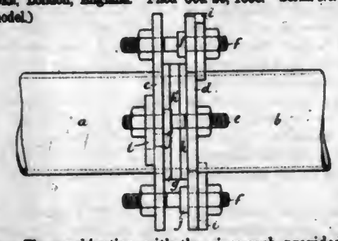
401,995.



stay-pieces between the plies of the garment, and stitching a binding over the outer edges of the stay-pieces and over the loops of the cord.

401,996. COUPLING FOR PIPES OR TUBES.

George W. H. Broeden, London, England. Filed Oct. 20, 1888. Serial No. 288,615. (No model.)



Claim.—The combination, with the pipes each provided with a flange adjacent to its ends, of rings or flanges encircling said pipe and engaging said flanges, consisting of two parts, each provided at one end with an offset to receive the plain end of the other part, and bolts having one end extending through the ends of the portions of said ring, each bolt having a shoulder engaging the inner face of said ring and a nut on said bolt engaging its outer face, the free ends of said bolts being adapted to engage apertures in the opposing flange and provided with nuts, substantially as described.

401,997. MACHINE FOR FORMING SPOOL-BLANKS.

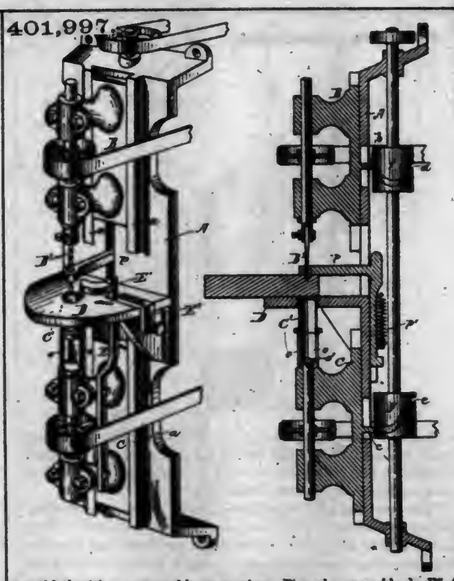
Charles A. Broughton, Conway, N. H. Filed Dec. 16, 1886. Serial No. 221,744. (No model.)

Claim.—1. In a machine for forming cylindrical perforated blanks, the combination, with a horizontal table for supporting the stock from which the blanks are to be cut, of a hollow saw operating upwardly through the table and adapted to cut or saw the said blank from the stock, an abutment or stop above the stock provided with an adjustment for regulating the lowest position of the said abutment above the table, and a spring for permitting the said abutment to move upwardly under the excessive upward pressure upon the stock, substantially as set forth.

2. In a machine for forming spool-blanks, the combination, with the saw C and its operating devices, substantially as set forth, of a gage against which the stock may be held to determine its lateral position, this gage consisting of a spring-arm, E, provided with a removable gage-piece, E', the said spring-arm being mounted upon the carriage which moves the saw, all substantially as set forth.

3. In a machine for forming spool-blanks, the combination, with the saw C and its operating devices, substantially as set forth, of the spring-arm E, mounted upon the carriage which moves the saw, and

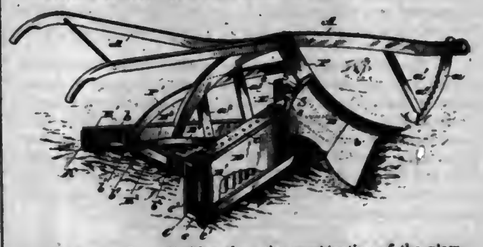
401,997.



provided with a removable gage-piece, E', and a gage-block, E'', for regulating the amount of motion outwardly of the spring-arm, the said gage-block being provided with an adjusting-screw whereby it may be moved in or out over the table D, all substantially as set forth.

401,998. DITCHING-PLOW.

William Burton, Lake Village, Ind. Filed Nov. 28, 1888. Serial No. 292,117. (No model.)



Claim.—1. In a ditching-plow, the combination of the plow-frame and a belt-carrying frame adjustable vertically at its front and laterally at its rear end, substantially as described.

2. In a ditching-plow, the combination of the plow-frame and a belted roller-frame adjustably secured at front to the plow-standard and connected at rear to the extended landside by adjustable braces, substantially as described.

3. In a ditching-plow, the combination of the plow-frame having an extended landside, the belted roller-frame secured at front to the plow-standard by a swivel-joint, adjustable braces connecting the extended landside with the rear end of the roller-frame near the bottom, and a brace pivoted at one end to the top of the roller-frame and adjustably secured at its other end to the adjustable brace, substantially as described.

4. In a ditching-plow, the combination of the plow-frame having an extended landside, the belted roller-frame provided at front with a plate having a vertical series of apertures, a swivel secured at one end to the plow-standard and adjustably connected at its other end to said plate, a horizontal brace connecting the extended landside with the rear end of the roller-frame near the bottom, and a brace pivoted at one end to the top of the roller-frame and adjustably connected at its other end to the horizontal brace, substantially as described.

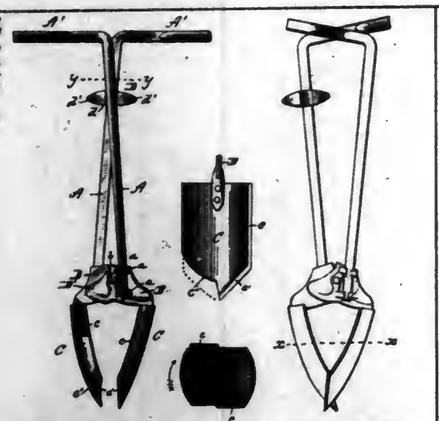
5. In a ditching-plow, the combination of the plow-frame having an extended landside, B', a belted roller-frame pivoted at its forward end to the plow-standard and connected at its rear end to the rear end of the landside by adjustable braces, and a long blade, K, secured to and projecting below the landside, to prevent lateral movement of said landside, substantially as described.

401,999. POST-HOLE AUGER.

Henry C. Cloyd, Union City, Ind. Filed Aug. 23, 1888. Serial No. 283,517. (No model.)

Claim.—1. The combination of the operating-rods, the angular

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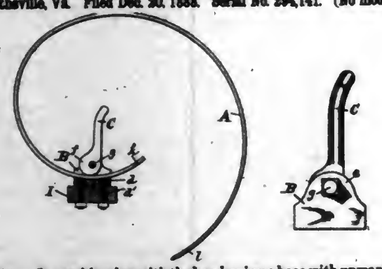
plates secured to the said operating-rods by means of malleable lugs *a*, formed integral with the said plates, the bolt *b* for pivoting these plates together, and the blades secured to downward extensions of the plates, substantially as described.

2. The combination of the pivoted angular plates, the operating-handles secured thereto, and the two concavo-convex blades C C, these blades being each pointed at its lower end and sharpened upon one of its vertical edges, each blade also having a portion of its lower pointed end cut away, as at *c'*, the cut-away portions being upon opposite sides of the auger, whereby, when the blades are brought together after boring, the space between their lower ends will be entirely closed, as and for the purpose set forth.

3. The combination of the blades, the angular arms or plates pivoted together, the operating-rods attached to the said arms or plates, and provided with oppositely-projecting handles, and the catch D, attached to one of the said rods, and provided with a notch in its face and oppositely-projecting inclined or beveled lips, as and for the purpose herein set forth.

4. The combination of the operating-rods A A, provided with the handles A' A', projecting in opposite directions, the catch D, secured to one of the said rods, and provided with oppositely-projecting inclined lips *d' d'*, the angular plates B B, secured, respectively, to the lower ends of the operating-rods and pivoted together, each of these plates being provided with oppositely-projecting extensions or guides B' B', and the blades C C, curved and pointed, as described, and provided with notches *c'* at their lower ends upon opposite sides of the auger, all arranged as and for the purpose described.

402,000. SPRING-TOOTHED HARROW. THOMAS R. CRANE, Heathsville, Va. Filed Dec. 20, 1888. Serial No. 294,141. (No model.)

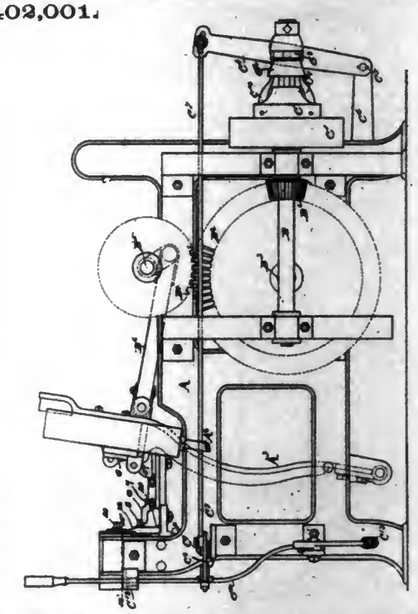


Claim.—In combination with the box having a base with upwardly-extending vertical ears formed integral with the base, a cam-lever pivoted between said ears, a space between the lever and base, and a spring harrow-tooth secured in said space, substantially as specified.

402,001. STOP MECHANISM FOR LOOMS. GEORGE CROMPTON and HORACE WYMAN, Worcester, Mass.; Mary C. Crompton administratrix of said George Crompton, deceased; said Mary C. Crompton and Horace Wyman assignors to the Crompton Loom Works, same place. Filed Feb. 19, 1886. Serial No. 192,519. (No model.)

Brief.—The dagger controlled by the weft-feeler drops when the weft-thread fails, and through mechanism engaged and operated thereby effects the release of the shipper-handle from its retaining-notch, while at about the same time and during the same forward beat of the lay a finger operated by the weft-stop mechanism raises a bunter and places it in position to be struck by a lug upon the lay, whereby its further forward movement is arrested and consequently all the other parts of the loom are caused to stop.

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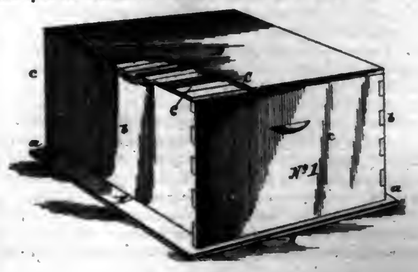
Claim.—1. The lay, means to move it, a stand attached to it between the selvages of the fabric to be woven, a feeler pivoted on the said stand at the front of the lay, a dagger pivoted below the feeler, means to connect the feeler and dagger, a dog acted upon by the dagger, a rock-shaft mounted in bearings at the under side of the breast-beam and having projection 45 and lug 86, and the bunter, and means between the said dog and the said projection 45 to operate the said shaft to place the said bunter in the line of movement of and to arrest the lay as the latter is moved forward after the breaking of the filling, substantially as described.

2. The lay, the two stands thereon, the two weft-feelers, each pivoted, as shown and described, at the front of the lay, the two daggers, and means to connect each feeler with its dagger, and a rock-shaft having attached dagger-lifters, combined with means to actuate the said rock-shaft and move both daggers together, substantially as described.

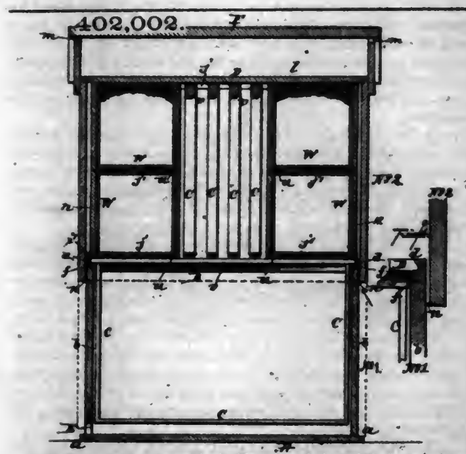
3. The lay, an attached stand, a weft-feeler pivoted thereon at the front of the lay, a dagger, and means to connect it with the feeler, a rock-shaft, the dagger-lifter thereon, and an arm, 64, attached to the said rock-shaft at a distance from the dagger-lifter, combined with a bracket, *g*, at or near one side of the loom and near the line of selvage, and with means, substantially as described, carried by the said bracket, to operate the said arm and turn the said rock-shaft and dagger-lifter, substantially as described.

402,002. BEE-HIVE. FRANCIS DANNENBAKER, Claymont, Del. Filed Aug. 17, 1888. Serial No. 282,905. (No model.)

Claim.—1. The combination of body No. 1, consisting of the brood-chamber, with body No. 2, consisting of a casing open at the top and at the bottom enveloping said body No. 1, the dimensions of the two bodies being such that a space, *s*, is left between said bodies, the cleats *i* on two of the sides of the inner walls of body No. 2, and a cleat or cleats, *i'*, arranged over said space or spaces, whereby said body No. 2 may be adjusted to close said spaces or to leave one of them open for ventilation, substantially as described.

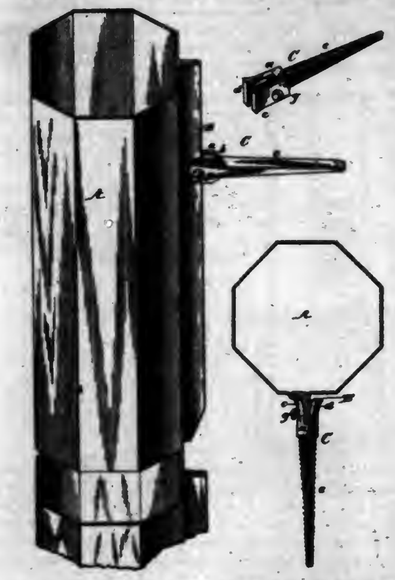


402,002.



2. The combination of body No. 1, consisting of the brood-chamber having the upper edges of its ends *b b* rabbeted at *d*, the removable strips *f f*, fitted in said rabbets, and comb-frames having their bars supported upon said strips, with body No. 2, consisting of a casing open at the top and at the bottom provided with comb-frames and section-crates and supported upon said top bars, so as to leave the bee-space *f'*, as described.

402,003. SUPPORT FOR WATER-CONDUCTORS. JOHN DAVIS, Allegheny, Pa. Filed Feb. 1, 1889. Serial No. 298,314. (No model.)



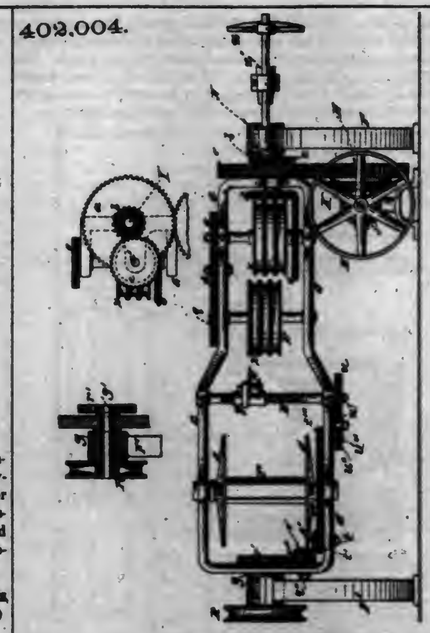
Claim.—1. A support for water-conductors, having a head provided with a slot, arms curved outwardly at their free ends, and suitable means for securing it to a conductor, substantially as described.

2. A support for water-conductors, having a head provided with a slot, arms curved outwardly at their free ends, and a screw for securing it, in combination with a water-conductor having a projection or fold on one side, substantially as described.

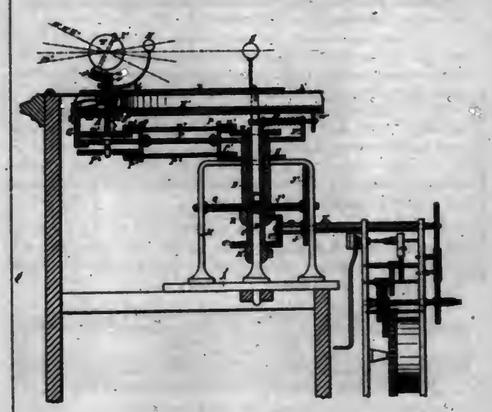
402,004. REEL FOR MACHINES FOR FORMING AND REELING ROPES OR STRANDS. MOSES H. DAY, Brookline, Mass. Filed July 29, 1887. Serial No. 245,631. (No model.)

Claim.—In a collapsible reel for receiving a rope or strand as produced in a machine such as described for forming ropes or strands, the combination, with the heads having mortises, of the semi-cylindrical blades having a tenon at each end to fit in said mortises, the tenons being secured by pins in the mortises of one head and detachable from the mortises in the other head, substantially as specified.

402,004.



402,005. TELLURIAN. LOUIS DEICHMANN, Cassel, Germany. Filed Sept. 18, 1888. Serial No. 285,782. (No model.) Patented in Germany June 28, 1887, No. 43,274; in France Aug. 31, 1887, No. 186,568, and in Belgium Feb. 6, 1888, No. 80,583.

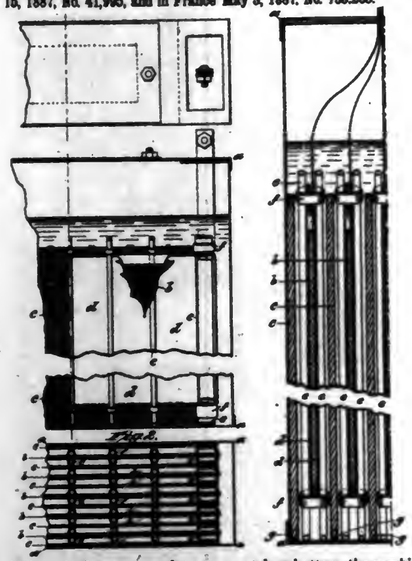


Claim.—1. The combination consisting of the clock mechanism, the rotary shaft K, pinion J, gear-wheel J', toothed wheel C^3, crown-wheel C', sleeve C, rotary shaft B, crown-wheel *n*, pinion *n'*, support or journal *p*, arbor or shaft n^2, support or journal q, pinion n^3, crown-wheel n^4, sleeve t^2, sleeve *u*, spring *f*, support G, and the spheres M and S, helical spring *w*, wheel *w'*, and arm F', and collar E', substantially as shown and described.

2. The combination consisting of the clock mechanism, the shaft K, pinion J, wheel J', worm J^2, worm-wheel J^3, sleeve D, crown-wheel N, pinion p', arbor or shaft p^2, pinion p^3, crown-wheel P^3, shaft *t*, and wheels *a*, sphere T, and axis *t'*, wheels a' a^2, elliptical disk E', the indicator Z, dial E, and collar E, substantially as shown and described.

3. The combination consisting of the clock mechanism, the rotary shaft K, gear-wheels J J', pinion C^3, crown-wheel C', shaft B, worm and wheel J^2 J^3, sleeves C D, crown-wheels N *n*, pinions n' p', shafts or arbors n^2 p^2, arm F, pinions n^3 p^3, crown-wheels n^3 P^3, shaft and sleeve t t^2, support G, spring *f*, wheels *a* a' a^2, sleeve *u*, axis *t'*, spheres T M S, indicator Z, dial E, helical spring *w*, shaft Q, and bracket H and plate A', substantially as shown and described.

402,006. SECONDARY BATTERY. CAMILLE DESMAZURES, Paris, France; James L. Norris, administrator of said Camille Desmazures, deceased, assignor to Marie Antoinette Desmazures, Paris, France. Filed Mar. 31, 1887. Serial No. 233,175. (No model.) Patented in England June 15, 1886, No. 7,966, and Mar. 21, 1887, No. 4,219; in Germany Mar. 15, 1887, No. 41,995, and in France May 3, 1887, No. 183,285.



Claim.—1. In an accumulator or secondary battery, the combination, with an alkaline liquid, of pure porous metallic plates, substantially as described.

2. In an accumulator in which an alkaline liquid is employed at the positive pole, the positive electrodes *b b*, composed of pure porous copper, substantially as described.

3. In an accumulator, the combination, with an alkaline liquid and pure porous-metal plates, of parchment-paper envelopes for said plates, whereby a metal may be employed whose oxide might dissolve in the electrolyte, substantially as described.

4. In an accumulator in which an alkaline liquid is employed, the electrolyte liquid composed of chlorate of soda with zincate of soda or of potash, substantially as described.

5. In an accumulator in which an alkaline liquid is used, the combination of the glass rods *e e* and india-rubber rings *f f* to separate and support the positives and negatives.

402,007. SPLICE-BOX FOR ELECTRIC CABLES. THOMAS J. DREWRY, Palmyra, N. J., assignor to the Electric Cable Construction and Maintenance Company, of Pennsylvania. Filed Feb. 23, 1889. Serial No. 300,809. (No model.)



Claim.—1. The combination of a cable of electric wires having a spliced joint, a sheath or box inclosing said splice and having packing-receiving sockets at each end, soft packing-rings in said socket portions, and couplings screwed into said socket portions and compressing the washer upon the cable.

2. The combination, with the spliced cable, of a protecting metal sheath or cylinder adapted to cover the spliced portion of said cable, washers of soft material surrounding said cable on each side of the splice, and means, substantially as described, to force said washers in contact with the cable to form a water-tight section.

3. The combination, with the spliced cable and an inclosing metal tube inclosing said cable, of a protecting metal sheath or box adapted to cover the spliced portion of said cable, couplings encircling said cable at each end of said sheath or box and uniting the tube and sheath or box, and washers of soft material between said coupling ends and the ends of the sheath or box, whereby, when said parts are drawn together, the washers are forced against the cable and make a tight joint.

4. The combination, with the spliced cable, of a protecting sheath or box adapted to cover the spliced portion of said cable, having screw-threaded ends, couplings encircling said cable at each end of said sheath or box and provided with screw-threads upon their outer surfaces to screw into the sheath or box, and washers of soft material between said couplings and the ends of the sheath or box, whereby, when said parts are screwed together, they force the washers against the cable.

5. The combination of the cable A, having the spliced portion, the box or sheath D, having projecting parts or collars E, couplings C, screwing into the projecting parts or collars, metallic rings F, having inner beveled edges, *f*, arranged within the projecting parts, and washers G, adapted to be compressed within the projecting parts or collars to make tight joints at each end of the splice-box.

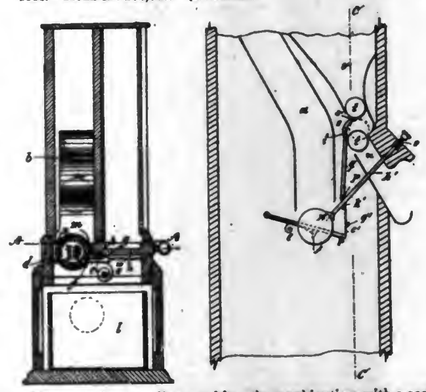
6. The combination of a spliced cable, an inclosing metal splice-box having its edges beveled and provided with an internally-screw-threaded part projecting beyond the beveled edges, soft washers or packing-rings within said projecting parts, and couplings which screw into the projecting part of the splice-box and compress the washers.

7. The combination of a cable of electric wires having a spliced joint, a sheath or box inclosing said splice and having packing-receiving sockets at each end, soft packing-rings in said socket portions, packing-receiving metallic rings upon each side of the packing, and couplings screwed into said socket portions and compressing the washer upon the cable.

8. The combination of the sheath or box D, having its ends provided with collars E, forming socket portions at each end, annular rings H and F within said socket portion, a soft washer, G, between the annular rings, and couplings C, screwed into said socket portions to compress the rings H upon the washer.

9. The combination of the sheath or box D, having its ends provided with collars E, forming socket portions at each end, annular rings H and F within said socket portions, a soft washer, G, between the annular rings, couplings C, screwed into said socket portions to compress the rings H upon the washer, and the conduit-pipe B, screwed into the couplings, substantially as set out.

402,008. VENDING-MACHINE. GUSTAV J. DOLLINGER, Hamburg, Germany, assignor to Josef Steindecker, same place. Filed Nov. 28, 1888. Serial No. 292,070. (No model.)

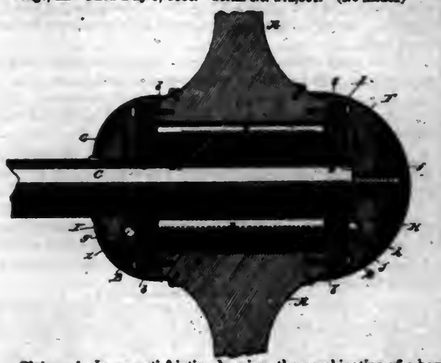


Claim.—1. In a vending-machine, the combination, with a casing and a coin-hopper, of a slotted lever adapted to receive and hold the coin and to be depressed by the latter, a delivery device adapted to engage the pivoted lever, and a spring adapted to hold the lever up in position, all substantially as shown, whereby, when a coin is placed upon the lever, the latter will be depressed and thrown out of engagement with the delivery device.

2. In a vending-machine, the combination, with a casing provided with a coin-hopper, of a spring-sustained slotted lever pivoted to the case and provided with spring-arms to receive and hold the coin, a delivering device adapted to engage the pivoted lever when in its normal position, and an arm or rod connected with the delivering device, all substantially as shown, whereby, when a coin is placed on the lever, it causes the disengagement of the latter from the delivering device and permits the arm or rod carried by the latter to force the coin through the slotted lever.

3. In a vending apparatus, the combination, with the box or casing provided with a coin-hopper, *a*, of the slotted lever *c*, pivoted to the case, as at *d*, and provided with spring-arms *f*, to clasp the coin projecting through the slot in the lever, a hook, *g*, secured to the free end of the lever, a delivery-slide, *h*, provided with a hook, *k*, to engage the hook on the lever, and a spring, *e*, secured to the case and adapted to hold the lever *c* up in engagement with the hook on the delivery-slide.

402,009. BEARING FOR JOURNALS. WILLIAM R. ELLIOTT, Chicago, Ill. Filed May 5, 1888. Serial No. 272,881. (No model.)

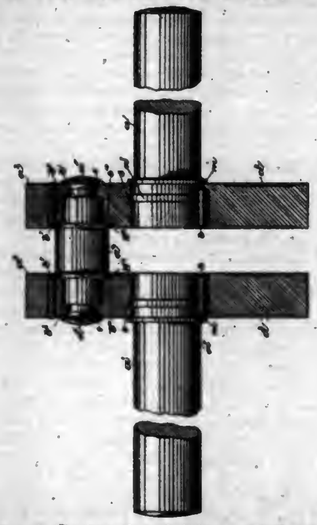


Claim.—1. In an anti-friction bearing, the combination of a box having in its ends annular grooves provided with inclined bearings, a series of bearing-cylinders, and a series of separating-cylinders, said separating-cylinders being provided with contracted journals having rounded ends engaging said inclined bearing in and free to traverse the annular groove, the circle traversed by the journals of the separating-cylinders being within the corresponding circle of the journal-bearing cylinders, substantially as described.

2. In an anti-friction bearing, the combination of a box having in its ends inclined bearings, and also annular grooves, a series of bearing-cylinders having rounded corners engaging said inclined bearings, and a series of separating-cylinders provided with contracted journals projecting in and free to traverse the annular grooves, the circle traversed by the journals of the separating-cylinders being within the corresponding circle of the journal-bearing cylinders, substantially as described.

3. In an anti-friction bearing, the combination of a box having at its ends inclined bearings, and also annular grooves having similar bearings, and a series of bearing and separating cylinders having rounded corners respectively engaging said inclined bearings, said separating-cylinders being provided with contracted journals projecting in and free to traverse the annular groove, the circle traversed by the journals of the separating-cylinders being within the corresponding circle of the journal-bearing cylinders, substantially as described.

402,010. CRANK-SHAFT. CHARLES FOSDICK, Fitchburg, Mass. Filed Dec. 4, 1888. Serial No. 292,678. (No model.)



Claim.—1. The journals, and disks carried thereby, provided with chambers having shoulders b^3, combined with the hollow sleeve to abut against the said shoulders, and the headed pin or bolt extended through the said sleeve and disks, substantially as described.

2. The journals, and the disks secured thereto, and provided with chambers having shoulders b^3, and countersinks 8, combined with the hollow sleeve, and the bolt extended through the disks and sleeve and filling the said countersinks, substantially as described.

3. The journals and their connected disks, provided with chambers having shoulders b^3 and b^{10}, and the sleeve having flanges b^{10}, combined with the bolt extended through the said disks and sleeve to hold them together snugly, substantially as described.

4. The combination, with the journals having each an annular projection, of the disks each having a bore provided with an annular groove to embrace the annular projection, and each provided with a chamber having a shoulder, b^3, and the hollow sleeve and headed pin or bolt extended through the said sleeve and disks, substantially as described.

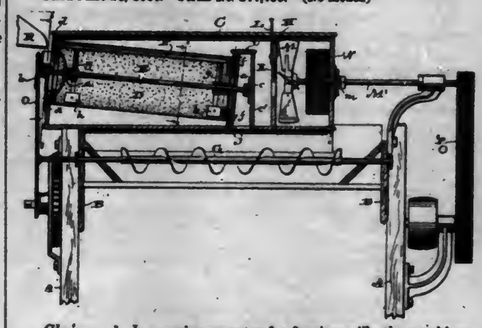
402,011. FINGER-RING. MOSES FREED, New York, N. Y. Filed Nov. 27, 1888. Serial No. 291,949. (No model.)



Claim.—1. In a ring having a head provided with a recess, the combination of a stone adapted to be received within said recess, a metallic plate upon the back of the stone, recesses or pockets formed by the metallic plate between the latter and the stone, projections upon the ring-head extending into certain of said recesses, and a locking-pin extending into another of said recesses, substantially as specified.

2. In a ring having a head provided with a recess, the combination of a stone adapted to be received within said recess, a metallic plate upon the back of the stone, recesses or pockets formed by the metallic plate between the latter and the stone, projections upon the ring-head extending into certain of said recesses, a locking-pin extending into another of said recesses, and a letter upon the front side of the stone provided with prongs extending through the stone and the metallic plate, by which both the letter and the plate are secured to the stone, substantially as specified.

402,012. GRAIN-SEPARATOR. STEPHEN FREEMAN, Racine, Wis. Filed June 21, 1888. Serial No. 277,753. (No model.)



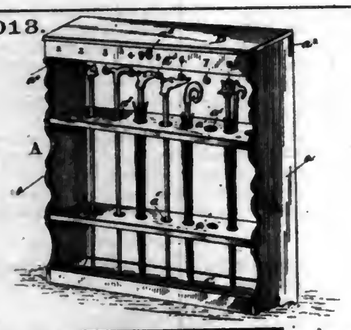
Claim.—1. In a grain-separator for fanning-mills, the combination, with a housing, of a gauze cylinder located therein, a fan and fan-chamber, a conduit between the fan-chamber and the cylinder-housing, and a chamber leading from the interior of the cylinder, the walls of which last-named chamber form a partition between the housing and the interior of the cylinder, so that the draft from the fan will be drawn through the walls of the cylinder, substantially as described.

2. The combination, in a grain-separator, of an inclined gauze cylinder and housing therefor, a fan and fan-chamber, the latter communicating with the cylinder-housing, and a chamber inclosing the inner end of the cylinder and leading therefrom, substantially as described.

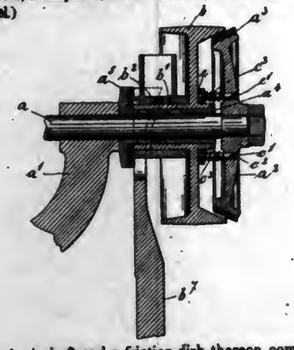
402,018. UMBRELLA OR CANE RACK. WILLIAM GABLE, Shamokin, Pa. Filed Aug. 15, 1888. Serial No. 282,777. (No model.)

Claim.—The combination, in an umbrella or cane rack, of the vertical side pieces, the horizontal cross-pieces connecting the vertical sides and provided with a series of apertures adapted to receive and hold the canes or umbrellas deposited in the rack, a drip-pan located in the bottom of the rack, and a single cover hinged upon one side of the rack at its top part and adapted to overlap and cover the entire series of apertures or receptacles and the articles placed therein, substantially as and for the purpose set forth.

402,013.



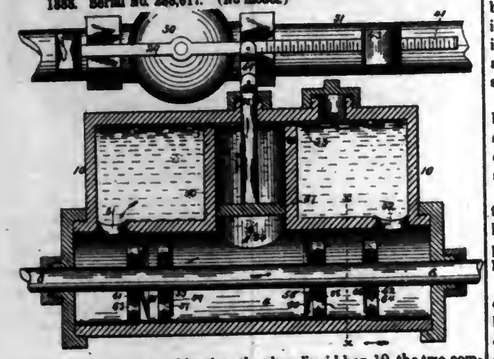
402,014. CLUTCH. LOUIS GODDU, Winchester, assignor to James W. Brooks, principal trustee, Cambridge, and Frank P. Stanley, associate trustee, Swampscott, Mass. Filed July 9, 1888. Serial No. 279,423. (No model.)



Claim.—1. A shaft and a friction-disk thereon, combined with a free and disconnected sleeve loose on said shaft and capable of longitudinal and rotary movement on said shaft, a pulley loose on said sleeve, and means to move the pulley longitudinally on the sleeve, substantially as and for the purpose specified.

2. A shaft and a friction-disk thereon, combined with a free and disconnected sleeve provided with a flange, and loose on said shaft, a pulley loose on said sleeve, a hub, b^2, and a shipper-rod acting on said hub to move the said pulley, substantially as described.

402,015. HYDRAULIC GOVERNOR FOR ENGINES. WILLIAM H. GRAY and JAMES D. GRAY, West Falls, Md. Assignors to the Gray Automatic Steam Governor Company of Alexandria, Va. Filed Oct. 20, 1888. Serial No. 288,617. (No model.)



Claim.—1. In combination, the close liquid-box 10, the two communicating cylinders 4 and 50 therein, having communication therewith at 51, 52, and 54, the pistons and diaphragms at opposite sides of the opening 54, and the pistons 67, with rod 68, passing through the top of box 10, as set forth.

2. In combination, a liquid box or reservoir, a cylinder therein having near each end a stationary diaphragm with inward-opening valve, a piston-rod in the cylinder carrying two heads with inward-opening valves, a second cylinder communicating with the first and with the liquid-box, a valve to control the opening to the liquid-box, and a piston in the second cylinder whose rod connects with and operates the supply-valve, as set forth.

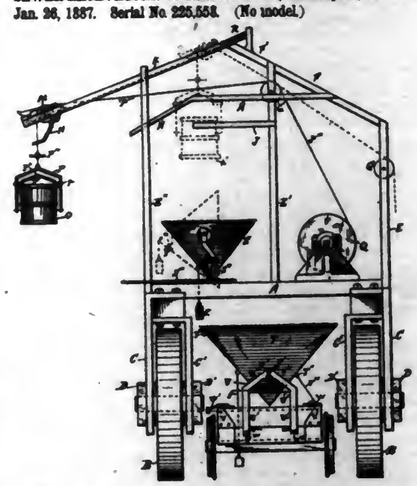
3. In combination, the liquid-cylinder, the supplementary cylinder communicating therewith, the liquid-box communicating with both cylinders, and the valve between the supplementary cylinder and liquid-box, having a pointer and graduated scale to indicate the speed, as set forth.

4. In combination, the liquid-box, the liquid-cylinder, and the supplemental cylinder having communication with each other, the valve between the supplemental cylinder and the liquid-box, and the pin in its plug to limit the extent of its adjustment in either direction, as set forth.

5. In combination, the rod 68, having teeth 79, the supply-pipe valve, its stem, the disk mounted thereon having teeth to engage those on the rod, and the lever 80, engaging therewith, as set forth.

6. In combination, the extensible lever having curved pieces 81 and 82 at its ends and mounted upon the supply-valve stem, the cord 83, having weight 84 at one end and the handle 88 at the other end of the lever, the disk on the valve-stem, and the stop 87 thereon, as and for the purposes set forth.

402,016. LOADING AND UNLOADING MECHANISM FOR SEWER-EXCAVATORS. NELSON R. GREEN, Minneapolis, Minn. Filed Jan. 26, 1887. Serial No. 225,553. (No model.)



Claim.—1. The combination, with a carriage adapted to receive a car beneath the same, of a pivoted automatic dumping-receptacle mounted in fixed bearings on said carriage and adapted to empty its contents into a car beneath the carriage, substantially as described.

2. The combination, with a carriage adapted to receive a car beneath the same, of a pivoted automatic dumping-receptacle mounted in fixed bearings on said carriage and adapted to empty its contents into the car beneath the carriage, and a hoisting-bucket adapted to automatically dump into the pivoted receptacle, substantially as described.

3. The combination, with a carriage adapted to receive a car beneath the same, of a dumping-receptacle pivoted above and to one side of the center of gravity of the said receptacle and adapted to discharge into a car beneath the carriage, and a counter-balance for said receptacle, substantially as described.

4. In combination, the hoisting-bucket having a bail pivoted to the same below the center of gravity, keepers sliding on the bail, said keepers being connected by a bridge or bail provided with a cross-bar projecting at right angles to the bridge or bail, and guides for the bucket-bail having inclined portions, substantially as described.

5. The combination, with a hoisting-bucket, of the rigid bucket-dumper J, located at one side of and slightly within the path of the bucket-body in its dumping position and at one side of the pivotal axis of the bucket, whereby the bucket is brought into contact with said dumper in its emptying position and is forced to turn always in one direction to discharge its contents, substantially as described.

6. A trolley consisting of a frame having a sheave provided with a notched hub, a gravity sheave-lock consisting of a pivoted bar having a projection on its under side in position to engage the notched hub, and a cam, in combination with a trolley-track having a projection and a lock for the trolley separate from the other parts named, substantially as described.

7. A bail-guide for a hoisting-bucket, consisting of two guiding-bars of unequal length having outer curved portions, substantially as described.

8. The combination, with a hoisting-bucket provided with a bail, of a movable support for the bucket, a guide for the movable support for the bucket, and a bail-guide consisting of two guiding-bars having at one end outwardly-curving portions, said curving portions being located at different distances from the other end of the guide, substantially as described.

9. In combination, the bucket O, provided with the lugs p', the bail P, pivoted below the center of gravity to said bucket, the false bail P', having the keepers p, sliding on the bail P, and provided with the cross-bar P'', the combined guides and tripping-bars H H', the metallic spring bucket stop and dumper J, attached to the post E, provided with the bends J'', J''', and J''', and suitable mechanism, substantially as described, for removing said bucket from its filling to its emptying position.

10. In combination, the trolley M, consisting of a frame, a grooved sheave, e, provided with the notched hub d, anti-friction journal-rollers f, the gravity sheave-lock g, provided with the lugs h and cam-surface k, guide K, provided with cam-surface L', the gravity trolley-frame lock N, pivoted at l to the under side of the guide K, and provided with the cam-faced hooks m, and the downwardly and outwardly extended loop-shaped portion n, the cable P'', provided with the disk P'', and the winding-drum Q, substantially as described, for the purpose set forth.

11. In combination, the sheave-carrying trolley M, the trolley-track K, the hoisting-bucket O, the cable P''', and the bucket-guides H and H', fixed to the main frame above the receiving-receptacle and extending outward and downward on opposite sides of the path of the bucket-bail and provided with laterally-curved extremities, as set forth, whereby the bucket-bail is always caught lengthwise between the guides, and the bucket is directed truly to its dumping position.

12. In an apparatus of the class described, the main platform, in combination with the vertical braces C C', the horizontal braces D D', connected with the truck-platform, and independent wheels journaled in said horizontal braces, as set forth.

13. The herein-described carriage for loading and unloading mechanism, provided with horizontal braces D D' for the wheels of the carriage, substantially as described.

14. The apparatus comprising a hoisting device and the supporting-platform therefor, the said hoisting device extending beyond the platform at one side, parts depending from each side of the platform with a clear space between through which a car may be passed, wheels mounted in the depending parts, horizontal braces for said wheels, and an automatic dumping-receptacle on said platform adapted to receive material from the hoisting device and to dump the same into a car beneath the platform, substantially as described.

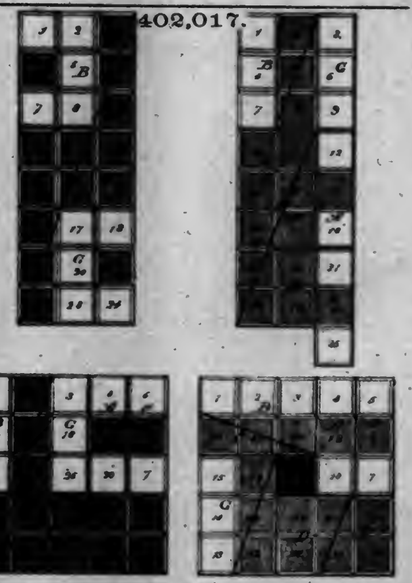
15. In combination with a hoisting-cable, a dumping hoisting-bucket provided with a bail and connected to said cable, a suitable support adapted to sustain said bucket and cable in their movement from the bucket's filling position in one vertical plane to its dumping position in another vertical plane, and a bail-guide consisting of two guiding-bars of unequal length extending from beyond said dumping-plane outward toward said filling-plane, both bars curving away from each other at their outer ends, the curved portion of one bar being nearer the filling-plane than the curved portion of the other, substantially as and for the purpose set forth.

16. In combination with the automatically-dumping hoisting-bucket provided with a bail, a support for said bucket adapted to sustain the same in its movement from its filling to its emptying position, a bail-guide for said bucket, consisting of two guiding-bars of unequal length having outer curved portions, said curved portions being located at different distances from the other end of said bail-guide, and a bucket-dumper located adjacent to the bucket in its emptying position, adapted to force said bucket always to dump in one direction, substantially as described.

17. The apparatus comprising a carriage adapted to receive a car beneath the same, a pivoted automatic dumping-receptacle mounted on said carriage and adapted to empty its contents into the car beneath the carriage, a hoisting-cable, an automatically-dumping hoisting-bucket provided with a bail attached to said cable and adapted to empty its contents into said pivoted receptacle, a suitable support adapted to sustain said bucket and cable in their movement from the bucket's filling position to its emptying position, a bail-guide consisting of two guiding-bars of unequal length having outer curved portions, said curved portions being located at different distances from the other end of said bail-guide and adapted to direct said bucket to its dumping position, and a bucket-dumper located adjacent to the bucket in its dumping position and adapted to force said bucket always to dump in one direction, all substantially as described, and for the purpose set forth.

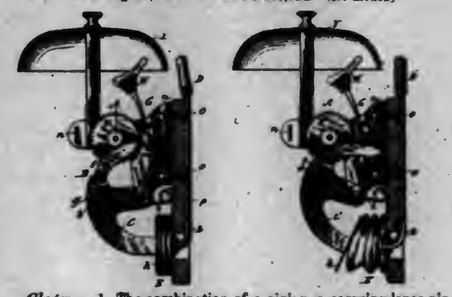
402,017. PUZZLE. FRED HOWARD, Hyde Park, Ill. Filed May 25, 1888. Serial No. 275,675. (No model.)

Claim.—1. In a game or puzzle, the combination of a number of blocks having the form of parallelograms, trapezoids, and triangles, and substantially of the numbers and proportions described in the specification, whereby, when arranged in one way, they produce a figure of a certain superficial area, and when arranged in another way a figure of an apparently different superficial area, substantially as described.



2. In a game or puzzle, a square divided into parallelograms, trapezoids, and triangles by dividing the whole square into two rectangular portions or parallelograms, one containing about two and the other three fifths of its superficial area, dividing the larger portion of the original square on lines parallel to its end at about one-fifth and two-fifths of its length, and dividing the remaining part of the larger portion diagonally on a line from a point on one side about one-third to a point on the opposite side about two-thirds of the length of its side, dividing the smaller portion of the original square into two triangles, and dividing these triangles on a line parallel to their shorter base at a point on their longer base about two-fifths of their length, measuring from the shorter base, whereby the parts may be rearranged to form a hollow square of the same apparent dimensions as the original solid square, a right parallelogram, or a right parallelogram of the same apparent dimensions, with a small square projecting at one corner, substantially as described.

402,018. MECHANICAL MOVEMENT. JOHN HUNT, New York, N. Y. Filed Aug. 24, 1888. Serial No. 283,634. (No model.)



Claim.—1. The combination of a pinion, a carrying-lever pivoted on an axis below the axis of the pinion, and a sector having teeth normally concentric with said axis and engaging said pinion, and said sector eccentrically pivoted to said lever on an axis normally to one side of said lever-axis, and which ascends as the lever is moved, whereby when the lever is moved to communicate rotation through the sector to the pinion the sector is caused to readily free itself by gravity at the completion of its active movement.

2. The combination of a pinion, a carrying-lever pivoted on a relatively-fixed axis, and a toothed sector having teeth normally concentric with said axis and engaging said pinion, said sector pivoted eccentrically to said carrying-lever at a point normally to one side of the center of gravity of the sector, so that its weight holds it in mesh with said pinion, but which point in the movement of the carrying-

lever passes to the opposite side of said center of gravity, so that the sector falls out of mesh with the pinion, and said sector having a toothless space, *f*, to enable it to thus fall out of mesh and free itself from the pinion independently of the continued rotation of the latter.

3. The combination of a pinion, a carrying-lever pivoted on a relatively-fixed axis, and a toothed sector having teeth normally concentric with said axis and engaging said pinion, said sector pivoted eccentrically to said carrying-lever at a point normally to one side of the center of gravity of the sector, so that its weight holds it in mesh with said pinion, but which point in the movement of the carrying-lever passes to the opposite side of said center of gravity, so that the sector falls out of mesh with the pinion, and said lever and sector having reciprocal shoulders arranged to limit the disengaging movement of the sector and as the lever is returned to draw back the sector.

4. The combination of a pinion, a carrying-lever pivoted on a relatively-fixed axis, and a toothed sector having teeth normally concentric with said axis and engaging said pinion, said sector pivoted eccentrically to said carrying-lever at a point normally to one side of the center of gravity of the sector, so that its weight holds it in mesh with said pinion, but which point in the movement of the carrying-lever passes to the opposite side of said center of gravity, so that the sector falls out of mesh with the pinion, and said lever and sector having reciprocal shoulders, consisting of the walls of a slot formed in one part and a screw fixed to the other part entering said slot and having an overhanging head, serving to hold the two parts together, while limiting their relative movement.

5. The combination of a pinion, a carrying-lever pivoted on a relatively-fixed axis, and a toothed sector having teeth normally concentric with said axis and engaging said pinion, said sector pivoted eccentrically to said carrying-lever at a point normally to one side of the center of gravity of the sector, so that its weight holds it in mesh with said pinion, but which point in the movement of the carrying-lever passes to the opposite side of said center of gravity, so that the sector falls out of mesh with the pinion, and a spring arranged to exert a retractile tension against said carrying-lever.

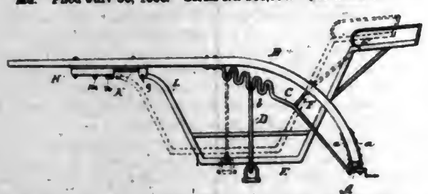
402,019. SLED. VICTOR D. JOHNSON, Mount Pleasant, Iowa. Filed Jan. 3, 1887. Serial No. 223,266. (No model.)



Claim.—1. A sled or sleigh runner having a shoe, A, shaped as shown, with one or more semicircular inverted arch-bars, B, resting on said shoe, constituting bench-knees, with a curved brace, D, fastened to the rear end of said shoe as auxiliary to the rear point of a segment, B, and a brace, C, fastened to the forward end of said shoe, supporting the forward point of an inverted segment, B, all formed of separate pieces of T-iron or steel bars, so placed that the web-flange *c* of the respective pieces will lie inward and bear against each other at the several connecting-points, with plates *r* placed on each side of the flanges *c* and riveted to both the shoe A and segments B, and the knee-caps *e*, in pairs, having laterally-projecting flanges extending in opposite directions, being firmly riveted to opposite sides at the meeting-points of the segments B and those also of the braces C and D, with said segments serving as bench-supports, all substantially as shown and described.

2. In combination with a sled or sleigh runner constructed of T or other transverse forms of metal bars, the combination of the bar or shoe A and sole A', both being curved transversely to fit each other, so as to form a longitudinal inverted gutter underneath them, substantially as shown, for the purpose specified.

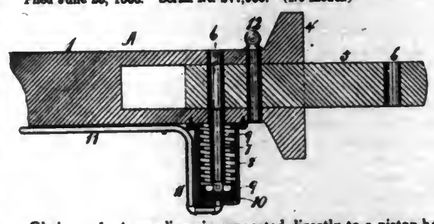
402,020. TWO-WHEELED VEHICLE. SETH L. KIMBEY, Graceton, Md. Filed July 30, 1888. Serial No. 281,357. (No model.)



Claim.—1. The combination, in a two-wheeled vehicle, of the thills secured to the axle, the corrugated brace extending from the axle to said thills, the hangers having their upper ends adjustably and loosely connected to said brace-rods, and their lower ends having eyes, the spring secured at the center of the bed and provided with loops on its ends, and said loops being connected with said eyes, whereby the bed may have a back-and-forth and sidewise movement, substantially as described.

2. The combination, in a two-wheeled vehicle, of the thills secured to the axle, the bed or body, the spring centrally secured to the bottom of the body and having the loops on its ends, the brace-rods, the hangers having their hook ends loosely connected to said brace-rods and their eye ends loosely connected with the loops, the blocks having grooves secured to said thills, the slotted slides working in said grooves, the bolts limiting the movement of said slides, set-screws engaging said slides, and the rocker-arms pivotally attached to said slides, substantially as described.

402,021. CAR-COUPLING. EDWARD J. KNAPP, Syracuse, N. Y. Filed June 23, 1888. Serial No. 277,989. (No model.)

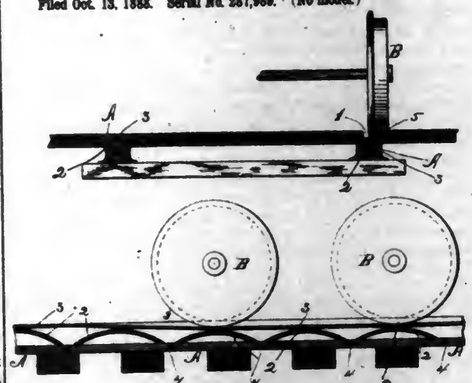


Claim.—1. A coupling-pin connected directly to a piston-head and operated vertically through the draw-bar, and a link inserted horizontally into the draw-bar by the introduction or withdrawal of air behind the piston-head, substantially as described.

2. In a car-coupling, a coupling-pin directly connected to a piston-head mounted in a cylinder secured to the draw-bar or bumper, and a pipe connected to an air compressor or exhauster, in combination, substantially as described.

3. In a car-coupling, a cylinder secured to the bumper, a piston-head within the cylinder, a coupling-pin connected directly to a piston-head, and means for forcing air into the cylinder or exhausting it therefrom, and a spring around the coupling-pin between the piston-head and bumper, substantially as described.

402,022. RAILWAY-RAIL. EDWARD J. KNAPP, Syracuse, N. Y. Filed Oct. 13, 1888. Serial No. 287,989. (No model.)



Claim.—A railway-rail grooved longitudinally and provided with a yielding filler, and drainage-perforations through the bottom of the groove, substantially as described.

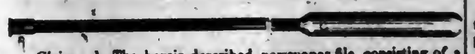
402,023. NUT-LOCK. ISAAC F. LEIBY, Baird, Tex. Filed Sept. 17, 1888. Serial No. 285,667. (Model.)



Claim.—1. The combination, with the loop-formed nut-locking device and the plate to which it is hinged, of the supplementary locking device, consisting of a wire or rod having one end bent at right angles and embracing the hinge of the main device and its other end provided with a hook to receive the side bar of the main device, as shown.

2. The combination, with the foundation-plate and the loop-formed nut-locking device 1, having the cross-piece 5 and hinged to said plate, as specified, of the supplementary locking device 1', having one end bent laterally to adapt it to bear against a nut and its other end bent downward and abutting the said cross-piece, as shown and described.

402,024. NEWSPAPER-FILE. THOMAS LOMAS, Bridgeport, Conn. Filed Jan. 14, 1889. Serial No. 296,231. (No model.)



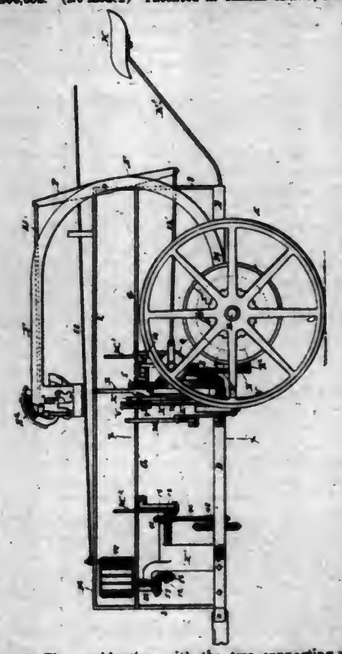
Claim.—1. The herein-described newspaper-file, consisting of a metal tube constructed with a longitudinal slot less in width than the internal diameter of the tube, combined with a rod of less diameter than the internal diameter of the tube, but greater in diameter than the width of the slot of the tube, substantially as described, the said rod being adapted to be placed in the fold of papers and with that folded portion of the papers introduced into the tube, the leaves of the paper extending through the slot, substantially as described.

2. The tube A, made from sheet metal, the edges of the metal brought near together so as to form a longitudinal slot, *a*, in the tube, the edges of the slot diverging at the end, so as to form a flaring mouth, *b*, combined with a rod, B, less in diameter than the internal diameter of the tube A, but larger in diameter than the width of the slot *a*, substantially as described.

3. The combination of the tube A, constructed with a longitudinal slot, *a*, one end fixed in a handle, C, the slot *a*, open at the opposite end, combined with a rod, B, less in diameter than the internal diameter of the tube A, but larger in diameter than the width of the slot *a*, substantially as and for the purpose described.

4. The longitudinally-slotted metal tube A, provided with a handle, C, at one end and with a removable cap, D, at the opposite end, combined with the rod B, of less diameter than the internal diameter of the tube A, but larger in diameter than the width of the slot *a* substantially as and for the purpose described.

402,025. HARVESTER. SAMUEL D. MADDIN, Sarnia, Ontario, Canada, assignor to Mary Maddin, same place. Filed May 2, 1887. Serial No. 236,852. (No model.) Patented in Canada Mar. 3, 1888, No. 28,617.



Claim.—1. The combination, with the two supporting-wheels and axle of a grain-binder, of a sleeve on the axle, a frame supported on the sleeve, a platform supported by the frame, and a U-shaped bar, F, supported by the frame below the platform and extending above the same, and a knotter supported by the bar F above the platform, substantially as described.

2. A binder-frame supported upon two wheels and an axle, and consisting of a sleeve, C, mounted on the axle, a bar, D, arranged transversely across the sleeve to which it is secured, a grain platform supported upon brackets rising from said bar and sleeve, and a U-shaped bar or plate supported at one end upon the frame below the platform, and having the other end extending above the same where it carries a support for the knotter, substantially as described.

3. A binder-frame provided with a longitudinal bar, D, brackets rising from said bar, a binder-platform supported on said brackets, and a strip or bar, E, extending above the platform and having downwardly-extending arms secured to the frame and supporting the platform at the ends, substantially as described.

4. The combination, with a continuously-rotating wheel, S, and the needle, of an intermittently-rotated wheel mounted below the binder-platform in a plane beside the needle and actuated from the wheel S, and provided with a crank-pin, and a link mounted on the said pin and connected directly with the needle, substantially as described.

5. The combination, with the knotter devices, the compressor, the ejector, and the needle, of the intermittently-rotated wheel N, mounted below the binder-platform in a plane beside the needle, and having a crank-pin connected by a link directly with the needle, and provided with separate racks, and mutilated pinions driven by the racks and driving, respectively, the knotter devices and the compressor and ejector, substantially as described.

6. The combination, with the compressor, the ejector, the needle, and the knotter, of an intermittently-rotated wheel, N, adjacent to the needle and connected directly therewith, gears between the compressor and the ejector and the wheel N, a bevel-wheel, Q, gearing with wheel N, and link-and-lever connections between the wheel Q and the knotter, substantially as described.

7. In a grain-binder, the combination, with the needle and the ejector supported upon the needle-shaft, of an intermittently-moving wheel, N, which drives the needle, mounted below the binder-platform in a plane beside the needle, and a gear-wheel, 5, connected with the ejector and driven directly by said wheel N, substantially as described.

8. In a grain-binder, the combination, with the needle and the compressor and ejector, both mounted upon the needle-shaft, of a wheel, N, arranged below the binder-platform in a plane beside the needle, but below the needle-shaft, and connected to drive the same, and a wheel, 5, to which the compressor and ejector are secured, driven directly by the wheel N, substantially as described.

9. In a grain-binder, a frame supporting the binder devices, located between two drive-wheels of equal size, which are both connected to drive the operative parts of the binder, a binder platform or table mounted on said frame extending over the said wheels, and an elevator supported by pivoted links from the said frame and resting loosely at its upper end upon a bar at the grain or receiving end of the binder-platform, substantially as described.

10. The combination of the packers M M', projecting through the binder-platform near the central portion thereof, cranked shaft 6, driving the same, a supplemental packer, M^3, projecting through the platform near the front edge thereof, a shaft, 43, parallel with the main packer's shaft, and a short shaft, 12, parallel thereto connected to drive the supplemental packer and driven from shaft 43, substantially as described.

11. The combination, with the platform, sleeve C, packers, needle, compressor and ejector arms, and knotting mechanism, of a bracket, J, carried by the sleeve and supporting the devices connected to drive the needle, compressor and ejector arms, packers, and knotting devices, substantially as described.

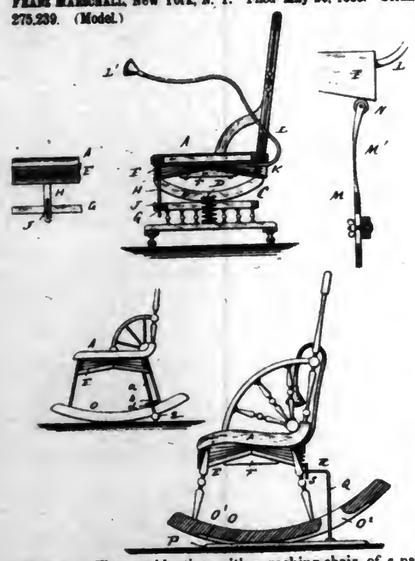
12. The combination, with two supporting-wheels, of the binder and the intermediate sleeve rocking upon the axle, of the packer, binder, discharge and knotter operating devices arranged above, close to, and forward of the sleeve, and the driver's seat in rear of said sleeve, substantially as described.

13. The combination of the frame of the binder supported upon two wheels, the platform-frame B^3, rocking together with the binder-frame on a line in rear of its center, arms connecting said frame to the binder, a shaft, 64, bearing against the under side of the platform-frame, near its front edge, having arms at the ends, one having an axle for the grain-wheel in line with the axes of the wheels of the binder, and means for rocking the shaft 64, substantially as described.

14. The combination, with the harvester-frame rocking with the binder-frame on a fulcrum in rear of its central line and flexibly connected to the binder-frame and traveling therewith, of a longitudinal bar located near the forward part of said harvester-frame and having a rearwardly-extending arm and axle for a grain-wheel with its journal about in line with the journals of the binder-wheels, substantially as described.

402,026. BELLOWS ATTACHMENT FOR ROCKING-CHAIRS.

FRANK MARSCHALL, New York, N. Y. Filed May 26, 1888. Serial No. 275,239. (Model.)

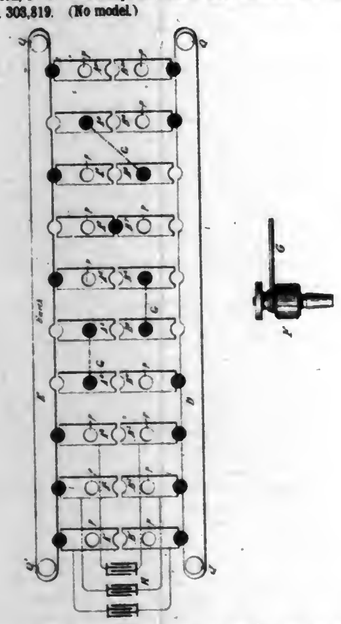


Claim.—1. The combination, with a rocking-chair, of a pair of bellows secured to the under side of the seat, a rigid piece connecting them, an air-conducting tube connected with the bellows, and a rod for operating the bellows, substantially as herein shown and described.

2. The combination, with a rocking-chair, of a bellows secured to the under side of the seat, a rod for operating the bellows by the rocking of the chair, and an air-conducting tube connected with the bellows, substantially as herein shown and described.

402,027. CONDENSER SWITCH-BOARD.

WILLIAM MARSHALL, New York, N. Y. Filed Sept. 29, 1887. Renewed Mar. 15, 1889. Serial No. 303,819. (No model.)



Claim.—1. The combination, with the positive leaf or leaves of each one of a series of condensers, of a series of contact-plates connected thereto, respectively, a corresponding series of contact-plates connected to the alternate or negative leaves, respectively, a strip adjacent to each series of plates, and a switch for connecting each plate with its corresponding strip.

2. The combination, in a condenser switch-board, of the positive series of plates A' A^2, &c., the corresponding series of negative plates, each plate of both series being provided with an independent plug-hole, and plugs adapted to the said holes provided with binding-screws at their upper ends, whereby a wire connection can be made between any two plates.

3. The combination, in a condenser switch-board, of the series of positive plates A' A^2, &c., the corresponding series of negative plates B' B^2, &c., the strips D and E, adjacent to the two series, respectively, a plug-connection between each plate and its adjacent strip, and plugs having binding-screws at their upper ends adapted to independent holes in the plates, whereby additional wire connections between the plates may be made.

402,028. LETTER-BOX FOR STREET-CARS.

GEORGE B. McALLISTER, Baltimore, Md. Filed Nov. 24, 1888. Serial No. 291,752. (No model.)



Claim.—1. The combination, with a letter receptacle or box arranged in the car with its receiving-opening in the opening of the car, of a guide plate or rib secured to the side of the car and arranged parallel therewith, and provided with a guide-bar on its outer edge, substantially as described.

2. The combination, with a letter-receptacle arranged in the car with its receiving-opening in said opening of the car, of a guide plate or rib secured horizontally on the side of the car, and provided with guides to direct the packages in the opening of the car, substantially as described.

3. The combination, in a letter-receptacle formed with an inclined chute opening therein, of the false bottoms arranged at different angles of incline and consisting of thin strips having their meeting ends intersecting, substantially as described, and for the purpose specified.

4. The combination, in a letter-receptacle, of false bottoms arranged at different angles of incline and consisting of thin strips having their meeting ends intersecting and supported on a common bearing, substantially as described.

5. The letter-receptacle herein described, composed of the receptacle A, inclined chute 1, mouth-piece 2, partially covered by the pieces 4, and the false bottoms arranged in said chute on different inclines and consisting of strips having beveled upper edges, substantially as described.

6. In a letter-receptacle, the inclined false bottoms composed of thin strips formed with beveled upper edges, substantially as described.

7. A letter-receptacle formed with a chute, constructed as described, leading into the main receptacle, and provided with vertical stop-pieces on the inner surface of the sides of the chute, whereby rain-drip is prevented from entering the receptacle.

8. The combination, with a letter box or receptacle, A, of a letter-chute, 1 2 3, constructed as herein described, that is of two sections arranged at different angles of inclination, and inclined bottom arranged to stop short of the receptacle, substantially as set forth.

9. The combination, with the receptacle A, constructed as described, having an inclined bottom, 18, of a series of beveled slats arranged on the bottom of the receptacle, as herein shown and specified.

10. The herein-described device, composed of a receptacle, A, a chute leading therein, and a mouth-piece opening into the chute, false bottom in the chute arranged at different angles of inclination, and a bottom in the receptacle composed of strips, all as specified.

11. In a letter-receptacle, the combination of the false bottom 5 6, composed of strips having beveled upper edges formed with notches, substantially as described, and for the purpose specified.

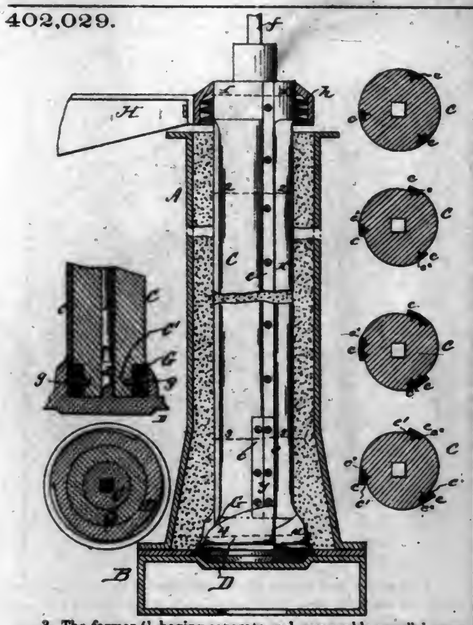
402,029. FORMER FOR PIPE-MOLDING APPARATUS.

ANDREW H. McNEAL and WILLIAM A. STINEBUCK, Burlington, N. J. Filed Apr. 23, 1887. Serial No. 235,856. (Model.)

Claim.—1. A vertically-arranged pipe-former having removable pressing-faces parallel with the axis, and the advance faces flush with the surface of the former.

2. A vertically-arranged pipe-former having removable pressing-faces, the advance edges of which are flush with the surface and the lower part provided with two faces contiguous to each other, for the purpose set forth.

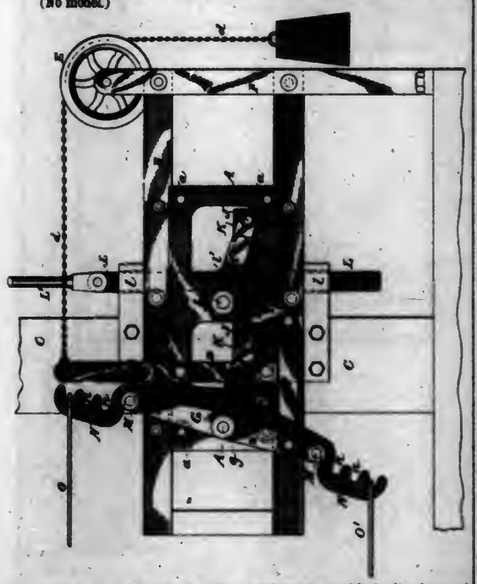
402,029.



3. The former C, having separate and removable parallel pressing-faces *c c*, extending from top to bottom of the former, and packing, *c'*, between the faces and former, substantially as and for the purpose set forth.

402,030. COMPENSATOR FOR RAILWAY SIGNAL AND SWITCH CONNECTIONS.

ALBERT R. MITCHELL, Paterson, N. J., and WILLIAM N. STEVENS, Brooklyn, N. Y. Filed Nov. 27, 1888. Serial No. 291,985 (No model.)



Claim.—1. The combination, with two movable bodies located at a distance from each other and wires for transmitting motion from one to the other, of a plate sliding on ways, mechanism mounted on said plate and to which the wires are connected so as to move simultaneously therewith, a weight attached to the sliding plate, and a horizontal bar connecting the mechanism on the plate with one of the movable bodies and adapted to have a movement in a direction at a right angle to and simultaneously with the movement of the wires, substantially as specified.

2. In a compensator, a bar, L, capable only of end reciprocating movement, and a plate having end reciprocating movement in a plane at a right angle to the movement of the bar L, combined with connected cranks pivoted in said plate, to one of which cranks the operating-wires are attached, and a bar, K, carried by said cranks and engaging with the bar L, substantially as set forth.

3. In a compensator, a bar, L, capable only of end reciprocating movement, a plate having end reciprocating movement in a plane at a right angle to that of the bar L, a bar, K, carried by said plate and engaging said bar L by a sliding connection, and means, also carried by said plate, for giving movement to said bar K, substantially as set forth.

4. In a compensator, a bar, L, capable only of vertical reciprocal movement, and a plate, A, sliding on ways and capable only of horizontal reciprocating movement, combined with the connected cranks G and H, pivoted to said plate, a bar, K, carried by said cranks and engaging the bar L by a sliding connection, and the safety attachment N, mounted on one of the cranks and to which the operating-wires are attached, substantially as set forth.

5. The plate A, having end reciprocating movement in tracks B and carrying the connected cranks G and H, bar K, and safety attachment N, combined with the wires O O', bar D, chain *d*, pulley E, and weight X, substantially as set forth.

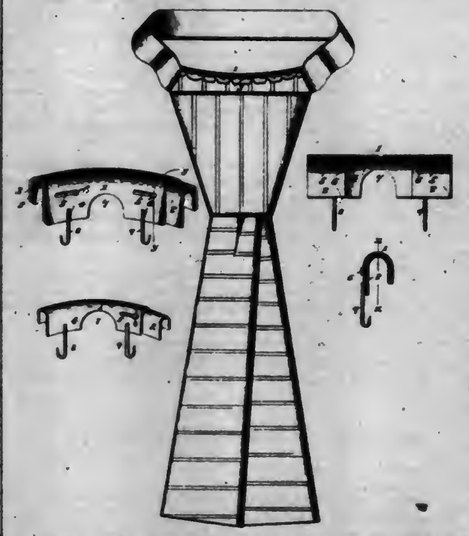
6. In a compensator, the plate A and crank G, having the grooved posts M, combined with the safety attachment N, substantially as set forth.

7. In a compensator, the crank G and grooved posts M, combined with the safety attachment N, having the notches *n* in front of the center of the said posts M, substantially as set forth.

8. In a compensator, a sliding plate, a T-crank pivoted on said plate, and posts attached to the ends of said T-crank, said posts having grooves, combined with a safety attachment which rests in said grooves and to which the operating-wires are attached, and a weight connected to said sliding plate, substantially as set forth.

402,031. SCARF-PROTECTOR.

JESSE H. MOYER, Temple, Tex. Filed Jan. 4, 1889. Serial No. 295,430. (No model.)



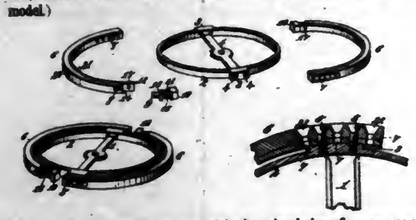
Claim.—1. A scarf-protector consisting of two members U-shaped in cross-section, fitted one within the other and having a pin-and-slot connection at the rear thereof, as and for the purpose described.

2. As a new article of manufacture, a scarf-protector consisting of a central member substantially U-shaped in cross-section, and two extensible members fitted within the central member at the ends thereof and connected thereto by a pin-and-slot connection, substantially as described.

3. As a new article of manufacture, a scarf-protector consisting of a longitudinally-curved central member substantially U-shaped in cross-section and having a transverse recess in its rear arm, and two extensible members fitted within and connected to the central member at the ends thereof and curved to correspond with the same, substantially as described.

4. As a new article of manufacture, a scarf-protector consisting of two extensible members connected to each other, and fastening hooks or claws permanently connected to one of the members, substantially as described.

402,032. COMPENSATION WATCH-BALANCE. AUGUSTUS F. PICKETT, Atlanta, Ga. Filed June 28, 1888. Serial No. 278,440. (No model.)



Claim.—1. The combination, with the wheel-rim of a compensating balance, of lengthwise movable and adjustable segments arranged upon and secured to the exterior of the wheel-rim, substantially as described.

2. The combination, with the wheel-rim of a compensating balance having screw-holes, of lengthwise-adjustable segments located outside the wheel-rim and provided with a longitudinal line of perforations, and screws passing through the segments into the holes of the wheel-rim, substantially as described.

3. The combination, with the wheel-rim of a balance having screw-holes, of segments on the exterior thereof having countersunk screw-holes, and screws attaching the segments and fitting the countersinks with their heads flush with the surface of the segments, substantially as described.

4. The combination, with the wheel-rim of a balance having screw-holes, of segments on the exterior thereof having countersunk screw-holes, screws attaching the segments and fitting the countersinks with their heads flush with the surface of the segments, and weights slidable lengthwise on the segments and having their sides and edges flush with or within the sides and edges of the segments to remove resistance to the air in the movement of the balance, substantially as described.

5. The combination, with the segments having rabbeted or recessed free extremities, of sliding weights having slotted shanks fitting the rabbets or recesses, and set-screws for holding the weights in their adjusted position, substantially as described.

6. The combination, with the wheel-rim having screw-holes, of lengthwise-adjustable segments, each having at one end more than two screw-holes, and screws adapted to pass through any of the holes into the wheel-rim to hold the segments when moved lengthwise, substantially as described.

7. The combination, with the wheel-rim having the thickened portions or projections provided with screw-holes, of lengthwise-adjustable segments, each having one end setting on the washer and provided with more than two screw-holes, and screws for holding the segments on the washers when adjusted lengthwise, substantially as described.

8. The combination, with a balance having a sectional wheel-rim thickened at points opposite the end of the cross-bar, substantially as described, of the segments and screws attaching the segments to said thickened portions of the sectional rim.

402,033. FLEXIBLE RAZOR-STROP. JEROME L. POMEROY, New Haven, Conn. Filed Oct. 29, 1888. Serial No. 289,627. (No model.)



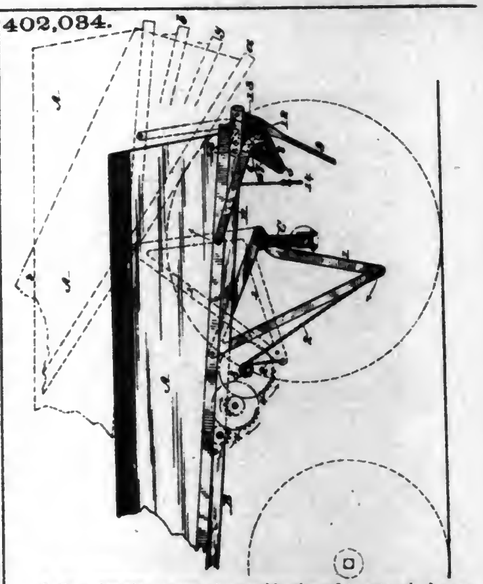
Claim.—A razor-strop consisting of a flat elastic metallic blade, A, combined with a handle attached at one end, a non-metallic jacket, *a*, around the blade, and a non-metallic surface applied to the said covering and attached thereto throughout its length, substantially as and for the purpose described.

402,034. DUMPING-WAGON. LEONHARD RODENHAUSEN, Philadelphia, Pa. Filed Feb. 1, 1889. Serial No. 298,220. (No model.)

Claim.—1. The body of a dumping-wagon and the sills of the running-gear thereof, in combination with the system of levers 5 and 6, the latter being connected with each other and with said body and sills, substantially as described.

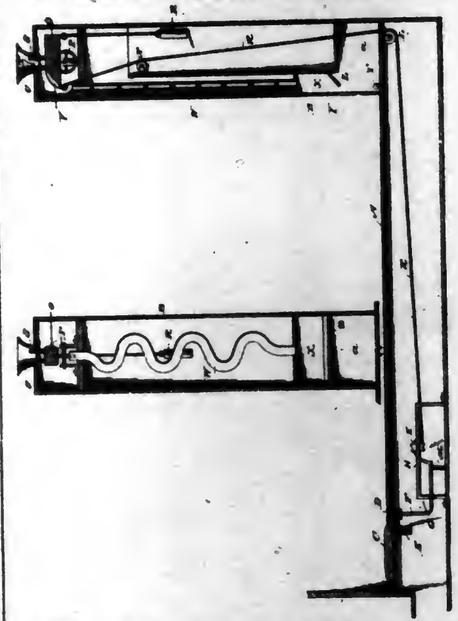
2. A dumping-wagon having the toggle-levers 5 and 6, said levers 5 consisting of levers 7 and 8, pivoted together, the lever 7 having openings or recesses in one end, and the levers 6 consisting of the levers 10 and 11, pivoted together, the lever 10 pivoted to the axis of the lever 7 and the lever 11 pivoted to the body of the wagon, and an operating-lever pivoted to the sill and to the end of lever 8, said parts being combined substantially as and for the purpose set forth.

402,084.



3. In a dumping-wagon, the combination of two toggle-levers connected together, one of said toggle-levers being secured to the sill and the other to the body of the wagon, and an operating-lever secured to said toggle-levers, substantially as and for the purpose set forth.

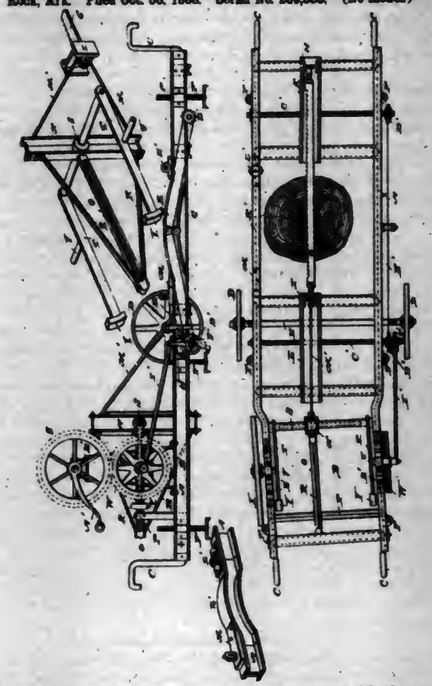
402,085. PASSENGER-REGISTER. ARNOLD ROMAIN, New Orleans, La. Filed Apr. 9, 1888. Serial No. 270,117. (No model.)



Claim.—1. An automatic register consisting of a box or case, B, the weighted tilting table O, the receptacle and chute leading from the table to the receptacle, the trap C, lever F, wheel I and its shaft, and the cord connecting the shaft and table O, substantially as and for the purpose specified.

2. An automatic register consisting of the box B, grooved and weighted tilting table O, zigzag chute W under one end of the table, the cord K, connected to the table, the wheel I and its shaft, to which the cord is attached, the bent lever F, acting on the wheel, and the trap C, all constructed substantially as specified.

402,086. TREE-SAWING MACHINE. JOHN C. SCHULTE, Little Rock, Ark. Filed Oct. 30, 1888. Serial No. 289,553. (No model.)

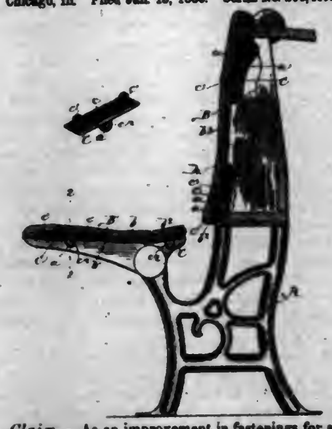


Claim.—1. In a sawing-machine, the combination, with the saw and supporting-frame, of the approximately U-shaped frame having side arms provided with short lateral shafts, the said arms also having counterbalance-weights at their rear ends, the frame N, the slotted rearwardly-extending branch O, and the pitman connecting the frame with the saw, substantially as specified.

2. In a sawing-machine, the combination, with the frame A, having the pivoted part K′ and angle portion B, of a reciprocating saw, guiding-ways for the saw arranged out of line, and a driving-gear mounted on the angle portion of the frame, substantially as specified.

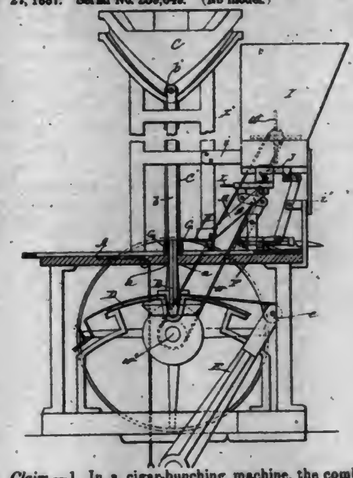
3. In a sawing-machine, the combination of the frame A, saw G, ways K L, out of line one with the other, screw feed-rods C′, frame N, connected to the saw, crank-shaft S T, shafts U V, for said crank-shaft, pitman I′, connected to the shaft U, pawl G′, and ratchet F′, and means, substantially as described, for imparting motion to the several parts, as set forth.

402,087. FASTENING FOR SCHOOL-DESKS. JOHN B. SHERWOOD, Chicago, Ill. Filed Jan. 15, 1889. Serial No. 296,419. (No model.)



Claim.—As an improvement in fastenings for school-desks, the combination, with clamp-plates C, provided with a broad corrugated bearing-surface and two perforated lugs projecting perpendicularly therefrom, and a perforated lug projecting perpendicularly from the under side of said clamp-plates, substantially as shown, of the bored slats, the rods for connecting said slats and clamp-plates, and the desk-frame provided with bolt-holes adapted to register with the perforations of the lugs projecting from the under side of said clamp-plates, and bolts *a*, for connecting the same with the frame, as specified.

402,088. CIGAR-BUNCHING MACHINE. JAMES R. SMITH, New York, N. Y., assignor, by direct and mesne assignments, of two-thirds to Adolph Moonelis and Benjamin Lichtenstein, same place. Filed Dec. 27, 1887. Serial No. 259,049. (No model.)



Claim.—1. In a cigar-bunching machine, the combination of a hopper having a receptacle of less area or size arranged below the same and communicating therewith, a valve operating in the hopper to cut off communication between the same and the receptacle, another valve operating in the receptacle to open the same and permit its contents to escape when the first-mentioned valve cuts off communication from the hopper and receptacle, a reciprocating carriage having an open mold and a cut-off, and mechanism for moving said valves, substantially as described.

2. In a cigar-bunching machine, the combination of an elevated hopper, a receptacle of less area arranged below said hopper, a valve operating in the hopper above the receptacle, another valve operating across the lower open end of the receptacle, a reciprocating carriage having an open mold, a fixed chute having its upper end arranged in proximity to the receptacle and its lower end terminating a suitable distance above said mold and carriage, and a cut-off operating to close the chute when the mold is moved by the carriage out of line with the chute, substantially as described.

3. In a cigar-bunching machine, the combination of a hopper having a lower receptacle communicating with the discharge-orifice thereof, a reciprocating carriage having an open mold into which the contents of the receptacle are discharged, a valve operating across the discharge-orifice of the hopper, another valve located in the lower open end of the receptacle, a link-connection between the carriage and the first-mentioned valve for reciprocating the latter at suitable regular intervals, and another independent connection, substantially as described, intermediate of the carriage and the last-mentioned valve, for moving said valve to open the receptacle for a limited time and while the first-mentioned valve cuts off communication between the hopper and receptacle, substantially as described.

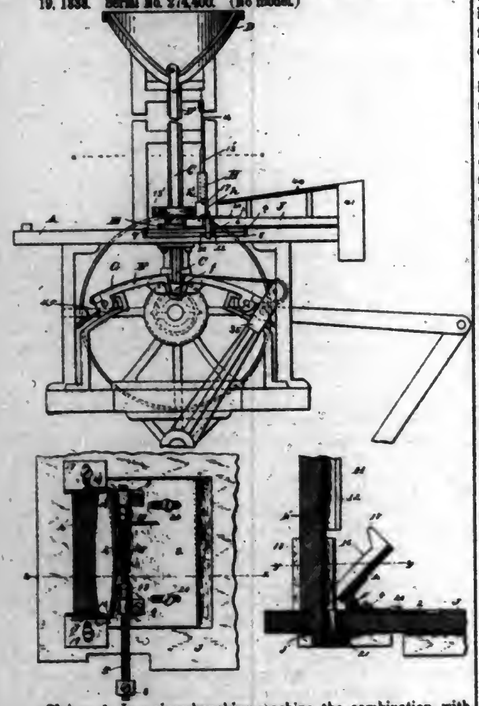
4. In a cigar-bunching machine, the combination of a carriage having an open mold and a valve-plate fixed thereto, an elevated hopper having a supplemental receptacle arranged below the discharge-orifice thereof, the independent valves K L, operating in the bottom of the hopper and its supplemental receptacle, link-connections, as described, between the carriage and each of the valves for alternately operating the latter, and an inclined chute below the hopper to convey the filler from the same to the mold, substantially as described, for the purpose set forth.

5. In a cigar-bunching machine, the combination of a carriage having an open mold and a rearward extension, H, a hopper having a supplemental receptacle below its discharge-orifice, the valve N, movable endwise in the box or receptacle to vary the area of the discharge-orifice in the hopper and receptacle, the independent valves K L, and connections, as described, between said valves and the carriage for alternately opening and closing the same, substantially as described.

6. In a cigar-bunching machine, the combination of a carriage having an open mold and a rearward extension, H, an elevated hopper having a discharge-orifice and a supplemental receptacle below said orifice, a reciprocating valve for opening and closing the orifice in said hopper, another valve in the supplemental receptacle for opening and closing the discharge-opening therein, link-connections between each valve and the carriage, an inclined chute below the supplemental receptacle, and the partitions in the chute, one or both of which are adjustable laterally therein, substantially as described, for the purpose set forth.

7. In a cigar-bunching machine, the combination of a carriage having an open mold, an elevated hopper provided with a supplemental receptacle below its discharge-orifice, the independent valves operating in the hopper and the receptacle thereof to alternately close the same, the vertical levers pivoted at intermediate points of their length and connected to the valves, a link connecting the lower end of one lever with the carriage by a pin-and-slot connection, and the connected arm and link S T, pivotally connected to the lower end of the other lever and the carriage, substantially as and for the purpose described.

402,039. CIGAR-BUNCHING MACHINE. JAMES E. SMITH, New York, N. Y., assignor, by direct and mesne assignments, of two-thirds to Adolph Moonelis and Benjamin Lichtenstein, same place. Filed May 19, 1888. Serial No. 274,400. (No model.)



Claim.—1. In a cigar-bunching machine, the combination, with a reciprocating carriage having an open mold and a cut-off, of a hopper having a shaper at its lower end for feeding tobacco directly to said mold, and a compressor for positively forcing the tobacco from said hopper and shaper into said mold, substantially as and for the purpose described.

2. In a cigar-bunching machine, the combination of a combined hopper and shaper having its walls constructed and arranged for primarily shaping the tobacco therein to the desired contour of a cigar-bunch, a reciprocating carriage adapted to slide beneath said hopper and shaper and having a cut-off, and an open mold carried by the carriage, substantially as described, for the purpose set forth.

3. In a cigar-bunching machine, the combination of a hopper having a shaper arranged in its lower part below the receiving-orifice for primarily forming the tobacco to the desired contour of a bunch before it is discharged from said hopper, a reciprocating carriage having a cut-off, and an open mold fixed to the carriage, substantially as described.

4. In a cigar-bunching machine, the combination of a combined hopper and shaper, a reciprocating carriage having an open shallow mold adapted to align with said hopper and shaper to receive a specified quantity of tobacco directly therefrom, a cut-off fixed to the carriage at one side of the mold and having a knife-edge to sever the tobacco when the mold is carried away from the hopper and shaper, and a reciprocating compressor operating in the hopper and shaper, substantially as and for the purpose described.

5. In a cigar-bunching machine, the combination of a combined hopper and shaper, a reciprocating carriage having an open mold and a cut-off, a vertically-reciprocating compressor operating in the hopper and shaper above the contents thereof, a power-shaft carrying two cams, one of which draws the carriage and mold away from the hopper and shaper, and mechanism, substantially as described, operated by the other cam of the power-shaft to permit the compressor to act on the contents of the hopper and shaper when the mold aligns with the latter, as and for the purpose described.

6. In a cigar-bunching machine, the combination of a primary shaping-hopper, a reciprocating carriage having an open mold and a cut-off, a gravity-compressor for positively expelling the contents of the hopper, and mechanism for automatically releasing the compressor to cause it to exert downward pressure on the contents of the hopper simultaneously with the arrival of the open mold beneath the hopper to receive tobacco therefrom, substantially as described.

7. In a cigar-bunching machine, the combination of a primary shaping-hopper, a reciprocating carriage having an open mold and a cut-off, a compressor operating in the hopper to force the tobacco into the open mold, a lever connected to said compressor, and a cam fixed to a rotary power-shaft and arranged to act against the free end of the lever, substantially as described, for the purpose set forth.

8. In a cigar-bunching machine, the combination of a combined hopper and shaper having the walls thereof constructed and arranged to shape the contents thereof to the desired contour of a bunch, one of the side walls of said hopper being adapted to swing back and forth with respect to the other wall thereof, a reciprocating carriage, an open mold on the carriage adapted to align with the hopper and shaper, and a cut-off fixed to the carriage at one side of the mold to close the hopper and shaper when the mold is forced away from the same, substantially as described.

9. In a cigar-bunching machine, the combination of a combined hopper and shaper having the walls thereof constructed and arranged to shape the contents of the same to the desired contour of a bunch, and having one of its walls arranged to swing back and forth, a reciprocating carriage having an open mold adapted to align with the hopper and shaper, connections intermediate of the carriage and swinging wall of the hopper and shaper for automatically closing said wall when the mold aligns with said hopper and shaper, and a cut-off, substantially as described.

10. In a cigar-bunching machine, the combination of a combined hopper and shaper having the walls thereof constructed and arranged to shape the contents to the desired contour of a bunch, and having one of its walls pivotally supported to swing laterally, a reciprocating carriage having an open mold, connections intermediate of the carriage and swinging wall of the hopper for automatically closing the latter when the mold aligns therewith, a cut-off, and a vertically-reciprocating compressor operating in the hopper and shaper to descend upon the contents of the same when the swinging wall is closed and force the tobacco into said mold, substantially as described.

11. In a cigar-bunching machine, the combination of a combined hopper and shaper having its walls constructed and arranged to shape the contents thereof to the desired contour of a bunch, and one of said walls movable away from the other, a reciprocating carriage having an open mold and a cut-off and adapted to slide beneath the hopper, and devices connected to the carriage and movable wall of said hopper and shaper for holding said wall open when the carriage is moved away from the hopper, substantially as described.

12. In a cigar-bunching machine, the combination of a hopper, a rock-shaft carrying one of the walls of said hopper and having a depending arm, a reciprocating carriage arranged to slide beneath said hopper and carrying an open mold and a cut-off, and fixed studs or projections on the carriage for alternately striking the depending arm, and thereby rocking the shaft, substantially as described.

13. In a cigar-bunching machine, the combination of a hopper, a rock-shaft to which one of the walls of said hopper is secured and having a depending arm at one end, a reciprocating carriage arranged to slide beneath the hopper and having an open mold and a cut-off, and a bar or rod arranged at one side of and secured to the carriage and having studs in the path of which the depending arm is arranged, substantially as described.

14. In a cigar-bunching machine, the combination of a hopper, a rock-shaft to which one of the walls of said hopper is secured, an arm depending from said rock-shaft, a reciprocating carriage having an open mold and a cut-off, a fixed stud on the carriage for striking the depending arm, and a spring for closing said movable wall of the hopper when the depending arm is released from the stud, substantially as described.

15. In a cigar-bunching machine, a hopper having a movable wall carrying knives or cutters for severing the protruding ends of tobacco, substantially as described, for the purpose set forth.

16. In a cigar-bunching machine, a hopper having a movable wall and knives or cutters adjustably connected to said wall, substantially as described.

17. In a cigar-bunching machine, a hopper having a movable wall and cutters or knives carried by the wall at the ends of the hopper and adjustable in the direction of the length of the hopper, substantially as described.

18. In a cigar-bunching machine, the combination of a hopper having a swinging side wall, end walls adjustable in the direction of the length of the hopper and having the cutting-edges, and knives or cutters carried by the swinging wall and adjustable thereon in the same direction as the end walls, substantially as described.

19. A hopper having one of its side walls adjustable laterally at either end of the opposite side wall, substantially as described, for the purpose set forth.

20. A hopper having a base-plate and a movable wall mounted on said plate, the plate being adjustable laterally at either end of the hopper, all combined substantially as described.

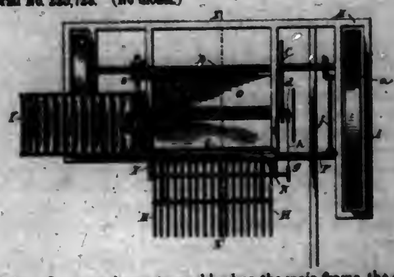
21. In a cigar-bunching machine, a hopper having an adjustable base-plate carrying one of the walls of the hopper, and a vertical shaper-plate, 21, secured to said base-plate and arranged in the lower end of the hopper below the movable wall of the same, all combined substantially as and for the purpose described.

22. In a cigar-bunching machine, the combination of a hopper, a reciprocating carriage having an open mold, and a cut-off plate fixed to the carriage at one side of the mold and having its edge adjoining the mold curved transversely and beveled to a cutting-edge, substantially as described.

23. In a cigar-bunching machine, the combination of a cigar-rolling table, an apron connected directly at one end thereto and having its opposite end cut or divided longitudinally for a suitable distance toward the middle thereof, and plates for independently fastening each of the pieces formed by the cuts to the opposite end of the rolling-table, substantially as described.

24. In a cigar-bunching machine, the combination of a cigar-rolling table, an apron, a rocking arm, the adjustable bearings or plates connected to the rocking arm and each adjustable independently thereon in the direction of its length, and a pair of spaced bunching-rollers journaled in said bearings or plates, substantially as described.

402,040. CORN-HARVESTER. WILLIAM D. STEELE, Huron, Dak., assignor of one-half to John R. Ward, same place. Filed Jan. 27, 1887. Serial No. 225,723. (No model.)

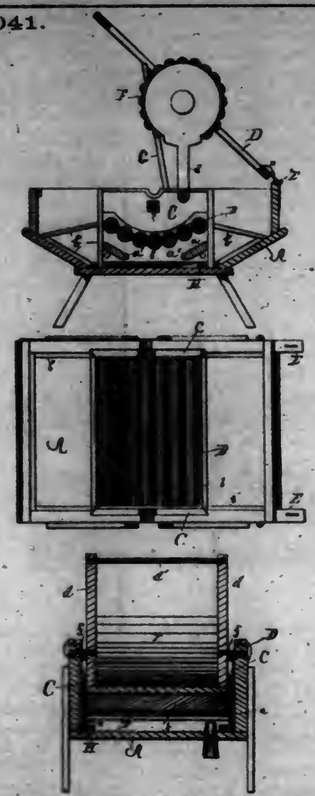


Claim.—In a corn harvester and husker, the main frame, the cutting apparatus on the front side thereof, the hopper in the main frame having the downward converging front and rear sides, the inclined husking-rollers journaled at the lower edges of the converging sides of the hopper, one of said rollers being in a slightly higher plane than the other, the driving-wheel journaled in one side of the main frame, the shaft B, geared to the said wheel, gears connecting said shaft to the husking-rollers, the sweep-reel mounted on the front of the frame and connections between the same and one of the husking-rollers, whereby said reel is rotated, and the inclined elevator projecting from the side of the frame opposite the driving-wheel, the lower roller of said elevator being in proximity to the lower ends of the husking-rollers and geared to the shaft B, all in combination, substantially as described.

402,041. WASHING-MACHINE. JACOB STINE, Martinsburg, W. Va. Filed Aug. 4, 1888. Serial No. 281,940. (Model.)

Claim.—1. In a washing-machine, the combination of a suds-box provided with central vertical dovetailed or undercut ways in two sides, braces or strengthening-strips for the ways, a removable roller-bed comprising end pieces and rollers extending between the same, the end pieces resting in the ways and adapted to slide in the same when being removed from or placed in the suds-box, auxiliary end pieces removably resting in said ways upon the upper edges of and

402,041.



closing the ways above said roller-bed end pieces, and a rubber to operate in conjunction with the roller-bed, substantially as described.

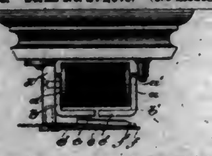
2. A washing-machine comprising a suds-box having central vertical ways in two sides, a removable rectangular frame resting on the bottom of the suds-box between the ways, a roller-bed resting on said frame and provided with end pieces, in which the rollers are journaled, removably resting in said ways, removable auxiliary end pieces filling the ways above the roller-bed end pieces, and a rubbing-cylinder to act in conjunction with the roller-bed.

402,042. BOTTLE. JOSEPH STONE, Boston, assignor to the Nelson Chemical Company, Newton, Mass. Filed July 16, 1888. Serial No. 280,242. (No model.)



Claim.—As an improvement in bottles, the herein-described bottle having a thickened portion at one side of its top, the mouth or discharge-orifice extending through said thickened portion and a circular recess in the thickened portion around and larger than the mouth, and the inclined spout opening from one side of said recess, substantially as described.

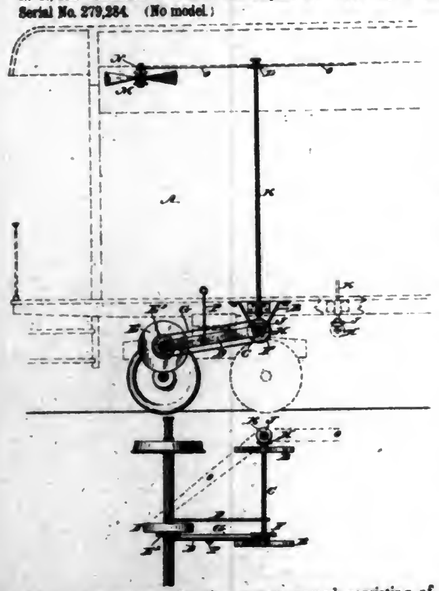
402,043. ANNUNCIATOR-DROP. JOHN M. STUART, Boston, Mass. Filed May 22, 1888. Serial No. 274,673. (No model.)



Claim.—The annunciator-drop herein described, comprising the core *a*, coil *a'*, metallic pieces *b b'*, bent to present large flat-surfaced

pole-pieces *c c'*, the armature *c*, attached to a spring, *d'*, the target or disk *f*, pivoted to move in a plane parallel with the flat-surfaced pole-pieces, and the support *d*, substantially as described.

402,044. CAR-VENTILATOR. LEOPOLD C. TAPPEY, Jr., New York, N. Y., and CLARENCE A. EVANS, Philadelphia, Pa. Filed July 7, 1888. Serial No. 279,284. (No model.)



Claim.—An apparatus for the purpose named, consisting of a vertical shaft suitably journaled in the car-body and having a pulley on its upper end and a gearing-wheel on its lower end, a shaft carrying a fan and pulley, the latter connected by a belt with said pulley on the vertical shaft, a horizontal shaft journaled in hangers on the car-body and having a gear-wheel meshing with the gear-wheel on the vertical shaft, an arm pivoted to said shaft, and having at its free end a friction-wheel adapted to contact with one of the axles of the car-truck, pulleys on said horizontal shaft and on the journal of friction-wheel, a belt connecting said last-mentioned pulley, and a lever connected to said pivoted arm and passing into the car, said parts being combined substantially as and for the purpose set forth.

402,045. SWAGING DEVICE. JOSEPH TAYLOR, Shingle Springs Cal. Filed Aug. 30, 1888. Serial No. 284,138. (No model.)

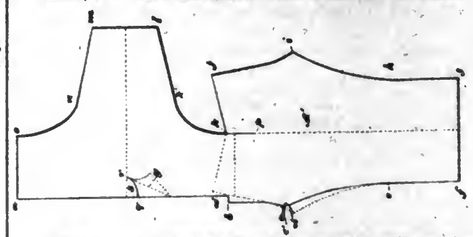


Claim.—1. In combination with an anvil, a bed-piece, B, having a downward projection, *b*, on its under side, the upper face of said bed-piece being provided with transverse grooves, the portion D, of less width than the bed-piece, said portion being pivoted to the bed-piece, the end opposite the pivot being inclined outwardly and upwardly, substantially as shown, and for the purpose set forth.

2. The attachments for anvils herein described, consisting of a bed-piece, B, having transverse semicircular grooves, and portion D, pivoted thereto and provided with corresponding grooves, for the purpose set forth.

3. The improved swaging-block herein described, consisting of a bed-piece, B, having downward projection *b*, for securing the same to an anvil, link C, having slotted portions, through which the pivot-pins pass, and portion D, pivotally secured to the bed-piece, so as to be capable of a vertical movement therein when in a horizontal position, substantially as and for the purpose set forth.

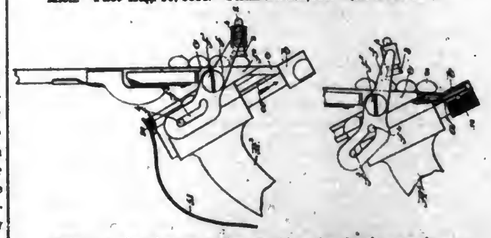
402,046. COMBINATION GARMENT-PATTERN. MORRIS TUCK, Elmira, N. Y. Filed Jan. 24, 1889. Serial No. 297,349. (No model.)



Claim.—1. A combination garment-pattern consisting of a trousers-pattern and formed in one piece therewith, a waist-pattern having a straight edge to form one edge of the back seam and open front of the waist, a straight edge to form the bottom of one-half of the back of the waist, corresponding curved edges to form a sleeve from the end of a sleeve to the bottom of the waist at the side, a straight edge to form the end of a sleeve, and a curved slit (about midway of the length of the first-named straight edge) to form the lapel of the collar, substantially as described.

2. A combination garment-pattern having a straight edge from *a* to *a'*, a right-angled jog from *a'* to *b*, an outcurved edge from *b* to *c*, corresponding incurved and straight edges from points *d* to *f* and *i* to *g* on opposite sides of the pattern, a straight edge from *f* to *g*, corresponding curved and straight edges between points *k* and *l* and *m* and *o*, straight edges between points *a* and *o* and *l* and *m*, a straight edge between points *k* and *j*, and an outcurved edge from *j* to *i*, substantially as described.

402,047. BUTTON-SETTING MACHINE. JOHN H. VINTON, Boston, Mass., assignor to the Peninsular Novelty Company, Grand Rapids, Mich. Filed Aug. 16, 1888. Serial No. 282,900. (No model.)



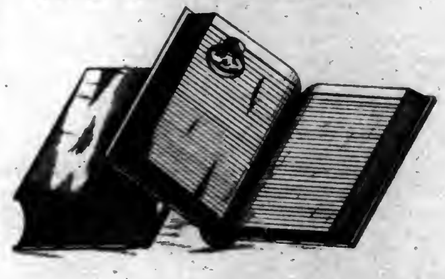
Claim.—1. In a button-setting machine, the simultaneously movable carrier and raceway constructed and arranged to receive and hold button-fastenings and attached buttons, and a spring-controlled pin, 12, within said carrier, combined with the driver adapted to obstruct the passage connecting the raceway and carrier, and to remove from the carrier the fastening contained and held therein by the said pin as the said raceway and carrier ascend, substantially as described.

2. In a button-setting machine, the staple-receiving raceway, combined with the movable feed and a retaining-lever having the yielding pin or presser to act upon the button, substantially as described.

3. In a button-setting machine, the raceway to receive button-fastenings and connected buttons, combined with the movable button-retaining lever *f*, formed at one end to co-operate with a fixed pin or stud, f^8, and having a spring-pin at its other end, substantially as described.

4. In a button-setting machine, the arm A' and the carrier *b*, combined with the spring 51, attached to the arm A', acting on the carrier, substantially as described.

402,048. PAPER-WEIGHT. FRANK R. WHIPPLE, Erie, Pa. Filed Jan. 21, 1888. Serial No. 261,495. (No model.)

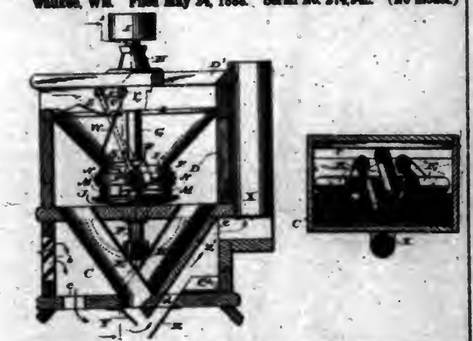


Claim.—1. As a new article of manufacture, a paper-weight having a soft india-rubber bearing-surface which is in the form of a ring which is held in place by its own elasticity.

2. As a new article of manufacture, a paper-weight having a soft india-rubber bearing-surface which is in the form of a ring, which is secured to the bottom of the weight by being set in a grooved or rabbeted space which conforms to the form of the ring.

3. As a new article of manufacture, a paper-weight having a soft india-rubber bearing-surface which is in the form of a flanged ring.

402,049. FEEDER FOR ROLLER-MILLS. RALPH WILCOX, Milwaukee, Wis. Filed May 24, 1888. Serial No. 274,942. (No model.)



Claim.—1. A feeder for roller-mills, &c., that comprises a hopper, a rotating disk arranged beneath the hopper, and a series of flues arranged to have their upper ends in a circle adjacent to the disk and their lower ends in a straight line immediately over the device to which the material is fed, substantially as set forth.

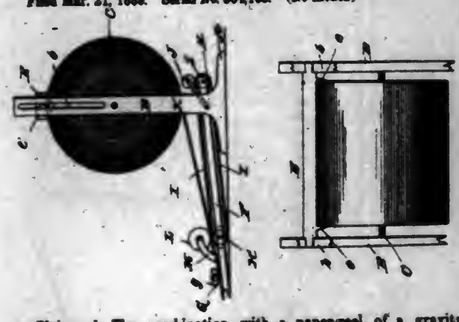
2. A feeder for roller-mills, &c., that comprises a hopper, a rotating disk arranged beneath the hopper, a series of flues arranged to have their upper ends in a circle adjacent to the disk and their lower ends in a straight line immediately over the device to which the material is fed, and deflector-plates located below said lower ends of the flues, substantially as set forth.

3. A feeder for roller-mills, &c., that comprises a hopper, a rotating disk arranged beneath the hopper, a series of flues arranged to have their upper ends in a circle adjacent to the disk and their lower ends in a straight line immediately over the device to which the material is fed, and means, substantially as described, for regulating the flow of stock from the hopper to said disk, as set forth.

4. A feeder for roller-mills, &c., that comprises a hopper, a rotating disk arranged beneath the hopper, a series of flues arranged to have their upper ends in a circle adjacent to the disk and their lower ends in a straight line immediately over the device to which the material is fed, a casing surrounding the flues and having its bottom provided with longitudinal air-passages, an air-inlet in one side of the casing, and an outlet in the opposite side of said casing arranged to communicate with a source of draft, substantially as set forth.

5. A feeder for roller-mills, &c., having a hopper, a ring surrounding the hopper-outlet, a lever connected to the ring, a crank-shaft provided with a wing that depends into said hopper, and a rod connecting said lever and crank-shaft, substantially as set forth.

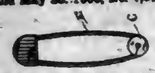
402,050. PAPER-REEL. HOMER T. WILSON, Harrodsburg, Ky. Filed Mar. 21, 1889. Serial No. 304,163. (No model.)



Claim.—1. The combination, with a paper-reel, of a gravity pressure-bar resting upon the roll of paper and provided with ear-guides, whereby the roll will be prevented from moving endwise, as set forth.

2. The combination, with a paper-reel, of means, substantially as shown and described, whereby the paper will be printed as it is unwound from the roll, and a pressure-bar resting upon said roll and provided with ear-guides which prevent a side or end motion of the roll, and thereby insuring the true and uniform delivery of the web of paper to the printing mechanism, as set forth.

402,051. SAFETY-PIN. JOHN ALCOCK, Cheadle, County of Stafford, England. Filed Nov. 15, 1888. Serial No. 290,893. (No model.) Patented in England May 23, 1888, No. 7,611.



Claim.—1. A safety-pin provided in the eye or coil of its spring with a plug or core, which prevents the pin from becoming entangled with the fabric, and at the same time furnishes an internal support for the coil, as and for the purposes hereinbefore set forth.

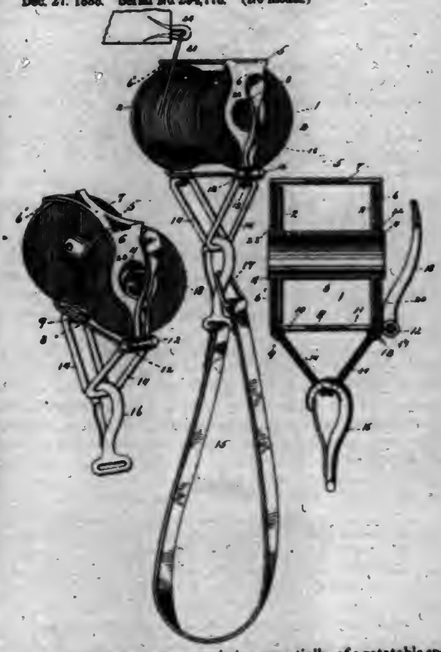
2. The safety-pin having inserted in the eye or loop of its spring a piece of correspondingly-shaped material provided at its ends with plates or shields, substantially as and for the purposes set forth.

402,052. CRANK FOR MOTORS. SAMUEL F. ARMSTRONG, Adamsville, assignor to Charles Rogers, Edwardsburg, Mich. Filed Oct. 9, 1888. Serial No. 287,902. (No model.)



Claim.—The combination of the driving-shaft provided with an annular series of ratchet-teeth and having its end reduced beyond said teeth, the handle provided with a barrel fitting over the reduced end of the driving-shaft and having an enlarged portion projecting over the ratchet-teeth, the said enlarged portion having a notch in its edge, the pawl mounted on the barrel and projecting through the notch to engage the ratchet-teeth, and the spring secured to the handle and bearing upon the pawl, as set forth.

402,053. FIRE-ESCAPE. ISAAC H. ATHEY, Marion, Ark. Filed Dec. 27, 1888. Serial No. 294,778. (No model.)



Claim.—1. A fire-escape consisting, essentially, of a rotatable spool or drum, a supporting-frame having the compressible sides or jaws in which said drum is journaled, a continuous wire compactly coiled around said drum, and a brake-lever fulcrumed on one of the sides of

the frame at or near the free end of the same for simultaneously compressing the jaws to bind on said drum, substantially as and for the purpose described.

2. A fire-escape consisting of a supporting-frame having the compressible jaws, a rotatable spool or drum journaled in said jaws between the latter, the wire coiled around the drum, the depending converging links pivotally connected to the lower ends of the jaws, and a body-strap adapted to be connected to the meeting ends of said converging links, substantially as and for the purpose described.

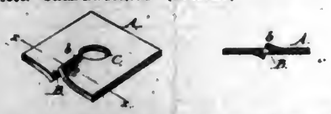
3. A fire-escape consisting of a supporting-frame having the compressible jaws, a rotatable spool or drum journaled therein between the same, the wire coiled around the drum, the depending links connected to said jaws, a body-strap connected to the meeting ends of said links, and a brake-lever fulcrumed on the frame in opposite position with relation to one of said jaws to positively bear against the latter and draw upon the other jaw to thereby compress both jaws on the spool or drum, substantially as and for the purpose described.

4. A fire-escape consisting of a frame having the compressible jaws or sides, a rotatable spool or drum journaled therein, a wire, and a brake-lever fulcrumed on said frame at a point at one side of the drum and having a cam-face arranged to bear directly against one of said sides or jaws, substantially as and for the purpose described.

5. In a fire-escape, supporting-frame consisting of the compressible jaws connected at one end by a rigid transverse piece and at their other end by a movable cross-piece, said jaws having depending eyes and the movable cross-piece having an eye at one end which is extended beyond the one of said sides, in combination with a spool or drum journaled in said sides between the same, the depending links connected to the eyes of said jaws, a body-strap connected to the links, and a brake-lever fulcrumed in the eye of the movable cross-piece, substantially as described.

6. A fire-escape, substantially as described, consisting of the compressible connected jaws having the transverse aligned slots or openings at intermediate points of their length, a rotatable spool or drum having its shaft journaled in said aligned slots, a wire coiled around said drum, and a brake-lever fulcrumed on one of the jaws for compressing the same on the heads of the drum, substantially as described.

402,054. NUT-LOCK. JOSEPH L. BAY, Little Rock, Ark. Filed Feb. 14, 1889. Serial No. 299,904. (No model.)

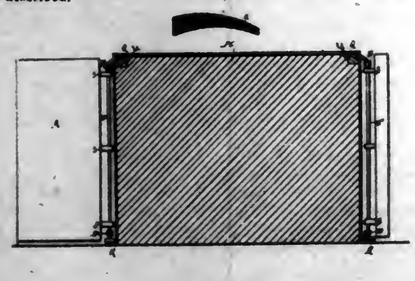


Claim.—An improved nut-lock consisting of a bolt, a washer split from its bolt-hole to one side and having the split portions curved in opposite directions from points near the outer edge to the slit, one of said parts being rounded on its edge to form a pawl and the other portion having a squared edge, and a nut having its face formed with curved depressions, as shown, to engage the rounded edge of the split portion of the washer, as herein described.

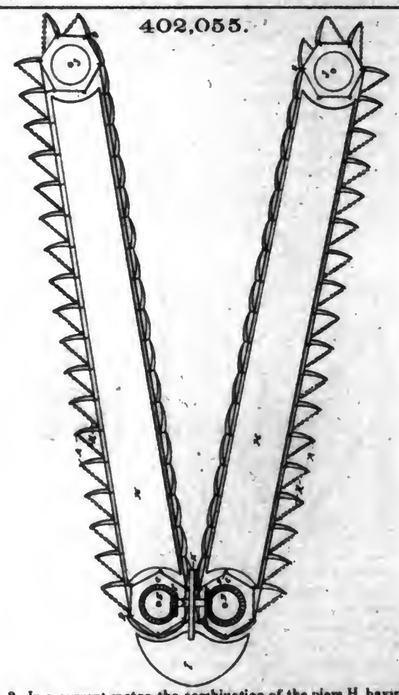
402,055. WATER-MOTOR. ANDREW A. BUSHNELL, Tecumseh, Mich. Filed Feb. 25, 1888. Serial No. 265,251. (No model.)

Claim.—1. A current-motor consisting of a protecting-pier, a submerged pier below the protecting-pier, sprocket-wheels journaled at the ends of said submerged pier and submerged therewith, endless chains connecting said sprocket-wheels, and a series of pivoted hollow buckets carried on said endless chains, substantially as shown and described.

2. A current-motor consisting of a protecting-pier, two submerged piers below said protecting-pier and diverging from each other, sprocket-wheels carried on upright shafts at the ends of said submerged piers, two endless chains connecting the sprocket-wheels at the respective ends of each submerged pier, and a series of pivoted hollow buckets carried on said endless chains, substantially as shown and described.



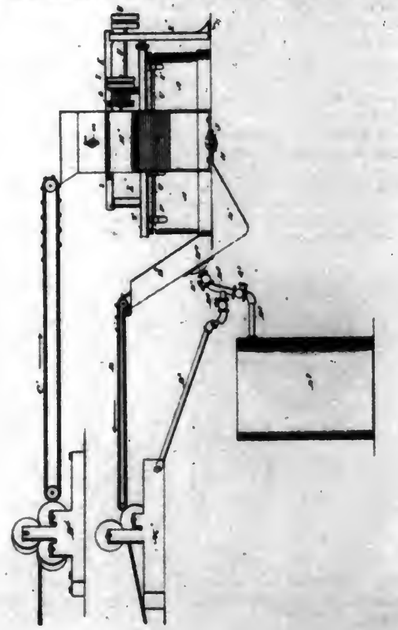
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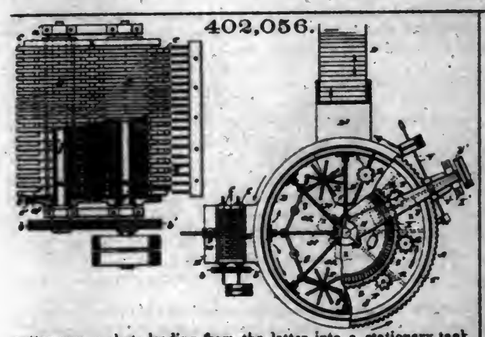
3. In a current-motor, the combination of the piers H, having the channels V therein, the endless chains B, and the rods T, carrying thereon the friction-rollers Q, moving in said channels at such an angle as to normally prevent their being withdrawn, substantially as described.

402,056. DIFFUSION APPARATUS. FRANCIS BIANCHI, New Orleans, La., assignor of one-half to Leon Boyer, same place. Filed June 25, 1887. Serial No. 242,561. (No model.)

Claim.—1. The combination, with a cane-crushing mill, of rotary cutters inclosed in a suitable case for finely dividing the crushed cane, an endless conveyer for moving the cane from said mill to said



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cutter-case, a chute leading from the latter into a stationary tank, and a revolving drum subdivided into compartments and provided with rotary agitators, all constructed and adapted to operate substantially as and for the purposes described.

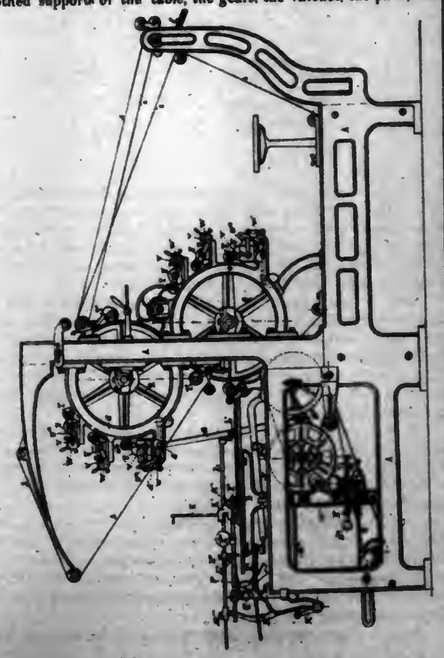
2. The combination of the cane-crushing mill with the endless carrier C, the cutter-case and its rotary cutters, the feed-water-supply pipe w, the stationary tank provided with a subdivided revolving drum having agitators therein and a surrounding strainer-band, a discharge-trunk for the saturated cane, an endless conveyer leading to an expressing-mill, a receiving-tank for the juice, and pipes provided with cocks and communicating with the said stationary tank, the receiving-tank, and the expressing-mill, all substantially as and for the purposes described.

3. The combination, with the stationary tank, a rotary drum therein subdivided into compartments, and an agitator in each of said compartments for stirring the same, of a mill adapted to express the juice from the saturated cane, and an endless carrier for conveying the saturated cane from the bottom of the tank to said mill, substantially as specified.

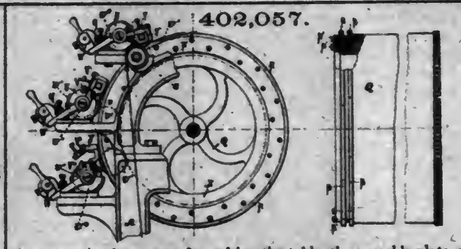
402,057. PAPER-RULING MACHINE. HENRI A. BERNARD, Paris, France. Filed Oct. 11, 1888. Serial No. 287,872. (No model.)

Claim.—1. The combination, with the vertically-movable table for supporting the pile of paper to be ruled, and the feeding mechanism or pusher, of means whereby the level of the top of the pile is kept constant, said means consisting of a system of gearing which operates to raise the table progressively, a presser which rests on the pile of paper, and a disconnecting mechanism controlled by said presser and operating to arrest the upward motion of the table when said presser is lifted above the normal, substantially as described.

2. The combination, with the vertically-movable table, of the toothed supports of the table, the gears, the ratchet, the pawl, and



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the eccentric pin or cam for raising the table, the movable plate or guard adapted to be interposed between the pawl and ratchet to prevent the operation of the latter by the former, the presser which rests on the pile of paper on the said table, and the lever and jointed rod connecting the said presser with the said guard, substantially as described.

3. The combination, with the carrying-drum, the series of tracing and inking rollers, and the lever-supports for the rollers, of the means for interrupting the operation of the lower roller of the upper drum, said means comprising a cam on a shaft of the machine, a lever-arm operated by said cam, a rock-shaft to which the arm is fixed, and additional lever-arms connected by links with the lever-supports of said tracing-rollers, substantially as described.

4. The combination, with an ink-roller and ink-well, of an adjustable scraper, of felt or like material, and a support for said scraper embracing the edge of the said well, and having the inside arm hollowed out next the wall of the well to prevent the ink from mounting by capillarity, substantially as described.

5. The combination, with a supporting-table and pusher, of a mechanically-operated straightening-stop arranged in front of a pile of paper on the table at a distance in excess of the stroke of the pusher, so that each sheet is fed against the stop to straighten the same by the pusher acting upon an underlying sheet, substantially as described.

6. The combination, with the ruling machinery proper, of the supporting-table, pusher, mechanically-operated straightening-stop, and feed-rollers or disks, substantially as described.

7. The combination, with the ruling machinery proper, of the supporting-table, pusher, mechanically-operating straightening-stop, feed-roller, series of springs, and vertically-movable pressure-disks set opposite the spaces between the springs, substantially as described.

8. A carrying-drum provided with a cam and holding-tapes, in combination with tracing-rollers rolling on said cam, and the means for inking said tracing-rollers, substantially as described.

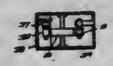
9. A drum provided with a cam formed by two rows of segmented pieces set in grooves in the periphery of the drum, the inner set of pieces and the grooves therefor being deepest, and the two sets of pieces being held by independent set-screws tapped in from the end of the drum, in combination with tracing-rollers running on said cam, and means for inking said rollers, substantially as described.

10. In combination with the carrying-drum, the cam thereon, and the tracing-rollers rolling on said cam, the forked supports for the journals of the said tracing-rollers, provided with removable covers for confining the journals in the forks, substantially as described.

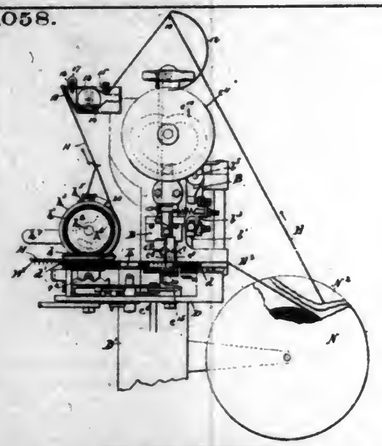
11. The ruling-machine comprising a machine-frame, a carrying drum or drums thereon, the tapes for said drums, the vertically-movable table, the gearing for lifting it, the guard or plate for interrupting the transmission of the movement to said table, the presser, the connections between the said presser and the said guide or plate, the pusher and its operating mechanism, the tracing-rollers, the inking-rollers, the ink-wells, and the gearing for rotating the inking-rollers in said wells, substantially as described.

402,058. MACHINE FOR MAKING TACK-STRIPS. MATTHIAS BROOX, Boston, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Sept. 7, 1888. Serial No. 284,782. (No model.)

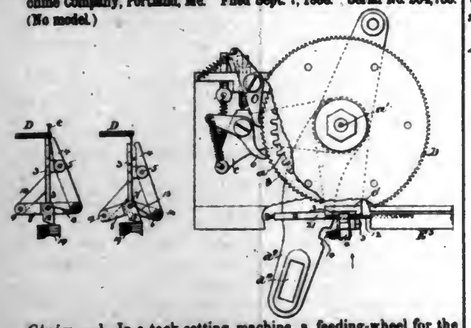
Claim.—In a machine for making tack-strips substantially such as described, the combination, with means for supporting and feeding a foundation-strip, and a tack-driver, of pasting or gumming mechanism by which to apply paste to unite the covering-strip to the foundation-strip, and with a presser to press the covering-strip to the foundation-strip after the same has been provided with tacks, thus securing the covering and foundation strips together, substantially as described.



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402,059. MACHINE FOR SETTING TACK-STRIPS. MATTHIAS BROCK, Boston, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Sept. 7, 1888. Serial No. 284,753. (No model.)

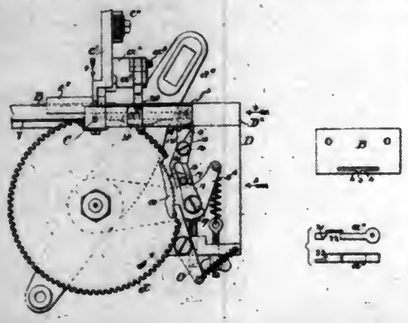


Claim.—1. In a tack-setting machine, a feeding-wheel for the strip and actuating devices to move the said feeding-wheel, combined with jaws between which to force the body of a tack, as described, the presence of the body of a tack between the faces of the said jaws insuring the action of the said actuating mechanism to move the feed-wheel, substantially as described.

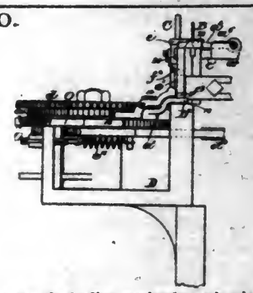
2. The feed-wheel and the vertically-movable jaws and their connecting spring-actuated toggle-links, combined with a stop to spring the said links and open the said jaws for the passage laterally from between them of the body of a driven tack, substantially as described.

402,060. MACHINE FOR MAKING TACK-STRIPS. MATTHIAS BROCK, Boston, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Oct. 29, 1888. Serial No. 289,390. (No model.)

Claim.—1. In a machine for driving tacks into a strip, the throat, the driver to drive a tack into the strip, feeding mechanism to act against the driven tack to feed the tack-strip, and a pawl and intermediate devices to engage and move the said feeding mechanism, and a gate, combined with a transferring-plate, to push a tack against the said gate, and with means between the said gate and pawl to cause



402,060.

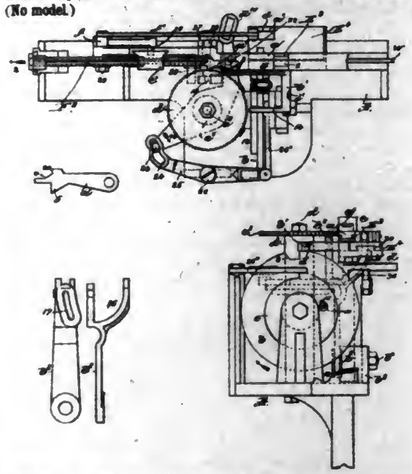


the latter to actuate the feeding mechanism only when the said gate is moved by the action of a tack against it, substantially as described.

2. In a machine for driving tacks into a strip, the feed-wheel, the pawl having a projection and intermediate ratchet to actuate the feed-wheel, and the double lever having a spring to control one of its arms, combined with the sliding beveled gate engaging one member of the said double lever, and with a throat, a driver, and a transferring-plate to push a tack against and move the said gate, substantially as described.

3. In a machine for driving tacks into a strip, the transferring-plate, the throat, the driver, and the gate having a stud, 20, combined with the pivoted finger having a notch, as 22, and beveled at 21 and and 23, to operate substantially as described.

402,061. MACHINE FOR MAKING TACK-STRIPS. MATTHIAS BROCK, Boston, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Dec. 18, 1888. Serial No. 293,943. (No model.)



Claim.—1. In a tack-strip-making machine, a slotted roadway to receive the shanks of the tacks driven into the strip, the driveway or throat, and a driver, combined with a reciprocating slide having a finger provided with a shoulder to act against a tack after the same has been driven into the said strip, thereby feeding the same along the said roadway, substantially as described.

2. In a tack-strip-making machine, a ratchet-wheel, a slide, a finger mounted thereon having a projection, an inclined surface, and a shoulder, combined with means to move the said slide and finger toward the tack last driven into the strip, the presence of a tack in the strip acting against the beveled face of the finger and causing the projection of the finger to engage and move the said ratchet-wheel, substantially as described.

3. In a tack-strip-making machine, the combination, with the slide and its finger having a projection and an inclined surface and a shoulder and the ratchet-wheel, of a spacing mechanism, substantially as described, whereby the strip is moved for a greater distance at stated intervals, substantially as described.

4. In a tack-strip-making machine, the combination, with the slide and its finger having a projection, an inclined surface and a shoulder, and the ratchet-wheel, of a spacing mechanism, substantially as described, whereby the strip is moved for a greater distance at stated intervals, and with cutting mechanism to sever the strip at intervals, substantially as described.

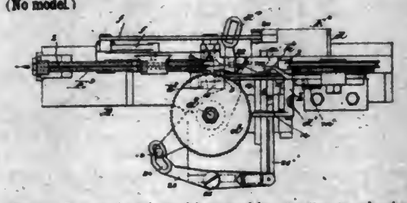
5. In a tack-strip-making machine, the slide having upon it a

feeding-finger, the lever b', having arms 14 15, and a pin, 16, combined with a slotted lever, b^3, and a cam to control the movement of the lever b', as and for the purposes set forth.

6. In a tack-strip-making machine, the lever d^{10}, provided with a projection, 23, and a lever, 24, and its attached pawl 26*, combined with the spacing mechanism and with a lever, b', and the slotted lever b^3, to operate substantially as described.

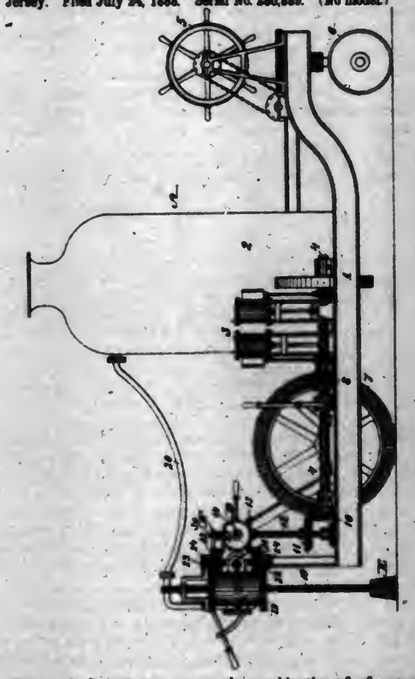
7. In a tack-strip-making machine, the reciprocating slide, and a finger thereon to be moved aside by contact with a tack already driven into the strip and having a toe to engage a notch in the strip substantially as described.

402,062. MACHINE FOR MAKING TACK-STRIPS. MATTHIAS BROCK, Boston, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Dec. 18, 1888. Serial No. 293,944. (No model.)



Claim.—In a tack-strip-making machine, feeding mechanism to engage and feed the tack-strip, a guideway for the tacks, a driver to drive the tacks, and a roadway for the tacks driven into the strip, combined with a slide and a finger therein having a beveled face and a projection, whereby the finger moved by a tack, as the slide is moved toward a driven tack, is made to effect the movement of the feeding mechanism to feed the strip, substantially as described.

402,063. STEAM ROAD-RAMMER. FREDERIC W. CARTER, Camden, N. J., assignor to the American Steam Paving Company, of New Jersey. Filed July 24, 1888. Serial No. 280,889. (No model.)



Claim.—1. In a steam-rammer, the combination of a frame with a rotary longitudinal shaft journaled therein, a vertical shaft connected by gearing with said longitudinal shaft, a cylinder with steam-hammer, and an internally-screw-threaded ear, a screw connected by gearing with said vertical shaft and carrying said ear of cylinder, and a lateral guideway for said cylinder, substantially as described.

2. In a steam-rammer, the vertical rotary shaft 12, with bevel gear-wheel on its upper end, the horizontal shaft B, with bevel-wheels 14 and 15, gearing with bevel-wheel on upper end of vertical shaft 12, the clutch 16 on said shaft B, the screw C, carrying pinion 18, gearing with a pinion, 17, on shaft B, and a cylinder with steam-hammer and the ear 21, the latter internally screw-threaded and working on the screw C, said parts being combined substantially as described.

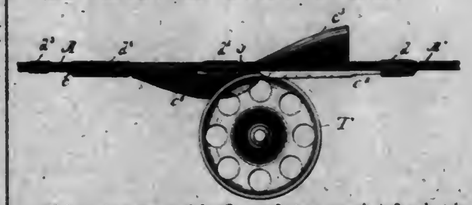
3. In a steam-rammer, the beams 22, in combination with a cylinder having a steam-hammer and the ear 21 internally screw-threaded, and plate guided on said beams, and a rotary screw on which said ear works, substantially as and for the purpose set forth.

4. In a steam-rammer, a cylinder with a steam-hammer, and the plates 23, the transverse beams 22, the rollers 24, the ear 21, internally screw-threaded, and the rotary screw C, said parts being combined substantially as and for the purpose set forth.

5. In a steam-rammer, the combination, with a frame, of a rotary shaft journaled therein, an upright shaft connected by gearing to said longitudinal shaft and carrying a bevel-wheel, the shaft B, with bevel-wheels 14 and 15 loosely mounted thereon and gearing with the bevel-wheel on the upright shaft, and the pinion 17, a clutch adapted to connect either of said wheels 14 and 15 rotatably with said shaft B, an operating-rod for said clutch having the lugs 29 and 30, the screw C, carrying pinion 18, meshing with the pinion 17, a cylinder with hammer, the said cylinder having an ear internally screw-threaded and working on said screw, and a plate connected to the cylinder and guided on cross-beams secured to the frame of the machine, and having the finger F, substantially as described.

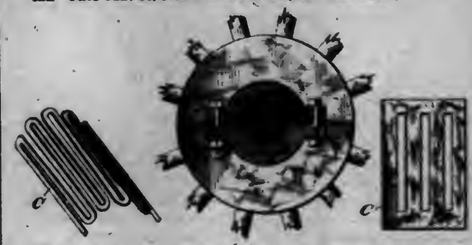
6. In a steam-rammer, the vertical shaft 12, with bevel-gear thereon, the shaft B, with bevel-gears 14 and 15 and pinion 17, the clutch 16 on said shaft B, the screw C, with pinion 18 meshing with said pinion 17, a cylinder with ear 21 internally screw-threaded, and the plate 23, having the finger F, and the clutch-operating rod 27, with studs 29 and 30, said parts being combined substantially as described.

402,064. SWITCH FOR ELECTRIC-MOTOR TROLLEYS. WILL CHRISTY, Akron, Ohio, assignor of one-half to James Christy, Jr., same place. Filed Dec. 27, 1888. Serial No. 294,762. (No model.)



Claim.—As a new article of manufacture, a switch for electric-motor trolleys, consisting of a stem and divergent arms, a concavo-convex web extending from the point of junction of the stem and arms, and a rib or flange extending longitudinally of the switch and serving to divert the trolley upon and off of the branch wires, substantially as described.

402,065. KEY FOR PULLEYS. CHESTER W. CLARK, Mishawaka, Ind. Filed June 11, 1888. Serial No. 276,683. (No model.)



Claim.—1. A pulley-key formed of a single strip of metal bent to form parallel ribs connected at their ends, substantially as set forth.

2. A pulley-key having a series of ribs arranged in parallel rows, connected to each other at their ends and provided upon their outer and inner corners with cutting-edges, substantially as set forth.

3. The combination, with a pulley-hub and a shaft of less diameter arranged to have an annular space surrounding the shaft, of keys, each having a series of ribs connected with each other at their ends and arranged upon opposite sides of the shaft.

402,066. DYNAMO-ELECTRIC MACHINE. CARL COERPER, Mirenfeld, near Cologne-on-the-Rhine, Prussia, Germany, assignor to the Helios Actien-Gesellschaft für Elektrisches Licht und Telegraphenbau, same place. Filed July 12, 1887. Serial No. 244,717. (No model.) Patented in France June 22, 1887, No. 184,384; in England June 24, 1887, No. 9,013; in Belgium June 28, 1887, No. 77,962, and in Italy Aug. 31, 1887. XXI, 21,906, XLIII, 352.

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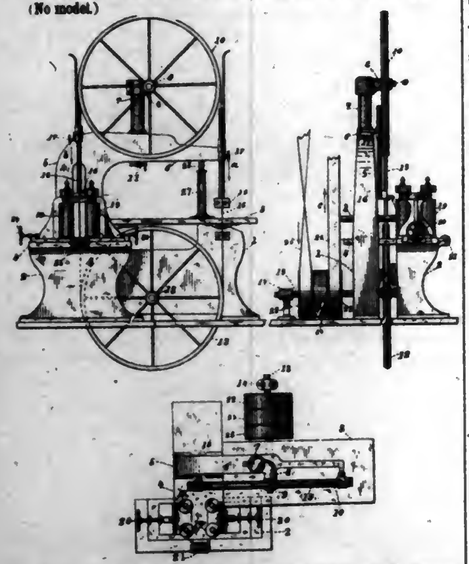
Claim.—1. In a dynamo-electric machine, an armature-core provided with notches for receiving the wires, tongues projecting toward each other at the open ends of said notches, and cross-pieces supported by said tongues, substantially as shown and described.

2. In a dynamo-electric machine, an armature-core having notches in its rim, which notches have their width increased a short distance from their outer ends, and insulating-pieces in said notches, which insulating-pieces serve for receiving the wires, substantially as shown and described.

3. In a dynamo-electric machine, the combination, with an armature-core provided with notches, of insulating-pieces in said notches, tongues at the open ends of said notches, and cross-pieces for retaining the wires in place in the insulating-pieces, substantially as shown and described.

4. In a dynamo-electric machine, the combination, with an armature-core having notches and tongues at the outer ends of said notches, of insulating-pieces in said notches, and cross-pieces at the open ends of the notches for retaining the wires in place in the notches, said cross-pieces resting on the inner edges of the tongues, substantially as shown and described.

402,067. COMBINED SCROLL AND RESAWING MACHINE. FRANCIS H. CRAFTS, Buffalo, N. Y. Filed Jan. 3, 1888. Serial No. 259,719. (No model.)



Claim.—1. The combination, with a band-saw, of the driving-pulleys mounted in bearings on the machine for carrying the saw, a table at the front of the machine for the scroll-cutting side of the saw, a table provided with a feeding mechanism facing the saw at the rear of the machine for feeding material to be resawed, and a means for reversing the motion of the saw, for the purposes described.

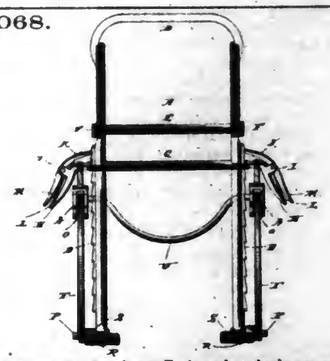
2. In a band sawing-machine, the combination of the overhanging arm having an opening through the vertical portion of the same and opposite the saw at the rear of the machine, a feeding mechanism for carrying the material to be resawed against the saw through said opening, and a reversing-gear for reversing the motion of the saw, substantially as described.

402,068. DRENCHING-BIT. CHARLES W. CRANNELL, Oberlin, Kans., assignor of one-half to Tully Scott, same place. Filed Nov. 27, 1888. Serial No. 291,988. (No model.)

Claim.—1. The combination of the frame having the rigid bar E, the adjustable bar G, movable on the frame, the detents to lock the same to the frame, and the cam-levers T, pivoted to the frame and connected to the bar G to operate the latter, substantially as described.

2. The combination of the frame A, having the cross-bar E and the arms C, with ratchet-teeth D, the bar G, movable on the arms C and having the detents to engage the ratchet-teeth, the links swiveled

402,068.



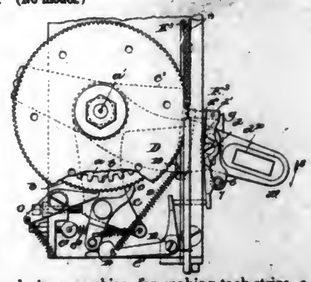
to the bar G, and the cam-levers T, pivoted at the lower ends of arms C and engaging the links, substantially as described.

3. The combination of the frame having the cross-bar E and the arms C, the cross-bar G, movable vertically on said arms, the links swiveled to the cross-bar, the cam-levers pivoted to the lower ends of arms C and operating in the links, and the yoke U, connecting the free ends of the cam-levers, substantially as described.

4. In a mouth-expander, the frame A, having the arched portion B to pass across the horse's nose, and having the side arms, C, and the cross-bar E, to enter the horse's mouth, combined with the adjusting-bar G, sliding on the arms C, and also adapted to enter the horse's mouth, the detents carried by the sliding bar G to engage the side arms, and the mechanism, substantially as described, to lower the bar G, as set forth.

5. In a mouth-expander, the frame A, having the arched portion to pass over the horse's nose, and the rigid bar E, to enter the mouth of the horse, combined with the bar G, sliding on the frame A, and also entering the horse's mouth, the yoke O, bearing under the jaw of the horse, and connecting devices between the yoke U and the bar G to raise and lower said bar G, and the detents for said bar G, as set forth.

402,069. MACHINE FOR MAKING TACK-STRIPS. JOHN A. CROSBY, Methuen, Mass., assignor to The McKay & Copeland Lasting Machine Company, Portland, Me. Filed Oct. 15, 1888. Serial No. 288,484. (No model.)



Claim.—1. In a machine for making tack-strips, a feed-wheel and a pawl to move it, combined with a feeler to contact with the side of a tack driven into the strip and enable the said pawl to act and move the said feed-wheel, substantially as described.

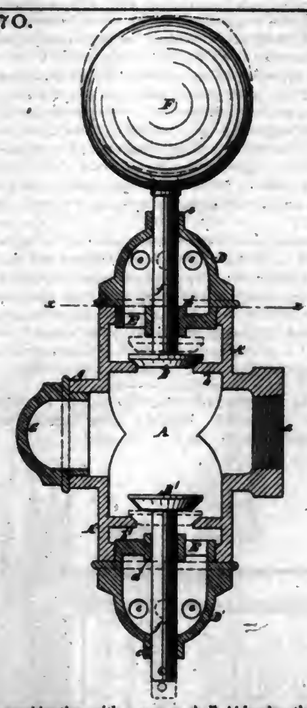
2. In a machine for making tack-strips, a feed-wheel, a pawl to move it, and a pawl-controller, combined with a feeler to contact with the side of a tack driven into the strip and keep the pawl-controller in position to enable the said pawl to act and move the said feed-wheel, substantially as described.

3. A feed-wheel, a pawl to rotate it, a support for one side of the body of a tack driven into a tack-strip, and a pawl-controller, combined with a feeler adapted to contact with the body of a driven tack between the said support and the said feed-wheel, to operate substantially as described.

402,070. SAFETY-VALVE. WILLIAM P. CUNNINGHAM, Brooklyn, N. Y., assignor of one-half to Enoch Rutzler, same place. Filed Jan. 23, 1889. Serial No. 297,316. (No model.)

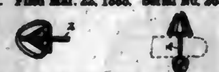
Claim.—1. In a safety-valve, the combination, with a case or shell forming a chamber and provided with a normally-open outlet-port, of two separate valves arranged at different parts of said chamber, one of which is adapted to open into said chamber and the other of which opens outwardly from said chamber, separate communications with the external atmosphere being established when either of said valves is raised from its seat, substantially as specified.

402,070.



2. The combination, with a case or shell, A', having the normally-open outlet-port *a*, of the valve B', the weighted valve B, seats for said valves within the case or shell, and caps or plugs for the said shell affording separate communications with the external atmosphere when either of the valves is raised from its seat, substantially as specified.

402,071. LOBE EAR-RING. JAMES C. DORAN and HORACE A. HALL, Pawtucket, R. I. Filed Mar. 22, 1888. Serial No. 268,158. (No model.)



Claim.—1. A catch for ear-rings struck up from sheet metal having the central aperture and the extended spring-tongue covering said aperture and adapted to engage the pin projected through the same, substantially as described.

2. A catch for ear-rings struck up from sheet metal having the central aperture and the extended spring-tongue, with the aperture in the same registering with the central aperture and engaging the pin projected through said apertures, substantially as described.

3. A catch for ear-rings struck up from sheet metal having the central aperture, the points *a* swaged up into juxtaposition, with the opening between them for the passage of the pin, and the spring-tongue having the aperture in its end and adapted to engage the pin projected through said central aperture and between the points, substantially as described.

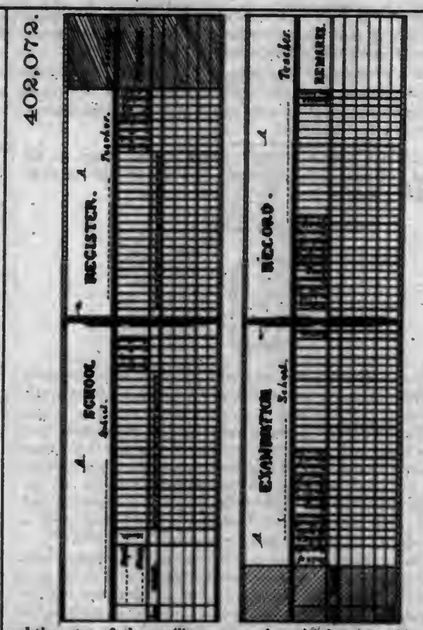
4. In an ear-ring, the combination, with the pin and the catch having the central aperture, of the points *a*, with the opening between their ends, and the extended spring-tongue passing over said opening to form a guard for the end of the pin passing between said points, its end extending between the points and engaging the pin to retain the same in position, substantially as described.

5. In an ear-ring, the combination, with the threaded pin and the catch having the central aperture, of the points *a*, with the opening between their ends, and the extended spring-tongue passing over said opening to form a guard for the end of the pin passing between said points, its end extending between the points and having the screw-threaded aperture therein engaging the pin to retain the same in position, substantially as described.

402,072. SCHOOL-RECORD BOOK. JAMES DU SHANE, South Bend, Ind. Filed July 11, 1888. Serial No. 279,682. (No model.)

Claim.—1. A record-book composed of a series of sheets having the school-register on one side and the examination-record on the other side, the sheets being folded in unequal lengths and bound at the folds, whereby alternate pages of different lengths are produced

402,072.

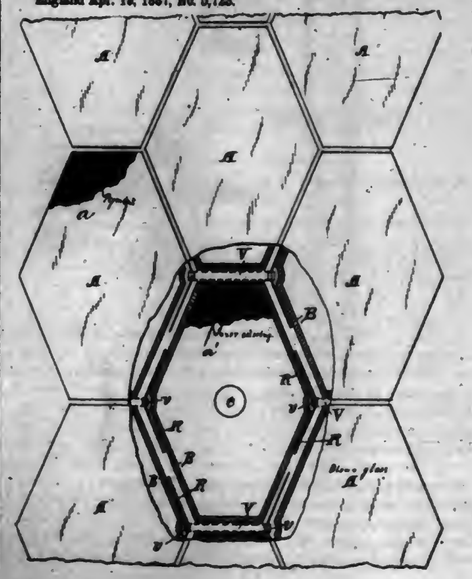


and the entry of the pupil's name on the school-register side of the sheet is seen when the examination-record is opened, substantially as described.

2. A record-book composed of a series of alternate long and short pages bound together, the adjoining faces of one long and one short page showing a school-record, and their opposite faces showing an examination-record, whereby, when the examination-record is opened, the name on the school-record on the preceding page will be disclosed, substantially as set forth.

3. A record-book composed of a series of alternate short and long sheets, A A, so bound that when the short sheet is turned down a margin on a preceding long sheet is disclosed, so that the record on the margin of the front sheet can be read with both sides of the short sheet, substantially as specified.

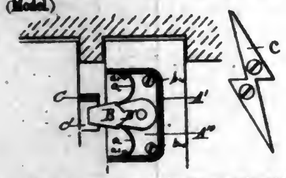
402,073. GLASS BUILDING-BLOCK. GUSTAVE FALCONNIER, Nyon, Vaud, Switzerland. Filed June 26, 1887. Serial No. 243,532. (No model.) Patented in France Nov. 11, 1886, No. 179,585; in Germany Mar. 14, 1887, No. 41,773; in Belgium Apr. 18, 1887, No. 77,079, and in England Apr. 19, 1887, No. 5,723.



Claim.—1. As a new article of manufacture, a blown-glass building-block having an air-chamber substantially entirely closed by the walls thereof, substantially as set forth.

2. As a new article of manufacture, a blown-glass building-block having an air-chamber substantially entirely closed by the walls thereof and provided with a coloring material within the inclosed air-chamber, substantially as set forth.

402,074. SASH-FASTENER. HENRY C. TROST, Chicago, Ill., and FRANK A. WESTON, Dodge City, Kans. Filed Mar. 30, 1888. Serial No. 269,025. (Model.)

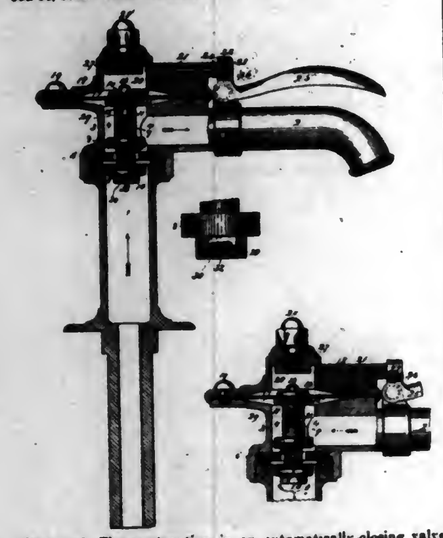


Claim.—1. The bolt-case comprising two parts, one of said parts forming the bottom and rim, and the other the top and side plate, substantially as set forth.

2. The combination of the trip-plate secured to the upper sash, its lateral edges each comprising two portions beveled in the same direction, and having between said portions an indentation with the bolt-case secured to the lower sash, the bolt located therein and projecting therefrom into the path of the trip-plate, and springs which resist but permit the movement of the bolt in a horizontal plane in both directions from the said plate, substantially as set forth.

3. The combination of the trip-plate secured to the upper sash, its lateral edges each comprising two portions beveled in the same direction, and having between said portions an indentation with the bolt-case secured to the lower sash, the bolt pivotally mounted therein and projecting therefrom into the path of the trip-plate, and springs which resist but permit the swinging of the bolt in a horizontal plane upon its pivot, said pivot having its axis fixed in location with respect both to the bolt and to the case, substantially as set forth.

402,075. AUTOMATICALLY-CLOSING FAUCET. ELLIOTT R. FURNEY, St. Louis, Mo., assignor to Nellie C. Furney, same place. Filed Oct. 31, 1888. Serial No. 289,601. (No model.)



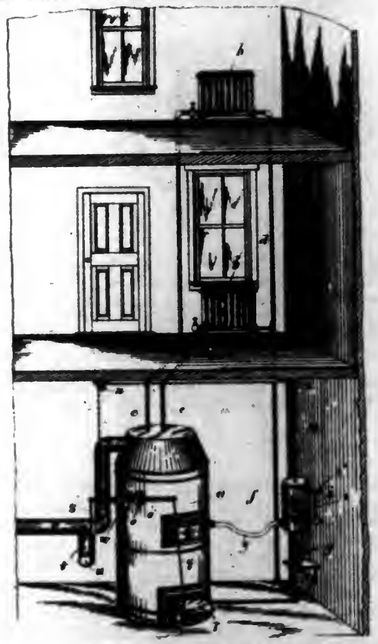
Claim.—1. The combination, in an automatically-closing valve of two valves upon a stem, said valves closing, respectively, in opposite directions upon seats between them, a flexible diaphragm secured at the center to the valve-stem, a chamber on the opposite side of the diaphragm from the valves communicating through a bore in the valve-stem with the source of supply, and a discharge-passage from the chamber controlled by a valve or cock, for the purpose set forth.

2. The combination, in an automatically-closing valve, of two valves upon a stem, a flexible diaphragm giving support to the stem, valve-seats between the valves against which they close, respectively, by an opposite movement of the valve-stem, an induction and eduction pipe on opposite sides of the valve-port, which is common to both valve-seats, a chamber separated from the valve-chamber 4 by the diaphragm and communicating with the induction pipe or chamber by a small passage, and having a discharge-passage governed by a valve, substantially as and for the purpose set forth.

3. The combinat on of the induction and eduction pipes, a valve-stem carrying two valves closing against the opposite sides of a plate having a valve-port through which the stem passes, through a flexible diaphragm supporting the valve and forming the separation between the valve-chamber 4 and the chamber 20, a small passage forming communication between the chamber 20 and the induction pipe or chamber, a valve, as 13, governing said passage, and a discharge-passage from chamber 20, governed by a valve or cock, for the purpose set forth.

4. The combination of induction and eduction pipes, the two valves 7 and 8, governing a valve-port, 5, between said pipes, a valve-stem passing through the valve-port and supporting the valves, a diaphragm, 17, separating the valve-chamber 4 from the chamber 20, a small passage between the induction-pipe or chamber, an adjustable valve governing the passage, a plug, 23, giving access to the adjustable valve, and a discharge-passage from the chamber 20, governed by a valve, substantially as and for the purpose set forth.

402,076. AUTOMATIC HEAT-REGULATOR FOR HOT-WATER HEATING APPARATUS. EUGENE H. GATES, Fitchburg, Mass. Filed Nov. 1, 1888. Serial No. 289,741. (No model.)



Claim.—1. The combination, with a water heating and circulating system, of a vertically-movable tank or chamber flexibly connected with said system and partly filled with the water thereof, a body of air which is compressed by the water-pressure, a mobile diaphragm interposed between the air and water in said tank, a damper or dampers controlling the fire, and connections between said damper or dampers and tank, whereby the fire is checked when the weight of the tank is increased, as set forth.

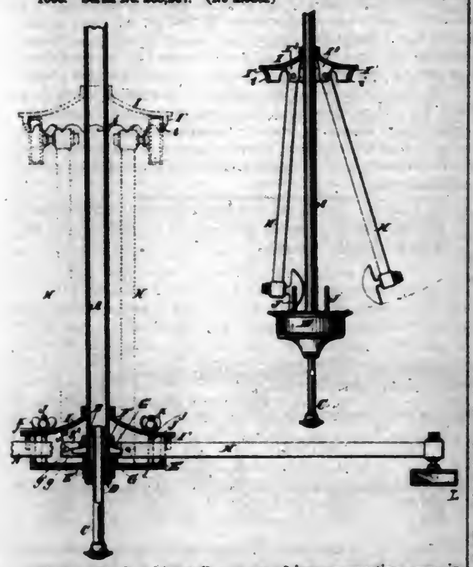
2. The combination, with a water heating and circulating system, of a vertically-movable tank or chamber flexibly connected with said system and partly filled with the water thereof, a body of oil supported by the water in said tank, a damper or dampers controlling the fire, and connections between said damper or dampers and tank, whereby the fire is checked when the weight of the tank is increased, as set forth.

3. The combination, with a water heating and circulating system, of a vertically-movable tank or chamber flexibly connected with said system and partly filled with the water thereof, a body of air which is compressed by the water-pressure, a mobile diaphragm interposed between the air and water in said tank, a damper or dampers controlling the fire, and connections between said damper or dampers and tank, whereby the fire is checked when the weight of the tank is increased, and a yielding check, as *y*, to prevent the abrupt descent of the tank, as set forth.

4. The combination, with a water heating and circulating system, of a vertically-movable tank or chamber flexibly connected with said system and partly filled with the water thereof, a body of air which is compressed by the water-pressure, a mobile diaphragm interposed between the air and water in said tank, a transparent indicator showing the height of water in the tank, a damper or dampers controlling the fire, and connections between said damper or dampers and tank, whereby the fire is checked when the weight of the tank is increased, as set forth.

5. The combination, with a water heating and circulating system, of a vertically-movable tank or chamber flexibly connected with said system and partly filled with the water thereof, a body of air which is compressed by the water-pressure, a mobile diaphragm interposed between the air and water in said tank, a damper or dampers controlling the fire, and connections between said damper or dampers and tank, whereby the fire is checked when the weight of the tank is increased, and means, as the weight *w*, whereby said damper or dampers are normally held in their fire-promoting positions with a yielding pressure, as set forth.

402,077. CHANDELIER. LEWIS F. GRISWOLD, Meriden, Conn., assignor to The Charles Parker Company, same place. Filed Sept. 13 1888. Serial No. 285,267. (No model.)



Claim.—1. In a chandelier, a set of lamp-supporting arms, in combination with movable arm-supports between which they are held and pivoted, and clamping devices for holding said arm-supports together, substantially as set forth.

2. A pair of arm-supports and a box detachable therefrom, in combination with a tubular shaft having a fixed internal nut and a fixed external collar, lamp-supporting arms held between said arm-supports and resting on said box, and a hand-piece which enters said tubular shaft and engages said nut, said hand-piece being provided with a shoulder which bears against said box to clamp said box and arm-supports between it and said collar, substantially as set forth.

3. A chandelier-shaft and a box mounted thereon, in combination with a cap vertically movable on said shaft, and clamping devices for holding said cap to said box at will, in order that said cap may be used to secure the lamp-supporting arms either in their horizontal or in their folded position, as set forth.

4. A set of lamp-supporting arms having pieces L attached to their outer ends, as described, in combination with shaft A, a cap, I, movable vertically on said shaft and adapted to fit over said pieces L, and attachments of said shaft to which said arms are pivoted, substantially as set forth.

5. A series of lamp-supporting arms, H, each having lateral gudgeons *h* near its inner end, in combination with a pair of arm-holders, G G', having arms *g g*^{3} and grooves *g' g*^{3} to receive and hold said gudgeons, a box, E, having a raised flange on which said lamp-supporting arms rest, a shaft on which said box and arm-holders are sleeved, and a hand-piece which clamps them in position, for the purpose set forth.

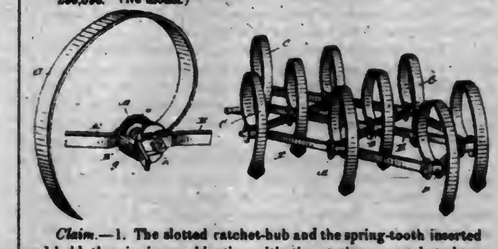
6. A box, E, and cap I, having overlapping peripheral flanges and corresponding recesses, *e i*, in combination with lamp-supporting arms extending through the openings formed by said recesses, a main shaft, to an attachment of which the inner ends of said lamp-supporting arms are pivoted, and clamping devices for holding said cap to said box, substantially as set forth.

402,078. BOTTLE-STOPPER. CHARLES C. HALEY, Newark, N. J., assignor to Henry A. Hausding and Adell A. Haley, same place. Filed Dec. 10, 1888. Serial No. 293,117. (No model.)



Claim.—The improved bottle-stopper herein described, combining with the button having an eye, d^3, a wire bail doubled, as at d^3, to form a finger-loop, and the hooked arms d' d', which extend downwardly and pass in opposite directions through said eye, the extremities of said arms being bent upward at said eye d^3, forming spring-bearings d^4 d^4 to engage the opposite sides of the interior of the neck, substantially as shown and described, for the purposes set forth.

402,079. SPRING-TOOTH HARROW. SAMUEL M. HENCH and WALKER A. DROSCOLD, York, Pa. Filed Feb. 11, 1889. Serial No. 299,396. (No model.)



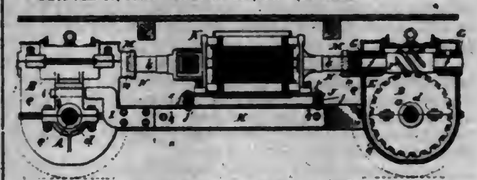
Claim.—1. The slotted ratchet-hub and the spring-tooth inserted and held therein, in combination with the stationary ratchet-plates and the pivot-bolt, substantially as and for the purposes hereinbefore set forth.

2. The slotted ratchet-hub having lug *e*, in combination with the spring-tooth inserted in the slot and notched to engage lug *e*, the pin or rivet *f*, by which the tooth is secured to the hub, the stationary ratchet-plates, and the pivot-bolt, substantially as and for the purposes hereinbefore set forth.

3. The harrow-frame composed of straps of zigzag form, in combination with individually hinged or pivoted spring-teeth located between the contiguous angles of adjoining straps, and pivot-bolts whereby both the teeth are held in place and the straps between which the teeth come are bound together, substantially as set forth.

4. The combination of the harrow-frame E, composed of straps bent into zigzag form, as described, the stationary ratchet-plates, the ratchet-hubs, the spring-teeth attached to said hubs, and the pivot-bolts by which both the hubs and stationary plates are held in place and the frame-straps are bound together, substantially as and for the purposes hereinbefore set forth.

402,080. ELECTRIC CAR. JOHN W. HENDERSON, Philadelphia, Pa. Filed Jan. 19, 1889. Serial No. 296,797. (No model.)



Claim.—1. In an electrically-propelled vehicle, the combination of two axles, an axle-frame journaled upon each axle, a motor-supporting frame hung from said axle-frames with provision for lateral movement, and an electric motor supported by said motor-supporting frame.

2. In an electrically-propelled vehicle, the combination of two axles, an axle-frame journaled upon each axle, a motor-supporting frame hung from said axle-frames with provision for lateral movement, an electric motor supported by said motor-supporting frame

having a longitudinal shaft, and gearing between the ends of said shaft and axles.

3. In an electrically-propelled vehicle, the combination of two axles, an axle-frame journaled upon each axle, a motor-supporting frame hung from said axle-frames with provision for lateral movement, an electric motor supported by said motor-supporting frame, having a longitudinal shaft, and gearing between the ends of said shaft and axles consisting of worms and worm-wheels, the latter being secured to the axles.

4. In an electrically-propelled vehicle, the combination of two axles, an axle-frame journaled upon each axle having a worm chamber or case, a motor-supporting frame hung from said axle-frames with provision for lateral movement, an electric motor supported by said motor-supporting frame, having a longitudinal shaft, and gearing between the ends of said shaft and axles consisting of worms and worm-wheels, the latter being secured to the axles and arranged within the inclosing chambers or casings of the axle-frames.

5. In an electrically-propelled vehicle, the combination of two axles, a frame supported by said axles between the wheels, an electric motor, elastic supports wholly supporting and arranged below the motor and between the motor and frame, and power-transmitting devices between the motor and axle.

6. In an electrically-propelled vehicle, the combination of two axles, a frame supported by said axles, an electric motor, elastic supports between the motor and frame, worm-wheels on the axles, worms for meshing with the worm-wheels, and flexible couplings between the motor-shaft and worms.

7. In an electrically-propelled vehicle, the combination of two axles, a laterally-swinging frame supported by said axles, an electric motor, elastic supports between the motor and frame, and power-transmitting devices between the motor and axle.

8. In an electrically-propelled vehicle, the combination of two axles, an axle-frame on each axle, a motor-supporting frame hung from said frames, worm-wheels on the axles, worms for said worm-wheels journaled in the axle-frames, a motor supported on motor-supporting frame, and flexible couplings between the motor-shaft and worms.

9. In an electrically-propelled vehicle, the combination of two axles, an axle-frame on each axle, a motor-supporting frame hung from said frames, worm-wheels on the axles, worms for said worm-wheels journaled in the axle-frames, a motor supported on motor-supporting frame by elastic connections, and flexible couplings between the motor-shaft and worms.

10. The combination of two axles, a laterally-movable motor-supporting frame carried by the axles, a motor on said frame, and a power-transmitting connection between one or both axles and motor-shaft.

11. The combination of two axles, an axle-frame journaled upon each axle, and a motor-supporting frame hung upon said axle-frame by longitudinal journals.

12. The combination of two axles, an axle-frame journaled upon each axle and having two holes, and a motor-supporting frame formed of two parallel beams hung upon said axle-frames by longitudinal journals of smaller diameter than the holes of the axle-frames.

13. The combination of two axles, a worm-wheel upon each axle, an axle-frame journaled concentrically with each axle, worms held by said frames, a motor to rotate said worms, and a longitudinal frame structure loosely connecting with each axle-frame to prevent them from rotating with the axles, but allow of movement of one axle-frame independent of the other.

14. The combination of two axles, a worm-wheel upon each axle, an axle-frame journaled concentrically with each axle, worms held by said frames, a motor to rotate said worms, a flexible coupling between the worms and motor-shaft, and a longitudinal frame structure loosely connecting with each axle-frame to prevent them from rotating with the axles, but allow of movement of one axle-frame independent of the other.

15. The combination of two axles, a worm-wheel on each axle, an inclosing-frame journaled concentric with each axle, a worm journaled in the upper parts of each of said frames and also inclosed thereby and meshing with the worm-wheels, an electric motor having a longitudinal shaft arranged in line with the worms, and flexible connections between the motor-shaft and worms.

16. The combination of two axles, a worm-wheel secured to each axle, a worm meshing with the upper part of each worm-wheel, an inclosing-frame for said worm-wheel, a worm on each axle forming a receptacle for oil and keeping out dust, and a longitudinal motor-shaft extending from worm to worm in a line above both axles.

17. The combination of an axle, a worm-wheel on the axle, a worm meshing with the worm-wheel, a motor, and a flexible coupling between the motor-shaft and worm, consisting of a slotted head, *m*, and pin N, substantially as shown.

18. The combination of two axles, axle-frames on each axle, two longitudinal beams hung from said axle-frame on longitudinals, elastic connections between the beams, and a motor supported on said beams.

19. In an electrically-propelled vehicle, the combination of two axles, an axle-frame journaled upon each axle having a worm chamber or case, a motor-supporting frame hung from said axle-frames with provision for lateral movement, an electric motor supported by said motor-supporting frame having a longitudinal shaft, and gearing between the ends of said shaft and axles, consisting of worms and worm-wheels, the latter being secured to the axles, arranged within the inclosing chambers or casings of the axle-frame, and in which the axle-frame, worm-wheel, and worm on one axle are fixed against lateral movement and the similar parts on the other axle are free to have lateral movement by sliding upon the axle.

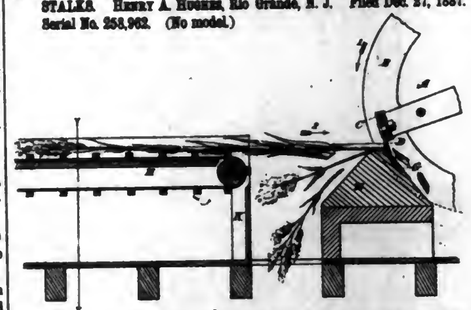
20. The combination of two axles, an axle-frame on each axle having a hole, P, and a longitudinal beam having journals *i* at each end loosely fitting said holes P and provided on top with a key or feather or similar projecting part, *p*.

21. The combination of two axles, a worm and worm-wheel and connecting-frame carried upon each axle, an intermediate loosely-connected motor-supporting frame connecting the frames on the two axles, and a motor supported by said motor-supporting frame having its shaft connected with the worms.

22. The combination of two axles, a worm-wheel on each axle, a worm for each worm-wheel, a frame for holding the worm to the worm-wheel, a detachable motor-frame connecting the frames for the worms to hold them in place, and a motor secured to the motor-frame and movable with it and having its shaft connected with the worms.

23. The combination of two axles, a worm-wheel on each axle, a worm for each worm-wheel, a frame for holding the worm to the worm-wheel, a detachable motor-frame connecting the frames for the worms to hold them in place, a motor secured to the motor-frame and movable with it, and a detachable connection between the motor-shaft and worms.

402,081. APPARATUS FOR REMOVING END SECTIONS FROM STALKS. HENRY A. HUGHES, Rio Grande, N. J. Filed Dec. 27, 1887. Serial No. 258,962. (No model.)



Claim.—1. An apparatus for removing and separating end sections from stalks, &c., containing the combination of a descending cutting-blade, a traveling carrier adapted to support said stalks and feed them to said cutting-blade, and a fixed support for said stalks in front of and adjacent to said cutting-blade, the said support and proximate end of the stalk-carrier being separated by a free space or interval greater in width than the length of the end sections to be separated, substantially as described.

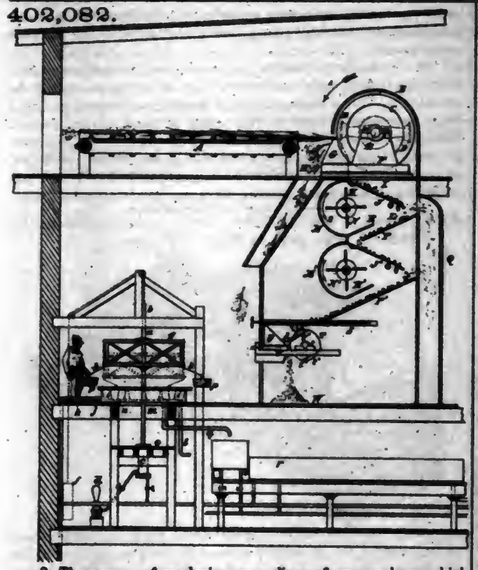
2. An apparatus for removing and separating end sections from stalks, &c., containing the combination of a rotary descending cutting-blade, a continuously-moving carrier adapted to support said stalks and feed them to said cutting-blade, and a fixed support for said stalks in front of and adjacent to said cutting-blade, the said support and proximate end of the stalk-carrier being separated by a free space or interval greater in width than the length of the end sections to be separated, substantially as described.

3. An apparatus for removing and separating end sections from stalks, &c., containing the combination of a rotary intermittently-descending cutting-blade, the endless traveling apron or carrier H and stationary support E, the said fixed support E and proximate end of apron H being separated by a space or interval greater in width than the length of the end sections to be separated, substantially as described.

402,082. PROCESS OF SUGAR PRODUCTION FROM SORGHUM. HENRY A. HUGHES, Rio Grande, N. J. Filed Dec. 27, 1887. Serial No. 258,964. (No specimens.)

Claim.—1. The process of preparing sorghum-cane for diffusion, which consists in first dividing the cane into short lengths and freeing it from seed-heads, leaves, and sheaths; second, separating the leaves, sheaths, &c., from the cane; third, subjecting the cane to shredding or fibrous disintegration, substantially as described.

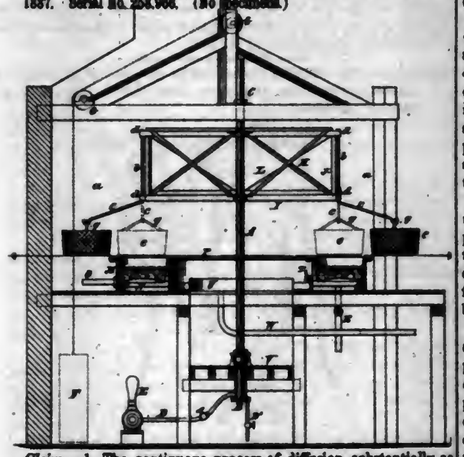
402,082.



2. The process of producing sugar-liquor from sorghum, which consists in first dividing the cane into short lengths and freeing it from seed-heads, leaves, and sheaths; second, separating the leaves, sheaths, &c., from the cane; third, subjecting the cane to shredding or fibrous disintegration; fourth, subjecting the disintegrated cane to diffusion in hot water until the water dissolves from said cane a given percentage or quantity of sugar, substantially as described.

3. The process of producing concentrated sugar-liquor from sorghum, which consists in first dividing the cane into short lengths and freeing it from seed-heads, leaves, and sheaths; second, separating the leaves, sheaths, &c., from the cane; third, subjecting the cane to shredding or fibrous disintegration; fourth, subjecting the disintegrated cane to diffusion in hot water until the water dissolves from the cane a given percentage or quantity of sugar, and, fifth, subjecting the liquor so obtained directly to evaporation until a concentrated liquor suitable for treatment in the vacuum-pan is produced, substantially as described.

402,083. PROCESS OF EXTRACTING SUGAR FROM SORGHUM BY DIFFUSION. HENRY A. HUGHES, Rio Grande, N. J. Filed Dec. 27, 1887. Serial No. 258,966. (No specimens.)



Claim.—1. The continuous process of diffusion, substantially as herein described, which consists in subjecting successive masses of cane in a disintegrated or shredded condition to the action of stationary bodies of hot water contained in a series of successive independent non-communicating vessels, by immersing each mass of cane successively in each vessel, and thereby bringing the liquor in each vessel to a predetermined density.

2. The continuous process of diffusion, substantially as herein described, which consists in, first, charging a given number of vessels not communicating with one another with hot water; second, immersing in vessel No. 1 a mass of cane, No. 1, in disintegrated or shredded condition; third, removing said mass No. 1 to vessel No. 2, and placing in vessel No 1 a new mass, No. 2, of shredded cane; fourth, removing masses Nos. 1 and 2, respectively, from vessels 1 and 2 to vessels 2 and 3, and placing a new mass of cane, No. 3, in vessel No. 1, and so continuing immersing successive masses of cane in each vessel until the liquor in each vessel shall attain a predetermined density.

402,084. INCLINE ELECTRIC RAILWAY. RUDOLPH M. HUNTER, Philadelphia, Pa. Filed Jan. 5, 1888. Serial No. 295,534. (No model.)



Claim.—1. In an electric railway having an upgrade, the combination of a source of electric supply, line working-conductors, a short switching turn-out or siding at the top of the grade provided with working-conductors for the traction-dummy, and electrical connections between said working-conductors for the dummy and line-conductors or their source of electrical supply.

2. In an electric railway having an upgrade, the combination of a source of electric supply, main-line working-conductors, a short switching turn-out or siding at the top of the grade provided with working-conductors for the traction-dummy, electrical connections between said working-conductors for the dummy and line-conductors or their source of electrical supply, and a slotted branched conduit containing said line and traction-dummy working-conductors.

3. In an electric railway having an upgrade, the combination of a source of electric supply, main-line working-conductors, a short switching turn-out or siding at the top of the grade provided with working-conductors for the traction-dummy, electrical connections between said working-conductors for the dummy, and line-conductors or their source of electrical supply, a slotted branched conduit containing said line and traction-dummy working-conductors, and switching devices to switch the dummy onto the siding or turn-out to allow the passage of the passenger-car.

4. In an electric railway having an upgrade, the combination of a source of electric supply, main-line working-conductors, a short switching turn-out or siding at the top of the grade provided with working-conductors for the traction-dummy, electrical connections between said working-conductors for the dummy and line-conductors or their source of electrical supply, a slotted branched conduit containing said line and traction-dummy working-conductors, switching devices to switch the dummy onto the siding or turn-out to allow the passage of the passenger-car, an electrically-propelled passenger-car, a traction dummy or motor to assist said car up the grade, and a disconnectible coupling between said car and traction-dummy.

5. The combination of an electric railway arranged on an incline with a substantially-horizontal part at top and bottom, a dummy-track at one end of said inclined portion of the railway arranged out of line of the main track to support the dummy to one side of the main track, electrical conductors for the dummy on the inclined portion of the railway, an electrically-propelled dummy or traction-vehicle, a passenger-car to run upon the main track, and a coupling between the passenger-car and dummy, whereby the dummy may assist the passenger-car up the grade or incline, and also allow the passenger-car to pass the dummy.

6. The combination of a railway-track having a grade portion, a main-line conductor arranged along the railway, an electrically-propelled passenger-car receiving current from said conductor, a dummy-track, a conductor for said dummy-track, an electrically-propelled dummy for assisting the passenger-car up the grade receiving current from said conductor for the dummy-track, and a detachable coupling between the dummy and passenger-car.

7. The combination of a railway-track having a grade portion, a main-line conductor arranged along the railway, an electrically-propelled passenger-car receiving current from said conductor, a dummy-track, a conductor for said dummy-track, an electrically-propelled dummy for assisting the passenger-car up the grade receiving current from said conductor for the dummy-track, a common source of supply to the main-line and dummy-track conductors, and a detachable coupling between the dummy and passenger-car.

8. The combination of a railway-track having a grade portion, a main-line conductor arranged along the railway, an electrically-propelled passenger-car receiving current from said conductor, a dummy-track, a conductor for said dummy-track, an electrically-propelled dummy for assisting the passenger-car up the grade receiving current from said conductor for the dummy-track, a common source of supply to the main-line and dummy-track conductors, a regulator to regu-

late the current supplied to the dummy-track conductor, and a detachable coupling between the dummy and passenger-car.

9. The combination, in a railway, of a main track having a grade, an auxiliary track at the grade, a passenger-car adapted to run on the main track, an electrically-propelled dummy-car to run upon the auxiliary track, a coupling between the passenger-car and dummy, and a source of electric supply to the motor on the dummy.

10. The combination, in a railway, of a main track having a grade, an auxiliary track at the grade, an electrically-propelled passenger-car adapted to run on the main track, an electrically-propelled dummy-car to run upon the auxiliary track, a coupling between the passenger-car and dummy, and a source of electric supply to the motor on the dummy and passenger-car.

11. The combination, in a railway, of a main track having a grade, an auxiliary track at the grade, a passenger-car adapted to run on the main track, an electrically-propelled dummy-car to run upon the auxiliary track, a coupling between the passenger-car and dummy, separate conductors for the main track and auxiliary track, and electrical connections between the motors on the passenger-car and dummy.

12. The combination, in a railway, of a main track having a grade, an auxiliary track at the grade, a passenger-car adapted to run on the main track, an electrically-propelled dummy-car to run upon the auxiliary track, a coupling between the passenger-car and dummy, separate conductors for the man track and auxiliary track, electrical connections between the motors on the passenger-car and dummy, and a common source of electric energy for both conductors.

13. The combination, in an electric railway having a grade, of the main track and line-conductor, with an auxiliary parallel track at the grade portion, an electrically-propelled passenger-car for the main track, a traction electrically-propelled dummy for the auxiliary track, a common source of electric energy, and a detachable coupling between the passenger-car and dummy.

14. The combination, in an electric railway having a grade, of the main track and line-conductor, with an auxiliary parallel track of different gage at the grade portion, an electrically-propelled passenger-car for the main track, a traction electrically-propelled dummy for the auxiliary track, a common source of electric energy, and a detachable coupling between the passenger-car and dummy.

15. The combination, in an electric railway having a grade, of the main track and line-conductor, with an auxiliary parallel track at the grade portion, an electrically-propelled passenger-car for the main track, a traction electrically-propelled dummy for the auxiliary track, and a conductor for the auxiliary track, and electrical connection between the conductors for the respective tracks and the car and dummy.

16. The combination, in an electric railway having a grade, of the main track with a dummy turn-out track at one end of the grade, an electrically-propelled passenger-car, an electrically-propelled dummy for assisting the car up the grade, a detachable coupling between the car and dummy, and a common source of electric energy for the motors of both the passenger-car and dummy.

17. The combination of a main track having a line-conductor, a parallel auxiliary track having a longitudinal conductor, a source of electric supply for said conductors, and a regulator to control the current passing to the conductor of the auxiliary track.

18. The combination of two electrically-propelled vehicles coupled together, a common source of electric energy for the motors of both vehicles, and a regulator independent of the two vehicles to control the relative supply of electricity to the motors.

19. The combination of a main track and line-conductor, a source of electric energy, an auxiliary track and conductor at a distance from the source of supply, and a connection between the two track-conductors, whereby the auxiliary track-conductor receives current from the source of supply through the line-conductor of the main track.

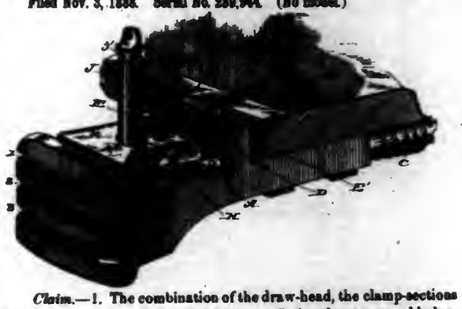
20. In an electric railway, line working-conductors from which a traveling motor derives its current, having an upgrade, in combination with a short section of working-conductors having a length substantially equal to said grade and arranged parallel to said line-conductors and on the grade, a passenger electrically-propelled vehicle receiving current from the line-conductors, a traction-motor or dummy receiving current from the short-grade sections of working-conductors, and a disconnectible coupling between the passenger-vehicle and dummy.

21. In an electric railway, line working-conductors from which a traveling motor derives its current, having an upgrade, in combination with a short section of working-conductors having a length substantially equal to said grade, and arranged parallel to said line-conductors and on the grade, and a common source of electric supply for both the line-conductors and upgrade-motor conductors.

22. In an electric railway, a line of working-conductors from which a traveling motor derives its current, having an upgrade, in combination with a short section of working-conductors having a length substantially equal to said grade, and arranged parallel to said line-conductors on the grade, an electric generator to supply electricity to said line-conductors, and branch conductors connecting the line-conductors with the corresponding conductors of the upgrade-motor circuit.

23. In an electric railway, a line of working-conductors from which a traveling motor derives its current, having an upgrade, in combination with a short section of working-conductors having a length substantially equal to said grade, arranged parallel to said line-conductors and on the grade, and an electrically-propelled passenger-vehicle receiving electricity from the line-conductors, an electric motor receiving electricity from the upgrade-motor conductors, and a disconnectible coupling between the motor and passenger-vehicle.

402,085. CAR-COUPLING. JOHN J. JETER, Campbellsville, Ky. Filed Nov. 3, 1888. Serial No. 289,944. (No model.)



Claim.—1. The combination of the draw-head, the clamp-sections having recesses f^3 and beveled surfaces f'; the plunger movable longitudinally and having its head e beveled and arranged to engage beveled surfaces f' of the clamp-sections, substantially as set forth.

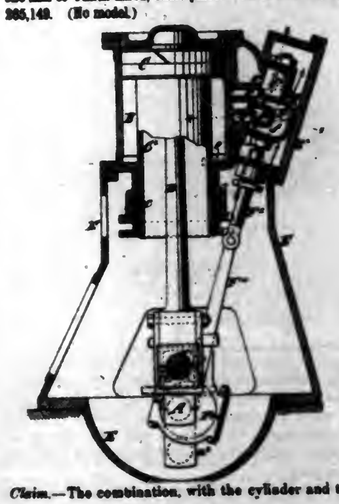
2. In a car-coupling, the combination of a longitudinally-movable draw-head, a plunger movable longitudinally independent of the draw-head, a bearing arranged for engagement by such plunger, whereby a rearward movement of the draw-head will effect a forward movement of the plunger, and the clamp-sections adapted to engage and hold the pin and arranged for actuation by the plunger, substantially as set forth.

3. In a car-coupling, the combination of the draw-head, the clamp-sections, and the plunger adapted to operate the clamp-sections, and a bearing by engagement with which the plunger is moved forward on the meeting of two draw-heads, substantially as set forth.

4. In a car-coupling, the combination of the draw-head movable longitudinally and having a lug, D, arranged to limit such movement, such lug D being provided with an opening, d, forming a guide for the plunger, the clamp-sections and the plunger movable in guide d and arranged to engage the clamp-sections, all substantially as and for the purposes specified.

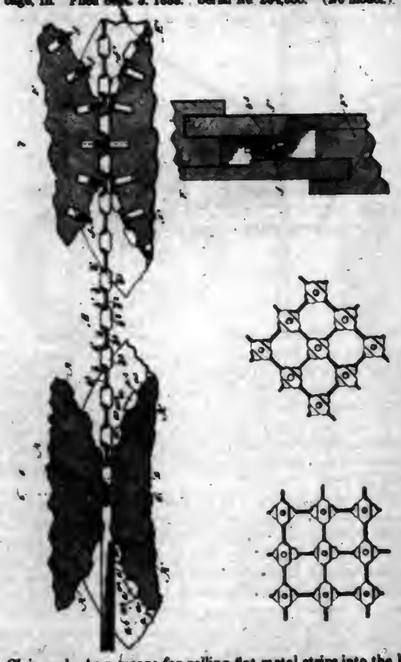
5. The combination of the draw-head, the clamp-sections, the plunger, and the pins i, operating in grooves I, and adapted to form a guide whereby to direct the movement of the forward ends of the clamp-sections, substantially as set forth.

402,086. ENGINE. JULIUS JOHNSON, New York, N. Y., assignor of one-half to Julius Elsen, same place. Filed Feb. 24, 1888. Serial No. 265,149. (No model.)



Claim.—The combination, with the cylinder and trunk-piston of a compound engine, the cylinder having a valve-seat in which are the supply-ports e e', adjacent to each other, and the exhaust-port e^2 beyond said supply-ports, of a valve having the passage f, whereby the two supply-ports may be placed in communication, and having between the ends of said passage a supply-cove, f', opening at the side of the valve, and also having beyond said passage the separate exhaust-cove f^2, substantially as herein described.

402,087. MACHINE FOR SHAPING METAL STRIPS FOR ORNAMENTAL METAL LATTICE OR FENCE WORK. FRED H. KINDL, Chicago, Ill. Filed Sept. 5, 1888. Serial No. 284,655. (No model.)



Claim.—1. As a means for rolling flat metal strips into the hereinbefore-described reversely-twisted strips having two portions which are intermediate of the twists alternately in different planes, a pair of dies, each having a series of substantially flat die-face portions alternately in different planes in correspondence with said portions of the strips that are intermediate of the twists, and a series of curved-face portions intervening between said flat die-face portions and alternately curved in reverse directions in correspondence with and to form the reverse twists in the strips, substantially as set forth.

2. In a machine for forming the within-described reversely-twisted metal strips, a pair of opposing rotary dies, each having die-face portions a, alternating with die-face portions a', and reversely-curved face portions a^2 and a^3, alternating with one another and formed at the points of junction between the die-faces a and a', substantially as described.

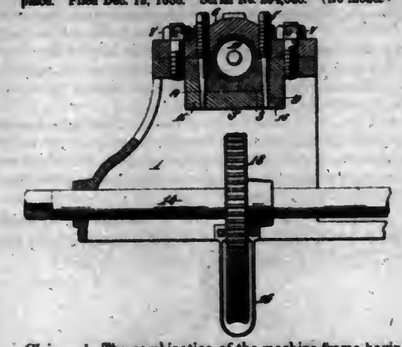
3. In a machine for forming the within-described reversely-twisted metal strips, the flanged dies, each provided with a die-face comprising the portions a, a', a^2, and a^3, for the purpose described.

4. In a machine for forming the within-described reversely-twisted metal strips, a pair of dies, each provided with a die-face comprising the alternately-arranged flat and curved portions, as set forth, for forming the reversely-twisted strips B, one of said die-holders being provided with a flange which works within a groove in the opposing die-holder, for the purpose described.

5. The combination, with the rolls provided with dies, each having the herein-described alternately-arranged flat and curved die-face portions for forming the reversely-twisted strips B, of a punching device arranged for punching rivet-holes in said strip, for the purpose described.

6. In a machine for forming strips B, the roll A, provided with the within-described die-face having the alternately-arranged flat and curved die-face portions, forming a die-face which is shaped in conformity to said strip, said roll being journaled eccentrically in rotary adjustable bearings, in combination with a separate movable die having alternately-arranged flat and curved die-face portions corresponding to and matching the said die-face portions of the die on roll A, substantially as and for the purpose described.

402,088. TOBACCO-CUTTING MACHINE. WILLIAM KRUTSCH, Dayton, Ohio, assignor to the Buckeye Iron and Brass Works, same place. Filed Dec. 19, 1888. Serial No. 294,065. (No model.)



Claim.—1. The combination of the machine-frame having a pillow-block, the feed-chain-operating shaft carrying a worm-wheel, the cutter-shaft, the worm detachably mounted on the end portion of the cutter-shaft, and a journal-box removably mounted on the pillow-block, supporting the ends of the cutter-shaft outside the worm and having a detachable cap for replacing the worm by another to change the speed of the feed-chain-operating shaft, substantially as described.

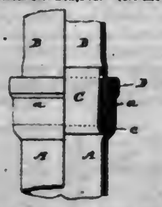
2. The combination of the machine-frame having a pillow-block provided with two stationary jaws, the feed-chain-operating shaft having a worm-wheel, the cutter-shaft, the worm detachably mounted on the cutter-shaft, and the removable journal-box supporting the end of the cutter-shaft outside the worm, and comprising a lower section detachably held between the jaws of the pillow-block, and the top cap detachably bolted to the pillow-block for replacing the worm by another to change the speed of the feed-chain-operating shaft, substantially as described.

3. The combination of the machine-frame having a pillow-block provided with two jaws, a feed-chain-operating shaft having a worm-wheel, a cutter-shaft having a detachable worm, a journal-box comprising a lower section removably located between the jaws of the pillow-block, and a top cap detachably secured to the pillow-block, and screws having tapering portions located between the said jaws and the lower section of the journal-box, substantially as described.

4. The combination of the machine-frame having a pillow-block provided with two jaws, the journal-box comprising the lower section removably located between the jaws, and a top cap detachably bolted to the pillow-block, the screws having tapering portions extending between the said jaws and the lower section of the journal-box, and the shaft having a removable worm, substantially as described.

5. The combination of the machine-frame having a pillow-block provided with two jaws, a journal box composed of a lower section removably located between the jaws, and a cap removably secured to the pillow-block, and screws having tapering portions arranged between the jaws and the lower section of the journal-box, substantially as described.

402,089. PIPE-JOINT. FRANK A. LANE, Manchester, N. H. Filed Apr. 30, 1888. Serial No. 272,375. (No model.)



Claim.—1. The herein-described ferrule, tapering toward one end and provided at the other end with the laterally-extending flange adapted to form a seat for the calking, and convex and tapering on its end face, and thereby adapted to center the ferrule within the bell, in combination with the bell having a tapering or rounded seat adapted to co-operate with said ferrule to bring both parts in line, substantially as set forth.

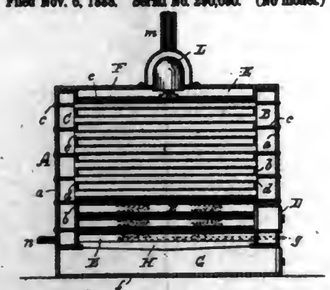
2. The herein-described ferrule C for pipe-joints, provided at one end with a convex or tapering end face, and having at the same end the laterally-extending flange or shoulder c, adapted to form a seat for the calking, said ferrule being tapered or flared on its inner surface toward the end opposite said flange, whereby obstruction of the pipe in which it may be inserted is avoided, substantially as set forth.

402,090. MANUFACTURE OF GLASSWARE. GEORGE W. LEIGHTON, Findlay, Ohio, assignor to the Dalzell Gilmore & Leighton Company, same place. Filed Feb. 1, 1889. Serial No. 298,393. (Specimens.)

Claim.—1. As a step in the manufacture of glassware, the method herein described of producing a metallic luster on the surface of the glassware, which consists in reheating a wholly or partially shaped article formed of glass having a metallic constituent and while hot subjecting the article to the action of sulphurous fumes or vapors, substantially as set forth.

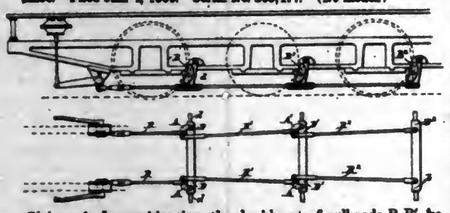
2. As a step in the manufacture of glassware, the method herein described of developing a metallic luster and a color on the surface of the glassware, which consists in heating a wholly or partially shaped article having its surface formed of glass having a metallic constituent in a sulphurous flame, substantially as set forth.

402,091. STEAM-BOILER. LEVI W. LOMBARD and NATHANIEL LOMBARD, Boston, Mass., assignors of one-half to Orlando E. Lewis, same place. Filed Nov. 6, 1888. Serial No. 290,096. (No model.)



Claim.—A steam-boiler composed of two hollow chambers having metallic walls which form the end heads, a series of pipes connecting said chambers, an exterior shell inclosing said tubes to form a combustion-chamber, a fluid-supply pipe, a steam-drum, L, above the steam-pipes *e* and connected directly to the middle thereof, and a smoke-stack inclosing the steam-drum, substantially as set forth.

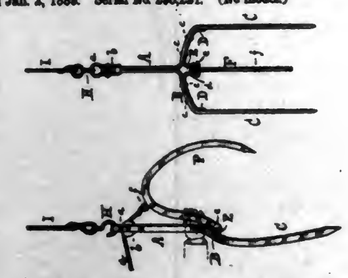
402,092. BRAKE. ALBERT P. MASSEY and ELIE NORMAND, Watertown, N. Y., assignors to the Eames Vacuum Brake Company, same place. Filed Jan. 4, 1889. Serial No. 295,417. (No model.)



Claim.—1. In combination, the double set of pull-rods R R', &c., the double set of levers A A', &c., the beams D D', &c., and the brake-heads B B', &c., all arranged and operating substantially as described.

2. In combination, the double set of pull-rods, the double set of levers, the beams, and the brake-heads, with the terminal beam D^2, and brake-heads B^2, that terminal beam being connected directly with the pull-rods, while the other beams in the system are connected with the pull-rods through the levers, all substantially as shown.

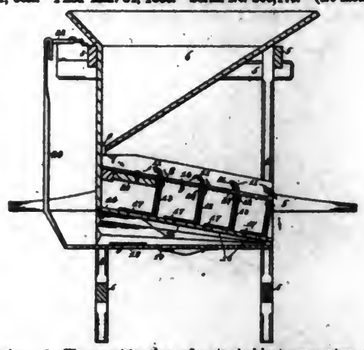
402,093. HAY-FORK. NATHAN F. MATHEWSON, Providence, R. I. Filed Jan. 2, 1889. Serial No. 295,231. (No model.)



Claim.—1. The combination of the handle A, having an eye, *a*, the top piece, B, the stiffening-pieces D, having the hangers E, the fixed tines C, the pivotally-mounted hooked tine F, and the rope G, fastened to the tine F and passing through the eye *a*, substantially as specified.

2. The improved hay-fork herein described, consisting of the handle A, having the eye *a* and sheave *b*, the top piece, B, the fixed tines C, the stiffening-pieces D, having the hangers E, the pivotally-mounted hooked tine F, having the stop-pins *e* and the eye *f*, and the rope G, substantially as specified.

402,094. ORE-CONCENTRATOR. WILLIAM H. MESSENGER, Denver, Colo. Filed Mar. 31, 1888. Serial No. 269,178. (No model.)

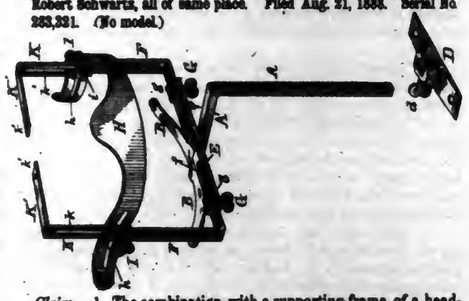


Claim.—1. The combination of a single-blast apparatus, a series of transverse walls directly upon the stationary side thereof, forming with side walls a series of chambers directly upon the blast apparatus, a series of outlet-valves for the blast apparatus, one for and opening into each chamber, the valve in any one chamber being weighted to require a different degree of pressure to raise it from that required by the valves in adjacent chambers, an inclined riddle lying directly over the chambers, and means for operating the blast apparatus, substantially as set forth.

2. The combination of a single-blast apparatus, a series of transverse walls projecting from the stationary side thereof and forming with side walls a series of chambers directly upon the blast apparatus, a series of outlet-valves for the blast apparatus, one for and opening into each chamber, an ordinary inlet-valve for such apparatus, an extra outlet-valve therefor having means for adjusting it to any desired pressure, an inclined screen lying directly over the chambers, and means for operating the blast apparatus, substantially as set forth.

3. The combination, in an ore-concentrator, of a screen having transverse riffle-bars, a perforated or reticulated metal base secured to a frame, transverse clamping-bars beneath such base, a bellows having walls or partitions upon its upper side coinciding with the riffle and clamping bars, forming chambers between the bellows and the riddle, and a valve in each chamber, the valve in any one chamber being weighted or constructed to require a different degree of force to raise it from that required by the other valves, substantially as set forth.

402,095. COMBINED HEAD-REST, CHIN-SUPPORT, AND EYE-CLOSER FOR CORPSES. FRANK MOHARTER, Nanticoke, Pa., assignor of four-fifths to Frank P. Grotzer, John J. Ditty, George W. Gruver, and Robert Schwartz, all of same place. Filed Aug. 21, 1888. Serial No. 283,231. (No model.)



Claim.—1. The combination, with a supporting-frame, of a head-rest, a chin-support, and an eye-closer, the latter consisting of a bar adapted to rest over the eye of a cadaver, substantially as described.

2. The combination, with a supporting-frame, of a head-rest and bars adapted to rest over the eyes of a cadaver, substantially as described.

3. The combination, with a supporting-frame, of adjustable bars adapted to rest over the eyes of a cadaver, substantially as described.

4. The combination, with a head-rest, of a cross-bar, side bars adjustably fastened to said cross-bar, and a chin-support attached to said side bars, substantially as set forth.

5. The combination, with a head-rest, of a cross-bar, side bars adjustably fastened to said cross-bar, and eye-closers secured to said side bars, substantially as set forth.

6. The combination, with a shank, A, having an arm, A', of a cross-bar, E, slotted side bars, F, sliding on said cross-bar, thumb-screws G and I, and slotted eye-closers K, having holes *k'* and sliding on said side bars, substantially as set forth.

402,096. RATCHET-DRILL. WILLIAM G. MORGAN, St. Louis, Mo. Filed June 11, 1888. Serial No. 276,753. (No model.)

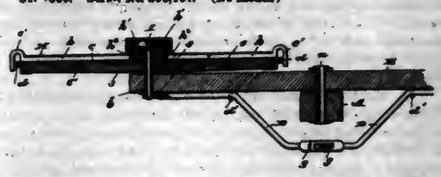


Claim.—1. A ratchet-drill composed of an outside casing, A, provided with a fulcrum-rest in its interior portion to engage the arm B, the arm B, having pawls *d d*, engaging ratchet-wheels *c c*, two ratchet-wheels, *c c*, handles $H' H^2$, shaft N, adapted to hold the drill at one end and containing a thread at the other, shank M, and band *b*.

2. In a ratchet-drill, an arm, B, fulcrumed in a casing, A, and having a circular recess on each side of said fulcrum for the reception and retention of pawls *d d*, in combination with a ratchet-wheel and casing, substantially as described.

3. In a ratchet-drill, the combination of two ratchet-wheels, one larger than the other, fixed to a drill-shank, an arm fulcrumed between two pawls held and operated by said arm and engaging the ratchet-wheels, and a casing inclosing said ratchet-wheels, pawls, and arm, substantially as described.

402,097. HORSE-DETACHER. WHEELER M. MORRISON, Tower Hill, Ill., assignor of one-half to David O. Miller, same place. Filed Jan. 31, 1889. Serial No. 298,167. (No model.)



Claim.—1. In a horse-detacher, the combination, substantially as described, of the whiffletrees and singletree connected by hollow bolts, hooked bars A, mounted to slide on the whiffletrees and provided at their inner ends with inclines, rods I, seated loosely in the hollow bolts and engaging directly with the inclines of the hooked bars, levers D, fulcrumed on the singletree and connected at their outer ends with the rods I, and a device connected with the inner ends of the levers to operate them simultaneously.

2. In a horse-detacher, the combination, substantially as described, of the whiffletrees and singletree connected by hollow bolts, hooked bars A, mounted to slide on the whiffletrees and provided at their inner ends with inclines, rods I, seated loosely in the hollow bolts and engaging directly with the inclines of the hooked bars, levers D, fulcrumed on the singletree and connected at their outer ends to the rods I, and a lever connected at one end to the slotted inner ends of levers D.

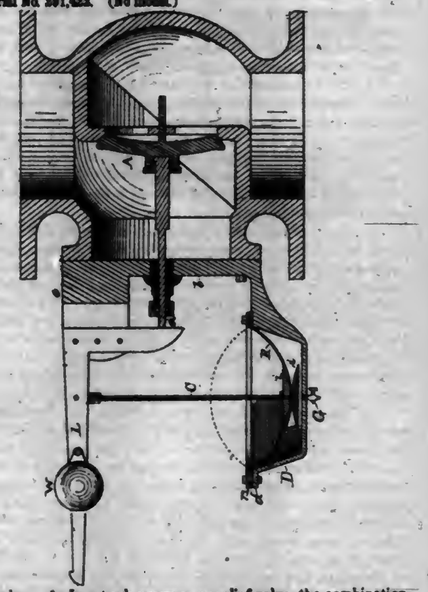
3. The combination, with the singletree and whiffletrees constructed and arranged as described, of hooked bars mounted to slide in the grooves of the whiffletrees and having at their inner ends upwardly-projecting inclined or beveled webs, rods I, seated between the inner ends of said hooked bars and provided with T-heads beveled to correspond to the bevel of the webs, levers D, fulcrumed on the singletree and connected at their outer ends to the rods I, and a bell-crank lever fulcrumed on the tongue and having its forward end in engagement with the slots at the inner ends of said levers D, substantially as set forth.

4. The combination, with a singletree constructed substantially as shown and provided with a longitudinal recess, of the sliding bars A, having upwardly-projecting inner ends which are beveled, notches A^3, which engage with the covering-plates H, and springs *s*, substantially as shown, and for the purpose set forth.

5. The combination, with a singletree, of the T-headed rod I, sliding bars A, said bars having their inner ends inclined and extended upwardly, plates *i i*, attached to the upwardly-extended portions of the bars A, so as to lie over the upper portion of the T-headed rod, substantially as shown.

6. The combination, with the singletree provided with a longitudinal recess and sliding bars A, of covering-plates H and a box, G, having downwardly-extended members A^2 A^3, which are adapted to embrace the singletree to retain said box in position, substantially as shown.

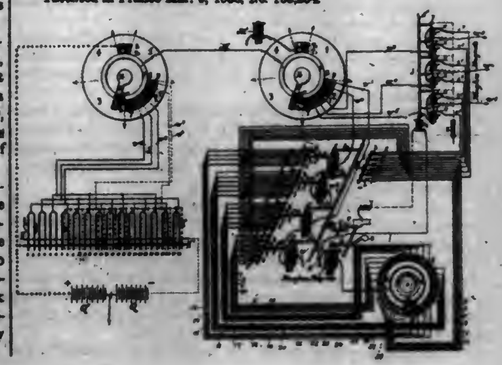
402,098. RELIEF-VALVE. FREDERICK T. MUELLER, New York, N. Y., assignor to Timothy Kisley, same place. Filed Nov. 21, 1888. Serial No. 291,422. (No model.)



Claim.—1. In a back-pressure or relief valve, the combination of the valve-lever with a dish-shaped vessel closed at the bottom and having its top hermetically covered by a flexible diaphragm of rubber or other suitable material, said diaphragm being connected with the lever by a rod one end of which is attached to the center of the diaphragm and the other to the lever, substantially as described.

2. In combination with the valve A and its lever L, the vessel D, covered by a flexible diaphragm, R, the rod C, connecting the diaphragm with the lever, and the cock G, substantially as and for the purpose set forth.

402,099. PRINTING-TELEGRAPH SYSTEM. CLAUDE J. A. MUSIER, Paris, France. Filed Oct. 27, 1888. Serial No. 289,352. (No model.) Patented in France Mar. 9, 1888, No. 189,254.



Claim.—1. The system of transmitting messages by telegraphic printers, characterized by the combination, with an electro-magnetic printer, of a collector having contacts corresponding to the different characters, and a traveling contact-maker for completing the circuit from the different contacts to the printer-maguet, a printing-battery or electrical generator, a series of branches and sub-branches over which the current to operate said printer-maguet is sent, the sub-branches being connected with the respective contacts of said collector, and electro-magnetic circuit-changers in the branches and sub-branches for establishing the connection of said branches collectively with individual groups of said sub-branches and of the individual branches with the printing-battery, so that the printing of a character is effected over a selected group of sub-branches and a selected branch and sub-branch in the selected group, substantially as described.

2. The combination of electro-magnetic multiple-circuit controllers, relays, branches connected with the circuit-changers of said relays, and groups of sub-branches connected with the said branches and with the circuit-changers of the multiple circuit-controllers, so that by operation of said circuit-controllers the branches are completed through a set of sub-branches, and by the operation of the relays a circuit is established through an individual branch and sub-branch in the selected group, substantially as described.

3. The combination of the line-wire, a distributer having two sets of contacts, the electro-magnetic multiple-circuit controllers having their magnets electrically connected with one set of said contacts, the relays having their magnets electrically connected with the other set of contacts, the branches connected with the circuit-changers of said relays, and the sub-branches connected with the said branches and with the circuit-changers of the said multiple-circuit controllers, substantially as described.

4. The combination of a line-wire, a distributer electrically connected with the line-wire and having two sets of contacts, the electro-magnetic multiple-circuit controllers having their magnets electrically connected with one set of distributing-contacts, the relays having their magnets electrically connected with another set of distributing-contacts, the branches connected with the circuit-changers of said relays, the sub-branches connected with the said branches and with the circuit-changers of said circuit-controllers, the collector having its contacts connected with the sub-branches, and the printing-magnet in circuit with said collector, substantially as described.

5. The combination, with the line-wire, the distributers connected therewith at a transmitting and a receiving station and having two sets of contacts, and a battery or electrical generator and circuit-closers for sending currents to line through the distributer at the transmitting-station, of the following apparatus at the receiving-station, namely: electro-magnetic multiple-circuit controllers having their magnets electrically connected with one set of contacts of the distributer, relays having their magnets electrically connected with another set of contacts, branches connected with the circuit-changers of the relays, and sub-branches connected with the branches and by groups with the multiple-circuit changers of the multiple-controllers, substantially as described.

6. The combination, with the line-wire, the distributers connected therewith at transmitting and receiving stations and having two sets of contacts, and a battery or electrical generator and circuit-closers for sending currents to line through the distributer at the transmitting-station, of the following apparatus at the receiving-station, namely: electro-magnetic multiple-circuit controllers having their electro-magnets connected with one set of the distributer-contacts, relays having their magnets electrically connected with another set of contacts, branches connected with circuit-changers of the relays, sub-branches connected by groups with the circuit-changers of the multiple-circuit controllers, the collector having contacts connected with the sub-branches, and the printer-magnet in circuit with said collector, substantially as described.

7. The combination, with the relays, multiple-circuit controller, branches, sub-branches, collector, and printing-magnet, of the replacers for the relay-armatures and for the multiple-circuit controllers, substantially as described.

8. The combination, with the branches and sub-branches, of a normally-closed multiple-circuit controller in one group of sub-branches, a normally-open circuit-controller in another, and an electro-magnet which opens the first when it closes the second of said multiple-circuit controllers, substantially as described.

9. The collector turning synchronously with a type-wheel and composed of, first, a solid contact-ring which is electrically connected with the electro-magnet of a Hughes printer; second, a ring divided into separate contacts corresponding to the characters on the type-wheel, which contacts are connected in circuit with circuit-changers; third, two brushes passing over the rings for successively connecting each contact in the divided ring with the printer-magnet, and, fourth, a carrier for said brushes, substantially as described.

10. The distributer divided into sectors equal in number to the transmitting key-boards which it is desired to employ at one time on same line-wire, and composed of a solid ring connected with the line, two others similarly divided into separate contacts and provided for each sector with seven divisions, the first two divisions of the outside sector being electrically connected with the electro-magnets of the multiple-circuit controllers, the next division with the earth, the next three divisions with the electro-magnets of the relays, and the last of the seven divisions with the earth, so that an earth-contact is interposed between the contacts for the multiple-circuit controllers and the relay-contacts, and the interior divided sector having its first two divisions connected with the circuit-closers of the transmitting key-board for operating the multiple-circuit controllers, and three succeeding divisions connected with the circuit-closers of the transmitting key-board for operating the relays, substantially as described.

11. The relays formed by six polarized magnets connected in pairs, of opposite polarity, with different contacts of the distributer and having their armatures arranged to close a local circuit when they move away from their magnets, in combination with the replacer, its magnets included in circuit with a local battery, and the printing-lever, the branches controlled by said relays being connected each with one of the circuit-changers in each of the multiple-circuit controllers, substantially as described.

12. The electro-magnetic multiple-circuit controllers composed of, first, four polarized electro-magnets connected in pairs of opposite polarity; second, an armature-lever for each magnet; third, a bar carried by each of said levers, and, fourth, a series of six circuit-changers operated simultaneously by the respective bars of the first three electro-magnets and four circuit-changers by that of the fourth; fifth, the rock-shaft having arms above other armatures of said magnets and on the opposite side two arms; sixth, a bar carried by one of the last-mentioned arms, the other arm being acted on by the printing mechanism, and, seventh, six circuit-changers operated simultaneously by the last-mentioned bar to open their circuits when any of the other groups of circuit-changers are operated by their magnets to close their said circuits, the said circuit-changers being connected with the contacts of the collector, substantially as described.

13. In combination with the distributer and line-batteries, the key-board provided with two strips and two series of circuit-closers, one strip being connected with the positive pole of one line-battery and the other strip with the negative pole of another line-battery, and half the circuit-closers in each series making contact with one of said strips and the other half said circuit-closers making contact with the other strip, and wires extending from the distributer-contacts and each connected with a number of positive and a number of negative circuit-closers, substantially as described.

14. The combination, with a distributer having two sets of contacts and a traveling contact-maker, of a series of circuit-closers arranged in groups and having one circuit-closer in each group connected with a contact of one set, and a second series of circuit-closers associated each with a circuit-controller of the first series and connected in groups with the contacts of the other set, substantially as described.

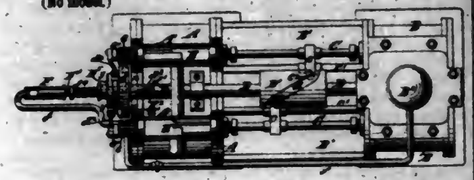
15. The combination, with a line and distributers on said line at transmitting and receiving stations, said distributers having synchronously-traveling contact-makers and being each provided with two sets of contacts, of a key-board provided with a series of circuit-closers arranged in groups and having one circuit-closer in each group connected on the transmitting-distributer with a contact of one set, and a second series of circuit-closers associated each with a circuit-controller of the first-mentioned series and connected on the transmitting-distributer in groups with the contacts of the other set, and the following receiving apparatus, namely: electro-magnetic multiple-circuit controllers having the magnets connected on the receiving-distributer with the contacts of the set corresponding to the last-mentioned series of circuit-closers, relays connected on the receiving-distributer with contacts of the set corresponding to the first-mentioned series of circuit-closers, branches controlled by said relays, sub-branches controlled in groups by the multiple-circuit controllers, the collector having contacts connected with said sub-branches, and the printing-magnet in circuit with collector, substantially as described.

16. The combination of the polarized relays connected in pairs of opposite polarity, the electro-magnetic multiple-circuit controllers having polarized magnets connected in pairs of opposite polarity, the branches connected with the circuit-changers of the relays, and the sub-branches connected with the branches and the circuit-changers of the multiple-circuit controllers, substantially as described.

17. The combination, with the line-wire and the distributer having two sets of contacts, of the polarized relays connected in pairs of opposite polarity with the distributer-contacts of one set, the electro-magnetic multiple-circuit controllers having polarized magnets connected in pairs of opposite polarity with the distributer-contacts of the other set, the branches connected with the circuit-changers of the said relays, the sub-branches connected with the branches and the

circuit-changers of the said multiple-circuit controllers, and the collector having a series of contacts connected with the sub-branches, substantially as described.

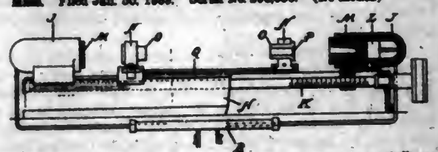
402,100. VALVE-GEAR FOR DUPLEX STEAM-PUMPS. NATHAN E. HAMM, Stonington, Conn. Filed Dec. 1, 1887. Serial No. 256,693. (No model.)



Claim.—1. In a duplex pump, the combination, with the steam-cylinders and rocking valves having their axes lengthwise of the cylinders, of a shaft extending parallel with and between the piston-rods and provided with eccentrics connected with the valve-stems for operating them, a cam upon said shaft having an endless groove formed obliquely or spirally thereon, and arms on the piston-rods having pins or rolls engaging the groove of the cam and imparting rotary motion thereto from the reciprocating movement of the piston-rods, substantially as herein described.

2. The combination, with the steam and water cylinders and steam-valves of a duplex pump, of a rotary shaft receiving motion from the piston-rods of the pump, a head or disk secured to said shaft and carrying a slide movable diametrically across it, eccentrics on the slide and having their straps connected with the steam-valves for operating them, a sleeve turning with the shaft and having a spiral slot, a regulating-cylinder connected by a pipe with a pressure-space of the pump, a plunger or piston fitting the cylinder and having upon its rod a tooth or projection locking the sleeve to the shaft by engaging said spiral slot, and a connection between said slide and sleeve, whereby the lengthwise movement of the regulating-plunger or piston-rod will turn the sleeve relatively to the shaft and shift the slide to vary the throw of the eccentrics, substantially as herein described.

402,101. MACHINE FOR MAKING AXLES. ANDREW PATERSON, McKeesport, Pa., assignor to the National Tube Works Company, Boston, Mass. Filed Jan. 20, 1888. Serial No. 296,056. (No model.)



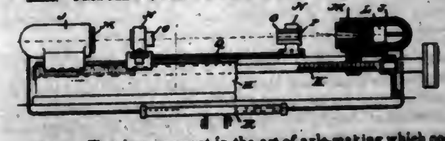
Claim.—1. In axle machinery, the combination, substantially as set forth, of a press-bed, a pair of chucks adjustable thereon and adapted to closely fit and clamp the body of an axle, a pair of hydraulic-press cylinders fitted for sliding motion on the ends of said bed, mechanism arranged to cause said cylinders to approach or recede from each other and said chucks, and a die in each cylinder having a cavity adapted to fit the spindle of the axle.

2. In axle machinery, the combination, substantially as set forth, of a press-bed, a pair of hydraulic-press cylinders fitted to slide thereon, mechanism for sliding said cylinders, a die in each cylinder, a pair of chucks fitted to slide on the press-bed between the two cylinders and adapted to grasp the body of an axle, and a removable distance-piece supported by the press-bed between the two chucks.

3. In axle machinery, the combination, substantially as set forth, of a pair of heaters, a set of rolls at each heater adapted to support an axle with its ends over the heaters, and a pulley for giving rotary motion to one of said rolls.

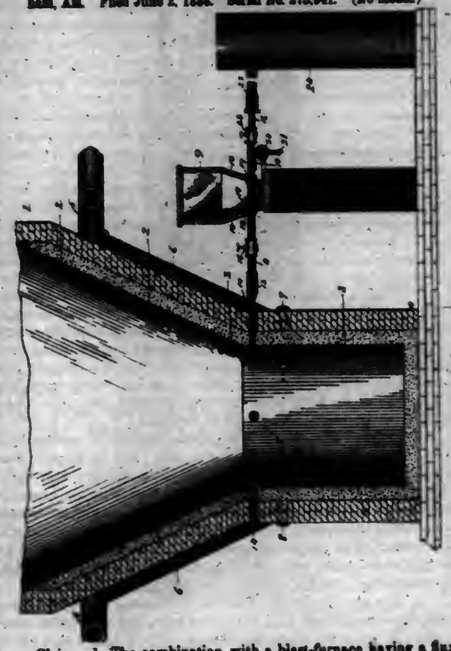
4. In axle machinery, the combination, substantially as set forth, of a pair of heaters, a set of axle-supporting rolls at each heater, a press-bed arranged parallel to said pair of heaters, a pair of chucks adapted to grasp the body of an axle, a track leading from said rolls to said chucks, and a press-cylinder at each end of said press-bed.

402,102. METHOD OF MAKING AXLES. ANDREW PATERSON, McKeesport, Pa., assignor to the National Tube Works Company, Boston, Mass. Filed Jan. 20, 1888. Serial No. 296,057. (No model.)



Claim.—That improvement in the art of axle-making which consists of the following steps, viz: forming the axle preliminarily with a surplus of length between the spindles, heating the preliminarily-formed axle at the necessary points, grasping the body of the axle at two points corresponding with the rear of the collars, grasping the entire spindle portions, and forcing the spindle portions toward the body portion, substantially as and for the purpose set forth.

402,103. FLUX-FEEDER FOR BLAST-FURNACES. NATHANIEL A. PRATT, Atlanta, Ga., assignor to the Pratt Steel Company, Birmingham, Ala. Filed June 2, 1888. Serial No. 275,941. (No model.)



Claim.—1. The combination, with a blast-furnace having a flux-nozzle, of a flux-hopper, a discharge-pipe having a sliding coupling thereon adapted to enter said nozzle, an injector-pipe which is movably inserted within said hopper and arranged with its inner end opposite the inner end of said discharge-pipe, and devices for longitudinally adjusting said injector-pipe, substantially as described.

2. The combination, with a blast-furnace having a flux-nozzle, of a flux-hopper, a discharge-pipe having a funnel-shaped inner end within said hopper and a sliding coupling on its outer end, and an injector-pipe having a conical mouth-piece arranged opposite the funnel-shaped inner end of said discharge-pipe, substantially as described.

3. The combination, with a blast-furnace, of a flux-hopper, a discharge-pipe which is adapted to enter said furnace, and which is provided with a funnel-shaped inner end within said hopper, a movable injector-pipe having a conical mouth-piece which is adapted to project into said funnel-shaped end of the discharge-pipe, and provided with a cogged rack, a pinion meshing with said rack, and a handle for revolving said pinion, substantially as described.

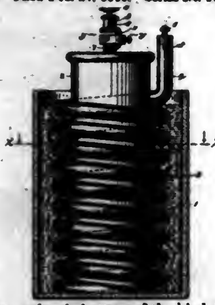
4. The combination, with a blast-furnace, of a flux-hopper provided with a stuffing-box on one side, a discharge-pipe which is formed with a funnel-shaped inner end within said hopper diametrically opposite said stuffing-box, an injector-pipe which slides through said stuffing-box, and which is provided with a conical inner end or mouth-piece and with a rack and stop-cock outside of said hopper, a pinion meshing with said rack and provided with a handle for revolving it, and a blast-conveying pipe which has the end of said injector-pipe sliding inside of its packed end, substantially as described.

5. The combination, with a blast-furnace having a flux-nozzle in the wall thereof, of a flux-hopper, a discharge-pipe formed with a funnel-shaped inner end within said hopper, and having a slidable coupling upon its outer end which is adapted to enter said flux-nozzle, and an injector-pipe entering said hopper opposite the funnel-shaped end of said discharge-pipe and adapted to project into the same, substantially as described.

6. The combination, with a blast-furnace, 1, having a flux-nozzle, 14, in the wall thereof, of a flux-hopper, 9, a discharge-pipe, 11, provided with a funnel-shaped inner end, 12, and with a stop-cock, 15, a sliding coupling, 13, upon said pipe, a sliding injector-pipe, 16, pro-

vided with a conical inner end, 18, a rack, 19, and stop-cock 22, a pinion, 20, provided with a handle, 21, and meshing with said rack, a blast-conveying pipe, 23, having the end of said injector-pipe sliding in its packed end, and a suitable compressed-air supply, substantially as described.

402,104. GALVANIC BATTERY. ROBERT J. PRATT, Greenbush Heights, N. Y., assignor to the Water Primary Battery Company, Jersey City, N. J. Filed Feb. 27, 1889. Serial No. 301,365. (No model.)



Claim.—1. In a galvanic battery of the kind described, the combination, with the compartment 1, of the porous cell 2 and its negative electrode, and a positive electrode consisting of a spirally-wound cylindrical bar of wrought-iron resting upon the bottom of the compartment 1 and encompassing the porous cell, the convolutions of said spiral being separated from each other by an intervening space, and the interior of the spiral being also separated from the porous cell by an intervening space, substantially as described.

2. In a galvanic battery of the kind described, the combination, with the compartment 1, of the porous cell 2 and its negative electrode, and a positive electrode consisting of a spirally-wound cylindrical bar of wrought-iron resting upon the bottom of the compartment 1 and encompassing the porous cell, the convolutions of said spiral being separated from each other by an intervening space, and the interior of the spiral being also separated from the porous cell by an intervening space, said spiral terminating in an upright projection, 4, constituting a binding-post therefor, substantially as described.

3. In a galvanic battery of the kind described, the combination, with the compartment 1, of the porous cell 2 and its negative electrode, and a positive electrode consisting of a spirally-wound bar of wrought-iron encompassing the porous cell, the convolutions of said spiral being separated from each other by an intervening space, and the interior of the spiral being also separated from the porous cell by an intervening space, substantially as described.

4. In a galvanic battery, the combination, with the negative electrode, of a rectangular frame, 12, of conducting material, provided with an offset, 15, faced with platinum, a clamping-screw, 14, and a binding-post, 8, having a leg, 11, faced with platinum, substantially as described.

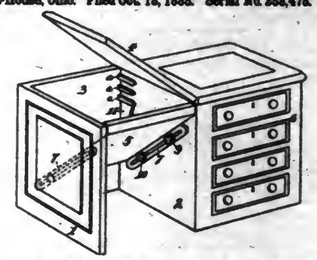
402,105. PITMAN. PHILIP R. PULLIAM, Omaha, Nebr., assignor to Elmer S. Dundy, Jr., same place. Filed Sept. 24, 1888. Serial No. 286,195. (No model.)



Claim.—1. The combination of the bracket having the transverse opening and the openings G H, communicating with opposite sides thereof, the spherical block having the trunnion on one side engaging the opening G and provided on the opposite side with the opening I, registering with opening H, said block being further provided with the transverse tapering opening, the bolt K, screwed in opening H, and having its inner end engaging opening I, for the purpose set forth, and the pitman having the tapered bearing at one end journaled in the tapered opening of the block, substantially as described.

2. The combination of the bracket, the block pivoted therein, the axis of said block being longitudinal in said bracket, the pitman having the tapered bearing at one end fitted in a transverse tapered opening in the block, and the clamping-bolt extending through said bearing having the head bearing against one side of the block and the clamping-nut bearing against the opposite side of the pitman, for the purpose set forth, substantially as described.

402,106. TYPE-WRITER CASE. HARRY D. PURSELL, Washington Court-House, Ohio. Filed Oct. 18, 1888. Serial No. 288,478. (No model.)



Claim.—1. A type-writer case comprising the opposite side walls, the rear wall, an opening and closing lid, the lengthwise-adjustable inclined cleats at the sides below the lid, the type-writer platform adapted to slide up and down on the cleats and to rest upon the upper ends of the latter and be adjusted to different heights thereby, and rear supports for the platform, substantially as described.

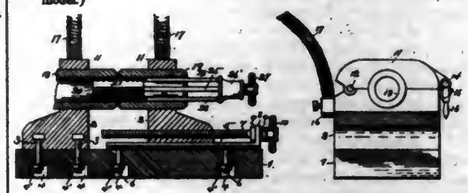
2. A type-writer case having at its opposite sides the lengthwise-adjustable inclined cleats, a type-writer platform adapted to slide up and down on the cleats and to be adjusted to different heights by the latter, rear supports for the platform, and a curved guide fixed in the rear of the case, and against which the inner edge of the platform bears to direct the latter in its descending movement, substantially as described.

3. A type-writer case comprising the side and rear walls, the lengthwise-adjustable inclined cleats on the side walls, the series of stationary cleats at the rear of the case, the rear supporting-ledge below the stationary cleats, and the type-writer platform adapted to slide up and down upon the inclined cleats and be adjustably supported in a horizontal position by the stationary cleats and the upper ends of the adjustable cleats, substantially as described.

4. A type-writer case having an opening and closing lid, 4, the lengthwise-adjustable inclined cleats 7 at the opposite sides, the type-writer platform 5, adapted to slide up and down on the cleats, adjustable thereby to different heights and provided at its outer edge with the flange 13, to form a dust-tight bearing for the lid, rear supports for the platform, and the rear ledge, 12, for supporting the inner edge of the platform when depressed within the case, substantially as described.

5. A type-writer case having an opening and closing lid, 4, the lengthwise-adjustable inclined cleats 7 at the opposite sides, the stationary cleats *a* in the rear top portion, the type-writer platform 5, adapted to slide up and down on the inclined cleats and having the flange 13 at its outer edge to form a dust-tight bearing for the lid, the rear guide, 11, against which the inner edge of the platform bears in its descent, and the rear ledge, 12, below the guide, for supporting the inner edge of the platform, substantially as described.

402,107. PROCESS OF WELDING TOGETHER SECTIONS OF PIPE BY ELECTRICITY. ELIAS R. RIES, Baltimore, Md., assignor to Ries & Henderson. Filed Feb. 12, 1889. Serial No. 299,572. (No model.)



Claim.—1. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in backing the interior of the sections about the contiguous ends by means of an unyielding core, and then raising the said ends to a welding heat by means of a current of electricity and upsetting the plastic metal to complete the weld, substantially as described.

2. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in introducing a core within the sections, then raising their contiguous ends to a welding heat by the action of a current of electricity, and then forcing the sections together to complete the weld, substantially as described.

3. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in raising the contiguous ends of the sections to a welding heat by the action of a current of electricity and then upsetting the said ends in the presence of an unyielding internal medium, whereby the upset metal is forced to the exterior of the pipe, substantially as described.

4. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in raising their contiguous ends to a welding heat by the action of a current of electricity and in the presence of an unyielding core, and then upsetting the said ends and circumscribing and limiting the protuberance of the metal on the exterior of the sections, substantially as described.

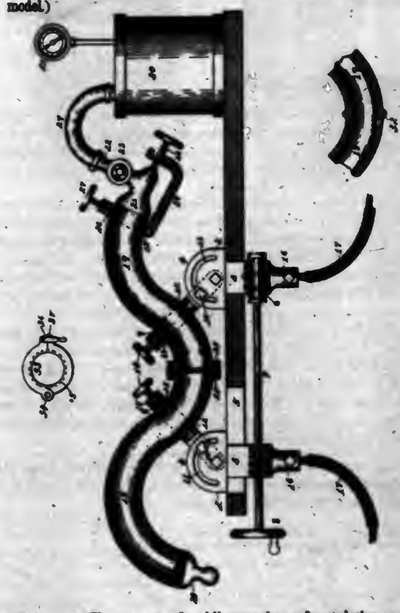
5. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in reducing the mass or thickness of the edges to be welded to increase their electrical resistance, then placing the sections with the reduced edges in contact, then introducing a removable core of electrically non-conducting material within the sections, and then raising the ends of the sections to a welding heat by a current of electricity and forcing the said ends together to upset the fused metal and complete the weld, substantially as described.

6. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in reducing the mass or thickness of the edges to be welded to increase their electrical resistance, then placing the sections with the reduced ends in contact, then introducing a removable core of electrically non-conducting material within the sections, then raising their contiguous ends to a welding heat by the action of a current of electricity, and upsetting the plastic metal and circumscribing and limiting the protuberance thereof on the exterior of the sections, substantially as described.

7. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in raising their contiguous ends to a welding heat by the action of a current of electricity in the presence of an unyielding core, then upsetting the said ends, whereby the upset metal is forced to the exterior of the pipe, and then condensing the upset portion by external pressure or hammering, substantially as described.

8. The process of forming continuous lines of pipe, consisting in electrically welding together one section after the other of such pipe in the presence of an unyielding removable core at the lines of juncture, whereby the upset metal is forced to the exterior of the pipe, substantially as described.

402,108. PROCESS OF WELDING TOGETHER SECTIONS OF PIPE BY ELECTRICITY. ELIAS R. RIES, Baltimore, Md., assignor to Ries & Henderson. Filed Feb. 12, 1889. Serial No. 299,573. (No model.)



Claim.—1. The process of welding sections of metal pipe or other hollow metallic articles, consisting in heating their contiguous ends to a welding heat by the action of an electric current in the presence of a fluid-pressure within the said sections, substantially as described.

2. The process of welding together sections of metal pipe or other hollow articles, consisting in raising their contiguous ends to a welding heat by the passage through the same of a current of electricity, and then forcing the ends of the sections together and simultaneously therewith applying an internal fluid-pressure, substantially as described.

3. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in subjecting their contiguous ends to the action of a heating-current of electricity until an initial fusion or weld hermetically closing the seam is produced, then applying an internal fluid-pressure at the said ends, and simultaneously therewith forcing the sections against each other, whereby the weld is finished and the formation of an internal burr is prevented, substantially as described.

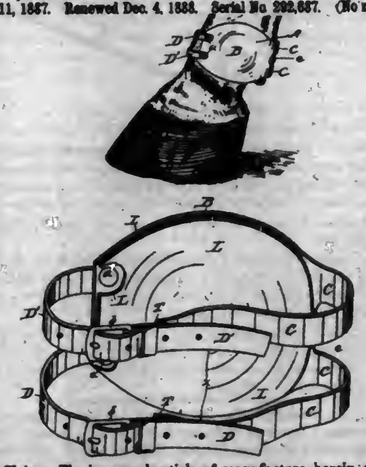
4. The process of welding together sections of metal pipe or other hollow articles, consisting in first reducing the mass or thickness of the ends to be welded, then placing said ends in contact with each other, then subjecting them to the action of a heating-current of electricity until an initial weld hermetically sealing the seam is produced, and finally completing the weld while applying an internal fluid-pressure, substantially as described.

5. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in subjecting the contiguous ends of the sections to the action of a welding current of electricity in the presence of an internal fluid-pressure, and circumscribing or limiting the protuberance of metal thus formed on the exterior of the seam, substantially as described.

6. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in raising the ends of the sections to be joined to a welding heat by the passage of a current of electricity, then upsetting the joined ends by a longitudinal pressure, and simultaneously therewith forcing the upset metal to the exterior of the pipe by internal gas-pressure, substantially as described.

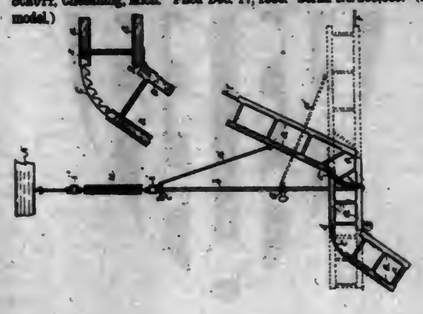
7. The process of welding together sections of metal pipe or other hollow metallic articles, consisting in subjecting their contiguous ends to the action of a welding current of electricity in the presence of a pressure of oxygen gas within the said sections, substantially as described.

402,109. HORSE-BOOT. JOHN J. RYAN, Midland, Mich. Filed Apr. 11, 1887. Renewed Dec. 4, 1888. Serial No. 292,657. (No model.)



Claim.—The improved article of manufacture herein described as an entirety, consisting of a metal plate of concavo-convex form, having formed integral with it the two narrow spring-metal straps, having an opening, *c*, between them to admit the joint of the ankle, the buckles *b* at the ends of said straps, the leather straps D D′, opposite said metal straps, and a suitable lining, L, upon the inner face of the concavo-convex plate, as specified.

402,110. CONVERTIBLE SUSPENDING CHAIR. MARTIN H. SCHUTT, Chesaning, Mich. Filed Dec. 17, 1888. Serial No. 293,885. (No model.)

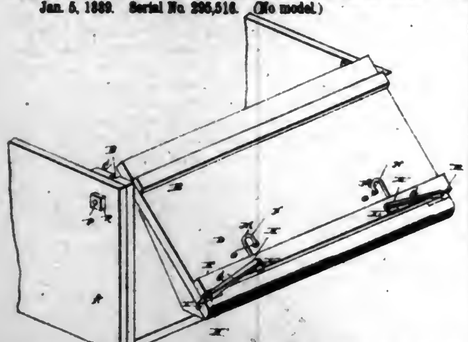


Claim.—1. The convertible suspending chair comprising the pendent rods, the central section supported by said rods, the front section attached to the center section by hinges at the lower side and the projections and notched bars at the upper side, the rear section hinged to the center section, the collars with set-screws on the vertical rods, and the oblique rods jointedly attached to said collars and the rear section, substantially as set forth.

2. The chair-sections hinged together, the pendent rods supporting the center section, the sliding collars on said rods and their set-screws, the rods jointedly attached to said collars and to the rear sections, and springs elastically suspending the whole, substantially as set forth.

3. The combination of the convertible chair-sections hinged together, the upper cross-pieces, the series of vertical springs between the cross-pieces and attached thereto at their ends, the pendent rods attached to the lower cross-piece and suspending the center section, the sliding collars on said rods and their set-screws, and the oblique rods jointedly attached to the collars and to the rear section of the chair, substantially as set forth.

402,111. END-GATE. ABRAHAM H. STARK, Belleville, Kans. Filed Jan. 5, 1889. Serial No. 295,516. (No model.)



Claim.—1. The combination, with the wagon-bed having the vertical slots or grooves B and bolts P at the upper ends thereof, of the end-gate having the hooks G near its lower side to engage the slots B, the frames or castings secured to the upper side of the end-gate, and keepers Y therein adapted to engage the bolts P, substantially as described.

2. The combination, with the end-gate, of the hooks G, pivoted thereto and adapted to engage the wagon-bed, and having the arms K and bent ends or handles L, and the pins or keys N, for the purpose set forth, substantially as described.

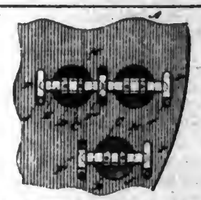
3. The frames or castings adapted to be secured to an end-gate and pivot the same to the wagon-bed, and having the ears V, and the keepers Y, with arms A′, adapted to slide in aligned openings in the said ears, substantially as described.

402,112. GAME-BOARD. SYLVESTER T. F. STERRIS, Gaithersburg, Md., assignor of two-thirds to Michael V. Tierney and Leonard C. Wood, Washington, D. C. Filed Sept. 19, 1888. Serial No. 285,798. (No model.)

Claim.—1. A game-board consisting of a board having a series of port-holes therein, a series of detachable ports in said holes, springs attached to said ports, their ends extending beyond the same, and fastenings on the board in which said ends of the springs are placed, substantially as described.



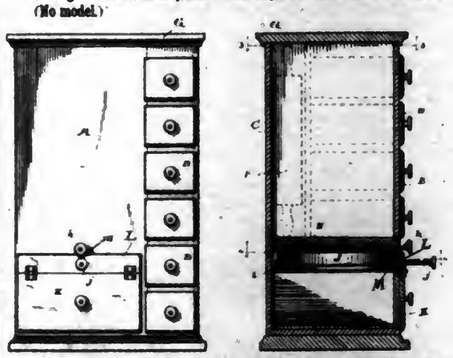
402,112.



2. A game-board consisting of a board having a series of port-holes therein with inclined walls, a series of ports in said holes having oppositely-inclined edges, flat springs on the ports, and fastenings on the board fitting over the projecting ends of said springs for detachably retaining them in place, having their ends projecting beyond the same, substantially as described.

3. A game-board consisting of a board having a series of openings formed therein and ports in the openings, springs secured on the rear sides of the ports and extending beyond the edges of the same on both sides thereof, and cleats and buttons placed, respectively, on opposite sides of the openings, fitting over to detachably retain the springs in place, substantially as described.

402,113. KITCHEN-CABINET AND FLOUR-CHEST. JOHN W. STOUT and ALBERT COLMAN, St. Lawrence, Dak., assignors of one-third to Eugene Baker, same place. Filed Sept. 22, 1888. Serial No. 286,072. (No model.)

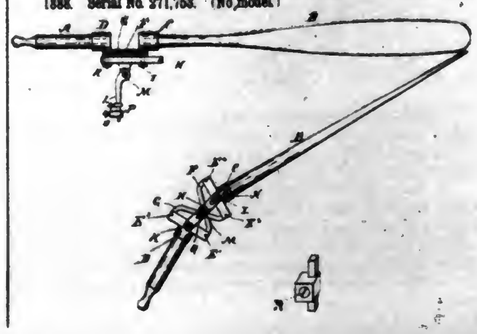


Claim.—1. In a kitchen-cabinet the combination of a flour-chest, a sieve removably supported below the flour-chest, a removable receptacle for the sifted flour located below the sieve, said receptacle having a flap hinged thereto for closing the front portion of the sieve-chamber, substantially as described.

2. In a kitchen-cabinet, the combination of a flour-chest, a movable sieve removably supported below the flour-chest, having a handle attached thereto extending to the outside of the cabinet, a removable receptacle for the sifted flour located below the sieve and having a flap hinged thereto for closing the front portion of the sieve-chamber, said flap being provided with a suitable notch, whereby the flap may be closed around said handle, substantially as described.

3. The herein-described kitchen-cabinet, comprising the following parts: a flour-chest, a series of drawers arranged one above the other beside the flour-chest, a vertical compartment in rear of said drawers for the reception of a rolling-pin, a removable sieve beneath the flour-chest, and a removable receptacle beneath the sieve for the sifted flour, having a hinged flap adapted to close the sieve-chamber, all substantially as shown and described.

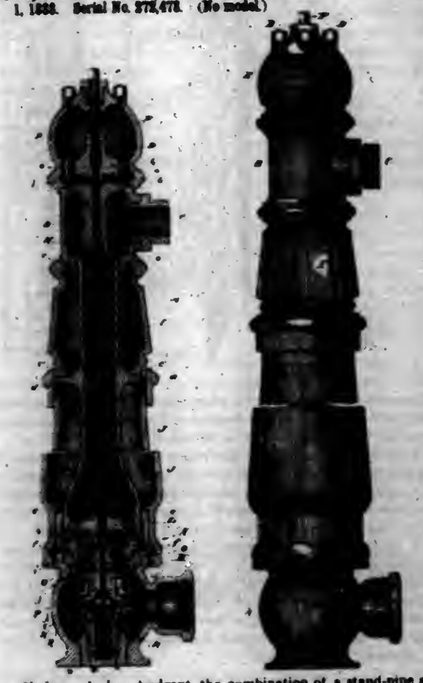
402,114. BOW-FACING OAR. STEPHEN R. SWEET, Lima, Ohio, assignor of two-thirds to William Ackerman, same place. Filed Apr. 24, 1888. Serial No. 271,753. (No model.)



Claim.—1. The combination, with an oar made in two parts, of sockets for the reception of the inner ends of said parts, bars rigidly attached to said sockets at right angles to the oar, bent levers pivotally connecting the diagonal ends of said bars, and a pivotal shank connected to said sockets, substantially as described.

2. The combination of two sockets, an oar-handle in one socket, an oar-blade in the other socket, and a cross-bar rigidly attached to each socket, with bent levers pivotally connecting the diagonally-opposite ends of said cross-bars, and a slotted bar connected to said sockets and bearing, the shank or pin pivotally connected thereto, substantially as described.

402,115. HYDRANT. AARON J. TYLER, Albion, N. Y. Filed May 1, 1888. Serial No. 272,478. (No model.)



Claim.—1. In a hydrant, the combination of a stand-pipe and valves, a water-chamber, B, and a valve-rod with a vertically-guided valve, G, attached to the upper end of this valve-rod, so as to move with the same, a packing-ring, *b*, between the valve and head of said water-chamber and surrounding the valve-rod, a cap, E, bolted to the head of the water-chamber, and means for operating the valve-rod and valve, substantially as described.

2. In a hydrant, the combination, with a stand-pipe, water-chamber, valve-rod, cap, and vertical bolts D D for securing this cap to the head of the water-chamber, of a valve, G, attached to the upper end of the valve-rod and provided with lugs *a a*, adapted to embrace the vertical bolts D D, a packing-ring, *b*, and means for raising and lowering the said valve and rod, substantially as described.

3. In a hydrant, the combination of the stand-pipe having cast integral with it an external flange, *d*, a water-chamber screwed upon the upper end of the stand-pipe, and a jacket, I, provided with internal shoulders, *c c′*, formed integral with it, the said jacket forming a dead-air chamber around the stand-pipe above the ground-line and being clamped removably in place by simply screwing the said water-chamber to the stand-pipe, substantially as herein set forth.

4. The combination of the stand-pipe having screwed to its upper end a water-chamber and provided with an integral flange, *d*, a jacket, I, surrounding the stand-pipe above the ground-line and provided with an internal integral flange, *c′*, adapted to abut against the aforesaid flange *d*, the lower end of this jacket extending below the said flange *d* on the stand-pipe, an elbow detachably attached to the lower end of the stand-pipe, the lower end of the stand-pipe setting in the vertical arm of the said elbow, and an upwardly-tapering frost-case, J, provided with an internal shoulder, *e*, adapted to rest upon the upper end of the vertical arm of the elbow, the upper end of the said frost-case being inserted in the lower end of the said jacket I, all arranged as and for the purposes herein set forth.

5. The combination of the stand-pipe enlarged at its lower end, a ring, N, screwed into the lower enlarged end of the stand-pipe, the said ring being provided with a beveled seat for the waste-valve, and a beveled seat, *i*, for the main valve, this seat *i* being smaller than the waste-valve seat and formed on the interior of the said ring N, a valve-rod, a main valve, M, and a beveled waste-valve, L, mounted loosely upon the valve-rod and adapted to automatically close upon its seat when the main valve opens, waste-apertures *h* being formed through the stand-pipe and ring, substantially as herein described.

6. In a hydrant, the combination, with the stand-pipe and elbow, of the vertical valve-rod, an automatically-closing waste-valve mounted upon this valve-rod, a ring screwed into the lower end of the stand-pipe and provided with a seat, *i*, for the main valve, the main valve M, attached to lower end of valve-rod below the waste-valve, and the spider Q, attached to the lower end of valve-rod below the main valve, of the supplemental valve immediately below and larger than the said main valve, the said supplemental valve being provided with a central opening or recess for the reception of the said spider Q and the supplemental valve-seat, substantially as described.

7. In a hydrant, the combination, with the stand-pipe, elbow, and vertical valve-rod, of the automatically-closing waste-valve mounted loosely upon the valve-rod, ring N, screwed into the lower end of the stand-pipe and forming a seat for the waste-valve and main valve, the main valve attached to valve-rod, a spider, Q, attached to valve-rod below the main valve, a removable externally-screw-threaded ring, O, screwed into the elbow and forming a seat for the supplemental valve, and the spring-actuated supplemental valve immediately below the main valve and provided with a central opening or recess for the reception of the spider Q, substantially as described.

8. The combination of the stand-pipe, a ring, N, screwed into the lower end of the stand-pipe, this ring being externally screw-threaded and provided internally with two beveled seats, one for the waste-valve and the other for the main valve, a valve-rod, beveled waste and main valves on this rod and adapted to close on their respective seats, elbow K, a removable externally-screw-threaded ring, O, screwed into the said elbow, this ring forming a seat for the supplemental valve, and a spring-actuated supplemental valve adapted to close on the seat in the ring O, this supplemental valve being larger than the main valve and located in close proximity to it, substantially as and for the purposes herein set forth.

9. In a hydrant, the combination, with a stand-pipe, elbow, vertical valve-rod provided with a pin, *p*, waste-valve, main valve, seats for these valves, a supplemental valve, P, having a perforated tubular stem and a central opening through it, and a spring-actuated auxiliary valve, R, adapted to automatically close the said central opening in the supplemental valve and be forced open by the said pin *p*, substantially as described.

10. In a hydrant, the combination, with the stand-pipe enlarged at its lower end, of a ring screwed into the lower enlarged end of this stand-pipe, this ring being beveled on its interior to form a waste-valve seat and provided with lateral waste-apertures *h*, a valve-rod provided with a main valve, a seat for this main valve, and an open beveled waste-valve mounted loosely upon the said valve-rod and adapted to automatically seat itself on the said beveled valve-seat formed on the interior of the ring N and close the said waste-apertures, substantially as and for the purpose herein set forth.

11. In a hydrant, the combination, with the stand-pipe provided with a flange, *d*, and a water-chamber screwed to the upper end thereof, of the jacket I, provided with a flange, *c′*, said jacket surrounding the stand-pipe between the said water-chamber and the surface of the ground, substantially as described.

12. In a hydrant, the combination, with the stand-pipe and the jacket I, surrounding the upper portion of the same, of the upwardly-tapering frost-case J, having its upper end inserted in the lower end of the jacket I, and the elbow K, attached to the lower end of the stand-pipe and having its vertical arm inserted in the lower end of the frost-case, substantially as described.

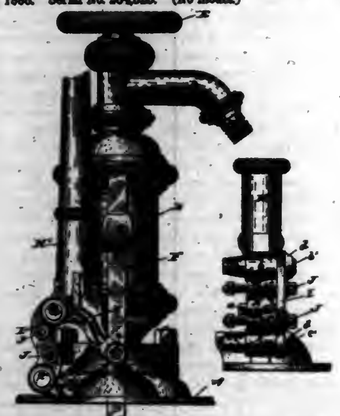
13. In a hydrant, the combination, with the stand-pipe and jacket I, of the elbow K, screwed to the lower end of the said stand-pipe, and the upwardly-tapering frost-case J, having its upper end inserted in the lower end of the said jacket I and its lower end surrounding the vertical arm of the elbow K, the said jacket being provided with an internal shoulder, *e*, which rests upon the upper end of the said vertical arm of the elbow, substantially as described.

14. In a hydrant, the combination, with the stand-pipe, valve-rod, a waste-valve, L, upon the valve-rod, and a main valve attached to the lower end of the said valve-rod, of the ring N, screwed into the lower end of the said stand-pipe and provided with seats for the main and waste valves, waste-apertures *h* being formed through the said seat N, between the two valves, substantially as described.

15. The combination of a stand-pipe, a valve-rod, a main valve upon this valve-rod, a supplemental valve located below the main valve and provided with a central opening, seats for these valves, an auxiliary valve, R, seated over the opening in the said supplemental valve, and a pin for opening the auxiliary valve, substantially as described.

16. The combination of a stand-pipe, a valve-rod, main and supplemental valves, the former being attached to the valve-rod, the said supplemental valve being located immediately below the main valve and provided with a central recess in its upper side, seats for these valves, and a spider or guide, Q, upon the valve-rod below the main valve, this spider being adapted to enter the recess in the upper side of the supplemental valve, as and for the purpose herein set forth.

402,116. PUMP-BRAKE. AARON J. TYLER, Albion, N. Y. Filed Sept. 4, 1888. Serial No. 284,585. (No model.)



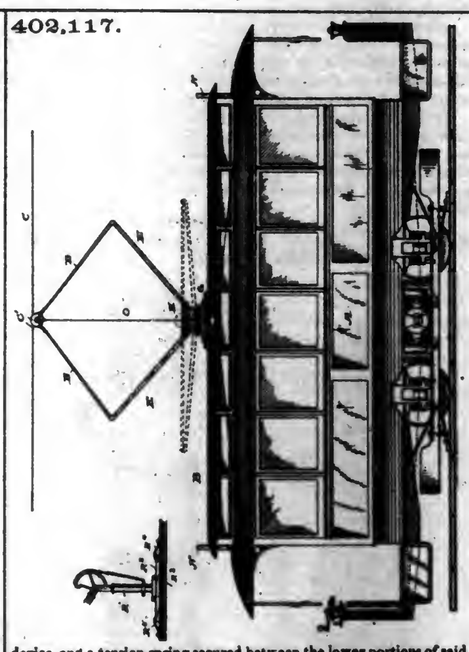
Claim.—1. The combination of a pump-rod, a vibrating lever provided with an arm, this arm being pivotally connected to the pump-rod at its forward end and provided at its rear end with an integral enlargement having oppositely-projecting reduced pins, a support or base provided with an integral enlargement having oppositely-projecting reduced pins, the fulcrum-links connecting the pins on these enlargements, and connecting-bolts for holding these links upon the pins, substantially as set forth.

2. The combination of a pump-rod, a vibrating lever provided with an arm at its lower end, this arm being pivotally connected at its forward end to the pump-rod and having formed on its rear end an enlargement provided with oppositely-projecting pins, a support or base provided with an enlargement having oppositely-projecting pins, the fulcrum-links pivotally connecting the pins on the enlargements, these links being provided on their adjacent faces with abutting sleeves, and the connecting-bolts, substantially as described.

3. The combination, with a support or base provided with an enlargement having tapering pins projecting in opposite directions, of a pump-rod, an operating-lever provided with an arm pivotally connected to the pump-rod, an enlargement provided with oppositely-projecting tapering pins being carried by this arm, the fulcrum-links connecting these tapering pins, these links being provided with internally-tapered sleeves adapted to fit the said tapering pins, and the connecting-bolts, substantially as described.

4. The combination of a base provided with an enlargement, this enlargement being provided with oppositely-projecting tapering pins, a pump-rod, an operating-lever provided with an arm on its lower end, the forward end of this arm being pivoted to the pump-rod and its rear end being provided with oppositely-projecting tapering pins, fulcrum-links connecting the tapering pins on the handle with those on the base, these links being provided with internally-tapered sleeves *d d*, adapted to fit over the said tapering pins, and the connecting-bolts passing through the fulcrum-links, substantially as described.

402,117. UNIVERSAL UPWARD-PRESSURE CONTACT-ARM. CHARLES J. VAN DEPOELE, Lynn, Mass. Filed Feb. 19, 1889. Serial No. 300,396. (No model.)



Claim.—1. In electric railways, the combination, with the suspended supply-conductor and a moving vehicle, of a contact-carrying device suitably supported upon the vehicle and comprising extensible members pivotally connected at their upper ends and provided with a contact device, substantially as described.

2. In electric railways, the combination, with the suspended supply-conductor and a moving vehicle, of a contact-carrying device suitably supported upon the vehicle and comprising extensible members pivotally connected at their upper ends, and a contact-wheel upon the axis of said pivotal connection, substantially as described.

3. In electric railways, the combination, with the suspended supply-conductor and a moving vehicle, of a contact-carrying device suitably supported upon the vehicle and comprising extensible members pivotally connected at their upper ends and provided with a contact device, and a tension-spring secured between the lower portions of said members for inclining the members toward each other and elevating the contact device, substantially as described.

4. In electric railways, in combination with a suspended supply-conductor and a moving vehicle, a contact-carrying device between the same, comprising extensible members pivotally connected at their upper ends and having a contact-wheel thereon, said members being suitably supported upon the vehicle, substantially as described.

5. In electric railways, in combination with a suspended supply-conductor and a moving vehicle, a contact-carrying device between the same, comprising extensible members supported by the car and pivoted together at their upper ends, and having a contact-wheel thereon and a spring-connection between the lower portions of said members for drawing the members together and elevating the contact, substantially as described.

6. In electric railways, in combination with a suspended supply-conductor and a moving vehicle, a contact-carrying device between the same, comprising upper members pivoted together at one end and sustaining a contact-wheel, lower members supported by the car and pivoted to the upper members, and a spring-connection between the said lower members, substantially as described.

7. In electric railways, in combination with a suspended conductor and a moving vehicle, a contact-carrying device extending between the vehicle and the conductor, and a tilting standard supporting the contact device when in operative relation to the conductor, substantially as described.

8. In electric railways, in combination with a suspended conductor and a moving vehicle, a contact-carrying device extending between the vehicle and the conductor, and a tilting standard upon which the contact device is supported and is laterally movable, substantially as described.

9. In electric railways, in combination with a suspended supply-conductor and a moving vehicle having a standard, a contact-carrying device between the same, comprising extensible members carrying at their upper ends a contact-wheel and at their lower ends being pivoted to swing longitudinally on a suitable support, said support being pivoted to swing laterally on said standard, substantially as described.

10. In electric railways, in combination with a suspended supply-conductor and a moving vehicle, a contact-carrying device carried by the vehicle and comprising extensible members carrying at their upper ends a contact-wheel for engaging the under side of the conductor and pivoted at their lower ends to swing longitudinally on a suitable support, said support being pivoted to swing laterally, substantially as described.

11. In electric railways, in combination with a suspended supply-conductor and a moving vehicle, a contact-carrying device carried by the vehicle and comprising extensible members carrying at their upper ends a contact-wheel for engaging the under side of the conductor and pivoted at their lower ends to swing longitudinally on a suitable support, said support being pivoted to swing laterally, and ropes connected to or near to the axis of the contact device and extending obliquely downward therefrom and passing to the ends of the vehicle, whereby vertical and lateral movement may be imparted to the contact-making device, substantially as described.

12. In combination with a suspended supply-conductor and a moving vehicle having a standard thereon, a contact-carrying device between the same, comprising extensible members carrying a contact-wheel at their upper united ends and pivoted at their lower ends to swing longitudinally on a suitable support, said support being pivoted to swing laterally on the standard, and ropes connected to the pivotal point of the extensible members and passing to the ends of the vehicle, whereby vertical and lateral movement may be imparted to the contact-making device, substantially as described.

13. In electric railways, in combination with a suspended supply-conductor and a moving vehicle, a tilting standard thereon, an extensible contact-carrying frame carrying at its upper end a contact-wheel pivotally connected to said tilting standard at its lower portion, substantially as described.

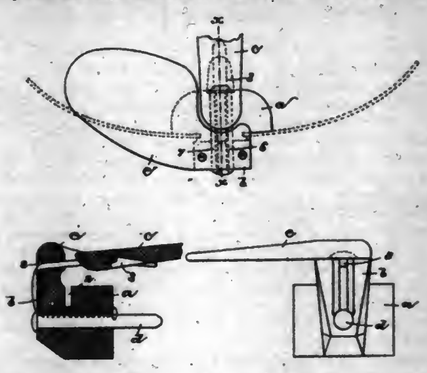
14. In combination with a suspended supply-conductor and a moving vehicle, a tilting standard thereon, an extensible contact-making device between the same, carrying at its upper end a contact-wheel and at its lower end pivoted to swing longitudinally upon a suitable support, said support being pivoted to swing laterally upon the tilting standard, substantially as described.

15. In combination with a suspended supply-conductor and a moving vehicle, a contact-carrying device comprising upper members pivoted together at their upper ends, and having a contact-wheel thereon, lower members pivoted to said upper members and secured at their lower ends to engaging gears pivoted on a suitable support, whereby movement of one member is imparted to the other, and a spring-connection between said lower members, substantially as described.

16. In the described contact-making device, having upper and lower members, the spring-connection for said lower members consisting of a plurality of parallel springs attached at opposite ends to pieces pivotally connected to the lower members, substantially as described.

17. The herein-described tilting standard for contact-carrying devices, consisting of eared brackets arranged at a suitable distance apart, links pivoted at one end to one of the brackets, a link pivoted at one end to the free ends of the links and at the other end upon the free end of the link, and a support for the contact device pivoted upon said forked lever, substantially as described.

402,118. TAIL-PIECE FASTENER FOR VIOLINS. MAURICE W. WHITE, Boston, Mass., assignor of one-half to George W. Ross, same place. Filed Sept. 14, 1888. Serial No. 285,201. (No model.)



Claim.—1. The butt-block *a* and block *b*, formed in one piece and having the hole through it, and the grooves, as described, combined with the pin *d* and the tail-piece string or cord, as and for the purpose set forth.

2. The butt-block *a* and chin-rest support or block *b*, said block *b* extending upward above the level of the body of the instrument, combined with the tail-piece string or cord drawing over the top of the said block *b*, free from contact with the body of the instrument, and the fastening for the said tail-piece string or cord, substantially as described.

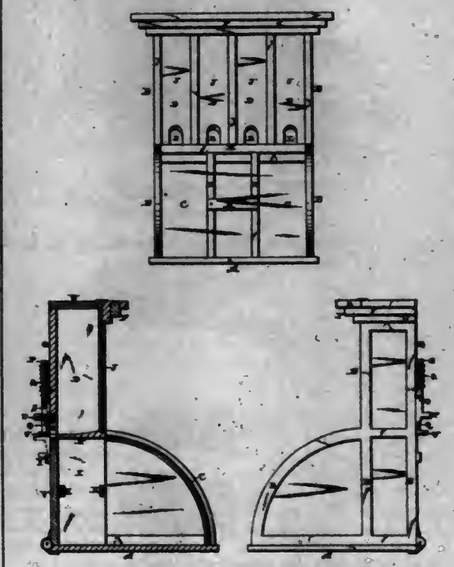
3. The butt-block *a* and chin-rest support or block *b* and the tail-piece string or cord, combined with the tail-piece having an opening, 3, and two holes through which the tail-piece string or cord passes, substantially as described.

4. The butt-block *a* and block *b* and tail-piece *c*, combined with the tail-piece string or cord, the free ends of which form a connection with the block *b* and the looped end with the tail-piece, substantially as described.

5. The butt-block *a*, the block *b*, extending upward above the level of the body of the instrument and over which the tail-piece string or cord passes, said blocks having a hole formed therethrough, and grooves which receive the ends of the tail-piece string or cord, and the pin *d*, combined with the chin-rest support *c*, all substantially as described.

6. A fastener for the tail-pieces of stringed instruments, it consisting of the butt-block *a*, having a hole through it and grooved, as shown, the string or cord, the looped end of which is connected with the tail-piece and the free ends of which enter the grooves in the butt-block, and the pin *d*, substantially as described.

402,119. COMBINED SHOW AND SHOT CASE. WILLIAM A. WHITEMORE, Hartman, Ark. Filed Aug. 2, 1888. Serial No. 282,304. (Model.)



Claim.—1. A combined show and shot case formed together in a single frame, the shot-case being located above and separated from the show-case by the horizontal partition H, in combination with the vertical uprights or supports I, the shot-case being divided by vertical partitions into a number of compartments, which have their fronts covered with glass, substantially as shown.

2. The combination of the shot-case, provided with an opening for the discharge of the shot, with a vertically-moving slide or door, O, provided with an extension, P, and having the opening S, with the guide T below it, the spring *a*, applied to the extension, and the guides between which the slide moves, substantially as set forth.

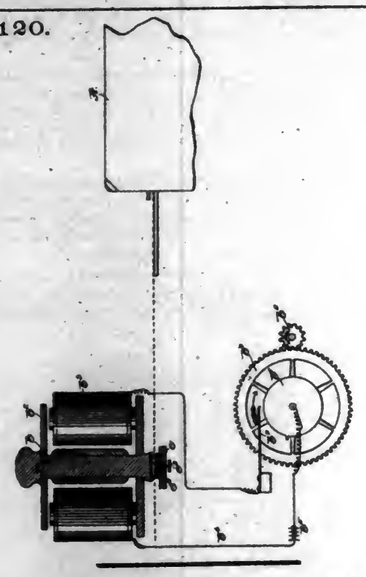
3. The combination of a show and a shot case formed together in a single frame, and separated from each other by a horizontal partition, H, with a vertically-moving slide for each opening for discharge of shot, each slide being provided with an opening, S, and an extension, P, the springs *a*, and guides Q, substantially as specified.

402,120. MESSAGE AND TIME RECORDER. JOHN C. WILSON, Boston, Mass. Filed Aug. 20, 1888. Serial No. 283,244. (No model.)

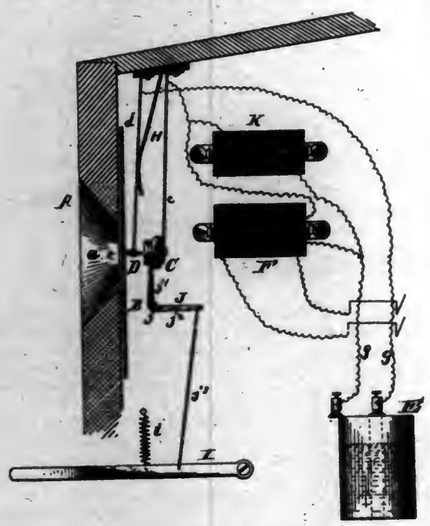
Claim.—1. The signal-receiving instrument and a time-stamp comprising a dial and pointer, one of which is continuously movable with relation to the other, a presser, and an electro-magnet for moving the presser, combined with a circuit-changing device which at regular intervals effects a change in the condition of the circuit of the said electro-magnet, and a motor mechanism for said circuit-changing device, all substantially as and for the purpose set forth.

2. The signal-receiving instrument and a time-stamp comprising time-printing indicators, a presser, and an electro-magnet for moving the presser, combined with a circuit-changing device which at regular intervals effects a change in the condition of the circuit of the said electro-magnet, and a motor mechanism for said circuit-changing device, all substantially as and for the purpose set forth.

402,120.



402,121. TELEPHONE. EDWARD A. WORLE, Belleville, Ill. Filed July 7, 1888. Serial No. 279,273. (No model.)



Claim.—1. In a telephone, the combination, with the diaphragm and the two separable contacts supported independently of each other and each movable toward and from the other, of a movable stop for the first of said contacts with which it engages when the contacts are separated, and a stop for the other contact limiting its movement, substantially as set forth.

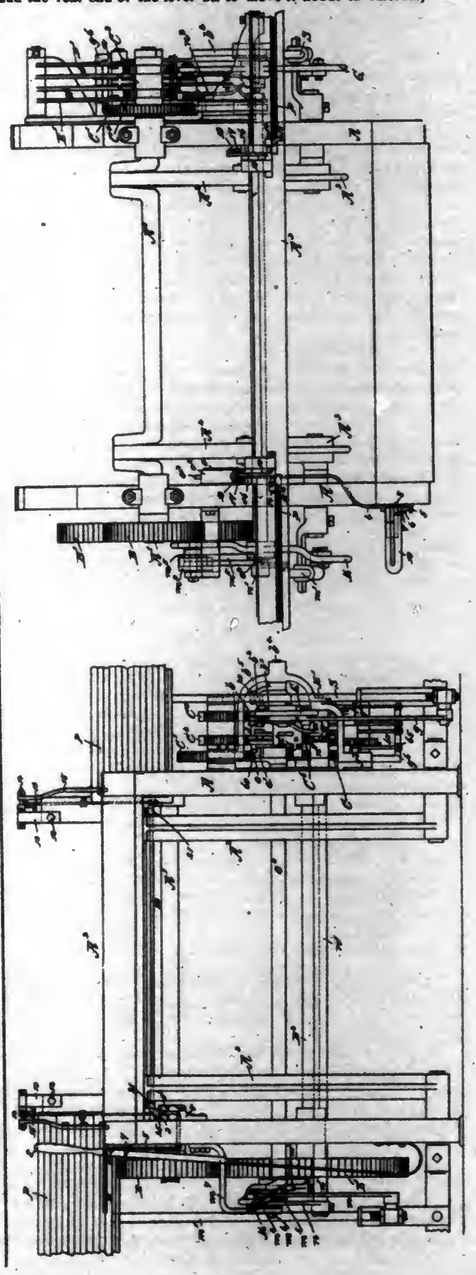
2. In a telephone, the combination, with the diaphragm, of the two contacts movable independently of each other and of the diaphragm, a stop limiting the movement of one of said contacts toward the other, and a lever connected with the other contact for positively withdrawing it from the first, substantially as set forth.

3. In a telephone, the combination, with the diaphragm and the two contacts movable independently of each other, of a yielding stop for one of said contacts, a spring or elastic support for the other contact, and a stop which holds the last said contact away from the first against the tension of the spring, substantially as set forth.

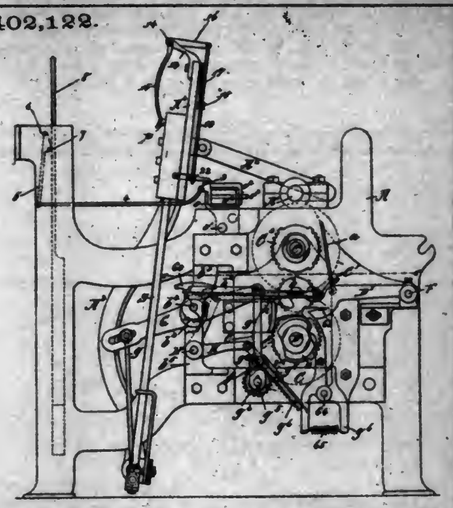
4. In a telephone, the combination, with the diaphragm and the contacts D and C, of the spring-stop H, adapted to engage with the contact D, and a pivoted lever, J, connected to the other contact, C, for withdrawing it from the contact D, substantially as set forth.

402,122. LOOM. HORACE WYMAN, Worcester, Mass., assignor to the Crompton Loom Works, same place. Filed Mar. 15, 1886. Serial No. 195,673. (No model.)

Claim.—1. The combination, in a loom, of the following instrumentalities, viz: the partial gears C^3 C^4 C^5 C^6, the vibrators, the toothed gears *b c d e*, mounted upon the said vibrators and located all at one side the loom-frame, means to operate the said partial gears to actuate the said toothed gears, the shuttle-box levers G and M, one at each side of the loom, the eccentrics b^3 and e^4, on which the said levers are mounted, connections between the gear *b* and eccentric b^3, the shaft e^4, extended across the loom-frame and carrying the eccentric e^4, the pinion e^3 thereon, the toothed connecting-rod to actuate the said pinion from the said gear *e*, the shaft *n'*, extended across the loom-frame, means, substantially as described, between the said shaft and the rear end of the lever M, to move it about its fulcrum, and



402,122.



means between the said shaft *n'* and the toothed gear *d*, whereby the said gear is enabled to actuate the said shaft, and a crank, as g^6, and means between it and the said gear *e* to actuate the said crank, and connections between the said crank and the said lever G, the combination being and operating substantially as described, whereby both shuttle-box levers at opposite sides of the loom are operated positively.

2. The shuttle-box lever M, the shaft e^4, the eccentric e^4, the pinion e^3 thereon, the toothed gear *e*, means between it and the said pinion to oscillate the said shaft, means to oscillate the said toothed gear, the toothed pinion m^3, and its co-operating crank-pin m^4, combined with the toothed gear *d*, means to oscillate it, and means, substantially as described, actuated by it to operate the said toothed gear m^5, for the purpose set forth.

3. The toothed gears *b e*, means to oscillate them, the gear b^3 and its attached eccentric, the shuttle-box lever G, mounted thereon, the link g', the shuttle-boxes, and means to connect them operatively with the said lever, the gear g^4 and its co-operating crank-pin g^6, and the elbow-lever H, combined with means actuated by the said toothed gears *b e*, to oscillate the pinion b^3 and the lever H, and with means actuated by the lever H to oscillate the gear g^4, substantially as described.

4. The series of shuttle-boxes, their binders, and the shaft 20, provided with arms 22 23, and a dagger, 25, combined with two fingers, 15, actuated by the said binders, and with means, substantially as described, between the said fingers and the said arms 22 23 to move the said shaft 20, to operate substantially as described.

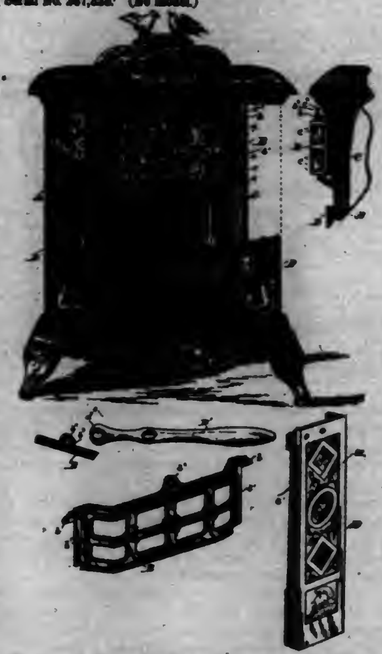
5. The bunter, means to support it, the rod 20, having the dagger and the arm 23, the rod 19, and means to normally elevate it, the arm 16, shaft and finger 15, combined with shuttle-boxes, and binders to operate the said finger, substantially as described.

6. The partial gears C^3 C^4 C^5 C^6, vibrators, and toothed gears mounted thereon, all located at one side of the loom-frame, the shaft e^4, extended across the loom-frame, and means between one of the toothed gears and the said shaft to oscillate the latter, combined with the eccentric e^4, attached to the shaft e^4 at that end of the loom farthest from that at which said vibrators and toothed gears are mounted, the shuttle-box lever M, mounted on the said eccentric, a crank at the same side of the loom as the eccentric and in connection with the said shuttle-box lever, and devices for communicating motion to the said crank from one of the said gears mounted on the vibrators, to operate substantially as described.

7. The shaft *n'*, extended across the loom, its attached arm *n*, the lever M, and connecting mechanism, substantially as described, between the said arm and the end of the said lever M, to move it, combined with the partial gears C^4 C^5 at the opposite side of the loom, a toothed gear, *d*, located between them and having a crank, a vibrator upon which the said gear *d* is mounted to oscillate, and means, substantially as described, between the said gear *d* and the said shaft *n'*, to oscillate said shaft, substantially as described.

8. The lay, two series of shuttle-boxes mounted to slide therein, the binders, shafts 14, the fingers 15 on said shafts actuated by said binders, arms 16 on said shaft, the shaft 20 and its arms 22 and 23, rods 19, and springs 17 to lift the said rods, combined with a dagger on shaft 20 and a bunter, the combination being each, substantially as described, that the outward movement of both of the two fingers resting on the said binders is required to oscillate the shaft 20 and place the dagger in operative position.

402,123. STOVE. BENJAMIN H. GOSMANN, New Albany, Ind., assignor to Tortotge, Gosmann & Co., Louisville, Ky. Filed Oct. 11, 1888. Serial No. 287,823. (No model.)

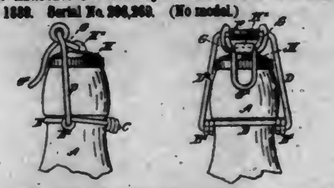


Claim.—1. In a stove or grate, side plates forming the front of the stove provided with a series of catches on their face above the opening for the blower, in combination with a blower having shouldered lugs at its upper corners to engage said catches, and a shoulder or offset at each end to bear against the column and cause the blower to rise uniformly at its ends, with columns at either side of the stove having cut-away portions to confine and guide the ends of the blower, substantially as set forth.

2. In a stove or grate, a front consisting in flat-faced plates at either side, said plates provided with a series of catches on their face near the top, a blower having flat ends, as *b'*, and lateral projections above said portions *b'* to engage the catches on the side plates or front, said blower being constructed to slide over the upper front portion of the stove, in combination with columns cut away along one edge with gradually-decreasing depth from top to bottom and overlapping the ends of the blower, substantially as set forth.

3. In combination with a stove or grate, a blower having a loop or handle to lift the same, formed thinner at its side than at its top, whereby, when the shaker is introduced, it will grip the loop without accidentally slipping its hold, permitting the blower to be moved with ease and comfort, no matter how hot it may be, substantially as set forth.

402,124. BOTTLE-STOPPER. DANIEL J. CONCORAN, Dedham, assignor to Lawrence Michael Aloysius Corcoran, Boston, Mass. Filed Jan. 31, 1888. Serial No. 262,262. (No model.)

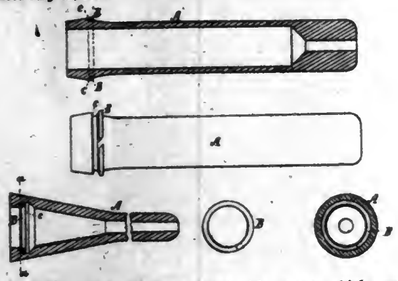


Claim.—1. The combination and arrangement, in connection with a bottle, of the neck-wire B, the bearing-wire D, held to the neck-wire B by coils in said neck-wire, and the stiff latch-wire G, held to the bearing-wire D by a pair of single coils and carrying the latch-loop G^x, with the metal stopple-block H, provided with the boss H^x, the boss holding the two respective ends of the latch-wire G and holding at its lower portion the hollowed rubber stopple J, all constructed and arranged substantially as described and shown.

2. The combination, with a bottle and any stopper, of the wires B, D, and G, the last-named wire, accompanied by the brace F, playing on the horizontal portion of the bearing-wire D, all substantially as described and shown.

REISSUES.

10,996. SPINNING-BOBBIN, &c. LUTHER C. BALDWIN, Manchester, N. H. Filed Nov. 26, 1888. Serial No. 291,915. Original No. 366,196, dated July 12, 1887.



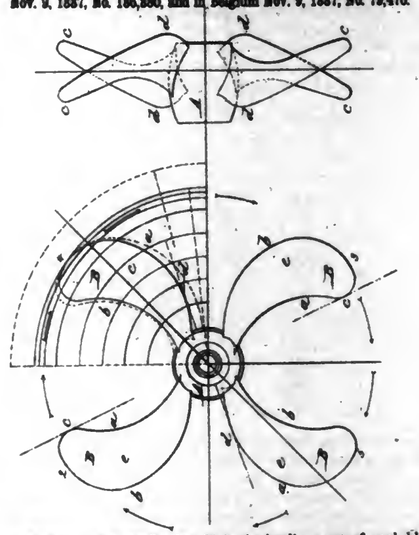
Claim.—1. A solid bobbin provided with a groove which receives and accommodates an elastic ring, in combination with a split elastic ring fitted into said groove, said ring having tapered ends which overlap each other when in position on the bobbin, substantially as described.

2. A solid bobbin provided with a groove, which groove receives and accommodates an elastic ring, in combination with a split elastic ring having overlapping tapered ends and extending in an unbroken curve from end to end, and which ring is sprung into said groove in the bobbin, substantially as described.

3. A solid bobbin provided on its outside with a groove, in combination with a split elastic ring which fits within the groove and extends slightly beyond the plane of the outer surface of the bobbin in a position to receive the wear, substantially as described.

4. The combination of a split elastic ring, and an unsawed or solid bobbin having a groove around it to receive said ring, for the purpose substantially as described.

10,997. SCREW-PROPELLER. ALEXANDER VOGELSANG, Brooklyn, N. Y., assignor to the Vogelsang Screw Propeller Company, same place. Filed Feb. 15, 1889. Serial No. 300,050. Original No. 361,193, dated Apr. 17, 1888. Patented in England Nov. 4, 1887, No. 15,055; in France Nov. 9, 1887, No. 186,880, and in Belgium Nov. 9, 1887, No. 79,470.



Claim.—1. A propeller in which the leading part of each blade rotates in a plane in advance of the part of the next preceding blade in the same radius and in the direction of progression of the screw, substantially as described.

2. A propeller in which the leading parts of two successive blades are situated at different distances from the hub in a plane that is normal to the axis of the propeller-shaft, the blades diametrically opposite each other are alike, and the leading part of each blade rotates in a plane in advance of the part of the next preceding blade in the same radius and in the direction of progression of the screw, substantially as described.

PHOTO-LITH. NORRIS PETERS WASHINGTON, D.C.

DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

COLLINS COMPANY *v.* COES *et al.*

Decided March 5, 1889.

JORDAN AND SMITH—WRENCHES.

Reissued Letters Patent No. 5,294, to Lucius Jordan and Leander E. Smith February 25, 1873, for an improvement in wrenches, *Held* to be anticipated by the patent to Loring Coes April 16, 1841, and by the wrenches known as the "Hewitt" wrenches, manufactured in 1851-4, and to be void for want of patentable novelty.

APPEAL from the Circuit Court of the United States for the District of Massachusetts.

STATEMENT OF THE CASE.

The Collins Company of Connecticut, a corporation located at Collinsville, in the county of Hartford and State of Connecticut, brought this suit in equity in the Circuit Court of the United States for the District of Massachusetts, against Loring Coes and Melvin O. Whittier, partners in business at Worcester, in Worcester county, Massachusetts, in the name and style of Loring Coes & Company, for the alleged infringement of Reissued Letters Patent No. 5,294, dated February 25, 1873, for an improvement in wrenches, issued to the Collins Company as assignee of Lucius Jordan and Leander E. Smith, said Reissued Letters Patent being based upon original Letters Patent dated October 10, 1865, No. 50,364. There had also been a reissue February 22, 1870.

The specification and accompanying drawings of the Reissue No. 5,294 are as follows:

The object of this invention is the prevention of end thrust or back pressure on the wooden handle of wrenches, which has heretofore availed to quickly destroy such wooden handles, and, in destroying the handles, has left the working parts of the wrench which depended upon the handles for support without such support, so as to injure and effectually impair their working qualities and efficiency; and is accomplished by so connecting the step which forms a bearing for the lower end of the screw-rod with the bar which forms the main part of the wrench that the back pressure put upon the step by the screw-rod will be directly transmitted to the wrench-bar at the place of connection therewith, and will not be transmitted to and mainly put upon the wooden handle.

Figure 1 is a side view of the whole wrench, the part below the

Fig. 1.

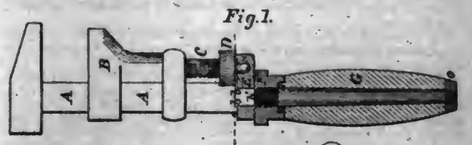


Fig. 2.



dotted line *x x* being in section. Fig. 2 is a top or plan view of the step which forms a bearing for the lower end of the screw-rod.

The letter A indicates the wrench-bar, flat-sided down to the under side of the step E, and from thence downward cylindrical or of other convenient shape, so as to take upon it the wooden handle G. B is the movable jaw. The letter C indicates the screw-rod, and D the rosette by which it is turned. The letter E indicates the step, in which is the bearing *s* for the lower end of the screw-rod, and also the hole *a* to admit the bar A, and fitting up against the shoulder *b*. On the bar A, just below the step E, is cut the screw-thread *t*, on which screws the nut F, forming a projection from the wrench-bar, on which rests the step E, and thus transmits the back pressure put upon the step directly to the wrench-bar at the place of connection therewith, and thus relieves the wooden handle therefrom, the connection of the step with the bar being made in such manner that the step may be removed or taken off the bar without any cutting or abrasion of parts.

The nut not only supports the step, but can be made to rigidly fasten the step to the bar by screwing it firmly up against the step so as to gripe it between itself and the shoulder *b*, thus giving the nut, so to speak, a double office, viz., that of supporting the step, and, also, that of fastening it rigidly to the bar. The nut is interiorly recessed at *d* for the purpose of forming a ferrule for the top of the wooden handle.

Heretofore the part designed to perform the office of the step E has rested directly on the wooden handle, which was secured upon the bar by a light nut, *o*, at the lower extremity of the bar, which is the present method of fastening on the handle.

It is known that, previous to this invention, steps have been forged or otherwise produced solid with the bar, and this became as much a part of it as the solid head at extremity of bar; and also by riveting to reach similar result; but such method, by making a permanent fastening, renders it impossible, or a work of great difficulty, to displace the step in order to remove the sliding jaw for repairs. It will be observed that, while Jordan and Smith's method of fastening is as firm as the permanent fastenings last above referred to, their step can readily be removed and again put in place at pleasure.

It is believed that Smith and Jordan were the first to secure easy divisibility of step and bar, together with a fixed or stationary step when in position, and at the same time supporting the step, when in position, immediately by the bar, and not mediately through the handle, as the manner had been.

As a matter of definition, the Jordan and Smith method of fastening and supporting the step when in position is denominated "removable" hereinafter in contradistinction from a connection and support made by forging or otherwise producing the step in one solid piece with the bar, and, therefore, a part of it; or by riveting it thereto, or the like.

Claims.

1. The step, combined with the wrench-bar and supported by the nut F, or its equivalent, at the place where the step is connected with the bar, in such manner that the step can be removed from the bar without cutting or abrasion of parts.

2. The nut F, combined with the wrench-bar, and interiorly recessed at *d*, for the purpose set forth.

3. The nut F, combined with the threaded bar, and performing the office of supporting the step, and also of rigidly fastening it to the bar, for the purpose set forth.

April 16, 1841, a patent issued to Loring Coes for what has since always been known as the Coes wrench, and this was reissued June 26, 1849. The specification and drawings of the reissue are as follows:

Figure 1 is an elevation of my improved wrench, and Fig. 2 an elevation of a wrench previously known but not of my invention.

Fig. 1.

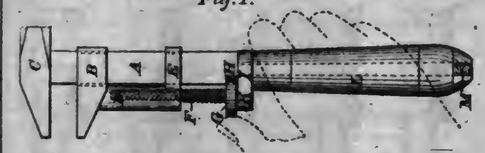
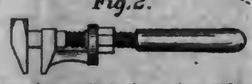


Fig. 2.



In my improved wrench the inner jaw slides on the bar of the permanent jaw and handle, and is moved by a screw at the side of the bar, operated by a head or rosette, which always remains in the same position relatively to the handle, whereby the movable jaw can be adjusted with the thumb of the hand, which grasps and holds the handle. The principle or character of my invention, and that which distinguishes it from all other things before known, consists in moving the adjustable jaw by means of a screw placed at the side of and parallel with the bar of the

permanent jaw and handle, when the required rotation for sliding the jaw is given by a rosette or head, or the equivalent thereof, which retains the same position relatively to the handle; and my invention also consists in retaining the required position of the rosette, or its equivalent, by which the required motion is given to the sliding jaw, by having its periphery to work in a notch or recess in the bar of the permanent jaw and handle, or vice versa.

In the accompanying drawings, A represents a quadrangular bar of metal with a permanent or hammer jaw, C, at one end, the other end being reduced in size to pass through a handle, L, secured to it by a nut, M. Between the ferrule of the handle and the shoulder of the bar an iron plate, I, is griped by the securing of the handle onto the bar, and this plate extends out sufficiently beyond the bar to receive the journal K (see dotted lines) of a screw, F, which is placed parallel with and by the side of the bar. This screw is tapped into a tubular piece, D, that projects from the back face of the adjustable jaw B, which is fitted to slide on the bar from or toward the permanent jaw C, the rear end of the tubular projection D being provided with and sustained by a bridle, E, which embraces and slides on the bar. At the rear end the screw is provided with a head or rosette, G, the periphery of which turns in a notch or recess, H, made in the edge of the bar, as shown by dotted lines, by which the position of the said rosette is retained relatively to the handle. The hand, represented by dotted lines, indicates the manner in which my improved wrench is operated. The handle is grasped by the fingers, and the rosette is operated by the thumb of the same hand, so that, without any change in the position of the hand, the movable jaw can be moved toward or from the permanent jaw, to set the wrench to any size required, with one hand.

By means of my improvement the bar can be made of any desired form best adapted to the sliding jaw and to strength. The rosette or its equivalent employed for operating the jaw is always retained in the same position relatively to the hand that gripes the handle. At the same time the use of two bearings for the screw is avoided.

The advantages of my improved wrench over other methods of construction will be seen by comparison with the wrench represented by Fig. 2 of the accompanying drawings.

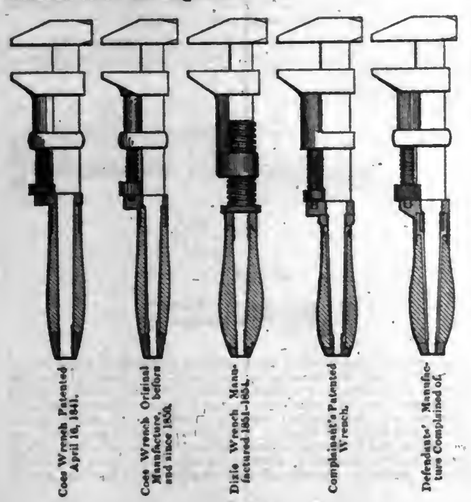
What I claim as my invention, and desire to secure by Letters Patent, is—

Moving the sliding jaw by a screw, combined with and placed by the side of and parallel with the bar of the permanent jaw and handle, substantially as described, when the required rotation for sliding the jaw is given by the head or rosette, or its equivalent, which retains the same position relatively to the handle during the operation, substantially as described.

And I also claim moving the sliding jaw by a screw, combined with and placed by the side of and parallel with the bar of the permanent jaw and handle, substantially as described, in combination with the rosette or its equivalent, retained in its position relatively to the hand in the manner described.

It appears from the evidence that during the years 1851 to 1854, E. F. Dixie was manufacturing, to the extent of from two hundred to four hundred wrenches per week of various sizes, a wrench known as the Hewitt wrench, which wrench contained a recessed nut screwed upon the wrench-bar just above the wooden handle, for the purpose of relieving the handle from back pressure put upon the step, and of serving as a ferrule for the upper end of the wooden handle. It had an adjusting screw-sleeve instead of the adjusting screw-rod of the Coes wrench, but was otherwise substantially the same.

The following diagrams give the various wrenches referred to on the argument:



On the 9th of August, 1880, the Collins Company filed a disclaimer in the Patent Office, stating—

Further, that said The Collins Company has reason to believe that through inadvertence and mistake the second clause of claim made in said last-mentioned Reissued Letters Patent, in the following words, to wit: "2. The nut F, combined with the wrench-bar, and interiorly recessed at *d*, for the purpose set forth," is too broad, including that of which said Jordan and Smith were not the first inventors. Said The Collins Company therefore hereby enters its disclaimer to "the nut F, combined with the wrench-bar, and interiorly recessed at *d*, for the purpose set forth," except when said recessed nut and wrench-bar are in combination with the handle G, the step or step-plate E, the screw-rod C, and the movable jaw B of the wrench, substantially as is shown and described in said last-mentioned Reissued Letters Patent—

being the reissue in question.

The defendants contend that the patent in suit did not disclose a patentable invention in view of the prior state of the art; that the reissue described and claimed a different invention from that for which the original patent was granted; that the reissue was taken too long after the date of the original patent to be permitted upon equitable grounds; and that there was no infringement.

The circuit court originally granted an interlocutory decree in favor of the plaintiff, in accordance with the opinion of Judge Lowell, reported in 5 Banning & Arden, 548, and 3 Fed. Rep., 225. But a rehearing was afterward moved for and granted, the interlocutory decree vacated, and the bill dismissed, for the reasons stated in the opinion of Mr. Justice Gray, presiding in the circuit, in a similar suit by the plaintiff against other defendants, which opinion was as follows:

This is a bill in equity for the infringement of the first claim in the specification of the second reissue to the complainant, dated February 25, 1873, of Letters Patent originally issued to Lucius Jordan and Leander E. Smith, on October 10, 1865, for an improvement in wrenches.

The wrench, as described, both in the original patent and in the reissue, has the following parts: The wrench-bar A, the upper part of which is of the usual shape, and has attached to it the movable jaw B, and the lower part of which is of convenient form to receive upon it the wooden handle; a screw-rod, C, parallel to the main bar; a rosette, D, at the lower end of the screw-rod, by means of which the movable jaw is worked; a ferrule or step, E, having a hole through it for the admission of the bar, and a recess in its upper face as a bearing for the lower end of the screw-rod; a nut, F, screwed on a thread in the bar, under the step, and having a recess in its under face to receive the top of the wooden handle G, and the wooden handle secured at its lower end to the main bar by a nut in the usual way.

Both the original patent and the reissue state that the object of the invention is to make the strain come upon the nut F, instead of coming upon the wooden handle. The original patent states that the nut F is, and the reissue states that it may be, screwed up firmly against the step E. The reissue affirms and repeats that the distinguishing characteristic of the invention is that the step can be readily removed and replaced at pleasure. There is no hint of such a distinction in the original patent.

The first claim of the original patent is for "The step E, made substantially as described, and for the purpose set forth." The corresponding claim in the reissue is for the "The step, combined with the wrench-bar, and supported by the nut F, or its equivalent, at the place where the step is connected with the bar, in such manner that the step can be removed from the bar without cutting or abrasion of parts."

The parallel screw-rod, with a rosette thereon to work the movable jaw, and resting upon a ferrule or step, had been introduced in the original Coes wrench, patented in 1841; and, long before the issue of the patent to Jordan and Smith in 1865, large numbers of the Hewitt or Dixie wrench had been made and sold, in which there was no separate screw-rod, and the screw that worked the movable jaw revolved on the main bar, but that screw rested on a ferrule or step, which was secured sometimes by driving it on under heavy pressure, and sometimes by a nut screwed under it on the bar.

The application to the bar of the Coes wrench, for the purpose of securing and supporting the step, and resisting the strain, of a nut already in use for the same purpose, on the Hewitt or Dixie wrench, lacks the novelty of invention requisite to support a patent, within the decisions of the Supreme Court at the last term, which have, in effect, overruled the earlier decision of this court in the suit of this complainant against Loring Coes and others, reported in 5 Banning & Arden, 548. *Pennsylvania Railroad* v. *Locomotive Engine Safety Truck Co.*, (110 U. S., 490;) *Bussey* v. *Excelsior Manuf. Co.*, (110 U. S., 131;) *Double-Pointed Tack Co.* v. *Two Rivers Manuf. Co.*, (109 U. S., 117;) *Phillips* v. *Detroit*, (111 U. S., 604.)

The complainant's patent being void for want of novelty, it becomes unnecessary to consider the other defenses.

Bill dismissed, with costs.

Mr. W. E. Simonds for the appellant.

Mr. George L. Roberts for the appellee.

Mr. Chief Justice FULLER delivered the opinion of the Court:

We concur with the circuit court in its disposition

of this case and the grounds upon which it rested its decision.

The wrench-bar, the fixed jaw upon its upper end, the movable jaw sliding upon the wrench-bar, the screw-rod parallel with the wrench-bar, the rosette upon the lower end of the screw-rod, the step-plate surrounding the wrench-bar, the wooden handle secured by the nut at its extreme lower end, are all described in the patent to Coes; and the nut screwed upon the wrench-bar just below the step-plate, and provided with a recess for the purpose of forming a ferrule for the step of the wooden handle, which is not in the Coes patent, but is in complainant's reissue, had already been in use in the Hewitt or Dixie wrench for the same purposes. The disclaimer conceded that "the nut F, combined with the wrench-bar, and interiorly recessed at *d*, for the purpose set forth" was an old device; but it is claimed that the device is new when the recessed nut and wrench-bar are in combination with the handle, the step, the screw-rod, and the movable jaw. The handle, the step, the screw-rod, and the jaw are all to be found in the Coes and Dixie wrenches, and the recessed nut of the Dixie wrench constituted, by the shoulder which it made at its upper end, a step upon which the screw rested, and served every purpose designated in the reissued patent in suit as intended to be secured by such recessed nut. This in itself justified the finding that "the application to the bar of the Coes wrench, for the purpose of securing and supporting the step and resisting the strain, of a nut already in use, for the same purpose, on the Hewitt or Dixie wrench, lacks the novelty of invention requisite to support a patent." This conclusion is not affected by the fact that in complainant's wrench the screw-rod of the Coes wrench is availed of instead of the screw-sleeve of the Dixie wrench.

Complainant's first claim is as follows:

1. The step, combined with the wrench-bar and supported by the nut F, or its equivalent, at the place where the step is connected with the bar, in such manner that the step can be removed from the bar without cutting or abrasion of parts.

The specification says:

On the bar A, just below the step E, is cut the screw-thread *f*, on which screws the nut F, forming a projection from the wrench-bar, on which rests the step E, and thus transmits the back pressure put upon the step directly to the wrench-bar at the place of connection therewith, and thus relieves the wooden handle therefrom, the connection of the step with the bar being made in such manner that the step may be removed or taken off the bar without any cutting or abrasion of parts.

The elements of this combination are the support of the step by the nut F, the transmission of back pressure directly to the wrench-bar through that nut, and the removability of the step without cutting or abrasion of parts. Now the Dixie wrench contained the nut F, screwed on the wrench-bar, and transmitting the back pressure directly to it, and removable without cutting or abrasion, by being simply unscrewed.

The second claim is:

2. The nut F, combined with the wrench-bar, and interiorly recessed at *d*, for the purpose set forth.

This, as so stated, was disclaimed, except when said recessed nut and wrench-bar are in combination with the handle, the step, the screw-rod, and the movable jaw.

It was said in *Hailes* v. *Albany Stove Company*, (123 U. S., 582, 587,) the Court speaking through Mr. Justice Bradley:

A disclaimer is usually and properly employed for the surrender of a separate claim in a patent, or some other distinct and separable matter, which can be exscinded without mutilating or changing what is left standing. Perhaps it may be used to limit a claim to a particular class of objects, or even to change the form of a claim which is too broad in its terms; but certainly it cannot be used to change the character of the invention. And if it requires an amended specification or supplemental description to make an altered claim intelligible or relevant, while it may possibly present a case for a surrender and reissue, it is clearly not adapted to a disclaimer.

The complainant's qualified disclaimer is an admission that the second claim of the patent is void for want of novelty, which is true, even if the qualification were effectual, since, as we have seen, the screw-rod and movable jaw of the patent have no different effect from the screw-sleeve and movable jaw of the prior Dixie wrench, upon the other parts of the combination.

The other claim is:

3. The nut F, combined with the threaded bar, and performing the office of supporting the step, and also of rigidly fastening it to the bar, for the purpose set forth.

The specification says:

The nut not only supports the step, but can be made to rigidly fasten the step to the bar by screwing it firmly up against the step, so as to gripe it between itself and the shoulder *b*, thus giving the nut, so to speak, a double office, viz., that of supporting the step, and, also, that of fastening it rigidly to the bar. The nut is interiorly recessed at *d*, for the purpose of forming a ferrule for the top of the wooden handle.

The purpose of supporting the step by the nut F, and fastening the step rigidly to the wrench-bar by means of that nut, is the relief of the wooden handle from the strain of back pressure. In the Dixie wrench the step and nut were made of one and the same piece of metal, thereby fully attaining the object of holding the step-plate rigidly fastened in position. In the Coes wrench the step was rigidly fastened to the bar by being griped between a shoulder above it and upon the bar and the handle below it, which was backed up by the nut screwed upon the lower extremity of the bar. Dispensing with a washer between a nut and that upon which it acts, makes no change in the office of the nut. The action of the nut M of the Coes wrench in griping the step-plate is the same as that of the nut F of the patent. This third claim is also void for want of novelty.

The decree of the circuit court is affirmed.

U. S. Circuit Court—Western District of Pennsylvania.

CARY *et al. v.* THE LOVELL MANUFACTURING COMPANY, (LIMITED.)

Decided January 26, 1889.

MEASURE OF DAMAGES.

It is a general rule in patent causes that established license-fees are the best measure of damages that can be used. In this case the master excluded certain license-fees as the basis of computing damages on the ground that they were practically settlements of pending litigations between the complainants and the parties taking said licenses, made with one exception after the commencement and during the pendency of this suit. *Held* that those licenses were in full operation when the defendants elected to resume their infringing manufacture; that they are competent evidence as bearing upon the fair market value of the privilege which the infringers have wrongfully undertaken to exercise, and that the defendants took the risk of being compelled to pay damages on the basis of the rate of license thus established.

SUR exceptions to the master's report.

Messrs. Witter & Kenyon for the complainants.
Mr. W. C. Witter of counsel.

Mr. William Bakewell and *Mr. J. K. Hallock* for the defendants.

Coram McKENNAN, *Cir. J.*, and ACHESON, *J.*

PER CURIAM:

The master being of opinion that the license for the future use of the patented process, at the rate of 2 cents per pound of springs, granted to R. H. Wolff & Co., (Limited,) on March 2, 1885, and the like license, at the same rate, granted to Gibson, Parish & Co., on November 4, 1885, were inadmissible as evidence, refused to hold the defendants liable for damages upon the basis of an established license-fee. And as he has found that there is no satisfactory evidence disclosing what part, if any, of the defendants' profits was due to the use of the patented process, or to show that the plaintiffs had sustained a loss of trade or any other special damage, the upshot of the matter is that if the master's report stands the plaintiffs will receive nothing but nominal damages for the defendants' infringement. Is this a just conclusion to this litigation?

The only reason assigned by the learned master for his rejection of the licenses as items of proof is that "they were practically settlements of pending litigations between the complainants and the parties taking said licenses," and (unless in the case of the Wolff license) were "made after the commencement and during the pendency" of this suit. But to determine properly the question of the admissibility of these licenses as evidence and the effect to be given to them, it is, we think, necessary not only to consider more closely than the master seems to have done the licenses themselves and the circumstances under which they were executed, but also to take a somewhat broader view of the case as a whole than his report presents. And reversing the above order of procedure, we first remark that his record throughout exhibits proof of the real merit of the Cary invention, and it is clearly shown that the patented process had great money value. For example, in each of the four proved instances in which there were settlements for past infringements substantial damages therefor were paid to the plaintiffs. Again, it appears that the West, Bradley & Cary Manufacturing Company, of which the plaintiff Cary was a member, manufactured springs under a verbal license from him, and that that company, besides discharging large liabilities connected with the litigation touching the patent, in a settlement made with Cary in April, 1876, allowed him for the use of the patent the sum of $14,000, which Mr. Cary testifies was arrived at by computing 2 cents a pound on all springs they had treated by the patented process. Furthermore, it is shown that from June, 1881, to the latter part of 1883 the defendants made large purchases from the plaintiffs of springs tempered by the patented process, and there is evidence that the plaintiffs' profits upon those springs due to said process considerably exceeded 2 cents per pound. We are then of the opinion that, aside from the particular instances of license in question, the proofs tend strongly to the conclusion that a royalty of 2 cents per pound was a reasonable and just rate during the period of the defendants' infringement.

Now, the defendants began their infringing manufacture in March, 1884, and they pursued it until March 28, 1885, when they were restrained by preliminary injunction. But the court, by an order made in February, 1886, having suspended the injunction upon the defendants giving security to pay to the plaintiffs such amount as might be adjudged to them on springs thereafter manufactured by the defendants, the latter resumed their infringing operations and continued the same until the final injunction was granted in July, 1887.

As we have seen, the license to R. H. Wolff & Co., (Limited,) was executed on March 2, 1885, which was 12 days before the bill in this case was filed. Gibson, Parish & Co. were licensed while the preliminary injunction was in force, and about four months before the second period of the defendants' infringement began. Both those licenses, it will be perceived, were in full operation when the defendants elected to resume their infringing manufacture, and they took the risk of being compelled to pay damages on the basis of the rate of license thus established. We have carefully examined the provisions of those instruments and all the evidence on the subject, and we are unable to discover anything which casts the slightest doubt on the good faith of either transaction. They seem to have been fair business arrangements voluntarily entered into by the respective parties. R. H. Wolff & Co., (Limited,) had never been sued at all. That company had infringed to a very limited extent, and at the time it was licensed paid $500 therefor; but it was not bound to take a license for the future. Gibson, Parish & Co., indeed, had been sued and settled for past infringement by paying $1,000; but they were under no sort of coercion to take a future license. Both those licensees regularly paid the stipulated royalty of 2 cents a pound on the springs manufactured by them under the patent from the dates of their respective licenses down to the expiration of the patent in June, 1888. Why then are those licenses not competent evidence as bearing upon the fair market value of a privilege which an infringer has wrongfully undertaken to exercise? We have critically examined the decisions referred to by the master and the other cases cited by the defendants' counsel, but cannot concur in the view that they warrant the exclusion of said licenses from consideration. We think that this case, in its facts, is plainly distinguishable from all the cases relied on to sustain the ruling of the learned master, and we are constrained to hold that he was in error in deciding that said licenses were inadmissible "as evidence showing, or tending to show, an established royalty for the use of the Cary patent." But it is contended that the license granted by the plaintiffs to the Domestic Spring Bed Company on March 19, 1886, for the sum of $2,500, to cover past infringement and future use, shows that there was in fact no uniform or established license-fee. But the right thereby granted to that company was exclusively a shop-right to temper by the patented process only such springs as the company had used or might thereafter use in their own beds. That company was not making springs for the market, and hence the case was exceptional and materially differed from the cases of R. H. Wolff & Co., (Limited,) Gibson, Parish & Co., and the defendants.

In addition to the two instances of licenses at the royalty of 2 cents per pound, we have the settlement already discussed between the patentee and the West, Bradley & Cary Manufacturing Company at the same rate, and also the recited corroborative evidence as to the reasonableness of that rate, and, taking the proofs altogether, we are of the opinion that the defendants are justly answerable to the plaintiffs in damages upon that basis.

In *Clark* v. *Wooster*, (119 U. S., 326,) which, like the present case, was a suit in equity, the Court, speaking of an established license-fee and the sufficiency of the proof thereof, said:

> It is a general rule in patent causes that established license-fees are the best measure of damages that can be used. The complainant proved several instances of licenses given by him to large sewing-machine companies, the fees on which were regularly paid and corresponded with the rate allowed by the master. We think that the defendants have no occasion to complain of the amount awarded.

How many instances of license were there shown does not appear; but we think the language of the Court fully justifies the conclusion we have reached here upon the proofs before us.

The plaintiffs ask the court, under the statutory authority, to increase the damages; but this we must decline to do.

The master reports that the defendants have manufactured by the patented process 437,267 pounds of springs, which, at 2 cents per pound, amount to $8,745.34, and for this sum the plaintiffs are entitled to a decree.

Let a decree be drawn in favor of the plaintiffs in accordance with the foregoing opinion.

U. S. Circuit Court—Southern District of New York.

UNTERMEYER *v.* FREUND *et al.*

Decided January 15, 1889.

1. LETTERS PATENT AS PRIMA-FACIE EVIDENCE.
   The rule is well settled that the production of Letters Patent for a Design establishes a *prima facie* right in the patentee which can only be defeated by proofs which are of convincing force.
2. DESIGN PATENTS AS DISTINGUISHED FROM PATENTS FOR INVENTIONS.
   The validity of a patent for a Design does not depend upon the exercise of the "inventive faculty of the mind" in the sense in which that expression is used in connection with inventions which relate strictly to the useful arts.
3. DESIGNS ANOLOGOUS TO COPYRIGHTS.
   The policy which protects a Design is akin to that which protects the works of an artist by copyright. If the Design produce a different impression upon the eye, even though it be simple, and does not show wide departure from other designs, its use will be protected.

Mr. Rowland Cox for the complainant.
Mr. Frederic H. Betts and *Mr. Samuel R. Betts* for the defendants.

COXE, *J.*:

This is an equity action of infringement founded upon Letters Patent No. 15,121, granted to the complainant July 1, 1884, for a Design for watch-cases. The Design consists of a central conventional star in which any ornament may be set, placed upon a larger star of leaves, both stars being bas-relief. Between the points of the star of leaves are diamond-shaped projections. The Design was the result of considerable effort and industry. It shows some genius, and it soon became popular with the public and a source of profit to those who adopted it.

The claims are as follows:

> 1. A design for watch-cases, consisting of the conventional star A and the larger star, B, the points of which represent leaves, the star A occupying the central field of the star B, all being in relief, substantially as shown and described.
> 2. A design for watch-cases, consisting of the conventional star A and the larger star, B, composed of leaves and having between its points ornamental projections C, the star A occupying the center of the star B, all being in relief, substantially as shown and described.
> 3. A design for watch-cases, consisting of the star A, containing the ornament D, the larger star, B, representing leaves and having between its points the ornamental projections C, and the star A occupying the center of the star B, all being in relief, substantially as shown and described.

The defenses are anticipation, lack of invention, and non-infringement of the second and third claims.

The claims would have to be unreasonably restricted to give the slightest plausibility to the defense of non-infringement. The two Designs look alike, and an ordinary purchaser could not detect the difference. The defendants in their circular of February 10, 1887, admit that they have made the Design of the patent and assert that they have a right to make it and will continue to do so. Infringement is clearly established.

Has novelty been negatived?

The patent is *prima facie* evidence that the complainant was the first inventor. (*Lehnbeuter* v. *Holthaus*, 105 U. S., 94.) He who asserts to the contrary must prove it beyond a reasonable doubt. The onus is upon him. The record discloses the usual conflict upon this subject. The witnesses do not agree. After the testimony has been read and weighed the mind has not a decided impression either way. It is in doubt. This is peculiarly a case where light would be thrown upon the controversy were the court permitted to see the witnesses and observe their manner while testifying. A witness may convince all who hear him testify that he is disingenuous and untruthful, and yet his testimony when read may convey a most favorable impression. To state the proposition as fairly as the defendants can expect, the issue upon this branch of the case is involved in uncertainty.

If the defendants' right to recover a sum of money in an ordinary action at law depended upon their establishing the affirmative of this issue, a verdict in their favor would probably not be disturbed by the court. If, however, the complainant's conviction of a crime depended upon the establishment by the prosecution of the same proposition, a verdict of guilty could hardly be sustained. The jury most certainly would declare that they were not satisfied beyond a reasonable doubt that prior use had been established.

The court had occasion to comment upon this rule in somewhat similar circumstances in the case of *Thayer* v. *Hart*, (20 Fed. Rep., 693; 22 Blatchf., 229.) What was there said need not be repeated.

The question of invention is a perplexing one. It is balanced in well-nigh even scales, and a decision either way would have much in reason and common sense to commend it. The prior art shows badges made with a central raised star of silver placed upon a larger star of similar material, the lower star being

chased into a form somewhat resembling leaves. Badges with a star of tinsel placed upon a larger star of silk were well known, as was a design for the center of a watch-dial resembling the star of leaves and the ornamental projections of the patent, but without the conventional star and the central ornament.

The defendants also introduced a large number of tracings from drawings found in volumes belonging to the Astor library. These show designs for pavements, ceilings, spandrels, panels, railings, pedestals, embroidery, carpets, and marquetry. All these, being drawings, are of course flat, though some show cross-sections, indicating that the originals were in relief. None were designed for watch-cases and none, if put on a watch-case, would be mistaken for the complainant's Design. None, if made now for the first time, would infringe; none can be said to anticipate. It is probably true that an expert, with the patent before him, can select from these drawings every separate feature of the Design, often finding two or more of them in similar juxtaposition. The drawings would not, however, suggest the Design to one who had not seen it before.

A Design requires invention; but a different set of faculties are brought into action from those required to produce a new process or a new machine. In each case there must be novelty; but the Design need not be useful in the popular sense. It must be beautiful. It must appeal to the eye. The distinction is a metaphysical one and difficult to put into words. A flying wheel, a wheel revolving rapidly between two outstretched wings, presents a pleasing object to the eye. A graceful pattern for the handle of a spoon or fork may attract many purchasers, and yet it cannot be said that the embodiment of these Designs requires an exercise of the "intuitive faculty of the mind" in the sense that this faculty is exercised in inventions like the telephone or the safety-lamp. The policy which protects a Design is akin to that which protects the works of an artist, a sculptor, or a photographer by copyright.

It requires but little invention, in the sense above referred to, to paint a pleasing picture, and yet the picture is protected because it presents the personal characteristics of the artist and because *it is his.* So with a Design. If it presents a different impression upon the eye from anything which precedes it; if it proves to be pleasing, attractive, and popular; if it creates a demand for the goods of its originator, even though it be simple and does not show a wide departure from other Designs, its use will be protected.

In the active competition of trade a dealer is fairly entitled to the advantage, slight though it be, which attends such enterprise, and a rival in business should not be permitted thus openly and defiantly to invade the territory of another. It is so easy for every dealer, with the wide universe before him, to select a Design of his own. The appropriation by him of the Design of his neighbor is usually so unnecessary and unwarrantable that the law is seldom relaxed for his advantage.

It is impossible to read the literature upon this subject without being convinced that the courts, though applying the same rules, have looked with greater leniency upon Design patents than patents for other inventions. From the nature of the case it must be so. A Design patent necessarily must relate to subject-matter comparatively trivial. The object of the law is to encourage those who have industry and genius sufficient to originate objects which give pleasure through the sense of sight.

The case of *Miller* v. *Smith* (5 Fed. Rep., 359) is exactly in point. It is rarely that two cases are so nearly parallel upon the facts. There the Design for lockets, sleeve-buttons, &c., consisted of a rustic letter in relief, ornamented with leaves placed on the line of the letter. The patent was upheld, although the prior art disclosed flat drawings of similar letters and also rustic letters having branches and sprays of leaves springing from and around them. If there is any difference in the two Designs, the preponderance of originality would seem to be in favor of the one in hand. There is no room to doubt that the decision would have been the same had Miller's Design been of a rustic letter placed upon a larger letter of leaves instead of leaves placed upon a rustic letter. To adopt the language of Mr. Justice Clifford, when speaking of proofs very similar to those offered by these defendants:

> Nothing of the exact kind is shown in these exhibits, nor is there anything which can be regarded as proof that the thing patented was known to others before the invention patented was made by the patentees. Many attempts are made to prove that fact, but the proofs all fall short of meeting the requirement.

Upon the authority of this decision the doubt which is entertained upon this question must be resolved in favor of the patent. See, also, *Gorham Co.* v. *White*, (14 Wall., 511;) *Simpson* v. *Davis*, (12 Fed. Rep., 144:) *Foster* v. *Crossin*, (23 Fed. Rep., 400;) *Wood* v. *Dolbey*, (19 Blatchf., 214;) *Streat* v. *White*, (O. G., 1291.)

There should be the usual decree for the complainant.

U. S. Circuit Court—Eastern District of New York.

ADEE *et al. v.* THOMAS.

Decided January 23, 1889.

NULLIFICATION OF PATENTS—PATENTEE—ASSIGNEE.

A patentee may not, as against the assignees of his entire interest, so restrict and qualify the claims of his patent as to make them void for want of novelty.

LACOMBE, *J.*:

The article made by the defendant apparently infringes the patent of 1883, (No. 286,746.) That patent was originally granted to the defendant and by him assigned to the complainants. It would be unjust to allow him now, as against his assignees, to so restrict and qualify the claims of the patent as to make them void for want of novelty. (*Curran* v. *Birdsall*, 20 Fed. Rep., 835.) Practically that is what he seeks to do on this motion. Complainants may take an injunction in the first action. The questions raised in the other two may be disposed of on final hearing.

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[BY AUTHORITY OF CONGRESS.]

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The Official Gazette.

THE OFFICIAL GAZETTE is published every Tuesday, simultaneously with the weekly issue of patents. From January 1, 1872, (the commencement of its publication,) to June 30, 1883, it was published and bound in semi-annual volumes; since July 1, 1883, in quarterly volumes. All subscriptions must commence with the beginning of a volume; none taken for less than three months. Terms: To all subscribers within the United States and Canada, $5 per annum; to foreign subscribers, $7; single copies, 10 cents; bound semi-annual volumes, (prior to June 30, 1883,) full sheep, $4 per volume; bound quarterly volumes, (subsequent to July 1, 1883,) full sheep, $2.75 per volume. No club rates. *Payment in advance.* All orders should be addressed to "The Commissioner of Patents, Washington, D. C."

Indexes to Patents on Electricity.

Appendix No. 2 to the index to patents relating to electricity, covering the period of time from July 1, 1882, to June 30, 1883, has been issued, and is now for sale. These indexes, arranged alphabetically, numerically, and by classes, are completed to June 30, 1883, and comprise the following volumes:

Vol. 1. Index to patents relating to electricity granted by the United States prior to June 30, 1881, with an appendix, July 1, 1881, to June 30, 1882. One volume, 250 pages. In paper covers, $3; bound, $5.

Vol. 2. Appendix No. 2, July 1, 1882, to June 30, 1883. One volume, 80 pages. In paper covers, $1.50.

Vol. 3. Appendix No. 3, July 1, 1883, to June 30, 1884. One volume, 60 pages. In paper covers, $1.50.

Vol. 4. Appendix No. 4, July 1, 1884, to June 30, 1885. One volume, 60 pages. In paper covers, $1.50.

Vol. 5. Appendix No. 5, July 1, 1885, to June 30, 1886. One volume, 54 pages. In paper covers, $1.50.

Vol. 6. Appendix No. 6, July 1, 1886, to June 30, 1887. One volume, 52 pages. In paper covers, $1.50.

Notice.

UNITED STATES PATENT OFFICE,
Washington, D. C., April 13, 1888.

To expedite the distribution of the mail in this Office, and to insure the prompt and certain delivery of communications to the divisions and officials having charge of the matters to which they relate, attorneys and correspondents are respectfully requested to enter upon the upper left-hand corner of amendments and other communications, if known to them, the number of the room and the name of the examiner or designation of the division to which the communication should be sent.

BENTON J. HALL,
Commissioner of Patents.

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Issue of April 30, 1889.

Patents	427	No. 402,125 to No. 402,551, inclusive.
Designs	15	No. 19,061 to No. 19,075, inclusive.
Trade-Marks	15	No. 16,532 to No. 16,546, inclusive.
Labels	5	No. 5,894 to No. 5,898, inclusive.
Reissues	4	No. 10,998 to No. 11,001, inclusive.
Total issue	466	

TO CITIZENS OF THE UNITED STATES.

States	Patents and Designs.	Trade-Marks and Labels.	States.	Patents and Designs.	Trade-Marks and Labels.
Alabama	2	....	Nebraska	5	1
Arizona Territory	....	....	Nevada	....	....
Arkansas	....	....	New Hampshire	....	....
California	9	1	New Jersey	20	....
Colorado	3	....	New Mexico Terri'ty	1	....
Connecticut	15	....	New York	90	7
Dakota Territory	....	....	North Carolina	1	....
Delaware	....	....	Ohio	24	1
District of Columbia	4	....	Oregon	1	....
Florida	1	1	Pennsylvania	49	5
Georgia	2	....	Rhode Island	7	....
Idaho Territory	....	....	South Carolina	1	....
Illinois	33	1	Tennessee	....	....
Indian Territory	....	....	Texas	2	1
Indiana	5	1	Utah Territory	....	....
Iowa	9	....	Vermont	4	....
Kansas	6	....	Virginia	6	....
Kentucky	6	....	Washington Territ'y	2	....
Louisiana	3	....	West Virginia	....	....
Maine	1	....	Wisconsin	6	....
Maryland	11	....	Wyoming Territory	....	....
Massachusetts	38	....	United States Army	....	....
Michigan	16	....	United States Navy	....	....
Minnesota	5	....			
Mississippi	....	....	Total to citizens of		
Missouri	17	....	the United States	405	19
Montana Territory	....	....			

TO CITIZENS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks and Labels.	Countries.	Patents and Designs.	Trade-Marks and Labels.
Argentine Republic	....	....	Germany	4	....
Australia	....	....	Ireland	1	....
Austria-Hungary	1	....	Mexico	....	....
Belgium	1	1	Newfoundland	....	....
Bermuda	....	....	New South Wales	....	....
Brazil	....	....	Norway	1	....
Canada	4	....	Russia	....	....
Chili	....	....	Scotland	1	....
Costa Rica	1	....	Spain	1	....
Curaçoa	1	....	Switzerland	4	....
Denmark	....	....	Victoria	....	....
England	12	....			
Finland	....	....	Total to citizens of		
France	5	....	foreign countries	37	1

DESIGNS.

19,061.—WATCH-CASE.—*Thomas K. Benton*, Summit, N. J., assignor to *The Courvoisier, Wilcox Manufacturing Company*, New York, N. Y. Application filed March 7, 1889. Serial No. 302,332. Term of patent 7 years.

19,062.—BRUSH OR MIRROR BACK.—*Henry Berry*, Shelton, Conn., assignor to *The Derby Silver Company*, same place. Application filed March 20, 1889. Serial No. 304,047. Term of patent 7 years.

19,063.—KNITTED GARMENT.—*Swits Condé*, Oswego, N. Y. Application filed March 18, 1889. Serial No. 303,780. Term of patent 7 years.

19,064.—BRIDLE-BIT.—*George F. Eberhard*, Cleveland, Ohio. Application filed March 18, 1889. Serial No. 303,778. Term of patent 7 years.

19,065.—CARPET.—*James L. Folsom*, Brooklyn, N. Y., assignor to *The Hartford Carpet Company*, Hartford, Conn. Application filed March 7, 1889. Serial No. 302,347. Term of patent 3½ years.

19,066.—ORNAMENTATION OF DISHES.—*Emile Gérard*, Limoges, France, assignor to *Oliver A. Gager*, Brooklyn, N. Y. Application filed April 20, 1887. Serial No. 235,564. Term of patent 7 years.

19,067.—CARPET.—*Henry Hunt*, Greenville, N. J., assignor to *The Hartford Carpet Company*, Hartford, Conn. Application filed March 7, 1889. Serial No. 302,336. Term of patent 3½ years.

19,068.—ORGAN-CASE TOP.—*Louis H. Marston*, Chicago, Ill. Application filed March 1, 1889. Serial No. 301,705. Term of patent 3½ years.

19,069.—BRETZEL OR CRACKER.—*Eugene H. Sandt*, Allentown, Pa. Application filed April 3, 1889. Serial No. 305,876. Term of patent 7 years.

19,070.—CARPET.—*William E. Sayers*, New York, N. Y., assignor to *The Hartford Carpet Company*, Hartford, Conn. Application filed March 7, 1889. Serial No. 302,331. Term of patent 3½ years.

19,071.—SPOON OR FORK HANDLE.—*Frederick Schmidt*, North Attleborough, Mass., assignor to *F. M. Whiting & Co.*, same place. Application filed March 29, 1889. Serial No. 305,311. Term of patent 3½ years.

19,072.—BOOK-MARK.—*Sarah P. Spencer, Jr.*, Elizabeth, N. J. Application filed March 19, 1889. Serial No. 303,936. Term of patent 7 years.

19,073.—FABRIC FOR CLOAKING, &c.—*Henry Topham*, Philadelphia, Pa., assignor to *Scheppers Brothers*, same place. Application filed March 27, 1889. Serial No. 305,003. Term of patent 3½ years.

19,074.—CURTAIN, DRAPERY, &c.—*Candace Wheeler*, New York, N. Y. Application filed February 20, 1889. Serial No. 300,628. Term of patent 7 years.

19,075.—STOVE-SHELF.—*George E. Wilbur*, Taunton, Mass., assignor to *The Weir Stove Company*, same place. Application filed March 8, 1889. Serial No. 302,534. Term of patent 14 years.

TRADE-MARKS.

[Certificates of registration of Trade-Marks numbered 8,191 and upward are registered under the act of March 3, 1881.]

16,532.—STATUARY.—*Carl Beer*, Chicago, Ill. Application filed March 19, 1889. Used since March 14, 1889.

"An equilateral triangle embracing a star."

16,533.—WATCHES AND WATCH-CASES.—*Crescent Watch Case Company*, Brooklyn, N. Y. Application filed March 9, 1889. Used since September, 1882.

"The representation of a star and crescent combined with the initials 'A. W. W. Co.'"

16,534.—CERTAIN NAMED MEDICINES.—*Forestine Medicine Company, (Limited,)* Gloversville, N. Y. Application filed February 9, 1889. Used since January 8, 1889.

"The word 'FORESTINE.'"

16,535.—CORN-SALVE.—*Giant Chemical Co.*, Philadelphia, Pa. Application filed January 24, 1889. Used since November, 1884.

"The word 'ACORN' and the representation of an acorn, whether the two be used together or separately, and whether a hyphen be used or omitted between the letters 'A' and 'c' of the word."

16,536.—DENIMS.—*Lewis C. Hasell*, New York, N. Y. Application filed March 16, 1889. Used since January 1, 1889.

"The word 'KENWOOD.'"

16,537.—ORANGES AND OTHER CITRUS FRUITS.—*Indian River Orange Growers' Association*, City Point, Fla. Application filed March 16, 1889. Used since February 20, 1889.

"The representation of a star."

16,538.—REFRIGERATORS AND BEER, WATER, AND WINE COOLERS.—*The John C. Jewett Manufacturing Company*, Buffalo, N. Y. Application filed March 25, 1889. Used since January 1, 1885.

"The word 'LABRADOR.'"

16,539.—SWEAT-COLLARS.—*E. L. McClain Manufacturing Co.*, Greenfield, Ohio. Application filed March 18, 1889. Used since February 14, 1889.

"The word 'INVINCIBLE.'"

16,540.—WATCH-CASES.—*H. Muhr's Sons*, Philadelphia, Pa. Application filed March 15, 1889. Used since April 26, 1888.

"'PHOENIX,' whether expressed pictorially or by word."

16,541.—CANNED SALMON.—*Nushagak Canning Company*, San Francisco, Cal. Application filed March 14, 1889. Used since July 1, 1888.

"The words 'MOOSE HEAD' and the pictorial representation of a moose's head."

16,542.—PAINTING AND GRAINING OIL.—*James B. Sipe & Co.*, Allegheny, Pa. Application filed March 13, 1889. Used since August, 1886.

"The words 'JAPAN OIL.'"

16,543.—LAMP-CHIMNEYS.—*Société Anonyme pour la Fubrication D'Apparells D'Eclairage*, Liege, Belgium. Application filed March 15, 1889. Used since November 29, 1883.

"The letters and figure 'L & B.'"

16,544.—SOCIETY BOOKS AND PRINTED MATTER.—*The Supreme Sitting of the Order of the Iron Hall*, Indianapolis, Ind. Application filed April 26, 1888. Used since March or April, 1881.

"The representation of a safe having figures indicating an amount or sum of money above it or on its top."

16,545.—LIQUID AND POWDERED PERFUMERIES AND SOAPS.—*John Wanamaker*, Philadelphia, Pa. Application filed June 25, 1888. Used since January 1, 1883.

"The word 'CARTWRIGHT.'"

16,546.—CHUCKS.—*Westcott Chuck Company*, Oneida, N. Y. Application filed March 14, 1889. Used since January 1, 1875.

"The words 'LITTLE GIANT.'"

LABELS.

5,894.—Title: "SILVER STEEL" (FOR BRASS BAND INSTRUMENTS.)—*Henry J. Distin*, Philadelphia, Pa. Application filed April 1, 1889.

5,895.—Title: "SAXE'S TASTELESS CASTOR OIL."—*A. W. Saxe*, South Omaha, Nebr. Application filed April 5, 1889.

5,896.—Title: "CALCULATION" (FOR CIGARS.)—*Schmidt & Co.*, New York, N. Y. Application filed December 15, 1888.

5,897.—Title: "F. M. THOMAS' SURE CURE FOR RHEUMATISM."—*Francis Marion Thomas*, Paris, Tex. Application filed April 4, 1889.

5,898.—Title: "WALKER'S COLD BELT-CEMENT."—*John Walker*, New York, N. Y. Application filed April 2, 1889.

PATENTS

GRANTED APRIL 30, 1889.

402,125. CAR-SEAL. HIRAM ABBOTT, Wakeman, Ohio. Filed Nov. 2, 1888. Serial No. 289,723. (No model.)

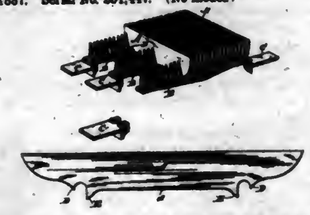


Claim.—1. In a car-seal, the combination, with a seal part, of the looped shackle having one arm secured permanently to the seal part and the other arm twisted around the former, substantially as and for the purpose specified.

2. In a car-seal, the combination of the seal part provided with a transverse perforation and a longitudinal perforation intersecting each other, and the looped shackle provided on one of its free ends with an eye which fits in the transverse perforation and is engaged by a pin arranged in the longitudinal perforation, the arms of the shank being twisted together, substantially as specified.

3. In a car-seal, the combination, with a seal part, of the looped shackle having an arm, d, attached to the seal part, and an arm, d^2, twisted around the arm d, the twisted portion of the shackle being provided at intervals with transverse indentations or cuts to partially sever the arms of the shackle, substantially as specified.

402,126. GRATE-BAR. JAMES A. ALLEN, Adams, Mass. Filed Oct. 4, 1887. Serial No. 251,447. (No model.)



Claim.—1. The combination, with the supporting-bars having the separating and spacing fingers with flat bearing-surfaces between them, of the grate-bars provided with projections on the under side terminating in transverse edges for resting upon the flat bearing-surfaces between the fingers of the supporting-bars, as set forth.

2. The combination, with the supporting-bars having the separating and spacing fingers with flat bearing-surfaces between them, of the grate-bars provided with projections on the under side terminating in transverse edges for resting upon the flat bearing-surfaces between the fingers of the supporting-bars, and other projections on said grate-bars for abutting against the supporting-bars to limit the longitudinal movement of the grate-bars, substantially as described.

402,127. STEAM-BOILER. JOHN BAIRD, New York, N. Y. Filed Jan. 2, 1888. Serial No. 295,188. (No model.)

Claim.—1. In combination with a fire-box composed of arched tubes, substantially as described, a heating-surface composed of vertical tubes near the rear end of the fire-box, said combination being substantially such as specified.

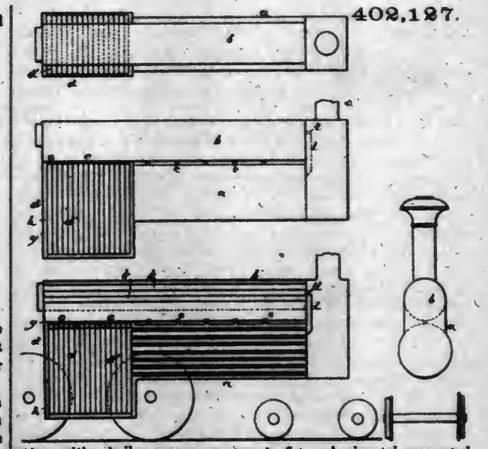
2. A fire-box composed of arched tubes, as specified, in combination with a boiler proper composed of two horizontal connected shells, the combination being substantially as hereinbefore set forth.

3. A fire-box composed of arched tubes connected at their lower ends with horizontal tubes, substantially as described, in combination with a boiler-iron front, as described.

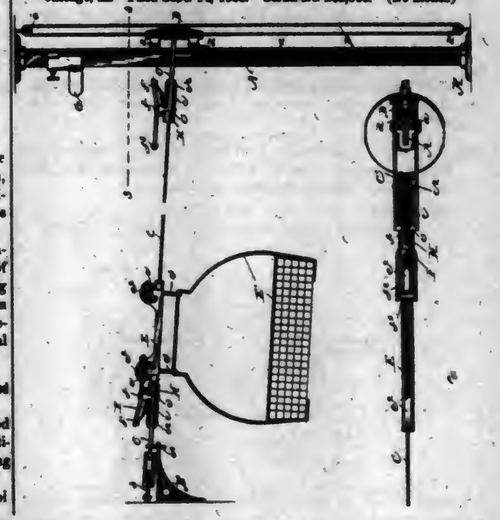
4. A fire-box composed of arched tubes connected at their lower ends with horizontal tubes, in combination with a tube-sheet and a water-leg to the boiler, as described.

5. A fire-box composed of arched tubes connected at their lower ends with horizontal tubes, in combination with the water-leg and tube-sheet of a boiler, and a boiler-iron front provided with a water-space, all substantially as described.

402,127.

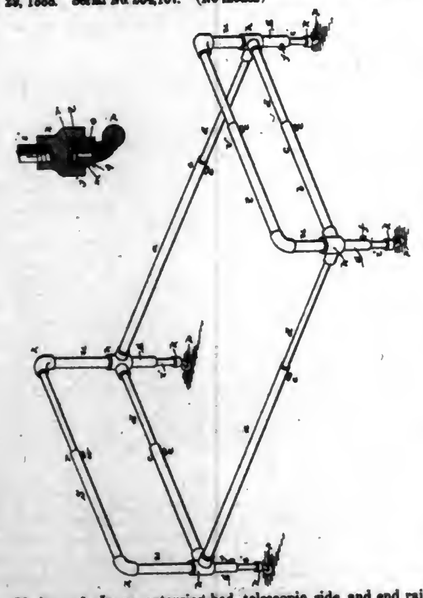


402,128. CASH AND PACKAGE CARRIER. JAMES F. BARTLETT, Chicago, Ill. Filed Sept. 14, 1888. Serial No. 285,269. (No model.)



Claim.—In a cash and package carrier, the combination, with the track-wire C, of links C', for attaching said track-wire to its support, having springs *e* applied between the ends of said links and the ends of the track-wire for permitting the track-wire to yield longitudinally under increasing or decreasing tension, the straight vertical track *a* at one end of said track-wire, a sliding piece, D, pivotally connected to the link C', which is adjacent to the track *a* and adapted to run on said track, and a taut belt, D', supported parallel to said track on a pulley at each end of the belt, said sliding piece being connected in said belt as a part thereof, as and for the purpose specified.

402,129. BED. WILLIAM BECKERT, Allegheny, Pa. Filed Aug. 29, 1888. Serial No. 284,107. (No model.)



Claim.—1. In an extension-bed, telescopic side and end rails, whereby the bed may be extended and contracted longitudinally and laterally, in combination with telescopic legs for adjusting the height of the bed, and devices, substantially as described, for locking said rails and legs in adjustment, in the manner and for the purpose set forth.

2. The combination, in an extension-bed, of the telescopic side and end rails, whereby the bed may be extended and contracted laterally and longitudinally, telescopic legs for adjusting the height of the bed, and four-way couplings for connecting said telescopic sections together, in the manner and for the purpose substantially as described.

3. The combination of the side rails, the end rails, extensible slats having their outer ends bent in the form of an S, the inner curved portion of which is loosely seated upon said side rails, and longitudinal extensible stringers connected to said slats, substantially as described.

402,130. ADJUSTABLE FOOT-REST. GEORGE P. BEDFORD, New York, N. Y., assignor of one-half to Watson L. Savage, same place. Filed Oct. 27, 1888. Serial No. 289,306. (No model.)



Claim.—1. In an adjustable foot-rest, the combination, with a removable supporting-frame terminating in upwardly-curved hooks *a a'*, which themselves are curved at their lower extremities into retaining-rings *f*, of a flexible suspension-cord, *b*, passing through the retaining-ring *f*, and a stirrup, S, supported at one end thereof, said cord being provided at the other end with a tension-block, *c*, having an eye engaging the suspension-cord *b*, substantially as described.

2. The combination, with a supporting-frame, A, of the foot-piece S', and the continuous suspension-cord *b*, the latter depending from the frame and having attached at one end a tension-block, *c*, provided with an eye engaging the main cord, and having its other end united to the main cord at *e* after passing through the foot-piece S', on each side of which it is knotted to prevent slipping, substantially as described.

402,131. HANDLE FOR SAUCEPANS. WILLIAM H. BERGER, Philadelphia, Pa. Filed May 8, 1886. Serial No. 201,584. (No model.)



Claim.—A handle for saucepans and similar articles, consisting of a main portion having side flanges and projecting lug at the inner end of the handle and perforated between said flanges to prevent accumulation of grease, substantially as and for the purposes specified.

402,132. ROD-COUPLER. ALBERT G. BERRY, Washington, D. C. Filed May 5, 1888. Serial No. 272,936. (Model.)



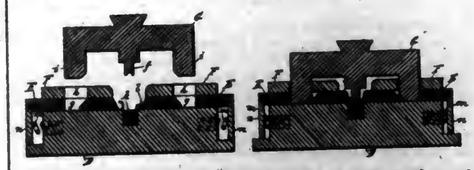
Claim.—1. A coupler having a joint composed of a key upon the male portion, a slot in the female portion for the reception of the key, a recess connected with said slot, and a keeper carried by and adjustable on the female portion to position alongside the recess and within said slot for locking the key within said recess, substantially as and for the purposes set forth.

2. A coupler having a joint composed of a key upon the male portion, a slot in the female portion, a recess in the side of said slot, a removable ring carrying a lug within the slot, a spring to actuate said ring, and a fixed ring to limit the movement of the movable ring, substantially as set forth.

3. A coupler having a joint composed of a key upon the male portion, a slot in the female portion, a recess connected with the slot, and a keeper actuated by a spring to lock the key within said recess, substantially as set forth.

4. A coupler having a joint composed of a key upon the male portion, a slot in the female portion, a recess connected with the slot, a lug within the slot for locking the key within the recess, and a movable ring to which the lug is secured for controlling said lug, substantially as set forth.

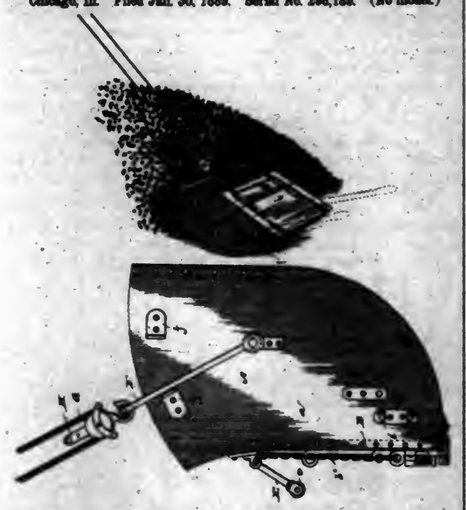
402,133. MACHINE FOR FINISHING METAL TUBES. LEWIS F. BEITS, New York, N. Y. Filed July 27, 1887. Serial No. 245,398. (No model.)



Claim.—1. In a machine for finishing metal tubes, the recessed bed-plate, the bending-plates mounted thereon and having openings with inclined faces, the mandrel, and the closing-die provided with projections arranged to enter the openings in the bending-plates and to move said plates, the parts being combined substantially as shown and described.

2. In a machine for finishing metal tubes, the combination of a recessed bed-plate, bending-plates mounted thereon and having openings with inclined faces, a mandrel, a closing-die provided with projections arranged to enter the openings in the bending-plates, and returning-springs operating in connection with the bending-plates, substantially as shown and described.

402,134. LOADING AND HOISTING BUCKET. WALTER S. BOGLE, Chicago, Ill. Filed Jan. 30, 1889. Serial No. 298,189. (No model.)

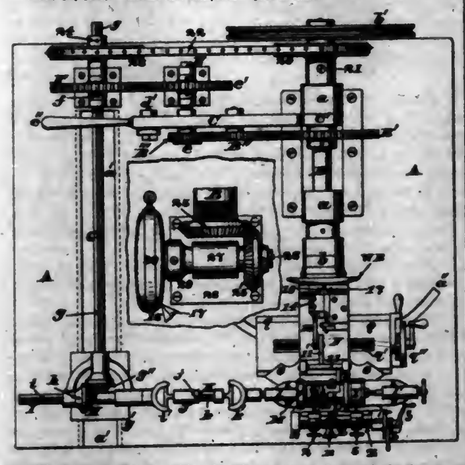


Claim.—1. A loading and hoisting bucket having a front wall with a straight portion, a bail pivoted to opposite walls of the bucket at right angles to said front, and a bail-stop located on one of the walls to which the bail is pivoted and in such position as to be above the bail when the bucket is in the act of filling, whereby to limit the movement of the bail and to form a fulcrum therefor, substantially as described.

2. A loading and hoisting bucket having a wall with a straight portion, a bail pivoted to opposite walls of the bucket at right angles to the straight portion, a bail stop located on one of the walls to which the bail is pivoted and between the pivotal point thereof and the mouth, whereby to limit the movement of the bail and to form a fulcrum therefor in filling, and lugs on the walls to which the bail is pivoted to provide bearings for levers, whereby to control the bucket in filling, substantially as described.

3. A loading and hoisting bucket having a front wall with a straight portion, a bail pivoted to opposite walls of the bucket at right angles to the straight portion, a bail-stop located on one of the walls to which the bail is pivoted, and in such position as to be above the bail when the bucket is filling, whereby to limit the movement of the bail and to form a fulcrum therefor, and a hinged door in the rear wall of the bucket and toward the bottom thereof, substantially as described.

402,135. ENGRAVING AND CHASING MACHINE. WILLIAM W BRADLEY, Newport, Ky., assignor to John C. Dueber, same place. Filed Mar. 14, 1888. Serial No. 282,706. (No model.)



Claim.—1. The combination, in an engraving and chasing machine, of a spindle provided with means for holding the blank, a roll having one section that produces the foreground ornament on said blank and another section that produces the background-lining on the same, a pair of tracers operated uniformly by a feed-screw and sliding along a common rocker, so as to traverse these sections, and devices that communicate the motion of said tracers to a single cutter, substantially as herein described.

2. An engraving and chasing roll composed of an ornamented section and another section consisting of a series of notched or fluted disks, said sections being mounted upon a common mandrel and traversed by uniformly-moving tracers that actuate a single cutter, substantially as herein described.

3. The combination, in an engraving and chasing machine, of a roll having foreground and background sections, tracers that traverse said sections and communicate motion to a single cutter, and a feed-screw that uniformly operates said tracers, substantially as herein described.

4. The combination, in an engraving and chasing machine, of a spindle provided with means for holding the blank, a roll having one section that produces the foreground ornament and another section that produces the background-lining, a pair of tracers operated uniformly by a feed-screw and sliding along a common rocker, so as to traverse these sections, and devices that communicate the motion of said tracers to a single cutter mounted in a carrier hinged to the head of a compound slide-rest, substantially as herein described.

5. In an engraving and chasing machine, the ornamented roll S *s* and notched disks V *v*, secured upon a common mandrel, R', having a head, R, in combination with the driving-chuck M, having a chamber, *m*, center *m'*, and screws *m'' m''*, which screws enter the longitudinal slots *r r* of said head R and cause the mandrel, roll, and disks to revolve in unison with said driving-chuck, as herein described.

6. The combination of rocker X, feed-screw Z, standard 6, having slot 6', and set-screw 10, and the divided nut composed of an unthreaded portion, 8, and threaded portion 8', said unthreaded portion being provided with a lug, 7, that engages said slot 6', for the purpose herein described.

7. The combination, in an engraving and chasing machine, of the main spindle B, having a sprocket-wheel, 20, and means for holding the blank, a longitudinally-shiftable shaft, G, having a sprocket-wheel, 23, and universal-joint connections with the slide-rest that carries the ornamental roll, and a perforated belt that communicates motion from wheel 20 to wheel 23, said wheel 20 having means for temporarily locking it to said spindle B, for the purpose described.

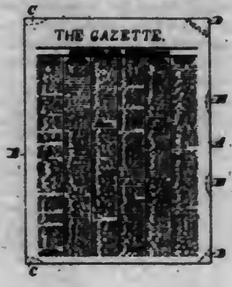
8. The combination, in an engraving and chasing machine, of the main spindle B, carrying a bevel-gear, 25, that drives a similar gear, 25', and an auxiliary chuck, 29, which is temporarily attached to the machine, for the purpose described.

9. An auxiliary chuck geared at an angle to the main spindle of an engraving and chasing machine, for the purpose described.

10. The combination, in an engraving and chasing machine, of a roll having foreground and background sections, a pair of tracers operated uniformly by a feed-screw and sliding along a common rocker, and devices for uncoupling the background-tracer from said screw, and means for temporarily locking said tracer to said rocker, for the purpose described.

11. The combination, in an engraving and chasing machine, of mandrel R', having a head, R, screw-threaded shank R'', and longitudinal groove *r''*, the ornamented roll S *s*, secured to said head by the screws *r' r'*, the head T, having a screw, *t*, that enters said groove *r''*, the stop-plate U, having an annular neck, *u'*, surrounding the mandrel R', a series of notched disks, V *v*, mounted upon said annular neck, a cap, W, secured to the stop-plate U by screws *w w*, traversing said disks, and a nut, *w'*, engaged with the screw-threaded shank R'' of the mandrel, which latter is coupled to the driving-chuck M, as herein described.

402,136. METHOD OF PREVENTING THE FRAUDULENT RETURN OF PERIODICALS. ROBERT D. BRAIN, Springfield, Ohio. Filed Oct. 13, 1888. Serial No. 288,018. (No model.)



Claim.—1. The herein-described method of preventing the fraudulent return of newspapers and other periodicals, the same consisting in uniting the sheets thereof at such point or points as will cause a severance by the act of opening the sheets to secure access to the reading-matter therein.

2. The herein-described method of preventing the fraudulent return of newspapers or other periodicals, the same consisting in uniting the sheets thereof at or near their margin, so that by the act of opening the sheets to secure access to the reading-matter therein a change from the normal appearance of the connection will be effected.

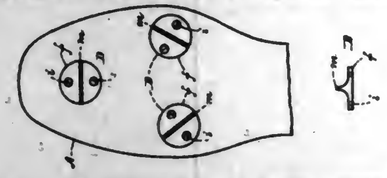
3. The herein-described method of preventing the fraudulent return of newspapers or other periodicals, the same consisting in uniting the margins of sheets at the corners thereof by an adhesive substance, whereby the sheet or sheets will be torn by the act of opening them for reading.

402,137. BOOT-DRIER. EDMUND A. BRYANT, Ellicottsville, N. Y. Filed Oct. 6, 1887. Serial No. 251,647. (No model.)



Claim.—As an improvement in boot-driers, the base A, adapted to be removably placed over a stove-hole, the reversely-inclined tubular standards rising from the base, and reversely-inclined tubes at the upper ends of the standards, as set forth.

402,138. CALK FOR RUNNING-SHOES. WALTER W. BURNHAM, Boston, Mass. Filed Jan. 25, 1888. Serial No. 297,506. (No model.)



Claim.—The calk D, comprising the bed-plate *f*, provided with holes *i*, and the blade *m*, formed centrally and integral therewith and projecting at right angles therefrom, substantially as described.

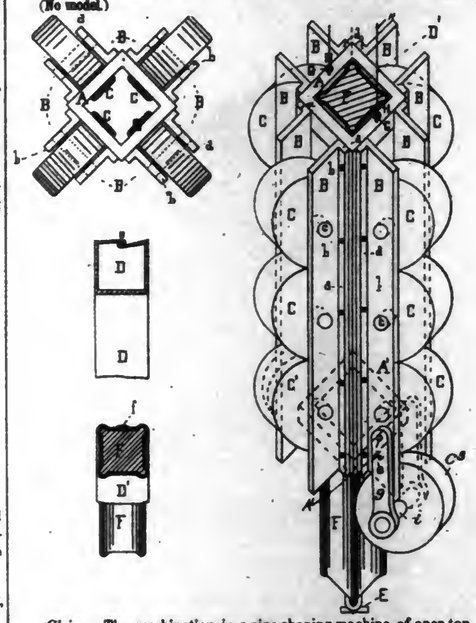
402,139. WATER-GATE. JOSEPH R. CAPLINGER, Smithfield, Ky. Filed Dec. 10, 1888. Serial No. 293,207. (No model.)



Claim.—1. The combination, with the posts B, the gate-sections C C, hinged thereto, and springs for normally throwing said sections to a closed position, (the lower inner ends of the sections being provided with projecting studs $c' c'$,) of the gravity-latch E, said latch hinged at its rear end forward of the gate, provided with a water-resistance surface at its rear end, its forward end inclined and provided with a notch adapted to engage the studs $c' c'$ when the latch is dropped, the forward end of said latch adapted to rise from engagement with the studs when increased pressure is applied against the rear end of the latch, substantially as and for the purpose specified.

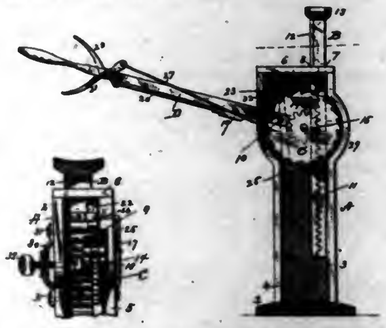
2. The combination, with the posts B B, the gate-sections C C, hinged to said posts, and springs for forcing said sections normally into a closed position, said sections provided with inwardly-projecting studs $c' c'$, of the gravity-latch pivoted forward of the gate and projecting to the rearward thereof, said latch consisting of the body portion e', having an inclined end, e^2, a notch, e^3, adapted to engage the studs $c' c'$, a rearwardly-extending arm, e, pivoted, as shown, and lateral wings or extensions E^4, extending transversely across the rear face of the latch below its pivotal point, said arms forming a resistance-surface for the water-pressure, substantially as and for the purpose set forth.

402,140. MACHINE FOR SHAPING SHEET-METAL PIPES. JAMES A. CARR, Woodbury, N. J. Filed May 17, 1888. Serial No. 274,178. (No model.)



Claim.—The combination, in a pipe-shaping machine, of open top and bottom bolting-pieces, A A', roll-carriers B, shaping-rolls C, stationary mandrel F, and suitable mechanism for operating the same, for the purpose shown and described.

402,141. LIFTING-JACK. HENRY H. CLEVER, Cloversburg, Pa. Filed July 13, 1888. Serial No. 279,892. (No model.)



Claim.—1. The combination, with the casing A, formed with a slot, 7, in its top 6, to receive the lifting-rack B, said slot having a groove, 8, at its edge, of the lifting-rack B, having the teeth united at the edge by a continuous flange, 12, the gear-wheel mounted in the casing, the stop-pawl 22, depending from the roof of the casing, the lever D, fulcrumed on bearings in the casing and formed with an open-end slot, 17, to set about the ratchet-wheel, and provided with a spring-actuated bar, $19^{\times}$, a bell-crank lever, 21, on the lifting-lever D, to operate the spring-actuated bar $19^{\times}$, the latch 25, mounted on the casing and arranged with its free end to bear out on the stop-pawl, and a bell-crank lever, 28, mounted on the lifting-lever to operate said latch, substantially as described.

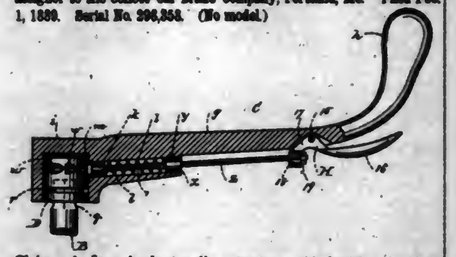
2. In a lifting-jack, the combination, with the reciprocable lifting-rack B, a gear and ratchet wheel, 14, mounted in the casing, and a pawl, 22, to hold the gear and ratchet against reversing, of a lifting-lever, D, fulcrumed on bearings in the casing, and formed with an open-end slot, 17, to set about the ratchet-wheel, a spring-actuated pawl-bar, $19^{\times}$, mounted on the lifting-lever, and a bell-crank lever, 21, on the lifting-lever to operate the stop-bar.

3. The casing A, having an enlarged upper portion to hold the operating mechanism, the lifting-rack B, arranged in the casing with its rack against the wall thereof, and formed with a side flange, 12, to

connect the teeth and guide the bar, combined gear and ratchet wheels 14, mounted on bearings in the casing, a spring-actuated pawl, 22, to stop the gears against reversal, a lever, D, to give intermittent motion to the gear and ratchet, and having a spring-pawl, $19^{\times}$, to engage the ratchets, and two levers, 21, 28, mounted on the lifting-lever D to release the pawls of the lever and casing, all substantially as described.

4. In combination with the casing, the reciprocable rack B, and gears, the spring-bar 30, secured to the side of the casing, and the set-screw 32, projected through the spring-bar with its end to bear on the end of the journal of the gears, substantially as and for the purpose specified.

402,142. BRAKE-HANDLE. AUSTIN B. COLLETT, Chelsea, Mass., assignor to the Collett Car Brake Company, Portland, Me. Filed Feb. 1, 1889. Serial No. 298,358. (No model.)



Claim.—1. In a brake-handle, a body provided with a head at one end and a vertical chamber in its opposite end, a ratchet-block fitted to revolve in said chamber and provided with a socket for the brake-rod, a horizontal chamber in said body opening into the vertical chamber, a spring-actuated pallet fitted to slide in said horizontal chamber, a lever pivoted to said handle, and a rod connecting one arm of said lever with the pallet, substantially as and for the purpose set forth.

2. In a brake-handle, a combination of a body having a vertical chamber, a ratchet-block fitted to revolve therein and provided with an annular groove, a retaining-pin projecting from the handle into said groove, a horizontal chamber opening into said vertical chamber, a pallet fitted to slide therein, a sleeve in the outer end thereof, a spring between said sleeve and pallet for holding it in engagement with said ratchet, a rod secured to said pallet and sliding in said sleeve, and a lever on said handle, one arm of which is secured to the outer end of said rod, substantially as described.

3. In a device of the character described, the combination of a brake-rod provided with a ratchet-wheel, a click for said wheel, a handle provided with a vertical chamber, a ratchet-block fitted to revolve therein and provided with a socket for the brake-rod, a horizontal chamber, a spring-actuated pallet therein in engagement with said ratchet-block, and a rod fastened by one end to said pallet, its opposite end being movably secured in an arm of a lever pivoted to said handle, substantially as described.

4. The brake-handle C, comprising the body *g*, provided with the head *h* and chamber *m v*, the ratchet-block D, fitted to revolve in the chamber *m* and provided with the socket *p*, the rod *x*, provided with the pallet *k*, disposed in the chamber *v*, the spring *l*, for actuating said pallet, and the lever H, pivoted to said body and provided with the opening 18, in which the outer end of said rod is secured, substantially as described.

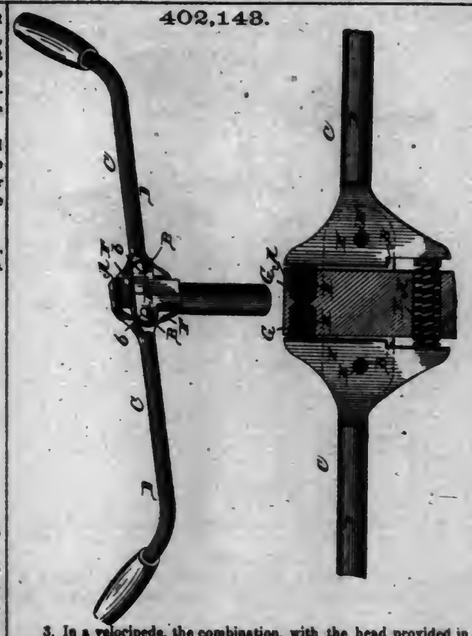
5. The brake-rod B, provided with the wheel *b* and head *g*, in combination with the click *f*, the handle C, comprising the body *g*, having the head *h* and chambers *m v*, the ratchet-block D, fitted to revolve in the chamber *m* and provided with the socket *p*, the pallet *k*, disposed in the chamber *v*, the sleeve *x*, the lever H, pivoted to said body and provided with the opening 18, the rod *x*, fitted to slide in said sleeve and secured to said pallet, and the spring *l*, disposed in the chamber *v*, substantially as described.

402,143. HANDLE-BAR FOR BICYCLES. CHARLES J. COLLINS, Cincinnati, Ohio. Filed Feb. 13, 1889. Serial No. 299,773. (No model.)

Claim.—1. In a velocipede, the combination, with the head, of the handle-bar formed in independent arms or sections, which are pivoted to the head and are provided with cross-heads at their adjacent ends, and the cushions arranged between the ends of the cross-heads and the head of the machine, substantially as specified.

2. In a velocipede, the combination, with a head provided with lateral parallel ears B B, of the handle-bar formed in independent arms or sections which are pivoted between the said ears and are provided with cross-heads F F, the rubber cushions bearing against the upper ends of the said cross-heads, and the coiled spring-cushion bearing against the lower ends of the said cross-head, substantially as specified.

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3. In a velocipede, the combination, with the head provided in its opposite sides with the recesses G G, and having a transverse perforation, I, of the rubber cushions fitting in the said recesses, the coiled spring-cushion arranged in the transverse perforation, and the handle-bar comprising the independent arms or sections D D, which are pivoted to the head, and are provided with cross-heads which bear at their upper and lower ends, respectively, against the rubber and the spring-cushions, substantially as specified.

4. In a velocipede, the head, the handle-bar formed in independent arms or sections which are pivoted to the head, the rubber cushions H, bearing above the pivot-point of the arms or sections, and the coiled spring K, bearing below the said pivot-point, as set forth.

5. In a velocipede, the head, the handle-bar formed in two independent sections pivoted to the head and held out of contact therewith by means of separate and independent cushions which bear against the said sections, respectively, above and below the pivot point thereof, as set forth.

402,144. ADJUSTABLE BARREL-COVER. SAMUEL R. CRAGER, Wichita, Kans. Filed Feb. 19, 1889. Serial No. 300,427. (No model.)



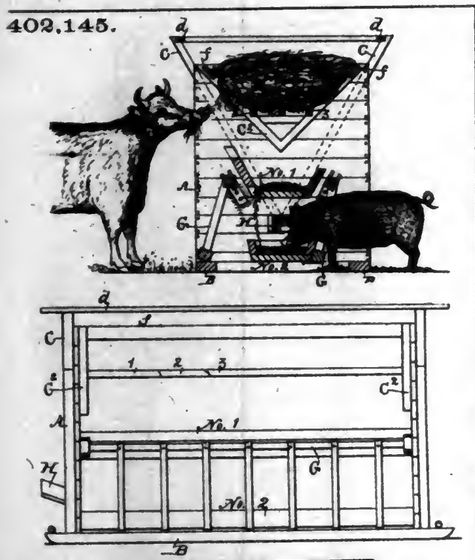
Claim.—1. The barrel-cover consisting of the combination of the screen-cover R S, the coil-spring band D, and the chains C, connecting said cover and band, substantially as and for the purpose set forth.

2. The combination, with a barrel-cover consisting of a screen or netting, of the adjustable spring-band D, and flexible connections connecting said cover with said band, substantially as and for the purpose specified.

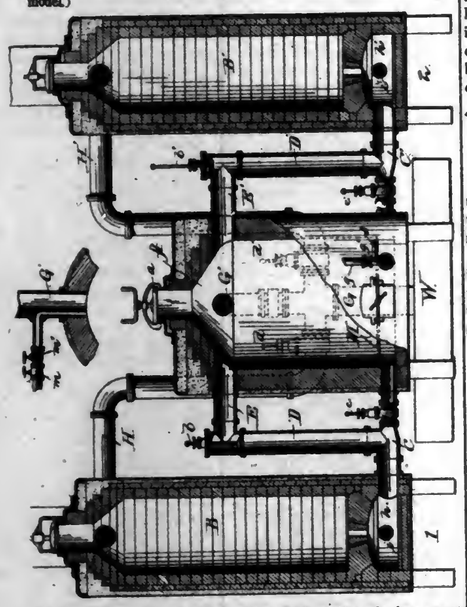
402,145. COMBINED TROUGH AND RACK. WILLIAM H. CRITCHFIELD and ROSS J. RENNER, Wirt, Iowa. Filed July 30, 1888. Serial No. 280,856. (No model.)

Claim.—The device for feeding animals, consisting of the frame A B, the triangular frames C and C^1, having fixed horizontal bars to produce a feed-rack, the trough No. 1, having an adjustable side or section, the trough No. 2, and the adjustable guards G, constructed and combined substantially as shown and described, for the purposes stated.

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402,146. PROCESS OF MANUFACTURING GAS. WILLIAM M. COSH, Baltimore, Md. Filed Oct. 19, 1888. Serial No. 288,603. (No model.)

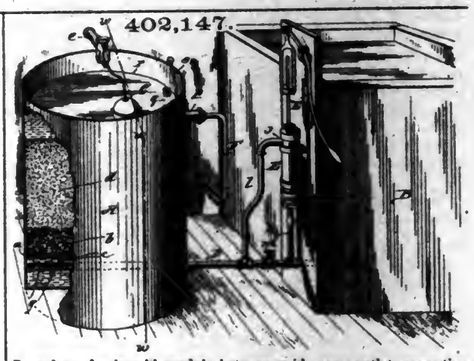


Claim.—The hereinbefore-described method of producing gas at a single heat, consisting in first passing steam through a superheater, and thence directly through an incandescent mass of coal, then causing the resultant gases to take up hydrocarbon vapor, and subsequently passing the gases and vapor through a fixing-chamber, then reversing the current of steam and passing it through the chamber first used as a fixing-chamber, then through the incandescent coal in a direction opposite to that first mentioned, then causing it to take up hydrocarbon, and, finally, passing the gases and vapor through the chamber first used as a superheater, all as set forth.

402,147. FILTERING APPARATUS. CHARLES H. DENISON, Springfield, Mass. Filed Jan. 14, 1889. Serial No. 296,230. (No model.)

Claim.—1. The combination, with a filter-tank, a cistern, and a conduit, D, leading thereto from the lower portion of the filter-tank, of a pump having its inlet in communication with said cistern, and having its outlet connected to an intermediate portion of said conduit

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D, and a valve in said conduit between said pump-outlet connection and the said cistern, substantially as described.

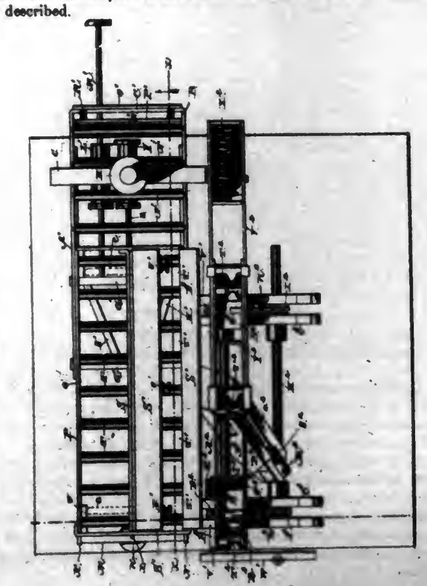
2. The combination, with a filter-tank provided with a perforated false bottom and a superposed filtering material, and an angular pipe rotatably mounted in said tank and having as a continuation thereof a waste-pipe, a cistern, and a conduit leading thereto from the tank-space below said false bottom, provided with a valve, of a pump by its inlet in communication with said cistern and by its outlet in communication with said lower tank-space, substantially as and for the purpose described.

3. In a filtering apparatus, in combination, a filter-tank provided with a perforated false bottom and a superposed filtering material, an angular pipe rotatably mounted in said tank, and having as a continuation thereof a waste-pipe, F, a supply-pipe, *e*, and a ball-cock, C, a cistern, B, and a pipe, D, leading thereto from the tank-space below said false bottom, provided with a valve, and a pump by its inlet in communication with said pipe D between the said valve and the cistern, and having a pipe, *l*, leading from its outlet to said pipe D between its valve and the filter-tank, all substantially as shown and described, and for the purpose set forth.

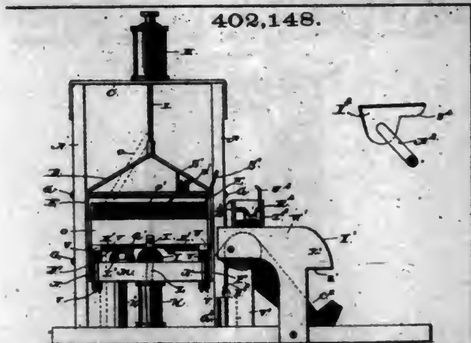
402,148. FEED AND TRANSFER MECHANISM FOR ROLLING-MILL PLANTS. ROBERT P. DOLAN, Steelton, Pa., assignor of one-half to A. R. Dunkle, same place. Filed Jan. 13, 1888. Serial No. 260,635. (No model.)

Claim.—1. The combination of the supporting-frame and the table arranged on the said frame and means for raising and lowering the opposite ends of the frame independently, whereby the frame may be tilted or inclined longitudinally, substantially as described.

2. The combination of the frame, means for raising and lowering the opposite ends of the same independently, whereby the frame may be tilted or inclined longitudinally, and the table supported on the frame and adapted to move back and forth thereon, substantially as described.



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3. The combination of the supporting-frame having its opposite ends independently movable in a vertical direction, the table movable longitudinally on the said frame, and means, substantially as set forth, for operating the said table, substantially as described.

4. The vertically-movable table having the rollers T, and the guide S', having the rollers U' on one side supported at an elevation above the rollers T, substantially as described.

5. The combination of the vertical standards A, the frame D, vertically movable on the said standards, the vertically-movable cross-head M, at a distance from the standards, the track-bars pivotally connected at opposite ends to the said cross-heads and to the frame D, and the table movable longitudinally on the said track-bars, substantially as described.

6. The table having the extension provided with the springs at its outer end, substantially as described.

7. The table having the rollers T, journaled permanently therein, and provided with the longitudinally-adjustable extension having the removable rollers N', substantially as described.

8. The combination of the supporting-frame, the hydraulic engines to raise and lower the opposite ends thereof independently, the table arranged on the frame, the hydraulic engine to move the said table in a longitudinal direction, the extension, and the hydraulic engine to operate the said extension, substantially as described.

9. The combination of the guide-arm W', the inclined guideways C^3, the endless carriers, the guide R^3, arranged on the said guideways and secured to the said carrier, means to normally elevate the guide the inclined cam P^3, and the extension movable longitudinally on the outer end of the guide and having the spring, said extension being further provided with the roller engaging the cam P^3, substantially as described.

10. The combination of the standards V', the shaft A^3, journaled therein, the guideways C^3, the shaft H^3, journaled in the lower ends of the said guideways, the sprocket-wheels on said shafts, the endless sprocket-chains connecting said sprocket-wheels, the drum secured to shaft A^3 and having the chain and counterweight G', and the guide secured to the endless chain and movable laterally on the guideways, substantially as described.

11. The table, in combination with the longitudinally-adjustable extension having the rollers N', as set forth.

12. The combination, with the guide R^3, means to elevate the same, and the extension V^3, of the guide having the roller W^3, and the inclined cam P^3, to be engaged by the roller when the guide is elevated and lowered, as set forth.

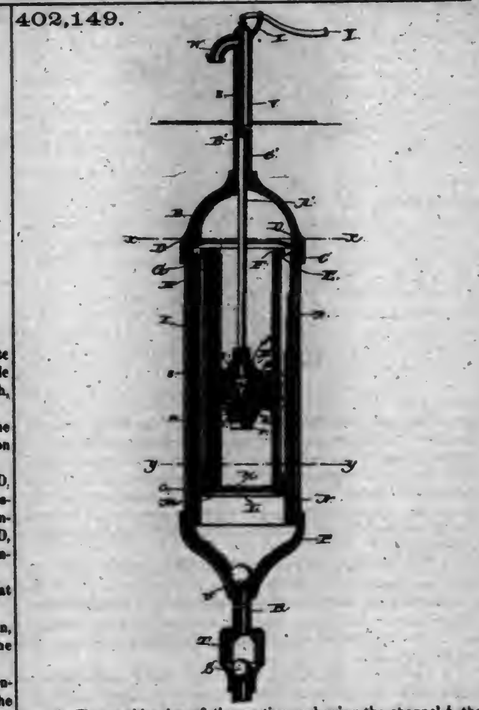
13. The guide R, having the longitudinally-movable extension V^3, in combination with the inclined arms supporting the guides, the carriers to move the same thereon, and the cam engaging the extension, whereby the latter is moved longitudinally by the ascent and descent of the guide, substantially as described.

402,149. PUMP. JOSEPH P. M. RAREY, Polk, Ohio. Filed Mar. 3, 1888. Serial No. 266,090. (No model.)

Claim.—1. In a pump, the combination of the outer cylinder, the cap secured to the upper end of the same, the ring E, and the valve-ring D, clamped between the cap and the outer cylinder, the inner cylinder secured to the ring E, the valve-ring K at the lower end of the inner cylinder, the plate L, the collar N, secured to the lower end of the inner cylinder and clamping the plate L and ring K against the inner cylinder, and the plunger reciprocating in said inner cylinder, as specified.

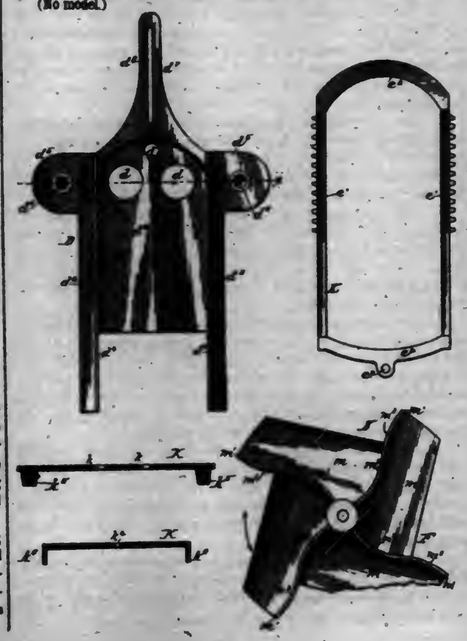
2. The plunger having the sections *a* and *m*, said section *a* having the channel *b*, the recess *f*, communicating with the said channel, said section *m* having the channel *o*, also communicating with the said recess, and the valve arranged in the said recess and adapted to alternately cut off communication between the same and the channels *b* and *o*, substantially as described.

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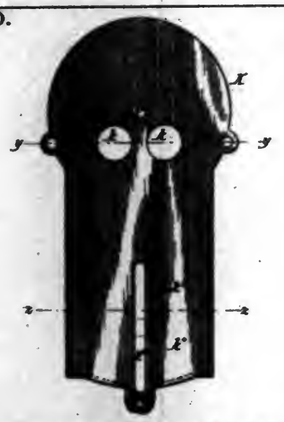


3. The combination of the section *a*, having the channel *b*, the depending stud *e*, the recess *f*, formed in said stud and communicating with channel *b*, the section *m*, fitted on the stud and having the channel *o*, communicating with recess *f*, the valve *i*, arranged in the said recess, the nut *r*, screwed to the lower end of the stud, and the packing-rings *s*, clamped between the sections *a* and *m*, substantially as described.

402,150. BROADCAST SEED-SOWER. LLOYD EBERHART and IRVING D. STEVENS, Joliet, Ill. Filed Oct. 24, 1887. Serial No. 253,213. (No model.)



402,150.



Claim.—1. The combination, substantially as hereinbefore set forth, with the hopper having its bottom apertured to discharge at separate points, of the two rotary adjustable valve-plates each provided with a graduated series of openings and arranged to bring its openings into register with one of the discharge-apertures of the hopper-bottom, whereby the discharge from the hopper at separate points may be governed by valve-apertures of different areas, for the purpose described.

2. The combination, substantially as hereinbefore set forth, with the hopper having an apertured bottom, of a rotary valve-plate, H, provided with a toothed hub or pinion and having a graduated series of openings for the purpose set forth, and a sliding rack engaging said toothed hub or pinion of the rotary valve-plate as a means for operating the same.

3. The rotary valve-plates each provided with a toothed hub or pinion and an annular line of graduated apertures, combined with the sliding double rack engaging the pinions of the rotary valve-plates, whereby the said valve-plates may be rotated either way by operating the double rack, substantially as described.

4. The apertured hopper-bottom provided with a slotted extension, in combination with the apertured rotary valve-plates each having a toothed hub or pinion, and the sliding double rack engaging the toothed hubs or pinions of the rotary valve-plates and having a handle extending up through the slot of the hopper-bottom extension, whereby the rack can be operated and the position of the apertures of the said valve-plates determined, substantially as described.

5. The combination, substantially as hereinbefore set forth, with the rotary adjustable apertured valve-plates, each provided with a toothed hub or pinion, of the sliding double rack engaging the pinions of said valve-plates, and an apertured bottom plate arranged below the rotary adjustable valve-plates and adapted as a guide for the sliding double rack.

6. The combination, substantially as hereinbefore set forth, with the rotary adjustable apertured valve-plates H, arranged below the apertured hopper-bottom, of a plate arranged below the rotary adjustable valves and provided with ribs d^6 and the cut-off slides G, supported to slide upon said plate between its said ribs.

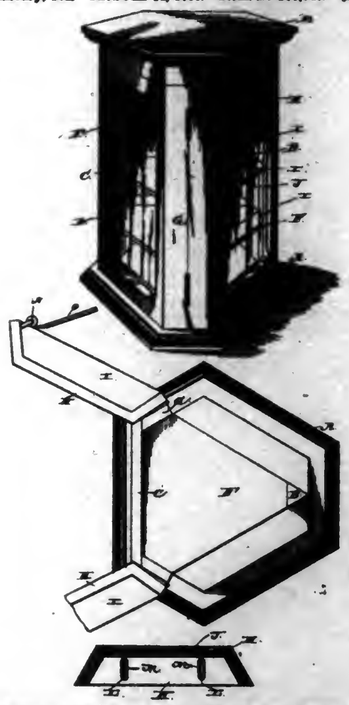
7. The combination, substantially as hereinbefore set forth, with the rotary adjustable apertured valves H, each provided with a toothed hub or pinion, of the double rack engaging said pinions, a plate arranged below said valves and provided with an end extension, d^7, having a slot in which a stud carried by the double rack is received, for the purpose described.

8. The combination, with the hopper and the rotary distributer, of the double-apertured bottom plate, D, having substantially the distinctive features of construction herein set forth, the double-rack frame E, fitted to slide on said bottom plate, the valve-plates H, each provided with a toothed hub, the hopper-bottom K, apertured and slotted, substantially as set forth, and the base-plate B, supporting the hopper and placed over the foregoing stated members.

9. In a broadcast seed-sower, the rotary distributer provided with a series of upturned wings or flanges having their outer end portions formed on the curves m^5, whereof the curvature is arranged in the direction of the length of the wing and substantially as set forth with relation to the direction of rotation of the distributer, for the purpose described.

10. In a broadcast seed-sower, the rotary distributer provided with a series of upturned wings or flanges, m', which are reversely curved in the direction of their length, substantially as and for the purpose described.

402,151. SHOW-CASE. ERNEST C. FAIN and GEORGE C. POSTON, Granbury, Tex. Filed Jan. 11, 1889. Serial No. 296,046. (No model.)



Claim.—1. The combination, with the case, of the doors, the shelves secured to the doors, the supplemental shelves arranged beneath the same and having transverse slots, and the headed pins or bolts inserted through said slots into the shelves secured to the doors, as set forth.

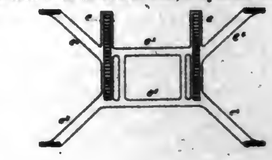
2. A show-case consisting of a casing having a base, a rigid side on the base, and a standard opposite the said side, doors hinged to the rigid side and adapted to close around the standard, the shelves secured between the side and the standard, and the shelves secured to the doors, as set forth.

3. The combination of the frame having one closed side and two open sides and being substantially triangular in horizontal section, the doors hinged to the closed side and adapted to swing over the open sides, the said doors being trapezoidal in horizontal section, the shelves secured in the frame, and the shelves secured to the doors, as set forth.

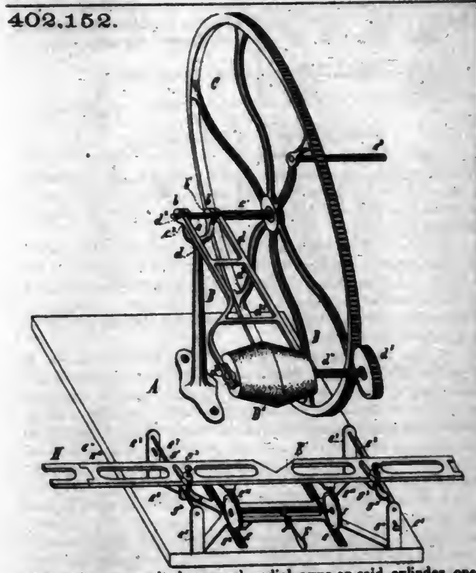
402,152. GRINDING-MACHINE FOR MOWER AND REAPER KNIVES. EPHRAIM H. FENTON, Kansas City, Mo. Filed Feb. 21, 1888. Serial No. 264,865. (No model.)

Claim.—1. In a grinding-machine, the combination, with the base having a suitable standard, of a driving-wheel, a vibrating tool-holder pivotally attached at one end to said standard and having a rotary grinding-tool at its opposite end in power connection with said driving-wheel, a reciprocating table having a suitable support opposite parallel racks upon said base of the machine and upon the under portion of said table, and cog-gear meshing with said racks, means for rotating said cog-gear, and adjustable stops in the path of said table, as described.

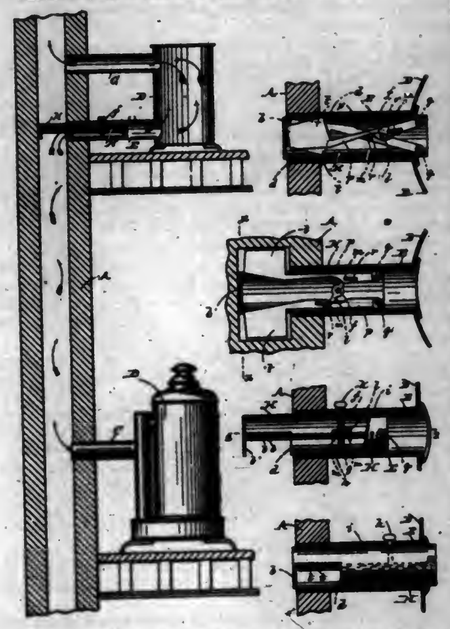
2. In a grinding-machine, the combination, with the base having a suitable standard, of a driving-wheel, a vibrating tool-holder attached at one end to said standard and having a rotary grinding-tool at its opposite end in power connection with said driving-wheel, a table adapted to support the knives to be ground in the path of said grinding-tool provided with a vertical bolt, a cylinder on said bolt provided with a cam at its lower end, radial arms on said cylinder, one of which extends in the plane of and across said table, and a spring on said bolt having one portion connected with the bolt and the opposite portion resting upon said cylinder, for the purpose described.



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402,153. HEATING APPARATUS. HENRY R. FLINT, Bethel, Me. Filed Feb. 4, 1888. Serial No. 263,545. (No model.)



Claim.—1. In a heating apparatus, the combination of a drum provided with an upper and lower funnel opening into the chimney, a pipe fitted to slide in the lower funnel and be projected into the chimney, and pivoted bars in said pipe having head-plates adapted to be projected into the chimney, whereby the heated air in said chimney may be directed into said drum, substantially as described.

2. In a heating apparatus, the combination of a drum provided with funnels opening into the chimney, a sliding pipe in one funnel adapted to be projected into the chimney and provided with a mouth, pivoted bars in said pipe provided with horizontal head-plates, and a rotating rod in said pipe having arms working in slots in said bars, whereby they may be moved to project their heads laterally into said chimney, substantially as and for the purpose set forth.

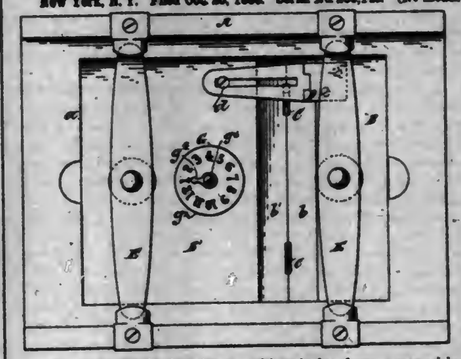
3. In a heating apparatus, the combination of a drum provided with funnels opening into a chimney, a pipe fitted to slide in one funnel and be projected into said chimney, a mouth in said pipe, two bars pivoted within the pipe and provided with head-plates adapted to be projected laterally through said mouth, a rotating rod in said pipe, and a bar on said rod provided with arms working in said pivoted bars, whereby they may be actuated as said rod is revolved, substantially as described.

4. In a heating apparatus, the combination of the drum D, provided with the funnels E G, the pipe H, fitted to slide in the funnel E, and provided with the mouth d', the bars p, pivoted in said pipe and provided with heads t, and means, substantially as described, for actuating said bars to project their heads through the mouth of said pipe.

5. In a heating apparatus, the combination of the drum D, provided with the funnels E G, the pipe H, fitted to slide in the funnel E and having the mouth d' and plate b, the bars p, pivoted in said pipe and provided with the heads t, the rod f, fitted to rotate in said pipe and projecting through the funnel-slot i, and the bar l on said rod provided with the arms m, working in slots r in said pivoted bars, all being arranged to operate substantially as described.

6. In a device of the character described, a tube fitted to slide in a drum-funnel and be projected into a chimney, said tube being provided with pivoted bars having head-plates adapted to be projected through the mouth of the tube and block the chimney, whereby the heated air arising therein may be directed into said drum, substantially as described.

402,154. PHOTOGRAPHIC-PRINTING FRAME. WILLARD H. FULLER, Passaic, N. J., assignor to The Scovill Manufacturing Company, New York, N. Y. Filed Oct. 25, 1888. Serial No. 289,140. (No model.)



Claim.—1. A tally for photographic-printing frames, comprising a cup-shaped piece having a screw-threaded hub and the ratchet-teeth turned up from the cup-shaped piece, a disk having figures thereon, a finger, a screw passing through the finger and the disk and engaging with the hub, and a resilient piece secured to the back of the disk and engaging with the ratchet, substantially as specified.

2. The combination, with the printing-frame, of a tally or record consisting of a part provided with ratchet-teeth g and an outer part marked with figures and provided with a spring pawl or detent, g^3, substantially as specified.

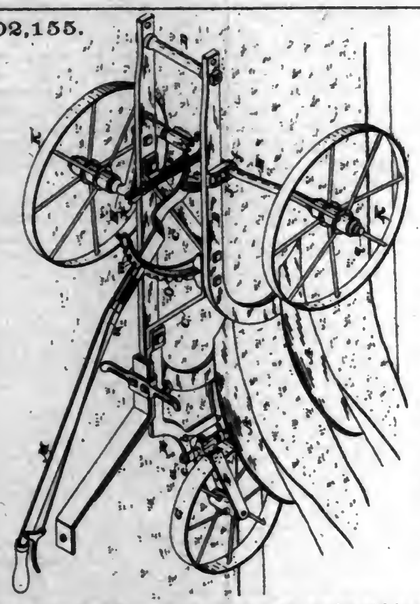
402,155. GANG-PLOW. LEWIS GIBBS, Canton, Ohio. Filed Aug 9, 1888. Serial No. 282,348. (No model.)

Claim.—1. The combination, with a plow-frame consisting of the suitably-connected beams B B', of a two-part axle, H H', journaled in bearings pivotally secured to said frame, a coupling-sleeve, L, in which the two-part axle is secured, one of the parts of the said two-part axle being free to turn in said sleeve, while the other part of the two-part axle is fixed to said sleeve, a segmental rack, k, secured to said sleeve, and a locking-lever, N, to engage the said segmental rack and lock the parts of the two-part axle to each other, substantially as set forth.

2. The coupling-sleeve L, having a segmental rack portion, g, and a laterally-extending arm, J, provided with a vertical aperture and rows of serrations arranged at the sides of said aperture, substantially as set forth.

3. The combination, with a plow-supporting frame, of a supporting axle-shaft composed of two sections, as B and B', secured to said frame in journal-boxes and adapted to be rocked in said journals simultaneously or separately, said axles having cranked portions p and guide-wheel spindles g, a coupling-sleeve secured to axle H', said sleeve having an outwardly-projected arm, j, to which a hand-lever, M, is secured, by which the axle-shaft H' may be rocked in its pivotal con-

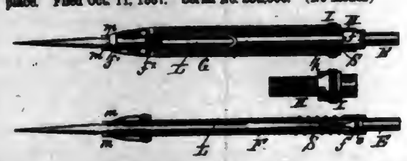
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nections to the beam B', a rack, O, and means for securing said lever and axle in desired adjustment, substantially as described, and for the purpose set forth.

4. The combination, with a plow-supporting frame composed, essentially, of the beams B B', spaced apart and secured in parallel relation, of a supporting axle-shaft composed of two portions, as H and H', pivotally secured to said frame, said axle portion having crank-portions, as *p* and spindles *q*, a coupling-sleeve, L, secured to the inner end of said portion H', said sleeve having a rack portion, *k*, and an outwardly-projected arm, *j*, a hand-lever, M, secured thereto, a rack, O, and means of adjustably securing said lever to said rack, and a hand-lever, N, secured to axle portion H, the end of said axle loosely secured in sleeve L, and means for locking said lever in engagement with said coupling-sleeve, the lever M, to rock the axles H and H' simultaneously when said axles are locked in rigid relation to raise and lower the plow-supporting frame, and the lever N, to rock the axle portion H independently of the axle H', to adjust the wheel K to the furrow, substantially as described, and for the purpose set forth.

402,156. DENTAL PLUGGER. JOHN W. GILBERT, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed Oct. 11, 1887. Serial No. 252,006. (No model.)

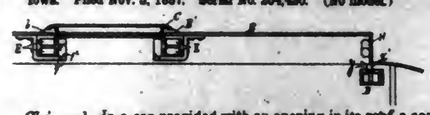


Claim.—1. The combination of the casing, the tool-carrying spindle fitted to be moved endwise in said casing, the tool-retaining device of said spindle, and the independent striking-plunger carried by said spindle and fitted to reciprocate independently of the reciprocation of said spindle, so as to impart the blows received from the hammer directly to an operating-tool inserted in said spindle, substantially as described.

2. The combination of the casing, the tool-carrying spindle fitted to be moved endwise in said casing, the retracting-spring between said spindle and casing, the tool-retaining device of said spindle, and the independent striking-plunger carried by said spindle and fitted to reciprocate independently of the reciprocation of said spindle, so as to impart the blows received from the hammer directly to an operating-tool inserted in said spindle, substantially as described.

3. The combination of the casing, the tubular spindle movable endwise in said casing, the tool-retaining device of said spindle, the independent striking-plunger carried by said spindle at its rear end, and the adjusting device to limit the inward thrust of said spindle, and thereby the relation of the striking-plunger to its hammer, substantially as described.

402,157. SAFETY RAILWAY-CAR. CHARLES C. GILMAN, Hilton, Iowa. Filed Nov. 5, 1887. Serial No. 254,420. (No model.)



Claim.—1. In a car provided with an opening in its roof, a cover for said opening, and catches arranged for engaging and disengaging with said cover, in combination with an electric battery and connections for operating said catches, substantially as and for the purpose described.

2. In a car provided with an opening in its roof, a cover for the opening, a catch or grapple device to catch and hold the cover and adapted also to be released therefrom, an armature, an electro-magnet, an electric battery, and a wire circuit, in combination with a circuit-breaker and means for operating the latter, substantially as and for the purpose described.

3. In a car having an opening in its top or roof, a cover to fit and close said opening, a catch device adapted to engage and hold said cover, an armature for operating the catch device to cause it to engage the cover, and means tending to move the armature in an opposite direction to disengage the catch device from the cover, in combination with an electric battery, an electro-magnet, an electric-circuit connection, and means for breaking the circuit, substantially as and for the purpose described.

4. A car having an opening in its roof, a cover adapted to close the opening, and a catch mechanism to engage and hold the cover and also adapted to be disengaged therefrom to release the same, in combination with electro-magnetic mechanism for operating the same, substantially as and for the purpose described.

5. A car provided with an opening of a size adapted for the escape of its occupants or passengers when unobstructed, a cover fitting said opening, and a catch device adapted to engage and hold said cover when the car is in its upright or normal position and to release the cover when the car is overturned, in combination with an electric battery, an electro-magnet, electric-circuit connections, and an armature connected with said catch device, substantially as and for the purpose described.

6. A car provided with an opening for the escape of passengers therethrough when unobstructed, a cover loosely fitting and closing said opening, and a catch device for fastening the cover in place, in combination with electro-magnetic mechanism arranged to release the catch device from the cover upon the overturning of the car, substantially as and for the purpose described.

7. In a car having an opening in its roof and a cover fitting to close the same, the combination of pivoted armatures provided with catches for engaging the cover, electro-magnets for operating the armatures in one direction, springs to operate them in the opposite direction, an electric battery, circuit-breakers, and an electric-circuit wire, substantially as and for the purpose described.

8. In a car having an opening in its roof and a cover, C c^3, to loosely fit within and close said opening, the electro-magnets E and spring-actuated pivoted armatures F, supported in bracket-frames G, in combination with an electric battery, D, an electric wire, and circuit-breakers, substantially as and for the purpose described.

9. In a car provided with a bushing, B', fitting in its roof and affording through its central part an opening for the escape of passengers, a cover, C c^3, fitting said opening, electro-magnets E, and pivoted armatures F, carried in brackets G, in combination with a battery, D, the electric-circuit wire formed of the parts *x*, *x'*, and *y*, and the circuit-breakers, substantially as and for the purpose described.

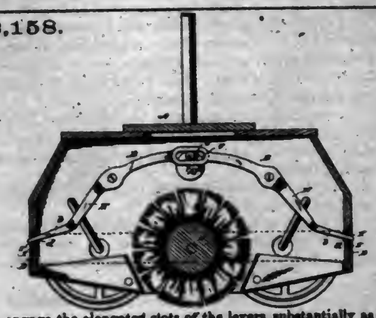
10. A car provided with an opening and a cover fitting loosely and closing the same, electro-magnets E, pivoted armatures F, brackets G, circuit-breaker c^3 L l^3, and circuit-breaker H I K *k' i'*, in combination with the battery D and the electric-circuit-wire connections, substantially as and for the purpose described.

402,158. CARPET-SWEEPER. HENRY A. GORE and HIRAM W. RUTTER, Goshen, Ind. Filed Sept. 12, 1888. Serial No. 285,239. (No model.)

Claim.—1. The combination, in a carpet-sweeper, of the case having its front and rear walls provided with apertures, the metallic bands supporting the brush-shaft, the said bands being pivoted to the case, and levers for moving the said bands on their pivoted bearings, substantially as specified.

2. The combination, with the main case having its front and rear walls provided with apertures, of the bands supporting the brush-shaft pivoted to the said case and having apertures coinciding with those of the case, levers journaled in the end walls of the case with their outer ends engaging the pivoted bands and their inner ends having elongated slots, and a cam or eccentric journaled in the side walls of the case to receive the handle-bail and having an eccentric stud or

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lug to engage the elongated slots of the levers, substantially as specified.

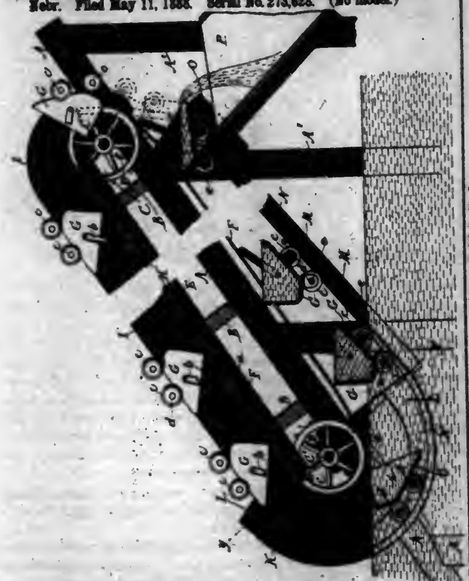
3. In a carpet-sweeper, the combination, with the main case, of metallic bands for supporting the brush-shaft pivoted to the said case, so that it may be allowed to move vertically, and levers connecting the handle-bail with the said bands, whereby the brush may be raised and lowered by the movements of the said bail, substantially as specified.

402,159. CUTTER-BAR. CALEB HANE, Jackson, Ohio. Filed Nov 10, 1887. Serial No. 254,773. (No model.)



Claim.—The combination, with the cutter-bar provided with studs extending at right angles thereto a distance greater than the thickness of the cutters, two studs for each cutter, of the cutters provided with two holes, each adapted to be slid over the studs, and the herein-described locking-bar provided with a series of holes corresponding to the holes in the cutters and to the studs projecting through the cutters, and fastening-screws for securing the locking-bar to the cutter-bar in engagement with the cutters, substantially as set forth.

402,160. WATER-ELEVATOR. ALEXANDER HOGELAND, Lincoln, Nebr. Filed May 11, 1888. Serial No. 273,623. (No model.)



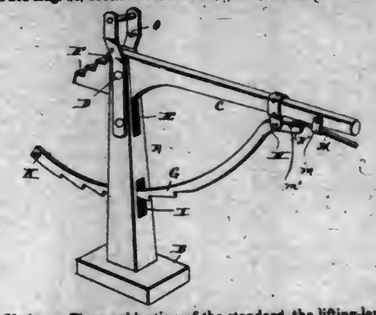
Claim.—1. In combination with the side girders, A, the sprocket-shafts C, having their bearings therein, the sprocket-wheels C, fastened upon said shafts, and the open-linked chains F, adapted to be set in motion by said sprocket-wheels, the buckets G, hinged to said chains, having their rear sides perpendicular to their bottoms, while their front sides incline outwardly from a vertical line, each bucket being provided with two pairs of truck-wheels, c, and their shafts c, one of which has its bearings in flanges rigidly attached to the bottom of the bucket, while the other shaft has its bearings fastened in like manner upon the forward or sloping side of the bucket, the whole adapted, when power is applied to one of the shafts C, to move the chains with their buckets, force in the forward edges of the buckets, and fill them automatically, and upon reaching a higher level dump their contents, substantially as described.

2. In combination with the inclined girders A, the sprocket-shafts C, having their bearing therein, the sprocket-wheels C, fastened upon said shafts, the open-linked endless chains F, the buckets G, hinged to said chains and provided with truck-wheels and shafts, substantially as specified, the two walls I, the cam-plates L, having flanges K, and the stringers N, adapted to furnish rolling supports to the buckets while empty, guide and support them down and around the lower shaft C, to fill and move them up the incline of the stringers N to the point of dumping them, substantially as set forth.

3. In combination with the side girders, A, the sprocket-shafts C, having their sprocket-wheels C, the open-linked chains F, the buckets G, hinged to said chains and provided with truck-wheels and shafts, substantially as specified, the walls I, plates L, having flanges K, and the stringers N, with curved depressions at O, to enable the buckets to fall down upon their front sides and dump their contents, substantially as described.

4. In combination with the sprocket-wheels and their shafts, the endless chains, the walls for the support of the buckets when empty, the flanged plates L, and the stringers N, constructed and arranged as hereinbefore specified, the buckets G, hinged to said chains and provided with sloping front sides, each bucket having truck-wheels and axles, one of which axles is fastened rigidly to the bottom of the bucket, while the other is in like manner fastened to the forward or sloping side of the same, adapted to scoop up the material and convey the same up the incline of the stringers N to a higher level and there dump the same, substantially as set forth.

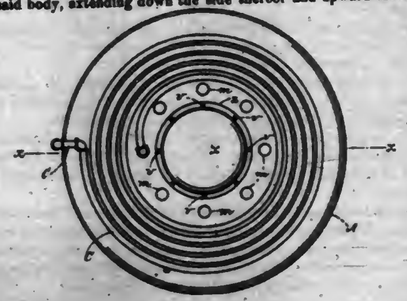
402,161. LIFTING-JACK. WILLIAM H. HOLMES, Charlotte, Vt. Filed Aug. 23, 1888. Serial No. 283,056. (No model.)



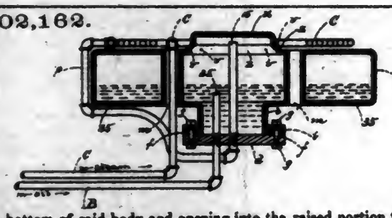
Claim.—The combination of the standard, the lifting-lever pivoted thereto, the ears H H, depending from the lifting-lever, the ratchet-arm pivoted to said ears and engaging a transverse pin secured to the standard, and the operating-lever pivoted to the under side of the lifting-lever and having one end provided with a notch, *n'*, engaging the end of the ratchet-arm, as specified.

402,162. HEATER. EDWIN H. JEWETT, Medford, assignor to himself, and George F. Jewett, Boston, Mass. Filed July 7, 1888. Serial No. 279,263. (No model.)

Claim.—1. In a heater of the character described, the combination of a hollow body adapted to contain oil and provided in its top with a raised central portion having an inclined wall provided with a series of burner-holes, a series of vertical tubes extending through said body around said central portion, an oil-pipe opening into said body from the bottom thereof, and a steam-pipe passing upward through one of said vertical tubes, said pipe being coiled on the top of said body, extending down the side thereof and upward through



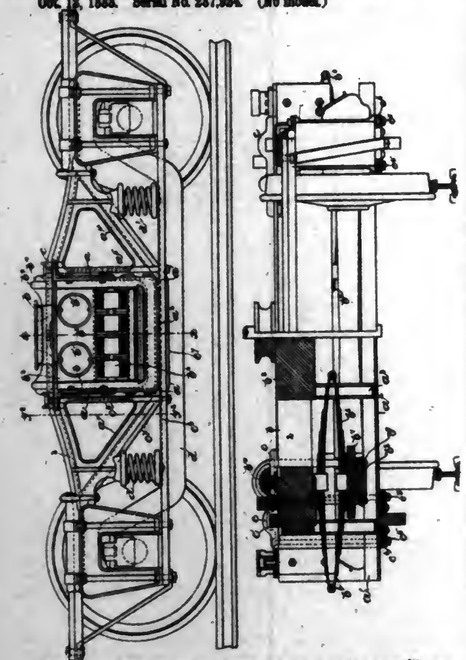
402,162.



the bottom of said body and opening into the raised portion thereof above the burner-openings, substantially as set forth.

2. In a heater of the character described, the combination of the body A, provided with the tubes *m* and raised portion *x*, having the inclined wall *z*, the burner-holes *v* in said wall, the oil-pipe B, opening into said body through the bottom thereof, and the steam-pipe C, passing through one of said tubes *m* and coiled on the top of said body, said pipe opening into the raised portion of said body above the burner-openings thereof, substantially as specified.

402,163. CAR-TRUCK. LUTHER K. JEWETT, Boston, Mass. Filed Oct. 12, 1888. Serial No. 287,924. (No model.)



Claim.—1. In a car-truck, the combination, with a metallic transom composed of independent pieces of castings or braces to unite the said pieces to form the transom, of sustaining-blocks provided with shoulders to co-operate with the said pieces, substantially as described.

2. In a car-truck, a metallic transom composed of independent side and corner pieces, combined with sustaining-blocks provided with shoulders to co-operate with the said pieces, and with braces or castings to unite the said pieces to form the transom, substantially as described.

3. In a car-truck, the combination, with a metallic transom, of a curve-plate-sustaining frame secured at or near the ends of the said transom, substantially as described.

4. In a car-truck, the combination, with a transom, of a bolster vertically movable therein and composed of independent tubes, and sustaining-blocks for said tubes, substantially as described.

5. In a car-truck, the combination, with a transom composed of independent pieces, of a bolster vertically movable therein and composed of tubes, and sustaining-blocks for said tubes, substantially as described.

6. In a car-truck, the combination, with a transom composed of independent pieces, and castings or braces to unite said pieces together, of a bolster composed of independent tubes and vertically movable in said transom, sustaining-blocks for said tubes, and chafe-irons to prevent wear of the bolster-tubes, substantially as described.

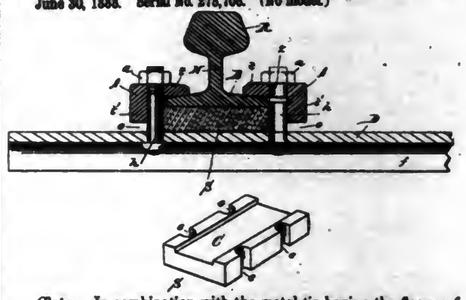
7. In a car-truck, the combination, with a transom composed of independent pieces, and castings or braces to unite said pieces together, of a bolster composed of tubes and vertically movable in said transom; sustaining-blocks for said tubes, and chafe-irons secured to said bolster-sustaining blocks, substantially as described.

8. In a car-truck, the combination, with a transom, of arch-bar-sustaining blocks having their upper or top sides concaved downward, and arch-bars shaped or bent to fit said concaved sides, as and for the purposes specified.

9. In a car-truck, the pedestal strap composed of a single corrugated bar, substantially as described.

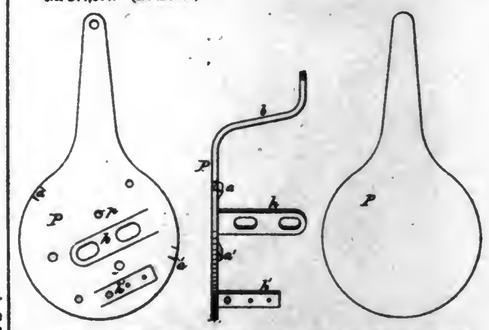
10. In a car-truck, the combination, with an arch-bar-sustaining block, of a metallic transom having its upper end resting upon and supported by the top of the said sustaining-block, substantially as described.

402,164. RAILWAY. WILLIAM J. KENNEY, Chicago, Ill. Filed June 30, 1888. Serial No. 278,708. (No model.)



Claim.—In combination with the metal tie having the flanges *f*, the rail, the interposed wooden block having the channel in its upper face, the angle-irons L-shaped in cross-section, the bolts passing through the tie, the wooden agent, and angle-irons having nuts on their upper ends for binding said parts together, substantially as and for the purposes specified.

402,165. BELL. ISAAC KENNEY, Cincinnati, Ohio, assignor to the Standard Electrical Works, same place. Filed June 14, 1888. Serial No. 277,077. (No model.)



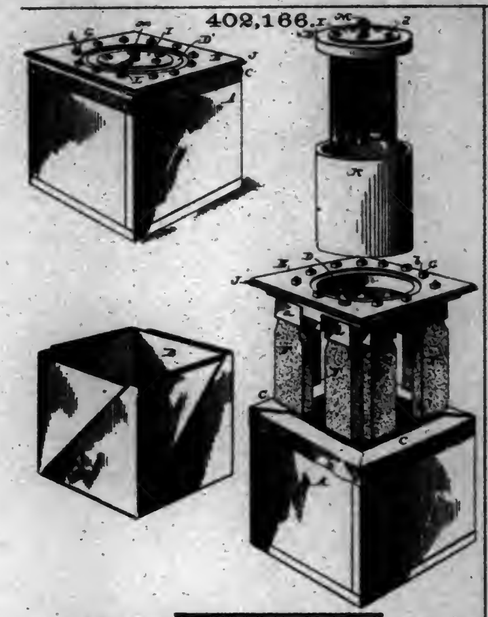
Claim.—As an article of manufacture, a metallic bell-plate formed integral with the bell-post *b* and having perforated tongues *h h'* struck out of the interior thereof and bent upward from said plate to form the helix and armature supports, respectively, and tongues *a a'*, formed in the edge of said plate and bent upward therefrom to form lugs for holding a cover, substantially as and for the purpose set forth.

402,166. GALVANIC BATTERY. WILLIAM P. KOOKOGEY, Brooklyn, N. Y., assignor to the Kookogey Electric Company. Filed June 13, 1887. Serial No. 241,181. (No model.)

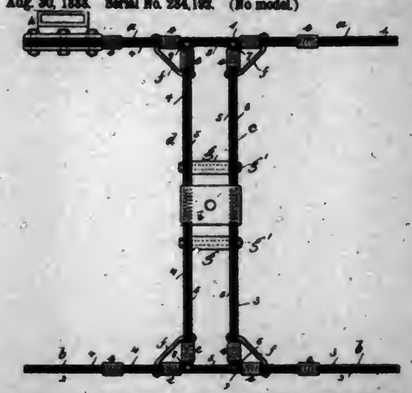
Claim.—1. In combination with box or shell A, the lining B, formed of a single piece of sheet metal folded together, substantially as shown, to fit the bottom and walls of the outer shell, and forming a water-tight lining without seam or joint.

2. In combination with box A, provided with metallic lining, the rubber packing, C, applied to the upper edge of said box or shell, top or cover D, provided with metal plates E and I, carbon element sections F, each having a threaded stem extending through the brass plate E, nuts B, applied to said stems and bearing upon the plate E, zinc element sections H, likewise provided with threaded stems extending through plate I, and nuts applied to said stems and bearing upon the plate, substantially as set forth.

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402,167. CAR-TRUCK. BERNARD J. LA MOTHE, New York, N. Y., assignor to the United States Rolling Stock Company, same place. Filed Aug. 30, 1888. Serial No. 284,192. (No model.)



Claim.—1. A truck for cars, composed of longitudinal frames or wheel-pieces *a b* and cross or transom frames *c d*, placed edgewise and connected, each of said frames being composed of several plates of metal laid flatwise and touching and connected rigidly together, substantially as specified.

2. A truck for cars, composed of longitudinal frames or wheel-pieces and cross or transom frames, said frames being composed of plates of metal laid flatwise together and placed edgewise, and straps for connecting said plates together at the intersections of the frames and near their ends, substantially as specified.

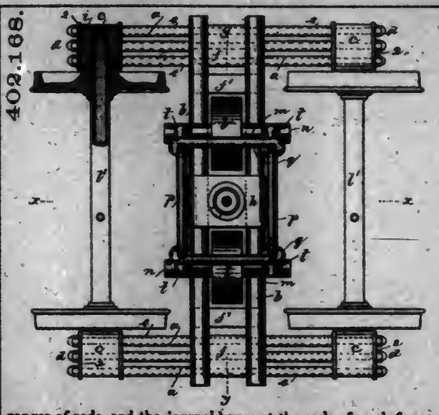
3. A truck for cars, composed of longitudinal frames or wheel-pieces and cross or transom frames, said frames being composed of plates of metal laid flatwise together and placed edgewise, straps for connecting said plates together, stiffening bars or rods *f*, tubes *g*, bolts *g'*, case *i*, and pedestals *h*, substantially as and for the purposes set forth.

402,168. RAILWAY-CAR TRUCK. BERNARD J. LA MOTHE, New York, N. Y., assignor to the United States Rolling Stock Company, same place. Filed Aug. 30, 1888. Serial No. 284,193. (No model.)

Claim.—1. The combination, with the side frames, each composed of the two ranges of rods, of the transom composed of two ranges of tubes, the rods of the side frames passing transversely through the tubes of the transom and supporting them, substantially as specified.

2. The combination, with the side frames, each composed of two

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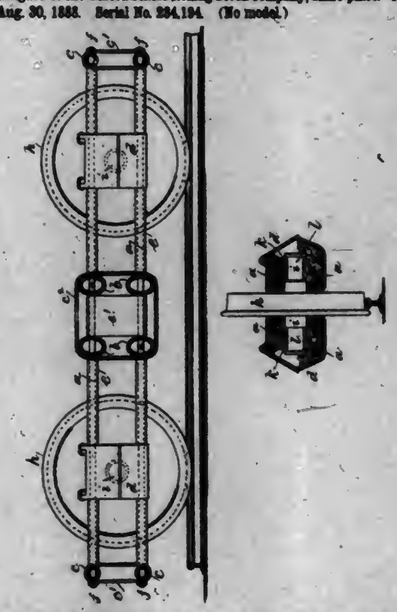
ranges of rods, and the journal-boxes at the ends of each frame and through which journal-boxes said rods pass, of the transom composed of two ranges of tubes through which pass transversely the rods of the side frames, substantially as specified.

3. The combination, with the side frames, each composed of two ranges of rods, the journal-boxes at the ends of the side frames, and the transom composed of two ranges of tubes through which pass transversely the rods of the side frames, of the tubes and bands around said rods, and nuts upon the ends of said rods for keeping the journal-boxes and transom-tubes in position upon said rods, substantially as specified.

4. The combination, with the truck-frame composed of the side frames and transom, consisting of rods and tubes, respectively, of the bearers *m m*, supported by the transom, the springs *l l*, bearers *n n*, frames *p p*, rods *q q*, and center plate, *s*, substantially as and for the purposes specified.

5. The combination, with the side frames composed of metal rods and the transom composed of tubes supported by the rods of the side frames passing transversely through said tubes, of the plates *h* at the center of the transom and the stays *f'* between said plates and the side frames, substantially as and for the purposes specified.

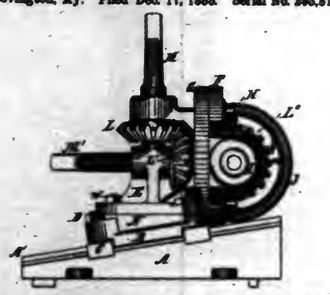
402,169. CAR-TRUCK. BERNARD J. LA MOTHE, New York, N. Y., assignor to the United States Rolling Stock Company, same place. Filed Aug. 30, 1888. Serial No. 284,194. (No model.)



Claim.—The combination with the car-wheels and their axles and journal-boxes, of the four groups of longitudinal rods *a a*, passing through and supporting said journal-boxes, the rods being arranged in two groups at each side of the truck, with the wheels between the

respective groups of rods, the transom-tubes *b*, supported by said rods of the side frames, the end frames, *c*, and the tubes *e* and bands *d* around said rods for keeping the parts of the truck-frame in their proper positions, substantially as and for the purposes specified.

402,170. DRILL. PULASKI LEEDS, Louisville, assignor to R. T. Miller, Covington, Ky. Filed Dec. 17, 1888. Serial No. 293,817. (No model.)



Claim.—1. A universal radial drill having horizontal and vertical angular adjustments, consisting of supporting-frame F, carrying the drill-stock I and the bevel-wheel L', the bearings of the shaft, which are secured by the ring G to the supporting-frame E, said frame carrying the bevel-wheel L, the double bevel-wheel L', and the driving-spindles M and M', and being pivoted to a slotted base-plate, as shown and described.

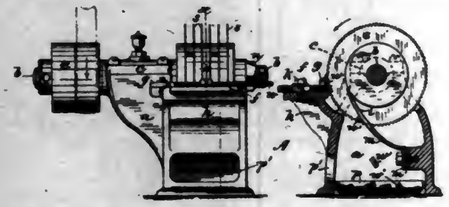
2. In a universal drill, the combination of the horizontally-rotatable frame E, carrying suitable driving-shaft, and the vertically-rotatable frame F, supported on the frame E and carrying suitable drill-shaft, said shafts having suitable connecting-gearing, for the purposes explained.

3. In a universal drill, the combination, with a suitable drill and its movable support or supports, of two driving-shafts gearing with said drill and projecting in different directions for convenience in driving the drill when in its different positions, as fully explained.

4. In a universal drill, the combination, with the horizontal rotatable frame and the drill and drill-shaft carried thereby, of additional drive-shaft gearing with the first and extending at right angles therefrom for convenience in driving when the first shaft is out of reach, as explained.

5. In a universal drill, the combination of a suitable base, a horizontally-rotatable supporting-frame mounted on the base, a horizontal driving-shaft, a vertical driving-shaft, a vertically-rotatable supporting-frame mounted on the horizontal frame, and a suitable drill mounted on the vertical frame and gearing with the said driving-shafts, said frames being also provided with suitable clamping devices, all substantially as set forth.

402,171. CUTTING-OFF MACHINE FOR JEWELERS' STOCK. FRANK L. LEWIS, Providence, R. I. Filed Jan. 10, 1889. Serial No. 295,918. (No model.)



Claim.—1. The combination, with a series of suitably-mounted cutting-off saws, *s*, of stationary guards or clearers *i*, arranged to intercept the severed blanks, substantially as shown and described, and for the purpose set forth.

2. The combination, with a series of mounted cutting-off saws, *s*, of a series of stationary guards or clearers, *i*, arranged to intercept the severed blanks, and a sliding table provided with a stop-gage, substantially as shown and described.

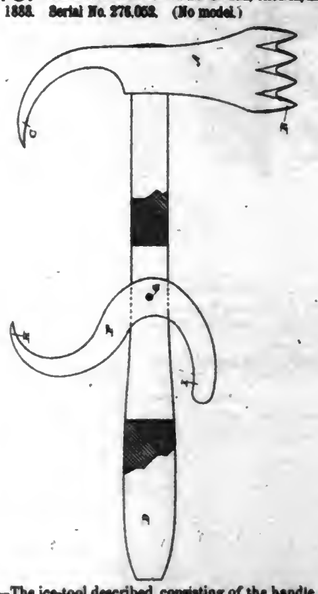
402,172. MOTOR. DE SOTO LOVEJOY, Moscow, Tex., assignor of one-half to Solomon Bergman and William M. Kennedy. Filed Nov. 23, 1888. Serial No. 291,673. (No model.)

Claim.—The combination of the chair, the reciprocating bar, the shaft mounted in the lower portion of the chair, the drum on said shaft, the cord coiled around the drum and connected to the bar, the rest secured to the upper end of the bar, and the spring coiled around the said bar between the chair-seat and the rest, as specified.

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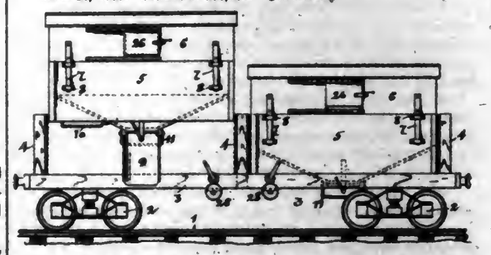


402,173. ICE-TOOL. SEWELL K. LOVEWELL, Chelsea, Mass. Filed June 4, 1888. Serial No. 276,052. (No model.)



Claim.—The ice-tool described, consisting of the handle, the head formed at one end as an ice cutting or separating implement and at the other as a curved hook or point, and the curved and pointed lever pivoted to the handle, so as to co-operate with the hook as a tongs, or be turned away therefrom, as specified.

402,174. FREIGHT-CAR. CHARLES MACKALL, Baltimore, Md. Filed Feb. 18, 1889. Serial No. 300,313. (No model.)



Claim.—In a freight-car for railroads, the combination of a car having a hopper-bottom and gate at the apex thereof, and provided with a cover, and having a door sufficiently high in the side to permit the car to be loaded by a chute and filled while the door is open, and an independent car-frame provided with trucks, and mechanism connected to the car-body and the car-frame for raising and lowering said car-body, substantially as described.

402,175. ADJUSTABLE TRESTLE. LUDWIG MAURER, Louville, assignor of one-half to Christian Scheer, New York, N. Y. Filed Nov. 28, 1888. Serial No. 292,073. (No model.)

Claim.—1. The combination, with the body, of the cap B, secured

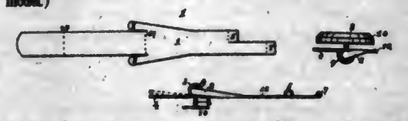
402,175.



to one end thereof and formed with tapered legs b^2, the inner ones of which are connected by the horizontal bar b^3, and the legs fitted in the spaces between each pair of legs and pivoted therein, substantially as described.

2. The combination, with the longitudinally-extensible body and the caps B, secured to the outer ends thereof, of the legs C, pivotally secured between downwardly-extending legs of said caps, and the legs C', adjustable lengthwise on the legs C, and the rack-bars and swinging bails for holding the legs in their adjusted positions, substantially as shown and described.

402,176. CUFF-HOLDER. CHARLES O. MCCASLAND, Denver, Colo. Filed Jan. 4, 1888. Renewed Oct. 13, 1888. Serial No. 288,046. (No model.)

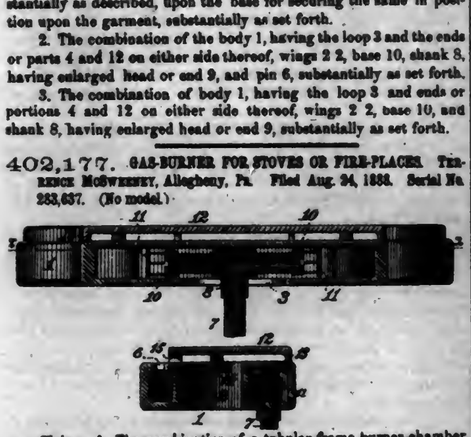


Claim.—1. The combination of the body having or carrying a shank with an enlarged end or head, a base having a spring-loop adapted to open and pass over and receive such head, and to be opened to permit the head to be passed therefrom, and means, substantially as described, upon the base for securing the same in position upon the garment, substantially as set forth.

2. The combination of the body 1, having the loop 3 and the ends or parts 4 and 12 on either side thereof, wings 2 2, base 10, shank 8, having enlarged head or end 9, and pin 6, substantially as set forth.

3. The combination of body 1, having the loop 3 and ends or portions 4 and 12 on either side thereof, wings 2 2, base 10, and shank 8, having enlarged head or end 9, substantially as set forth.

402,177. GAS-BURNER FOR STOVES OR FIRE-PLACES. TERRENCE MCSWEENEY, Allegheny, Pa. Filed Aug. 24, 1888. Serial No. 283,637. (No model.)



Claim.—1. The combination of a tubular-frame burner-chamber inclosing a central space and having lateral channels leading from opposite sides of a rear gas and air supply opening to opposite ends of a front passage perforated with burner-openings, and a cover-plate which closes the top of the central space at its rear and sides and presents a front discharge-passage for air adjoining the burner-openings, substantially as set forth.

2. The combination of a tubular-frame burner-chamber inclosing a central space and having lateral channels leading from opposite sides of a rear opening to opposite ends of a front passage perforated with burner-openings, a gas-supply pipe leading into the chamber through its rear opening and having branches provided with perforated end caps and extending in the direction of each of the lateral channels, and perforated diffusing-plates connected to the branches of the gas-supply pipe beyond their ends, substantially as set forth.

402,178. DEVICE FOR SKIMMING MILK. ALBERTUS MILLER, Meadville, Pa. Filed July 12, 1888. Serial No. 279,795. (Model.)

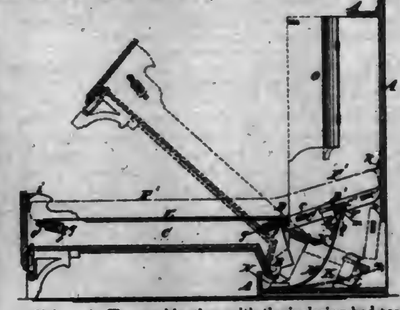
Claim.—The described device for skimming cream from milk, consisting of a pail provided with an air-tight cover, an air-pump, a tube connecting the pail and pump, and a flexible tube connected to

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said pail and carrying at its outer end a curved skimmer with a long narrow mouth, all constructed and operating substantially as set forth.

402,179. FOLDING BED. FREDERICK R. MILLER, Brooklyn, N. Y., assignor to Andresen, Blatt & Co., same place. Filed Aug. 19, 1886. Serial No. 211,333. (No model.)



Claim.—1. The combination, with the inclosing bed-case, of the main section C and minor sections C' C', hinged as shown, staple or staples G, affixed to one of the minor sections, and bow spring or springs M, fixed at one end to the base of the case and hooked at the other end in said staples, substantially as shown and described.

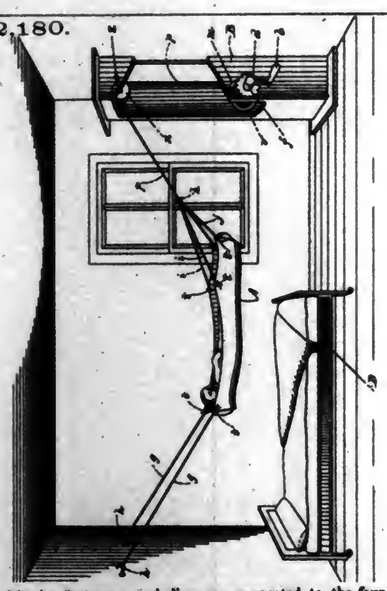
2. The combination, with an inclosing bed-case, of the main swinging section C and minor sections C' C', hinged as shown, with the weight F attached to one of the minor sections, staple or staples G, and spring or springs M, arranged and operating substantially as shown and described.

3. In a folding bed, the combination, with the inclosing-case and a swinging bed-frame pivoted thereto and made of a main section, and two toggle-like sections, of a bow spring or springs arranged in the base of the case parallel with the length of the bed-frame, fixed at one end at or near the joint of the two sections, and connected at the opposite end with the minor section, substantially as shown and described.

402,180. INVALID-LIFTER. JAMES H. MURDOCK, Woodstock, Vt. Filed Sept. 29, 1888. Serial No. 286,768. (No model.)

Claim.—1. The combination, with a hammock provided with a set of eyes at its head end, of a set of eyes at its foot end, and an intermediate set of eyes at its opposite edges disposed about a chair height distance from the foot end, supporting-ropes engaging the eyes at the head end, four supporting-ropes united at their outer ends, one pair thereof being connected at their inner ends with said intermediate eyes and the other pair being detachably connected at their inner

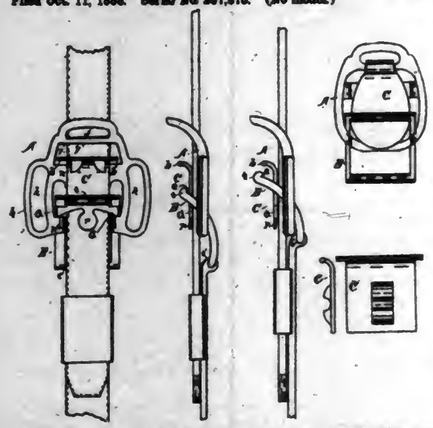
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ends with the foot-eyes, a winding-rope connected to the four supporting-ropes, and a windlass on which the winding-rope is wound for raising or lowering the hammock, substantially as described.

2. In an apparatus of the character described, the combination of the cabinet B, provided with the pulley *x*, the shaft *f*, journaled in said cabinet and provided with the drum *v*, handle *b*, and ratchet *d*, the retaining-pawl *m*, the hammock A, the hooks *h*, the ropes *g*, having the hooks *t*, and adapted to connect the head of said hammock with the hooks *h*, the foot-ropes *i j*, provided with hooks *t*, and knotted at *k*, and the rope *p*, connecting said foot-ropes with the drum *v*, all being arranged to operate substantially as specified.

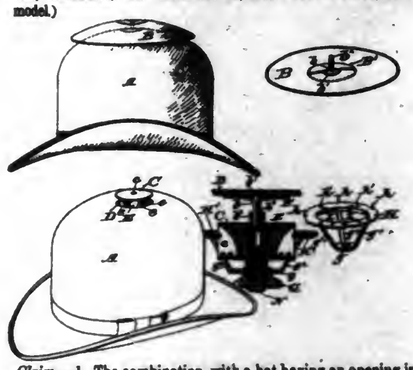
402,181. TUG-BUCKLE. JAMES H. MYERS, Grand Rapids, Mich. Filed Oct. 11, 1888. Serial No. 287,573. (No model.)



Claim.—1. A tug-buckle having a body, A, in combination with a bail or stirrup, B, provided with a projecting point, *e*, and entirely detached from the balance of the buckle, and a clasp, C, the forward end of which turns outward and is provided with short projections *b*, to prevent the bail from dropping over the end of the clasp, and with a tongue, *d*, and has formed at its back end two outwardly-projecting lugs, *a*, intended to sustain the draft of the tug and to prevent the bail from drawing or dropping from over the clasp, the clasp being entirely detached from the balance of the buckle, substantially as and for the purpose set forth.

2. The combination, in a tug-buckle, of a body, A, provided with bearings *a a'*, opening *h*, for the reception of the bail, opening *i*, for the reception of the tug, bearings *m m*, projecting end P, and loops *j k* and *l*, with a bail, B, of sufficient length, so that when thrown back the clasp may be raised entirely clear of the tug, and provided with a projecting point, *e*, and a clasp, C, having its forward end projected outward from the tug, with small projections *b* formed upon the outer edges, and a tongue, *d*, and provided with lugs *a*, projecting outward from the edges of the back end of the clasp, and a thumb-piece, *r*, at the back end, the bail being entirely separate from the body and attached to the hame-tug, and the clasp being detached from both the body and the bail, substantially as specified, and for the purpose set forth.

402,182. HAT SHIELD AND VENTILATOR. WILLIAM P. O'CONNOR, Milwaukee, Wis. Filed Oct. 23, 1888. Serial No. 288,921. (No model.)



Claim.—1. The combination, with a hat having an opening in the center of the crown, of a ventilator placed in said opening and composed of an inverted cone with laterally-projecting upright wings extending above and below said opening when the ventilator is in working position, substantially as and for the purposes set forth.

2. The combination, with a hat having an opening in the crown, of a vertically-adjustable ventilator placed in said opening and composed of an inverted cone with laterally-projecting upright wings, and means for raising and lowering said ventilator, whereby the size of the aperture around the same is varied or the opening is entirely closed, substantially as and for the purposes set forth.

3. The combination, with a hat having an opening in the crown, of a ventilator placed in said opening and composed of an inverted cone, and laterally-projecting wings having their lower edges slit and bent in opposite directions, substantially as and for the purposes set forth.

4. The combination, with a hat having an opening in the crown, of a ventilator placed therein and composed of an inverted cone with laterally-projecting upright wings, which engage notches in the edge of said opening and serve as guides for the ventilator, and means of adjusting said ventilator vertically, substantially as and for the purposes set forth.

5. The combination, with a hat having an opening formed by the removal of a piece from the top of the crown, of a ventilator placed in said opening and composed of an inverted cone, to the top of which is attached, so as to project over its edges, the piece removed from the hat, and of upright wings projecting laterally from said cone, a ring attached to the inside of the hat and projecting inwardly past the edges of the opening therein, so as to form a seat for the overhanging top of said cone when the ventilator is closed, and means for adjusting said ventilator vertically, substantially as and for the purposes set forth.

6. The combination, with a hat having an opening in the top of the crown, of a ventilator placed in said opening and serving as a shield-support, and a shield having a central stem on its under side which is removably attached to said ventilator, substantially as and for the purposes set forth.

7. The combination, with a hat having a support carrying a vertical socket in the center of the crown, of a shield shaped to conform to the crown of the hat and provided on the under side with a central vertical stem, which is held adjustably in said socket, whereby the shield may be set at different heights above the crown, brought snugly down against the crown, or removed from the hat, as desired, substantially as and for the purposes set forth.

8. The combination, with a hat having an opening in the crown, of a vertically-adjustable ventilator placed in said opening, and a shield having a telescoping stem by which it is attached to said ventilator over the crown of the hat, so as to be capable of vertical adjustment with and independently of said ventilator, substantially as and for the purposes set forth.

402,183. WAGON-BOX. SOLOMON H. OVIATT, Lansing, Mich., assignor of one-half to Reuben Andrè, Akron, Ohio. Filed June 16, 1888. Serial No. 277,291. (No model.)

Claim.—1. The combination, with a wagon-stake, of an adjustable arm having a jointed engagement therewith, the stake and the arm each constructed with arcs having registering perforations, and a locking device to engage said arcs and hold the arm in any desired position, substantially as described.

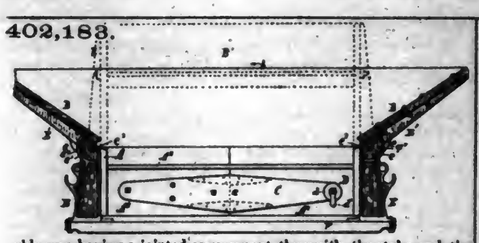
2. The combination, with a wagon-box, A, and stake E, of box sides B and removable end-gate B', an arm, E', having a jointed engagement with said stake and united with the side B, said stake and said arm each constructed in a single integral piece, substantially and in the manner described.

3. The combination, with a wagon-box and an end-gate consisting of jointed removable wings, of a cleat having a fixed engagement with one of said wings and a removable engagement with the adjacent wing, a bolt projecting from one of said wings and pushing through the free end of said cleat, and a tightening-nut, substantially as set forth.

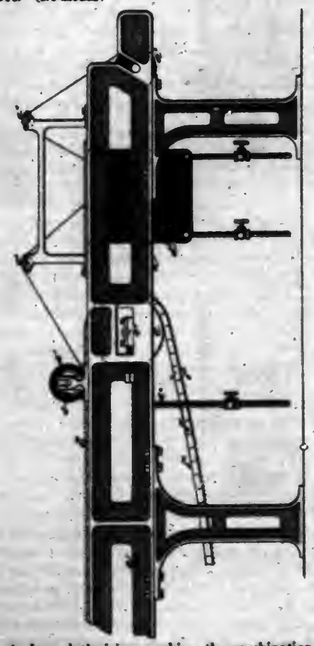
4. The combination, with a wagon-box, of an end-gate consisting of flexibly-connected wings, a cleat having a fixed engagement with one of said wings, a bolt, and a washer for holding the bolt in place on one of said wings, the bolt projecting through the free end of said cleat and provided with a tightening-nut, substantially as set forth.

5. The combination, with a wagon-box, of an end-gate consisting of jointly-connected removable wings, and a cleat shorter than the end-gate, having a fixed engagement at one end with one of the wings, the other end of said cleat removably engaged with the adjacent wing between the ends of said wings, substantially as set forth.

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402,184. MACHINE FOR SIZING AND PAINTING CLOTH. DUNCAN A. PAGE and RICHARD C. BIRD, Chicago, Ill., assignors to the Calumet Shade Cloth Company, same place. Filed Mar. 30, 1888. Serial No. 268,911. (No model.)



Claim.—1. In a cloth-sizing machine, the combination, with the main frame and the sizing apparatus, of the carrier-belts, each consisting of a cable and a series of short spiked sections recessed upon their under sides, in which recesses are secured the cables, and grooved guides in which the said belts run, substantially as described.

2. In a machine for painting or sizing cloth, the combination, with the tank and the positive cloth-feeding devices which engage with the cloth after leaving the tank, of a winding shaft or drum for the finished cloth, provided at its end with a friction-pulley, h^3, a friction driving-wheel, h^2, engaging with the pulley, a hinged arm in which the said pulley is mounted, and a weight adjustable upon the said arm, substantially as described.

3. In a machine for sizing and painting cloth, the combination of the main frame, the size-tank, the positive cloth moving and stretching belts engaging with the cloth after leaving the tank, the paint-tank, the spreading-brushes, the friction driving-wheel, and the friction-driven winding-shaft for receiving the cloth after leaving the painting device, substantially as set forth.

402,185. FINGER-SHIELD AND FOUNTAIN ATTACHMENT. JAMES PATMOR, Pittsburg, Kans. Filed Oct. 6, 1888. Serial No. 287,393. (No model.)



Claim.—1. A combined fountain attachment and finger-shield comprising the coil of wire, and the shield adapted to slide upon a pen and close the base of the coil, substantially as described.

2. A combined fountain attachment and finger-shield comprising the coil of wire, and the shield secured to the coil and closing the base thereof, and provided with a semicircular slot to receive the pen, substantially as described.

3. A combined fountain attachment and finger-shield comprising the wire coil, and the shield having a semicircular pen-slot and provided with a projection fitting within the base of said coil and affording means whereby the coil is secured to the shield, substantially as described.

402,186. WRENCH. IRA F. PECK, Providence, R. I. Filed Dec. 17, 1888. Serial No. 293,907. (No model.)



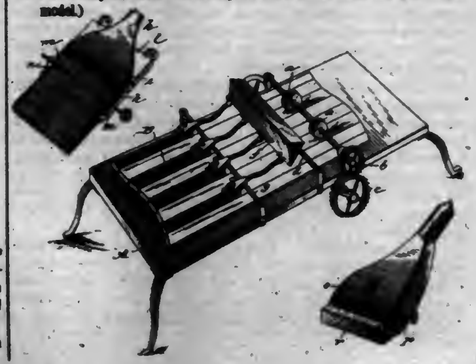
Claim.—In combination, the stationary jaw C, movable jaw E, the ferrule B, provided with the socket *b*, and the flat inclined face *c*, the operating-screw F, having a milled collar, *g*, and bearing-stem *a*, which enters the socket *b*, and the lever G, provided with a perforation, *d*, to receive the stem *a*, and with opposite flat surfaces inclined to form a wedge which by partial rotation upon the stem *a* will serve to produce the desired powerful forward movement of the jaw E, substantially as described.

402,187. MOLD FOR CASTING HOLLOW INGOTS. IRA F. PECK, Providence, R. I. Filed Jan. 4, 1889. Serial No. 295,460. (No model.)



Claim.—In an elongated mold for casting hollow metal ingots, the combination, with the outer metallic shell and the hollow metallic core, of the removable plug for heating the hollow core, substantially as described.

402,188. PAINTING APPARATUS. SEYMOUR W. PERREGRINE, Grand Rapids, Mich. Filed Apr. 10, 1888. Serial No. 270,214. (No model.)



Claim.—1. In combination, the table, the brush or stainer consisting of the hollow head with the staining-brush held therein, a reservoir, a connection between said reservoir and the hollow head of the brush, and adjusting-screws for varying the size of the staining-brush.

2. In combination, the table, the reservoir, the bar *g*, and the brush-holders K, pivotally secured to said bar *g*, whereby they may be adjusted in elevation to conform to the surface being painted, substantially as described.

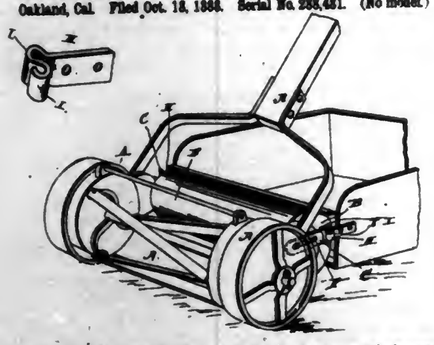
3. In combination, the table, the reservoir, the bar *g*, and the brush-holders K, pivotally secured to said rod to have vertical adjustment, said brushes being adjustable laterally toward and from each other, substantially as described.

4. In a machine for painting slats of school-seats, &c., a table, a reservoir above the same, a supporting-bar, *g*, extending across said table, a series of staining-brushes pivotally supported on said bar at different points to paint the desired slats, feeding-rolls arranged in rear of the brushes, and means for operating said rolls, substantially as described.

5. In a machine for painting slats of school-seats, a table, a reservoir above and a reservoir below the same, a supporting-bar, *g*, extending across above said table, a series of staining-brushes pivotally supported thereon at different points to paint the desired slats, a shaft beneath the table, painting wheels or rollers supported at different points along said shaft in connection with the lower reservoir, and openings in the table in line with said wheels or rollers, whereby the slats are painted upon both sides at the same time, substantially as described.

402,189. ATTACHMENT FOR LAWN-MOWERS.

HENRY PETERSON, Berkeley, assignor of two-thirds to J. R. Wilson and W. F. Delainey, Oakland, Cal. Filed Oct. 12, 1888. Serial No. 288,481. (No model.)



Claim.—The combination, with the lawn-mower, of the rearwardly-projecting longitudinally-adjustable hooks secured to the sides thereof, the tray or grass-receptacle having the runner on its under side, and a concave front end to fit over the ground-roller of the mower, and forwardly-projecting arms, detachably secured to the sides of the tray and having each two eyes arranged as described and adapted to be engaged by the hooks secured to the mower, as specified.

402,190. DISTRIBUTION OF ELECTRICITY BY SECONDARY BATTERIES.

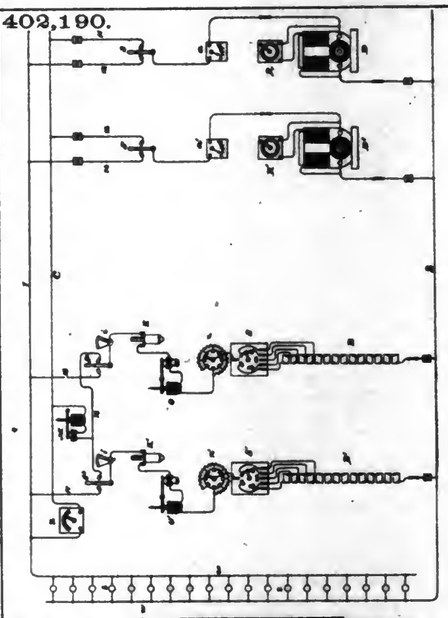
GEORGE B. PRESCOTT, Jr., Newark, N. J., assignor to The Electrical Accumulator Company, of New York. Filed Feb. 7, 1889. Serial No. 298,975. (No model.)

Claim.—1. The combination of a dynamo-electric machine, two main leads therefor, a working-circuit containing lamps, one or more series of cells of secondary battery, an auxiliary lead containing an artificial resistance, and switches for changing the batteries and dynamos from one lead to the other for the purpose of charging and discharging, substantially as described.

2. The combination of two or more dynamo-electric machines connected in multiple arc, main leads therefor, a working-circuit containing lamps in multiple arc, two or more series of cells of secondary battery in parallel circuit, with their opposite terminals connected to the main leads, respectively, whereby both dynamos and batteries supply the working-circuit, a switch in each battery branch for varying the number of cells in circuit, and a switch in each dynamo branch to connect and disconnect either dynamo with respect to the main leads, substantially as described.

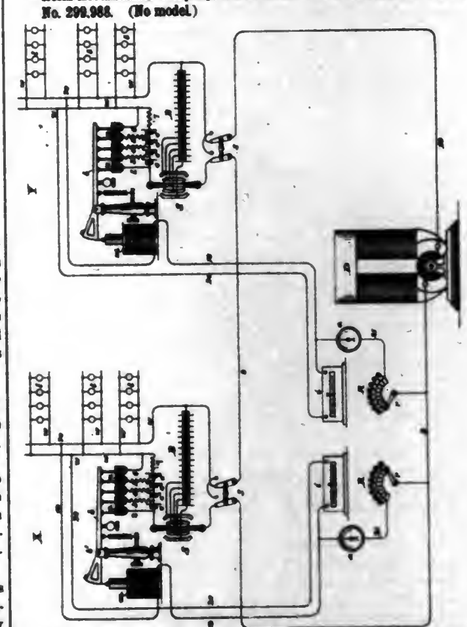
3. The combination of a dynamo-electric machine, main leads therefor, two or more series of cells of secondary battery connected in parallel circuit with each other, and an adjustable artificial resistance in circuit with each battery to compensate for fractional differences in the electro-motive force between each series, substantially as described.

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402,191. SYSTEM OF DISTRIBUTION BY SECONDARY BATTERIES.

GEORGE B. PRESCOTT, Jr., Newark, N. J., assignor to The Electrical Accumulator Company, of New York. Filed Feb. 15, 1889. Serial No. 299,988. (No model.)



Claim.—1. The combination of a primary generator of electricity located at a main station, a charging-circuit, a secondary battery located at a sub-station, a working-circuit therefor, one or more cells yielding a counter electro-motive force to be introduced and withdrawn with respect to the working-circuit, a switch or circuit-changer controlling the position of said cells, an electro-magnet for operating the switch, and a separate circuit connecting the main and sub stations, including the coils of said magnet.

2. The combination of a primary generator of electricity located at one station, a secondary battery located at a second station, a charging-circuit uniting both stations, a working-circuit for the battery, one or more cells yielding a counter electro-motive force to be inserted and withdrawn with respect to the working-circuit, a circuit connecting points in the working-circuit at one station with an indicator at the other station, and an electro-magnetic switch at the sub-station having its coils in an electrical circuit uniting both stations, substantially as described.

3. The combination of a primary generator of electricity located at one station, a secondary battery located at a second station, a charging-circuit uniting said stations, a working-circuit for the battery, one or more cells yielding a counter electro-motive force to be inserted and withdrawn with respect to the working-circuit, a circuit connecting points in the working-circuit at one station with an indicator at the other station, an electro-magnetic switch at the sub-station controlling the counter-electro-motive-force cells, and an electrically-independent circuit uniting both stations and controlling the electro-magnetic switch, substantially as described.

4. The combination of a primary generator of electricity located at one station, a secondary battery located at a second station, a charging-circuit uniting said stations, a working-circuit for the battery at said second station, a series of cells yielding a counter electro-motive force, a switch or circuit-changer for varying the connections of said cells with respect to the working-circuit, an electro-magnet controlling said switch, a separate circuit containing the coils of said magnet, and a third circuit connecting points in the working-circuit with an indicator located at the first station, substantially as described.

5. The combination of a primary generator of electricity located at a main station, a secondary battery located at a sub-station, a charging-circuit uniting both stations, a working-circuit for the secondary battery, a series of artificial resistances and one or more cells yielding a counter electro-motive force to be inserted and withdrawn with respect to the working-circuit, a switch or circuit-changer controlling the position of said cells, an electro-magnet for operating the switch, and a separate circuit connecting the main and sub stations, including the coils of said magnet.

6. The combination of a secondary battery, a working-circuit therefor, a series of cells yielding a counter electro-motive force, and a switch or circuit-changer for introducing one cell after another between the battery and working-circuit, substantially as described.

7. The combination of a secondary battery, a working-circuit therefor, a series of cells yielding a counter electro-motive force, located in the working-circuit, a circuit containing an artificial resistance around each cell, and a switch or circuit-changer operating to break the circuit of each cell successively, substantially as described.

8. The combination of a secondary battery, a working-circuit therefor, a series of cells yielding a counter electro-motive force, located in the working-circuit, a sectional artificial resistance for such cells included in circuit therewith, and a switch or circuit-changer normally completing a circuit round each cell, including a resistance and means for breaking such circuits successively to introduce said cells and resistance with respect to the working-circuit, substantially as described.

402,192. DISTRIBUTION OF ELECTRICITY BY SECONDARY BATTERIES.

GEORGE B. PRESCOTT, Jr., Newark, N. J., assignor to The Electrical Accumulator Company, of New York. Filed Feb. 16, 1889. Serial No. 300,261. (No model.)

Claim.—1. The combination of a source of electricity, a working-circuit therefor containing translating devices, a series of cells yielding a counter electro-motive force, and means for successively introducing or withdrawing such cells in accordance with variations in the electro-motive force, substantially as described.

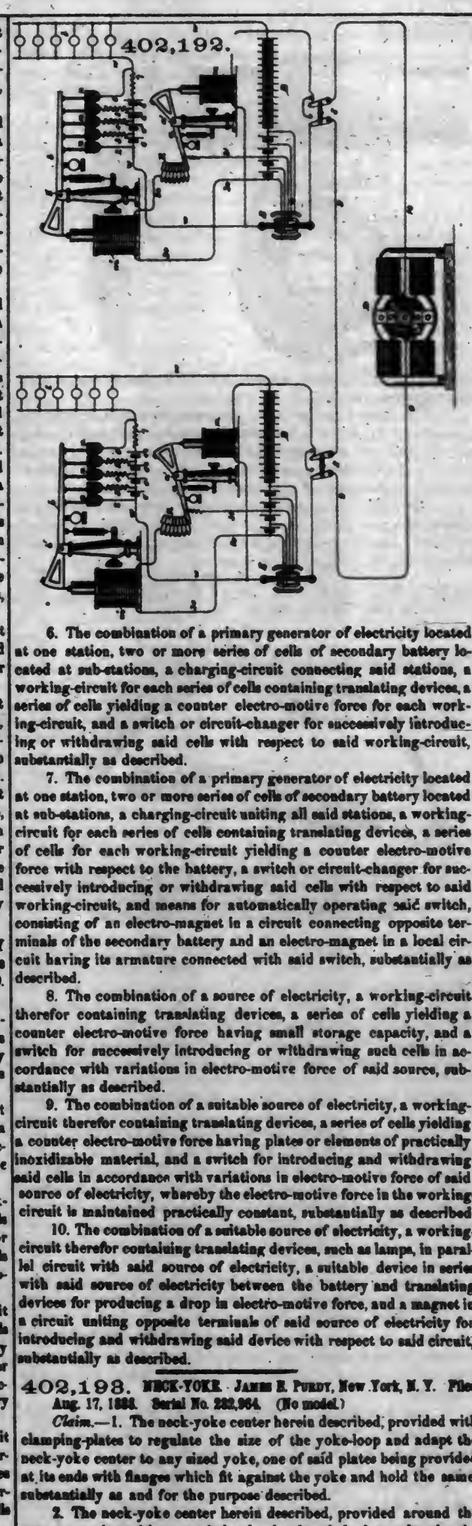
2. The combination of a secondary battery, a working-circuit therefor containing translating devices, a series of cells yielding a counter electro-motive force, and a switch or circuit-changer for successively introducing or withdrawing said cells with respect to the working-circuit, substantially as described.

3. The combination of a suitable source of electricity, a working-circuit therefor containing translating devices, a series of cells yielding a counter electro-motive force, and an automatic switch or circuit-changer for successively introducing or withdrawing said cells with respect to the working-circuit operated by variations in electro-motive force at said source of electricity, substantially as described.

4. The combination of a secondary battery, a working-circuit therefor containing translating devices, such as lamps, a series of cells yielding a counter electro-motive force located between the battery and translating devices, an electro-magnetic switch or circuit-changer for successively introducing and withdrawing said cells, and an electro-magnet in a circuit joining opposite terminals of the secondary battery controlling said switch, substantially as described.

5. The combination of a secondary battery, a charging-circuit therefor containing a primary generator of electricity, a working-circuit for the secondary battery containing translating devices, a series of cells yielding a counter electro-motive force, and a switch or circuit-changer for successively introducing or withdrawing said cells with respect to the working-circuit, substantially as described.

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6. The combination of a primary generator of electricity located at one station, two or more series of cells of secondary battery located at sub-stations, a charging-circuit connecting said stations, a working-circuit for each series of cells containing translating devices, a series of cells yielding a counter electro-motive force for each working-circuit, and a switch or circuit-changer for successively introducing or withdrawing said cells with respect to said working-circuit, substantially as described.

7. The combination of a primary generator of electricity located at one station, two or more series of cells of secondary battery located at sub-stations, a charging-circuit uniting all said stations, a working-circuit for each series of cells containing translating devices, a series of cells for each working-circuit yielding a counter electro-motive force with respect to the battery, a switch or circuit-changer for successively introducing or withdrawing said cells with respect to said working-circuit, and means for automatically operating said switch, consisting of an electro-magnet in a circuit connecting opposite terminals of the secondary battery and an electro-magnet in a local circuit having its armature connected with said switch, substantially as described.

8. The combination of a source of electricity, a working-circuit therefor containing translating devices, a series of cells yielding a counter electro-motive force having small storage capacity, and a switch for successively introducing or withdrawing such cells in accordance with variations in electro-motive force of said source, substantially as described.

9. The combination of a suitable source of electricity, a working-circuit therefor containing translating devices, a series of cells yielding a counter electro-motive force having plates or elements of practically inoxidizable material, and a switch for introducing and withdrawing said cells in accordance with variations in electro-motive force of said source of electricity, whereby the electro-motive force in the working-circuit is maintained practically constant, substantially as described.

10. The combination of a suitable source of electricity, a working-circuit therefor containing translating devices, such as lamps, in parallel circuit with said source of electricity, a suitable device in series with said source of electricity between the battery and translating devices for producing a drop in electro-motive force, and a magnet in a circuit uniting opposite terminals of said source of electricity for introducing and withdrawing said device with respect to said circuit, substantially as described.

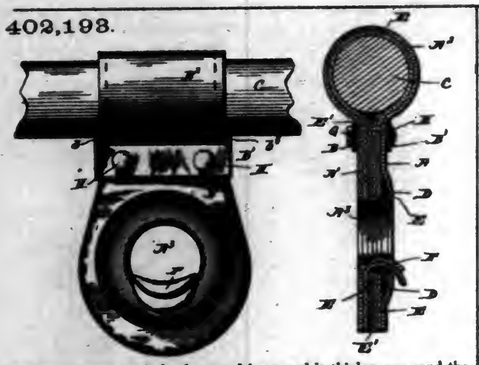
402,193. NECK-YOKE.

JAMES E. PURDY, New York, N. Y. Filed Aug. 17, 1888. Serial No. 282,964. (No model.)

Claim.—1. The neck-yoke center herein described, provided with clamping-plates to regulate the size of the yoke-loop and adapt the neck-yoke center to any sized yoke, one of said plates being provided at its ends with flanges which fit against the yoke and hold the same, substantially as and for the purpose described.

2. The neck-yoke center herein described, provided around the tongue-opening with a metal ring having beveled edges, whereby the

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neck-yoke center is bulged out and increased in thickness around the tongue-opening, substantially as described.

3. The herein-described neck-yoke center, having the wear-pieces in the tongue-opening and the beveled ring surrounding said opening, and provided with clamping-plates to regulate the size of the yoke-loop, one of said clamping-plates having at its ends flanges, which fit against the yoke and hold the same, substantially as described.

4. The neck-yoke center herein described, provided in the tongue-opening with wear-pieces, formed integral with the leather at the bottom of said opening, and pushed through the same to receive the wear from the tongue, substantially as described.

402,194. STRAP-LOOP. ALVIN C. REEVES, Palouse, Wash. Filed Dec. 13, 1888. Serial No. 293,451. (No model.)



Claim.—1. A keeper for straps, consisting of a loop which is provided at an intermediate point with a stationary tapered or wedge-shaped separator arranged transversely therein, whereby straps extending through the keeper on opposite sides of the separator are held in a divergent position, substantially as specified.

2. As an improved article of manufacture, the keeper for straps, comprising a loop provided with divergent sides, and the stationary tapered or wedge-shaped separator disposed in the loop, with its sides respectively parallel with the sides of the loop, substantially as specified.

3. The keeper having a base-plate, a loop provided with divergent sides, and a tapered or wedge-shaped separator arranged centrally in the loop, with its sides parallel respectively with the sides of the loop, combined with the back-strap bifurcated at one end to form latches D D, which pass through the loop on opposite sides of the separator, substantially as and for the purpose specified.

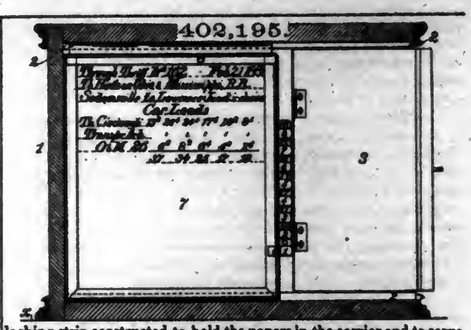
402,195. FILE-BOX. JONATHAN A. RHOADS, East Liverpool, Ohio, assignor of one-half to George M. Irwin, Pittsburg, Pa. Filed Aug. 20, 1888. Serial No. 283,252. (No model.)

Claim.—1. A file-box having two opposite sides extended beyond the body of the box, the inner surfaces of said sides and extensions being provided with grooves for the reception of papers, substantially as set forth.

2. A file-box having two opposite sides extended beyond the body of the box, the inner surfaces of said sides and extensions being provided with grooves, in combination with a series of two or more carriers arranged in said grooves, substantially as set forth.

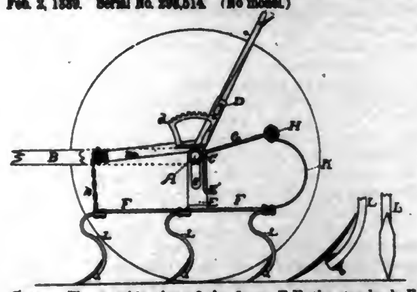
3. A file-box having two opposite sides extended beyond the body of the box, the inner surfaces of said sides and extensions being provided with grooves, in combination with a series of two or more carriers, each carrier provided with retaining-grooves, and a keeper or

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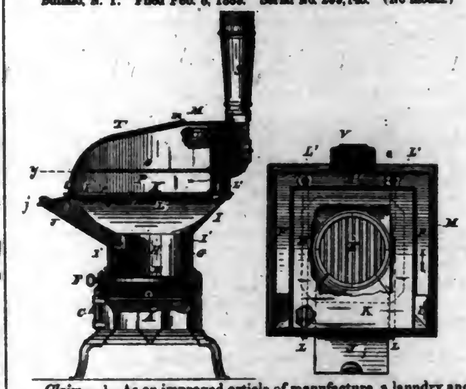
locking-strip constructed to hold the papers in the carrier and to serve as a guide for the carrier, substantially as set forth.

402,196. CULTIVATOR. THOMAS R. RINGWOOD, Solvio, N. Y. Filed Feb. 2, 1889. Serial No. 298,514. (No model.)



Claim.—The combination of the frame F F, the standards E E, provided with racks F' F', the axle A, provided with the actuating-lever D, pinions C C, and bars G G, and the springs K K, connecting said bars with the rear of the frame F F.

402,197. SMOOTHING AND SAD IRON HEATER. ADOLPH SCHMITT, Buffalo, N. Y. Filed Feb. 8, 1888. Serial No. 299,145. (No model.)



Claim.—1. As an improved article of manufacture, a laundry and tailor stove for heating flat and smoothing irons, consisting, essentially, of the base having the grate, the fire-pot, the flaring middle piece having the chute and cover, the plate having the side openings, and the top having the side and back flues, and the hinged cover, as and for the purpose set forth.

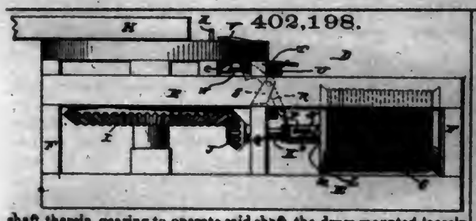
2. In heating-stoves, the combination, with the flaring middle piece of the plate and the series of tubes supporting said plate, said tubes having their exit in the back flue, as and for the object set forth.

3. In laundry and heating stoves, the combination, with a suitable base and fire-pot, of a flaring middle piece, a plate having tubular supports and provided with passages in its forward corners, and a U-shaped top having double walls provided with ducts and a hinged cover for said top, the whole being constructed and arranged in the manner as and for the purpose set forth.

402,198. HORSE-POWER. JOHN R. SHEAR, Auburn, N. Y. Filed Dec. 28, 1888. Serial No. 294,857. (No model.)

Claim.—1. The combination, with the frame, of the horizontal

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shaft therein, gearing to operate said shaft, the drum mounted loosely on the shaft and provided with a half-clutch at one end, the half-clutch on the shaft engaging the half-clutch on the drum, the vibrating lever mounted on the frame and engaging said clutch, and a trip-lever mounted above and engaging said vibrating lever, as set forth.

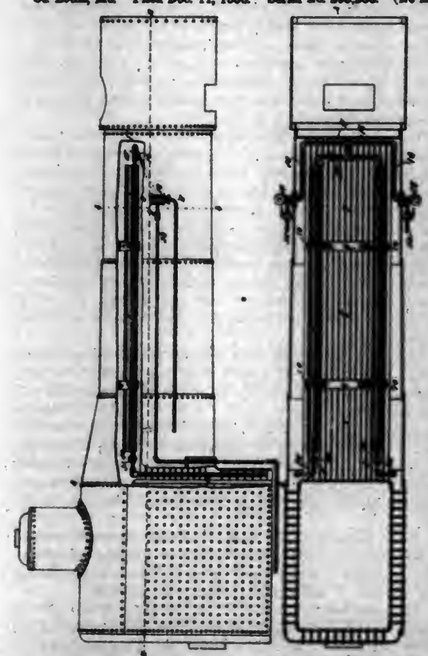
2. The combination, with the frame, of the horizontal shaft mounted therein, the drum mounted loosely on the said shaft and provided with a half-clutch at one end, the half-clutch sliding on the shaft and engaging the half-clutch on the drum, the vibrating lever mounted on the frame and having its lower end engaging said sliding half-clutch, the spring forcing the lower end of the lever outward, and devices for forcing the lower end of the lever inward and thereby disengaging the half-clutches, as set forth.

3. The combination of the frame, the horizontal shaft therein, gearing for operating said shaft, the drum mounted loosely on the shaft and provided with the half-clutch at one end, the half-clutch sliding on the shaft and engaging the half-clutch of the drum, the vibrating lever mounted on the frame and having its lower end engaging the clutch, the trip-lever mounted on the frame and engaging the upper end of the vibrating lever, and the pulley having the pin on the upper side engaging the trip-lever and a cam on its lower side engaging the vibrating lever, as specified.

4. In a horse-power, the shaft K, having the drum mounted loosely thereon, the clutch connecting the drum to the shaft, the driving-shaft having the usual sweep, H, the pulley *a*, secured to the driving-shaft below the sweep, a pulley, *b*, connected to pulley *a* by a belt, and tripping devices actuated by the pulley *b* to cause the engagement of the clutch on the drum-shaft, as set forth.

5. In a horse-power, the drum-shaft K, the drum loosely mounted thereon, the clutch connecting the drum to the shaft, the driving-shaft having the sweep, and tripping devices actuated by the movement of the driving-shaft to cause the disengagement and engagement of the clutch on the drum-shaft, as set forth.

402,199. FEED-WATER PURIFIER. WILLIAM J. SMITH, Chicago, Ill., assignor to the Smith Feed Water Heater and Purifier Company, St. Louis, Mo. Filed Dec. 11, 1888. Serial No. 293,288. (No model.)



Claim.—1. The combination, with a feed-water purifier, of a suction-pipe connecting the bottom of the boiler with said feed-water purifier, and a valve in said pipe whereby the feed-water is prevented from passing through said pipe and the sediment is drawn off by said pipe when blowing off the purifier.

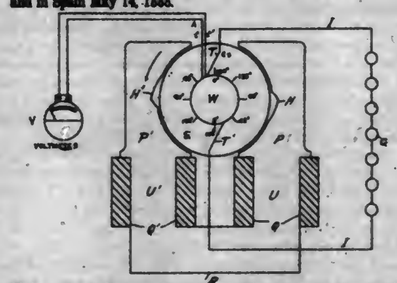
2. The combination, with a feed-water purifier located within a boiler, of a pipe, 25, opening into said purifier, and having its other end communicating with the water at or near the bottom of said boiler, and a valve in said pipe whereby the feed-water is prevented from entering the boiler by way of said pipe and circulation is caused in said pipe when blowing off said purifier.

3. The combination, with a feed-water purifier located wholly within the boiler, having a diaphragm intermediate of it provided with holes 13, of a pipe, 25, projecting in said purifier below said diaphragm beyond the holes 13, its other end being open or provided with holes communicating with the water of the boiler, and a valve in said pipe for preventing the feed-water from entering the boiler by way of said pipe.

4. The combination, with a feed-water purifier having one or more apertures through which the feed-water passes to the boiler, said aperture or apertures being arranged at the water-level of said water, of a suction-pipe provided with a valve and connected to said purifier and passing to or near the bottom of the boiler, whereby when the purifier is blown off the surface of the water in the boiler will be skimmed and the sediment deposited in said boiler will be removed.

5. The combination, as hereinbefore set forth, of the tubes 8 8, arranged within and at each side of the boiler, brackets 9 9 for supporting said tubes from the boiler-shell, pipes connecting said tubes with pump and injector connections, the connection between said pipes and said tubes being made inside of the boiler, a diaphragm within said tubes, holes 13 and 14, as described, in the diaphragm and purifier-tubes, respectively, a pipe extending into the lower compartment of said purifier-tubes beyond the holes 13 and connected with the boiler, and a valve, 29, in said pipe, substantially as and for the purpose set forth.

402,200. POLE-PIECE FOR DYNAMO-ELECTRIC MACHINES. JOHN G. STATTER, London, County of Middlesex, England. Filed Feb. 9, 1888. Serial No. 263,453. (No model.) Patented in England Feb. 23, 1887, No. 2,825; in France Feb. 13, 1888; in Belgium Feb. 15, 1888, and in Spain May 14, 1888.



Claim.—1. A dynamo-electric machine or motor having one or more of its pole-pieces cut away or incised at a point, H, intermediate of the extremities of said pole-pieces, to vary the length of the conductor acted upon and keep constant the magnetism generated in the coils passing under the brushes, whereby, when said brushes are shifted, sparking will be obviated, substantially as described.

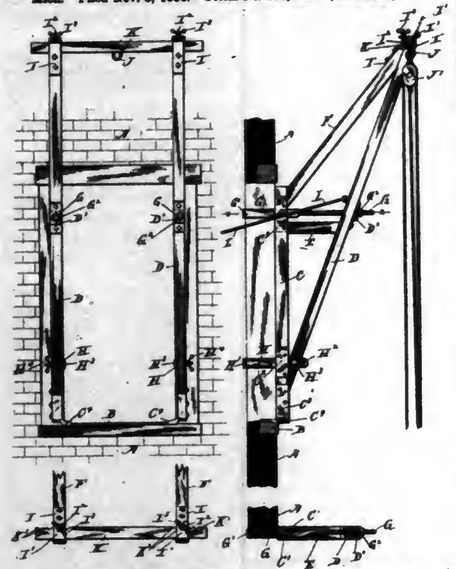
2. A dynamo-electric machine motor having one or more of its pole-pieces cut away or incised at a point or points, H, intermediate of the extremities of said pole-pieces, to make the inductive effect of the field-magnets equal to the self-induction generated in those coils of the armature passing under the brushes, whereby the inductive effect and the self-inductive effect will neutralize each other and no sparking will occur when the brushes are shifted.

3. A dynamo-electric machine or motor having one or more of its pole-pieces cut away or incised at the point H, intermediate of the extremities of said pole-pieces, to vary the magnetic effect of the field-magnets upon the armature and prevent sparking when the brushes are shifted, substantially as described.

4. A dynamo-electric machine or motor having one or more of its pole-pieces cut away or incised at a point, H, intermediate of the extremities of said pole-pieces, to keep constant the inductive effect of the field-magnets upon the armature-coils passing under the brushes, whereby sparking will not occur when said brushes are shifted.

5. A pole-piece for a dynamo-electric machine or motor cut away or incised at a point, H, intermediate of the extremities of said pole-piece, to vary the magnetic effect of said pole-piece upon the armature and make the resultant of the magnetic effect of the pole-pieces and the self-induction generated in the coils of the armature passing under the brushes zero, the location, size, and form of the cavities H being determined substantially in the manner set forth.

402,201. ADJUSTABLE DERRICK. EDWIN B. STEELE, Adrian, Mich. Filed Nov. 5, 1888. Serial No. 290,060. (No model.)



Claim.—1. The combination of a frame comprising an upright post adapted to rest against the outside of the wall and inclined braces connected at their upper ends to each other and attached at their lower ends to the upper and lower parts, respectively, of said post, horizontal slides adjustable in said frame and provided with hooks at their inner ends for engaging the wall, and bolts having nuts for adjusting said slides.

2. The combination of an upright post provided with a sill-shoe, inclined braces connected at their upper ends to each other and attached at their lower ends to the upper and lower parts, respectively, of said posts, a horizontal slide near the upper end of said post provided with a hook at its inner end for engaging the wall and a bolt-shaped outer end extending through the outer brace, a washer on the outer brace, and a nut on said bolt end for adjusting the slide.

3. The combination of an upright post, inclined braces connected at their upper ends to each other and attached at their lower ends to the upper and lower parts, respectively, of said post, a horizontal slide near the upper end of said post provided with a hook at its inner end for engaging the wall and with a bolt-shaped outer end extending through the outer brace, a washer on the outer brace and a nut on said bolt end for adjusting the slide, and an adjustable horizontal slide near the lower end of said post provided with a hook at its inner end.

4. The combination of an upright post, inclined braces connected at their upper ends to each other and attached at their lower ends to the upper and lower parts, respectively, of said post, a horizontal slide near the upper end of said post provided with a hook at its inner end for engaging the wall and with a bolt-shaped outer end extending through the outer brace, a washer on the outer brace, a nut on said bolt for adjusting the slide, an adjustable horizontal slide near the lower end of said post provided with a hook at its inner end and a slot at its outer end, a bolt extending through said slot and through the lower end of said outer brace, and a thumb-nut on said bolt

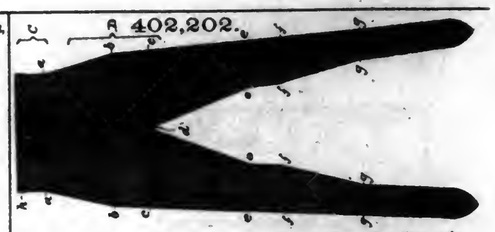
5. The combination of two adjustable window derrick-sections adapted to be secured to the wall of a building, a cross-bar provided with notches near its ends, and bolts in said sections engaging said notches for securing the bar and sections together.

6. The combination of two adjustable window-derrick sections adapted to be secured to the wall of a building and provided with brackets having hinged plates, a bar for connecting said sections resting in said brackets and provided with notches near its opposite ends, and bolts passing through said hinged plates, notches, and brackets, substantially as described.

402,202. FULL TIGHTS. SIMON T. SUTTON, Chicago, Ill. Filed Nov. 8, 1887. Serial No. 254,617. (No model.)

Claim.—1. As an improved manufacture, knitted tights having a seamless waist portion of plain circular work and a seamless hip portion, the latter being widened out from the line *a a* to the line *b b*, or approximately so, substantially as shown and described.

2. As an improved manufacture, knitted tights having a seamless waist portion of plain circular work, and a seamless hip portion which is widened on the two opposite sides of the garment, substantially as shown and described.

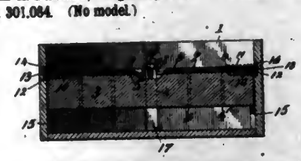


3. As an improved manufacture, seamless knitted tights having a waist portion, C, of plain circular work commencing at the top of the garment and extending to the line *a a*, the hip portion D, widened from the line *a a* to the line *b b*, or approximately so, and then knit in plain circular work to the point or line *c c* at the crotch, substantially as shown and described.

4. As an improved manufacture, seamless knitted tights having a waist portion of plain circular work, a hip portion widened from the line *a a* to the line *b b*, or approximately so, and then plain circular work to the line *c c* at the crotch, and the seamless legs narrowed on their insides from the crotch to the ankle portions, excepting at the knee portions between the lines *e e* and *f f*, which are of plain circular work, substantially as shown and described.

5. As an improved manufacture, seamless knitted tights having legs narrowed on their inside lines from the points *d* to the points *e*, and from points *f* to points *g*, and having waist and hip portions formed continuously therewith and of circular knitted work, substantially as shown and described.

402,203. RACK-BOX FOR BOTTLES. THEODORE A. TAYLOR and WILLIAM H. DIAMOND, Poughkeepsie, N. Y. Filed Feb. 25, 1889. Serial No. 301,084. (No model.)



Claim.—1. The combination, with a box, of a rack removably supported therein and provided with locking or latching devices for removably securing the same in said box, substantially as described.

2. The combination, with a box, of a rack removably supported therein and provided with yielding locking or latching devices for removably securing the same in said box, substantially as described.

3. The combination, with a box provided with holes in its sides and ends, of a rack removably supported therein, and spring-actuated rods or bolts secured to said rack for removably securing the same in place in said box, substantially as described.

4. The combination, with a box provided with holes in its sides and ends, of a rack formed with grooves in the upper edges of its central longitudinal and transverse bars or partitions, and spring-actuated rods or bolts, which are adapted to be slid in said grooves, and provided with suitable handles, substantially as described.

5. The combination, with a box provided with holes in its sides and ends, of a rack formed with grooves in the upper edges of its central longitudinal and transverse bars or partitions, rods or bolts placed and adapted to slide in said grooves, and provided with handles at their inner ends, staples fitted over said rods or bolts, and coiled springs surrounding them for forcing their outer ends into said holes, substantially as described.

6. The combination, with a box provided with holes in its sides and ends, a rack formed with grooves in the upper edges of its central longitudinal and transverse bars or partitions, and with enlarged recesses near their outer ends, rods or bolts which are adapted to slide in said grooves, and which are formed with handles at their inner ends and provided with studs or projections near their outer ends, staples for securing said rods or bolts within said grooves, and coiled springs surrounding them and arranged within said enlarged recesses and bearing against said studs or projections, substantially as described.

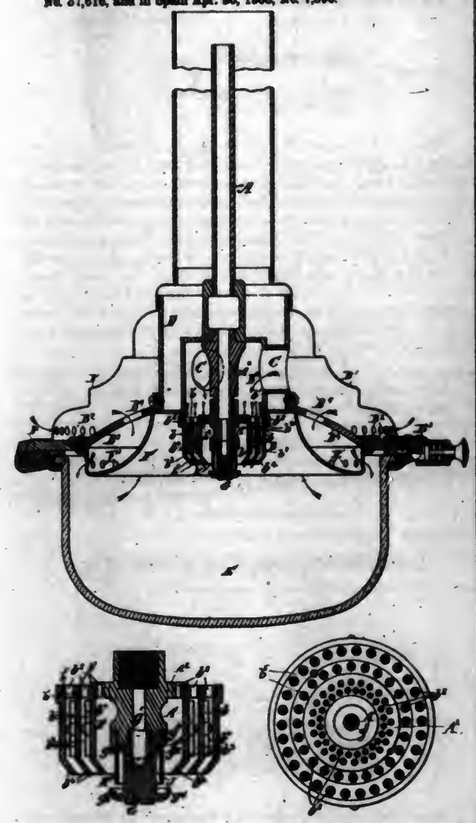
7. The combination, with a box, of a rack removably secured within said box and provided with locking or latching devices and stop-blocks secured to the sides and bottom of said box for supporting the ends and sides of said rack, substantially as described.

8. The combination, with the box 1, provided with the holes 13 in its sides and ends, of the rack 2, having the central longitudinal and transverse bars 3 and 4, the rods or bolts 7 and 8, the stop-blocks 15

for the ends of said central longitudinal bar, and the stop-blocks 17, formed with the notches 16 for the ends of said central transverse bar, substantially as described.

9. The combination, with the box 1, provided with the stop-blocks 15 and 17 and the plates 14, having the holes 13, of the rack 2, provided with the central longitudinal and transverse bars, 3 and 4, formed with the grooves 5 and 6 and the enlarged recesses 10, and provided with the staples 9, the rods or bolts 7 and 8, having the handles 8' upon their inner ends and the studs 12 near their outer ends, and the springs 11, surrounding said rods or bolts and arranged within said recesses 10, substantially as described.

402,204. GAS-LAMP. THOMAS C. J. THOMAS, Finsbury Park, County of Middlesex, England. Filed Mar. 30, 1887. Serial No. 232,974. (No model.) Patented in England Jan. 21, 1885, No. 883, and Jan. 13, 1887, No. 579; in France June 8, 1885, No. 169,417, and Feb. 3, 1887, No. 181,338; in Germany June 10, 1885, No. 35,064; in Belgium Feb. 3, 1887, No. 76,307; in Victoria June 8, 1887, No. 6,116; in South Australia June 9, 1887, No. 319; in New Zealand June 17, 1887, No. 2,383; in New South Wales Aug. 2, 1887, No. 15; in Italy Sept. 23, 1887, XLIV, 134; in India Jan. 10, 1888, No. 190; in Austria-Hungary Feb. 23, 1888, No. 37,616, and in Spain Apr. 20, 1888, No. 7,390.



Claim.—1. In a gas-lamp, the combination, with a gas-supply pipe and a burner, of an air-heating chamber provided with a series of annular divisions placed one within the other and open at both ends for the direct downward passage of air therethrough, said divisions being so arranged that their lower ends form a series of concentric annular openings located above the flame or flames passing laterally from said burner, substantially as described.

2. In a gas-lamp, the combination, with a gas-supply pipe and a burner, of an air-heating chamber provided with a series of annular divisions placed one within the other and open at both ends for the direct downward passage of air therethrough, said divisions being contracted or made of gradually-decreasing diameter at their lower ends and so arranged as to form a series of concentric annular openings located above the flame or flames passing laterally from said burner, substantially as described.

3. In a gas-lamp, the combination, with a gas-supply pipe, a burner, and an air-heating chamber provided with a series of annular divisions open at both ends and so arranged one within the other that their lower ends form a series of concentric annular air-outlet passages located above the flame or flames from said burner, of a perforated cover or plate secured at the upper ends of said divisions, substantially as herein described, for the purpose set forth.

4. In a gas-lamp, the combination, with a gas-supply pipe, of a preliminary air-heating chamber with air-inlet openings, a main air-heating chamber arranged below said preliminary air-heating chamber, and provided with a series of annular divisions placed one within the other and so arranged that their lower ends form a series of concentric annular openings, the spaces between said divisions being in communication at their upper ends with said preliminary air-heating chamber, a burner secured to the under part of said main air-heating chamber, and a nipple or socket carried by the upper part of said main air-heating chamber and adapted to be connected to said gas-supply pipe, substantially as herein described, for the purposes set forth.

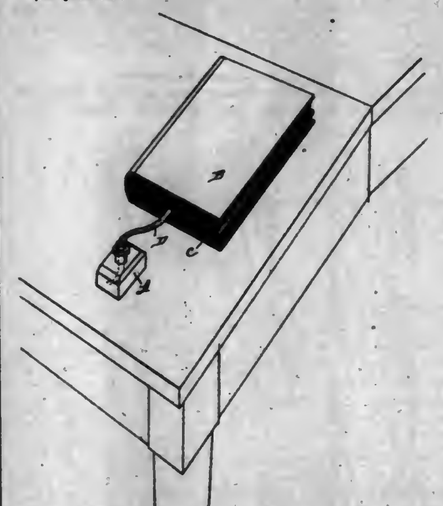
5. In a gas-lamp, the combination, with a gas-supply pipe, of an air-heating chamber provided with annular divisions *b b*, formed at one end with perforated flanges b^2, and a hollow casting, A', with perforated flange A^2, said flanges being adapted to enter the tops of said annular divisions and form a perforated cover or plate, substantially as herein described, for the purpose specified.

6. In a gas-lamp, the combination, with a gas-supply pipe, of an air-heating chamber provided with annular divisions *b b*, formed at one end with perforated flanges b^2 and at the other end with conoidal parts b^4, and a hollow casting, A', with perforated flange A^2, said flanges being adapted to enter the tops of said annular divisions and form a perforated cover or plate, substantially as herein described, for the purpose specified.

7. In a gas-lamp, the combination, with a gas-supply pipe and an air-heating chamber provided with a series of annular divisions open at both ends and so arranged one within the other that their lower ends form a series of concentric annular air-outlet passages, of an inverted burner from which flame passes laterally below said outlet-passages, substantially as herein described.

8. In a gas-lamp, the combination, of a gas-supply pipe, A, a preliminary air-heating chamber, B^3, secured to said gas-supply pipe and provided with air-inlets C, a main air-heating chamber, B, arranged below said preliminary air-heating chamber and comprising a hollow casting, A', screwed to said gas-supply pipe A, a perforated top or plate, b^3, carried by said hollow casting, and a series of concentric annular divisions, *b*, depending from said top or cover, contracted at their lower ends and arranged to form a series of concentric annular outlet-passages for air, and a burner secured to said hollow casting A', substantially as described, for the purposes specified.

402,205. METHOD OF MOISTENING PRESS-COPYING LEAVES. HUGO THUN, Grand Rapids, Mich. Filed July 26, 1888. Serial No. 280,904. (No specimens.)

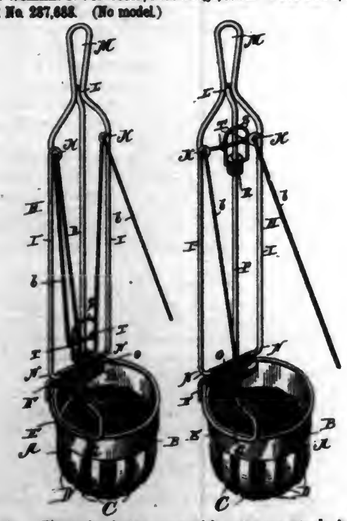


Claim.—1. The method of preparing a quantity of sheets of press-copying paper for use by moistening the same, consisting in placing and supporting one end of a wick in direct connection with the sheets, the other end of said wick extending to and being located and supported in a reservoir, the said wick remaining in permanent contact with the entire number of sheets desired to be prepared to cause complete and proper saturation thereof, substantially as described.

2. The method of preparing sheets of press-copying paper for use by moistening, consisting in separating the desired number of sheets from the entire number by means of oil-boards, then placing and supporting one end of a wick in direct connection with and by said sheets, the other end of which extends into a reservoir, substantially as described.

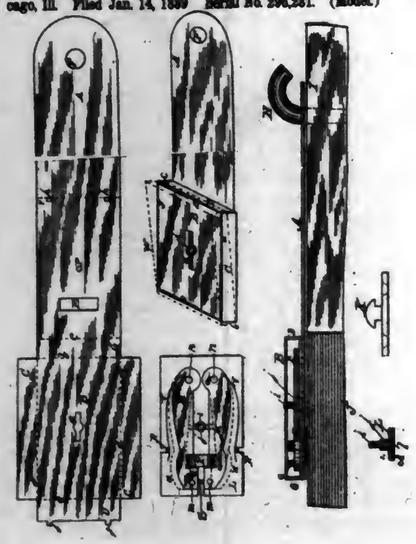
3. The method of preparing sheets of press-copying paper by moistening the same, consisting in placing and supporting one end of a wick in direct connection with said sheets, the other end of said wick extending into a reservoir containing water having an antiseptic therein, substantially as described.

402,206. TWINE-HOLDER. WILLAR A. TIDBALL, Independence, and WILLIAM B. VON STEIN, Fort Dodge, Iowa. Filed Oct. 9, 1888. Serial No. 287,688. (No model.)



Claim.—The twine-holder comprising the receptacle having the wire E with eyes F G, the keeper O, secured to one edge of the receptacle, the frame H, made of a single piece of wire bent to form the eyes or loops K, and the vertical arms I, the latter having the hooks N at their lower ends inserted in keeper O, the vertical guide P, having its lower end secured to the keeper and its upper end secured between the upper ends of arms I, and the weight R, movable on said vertical guide and having the bail S, with eyes T, adapted to engage a cord or twine strung through the loops or eyes F, G, and K, substantially as described.

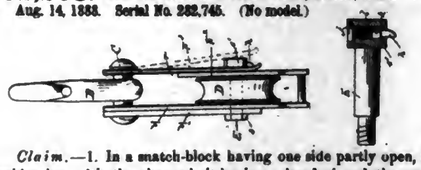
402,207. HASP-LOCK. HERMAN TRIPP and LOUIS LATTAN, Chicago, Ill. Filed Jan. 14, 1889. Serial No. 296,261. (Model.)



Claim.—1. In combined hasps and locks, the hasp and lock-case formed of a single piece of metal, as shown, the same being bent at right angles on the lines *b c* to form the outer end, C, of the lock-case, bent on the line *c* to form the inner end, D, of the same, and bent on lines *d g* for the parts C to form the edges of the case, the portion B forming the front and the hasp portion A forming the back thereof, and the inner end portion, D, provided with tenons *f f*, which engage mortises in the hasp portion, the back of the case provided with a slot for the passage of the catch, and the face of the case provided with a key-slot in combination with a lock, the supporting-plate of which is secured to the back of the case by the key-post *i*, and a catch projecting through the back of the case, as specified.

2. In a hasp and lock-case formed of a single plate of metal, a supporting lock-plate placed inside of the case and having an area coinciding to the inside area of the back of the case, in combination with a lock attached to said plate, and the plate attached to the case and the back of the lock-case, and supporting lock-plate provided with coinciding slots, and a catch passing through the slots, as and for the purpose specified.

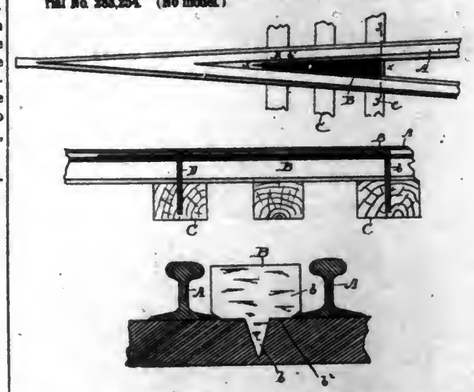
402,208. SNATCH-BLOCK. ANDREW UREN, Seattle, Wash. Filed Aug. 14, 1888. Serial No. 282,745. (No model.)



Claim.—1. In a snatch-block having one side partly open, the combination, with the sheave-bolt having a head, *c*, and the cross-head having one of its rivet ends so extended beyond said open side as to give room for the strap to have lateral and swinging movement, of the said strap pivoted to the cross-head and provided with an opening in its lower end for fitting over said bolt-head, as set forth.

2. In a snatch-block provided with an opening at one side for the insertion of the rope, substantially as shown, the combination, with the said open side and the sheave-bolt provided with a head, of a swinging strap having an opening to fit over said head, the latter being provided with an automatic latch for quickly releasing or locking down said strap, as set forth.

402,209. FOOT-GUARD FOR FROGS, SWITCHES, &c. CHARLES H. WAKEFIELD, Sherbrooke, Quebec, Canada. Filed Aug. 20, 1888. Serial No. 283,254. (No model.)

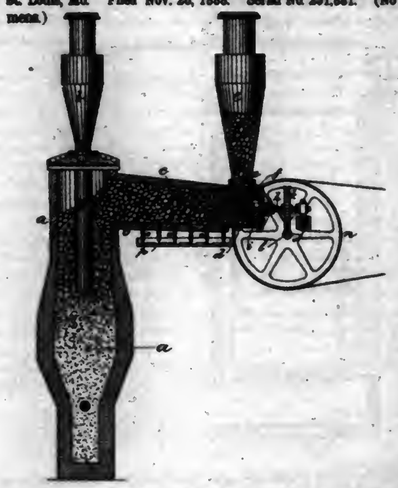


Claim.—1. The herein-described foot-guard for railway frogs, switches, &c., consisting of a tapering bar having the larger end turned down and formed to adapt it to be driven into the tie, and having one or more holes through it, in combination with a spike having its upper end formed to fit said holes, substantially as described.

2. The herein-described foot-guard for railway frogs, switches, &c., consisting of a tapering bar having the larger end turned down and formed to be driven into the tie, a shoulder on said turned-down end to limit its entrance into said tie, and one or more holes in said bar, in combination with a spike to fit said holes and to support the small end of said bar, substantially as described.

3. The herein-described foot-guard for railway frogs, switches, &c., consisting of a tapering bar having its larger end turned down and formed to be driven into the tie, a shoulder on said turned-down end to limit its entrance into the tie, and a series of holes in said bar, in combination with a spike for supporting the smaller end, having a tongue at its upper end adapted to fit said holes and a shoulder to limit its entrance into the tie, substantially as described.

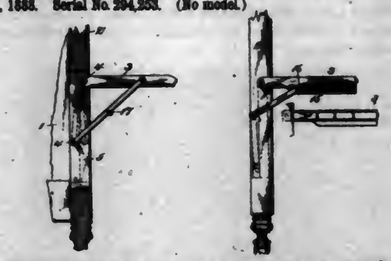
402,210. METHOD OF CONDENSING ZINC VAPORS AND COLLECTING THE METALLIC ZINC THEREFROM. EDWARD WAILES, Jr., St. Louis, Mo. Filed Nov. 26, 1888. Serial No. 291,881. (No specimens.)



Claim.—1. The method herein described for preventing the oxidation of zinc vapors and condensing the same into metallic zinc, which consists in passing the mixed zinc vapors, carbonic-acid gases, &c., through a body of carbon, which at its receiving end is at or above a temperature of fifteen hundred degrees (1,500°) Fahrenheit and at its discharging end, or where the non-condensable gases and molten zinc escape, at a much lower temperature, substantially as and for the purposes specified.

2. As an improvement in the art of condensing metallic zinc from mixed zinc vapors, and oxidizing-gases, subjecting said mixed gases and vapors to a body of carbon which is fed continuously forward through a chamber heated at its discharge end, or where the carbon is discharged, to a temperature of fifteen hundred degrees (1,500°) Fahrenheit, or more, and its carbon-receiving end, or that where the non-condensable gases escape, at or below a temperature at which zinc vapors will condense into liquid molten zinc, the mixed vapors and gases being passed in a reverse direction to the passage or travel of the carbon or condensing medium, substantially as and for the purposes specified

402,211. RACK ATTACHMENT FOR BEDSTEADS. HOWARD M. WARE, Philadelphia, Pa., assignor to I. D. Ware, same place. Filed Dec. 21, 1888. Serial No. 294,253. (No model.)



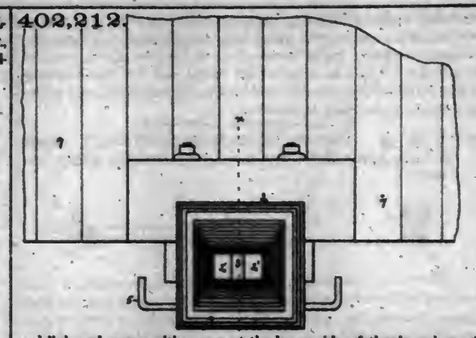
Claim.—1. The combination, with the upright of a bedstead provided with a vertical slot, of a rack pivoted in the slot and a diagonal brace for supporting the rack, the rack and brace being adapted for folding within the slot, substantially as specified.

2. The combination, with the upright of a bedstead, of a rack formed of angle-iron pivoted thereto and provided with foldable removable hooks, and a pivoted brace for supporting the rack in position, substantially as specified.

3. The upright 2, recessed, as at 5, in combination with the rack 3, adapted to fold therein, having the opposite flanges 7, perforated, as at 8, and the hooks 6, having divergent arms 9 and long and short pins 10 and 11, adapted to take into the openings 8, substantially as specified.

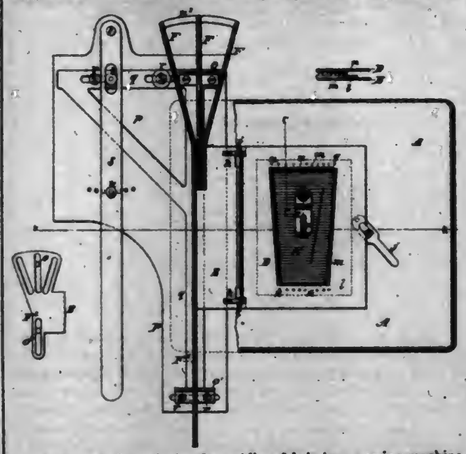
402,212. CAR-COUPLING. CHARLES I. WEBBER, Neenah, Wis. Filed Dec. 18, 1888. Serial No. 293,969. (No model.)

Claim.—In a car-coupling, the combination, with the draw-bar having a link-opening, a cavity for the link leading inward therefrom, and link and cam cavities open at the lower side of the draw-bar, of a hook pivoted therein, said hook having its face or front so formed that it will produce such an angle with the draw-bar when in a closed position that the pressure of the link against it will raise the same, said hook also having a horn extending in a forward direction from below the pivotal point of said hook, a cam pivoted below said pivotal point and adapted in position for raising the hook by its engagement with and its partial revolution toward said horn, and also for retaining the hook in a raised or open position, and the pivot of said cam extended through the cheeks of the draw-bar and adapted for the partial revolution of said cam, all combined and operating substantially as described.



402,213. GLOVE-EMBROIDERING ATTACHMENT FOR SEWING MACHINES. CHARLES E. WEYAND, Brooklyn, N. Y., assignor to A. G. Jennings & Sons, same place. Filed Apr. 30, 1888. Serial No. 272,506. (No model.)

Brief.—The glove-backs are clamped between two plates. The sewing-machine feed acting upon the fabric feeds the same along. The direction is determined by the diverging rods F and shank F^3, which are attached to the plate carrying the fabric and slide in guiding-grooves. Either of the rods F may be placed in the guide-slots.



Claim.—1. In a device for guiding fabric in a sewing-machine, the combination of stitch forming and feeding mechanism with a fabric-clamp having diverging guides F, guide-shank F^3, and bearings for said guides and shank, substantially as described.

2. The fabric-clamp B D, having guide-rods F and shank F^3, combined with the movable bearings *o o'*, whereby by moving said bearings the fabric-clamp will be moved laterally over the bed-plate of a sewing-machine, substantially as described.

3. The fabric-clamp B D, having an opening for the passage of a needle, and having the diverging guide-rods F and shank F^3, combined with the bearings *o o'*, and the frame *q*, carrying said bearings and guided in the base *p*, substantially as described.

4. The fabric-clamp B D, having the diverging guide-rods F and straight shank F^3, combined with the bearings *o o'* for said guide-rods, and shank-frame *q*, carrying said bearings and guided on the base *p*, and with the lever *s*, for moving said frame, substantially as herein shown and described.

5. The plate B, having an opening, *f*, and pins *n n*, at opposite edges of said opening, upon which pins a tape may be placed and

stretched across said opening, combined with the plate D, having an opening that registers with the opening *f*, said plates B D being constructed to clamp a fabric between them, so that the tape that is held by the pins *n n* may be sewed to the fabric, and with the diverging guides F and straight shank F^2, and bearings for supporting said guides and shank, substantially as described.

402,214. PHOTOGRAPHIC-PLATE-DEVELOPING TRAY. THOMAS S. WILES, Albany, N. Y. Filed Dec. 21, 1888. Serial No. 294,268. (No model.)



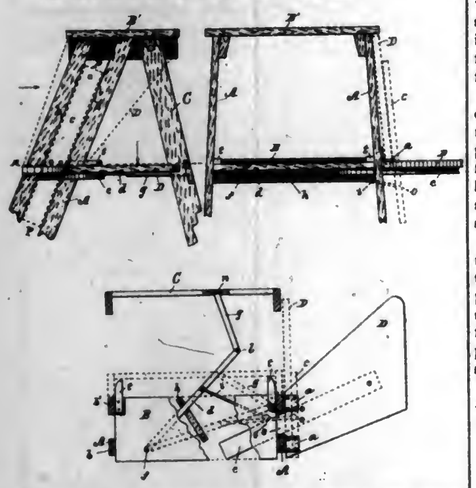
Claim.—1. A bottomless tray adapted to receive within its walls a photographic plate serving as a bottom and provided with swiveled fastening devices for retaining the plate removably in position, substantially as specified.

2. A bottomless tray provided with plate-securing devices having extensions adapted to bear upon the exterior of the walls of the tray, substantially as specified.

3. A bottomless tray provided with corner extensions, in combination with plate-securing devices extended to form spring-tongues, substantially as specified.

4. A bottomless tray provided with plate-retaining devices connected with the tray by headed securing devices, whereby the latter perform the additional function of feet, substantially as specified.

402,215. STEP-LADDER. CHARLES R. WILLIAMS, Newark, N. Y. Filed Dec. 17, 1888. Serial No. 293,896. (No model.)



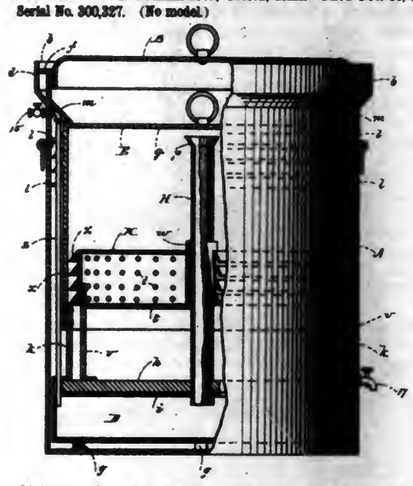
Claim.—1. A step-ladder having the side A formed with an opening, in combination with a step for the ladder, and a shelf joined to the outer surface of said side A and provided with a supporting-bar held in position to pass through said opening in the side A and to rest against the under surface of the step, substantially as described.

2. A step-ladder having sides A, in combination with a step for the ladder, and a shelf joined by a hinge to a side A and having a supporting-bar held to pass through an opening in the side A and to bear against the step, said shelf being formed with a part extending through said opening in the side A to meet the step, substantially as shown and described.

3. A step-ladder having the side formed with an opening, in combination with a step, rear legs or braces for the ladder, a folding shelf joined to said side by a hinge and provided with a supporting-bar held to pass through said opening in the side, a lever secured to said step, a link connecting said lever and rear braces, and a connecting-rod joining said lever and supporting-bar, substantially as shown and described.

4. A step-ladder having the side formed with an opening, in combination with a step, rear braces for the ladder, a shelf joined to said side by a hinge and provided with a supporting-bar passing through said opening in the side, a lever secured to the step, a link connecting said lever and rear braces, and a rod connecting said lever and supporting-bar, said connecting-rod being detachable from said supporting-bar, substantially as and for the purpose set forth.

402,216. APPARATUS FOR THE MANUFACTURE OF HYDROGEN GAS. PERRY YARRINGTON, Boston, Mass. Filed Feb. 18, 1889. Serial No. 300,327. (No model.)



Claim.—1. In a hydrogen-gas generator, the combination of a body or tank, a carburetor disposed therein and provided on its top with a guard-plate, a perforated pan for the gas-generating material, supported on said plate and provided with guard-flanges, a bell or inner casing supported on said plate and inclosing said pan, a pipe from the carburetor opening into said bell, and a supply-tube leading from said carburetor through said body, substantially as described.

2. In a gas-generator, the combination of a body, a reservoir for carbureting material so disposed in said body that it may be surrounded by the acid liquid, a wooden guard-plate on said reservoir, a perforated pan supported on said plate and provided with guard-flanges, a bell supported on said plate and inclosing said pan, said bell having guard-flanges, a pipe from the reservoir opening into the bell above said pan, and a supply-tube leading from the reservoir through said body, substantially as described.

3. In a gas-generator, a body provided with a gutter near its mouth, a cover for said body, a carburetor disposed in the bottom of the body, a wooden guard-plate on said carburetor, a perforated pan provided with guard-flanges supported on said plate, a bell inclosing said pan and resting on said plate, guard-flanges on said bell, a pipe from the carburetor opening into the bell above said pan, and a supply-tube leading from said carburetor through the body-wall, substantially as described.

402,217. HEATING AND VENTILATING APPARATUS. WILLIAM S. ZIEGLER, Butler, Pa. Filed Jan. 10, 1889. Serial No. 295,997. (No model.)



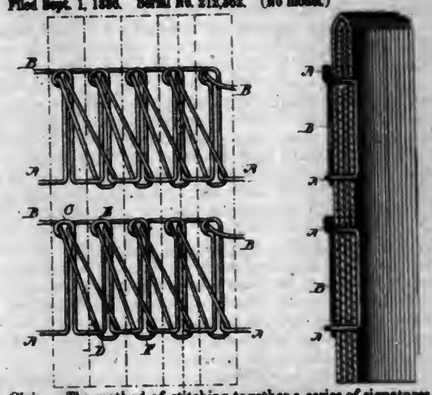
Claim.—1. The combination, with receiving and delivery pipes having their opposing ends provided with circumferential flanges, of a removable drum adapted to occupy the space between said ends and having its own ends screw-threaded, and sleeves provided with interior screw-threads, said sleeves being adapted to be disposed upon the ends of the drum and screwed over said pipe ends and against the flanges thereon, substantially as set forth.

2. The combination, with receiving and delivery pipes provided with smooth opposing ends and with circumferential flanges in rear thereof, of a removable drum adapted to occupy the space between said ends and having its own ends screw-threaded, and cylindrical sleeves provided with interior screw-threads at one end adapted to engage the ends of the drum, the remaining interior surface being smooth and adapted to be screwed over the corresponding smooth ends of said pipes and against the shoulder, substantially as set forth.

3. The combination, with a fire-place, of receiving and delivery pipes having their opposing ends projecting therein at opposite sides and provided with circumferential flanges adapted to fit against the sides of the fire-place, a removable drum adapted to fit the space between said ends and provided at its own ends with exterior screw-threads, and connecting-sleeves provided with interior screw-threads and disposed upon the ends of the drum, said sleeves being adapted to be screwed over the pipe ends and against the flanges thereon, substantially as set forth.

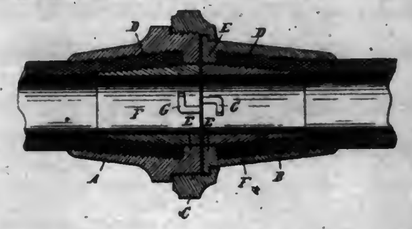
4. The herein-described heating and ventilating apparatus, comprising the receiving and delivery tubes, the former being provided with a damper and the latter with a register or registers, the opposing ends of said pipes being formed with circumferential flanges, a removable drum adapted to occupy the space between said ends and having its own ends screw-threaded, sleeves disposed on the latter having a partially-screw-threaded interior surface for engaging the drum ends, the remainder of said interior surface being smooth and adapted to be adjusted over the corresponding ends of the pipes and against the flanges, substantially as and for the purpose set forth.

402,218. METHOD OF BOOK-STITCHING. HORACE I. ARNOLD, Hartford, Conn., assignor to Robert S. Woodruff, trustee, Trenton, N. J. Filed Sept. 1, 1886. Serial No. 212,362. (No model.)



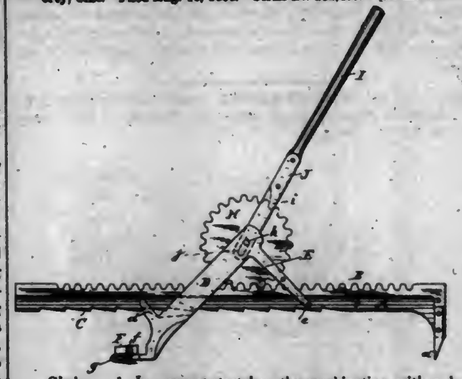
Claim.—The method of stitching together a series of signatures, which consists in carrying a loop of one thread through the back of one signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying a loop of another thread through the end of the first loop, outside of the signature, and then carrying another loop of the first thread through the first loop of the second thread, and then through the back of another signature from the outside thereof, and then bringing it out through the same back at another place, and then carrying another loop of the second thread through the end of the second loop of the first thread, and then repeating the operation, if necessary, until all the signatures in the series are stitched together, all substantially as described.

402,219. HOSE-COUPLER. ROBERT A. AUSTIN, Sandusky, Ohio. Filed July 26, 1888. Serial No. 281,079. (No model.)



Claim.—In a pipe or hose coupling, the coupling A, provided with a tapering bore threaded or corrugated, the annular stop E at the inner ends of the tapering bore, the tapering thimble F, exteriorly screw-threaded, and the L-shaped nibs G, formed in the interior of the thimble upon diametrically-opposite sides thereof, substantially as and for the purposes described.

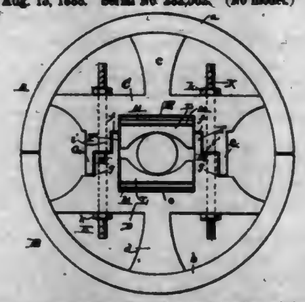
402,220. CARPET-STRETCHER. LEVI G. BALLINGER, East Liberty, Ohio. Filed Aug. 10, 1888. Serial No. 282,405. (No model.)



Claim.—1. In a carpet-stretcher, the combination, with a bar provided with a toothed rack, a ratchet, and points for securing the bar to the floor, of an inclined bracket sliding on the bar and having a tooth at its lower end below said bar for engaging with the said ratchet, carpet-hooks connected to the lower part of the bracket, a toothed pinion journaled in the sliding bracket and engaging with the said rack, and a hand-lever for turning the pinion, substantially as set forth.

2. In a carpet-stretcher, the combination, with the bar provided with points for securing it to the floor, a flange upon its upper edge, a toothed rack, and a ratchet, of the inclined sliding bracket provided with a tooth for the ratchet underneath the said bar, and arms projecting downwardly from the bracket and inclined in the opposite direction, said arms having projections engaging with the flange on the said bar, a cross-bar pivoted to the sliding bracket and provided with carpet-hooks, a toothed pinion journaled in the said bracket and engaging with the rack, and a hand-lever for operating the toothed pinion, substantially as set forth.

402,221. SPLIT PULLEY. HENRY BAUTZ, Benton Harbor, Mich. Filed Aug. 13, 1888. Serial No. 282,562. (No model.)



Claim.—1. In a split pulley, the combination of the opposite sections having transverse spoke-bars C D, provided with engaging-shoulders *f* and *g*, and lugs G and F, to prevent displacement of the sections when united, and the uniting-rods and nuts for said sections, substantially as specified.

2. In a split pulley, the combination of the opposite sections having transverse spoke-bars C D, united to the rim-sections near the ends thereof and provided on their meeting faces with engaging-lugs G F and shoulders *f g*, and having opposite angular recesses in their meeting faces, with the ovaled faced bushing-blocks L in said recesses, and the uniting-rods, substantially as specified.

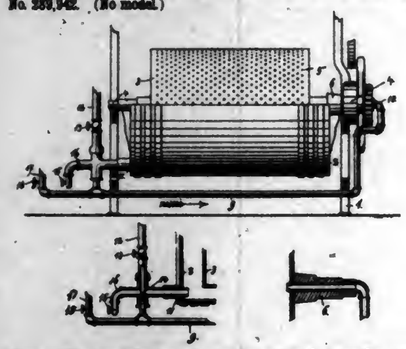
3. In a split pulley, the combination of the opposite sections having recesses E *e*, for the passage of the shaft in their meeting faces, with the bushing-blocks L L in said recesses, having oval concaved faces, and the packing-blocks M M, placed in recesses E *e* below blocks L, and uniting-rods and nuts, all substantially as described.

4. The combination of the opposite sections having transverse spoke-bars formed with recesses E *e* in their meeting faces for the passage of the shaft and having engaging-lugs G F and shoulders *f g*, substantially as described, with the uniting-rods and nuts, and the ovaled concaved faced bushing-blocks L in the recesses of the bars, and the packing-blocks M M therein, substantially as set forth.

5. The combination of the opposite pulley-sections having transverse spoke-bars formed with central angular recesses, and with pairs of engaging shoulders and lugs on their meeting faces and widened

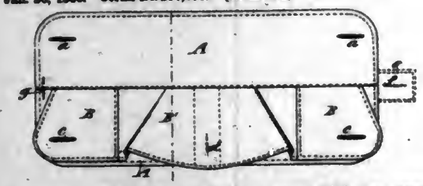
between said shoulders, and lugs on opposite sides of the central recess, with the oval concave-faced bushing-blocks mounted in said recesses, the packing-blocks therefor, and the uniting-rods passing through openings in the widened portions of the spoke-bars, and tightening-nuts thereon, all constructed and arranged substantially as described.

402,222. WASHING-MACHINE. DANA H. BENJAMIN, Utica, N. Y., assignor to Edward Hurlburt, same place. Filed Nov. 3, 1888. Serial No. 289,942. (No model.)



Claim.—The combination of a stationary tank, a perforated rotating cylinder inside of the tank, a hollow bearing, a passage-way connecting with the hollow bearing and the stationary tank, and a steam-pipe entering the connecting passage-way, substantially as set forth, for the purposes stated.

402,223. APPAREL-CUFF. GEORGE BENSON, Belfast, Ireland. Filed Jan. 28, 1889. Serial No. 297,706. (No model.)

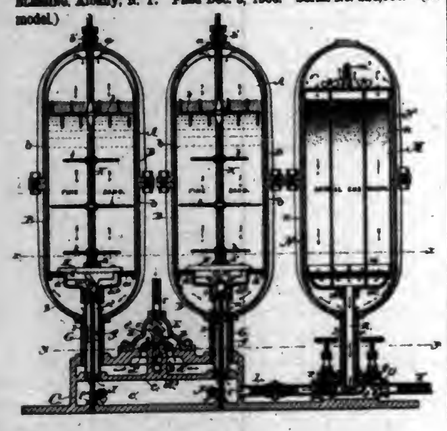


Claim.—1. A reversible cup having an attached flap or apron, said flap or apron being provided with a thin flexible central portion and end portions thicker than said central portion, substantially as specified.

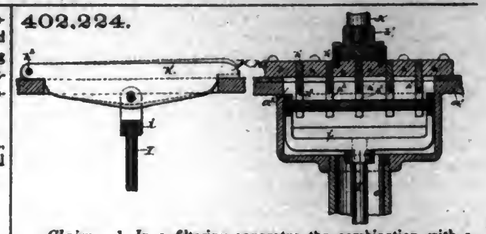
2. A reversible cup having an attached flap or apron, said flap or apron being provided with a thin flexible central portion and end portions thicker than said central portion, the central portion being longer upon its outer edge than upon its inner edge, substantially as specified.

3. A reversible cuff having an attached flap or apron, said flap or apron being provided with a thin flexible central portion and end portions thicker than said central portion, said central portion being made in semicircular form, substantially as specified.

402,224. APPARATUS FOR PURIFYING WATER. JAMES H. BLEMING, Albany, N. Y. Filed Dec. 8, 1886. Serial No. 221,007. (No model.)



402,224.



Claim.—1. In a filtering apparatus, the combination, with a base provided with a valve-seat having at opposite ends induction-ports and an intermediate eduction-port, and a slide-valve of insufficient length to cover both of said induction-ports at the same time, the said base containing two independent unfiltered-water passages and a waste-water outlet, which are separated from an underlying filtered-water chamber, also contained in said base, of two independent filtering-chambers erected on said base, and each consisting of an inner cylinder for containing the filtering material, and an outer casing which surrounds said inner cylinder, so as to form an annular water-way between said cylinder and casing, each of said inner cylinders being connected by its own outlet water-pipe with the filtered-water chamber of the base, and each of said casings being connected by an independent inlet water-pipe with the unfiltered-water passage of said base, the filtered-water chamber of said base being provided with an outlet-pipe for the filtered water, as and for the purpose specified.

2. In a filtering apparatus, the combination of a filtering-chamber for containing animal charcoal or other purifying material, said chamber consisting of an inner cylinder, M, and an outer casing, N, so as to form an annular water-way, *n*, a base, O, provided with a lower inlet water-passage, *o*, an upper inlet water-passage, o', an upper outlet water-passage, o^2, and a lower outlet water-passage, o^3, said lower inlet water-passage having through its upper side an opening, o^4, which communicates with said upper inlet water-passage, said lower inlet water-passage also having at its lower side an opening, o^5, which leads directly into said outlet water-passage, the openings o' and o^3 being directly opposite each other and having a double-faced valve, P, fitted thereto and arranged to operate so as to reciprocally close one of said openings when the other is opened, the upper outlet water-passage, o^2, being connected to the lower outlet water-passage, o^3, by an opening, o^4, in which a valve, Q, is fitted to close the communication between said outlet water-passages, the inner cylinder, M, being connected by a pipe, R, to the outlet water-passage o^2, and the outer casing, N, being connected by a pipe, S, to the inlet water-passage *o*, as and for the purpose herein specified.

3. In a filtering apparatus, a percolating-bed composed of alternately-arranged reciprocating and stationary bars which are fitted side by side to form leaky joints through which the water will ooze, said reciprocating bars having an endwise movement and being so fitted in respect to said stationary bars as to always form a barrier to the escape of the filtering material, as and for the purpose herein specified.

402,225. MUSICAL NOTATION. BERNARD BOEKELMAN, New York, N. Y. Filed Apr. 4, 1888. Serial No. 269,526. (No model.)



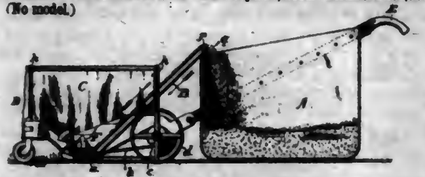
Claim.—1. The herein-described improvement in musical notation, consisting in representing the several constituent or voice parts of musical compositions by notes of such different appearance that such several parts may be distinguished from each other by the appearance of the notes, substantially as described.

2. The improvement in musical notation, consisting in representing the several constituent or voice parts of musical compositions by notes of different colors, whereby such parts may be distinguished from each other by the color of the notes, substantially as described.

402,226. PROCESS OF MANUFACTURING CAUSTIC SODA. JOSEPH A. BRADBURN, Northwich, County of Chester, England. Filed July 24, 1888. Serial No. 280,963. (No specimens.)

Claim.—The process for the manufacture of caustic soda or caustic potash and bleaching-powder, consisting of the following steps, to wit: first, the treatment with nitric acid and peroxide of manganese of common salt or of potassium chloride in a still; second, the treatment of spent liquor with caustic soda or caustic potash and the removal of the peroxide of manganese or its chemical equivalent; third, the evaporation of the nitrate of soda or nitrate of potash mixing it with ferric oxide and furnacing, and, fourth, lixiviating the mass from the furnace.

402,227. GRASS-RECEPTACLE FOR LAWN-MOWERS. CHARLES H. BRAITHWAITE, Ardmore, Pa. Filed Sept. 27, 1888. Serial No. 286,537. (No model.)



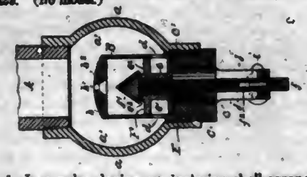
Claim.—1. In a lawn-mowar, the combination of the grass-receptacle A, the endless band B, traveling from near the edge of the blades of the mower to the receptacle, and the curtains C D C, surrounding the front and sides of the blades, substantially as set forth.

2. In a lawn-mower, the combination of curtains C C, hung on either side of the cutting part thereof, and the curtain D, hung in front of the same, substantially as set forth.

3. A lawn-mower having uprights A A A A at the four corners thereof and curtains C D C upon the uprights and surrounding the front and sides of the blades.

4. In a lawn-mower, the combination of the grass-receptacle A and the handles E E', fastened thereto at the sides, one of which, E, is swiveled at its forward end to the mower-frame, and the other of which, E', is detachably connected at its forward end to the mower-frame, whereby it is capable of being lifted from its fastening to overturn the receptacle on the other handle, substantially as set forth.

402,228. VALVE. JOHN BURKE, Minneapolis, Minn., assignor of one-half to Patrick H. Gunckel, same place. Filed Feb. 2, 1889. Serial No. 298,429. (No model.)



Claim.—1. In a valve device, an inclosing-shell arranged within the fluid and provided at the side and at the inner end with inlet-ports and at the other end with an outlet-opening, a valve for the latter, a piston in the shell, a hollow connection for the valve and piston, and providing an intermediate chamber in communication with the side port, and a sliding stem carrying a valve adapted to close in turn said hollow connection and said end inlet-port, substantially as set forth.

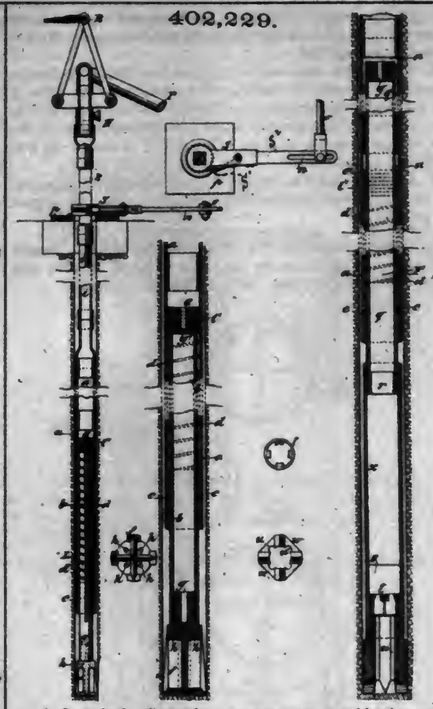
2. In a valve device, an inclosing-shell, a connected piston and valve therein providing an intermediate chamber, inlet-ports at both sides of the piston, a main outlet controlled by said valve, a secondary outlet through said piston and valve, and a stem therein carrying a valve for alternately opening and closing the latter outlet and the inlet in front of the piston, substantially as set forth.

402,229. ROCK-DRILL. FRIEDRICH BUSCHMANN, Heilbronn, Germany, assignor to the Salzwerk Heilbronn, same place. Filed Oct. 26, 1887. Serial No. 253,411. (No model.) Patented in England Aug. 16, 1887, No. 11,210; in Belgium Aug. 31, 1887, No. 73,614; in France Dec. 2, 1887, No. 185,296; in Austria-Hungary Jan. 23, 1888, No. 31,704 and No. 64,920; in Germany June 8, 1888, No. 43,326, and in Spain June 12, 1888, No. 8,005.

Claim.—1. In a hydraulic boring apparatus, the combination, with a pump, of a plunger-cylinder, pipe-connections between the same, a plunger within the said cylinder, and a boring-tool connected with the plunger, all being so arranged and combined that the pump will cause the lifting and forcing downward of water in the bore-hole to elevate or depress the boring-tool, substantially as specified.

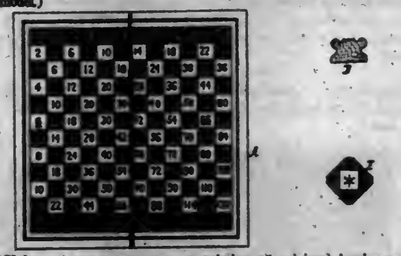
2. In a hydraulic boring apparatus, the combination, with a pump, of hollow connecting-rods, a cylinder connected to one of said rods, a plunger within said cylinder, a boring-tool, and a spring for assisting in the elevation of the plunger, substantially as specified.

402,229.



3. In a hydraulic boring apparatus, the combination, with a pump, of hollow connecting-rods, a cylinder connected to one of said rods, a hollow plunger within said cylinder, and a boring-tool, said plunger and boring-tool being provided with apertures for the passage of water, substantially as specified.

402,230. GAME APPARATUS. JOHN L. COLES and DAVID H. COLES, Brooklyn, assignors to the Empire State Manufacturing Company, New York, N. Y. Filed Oct. 25, 1888. Serial No. 289,110. (No model.)



Claim.—A game apparatus consisting of a board having on its face a multiplication-table, consisting of a series of numbers arranged in line, and the successively increasing multiples of such numbers arranged in successive lines to form a rectangular board, in combination with various sets of markers, and with polyhedrical numerators, the number of sides of each of which exceeds the square root of the largest figure on the multiplication-table, said sides being marked with figures and signs, substantially as described.

402,231. SINKER FOR FISHING-LINES. JOHN L. COLES and DAVID H. COLES, Brooklyn, assignors to the Empire State Manufacturing Company, New York, N. Y. Filed Oct. 25, 1888. Serial No. 289,111. (No model.)



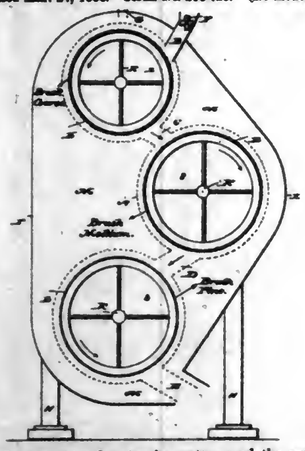
Claim.—1. A fishing-line sinker consisting of the end parts, A and B, each having a central orifice extending entirely through it for

the lengthwise passage of the line and interposed removable and replaceable sections E, each having a radial slot, F, to receive the line, substantially as described.

2. A fishing-line sinker consisting of the two parts A and B, each having a screw-thread and a central orifice extending entirely through it for the lengthwise passage of the line, and the interposed sections E, screw-threaded together and to the screw-threaded parts of the sinker, and each section having a radial slot, F, to receive the line, substantially as described.

3. A fishing-line sinker containing at one end a cavity having the outer edge of its wall provided with scallops or recesses D, substantially as described.

402,232. MACHINE FOR DELINTING COTTON-SEED. ROBERT H. COLLYER, New Orleans, La., assignor to George M. Harrison, same place. Filed Mar. 27, 1888. Serial No. 268,723. (No model.)



Claim.—In a machine for cleaning cotton-seed, the combination, with the casing I, of a series of cylinders arranged horizontally therein one above another and provided in succession with brushes of increasing degrees of fineness, the wire screen A, concentric with each cylinder, the said screen surrounding the upper cylinder having a conduit, B, and being connected at its bottom by a tangential passage with the top of the screen around the intermediate cylinder, and the said intermediate screen connected in a like manner with the lower cylinder-screen having an outlet, E, the cylinder-shafts, and gearing, substantially as described, for rotating the same at successively-increased speeds.

402,233. CARRIAGE-DRIVING MECHANISM. DARIUS W. DODSON, Wilkes-Barré, Pa. Filed Mar. 30, 1887. Serial No. 232,945. (No model.)



Claim.—1. The combination, with the reciprocatable carriage of a machine, of a driving-gear, a rack carried on said carriage and meshing with said gear and having a lateral movement relative to said gear, a fixed shuttle, a shuttle-guide, and rack-switching apparatus, substantially as described, operating to throw said guide past the ends of said shuttle, and thereby throw the rack into mesh and out of mesh, all substantially as described, and for the purpose specified.

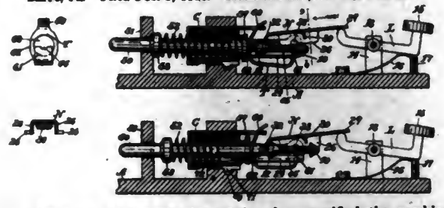
2. The combination, with the reciprocatable carriage of a machine, and with a driving-gear located beside said carriage, of a rack carried on said carriage and meshing with said gear and having a lateral movement relative to said gear, of the fixed stud or shuttle, the guide on said rack, and the yieldingly-held switch-arm carried on said rack and operating to force the guide past the end of said shuttle, all substantially as described, and for the purpose specified.

3. The combination, with the reciprocatable carriage, as C, of a machine, of gear P, rack R, carried by a parallel motion on the carriage, and a shuttle, shuttle-guide, and switch-arm, all substantially as shown and described.

4. The combination, in a mechanism of the class specified, of the gear and rack, a fixed stud or shuttle, 5, guide 7, and an inclined switch-arm having a part, as 14, about parallel to said guide, substantially as described, and for the purpose specified.

5. The combination, with a mechanism of the class specified, having guide 7 and shuttle 5, of the switch-arm having hook 8, substantially as and for the purpose set forth.

402,234. MECHANICAL MOVEMENT. DARIUS W. DODSON, Wilkes-Barré, Pa. Filed Feb. 3, 1888. Serial No. 262,870. (No model.)



Claim.—1. In a mechanism of the class specified, the combination of the reciprocating latch provided with two catches set one in advance of the other, the escapement located at one side of said latch and having two corresponding catches, and a spring-actuated device, substantially as described, pressing said latch against said escapement, substantially as described.

2. In a mechanism of the class specified, the combination of the latch provided with two catches, set one in advance of the other, the escapement having two corresponding catches, the lever pressing said latch against said escapement, and a spring taking its bearings between said latch and lever, all substantially as described.

3. In a mechanism of the class specified, the combination, with a frame-work having a bearing for the latch and a bearing for the latch-case, of the latch, the latch-case having a fulcrum for the lever and carrying the escapement, and the spring-actuated lever fulcrumed in said case and acting on said latch to press the same against said escapement, all substantially as described.

4. In a mechanism of the class specified, the combination consisting of the latch 50, having two catches set one in advance of the other and having a collar or shoulder, 53, the pivoted escapement located at one side of said latch and having two corresponding catches, the bent lever T, pressing said latch against said escapement-catches, and the spiral spring 52, carried on said latch and taking its bearing between said collar 53 and said lever, all substantially as described.

5. In a mechanism of the class specified, the combination, with the latch-case C, having the arms 24 24 perforated at 23, and having a fulcrum for lever T, of the spring-actuated latch having catches 10 and 12, the escapement N, journaled in said case at 23 23, and having catches 30 32, and the bent lever T, fulcrumed in said case and perforated for said latch, and with its point taking its bearing on the side of said latch opposite said escapement, all substantially as described.

6. In a mechanism of the class specified, the combination, with the latch provided with the catches 10 and 12, of the escapement N, pivotally supported on a fixed axis and located at one side of said latch, and having the holding-catch 30 and the detaining-catch 32, the distance between catches 30 and 32 being less than between catches 10 and 12, and the latch having a lateral movement toward and from said escapement, all substantially as described.

7. In a mechanism of the class specified, the combination, with a latch, substantially as described, of the lever T, having the fulcrum-bearing 60 and the latch-bearing 61, and formed at 62 for the passage through said lever of the latch, and to there receive the force of a spring that is carried on said latch, all substantially as described.

8. In a mechanism of the class specified, the combination, with an arm, 26, having two rotary movements, as set forth, of the spring-actuated reciprocating latch interposable into the orbital path of said arm and having two catches, as set forth, the pivoted escapement located at one side of said latch and having two corresponding catches, a key operating said escapement, and a spring-actuated device pressing said latch-catches into engagement with said escapement, the whole being organized and coacting to throw forward the latch on depressing the key and to recatch the latch on its return either before or after the release of the key, all substantially as described, and for the purpose specified.

9. In a mechanism of the class specified, the escapement N, having the holding-catch 30 and detaining-catch 32, and having the depending flanges 26 26, each provided with a trunnion, 25, below the line of said catches, all substantially as described.

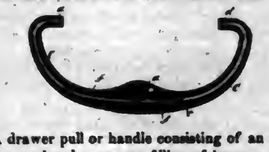
10. In a mechanism of the class specified, the combination, with a suitable frame-work and with the latch, of the latch-case removably fixed in said frame-work, the escapement carried by said case and arranged for engagement with the latch-catches, the bent lever bearing against one side of said latch between the latch-catches and fulcrumed in said case on the opposite side of said latch from its said bearing on the latch, and a spring carried on the latch within said case and acting between the latch and said lever, all substantially as described.

11. In a mechanism of the class specified, the combination, with the revolable latch, having catches 10 12, and having the cylindrical portion 65 between said catches, of the latch-case C, the escapement N, pivoted in said case, and the spring-actuated lever T, fulcrumed in said case and having a concave bearing, 66, resting on said part 65, all as set forth.

402,235. FIREPROOFING COMPOUND. CHARLES W. DOUGHTY, Augusta, Ga. Filed July 26, 1888. Serial No. 280,990. (No specimens.)

Claim.—The herein-described composition of matter for protecting cotton-bales against flash of flame and deterioration, consisting of linseed-oil, copperas, water, and kaolin, in substantially the proportions specified.

402,236. DRAWER-PULL. SIGMUND FREUD, New York, N. Y. Filed Dec. 22, 1888. Serial No. 293,406. (No model.)



Claim.—A drawer pull or handle consisting of an outer shell or casing of sheet metal and a core or filling of baser metal than the said shell or casing, the latter being compressed upon and depressed in ornamental or other designs into the core or filling, substantially as specified.

402,237. PAPER-HOLDER. CHARLES H. FISHER, Santa Fé, N. Mex., assignor of one-half to Edward L. Bartlett and L. A. Hughes, same place. Filed Dec. 8, 1888. Serial No. 292,005. (No model.)



Claim.—1. A receptacle for stationery, having a compartment for carbon-paper, provided with a false perforated bottom, and a tray below said bottom, substantially as described.

2. A receptacle for stationery, having a compartment for carbon-paper, provided with a lid, a false perforated bottom, and a removable tray below said bottom, substantially as described.

3. A receptacle for stationery, having one or more compartments provided with a removable bottom, as and for the purpose set forth.

4. A receptacle for stationery, having one or more compartments, and provided with a copy-holder, substantially as described.

5. A receptacle for stationery, provided with a copy-holder, and having a compartment for carbon-paper, provided with means for keeping the paper moist, substantially as described.

6. The combination, with the base A and standard B, of the receptacle E, adjustable on the standard and having one or more compartments, substantially as described.

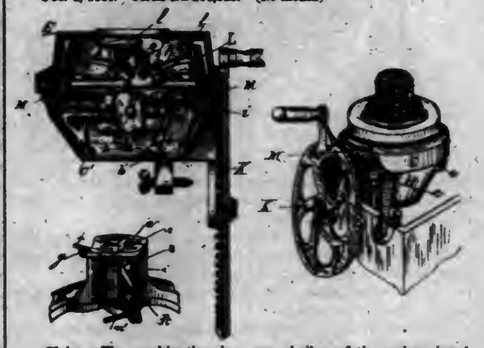
7. The combination, with the base A and standard B, of the adjustable collar D, the tube C, resting thereon, and the receptacle E, fastened to the tube and having one or more compartments for stationery, substantially as described.

8. The combination, with the base A and standard B, of the stationery-receptacle E, adjustable on the standard and provided with a copy-holder, F, attached to said receptacle, substantially as described.

9. The stationery-receptacle E, having the slotted block f', and having a copy-holder, F, hinged thereto and provided with an arc, f, adjustable in the slotted block f', substantially as described.

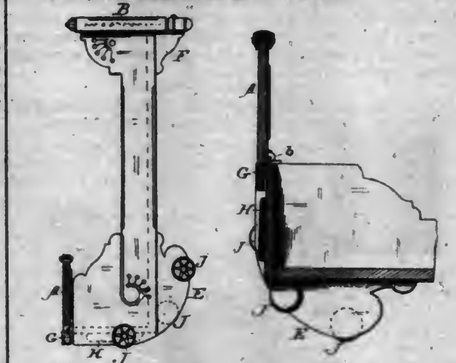
10. The combination, with the base A and standard B, of the tube C, the adjustable collar D, supporting the tube, the receptacle E attached to the tube and provided with the slotted block f', the copy-holder F, hinged to the receptacle and having the arc f sliding through the block f', and the set-screw f^3, for clamping the arc at any desired point, substantially as described.

402,238. CORN-SHELLER. CURTIS GODDARD, Alliance, Ohio. Filed Feb. 1, 1888. Serial No. 263,235. (No model.)



Claim.—The combination, in a corn-sheller, of the springs i and the vibrating arms A, with the gear-wheel M, having uprights L, with lateral projections l, provided with a hook, g, substantially as shown and described.

402,239. BEDSTEAD. ROBERT C. GRAHAM, Philadelphia, Pa. Filed Nov. 17, 1887. Serial No. 255,445. (No model.)

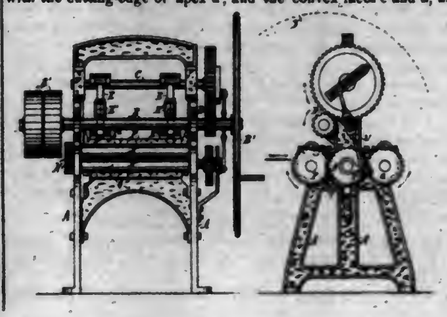


Claim.—1. A bedstead having a head-board hinged thereto and provided with a weight, G, attached to said head-board behind and below the hinge, substantially as set forth.

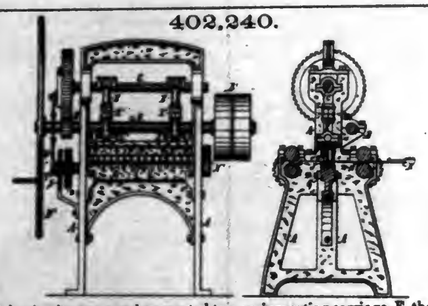
2. A bedstead having rockers at the head end of the frame, and a weight, H, attached to said end beyond the rockers, and further provided with a hinged head-board having a weight attached to it behind and below the hinge to hold said head-board vertical when the bed is turned from a vertical position down into a horizontal position, substantially as set forth.

402,240. MACHINE FOR MAKING METALLIC LATHING. GEORGE HAYNS, New York, N. Y. Filed Nov. 26, 1888. Serial No. 291,845. (No model.)

Claim.—1. A machine for the manufacture of sheet-metal lathing, containing cutting-dies H, each die having its lower end formed with the cutting-edge or apex d', and the convex faces c and d, also



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each having its upper end connected to a reciprocating carriage, F, the said carriage provided with moving mechanism giving it reciprocating motion, essentially as shown and described.

2. The combination of cutting-dies H, each having cutting-edge a', also convex faces c and d, reciprocating carriage F, stripper J, and grooved bed G, essentially as shown and described.

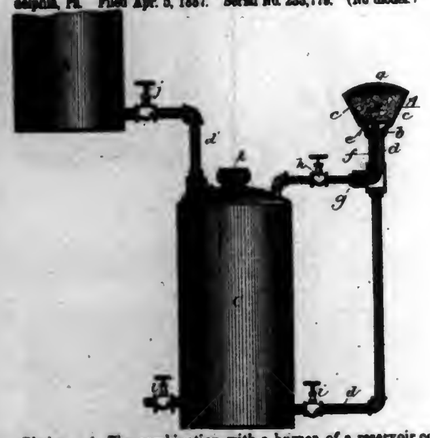
3. The combination of dies M with carriage F and matrix M', as and for the purpose set forth.

4. Shafts B and C, connected by gearing at D, pitmen E, carriage F, provided with dies H, stripper J, and grooved bed G, arranged and combined essentially as shown and described.

5. The shafts C, connecting-rod U, pawl T, ratchet-wheel S, gear-wheels P, Q, and R, with rollers N and rollers O, the lowermost of the latter being formed to admit free passage of the punctured metal sheet through, all combined essentially as shown and described.

6. A die, H, rectangular in cross-section, having its one end formed with cutting-edge (or apex) a', and the two convex faces c, and the two convex faces d, as a device for puncturing sheet metal and turning outwardly and backwardly the edge metal into form, as tongues and lips, essentially as shown and described.

402,241. HYDROCARBON-BURNER. CHARLES L. HEVERIN, Philadelphia, Pa. Filed Apr. 5, 1887. Serial No. 233,779. (No model.)



Claim.—1. The combination, with a burner, of a reservoir containing oil and water, pipes leaving said reservoir at different levels and communicating with the burner, and a water supply or reservoir above the burner communicating with said water and oil reservoir, substantially as described.

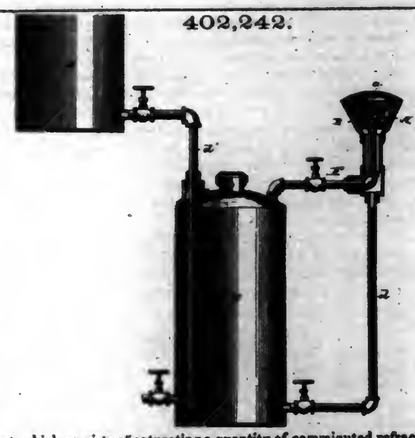
2. The combination, with the burner, of an oil and water reservoir, a tank or receptacle containing water, a pipe leading from the water-supply to the said reservoir, and separate pipes between the oil and water containing parts of the reservoir and the burner, whereby the water and oil are supplied to the burner under equal pressure, substantially as described.

3. In a hydrocarbon-burner, the combination of a burner, a hydrocarbon-fluid tank, a connecting-tube between the upper part of said tank and the burner, a water-tank, a connecting-tube leading from the water-tank to the lower part of the hydrocarbon-fluid tank, and another tube connecting the lower part of the hydrocarbon-fluid tank with the burner, substantially as set forth.

402,242. PROCESS OF BURNING HYDROCARBON OIL. CHARLES L. HEVERIN, Philadelphia, Pa. Filed Dec. 5, 1887. Serial No. 257,038. (No model.)

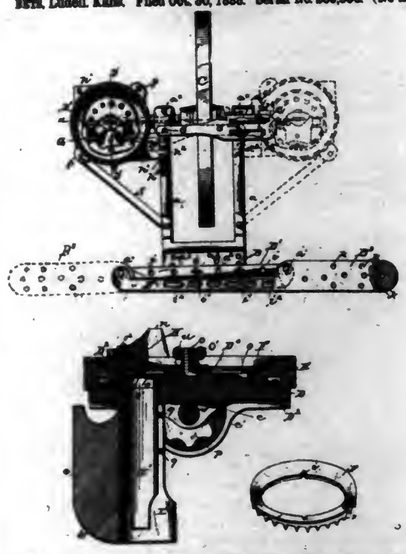
Claim.—The herein-described method or process of generating

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heat, which consists of saturating a quantity of comminuted refractory material with two liquids, one a hydrocarbon and the other a liquid which, when decomposed, will yield oxygen, conducting said liquids intermingled each in a diffused state outward from the body to the surface of the refractory material, and burning the same at the surface of the material, substantially as described.

402,243. SEEDING ATTACHMENT FOR PLOWS. JAMES S. HIBBEN, Ludell, Kans. Filed Oct. 30, 1888. Serial No. 289,533. (No model.)



Claim.—1. A seeding attachment for a walking-plow which may be regulated for depth of seed-planting, and also the spacing apart of individual seed or groups of the grain as it is being planted, substantially as set forth.

2. A seeding attachment for plows, which is adapted to be removed at will and attached to either a left or a right hand plow, substantially as set forth.

3. A seeding attachment for a right or left hand walking-plow, which is removably secured to the plow and adapted to plant seed at different depths by changing its adjustment on the plow, substantially as set forth.

4. A seeding attachment for a right or left hand walking-plow, comprised of a frame, a land-wheel, and seed-dropping mechanism which is actuated by the revolution of the land-wheel, substantially as set forth.

5. A seeding attachment for a left or right hand walking-plow, having a frame which is hinged to the plow, so as to vibrate vertically independent of the plow, a land-wheel supported to rotate on the frame, and a seed-dropping device, which is operated by the revolution of the land-wheel when the plow is in use and turning a furrow-slice, substantially as set forth.

6. A seeding attachment for a right or left hand walking-plow,

which is adapted to drop seed a given depth and be thrown out of use when the plow is in motion, substantially as set forth.

7. A seeding attachment for a right or left hand walking-plow, that is hinged to allow it to conform to the undulations of the ground operated upon and adapted to plant seed at a predetermined depth, space apart individual seeds or groups of seed, and be arrested from dropping seeds while the plow is in motion and turning a furrow-slice, substantially as set forth.

8. The combination, with a plow that turns a furrow to the right or left, of a frame, a driving-shaft, a land-wheel that is adapted to run loose on the shaft or be locked fast to it, and a seeding device which is operated by the land-wheel when the plow is given a forward motion, substantially as set forth.

9. The combination, with a plow, of a reversible bracket-arm, a hinged frame, a driving-shaft, a land-wheel, and seed-dropping mechanism which is adapted to be changed in adjustment for regulating the depth of seed-planting, and also the distance of spaced separation of individual grains or groups of seed, substantially as set forth.

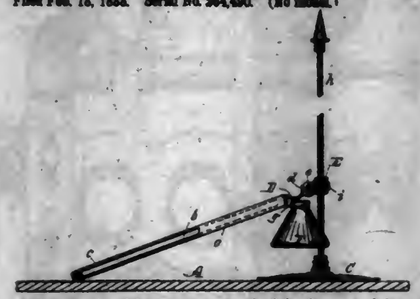
10. In a seeding attachment for right or left hand plows, the combination, with a plow, a bracket-arm removably attached to the plow to operate in advance of or in the rear of the mold-board, and a hinged frame, of a driving-shaft, a land-wheel mounted on the driving-shaft, a device to lock the land-wheel to the shaft or release it, and a seed-dropping device which is supported on the driving-axle, and is adapted to periodically deposit seed in plowed soil which has been turned by the plow, substantially as set forth.

11. In a seeding attachment for walking-plows, the combination, with a plow-beam, a bracket-arm adjustably attached to the beam, and a frame which is hinged to the bracket-arm, of a driving-shaft supported to revolve on the frame, a land-wheel mounted loosely on the driving-shaft, a device to shift the land-wheel on the shaft and lock it thereto, a base-plate, a seed-hopper, and seed-dropping mechanism mounted on the base-plate and adapted to be operated by the revolution of the driving-shaft and land-wheel, substantially as set forth.

12. In a seeding attachment for a walking-plow, the combination, with the handles of a plow, a bracket-arm removably and extensibly secured to these handles, and a frame that is hinged to have vertical vibration on the bracket-arm, of a driving-shaft revolubly secured in the frame, a land-wheel slidingly mounted on the driving-shaft, a shifting-lever to move the land-wheel, and means to lock it to the driving-shaft, substantially as set forth.

13. In a seeding attachment for plows, the combination, with the handles of a right or left hand plow, a bracket-arm, a frame, a driving-shaft, a land-wheel, a lever that is adapted to shift the land-wheel longitudinally of the driving-shaft, and a means to interlock the driving-shaft and land-wheel when it is shifted on the shaft, of a base-plate, a seed-hopper, and dropping mechanism which is supported on the base-plate and actuated by a pinion which is mounted on the driving-shaft and revolves when the plow is moved forwardly to turn a furrow-slice, substantially as set forth.

402,244. WRITING-CASE. CHARLES E. HIGGS, Somerville, Mass. Filed Feb. 18, 1888. Serial No. 264,490. (No model.)

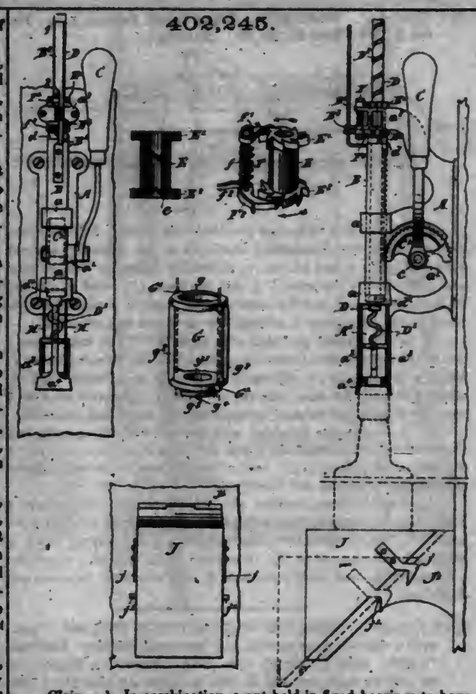


Claim.—1. A writing-case composed of the frame or slab a, with a plane writing-surface, c, and a plate, D, combined with the base C, the vertical rod or standard A, and the block E, adapted to slide upon the latter and pivotally united to the writing-case frame a, substantially for purposes described.

2. The combination, with a table or other support, A, a stand composed of a base, C, and removable rod A, a sliding block, E, with its fastening-screw i, of a writing-case, B, having curved pins d d and pivotally united to said block, whereby the rear part can be raised to change the inclination of said writing-case, substantially as herein specified.

402,245. APPARATUS FOR DRAWING CORKS. WILLIAM J. KIRBY, Montreal, Quebec, Canada. Filed July 9, 1888. Serial No. 279,471. (No model.) Patented in Canada July 17, 1888, No. 29,502.

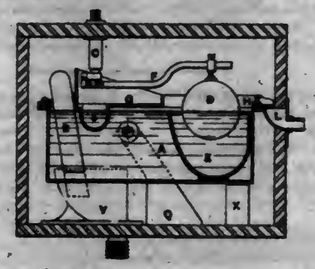
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Claim.—1. In combination, a nut held in fixed bearings to have rotary movement therein, a pawl for controlling the movement of said nut, a threaded spindle passing through the nut and adapted to rotate therein and reciprocate through the same, and a releasing-arm moving with the spindle and in line with the pawl, whereby it acts upon the pawl and releases the nut, so that it may revolve, and thus allow the spindle to move longitudinally without rotating, substantially as described.

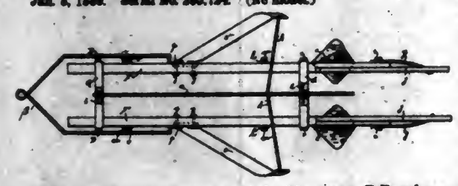
2. In an apparatus for drawing corks, the combination, with a sleeve carried in bearings and movable in either direction vertically, and a spindle within such sleeve and moving vertically with it, having a helical groove cut on a portion of its length, and means for moving the sleeve, of a nut carried loosely in suitable bearings, encircling said spindle, having ratchets formed on it, one at each end, and an interior helical thread corresponding to groove in said spindle, the said ratchets being arranged in opposite or right and left hand order, pawls adapted to engage with said ratchets, and means for operating one of said pawls from the said sliding sleeve, so as to free it from the ratchet during a portion of the ascent of said sleeve, as and for the purpose described.

402,246. FLUSHING-CISTERN FOR WATER-CLOSETS, &c. THOS. HOLT and JAMES HOLT, Liverpool, County of Lancaster, England. Filed Mar. 30, 1888. Serial No. 268,821. (No model.) Patented in England Mar. 21, 1888, No. 4,496.



Claim.—The combination, with the supply-valve of a tilting flushing-cistern, located so as to deliver its water onto the cistern-cover near the falling end, of a cover formed with an opening into the cistern at the rising end, and with its edges extending some distance above the top of the cover, whereby the water of the supply-valve is not allowed to enter the cistern when the cover is in a tilted position.

402,247. CULTIVATOR. ROBERT IMLEY, Bateham, Kans. Filed Jan. 8, 1889. Serial No. 295,734. (No model.)



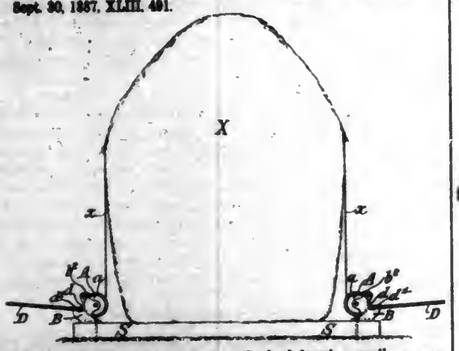
Claim.—1. In a cultivator provided with runners F F and cross-pieces *g* and *d*, the combination therewith of the adjustably-secured colters *l l* and *u u*, and knives *o o*, adjustably hinged to said runners and connected by the arms A A with the lever *a*, pivoted at one end to the cross-piece *g*, and the other playing freely in the bracket C, secured to the cross-piece *d*, substantially as shown and described.

2. In a cultivator provided with runners F F and cross-pieces *g* and *d*, the combination therewith of the adjustably-secured colters *l l* and *u u*, the shovels *s s*, adjustably secured to said runners and extending beneath the same, and the coverers *g g*, adjustably secured to the rear ends of said runners, substantially as shown and described.

3. In a cultivator provided with runners F F, the combination therewith of the cross-pieces *g* and *d*, colters *l l* and *u u*, knives *o o*, shovels *s s*, and coverers *g g*, each adjustably secured to said runners, substantially as shown and described.

4. In a cultivator provided with runners F F and cross-pieces *g* and *d*, the combination therewith of the colters *l l* and *u u*, knives *o o*, arms A A, lever *a*, pivoted to the cross-piece *g* and playing freely in the bracket C, secured to the cross-piece *d*, the shovels *s s*, coverers *g g*, handles *j j*, and draft-connection B, all substantially as shown and described.

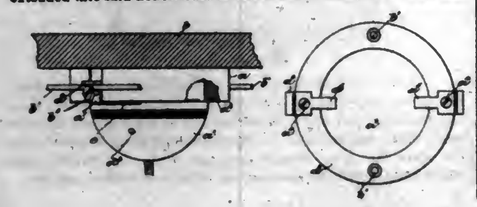
402,248. METHOD OF MANUFACTURING ENSILAGE. CUTHBERT G. JOHNSON, Oakwood Croft, near Darlington, England. Filed June 28, 1887. Serial No. 242,721. (No model.) Patented in England Oct. 26, 1884, No. 14,113, and Mar. 15, 1886, No. 3,659; in France Dec. 7, 1886, No. 180,132; in Belgium Dec. 10, 1886, No. 75,560; in Victoria Mar. 14, 1887, No. 4,961; in Canada Mar. 16, 1887, No. 26,269; in Cape of Good Hope Aug. 17, 1887, No. 6/406; in Natal Aug. 18, 1887, and in Italy Sept. 30, 1887, XLIII. 491.



Claim.—The herein-described method of forming ensilage, consisting in placing the material in a loose stack above the ground and compressing the stack both upon its top and sides in lines at distances apart, said pressure being uniformly distributed over the top and sides at each of the lines of compression, and varying the pressure upon each of the lines of compression at will, substantially as specified.

402,249. ELECTRIC CUT-OUT. JAMES L. KINBALL and HERBERT C. WIRT, Boston, Mass. Filed Jan. 10, 1889. Serial No. 295,975. (No model.)

Claim.—1. The combination, with the hollow base having a rim, metallic strips a^5 a^6, secured to said rim, and having their inner ends extended into said hollow base to form contact-arms, and having their



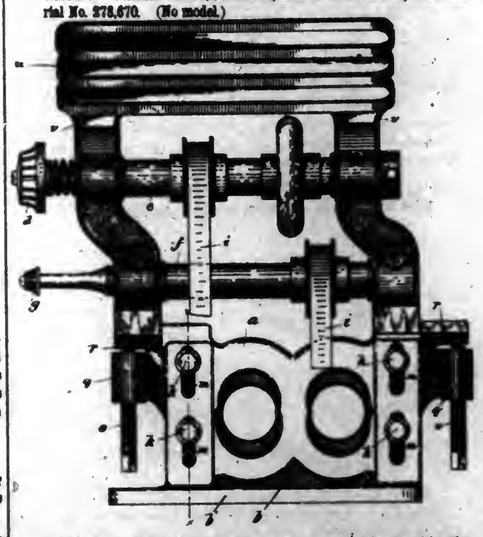


outer ends extended outside of the said rim, and to which the line-wires are secured on the outside of the said base, of the rosette provided on its upper face with contact-pieces b^3 b^4, to engage said contact-arms, terminals secured to the upper face of the said rosette, a fusible strip connecting each terminal with a contact-piece, and branch wires connected to said terminals, and to which an incandescent lamp may be connected, substantially as described.

2. The combination, with the hollow base having an annular rim, metallic strips a^5 a^6, secured to said rim, and having their inner ends extended into said hollow base to form contact-arms, and having their outer ends extended outside of the said rim, and to which the line-wires are secured outside the said base, of the rosette provided on its upper face with contact-pieces b^3 b^4, to engage said contact-arms, and having their ends bent or concaved, as at c^3, to form a lock for said contact-arms, terminals secured to the upper face of the said rosette, a fusible strip, *d*, connecting each terminal with a contact-piece, and branch wires connected to said terminals, and to which an incandescent lamp may be connected, substantially as described.

3. The combination, with the hollow base having an annular rim, and provided with metallic strips secured to said rim, and having their inner ends extended into said hollow base to form contact-arms, and having their outer ends extended outside of the said rim, and to which the line-wires are secured outside the said base, of the rosette provided on its upper face with contact-pieces to engage said contact-arms, terminals secured to the upper face of the said rosette, a fusible strip connecting each terminal with a contact-piece, and branch wires connected to said terminals, and to which an incandescent lamp may be connected to be suspended from the said rosette, and a key to engage and disengage the rosette from its base, whereby the suspended lamp may be removed from the floor of the building, substantially as described.

402,250. BELT-TIGHTENER FOR SOLE-EDGE-TRIMMING MACHINES. WILLIAM LAREY, Stoneham, Mass. Filed June 30, 1888. Serial No. 278,670. (No model.)



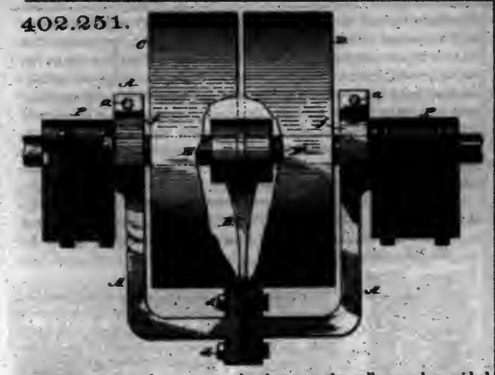
Claim.—As an improvement in belt-tighteners, the combination of the stationary section having tapped sockets, the vertically-disposed adjusting-screws, the adjustable section provided with the end shoulders bearing on said vertical screws, and carrying rotary shafts, and having slots and nutted bolts passed through said slots, substantially as set forth.

402,251. PULLEY-SUPPORT. ADELBERT G. LAWRENCE, Motley, Minn. Filed June 21, 1888. Serial No. 277,266. (No model.)

Claim.—1. In combination with the pulleys C D, the shafts E F, yoke A A, arm B, and the boxes P P, reduced at *f f*, substantially as set forth.

2. In combination with the fast and loose pulleys and the shafts,

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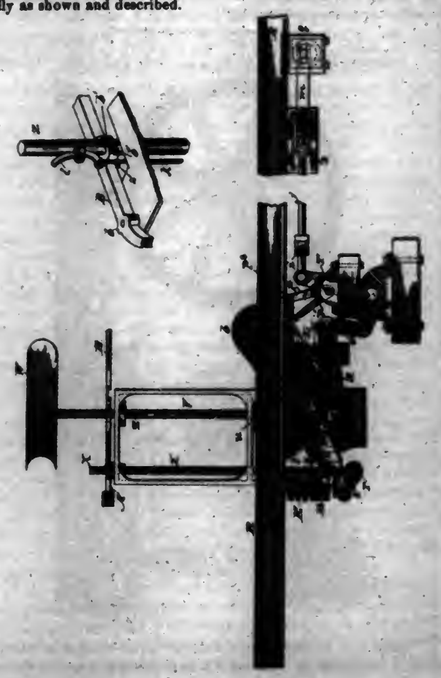
the yoke A A, and an arm passing between the pulleys and provided with a box at one end for inclosing the meeting ends of the shafts, substantially as set forth.

402,252. AUTOMATIC SWITCH. ADELBERT G. LAWRENCE, Motley, Minn. Filed June 21, 1888. Serial No. 277,259. (No model.)

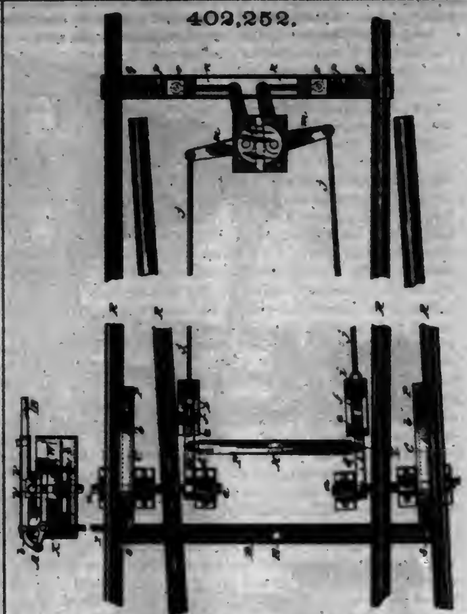
Claim.—1. In an automatic switch, the combination, with the shaft *a*, the operating-levers C C, said levers connected with each other, means for transmitting reverse motion to said levers, substantially as shown and described, and locking-latches P, the arms P' of which normally look the levers C C, of the shields *b*, pivotally secured normally a slight distance above the levers C, their lower outer ends normally supported on the arms P^2 of the latch P, said shield adapted to automatically unlock the levers C C, substantially as hereinbefore described.

2. In combination with the operating-levers and attachments for throwing the switch, as above set forth, the shield *b*, arranged in connection with the operating-lever, as set forth, eccentric V, locking-dogs P, and springs T, all arranged substantially as and for the purpose described.

3. In an automatic switch, the combination, with the shafts *a*, the levers C C, said levers provided with eccentrics V, having a groove in their upper outer edges at their hub ends, of the swinging shields *b b*, extending over and embracing said levers C C, said shields provided with a small wheel journaled transversely in the lower end thereof, said wheel adapted to normally rest in the groove of the eccentric V, and means for operating the levers and shields, substantially as shown and described.



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4. The combination, with the shield *b*, of the presser-bar D and spring E, substantially as and for the purpose described.

5. The combination, with crank *d*, of the links L, presser-bar F, and spring H, substantially as and for the purpose described.

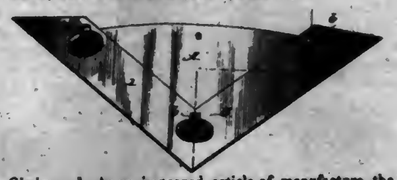
6. In an automatic switch, the combination, with the levers *f* and *m*, the pitman-rods J J, the operating-levers C C, and the throw-bar *q*, of the perpendicular joint *i* and the horizontal joint 3, formed in the said rods J, substantially as and for the purpose specified.

7. In combination with the throw-bar *q*, the sliding block *o* and spring *p*, substantially as and for the purpose specified.

8. In combination with the switch-stand, shields *b*, and operating-levers C C, the shaft *r*, cranks *s*, latch-lever X, link A, and locking-bar B, constituting the device for unlocking the dog P, substantially as and for the purpose hereinbefore specified.

9. The combination, with the shaft *a* under the main track, signal-stand, signal-vane, and the locking-bar B, as set forth, of the lever Z, secured upon the shaft *a*, a toothed disk, Y, mounted on the shaft *a*, a pivoted dog, A, engaging the disk Y, the rod *k*, having a lug, 2, said rod connecting the dog with the hand-lever *l*, said lever Z and rod *k* adapted to be engaged by the locking-bar B, and held from movement when said bar is in a locked position, substantially as and for the purpose set forth.

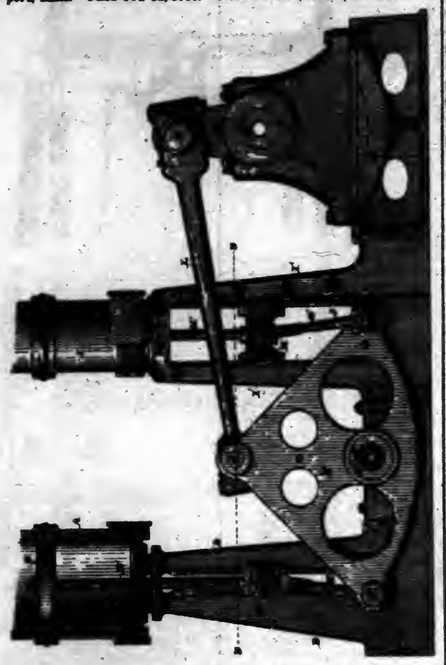
402,253. PLOW. WILLIAM W. LEAK, Montgomery, Ala. Filed Nov. 30, 1888. Serial No. 292,399. (No model.)



Claim.—1. As an improved article of manufacture, the plow-point B, consisting of a thin plate of metal formed approximately V-shaped, with wings 1 1, such wings being arranged to diverge longitudinally and laterally or transversely, and provided with slots at the juncture of and near the outer ends of wings 1, such slots being arranged parallel with each other and with a line intersecting the angle between the wings, all substantially as and for the purposes set forth.

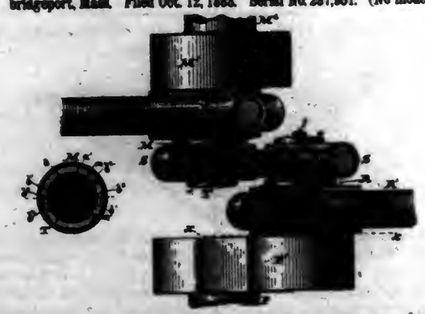
2. The combination, substantially as herein described, of the sweep A, constructed to incline downward on opposite sides from a central longitudinal line, the point B conformed to such sweep and consisting of a thin V-shaped metal plate having wings 1 1 arranged to diverge longitudinally and laterally or transversely, and provided at its center and near its ends with the slots *b*, and the fastening-bolts passed through such slots and through openings in the point A and secured, all substantially as and for the purposes set forth.

402,254. STEAM-ENGINE. ERASMUS D. LEAVITT, Jr., Cambridgeport, Mass. Filed Oct. 12, 1888. Serial No. 287,960. (No model.)



Claim.—In a steam-engine having a plurality of cylinders, the combination, with said cylinders, of a triangular rocker-beam having a plurality of journals or bearings formed on three pins fixed in said beam, one at each angle, a plurality of cross-heads, a plurality of parallel and straight slides, piston-rods connecting said cross-heads with the pistons within said cylinders, links or rods connecting two of said cross-heads to two of said journals or bearings upon one of said beam-pins and the remaining cross-head or cross-heads to another of said beam-pins, a main-shaft crank-pin, and a connecting-rod mounted at one end upon said main-shaft crank-pin and at its other end upon the journal or bearing upon the third beam-pin, said connecting-rod passing and vibrating between two of said cross-heads and piston-rods.

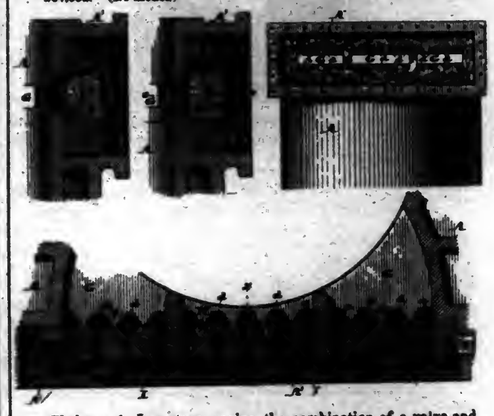
402,255. DEVICE FOR CONNECTING THE CRANKS OF TWO INDEPENDENTLY-ACTING ENGINES. ERASMUS D. LEAVITT, Jr., Cambridgeport, Mass. Filed Oct. 12, 1888. Serial No. 287,961. (No model.)



Claim.—1. Means for connecting and disconnecting two independently-operated engines having their shafts in axial line with each other, so that both shafts may be revolved by either engine, comprising a drag-link and two crank-pins, one of which pins is made in two parts, one tubular and fixed in the crank and provided with a journal to receive the connecting-rod of the engine and the other removably set in said tubular portion in axial line therewith and provided with a journal to receive one end of the drag-link.

2. Means for connecting and disconnecting two independently-operated engines having their shafts in axial line with each other, so that both shafts may be revolved by either engine, comprising a drag-link and two crank-pins, one of which pins is made in two parts, one tubular and fixed in the crank of one of the shafts, and is provided with a journal to receive the connecting-rod of the engine, and the other is removably set in said tubular portion in axial line therewith, and is provided with a journal to receive one end of the drag-link, another crank-pin fixed in the crank of the other shaft and provided with two journals, one to receive the connecting-rod of the engine and the other to receive one end of the drag-link, and a cap secured to the end of the last-mentioned crank-pin to retain said link in position when in use, and which is adapted to be removed when said engines are running independently of each other.

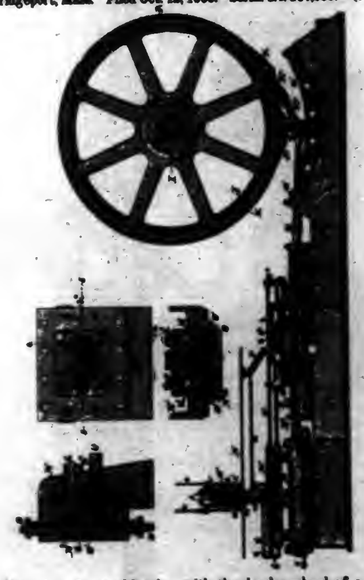
408,256. STEAM-CYLINDER FOR STEAM-ENGINES. ERASMUS D. LEAVITT, Jr., Cambridgeport, Mass. Filed Oct. 12, 1888. Serial No. 287,962. (No model.)



Claim.—1. In a steam-engine, the combination of a valve and valve-seat, each provided with a series of transverse slots or ports, and a cylinder having a port or passage made shallow in the direction of the length of said cylinder for the greater part of the distance from its inner to its outer end, and terminating at its outer end in a series of flaring passages corresponding in number and height in the direction of the length of the cylinder to the length of the slots or ports in the valves.

2. A steam-cylinder provided with a shallow passage extending from each steam-chest to the interior of said cylinder and terminating at its outer end in a series of flaring smaller passages, substantially as and for the purposes described.

402,257. HOISTING-ENGINE. ERASMUS D. LEAVITT, Jr., Cambridgeport, Mass. Filed Oct. 12, 1888. Serial No. 287,963. (No model.)



Claim.—1. In combination with the brake-wheel of a hoisting-drum, a reciprocating cross-head, a lever pivoted to said cross-head,

a strap encircling said wheel and connected at one end to said cross-head and at the other end with one end of said lever, and means for moving said lever in one direction to clamp said strap to said wheel, so that said wheel will move about its axis with said cross-head and in the opposite direction to loosen the grip of said strap upon said wheel.

2. In combination with the brake-wheel of a hoisting-drum, a cross-head reciprocating in a path concentric with the axis of said wheel, a fulcrum-pin mounted in said cross-head, a lever mounted upon said pin, a strap encircling said wheel and connected at one end to said cross-head and at the other end with one end of said lever, a reciprocating frame, a lever pivoted to said frame, a rod connecting the lower ends of said levers, another rod connecting said cross-head and said sliding frame, two cylinders secured to said reciprocating frame, and a reciprocating plunger mounted in said cylinders and connected with the upper end of the lever pivoted to said reciprocating frame.

3. In combination with the brake-wheel of a hoisting-drum, a fixed cylinder, a reciprocating piston mounted within said cylinder, a cross-head or frame mounted in suitable guides, a rod connecting said cross-head with said piston, a lever mounted upon said cross-head, an engine-cylinder mounted upon and movable with said cross-head or frame, a piston fitted to said cylinder and arranged to be reciprocated therein and connected to one end of said lever, a second cross-head mounted in guides located beneath said brake-wheel and curved to an arc of a circle concentric to the axis thereof a rod connecting said two cross-heads, a lever pivoted at or near the center of its length to said second cross-head, a brake-strap surrounding said brake-wheel and connected at one end to said second cross-head and at its other end to one end of the lever carried by said cross-head, and a rod connecting the other end of said lever with the lever pivoted to the first-mentioned cross-head or frame.

4. In combination with a fixed cylinder, a piston reciprocating in said cylinder, a frame adapted to slide in suitable guides, a rod connecting said piston with said frame, two cylinders secured to said frame in axial line with each other, a plunger mounted in said cylinders and extending from one to the other, a casting secured to said fixed cylinder and provided with two parallel water-chambers, a pipe secured to one of said sliding cylinders and extending into one of said water-chambers, another pipe secured to the other sliding cylinder and extending into the other water-chamber, and pipes leading to the outer ends of said water-chambers to admit the water thereto or exhaust it therefrom, as the case may be, valves for controlling the flow of water to or from said water-chambers, a two-armed lever pivoted to said reciprocating frame and connected at one end to said plunger, a brake-wheel, a second cross-head located beneath said brake-wheel, curved slides for guiding said second cross-head in a path concentric to the axis of said brake-wheel, a second two-armed lever pivoted to said second cross-head, a brake-strap surrounding said brake-wheel, a rod connecting said reciprocating frame and second cross-head, and a rod connecting the lower ends of the two two-armed levers.

5. In combination with the brake-wheel of a hoisting-drum, a cross-head reciprocating in a path concentric with the axis of said wheel, a fulcrum-pin mounted in said cross-head, a lever mounted upon said pin, a strap encircling said wheel and connected at one end to said cross-head and at the other end with one end of said lever, a reciprocating cross-head or frame, a lever pivoted to said frame, a rod connecting the lower ends of said levers, another rod connecting said cross-head and said reciprocating frame, two cylinders secured to said reciprocating frame in axial line with each other, a reciprocating plunger mounted in said cylinders and extending from one to the other and connected to the upper end of the lever pivoted to said reciprocating frame, a fixed cylinder, a piston mounted in said fixed cylinder and adapted to reciprocate therein, and a rod connecting said piston to said reciprocating frame, so that said frame, said cross-head, and said piston will all move in unison.

6. In combination with the brake-wheel of a hoisting-drum, a reciprocating frame, two cylinders secured to said frame in axial line with each other, a plunger mounted in said cylinders and extending from one to the other, a lever pivoted to said reciprocating frame and connected at one end to said plunger, and pipes connecting with the outer ends of said cylinders to admit water to reciprocate said plunger, a cross-head located beneath said brake-wheel and arranged to be reciprocated in a path concentric to the axis of said wheel, a two-armed lever pivoted to said cross-head, a brake-strap surrounding said brake-wheel and pivoted at one end to said cross-head and at its other end to one end of the lever carried by said cross-head, and a rod connecting the other end of said lever with the lower end of the two-armed lever carried by said reciprocating frame.

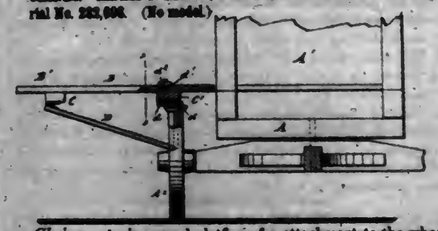
7. In combination with the brake-wheel of a hoisting-drum, a reciprocating frame, a cylinder and piston for transmitting motion to said reciprocating frame, a valve-seat provided with an exhaust-port and another port upon either side of said exhaust-port, pipes connecting said outer ports with the opposite ends of said cylinder, a valve adapted to cover all of said ports or either two of them, as desired, a valve-stem for operating said valve, a lever connected at one end to said valve-stem and at the other end to a fulcrum-pin which is adapted to be raised or lowered at the will of the operator, a sliding cross-head pivoted at one end to said lever, and a series of links and levers interposed between said reciprocating frame and said cross-head, by which, when said frame is moved away from the hoisting-drum, said cross-head will be moved so that all the ports in the valve-seat will be closed by said valve.

8. In combination with the brake-wheel of a hoisting-engine and a gripping or clamping device constructed and arranged to be intermittently clamped to and released from said wheel, a fixed cylinder, a piston working in said cylinder, a reciprocating frame or cross-head connected by a piston-rod to said piston, a pair of differential cylinders mounted upon and movable with said frame, a differential plunger fitted to said cylinders and extending from one to the other, a lever mounted on said frame and connected at one end to said differential plunger and at its other end to the gripping device, a pair of fixed water-chambers, pipes leading from the interior of said water-chambers to the opposite ends of said differential cylinders, a valve-chamber provided with two sets of ports leading therefrom and two valves to cover said ports, pipes leading from the two outer ports of one set to the opposite ends of the fixed cylinder, pipes leading from the two outer ports of the other set to the interior of the water-chambers, a cross-head connected at one end with the stem of the valve that controls the flow of water to the fixed cylinder, and a system of links and rods connecting the other end of said cross-head to one of said differential cylinders or to the frame on which said cylinder is mounted.

9. The combination of the fixed cylinder B, the piston B', the piston-rod B^3, a reciprocating cross-head or frame connected to said piston-rod, the differential cylinders D and D', mounted upon and movable with said reciprocating frame, a differential plunger fitted to said differential cylinders and extending from one to the other, the fixed water-chambers M and M', the pipes L and L', the valve-chamber N^3, the two valves g' g', the ports i, i^2, k^3, k^2, k, and k^4, pipes connecting ports i and i^2 with the opposite ends of the cylinder B, pipes connecting the ports k and k^2 with the water-chambers M' and M, respectively, the valve-rods g g, hand-levers O, means for locking one of said levers in any desired position, links l and l^2, levers I and I^2, the cross-head I^3, the pantograph P, the crank-shaft m^3, lever n, and rod n', all constructed, arranged, and operating substantially as described.

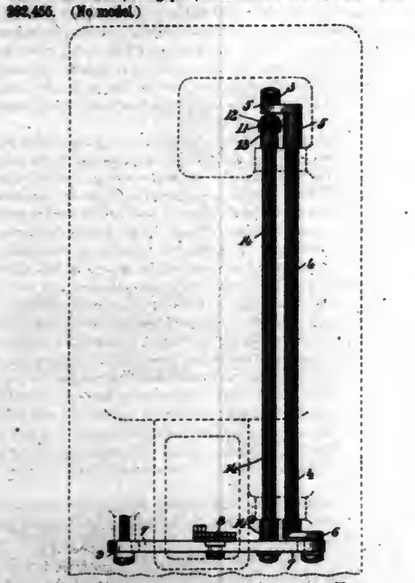
10. In combination with the brake-wheel of a hoisting-drum, a reciprocating cross-head, a strap encircling said wheel and secured at one end to said cross-head, a frame reciprocating in unison with said cross-head, a lever for causing said strap to grip the said wheel when said cross-head is at one end of its movement and to release the same when at the other end of its movement, a pair of differential cylinders mounted upon and movable with said frame, a differential plunger fitted to said cylinders and extending from one to the other, a two-armed lever pivoted to said frame and connected at its upper end to said plunger, a rod connecting the other end of said lever to the strap-clamping lever, a valve-seat provided with three ports in line with each other, a fixed cylinder, a piston adapted to reciprocate within said cylinder and connected with said frame, pipes connecting the ends of said cylinder with two of the ports in said valve-seat, a lever for operating said valve to uncover either of the outer ports and allow water to pass into either end of said cylinder and cause the piston, frame, and cross-head to be moved toward or from said drum, as may be desired, and a system of links and levers connecting said reciprocating frame with the valve, and so arranged that it will cause said valve to cover said ports when said frame has moved a predetermined distance and prevent all further movement in that direction.

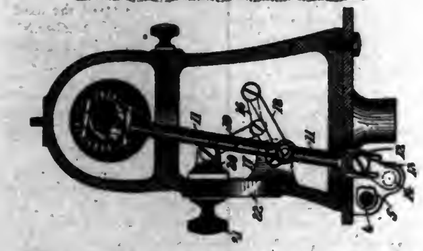
402,258. BAND-CUTTER PLATFORM FOR THRASHING-MACHINES. ALFRED B. LESPER, Owasco, Ill. Filed Aug. 14, 1888. Serial No. 282,606. (No model.)



Claim.—An improved platform for attachment to the wheeled truck of a thrashing-machine, the same consisting of the flat body having near one end a concavity adapted to fit the rim of a wheel, the hook-shaped clamping-bolt applied to such recessed end of the body, and a brace-bar hinged to the under side of said body near its outer end, substantially as shown and described.

402,259. FEEDING MECHANISM FOR SEWING-MACHINES. FRANCIS T. LESLIE, Bridgeport, Conn. Filed Dec. 3, 1888. Serial No. 292,455. (No model.)



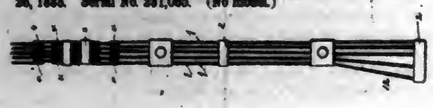


Claim.—1. The combination, with the main shaft, of the cams arranged thereon, the connections arranged within the arm and operated by said cams, the two rock-shafts actuated by said connections, the feed-bar forked at each end and supported the one end upon a stud and the other on the wrist of the lifting rock-shaft crank, the slotted connection of the feed-bar with the wrist of the other rock-shaft, and the link, arm, and a slide-block held by a thumb-screw binding on the arm connected to the feed-driving connection, and whereby the throw imparted by the latter to the wrist of its rock-shaft is controlled and varied, substantially as set forth.

2. In a feeding mechanism for sewing-machines, the combination, with the feed-bar and the serrated feed-dog mounted thereon, said bar being slotted horizontally and vertically near one end and having its other end forked and supported upon a pin, of the feed-driving rock-shaft having a crank engaging the vertical slot in the bar, a cam-actuated connection engaging said feed-driving rock-shaft, and means for varying the throw of said connection, the feed-lifting rock-shaft having a crank engaging the horizontal slot in the bar and extended beneath the bed parallel to the feed-driving rock-shaft, and a cam-actuated reciprocating connection between the main shaft and the rear end of the feed-lifting rock-shaft, substantially as set forth.

3. The combination, with the feed-bar and the means for imparting thereto its vertical reciprocation, of the main shaft, the rotating cam thereon, the reciprocating connection engaged by said cam and having its lower end forked to embrace the wrist of the feed-driving shaft-crank, a link pivoted to the connection and fulcrumed at its opposite end to one extremity of an adjustable arm fulcrumed to the head, and means for adjusting and securing said arm in various positions, substantially as set forth.

402,260. CORSET-BUSK. ISAAC LEVY, Newport, R. I. Filed July 26, 1888. Serial No. 281,065. (No model.)



402,260.



Claim.—1. A corset-busk consisting of a series of longitudinal wires connected together at intervals in their length by strips or braces, each wire being formed with spring-coils, substantially as described.

2. A corset-busk consisting of a series of longitudinal wires, 1, formed with spring-coils 4 and secured together by the clips or braces 2, and having a broad lower end, 12, substantially as described.

3. The combination of two corset-busks, each consisting of a series of longitudinal wires formed with spring-coils and secured together at intervals, one of the said busks having one of its wires bent to form a hook projecting from the face of the busk and the other busk having one of its wires bent to form a loop projecting from the edge of the busk, substantially as herein shown and described.

402,261. DETACHABLE FAUCET. RIVERIUS MARSH, New Brunswick, N. J. Filed Jan. 18, 1889. Serial No. 296,706. (No model.)



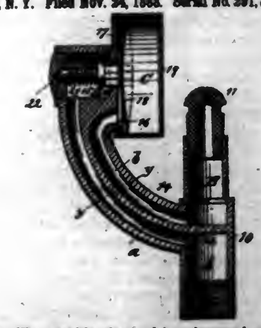
Claim.—1. The combination, with the threaded spout-sleeve having an inwardly-standing flange at its lower end, of the threaded sleeve, a stopper provided with a base portion, P, to force said flange L down on an underlying annular washer, and with a central depending circular portion having a downwardly-tapered side to bind against and compress the inner edge of said washer till said side comes in contact with the inner edge of the flange L, the said depending portion then closing the discharge-opening of the can to which the device is attached, substantially as specified.

2. The combination, with the base-sleeve attached to the top of a can, of the spout-sleeve screwing therein and having the flange L, the washer N, underlying said spout-sleeve, and the screw-stopper entering the spout-sleeve and provided with the flat base portion P and the depending circular base portion Q, having the downwardly-tapered side R, substantially as specified.

3. The combination, with the can and the base disk D, attached thereto and provided with the circular groove F, having the overhanging edges G G', of the base-sleeve carrying the upper portions of the faucet and provided with the flange I, that rests and turns in the groove F, substantially as specified.

4. The combination, with the can, the base-disk secured thereto and provided with the groove F, and the rotatory base-sleeve provided with the flange I, to enter and turn in the groove F, of the ring washer N, lying on the flange I and on the inner edge, G', of groove F, the spout-sleeve screwing in the base-sleeve and provided with the flange L, that overlies the washer, and the stopper screwing in the spout-sleeve and provided with the base portions P and Q, the latter having a depending downwardly-tapered side, R, substantially as and for the purpose specified.

402,262. SAFETY-BURNER. JOSEPH MASON and HENRY MASON, New York, N. Y. Filed Nov. 24, 1888. Serial No. 291,765. (No model.)



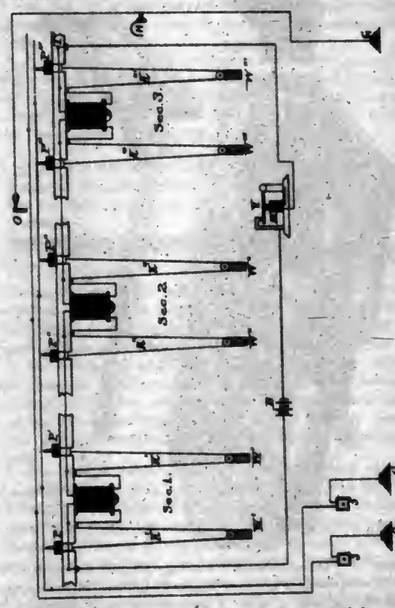
Claim.—1. The combination, with a burner-body divided into upper and lower chambers or compartments, of an arm extending upward from the side of the burner-body and formed with gas-passages which connect the burner-body chambers, a cap and diaphragm carried by the arm and forming an air-tight chamber, a valve mounted to control the gas-passages and arranged to bear against the diaphragm, and a spring arranged in connection with the valve, substantially as described.

2. The combination, with a burner-body divided into chambers A and B, of an arm formed with passages *a* and *b* and a valve-chamber, a valve mounted within the chamber, a diaphragm arranged in advance of the valve, and a cap connected to the arm in advance of the diaphragm and forming therewith an air-chamber located in close proximity to the burner, substantially as described.

402,263. DENTAL ANÆSTHETIC. ALFRED L. MCCARTY, Des Moines, Iowa. Filed Jan. 17, 1889. Serial No. 296,650. (No specimens.)

Claim.—The herein-described compound to be used as an anæsthetic, consisting of crystallized muriate of cocaine, chloroform, fluid extract of staphisagria, (staves-acre,) oil of cloves, and water, in about the proportions specified.

402,264. MULTIPLE SWITCH-BOARD. CHARLES E. MCCLURE, Richmond, Va. Filed Oct. 22, 1888. Serial No. 288,676. (No model.)



Claim.—1. The combination, with a multiple switch-board and connected telephone-lines, of a testing apparatus comprising a local circuit with a battery and rheotome, said local circuit passing through the primaries of the induction-coils at each board, the terminals of the secondary of each induction-coil being connected to the switch-plugs of a flexible cord, with a testing-plug grounded through a receiver, as described.

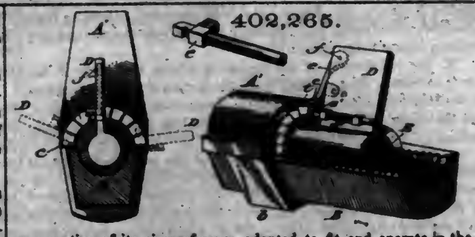
2. The combination, with a telephone-exchange multiple switch-board, of a local battery, a rheotome, and the primaries of a series of Ruhmkorff induction-coils connected up in metallic circuit, while the terminals of the secondaries of the induction-coils are connected each to a pair of flexible connecting cords and plugs, as described.

3. The combination of any number of Ruhmkorff induction-coils, with their primaries connected up in circuit with a local battery, and a vibrator or circuit-breaker for each circuit, thereby producing an intermittent or undulatory flow of electricity through the said primary coils, the secondary terminals of each induction-coil being connected to a separate pair of connecting cords and plugs in such manner that the necessary movement of the connecting-plugs when carried by the hand of the operator to the line-commutators in the act of making a connection will not disconnect them, but will cause an intermittent or undulatory flow of induced electricity to traverse the subscriber's lines thus connected together until they are disconnected, substantially as described, and for the purpose explained in the foregoing specification.

402,265. WRENCH. VINCENT J. MCDOWELL, Philadelphia, Pa. Filed Dec. 13, 1888. Serial No. 293,441. (No model.)

Claim.—1. In a wrench, a semicircularly-shaped screw-threaded groove provided on the main shank or stem, in combination with a tubular-shaped section secured to the adjustable section of the wrench, said section provided with a handle projection and with screw-threads

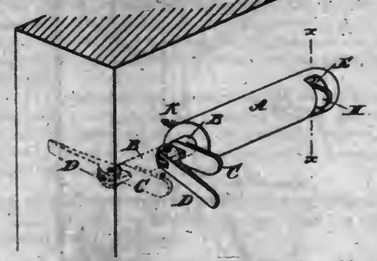
402,265.



on a portion of its circumference adapted to fit and operate in the screw-threads of the groove of the shank or stem, a pawl adjusted to the tube-section operated by a lever, and notches provided on the end of the adjustable section of the wrench to engage said pawl, substantially in the manner and for the purpose as hereinbefore set forth and described.

2. In a wrench, the screw-threaded groove *a*, in combination with the tubular section E, secured to the adjustable section A' and provided with screw-threads on a portion of its circumference and a handle or projection, D, the screw *d*, connecting the tubular section E with the adjustable section A', a pawl, *d'*, adjusted to the tubular section E, a lever, *e*, and teeth *t*, provided on A', substantially as hereinbefore set forth and described.

402,266. BURGLAR-ALARM. NEIL MCINTYRE, Brooklyn, N. Y., assignor to himself and James J. Manion, East Newark, N. J. Filed Nov. 24, 1888. Serial No. 291,782. (No model.)

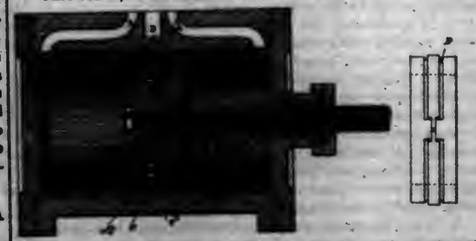


Claim.—1. In a burglar-alarm, the combination, with a tubular body and a plate loosely and transversely mounted in the said body, of a spring-actuated plunger-carrying bar sliding in the bore of the body, and an essentially wedge-shaped arm hinged to the outer end of the said bar, as and for the purpose specified.

2. In a burglar-alarm, the combination, with a tubular body, a screw integral with the inner face of the same, and a plate loosely and transversely mounted near the rear end of the said body, of a spring-actuated plunger-carrying bar reciprocating in the bore of the body, provided with a handle extending outward at a right angle therefrom, and an essentially wedge-shaped arm hinged to the outer end of the said bar, all combined to operate substantially as and for the purpose specified.

3. In a burglar-alarm, the combination, with a tubular body provided with aligning transverse slots in opposite faces near the rear end, a plate projecting through the outer slot and loosely held in a slot, and a screw integral with the body near the forward end, of a spring-actuated plunger-carrying bar reciprocating in the bore of the body, a handle attached to the said bar near the outer end, and an essentially wedge-shaped arm hinged to the outer extremity of the said bar, all combined for operation as and for the purpose specified.

402,267. PISTON-PACKING. GEORGE H. MEADER, Boston, Mass. Filed Oct. 26, 1888. Serial No. 289,125. (No model.)



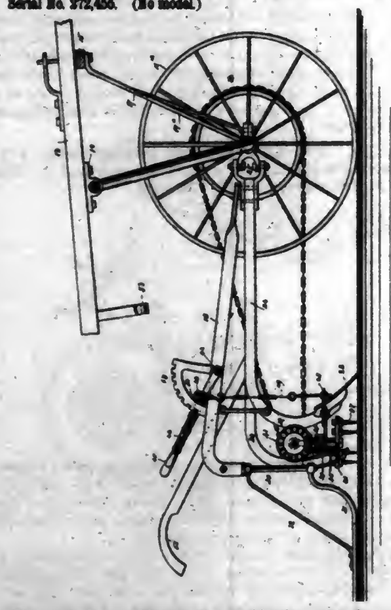
Claim.—1. The combination, in a piston-packing, of a section of a ring or holder having the sleeve a^2, the wall a^3, and the inclined surface a^4, with the removable section having the annular recess a^4, the wall a^5, and the inclined section a^6, and the cleft or divided pack-

ing-ring B, having the flange *b* and head or rim *b'*, extending from both sides of the flange and contained or held between the said two sections, substantially as described.

2. The combination of the section *a*, having the sleeve a^3, the key C, extending from the sleeve, and the section *a'*, having the recess a^4, with the packing-ring B, having the flange *b* and the head or rim *b'*, and the recess *c'* in the flange to receive the key, substantially as described.

3. The combination of the section *a* of the bull-ring or support having the projection or cheek *c*, the section *a'* of the bull-ring or support having the projection or cheek *c'*, the two sections being shaped to provide, when together, the packing-ring-holding space D, with said packing-ring B, the head or rim of which is cut away on each side of the opening to provide recesses, into which said cheeks or projections *c c'* enter, substantially as described.

402,268. CULTIVATOR. THEODORE MEYER, Amity, Iowa, assignor of one-half to Frederick Meyer, same place. Filed May 1, 1888. Serial No. 272,450. (No model.)



Claim.—1. In a cultivator, the combination, with the axle and drive-wheels and a central frame, of vertically and laterally adjustable drag-bars attached to said axle, having bifurcated ends of unequal length, shovels secured to the shorter member of said drag-bars, a cross-bar supported by the longer members, rotary toothed frames carried by said cross-bar, and means, substantially as described, for revolving said toothed frames from the drive-wheels, as and for the purpose specified.

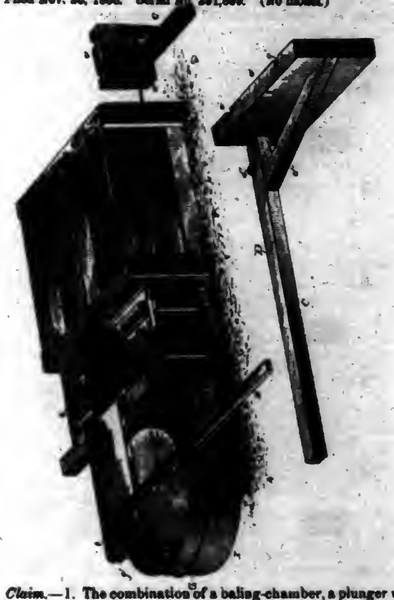
2. In a cultivator, the combination, with the axle and drive-wheels, a central frame, runners attached to said frame at the rear, and vertically and laterally adjustable drag-bars mounted upon the axle, having bifurcated ends of unequal length, of shovels attached to the shorter members of the drag-bars, a horizontal cross-bar supported in the longer members, rotary toothed frames carried by said cross-bar, and means for rotating the toothed frames and elevating the said drag-bars, as and for the purpose specified.

3. In a cultivator, the combination, with the axle, the drive-wheels, sprocket-wheels attached to the latter, a central frame provided with rearwardly-extending runners, and vertically and laterally adjustable drag-bars mounted upon said axle, having downwardly-curved bifurcated rear ends of unequal length, of shovels attached to the shorter members of the drag-bars, a horizontal vertically-adjustable cross-bar supported in the longer members, rotary toothed frames carried by said cross-bar, a horizontal drive-shaft geared to rotate said toothed frame, sprocket-wheels keyed upon said shaft, and an endless belt connecting the sprocket-wheels of the shaft and drive wheels, as and for the purpose specified.

4. In a cultivator, the combination, with the axle, a frame secured to said axle, laterally and vertically adjustable drag-bars mounted upon the same, provided with bifurcated downwardly-curved rear ends of unequal length, and shovels secured to the shorter members, of a horizontal cross-bar supported in the longer members of the frame, rotary toothed frames carried by the cross-bar, a rack secured to the main frame, a lever pivoted to said frame engaging the rack, a crank-arm projected from said lever, and a chain-connection between the cross-bar and crank-arms, substantially as shown and described.

5. In a cultivator, the combination, with the axle, a frame secured at each side the center of the axle, laterally and vertically adjustable drag-bars pivoted upon the same at each side of the frame, provided with forked downwardly-curved rear ends of unequal length, and shovels secured to the shorter members, of a horizontal cross-bar supported by the longer members of the arms, having vertical play, toothed frames carried by said cross-bar, a rack secured to the main frame, a lever pivoted to said frame engaging the rack, a crank-arm projected from said lever, and a chain having lateral movement upon the crank-arm secured to said cross-bar, substantially as shown and described.

402,269. BALING-PRESS. JOSEPH D. MOON, Walnut Grove, Ga. Filed Nov. 26, 1888. Serial No. 291,869. (No model.)



Claim.—1. The combination of a baling-chamber, a plunger working therein comprising a block, a longitudinal beam projecting rearwardly therefrom, and a brace, a block eccentrically journaled in front of the chamber, and a rope or chain secured at one end to said block at a point farthest from its axis, and at the other end to the outer side of the follower, substantially as and for the purpose set forth.

2. The combination, with a baling-chamber, and a block eccentrically journaled in front thereof, of a follower comprising a block, a rearwardly-projecting longitudinal beam at one side thereof and a brace, and a rope or chain secured to said block and to the outer side of said longitudinal beam, whereby the latter is held in contact with the adjacent side of the chamber, said rope or chain passing through slots provided therefor and out of contact with the material to be pressed, substantially as and for the purpose set forth.

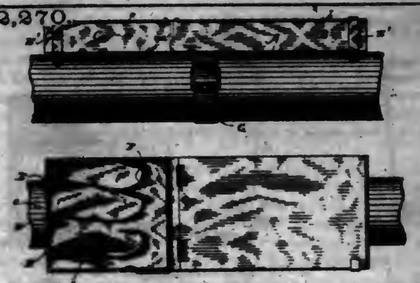
3. The combination of a baling-press comprising the baling-box divided into two separate chambers lying side by side, a block eccentrically journaled at the front thereof, and followers working in said chambers and connected by ropes or chains with said block at a point farthest from its axis, substantially as and for the purpose set forth.

4. The herein-described baling-press, comprising two separate parallel chambers provided with independent followers, and with top and side doors for the removal of the bales, an eccentrically-journaled block connected with the followers by chains or ropes, the latter being secured to the periphery of the block at the point farthest from the axis thereof, and an operating-lever secured to said block, all arranged and adapted to operate substantially as and for the purpose set forth.

402,270. HOOK AND BAIT SAFETY-BOX. WILLIAM R. MURFORD, Kansas City, Mo. Filed Apr. 6, 1888. Serial No. 269,655. (No model.)

Claim.—1. The combination, with a fishing-rod, of a combined bait and hook box having attached thereto a fastening device for securing the box to the pole, the said box being provided with a bait-

402,270.

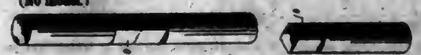


compartment and a hook-compartment, and covers opening into said compartments, substantially as set forth.

2. The combination, with a fishing-rod and a combined bait and hook box, of a pair of spring-jaws secured to the box and adapted to be sprung around the pole to secure the box thereto, substantially as set forth.

3. A bait and hook box consisting of a receptacle having apertures in one of its ends and provided with a partition, and covers hinged to said receptacle and provided with catches for holding the covers in a closed position, in combination with a fastening device for securing the box to a fishing-rod, substantially as set forth.

402,271. METHOD OF MANUFACTURING SET-SCREW BLANKS. FREDERICK MOTHERS, Rockford, Ill., assignor of one-half to the Rockford Bolt Works, same place. Filed Dec. 8, 1888. Serial No. 293,031. (No model.)



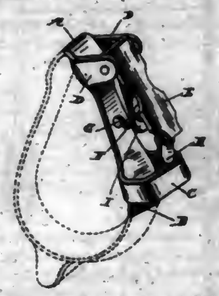
Claim.—1. The herein-described process of manufacturing set-screw blanks, consisting in reducing in a single operation a section of the bar material to a polygonal form of sufficient length to form the polygonal portion of two set-screw blanks, substantially as set forth.

2. The herein-described process of manufacturing set-screw blanks, consisting in feeding material enough to form two blanks, cutting it from the main bar, and reducing in a single operation a section of the cut portion to a polygonal form of sufficient length to form the polygonal portion of two set-screw blanks, substantially as set forth.

3. The herein-described process of manufacturing set-screw blanks, consisting in feeding material enough to form two blanks, cutting it from the main bar, reducing a section of the cut portion to a polygonal form of sufficient length to form the polygonal portion of two blanks, and transversely cutting the polygonal portion, thus forming two complete set-screw blanks, substantially as set forth.

4. The herein-described process of manufacturing set-screw blanks, consisting in reducing a section of the bar material to a polygonal form of sufficient length to form the polygonal portion of two set-screw blanks and transversely cutting the polygonal portion, thus forming two complete set-screw blanks, substantially as set forth.

402,272. HARNESS-BUCKLE. HENRY L. NORRIS, Providence, R. I. Filed Sept. 12, 1888. Serial No. 285,218. (No model.)

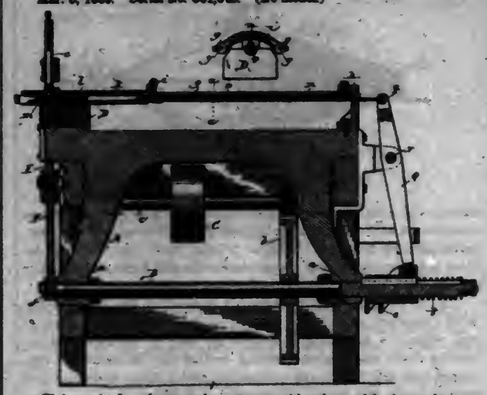


Claim.—1. In a harness-buckle, the base A B, loop C, ears D D, plate E, with tongue F thereon, and a device for keeping the tongue in place, all constructed and combined so as to operate substantially as set forth.

2. The combination of the base A B, loop C, ears D D, plate E, with tongue F thereon, button H, and spring I, all constructed and combined so as to operate substantially as set forth.

3. In a harness-buckle, the base A B, loop C, ears D D, and plate E, with tongue F thereon, all constructed and combined so as to operate substantially as set forth.

402,273. PIPE-PUNCH. CLARENCE S. CLEVELAND, Chicago, Ill. Filed Mar. 5, 1889. Serial No. 301,940. (No model.)

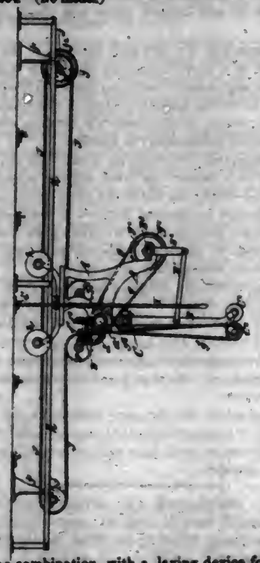


Claim.—1. In pipe-punches, the combination, with the reciprocating bar carrying the wedge-section of the mandrel, of the stiff vibrating lever to actuate said bar and the revolving shaft having a cam-collar to engage said lever, substantially as described.

2. In pipe-punches, the combination, with the reciprocating bar carrying the wedge-section of the mandrel, of the vibrating lever to actuate said bar, the revolving shaft having cam-collar sliding thereon to engage said lever, and the reaction-spring set upon said shaft and bearing against said collar to control the shift thereof, substantially as described.

3. In pipe-punches, the two-part mandrel divided at an incline longitudinally to form wedge-like contacting sections, one of said sections carrying the die and the other being slotted to receive the clippings, and both sections conforming externally to the curvature of the pipe, substantially as described.

402,274. APPARATUS FOR DELIVERING MATERIAL IN ROPY FORM. ISAAC R. PALMER, Middletown, Conn. Filed July 2, 1887. Serial No. 243,304. (No model.)

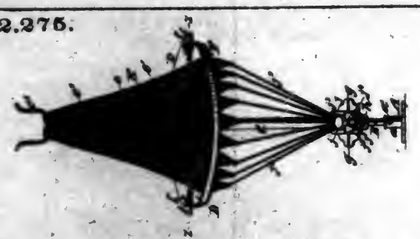


Claim.—The combination, with a laying device for laying ropy material in folds or layers throughout its range of movement, of a carriage supporting the laying device and a track whereon the carriage is movable in a direction parallel with the direction of movement of the laying device, and a traverse motion for reciprocating the material in a direction transverse to the direction of movement of said laying device, substantially as herein described.

402,275. APPARATUS FOR STRINGING HAMMOCKS. ISAAC R. PALMER, Middletown, Conn. Filed Sept. 13, 1888. Serial No. 285,201. (No model.)

Claim.—1. In an apparatus for stringing hammocks, the combi-

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nation, with a standard, of a rotary support mounted thereon, a frame mounted on said support, clamping devices for the body of the hammock adapted to clamp the same to said frame, and retaining devices also mounted on said support below the said frame, substantially as specified.

2. In an apparatus for stringing hammocks, the combination, with a standard, of a rotary support thereon, a frame mounted on said support, a supporting device for the body of the hammock extending above said frame, clamping devices for the hammock connected with said frame, and a retaining device also mounted on said support below said frame, substantially as specified.

3. In an apparatus for stringing hammocks, the combination, with a standard which is bent or deflected at an angle, of a rotary support thereon, a frame mounted on said support, a supporting device for the body of the hammock extending above said frame, clamping devices for the hammock mounted on said frame, and retaining devices mounted on said support below said frame, substantially as specified.

4. In an apparatus for stringing hammocks, the combination, with a standard, of a rotary support mounted upon the same and adjustable lengthwise thereon, a frame upon said support, a supporting device for the body of the hammock mounted upon said support, and retaining devices also mounted upon said support below said frame substantially as specified.

5. In an apparatus for stringing hammocks, the combination, with a standard, of a rotary support mounted thereon, a frame of circular or rounded form mounted upon said support, a supporting device for the body of the hammock extending above said frame, clamping devices for the hammock mounted on said frame, and retaining devices mounted on said support below said frame, substantially as specified.

6. In an apparatus for stringing hammocks, the combination, with a standard, of a support mounted thereon, a frame of circular form mounted on said support, a securing device for the hammock, consisting of bands extending about the edges of said frame and adapted to bind the end portions of the hammock between the edges of the frame and the bands, substantially as specified.

7. In an apparatus for stringing hammocks, the combination, with a standard, of a support mounted thereon, a frame secured to the said support, a supporting device for the body of the hammock, and clamping devices for the end portions of the hammock, which clamping devices are secured near one of their ends to said frame and at their other ends to tighteners, whereby they may be tightened about the hammock, substantially as specified.

8. In an apparatus for stringing hammocks, the combination, with a standard, of a support mounted thereon, a frame mounted on said support, and clamping devices for the end portions of the body of the hammock secured near one of their ends to said frame and extending in reverse directions about the same, and tighteners for causing the clamping devices to grip and secure the hammock, substantially as specified.

9. In an apparatus for stringing hammocks, the combination, with a standard, of a support mounted thereon and radially-adjustable retaining devices mounted upon said support, substantially as and for the purpose specified.

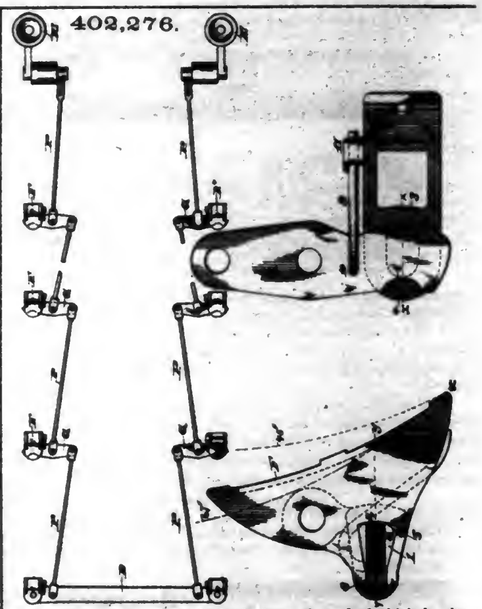
402,276. BRAKE-HEAD AND LEVER FOR OPERATING THE SAME. GEORGE H. POOR, St. Louis, Mo., assignor to the Westinghouse Air Brake Company, Pittsburg, Pa. Filed Feb. 2, 1889. Serial No. 298,499. (No model.)

Claim.—1. The combination of a brake-head recessed to permit of play between the head and its operating-lever, said recess having a concave bearing-surface for the operating-lever, and an operating-lever having a convex bearing face or edge, substantially as and for the purposes specified.

2. The combination of a brake-head having a triangular or key-hole slot with a concave bearing-surface for the reception of the end of the operating-lever and an operating-lever having a rounded or convex bearing edge, substantially as and for the purposes specified.

3. The combination, with a brake-head having a slot for the end of the brake-lever, said slot having walls which are curved or concentric in transverse section, of a brake-lever the end of which has its edges concentrically curved to correspond with the walls of the slot in the brake-head, substantially as and for the purposes specified.

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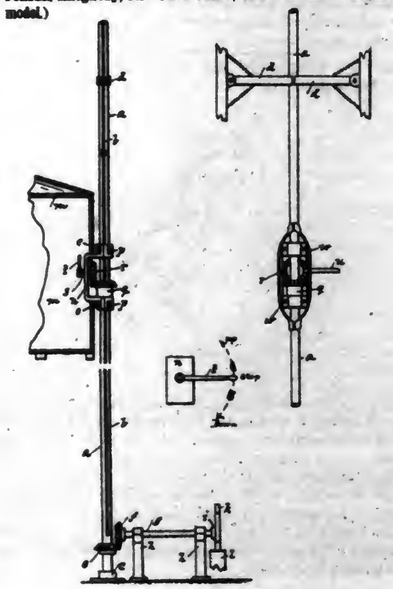


4. The combination, with a slotted brake-head, of an operating-lever or brake-lever having a hooked end to engage in the slot of the brake-head, substantially as and for the purposes specified.

5. The combination, with a brake-head having a tapering slot for the end of the brake-lever, and with the brake-lever, of a balance or support rod arranged parallel with the side of the brake-head for maintaining the brake-head in its proper position, substantially as and for the purposes specified.

6. The combination, with a brake-head having a tapering slot and a lug at its lower end, of a lever whose end engages in the slot of the brake-head and a rod arranged parallel with the side of the brake-head and having one end secured to the lever and the other end passing under the lug on the brake-head, substantially as and for the purposes specified.

402,277. ELEVATOR-CAR-OPERATING DEVICE. GEORGE W. PORTER, Allegheny, Pa. Filed Jan. 3, 1888. Serial No. 259,635. (No model.)

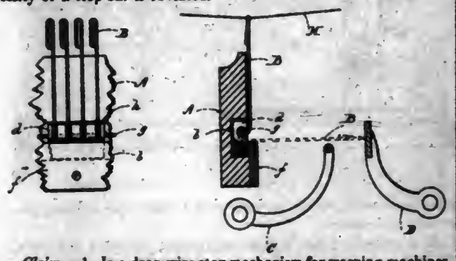


Claim.—1. In an elevator-controlling device such as described, the vertical shaft *a*, having formed along its entire length a key-seat, *b*, and the same properly secured in a vertical position in an elevator-shaft, the gear-wheel *g*, operating along the shaft *a* by means of a spline, *s*, and mounted in a frame, *n*, attached to the side of the elevator-car *m*, and the beveled pinion *r*, secured to the operating-lever shaft *z* whereby the vertical shaft *a* may be revolved in either direction, as and for the purpose described.

2. In a device for operating and controlling elevator-cars, the vertical shaft *a*, secured at the top and base in suitable bearings, *c*, the hinged braces *d*, and a means for retaining the same in a horizontal position, in combination with a shield or guard, *w*, secured about the device for operating the shaft *a*, whereby the said braces *d* may be temporarily removed from the vertical shaft, substantially as set forth.

402,278. DROP-WIRE STOP MECHANISM FOR WARPING-MACHINES. JOHN E. PERRY, Northbridge, Mass. Filed Sept. 17, 1888. Serial No. 285,585. (No model.)

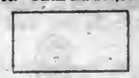
Brief.—The object of the invention is to provide improved means for mounting the drop-wires in the supporting-bar, whereby they are prevented from clogging with lint, &c., and whereby the necessity of a stop-bar is obviated.



Claim.—1. In a drop-wire stop mechanism for warping-machines, the plate *d*, provided with the slots *h*, in combination with the wires B, pivoted in said plate with their bodies outside the pivoted point, and the supporting-bar A, provided with the groove *b*, for receiving said plate, substantially as described.

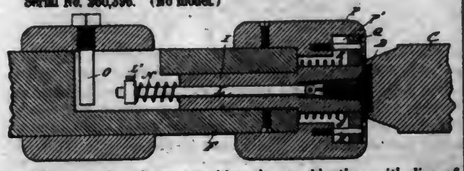
2. In a drop-wire stop mechanism for warping-machines, a supporting-bar provided with a longitudinal groove in its face, a plate inserted in said groove, drop-wires pivoted to said plate and having their bodies outside the pivotal point, and a retaining-plate secured to the face of said bar for holding the drop-wire plate therein, all being arranged to operate substantially as described.

402,279. PHOTOGRAPHIC PAPER. FREDERICK H. ROGERS, Los Angeles, Cal., assignor of one-half to Charles Conklin Bell, Minneapolis, Minn. Filed Apr. 9, 1888. Serial No. 270,122. (No specimens.)



Claim.—Photographic paper coated with a compound formed by the admixture of water, salt, albumen, and ammonia, in or about the proportions specified.

402,280. BUTTON-MACHINE. ANTON SCHOLZ, Brooklyn, assignor to himself, and Minnie E. Levy, New York, N. Y. Filed Jan. 11, 1888. Serial No. 260,396. (No model.)

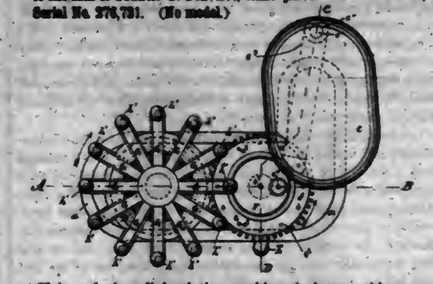


Claim.—1. In a button-machine, the combination, with dies, of jaws held in one of the said dies to support the staple, and a yielding plate held to slide on one of the said dies to remove surplus material, substantially as shown and described.

2. In a button-machine, the combination, with a fixed die having a recess, of a movable die adapted to be pressed against the said fixed die, jaws held in the said movable die to support the staple, and a plate held to slide on the said movable die to remove surplus material, substantially as described.

3. In a button-machine, a fixed die having a recess, a movable die adapted to be pressed against the fixed die, and jaws held in the said movable die and adapted to hold the staple, in combination with a plate held to slide on the said movable die, and a spring pressing against the said plate, substantially as shown and described.

402,281. STENCIL. ALBERT W. SMITH, Haverhill, Mass., assignor of one-half to Francis D. Benedict, same place. Filed June 11, 1888. Serial No. 276,731. (No model.)



Claim.—1. In a dial-painting machine, the intermeshing gears *d e*, journaled to the base-plate *a*, the gear *d* having a series of vertically-movable templets or stencils adapted to be moved to and from the dial secured to the gear *e*, substantially as and for the purpose set forth.

2. In a dial-painting machine, the base-plate *a* and the dial-supporting gear *e*, journaled to it and having means for securing to it the dial to be painted, combined with the gear *d*, intermeshing with the gear *e*, a series of radially-adjustable bars, G G, mounted on the disk D' on the gear *d*, and a series of vertically-movable templets or stencils arranged on spindles in said bars G and adapted to be moved to and from the dial that is being painted, substantially as and for the purpose set forth.

3. In a dial-painting machine, the base-plate *a*, having trunnion or pivot *a'*, adapted to be inserted in a corresponding recess in the support *b*, combined with the dial-supporting gear *e* and the intermeshing gear *d*, journaled to the said base-plate, and the radially-adjustable and vertically-movable stencils or templets I, all arranged and combined substantially as and for the purpose set forth.

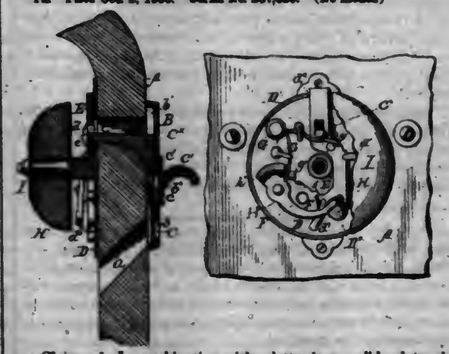
4. In a dial-painting machine, the dial-supporting gear *e*, having a series of annular grooves, *e'*, on its upper side, adapted to receive the projections on the under side of the dial, and having recesses on its upper side for receiving the pins e^3 e^4, for holding the dial in place on such gear, combined with the locking-lever E, having projection E', adapted to be locked into one of the recesses e^4 on the gear *e*, substantially as and for the purpose set forth.

5. In a dial-painting machine, an intermittently-rotating dial-carrying device and an intermittently-rotating stencil-carrying device having radially-adjustable and vertically-movable stencils or templets I, combined with an oscillating and horizontally-adjustable wrist-rest, substantially as and for the purpose set forth.

6. In a dial-painting machine, an intermittently-rotating templet-carrier and an intermittently-rotating dial-support and a locking and releasing device for securing said parts firmly in position during the operation of painting the figures, marks, or designs on the dial, substantially as set forth and described.

7. In a dial-painting machine, the templet-carrying gear *e*, journaled to the plate *a* and having a radially-grooved disk, D', a series of radially-adjustable bars, G, mounted in said grooved disk D', a locking device, as described, for securing said bars in position, and the spring-pressed spindles H, movable in bearings on said bars G and provided with stencils or templets I, substantially as and for the purpose set forth.

402,282. LETTER-BOX ALARM. FREDERICK SNYDER, Lancaster, Pa. Filed Oct. 2, 1888. Serial No. 287,090. (No model.)



Claim.—1. In combination with a letter-box, a slide-plate which closes and opens the opening for letters and is provided with a rigid

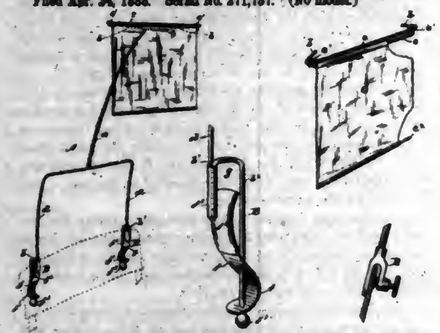
rearwardly-extending arm, a trip-bar engaged by said arm, a hammer arranged to be drawn back by said trip-bar, and a spring for operating said hammer and replacing said trip-bar, substantially as set forth.

2. A hammer, a pivoted carriage on which it is pivoted, and a spring, *K*, between said hammer and carriage, in combination with a trip-bar having a nose which engages a nose on said hammer-carriage, a spring, G, engaging said carriage and trip-bar, and a slide-plate operating said trip-bar to turn the hammer-carriage against the action of the spring G, substantially as set forth.

3. In combination with alarm mechanism and a letter-box inclosing the same and having in its front a vertical slot and also a passage for letters, a front plate recessed on its inner face and provided with opening *a*, and a vertical slot communicating therewith, and a slide-plate which moves up and down in said recess to open and close opening *b*, said slide-plate being provided with a handle which extends forward through the vertical opening in said front plate, and an arm extending rearwardly through the vertical slot in the front of the box to engage with the alarm mechanism and operate it, for the purpose set forth.

4. The pivoted hammer-carriage F, constructed with a nose, *f*, and a tongue, *f'*, in combination with a trip-bar having a nose which engages and releases, as described, the nose aforesaid, a fixed lug which guides said noses and also limits the play of said hammer-carriage, a slide-plate arranged to raise the trip-bar for turning the hammer-carriage when said slide-plate is lifted, a hammer pivoted on said hammer-carriage to continue the stroke by momentum when the motion of said hammer-carriage ceases, and a spring in contact with said hammer which resists this independent motion of the latter and replaces it in its former position, substantially as set forth.

402,288. FAN ATTACHMENT. JACQUES B. STETTHEIMER, Rochester, N. Y., assignor of one-half to William H. Osthout, same place. Filed Apr. 24, 1888. Serial No. 271,737. (No model.)



Claim.—1. In an attachment such as described, the support A, constructed of wire bent and twisted, as described, to form a cross-piece, *c*, arms *b*, and standards *a d*, combined with clamps B, as and for the purpose set forth.

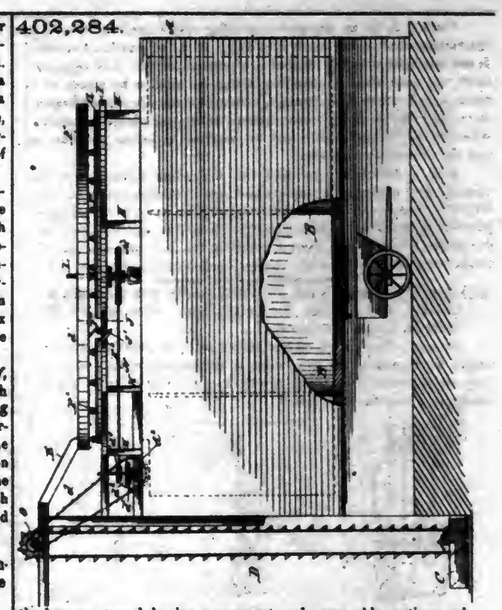
2. In an attachment such as described, the combination, with the support A, provided with a supporting wire or rod, *d*, bent or folded, as at $b' b^2$, to form a yoke, of a spring attached to one leg of said yoke, substantially as described.

3. In an attachment such as described, the wire support A, bent and twisted together at or near the upper portion to form a support for the fan, and the supporting-wires *d*, constituting a continuation of said twisted portion and each provided with a clamp, B, adapted to engage the back of a chair or other support, substantially as described.

4. In an attachment such as described, the combination, with the support A, formed of a single piece of wire bent and twisted in the manner indicated to form cross-piece *c*, arms *b*, upright *a*, supports *b*, and yoke *g*, of the spring *f*, applied to leg b^2 of said yoke, substantially as described.

5. In an attachment such as described, and in combination with the yoke at the lower end for attachment to the chair-back formed by bending the wire upon itself, as at *b'*, and parallel thereto, as at b^2 the curved spring attached to wire b^2 of the yoke and with its free end adapted to be moved into position between the arms $b' b^2$ of the yoke, substantially as described.

402,284. COAL-CONVEYER. GUSTAVUS L. STOEBNER, Long Island City, N. Y. Filed Feb. 8, 1889. Serial No. 299,110. (No model.)



Claim.—1. A conveyer comprising several hoppers arranged in the form of a circle and mounted on wheels, and each provided with a door at the bottom, in combination with a track on which the hoppers travel and means for automatically opening and closing the said doors, substantially as described.

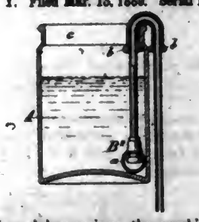
2. The conveyer comprising several connected hoppers, each having a trap-door at the bottom, in combination with a track on which the hoppers travel, having permanent and removable sections, substantially as described.

3. A conveyer comprising several hoppers connected in a circle, each having a trap-door at the bottom, in combination with a circular track having permanent and movable sections, each trap-door being provided with a support to run upon the track, substantially as described.

4. The receptacle A, divided into bins, and the circular track G, supported above the bins and having removable sections G', in combination with the circular conveyer F, having a series of hoppers placed upon the track, each hopper being provided with a trap-door at the bottom, substantially as described.

5. The receptacle A, divided into bins, and the platform I and track G thereon, supported above the bins, said platform being formed with the openings J, having inclines J', and said track being formed with movable sections G', in combination with the conveyer F, having doors F' at its bottom, substantially as described.

402,285. TUBE-REST FOR SYRINGES. BENJAMIN F. SUTTON, Brooklyn, N. Y. Filed Mar. 13, 1889. Serial No. 303,179. (No model.)



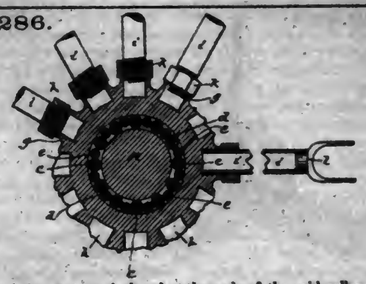
Claim.—In a siphon-syringe, the combination, with a syringe-tube, of a rest therefor adapted to support the same upon a vessel, said rest being made of india-rubber and in the form of a U-shaped tube of such internal diameter that the syringe-tube may be drawn through it, but which will normally maintain the syringe-tube in a position into which it may be adjusted by friction, substantially as specified.

402,286. JOURNAL-BEARING FOR VEHICLE-WHEELS. CHARLES TAYLOR, Elizabeth, assignor of one-half to O. D. Levis, Pittsburg, Pa. Filed Aug. 25, 1888. Serial No. 283,777. (No model.)

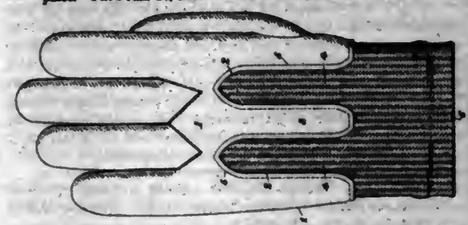
Claim.—1. A journal-bearing, substantially as described, consisting of a box, *b*, having annular grooves formed in its ends of greater diameter than the longitudinal bore of the box, a series of friction-rolls, *c*, surrounding the axle and terminating at their ends within the annular grooves of the box, another series of friction-rolls, *e*, placed between the rolls *c* and corresponding in length thereto, and the elastic washers *f*, fitted snugly in said annular grooves, substantially as described.

2. A journal-bearing consisting of the two series of rollers *c e*, of large and small diameter and extending the entire length of the journal A, and the washers *f*, placed at the ends of the said rollers *c e*, in combination with the journal-box *b*, the annular hub *g*, the metallic hollow spokes *i*, fitted with a nut, *k*, and the U-shaped clamp *l*, substantially as described.

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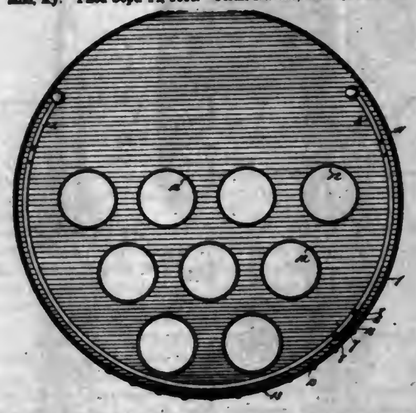


402,287. GLOVE OR MITTEN. WILLIAM M. TERRELL, Gloversville, N. Y., assignor to Earl G. Thomas and Charles D. Thomas, same place. Filed Jan. 14, 1889. Serial No. 296,302. (No model.)



Claim.—In a glove or mitten, the combination, with the glove-facing 1, made of comparatively inelastic material and cut away at the back from the wrist to about the knuckle-line, of elastic material 4, inserted in the said cut-away part of the facing, and a stay-piece, 3, attached to the facing and secured to the elastic material and extending lengthwise the elastic back to stay it, and leaving openings 2 2, substantially as and for the purpose set forth.

402,288. RIVET-HOLDING DEVICE. JOHN P. WEIDENSTEIN, Ashland, Ky. Filed Sept. 14, 1888. Serial No. 285,572. (No model.)



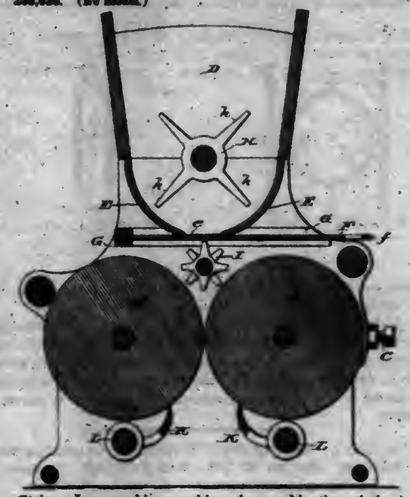
Claim.—1. A rivet-holding tool for boilers, consisting of a curved strip in the form of a segment of a circle, to extend over a portion of the interior surface of a boiler, and a holding-plate on the curved strip to hold the head of a rivet while being secured, substantially as shown and described.

2. A rivet-holding tool for boilers, consisting of a curved strip adapted to extend over a portion of the interior surface of a boiler and having detachable handles, and a rivet-head-holding plate adjustable lengthwise on the curved strip, substantially as shown and described.

3. In a rivet-holding tool for boilers, the curved strip 1, of a size adapted to pass through the man-hole of a boiler and to extend over a portion of the interior surface of a boiler, and having a series of holes, 9, the handles 2, secured by nuts 5 and bolts 3, passing through the shouldered overlapping ends 4 of strip 1 and handles 2, and the plate 6, with rivet-head recess 7, secured to strip 1 by nuts 10 and bolts 8, passing through holes 9, substantially as shown and described.

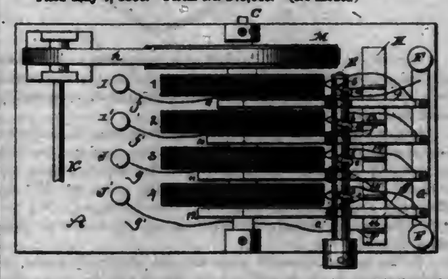
4. A rivet-holding tool for boilers, consisting of a curved strip of a size to extend over a portion of the interior surface of a boiler, and having detachable handles, a rivet-head-holding plate adjustable lengthwise on the curved strip, and a guide-rod detachably secured to the rivet-head-holding plate, substantially as shown and described.

402,289. COTTON-SEED CRUSHER. JOHN J. WOODWARD and PETTUS B. REID, Montgomery, Ala. Filed Dec. 14, 1888. Serial No. 293,630. (No model.)



Claim.—In a crushing-machine, the combination of the hopper having a discharge-opening, the crushing-rolls arranged below such opening, the clearing-distributer arranged immediately above the meeting faces of said rolls, and the cut-off operating between said distributer and the discharge-opening of the hopper, all substantially as described, whereby in case the rolls become clogged the supply may be cut off, the clearing-distributer meanwhile operating to clear the said rolls, substantially as and for the purposes set forth.

402,290. ELECTRIC MOTOR. FREDERICK YERGER, Tampa, Fla. Filed May 7, 1888. Serial No. 273,015. (No model.)



Claim.—1. An electric motor comprising a series of coils, a shaft journaled eccentrically in the coils, a series of armatures arranged around the shaft at equidistant points, a corresponding series of cams carried by the said shaft, and circuit making and breaking levers adapted to be operated by the arm, substantially as described.

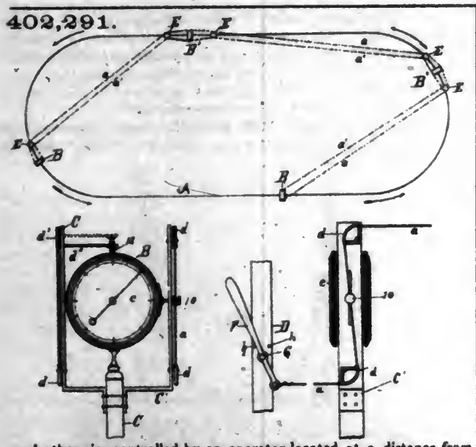
2. In an electric motor, the combination, with a series of coils, 1 2 3 4, of the armature-shaft C, carrying armatures 5 6 7 8, the cams 9 10 11 12, the circuit-operating levers 13 14 15 16, the spring-supported bar G, and the electrical connections, substantially as specified.

3. In an electric motor, the combination, with a series of circuit-operating levers provided with conducting-caps, of a spring-supported conducting-bar arranged to be touched by all of the levers, substantially as specified.

402,291. TIMING APPARATUS FOR RACE-COURSES. RICHARD O. ADAMS, Louisville, Nebr. Filed Mar. 15, 1887. Serial No. 230,967. (No model.)

Claim.—1. In a timing mechanism for race-courses, the combination of an operative timing-instrument mechanically mounted so as to be visible to the general class of spectators at a race-course, and controlling-connections between said timing-instrument and a distant operating-point, whereby said instrument may be started, stopped,

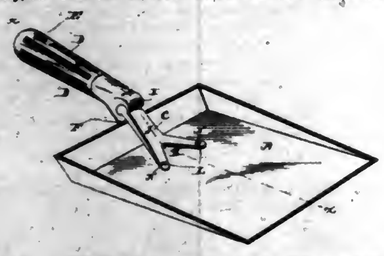
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and otherwise controlled by an operator located at a distance from said timing-instrument, substantially as shown and specified.

2. In a timing mechanism for race-courses, the combination of a series of operative timing-instruments arranged at intervals around the course and facing the direction of advance, and devices, substantially as described, arranged to control, stop, and start each timing-instrument of the series simultaneously, substantially as shown and specified.

402,292. HANDLE FOR DUST-PANS. LEWIS ABGEVINE, Sweden Valley, Pa. Filed Nov. 27, 1888. Serial No. 291,969. (No model.)



Claim.—1. A handle for dust-pans, comprising two members adapted to clamp the pan, the outer member having the overhanging lip I, and the upper end of the inner member engaging under said lip and held thereby, as set forth.

2. A handle for dust-pans, comprising the member B, having the tubular portion D, provided with a lip, I, a stem depending from the tubular portion, and a fork extending from the end of the stem, and a smaller member having the stem engaging under the lip I and adapted to bear against the stem of the member B, and a fork projecting from said stem and adapted to bear upon the fork of the other member, as set forth.

3. The improved handle comprising the member B, having the tubular portion D, the stem F, and the fork G, and the overhanging lip I at the angle of the stem and the tubular portion, and the member C, having a stem adapted to engage under the lip I and provided with a spur or pin, M, and the fork extending from the said stem, the ends of the forks of the two members being provided with openings adapted to receive securing-rivets, as set forth.

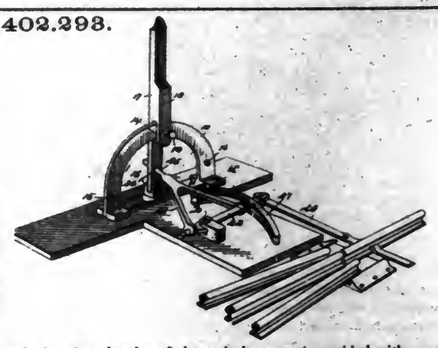
402,293. SWITCH-STAND. FRANK C. BAKER, Blue Island, Ill. Filed Oct. 15, 1888. Serial No. 288,066. (No model.)

Claim.—1. In a switch-stand, a pivoted switch-lever swinging in a plane parallel with the rails, and a horizontally-turning bell-crank lever pivoted at one end directly to the switch-lever and pivoted at its other end to the switch-bar, substantially as set forth.

2. In a switch-stand, the combination, with an apertured arch and an essentially straight lever sliding upon the same and provided with an aperture near the lower end, of a switch-bar and an essentially bell-crank lever attached to the said switch-bar and provided with one cylindrical end adapted to pass through the aperture in the straight or main lever, as and for the purpose specified.

3. In a switch-stand, the combination, with the base, an arch secured to the base, and an essentially straight lever pivoted upon the said base and guided over the said arch, provided with an aperture near the pivotal point, of a hinged bell-crank lever pivoted in alignment

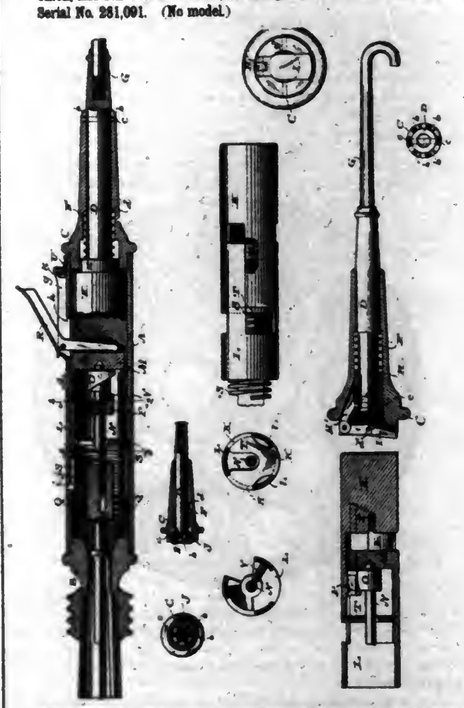
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with the pivotal point of the main lever, and provided with a cylindrical shank end adapted to project through the aperture of the main lever, all combined to operate substantially as and for the purpose specified.

4. In a switch-stand, the combination, with the base, an arch secured to the base, and an essentially straight lever pivoted upon the said base, guided over the said arch, and provided with an aperture near the pivotal point, of a switch-rod, a bell-crank lever provided with a cylindrical shank end projecting through the aperture of the main lever, a semicircular guide, a transverse bar passing loosely through the opposing members of the bell-crank lever, uniting the same, the said transverse bar being pivoted in alignment with the pivotal point of the main lever, substantially as shown and described.

402,294. DENTAL PLUGGER. FRANK L. BARNEY, Prairie du Chien, and HILBERT R. TAYLOR, Bloomington, Wis. Filed July 26, 1888. Serial No. 281,091. (No model.)



Claim.—1. In a dental plugger, the combination of a spring-controlled tool-plunger, a mallet for the plunger, a shell loosely spliced to the mallet, a spring arranged to exert its pressure against said mallet, another spring arranged to exert its pressure against the shell, a cam or pin arranged on one of the mallet-splices, a jointed drive-shaft stepped in said shell and moved back and forth by the latter, and a cam carried by the shaft to come in and out of contact with the cam or pin on said mallet-splice, substantially as set forth.

2. In a dental plugger, the combination of a spring-controlled tool-plunger, a mallet for the plunger provided with a recess, a bell-crank lever fulcrumed to the casing or body portion of the plugger

and arranged to engage said recess, a spring arranged to exert its pressure against the mallet, a shell loosely spliced to said mallet, a spring arranged to exert its pressure against the shell, a cam or pin arranged on one of the mallet-splices, a jointed drive-shaft stepped in said shell and moved back and forth by the latter, and a cam carried by the shaft to be brought in and out of contact with the cam or pin on said mallet-splice by a movement of the bell-crank lever, substantially as set forth.

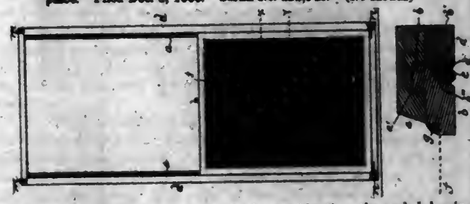
3. In a dental plugger, the combination of a spring-controlled tool-plunger, a mallet for the plunger provided with a recess, a bell-crank lever fulcrumed to the casing or body portion of the plugger and arranged to engage said recess, a sliding plate provided with a rest for the bell-crank lever, a spring arranged to exert its pressure against the mallet, a shell loosely spliced to said mallet, a spring arranged to exert its pressure against the shell, a cam or pin arranged on one of the mallet-splices, a jointed drive-shaft stepped in said shell and moved back and forth by the latter, and a cam carried by the shaft to be brought in and out of contact with the cam or pin on said mallet-splice by a movement of the bell-crank lever, substantially as set forth.

4. In a dental plugger, the combination of a spring-controlled tool-plunger, a tip for the latter, a series of notches, and a pin or lug arranged with relation to the plunger and its tip, whereby the tool carried by said plunger may be set at different angles, and means, substantially as described, for actuating the plunger.

5. In a dental plugger, the combination of a spring-controlled tool-plunger provided with a transverse pin or lug, the plunger-tip provided at its free end with a series of diametrically-opposed notches for engagement with said pin or lug, whereby the tool carried by said plunger may be set at different angles, and means, substantially as described, for actuating the plunger.

6. In a dental plugger, the combination of a tool-plunger, a mallet for actuating the plunger, a drive-shaft, and cams arranged with relation to the mallet and shaft, whereby the revolution of the latter causes an impact of said mallet against said plunger, a bell-crank lever for engagement with the mallet, and a spring in opposition to the lever, substantially as set forth.

402,295. ADJUSTABLE WINDOW SCREEN AND FRAME. CHAS. H. BARRETT, Decatur, Ill., assignor of one-half to Otto R. Curtis, same place. Filed Dec. 3, 1888. Serial No. 292,549. (No model.)



Claim.—1. In window-screens, in combination, the sash *b*, having the rabbet-ledges *b'* and the beveled edges *b''*, the side strips, *a*, having rabbet-grooves *a'*, adapted to the ledges of the sash, and stops *d*, having beveled edges *d'*, adapted to the beveled edges of the sash, as set forth.

2. In window-screens, in combination, the sash *b*, having the rabbet-ledges *b'* and the beveled edges *b''*, the side strips, *a*, having rabbet-grooves *a'*, adapted to the ledges of the sash, stops *d*, having beveled edges *d'*, adapted to the beveled edges of the sash, and a spring or springs, *e*, between the sash and stop, as set forth.

402,296. EXPECTORANT. JEREMIAH W. BRADLEY, Marshall, N. C. Filed Feb. 13, 1889. Serial No. 299,751. (No specimens.)

Claim.—The herein-described composition of matter to be used in lung diseases, consisting of water, life-everlasting, (*Gnaphalium margaritaceum,*) ground-ivy, (*Glechoma hederacea,*) sal-soda, paregoric, sirup of squills, cinnamon, and sugar, in the proportions specified.

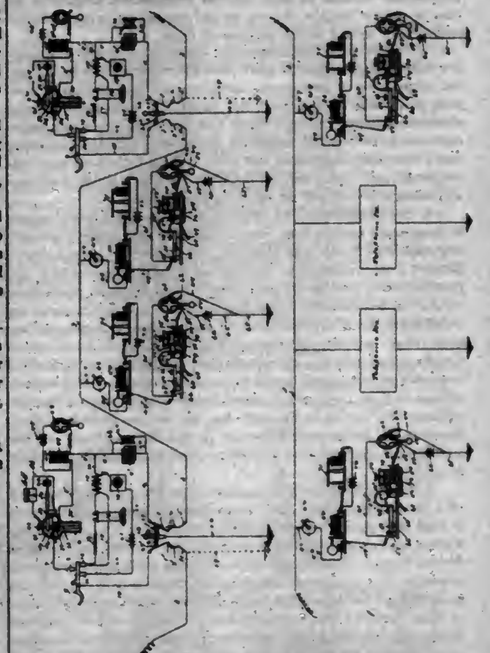
402,297. BOTTLE-STOPPER COVER. THOMAS C. BOOTING, East Mauch Chunk, Pa. Filed Oct. 3, 1888. Serial No. 287,130. (No model.)



Claim.—1. In a bottle-stopper cover, an inwardly-flanged closed tube removably attached by turn-buttons to an annular collar, the collar having a tapering opening inclosing the neck of the stopper and fixed thereto by bolts or pins which pass through the said collar and press down upon the neck of the stopper, substantially as described, for purpose set forth.

2. In a stopper-cover, an extensible case composed of the two closed tubes M and N, removably attached by the flanged edge L L to an annular collar having the tapering opening V, the turn-buttons F F, and the pins E E, substantially as and for the purpose herein shown.

402,298. COMBINED TELEPHONE AND TELEGRAPH SYSTEM. WILLIAM BURNLEY, North East, assignor of two-thirds to Charles A. Hitchcock and Samuel A. Davenport, Erie, Pa. Filed Jan. 30, 1888. Serial No. 262,436. (No model.)



Claim.—1. In a combined telegraphic and telephonic system, the combination of undulatory-current telegraphic transmitting-instruments adapted to operate and maintain a continuous current over a main line, and telegraphic receiving-instruments on said line, with telephonic transmitting and receiving instruments operating over said main line, and condensers between said telephonic instruments and said main line, substantially as and for the purpose set forth.

2. In a combined telegraphic and telephonic system, the combination of undulatory-current telegraphic transmitting apparatus, telegraphic relay, sounder, and battery apparatus with telephonic receiving, transmitting, and signaling apparatus, all operating on the same main line, and a condenser through which the telephonic current passes from the main line to the telephonic instruments, whereby both telegraphic and telephonic currents simultaneously pass over the main line to and from the telephonic and telegraphic instruments without interference with each other, substantially as and for the purpose set forth.

3. In a combined telegraphic and telephonic system, the combination, on a main line, of terminal stations having telephonic transmitting, receiving, and signaling instruments operating over said line, and condensers between said instruments and the main line, with intermediate telegraphic stations on said line having undulatory-current telegraphic transmitting-instruments through which a continuous current may be maintained over the main line, and telegraphic receiving-instruments on said line at said intermediate stations, substantially as and for the purpose set forth.

4. In a combined telegraphic and telephonic system, the combination, on a main line, of terminal stations having undulatory-current telegraphic transmitting-instruments through which the currents over the main line can continuously pass, and telegraphic receiving-instruments on said line at said stations, with intermediate telephone-stations having telephonic transmitting, receiving, and signaling instruments operating on said line, and condensers between said instruments and said main line, substantially as and for the purpose set forth.

5. In a combined telegraph and telephone system, the combination, on a single main line, of terminal telephone-stations having condensers between them and the main line, and intermediate telegraph-stations having undulatory telegraphic transmitting mechanism, with condensers located in the main line at some of the telegraph-stations, said telegraph-stations being located in derived lines shunted to and from the main line around said condensers, and rheostats between the relays and main line at each telegraph-station, substantially as and for the purpose set forth.

6. The combination, in a single main-line system, of a closed telegraphic circuit having undulatory-current telegraphic-transmitting mechanism, and ordinary relays, and receiving mechanism operating thereon, with telephonic mechanism and condensers at terminal and intermediate stations on said line, and intermediate telegraphic stations located in circuits shunted around condensers in the main line, substantially as and for the purpose set forth.

7. In a combined telegraphic and telephonic system having main-line wires bundled together into a cable and insulated from each other, the combination of undulatory-current transmitting-instruments operating over some of said wires and adapted to maintain continuous electrical currents over such wires, and telegraphic receiving-instruments on said wires, with telephonic transmitting and receiving instruments operating on other of said wires, and condensers between said telephonic instruments and the main-line wires over which they operate, substantially as and for the purpose set forth.

8. The combination, in a single main-line electrical-circuit system, of telegraphic stations each having undulatory telegraphic transmitting apparatus, relays, and sounders, and located in derived circuits shunted from the main line, and having rheostats therein, with telephonic stations each having a condenser, an induction-coil, a telephone transmitter and receiver, a local-battery circuit, a rapid-discharge signaling apparatus, a switch for putting the telephone induction-coil and local battery into and out of circuit and for putting the extra-current signaling apparatus into circuit when the telephone is not in use, and located in and connected to said circuit each way by means of contact-springs having a grounded switch between said contact-springs, whereby the current on the main line may be grounded from either direction and two classes of messages be simultaneously sent over the main line or circuit without interference with each other, substantially as set forth.

9. The combination, in a single main-line electrical-circuit system, of a closed telegraphic-circuit apparatus having one derived branch at each joint-station containing undulatory-current telegraphic transmitting apparatus, keys, relays, sounders, and rheostats, with another derived branch at each joint-station containing telephonic apparatus consisting of a condenser, induction-coil, telephonic transmitter and receiver, local-battery circuit, rapid-discharge signaling apparatus, and switches, whereby telephonic currents will pass through the condensers and through the undulatory-current telegraphic transmitting apparatus when the undulatory-current telegraphic transmitting apparatus is normally open or when the current is at its lowest potential, substantially as and for the purpose set forth.

10. The combination, in a single main-line electrical-circuit system, of a closed-circuit telegraphic apparatus consisting of undulatory-current telegraphic transmitters and keys, relays, sounders, and rheostats, with an extra or secondary current vibrator controlling a signaling apparatus in a local-battery circuit arranged in a branch circuit, shunting the telegraphic branch circuit, and containing a condenser, telephonic apparatus, and grounding-switches, substantially as and for the purpose set forth.

11. In a combined telegraphic and telephonic system, the combination of undulatory-current telegraphic transmitting-instruments through which electrical currents over the main line can continuously pass, telegraphic receiving-instruments on said line, telephonic transmitting and receiving instruments operating over said main line, and condensers between said telephonic instruments on said main line, with extra or induced current vibrators adapted to operate telephonic signaling apparatus, substantially as and for the purpose set forth.

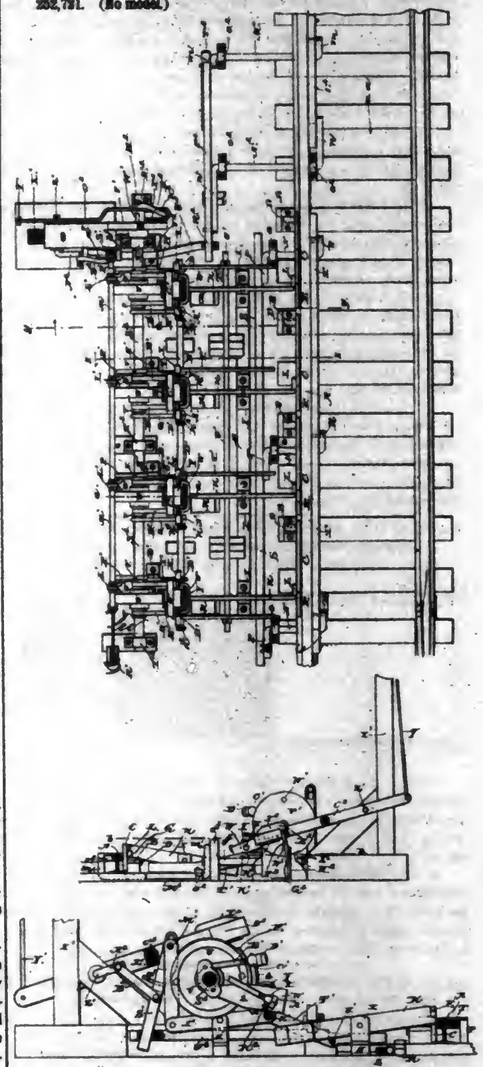
12. In a combined telephonic and telegraphic system, the combination, on the same main line, of telephonic signaling, transmitting, and receiving mechanism with telegraphic receiving mechanism and combined undulatory-current telegraphic transmitting and Morse-key telegraphic transmitting mechanism, substantially as and for the purpose set forth.

13. The combination, in the telegraphic transmitting-instruments of a combined telegraphic and telephonic system operating on the same line, of undulatory-current telegraphic transmitters with make-and-break transmitting-keys, substantially as and for the purpose set forth.

14. The combination, in a telegraphic transmitter for combined telephonic and telegraphic systems operating on the same main line, of an undulatory-current transmitting key-lever operating to immerse a metal electrode in electrical connection therewith into and withdraw the same from a conducting-liquid in circuit, and also to simultaneously immerse a non-conducting medium connected with said electrode into and partially withdrawing the same from said liquid, with a make-and-break key-lever, so that the two key-levers can be simultaneously operated by means of the finger-knob of the make-and-break key, substantially as and for the purpose set forth.

402,299. SETTING APPARATUS FOR SIGNALS AND GATES.

TOWNSEND W. BURZ, Minoola, N. Y. Filed Oct. 16, 1887. Serial No. 252,731. (No model.)



Claim.—1. The combination of the revoluble operating-shaft having the wheels and the levers adapted to be operated in succession by a passing train, and each provided with a gripping device to engage the wheels of the shaft, for the purpose set forth, substantially as described.

2. The combination of the revoluble operating-shaft and the series of successively-operated independent levers provided with gripping devices to engage the shaft and rotate the same by a step-by-step motion, substantially as described.

3. The combination of the revoluble shaft having the wheel, the yoke having the gripping devices adapted to engage the wheel, and the lever to operate the yoke, substantially as described.

4. The combination of the revoluble shaft having the wheel, the yoke having the gripping devices adapted to engage the wheel, the lever K, to operate the yoke, and the lever C, connected to the lever K, substantially as described.

5. The combination of the revoluble shaft having the wheel, the gripping-shoe, and the eccentrically-pivoted yoke having the eccentric bearing against the shoe, substantially as described.

6. The combination of the revoluble shaft having the wheel, the links journaled on the shaft, and the yoke connected to the links and having the gripping devices to engage the wheel, substantially as described.

7. The combination of the revoluble shaft having the wheel, the links journaled on the shaft, the shoe arranged on the wheel, the rods connecting said shoe to the upper ends of the links, the yoke connected to the lower ends of the links and having the eccentric bearing against the shoe, substantially as described.

8. The combination of the revoluble shaft having the wheel, the links journaled on the shaft, the shoe-connections between the upper ends of the links, the yoke connected to the lower ends of the links, the eccentric journaled to the yoke and bearing against the shoe, and the hanger supporting the said eccentric, substantially as described.

9. The combination of the revoluble shaft having the wheel, the shoe, the yoke pivotally connected to the shaft at a point beyond the center of the latter, the eccentric journaled to the yoke, and the spring to keep the eccentric normally engaged with the shoe, substantially as described.

10. The combination of the revoluble shaft having the wheels, the gripping devices to engage the wheels, the levers to operate the gripping devices and thereby rotate the shaft, the detents to limit the rotation of the shaft, and the bar L^2, and connections between the same and the detents, substantially as described.

11. The combination of the rotating operating-shaft having the wheels, the detents to limit the rotation thereof, and the operating-bar L^2 and connections between the same and the detents, substantially as described.

12. The combination of the rotating operating-shaft having the wheels, the detents to limit the rotation thereof, the lever S', connected to said detents and adapted to trip the same, the lever U^3, adapted to engage the lever S', the operating-bar L^2, and connections between the said bar and the lever U^3, substantially as described.

13. The combination of the rock-shafts M^3 and N^3, having the oppositely-inclined crank-arms at their ends, the operating-bar L^2, having its ends supported by the cranks at one end of the said rock-shafts, and the link-bar P^3, supported by the crank-arms at the opposite ends of the rock-shafts, substantially as described.

14. The combination of the operating mechanism adapted to be actuated by a passing train, the detents to limit the movements of the operating mechanism, and the operating-bar L^2 and connections between the same and the detents to trip the latter, substantially as described.

15. The combination of the shaft having the wheels provided with the stop-pins, the yokes having the gripping devices to engage the wheels and rotate the shaft, the levers to raise the yokes, the movable detents to engage the stop-pins, and thereby limit the rotation of the shaft, and the levers I', connected to the detents and engaging the free ends of the yokes when the latter are raised, substantially as described.

16. The combination of the pressure-bar, the weight-bar, connections between the said pressure and weight bars, whereby they are moved vertically in opposite directions simultaneously, the operating-levers, the weighted levers K, connected thereto, and connections between the weight-bar and the weighted levers to cause the latter to depress the operating-levers when the pressure-bar is lowered, substantially as described.

17. The combination of the pressure-bar, the operating-levers C, the weighted levers K, connected thereto, the link-levers T, adapted to engage the levers K, and connections between the said link-levers and the pressure-bar to elevate the former when the latter is depressed, substantially as described.

18. The combination of the gripping devices, for the purpose set forth, the operating-levers C, the levers K, connected to the operating-levers and adapted to operate the gripping devices, the said levers K being weighted, substantially as described.

19. The combination of the rotating shaft having the wheels provided with the stop-pins, the operating devices for the said shaft, the levers C, the levers K, connected to the same and operating devices, the pressure-bar, the detents to engage the stop-pins and thereby limit the rotation of the shaft, the link-levers T, adapted to engage the levers K, and connections between the said link-levers and the detents and pressure-bar, substantially as described.

20. The combination of the rotating wheel V^7, having the tappet-pins W^7, the lever O^3, adapted to be operated by said pins, the catch, and the locking-lever pivoted to the lever O^3, and having the locking-arm to engage the catch, and the trip-arm adapted to be operated by the tappet-pins to disengage the locking-lever from the catch, substantially as described.

21. The combination of the operating-shaft having the wheels, the detaining devices to limit the movement of the shaft, the rock-shaft Z', the lever O^3, connections between the same and the shaft, the lever U^3, the lever S', connected to the detaining devices, connections between the same and the lever O^3 to throw the lever S' in and out of connection with the lever U^3, the rock-shafts M^3 and N^3, having the crank-arms at opposite ends, the bar L^2, connected to the crank-arms at one end of the rock-shafts, and the link-bar P^3, connected to the crank-arms at the other end of the rock-shafts, and having the notch R^3 to engage the lever U^3, substantially as described.

22. The combination of the lever U^3, the rock-shaft N^3, having the crank-arms n and n', the link-bar supported by the arms m' and n', and having one end adapted to engage and disengage the lever U^3, and the bar L^2, supported by the arms m and n, substantially as described.

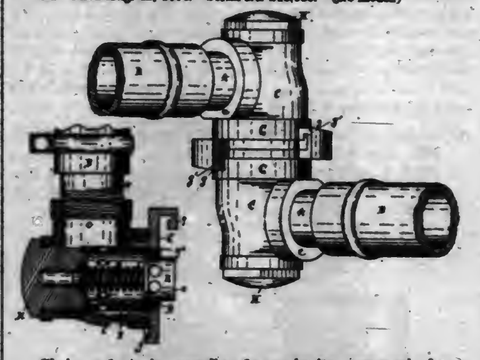
23. In a setting apparatus, the revoluble shaft having the wheels, the gripping device to engage the wheel and turn the same, and the lever to be operated by the passing train to work the gripping device, substantially as described.

24. In a setting apparatus, the combination of the lever O^3, to be connected to the gate or signal, the revoluble shaft having the wheel or wheels, the gripping device or devices to engage the wheel or wheels, the lever or levers connected to the gripping device or devices to be operated by a passing train, and connections between the revoluble shaft and the lever O^3, which connections are adapted to become disconnected from the lever at a certain point of the revolution of the shaft, for the purpose set forth.

25. In a setting apparatus, the combination of the revoluble shaft, the gripping device or devices to engage the shaft, the lever or levers to operate the gripping device or devices, said lever or levers being operated by the wheels of a passing train, the detents to limit the rotation of the shaft, said detents being withdrawn from out of engagement by the wheels of a passing train.

402,800. BRAKE-PIPE COUPLING.

GEORGE P. CAMPBELL, Cincinnati, Ohio, assignor to the Friction Car Brake Company, East St. Louis, Ill. Filed Aug. 12, 1886. Serial No. 210,068. (No model.)



Claim.—1. A pipe-coupling for car-brakes, composed of two similar sections, each section consisting of case C, coupling-piece G, secured in the open end of said case and having oppositely-inclined locking members g g' upon its opposite faces, the perforated tube F, and packing-ring D, held between the coupling-piece and said tube, and the spring-actuated valve E, having its reduced part projecting through the packing-ring, the whole combined and arranged substantially as specified.

2. In a pipe-coupling consisting of two equal parts, the combination, substantially as specified, of the valve-case C, locking-piece G, having hooks g and flanges g', inclining in opposite directions, the spring-actuated valves E, and the perforated tube F, with the branches A in the opposite couplings so arranged that the couplings will separate when they are brought into the same horizontal plane and to be locked when they are at an angle to each other.

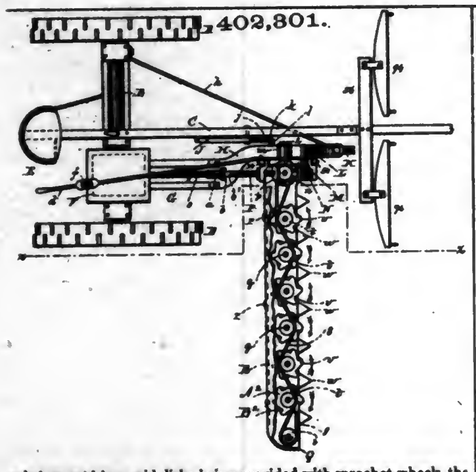
402,801. MOWING-MACHINE.

AMOS H. CARPENTER, Waterford Vt. Filed Mar. 22, 1888. Serial No. 268,061. (No model.)

Claim.—1. In a mowing-machine, the disk A^3, provided peripherally with the radially-arranged cutters or knives v, and having the sprocket-wheel t secured to its upper side, in combination with the disk B^3, provided peripherally with the radially-arranged cutters or knives x, and having the sprocket-wheel 4 secured to its lower side, said disks concentrically journaled one above the other on the cutter-supporting bar of the machine, and a single endless chain engaging all the upper and lower sprocket-wheels and turning each vertical pair of said disks in opposite directions, substantially as set forth.

2. In a mowing-machine, the cutter-supporting bar Q, provided with the fingers w, the disks A^3 and B^3, arranged in pairs and jour-

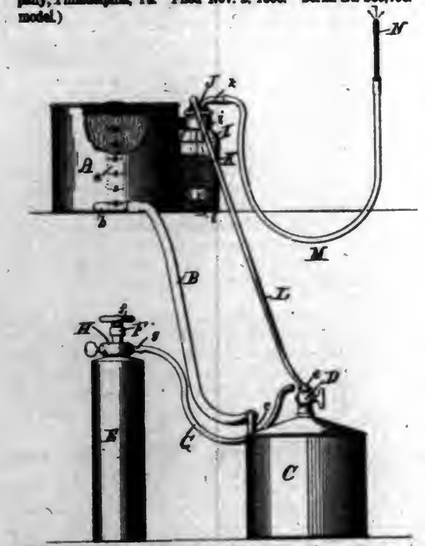
402,301.



naled on said bar, said disks being provided with sprocket-wheels, the guide sprocket-wheel *i*, journaled at the outer end of said bar, the sprocket-wheel 3, journaled at the inner end of said bar, the endless chain *g*, the two plies of the chain engaging each sprocket-wheel of a pair on the same side, and those of different pairs on opposite sides alternately, and means for actuating the sprocket-wheel, all being combined to operate substantially as set forth.

3. In a mowing-machine, the combination of the cutter-supporting bar Q, the sprocket-wheels *i* 3, journaled at the opposite ends of said bar, the cutting-disks A^2 B^2, provided, respectively, with the sprocket-wheels *t* 4 and journaled in pairs on said bar, the endless chain belt *g*, the two plies of the chain engaging each sprocket-wheel of a pair on the same side and those of different pairs on opposite sides alternately, the beveled gear *n*, connected with the sprocket-wheel 3, the beveled gear *p*, intermeshing with the gear *n* and mounted on the shaft P, journaled on said bar, the shaft O, jointed to the shaft P, and means for actuating said shafts, substantially as set forth.

402,302. APPARATUS FOR ADMINISTERING ENEMA OF OXYGEN. JOHN R. CASEY, Tottenville, and ARTHUR W. BROWNE, Prince's Bay, N. Y., assignors to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed Nov. 2, 1888. Serial No. 289,788. (No model.)

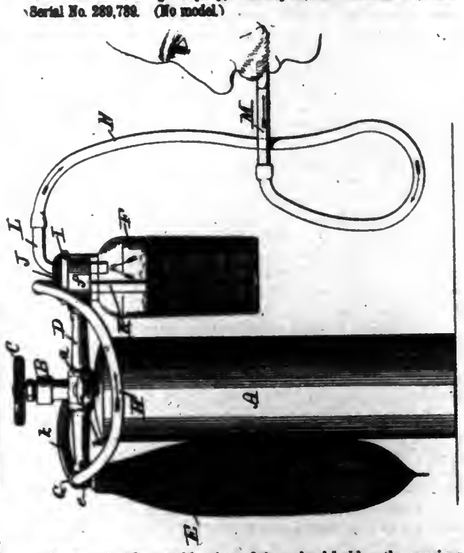


Claim.—1. The combination of the water-reservoir, the receiver provided with the valve at one end and having communicating connection near its opposite end with the reservoir near its bottom, the holder, its valve, and the communicating connection between the holder and receiver by way of their valves, substantially as and for the purpose set forth.

2. The combination of the water-reservoir, the receiver provided with the valve at one end and having communicating connection near its opposite end with the reservoir near its bottom, and the water-trap vessel with which the receiver has communicating connection by way of its valve, substantially as and for the purpose set forth.

3. The combination of the water-reservoir, the gage, the receiver provided with the valve at one end and having communicating connection near its opposite end with the reservoir near its bottom, the water-trap vessel with which the receiver has communicating connection by way of its valve, and the delivery-tube having communicating connection with the water-trap vessel and provided with the syringe-point, substantially as and for the purpose set forth.

402,303. OXYGEN-INHALER. JOHN R. CASEY, Tottenville, and ARTHUR W. BROWNE, Prince's Bay, N. Y., assignors to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed Nov. 2, 1888. Serial No. 289,789. (No model.)



Claim.—1. The combination of the valved holder, the receiver having communicating connection with the holder, and the water-trap vessel supported by connection with the holder and with which the receiver has communicating connection, substantially as set forth.

2. The combination of the valved holder, the carrier supported thereby, the receiver supported by the carrier and having communicating connection with the holder, and the water-trap vessel supported by the carrier and having communicating connection with the receiver, substantially as set forth.

3. The combination of the valved holder, the receiver having communicating connection with the holder, the water-trap vessel with which the receiver has communicating connection, and the delivery-tube having communicating connection with the water-trap vessel and provided with the mouth-piece, substantially as set forth.

402,304. BICYCLE-STEP. HORATIO P. CHAPIN, Chicopee, Mass. Filed Aug. 31, 1888. Serial No. 284,363. (No model.)



Claim.—1. A bicycle-step formed of metal bent centrally, and having the outer ends of the step portion curved inwardly and interlocked by means of the tongue *c* and the recess *d*, substantially as specified.

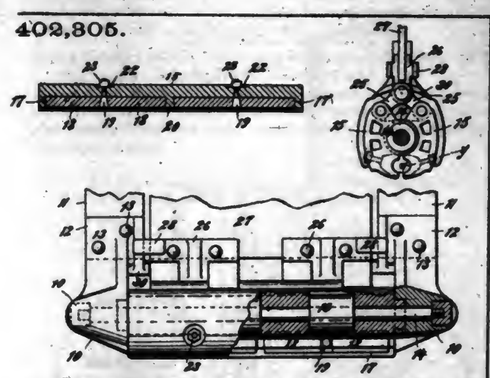
2. The bicycle-step formed from a single strip of sheet metal bent centrally, having the parallel portions interlocked at the outer ends by a tongue and recess, and having the upper edges provided with teeth and rounded inwardly, in combination with the clamping-bolt and nut, substantially as specified.

402,305. CABLE-GRIP. CHARLES S. CHAPMAN, Kansas City, Mo. Filed Dec. 20, 1888. Serial No. 294,174. (No model.)

Claim.—1. In a cable-grip, the combination, with jaws formed with undercut recesses, of shoes or dies fitting within said recesses, and bolts formed with wedge-shaped heads which bear against the shoe ends, substantially as described.

2. In a grip, the combination, with the grip-heads, of jaws supported thereby, and hoods carried by the grip-heads and extending over the jaw ends, substantially as described.

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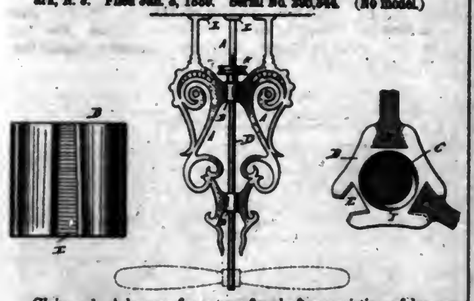


3. In a cable-grip, the combination, with grip-heads, of jaws pivoted in the heads, the body-sheet provided with a casting having side lugs or ears, and toggle-levers pivoted to the jaws and to the said casting, substantially as herein shown and described.

4. A cable-grip provided with a central movable jaw, two side jaws, and toggles by which the side jaws are connected, substantially as described.

5 In a cable-grip, the combination, with the grip-heads formed with recesses 54, of a central jaw, 52, formed with projections 53, which fit within the recesses 54, side jaws, 15, and toggles by which the side jaws are connected, substantially as described.

402,306. HANGER FOR ROTARY FAN-SHAFTS. ROBERT B. CRANE, Elizabeth, assignor to the Backus Water Motor Company, Newark, N. J. Filed Jan. 3, 1889. Serial No. 295,944. (No model.)



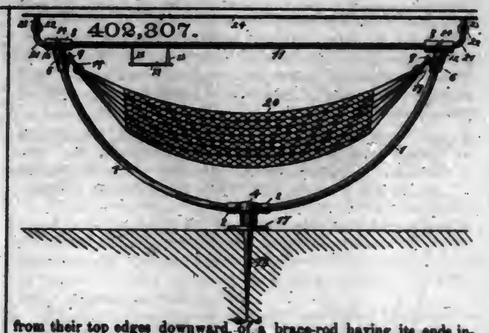
Claim.—1. A hanger for rotary fan-shafts, consisting of hanger-sections having lugs and coupling-blocks provided with grooves for receiving said lugs and a central bore for the fan-shaft, which blocks are supported by said hanger-sections, substantially as set forth.

2. In a hanger for rotary fan-shafts, the combination, with the hanger-sections having tapering dovetailed lugs, of coupling-blocks having a central bore for the fan-shaft, and a tapering dovetailed socket for the lugs of the hanger-sections, which coupling-blocks are supported by the hanger-sections, substantially as set forth.

3. In a hanger for rotary fan-shafts, the combination, with hanger-sections having lugs, of coupling-blocks having grooves for receiving said lugs and bores for the fan-shaft, a washer resting on one of said coupling-blocks, and a pulley secured on the fan-shaft and resting on said washer, substantially as set forth.

4. In a hanger for rotary fan-shafts, the combination, with the hanger-frames, of Babbitt-metal coupling-blocks supported by and uniting said hanger-frames, which coupling-blocks have each a longitudinal bore, forming a bearing and guide for a rotary shaft, substantially as set forth.

402,307. HAMMOCK-SUPPORT. HORATIO E. COLLINS, Detroit, Mich. Filed July 16, 1888. Serial No. 280,086. (No model.)



Claim.—1. The combination, with the curved frame having a central vertical socket on its lower side and hammock-attaching devices at its upper ends, of the spike 18, having a supporting-plate, 17, and a pivot-pin, 16, entering said socket, substantially as set forth.

2. The combination, with the casting 4, having opposite side projections, 3, and a vertical intermediate socket, 5, of the curved arms 1 1, having sockets at their lower ends receiving said projections, hammock-attaching devices at their upper ends, a brace-rod connecting said upper ends, and a pivot entering said socket, substantially as set forth.

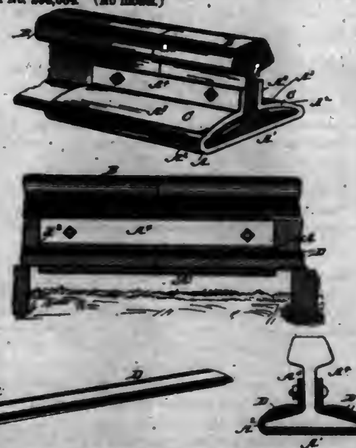
3. The combination, with the hammock-frame having socket-pieces on its ends open on their upper sides and having slots extending from their top edges downward, of a brace-rod having its ends inserted into the socket-pieces from above and provided with side projections entering said slots at the same time.

4. The combination, with the hammock having sleeves on its upper ends, provided with hammock-supporting hooks on their adjacent sides, and horizontal socket-pieces open on their upper sides and having transverse slots through their sides, of the brace-rod inserted at its ends into said sockets from above, and having transverse projections entering said slots at the same time, substantially as set forth.

5. The combination, with the hammock-frame, of the sleeves 6 on the upper ends of said frame, formed with horizontally-aligned socket-pieces 8 on the upper ends, having transverse slots 14, the tubular brace-rod 11, resting at its ends in said socket-pieces and provided with transverse projections 12, resting on said slots, the brackets 21, having upwardly-projecting ends entering the opposite ends of the tubular brace-rod within the socket-pieces, and the canopy-frame secured to said brackets, substantially as set forth.

6. The combination, with the canopy-frame and the transverse curved rods 23 at the ends thereof, of the angular supporting-brackets 21, having transverse sleeves 22 on the upper ends of their vertical members, through which the said rods pass, the horizontal members or arms of the brackets forming their attaching means, substantially as set forth.

402,308. RAIL-JOINT. EDWIN M. COOKE, Brooklyn, assignor of one-half to Noyes G. Worcester, New York, N. Y. Filed Feb. 4, 1889. Serial No. 298,694. (No model.)



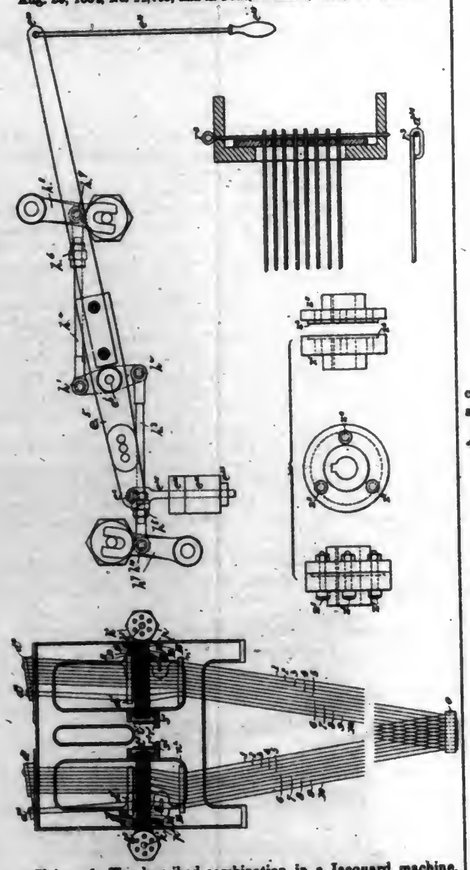
Claim.—1. In a rail-joint, the combination, with the rails and the jacket embracing the same, ways or recesses being provided between the upper side of the base of the rail and the jacket, of the wedges fitting said ways or recesses and formed of sections *d d'*, having each a straight and an inclined face, the section *d* being inserted in the way and the section *d'* being driven up on such section *d* and secured, substantially as set forth.

2. The improved rail-joint consisting of the jacket having a base-plate and provided with goffers or corrugations A^3, having their under sides or faces formed on horizontal lines, whereby in operation such surfaces will be on lines parallel with the tops of the rail-base, and the wedge formed in sections and adapted to bear between said goffers and the rail-base, substantially as set forth.

3. The improvement in rail-joints, substantially as herein described, consisting of the rails, the jacket A, fitted thereto and formed with goffers or corrugations A^3, having their under sides formed in

lines parallel with the tops of the rails, and the wedges formed in sections d d, the sections d being inserted in the ways between the goffers A^3 and the rail-base, and the sections d' being driven up on the sections d until the points pass the bases of sections d, and bent at d^3 down against the bases of sections d, all substantially as and for the purposes specified.

402,309. JACQUARD MECHANISM FOR LOOMS. EDWARD CROSSLEY and HENRY N. MELLOR, Halifax, County of York, England. Filed June 16, 1885. Serial No. 168,882. (No model.) Patented in England Aug. 29, 1884, No. 11,763, and in France June 6, 1885, No. 169,391.

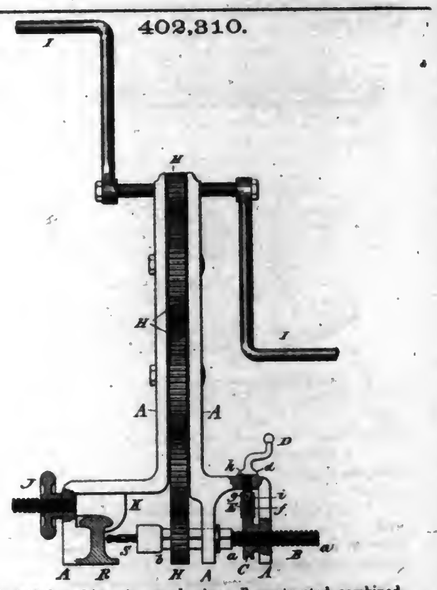


Claim.—1. The described combination, in a Jacquard machine, of two card-cylinders placed front and back of each other, as set forth, the harness-cords and their lifting devices, and two sets of selecting-needles, with lever c^3, slotted rod c^5, and cranked lever b^7, rods h^2 h^4, studs h' h^3, regulating-swivels h^2 h^3, shafts h^{11} h^{12}, levers h^7 h^9, and their arms f' f^3, the combination serving to cause cards carried by the cylinders to act simultaneously on their respective sets of selecting-needles and to form the shed or lift of the warp, substantially as hereinbefore set forth.

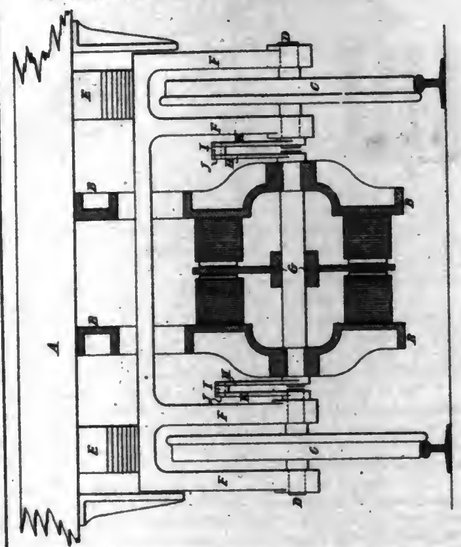
2. The combination, with the cam-shaft of a loom, and with its cam and the intermediate devices—namely, lever a^2, rod a, lever a^3, bell-crank lever a^4, rod b', bell-crank b^7, and rod c^2—of different sets of selecting-needles placed one set behind the other from the front part of the loom, card-cylinders placed, respectively, one at the front and one at the back of the loom, and devices, substantially as described, consisting of the lever c^3, rods h^2 h^4, studs h' h^3, regulating-swivels h^2 h^3, shafts h^{11} h^{12}, levers h^7 h^9, and their arms f' f^3, whereby the cards carried by the respective cylinders shall be caused to act simultaneously on their respective sets of selecting-needles, substantially as and for the purpose set forth.

402,310. MACHINE FOR DRILLING RAILS FOR FISH-BOLTS. JOHN DAVIS, New Bedford, Mass. Filed June 30, 1888. Serial No. 278,714. (No model.)

Claim.—Frame A A A A A, drill-shaft B, friction-wheel C, crank-shaft D, thimble E, gear-wheels H H H H H, cranks I I, nut-wheel J, clamp K, drill S, and its other mechanism, all constructed, combined, and operated as and for the purposes set forth and described.



402,311. ELECTRO LOCOMOTIVE-ENGINE. SEBASTIAN ZIANI DE FERRANTI, Hampstead, County of Middlesex, England. Filed Sept. 24, 1888. Serial No. 286,204. (No model.) Patented in England Sept. 13, 1887, No. 12,419.



Claim.—1. The combination, with the frame and driving-wheels of an electric locomotive-engine, of a dynamo-electric machine placed between the driving-wheels of the locomotive, with its armature concentric with the axle or axles of the wheels, and flexing couplings between the axle and armature which allow the frame of the locomotive and the dynamo which it carries to play up and down freely.

2. In an electric locomotive, the combination, substantially as set forth, with the wheels and axle or axles, of a dynamo-electric machine having its armature arranged concentrically with the axle or axles and flexing couplings by which the armature drives the latter, whereby the armature may independently vibrate or play up and down.

3. In an electric locomotive, the combination, substantially as set forth, of the driving-wheels and axles, a dynamo-electric machine having a hollow armature through which the axle passes, and flexing couplings by which the armature drives the axle, whereby the armature may play independently of the axle.

402,312. BITTER TONIC. JOSEPH D. DELISLE, Lowell, Mass. Filed Mar. 5, 1889. Serial No. 302,007. (No specimens.)

Claim.—The above-described composition of matter to be used as a tonic medicine, consisting of citrate of iron and quinine, tincture of nux vomica, tincture of quassia, and white wine, in substantially the proportions specified.

402,313. VELOCIPEDE. CHARLES E. DURYEA, Washington, D. C. Filed June 13, 1888. Serial No. 277,015. (No model.)



Claim.—1. A bicycle in which the wheels are connected by a frame that passes to one side only of each wheel and that does not rise above a line passing through their axles.

2. A bicycle in which the wheels are connected by a frame that is single throughout its length, that is joined to one end only of each wheel-axle, and that does not rise above a line passing through the wheel-axles.

3. A bicycle having a frame of which that portion connecting the wheels does not rise above a line passing through the axles of the wheel and passes to one side only of the steering-wheel.

4. A bicycle having its steering centers located at one side of the steering-wheel.

5. A velocipede having its steering centers located at one side of the steering-wheel and inclined so that a line through the said centers would intercept the line of the wheel-bases.

6. A velocipede having its steering centers located at one side of the steering-wheel and inclined so that a line through the said centers would intercept the line of the wheel-bases at a point at or in front of the forward point of contact with the ground.

7. A bicycle having the frame that connects the wheels jointed between the wheels to swing vertically, each part being elastically connected with the saddle-support, whereby a vertical movement of either wheel out of its normal position may occur without affecting the saddle.

8. In a bicycle, an elastic frame so arranged that each wheel may swing vertically in an arc of a circle of which the center is at or near the crank-axle without affecting the saddle.

9. In a bicycle, a jointed elastic frame of which the joints are located at or near the crank-axle, the elasticity is supplied by adjustable springs, and which is elastically connected with the saddle-support, whereby either wheel may rise vertically without affecting the saddle.

10. In a bicycle of the class described, a frame connecting the wheels jointed at or near the crank-axle, and a saddle-support pivoted thereto, all being maintained in position by adjustable springs.

11. A bicycle of the class described, in which the frame connecting the wheels is jointed at or near the crank-axle to swing in a plane approximately vertical, whereby the parts may be brought into proximity for convenience in storing and shipping.

12. A bicycle of the class described, having the frame that connects the wheels jointed at or near the crank-axle to swing vertically and provided with a means to prevent accidental folding.

13. In a velocipede, a saddle-support pivoted to the supporting-frame at or near the crank-axle and supported in an upright position by springs.

14. In a velocipede, a support for handles and saddle pivoted at or near the crank-axle to swing in a vertical plane parallel to the plane of the wheels and supported in an upright position by springs.

15. In a velocipede, a support for handles and saddle pivoted at or near the crank-axle to swing in a vertical plane parallel to the plane of the wheels, and supported in an upright position by adjustable springs.

16. In a bicycle of the class described, a frame connecting the wheels jointed at or near the crank-axle and held in position by a spring which may be adjusted so as to hold the crank-axle at a greater or less distance from the ground, as desired.

17. A bicycle of the class described having a saddle-support pivoted to the frame that connects the wheels, and held upright by springs that have a means of adjustment, whereby it is possible to cause the saddle-support to lean forward or backward by adjusting one spring more than the other.

18. In a velocipede, a handle-bar removably attached to the top of the steering-post, so that it may be reversed either horizontally or vertically, as and for the purpose described.

19. A velocipede having the axis around which the handles move placed under the saddle and the bars so curved as to pass outward to the handles without interfering with the motion of the rider, and, further, having the bars so attached to the steering-post that they may be reversed, by which arrangement they may be caused to pass either before or behind the rider at will.

20. A velocipede wherein the saddle may have a lateral motion with respect to the wheels and pedals around the same center as the handles, and wherein the saddle is so connected with the steering-wheel that the said wheel is turned toward the side to which the saddle is moved.

21. A velocipede wherein the saddle may have a lateral motion with respect to the wheels and pedals around the same center as the handles, and wherein the saddle is so connected with the handles that motion of one causes the other to move around the same center in a reverse direction.

22. A bicycle of the class described having the saddle-support, forward part, and rear part separably joined together at or near the crank-axle, whereby either forward or rear part may be separated from the other two, for the purpose described.

23. In combination with the wheels of a rear-driving safety-bicycle, a frame which passes from the rear axle forward until beyond the periphery of the rear wheel, where it carries the crank-axle, thence forward till near the periphery of the front wheel, thence outward far enough to allow the front wheel to turn in steering, thence forward and inward to the steering center located near the front axle, to which the frame is connected by means of a neck.

24. The combination, with a front steering-wheel of a velocipede, a horizontal supporting-frame therefor, and a handle-bar axis approximately perpendicular thereto, of a crank or arm attached to the said axis perpendicular to the plane of the wheels, an arm similarly attached to that portion of the frame between the steering centers and the front axle, and a lever pivoted to the frame between the said arms and connected to their projecting ends by connecting-rods and universal joints, whereby motion of the handle-bar axis is transmitted to the said steering-wheel.

25. The combination, with a velocipede having a wheel centrally located behind the rider, of a brake applied to the tire thereof and operated from the vicinity of the handles by means of a lever attached to the handle-bar, and an arm attached to the brake and connected to the said lever by a connection which passes through the axis of the handle-bar.

402,314. ART OF ENGRAVING. WILLIAM S. RATOR, Sag Harbor, N. Y., assignor to the Fahys Watch Case Company, same place. Filed Dec. 26, 1888. Serial No. 294,846. (No model.)



Claim.—1. The within-described improvement in the art of machine-engraving, which consists in producing a series of engraved pattern-plates, each of which has a fragment only of the design upon it, but collectively compose the entire design, and which are successively used in transferring the design to the article to be engraved, as set forth.

2. The improvement described in the art of engraving, which consists in first engraving upon a series of pattern-plates different fragments of the entire design to be produced, including lines which cross each other, and subsequently transferring on any desired scale, by a tracing and engraving instrument, successively, from said plates to the article to be engraved, the different fragments of the design, substantially as specified.

402,315. RUBBER-DAM CLAMP. JOHN D. ERWIN, Norfolk, Va. Filed Sept. 20, 1888. Serial No. 286,243. (No model.)

Claim.—1. A rubber-dam holder consisting of a base-clamp hav-

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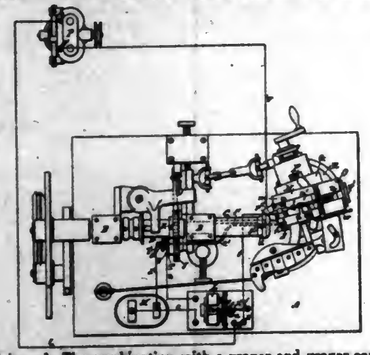


ing a front lip and a slotted angular rear fold provided with an edge approximating said base, a clamp-jaw having a V-form rear portion engaging said fold and a biting-lip to engage the lip of the base, and a removable pin in said fold, substantially as specified.

2. The combination, with the spring-base D, having an angular rear fold and front clamping-lip, of the longitudinally-adjustable clamp-jaw E, having a front lip, and a V-form rear portion consisting of a shoulder portion, *b*, and spring-tongue *c*, substantially as specified.

3. In a spring-jaw rubber-dam clamp, the slotted angular fold of the base, having a removable pin extending through said fold, substantially as specified.

402,816. ENGRAVING-MACHINE. CHARLES H. FIELD, Providence, R. I. Filed Nov. 9, 1888. Serial No. 290,404. (No model.)

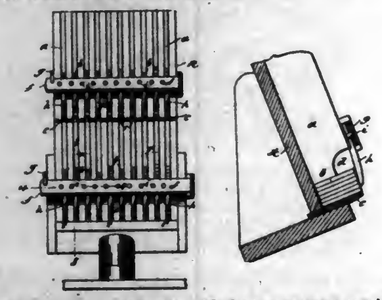


Claim.—1. The combination, with a graver and graver-carriage, of a main electric circuit and an electro-magnet adapted to operate the graver, a separate electric circuit, including a pattern-plate, tracing-point, and electro-magnet for closing or breaking the main electric circuit, and means for imparting traversing movement to the graver and tracing-point, substantially as and for the purpose specified.

2. The combination, with the graver and graver-carriage, of a main electric circuit and electro-magnet adapted to operate the graver, the separate electric circuit, including a pattern-plate, tracing-point, and electro-magnet for closing or breaking the main electric circuit, and the adjustable cam and multiplying lever for transmitting the traversing movement of the graver to the tracing-point, substantially as described.

3. The combination, with the graver and graver-carriage, of the electro-magnet hinged to the graver-carriage and adapted to draw the graver backward from the work, and also for convenient removal from its armature, substantially as and for the purpose specified.

402,817. TYPE-CASE. HENRY FREEMAN, Hartford, Conn., assignor to the Thorne Machine Company, same place. Filed Mar. 10, 1888. Serial No. 266,787. (No model.)

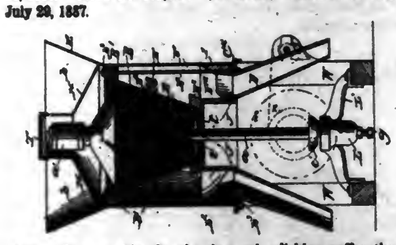


Claim.—1. The combination, with the type or space case having the channels *a*, of the adjustable fingers *h*, located in front of the channels, with their lower ends just above the lower type or space in the lines, substantially as described.

2. The combination, in a type or space case, of the type or space channels *a*, a plurality of fingers, *c*, arranged at different heights in the same channel to support the type or spaces, and a corresponding number of fingers, *h*, located above the fingers *c* and extending downward in front of the channel, with their lower ends a short distance above the fingers *c*, substantially as described.

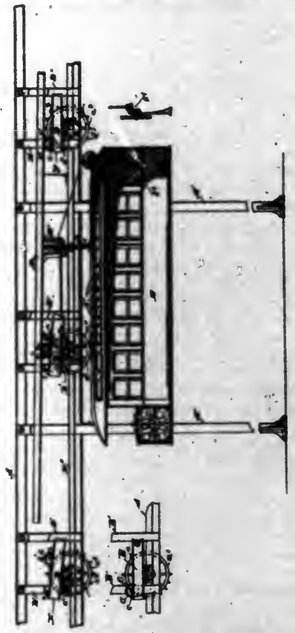
3. The combination, with the type or space case having the channels *a*, of the fingers *h* and the hinged bar *f*, supporting said fingers, substantially as described.

402,818. MACHINE FOR PEELING, POLISHING, AND CLEANING COFFEE. AUGUSTO GALLARDO, San José, Costa Rica. Filed Oct. 20, 1887. Serial No. 252,898. (No model.) Patented in Costa Rica July 29, 1887.



Claim.—In a machine for cleaning and polishing coffee, the combination, with a casing provided with a hopper at its upper end and with openings in its bottom, of a stationary inverted cone-frustum of wire-gauze, supported on the casing, a rotary inverted cone-frustum covered with wire-gauze, arranged within the stationary cone-frustum with a space between them, and provided with diagonal rods on its outside, and a spout leading from the space between the said inverted cone-frusta, substantially as herein shown and described.

402,819. ELEVATED RAILWAY. ALFONSO D. GATES, Cleveland, Ohio. Filed Jan. 16, 1889. Serial No. 296,514. (No model.)



Claim.—1. An elevated railway consisting of the supporting-pillars A', the main frame A, the girders B, provided with stops *c* and means for tilting said girders, the rollers C, and the platform D, substantially as shown.

2. In an elevated railway, the combination of the car-supporting platform D, the rollers C, the girders B, and means for tilting said girders, substantially as shown.

3. In an elevated railway, the platform D and the car E, suspended by and moving with said platform, in combination with girders adapted to be tilted within certain limits, and rollers C, adapted to move upon said girders within certain limits with the movement of the car, substantially as described, for the purpose stated.

4. In an elevated railway, the girders supported at intervals adapted for independent tilting movement within and on each side of the supporting structure, and provided on their upper surfaces with the fixed stops *c c*, near each end thereof, in combination with the rollers C, having their axis resting and rolling upon said girders between said stops, the platform D, supported upon said rollers, and the car suspended from said platform below said girders, substantially as described, for the purpose specified.

5. In an elevated railway, the platform D and the car E, suspended by and moving with said platform, in combination with girders B, supported at intervals and adapted for independent tilting movement within and on each side of the supporting structure, the rollers C, adapted to have a limited movement upon the said girders, and wheels a^3, supported by said structure and provided with means for engaging the car, substantially as described, for the purpose specified.

6. In an elevated railway, the combination of the platform D, the car E, suspended thereby and provided with projections *c'*, the girders B, mounted for independent tilting movement, the rollers C, adapted to have a rolling movement between stops on said girders, and the wheels a^3, having projections a^4 upon a portion of the circumference adapted to engage with the said car projections, in the manner and for the purpose stated.

7. In an elevated railway, a car-supporting platform propelled upon rollers C and means for returning said rollers, substantially as shown.

8. In an elevated railway, the platform and the car suspended thereby, and means, substantially as described, for supporting said platform, consisting of the girders B, adapted to have independent tilting movement, the rollers C, adapted to have limited movement upon said girders in carrying the car forward, and means for returning said rollers to their starting-point, consisting of the spring *b*, substantially as described, for the purpose stated.

9. In an elevated railway, the combination, with a car and a platform which supports and carries the same in suspended relation thereto, of girders B at intervals in the superstructure and adapted to have independent tilting movements within certain limits, and provided with rollers C, adapted to support said platform, to roll upon said girders, and to be returned by gravity upon said girders to the starting-point, substantially as described, for the purpose specified.

10. In an elevated railway, the combination, with a car, a platform carrying and moving with said car in suspended relation thereto, and the rollers C, for supporting said platform, of a brake attachment depending from said platform in proper relation to a fixed part of the superstructure, and means, substantially such as described, for operating said brake from the car, whereby the weight of the car and its carrying-platform are partially or fully relieved from their rolling supports and transferred to the bearing of the brake-shoes upon the superstructure, substantially as described, for the purpose specified.

11. The combination, in an elevated railway, of the platform D, the rollers C, supporting the latter, a car suspended from said platform, with a brake suspended from the latter, consisting of the knee-joint and brake-shoe, the fixed frame-stringer part E, and means, substantially as described, for connecting said knee-joint with operating devices of the car, substantially as described, for the purpose specified.

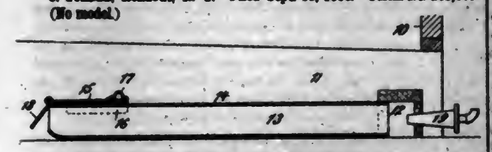
402,820. METHOD OF SECURING BLADES TO METAL HANDLES. HORACE GLIDDEN and WILLIAM W. HOLMES, Bridgeport, Conn. Filed Aug. 16, 1888. Serial No. 282,916. (No model.)



Claim.—1. The method of securing perforated blades to slotted shanks, the same consisting in forcing the metal of the shank inward through the perforations of the blade by pressure applied to the outside of the shank, substantially as specified.

2. The method of securing blades by their tangs within a metal handle, the same consisting in forming an elongated perforation in the end of the tang, then inserting the pierced end of the tang or tangs within the slotted shank, and finally forcing the metal of the shank inward through the perforations by pressure applied to the outside of the shank, substantially as set forth.

402,821. DRYING ATTACHMENT FOR BRICK-KILNS. PALMER J. GUERIN, Rondout, N. Y. Filed Sept. 18, 1888. Serial No. 285,075 (No model.)

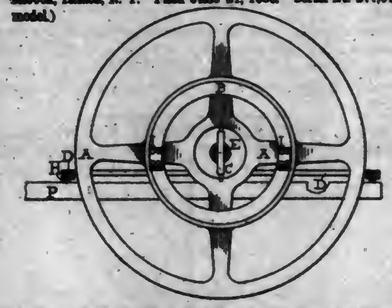


Claim.—1. The combination, with the arch of a brick-kiln and a burner introduced therein, of a heater located in said arch, having open ends and provided with a perforated top, and a damper capable of sliding over said top provided with a hinged gate, substantially as shown and described.

2. A portable heater for brick-kilns, consisting of a box having a perforated top and provided with an imperforate slide or damper fitted to slide upon its upper perforated surface, substantially as described.

3. The combination, with a heater provided with a series of graduated perforations and open at its ends, of a damper held to slide over the perforations and a gate hinged to said damper, substantially as shown and described.

402,822. DRIVING-GEAR FOR LOCOMOTIVES. ALFRED HASMOUK, Ithaca, N. Y. Filed June 21, 1888. Serial No. 277,944. (No model.)



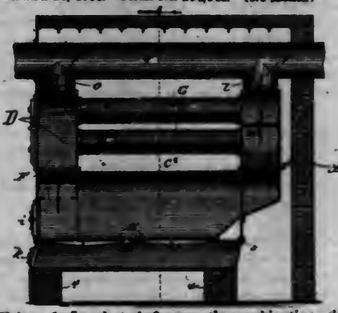
Claim.—1. The combination, in a locomotive, of the turn-plate D, the two annular bearings B, fixed thereon, and the draft-wheel A, journaled between and upon the said annular bearings, substantially as shown and described.

2. The combination of the frame P, the circular trucks H, fixed thereon, the turn-plate D, fitted to rotate on the said trucks, the annular bearings B, fixed to the said plate, and the draft-wheel A, journaled between and upon the said annular bearings, substantially as shown and described.

3. The combination of the shaft E, having a slot transversely through it, the wheel A, having a large central opening, and the pin C, having a square body, fitted through the said slot and journaled at its ends in the wheel at the sides of the said opening, substantially as shown and described.

4. The combination of the drive-shaft E, bored in at its end and slotted in its side to meet the bore, the rod M, fitting the said bore and provided with a side key, O, projecting through the said slot, gear-wheels of different sizes journaled upon the said shaft and slotted to register with the said key, and the intermediate shaft, N, having gear-wheels fixed upon it, adapted to gear permanently with the gear-wheels on the drive-shaft, substantially as shown and described.

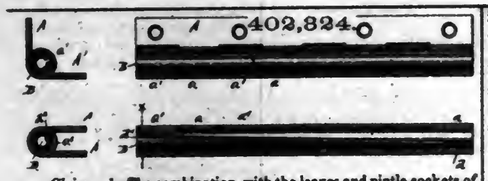
402,823. HOT-AIR FURNACE. HENRY G. HERBERT, Chicago, Ill. Filed Dec. 26, 1888. Serial No. 294,641. (No model.)



Claim.—1. In a hot-air furnace, the combination, with the casing A, fire-chamber, and ash-pit, of a radiator, D, comprising smoke-chambers F F', upper and lower flues G and flue *w*, dampers *o' p'* in the chamber F, an opening, *n*, damper *l*, and damper *m*, substantially as described, in the chamber F', substantially as and for the purpose set forth.

2. In a hot-air furnace, the combination, with the casing A and radiator, of an ash-pit, B, having a groove, *s*, in its upper edge, and a fire-chamber, C, comprising a wall portion, C', which rests in the groove *s* and is provided toward its upper edge with a flange, *r*, and a circular top portion, C^2, having a flange, *g*, riveted to the flange *r*, substantially as described.

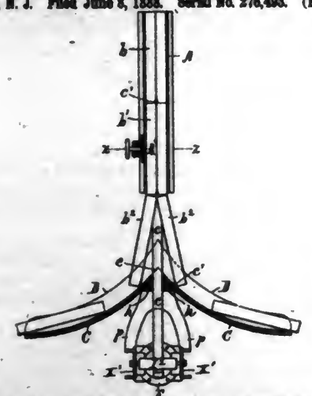
402,824. SPRING-HINGE. HENRY HERTEL, Brooklyn, N. Y., assignor to the William Lang Company, same place. Filed Jan. 4, 1888. Serial No. 295,414. (No model.)



Claim.—1. The combination, with the leaves and pintle-sockets of a hinge, of a separate tubular longitudinally-slitted pintle, substantially as set forth.

2. The combination, with the leaves and pintle-sockets of a hinge, of a tubular longitudinally-slitted pintle, the ends of said pintle being attached to the opposite end sockets of the leaves in such a manner that a torsional spring action is imparted to the pintle, substantially as set forth.

402,325. INGOT-FORMING APPARATUS. WILLIAM R. HINSDALE, Hoboken, N. J. Filed June 8, 1888. Serial No. 276,493. (No model.)



Claim.—1. In an ingot-forming apparatus, the combination, with a frame having ways to guide the mold-sections, of a series of ingot-mold sections movable in such ways, a spring-holder to retain the mold-sections within the ways, means for operating it to effect a varied pressure upon each mold-section in its passage through the ways, to permit the mold-sections to fall after filling, and means below such ways, applied directly to the ingot-bar, for severing the lower portion of the ingot, substantially as herein set forth.

2. In an ingot-forming apparatus, the combination, with a frame having ways to guide the mold-sections, of a series of ingot-mold sections movable in such ways, a spring-holder to retain the mold-sections within the ways, means for operating it to effect a varied pressure upon each mold-section in its passage through the ways, to permit the mold-sections to fall after filling, a stripping-space, a severing-chamber, and an apertured ingot-bearing for the ingot-bar below such ways, and means for severing the ingot, substantially as herein set forth.

3. In an ingot-forming apparatus, the combination, with a frame having suitable ways, of a series of mold-sections movable in such ways and adapted to be stripped from the ingot-bar, a stripping-space below such ways, a separator to detach the mold-sections from the bar, and means for severing the stripped portion of the bar, substantially as set forth.

4. In an ingot-forming apparatus, the combination, with a frame having suitable ways, of a series of mold-sections movable in such ways and adapted to be stripped from the ingot-bar a stripping-space below such ways, a separator to detach the mold-sections from the bar, and guides for receiving the mold-sections from the separator, and means for severing the stripped portion of the bar, substantially as set forth.

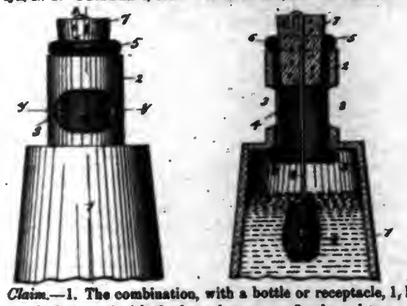
5. In an ingot-forming apparatus, the combination, with a frame having suitable ways, of a series of mold-sections movable in such ways and adapted to be stripped from the ingot-bar, a stripping-space below such ways, an apertured bearing below such stripping-space, a separator mounted upon such apertured bearing to detach the mold-sections from the bar, and guides for receiving the mold-sections from the separator, and means for severing the stripped portion of the bar, substantially as set forth.

6. In an ingot-forming apparatus, the combination, with a frame having suitable ways, of a series of mold-sections movable in such ways and adapted to be stripped from the ingot-bar, a stripping-space below such ways, inclined troughs C for the mold-sections, united in the path of the ingot-bar, an aperture through the troughs at their junction to form an ingot-bearing, the wedges *e*, for separating the ingot-sections and diverting them into the troughs, and means for severing the stripped portion of the bar, substantially as set forth.

7. In an ingot-forming apparatus, the combination, with a frame having suitable ways, of a series of ingot-mold sections movable in such ways, a holder applied to the ways to sustain the mold-sections therein, a spring applied to the holder, means for increasing the tension of the spring, means for stripping the mold-sections from the ingot-bar, and means for severing the ingot, substantially as set forth.

8. In an ingot-forming apparatus, the combination, with a frame having suitable ways, of a series of ingot-mold sections movable in such ways, a holder applied to the ways to sustain the mold-sections therein, a spring pressed upon the holder, and a cam to vary the pressure of the spring, means for stripping the mold-sections from the ingot-bar, and means for severing the ingot, substantially as set forth.

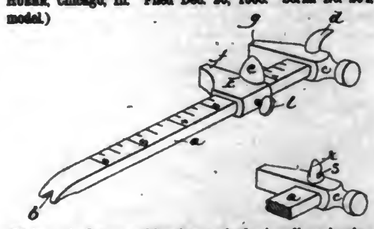
402,326. SHOE-VARNISH RECEPTACLE. JOHN HOSBLE, Brooklyn, N. Y. Filed Jan. 4, 1889. Serial No. 295,441. (No model.)



Claim.—1. The combination, with a bottle or receptacle, 1, having a neck, 2, formed with the lateral apertures 3, adapted to receive the ends of a thumb and forefinger, of a flexible tube, 4, fitting within the neck 2, and having projections located in the apertures 3, and ribs 5 overlapping the ends of the neck, substantially as shown and described.

2. The combination, with a bottle or receptacle having a neck formed with lateral apertures adapted to receive the ends of the thumb and forefinger, and a transversely-compressible tube located in the neck of the bottle and extending over the apertures therein, of a stopper having a wire attached thereto and extending through the neck into the bottle, with a sponge secured to its lower end, substantially as shown and described.

402,327. COMBINATION HOUSEHOLD-TOOL. FREDERICK A. HUBER, Chicago, Ill. Filed Dec. 26, 1888. Serial No. 294,685. (No model.)



Claim.—1. In a combination-tool, the handle *a*, having the claw *b*, and hammer *c*, provided with prong or spur *d*, and jaw *g*, in combination with the sleeve E, having knife *e*, jaw *f*, and set-screw *l*, substantially as shown and described, and for the purpose set forth.

2. In a combination-tool, the graduated handle *a*, having claw *b*, and hammer *c*, provided with prong or spur *d*, and jaw *g*, all made in one piece, in combination with the sleeve E, having knife *e*, jaw *f*, and set-screw *l*, substantially as shown and described, and for the purpose set forth.

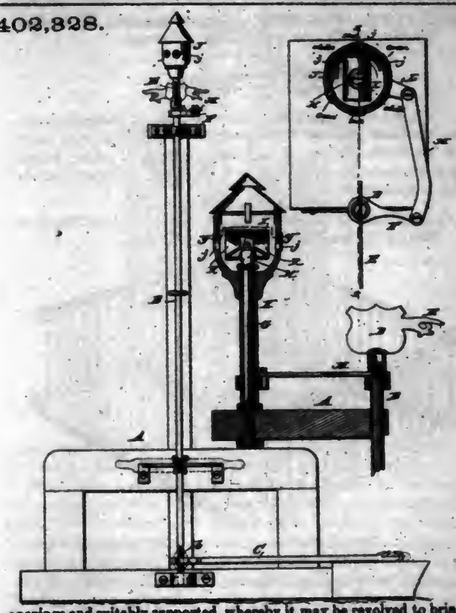
3. In a combination-tool, the graduated handle *a*, in combination with hammer *c*, having the prong *k*, provided with notch or niche *s*, and the sleeve E, having the knife *e*, and set-screw *l*, and jaw *f*, substantially as shown and described, and for the purpose set forth.

4. In a combination-tool, the adjustable sliding sleeve E, having the knife *h*, jaw *f*, and set-screw *l*, in combination with the graduated handle *a*, having claw *b*, and hammer *c*, provided with jaw *g*, substantially as shown and described, and for the purpose set forth.

402,328. SWITCH-STAND SIGNAL. MICHAEL B. HURLY, Quebec, Canada. Filed Feb. 23, 1888. Serial No. 265,262. (No model.)

Claim.—1. In a switch-stand signal, the combination of a fixed signaling-lamp, an opaque hood fitted thereover and having light-openings in two opposite sides, and the lantern fitted over said lamp and hood and detached therefrom, such lantern being provided with light-openings and suitably supported, whereby it may be revolved to bring any two of its light-openings into register with those of the opaque hood, all substantially as and for the purposes specified.

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2. The combination of the switch-stand, the operating-shaft, a pointer on said shaft, a lamp fixed on said stand, a lantern fitted over said lamp and having light-openings and suitably supported, whereby it may be revolved, crank-arms connected with said lantern and with the operating-shaft, and a link connecting such cranks, whereby the turning of the shaft will effect a turning of the lantern, substantially as described, and for the purposes specified.

3. The improvement in switch-stand signals, substantially as herein described and shown, consisting of the operating-shaft, the upright shaft or rod mounted on the switch-stand and having the lamp fixed on its upper end, the opaque hood having opposite light-openings and fitted over the lamp, the lantern having light-openings and fitted over the hood and lamp and having a depending sleeve encircling the upright rod and provided with a crank-arm, a crank-arm on the operating-shaft, and a link connecting such arms, substantially as set forth.

4. In a switch-stand signal, the combination of a fixed signal-lamp, an opaque hood fitted over said lamp, and the lantern fitted over said lamp and hood and suitably supported, whereby it may be moved rotarily, substantially as set forth.

5. In a switch-stand signal, the combination, with a fixed lamp, of an opaque hood fitted over said lamp, and having a reflector or reflectors, R, and a lantern fitted over the lamp and hood and adapted to revolve, substantially as set forth.

402,329. ELECTRIC STRIKING AND REPEATING CLOCK. ALPHONSE M. J. JANSEN and VISCOUNT J. A. M. JANSEN, San Willibrordo, Curaçoa. Filed Oct. 9, 1888. Serial No. 287,867. (No model.)

Claim.—1. In an electric clock, the combination of the impulse-wheel C, pallets *b b'*, the arbor *a*, carrying the said pallets, the lever D, provided with a contact-point, *c*, the balance-wheel and roller E *d*, for engaging said lever, the electro-magnet G, and the armature-lever *j*, provided with a contact-point, *k*, substantially as described.

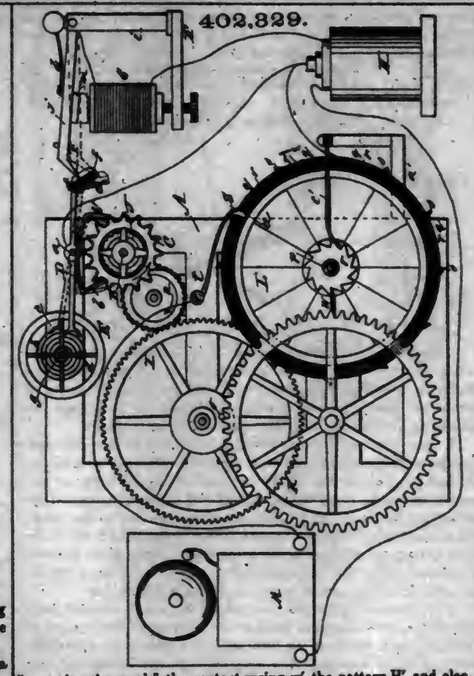
2. In an electric clock, the combination of the impulse-wheel C, the pallets *b b'*, engaging said impulse-wheel, the lever D, provided with the fork *d* and the contact-point *c*, the balance E, the electro-magnet G, the armature-lever *j*, provided with a contact-point, *k*, and the retractile spring *l*, substantially as described.

3. In an electric clock, the combination, with a time-movement of a clock, of the wheel K, arranged to be moved by step-by-step mechanism, and provided with the arm *w*, the strike-wheel L, provided with the insulated contact-bars *r*, the ratchet-wheel *v*, the contact-spring *u*, the electric bell M, the battery H, and circuit-connections, substantially as shown and described.

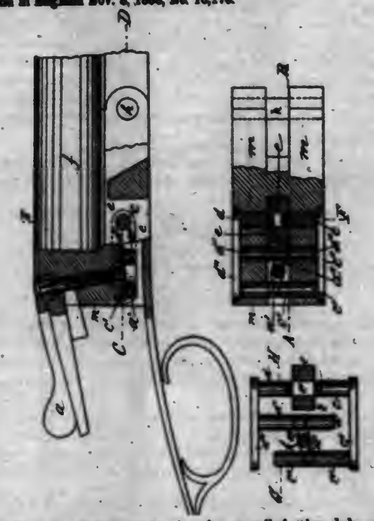
4. In an electric clock, the combination, with a time-movement of a repeating-wheel, L', arranged to be moved by a step-by-step movement, a series of contact making and breaking wheels, *d'*, carried by the repeating-wheel L', the electro-magnet O, the vibratory armature *l'*, carrying the pawl *l'*, the contact-spring *m'*, the battery H', and electrical connections, substantially as described.

5. In an electric clock, a repeating-wheel, L', a series of contact-wheels carried by the said repeating-wheel and provided with contact-points representing hours, and mechanism, substantially as described, for rotating the contact-wheels.

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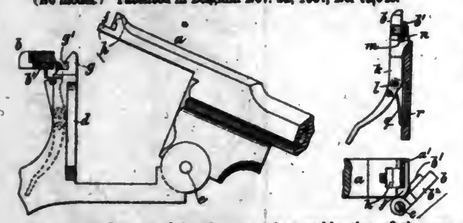
402,330. BARREL-LOCK FOR BREAKDOWN GUNS. LOUIS JUSSETTE, DENI D. HEBRARD, and HENRI HEBRARD, Hertal, Belgium. Filed Nov. 20, 1888. Serial No. 291,261. (No model.) Patented in Belgium June 20, 1888, No. 82,209; in France Nov. 2, 1888, No. 186,948, and in England Nov. 3, 1888, No. 16,176.



Claim.—A closing mechanism for so-called "breakdown guns," consisting of the combination of a lug, *c*, on the barrel, guiding-pins *c' d'*, seated in the breech-frame and adapted to be reciprocated transversely thereto in corresponding openings in the breech-frame, ties *c'' d''*, to which these pins are severally connected, locking-bolts *e d*, severally connected to said ties and seated in the breech-frame, a lever, *a*, arranged as described, a cross-head, *a' a''*, acted upon by said

lever and serving to move transversely of the breech-frame the said guiding-pins *d' d'*, ties *d'' d''*, and bolts *c d*, substantially as shown and described. and for the purposes set forth.

402,831. REVOLVING FIRE-ARM. MICHAEL KAUFMANN, Greenwich, County of Kent, England. Filed May 9, 1888. Serial No. 273,205. (No model.) Patented in Belgium Nov. 22, 1887, No. 78,640.



Claim.—1. In a revolving fire-arm, the combination of the supporting-frame having a notched or undercut lug, a tilting barrel provided with a recessed tail-piece or strap fitting over said lug, and a pivoted and laterally-swinging locking-bolt adapted to engage the notched lug and recessed tail-piece, substantially as set forth.

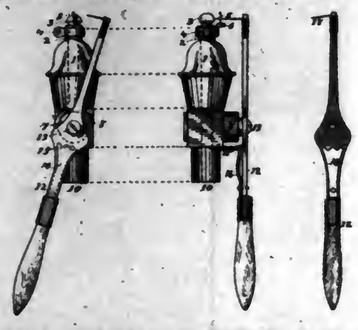
2. In a revolving fire-arm having a tilting barrel provided with a rearwardly-extending tail-piece or strap, the combination, with the rabbeted or grooved and slotted butt-end of the tail-piece, of the notched lug on the frame fitting in the slot of the tail-piece and of the locking-bolt, so pivoted as to move in a plane parallel to the longitudinal axis of the barrel, and perpendicular to the plane in which the barrel moves, said pivoted bolt being adapted to engage in the grooved or rabbeted end of the tail-piece, and to engage at the same time in the notch of the lug on the frame, substantially as specified.

3. In a revolving fire-arm, the combination, with a locking-bolt pivoted on a vertical axis at one side of the frame of the weapon, of a thumb-lever pivoted on an axis at right angles to the axis of the locking-bolt, and engaging at its upper end with said locking-bolt near its axis by a lug on the one received in a notch in the other, as specified, whereby motion of the thumb-lever on its axis will be transmitted to the locking-bolt, in the manner described.

4. In a fire-arm, the combination, with a locking-bolt pivoted on a vertical axis at one side of the frame of the weapon, of a thumb-lever pivoted on an axis at right angles to the axis of the locking-bolt, and engaging therewith by a lug and notch for transmitting motion, as described, and of a spring contained in a cavity in the frame and acting on the thumb-lever, as described.

5. In a fire-arm, the combination, with the tail-piece *a*, having the slot *h*, and the rabbeted or grooved butt-end *f*, of the lug *g* on the frame, having the notch *g'*, the locking-bolt *b*, adapted to lie in the groove or rabbet *f*, and having the lug *b'*, adapted to engage in the notch *g'*, the bolt *b* being pivoted on the axis *c* at one side of the frame and moving in a plane parallel to the longitudinal axis of the barrel and perpendicular to the plane in which the tail-piece moves, and a thumb-lever, *k*, engaging with the locking-bolt *b* by a notch, *m*, and lug *n*, and a spring, *q*, the whole combined for operation, substantially as specified.

402,832. ELECTRICAL GAS-LIGHTER. DANIEL G. KNOWLTON, Boston, Mass. Filed Oct. 16, 1888. Serial No. 288,514. (No model.)



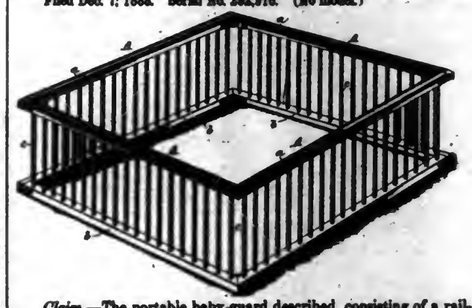
Claim.—A gas-burner and a cock controlling the passage of gas through the same, in combination with a lever attached to said cock and pivoted thereby in said burner, a pair of electrodes attached to said burner and said lever, a fixed pin, and a notched spring attached to said lever and engaging said pin, one of said notches being arranged to hold the cock open and the other to hold it closed by engaging with said pin, substantially as set forth.

402,833. WOOD-SCREW. HERMEN KNEPPEL, St. Louis, Mo. Filed Dec. 17, 1888. Serial No. 293,911. (No model.)



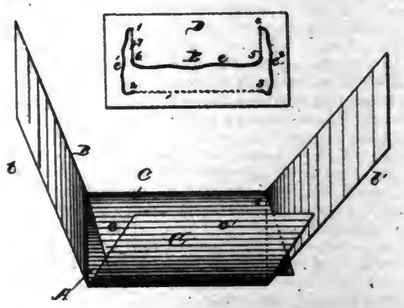
Claim.—The herein-described wood-screw A, having the tapering shouldered flat head B, provided with a slot, C, at right angles with the flat parallel sides E, and having a threaded portion consisting of disconnected spiral threads D, separated by the said parallel sides E, substantially as set forth.

402,834. GUARD FOR INFANTS. ARTHUR B. LANE, Chicago, Ill. Filed Dec. 7, 1888. Serial No. 292,916. (No model.)



Claim.—The portable baby-guard described, consisting of a railing forming a complete inclosure and composed of four sections hinged together in pairs, each pair consisting of two sections connected with each other by hinged joints and provided with oblique abutting faces by which the sections are held at right angles with each other, and having locking devices on their outer ends for detachably securing the pairs of sections together, whereby the railing may be separated into two parts and folded into a small compass for convenience in storing and transportation, substantially as described.

402,835. MERCHANDISE WRAPPER OR ENVELOPE. LOUIS P. LECLERCQ, Lille, France. Filed Aug. 16, 1888. Serial No. 282,915. (No model.)



Claim.—1. A wrapper or envelope comprising a tablet of a more or less rigid material, provided with an elastic fastening band or cord arranged to form the tying-loops *c c' c²*, and a wrapper of flexible material, substantially as and for the purposes specified.

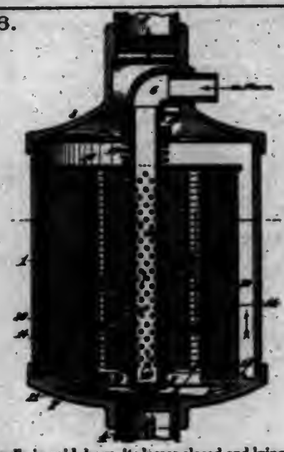
2. A wrapper or envelope comprising the tablet A, the wrapping-sheets B C, secured thereto, and the tablet D, having the elastic band E, secured thereto to form the tying-loops *c c' c²*, substantially as and for the purposes specified.

402,836. MUFFLER FOR STEAM OR OTHER HEATERS. EDWIN A. LELAND, Brooklyn, N. Y., assignor to Leonard Richardson, same place. Filed Feb. 19, 1889. Serial No. 300,443. (No model.)

Claim.—1. In a steam-muffler for water-heaters, the combination, with a drum having an inlet and outlet, of a steam-pipe entering the upper portion of the drum and having the closed end dropped nearly to the lower end of said drum, a series of annular plates closely surrounding a perforated portion of said pipe, an outer series of annular plates supported within the drum and leaving an interior and exterior annular space, and an imperforate disk closely surrounding the pipe and resting on both series of annuli, the inlet current of water being compelled to pass between the two series and between the members of the outer series, substantially as described.

2. In a steam-muffler for water-heaters, the combination, with a drum having a water-inlet below and an outlet above, of a steam-pipe

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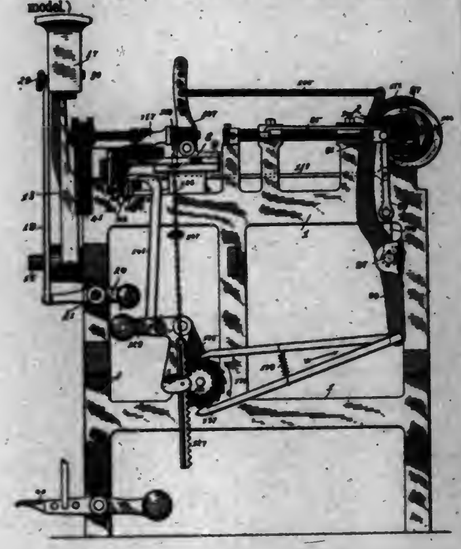


hanging centrally in said drum, its lower closed end lying a little above the inlet, a series of annular plates closely surrounding a finely-perforated portion of said pipe and resting one upon the other, an outer series of annular plates resting upon a horizontal annular shelf projecting from the inner face of the drum at its bottom, an imperforate disk closely surrounding the pipe above its perforated portion and resting upon the upper annuli in both series, a spring resting upon said disk, and means for compressing said spring, substantially as described.

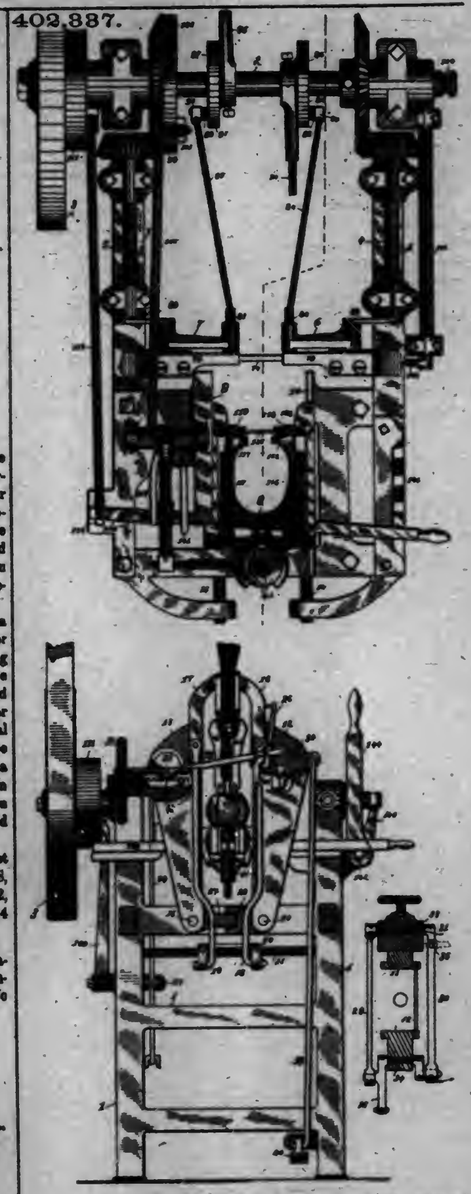
3. In a steam-muffler for water-heaters, the combination, with a drum having a water-inlet at its lower end and an outlet at its upper end, of a steam-inlet pipe entering said drum at the top and dropping centrally therein, its lower closed end lying above the mouth of the inlet, a series of annular plates closely surrounding a finely-perforated portion of said pipe and supported by a collar, a series of outer annuli resting on a shelf projecting from the lower end of the vertical wall of the drum, an imperforate disk closely surrounding the pipe above the perforated portion and resting on both series of annuli, a spring resting on said disk, and means for compressing the spring, an annular space being left between the two series of annuli and between the outer series and the drum, and the disk and shelf being connected by tie-rods, confining the outer annuli, substantially as described.

4. The combination, with the drum 1, having inlet 2 and outlet 3, of the steam-pipe 6, having perforations 10, the annular plates 8, surrounding said pipe, the annular plates 14, resting on the shelf 12, the disk 16, and spring 17, compressed by the collar 19, the annuli 14 being held in place by tie-rods 21, substantially as described.

402,837. BROOM-SEWING MACHINE. CHARLES R. LIPE, Syracuse, N. Y., assignor to the Hand Stitch Broom Sewing Machine Company, Pittsburg, Pa. Filed Oct. 11, 1887. Serial No. 252,084. (No model.)



402,837.



Claim.—1. The combination, with a broom-holding vise, of a pivoted clamp provided with a bearing projection, and a second pivoted clamp having a corresponding projection, as described, in position to engage the first when the clamps are closed, substantially as described.

2. In a broom-sewing machine, a pair of pressing-levers actuated by usual compressing mechanism, a sliding pressing-pad attached to each lever, and a catch by which the pad can be held in adjusted position relatively to its lever, all in combination, substantially as set forth.

3. In a broom-sewing machine, the combination of the pressing-levers and their actuating mechanism, a sliding pressing-pad on each lever, a connecting-rod attached to each pad, and a counter-weight connected to both rods to counterbalance the weight of the pads, substantially as described.

4. In a broom-machine, a pair of pressing-levers suitably pivoted to the frame, an eccentric bushing on one lever, and an adjusting screw and rack operating on the eccentric to hold the same in adjusted position, and a link connecting the bushing to the other lever

and the lever-actuating devices, all combined substantially as described.

5. In a broom-machine, a broom-holding vise provided with a series of swinging clamps, bearing projections from said clamps, as described, and a catch for holding the clamp last operated, all combined substantially as described.

6. The combination, with a broom-holding vise, of a series of swinging clamps secured thereto, projecting bearing-surfaces on the clamps, and movable clamp-lifters in proximity to said clamps, substantially as described.

7. In a broom-machine, the combination, with the sewing-needle and the holding-clamps, of a series of yielding band-supporting spurs borne by said clamps, substantially as described.

8. In a broom-machine, the combination of the clamping-pads, a banding-hook, a hook-supporting rod, and connections from said rod to the pad-operating mechanism, whereby the banding-hook is made to maintain the proper relation with the pads, substantially as described.

9. In a broom-machine, the combination of the broom-holding jaws, a pair of movable pinch-bars in proximity thereto, and adjunctive mechanism bearing on the pinch-bars, substantially as described.

10. In a broom-sewing machine, the combination of the broom-jaws, a pair of pivoted pinch-bars in proximity to said jaws, a wedge with which said pinch-bars have engagement, and a locking-stop by which the wedge may be operated to hold the pinch-bars, substantially as described

11. In a broom-sewing machine, the combination of the broom-jaws, a pair of offset pinch-bars pivoted in the frame and having bearing-surfaces, as described, a wedge between the pinch-bars and having bearing on both said bars, and a screw-threaded spindle in position to engage and retain said wedge, substantially as described.

12. In a broom-sewing machine, a double-pointed needle and a guideway therefor, a crank, and a pitman and pin connecting the crank directly to the needle, all in combination, substantially as described.

13. In a broom-sewing machine, a needle having engaging means at each end thereof, a guideway for said needle, a crank at each end of the needle, and a pitman connected to each crank and having means for alternate engagement with the needle, in combination, substantially as described.

14. In a broom-sewing machine, a needle having engaging means at each end thereof, a guideway for said needle, a crank at each end of the needle, a pitman connected to each crank and having means for engaging the needle, and a switch engaging the pitman alternately with the needle, all in combination, substantially as described.

15. In a broom-sewing machine, a double-ended needle having engaging means at each end thereof, separate needle-drivers at each end of the needle, also provided with engaging means, and separate cams, whereby the needle-drivers are alternately coupled to the needle, all in combination, substantially as described.

16. In a broom-machine, the combination of the frame, swinging broom-jaws supported by the frame, and a flexible chain-support connected to the frame in position to support the jaws when swung down, all substantially as described.

17. In a broom-sewing machine, the combination, with the broom-jaws, of a flexible chain-support for said jaws and a chain-tightener, whereby the flexure of the chain may be regulated, substantially as described.

18. In a broom-machine, the combination of the swinging jaws, a flexible chain-support therefor, a rack attached to said chain, and a pinion and driving-ratchet by which the chain may be tightened, substantially as described.

19. In a broom-machine, the combination of the swinging jaws, a chain-support therefor attached at one end to the frame, a rack attached to the other end of the chain, an actuating-pinion for said rack, and a lever by which the rack and pinion may be thrown into or out of engagement, substantially as described.

402,838. BOTTLE-STOPPER. EDWIN L. LLOYD, Philadelphia, Pa., assignor to the Joly Stopper Company, same place. Filed Jan. 16, 1889. Serial No. 296,494. (No model.)



Claim.—1. The combination, in a bottle-stopper, of the sealing-ring, with a stem having a rigid skeleton shank which fits snugly in the neck above said sealing-ring, and has an eye or loop below the same, no portion of said shank being of greater width than the most contracted portion of the neck, substantially as specified.

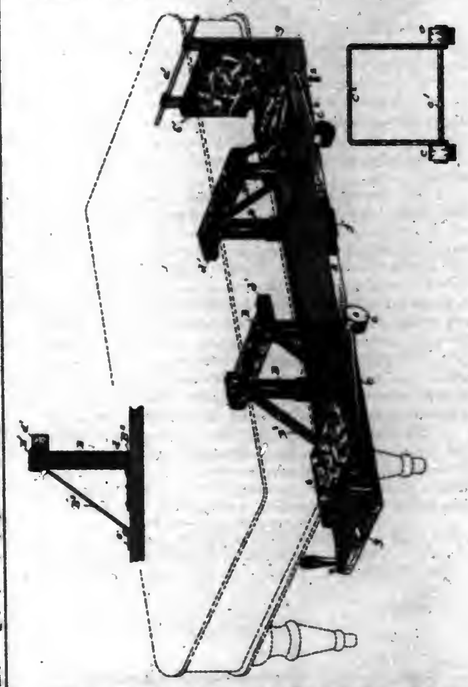
2. The combination, in a bottle-stopper, of the sealing-ring, with a stem having a flat shank above the ring and an eye or loop below the same, said shank being rigid and of a width equal or almost equal to the inside diameter of the bottle-neck, but having no portion of greater width than the most contracted portion of said neck, substantially as specified.

402,839. METHOD OF MAKING BUTTON-STRIPS. HENRY W. LYON, Bridgeport, Conn. Filed Feb. 16, 1889. Serial No. 300,167. (No model.)



Claim.—The method of making button-strips, the same consisting in forming within a strip of webbing a series of flexible transverse pockets open at both ends, inserting tape flatwise within and through said pockets and forming loops extending from the front of said pockets, threading said loops during their formation through the buttons, and stitching said strip lengthwise at the front and rear edges through said pockets and tapes, substantially as set forth.

402,840. GRAND-PIANO TRUCK. CHRISTIAN H. MARTIN, Sioux City, Iowa. Filed Dec. 20, 1888. Serial No. 294,963. (No model.)



Claim.—1. The skid provided with rollers carried by axles borne by bails, said skid having buttons or pivoted plates engaging with said axles, holding said rollers elevated, substantially as and for the purpose set forth.

2. The skid provided with elevated rests or supports, each consisting of a frame, with its lower cross piece or plate engaging with a cleat or keeper fastened to the skid, the upper side of the said frames having braces or props hinged or articulated to the skid and frames, substantially as and for the purpose specified.

3. The skid provided near its front and rear ends with cushioned supports, as also a cushioned back at its rear end, and with elevated folding cushioned supports or rests, substantially as and for the purpose set forth.

4. The piano-moving truck consisting of the skid provided with eyes or ears for the application of the draft thereto, and with a cushioned back having a hand push-rod connected therewith, the elevated folding cushioned supports having their braces hinged thereto and to the skid, the lower cross bars or plates thereof engaging with keepers or cleats applied to the upper side of the skid, and trucks or rollers hung upon said skid, and pivoted buttons or plates to engage with the axles of said rollers, holding the latter elevated, said skid also having fixed cushioned supports secured thereto, substantially as and for the purpose indicated.

402,841. UPRIGHT-PIANO TRUCK. CHRISTIAN H. MARTIN, Sioux City, Iowa. Filed Dec. 20, 1888. Serial No. 294,964. (No model.)



Claim.—1. The truck or skid having the swinging rollers or trucks, the axle of one being arranged to swing beyond and snap into position upon the vertical end portion of the skid, said vertical end portion having at its outer or upper end casters or rollers, said swinging rollers being used interchangeably with the base and vertical end portions, substantially as and for the purpose specified.

2. The truck or skid provided with an upright vertical end portion or arm and with the crossing straps connected together, one strap being applied to the skid or truck and the other strap being passed around said vertical end portion or arm, said swinging rollers being used interchangeably with the base and vertical end portions, substantially as and for the purpose specified.

3. The skid or truck provided with a vertical end portion, having applied to its outer end swiveled rollers or casters and to or near its other end a spring snap or catch, said skid or truck also having applied thereto swinging rollers or trucks, the axle of one pair of which snaps past or over said spring snap or catch, and the steadying or holding crossed straps connected together and applied to the skid or truck, said swinging rollers being used interchangeably with the base and vertical end portions, substantially as and for the purpose specified.

402,842. DOOR-HANGER. RICHARD MILLER and JOHN G. KAMOUSE, Appleton, Wis., assignors to the Eagle Manufacturing Company, same place. Filed Dec. 27, 1888. Serial No. 294,768. (No model.)



Claim:—1. The combination, with a suitable support, of a rail, spacing and supporting blocks interposed between the rail and support, and headed bolts for securing the said rail to the faces of the outer ends of the said block, the said bolts passing below the lower edge of the rail and into the said support, whereby the rail and spacing-blocks may be adjusted independently of each other, substantially as described.

2. The combination of the vertical bars *b b*, having their upper ends bent over, forming arches *b' b'*, the horizontal rails *c c*, secured to upper ends of the said bars, the inner one of the said rails being extended outwardly and downwardly and bolted to the said vertical bars *b b*, whereby the said vertical bars and their arches are effectually braced and strengthened.

3. The combination of a suitable support, a rail, tubular spacing-blocks interposed between the said rail and support, these spacing-blocks being notched at their outer ends for the reception of the lower edge of the rail, and headed bolts for holding the said rails in their notches and clamping the spacing-blocks to their support, as described.

402,843. REPEATING-WATCH. CHARLES MOELLER, Hoboken, N. J., assignor of one-half to Prosper Nurtman, New York, N. Y. Filed Sept. 12, 1888. Serial No. 285,162. (No model.)



Claim.—1. A repeating-watch having its moderating-gear mounted on a movable bridge, substantially as set forth.

2. A repeating-watch having its moderating-gear mounted on a bridge pivoted to oscillate on a plate of the works, substantially as set forth.

3. A repeating-watch having its moderating-gear mounted in a bridge pivoted at one end to oscillate on one of the plates of the works, the wheels at the opposite end of the bridge engaging one of the wheels driven by the motor of the repeating-gear, substantially as set forth.

4. In a repeating-watch, the combination, with the repeating-gear, of a moderating-gear mounted in an oscillating bridge on a plate of the works and a spring acting on said bridge and serving to keep one of the wheels on the oscillating bridge engaged with one of the wheels operated by the motor of the repeating-gear, substantially as set forth.

5. A repeating-watch having a motor for the repeating mechanism, composed of a helical spring surrounding a rod, substantially as set forth.

6. A repeating-watch having a motor for the repeating mechanism, composed of a helical spring surrounding a curved rod at the rim of the movement, substantially as set forth.

7. In a repeating-watch, the combination, with one of the plates, of a curved rod held at the rim of the same, a helical spring surrounding said rod, a slide on said rod, on which slide the spring can act, a rocking lever operated from said slide, and gearing for transmitting motion from said rocking lever to the repeating mechanism, substantially as set forth.

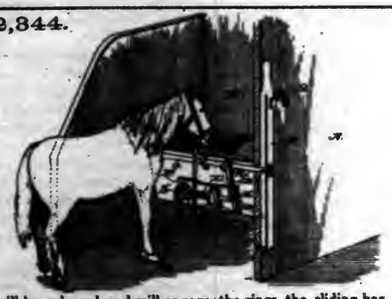
402,844. ANIMAL-RELEASING DEVICE. WILLIAM H. MCCURDY, York, Pa. Filed Dec. 31, 1888. Serial No. 296,018. (No model.)

Claim.—1. In an animal-releasing device, the combination of the spring-actuated sliding bolt with a spring-latch adapted to engage the end of the bolt, whereby when the ring on the halter-strap is pressed against said spring-latch the bolt will be released and projected through the ring, as set forth.

2. The combination of the sliding bolt, the spring-latch adapted to engage the end of the said bolt, whereby when the ring on the halter-strap is pressed against the spring-latch the bolt will be released and will engage the ring, the sliding bar or rod provided with means adapted to disengage the bolt from the ring, and means for operating said sliding bar or rod, as set forth.

3. The combination of the spring-bolts having legs at their free ends, the spring-latches adapted to engage the ends of the bolts, whereby when the rings on the halter-straps are pressed against the latches the

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bolts will be released and will engage the rings, the sliding bar, the tappet-arms carried by said bar and engaging the lugs on the bolts, and means for operating said bar, as set forth.

4. The combination, with the troughs having the notches G and longitudinal grooves H extending therefrom, of the spring-latches secured in said grooves and projecting into said notches and the bolts engaged by said latches, whereby when the rings on the halter-straps are pressed against the latches the bolts will be released and will engage the rings, as set forth.

5. The combination of the base-plate having a slot at one end, the spring-actuated sliding bolt mounted on the base-plate, and the spring-latch arranged below the base-plate and having a projection extending through the slot in the base-plate to engage the end of the bolt, whereby when the ring on the halter-strap is pressed against the latch the bolt will be released and will engage the ring, as set forth.

6. The combination of the base-plate having a slot in one end and lugs projecting from its front side, the sliding bolt mounted in said lugs and having the stop N, adapted to come into contact with one of said lugs, the spring arranged around said bolt and adapted to project the same over the slot, and the spring-latch arranged beneath the base-plate and engaging the bolt to hold it from over the slot, whereby when the ring on the halter-strap is pressed against the latch the bolt will be released and engage the ring, as set forth.

402,845. OIL-DISTRIBUTING CARTRIDGE AND PROJECTILE. GEORGE H. MCKINNIS, New York, N. Y. Filed Dec. 7, 1888. Serial No. 292,876. (No model.)



Claim.—1. As a means of distributing oil on rough water, the combination, with an inclosing-shell, of a projectile containing oil within said shell, said projectile comprising an oil-holder in the form of a cup, and a loosely-fitting cap, which closes the mouth of said holder, and which embraces the forward end of the holder, so that it may not slip off laterally while the cartridge is in transit, said cap being cemented at its margin to the inclosing-shell to prevent leakage of the oil, as set forth.

2. As a means of distributing oil on rough water, the combination, with a cartridge-shell containing an explosive charge, of a projectile within said shell containing oil, said projectile comprising an oil-holder in the form of a cup, and a loosely-fitting cap, which closes the mouth of said holder, and which embraces the forward end of the holder, so that it may not slip off laterally while in transit, said cap being cemented at its margin to the cartridge-shell.

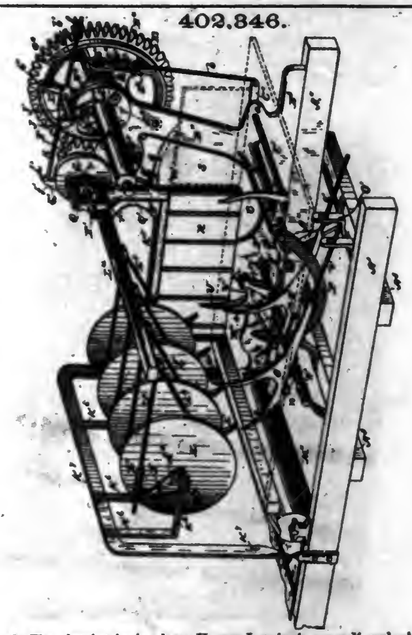
3. As a means of distributing oil on rough water, the combination, with the cylindrical cartridge-shell, of the projectile consisting of the oil-holder having a less exterior diameter than the interior diameter of the inclosing-shell, said holder being provided with a centering-guide at its base, and the conical cap, which closes the said holder at its forward end and projects over and houses the end of the holder and is cemented at its margin to the shell, as and for the purposes set forth.

4. An oil-projectile consisting of an elongated cup-like holder for the oil, provided with a weight, *g*, at its front end to prevent its turning over in transit, and a loosely-fitting conical cap, *e*, which embraces and incloses the end of said holder, so that it may not be displaced by lateral movement when the projectile is in transit, as set forth.

402,846. GRAIN-BINDING HARVESTER. WILLIAM F. OLIN, Chicago, Ill., assignor to William Deering & Company, same place. Filed Aug. 20, 1884. Serial No. 141,063. (No model.)

Claim.—1. The clutch-tripping lever H, bracket I, and swinging arm I', in combination with the driving-wheel E, having a track or flange, E^4, and a clutch mechanism connected with the driving-pinion, substantially as and for the purposes specified.

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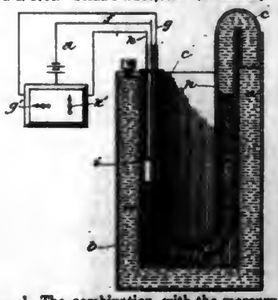
2. The clutch-tripping lever H, arm I, swinging arm I', and wheel E, having the track or flange E^4, in combination with the clutch-dog G', driver G, and pinion F, for throwing the binding apparatus into and out of gear, substantially as specified.

3. The clutch-tripping lever H, arm I, swinging arm I', wheel E, having the flange or track E^4, and spring J, in combination with a clutch-dog, G', driver G, and pinion F, substantially as and for the purposes specified.

4. The clutch-tripping lever H, swinging arm I', driving-wheel E, having flange E^4, and a clutch mechanism, in combination with a compressor-finger and a connection between the finger and the clutch-lever, substantially as and for the purposes specified.

5. The frame U', having a slot, U'', and carrying a finger, U, in combination with a crank-shaft, N', cranks *n'*, and pitman-rod *n''*, substantially as and for the purposes specified.

402,847. THERMOMETRIC INDICATOR. WILLIAM R. PATTERSON, Chicago, Ill., assignor to the Western Electric Company, same place. Filed Oct. 1, 1888. Serial No. 286,535. (No model.)



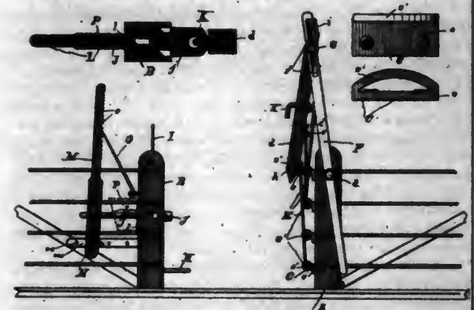
Claim.—1. The combination, with the mercury, of a non-conducting liquid placed in the bent tube containing said mercury and electrical connections—one on each side of said mercury—with which the mercury is adapted to make electrical connections alternately as the temperature rises and falls, substantially as and for the purpose specified.

2. The combination, with a tube containing mercury, of closed chambers—one at each end of the said tube—one of said chambers containing an insulating-liquid and the other containing air, and an electric circuit permanently connected with said mercury and extending through a battery to two signal-instruments and from said signal-instruments in two branches to points *h* and *i* on opposite sides of the mercury, whereby the circuit is closed through one signal-instrument or the other as the oil expands or contracts to move the mercury into contact with one or the other of said points.

3. The combination, with the mercury, of oil contained in the same tube therewith and branch electric circuits and contact-points on different sides of the said mercury in said tube, whereby one circuit or the other will be closed as the temperature rises or falls below the point to which the apparatus is adjusted.

4. The combination, with the annular reservoir *b*, containing an insulating-liquid, *a*, of the bent tube *c*, containing mercury, placed within the opening in the reservoir, said mercury being in both branches of said tube, said tube being closed at one end of the reservoir *b*, and the other end of said tube, above the mercury, containing air, the battery *d*, one pole of which is connected permanently with the mercury, while the other pole is extended by the branches *g k* to points *h* and *i*, to which points the mercury is adapted to be alternately forced by changes in the temperature of the oil, and the signal-instruments *k' g'*—one in each of said branches—whereby changes of temperature within certain limits will be indicated by the signal-instruments, substantially as and for the purpose specified.

402,848. GATE. ALPHEUS I. PETERSON, Horsham, Pa. Filed Jan. 23, 1888. Serial No. 297,234. (No model.)



Claim.—1. The combination of the opposite posts, the series of elongated loops C C, connected to one of said posts, and the gate-fastening devices on the other post, substantially as described, with the gate composed of an upright bar, *d*, the series of staples connected thereto, and the wires and links connecting said wires to the respective loops, C C, of the post and staples and bar, all substantially as described.

2. The combination of the post and the gate consisting of an upright bar and a series of wires loosely connected to said post and bar, with the pivoted lifting-levers F, fulcrumed on the post, and having their front ends slotted and engaged by a bolt passing transversely through said bar, all substantially as described.

3. The combination of a gate-post, the headed bolt passing therethrough, and the lever for operating said bolt, with the gate consisting of an upright bar adapted to be connected to said bolt, a series of horizontal wires loosely connected to said bar and to the opposite gate-post, and the dogging-plate G, engaging ratchet-teeth on said lever, substantially as and for the purpose described.

4. The combination of the post, the horizontal bolt passing therethrough, and the horizontal perforated arm below said bolt, with the lever pivotally connected to said bolt and adjustably connected to said arm and having ratchet-teeth at its upper end, and the dogging-plate engaging and locking said lever, substantially as described.

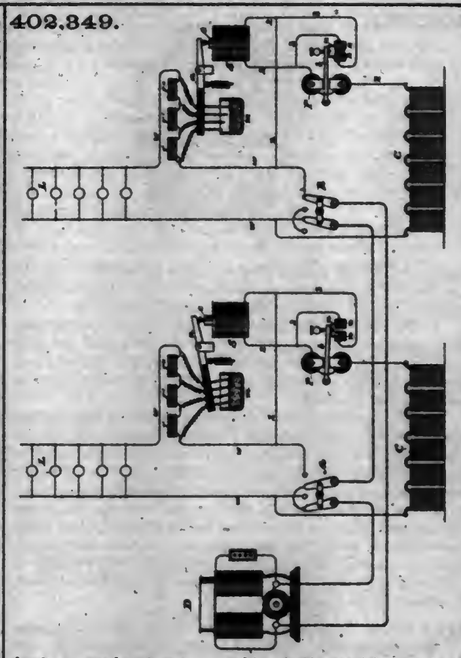
5. The combination of the opposite gate-posts, the gate consisting of an upright bar, and a series of horizontal wires loosely connected to said bar and to one of said posts, the pair of levers pivotally mounted on said post and having slotted front ends, and the bolt passing through said slots and the upper end of said bar, with the horizontal vertically-slotted bolt passing through the opposite gate-post and adapted to be engaged by a finger on said bar, the lever for operating said bolt, and the locking devices therefor, all substantially as and for the purpose set forth.

402,849. DISTRIBUTION OF ELECTRICITY BY SECONDARY BATTERIES. MATTHIAS PFATISCHER, New York, N. Y., assignor to The Electrical Accumulator Company, of New York. Filed Nov. 2, 1888. Serial No. 289,834. (No model.)

Claim.—1. The combination of a dynamo-electric machine, a charging-circuit, a secondary battery, a working-circuit containing a series of translating devices in multiple arc with the battery, an artificial resistance in the working-circuit between the battery and translating devices, a switch or circuit-changer for inserting and withdrawing said resistance, an electro-magnetic device located in said circuit controlling said switch, and a polarized electro-magnet located in a branch circuit between the dynamo and battery and between the battery and lamps operating to control the first-named magnet, substantially as described.

2. The combination of a dynamo-electric machine, a charging-

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circuit, a secondary battery, a working-circuit containing a series of translating devices in parallel circuit with the battery, a series of artificial resistances to be inserted and withdrawn with respect to the working-circuit between the battery and translating devices, a switch or circuit-changer for inserting and withdrawing said resistances successively, an electro-magnetic device located in said circuit controlling said switch, and a polarized electro-magnet located in a branch circuit between the dynamo and battery and between the battery and translating devices operating to control the first-named magnet, substantially as described.

402,850. BOTTLE-STOPPER. GEORGE RENFUM, JOHN G. RENFUM, and MARTIN G. RENFUM, Philadelphia, Pa., assignors to the Joly Stopper Company, same place. Filed Feb. 6, 1888. Serial No. 263,134. (No model.)



Claim.—1. The combination of the bottle with the stopper, the bail, and a tightening-lever hung to the bail and movable vertically on the bottle, the side bars of said lever occupying a position close to the sides of the neck and engaging with the shoulder formed by the head of the bottle, substantially as specified.

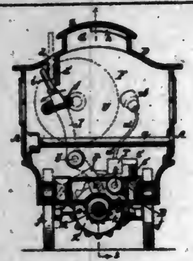
2. The combination of the shouldered bottle, the stopper, and the stopper-carrying bail, with the operating-lever hung to said bail and having opposite side bars for engaging with the shoulder of the bottle, and opposite yokes connecting the upper and lower ends of said side bars, substantially as specified.

402,851. COIN-OPERATED TOY CAR. ALFRED C. REX, Philadelphia, Pa. Filed Nov. 12, 1888. Serial No. 290,576. (No model.)

Claim.—1. The combination of the wheels and axle geared to a longitudinal shaft driven by a spring, with a ratchet-wheel secured to said shaft and a lever, one arm of which forms a pawl for retaining the ratchet-wheel, the other arm being adapted to be moved so as to throw the pawl out of engagement with the ratchet-wheel, and thus start the car, substantially as described.

2. The combination of the driving-wheels and axle, with a longitudinal shaft geared to said axle, a spring on said longitudinal shaft acting to drive the same, a lever having a short arm engaging with a ratchet-wheel on the spring-shaft, and a car-body provided with a coin slot or chute through which a coin may be passed, the long arm of the lever being in the path of the coin when the short arm is in

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engagement with the ratchet-wheel, so that as the coin is inserted the long arm will be moved and the short arm will be thrown out of engagement with the ratchet-wheel, substantially as described.

3. The combination of the driving-wheels and axle, a spring-actuated longitudinal shaft geared to said axle and having lugs *s s*, a lever having two arms, one arm acted on by the lugs and the other arm carrying a hammer, and a bell against which the hammer strikes, substantially as described.

4. The combination of the receptacle made in the form of a car or other vehicle, a spring-actuated propelling device for said car, and a lever governing said propelling device and terminating near the coin-slot, whereby, when a coin is inserted in said slot, the motor mechanism is released and the car started, substantially as described.

5. The combination of the driving-wheel and axle, the spring-actuated shaft geared to said axle and having a ratchet-wheel, and a governing-lever having one arm forming a pawl for said ratchet-wheel, and another and preponderating arm, the normal tendency of which is to hold said pawl out of engagement with the ratchet-wheel, all substantially as specified.

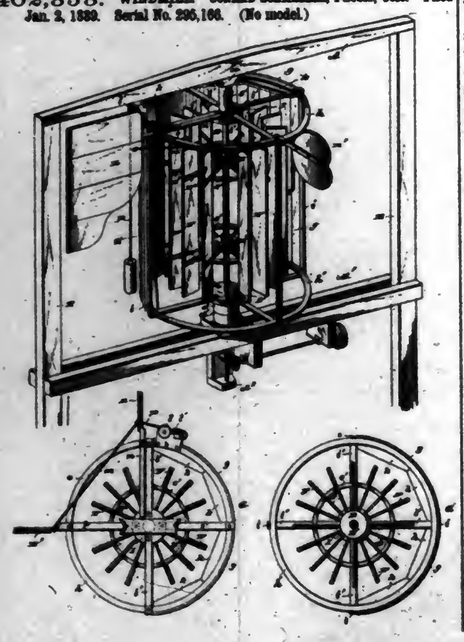
402,852. PROCESS OF FILLING TEETH. ALBERT ROBINSON, Grand Rapids, Mich. Filed Feb. 8, 1888. Serial No. 299,135. (No model.)



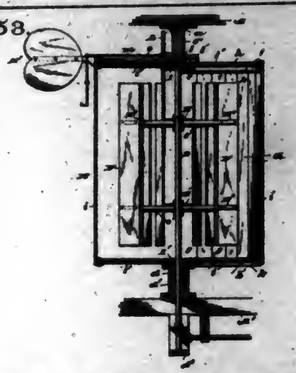
Claim.—1. The process of filling teeth by first making a mold by swaging metal foil into the cavity and then filling said mold with melted gold or other metal, substantially as described.

2. The process of filling teeth by first making a mold by swaging metal foil into the cavity, filling said mold with melted gold or other metal, grooving the bottom of the filling thus prepared, and fastening said filling into said cavity by means of cement inserted in said grooves, substantially as described.

402,853. WINDMILL. CONRAD SCHMELZER, Pueblo, Colo. Filed Jan. 2, 1889. Serial No. 295,166. (No model.)



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Claim.—1. In a wind wheel or engine, the combination of a vertical shaft having hubs with radial arms to which are attached vertical blades, a movable frame made up of upper and lower rings rigidly connected and provided with segmental pieces, to which are attached vertical strips forming a semicircular shield, a small fan or vane rigidly attached to the upper portion of the frame, and a fan or vane pivotally attached to one side of the center of the movable frame and provided with a roller which moves upon a segmental plate, under which the arm of the main fan or vane passes, a weighted cord attached to the main fan and passing over suitable guide-pulleys carried by the shield-supporting frame, and a cord attached to the opposite side of the main fan and guided through the smaller fan for drawing said vanes parallel with each other, the parts being organized substantially as shown, and for the purpose set forth.

2. The combination, in a wind wheel or engine, of a movable frame provided with a semicircular shield, a small vane or fan rigidly attached thereto, and an outwardly-projecting arm carrying a pulley, a main vane pivoted to one side of the center of the shield-carrying frame and provided with a weighted cord, whereby the shield is automatically moved by the force of the wind, and a vertical wheel journaled within the shield-carrying frame, substantially as shown, and for the purpose set forth.

3. The combination, in a wind-engine, of a central wheel, a shield-carrying frame made up of the upper and lower rings rigidly secured to radial arms, vertical bars having inturned ends which are bolted to the rings and radial arms, a segmental plate beneath which the supporting-arm of the main fan passes, said fan carrying a roller which travels above said plate, and segmental plates attached to the rings for securing thereto strips forming the shield, substantially as shown, and for the purpose set forth.

4. The combination, with a horizontal wind wheel or engine, of a frame carrying a shield and a small vane or fan rigidly secured thereto, a main vane or fan mounted on a suitable horizontal arm pivoted to one side of the center of the shield-carrying frame, and means, substantially as described, for moving the larger vane so as to lie parallel with the smaller vane, substantially as shown, and for the purpose set forth.

402,854. POSITIVE SHUTTLE-MOTION FOR LOOMS. FRANZ SCHNEIDER, Grossenhain, Saxony, Germany. Filed May 12, 1888. Serial No. 273,710. (No model.) Patented in Germany Nov. 12, 1886, No. 40,573, and May 1, 1887, No. 42,749; in England June 24, 1887, No. 9,014, and in Austria-Hungary Nov. 16, 1887, No. 21,050 and No. 52,779.

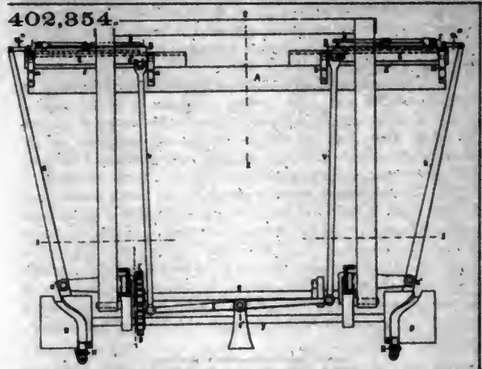
Claim.—1. In a loom, the combination, with the batten A, of the guides *a*, the grippers B, having each a pivoted jaw, *b*, provided with teeth *i* and projection *f*, mechanism for positively moving the grippers toward and away from each other, the bars *d*, hinged to the batten and having each an arm, *d'*, and an edge parallel to the guides *a*, adapted to bear against the projections *f*, and means connected with said arms *d'* for oscillating the bars *d* and pressing their edges against the projections *f*, substantially as set forth.

2. In a loom, the combination, with the batten A, of the guides *a*, the grippers B, having each a movable toothed jaw, *b*, with projection *f*, the shaft *y*, with cam-cylinders N, means of connection between the cylinders N and the grippers, the oscillating bars *d*, shaft *q*, with cam disk or disks F, means of connection between the disk or disks F and the bars *d*, and gear-wheels connecting together the shafts *y* and *q*, substantially as and for the purpose specified.

3. In a shuttle, the combination, with the body of the shuttle having recesses *i*, with shoulders *l'*, of the toothed gripping-plates *k*, lodged movably in the said recesses, and springs *k'*, pressing the plates *k* against the shoulders *l'*, substantially as and for the purpose set forth.

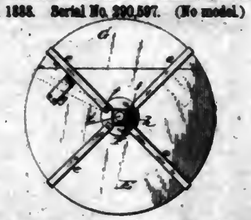
4. The combination, with the batten A and the shuttle having

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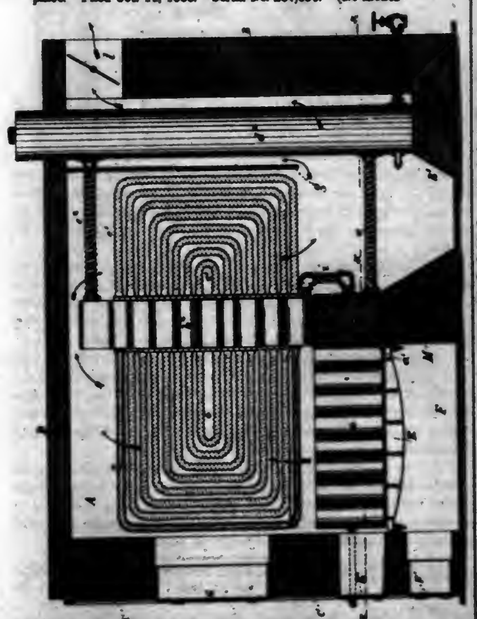
teeth, of the grippers B, each having a pivoted jaw provided with teeth adapted to engage said shuttle, mechanism for moving said grippers toward and from each other, a cam operating in unison with said mechanism, the pivoted lever *x*, operated by said cam, and bars connected to the respective ends of said lever *x* and arranged to engage with and oscillate said pivoted jaws, as set forth.

402,855. WASHING-MACHINE. HENRY SEAMAN, Memphis, Mo. Filed Nov. 12, 1888. Serial No. 290,507. (No model.)



Claim.—In a washing-machine, the combination, with the cylinder having removable portion G, of the castings F and the radial arms pivoted to said castings and extended across the face or periphery of said removable portions, and the catches *g* on the lower portion, substantially as and for the purpose specified.

402,856. STEAM-BOILER. JOSEPH SHACKLETON, New York, N. Y., assignor to the Shackleton Car Heating and Ventilating Company, same place. Filed Oct. 11, 1888. Serial No. 287,856. (No model.)



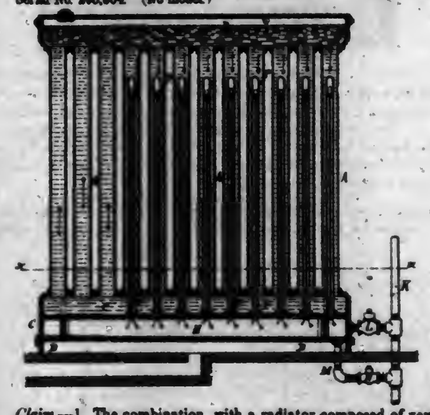
Claim.—1. In a steam-boiler, the combination of corrugated water-bases surrounding the fire-chamber on three sides, and upright corrugated chambers set edgewise and resting upon the water-bases and extending across between the side walls of the boiler, and pipes connecting the water-bases with the upright chambers, substantially as set forth.

2. In a steam-boiler, the combination, with the fire-chamber and grate-bars, of corrugated water-bases surrounding the fire-chamber on three sides, the upright water-chambers set edgewise and corrugated on their contiguous faces and resting on the water-bases, and pipes connecting the water-bases and upright chambers together, and series of U-shaped corrugated pipes connected upon each side of the upright water-chambers, substantially as set forth.

3. The combination, in a steam-boiler, with the L-shaped corrugated water-bases *a a'*, and the upright water-chambers resting thereon, and pipes connecting the bases and chambers, of the stand-pipes *d d' d''*, and a steam-receptacle connected therewith, and pipes connecting the lower portion of the stand-pipes to the water-bases and the upper portion of the stand-pipes to the top of the vertical water-chambers, substantially as and for the purposes set forth.

4. In a steam-boiler, the combination, with the L-shaped water-bases, the upright water-chambers, and the series of U-shaped corrugated circulating-pipes *e e'*, connected to the opposite sides of the upright water-chambers, of a deflecting-plate, *g*, back of the circulating-pipes *e'*, whereby the products of combustion passing up between the pipes *e* and over the upright chambers are caused to pass down between the pipes *e'* before reaching a chimney, substantially as set forth.

402,857. RADIATOR FOR HEATING BUILDINGS. JOSEPH SHACKLETON, New York, N. Y. Filed Jan. 16, 1888. Renewed Jan. 8, 1889. Serial No. 295,804. (No model.)



Claim.—1. The combination, with a radiator composed of vertical pipes with a hollow top chamber and a hollow base connected by said pipes, of steam-pipes applied within a portion of the vertical pipes and a steam-chamber with which the lower ends of the pipes are connected for heating the water contained in the radiator and causing an upward circulation, the return circulation being through the vertical pipes that are not provided with steam-pipes, substantially as set forth.

2. The hollow base C, vertical radiator-pipes A, and hollow top chamber, B, in combination with the steam-chamber H, the supply-pipe K and cock L, the pipe M and check-valve N, for the water of condensation, and the vertical pipes P, extending up from the steam-chamber H, within the radiator-pipes A, substantially as and for the purposes set forth.

402,858. PRESERVE-JAR FASTENING. GEORGE SIMKINS, Philadelphia, Pa. Filed Feb. 23, 1888. Serial No. 300,639. (No model.)

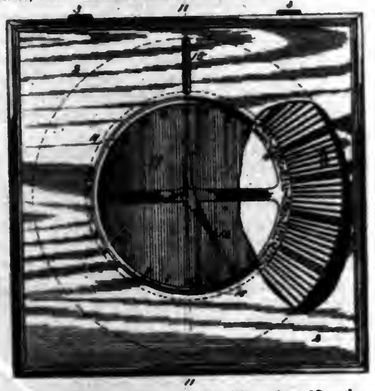
Claim.—The lid B, in combination with the bail C, having the lips D, the curved spring-piece F, having flaring ends bent downwardly and adapted to bear against the lid near the periphery thereof, and the band G, embracing both the bail C and the spring-piece, substantially as described.



402,358.



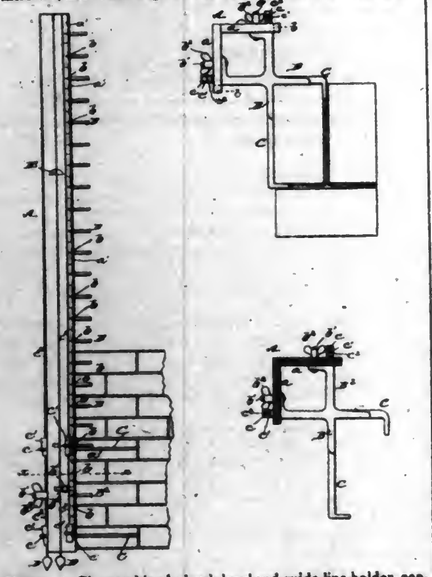
402,359. WATCHMAN'S TIME-REGISTER. HENRY W. SMITH, St. Louis, assignor of one-half to Henry C. Baker, Kansas City, Mo. Filed Dec. 26, 1888. Serial No. 294,623. (No model.)



Claim.—1. The revolving drum 9, with pockets 13 and recess 19, inclosing-case 1, having pin-hole 8, lock-cover 2, with slot 15, and spring-catch 4, all constructed and combined substantially as set forth.

2. The combination, in a watchman's time-register, of the case 1, with pin-hole 8, revolving drum 9, with numbered pockets 13, and recess 18, spring-catch 4, hands 11 and 12, and dial-plate 17, fixed to the cover, substantially as set forth.

402,360. BRICK-LAYER'S PLUMB-LEVEL, &c. JAMES SMITH, Centreville, Md. Filed Aug. 31, 1888. Serial No. 284,310. (No model.)



Claim.—1. The combined plumb-level and guide-line holder consisting of an angle upright provided with a series of angle castings or guides to fit the angle or corner of a wall and with clamps detachably connected therewith to engage with or enter the joints between the bricks of the wall, substantially as and for the purpose set forth.

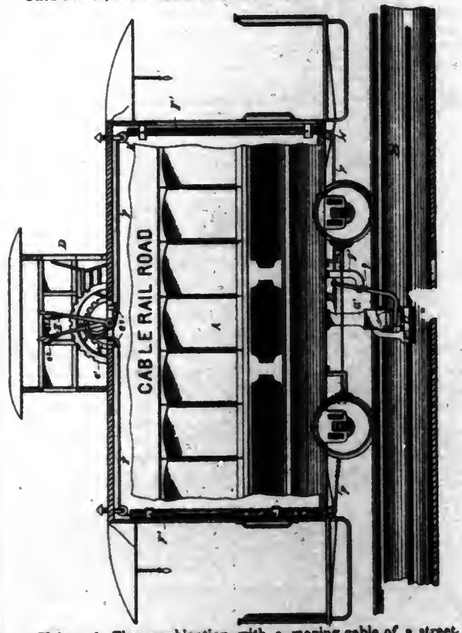
2. The combined plumb-level and guide-line holder provided with angle guides or castings adapted to fit the implement to the angle or corner of a wall, the bottom guides being adjustable, substantially as set forth.

3. The combined plumb-level and guide-line holder having a graduated upright provided with the guide-line slits or notches, angle castings or guides to fit the angle or corner of a wall, and clamps to engage with or enter the joints between the bricks of the wall and confined to the upright by keys or wedges, substantially as and for the purpose specified.

4. The combined plumb-level and guide-line holder having an upright provided with angle castings or guides to fit the angle or corner of a wall, clamps to engage with or enter the joints between the bricks of the wall, and keys or wedges suspended from the top or upper end of the upright and engaging with apertures in the inner ends of the clamps, substantially as and for the purpose specified.

5. The combined plumb-level and guide-line holder consisting of the graduated upright having a series of guide-line slits or notches, the angle castings or crossing-guides applied to the upright and adapted to fit the corner or angle of a wall, the clamps to engage with or enter the joints between the bricks of the wall and provided at their inner ends with apertures, the keys or wedges engaging with the apertures of the clamps, and the suspending cords or wires of the keys or wedges connected or applied to the top or upper end of the upright, substantially as set forth.

402,361. GRIP-CAR. CHARLES T. SHEDEKOR, New York, N. Y. Filed Dec. 19, 1888. Serial No. 294,067. (No model.)



Claim.—1. The combination, with a moving cable of a street-railway system and a car, of brake and grip mechanism on the under side of the car, a compartment on the top of the car, and levers in the compartment having connection with the mechanism below the car for controlling the movement of the same, substantially as described.

2. The combination, with a car of a cable system of street-railways, having its interior arranged for the reception of passengers, of a cable-gripping device on the bottom of the car, and mechanism located on the top of the car having connection with the gripping device for operating the same, substantially as described.

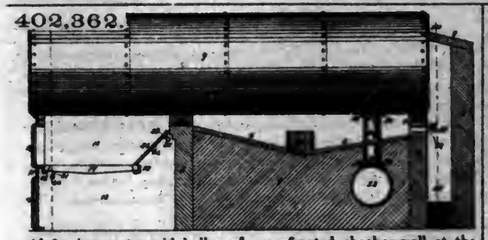
3. In a street-car for cable roads, the combination, with the top, of a compartment centrally located thereon, operating-levers in the compartment, brake and grip mechanism below the car, and means secured to the levers and extending in opposite directions to the bottom of the bar for connecting the levers with the brake and grip mechanism, substantially as described.

4. The combination, in a street-car for cable roads, of brake and grip mechanism on the bottom thereof, levers on the top of the car having connection with the brake and grip mechanism, and tubes on the car through which the connecting means of the levers and brake and grip mechanism pass, substantially as described.

402,362. SMOKE-CONSUMING BOILER-FURNACE. JAMES STAPLETON, St. Louis, Mo. Filed Oct. 23, 1888. Serial No. 288,981. (No model.)

Claim.—1. In a boiler-furnace, the combination, with the fire-box having a grate, the boiler, and a combustion-chamber extending from

402,362.

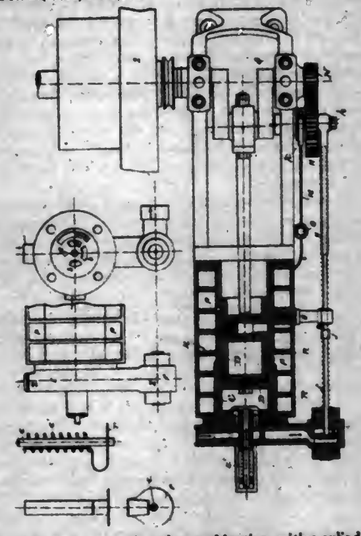


said fire-box under said boiler, of a perforated checker-wall at the end of said combustion-chamber remote from the fire-box, a steam-pipe arranged under the grate and having jets for forcing the products of combustion into the combustion-chamber, and a steam-pipe arranged behind the checker-wall and having jets discharging through said perforations into the combustion-chamber for retarding the current of the products of combustion and supplying the combustion-chamber with aqueous gases to promote combustion therein, substantially as set forth.

2. In a furnace, the combination, with the fire-box having a grate, the combustion-chamber, a bridge-wall dividing said combustion-chamber from said fire-box, and a perforated checker-wall arranged at the end of said combustion-chamber, of steam-jets arranged behind said checker-wall and discharging into said combustion-chamber toward the fire-box, and steam-jets arranged under said grate remote from said bridge-wall and inclined upwardly and toward the jets behind the checker-wall, substantially as set forth.

3. In a steam-boiler furnace, the combination of the fire-box, the combustion-chamber, the grates beneath said fire-box, the bridge-wall between the fire-box and combustion-chamber, the perforated bridge-plate, the perforated checker-wall at the rear terminal of the combustion-chamber, the steam-pipe 30, the jet-tubes from said pipe that discharge between the grate-bars, the steam-pipe 35, the jet-tubes from said pipe that discharge through the perforations of the bridge-plate, the steam-pipe 39 at the exhaust of the combustion-chamber, and the jet-tubes that discharge through perforations in the checker-wall and provide a buffer-draft at the exhaust of the combustion-chamber to prevent the too rapid exhaust from the same, substantially as and for the purpose set forth.

402,363. GAS-ENGINE. HENRI TRITSCH, Paris, France. Filed Jan. 16, 1888. Serial No. 296,505. (No model.) Patented in France July 7, 1887, No. 184,406; in Belgium Feb. 13, 1888, No. 80,630, and in England Feb. 24, 1888, No. 2,804.

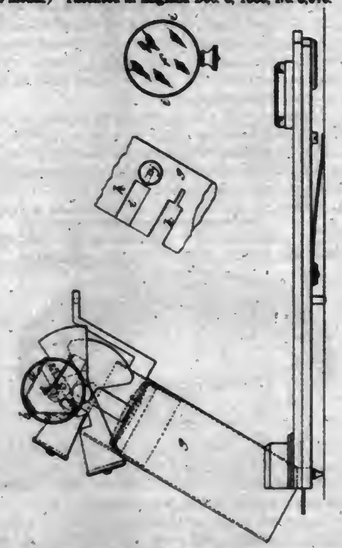


Claim.—1. In a gas-engine, the combination, with a cylinder and piston, of the ports for admission of air and gas, a single valve opening by operation of the piston at each alternate forward stroke thereof while the exhaust-port is closed, an exhaust-valve, a valve-rod therefor provided with a collar or boss, an actuating-rod connected with the main shaft by suitable gearing, so as to make one reciprocation for two revolutions of the main shaft, a governor, and a movable stop operated thereby and adapted, when excessive speed is developed, to be thrown into the path of the collar or boss on said valve-rod and prevent the complete closing of the valve, substantially as described.

2. The combination, with the cylinder and piston, of the valve-box cast in one piece and bolted to the end of the cylinder, said valve-box containing passages for supplying air and gas, a single valve controlling the same, an exhaust passage or outlet, and a valve controlling the same, substantially as described.

3. The combination, with the valve, valve-rod, and spiral retracting-spring encircling the same, of a spring-blade arranged in contact with the coils of said spring for preventing concussion of the valve against its seat, substantially as described

402,364. AZIMUTH-INSTRUMENT. WILLIAM THOMSON, Glasgow, County of Lanark, Scotland. Filed Nov. 5, 1885. Serial No. 181,986. (No model.) Patented in England Dec. 8, 1883, No. 5,676.



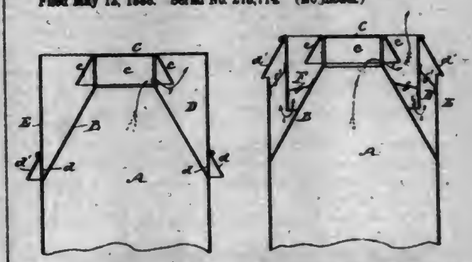
Claim.—1. An azimuth-mirror having one or more eccentrically-mounted lenses, substantially as described.

2. An azimuth-mirror having a tube, *g*, formed with slot or slots and provided with one or more lenses, substantially as described.

3. An azimuth-mirror having a totally-reflecting prism, *c*, and one or more lenses, substantially as described.

4. An azimuth-mirror having a tube, *g*, formed with slot or slots, provided with one or more eccentrically-mounted lenses and a totally-reflecting prism, substantially as described.

402,365. CHIMNEY-COWL. ISAAC J. TURNER, Princeton, N. J. Filed May 12, 1888. Serial No. 273,714. (No model.)



Claim.—1. In a chimney-cowl, the combination, with a number of outwardly-swinging doors for the escape of downdrafts located on the cowl at different points of the compass, of a deflector arranged within the cowl for directing the downdrafts to the doors, substantially as and for the purpose set forth.

2. In a chimney-cowl, the open flue or body A, arranged centrally therein, the cover C, the casing or flange E, and the outwardly-swinging doors for the escape of downdrafts.

3. The combination of the flue or body A, having a contracted top, the cover C, placed over and in close proximity to the flue or body A, the outer flange or casing extending around the mouth of the flue or body A, and the hinged doors *d'*, substantially as set forth.

4. The pyramidal or contracted flue or body A, having the cover C, in combination with the flange or casing E, intermediate plate, F, and doors *d'*, hinged to the top of the plate F, substantially as described.

402,366. HEEL FOR BOOTS OR SHOES. FRANCISCO P. URRUELA, Madrid, Spain. Filed Dec. 3, 1888. Serial No. 292,561. (No model.) Patented in Spain Aug. 16, 1888, No. 8,507, and in England Nov. 14 1888, No. 16,548.



Claim.—1. The combination, with a boot or shoe heel having the top lift with the U-shaped recess above said lift, of the removable sliding heel-plate having the U-shaped plate thereon fitting within the U-shaped recess in the heel, and the screw passing through said parts within the space between the arms of the U-shaped plate for holding the parts in position, substantially as described.

2. The combination, with a boot or shoe heel having the extended top lift with the U-shaped recess above the same around the outside of the heel, of the removable sliding heel-plate having the flanged U shaped plate substantially U-shaped in cross-section secured thereto and fitting within the circumferential U-shaped recess in the heel, and the screw for holding the parts in position, substantially as described.

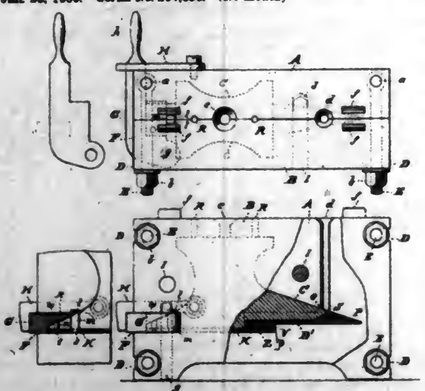
402,367. ELECTRIC BELT. WILLIAM L. VAN DORN, Brooklyn, N. Y. Filed Mar. 5, 1889. Serial No. 301,924. (No model.)



Claim.—1. An electric belt carrying positive and negative electrodes and a strip of cloth or flannel interposed between the same and saturated with a composition of water, capsicum, calcic chloride, and oxide of zinc, to serve substantially as specified.

2. As an improved article of manufacture, the electric belt described, consisting, essentially, of the web A, having punctures therein, the outer zinc and copper plates B C, also having punctures and secured to the web by metallic eyelets, the wire *c*, flexibly connecting said plates, the inner zinc and copper plates B C, the flannel strip saturated with an exciting solution and interposed between the two sets of plates, the flannel strip E, covering the battery-plates, and the terminal electrodes F, arranged substantially as shown and described.

402,368. ANVIL-MOLD. THOMAS W. VARE, Trenton, N. J. Filed Jan. 28, 1889. Serial No. 297,858. (No model.)



Claim.—1. A metallic anvil-mold consisting of lateral mold-sections and having an opening at the level of the floor of the matrix for the insertion of a face-plate piece, and a closing-gate forming a part of the matrix, substantially as specified.

2. The combination, with the lateral sections of a metallic anvil-mold, notched or recessed to form an opening into the matrix at the level of its floor, of the fastenings holding the sections together, the dowel guide-pins, and the closing-gate for said opening and its fastening, substantially as specified.

3. In a metal anvil-mold, the combination, with its lateral sections notched or recessed to form a horizontal opening into the matrix, and the closing-gate for said opening, of the face-plate piece adapted to be inserted through said opening into the matrix, substantially as specified.

4. In a metal anvil-mold, the combination, with the lateral sections of the mold notched or recessed to form a horizontal opening, and having the pouring-gates for the body and horn portions, as indicated, of the closing-gate and the face-plate piece consisting of the main plate and horn-plate connected, substantially as specified.

402,369. BRICK-KILN. ERNEST VON OVEN, Naperville, Ill. Filed Dec. 20, 1888. Serial No. 294,161. (No model.)



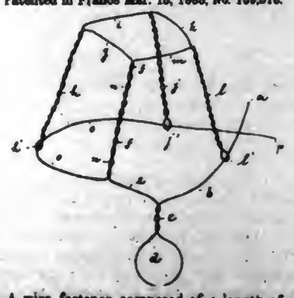
Claim.—1. In combination with the superstructure of a kiln for burning brick, tile, and the like, a kiln-bottom, B, having a series of flues, *r*, a series of flues, *m*, and an intervening flue, H, into which the flues *r* lead, a main flue, I, in the base of the bottom B and forming the ultimate outlet for the products of combustion, and flues M, communicating directly with the flues *m* and extending below the flues *r* into the main flue I, substantially as described.

2. In combination with the superstructure of a kiln for burning brick, tile, and the like, a kiln-bottom, B, having a series of flues, *r*, a series of flues, *m*, and an intervening flue, H, flues G, extending radially from near the center of the kiln into the flue H and communicating directly with the flues *r*, a main flue, I, in the base of the bottom B and forming the ultimate outlet for the products of combustion, and flues M, extending radially from near the wall of the kiln between the flues G into the main flue below the flues *r* and communicating directly with the flues *m*, substantially as described.

3. In combination with the superstructure of a kiln for burning brick, tile, and the like, a kiln-bottom, B, having a series of flues, *r*, a series of flues, *m*, and an intervening deeper flue, H, flues G, extending radially from near the center of the kiln into the flue H and communicating directly with the flues *r*, a main flue, I, extending from near the center of the base of the bottom to the chimney K, flues M and M', extending radially from near the wall of the kiln between the flues G into the main flue below the flues *r* and communicating directly with the flues *m*, and lateral branches *x* on the flues M', substantially as described.

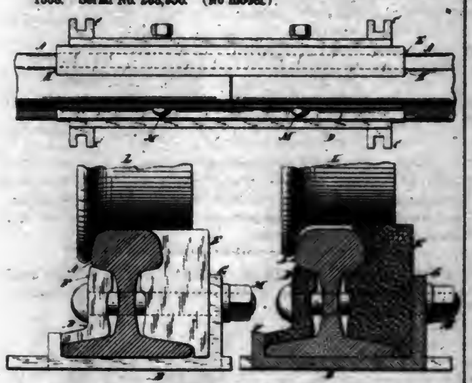
4. In a kiln for burning brick, tile, and the like, the superstructure comprising an outer wall, D, and crown E, forming together, substantially, a hemisphere, an inner wall, D', joining the outer wall near its junction with the crown, and fire-chambers L, formed at intervals between the walls D and D' and opening at their upper ends into the kiln, substantially as and for the purpose set forth.

402,370. WIRE FASTENING FOR BOTTLE-STOPPERS. PAUL O. WALCH, Paris, France. Filed Aug. 8, 1888. Serial No. 282,260. (No model.) Patented in France Mar. 13, 1888, No. 189,318.



Claim.—A wire fastener composed of a length of wire bent to form a series of twisted shanks connected on top and terminating in loops at their lower ends, and to form a neck-wire which is provided with a twisted portion, *c*, and loop *d*, and which passes through the loops at the ends of the twisted shanks, substantially as specified.

402,371. FISH-PLATE AND CHAIR. GEORGE A. WEBER, New York, N. Y., assignor to Caroline C. Weber, same place. Filed Mar. 30, 1888. Serial No. 268,950. (No model.)



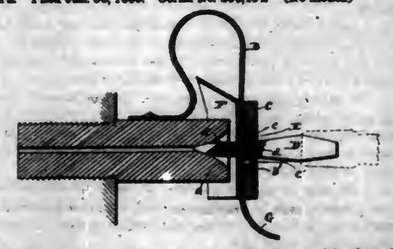
Claim.—The combination of the rail A, fish-plate D, fish-block E, occupying part of the surface of the rail at the joint, the bearing-surface of said block E being equal in length to the block itself, and the chair B, having bends F and G, for holding the parts D and E, and the transverse horizontal bolt M, locking together the chair and fish-plates, substantially as described.

402,372. RAIL-JOINT. GEORGE A. WEBER, New York, N. Y., assignor to Caroline C. Weber, same place. Filed Feb. 1, 1889. Serial No. 298,394. (No model.)



Claim.—The combination of the rail 12, fish-plate 6, fish-plate 7, having chambers 8 and 9, each filled with elastic packing, and the chair 1, having lips or flanges 3 and 4, the flange 4, extending over the elastic packing in chamber or recess 9, and the bolt 10, locking together the chair and fish-plates, substantially as described.

402,373. GAGE-COCK. DAVID B. WHITEHILL, North Clarendon, Pa. Filed Jan. 30, 1889. Serial No. 298,134. (No model.)



Claim.—1. In a gage-cock, the combination, with the tube, of the spring B, attached thereto and extending in front of the end thereof, and the adjustable plug attached to the spring and fitting in the outer end of the bore of the tube, substantially as specified.

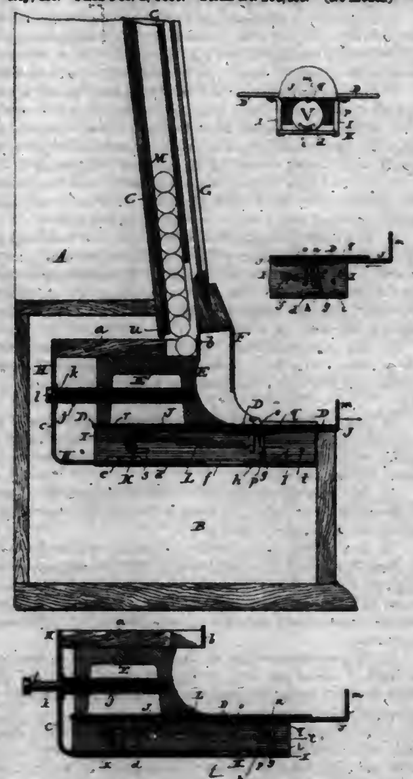
2. In a gage-cock, the combination, with the tube and the spring attached thereto, of the block provided with a recess, *c*, the plug mounted in registering perforations in the block and spring and provided with a series of perforations, and the transverse adjusting-pin fitting in the said perforations and operating in the recess *c*, substantially as specified.

3. In a gage-cock, the combination, with the tube, of the spring attached thereto and carrying a plug which fits in the bore of the tube, and the cap attached to the spring and fitting over the outer end of the tube, substantially as and for the purpose specified.

4. In a gage, the combination, with the tube and the spring attached thereto, of the revoluble plug D, mounted in the spring, fitting in its inner end in the bore of the tube and provided with a squared outer end, substantially as specified.

5. In a gage-cock, the combination, with a tube having the outer end of its bore flared and the spring attached to the tube, of the revoluble plug mounted in the free end of the spring and provided with a tapered inner end fitting in the flared bore of the tube, substantially as specified.

402,374. VENDING APPARATUS. JOHN A. WILLIAMS, Kansas City, Mo. Filed Feb. 2, 1889. Serial No. 298,460. (No model.)



Claim.—1. In a vending-machine, the combination, with a reciprocating delivery-slide provided with a lug, as *i*, of a reciprocating operating-slide, and a coin-holder secured to the operating-slide in rear of the lug on the delivery-slide and adapted to hold and support the coin, whereby, when a coin of the requisite size is inserted, it will, upon movement of the operating-slide, come into engagement with the lug on the delivery-slide and actuate the latter.

2. In a vending-machine, the combination, with the operating-slide provided with the separated arms *p p*, adapted to hold the coin by its side edges, of a lug, *q*, on the operating-slide in advance of and midway between the arms *p p*, and a delivering-slide provided with a lug, *i*, in advance of and midway between the arms *p p*, all substantially as shown.

3. In a vending-machine, the combination, with a delivery-slide, of an independent operating-slide, a coin-holder secured to the latter and adapted to hold the coin in position to strike the delivery-slide, and a lug, as *k*, secured to the latter, whereby, when the operating-slide is released, the coin will strike the lug and be deposited in the box.

4. In a vending-machine, the combination, with a delivery-slide and an operating-slide adapted to be connected by means of a coin, of a locking device for holding the delivery-slide in its extended position during the return movement of the operating-slide.

5. In a vending-machine in which the delivery and operating slides are connected by means of a coin, the combination, with said slides and a suitable coin-holder, of a pawl or dog adapted to engage the delivery-slide, said dog being arranged in position to be struck by the operating-slide.

6. In a vending-machine, the combination, with the delivery and operating slides and their retracting-springs, of a coin-holder secured to the operating-slide, as and for the purpose set forth, and a pawl or dog to engage the delivery-slide and arranged in the path of the operating-slide.

7. In a vending-machine in which the delivery and operating

slides are connected by a coin, the combination, with said slides and their retracting-springs, of the coin-holder secured to the operating-slide, the lugs *h* and *i*, secured to the delivery-slide, and a pawl or dog to engage the delivery-slide, arranged in the path of the operating-slide, whereby, when the latter is released, the coin will be discharged before the delivery-slide begins to move backward.

8. In a vending-machine, the combination, with the delivery-slide provided with a ratchet, *c*, and a spring, of the operating-slide provided with a coin-holder and a spring, and a pivoted pawl or dog having a tail or arm to extend upward behind the operating-slide.

9. In a vending-machine, the combination, with the delivery-slide provided with a ratchet and a spring, of the operating-slide provided with a coin-holder, a pivoted pawl or dog provided with an arm to engage the ratchet and an arm to extend upward behind the operating-slide, and a spring connecting the said slide with the pawl.

10. In a vending-machine, the combination, with the delivery-slide provided with lugs *h* and *i*, separated as shown, of the operating-slide provided with a slot, *n*, and arms *p p*, and a rib, *q*.

11. In a vending-machine, the combination, with a delivery-slide and a slotted operating-slide adapted to be connected by a coin, of the arms *p p*, secured to the under side of the operating-slide in line with the rear wall of the slot, and a rib or lug, *q*, also on the under side of the slide, and adapted, if the coin be of the proper size, to hold said coin at its upper edge.

12. In a vending-machine, the combination, with the operating-slide provided with a slot, *n*, arms *p p*, and lug or rib *q*, of the delivery-slide provided with a sharpened or pointed lug, *i*, to engage the coin.

13. In a vending-machine, the combination, with the main plate D, provided with a coin-slot, *o*, of the operating-slide provided with a slot, *n*, to register with slot *o*, and having its rear wall sharpened, as and for the purpose set forth.

14. In a vending-machine, the combination, with the frame, of the parallel grooved guides I, secured thereto, and the operating and delivery slides mounted in said guides.

15. In a vending-machine, the combination, with the frame A, of the plate D, the block E, resting thereon, the operating-slide beneath the plate, and the delivery-slide provided with a delivering-frame, *a b*, to rest upon the block, and with a plate, *d d*, to be engaged by the coin, the frame *a b* and plate *d d* of the delivery-slide being connected by an arm, *c*.

16. In a vending-machine, the combination, with the chutes and the block E below the same, of the delivery-slide provided with a flat block and a forwardly-extending open frame, and means for actuating the slide.

17. In a vending-machine, the combination, with the chutes and the block E, of the delivery-slide, the bolt or stem secured to the block and provided with a head or enlargement at its outer end, a spring coiled about the bolt and bearing at its ends against the block and a part of the slide, and means for actuating the slide.

18. In a vending-machine, the combination, with the frame A, having chutes C, of the block E below the chutes, having its front face curved, as shown, the door provided with a guard, and the delivery-slide interposed between the block and the chutes.

402,375. LEATHER-CUTTING TOOL. HENRY W. WINTER, Boston, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed July 16 1888. Serial No. 280,057. (No model.)

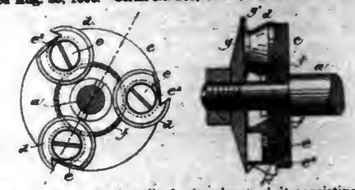


Claim.—1. The herein-described cutting-tool, composed, essentially, of a plate or hub, *c*, one or more hollow cutters slotted to form throats, and the guard *g* at the outer end of the cutter, and having a thin edge, *g'*, to enter the rand-crease, to operate substantially as described.

2. The plate or hub *c*, recessed to receive the cylindrical ends of several cutters, and the plate *g*, combined with a series of cutters cylindrical in cross-section, each slotted to form an open throat for the discharge of the material, and screws to fix the cutters to the plate *c*, and with the register having pins to insure the correct position for the edges of the cutters, substantially as described.

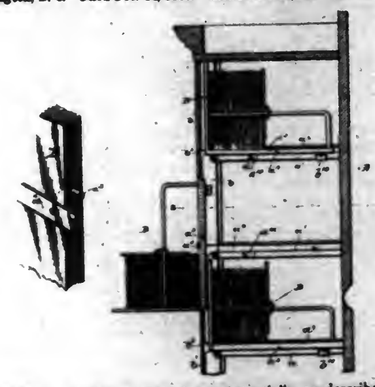
3. The plate or hub *c*, provided with a boss, combined with a cutter cylindrical in cross-section and slotted to form an open throat, and with a screw to confine the cutter in place, the said boss entering a hole in the cutter, and thereby serving to locate the center of the cutter properly with relation to the center of the plate, substantially as described.

402,376. TRIMMING-TOOL FOR BOOTS OR SHOES. HENRY W. WINTER, Boston, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed Aug. 25, 1888. Serial No. 283,733. (No model.)



Claim.—The herein-described trimming-tool, it consisting, essentially, of a plate, a series of circular cutters attached thereto, and connected pinions or teeth, combined with a plate or gear to engage and simultaneously rotate the said cutters more or less on the said plate, substantially as described.

402,377. FILE CASE OR CABINET. WILLIAM T. WOOD, Washington, D. C. Filed Dec. 14, 1888. Serial No. 293,546. (No model.)



Claim.—1. The combination, substantially as described and shown, of a file case or cabinet, movable file-boxes therein, and vertical guides at the front to receive the boxes when withdrawn and admit of their being carried upward and downward.

2. A case or cabinet and a contained file-box removable at the front, in combination with two side guides extending downward at the front of the case to receive the box when withdrawn and guide it in its descent.

3. A case or cabinet and two vertical guides, bars, or rails at its front, in combination with a vertical row of file-boxes arranged to slide inward and outward between the guides and to slide upward and downward thereon when withdrawn from the cabinet.

4. The case or cabinet provided with the horizontally-grooved bars or guides *a* and the vertical grooved guides at the front, in combination with the file-boxes having studs arranged to travel in said guides, whereby the boxes are held and guided in both their horizontal and their vertical movements.

5. A file case or cabinet provided at the front with vertically-grooved guides or rails, in combination with file-boxes provided with side studs or projections to enter the said vertical grooves as the boxes are withdrawn from the case.

6. A file case or cabinet provided with vertical front guides or rails having horizontal notches or openings therethrough, in combination with file-boxes arranged to slide into and out of the cabinet and provided at each side with two projections, one of which passes through the corresponding notched guide when the file is withdrawn from the case, whereby the box is adapted for withdrawal to slide upon and interlock with vertical guides.

7. In combination with a cabinet having the horizontal rails or bars *a*, the vertical notched guides, and the cross-bars *d*, the file-boxes provided with lateral studs or projections a^3 and a^4, whereby the boxes are vertically guided and automatically suspended when withdrawn from the cabinet.

8. The file case or cabinet composed of the standards, the horizontal guides *a*, attached thereto, the transverse rods extended through the standards, and the keys or fastening devices connecting the rods and standards.

9. The knock-down file-case consisting of parallel vertical frames provided with horizontal bars or guides *a* and cross-bars passed through and keyed to the standards, as shown.

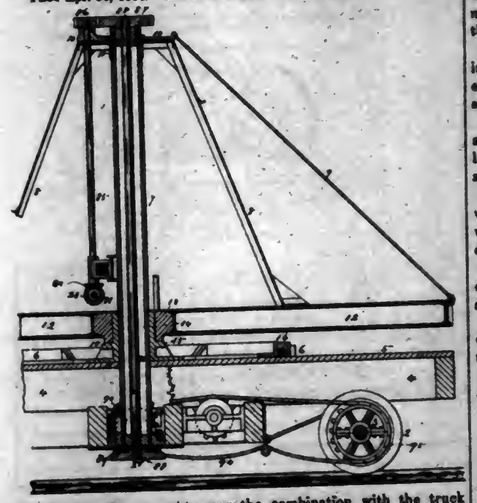
10. The sheet-metal standard for a file-case, composed of the vertical halves having their forward edges bent apart to form vertical guides or flanges.

11. In combination with the bar *a*, having the notched ends, the two-part standard having its rear edges brought together and inserted into the bar *a*, as shown.

12. The case having the vertically-grooved front guides and the horizontally-grooved guides *a*, with notches a^{10} therein, in combination with the file having the rear lips, b^{16}, and the side studs to ride in the grooves, whereby the box is compelled to slide horizontally on guides *a*, but permitted to tip forward and slide downward in the vertical guides.

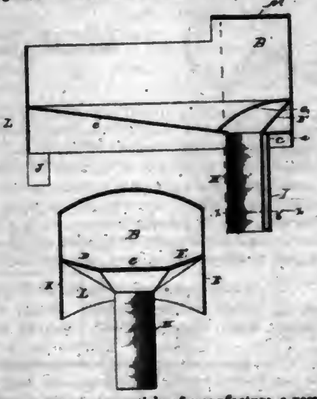
13. The case or cabinet provided with vertical guides, the movable file-boxes adapted to engage said guides, and a shelf applied to the case and adapted to sustain the boxes when lowered thereon.

402,378. WRECKING-CAR. MORRIS WUKEFEL, St. Louis, Mo. Filed Apr. 30, 1888. Serial No. 272,365. (No model.)



Claim.—In a wrecking-car, the combination, with the truck mounted on wheels, of the master-wheel mounted on said truck and having a hub, 14, provided with a flange, the frame 12, having a hub surrounding the hub 14 and resting upon said flange, a hollow mast passing through said hubs, the collar 11, secured to the upper end of said mast, a shaft, 88, passing through said mast and collar and carrying a gear-wheel at both ends, the head 10, swiveled upon said collar, braces supporting said head, the driving mechanism, the vertical shaft 85, passing through said head and having a gear meshing with the gear on the shaft 88 and geared to the driving mechanism, and gearing connecting the said shaft 88 with the truck-wheels, substantially as set forth.

402,379. FUNNEL. CHRISTIAN XANDER and WILLIAM THOMAS, Washington, D. C. Filed June 14, 1888. Serial No. 277,119. (No model.)



Claim.—1. As a new article of manufacture, a vessel for filling barrels, tanks, or the like, comprising a tank, constructed substantially as set forth and to rest upon the exterior of the barrel, provided with a downwardly-inclined bottom, and a funnel-nozzle extending from the lowest portion of said bottom, substantially as described.

2. A vessel for filling barrels or the like, comprising a tank, constructed substantially as set forth and provided with downwardly-extending sides or legs to hold the same in position upon the exterior of the vessel to be filled, and a funnel-nozzle extending downwardly from the bottom of said tank, substantially as described.

3. As a new article of manufacture, a vessel for filling barrels or the like, comprising a tank, constructed substantially as set forth, to rest upon the exterior of the barrel, a funnel-nozzle extending downwardly from the bottom of said tank, and a hood partially closing the top of the tank at end, constructed and arranged substantially as described.

4. A barrel-funnel comprising a tank, constructed substantially as set forth, to rest upon the exterior of the barrel, a nozzle extending downwardly from the bottom of the tank, said bottom slanting downwardly to the mouth of the nozzle from all sides, a screen permanently secured over the mouth of said nozzle, and a vent-tube for the nozzle, substantially as described.

5. The combination, in a vessel having sides and ends, of the inclined bottom terminating in a funnel-nozzle provided with an air-eduction tube, and the screen, and concave ends, substantially as described.

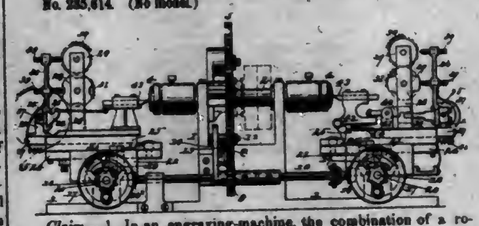
6. The combination, in a vessel for filling barrels, having sides and ends to fit the contour of the barrel, and provided with an angularly-inclined bottom, of a screen and funnel-nozzle, the latter having a vent-tube, substantially as described.

7. The combination, in a vessel for filling barrels and the like, provided with two parallel sides and concave ends, the former being provided with legs, whereby the vessel is kept in a horizontal position, of the angularly-inclined bottom and a funnel-nozzle, as set forth.

8. The combination, in a vessel for filling barrels, having sides and ends, as described, and a funnel-nozzle, of the hood or crown M, constructed and arranged substantially as described.

9. The combination, in a vessel for filling barrels, as described, of the inclined bottom, a funnel-nozzle, and a screen, air-eduction tube, and hood M, all operating together as set forth.

402,380. MACHINE FOR ENGRAVING WATCH OR OTHER CASES. ANI ZUAHLEN, Philadelphia, Pa. Filed Sept. 17, 1888. Serial No. 285,614. (No model.)



Claim.—1. In an engraving-machine, the combination of a rotary shaft having journal-bearings between its ends, heads or mandrels secured to said ends and adapted to receive the cases, and engraving mechanism adapted to contact with the cases on both of said ends, substantially as described.

2. In an engraving-machine, the combination of a shaft having cases on each of its ends, gearing operated by said shaft, traveling screws operated by said gearing, and carriages mounted on said screws carrying engraving mechanism for engraving the cases on the ends of the shaft, substantially in the manner described.

3. In an engraving-machine, the combination of a frame having a central upright, a driving-shaft journaled in said upright with cases on its free ends, gearing operated by the driving-shaft, traveling screws mounted in the frame, on each side thereof, and operated by said gearing, and carriages carrying engraving mechanism traveling on said screws, substantially in the manner described.

4. In an engraving-machine, the combination of a driving-shaft having cases on each end thereof, gearing operated by said shaft, a shaft operated by said gearing and having a bevel gear-wheel on each end thereof, bevel gear-wheels meshing with the gears on said shaft, traveling screws operated by said last-named gear-wheels, carriages having engraving mechanism mounted thereon, said carriages being operated by the traveling screws, substantially in the manner and for the purpose described.

5. In an engraving-machine, the combination of a shaft having a bevel gear-wheel at each end, the bevel gear-wheels meshing therewith, the screws on which said gear-wheels are loosely mounted, the toothed wheels on the screws, and devices on the bevel gear-wheels for engaging the toothed wheels to cause the motion of the bevel gear-wheels to be transmitted to the screws, substantially as and for the purpose described.

6. In an engraving-machine, the combination of the arm having a curved slot, the arm having an elongated slot, and a pin or stud arranged in the curved slot of the first-mentioned arm, a gear-wheel having a stud or pin arranged in the elongated slot, and the gear-wheel meshing with said gear-wheel, said parts being arranged and adapted to operate substantially in the manner and for the purpose described.

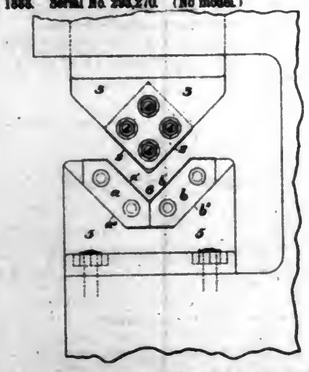
7. In an engraving-machine, the combination of the carriages having the channels in their upper faces, the plates fitting in said channels, the plates pivoted to said plates having curved grooves in their under side and channels in their upper sides, posts, studs, or rollers adapted to enter the curved grooves, the plates fitting in the chambers, and the design-rollers, rock-arms, and grooves mounted on the last-mentioned plate, all arranged and adapted to operate in the manner and for the purpose described.

8. In an engraving-machine, the combination of the carriage having the channel in its upper side, the plate fitting and adapted to slide in said channel, the plate pivoted to said sliding plate and having a channel in its upper side, the plates fitting in said channels, the uprights rising from said plates, the design-rollers mounted in said uprights, the rock-arms and operating-screws therefor, the rods connected at one end to the lower ends of the rock-arms, and the cutter or graver connected with the other ends of said rods, all of said parts being arranged and adapted to operate substantially in the manner and for the purpose described.

9. An engraving-machine having a series of rotary shafts, each having bearings between its ends, heads or mandrels secured to said ends, the said series of shafts having gearing operating from a common driving-shaft, and engraving mechanism adapted to contact with the cases on each of said heads, said parts being combined substantially as and for the purpose set forth.

10. In an engraving-machine, the plate 27, with uprights 33, the pivoted lever 34, having beveled outer ends, the rock-arms 36, with beveled lower end, the pins 39, and design-rollers, said parts being combined substantially as and for the purpose set forth.

402,881. SHEAR-KNIFE. HENRY AIKEN, Homestead, Pa. Filed Dec. 11, 1888. Serial No. 293,270. (No model.)



Claim.—1. An angled shear-knife made in separate interchangeable sections constituting the sides of the angle, substantially as and for the purpose described.

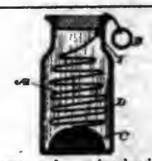
2. An angled shear-knife made in sections which constitute the sides of the angle, each section having its ends formed at equal angles, so that the knife may be shifted to present fresh cutting-edges, substantially as and for the purposes described.

3. An angled shear-knife made in sections which are reversible and which constitute the sides of the angle, each section having its ends formed at equal angles, so that the knife may be shifted to present fresh cutting-edges, substantially as and for the purposes described.

4. An angled shear-knife made in separate interchangeable sections constituting the sides of the angles, and a knife-holder having an angular recess in which the said sections are fitted, substantially as and for the purposes described.

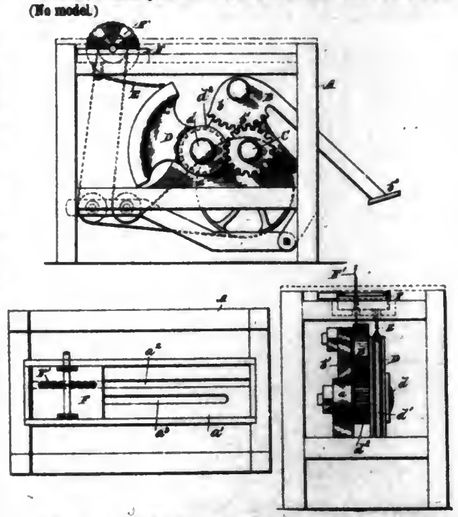
5. A shear-knife holder having an angular recess for reception of the shear-knife, and an equiangular polygonal shear-knife secured therein having shearing-edges which fit against the sides of said recess, in virtue of which any one of its salient angles may be presented in cutting, in combination with a bed-knife having an angular cutting-edge the counterpart of the salient angle of the first-named shear-knife, substantially as and for the purposes described.

402,882. FLY-CATCHER. ALBERT ARENTS, Alameda, Cal. Filed Aug. 29, 1888. Serial No. 284,072. (No model.)



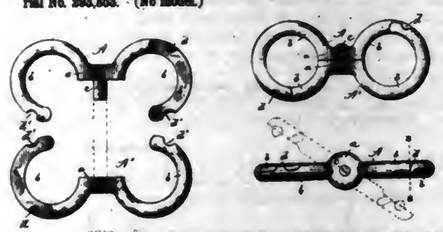
Claim.—An improved fly-catcher consisting of a bottle containing a suitable sticky compound, a string having a suspending-loop at one end and a button at the opposite end for securing the string within the bottle, said string having also the knot I, which lies under the bottle-stopper and serves to remove it when desired, as herein set forth.

402,883. TREADLE SAW-FEEDER. HENRY ARNDT and FRANK STUTZMAN, Williamsport, Pa. Filed Dec. 31, 1887. Serial No. 258,497. (No model.)



Claim.—In a treadle saw-feed, a saw-plate having a saw suitably mounted in it, combined with the mechanism, as described, consisting of a treadle having a curved rack, a cog, and a cam having cogs on its shaft, and a connecting bar or chain whereby the forward movement of said plate can be obtained.

402,884. LAP-RING. WILLIAM H. BAKER, Pontiac, Mich., assignor of one-half to Samuel W. Smith, same place. Filed Dec. 17, 1888. Serial No. 293,863. (No model.)

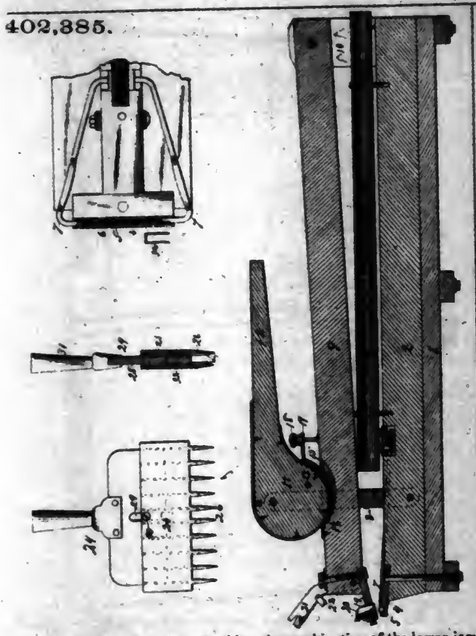


Claim.—As an improved article of manufacture, a lap-ring consisting of the two sections A A', these sections being pivoted together and constructed each of a disk, *a*, and the oppositely-projecting hook portions *b*, having their adjacent faces flattened and their exposed surfaces rounded, each of the said hook portions having projecting from its outer edge an integral lug, *d*, these lugs fitting in recesses formed in the outer edges of the adjacent hook portions and having their outer or exposed portions rounded to conform to the contour of the rings formed by the said hook portions, substantially as herein set forth.

402,885. BROOM-MAKING MACHINE. GEORGE H. BALDWIN, Grand Summit, Kans. Filed July 16, 1887. Serial No. 244,480. (No model.)

Claim.—1. In a broom-making machine, a staple-driver consisting of a narrow box having registering and tapering teeth upon the lower edges of its sides formed with grooves for the reception of the legs of the staples in their inner sides, and a flat block sliding in the box, as and for the purpose shown and set forth.

402,885.



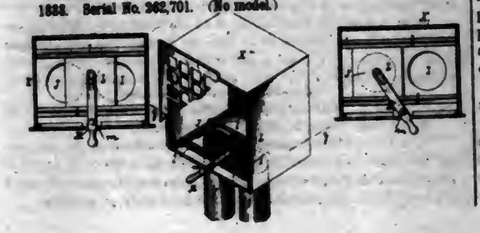
2. In a broom-making machine, the combination of the lower jaw of a broom-holding vise formed with a groove having oblique pairs of notches in it, an upper jaw formed with a narrow box open at top and bottom and registering with the groove, a staple-driver consisting of a narrow box fitting in the box of the upper jaw and having registering and tapering teeth upon the lower edges of its sides formed with grooves for the reception of the legs of the staples in their inner sides and a flat block or plunger sliding within the box, and means for forcing the staple-driver through the broom, as and for the purpose shown and set forth.

3. In a broom-making machine, the combination of the lower jaw of a broom-holding vise formed with a groove having oblique pairs of notches in it, an upper jaw formed with a narrow box open at the top and bottom and registering with the groove, a bifurcated lever pivoted upon the upper jaw with its ends and having pivoted bearing-blocks near its ends, and a staple-driver consisting of a narrow box fitting in the box of the jaw and having tapering teeth arranged in registering pairs upon the lower edges of the sides and formed with grooves upon the inner sides for the reception of the legs of the staples and of a flat block or plunger sliding within the box, as and for the purpose shown and set forth.

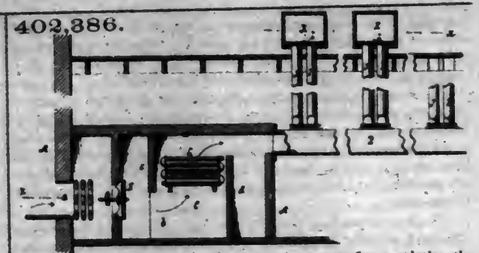
4. In a broom-making machine, the combination of a beam for the lower jaw having two uprights near the forward end, a beam for the upper jaw pivoted between upright ears at the rear end of the lower beam and having a recess in its upper side near the free end, an eccentric cam-disk pivoted between the uprights and having a handle, and a segmental strip or bar pivoted with one end in the forward end of the recess and having its rear end bent and provided with a set-screw passing through it and bearing against the upper side of the beam, as and for the purpose shown and set forth.

5. In a broom-making machine, the combination of a stationary lower jaw, a pivoted upper jaw having means for forcing it down, and a tube for the reception of the broom-handle secured to the lower jaw between it and the upper jaw, as and for the purpose shown and set forth.

402,886. APPARATUS FOR HEATING AND VENTILATING BUILDINGS. WILLIAM J. BALDWIN, Brooklyn, N. Y. Filed Feb. 2, 1888. Serial No. 262,701. (No model.)



402,886.



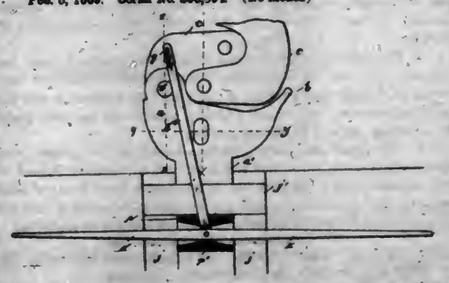
Claim.—1. The combination, in an apparatus for regulating the supply of hot and cold air to different rooms of a building, of a head communicating at one side with the room, the separate pipes I J, opening into said head, and a valve or slide moving in a right line across the openings of the pipes and adapted to close or partly close either one and effect an equal opening of the other pipe, substantially as shown and described.

2. The combination, with a furnace having a hot-air chamber and a separate chamber containing a radiator or coil for removing the chill from the air, of separate pipes connected with said chambers, a head with which said pipes have separate and adjacent communication, and a valve sliding in a right line across the open ends of both pipes and adapted to close or partly close either one of said pipes and effect an equal opening of the other pipe, substantially as described.

3. The combination, with the furnace A, having separate chambers B and C, one adapted to supply heated air and the other to supply cold air, of the fan H, the extensions D and E, the pipes I and J, running from the extensions to the rooms, the head K, in which the pipes I and J have their terminals side by side, the valve L, moving in said head to cover or partly cover either terminal and equally uncover the other, and the lever M, substantially as described.

4. The combination, with the pipes I and J, one for hot and the other for cold air, of a head, K, opening on one side into the room to be heated, and having upon another side the terminals of the pipes entering side by side, a valve, L, moving in a right line over said terminals, and having such dimensions as to wholly close or partly close either pipe and effect an equal opening of the other, and a lever operating said valve, substantially as shown and described.

402,887. CAR-COUPLING. NICHOLAS BARR, Cayuta, N. Y. Filed Feb. 5, 1889. Serial No. 298,894. (No model.)



Claim.—1. In a twin-jaw car-coupler, the combination of the coupling-head having a recess in its front end and a vertical passage for the locking-pin extending through the head and opening into the recess, a movable jaw pivoted in the head and having a heel to swing into the recess, a locking-pin to lock the heel in the recess, and a swinging pin-holder adapted to hold the pin suspended and extend into the path of the heel when the same is swung out, whereby, when the heel is swung in, the holder is swung back and the pin dropped into locking position, substantially as described.

2. In a twin-jaw car-coupling, the combination of the coupling having a rigid jaw, a movable jaw pivoted to the head and having a heel to swing in and out of the head, a vertically-movable locking-pin in the head adapted to lock the heel in the head, and a swinging pin-holder in the head adapted to removably hold the pin suspended and movably extend into the path of the heel when the heel is swung out, substantially as described.

3. In a car-coupling, the combination of a coupling-head, the rigid guide or jaw, the movable jaw, said head having a recess in which the movable jaw is pivoted and in or out of which the heel of said jaw can swing, a locking-pin to lock said heel in the recess, said head being provided with a vertical passage for the locking-pin opening into the jaw-heel recess, and with a recess to the rear of the jaw-heel recess and pin-passage, and a pin-holder provided with pintles

journaled in the pin-passage adapted to support the pin on its upper edge and extend in the heel-recess, whereby, when the heel is swung in, said holder is swung back into said rear recess and the pin is dropped in front of the heel, substantially as described.

4. A coupling-head having a rigid jaw or guide and a recess in its front end, in combination with a movable jaw pivoted in said recess by a pivot-pin and having recesses in its upper and lower sides directly in rear of said pivot, and shoulders on the inner walls of said recess to fit in said recesses, and thereby remove the strain from the pin and withstand the strain when the pin is removed, substantially as described.

5. In a car-coupling, the coupling-head with its draw-bar and the rigid and movable jaws, in combination with a lever pivoted to the draw-bar and extending to one side of the car, and having a forwardly-extending arm loosely pivoted to the movable jaw, whereby the same can be swung out or in from the side of the car, substantially as described.

6. In a car-coupling, the coupling-head and its draw-bar and pivoted jaws, in combination with a lever extending across the bottom of the car and pivoted to swing horizontally and provided with a downward bend around the draw-bar, and an arm extending forwardly from the lever and loosely secured to the under side of the movable jaw, and provided with a downward bend to pass beneath a support of the draw-bar, substantially as described.

402,388. SPRING-HINGE. RICHARD BELCHER, Haymarket, Va.

Filed Aug. 13, 1888. Serial No. 282,586. (No model.)



Claim.—1. The combination, with the base having the two guides thereon, of the bolt moving in such guides, formed in two parts hinged together, and the hinge-plate hinged to one of said sections, substantially as described.

2. The combination, with the base having the two guides thereon and the slots beneath such guides, of the bolt moving in the guides, formed in two sections hinged together, and the hinge-plate hinged to one of said sections, substantially as described.

3. The combination, with the base having the two guides thereon, the bolt formed in two sections hinged together, one section adapted to normally rest in each guide and the hinge-plate united to one section, of the spring engaging one of said sections and abutting against the base for returning the bolt to normal position, substantially as described.

4. The combination, with the base having the guides thereon, the two-part bolt, and the hinge-plate united thereto, of the rod connected to the base and working through a guide on the bolt, and the spring surrounding the rod and abutting against the base and guide for returning the bolt to normal position.

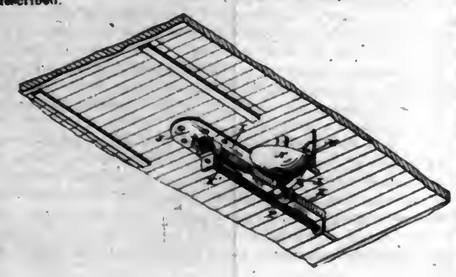
5. The combination, with the base having the two guides, with slots beneath the same, of the bolt moving in said guides, formed in two sections hinged together, the hinge-plate hinged to one of said sections, the rod and its guide, and the spring surrounding said rod for returning the bolt to normal position, substantially as described.

402,389. FIRE-ESCAPE. RICHARD BELCHER, Haymarket, Va.

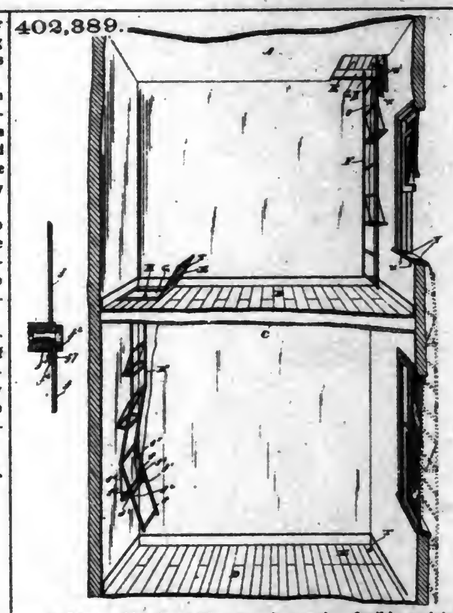
Filed Aug. 23, 1888. Serial No. 283,531. (No model.)

Claim.—1. The combination, with the ladder composed of the strap-iron side pieces jointed together at the rounds to fold toward each other in but one direction, of the braces pivoted to the ladder and extending on the side toward which the sections of the ladder fold, substantially as and for the purpose set forth.

2. The combination, with a trap-door and a flexible ladder, of a connection between said door and ladder, whereby upon fully extending the ladder the door will be automatically closed, substantially as described.



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3. The combination, with a trap-door and a flexible or jointed ladder, of a connection between the ladder and door, which raises a portion of the ladder when the door is opened and automatically closes the door when the ladder is fully extended, substantially as described.

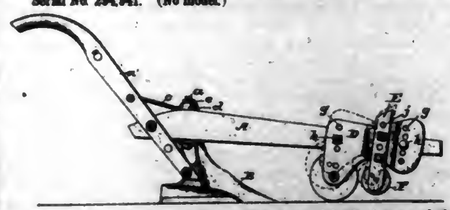
4. The combination, with the trap-door, of the hinge for holding the door off the center, the flexible ladder, and the door-closing connection between the door and ladder, substantially as described, for the purpose specified.

5. The combination, with the ladder-compartment between adjacent upper and lower rooms, of a stripping-bar in said compartment extending transversely across the laths, and a device, such as a bolt, extending through the ceiling below by which to operate the said stripping-bar from the room below, substantially as described.

6. The combination, with a ladder-compartment and a ladder therein, of a hinged stripping-bar extending transversely across the laths at the bottom of said compartment, substantially as described.

7. The combination, with a ladder-compartment and a ladder therein, of a ball-shaped stripping-bar extending transversely across the laths at the bottom and at each side of the compartment, substantially as described.

402,890. PLOW. CRALY BILLUPS, Norfolk, Va. Filed Dec. 29, 1888. Serial No. 294,941. (No model.)



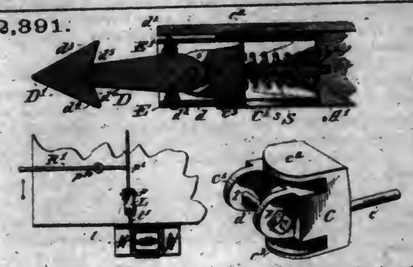
Claim.—1. In a plow, the combination, with the beam, of the brace *c*, secured to one of the handles and having an eye resting on the beam and hung over the top end of the beam-bolt, the concave washer having a notch in its edge to fit the brace, the bolt *a*, and nut, all substantially as shown, and for the purpose described.

2. In a plow, the combination, with the beam, of a pair of adjustable jaws attached thereto at or near its forward end and adapted to carry a rolling colter, and a pair of legs or brackets having a roller vertically adjustable on the jaws, substantially as described.

402,891. CAR-COUPLING. PHILIP BOELER, Stewart, Minn. Filed Oct. 9, 1888. Serial No. 287,661. (No model.)

Claim.—1. The combination, with the bed-frame of the car, having the transverse plates F and E, of the pivot-block C, provided with horizontal flanges c^2 and c^3, loosely engaging the plates F and E and carrying the pivoted draw-bar D, substantially as specified.

402,891.

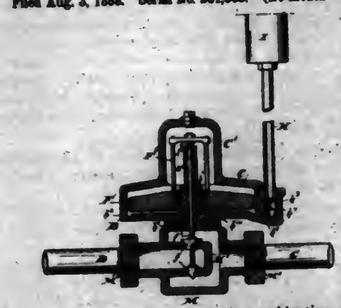


2. The combination, with the bed-frame of the car, having the transverse plates E and E, of the pivot-block C, engaging such transverse plates and provided with the vertical jaws c' c', carrying the spring-supported draw-bar D, and provided also with the rearwardly-extending spring-carrying spindle *c*, substantially as shown and described.

3. The combination, with the bed-frame A', of the pivot-block C, having the top and bottom horizontal flanges, c^2 and c^3, and the vertical jaws c' c', and the draw-bar D, pivoted in the jaws c', and provided with top and bottom sustaining-springs, d' and d^2, substantially as specified.

4. The combination, with the pivot-block C, having engaging-flanges, vertical jaws, and rearwardly-extending spindle, of the draw-bar D, pivoted in the vertical jaws of the block C, provided with top and bottom springs and with arrow-head, and having lifting-chain *f'*, attached to the side of such arrow-head, substantially in the manner and for the purposes set forth.

402,892. PRESSURE-REGULATOR. JOHN D. BOWMAN, Altoona, Pa. Filed Aug. 3, 1888. Serial No. 281,883. (No model.)



Claim.—1. In a pressure-regulator, the combination, with a conduit, of a regulator-valve situated therein, a chamber adapted to contain mercury and made of two sections, B and C C', a central tube, E, extending upward in the chamber from the lower section, B, and opening into the conduit, a passage, b^2, leading from the bottom of the chamber, an upright pipe connecting with said passage and open to the air, an annular float, F, fitting in the enlarged bottom of the chamber, as described, a tube, F', or its equivalent, extending from said float along and above the tube E, and a connecting device securing the tube F' to the regulating-valve.

2. In a pressure-regulator, the combination of a chamber adapted to contain mercury and made of two sections, B and C C', with a central tube, E, having a valve-seat at its top and extending upward in the chamber from the section B, a passage, b^2, leading through section B to the tube E, by which said tube is connected with a supply-pipe, a narrow passage, b^3, leading from the bottom of the chamber, an upright pipe connecting with said passage and open to the air, a pipe, G, leading from the chamber, an annular float, F, fitting in the enlarged bottom of the chamber, as described, a tube, F', or its equivalent, extending from said float along and above the tube E, and a valve secured to the end of tube F' and above the valve-seat *e*, all substantially as and for the purpose specified.

3. In a pressure-regulator, the combination of a chamber adapted to contain mercury and made of two sections, B and C C', with a central tube, E, having double valve-seats *e e*, facing each other at its top and extending upward in the chamber from the section B, a passage, b^2, leading through section B to the tube E, by which said tube is connected with a supply-pipe, a narrow passage, b^3, leading from the bottom of the chamber, an upright pipe connecting with said passage and open to the air, a pipe, G, leading from the valve-chamber, an annular float, F, fitting in the enlarged bottom of the chamber, as described, a tube, F', or its equivalent, extending from said float along and above the tube E, and a double-faced valve, *f f'*, secured between the valve-seats *e e* by means of a rod, f^2, extending from the end of tube F', all substantially as and for the purpose specified.

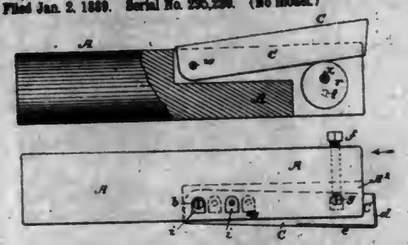
4. In a pressure-regulator, the combination of a chamber adapted to contain mercury and made of two sections, B and C C', with a central tube, E, having a valve-seat at its top and extending upward in the chamber from the section B, a passage, b^2, leading through section B to the tube E, by which said tube is connected with a supply-pipe, a narrow passage, b^3, leading from the bottom of the regulator-chamber, an upright pipe connecting with said passage and open to the air, a chamber, I, secured to said pipe and provided with devices, as described, for intercepting mercury, a pipe, G, leading from the regulator-chamber, an annular float, F, fitting in the enlarged bottom of the regulator-chamber, as described, a tube, F', or its equivalent, extending from said float along and above the tube E, and a valve secured to the end of the tube F' and above the valve-seat *e*, all substantially as and for the purpose specified.

402,893. MACHINE FOR MIXING MINERAL COMPOUNDS. MILTON BROUGHTON, Syracuse, N.Y. Filed Apr. 30, 1888. Serial No. 272,311. (No model.)



Claim.—In a machine for mixing minerals, &c., the combination of troughs arranged parallel side by side, shafts extending longitudinally through said troughs and geared to rotate in opposite directions, and paddles projecting from the shafts only part way toward the center between the shafts and standing with the entire lengths of their flat sides at the same angle in relation to the axes of the shafts, substantially as described and shown.

402,894. BORING-TOOL. ALEXANDER R. BROWN, Cleveland, Ohio. Filed Jan. 2, 1889. Serial No. 295,290. (No model.)



Claim.—1. In a boring-tool, the combination, with the tool-holder or bar A, of a plate-like cutter, C, pivotally connected near its inner end to said tool-holder, means for adjusting or setting out the outer end of said cutter laterally of the tool-holder, and means for clamping or securely holding in adjustment said cutter, the whole constructed and operating substantially as specified, for the purposes set forth.

2. In combination with a suitable tool-holder or spindle-bar, A, a series of plate-like cutters arranged partially within suitable housings in said holder and having their cutting-edges in planes which pass radially through the said holder, suitable means for adjusting the cutting edges or portions of said plate-like cutters radially of the tool-holder and equidistant, respectively, from the axis of said holder, and means for clamping or holding in place said cutters when properly adjusted, all in substantially the manner hereinbefore set forth.

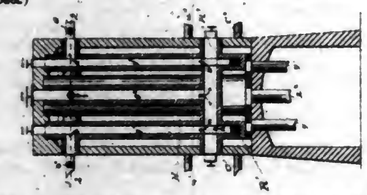
3. In combination with the tool-holder A and a plate-like cutter, C, arranged partially within a housing in said holder, a movable or adjustable pivotal connection between said cutter and holder, and means for holding fast the outer or operative end of the adjustable cutter, all substantially as and for the purposes set forth.

4. In a boring-tool of the type shown and described, the combination, with the slotted-out tool-holder A and a series of plate-like cutters, C, pivotally connected therewith, as specified, of a series of adjusting cam-like disks and a series of clamping-screws for holding fast said cam-like disks and said cutters, all substantially as hereinbefore set forth.

5. In a boring-tool of the type shown and described, the combination, with the tool-holder A and a cutter, C, arranged partially

within a housing of said holder and laterally adjustable therein, of a series of screw-holes in the holder, a series of indentations in the cutter-plate C, and a removable set-screw adapted to effect the pivotal engagement of the cutter and holder at different points as the cutter becomes worn and has to be set farther out endwise, all substantially as hereinbefore set forth.

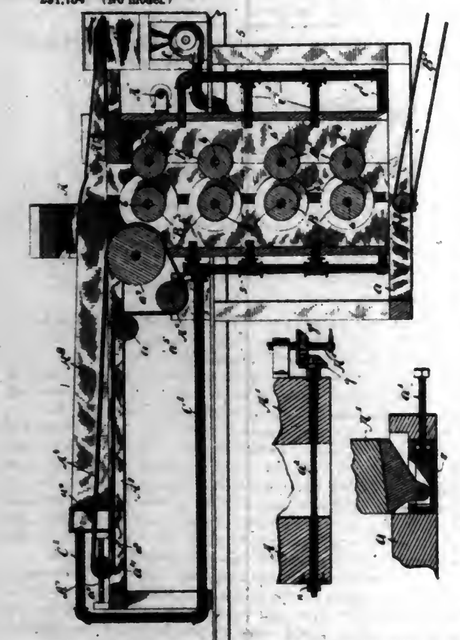
402,395. APPARATUS FOR THE MANUFACTURE OF GAS. GEO. H. BROWN, St. Louis, Mo. Filed Jan. 16, 1889. Serial No. 296,561. (No model.)



Claim.—1. The combination, with the generators and the fixing-chamber, of the series of superposed horizontal and vertical retorts contained in said chamber, the vertical retorts constituting at the same time flues through which the gas is both supplied to and carried off from each one of the horizontal retorts, substantially as and for the purposes hereinbefore set forth.

2. The fixing-chamber provided with a vertical partition-wall dividing it into two combustion-chambers communicating with each other at one end and at the opposite end provided each with a valve-controlled outlet, and the generators communicating one with one and the other with the other combustion-chamber, in combination with the superposed series of horizontal and vertical retorts contained in said fixing-chamber, the vertical retorts constituting at the same time flues through which gas is both supplied to and carried off from each one of the horizontal retorts, substantially as and for the purposes hereinbefore set forth.

402,396. BREAD-MAKING MACHINE. PETER F. BRYCE and ALEXANDER F. BRYCE, Indianapolis, Ind. Filed Nov. 24, 1888. Serial No. 291,734. (No model.)



Claim.—1. The combination, in a bread-making machine, of the two-part frame, one part of which is adjustable toward and from the other, a series of rolls arranged in pairs, one roll of each pair being mounted on said adjustable portion of the frame, and the gearing for operating said rolls, substantially as set forth.

2. In a bread-making machine, the combination of the frame consisting of the rigid portion A, the adjustable portion A', and the table portion A^2, a series of rolls arranged in pairs, one roll of each pair being mounted on the rigid portion A and the other on the adjustable portion A' of the frame, an endless feeding-apron mounted on said table portion, and the gearing for operating said several parts, substantially as set forth.

3. The combination, in a bread-making machine, of the frame, the rolls for reducing the dough, and an apparatus for dusting said rolls, consisting of a blow-fan connected with the flour-supply, and pipes connecting said blow-fan with the casing in which said rolls are mounted, and the operating mechanism, substantially as set forth.

4. The combination, in a machine for rolling out dough, of the frame, the reducing-rolls, the feeding-apron, the hopper C^2, casing C', a conveyer connecting said hopper and said casing, a blow-fan, and a pipe running from said casing to the casing containing said reducing-rolls, and the gearing for driving said several operating parts, substantially as set forth.

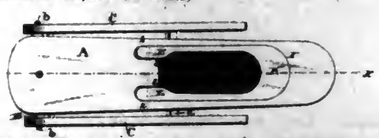
5. In a machine for rolling out dough, the combination of the reducing-rolls, the feeding-apron, the blow-fan, the flour-supply connected with said blow-fan, the system of pipes connected with said blow-fan and arranged to discharge onto said rolls and feeding-apron, and the air-supply pipe for said blow-fan, arranged with its mouth just above said rolls and the discharge end of said feeding-apron, substantially as described, and for the purpose specified.

6. The combination, in a bread-making machine, of a frame consisting of a rigid portion carrying one of each of the pair of rolls, an adjustable portion carrying the other rolls, and the screw-threaded rods a^3, by which the movement of said adjustable portion is effected, substantially as set forth.

7. The combination of the rigid frame portion A, the adjustable portion A', sills *a*, carrying sliding parts or shoes to which said adjustable portion is hinged, screws for adjusting said sliding shoes, the screw-threaded rods at the top extending from said portion A' to said portion A for securing and adjusting the top of said portion A', the pairs of rolls, one of each pair being journaled on the portion A and the other on the portion A', and the gearing for driving said rolls, substantially as set forth.

8. In a machine for rolling dough, the combination of the frame, the series of rolls arranged with the space between the rolls of each pair narrowing from the top to the bottom of the machine, gear-wheels on the ends of the journals of each roll of an increasing size from the bottom to the top, and intermediate gear-wheels connecting the gear-wheels of the rolls on each side, all arranged and operating substantially as set forth.

402,397. IRONING-BOARD. GEORGE W. CARR, Richmond, Va., assignor of one-half to Edwin W. Grafton, same place. Filed Dec. 1, 1888. Serial No. 292,423. (No model.)



Claim.—The ironing-board A, cut out to form a recess, I, and bosom-board J, in combination with the pivoted piece K, adapted to fit into the recess, substantially as and for the purpose herein shown and set forth.

402,398. AUTOMATIC RAILWAY-SIGNAL. JOHN T. CARTER, Baltimore, Md., assignor of one-half to Frank J. Hilbert, same place. Filed Nov. 8, 1888. Serial No. 290,283. (No model.)

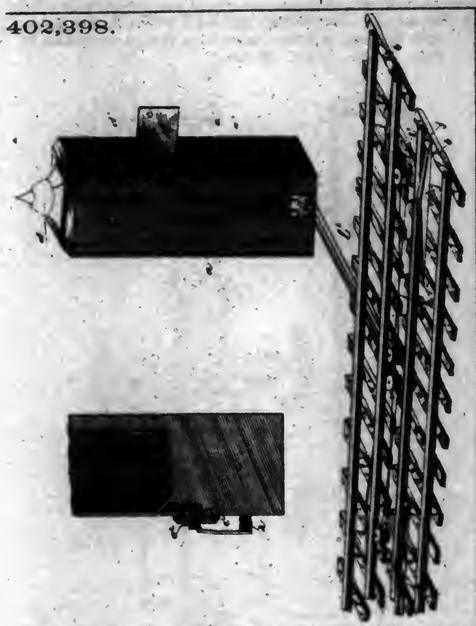
Claim.—1. In a railway-signal, the combination of a signal-box, a movable semaphore normally located therein, an audible alarm, a rocking shaft to sound the alarm, a vertically-swinging lever pivoted within the box and carrying the semaphore and adapted to display or withdraw the same and simultaneously rock said shaft to start or stop the alarm, and a trip connected with the lever and located on the track and operated by a passing train, substantially as described.

2. In a railway-signal, the combination of a movable semaphore, a gong, an electric circuit including the gong, a circuit-controller in the circuit, a lever to simultaneously display the semaphore and operate the circuit-controller to close the circuit and sound the gong, and mechanism connected with said lever and operated by a passing train, substantially as described.

3. A railway-signal comprising a centrally-pivoted lever movable in a vertical plane, an upwardly-extending rod carried by and swinging with said lever, a semaphore carried by the upper portion of said rod, an inclosing signal-box, whereby, when one arm of the lever is depressed, the semaphore is displayed, and when the other arm is depressed the semaphore is withdrawn, and mechanism for operating the lever, substantially as described.

4. In a railway-signal, the combination of a signal-box, a lever pivoted therein and movable in a vertical plane, an upwardly-extending swinging rod carried by and moving with the lever, a weight upon the upper end of said rod, a semaphore carried by the upper portion

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of the rod and displayed when the rod is swung in one direction and withdrawn when the same is swung in the opposite direction, and a trip located on the track and connected with said lever, substantially as described.

5. A railway-signal comprising a signal-box, a lever centrally pivoted in the box to swing in a vertical plane, a swinging rod secured at its lower end to said lever and extending upwardly from the same and counterbalanced at its upper free end, a semaphore carried by the upper portion of said rod and adapted to be displayed when the lever and rod are swung in one direction and to be withdrawn when the same are swung in the opposite direction, and a pair of trips located upon opposite sides of a railway-crossing and connected, respectively, with the opposite free ends of said lever, substantially as described.

6. A railway-signal comprising a signal-box, a vertical support therein, a lever pivoted at its center to said support to swing in a vertical plane, a swinging rod carried by the lever and counterbalanced at its upper end, a semaphore carried by the upper portion of the rod, an electric circuit including a gong and circuit-controller, a rock-shaft mounted on said support to close or open the circuit and operated by said lever, and trips located on a track and connected with the opposite ends of said lever, substantially as described.

7. A railway-signal comprising a T-lever pivoted to swing in a vertical plane, a swinging rod secured at its lower end centrally to the same and weighted at its upper end, a visual signal carried by the upper portion of the rod, and a pair of trips located upon a railway-track and connected, respectively, with the opposite ends of said lever to swing the rod in opposite directions, substantially as described.

8. A railway-signal comprising a rod mounted to swing in a vertical plane, a hollow apertured counterbalancing-weight upon its upper end, a signal lamp or light within the weight, a signal-box, and mechanism upon the track to swing the rod to display or withdraw the signal-light, substantially as described.

9. A railway-signal comprising a signal-box, a counterbalanced rod mounted at its lower end in the box upon a lever to swing in a vertical plane, a lamp or light carried by the upper end of the rod, a flag or similar signal carried by the upper portion of the rod, and mechanism upon the track connected with the lever to swing the rod and display or withdraw the signals, substantially as described.

10. A railway-signal comprising a movable visual signal and an audible alarm, an electric circuit including the alarm, a circuit-closer, and mechanism located upon the track and operated by a passing train to simultaneously operate the visual signal and audible alarm, substantially as described.

402,399. BACK-BAND TRACE-CARRIER. JOSEPH COLLIN, New Orleans, La. Filed Oct. 27, 1888. Serial No. 289,901. (No model.)

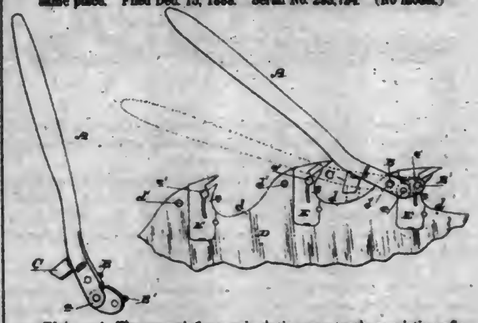
Claim.—The within-described back-band buckle consisting of the bars *a b c*, having spaces *d e* between the same, the bar *b*, provided with outwardly-projecting spurs *f*, and the sides of the buckle pro-

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jecting downward, thence inwardly, and having a connecting-web to form a broad flat hook, *x*, substantially as and for the purpose specified.

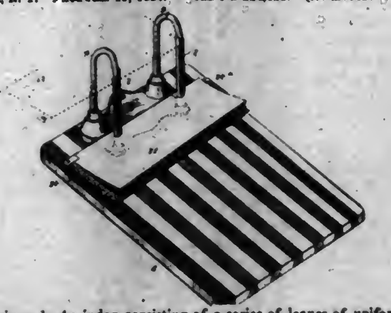
402,400. TOOL FOR MANIPULATING SAW-TEETH. FREDERICK W. COOK, San Francisco, Cal., assignor of one-half to H. F. Gregory & Co., same place. Filed Dec. 15, 1888. Serial No. 293,734. (No model.)



Claim.—1. The wrench for manipulating saw-teeth, consisting of a stock having separated pins for engaging sockets in the saw-plate and bit-holder, as described, said stock being hinged or pivotally jointed on a line between the pins, whereby the latter may be brought closer together or forced farther apart by the bending of the stock at its joint, substantially as herein described.

2. The wrench for manipulating saw-teeth, consisting of a stock having separated pins for engaging sockets in the saw-plate and bit-holder, as described, said stock being hinged or pivotally jointed on a line between the pins, whereby the latter may be brought closer together or forced farther apart by the bending of the stock at its joint, and a stop-piece on said stock for limiting its movement by contact with the saw-plate, substantially as herein described.

402,401. PAPER-FILING INDEX. WILLIAM A. COOKE, Jr., Brooklyn, N. Y. Filed Jan. 19, 1887. Serial No. 224,822. (No model.)



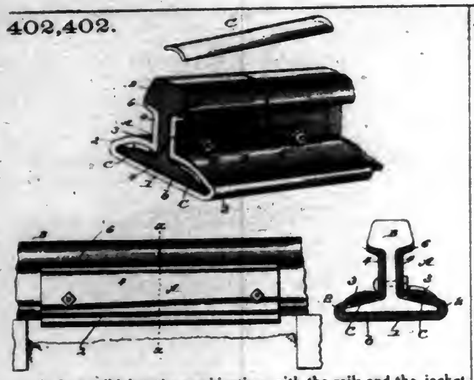
Claim.—1. An index consisting of a series of leaves of uniform width and length provided with index-characters, the series being divided into parts and the parts distinguished from each other by having the index-characters on opposite edges of their respective leaves, substantially as specified.

2. In combination with a letter-file composed of fixed and movable wires, a series of disconnected leaves of uniform width and length having perforations in one edge and provided with index-characters on both sides, the characters on one side being the next in order and in a reversed position relatively to those on the opposite side, and the said leaves being divided into parts distinguished from each other by having the index-characters on opposite sides or edges of their respective leaves, substantially as specified.

402,402. RAIL-JOINT. EDWIN M. COOKE, Brooklyn, assignor of one-half to Noyes C. Wooster, New York, N. Y. Filed Aug. 13, 1888. Serial No. 282,670. (No model.)

Claim.—1. In a rail-joint, a jacket formed with a base-plate, 1, goffers or corrugated portions 3, made of equal thickness throughout and inclined longitudinally, and side plates, 4, all substantially as set forth.

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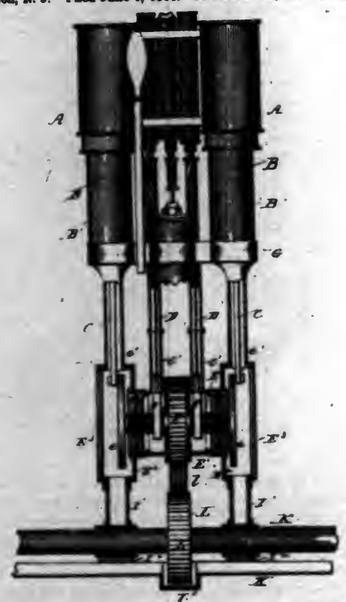


2. In a rail-joint, the combination, with the rails and the jacket fitted thereon, of the wedges or keys curved or arched transversely, substantially as and for the purposes specified.

3. The improved jacket for rail-joints, consisting of the base-plate 1, edge portions 2, goffers or corrugated portions 3, made of equal thickness throughout and inclined longitudinally, the portions 3 on opposite sides being inclined in reverse directions, and the side plates, 4, all substantially as and for the purposes specified.

4. The combination of the rails, the jacket formed with base-plate 1, edge portions 2, goffers or corrugated portions 3, inclined from end to end, and side plates, 4, the upper edges of the side plates fitting snugly under the tread of the rail, and a space being provided between the base of the rail and the base of the jacket, and the wedges or keys curved or arched transversely, all substantially as and for the purposes specified.

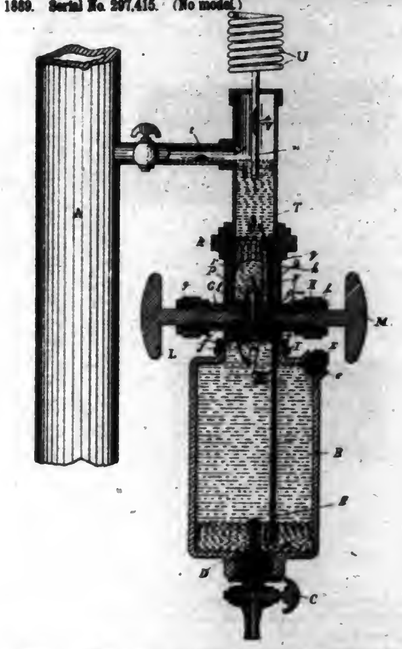
402,403. CASING FOR MARINE ENGINES. LUCIUS D. COPELAND, Camden, N. J. Filed June 1, 1888. Serial No. 275,739. (No model.)



Claim.—1. The combination, with a pair of twin engines coupled to a single driving-shaft, of a casing or shield inclosing the working parts of said engines and made in separable sections, that portion of the casing inclosing the main shaft being formed of the tubular cast section E' and circular boxes or heads E^2 E^3, fitted thereto by threaded connections and provided with removable end caps, E^3, substantially as described.

2. The combination, with a pair of twin engines coupled or connected to a single driving-shaft and with a horizontal propeller-shaft of a hollow casing inclosing the working parts of said engine, the hollow pillars I' I', supporting said casing and communicating with the interior thereof, and the arched plates or bearings I^2 I^2, upon which said pillars rest, substantially as described.

402,404. LUBRICATOR. WILLIAM H. COOPER, San José, Cal., assignor of one-half to Christian Anderson Fox, same place. Filed Jan. 24, 1889. Serial No. 297,415. (No model.)



Claim.—1. The combination of the oil-cup, the casing connected thereto having oil and water passages valved, as described, and sight-openings, and the pipe connected to said casing and to the main steam-pipe, the pipe *q*, rising in said casing, with the water-pipe depending in said cup, and the coiled condenser U, having depending perforated portion *u*, substantially as described.

2. The combination of the oil-cup and the casing having a partition provided with valved oil and water passages, the vertical pipe communicating therewith and connected at a single point with the main steam-pipe, with the coiled condenser U, connected to the upper end of said vertical pipe and having its inner end depending therein and perforated above its point of connection with the main steam-pipe, substantially as and for the purpose set forth.

3. The combination of the oil-cup and the valve-casing F, having partition K, formed with oil and water passages, and a tubular extension above said partition, the valves closing said passages, the pipe depending in said cup and connected to the water-passage, and the pipe T, connected to said extension above the passage, with the pipe *t*, connecting pipe T and the main steam-pipe, and the condenser-coil U, outside of and above pipe T, and having an end depending therein and perforated above the point where pipe *t* opens thereinto, substantially as described.

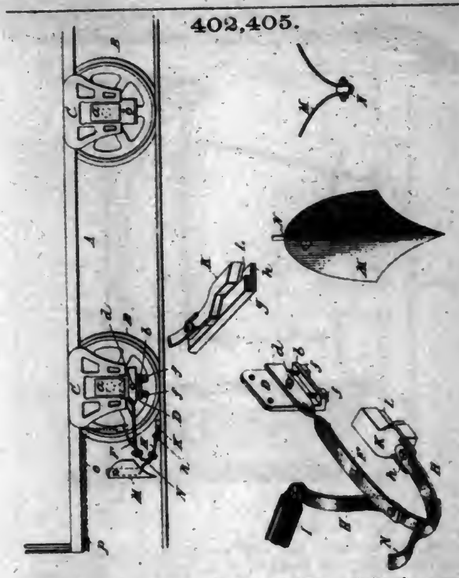
4. In a lubricator, the combination of the oil-cup having a petcock and drain-pipe D, and the valve-casing F, connected to said cup and having a partition, K, provided with oil and water passages, the valve-stems for closing said passages, and a tubular extension, *k*, above said partition having sight-openings *r*, closed by a glass tube, and the pipe S, connected to the water-opening and depending in the oil-cup below the upper end of pipe D, and the tube *q* in extension *k*, communicating with the water-passage, and the nipple Q, connected to the oil-passage, with the pipe T, connected to extension *k*, the valve-pipe *p*, making a single connection between pipe T and the steam-pipe, and the condenser-coil U, all substantially as specified.

402,405. TRACK-CLEARER. JOHN M. CHRISTOPHER, Clifton, Md. Filed June 1, 1888. Serial No. 275,736. (No model.)

Claim.—1. In a track-clearer, a spring-bar attached to the axle-box of a car, extending forward of the wheel and then backward toward the said wheel, and provided at its ends with a box or holder containing a block of rubber having a face adapted to fit the face of the track-rail, substantially as and for the purpose specified.

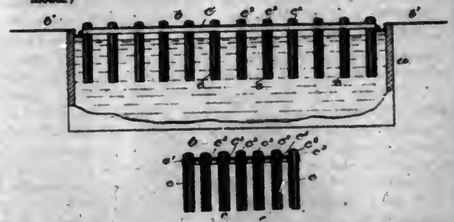
2. In a track-clearer, a spring-bar attached to the axle-box of the car, extending forward and then backward toward the wheel, having at its ends a box containing a block of rubber of angular shape as seen from its top, and provided with a face adapted to fit

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the surface of the track-rail, substantially as and for the purpose specified.

402,406. DRYING-FRAME FOR COATED CANDIES. ELIZABETH CLIFFORD, Boston, Mass. Filed May 10, 1888. Serial No. 273,406. (No model.)



Claim.—1. In an apparatus for drying coated drops of the kind described, a liquid-holding tray and an open-work frame, combined with several posts or rests, held in said frame and adapted to be heated by the contents of said tray and to support thereon the coated drops, substantially as described.

2. In an apparatus for drying coated drops, several posts or rests, *c*, having convex tops, combined with a support, a frame for said posts or rests, and the longitudinal stripe *c'*, substantially as described.

3. In an apparatus for drying coated drops, several tubular or hollow posts or rests, combined with the supporting-frame *b*, through which they pass, substantially as described.

4. In an apparatus for drying coated drops, the tubular or hollow posts or rests having open lower ends, convex upper ends or tops, c^2, and one or more vent-openings in the said ends or tops, combined with a liquid-holding tray into which said posts or rests are partially immersed, and a support for said posts or rests above said tray, substantially as described.

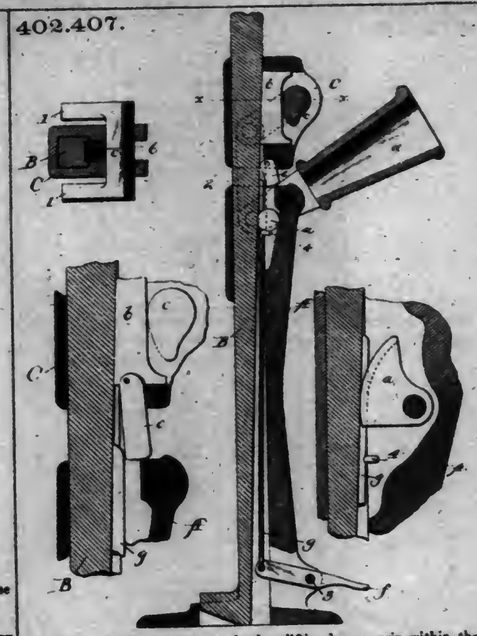
402,407. LIFTING-JACK. LOUIS J. CRECELIUS, St. Louis, Mo., assignor to Andrew Warren, same place. Filed Jan. 26, 1889. Serial No. 297,610. (No model.)

Claim.—1. In a lifting-jack, a standard, a lifting-bar, a holding-grip in the standard, a clutch-box, a cam-shaft within the clutch-box as operating-lever, and a positive connection between said lever and the cam-shaft for operating the same to grip and raise the lifting-bar, substantially as described.

2. In a lifting-jack, a standard, a lifting-bar, a clutch-box, a cam-shaft within said clutch-box, an operating-lever pivoted on the standard, arms I I, secured to the cam-shaft, and links connecting said arms with the lower end of the lever, substantially as described.

3. In a lifting-jack, a standard, a lifting-bar, a clutch-box, a cam-shaft, an interposed clutch-block between said shaft and the face of the lifting-bar, an operating-lever, and connections between said lever and the cam-shaft, substantially as described.

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4. In a lifting-jack, a standard, a lifting-bar, a grip within the standard, a clutch-box carrying a grip, a lever and connections for operating said grip, a lowering-lug carried by the clutch-box, the standard having an opening in line with the normal position of the lowering-lug, and means for releasing the grip in the standard and throwing aside the lowering-lug, substantially as described.

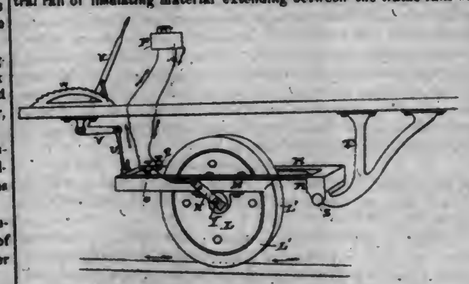
5. In combination, a standard, a lifting-bar, a grip within the standard, a clutch-box, a grip within the same, and an operating-lever, a lowering-lug carried by said clutch-box and pivoted at one side of the standard having an opening in line with the lowering-lug, a foot-lever at the base of the standard, and connections therefrom for releasing the grip in the standard and for throwing aside the lowering-lug, substantially as described.

6. In combination, a standard, a lifting-bar, a grip in the standard, a clutch-box, a clutch-block within the same, an operating-lever, a lowering-lug carried by said clutch-block and pivoted at one corner, the standard having an opening in the top thereof in line with the normal position of the lowering-lug, and a rod for releasing the grip in the standard and for throwing aside the lowering-lug, substantially as described.

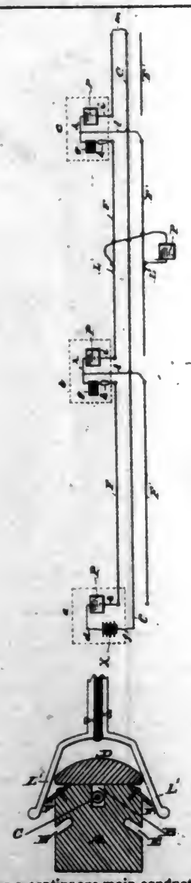
402,408. RAILWAY-TELEGRAPH. FRANK J. CROUCH, Oakland, assignor of one-half to C. P. Houston, Junction City, Oreg. Filed Jan. 21, 1887. Serial No. 225,088. (No model.)

Claim.—1. In a system of railway-telegraphy, a central rail of insulating material located between the traffic-rails of the road, having a continuous main conductor embedded therein, and sectional contact-plates fixed on bevels formed on the upper edges of the rail, in combination with a roof or water-shed over the top of the rail and partly extending over the contact-plates, and a longitudinally-inclined slot in each side of the rail for preventing the moisture of the ground from reaching the contact-rails, substantially as described.

2. In a system of railway-telegraphy, the combination of a central rail of insulating material extending between the traffic-rails of



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the road and having a continuous main conductor embedded therein, and sectional contact-plates fixed on bevels formed on the upper edges of the rail, with a contact-wheel carried upon a car of a train in a hinged frame, a lever fulcrumed in the car, and connections of the same with the frame for raising the wheel out of contact with the contact-plates and for lowering the same to establish contact, substantially as described.

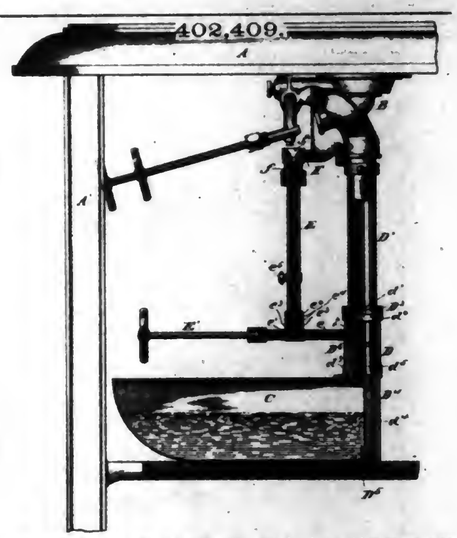
3. In a system of railway-telegraphy, the combination of an insulated main conductor and two sectional contact-plates extending between the traffic-rails of the road with a hinged frame upon a car traveling upon the road, having a contact-wheel mounted therein for establishing and breaking contact with the contact-plates, and a spring connecting the body of the frame with its hinges, whereby the frame and wheel will yield laterally to accommodate themselves to the curves of the road, substantially as described.

4. In a system of railway-telegraphy, the combination of a continuous main conductor and two sectional lines of contact-plates extending between the traffic-rails of the road, and signal-stations equipped with telegraphic apparatus and a resistance-coil located at the breaks in the sections of contact-rails, bridging the continuous sections of one of these lines, and also connected with one section of the other line, with a telegraphic outfit and a battery at one end of the road bridging the main conductor and the line of sectional rails bridged by the intermediate signal-stations, a permanent connection between the main conductor and said line of contact-plates at the other end of the road, and a traveling car provided with telegraphic instruments and with means for deriving current from the lines of contact-plates, substantially as described.

402,409. VAPOR-STOVE. SAMUEL DANIELS, Chicago, Ill., assignor to J. McGregor Adams, same place. Filed Nov. 17, 1888. Serial No. 291,120. (No model.)

Claim.—1. The combination, with a gasoline-tank, a generating-burner, and liquid and air pipes, respectively, for supplying and initially heating the generator, of a fitting, D, having a passage extending to the lower portion of the liquid-tank and a passage extending

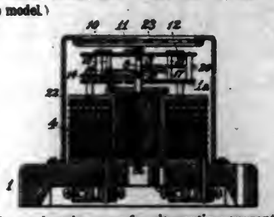
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from the upper portion of said tank, and having said passages connected, respectively, with the liquid and air pipes.

2. In combination with a gasoline-tank and a vapor-generator, an air-pipe leading from the air-space of the gasoline-tank and provided with a valved inlet for the admission of external air, substantially as described.

402,410. ELECTRIC METER FOR ALTERNATING CURRENTS. DELAMORE L. DAVIS, Salem, Ohio. Filed Jan. 15, 1889. Serial No. 296,409. (No model.)



Claim.—1. In an electric meter for alternating currents, the combination of an electro-magnet, an armature vibrating with the current-alternations and having a connected friction-plate, a disk subject to pressure from the friction-plate and rotated by its vibrations, and an indicating mechanism actuated by the disk, substantially as set forth.

2. In an electric meter for alternating currents, the combination of an electro-magnet, an armature which is movable in opposite directions under the attraction of the magnet and under its own elasticity, respectively, a friction-plate secured to the armature, a rotatable disk subject to pressure from the friction-plate, and an indicating mechanism actuated by the disk, substantially as set forth.

3. In an electric meter for alternating currents, the combination of a coil or helix, a core journaled on pivots and adapted to rotate within the helix, a disk fixed to said core concentric with its pivots, an armature-bar fixed at one end and extending therefrom adjacent to the disk and substantially tangential thereto, a friction-plate fixed to the free end of the armature-bar and bearing against the periphery of the disk, and an indicating mechanism actuated by the disk, substantially as set forth.

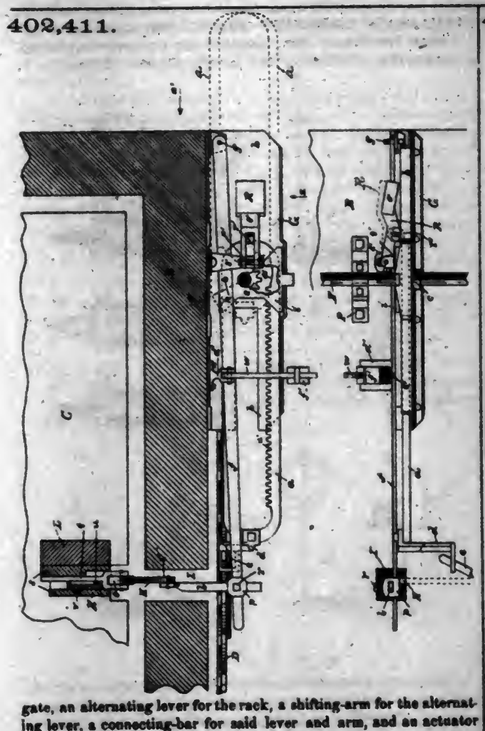
402,411. MECHANISM FOR OPERATING THE GATES OR DOORS OF ELEVATOR-WELLS. ORION L. DAVIS, Rochester, N. Y. Filed June 7, 1888. Serial No. 276,327. (No model.)

Claim.—1. In combination with a gate, a shaft and gear secured thereto, a rack for the gear, and a connecting-link for the rack and gate, said shaft turning always in the same direction, and the rack being capable of moving independently of the gate, substantially as described.

2. In combination with a gate, a revolving shaft and gear thereon, a sidewise-shiftable rack having rows of teeth facing each other for the gear, and a connecting-link for the rack and gate, substantially as described.

3. In combination with a rotatory shaft and gear and a movable gate, a laterally-shiftable rack, a connecting-link for the rack and

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gate, an alternating lever for the rack, a shifting-arm for the alternating lever, a connecting-bar for said lever and arm, and an actuator for the shifting-arm carried by the car, substantially as shown and described.

4. In combination with a rotatory shaft and gear and a movable gate, a laterally-shiftable rack, a connecting-link for the rack and gate, an alternating lever for the rack, a shifting-arm for the alternating lever within the well, a connecting-bar for said lever and arm, and an adjustable actuator projecting from the car to act upon the shifting-arm, substantially as and for the purpose set forth.

5. In combination with a rotatory shaft and gear and a movable gate, a rack, a connecting-link for the rack and gate, an alternating lever for the rack, a shifting-arm for the alternating lever within the well, a connecting-bar for said lever and arm, and an actuator for the shifting-arm carried by the car, said shifting-arm adapted to have a part of its surface traversed by the actuator in a vertical plane, substantially as and for the purpose set forth.

6. In combination with a gate, a revolving shaft, and gear thereon, a shiftable rack having opposing rows of teeth, and a connecting-link for the rack and gate, said rows of teeth of the rack extending longitudinally one beyond the other, as and for the purpose set forth.

7. In combination with a gate, a revolving shaft, and gear secured thereto, a rack for the gear, a connecting-link for the rack and gate, and a pushing-lever to force the rack beyond the action of the gear, for the purpose set forth.

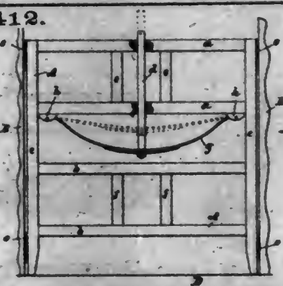
8. In combination with a revolving shaft and gear, a gate, a movable rack, a connecting-link for said rack and gate, a shifting-arm for the rack, and a returning-lever for the rack, substantially as shown and described.

402,412. ELEVATOR-GATE. ORION L. DAVIS, Rochester, N. Y. Filed June 18, 1888. Serial No. 277,451. (No model.)

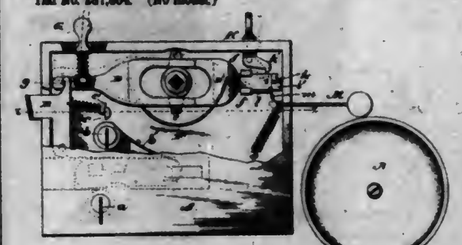
Claim.—In combination with the lifter of an elevator-car, a gate for the well, provided with a catch-bar held to move in vertical bearings in the gate, and a spring-connection between said catch-bar and gate, substantially as shown and described.



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402,413. ALARM-LOCK. GEORGE C. DAY, Nineveh, Pa., assignor of one-half to George M. Condit, same place. Filed Oct. 11, 1888. Serial No. 287,804. (No model.)



Claim.—1. The combination, in an alarm-lock, of the bifurcated bolts D and D′, having hooks which engage with the arms of the knob-spindle, a spring for holding said bolts apart and in contact with the arms of the knob-spindle, a pivoted latch, B, operated by one of the bolts, and a bell-hammer actuated by the other bolt, substantially as shown, and for the purpose set forth.

2. The combination, in a lock having bolts D and D′, and a bell-hammer actuated by one of said bolts, of a pivoted latch having an arm, *c*, stud *c′*, through which said arm passes, and a spiral spring for throwing said latch outwardly, the upper portion of said latch being bifurcated to engage with a pin, *g*, carried by the bolt D, substantially as shown, and for the purpose set forth.

3. The combination, in a lock, of the bifurcated bolt D, having hooks *d d*, which engage with arms on the knob-spindle, and a pin, G, extending through the lock-casing and engaging with the bolt for elevating the end thereof to throw the same out of engagement with the latch, substantially as shown, and for the purpose set forth.

4. The combination, in an alarm-lock, of the bolt D′, adapted to be actuated by the knob-spindle, said bolt being provided with an inclined notch, *k*, and a pivoted dog, K, provided with a hook to engage the notch *k* to hold said bolt out of engagement with the arms of the knob-spindle, so that the alarm will not be actuated, substantially as shown, and for the purpose set forth.

5. The combination, in an alarm-lock, of the bell, spring-actuated bell-hammer, and arm *m*, the bolt D′, having inclined portions *i* and *i′* and an inclined plate, *l*, over which the arm *m* rides to release the same from the notches formed on the end of the bolt D′, substantially as shown, and for the purpose set forth.

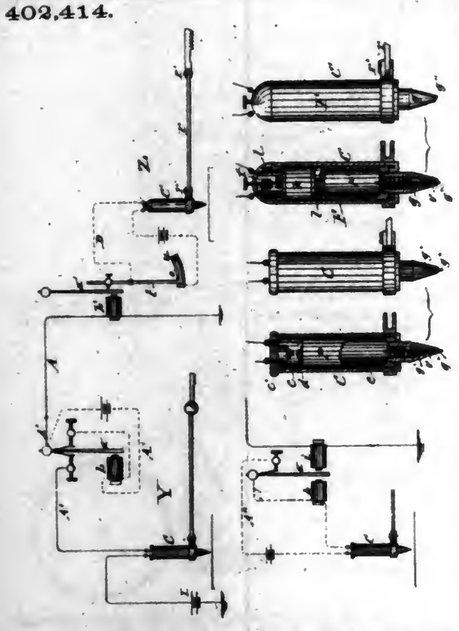
6. The combination, in an alarm-lock, of the bolts D and D′, constructed substantially as shown, and adapted to be operated by a single knob-spindle having arms *e e*, said bolts being provided with a common spring, F, guide-lugs *f f*, notches *i*, *i′*, and *k*, formed in the bolt D′, a dog, K, for engaging with one of said notches, and a spring-actuated bell-hammer with which the bolt D′ engages, a pin, G, extending through the lock-casing and engaging with the bolt D to hold the same out of engagement with the latch, and a latch, B, carrying a pivoted arm encircled by a spring, with which a key can engage for operating said latch independent of the knob-spindle, substantially as shown, and for the purpose set forth.

402,414. TELEGRAPHY. MARK W. DEWEY, Syracuse, N. Y., assignor, by direct and mesne assignments, to the Dewey Corporation, same place. Filed Oct. 3, 1888. Serial No. 287,069. (No model.)

Claim.—1. In the art of reproducing written characters electro-telegraphically, the method which consists in varying the strength of the line-current formed of rapid impulses and causing such varying line-current to actuate electro-magnetic devices to control the flow of ink or marking-fluid of the receiving-instrument.

2. In the art of reproducing written characters electro-telegraphically, the method which consists in varying the strength of the line-

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current formed of rapid impulses of varying amplitude and causing such varying line-current to actuate electro-magnetic devices to vary proportionally and synchronously the impulses and their amplitude, and a local circuit in which are located electro-magnetic valve-operating devices to control the flow of ink or marking-fluid of the receiving-instrument.

3. In the art of reproducing written characters electro-telegraphically, the method which consists in transmitting over a line-circuit rapid electrical impulses of varying strengths, varying the strength of said impulses by the pressure exerted upon the transmitting-instrument, and operating electro-magnetic devices at the receiving end of the line-circuit by the varying electrical impulses to control the flow of ink or marking-fluid of the the receiving-instrument.

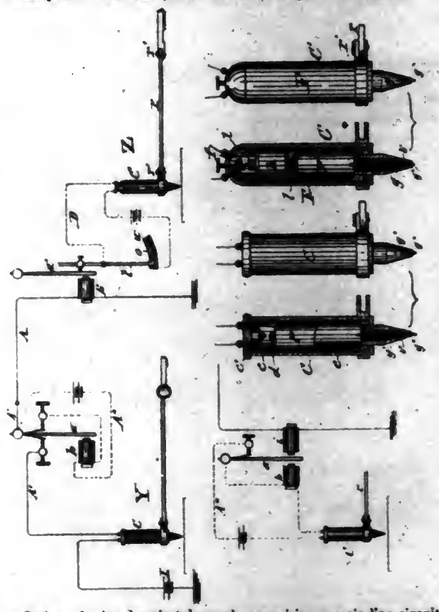
4. In the art of reproducing written characters electro-telegraphically, the method which consists in transmitting over a line-circuit rapid electrical impulses of varying strengths, varying the resistance of the line-circuit and with it the strengths of said impulses by the pressure exerted upon the transmitting-instrument, and operating electro-magnetic devices at the receiving end of the line-circuit by the varying electrical impulses to decrease or increase the flow of ink or marking-fluid of the receiving-instrument synchronously with the increase or decrease of the resistance of the line.

5. In the art of reproducing written characters electro-telegraphically, the method which consists in varying the strength of the line-current formed of rapid impulses by the action of a transmitting-instrument and causing the impulses of the line-current to energize to a varying degree, and an electro-magnetic device controlling the strength of a local circuit formed of rapid impulses by said electro-magnetic device in the line-circuit and operating an electrically-actuated ink or marking-fluid feeding device in a receiving-instrument to vary the flow of said ink or marking-fluid.

6. In the art of reproducing written characters electro-telegraphically, the method which consists in transmitting over the line-circuit electrical impulses by varying the resistance in the line-circuit and simultaneously (by the aid of electro-magnetic devices actuated by said line-current) varying the resistance of a local circuit synchronously with the variations in the resistance of the line-circuit, and by the varying current in the local circuit operating an electro-magnetic fluid-controlling device of a receiving-instrument.

7. In the art of reproducing written characters, the method which consists in supplying current to a line-circuit and controlling the strength of the current by interposing a variable resistance in the operating-circuit, varying the resistance by the pressure of a transmitting-instrument upon a surface, and synchronously operating through the agency of the line-current a receiving-instrument having an electro-magnetically-operated point or marking part to move said marking part of the receiving-instrument in accordance with the varying current transmitted over the line-circuit.

402,415. TELEGRAPHY. MARK W. DEWEY, SYRACUSE, N. Y., assignor, by direct and mesne assignments, to the Dewey Corporation, same place. Filed Oct. 3, 1888. Serial No. 287,040. (No model.)



Claim.—1. An electric telegraph comprising a main-line circuit, a table upon which to trace the message, a transmitting-instrument arranged yieldingly in contact with the table, a current-controller operated by the pressure of the transmitting-instrument upon the table and varying the strength of the current, and a receiving-instrument yieldingly in contact with the sheet to be inscribed and controlled in its degree of pressure upon the sheet by the aforesaid current.

2. In a writing-telegraph, the combination, with the stylus or pen, of a variable resistance attached directly to said stylus or pen and moving with the same over the surface receiving the inscription.

3. In a writing-telegraph, the combination of a table upon which to trace the message, a stylus or pen yieldingly in contact with said table, and a variable resistance carried directly on said stylus or pen and controlled by the pressure of the latter upon the aforesaid table, as set forth.

4. In combination with the table upon which to trace the message, a transmitting stylus or pen consisting of a holder arranged movable laterally over said table and toward and from the same, a marker carried movably on said holder, and a variable resistance operated by the movement of the marker on its said holder.

5. In combination with the table upon which to trace the message, a transmitting stylus or pen consisting of a holder arranged movably laterally over said table and vertically toward and from the same, a marker arranged movably longitudinally on said holder, a carbon on the holder, an electric contact-point on the marker and pressed against the carbon by the inward movement of the marker in the holder, and electric conductors connected with said carbon and contact-point, substantially as described and shown.

6. In a writing-telegraph, the combination, with a main-line circuit, of a branch of said circuit, a reed in said branch, a transmitting stylus or pen consisting of a holder arranged movable laterally over the writing-table and vertically toward and from the same, a marker arranged movably longitudinally in said holder, a carbon on the holder, an electric contact-point on the marker, and electric conductors connected with said carbon and contact-point, substantially as described and shown.

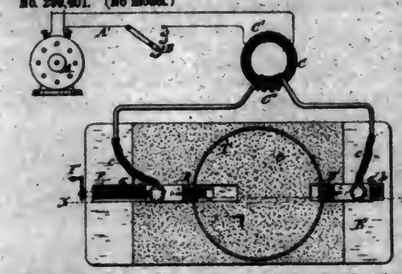
7. In a writing-telegraph having a receiving stylus or pen adapted to conform its movements to the movements of the transmitting stylus or pen in different directions, the main line having a branch including a reed, the transmitting stylus or pen yieldingly in contact with the writing-table, and a combined circuit maker and breaker and variable resistance controlled by the pressure of said stylus or pen upon the surface over which it moves, as set forth.

8. In a receiving-instrument of a writing-telegraph, a reed vibrated with different degrees of amplitude by impulses in a magnet in the main line, a maker and breaker and variable resistance in a local circuit controlled by the difference of amplitude of the said reed, and the receiving stylus or pen having a solenoid included in said local circuit and adapted to raise and lower said receiving stylus or pen by the varied strength in the said local circuit, substantially as set forth.

9. In a receiving-instrument of a writing-telegraph, a reed vibrated with varying degrees of amplitude by impulses in a magnet in the main line, a circuit maker and breaker, and a variable resistance in a local circuit controlled by the difference of amplitude of said reed, the receiving-pen having a solenoid also included in said local circuit and adapted to raise and lower said receiving-pen, and a valve controlling the flow of ink operated by lowering and raising said pen when in contact with the paper, substantially as described and shown.

10. In a telegraphic receiving-instrument, the combination of a bar having an operative end capable of universal movement within one uniform plane, a stylus or pen carried on said operative end of the bar and movable at right angles to the aforesaid plane, an armature connected to the stylus or pen, and an electro magnet or solenoid for moving said armature, as set forth.

402,416. METHOD OF EXPANDING HOOPS OR TIRES. MARK W. DEWEY, Syracuse, N. Y., assignor, by direct and mesne assignments, to the Dewey Corporation, same place. Filed Feb. 11, 1889. Serial No. 299,401. (No model.)

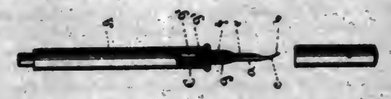


Claim.—1. As a preliminary step in the process of setting hoops or tires, the within-described method of expanding said hoops or tires, consisting in suitably insulating the same and then subjecting the hoops or tires to the heating effect of an electric current, as set forth.

2. The method of heating hoops or tires, consisting in bringing in contact therewith at points diametrically opposite each other the terminals of a low-resistance supply-conductor and passing an electric current of large volume through said conductor and hoop or tire, substantially as set forth.

3. The method of expanding a hoop or tire preparatory to setting the same, consisting in circulating uniformly or substantially uniformly within the entire circumference thereof an electric current of large volume, as set forth.

402,417. FOUNTAIN-PEN. SIMEON D. DIAS, New York, N. Y. Filed July 2, 1888. Serial No. 278,727. (No model.)



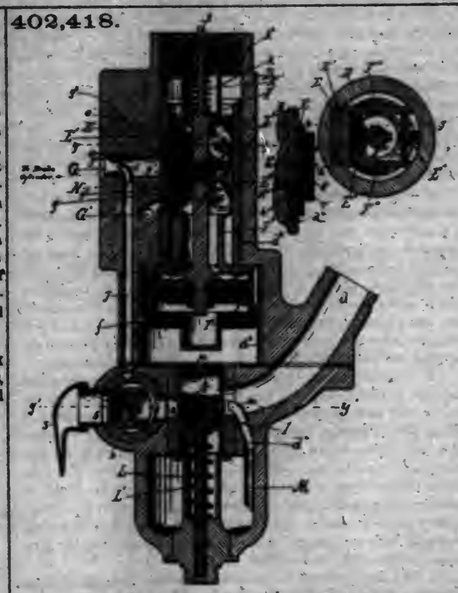
Claim.—A fountain-pen having a spring-tongue with its free end bearing against and covering the slit between the nibs of the pen, and also having a continuous ink-reservoir, part of which is in the handle and which extends between the pen and the tongue and to the free end of the latter, substantially as shown and described.

402,418. AIR-BRAKE. THERON S. R. DEVOE, Hyde Park, Ill. Filed Feb. 13, 1888. Serial No. 300,252. (No model.)

Claim.—1. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and brake-cylinder with two exhaust ports or passages from the brake-cylinder to the atmosphere controlled by a governing-valve device provided with means for opening and closing either of said ports or passages at different times, at the will of the engineer, by varying the air-pressure in the train-pipe, substantially as described.

2. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and brake-cylinder with two exhaust ports or passages of different size from the brake-cylinder to the atmosphere, controlled by a governing-valve device provided with means for opening and closing either of said ports or passages at different times, at the will of the engineer, by varying the air-pressure in the train-pipe, substantially as described.

3. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and brake-cylinder with an exhaust port



or passage from the brake-cylinder to the atmosphere and a governing-valve device so provided with ports as to adapt it to open said port or passage upon an increase of train-pipe air-pressure and to close it automatically by the equalization of pressure between the train-pipe and the auxiliary reservoir, substantially as described.

4. In a fluid-pressure brake mechanism, the combination of the train-pipe, brake-cylinder, and auxiliary reservoir with both a main and a second or supplemental exhaust port or passage from the brake-cylinder to the atmosphere, the latter of which is controlled by a valve which is operated by varying the pressure in the train-pipe and which is opened against an opposing spring force, substantially as described.

5. In a fluid-pressure brake mechanism, the combination of a train-pipe, auxiliary reservoir, and brake-cylinder with two exhaust ports or passages from the brake-cylinder to the atmosphere and two valves of different sensitiveness operated by varying the pressure in the train-pipe to control the discharge of air from the brake-cylinder to the atmosphere through said ports or passages, substantially as described.

6. In a fluid-pressure brake mechanism, the combination of a train-pipe, auxiliary reservoir, and brake-cylinder with two exhaust ports or passages of different size from the brake-cylinder to the atmosphere, and a main valve which, while holding the service-port open, holds the larger of said ports or passages closed, and a supplementary valve which, while the main valve holds the service-port open, is capable, by an independent movement, of opening and closing the smaller of said ports or passages, substantially as described.

7. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and brake-cylinder with two exhaust ports or passages of different size from the brake-cylinder to the atmosphere, a non-sensitive valve operated by varying the pressure in the train-pipe to govern the larger of said ports or passages, and a sensitive valve operated by varying the pressure in the train-pipe to govern the smaller of said ports or passages, substantially as described.

8. In a fluid-pressure brake mechanism, the combination of a train-pipe, auxiliary reservoir, and brake-cylinder with two exhaust ports or passages from the brake-cylinder to the atmosphere and a governing-valve device operated by varying the pressure in the train-pipe and adapted to open said ports or passages separately at different positions in its movement, substantially as described.

9. In a fluid-pressure brake mechanism, the combination of a train-pipe, auxiliary reservoir, and brake-cylinder with an ample exhaust port or passage from the brake-cylinder to the atmosphere for quickly releasing the brakes, a valve operated by varying the pressure in the train-pipe and adapted to open said port or passage upon arrival at the inner end of its traverse, a restricted exhaust port or passage from the brake-cylinder to the atmosphere for slowly grading down the brake-pressure, and a valve operated by varying the pressure in the train-pipe adapted to open and close said restricted port or passage, at the will of the engineer, when the governing-valve device is at the service-port, substantially as described.

10. In a fluid-pressure brake mechanism, the combination of a train-pipe, auxiliary reservoir, and brake-cylinder with a governing-valve device having a main valve and supplementary valve operated by varying the pressure in the train-pipe, and with an exhaust port or passage from the brake-cylinder to the atmosphere and an equalizing port or passage from the train-pipe to the auxiliary reservoir, said governing-valve device being adapted to open both of said ports or passages when the main valve is at the service-port and the supplementary valve has been moved inward independently of the main valve, substantially as described.

11. In a fluid-pressure brake mechanism, the combination of a train-pipe and auxiliary reservoir with a governing-valve device having a main valve and supplementary valve operated by varying the pressure in the train-pipe, an equalizing port or passage from the train-pipe to the auxiliary reservoir, arranged and adapted to be open when the main valve is at the service-port and the supplementary valve is moved inward to the extent of its limited independent movement, and a spring acting outwardly to close or nearly close said port or passage when the pressure has substantially equalized between the train-pipe and the auxiliary reservoir, substantially as described.

12. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and brake-cylinder with an ample exhaust port or passage from the brake-cylinder to the atmosphere, a refilling port or passage from the train-pipe to the auxiliary reservoir, and a valve device which opens said ports or passages when the governing-valve is at the inner extremity of its traverse, and with a restricted exhaust port or passage from the brake-cylinder to the atmosphere, an equalizing port or passage from the train-pipe to the auxiliary reservoir, and a valve device which opens and closes said last-named ports or passages when the governing-valve is at the service-port, substantially as described.

13. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and brake-cylinder with a port or passage for locally exhausting from the train-pipe, and with a governing-valve device adapted to open said port or passage upon a preliminary reduction of train-pipe pressure and close it by the movement of the governing-valve device to open the service-port, substantially as described.

14. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, brake-cylinder, and governing-valve device with a port or passage for locally exhausting from the train-pipe, which is opened by the movement of a supplementary valve upon a preliminary reduction of train-pipe pressure and closed by the movement of the governing-valve device to open the service-port, substantially as described.

15. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with a port or passage for locally exhausting from the train-pipe, and a valve device actuated to open said port or passage upon a reduction in the train-pipe pressure and adapted to automatically close said port or passage by an outward movement, substantially as described.

16. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with a valved port or passage for locally exhausting from the train-pipe and a piston and valve operated by the reduction of train-pipe pressure thus produced to close the local exhaust, substantially as described.

17. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with two ports or passages of different size for locally exhausting from the train-pipe and a governing-valve device adapted to open said ports or passages at different positions in its movement, substantially as described.

18. In a fluid-pressure brake mechanism, the combination of a train-pipe and auxiliary reservoir with a main valve controlled by varying the pressure in the train-pipe and a supplementary valve having a play in both directions from its normal position with respect to the main valve, substantially as described.

19. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with two valves, one of which has with relation to the other a normal position, from which it can be moved in two directions and tends to return automatically to such normal position when relieved from the moving force, substantially as described.

20. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, and main valve with a supplementary valve held in normal position with relation to the main valve by the action of opposite spring forces and capable of being moved in both directions from said normal position without necessarily moving the main valve, substantially as described.

21. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with a main slide-valve, E, a supplementary slide-valve, E', and a spring or springs, K', adapted to resist the movement of the latter valve in both directions from its normal position with relation to the former, substantially as described.

22. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with a port or passage for refilling said reservoir from said pipe, and a piston or valve which normally holds said port or passage restricted to the dimensions of a small equalizing port or passage, but opens the same wide open when the train-pipe pressure is increased for the purpose of refilling said reservoir, substantially as described.

23. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with a port or passage for refilling said reservoir from said pipe, a piston or valve for controlling said port or passage, and a spring acting outwardly against said piston or valve, and thereby causing it to hold said port or passage normally restricted to the dimensions of a small equalizing port or passage, but allowing it to yield and open the same wide open when the train-pipe pressure is increased for the purpose of refilling said reservoir, substantially as described.

24. In a fluid-pressure brake mechanism, the combination of the train-pipe and auxiliary reservoir with a port or passage for normally maintaining communication between them, and a piston or valve subject to the outward pressure of a spring for controlling said port or passage and operated by varying the relative pressures of the train-pipe and auxiliary reservoir, the whole being adapted to hold said port or passage restricted to the dimensions of a small equalizing port or passage when the pressures in the train-pipe and auxiliary reservoir are substantially equal to open said port or passage wide open when the train-pipe pressure is slightly increased above that of the auxiliary reservoir and to completely close said port or passage when the train-pipe pressure is slightly reduced below that of the auxiliary reservoir, substantially as described.

25. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, brake-cylinder, and governing-valve device with an equalizing port or passage which effects communication between the train-pipe and auxiliary reservoir when the main valve is at the service-port and the supplementary valve is holding said service-port closed, substantially as described.

26. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, brake-cylinder, and governing-valve device with two equalizing ports or passages from the train-pipe to the auxiliary reservoir, one of which is adapted to come into action when the governing-valve device is in its normal position and the other when the main valve is at the service-port and the supplementary valve is holding the latter closed, substantially as described.

27. In a fluid-pressure brake mechanism, the combination of the brake-cylinders, auxiliary reservoirs, controlling-valve devices, and the train-pipe with two main compressed-air reservoirs controlled by a cock or cocks for the admission of fluid-pressure into the train-pipe from either of said reservoirs at the will of the engineer, substantially as described.

28. In a fluid-pressure brake mechanism, the combination of the brake-cylinders, auxiliary reservoirs, controlling-valve devices, and the train-pipe with two main compressed-air reservoirs, and with a controlling cock or valve which, at different positions of its movements, successively puts them into communication with the train-pipe, substantially as described.

29. In a fluid-pressure brake mechanism, the combination of the brake-cylinders, auxiliary reservoirs, controlling-valve devices, and the train-pipe with two main compressed-air reservoirs, and with a controlling cock or valve provided with two ports, one of which when open discharges the contents of one main reservoir into the train-pipe and the other of which when open discharges the contents of the other main reservoir into the train-pipe, substantially as described.

30. In a fluid-pressure brake mechanism, the combination of the brake-cylinders, auxiliary reservoirs, controlling-valve devices, and the train-pipe with two main compressed-air reservoirs and a controlling cock or cocks, and with separate passages leading from said reservoirs to said cock or cocks, one of which passages is provided with a reducing-valve and the other is without a reducing-valve, substantially as described.

31. In a fluid-pressure brake mechanism, the combination of a train-pipe, two main reservoirs, an air-pump, and a controlling cock or valve with two passages, *o o'*, a reducing-valve, and a check-valve, o^3, substantially as described.

32. In a fluid-pressure brake mechanism, the combination of the brake-cylinders, auxiliary reservoirs, controlling-valve devices, and the train-pipe, two main compressed-air reservoirs, and passages *o o'* Q with a way-cock, P, provided with a through-port, *p*, and valve-surfaces $p' p^3$, adapted to operate with relation to said passages substantially as described.

33. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, brake-cylinder, and governing-valve device with two main reservoirs communicating with the train-pipe by independent passages, and with a way-cock, P, provided with a through-port, *p*, and valve-surfaces $p' p^3$, and having the edges of said valve-surfaces rounded or beveled, as shown at *v v'*, substantially as described.

34. In a fluid-pressure brake mechanism, the combination of the train-pipe, auxiliary reservoir, brake-cylinder, and governing-valve device having a main valve and supplementary valve with an air port or passage, H, leading from the train-pipe to the face of the main valve, an exhaust-port, G', communicating with the face of the main valve, a main valve provided with two through-ports which, when it is at its normal position, open into the passages H and G', respectively, and a supplementary valve which, when in its normal position with relation to the main valve, holds said through-ports out of communication with each other, but provided with a recess or passage which, in case of an outward movement of the supplementary valve with relation to the main valve, puts said through-ports into communication with each other, substantially as described.

35. In a fluid-pressure brake mechanism, the open duct J, extending from an air-space behind the piston 6 to the passage G, which leads from the auxiliary reservoir to the brake-cylinder, and arranged to act as an ejector or siphon to reduce the air-pressure behind said piston while air is flowing violently from the auxiliary reservoir to the brake-cylinder, substantially as described.

36. In a fluid-pressure brake mechanism, the combination of the chamber J', the open duct J, and nozzle *j* with the piston 6 and passage G, substantially as described.

37. In a fluid-pressure brake mechanism, the combination of the chamber J', the piston 6, the open duct J, nozzle *j*, and passage G, having its diameter reduced at the end of the nozzle, substantially as described.

38. In a fluid-pressure brake mechanism having means for suddenly exhausting the train-pipe through a valved port, 2, in the act of applying the emergency-stop, the enlarged stem L, provided with the ample transverse passage N, arranged to come in line with the train-pipe and port aforesaid and afford a direct and unobstructed exhaust-passage for the train-pipe air when the governing-valve is at the emergency-port, substantially as described.

39. In a fluid-pressure brake mechanism, the open duct M, extending from a lower recess of the valve-casing to an exhaust-passage through which the air is discharged at great velocity, and arranged to act in the manner of an ejector or siphon to draw up and discharge collected water, substantially as described.

40. In a fluid-pressure brake mechanism, the combination of the main valve E, having the ports *e g g'*, with a supplementary valve, E', having the passage g^3, substantially as described.

41. In a fluid-pressure brake mechanism, the combination of the main valve E, having the ports *e g g'*, with a supplementary valve, E', having the passage g^3, and with a spring, K', substantially as described.

42. In a fluid-pressure brake mechanism, the combination of the main valve having an elongated exhaust-passage, *g*, with a supplementary valve having an elongated exhaust-passage, g^3, substantially as described.

43. In a fluid-pressure brake mechanism, the combination of a casing having the passages G G', and a main valve having the ports *e g g'*, and a supplementary valve having the port g^3, substantially as described.

44. In a fluid-pressure brake mechanism, the combination of a casing having the passages G G', and a main valve having the ports *e g g'*, and a supplementary valve having the port g^3, and a spring, K', tending to hold the supplementary valve in a normal position with respect to the main valve, but allowing it to be moved in both directions therefrom by the application of sufficient force, substantially as described.

45. In a fluid-pressure brake mechanism, the combination of a main valve having a surface-channel, *g*, in communication with the exhaust-port G', and a supplementary valve having an internal passage, g^3, open at both ends to the face of the valve, substantially as described.

46. In a fluid-pressure brake mechanism, the combination of a casing having opposite passages, 2 *d*, through its walls, and a spring-stem, L, enlarged to fill the casing between said passages and provided with a tapering opening through it in the plane of said passages, the larger end of said opening being on the side toward the passage *d* and always in communication therewith, and with an air-chamber at the outer end of the governing-valve device, substantially as described.

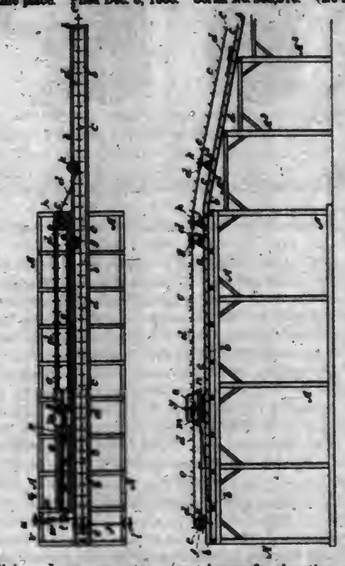
47. In a fluid-pressure brake mechanism, the combination of the local outlet-port 5 with the elastic tubular dust-shield S, substantially as described.

48. In a fluid-pressure brake mechanism, the combination of the two valves E E' with the spring K', the spring-holding device *k*, attached to the main valve, and the plates $k' k^2$ at the ends of the spring and operated by the piston-stem to compress the spring in both directions, substantially as described.

49. In a fluid-pressure brake mechanism, the combination of the two main reservoirs, an air-pump, a passage leading from the air-pump to one of said reservoirs, and a passage leading from the air-pump to the other of said reservoirs and provided with a reducing-valve, substantially as described.

50. In a fluid-pressure brake mechanism, the combination of the two main reservoirs, air-pump, train-pipe, way-cock or engineer's valve, and passages leading from each of said reservoirs to said cock or valve, with a passage leading from one to the other of said reservoirs and provided with a check-valve, whereby the turning of said cock or valve to one position will vent air from one only of said reservoirs to the train-pipe, and to another position will vent air from the other reservoir to the train-pipe until the pressure in the two reservoirs is equalized, and will then vent from both of said reservoirs to the train-pipe, substantially as described.

402,419. APPARATUS FOR UNLOADING BOATS. JAMES M. DODGE, Philadelphia, Pa., assignor to the Dodge Coal Storage Company, same place. Filed Dec. 3, 1888. Serial No. 292,516. (No model.)



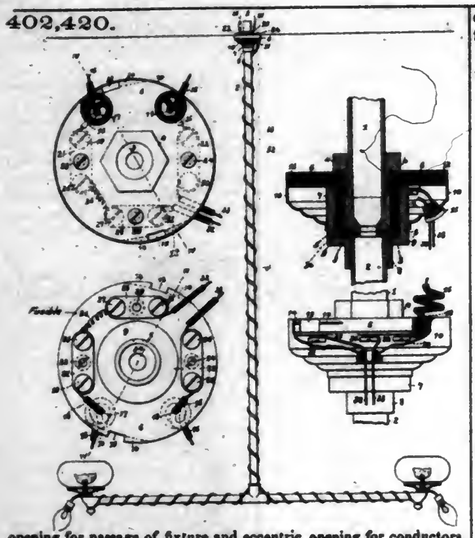
Claim.— In an apparatus or contrivance for elevating and conveying coal or other material, the combination of the following instrumentalities, viz: first, a conveyer-trough mounted upon and supported by suitable frame-work, as specified; second, the conveyer-chain provided with suitable flights which co-operate with said trough and doubled on itself in a plane transverse to that in which lie those portions of the upper and lower runs of the chain, the flights of which lower run coact with the conveyer-trough; third, a suitable driving sprocket-wheel in engagement with said chain and that is mounted on a fixed axis of motion, as specified; fourth, a series of idler sprocket-wheels over which the loops or contractive turns of the chain are made, and which are in a plane transverse to that in which are located the upper and lower runs of the chain, the flights of which lower run travel in the trough, and, fifth, a take-up device and means for operating the same, the whole adapted to operate in substantially the manner and for the purpose hereinbefore set forth.

402,420. INSULATING CUT-OUT JOINT. HARRY M. DOUBLEDAY and RUSSELL DOUBLEDAY, Pittsburg, Pa. Filed Sept. 18, 1888. Serial No. 285,732. (No model.)

Claim.—1. In a combined insulating-joint and cut-out for electric lamps, the combination of a gas-pipe terminal, 1, sleeve 3, screwing on the terminal, insulating-jacket 5, screwing on the sleeve 3 and having flange 6, for carrying the connectors and cut-out, and outer sleeve, 7, screwing on the insulator 5 and having shoulder 9 and neck 8, the fixture 2, screwed into said neck, the gasket 34, supported by shoulders 9 and impinged by sleeve 3 and end of fixture 2, the cap 10, secured to the flange 6 and having the central opening for passage of the joint, and an eccentric opening in which is the bushing 11, through which the lamp-supplying conductors 32 33 pass from the connectors, as hereinbefore set forth.

2. The combination, with the gas-pipe terminal 1 and gas-fixture 2, of the interposed insulating-joint and cut-out consisting of sleeve 3, screwed on the terminal, insulating-jacket 5, screwed on the sleeve and carrying the supply-wires, connectors, cut-out, and lamp-wires, the outer sleeve, 7, screwed on the insulator and supporting the gas-fixtures, and cap 10, for concealing the connectors, having central

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opening for passage of fixture and eccentric opening for conductors, as set forth.

3. The combination of a suitable support, 1, sleeve 3, screwing on said support, insulating-jacket 5, screwing on sleeve 3, and cap 10, surrounding the insulator, having a central opening for the joint, said insulator having suitable electrical connections and carrying the cut-out, and the lamp-conductors passing through an eccentric opening in the cap, all substantially as herein described.

4. The combination, with the terminal 1 and gas-fixture 2, of an insulating-jacket carried by the terminal, a sleeve carried by the insulator and supporting the gas-fixture, and a transverse surrounding flange, 6, formed on the insulating-sleeve and carrying the cut-out, and connections whereby the electric lamp is connected on the opposite side of the insulator from the terminal, as fully explained.

5. In combination with a gas-fixture supply-pipe, a screw-threaded insulating-sleeve having a passage therethrough interpolated between two portions of the fixture and having a broad insulating surrounding flange formed integrally therewith for supporting the connections for an electric lamp, whereby a continuous passage for gas is maintained without affording ground-connection for leakage.

6. In combination with a gas-fixture, an insulating-sleeve interposed between two parts of the fixture to completely insulate them, said insulator having a broad lateral insulating-flange formed integrally therewith, supporting the cut-out and other connectors for an electric lamp, as shown and described.

7. In an insulating-joint and cut-out, the combination, with an insulating-support, 6, carrying the conductors, as explained, and having a cylindrical portion for coupling the gas fixture and pipe, of a cap, 10, having a central opening for the passage of the fixture and an opening without the center for the passage of the lamp-conductors, as explained.

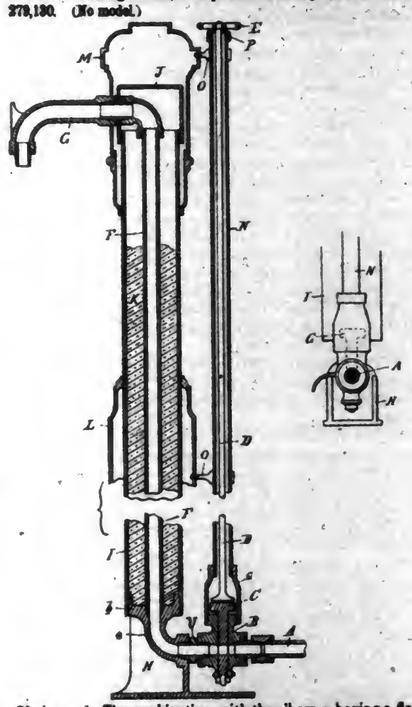
8. In a cut-out for electric lamps, the combination, with the support 8, carrying the electrical connections and lamp-supplying conductors 32 33, of a cap, 10, having a passage for the conductors 32 33 and secured to the support by bayonet-joints extending from said recess, the said conductors being secured to the support to one side of their passage through the cap, whereby upon being bent they form an effective stop to the movement of the cap, as explained.

9. In a cut-out for electric lamps, the combination, with the support carrying the cut-out wire and suitable connectors, of the lamp-supplying wires depending from the support and the cap fitting over the support and secured thereto by a catch and having an eccentric opening for the lamp-wires, the said lamp-wires being attached to the support on opposite sides of the opening through which they pass, whereby they prevent the movement and consequent disengagement of the cap, as explained.

10. In a combined insulating-joint and cut-out for electric lamps, the combination, with the insulating-support 6, from which depend the lamp-conductors, of a cap, 10, having an eccentric passage for said conductors, a central passage for the joint, and an insulating-bushing, 11, screwed into said eccentric passage, as set forth.

11. The combination, with a gas-fixture and electric lamps supported on the same, of a combined cut-out and insulating-joint interposed in the fixture, consisting of an integral screw-threaded insulating-sleeve and broad annular flange carrying cut-out wires and electrical connection between the cut-out and lamps, as and for the purpose set forth.

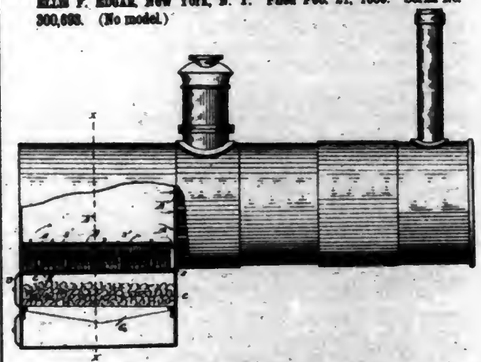
402,421. HYDRANT. JOHN F. DURHAM, Detroit, Mich., assignor of one-half to George Bliss, same place. Filed July 5, 1888. Serial No. 279,130. (No model.)



Claim.—1. The combination, with the elbow *a*, having a flange, *b*, of the delivery-pipe E, set into the orifice of the elbow *a* and extending with an unobstructed discharge to the nozzle, the casing I, screwed water-tight to the outside of the flange, the non-conducting impervious material set between them, and the connection with the shut-off cock below the union of the elbow and delivery-pipe, substantially as described.

2. The combination, with the elbow *a*, having a flange, *b*, and both ends of its passage screw-threaded, the delivery-pipe screwed into one end thereof, the casing I, screwed water-tight to the same, the impervious non-conducting filling between the two, the shut-off cock B, the union U, connecting the shut-off cock to the elbow, the coupling *c*, secured water-tight to the shut-off cock, the casing N, screwed water-tight into the coupling *c*, and the valve-rod D, passing through the casing N and operating the shut-off cock, substantially as described and shown.

402,422. PROCESS OF BURNING CARBONACEOUS MATERIAL. ELLIS F. EDGAR, New York, N. Y. Filed Feb. 21, 1889. Serial No. 300,698. (No model.)



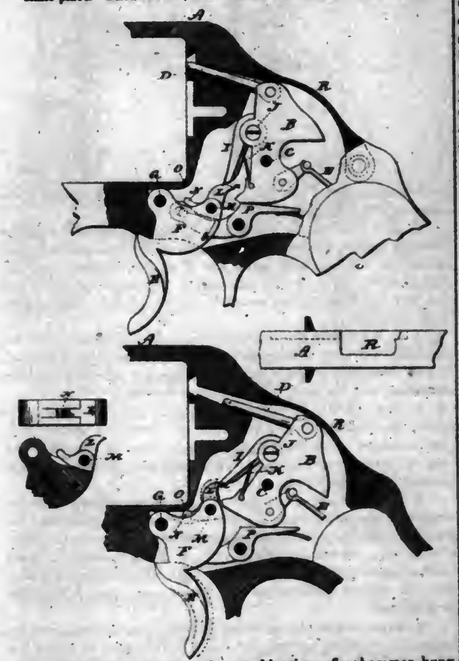
Claim.—1. The process of producing heat by igniting a mass of fuel, passing the flame, gas, and unconsumed particles thereof between the interstices of a mass of small pieces of highly-heated incombustible material, introducing air by separate passage-ways evenly and generally throughout the interstices of said mass, there combining it with the unconsumed material of fuel passing through said interstices, and there igniting the combined mixture by the heat of said incombustible mass, substantially as set forth.

2. The process of producing heat by igniting a mass of fuel, passing the flame, gas, and unconsumed particles thereof between the interstices of a mass of small pieces of incombustible material, which said interstices are smaller at the point farthest from the fuel than at that nearest to it, and which material is thereby highly heated, introducing air by separate passage-ways evenly and generally throughout the interstices of said mass, there combining it with the unconsumed particles of fuel and gas passing through said interstices, and igniting the combination by the heat of said incombustible mass, substantially as set forth.

3. The process herein described of burning carbonaceous material by first locating a mass of incombustible material in the line of draft to the chimney, then causing the gases from the combustion-chamber to enter said mass, retarding their progress and causing them to take a circuitous route, then supplying air to said retarded gases in finely and evenly distributed quantities, whereby the mixture of the air and gases is brought in contact with highly-heated mass of the incombustible material, as set forth.

4. The process herein described of burning carbonaceous material, consisting in passing the products of combustion through a highly-heated mass of refractory incombustible material, and introducing atmospheric air finely divided into said mass in such manner that it is evenly and generally distributed throughout the mass and in this state meets and mingles with the products of combustion, whereby perfect combustion takes place, as set forth.

402,423. LOCK FOR FIRE-ARMS. CARL J. ERESS, Hartford, Conn., assignor to the Colt's Patent Fire Arms Manufacturing Company, same place. Filed Jan. 14, 1889. Serial No. 296,323. (No model.)



Claim.—1. In a fire-arm, the combination of a hammer hung upon a pivot in a frame, a trigger hung forward of the hammer, a dog hung upon the trigger in rear of its pivot, the nose of the dog extending upward, a shoulder on the trigger to arrest the rear movement of the dog, a tail extending forward from the dog, the nose of the dog adapted to engage the hammer on the pull of the trigger, and a stationary bearing in the frame in the path of the tail of the dog, and against which bearing the tail of the dog will strike as the hammer is brought to the full-cocked position and before its release, substantially as described.

2. In a fire-arm, the combination of the hammer B, hung upon a pivot in the frame, a strut, I, hinged to the hammer above and forward of its pivot, the said strut extending downward and provided with a spring the tendency of which is to turn the strut forward, the trigger F, hung in the frame forward of the hammer, the dog L, hung upon the trigger in rear of its pivot, the trigger constructed with a bracing, *b*, against which the dog rests in its normal position, the dog extending upward, its nose adapted to engage the lower end of said strut and provided with a forwardly-projecting tail, N, and a stationary bearing, O, in the frame in the path of the tail of the dog, substantially as and for the purpose described.

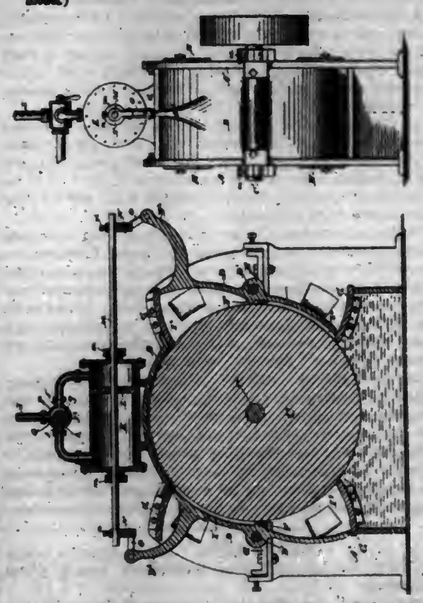
402,424. CARTRIDGE-FEED PACK FOR REVOLVERS. CARL J. ERESS, Hartford, Conn., assignor to the Colt's Patent Fire Arms Manufacturing Company, same place. Filed Feb. 4, 1889. Serial No. 298,576. (No model.)



Claim.—1. In a cartridge-pack, a ring constructed with an internal flange at one end and with an annular groove upon the inside, adjacent to the flange, the diameter of the ring contracted toward the opposite end, combined with a plug adapted to be inserted from the flange end of the ring, the head end of the plug constructed with an annular shoulder adapted to bear against the inner edge of the cartridge-heads as they rest in the groove on the ring, and the plug near its inner end adapted to bear against the inner side of the cartridges near the points, substantially as described.

2. In a cartridge-pack, a ring constructed with an internal flange at one end and with an annular groove upon the inside adjacent to the flange, the diameter of the ring contracted toward the opposite end, combined with a plug adapted to be inserted from the flange end of the ring, the head end of the plug constructed with an annular shoulder adapted to bear against the inner edge of the cartridge-heads as they rest in the groove of the ring, the plug near its inner end adapted to bear against the inner side of the cartridges near the points, and the inner end of the plug constructed corresponding to the center at the rear end of the cylinder, and so that the said rear center of the cylinder serves as a guide in the arrangement of the pack upon the cylinder, substantially as described.

402,425. WOOD-GRINDER FOR PULP-MAKING. BERNARD BIELER, Jr., Rochester, N. Y. Filed July 9, 1888. Serial No. 279,432. (No model.)



Claim.—1. The combination, with a grinding-cylinder, of two or more stock-pressing surfaces or plates for feeding material to the cylinder, connected for simultaneous operation in opposite directions relative to the portions of the cylinder-surface with which they co-

operate, and a motor connected to said plates for causing their positive operation in both directions, substantially as described.

2. The combination, with a grinding-cylinder, of two pivoted stock-pressing surfaces or plates for feeding material to the cylinder, connected for simultaneous operation in opposite directions relative to the portions of the surface of the cylinder with which they co-operate, and a motor connected to said plates for causing their positive operation in both directions, substantially as described.

3. The combination, with a grinding-cylinder, of two pivoted presser-plates for feeding material to the cylinder, both ends of each plate being adapted to be brought alternately in proximity to the cylinder-surface, connections between the plates for causing their simultaneous operations on the pivots, and a motor for causing the positive movements of the plates, substantially as described.

4. The combination, with a grinding-cylinder, of two pivoted presser-plates for feeding material to the cylinder, both ends of each plate being adapted to be brought alternately into proximity to the cylinder-surface, connections between the proximate ends of the plates for causing their movements in the same direction, and a motor for causing the positive movements of the plates in both directions, substantially as described.

5. The combination, with a grinding-cylinder, of two pivoted presser-plates for feeding the material to the cylinder, located on opposite sides of the same, both ends of each plate being adapted to be brought alternately in proximity to the cylinder-surface, connections between the corresponding ends of the plates, and a motor connected to the plates for causing their positive movements in both directions, substantially as described.

6. The combination, with a grinding-cylinder, of two pivoted presser-plates for feeding material to the cylinder, located on opposite sides of the same, both ends of each plate being adapted to be brought alternately into proximity to the cylinder-surface, a rod connecting the corresponding ends of the plates, and a motor for causing the positive movements of the rod in opposite directions, substantially as described.

7. The combination, with a grinding-cylinder, of two pivoted presser-plates for feeding material to the cylinder, both ends of each plate being adapted to be brought alternately into proximity to the cylinder-surface, a rod connecting the proximate ends of the plates, a piston connected to said rod, a cylinder in which the piston operates, and valve mechanism for admitting pressure on opposite sides of the piston to operate it positively in both directions, substantially as described.

8. The combination, with the grinding-cylinder, of a pivoted presser-plate both ends of which are adapted to be brought alternately into proximity to the cylinder-surface, and a motor connected to the plate for moving it on its pivot, substantially as described.

9. The combination, with a grinding-cylinder, of a pivoted presser-plate both ends of which are adapted to be brought alternately into proximity to the cylinder-surface, and adjustable bearings in which the plate is pivoted located substantially in the plane of the axis of the cylinder, and adjustable toward and from said cylinder, substantially as described.

10. The combination, with the grinding-cylinder, of a pivoted presser-plate both ends of which are adapted to be brought alternately into proximity to the cylinder-surface, the pivotal point of the plate being substantially in the plane of the cylinder-axis, and a rib on the plate on the side next the cylinder, substantially in line with the plate-bearings, substantially as described.

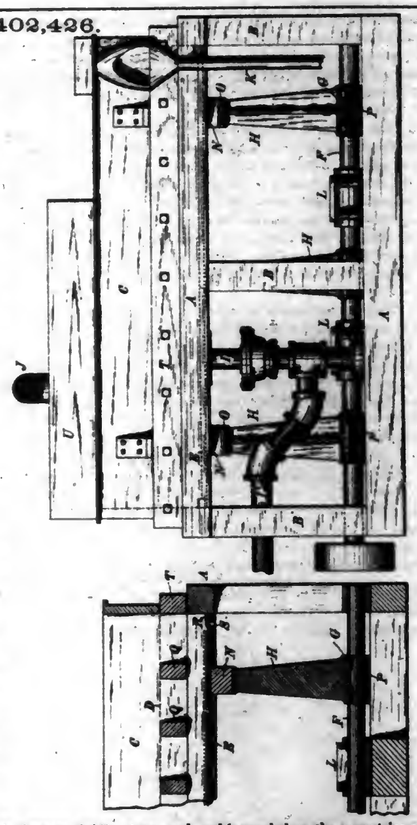
11. The combination, with the main casing having a series of feeding-apertures and the grinding-cylinder located therein, of two presser-plates for feeding material to the cylinder pivoted to the casing, both ends of each plate being adapted to be brought alternately into proximity to the cylinder-surface, a pressure-cylinder secured to the casing, a piston operating therein, and a piston-rod extending out at opposite ends, and links forming the connection between the rod ends and the presser-plates, substantially as described.

12. The combination, with the casing having the feeding-apertures and the grinding-cylinder therein, of the presser-plates for feeding material to the cylinder pivoted to the casing, both ends of each plate being adapted to be brought alternately into proximity to the grinding-cylinder surface, connections between the presser-plates for causing their simultaneous operations, and the segmental plates secured to the casing at the ends of the presser-plates, constituting the ends of the chambers in which they operate, substantially as described.

402,426. PAPER-PULP SCREEN. BERNARD EILERS, Jr., Rochester, N. Y. Filed Oct. 5, 1887. Renewed Mar. 6, 1889. Serial No. 302,196. (No model.)

Claim.—1. In a machine for screening pulp, the combination, with the trough and the screen located therein, of the vibratory bottom secured to the trough at its edges by flexible material, and the shaft having two or more eccentrics thereon, and the rods secured to

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the bottom rigidly at one end and journaled on the eccentrics at the other, substantially as described.

2. In a machine for screening pulp, the combination, with the vibrating bottom, of the shaft having two or more eccentrics formed thereon in line with each other and of smaller diameter than the shaft, and the arms or rods attached to the bottom at their upper ends and journaled on the eccentrics at their lower ends, substantially as described.

3. In a machine for screening pulp, the combination, with the screen, the vibrating bottom, and means for vibrating it, of the outlet-pipe connected to the bottom, the stationary pipe, and a flexible connection between them, substantially as described.

4. In a machine for screening pulp, the combination, with the screen, the vibrating bottom, and means for vibrating it, of the outlet-pipe connected to the bottom, the stationary pipe, an extensible connection between the two, and a trap located in said stationary pipe, substantially as described.

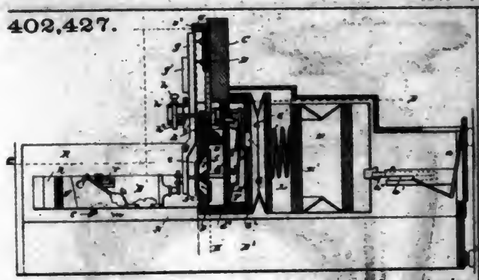
5. In a machine, for screening pulp, the combination, with the receptacle, the screen located therein, the vibrating bottom, and the flexible connection with the receptacle, of the shaft having the eccentries thereon, the rods connected rigidly to the bottom and journaled on the eccentrics, the outlet-pipe attached to the bottom, the stationary pipe, and the flexible connection between said pipes, substantially as described.

6. In a machine for screening pulp, the combination, with the screen, the vibrating bottom, and means for vibrating it, of the outlet-pipe connected to the bottom, the stationary pipe having a trap therein, and the diaphragm connected to the movable and stationary pipes, substantially as described.

402,427. COMBINED PIANO AND HARMONIUM. JACOB W. ERBE, Bischach, Saxony, Germany. Filed Sept. 28, 1883. Serial No. 286,680. (No model.) Patented in Germany Feb. 18, 1883. No. 23,201.

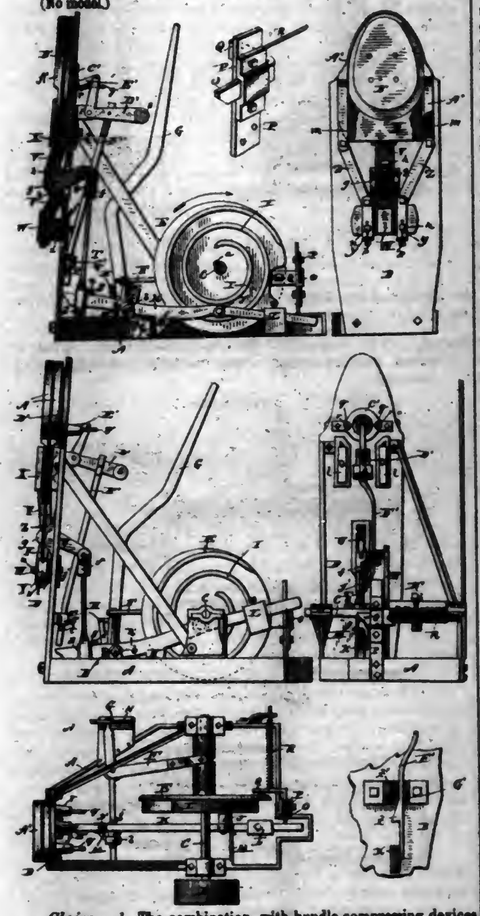
Claim.—In a combined piano and harmonium, as hereinbefore described, the decrescendo mechanism consisting of the folding parts P P, sliding piece Q, lever *p p'*, acoustic hammer or anvil covered with felt, *r*, and a cam-shaped bow, *s'*, mounted in the frame B of the mechanism, substantially as described, for reducing the intensity of the tones of the piano or for entirely arresting the action of the hammers upon

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the string or chords and drawing back the frame of the mechanism, as set forth.

402,428. MACHINE FOR BUNDLING KINDLING-WOOD. JONAS FISCHER, Williamsport, Pa. Filed Aug. 9, 1888. Serial No. 282,347. (No model.)



Claim.—1. The combination, with bundle-compressing devices and a pivoted lever, K, connected to the compressing devices by means of a connecting-rod, of the drive-shaft and a rotating disk upon the shaft, this disk being provided with a spiral cam upon its face adapted to engage with the said pivoted lever and gradually elevate the same, substantially as described.

2. The combination of bundle compressing and forming devices, a pivoted lever connected to and operating the said compressing devices, a weight on the said lever, a pin, J, secured on the lever, a sliding cam-wheel adapted to elevate the rear end of the lever, and an automatic locking-bar adapted to hold the rear end of the said lever in an elevated position, as and for the purposes set forth.

3. The combination of bundle compressing and forming devices, a rod, T, connected to the compressing devices, a pivoted weighted lever, K, a clip, S, pivotally connected to the lower end of the said rod and adjustably connected to the said lever K, and means for elevating the rear end of the said lever K, substantially as described.

4. The combination, with bundle-compressing devices, of the pivoted lever K, connected to the bundle-compressing devices and provided with a weight, a cam-wheel for elevating the rear end of this lever, and a sliding beveled locking-bar adapted to hold the said lever in an elevated position, substantially as described.

5. The combination, with the bundle-compressing devices, of the pivoted weighted lever connected to the bundle-compressing devices, a cam for elevating the rear end of the said lever, and an automatic spring-actuated locking-bar provided with a beveled nose, the said bar being provided with a lateral arm, as and for the purposes herein set forth.

6. The combination, with compressing devices, of an ejector-plate, weighted angle-lever pivotally connected to the ejector-plate, a depending rod, F', attached to the angle-lever, a pivoted weighted lever, K, for elevating this rod F', and means for operating the said lever K, substantially as described.

7. The combination of ejector-plate, pivoted angle-lever connected to the same, a depending rod, F', connected to the angle-lever, the lower end of this rod being provided with a beveled lug, *f*, a confining loop or box, G, for the lower end of this rod F', and a pivoted lever for elevating the said rod F', substantially as described.

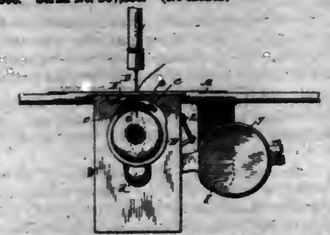
8. The combination of the sliding former X, the sliding cross-head W, means for moving these parts in opposite directions, yokes A' A', embracing the former X, and pivotal links Z, for connecting the said yokes with the cross-head W, substantially as described.

9. The combination of the sliding former X, the sliding cross-head W, toggle-levers for forcing these parts in opposite directions, spring-yokes A' A', embracing the former X, and pivotal links connecting the ends of the yokes with the cross-head, substantially as described.

10. The combination of a former, X, provided with beveled lugs *m m* on its vertical edges, spring-yokes A' A', embracing the said former and lugs, a sliding cross-head, pivotal links Z Z, connecting the cross-head to the spring-yokes, and means for forcing the cross-head in a downward direction, substantially as described.

11. The combination, with a former, of vertically-movable and laterally-expansible yokes embracing the said former, lugs or projections for expanding the said yokes, pivoted links connected to the said former, and means for operating the yokes, substantially as set forth.

402,429. OSCILLATING LOOP TAKER AND SPREADER FOR SEWING-MACHINES. JOSEPH L. FOLLETT, Brooklyn, N. Y. Filed Oct. 4, 1888. Serial No. 287,233. (No model.)



Claim.—1. The combination of the oscillatory hook and the oscillating spreader pointed and moving in a direction opposite to that in which the hook is pointed and moves, substantially as and for the purposes hereinbefore set forth.

2. The combination of the oscillating hook, the retainer moving in unison with the hook, and the oscillating spreader pointed and moving in a direction opposite to that in which the hook is pointed and moves, substantially as and for the purposes hereinbefore set forth.

3. The combination of the bobbin case or holder for the under thread, the oscillating hook, the retainer moving in unison with the hook, and the oscillating spreader pointed and moving in a direction opposite to that in which the hook is pointed and moves, substantially as and for the purposes hereinbefore set forth.

4. The combination of the cloth-plate, the needle, the oscillating hook, and the oscillating spreader pointed and moving in a direction opposite to that in which the hook is pointed and moves and interposed between the hook and the cloth-plate, substantially as and for the purposes hereinbefore set forth.

402,430. MECHANICAL MOVEMENT. JOSEPH L. FOLLETT, Brooklyn, N. Y. Filed Nov. 10, 1888. Serial No. 290,413. (No model.)

Claim.—1. The combination, with the arm A, oscillatory upon an axis, 1, of the vibratory bar C, connected directly to arm A at *a*, with its axis 2 on or nearly on a circle described from axis 1 with a radius, 1 *a*, and means for vibrating said bar C, substantially as hereinbefore set forth.

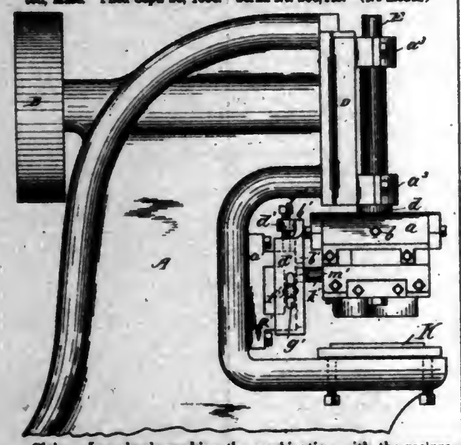
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2. The combination of the oscillatory arm A, the main vibrating bar C, having its axis 2 on or nearly on a circle described from axis 1 of arm A with 1 *a* as a radius, and the auxiliary vibrating bar D, having its axis 3 in line with axes 2 1, substantially as and for the purposes hereinbefore set forth.

3. The combination of a rotary shaft, B, the arm A, the main vibrating bar C, having its axis located with reference to arm A, as specified, the auxiliary vibrating bar D, having its axis in the same line with those of arm A, and bar C, and an eccentric or crank and connecting-rod for imparting movement from the shaft B to bar D, substantially as and for the purpose hereinbefore set forth.

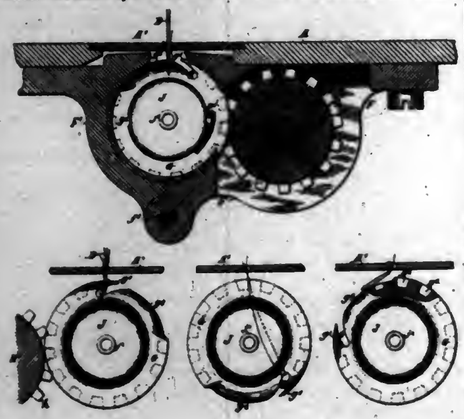
402,431. SHOE-SHANK MACHINE. WILLIAM H. FOWLER, Newton, Mass. Filed Sept. 26, 1888. Serial No. 286,445. (No model.)



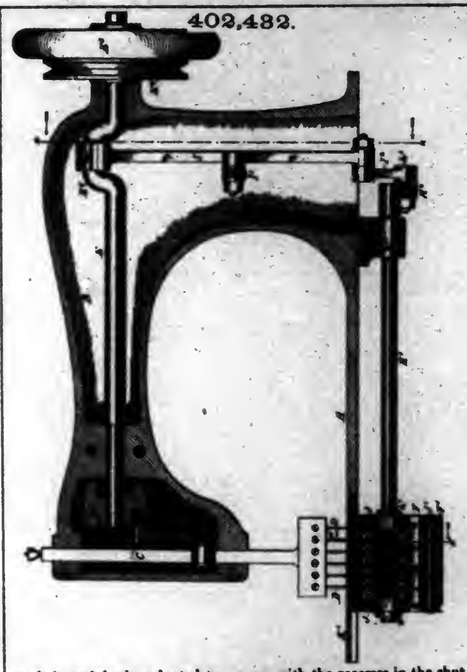
Claim.—In a shank-machine, the combination, with the reciprocating piece or head *a*, of the knife-carrying blocks pivoted thereto and provided with studs *k'*, and the cam-plate *b'*, having the cam-slots *k'*, into which the said studs extend, substantially as set forth.

402,432. SEWING-MACHINE. MARSHALL GARDNER, Aurora, Ill., assignor to Thomas H. Ball and James Stone, same place, and Simon Florsheim, Chicago, Ill. Filed July 8, 1887. Serial No. 243,734. (No model.)

Claim.—The combination, with a plurality of reciprocating needles, of a series of circular revolving hooked shuttles moving in planes parallel with planes passing through the vertical axes of the needles at right angles to the common axes of the shuttles, circular guides or bearings engaging the margins of said shuttles, said shuttles having recesses formed in their peripheries, and revolving driving-wheels mounted upon one side of the shuttle and having teeth formed

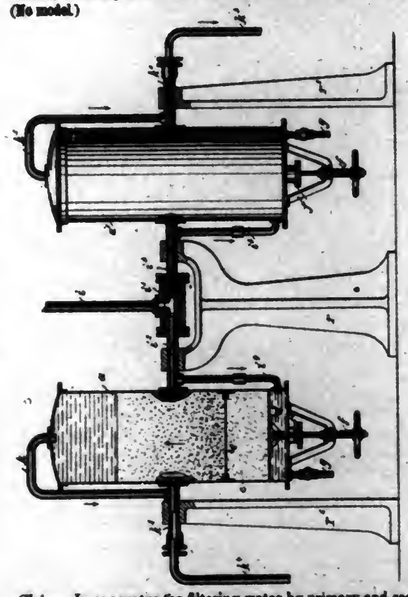


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on their peripheries adapted to engage with the recesses in the shuttles whereby the same are driven, substantially as described.

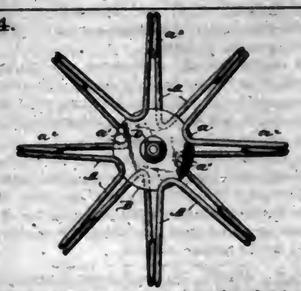
402,433. APPARATUS FOR FILTERING WATER. GEORGE D. GIBSON, Hamburg, Germany. Filed Dec. 4, 1888. Serial No. 292,611. (No model.)



Claim.—In apparatus for filtering water by primary and secondary filtration, the combination of turnable primary and secondary filtering vessels *a a'* and *b b'*, arranged in series, with the three-way cocks *i*, *l*, *l'*, and *n*, the conducting-pipes, and hollow trunnions, substantially as and for the purpose specified.

402,434. FURNITURE-SPRING. ALEXANDER M. GJERVARD, Christiania, Norway. Filed Feb. 23, 1888. Serial No. 265,077. (No model.) Patented in Norway Jan. 3, 1888, No. 773; in Sweden Jan. 31, 1888, No. 1,300; in England May 11, 1888, No. 7,088, and in France June 4, 1888, No. 180,986.

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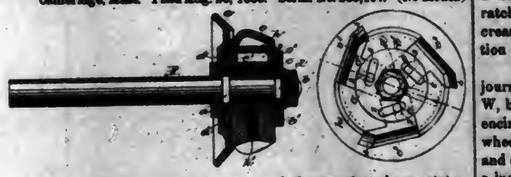
Claim.—1. A spring consisting of a plurality of spring-arms bent into or substantially into the form of a half-ellipse and arranged to converge toward a common center, said spring being constructed of a single or continuous wire, substantially as described.

2. A spring consisting of a plurality of spring-arms converging toward a common center, each spring-arm comprising two members or branches bent into or substantially into the form of a half-ellipse, and having one or more convolutions formed in the members thereof at a point or points intermediate of the extremes of such branches, substantially as and for the purposes specified.

3. A spring consisting of a plurality of spring-arms converging toward a common center, each spring-arm comprising two members or branches bent into or substantially into the form of a half-ellipse, and having one or more convolutions formed in the members thereof at a point or points intermediate of the extremes of such arms, said spring being made of a single or continuous wire, substantially as and for the purposes specified.

4. A spring consisting of a plurality of spring-arms, each comprising two members or branches bent into the form of a half-ellipse, in combination with the retaining-disk B, provided with the angular recesses *b*, and the retaining-disk C, provided with corresponding angular projections, *c*, substantially as and for the purposes specified.

402,435. ROTARY TRIMMING-TOOL FOR BOOTS OR SHOES. CHARLES W. GLIDDEN, Lynn, assignor to James W. Brooks, trustee, Cambridge, Mass. Filed Aug. 20, 1888. Serial No. 283,197. (No model.)



Claim.—1. In a rotary trimming-tool, the two slotted cam-plates, the slotted hub, and the strap cutter-blades having ears, combined with pins extended through the slots in the head, through the ears of the cutter-blades, and into the slots of the cam-plates, whereby change of relative positions of the hub and cam-plates effects the simultaneous adjustment of the blades, substantially as described.

2. The combination, with the hub of a rotary cutter, of strap-like blades bent at right angles to their width to present ears the flat faces of which are substantially parallel to each other and to the face of the hub to which they are secured, the said blades being made substantially straight in the direction of their depth, as from heel to cutting-edge, the said cutting-edge being beveled from the inner side of the blade backwardly toward the heel thereof, substantially as described.

3. A rotary cutter containing blades molded in the direction of their width to correspond with the shape to be given to the heel, and substantially straight from their heels to their cutting-edges, and beveled, as at 4, as shown and described.

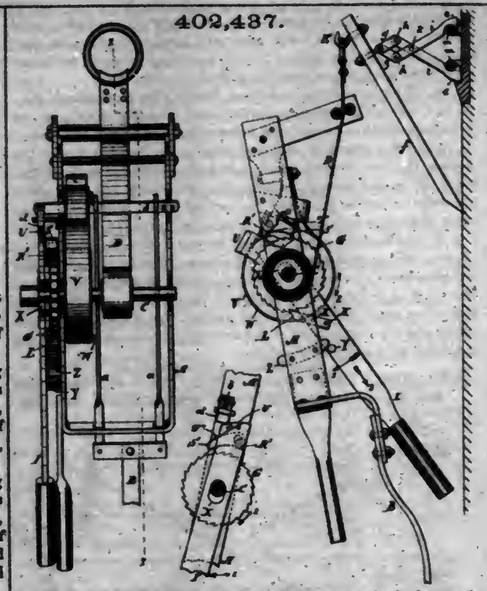
402,436. RED CARBON COLOR. ROBERT GNEHM, Basle, Switzerland, assignor to the Society of Chemical Industry of Basle, same place. Filed Sept. 24, 1888. Serial No. 286,945. (No specimens.)

Claim.—The red coloring-matter obtained from succinic acid and diethylmetaamidophenol, forming a hygroscopic powder soluble in water and alcohol, and dyeing wool, silk, and mordanted cotton a brilliant red with yellow fluorescence.

402,437. FIRE-ESCAPE. PHILIPP GOLDMANN, New York, N. Y. Filed July 30, 1888. Serial No. 280,490. (No model.)

Claim.—1. A fire-escape combining in its structure a frame, A, a suspended support or rest, B, for carrying the person, an axle, C, journaled in the frame, a cable, D, a ratchet-wheel, G, secured to the axle, a detaining-detent, S, pivoted to the frame above the ratchet-wheel to engage therewith, an oscillatory pendent lever, I, pivoted and swinging directly on the axle, extended above the latter, having a

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lug, R', to disengage the detent from the ratchet-wheel when said lever is swung in one direction, and provided with an attached pawl, L, below the ratchet-wheel to engage and disengage the same, and a brake mechanism for the axle, substantially as described.

2. The combination, in a fire-escape, of a frame, A, an axle, C, journaled therein, a cable, D, a ratchet-wheel, G, and a brake-wheel, W, both fixed to the axle, a brake-band, V, secured to the frame and encircling the brake-wheel, and an oscillating lever, I, loosely hung directly from the axle, having a pawl, L, to engage and disengage the ratchet-wheel and extended above the axle into an arm, U, for increasing or diminishing the pressure of the brake-band by the oscillation of said pawl-carrying lever, substantially as described.

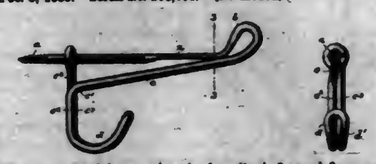
3. The combination, in a fire-escape, of a frame, A, an axle, C, journaled therein, a cable, D, a ratchet-wheel, G, and a brake-wheel, W, both fixed to the axle, a brake-band, V, secured to the frame and encircling the brake-wheel, a detent, S, on the frame above the ratchet-wheel to engage therewith, an oscillatory pendent lever, I, pivoted and swinging directly on the axle, extended above the same, having a lug, R', to disengage the detent from the ratchet-wheel provided with a pawl, L, to engage and disengage the ratchet-wheel and extended above the axle into an arm, U, for increasing or diminishing the pressure of the brake-band by the oscillation of said pawl-carrying lever, substantially as described.

4. The combination, with the frame A and an axle or bar, C, adapted for the reception of a rope or chain, of a detent and brake, a handle, I, secured by a slot-connection to said axle and adapted to engage the brake and detent, and provided with a pawl, L, adapted to engage a ratchet-wheel, G, connected to said axle or bar, substantially as described.

5. The combination, with the frame A and an axle or bar, C, adapted for the reception of a rope or chain, of a detent and brake, a seat or rest, B, made to act on said brake, and a handle, I, adapted to engage said detent and being made to communicate with the seat or rest B, to regulate its action on the brake, substantially as described.

6. An attaching device for fire-escapes, consisting of an arm, *f*, having an attaching-point, E, and provided with links *g*, jointed to the attaching-jaws *i*, substantially as described.

402,438. WIRE HOOK. ROBERT GORTON, Plainfield, N. J. Filed Feb. 5, 1889. Serial No. 298,700. (No model.)



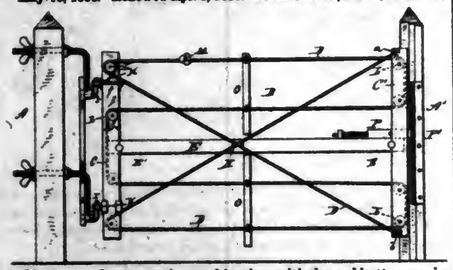
Claim.—1. The hanger herein described, formed from a continuous piece of wire, having the horizontal portion screw-threaded at its inner end for attachment to a support, the portion *c*, extending rearwardly and downwardly to the rear face of the hanger, the down-

wardly-extending vertical part c^4, the outwardly and upwardly curved parts d d', forming the lower hook and arranged in the same horizontal lines, and the vertical part c^5, extending up to the horizontal arm in the same transverse plane with the portion c^3

2. The hanger herein described, formed from a continuous piece of wire, having the horizontal portion screw-threaded at its inner end for attachment to a support, and rolled or swaged, as at x, the portion c, extending rearwardly and downwardly to the rear face of the hanger, the downwardly-extending vertical part c^3, the outwardly and upwardly curved parts d d', forming the lower hook and arranged in the same horizontal lines, and the vertical part c^5 in the same transverse plane with the portion c^3 and extending up to the horizontal arm.

3. The hanger herein described, formed from a continuous piece of wire, having the horizontal portion screw-threaded at its inner end for attachment to a support, a return portion, c, extending to the rear face of the hanger, the vertical part c^3, double wires, as d d', forming the lower hook, and the vertical portion c^5 in the same transverse plane with the vertical part c^3 and extending up to and around the inner end of the horizontal portion.

402,439. GATE. WILLIAM I. HAAS, Charles City, Iowa. Filed May 18, 1888. Renewed Apr. 1, 1889. Serial No. 305,646. (No model.)

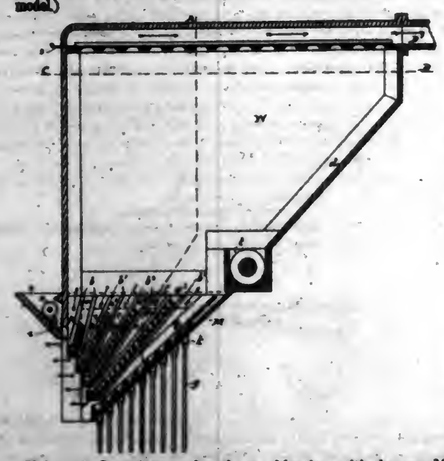


Claim.—1. In a gate, the combination, with the end battens, a pivotally-supported center beam, and pulleys journaled between the said battens, of a continuous wire, D, passed around the said pulleys and extending back and forth across the gate, substantially as described, and a wire-stretcher applied to said continuous wire.

2. In a gate, the combination, with the end battens, a center beam pivotally supported between the end battens, and pulleys journaled on the battens, of a continuous single wire, D, passing around the said pulleys and passing horizontally back and forth across the gate, the two ends of the said wire being extended in opposite directions diagonally across the gate, a bolt for securing the diagonal portions of the wire to the center beam, where they intersect each other, and a wire-stretcher, substantially as herein set forth.

3. The combination, with the end battens, a horizontal center beam, and pulleys journaled upon said battens, of a continuous wire passing around these pulleys and extending back and forth across the gate, substantially as herein described, and means for stretching the said continuous wire.

402,440. CHOP-GRADER. CARL HAGENMACHER, Buda-Pesth, Austria-Hungary. Filed July 13, 1888. Serial No. 280,311. (No model.)

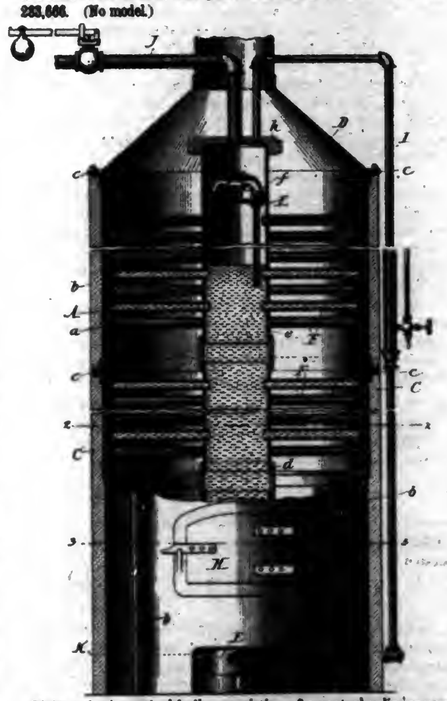


Claim.—1. In a chop-grader, the combination, with the case M, of the inclined upwardly-diverging frames arranged in a series and provided with slats forming gathering-passages p and q, substantially as and for the purpose set forth.

2. In a chop-grader, the combination, with the case M, of the inclined upwardly-diverging frames provided with slats forming the gathering-passages p and q, the guides between which the said removable frames are slid, and the hopper provided with an air-valve, substantially as and for the purpose set forth.

3. In a chop-grader, the combination, with the case M, of the inclined upwardly-diverging frames provided with slats forming the gathering-passages p and q, the air-case W, provided with a sloping side and the discharge-chamber t, the air-regulating slide at the top of the air-case, and the hopper e, provided with an air-valve, substantially as and for the purpose set forth.

402,441. BOILER. CHARLES HALLETT, Riverhead, N. Y., assignor to Francis Carll Hallett, same place. Filed Aug. 24, 1888. Serial No. 283,666. (No model.)



Claim.—1. A vertical boiler consisting of a central cylinder composed of separable sections provided with radial tubes F and connected by couplings d, in combination with a shell or casing composed of separable sections connected by flanges and bolts, substantially as described.

2. A vertical boiler consisting of a central cylinder composed of separable sections, and having screwed therein radial tubes, in combination with a casing and jacket divided horizontally and vertically into separable sections, and a packing of asbestus interposed between said casing and jacket, substantially as described.

402,442. GAS-GOVERNOR. CORNELIUS J. HAMILTON, Philadelphia, Pa., assignor to James H. Wilson, same place. Filed Dec. 15, 1888. Serial No. 293,748. (No model.)

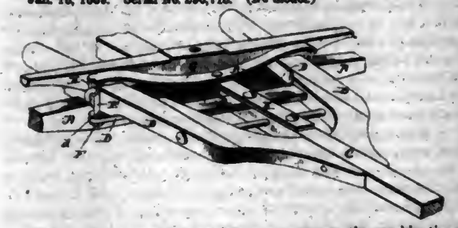


Claim.—1. In a gas-governor, the inlet-tube a, the orifices f and e, the valve n, the chambers D and C, the connecting-tubes d d' d^2, and the outlet a', in combination with a spring-regulated float, E, substantially as hereinbefore set forth and described.

2. In a gas-governor, the chambers D and C, connected, respectively, with the inlet and outlet tubes a and a', said chamber D connected with said chamber C by the tubes d d' d^2 and the chamber C connected with the inlet-tube a by the orifice e, the float E, provided to fit closely in the chamber C, and the spring s, in the manner and for the purpose substantially as hereinbefore set forth and described.

3. In a gas-governor having inlet and outlet tubes or orifices a and a', the chambers C and D, the chamber D connected with the inlet-tube by the valved orifice f, the tubes d d' d^2, connecting the chambers D and C, the orifice e, connecting the chamber C with the inlet-tube, the outlet-tube being also connected with the chamber C, the float E, provided in the chamber C, having the sides c', and the spring s, in the manner and for the purpose substantially as set forth and described.

402,443. TONGUE-SUPPORT. ELIAS HANSHAW, Russell, Ky. Filed Jan. 18, 1889. Serial No. 296,713. (No model.)



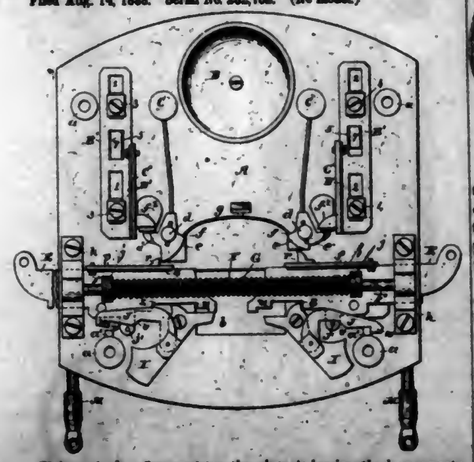
Claim.—As an improvement in tongue-supports, the combination, with the hounds and the tongue pivoted between the ends of the same, of the transverse bar D, secured to the under sides of the hounds and having perforated ends projecting beyond the sides of the hounds, the leaf-spring having an arm, K, projecting forward from its center, the said arm being secured on the upper side of the tongue at the rear end of the same, and the ends of the spring projecting over the hounds, the swinging loops secured to the ends of said spring, the hooks engaging said loops and having threaded lower ends projecting through the perforated ends of the bar D, and the nuts on the lower ends of the hooks turning up against the said bar D, as specified.

402,444. CULINARY VESSEL. ORLIN B. HARMON, Bloomingdale, Mich. Filed Feb. 10, 1888. Serial No. 263,615. (No model.)



Claim.—The combination, with a vessel provided with ears, of a bail having spiral eccentrics near its ends, the ends beyond the eccentrics being passed through the ears of the vessel, a bowed handle passed around the sides of the vessel, the ends of the bail and ends of the handle being hooked together, and the tie-wire holding the handle close to the vessel, substantially as set forth.

402,445. FARE-REGISTER. JOSEPH L. HARLEY, Baltimore, Md. Filed Aug. 14, 1888. Serial No. 282,702. (No model.)



Claim.—1. In a fare-register, the plate A, having the lower posts, e, squared as shown, forming guide-bearings for the push-bars E, in combination with the pawls J and l and the said push-bars E, substantially as and for the purposes specified.

2. In a fare-register, the horizontal push-bars, each having a notch in its lower edge of a different extent from that of the other, and having studs K K, in combination with the levers v and the wheels H, substantially as and for the purposes specified.

3. The combination, with the toothed register-wheels H, of the sliding push-bars E, notched on their under sides for a distance equal to the distance between one, two, or more teeth of the said wheels, and the spring-actuated pawls l l, adapted to engage said wheels, substantially as specified.

4. In a fare-register, the combination, with the sliding push-bars having notches in their inner lower sides, of the pivoted gravitating pawls, the disks or wheels operated thereby, the detent-levers secured thereto, and the projections on the bars, whereby the levers are released when the bars are moved inward, substantially as specified.

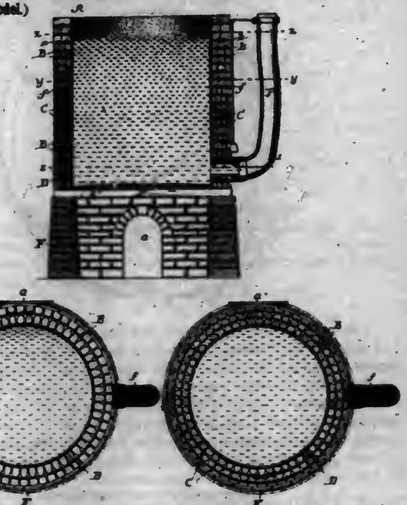
5. The combination, with the bell or alarm mechanism, of the plate A, provided with brackets h h, the horizontal bars having collars j j, the right-angled shelves, and the guide-rod having a surrounding spring interposed between the sliding bars, whereby they are pressed normally outward, substantially as specified.

6. In a fare-register, the combination, with the registering-wheels, of the vertically-sliding pull-bars, each being notched for a length differing or varying from the other, the said bars being slotted to receive guide-pins and notched at their upper edges, substantially as and for the purposes specified.

7. The combination, with the registering-wheels, of the pull-bars having notches in their sides, each of a different length from the other, and provided with projections g' g', the weighted dogs B' B', having shoulders, and the levers a', arranged to operate substantially as specified.

8. The combination, in a fare-register, of the vertically-sliding bars, the slides B' B', having right-angled shelves and spring-arms D' D', provided with lips f f, and the alarm-hammers, the whole arranged to operate substantially as specified.

402,446. CONSTRUCTION OF WATER-TANKS. WILLIAM H. HARRELSON, Kansas City, Mo. Filed Dec. 5, 1888. Serial No. 292,742. (No model.)



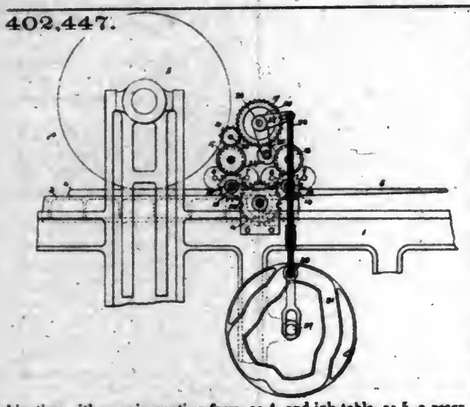
Claim.—1. In the construction of water-tanks, &c., the combination, with the constituent parts of the wall of the structure, of series of encircling bands embedded in the wall and arranged each series of two or more bands in the same horizontal plane and firmly bound in place, the bands in each series increasing in number toward the bottom of the structure, substantially as set forth.

2. In the construction of water-tanks, &c., the combination, with the constituent parts of the wall of the structure, of series of encircling bands embedded in the wall and arranged each series of two or more bands in the same horizontal plane and let into grooves in the bricks of the wall, the bands in each series increasing in number toward the bottom, the same being decreased toward and to a minimum at the top, substantially as and for the purpose specified.

402,447. INKING APPARATUS FOR PRINTING-PRESSES. JOHN T. HAWKINS, Taunton, Mass. Filed Mar. 30, 1888. Serial No. 267,706. (No model.)

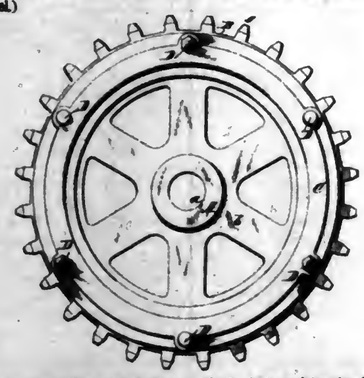
Claim.—In the inking apparatus of a printing-machine, in com-

402,447.



bination with a reciprocating form, as 4, and ink-table, as 5, a reservoir-roller, as 19, pairs of form-rollers, as 6 and 7 8 and 9, one pair or both pairs, riding or distributing rollers, as 10 and 11, one or both, in contact each with a pair of said form-rollers, and a doctor roller or rollers, as 24 24ª, in constant contact with said reservoir-roller, and automatically oscillated in and out of contact with said riding or distributing roller or rollers, whereby the ink deposited upon said ink-table is first partially conveyed to said reservoir-roller, afterward distributed to the form-rollers, and by them deposited upon the form in an equable manner, substantially as described, for the purposes set forth.

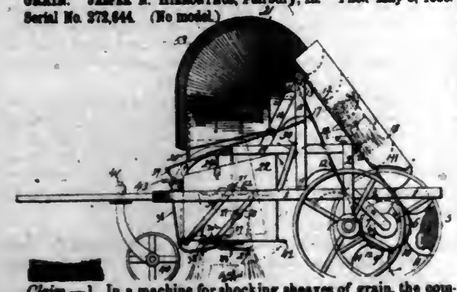
402,448. SPROCKET-WHEEL. JOHN R. HERSH and JAMES M. STALEY, Dayton, Ohio. Filed Feb. 12, 1889. Serial No. 299,605. (No model.)



Claim.—1. The combination, with the hub and its rim formed with shoulder *d* and recess *e*, of the ring B, formed with a toe, *f*, the retaining-ring, and the securing-bolts, substantially as described.

2. The combination, with the hub and its rim formed with shoulder *d* and recess *e*, provided with inclined side, of the ring provided with teeth and with a toe having an inclined side, the retaining-ring bearing against the toothed ring and the side of the rim, and the bolts or rivets passed through the retaining-ring, the ring, and the rim of the hub, substantially as shown and described.

402,449. MACHINE FOR SHOCKING SHEAVES OF SMALL GRAIN. JASPER N. HIBBONSTRAW, Fairbury, Ill. Filed May 3, 1888. Serial No. 272,644. (No model.)



Claim.—1. In a machine for shocking sheaves of grain, the combination, with a table and tines secured to an endless belt for elevating the sheaves from the ground to said table, of a box to receive the sheaves from said table, wings pivoted in said box and actuated by means of lever 30, and bell-cranks 30½ and 31, connected at their opposite ends by rod 32, and provided with stud-pins 33 on their free ends adapted to engage arms 29, which form bent extensions of said wings outside the bottom of the box, whereby the wings are turned to compress the sheaves, substantially as shown and described.

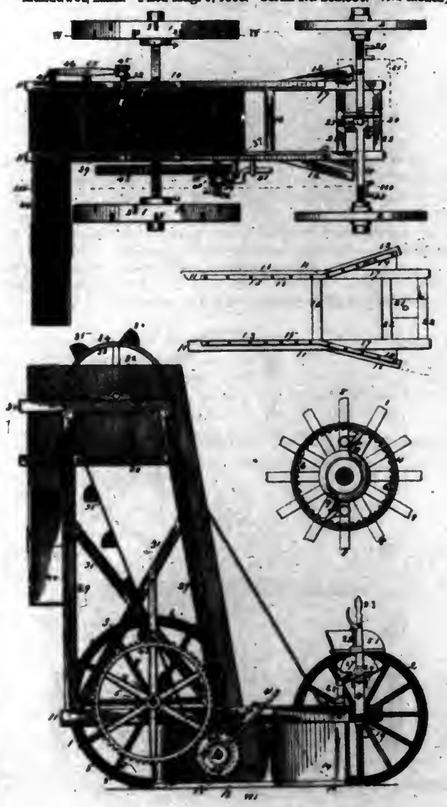
2. In a machine for shocking sheaves of grain, the combination of a drum secured to a supporting-wheel, a roller journaled in standards on the main frame, an inclined frame having a closed bottom which serves as a supporting bed or way, an endless belt in said inclined frame on said drum and roller provided with cross-bars having curved tines for gathering the sheaves from the ground and supporting them while being elevated, a downwardly-slanting table, and a pivoted shocking-box, substantially as shown and described.

3. In a machine for shocking sheaves of grain, the combination, with a box having wings pivoted therein, and arms forming bent extensions of said wings, located outside of said box, of bell-cranks pivoted on said wings outside of the box and provided with stud-pins on their free ends, a rod connecting the opposite ends of said cranks, and a lever pivoted to the outside of the box for actuating the bell-cranks and wings, substantially as shown and described.

4. In a machine for shocking sheaves of grain, the combination, with a box having wings pivotally secured therein, and arms forming bent extensions of said wings, of bell-cranks provided with stud-pins on their free ends, a rod connecting the opposite ends of the bell-cranks, and a lever pivoted to the box for actuating with cranks and wings, substantially as shown and described.

5. In a machine for shocking sheaves of grain, the combination, with a box having wings pivotally secured therein, arms forming bent extensions of said wings, bell-cranks pivoted on said wings and provided with stud-pins on their free ends, and a rod connecting the opposite ends of the bell-cranks, of spring-arms secured to said box provided with notches to lock the arms extending from the wings, and a pivoted lever for operating said spring-arms to release the extension-arms of the wings and allow the wings to fall back against the sides of the box, substantially as and for the purposes shown and described.

402,450. DIRT-LOADING MACHINE. EDWARD T. HOFFMAN, Simmunduwot, Kans. Filed Aug. 9, 1888. Serial No. 282,356. (No model.)



Claim.—1. The combination, in a dirt-loading machine, of an endless elevator carrying scoops adapted to enter the dirt before the latter is elevated from the ground, supporting-wheels with suitable driving mechanism connecting said wheels with the elevator, and mold-boards at the sides entering the earth and having parallel rear portions between which the scoops descend, and laterally-flaring front portions adapted to collect the dirt and crowd it between the parallel portions, whereby its depth is increased at the foot of the endless belt, as set forth.

2. The combination, in a dirt-loading machine, of an endless elevator provided with scoops, a main frame constructed to tilt on the rear axle of the machine, a bell-crank lever upon the front axle, a link connecting said lever to the front end of the main frame, a lock bar or plate, 27, a latch on said lever for engaging said plate 27, and mold-boards attached to the frame and descending to the dirt each side of the elevator, and having rear parallel portions, 13, and flaring front portions, 14, substantially as set forth.

3. The combination, in a dirt-loading machine, of a frame constructed to tilt on the rear axle, an arched front axle with a tie-bar connecting the lower ends of the arch and leaving space for the front end of the tilting frame to rise and fall between the arched part of the axle and the tie-bar, a king-bolt passing through the middle of the arch and the tie-bar and through a part of the tilting frame, and a lever fulcrumed to the axle and connected to the tilting frame, substantially as and for the purpose set forth.

4. In a dirt-loading machine, the longitudinal timbers 10, having parallel portions 11, and the extensions 17, forming draft-timbers, the outwardly inclined or flaring parts 12, secured to said timbers, and the mold-boards or scrapers suspended from said portions 11 12 and having parallel rear and flaring front portions, 13 14, respectively, in combination with an elevator having an elevator-belt provided with scoops arranged to descend between said parallel portions 13, as set forth.

402,451. STOVE. HERBERT HOPKINS and JOSEPH R. PERRY, Wilkes-Barré, Pa. Filed Jan. 11, 1889. Serial No. 296,097. (No model.)

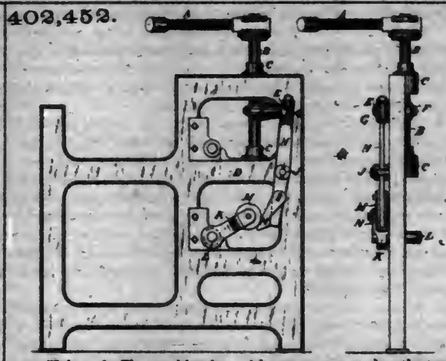


Claim.—1. The combination, with the base-ring, of the hot-water or steam pipe or cylinder, the inner central hot-air pipe or flue, and the rings *b* and *d*, substantially as set forth.

2. The combination, with the base-ring and the air-inlet pipes, of the outer pipe or cylinder and the inner pipe or flue having a lower apertured end, substantially as set forth.

402,452. PICKING MECHANISM FOR LOOMS. JOSEPH HORROCKS and EDWIN HORROCKS, Bradford, County of York, England. Filed June 4, 1888. Serial No. 276,946. (No model.) Patented in England June 30, 1887, No. 9,279, and in Germany June 29, 1888, No. 46,718.

402,452.



Claim.—1. The combination, with an arm mounted on the tappet-shaft, of an approximately-vertical lever adapted to be oscillated by the said arm at each revolution of the tappet-shaft, and a picking-shaft provided with a projecting arm engaging the upper end of said lever, substantially as described.

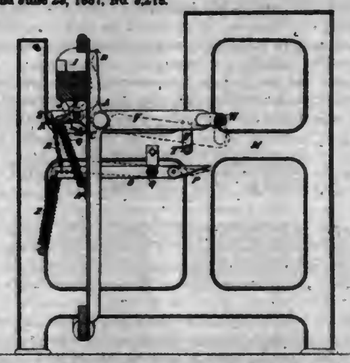
2. The combination, with an arm projecting from and rotating with the tappet-shaft, of a lever, a pawl or pendant pivoted to the lever, so that the pawl will be engaged and the lever oscillated by the arm as the tappet-shaft revolves in one direction, but the lever will not be oscillated when the shaft rotates in the opposite direction and the arm engages the pawl, and a picking-shaft provided with an arm engaging the lever and operated by the same when the lever is oscillated, substantially as described.

3. A mechanism for actuating the pickers in looms, comprising a vertical rocking-shaft, a picking-stick extending from the same, an arm projecting from the shaft, a lever adapted to engage the arm and rock the shaft, and mechanism for intermittently oscillating the lever, substantially as described.

4. In a mechanism for actuating the pickers of looms, the combination of a vertical picking-shaft, a picking-stick extending from the same, an arm projecting laterally from the shaft, a conical or taper anti-friction roller journaled on the arm, a lever to engage said roller and intermittently rock the picking-shaft, and the tappet-shaft provided with an arm to rock the lever, substantially as described.

5. The combination of a picking-shaft provided with a projecting arm, an anti-friction roller mounted on the arm, a lever provided on one end with a roller to engage the roller on said arm, a tappet-shaft provided with a projecting arm, and a roller mounted on said arm to engage the opposite end of the lever, substantially as described.

402,453. SHUTTLE-RELIEF MECHANISM FOR LOOMS. JOSEPH HORROCKS and EDWIN HORROCKS, Bradford, County of York, England. Filed June 4, 1888. Serial No. 276,947. (No model.) Patented in England June 29, 1887, No. 9,218.



Claim.—1. The combination, with the lathe, a shuttle-box swell, and a stop-rod having an arm engaging the swell, of a stationarily pivoted lever, a flexible connection between one end of the lever and the stop-rod, a supplementary spring normally holding the connection taut and the arm exerting pressure on the swell, a light spring connected with the rod and holding the arm constantly bearing on the swell, and a finger carried by a movable portion of the loom to depress the lever and relieve the swell of the pressure of the supplementary spring when a pick is made, substantially as described.

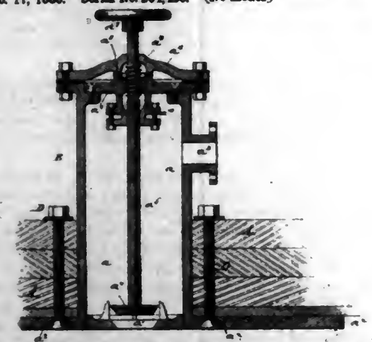
2. In a loom, the combination of the frame, the lathe, a shuttle-swell, a stop-rod provided with arms, one of them bearing on the swell,

a light spring secured to and exerting a constant pressure upon the rod, a lever pivoted to the frame, a spring secured to and tending to depress an end of the lever, a flexible connection between said end of the lever and an arm of the stop-rod, the crank-arm, and a finger carried by the same and adapted to intermittingly engage and raise the spring end of the lever, substantially as described.

3. The combination of a lathe, a shuttle-box having a pivoted swell, a stop-rod having an arm engaging said swell, a light spring connected to the stop-rod, causing it to exert a constant pressure on the swell, a pivoted lever, a supplemental spring secured to and tending to depress one end of the same, a chain connecting said end of the lever and the stop-rod, whereby the supplemental spring normally exerts its pressure together with the light spring upon the swell and the driving mechanism, and a finger carried by the same and adapted to intermittingly engage the lever and raise the spring end of the same, substantially as described.

4. In a loom, the frame, a lathe, a rod carried by the same having arms, a shuttle-swell engaged by one of the arms carried by said rod, a spring connected with said rod and yieldingly causing said arm to bear on the swell, and a crank-shaft and pitman to swing the lathe, in combination with a lever pivoted to the frame, a chain connecting one end of the same and an arm of said rod, a spring tending to depress said end of the lever and hold the chain taut, a pawl pivoted to the opposite end of the lever to have an independent upward swing, and a finger carried by the pitman and adapted to engage said pawl from above and raise the spring end of the lever, for the purpose set forth.

402,454. SEA-COCK. BENJAMIN S. HORTON, Vermilion, Ohio. Filed Feb. 17, 1888. Serial No. 264,420. (No model.)



Claim.—1. In a sea-cock, the hollow closed body adapted to extend through the hull of a vessel, and provided at its extreme outer end with the valve-seat and at its inner end with a pipe-receiving neck, in combination with an inwardly-opening valve adapted to close against the seat practically flush with the outer end of the body, the valve-operating spindle extended through the inner end of the body, and guides for said spindle located wholly on the inner side of the valve, whereby the formation of ice within the body outside of the valve proper, injury to the valve by contact with external objects, and the closure of the valve by such contact are all prevented.

2. In a sea-cock, the body having the seat at its extreme end, the inwardly-opening valve, the threaded valve-operating spindle, its supporting-bar attached to the body, and the independently-removable cap or cover a^4, combined as and for the purpose described.

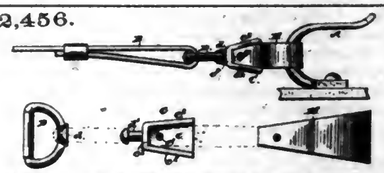
402,455. FILTER-PRESS. JOHN JOHNSON, Brooklyn, N. Y. Filed Sept. 3, 1888. Serial No. 284,873. (No model.)



Claim.—1. The combination, with the diaphragm or partition-plates severally in a filter-press, of a filtering-cloth support consisting of a bar extending along the top of the same and fixed adjustably thereon toward and from the plate, and a filtering-cloth suspended from said bar, substantially as described.

2. The combination, with the diaphragms or partition-plates severally in a filter-press, of a filtering-cloth support consisting of a bar extending along the top of the same and fixed adjustably toward and from the plate, and a duplex filtering-cloth suspended on said support and each side of the plate, substantially as described.

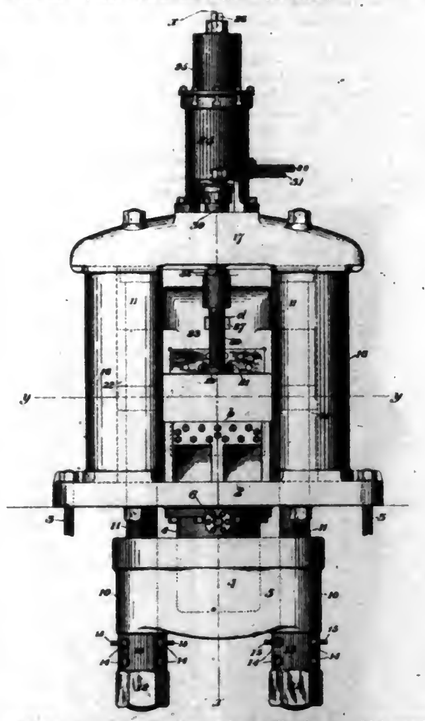
402,456. OVERDRAW OR CHECK REIN ATTACHMENT. RICHARD W. JOHNS, Syracuse, N. Y. Filed Jan. 21, 1889. Serial No. 297,009. (No model.)



Claim.—1. As an improved article of manufacture, a loop for overdraw or check reins, consisting of a body portion or plate with a recess on each side thereof and marginal flanges on the side and rear end and perforated to receive the rivet or bolt for securing the strap-loop, in combination with said loop and provided with the attaching-ring, substantially as described.

2. The attaching device for overdraw or check reins, substantially as described, of a plate having a tongue with flanges projecting from the edges of the sides and one end thereof, a closed yoke swiveled to one end of said plate by a headed stud or pin engaging a central socket of said yoke, and a leather-strap loop whose ends are snugly fitted between the flanges of the plate and bearing upon and secured to the tongue thereof by a single rivet, substantially as described.

402,457. HYDRAULIC SHEARS. JULIAN KENNEDY, Latrobe, Pa. Filed Oct. 29, 1888. Serial No. 289,407. (No model.)



Claim.—1. An improvement in hydraulic shears, which consists in the combination, with the moving shear-knife and the hydraulic cylinder by which it is actuated in the act of shearing, of a gag or holder having a hydraulic cylinder which is connected with the same power-supply which supplies the cylinder of the shear-knife, whereby the pressure applied to the gag is proportioned to the pressure applied to the shear-knife, substantially as and for the purposes described.

2. An improvement in hydraulic shears, which consists in the combination, with the moving shear-knife and holder and its actuating-cylinder, of a gag or holder and the cylinder by which it is moved in the act of shearing, and a projection or collar which connects the gag and knife-holder, whereby the gag is supported and lifted by the ascent of the knife-holder, and the knife is permitted to descend independently of the gag after the latter has engaged the metal to be sheared, substantially as and for the purposes described.

3. An improvement in hydraulic shears, which consists in the combination, with the moving shear-knife and the hydraulic cylinder by which it is actuated in the act of shearing, of a gag or holder having a hydraulic cylinder which is connected with the same power-supply which supplies the cylinder of the shear-knife, whereby the

pressure applied to the gag is proportioned to the pressure applied to the shear-knife, the said gag passing through the knife-holder and being provided with a projection or collar which affords means whereby the gag is raised in raising the knife-holder, substantially as and for the purposes described.

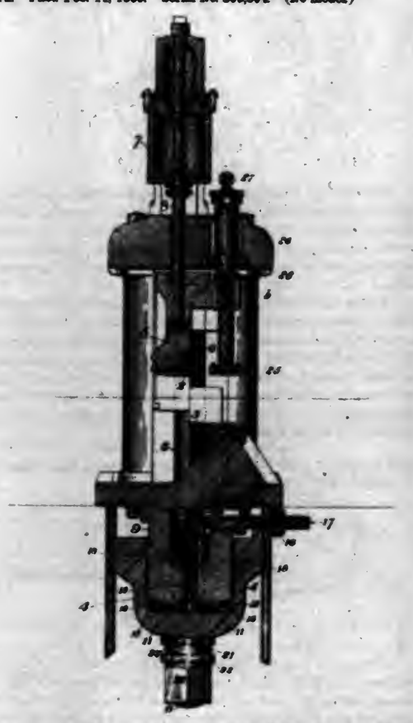
4. An improvement in shears, which consists in the combination of the two shear-knives and their holders, and guideways by which the moving holder is guided, said shear-knife holders being provided with portions at their ends which are situate in the guideways, and which overlap each other and brace the moving holder in the act of shearing, substantially as and for the purposes described.

5. An improvement in shears, which consists in the combination of the two shear-knives and their holders, guideways by which the moving holder is guided, said shear-knife holders being provided with portions at their ends which are situate in the guideways, and which overlap each other and brace the moving holder in the act of shearing, a hydraulic cylinder for operating the moving knife-holder during the act of shearing, and bolts which extend from the cylinder in recesses between the meeting faces of the knife-holders in the guideways and are connected with the moving knife-holder, substantially as and for the purposes described.

6. In hydraulic shears, the combination, with the moving shear knife or holder and the cylinder by which it is moved in the act of shearing, of a gag or holder connected with the moving parts of the shear-knife, the said connection being loose, whereby the gag is restrained during the descent of the knife, and the knife is permitted to descend independently of the gag or holder after the latter has engaged the metal to be sheared, and a cylinder for actuating the gag, substantially as and for the purposes described.

7. In hydraulic shears, the combination, with the moving knife-head, of a stationary plunger and movable cylinder situate below the same, and vertical bolts connecting the cylinder with the knife-head, whereby the descent of the cylinder will draw the knife-head with it, and a second cylinder for raising the knife-head and the first-named cylinder, substantially as and for the purposes described.

402,458. HYDRAULIC MACHINE. JULIAN KENNEDY, Latrobe, Pa. Filed Feb. 11, 1889. Serial No. 299,394. (No model.)



Claim.—1. The combination of the cylinder, the piston fitting within the same, and a pipe-connection for the water-supply pipe extending through the piston and having an integral flange at the end of the latter, substantially as and for the purposes described.

2. The combination of the cylinder, the piston fitting within the same, and a flange or facing for the end of the piston having an integral pipe-connection for the water-supply pipe and having also a suitable peripheral packing, substantially as and for the purposes described.

3. The combination of the cylinder, the piston fitting within the same and having at the margin of its base a peripheral recess, and a facing for the end of the piston having a marginal band or bead which fits in said recess and forms the bearing-surface of the piston, substantially as and for the purposes described.

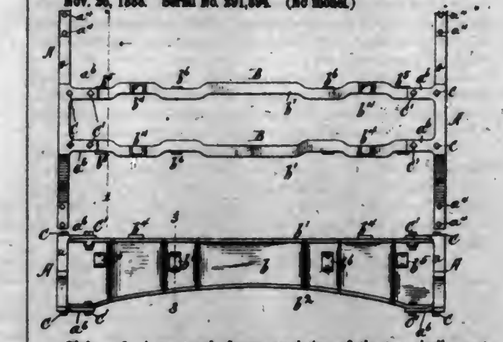
4. The combination of the cylinder, the piston fitting within the same, a facing for the end of the piston having an integral pipe-connection for the water-supply pipe and having also a suitable peripheral packing, and a retaining-ring by which the packing is held in place, substantially as and for the purposes described.

5. In hydraulic machinery, the combination, with a moving head or plunger, of a hydraulic motor which actuates the same, connecting-rods extending from the head or plunger and having heads or nuts on which the movable element of the hydraulic motor is supported, and removable separators or collars interposed between the said heads or nuts and the said movable element, substantially as and for the purposes described.

6. In hydraulic machinery, the combination, with a moving head or plunger, of a hydraulic motor which actuates the same, connecting-rods extending from the head or plunger and having heads or nuts on which the movable element of the hydraulic motor is supported, and removable separators or collars interposed between the said heads or nuts and the said movable element, said separators being divided longitudinally into separable parts, substantially as and for the purposes described.

7. In hydraulic machinery, the combination, with a moving head or plunger, of a hydraulic motor which actuates the same, connecting-rods extending from the head or plunger and having heads or nuts on which the movable element of the hydraulic motor is supported, removable separators or collars interposed between the said heads or nuts and the said movable element, and a second hydraulic motor connected with the said head or plunger for raising the same, substantially as and for the purposes described.

402,459. CAR-TRUCK. MARTIN KENNEDY, Hegewisch, Ill. Filed Nov. 26, 1888. Serial No. 291,894. (No model.)



Claim.—1. A car-truck frame consisting of the two similar end pieces, A, each cast in a single piece and provided with inwardly-extending projections, the two similar cheek-pieces, B, each cast in a single piece, and suitable bolts connecting the cheek-pieces to the projections on the end pieces, substantially as and for the purposes specified.

2. A car-truck frame consisting of the end pieces, A, having recesses a^3 and projections a^6, the cheek-pieces B, fitting at their ends in said recesses and between said projections, and the long bolts C and short bolts C', connecting said end pieces and cheek-pieces, substantially as and for the purposes specified.

3. In a car-truck frame, the end piece, A, having the arch-bars a and columns a' cast in a single piece, substantially as and for the purposes specified.

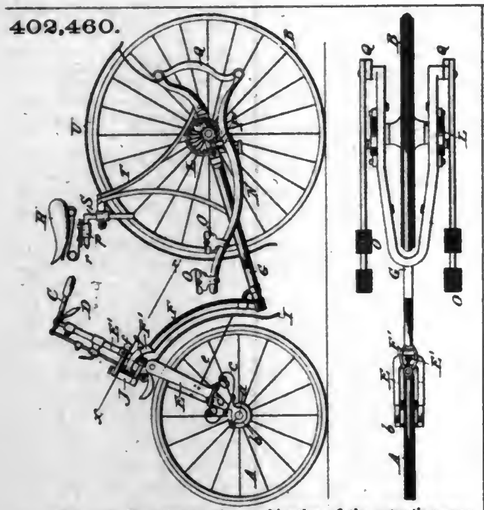
4. In a car-truck frame, the end piece, A, having arch-bars a, columns a', and tie-bars a^5, all cast in a single piece, said tie-bars being in the same plane with and forming extensions of the lower portion of the lower arch-bar, substantially as and for the purposes specified.

5. In a car-truck frame, the end piece, A, having the arch-bars a and columns a' cast in a single piece, said columns being provided with recesses a^3 and having their opposite faces plane and parallel, substantially as and for the purposes specified.

6. In a car-truck frame, the cheek-piece B, cast in a single piece and having formed thereon recesses b^3, apertured lugs b^4, and hooks b^5, substantially as and for the purposes specified.

402,460. BICYCLE. GERRIT KIEBE, Amsterdam, N. Y. Filed Oct. 27, 1888. Serial No. 289,200. (No model.)

402,460.



Claim.—1. In a bicycle, the combination of the actuating-gearing for the drive-wheel, consisting of the pinion on the axle, the internally-toothed gear engaging it, the casing on the main frame, and the ball-bearing in said casing for the gear, the pedal-lever, connecting-rod between it and the gear, and the link pivoted to the said lever and the main frame, substantially as described.

2. In a bicycle, the combination, with the actuating-gearing for the drive-shaft, consisting of the pinion on the axle, the internally-toothed gear engaging it, the casing on the frame, the ball-bearing in said casing for the gear, and a pedal-lever, substantially as described.

3. In a bicycle, the combination of the forked standard E, the wheel A, its axle *a*, the axle-bearings *b*, and the interposed springs between the bearings and the standard, consisting of parts *c* and *c'*, substantially as described.

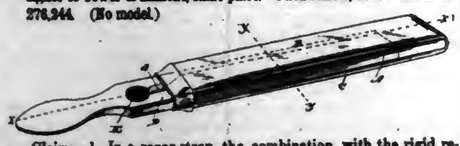
4. In a bicycle, the combination of the forked standard E, the steering-rod E', carrying steering-bar C, the steering-head J, carrying bearings for said rod, and the frame F, supporting said head and looped at F' to inclose the steering-rod, substantially as described.

5. In a bicycle, the combination of the forked standard E, the bearings *b* for the axle of the front wheel, the interposed springs *c c'* between said bearings and the standard, the steering-rod E', carrying the steering-bar, the steering-head J, located in front of the steering-rod and having bearings *f f* therefor, and the looped part F' of the main frame, substantially as described.

6. In a bicycle, the combination of the saddle H, its spring connected to an adjustable sleeve, *p*, the seat-frame having the horizontal rod *r* enter said adjustable sleeve and the vertical rods R, and the part T of the main frame, having clamped ends adapted to receive and hold the vertical rods R R, substantially as described.

7. In a bicycle, the combination of the actuating-gearing consisting of pinion M on the axle, gear K, engaging this pinion, casing L on the main frame, the ball-bearing in the casing for the gear, the multiple-pedaled lever N, the connecting-rod P on said lever, pivoted to the gear K, and the link Q, pivoted to the lever and the main frame, substantially as described.

402,461. RAZOR-STROP. JOHN LAMONT, Rochester, N. Y., assignor to Tower & Lamont, same place. Filed June 6, 1888. Serial No. 276,344. (No model.)



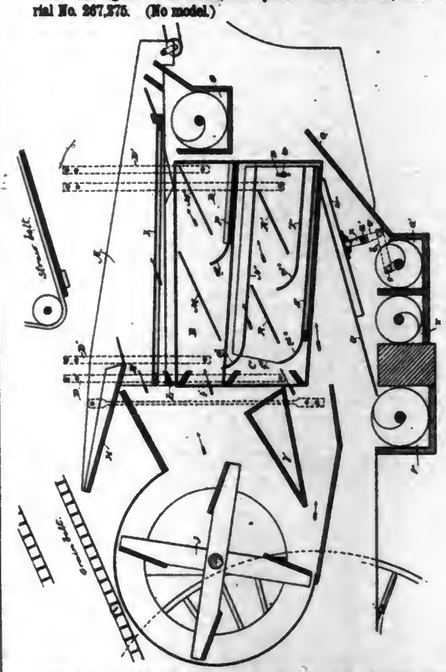
Claim.—1. In a razor-strop, the combination, with the rigid removable center piece and the sheath entirely surrounding the same, of the pads having the stropping-surfaces on the outside and secured to opposite sides of the sheath, substantially as and for the purpose set forth.

2. In a razor-strop, the combination, with the rigid removable center piece and sheath having the finished edges, of the pads with the stropping-surfaces on the outside secured to opposite sides of the sheath, substantially as described.

3. In a razor-strop, the combination, with the rigid center piece and the sheath within which the center piece fits, open at both ends, of the pads secured to the sides thereof and having the extended ends secured over one end of the sheath to close the same and present a finished appearance, substantially as described.

4. In a razor-strop, the combination, with the central sheath and the pads secured on opposite sides thereof, of the rigid removable center piece fitting within the sheath, and the raised strips or ribs secured thereto and extending longitudinally thereof on opposite sides to retain the pads in proper shape, substantially as described.

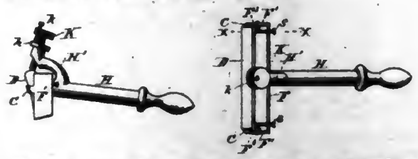
402,462. GRAIN SEPARATOR AND CLEANER. MICHAEL N. LAUFENBURG, Stockton, Cal., assignor to the Stockton Combined Harvester and Agricultural Works, same place. Filed Mar. 15, 1888. Serial No. 267,375. (No model.)



Claim.—1. The shoe or gang having the side walls, the screens by which the grain is separated from the barley and oats, the inclined plates whereby the grain is returned to the front of the succeeding screen, and the vertical partitions or diaphragms by which the shoe is separated into longitudinal channels, substantially as herein described.

2. The vertical rotary shaft journaled upon the frame of the machine and the eccentric fixed to the shaft, so as to rotate in a horizontal plane, in combination with the shoes suspended to oscillate from side to side about their points of suspension, rollers journaled upon the sides of the shoes and partaking of the pendulous movements of the shoes, the faces of said rollers turning in contact with those of the eccentrics and made crowning, so as to rock thereon without jar, substantially as described.

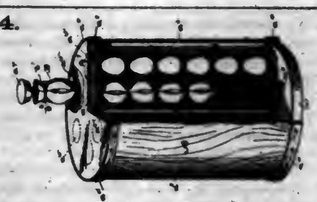
402,468. SAFETY-RAZOR. HENRY B. LEACH, Boston, Mass. Filed Sept. 6, 1888. Serial No. 284,735. (No model.)



Claim.—1. In a safety-razor, the combination, with the frame or holder having fixed clips C C and the razor-blade, of a clamping device operating upon the top edge of said blade, and the rearward adjusting-screws S S, operating upon the rear face of the blade, substantially as described.

2. In a safety-razor, the combination of the frame or holder having clips C C, the razor-blade, the clamping-screw K and gage-screw *k*, and the rearward adjusting-screws S S, substantially as described.

402,464. EGG-CRATE. ALLEN D. LEE, Grand Rapids, Mich. Filed Jan. 30, 1889. Serial No. 298,103. (No model.)



Claim.—1. The egg-crate consisting of an external case or body, and a series of independent tubes each sustained at its two ends in the body, and composed of a flexible sheet adapted to encircle a row of eggs, and provided with contractions to maintain their separation.

2. In an egg-carrier, a rigid case or body having openings through one end, in combination with a series of independent egg-receiving tubes adapted to be introduced through the end openings and sustained at their ends within the body, substantially as described and shown.

3. The egg-carrier consisting of the cylindrical body having top openings, the caps to close the openings, and the series of removable tubes, each divided longitudinally and provided with transverse contractions.

4. In an egg-carrier, the combination of the two heads, the sustaining-post, the outer shell, and the series of tubes sustained at their ends in said heads.

5. An egg-holder consisting of a sheet of veneer bent into tubular form with the grain lying longitudinally, and the contractions therein at different points in its length.

6. An egg-holder consisting of a longitudinally-divided tube having a series of circumferential contractions to maintain the separation of the eggs.

7. An egg-holder consisting of a longitudinally-divided tube with a series of circumferential contractions and removable encircling bands.

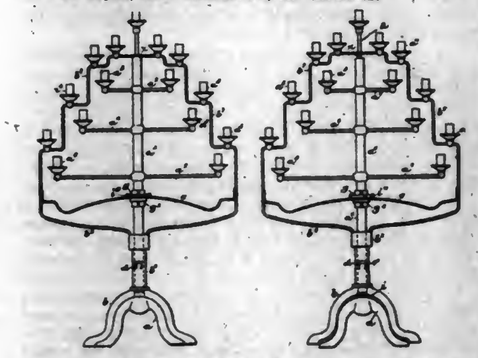
402,465. DEVICE TO FACILITATE GRINDING SECTIONS OF MOWING-MACHINES. FREDERICK J. MCCLENON, Walton, N. Y. Filed Dec. 21, 1888. Serial No. 294,299. (No model.)



Claim.—1. A section-bar holder consisting of the side bars connected by a transverse guide-bar and having shoulders upon their inner sides near their lower ends, the planes of which extend one at a proximate right angle to the other, the base-bar to which said side bars are pivoted, the clamp of the base-bar, the notched guides pivoted to the upper ends of the side bars, the adjustable clamp on the guide-bar, and its pivoted jaw and set-screw, substantially as specified.

2. The combination, with the guide-bar of the section-bar holder, of the clamp consisting of the slide adjusted upon said guide-bar and having a concave shoulder, and the pivoted jaw applied to said slide and having a curved end fitting in the concavity of said shoulder, said jaw having a set-screw, substantially as set forth.

402,466. CANDELABRUM. THOMAS MCGOVERN, New York, N. Y. Filed May 23, 1888. Serial No. 274,796. (No model.)



Claim.—1. In a candelabrum, the combination, with the inner member comprising a foot, a stem secured to and rising from said foot, and branches from said stem bearing candle holders or sockets, of the outer member comprising a foot adapted to embrace the foot on the inner member, a tubular stem which embraces the stem of the inner member, and a frame to support candle holders or sockets, secured below to the tubular stem and having a bearing above on the stem of the inner member, said outer member being adapted to embrace or fold over the inner member, substantially as and for the purpose set forth.

2. In a candelabrum, the combination, with the two substantially flat members mounted rotatively on each other and adapted to fold the one within the other, of the elastic bar *e*, secured at its ends to the frame of the outer member and having a bearing on the stem of the inner member, said members being provided with limiting stops and locks, substantially as and for the purposes set forth.

3. In a candelabrum composed of two substantially flat members rotatively mounted on each other, as described, the combination, with the cylindrical stem *a'* of the inner member provided with connected grooves *c c'*, of the tubular stem *b'* of the outer member embracing stem *a'*, and provided with a stud or screw, *d*, the end of which engages the connected grooves in the last-named stem, substantially as and for the purposes set forth.

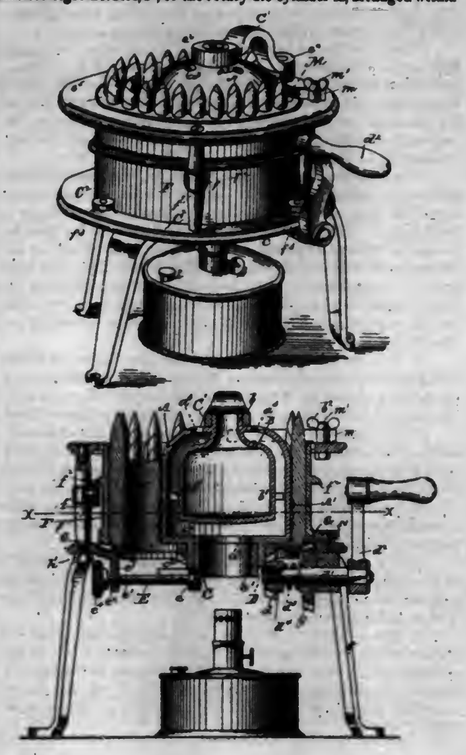
4. In a candelabrum, the combination, with the inner member having an upright stem, *a'*, with branches a^2 of the outer member rotatively mounted on the inner member and having a frame, b^2, with steps or offsets formed therein to receive the candle sockets or holders, substantially as set forth.

5. In a candelabrum composed of two flat members rotatively mounted the one on the other, the combination, with the stem of the inner member provided with a groove, *c' c c'*, and a square, *i*, of the outer member provided with a stud which engages said groove, and a square socket which receives said square, said square and socket being auxiliary to the said groove and stud, substantially as set forth.

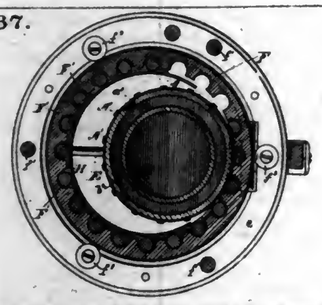
402,467. MACHINE FOR IMPRESSING LETTERS OR MARKS IN CIGARS. GEORGE F. MCINDOE and JAMES W. MCINDOE, Boston, Mass. Filed Jan. 31, 1887. Serial No. 226,000. (No model.)

Claim.—1. In a machine for impressing or stamping cigars, the combination, with a rotary cigar-carrier adapted to hold a number of cigars, of a rotary cylinder having a series of dies in relief thereon, and a flame-producing device, substantially as described, for heating said dies from the interior of the said cylinder, as set forth.

2. In a machine for impressing or stamping cigars, the combination, with the rotary cylinder or cigar-carrier F, having a series of interior cigar-holders, F', of the rotary die-cylinder A, arranged within



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and eccentric to the said cylinder F and provided on its exterior with a series of dies or molds, and means, substantially as described, for heating said dies, as set forth.

3. In a machine for stamping cigars, the combination, with the rotary cylinder F, having a series of interior cigar-holders, of the guard-plate H, extending partly around the interior of the said cylinder, the rotary die-cylinder A, arranged within and eccentric to the said cylinder F, and means, substantially as described, for heating the said die-cylinder, as set forth.

4. In a machine for impressing cigars, the combination, with a rotary cigar-carrier, as cylinder F, provided with a series of open cigar-holders, of an adjustable guard-plate for retaining the cigars in the said holders, whereby the same holders may be used for cigars of different sizes, substantially as set forth.

5. In a machine for impressing or stamping cigars, the combination, with a rotary cigar-holding cylinder, of an adjustable die-cylinder within and eccentric to the said cigar-holding cylinder, substantially as set forth.

6. In a machine for impressing or stamping cigars, the combination, with a rotary cigar-cylinder having a series of cigar-holders, of a rotary die-cylinder, a guard-plate for retaining the cigars in the holders until they have been impressed, and a stripper for removing the cigars after the impressing operation has been completed, substantially as set forth.

7. In a machine for impressing letters, &c., in cigars, the combination of a movable cigar-carrier having a series of cigar-holders open upon their sides, a guard-plate for maintaining the cigars in their holders during the movement of the carrier, and a plate for closing the bottoms of the holders, substantially as described.

8. In a machine for impressing letters, &c., in cigars, the combination of a movable cigar-carrier having a series of cigar-holders open upon their sides, a guard-plate for maintaining the cigars in their holders during the movement of the carrier, and a plate for closing the bottoms of the holders, provided with an opening beyond the impressing-die, through which the cigars escape from their holders, substantially as described.

9. In a machine for impressing letters, &c., in cigars, the combination of a movable cigar-carrier having a series of cigar-holders open upon their sides, a guard-plate for maintaining the cigars in their holders during the movement of the carrier, and a plate for closing the bottoms of the holders, provided with an opening beyond the impressing-die, through which the cigars escape from their holders, and a stripping or freeing device arranged to project into the line of movement of the cigars to free or strip them from their holders and arranged above the opening in the said plate, substantially as described.

10. In a machine for impressing or stamping cigars, the combination, with a rotary cigar-holding cylinder, of a die-cylinder open at its bottom and provided with an interior deflecting shell or casing, B, and means, substantially as set forth, for heating the said die-cylinder.

11. In a machine for impressing or stamping cigars, the combination, with a rotary cigar-holding cylinder, of a rotary die-cylinder open at its bottom and provided on its outer surface with a series of relief-dies at uniform distances apart, and having at its top the holes a^2, and the deflecting shell or casing B, concentrically placed within the said die-cylinder to form an annular heating-chamber, substantially as set forth.

12. The combination, with the rotary cigar-holding cylinder F, of the rotary die-cylinder A within and eccentric to the said holding-cylinder, and the supporting-arms C and C', by which the die-cylinder is supported, substantially as set forth.

13. The combination, with the rotary cigar-holding cylinder F and the rotary die-cylinder A within the said cylinder F, of the supporting-arms on which the die-cylinder is mounted, and means, substantially as described, for varying the position of the said arms to adjust the die-cylinder relative to the cigar-holding cylinder, as set forth.

14. In a machine for impressing or stamping cigars, the combination, with a rotary cigar-holding cylinder, of a die-cylinder within the said holding-cylinder and adjustable relative thereto, substantially as set forth.

15. The combination, with the die-cylinder A and its supporting-arm C, of the threaded adjusting-rod E, having a ball-joint connection with the said arm, and a stationary nut, as c^3, through which the said rod passes, substantially as set forth.

16. The combination, with the die-cylinder A, having a bottom plate, c^6, provided with the flange c^7, of the arm C, having the annular supporting end c', fitting within the said flange, substantially as set forth.

17. The combination of the adjustable die-cylinder A, provided with the gear-wheel D, the shaft d', the gear-wheel d, splined to said shaft to revolve therewith, but movable lengthwise thereof, and the spring for maintaining the said gear d in operative contact with gear D in different positions of the said cylinder, substantially as set forth.

18. The combination, with the rotary cigar-carrier F, provided with the internal cigar-holders, F', and with the external flange or lip, f^3, of the machine-frame provided with the anti-friction rolls f, on which the said flange or lip rests, substantially as set forth.

19. The combination, with the rotary cigar-carrier F, having the internal cigar-holders, F', of the machine-frame having the anti-friction rolls f^3, with which the base of the said rotary carrier is in contact, substantially as set forth.

20. The combination, with the rotary cigar cylinder or carrier F, provided with the internal cigar-holders, F', and the exterior flanges or lip, f^3, of the frame of the machine having the supporting anti-friction rolls f and the centering anti-friction rolls f^3, substantially as set forth.

21. The combination, with a rotary cigar-carrier, of the inclined stripper M, arranged at one end of the said carrier, and the thumb-nut by which said stripper may be secured in different positions of adjustment, substantially as set forth.

22. In a machine for impressing cigars, the combination, with a heated die, of a concave cigar-holder constructed to surround more than one-half of a cigar circumferentially, and thereby prevent the cigars from spreading when subjected to the impression of the die, substantially as set forth.

402,468. METHOD OF FORMING AN ORNAMENTAL BORDER ON FABRICS. JOSEPH M. MERROW, Merrow, Conn. Original application filed Sept. 12, 1887, Serial No. 249,491. Divided and this application filed Jan. 12, 1888. Serial No. 260,573. (No model.)



Claim.—1. The improvement in the art of crocheting or overseaming, which consists in forming along the edge of the fabric a series of connected clusters or loops by passing the thread through the fabric from one side and grasping the thread alternately on opposite sides of the fabric, to form and draw loops beyond the edge of said fabric, and interlocking the loops thus formed by drawing one loop through two preceding loops projected from the opposite sides of the fabric, repeating the operation a number of times at one point to form a cluster of loops, and subsequently passing the thread through the fabric at another point, drawing loops from opposite sides, and interlocking them, substantially as described.

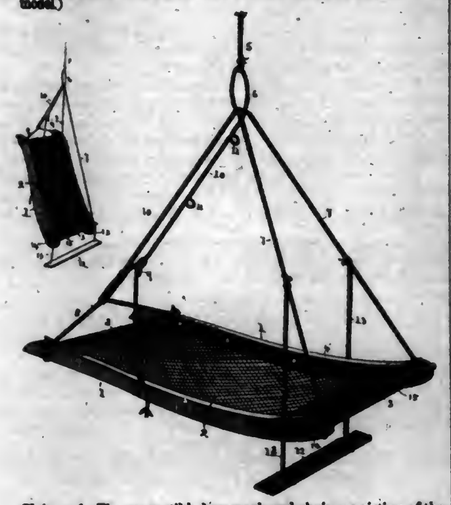
2. The mode herein described of producing an ornamental border upon fabrics, said mode consisting in forming a group of stitches while the fabric is stationary by carrying the thread through the fabric, drawing a loop from one side of and beyond the edge of the fabric, then from the other side in like manner, and interlacing said loops at their outer ends, repeating said operation until a given number of loops are formed, then spreading the group to assume a shell-like form by feeding the fabric and repeating the loop-forming operation.

3. The mode herein described of producing an ornamental border or finish upon fabrics, the same consisting in forming a group or cluster of stitches at a given point by passing the thread repeatedly through the fabric and grasping it on opposite sides of the fabric, forming loops extending from said point of insertion of the thread to or beyond the edge of the fabric, connecting or interlooping the outer ends of said loops to form a continuous margin for the group, and subsequently passing the thread through the fabric at another point, drawing loops therefrom and connecting or interlooping said loops to the loops of the preceding group or cluster to spread and retain the latter.

4. The herein-described improvement in the art of producing a border upon fabrics, the same consisting in passing the thread repeatedly through the fabric at or near the same place and from one side, grasping the thread alternately on opposite sides of the fabric to form and draw the loops beyond the edge of the latter, and interlooping or interlocking the loops so formed by drawing a loop from the top through the two preceding loops, the one from below and the other from on top, repeating this operation until the requisite number of stitches have been formed, and then carrying the thread through the fabric at a remote point, while the top loop is held preparatory to the formation of the next bottom loop, where the branches of said top loop are separated and carried through the fabric at different points.

5. The improvement in the art of finishing fabrics, which consists in carrying the thread through the fabric, grasping said thread below the fabric, carrying the thread beyond the edge of the fabric below and above the latter, enchaining or interlooping said thread beyond the edge of the fabric, repeating said operations several times at one point, and subsequently repeating the operation one or more times at a point suitably distant, substantially as described.

402,469. CONVERTIBLE HAMMOCK AND CHAIR. REESE W. MIMMOUGH, Washington Court-House, Ohio, assignor of one-half to Jas. F. Dennis, same place. Filed Aug. 22, 1888. Serial No. 283,474. (No model.)



Claim.—1. The convertible hammock and chair, consisting of the rigid frame-work, the netting secured to the same at both the ends and sides, the suspending-ropes secured to each end of the frame, one of which ropes is provided with loops 11 and with a ring or loop, 9, for adjusting the inclination of the hammock, and a ring or loop, 6, through which the suspending-ropes are passed, substantially as specified.

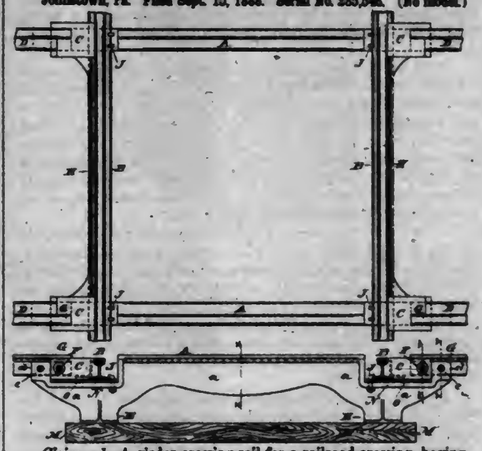
2. In a hammock, the rigid frame, the netting attached thereto, suspending-cords fastened around the frame-work connections at the corners of the frame, one of which is provided with a hook and loops or rings 11, and a supporting-rope, 5, substantially as specified, whereby the cords that suspend the frame serve to strengthen it at its corners, and whereby the hammock is made adjustable and suspended from a single point.

3. In a hammock, the rigid frame having the ends of the front end bar projecting from the sides thereof, the suspending cords or ropes secured to the frame at the front, the cord attached to the opposite end of the frame, provided with a hook and rings, a suspending loop or ring, and the foot-rest supported by cords attached to the front suspending-ropes and adapted to hang outside the hammock-frame, all combined substantially as specified, whereby the foot-rest may be arranged to hang over and rest upon an end bar of the frame, or may be dropped beneath it and be suspended directly from the main suspending-cords by simply manipulating said foot-rest-supporting cords.

4. In a convertible hammock and chair having a rigid frame having the ends of the front end bar projecting from the sides thereof, a single support, as cord 5, the several suspending-cords, and the foot-rest supported by cords attached to two of said suspending-cords at a point above the frame, all combined substantially as specified, whereby the foot-rest cords can be made to depend either from the frame-bars, so as to conveniently receive the feet of an occupant, or directly from the points of suspension above the frame, so as to hang beneath the hammock, substantially as specified.

5. In a convertible hammock and chair, the several suspending-cords and the supporting loop or ring 6, in combination with an adjustable suspending-cord, 10, provided with loops or rings 11, and a hook, 9, said hook being secured to a transverse suspending-cord, as 8, and to an end of the adjustable cord having the rings by a part of said cord, substantially as specified.

402,470. STREET-RAILROAD CROSSING. ARTHUR J. MOXHAM, Johnstown, Pa. Filed Sept. 15, 1888. Serial No. 285,546. (No model.)



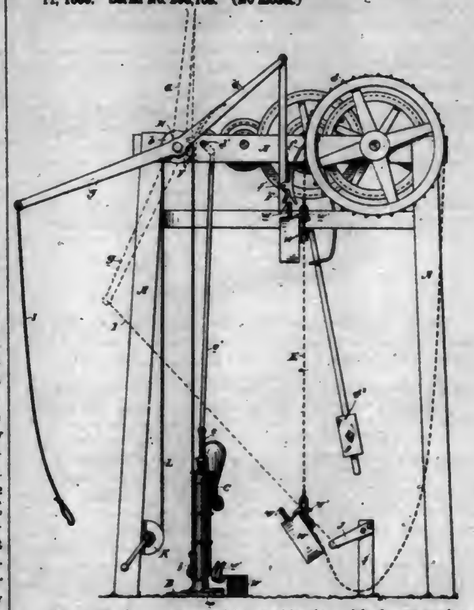
Claim.—1. A girder crossing-rail for a railroad-crossing, having a head of any desired section and a vertical web, and flanges for its support, said crossing-rail being provided with bearings for the crossed rails and for locking-blocks, and with pockets for the connecting crossing track-rails, substantially as set forth.

2. A tie-rod for a railroad-crossing, having at its end a pocket to receive a connecting-rail, and a protrusion for fitting into the crossed rail, substantially as set forth.

3. A tie-rod for a railroad-crossing, having at its end a lifting-block provided with flanges, as *f*, to fit over a seat or bearing in a crossing-rail, substantially as set forth.

4. A lifting-block for a railroad-crossing, provided with a flange, as K, for lapping over its bearing on the crossing-rail, substantially as set forth.

402,471. MOTOR. HANS M. OLSEN, Sacramento, Cal. Filed Jan. 11, 1888. Serial No. 260,102. (No model.)



Claim.—1. In a motor, and in combination with the operating-chain E, the mechanism for connecting a weight with the chain, con-

sisting of a grip for engaging the weight, a swinging arm by which said grip is suspended, and connections for holding the arm and relieving it to cause the weight to swing over toward and engage the operating-chain, substantially as described.

2. In a motor, and in combination with its operating-chain and a weight connected therewith, a second weight, a grip for hanging up said second weight, a swinging arm suspending the grip, and trip-connections for holding the swinging arm, adapted to be released by the descending first weight, whereby the second weight is swung over to and engages the operating-chain, substantially as herein described.

3. In a motor, and in combination with the operating-chain and a weight connected therewith, a second weight, a grip for hanging up said second weight, a swinging arm suspending the grip, a cord or rope connected with the arm for holding it in position, and a fixed piece for holding the cord or rope, said cord or rope being in the vertical plane of the descending first weight, whereby it is released from the fixed piece by the contact of said weight, to relieve the swinging arm and carry the second weight over to and connect it with the operating-chain, substantially as herein described.

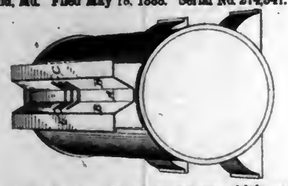
4. In a motor, the chain or sprocket pulley of a gear-train, and a chain, E, operating it, in combination with the suspended grip having the pivoted jaw, with an extension, f^3, said grip being adapted to receive and hang up a weight, the swinging arm suspending the grip, and connections with said arm for holding it in position and relieving it, whereby the weight and grip are swung over toward the chain E, to connect said weight therewith and to release it from the grip by the contact of its pivoted arm-extension f^3 with the sprocket-pulley, substantially as described.

5. In a motor, the sprocket-pulley of the gear-train, and the chain E engaging it, in combination with a weight having a forked catch, w', for readily engaging the links of said chain, whereby said weight is suspended therefrom, and the swinging grip and arm for temporarily suspending the weight and throwing it over to engage the chain, substantially as described.

6. In a motor, the combination of the gear-train and the sprocket-pulley thereof, the endless chain E, engaging the pulley, and the two weights with forked hooks w', for engaging the chain successively, said weights having loops w, the swinging arm G, the cord or rope I, for holding said arm, the inclined piece J below for engaging the said cord or rope and holding it in the vertical plane of the descending weight, and the grip suspended from the upper end of the arm G and adapted to engage the loops w of the weights, whereby they are temporarily hung up and swung over to engage the chain E, all arranged and adapted to operate substantially as herein described.

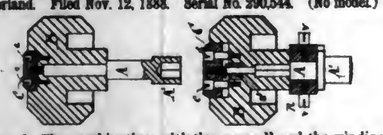
7. In a motor, the gear-train having the sprocket-pulley and the endless chain engaging it, in combination with a weight having a forked catch, w', for engaging the chain, and a loop, w, in its top, whereby it is suspended, a pivoted swinging arm, G, above, and a trip-rope, I, for holding the said arm and releasing it, as described, the grip carried by the arm and adapted to engage and temporarily suspend the weight, and the windlass and hoisting-rope for raising the weight to the grip, substantially as described.

402,472. STEAM-ENGINE VALVE AND SEAT. ROBERT G. PAUL, Cumberland, Md. Filed May 18, 1888. Serial No. 274,347. (No model.)



Claim.—Cyliuder-ports in steam-engines which open from the bottom and sides of a depressed or trough-shaped valve-seat, in combination with said seat and its valve, substantially as set forth.

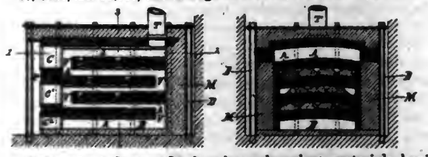
402,473. WATCH-PENDANT. PAUL PERRET, Chaux-de-Fonds, Switzerland. Filed Nov. 12, 1888. Serial No. 290,544. (No model.)



Claim.—1. The combination, with the crown B and the winding-stem A, passing through the said crown, of the nut C, screwed upon the end of the stem, and the small screws c, for preventing the nut becoming unscrewed, substantially as set forth.

2. The crown B, having a central hole and recessed for the end of the pendant, in combination with the stem A, having a socket, A', at one end, the nut C, screwed upon the other end of the stem and occupying a recess in the crown, the screws c, passing through the nut into the crown, and a spring between the nut and the crown, substantially as set forth.

402,474. FURNACE. MICHEL PERRET, Paris, France. Filed Nov. 9, 1888. Serial No. 290,389. (No model.) Patented in France Feb. 17, 1887, No. 181,623; in Denmark Apr. 24, 1887, No. 641; in Belgium Dec. 23, 1887, No. 80,069, and in England Dec. 29, 1887, No. 17,899.



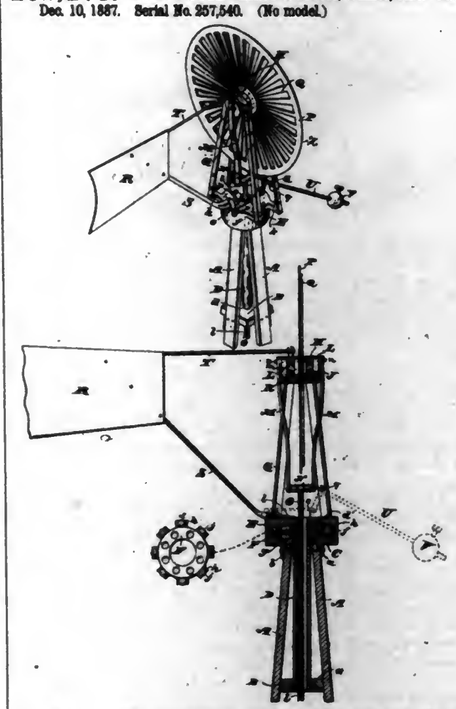
Claim.—1. A furnace for burning pulverulent materials, having shelves provided with perforations, whereby the combustible matter is caused to descend and arrange itself automatically in the form of a series of independent conical heaps arranged in such a manner that the gaseous agent supporting combustion is compelled to circulate around and impinge against the said heaps, all substantially as described.

2. A furnace provided with a series of perforated shelves for the fuel, the perforations in one shelf being opposite the solid parts in the next shelf, all substantially as described.

3. A furnace with perforated shelves placed nearer together at the lower than at the upper part of the furnace and presenting perforations regularly distributed quincuncially, in combination with an ash-pit for the admission of air, and passages for the circulation of the gases, substantially as and for the purpose described.

4. In a furnace, the shelves provided with perforations, in combination with a projecting or raised part or bench, an ash-pit, openings, passages, and a brick-work or other casing, substantially as described.

402,475. WIND-WHEEL. LEROY S. PROUTY, Wilmot, Ohio. Filed Dec. 10, 1887. Serial No. 257,540. (No model.)

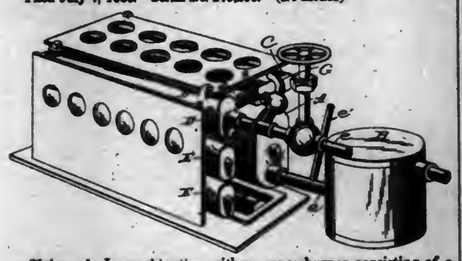


Claim.—1. The combination, with the wind-wheel centrally supported on the turn-table, of a vane hinged to said turn-table by the diagonal and horizontal rods S and T, respectively, said rods connected with the said turn-table at one side of the axis of the wheel-shaft, the diagonal rod connected to the turn-table at the base and the horizontal rod at a point above the base, the diagonal rod being provided with a bend terminating in a laterally-projecting arm,

thereby providing a firm bearing for said brace, the shaft g, pivoted to the wind-wheel support, the cranked lever U, fixed to said shaft, a link, p, connected at one end to the crank-arm of the lever U and connected at its opposite end to the laterally-projecting arm of the rod S, substantially as set forth.

2. The combination, with a wind-wheel and its supporting-frame G, of a turn-table to which the said supporting-frame is secured, the said turn-table consisting of the top central apertured plate provided with annular flanges g and f, the latter flange having a greater diameter than the former flange, an annular supporting-head, C, provided with a central aperture coincident with the aperture of the top plate, the short annular flange of said top plate turning upon the upper face of said head, while the longer annular flange engages the periphery of said head, thereby forming a closed chamber, the circular plate inclosed within said chamber and provided with a central aperture through which the short annular flange projects, said plate further provided with radial spindles upon which rollers are journaled, and a tube-spindle, D, projecting through the aperture of the turn-table journaled at its lower end in stationary bearings and secured at its upper end to the said turn-table, substantially as set forth.

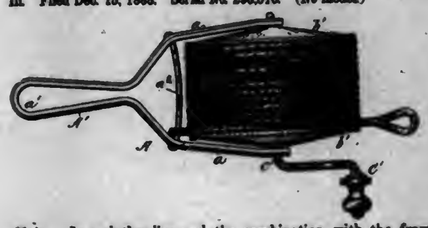
402,476. BURNER. EDWARD POLLARD, East Cambridge, Mass. Filed July 7, 1888. Serial No. 279,290. (No model.)



Claim.—1. In combination with a vapor-burner consisting of a generator, a superheater above the generator, a vaporizer in connection with said superheater, a burner arranged below the vaporizer and generator, so as to heat both, and an open vent in connection with the generator for preventing the extinguishment of the flame, substantially as described.

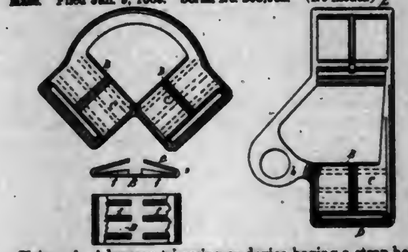
2. In combination with a vapor-burner, a generator, a superheater above the same, a vaporizer in connection with the superheater, a burner and pipe connections from the vaporizer, whereby a vapor of mixed steam and carbon is fed to the burner, and an open vent-pipe in the water-feed pipe to the generator, substantially as described.

402,477. CLOTHES-LINE REEL. HERMAN C. PRIEBE, Englewood, Ill. Filed Dec. 13, 1888. Serial No. 293,510. (No model.)



Claim.—In a clothes-line reel, the combination, with the frame A, consisting of arms a, handle A', with space a' and rod a^3, of the reel B and the shaft C, mounted in the arms a and provided with crank-handle C', substantially as and for the purposes specified.

402,478. HARNESS-TRIMMING. DENNIS J. REGAN, Agawam, Mass. Filed Jan. 9, 1889. Serial No. 295,902. (No model.)



Claim.—1. A harness trimming or device having a strap-holding part consisting of a plate, B, provided with overhanging wing C and holding-ribs shallow toward the bent-over edges and deeper toward the center, substantially as shown.

2. A harness-trimming, substantially as shown, consisting of a plate, B, having overhanging wings C, one or both being provided with holding-ribs, in combination with a ring, A, formed at one side, and a buckle-frame, E, formed by the projecting side parts, as shown, united by cross-bars, all being made integral and provided with a tongue pivotally secured in position, substantially as set forth.

402,479. VARIABLE EXCENTRIC. DE LA FAYETTE REMINGTON, San Leandro, Cal. Filed Jan. 19, 1889. Serial No. 296,910. (No model.)

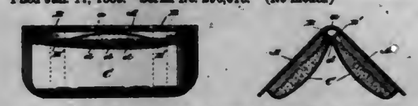


Claim.—1. In a variable excentric, the combination of a fixed disk, an excentric connected with and adapted to slide on the fixed disk, whereby its position may be varied, said excentric having an arm projecting from its face at an angle, a sliding disk having a hole through which the inclined arm of the excentric passes, and connections for moving the sliding disk, whereby it moves the inclined arm and varies the position of the excentric on the fixed disk, substantially as herein described.

2. In a variable excentric, the combination of the fixed disk having the elongated slots, the excentric having guides seated in the slots, whereby it is adapted to be moved on said disk, the inclined arm of the excentric, the sliding disk having a hole receiving and moving the inclined arm, and connections for moving the sliding disk, substantially as described.

3. In a variable excentric, the combination of the fixed disk having the elongated slots, the excentric having the cross rib or bar with guide-flanges and screw-bolts with nuts and washers for fitting it to the slotted disk, whereby it is movable thereon, the inclined arm projecting from the excentric, the sliding disk having a hole receiving and moving the inclined arm of the excentric, and connections for moving the sliding disk, substantially as herein described.

402,480. HARNESS-PAD. WILLIAM G. ROBBINS, Bromfield, Nebr. Filed Jan. 17, 1889. Serial No. 296,618. (No model.)



Claim.—A harness-pad consisting of two rigid blocks having their inner meeting edges cut away, bent spring-metal bands for connecting the cut-away edges of the blocks, a single cushion covering the inner faces of both blocks, and provided at the center with ventilating-openings, and a cover secured to the outer faces of the blocks and provided at the center with ventilating-openings aligned with the openings in the cushion and space between the blocks, substantially as described.

402,481. INCANDESCENT-LAMP SOCKET. FREDERICK C. ROCKWELL, Hartford, Conn. Filed Jan. 24, 1889. Serial No. 297,453. (No model.)



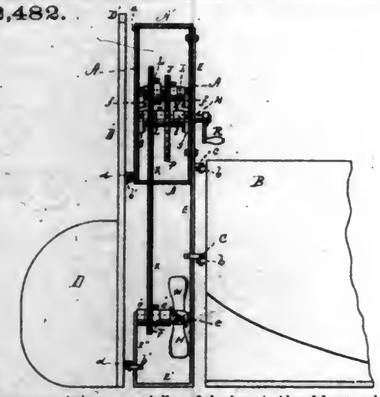
Claim.—1. The herein-described shell for incandescent electric lamp sockets, formed of paper the surfaces of which are provided with a coating of insulating material of higher resistance than the paper, substantially as described, and for the purpose set forth.

2. The herein-described shell for incandescent electric-lamp sockets, formed from a sheet of paper the surfaces of which are provided with a coating of gum and an earthy material hardened by heat and pressure, whereby the shell is stiffened and rendered water-proof, fire-proof, and insulating, substantially as described, and for the purpose set forth.

402,482. HAND-PROPELLER FOR SMALL BOATS. EDWIN W. SCHILDKNECHT, Boston, Mass. Filed Jan. 24, 1889. Serial No. 297,495. (No model.)

Claim.—The herein-described improved propelling device for

402,482.



small boats, consisting, essentially, of the box A A' and bent rod E E' E", supporting the same and provided with the pintles C and eyebolts b', the shaft c, supported by said bent rod and carrying the propeller H and sprocket-wheel F, chain K, shaft I, supported within the box and provided with the sprocket-wheel L and pinion J, and shaft N, supported by the box and provided with the gear-wheel P and crank R, substantially as and for the purpose set forth.

402,483. DEVICE FOR GUIDING THE EDGES OF FABRICS. JOS. J. SCHOLFIELD, Providence, R. I. Filed Mar. 19, 1888. Serial No. 267,787. (No model.)

Brief.—Whenever the edge of the fabric varies from the correct line it engages a pivoted detector-plate, causing the latter to engage an edge of an oppositely-notched ratchet-bar carried by a segmental rack frictionally held in a reciprocating slide, thus changing the relative movement of the slide and rack and consequently that of a pivoted guide-roller in gear with said rack. Connected with the segmental rack is another guide-roller capable of endwise movement, and a fixed guide is placed beyond the automatic devices.



Claim.—1. In a cloth-guiding machine, the combination, with the ratchet member adapted for reverse movement, the friction-slide, and reciprocating means therefor, which together constitute a power-dispensing mechanical movement, as set forth, of a detector which engages frictionally with the running web, so as to move therewith when in engagement, a guide-roller held upon a pivoted head or frame, and the pivoted head or frame supporting the guide-roller and geared with the ratchet member, substantially as described.

2. In a cloth-guiding machine, the combination, with the ratchet member adapted for reverse movement, the friction-slide, and reciprocating means therefor, which together constitute a power-dispensing mechanical movement, as set forth, of a detector which engages frictionally with the running web, so as to move therewith when in engagement, a guide-roller held upon a pivoted head or frame, the pivoted head or frame supporting the guide-roller and geared with the ratchet member, and the guide for holding the edge of the web back to the true line after the said edge passes the frictionally-engaged detector, substantially as described.

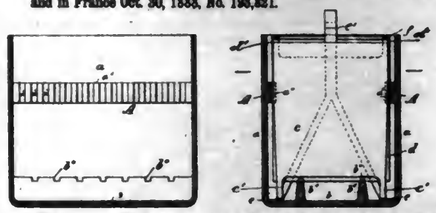
3. In a cloth-guiding machine, the combination, with the ratchet member, the friction-slide, and reciprocating means therefor, which together constitute a power-dispensing mechanical movement, as set forth, of a detector the movement of which serves to direct the required movement of the ratchet member, and an endwise-moving guide-roller connected with the ratchet member, so as to move in opposition to the in-and-out varying movement of the edge of the web, substantially as described.

4. In a cloth-guiding machine, the combination, with the ratchet member, the friction-slide, and reciprocating means therefor, which together constitute a power-dispensing mechanical movement, as set forth, of a detector which serves to direct the required movement of the ratchet member, a guide-roller held upon a pivoted head or frame, the pivoted head or frame supporting the guide-roller and geared with the ratchet member, and an endwise-moving guide-roller connected with the ratchet members, so as to move in opposition to the in-and-out varying movement of the edge of the web, substantially as described.

5. In a cloth-guiding machine, the combination, with the guide-roller and its pivoted head or frame, of the oppositely-notched sliding bar, the intermediate gearing between the pivoted head or frame and the notched sliding bar, the reciprocated slide which frictionally holds the notched sliding bar, means for reciprocating the said slide, and the overbalanced detector adapted for frictional engagement with the running edge of the web, substantially as and for the purpose specified.

6. In a cloth-guiding machine, the combination, with the ratchet member, the friction-slide, and reciprocating means therefor, which together constitute a power-dispensing mechanical movement, as set forth, of a detector which engages frictionally with the running web, a guide-roller held in a pivoted head or frame, the pivoted head or frame supporting the guide-roller and geared with the ratchet member, the curved guide-plate for guiding the edges of the web to the detector, and the rollers at opposite sides of the curved guide-plate, substantially as described.

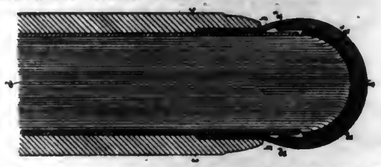
402,484. CONTAINING-CELL FOR SECONDARY BATTERIES. PAUL SCHOOP, Zurich, Switzerland. Filed Dec. 19, 1888. Serial No. 294,073. (No model.) Patented in England Oct. 30, 1888, No. 15,626, and in France Oct. 30, 1888, No. 193,821.



Claim.—1. The rectangular cell-body for secondary batteries, provided on its inner sides and bottom with parallel notched side racks and parallel upwardly-extending bottom racks, substantially as described.

2. The combination, in an element for secondary batteries, of the cell-body provided on its inner sides and bottom with the parallel side racks, A, and bottom racks, b', the positive electrode-plates having upwardly-projecting arms and resting with their lower edges in the notches of the bottom racks, the negative electrode-plates having legs or supports straddling the bottom racks, and the strips *f* and *e*, whereby the positive and negative electrodes are respectively connected to one another and to their respective poles *f"* and *e'*, substantially as and for the purpose set forth.

402,485. SPRING-BACK FOR BOOKS. FRITZ E. SCHUBERT, Zurich, Switzerland, assignor to Carl Freidrick Schubert, same place. Filed Dec. 26, 1888. Serial No. 294,632. (No model.)



Claim.—1. A spring-back for books, having an inner layer or core consisting in a resilient piece of untanned hide formed in an arc of a circle, substantially as described.

2. An article of manufacture consisting in a resilient piece of untanned hide formed in an arc of a circle and adapted to be used as core for the spring-back of a book, substantially as set forth.

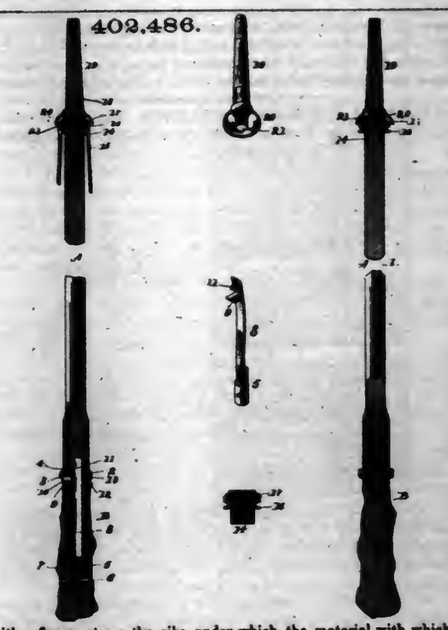
402,486. UMBRELLA. SIMON SCHWARTZ, Joplin, Mo. Filed Dec. 22, 1888. Serial No. 294,374. (No model.)

Claim.—1. The combination, with the handle of an umbrella, one portion of which is made hollow, of a plug fitting in the said hollow portion and held there by means of a pin, the end of the said plug being cut away to form a shoulder, to which is secured a curved spring or springs carrying a pin or pins for engaging openings in a ferrule on the stick, to hold the said handle in place thereon, substantially as described.

2. The combination, with the spring mounted upon the plug secured within the handle and carrying a pin for engaging an opening in the ferrule secured to the stick, of a catch designed to engage a recess formed in the edge of the ferrule, whereby the pin may be pressed down and out of contact with the opening in the ferrule, and thus release the handle, substantially as described.

3. The combination, with an umbrella-stick having a hollow handle provided with a spring carrying a pin for engaging an opening in the ferrule secured upon the stick to hold the said handle in place thereon, of a thimble screwed upon the opposite end and provided

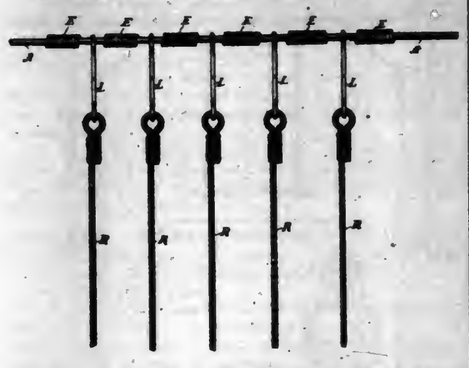
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with a flange above the ribs, under which the material with which the umbrella is covered is secured, substantially as described.

4. The combination, with a thimble provided with a flange under which the material covering the umbrella is secured, of a drip-cup provided with a screw-threaded projection designed to engage the threaded opening within the said thimble, and carrying on its outer ends a tip, whereby the said tip may be removed when the umbrella is to be packed, substantially as described.

402,487. RAILWAY-BRIDGE GUARD. STEPHEN G. SCOTT, Plainwell, Mich., and WILLIAM O'HERN, Fort Wayne, Ind., assignors of one-half to John H. P. Hughart, Grand Rapids, Mich., and Patrick H. O'Rourke, Fort Wayne, Ind. Filed Jan. 23, 1889. Serial No. 297,275. (No model.)



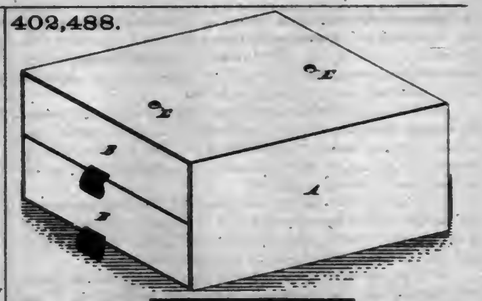
Claim.—1. In a bridge-guard, the combination of a wire support, a series of links, and a series of ropes or cords, one end of each of said links loosely surrounding the supporting-wire and the other end attached to one of the cords, substantially as and for the purpose described.

2. In a bridge-guard, the combination of the cord supported by the connecting-link, the connecting-link constructed of a bent wire or rod having a loop at each end, one for holding the rope and one for loosely encircling the supporting-wire, all substantially as described.

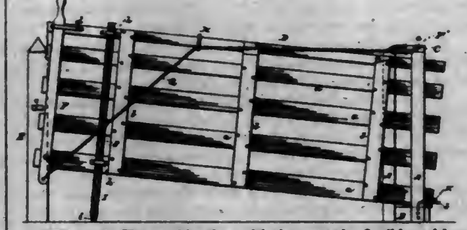
402,488. PRESCRIPTION-FILE. ALBERT J. SHAUL, Long Pine, Nebr. Filed July 31, 1888. Serial No. 281,580. (No model.)

Claim.—The box or case A, provided with the holes E E, the drawers B, having open ends and slanting sides, the straight filing-needle C, and keeper D, in combination with the bolts F and the washers G G, whereby the boxes or cases A may be fastened to a base and to each other to form a continuous cabinet of drawers.

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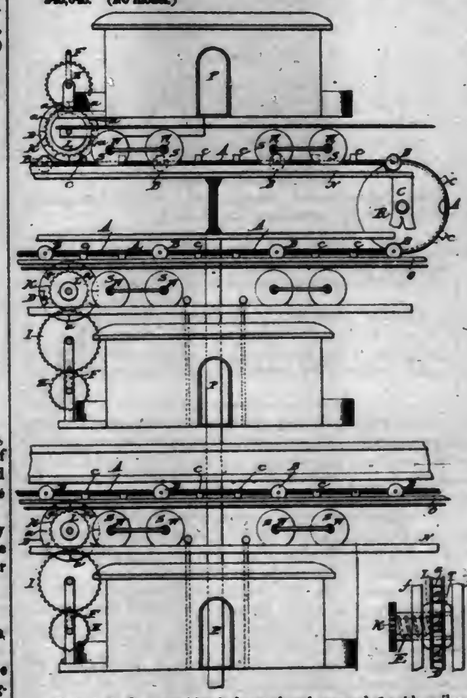
402,489. FARM-GATE. SAMUEL S. SHERMAN and JEREMIAH G. SHERMAN, West Mollenry, Ill. Filed July 24, 1888. Serial No. 281,331. (No model.)



Claim.—1. The combination, with the gate, the flexible rod having the hook, the posts, and the cross-bar B, of the yielding pivot or hinge having the hook ends engaging, respectively, the end of the lower bar and the cross-bar B, substantially as specified.

2. The combination, with the gate, the posts, and the cross-bar B, of the yielding pivot having the hooks at right angles to each other, engaging, respectively, in an opening in the cross-bar and with the end of the lower gate-bar, and the supporting-pin, substantially as specified.

402,490. ELEVATED AND SUSPENDED CABLE RAILWAY. GEORGE R. TAYLOR, Louisville, Ky. Filed July 29, 1887. Serial No. 245,645. (No model.)



Claim.—1. In a combined elevated and suspended cable-railroad system, a threefold combination, to wit: one elevated and two suspended cable railroads constructed on a double set of posts connected

by transverse and longitudinal girders, in combination with tracks O and N, standards C, supporting driving-wheel R, and the endless driving-cable A, provided with clips C, trucks B, and axle-boxing *h h*, the said cable being arranged to propel one upper and one suspended line, as described, and for purposes specified.

2. In a combined elevated and suspended cable-railroad system, the capstan or friction-wheel D, provided with a groove and steel pins or bars *a*, in combination with the shoulder T, disk L, axle or shaft E, frames *f f*, and cogged screw and nut K, to regulate friction, as described, and for purposes specified.

3. In a combined elevated and suspended cable-railroad system, the capstan or friction-wheels D and D′ in frame *f f*, in combination with shoulder T, disk L, cog-screw and nut K, with cable A, clips C, and trucks B, as described, and for purposes specified.

4. In a combined elevated and suspended cable-railroad system, the wheels H and I, in combination with cog-screw and nut K and capstan-wheel D, as described, and for purposes specified.

5. In a combined elevated and suspended cable-railroad system, the conduit with closed sides and top and open bottom, in combination with cable-track O and car-track N, with groove M in each, and braces Q Q, as described, and for purposes specified.

6. In a combined elevated and suspended cable-railroad system, the half-springs Z Z, in combination with the iron rods Y V Y, axle W, and car, as described, and for purposes specified.

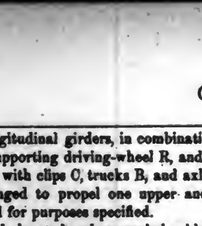
7. In a combined elevated and suspended cable-railroad system, a railroad and cable track grooved, beveled, and filled with composition or concrete composed of sand, coal-ashes, gas-house lime, and Liverpool tar, as described, and for purposes specified.

8. In a combined elevated and suspended cable-railroad system, a grooved railroad and cable track inlaid with composition, in combination with leather or rubber, as described, and for purposes specified.

9. In a combined elevated and suspended cable-railroad system, braces Q Q, in combination with conduit or tramway, car-wheels S S, and suspended cars, as described, and for purposes specified.

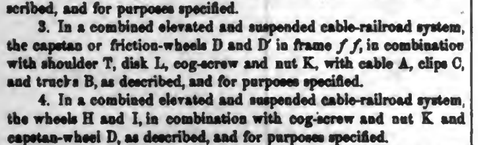
10. In a combined elevated and suspended cable-railroad system, iron bands or rods X X, passing around the frame of the suspended car and up between and over the rails of the suspended track, in combination with the elbows and small wheels *b b*, as described, and for purposes specified.

402,491. MAGNETIC POCKET-BOOK. BENJAMIN F. THOMAS, Denver, Colo. Filed Dec. 27, 1888. Serial No. 294,750. (No model.)



Claim.—A pocket-book provided with a flap, and a magnet secured in the said flap, substantially as described.

402,492. ATTACHMENT FOR BOLTS. WILLIAM H. THOMAS, Jenkintown, Pa. Filed Dec. 26, 1888. Serial No. 294,670. (No model.)



Claim.—1. The combination, with a shutter or other bolt, of a latch provided with a head thereon and pivoted to the base-plate of said bolt, said head normally resting on the edge of the bolt and automatically dropping back of the rear end of the said bolt when the same is in its locked position, substantially as shown and described.

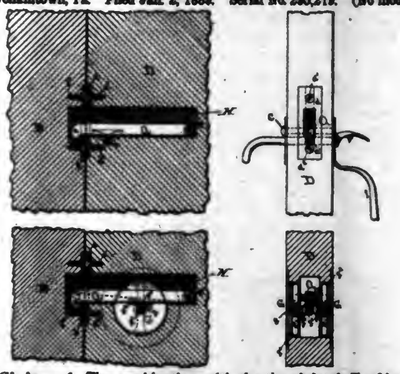
2. The combination, with a shutter or other bolt having a pivoted latch on the base-plate thereof, of a curved spring loosely secured to one of the keepers of said bolt and resting in a notch in the head of said latch, as and for the purpose set forth.

3. The combination, with a shutter or other bolt, of a latch pivoted to the base-plate thereof, the head of said latch being provided with an elastic cushion and forced into operative relation with said bolt by a curved spring, as and for the purpose set forth.

4. The combination, with a shutter or other bolt, of a latch pivoted to the base-plate thereof and actuated by a curved spring, the head of said latch being provided with a notch in its under edge for grasping said bolt, as and for the purpose set forth.

5. The combination, with the bolt A, of a latch, D, pivoted on screw *d* in base-plate B, and actuated by a spring, C, secured to one of the keepers *b′* in a hole, *b²*, and resting at its other end in a notch, *d²*, in the head *d′* of said latch, said head having a notch, *d³*, in its lower edge and a cushion, *d⁴*, thereon, as and for the purpose set forth.

402,493. LATCH FOR SLIDING DOORS. WILLIAM H. THOMAS, Jenkintown, Pa. Filed Jan. 2, 1889. Serial No. 295,219. (No model.)



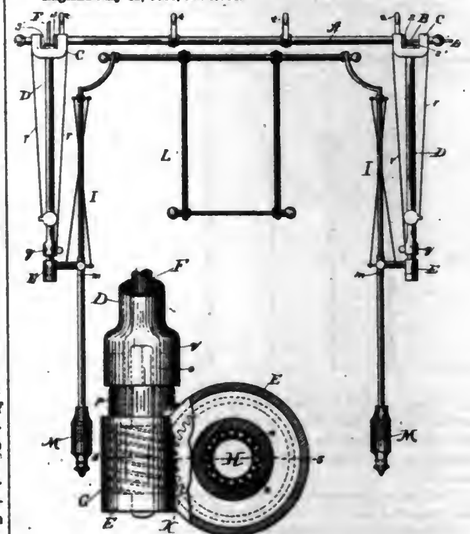
Claim.—1. The combination, with the thumb-latch F, of latch-arm A, having its bearing on screw C, said arm being actuated by spring E, which spring is secured in place between plate *d* and the edge of door D by screw *d′*, passing through said plate and spring and into said door, as and for the purpose set forth.

2. The combination, with latch-bar A, actuated by spring E and having its bearing on screw C, of the cam-plate *g⁴*, adjustably secured to shaft *g* of handles G by screw *g³*, as and for the purpose set forth.

402,494. SERUM-ALBUMEN PEPTONE. SABBATI E. ULLMAN, New York, N. Y. Filed Aug. 31, 1888. Serial No. 284,248. (No specimens.)

Claim.—A peptone or peptone-pepsin composed of the peptonized albumen of blood-serum, substantially as herein set forth.

402,495. REVOLVING TRAPEZE. LOUIS A. VAIDA, Chicago, Ill. Filed Jan. 8, 1889. Serial No. 295,781. (No model.) Patented in England July 12, 1886, No. 9,061.



Claim.—1. In a revolving trapeze, the combination, with the frame I, having journals H, each provided with a worm gear-wheel, K, of vertical shafts F, each having at its lower end a worm, *g*, meshing with the worm-wheel K, and toward its upper end with a beveled wheel, *f′*, horizontal shaft B, having beveled wheels *e*, meshing with the beveled wheels *f′*, and means, substantially as described, for supporting said shafts, whereby power applied to the turning of either of said shafts acts simultaneously upon both journals of the frame, substantially as described.

2. In a revolving trapeze, the combination, with the supported tube A and yokes C, of shaft B, passing through the tube A and having the beveled gear-wheels *e*, pendent tubes D, carrying the housings E and supported from the yokes C, vertical shafts F, having the beveled gear-wheels *f′* toward their upper ends and carrying the worms G at their lower ends, frames I, having the journals H resting in anti-friction bearings in the housings E, and worm-wheels K on the journals H, meshing with the worm *g*, substantially as described.

3. In a revolving trapeze, the combination of the pendent vertical tubes D, carrying the housings E, separable toward their lower ends by means of a screw-connection, *q*, and the pendent shafts F, inclosed in said tubes and carrying the worms *g*, and made separable within the inclosing-tubes by means of the angular socket and stem-connection *o*, substantially as described.

4. In a revolving trapeze, the side bars of the revolving frame I thereof, made separable toward their centers by screw-connections *m*, whereby an entire end may be omitted and weighted bars M substituted in lieu thereof, substantially as described.

5. In a revolving trapeze, the revolving frame thereof mounted in pendent bearings, in combination with housed worm-gear mechanism and a housed driving-shaft therefor, whereby motion is transmitted to the revolving frame through means invisible to the general spectators, substantially as described.

6. In a revolving trapeze, the combination, with the tube A, provided with the slot *h*, shaft B, having the fixed collars *l*, a vertical shaft, F, connected through beveled gearing *e f′* with the shaft B, and having at its lower end mechanism for imparting motion to the revolving frame of the trapeze, of the fork or collar *k*, provided with the stem *i*, extending up through the slot *h*, whereby the shaft B may be thrown into and out of gear with the shaft F, substantially as described.

7. In a revolving trapeze, the combination, with the journal H, of the revolving frame and tubular bar D, of the housing E, forming a bearing for the journal and provided with the hollow extension *p*, constituting the lower portion of the tubular bar D, which incloses the driving-shaft, anti-friction rollers *n*, worm-wheel K, mounted upon the journal, and driving-shaft F, carrying the worm G, meshing with the worm-wheel K, substantially as described.

402,496. TENSIONAL SOUND-BOARD. CHARLES S. WEBER, San José, Cal. Filed Mar. 3, 1887. Serial No. 229,555. (No model.)



Claim.—1. The combination, with the frame and the sound-board, of the clamps adjustably connecting the sound-board with the frame, whereby the linear tension upon the fibers composing the sound-board can be varied, substantially as set forth.

2. The combination, with the frame and the sound-board having its ends thickened, as shown, of the clamps having bifurcated ends conforming to and embracing the thickened ends of the boards, substantially as set forth.

3. The combination, with the frame and the sound-board having thickened ends, of the clamp fitted to the thickened ends, and the threaded shank passed through the frame, and the nut mounted upon the threaded end, substantially as specified.

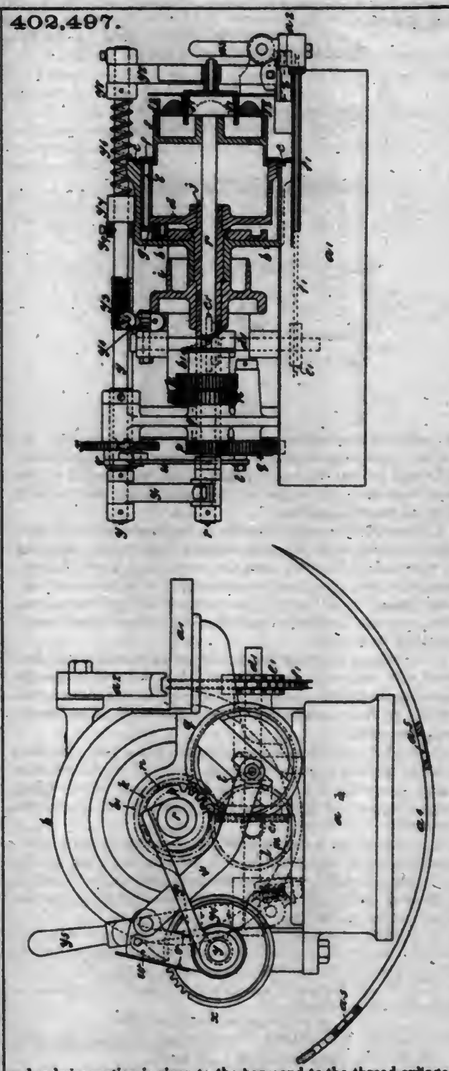
402,497. OVEREDGE SEWING-MACHINE. WILLIAM WEBSTER, Armley, Leeds, County of York, England. Filed Apr. 26, 1887. Serial No. 236,261. (Model.) Patented in England Sept. 15, 1880, No. 3,725 and Apr. 15, 1887, No. 5,031.

Brief.—The stitch formed is the ordinary hand overedge stitch. The thread is carried by a hook in the rear end of the needle, which is of the shape of an arc of a circle and is positively rotated in a circular groove in the head.

Claim.—1. In an overedge sewing-machine, the combination, with a fixed head-stock, such as *b*, provided with a needle race or groove, a curved needle traveling in said groove, the driving-arms *f f*, having axles *e e*, a carriage, *d*, that rotates within the fixed head-stock, a fixed cam, *h*, attached to said head-stock, and arms *g g*, (on said axles,) the ends of which take into and are controlled by said fixed cam, substantially as and for the purposes described.

2. In combination with the take-up-thread cylinder *s* and its shaft *r*, the wheel *n*, provided with an internal feather to engage with a groove in said shaft, the crank-wheel *q*, provided with the stud *t* to drive said cylinder, the bar *y*, provided with the screw y^3, the link *u* and the lever *v*, by which the said bar is connected to the said stud and crank-wheel, the arm y', connecting the bar *y* and the shaft *r*, the ratchet-wheel *x′*, and pawl *w*, to which motion is imparted through link *u* and lever *v* to bar *y*, the nut-segment y^4, engaging with the screw y^3, the traveling guide-rest *z*, the arm y^5, connecting said guide-rest and the bar *y*, and handle y^6, whereby an intermittent rotating

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and endwise motion is given to the bar *y* and to the thread-cylinder *s*, substantially as described.

3. In an overedge sewing-machine, the traveling guide-rest *z*, provided with a rounded part, *z′*, to raise the edges of the seam, in combination with the shaft *r*, connecting-arms, and a take-up on said shaft, the said parts traveling in unison with each other, substantially as described.

402,498. THREAD HOLDER AND CUTTER. MARY E. WEST, Binghamton, N. Y. Filed Oct. 5, 1888. Serial No. 287,268. (No model.)

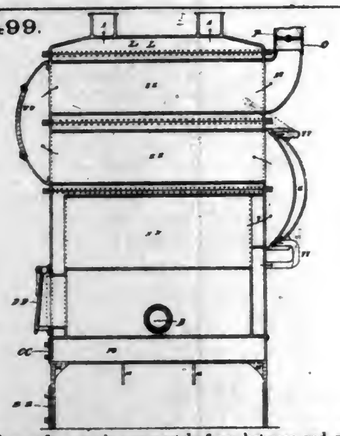


Claim.—The combination, with a spool and a thread wound thereon, of a metallic plate secured to the spool and provided with a slit in its outer end and a knife upon its inner end, and a slitted rubber secured between the knife and slit, substantially as described.

402,499. WATER-HEATER. WILLIAM A. WHITE, Stanisburg, N. Y. Filed Oct. 24, 1888. Serial No. 289,063. (No model.)

Claim.—1. In a sectional hot-water heater or low-pressure steam-

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boiler, a flue or flues passing separately from between and near the top of the water-cells and extending by means of outside smoke-bonnets through between the water-spaces in each upper section to give a direct draft along the surfaces of the upper-section water-cells, as and for the purpose described.

2. A sectional hot-water heater or low-pressure steam-boiler having the water-cells in all the upper sections, K K, directly above the deep water-cells H H, which form the crown-sheet of the fire-box, thus giving a clear open water-space vertically from the arch of the fire-box through and to the top of the boiler, including all the sections, for the purpose of facilitating rapid circulation of the heated water, substantially as described.

3. A sectional hot-water heater or low-pressure steam-boiler constructed with continuous separate flues T T between the water-cells and running lengthwise of each of the upper sections and connected by outside smoke-bonnets to make a continuous draft, as and for the purpose described.

4. In a hot-water heater or low-pressure steam-boiler, the combination of the deep water-cells forming the top of the fire-box with the short smoke-flues F F, passing only from the back of the fire-box through the water-leg to the outside continuous flue or smoke-bonnet, substantially as described.

5. In a sectional hot-water heater or low-pressure steam-boiler, the combination of the water-cells H H, forming the arch of the fire-box, the short flues F F, leading to the smoke-bonnet, the flues T T, and the smoke-bonnet W W, all for the purpose of securing economical combustion, as described.

6. A sectional hot-water heater or low-pressure steam-boiler consisting of a fire-box having an arch formed by deep water-cells H H, the short flues F F, and the flues of the upper sections, T T, smoke-bonnet W W, and the water-hubs A A and B B; all substantially as and for the purpose described.

402,500. BEER-FILTER. OTTO SWIETUSCH, Milwaukee, Wis. Filed Aug. 22, 1888. Serial No. 283,466. (No model.)

Claim.—1. In combination with an apparatus for filtering gaseous liquids under pressure, provided with a discharge-valve, d', the discharge-conduit B, comprising the ascending part o, leading from the valve b', and the descending part n, of smaller diameter than the part o and terminating in a discharge-valve, d^3, of smaller discharging capacity than the valve d', substantially as described.

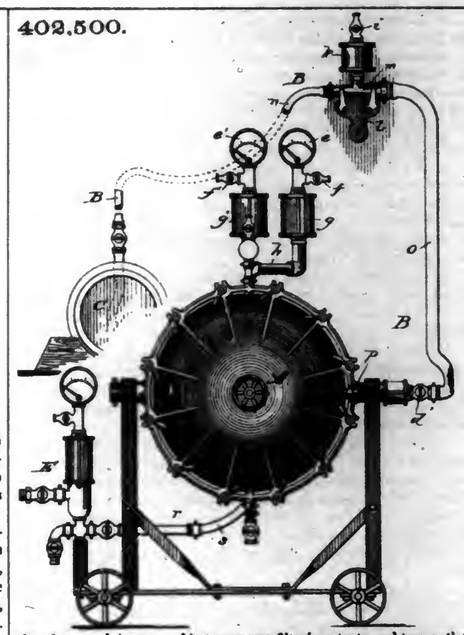
2. In combination with a beer-filter having a discharge-valve, d', the discharge-conduit B, comprising the part o, leading from the valve d', and part n, of smaller diameter than the part o and terminating in a discharge-valve, d^3, of smaller discharging capacity than the valve d', and intermediate tapering connection, m, substantially as described.

3. In combination with a beer-filter having a discharge-valve, d', the discharge-conduit B, comprising the ascending part o, leading from the valve d', descending part n, of smaller diameter than the part o and terminating in a discharge-valve, d^3, of smaller discharging capacity than the valve d' and a controllable vent upon the highest part of the discharge-conduit, substantially as described.

4. The combination, with a filter, A, having a discharge-valve, d', of the discharge-conduit B, supported as at l, and comprising the ascending part o, leading from the valve d', descending part n, of smaller diameter than the part o and terminating in a discharge-valve, d^3, of smaller discharging capacity than the valve d', and the tapering connection m, provided with a controllable vent, substantially as described.

5. In combination with a beer-filter having a plurality of inlet-chambers each interposed between two filtering strata and two outlet-chambers, as set forth, pipes h h, leading from the tops of the several inlet-chambers and converging together and terminating in a single controllable vent common to all, substantially as described.

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6. The combination, with a beer-filter having a plurality of outlet-chambers, of a tube, D, above the filter, having a discharge-cock, d, at one end, transparent section b, and a controllable vent, and pipes h', connecting the tube D with the upper parts of the several outlet-chambers, substantially as described.

7. The combination, with a beer-filter having a plurality of outlet-chambers, of a tube, D, above the filter, having a discharge-cock, d, at one end, a transparent section, b, a controllable vent and a pressure-gage, and pipes h', connecting the tube D with the upper parts of the several outlet-chambers, substantially as described.

8. The combination, with a beer-filter having a plurality of outlet-chambers, of the tube D, having the discharge-cock d, transparent section b, and vent-cock c, pipes h', connecting the tube D with the upper parts of the several outlet-chambers, and receiver g', cock f', and pressure-gage e', surmounting the tube D, substantially as described.

402,501. GATE. WILLIAM BALL, Lynchburg, Ohio. Filed Aug. 14, 1888. Serial No. 282,714. (No model.)



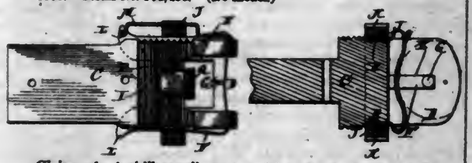
Claim.—1. The combination, with the gate-support, the gate hinged to the support, and the connection interposed between the gate and the said gate-support, of the swinging arm G, adjustably interposed between the said support and the said connection, whereby the height of the gate can be varied as desired, substantially as and for the purpose described.

2. The combination, with the gate-support, of the gate hinged to the said support, the plate D, the turn-table on the plate D, and the arm hinged to the turn-table and having connection with the gate and with the gate-support, substantially as described.

3. The combination, with the gate-support, the gate, and the hinged arm, of the yoke adjustable on the arm, the link I between one end of the yoke and the gate-support, and the rods J J' between the gate and the other end of the yoke, substantially as described.

4. The combination, with the gate-support and the gate, of the plate D, having a cam on a portion of its upper surface, the turn-table, the arm hinged to said turn-table, and a connection between the gate and the gate-support, said connection being fastened to the said arm, substantially as described.

402,502. THILL-COUPLING. WILLIAM B. BRADSBY, Greenville, Ill., assignor of one-half to Charles Stewart, same place. Filed Feb. 28, 1889. Serial No. 301,486. (No model.)



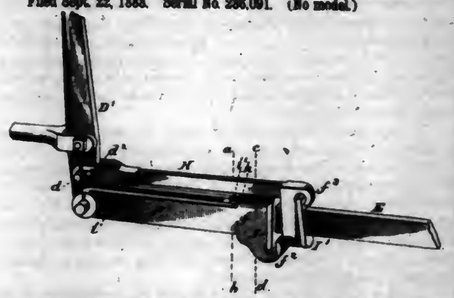
Claim.—1. A thill-coupling comprising the body, the coupling-arms pivoted thereto and having inwardly-projection pivot-pins at their front ends adapted to engage the eye of the thill-iron, and the sliding collar acting on the said arms to force them into engagement with the eye of the thill-iron, as set forth.

2. The combination of the body, the coupling-arms pivoted thereto and adapted to engage the eye of the thill-iron, the collar mounted on the body and acting on the coupling-arms to force them into engagement with the eye of the thill-iron, and the locking-spring secured on the body and engaging the said collar, as set forth.

3. The combination of the body, the coupling-arms pivoted thereto and having inclined outer surfaces and provided at their front ends with inwardly-projecting pivot-pins adapted to engage the eye of the thill-irons, the collar mounted on the body and acting on the inclined surfaces of the coupling-arms and provided in its outer side with a series of longitudinal notches, and a locking-spring secured to the body and engaging one of the notches of the collar, as set forth.

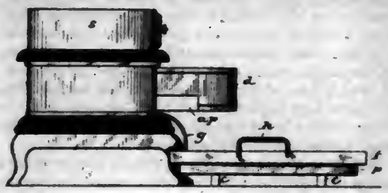
4. The combination of the body, the coupling-arms pivoted thereto, the anti-rattling spring fitted on the body and passing vertically across the end of the same, the collar mounted on the body and acting on the coupling-arms, and the locking-spring secured on the body and engaging the collar, as set forth.

402,503. AUTOMATIC BRAKE-ADJUSTER. JOHN B. BURNS, Indianapolis, Ind., assignor of one-half to Elisha D. Barnes, Watertown, N. Y. Filed Sept. 22, 1888. Serial No. 286,091. (No model.)



Claim.—In a brake mechanism, a brake-lever, a short connection pivoted thereto, a brake-rod adapted to slide upon the short connection, a rod pivoted by means of a slot and pin to the brake-lever, and having at its inner end a strap or shackle, combined with a link surrounding the brake-rod and in loose engagement at its upper end with said shackle, and a second similar link also surrounding the brake-rod, but in loose engagement with the inner end of the short connection, substantially as set forth, the first link being adapted to grip the brake-rod as the brake-lever is moved to shorten said rod and the second link to detain the brake-rod and prevent its return movement upon the opposite motion of the brake-lever, as described.

402,504. CARPET-PROTECTOR. GEORGE S. BURRELL, Kalamazoo Mich., assignor to Fletcher E. Marsh, Indianapolis, Ind. Filed Feb. 11 1889. Serial No. 299,545. (No model.)

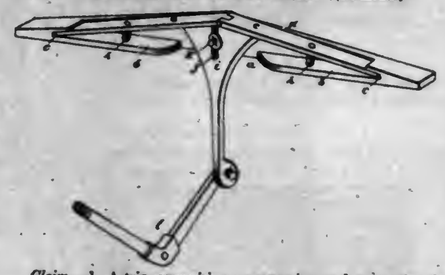


1. *Claim.*—The pan p, provided with curved front piece, g, substantially as shown and described.

2. The pan p, having the curved front piece, g, connected with the frame-work f, and having handles h at the sides of such frame, substantially as shown and described.

3. The pan p, having curved front piece, g, the frame-work f, surrounding the pan, handles h, also connected to such frame, and cleats c beneath the bottom of the pan, all combined substantially as shown and described.

402,505. TRIPPING DEVICE FOR RAILWAY-SIGNALS. JOHN T. CARTER, Baltimore, Md., assignor of one-half to Frank J. Hilbert, same place. Filed Jan. 22, 1889. Serial No. 297,294. (No model.)



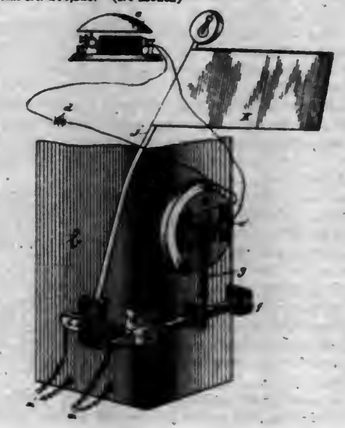
Claim.—1. A trip comprising a supporting and protecting frog adapted to be secured beside a railroad-rail and provided with an upwardly-extending flange on its outer side and horizontal bottom bearing-flanges, a pair of levers longitudinally located on said frog with their upper ends hinged together and their opposite free ends confined and movable on said bottom flanges, a head loosely secured to the frog to allow vertical movement and having a rounded upper end upon which the hinged ends of the levers rest, and an elbow-lever pivotally secured to the lower end of said head, substantially as described.

2. A trip comprising a supporting and protecting frog adapted to be secured beside a rail and provided with an upwardly-extending flange at its outer side and with bottom bearing-flanges, the ends of the frog having sockets open on their inner sides, a pair of levers longitudinally located on the frog hinged together at their upper adjoining ends and having their opposite ends loosely extending into said sockets, stops or guides for said levers, and a head operated by the levers, substantially as described.

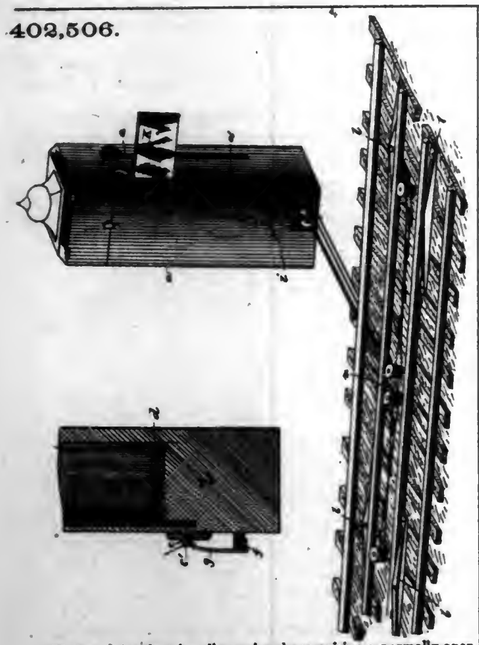
3. A trip comprising a frog adapted to be secured beside a rail and open on its inner side and top, one or more levers in the same adapted to be depressed by the wheels of a passing car, and a head upon which said lever or levers rest and adapted to be vertically moved by the same, said head having a vertical slot, and a headed pin secured to the frog and extending loosely through the slot, substantially as described.

4. A trip comprising a frog having bottom bearing-flanges and sockets, levers movably located in the frog with their ends in the sockets and bearing on the flanges, guiding-pins for the same, and a head upon which the levers rest loosely secured to the frog by a pin and slot, substantially as described.

402,506. ELECTRIC SIGNAL. JOHN T. CARTER, Baltimore, Md. assignor of one-half to Frank J. Hilbert, same place. Filed Jan. 22, 1889. Serial No. 297,295. (No model.)



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Claim.—An electric railway-signal comprising a normally-open circuit, a gong included in the same and located at or near a crossing, a support located at or near the crossing, a circuit-closer on the same, a rock-shaft mounted on the support and provided with an arm to engage the circuit-closer and close the circuit when the shaft is swung in one direction, said shaft being provided with a toe at one end, a lever pivoted to the support to swing in a horizontal plane and engage said toe to rock the shaft to close the circuit when swung in one direction, a pair of trips located on the track on opposite sides of the crossing, and each connected with an opposite end of said lever, whereby when one trip is operated one end of the lever is drawn down and the circuit closed, and when the other trip is depressed the opposite arm of the lever is drawn down and the circuit opened.

402,507. DUPLEX FIRE-ALARM TELEGRAPH. SIDNEY A. CHASE, Evart, Mich., assignor of one-half to William R. Mapes, same place. Filed Apr. 9, 1888. Serial No. 270,114. (No model.)

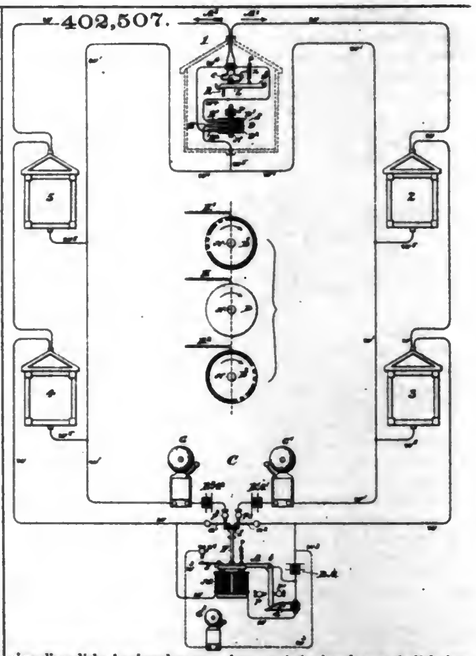
Claim.—1. In a system of fire-alarm telegraphs or signals, the combination of a normally-closed main circuit, including circuit-breakers in each of a series of signaling-boxes and an electro-magnet at the central station, with an additional divided circuit, including two independent normally-open batteries, located also at the central station, and signal-transmitters at each box, divided into two parts, the central-station magnet having an armature-lever-carrying circuit, and controlling devices for keeping the main circuit normally closed, and also for closing the divided circuits when the main circuit is broken, whereby independent signals are transmitted by different routes, substantially as described.

2. In a system of fire-alarms or telegraphs, a main circuit including a series of circuit-breakers, one in each box, and an electro-magnet located at the central station, having an armature-lever carrying a circuit-controlling device adapted to hold the main circuit closed so long as the line is intact, with an additional circuit-controlling device on said armature-lever for closing a second or independent circuit when the main circuit is broken, and signal-transmitters, located one in each box, for sending signals over the two circuits conjointly, substantially as described.

3. In a non-interfering system of fire-alarms or telegraphs, the combination of a normally-closed main-line circuit, including circuit-breakers, one in each box, and an electro-magnet at the central station, with two signal-circuits, each normally open at one point in the central station, a three-part signal-transmitter in each box, one part of which is connected continuously with both of said open circuits, while the other parts are connected successively to different portions of the main-line wire, and a circuit-controlling armature-lever for said magnet, which in its normal position holds the main line closed, but when the main line is broken closes the normally-open circuits, substantially as described.

4. In a system of fire-alarm signals or telegraphs, a duplex signal-transmitter consisting of a central metallic disk and two independent

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signaling-disks having the same characteristic signal on each disk, but located at points diametrically opposite each other, in combination with contact-springs and circuit-connections, whereby the same signal may be sent twice in one revolution of the signal-wheel, substantially as described.

5. In a system of fire-alarm telegraphs or analogous signaling apparatus, the combination of a two-way signal composed of a continuity-preserving disk, and two independent transmitting-disks having the same characteristic signal arranged at different radial portions of their circumference, and a two-way signaling circuit running to the central station, including two independent gongs or signal-receiving apparatus, whereby the same signal is transmitted to the central station by different routes and sounded on independent alarm apparatus, substantially as described.

6. In a system of fire-alarm telegraphs or analogous signaling apparatus, the combination of a two-way signal-transmitter connected to two circuits running in opposite directions to a central station and through two normally-open batteries, and also connected to an additional circuit running to the central station, normally closed at circuit breaking contacts in outlying signal-boxes and at the central station, where it includes an electro-magnet having a circuit-controlling armature adapted to control said circuit-breaking contacts at the central station, substantially as described.

7. In a fire-alarm or analogous system, the combination of the following elements: a normally-charged main line, a series of signal-transmitters located one at each of a series of outlying stations, a series of circuit-breakers similarly located, an electro-magnet located at the central station and included in said main-line circuit, a normally-closed circuit-closer held closed by the armature of said magnet so long as the main circuit remains intact, a preliminary signal-receiver located in a normally-open shunt from the main-line battery around said magnet, and one or more signaling-receivers located in one or more normally-open independent battery-circuits, substantially as described.

8. In a fire-alarm or analogous system of signals, the combination of the following elements: a two-way signal-transmitter located at a signaling-station connected to two circuits running by different routes to a central station, a circuit-breaker at said signaling-station, which normally shunts said signal-transmitter through both of said circuits, and an electro-magnet located in a central or receiving station and having an armature-lever which acts upon a circuit-closer, also located at said central station, and holds it closed so long as the main line remains intact, and two normally-open independent circuits open at back-stops of the armature while said magnet is energized, said circuits including independent signal-receivers and running by different routes to the double signal-transmitter located at the signal-station, substantially as described.

9. In a system of fire-alarm telegraphs or analogous signals, a duplex signal-transmitter composed of two independent signaling-disks having the same characteristic signal arranged on the surface of each disk, in combination with open-circuit contact-springs and circuit-connections, and a ground-circuit conducting part having a continually-closed earth-connection, and an automatic circuit-changer at the central station, and circuit-connections, whereby the same signal may be sent to the central station in opposite directions at every revolution of the circuit-wheel, substantially as described.

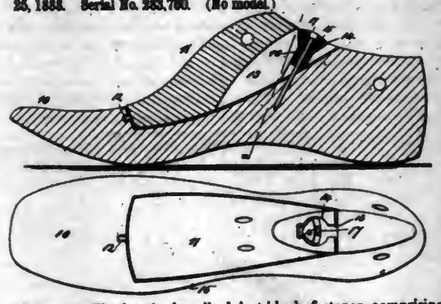
10. In a duplex system of fire-alarms or analogous signaling, the combination of a normally-closed main circuit, a series of circuit-breakers, one in each signal-box, and one in the central station, and a main-line battery and an electro-magnet circuit-changer at the central station, the circuit-changer controlling divided open-circuit signaling-circuits, including normally-open batteries and visual or audible signal-receiving apparatus, a duplex signal-transmitter in each signal-box, having a continuous electric connection with the divided circuits, and open-circuit electrical-signaling contact-springs connected to opposite portions of the normally-closed main-line wire running to the central station, a circuit-controlling armature-lever for said circuit-changer, which in its operation breaks the main-line circuit and closes the divided circuits, whereby two different signals may be sent at the same time in opposite directions, substantially as described.

402,508. MOLDING-MACHINE. THOMAS A. COMMERFORD, Chicago, Ill. Filed Feb. 26, 1889. Serial No. 301,187. (No model.)



Claim.—In a molding-machine, the combination, with a revoluble mold-board, of the crank-shafts H H', having pulleys and sprocket-wheels arranged thereon, the straps A^2 A^2 in operative connection with the mold-board shaft, shaft J, sprocket-wheels j' j', and chains j, substantially as shown and described.

402,509. LAST-BLOCK FASTENER. WILLIAM COOK, New York, N. Y., assignor of one-fourth to Paul D. Reed, same place. Filed Aug. 25, 1888. Serial No. 283,760. (No model.)



Claim.—1. The herein-described last-block fastener, comprising a shank and a flattened head thereon and axially bored through said shank and head, substantially as described.

2. The combination, with a last-body, of a last-block having a longitudinal slot and a countersink at the outer end of said slot, and the flattened head held to the last-body by a fixed nail or screw, the said head being adapted to be turned independently of the nail or screw to bring it wholly within the longitudinal slot of the last-block or transversely thereto, substantially as described.

402,510. VALVE-OPERATING MECHANISM FOR GRAIN-SCALES. CHARLES H. COOLEY, Hartford, Conn., assignor to The Pratt & Whitney Company, same place. Filed Nov. 12, 1888. Serial No. 290,635. (No model.)



Claim.—1. In a grain-scale, the combination, with a stop-cam controlling the closing of the valves, of a cam-stop carried on the scale-beam and acting on said cam, and a stop connected to said cam and located to limit the first downward movement of the beam, all organized and coacting substantially as described.

2. The combination of the scale-beam having stop M, the valve-shaft carrying cam K^3, and the hook 4, movably connected to said cam and having the stop-face 5, substantially as described.

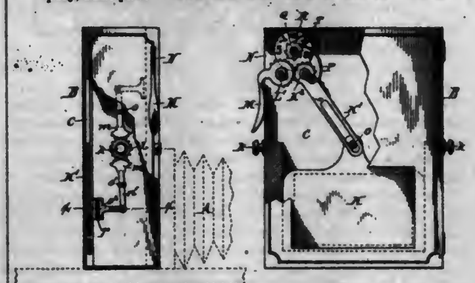
402,511. CEMENT. URIAH CUMMINGS, New Haven, Conn. Filed Jan. 26, 1889. Serial No. 297,673. (No specimens.)

Claim.—1. As a new article of manufacture, a hydraulic cement consisting of silicate of magnesia calcined and pulverized, substantially as set forth.

2. As a new article of manufacture, a hydraulic cement containing, principally, a single silicate of magnesia calcined and pulverized, substantially as set forth.

3. As a new article of manufacture, a hydraulic cement consisting of silicate of magnesia and lime calcined and pulverized, substantially as set forth.

402,512. PHOTOGRAPHIC-PLATE-HOLDING APPARATUS. JACOB P. DECKER, New York, N. Y., assignor to E. & H. T. Anthony & Company, same place. Filed Dec. 3, 1888. Serial No. 292,453. (No model.)



Claim.—1. A plate-holding box provided with exposure-apertures at opposite ends and on opposite sides, a light-excluding shutter for each aperture, and a partition across the box having openings therein for the passage of the carriers, substantially as set forth.

2. A plate-holding box having exposure-apertures at opposite ends and on opposite sides, a light-excluding shutter for each aperture, a partition across the box having openings therein for the passage of the carriers, and an index operated at the same time with the shutter, substantially as set forth.

3. A plate-holding box having exposure-apertures at opposite ends and on opposite sides, a light-excluding shutter for each aperture, a partition across the box having openings therein for the passage of the carriers, and means, substantially as described, to secure the proper focal position of the surface about to be exposed, substantially as set forth.

4. A plate-holding box having exposure-apertures at opposite ends and on opposite sides, a light-excluding shutter for each aperture, a partition across the box having openings therein for the passage of the carriers, an index operated at the same time with the shutters, and means, substantially as described, to secure the proper focal position of the sensitive surface about to be exposed, substantially as set forth.

5. A plate-holding box having exposure-apertures at opposite ends and on opposite sides thereof, in combination with dual series of sensitive surfaces, one series presented to one of said exposure-apertures and the other to the other, substantially as set forth.

6. The combination of a plate-holding box having exposure-apertures on opposite sides and opposite ends with a dual series of sensitive surfaces, one series presented to one of said apertures and the other to the other one of said series, exceeding by one the number of the other series, substantially as set forth.

7. A plate-holding box having double sides and edges and provided with exposure-apertures at opposite ends and on opposite sides, shutters for the said apertures, and shutter-operating mechanism, substantially as described, and focusing mechanism, substantially as described, both plates between the double walls of the box, substantially as set forth.

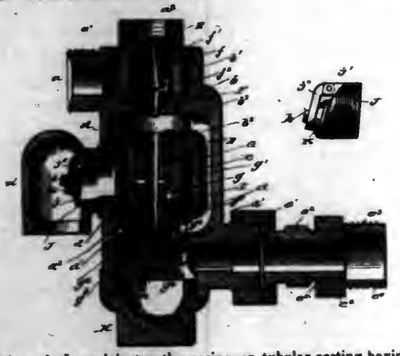
8. A plate-holding box having double walled sides and provided with exposure-apertures at opposite ends and on opposite sides, shutters for the said apertures, and shutter-operating mechanism, substantially as described, placed between the double walls, substantially as set forth.

9. A plate-holding box having double walled sides and exposure-apertures at opposite ends and on opposite sides, shutters for the said

apertures, and shutter-operating and exposure-indicating mechanism, substantially as set forth.

10. A plate-holding box having double walls and edges, exposure-apertures at opposite ends and opposite sides, shutters to the said apertures, and focusing mechanism, substantially as described, placed between the double walls of the box, substantially as set forth.

402,513. STEAM-INJECTOR. JOHN DESMOND, Wadsworth, Ohio, assignor to the Garfield Injector Company, same place. Filed June 20, 1888. Serial No. 277,635. (Model.)



Claim.—1. In an injector, the casing or tubular casting having the upper, primary, and lower auxiliary overflow-chambers and the single duct or passage-way formed in the outside of said casing and connecting said upper and lower overflow-chambers at its ends independent of the main overflow-chamber, substantially as described.

2. In an injector having the single casing or tubular casting, the main central overflow-chamber formed by said casing and having the outlet arm or branch, the upper, primary, and lower auxiliary overflow-chambers formed, respectively, above and below said main central overflow-chamber, and the duct or passage-way connecting said upper and lower overflow-chambers independent of said main overflow-chamber, substantially as described.

3. In an injector, the apertured inclosing-ring, the delivery and combining tubes, and the check-valve moving on said delivery-tube and designed to rest on the upper end of said ring, substantially as described.

4. The combination, with the casing having the circular flanges and the central and lower auxiliary overflow-chambers, of the apertured inclosing-ring designed to bear against said flanges, the delivery and combining tubes, and the check-valve designed to move on said delivery-tube and to rest upon said ring, substantially as described.

5. As an improvement in injectors, the steam-inlet jet or tube having a covering and the lifting-tube having an upper cylindrical extension surrounding said covering, whereby the water is not affected by the heat of said jet or tube, substantially as described.

6. As an improvement in steam-injectors, the steam-inlet jet or tube, the hardened or vulcanized rubber sleeve or jacket surrounding the inner portion thereof, and the lifting-tube having an upper cylindrical extension surrounding said rubber sleeve or jacket and provided with a series of holes or apertures, substantially as described.

402,514. FURNACE. ELLIS F. EDGAR, Woodbridge, N. J. Filed Jan. 12, 1888. Serial No. 296,130. (No model.)

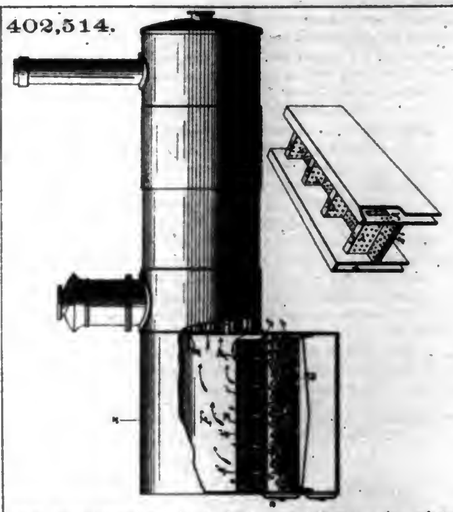
Claim.—1. The combination, in a furnace for burning carbonaceous material, of a chamber subdivided by perforated hollow partitions, whereby the air is finely divided and heated, the chamber formed by the hollow perforated partitions having a perforated bottom adapted to hold incombustible refractory material, and means for heating, conveying, and distributing air to the same, as set forth.

2. The combination, in a furnace for burning carbonaceous material, of a mass of refractory incombustible material, perforated air-chambers located within the body of said material, a support for the refractory material, and means for supplying air thereto and evenly distributing the same, substantially as described.

3. The combination, in a furnace, of a perforated plate over the fuel, a mass of refractory incombustible material supported by said perforated plate, an air-passage interposed between the perforated plate and the refractory material, and side air-passages opening into said air-passage, substantially as described.

4. The combination, in a furnace for burning carbonaceous material, of the perforated plate over the fuel in the furnace, a mass of refractory incombustible material located on said plate, a second perforated plate over the refractory mass, and means for supplying air and evenly distributing the same through said mass, whereby all the

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gases are consumed and the sparks prevented from escaping, substantially as described.

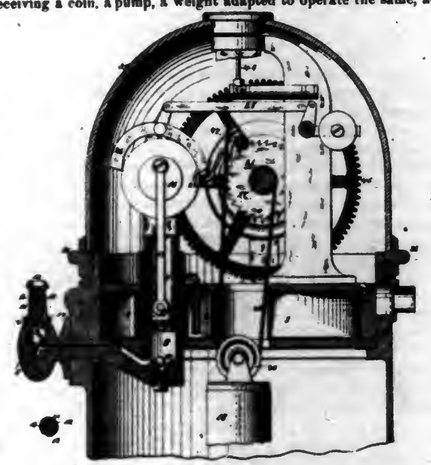
5. The combination, in a furnace for burning carbonaceous material, of a mass of refractory incombustible material located in the line of draft, whereby the products of combustion, &c., pass through the same, means for supporting said refractory material, and air-supply chambers located within the incombustible material for evenly distributing air thereto, substantially as described.

6. In a heating apparatus, the combination of the coal-space, the grate therefor, and opening into said coal-space, whereby coal may be introduced into the same, apertures for the introduction of air to said coal-space, a combining-chamber beyond said coal-space in the line of draft of the apparatus partially filled with incombustible matter in pieces with interstices between them, into which the gases from the coal are adapted to pass, supports for said incombustible matter, air-inlets leading into the space occupied by said incombustible matter and adapted to supply air into said spaces separately from the gases, and a draft-passage beyond said matter, substantially as set forth.

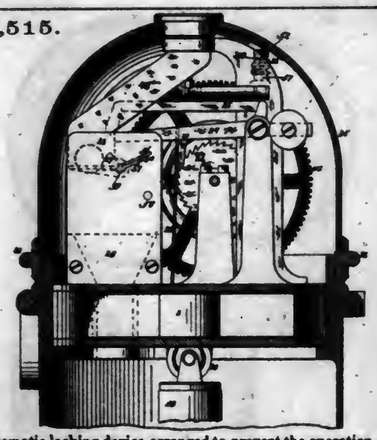
7. In a furnace for burning carbonaceous material, the combination of a mass of refractory incombustible material having interstices therethrough, and located in the line of draft, whereby the gases, products of combustion, &c., pass into said interstices, a support for said material, and means for supplying and evenly distributing air into the interstices of the same, substantially as described.

402,515. VENDING-MACHINE. PERCIVAL EVERITT, London, England, assignor to the Automatic Perfume Fountain Company, of New Jersey. Filed June 13, 1888. Serial No. 276,961. (No model.) Patented in England July 21, 1887, No. 10,232.

Claim.—1. In a liquid-vending machine having an aperture for receiving a coin, a pump, a weight adapted to operate the same, and



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an automatic locking device arranged to prevent the operation of the pump.

2. In a liquid-vending machine having a coin-aperture, a pump operated by a weight, an escapement engaging the same, a lever arranged to release and to reset the escapement, and a coin-receptacle attached to said lever which is depressed by the weight of a coin passed through the coin-aperture.

3. The combination of the pump 7, the weight 18, and cord 29, operating the same, the crank-disk 16, the escapement 26, the levers 24 and 25, and the coin-bucket 23.

4. In combination with a case provided with a coin-aperture, a pump operated by a weight, a disk and escapement arranged to be released by placing a coin in the coin-aperture, and a projection on the disk, whereby the escapement is returned to its position and the escapement reattached to the disk, substantially as described.

5. In a liquid-vending machine having an aperture for receiving a coin, a pump, a weight adapted to operate the same, and a coin-receiver arranged so that when a coin is placed within the receiver it shall release the weight and permit the pump to be operated.

6. The combination of a case provided with a coin-aperture, a pump, a tank so placed that the liquid therein flows by gravity into the chamber of the pump, a crank-disk connected with the pump, a weight and cord actuating the crank-disk, a coin-bucket, and suitable levers connected with an eccentric and escapement on the crank-disk, as and for the purpose set forth.

7. In a liquid-vending machine, the combination of a case provided with a coin-aperture, mechanism adapted to be operated by a weight, a coin-receptacle arranged so that when a coin is placed within the receptacle it shall release the weight and permit the device to be operated, and a closing device adapted to shut the coin-aperture when the weight has ceased to act, substantially as described.

8. The combination of a case provided with the coin-aperture 32, the shutter 31, closing the same, the spring 33, connected with the shutter by suitable levers, and the weight and cord 29, attached to the lever 34, as and for the purpose set forth.

9. In a liquid-vending machine, the nozzle 11, provided with an opening, 12, for the ejection of liquid, and the air-passages 13 13 around the opening, as and for the purpose set forth.

402,516. STEAM-TRAP. BARRENT W. FELTHOUSEN, Milwaukee, Wis., assignor to the Albany Steam Trap Company, of New York. Filed July 30, 1888. Serial No. 281,470. (No model.)

Claim.—1. The combination, in a steam-trap, of a valve-case having a steam-connection and relief-opening, steam and relief valves seated in said case and having depending stems, a rock-shaft extending through said valve-case and provided on the outside with a V-lever and on the inside with a cross-head, which is arranged to engage said valve-stems, a weighted lever fulcrumed to said valve-case and working with said V-lever, a lever fulcrumed concentrically with said weighted lever and having projections working therewith, and a float having an external connection with said last-named lever, substantially as and for the purposes set forth.

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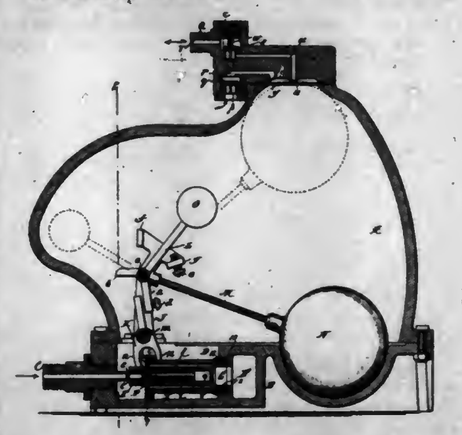


2. The combination, in a steam-trap with steam and relief valves having depending stems, of a rock-shaft provided with inclined wings working with said valve-stems, whereby the valves are slightly turned each time they are opened and closed, and thus caused to wear evenly on their seats, substantially as and for the purposes set forth.

3. The combination, in a steam-trap with the steam and relief valves having downwardly-projecting stems, of a rock-shaft provided with a cross-head working with said valve-stems, and a V-lever, a weighted lever fulcrumed between the limbs of said V-lever and arranged to operate the same, and a lever connected with a float which operates to carry said weighted lever in opposite directions past its center of gravity, substantially as and for the purposes set forth.

4. The combination, in a steam-trap with steam and relief valves, of a rock-shaft provided with a cross-head arranged to open said valves alternately, and with a V-lever and a weighted lever fulcrumed between the limbs of said V-lever, and provided with inclined sides working therewith, and a float connected with a lever which is arranged to move said weighted lever past its center of gravity, substantially as and for the purposes set forth.

402,517. AIR-COMPRESSOR. HUGH F. FITZPATRICK, New York, N. Y., assignor to Edwin K. Conover, Newark, N. J. Filed Aug. 9, 1888. Serial No. 282,348. (No model.)

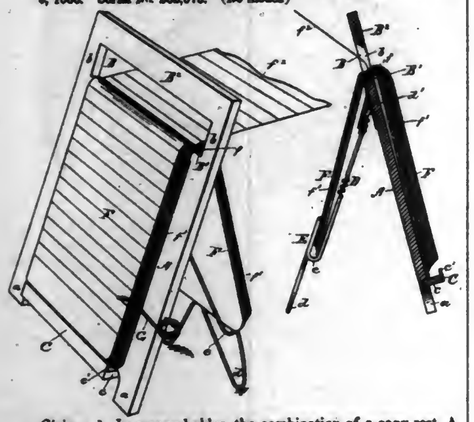


Claim.—1. The combination, with the chamber A, having the water inlet and discharge ports c G, of the valve I, controlling the port G, an auxiliary discharge-port, *l*, communicating with the chamber A and the discharge-outlet, and the valve H, controlling the ports *l c*, substantially as described.

2. The combination, with the chamber A, having the water inlet and discharge ports *c* G, of the valve I, sliding on the spindle P and controlling the port G, and having a port, *l*, communicating with the port G and the chamber, the valve H also sliding on said spindle and controlling the ports *l c*, the lever K, operating said valves with lost motion between the two, the weighted lever L, having tappets engaging with the lever K, and the lever M, operated by a float and having tappets engaging with the lever L, substantially as described.

3. The combination, with the chamber A and float N, of the air-outlet duct *u*, and valve *s* and the diaphragm *x*, extending across the air-duct and arranged to be pressed against the opening of the duct to close the same by the float N, substantially as described.

402,518. COPY-HOLDER OR EASEL FOR USE WITH TYPE-WRITING MACHINES. NATHANIEL C. FOWLER, Jr., Winthrop, Mass., assignor to the Pope Manufacturing Company, Portland, Me. Filed Aug. 6, 1888. Serial No. 282,078. (No model.)



Claim.—1. In a copy-holder, the combination of a copy-rest, A, a back-rest, B', a brace, D, and leaf-holders E and G, constructed to operate essentially as set forth.

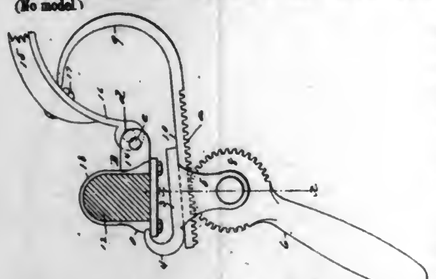
2. In a copy-holder, the combination of a copy-rest, A, a back-rest, B', a brace, D, foot-ledges *c c*, and leaf-holders G E, constructed to operate essentially as set forth.

3. In a copy-holder, the combination of a copy-rest, A, a back-rest, B', a leaf-space, B, a leaf-detainer, B^3, above the copy-rest, and the back-rest, with the brace D, constructed to operate essentially as set forth.

4. In a copy-holder, the combination of a copy-rest, a back-rest, a leaf-space, a leaf-detainer, B^3, a brace, and a front leaf-holder, G, constructed to operate essentially as set forth.

5. In a copy-holder, the combination of a copy-rest, a leaf-space, a leaf-detainer, a brace, and a leaf foot-holder, C, having a ledge, *c*, and a trip, *c'*, constructed to operate essentially as set forth.

402,519. THILL-JACK. JACOB FULLER, Florence, and JAMES MORRISON, Easthampton, Mass. Filed Sept. 3, 1888. Serial No. 284,418. (No model.)



Claim.—A thill-jack consisting of a frame-plate, 3, a hook, 4, and the opposing ear-pieces 5 5, formed thereon, a pinion-headed lever pivoted by its toothed end in said ear-pieces, and the shank-bar 10, provided with the hook 9, formed integrally therewith, said bar being provided with rack-teeth on its outer side, engaged by said pinion, and constrained thereby against outward movement from the said frame-plate and held by said ear-pieces against lateral movement thereon, as shown and described.

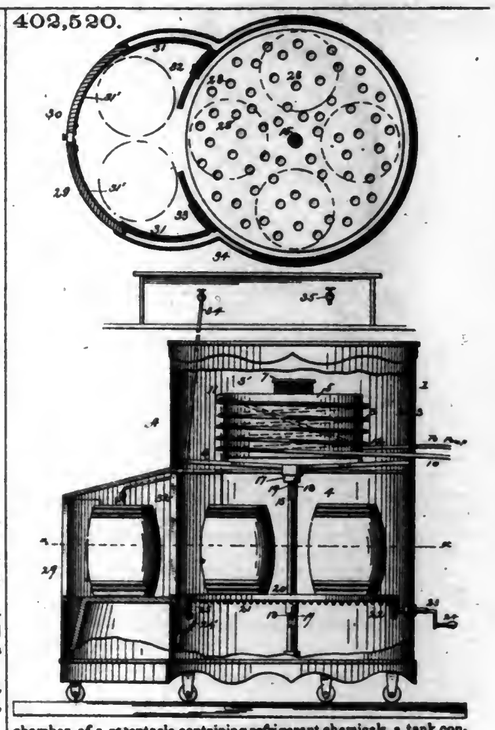
402,520. REFRIGERATING APPARATUS. ROBERT R. GRAY, Baltimore, Md., assignor to Henry C. Turnbull, Jr., trustee, same place. Filed Oct. 3, 1888. Serial No. 287,463. (No model.)

Claim.—1. In a refrigerator, the combination of a receptacle containing refrigerant chemicals, and a liquid-containing pipe surrounding the exterior and extending through the interior of the receptacle, substantially as described.

2. In a refrigerator, the combination of a receptacle containing refrigerant chemicals, a liquid-containing pipe coiled around the exterior and within the interior of the receptacle, and a pump connecting with the ends of the pipe to force a liquid through the same, substantially as described.

3. In a refrigerator, the combination, with the refrigerating-

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chamber, of a receptacle containing refrigerant chemicals, a tank containing brine, a pump on the tank, and a pipe coiled around the exterior and within the interior of the receptacle, the ends of which pipe connect with the pump, substantially as and for the purpose specified.

4. The combination, with a refrigerator having a cylindrical form and constructed with an inner and an outer wall, of curved doors sliding between the said walls, a semi-cylindrical auxiliary chamber on the refrigerator, curved sliding doors between the walls of the said chamber moving on the same horizontal plane as the doors of the refrigerator, and flexible metallic strips confined between the walls of the refrigerator and auxiliary chamber and connecting the two sets of doors, whereby when one set is opened the other set will be closed, substantially as described.

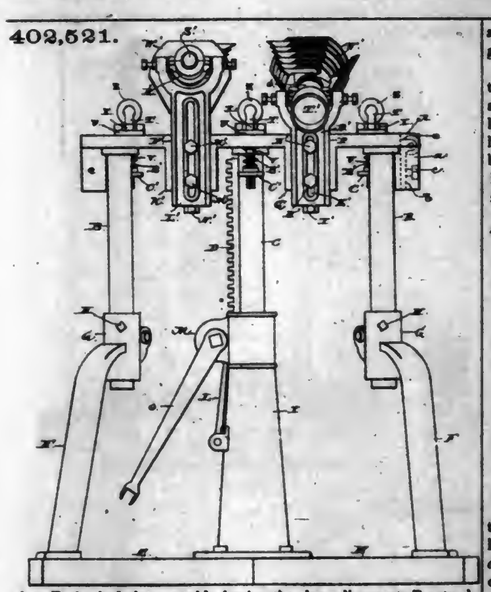
402,521. MACHINE FOR GROOVING LUMBER. JULIAN T. GREYDOWENI, Grand Rapids, Mich., assignor of one-half to R. E. Butterworth and James Lowe, same place. Filed Nov. 1, 1887. Serial No. 253,989. (No model.)

Claim.—1. In a grooving-machine, the combination, with the bed or table having the vertical notches in its sides, of the vertical standards fitting in said notches and having the vertical slots and the inwardly-extending lugs F' at their lower ends, the vertical adjusting-screws extending through the lugs and engaging threaded openings in the lower side of the table, and clamping-bolts extending transversely through the slots in the standards and engaging threaded openings in the sides of the table, the bearings R' O', pivoted in the upper ends of the standards, and the oppositely-inclined shafts journaled in said pivoted bearings and having the cutter-heads, substantially as described.

2. In a grooving-machine, the combination of the movable base, the hollow central standard, I, and the legs F, arranged around the standard, all resting on and permanently and rigidly secured to the base, said legs F being solid and having at their upper ends cylindrical sockets or sleeves G, open at both ends, the bed-plate or table having the cylindrical posts B, to work through the sleeves G, and the post C, to work into the standard I, the set-screws for the sleeves G, the rack on the post C, the pinion journaled in the standard I and engaging the rack, and the pawl, also engaging the rack, as set forth.

3. The combination of the movable supporting-base, the vertical standard I, resting on and permanently secured to the center of the base, the legs F, arranged around the leg I and resting and permanently secured on the base, whereby said legs or standards I and F are rigidly connected, the sockets or sleeves G at the upper ends of

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legs F, the bed-plate or table having the depending posts B extending through and working in the sockets or sleeves, and the depending post C, working in the standard I and having the rack and the pinion journaled on the standard I and engaging the rack to lift or lower the bed-plate or table, substantially as described.

4. The combination of the crossed timbers E, forming the supporting-base, the standard I, having its lower end bolted on the center of the base, the legs F, having their lower ends secured on the ends of the crossed timbers and provided at their upper ends with the sockets or sleeves G, the table or bed-plate having the central depending post, C, working in standard I, and the depending corner-posts B, working in the sockets or sleeves, and means, substantially as set forth, to lift and lower the bed-plate or table, substantially as described.

5. The combination, in a grooving-machine, of the bed-plate or table having the slots R, the laterally-adjustable posts T, having the stems extending through the said slots and depending from the table or plate, said posts being adjustable independently of each other, the rollers Z, journaled to the said posts, and the springs bearing downward on the said posts, for the purpose set forth, substantially as described.

6. The combination, in a grooving-machine, of the bed-plate or table having the slots R and the grooves S on its under side and communicating with said slots, the laterally-movable posts T, having the depending studs fitted in the slots, the rollers Z, journaled to the said posts, the base-plates U, bearing on the bed-plate or table, having the openings to receive the lower ends of the posts, and the bolts W, having their heads fitted in the grooves S, the said bolts extending upward through the slots R and through the openings in the base-plate, and provided with clamping-nuts X, bearing on the upper side of the base-plate, for the purpose set forth, substantially as described.

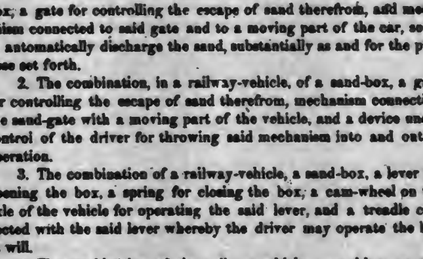
7. In a grooving-machine, the table or bed-plate, the hangers or standards having the slot E' and provided with the lugs F', which engage under the table, the bolts extending through the slots E' and entering the table or bed-plate, and thereby securing the hangers thereto, the bearing-boxes pivoted to the said hangers or standards, and the oppositely-inclined shafts journaled in the said bearing-boxes and having the cutter-heads, substantially as described.

8. In a grooving-machine, the table or bed-plate having the guide-boxes G', the hangers or standards having their upper ends bifurcated to form diverging arms and having the slots E' and provided with the lugs F', which engage under the table, the adjusting-screws I', extending through the said lugs and engaging the guide-boxes, the bolts extending through the slots E' and entering the guide-boxes, and bearing-boxes pivoted to said hangers or standard, and the oppositely-inclined shafts journaled in the said bearing-boxes and having the cutter-heads, substantially as described.

9. The combination, in a grooving-machine, of the vertically-adjustable bed-plate, the grooving mechanism supported above the bed-plate and vertically adjustable, and the vertically-adjustable standards *b*, secured to the bed-plate and having the rollers *c* at their upper ends, whereby, when the bed and grooving mechanism are lowered and the standard raised, the rollers serve to direct the board over the grooving mechanism, substantially as described.

10. The combination, in a grooving-machine, of the bed-plate or table having the vertical guide-boxes formed in its sides, the vertically-adjustable hangers or standards secured in the guiding-boxes and having the lugs F', the adjusting-screws I', extending through the said lugs and engaging the lower ends of the guiding-boxes, the bearing-boxes pivoted to the said standards or hangers, and the oppositely-inclined shafts journaled in said bearings and having the cutter-heads, substantially as described.

402,522. ELEVATOR FOR GRAIN-SEPARATORS. STACY R. HART, Peoria, Ill. Filed Sept. 10, 1888. Serial No. 285,000. (No model.)

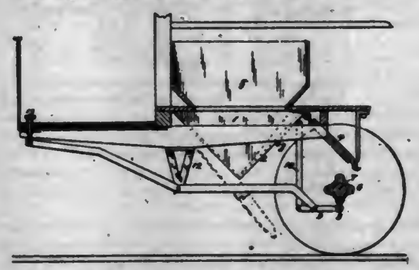


Claim.—1. An elevator-tube, A, made in sections *a a'*, adapted to telescope, in combination with a contained partition made in overlapping sections *d d'* and with means by which the sections *a a'* and *d d'* may be fastened in their adjusted positions with relation to each other, substantially as described.

2. An elevator-tube, A, having a semi-annular flange, *i*, around the lower edge of the grain-receiving opening A, provided with holes *i'* to receive the screws or rivets by which the grain-chute is attached to the elevator, substantially as described.

3. The combination of the elevator-tube A, having the semi-annular flange *i* arranged around the lower edge of the grain-opening A, provided with holes *i'* and permanently connected to the elevator-tube, and a rectangular piece of sheet metal adapted to be folded and applied, substantially as and for the purpose described.

402,523. SAND-BOX FOR STREET-CARS. GEORGE H. HATHAWAY, Boston, assignor of one-half to William A. Perry, Winchester, Mass. Filed Aug. 22, 1888. Serial No. 283,424. (No model.)



Claim.—1. The combination, in a wheeled vehicle, of a sand-box, a gate for controlling the escape of sand therefrom, and mechanism connected to said gate and to a moving part of the car, so as to automatically discharge the sand, substantially as and for the purpose set forth.

2. The combination, in a railway-vehicle, of a sand-box, a gate for controlling the escape of sand therefrom, mechanism connecting the sand-gate with a moving part of the vehicle, and a device under control of the driver for throwing said mechanism into and out of operation.

3. The combination of a railway-vehicle, a sand-box, a lever for opening the box, a spring for closing the box, a cam-wheel on the axle of the vehicle for operating the said lever, and a treadle connected with the said lever whereby the driver may operate the box at will.

4. The combination of the railway-vehicle, a sand-box carried thereby under the floor, and an auxiliary sand-reservoir above the floor and opening through the floor into the sand-box below.

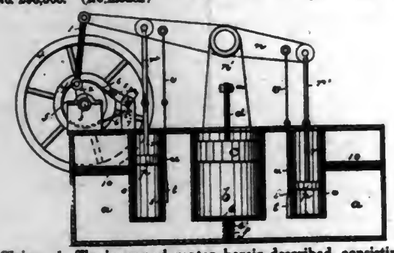
5. The combination of a railway-vehicle with a sand-box, a sand-box lever for operating the same, a cam-wheel driven by the car, and a treadle under control of the driver and connected by a lever with the fulcrum of the sand-box lever, so that when the treadle is depressed the cam-wheel will operate the sand-box lever and automatically operate the sand-box.

402,524. TRAVELING-CRANE. GEORGE H. HELVEY, Hamilton, Ohio, assignor to the Hooven, Owens & Rentschler Company, same place. Filed Feb. 15, 1889. Serial No. 300,072. (No model.)



Claim.—In a traveling crane, the combination, substantially as set forth, of a pair of track-rails, a crane-bridge arranged for travel thereon, a trolley arranged to travel along the crane-bridge, an air-cylinder suspended from the trolley and having an attaching device—as a crane-hook—upon the lower end of its piston-rod, an air-reservoir adapted for connection with a source of supply or production of air under pressure, a header-pipe connected with said reservoir and disposed parallel to said track-rails, a series of branch pipes connected with said header-pipe and provided each with a coupling part and with a valve, a swing-pipe connected with said air-cylinder and provided at its free end with a coupling part adapted to engage the coupling part of any one of said branch pipes, a valve in said swing-pipe adapted for manipulation to open or close said pipe, and an outlet valve or cock communicating with said swing-pipe between said valve therein and said air-cylinder.

402,525. AIR-MOTOR. SAMUEL C. HILL, Newark, N. J., assignor of one-half to Albert A. Schmidt, same place. Filed Feb. 4, 1889. Serial No. 298,565. (No model.)



Claim.—1. The improved motor herein described, consisting of a compressed-air reservoir containing therein an air-pump, cylinders with motor-pistons, and operating-valves, and outlet-pipes, as shown, said pistons being connected outwardly with a beam oscillating in a frame secured to the top of said reservoir and pivotally connected with the driving mechanism, as described, and for the purpose set forth.

2. In an air-motor, the combination, with a compressed-air reservoir and air-pump, of a cylinder, motor-piston working in said cylinder, automatic air-valves in said piston, rods connecting said piston with an oscillating beam pivoted to a frame secured on said reservoir, a driving mechanism pivoted to said beam, and a spring-brake, 6, adapted to bear on a wheel of said driving mechanism, all as shown, and for the purpose set forth.

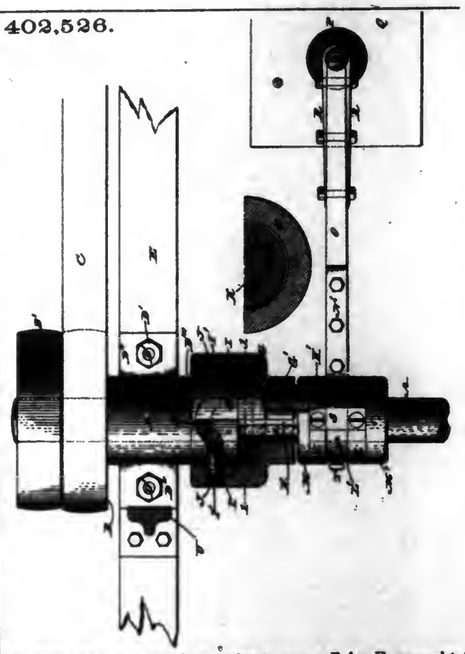
402,526. GOLD-BEATER'S HAMMER. HENRY B. HOUSER, Philadelphia, Pa. Filed Jan. 31, 1889. Serial No. 298,300. (No model.)

Claim.—1. The combination of shaft A, elongated bearing D", provided with sinuous groove F, sleeve G, the said shaft being provided with a feather, K, setting in a corresponding groove in sleeve G, to revolve the latter, pin I, engaging a groove, F, lug H, secured to sleeve G, a loose sleeve, L, and hammer-handle O, and hammer P, secured rigidly to sleeve L, and block S, secured to sleeve L, all combined and operated substantially as described.

2. The combination of shaft A, elongated bearing D", provided with sinuous groove F, sleeve G, the said shaft being provided with a feather, K, setting in a corresponding groove in sleeve G, to revolve the latter, pin I in sleeve G, engaging in groove F, lug H, secured to sleeve G, a loose sleeve, L, and hammer-handle O, and hammer P, secured rigidly to sleeve L, block S, secured to sleeve L, and cushion X, adapted to receive the hammer in its upward throw and to cause its rebound, substantially as described.

3. The combination of shaft A, elongated bearing D", provided with sinuous groove F, sleeve G, the said shaft being provided with a feather, K, setting in a corresponding groove in sleeve G, to revolve

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the latter, pin I in sleeve G, engaging in groove F, lug H, secured to sleeve G, a loose sleeve, L, and hammer-handle O, and hammer P, secured rigidly and adjustably by set-screw T to loose sleeve L, and block S, secured to sleeve L, all combined and operating substantially as described.

402,527. THILL-COUPLING. GEORGE H. HUTTON, Baltimore, Md. Filed Mar. 5, 1889. Serial No. 301,899. (No model.)



Claim.—1. In a thill or pole coupling, the combination of the clip having two ears, *c*, a bolt, *d*, the iron provided with a downward-projecting hook, *f*, a presser-plate, G, loosely attached to the clip-ears and having a beak or boss, *h*, which bears against the said hook, and a spring, I, between the clip and presser-plate.

2. In a thill or pole coupling, the combination of the clip having two ears, *c*, a bolt, *d*, the iron provided with a downward-projecting hook, *f*, a presser-plate, G, loosely attached to the clip-ears and having a beak or boss, *h*, which bears against the said hook, a yoke-plate uniting the two ends of the clip and having one end projected forward and holding the lower part of the presser-plate, and a spring between the clip and presser-plate.

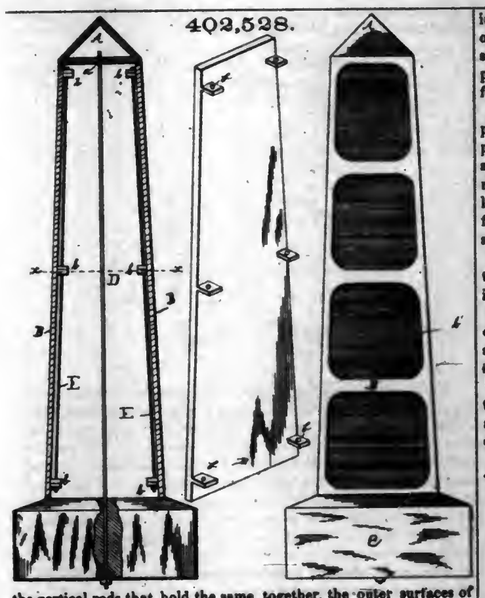
3. In a thill or pole coupling, the combination of the clip having two ears, *c*, and a socket in the front part, a bolt, *d*, the iron provided with a downward-projecting hook, *f*, a presser-plate, G, loosely attached to the clip-ears and having in its back a socket, *i*, and a spiral spring having one end in the clip-socket and the other end in the plate-socket.

402,528. MONUMENT. MARK D. JUDKINS, Osakis, Minn. Filed May 26, 1888. Serial No. 275,142. (No model.)

Claim.—A hollow monument, the shaft of same being composed of four pieces having on their inner edges lugs, through which pass

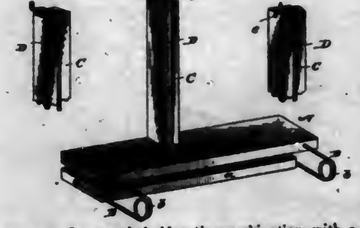


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the vertical rods that hold the same together, the outer surfaces of said shaft having recesses adapted to receive and hold the inscription-plates, in combination with the inscription-plates, and a suitable base and cap, which are held in position by means of the central rod, D, substantially as described.

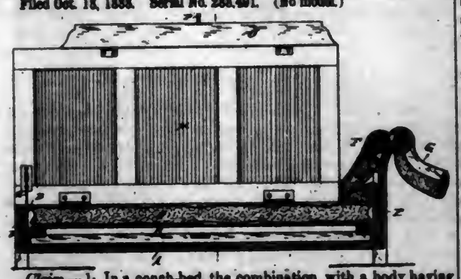
402,529. MUSIC-HOLDER. GUSTMAN H. KOEHER, New Orleans, La. Filed Oct. 1, 1888. Serial No. 286,885. (No model.)



Claim.—1. In a music-holder, the combination, with a spring-clamp adapted to be applied to the leaf of a piano or the like and having its upper portion composed of the bar to serve as a support for music or books, of an upright bar or support and an upright rod or holder secured to the clamp and adapted to confine music in an open position against the bar, substantially as specified.

2. A music-holder comprising two spring-actuated clamping-jaws, a bar secured to the upper side of the upper jaw in an approximately upright position, and a rod adapted to confine sheets of music against said bar, substantially as specified.

402,530. COUCH-BED. FREDERICK KRUEDELBACH, Winfield, N. Y. Filed Oct. 18, 1888. Serial No. 288,491. (No model.)



Claim.—1. In a couch-bed, the combination, with a body having a rigid foot end piece, an end piece at the head end, the outer wall of said head-piece forming the head end of the body, and rigid wings at the front and rear edges of said head-piece, of a head-rest pivoted between the wings of said head end piece, a removable seat extending from the bottom edge of said head-rest to the rigid foot end piece of the body, and a removable mattress and spring bed-frame below said seat, said mattress and spring bed-frame extending from the foot-piece to the inner surface of the head end piece, substantially as set forth.

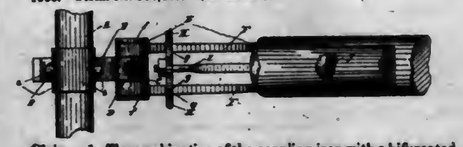
2. In a couch-bed, the combination, with a body, of a rigid foot-piece and a rigid head end piece, the outer wall of said head end piece forming the head end of the body and forming an uninterrupted space for a mattress in said body of the entire length of said body, rigid wings at the front and rear edges of said head end piece, a hollow head-rest hinged to said wings, and a removable seat extending from the foot end piece to the swinging end of the hinged head-rest, substantially as set forth.

3. The combination, with a couch-frame having a recess in the top edge of one side piece, of a removable seat having a wing fitting into said recess, substantially as herein shown and described.

4. The combination of a couch-frame having a recess in the top edge of one side piece with a removable seat and a wing fitting in said recess of the side piece and hinged to the bottom edge of one side piece of the seat, substantially as set forth.

5. The combination, with a couch-frame having a recess in the top edge of one side piece, of a hinged seat, a wing fitting in said recess and hinged to the said seat, a hook on said wing, and a catch in the couch-frame, substantially as herein shown and described.

402,531. THILL-COUPLING. GEORGE W. LEE, Homeworth, Ohio, assignor to himself and Herbert T. Gould, Perry, N. Y. Filed Feb. 16, 1889. Serial No. 300,373. (No model.)



Claim.—1. The combination of the coupling-iron with a bifurcated thill-iron and a locking-plate placed in the bifurcation of said thill-iron and engaging the arms thereof, substantially as and for the purpose specified.

2. The combination of the coupling-iron and the bifurcated thill-iron with a locking-plate in the bifurcation of said thill-iron and the spring-bar connected to the plate and controlling the same, constructed and arranged substantially as specified.

3. The combination of the coupling-iron and the stub-shaft with a bifurcated thill-iron embracing said shaft, and a locking-plate placed in the bifurcation of said thill-iron and engaging the arms thereof, all substantially as set forth

4. The combination of the coupling-iron and a bifurcated thill-iron with a locking and spreading plate, G, for said thill-iron, constructed and arranged substantially as specified.

5. The combination of the coupling-iron, the bifurcated thill-iron, and the locking and distending plate with the key for operating said plate to distend the thill-iron, substantially as and for the purpose specified.

6. The combination of the coupling-iron, the stub-shaft secured thereto, and the bifurcated thill-iron engaging said stub-shaft with the locking-plate for said thill-iron and its controlling spring-bar, substantially as specified.

7. The combination of the stub-shaft having concentric corrugations in its ends with a bifurcated thill-iron having heads recessed to embrace the ends of said shaft, said recesses being concentrically corrugated at bottom, substantially as specified.

8. The combination of the coupling-iron having a sleeve and set-screw with a stub-shaft perforated, as described, and secured in said sleeve, and a bifurcated thill-iron engaging said stub-shaft, substantially as and for the purpose set forth.

9. In a thill-coupling, the combination of the coupling-iron, the stub-shaft, and the bifurcated thill-iron engaging said shaft, with the locking and distending plate in the bifurcation of said shaft, the spring engaging the same, and the releasing-key, all substantially as described.

10. The combination of the coupling-iron, the stub-shaft secured to a sleeve of said iron, and a bifurcated thill-iron having recessed heads on its arms engaging said sleeve, with a plate placed between the arms of the thill-iron and engaging the same, and the spring-bar seated in a recess in the shank of the thill-iron and engaging said plate, all substantially as described.

402,532. DUMPING-WAGON. CHARLES LEE and ANDREW B. LEE, Sioux City, Iowa. Filed Aug. 23, 1888. Serial No. 283,516. (No model.)

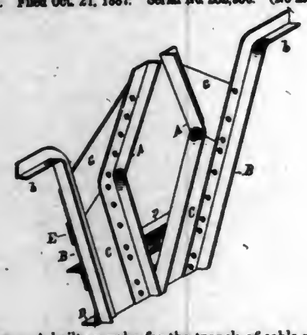
Claim.—The combination with the wagon-body, of a bottom consisting of hinged wings, a shaft to which the wings are connected, a collar, *c*, secured upon the front end of the shaft, and an arm, *d*, secured to the collar, a ratchet-plate, E, a bell-crank lever, F, one arm

402,532.



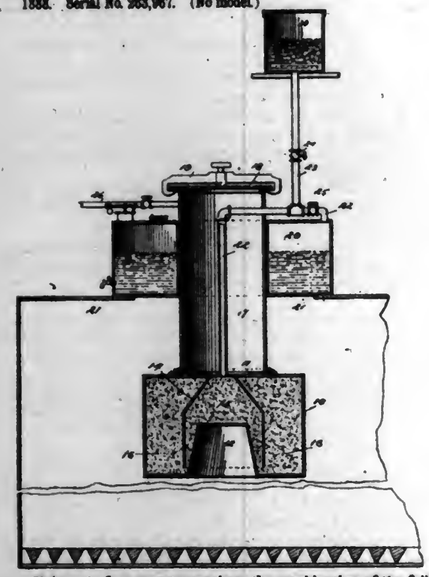
of which is arranged behind the arm *d*, and a spring, *e*, arranged below the short arm of the bell-crank lever, substantially as set forth.

402,533. TUNNEL-YOKE FOR CABLE RAILWAYS. CHARLES A. MARSHALL, Johnstown, Pa., assignor to The Johnson Company, of Kentucky. Filed Oct. 21, 1887. Serial No. 252,956. (No model.)



Claim.—A built-up yoke for the tunnels of cable railways constructed entirely of angle metal and plate metal, so that said yoke presents a channel-section viewed either through its side walls or through the center of its bottom binders or brace, substantially as set forth.

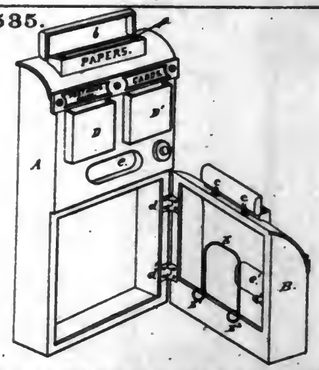
402,534. GAS-GENERATOR. SAMUEL MCILVAINE, Oakwood, Ontario, assignor to Catharine McIlvaine, Toronto, Canada. Filed Feb. 14, 1888. Serial No. 263,967. (No model.)



Claim.—1. In a retort-vaporizer, the combination of the following parts: a retort having an open top and a central bottom elevation, a vertical cylinder set on said retort and having a gas-exit pipe, and a steam and oil pipe passing down through the cylinder and connecting with a funnel which partly incloses the aforesaid elevation, all as shown and described.

2. In a retort-vaporizer, the combination, with a vertical cylinder and a retort below the same, of an annular steam-generator surrounding the cylinder, a steam-pipe connecting with the generator, and an oil-pipe joined with said steam-pipe and extending down through the cylinder, and a funnel connected with said pipe, as shown and described.

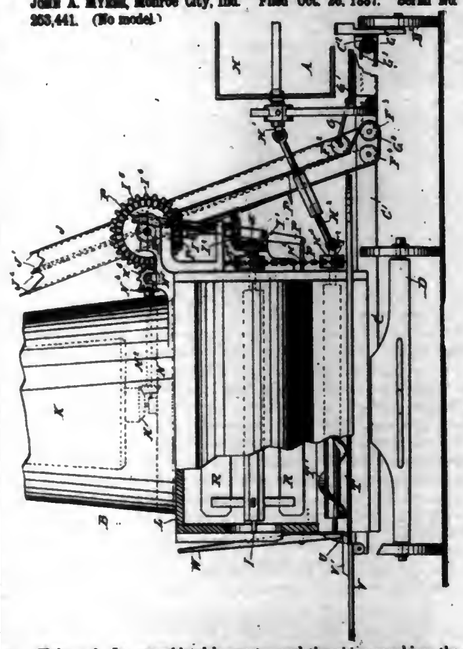
402,535. LETTER-BOX. JONATHAN R. MOREN, Hyde Park, Ill. Filed Sept. 2, 1887. Serial No. 248,397. (No model.)



Claim.—1. In mail-boxes designed to be used on residences, public buildings, and offices, the combination of the receptacle for periodicals, provided with an opening through which they may be introduced from the outside, and a receptacle for letters provided with an opening through which they may be introduced from the outside, said receptacles being hinged together and so constructed that one forms a door to the other, openable to permit access to both the periodicals and the letters, substantially as described, and for the purpose set forth.

2. In mail-boxes having a periodical-receptacle and a receptacle for letters hinged together, so that one forms a door for the other, the combination, with the letter-receptacle, of the guard E, substantially as and for the purposes described.

402,536. COMBINED HARVESTER AND THRASHING-MACHINE. JOHN A. MYERS, Monroe City, Ind. Filed Oct. 26, 1887. Serial No. 253,441. (No model.)

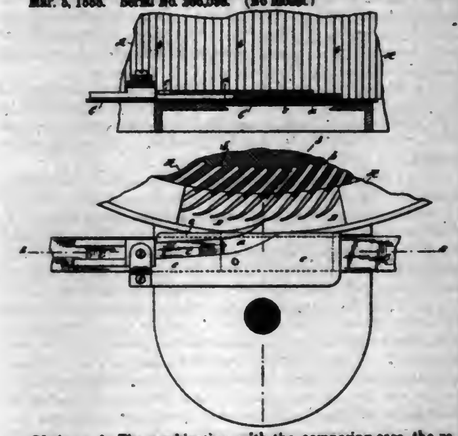


Claim.—1. In a combined harvester and thrashing-machine, the combination of the main driving-shaft E, provided with the pulley F, the pulleys F^3 F^4, the belt F', actuating the pulleys F^3 and F^4, the knife-bar G', the pitman G, connecting the knife-bar to a pin on the pulley F^3, the rollers G^2 and G^3, the roller G^3 being on the shaft of the pulley F^3, and the apron G^4, passing over said rollers, substantially as herein shown and described.

2. In a combined harvester and thrashing-machine, the combination of the main driving-shaft E, provided with the pulley F, the pulleys F^3 F^4, the belt F', actuating the pulleys F^3 and F^4, the knife-bar G', the pitman G, connecting the knife-bar with a pin on the pulley F^3, and the elevator-belts J' J^3, driven from the pulleys F^3 and F^4, substantially as herein shown and described.

3. The main shaft E, the pulley F, mounted on the said shaft, the endless belt or chain F', and the pulleys F^3, F^4, and F^4, actuated by the said belt or chain F', in combination with the pitman G, connecting the knife-bar G' with the pulley F^3, the endless apron or belt G^3 operated by the pulley F^3, and the endless belts J' and J^3, operated from the pulleys F^3 and F^4, substantially as shown and described.

402,537. TYPE-SETTING MACHINE. ROBERT W. NELSON, Hartford, Conn., assignor to the Thorne Machine Company, same place. Filed Mar. 8, 1888. Serial No. 266,592. (No model.)



Claim.—1. The combination, with the composing-case, the revolving type-carrying table, and the type-conveying belt, of the bridge-plate *a*, forming a continuation of the table and extending above the belt, substantially as described.

2. The combination, with the type-conveying belt C and the side guides, *c*, of the bridge-plate *a*, extending over the belt between the guides, substantially as described.

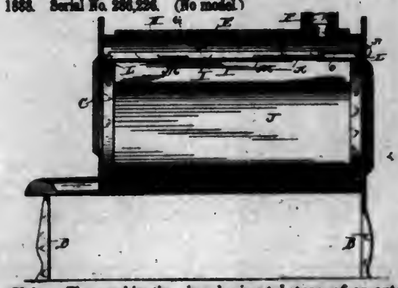
402,538. TOOL-DRIVER. CHRISTOPHER H. OLSON, Decatur, Ill., assignor to the Decatur Coffin Company, same place. Filed June 8, 1888. Serial No. 276,508. (No model.)



Claim.—1. A tool-driver comprising the spiral shaft, the handle adapted to rotate the shaft by longitudinal reciprocation, the coupling-sleeve secured to the shaft and having the square recess, the securing-screw in the sleeve, and the tool having the square portion, the round bearing, and the diminished portion adapted to the securing-screw, as set forth.

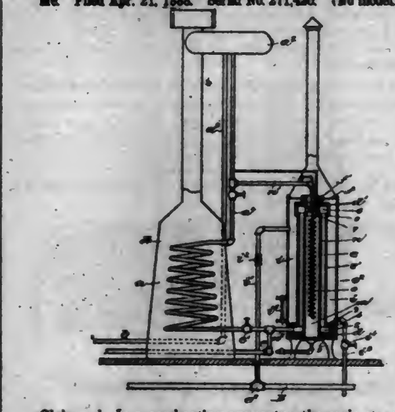
2. A tool-driver comprising the spiral shaft having guide-collar *g*, the handle adapted to rotate the shaft by longitudinal reciprocation and having the bearing *d'* for the guide-collar, the coupling-sleeve secured to the shaft and having the square recess, the securing-screw in the sleeve, and the tool having the square portion, the round bearing, and the diminished portion adapted to the securing-screw, as set forth.

402,539. STOVE. WILLIAM H. OWEN, Onarga, Ill., ARTHUR C. BOSWELL, Fowler, Ind., and JOHN J. CARLOCK, Watseka, Ill. Filed Sept. 24, 1888. Serial No. 286,226. (No model.)



Claim.—The combination, in a horizontal stove, of an outer cylindrical casing formed with a longitudinal bulge at its top, having apertures for cooking utensils and for the stove-pipe, with an inner casing opening at the top of the stove into the fire-place, passing around the inside of the outer casing parallel to the same, and a longitudinal soot and drip receptacle or trough secured with one of its edges to the outer cylindrical casing at its top in the interior thereof, and secured with its opposite edge to the upper edge of the inner casing, the said trough or receptacle being formed at one end with a draft-opening and a damper sliding over the same, substantially as set forth.

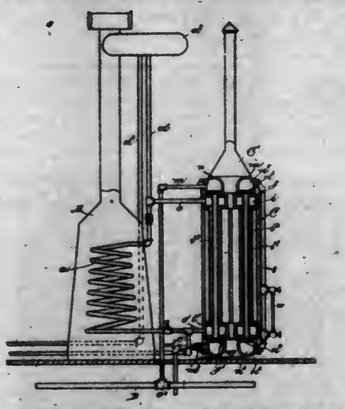
402,540. CAR-HEATING APPARATUS. JOHN R. PORTER, New York, N. Y., assignor to the Sewall Safety Heating Company, Portland, Me. Filed Apr. 21, 1888. Serial No. 271,420. (No model.)



Claim.—1. In a car-heating apparatus, the main steam-pipe and the pipe *i'* leading therefrom to the steam-chamber, combined with the main heater comprising the closed steam jacket or chamber *i*, the water-chamber *n*, contained concentrically and entirely within it, the open-end heating-chamber *m*, contained within the water-chamber, the grooved heads *d d'*, through which the chamber *m* is continued, and the circulating-pipes opening into said heads, substantially as described.

2. In a car-heating apparatus, the heater consisting of the vertical annular water-chamber *n* and the vertical annular steam or heating chamber *i*, parallel to and surrounding it and attached at its lower end to the head *d*, the annularly-grooved heads *d d'*, which form the ends of the chamber *n*, and the diaphragm *f*, closing the upper end the chamber *i*, substantially as described.

402,541. CAR-HEATING APPARATUS. JOHN R. PORTER, New York, N. Y., assignor to the Sewall Safety Heating Company, Portland, Me. Filed Apr. 21, 1888. Serial No. 271,421. (No model.)



Claim.—1. In a car-heating apparatus, the combination, with the main steam-pipe and a system of warming-pipes, of several vertical water-reservoirs connected to each other at their ends by the chambered heads *i i'*, and in communication thereby with the warming-pipes, that the water may circulate freely therethrough, and several steam-reservoirs, i^2, passing entirely through said chambered heads, in communication with the main steam-pipe and with each other by the chambers n^2 n^2 and extended through the said water-

reservoirs and surrounded throughout their length by the water contained therein, substantially as described.

2. In a car-heating apparatus, the main steam-pipe and warming-pipes, combined with the water-chambers *f f'*, connected by two or more pipes, i^3, attached to the under and upper side, respectively, of the said chambers, and the steam-chambers n^2 n^3, secured and adjacent to said chambers *f f'*, respectively, and connected by two or more pipes, i^3, arranged within, parallel and concentric with relation to the water-pipes and passing completely through, but not communicating with, said water-chambers, substantially as described.

3. In a car-heating apparatus, the heater herein described, comprising the chambered heads *i i'*, joined by the pipes i^3, attached to the under and upper sides, respectively, of the said heads, and the chambered heads *n n'*, joined by the pipes i^3, which pass through the chambered heads *i i'* and concentrically through the pipes i^3, substantially as described.

4. In a car-heating apparatus, the heater comprising several vertical water-reservoirs, i^3, completely inclosed in a drum or casing, C, open at its ends and adapted to be heated externally by a flame in said drum, combined with the warming-pipes attached to said reservoirs at the end thereof, substantially as described.

402,542. CHURN. JOHN J. PURSLEY, Hubbell, Nebr. Filed Sept. 26, 1888. Serial No. 286,447. (No model.)

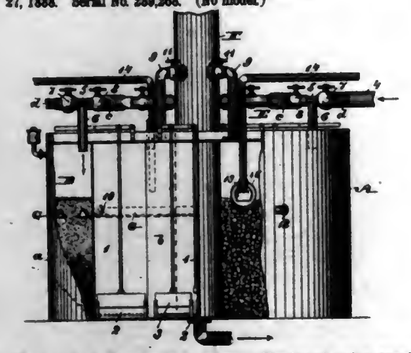


Claim.—1. A churn-body provided with outwardly-bulging pockets near its upper portion opening into the interior of the body, in combination with ducts longitudinally located upon the exterior of the body, the lower ends thereof opening into the lower portion of the body, and their upper ends opening into said pockets and extending up through and above the bottom of the same, as set forth.

2. A churn-body provided with pockets at its upper portion opening into the interior of the body, ducts opening into the body at or near its bottom and extending upwardly into said pockets, and deflectors upon the upper open ends of said ducts to throw the liquid passing from the same against the walls of the pockets, in combination with a reciprocating dasher in the body to force the liquid through the ducts, substantially as described.

3. A churn-body having longitudinal communicating ducts, in combination with a reciprocating dasher in the same, composed of a head snugly fitting in the body and provided with an aperture, a closed vertical rod to reciprocate the head, a valve to close the head when the same is pushed down and force the liquid through the ducts and open the aperture for the passage of liquid when the head moves up, and an open frame loosely confining the valve to the head, substantially as described.

402,543. FILTER. HENRY ROEMER, Philadelphia, Pa. Filed Oct. 27, 1888. Serial No. 289,268. (No model.)



Claim.—1. A filter having a primary filtering-chamber provided with partitions forming compartments, valves at or near the lower portions of said partitions, a secondary chamber in communication with the primary chamber, valves between said chambers, and discharge-pipes connected with the secondary chamber, substantially as described.

2. A filter having an outer and an inner chamber, each divided into compartments, valves affording communication between said compartments, a stand-pipe with pipes leading from each of said inner compartments, and a supply-pipe with branch pipes leading into each of said outer compartments, said parts being combined substantially as described.

3. A filter having primary and secondary chambers, a supply-pipe, a distributing-pipe, a branch pipe connected with said distributing-pipe and primary chamber, two valves connected with the branch pipe, and a discharge-pipe with a valve connected with the secondary chamber, the parts named being combined substantially as described.

4. In a filter having a chamber with filtering material therein, a flue having a peaked closed roof and perforated bottom located in said filtering material and connecting with a plug on the outer wall of the outer chamber, said parts being combined substantially as described.

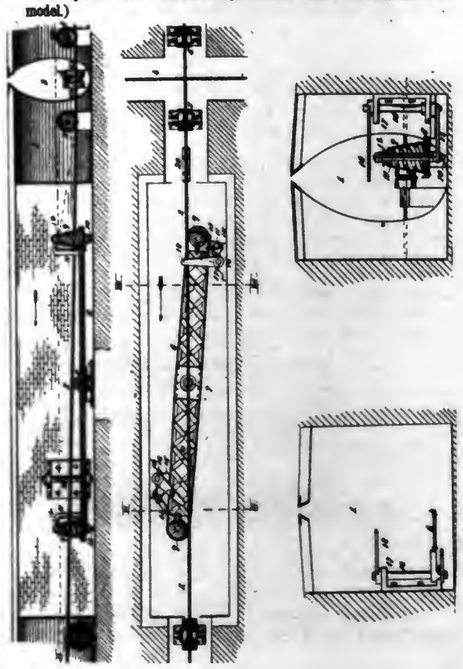
5. A filter having a partitioned chamber and a flue or canal within the filter-bed thereof, said flue being closed at top, perforated at bottom, and open at its ends, one end communicating with the atmosphere through an opening in the outer wall of the chamber and the other end communicating with a partition of the chamber, the opening in said wall being provided with a closing cap or plug, the parts enumerated being combined substantially as described.

6. A filter having primary and secondary chambers, with means of communication between the same, a supply-pipe, a distributing-pipe, with a branch pipe connected with the primary chamber, two valves on the branch pipe, partitions in the primary chamber forming compartments, with valves between the same, a discharge-pipe connected with the secondary chamber, and flues or canals within the filter-bed of the primary chamber communicating with said chamber, the partition thereof, and the atmosphere, the several parts being combined substantially as described.

7. The distributing-pipe E, in combination with the branch pipe 5, attached thereto, having a conveying-pipe, 6, leading into the filtering-chamber, said branch pipe having valves 7 8, of different capacities, and said conveying-pipe and the outlet end *d* of the branch pipe being of greater diameters than the inlet ends *e* of said branch pipe, substantially as described.

8. A filter having a filtering-chamber with partitions therein, the latter having ports affording communication between adjacent compartments, and channels leading from said ports to the atmosphere outside of said chamber, said parts combined substantially as and for the purpose set forth.

402,544. CABLE-LIFTER FOR RAILWAY-CARS. DANIEL W. SMITH, St. Louis, Mo., assignor of one-half to Elias E. Wilson, same place. Filed Sept. 15, 1888. Renewed Apr. 4, 1889. Serial No. 306,028. (No model.)



Claim.—1. In a cable-lifter, the combination of a pivoted beam, rollers on the beam for elevating the cable, and mechanism for operating the beam automatically through means of the grip, substantially as set forth.

2. In a cable-lifter, the combination of a pivoted beam, rollers secured to the opposite ends of the beam, a cable passing on opposite sides of said rollers, and mechanism for moving the beam automatically through means of the grip, substantially as set forth.

3. In a cable-lifter, the combination of the pivoted beam, conical rollers secured to the opposite ends of the beam, a cable passing on the opposite sides of said rollers, and mechanism for moving the beam automatically through means of the grip, substantially as set forth.

4. In a cable-lifter, the combination of the pivoted beam, rollers mounted on opposite ends of the beam and having threaded peripheries, a cable passing on opposite sides of the rollers, and mechanism for moving the beam automatically through means of the grip, substantially as set forth.

5. In a cable-lifter, the combination of the pivoted beam, rollers mounted on opposite ends of the beam, grooved pulleys on top of the rollers, a cable passing on opposite sides of the rollers, and mechanism for moving the beam automatically through means of the grip, substantially as set forth.

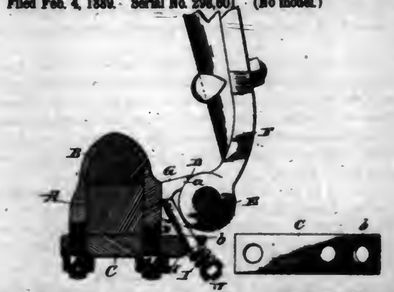
6. In a cable-lifter, the combination of the pivoted beam, rollers mounted on opposite ends of the beam, clevises securing the rollers to the beam, a cable passing on opposite sides of the rollers, and mechanism for moving the beam automatically through means of the grip, substantially as set forth.

7. In a cable-lifter, the combination of the pivoted beam, rollers mounted on opposite ends of the beam, and mechanism for moving the beam automatically through means of the grip, said mechanism consisting of rock-shafts, levers secured to the rock-shafts, segments or arms secured to the rock-shafts, and links connecting the segments or arms to the respective ends of the beam, substantially as and for the purpose set forth.

8. In a cable-lifter, the combination of the pivoted beam, rollers secured to the opposite ends of the beam, mechanism for moving the beam automatically through means of the grip, said mechanism consisting of rock-shafts, levers secured to the rock-shafts, arms or segments secured to the rock-shafts, and links connecting the arms or segments with the beam, said links having slot-and-pin connection with said segments, substantially as set forth.

9. In a cable-lifter, the combination of the beam, rollers, and mechanism for moving the beam, said beam consisting of channel-bars connected by crossing-strips, substantially as set forth.

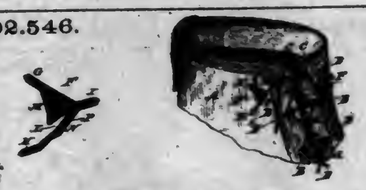
402,545. THILL-COUPLING. STEPHEN G. SMITH, Hannibal, Mo. Filed Feb. 4, 1889. Serial No. 298,901. (No model.)



Claim.—1. In a thill-coupling, the combination, with a clip, a thill-iron having an eye, and a bolt passing through the clip and eye, of a non-yielding block located between the clip and adjacent end of the thill-iron and provided with a flat face which bears against the front face of the clip, and with a forwardly-projecting lip which overhangs and rests on the thill-iron, an arm depending from the lower face of the block, a spring encircling said arm and bearing against a rigid support, and a nut secured on the arm and forming a bearing for the spring, substantially as set forth.

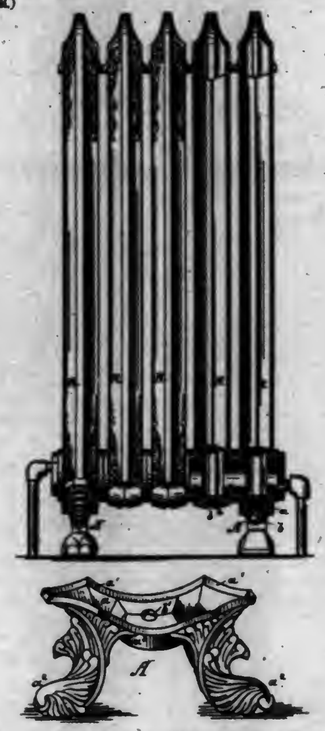
2. In a thill-coupling, the combination, with a clip, a thill-iron, and a securing-bolt, of the securing-bar provided with a beveled front end, and an oblique opening through said front end, a non-yielding block located between the clip and eye of the thill-iron and having a beveled lip which rests on or against the head of the thill-iron, a forwardly-curved arm depending from the block and passing through the oblique slot in the bar, a spring encircling the arm and resting against the inclined or beveled end of the bar, and a nut for locking the spring in position, substantially as set forth.

402,546. SHOE-LACE FASTENER. IRA R. STOFFEL, Hatboro, and CHARLES R. CUTHBERT, Pittsburg, Pa. Filed Sept. 3, 1888. Serial No. 284,436. (No model.)



Claim.—A shoe-fastening provided with two sector-shaped portions, M N, disposed one above the other and separated by a slit or opening, L, the lower laterally-projecting portion, N, being provided with an upwardly-projecting flange or lip, P, substantially as specified.

402,547. RADIATOR. SAMUEL D. TOMPKINS and THOMAS H. WILLIAMS, Jersey City, N. J. Filed Feb. 27, 1888. Serial No. 301,349. (No model.)



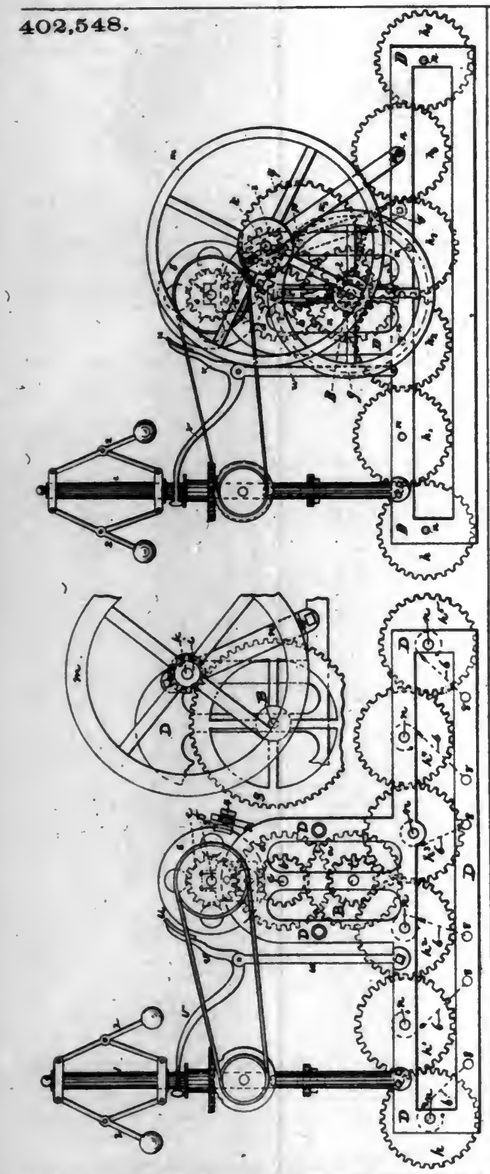
Claim.—The combination, with a radiator composed of interchangeable sections, each having a convex lower end, of interchangeable leg-arches for the sections, having concave upper surfaces to receive the convex lower ends of the radiator-sections, secured by a bolt or other locking device to hold the leg-arches in position on any section, substantially as described.

402,548. SPRING-MOTOR. BENJAMIN TURTON, Newark, N. J., assignor of three-fourths to Joseph L. Doremus, John Turton, and Harry Turton, all of same place. Filed Mar. 23, 1888. Serial No. 268,217. (Model.)

Claim.—1. In a spring-motor, the combination, with the main frame and driving-shaft of the machine, of a supplemental frame, *o*, shaft *p*, journaled in said frame *o*, spring 9, auxiliary gear-wheel *q*, independent of but connected with the spring driving mechanism, and pinion *r*, connecting said auxiliary gear-wheel with the driving-shaft of the machine, substantially as shown, and for the purposes set forth.

2. In a spring-motor, an auxiliary spring driving mechanism consisting of a supplemental frame, *o*, shaft *p*, journaled in said frame *o*, spring 9, auxiliary gear-wheel *q*, independent of but connected with the spring driving mechanism, and pinion *r*, connecting said auxiliary gear-wheel *q* with the main driving-shaft of the machine, in combination with the main spring driving mechanism consisting of a series of spring-bearing shafts, *n*, gear-wheel h^3, revolving on one of said shafts *n* and meshing into pinion *t* on main shaft, a series of gear-wheels revolving on similar shafts, *n*, and arranged to transmit their united

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power to gear-wheel A^2, and pawl-and-ratchet devices connecting said gear-wheels with their respective shafts, all as shown and described, and for the purposes set forth.

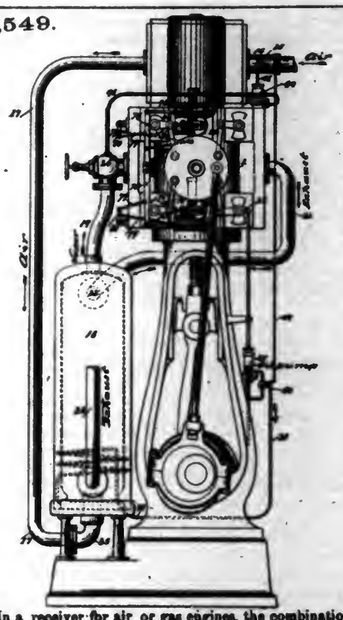
402,549. GAS OR AIR ENGINE. STEPHEN WILCOX, Brooklyn, N. Y. Filed Mar. 21, 1887. Renewed Feb. 7, 1889. Serial No. 299,067. (No model.)

Claim.—1. The combination, with a gas-engine receiver having its induction-port at the bottom and eduction-port at the top, of a pulverizer, through which the induction passes thereto, and a deflector, around which the eduction escapes therefrom, as set forth.

2. A gas-engine receiver having a surrounding jacket enveloping a heating-coil, one end of said coil connecting with the oil-pump and its opposite end with the pulverizer, as set forth.

3. In a gas-engine having a compressed-air receiver and air and fuel pumps, a pressure-regulator for controlling the effective capacity of both the air and fuel pumps to determine the amount each shall furnish to maintain a uniform pressure and to supply the cylinder with charges of maximum efficiency.

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4. In a receiver for air or gas engines, the combination, with a compressed-air-inlet pipe entering said receiver and provided with a porous diaphragm intercepting its aperture, of an inflammable fluid-chamber surrounding the margins of said diaphragm and so located that the portions of the inflammable fluid not effectually pulverized by the action of the air in the manner described shall be returned by gravity to said chamber and repulverized.

5. In an air or gas engine in which combustible gases are fired in the working-cylinder, the combination of a heat-transmitting igniter-tube, the same being exposed to an exterior flame and communicating at its inner end with the working-cylinder, at its outer end with an exterior chamber, with an interposed controlling-valve between the igniter-tube and the exterior chamber, whereby the explosive mixture within said cylinder is admitted to said tube and fired at the moment of opening said controlling-valve, substantially as described.

6. In air or gas engine in which combustible gases are fired in the working-cylinder, the combination of a heat-transmitting igniter-tube and exterior chamber, substantially as shown, with an interposed controlling-valve between the firing-tube and the exterior chamber, the same being actuated simultaneously with the variable cut-off movement of the cylinder induction-valve, so as to fire the cylinder-charge at the moment of cut off.

7. In an air or gas engine, an air-pump cylinder constructed with valve-boxes, substantially as described, covered by the working-cylinder head and opposite extended pump-cylinder head and side bonnets, whereby the valve-seats are made accessible and the examination and removal of the valves facilitated.

402,550. SURGICAL-NEEDLE CASE. EMIL WILLBRANDT, Indianapolis, Ind. Filed Feb. 5, 1889. Serial No. 298,763. (No model.)



Claim.—1. A case for containing surgical needles, composed of metal and having a metallic part formed with depressions in its surface to receive the needles, and means, substantially as described, for holding said needles in place, substantially as set forth.

2. A case for containing surgical needles, having a diaphragm arranged centrally therein and formed with corrugations in both its sides to receive said needles, substantially as set forth.

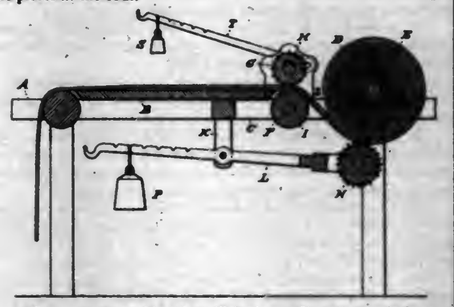
3. In a case for surgical needles, a diaphragm corrugated to receive said needles and formed with slots transversely of said corrugations, substantially as set forth.

4. The combination of the two-part case A and diaphragm B, hinged together at one edge and provided with a catch at the other, the springs A', secured to said case A, and the slots b, formed in said diaphragm at the points where said springs close against it, substantially as set forth.

5. A needle-case formed of metal and provided with slots, whereby boiling water may be allowed to flow into and escape from said case, substantially as described, and for the purposes specified.

402,551. MACHINE FOR WINDING BAGGING, &c., IN PIECES. DAVID J. WIER, Sumter, S. C. Filed Dec. 12, 1888. Serial No. 293,390. (No model.)

Brief.—The object of the machine is to form a roll out of pieces of bagging, &c., so that each piece shall follow the preceding one in stretched and even shape and without the necessity of first connecting the pieces at the ends.

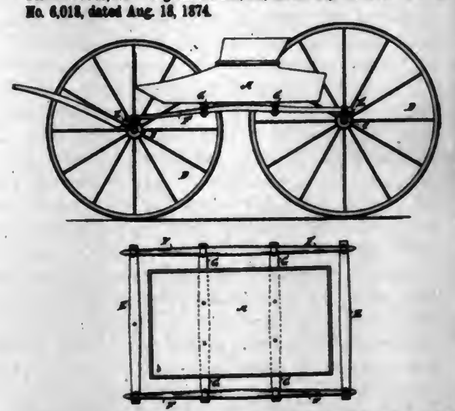


Claim.—1. A machine for rolling pieces of bagging or cloth, consisting of the feed-table and the rollers I G thereon, the roll-shaft, under lever, L, spur-roller N, and weight P, substantially as specified.

2. A machine for rolling pieces of bagging or cloth, the combination, with the table having an opening at one end and the roll-shaft in bearings at the outer end of said opening, of the rollers I G at the inner end of said opening, the under lever, L, spur-roller N, and weight P, substantially as specified.

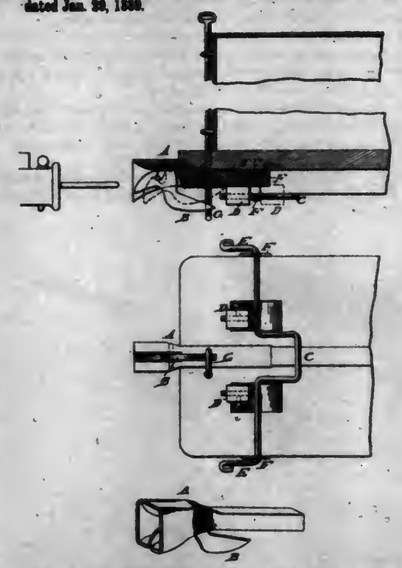
REISSUES.

10,998. LIGHT CARRIAGE. J. R. BREWSTER & COMPANY, New York, N. Y., assignees of THOMAS H. WOOD, deceased. Filed Mar. 15, 1888. Serial No. 268,500. Original No. 139,248, dated May 27, 1873. Reissue No. 6,018, dated Aug. 14, 1874.



Claim.—A frame consisting of the longitudinal side bars, P P, downwardly-bowed end springs, E E, and upwardly-bowed middle springs, G G, constructed, arranged, and applied as and for the purpose described, each middle spring being connected to the under side of the body and to the under side of each side bar.

10,999. CAR-COUPLING. FREDERICK J. HUSBER, Watford, Ontario, Canada. Filed Apr. 6, 1889. Serial No. 306,285. Original No. 307,053, dated Jan. 28, 1889.



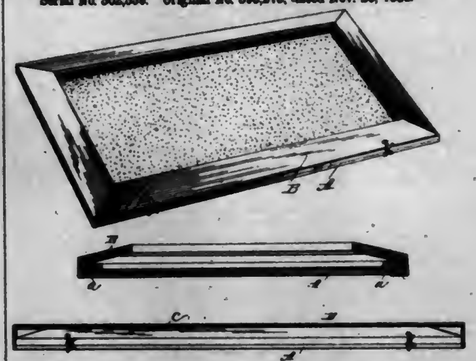
Claim.—1. The combination of the draw-head A, having a solid top for the exclusion of snow and ice, with the counterweighted dog B, having the bottom of its hook below the level of the pivot, so as to permit of an upward pull by the link and an easy disengagement thereof, substantially as shown and described.

2. In combination with dog E, under shaft with cranks E E bent at each end, with bent center C and adjustable weights D D opposite, which move in a half-circle when uncoupling from side of car, and journals F F, which carry said under shaft, as shown and described.

3. In combination with dog B, upright rod G, passing down end of car, with hand-hold at top, with bottom end turned at right angles, which acts on dog for uncoupling from top of car.

4. The combination of the draw-head A, having a beveled mouth or link-guide, and the counterweighted dog B, with inclined curve, as stated above, on the top or part that engages link, with the bottom of its hook below the level of the pivot and coming even with front part of draw-head and projecting upward and forward of beveled mouth of draw-head, substantially as set forth.

11,000. COMBINED STICKY FLY-PAPER HOLDER AND TRAP. OTTO THUM and WILLIAM THUM, Grand Rapids, Mich. Filed Mar. 8, 1889. Serial No. 302,539. Original No. 300,273, dated Nov. 20, 1883.



Claim.—1. A combined holder and trap consisting of a support for the fly-paper, and an open frame or holding-rim above the paper, said rim being extended upwardly and inwardly, substantially as described.

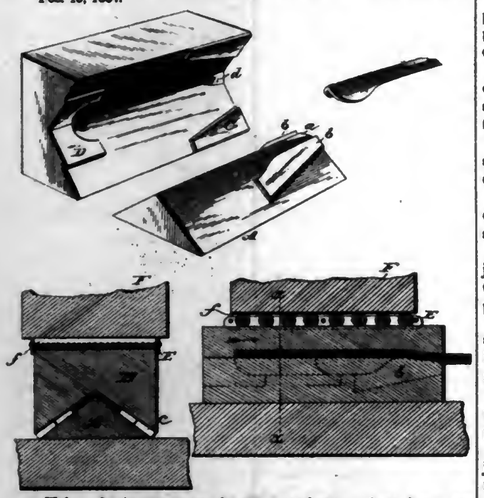
2. A combined holder and trap consisting of a support for the fly-paper, and an open frame or holding-rim above the paper, the said rim being inclined inwardly and upwardly, substantially as described.

3. A holder for fly-paper consisting of a base-plate to support the paper, and a hinged open frame or rim for clamping the paper to the base-plate, said rim extending inwardly and upwardly, so that its inner edge is above the fly-paper, substantially as described.

4. A combined holder and trap consisting of a base-plate, a rim inclined inwardly and upwardly, having its inner edges above the surface of the fly-paper, said rim being hinged to the base-plate, and a cover for the holder, substantially as described.

5. A combined holder and trap consisting of the base-plate and rim hinged thereto having a clamping-frame, *a*, and a fastening for holding the rim and base-plate together, substantially as described.

11,001. DIE FOR MAKING EYE-BARS. JOHN F. KINSLEY, Athens, Pa. Filed Feb. 11, 1889. Serial No. 299,526. Original No. 357,333, dated Feb. 15, 1887.



Claim.—1. An apparatus for the manufacture of eye-bars, consisting of upper and lower die-sections, as A B, means for moving one of said sections vertically in relation to the other and longitudinally over the face of the other, and an upsetting projection, D, on the face of the moving section, substantially as described.

2. An apparatus for the manufacture of eye-bars, consisting of a lower die-section, A, angular in cross-section, an upper die-section, B, corresponding thereto, a projection, D, on the face of one of said sections, and means for moving one of said sections vertically and longitudinally, substantially as described.

3. A pair of dies for forming eye-bars and the like, one of said dies having a projection, D, at one end, and the other having projections *b b* at the opposite end, with a space between the projections *b b*, substantially as described.

4. In the manufacture of eye-bars, a pair of dies having forming projections upon each die extending above the level of the die-surface proper, substantially as described.

5. In the manufacture of eye-bars, a pair of dies having forming projections upon each die extending above the level of the die-surface proper, one of said dies having longitudinal movement over the face of the other to upset the bar, substantially as described.

6. In combination, a pair of dies having forming projections upon each die extending above the level of the die-surface proper, one of said dies being stationary and the other having vertical and longitudinal movement, substantially as described.

7. In combination, the upper and lower dies, angular in cross-section, the surfaces of said dies diverging from each other from the center outward, substantially as described.

8. A pair of dies having projections upon their faces, having a cut-away portion, *a*, on one die and a projection, *d*, on the other die, substantially as described.

9. A pair of dies, one movable over the face of the other, a projection on one at one end and a pair of projections with a space between them on the other at the opposite end, the inner ends of the pair of projections being cut away, substantially as described.

10. The combination of upper and lower dies, triangular in cross-section, as shown, and having projections upon their inner or meeting faces, the upper one of said dies being adapted to move vertically and longitudinally over the lower die, substantially as described.

11. The combination, with a lower die and a vertically-moving upper die, of a former-head and a frame provided with rollers supported upon the upper die, substantially as described.

12. The combination, with an upper and a lower die having projections, as thus described, of the roller-frame, substantially as and for the purpose set forth.

13. The combination, with a lower die-section and a vertical movable upper die-section, of a former-head, and rollers interposed between the said head and die, substantially as described.

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DECISIONS

OF THE

COMMISSIONER OF PATENTS

AND OF

UNITED STATES COURTS IN PATENT CASES.

DECISIONS OF THE U. S. COURTS.

Supreme Court of the United States.

BALLARD *v.* SEARLS.

Decided March 5, 1889.

PRACTICE IN THE COURTS.

The facts are set forth in the statement below. The Court held that the whole basis and foundation of the present suit had disappeared by reason of its decree in a former case, and that the cause should be remanded to the circuit court with instructions to allow the appellant, defendant below, to file such supplemental bill as he may be advised, in the nature of a bill of review, or for the purpose of suspending or avoiding the decree, upon the new matter arising from the reversal of the decree in the former case.

APPEAL from the Circuit Court of the United States for the Eastern District of Michigan. On motion of the appellant for a reversal of the decree upon matters shown to the court.

Mr. Charles J. Hunt for the appellant.
Mr. A. G. N. Vermilya for the appellee.

Mr. Justice BRADLEY delivered the opinion of the Court.

The appellant has made a motion that the decree appealed from in this case, so far as it affects the said appellant, be reversed, and that the cause may be remanded to the circuit court with direction to dismiss the bill. This motion proposes that the decree be reversed without argument of the cause in view of extrinsic facts, which are made to appear by the records of this Court and of the circuit court, and by affidavits. If such a course can be properly taken in any case, we think it would be improper in the present, since the decree may be perfectly correct and free from objection on the facts of the case as they appear upon the record, and it is possible to be correct, notwithstanding the facts alleged by the appellant. These facts, however, are of such a character that the appellant may be subjected to great injustice if the cause should go to hearing on the appeal in the present condition of the record; and, as they have occurred since the appeal was taken, there seems to be no mode of affording relief to the appellant except by sending the cause back to the circuit court for the purpose of allowing supplementary proceedings to be had in that court.

The facts as stated by the appellant, and not denied by the appellee, are as follows:

On the 12th day of July, 1880, Anson Searls, the appellee in this cause, filed in the Circuit Court of the United States for the Eastern District of Michigan his bill of complaint against Alva Worden and John S. Worden, for the infringement of a patent, and such proceedings were had in the cause that on the 5th day of September, 1883, a decree was entered in said cause in said circuit court, whereby it was decreed that the said Alva Worden and John S. Worden infringed the patent, and should pay over to the said Anson Searls $24,960.31.

That upon the entry of said decree the defendants appealed the case to this Court. But the defendants, Alva Worden and John S. Worden, were unable to give the necessary bond to operate as a supersedeas bond upon said appeal.

On the 17th of September, 1883, the complainant issued an execution on his decree, and placed it in the hands of the marshal of said district.

On the 18th of September, 1883, the marshal, under the execution, levied upon certain lots in the city of Ypsilanti, county of Washtenaw, and upon certain lands in the town of Sumpter, county of Wayne, all in the State of Michigan, in the eastern district thereof, the property of the said appellant, Harrison H. Ballard; and on other lands in the said city of Ypsilanti, belonging to the said Alva Worden and John S. Worden, but which were mortgaged to Mary Ann Andrews, Henry M. Curtis, Henry Van Tuyl, and Charles King.

That, on the 10th day of October, 1883, the said Anson Searls, in aid of his execution against the Wordens, filed in the said Circuit Court of the United States for the Eastern District of Michigan, his bill of complaint against Harrison H. Ballard, Mary A. Andrews, Henry M. Curtis, Henry Van Tuyl, Charles King, Alva Worden, and John S. Worden, to set aside as fraudulent and void, as to the creditors of the said Alva Worden and John S. Worden, the conveyances under which the said Harrison H. Ballard held the lands so levied upon; and also the mortgages given by the said Alva Worden and John S. Worden on the said lands belonging to them to the said Mary Ann Andrews, Henry M. Curtis, Henry Van Tuyl, and Charles King. That such proceedings were had in said last-mentioned cause; that the cause was brought to a final hearing, and a decree entered on the 24th day of November, A. D. 1884, in which it was decreed that the mortgages given by the said defendants Alva Worden and John S. Worden to the said defendants Mary A. Andrews, Henry M. Curtis, Henry Van Tuyl, and Charles King, were good and valid liens upon the lands mentioned therein, and that the several conveyances to Harrison H. Ballard were fraudulent and void as against the creditors of the said Alva Worden and John S. Worden.

Thereupon the said defendant Harrison H. Ballard prayed an appeal to the Supreme Court of the United States to reverse the said decree, as far as it related to him.

That the said appeal was allowed and the amount of the appeal bond was fixed at the sum of $8,500. That the said bond was duly executed and approved by one of the judges of the said circuit court, and filed in the office of the clerk of said circuit court. That on the 8th day of October, 1885, the clerk of the said Circuit Court of the United States for the Eastern District of Michigan transmitted the transcript of the record in the case of *Anson Searls* v. *Harrison H. Ballard et al.* to the clerk of the Supreme Court of the United States, and that the said transcript was filed in the office of the clerk of this Court on the 13th day of October, 1885, and now stands on the docket for the October term, 1888, as No. 144.

That since the appeal in this case, the appeal in the original case of *Alva Worden and John S. Worden, Appellants* v. *Anson Searls* has been heard in this Court, and a decree entered thereon on the 27th of March, 1887, wherein and whereby it was, among other things, ordered, adjudged, and decreed that the final decree of the said circuit court in this cause be, and the same is hereby, reversed with costs, and that the same be remanded to the said circuit court with a direction to dismiss the bill with costs.

That on the 8th day of August, 1887, this Court issued its mandate in the said case of *Alva Worden et al., Appellants* v. *Anson Searls* to the said circuit court, in which, among other things, the said Circuit Court of the United States for the Eastern District of Michigan was directed to dismiss the bill with costs.

That said mandate was filed in the said circuit court on the 3d day of October, 1887.

That on the 3d day of September, 1888, a decree was entered in pursuance of said mandate in the case of *Anson Searls* v. *Alva Worden and John S. Worden* (the original case) dismissing the bill of complaint with costs.

It is apparent from this statement that the whole basis and foundation of the present suit has disap-

peared by the decree rendered in the former case of *Worden and others* v. *Searle*, reported in 121 U. S., 14. Surely there ought to be some mode of relieving a party in such a case. The appellee is endeavoring to collect the amount recovered by a decree which has been reversed, and in a case in which his bill has been dismissed on the merits. The object of the present suit is to aid the execution of that former decree by having declared void certain conveyances of property by the defendants, which the appellee has caused to be levied on for the satisfaction of the decree. If the former decree had been reversed before the taking of the present appeal, the appellant could have instituted supplementary proceedings in the circuit court for obtaining the benefit of that reversal. The conveyances sought to be set aside were good as between the parties, and only void as to creditors: and as the appellee, by the reversal of his decree, ceased to be a creditor, his bill to have the conveyances set aside had no longer any ground to stand on. A supplemental proceeding of some kind, therefore, would have been the right of the defendant, the present appellant. But as the case had been removed to this Court by appeal before that decree of reversal was rendered, such a proceeding was out of his power. Nor could it be taken in this Court, where the case was pending on appeal, for this Court cannot entertain proceedings that require the exercise of original jurisdiction, except in the few cases pointed out in the Constitution.

The only course which can be properly pursued is to remand the cause to the circuit court, with instructions to allow the appellant to file a supplemental bill, in the nature of a bill of review, or a bill to suspend or avoid the operation of the decree, according to the mode pointed out by Lord Redesdale in his work on Equity Pleading. He says, on page [86]:

> But if a case were to arise in which the new matter discovered could not be evidence of any matter in issue in the original cause, and yet clearly demonstrated error in the decree, it should seem that it might be used as ground for a bill of review, if relief could not otherwise be obtained.

And on page [95] he says:

> 5. The operation of a decree signed and enrolled has been suspended in special circumstances, or avoided by matter subsequent to the decree, upon a new bill for that purpose—

and he gives an instance occurring in the time of Charles II. These views are adopted by Mr. Justice Story in his work on Equity Pleading. (See sections 415 and note, 428.) We do not decide what precise form such a proceeding should take: the appellant will be advised by his counsel in this regard.

The appellee, in opposition to the appellant's motion, has produced the certificates of the marshal of the United States for the Eastern District of Michigan, showing that, on the 10th day of December, 1884, he sold the property in dispute, or some part thereof, to certain persons, under the execution issued upon the decree in the case of *Anson Searls* v. *Alva Worden and John Worden*, (which was reversed by this Court, as before stated,) and that the purchasers would be entitled to a deed of said lands, and the sales would become absolute at the expiration of fifteen months, unless previously redeemed as prescribed by the statute of Michigan.

It is possible that these sales may complicate the inquiry to be made by the Court upon the supplemental proceedings of the appellant; but we do not see that they can preclude such proceedings. It is not shown that the purchasers have advanced any money on the faith of the purchases; and it is possible that the appellant can show that they were made for the benefit of the appellee; in either case the sales would be liable to be set aside on the reversal of the decree. Should the circuit court deem it proper to require that the purchasers be made parties to the supplemental proceedings, the facts of the case could be fully elicited, and right could be done without prejudice to any of the parties.

Our decision is that the cause be remanded to the circuit court with instructions to allow the appellant, defendant below, to file such supplemental bill as he may be advised, in the nature of a bill of review, or for the purpose of suspending or avoiding the decree, upon the new matter arising from the reversal of the decree in the former case of *Anson Searls* v. *Alva Worden and John Worden*, and that such proceedings be had thereon as justice and equity may require, and it is so ordered.

Supreme Court of the United States.

THOMPSON *v.* HALL *et al.*

Decided March 18, 1889.

JOHNSON—CUTTING-PLIERS.

The conclusion of the circuit court (33 O. G., 1140,) that Moses C. Johnson was not the first and original inventor of the improvements claimed in Letters Patent No. 232,975, granted October 5, 1880, to Henry G. Thompson, as assignee of said Moses C. Johnson, for cutting-pliers, sustained and decree affirmed.

APPEAL from the Circuit Court of the United States for the Eastern District of New York.

Mr. Horace Barnard for the appellant.
Mr. Amos Broadnax for the appellees.

Mr. Justice BLATCHFORD delivered the opinion of the Court.

This is a suit in equity, brought in the Circuit Court of the United States for the Eastern District of New York, by Henry G. Thompson against Thomas G. Hall, J. F. Oliver, Samuel Leopold, and David L. Harris, for the alleged infringement of Letters Patent No. 232,975, granted October 5, 1880, to the plaintiff, as assignee of the inventor, Moses C. Johnson, for an improvement in cutting-pliers, on an application filed June 2, 1880.

The specification, drawings, and claim of the patent are as follows:

This invention relates to cutting-pliers, and is an improvement on that class of pliers represented in United States Patent No. 209,677, dated November 5, 1878, granted to T. G. Hall, to which reference may be had. In that invention either of the two hand-levers may be turned on its pivot without turning the other, and the tool-body formed by the face or covering plates is permitted to vibrate or turns more or less with relation to the handles, and the central space between the cutting-faces of the jaw-levers, when the pliers are taken in the hand to be used, drops more or less out of line with the central line of the handles, making, as it were, a loose joint midway between the ends of the pliers.

One of the objects of my invention is to construct a stiff pair of pliers, or pliers in which the hand and jaw levers shall each be compelled to move positively in an opposite direction to the movement of its fellow, or a pair of pliers in which the tool-body shall not of itself swing or vibrate upon the pins or studs holding the hand-levers.

In the patent above referred to the end of wire or other thing cut off by the cutters drops into and injures the spring that opens the jaw-levers. This I obviate by providing each jaw-lever with a lip to cover or bridge the space between the jaws as the jaw-levers are closed.

My invention consists in the combination and arrangement of parts for effecting these ends, as hereinafter specified and claimed.

Figure 1 represents, in side elevation, a pair of cutting-pliers containing my improvements; and Fig. 2, a like view with one of the body or side plates removed.

Fig. 1.

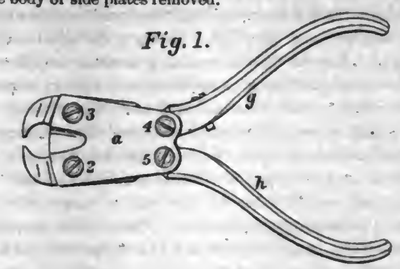
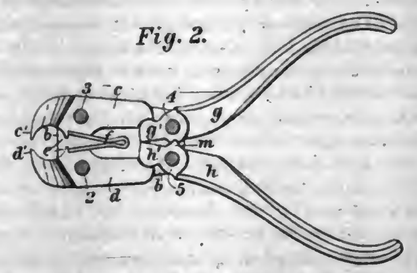


Fig. 2.



The body of the pliers is composed of two side plates, *a b*. These side plates are fixed together by the screws 2 3 4 5. Of these screws, those 2 3 serve as the fulcra of the jaw-levers *c d*, having at their ends the usual cutters or cutting-surfaces *c' d'*. Each of these jaw-levers has a lip, *l*, and the end of one meets the end of the other lip just as or just before the two cutting-edges *c' d'* separate the wire or other metal end to be cut off by them, thus closing the space between the said jaw-levers and side plates, in which is placed the spring *f*, and preventing the entrance into said space of hard pieces of wire or other articles that would clog the pliers. These lips also serve another essential purpose—viz., that of holding the ends of the spring from displacement and obviating the employment of a separate pin or stud to hold the said spring at one end, as heretofore common.

The screws 4 5 serve as the fulcra for the hand-levers *g h*, having short arms *g' h'*, to act upon the ends of the longer arms of the jaw-levers and turn them on their fulcra to close the jaws and bring the cutting-edges together. The spring *f* opens the jaws the instant the clasping pressure on the hand-levers is relaxed.

In order to move the jaw-levers equally at all times and prevent the jaw-levers and body of the pliers turning on the handles, I have provided one hand-lever with a prong, *m*, having a rounded end that enters a rounded notch in the opposite lever. This one prong and its notch are always in engagement, and so connect the two levers that the body of the pliers cannot vibrate on the screws 4 5, but, on the contrary, the two levers may turn each on its own pivot, both levers always turning the same distance, but in exactly opposite directions. This connection between the two hand-levers, as described, insures a stiff pair of pliers, that can be handled more readily and accurately than the old form of cutting-pliers referred to, and which are more positive as to the movement of the cutting-jaws.

I am aware, in bolt-cutters, where the short ends of the hand-levers are jointed with the long ends of the cutting jaw-levers, that a series of teeth or cogs have been interposed to cause the hand-levers to be geared together; but in such bolt-cutters one single tooth and notch would not operate to always keep the two hand-levers locked together as to their movement in unison, as is the case with my one prong, *m*, rounded at its end and inserted within a rounded notch.

I claim—

The body composed of the side plates, *a b*, the independent fulcra 2 3 4 5 for the jaw-levers and hand-levers, the jaw-levers provided with cutting-edges and with lips *c*, and the hand-levers having short arms *g' h'*, and a prong and notch always in engagement, as described, combined with the V-shaped spring, held, as described, by the lips of the jaw-levers, all as and for the purpose set forth.

One of the defenses set up in the answer is, that Johnson and Thompson surreptitiously obtained the patent in fraud of the rights of the defendants; that the defendants are trustees and directors of a New York corporation, known as the Interchangeable Tool Company; that that corporation was organized in August, 1878, for the purpose of manufacturing cutting-pliers or nippers, under Letters Patent No. 209,077, granted to the defendant Hall, November 5, 1878; that Hall invented certain improvements upon such pliers, and immediately described and explained them to the officers of the company; that the company thereupon caused a model of them to be made, embracing such improvements; that Johnson was employed to make such model pliers for the company, and made them for the company while in its employ, and under the direction of Hall; that Johnson was in the employ of the company, in making such pliers, from April 20, 1879, until May 1, 1880, during which time the company made and sold upward of 30,000 of such pliers, with the knowledge and consent of Johnson, and without any objection on his part, and without notice that he claimed to be the inventor of the whole or any part of such pliers, or intended to apply for a patent for the same; that Hall was the first and original inventor of said original cutting-pliers and of said improvements thereon, and assigned to the company the whole of the patent of November 5, 1878, immediately on its issue, and also the whole of said improvements upon such cutting-pliers; that Johnson, after so being in the employ of the company for one year, was dismissed from its service, and thereupon, as the result of a conspiracy between Thompson, Johnson, and one Gustam, Johnson falsely claimed that he was the first and original inventor of said improvements, and applied for a patent therefor, and sold his pretended claim to the invention to Thompson; and that Johnson, without the knowledge of Hall, or of the other defendants, or of the company, applied for a patent for said improvements, falsely alleging that he was their first and original inventor, and surreptitiously obtained said patent, No. 232,975, for said invention of Hall, and for an improvement upon the pliers so patented November 5, 1878. There was a replication to this answer, proofs were taken, and the circuit court entered a decree dismissing the bill, from which the plaintiff has appealed. In its opinion (33 O. G., 1140; 25 Fed. Rep., 906) the circuit court stated, that the question at issue was whether the combination covered by the claim of the plaintiff's patent was invented by Johnson while he was an employé of the corporation; that the plaintiff had sought to prove that a model produced by him, known as Exhibit C, was made by Johnson while he was in the employ of the company; that, on the other hand, the defendants had sought to prove that that model was not made by Johnson while he was employed by the company, but after he had been discharged from its employ, and for the purpose of supporting a fraudulent claim to an invention really made by Hall, and which claim had been put forth by Johnson for the first time after he had been discharged from the service of the company; and that, upon a full consideration of all the evidence, the conclusion of the court was, that Exhibit C was not made while Johnson was a workman for the company, but was made subsequently to his leaving its employment, and that he was not the first inventor of the combination claimed in the patent issued to the plaintiff.

The testimony is voluminous and contradictory, and, without discussing it, it is sufficient to say that we are of opinion that the evidence establishes the conclusion reached by the circuit court, and that the decree must be affirmed; and it is so ordered.

U. S. Circuit Court—Eastern District of Michigan.

RODEBAUGH *et al. v.* JACKSON *et al.*

Decided February 25, 1889.

1. RODEBAUGH—SAW-MILL DOG—INVALID PATENT.
The first claim of Letters Patent No. 196,102, granted October 16, 1877, to George W. Rodebaugh, for an improvement in saw-mill dogs, is anticipated by the patent of Craney, No. 150,534, dated May 5, 1874.

2. LIMITATION IMPOSED BY PATENT OFFICE.
The intimation in *Sargeant* v. *Hall* (114 U. S., 38) that the limitations introduced into an application after it was persistently rejected must be strictly construed against the inventor and in favor of the public, and looked upon as in the nature of disclaimers, means no more than that when under the state of the art and the action of the Office a patentee of a combination has modified and limited his claim he shall be held strictly to the combination as he has described it. It does not debar the patentee from the benefit of the doctrine of equivalents.

3. SAME—MECHANICAL EQUIVALENT.
In such a case, where an infringer has attempted to avoid the patent by the use of a well-recognized mechanical equivalent, the court is bound to look to the state of the art at the time the patent was applied for to determine the limitations of the claim.

4. ANTICIPATION—EQUIVALENT.
When a T-lever had already been used for operating a saw-mill dog, there was no invention in the substitution of an eccentric-lever which was used to perform the same function in a no more effectual manner.

5. SAME—REARRANGEMENT.
The rearrangement of an old combination, where each element of the combination operates practically as before, is not patentable unless a new or greatly-improved result is gained.

6. SAME—NON-INFRINGEMENT.
Where the claim is limited to a lever locking in vertical position, and defendants' lever, like a prior patented lever, locked in a horizontal position, *Held* that the claim is either anticipated or not infringed.

IN equity.

STATEMENT OF THE CASE.

This was a bill in equity to recover damages for the infringement of the first claim of Letters Patent No. 196,102, issued October 16, 1877, to George W. Rodebaugh, for an improvement in saw-mill dogs. The claim alleged to be an infringement read as follows:

1. The combination of the eccentric-lever E E', pivoted to the standard B at O, with the connecting-strap F, articulated to the arm G of the reciprocatory shaft D, carrying the dog-head, the parts being so arranged that a downward movement of the lever will embed the dog into the log and lock it there, the lever assuming a perpendicular position against the standard out of the way, substantially as described.

The defense was anticipation and non-infringement.

Mr. Charles J. Hunt for the plaintiffs.

Messrs. Coulter & Griffin and *Mr. Harry E. Knight* for the defendants.

BROWN, *J.:*

A dog is an instrument for holding a log in position while it is being sawed into boards or planks. Formerly the log was supported on the ends of the carriage and was held firmly down and secured against lateral displacement by iron dogs hinged to the carriage and having teeth which were driven into the ends of the log. When the circular saw came into use, the form of the carriage was changed. Instead of supporting the log at the end, it was laid so its side rested on the side rail of the carriage, and was supported its entire length. To hold it in position, two or more movable supports, called "knees," were placed upon the carriage behind the log. To prevent the rolling of the log, two or more pieces of iron were hinged or hung to the cross-pieces of the carriage, having at their free ends a right-angled hook, which was driven into the log. These were also called "dogs." After a time this arrangement was followed by teeth attached to the knees and operated in various ways. Some were driven down into the timber by blows and some by means of levers of various shapes. In some cases the teeth moved simultaneously in an upward and downward direction—that is, into the upper and under sides of the log or cant—and in others the action was separate. These teeth were not often locked in place; but in a few cases the adjustment of the lever locked them in position. These teeth were also called "dogs;" but the term was also applied to the whole device, which was placed on the knee of the carriage, and included all the mechanism for protruding and retracting the teeth. Under this state of the art the patent in this suit was issued. The patentee Rodebaugh claims an improvement in these dogs, consisting of an eccentric-lever pivoted to the standard upon which the dog slides, the office of which is to raise and lower the reciprocating shaft, which carries the dog-head, by means of a connecting-strap between the eccentric and reciprocating shaft. By the use of this device the teeth of the dog are forced into and withdrawn from the log at pleasure.

In order to ascertain the full scope of Rodebaugh's invention it is necessary to advert for a moment to the first claim of his original application. It read as follows:

1. The eccentric-lever E E, connecting-strap F, combined with the vertical shaft or bar D, carrying the dog-head, substantially as described, for the purpose specified.

This was a broad claim for the use of an eccentric-lever and connecting-strap combined with a shaft carrying the dog-head for the purpose of raising and lowering the teeth, and was rejected by the Patent Office upon the ground that it had been substantially anticipated by Patent No. 163,309, issued to C. R. Ely, for a head-block. This was a combination of a lever working with a cam, the object of which was to elevate and depress the dog-head, which was carried upon a cylinder in much the same manner as Rodebaugh's. The ground of the rejection is not stated; but it is obvious that it must have been upon the theory that the eccentric-lever of Rodebaugh was a substantial equivalent for the weighted lever and cam of the Ely patent. The operation of the two is admitted to be substantially identical, and, in our opinion, the action of the examiner in holding that there was no invention in substituting the one for the other was correct. Upon this intimation from the Patent Office Rodebaugh thereupon amended his claim and restricted himself to the combination of the eccentric-lever pivoted to a standard, with a connecting-strap articulated to an arm of the reciprocating shaft carrying the dog-head, the parts being so arranged that a downward movement of the lever will embed the dog into the log and lock it there, the lever assuming a perpendicular position against the standard, out of the way. Defendants' theory is that Rodebaugh, having assented to the rejection of his original claim and having substituted another, is bound by the literalism

of his new claim; and inasmuch as in the defendants' device the lever when locked does not assume a perpendicular position, as required by Rodebaugh's claim, there is no infringement. If it be broadly true that a patentee who has re-formed his claim under instructions from the Patent Office is thereby debarred from the benefit of the doctrine of equivalents, his position is correct. It is true there is an intimation in the case of *Sargeant* v. *Hall* (114 U. S., 86) that the limitations introduced into an application after it was persistently rejected must be strictly construed against the inventor and in favor of the public, and looked upon as in the nature of disclaimers; but on a careful consideration of this and other cases we think nothing more is meant than that where, under the state of the art and the action of the Office, a patentee of the combination has modified and limited his claim he shall be held strictly to the combination as he has described it. Thus in *Leggett* v. *Avery* (101 U. S., 259) it is intimated that if an applicant, in order to obtain the issue of a patent, acquiesces in the rejection of a claim thereto, a reissue containing such claim is invalid; but there is no suggestion that the patentee of such reissue is not entitled to the benefit of the doctrine of equivalents. So, in the *Goodyear Dental Vulcanite Company* v. *Davis*, (102 U. S., 222-227,) after disclaiming an assertion that the correspondence between the applicant for a patent and the Commissioner of Patents can be allowed to enlarge, diminish, or vary the language of a patent after it is issued, it is said that a patent, like any other written instrument, is to be interpreted by its own terms.

But when a patent bears on its face a particular construction, inasmuch as the specification and claim are in the words of the patentee, it is reasonable to hold that such a construction may be confirmed by what the patentee said when he was making his application. The understanding of the party to a contract has always been regarded as of some importance in its interpretation.

So all that was said in *Fay* v. *Cordesman* (109 U. S., 420) is that if the patentee specified any element as entering into the combination, he makes such element material, and the court cannot declare it to be immaterial. It is his province to make his own claim and his privilege to restrict it. If it be a claim to a combination and be restricted to specified elements, all must be regarded as material, leaving open only the question whether an omitted part is filled by an equivalent device or instrumentality. There is nothing in any of these cases inconsistent with what had been previously regarded as well settled, or to lead one to believe that it was the intention of the court to debar the patentee from his right to pursue an infringer who has endeavored to avoid his patent by the use of a well-recognized mechanical equivalent. We think, therefore, that we are bound to look to the state of the art at the time this patent was applied for to determine the limitations upon the clause in question.

Under the first clause of plaintiffs' patent as amended there are none of the so-called anticipations which are worthy of serious consideration except that of Craney, which undoubtedly resembles Rodebaugh's device in all its important particulars. There is a fixed standard, A, corresponding to plaintiffs' standard B, a guide-bar, B, answering to the reciprocating shaft D, and the same lever E, though in one it is a T-lever and in the other an eccentric, a connecting-bar, D, performing substantially the same functions as the connecting-strap F of the Rodebaugh patent, and a projecting or horizontal arm, C, which answers the purpose of plaintiffs' arm G, projecting from the upper end of the reciprocating shaft. All these elements perform substantially the same functions as the corresponding elements of the Rodebaugh patent. There are, however, three distinctions in the two devices, which it becomes necessary to notice before determining finally the question of anticipation.

First, in the use of a T-lever instead of an eccentric. This fact is relied upon by the plaintiffs as constituting the improvement which distinguishes the Rodebaugh patent not only from that of Craney, but from all the others which are claimed as anticipations. But the testimony, even of plaintiffs' experts, indicates very strongly that for the purpose of driving the teeth of the dog into the log a T-lever performs the same function and in as effectual a manner as an eccentric. The operation of the two is precisely the same. Indeed, a model was exhibited in which an eccentric and a T lever were used to move coincidently the same connecting-rod, and their operation was shown to be practically identical. The one difference suggested is that eccentrics are not affected by back-pressure—a distinction which is strenuously denied by defendants' experts—while the lever may be moved backward and forward unless it is locked. This, however, is of no importance, as it is always intended that the lever operating the dog shall either be locked or held in place by a weight upon the end of the lever. We are clear in our opinion that there is no invention in substituting one for the other.

Second, there is in the Rodebaugh patent a rearrangement of the entire combination of the Craney patent by placing the lever and locking device midway between the upper and lower ends of the standard, instead of at the bottom, and using it to depress the upper dog, instead of raising the lower dog into the log. We do not understand that the rearrangement of an old combination, where each element of the combination operates practically as before, is patentable unless a new or greatly-improved result is gained. (*Woodward* v *Dinsmore*, 4 Fish., 163, 169.) The variations of the Rodebaugh patent from that of Craney are scarcely greater than those of defendants' device from that of Rodebaugh, and it is entirely clear to our mind that defendants' device differs from that of Rodebaugh only in the rearrangement of the combination, by which a connecting-rod operated by a thrust and articulating with the movable shaft at the bottom is substituted for a connecting-strap, F, operating by tension and articulated with the reciprocating shaft at the top by means of the arm G. In this particular the case is much like that of *Ives* v. *Hamilton*, (92 U. S., 426.)

Third, the feature of the Rodebaugh patent by which the lever when the dog is locked assumes a perpendicular position against the standard out of the way, is not found in the Craney patent, and is probably the novel arrangement which obtained from the Patent Office the allowance of his first claim as amended. Now, this is either a mechanical equivalent for a lever which locks horizontally, or it is not. If it be such an equivalent, then it is anticipated by the Craney patent; but if it be not such equivalent

and be a patentable improvement upon the Craney patent, then it is not infringed by the defendants, since they do not use this feature of the claim.

There was undoubtedly considerable mechanical ingenuity shown by Rodebaugh in readjusting the various elements of the Craney combination, and perhaps some improvement in its mechanical operation, and we think his device approaches very near the border line of invention; but upon the point which has been most earnestly pressed upon our attention, that the eccentric is a patentable improvement over the T-lever—and the plaintiffs' case was practically put upon this ground—we have not been able to adopt their view.

U. S. Circuit Court—Eastern District of Michigan.

RODEBAUGH *et al. v.* JACKSON *et al.*

Decided March 13, 1889.

1. RODEBAUGH—SAW-MILL DOG—INVALID PATENT.
The first claim of Letters Patent No. 196,102, granted October 16, 1877, to George W. Rodebaugh, for an improvement in saw-mill dogs, is anticipated both by the patent of Craney, No. 150,534, dated May 5, 1874, and the patent of Ely, No. 163,309, dated May 18, 1875.

2. LIMITATION IMPOSED BY PATENT OFFICE.
Where a claim in complainants' application broad enough to cover the machine used by defendants was rejected on reference to a prior patent, and the applicant was compelled to present a new claim having a limitation not found in the claim first presented, the new claim cannot be enlarged to cover what was first rejected.

3. SAME—NON-INFRINGEMENT.
Where after official rejection a patentee's claim was limited to the specific device described, in which the lever for operating the dog-bar locked when in vertical position, and the defendant's lever was so arranged as not to lock in that position, *Held* to be no infringement.

ON application for rehearing.

Mr. Charles J. Hunt for the complainants.

Messrs. Coulter & Griffin and *Mr. Harry E. Knight* for the defendants.

JACKSON, *J.:*

I concur fully in the conclusion reached by the district judge that the Rodebaugh patent of October 16, 1877, Letters Patent No. 196,102, was anticipated by the patent issued to Thomas Craney, No. 150,534, dated May 5, 1874; that in so far as the Rodebaugh improvement differs from that of the Craney patent nothing more than mechanical skill was involved and exercised. I am further of the opinion that said Rodebaugh patent was anticipated by the patent of Ely, No. 163,309, dated May 18, 1875. Secondly, if the Rodebaugh patent could be held valid, it would, in view of the action of the department as shown by the file-wrapper and contents, have to be limited to the precise mechanism and construction therein described, and that as thus limited it is not infringed by the machine used by the defendants. Rodebaugh's original claim was broad enough to have covered the machine as used by defendants. It was:

1. The eccentric-lever E E, and connecting-strap F, combined with the vertical shaft or bar D, carrying the dog-head, substantially as described, and for the purpose specified.

This claim was rejected by the Patent Office in reference to said Ely patent, No. 163,309, in which is found an eccentric-lever operating on the vertically-reciprocating bar which carries the dog and capable of locking the bar in any position it may be set. Upon the rejection of this broad claim Rodebaugh was compelled to present the new claim now shown in claim 1 of the Letters Patent issued to him, which cannot by any construction or under any rule or doctrine of equivalents be enlarged so as to cover or embrace what was previously rejected. It must manifestly be limited to the specific device therein described, in which the dog-head is locked when the eccentric-lever has been moved through the half-circle, or 180 degrees of the circle of its action, and brought into a perpendicular position with the standard or shaft. The defendants' lever is differently constructed, having its greatest locking capacity when in a horizontal position and losing this locking capacity entirely when carried to the position of the perpendicular, at which the Rodebaugh lever makes its most effective lock.

I am clearly of the opinion that the application for rehearing should be denied, and that complainants' bill should be dismissed, with costs.

U. S. Circuit Court—Northern District of Illinois.

LYMAN *v.* BURNS.

Decided April 15, 1889.

INJUNCTION.
Injunction under Trade-Mark No. 16,473, registered April 9, 1889, by Moses Lyman, for a game, "Pigs in Clover."

BLODGETT, *J.:*

Now come the parties by their solicitors, and the complainant's motion for a preliminary injunction now comes on to be heard, and after hearing the arguments of counsel the court sustains said motion. Thereupon it is ordered that said defendant, his agents, servants, and workmen be, and they are hereby, enjoined and restrained, until the further order of this court, from marking, stamping, or designating in any manner games, toys, or any article of manufacture with the words "Pigs in Clover," or any material part thereof, or any word or designation that can be mistaken therefor, and from making games, toys, or puzzles of the size, shape, or appearance of "Exhibit A" which may in any manner be mistaken therefor, and that a writ of injunction issue accordingly.

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